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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

ute to:

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DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

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OFFICIAL GAZETTE of the
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January 7, 1997 Volume 1194 Number 1

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CONSOLIDATED LISTING OF OFFICIAL GAZETTE NOTICES RE PATENT AND TRADEMARK OFFICE PRACTICES AND PROCEDURES

PATENT NOTICES

The following is a compilation of the more important notices and rule changes which have been published in the Official Gazette from July 1, 1964 through December 31, 1996. These notices and rule changes are currently in effect unless otherwise noted.

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INFORMATION AND CORRESPONDENCE

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(1) Change of Address for Patent Applications and Patent Related Papers

Effective immediately, correspondence in patent-related matters under the direction of the Assistant Commissioner for Patents should be addressed to:

Assistant Commissioner for Patents
Washington, D.C. 20231

This change is being made to reflect the reorganization of the Patent and Trademark Office (PTO), and the integration of patent and trademark processing activities under the Assistant Commissioner for Patents and the Assistant Commissioner for Trademarks, respectively. The reorganization has been made to emphasize and facilitate better service to customers of the PTO.

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal, briefs in support of an appeal, requests for oral hearing, extensions of term of patent, requests for publication of Statutory Invention Registration (SIR), requests for reexamination, statutory disclaimers, petitions to the Assistant Commissioner for Patents, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. However, unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board of Patent Appeals and Interferences, patent services including certificates of correction, patent copy sales, assignments, library services, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks.

Special PTO mail boxes as currently listed in each issue of the *Official Gazette* should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the PTO's timely and accurate identification and processing of the designated correspondence.

All correspondence with the PTO, except for communications relating to pending litigation as specified in 37 CFR 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 Jefferson Davis Highway, Arlington, Va.

In addition to the Office of the Solicitor, as specified in 37 CFR 1.1(g), the Office will now have three separate addresses. The addresses are as follows: 1) Assistant Commissioner for Patents for correspondence described above; 2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Branch for recordation and requests for certified and uncertified copies of trademark documents. See: *Change of Address For Trademark Applications and Trademark Related Papers*, 1163 Off. Gaz. Pat. Office 80 (June 28, 1994); and 3) Commissioner of Patents and Trademarks for all other correspondence that does not fall into the categories designated above.

Those who correspond with the PTO are requested not to mix correspondence which will have to be directed to different areas (e.g., Patents and Trademarks) of the Office in a single envelope. At the present time, use of the wrong mailing address will not affect the filing date assigned to any application or correspondence received in the PTO, except as specified in 37 CFR 1.1(g).

The Office is currently preparing a notice of proposed rulemaking to formally change the address for patent-related correspondence. Sections 1.1, 1.8, 1.10 and 1.51 of Title 37 of the Code of Federal Regulations are waived to the extent that a certificate of mailing under section 1.8 or 1.10, for patent applications and related patent documents, may be addressed either to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or to the Assistant Commissioner for Patents, Washington, D.C. 20231.

March 9, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1173 O.G. 13]

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(2) Establishment of a Special Box for Comments to Proprosed Rulemaking

Effective immediately, the Patent and Trademark Office has established a special box designator for public comments regarding patent related regulations and procedures.

In order to take advantage of this new service, the envelope should be addressed:

Box Comments - Patents
Assistant Commissioner for Patents
Washington, D.C. 20231

Only comments regarding patent related regulations and procedures are to be placed in the envelope. In order to assist the public, notices published in the *Federal Register* or the *Official Gazette* will specifically direct that comments be addressed to "Box Comments - Patents" when appropriate.

January 11, 1996 STEPHEN G. KUNIN
Deputy Assistant Commissioner for Patent Policy and Projects

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Department of Commerce
Patent and Trademark Office

[Docket#: 950411100-6267-02]
RIN 0651-XX01

Extension of the Payor Number Practice (through "Customer Numbers") to Matters Involving Pending Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Change in Procedure.
Summary: The Patent and Trademark Office (PTO) is extending the Payor Number practice to matters involving pending patent applications. Payor Numbers are currently used to establish a "fee address" for receipt of maintenance fee correspondence. Through the use of "Customer Numbers," the PTO will extend the Payor Number practice to matters involving patent applications. Under this Customer Number practice, an applicant (or patentee) will be able to use a Customer Number to: (1) designate the address associated with the Customer Number as the correspondence address for an application (or patent); (2) designate the address associated with the Customer Number as the fee address (37 CFR 1.363) for a patent; and (3) submit a power of attorney in the application (or patent) to the registered practitioners associated with the Customer Number. The change of either the address or practitioners having a power of attorney in multiple patent applications through a single paper directed to the Customer Number should result in savings to the attorney, agent, or law firm, as well as the PTO.
Effective Date: November 1, 1996. Any request to change the correspondence address of a pending application to the address associated with a currently assigned Payor Number filed *before* November 1, 1996 will *not* be effective until November 1, 1996.
For Further Information Contact: Robert W. Bahr by telephone at (703) 305-9285 or by facsimile at (703) 308-6916, or by mail addressed to Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231.
Supplementary Information

Payor Numbers are currently used to establish a "fee address" for receipt of maintenance fee correspondence. Such Payor Numbers permit, *inter alia*, an attorney, agent or law firm to file a single change of address paper for the Payor Number, and this change of address is effective for every patent designating the address associated with the Payor Number as the correspondence address for the patent. This Payor Number practice avoids the filing of a separate change of address paper for every patent affected by the change of address.

In a Notice entitled "Extension of the Use of Payor Numbers to Matters Involving Pending Patent Applications" (Payor Number Notice), published in the *Federal Register* at 60 FR 26026-28 (May 16, 1995), and in the PTO *Official Gazette* at 1175 *Off. Gaz. Pat. Office* 14-15 (June 6, 1995), the PTO proposed to extend the current Payor Number practice to matters involving pending patent applications. In view of the comments received in response to the Payor Number Notice, the PTO is adopting the following "Customer Number" practice.

Currently assigned "Payor Numbers" will be redesignated as "Customer Numbers" to avoid requiring persons or organizations currently assigned a Payor Number to request a "new" Customer Number. Thus, persons or organizations currently assigned a "Payor Number" should not request a new "Customer Number." Persons or organizations not currently assigned a Payor Number can request assignment of "new" Customer Numbers.

The PTO has created a box designation for correspondence related to a Customer Number ("Box CN"), and all correspondence related to a Customer Number (*e.g.*, requests for a Customer Number) should be addressed to this box designation.

The PTO will provide standard forms to: (1) request a Customer Number (PTO/SB/125); (2) request a change in the data (address or list of practitioners) associated with an existing Customer Number (PTO/SB/124); (3) change the correspondence address of an individual application (PTO/SB/122) or patent (PTO/SB/123) to the address associated with a Customer Number; or (4) change the correspondence address of a list of applications or patents to the address associated with a Customer Number (PTO/SB/121). The PTO is also modifying its current standard forms (*e.g.*, the declaration form) to permit: (1) the designation of the address associated with the Customer Number as the correspondence address for an application; (2) designation of the address associated with the Customer Number as the fee address for a patent; and (3) the submission of a power of attorney in the application to the practitioners associated with the Customer Number. The forms provided by the Office may be obtained by contacting the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214. Also, many standard forms have been loaded on the PTO's Internet Website and may be electronically copied *via* the Internet through anonymous file transfer protocol (ftp) (address: ftp.uspto.gov). While use the standardized forms provided by the PTO is encouraged, it is not mandatory.

This notice of change in procedure contains a collection of information subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* This collection of information is currently approved by the Office of Management and Budget under Control No. 0651-0035. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Data Administration Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0035).

Notwithstanding any other provision of law, no person is required to respond to nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

The PTO will also accept requests submitted electronically *via* a computer-readable diskette to: (1) change the correspondence address of a list of applications or patents or the fee address for a list of patents to the address associated with a Customer Number; and (2) submit a power of attorney in a list of applications or patents to the registered practitioners associated with the Customer Number. Persons electronically submitting such a request *must* submit an IBM-compatible diskette containing a Microsoft Excel spreadsheet, or a comma separated text file which can be imported into Microsoft Excel spreadsheet, formatted as follows: (1) row 1, column B containing the six-digit Customer Number; (2) row 2 being blank; (3) rows 3 through 9 containing the address associated with the Customer Number; (4) rows 10 through 15 being blank; and (5) row 16 starting with the list of patents or applications with column A containing the patent number (if appropriate), column B containing the application number, column C containing the patent date (if appropriate), column D containing the application filing date, column E indicating "YES" or "NO" to designate assignment of the address associated with the Customer Number as the correspondence address of the application or patent, column F indicating "YES" or "NO" to designate assignment of the registered practitioners associated with the Customer Number as the list of persons having a power of attorney in the applications or patents, and column G indicating "YES" or "NO" to designate assignment of the address associated with the Customer Number as the fee address of the patent.

The patent number (if appropriate), application number, patent date (if appropriate), and application filing date are being required as redundant identifiers to avoid changing the correspondence or fee address or entering a power of attorney in the wrong patent or application due to a typographical error in the patent or application number. The PTO will enter a change in correspondence or fee address or power of attorney in a listed application or patent only if the following identifiers are provided: (1) the patent number and the corresponding application number; (2) the patent number and the corresponding patent date; (3) the application number and the corresponding filing date; (4) the patent number and the corresponding application filing date; and (5) the application number and the corresponding patent date.

A sample spreadsheet is included as an Appendix A to this notice of change in procedure. The phrase "Customer Number" in row 1, column A, and "Requester (Attorney/Firm) Information" in row 3, as well as the information provided in rows 10 through 15, are provided on the sample spreadsheet for explanatory purposes only, and should *not* be included on any spreadsheet submitted to the PTO.

The diskette must be accompanied by a paper copy of the spreadsheet and a cover letter requesting entry of the changes contained on the spreadsheet into PTO records for the listed applications or patents. In addition, for any application or patent listed on such spreadsheet, the cover letter must be signed by the applicant or patentee, assignee in compliance with 37 CFR 3.73(b), or registered practitioner of record in the patent or application. The PTO will issue a written confirmation of the list of applications or patents indicating the change(s) entered into PTO records.

Through the use of "Customer Numbers," the PTO is extending the "fee address" practice to matters involving pending patent applications to permit: (1) the designation of the correspondence address of a patent application by a Customer Number such that the correspondence address for the patent application would be the address associated with the Customer Number; (2) the designation of the fee address of a patent by a Customer Number such that the fee address for the patent would be the address associated with the Customer Number; and (3) the submission of a list of practitioners by a Customer Number such that an applicant may in a Power of Attorney appoint those practitioners associated with the Customer Number. While this notice discusses this new Customer Number practice as it regards patent applications and applicants, it will apply equally to patents and patentees.

The designation in a patent application of a specific Customer Number as the correspondence address for such application will permit an attorney, agent or law firm to file a single paper containing a change of address, rather than a separate paper in each application, and this change of address paper will be applicable to all applications designating the Customer Number as the correspondence address for such application. The designation of a Customer Number as the correspondence address for a patent application is optional, in that any application not designating a Customer Number as the correspondence address will not be affected by a change of address filed for a Customer Number, even if the correspondence address provided for such application is that of an attorney, agent, or law firm associated with a Customer Number. The change of address in multiple patent applications through a single paper directed to the Customer Number, rather than through individual letters directed to each application, will result in savings to the attorney, agent or law firm, as well as the PTO.

This new Customer Number practice will not affect the current practice of permitting a patentee to provide a "fee address" for the receipt of maintenance fee correspondence. A patentee will be able to designate a "fee address" for the receipt of maintenance fee correspondence, and a different address for the receipt of all other correspondence. The designation of a "fee address" by reference to a Customer Number will not affect or be affected by the designation of a correspondence address by reference to another Customer Number, in that the PTO will send maintenance fee correspondence to the address associated with the Customer Number designated as the "fee address" and will send all other correspondence to the address associated with the Customer Number designated as the correspondence address.

The association of a list of practitioners with a Customer Number will permit an applicant to appoint all of the practitioners associated with the Customer Number merely by reference to the Customer Number in the Power of Attorney (*i.e.*, without individually listing the practitioners in the Power of Attorney). The addition and/or deletion of a practitioner from the list of practitioners associated with a Customer Number will result in the addition or deletion of such practitioner from the list of persons authorized to represent any applicant who appointed all of the practitioners associated with such Customer Number. This will avoid the necessity for the filing of additional papers in each patent application affected by a change in the practitioners of the law firm prosecuting the application. The appointment of practitioners associated with a Customer Number will be optional, in that any applicant may continue to individually name those practitioners to represent the applicant in a patent application.

Currently, the PTO must individually enter into the Patent Application Location and Monitoring (PALM) system the registration number for each practitioner appointed to represent the applicant in a patent application. The change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Customer Number will require only a single entry into the PALM system, where the change of persons authorized to represent applicants in multiple patent applications through individual letters directed to each application require a separate entry into the PALM system for each affected application. Thus, the use of Customer Numbers in a Power of Attorney will significantly reduce the amount of data which must be entered into the PALM system, and would thus result in savings to the PTO. In addition, permitting a change of persons authorized to represent applicants in multiple patent applications through a single paper directing the PTO to change its records concerning the Customer Number would result in similar savings to the attorney, agent, or law firm.

As the PTO will not recognize more than one correspondence address (37 CFR 1.34(c)), any inconsistencies between the correspondence address resulting from a Customer Number being provided in an application for the correspondence address and any other correspondence address provided in that application would be resolved in favor of the address of the Customer Number. Where an applicant appoints all of the practitioners associated with a Customer Number as well as a list of individually named practitioners, such action would be treated as only an appointment of all of the practitioners associated with a Customer Number due to the potential for confusion and data entry errors in entering registration numbers from plural sources.

The following are examples of language effective to provide as the correspondence address the address of, and appoint those practitioners associated with, a Customer Number:

1. The following language would be effective to appoint those practitioners individually listed, and provide as the correspondence address the address of Customer Number 99,999:

> I hereby appoint the following practitioners to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:
>
> John Doe, Registration No. 99,991, Jane Doe, Registration No. 99,992 and Richard Doe, Registration No. 99,993.
>
> Address all correspondence to: Customer Number 99,999.

2. The following language would be effective to appoint those practitioners associated with, and provide as the correspondence address the address of, Customer Number 99,999:

> I hereby appoint the practitioners associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to that Customer Number:
>
> Customer Number 99,999.

Response to Comments

Eleven comments were received in response to the Payor Number Notice. The written comments have been analyzed, and responses to the comments follow.
Comment (1): Ten comments supported the proposed extension of use of the Payor Number practice to matters involving pending patent applications.
Response: In view of the positive response to this proposed extension of use of the Payor Number practice to matters involving pending patent applications, the PTO is extending the Payor Number practice to matters involving pending patent applications.
Comment (2): One comment opposed combining the maintenance fee Payor Number with the practitioner responsible for the application or patent. The comment argued that, in many instances, a client instructs a practitioner that a particular service organization is responsible for the payment of maintenance fees, and, while the practitioner continues as counsel of record and receives correspondence unrelated to maintenance fees (*e.g.*, reexamination or interference notices), the client advises

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that the practitioner is no longer responsible for payment of the maintenance fees or even reminding the client of the due date for paying such fees.

Response: As discussed *supra*, the implemented "Customer Number" practice will not affect the current practice of providing a "fee address" for correspondence relating to the payment of maintenance fees. While the current "Payor Numbers" will be redesignated as "Customer Numbers," a patentee will be permitted to specify a "fee address" by reference to one Customer Number (*e.g.*, the Customer or Payor Number of a maintenance fee service organization) and a correspondence address by reference to another Customer Number (*e.g.*, the Customer Number of the attorney or agent of record). Designating a "fee address" for maintenance fee payment purposes, by Customer Number or otherwise, will not affect the correspondence address for correspondence unrelated to maintenance fees, regardless of whether the correspondence address is also specified by a Customer Number. Likewise, providing a "fee address" for maintenance fee payment purposes, by Customer Number or otherwise, will not affect any previous appointments of practitioners.

Comment (3): One comment cautioned that sufficient safeguards be built into the system to avoid errors. Specifically, the comment cautioned that: (1) a data entry error in the Customer Number in one application (a key field error) would result in correspondence for that application being sent to an entirely different address; (2) a single error in the look-up data base would result in correspondence for every application designating a particular Customer Number being sent to an entirely different address; and (3) an indexing or programming error affecting the entire look- up data base could result in correspondence for every application designating any Customer Number being sent to an entirely different address.

Response: Currently, the application number is entered into the PALM data base to look-up the actual address (*i.e.*, the application number is a key field). Thus, the risk of error in the improper entry of a Customer Number is no greater than the current risk of error in the improper entry of an application number. Nevertheless, the PTO endeavors to reduce such errors by requiring that employees check the returned application data.

To avoid errors in information associated with a Customer Number, the PTO will double enter the Customer Number anytime there is a change to the information associated with the Customer Number. In addition, the PTO is in the process of developing Customer Number bar code labels for use on incoming requests for changes to the information associated with a Customer Number to permit scanning and reduce data entry errors.

In any event, errors in the look-up data base would result in correspondence for every application designating a particular Customer Number being sent to an entirely different address, and indexing or programming errors affecting the entire look-up data base could result in correspondence for every application designating any Customer Number being sent to an entirely different address. These errors would result in mismailings of such magnitude that it would be readily apparent to the attorney, agent or law firm of the Customer Number, if not the PTO, that an error has occurred.

Comment (4): Three comments suggested that registration numbers be used as Customer Numbers.

Response: The suggestion has not been adopted. The PTO currently has a data base of addresses (*i.e.*, fee addresses) associated with the current Payor Numbers that will be redesignated as "Customer Numbers." To avoid an adverse impact on the current fee address practice, the Customer Number practice is being implemented using the existing fee address data base. Thus, the PTO cannot use registration numbers as Customer Numbers since newly assigned Customer Numbers must be compatible with the existing Payor Numbers.

Comment (5): One comment suggested that a Power of Attorney be permitted to include the practitioners associated with a Customer Number and no more than one additional practitioner. The comment argued that clients will desire to name a responsible person in the Power of Attorney, and that this would also be helpful in the event that a practitioner withdraws from a law firm and the client continues with that practitioner. The comment cautioned that if this is not permitted, each practitioner will establish his or her own Customer Number, resulting in the appointment of a large number of Customer Numbers.

Response: The comment is adopted only to the extent indicated. To accommodate the desire of a client to see the responsible person mentioned by name in the Power of Attorney, a Power of Attorney appointing the practitioners associated with a specific Customer Number may also specifically mention any of the practitioners associated with such Customer Number. This mention may designate the responsible practitioner(s) as the principal attorney(s) or agent(s) in the application. In a Power of Attorney appointing those practitioners associated with a Customer Number, the specific mentioning of practitioner(s) will be ineffective to appoint a practitioner not associated with the Customer Number.

As discussed *supra*, the entry of a single Customer Number, rather than the individual registration number of each practitioner, into the PALM system is a primary benefit of permitting the appointment of a list of practitioners by Customer Number. As the individually listed practitioner is ostensibly among those practitioners associated with the Customer Number provided in the Power of Attorney, requiring the PTO to enter the individual registration numbers of a list of practitioners associated with a Customer Number, as well as the Customer Number, would frustrate this benefit. Thus, the PTO will treat such an appointment as an appointment of only those practitioners associated with the Customer Number.

Customer Numbers are designed to serve the dual purpose of providing a correspondence address, and providing the list of practitioners appointed with a power of attorney. Due to the prohibition against dual correspondence (37 CFR 1.33(a)), an applicant will be permitted to provide only a single number at a time as the Customer Number, and thus correspondence address, for the application. In an instance in which an applicant provides more than one Customer Number, the last provided Customer Number is controlling. Thus, the appointment of a plurality (much less a large number) of Customer Numbers will result in the PTO recognizing only the last mentioned Customer Number. Applicants are strongly cautioned not to attempt to appoint more than one Customer Number in a single communication, as such action will *not* have a cumulative effect.

Comment (6): Three comments suggested that in this new context, the term "Payor Number" could cause confusion, and would be demeaning to applicants and their representatives.

Response: In view of these comments, the term "Customer Number" has been used to describe the number having an address or a list of practitioners associated with such number. The term "Payor Number" was used in the Payor Number Notice as this term had a specific meaning with regard to the "fee address" for maintenance fee correspondence, and thus served to provide a frame of reference for the extension of such practice.

Comment (7): One comment suggested that the form of appointment refer to registered practitioners, rather than attorneys and agents.

Response: The PTO does not require any specific form of appointment (*i.e.*, the forms of appointment in the Payor Number Notice were merely exemplary). Nevertheless, the phrase "practitioner" is defined in 37 CFR 10. l(r), and "registered practitioners" is considered preferable to "attorneys or agents" or "attorneys and agents." As such, the PTO will change its standardized forms of appointment to refer to "registered practitioners."

Comment (8): One comment questioned the form and effect of an appointment of all practitioners associated with a Customer Number. The comment specifically questioned whether the practitioner would have to obtain a new power of attorney in a situation in which: (1) a practitioner is associated with the Customer Number of a law firm, and is thus appointed in every application appointing the practitioners associated with that Customer Number; (2) the practitioner subsequently leaves the law firm; and (3) an applicant in an application appointing the practitioners associated with the law firm's Customer Number continues with the practitioner leaving the law firm.

Response: The practitioner should obtain a new power of attorney to continue to have a power of attorney in the application. An appointment in an application of the practitioners associated with a particular Customer Number is the appointment of each of the practitioners associated with that Customer

Number at the time any practitioner associated with such Customer Number seek to act for the applicant. With such an appointment, a practitioner is of record until removed from the Customer Number (*i.e.*, until the practitioner is no longer associated with the Customer Number). As the practitioner's former law firm should promptly remove such practitioner from the list of practitioners associated with the law firm's Customer Number, a new power of attorney will be necessary for the practitioner to continue to have a power of attorney in the application.

In an instance in which a particular practitioner in a law firm has a significant number of clients who are clients of the practitioner rather than the law firm (*i.e.*, clients who would prefer to be represented by the practitioner, rather than the law firm, in the event that the practitioner left the law firm), such practitioner should consider establishing a Customer Number separate from the law firm's Customer Number. This would permit the clients of the practitioner to appoint a power of attorney to the practitioners associated with the practitioner's, rather than the law firm's, Customer Number. The practitioner can list any or all of the practitioners in the law firm as practitioners associated with the Customer Number, and can change the practitioners associated with the Customer Number in the event that the practitioner left the law firm. This would avoid the necessity for a new power of attorney in the event that the practitioner leaves the law firm.

Comment (9): One comment suggested that the proposed practice be extended to trademark applications.

Response: The suggestion has been forwarded to the Assistant Commissioner for Trademarks for consideration.

Comment (10): One comment suggested that procedures be adopted such that this number could be utilized informally to identify the source of documents such as drawings, certified copies, etc., by including this number on the back of the document.

Response: There is no prohibition against using a Customer Number on the back of a document to informally identify the source of the document. That is, while 37 CFR 1.52(b) and 1.84(e) provide that the application papers contain writing or drawings only on one side of a sheet, these provisions are directed to the writing and drawings forming the application papers. Thus, the inclusion of identifying information on the back of a sheet simply results in that information not being considered part of the application papers. However, the inclusion of a Customer Number to informally identify the source of a document is not a substitute for the inclusion on the document of the application number to which the document is directed. In addition, a telephone number should also be provided on such document, as the Customer Number will not provide the telephone number (but only the address) of the source of the document.

Comment (11): One comment suggested that the PTO update the address of all registered practitioners in the Office of Enrollment and Discipline (OED) index by a change in the Customer Number address.

Response: The suggestion has been forwarded to OED for consideration.

October 15, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1191 OG 187]

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(4) **Mailing of Papers to the PTO in Patent Interference Proceedings**

Effective immediately, attorneys and agents are requested to address all papers mailed to the Patent and Trademark Office in connection with an interference proceeding, and any patent or application involved in an interference proceeding, as follows:

BOX INTERFERENCE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Use of this address will considerably assist the Board in its administration of patent interference proceedings.

Nov. 28, 1983 DONALD J. QUIGG
Deputy Commissioner of Patents and Trademarks

[1037 OG 25]

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(5) **Establishment of a Special Box for Expedited Processing of Issue Fees**

Effective immediately, the Patent and Trademark Office has established a special box designator for issue fees to allow expedited processing of the Issue Fee Transmittal (PTOL Form 85), and the order for advance copies.

In order to take advantage of this new service, the envelope should be addressed:

Box Issue Fees
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Only the Issue Fee Transmittal (PTOL Form 85), advance copy orders and the fees associated with these two services are to be placed in the envelope. Including documents other than those specified will delay their reaching the area for which they were intended.

PLEASE USE THE NEW ISSUE FEE BOX.

Mar. 4, 1988 THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1088 OG 41]

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(6) **Use of Box Issue Fee**

On April 29, 1996, the Office will begin processing Issue Fee payments in the Office of Patent Publication. All issue fees mailed to the existing Box Issue Fee will be delivered directly to the Office of Patent Publication. Any issue fees received by the Office not addressed to Box Issue Fee will result in a delay in posting the fee.

March 28, 1996 RICHARD BAWCOMBE
Director, Office of Patent Publication

[1186 OG 12]

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(7) **Establishment of Three Special Boxes for Expedited Processing**

The Patent and Trademark Office has established three additional special boxes to allow expedited processing of non-fee amendments to patent applications, petitions for filing date and/or serial number information for patent applications, and issue fees.

In order to take advantage of these new expedited services, the envelope must be addressed:

For non-fee amendments to patent applications:

Box Non-Fee Amendments (Pats)
Commissioner of Patents and Trademarks
Washington, D.C. 20231

For petitions under 37 CFR 1.182 and associated fees for obtaining filing date and/or serial number information for patent applications prior to receipt of the official "Filing Receipt", "Notice to File Missing Parts", or "Notice of Incomplete Application".

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Box SN
Commissioner of Patents and Trademarks
Washington, D.C. 20231

For Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings:

Box Issue Fees
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Only those documents specified for the special box are to be placed in the envelope addressed to that special box. Placing extraneous documents in an envelope marked for any special box will significantly delay their reaching the area for which they were intended.

Mar. 22, 1988 THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1089 OG 45]

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(8) **Establishment of a Special Box for Design Patent Applications**

Effective immediately, the Patent and Trademark Office (PTO), as a part of the current reengineering effort, has established a special box for filing design patent applications and papers for design applications. Use of this box will allow the PTO to provide more efficient and effective handling of these applications and papers for customers.

To take advantage of this new service, the envelope should be addressed:

Box Design
Assistant Commissioner for Patents
Washington, D.C. 20231

Because all processing of design patent applications, including fee processing, from the initial filing of the design patent application through payment of the design issue fee will now be performed in Examining Group 2900, design patent applications and all papers for these applications may be hand-carried directly to Examining Group 2900 or mailed to Box Design. Petitions and amendments filed under 37 CFR 1.312 submitted for design patent applications will also be processed in Examining Group 2900 and thus may be filed directly in Examining Group 2900 or mailed to Box Design. All regular methods of filing papers for design patent applications will still be available but the utilization of Box Design will enable the PTO to provide better customer service.

In order to facilitate speedier processing of papers, it is requested that papers and fees for design patent applications be submitted separately from papers and fees for utility patent applications.

Point of Contact for this Notice:

Name: John Kittle
Telephone number: (703) 308-1495
Fax number: (703) 305-3600

May 10, 1996 EDWARD R. KAZENSKE
Deputy Assistant Commissioner for Patents

[1187 OG 37]

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(9) **Changes in How Papers May be Filed in the Patent and Trademark Office**

Beginning April 21, 1992, an improved service will be offered to people who wish to file papers directly with the Patent and Trademark Office (PTO) by extending the hours of operation for the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Virginia. The current hours of operation are from 8:30 a.m. to 5:00 p.m., Monday through Friday, except Federal holidays within the District of Columbia. The change will extend the hours of operation until 12:00 midnight on Monday through Friday, except holidays, on a trial basis. If, after six months, usage does not warrant retaining operations until midnight, the hours of operation will be reduced.

This change will provide walk-up, personalized service to firms and individuals who are filing documents with the PTO. The PTO will continue to stamp postcard-type receipts to acknowledge the receipt of papers filed at the Attorneys' Window.

Also, effective on April 21, 1992, the PTO is discontinuing the use of drop boxes in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the main entrance of the Department of Commerce Building, Washington, D.C. (37 CFR 1.6(c)) as means for receiving papers.

These changes will provide improved services with respect to receipt and processing of documents while, at the same time, overcoming problems with the present arrangement.

Problems encountered with the present arrangement for the drop boxes have occasionally made it difficult to determine the dates of actual deposit of papers. For example, there have been many incidents of papers being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). On occasion, the PTO and/or filers have been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place in the lobby.

Provisions are also available for filing papers through the use of the certificate of mailing (37 CFR 1.8) and the Express Mail (37 CFR 1.10) procedures.

March 17, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1137 OG 7]

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(10) **Relief in Certain Extraordinary Situations**

This notice addresses the extraordinary situation in which a Patent and Trademark Office (PTO) customer has been intentionally deceived by his or her representative, resulting in a potential loss of intellectual property rights. In such a situation, the PTO will mitigate any such potential loss, to the extent possible within the PTO's statutory framework and the bounds of controlling law.

To mitigate any such loss, the Commissioner of Patents and Trademarks may suspend or waive certain regulations. When that is the case, the Commissioner will exercise his power to do so under 37 C.F.R. §§ 1.183 and 2.148 ("In an extraordinary situation, when justice requires," the Commissioner has the power to *sua sponte* suspend or waive any requirement of the regulations which is not required by statute.).

In advance of the occurrence of such an extraordinary situation, the Commissioner cannot determine what specific action justice will require. Such action, however, could include waiving of certain non-statutory fees, reviving an abandoned application, or granting an application filing date based on the PTO filing date of a copending document that has all the elements of a patent application required by law.

August 11, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1178 O.G. 42]

(11)

(11) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 5 and 10
[Docket No. 951006247-5247-01]
RIN 0651-AA70

Communications with the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking.
Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent and trademark cases to: (1) require that patent-related mail be addressed to the Assistant Commissioner for Patents; (2) require that most trademark-related mail be addressed to the Assistant Commissioner for Trademarks; (3) specify a separate address for mail related to disciplinary proceedings pending before the Administrative Law Judge or the Commissioner in the Office of the Solicitor; (4) provide a definition of "Federal holiday within the District of Columbia"; and (5) delete the requirement for a certificate for "Express Mail" in section 1.10 and incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.
Dates: Comments must be received by January 2, 1996. No hearing will be held.
Addresses: Address written comments to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Lynne G. Beresford. In addition, written comments may also be sent by facsimile transmission to (703) 308-7220 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to mail-rule@uspto.gov.

Written comments will be available for public inspection on [Insert date 75 days after date of publication in the FEDERAL REGISTER], in the Assistant Commissioner for Trademarks' suite on the 10th floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
For Further Information Contact: Lawrence E. Anderson (for patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Lynne G. Beresford (for trademark-related matters) by telephone at (703) 308-8900, extension 44, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
Supplementary Information: Addresses for correspondence with the Office are proposed to be changed to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; and to add a separate mailing address in the Office of the Solicitor for disciplinary matters.

The proposed rulemaking entitled "Changes in Requirements for Addressing Trademark Applications and Trademark-Related Papers" (0651-AA73) has been merged with this notice of proposed rulemaking.

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. Notwithstanding the above, it is proposed that there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Because patent-related mail will be sent to the Assistant Commissioner for Patents, the requirement to designate patent application correspondence as "PATENT APPLICATION" is proposed to be deleted from section 1.5(a).

In addition, it is proposed that "Federal holiday within the District of Columbia" be defined as including Official closings.

It is further proposed that a "Certificate of Mailing by Express Mail" (currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper) no longer be required for correspondence actually received in the Office.

PATENT-RELATED MAIL

Section 1.1 is proposed to be amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice (Change of Address for Patent Applications and Patent Related Papers) published in the *Official Gazette* at 1173 Off. Gaz. Pat. Office 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board, patent services including patent copy sales, assignments, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the Official Gazette should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

TRADEMARK-RELATED MAIL

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. When trademark-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice (Change of Address for Trademark Applications and Trademark Related Papers) published in the Federal Register at 59 FR 29275 (June 6, 1994) and in the Trademark

Office Official Gazette at 1163 Off. Gaz. Trademark Office 80 (June 28, 1994) (republished in 1170 Off. Gaz. Pat. Office 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the Official Gazette. In addition to addressing trademark-related mail as set forth above, the boxes should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

HAND-CARRIED CORRESPONDENCE

All correspondence with the Office, except for communications relating to pending litigation as specified currently in section 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia.

FEDERAL HOLIDAYS WITHIN THE DISTRICT OF COLUMBIA

When the Patent and Trademark Office is officially closed for an entire day (for reasons due to weather or other causes), the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.

Legal holidays considered "Federal holidays within the District of Columbia" are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25). In the past, the Office has published notices concerning unscheduled closings. *See, e.g.*, "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994," 1161 Off. Gaz. Pat. Office 12 (April 5, 1994) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office," 1097 Off. Gaz. Pat. Office 53 (December 20, 1988) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)). The proposed rule change will further implement the existing policy.

EXPRESS MAIL PROVISIONS

Section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper. The title of section 1.10 is proposed to be revised and section 1.10 is also proposed to be amended to incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the Office, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office proposes to delete this requirement from section 1.10.

MISCELLANEOUS CHANGES

Miscellaneous changes are proposed to change the word "communications" to "correspondence" for purposes of consistency. Also, since the certificate of mailing by "Express Mail" will no longer be a requirement of the proposed rules, the provisions of Part 10 relating to misconduct are proposed to be amended to delete reference to this requirement.

DISCUSSION OF SPECIFIC RULES

If revised as proposed, the heading of section 1.1 will be changed to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is proposed to be revised to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). It should be noted that the remaining paragraphs of section 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) is proposed to be added to set out the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) is proposed to be added to set out the new mailing address to which most trademark-related documents should be sent. The Solicitor's mailing address, formerly set out in paragraph (g) of the section is moved to a new paragraph (a)(3). Paragraph 1.1(g) is proposed to be removed and reserved.

Sections 1.1 and 1.3 are proposed to be amended so that the word "communications" is changed to "correspondence."

Section 1.5(a) is proposed to be amended by removing the requirement of the words "PATENT APPLICATION" on letters concerning patent applications.

Section 1.8 (a) is proposed to be revised to state that papers and fees must be addressed as set out in section 1.1 (a). For the purposes of 1.8 (a) (1) (i) (A), first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the U.S.P.S.

Section 1.9 is proposed to be amended to add a definition of "Federal holiday within the District of Columbia" to include Federal holidays and days when the Patent and Trademark Office is officially closed for the entire day (for reasons due to adverse weather or other causes).

Section 1.10 is proposed to be revised to state that "Express Mail" must be addressed as set out in § 1.1(a). The title of section 1.10 is proposed to be revised to reflect this change. Further, for all correspondence *actually received* in the Office, the Office will consider the correspondence filed on the date shown by the "date in" notation on the "Express Mail" label unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. Because of the reliance on the "date in" marked by the Postal Service, correspondence should be deposited directly with a person at the United States Postal Service, rather than in a drop box, to ensure that the person making the deposit receives a copy of the "Express Mail" label at the time of making the deposit to verify that the "date in" is accurately and clearly written by the Postal Service employee. Persons using an Express mail receptacle (such as a drop box) do so at the risk of not receiving an accurate and legible copy of the Express mail label at the time of deposit from which the Office may determine the "Express mail" "date in," and, therefore, may not later argue that they should be entitled to the date on which they deposited the correspondence into a receptacle. Moreover, if the "date in" is found to be illegible or unclear, a person dealing directly with a Postal Service employee must take corrective action to ensure that a clear and accurate date is marked at the time of deposit. Persons choosing to use a receptacle (or the like) obviously do not oversee the marking by a Postal Service employee and thus may not later argue for the benefit of a section 1.10 filing date if the "date in" on the "Express Mail" label is improperly or not clearly marked. The determinative factor is when the Postal Service marks the "date in" and the mere deposit into a receptacle does not entitle one to an "Express Mail" "date in" under section 1.10.

Paragraph (b) of section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) express mail service as the filing date of the paper.

Paragraph (c) of section 1.10 is proposed to be amended to set forth the requirements for the treatment of correspondence not received by the Office for which the "Express Mail" procedure was utilized. Correspondence not received by the Office will be considered filed in the Office on the date shown by the "date in" notation entered by the Postal Service if the party who forwards the correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies an additional copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in section 10.1(r) of this chapter.

In addition, although the requirement for a certificate of express mail has been proposed to be eliminated from section 1.10, applicants are strongly encouraged to continue using the certificate of express mail, as well as the placement of the Express Mail label number in the upper right corner of the first page of each separate piece of correspondence and to retain a clearly marked Express Mail label, to facilitate complying with the requirements of paragraph (c) if the correspondence is not received in the Office or if reliance on the U.S.P.S. "date in" is not possible. Moreover, paragraph (d) is proposed to be added so that additional evidence may be required if the Office so determines.

Section 5.33 (entitled "Correspondence") is proposed to be amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is proposed to be revised to reflect the proposed change to section 1.10 that the certificate of mailing by "Express Mail" is no longer a requirement of the rules.

OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Information collection requirements are not affected by the change of address. This proposed rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The proposed rule change has no effect on patent fees.

These proposed rule changes contain collections of information subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which are currently approved by the Office of Management and Budget under Control No. 0651-0009 and 0651-0031. The public reporting burden for these collections of information for certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0031).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

37 CFR PART 10

Administrative Practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 5 and 10 are proposed to be amended as follows:

PART 1--RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by removing and reserving paragraph (g) and by revising the title and paragraph (a) to read as follows:

§ 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for those documents identified in paragraphs (1), (2) and (3) of this section, all correspondence intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks, Washington, D.C. 20231." When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a

notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence addressed to the wrong Post Office Box will not be filed elsewhere in the Patent and Trademark Office and might be returned.

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(g) [Reserved]

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3. Section 1.3 is proposed to be revised to read as follows:

§ 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5(a) is proposed to be revised to read as follows:

§ 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; *e.g.*, 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

5. Section 1.8(a)(1)(i)(A) is proposed to be revised to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) ***

(1) ***

(i) ***

(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

*****

6. Section 1.9 is proposed to be revised by adding a new paragraph (h) to read as follows:

§ 1.9 Definitions.

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(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business.

7. Section 1.10 is proposed to be revised to read as follows:

§ 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. See § 1.6(a). This procedure can be used to file any correspondence in the Office.

(b) Any correspondence filed by "Express Mail" must be addressed as set out in § 1.1(a) and should be deposited directly with the United States Postal Service to ensure that the person depositing the correspondence receives a copy of the "Express Mail" label at the time of deposit with the "date in" clearly marked thereon. Persons dealing indirectly with the United States Postal Service (such as by deposit in an Express Mail drop box) do so at the risk of not receiving their copy of the "Express Mail" label with the "date in" clearly marked.

(c) Any correspondence mailed to the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service, but not received by the Office, will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia (see § 1.6(a)), if the party who forwarded such correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies a copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, to the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(d) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the United States Postal Service on the date in question.

Part 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

8. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR §10.7).

9. Section 5.33 is proposed to be revised to read as follows:

§ 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Part 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

10. The authority citation for 37 CFR Part 10 continues to read as follows:
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

11. Section 10.23(c)(9) is proposed to be revised to read as follows:

§ 10.23 Misconduct.

*****

(c) ***

*****

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

October 26, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1180 O.G. 122]

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(12) **Identifying Application Correspondence With Issue Batch Number**

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed after receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

Jan. 16, 1976 RICHARD J. SHAKMAN
Assistant Commissioner for Administration

[943 O.G. 519]

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(13) **Post Card Receipt Reminder**

Applicants and the agents are reminded of the provision in Section 717.01(a) (now Section 503) of the Manual of Patent Examining Procedure relating to the use of post cards as "receipts" of papers filed in the Patent Office.

If a receipt for any paper filed in the Patent Office is desired, it may be had by enclosing with the paper a self-addressed post card identifying the paper. The Patent Office will stamp the receipt date on the card and place it in the outgoing mail.

The identifying data on the card should be so complete as to match the paper with the application or other document to which it is to be associated. For example, the document should be identified by the applicant's name(s), Serial No., filing date, appeal number, interference number, etc., and the paper should be identified by specifying the type thereof, viz, affidavit, amendment, appeal, application papers, brief, drawings, fees, motions, supplemental oath or declaration, petition, etc.

When papers for more than one document are filed under a single cover a return post card should be attached to the paper for each document for which a receipt is desired.

Nov. 21, 1968 RICHARD A. WAHL
Assistant Commissioner

[857 O.G. 667]

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(14) **Acknowledgement of Receipt of a Patent or Trademark Application**

When early notification of the serial number of newly filed application papers is desired, a *stamped, self-addressed post card* should be submitted with each application. Immediately after the mail has been opened in the Patent and Trademark Office, the post card will be stamped with both the receipt date and the serial number, and then returned to the addressee.

Within recent months, hundreds of cards could not be successfully returned because of insufficient postage or incomplete or nonexistent forwarding addresses. Accurate and complete addresses, including ZIP codes, are necessary to ensure prompt acknowledgement of the receipt of patent and trademark applications.

To assist in easy identification once the post card has been returned, it is suggested that the post card include applicant's names and title of invention.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

July 19, 1982 THERESA A. BRELSFORD
Acting Assistant Commissioner for Administration

[1021 O.G. 96]

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(15) Treatment of Correspondence Deposited as First Class Mail Pursuant to 37 CFR 1.8 and Returned by the U.S. Postal Service

Due to heightened security concerns, effective September 1, 1996, the United States Postal Service (USPS) is requiring that all *domestic first-class mail, bearing stamps and weighing sixteen ounces, or more*, be presented to a retail clerk at a USPS office. All such mail that is not presented to a retail clerk at a USPS office (*e.g.*, placed in a mailbox) will be returned by the USPS. The USPS has posted notice of this requirement on mailboxes. The "Express Mail" service of the USPS is not affected.

37 CFR 1.8 provides that certain correspondence will be considered timely filed by the Patent and Trademark Office (PTO) if, among other things, it is deposited with the USPS by the due date, and includes a certificate of mailing that sets forth the date the person signing the certificate reasonably expected the correspondence to be mailed. Correspondence must be deposited with the USPS as first class mail in compliance with any and all applicable requirements of the USPS to be considered "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A). Correspondence presented to the USPS in a manner that does not comply with the applicable requirements of the USPS is not "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A) and is not entitled to any benefit under 37 CFR 1.8.

To alleviate hardships caused by this change in USPS requirements, the PTO will treat correspondence returned by the USPS because of its size as "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A), so long as the correspondence was otherwise originally deposited with the USPS in compliance with 37 CFR 1.8(a)(1)(i) on or before December 1, 1996. Returned mailed that is either resubmitted to the USPS for delivery, or hand-delivered to the PTO, will be stamped by the PTO with the actual date of receipt in the PTO. The correspondence will, however, be accorded the benefit of any certificate of mailing under 37 CFR 1.8.

Correspondence mailed after December 1, 1996, and returned by the USPS as not mailed in compliance with USPS requirements concerning mail weighing sixteen ounces or more will not be entitled to any benefit under 37 CFR 1.8.

Because this change in USPS requirements does not affect the "Express Mail" service of the USPS, it does not affect correspondence filed in compliance with 37 CFR 1.10. Persons filing correspondence in a manner other than by the procedures set forth in 37 CFR 1.8 or 1.10 do so at their own risk.

Questions concerning this notice should be directed to Senior Legal Advisor Robert W. Bahr at (703) 305-9285.

October 10, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1192 OG 43]

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(16) Waiver of Certificate of Mailing Requirement Under 37 CFR 1.10

The Patent and Trademark Office (PTO) will propose to amend 37 CFR 1.10, regarding the "Filing of papers and fees by 'Express Mail' with certificate" by, among other things, deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper.

Background of 37 CFR 1.10 and Rationale for Amendment

35 U.S.C. § 21 authorizes the Commissioner "by rule [to] prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." 37 CFR 1.10 was promulgated to implement this provision.

Pursuant to 37 CFR 1.6, papers are stamped with the date of receipt in the PTO. An exception is made for papers filed in accordance with 37 CFR 1.10, which provides for the filing of papers and fees by Express Mail with a certificate. However, in order to claim the benefits of 37 CFR 1.10, a party must comply with its specific requirements that the papers have the number of the Express Mail label placed thereon prior to mailing, be properly addressed to the PTO (see "Change of Address For Trademark Applications and Trademark Related Papers," 1163 TMOG 80 (June 28, 1994), which waived 37 CFR 1.10 to the extent that certain trademark related papers could be addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513; and "Change of Address For Patent Applications and Patent Related Papers," 1173 OG 13 (April 4, 1995), which waived 37 CFR 1.10 to the extent that patent related papers could be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231), and include a Certificate of Mailing by Express Mail which states the date of mailing and is signed by the person mailing the papers.

37 CFR 1.10 was promulgated in response to concerns that mail service was sometimes subject to delay and, except for hand-delivery, that there was no way to ensure the timely filing of time-critical documents with the PTO. "Express Mail" was chosen because, among other things, a person other than the filer, that is a disinterested third party working for the U.S.P.S., enters the date of deposit on the Express Mail label.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the PTO, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail and its apparent redundancy in purpose, inasmuch as the date of deposit has already been entered by a disinterested third party, the PTO will propose to delete this requirement from 37 CFR 1.10.

This notice applies *only* to correspondence actually received (not to papers lost or misplaced by the U.S.P.S.) at the PTO via Express Mail Post Office to Addressee service where there is a clear indication of the "date in" on the Express Mail label by the U.S.P.S. Filers are encouraged to continue the practice of placing a Certificate of Mailing by Express Mail on papers filed in the PTO by Express Mail since, in some cases, the certificate may provide useful evidence.

Interim Waiver of 37 CFR 1.10 for Documents Filed without Certificate of Express Mail

Because a significant period of time will elapse before any final rule change can be promulgated, and because there appears to be no harmful consequence to any party, effective as of the publication date of this notice, the PTO will, sua sponte, waive 37 CFR 1.10 to the extent of granting a filing date as of the "date in" entered on the Express Mail label by the U.S.P.S. employee (unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia; see § 1.6(a)) for all papers actually received at the PTO via Express Mail, regardless of whether the requirement for a Certificate of Mailing by Express Mail has been met provided all other requirements of 37 CFR 1.10 are met.

For all papers filed prior to the date of this notice, which were not in compliance with the Certificate of Mailing by Express Mail requirements under 37 CFR 1.10, a petition to the Commissioner will be required to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper. The petition should include a copy of the Express Mail label showing the "date in" entered by the U.S.P.S. employee and a declaration attesting to the contents of the envelope to which the Express Mail label was attached. See 37 CFR 1.183 or 2.146.

Summary

In summary, the PTO is waiving, sua sponte, the requirement of 37 CFR 1.10 for a Certificate of Mailing by Express Mail and will propose to amend 37 CFR 1.10 to delete the requirement for a Certificate of Mailing by Express Mail. This waiver becomes effective upon the publication of this notice. For all documents filed by Express Mail prior to this notice, but not in compliance with the Certificate of Mailing by Express Mail requirement, a petition to the Commissioner under either 37 CFR 1.183 or 2.146 must be filed to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper.

PHILIP G. HAMPTON, II *Assistant Commissioner for Trademarks*
EDWARD R. KAZENSKE *Deputy Assistant Commissioner for Patents*

[1174 O.G. 92]

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(17) Information in Oath/Declaration Necessary to Identify the Specification for an Application filed under 35 USC 111 in Accordance with 37 CFR 1.63

This notice supersedes the previous notice published at 1035 Off. Gaz. Pat. Office 3 on September 12, 1983, and is intended to make it easier for an applicant(s) to comply with the identification requirement of 37 CFR 1.63.

37 CFR 1.63 requires that an oath or declaration identify the specification to which it is directed. The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in order to adequately identify the specification in compliance with 37 CFR 1.63(a)(2).

The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;
(2) name of inventor(s), and attorney docket number which was on the specification as filed; or
(3) name of inventor(s), and title which was on the specification as filed.

Filing dates are now granted on applications filed without an oath or declaration in compliance with 37 CFR 1.63, the oath or declaration being filed later with a surcharge. The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 CFR 1.63:

(1) name of inventor(s), and application number (consisting of the series code and the serial number; e.g.,08/123,456);
(2) name of inventor(s), serial number and filing date;
(3) name of inventor(s) and attorney docket number which was on the specification as filed;
(4) name of inventor(s), title which was on the specification as filed and filing date;
(5) name of inventor(s), title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or
(6) name of inventor(s), title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number; e.g.,08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.

Any specification that is filed attached to an oath or declaration on a date later than the application filing date will not be compared with the specification submitted on filing. Absent any statement(s) to the contrary, the "attached" specification will be presumed to be a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application.

Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)).

Further, an oath or declaration attached to a cover letter referencing an incorrect application may not become associated with the correct application and, therefore, could result in the abandonment of the correct application.

Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not in compliance with the other requirements of 37 CFR 1.63 but contain sufficient information to identify the specifications to which they apply as detailed above.

A copy, such as a photocopy or facsimile transmission, of an originally executed oath or declaration is acceptable and may be filed. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original. See 37 CFR 1.4(d)(2).

See MPEP § 1896 for the identification requirements for a declaration filed in a U.S. national stage application filed under 35 USC 371.

These changes will appear in MPEP § 601.01 in the next revision of the Manual.

July 13, 1995 STEPHIN G. KUNIN
Deputy Assistant Commissioner for Patent Policy and Projects

[1177 OG 60]

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(18) Handling of Status Inquiries

This notice is intended to supplement the discussion set forth in the *Official Gazette* Notice published at 893 *Official Gazette* 810 entitled "Status Inquires" (Dec. 21, 1971).

It has come to the attention of the Patent and Trademark Office (PTO) that its employees may have improperly released confidential information concerning pending applications. Specifically, issue date and patent number information assigned to pending applications may have been improperly released.

No information concerning pending or abandoned patent applications (except reissue applications and reexamination proceedings) may be given to the public by the PTO without the authorization of the applicant or the assignee or attorney or agent of record. 35 USC § 122 and 37 CFR § 1.14. Other exceptions are specified at 37 CFR § 1.14.

However, PTO employees will release information on the status of patent applications to the applicant or assignee or

attorney or agent of record if the identity of the requestor can be adequately verified as set forth below.

Telephonic status inquiries should continue to be directed to the PTO clerical personnel. The PTO clerical personnel will obtain the caller's full name, the application serial number and the caller's telephone number. The PTO clerical personnel will ask the caller if there is an attorney or agent of record.

If there is an attorney or agent of record, the PTO clerical personnel will ask for his/her registration number. If the registration number is not known, the PTO clerical personnel will ask for the name of the attorney or agent of record. The PTO clerical personnel will inform the caller that an attorney or agent of record will be called after verification of his/her identity and that the requested status information concerning the application will be released to that attorney or agent.

If there is no attorney or agent of record, the PTO clerical personnel will ask the caller why he/she is entitled to information concerning the application. If the caller identifies himself/Herself as an applicant or an authorized representative of the assignee of record, the PTO clerical personnel will ask for the correspondence address of record. Then, the PTO clerical personnel will inform caller that his/her association with the application must be verified before any information concerning the application can be released, and that he/she will be called back. If the caller indicates that he/she is not an applicant or an authorized representative of the assignee of record, the PTO clerical personnel will inform caller that no information concerning that application will be released.

The PTO clerical personnel will then verify the identity of any caller claiming to be associated with the application by checking the Patent Application Locating and Monitoring (PALM) system or the application file.

If an attorney or agent is of record in the application, the PTO clerical personnel will release the status information concerning the application by calling the attorney's or agent's telephone number obtained from PALM or the application file.

If the applicant or an authorized representative of the assignee of record requests information, and there is no attorney or agent of record and the correspondence of record has been verified, the PTO clerical personnel will release the status information to the caller using the telephone number given by the caller. If the caller's association with the application cannot be verified, no information concerning the application will be released. However, the caller should be informed that the caller's association with the application could not be verified.

In handling an in-person status request, PTO clerical personnel will ask the requester to wait while verifying their identification as set forth above.

May 14, 1990 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1115 O.G. 17]

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(19) **Federal Government Holidays, 1996**

Monday, January 1	New Year's Day
Monday, January 15	Martin Luther King, Jr.'s Birthday
Monday, February 19	Presidents' Day
Monday, May 27	Memorial Day
Thursday, July 4	Independence Day
Monday, September 2	Labor Day
Monday, October 14	Columbus Day
Monday, November 11	Veterans' Day
Thursday, November 28	Thanksgiving Day
Wednesday, December 25	Christmas Day

[1184 OG 108]

(20) **Closing of Patent and Trademark Office on Monday, Jan. 26, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Jan. 26, 1987, the Patent and Trademark Office will consider Jan. 26, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purpose of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Jan. 27, 1987.

Jan. 28, 1987 DONALD W. PETERSON
Acting Assistant Secretary and Commissioner of Patents and Trademarks

[1075 OG 29]

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(21) **Closing of Patent and Trademark Office on Monday, Feb. 23, 1987**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Feb. 23, 1987, the Patent and Trademark Office will consider Feb. 23, 1987, a "federal holiday within the District of Columbia" under 35 U.S.C. 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. 119, 133 and 151, if the action is taken, or fee paid, on Feb. 24, 1987.

Feb. 27, 1987 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1098 OG 548]

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(22) **Closing of the Patent and Trademark Office on Friday, Jan. 20, 1989**

In view of the fact that Federal and District of Columbia government offices in Washington, D.C. metropolitan area, including the Patent and Trademark Office were officially closed on Jan. 20, 1989, the Patent and Trademark Office will consider Jan. 20, 1989, a "holiday within the District of Columbia" under 35 U.S.C. 21. Any action or fee due that day will be considered as timely for the purposes of e.g. 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on Jan. 23, 1989. Papers deposited in U.S. Department of Commerce District Offices on Jan. 20, 1989, will similarly be considered timely for the purposes of 35 U.S.C. §§ 119, 133 and 151.

Jan. 6, 1989 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1098 OG 548]

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(23) **Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994**

In view of the official closing of the Federal and District of Columbia government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on January 20, 1994 and February 11, 1994, the Patent and Trademark Office will consider each of those days a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on either of those days will be considered as timely for the purpose of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office was open (i.e., Friday, January 21, 1994, and Monday, February 14, 1994, respectively).

March 10, 1994 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1161 OG 12]

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(24) **Closing of the Patent and Trademark Office on Monday, January 8, 1996 through Wednesday, January 10, 1996**

In view of the official closing of the Federal government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Monday, January 8, 1996 through Wednesday, January 10, 1996, the Patent and Trademark Office will consider each of those days, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21 and 37 C.F.R. §§ 1.6, 1.7 and 1.10. Any action or fee due on any of those days will be considered as being timely filed if the action is taken, or the fee paid, on the next succeeding business day on which the Patent and Trademark Office was open, that is, Thursday, January 11, 1996.

January 24, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1183 OG 59]

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(25) **Closing of the Patent and Trademark Office on Friday, January 12, 1996**

In view of the official closing of the Federal government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Friday, January 12, 1996, the Patent and Trademark Office will consider January 12, 1996, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21 and 37 C.F.R. §§ 1.6, 1.7 and 1.10. Any action or fee due on that day will be considered as being timely filed if the action is taken, or the fee paid, on the next succeeding business day on which the Patent and Trademark Office was open, that is, Tuesday, January 16, 1996 (Monday, January 15, 1996, was a federal holiday, Martin Luther King, Jr's. Birthday).

January 24, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1183 OG 60]

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(26) **Filing of Papers During Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open.

When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Information regarding whether or not the Office is officially closed on any particular day may be obtained by calling (703)-557-INFO.

Nov. 18, 1988 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1097 OG 53]

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(27) **Iraqi Sanctions Regulations**

On January 18, 1991, the Department of the Treasury, Office of Foreign Assets Control (OFAC), published the Iraqi Sanctions Regulations (Regulations) (31 CFR Part 575). 56 Fed. Reg. 2112. The regulations implement Executive Orders 12722 (August 2, 1990) and 12724 (August 9, 1990) relating to certain property and transactions in which the Government of Iraq and persons in Iraq may have an interest.

It appears that the provisions of the Executive Orders and Regulations prohibit transactions relating to the filing or prosecution of applications for patents or for registration of trademarks, where an Iraqi interest is involved. The prohibited transactions, however, may be authorized by a specific license issued pursuant to the proceedures described in Section 575.801 of Subpart H of the Regulations.

This notice is intended to alert practitioners and applicants to the prohibitions which may apply to matters before the Patent and Trademark Office, (PTO) if Iraqi interests are involved. This notice is further intended to advise that where such interests or potential interests come to the attention of the PTO, an appropriate specific license from OFAC may be required.

Jan. 29, 1991 HARRY F. MANBECK, Jr.
Commissioner of Patents and Trademarks

[1123 OG 37]

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(28) **United States Postal Service Interruption and Emergency in South Florida**

The United States Postal Service (USPS) has informed the Patent and Trademark Office (PTO) that an interruption in its service in South Florida was caused by Hurricane Andrew. Normal postal delivery and collection operations of the USPS were impacted by Hurricane Andrew throughout South Florida to varying degrees from Aug. 23, 1992, through Sept. 12, 1992. By Sept. 12, 1992, the USPS restored delivery and collection operations to all of South Florida with the exception of Homestead.

The PTO is designating the interruption in the service of the USPS in South Florida and the overall destruction caused by Hurricane Andrew as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by the Hurricane Andrew emergency should be directed to Jeffrey V. Nase, Director, Office of Petitions, (703) 305-9285, PK2-913, for patent-related matters and to Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464, Pk2-910, for trademark-related matters.

Oct. 7, 1992 DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1144 OG 8]

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(29) **UNITED STATES POSTAL SERVICE INTERRUPTION and EMERGENCY IN LOS ANGELES**

The January 17, 1994, Los Angeles earthquake has caused a service interruption in United States Postal Service (USPS)

in the greater Los Angeles area. Normal postal delivery and collection operations of the USPS were impacted by the earthquake throughout the greater Los Angeles area to varying degrees from January 17, 1994, through January 21, 1994.

The Patent and Trademark Office (PTO) is designating the interruption in the service of the USPS in the greater Los Angeles area and the overall destruction caused by the earthquake as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by this emergency should be directed to Jeffrey V. Nase, Director, Office of Petitions, (703) 305-9285, PK3-704, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464, PK2-910, for trademark-related matters.

February 9, 1994 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1160 OG 39]

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(30) **United States Postal Service Emergency in the State of California Terminated**

The service interruption in United States Postal Service (USPS) in the State of California that occurred on June 29, 1995, due to the action of the UNABOM bomber, caused the USPS to maintain heightened security procedures for mail originating in the State of California. Currently there are no extraordinary restrictions being placed on Express Mail originating in the State of California. Therefore, the Patent and Trademark Office (PTO) is terminating the postal service interruption and emergency declared in the Official Gazette Notice entitled "United States Postal Service Interruption and Emergency in the State of California", 1176 *Off. Gaz. Pat. Office* 74 (July 18, 1995). Any questions regarding this Notice should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 4, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1188 OG 15]

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(31) **United States Postal Service Non-Delivery of Mail**

This notice is to advise the public of a mail disruption which occurred for correspondence mailed in late July 1996, directed to the Patent and Trademark Office (PTO) Zip Code 20231. As a result of a United States Postal Service (USPS) error, some mail directed to Zip Code 20231 was returned to the sender as "undeliverable." The USPS has now corrected the problem and mail directed to Zip Code 20231 is presently being delivered as usual. This disruption did not affect mail addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, VA 22202-3513.

The PTO has been advised by the USPS that any mail returned as a result of this particular USPS error will be accepted by the USPS if resubmitted at a service window in the same envelope. No additional postage will be required. It is suggested that the USPS employee at the service window be consulted about crossing out any "undeliverable" notation on the envelope. Any problems associated with the resubmission should be immediately called to the attention of the USPS, particularly, Ms. Cynthia McMullen at (202) 636-1278/1279 or by way of the Internet at cmcmull2@email.usps.gov.

1. Papers Filed Pursuant To 37 CFR 1.8

Any correspondence mailed by first class mail with a certificate of mailing thereon in compliance with 37 CFR 1.8 which was returned to the sender as a result of this particular USPS error and which is either resubmitted to the USPS for delivery or delivered to the PTO by private courier will be stamped by the PTO with the actual date of receipt in the PTO. The correspondence will, however, be accorded the benefit of any certificate of mailing under 37 CFR 1.8.

2. Papers Filed Pursuant To 37 CFR 1.10

Any correspondence mailed by "Express Mail" with the "Express Mail" label number placed thereon in accordance with 37 CFR 1.10 which was returned to the sender as a result of this particular USPS error and which is either resubmitted to the USPS for delivery or delivered to the PTO by private courier will be stamped with the original date of deposit as "Express Mail" with the USPS or the next business day, if the date of deposit is a Saturday, Sunday, or Federal holiday within the District of Columbia. 37 CFR 1.6(a)(2). The correspondence must be received by the PTO in the original "Express Mail" envelope or be accompanied by either the original "Express Mail" label or a legible copy thereof.

3. Paper Not Filed Pursuant To 37 CFR 1.8 or 1.10

Section 21(a) of title 3:5, United States Code, provides that [t]he Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service . . . "

Therefore, in order to minimize the impact of this particular USPS error, any correspondence deposited with the USPS which was returned as a result of the error and which was originally mailed by first class mail *without a certificate of mailing under . . . 37 CFR 1.8* or by "Express Mail" *without the "Express Mail" label number placed on the correspondence* will be stamped by the PTO with the original postmark date, rather than the date of receipt in the PTO, or the next business day, if the original postmark date is a Saturday, Sunday, or Federal holiday within the District of Columbia.

In order to take advantage of this temporary practice, any patent or trademark correspondence affected by this disruption must be promptly resubmitted to the PTO in a new envelope addressed to the

Assistant Commissioner for Patents
Box Postal Disruption
Washington, DC 20231

Such correspondence must be accompanied by the original mailing envelope or a copy thereof showing the original postmark date and by a certificate demonstrating the original mailing date. Applicant should retain a copy of the original mailing envelope in his or her file in case a question is later raised concerning the original date of mailing.

A suggested certificate is as follows:

> The undersigned certifies that the attached correspondence was deposited as first class mail/"Express Mail" with the U.S. Postal Service with sufficient postage addressed to the PTO at Washington, DC 20231 on _____ and was returned as a result of a Postal Service error.
>
> Accordingly, it is requested that the filing date of _____ be accorded the correspondence.
>
> _____
> (Printed Name)
>
> _____
> (Signed)
>
> _____
> (Date)

Papers which were returned to the sender and forwarded to the PTO prior to this notice or papers promptly returned to the PTO in the original envelope after this notice will be given the postmark date to the extent possible.

Any review of these matters would be by way of petition (no petition fee required) providing whatever arguments and evidence petitioner has that the application/correspondence is entitled to a different filing date.

Questions concerning this notice should be directed to John F. Gonzales, Senior Legal Advisor, (703) 305-9285.

August 9, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commmsioner of Patents and Trademarks

[1189 OG 92]

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(32) **Rules Concerning Conduct on Patent and Trademark Premises**

1. *Applicability*

These rules apply to all premises under the charge and control of the U.S. Patent and Trademark Office (PTO) through the General Services Administration and to all persons entering such premises.

2. *Admission to Property*

Patent and Trademark Office facilities are closed to the public outside of normal working hours. During normal working hours, a valid User Pass is required to enter PTO premises.

The individual's User Pass must be displayed at all times while on PTO premises.

3. *Preservation of Property/Conduct on PTO Premises*

The following activities are prohibited on PTO premises:

a. Improperly disposing of rubbish; willfully destroying or damaging property; theft of property; creating a hazard to persons or things; and placing Government documents or materials in storage lockers.

b. The willfull and unlawfull concealment, removal, mutilation, obliteration or destruction, or attempts to do so, or, with intent to do so, or taking and carrying away of any record, book, paper, document, or other things from the facilities shall result in a fine of not more than $2,000 or imprisonment of not more than 3 years, or both. *See* 18 U.S.C. § 2071.

c. Removal of papers, materials, or other Government property from designated areas. Within a designated area, papers or other Government property must be returned to its proper location after use, unless otherwise posted.

d. Using PTO premises and facilities as a place of business. It is prohibited to reserve work areas, use PTO as a mailing address, use PTO stationery, or a PTO telephone number as a personal telephone number.

4. *Inspection*

Packages, briefcases, storage lockers and other containers in the possession of visitors, employees, or other persons arriving at, working at, visiting, or departing from the PTO are subject to inspection. *See* 41 CFR § 101-20.301.

5. *Disturbances*

Disorderly conduct or other conduct which creates a loud or unusual noise or a nuisance which impedes or disrupts the performance of official duties by Government employees or which prevents the public from obtaining the administrative services provided on the property in a timely manner is prohibited. *See* 41 CFR § 101-20.305.

6. *Conformity with signs and directions*

Persons on the PTO premises shall at all times comply with the officical signs of a prohibitory, regulatory or directory nature and with the lawful direction of PTO employees.

No rude or abusive conduct to PTO employees and fellow users.

No food or beverages are permitted.

No smoking except in designated areas.

No mechanical or electronic equipment such as radios, televisions, typewriters, computers, or photographic equipment may be used without prior permission from the Assistant Commissioner for Administration.

No use of PTO telephone and office equipment, except as specifically designated for public use.

7. *Penalties and other laws.*

Nothing in these rules shall be construed to abrogate any other Federal laws or regulations or any State and local laws and regulations applicable to any area in which property under the charge and control of the PTO through the U.S. General Services Administration is situated. *See* 40 U.S.C. §§ 318(c) and 486(c).

41 CFR § 101-20.315 provides that whoever is found guilty of violating the rules of conduct on Federal property contained in 41 CFR § 101-20.3 while on any property under the charge and control of the U.S. General Services Administration is subject to a fine of not more than $50, imprisonment of not more than 30 days, or both. *See* 40 U.S.C. § 318c.

Failure to follow these rules may result in immediate removal from the premises, suspension of user privileges, and/or enforcement of any criminal sanctions that may apply.

Aug. 30, 1991 THERSA A. BRELSFORD
Assistant Commissioner for Administration

[1131 OG 7]

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(33) **Filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit in the Patent And Trademark Office**

This notice supersedes a notice entitled Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks published at 1079 Off. Gaz. Office 72 (June 30, 1987).

A notice of appeal to the Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any one of the following ways:

A. By first-class mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:
Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:
Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand (on or before the due date) to the Office of the Solicitor. The Office of the Solicitor is located at:
Crystal Park II
Suite 918
2121 Crystal Drive
Arlington, Va.

D. By facsimile transmission to the Office of the Solicitor. The telephone number for accessing the Office of the Solicitor facsimile machine is (703) 557-9373. A notice of appeal will be deemed timely filed on the date the facsimile transmission is *received* by the Office of the Solicitor, provided an original notice of appeal is subsequently received in either of the following ways:

(1) An original, signed copy of the notice of appeal is actually received in the Office of the Solicitor within five calendar days of the facsimile transmission; or,

(2) An original, signed copy of the notice of appeal is mailed by "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 on the day of the facsimile transmission.

The facsimile machine for receiving a notice of appeal is located in the Office of the Solicitor and is staffed during the business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. Due to possible equipment failure or maintenance requirements, precautions must be taken when relying on the availability of this service near the end of the time for filing a notice of appeal.

Mar. 22, 1990 FRED E. McKELVEY
Solicitor

[1113 O.G. 27]

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(34) **Service of Court Papers on the Commissioner of Patents and Trademarks**

Court papers other than a notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 a.m. and 5:00 p.m. at the Office of the Solicitor, located in Crystal Park II, Suite 918, 2121 Crystal Drive, Arlington, Va.

B. By *mail* in an envelope addressed as follows:
Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office shall not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Mar. 22, 1990 FRED E. McKELVEY
Solicitor

[1113 O.G. 28]

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(35) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1, 2 and 3
[Docket No. 910246-2140]
RIN 0651-AA43

Changes in Patent and Trademark Assignment Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice regarding assignments in patent and trademark cases to improve and clarify the rules, to codify changes in practice and to consolidate the rules. The Office has combined the assignment rules currently in Parts 1 and 2 into a new Part 3 directed to assignments.

Effective Date: Sept. 4, 1992. These rules will be applicable to all documents filed with the Office on or after the effective date.

For Further Information Contact: Trademark related matters: Lynne Beresford by telephone at (703) 305-9464 or by mail marked to her attention addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Patent related matters: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.

Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register on May 10, 1991 at 56 FR 21641 and in the Patent and Trademark Office "Official Gazette" of June 4, 1991 at 1127 O.G. 8-16, the Office proposed to amend the rules of practice in patent and trademark cases to revise, simplify, remove, or clarify existing assignment rules or to codify certain practices currently in effect. Changes were proposed for rules relating to the documents that will be recorded, to the requirements for recording a document, to the effect of recording, to new cover sheet requirements, to the appointment of domestic representatives; and to prosecution by assignees and issuance to assignees. While the existing rules do not require a cover sheet to accompany each document submitted for recording, typically a cover letter is submitted to ensure proper processing of the document.

The Office has encouraged the public to use a cover letter containing specific information concerning the document being submitted with each document submitted for recording. *See* "Helpful Hints", 1114 *Official Gazette* 77 (May 29, 1990). The public has adopted the suggested procedure to such an extent that most documents now submitted for recordation are accompanied by a cover letter which contains the suggested data. Documents submitted with these cover letters have enabled the Office to greatly improve the quality and efficiency of the recording process. To better ensure that the correct data is captured in recordation and recorded promptly, the Office is making a cover sheet mandatory. The cover sheet will contain all the information necessary for the Assignment Branch to properly and promptly process the document.

Written comments were submitted by 12 firms, 2 individuals, 4 corporationsand 1 organization. No one testified at the oral hearing held on July 17, 1991.

The following includes a brief discussion of the rules being changed and the reasons for those changes, a detailed section-by-section analysis of the final rules, and an analysis of the comments received in response to the notice of proposed rulemaking.

Specific Rules to be Deleted or Added: The existing rules of practice in Parts 1 and 2 of Title 37 of the Code of Federal Regulations which are deleted are §§ 1.32, 1.331, 1.332, 1.333, 1.334, 2.185, 2.186 and 2.187. These rules are deleted in their entirety and rewritten and renumbered under a new Part 3. Table 1 is provided to assist readers in correlating previous rules with the new rules.

TABLE 1

Old Section	New Section
1.32	3.71 & 3.73
1.331(a)	3.11
1.331(b)	3.26
1.331(c)	3.21
1.332	3.51
1.333	3.56
1.334	3.81
2.185(a)	3.11
2.185(a)(1)	3.31
2.185(a)(2)	3.26
2.185(a)(3)	3.41
2.185(a)(4)	3.61
2.185(b)	3.31(b)
2.185(C)	3.51

Old Section	New Section
2.186	3.71 & 3.73
2.187	3.85

Consideration was given to moving § 1.12 (Assignment records open to public inspection.) to Part 3. However, since this section primarily relates to records maintained by the Office and procedures for accessing those records, and no comments were received regarding the placement of § 1.12, this section remains under the general heading "Records and Files" of the Patent and Trademark Office.

Discussion of Specific Rules to be Changed or Added: Section 1.12(a) is revised to reflect the fact that all assignment records related to pre-1955 trademark records and pre-1957 patent records were transferred to the National Archives and Records Administration (NARA) during 1990. All assignments recorded on or after January 1, 1955, for trademarks and May 1, 1957, for patents continue to be maintained by the Office. The pre-1955/1957 records have been transferred to NARA to allow for greater accessibility to the public, improvement of file integrity for the older records, and preservation of these materials. The pre-1955/1957 assignment cards, digest books, and libers were stored in four locations: the Assignment Search Room (ASR) at the Office, the Federal Records Center in Suitland, Maryland, the National Archives in downtown Washington, D.C., and the National Archives location in Alexandria, Virginia. Storage of information in these various locations made searching of old assignment records difficult. The materials located at the Federal Records Center could be ordered from the ASR. However, many times it took months to receive the materials.

All assignment records from 1837 to December 31, 1954, for trademarks and from 1837 to April 30, 1957, for patents are now maintained and are open for public inspection in the National Archives Research Room located at the Washington National Records Center Building, 4205 Suitland Road, Suitland, Maryland 20746. Assignments recorded before 1837 are-maintained at the National Archives and Records Administration, 841 South Pickett Street, Alexandria, Virginia 22304.

All requests for abstracts of title continue to be provided by the Office upon request and payment of fees set forth in §§ 1.19 and 2.6. Requests for copies and certified copies of the pre-1955 records for trademarks and pre-1957 records for patents should be directed to NARA since those records are not maintained by the Office. Since these records are maintained by NARA, it is more expeditious to request copies directly from NARA, rather than the Office, which would then have to route the requests to NARA. Payment of the fees required by NARA should accompany all requests for copies.

Another change makes clear that separate assignment records are kept for patents and trademarks, and that an extra charge will be imposed by the Office on requests for copies of recorded assignments if the correct reel and frame number are not identified.

Sections 1.17 and 1.46 are amended to make reference to § 3.81, which replaces § 1.334, and delete reference to § 1.334. The amount of the fee for recording a document is not affected by this rule change.

Section 1.104(e) is amended to make reference to Part 3, which replaces § 1.331, and delete reference to § 1.331.

Section 3.1 is added to set out definitions of terms used in Part 3. Terms which are defined include "application," "assignment," "document," "Office" (meaning Patent and Trademark Office), "recorded document," and "registration." Definitions are provided to make clear the intended meanings of the terms used in Part 3. These definitions are intended to be applicable only to Part 3. For example, the term "application" is defined, for the purpose of Part 3, to mean a national application for patent, an international application for patent that designates the United States of America, or an application to register a trademark, unless otherwise indicated.

Section 3.11 replaces and modifies the practice set forth in§ 1.331(a) and 2.185(a), which specify the documents the Office will record. This section specifies that assignments of patents and registrations will be recorded, as well as other documents which affect title to applications, registrations and patents. Section 3.11 requires that a completed cover sheet as specified in §§ 3.28 and 3.31 be submitted with the document to be recorded.

Section 3.16 is added to incorporate the limitation set out in 15 U.S.C. § 1060 proscribing the assignment of an intent-to-use trademark application prior to the filing of a statement of use, except as a part of the sale of an on-going business. Because the rules in Part 3 are intended to address all rules relating to assignments, it is appropriate to refer to the statutory requirements of an assignment of an intent-to-use trademark application.

Section 3.21 replaces and modifies the practice of § 1.331(c). Section 3.21 sets forth requirements for the identification of patents or patent applications in documents submitted for recording. An assignment relating to a patent must identify the patent by number. The name of the inventor, the issue date, and title of the invention as stated in the patent may also be given in the assignment to provide additional information on the patent being assigned. An assignment relating to a national patent application must identify the national patent application by application number (consisting of the series code and the serial number, e.g., 07/123,456) or serial number and filing date. An assignment relating to an international patent application which designates the United States of America must identify the international application number (e.g., PCT/US90/01234). The name of the inventor, date of filing, and title of the invention as stated in the patent application may also be given in the assignment. If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended. Assignments submitted for recording that do not identify the patent or patent application as required by this section will not be recorded, but will be returned to the correspondence address that is required to be provided on the cover sheet by § 3.31(e).

Section 3.24 is added to set out formal document requirements to facilitate and expedite the recording process. This section requires that documents, either the original or a true copy of the original, submitted for recording be legible, using only one side of each page. The paper used should be flexible, white, durable, and preferably no larger than 21.6 x 33.1 cm. (8 x 14 inches), with a 2.5 cm. (one-inch) margin on all sides. Documents submitted in this form are camera-ready and can be recorded expeditiously with little additional handling required. Documents that fail to meet the legibility and single-sided paper requirements of this section will be returned as set forth in 3.51.

Section 3.26 replaces and modifies the practice of §§ 1.331(b) and 2.185(a)(2). Section 3.26 provides that the Office will accept and record non-English documents provided they are accompanied by a verified English translation signed by the translator. Documents submitted that fail to meet the requirements of this section will be returned as set forth in § 3.51.

Section 3.27 is added to set out how documents submitted for recording should be addressed to the Office. To ensure prompt and proper processing, documents and their cover sheets should be addressed to the Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231, unless they are filed together with new applications or with a petition under § 3.81(b). Petitions under § 3.81(b) should be addressed to the Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231. New applications and other petitions should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Section 3.28 is added to set out the requirement that all documents submitted to the Office for recording be accompanied by at least one coversheet referring either to the patent applications and patents or to the trademark applications and registrations against which the document is to be recorded. Only one set of documents and cover sheets to be recorded should be filed. If a document to be recorded includes interests in, or transactions involving, both patents and trademarks, separate patent and trademark coversheets must be submitted. If a document to be recorded is not accompanied by a completed cover sheet, the document and any incomplete cover sheet will bereturned to the correspondence address for proper completion of the cover sheet and resubmission of the cover sheet and document. While the previous rules did not require a cover sheet to accompany each document submitted for recording, typically a cover letter is submitted to ensure proper processing

of the document. The Office is making a cover sheet mandatory in order to betterensure prompt and proper processing of all documents submitted for recording. The cover sheet contains all the information necessary for the Office toprocess the document.

Section 3.31 is added to set out the formal requirements of the cover sheet. Section 3.31 requires that each patent or trademark cover sheet must contain (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a brief description of the interest conveyed or transaction to be recorded (e.g., assignment, license, change of name, merger, security agreement, etc.); (4) each application number, patent number or registration number against which the document is to be recorded, or an indication that the document is filed together with a patent application; (5) the name and address of the party to whom correspondence concerning the document to be recorded should be mailed; (6) the number of applications, patents or registrations identified in the cover sheet and the total fee; (7) the date the document was executed; (8) an indication that the assignee of a trademark application or registration who is not domiciled in the United States has designated a domestic representative; (9) a statement by the party submitting the document that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct, and (10) the signature of the party submitting the document. The term "party" as used in this rule means the person whose name appears on the documents to be recorded, that person's attorney or registered agent, or a corporate officer where a corporation's name appears on the document. Sample cover sheets for patent documents and for trademark documents are shown in Appendices A and B.

Section 3.34 is added to set out the procedure to correct obvious errors in a recorded cover sheet. This section requires that if a recorded cover sheet contains an error that is apparent when the cover sheet is compared with the recorded document, the error will be corrected only if a corrected cover sheet is filed for recordation. The corrected cover sheet must be accompanied by the originally-recorded document or a copy of the originally-recorded document and by a new assignment recording fee in the appropriate amount.

Section 3.41 replaces and consolidates practice under §§ 1.331(a) and 2.185(a)(3) regarding recording fees. Section 3.41 requires that all requests to record documents be accompanied by the appropriate fee. A fee is charged for each application, patent and registration identified in the cover sheet. The recording fee for patents and patent applications is specified in § 1.21(h). The recording fee for trademark registrations and applications is specified in § 2.6(q).

Section 3.51 replaces and modifies the practice of §§ 1.332 and 2.185(c). Section 3.51 sets the date of recording of a document as the date the document meeting the requirements for recording set forth in this Part is filed in the Office. A document which does not comply with the identification requirements of § 3.21 will not be recorded. For documents not accepted for recording, parties can petition under 37 CFR §§ 1.181 and 2.146(a). Other documents not meeting the requirements for recording, for example, a document submitted without a completed cover sheet, without the required fee, or without any required translation, will be returned for correction to the sender when a return address is available. The returned papers, stamped with the official date of receipt in the Office, will be accompanied by a letter indicating that if the returned papers are corrected and resubmitted to the Office within time specified in the letter, the Office will consider the original date of filing of the papers as the date of recording of the papers. Submitters can use the certificate procedure under either § 1.8 or § 1.10 for resubmissions of returned papers if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned papers are not corrected and resubmitted within the specified period, the date of filing of the corrected papers will be considered to be the date of recording of the papers. Extensions of time will not be available to extend the specified period to resubmit the returned papers.

Section 3.54 is added to set out the effect of recording a document. This section states that the recording of a document is not a determination by the Office of the validity of the document or the effect that document has on the title to an application, a patent, or a registration. The Office will determine, when necessary, what effect a document has, including whether a party has the authority to take an action in a matter pending before the Office. Examples of when the Office will need to determine whether a party has the authority to take an action in a matter pending before the Office include: (1) prosecution by the assignee as in § 3.71; (2) consent of an assignee to the filing of a reissue application as provided in § 1.172; and (3) execution of a disclaimer under § 1.321 by an assignee.

Section 3.56 replaces and modifies the practice of § 1.333. Section 3.56 provides that an assignment, which at the time of its execution is conditional on a given act or event, will be treated by the Office as an absolute assignment. This section serves as notification as to how a conditional assignment will be treated by the Office in any proceeding requiring a determination of the owner of an application, patent or registration. Since the Office will not determine whether a condition has been fulfilled, the Office will treat the submission of such an assignment for recordation as signifying that the act or event has occurred.

Section 3.61 replaces and modifies the practice of § 2.185(a)(4). Section 3.61 sets forth that an assignee of a trademark application or registration not domiciled in the United States must designate a domestic representative in writing to the Office. Assignees of patent applications or patents may designate domestic representatives if the assignee is not residing in the United States. 35 U.S.C. § 293. The designation is required to state the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the application, patent or registration or rights thereunder.

Section 3.71 replaces and modifies the practice of §§ 1.32 and 2.186. Section 3.71 sets forth that the assignee of record of the entire right, title and interest in an application for patent is entitled to conduct the prosecution of the patent application to the exclusion of the named inventor. Similarly, the assignee of an application for registration is entitled to conduct the prosecution of the trademark application to the exclusion of the applicant.

Section 3.73 is added to set out the procedure by which an assignee can establish the right to take action in an application, patent or registration. The inventor is presumed to be the original owner of a patent application and any patent that may issue therefrom, unless there is an assignment. The original applicant is presumed to be the original owner of a trademark application and any registration that may issue therefrom, unless there is an assignment. Any action before the Office with respect to an assigned patent application, patent, or reexamination may be taken by the assignee of the entire right, title, and interest, provided ownership is established to the satisfaction of the Commissioner. The assignee may establish ownership by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee or by specifying (e.g., reel and frame number, etc.) where such evidence is recorded in the Office. Additionally, when a patent assignee is not represented by an attorney or registered agent, a statement signed by the assignee must also be submitted stating the evidence has been reviewed and certifying that, to the best of the party's knowledge and belief, title is in the party seeking to take the action. Documents submitted to establish ownership may be required to be recorded in the Office as a condition to permitting the requesting party to take action in a matter pending before the Office. Any action before the Office with respect to an assigned trademark registration, application or post-registration matter, may be taken by the assignee provided ownership is established to the satisfaction of the Commissioner by recording an assignment to the assignee or by submitting other proof of the assignment.

Section 3.81 replaces and modifies the practice of § 1.334. Section 3.81 sets forth the procedure for issuance of a patent to an assignee. If an assignment of the entire right, title, and interest is recorded before the issue fee is paid for a patent application, the patent may issue in the name of the assignee. If the assignee holds an undivided part interest, the patent may issue jointly to the inventor and the assignee. At the time the issue fee is paid, the name of the assignee must be provided if the patent is to issue solely or jointly to that assignee. If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the assignee. Any such petition must be accompanied by the fee set forth in § 1.17(i)(1).

Section 3.85 replaces and modifies the practice of § 2.187. Section 3.85 sets forth the procedure for issuance of a registration to an assignee. The certificate of registration may be issued to the assignee of the applicant, or in a new name of the applicant, provided that the party files a written request in the trademark application record by the time the application is being prepared for issuance of the certificate of registration, and an appropriate document is recorded in the Office. If the assignment or name change document has not been recorded in the Office, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the trademark application file.

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

In this discussion, "Patent and Trademark Office" is abbreviated as "Office" or "PTO".

Comment: Two comments were received addressed to the overall rule package. One comment expressed concern over the potential confusion of instituting a new Part 3. It was suggested that Parts 1 and 2 be amended to contain the necessary changes. Another comment was concerned that the rules and specifically the new cover sheet requirement would impede promptness and accuracy of the recordation process.

Response: The Office has determined that the new rules will result in greater efficiency and accuracy in the recordation process and improve the integrity of the records maintained by the PTO. Further, the PTO believes that a new Part 3, containing all rules relating to assignments, will be beneficial to the majority of patent and trademark system users.

Comment: Section 3.1 was proposed to define "application" as an application for patent or an application to register a trademark. One comment questioned whether international applications filed under the Patent Cooperation Treaty were included in the definition of the word "application."

Two comments were received concerning the definition of "assignment." As proposed, § 3.1 defines "assignment" of a trademark in terms of a "trademark application" or "registration." The comments suggested that because Section 10 of the Trademark Act, 15 U.S.C. § 1060, speaks in terms of a "registered mark" or a "mark for which application to register has been filed," which was reflected in previous trademark rule 2.186, the different terminology may be construed to permit assignment of a trademark without assignment of the underlying goodwill.

Response: The wording of § 3.1 has been changed to include both national applications for patent and international applications that designate the United States in the term "application."

Also to avoid any potential confusion over the definition of a trademark assignment, the Office adopted the suggestion to reflect Section 10 of the Trademark Act and to refer to a "registered mark" or a "mark for which application to register has been filed" in its definition of assignment.

Comment: As proposed, § 3.16 provides that an application to register a mark under 15 U.S.C. § 1051(b) cannot be assigned before a statement of use is filed except to a successor to an ongoing business of the original applicant. One comment suggested § 3.16 be further amended to correct a legislative oversight and permit assignment of the application after an amendment to allege use is filed.

One other comment suggested the PTO define the statutory language "successor to the business of the applicant."

Response: As proposed, Rule 3.16 merely restates the statute. To permit the filing of an assignment to a successor to an ongoing business before an amendment to allege use has been filed would make the rule inconsistent with the statute.

As to the definition of "successor to the business of the applicant," it has been determined that in the absence of any statutory definition, it is better left to case law to establish the meaning. A business, or portion thereof, can be transferred or assigned in a variety of ways, and the question of valid ownership might arise in a variety of circumstances. For the PTO to define what constitutes a successor may be duly restrictive.

Accordingly, the suggested modifications have not been adopted.

Comment: Section 3.21, as proposed, provides that an assignment of a patent or patent application must be identified by number. One comment requested a further amendment to allow the filing of a patent assignment after filing an application for patent but before knowing the application number by allowing identification by the execution date, inventors and title of the invention instead of the application number.

Another comment suggested that assignments relating to trademark applications and registrations should also be required to have the identifying serial and registration numbers within the body of the assignment document.

One comment questioned whether the patent identification number was required in the document or whether the number could just appear on the cover sheet.

Response: Providing the identifying number in the assignment document allows for greater efficiency and accuracy in recording assignments. However, unlike patents, trademarks can have an indefinite life. Assignments may be recorded years after an assignment has occurred to clear up the chain of title. It may not be possible to execute a new assignment to include identifying numbers in the document years later. Accordingly, it is preferable for the PTO to be more flexible in recording trademark assignments which may contain the identifying number in the cover sheet rather than in the document itself. Because of the nature of a patent, less flexibility is permitted. Patent rights, unlike trademark rights, do not exist apart from the issued patent. Accordingly, when an interest in a patent is transferred, the patent identifying number must be in the assignment document. This requirement only applies to assignments, not to documents other than assignments.

The PTO makes every effort to provide applicants with the application numbers for newly-filed patent applications as soon as possible. It is suggested, however, that assignment documents may be written to allow entry of the identifying number after the execution of the assignment. An example of acceptable wording is: "I hereby authorize and request my attorney, (Insert name), of (Insert address), to insert here in parentheses (Application number_____, filed) the filing date and application number of said application when known."

Accordingly, the suggested modifications have not been adopted.

Comment: Section 3.24, as proposed, provides the formal requirements for the documents which are to be recorded and the cover sheet. Three comments stated that the one-side only requirement was unreasonable in light of PTO's issuance of two-sided patent and trademark copies and of the practices of other governments and corporations over which the submitter would have no control.

One comment requested clarification of "bond weight paper" and suggested the language used in the rules setting out drawing requirements be adopted.

One comment stated that the document size requirements should only pertain to documents prepared and executed by parties who wish to convey title.

Two comments questioned whether the PTO would permit the filing of copies or true copies in lieu of the original documents for recording.

Response: The formal requirements set out in § 3.24 are related to PTO's ability to capture on film papers filed with the PTO. The requirements are not related to the other printing or photocopying services PTO provides. Micrographics reproduction requires that only one side of each page be used for efficiency. If the original document is two-sided or the wrong size, the practitioner can comply with this requirement by providing a true copy of the original document using only one side of each page on the correct size paper. The language in § 3.24 has been changed to clarify that true copies or originals are acceptable. Further, the language describing the type of paper to be used has been changed to be consistent with the drawing requirement rules.

Comment: Section 3.28, as proposed, provides that all requests to record a document must be accompanied by the document to be recorded and at least one cover sheet. One comment expressed confusion over whether the document must be accompanied by a cover letter as well as a request for recording. One comment stated the requirement for a cover sheet did not help the PTO with the documents which are filed

with applications and the commenter did not see the need for an additional paper included among the papers for a new application.

Response: The first sentence has been rewritten to clarify that only the document and a cover sheet(s) must be submitted. A separate request for recording is not required or needed. Because the cover sheet provides all pertinent information in one place, it will greatly assist the processing of assignments by the PTO. For those applications which are filed with an assignment, the additional cover sheet required for the assignment aids the processing of the assignment.

Comment: Numerous comments were received on the proposed cover sheet requirements of § 3.31. One comment questions whether the form or the contents of the form are being required and cautioned that the cover sheet should not become a technical obstacle to recordation.

Two comments claimed the cover sheet requirement would be burdensome and the documents recorded should speak for themselves.

Two comments objected to the requirement for the characterization of the interest being conveyed. One of the commentors indicated it was not the best evidence of what the interest is and may be misleading while the second comment or was concerned practitioners would be subject to malpractice claims and be made parties to litigation involving the transfer.

One comment stated that requiring the assignee's address was burdensome and excessive. Three comments questioned the lack of consistency between proposed subsections (a) and (b) of § 3.31 which requires only the name of the conveyor but both the name and address of the receiver.

Two comments stated that the language of the rule was unclear as to whether the list of properties within the assignment document should be retyped on the cover sheet, which would be burdensome and fraught with potential errors.

One comment was received suggesting that properties be identified with as much information as possible (i.e., serial number, patent number, filing date, inventors, etc.).

Four comments stated that the requirement for an execution date of the document is excessive and burdensome. One of the comments stated that the execution date may not be as important as the effective date of the document. One suggested the effective date would be more accurate and another suggested the document should speak for itself. One additional comment stated that a nunc pro tunc assignment of the substantive rights of an assignee or assignor may be unduly affected by the requirement for recitation of the execution date.

Nine comments were received objecting to the language of the proposed verification. Some comments recommended that the verification statement be deleted. Other comments recommended that the verification statement be based on "information and belief." The comments indicated (1) practitioners did not want to be held responsible for the information entered on the cover sheet, (2) there was no purpose served by signing the cover sheet because the documents should speak for themselves and (3) under 37 C.F.R. § 10.18, a registered practitioner's signature indicates that the filing is correct.

One comment suggested that proposed § 3.31(i) does not recognize the right of some non-lawyers to practice in trademark matters before the PTO.

Additionally, many comments and suggestions were received on the layout of the sample cover sheets.

Response: The proposed purpose of the cover sheet is to provide a synopsis of the vital information contained in a recorded document. The cover sheet form itself is not required, only the information outlined in § 3.31 is required. Use of the sample cover sheet formats appearing as Appendices A and B to the rule package is encouraged. The Office will make paper copies of the sample cover sheets available for customer use. Persons wishing to obtain paper copies of the sample cover sheets should contact the Public Service Center at (703) 305-HELP. Questions regarding the sample cover sheets should be directed to the Assignment and Certification Services Division at (703) 308-9700.

As indicated in the proposed rule package, a majority of documents presently filed for recording are accompanied by a cover letter containing much of the information required in § 3.31. The PTO does not believe standardization of the information submitted is an undue burden. Standardization ensures easy reference to all critical information. Further, the parties or their representatives are in a better position to know or ascertain the nature of the interest involved than the PTO. The document will always speak for itself. However, a characterization assists in putting others on notice as to the nature of the transaction.

It was determined that a verification is not required. The language has been changed to a statement on the cover sheet based on "information and belief." Further, § 3.31(i) has been divided into two paragraphs, one for the statement that is required and one for the signature.

The address of the assignee or receiving party is vital information for maintaining complete assignment records. The original owner is the applicant, for which the Office has the address of record. Each subsequent assignee address is then obtained under this requirement and is of record if the PTO or public needs to contact the present assignee. The execution date is required to determine whether an assignment has been recorded within three months provided in 35 U.S.C. § 261 and 15 U.S.C. § 1060.

When there is a listing of properties contained within a document, any listing may be copied and attached to the cover sheet to reduce the amount of typing necessary. A notation of this attachment can be made in lieu of entering every property identification number on the cover sheet. Should submitters provide information in addition to that required by § 3.31, it is always welcome, but not required.

The comments received on the layout of the sample cover sheets have all been considered and some modifications have been made. However, the sample cover sheet is not required and it is not part of the rules.

Comment: Section 3.34, as proposed, provides for correction of errors in a recorded cover sheet when the error is apparent by comparing the information on the cover sheet with the recorded document itself. One comment received expressed confusion regarding the correction procedure. Another comment suggested that corrections should not be limited to apparent errors.

Response: The PTO will not compare the cover sheet with the original documents during the recording process except to assure that application and patent numbers are present in patent assignments. Otherwise, it will only check to see that the cover sheet is complete. When a submitter discovers an obvious error on the recorded cover sheet, the PTO will consider a request to correct it when it receives: (1) the original recorded document (or a copy); (2) a corrected cover sheet; and (3) the appropriate fee for each property to be corrected. The PTO will then compare the cover sheet with the document to determine whether the error is apparent on its face. If the error is obvious, the corrected cover sheet will be recorded and the respective Office records corrected. If the error is not obvious, the procedure set forth in the Manual of Patent Examining Procedure, MPEP § 323 will govern for patents and the procedure set forth in *In re Abacab International Computers Ltd.* (Assignee of IHEC, Ltd.), 21 USPQ2d 1078 (Comm'r Pats. 1987), *on reconsideration*, 21 USPQ2d1079 (Comm'r Pats. 1988) will govern for trademarks. Submitters may also petition under § 1.833 or § 2.146 for other corrections. Typographical errors made by the Office will be corrected without charge when brought to our attention.

Accordingly, the suggested modification has not been adopted. The rule has only been changed to correct a cross reference.

Comment: As proposed, § 3.51 provides that the date of recording is the date all of the required information is filed in the Office. Incomplete documents will be returned. If the returned documents are resubmitted timely, the document will retain the date on which it was received as incomplete. Two comments were received regarding the time period to be set by the PTO. One comment indicated that any delay may affect the requirements of 15 U.S.C. § 1060. It was therefore recommended that the PTO make some type of "conditional entry" in the records indicating an assignment has been submitted so interested members of the public could ascertain that there may be an effective recording date. The other comment suggested the time period for resubmission be long enough to allow communication with foreign parties, but it should be no longer than six months.

Response: After a review of the proposed rule, it was determined that the language of § 3.51 should be clarified to reflect that the originally-submitted papers with the official Office

date stamp indicating the original receipt date in the Office must be returned in order to retain the original date. It is the intent of the PTO to set the time for response at one month from the date of mailing of the returned documents from the PTO. It is believed that most correctable errors will involve an incomplete cover sheet or the amount of the fee submitted, both of which can be corrected within one month.

Further, it is the policy of the PTO to make of record only those documents which meet the requirements for recording. It is not beneficial to cloud title to properties with potential transfers.

Comment: Section 3.56, as proposed, is a restatement of former § 1.333 and is made applicable to trademarks. It provides that an assignment which is made conditional upon a condition subsequent will be regarded by the Office as an absolute assignment. One comment was received inquiring as to whether § 3.56 applied to security interests, another was received requesting a reference in the rules to recording of security agreements.

Response: Section 3.56 is applicable only to assignments, as they are defined by § 3.1, that is, a transfer of right, title and interest in a patent or a trademark. A security interest or a security agreement is in the nature of a lien, not an assignment. Accordingly, § 3.56 would not apply to security interests or security agreements which are also recordable. It applies to conditional assignments because the Office has no way of determining whether and when conditions are satisfied and therefore must address this type of assignment in a uniform manner. The reference to the recordability of security agreements is referred to here in the final rule package.

Comment: The second sentence of § 3.71, as proposed, provides: "[t]he assignee of record of the entire right title and interest in a trademark application or registration is entitled to conduct the prosecution of the trademark application or registration to the exclusion of the original applicant or previous assignee." One comment suggested, as had been recommended for the definitions in § 3.1, that language be adopted consistent with Section 10 of the Trademark Act, 15 U.S.C. § 1060, so there be no confusion as to what can be assigned in the trademark area and further, that the language requiring "entire right, title and interest" be deleted.

Response: As was the case with the PTO's review of § 3.1, the language in § 3.71 has also been modified to eliminate any confusion. Accordingly, § 3.71 now provides for assignments of registered marks or a mark for which an application for registration has been filed, making it consistent with § 3.1. While this change cannot prevent assignments from being made without the underlying goodwill, it may eliminate some confusion.

Comment: Section 3.73, as proposed, provided that a full assignee could take any action before the Office with respect to the assigned application, patent, or registration provide ownership is established to the satisfaction of the Commissioner. The rule further provided that ownership could be established by providing documentary evidence of the chain of title to the assignee. The assignee was also required to submit a verified statement stating the evidence had been reviewed and certifying to the best of the party's belief, title is in the party seeking to take the action. The Office reserved the right to require recordation of any ownership documents. One comment suggested the procedure was too "elaborate" and "confusing" to permit the submitting party to act rapidly. Another comment suggested the Office use the language of former § 2.186 which only required "the assignment has been recorded or that proof of the assignment has been submitted" to enable action by the assignee.

Another comment suggested that a simple statement identifying the documents thought to place ownership in a party should be sufficient. It was believed that no additional benefit accrued by having the party state that they believed they were entitled to take the action because whether or not a party can act is a determination the PTO must make.

Two comments suggested that a literal reading of the rule would require every paper filed on behalf of an assignee be accompanied by a proof of ownership. One comment suggested it was too harsh to preclude a party from taking action in a trademark matter until proof of ownership is established to the satisfaction of the Commissioner. Rather, it was suggested that a party be permitted to take action once documents establishing ownership are filed.

One comment received pointed to the proposed language of § 3.73 providing the statement must be signed by the party or its attorney or agent *of record* which was a greater requirement than § 1.34(a), if that was intended.

Another comment suggested that the proposed language be changed by deleting the provision that ownership must be established to the satisfaction of the Commissioner and substituting therefore "provided the assignee is owner of the entire right, title, and interest in the patent application, patent, registered-mark or mark for which an application for registration has been filed."

One final comment suggested that § 3.73 be changed to specifically set forth that it applied to secure Office acceptance of a Section 8 or 15 affidavit or a Section 9 application, 15 U.S.C. §§ 1058, 1059, for trademark filings, and requested examples of the types of documents necessary to establish ownership.

Response: Ownership need only be established the first time the new party wants to act in patent and trademark cases, provided the appropriate documents are recorded. Section 3.73(b) is modified to provide that a statement of ownership need only be provided when a patent assignee wishes to act on a matter. For patents, the PTO believes it is appropriate for the patent assignee to review the documents it believes establishes its ownership prior to filing a paper signed by that assignee. Additionally, the statement will certify that to the best of the assignee's knowledge and belief, title is in that assignee. This will establish, to the satisfaction of the Commissioner, that the assignee knows of no other document establishing title in someone other than the assignee. The PTO will still make the determination of whether the assignee is entitled to take action after a review of the documents.

For trademarks the action sought to be taken can be submitted simultaneously by the party. The action will be examined as will the claim of ownership and the party will be notified whether it is satisfactory. As in the past, "any action" refers to post-registration documents as well.

Other Considerations

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to require that a cover sheet accompany each document submitted for recording. The rule change includes no additional or increased fees. Substantive rights to use trademarks and patents are not adversely affected.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. Because most of the changes reduce procedural burdens, there will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

These rule changes contain a collection-of-information requirement subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The rule changes add a requirement for a cover sheet to be submitted with each document to be recorded that will expedite the recording process and improve quality. This collection of information requirement is cleared under OMB Control No. 0651-0011. The public reporting burden for this requirement is estimated to be *one-half* hour per filing, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record-keeping requirement.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 3

Administrative practice and procedure, Inventions and patents, Trademarks, Reporting and recordkeeping requirement.

For the reasons set out in the preamble and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 3 of title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.12 paragraphs (a) and (d) are revised to read as follows:

§ 1.12 Assignment records open to public inspection.

(a) (1) Separate assignment records are maintained in the Patent and Trademark Office for patents and trademarks. The assignment records, relating to original or reissue patents, including digests and indexes, for assignments recorded on or after May 1, 1957, and assignment records relating to pending or abandoned trademark applications and to trademark registrations, for assignments recorded on or after January 1, 1955, are open to public inspection at the Patent and Trademark Office, and copies of those assignment records may be obtained upon request and payment of the fee set forth in §§ 1.19 and 2.6 of this Chapter.

(2) All records of assignments of patents recorded before May 1, 1957, and all records of trademark assignments recorded before January 1, 1955, are maintained by the National Archives and Records Administration (NARA). The records are open to public inspection. Certified and uncertified copies of those assignment records are provided by NARA upon request and payment of the fees required by NARA.

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(d) An order for a copy of an assignment or other document should identify the reel and frame number where the assignment or document is recorded. If a document is identified without specifying its correct reel and frame, an extra charge as set forth in § 1.21(j) will be made for the time consumed in making a search for such assignment.

3. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

§ 1.17 Patent application processing fees.

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(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....$130.00

§ 1.12 — for access to an assignment record.
§ 1.14 — for access to an application.
§ 1.53 — to accord a filing date.
§ 1.55 — for entry of late priority papers.
§ 1.60 — to accord a filing date.
§ 1.62 — to accord a filing date.
§ 1.103 — to suspend action in application.
§ 1.177 — for divisional reissues to issue separately.
§ 1.312 — for amendment after payment of issue fee.
§ 1.313 — to withdraw an application from issue.
§ 1.314 — to defer issuance of a patent.
§ 1.666(b) — for access to interference settlement agreement.
§ 3.81 — for patent to issue to assignee, assignment submitted after payment of the issue fee.

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4. Section 1.32 is removed and reserved.

1.32 [Reserved]

5. Section 1.46 is revised to read as follows:

§ 1.46 Assigned inventions and patents.

In case the whole or a part interest in the invention or in the patent to be issued is assigned, the application must still be made or authorized to be made, and an oath or declaration signed, by the inventor or one of the persons mentioned in §§ 1.42, 1.43, or 1.47. However, the patent may be issued to the assignee or jointly to the inventor and the assignee as provided in § 3.81.

6. Section 1.104 is amended by revising paragraph (e) to read as follows:

§ 1.104 Nature of examination; examiner's action.

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(e) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if:

(1) the application files refer to assignments recorded in the Patent and Trademark Office in accordance with Part 3 of this chapter which convey the entire rights in the applications to the same person or organization; or

(2) copies of unrecorded assignments which convey the entire rights in the applications to the same person or organization are filed in each of the applications; or

(3) an affidavit or declaration by the common owner is filed which states that there is common ownership and states facts which explain why the affiant or declarant believes there is common ownership; or

(4) other evidence is submitted which establishes common ownership of the applications.

In circumstances where the common owner is a corporation or other organization, an affidavit or declaration may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

7. The undesignated center head above § 1.331 is revised to read as follows:

Arbitration Awards

8. Sections 1.331 through 1.334 are removed and reserved.

§§ 1.331- 1.334 [Reserved]

Part 2 - RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. The undesignated center head § 2.185 is removed.

11. Sections 2.185 through 2.187 are removed and reserved.

§§ 2.185-2.187 [Reserved]

12. Part 3 is added to read as follows:

Part 3 - ASSIGNMENT, RECORDING AND RIGHTS OF ASSIGNEE

Sec.

3.1 Definitions

DOCUMENTS ELIGIBLE FOR RECORDING

3.11 Documents which will be recorded.
3.16 Assignability of trademarks prior to filing of use statements.

REQUIREMENTS FOR RECORDING

3.21 Identification of patents and patent applications.
3.24 Formal requirements for documents and cover sheets.
3.26 English language requirement.
3.27 Mailing address for submitting documents to be recorded.
3.28 Requests for recording.

COVER SHEET REQUIREMENTS

3.31 Cover sheet content.
3.34 Correction of cover sheet errors.

FEES

3.41 Recording fees.

DATE AND EFFECT OF RECORDING

3.51 Recording date.
3.54 Effect of recording.
3.56 Conditional assignments.

DOMESTIC REPRESENTATIVE

3.61 Domestic representative.

PROSECUTION BY ASSIGNEE

3.71 Prosecution by assignee.
3.73 Establishing right of assignee to prosecute.

ISSUANCE TO ASSIGNEE

3.81 Issue of patent to assignee.
3.85 Issue of registration to assignee.

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

§ 3.1 Definitions.

For purposes of this part, the following definitions shall apply:

Application means a national application for patent, an international application that designates the United States of America, or an application to register a trademark unless otherwise indicated.

Assignment means a transfer by a party of all or part of its right, title and interest in a patent or patent application, or a transfer of its entire right, title and interest in a registered mark or a mark for which an application to register has been filed.

Document means a document which a party requests to be recorded in the Office pursuant to § 3.11 and which affects some interest in an application, patent, or registration.

Office means the Patent and Trademark Office.

Recorded document means a document which has been recorded in the Office pursuant to § 3.11.

Registration means a trademark registration issued by the Office.

DOCUMENTS ELIGIBLE FOR RECORDING

§ 3.11 Documents which will be recorded.

Assignments of applications, patents, and registrations, accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, will be recorded in the Office. Other documents, accompanied by completed cover sheets as specified in §§ 3.28 and 3.31, affecting title to applications, patents, or registrations, will be recorded as provided in this Part or at the discretion of the Commissioner.

§ 3.16 Assignability of trademark prior to filing of use statement.

No application to register a mark under 15 U.S.C. 1051(b) is assignable prior to the filing of the verified statement of use under 15 U.S.C. 1051(d) except to a successor to the business of the applicant, or portion thereof, to which the mark pertains, if that business is ongoing and existing.

REQUIREMENTS FOR RECORDING

§ 3.21 Identification of patents and patent applications.

An assignment relating to a patent must identify the patent by the patent number. An assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date. An assignment relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

§ 3.24 Formal requirements for documents and cover sheets.

The document and cover sheet must be legible. Either the original document or a true copy of the original document, may be submitted for recording. Only one side of each page shall be used. The paper used should be flexible, strong, white, non-shiny, durable, and preferably no larger than 21.6 x 33.1 cm. (8 1/4 x 14 inches) with a 2.5 cm. (one-inch) margin on all sides.

§ 3.26 English language requirement.

The Office will accept and record non-English language documents only if accompanied by a verified English translation signed by the individual making the translation.

§ 3.27 Mailing address for submitting documents to be recorded.

Documents and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignments, Washington, D.C. 20231, unless they are filed together with new applications or with a petition under 3.81(b).

§ 3.28 Requests for recording.

Each document submitted to the Office for recording must be accompanied by at least one cover sheet as specified in § 3.31 referring either to those patent applications and patents, or to those trademark applications and registrations, against which the document is to be recorded. If a document to be recorded includes interests in, or transactions involving, both patents and trademarks, separate patent and trademark cover

sheets must be submitted. Only one set of documents and cover sheets to be recorded should be filed. If a document to be recorded is not accompanied by a completed cover sheet, the document and any incomplete cover sheet will be returned pursuant to § 3.51 for proper completion of a cover sheet and resubmission of the document and a completed cover sheet.

COVER SHEET REQUIREMENTS

§ 3.31 Cover sheet content.

(a) Each patent or trademark cover sheet required by § 3.28 must contain:

(1) the name of the party conveying the interest;

(2) the name and address of the party receiving the interest;

(3) a description of the interest conveyed or transaction to be recorded;

(4) each application number, patent number or registration number against which the document is to be recorded, or an indication that the document is filed together with a patent application;

(5) the name and address of the party to whom correspondence concerning the request to record the document should be mailed;

(6) the number of applications, patents or registrations identified in the cover sheet and the total fee;

(7) the date the document was executed;

(8) an indication that the assignee of a trademark application or registration who is not domiciled in the United States has designated a domestic representative (see § 3.61); and

(9) a statement by the party submitting the document that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original document; and

(10) the signature of the party submitting the document.

(b) A cover sheet may not refer to both patents and trademarks.

§ 3.34 Correction of cover sheet errors.

(a) An error in a cover sheet recorded pursuant to 3.11 will be correctedonly if:

(1) the error is apparent when the cover sheet is compared with the recorded document to which it pertains and

(2) a corrected cover sheet is filed for recordation.

(b) The corrected cover sheet must be accompanied by the originally recorded document or a copy of the originally recorded document and by the recording fee as set forth in § 3.41.

FEES

§ 3.41 Recording fees.

All requests to record documents must be accompanied by the appropriate fee. A fee is required for each application, patent and registration against which the document is recorded as identified in the cover sheet. The recording fee is set in § 1.21(h) of this Chapter for patents and in § 2.6(q) of this Chapter for trademarks.

DATE AND EFFECT OF RECORDING

§ 3.51 Recording date.

The date of recording of a document is the date the document meeting the requirements for recording set forth in this Part is filed in the Office. A document which does not comply with the identification requirements of § 3.21 will not be recorded. Documents not meeting the other requirements for recording, for example, a document submitted without a completed cover sheet or without the required fee, will be returned for correction to the sender where a correspondence address is available. The returned papers, stamped with the original date of receipt by the Office, will be accompanied by a letter which will indicate that if the returned papers are corrected and resubmitted to the Office within the time specified in the letter, the Office will consider the original date of filing of the papers as the date of recording of the document. The certification procedure under either § 1.8 or § 1.10 of this Chapter may be used for resubmissions of returned papers to have the benefit of the date of deposit in the United States Postal Service. If the returned patent was not corrected and resubmitted within the specified period, the date of filing of the corrected papers will be considered to be the date of recording of the document. The specified period to resubmit the returned papers will not be extended.

§ 3.54 Effect of recording.

The recording of a document pursuant to § 3.11 is not a determination by the Office of the validity of the document or the effect that document has on the title to an application, a patent, or a registration. When necessary, the Office will determine what effect a document has, including whether a party has the authority to take an action in a matter pending before the Office.

§ 3.56 Conditional assignments.

Assignments which are made conditional on the performance of certain acts or events, such as the payment of money or other condition subsequent, if recorded in the Office, are regarded as absolute assignments for Office purposes until cancelled with the written consent of all parties or by the decree of a court of competent jurisdiction. The Office does not determine whether such conditions have been fulfilled.

DOMESTIC REPRESENTATIVE

§ 3.61 Domestic representative.

If the assignee of a trademark application or registration is not domiciled in the United States, the assignee must designate, in writing to the Office, a domestic representative. An assignee of a patent application or patent may designate a domestic representative if the assignee is not residing in the United States. The designation shall state the name and address of a person residing within the United States on whom may be served process or notice of proceedings affecting the application, patent or registration or rights thereunder.

PROSECUTION BY ASSIGNEE

§ 3.71 Prosecution by assignee.

The assignee of record of the entire right, title and interest in an application for patent is entitled to conduct the prosecution of the patent application to the exclusion of the named inventor or previous assignee. The assignee of a registered trademark or a trademark for which an application to register has been filed is entitled to conduct the prosecution of the trademark application or registration to the exclusion of the original applicant or previous assignee.

§ 3.73 Establishing right of assignee to prosecute.

(a) The inventor is presumed to be the owner of a patent application, and any patent that may issue therefrom, unless there is an assignment. The original applicant is presumed to be the owner of a trademark application unless there is an assignment.

(b) When the assignee of the entire right, title and interest seeks to take action in a matter before the Office with respect to a patent application, trademark application, patent, registration, or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commissioner. Ownership is established by submitting to the Office documentary evidence of a chain of title from the original owner to the assignee or by specifying (e.g. reel and frame number, etc.) where such evidence is recorded in the Office. Documents submitted to establish ownership may be required to be recorded as a condition to permitting the assignee to take action in a matter pending before the Office. In addition, the assignee of a patent application or patent must submit a statement specifying that the evidentiary documents have been reviewed and certifying that, to the best of assignee's knowledge and belief, title is in the assignee seeking to take the action.

ISSUANCE TO ASSIGNEE

§ 3.81 Issue of patent to assignee.

(a) For a patent application, if an assignment of the entire right, title, and interest is recorded before the issue fee is paid, the patent may issue in the name of the assignee. If the assignee holds an undivided part interest, the patent may issue jointly to the inventor and the assignee. At the time the issue fee is paid, the name of the assignee must be provided if the patent is to issue solely or jointly to that assignee.

(b) If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the assignee. Any such petition must be accompanied by the fee set forth in 1.17(i)(1) of this Chapter.

§ 3.85 Issue of registration to assignee.

The certificate of registration may be issued to the assignee of the applicant, or in a new name of the applicant, provided that the party files a written request in the trademark application by the time the application is being prepared for issuance of the certificate of registration, and the appropriate document is recorded in the Office. If the assignment or name change document has not been recorded in the Office, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the application file.

June 24, 1992 DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1140 OG 53]

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(36) **Issuance of a Patent to an Assignee**

The purpose of this notice is to clarify the procedures to have a patent issue to an assignee. See 37 CFR 3.81 and Manual of Patent Examining Procedure § 307.

Section 3.81(a) permits a patent to isssue to an assignee, provided that at the time the issue fee is paid, the assignment has been submitted for recordation and the name of the assignee is provided. The name of the assignee is usually provided in item 5 of the Issue Fee Transmittal form (PTOL-85B).

Section 3.81(b) permits a patent to issue to an assignee when the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, provided a petition and fee are filed requesting that the patent issue to the newly recorded assignee.

When the correct name of the assignee was not provided in accordance with either section 3.81(a) or (b) (i.e., either no name or an incorrect name was provided in item 5 of the Issue Fee Transmittal when the assignment had been recorded or submitted for recordation at the time the issue fee was paid, or an incorrect name was provided in the petition required by section 3.81(b) when the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent), a correction can be made by filing a petition under 37 CFR 1.183 requesting that the requirements of 37 CFR 3.871 be waived. This procedure is required at any time after the issue fee is paid, including after issuance of the patent. A petition under 37 CFR 1.183 should include: (1) the petition fee set forth in 37 CFR 1.17(h) (currently $130); (2) the correct name of the assignee; and (3) the reel and frame number where the assignment is recorded or proof of the date the assignment was submitted for recordation.

If the petition under 37 CFR 1.183 is filed and granted prior to issuance of the patent, the patent will either: (1) be printed with the correct assignee's name; or (2) be printed without the correct assignee's name. In the latter case, patentee would be entitled to a certificate of correction under 37 CFR 1.322 to correct an Office mistake in not correctly printing the assignee's name on the patent.

If the petition under 37 CFR 1.183 is filed and/or granted after issuance of the patent, the patent would be printed without the correct assignee's name. However, if the petition is granted, patentee would be entitled to a certificate of correction under 37 CFR 1.323 due to the mistake in not complying with 37 CFR 3.81.

March 16, 1994 CHARLES E. VAN HORN
Patent Policy and Projects Administrator
Office of the Assistant Commissioner for Patents

[1161 OG 293]

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(37) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1, 2 § 3

[Docket No. 910246-2140]
RIN 0651-AA43

Changes in Patent and Trademark Assignment Practice

Agency: Patent and Trademark Office, Commerce
Action: Final Rule; correction.
Summary: The Patent and Trademark Office (Office) amended the rules of practice regarding assignments in patent and trademark cases to improve and clarify the rules, to codify changes in practice and to consolidate the rules into a new Part 3 directed to assignments. In the final assignment rules a fee change promulgated in January 1992 was inadvertently omitted from the § 1.17(i)(1) listing.
Effective Date: September 4, 1992.
For Further Information Contact: Jeffery V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.
Supplementary Information: The amended assignment rules first appeared in a notice of proposed rulemaking published in the *Federal Register* on May 10, 1991, at 56 FR 21641, and the Patent and Trademark Office *Official Gazette* of June 4, 1991, at 1127 OG 8-16. The final rules appeared in the *Federal Register* on July 6, 1992, at 57 FR 29634. Between the time the proposed and final rules were published, 37 CFR § 1.97(d) was amended, effective March 16, 1992, by a final rule which appeared in the *Federal Register* of January 17, 1992, 57 FR 2021, relating to the duty of disclosure. The amendment provided for a new petition fee which was referenced in 37 CFR § 1.17, patent application processing fees. The reproduction of § 1.17 in the final assignment rule package neglected to add the reference to the new petition under § 1.97(d).

Section 1.17(i)(1) is reproduced in its entirety to include the reference to § 1.97(d) which was inadvertently omitted The amount of the fee for considering an information disclosure statement is not affected by this rule change.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents.

For the reasons set out in the preamble and pursuant to the authority contained in 35 U.S.C. 6, part 1 of title 37 of the Code of Federal Regulations has been amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....$130.00

§ 1.12 - foraccess to an assignment record.
§ 1.14 - for access to an application.
§ 1.53 - to accord a filing date.
§ 1.55 - for entry of late priority papers.
§ 1.60 - to accord a filing date.
§ 1.62 - to accord a filing date.
§ 1.97(d) - to consider an information disclosure statement.
§ 1.103 - to suspend action in application.
§ 1.177 - for divisional reissues to issue separately.
§ 1.312 - for amendment after payment of issue fee.
§ 1.313 - to withdraw an application from issue.
§ 1.314 - to defer issuance of a patent.
§ 1.666(b) - for access to interference settlement agreement.
§ 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee.

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July 17, 1992 DOUGLAS B. COMER
Assistant Secretary & Acting Commissioner of Patents and Trademarks

[1141 OG 38]

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(38) **Taking Action in a Patent Matter Before the Office by the Assignee under 37 CFR 3.73.**

When the assignee of the entire right, title and interest first seeks to take action in a matter before the Office with respect to a patent application, patent or reexamination proceeding, the assignee must establish its ownership of the property to the satisfaction of the Commissioner. 37 CFR 3.73(b). The assignee's ownership may be established either 1) by submitting to the Office copies of the documentary evidence of a chain of title from the original inventor to the assignee, or 2) by specifying, by reel and frame number, for example, where such documentary evidence is recorded in the Office. In addition to the establishment of ownership, there is further requirement that the assignee submit a statement specifying that the evidentiary documents have been reviewed and certifying that, to the best of the assignee's knowledge and belief, title is in the assignee seeking to take action. Once 37 CFR 3.73(b) is complied with by an assignee, that assignee may continue to take action in that application, patent or reexamination proceeding without filing a 37 CFR 3.73(b) statement each time, provided that ownership has not changed.

When an assignee files a continuation or divisional application (under 37 CFR 1.53, 1.60 or 1.62), reference may be made to a statement filed under 37 CFR 3.73(b) in the parent application or a copy of that statement may be filed. A newly executed statement under 37 CFR 3.73(b) must be filed when a continuation-in-part application is filed by an assignee.

The statement under 37 CFR 3.73(b) may be signed on behalf of the assignee in the following two manners if the assignee is an organization (e.g., corporation, partnership, university, government agency, etc.).

(1) The statement may be signed by a person in the organization having apparent authority to sign on behalf of the organization. An officer (president, vice-president, secretary, or treasurer) is presumed to have authority to sign on behalf of the organization. The signature of the chairman of the board of directors is acceptable, but not the signature of an individual director. A person having a title (manager, director, administrator, general counsel) that does not clearly set forth that person as an officer of the assignee is not presumed to be an officer of the assignee or to have authority to sign the statement on behalf of the assignee. A power of attorney from the inventors in an organization to a practitioner to prosecute a patent application does not make the practitioner an official of an assignee or empower the practitioner to sign the statement on behalf of the assignee.

(2) The statement may be signed by any person, if the statement includes an averment that the person is empowered to sign the statement on behalf of the assignee and, if not signed by a registered practitioner, the statement must be in oath or declaration form. Where a statement does not include such an averment, and the person signing does not hold a position in the organization that would give rise to a presumption that the person is empowered to sign the statement on behalf of the assignee, evidence of the person's authority to sign will be required.

Examples of situations where ownership must be established and the statement under 37 CFR 3.73(b) *must* be submitted are when the assignee: signs a request for status of an application or gives a power to inspect an application; acquiesces to express abandonment of an application; appoints its own legal representative; signs a terminal disclaimer; consents to the filing of a reissue application; consents to the correction of inventorship; files an application under 37 CFR 1.47(b) or 37 CFR 1.475; signs an Issue Fee Transmittal (PTOL-85B); or signs a response to an Office action.

Examples of situations where ownership need not be established and a statement under 37 CFR 3.73(b) is *not* required to be submitted are when the assignee: signs a small entity declaration; signs an affidavit or declaration of common ownership of two inventions; signs a NASA or DOE property rights statement; signs an affidavit under 37 CFR 1.131 where the inventor is unavailable; signs a Certificate of Mailing under 37 CFR 1.8; or files a request for reexamination of a patent under 37 CFR 1.510.

An acceptable certification under 37 CFR 3.73(b) is attached to this notice.

For further information related to actions taken by an assignee in patent matters, contact Jeffrey V. Nase at (703) 305-9282.

Apr. 30, 1993 CHARLES E. VAN HORN
Patent Policy and Projects Administrator Office of the Assistant Commissioner for Patents

[1150 OG 62]

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(39) **Submission of Uniform Assignee Names on the Issue Fee Payment Form PTOL-85b**

The Patent and Trademark Office is experiencing problems when computer-sorting assignee names for the Patentee Index because of the non-uniform use of the names of certain companies and corporations on the issue fee payment form PTOL-85b. The use of different spellings or nomenclature for the same company requires the Office to expend time and effort to determine whether the various name forms are in fact for the same company. If such inconsistencies are not corrected, patents to the same company will appear in different locations in the Patentee Index. An example of inconsistent use is "ABC Company, Ltd." and "ABC Co., Limited."

Therefore, persons who list assignee names on issue fee payment form PTOL-85b should ensure that the same company name form is used for all patents issuing to a particular company.

Nov. 17, 1977 RICHARD J. SHAKMAN
Assistant Commissioner for Administration

[965 O.G. 8]

(40) **Indexing Against a Recorded Assignment**

It has been the practice of the Patent and Trademark Office (PTO) to process requests for indexing against a recorded document by adding the newly requested property to the data base record for the previously recorded document, except if the previously recorded document was an assignment. The PTO only required a transmittal letter with the recording fee and not a copy of the previously recorded document to process the indexing request. While indexing the additional properties resulted in the assignment data base being updated, the indexing request itself was never microfilmed to become part of the official record.

Effective immediately, the PTO will no longer process such indexing requests. Such indexing requests do not comply with 37 CFR 3.11, 3.28, and 3.31 which require that each request for recordation include the document to be recorded and a cover sheet. Instead of filing an indexing request, a party should submit a cover sheet in conformance with 37 CFR 3.31, a true copy of the document, and the recording fee. PTO will assign a new recording date to that submission, update the assignment data base, and microfilm the cover sheet and document to become part of the official record.

Nov. 3, 1993 THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

[1157 OG 12]

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(41) **Recordability of Foreclosures for Assignment Purposes**

It has been the practice of the Assignment Branch to record security agreements between a secured party and a debtor which refer specifically to a patent or a patent application and which are signed by the debtor. However, foreclosures by the secured party were not recorded because they were not signed by the debtor. Accordingly, before recording a foreclosure not signed by a debtor, the Assignment Branch required a Court order. This requirement forced the secured party to bring action in a court of law where otherwise Court action might not have been necessary.

To facilitate recording of foreclosures not signed by a debtor and avoid unnecessary court proceedings, the Office will record foreclosures which comply with all of the following criteria:

(1) Submission of the foreclosure document with original endorsement by the secured party, or a verified copy thereof;
(2) Identification of the patent by patent number or the patent application by serial number, or other acceptable identifier(s) as specified in 37 CFR 1.331(c), in the body of the foreclosure document itself or any addenda incorporated by reference;
(3) Reference to the security agreement recorded under 37 CFR 1.331; and
(4) Submission of a verified statement by a representative of the secured party stating that the patent or the patent application has been legally foreclosed on based upon the applicable state laws.

A foreclosure document complying with the above criteria will be deemed to be a recordable instrument in accordance with 37 CFR 1.331.

March 14, 1988 THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1089 OG 35]

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(42) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 960417113-6186-02]
RIN 0651-AA82

Revision of Patent Fees for Fiscal Year 1997

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Final Rulemaking.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases to adjust certain patent fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation.
Effective Date: October 1, 1996.
For Further Information Contact: Robert Harris by telephone at (703) 305-8510, fax at (703) 305-8525, e-mail at rharris@uspto.gov, or by mail marked to his attention and addressed to the U.S. Patent and Trademark Office, Office of Planning and Evaluation, Crystal Park 1, Suite 1107, Washington, D.C. 20231.
Supplementary Information: This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code; and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (as amended by section 8001 of Public Law 103-66), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

BACKGROUND:

Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and (b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (amended by section 8001 of Public Law 103-66) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and (b) to collect $115 million in fiscal year 1997.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office.*

Recovery Level Determinations

This rule adjusts patent fees for a planned recovery of $716,723,000 in fiscal year 1997, as proposed in the Administration's budget request to the Congress.

The patent statutory fees established by 35 U.S.C. 41(a) and (b) will be adjusted on October 1, 1996, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index for all urban consumers (CPI-U). In calculating these fluctuations, the Office of Mangement and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for

the month of June 1996. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1996, which is 3.1 percent. Based on this projection, patent statutory fees will be adjusted by 3.1 percent. Before the final fee schedule is published, the fees may be adjusted slightly based on updated data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 will be adjusted to recover their estimated average costs in fiscal year 1996. Three patent service fees that are set by statute will not be adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

The final fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to an even number so that any comparable small entity fee would be a whole number.

Workload Projections

Determination of workload varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 79 percent, 55 percent and 32 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

General Procedures

Any fee amount that is paid on or after the effective date of the fee increase would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not proper for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not proper. Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

In order to ensure clarity in the implementation of the new fees, a discussion of specific sections is set forth below.

Discussion of Specific Rules

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f) through (i), is revised to adjust fees established therein to reflect fluctuations in the CPI. Further, section 1.16, is revised to remove the undesignated text following paragraph (d), and add a new paragraph (k) including the provisions of such deleted undesignated text. In addition, § 1.16(k) is also applicable to any additional fees required by §§ 1.16(i) and (j).

37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b) through (g), (m), (r) and (s), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j) and (n) through (p), is revised to adjust fees established therein to recover costs.

37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a) through (c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (c), (i), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e) through (g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, paragraph (a)(1), is revised to establish a non-refundable application fee which reflects the costs of processing an application for the registration examination. Currently, the PTO evaluates and processes the applications of individuals who do not qualify for admission or those who withdraw from the examination, but generally refunds the examination fee to such applicants. Thus, other fee payers bear the costs of this evaluation and processing. This amendment will shift the expense of evaluating applications to all applicants. In order to offset the application fee, the examination fee will be slightly decreased.

Section 1.21, paragraphs (a)(3) and (a)(6), is revised to adjust fees established therein to recover costs.

37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs and reflect current business practices.

37 CFR 1.482 International preliminary examination fees.

Section 1.482, paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 National stage fees.

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Response to Comments on the Rules

A notice of proposed rulemaking to adjust patent fee amounts was published in the *Federal Register* on May 1, 1996, at 61 FR 19224 and in the *Official Gazette of the United States Patent and Trademark Office* on May 7, 1996, at 1186 OG 14.

A public hearing was held on June 5, 1996. Two comments were received and considered in adopting the rules set forth herein. No oral testimony was presented.

Comment: One respondent stated that the PTO should not adjust patent fee amounts using the U.S. Department of Labor's Consumer Price Index (CPI). The respondent stated that the CPI does not reflect a true or accurate index of increasing consumer prices.

Response: The PTO is required by law to base its inflationary fee increases on fluctuations in the CPI over the 12 months prior to the effective date of the fee increase. However, if the Department of Labor modifies the definition or changes the method of calculating the Consumer Price Index for all urban consumers (CPI-U), which is the version of the CPI that OMB has determined the PTO should use, future PTO inflationary fee increases could be based on the revised index.

Comment: One respondent stated that the patent extension fees set in 37 CFR 1.17(a) through (d) should be reduced by at least 50 percent for patent applications filed on or after June 8, 1995.

Response: Patent extension fees were set in statute by Congress in 1982 with the enactment of Public Law 97-247. The PTO does not have the authority to offer a 50 percent discount for all patent applications filed on or after June 8, 1995.

Other Considerations

This rulemaking contains no information collection within the meaning of the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 et seq. This rule has been determined to be not significant for purposes of Executive Order 12866. The PTO has determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The rule change increases fees to reflect the change in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

A comparison of existing and new fee amounts is included as an Appendix to this notice of final rulemaking.

Lists of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Part 1, as set forth below.

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), (f) through (i), and adding a new paragraph (m) before the note to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f))	$385.00
By other than a small entity	$770.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f))	$40.00
By other than a small entity	$80.00

*****

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f))	$130.00
By other than a small entity	$260.00

*****

(f) Basic fee for filing each design application

By a small entity (§ 1.9(f))	$160.00
By other than a small entity	$320.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f))	$265.00
By other than a small entity	$530.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f))	$385.00
By other than a small entity	$770.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f))	$40.00
By other than a small entity	$80.00

*****

(m) If the additional fees required by paragraphs (b), (c), (d), (i) and (j) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims must be canceled by amendment, prior to the expiration of the time period set for reply by the Office in any notice of fee deficiency.

3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), (m) through (p), (r), and (s) to read as follows:

§ 1.17 Patent application processing fees.

*****

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f))	$195.00
By other than a small entity	$390.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f))	$465.00
By other than a small entity	$930.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f))	$735.00
By other than a small entity	$1,470.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f))	$150.00
By other than a small entity	$300.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9 (f))	$150.00
By other than a small entity	$300.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f))	$130.00
By other than a small entity	$260.00

*****

(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $1,470.00

*****

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or

(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) $645.00
By other than a small entity $1,290.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104—$900.00 reduced by the amount of the application basic filing fee paid.

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104—$1,790.00 reduced by the amount of the application basic filing fee paid.

(p) For submission of an information disclosure statement under § 1.97(c) $230.00

*****

(r) For entry of a submission after final rejection under §1.129(a):

By a small entity (§ 1.9(f)) $385.00
By other than a small entity $770.00

(s) For each additional invention requested to be examined under §1.129(b):

By a small entity (§ 1.9(f)) $385.00
By other than a small entity $770.00

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) $645.00
By other than a small entity $1,290.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) $220.00
By other than a small entity $440.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) $325.00
By other than a small entity $650.00

5. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), (i)(2), and (j)(1) through (j)(3) to read as follows:

§ 1.20 Post issuance fees.

*****

(c) For filing a request for reexamination (§ 1.510(a)) $2,460.00

*****

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

*****

(i) ***

(1) unavoidable $680.00
(2) unintentional $1,600.00

(j) ***

(1) Application for extension under §1.740 ..... $1,090.00
(2) Initial application for interim extension under §1.790 ..... $410.00
(3) Subsequent application for interim extension under §1.790 ..... $210.00

6. Section 1.21 is amended by revising paragraph (a)(1), (a)(3), and (a)(6) to read as follows:

§ 1.21 Miscellaneous fees and charges.

*****

(a) ***

(1) For admission to examination for registration to practice:
(i) Application Fee (non-refundable) $40.00
(ii) Registration examination fee $300.00

*****

(3) For reinstatement to practice $40.00

*****

(6) For requesting regrading of an examination under § 10.7(c):
(i) Regrading of morning section (PTO Practice and Procedure) $225.00
(ii) Regrading of afternoon section (Claim Drafting) $530.00

*****

7. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:
(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $230.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16):
(i) Where a corresponding prior United States National application filed under 35 U.S.C. 111(a) with the filing fee under 37 CFR 1.16(a) has been filed $440.00
(ii) For all situations not provided for in (a)(2)(i) of this section $680.00
(3) A supplemental search fee when required, per additional invention $200.00

*****

8. Section 1.482 is amended by revising paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii) to read as follows:

§ 1.482 International preliminary examination fees.

(a) ***

(1) ***

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of $480.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of $730.00

(2) ***

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office $260.00

*****

9. Section 1.492 is amended by revising paragraphs (a), (b), and (d) to read as follows:

§ 1.492 National stage fees.

*****

(a) The basic national fee:
(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $350.00
By other than a small entity $700.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)) $385.00
By other than a small entity $770.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $520.00
By other than a small entity $1,040.00

(4) Where an international preliminary examination fee as set forth in §1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) $48.00
By other than a small entity $96.00

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f)) $455.00
By other than a small entity $910.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $40.00
By other than a small entity $80.00

*****

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $130.00
By other than a small entity $260.00

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July 24, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1189 OG 62]

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(43) **Department of Commerce**
Patent and Trademark Office

37 CFR Parts 1, 2, and 7
[Docket No. 950501124-5185-02]
RIN 0651-AA74

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1, 2 and 7 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation, and is amending the requirements for recording documents on the Government Register. This rule also includes information relating to the availability of patent and trademark information products provided by the PTO.
Effective Date: October 1, 1995.
For Further Information Contact: Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code; section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113); and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (as amended by section 8001 of Public Law 103-66), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

The cover sheet referenced in 37 CFR 7.1 (c) must be in a format approved by the Office. The Office of Public Records will maintain a list of approved formats that will meet this requirement. Contact the Office of Public Records at (703) 308-9743 regarding specific questions relating to this requirement and to seek approval of additional formats.

BACKGROUND

Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and (b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (amended by section 8001 of Public Law 103-66) provides that there shall be a surcharge on all fees established

under 35 U.S.C. 41(a) and (b) to collect $111 million in fiscal year 1996.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new trademark fee amounts to take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the United States Patent and Trademark Office*.

Recovery Level Determinations

This rule adjusts patent and trademark fees for a planned recovery of $643,014,000 in fiscal year 1996, as proposed in the Administration's budget request to the Congress.

The patent statutory fees established by 35 U.S.C. 41(a) and (b) are being adjusted on October 1, 1995, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1995. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1995, which is 3.2 percent. Based on this projection, patent statutory fees will be adjusted by 3.2 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted to recover their estimated average costs in fiscal year 1996. Three patent service fees that are set by statute will not be adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

Certain trademark service fees established under 15 U.S.C. 1113 are being adjusted to recover their estimated average costs in fiscal year 1996.

The fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to an even number so that the comparable small entity fee would be a whole number.

Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 79 percent, 55 percent and 32 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

General Procedures

Any fee amount that is paid on or after the effective date of the fee increase would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A notice of final rulemaking was published at 60 FR 20195 (April 25, 1995) wherein several new fee provisions were made to implement the 20-year patent term and provisional applications. Language changes were made in 37 CFR 1.16(a), (b), (d), (f), and (g) which are reproduced in this final rule package. In addition, fees involving 37 CFR 1.17(r) and (s) are being adjusted by changes in the CPI to remain equal to the basic filing fee for a utility patent application.

PTO Information Dissemination Products

The PTO provides information to the public in the Patent Search Room and the Trademark Search Library in Arlington, Virginia, and at 78 Patent and Trademark Depository Libraries around the country. A list of the libraries is included in each issue of the *Official Gazette of the Patent and Trademark Office*. In addition, a number of patent and trademark search tools and document-delivery products, published on paper and on various machine-readable media, are sold directly to the public.

Printed PTO publications may be ordered from the Government Printing Office (GPO) or one of its Book Stores located throughout the country. A list of patent and trademark-related publications with current prices and ordering information is available from the GPO (Subject Bibliography SB 021).

Superintendent of Documents
P.O. Box 371984
Pittsburgh, Pa. 15250-7954
Voice: 202-512-1800
Fax: 202-512-2250

Machine-readable publications, including magnetic tapes and CD-ROMs, may be ordered directly from the PTO. A printed catalog of machine-readable products, including current prices and ordering information, is available from the Office of Information Products Development.

US Patent and Trademark Office
Office of Information Products Development
Crystal Park 3, Room 412
Washington, D.C. 20231
Voice: 703-308-0322
Fax: 703-308-0493

The catalog of machine-readable products is published in the *Official Gazette of the Patent and Trademark Office* in late December each year and may also be viewed on, or downloaded from, the PTO electronic bulletin board (703-305-8950, 8/no/1) or from the PTO's home page on the Internet (http://www.uspto.gov/).

In order to ensure clarity in the implementation of the new fees, a discussion of specific sections is set forth below.

Discussion of Specific Rules

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.16, paragraphs (a), (b), (d), and (g) include language changes relating to provisional patent applications (see 60 FR 20195, dated April 25, 1995).

37 CFR 1.17 *Patent application processing fees.*

Section 1.17, paragraphs (b)-(g) (m), (r), and (s), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j) and (n)-(p), is revised to adjust fees established therein to recover costs.

37 CFR 1.18 *Patent issue fees.*

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.19 *Document supply fees.*

Section 1.19, paragraphs (a)(1)(ii) and (a)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 1.19, paragraph (b)(1), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.20 *Post-issuance fees.*

Section 1.20, paragraphs (c), (i), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 *Miscellaneous fees and charges.*

Section 1.21, paragraph (a)(1), is revised to adjust fees established therein to recover costs.

37 CFR 1.445 *International application filing, processing, and search fees.*

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.482 *International preliminary examination fees.*

Section 1.482, paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 *National stage fees.*

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 2.6 *Trademark fees.*

Section 2.6, paragraphs (b)(1)(ii) and (b)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 2.6, paragraph (b)(2), is revised to adjust fees therein to recover costs.

37 CFR 7.1 Requirements

Section 7.1, is revised to designate the current language as paragraph (a), and to add new paragraphs (b)-(j) to clarify that the requirements for patent and patent application assignment documents, including the requirement for the fee set forth in § 1.21(h), submitted for recording also apply to instruments submitted for recording on the Government Register. Sections 7.1(b)-(d) and (f)-(i) contain language similar to that in §§ 3.21, 3.28, 3.31, 3.34, 3.26, 3.27, and 3.41, respectively.

Section 7.1(b), is added to provide that an instrument relating to a patent must identify the patent by the patent number, that an instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date, that an instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234), and that if an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Section 7.1(c), is added to provide that each instrument submitted to the PTO for recording must be accompanied by a cover sheet referring to those patent applications and patents against which the instrument is to be recorded, that one set of instruments and cover sheets to be recorded should be filed, and that if an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

Section 7.1(d), is added to provide that each cover sheet must contain: (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a description of the interest conveyed or transaction to be recorded; (4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application; (5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed; (6) the number of applications or patents identified in the cover sheet and the total fee; (7) the date the instrument was executed; (8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and (9) the signature of the party submitting the instrument.

Section 7.1(e), is added that each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must: (1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7, and (2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

Section 7.1 (f), is added to provide for the correction of errors in the cover sheet. Specifically, § 7.1(e), provides that an error in a cover sheet recorded pursuant to this Part will be corrected only if: (1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and (2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

Section 7.1(g), is added to provide that the Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

Section 7.1(h), is added to provide that instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

Section 7.1(i), is added to provide that all requests, except as provided by paragraph (j) of this section, to record instruments must be accompanied by the recording fee set forth in § 1.21(h) of this chapter, and that the fee set forth in § 1.21(h) of this chapter is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

Section 7.1 (j), is added to provide that no fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943-1948 Comp.)

to be filed if: (1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and (2) the cover sheet is filed in a format approved by the Office.

Response to Comments on the Rules

A notice of proposed rulemaking to adjust certain patent and trademark fee amounts and to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register was published in the *Federal Register* on May 26, 1995, at 60 FR 27934, and in the *Official Gazette of the United States Patent and Trademark Office* on May 30, 1995, at 1174 OG 134.

A public hearing was held June 29, 1995. Nine comments were received and considered in adopting the rules set forth herein. No oral testimony was presented.

Comments: Two respondents stated that the proposed inflationary increase of patent and trademark fees is unnecessary because the PTO is already operating at a surplus.

Response: Current PTO resources include carryover funds from fiscal year 1994. These carryover funds are partly unobligated balances to be carried forward, but primarily advanced fee payments for work to be done in fiscal year 1995. Furthermore, this carryover includes fee income generated from trademark-related products and services which, according to 35 U.S.C. 42(c), may be used only for trademark-related activities. Therefore, to recover all costs associated with the processing of patent applications, and to remain consistent with the current rate of inflation, the PTO is increasing certain patent fees by 3.2 percent as authorized by 35 U.S.C. 41(f).

In addition, two trademark service fees were proposed to be increased. The adopted fee amounts will recover the average cost of providing the service as authorized by 35 U.S.C. 41(d), and will also remain consistent with the equivalent patent service fee amounts.

Comments: Seven respondents objected to the proposal to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register. The respondents stated that not only are Government agencies required by Executive Order 9424 to forward an assignment to the PTO for recordation, but also the PTO lacks the authority under Title 35 of the United States Code to impose a fee for recording an assignment on the Government Register.

Response: 35 U.S.C. 41(d)(1) provides that the Commissioner shall charge a fee of $40 per property for recording any document affecting title. An assignment is a document affecting title. Therefore, the Office must require a $40 recording fee for recording any assignment, even those being recorded on the Government Register. If a document to be recorded on the Government Register does not affect title and if it is accompanied by the appropriate cover sheet, then no fee is required.

Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. This rulemaking contains no information collection within the meaning of the Paperwork Reduction Act. This final rule has been determined not to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees to reflect the change in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

A comparison of existing and new fee amounts is included as an Appendix to this notice of final rulemaking.

Lists of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 7

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter I, Part 1, as set forth below.

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i), to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $39.00
By other than a small entity $78.00

*****

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $125.00
By other than a small entity $250.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

*****

(f) Basic fee for filing each design application

By a small entity (§ 1.9(f)) $155.00
By other than a small entity $310.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) $255.00
By other than a small entity $510.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) $39.00
By other than a small entity $78.00

*****

3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), (m) through (p), (r), and (s) to read as follows:

§ 1.17 Patent application processing fees.

*****

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $190.00
By other than a small entity $380.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $450.00
By other than a small entity $900.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $700.00
By other than a small entity $1,400.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) $145.00
By other than a small entity $290.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9 (f)) $145.00
By other than a small entity $290.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f)) $125.00
By other than a small entity $250.00

*****

(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $1,430.00

*****

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or

(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) $625.00
By other than a small entity $1,250.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104—$870.00 reduced by the amount of the application basic filing fee paid.

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104—$1,740.00 reduced by the amount of the application basic filing fee paid.

(p) For submission of an information disclosure statement under § 1.97(c) $220.00

*****

(r) For entry of a submission after final rejection under §1.129(a):

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) $625.00
By other than a small entity $1,250.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) $215.00
By other than a small entity $430.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) $315.00
By other than a small entity $630.00

5. Section 1.19 is amended by revising paragraphs (a)(1)(ii), (a)(1)(iii), (b)(1)(i), and (b)(1)(ii) to read as follows:

§ 1.19 Document supply fees.

*****

(a) ***

(1) ***

*****

(ii) Overnight delivery to PTO Box or overnight fax $6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two workdays $25.00

*****

(b) ***

(1) ***

(i) Regular service $15.00
(ii) Expedited regular service $30.00

*****

6. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), (i)(2), and (j) to read as follows:

§ 1.20 Post issuance fees.

*****

(c) For filing a request for reexamination (§ 1.510(a)).....$2,390.00

*****

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By a small entity (§ 1.9(f)).....$495.00
By other than a small entity.....$990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f)).....$995.00
By other than a small entity.....$1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f)).....$1,495.00
By other than a small entity.....$2,990.00

*****

(i) ***

(1) unavoidable.....$660.00
(2) unintentional.....$1,550.00

*****

(j) For filing an application for extension of the term of a patent (§ 1.740).....$1,060.00

7. Section 1.21 is amended by revising paragraph (a)(1) to read as follows:

§ 1.21 Miscellaneous fees and charges.

*****

(a) ***

(1) For admission to examination for registration to practice: fee payable upon application.....$310.00

*****

8. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14).....$220.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed.....$660.00
(ii) A corresponding prior United States national application with basic filing fee has been filed.....$430.00

(3) A supplemental search fee when required, per additional invention.....$190.00

*****

9. Section 1.482 is amended by revising paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii) to read as follows:

§ 1.482 International preliminary examination fees.

(a) ***

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of.....$470.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of.....$710.00

(2) ***

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office.....$250.00

*****

10. Section 1.492 is amended by revising paragraphs (a), (b), and (d) to read as follows:

§ 1.492 National stage fees.

*****

(a) The basic national fee:

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)).....$340.00
By other than a small entity.....$680.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)).....$375.00
By other than a small entity.....$750.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)).....$505.00
By other than a small entity.....$1,010.00

(4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)).....$47.00
By other than a small entity.....$94.00

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f)).....$440.00
By other than a small entity.....$880.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)).....$39.00
By other than a small entity.....$78.00

*****

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)).....$125.00
By other than a small entity.....$250.00

*****

Part 2 - Rules of Practice in Trademark Cases

1. The authority citation for 37 CFR Part 2 would continue to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (b)(1)(ii), (b)(1)(iii), (b)(2)(i), and (b)(2)(ii) to read as follows:

§ 2.6 Trademark fees.

*****

(b) ***

(1) ***

*****

(ii) Overnight delivery to PTO Box or overnight fax.....$6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two work days.....$25.00

*****

(2) ***

(i) Regular service.....$15.00
(ii) Expedited local service.....$30.00

*****

Part 7 - Register of Government Interests in Patents

1. The authority citation for 37 CFR Part 7 would continue to read as follows:

Authority: E.O. 9424, February 18, 1944, 9 FR 1959; 3 CFR 1943-1948 Comp.

2. Section 7.1 is revised to read as follows:

a) Executive Order 9424 (3 CFR 1943-1948 Comp.) requires the several departments and other executive agencies of the Government, including Government-owned or Government-controlled corporations, to forward promptly to the Commissioner of Patents and Trademarks for recording all licenses, assignments, or other interests of the Government in or under patents or applications for patents.

(b) An instrument relating to a patent must identify the patent by the patent number. An instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, *e.g.*, 07/123,456) or the serial number and filing date. An instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (*e.g.*, PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

(c) Each instrument submitted to the Office for recording must be accompanied by at least one cover sheet as specified in paragraph (d) of this section referring to those patent applications and patents against which the instrument is to be recorded. Only one set of instruments and cover sheets to be recorded should be filed. If an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

(d) Each cover sheet required by paragraph (c) of this section must contain:

(1) the name of the party conveying the interest;
(2) the name and address of the party receiving the interest;
(3) a description of the interest conveyed or transaction to be recorded;
(4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application;
(5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed;
(6) the number of applications or patents identified in the cover sheet and the total fee;
(7) the date the instrument was executed;
(8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and
(9) the signature of the party submitting the instrument.

(e) Each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must:

(1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7.
(2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

(f) An error in a cover sheet recorded pursuant to this Part will be corrected only if:

(1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and
(2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

(g) The Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

(h) Instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

(i) All requests to record instruments must be accompanied by the appropriate fee. Except as provided in paragraph (j) of this section, a recording fee set forth in § 1.21(h) of this chapter fee is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

(j) No fee is required for each patent application and patent

against which an instrument required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) to be filed if:

(1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and

(2) the cover sheet is filed in a format approved by the Office.

August 4, 1995

BRUCE A. LEHMAN
Secretary of Commerce and Commissioner of Patents and Trademarks

[1177 O.G. 171]

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(44) **DEPARTMENT OF COMMERCE**
Billing Code: 3510-16M

Patent and Trademark Office
37 CFR Parts 1 and 2

[Docket No. 920401-2194]
RIN 0651-AA54

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation. The PTO is also establishing fees for providing public access to APS-Text in Patent and Trademark Depository Libraries (PTDLs), and for dividing a trademark application. In response to comments received from the Libraries in which they expressed their concerns about the administrative burdens of collecting fees from the public for use of APS-Test, the Commissioner is immediately suspending collection of that fee to provide additional time for the PTO to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries.
Dates: Effective Date: October 1, 1992. Rule 1.21(p) will take effect on October 1, 1992 but will immediately be suspended by the Commissioner. Comment Date: The PTO will accept comments on alternative collection methods, and other options for accessing patent search and retrieval in the PTDLs (37 CFR 1.21(p)) until January 4, 1993. The Office will provide written notice in the Federal Register and the Official Gazette of the United States Patent and Trademark Office thirty days before starting to collect fees for accessing APS-Text in the PTDLs.
Addresses: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Frances Michalkewicz, Suite 507, Crystal Park 1, or by FAX to (703) 305-8436.
For Further Information Contact: Frances Michalkewicz by telephone at (703) 305-8510 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed to adjust the Patent and Trademark Office fees in accordance with the applicable provisions of title 35, United States Code, section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113), and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

Background:

Statutory Provisions: Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A 50 percent reduction in the fees paid under 35 U.S.C. 41(a) and 41(b) by independent in-ventors, small business concerns, and nonprofit organizations who meet prescribed definitions is authorized by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Pub. L. 101-508) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and 41(b) to collect $99 million in fiscal year 1993.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty.

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the Federal Register and the Official Gazette of the Patent and Trademark Office.

Subsection 41(i)(3) of title 35, United States Code, authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials furnished by the PTO relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new fee amounts to take effect thirty days after notice in the Federal Registration and the Official Gazette of the Patent and Trademark Office.

Recovery Level Determination: Fees have been adjusted for a planned recovery of $486,000,000 in fiscal year 1993, as proposed in the Administration's budget request to the Congress.

Fees established by 35 U.S.C. 41(a) and 41(b) (patent statutory fees) may be adjusted on October 1, 1992, to reflect any fluctuations occurring during the previous 12 months in the CPI. The Office of Management and Budget (OMB) has determined that the PTO should use Consumer Price Index-U to adjust patent statutory fees. The Department of Labor's Consumer Price Index is made public approximately 21 days after the end of the month being calculated. The patent statutory fees are being adjusted by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12-month period beginning October 1, 1991.

The patent statutory fees established by rule (56 FR 65142) on December 13, 1991, are being adjusted by the projected changes in the CPI of 3.3 percent. Amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to an even number so that the comparable small entity fee would be a whole number.

Patent statutory fees also are subject to the provisions of the Omnibus Budget Reconciliation Act of 1990, as amended by Public Law 102-204. These provisions require that $99 million be collected in fiscal year 1993 for deficit reduction purposes in lieu of seeking general taxpayer funds from the U.S. Treasury. The $99 million is deposited in a special account in the U.S. Treasury, and is reserved exclusively for use by the PTO, and is made available to the PTO through the appropriation process.

In establishing the 1993 patent statutory fees, the PTO applied the projected Consumer Price Index-U rate of 3.3 percent to the 1992 fees. The 1993 fees were rounded as explained above. Of the total amount of section 41(a) and (b) income expected to be collected in 1993, $99 million must be deposited to the Fee Surcharge Fund.

Non-statutory patent service fees established under section 41(d) of title 35, United States Code, as amended, and PCT processing fees are being adjusted to recover planned costs in 1993, except in the case of three patent service fees set by

statue. The three fees are assignment recording fees, printed patent copy fees and photocopy charge fees.

Trademark fees are being adjusted in fiscal year 1993, in the aggregate, to reflect changes over the prior 12 months in the CPI. The OMB has determined that the PTO should use Consumer Price Index-U to adjust trademark fees, which is made public by the Department of Labor approximately 21 days after the end of the month being calculated. The trademark fees are being adjusted, in the aggregate, by 3.3 percent, which reflects the Administration's projected Consumer Price Index-U for the 12 month period beginning October 1, 1991. The PTO is adjusting only two trademark fees in 1993: for filing an application (37 CFR § 2.6(a)(1)) and for assignment records, abstract of title and certification (37 CFR § 2.6(b)(7)). One new fee is being set for dividing an application (37 CFR 2.6 (a)(19)). No other trademark fees are changing in 1993. The net effect of these changes is to increase trademark fees, in the aggregate, by 3.3 percent, the expected Consumer Price Index-U rate for the prior 12 month period.

Workload Projections: Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent and trademark application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an inhouse patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 75 percent, 50 percent and 25 percent, respectively. Trademark affidavit projections are based on filing trends for marks registered five to six years prior to 1993. Trademark renewal projections are based on marks registered 20 years prior to 1993. Service fee workloads follow linear trends from prior year activities.

Public Access to Automated Systems: In April 1989, the PTO began providing access to APS-Text in the Patent Search Room at its facilities in Arlington, Virginia. On February 12, 1990, the PTO began charging a fee for access to APS-Text in the Patent Search Room. In September 1991, the PTO began providing, without charge, APS-Text to 14 Patent and Trademark Depository Libraries (PTDLs) as a pilot test program. APS-Text provides users of the patent search files with a value added search tool that enables them to conduct more comprehensive searches.

Although many PTDLs believe that government information should be available to the public free of charge, the PTO's fiscal year 1993 budget does not include any general taxpayer funds, but requires that all of the expenses of the PTO be recovered through user fees. These expenses include the cost of providing APS-Text to the public, both in the Patent Search Room in Virginia and at the PTDLs. Continuation of this service in the PTDLs, without direct charge to the users of the automated system, would require support from all other customers who pay for products and services from the PTO.

A second issue raised by many PTDLs concerns the method that PTO would use to collect fees from the users of APS-Text in the PTDLs. Users of APS-Text in the Patent Search Room pay for use of the system directly to the PTO. PTDLs have commented that collecting fees would be an administrative burden for many, while some are legally precluded from collecting fees.

The PTO has a strong interest in expanding access to APS-Text to all PTDLs that wish to participate, but considers allocating user fees paid for other products and services to subsidize this effort to be inappropriate. Therefore, PTO concludes that establishment of a fees for access to APS-Text is necessary.

At the same time, PTO wants to limit the administrative burden imposed on the PTDLs to collect user fees. Therefore, PTO intends to enter into an agreement establishing a service bureau arrangement for administering the collection of fees at participating PTDLs. This arrangement provides one alternative for providing administrative services, but PTO is seeking others. Therefore, through this rulemaking notice, the PTO is soliciting alternatives from other organizations, including the libraries themselves, for providing the administrative services associated with APS-Text. Likewise, the Office would like to consider other options for accessing patent search and retrieval in the PTDLs. The PTO will accept comments on alternative collection methods, and other options for accessing patent search and retrieval in the PTDLs until January 4, 1993.

In rule 1.21(p), the PTO is establishing a $70 per connect hour fee to recover the cost of providing APS-Text services in participating PTDLs, but the Commissioner is immediately suspending collection of that fee until alternative methods of collecting the fee from users of APS-Text in the PTDLs are identified. Although access to the 14 pilot PTDLs will continue for further evaluation purposes, the PTO will not extend access to additional PTDLs until a fee collection arrangement is established. Section 41(i)(3) of 35 U.S.C. states that if PTO establishes fees for access to the automated search system "a limited amount of free access shall be made available to users of the systems for purposes of education and training."

The $70 per connect hour fee amount established by this rule is based on a calculation of the costs of PTO services, and preliminary cost estimates that were provided by a potential service bureau contractor. The cost elements for PTO include training; training software for personal computers (to be developed); manuals and documentation; additional mainframe CPU; and additional staff time for client support. The cost elements for services provided by the service bureau include billing, account administration, and user support; telecommunication costs to the network; and the Messenger Software enhancement fee.

After PTO has evaluated other options for a service bureau arrangement, a notice will be published in the Federal Registration and the Official Gazette of the Patent and Trademark Office. At that time, PTO will provide administrative procedures for public use of APS-Text in the PTDLs. Depending on responses to the solicitation for alternatives for providing the administrative services associated with APS-Text, the fee amount could be reduced at that time.

General Procedures: Any fee amount that is paid on or after October 1, 1992, would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A "Certificate of Mailing under Section 1.8" is not "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A comparison of existing and revised fee amounts is included as an Appendix to this final rule.

In order to ensure clarity in the implementation of the revised fees, a discussion of specific sections is set forth below.

DISCUSSION OF SPECIFIC RULES

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a)-(d) and (f)-(j), is revised to adjust patent application filing fees to reflect fluctuations in the CPI.

37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g), and (m), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j), (n) and (o), is revised to adjust fees established therein to recover costs.

37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust the issue fee for each original or reissue patent to reflect fluctuations in the CPI.

37 CFR 1.19 Document supply fees.

Section 1.19, subparagraph (b)(4) and paragraphs (f) and (h), is revised to adjust fees established therein to recover costs.

37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (a), (c) and (i), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21, subparagraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3), and paragraphs (e) and (i), is revised to adjust fees established therein to recover costs.

Section 1.21, paragraph (p), is added to establish the fee for providing public access to the Automated Patent System full-text search (APS-Text) capability in Patent and Trademark Depository Libraries. The $70.00 per connect hour fee would recover the marginal cost of providing the service to the public, including the cost for a service bureau to handle billing, account administration, and user support.

37 CFR 1.26 Refunds.

Section 1.26, paragraph (a), is revised to increase the minimum amount of a refund, without a request, from one dollar to twenty-five dollars in accordance with the Treasury Fiscal Manual, Volume One, Part Six, Chapter 3000.

Section 1.26, paragraph (c), is revised to provide for a refund of $1,690 if the Commissioner decides not to institute reexamination proceedings. The $1,690 refund would apply to those instances where the reexamination fee of $2,250 under 37 CFR 1.20(c) was paid. The current $1,635 refund would be made in those cases where the current $2,180 reexamination fee was paid.

37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.482 International preliminary examination fees.

Section 1.482, subparagraphs (a)(1), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 National stage fees.

Section 1.492, subparagraphs (a)(1)-(a)(3), and paragraphs (b)-(d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.492, subparagraph (a)(5), is revised to adjust the fee authorized by 35 U.S.C. 376 to recover costs.

37 CFR 2.6 Trademark fees.

Section 2.6, subparagraphs (a)(1) and (b)(7), is revised to adjust the fees authorized by the Trademark (Lanham) Act of 1946 to reflect fluctuations in the CPI.

New section 2.6(a)(19), is added to establish a fee for dividing a trademark application in accordance with 37 CFR 2.87. Section 2.6(a)(19) is revised from the proposal by adding the words "file wrapper" to clarify that the fee amount is due for each new file wrapper created.

37 CFR 2.87 Dividing an Application.

Section 2.87, is revised to establish a fee for dividing an application into two or more applications. Currently, no fee is charged for the physical act of dividing an application. Experience to date reveals that the creation of so-called "divisional" applications is labor intensive. For that reason, and because the creation of a divisional application is a significant benefit to an applicant, the PTO will charge a fee for dividing an application. The fee will be due for each new file wrapper created.

Section 2.87, is revised to divide paragraph (a) into paragraphs (a) and (b), and renumber paragraphs (b) and (c) as (c) and (d).

Response to Comments on the Rules: A notice of proposed rulemaking to adjust patent and trademark fees in accordance with the proposed provisions of Public Law 102-204 was published in the Federal Register on May 20, 1992, at 57 FR 21536, and in the Official Gazette on May 26, 1992, at 1138 OG 58. Corrections were published in the Federal Register on June 2, 1992, at 57 FR 23257.

A public hearing was held on June 24, 1992. A total of 28 comments were received: 27 respondents submitted written comments and three people presented oral testimony (two of whom also submitted written comments) at the public hearing. Over half of the comments received represented the views of libraries. All of the written and oral comments were considered in adopting the rules set forth herein.

Comment: Two people claimed that the proposed fees for filing an application under the Patent Cooperation Treaty (PCT) is discriminatory against applicants who file under the PCT route.
Response: The PTO is undertaking a thorough analysis of all PCT fees. The results of this analysis, and the recommendations concerning PTO's fee structure to be made to the Secretary of Commerce by the Advisory Commission on Patent Law Reform, will be taken into consideration when PTO proposes the fiscal year 1994 fee adjustments.

Comment: One respondent, although not objecting to the proposed 3.3 percent fee increase, suggested that the PTO may be understating its projected income from maintenance fees which could be used to offset inflationary increases and possibly reduce PCT fees.
Response: When maintenance fees first were imposed, the Office looked at historical payment trends experienced by other offices, such as the European Patent Office. The PTO conservatively projected the number of maintenance fees to be paid for two reasons. First, there is not a long history of maintenance fee payments on which to base income projections; for example, second stage maintenance fees only recently have started to come due, and third stage maintenance fees will not become due for many patent owners until 1995. Second, the percentage of patent owners paying second stage maintenance fees in recent months has declined from the renewal rate that was experienced during the first year that second stage maintenance fees were paid. Therefore, PTO is properly conservative in its maintenance fee payment projections. We will conduct a comprehensive analysis of projected maintenance fee payments prior to proposing the fiscal year 1994 fee adjustment.
Comment: Eighteen respondents opposed establishment of fees for the public to access APS-Text at the Patent and Trademark Depository Libraries, primarily because the public has a right to free access to patent information. One person asked about administrative procedures for providing APS-Text in the PTDLs, and suggested that CD-ROM products continue to be made available free of charge and access fees for APS-Text be kept as low as possible.
Response: As a fully fee-funded agency, the costs to the PTO of providing access to APS-Text in the 74 Patent and Trademark Depository Libraries (PTDLs) would have to be borne either by the individual users of the system, or by all users of the patent system (e.g., patent applicants). In June 1988, the PTO published in 53 Federal Register 23677 the results of comments solicited on alternatives for funding access to the PTO's automated systems. In response, the PTO received 21 comments, 12 of which advocated the use of taxpayer revenues, and seven supported at least some reliance on user fees. The latter based their decisions on the reality of budget deficit problems; the inequity of providing taxpayer funds to subsidize on-line searchers who charge fees for their services; and the need to have an equitable fee structure that applies throughout the United States.

The PTO has a strong interest in expanding access to APS-Text to all PTDLs that wish to participate, with the least amount of administrative burden to the PTDLs, but considers allocating user fees paid for other products and services to subsidize this effort to be inappropriate. Therefore, the PTO is establishing a fee of $70 per connect hour for accessing APS-Text in the PTDLs, which includes the cost of having a service bureau provide billing, account administrative, and user support. However, the Commissioner is immediately suspending collection of that fee to provide additional time to solicit comments through this rulemaking for providing the administrative services associated with APS-Text. Likewise, the Office would like to consider other options for accessing patent search and retrieval in the PTDLs. The Office will publish a notice in the Federal Register and the Official Gazette of the Patent Trademark Office thirty days before it begins collecting a fee for public access tThe PTO has a strong interest in expanding access to APS-Text to all PTDLs that wish to participate, with the least amount of administrative burden to the PTDLs, but considers allocating user fees paid for other products and services to subsidize this effort to be inappropriate. Therefore, the PTO is establishing a fee of $70 per connect hour for accessing APS-Text in the PTDLs, which includes the cost of having a service bureau provide billing, account administrative, and user support. However, the Commissioner is immediately suspending collection of that fee to provide additional time to solicit comments through this rulemaking for providing the administrative services associated with APS-Text. Likewise, the Office would like to consider other options for accessing patent search and retrieval in the PTDLs. The Office will publish a notice in the Federal Register and the Official Gazette of the Patent Trademark Office thirty days before it begins collecting a fee for public access to APS-Text in the PTDLs.
Comment: One respondent claimed that proposed 37 CFR 1.21(p) is not in accord with the rulemaking provision of 5 U.S.C. 553(b) which requires that the issues involved be described in the notice of proposed rulemaking.
Response: The Notice of Proposed Rulemaking 57 FR 21536, referenced 35 U.S.C. 41(i)(3) which authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO. Further in the notice at 57 FR 21537, under the discussion of the proposed revision to 37 CFR § 1.21, it was stated that the proposed $40.00 fee would recover the PTO's estimated marginal cost of providing the service to the PTDLs. The notice also indicated the PTO was investigating the use of a contract service bureau to provide access in which case the fee would be approximately $70.00. This fully described the issue involved in the proposed rule change.
Comment: Two respondents commented on the administrative burden caused by a change to the fee structure at this time, particularly in light of prior fee changes and the small amount of the adjustment.
Response : The PTO proposed to adjust its fees because operating costs have increased over the past year. The Commissioner is authorized to adjust patent and trademark fees on October 1, 1992 and every year thereafter to reflect fluctuations in the Consumer Price Index over the prior twelve months. Future charges are expected to occur annually on October 1st. The fee increases that will be implemented on October 1, 1992, are expected to generate $15.1 million. Without this revenue, PTO would be forced to make cuts in patent and trademark operations that would affect the quality of examination.
Comment: One person expressed concern about the quality and timeliness of services for which new or increased fees are proposed, complaining specifically of the delay in receiving an official filing receipt when a trademark application is divided and in the recording of assignments.
Response: A major objective of the Office is to assure continuous quality improvements throughout all operations. The Office has taken steps to address the areas of concern identified.
Comment: One organization and one person objected to the PTO's sole reliance on fee income, particularly for funding automation development costs.
Response: The Omnibus Budget Reconciliation Act of 1990 requires that a user fee surcharge on certain patent fees replace taxpayer funds for the five year period 1991-1995. Whether PTO should receive funds from other sources in future fiscal years is beyond the scope of the rule package.

The automation programs, which are funded from user fees, are designed to improve the quality and timeliness of PTO services and products, and to discontinue reliance on manual processes and paper references.
Comment: One person said that small entities do not benefit from the 50 percent reduction to certain patent fees, because many small companies, particularly those in high technology areas, must license their patent rights and thus pay large entity status fees.
Response: The purpose of the small entity subsidy is to ensure that individual inventors, small businesses and non-profit organizations are not barred from using the patent system because of the PTO's fee structure. Once a small entity assigns the rights to a patent application or a patent to a large entity, presumably receiving compensation from the large entity, the reduced fee amounts no longer apply.
Comment: One organization said that trademark fees appear to be justified but PTO must ensure that trademark functions are being discharged in the most efficient and economical manner. For example, the organization questioned whether it is efficient for the Office to continue to maintain a paper search file and to continue to pay the General Services Administration (GSA) for building services.
Response: The Office is committed to ensuring that its trademark functions are being discharged effectively and, as part of its quality improvement program, is currently reviewing various work-related processes. No decision has yet been made as to when the paper search file will be eliminated and no such decision will be made until the public has been given an opportunity to comment. The Office has asked GSA to review the level of charges assessed in light of current market conditions.

Other Considerations: The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354); Executive Orders 12291 and 12612; and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The PTO has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change would not have a significant adverse impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rule change increases fees by changes in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

The PTO has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy would be less than $100 million. There would be no major increase in costs or prices for consumers; individual industries; Federal, state, or local government agencies; or geographic regions. There would be no significant adverse effects on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to complete with foreign-based enterprises in domestic or export markets.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter I, as set forth below.

Part 1-Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a)-(d), the parenthetical following paragraph (d), paragraphs (f)-(j), and the note at the end of the section to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:
By a small entity (§ 1.19(f)) $355.00
By other than a small entity $710.00

(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)) $37.00
By other than a small entity $74.00

(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20.
(Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):
By a small entity (§ 1.9(f)) $11.00
By other than a small entity $22.00

(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s) per application:
By a small entity (§ 1.9(f)) $115.00
By other than a small entity $230.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

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(f) For filing each design application:
By a small entity (§ 1.9(f)) $145.00
By other than a small entity $290.00

(g) Basic fee for filing each plant application:
By a small entity (§ 1.9(f)) $240.00
By other than a small entity $480.00

(h) Basic fee for filing each reissue application:
By a small entity (§ 1.9(f)) $355.00
By other than a small entity $710.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:
By a small entity (§ 1.9(f)) $37.00
By other than a small entity $74.00

(j) In addition to the basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent.
(Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):
By a small entity (§ 1.9(f)) $11.00
By other than a small entity $22.00

(Note: See §§ 1.445, 1.482 and 1.492 for international application filing and processing fees.)
(m)-(o) to read as follows:

§ 1.17 Patent application processing fees.

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(b) Extension fee for response within second month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $180.00
By other than a small entity $360.00

(c) Extension fee for response within third month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $420.00
By other than a small entity $840.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):
By a small entity (§ 1.9(f)) $660.00
By other than a small entity $1,320.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:
By a small entity (§ 1.9(f)) $135.00
By other than a small entity $270.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:
By a small entity (§ 1.9(f)) $135.00
By other than a small entity $270.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:
By a small entity (§ 1.9(f)) $115.00
By other than a small entity $230.00

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(j) For filing a petition to institute a public use proceeding under § 1.292 ..... $1,350.00

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(m) For filing a petition:
(1) For revival of an unintentionally abandoned application, or
(2) For the unintentionally delayed payment of the fee for issuing a patent:
By a small entity (§ 1.9(f)) $585.00
By other than a small entity $1,170.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to §1.104-$820.00 reduced by the amount of the application basic filing fee paid

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104-$1,640.00 reduced by the amount of the application basic filing fee paid

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4. Section 1.18 is amended by revising paragraphs (a)-(c) to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:
By a small entity (§ 1.9(f)) $585.00
By other than a small entity $1,170.00

(b) Issue fee for issuing a design patent:
By a small entity (§ 1.9(f)) $205.00
By other than a small entity $410.00

(c) Issue fee for issuing a plant patent:
By a small entity (§ 1.9(f)) $295.00
By other than a small entity $590.00

5. Section 1.19 is amended by revising paragraph (b)(4) and paragraphs (f) and (h) to read as follows:

§ 1.19 Document supply fees:

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(b)***

(4) For assignment records, abstract of title and certification, per patent $25.00

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(f) Uncertified copy of a non-United States patent document, per document $25.00

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(h) Additional filing receipts; duplicate; or corrected due to applicant error $25.00

6. Section 1.20 is amended by revising paragraphs (a), (c), (e)-(g) and (i) to read as follows:

§ 1.20 Post issuance fees.

(a) For providing a certificate of correction for applicant's mistake (§ 1.323) $100.00

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(c) For filing a request for reexamination
(§ 1.510(a)) $2,250.00

*****

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant.
By a small entity (§ 1.9(f)) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant:
By a small entity (§ 1.9(f)) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant.
By a small entity (§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

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(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $620.00

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7. Section 1.21 is amended by revising paragraphs (a)(1), (a)(5), (a)(6), (b)(2), (b)(3), (e), and (i) and adding paragraph (p) to read as follows:

§ 1.21 Miscellaneous fees and charges.

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(a) ***

(1) For admission to examination for registration to practice, fee payable upon application $300.00

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(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c) $130.00

(6) For requesting regrading of an examination under § 10.7(c) $130.00

(b) ***

(2) Service charge for each month when the balance at the send of the month is below $1,000 ..... $25.00

(3) Service charge for each month when the balance at the end of the month is below $300.00 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued $25.00

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(e) International type search reports: For preparing an international type search report of an international type search made at the time of the first action on the merits in a national patent application $40.00

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(i) Publication in Official Gazette: For publication in the Official Gazette of a notice of the availability of an application or a patent for licensing or sale, each application or patent $25.00

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(p) Library service: marginal cost for providing to a Patent and Trademark Depository Library access to Automated Patent System (APS) full-text search capability, per hour of terminal session time, including print time $70.00

8. Section 1.26 is amended by revising paragraphs (a) and (c) to read as follows:

§ 1.26 Refunds.

(a) Money paid in excess will be refunded, but a mere change of purpose after the payment of money, as when a party desires to withdraw an application, an appeal, or a request for oral hearing, will not entitle a party to demand such a return. Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amount; amounts over twenty-five dollars may be returned by check, or if requested, by credit to a deposit account.

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(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,690 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:
(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $200.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed.....$620.00
(ii) A corresponding prior United States national application with basic filing fee has been filed.....$410.00
(3) A supplemental search fee when required, per additional invention.....$170.00

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10. Section 1.482 is amended by revising paragraphs (a) introductory text, (a)(1), and (a)(2)(ii) to read as follows:

§ 1.482 International preliminary examination fees.

(a) The following fees and charges for international preliminary examination are established by the Commissioner under the authority of 35 U.S.C. 376:
(1) A preliminary examination fee is due on filing the Demand:
(i) Where an international search fee as set forth in § 1.455(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an In-ternational Searching Authority, a preliminary examination fee of.....$450.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of.....$670.00

(2)***

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office.....$230.00

*****

11. Section 1.492 is amended by revising paragraphs (a)(1)-(a)(3), (a)(5), paragraphs (b)-(d), and the parenthetical following paragraph (d) to read as follows:

§ 1.492 National stage fees.

*****

(a) ***

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$320.00
By other than a small entity.....$640.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:
By a small entity (§ 1.9(f)).....$355.00
By other than a small entity.....$710.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$475.00
By other than a small entity.....$950.00

*****

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office: By a small entity (§ 1.9(f)).....$415.00
By other than a small entity.....$830.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)).....$37.00
By other than a small entity.....$74.00

(c) In addition to the basic national fee, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):
By a small entity (§1.9(f)).....$11.00
By other than a small entity.....$22.00

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:
By a small entity (§ 1.9(f)).....$115.00
By other than a small entity.....$230.00

(If the additional fees required by paragraphs (b), (c) and (d) are not paid on presentation of the claims for which the additional fees are due, they must be paid or the claims cancelled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

*****

Part 2 - Rules of Practice in Trademark Cases

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (a)(1) and (b)(7) and adding paragraph (a)(19) to read as follows:

§ 2.6 Trademark fees.

*****

(a) Trademark process fees.
(1) For filing an application, per class.....$210.00

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(19) Dividing an application, per new application (file wrapper) created.....$100.00

(b) Trademark service fees.

*****

(7) For assignment records, abstract of title and certification, per registration.....$25.00

*****

3. Section 2.87 is revised to read as follows:

Section 2.87 Dividing an Application

(a) An application may be physically divided into two or more separate applications upon the payment of a fee for each new application created and submission by the applicant of a request in accordance with paragraph (d) of this section.
(b) In the case of a request to divide out one or more entire classes from an application, only the fee under paragraph (a) of this section will be required. However, in the case of a request to divide out some, but not all, of the goods or services in a class, an application filing fee for each new separate application to be created by the division must be submitted, together with the fee under paragraph (a) of this section. Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.
(c) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.
(d) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application." should appear at the top of the first page of the paper.

Aug. 17, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

Note:- The following appendix will not appear in the Code of Federal Regulations

Appendix A - Comparison of Existing and Revised Fee Amounts

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.16(a)	Basic Filing Fee	$690	$710
1.16(a)	Basic Filing Fee (Small Entity)	$345	$355
1.16(b)	Independent Claims	$72	$74
1.16(b)	Independent Claims (Small Entity)	$36	$37
1.16(c)	Claims in Excess of 20	$20	$22
1.16(c)	Claims in Excess of 20 (Small Entity)	$10	$11
1.16(d)	Multiple Dependent Claims	$220	$230
1.16(d)	Multiple Dependent Claims (Small Entity)	$110	$115
1.16(e)	Surcharge - Late Filing Fee	$130	$130
1.16(e)	Surcharge - Late Filing Fee (Small Entity)	$65	$65
1.16(f)	Design Filing Fee	$280	$290
1.16(f)	Design Filing Fee (Small Entity)	$140	$145
1.16(g)	Plant Filing Fee	$460	$480
1.16(g)	Plant Filing Fee (Small Entity)	$230	$240
1.16(h)	Reissue Filing Fee	$690	$710
1.16(h)	Reissue Filing Fee (Small Entity)	$345	$355
1.16(i)	Reissue Independent Claims	$72	$74
1.16(i)	Reissue Independent Claims (Small Entity)	$36	$37
1.16(j)	Reissue Claims in Excess of 20	$20	$22
1.16(j)	Reissue Claims in Excess of 20 (Small Entity)	$10	$11
1.17(a)	Extension - First Month	$110	$110
1.17(a)	Extension - First Month (Small Entity)	$55	$55
1.17(b)	Extension - Second Month	$350	$360
1.17(b)	Extension - Second Month (Small Entity)	$175	$180
1.17(c)	Extension - Third Month	$810	$840
1.17(c)	Extension - Third Month (Small Entity)	$405	$420
1.17(d)	Extension - Fourth Month	$1,280	$1,320
1.17(d)	Extension - Fourth Month (Small Entity)	$640	$660
1.17(e)	Notice of Appeal	$260	$270
1.17(e)	Notice of Appeal (Small Entity)	$130	$135
1.17(f)	Filing a Brief	$260	$270
1.17(f)	Filing a Brief (Small Entity)	$130	$135
1.17(g)	Request for Oral Hearing	$220	$230
1.17(g)	Request for Oral Hearing (Small Entity)	$110	$115
1.17(h)	Petition - Not All Inventors	$130	$130
1.17(h)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Decision on Questions	$130	$130
1.17(h)	Petition - Suspend Rules	$130	$130
1.17(h)	Petition - Expedited License	$130	$130
1.17(h)	Petition - Scope of License	$130	$130
1.17(h)	Petition - Retroactive License	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee - Expired Patent	$130	$13
1.17(h)	Petition - Interference	$130	$130
1.17(h)	Petition - Reconsider Interference	$130	$130
1.17(h)	Petition - Late Filing of Interference	$130	$130
1.20(b)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Refusal of Publish SIR	$130	$130
1.17(i)(1)	Petition - For Assignment	$130	$130
1.17(i)(1)	Petition - For Application	$130	$130
1.17(i)(1)	Petition - Late Priority Papers	$130	$130
1.17(i)(1)	Petition - Suspend Action	$130	$130
1.17(i)(1)	Petition - Divisional Reissues to Issue Separately	$130	$130
1.17(i)(1)	Petition - For Interference Agreement	$130	$130
1.17(i)(1)	Petition - Amendment After Issue	$130	$130
1.17(i)(1)	Petition - Withdrawal After Issue	$130	$130
1.17(i)(1)	Petition - Defer Issue	$130	$130
1.17(i)(1)	Petition - Issue to Assignee	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.53	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.60	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.62	$130	$130
1.17(i)(2)	Petition - Make Application Special	$130	$130
1.17(j)	Petition - Public Use Processing	$1,310	$1,350
1.17(k)	Non-English Specification	$130	$130
1.17(l)	Petition - Revive Abandoned Appl.	$110	$110

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.17(l)	Petition - Revive Abandoned Appl. (Small Entity)	$55	$55
1.17(m)	Petition - Revive Unintentionally Abandoned Appl.	$1,130	$1,170
1.17(m)	Petition - Revive Unintentionally Abandoned Appl. (Small Entity)	$565	$585
1.17(n)	SIR - Prior to Examiner's Action	$790	$820
1.17(o)	SIR - After Examiner's Action	$1,580	$1,640
1.17(p)	Submission of an Information Disclosure Statement (§ 1.97)	-	$200
1.18(a)	Issue Fee	$1,130	$1,170
1.18(a)	Issue Fee (Small Entity)	$565	$585
1.18(b)	Design Issue Fee	$400	$410
1.18(b)	Design Issue Fee (Small Entity)	$200	$205
1.18(c)	Plant Issue Fee	$570	$590
1.18(c)	Plant Issue Fee (Small Entity)	$285	$295
1.19(a)(1)(i)	Copy of Patent	$3	$3
1.19(a)(1)(ii)	Patent Copy - Expedited Local Service	$6	$6
1.19(a)(1)(iii)	Patent Copy Ordered Via EOS - Expedited Service	$25	$25
1.19(a)(2)	Plant Patent Copy	$12	$12
1.19(a)(3)(i)	Copy of Utility Patent or SIR in Color	$24	$24
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed	$12	$12
1.19(b)(1)(ii)	Certified Copy of Patent Application as Filed, Expedited	$24	$24
1.19(b)(2)	Cert. or Uncert. Copy of Patent- Related File Wrapper/Contents	$150	$150
1.19(b)(3)	Cert. or Uncert. Copies of Office Records, per Document	$25	$25
1.19(b)(4)	For Assignment Records, Abstract of Title and Certification	$20	$25
1.19(c)	Library Service	$50	$50
1.19(d)	List of Patents in Subclass	$3	$3
1.19(e)	Uncertified Statement-Status of Maintenance Fee Payment	$10	$10
1.19(f)	Copy of Non-U.S. Patent Document	$12	$25
1.19(g)	Comparing the Certifying Copies, Per Document, Per Copy	$25	$25
1.19(h)	Duplicate or Corrected Filing Receipt	$20	$25
1.20(a)	Certificate of Correction	$70	$100
1.20(c)	Reexamination	$2,180	$2,250
1.20(d)	Statutory Disclaimer	$110	$110
1.20(d)	Statutory Disclaimer (Small Entity)	$55	$55
1.20(e)	Maintenance Fee - 3.5 Years	$900	$930
1.20(e)	Maintenance Fee - 3.5 Years (Small Entity)	$450	$465
1.20(f)	Maintenance Fee - 7.5 Years	$1,810	$1,870
1.20(f)	Maintenance Fee - 7.5 Years (Small Entity)	$905	$935
1.20(g)	Maintenance Fee - 11.5 Years	$2,730	$2,820
1.20(g)	Maintenance Fee - 11.5 Years (Small Entity)	$1,365	$1,410
1.20(h)	Surcharge - Maintenance Fee - 6 Months	$130	$130
1.20(h)	Surcharge - Maintenance Fee - 6 Months (Small Entity)	$65	$65
1.20(i)	Surcharge - Maintenance After Expiration	$600	$620
1.20(j)	Extension of Term of Patent	$1,000	$1,000
1.21(a)(1)	Admission to Examination	$290	$300
1.21(a)(2)	Registration to Practice	$100	$100
1.21(a)(3)	Reinstatement to Practice	$15	$15
1.21(a)(4)	Certificate of Good Standing	$10	$10
1.21(a)(4)	Certificate of Good Standing, Suitable Framing	$20	$20
1.21(a)(5)	Review of Decision of Director, OED	$120	$130
1.21(a)(6)	Regrading of Examination	$120	$130
1.21(b)(1)	Establish Deposit Account	$10	$10
1.21(b)(2)	Service Charge Below Minimum Balance	$20	$25
1.21(b)(3)	Service Charge Below Minimum Balance	$20	$25
1.21(c)	Filing a Disclosure Document	$10	$10
1.21(d)	Box Rental	$50	$50
1.21(e)	International Type Search Report	$35	$40
1.21(g)	Self-Service Copy Charge	$0.25	$.25
1.21(h)	Recording Patent Property	$40	$40
1.21(i)	Publication in the OG	$20	$25
1.21(j)	Labor Charges for Services	$30	$30
1.21(k)	Unspecified Other Services	Actual Cost	Actual Cost
1.21(l)	Retaining Abandoned Application	$130	$130
1.21(m)	Processing Returned Checks	$50	$50
1.21(n)	Handling Fee - Incomplete Application	$130	$130
1.21(o)	Terminal Use APS-Text	$40	$40
1.21(p)	Terminal Use APS-Text by the PTDL's	-	$70
1.24	Coupons for Patent Copies	$3	$3
1.296	Handling Fee - Withdrawal SIR	$130	$130
1.445(a)(1)	Transmittal Fee	$190	$200
1.445(a)(2)(i)	PCT Search Fee - No U.S. Application	$600	$620
1.445(a)(2)(ii)	PCT Search Fee - Prior U.S. Application	$400	$410
1.445(a)(3)	Supplemental Search	$160	$170
1.482(a)(1)(i)	Preliminary Exam Fee	$440	$450
1.482(a)(1)(ii)	Preliminary Exam Fee	$650	$670
1.482(a)(2)(i)	Additional Invention	$140	$140
1.482(a)(2)(ii)	Additional Invention	$220	$230
1.492(a)(1)	Preliminary Examining Authority	$620	$640
1.492(a)(1)	Preliminary Examining Authority (Small Entity)	$310	$320

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.492(a)(2)	Searching Authority	$690	$710
1.492(a)(2)	Searching Authority (Small Entity)	$345	$355
1.492(a)(3)	PTO Not ISA nor IPEA	$920	$950
1.492(a)(3)	PTO Not ISA nor IPEA (Small Entity)	$460	$475
1.492(a)(4)	Claims - IPEA	$90	$90
1.492(a)(4)	Claims - IPEA (Small Entity)	$45	$45
1.492(a)(5)	Filing with EPO/JPO Search Report	$800	$830
1.492(a)(5)	Filing with EPO/JPO Search Report (Small Entity)	$400	$415
1.492(b)	Claims - Extra Individual (Over 3)	$72	$74
1.492(b)	Claims - Extra Individual (Over 3) (Small Entity)	$36	$37
1.492(c)	Claims - Extra Total (Over 20)	$20	$22
1.492(c)	Claims - Extra Total (Over 20) (Small Entity)	$10	$11
1.492(d)	Claims - Multiple Dependents	$220	$230
1.492(d)	Claims - Multiple Dependents (Small Entity)	$110	$115
1.492(e)	Surcharge	$130	$130
1.492(e)	Surcharge (Small Entity)	$65	$65
1.492(f)	English Translation - After 20 Months	$130	$130
2.6(a)(1)	Application for Registration, Per Class	$200	$210
2.6(a)(2)	Amendment to Allege Use, Per Class	$100	$100
2.6(a)(3)	Statement of Use, Per Class	$100	$100
2.6(a)(4)	Extension for Filing Statement of Use, Per Class	$100	$100
2.6(a)(5)	Application for Renewal, Per Class	$300	$300
2.6(a)(6)	Surcharge for Late Renewal, Per Class	$100	$100
2.6(a)(7)	Publication of Mark Under § 12(a), Per Class	$100	$100
2.6(a)(8)	Issuing New Certificate of Registration	$100	$100
2.6(a)(9)	Certificate of Correction of Registrant's Error	$100	$100
2.6(a)(10)	Filing Disclaimer to Registration	$100	$100
2.6(a)(11)	Filing Amendment to Registration	$100	$100
2.6(a)(12)	Filing Affidavit Under Section 8, Per Class	$100	$100
2.6(a)(13)	Filing Affidavit Under Section 15, Per Class	$100	$100
2.6(a)(14)	Filing Affidavit Under Sections 8 & 15, Per Class	$200	$200
2.6(a)(15)	Petitions to the Commissioner	$100	$100
2.6(a)(16)	Petition to Cancel, Per Class	$200	$200
2.6(a)(17)	Notice of Opposition, Per Class	$200	$200
2.6(a)(18)	Ex Parte Appeal to the TTAB, Per Class	$100	$100
2.6(a)(19)	Dividing an Application, Per New Application Created	-	$100
2.6(b)(1)(i)	Copy of Registered Mark	$3	$3
2.6(b)(1)(ii)	Copy of Registered Mark, Expedited	$6	$6
2.6(b)(1)(iii)	Copy of Registered Mark Ordered Via EOS, Expedited Svc.	$25	$25
2.6(b)(2)(i)	Certified Copy of TM Application as Filed	$12	$12
2.6(b)(2)(ii)	Certified Copy of TM Application as Filed, Expedited	$24	$24
2.6(b)(3)	Cert. or Uncert. Copy of TM-Related File Wrapper/Contents	$50	$50
2.6(b)(4)(i)	Cert. Copy of Registered Mark, Title or Status	$10	$10
2.6(b)(4)(ii)	Cert. Copy of Registered Mark, Title or Status - Expedited	$20	$20
2.6(b)(5)	Certified or Uncertified Copy of TM Records	$25	$25
2.6(b)(6)	Recording Trademark Property, Per Mark, Per Document	$40	$40
2.6(b)(6)	For Second and Subsequent Marks in Same Document	$25	$25
2.6(b)(7)	For Assignment Records, Abstracts of Title and Cert.	$20	$25
2.6(b)(8)	Terminal Use T-SEARCH	$40	$40
2.6(b)(9)	Self-Service Copy Charge	$0.25	$0.25
2.6(b)(10)	Labor Charges for Services	$30	$30
2.6(b)(11)	Unspecified Other Services	Actual Cost	Actual Cost
1.19(g)	Comparing and Certifying Copies, per Document, per Copy	$25	$25
1.24	Trademark Coupons	$3	$3

[1141 OG 68]

(45) **DEPARTMENT OF COMMERCE**
Billing Code: 3510-16-M
Patent and Trademark Office
37 CFR Part 1
[Docket No. 940415-4212]
RIN 0651-AA68
Revision of Patent Fees

Agency: Patent and Trademark Office, Commerce
Action: Notice of Final Rulemaking and Lifting of Suspension.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Part 1 of title 37, Code of Federal Regulations, to adjust certainpatent fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation. The PTO also is providing notice that, beginning on October 1, 1994, the suspension of the fee for access to the Automated Patent System's Full Text Search capability (APS-Text) at a Patent and Trademark Depository Library (PTDL) will be lifted. However, the PTO is rescinding this hourly fee, which was established by 37 CFR 1.21(p), and in its place assessing an annual subscription fee on PTDLs providing such service. On October 1, 1994, the PTO also will begin collecting a fee for access to the Automated Patent System's Classified Search and Image Retrieval capability (APS-CSIR) from the search facilities Arlington, Virginia.
Effective Date: October 1, 1994.
For Further Information Contact: Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code, and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

There are two objectives of this final rule package. The first objective is to adjust certain patent fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation.

The second objective is to provide notice that PTO is lifting the suspension or on the fee for access to APS-Text at a Patent and Trademark Depository Library (PTDL). This was established by rule on October 1, 1992 (published in the Federal Register on August 21, 1992 at 57 FR 38190). Collection of the fee was immediately suspended by the Commissioner to provide additional time for the PTO to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries. In response to public comments, the PTO will rescind the fee established by 37 CFR 1.21(p), and assess a subscription fee under 37 CFR 1.21(k) on each PTDL that provides its patrons with access to APS-Text. The basis for the subscription amount is less than the fee amount that was established in 37 CFR 1.21(p). Each participating library will be responsible for establishing policies for providing access to their patrons.

The PTO also will begin charging a fee for on-line access to APS-CSIR at the Patent Search and Image Retrieval Facility (PSIRF) in Arlington, Virginia. Free access to APS-CSIR has been offered at the PSIRF since July 12, 1993. The PTO now will begin recovering the cost of providing this on-line access in accordance with 37 CFR 1.21(k).

The PTO will make any necessary adjustments to these automated system fees based upon actual fiscal year 1995 usage. Future adjustments will be made based upon deviations in system costs and/or public usage.

BACKGROUND

Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and 41(b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (Pub. L. 101-508) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and 41(b) to collect $107 million in fiscal year 1995.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(i)(3) of title 35, United States Code, authorizes the Commissioner to establish reasonable fees for access to automated search systems of the PTO.

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under Section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Recovery Level Determinations

This rule adjusts patent fees for a planned recovery of $571,439,000 in fiscal year 1995, as proposed in the Administration's budget request to the Congress. The fee amounts established for automated access to PTO's data bases will recover reasonable costs of providing these services to the public. The total amount expected to be collected is consistent with the budgeted amount.

The patent statutory fees established by 35 U.S.C. 41(a) and 41(b) are being adjusted on October 1, 1994, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1994. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1994, which is 3.0 percent. Based on this projection, patent statutory fees are being adjusted by 3.0 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted up to the three percent fluctuation in the CPI in order to recover their estimated average costs in 1995. Three patent service fees that are set by statute are not adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

The Office calculated unit costs for all fees based on OMB Circular A-25, "User Fees", and OMB Circular A-130, "Management of Federal Information Resources". Costs were determined from the best available records (for example, financial statements of the Office) and included direct and indirect costs to the Office for carrying out the activity, as directed by OMB Circular A-25. The patent statutory fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user.

Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to an even number so that the comparable small entity fee would be a whole number.

The Office has detailed cost calculation worksheets for each fee amount. These worksheets are available for public inspection in Suite 507 of Crystal Park 1, 2011 Crystal Drive, Arlington, Virginia

Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patentproduction model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior topayment and assume payment rates of 80 percent, 57 percent and 25 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

Any fee amount that is paid on or after October 1, 1994, would be subject to the newfees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, *inter alia*, the filing of national and international applications for patents. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

COST CALCULATIONS

APS-Text at a Patent and Trademark Depository Library

(PTDL) The costs for one hour terminal session time on APS-Text at a PTDL include licensefees that must be paid to Chemical Abstracts Service (CAS) for its proprietary text and structure search software. Other costs are included for a portion, projected at 3.65 percent, of the lease of a computer mainframe for memory storage purposes; all costs associated with training PTDL staff (equipment rental, materials and time); personnel to provide client support to the PTDLs; and telecommunication costs. A summary of the costs are listed below.

APS-Text Cost of One Hour of Terminal Session Time at a Patent and Trademark Depository Library

Cost Element	Public Share
Client Support Overtime	$10,203
Additional Mainframe Costs	$43,216
Software (license fee)	$273.000
Training Costs	$10.000
Subtotal	$336,419
General & Admin. Overhead @ 12.2%	$40.976
Total Cost	$377,395
Estimated Annual Usage (hours)	54,600
Unit Cost (per hour)	$6.91
Telecommunication Costs (per hour)	$8.00
Total Cost (per hour)	$14.91
Total Cost (per hour - rounded)	$15.00

The PTDLs will pay an annual maximum use subscription rate based on one of five tier levels, roughly equivalent to one to five hours of use per day, five days per week. Each PTDL will select a maximum use subscription tier based on its anticipated usage and be responsible for monitoring their own use. The PTDLs will also be responsible for establishing their own policies regarding the provision of APS-Text in their library. If during the year a PTDL is about to exceed its chosen level of maximum use, the PTDL will be allowed to move to a higher tier (and pay the additional subscription rate) or to use up to the subscribed level and cease continued access mid-year.

Tiers	Annual Usage	Annual Subscription Rate
I	0 - 300 hours	$2,250
II	301 - 600 hours	$6,750
III	601 - 900 hours	$11,250
IV	901 - 1200 hours	$15,750
V	1201 - 1500 hours	$20,250

The subscription rates were derived using the $15.00 per hour access charge previously calculated. There will be no additional charges or refunds to each library. For each tier, a discount mechanism is included in the annual subscription calculation. For example, the annual subscription rate of $2,250 for Tier I is calculated by taking the mean average of the annual usage range (in this case 150 hours is the mean of zero and 300 hours) and multiplying it by the $15.00 per hour access charge. Therefore, fora PTDL in Tier I, any usage over 150 hours is free to the library. But if a PTDL in Tie were to not use at least 150 hours, the PTO would not be required to refund the amount of the subscription fee that was not used.

APS-CSIR at the Patent Search and Image Retrieval Facility (PSIRF)

The costs for one hour terminal session time on APS-CSIR at the PSIRF include proprietary text and structure search software. It is estimated that 40 percent of the terminal time license fees that must be paid to Chemical Abstracts Service (CAS) for its will be used for text searching, which requires the search software from CAS.

Other costs are included for a portion, projected at 2.25 percent, of the lease of a computer mainframe for memory storage purposes; additional personnel for the PSIRFand the Office of Computer and Telecommunications Operations; computer acquisition, installation, and maintenance; supplies and equipment dedicated to public use; and general and administrative overhead. A summary of the costs are listed below.

APS-CSIR Cost of One Hour of Terminal Session Time at the Patent Search and Image Retrieval Facility

Cost Element	Total Cost
Compensation and Benefits	$250,813
Additional Hardware and Mainframe Costs	$226,792
Software (license fee)	$25,000
Supply Costs	$10,512
Installation Costs (amortized)	$25,366
Subtotal	$538,483
Space Costs	$41,759
General & Admin Overhead @ 12.2%	$65,695
Total Cost	$645,937
Estimated Annual Usage (hours)	13,000
Unit Cost (per hour)	$49.68
Rounded Fee Amount (per hour - pro-rated)	$50.00

A comparison of existing and revised fee amounts is included as an Appendix to thisnotice of final rulemaking.

In order to ensure clarity in the implementation of the revised fees, a discussion of specific sections is set forth below.

Discussion of Specific Rules

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.17 Patent application processing fees.

Section 1.17, paragraphs (b)-(g) and (m), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j), and (n)-(p), is revised to adjust fees established therein to recover costs.

37 CFR 1.18 Patent issue fees.

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.20 Post-issuance fees.

Section 1.20, paragraphs (c), (i)(1), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to remove paragraph (p).

37 CFR 1.445 International application filing, processing, and search fees.

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.482 International preliminary examination fees.

Section 1.482, paragraphs (a)(1) and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 National stage fees.

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Response to Comments on the Rules

Patent Fee Increase

A notice of proposed rulemaking to adjust patent fees was published in the *Federal Register* on May 27, 1994, at 59 FR 27519, and in the *Official Gazette* on June 7, 1994, at 1163 OG 14.

A public hearing was held on June 28, 1994. Three comments were received and considered in adopting the rules set forth herein.

Comments: The respondents, although not objecting to the three percent fee increase, strongly oppose any fee increase for the purpose of making up patent fee surcharge money that is being withheld from the PTO. The respondents support theAdministration's proposal to ensure that all user fees assessed by the PTO are used exclusively by the PTO.

Response: The Omnibus Budget Reconciliation Act of 1990 (Public Law 101-508) requires the PTO, in fiscal year 1995, to collect $107 million in patent fee surcharges and to deposit these collections to the Patent and Trademark Office Fee Surcharge Fund. In the past, Congress has only appropriated part of these deposits back to the PTO. Deposits not made available to the Office reside in the Fund. To date, the reserve in the Fund is slightly in excess of $35 million. For fiscal year 1995, the PTO requested that all patent fees be provided directly to the Office, thereby eliminating reliance on appropriations from the Fee Surcharge Fund. This language will not be enacted. The House of Representatives has recommended that an additional $18.7 million in patent fee surcharges not be made available to the Office in fiscal year 19 Final action on the 1995 appropriations bill is pending. The Administration does not propose to increase patent fees in fiscal year 1995 other than the increase that reflects fluctuations in the Consumer Price Index.

Collection of the Fee for Access to APS-Text at the PTDLs

A fee for access to APS-Text at a PTDL was set in the final rule package published in the *Federal Register* on August 21, 1992 (57 FR 38189). The final rule became effective October 1, 1992. On that date, the fee took effect but collection was immediately suspended by the Commissioner to provide additional time to solicit input from the private sector on alternative collection methods, and other options for accessing patent search and retrieval in the Libraries.

The Office received six comments.

Comment: Two respondents stated that many of the PTDLs already have considerable experience in collecting fees for access to on-line patent and trademark services provided by private sector vendors. They suggested that mechanisms already in place could be adapted to the collection of fees for PTO-provided services.

These respondents also suggested that the PTO procure access for the PTDLs to private sector on-line patent and trademark services, using a Federal procurement mechanism, such as Fedlink.

Response: The PTO encourages the PTDLs to provide a variety of patent and trademark services for their patrons. However, the PTDLs are not required to provideaccess to private sector on-line services, and the PTO can only provide support and training to the PTDLs for products and services it develops.

In the case of APS access, participation on the part of the PTDLs will be voluntary. With respect to other services, the PTDLs will make the decision as to which ones best fit the needs of their user communities. Fedlink, which provides on-line services to Government agencies, cannot extend its charter to include the PTDLs.

Under the proposed subscription method, libraries should develop policies and procedures which best suit their particular circumstances.

Comment: One respondent suggested that the access to APS be expanded beyond the PTDLs, with a small fee for general use, and discounted fees for independent inventors and/or off-peak usage.

Response: At this time, allowing direct access by the public would impact internal PTO operations. Access at PTDLs will ensure usage in a controlled environment, where end-users will have access to knowledge and skills of trained librarians.

Comment: One respondent suggested that the PTO permit voluntary participation by the individual PTDLs.

Response: Participation on the part of the PTDLs will be voluntary. The level of participation by the PTDLs will not affect their relationship with the PTO in any manner.

Comment: One respondent suggested that the PTO provide access to APS-Text on a subscription basis. This method would set a fee for anticipated usage over a determined period of time.

Response: The PTO will provide access to APS-Text to the PTDLs on an annual subscription basis. All of the libraries will have the option of subscribing. Each library that chooses to subscribe will establish a policy for providing the public with access to APS-Text.

Comment: One respondent suggested that the PTO set up a system that allows users to input credit or debit card numbers.

Response: Currently, the PTO is studying this collection option. The current equipment in use does not allow access via a credit or debit card. This option may be feasible in the near future.

Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to these patent fee rules. This final rule has been determined to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees by changes in the CPI as authorized by 35 U.S.C. 41(f). The principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

Lists of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter 1, Part 1, as set forth below.

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i) to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:
By a small entity (§ 1.9(f)) $65.00
By other than a small entity $730.00
(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)) $38.00
By other than a small entity $76.00

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(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:
By a small entity (§ 1.9(f)) $120.00
By other than a small entity $240.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

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(f) For filing each design application:
By a small entity (§ 1.9(f)) $150.00
By other than a small entity $300.00
(g) Basic fee for filing each plant application:
By a small entity (§ 1.9(f)) $245.00
By other than a small entity $490.00
(h) Basic fee for filing each reissue application:
By a small entity (§ 1.9(f)) $365.00
By other than a small entity $730.00
(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:
By a small entity (§ 1.9(f)) $38.00
By other than a small entity $76.00

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3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), and (m) through (p) to read as follows:

§ 1.17 Patent application processing fees.

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(b) Extension fee for response within second month pursuant to 1.136(a):
By a small entity (§ 1.9(f)) $185.00
By other than a small entity $370.00
(c) Extension fee for response within third month pursuant to 1.136(a):
By a small entity (§ 1.9(f)) $435.00
By other than a small entity $870.00
(d) Extension fee for response within fourth month pursuant to 1.136(a):
By a small entity (§ 1.9(f)) $680.00
By other than a small entity $1,360.00
(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:
By a small entity (§ 1.9(f)) $140.00
By other than a small entity $280.00
(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:
By a small entity (§ 1.9 (f)) $140.00
By other than a small entity $280.00
(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:
By a small entity (§ 1.9(f)) $120.00
By other than a small entity $240.00

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(j) For filing a petition to institute a public use proceeding under 1.292 ..... $1,390.00

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(m) For filing a petition:
(1) For revival of an unintentionally abandoned application, or
(2) For the unintentionally delayed payment of the fee for issuing a patent:
By a small entity (§ 1.9(f)) $605.00
By other than a small entity $1,210.00
(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiners action pursuant to § 1.104–$840.00 reduced by the amount of the application basic filing fee paid.
(o) For requesting publication of a statutory invention registration after the mailing of the first examiners action pursuant to § 1.104–$1,690.00 reduced by the amount of the application basic filing fee paid.
(p) For submission of an information disclosure statement under § 1.97(c) $210.00

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:
By a small entity (§ 1.9(f)) $605.00
By other than a small entity $1,210.00
(b) Issue fee for issuing a design patent:
By a small entity (§ 1.9(f)) $210.00
By other than a small entity $420.00
(c) Issue fee for issuing a plant patent:
By a small entity (§ 1.9(f)) $305.00
By other than a small entity $610.00

5. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), and (j) to read as follows:

§ 1.20 Post issuance fees.

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(c) For filing a request for reexamination (§ 1.510(a)) $2,320.00

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(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant
By a small entity (§ 1.9(f)) $480.00
By other than a small entity $960.00
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant
By a small entity (§ 1.9(f)) $965.00
By other than a small entity $1,930.00
(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant
By a small entity (§ 1.9(f)) $1,450.00
By other than a small entity $2,900.00

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(i) ***
(1) unavoidable $640.00

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(j) For filing an application for extension of the term of a patent (§ 1.740) $1,030.00

6. Section 1.21 is amended by removing paragraph (p).

7. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:
(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $210.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:(i) No corresponding prior United States national application with basic filing fee has been filed $640.00
(ii) A corresponding prior United States national application with basic filing fee has been filed $420.00

(3) A supplemental search fee when required, per additional invention.....$180.00

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8. Section 1.482 is amended by revising paragraphs (a)(1) and (a)(2)(ii) to read as follows:

§ 1.482 International preliminary examination fees.

(a) ***

(1) A preliminary examination fee is due on filing the Demand:
(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of.....$460.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of.....$690.00
(2) ***
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office....$240.00

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9. Section 1.492 is amended by revising paragraphs (a),(1) through (5), (b), and (d) to read as follows:

§ 1.492 National stage fees.

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(a) ***
(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$330.00
By other than a small entity.....$660.00
(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:
By a small entity (§ 1.9(f)).....$365.00
By other than a small entity.....$730.00
(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:
By a small entity (§ 1.9(f)).....$490.00
By other than a small entity.....$980.00
(4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):
By a small entity (§ 1.9(f)).....$46.00
By other than a small entity.....$92.00
(5) Where a search report on the international application has been prepared by the European Patent Office of the Japanese Patent Office:
By a small entity (§ 1.9(f)).....$425.00
By other than a small entity.....$850.00
(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:
By a small entity (§ 1.9(f)).....$38.00
By other than a small entity.....$76.00

*****

(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:
By a small entity (§ 1.9(f)).....$120.00
By other than a small entity.....$240.00

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Aug. 18, 1994

Bruce A. Lehman
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Appendix A - Comparison of Existing and Revised Fee Amounts

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.16(a)	Basic Filing Fee	$690	$710
1.16(a)	Basic Filing Fee (Small Entity)	$345	$355
1.16(b)	Independent Claims	$72	$74
1.16(b)	Independent Claims (Small Entity)	$36	$37
1.16(c)	Claims in Excess of 20	$20	$22
1.16(c)	Claims in Excess of 20 (Small Entity)	$10	$11
1.16(d)	Multiple Dependent Claims	$220	$230
1.16(d)	Multiple Dependent Claims (Small Entity)	$110	$115
1.16(e)	Surcharge - Late Filing Fee	$130	$130
1.16(e)	Surcharge - Late Filing Fee (Small Entity)	$65	$65
1.16(f)	Design Filing Fee	$280	$290
1.16(f)	Design Filing Fee (Small Entity)	$140	$145
1.16(g)	Plant Filing Fee	$460	$480
1.16(g)	Plant Filing Fee (Small Entity)	$230	$240
1.16(h)	Reissue Filing Fee	$690	$710
1.16(h)	Reissue Filing Fee (Small Entity)	$345	$355
1.16(i)	Reissue Independent Claims	$72	$74
1.16(i)	Reissue Independent Claims (Small Entity)	$36	$37
1.16(j)	Reissue Claims in Excess of 20	$20	$22
1.16(j)	Reissue Claims in Excess of 20 (Small Entity)	$10	$11
1.17(a)	Extension - First Month	$110	$110
1.17(a)	Extension - First Month (Small Entity)	$55	$55
1.17(b)	Extension - Second Month	$350	$360
1.17(b)	Extension - Second Month (Small Entity)	$175	$180
1.17(c)	Extension - Third Month	$810	$840
1.17(c)	Extension - Third Month (Small Entity)	$405	$420
1.17(d)	Extension - Fourth Month	$1,280	$1,320
1.17(d)	Extension - Fourth Month (Small Entity)	$640	$660
1.17(e)	Notice of Appeal	$260	$270
1.17(e)	Notice of Appeal (Small Entity)	$130	$135

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.17(f)	Filing a Brief	$260	$270
1.17(f)	Filing a Brief (Small Entity)	$130	$135
1.17(g)	Request for Oral Hearing	$220	$230
1.17(g)	Request for Oral Hearing (Small Entity)	$110	$115
1.17(h)	Petition - Not All Inventors	$130	$130
1.17(h)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Decision on Questions	$130	$130
1.17(h)	Petition - Suspend Rules	$130	$130
1.17(h)	Petition - Expedited License	$130	$130
1.17(h)	Petition - Scope of License	$130	$130
1.17(h)	Petition - Retroactive License	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee	$130	$130
1.17(h)	Petition - Refusing Maintenance Fee - Expired Patent	$130	$13
1.17(h)	Petition - Interference	$130	$130
1.17(h)	Petition - Reconsider Interference	$130	$130
1.17(h)	Petition - Late Filing of Interference	$130	$130
1.20(b)	Petition - Correction of Inventorship	$130	$130
1.17(h)	Petition - Refusal of Publish SIR	$130	$130
1.17(i)(1)	Petition - For Assignment	$130	$130
1.17(i)(1)	Petition - For Application	$130	$130
1.17(i)(1)	Petition - Late Priority Papers	$130	$130
1.17(i)(1)	Petition - Suspend Action	$130	$130
1.17(i)(1)	Petition - Divisional Reissues to Issue Separately	$130	$130
1.17(i)(1)	Petition - For Interference Agreement	$130	$130
1.17(i)(1)	Petition - Amendment After Issue	$130	$130
1.17(i)(1)	Petition - Withdrawal After Issue	$130	$130
1.17(i)(1)	Petition - Defer Issue	$130	$130
1.17(i)(1)	Petition - Issue to Assignee	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.53	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.60	$130	$130
1.17(i)(1)	Petition - Accord a Filing Date Under § 1.62	$130	$130
1.17(i)(2)	Petition - Make Application Special	$130	$130
1.17(j)	Petition - Public Use Processing	$1,310	$1,350
1.17(k)	Non-English Specification	$130	$130
1.17(l)	Petition - Revive Abandoned Appl.	$110	$110
1.17(l)	Petition - Revive Abandoned Appl. (Small Entity)	$55	$55
1.17(m)	Petition - Revive Unintentionally Abandoned Appl.	$1,130	$1,170
1.17(m)	Petition - Revive Unintentionally Abandoned Appl. (Small Entity)	$565	$585
1.17(n)	SIR - Prior to Examiner's Action	$790	$820
1.17(o)	SIR - After Examiner's Action	$1,580	$1,640
1.17(p)	Submission of an Information Disclosure Statement (§ 1.97)	-	$200
1.18(a)	Issue Fee	$1,130	$1,170
1.18(a)	Issue Fee (Small Entity)	$565	$585
1.18(b)	Design Issue Fee	$400	$410
1.18(b)	Design Issue Fee (Small Entity)	$200	$205
1.18(c)	Plant Issue Fee	$570	$590
1.18(c)	Plant Issue Fee (Small Entity)	$285	$295
1.19(a)(1)(i)	Copy of Patent	$3	$3
1.19(a)(1)(ii)	Patent Copy - Expedited Local Service	$6	$6
1.19(a)(1)(iii)	Patent Copy Ordered Via EOS - Expedited Service	$25	$25
1.19(a)(2)	Plant Patent Copy	$12	$12
1.19(a)(3)(i)	Copy of Utility Patent or SIR in Color	$24	$24
1.19(b)(1)(i)	Certified Copy of Patent Application as Filed	$12	$12
1.19(b)(1)(ii)	Certified Copy of Patent Application as Filed, Expedited	$24	$24
1.19(b)(2)	Cert. or Uncert. Copy of Patent- Related File Wrapper/Contents	$150	$150
1.19(b)(3)	Cert. or Uncert. Copies of Office Records, per Document	$25	$25
1.19(b)(4)	For Assignment Records, Abstract of Title and Certification	$20	$25
1.19(c)	Library Service	$50	$50
1.19(d)	List of Patents in Subclass	$3	$3
1.19(e)	Uncertified Statement-Status of Maintenance Fee Payment	$10	$10
1.19(f)	Copy of Non-U.S. Patent Document	$12	$25
1.19(g)	Comparing the Certifying Copies, Per Document, Per Copy	$25	$25
1.19(h)	Duplicate or Corrected Filing Receipt	$20	$25
1.20(a)	Certificate of Correction	$70	$100
1.20(c)	Reexamination	$2,180	$2,250
1.20(d)	Statutory Disclaimer	$110	$110
1.20(d)	Statutory Disclaimer (Small Entity)	$55	$55
1.20(e)	Maintenance Fee - 3.5 Years	$900	$930
1.20(e)	Maintenance Fee - 3.5 Years (Small Entity)	$450	$465
1.20(f)	Maintenance Fee - 7.5 Years	$1,810	$1,870
1.20(f)	Maintenance Fee - 7.5 Years (Small Entity)	$905	$935
1.20(g)	Maintenance Fee - 11.5 Years	$2,730	$2,820
1.20(g)	Maintenance Fee - 11.5 Years (Small Entity)	$1,365	$1,410
1.20(h)	Surcharge - Maintenance Fee - 6 Months	$130	$130
1.20(h)	Surcharge - Maintenance Fee - 6 Months (Small Entity)	$65	$65
1.20(i)	Surcharge - Maintenance After Expiration	$600	$620
1.20(j)	Extension of Term of Patent	$1,000	$1,000

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
1.21(a)(1)	Admission to Examination	$290	$300
1.21(a)(2)	Registration to Practice	$100	$100
1.21(a)(3)	Reinstatement to Practice	$15	$15
1.21(a)(4)	Certificate of Good Standing	$10	$10
1.21(a)(4)	Certificate of Good Standing, Suitable Framing	$20	$20
1.21(a)(5)	Review of Decision of Director, OED	$120	$130
1.21(a)(6)	Regrading of Examination	$120	$130
1.21(b)(1)	Establish Deposit Account	$10	$10
1.21(b)(2)	Service Charge Below Minimum Balance	$20	$25
1.21(b)(3)	Service Charge Below Minimum Balance	$20	$25
1.21(c)	Filing a Disclosure Document	$10	$10
1.21(d)	Box Rental	$50	$50
1.21(e)	International Type Search Report	$35	$40
1.21(g)	Self-Service Copy Charge	$0.25	$.25
1.21(h)	Recording Patent Property	$40	$40
1.21(i)	Publication in the OG	$20	$25
1.21(j)	Labor Charges for Services	$30	$30
1.21(k)	Unspecified Other Services	Actual Cost	Actual Cost
1.21(l)	Retaining Abandoned Application	$130	$130
1.21(m)	Processing Returned Checks	$50	$50
1.21(n)	Handling Fee - Incomplete Application	$130	$130
1.21(o)	Terminal Use APS-Text	$40	$40
1.21(p)	Terminal Use APS-Text by the PTDL's	-	$70
1.24	Coupons for Patent Copies	$3	$3
1.296	Handling Fee - Withdrawal SIR	$130	$130
1.445(a)(1)	Transmittal Fee	$190	$200
1.445(a)(2)(i)	PCT Search Fee - No U.S. Application	$600	$620
1.445(a)(2)(ii)	PCT Search Fee - Prior U.S. Application	$400	$410
1.445(a)(3)	Supplemental Search	$160	$170
1.482(a)(1)(i)	Preliminary Exam Fee	$440	$450
1.482(a)(1)(ii)	Preliminary Exam Fee	$650	$670
1.482(a)(2)(i)	Additional Invention	$140	$140
1.482(a)(2)(ii)	Additional Invention	$220	$230
1.492(a)(1)	Preliminary Examining Authority	$620	$640
1.492(a)(1)	Preliminary Examining Authority (Small Entity)	$310	$320
1.492(a)(2)	Searching Authority	$690	$710
1.492(a)(2)	Searching Authority (Small Entity)	$345	$355
1.492(a)(3)	PTO Not ISA nor IPEA	$920	$950
1.492(a)(3)	PTO Not ISA nor IPEA (Small Entity)	$460	$475
1.492(a)(4)	Claims - IPEA	$90	$90
1.492(a)(4)	Claims - IPEA (Small Entity)	$45	$45
1.492(a)(5)	Filing with EPO/JPO Search Report	$800	$830
1.492(a)(5)	Filing with EPO/JPO Search Report (Small Entity)	$400	$415
1.492(b)	Claims - Extra Individual (Over 3)	$72	$74
1.492(b)	Claims - Extra Individual (Over 3) (Small Entity)	$36	$37
1.492(c)	Claims - Extra Total (Over 20)	$20	$22
1.492(c)	Claims - Extra Total (Over 20) (Small Entity)	$10	$11
1.492(d)	Claims - Multiple Dependents	$220	$230
1.492(d)	Claims - Multiple Dependents (Small Entity)	$110	$115
1.492(e)	Surcharge	$130	$130
1.492(e)	Surcharge (Small Entity)	$65	$65
1.492(f)	English Translation - After 20 Months	$130	$130
2.6(a)(1)	Application for Registration, Per Class	$200	$210
2.6(a)(2)	Amendment to Allege Use, Per Class	$100	$100
2.6(a)(3)	Statement of Use, Per Class	$100	$100
2.6(a)(4)	Extension for Filing Statement of Use, Per Class	$100	$100
2.6(a)(5)	Application for Renewal, Per Class	$300	$300
2.6(a)(6)	Surcharge for Late Renewal, Per Class	$100	$100
2.6(a)(7)	Publication of Mark Under § 12(a), Per Class	$100	$100
2.6(a)(8)	Issuing New Certificate of Registration	$100	$100
2.6(a)(9)	Certificate of Correction of Registrant's Error	$100	$100
2.6(a)(10)	Filing Disclaimer to Registration	$100	$100
2.6(a)(11)	Filing Amendment to Registration	$100	$100
2.6(a)(12)	Filing Affidavit Under Section 8, Per Class	$100	$100
2.6(a)(13)	Filing Affidavit Under Section 15, Per Class	$100	$100
2.6(a)(14)	Filing Affidavit Under Sections 8 & 15, Per Class	$200	$200
2.6(a)(15)	Petitions to the Commissioner	$100	$100
2.6(a)(16)	Petition to Cancel, Per Class	$200	$200
2.6(a)(17)	Notice of Opposition, Per Class	$200	$200
2.6(a)(18)	Ex Parte Appeal to the TTAB, Per Class	$100	$100
2.6(a)(19)	Dividing an Application, Per New Application Created	-	$100
2.6(b)(1)(i)	Copy of Registered Mark	$3	$3
2.6(b)(1)(ii)	Copy of Registered Mark, Expedited	$6	$6
2.6(b)(1)(iii)	Copy of Registered Mark Ordered Via EOS, Expedited Svc.	$25	$25
2.6(b)(2)(i)	Certified Copy of TM Application as Filed	$12	$12
2.6(b)(2)(ii)	Certified Copy of TM Application as Filed, Expedited	$24	$24
2.6(b)(3)	Cert. or Uncert. Copy of TM-Related File Wrapper/Contents	$50	$50

37 CFR Sec.	DESCRIPTION	Dec 1991	Oct 1992
2.6(b)(4)(i)	Cert. Copy of Registered Mark, Title or Status	$10	$10
2.6(b)(4)(ii)	Cert. Copy of Registered Mark, Title or Status - Expedited	$20	$20
2.6(b)(5)	Certified or Uncertified Copy of TM Records	$25	$25
2.6(b)(6)	Recording Trademark Property, Per Mark, Per Document	$40	$40
2.6(b)(6)	For Second and Subsequent Marks in Same Document	$25	$25
2.6(b)(7)	For Assignment Records, Abstracts of Title and Cert.	$20	$25
2.6(b)(8)	Terminal Use T-SEARCH	$40	$40
2.6(b)(9)	Self-Service Copy Charge	$0.25	$0.25
2.6(b)(10)	Labor Charges for Services	$30	$30
2.6(b)(11)	Unspecified Other Services	Actual Cost	Actual Cost
1.19(g)	Comparing and Certifying Copies, per Document, per Copy	$25	$25
1.24	Trademark Coupons	$3	$3

[1141 OG 68]

(46) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office

37 CFR Parts 1 and 2
[Docket No. 90363-9221]
RIN: 0651-AA40

Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to set forth fees for public access to the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office will provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available), hereinafter referred to as APS-Text, in its Patent Search Room and to T-Search in its Trademark Search Library, located in Arlington, Virginia. Except for a series of pilot experiments which may occur over the next one or two years, the Office does not plan to provide routine remote on-line access to these data bases at any other facilities at the present time. A separate rulemaking process will be followed when the Office determines to provide such remote on-line access.

Both search systems have been made available to the public free of charge since April 3, 1989, for the purposes of education and training (familiarization).

The paper and/or microfilm collections of U.S. patents, foreign patents documents and U.S. trademark registrations continue to be available to the public free of charge, as provided by section 104(b) of Pub. L. 100-703. The Office reaffirms its commitment to hold a public hearing prior to making any decision concerning the elimination of the paper files.

This final rule establishes fees for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.

In response to the notice of proposed rulemaking published in the *Federal Register* on May 3, 1989 (54 FR 18907), and at a public hearing held on June 30, 1989, the Office received many comments regarding problems encountered by the public in the use of T-Search. The Office believes that T-Search has proven effective for searches performed by Trademark examining attorneys in connection with their examination of applications for the registration of marks. Although the Office is establishing a fee for accessing the T-Search system, the Commissioner is immediately suspending collection of that fee to provide additional time for the public to familiarize themselves with T-Search. The Office will provide the public with sixty days notice before starting to collect the fee.

Effective Date: February 12, 1990. Rule 2.6(w) will take effect February 12, 1990 but immediately be suspended by the Commissioner. The Office will provide written notice in the *Federal Register* sixty days before starting to collect fees for accessing T-Search.

For Further Information: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The purpose of this final rule is to establish new fees for the on-line use by the public of APS-Text, and T-Search that are to be provided in the Office's facilities in Arlington, Virginia. This final rule is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which were published in final form in the *Federal Register* on May 3, 1989, at 54 FR 18920. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is authorized by section 31 of the Trademark (Lanham) Act 1946, as amended (15 U.S.C. 1113), and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees, also is presented.

Background: In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve the integrity and quality of Office records; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable trademark examining attorneys to search the data base for registered and pending trademarks and associated textual data, including marks containing designs, and to retrieve, display and print all information as a substitute for paper file searches. Trademark examining attorneys have been using T-Search exclusively since January 1988 via a network of approximately 40 terminals. After a six-month experimental T-Search evaluation program conducted between June and December 1988, the capability was deployed for public use in the Trademark Search Library on April 3, 1989.

The T-Search "dead data base", trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. Trademark examining attorneys do not search this data base in connection with examining activities.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected

on July 1, 1986, to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from approximately 71 single screen text terminals located throughout the Office. The APS-Text capability was deployed to the public in the Patent Search Room on April 3, 1989.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tubular data and chemical and mathematical equations will be added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained an APS-Text during January 1988, and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches.

A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December 1988. Preliminary review indicated that public users considered T-Search to be useful both as a source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Pub. L. 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest.

The information contained in the automated data bases, which will be available to the public at the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through commercial vendors. The Office believes it to be in the public interest to waive the fee for public access to its text data bases in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for renumeration -- e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only when terminals are available. It is not anticipated that fees will be waived for any one individual more than once or twice each year. The Commissioner reserves the authority to control access to the data bases and deny a waiver to any individual.

The waiver policy would apply only to use of the automated system, and not to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual.

Cost Calculations: The Office calculated unit costs for all fees based on OMB Circular A-25 "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. User charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be resonable by reflecting the marginal cost for providing the new service and not include the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

Prior to preparation of this final rule, all of the cost assumptions and cost calculations were reviewed and modified to ensure that they included the Office's best estimates and projections.

APS-Text

The Office is establishing the $40.00 fee for each hour of terminal session time on APS-Text. The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the three (3) month period March 1990 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected than an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The fee calculations for public access also include the costs for equipment: network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs include a portion of the license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The Office is providing free access time during training on the automated search systems in accordance with § 104(c) of Public Law 100-703 which reads. "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

The usage rate estimates are based on the three-month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three-month study period, use of the three terminals averaged approximately 50 percent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempted to take into account the following factors and assumptions:

1. Future public users, on averge, would use APS-Text less frequently than the 42 frequent users selected for the 1988 study, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) would reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes -- the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a workday, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, would provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appeared to be adequate for the foreseeable future.

6. For purposes of actual use of available text terminals, the following estimates were used:

(a) In fiscal year 1990, between four (4) and six (6) terminals would be available during the first quarter. An estimate of 45 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 10 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time was projected.

(b) During fiscal year 1991 and beyond, stable levels of usage were projected to be achieved, yielding an estimated 35 percent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, a total of 286 search sessions per day. Although usage rates since the system was made available to the public in April 1989 have been higher than projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$918,196
Hardware & Maintenance	$691,289
Software (license fees)	$295,676
Site Preparation	$38,118
Non-capital Furniture	$8,750
Supplies & Forms	$3,500
Sub-Total	$1,955,529
General & Administrative Overhead	$361,773
TOTAL COST	$2,317,302
Estimated Use (hours)	$65,946
UNIT COST (per hour)	$35.14

The marginal cost for one hour of Office staff search assistance on APS-text includes the costs of personnel compensation and benefits.

A summary of the fee calculation is as follows:

APS-Text
Marginal Cost of One-Hour of
Office Staff Search Assistance
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Com pensation and Benefits	
TOTAL COST	$45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	$25.71

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, furniture for the printers, supplies and forms, and general and administrative overhead. A summary is as follows:

APS-Text
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$173,472
Hardware & Maintenance	$13,483
Non-capital Furniture	$5,000
Supplies & Forms	$35,882
Sub-Total	$227,837
General & Administrative Overhead	$42,150
TOTAL COST	$269,987
Estimated Use (pages)	4,496,325
UNIT COST(per page)	$0.060

T-Search

The marginal cost for one hour of terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, maintenance of the T-Search terminals, routine site preparation, supplies and forms, and general and administrative overhead. The Office is establishing the $40.00 fee for each hour of terminal session time on T-Search, but is immediately suspending collection of that fee in order to provide public users additional time to familiarize themselves with the system.

The comments submitted in response to the proposed rulemaking indicate that the public users have not adequately adjusted to the T-Search system. During the period collection of the fee is suspended, the public will have an opportunity to better learn the system so as to perform more effective searches than they may be experiencing now. The Office will publish a notice in the *Federal Register* sixty days before it begins collecting a fee for public access to T-Search.

Usage rates for T-Search during fiscal years 1990-1992 were projected to be 28 percent of the hours the system would be available to the public. This rate was extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search, and about 24 to 28 public users were active on T-Search each month. The overall usage rate of these active users was 14 percent of the hours the system was available to the public. In projecting usage rates on which to base a fee amount, it was anticipated that the overall number of users and the usage rate would double once T-Search was made available in the Trademark Search Library to all users of that search facility and training was provided on a routine basis. Although usage rates since the system was made available to the public in April 1989 have been higher projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations are as follows:

T-Search
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$154,451
Hardware & Maintenance	$28,809
Site Preparation	$1,000
Supplies & Forms	$3,298
Sub-Total	$187,558

Cost Element	(Marginal Cost)
General & Administrative Overhead	$34,698
TOTAL COST	$222,256
Estimated Use (hours)	5,985
UNIT COST (per hour)	$37.14

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms.

A summary of the costs is as follows:

T-Search
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$27,862
Hardware & Maintenance	$5,274
Supplies & Forms	$3,579
Sub-Total	$36,715
General & Administrative Overhead	$6,792
TOTAL COST	$43,507
Estimated Use (pages)	448,875
UNIT COST (per page)	$0.097

The proposed fee of $25.00 for each hour of Office staff search assistance to conduct a search using T-Search has been withdrawn. The T-Search system can be used by the public with routine assistance provided by the regular staff of the Trademark Search Library. This is similar to assistance on how to use the paper files now provided free of charge by the Trademark Search Library staff. Office employees will neither work one-on-one with members of the public in conducting searches, nor conducted searches for members of the public.

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate.

The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially four (4) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and adminstrative activities. Up to twenty-one (21) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers all be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administration activities. Additional terminals printers will be added as demand warrants and space permits.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. For those familiar with automated search systems, a shorter course of six (6) hours is provided. Ten (10) members of the public can be trained during each class. Training is being held at the Office's Arlington, Va. complex during normal work hours.

Four (4) hours of basic training is being offered on the use of T-Search. For those familiar with automated search systems, a shorter course of one (1) hour is available. T-Search training is being held in the Office's Arlington, Va. complex during morning, evening and weekend hours.

Enrollment in all training classes initially was on a lottery basis. Public users who wished to be trained on APS-Text or T-Search were required to submit an application form. The Office is now accepting requests for training and adding the names to the list. As of August 31, 1989, 696 people or 70 percent of all those requesting training have been trained.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well an efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules and with all other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Up to three (3) of the initial four (4) terminals in the Patent Search Room and up to two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in the Patent Search Room will be available for walk-up users and for assisted searches for infrequent users. The remaining terminal in the Trademark Search Library will be available for walk-up users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches (in the Patent Search Room) is subject to change based upon operational experience.

All public use of APS-Text and T-Search, with the exception of scheduled training classes, is on a pre-payment basis. In pre-paying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalized payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21 is amended to add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21 is amended to add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6 is amended to add new paragraph (w) to set the fees for access to the automated trademark search system (T-Search) and to provide for the waiver of fees under certain circumstances.

Section 2.6 is amended to add new paragraph (x) to set the fee for a printed copy from T-Search.

A final rule package establishing two new fees under the provisions of Pub. L. 100-667, the Trademark Law Revision Act of 1988, has been published which added paragraphs (u) and (v) to section 2.6. Therefore, the rule has been modified from the proposal to add paragraphs (w) and (x) instead of paragraphs (u), (v) and (w).

Response to Comments on the Rules

A notice of proposed rulemaking to establish a basis for the charges for use of the on-line automated search systems in the Patent Search Room and Trademark Search Library located at the Patent and Trademark Office in Arlington, Virginia was published in the *Federal Register* on May 3, 1989, at 54 FR 18907. Corrections were published in the *Federal Register* on May 12, 1989, at 54 FR 20670. A notice also was published on May 30, 1989, in volume 1102 of the Official Gazette of the United States Patent and Trademark Office, pages 94 through 98 for patents, and pages 96 through 100 for trademarks.

A public hearing was conducted on June 30, 1989. A total of 25 comments were received: 24 respondents submitted written comments and five people presented oral testimony (four of whom also submitted written comments) at the public hearing. On the 25 comments, twelve (12) were from individuals, seven (7) from libraries, five (5) from organizations and one (1) from business. All of the written and oral comments were considered in adopting the rules set forth herein.

Many of the comments from the representatives of the Patent Depository Libraries raised questions or commented on the proposed rules from the perspective of their impact on Patent Depository Libraries. The proposed rules and policies set forth in the *Federal Register* Notice of May 3, 1989 are applicable only to the automated search systems provided in PTO's facilities located in Arlington, Virginia. When the Office is prepared to offer the automated search systems at the Patent Depository Libraries, a proposed notice will be published for public comment. Therefore, any comments relating to procedures for accessing the automated search systems in the Patent Depository Libraries will not be addressed at this time.

Comment: Overall, nine respondents acknowledged the usefulness of the automated search systems, particularly APS-Text. Although seven respondents alleged that T-Search is not adequate to meet the needs of the public, that its response time is too slow, and that it is not sufficiently accurate to meet the specific needs of the commentor, most of these respondents acknowledged that T-Search had the potential for being a useful tool. Documentaton of specific problems, for example, those associated with conducting a phonetic search, were provided. Two respondents said that T-Search is flawed and the decision to require examiners to use the system on an exclusive basis was ill-advised and regrettable.

Response: Trademark examining attorneys have been using T-Search for word mark searches since August 1987, and for word mark and design searches since January 1988. The public has been using the system since April 3, 1989.

The minutes to the September 27, 1988, meeting of the Public Advisory Committee for Trademark Affairs, express the view that: "...T-Search searches are more thorough than manual searches." The transcript to that meeting contains the following comments: "I don't think there is any question, but a T-Search [sic] properly done gives an excellent result" and "...from the corporate point of view, ... I am pleased to say that I like what I see. I like the very fast action we're getting on the first action." From the transcript to the February 23, 1988 meeting: "I'd like to start with a glowing report. I think that the registration process is working very well. From my own personal experience in terms of what the examiners are doing, they get an A plus. They're really doing a good job."

The concensus of the management of the Trademark Examining Operation is that the T-Search system meets the needs of the Office at this time. There is no indication in any records or activities in the PTO which would indicate that the use of T-Search has caused a deterioration in the quality of searches conducted by Trademark examining attorneys.

The difference between the perceptions of the Trademark examining attorneys and the public may be attributed to several factors; Trademark examining attorneys use the system on a daily basis; they know what the system can do and what it cannot do and avoid the latter; and they know how to utilize the system's functionalities to perform the best search possible. Further, Trademark examining attorneys do different types of searches, and have different needs, than the public. T-Search use statistics for the period April 1989 through August 1989 demonstrate that the public is making extensive use of the system. Following is a summary of those statistics:

Month	Available Hours	Hours Used By Public	Rate of Usage	Average Session Time
April	513	108	21%	13.02 min.
May	513	126	24%	12.25 min.
June	627	183	29%	10.84 min.
July	570	186	33%	12.51 min.
August	656	217	33%	9.66 min.

This usage rate compares favorably to the projected usage rate of 28 percent.

Comment: Seven respondents claimed that the paper Trademark files have been allowed to deteriorate and, therefore, are not reliable for use by the public.

Response: The Office contracts for file maintenance sevices in both the Trademark Search Library and the Patent Search Room. Among the tasks performed by the contractor in the Trademark Search Library are maintaining the pending files, filing newly registered Trademarks, pulling erroneous registrations from the file, etc. The contract for the Trademark Search Library includes a monitoring system based on MIL-STD 105, which is a sampling plan that provides a 97 percent accuracy level. Once the contractor completes a task, Office staff check the required sample levels to ensure that filing was performed accurately. The Office is constantly monitoring the status of the paper files, but notes that maintenance of paper file integrity is subject to inherent limitations.

Comment: In view of the above comments about the inadequacy of the Trademark paper search files and T-Search, six respondents advocated the need for T-Search, at no charge to the user, as an adjunct or back-up to the paper files. One respondent suggested a similar arrangement in the Patent Search Room.

Response: The Office has adopted the $40.00 fee amount for one hour of terminal session time on both APS-Text and T-Search. In order to give the public more time to become familiar with the T-Search system, the Commissioner is immediately suspending collection of that fee. This will enable users to learn the system so as to perform more effective searches. The Office will publish a notice in the *Federal Register* announcing its decision regarding the imposition of the fee at least 60 days before starting to collect the fee amount. At that time, the Office also will publish validated cost estimates based on usage rates and actual costs documented from the present time to the time the decision to collect a fee is made.

Comment: Two respondents claimed that the objective of automation necessarily contemplated a free search system to give meaning to the constructive notice provisions of the Trademark Act.

Response: Registration of a trademark constitutes constructuve notice and records of all active trademark registrations and pending applications are available for searching free of charge in the paper file and on TRAM (Trademark Reporting and Monitoring System) data base.

Comment: One respondent claimed that PTO is required to provide access to disclosed patent information as the information is made public; four respondents were opposed to the Office charging fees for accessing the automated search systms; two other respondents commented that the Office should not charge fees for using systems designed to be the sole searching source of the public records which the Office is charged by law to provide; and one respondent commented that the proposal to limit access to the automated data bases only to those who can pay a fee is deplorable policy at a time when there is concern about industrial competitiveness with Japan.

Response: The Office will continue to make the paper and/or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations available for pubic access free of charge. The Office also has adopted a policy whereby the hourly terminal session fee for access to the data base can be waived when it is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. In this way, the Office will continue to provide public access to all available information free of charge.

Comment: One respondent commented that user fees for electronic data is a form of dual taxation when information was gathered, organized and produced at taxpayers expense; and two respondents claimed that users of information have contributed up to 30 percent of the $120 milllion for development of the APS system to date — in other words, the public already has paid for APS.

Response: In calculating the proposed fees, the Office is consistent with the Office of Management and Budget's proposed policy on user charges for Government information products, as clarified in the June 15, 1989 *Federal Register* notice entitled "Second Advance Notice of Further Policy Development on Dissemination of Information." In that notice, OMB's stated policy is that user charges for Government Information products should be no higher than a level sufficient to recover the costs of disseminating, not collecting, the information.

The costs associated with the fees for accessing APS-Text and T-Search are directly related to the public's use of the systems; for example, the costs associated with the acquisition of the APS-Text terminals that are being used by the public. No costs associated with designing or installing the automated system for use by Office examiners, or the development of the new systems have been included. Neither have costs been included for gathering, organizing or producing information.

The *Federal Register* notice of June 15, 1989 (54 FR 25554, 25558) dealing with policy development on dissemination of information states that: "As to double taxation, OMB notes that user charges policy has a basis in statute (31 U.S.C. 9701), and the Congress has not viewed user charges as double taxation because they are applied when the recipient receives special benefits."

Comment: Two respondents stated that Government information is the same, whether it is provided in printed or electronic form.

Response: Charging fees for access to the automated search systems is consistent with PTO's fee policy. For example, fees are charged for manual search services (e.g., for a search of Office records or for a search of assignment records), and for printed copies of patents and trademarks and for copies of Office documents.

Comment: The Japanese system is available at four locations at no cost, and includes U.S. information made available at U.S. taxpayer expense.

Response: The Japanese automated search system, like the automated search systems in the PTO's search facilities, is being made available free of charge at the present time. The costs of such use, however, are being paid from general fee revenues collected by the Japanese Patent Office. Additionally, the APS-Text system currently includes Japanese English language abstracts and the Office is in the process of acquiring Japanese patent information in digital facsimile form.

Comment: One respondent commented that PTO has no responsibility to provide an expensive, complex, internal Government on-line value-added computer service, that this is far beyond the requirements of public access to patent files; and another respondent commented that it is in the public interest to have the same system that is being used by the examiners also available to the public.

Response: The Office agrees that it is in the public interest to provide the same search system capability to the public that is being used by the examiners.

Comment: One respondent stated that providing free access is not competing with the private sector, and that there always is a place for the private sector to provide value-added information.

Response: The user charges adopted for public access to the APS-Test and T-Search systems are consistent with OMB Circulars A-25 "User Charges" and A-130 "Management of Federal Information Resources", and with the PTO's Electronic Data Dissemination Policies and Guidelines. The PTO's user's fees are designed to recover the marginal costs associated with providing access to the automated search systems to the public.

Comment: Five respondents stated that the proposed fees are not "reasonable" and the Office does not have documented cost estimates and usage rates to support the proposed fee amounts.

Response: The Office is meeting Congressional direction to establish "reasonable" fees by recovering only the marginal costs associated with providing public access to the automated search systems. Costs and projected usage rates were determined from the best available records, for example, financial statements for the Office and the results of the public evaluations of the APS-Text and T-Search systems. A summary of the costs used in the fee calculations is included above under "Cost Calculations." Full details of these cost calculations are available for public inspection at the Patent and Trademark Office in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.

Comment: Two respondents questioned the proposed fees for search assistance. If the search assistance is similar to that which is provided free now, there should be no fee. If the search assistance entails doing searches, the Office should not be getting into that business.

Response: The PTO is withdrawing the proposed fee for staff search assistance to conduct a search using T-Search capabilities. The fee for staff search assistance to conduct a search using APS-Text capabilities is being adopted, because an untrained user cannot conduct a search without significant help from Office staff. Users of course, have the option of obtaining free training on the system.

Comment: One respondent commented that user fees cannot be justified under the theory that electronic search provides a new service or offers an enhancement to the public's ability to search the patent data base, and that the public has an option of paying the fee or using the paper files. Another respondent commented that APS-Text and T-Search represent enhancements to services already provided.

Response: The fees are specifically authorized under $ 104 (c) of Pub. L. 100-703 and are calculated to allow recovery of only the marginal cost for providing the system to the public.

Comment: Two respondents claimed that the Office should ask Congress for funding to offer free access here and at the PDLs.

Response: It continues to be PTO policy, consistent with OMB Circular A-130, that costs for access to the automated search systems be borne by those who actually use the automated search systems.

Comment: One respondent claimed that the accuracy of the trademark data base is suspect.

Response: All of the backfile data base elements (registrations issued prior to September 9, 1980) have been corrected except owner information. As originally planned, the owner field will be cleaned up the active registrations issued prior to September 9, 1980. It is projected that this owner field will be cleaned up by the third quarter of fiscal year 1991.

Comment: Three respondents claimed that the public requires access to the dead data base.

Response: The Office will consider this proposal further. The dead data base is now available in electronic format for all applications and registrations that were active on January 1, 1983 and are now inactive. However, many of these records are of poor quality. Costs for cleaning up these records would be significant, and those costs would likely be reflected in the T-Search user fee.

Comment: Four respondents addressed the fee waiver policy. The proposal to waive fee appears inconsistent wih PTO's position that the free paper search files provide an equal and viable resource to anyone not wanting to pay for the automated files. If paper records are inferior, then anyone seeking access to T-Search should be able to qualify for the fee waiver. If the paper records are adequate, then there should be no need to waive the access fee for anyone.

Response: The waiver policy authorized by Pub. L. 100-703 is designed for those individuals who, for some reason in the public interest, such as an educational purpose, need the capabilities of the automated system, for example, to manipulate the data.

Comment: One respondent commented that the procedure to enroll people in training classes by the use of a lottery was unfair and that everyone who wants to be trained should be enrolled.

Response: The lottery was a method for establishing the initial schedules to provide training. Everyone who requests training will be trained. As of August 31, 1989, 449 out of 623 people requesting training on APS-Text, and 247 out of 376 people requesting training on T-Search have been trained.

Comment: One respondent commented that advance registration is an unrealistic approach for many searchers.

Response: At least one terminal in the Patent Search Room and one in the Trademark Search Library will be available for walk-up users. The other terminals will be available first for users with a reservation and then, if needed, for walk-up users. The system is designed to ensure equity of public access to the automated systems.

Comment: Two respondents asked for information justifying that this is not a "Major Rule" as defined by Executive Order 12291, and that the rule will not have a significant adverse impact on small entities.

Response: The no "major rule" determination and no significant adverse impact on small entities was based on the fact that the automated systems are being offered only at the Patent and Trademark Office's public search facilities located in Arlington, Virginia. The total number of users of these facilities averages less than 400 a day, and many of these users are members of law firms or commercial search services. The annual effect on the economy is expected to be about $1 million, far less than the $100 million annual threshold specified in the Executive Order. The fees for accessing the automated search systems are reasonable and should not burden small entities and, at the same time, the Office is continuing to maintain the paper search files which are available to the public free of charge. Finally, there should be no significant adverse effects on competition, because the systems are being offered only at one location, the Patent and Trademark Office in Arlington, Virginia, and the public may continue to use paper files without payment of any fee.

Comment: Five respondent commented that user fees burden small entities and run counter to a fundamental objective of the patent system which is to advance technology through dissemination of the technical information contained in patents.

Response: The Office does not believe that the fee amounts adopted will burden small entities or negatively impact the dissemination of technical information. The Office also will continue to maintain the paper search files using taxpayer funds, and provide access to the public free of charge. Further, the Office has adopted a fee waiver policy whereby the fee amount can be waived where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. Full details are included above under "Background".

Comment: One respondent commented that the Office needs a policy to ensure that no user of the patent and trademark information is disenfranchised due to an inability to pay for the services necessary to its access.

Response: The Commissioner will consider a fee waiver for users with a genuine financial hardship.

Other Considerations:

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Parts 1 and 2

37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the permeable, the Office is proposing to amend Title 37 of the code of Federal Regulations, Chapter 1, as set forth below.

PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is amended by adding new paragraphs (o)-(q).

§1.21 Miscellaneous fees and charges.

* * * * *

(o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waiver the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest $40.00

(p) Marginal cost, paid advance, for each hour of Office staff search assistance to conduct a search using Automated Patent System full-text search capabilities (APS-Text), prorated for the actual time used..... $25.00

(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal.....$0.10

PART 2- RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:
Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by adding new paragraphs (w)-(x).

§ 2.6 Trademark fees

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(w) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest $40.00

(x) Marginal cost, for each printed page generated from the T-Search terminal.....$0.10

Dec. 4, 1989 JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

[1110 O.G. 601]

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(47) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 2

Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Listing of suspension of final rule
Summary: The Patent and Trademark Office (Office), on December 11, 1989, amended the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, setting forth the fees for public access to the Office's text data bases: the Automated Patent System (APS) and the automated trademark search system (T-Search). 54 FR 50942. That final rule became effective on February 12, 1990. On that date, 37 CFR 2.6(w), dealing with T-Search fees, took effect, but was immediately suspended by the Commissioner.
The collection of the fee was initially suspended to permit users to become familiar with the T-Search system. The T-Search system has been available to the public since April 1989, a sufficient time for users to become familiar with the system. Therefore, as provided in the final rule, the Office now gives notice that the suspension is lifted. The Office will begin to collect the fees set forth in 37 CFR 2.6(w) sixty (60) days from the date of this notice. Cost estimates based on usage and actual costs are available for inspection in the Office of Long-Range Planning and Evaluation, Room 507, Crystal Park 1, Crystal Drive, Arlington, Virginia.
Dates: The suspension of 37 CFR 2.6(w) is lifted as of Nov. 13, 1990. The collection of fees under 37 CFR 2.6(w) will begin on November 13, 1990
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

September 4, 1990 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1119 O.G.6]

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(48) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 95-0720187-5187-01]
RIN 0651-AA79

Rules of Practice in Patent Cases; Reexamination Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office (Office) is proposing to amend its rules of practice in patent cases to provide revised procedures for the reexamination of patents. H.R. 1732 proposes to authorize the extension of reexamination proceedings as a means for improving the quality of United States patents. The Office intends, through this proposed amendment of its rules, to provide patent owners and the public with guidance on the procedures the Office would follow in conducting reexamination proceedings.
Dates: A public hearing will be held on Wednesday, September 20, 1995, at the Stouffer Renaissance Crystal City Hotel, 2399 Jefferson Davis Highway, Arlington, Virginia, 22202 at 9:30 a.m. Those wishing to present oral testimony must request an opportunity to do so no later than September 14, 1995. Written comments must be submitted on or before September 22, 1995.
Addresses: Written comments concerning the rule changes should be addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Gerald A. Dost, Senior Legal Advisor, Special Program Law Office, Crystal Park 1, Suite 520. In addition, written comments may also be sent by facsimile transmission to (703) 308-6916 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to [reexamrule@uspto.gov].
Written comments concerning reexamination rule matters will be available for public inspection on October 2, 1995, in Room 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Gerald A. Dost or Lawrence E. Anderson by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to Gerald A. Dost to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

Supplementary Information:

Background

This proposed rulemaking sets forth distinct procedures directed towards determining and improving the quality and reliability of United States patents. The procedures are proposed to provide for the expanded reexamination of patents as proposed in H.R. 1732.

Discussion of General Issues Involved

The proposals are in response to H.R. 1782 which resulted from suggestions and comments to the Administration by the public, bar groups, and the August 1992 Advisory Commission on Patent Law Reform suggesting more participation in the reexamination proceeding by third party requesters. Under the rules proposed herein, third party requesters will have greater opportunity to participate in reexamination proceedings in keeping with the spirit and intent of the proposed law. At the same time, participation will be limited to minimize the costs and other effects of reexamination requests on patentees.
If H.R. 1732 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1732 is not enacted, the proposed rules that would implement expanded reexamination of patents would be withdrawn.
Because reexaminations filed before the proposed law takes effect will continue to be governed by 37 CFR 1.501 - 1.570, to avoid confusion between the new and old rules the newly proposed reexamination rules have been numbered 37 CFR 1.901 - 1.997.
Regarding the reexamination fee, 35 U.S.C. 41(d) requires the Commissioner to set the fee for reexamination at a level which will recover the estimated average cost to the Office. The estimated average cost is $4,500 per patent owner requested reexamination and $11,000 for third party requested reexaminations. The difference in price takes into account the estimate that the examiner will spend twice the amount of time examining a case where a third party requester is present and additional costs incurred during the appellate stages incident to additional processing steps required in the third party proceedings.

Discussion of the Major Specific Issues Involved

The proposed rules relating to reexamination proceedings are directed to the procedures set forth in proposed Chapter 30 of Title 35 of the United States Code (35 U.S.C. 301-307). This proposed Chapter provides for the citation of prior art in patents, filing of requests for reexamination, decisions on such requests, reexamination and appeal from reexamination decisions, and the issuance of a certificate at the termination of the reexamination proceedings.
Section 1.4 is proposed to be amended so that paragraph (a)(2) includes the reexamination §§ 1.901 - 1.997.
Section 1.6 is proposed to be amended so that paragraph(d)(5) incudes § 1.913, which related to the exception of the use of facsimile transmission for filing the request for reexamination.

Section 1.11 is proposed to be amended so that paragraph (c), which relates to reexaminations at the initiative of the Commissioner, includes the reference to reexamination § 1.929.
Section 1.17 is proposed to be amended so that paragraph (l) reflects the fact that in the case of reexaminations filed after January 1, 1996, petitions for revival of a reexamination proceeding terminated for an unavoidable failure to respond require the fees of $55.00 for a small entity and $110.00 for other than small entity. Also, § 1.17 is proposed to be amended so that paragraph (m) reflects the fact that in the case of reexaminations filed after January 1, 1996, petitions for revival of a reexamination proceeding terminated for an unintentional failure to respond require the fees of $605.00 for a small entity and $1,210.00 for other than small entity. The Office has proposed an increase in the fee set by § 1.17(m). See "Revision of Patent and Trademark Fees" published in the *Federal Register* at 60 FR 27934 (May 26, 1995) and in the Patent and Trademark Office *Official Gazette* at 1174 Off. Gaz. Pat. Office 134 (May 30, 1995).
Section 1.20 is proposed to be amended so that paragraph (c) reflects the fact that in the case of reexaminations filed after January 1, 1996, there is a two tier fee scale in which patent owner requesters will be charged $4,500 and third party requesters will be charged $11,000.
Section 1.25 is proposed to be amended so that paragraph (b), which relates to requests for reexaminations, includes the reference to reexamination § 1.913.
Section 1.26 is proposed to be amended so as to reflect that in the case of reexaminations filed after January 1, 1996, a refund of seventy-five percent (75%) of the fee paid for filing the request for reexamination will be made to the requester.
Section 1.112 is proposed to be amended so that the last sentence reflects the fact that in the case of reexaminations filed after January 1, 1996, the examiner may close prosecution prior to making the action final. Section 1.113, which provides for a final rejection or action in a reexamination proceeding, is proposed to be amended so that its application is limited to applicants and patent owners in reexaminations filed before January 1, 1996. For reexaminations filed after January 1, 1996, the new reexamination rules will apply.
Section 1.115, which provides for amendments by the patent owner in a reexamination proceeding, is proposed to be amended so that its application is limited to applicants and patent owners in reexaminations filed before January 1, 1996. For reexaminations filed after January 1, 1996, the new reexamination rules will apply.
Section 1.116, which provides for amendments after final action in reexamination proceedings, is proposed to be amended so that its application is permissible after an action closing prosecution for patent owners in reexaminations filed on or after January 1, 1996. Also, for clarity, the rule is amended to provide that for reexaminations filed after January 1, 1996, no appeal is permitted until a right of appeal notice has been issued.
Section 1.136, which provides for filing of timely responses with petitions and fee for extension of time and extensions of time for cause, is amended to make it clear that for reexamination proceedings filed on or after January 1, 1996, § 1.957 is controlling for extensions of time.
Section 1.137, which provides for revival of abandoned applications or lapsed patents, is proposed to be amended to change the title and add new paragraphs (g) and (h). Paragraph (f) is proposed to be utilized for provisional applications. Paragraph (g) is proposed to be added to provide for revival of unavoidably terminated proceedings for reexamination proceedings filed before January 1, 1996. Paragraph (h) is proposed to be added to make it clear that for reexamination proceedings filed on or after January 1, 1996, § 1.958 is controlling.
Section 1.191, which provides for appeal to the Board of Patent Appeals and Interferences by the patent owner from any decision adverse to patentability, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.959 is controlling.
Section 1.192, which provides two months from the date of the Notice of Appeal for the patent owner to file an appeal brief in a reexamination proceeding, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.965 is controlling.
Section 1.193, which provides for the Examiner's answer and reply brief, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, §§ 1.969 and 1.971 are controlling.
Section 1.194, which provides for the oral hearing, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.973 is controlling.
Section 1.195, which provides for the affidavits or declarations after appeal, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.975 is controlling.
Section 1.196, which provides for the decision of the Board of Patent Appeals and Interferences, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.977 is controlling.
Section 1.197, which provides for action following the decision, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.979 is controlling.
Section 1.198, which provides for reopening after the decision, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.981 is controlling.
Section 1.301, which provides for appeal by the owner of a patent in reexamination proceedings to the U.S. Court of Appeals for the Federal Circuit, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.
Section 1.303, which provides for remedy by civil action under 35 U.S.C. 145 for the owner of a patent in reexamination proceedings, is proposed to be amended so as to be applicable to reexaminations filed before January 1, 1996. For reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.
Section 1.304 which provides for time for appeal or civil action, is proposed to be amended so as to refer also to § 1.957.
The title to Subpart D is proposed to be amended to provide that the reexamination rules in this part apply only to reexamination proceedings filed before January 1, 1996.
The proposed title to Subpart H provides that the reexamination rules in this part apply only to reexamination proceedings filed on or after January 1, 1996.
Proposed § 1.901 provides a system for citation of patents and printed publications to the Office for placement in the patent file by any person during the period of enforceability of the patent in accordance with 35 U.S.C. 301. The section provides for citations limited to patents and printed publications when the person making the citation states the pertinency and applicability of the citation to the patent and the bearing the citation has on the patentability of at least one claim of the patent. The rule provides that a citation made by the patent owner may include an explanation of how the claims differ from the prior art cited. Any citations which include items other than patents and printed publications will not be entered in the patent file. This does not, of course, limit in any manner the kinds and types of information which can be relied upon in protests against pending patent applications, whether such be original applications or reissue applications. The term "period of enforceability of a patent" includes any period for which recovery can be had for infringement. Under usual circumstances, this would be the term of the patent plus the six years provided by 35 U.S.C. 286.
Proposed § 1.902 provides for the processing of prior art citations during a reexamination proceeding.
Proposed § 1.903 provides for the service of papers on parties.
Proposed § 1.904 provides that the notices published in the Official Gazette will be considered to be constructive notice.
Proposed § 1.905 provides for submission of papers by the public.

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Proposed § 1.906 covers the scope of reexamination in a reexamination proceeding. While it is not intended that the examiners will routinely complete a new search when conducting reexamination, the examiners will be free to, and will, very likely, conduct additional searches and cite and apply additional prior patents and publications when they consider it is appropriate and beneficial to do so. Insofar as the actual reexamination is concerned, the examination is only on the basis of patents or printed publications and on the basis of the requirements of 35 U.S.C. 112, except for the best mode requirement. Claims in a reexamination proceeding must not enlarge the scope of the claims of the patent and must not introduce new matter. Paragraph (c) provides that questions relating to matters other than those indicated in paragraphs (a) and (b) of this section will not be resolved in a reexamination proceeding, but will be noted by the examiner as being an open question in the record. Patent owners could then file a reissue application if they wish such questions to be resolved.

Proposed § 1.907 sets forth when reexamination is prohibited. Once an order to reexamine has been issued under § 1.931, neither the patent owner nor the third party requester, if any, nor privies of either, may file a subsequent request for reexamination of the patent until a reexamination certificate is issued under § 1.997, unless authorized by the Commissioner. Once a final decision has been entered against a party in a civil action arising in whole or in part under 28 U.S.C. 1338 in which the party did not sustain its burden of proving invalidity of any patent claim in suit, then neither that party nor its privies may thereafter request reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action, and a reexamination requested by that party or its privies on the basis of such issues may not thereafter be maintained by the Office.

Proposed § 1.909 provides for estoppel of third party requesters from previous reexamination proceedings. A third party requester, or its privy, who, during a reexamination proceeding, has filed a notice of appeal to the Court of Appeals for the Federal Circuit, or who has participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144, is estopped from later asserting, in a subsequent reexamination proceeding, the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester, or its privy, raised or could have raised during the prior reexamination proceeding. A third party requester, or its privy, is deemed not to have participated as a party to an appeal by the patent owner unless, within twenty days after the patent owner has filed notice of appeal, the third party (or its privy) files notice with the Commissioner electing to participate.

Proposed § 1.911 provides factors for consideration of privies and persons bound. For the purposes of § 1.907, a determination of whether a person is a privy with respect to the patent owner shall include consideration of whether there is: (1) a mutual, concurrent or successive relationship to the same property rights in the patent involved in the reexamination proceeding; or (2) representation of the interests of the patent owner concerning the patent. For the purposes of §§ 1.907 and 1.909, a determination of whether a person is a privy with respect to a third party requester shall include consideration of whether there is: (1) a mutual, concurrent or successive relationship to the same property rights which are or may be affected by and/or infringe the patent involved in the reexamination proceeding; or (2) representation of the interests of the other party which are or may be affected by and/or potentially infringe the patent. For the purposes of §§ 1.907 and 1.909, a person who is not a party to the reexamination proceeding but who controls or substantially participates in the control of the presentation of the reexamination proceeding on behalf of a party is bound by the determination of issues decided as though he or she were a named party. To have control of the presentation requires that person to have effective choice as to the legal theories and/or grounds of rejection or defenses to be advanced on behalf of the party to the reexamination proceeding. Under this section a party would be precluded from hiring another law firm and having that firm file a subsequent reexamination request in order to avoid the prohibitions of 35 U.S.C. 307(c) or 308.

Proposed § 1.913 sets forth procedures for any person to request reexamination in accordance with 35 U.S.C. 302 and limits the period for such request to the period of enforceability of the patent for which the request is filed.

Proposed § 1.915(a) requires payment of the fee for requesting reexamination. Paragraph (b) of new § 1.915 indicates what each request for reexamination must include. Paragraph (c) of new § 1.915 covers amendments which a patent owner can propose. Such amendments can accompany a request for reexamination by the patent owner. Paragraph (d) indicates that requests for reexamination may be filed by attorneys or agents on behalf of a requester, but it is noted that the real party in interest must be identified in accordance with § 1.915(b)(10).

Proposed § 1.917 indicates what will be done if the request is incomplete.

Proposed § 1.919 indicates the date on which the entire fee is received will be considered to be the date of the request for reexamination.

Proposed § 1.921 provides that prior art submissions by the third party requester filed after the reexamination order shall be limited solely to prior art which is used to rebut a finding of fact by the examiner or a response of the patent owner.

Proposed § 1.923 relates to a determination as to whether the request has presented a substantial new question of patentability under 35 U.S.C. 303 and requires that the determination be made within 3 months of the filing date of the request.

Proposed § 1.925 refers to the refund provisions.

Proposed § 1.927 provides for review by petition to the Commissioner of any decision refusing reexamination.

Proposed § 1.929 provides for reexamination at the initiative of the Commissioner under the provisions of the last sentence of paragraph (a) of 35 U.S.C. 303.

Proposed § 1.931 provides for ordering reexamination where a substantial new question of patentability has been found pursuant to §§ 1.923 or 1.929. Under paragraph (b), the only limitation placed on the selection of the examiner by the Office is that the same examiner whose decision was reversed on petition ordinarily will not conduct the reexamination.

Proposed § 1.933 covers the duty of disclosure by a patent owner in a reexamination proceeding involving the owner's patent.

Proposed § 1.935 indicates that the initial Office action normally accompanies the reexamination order.

Proposed § 1.937 provides that in accordance with 35 U.S.C. 305(c), unless otherwise provided by the Commissioner for good cause, all reexamination proceedings will be conducted with special dispatch. Paragraph (b) covers the basic items relating to the conduct of reexamination proceedings.

Proposed § 1.939 provides that no paper shall be filed before the first Office action.

Proposed § 1.941 provides for proposed amendments provided for in the second sentence of 35 U.S.C. 305. Amendments submitted by the patent owner cannot enlarge the scope of a claim in the patent. Amendments will not be effectively entered into the patent until the certificate under § 1.997 and 35 U.S.C. 307 is issued.

Proposed § 1.943 provides a page limit for responses and briefs of 50 pages. Prior art references and Appendix of claims would not be included in this total.

Proposed § 1.945 provides that a patent owner will be given at least thirty days to respond to any Office action. Although problems may arise in certain cases and extensions of time may be granted, it is felt that relatively short response times are necessary in order to process reexaminations with "special dispatch."

Proposed § 1.947 provides that in accordance with 35 U.S.C. 305 (b)(3), if a patent owner files a response to any Office action on the merits, the third party requester may once file written comments.

Proposed § 1.949 provides when prosecution may be closed.

Proposed § 1.951 provides for responses by the parties after an Office action closing prosecution. The responses and time periods provided for by paragraphs (a) and (b) may run concurrently.

Proposed § 1.953 provides that, following the responses or expiration of the time for response in § 1.951, the examiner may issue a right of appeal notice which shall include a final rejection or final decision favorable to patentability in accordance with 35 U.S.C. 134. The intent of limiting the appeal rights until after the examiner issues a "Right of Appeal Notice" is to specifically preclude the possibility of one party attempting to appeal prematurely while prosecution before the examiner is being continued by the other party.

Proposed § 1.955 relates to the conduct of interviews in reexamination proceedings. The third party requester is permitted to attend all interviews. Interviews are permitted before the first Office action only when initiated by the examiner.

Proposed § 1.957 relates to extensions of time and termination of reexamination proceedings. In circumstances where the response by the patent owner is not required by the examiner and is merely discretionary, such as when all claims are allowed or their patentability is confirmed and the patent owner is merely given the opportunity for comment, such a failure to comment is not the type of lack of response contemplated by paragraphs (b) and (c) and, therefore, not grounds for termination or limiting prosecution.

Proposed § 1.958 relates to revival of terminated proceedings.

Proposed § 1.959 relates to appeals and cross appeals to the Board of Patent Appeals and Interferences. Both patent owners and third party requesters are given appeal rights in accordance with 35 U.S.C. 306.

Proposed § 1.961 relates to time of transfer of the jurisdiction of the appeal over to the Board of Patent Appeals and Interferences.

Proposed § 1.962 relates to the definition of appellant and respondent.

Proposed § 1.963 relates to the time periods for filing briefs.

Proposed § 1.965 relates to the appellant brief.

Proposed § 1.967 relates to the respondent brief.

Proposed § 1.969 relates to the examiner's answer.

Proposed § 1.971 relates to the reply brief.

Proposed § 1.973 relates to the oral hearing.

Proposed § 1.975 relates to affidavits or declarations after appeal.

Proposed § 1.977 relates to the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.979 relates to the procedure following the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.981 relates to the procedure for reopening prosecution following the decision by the Board of Patent Appeals and Interferences.

Proposed § 1.983 relates to appeals to the United States Court of Appeals for the Federal Circuit, in accordance with 35 U.S.C. 306. Under H.R. 1732, civil actions under 35 U.S.C. 145 are not permitted in reexamination proceedings filed on or after January 1, 1996.

Proposed § 1.985 relates to notification of prior or concurrent proceedings.

Proposed § 1.987 relates to the stay of concurrent proceedings. Decisions as to whether to delay or combine cases will be made on a case-by-case basis to minimize delays and to protect the interests of all parties concerned.

Proposed § 1.989 relates to the merger of concurrent proceedings.

Proposed § 1.991 relates to the merger of a concurrent reissue application and a reexamination proceeding.

Proposed § 1.993 relates to the stay of a concurrent interference and reexamination proceeding.

Proposed § 1.995 relates to a third party requester's participation rights being preserved in merged proceeding.

Proposed § 1.997 concerns the issuance of the reexamination certificate under 35 U.S.C. 307 after the conclusion of reexamination proceedings. The certificate will cancel any patent claims determined to be unpatentable, confirm any patent claims determined to be patentable, and incorporate into the patent any amended or new claim determined to be patentable. Once all of the claims have been canceled from the patent, the patent ceases to be enforceable for any purpose. Accordingly, any pending reissue or other Office proceeding relating to a patent in which such a certificate has been issued will be terminated. This provides a degree of assurance to the public that patents with all the claims canceled via reexamination proceedings will not again be asserted. It is intended that copies of the certificate will continue to be part of subsequently sold copies of the patent.

Other Considerations

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* It has been determined that this rulemaking is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impacts of these proposed changes are to expand the grounds for requesting a reexamination and to permit the third party to participate more extensively during the reexamination proceeding as well as having appeal rights.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which is currently approved by the Office of Management and Budget under Control No. 0651-0033. The public reporting burden for the collection of information for requests for reexamination is estimated to average 2.0 hours each including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0033).

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposed to amend Title 37 of the Code of Federal Regulations as set forth below.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Part 1 of Title 37 CFR is proposed to be amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.4(a)(2) is proposed to be revised to read as follows:

§ 1.4 Nature of correspondence and signature requirements.

(a) * * *

(2) Correspondence in and relating to a particular application or other proceeding in the Office. See particularly the rules relating to the filing, processing, or other proceedings of national applications in Subpart B, §§ 1.31 to 1.378; of international applications in Subpart C, §§ 1.401 to 1.499; of reexamination of patents filed before January 1, 1996, in Subpart D, 1.501 to 1.570, and of reexaminations filed on or after January 1, 1996, in Subpart H, §§ 1.901-1.997; of interferences in Subpart E; §§ 1.601 to 1.690; of extension of patent term in Subpart F, §§ 1.710 to 1.785; and of trademark applications §§ 2.11 to 2.189.

* * * * *

3. Section 1.6(d)(5) is proposed to be revised to read as follows:

§ 1.6 Receipt of Correspondence

* * * * *

(d)(5) A request for reexamination under § 1.510 or § 1.913.

* * * * *

4. Section 1.11(c) is proposed to be revised to read as follows:

§ 1.11 Files open to the public.

* * * * *

(c) All requests for reexamination for which the fee under 1.20(c) has been paid, will be announced in the Official Gazette. Any reexaminations at the initiative of the Commissioner pursuant to 1.520 or 1.929 will also be announced in the Official Gazette. The announcement shall include at least the date of the request, if any, the reexamination request control number or the Commissioner initiated order control number, patent number, title, class and subclass, name of the inventor, name of the patent owner of record, and the examining group to which the reexamination is assigned.

5. Section 1.17(l) and (m) are proposed to be revised to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(l)For filing a petition:

(1)For the revival of an unavoidably abandoned application under 35 U.S.C. 111, 133, 364, or 371,

(2) For delayed payment of the issue fee under 35 U.S.C. 151, or,

(3) For the revival of an unavoidably terminated reexamination proceeding:

By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application,

(2) For the unintentionally delayed payment of the fee for issuing a patent, or

(3) For reexamination proceedings filed on or after January 1, 1996, for the revival of an unintentionally terminated reexamination proceeding:

By a small entity (§ 1.9(f))	605.00
By other than a small entity	1,210.00

6. Section 1.20(c) is proposed to be revised to read as follows:

§ 1.20 Post issuance fees.

* * * * *

(c) For filing a request for reexamination (§ 1.915(a)):

by a patent owner	$4,500.00
by a third party requester	$11,000.00

* * * * *

7. Section 1.25(b) is proposed to be revised to read as follows:

§ 1.25 Deposit accounts.

* * * * *

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to § 1.510 or § 1.915 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.26(c) is proposed to be revised to read as follows:

§ 1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, for reexaminations filed on or after January 1, 1996, a refund of seventy-five percent (75%) of the fee paid for filing the request for reexamination will be made to the requester. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

9. Section 1.112 is proposed to be revised to read as follows:

§ 1.112 Reconsideration.

After response by applicant or patent owner (§ 1.111), the application or patent under reexamination will be reconsidered and again examined. The applicant or patent owner will be notified if claims are rejected, or objections or requirements made, in the same manner as after the first examination. Applicant or patent owner may respond to such Office action in the same manner provided in § 1.111, with or without amendment. Any amendments after the second Office action must ordinarily be restricted to the rejection or to the objections or requirements made. The application or patent under reexamination will be again considered, and so on repeatedly, unless the examiner has indicated that the action is final or is an action closing prosecution.

10. Section 1.113(a) is proposed to be revised to read as follows:

§ 1.113 Final rejection or action.

(a) On the second or any subsequent examination or consideration the rejection or other action may be made final, whereupon applicant's or (for reexaminations filed before January 1, 1996) patent owner's response is limited to appeal in the case of rejection of any claim (§ 1.191), or to amendment as specified in § 1.116. Petition may be taken to the Commissioner in the case of objections or requirements not involved in the rejection of any claim (§ 1.181). Response to a final rejection or action must include cancellation of, or appeal from the rejection of, each rejected claim. If any claim stands allowed, the response to a final rejection or action must comply with any requirements or objection as to form.

* * * * *

11. Section 1.115 is proposed to be revised to read as follows:

§ 1.115 Amendment.

The applicant may amend before or after the first examination and action and also after the second or subsequent examination or reconsideration as specified in § 1.112 or when and as specifically required by the examiner. For reexaminations filed before January 1, 1996, the patent owner may amend in accordance with §§ 1.510(e) and 1.530(b) prior to reexamination, and during reexamination proceedings in accordance with §§ 1.112 and 1.116.For reexaminations filed on or after January 1, 1996, the patent owner may amend in accordance with § 1.915(c) prior to reexamination, and during reexamination proceedings in accordance with §§ 1.941 and 1.945.

12. Section 1.116(a) is proposed to be revised to read as follows:

§ 1.116 Amendments after final action.

(a) After final rejection or action (§ 1.113) or action closing prosecution (§ 1.949) for reexaminations filed on or after January 1, 1996, amendments may be made cancelling claims or complying with any requirement of form which has been made. Amendments presenting rejected claims in better form for consideration on appeal may be admitted. The admission of, or refusal to admit, any amendment after final rejection, and any proceedings relative thereto, shall not operate to relieve the application or patent under reexamination from its condition as subject to appeal or to save the application from abandonment under § 1.135. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, no appeal may be had until a right of appeal notice has been issued pursuant to § 1.953.

* * * * *

13. Section 1.136(a) (2) and (b) are proposed to be revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a)* * *

(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to § 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings filed before January 1, 1996, § 1.957 for extension of time in reexamination proceedings filed on or after January 1, 1996, and § 1.645 for extension of time in interference proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings, § 1.550(c) for extension of time in reexamination proceedings filed before January 1, 1996, and § 1.957 for extension of time in reexamination proceedings filed on or after January 1, 1996.

14. Section 1.137(g) and (h) are proposed to be added and the Section heading revised to read as follows:

§ 1.137 Revival of abandoned application, lapsed patent or terminated reexamination.

* * * * *

(g) A reexamination proceeding filed before January 1, 1996, which is terminated for failure to prosecute may be revived as a pending proceeding if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an unavoidably terminated reexamination proceeding must be promptly filed after the patent owner is notified of, or otherwise becomes aware of, the termination of the proceeding, and must be accompanied by:

(1) a proposed response to continue prosecution of that proceeding unless it has been previously filed;

(2) the petition fee as set forth in § 1.17(l); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(h) For reexamination proceedings filed on or after January 1, 1996, see § 1.958.

15. Section 1.191(a) is proposed to be revised to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences.

(a) Every applicant for a patent or for reissue of a patent, or every owner of a patent under reexamination (for reexaminations filed before January 1, 1996), any of the claims of which have been twice rejected or who has been given a final rejection (§ 1.113), may, upon the payment of the fee set forth in § 1.17(e), appeal from the decision of the examiner to the Board of Patent Appeals and Interferences within the time allowed for response. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.959 *et seq.*, is controlling.

* * * * *

16. Section 1.192(a) is proposed to be revised to read as follows:

§ 1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination (for reexaminations filed before January 1, 1996), or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.965 is controlling.

* * * * *

17. Section 1.193 is proposed to be amended by adding a paragraph (c) to read as follows:

§ 1.193 Examiner's answer.

* * * * *

(c) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, §§ 1.969 and 1.971 are controlling.

18. Section 1.194 is proposed to be amended by adding a paragraph (d) to read as follows:

§ 1.194 Oral hearing.

* * * * *

(d) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.973 is controlling.

19. Section 1.195 is proposed to be revised to read as follows:

§ 1.195 Affidavits or declarations after appeal.

Affidavits, declarations, or exhibits submitted after the case has been appealed will not be admitted without a showing of good and sufficient reasons why they were not earlier presented.

Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.975 is controlling.

20. Section 1.196 is proposed to be amended by adding a paragraph (g) to read as follows:

§ 1.196 Decision by the Board of Patent Appeals and Interferences.

* * * * *

(g) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.977 is controlling.

21. Section 1.197 is proposed to be amended by adding a paragraph (d) to read as follows:

§ 1.197 Action following decision.

* * * * *

(d) Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, p 1.979 is controlling.

22. Section 1.198 is proposed to be revised to read as follows:

§ 1.198 Reopening after decision.

Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of § 1.196 without the written authority of the Commissioner, and then only for the consideration of matters not already adjudicated, sufficient cause being shown. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.981 is controlling.

23. Section 1.301 is proposed to be revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and in the Court, file a copy of the notice of appeal and pay the fee for appeal as provided by the rules of the Court. Notwithstanding the above, for reexamination proceedings filed on or after January 1, 1996, § 1.983 is controlling.

24. Section 1.303 is proposed to be amended by revising paragraphs (a) and (b) and adding a new paragraph (d) to read as follows:

§ 1.303 Civil action under 35 U.S.C. 145, 146, 306.

(a) Any applicant or any owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party dissatisfied with the decision of the Board of Patent Appeals and Interferences may, instead of appealing to the U.S. Court of Appeals for the Federal Circuit (§ 1.301), have remedy by civil action under 35 U.S.C. 145 or 146, as appropriate. Such civil action must be commenced within the time specified in § 1.304.

(b) If an applicant in an ex parte case or an owner of a patent involved in a reexamination proceeding (filed before January 1, 1996) has taken an appeal to the U.S.Court of Appeals for the Federal Circuit, he or she thereby waives his or her right to proceed under 35 U.S.C. 145.

* * * * *

(d) For reexamination proceedings filed on or after January 1, 1996, no remedy by civil action under 35 U.S.C. 145 is available.

25. Section 1.304(a)(2) is proposed to be revised to read as follows:

§ 1.304 Time for appeal or civil action.

(a) * * *

(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c), 1.957 or 1.645 (a) or (b).

* * * * *

26. The heading for Subpart D is proposed to be revised to read as follows:

Subpart D — Reexamination of Patents for Proceedings Filed Before January 1, 1996
(For Proceedings beginning on or after January 1, 1996, see Subpart H)

27. Subpart H is proposed to be added to read as follows:

Subpart H — Reexamination of Patents for Proceedings Filed On or After January 1, 1996
(For Proceedings beginning Before January 1, 1996, see Subpart D)

§ 1.901 Citation of prior art in patent files.

§ 1.902 Processing of prior art citations in patent files during a reexamination proceeding.

§ 1.903 Service of papers on parties.

§ 1.904 Notice of reexamination in Official Gazette.

§ 1.905 Submission of papers by public.

§ 1.906 Scope of reexamination in reexamination proceeding.

§ 1.907 Reexamination prohibited.

§ 1.909 Estoppel of third party requester from previous reexamination proceedings.

§ 1.911 Privies and persons bound.

§ 1.913 Persons eligible.

§ 1.915 Content of request.

§ 1.917 Omission of a requirement in the request for reexamination.

§ 1.919 Filing date for request for reexamination.

§ 1.921 Submission of prior art by third party following the order for reexamination.

§ 1.923 Examiner's consideration of the request for reexamination.

§ 1.925 Partial refund if request is denied.

§ 1.927 Petition to review denial of the request for reexamination.

§ 1.929 Reexamination at the initiative of the Commissioner.

§ 1.931 Order to reexamine.

§ 1.933 Information material to patentability in reexamination proceedings.

§ 1.935 Initial Office action normally accompanies order to reexamine.

§ 1.937 Conduct of Reexamination.
§ 1.939 Unauthorized papers.

§ 1.941 Amendments by patent owner and their effective date.

§ 1.943 Length of responses and briefs.

§ 1.945 Response by patent owner.

§ 1.947 Response by third party requester to patent owner's response.

§ 1.949 Examiner's Office action closing prosecution.

§ 1.951 Responses after Office action closing prosecution.

§ 1.953 Examiner's Right of Appeal Notice.

§ 1.955 Interviews in reexamination proceedings.

§ 1.957 Extensions of time and cause for termination in reexamination proceedings.

§ 1.958 Revival of terminated proceedings.

§ 1.959 Notice of appeal and cross appeal to Board of Patent Appeals and Interferences.

§ 1.961 Jurisdiction over appeal.

§ 1.962 Appellant and respondent defined.

§ 1.963 Time for filing briefs.

§ 1.965 Appellant brief.

§ 1.967 Respondent brief.

§ 1.969 Examiner's answer.

§ 1.971 Reply brief.

§ 1.973 Oral hearing.

§ 1.975 Affidavits or declarations after appeal.

§ 1.977 Decision by the Board of Patent Appeals and Interferences.

§ 1.979 Action following decision.

§ 1.981 Reopening after decision.

§ 1.983 Appeal to the United States Court of Appeals for the Federal Circuit.

§ 1.985 Notification of prior or concurrent proceedings.

§ 1.987 Stay of concurrent proceeding.

§ 1.989 Merger of concurrent reexamination proceedings.

§ 1.991 Merger of concurrent reissue application and reexamination proceeding.

§ 1.993 Stay of concurrent interference and reexamination proceeding.

§ 1.995 Third party requester's participation rights preserved in merged proceeding.

§ 1.997 Issuance of reexamination certificate after reexamination proceedings.

§ 1.901 Citation of prior art in patent files.

(a) At any time during the period of enforceability of a patent, any person may cite to the Patent and Trademark Office in writing prior art consisting of patents or printed publications which that person states to be pertinent and applicable to the patent and believes to have a bearing on the patentability of any claim of a particular patent. If the citation is made by the patent owner, the explanation of pertinency and applicability may include an explanation of how the claims differ from the prior art.

(b) If the person making the citation wishes his or her identity to be excluded from the patent file and kept confidential, the citation papers must be submitted without any identification of the person making the submission.

(c) Citations of patent or printed publications by the public in patent files should either:

(1) reflect that a copy of the same has been mailed to the patent owner at the address as provided for in § 1.33(c); or in the event service is not possible,

(2) be filed with the Office in duplicate.

(d) Except as provided in § 1.902, citations submitted in accordance with this section will be placed and made of record in the patent file.

§ 1.902 Processing of prior art citations in patent files during a reexamination proceeding.

Citations by the patent owner in accordance with § 1.933 and by a reexamination third party requester under § 1.915 will be entered in the patent file. The entry in the patent file of other citations submitted after the date of an order to reexamine pursuant to § 1.931 will be delayed until the reexamination proceeding has been terminated.

REEXAMINATION PROCEEDINGS

§ 1.903 Service of papers on parties.

The patent owner and any third party requester will be sent copies of Office actions issued during the reexamination proceeding. After filing of a request for reexamination by a third party requester, any document filed by either the patent owner or the third party requester must be served on every other party in the reexamination proceeding in the manner provided in § 1.248. Any document must reflect service or the document may be refused consideration by the Office. The failure of the third party requester, if any, to timely file or serve documents may result in their being refused consideration.

§ 1.904 Notice of reexamination in Official Gazette.

A notice of the filing of a reexamination request or initiation of a Commissioner-ordered reexamination will be published in the Official Gazette. The notice published in the Official Gazette under § 1.11(c) will be considered to be constructive notice of the reexamination proceeding and reexamination will proceed.

§ 1.905 Submission of papers by public.

Unless specifically provided for, no submissions on behalf of any third parties other than third party requesters as defined in 35 U.S.C. 100(e) will be considered unless such submissions are (1) in accordance with § 1.915 or (2) entered in the patent file prior to the date of the order to reexamine pursuant to § 1.931. Submissions by third parties, other than third party requesters, filed after the date of the order to reexamine pursuant to § 1.931, must meet the requirements of § 1.901(a-c) and will be treated in accordance with § 1.902.

§ 1.906 Scope of reexamination in reexamination proceeding.

(a) Claims in a reexamination proceeding will be examined on the basis of patents or printed publications and on the basis of the requirements of 35 U.S.C. 112 except for the best mode requirement.

(b) Claims in a reexamination proceeding must not enlarge the scope of the claims of the patent.

(c) Questions other than those indicated in paragraphs (a) and (b) of this section will not be resolved in a reexamination proceeding. If such questions are raised by the patent owner or third party requester during a reexamination proceeding, the existence of such questions will be noted by the examiner in the next Office action, in which case the patent owner may desire to consider the advisability of filing a reissue application to have such questions considered and resolved.

§ 1.907 Reexamination prohibited.

(a) Once an order to reexamine has been issued under § 1.931, neither the patent owner nor the third party requester, if any, nor privies of either, may file a subsequent request for reexamination of the patent until a reexamination certificate is issued under § 1.997, unless authorized by the Commissioner.

(b) Once a final decision has been entered against a party in a civil action arising in whole or in part under 28 U.S.C. 1338 that the party has not sustained its burden of proving invalidity of any patent claim in suit, then neither that party nor its privies may thereafter request reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action, and a reexamination requested by that party, or its privies, on the basis of such issues may not thereafter be maintained by the Office.

§ 1.909 Estoppel of third party requester from previous reexamination proceedings.

A third party requester, or its privy, who, during a reexamination proceeding, has filed a notice of appeal to the Court of Appeals for the Federal Circuit, or who has participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144, is estopped from later asserting, in a subsequent reexamination proceeding, the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester, or its privy, raised or could have raised during the prior reexamination proceeding. A third party requester, or its privy, is deemed not to have participated as a party to an appeal by the patent owner unless, within twenty days after the patent owner has filed notice of appeal, the third party, or its privy, files notice with the Commissioner electing to participate.

§ 1.911 Privies and persons bound.

(a) For the purposes of § 1.907, a determination of whether a person is a privy with respect to the patent owner shall include consideration of whether there is:

(1) a mutual, concurrent or successive relationship to the same property rights in the patent involved in the reexamination proceeding; or

(2) representation of the interests of the patent owner concerning the patent.

(b) For the purposes of §§ 1.907 and 1.909, a determination of whether a person is a privy with respect to a third party requester shall include consideration of whether there is:

(1) a mutual, concurrent or successive relationship to the same property rights which are or may be affected by and/or infringe the patent involved in the reexamination proceeding; or

(2) representation of the interests of the other party which are or may be affected by and/or potentially infringe the patent.

(c) For the purposes of §§ 1.907 and 1.909, a person who is not a party to the reexamination proceeding but who controls or substantially participates in the control of the presentation of the reexamination proceeding on behalf of a party is bound by the determination of issues decided as though he or she were a named party. To have control of the presentation requires that person to have effective choice as to the legal theories and/or grounds of rejection or defenses to be advanced on behalf of the party to the reexamination proceeding.

DETERMINING IF REEXAMINATION WILL BE ORDERED

§ 1.913 Persons eligible.

Except as otherwise provided, any person may, at any time during the period of enforceability of a patent, file a request for reexamination by the Patent and Trademark Office of any claim of the patent on the basis of prior art patents or printed publications cited under § 1.901 or on the basis of the requirements of 35 U.S.C. 112 except for the best mode requirement.

§ 1.915 Content of request.

(a) The request must be accompanied by the fee for requesting reexamination set in § 1.20(c).

(b) Any request for reexamination must include the following parts:

(1) A statement pointing out each substantial new question of patentability based on prior patents and printed publications or based on the manner in which the patent specification or claims fail to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement.

(2) An identification of every claim for which reexamination is requested.

(3) A detailed explanation of the pertinency and manner of applying the cited prior art to every claim for which reexamination is requested or a detailed explanation of the manner in which the specification or claim(s) fail to comply with 35 U.S.C. 112 except for the best mode requirement. If appropriate, the party requesting reexamination may also point out how claims distinguish over cited prior art or how 35 U.S.C. 112 requirements are complied with except for the best mode requirement.

(4) A copy of every patent or printed publication relied upon or referred to in paragraphs (b)(1) and (3) of this section accompanied by an English language translation of all the necessary and pertinent parts of any non-English language document.

(5) The entire patent for which reexamination is requested must be furnished in the form of cut-up copies of the original patent with only a single column of the printed patent securely mounted or reproduced in permanent form on one side of a separate paper. A copy of any disclaimer, certificate of correction, or reexamination certificate issued in the patent must also be included.

(6) A certification that a copy of the request filed by a person other than the patent owner has been served in its entirety on the patent owner at the address as provided for in § 1.33(c). The name and address of the party served must be indicated. If service was not possible, a duplicate copy must be supplied to the Office.

(7) If the patent is currently involved in a reexamination proceeding for which a reexamination certificate has not been issued, a certification that the person making the request is not a privy of the patent owner or third party requester, unless otherwise authorized by the Commissioner.

(8) In a request filed by a third party requester, a certification that (i) no final decision has been entered against that party or its privies in a civil action arising in whole or in part under 28 U.S.C. 1338 in which that party or its privies did not sustain its burden of proving the invalidity of any patent claim in suit and (ii) neither that party nor its privies are requesting reexamination of any such patent claim on the basis of issues which that party or its privies raised or could have raised in such civil action.

(9) In a request filed by a third party requester, a certification that the request does not assert the invalidity of any claim determined to be patentable on appeal on any ground which the third party requester or its privy raised or could have raised during a prior reexamination proceeding in which that party or its privies filed a notice of appeal to the Court of Appeals for the Federal Circuit and/or participated as a party to an appeal by the patent owner, under the provisions of 35 U.S.C. 141 to 144.

(10) A statement identifying the real party in interest to the extent necessary for a subsequent person filing a reexamination request to determine whether that person is a privy.

(c) A request filed by the patent owner may include a proposed amendment in accordance with § 1.121(f).

(d) If a request is filed by an attorney or agent identifying another party on whose behalf the request is being filed, the attorney or agent must have a power of attorney from that party or be acting in a representative capacity pursuant to § 1.34(a).

§ 1.917 Omission of a requirement in the request for reexamination.

If the request is not accompanied by the fee for requesting reexamination or all of the other parts required by § 1.915, the person identified as requesting reexamination will be so notified and given an opportunity to complete the request within a specified time. If the fee for requesting reexamination has been paid but the defect in the request is not corrected within the specified time, the determination whether or not to institute reexamination will be made on the request as it then exists. If the fee for requesting reexamination has not been paid, no determination will be made and the request will be placed in the patent file as a citation if it complies with the requirements of § 1.901 and/or § 1.902.

§ 1.919 Filing date for request for reexamination.

The filing date of the request is the date on which the request including the entire fee for requesting reexamination is received; or, if the request is not initially accompanied by the entire fee, the date on which the last portion of the fee is received in the Patent and Trademark Office.

§ 1.921 Submission of prior art by third party following the order for reexamination.

Prior art submissions by the third party requester filed after the reexamination order shall be limited solely to prior art which is used to rebut a finding of fact by the examiner or a response of the patent owner.

§ 1.923 Examiner's consideration of the request for reexamination.

Within three months following the filing date of a request for reexamination, an examiner will consider the request and determine whether or not a substantial new question of patentability affecting any claim of the patent is raised by the request and the prior art cited therein, with or without consideration of other patents or printed publications, or by the failure of the patent specification or claim(s) to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement. The examiner's determination will be based on the claims in effect at the time of the determination and will become a part of the official file of the patent and will be mailed to the patent owner at the address as provided for in § 1.33(c) and to the person requesting reexamination.

§ 1.925 Partial refund if request is denied.

Where no substantial new question of patentability has been found, a refund of a portion of the fee for requesting reexamination will be made to the requester in accordance with § 1.26(c).

§ 1.927 Petition to review denial of the request for reexamination.

The requester may seek review by a petition to the Commissioner under § 1.181 within one month of the mailing date of the examiner's determination refusing reexamination. Any such petition must comply with § 1.181(b). If no petition is timely filed or if the decision on petition affirms that no substantial new question of patentability has been raised, the determination shall be final and nonappealable.

REEXAMINATION OF PATENTS

§ 1.929 Reexamination at the initiative of the Commissioner.

The Commissioner, at any time during the period of enforceability of a patent, may determine whether or not a substantial new question of patentability is raised by patents or printed publications which have been discovered by the Commissioner or which have been brought to the Commissioner's attention or by the failure of the patent specification or claim(s) to comply with the requirements of 35 U.S.C. 112 except for the best mode requirement. The Commissioner may order reexamination even though no request for reexamination has been filed in accordance with § 1.915. Normally requests from outside the Patent and Trademark Office that the Commissioner undertake reexamination on his or her own initiative will not be considered. Any determination to initiate reexamination under this section will become a part of the official file of the patent and will be given or mailed to the patent owner at the address as provided for in § 1.33(c).

§ 1.931 Order to reexamine.

(a) If a substantial new question of patentability is found, the determination will include an order for reexamination of the patent for resolution of the question.

(b) If the order for reexamination resulted from a petition pursuant to § 1.927, the reexamination will ordinarily be conducted by an examiner other than the examiner responsible for the initial determination under § 1.923.

INFORMATION DISCLOSURE

§ 1.933 Information material to patentability in reexamination proceedings.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective reexamination occurs when, at the time a reexamination proceeding is being conducted, the Office is aware of and evaluates the teachings of all information material to patentability in a reexamination proceeding. Each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding. The individuals who have a duty to disclose to the Office all information known to them to be material to patentability in a reexamination proceeding are the patent owner, each attorney or agent who represents the patent owner, and every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. The duty to disclose the information exists with respect to each claim pending in the reexamination proceeding until the claim is cancelled. Information material to the patentability of a cancelled claim need not be submitted if the information is not material to patentability of any claim remaining under consideration in the reexamination proceeding. The duty to disclose all information known to be material to patentability in a reexamination proceeding is deemed to be satisfied if all information known to be material to patentability of any claim in the patent after issuance of the reexamination certificate was cited by the Office or submitted to the Office in an information disclosure statement. However, the duties of candor, good faith, and disclosure have not been complied with if any fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct by, or on behalf of, the patent owner in the reexamination proceeding. Any information disclosure statement must be filed with the items listed in § 1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding, and should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible.

(b) Under this section, information is material to patentability in a reexamination proceeding when it is not cumulative to information of record or being made of record in the reexamination proceeding, and

(1) It is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a *prima facie* case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the patent owner takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability of a claim pending in a reexamination proceeding is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration

is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) The responsibility for compliance with this section rests upon the individuals designated in paragraph (a) of this section, and no evaluation will be made by the Office in the reexamination proceeding as to compliance with this section. If questions of compliance with this section are discovered during a reexamination proceeding, they will be noted as unresolved questions in accordance with § 1.906(c).

OFFICE ACTIONS AND RESPONSES (BEFORE THE EXAMINER)

§ 1.935 Initial Office action normally accompanies order to reexamine.

The order for reexamination will normally be accompanied by the initial Office action on the merits of the reexamination.

§ 1.937 Conduct of Reexamination.

(a) All reexamination proceedings, including any appeals to the Board of Patent Appeals and Interferences, will be conducted with special dispatch within the Office, unless the Commissioner makes a determination that there is good cause for suspending the reexamination proceeding. A final determination that good cause exists shall not be made until the patent owner and third party requesters (if any) have had a reasonable opportunity to comment on or oppose any suspension.

(b) Except as otherwise provided, the reexamination proceeding will be conducted in accordance with the sections governing the application examination process; §§ 1.104 through 1.119, and will result in the issuance of a reexamination certificate under § 1.997.

§ 1.939 Unauthorized papers.

Unless authorized by the reexamination regulations (§§ 1.901-1.997), no paper shall be filed prior to the first Office action. If an unauthorized paper is filed by the patent owner or third party requester, it will not be considered in making the determination under § 1.923 and will be returned.

§ 1.941 Amendments by patent owner and their effective date.

(a) Any proposed amendment to the description and claims must be made in accordance with § 1.121(f) and be accompanied by an explanation of the support for the proposed amendment in the disclosure of the patent. No amendment may enlarge the scope of the claims of the patent or introduce new matter. No amendment may be proposed for entry in an expired patent. Moreover, no amendment will be incorporated into the patent by certificate issued after the expiration of the patent.

(b) Amendments made to a patent during a reexamination proceeding will not be effective until a reexamination certificate is issued.

§ 1.943 Length of responses and briefs.

Responses and appellant briefs by the patent owner (including amendments) and third party requester, if any, shall not exceed 50 pages in length, excluding Appendix of claims and reference materials such as prior art references. All further briefs by any party shall not exceed 35 pages in length.

§ 1.945 Response by patent owner.

The patent owner will be given at least thirty (30) days to respond to any Office action. Such response may include arguments in response to any rejections and/or proposed amendments or new claims to place the patent in condition where all claims, if amended as proposed, would be patentable.

§ 1.947 Response by third party requester to patent owner's response.

If the patent owner files a response to an Office action, any third party requester may once file written comments within a period of one month from the date of service of the patent owner's response. These comments shall be limited to issues covered by the action or the patent owner's response.

§ 1.949 Examiner's Office action closing prosecution.

Upon consideration of the issues and/or grounds of rejection a second or subsequent time, or upon allowance of all claims, the examiner shall issue an Office action treating all claims present in the reexamination proceeding, which may be an action closing prosecution. An action will not normally close prosecution if it includes a new ground of rejection which was not previously addressed by the patent owner, unless the new ground was necessitated by an amendment.

§ 1.951 Responses after Office action closing prosecution.

(a) After any action closing prosecution issued by the examiner, the third party requester may once file written comments limited to the issues raised in the Office action closing prosecution. Such comments must be filed within the time set for response in the action closing prosecution. When the third party requester does file such comments, the patent owner may file comments responding to the third party requester's comments within one month from the date of service of the third party requester's comments on the patent owner.

(b) After any action closing prosecution issued by the examiner, the patent owner may once file written comments limited to the issues raised in the reexamination proceeding and/or present a proposed amendment to the claims which amendment will be subject to the criteria of § 1.116 as to whether it shall be entered and/or considered. Such comments and/or proposed amendments must be filed within the time set for response in the action closing prosecution. Where the patent owner does file such comments and/or proposed amendment, the third party requester may file comments responding to such comments and/or proposed amendments by the patent owner within one month from the date of service of patent owner's comments and/or proposed amendment on the third party requester.

§ 1.953 Examiner's Right of Appeal Notice.

Upon considering the responses of the patent owner and any third party requester subsequent to the Office action closing prosecution, or upon expiration of the time for submitting such responses, the examiner shall issue a "Right of Appeal Notice," unless the examiner reopens prosecution. The "Right of Appeal Notice" shall include a final rejection and/or final decision favorable to patentability which shall identify the status of each claim and reasons for patentability or grounds of rejection for each claim. It shall set a 30-day or one month time period, whichever is longer, for either party to appeal. If no appeal follows, the reexamination proceeding will be terminated and the Commissioner will proceed to issue a certificate under § 1.997 in accordance with the last action of the Office.

INTERVIEWS

§ 1.955 Interviews in reexamination proceedings.

(a) Interviews in reexamination proceedings pending before the Office between examiners and the owners of such patents or their attorneys or agents of record must be had in the Office at such times, within Office hours, as the respective examiners may designate. Interviews will not be permitted at any other time or place without the authority of the Commissioner. Interviews should be arranged for in advance. A third party requester may not initiate an interview. A third party requester has a right to participate in an interview initiated by the patent owner or the examiner and must be given adequate notice and opportunity to participate. A senior level Office official will be present when the interview is attended by a third party requester.

(b) Interviews for the discussion of the patentability of claims in patents involved in reexamination proceedings will not be initiated by the patent owner prior to the first office action thereon.

(c) In every instance of an interview with an examiner, each party must present a statement of the issues which were discussed. An interview does not remove the necessity for response to Office actions as specified in § 1.111.

EXTENSIONS OF TIME AND REVIVAL OF PROCEEDINGS

§ 1.957 Extensions of time and cause for termination in reexamination proceedings.

(a) The time for taking any action by a patent owner or third party requester in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner or third party requester is due, but in no case will the mere filing of a request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(b) If the patent owner fails to file a timely and appropriate response to any Office action in a reexamination proceeding, the reexamination proceeding will be terminated and the Commissioner will proceed to issue a certificate under § 1.997 in accordance with the last action of the Office, unless there is a third party requester and claims are found patentable.

(c) If there is a third party requester and claims are found patentable, and the patent owner fails to file a timely and appropriate response to any action in a reexamination proceeding, prosecution will be limited to claims found patentable at the time of the failure to respond and to claims which do not enlarge the scope of the claims found patentable at that time.

§ 1.958 Revival of terminated proceedings.

(a) A reexamination proceeding terminated for failure to prosecute may be revived as a pending proceeding if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an unavoidably terminated reexamination proceeding must be promptly filed after the patent owner is notified of, or otherwise becomes aware of, the termination of the proceeding, and must be accompanied by:

(1) a proposed response to continue prosecution of that proceeding unless it has been previously filed;

(2) the petition fee as set forth in § 1.17(l); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) A reexamination proceeding terminated for failure of the patent owner to prosecute may be revived as a pending proceeding if the delay in prosecution was unintentional. A petition to revive an unintentionally terminated reexamination proceeding must be:

(1) accompanied by a proposed response to continue prosecution of that proceeding unless it has been previously filed;

(2) accompanied by the petition fee as set forth in § 1.17(m);

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within two months of the date of the first Office notification that the proceeding has been terminated; or

(ii) within two months of the date of the first decision on a petition to revive under paragraph (a) of this section which was timely filed within the time period set forth in paragraph (b)(4)(i) of this section.

(c) Any request for reconsideration or review of a decision refusing to revive a proceeding upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(d) The time periods set forth in this section cannot be extended, except that the time period set forth in paragraph (c) of this section may be extended under the provisions of § 1.957(a).

APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

§ 1.959 Notice of appeal and cross appeal to Board of Patent Appeals and Interferences.

(a)(1) Once a "Right of Appeal Notice" has been issued, by filing a notice of appeal within the time provided in § 1.953 and paying the fee set forth in § 1.17(e), the patent owner may appeal to the Board of Patent Appeals and Interferences with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

(2) Once a "Right of Appeal Notice" has been issued, by filing a notice of appeal within the time provided in § 1.953 and paying the fee set forth in § 1.17(e), a third party requester involved in a reexamination proceeding may appeal to the Board of Patent Appeals and Interferences with respect to any final decision favorable to the patentability of any original or proposed amended or new claim of the patent.

(b)(1) Within fourteen days of service of a third party requester's notice of appeal, and upon payment of the fee set forth in § 1.17(e), a patent owner who has not filed a notice of appeal may file a notice of cross appeal with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent.

(2) Within fourteen days of service of a patent owner's notice of appeal, and upon payment of the fee set forth in § 1.17(e), a third party requester who has not filed a notice of appeal may file a notice of cross appeal with respect to any final decision favorable to the patentability of any original or proposed amended or new claim of the patent.

(c) The appeal in a reexamination proceeding must identify the claim(s) appealed, and must be signed by the patent owner or third party requester, or their duly authorized attorney or agent.

(d) An appeal when taken must be taken from the rejection of all claims under rejection in a Right of Appeal Notice which the patent owner proposes to contest, or from the determination of patentability of all claims indicated as patentable in a Right of Appeal Notice which the third party requester proposes to contest. Questions relating to matters not affecting the merits of the invention may be required to be settled before an appeal can be considered.

(e) The time periods set forth in §§ 1.959 through 1.969 are subject to the provisions of § 1.957(a) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

§ 1.961 Jurisdiction over appeal.

Jurisdiction over the patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may sua sponte order the patent remanded to the examiner, for action consistent with the Commissioner's order.

§ 1.962 Appellant and respondent defined.

For the purposes of reexamination, appellant is any party filing a notice of appeal. A respondent is any opposing party responding to the appeal of the appellant. If more than one party appeals, each is an appellant with respect to the claims to which his or her appeal is directed and, to the extent each responds, each is a respondent with respect to the claims to which his or her opponent's appeal is directed.

§ 1.963 Time for filing briefs.

(a) If a party files a notice of appeal or cross appeal, the party must file an appellant brief within two months of the date of filing of their notice of appeal or cross appeal. However, if another party files a notice of appeal or cross appeal subsequent to that of the party, then the party must file an appeal brief within two months of the date of filing of the subsequent notice of appeal or cross appeal, so that the appellant briefs of

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all parties filing a notice of appeal or cross appeal will be due no later than two months after the last-filed notice.

(b) Once an appellant brief has been properly filed, an opposing party may file a respondent brief within one month from the date of service of the appellant brief. The examiner will consider both the appellant and respondent briefs and prepare an examiner's answer.

(c) The third party requester and the patent owner may each file a reply brief within one month of the date of the examiner's answer. No further brief will be acknowledged or considered.

§ 1.965 Appellant brief.

(a) Appellant(s) shall, within time limits for filing set forth in § 1.963, file a brief in triplicate and serve the brief on all parties in accordance with § 1.903. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown.

(b) On failure of a party to file the brief, accompanied by the requisite fee, within the time allowed, the appeal shall stand dismissed with respect to the claims appealed by that party.

(c) The brief shall contain the following items under appropriate headings and in the order indicated below unless the brief is filed by a party who is not represented by a registered practitioner:

(1) *Real Party in Interest.* A statement identifying the real party in interest, if the party named in the caption of the brief is not the real party in interest.

(2) *Related Appeals and Interferences.* A statement identifying by number and filing date all other appeals or interferences known to the appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of Claims.* A statement of the status of all the claims, pending or cancelled, and identifying the claims appealed.

(4) *Status of Amendments.* A statement of the status of any amendment filed subsequent to final rejection.

(5) *Summary of Invention.* A concise explanation of the invention or subject matter defined in the claims involved in the appeal, which shall refer to the specification by column and line number, and to the drawing(s), if any, by reference characters.

(6) *Issues.* A concise statement of the issues presented for review.

(7) *Grouping of Claims.* For each ground of rejection, or, in the case where the appeal is by a third party requester, each determination of patentability or determination of inapplicability of a proposed rejection, which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of this group are believed to be separately patentable or unpatentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

(8) *Argument.* The contentions of appellant with respect to each of the issues presented for review in paragraph (c)(6) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

(i) For each rejection or, in the case where the appeal is by a third party requester, any other determination under 35 U.S.C. 112, first paragraph, the argument shall specify the errors in the rejection or other determination and how the first paragraph of 35 U.S.C. 112 is or is not complied with, including, as appropriate, how the specification and drawings, if any,

(A) describe or fail to describe the subject matter defined by each of the appealed claims, and

(B) enable or fail to enable any person skilled in the art to make and use the subject matter defined by each of the appealed claims, and

(ii) For each rejection, or in the case where the appeal is filed by a third party requester, any determination, under 35 U.S.C. 112, second paragraph, the argument shall specify the errors in the rejection or other determination and how the claims do or do not particularly point out and distinctly claim the subject matter which appellant regards as the invention.

(iii) For each rejection or, in the case where the appeal is by a third party requester, each determination of patentability, under 35 U.S.C. 102, the argument shall specify the errors in the rejection or determination and why the appealed claims are or are not patentable under 35 U.S.C. 102, including any specific limitations in the appealed claims which are not described in the prior art.

(iv) For each rejection or, in the case where the appeal is by a third party requester, each determination of patentability under 35 U.S.C. 103, the argument shall specify the errors in the rejection or determination and, if appropriate, the specific limitations in the appealed claims which are or are not described in the prior art, and shall explain how such limitations render the claimed subject matter obvious or unobvious over the prior art. If the rejection or determination is based upon a combination of references, the argument shall explain why the references, taken as a whole, do or do not suggest the claimed subject matter, and shall include, as may be appropriate, an explanation of why features disclosed in one reference may or may not properly be combined with features disclosed in another reference. A general argument that all the limitations are or are not described in a single reference does not satisfy the requirements of this paragraph.

(v) For any rejection or, in the case where the appeal is by a third party requester, any determination of patentability, other than those referred to in paragraphs (c)(8)(i) to (iv) of this section, the argument shall specify the errors in the rejection or other determination and the specific limitations in the appealed claims, if appropriate, or other reasons, which cause the rejection or other determination to be in error.

(9) *Appendix.* An appendix containing a copy of the claims involved in the appeal.

(d) If a brief is filed which does not comply with all the requirements of paragraph (c) of this section, appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will stand dismissed as to that party.

§ 1.967 Respondent brief.

(a) The brief(s) of the respondent(s) specified in § 1.963 must be filed in triplicate, served on all other parties in accordance with § 1.903 and be accompanied by the requisite fee set forth in § 1.17(f). Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown. The respondent brief shall be limited to issues raised in the appellant brief to which the respondent brief is directed.

(b) The respondent brief shall contain the following items under appropriate headings and in the order here indicated, and may include an appendix containing portions of the record on which reliance is made:

(1) *Real Party in Interest.* A statement identifying the real party in interest, if the party named as the respondent in the brief is not the real party in interest.

(2) *Related Appeals and Interferences.* A statement identifying by number and filing date all other appeals or interferences known to the respondent, the respondent's legal representative, or assignee (if any) which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of claims.* A statement accepting or disputing appellant's statement of the status of claims. If appellant's statement of the status of claims is disputed, the errors in appellant's statement must be specified with particularity.

(4) *Status of amendments.* A statement accepting or disputing appellant's statement of the status of amendments. If appellant's statement of the status of amendments is disputed, the errors in appellant's statement must be specified with particularity.

(5) *Summary of invention.* A statement accepting or disputing appellant's summary of the invention or subject matter defined in the claims involved in the appeal. If appellant's summary of the invention or subject matter defined in the claims involved in the appeal is disputed, the errors in appellant's summary must be specified with particularity. A counter explanation of the invention may be made.

(6) *Issues.* A statement accepting or disputing appellant's statement of the issues presented for review and identifying any examiner's determination not to make a rejection proposed by the third party requester. If appellant's statement of the issues presented for review is disputed, the errors in appellant's statement must be specified with particularity. A counter statement of the issues for review may be made.

(7) *Grouping of claims.* A statement accepting or disputing any statement by appellant that allowed or rejected claims stand or fall together. If appellant's statement is disputed, the errors in appellant's statement must be specified with particularity. A counter statement may be made.

(8) *Argument.* A statement accepting or disputing the contentions of the appellant with respect to each of the issues. If a contention of the appellant or a determination of the examiner not to make a rejection proposed by the requester is disputed, the errors in appellant's argument or examiner's determination must be specified with particularity, stating the basis therefor, with citations of the authorities, statutes and parts of the record relied on. Each issue should be treated under a separate heading. An argument may be made with respect to each of the issues stated in the counter statement of the issues, with each counter stated issue being treated under a separate heading. The provisions of §§ 1.965(c)(8)(iii) and (iv) of these regulations shall apply to any argument raised under 35 U.S.C. 102 or 103.

(c) If a respondent brief is filed which does not comply with all the requirements of paragraph (b) of this section, respondent will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the respondent does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the respondent brief will not be received into the record and will not be considered.

§ 1.969 Examiner's answer.

The primary examiner may, within such time as may be directed by the Commissioner, furnish a written statement in answer to the patent owner's and/or third party requester's appellant brief or respondent brief including such explanation of the invention claimed and of the references and grounds of rejection or reasons for patentability as may be necessary, supplying a copy to the patent owner and each third party requester, if any. If the primary examiner shall find that the appeal is not regular in form or does not relate to an appealable action, he or she shall so state and a petition from such decision may be taken to the Commissioner as provided in § 1.181.

§ 1.971 Reply brief.

(a) The patent owner and any third party requester may each file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within one month from the date of such answer. The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant.

(b) If the examiner's answer expressly states that it includes a new ground of rejection or allowance of claims not previously allowed, the party adversely affected must file a reply thereto within one month from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection or allowance; such reply may be accompanied by any amendment (in the case of the patent owner) or material appropriate to the new ground. See § 1.957 for extensions of time for filing a reply brief.

§ 1.973 Oral hearing.

(a) An oral hearing should be requested only in those circumstances in which the appellant, or a respondent who has filed a respondent brief under § 1.967, considers such a hearing necessary or desirable for a proper presentation of the appeal. An appeal decided without an oral hearing will receive the same consideration by the Board of Patent Appeals and Interferences as an appeal decided after oral hearing.

(b) If appellant, or a respondent who has filed a respondent brief under § 1.967, desires an oral hearing, he or she must file a written request for such hearing accompanied by the fee set forth in § 1.17(g) within one month after the date of the examiner's answer. If appellant, or a respondent who has filed a respondent brief under § 1.967, requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board. See § 1.957 for extensions of time in a reexamination proceeding.

(c) If no request and fee for oral hearing have been timely filed by an appellant or a respondent who has filed a respondent brief under § 1.967, the appeal will be assigned for consideration and decision. If an appellant or respondent who has filed a respondent brief under § 1.967 has requested an oral hearing and has submitted the fee set forth in § 1.17(g), a hearing date will be set, and notice thereof given to each appellant, to the primary examiner and to each respondent who has filed a respondent brief under § 1.967. The notice shall set a period within which all requests for oral hearing shall be submitted. Hearing will be held as stated in the notice, and oral argument will be limited to twenty minutes for each appellant and respondent, and fifteen minutes for the primary examiner unless otherwise ordered before the hearing begins.

§ 1.975 Affidavits or declarations after appeal.

Affidavits, declarations, or exhibits submitted after the case has been appealed will not be admitted without a showing of good and sufficient reasons why they were not earlier presented.

§ 1.977 Decision by the Board of Patent Appeals and Interferences.

(a) The Board of Patent Appeals and Interferehces, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner, or on the grounds presented by a third party requester, or remand the reexamination proceeding to the examiner for further consideration. The affirmance of the rejection or allowance of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed or otherwise stated. A rejection of claims by the examiner may also be affirmed on the basis of the arguments presented by the third party requester.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds for rejecting any appealed claim not raised in the appeal, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for purposes of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the patent owner may exercise one of the following two options with respect to the new ground:

(1) The patent owner may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the patent will be remanded to the examiner. The statement of the Board of Patent Appeals and Interferences shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the claims, the patent owner may again appeal to the Board of Patent Appeals and Interferences.

(2) The patent owner may have the case reconsidered under § 1.979(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such

reconsideration is made, the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

(c) Should the decision of the Board of Patent Appeals and Interferences include an explicit statement that a claim may be allowed in amended form, patent owner shall have the right to amend in conformity with such statement which shall be binding on the examiner in the absence of new references or grounds of rejection.

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections and allowances made by the examiner and/or arguments of the third party requester, should it have knowledge of any grounds for rejecting any allowed claim not advanced by the examiner or third party requester, it may recommend a rejection of the claim in its decision and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the patent owner may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid any grounds for rejection set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by any such recommended rejection and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the patent owner may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.957(a) for extensions of time to take action under this section.

§ 1.979 Action following decision.

(a) After decision by the Board of Patent Appeals and Interferences, the case shall be returned to the examiner, subject to a right of appeal or other review by the appellant or respondent, for such further action by the patent owner or by the examiner, as the condition of the case may require, to carry into effect the decision.

(b) Each party may file a single request for reconsideration or modification of the decision if filed within one month from the date of the original decision, unless that decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See § 1.957(a) for extensions of time for seeking reconsideration.

(c) The appeal proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the U.S. Court of Appeals for the Federal Circuit. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the Federal Circuit expires. If an appeal to the Federal Circuit has been filed, proceedings are considered terminated when the appeal is terminated. An appeal to the Federal Circuit is terminated when the mandate is received by the Office. Upon termination of the reexamination proceeding, the Commissioner will issue a certificate under § 1.997.

§ 1.981 Reopening after decision.

(a) Cases which have been decided by the Board of Patent Appeals and Interferences will not be reopened or reconsidered by the primary examiner except under the provisions of § 1.979 without the written authority of the Commissioner, and then only for the consideration of matters not already adjudicated, sufficient cause being shown.

(b) In the event prosecution is reopened or the case is reconsidered by the primary examiner after decision by the Board of Patent Appeals and Interferences or by the U.S. Court of Appeals for the Federal Circuit, any third party requester who appealed or responded under § 1.967 may again present comments pursuant to § 1.947 and may appeal or participate in an appeal by the patent owner pursuant to § 1.959.

APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

§ 1.983 Appeal to the United States Court of Appeals for the Federal Circuit.

Any third party requester or patent owner involved in a reexamination proceeding who is a party to any appeal to the Board of Patent Appeals and Interferences and who is dissatisfied with the decision of the Board of Patent Appeals and Interferences may appeal to the U.S. Court of Appeals for the Federal Circuit and may be a party to any appeal thereto taken from a reexamination decision of the Board of Patent Appeals and Interferences. The appellant must take the following steps in such an appeal:

(a) in the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and

(b) in the Court, file a copy of the notice of appeal and pay the fee, as provided for in the rules of the Court. A third party requester is deemed not to have participated as a party to an appeal by the patent owner, and thereby not subject to § 1.909, unless, within twenty days after the patent owner has filed notice of appeal pursuant to § 1.983(a), the third party requester files notice with the Commissioner electing to participate.

PROCEEDINGS INVOLVING SAME PATENT AS IN REEXAMINATION

§ 1.985 Notification of prior or concurrent proceedings.

Any person at any time may file a paper in a reexamination proceeding notifying the Office of a prior or concurrent proceeding in which the same patent is or was involved, such as interferences, reissues, reexaminations, or litigation and the results of such proceedings. Such paper must be limited to merely providing notice of the other proceeding without discussion of issues of the current reexamination proceeding.

§ 1.987 Stay of concurrent proceeding.

If a patent in the process of reexamination is or becomes involved in litigation or a reissue application for the patent is filed or pending, the Commissioner shall determine whether or not to stay the reexamination or reissue proceeding.

§ 1.989 Merger of concurrent reexamination proceedings.

(a) If reexamination is ordered while a prior reexamination proceeding is pending for the same patent, the reexamination proceedings will be merged and result in the issuance of a single certificate under § 1.997.

(b) A reexamination proceeding filed under § 1.915 which is merged with a reexamination proceeding filed under § 1.510 will result in the merged proceeding being governed by §§ 1.901 - 1.997.

§ 1.991 Merger of concurrent reissue application and reexamination proceeding.

If a reissue application and a reexamination proceeding on which an order pursuant to § 1.931 has been mailed are pending concurrently on a patent, a decision may be made to merge the two proceedings or to stay one of the two proceedings. Where merger of a reissue application and a reexamination proceeding is ordered, the merged examination will be conducted in accordance with §§ 1.171 through 1.179 and the patent owner will be required to place and maintain the same claims in the reissue application and the reexamination proceeding during the pendency of the merged proceeding. In a merged proceeding, participation by the third party requester shall be limited to issues within the scope of reexamination. The examiner's actions and any responses by the patent owner or third party requester in a merged proceeding will apply to both the reissue application and the reexamination proceeding and be physically entered into both files. Any reexamination proceeding merged with a reissue application shall be terminated by the grant of the reissued patent.

§ 1.993 Stay of concurrent interference and reexamination proceeding.

If a patent in the process of reexamination is or becomes involved in an interference, the Commissioner may stay reexamination or the interference. The Commissioner will not consider a request to stay an interference unless a motion (§ 1.635) to stay the interference has been presented to and denied by an administrative patent judge and the request is filed within ten (10) days of a decision by an administrative patent judge denying the motion for a stay or such other time as the administrative patent judge may set.

§ 1.995 Third party requester's participation rights preserved in merged proceeding.

When a third party requester is involved in one or more proceedings including a reexamination proceeding, the merger of such proceedings will be accomplished so as to preserve the third party requester's right to participate to the extent specifically provided for in these regulations. In merged proceedings involving different requesters, any paper filed by one party in the merged proceeding shall be served on all other parties of the merged proceeding.

CERTIFICATE

§ 1.997 Issuance of reexamination certificate after reexamination proceedings.

(a) Upon the conclusion of a reexamination proceeding, the Commissioner will issue a certificate in accordance with 35 U.S.C. 307 setting forth the results of the reexamination proceeding and the content of the patent following the reexamination proceeding.

(b) A certificate will be issued in each patent in which a reexamination proceeding has been ordered under § 1.931. Any statutory disclaimer filed by the patent owner will be made part of the certificate.

(c) The certificate will be mailed on the day of its date to the patent owner at the address as provided for in § 1.33(c). A copy of the certificate will also be mailed to the requester of the reexamination proceeding.

(d) If a certificate has been issued which cancels all of the claims of the patent, no further Office proceedings will be conducted with regard to that patent or any reissue applications or reexamination requests relating thereto.

(e) If the reexamination proceeding is terminated by the grant of a reissued patent as provided in § 1.965(d), the reissued patent will constitute the reexamination certificate required by this section and 35 U.S.C. 307.

(f) A notice of the issuance of each certificate under this section will be published in the Official Gazette on its date of Issuance.

August 1, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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(49)

Public Law 96-517
96th Congress
An Act

To amend the patent and trademark laws.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assemble That title 35 of the United States Code, entitled "Patents," is amended by adding after chapter 29 the following new chapter 30:

"CHAPTER 30-PRIOR ART CITATIONS TO OFFICE AND REEXAMINATION OF PATENTS

Dec. 12, 1980
[H.R. 6933]

Patent and trademark laws, amendment.

"Sec.
"301. Citation of prior art.
302. Request for reexamination.
303. Determination of issue by Commissioner.
304. Reexamination order by Commissioner.
305. Conduct of reexamination proceedings.
306. Appeal.
307. Certificate of patentability, unpatentability, and claim cancellation.

35 USC 301.

"§ 301. Citation of prior art

Any person at any time may cite to the Office in writing prior art consisting of patents or printed publications which that person believes to have a bearing on the patentability of any claim of a particular patent. If the person explains in writing the pertinency and manner of applying such prior art to at least one claim of the patent, the citation of such prior art and the explanation thereof will become a part of the official file of the patent. At the written request of the person citing the prior art, his or her identity will be excluded from the patent file and kept confidential.

35 USC 302.

" § 302. Request for reexamination

Fee

"Any person at any time may file a request for reexamination by the Office of any claim of a patent on the basis of any prior art cited under the provisions of section 301 of this title. The request must be in writing and must be accompanied by payment of a reexamination fee established by the Commissioner of Patents pursuant to the provisions of section 41 of this title. The request must set forth the pertinency and manner of applying cited prior art to every claim for which reexamination is requested. Unless the requesting

person is the owner of the patent, the Commissioner promptly will send a copy of the request to the owner of record of the patent.

" § 303. Determination of issue by Commissioner — 35 USC 303.

"(a) Within three months following the filing of a request for reexamination under provisions of section 302 of this title, the Commissioner will determine whether a substantial new question of patentability affecting any claim of the patent concerned is raised by the request, with or without consideration of other patents or printed publications. On his own initiative, and any time, the Commissioner may determine whether a substantial new question of patentability is raised by patents and publications discovered by him or cited under the provisions of section 301 of this title.

"(b) A record of the Commissioner's determination under subsection (a) of this section will be placed in the official file of the patent and a copy promptly will be given or mailed to the owner of record of the patent and to the person requesting reexamination, if any. — Record.

"(c) A determination by the Commissioner pursuant to subsection (a) of this section that no substantial new question of patentability has been raised will be final and nonappealable. Upon such a determination, the Commissioner may refund a portion of the reexamination fee required under section 302 of this title. — Refund

"§ 304. Reexamination order by Commissioner — 35 USC 304.

"If, in a determination made under the provisions of subsection 303(a) of this title, the Commissioner finds that a substantial new question of patentability affecting any claim of a patent is raised, the determination will include an order for reexamination of the patent for resolution of the question. The patent owner will be given a reasonable period, not less than two months from the the date a copy of the determination is given or mailed to him, within which he may file a statement on such question, including any amendment to his patent and new claim or claims he may wish to propose, for consideration in the reexamination. If the patent owner files such a statement, he promptly will serve a copy of it on the person who has requested reexamination under the provisions of section 302 of this title. Within a period of two months from the date of service, that person may file and have considered in the reexamination a reply to any statement filed by the patent owner. That person promptly will serve on the patent owner a copy of any reply filed. — Filing period

"§ 305. Conduct of reexamination proceedings — 35 USC 305.

"After the times for filing the statement and reply provided for by section 304 of this title have expired, reexamination will be conducted according to the procedures established for initial examination under the provisions of sections 132 and 133 of this title. In any reexamination proceeding under this chapter, the patent owner will be permitted to propose any amendment to his patent and a new claim or claims thereto, in order to distinguish the invention as claimed from the prior art cited under the provisions of section 301 of this title, or in response to a decision adverse to the patentability of a claim of a patent. No proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding under this chapter. All reexamination proceedings under this section, including any appeal to the Board of Appeals, will be conducted with special dispatch within the Office. — 35 USC 132, 133.

"§ 306. Appeal — 35 USC 306.

"The patent owner involved in a reexamination proceeding under this chapter may appeal under the provisions of section 134 of this title, and may seek court review under the provisions of sections 141 to 145 of this title, with respect to any decision adverse to the patentability of any original or proposed amended or new claim of the patent. — 35 USC 134. 35 USC 141-145.

" § 307. Certificate of patentability, unpatentability, and claim cancellation — 35 USC 307.

"(a) In a reexamination proceeding under this chapter, when the time for appeal has expired or any appeal proceeding has terminated, the Commissioner will issue and publish a certificate canceling any claim of the patent finally determined to be unpatentable, confirming any claim of the patent determined to be patentable, and incorporating in the patent any proposed amended or new claim determined to be patentable.

"(b) Any proposed amended or new claim determined to be patentable and incorporated into a patent following a reexamination proceeding will have the same effect as that specified in section 252 of this title for reissued patents on the right of any person who made, purchased, or used anything patented by such proposed amended or new claim, or who made substantial preparation for the same, prior to issuance of a certificate under the provisions of subsection (a) of this section." — 35 USC 252.

SEC. 2. Section 41 of title 35, United States Code, is amended to read as follows:

§ 41. Patent fees — 35 USC 41.

"(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

"(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through dispostion by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

"(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee.

"(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

"(e) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge. — 35 USC 13. Waiver. 35 USC 132.

"(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three years. — Notice.

"(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register."

SEC. 3. Section 42 of title 35, United States Code, is amended to read as follows:

§ 42. Patent and Trademark Office funding — 35 USC 42

"(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

"(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

"(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office.

"(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required." — Refund Notice.

SEC. 4. Section 154 of title 35, United States Code, is amended by deleting the word "issue".

SEC. 5. Section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended to read as follows:

"§ 31. Fees

"(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material. However, no fee for the filing or processing of an application for the registration of a trademark orother mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

"(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with any occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups." — Waiver.

SEC. 6. (a) Title 35 of the United States Code, entitled "Patents", is amended by adding after chapter 37 the following new chapter 38: — Indian Products, exception.

"CHAPTER 38-PATENT RIGHTS IN INVENTIONS MADE WITH FEDERAL ASSISTANCE

"Sec.
"200. Policy and objective.
"201. Definitions.
"202. Disposition of rights.
"203. March-in rights.
"204. Preference for United States industry.
"205. Confidentiality.
"206. Uniform clauses and regulations.
"207. Domestic and foreign protection of federally owned inventions.
"208. Regulations governing Federal licensing.
"209. Restrictions on licensing of federally owned inventions.
"210. Precedence of chapter.
"211. Relationship to antitrust laws.

" § 200. Policy and objective.

35 USC 200.

"It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small small business firms are used in a manner to promote free competition and enterprise; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.

" § 201. Definitions

35 USC 201.

"As used in this chapter—

"(a) The term 'Federal agency' means any executive agency as defined in section 105 of title 5, United States Code, and the military departments as defined by section 102 of title 5, United States Code.

"(b) The term 'funding agreement' means any contract, grant, or cooperative agreement entered into between any Federal agency, other than the Tennessee Valley Authority, and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government. Such term includes any assignment, substitution of parties, or subcontract of any type entered into for the performance of experimental, developmental, or research work under a funding agreement as herein defined.

"(c) The term 'contractor' means any person, small business firm, or nonprofit organization that is a party to a funding agreement.

"(d) The term 'invention' means any invention or discovery which is or may be patentable or otherwise protectable under this title.

"(e) The term 'subject invention' means any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.

"(f) The term 'practical application' means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are to the extent permitted by law or Government regulations available to the public on reasonable terms.

"(g) The term 'made' when used in relation to any invention means the conception or first actual reduction to practice of such invention.

"(h) The term 'small business firm' means a small business concern as defined at section 2 of Public Law 85-536 (15 U.S.C 632) and implementing regulations of the Administrator of the Small Business Administration.

"(i) The term 'nonprofit organization' means universities and other institutions of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a State nonprofit organization statute.

" § 202. Disposition of rights

35 USC 202.

"(a) Each nonprofit organization or small business firm may, within a reasonable time after disclosure as required by paragraph (c)(1) of this section, elect to retain title to any subject invention: Provided, however, That a funding agreement may provide otherwise (i) when the funding agreement is for the operation of Government-owned research or production facility, (ii) in exceptional circumstances when it is determined by the agency that restriction or elimination of the right to retain title to any subject invention will better promote the policy and objectives of this chapter or (iii) when it is determined by a Government authority which is authorized by statute or Executive order to conduct foreign intelligence or counterintelligence activities that the restriction or elimination of the right

Funding agreement

to retain title to any subject invention is necessary to protect the security of such activities. The rights of the nonprofit organization or small business firm shall be subject to the provisions of paragraph (c) of this section and the other provisions of this chapter.

Written determination.

"(b)(1) Any determination under (ii) of paragraph (a) of this section shall be in writing and accompanied by a written statement of facts justifying the determination. A copy of each such determination and justification shall be sent to the Comptroller General of the United States within thirty days after the award of the applicable funding agreement. In the case of determinations applicable to funding agreements with small business firms copies shall also be sent to the Chief Counsel for Advocacy of the Small Business Administration.

Copy to Comptroller General.

Copy to SBA.

"(2) If the Comptroller General believes that any pattern of determinations by a Federal agency is contrary to the policy and objectives of this chapter or that an agency's policies or practices are otherwise not in conformance with this chapter, the Comptroller General shall so advise the head of the agency. The head of the agency shall advise the Comptroller General in writing within one hundred and twenty days of what action, if any, the agency has taken or plans to take with respect to the matters raised by the Comptroller General.

"(3) At least once each year, the Comptroller General shall transmit a report to the Committees on the Judiciary of the Senate and House of Representatives on the manner in which this chapter is being implemented by the agencies and on such other aspects of Government patent policies and practices with respect to federally funded inventions as the Comptroller General believes appropriate.

Contrary agency determinations.

"(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

"(1) A requirement that the contractor disclose each subject invention to the Federal agency within a reasonable time after it is made and that the Federal Government may receive title to any subject invention not reported to it within such time.

Report to congressional committees.

"(2) A requirement that the contractor make an election to retain title to anysubject invention within a reasonable time after disclosure and that the Federal Government may receive title to any subject invention in which the contractor does not elect to retain rights or fails to elect rights within such time.

Funding agreement requirements.

"(3) A requirement that a contractor electing rights file patent applications within reasonable times and that the Federal Government may receive title to any subject inventions in the United States or other countries in which the contractor has not filed patent applications on the subject invention within such times.

"(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-uplicense to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

"(5) The right of the Federal agency to require periodic reporting on the utilization or efforts at obtaining utilization that are being made by the contractor or his licensees or assignees: Provided, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Rights, retention.

"(6) An obligation on the part of the contractor, in the event a United States patent application is filed by or on its behalf or by any assignee of the contractor, to include within the specification of such application and any patent issuing thereon, a statement specifying that the invention was made with Government support and that the Government has certain rights in the invention.

Rights, transfer or assignment.

"(7) In the case of a nonprofit organization, (A) a prohibition upon the assignment of rights to a subject invention in the United States without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions and which is not, itself, engaged in or does not hold a substantial interest in other organizations engaged in the manufacture or sale of products or the use of processes that might utilize the invention or be in competition with embodiments of the invention (provided that such assignee shall be subject to the same provisions as the contractor); (B) a prohibition against the granting of exclusive licenses under United States Patents or Patent Applications in a subject invention by the contractor to persons other than small business firms for a period in excess of the earlier of five years from first commercial sale or use of the invention or eight years from the date of the exclusive license excepting that time before regulatory agencies necessary to obtain premarket clearance unless, on a case-by-case basis, the Federal agency approves a longer exclusive license. If exclusive field of use licenses are granted, commercial sale or use in one field of use shall not be deemed commercial sale or use as to other fields of use, and a first commercial sale or use with respect to a product of the invention shall not be deemed to end the exclusive period to different subsequent products covered by the invention; (C) a requirement that the contractor share royalties with the inventor; and (D) a requirement that the balance of any royalties or income earned by the contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, be utilized for the support of scientific research or education.

Third-party licensing prohibition.

"(8) The requirements of sections 203 and 204 of this chapter.

"(d) If a contractor does not elect to retain title to a subject invention in cases subject to this section, the Federal agency may consider and after consultation with the contractor grant requests for retention of rights by the inventor subject to the provisions of this Act and regulations promulgated hereunder.

"(e) In any case when a Federal employee is a coinventor of any invention made under a funding agreement with a nonprofit organization or small business firm, the Federal agency employing such coinventor is authorized to transfer or assign whatever rights it may acquire in the subject invention from its employee to the contractor subject to the conditions set forth in this chapter.

"(f) (1) No funding agreement with a small business firm or nonprofit organization shall contain a provision allowing a Federal agency to require the licensing to third parties of inventions owned by the contractor that are not subject inventions unless such provision has been approved by the head of the agency and a written justification has been signed by the head of the agency. Any such provision shall clearly state whether the licensing may be required in connection with the practice of a subject invention, a specifically identified work object, or both. The head of the agency may not delegate the authority to approve provisions or sign justifications required by this paragraph.

"(2) A Federal agency shall not require the licensing of third parties under any such provision unless the head of the agency determines that the use of the invention by others is necessary for the practice of a subject invention or for the use of a work object of the funding agreement and that such action is necessary to achieve the practical application of the subject invention or work object. Any such determination shall be on the record after an opportunity for an agency hearing. Any action commenced for judicial review of such determination shall be brought within sixty days after notification of such determination.

" § 203. March-in rights

35 USC 203.

"With respect to any subject invention in which a small business firm or nonprofit organization has acquired title under this chapter, the Federal agency under whose funding agreement the subject invention was made shall have the right, in accordance with such procedures as are provided in regulations promulgated hereunder to require the contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the contractor, assignee, or exclusive licensee refuses such request, to grant such a license itself, if the Federal ageacy determines that such—

"(a) action is necessary because the contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

"(b) action is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignee, or their licensees;

"(c) action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the contractor, assignee, or licensees; or

"(d) action is necessary because the agreement required by section 204 has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of its agreement obtained pursuant to section 204.

" § 204. Preference for United States industry

35 USC 204.

"Notwithstanding any other provision of this chapter, no small business firm or nonprofit organization which receives title to any subject invention and no assignee of any such small business firm or nonprofit organization shall grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency under whose funding agreement the invention was made upon a showing by the small business firm, nonprofit organization, or assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

Waiver.

" § 205. Confidentiality

35 USC 205.

"Federal agencies are authorized to withhold from disclosure to the public information disclosing any invention in which the Federal Government owns or may own a right, title, or interest (including a nonexclusive license) for a reasonable time in order for a patent application to be filed. Furthermore, Federal agencies shall not be required to release copies of any document which is part of an application for patent filed with the United States Patent and Trademark Office or with any foreign patent office.

" § 206. Uniform clauses and regulations

35 USC 206.

"The Office of Federal Procurement Policy, after receiving recommendations of the Office of Science and Technology Policy, may issue regulations which may be made applicable to Federal agencies implementing the provisions of sections 202 through 204 of this chapter and the Office of Federal Procurement Policy shall establish standard

funding agreement provisions required under this chapter.

" § 207. Domestic and foreign protection of federally owned inventions

35 USC 207.

"Each Federal agency is authorized to—

"(1) apply for, obtain, and maintain patents or other forms of protection in the United States and in foreign countries on inventions in which the Federal Government owns a right, title, or interest;

"(2) grant nonexclusive, exclusive, or partially exclusive licenses under federally owned patent applications, patents, or other forms of protection obtained, royalty-free or for royalties or other consideration, and on such terms and conditions, including the grant to the licensee of the right of enforcement pursuant to the provisions of chapter 29 of this title as determined appropriate in the public interest;

35 USC 281 et seq.

"(3) undertake all other suitable and necessary steps to protect and administer rights to federally owned inventions on behalf of the Federal Government either directly or through contract; and

"(4) transfer custody and administration, in whole or in part, to another Federal agency, of the right, title, or interest in any federally owned invention.

" § 208. Regulations governing Federal licensing

35 USC 208.

"The Administrator of General Services is authorized to promulgate regulations specifying the terms and conditions upon which any federally owned invention, other than inventions owned by the Tennessee Valley Authority, may be licensed on a nonexclusive, partially exclusive, or exclusive basis.

" § 209. Restrictions on licensing of federally owned inventions

35 USC 209

"(a) No Federal agency shall grant any license under a patent or patent application on a federally owned invention unless the person requesting the license has supplied the agency with a plan for development and/or marketing of the invention, except that any such plan may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code.

Development or marketing plan

"(b) A Federal agency shall normally grant the right to use or sell any federally owned invention in the United States only to a licensee that agrees that any products embodying the invention or produced through the use of the invention will be manufactured substantially in the United States.

Manufacture in U.S.

"(c)(1) Each Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a federally owned domestic patent or patent application only if, after public notice and opportunity for filing written objections, it is determined that—

"(A) the interests of the Federal Government and the public will best be served by the proposed license, in view of the applicant's intentions, plans, and ability to bring the invention to practical application or otherwise promote the invention's utilization by the public;

"(B) the desired practical application has not been achieved, or is not likely expeditiously to be achieved, under any nonexclusive license which has been granted, or which may be granted, on the invention,

"(C) exclusive or partially exclusive licensing is a reasonable and necessary incentive to call forth the investment of risk capital and expenditures to bring the invention to practical application or otherwise promote the invention's utilization by the public; and

"(D) the proposed terms and scope of exclusivity are not greater than reasonably necessary to provide the incentive for bringing the invention to practical application or otherwise promote the invention's utilization by the public.

"(2) A Federal agency shall not grant such exclusive or partially exclusive license under paragraph (1) of this subsection if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the country in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with the antitrust laws.

Antitrust factors.

"(3) First preference in the exclusive or partially exclusive licensing of federally owned inventions shall go to small business firms submitting plans that are determined by the agency to be within the capabilities of the firms and equally likely, if executed, to bring the invention to practical application as any plans submitted by applicants that are not small business firms.

Small business preference.

"(d) After consideration of whether the interests of the Federal Government or United States industry in foreign commerce will be enhanced, any Federal agency may grant exclusive or partially exclusive licenses in any invention covered by a foreign patent application or patent, after public notice and opportunity for filing written objections, except that a Federal agency shall not grant such exclusive or partially exclusive license if it determines that the grant of such license will tend substantially to lessen competition or result in undue concentration in any section of the United States in any line of commerce to which the technology to be licensed relates, or to create or maintain other situations inconsistent with antitrust laws.

Antitrust factors.

"(e) The Federal agency shall maintain a record of determinations to grant exclusive or partially exclusive licenses.

Record.

"(f) Any grant of a license shall contain such terms and conditions as the Federal agency determines appropriate for the protection of the interests of the Federal Government and the public, including provisions for the following:

Terms and conditions.

"(1) periodic reporting on the utilization or efforts at obtaining utilization that are

being made by the licensee with particular reference to the plan submitted: Provided, That any such information may be treated by the Federal agency as commercial and financial information obtained from a person and privileged and confidential and not subject to disclosure under section 552 of title 5 of the United States Code;

"(2) the right of the Federal agency to terminate such license in whole or in part if it determines that the licensee is not executing the plan submitted with its request for a license and the licensee cannot otherwise demonstrate to the satisfaction of the Federal agency that it has taken or can be expected to take within a reasonable time, effective steps to achieve practical application of the invention;

"(3) the right of the Federal agency to terminate such license in whole or in part if the licensee is in breach of an agreement obtained pursuant to paragraph (b) of this section; and

"(4) the right of the Federal agency to terminate the license in whole or in part if the agency determines that such action is necessary to meet requirements for public use specified by Federal regulations issued after the date of the license and such requirements are not reasonably satisfied by the licensee.

" § 210. Precedence of chapter

35 USC 210

"(a) This chapter shall take precedence over any other Act which would require a disposition of rights in subject inventions of small business firms or nonprofit organizations contractors in a manner that is inconsistent with this chapter, including but not necessarily limited to the following:

91 Stat. 1320

"(1) section 10(a) of the Act of June 29, 1935, as added by title I of the Act of Aug. 14, 1946 (7 U.S.C. 427i(a); 60 Stat. 1085);

64 Stat. 154
68 Stat. 944

"(2) section 205(a) of the Act of Aug. 14, 1946 (7 U.S.C. 1624(a); 60 Stat. 1090);

"(3) section 501(c) of the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 951(c); 83 Stat. 742);

"(4) section 106(c) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1395(c); 80 Stat. 721);

"(5) section 12 of the National Science Foundation Act of 1950 (42 U.S.C. 1871(a); 82 Stat. 360);

"(6) section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182; 68 Stat. 943);

"(7) section 305 of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457);

"(8) section 6 of the Coal Research Development Act of 1960 (30 U.S.C. 666; 74 Stat. 337);

"(9) section 4 of the Helium Act Amendments of 1960 (50 U.S.C. 167b; 74 Stat. 920);

"(10) section 32 of the Arms Control and Disarmament Act of 1961 (22 U.S.C. 2572; 75 Stat. 634);

"(11) subsection (e) of section 302 of the Appalachian Regional Development Act of 1965 (40 U.S.C. App. 302(e); 79 Stat. 5);

"(12) section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5901); 88 Stat. 1878);

"(13) section 5(d) of the Consumer Product Safety Act (15 U.S.C. 2054(d); 86 Stat. 1211);

"(14) section 3 of the Act of April 5, 1944 (30 U.S.C. 323; 58 Stat. 191);

"(15) section 8001(c)(3) of the Solid Waste Disposal Act (42 U.S.C. 6981(c); 90 Stat. 2829);

"(16) section 219 of the Foreign Assistance Act of 1961 (22 U.S.C. 2179; 83 Stat. 806);

"(17) section 427(b) of the Federal Mine Health and Safety Act of 1977 (30 U.S.C. 937(b); 86 Stat. 155);

"(18) section 306(d) of the Surface Mining and Reclamation Act of 1977 (30 U.S.C. 1226(d); 91 Stat. 455);

"(19) section 21(d) of the Federal Fire Prevention and Control Act of 1974 (15 U.S.C. 2218(d); 88 Stat. 1548);

88 Stat. 1887.

"(20) section 6(b) of the Solar Photovoltaic Energy Research Development and Demonstration Act of 1978 (42 U.S.C. 5585(b); 92 Stat. 2516);

42 USC 5908.

"(21) section 12 of the Native Latex Commercialization and Economic Development Act of 1978 (7 U.S.C. 178(j); 92 Stat. 2533); and

7 USC 178j.

"(22) section 408 of the Water Resources and Development Act of 1978 (42 U.S.C. 7879; 92 Stat. 1360).

The Act creating this chapter shall be construed to take precedence over any future Act unless that Act specifically cites this Act and provides that it shall take precedence over this Act.

92 Stat. 1316.

"(b) Nothing in this chapter is intended to alter the effect of the laws cited in paragraph (a) of this section or any other laws with respect to the disposition of rights in inventions made in the performance of funding agreements with persons other than nonprofit organizations or small business firms.

Rights, disposition

"(c) Nothing in this chapter is intended to limit the authority of agencies to agree to the disposition of rights in inventions made in the performance of work under funding agreements with persons other than nonprofit organizations or small business firms in accordance with the Statement of Government Patent Policy issued on Aug. 23, 1971 (36 Fed. Reg. 16887), agency regulations, or other applicable regulations or to otherwise limit the authority of agencies to allow such persons to retain ownership of inventions. Any disposition of rights in inventions made in accordance with the Statement or implementing regulations, including any disposition occurring before enactment of this section, are hereby authorized.

"(d) Nothing in this chapter shall be construed to require the disclosure of intelligence

sources or methods or to otherwise affect the authority granted to the Director of Central Intelligence by statute or Executive order for the protection of intelligence sources or methods.

Disclosure.

" § 211. Relationship to antitrust laws

35 USC 211.

"Nothing in this chapter shall be deemed to convey to any person immunity from civil or criminal liability, or to create any defenses to actions, under any antitrust law."

(b) The table of chapters for title 35, United States Code, is amended by adding immediately after the item relating to chapter 37 the following:

"38. Patent rights in inventions made with Federal assistance."

Effective dates.

SEC. 7. AMENDMENTS TO OTHER ACTS.—The following Acts are amended as follows:

(a) Section 156 of the Atomic Energy Act of 1954 (42 U.S.C. 2186; 68 Stat. 947) is amended by deleting the words "held by the Commission or".

35 USC 41 note.

(b) The National Aeronautics and Space Act of 1958 is amended by repealing paragraph (g) of section 305 (42 U.S.C. 2457(g); 72 Stat. 436).

(c) The Federal Nonnuclear Energy Research and Development Act of 1974 is amended by repealing paragraphs (g), (h), and (i) of section 9 (42 U.S.C. 5908 (g), (h), and (i); 88 Stat. 1889-1891).

SEC. 8. (a) Sections 2, 4, and 5 of this Act will take effect upon enactment.

(b) Section 1 of this Act will take effect on the first day of the seventh month beginning after its enactment and will apply to patents in force as of that date or issued thereafter.

(c) Section 3 of this Act will take effect on the first day of the first fiscal year beginning on or after one calendar year after enactment. However, until section 3 takes effect, the Commissioner may credit the Patent and Trademark Office appropriation account in the Treasury of the United States with the revenues from collected reexamination fees, which will be available to pay the costs to the Office of reexamination proceedings.

Computerized data and retrieval system, report to

(d) Any fee in effect as of the date of enactment of this Act will remain in effect until a corresponding fee established under section 41 of title 35, United States Code, or section 1113 of title 15, United States Code, takes effect.

(e) Fees for maintaining a patent in force will not be applicable to patents applied for prior to the date of enactment of this Act.

Congress
35 USC 14 note.

(f) Sections 6 and 7 of this Act will take effect on the first day of the seventh month beginning after its enactment. Implementing regulations may be issued earlier.

(g) Sections 8 and 9 will take effect on the date of enactment of this Act.

SEC. 9. The Commissioner of Patents and Trademarks shall report to Congress, within two years after the effective date of this Act, a plan to identify, and if necessary develop or have developed, computerized data and retrieval systems equivalent to the latest state of the art which can be applied to all aspects of the operation of the Patent and Trademark Office, and particularly to the patent search file, the patent classification system, and the trademark search file. The report shall specify the cost of implementing the plan, how rapidly the plan can be implemented by the Patent and Trademark Office, without regard to funding which is or which may be available for this purpose in the future.

"Computer program."

17 USC 117.

17 USC 106

SEC. 10. (a) Section 101 of title 17 of the United States Code is amended to add at the end thereof the following new language:

"A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."

(b) Section 117 of title 17 of the United States Code is amended to read as follows:

"117. Limitations on exclusive rights: Computer programs

"Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

"(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

"(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

"Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner."

Approved Dec. 12, 1980.

LEGISLATIVE HISTORY:

HOUSE REPORTS: No. 96-1307, Pt. I (Comm. on the Judiciary) and No. 96—1307, Pt. 2 (Comm. on Government Operations).

CONGRESSIONAL RECORD, Vol. 126 (1980):

Nov. 17, considered and passed House.

Nov. 20, considered and passed Senate, amended.

Nov. 21, House concurred in Senate amendment.

Public Law 97-247

97th Congress
An Act

15 USC 632.

To authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That there is authorized to be appropriated for the payment of salaries and necessary expenses of the Patent and Trademark Office to become available for fiscal year 1983, $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary as well as such additional or supplemental amounts as may be necessary, for increases in salary, pay, retirement, or other employee benefits authorized by law. Funds available under this section shall be used to reduce by 50 per centum the payment of fees under section 41 (a) and (b) of title 35, United States Code, by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration. When so specified and the the extent provided in an appropriation Act, any amount appropriated pursuant to this section and, in addition, such fees as shall be collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), may remain available without fiscal year limitation.

Fees.

SEC. 2. Notwithstanding any other provision of law, there is authorized to be appropriated for the payment of salaries and expenses of the Patent and Trademark Office, $121,461,000 for the fiscal year ending September 30, 1982, and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law.

SEC. 3. (a) Section 41(a) of title 35, United States Code, is amended to read as follows:

35 USC 112.

"(a) The Commissioner shall charge the following fees:

"1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

"2. For issuing each original or reissue patent, except in design or plant cases, $500.

"3. In design and plant cases:

"a. On filing each design application, $125.

"b. On filing each plant application, $200.

"c. On issuing each design patent, $175.

"d. On issuing each plant patent, $250.

"4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30. for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

35 USC 133, 151.

"5. On filing each disclaimer, $50.

"6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

"7. On filing each petition for the revival of an unintentionally abondoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

"8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

Maintenance fees.

"a. On filing a first petition, $50.

"b. On filing a second petition, $100.

"c. On filing a third or subsequent petition, $200.".

Expiration. Surcharge.

(b) Section 41(b) of title 35, United States Code, is amended to read as follows:

"(b) The Commissioner shall charge the following fees for maintaining a patent in force:

"1. Three years and six months after grant, $400.

"2. Seven years and six months after grant, $800.

"3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an application maintenance fee. No fee will be established for maintaining a design or plant patent in force."

Maintenance fee, delayed payment. NSurcharge.

(c) Section 41(c) of title 35, United States Code, is amended to read as follows:

"(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

"(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection."

Fees.

(d) Section 41(d) of title 35, United States Code, is amended to read as follows:

"(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 113 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50."

(e) Section 41(f) of title 35, United States Code, is amended to read as follows:

"(f) The fees established in subsections (a) and (b) of this section may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occuring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.".

Adjusted fees.

(f) Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is amended by deleting "Fees will be set and adjusted by the Commissioner to recover the aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or funished the material."

(g) Section 42(c) of the title 35, United States Code, is amended by adding the following sentence at the end thereof: "Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks."

SEC. 4. Section 3(a) of title 35, United States Code is amended (1) by deleting the phrase "not more than fifteen"; and (2) by inserting the phrase "appointed under section 7 of this title" immediately after the phrase "examiners-in- chief".

SEC. 5. Section 111 of title 35, United States Code, is amended to read as follows:

Application.

"SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office."

35 USC 112.
35 USC 113.
35 USC 115.

Filing date.

SEC.6. (a) Section 116 of title 35, United States Code, is amended (1) by deleting the phrase "Joint inventors" from the title and inserting in its place "Inventors"; and (2) in the third paragraph, by deleting the phrase "a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error" and inserting in its place the phrase "through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application".

(b) Section 256 of title 35, United States Code, is amended to read as follows:

"§ 256. Correction of named inventor

"Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error.

"The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly."

SEC. 7. Section 6 of the title 35, United States Code, is amended by deleting paragraph (d) thereof.

SEC. 8. (a) Section 8(a) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(a)), is amended (a) by deleting the word "still"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

(b) Section 8(b) of the Trademark Act of 1946, as amended (15 U.S.C. 1058(b)), is amended (1) by deleting the word "stille"; and (2) by inserting the phrase "in commerce" immediately after the word "use".

SEC. 9. (a) Section 13 of the Trademark Act of 1946, as amended (15 U.S.C. 1063), is amended (1) by deleting the phrase "a verified" and inserting in its place the word "an"; (2) by adding the phrase "when requested prior to the expiration of an extension" immediately after the word "cause"; and (3) by deleting the fourth sentence.

(b) Section 14 of the Trademark Act of 1946, as amended (15 U.S.C. 1064), is amended by deleting the word "verified".

SEC. 10. Section 15 of the Trademark Act of 1946, as amended (15 U.S.C. 1065), is amended by deleting the phrase "the publication" and inserting in its place the word "registration".

SEC. 11. The first sentence of section 16 of the Trademark Act of 1946, as amended (15 U.S.C. 1066), is amended to read as follows: "Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to deceive." Filing Date

SEC. 12. Section 21 of title 35, United States Code, is amended—

(1) by deleting the phrase "Day for taking action falling on Saturday, Sunday, or holiday" from the title and inserting in its place the phrase "Filing date and day for taking action";

(2) by inserting the following as subsection (a):

"(a) The Commissioner may be rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.";

(3) by designating the existing paragraph as subsection (b); and

(4) by inserting the word "federal" in subsection (b), as designated above, immediately after the word "a".

SEC. 13. Section 6(a) of title 35, United States Code, is amended (1) by deleting the word "and", third occurrence, and inserting in its place a comma; (2) by inserting the phrase, "or exchanges of items or services" immediately after the word "programs"; and (3) by inserting the phrase "or the administration of the Patent and Trademark Office" immediately after the word "law", second occurrence. Effective dates.

SEC. 14. (a) Section 115 of title 35, United States Code, is amended by (1) deleting the phrase "shall be" and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

(b) Section 261 of title 35, United States Code, is amended, in the third paragraph, by inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States". 35 USC 41 note.

(c) Section 11 of the Trademark Act of 1946, as amended (15 U.S.C. 1061), is amended by (1) deleting the phrase "shall be", first occurrence, and inserting in its place the word "is"; and (2) inserting the following immediately after the phrase "United States", third occurrence: ", or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States".

SEC. 15. Section 13 of title 35, United States Code, is amended by deleting "(a)" and inserting in its place "(d)".

SEC. 16. Section 173 of title 35, United States Code, is amended to read as follows: "Patents for designs shall be granted for the term of fourteen years."

SEC. 17. (a) Sections 1, 2, 4, 7, and 13 through 15 of this Act shall take effect on the date of enactment of this Act. Sections 3 and 16 of this Act shall take effect on Oct. 1, 1982. The maintenance fees provided for in section 3(b) of this Act shall not apply to patents applied for prior to the date of enactment of this Act. Each patent applied for on or after the date of enactment of this Act shall be subject to the maintenance fees established pursuant to section 3(b) of this Act or to maintenance fees hereafter established by law, as to the amounts paid and the number and timing of the payments.

(b)(1) Title 35, United States Code, is amended by inserting after section 293 the following new section of chapter 29:

"§ 294. Voluntary arbitration

"(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract. Awards. 9 USC 1 *et seq.* 35 USC 282.

"(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

"(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification. Modification.

"(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall, upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner. Notices. Modification.

"(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner."

(2) The analysis for chapter 29 of title 35 of the United States Code is amended by adding at the end the following:

"294. Voluntary arbitration."

(c) Sections 5, 6, 8 through 12, and 17(b) of this Act shall take effect six months after enactment.

Approved Aug. 27, 1982.

LEGISLATIVE HISTORY-H.R. 6260

HOUSE REPORT No. 97-542 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 128 (1982):
June 8, considered and passed House.
Aug. 12, considered and passed Senate.
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 18, No. 36 (1982):
Aug. 28, Presidential statement.

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(51) 97TH CONGRESS **HOUSE OF REPRESENTATIVES REPORT**

2d Session No. 97-542

PATENT AND TRADEMARK OFFICE AUTHORIZATION

May 17, 1982.-Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 6260]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 6260) to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

PURPOSE OF THE BILL

The purpose of H.R. 6260 is to authorize appropriations for the Patent and Trademark Office for fiscal years 1983 through 1985.

STATEMENT

The Subcommittee on Courts, Civil Liberties and the Administration of Justice previously held two days of hearings on the legislation, receiving testimony from a representative group of witnesses including the Commissioner of Patents and Trademarks, the American Bar Association Section of Patent, Trademark and Copyright Law, the American Patent Law Association, the Patent, Trademark and Copyright Section of the State Bar of Virginia, the United States Trademark Association and the General Patent Counsel of the General Electric Corporation.

H.R. 6260 reflects the recommendation of the Administration with three modifications as follows. First, the Administration proposal authorized the Commissioner of Patents and Trademarks to establish fees administratively. The subcommittee approved an amendment to set forth

specific fees in the statute and limited the Commissioner's authority to raise fees. Second, the Administration recommended that user fees recover 100% of the costs of actual processing of patents and trademarks. The subcommittee amended the bill to reduce by 50% patent filing and maintenance fees for individual inventors, small businesses and not for profit institutions. The effect of the amendment is to increase by $8 million the authorized appropriation which would have been provided under the original Administration request. Third, the subcommittee adopted a recommendation of the Commissioner of Patents and Trademarks, the American Bar Association and a coalition of corporate patent counsel permitting arbitration of patent disputes.

H.R. 6260 was considered by the Full Committee on the Judiciary on May 11, 1982 and was approved as reported by the subcommittee with an amendment offered by Mr. Frank described below.

SYNOPSIS OF H.R. 6260

SECTIONS 1-3

Authorizes the Patent and Trademark Office for fiscal year 1983 at an appropriations level of $76,000,000 and for fiscal years 1984 and 1985 such sums as may be necessary. This would be augmented by additional fee income under the bill of approximately $79 million for a total budget of $155 million. In fiscal year 1982 the Patent and Trademark Office was authorized at a level of $118,961,000 of which $29,600,000 was provided through fee income. Fiscal year 1983 will be the first year in which fee income under P.L. 96-517 will be credited to the Patent and Trademark Office without being counted as part of its authorized appropriation. Had this new accounting procedure been applied to fiscal year 1982 the authorization and appropriation for the Patent and Trademark Office would have been $89 million. This constitutes the actual level of taxpayer support of the Office. Thus, H.R. 6260 authorizes the expenditure of tax revenue in fiscal 1983 to support the Patent and Trademark Office at a level $21 million lower than for fiscal 1982. H.R. 6260 proposes to double current fees as the means of making up for the difference between a lower level of taxpayer support and an increased total budget. Further, maintenance fees which were first authorized in P.L. 96-517 and which will not begin to be collected until fiscal year 1986 (Oct. 1, 1985) will also be doubled over the amounts provided for under P.L. 96-517.

The overall objective of H.R. 6260 is to provide for increased user support for the Patent and Trademark Office costs associated with the actual processing of patent applications by fiscal year 1996. The fee schedule is designed to return to the government 100% of actual costs. However, an amendment to the original Administration proposal adopted by the subcommittee would reduce by half the fees for individuals, small businesses and nonprofit inventors. At the present time less than 25% of the actual costs of processing patent applications are supported by fee revenue and under P.L. 96-517, which becomes effective on Oct. 1, 1982, this amount will gradually begin to rise but will only reach 50% of actual costs in 1996.

The amendment offered by Mr. Frank and approved by the Committee modifies that portion of Section 3 of H.R. 6260 dealing with Trademark fees. Public Law 96-517 (35 United States Code, section 31(a)) provides, "Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost . . . of performing the service or furnishing the material."

The Administration requested that the figure, "50 per centum", be changed to "100 per centum", thus mandating full recovery to the Treasury of all costs associated with processing trademarks. An amendment offered during subcommittee consideration of the legislation proposed to reduce fee generated revenue supporting processing of trademarks to less than the 100 per centum recovery level. The amendment was not agreed to. The author of the amendment, Mr. Frank, then proposed to amend the law to provide a statutory fee schedule which would return revenue to the Patent and Trademark Office at a level designed to recover 100 per centum of costs. However, following consultations with interested parties, Mr. Frank modified his amendment simply to repeal those portions of P.L. 96-517 which mandate a specified level of cost recovery for the processing of trademark registrations. Thus, the level of cost recovery for processing of trademark registrations will be within the discretion of the Commissioner. The Committee is aware of the concerns of users of the Trademark registration system, however, and intends to exercise vigorous oversight with respect to the Commissioner to ensure that fees remain at a reasonable level and that trademark registrations are processed in an efficient and cost effective manner. As part of this oversight, the Committee recommends the following fee structure to the Commissioner for Fiscal Year 1983.

Type of fee:	*Proposed fee*
Application filing fee per class	$175
Renewal fee	300
Late renewal	100
Section 12(c) claim	100
New certificate	100
Certificate of correction	100
Disclaimer to registration	100
Amendment to registration	100
Per class combines section 8 and 15 affidavit	200
Per class section 8 affidavit alone	100
Per class section 15 affidavit alone	100
All petitions to Commissioner	100
Cancellation opposition per class	200
TTAB appeal	100
Certified copies	10

Type of fee:	*Proposed fee*
Copies of trademarks	1
Assignments	1

[1]100 plus for each mark in addition to 1.

Section 3(d) also permits the Commissioner of Patents to accept late payment of maintenance fees where it is established that the delay in payment was unavoidable.
Section 4 permits the Commissioner of Patents and Trademarks to appoint temporary examiners in chief for the Board of Patent Appeals to deal more flexibly with workload.
Section 5 permits late filing of the oath and fee accompanying submission of specifications and drawings which accompany patent claims.
Section 6 permits greater flexibility in correcting mistakes in the naming of inventors on a patent application.
Section 7 allocates funds from the Patent and Trademark Office to the Department of State to pay the financial obligations of administering the patent Cooperation Treaty.
Section 8 clarifies the Trademark law with respect to what constitutes use of a mark "in commerce".
Section 9 deletes the burdensome technical requirement that trademark oppositions be verified.
Section 10 makes the date of registration rather than the date of publication the crucial date for purposes of establishing the incontestability of a trademark. This eliminates an ambiguity in the present law.
Section 11 limits the declaration ofinterferences under the trademark law to situations where extraordinary circumstances exist.
Section 12 authorizes the Commissioner of the Patent and Trademark Office the flexibility to deal with problems of delay in filing due to postal service breakdowns.
Section 13 permits the Commissioner of Patents to enter into cooperative studies, programs, exchanges and similar ventures associated with the administration of the Patent Office.
Section 14 conforms U.S. Patent and Trademark Law to a recent international treaty governing diplomatic or consular legalization of documents.
Section 15 corrects a mistaken citation in P.L. 96-517.
Section 16 creates a uniform term for design patents.
Section 17 establishes the effective dates for provisions of the Act. Increased filing fees would apply to all applications made on or after the date of enactment of H.R. 6260.
Section 18 permits voluntary arbitration of patent disputes.

SECTION-BY-SECTION ANALYSIS

SECTION 1

This section authorizes appropriations for the Patent and Trademark Office for the payment of salaries and necessary expenses of the Office. For Fiscal Year 1983, this section authorizes appropriations of $76,000,000, and in fiscal years 1984 and 1985 such sums as may be necessary, as well as such additional and supplemental amounts as may be necessary to cover any increases in salary, pay, retirement, or employee benefits which may be authorized by law. Funds made available by these appropriations are to be used to reduce by 50 per centum the amount of the fees to be paid under title 35, United States Code, section 41(a) and (b) by independent inventors and nonprofit organizations as defined in regulations established by the Commissioner of Patents and Trademarks, and by small business concerns as defined in section 3 of the Small Business Act and by regulations established by the Small Business Administration.

In addition, fees collected pursuant to title 35, United States Code, and the Trademark Act of 1946, as amended (15 U.S.C. 1051 et seq.), will augment the authorized appropriation to provide the resources needed to conduct the operations of the Office for fiscal year 1983. The total resources for the Office in fiscal year 1983, that is, the amount appropriated pursuant to this section plus fees collected pursuant to the patent and trademark laws, which will be available to the Office, are estimated to be $154,934,000. The corresponding levels for fiscal year 1984 and fiscal year 1985 are estimated in the President's Budget to be $167 million and $176 million, respectively. Any additional amounts to cover increases in salary, pay, retirement, or other employee benefits which may be authorized by law will be in addition to, and will therefore increase, those program levels. Finally, any funds appropriated pursuant to this section and all fees collected, when specified in an appropriation act, will remain available without any fiscal year limitation.

SECTION 2

This section provides that, notwithstanding any other provision of law, there is authorized to be appropriated to the Patent and Trademark Office for fiscal year 1982, $121,461,000 and such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other employee benefits authorized by law. This section increases the amount authorized for the Patent and Trademark Office by 2.5 million over that authorized in Public law 97-35. The President is recommending a supplemental appropriation of $2,500,000 for the Patent and Trademark Office for fiscal year 1982 in order to carry out the program recommendations included in his fiscal year 1983 Budget.

SECTION 3

This section establishes certain statutory fees which are to be charged by the Commissioner and authorizes the Commissioner to establish other fees whose amounts are not specifically set. Thus, the major routine fees which are applicable to patents and patent application processing are established (e.g., filing, issuance, and maintenance fees). The Commissioner is authorized to establish fees for all other processing, services, or materials related to patents which are not

specifically established by statute. The processing and service fees, which would be established at a level to recover the estimated average costs to the Office. A more specific discussion of the various provisions of this section is set forth below.

Section 3(a) amends section 41(a) of title 35 to provide the amounts of the fees for filing and issuance of patent applications. In addition, the section includes provisions for increasing the filing fees due to increased complexities presented by certain applications, e.g., applications containing more than a specified number of claims and any application containing a multiple dependent claim. The section also provides that fees will be charged when the number of claims is increased above the specified number or when a multiple dependent claim is first presented, whether on filing or at a later point in processing.

Under section 41(a)1, the filing fee for an original patent, except in design or plant cases, is $300. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of three, $10 is due for each claim (whether independent or dependent) which is in excess of twenty, and $100 is due for each application containing a multiple dependent claim. The latter fee is a one-time charge per application due the first time a multiple dependent claim is presented for examination. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of title 35, United States Code, or any claim depending therefrom, will be considered as separate dependent claims in accordance with the number of claims to which reference is made. Under the section, errors in payment ofthe additional fees may be rectified in accordance with regulations of the Commissioner. This will enable the Commissioner to establish regulations whereby patent applications may correct, without prejudice, errors in the additional fees, i.e., those in addition to the basic fees established.

Under section 41(a)2, the fee for issuing all original and reissue patents, except in design or plant cases, would be a uniform amount of $500. No supplemental issue fees are required.

Section 41(a)3 establishes fixed fees for filing applications for, and issuance of design and plant patents. For design patent cases, the filing fee would be $200 and the issue fee $250.

Section 41(a)4 relates to fees in reissue cases and establishes a fee of $300 for filing each application for the reissue of a patent. In addition, on filing or on presentation at any other time, $30 is due for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 is due for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

Under section 41(a)5, a fee of $50 would be established for filing each disclaimer in a patent or patent application.

Section 41(a)6 establishes a fee due on filing an appeal from the examiner to the Board of Appeals of $115. In addition, a fee of $115 is due on filing a brief in support of the appeal, and a fee of $100 is due for requesting an oral hearing before the Board of Appeals.

Section 41(a)7 establishes two different fees for filing petitions with different standards to revive abandoned patent applications. The same two fees are applicable to petitions to accept the delayed payment of the fee for issuing a patent. The fees set forth in this section are due on filing the petition. Since the section provides for two alternative fees with different standards, the section would permit the applicant seeking revival or acceptance of a delayed payment of the fee for issuing a patent to choose one or the other of the fees and standards under such regulations as the Commissioner may establish. Under the section the Commissioner could establish time limits within which petitions under each of the different fees and standards can be filed. The section establishes a fee of $500 for filing each petition for revival or for acceptance of the delayed payment of an issue fee where the abandonment or the failure to pay the issue fee is unintentional. In order to prevent abuse and injury to the public the Commissioner could require a terminal disclaimer equivalent to the period of abandonment and could require applicants to act promptly after becoming aware of the abandonment. The section establishes a fee of $50 for filing a petition under sections 133 or 151 of title 35 in accordance with standards presently in effect requiring that the delay resulting in the abandonment, or the delay in payment of the issue fee, be unavoidable. Under this section a petition accompanied by either a fee of $500 or a fee of $50 would not be granted where the abandonment or the failure to pay the fee for issuing the patent was intentional as opposed to being unintentional or unaviodable. This section would permit the Commissioner to have more discretion than present law to revive abandoned applications and accept late payment of the fee for issuing a patent in appropriate circumstances.

Section 41(a)8 establishes fees for filing of petitions for extensions of time. Various time periods are set by the Office for taking actions on matters relating to patent applications. These time periods are set pursuant to statute or by regulations established by the Commissioner under the authority granted to the Commissioner by statute. This section would provide for fees for filing petitions to extend the time periods set pursuant to statute or by regulations for taking action within any limitations set by statute.

A fee of $50 is established for filing a request for a first one month extension of time, an additional fee of $100 for filing a request for a second one month extension of time which would expire two months after the end of the time period set for taking action, and an additional fee of $200 for filing a request for a third one month extension of time which would expire three months after the end of the time period set for taking action. A subsequent or fourth extension could be requested if additional time was available under the statute. In no case could a period be extended beyond the maximum time set by statute.

The Commissioner may issue regulations providing when, within any maximum period permitted by statute, petitions for extensions of time, and the required fee therefor, may be filed. This section does preclude the Commissioner from waiving the fee for filing a petition for an extension of time where the Office extends the period due to equity considerations or sufficient cause.

Section 41(b) provides that the Commissioner charge the following fees for maintaining a patent other than a design or plant patent, in force: at three years and six months after grant, $400; at seven years and six months after grant, $800; and at eleven years and six months after

grant, $1,200. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of a maintenance fee.

In order to avoid an inequitable loss of patent rights, the Commissioner is given the authority to accept payment of any maintenance fee after the six-month grace period if it is established that the delay in payment was unavoidable. It is intended that the Commissioner will issue regulations establishing guidelines for acceptance of late payment. After the expiration of a reasonable period of time, the patentee would bear a heavy burden of proof that the delay was unavoidable. A surcharge may be imposed by the Commissioner as a precondition to acceptance of a late fee. This surcharge may be in addition to any surcharge imposed for payment during the grace period.

A provision is included to protect the rights of one who began using or who took steps to begin use of a patent which expired for failure to pay a maintenance fee and which was subsequently reestablished by acceptance of the late payment. The intervening rights provision in section 41(c)(2) is similar to the intervening rights provision in 35 U.S.C. 252 concerning reissued patents.

Section 41(d) provides that the Commissioner establish fees for all other processing services, or materials related to patents not specified in section 41 at an amount calculated to recover the estimated average cost to the Office of such processing, services, or materials. Such processing and other services includes, but is not limited to, the processing of various petitions desiring certain actions to be taken regarding patent applications, recording of assignments, reexamination of patents and the processing of international applications. Fees for materials include the price of patent copies, certifications and other copying services. The yearly fee for providing a library specified in section 13 of title 35 with uncertified copies of the specifications and drawings for all patents issued in that year is set at $50.

Section 41(f) provides that the fees established in subsections (a) and (b) of section 41 may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than one per centum may be ignored by the Commissioner in making such adjustments.

Subsection (a) of section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), is being changed to grant the Commissioner discretion to establish the level of recovery of office costs related to trademarks. It is expected that the Commissioner will set the fees in a way that the filing fee will be kept as low as possible to foster use of the Federal registration system. This may require that other fees for services or materials related to trademarks recover more than their actual estimated cost in order that the Commissioner achieve in the aggregate adequate cost recovery for the entire trademark operation.

A provision is inserted in section 42(c) of title 35 in order to ensure that the trademark fees collected are used to fund trademark operations only and not the processing of patent applications.

SECTION 4

Section 3 of title 35 is amended by deleting specific reference to the number of examiners-in-chief in the first sentence. Elimination of the upper limit on the number of permanent members of the Board of Appeals would provide greater flexibility in filling most of its personnel needs, thereby avoiding an excess of examiner details. The authority to appoint acting examiners-in-chief, however, is maintained in order that temporary fluctuations in the workload of the Board may be accommodated.

SECTION 5

Under revised section 111 of title 35, the filing date of an application would be that on which the specification and any required drawings are received by the Patent and Trademark Office. The oath or declaration and filing fee could be submitted at such later time as established by the Commissioner, without any loss of the original filing date. Under the amendment, an applicant could either file the oath or declaration (including the applicant's signature) and fee together with an application or submit them at a later time as determined by the Commissioner.

The section would also authorize the imposition of a surcharge as a condition for accepting filing of the oath of payment of the filing fee after the filing date of the application. Since an application filed without the oath or declaration would not be signed or "made" by the applicant, the amendment permits a patent attorney or agent, authorized by the applicant, to submit the specification and drawings for the purpose of obtaining a filing date. Should the applicant, however, fail to file the oath or declaration, or pay the filing fee within the time limits set by the Commissioner, the application would be regarded as having been abandoned.

SECTION 6

The third paragraph of section 116 of title 35 is amended to enlarge the possibilities for correcting misnamed inventive entities. As a consequence, correction would be permitted also in cases where the person originally named as inventor was in fact not the inventor of the subject matter contained in the application. If such error occurred without any deceptive intention on the part of the true inventor, the Commissioner would have the authority to substitute the true inventor for the erroneously named person. Although probably rarer, instances such as changes from a mistakenly identified sole inventor to a different, but actual, joint inventors, conversions from erroneously identified joint inventors to different but actual, joint inventors, and conversions from erroneously identified joint inventors to a different, but actual, sole inventor would also be permitted. In each instance, however, the Commissioner must be assured of the presence of

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innocent error, without deceptive intention on the part of the true inventor or inventors, before permitting substitution of a true inventor's name.

The ability to receive a filing date based on a specification and drawings without signature as set forth in revised section 111 of title 35, and to file the oath or declaration and pay the filing fee within such period as determined by the Commissioner is also available to joint inventors.

Section 256 of title 35, which is a companion to section 116, would be amended to similarly enlarge the possibilities for correction of misnamed inventors in issued patents.

SECTION 7

Section 6(d) of title 35, which provides for the allocation of appropriated Patent and Trademark Office funds to the Department of State for payment of United States financial obligations under the Patent Cooperation Treaty, is deleted. The Department of State has traditionally assumed responsibility for financial obligations for international agreements to which the United States adheres.

SECTION 8

Section 8(a) of the Trademark Act is amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce" may have been inadvertent in the 1946 Act, this section has been interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce". Although it is believed by some that omission of the words "in commerce may have been inadvertent in the 1946 Act, this section has interpreted so that use in a foreign country, or use in intrastate commerce, is sufficient. Such interpretation is fundamentally in conflict with other requirements of the Act.

Section 8(b) of the Act is also amended to clarify that the continued use required to be shown in the sixth year be use "in commerce" for registrations published under section 12(c) of the Act. (This pertains to registrations issued under the Act of Mar. 3, 1881 and the Act of Feb. 20, 1905).

The word "still" has been deleted from section 8(a) and 8(b). Thus, the owner of a registration issued on the basis of a foreign registration under the provisions of section 44(e) of the Act will have to submit an affidavit to the effect that the mark is in use in commerce. Since the mark need not be used in commerce when it is registered, the requirement cannot be required to state that it is "still" in such use.

SECTION 9

Section 13 of the Trademark Act is amended to delete the requirement that an opposition be verified. The sentence which allowed an unverified application to be verified at a later date has been deleted. In addition, a phrase has been added to make it clear that any subsequent extension of time to file an opposition, beyond the first extension, must be requested before the end of the preceding extension.

Section 14 of the Trademark Act would also be amended to delete the requirement that a petition to cancel a registration be verified.

SECTION 10

Section 15 of the Trademark Act is amended to change the term "the publication" to "registration" in the first sentence. This change makes the date of registration rather than the date of publication the crucial date for purposes of incontestablility. It will also make section 15 consistent with sections 22 and 33 of the Act.

SECTION 11

Section 16 of the Trademark Act is amended to limit the declaration of interferences to those situations where a petition to the Commissioner shows that extraordinary circumstances exist, the rights of the parties can be determined adequately by the existing opposition and cancellation procedures. Additionally, if an interference is declared between an application and a registration and the applicant wins, a cancellation must still be initiated against the registration.

SECTION 12

A new subsection (a) has been added to section 21 of title 35 to authorize, but not to require, the Commissioner of Patents and Trademarks to give as the filing date of any paper or fee which is required to be filed in the Patent and Trademark Office the date on which the paper or fee was deposited with the United States Postal Service. The Commissioner may also give as the filing date of any paper or fee which was required to be filed in the Patent and Trademark Office the date it would have been deposited with the United States Postal Service but for postal service interruptions or emergencies which the Commissioner designates. The requirements governing whether any given paper or fee may be given the filing date of the day on which it was, or would have been deposited with the United States Postal Service will be set forth in regulations established by the Commissioner.

Section 21(b) of title 35 is identical to existing section 21 with two minor amendments. The word "federal" has been inserted before the phrase "holiday within the District of Columbia" to clarify the nature of the holiday.

SECTION 13

This section clarifies the authority of the Commissioner in section 6(a) of title 35 to enter into a wide range of cooperative agreements concerning the patent and trademark laws or the administration of the Patent and Trademark Office. These agreements are in addition to the exchange of publications authorized in 35 U.S.C. 11(b) and 12. These cooperative agreements may take the form of studies, programs, exchanges, and other similar ventures. Thus, the Patent and Trademark Office could, for example, exchange patent copies, non-patent literature, tapes or services in return for goods or services of value to the Patent and Trademark Office.

SECTION 14

The amendments of 35 U.S.C. 115 and Section 11 of the Trademark Act of 1946 recognize the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" which entered into force in the United States on Oct. 15, 1981. The Convention abolishes the requirement of diplomatic or consular legalization for foreign public documents which are sworn to or acknowledged by a notary public in any of the countries adhering to the Convention. For documents executed by a notary public of all other foreign countries, diplomatic or consular legalization will still be required.

The amendment of 35 U.S.C. 261 is intended to give affirmative effect to acknowledgments executed pursuant to the Hague Convention.

SECTION 15

This section corrects an incorrect citation. Public Law 96-517 amended section 41 of title 35, United States Code, in a way which eliminated 35 U.S.C.. § 41(a)(9). Unfortunately, section 13 of title 35, United States Code, was not amended accordingly by Public Law 96-517. This section corrects that oversight.

SECTION 16

This section sets a uniform term of fourteen years for all design patents.

SECTION 17

Sections 17(a) and (c) specify the effective dates of the Act. Section 17(a) also specifies that the maintenance fees provided for in section 3(b) of this Act will only apply to patents in which the application was filed on and after the date of enactment or to maintenance fees later established by law.

Section 17(b) adds a section to title 35 providing for the voluntary arbitration of patent disputes by the parties to the dispute. The section requires that the Commissioner be notified in writing of an award made by an arbitrator or modified by a court. Such notification will be entered in the record of the prosecution of the patent.

At present, agreements to arbitrate some aspects of disputes arising under patent licenses are enforceable by the courts; however, there have been court decisions that have disapproved arbitration of disputes concerning patent validity or infringement. In this regard, see, for example, *Zip Mfg. Co.* v. *Pep Mfg. Co. 44 F.2d 184, 7 U.S.P.Q. 62 (D. Del. 1930) and Beckman Instruments, Inc.* v. *Technical Developments Corp.* 433 F.2d 55, 167 U.S.P.Q. 10 (7th Cir. 1965).

Partly as a reaction to those decisions, during the 93rd Congress both the Department of Commerce and the Department of Justice endorsed a provision specifically authorizing arbitration of validity and infringement disputes. This provision, included in an omnibus patent law revision bill, S. 2504, was never enacted due to the many controversial aspects of that legislation.

In the view of the Committee, a statutory authorization of voluntary agreements to arbitrate validity and infringement disputes would benefit both the parties to these disputes and the public.

Statutory endorsement of arbitration agreements would assure the parties that they could avail themselves of the numerous advantages of arbitration without the possibility of having to reargue the dispute in court. The advantages of arbitration are many: it is usually cheaper and faster than litigation; it can have simpler procedural and evidentiary rules; it normally minimizes hostility and is less disruptive of ongoing and future business dealings among the parties; it is often more flexible in regard to scheduling of times and places of hearings and discovery devices; and, arbitrators are frequently better versed than judges and juries in the area of trade customs and the technologies involved in these disputes.

The enforcement of voluntary arbitration provisions would serve the public in two ways. First, the availablity of arbitration with its numerous advantages will enhance the patent system and thus will encourage innovation. This view is supported by the Committee for Economic Development in their Jan. 1980 statement entitled "Stimulating Technological Progress." Secondly, arbitration could relieve some of the burdens on the overworked Federal courts. Chief Justice Burger in his speech to the American Bar Association on Jan. 24, 1982, generally endorsed the use of arbitration to reduce the judicial backlog. Also, I think it is important to note that the American Bar Association's Section on Patent, Trademark and Copyright Law has endorsed court enforcement of arbitration agreements calling for arbitration of validity and infringement.

The recommendations of the Secretary of Commerce to increase substantially patent and trademark user fees were made on the promise that such increases "will lay the groundwork for revitalizing the patent and trademark systems." The Secretary committed to three major goals: (1) to reach an average patent application pendency time of 18 months by FY 1987, (2) to issue an examiner's first action on trademark registrability in three months and disposal of an application within 13 months, and (3) to move realistically toward a fully automated Office by the 1990's. In accepting the Administration's recommendations on user fees, the Committee fully expects the Administration to live up to its end of the bargain to bring about a first-class Patent and

Trademark Office. To provide an opportunity for timely and effective Committee oversight of progress toward improving the Patent and Trademark Office, the Committee directs that the Secretary of Commerce report annually to the Committee on progress toward achieving the three major goals of the Patent and Trademark Office, as outlined above, and, in addition, promptly inform the Committee at any time it appears that any of the goals, for any reason, is viewed as not attainable.

OVERSIGHT STATEMENT

The Committee on the Judiciary has oversight responsibility over the Patent and Trademark Office in the Department of Commerce. In addition to its ongoing oversight, the Committee's Subcommittee on Courts, Civil Liberties and the Administration of Justice held an oversight hearing with respect to the Patent and Trademark Office on Mar. 4, 1981, published as Oversight Hearings Before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the Committee on the Judiciary, House of Representatives, Ninety-Seventh Congress, First Session on the Copyright Office, The U.S. Patent and Trademark Office, and the Copyright Royalty Tribunal. Serial No. 17.

The Committee expects to continue its oversight activities in this area.

STATEMENT OF THE BUDGET COMMITTEE

No statement has been received on H.R. 6260 from the House Committee on the Budget.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 7, rule XIII of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate of H.R. 6260, as amended, prepared by the Congressional Budget Office.

U.S. CONGRESS
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 13, 1982.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional budget Office has prepared the attached cost estimate for H.R. 6260, a bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely

ALICE M. RIVLIN,
Director.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 6260.

2. Bill title: A bill to authorize appropriations to the Patent and Trademark Office in the Department of Commerce, and for other purposes.

3. Bill status: As ordered reported by the House Committee on the Judiciary, May 11, 1982.

Bill purpose: H.R. 6260 would authorize 1982 appropriations at a level $2.5 million above the amount already appropriated, and would provide a $76 million authorization level in 1983 to carry out the activities of the Patent and Trademark Office (PTO). In addition, such sums as may be necessary are authorized for fiscal years 1984 and 1985, plus such additional or supplemental amounts as may be necessary for increases in salary, pay, retirement, or other benefits authorized by law for each fiscal year 1983 thorugh 1985. PTO would also have available for obligation offsetting fee collections as provided for in Public Law 96-517, plus the additional fees as specified in H.R. 6260.

Assuming enactment of H.R. 6260, total PTO collections over time would result in recovery of approximately 100 percent of patent and trademark processing costs. Individuals, small businesses, and non-profit institutions would be exempt from the proposed additional fees, however, but would continue to follow the fee schedule outlined in P.L. 96-517, which assumes the ultimate recovery of approxiamtely 50 percent of all processing costs.

The President's 1982 budget includes a request for a $2.5 million supplemental for the PTO. The Administration has recommended increasing user fees to ultimately recover 100 percent of processing costs beginning in 1983, but does not provide for any exemptions to the proposed fee increases relative to current law. The effect of exemptions is to increase by approximately $8 million the authorized level of appropriations relative to the Administration's request.

In addition, the bill would make a number of other changes that are not expected to have a cost impact.

5. Cost estimate:

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Authorization level:					
Specified	2.5	76.0	....	....	....
Estimated	....	6.8	86.4	86.8	....
Subtotal	2.5	82.8	86.4	86.8	....
Total estimated outlays	2.4	61.8	82.4	82.8	5.5

Including outlays from appropriations to date for PTO, total 1982 outlays are estimated to be $121.5 million, and total 1983 outlays are estimated to be $79.8.

The costs of this bill fall within budget subfunction 376.

6. Basis of estimate: The authorization levels for PTO for 1982 and 1983 are those specified in the bill. The estimate authorization levels for 1984 and 1985 assume a level of funding sufficient to maintain a program level of $167 million and $176 million, respectively, including offsetting collections. In addition, authorization for increases in pay and other benefits of approximately $6.8 million, $7.4 million, and $7.8 million for fiscal years 1983 through 1985, respectively, were estimated based on CBO's current inflators. Outlays are based on historical spending patterns.

The estimated collections to PTO as a result of fees charged to cover the costs of processing trademarks and patents were provided by the agency, and assume the fee structure outlined in the bill. The estimated collections, under current law and under H.R. 6260, are shown in the table below.

[By fiscal years, in millions of dollars]

	1982	1983	1984	1985	1986
Estimated offsetting collections:					
Current law	....	47.8	52.7	57.7	....
Added by H.R. 6260	....	31.2	35.3	39.3	....
Total-H.R. 6260	....	79.0	88.0	97.0	....

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Mary B. Maginniss.

10. Estimate approved by: C. G. Nuckols (James L. Blum, Assistant Director for Budget Analysis).

COMMITTEE VOTE

The Committee on the Judiciary ordered H.R. 6260 as amended reported by a voice vote, without objection being heard, with a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of Rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, existing law in which no change is proposed is shown in roman):

TITLE 35, UNITED STATES CODE
PART 1—PATENT AND TRADEMARK OFFICE

* * * * *

CHAPTER 1—ESTABLISHMENT, OFFICERS, FUNCTIONS

* * * * *

§ 3. Officers and employees.

(a) There shall be in the Patent and Trademark Office a Commissioner of Patents and Trademarks, a Deputy Commissioner, two Assistant Commissioners, and [not more than fifteen] examiners-in-chief *appointed under section 7 of this title.* The Deputy Commissioner, or, in the event of a vacancy in that office, the Assistant Commissioner senior in date of appointment shall fill the office of Commissioner during a vacancy in that office until the Commissioner is appointed and takes office. The Commissioner of Patents and Trademarks, the Deputy Commissioner, and the Assistant Commissioners shall be appointed by the President, by and with the advice and consent of the Senate. The Secretary of Commerce, upon the nomination of the Commissioner, in accordance with law shall appoint all other officers and employees.

* * * * *

§ 6. Duties of Commissioner.

(a) The Commissioner, under the direction of the Secretary of Commerce, shall superintend or perform all duties required by law respecting the granting and issuing of patents and the registration of trademarks; shall have the authority to carry on studies [and] programs, *or exchanges of items or services* regarding domestic and international patent and trademark law *or the administration of the Patent and Trademark Office*, and shall have charge of property belonging to the Patent and Trademark Office. He may, subject to the approval of the Secretary of Commerce, establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office.

(b) The Commissioner, under the direction of the Secretary of Commerce, may, in coordination with the Department of State, carry on programs and studies cooperatively with foreign patent offices and international intergovernmental organizations, or may authorize such programs and studies to be carried on, in connection with the performance of duties stated in subsection (a) of this section.

(c) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, transfer funds appropriated to the Patent and Trademark Office, not to exceed $100,000 in any year, to the Department of State for the purpose of making special payments to internatinal intergovernmental organizations for studies and programs for advancing international cooperation concerning patents, trademarks, and related matters. These special payments may be in addition to any other payments or contributions to the international organization and shall not be subject to any limitations imposed by law on the amounts of such other payments or contributions by the Government of the United States.

[(d) The Commissioner, under the direction of the Secretary of Commerce, may, with the concurrence of the Secretary of State, allocate funds appropriated to the Patent Office, to the Department of State for the purpose of payment of the share on the part of the United States to the working capital fund established under the Patent Cooperation Treaty. Contributions to cover the share on the part of the United States of any operating deficits of the International Bureau under the Patent Cooperation Treaty shall be included in the annual budget of the Patent Office and may be transferred by the Commissioner, under the direction of the Secretary of Commerce, to the Department of State for the purpose of making payments thereof to the International Bureau.]

* * * * *

§ 13. Copies of patents for public libraries.

The Commissioner may supply printed copies of specifications and drawings of patents to public libraries in the United States which shall maintain such copies for the use of the public, at the rate for each year's issue established for this purpose in section 41 [(a)9] (d) of this title.

* * * * *

CHAPTER 2-PROCEEDINGS IN THE PATENT AND TRADEMARK OFFICE

* * * * *

§ 21. [Day for taking action falling on Saturday, Sunday, or holiday] *Filing date and day for taking action.*

(a) The Commissioner may by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service or would have been deposited with the United States Postal Service but for postal service interruptions or emergencies designated by the Commissioner.

(b) When the day, or the last day, for taking any action or paying any fee in the United States Patent and Trademark Office falls on Saturday, Sunday, or a Federal holiday within the District of Columbia, the action may be taken, or the fee paid, on the next succeeding secular or business day.

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CHAPTER 4-PATENT FEES

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§ 41. Patent fees

[(a) The Commissioner of Patents will establish fees for the processing of an application for a patent, from filing through disposition by issuance or abandonment, for maintaining a patent in force, and for providing all other services and materials related to patents. No fee will be established for maintaining a design patent in force.

[(b) By the first day of the first fiscal year beginning on or after one calendar year after enactment of this Act, fees for the actual processing of an application for a patent, other than for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 25 per centum of the estimated average cost to the Office of such processing. By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for the processing of an application for a design patent, from filing through disposition by issuance or abandonment, will recover in aggregate 50 per centum of the estimated average cost to the Office of such processing.

[(c) By the fifteenth fiscal year following the date of enactment of this Act, fees for maintaining patents in force will recover 25 per centum of the estimated cost to the Office, for the year in which such maintenance fees are received, of the actual processing all applications for patents, other than for design patents, from filing through disposition by issuance or abandonment. Fees for maintaining a patent in force will be due three years and six months, seven years and six months, and eleven years and six months after the grant of the patent. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as the end of such grace period. The Commissioner may require the payment of a surcharge as a condition

of accepting within such six-month grace period the late payment of an applicable maintenance fee.

[(d) By the first day of the first fiscal year beginning on or after one calendar year after enactment, fees for all other services or materials related to patents will recover the estimated average cost to the Office of performing the service or furnishing the material. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.]

(a) The Commissioner shall charge the following fees:

1. On filing each application for an original patent, except in design or plant cases, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of three, $10 for each claim (whether independent or dependent) which is in excess of twenty, and $100 for each application containing a multiple dependent claim. For the purpose of computing fees, a multiple dependent claim as referred to in section 112 of this title or any claim depending therefrom shall be considered as separate dependent claims in accordance with the number of claims to which reference is made. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

2. For issuing each original or reissue patent, except in design or plant cases, $500.

3. In design and plant cases:

a. On filing each design application, $125.

b. On filing each plant application, $200.

c. On issuing each design patent, $175.

d. On issuing each plant patent, $250.

4. On filing each application for the reissue of a patent, $300; in addition, on filing or on presentation at any other time, $30 for each claim in independent form which is in excess of the number of independent claims of the original patent, and $10 for each claim (whether independent or dependent) which is in excess of twenty and also in excess of the number of claims of the original patent. Errors in payment of the additional fees may be rectified in accordance with regulations of the Commissioner.

5. On filing each disclaimer, $50.

6. On filing an appeal from the examiner to the Board of Appeals, $115; in addition, on filing a brief in support of the appeal, $115, and on requesting an oral hearing before the Board of Appeals, $100.

7. On filing each petition for the revival of an unintentionally abandoned application for a patent or for the unintentionally delayed payment of the fee for issuing each patent, $500, unless the petition is filed under sections 133 or 151 of this title, in which case the fee shall be $50.

8. For petitions for one-month extensions of time to take actions required by the Commissioner in an application:

a. On filing a first petition, $50.

b. On filing a second petition, $100.

c. On filing a third or subsequent petition. $200.

(b) The Commissioner shall charge the following fees for maintaining a patent in force:

1. Three years and six months after grant, $400.

2. Seven years and six months after grant, $800.

3. Eleven years and six months after grant, $1,200.

Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period. The Commissioner may require the payment of a surcharge as a condition of accepting within such six-month grace period the late payment of an applicable maintenance fee. No fee will be established for maintaining a design or plant patent in force.

(c)(1) The Commissioner may accept the payment of any maintenance fee required by subsection (b) of this section after the six-month grace period if the delay is shown to the satisfaction of the Commissioner to have been unavoidable. The Commissioner may require the payment of a surcharge as a condition of accepting payment of any maintenance fee after the six-month grace period. If the Commissioner accepts payment of a maintenance fee after the six-month grace period, the patent shall be considered as not having expired at the end of the grace period.

(2) No patent, the term of which has been maintained as a result of the acceptance of a payment of a maintenance fee under this subsection, shall abridge or affect the right of any person or his successors in business who made, purchased or used after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used. The court before which such matter is in question may provide for the continued manufacture, use or sale of the thing made, purchased, or used as specified, or for the manufacture, use or sale of which substantial preparation was made after the six-month grace period but before the acceptance of a maintenance fee under this subsection, and it may also provide for the continued practice of any process, practiced, or for the practice of which substantial preparation was made, after the six-month grace period but prior to the acceptance of a maintenance fee under this subsection, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced after the six-month grace period but before the acceptance of a maintenance fee under the subsection.

(d) The Commissioner will establish fees for all other processing, services, or materials related to patents not specified above to recover the estimated average cost to the Office of such processing, services, or materials. The yearly fee for providing a library specified in section 13 of this title with uncertified printed copies of the specifications and drawings for all patents issued in that year will be $50.

(3) The Commissioner may waive the payment of any fee for any service or material related to patents in connection with an occasional or incidental request made by a department or agency of the Government, or any officer thereof. The Commissioner may provide any applicant issued

a notice under section 132 of this title with a copy of the specifications and drawings for all patents referred to in that notice without charge.

[(f) Fees will be adjusted by the Commissioner to achieve the levels of recovery specified in this section; however, no patent application processing fee or fee for maintaining a patent in force will be adjusted more than once every three times.

(f) The fees established in subsection (a) and (b) of this section may be adjusted by the Commissioner on Oct. 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor. Changes of less than 1 per centum may be ignored.

(g) No fee established by the Commissioner under this section will take effect prior to sixty days following notice in the Federal Register.

§ 42. Patent and Trademark Office funding.

(a) All fees for services performed by or materials furnished by the Patent and Trademark Office will be payable to the Commissioner.

(b) All fees paid to the Commissioner and all appropriations for defraying the costs of the activities of the Patent and Trademark Office will be credited to the Patent and Trademark Office Appropriation Account in the Treasury of the United States, the provisions of section 725e of title 31, United States Code, notwithstanding.

(c) Revenues from fees will be available to the Commissioner of Patents to carry out, to the extent provided for in appropriation Acts, the activities of the Patent and Trademark Office. *Fees available to the Commissioner under section 31 of the Trademark Act of 1946, as amended (15 U.S.C. 1113), shall be used exclusively for the processing of trademark registrations and for other services and materials related to trademarks.*

(d) The Commissioner may refund any fee paid by mistake or any amount paid in excess of that required.

PART II-PATENTABILITY OF INVENTIONS AND GRANT OF PATENTS

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CHAPTER 11-APPLICATION FOR PATENT

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§ 111. Application for patent

[Application for patent shall be made by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include: (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be signed by the applicant and accompanied by the fee required by law.]

SEC. 111. Application for patent shall be made, or authorized to be made, by the inventor, except as otherwise provided in this title, in writing to the Commissioner. Such application shall include (1) a specification as prescribed by section 112 of this title; (2) a drawing as prescribed by section 113 of this title; and (3) an oath by the applicant as prescribed by section 115 of this title. The application must be accompanied by the fee required by law. The fee and oath may be submitted after the specification and any required drawing are submitted, within such period and under such conditions, including the payment of a surcharge, as may be prescribed by the Commissioner. Upon failure to submit the fee and oath within such prescribed period, the application shall be regarded as abandoned, unless it is shown to the satisfaction of the Commissioner that the delay in submitting the fee and oath was unavoidable. The filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office.

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§ 115. Oath of applicant

The applicant shall make oath that he believes himself to be the original and first inventor of the process, machine, manufacture, or composition of matter, or improvement thereof, for which he solicits a patent; and shall state of what country he is a citizen. Such oath may be made before any person within the United States authorized by law to administer oaths, or when, made in a foreign country, before any diplomatic or consular office of the United States authorized to administer oaths, or before any officer having an official seal and authorized to administer oaths in the foreign country in which the applicant may be, whose authority [shall be] is proved by certificate of a diplomatic or consular officer of the United States, or *apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States* and such oath shall be valid if it complies with the laws of the state or country where made. When the application is made as provided in this title by a person other than the inventor, the oath may be so varied in form that it can be made by him.

§ 116. [Joint inventors] *Inventors.*

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each sign the application and make the required oath, except as otherwise provided in this title.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever [a person is joined in an application for patent as joint inventor through error, or a joint inventor is not included in an application through error] *through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application,* and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.

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CHAPTER 16-DESIGNS

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§ 173. Term of design patent.

[Patents for designs may be granted for the term of three years and six months, or for seven years, or for fourteen years, as the applicant, in his application, elects.]

Patents for designs shall be granted for the term of fourteen years.

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PART III-PATENTS AND PROTECTION OF PATENT RIGHTS

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CHAPTER 25-AMENDMENT AND CORRECTION OF PATENTS

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§ 256. Misjoinder of inventor.

[Whenever a patent is issued on the application of persons as joint inventors and it appears that one of such persons was not in fact a joint inventor, and that he was included as a joint inventor by error and without any deceptive intention, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate deleting the name of the erroneously joined person from the patent.

[Whenever a patent is issued and it appears that a person was a joint inventor, but was omitted by error and without deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate adding his name to the patent as a joint inventor.

[The misjoinder or nonjoinder of joint inventors shall not invalidate a patent, if such error can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.]

§ 256. Correction of named inventor.

Whenever through error a person is named in an issued patent as the inventor, or through error an inventor is not named in an issued patent and such error arose without any deceptive intention on his part, the Commissioner may, on application of all the parties and assignees, with proof of the facts and such other requirements as may be imposed, issue a certificate correcting such error. The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section. The court before which such matter is called in question may order correction of the patent on notice and hearing of all parties concerned and the Commissioner shall issue a certificate accordingly.

CHAPTER 16-OWNERSHIP AND ASSIGNMENT

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§ 261. Ownership; assignment.

Subject to the provisions of this title, patents shall have the attributes of personal property.

Applications for patent, patents, or any interest therein, shall be assignable in law by an instrument in writing. The applicant, patentee, or his assigns or legal representatives may in like manner grant and convey an exclusive right under his application for patent, or patents, to the whole or any specified part of the United States.

A certificate of acknowledgment under the hand and official seal of a person authorized to administer oaths within the United States, or, in a foreign country, of a diplomatic or consular officer of the United States or an officer authorized to administer oaths whose authority is proved by a certificate of a diplomatic or consular officer of the United States, *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States,* shall be prima facie evidence of the execution of an assignment, grant or conveyance of a patent or application for patent.

An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration, without notice, unless it is recorded in the Patent and Trademark Office within three months from its date or prior to the date of such subsequent purchase or mortgage.

CHAPTER 29-REMEDIES FOR INFRINGEMENT OF PATENT, AND OTHER ACTIONS

Sec.
281. Remedy for infringement of patent.

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294. Voluntary arbitration.

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§ 294. Voluntary arbitration.

(a) A contract involving a patent or any right under a patent may contain a provision requiring arbitration of any dispute relating to patent validity or infringement arising under the contract. In the absence of such a provision, the parties to an existing patent validity or infringement dispute may agree in writing to settle such dispute by arbitration. Any such provision or agreement shall be valid, irrevocable, and enforceable, except for any grounds that exist at law or in equity for revocation of a contract.

(b) Arbitration of such disputes, awards by arbitrators and confirmation of awards shall be governed by title 9, United States Code, to the extent such title is not inconsistent with this section. In any such arbitration proceeding, the defenses provided for under section 282 of this title shall be considered by the arbitrator if raised by any party to the proceeding.

(c) An award by an arbitrator shall be final and binding between the parties to the arbitration but shall have no force or effect on any other person. The parties to an arbitration may agree that in the event a patent which is the subject matter of an award is subsequently determined to be invalid or unenforceable in a judgment rendered by a court to competent jurisdiction from which no appeal can or has been taken, such award may be modified by any court of competent jurisdiction upon application by any party to the arbitration. Any such modification shall govern the rights and obligations between such parties from the date of such modification.

(d) When an award is made by an arbitrator, the patentee, his assignee or licensee shall give notice thereof in writing to the Commissioner. There shall be a separate notice prepared for each patent involved in such proceeding. Such notice shall set forth the names and addresses of the parties, the name of the inventor, and the name of the patent owner, shall designate the number of the patent, and shall contain a copy of the award. If an award is modified by a court, the party requesting such modification shall give notice of such modification to the Commissioner. The Commissioner shall upon receipt of either notice, enter the same in the record of the prosecution of such patent. If the required notice is not filed with the Commissioner, any party to the proceeding may provide such notice to the Commissioner.

(e) The award shall be unenforceable until the notice required by subsection (d) is received by the Commissioner.

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TRADEMARK ACT OF 1946

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Sec. 8 (a). Duration of registration-Cancelation at end of 6 years unless affidavit of use filed.

Each certificate of registration shall remain in force for 20 years: *Provided*, That the registration of any mark under the provisions of this Act shall be canceled by the Commissioner at the end of 6 years following its date, unless within 1 year next preceding the expiration of such 6 years the registrant shall file in the Patent and Trademark Office an affidavit showing that said mark is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark. Special notice of the requirement for such affidavit shall be attached to each certificate of registration.

Sec. 8(b). Cancelation of republished prior registrations unless affidavit of use filed.

Any registration published under the provisions of subsection (c) of section 12 of this Act shall be canceled by the Commissioner at the end of 6 years after the date of such publication unless within 1 year next preceding the expiration of such 6 years and registrant shall file in the Patent and Trademark Office an affidavit showing that said marks is [still] in use *in commerce* or showing that its nonuse is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark.

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Sec. 11. Acknowledgments and verifications.

Acknowledgments and verifications required hereunder may be made before any person within the United States authorized by law to administer oaths, or, when made in a foreign country,

before any diplomatic or consular officer of the United States or before any official authorized to administer oaths in the foreign country concerned whose authority [shall] is proved by a certificate of a diplomatic or consular officer of the United States *or apostille of an official designated by a foreign country which, by treaty or convention, accords like effect to apostilles of designated officials in the United States*, and shall be valid if they comply with the laws of the state or country where made.

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Sec. 13. Opposition to registration of marks on the Principal Register.

Any person who believes that he would be damaged by the registration of a mark upon the principal register may upon payment of the required fee, file [a verified] *an* opposition in the Patent and Trademark Office, stating the grounds therefor, within thirty days after the publication under subsection (a) of section 12 of this Act of the mark sought to be registered. Upon written request prior to the expiration of the thirty-day period, the time for filing opposition shall be extended for an additional thirty days, and further extensions of time for filing opposition may be granted by the Commissioner for good cause *when requested prior to the expiration of an extension*. The Commissioner shall notify the applicant 86 of each extension of the time for filing opposition. [An unverified opposition may be filed by a duly authorized attorney, but such opposition shall be null and void unless verified by the opposer within a reasonable time after such filing to be fixed by the Commissioner.] An opposition may be amended under such conditions as maybe prescribed by the Commissioner.

SEC. 14. A [verified] petition to cancel a registration of a mark, stating the grounds relied upon, may, upon payment of the prescribed fee, be filed by any person who believes that he is or will be damaged by the registration of a mark on the principal register established by this Act, or under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905—

(a) within five years from the date of the registration of the mark under this Act; or

(b) within five years from the date of publication under section 12(c) hereof of a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905; or

(c) at any time if the registered mark becomes the common descriptive name of an article or substance, or has been abandoned, or its registration was obtained fraudulently or contrary to the provisions of section 4 or of subsections (a), (b), or (c) of section 2 of this Act for a registration hereunder, or contrary to similar prohibitory provisions of said prior Acts for a registration thereunder, or if the registered mark is being used by, or with the permission of, the registrant so as to misrepresent the source of the goods or services in connection with which the mark is used; or

(d) at any time if the mark is registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, and has not been published under the provisions of subsection (c) of section 12 of this Act; or

(e) at any time in the case of a certification mark on the ground that the registrant (1) does not control, or is not able legitimately to exercise control over, the use of such mark, or (2) engages in the production or marketing of any goods or services to which the certification mark is applied, or (3) permits the use of the certification mark for purposes other than to certify, or (4) discriminately refuses to certify or to continue to certify the goods or services of any person who maintains the standards or conditions which such mark certifies:

Provided, That the Federal Trade Commission may apply to cancel on the grounds specified in subsections (c) and (e) of this section any mark registered on the principal register established by this Act, and the prescribed fee shall not be required.

Sec. 15. Incontestability under certain conditions of right to use mark.

Except on a ground for which application to cancel may be filed at any time under subsections (c) and (e) of section 14 of this Act, and except to the extent, if any, to which the use of a mark registered on the principal register infringes a valid right acquired under the law of any State or Territory by use of a mark or trade name continuing from a date prior to the date of [the publication] *registration* under this Act of such registered mark, the right of the registrant to use such registered mark in commerce for the goods or services on or in conncection with which such registered mark has been in continuous use for 5 consecutive years subsequent to the date of such registration and is still in use in commerce, shall be incontestable: *Provided*, That—

(1) there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register; and

(2) there is no proceeding involving said rights pending in the Patent Office or in a court and not finally disposed of; and

(3) an affidavit is filed with the Commissioner within 1 year after the expiration of any such 5-year period setting forth those goods or services stated in the registration on or in connection with which such mark has been in continuous use for such 5 consecutive years and is still in use in commerce, and the other matters specified in subsections (1) and (2) hereof; and

(4) no incontestable right shall be acquired in a mark which is the common descriptive name of any article or substance, patented or otherwise.

Subject to the conditions above specified in this section, the incontestable right with reference to a mark registered under this Act shall apply to a mark registered under the Act of Mar. 3, 1881, or the Act of Feb. 20, 1905, upon the filing of the required affidavit with the Commissioner within 1 year after the expiration of any period of 5 consecutive years after the date of publication of a mark under the provisions of subsection (c) of section 12 of this Act.

The Commissioner shall notify any registrant who files the above-prescribed affidavit of the filing thereof.

Sec. 16. Interference.

[Whenever application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause *confusion or mistake or to deceive, the Commissioner may declare that an interference exists.] Upon petition showing extraordinary circumstances, the Commissioner may declare that an interference exists when application is made for the registration of a mark which so resembles a mark previously registered by another, or for the registration of which another has previously made application, as to be likely when applied to the goods or when used in connection with the services of the applicant to cause confusion or mistake or to decieve.* No interference shall be declared between an application and the registration of a mark the right to the use of which has become incontestable.

Aug. 27, 1982

[H.R. 6260]

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§ 31. Fees

(a) The Commissioner of Patents will establish fees for the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by and materials furnished by the Patent and Trademark Office related to trademarks and other marks. [Fees will be set and adjusted by the Commissioner to recover in aggregate 50 per centum of the estimated average cost to the Office of such processing. Fees for all other services or materials related to trademarks and other marks will recover the estimated average cost to the Office of performing the service or furnishing the material.] However, no fee for the filing or processing of an application for the registration of a trademark or other mark or for the renewal or assignment of a trademark or other mark will be adjusted more than once every three years. No fee established under this section will take effect prior to sixty days following notice in the Federal Register.

Patent and Trademark Office Appropriation Authorization

(b) The Commissioner may waive the payment of any fee for any service or material related to trademarks or other marks in connection with an occasional request made by a department or agency of the Government, or any officer thereof. The Indian Arts and Crafts Board will not be charged any fee to register Government trademarks of genuineness and quality for Indian products or for products of particular Indian tribes and groups.

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(52) **Request for Refunds**

In order to expedite the processing of refunds for payment of fees by actual mistake or in excess of the designated fees, attorneys and applicants requesting refunds should direct their correspondence to the attention of the "Refund Section, Accounting Division, Office of Finance." This procedure should be followed whether the request is for a refund check or for a credit to the deposit account. The problems of misrouting the request for a refund in the Patent and Trademark Office would be alleviated and the payment of refunds accelerated.

BRADFORD R. HUTHER
Assistant Commissioner for Finance & Planning

[1024 OG 59 (11-23-82)]

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(53) **Deposit Account Authorizations**

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in §§ 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed." A general authorization would not apply to document supply fees under § 1.19, such as those required for certified copies; to post-issuance fees under § 1.20 such as those required for maintenance fees; or to miscellaneous fees and charges under § 1.21, such as assignment recording fees.

Many applications filed prior to Oct. 1, 1982, contain broad language authorizing any additional fees which might have been due to be charged to a deposit account. The Patent and Trademark Office does not interpret such broad authorizations, filed in an application on or after Oct. 1, 1982, will be interpreted as authorization to charge the issue fee; as well as any other fee set forth in §§ 1.16, 1.17 or 1.18. Fees under sections 1.19, 1.20 and 1.21 will not be charged as a result of a general authorization under section 1.25.

It is recommended that authorizations to charge fees to deposit accounts include reference to the particular fees or fee sections of the rules which applicant intends to authorize. For example, if filing and processing fees under §§ 1.16 and 1.17 only are intended to be included in the authorization, and not the issue fee under § 1.18, the authorization could read: "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the entire pendency of the application to Deposit Account No. ." Such an authorization would clearly exclude issue fees under 37 CFR 1.18 while including all the filing and processing fees listed in 37 CFR 1.16 and 1.17. Similarly, if it were intended to authorize the charging of fees relating only to a specific paper, the authorization could read "The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. ." Such authorizations would cover situations in which a check to cover a filing and processing fee under 37 CFR 1.16 and 1.17 was omitted or was for an amount less than the amount required.

It is extremely important that the authorization be clear and unambiguous. If applicants file authorizations which are ambiguous and which deviate from the usual forms of authorizations, the Office may not interpret the authorizations in the manner applicants intend. In such cases applicants could be subject to further expenses, petitions, etc. in order to correct fees which were not charged as intended due to an ambiguous authorization.

July 1, 1983

GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks

[1032 OG 32]

(54) **Deposit Account Authorization to Charge Issue Fee**

This notice supplements the Official Gazette notice, dated July 1, 1983, published at 1032 O.G. 33 on July 26, 1983.

The rules of practice were amended effective Oct. 1, 1982, at 37 CFR 1.25(b) to state that: "A general authorization to charge all fees, or only certain fees, set forth in 37 CFR 1.16 to 1.18 to a deposit account may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed."

The Patent and Trademark Office will treat broad language to "charge any additional fees which may be required at any time during the prosecution of the application" as authorization to charge the issue fee on applications filed on or after Oct. 1, 1982.

Sept. 30, 1988

RENE D. TEGTMEYER
Assistant Commissioner for Patents

[1095 OG 44]

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(55) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987

DONALD W. PETERSON
Deputy Commissioner

[1083 TMOG 44]

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(56) **Posting of Filing Fee Codes**

We are making a minor change in the recording of fees so that we can speed up the processing of mail.

First, a brief explanation of the problem. Incoming mail to the PTO has soared. The number of envelopes received in the Mail Room in the first four months of this fiscal year is almost 30% higher than for the same period last year. This sudden increase has taxed existing resources and a backlog has developed. It takes a new employee over one year to become proficient in recognizing the hundreds of different types of documents entering the Office, the appropriate fee codes to apply, and the appropriate destination.

One of the most time-consuming functions of the Mail Room initial review clerks is the determination of how many independent and dependent claims there are in a patent application so that the appropriate amounts can be coded for the basic application fee, the extra independent claim fee, the extra total claim fee, and the multiple dependent claim fee. This can involve a substantial amount of time in complicated cases, particularly when there are preliminary amendments. With over 30,000 individual documents patent applications and all other mail to be processed and routed each day, such time-consuming delays have a severe adverse impact in moving all the work.

So, effective immediately, we are making a change which will move the mail more quickly. Rather than go through the time-consuming computation in the Mail Room to determine the amount to charge to each specific claim fee code, the total amount received will be recorded in one filing code. The detailed calculations will continue to be done later in the process where, in conjunction with the formality review of the application, the analysis takes place as to whether or not the fee submitted was correct. The individual charges remain the same and the information on claims contained in the application will continue to be reported on the application filing receipt without change. Here's what would be seen on deposit account charges and checks:

101-Includes amount for basic filing fee, extra independent claims, extra total claims, and multiple dependent claims, previously recorded as 101, 102, 103, and 104, respectively.
201-Includes same items as above for small entity applications, previously recorded as 201, 202, 203, and 204.
108-Includes same items as above for reissue applications, previously recorded as 108, 109, and 110.
208-Includes same items as above for small entity reissue applications, previously recorded as 208, 209, and 210.

This revised procedure allows us to be more efficient.

Mar. 31, 1988

THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1089 OG 57]

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(57) **Use of Metric System of Measurements in Patent Applications**

The ability of the United States to compete in world trade and improve our trade balance is becoming more important and more difficult each day as our competitors get stronger. Presently, the United States is the only industrial country which has not adopted the metric system of weights and measures. The lack of U.S. goods being produced and packaged under metric standards results in our country being at a competitive disadvantage in world markets.

To improve our competitiveness, in the 1988 trade bill, Congress established metric as the Nation's "preferred system of units for United States trade and commerce," and set a 1992 date for Federal agencies to complete their transition to metric uses in "procurement, grants and other business related activities".

To implement the congressional designation of the metric system of measurement for U.S. trade and commerce, the President on July 25, 1991, issued an Executive Order (Metric Usage in Federal Government Programs) for the Federal Government to lead the way in metric usage. The Department of Commerce has been designated as the lead agency responsible for coordinating usage by the Federal Government.

The Patent and Trademark Office (PTO) does not currently require weights and measures in patent applications to be stated in the metric system. However, in Section 608.01 of the Manual of Patent Examining Procedure, all patent applicants are strongly encouraged to use either (1) only metric units or (2) inch-pound units together with their metric equivalents, when describing their inventions in the specifications of patent applications.

In the spirit of the Executive Order, the PTO reiterates and emphasizes strong encouragement for patent applicants to use the metric system of weights and measurements in patent applications. At some future time when there has been a sufficient conversion to metric usage by U.S. research and development industries, the PTO will consider making it a requirement that patent applicants use metric units in patent applications.

Jan. 15, 1992

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1135 OG 55]

(58) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1, 2 and 10
[Docket No. 920671-3225]
RIN 0651-AA55

Changes in Signature and Filing Requirements for Correspondence filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce
Action: Final rule; correction.
Summary: The Patent and Trademark Office (Office) is correcting errors in the final rule which appeared in the Federal Register on Friday, October 22, 1993 (53 FR 54494). The regulations related to changes in signature and filing requirements for correspondence filed in the patent and Trademark Office contained in parts 1,2 and 10.
Effective Date: November 22, 1993.
For Further Information Contact: Abraham Hershkovitz by telephone at (703) 305-9282, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231

Supplementary Information:

Background

The final regulations that are the subject of these corrections, make changes to the rules of practice relating to signatures and filing requirements for correspondence filed in the Patent and Trademark Office.

Need for Correction

As published, the final regulations contain errors, which may be misleading and are in need of clarification. Several sections realting to receipt of facsimile transmissions in certain trademark documents were omitted.

Correction of Publication

Accordingly, the publication on October 22, 1993, of the final regulations (docket No. 920671-3225), which were the subject of FR Doc. 93-25864, is corrected as follows:

1. On page 54494, in the second column, at the end of the first partial paragraph, the following sentence should be added: "This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents which were not part of the proposed rulemaking."

2. On page 54495, in the second column, after the first full paragraph, the following paragraphs should be added: "This final rulemaking also expands the acceptability of facsimile transmissions to certain trademark documents, not included in the proposed rulemaking. These additional documents are:
(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C 1058(a), 1058(b), 1062(c);
(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;
(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).
The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1) through (3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051 (d)(2), for an extension of time to file a statement of use under 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1). See 1.8(a) (v), (viii), (ix), (xi) and (xii). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely"

3. On page 54495, second column, in the first sentence of the second full paragraph, "2.51, 2.52 or 2.72" should be revised to read "or 2.21".

4. On page 54495, second column, at the end of the third full paragraph, the following sentence should be added: "This final rulemaking also expands the acceptability of specimens filed in conjuction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8(a) or (b) or 12(c); and application for renewal under section 9 of the Trademark Act, 15 U.S.C. 1051 (c) and (d); 1058 (a) and (b); 1062(c) and 1059."

5. On page 54495, third column, in item numbered (2) §§ 2.51, 2.52, or 2.72" should be revised to read "§ 2.21".

6. On the page 54495, third column, the item numbered "(3)" at the bottom of the column, should be removed.

7. On page 54495, third column, the item numbered "(4)" at the bottom of the column, should be removed.

8. On page 54495, third column, the item numbered "(5)" should be redesignated as "(3)".

9. On page 54495, the item numbered "(6)" should be removed.

10. On page 54496, top of the first column, the item numbered "(7)" should be redesignated as "(4)".

11. On page 54496, top of the first column, the item numbered "(8)" should be redesignated as "(5)".

12. On page 54498, in lines 16 and 17, from the top of the third column, "2.51, 2.51, or 2.72" should be revised to read "or 2.21".

13. On page 54498, in the third column, at the end of the first paragraph, the following sentence should be added: "However, the suggestion has been adopted to the extent that the Office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1)."

14. On page 54502, in section 1.603, lines 4 and 5 should be revised to read "§ 1.8(a)(2)(i)(A) through (D) and (F); 1.8 (a)(2)(ii)(A) and (D); and 1.8(a)(2)(iii)(A)".

15. On page 54502, in section 1.8(a)(2) introductory text, the coma in the last line between "on" and "the" should be removed.

November 27, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

The corrected Final Rulemaking incorporating the changes identified above is set forth below.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Parts 1, 2 and 10
[Docket No. 920671-3225]
RIN 0651-AA55

Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases to: specify the types of correspondeace which will no longer require original signatures; provide for facsimile transmission of certain correspondence to the Office; discontinue use of the drop boxes at Crystal Plaza Building 3 and at the Department of Commerce Building in Washington, D.C.; and clarify other provisions with respect to practice before the Office.
Effective Date: November 22, 1993. These rules will be applicable to all correspondence filed with the Office on or after the effective date.
For Further Information Contact: Abraham Hershkovitz by telephone at (703) 305-9282, by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 36034 (August 12, 1992) and in the Patent and Trademark Office Official Gazette at 1142 Off. Gaz. Pat. Office 8-13 (September 1, 1992), the Office proposed to amend the rules of practice in patent and trademark cases to simplify the manner in which correspondence may be transmitted to the Office and clarify other provisions with respect to practice before the Office. This rulemaking includes changes to expand those situations where a party can use the Certificate of Mailing or Transmission procedure, and minor technical modifications in Part 2 of Title 37 of the Code of Federal Regulations which were not part of the proposed rulemaking. This rule making also expands the acceptability of facsimile transmissions to certain trademark documents which were not part of the proposed rulemaking.

Written comments were submitted by twenty-two law firms, five individuals, nine corporations, two organizations and three agencies. An oral hearing was not conducted.

The following includes a discussion of the rules being changed and the reasons for those changes, and an analysis of the comments received in response to the notice of proposed rule-making.

Discussion of Specific Sections to be Changed or Added:

(1) Types of Correspondence No longer Requiring Original Signatures (Section 1.4)

Section 1.4 is amended to include a new paragraph (d) to specify that most correspondence filed in the Office, which requires a person's signature, may be an original, or a copy thereof. See §§ 1.4 (e) and (f) for types of correspondence where the original must be filed in the Office. The word original, as used in this rulemaking, is defined as correspondence which is personally signed in permanent ink by the person whose signature appears thereon. Where copies of correspondence are acceptable, photocopies or facsimile transmissions may be filed. For example, a photocopy or facsimile transmission of an original of an amendment, declaration, petition, issue fee transmittal form, authorization to charge a deposit account, etc., may be submitted in a patent or trademark application. Furthermore, where copies are permitted, second and further generation copies (i.e., copy of a copy) are acceptable. The original, if not submitted to the Office, should be retained as evidence of proper execution in the event that questions arise as to the authenticity of the signature reproduced on the photocopy or facsimile-transmitted correspondence. If a question of authenticity arises, the Office may require submission of the original.

Section 1.4(e) identifies types of correspondence in which an original must be submitted to the Office. Where an original is required, copies are not acceptable and will not be accorded a receipt date. Correspondence, as referred to in this section, includes application forms for registration to practice before the Office and data sheets for the register of patent attorneys and agents.

Section 1.4(f) provides that when a document that is required by statute to be certified must be filed (such as a certified copy of a foreign patent application, pursuant to 35 U.S.C. 119; a certified copy of an international application, pursuant to 35 U.S.C. 365; a certified copy of a foreign trademark registration, pursuant to 15 U.S.C. 1126(e); a certified copy of a final court order, pursuant to 15 U.S.C. 1119; or a certified copy of a U.S. trademark registration), a copy of the certification, including a photocopy or facsimile transmission, will not be acceptable. The requirement for an original certification does not apply to certifications such as required under §§ 1.8, 1.10, 1.60, 1.97(e) and 3.73(b), since these certifications are not required by statute.

(2) Identification of Applications (Section 1.5) Section 1.5(a) is amended to make reference to the certificate procedure under § 1.8 consistent with the new title for § 1.8.

(3) Receipt of Correspondence (Section 1.6)

A descriptive heading is added to each paragraph of § 1.6 to identify the content of that paragraph.

The phrase "correspondence" is used in § 1.6 since the terms "papers", "letters" and "fees" all fall within the generic definition of "correspondence".

Section 1.6(a) is amended to clarify that correspondence transmitted by facsimile on weekends or Federal holidays within the District of Columbia, will be accorded the next business day as the date of receipt.

Sections 1.6(b) and (c) are amended to clarify that weekdays refer to any day except a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.6(c) is amended to delete reference to the box locations in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the Department of Commerce Building in Washington, D.C. The use of the drop boxes was discontinued on April 21, 1992, and the hours of operation for the attorney's window were extended to midnight, the same hours the drop boxes were available. The public can now deposit correspondence with the Office and obtain an acknowledgment of receipt after normal business hours. See "Changes in How Papers May Be Filed in the Patent and Trademark Office", 1137 Off. Gaz. Pat. Office 7 (April 7, 1992).

Use of the drop boxes at Crystal Plaza Building 3 and Department of Commerce Building locations had caused problems for both the public and the Office. Occasionally, it had been difficult to determine the dates of actual deposit of correspondence in the boxes. On occasion, Office employees and/or members of the public had been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place at the Department. Additionally, there were instances of correspondence being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). As a result, on occasion, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the boxes at Crystal Plaza Building 3 and at the Department of Commerce Building. Given these difficulties, and the fact that the necessity for these boxes has been greatly diminished as a result of the facsimile transmission and certificate of mailing procedures,1.6(c) is amended by deleting reference to the drop boxes at Crystal Plaza Building 3 and the Department of Commerce Building.

A new section 1.6(d) is added to specify the types of correspondence which may be transmitted by facsimile and former § 1.6(d) is revised to be consistent with § 1.8(b) and redesignated as § 1.6(e). The widespread use of facsimile transmission and the resulting time saved in correspondence between applicants and the Office prompted the Office to establish a trial program to accept facsimile transmission of certain correspondence. The policy on "Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1096 Off. Gaz. Pat. Office 30 (November 15, 1988) and was supplemented in the notice "Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission" published at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989). The policy on "Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1123 Off. Gaz. TM. Office 18 (February 12, 1991). In light of the success of the trial program, a policy on acceptance of facsimile transmission is incorporated into § 1.6(d). The situations where transmission of correspondence by facsimile is permitted have been increased over those permissible under the trial program outlined above. The situations where transmissions by facsimile remain prohibited are identified in 1.6(d)(1)-(9). Prohibitions cover situations where originals are required as specified in §§ 1.4 (e) and (f), and situations where accepting a facsimile transmission would be unduly burdensome on the

Office. As a courtesy, the Office will attempt to notify senders whenever correspondence is sent to the Office by facsimile transmission that falls within one of these prohibitions. Senders are cautioned against submitting correspondence by facsimile transmission which is not permitted under § 1.6(d) since such correspondence will not be accorded a receipt date.

This final rulemaking expands the acceptability of facsimile transmission to certain patent interference proceedings, not included in the proposed rulemaking, to reflect the practice set forth at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989).

This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents, not include in the proposed rulemaking. These additional documents are:

(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1)-(3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark act, 15 U.S.C. 1051 (d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1). See §§ 1.8 (a)(2)(i)(E) and 1.8 (a)(2)(ii)(B), (C), (E) and (F). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely.

Under § 1.6(d)(4) as adopted in this final rulemaking, drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21 may not be filed by facsimile in patent and trademark applications. The experience of the Office is that the quality of the drawings received by facsimile transmission is generally not sufficient to comply with the drawing requirements set forth in these rules. However, applicants may submit by facsimile transmission proposed drawing corrections for approval by the Office.

In trademark proceedings, the facsimile transmission of specimens in response to an Office action will be permitted. Facsimile-transmitted specimens must be legible in order to be accepted and examined as specimens. This final rulemaking also expands the acceptability of specimens filed in conjunction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8 (a) or (b) or 12(c); and applications for renewal under section 9 of the Trademark Act. 15 U.S.C. 1051 (c) and (d); 1058 (a) and (b); 1062(c) and 1059.

The date of receipt accorded to any correspondence permitted to be sent by facsimile transmission is the date the complete transmission is received by an Office facsimile unit, unless the transmission is completed on a Saturday, Sunday, or Federal holiday within the District of Columbia. Correspondence for which transmission was completed on a Saturday, Sunday, or Federal holiday within the District of Columbia, will be accorded a receipt date of the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia. For example, a facsimile transmission to the Office from California starting on a Friday at 8:45 p.m. Pacific time and taking 20 minutes, would be completed at 9:05 p.m. Pacific time. The complete transmission would be received in the Office around 12:05 a.m. Eastern time on Saturday. The receipt date accorded to the correspondence is the date of the following business day, which in this case, would be Monday (assuming that Monday was not a Federal holiday within the District of Columbia).

The following lists itemize types of correspondence which may not be filed by facsimile transmission, and, if submitted by facsimile, will not be accorded a date of receipt:

Correspondence Relative to Patents and Patent Applications Where Filing by Facsimile Transmission is Not permitted

(1) A document that is required by statute to be certified;

(2) A national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

(3) Drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, or 1.437;

(4) Correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

(5) Agreements between parties to an interference under 35 U.S.C. 135(c);

(6) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under 1.684(c); or an evidentiary record and exhibits under § 1.653;

(7) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1-5.8 of this chapter and directly related to the secrecy order content of the application;

(8) An international application for patent;

(9) A copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b);

(10) A request for reexamination under § 1.510.

Correspondence Relative to Trademark Registrations and Trademark Applications Where Filing by Facsimile Transmission is Not Permitted

(1) The filing of a trademark application;

(2) Drawings submitted under § 2.21;

(3) A petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

(4) Request for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(5) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal.

Correspondence Relative to Practitioner Registrations, Investigations, and Disciplinary Proceedings Where Filing by Facsimile Transmission is Not Permitted

Correspondence requiring a person's signature and relating to:

(1) Registration to practice before the Patent and Trademark Office in patent cases;

(2) Enrollment and disciplinary investigations; or

(3) Disciplinary proceedings.

(4) Certificate of Mailing or Transmission Procedure (Section 1.8)

The title of § 1.8 is changed from Certificate of Mailing to Certificate of Mailing or Transmission so as to include facsimile transmission.

Section 1.8(a) prescribes procedures for the use of a certificate of mailing or transmission to file papers or fees in the Office by first class mail or by facsimile transmission. The description of the Certificate of Mailing or Transmission practice is set forth in § 1.8(a)(1), and the list of exceptions to the certificate practice is found in § 1.8(a)(2). The phrase papers or fees "in § 1.8(a) is changed to correspondence" since both "papers and "fees" fall within the generic definition of correspondence. Paragraphs (a) and (b) of § 1.8 are amended to include correspondence transmitted by facsimile. In the event that correspondence is filed by facsimile transmission, it is recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. This report should be retained by the applicant, along with the correspondence used as the original, as evidence of content and date of transmission. Paragraph (a)(2) of § 1.8 is amended to include separate headings for correspondence which relate to patents, trademarks and disciplinary proceedings. The sequence of some of the paragraphs found in 1.8(a)(2) has been changed in order to have those paragraphs listed under the appropriate heading. The ability to use the Certificate of Mailing or Transmission procedures has been expanded to the filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065(3), the filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit, the filing of a notice and reasons of appeal under 35 U. S.C. 142 or a notice of appeal under 15 U.S.C. 1071(a)(2), and the filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

Paragraph (a)(2)(vi) of § 1.8 is redesignated as paragraph (a)(2)(x) and amended to refer to section 14(1) or 14(2) of the Trademark Act, 15 U.S.C. 1064, to conform with the numbering of the Trademark Law Revision Act of 1988. Other sections of paragraph (a)(2) of § 1.8 are amended to identify the types of correspondence which will not receive the benefit of a certificate of mailing or transmission.

Paragraph (b) of § 1.8 outlines procedures to be followed to document the timely filing of correspondence in accordance with § 1.8(a) where such correspondence is not received by the Office. The phrase "correspondence or fees" in § 1.8(b) is changed to "correspondence" since "fees" fall within the generic definition of "correspondence". Before adoption of this final rule, 1.8(b) required that the party forwarding the correspondence or fee include a declaration, under §§ 1.68 or 2.20 of this chapter, attesting to the previous timely mailing or transmission. In order to be consistent with other sections in Parts 1 and 2 of this chapter, the practice under § 1.8(b) is amended to permit a practitioner, as defined in § 10.1(r), to submit a statement rather than an oath or declaration under §§ 1.68 or 2.20 of this chapter. New paragraph (c) of § 1.8 is added to explicitly provide for a requirement for additional evidence relating to the mailing or transmission of correspondence in accordance with paragraph (a) of this section. The Office may invoke this requirement when it is deemed appropriate to establish an actual date of mailing or transmission. See, e.g., In re Klein, 6 USPQ2d 1547 (Comm'r Pat. 1987), aff'd sub nom. Klein v. Peterson, 696 F. Supp. 695, 8 USPQ2d 1434 (D.D.C. 1988), aff'd 866 F.2d 412, 9 USPQ2d 1558 (Fed. Cir.), cert. denied, 490 U.S. 1091 (1989).

(5) Time for Appeal or Civil Action (Section 1.304)

In section 1.304. paragraphs (a) and (c) are amended to delete a statement that use of the certificate procedure under § 1.8 is prohibited so as to be consistent with changes to § 1.8. Also, a cross reference to 1.658 in paragraph (a) is clarified.

(6) Submission of Mainteanance Fees (Section 1.366)

Section 1.366(b) is amended by deleting the words "of mailing" to conform with the new title for § 1.8.

(7) Filing Date of Application for Extension of Patent Term Section 1.741(a) Section 1.741(a) is amended to conform with the new title for the certificate procedure under § 1.8.

(8) Appeal to Court and Civil Action (Section 2.145)

Sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with the revised list of types of correspondence excluded from the certificate of mailing or transmission procedure set out in § 1.8. Formerly, the notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), and the filing of notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2), were specifically excluded, under §§ 1.8(a)(2) (viii) and (ix), respectively, from the certificate of mailing procedure. Since these notices are no longer excluded under amended § 1.8(a)(2), sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with § 1.8 by deleting the last sentence which provided that the certificate of mailing procedure was not available.

(9) Reconsideration of Affidavit or Declaration (Section 2.165) Section 2.165(a)(1) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

(10) Signature and Certificate of Practitioner (Section 10.18) Section 10.18 is modified to clarify signature requirements for correspondence signed by practitioners. The reference to § 1.4 of this chapter will make it apparent that copies, including photocopies or facsimile transmissions, of correspondence signed by practitioners will be accepted under appropriate circumstances.

(11) Misconduct (Section 10.23(c))

Section 10.23(c) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment: In order to clarify how the Office will treat a copy of a paper, one comment suggested changing the second sentence in proposed § 1.4(d) to indicate that, except as provided in §§ 1.4 (e) and (f), a copy would be treated by the Office as if the original had been filed.

Response: While the suggested language was not adopted, the rule was modified to clarify that, except as provided in §§ 1.4 (e) and (f), an original or a copy thereof may be filed. The rules as stated in this final rulemaking are clear that, where an original is not required, a paper filed will be treated in the same way regardless of whether it is an original or a copy.

Comment: Five comments objected to a perceived requirement in § 1.4(d) that the color of ink used for signing a paper be different from the printing on the paper.

Response: Proposed § 1.4(d) did not require that the color of ink used for signing a paper be different from the printing on the paper. The suggested use of different colors of ink is a preferred procedure for distinguishing between an original and a copy. However, in order to avoid further confusion, the suggestion that a different color of ink be used has been deleted.

Comment: One comment recommended that the issue of signature authenticity end upon issuance of a patent in order to reduce the need to keep files in storage for long periods of time and to remove the burden on applicants of having to retrieve files from storage.

Response: Once a patent issues, the Office is not likely to inquire into any matters related to signature authenticity of correspondence filed in that patent application. Nevertheless, on rare occasions, a question of signature authenticity might arise after issuance of a patent. Applicants must therefore make their own decisions as to how long to retain originals.

Comment: Two comments questioned the justification for proposed § 1.4(e) requiring originals to be submitted in international patent applications.

Response: Section 1.4(e), as adopted, does not prohibit the filing of photocopies in an international patent application. With regard to facsimile transmissions, Patent Cooperation Treaty (PCT) Rule 92.4, as revised on July 1, 1992, permits the filing by facsimile of certain correspondence related to an international patent application. However, as indicated in §§ 1.6(d)(3), 1.8(a)(2)(iv) and 1.8(a)(2)(vi), the filing by facsimile is not permitted in the following situations relative to international applications for patent: (1) the filing of an international application for patent and (2) the filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in §§ 1.494(b) or 1.495(b).

Applicants are cautioned, however, that the Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence filed in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority, regardless of whether the correspondence was filed by mail or facsimile transmission. See § 1.8(a)(2)(5).

Comment: One comment suggested that, in applications filed under § 1.60, the certification that the application and papers being filed are true copies of those filed in the parent application should be excluded from the original signature requirement.

Response: Filing of copies of statements under § 1.60 as well as certifications under §§ 1.8, 1.10, 1.97(e) and 3.73(b) will be permitted. The certified documents referred to in § 1.4(f) are those which are required to be certified by statute (e.g., certified documents under 35 U.S.C. 119).

Comment: One comment questioned whether routine papers could be photocopied with a practitioner's signature thereon with appropriate information being filled in later by another person.

Response: Section 10.18(a) states that the signature of a practitioner, on correspondence filed, constitutes a certificate that the correspondence has been read by the practitioner. Accordingly, the photocopying of papers with a practitioner's signature

thereon and subsequently having appropriate information filled in by another person, is not authorized or permitted under the rules.

Comment: One comment questioned whether a docket clerk could use a signature stamp of a registered attorney on a transmittal letter.

Response: Section 10.18(a) states that correspondence filed by a practitioner must be personally signed by that practitioner. Accordingly, use of a signature stamp of a registered attorney by a docket clerk would not be permitted.

Comment: Two comments suggested that the facsimile transmission practice be further liberalized to permit scanned-in signatures to be affixed to facsimile or electronically transmitted correspondence. The personal, handwritten signature would be affixed on a copy of the transmitted correspondence which would be kept by the applicant or his or her representative.

Response: The Office is actively considering acceptance of electronically filed applications and papers related thereto. See "Electronic Filing of Patent and Trademark Applications" published at 57 FR 56537 (November 30, 1992) and 1145 Off. Gaz. Pat. Office 378 (December 22, 1992). Until an acceptable program is established, every paper, requiring a signature, filed in the Office, regardless of the manner in which it was transmitted, will have to be a paper which was signed by the person whose signature appears thereon, or be a copy thereof. Scanned signatures affixed to papers which were not personally signed will not be permitted at this time.

Comment: One comment indicated that proposed § 1.5(a) appeared to be contrary to PCT Article 27(1) in that it added the additional requirement not set forth in the PCT of requiring correspondence concerning an international application to identify the international application number.

Response: PCT Rule 92.1 requires any paper relating to an international application to identify the international application to which it relates. In order to ensure prompt and proper association of correspondence with the intended application file, it is essential to use the application number on all papers. The practice (which was not a new one added in this rulemaking) is a mere implementation of the requirement in PCT Rule 92.1 and is not contrary to PCT Article 27(1) as no additional requirement is being placed on applicants.

Comment: Two comments recommended an increase from two weeks to 30 days or one month in the period provided in § 1.5(a) for resubmission of correspondence.

Response: The two-week period provided in § 1.5(a) is to enable applicants to provide the necessary identifying data where such data was not provided during the original submission. This is intended to permit immediate resubmission and no additional time is deemed to be necessary. Extending this period to 30 days would unnecessarily delay prosecution of applications.

Comment: Section 1.5(a) suggests that all letters directed to the Office concerning applications for patents should also state "Patent Application". One comment suggested that § 1.5(a) be amended to replace the restrictive reference to a "Patent Application" to read "identifying the correspondence a relating to a patent application".

Response: In order to make it easier for Office employees handling incoming correspondence to direct mail, § 1.5(a) recommends that letters relating to a patent application should state "Patent Application". The suggestion in the comment was not adopted since uniformity in the reference to "Patent Application" is desirable. Furthermore, this suggested labeling is not a requirement as evidenced by the use of the word "should" rather than "must".

Comment: Section 1.5(a) states that "No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office". One comment suggested that the phrase "notification of the application number" was not adequately defined as it was not clear if applicants had to wait for the official filing receipt before information disclosure statements or other papers could be filed.

Response: The phrase "notification of the application number" as used in 1.5(a) includes any manner in which an applicant becomes aware of the application number. The phrase is purposely broad and is not limited to the mailing of an official filing receipt. Rather, it includes a return post card which has an application number stamped thereon. The reasoning behind the statement in § 1.5(a) that no correspondence should be filed prior to notification of the application number is that correspondence received without an application number is difficult to match with the appropriate file. Further defining the phrase "notification of the application number" in 1.5(a) is not warranted.

Comment: One comment suggested defining a business day as Monday through Friday, except for Federal holidays in the District of Columbia.

Response: It is not clear which section the comment was directed to, but § 1.6 indicates that no correspondence will be received by the Office on Saturdays, Sundays or Federal holidays within the District of Columbia. Since the language has not created problems in the past, the suggestion will not be adopted.

Comment: Two comments suggested amending § 1.6(c) to indicate the hour of operation of the "walk-up window".

Response: Specifying in the regulations the hours of operation of the "walk-up window" is unnecessary. The hours of operation have been published in Official Gazette announcements and if those hours are changed in the future, the new schedule will published. Should the hours of operation of the "walk-up window" be changed due to unforeseen circumstances (i.e., snow emergency, etc.), a sign will be posted at the "walk-up window" giving an alternate location to deposit correspondence for the Office.

Comment: Two comments requested that the Office reconsider and withdraw the proposal to eliminate the mail drop box at the guard's desk at the Department of Commerce Building in Washington, D. C.

Response: As indicated in the notice of proposed rulemaking, members of the public were occasionally denied access to the drop box at the Department of Commerce. Additionally, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the box as a result of instances when correspondence was found outside of the drop box. Further, since there are many ways to file papers with the Office (i.e., certificate of mailing or transmission, Express Mail, facsimile transmission, longer hours at the "walk-up-window"), there is no need to maintain an off-site drop box.

Comment: One comment suggested that the Office publish phone numbers for facsimile machines at various locations, (i.e., Publishing Division, various examining groups, etc.), in order to enable the public to direct their transmissions to a particular location, rather than a central location.

Response: The suggestion has been adopted. See "Patent and Trademark Office (PTO) Information Contacts", 1149 Off. Gaz. Pat. Office 67 (April 27, 1993). The Office will publish in the Official Gazette periodic updates of this list.

Comment: Three comments advocated a further expansion of the facsimile transmission practice to permit transmission of any paper which did not require an original signature. According to the comment, it was difficult to understand why the Office would not permit facsimile transmission of certain papers directly to the Office, but would accept those same papers if transmitted by facsimile to a third party who then hand-delivered the papers to the Office.

Response: The only papers, not requiring an original signature or certification, which the Office will not accept by facsimile transmission are those which, for various reasons, would cause an undue burden on the Office. For example, papers submitted for the purpose of obtaining an application filing date are often rather voluminous difficult to collate and would create inefficiencies in tying up the Office facsimile machines for long periods of time. In addition, there is a time and content criticality to papers filed for the purpose of obtaining a filing date which is not shared by other types of papers. Another example would be drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21. Experience has shown that the quality of drawings received by facsimile transmission would typically result in an objection by the Official Draftsman. Disputes might arise at that point as to whether the cause of the poor quality was applicant's transmitting unit or the receiving unit of the Office. Hence, the Office will continue to prohibit facsimile transmission of certain papers as specified in § 1.6(d). However, the suggestion has been adopted to the extent that the office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).

Comment: Section 1.6(d) states that the receipt date accorded to a paper transmitted by facsimile will be the date on which the complete transmission is received in the Office. Three comments objected to this language by arguing that this practice discriminated against West Coast practitioners and gave an advantage to East Coast practitioners because the West Coast practitioners had only until 9 P.M. to complete a transmission in order to receive the benefit of that day's filing.

Response: The facsimile transmission practice is similar to regular mail practice. Thus, a West Coast practitioner depositing correspondence with the local postal service without a certificate of mailing will receive as a receipt date the date on which the Office receives the correspondence, rather than the date on which the correspondence was deposited. Similarly, a paper transmitted by facsimile will be accorded, as the date of receipt, the date on which the complete transmission was received in the Office, unless the date of receipt is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, the date of receipt will be the next business day.

The certificate practice provided in § 1.8, on the other hand, permits the sender to indicate on the correspondence the date of mailing or transmission from the sender's perspective, which date would then be effective to meet a deadline set for response. Use of the certificate of mail or transmission is applicable to correspondence submitted by mail and correspondence transmitted by facsimile. If transmitted by facsimile, the person signing the certificate certifies the expectation that the transmission would be initiated before midnight, local time.

By way of example, a West Coast practitioner preparing a response on the last day of the period for response would have to use the § 1.8 certificate of mailing procedure or the § 1.10 Express Mail procedure, for the response to be considered timely, if the correspondence was sent by way of the U. S. Postal Service. If the practitioner chose to send the correspondence by facsimile on the last day for response and the transmission was started before 9:00 p.m. Pacific time, but was completed after 9:00 p.m. Pacific time, the Office would accord that correspondence a receipt date as of the next business day, which would be after the period for response expired because the Office would have received the correspondence after midnight Eastern time of the last day for response. However, if the practitioner affixed a certificate of transmission to the correspondence sent by facsimile transmission, indicating that the correspondence was being transmitted on the last day in the period for response, then the correspondence would be considered timely filed.

As another example, a transmission started before midnight, Pacific time, on the last day for response and having a certificate of transmission affixed thereto, would be considered timely filed even though the transmission was completed after midnight, Pacific time and was received in the Office the day after the deadline for response.

Comment: One comment suggested replacing "drawings" in § 1.6(d)(4) with "formal drawings" for clarity.

Response: The suggestion has not been adopted because the phrase "formal drawings" does not find support or antecedent basis in sections referred to in § 1.6(d)(4).

Comment: One comment objected to the perceived requirement for a certificate of transmission in order for a facsimile-transmitted document to be accorded a date of receipt.

Response: The receipt date accorded to correspondence eligible for facsimile transmission, whether containing a certificate of transmission or not, will be the date of receipt in the Office of the complete transmission (unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date accorded will be the next business day). The certificate of transmission, if used, is for purposes of establishing timely filing if the correspondence is transmitted within the period for response but is (1) received in the Office after expiration of the period for response, or (2) lost or (3) not received by the Office.

Comment: One comment requested clarification as to what constituted a "complete transmission" as used in § 1.6(d).

Response: The context in which the phrase "complete transmission" was used in 1.6(d) was to indicate that the transmission was finished. For example, if page 1 of a ten-page facsimile transmission is received in the Office at 11:55 p.m. on a Tuesday and page 10 ofthat transmission is received at 12:05 a.m. Wednesday, the receipt date accorded to that correspondeace will be the date of that Wednesday. (This example assumes that Wednesday is not a Federal holiday within the District of Columbia).

Comment: One comment questioned whether a confirmation in the sender's facsimile machine that the entire facsimile was received constituted sufficient proof that a transmission was complete.

Response: A confirmation by the sender's facsimile machine is evidence that a transmission was made. As such, the confirmation will be considered together with any other evidence presented when questions of filing by facsimile transmission arise. It is therefore suggested that a certificate of transmission be used to enable the sender to rely on the procedures set forth in § 1.8(b).

Comment: One comment requested clarification as to what constituted an incomplete, faulty or illegible facsimile. Also, if an incomplete transmission was sent near the end of the period for response, will the sender be able to rely on the date the facsimile was initially transmitted, or would the sender have to rely on § 1.137 to revive the application if it became abandoned?

Response: If an incomplete, faulty or illegible facsimile transmission is received, that correspondence will be treated by the Office in the same manner that a comparably incomplete, faulty or illegible piece of correspondence would be treated if the correspondence were hand-delivered or mailed to the Office. Whether the application would be held abandoned upon receipt of an incomplete facsimile transmission or whether an opportunity would be provided to complete the transmission will be decided on a case-by-case basis using the same standards that are currently used - for example, for incomplete *responses* to Office actions, see § 1.135(c).

Comment: One comment indicated that the proposed practice of not accepting papers related to international applications if transmitted by facsimile and the indication that papers transmitted by facsimile, when prohibited, may be disposed of is contrary to PCT practice wherein PCT expressly provides for facsimile transmission of such papers and when not acceptable, an opportunity to correct is provided.

Response: PCT does not mandate acceptance of facsimile transmissions; it merely authorizes their acceptance. See PCT Rule 92.4(h). Additionally, as indicated above, the suggestion that the Office permit facsimile transmission of correspondence relative to an already filed international application has been adopted to a large extent.

There is no provision in PCT to provide an opportunity for correction when correspondence is filed by facsimile in spite of a refusal by a national Office to accept that type of correspondence by facsimile. As with national applications, the Office will attempt to notify senders whenever a facsimile transmission received is of a type which the Office has not agreed to accept by facsimile. Senders are cautioned against submitting such correspondence by facsimile transmission since the correspondence will not be accorded a filing date or date of receipt in the Office.

Comment: One comment suggested changing the phrase "Certificate of Transfer" in § 1.8 to "Certificate of Transmittal" or "Certificate of Sending" because "transfer" typically implies transfer of ownership interest in patents or trademarks.

Response: While each phrase has its own advantages and drawbacks, the suggestion will not be adopted. Nevertheless, in order to avoid confusion, this rulemaking leaves the old "Certificate of Mailing" intact, while adding "or Transmission" to include correspondence filed by facsimile transmission.

Comment: In the notice of proposed rulemaking, it was recommended that the facsimile machine transmission report be retained by the sender along with the correspondence used as the original, as evidence of content and date of transfer. One comment indicased that the correspondence used as the original can only be retained using the older stand-alone type of facsimile machine, since there is no such physical document with the newer in-computer facsimile cards.

Response: Section 1.4(d)(2) provides for submission of copies,

e.g., by facsimile, of originals as defined in § 1.4(d)(1). Section 1.4(d)(2) does not provide for transmission of unsigned correspondence from a computer. While 1.4(d)(2) does not require the sender to retain the original, there may be occasions when the sender will have to document the date and content of a document previously filed by facsimile transmission. The recommendation made in the notice of proposed rulemaking will apply to any situation where a paper document served as the original from which a facsimile was transmitted. If a facsimile transmission by using a computer is desired, a paper copy of the document to be transmitted may be printed out, signed and retained by the sender as evidence of content of the document transmitted. Once signed, if filing of a copy is permitted, the document could be scanned into the computer and facsimile transmitted to the Office.

Comment: In proposed section 1.8(a)(1) published in the Federal Register, paragraphs (i) and (ii) were joined with the alternative "or" to indicate that correspondence could be filed by being deposited with the U. S. Postal Service or transmitted by facsimile. This same section was published in the Official Gazette, by having paragraphs (i) and (ii) joined with the connective "and". Numerous comments, received apparently from individuals who saw the proposed rules in the Official Gazette, objected to the requirement that, in order to receive benefits under § 1.8, correspondeace transmitted by facsimile also had to be mailed.

Response: Section 1.8(a)(1) as published in the Federal Register was correct, while the version published in the Official Gazette contained a typographical error. Hence, §§ 1.8(a)(1)(i) (A) and (B), as adopted in this rulemaking, make clear that the certificate of mailing or transmission practice will be applicable to correspoadence mailed or sent by facsimile. The Office discourages the practice of having the same papers submitted by both methods as this practice would result in unnecessary duplication of papers and processing requirements.

Comment: One comment indicated that since all facsimile transmissions include the date and time of the actual facsimile transmission, the Office should not require a certificate of transmission, in order to get the beaefit of an earlier filing date under § 1.8(a), when correspondeace is transmitted by facsimile.

Response: The Office is concerned that some older machines may not print the date and time of the acuual transmission. Furthermore, even on the new machines the date and time printed by the sending unit may not always be correct, particularly after a temporary electrical disconnection, change in time, etc. Hence, for purposes of being considered timely filed, if the sender wishes to obtain the benefits of a date earlier than the date the complete transmission is received in the Office, the correspondence must include a certification in accordance with § 1.8(a).

A suggested format for a Certificate of Mailing and a Certificate of Transmission under § 1.8, to be included with the correspondence, is reproduced below:

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

on

_____ _____
Date Signature

_____
Typed or printed name
of person signing certificate

Certificate of Transmission

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office:

on

_____ _____
Date Signature

_____
Typed or printed name
of person signing certificate

OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et Seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate existing Office policy into the regulations, permit the filing of certain correspondence without an original signature and permit the filing of certain correspondence by facsimile transmission.

The Office has determined that these rule changes are not major rules under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S C. 3501 et seq., which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0009 and 0651-0011. The public reporting burden for these collections of information for Certificates of Mailing or Transmission is estimated to average 0.1 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Abraham Hershkovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0011).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. In Section 1.4, the title is revised and paragraphs (d) through (f) are added to read as follows:

§ 1.4 Nature of correspondence and signature requirements.

•••••

(d) Each piece of correspondence, except as provided in paragraphs (e) and (f) of this section, filed in a patent or trademark application, reexamination proceeding, patent or trademark interference proceeding, patent file or trademark registration file, trademark opposition proceeding, trademark cancellation proceeding, or trademark concurrent use proceeding, which requires a person's signature, must either:

(1) be an original, that is, have an original signature personally signed in permanent ink by that person; or

(2) be a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of an original. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original.

(e) Correspondence requiring person's signature and relating to registration to practice before the Patent and Trademark Office in patent cases, enrollment and disciplinary investigations, or disciplinary proceedings must be submitted with an original signature personally signed in permanent ink by that person.

(f) When a document that is required by statute to be certified must be filed, a copy, including a photocopy or facsimile transmission, of the certification is not acceptable.

3. Section 1.5(a) is revised to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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4. In section 1.6, is revised, to read as follows:

§ 1.6 Receipt of correspondence.

(a) Date of receipt and Express Mail date of deposit.

Correspondence received in the Patent and Trademark Office is stamped with the date of receipt except as follows:

(1) No correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia;

(2) Correspondence filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or Federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia;

(3) Correspondence transmitted by facsimile to the Patent and Trademark Office will be stamped with the date on which the complete transmission is received in the Patent and Trademark Office unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

(b) Patent and Trademark Office Post Office pouch.

Mail placed in the Patent and Trademark Office pouch up to midnight on any day, except Saturdays, Sundays and Federal holidays within the District of Columbia, by the post office at Washington, D.C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch by the U.S. Postal Service.

(c) Correspondence delivered by hand.

In addition to being mailed, correspondence may be delivered by hand during hours the Office is open to receive correspondence.

(d) Facsimile transmission.

Except in the cases enumerated below, correspondence, including authorizations to charge a deposit account, may be transmitted by facsimile. The receipt date accorded to the correspondence will be the date on which the complete transmission is received in the Patent and Trademark Office, unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia. See § 1.6(a)(3). To facilitate proper processing, each transmission session should be limited to correspondence to be filed in a single application or other proceeding before the Patent and Trademark Office. The application number of a patent or trademark application, the control number of a reexamination proceeding, the interference number of an inter-

ference proceeding, the patent number of a patent, or the registration number of a trademark should be entered as a part of the sender's identification on a facsimile cover sheet. Facsimile transmissions are not permitted and if submitted, will not be accorded a date of receipt, in the following situations:

(1) Correspondence as specified in § 1.4(e), requiring an original signature;

(2) Certified documents as specified in § 1.4(f);

(3) Correspondence which cannot receive the benefit of the certificate of mailing or transmission as specified in §§ 1.8(a)(2)(i)(A) through (D) and (F); 1.8 (a)(2)(ii)(A) and (D); and 1.8 (a)(2)(iii)(A);

(4) Drawings submitted under §§ 1.81, 1.83 through 1.85, 1.152, 1.165, 1.174, 1.437, 2.51; 2.52, or 2.72;

(5) A request for reexamination under § 1.510;

(6) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1 through 5.8 of this chapter and directly related to the secrecy order content of the application;

(7) Requests for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(8) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal;

(9) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653.

(e) Interruptions in U.S. Postal Service.

If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any correspondence which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and

(2) Accompanied by a statement indicating that such correspondence would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

5. Section 1.8 is revised to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) Except in the cases enumerated in paragraph (a)(2) of this section, correspondence required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if the procedure described in this section is followed. The actual date of receipt will be used for all other purposes.

(1) Correspondence will be considered as being timely filed if:

(i) the correspondence is mailed or transmitted prior to expiration of the set period of time by being:

(A) deposited with the U.S. Postal Service with sufficient postage as first class mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231; or

(B) transmitted by facsimile to the Patent and Trademark Office in accordance with § 1.6(d); and

(ii) the correspondence includes a certificate for each piece of correspondence stating the date of deposit or transmission. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed or transmitted on or before the date indicated.

(2) The procedure described in paragraph (a)(1) of this section does not apply to, and no benefit will be given to a Certificate of Mailing or Transmission on the following:

(i) Relative to Patents and Patent Applications

A. The filing of a national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

B. The filing of correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

C. The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

D. The filing of an international application for patent;

E. The filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority;

F. The filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b).

(ii) Relative to Trademark Registrations and Trademark Applications

A. The filing of a trademark application;

B. The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

C. The filing of an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

D. The filing of a petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

E. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1);

F. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(l).

(iii) Relative to Disciplinary Proceedings

A. Correspondence filed in connection with a disciplinary proceeding under Part 10 of this chapter.

B. Reserved.

(b) In the event that correspondence is considered timely filed by being mailed or transmitted in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence will be considered timely if the party who forwarded such correspondence:

(1) informs the Office of the previous mailing or transmission of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(2) supplies an additional copy of the previously mailed or transmitted correspondence and certificate, and

(3) includes a statement which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing or transmission. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter. If the correspondence was sent by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.

(c) The Office may require additional evidence to determine if the correspondence was timely filed.

6. Section 1.304 paragraphs (a) and (c) are revised to read as follows:

§ 1.304 Time for appeal or civil action.

(a)(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:

(i) 14 days after service of the notice of appeal or the summons and complaint, or

(ii) Two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

(a)(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or § 1.645 (a) or §§ (b). (a)(3) The Commissioner may extend the time for filing an appeal or commencing a civil action:

(i) For good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or

(ii) Upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

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(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint.

7. Section 1.366(b) is revised to read as follows:

§ 1.366 Submission of maintenance fees.

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(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362 (d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate procedures of either §§ 1.8 or 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

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8. Section 1.741, paragraph (a) is revised to read as follows:

§ 1.741 Filing date of application.

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing or Transmission" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

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PART 2-RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:
Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 2.145 is amended by revising Paragraphs C(3) and D(1) to read as follows:

§ 2.145 Appeal to Court and Civil Action.

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(c) ***

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119.

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(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or § 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires

(i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later.

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11. Section 2.165(a)(1) is revised to read as follows:

§ 2.165 Reconsideration of Affidavit or Declaration

(a)(l) If the affidavit or declaration filed pursuant to § 2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the registration or from the date of publication under section 12(c) of the Act. The Certificate of Mailing or Transmission" procedure provided by § 1.8 does not apply to affidavits or declarations or to supplemental or substitute affidavits or declarations filed under section 8(a) or (b) of the Act, but the certificate by "Express Mail" procedure provided by § 1.10 does apply thereto.

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PART 10-REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

12. The authority citation for 37 CFR Part 10 continues to read as follows:
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32 41.

13. Section 10.18, is revised to read as follows:

§ 10.18 Signature and certificate of practitioner.

(a) Except where a copy, including a photocopy or facsimile transmission, of a personally signed piece of correspondence is permitted to be filed pursuant to § 1.4 of this chapter, every piece of correspondence filed by a practitioner on behalf of himself or herself or representing an applicant or a party to a proceeding in the Patent and Trademark Office must bear an original signature personally signed in permanent ink by such practitioner except for correspondence which is required to be signed by the applicant or party. The signature of a practitioner on correspondence filed by the practitioner, regardless of

whether the correspondence has an original signature or is a copy, including a photocopy or facsimile transmission, of correspondence bearing an original signature, constitutes a certificate that:

(1) The correspondence has been read by the practitioner;

(2) The filing of the correspondence is authorized;

(3) To the best of practitioner's knowledge, information, and belief, there is good ground to support the correspondence, including any allegations of improper conduct contained or alleged therein; and

(4) The correspondence is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

14. Section 10.23, paragraph (c)(9), is revised to read as follows:

10.23 Misconduct

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(c) ***

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under 1.8 of this chapter or a certificate of "Express Mail" under § 1.10 of this chapter.

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Oct. 15, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1157 OG 86]

(58A) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 961030301-6301-01]
RIN 0651-AA55

Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Correcting amendment.
Summary: This document contains a further correction to the final regulations which were published Friday, October 22, 1993 (58 FR 54494). The regulations related to the changes in signature and filing requirements for correspondence filed in the Patent and Trademark Office. The correction re-inserts part of a rule (37 CFR 1.741) that was inadvertently deleted when the rule was amended.
Effective Date: December 3, 1996.
For Information Contact: Karin Tyson by telephone at (703) 305-9285; by mail marked to her attention and addressed to the Assistant Commissioner for Patents, Box COMMENTS - PATENTS, Washington, D.C. 20231; or by fax marked to her attention at (703) 308-6916.

Supplementary Information:
Background

The final regulation that is the subject of this correction was revised to change "Certificate of Mailing" to "Certificate of Mailing or Transmission" in 37 CFR 1.741(a) as published at 58 FR 54494 (October 22, 1993), corrected at 58 FR 64154 (December 6, 1993), and in the Official Gazette of the Patent and Trademark Office at 1156 Off. Gaz. Pat. Office 61 (November 16, 1993), corrected at 1157 Off. Gaz. Pat. Office 87 (December 28, 1993).

Need for Correction

As published, the final regulation inadvertently deleted the last sentence of the first paragraph of paragraph (a) of Rule 741 and paragraphs (a)(1) — (a)(6).

Paperwork Reduction Act Statement

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

OMB has approved the collection of the information required by this rule under OMB # 0651-0020.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Freedom of Information, inventions and patents, Reporting and record keeping requirements.

PART 1—RULES OF PRACTICE IN PATENT CASES

Accordingly, 37 CFR Part 1 is corrected by making the following correcting amendment:

1. The authority citation for 37 CFR part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In § 1.741, paragraph (a) is revised to read as follows:

§ 1.741 Filing date of application.

(a) The filing date of an application for extension of a patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing or Transmission" procedures of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10. A complete application shall include:

(1) An identification of the approved product;

(2) An identification of each Federal statute under which regulatory review occurred;

(3) An identification of the patent for which an extension is being sought;

(4) An identification of each claim of the patent which claims the approved product or a method of using or manufacturing the approved product;

(5) Sufficient information to enable the Commissioner to determine under 35 U.S.C. 156 subsections (a) and (b) the eligibility of a patent for extension and the rights that will be derived from the extension and information to enable the Commissioner and the Secretary of Health and Human Services or the Secretary of Agriculture to determine the length of the regulatory review period; and

(6) A brief description of the activities undertaken by the marketing applicant during the applicable regulatory review period with respect to the approved product and the significant dates applicable to such activities.

November 26, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1193 OG 106]

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(59) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 920666-2275]
RIN 0651-AA59

Changes in Practice Relating to Filing Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.

Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to provide a uniform practice with respect to filing an oath or declaration and filing fees in continuing applications.
Effective Date: Jan. 4, 1993. These rules will be applicable to all papers and applications filed with the Office on or after the effective date.
For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 31344) on July 15, 1992, and in the Patent and Trademark Office *Official Gazette* (1141 Off. Gaz. Pat. Office 9) on Aug. 4, 1992, the Office proposed to amend § 1.60. The due date for submitting written comments was extended to Sept. 10, 1992, in an Extension of Comment Period published in the *Federal Register* (57 FR 38640) on Aug. 26, 1992.

One comment was received. The comment favored adoption of the proposed rule changes.

A continuation or divisional application filed under § 1.60 did not receive a filing date until a complete copy of the prior application was filed, including a true copy of the oath or declaration. Since the Office is in possession of the oath or declaration of the prior application, § 1.60 is being modified to be consistent with §§ 1.53 and 1.62 by permitting filing of a true copy of the oath or declaration within a time specified in a notice of missing parts mailed by the Office.

The specific revisions are discussed below:

(1) Correction of inventorship (§ 1.48)

Section 1.48(a) is amended to replace the designation by letter of various requirements therein with numbered designations so as to avoid confusion when making reference to this section.

(2) Procedures for completing applications filed under § 1.60

Section 1.60 outlines one of the procedures that may be followed by applicants to file a continuation or divisional application. One of the requirements under this section is that applicants file a true copy of the complete parent application as filed, including the oath or declaration. Paragraph (c) ofthis section had specified that a filing date would not be granted if applicant failed to file a complete application under this section. When the missing item was filed, a filing date was granted as of the date of receipt of the missing item. Practice under § 1.60 is being modified to be similar to the procedures for filing continuing applications under §§ 1.53(d) and continuation-in-part applications under § 1.62. More specifically, a new paragraph (d) is added in § 1.60 to indicate that if an application filed pursuant to § 1.60(b) is otherwise complete, but does not include the appropriate filing fee or a true copy of the oath or declaration from the prior complete application, a filing date will be granted. The copy of the oath or declaration, as well as payment of the appropriate filing fee must be submitted within a time period specified in a notice of missing parts mailed by the Office. In a manner similar to the practice under §§ 1.53(d) and 1.62(d), the appropriate oath or declaration and/or filing fee as well as the surcharge set forth in § 1.16(e) must be filed within the time period specified in the notice of missing parts in order to avoid abandonment of the application. Paragraphs (b) and (c) of this section are amended to make reference to the exception specified in paragraph (d) discussed above.

OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to accord a filing date to certain continuing applications which, through oversight, fail to include certain papers which can be submitted after the filing date.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions most of the changes reduce procedural burdens. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.48, paragraph (a) is revised to read as follows:

§ 1.48 Correction of inventorship

(a) if the correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by:

(1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred;

(2) an oath or declaration by each actual inventor or inventors as required by § 1.63;

(3) the fee set forth in § 1.17(h); and

(4) the written consent of any assignee.

When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

* * * * *

3. In Section 1.60, paragraphs (b) and (c) are revised and paragraph (d) is added to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior application.

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(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 and 121 and § 1.78(a)) if:

(1) the prior application was a complete application as set forth in § 1.51(a),

(2) applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (with claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application,

(3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application, and

(4) the application is filed before the patenting or abandonment of or termination of proceedings on the prior application.

The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (2 1.78(a)) will be entered before calculating the filing fee and granted the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. Except as provided in paragraph (d) of this section, if a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i)(1) is filed which satisfactorily explains the delay in filing these items.

(c) if an application filed pursuant to paragraph (b) of this section is incomplete for reasons other than those specified in paragraph (d) of this section, applicant will be notified and given a time period within which to complete the application in order to obtain a filing date as of the date of filing the omitted item provided the omitted item is filed before the patenting or abandonment of or termination or proceedings on the prior application. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n)

(d) If an application filed pursuant to paragraph (b) of this section is otherwise complete, but does not include the appropriate filing fee or a true copy of the oath or declaration from the prior complete application, showing the signature or an indication it was signed, a filing date will be granted and applicant will be so notified and given a period of time within which to file the fee, or the true copy of the oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section.

Dec. 2, 1992 DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1145 OG 377]

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(60) **Applications Filed Under 37 CFR 1.60 on or After May 8, 1995, and Prior to June 8, 1995**

The PTO has always required a proper continuation or divisional application filed under 37 CFR 1.60 to identify the application number (or serial number and filing date) of the prior application. The information is typically provided by the applicant in the application transmittal letter containing the request for processing under 37 CFR 1.60 or in a separate statement verifying the copy of the prior application supplied by the applicant as a "true copy".

As a result of the new 20-year patent term which was effective on June 8, 1995, a large number of continuation or divisional applications were received in the Patent and Trademark Office (PTO) during the weeks prior to June 8, 1995, using the procedure set forth in 37 CFR 1.60. Unfortunately, a number of these applications were incomplete under 37 CFR 1.60 because the applications failed to identify the application number (or serial number and filing date of the prior application. In some instances, the application number of the prior application could not be identified in the 37 CFR 1.60 application papers because the information concerning the application number assigned to the prior application by the PTO had not yet been supplied to the applicant by the PTO. A petition and payment of the $130.00 petition fee would normally be required to accord the application the original date of deposit as the filing date.

However, in view of the extraordinary circumstances which necessitated the filing of these continuation or divisional applications prior to June 8, 1995, the requirment that the application number of the prior application be supplied in the 37 CFR 1.60 application papers on filing is hereby waived, *sua sponte*, for all continuation or divisional applications filed under 37 CFR 1.60 which were filed in the PTO or deposited in the Express Mail service pursuant to 37 CFR 1.10 on or after May 8, 1995, and prior to June 8, 1995. No other requirement of 37 CFR 1.60 is being waived by this notice.

Where applicant receives a notice from the PTO in a continuation or divisional application under 37 CFR 1.60 filed on or after May 8, 1995, and prior to June 8, 1995, stating that the application is incomplete because the application number of the prior application was omitted, the delay in supplying the application number of the prior application will be excused without a petition or a petition fee being required, if applicant files a paper supplying the application number (or serial number and filing date) of the prior application within TWO MONTHS of the date of the notice mailed in the application or the publication date of this notice in the *Official Gazette*, whichever is later. If a petition fee has already been paid in such a case, the Office will refund the petition fee.

June 27, 1995 EDWARD R. KAZENSKE
Deputy Assistant Commisioner for Patents

[1177 OG 130]

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(61) **Department of Commerce**
Patent and Trademark Office

[Docket #: 951019254-6136-02]
RIN 0651-XX05

Change in Procedure Relating to an Application Filing Date

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Change in Procedure.
Summary: The Patent and Trademark Office (PTO) is implementing a change in procedure relating to the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings. Under this new procedure, the PTO will accord a filing date to any application that contains something that can be construed as a written description, any necessary drawing, and, in a nonprovisional application, at least one claim, regardless of whether the application is filed without all the pages of the specification or without all of the figures of the drawings. Applications filed without all the pages of the specification or without all of the figures of the drawings will be treated by mailing a notice indicating that the application has been accorded a filing date, but is missing pages of the specification or figures of drawings. The notice will indicate that failure to timely (37 CFR1.181(f)) file a petition under 37 CFR 1.53(c) or 1.182 in response to such notice will result in the PTO treating the original application papers (the original disclosure of the invention) as including only those application papers present in the PTO on the date of deposit.
Effective Date: July 22, 1996.
For Further Information Contact: Robert W. Bahr by telephone at (703) 305-9285, by facsimile at (703) 308-6916, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail addressed to Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231.

Supplementary Information

The PTO is implementing a change in procedure relating to the treatment of applications filed without all the pages of the specification (Section 608.01 of the Manual of Patent Examining Procedure (MPEP)) (*e.g.*, with page numbering revealing that page(s) are missing), or without all of the figures of the drawings (MPEP 608.02) (*e.g.*, without drawing figures that are mentioned in the specification). The procedure set forth in this notice will be incorporated into the next revision of the MPEP.

The current treatment of applications that fail to identify the names of the actual inventor(s) (*e.g.*, an application naming the inventorship only as "Jane Doe et al.") as required by 37 CFR 1.41(a) and 1.53(b) is not affected by the adoption of the procedure set forth in this notice.

In a Notice entitled "Proposed Changes in Procedures Relating to an Application Filing Date" (Filing Date Notice), published in the *Federal Register* at 60 FR 56982-84 (November 13, 1995), and in the PTO *Official Gazette* at 1181 *Off. Gaz. Pat. Office* 12-13 (December 5, 1995), the PTO proposed a change in procedure relating to the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings. In view of the comments received in response to the Filing Date Notice, the PTO is adopting the proposed change.

The adopted procedure for the treatment of applications filed without all the pages of the specification or without all of the figures of the drawings is set forth below.

APPLICATIONS FILED WITHOUT ALL PAGES OF SPECIFICATION

The Initial Application Examination Division reviews application papers to determine whether all of the pages of the specification are present in the application. If the application is filed without all of the page(s) of the specification, but containing something that can be construed as a written description, at least one drawing figure, if necessary under 35 U.S.C. 113, the names of all the inventors, and, in a nonprovisional application, at least one claim, the Initial Application Examination Division will mail a "Notice of Omitted Items" indicating that the application papers so deposited have been accorded a filing date, but are lacking some page(s) of the specification.

The mailing of a "Notice of Omitted Items" will permit the applicant to either: (1) promptly establish prior receipt in the PTO of the page(s) at issue (generally by way of a date-stamped postcard receipt (MPEP 503)), or (2) promptly submit the omitted page(s) in a nonprovisional application and accept the date of such submission as the application filing date. An applicant asserting that the page(s) was in fact deposited in the PTO with the application papers must file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application), which will be refunded if it is determined that the page(s) was in fact received by the PTO with the application papers deposited on filing) with evidence of such deposit within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)). An applicant desiring to submit the omitted page(s) in a nonprovisional application and accept the date of such submission as the application filing date must file any omitted page(s) with an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such page(s) and a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) requesting the later filing date within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)).

An applicant willing to accept the application as deposited in the PTO need not respond to the "Notice of Omitted Items," and the failure to file a petition under 37 CFR 1.53(c) or 1.182 (and the requisite petition fee) as discussed above within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)) will be treated as constructive acceptance by the applicant of the application as deposited in the PTO. Amendment of the specification is required in a nonprovisional application to renumber the pages consecutively and cancel any incomplete sentences caused by the absence of the omitted pages. Such amendment should be by way of preliminary amendment submitted prior to the first Office action to avoid delays in the prosecution of the application.

If the application does not contain anything that can be construed as a written description, the Initial Application Examination Division will mail a Notice of Incomplete Application (PTO-1123) indicating that the application lacks the specification required by 35 U.S.C. 112. The applicant may file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application)) asserting that: (1) the missing specification was submitted, or (2) the application papers as deposited contain an adequate written description under 35 U.S.C. 112. The petition under 37 CFR 1.53(c) must be accompanied by sufficient evidence (37 CFR 1.181(b)) to establish the applicant's entitlement to the requested filing date (*e.g.*, a date-stamped postcard receipt (MPEP 503) to establish prior receipt in the PTO of the missing specification). Alternatively, the applicant may submit the omitted specification, including at least one claim in a nonprovisional application, accompanied by an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to the specification being submitted and accept the date of such submission as the application filing date.

Original claims form part of the original disclosure and provide their own written description. *See In re Anderson*, 471 F.2d 1237, 176 USPQ 331 (CCPA 1973). As such, an application that contains at least one claim, but does not contain anything which can be construed as a written description of such claim(s), would be unusual.

NONPROVISIONAL APPLICATIONS FILED WITHOUT AT LEAST ONE CLAIM

35 U.S.C. 111(a)(2) requires that an application for patent include, *inter alia*, "a specification as prescribed by section 112 of this title," and 35 U.S.C. 111(a)(4) provides that the "filing date of an application shall be the date on which the specification and any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 112, first paragraph, provides, in part, that "[t]he specification shall contain a written description of the invention," and 35 U.S.C. 112, second paragraph, provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." Also, the Court of Appeals for the Federal Circuit stated in *Litton Systems, Inc. v. Whirlpool Corp.*:

> Both statute, 35 U.S.C. 111 [(a)], and federal regulations, 37 CFR 1.51 [(a)(1)], make clear the requirement that an application for a patent *must* include . . . a specification and claims. . . . The omission of any *one* of these component parts makes a patent application incomplete and thus not entitled to a filing date.

728 F.2d 1423, 1437, 221 USPQ 97, 105 (Fed. Cir. 1984) (citing *Gearon v. United States*, 121 F.Supp 652, 654, 101 USPQ 460, 461 (Ct. Cl. 1954), *cert. denied*, 348 U.S. 942, 104 USPQ 409 (1955)) (emphasis in the original).

Therefore, in an application filed under 35 U.S.C. 111(a), a claim is a statutory requirement for according a filing date to the application. 35 U.S.C. 162 and 171 make 35 U.S.C. 112 applicable to plant and design applications, and 35 U.S.C. 162 specifically requires the specification in a plant patent application to contain a claim. 35 U.S.C.111(b)(2), however, provides that "[a] claim, as required by the second through fifth paragraphs of section 112, shall not be required in a provisional application." Thus, with the exception of provisional applications filed under 35 U.S.C. 111(b), any application filed without at least one claim is incomplete and not entitled to a filing date.

If a nonprovisional application does not contain at least one claim, a "Notice of Incomplete Application" will be mailed to the applicant(s) indicating that no filing date has been granted and setting a period for submitting a claim. The filing date will be the date of receipt of at least one claim. *See In re Mattson*, 208 USPQ 168 (Comm'r Pats. 1980).

As 37 CFR 1.53(b)(2)(ii) permits the conversion of an application filed under 35 U.S.C. 111(a) to an application under 35 U.S.C. 111(b), an applicant in an application, other than for a design patent, filed under 35 U.S.C. 111(a) on or after June 8,

1995, without at least one claim has the alternative of filing a petition under 37 CFR 1.53(b)(2)(ii) to convert such application into an application under 35 U.S.C. 111(b), which does not require a claim to been entitled to its date of deposit as a filing date. Such a petition, however, must be filed prior to the expiration of twelve months after the date of deposit of the application under 35 U.S.C. 111(a), and comply with the other requirements of 37 CFR 1.53(b)(2)(ii).

APPLICATIONS FILED WITHOUT ANY DRAWINGS

35 U.S.C. 111(a)(2)(B) and 111(b)(2)(B) each provide, in part, that an "application shall include . . . a drawing as prescribed by section 113 of this title" and 35 U.S.C.111(a)(4) and 111(b)(4) each provide, in part, that the "filing date . . . shall be the date on which . . . any required drawing are received in the Patent and Trademark Office." 35 U.S.C. 113 in turn provides that an "applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented."

Applications filed without drawings are initially inspected to determine whether a drawing is referred to in the specification, and if not, whether a drawing is necessary for an understanding of the invention. 35 U.S.C. 113.

In general, it has been PTO practice to treat an application that contains at least one process or method claim as an application for which a drawing is not necessary for an understanding of the invention under 35 U.S.C. 113. The same practice has been followed in composition applications. Other situations in which drawings are usually not considered necessary for an understanding of the invention under 35 U.S.C. 113 are:

I. *Coated articles or products*: where the invention resides solely in coating or impregnating a conventional sheet (*e.g.*, paper or cloth, or an article of known and conventional character with a particular composition), unless significant details of structure or arrangement are involved in the article claims;

II. *Articles made from a particular material or composition*: where the invention consists in making an article of a particular material or composition, unless significant details of structure or arrangement are involved in the article claims;

III. *Laminated Structures*: where the claimed invention involves only laminations of sheets (and coatings) of specified material unless significant details of structure or arrangement (other than the mere order of the layers) are involved in the article claims; or

IV. *Articles, apparatus or systems where sole distinguishing feature is presence of a particular material*: where the invention resides solely in the use of a particular material in an otherwise old article, apparatus or system recited broadly in the claims, for example:

a. A hydraulic system distinguished solely by the use therein of a particular hydraulic fluid;

b. Packaged sutures wherein the structure and arrangement of the package are conventional and the only distinguishing feature is the use of a particular material.

A nonprovisional application having at least one claim, or a provisional application having at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, not describing drawing figures in the specification, and filed without drawings will usually be processed for examination, so long as the application contains something that can be construed as a written description and the names of all the inventors. A nonprovisional application having at least one claim, or a provisional application having at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, describing drawing figure(s) in the specification, but filed without drawings will be treated as an application filed without all of the drawing figures referred to in the specification as discussed below, so long as the application contains something that can be construed as a written description and the names of all the inventors. In a situation in which the appropriate examining group determines that drawings are necessary under 35 U.S.C. 113 the filing date issue will be reconsidered on reference from the examining group.

If a nonprovisional application does not have at least one claim, or a provisional application does not have at least some disclosure, directed to the subject matter discussed above for which a drawing is usually not considered essential for a filing date, and is filed without drawings, the Initial Application Examination Division will mail a "Notice of Incomplete Application" indicating that the application lacks drawings and that 35 U.S.C. 113 requires a drawing where necessary for the understanding of the subject matter sought to be patented.

The applicant may file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application)) asserting that (1) the drawing(s) at issue was submitted, or (2) the drawing(s) is not necessary under 35 U.S.C. 113 for a filing date. The petition must be accompanied by sufficient evidence to establish the applicant's entitlement to the requested filing date (*e.g.*, a date-stamped postcard receipt (MPEP 503) to establish prior receipt in the PTO of the drawing(s) at issue). Alternatively, the applicant may submit drawing(s) accompanied by an oath or declaration incompliance with 37 CFR 1.63 and 1.64 referring to the drawing(s) being submitted and accept the date of such submission as the application filing date.

In design applications, the Initial Application Examination Division will mail a "Notice of Incomplete Application" indicating that the application lacks the drawings required under 35 U.S.C. 113. The applicant may: (1) promptly file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i)) asserting that the missing drawing(s) was submitted, or (2) promptly submit drawing(s) accompanied by an oath or declaration in compliance with 37 CFR 1.63 and 1.64 and accept the date of such submission as the application filing date. 37 CFR 1.154(a) provides that the claim in a design application "shall be in formal terms to the ornamental design for the article (specifying name) as shown, or as shown and described." As such, petitions under 37 CFR 1.53(c) asserting that drawings are unnecessary under 35 U.S.C. 113 for a filing date in a design application will not be found persuasive.

APPLICATIONS FILED WITHOUT ALL FIGURES OF DRAWINGS

The Initial Application Examination Division reviews application papers to determine whether all mentioned drawing figures in the specification are present in the application. If the application is filed without all of the drawing figure(s) referred to in the specification, and the application contains something that can be construed as a written description, at least one drawing, if necessary under 35 U.S.C. 113, the names of all the inventors, and, in a nonprovisional application, at least one claim, the Initial Application Examination Division will mail a "Notice of Omitted Items" indicating that the application papers so deposited have been accorded a filing date, but are lacking some of the drawings described in the specification.

The mailing of a "Notice of Omitted Items" will permit the applicant to either: (1) promptly establish prior receipt in the PTO of the drawing(s) at issue (generally by way of a date-stamped postcard receipt (MPEP 503)), or (2) promptly submit the omitted drawing(s) in a nonprovisional application and accept the date of such submission as the application filing date. An applicant asserting that the drawing(s) was in fact deposited in the PTO with the application papers must file a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) (37 CFR 1.17(q) in a provisional application), which will be refunded if it is determined that the drawing(s) was in fact received by the PTO with the application papers deposited on filing) with evidence of such deposit within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)). An applicant desiring to submit the omitted drawings in a nonprovisional application and accept the date of such submission as the application filing date must file any omitted drawing(s) with an oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such drawing(s) and a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) requesting the later filing date within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)).

An applicant willing to accept the application as deposited in the PTO need not respond to the "Notice of Omitted Items,"

and the failure to file a petition under 37 CFR1.53(c) or 1.182 (and the requisite petition fee) as discussed above within two months of the date of the "Notice of Omitted Items" (37 CFR 1.181(f)) will be treated as constructive acceptance by the applicant of the application as deposited in the PTO. Amendment of the specification is required in a nonprovisional application to cancel all references to the omitted drawing, both in the brief and detailed descriptions of the drawings and including any reference numerals shown only in the omitted drawings. In addition, a separate letter is required in a nonprovisional application to renumber the drawing figures consecutively (showing the proposed changes in red ink), if necessary, and amendment of the specification is required to correct the references to the drawing figures to correspond with any relabelled drawing figures, both in the brief and detailed descriptions of the drawings. Such amendment and correction to the drawing figures, if necessary, should be by way of preliminary amendment submitted prior to the first Office action to avoid delays in the prosecution of the application.

SUBSEQUENT TREATMENT OF APPLICATION

In instances in which a "Notice of Incomplete Application" has been mailed, further action by the applicant is necessary for the application to be accorded a filing date. As such, the application will be retained in the Initial Application Examination Division to await such action. Unless the applicant either completes the application or files a petition under 37 CFR 1.53(c) (and the petition fee under 37 CFR 1.17(i) or 1.17(q)) within the period set in the "Notice of Incomplete Application," the application will be processed as an incomplete application under 37 CFR 1.53(c).

In instances in which a "Notice of Omitted Items" has been mailed, the application will be retained in the Initial Application Examination Division for a period of two months from the mailing date of "Notice of Omitted Items" to permit the applicant to either: (1) establish prior receipt in the PTO of the page(s) or drawing(s) at issue, or (2) promptly submit the omitted page(s) or drawing(s) in a nonprovisional application and accept the date of such submission as the application filing date. Extensions of time under 37 CFR 1.136 will not be applicable to this two-month time period.

The grant of a petition under 37 CFR 1.182 to accept the omitted page(s) or drawing(s) in a nonprovisional application and accord the date of such submission as the application filing date will be indicated by the issuance of a new filing receipt indicating the filing date accorded the application.

Unless the applicant timely files a petition under 37 CFR 1.53(c) or 1.182 (and the requisite petition fee), the application will maintain the filing date as of the date of deposit of the application papers in the PTO, and the original application papers (*i.e.*, the original disclosure of the invention) will include only those application papers present in the PTO on the date of deposit. Nonprovisional applications that are complete under 35 CFR 1.51(a)(1) will then be forwarded to the appropriate examining group for examination of the application. Provisional applications that are complete under 35 CFR 1.51(a)(2) will then be forwarded to Files Repository. The current practice for treating applications that are not complete under 37 CFR 1.51(a) will remain unchanged (37 CFR 1.53(d)).

Any petition under 37 CFR 1.53(c) or 1.182 not filed within this two-month period may be dismissed as untimely. 37 CFR 1.181(f). Under the adopted procedure, the PTO may strictly adhere to the two-month period set forth in 37 CFR 1.181(f), and dismiss as untimely any petition not filed within this two-month period. This strict adherence to the two-month period set forth in 37 CFR 1.181(f) is justified as such applications will now be forwarded for examination at the end of this two-month period. It is further justified in instances in which the applicant seeks to submit the omitted page(s) or drawing(s) in a nonprovisional application and request the date of such submission as the application filing date since: (1) according the application a filing date later than the date of deposit may affect the date of expiration of any patent issuing on the application due to the changes to 35 U.S.C. 154 contained in Public Law 103-465, § 532, 108 Stat. 4809 (1994), and (2) the filing of a continuation-in-part application is a sufficiently equivalent mechanism for adding additional subject matter to avoid the loss of patent rights.

The submission of omitted page(s) or drawing(s) in a nonprovisional application and acceptance of the date of such submission as the application filing date is tantamount to simply filing a new application. Thus, applicants should consider filing a new application as an alternative to submitting a petition under 37 CFR 1.182 (with the petition fee under 37 CFR 1.17(h)) with any omitted page(s) or drawing(s), which is a cost-effective alternative in instances in which an nonprovisional application is deposited without filing fees. Likewise, in view of the relatively low filing fee for provisional applications, and the PTO's desire to minimize the processing of provisional applications, the PTO will not grant petitions under 37 CFR 1.182 to accept omitted page(s) or drawing(s) and accord an application filing date as of the date of such submission. Instead, the applicant should simply refile the complete provisional application.

Response to Comments

Thirteen comments were received in response to the Filing Date Notice. Nine comments expressly supported the proposed change, while the remaining four comments simply made additional comments or suggested additional changes, but did not oppose the proposed change. The written comments have been analyzed, and responses to the comments follow.

Comment (1): One comment suggested that the PTO should, by rulemaking, permit the addition of subject matter in a foreign application for which priority is claimed.

Response: Where an application includes in the papers deposited on filing with the application a certified copy of a foreign application for which priority is claimed, the PTO will grant a timely petition under 37 CFR 1.182 requesting that: (1) the corresponding sheets of drawings in the foreign priority application be accepted for any omitted sheets of drawings in the application, or (2) the foreign priority application be accepted as the application as filed, which may result in the treatment of the foreign priority application as an application filed in a non-English language (37 CFR 1.52(d)).

In instances in which the foreign priority application was not present among the papers deposited on filing with the application, any addition of subject matter from the foreign priority application into the application must be considered as new matter under 35 U.S.C. 132 (and, as such, will not be permitted by petition), unless the application-as-filed specifically incorporates the foreign priority application by reference.

Drawing figures do not require translation of the subject matter shown therein and individual drawing figures are sufficiently segregated that it is considered appropriate to permit, by petition under 37 CFR 1.182, the acceptance of the corresponding sheets of drawings in the foreign priority application for any omitted sheets of drawings in the application. The specification of a foreign priority application, however, is generally subject to translation and revision prior to its filing in the PTO as the specification of an application. As such, it is considered appropriate to permit, by petition under 37 CFR 1.182, the acceptance of a foreign priority application as the application as filed, but it is not considered acceptable to permit the acceptance of a translation of portions of the foreign priority application for omitted pages of the specification.

Finally, the occurrence of situations in which it is necessary for an applicant to request that the corresponding sheets of drawings in the foreign priority application be accepted for any omitted sheets of drawings in the application, or the foreign priority application be accepted as the application as filed is relatively rare. In addition, the treatment of these few applications on an *ad hoc* basis pursuant to 37 CFR 1.182 and 1.183 has proven acceptable.

Comment (2): One comment suggested that the PTO should consider requiring a declaration from the attorney averring that the omitted matter was inadvertently omitted.

Response: First, in view of a registered practitioner's responsibilities as set forth in 37 CFR Part 10, the PTO does not generally require verification of statements by registered practitioners. *See, e.g.*, 37 CFR 1.125 and 1.137. Second, as there is no apparent benefit to omitting material from an application as deposited in the PTO, there appears to be little justification for requiring even a statement that the omitted matter was inadvertently omitted.

Comment (3): One comment questioned whether the change would be applicable to applications filed under 37 CFR 1.60 or 1.62.

Response: The adopted procedure applies to applications filed under 37 CFR 1.53.

37 CFR 1.60 requires, *inter alia*, that the application be a true copy of the prior application (37 CFR 1.60(b)(2)), and a copy that omits pages of specification or sheets of drawings from the prior application is not a true copy of the prior application. As such, a copy that omits pages of specification or sheets of drawings from the prior application is an improper application under 37 CFR 1.60, and cannot be accorded a filing date as an application under 37 CFR 1.60 until the filing error is corrected.

The PTO considers 37 CFR 1.60 to be unnecessary in view of changes to 37 CFR 1.4(d), and a trap for the unwary. The PTO has previously proposed to eliminate 37 CFR 1.60 (*See* notice of proposed rulemaking entitled "Changes to Implement 20-Year Patent Term and Provisional Application" (20-Year Term Notice of Proposed Rulemaking) published in the *Federal Register* at 59 FR 63951 (December 12, 1994), and in the Patent and Trademark Office *Official Gazette* at 1170 *Off. Gaz. Pat. Office* 377 (January 3, 1995)), and will again propose to eliminate 37 CFR 1.60, as well as 37 CFR 1.62, in an impending rulemaking to implement the Administration's regulatory reform initiative.

A continuation or divisional application may be filed under 35 U.S.C. 111(a) using the procedures set forth in 37 CFR 1.53(b)(1), by providing a copy of the prior application, including a copy of the oath or declaration in such prior application, as filed. The patent statutes and rules of practice do not require that an oath or declaration include a recent date of execution, and the Examining Corps has been directed not to object to an oath or declaration as lacking either a recent date of execution or any date of execution. This change in examining practice will appear in the next revision of the MPEP. As is currently the situation under 37 CFR 1.60 and 1.62, the applicant's duty of candor and good faith including compliance with the duty of disclosure requirements of § 1.56 is continuous and applies to the continuation or divisional application, notwithstanding the lack of a newly executed oath or declaration.

37 CFR 1.60(b)(4) and 1.62(a) currently permit the filing of a continuation or divisional application by less than all of the inventors named in a prior application without a newly executed oath or declaration. The oath or declaration in an application filed under 37 CFR 1.53(b), however, must identify the inventorship of such application. Thus, unless it is necessary to file a continuation or divisional application under 37 CFR 1.60 to name less than all of the inventors named in a prior application, applicants are encouraged to file continuing applications under 37 CFR 1.53(b) (*i.e.*, omit any reference to 37 CFR 1.60 in the application papers) to avoid an inadvertent failure to comply with all of the requirements of 37 CFR 1.60.

An application under 37 CFR 1.62 uses the content of the prior application, and is itself only a request for an application under 37 CFR 1.62. As such, there is no concern that an application under 37 CFR 1.62 will be filed without all the pages of the specification or without all of the figures of the drawings.

Comment (4): One comment questioned whether a filing date would be accorded if the name of an inventor were omitted.

Response: 37 CFR 1.41 and 1.53 currently require that an application be filed in the name of the actual inventor or inventors, and this notice does not involve changes to the rules of practice. The PTO will propose to eliminate this requirement in 37 CFR 1.41 and 1.53 in the rulemaking to implement the Administration's regulatory reform initiative.

Comment (5): One comment suggested that the notices be mailed out as soon as possible to avoid a loss of rights for those applicants who require completion or refiling of the application. Another comment suggested that the decision as to whether an application is "incomplete" should be made by the Examining Corps, rather than on a formalistic basis by the Initial Application Examination Division.

Response: The efficient pre-examination processing of applications is in the mutual interest of the PTO and applicants. The PTO is currently in the process of modifying its pre-examination processing procedures to avoid any unnecessary delay. This new procedure will not impact the pre-examination processing of applications, in that the Initial Application Examination Division will mail a "Notice of Incomplete Application," "Notice of Omitted Items," and "Notice to File Missing Parts" under this new procedure at the time the "Notice of Incomplete Application" and "Notice to File Missing Parts" are currently mailed.

The adopted procedure replaces formalistic procedures with procedures based upon the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. Filing date issues are ultimately decided by the Office of Petitions in the Office of the Deputy Assistant Commissioner for Patent Policy and Projects (MPEP 1002.02(b)(35)) on the basis of whether and when the application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113, and not on the basis of who made the initial decision not to accord a filing date to the application.

It should be recognized that there is tension between the comments objecting to any review of the entitlement of an application to a filing date by the Initial Application Examination Division (arguing that this issue should be considered only by the Examining Corps) and the desire for speedy notification to the applicant that a portion of the application appears to have been omitted. To defer all review of the entitlement of an application to a filing date until the application is picked-up for examination would cause a significant delay in any such notification to the applicant.

Comment (6): One comment noted that 35 U.S.C. 111(b) does not require a claim for a provisional application. Several comments suggested that the PTO automatically treat any nonprovisional application filed without at least one claim as a provisional application, if such application is otherwise entitled to a filing date as a provisional application.

Response: A provisional application does not require a claim to be entitled to a filing date. As discussed *supra*, an applicant in an application, other than for a design patent, filed under 35 U.S.C. 111(a) on or after June 8, 1995, without at least one claim has the alternative of filing a petition under 37 CFR 1.53(b)(2)(ii) to convert such application into an application under 35 U.S.C. 111(b). The PTO does not consider it appropriate to "automatically" consider an application filed under 35 U.S.C. 111(a) without a claim to be an application under 35 U.S.C. 111(b) (a provisional application), since the applicant may not desire an application under 35 U.S.C. 111(b), and may desire to file a claim to obtain an application filing date as of the date of submission of such claim.

Comment (7): One comment suggested that the MPEP should clearly indicate that applications filed without all the pages of specification or all the figures of drawings described in the specification cannot automatically be treated as defective under 35 U.S.C. 112, but must be considered for compliance with 35 U.S.C. 112 by the subject matter that is present in the application papers.

Response: In an effort to improve the examination of applications, chapter 2100 of the MPEP has been revised to set forth specific guidelines for rejections under 35 U.S.C. 101, 102, 103, and 112. MPEP 2161 *et seq.* set forth the guidelines for rejections under 35 U.S.C. 112, first and second paragraphs, and do not authorize a rejection under 35 U.S.C. 112 based merely upon the fact that pages of specification or figures of drawing were omitted.

Comment (8): One comment questioned whether the proposed procedure for the treatment of applications filed without all the pages of specification or all the figures of drawings described in the specification is applicable to provisional applications, noting that 35 U.S.C. 111(b) provides that a claim is not required in a provisional application.

Response: The adopted procedure applies to applications (both provisional and nonprovisional) filed under 37 CFR 1.53. The procedure recognizes that 35 U.S.C. 111(b) does not require a claim in a provisional application.

Comment (9): One comment suggested that the two-month period for taking action would be unfair in instances in which the PTO prepares and enters the notice into the Patent Application Locating and Monitoring (PALM) system but fails to mail the notice or mails the notice to an incorrect correspondence address.

Response: The "Notice of Omitted Items" is not an action within the meaning of 35 U.S.C. 133 to which a response is required to avoid abandonment. An applicant simply has the opportunity to file a petition, but need not take action, in response to a "Notice of Omitted Items." Thus, the timeliness of any such petition is governed by 37 CFR 1.181(f). 37 CFR 1.181(f) provides that any petition not filed within two months from the action complained of may be dismissed as untimely.

Establishing prior receipt in the PTO of the page(s) or drawing(s) at issue or submitting the omitted page(s) or drawing(s) and accepting the date of such submission as the application filing date would result in an addition to the papers constituting the original disclosure of the application, and submitting the omitted page(s) or drawing(s) and accepting the date of such submission as the application filing date would result in a change in application filing date. As a change in either the original disclosure or filing date of an application would interfere with the examination of the application for compliance with 35 U.S.C. 102, 103, and 112, the PTO will not forward an application in which a "Notice of Omitted Items" has been mailed for examination until it is apparent that the applicant has not responded to the "Notice of Omitted Items." Thus, a nonprovisional application will not be processed for examination, and the examination of the application will be delayed, until the expiration of two months from the mailing date of "Notice of Omitted Items." The two-month period set forth in 37 CFR 1.181(f) is considered an appropriate balance between providing an applicant sufficient time to take action in response to a "Notice of Omitted Items" and avoiding unnecessary delays in the examination of the application, which would be undesirable in view of 35 U.S.C. 154 as amended by Public Law 103-465. While an applicant willing to accept a nonprovisional application as deposited in the PTO need not respond to the "Notice of Omitted Items," the filing of an express communication to that effect would permit the PTO to proceed with the processing of the application for examination, and, as such, may reduce the delay in the examination of the application.

While a "Notice of Omitted Items" is not an action within the meaning of 35 U.S.C. 133, the principles regarding nonreceipt or delayed receipt of a "Notice of Omitted Items," due either to a failure on the part of the PTO to properly mail such notice or a failure on the part of the U.S. Postal Service to deliver such notice to the correspondence address in a timely manner, are applicable to the nonreceipt or delayed receipt of a "Notice of Omitted Items." Applicants are directed to the Notice entitled "Withdrawing the Holding of Abandonment When Office Actions Are Not Received," published in the PTO *Official Gazette* at 1156 *Off. Gaz. Pat. Office* 53 (November 16, 1993), for the evidence necessary to establish nonreceipt of a "Notice of Omitted Items," and the Notice entitled ""Procedures For Restarting Response Periods," published in the PTO *Official Gazette* at 1160 *Off. Gaz. Pat. Office* 14 (March 1, 1994), for the evidence necessary to establish delayed receipt of a "Notice of Omitted Items."

Comment (10): One comment suggested that while the proposed procedure is an improvement, it still conflicts with 35 U.S.C. 112 and 113. The comment specifically argues that the sufficiency of an application is a matter for determination by an examiner skilled in the subject matter of the application, in that Congress did not intend that the sufficiency of an application be determined by the Initial Patent Examination Division.

Response: The adopted procedure will accord a filing date to any application that contains something that can be construed as a written description, any necessary drawing, and, in a nonprovisional application, at least one claim. This procedure is consistent with the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. 35 U.S.C. 113, second sentence, contemplates that drawings may be filed after the filing date of an application. 35 U.S.C. 113, however, provides that an "applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented," and 35 U.S.C. 111(a)(4) and 111(b)(4) each provide, in part, that the "filing date . . . shall be the date on which . . . any required drawing are received in the Patent and Trademark Office." As such, the PTO has the statutory authority, and responsibility, to determine whether a drawing is necessary under 35 U.S.C. 113 in an application filed without drawings prior to according a filing date to that application.

There is nothing in 35 U.S.C. 111, 112, or 113 that limits the authority of the Commissioner to delegate the determination of whether or when any application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113. In any event, filing date issues are, as discussed *supra*, ultimately decided by Office of the Deputy Assistant Commissioner for Patent Policy and Projects on the basis of whether and when the application meets the requirements for a filing date as set forth in 35 U.S.C. 111, 112, and 113, and not on the basis of who made the initial decision not to accord a filing date to the application.

Comment (11): One comment suggested that the proposed procedure be adopted by rulemaking. Another comment suggested that the proposed procedure either be adopted by rulemaking or clearly set forth in the MPEP.

Response: 37 CFR 1.53(b)(1) provides that the "filing date of an application for patent filed under this section, except for a provisional application, is the date on which: a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." 37 CFR 1.53(b)(2) provides that the "filing date of a provisional application is the date on which: a specification as prescribed by 35 U.S.C. 112, first paragraph; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." Thus, no change to the rules of practice is necessary to adopt the procedure set forth in this notice.

It should be noted that the MPEP 608.01 sets forth the former procedure for treating an application filed without all of the pages of specification or filed under 35 U.S.C. 111(a) without at least one claim. Likewise, MPEP 608.02 sets forth the former procedure for treating an application filed without drawings or all of the figures of drawings.

The next revision of the MPEP will incorporate the change in procedure set forth in this notice.

June 5, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1188 OG 48]

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(62) **Patent and Trademark Office**
37 CFR Part 1

Changes in Patent Drawing Standards

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice regarding patent drawings to adopt international standards and to eliminate unnecessary requirements. The Office is amending the rules to provide clarification and adopt international standards; to delete the reference to changes by bonded draftsmen since the Office will no longer release drawings from patent applications and to include the option of submitting black and white photographs in lieu of black ink drawings.
Effective Date: October 1, 1993. These rules will be applicable to all drawings and papers filed with the Office on or after the effective date.
For Further Information Contact: Richard A. Bawcombe by telephone at (703) 305-8594, by mail marked to his attention addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or by facsimile transmission to his attention at (703) 305-4372.
Supplementary Information: In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 42721) on September 16, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat Office 13) on Oct. 6, 1992, the Office proposed to amend the rules of practice in patent drawings. Drawings acceptable for patent applications filed outside of the United States are not always acceptable in a patent application filed in the United States. Therefore, the rules relating to drawing requirements are being amended to enable the Office, when appropriate, to accept drawings that are capable of clear reproduction for the printing of any resulting patent. Drawings in compliance with the old § 1.84 will be in

compliance with the new § 1.84. An oral hearing was not conducted. However, six written comments were submitted.

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and several of the suggested modifications have been adopted.

Another modification, since the "Notice of Proposed Rulemaking," is under § 1.84 wherein five sets of drawings were required, but the total has been decreased to three sets due to a reassessment of the need for the additional copies for Office use. The comments and responses are discussed below.

Comment: Three comments were received regarding the proposed changes within § 1.84(b). Three other comments were received regarding the proposed changes to § 1.165. All six comments suggested that the Office continue to accept mounted photographs.

Response: The Office will adopt the suggestion and continue to accept mounted photographs for utility, design, and plant patent applications. The initial reason the Office sought to change the rule was to overcome the problem of mounted photographs becoming detached and separated from the file. The apparent burden to applicants associated with the Office not accepting mounted photographs is the reason the Office will continue to permit mounted photographs provided they are permanently affixed.

Several of the commenters mentioned that they have never had problems with mounted photographs. As commentary on these remarks, it is not the person filing the drawings who would have problems with mounted photographs; it is the Office. And, indeed, the Office has, in the past, experienced problems with mounted photographs coming loose from the paper they are mounted on. When this happens, the photographs can become displaced from the file and lost. This has occurred many times, leading to frustration and wasted effort on the part of many practitioners, as well as on the part of Office personnel. If mounted photographs are to be used, they must be mounted in such a way that they cannot become loose from the bristol board to which they are mounted.

Comment: Two of the comments regarding 1.84(b) also mentioned that the proposed rules would not allow more than one figure on each sheet of drawings where photographs are being used, and sought relief from this proposed change.

Response: Since the Office will continue to accept mounted photographs, the Office will also accept sheets of drawings where more than one photograph appears on the drawing sheet provided that all other drawing requirements are met.

Comment: Two of the comments suggested that the Office not require photographs to be on A4 size paper.

Response: The Office will adopt the suggestion. The Office will accept photographs on one of the four paper sizes specified in § 1.84(f), as long as all sheets are the same size.

Comment: Regarding § 1.84(f), one comment suggested that the Office permit use of an additional size of paper, i.e., 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

Response: The Office will adopt the suggestion. The adoption of the suggestion to add an additional paper size under § 1.84(f), results in the need for an additional margin size. Therefore, an additional paragraph is added to § 1.84(g) to state that "On 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight precisely 20.3 by 24.8 cm. (8 by 9 3/4 inches)."

Comment: Regarding 1.84(p)(3), one comment suggested liberalization for drawings which include typewritten subject matter, such as gene or protein sequences that consist predominantly of letters, sometimes with underlining and boxes around them. Other situations cited were graphs and photographs of gels, which often appear in biotechnological inventions, which include typed matter as legends.

Response: The suggestion has not been adopted because letters need to stand at the designated height to maintain legibility when reductions become necessary to accommodate the various photocomposed products.

Comment: Regarding § 1.84(w), one comment mentioned that correction fluid is not permanent and has a tendency to flake and fall from the surface it covers.

Response: Section 1.84(w) permits correction fluid to be used provided the correction fluid is durable and permanent. If correction fluid is used on drawings submitted to the Office, the applicant will be required by the Office to correct the drawings if the correction fluid becomes loose before the patent printing process is completed.

Comment: One comment suggested that § 1.152 was improper in permitting either ink drawings or photographs to be submitted with an application for a design patent, but not both, and in requiring any photographs submitted to show only the design claimed and none of the environment in which it is used. The comment argued that prohibition against using both ink drawings and photographs is inconsistent with 35 U.S.C. 112. Under that section of the statute, a design patent application must disclose the invention "in such full, clear, concise, and exact terms as enable any person skilled in the art ... to make and use" the invention and "set forth the best mode contemplated by the inventor of carrying out his invention."

Response: Section 1.152 is consistent with 35 U.S.C. 112. The introduction of both photographs and ink drawings in a design application would result in a high probability of inconsistencies between corresponding elements on the ink drawings as compared with the photographs. However, if special circumstances warrant use of both ink drawings and photographs, applicant can file a petition under § 1.183 to permit both in a design application if such drawings do not introduce inconsistencies between the views.

DISCUSSION OF SPECIFIC SECTIONS CHANGED OR ADDED:

Section 1.17(h) is amended to include a reference to § 1.84 for accepting color drawings or photographs in utility patent applications.

Section 1.19(a)(3) is amended to change the citation of § 1.84(p) to § 1.84(a)(2) in view of the amendments to § 1.84.

Section 1.71(d) is amended to change the citation of § 1.84(o) to § 1.84(s) in view of the amendments to § 1.84.

Section 1.84 is revised as follows:

(a) Drawings. This paragraph is added to classify drawings into two categories, i.e., black ink and color, and deletes the limitation that the use of white pigment to cover lines is not normally acceptable. The black ink drawing requirements are amended to allow computer-generated drawings to be accepted subject to the same standards applied to all black ink drawings. Color drawing requirements are moved from § 1.84(p) to § 1.84(a). Color drawings may be acceptable upon the granting of a petition filed under this paragraph explaining why the color drawings are necessary. A petition is required because the special handling necessary for color drawings is time consuming and the Office cannot permit such a special procedure except in extenuating circumstances. Since utility patents are not printed in color, 3 sets of color drawings are necessary for proper distribution within the Office. One color set will be attached to the Letters Patent for routing to the applicant. The remaining two color sets will be routed to (1) the patent file, and (2) the Office of Publication and Dissemination, Patent and Trademark Copy Sales, for copying purposes when a copy in color of a utility patent containing a color drawing, as provided for in § 119(a)(3), is requested.

(b) Photographs. This paragraph permits the acceptance of photographs upon granting of an applicant's petition. The Office will accept black and white and color photographs or photomicrographs (not photolithographs or other reproductions of photographs made by using screens) developed on double weight photographic paper or permanently mounted on bristol board, in lieu of ink drawings. The photographs must be of sufficient quality so that all details in the drawing are reproducible in the printed patent.

(c) Identification of drawings. This paragraph permits an applicant to provide proper identification information on the reverse side of each sheet of drawings. The identification information allows the Office to match drawing sheets with the proper application. The identification information should include the application number, if known, or the title of the invention, inventor's name, docket number (if any), and name and telephone number of the person to call if the drawings cannot be matched to the proper patent application. The Office will not object if identifying information is not present; however, if the drawings become separated, it will be virtually impossible for the Office to match the drawings with the application. This paragraph is restructured from previous § 1.84(1) and revised to state that the preferred placement of the information is on the back side of the drawing sheets.

(d) Graphic forms in drawings. This paragraph is added to set standards for chemical and mathematical formulae to align Office standards for formulae, tables, and waveforms with international standards.

(e) Type of paper. This paragraph is a revision of previous §1.84(a) to set forth the requirements for the type of paper to be used for drawings, including the type of paper for photographs.

(f) Size of paper. This paragraph clarifies Office requirements set forth in previous § 1.84(b) and permits one additional size of paper, i.e., 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) for drawings.

(g) Margins. This paragraph is restructured from previous § 1.84(b) to indicate how the size of the paper changes the margin requirements. The Office will accept four sizes of paper, however, the sight (i.e. the usable surface) is the same for two of the paper sizes, i.e., 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches), and 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches). The sight is 17 0 cm. by 26.2 cm. for DIN size A4 paper. The sight is 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches) for the added paper size of 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

(h) Views. This paragraph is added to reformat previous § 1.84(i) to provide a logical arrangement of the different views provided in the rules, to revise the standards for purposes of clarification, to include the standard for waveforms to show the relative timing, to provide clearer language relative to hatching shown on drawings, to set forth the standard for depicting hatching in sectional views as regularly spaced parallel oblique strokes which precludes use of cross-hatching strokes, and to include requirements pertaining to alternate positions. In addition, both Roman and Arabic numerals are acceptable to designate the section being illustrated.

(i) Arrangement of views. This paragraph is relocated from previous § 1.84(j) and revised to incorporate international standards. In addition, this paragraph is changed and broadened to provide for placement of words on drawings. One view is not to be superimposed within the outline of another. The changes expand the possibilities for presenting graphs to conform to standard scientific conventions, while using a format which is compatible with automated patent searching displays. See 1121 Off. Gaz. Pat. Office 54 (Dec. 25, 1990) and 1129 Off. Gaz. Pat. Office 22 (Aug. 13, 1991).

(j) View for *Official Gazette*. This paragraph is relocated from previous § 1.84(k).

(k) Scale. This paragraph is relocated from previous § 1.84(e) and § 1.84(i) and revised to indicate that the words "actual size" or "scale 1/2" on the drawings are not permitted since the meaning is lost in reduction/enlargement. The paragraph provides that elements of the same view must be in proportion to each other, unless a difference in proportion is indispensable for the clarity of the view. As a preferred alternative to a difference in proportion within one view for the purpose of achieving the necessary clarity, a supplementary view may be added giving a larger-scale illustration of an element from the initial view. When a supplementary view is included, it is recommended that the enlarged element shown in the second view be surrounded by a finely drawn or "dot-dash" circle in the first view pinpointing its location, without obscuring the view.

(l) Character of lines, numbers, and letters. This paragraph is relocated from previous § 1.84(c) and revised to indicate that lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have different meanings. In addition, this paragraph is changed and broadened to allow drawings to be made by any process which will give them satisfactory reproduction characteristics.

(m) Shading. This paragraph is changed and broadened to expand definitions for shading and deletes the limitation that drawings transmitted to the Office should be sent flat, protected by a sheet of heavy binder's board, or rolled for transmission in a suitable mailing tube. This change provides the individual practitioner with greater discretion on how to send drawings. In addition, this paragraph is relocated from previous § 1.84(d) to separate shading requirements from hatching requirements by stating that shading may be used to indicate the surface or shape of spherical, cylindrical, and conical elements of an object, and that spaced lines are preferred for shading purposes. Solid black areas are not permitted, except when used to represent bar graphs or color.

(n) Symbols. This paragraph is relocated from previous § 1.84(g) to separate symbols requirements from legends requirements and enlarges the number of acceptable symbols. Known devices should be illustrated by symbols which have a universally-recognized meaning, and which are generally accepted in the art, provided no further detail is essential for understanding the subject matter of the claimed invention. Symbols which are not universally recognized may be used if they are not likely to be confused with existing conventional symbols and if they are readily identifiable, subject to approval by the Examiner.

(o) Legends. This paragraph is relocated from previous § 1.84(g) to separate legends requirements from symbols requirements and revised to integrate international standards. Where text matter is (1) deemed indispensable for understanding the drawing or (2) may be required by the Examiner, a minimum of words should be used. While such requirement by the Examiner was not contained in the "Notice of Proposed Rulemaking," it was contained in former § 1.84(g). Words should not be used to describe the figure itself, such as "this is a bar graph." All text legends are subject to approval by the examiner.

(p) Numbers, letters, and reference characters. This paragraph is relocated from previous § 1.84(f) and revised to include numbers and letters in the heading formerly designated "reference characters." This section has been reformatted into five subsections and revised to integrate international standards, where possible. Although the Latin alphabet is used in the international standard, the Office takes the view that the English alphabet is more universally acceptable for letters, except where another alphabet is customarily used, such as the Greek alphabet to indicate angles, wavelengths, and mathematical formulae. In addition, the characters used must be oriented in the same direction as the view so as to avoid having to rotate the sheet. Reference characters should be so arranged to follow the profile of the object depicted. See 1121 Off. Gaz. Pat. Office 54 (Dec. 25, 1990) and 1129 Off. Gaz. Pat. Office 22 (Aug. 13, 1991).

(q) Lead lines. This paragraph is added to integrate international standards, to incorporate brief language which appears in previous § 1.84(f), and to change and expand the definition for lead lines. Lead lines are those lines between the reference characters and the details referred to, and they must be executed in the same way as other lines in the drawing.

(r) Arrows. This paragraph is relocated from previous § 1.84(g) and revised to indicate the meaning of the use of arrows, and to show that they may be used at the end of lead lines only if their meaning is clear.

(s) Copyright or mask work notice. This paragraph is relocated from previous § 1.84(o).

(t) Numbering of sheets of drawings. This paragraph is relocated from previous § 1.84(n) and changed and broadened to allow for the placement of sheet numbers within the sight of the drawing. It is preferable that the sheets be numbered with two Arabic numerals placed on either side of an oblique line, with the first number being the sheet number and the second the total number of sheets of drawings.

(u) Numbering of views. This paragraph is relocated from previous § 1.84(i) and, for clarity, is separately identified in this new section. Use of the abbreviation "FIG." must precede all view numbers.

(v) Security markings. This paragraph is relocated from previous § 1.84(l) to provide that security markings may be placed on the drawings if they are outside the sight and preferably centered in the top margin.

(w) Corrections. This paragraph is added to provide that any corrections made on drawings submitted to the Office must be durable and permanent. The language is revised from previous 1.84(a) which prohibited the use of white pigment to cover lines.

(x) Holes. This paragraph is relocated from previous § 1.84(b) to permit two holes to be punched in the top margin of the drawings with their center lines spaced 7.0 cm. (2 3/4 inches) apart.

Section 1.88 is removed and reserved since the changes effective January 1, 1991, in § 1.85(b) make the regulation regarding the transfer of drawings unnecessary. Since the Office

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no longer releases drawings from patent applications, applicants are generally retaining the master copy of the drawings. Accordingly, applicants can easily file a copy of drawings in an application and therefore eliminate the need for the Office to transfer drawings. Any situations which present a hardship to applicants may be accommodated by the filing of a petition under § 1.182 requesting the transfer of the drawings.

Section 1.123 prescribes procedures for amending drawings. With the adoption of new rules for amending drawings effective January 1, 1989, the Office no longer requires the submission of formal drawings upon filing a patent application. See 1097 Off. Gaz. Pat. Office 36 (Dec. 13, 1988). Since corrections are the responsibility of the applicant, the original drawing(s) should be retained by the applicant for future correction, if necessary.

As a result of adoption of the new rules in 1989 relating to drawings, the Office will no longer release to applicants, bonded drafting companies or others, drawings from patent applications. Effective January 1, 1991, § 1.85(b) prohibits release of drawings from all patent applications. Accordingly, the reference to changes by bonded draftsmen is deleted from § 1.123.

Section 1.152 is revised to provide that photographs and ink drawings must not be combined in one design application. The reason for this requirement is to avoid inconsistencies between the photograph and the drawing, and further eliminate views that may distort the proportionate relationship between the corresponding elements on the drawing and the photograph. All design photographs are limited to the design for the article claimed and are not to include environmental structure.

Color drawings and color photographs are not permissible in design patent applications. The submission of color photographs will be accepted for filing date purposes, in design patent applications, contrary to the requirement for black ink drawings. The Applications Processing Division has been authorized to construe the color photographs as informal drawings, rather than to hold the applications incomplete as filed. By so construing color photographs when filed as informal drawings, the Office will accept the applications without requiring applicants to file a petition to obtain the original deposit date as the filing date. During the course of prosecution, the Examiner will require properly executed formal black ink drawings or black and white photographs as a substitute for the originally filed color photographs prior to allowance of the claim. Solid black surface shading is not permitted on a design drawing, except when used to represent color contrast.

Section 1.165 is revised to provide that plant patent drawings must comply with the requirements of § 1.84. The current exception that plant patent drawings do not automatically require view numbers and reference characters is maintained. Two sets of the drawings are needed. One set will be forwarded to the Department of Agriculture and the other set will be routed to the Office of Publication and Dissemination, Patent and Trademark Copy Sales, for copying purposes.

OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Acting General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to revise and reformat the drawing standards to adopt international standards, to the extent possible, and to facilitate access to sections through inclusion of pertinent subsection headings, which should be helpful to small entities.

The Office has determined that these rule changes are not a major rule under Executive Order 12291 The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these rule changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011.

List of Subjects in 37 CFR Part 1.

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting, and Record keeping requirement.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.17(h) is revised to read as follows:

§ 1.77 Patent application processing fees.

• • • • •

(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....$130.00

§ 1.47—for filing by other than all the inventors or a person not the inventor.
§ 1.48—for correction of inventorship
§ 1.84—for accepting color drawings or photographs.
§ 1.182—for decision on questions not specifically provided for.
§ 1.183—to suspend the rules.
§ 1.295—for review of refusal to publish a statutory invention registration.
§ 1.377—for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.
§ 1.378(e)—for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.
§ 1.644(e)—for petition in an interference.
§ 1.644(f)—for request for reconsideration of a decision on petition in an interference.
§ 1.666(c)—for late filing of interference settlement agreement.
§§ 5.12, 5.13, & 5.14—for expedited handling of a foreign filing license.
§ 5.15—for changing the scope of a license.
§ 5.25—for retroactive license.

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3. Section 1.19(a)(3) is revised to read as follows:

§ 1.19 Document supply fees.

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(a) Uncertified copies of patents:

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(3) Copy of a utility patent or statutory invention registration containing color drawing (see § 1.84(a)(2)) $24.00

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4. Section 1.71(d) is revised to read as follows:

§ 1.71 Detailed description and specification of the invention.

• • • • •

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may appear at any appropriate portion of the patent application disclosure. For notices in drawings, see § 1.84(s). The content of the notice must be limited to only those elements provided for by law. For example, " ©1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

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5. Section 1.84 is revised to read as follows:

§ 1.84. Standards for drawings.

(a) *Drawings*. There are two acceptable categories for presenting drawings in utility patent applications:

(1) *Black ink*. Black and white drawings are normally required. India ink, or its equivalent that secures solid black lines, must be used for drawings, or

(2) *Color*. On rare occasions, color drawings may be necessary as the only practical medium by which to disclose the subject matter sought to be patented in a utility patent application or the subject matter of a statutory invention registration. The Patent and Trademark Office will accept color drawings in utility patent applications and statutory invention registrations only after granting a petition filed under this paragraph explaining why the color drawings are necessary. Any such petition must include the following:

(i) The appropriate fee set forth in § 1.17(h);
(ii) Three (3) sets of color drawings; and
(iii) The specification must contain the following language as the first paragraph in that portion of the specification relating to the brief description of the drawing:

The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee."

If the language is not in the specification, a proposed amendment to insert the language must accompany the petition.

(b) *Photographs*.

(1) *Black and white*. Photographs are not ordinarily permitted in utility and design patent applications. However, the Office will accept photographs in utility and design patent applications only after granting a petition filed under this paragraph which requests that photographs be accepted. Any such petition must include the following:

(i) The appropriate fee set forth in 1.17(h); and

(ii) Three (3) sets of photographs. Photographs must either be developed on double weight photographic paper or be permanently mounted on bristol board. The photographs must be of sufficient quality so that all details in the drawing are reproducible in the printed patent.

(2) *Color*. Color photographs will be accepted in utility patent applications if the conditions for accepting color drawings have been satisfied. See paragraph (a)(2) of this section.

(c) *Identification of drawings*. Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page.

(d) *Graphic forms in drawings*. Chemical or mathematical formulae, tables, and waveforms may be submitted as drawings, and are subject to the same requirements as drawings. Each chemical or mathematical formula must be labeled as a separate figure, using brackets when necessary, to show that information is properly integrated. Each group of waveforms must be presented as a single figure, using a common vertical axis with time extending along the horizontal axis. Each individual waveform discussed in the specification must be identified with a separate letter designation adjacent to the vertical axis.

(e) *Type of paper*. Drawings submitted to the Office must be made on paper which is flexible, strong, white, smooth, nonshiny, and durable. All sheets must be free from cracks, creases, and folds. Only one side of the sheet shall be used for the drawing. Each sheet must be reasonably free from erasures and must be free from alterations, overwritings, and interlineations. Photographs must either be developed on double weight photographic paper or be permanently mounted on bristol board. See paragraph (b) of this section for other requirements for photographs.

(f) *Size of paper*. All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

(1) 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches),
(2) 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches),
(3) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), or
(4) 21.0 cm. by 29.7 cm. (DIN size A4).

(g) *Margins*. The sheets must not contain frames around the sight, i.e., the usable surface. The following margins are required:

(1) On 21.6 cm. by 35.6 cm. (8 1/2 by 14 inch) drawing sheets, each sheet must include a top margin of 5.1 cm. (2 inches), and bottom and side margins of .64 cm. (14 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).

(2) On 21.6 cm. by 33.1 cm. (8 1/2 by 13 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (14 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).

(3) On 21.6 cm. by 27.9 Cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches).

(4) On 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, each sheet must include a top margin of at least 2.5 cm., a left side margin of 2.5 cm., a right side margin of 1.5 cm., and a bottom margin of 1.0 cm., thereby leaving a sight no greater than 17.0 cm. by 26.2 cm.

(h) *Views*. The drawing must contain as many views as necessary to show the invention. The views may be plan, elevation, section, or perspective views. Detail views of portions of elements, on a larger scale if necessary, may also be used. All views of the drawing must be grouped together and arranged on the sheet(s) without wasting space, preferably in an upright position, clearly separated from one another, and must not be included in the sheets containing the specifications, claims, or abstract. Views must not be connected by projection lines and must not contain center lines. Waveforms of electrical signals may be connected by dashed lines to show the relative timing of the waveforms.

(1) *Exploded views*. Exploded views, with the separated parts embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When an exploded view is shown in a figure which is on the same sheet as another figure, the exploded view should be placed in brackets.

(2) *Partial views*. When necessary, a view of a large machine or device in its entirety may be broken into partial views on a single sheet, or extended over several sheets if there is no loss in facility of understanding the view. Partial views drawn on separate sheets must always be capable of being linked edge to edge so that no partial view contains parts of another partial view. A smaller scale view should be included showing the whole formed by the partial views and indicating the positions of the parts shown. When a portion of a view is enlarged for magnification purposes, the view and the enlarged view must each be labeled as separate views.

(i) Where views on two or more sheets form, in effect, a single complete view, the views on the several sheets must be so arranged that the complete figure can be assembled without concealing any part of any of the views appearing on the various sheets.

(ii) A very long view may be divided into several parts placed one above the other on a single sheet. However, the

relationship between the different parts must be clear and unambiguous.

(3) *Sectional views*. The plane upon which a sectional view is taken should be indicated on the view from which the section is cut by a broken line. The ends of the broken line should be designated by Arabic or Roman numerals corresponding to the view number of the sectional view, and should have arrows to indicate the direction of sight. Hatching must be used to indicate section portions of an object, and must be made by regularly spaced oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. Hatching should not impede the clear reading of the reference characters and lead lines. If it is not possible to place reference characters outside the hatched area, the hatching may be broken off wherever reference characters are inserted. Hatching must be at a substantial angle to the surrounding axes or principal lines, preferably 45. A cross section must be set out and drawn to show all of the materials as they are shown in the view from which the cross section was taken. The parts in cross section must show proper material(s) by hatching with regularly spaced parallel oblique strokes, the space between strokes being chosen on the basis of the total area to be hatched. The various parts of a cross section of the same item should be hatched in the same manner and should accurately and graphically indicate the nature of the material(s) that is illustrated in cross section. The hatching of juxtaposed different elements must be angled in a different way. In the case of large areas, hatching may be confined to an edging drawn around the entire inside of the outline of the area to be hatched. Different types of hatching should have different conventional meanings as regards the nature of a material seen in cross section.

(4) *Alternate position*. A moved position may be shown by a broken line superimposed upon a suitable view if this can be done without crowding; otherwise, a separate view must be used for this purpose.

(5) *Modified forms*. Modified forms of construction must be shown in separate views.

(i) *Arrangement of views*. One view must not be placed upon another or within the outline of another. All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views wider than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet, with the appropriate top margin to be used as the heading space, is on the right-hand side. Words must appear in a horizontal, left-to-right fashion when the page is either upright or turned so that the top becomes the right side, except for graphs utilizing standard scientific convention to denote the axis of abscissas (of X) and the axis of ordinates (of Y).

(j) *View for Official Gazette*. One of the views should be suitable for publication in the *Official Gazette* as the illustration of the invention.

(k) *Scale*.

(1) The scale to which a drawing is made must be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction. Views of portions of the mechanism on a larger scale should be used when necessary to show details clearly. Two or more sheets may be used if one does not give sufficient room. The number of sheets should be kept to a minimum.

(2) When approved by the examiner, the scale of the drawing may be graphically represented. Indications such as "actual size" or "scale 1/2" on the drawings, are not permitted, since these lose their meaning with reproduction in a different format.

(3) Elements of the same view must be in proportion to each other, unless a difference in proportion is indispensable for the clarity of the view. Instead of showing elements in different proportion, a supplementary view may be added giving a larger-scale illustration of the element of the initial view. The enlarged element shown in the second view should be surrounded by a finely drawn or "dot-dash" circle in the first view indicating its location without obscuring the view.

(l) *Character of lines, numbers, and letters*. All drawings must be made by a process which will give them satisfactory reproduction characteristics. Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. This requirement applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. Lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have a different meaning.

(m) *Shading*. The use of shading in views is encouraged if it aids in understanding the invention and if it does not reduce legibility. Shading is used to indicate the surface or shape of spherical, cylindrical, and conical elements of an object. Flat parts may also be lightly shaded. Such shading is preferred in the case of parts shown in perspective, but not for cross sections. See paragraph (h)(3) of this section. Spaced lines for shading are preferred. These lines must be thin, as few in number as practicable, and they must contrast with the rest of the drawings. As a substitute for shading, heavy lines on the shade side of objects can be used except where they superimpose on each other or obscure reference characters. Light should come from the upper left corner at an angle of 45 Surface delineations should preferably be shown by proper shading. Solid black shading areas are not permitted, except when used to represent bar graphs or color.

(n) *Symbols*. Graphical drawing symbols may be used for conventional elements when appropriate. The elements for which such symbols and labeled representations are used must be adequately identified in the specification. Known devices should be illustrated by symbols which have a universally recognized conventional meaning and are generally accepted in the art. Other symbols which are not universally recognized may be used, subject to approval by the Office, if they are not likely to be confused with existing conventional symbols, and if they are readily identifiable.

(o) *Legends*. Suitable descriptive legends may be used, or may be required by the Examiner, where necessary for understanding of the drawing, subject to approval by the Office. They should contain as few words as possible.

(p) *Numbers, letters, and reference characters*.

(1) Reference characters (numerals are preferred), sheet numbers, and view numbers must be plain and legible, and must not be used in association with brackets or inverted commas, or enclosed within outlines, e.g., encircled. They must be oriented in the same direction as the view so as to avoid having to rotate the sheet. Reference characters should be arranged to follow the profile of the object depicted.

(2) The English alphabet must be used for letters, except where another alphabet is customarily used, such as the Greek alphabet to indicate angles, wavelengths, and mathematical formulas.

(3) Numbers, letters, and reference characters must measure at least .32 cm. (1/8 inch) in height. They should not be placed in the drawing so as to interfere with its comprehension. Therefore, they should not cross or mingle with the lines. They should not be placed upon hatched or shaded surfaces. When necessary, such as indicating a surface or cross section, a reference character may be underlined and a blank space may be left in the hatching or shading where the character occurs so that it appears distinct.

(4) The same part of an invention appearing in more than one view of the drawing must always be designated by the same reference character, and the same reference character must never be used to designate different parts.

(5) Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

(q) *Lead lines*. Lead lines are those lines between the reference characters and the details referred to. Such lines may be straight or curved and should be as short as possible. They must originate in the immediate proximity of the reference character and extend to the feature indicated. Lead lines must not cross each other. Lead lines are required for each reference character except for those which indicate the surface or cross section on which they are placed. Such a reference character must be underlined to make it clear that a lead line has not been left out by mistake. Lead lines must be executed in the same way as lines in the drawing. See paragraph (1) of this section.

(r) *Arrows*. Arrows may be used at the ends of lines, provided that their meaning is clear, as follows:

(1) On a lead line, a freestanding arrow to indicate the entire section towards which it points;

(2) On a lead line, an arrow touching a line to indicate the surface shown by the line looking along the direction of the arrow; or

(3) To show the direction of movement.

(s) *Copyright or Mask Work Notice*. A copyright or mask work notice may appear in the drawing, but must be placed within the sight of the drawing immediately below the figure representing the copyright or mask work material and be limited to letters having a print size of .32 cm. to .64 cm. (1/8 to 1/4 inches) high. The content of the notice must be limited to only those elements provided for by law. For example, "© 1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in § 1.71(e) is included at the beginning (preferably as the first paragraph) of the specification.

(t) *Numbering of sheets of drawings*. The sheets of drawings should be numbered in consecutive Arabic numerals, starting with 1, within the sight as defined in paragraph (g) of this section. These numbers, if present, must be placed in the middle of the top of the sheet, but not in the margin. The numbers can be placed on the right-hand side if the drawing extends too close to the middle of the top edge of the usable surface. The drawing sheet numbering must be clear and larger than the numbers used as reference characters to avoid confusion. The number of each sheet should be shown by two Arabic numerals placed on either side of an oblique line, with the first being the sheet number, and the second being the total number of sheets of drawings, with no other marking.

(u) *Numbering of views*.

(1) The different views must be numbered in consecutive Arabic numerals, starting with 1, independent of the numbering of the sheets and, if possible, in the order in which they appear on the drawing sheet(s). Partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter. View numbers must be preceded by the abbreviation "FIG." Where only a single view is used in an application to illustrate the claimed invention, it must not be numbered and the abbreviation "FIG." must not appear.

(2) Numbers and letters identifying the views must be simple and clear and must not be used in association with brackets, circles, or inverted commas. The view numbers must be larger than the numbers used for reference characters.

(v) *Security markings*. Authorized security markings may be placed on the drawings provided they are outside the sight, preferably centered in the top margin.

(w) *Corrections*. Any corrections on drawings submitted to the Office must be durable and permanent.

(x) *Holes*. The drawing sheets may be provided with two holes in the top margin. The holes should be equally spaced from the respective side edges, and their center lines should be spaced 7.0 cm. (2 3/4 inches) apart.
(See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

6. Section 1.88 is removed and reserved.

§ 1.88 [Reserved]

7. Section 1.123 is revised to read as follows:

§ 1.123 Amendments to the drawing.

No change in the drawing may be made except with permission of the Office. Permissible changes in the construction shown in any drawing may be made only by the submission of a substitute drawing by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

8. Section 1.152 is revised to read as follows:

§ 1.152 Design drawing.

The design must be represented by a drawing that complies with the requirements of § 1.84, and must contain a sufficient number of views to constitute a complete disclosure of the appearance of the article. Appropriate surface shading must be used to show the character or contour of the surfaces represented. Solid black surface shading is not permitted except when used to represent color contrast. Broken lines may be used to show visible environmental structure, but may not be used to show hidden planes and surfaces which cannot be seen through opaque materials. Alternate positions of a design component, illustrated by full and broken lines in the same view are not permitted in a design drawing. Photographs and ink drawings must not be combined in one application. Photographs submitted in lieu of ink drawings in design patent applications must comply with § 1.84(b) and must not disclose environmental structure but must be limited to the design for the article claimed. Color drawings and color photographs are not permitted in design patent applications.

9. Section 1.165 is revised to read as follows:

§ 1.165 Plant drawings.

(a) Plant patent drawings should be artistically and competently executed and must comply with the requirements of § 1.84. View numbers and reference characters need not be employed unless required by the examiner. The drawing must disclose all the distinctive characteristics of the plant capable of visual representation.

(b) The drawing may be in color and when color is a distinguishing characteristic of the new variety, the drawing must be in color. Two copies of color drawings or color photographs must be submitted.

July 14, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and
Acting Commissioner of
Patents and Trademarks

[1153 OG 33]

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(63) Temporary Suspension of "At Cost" Services for Orders for Certified Copies

Effective immediately, and until further notice, the Certification Division, Office of Public Records, will temporarily suspend accepting requests for "at cost" service for orders of certified copies of PTO documents except where the requester provides documentation that the copy is required for pending litigation.

The Certification Division's ability to provide "at cost" services is based upon the ready availability of source documents either on microform or via access to electronic images. Increased filings of both patent and trademark applications have resulted in more instances where requested documents are not yet available on film or electronic media to fill customer orders on an "at cost" basis efficiently and for a reasonable fee.

Orders for expedited service for certified copies of both patent and trademark applications-as-filed and trademark registrations will continue to be accepted. Customers will be advised within three working days if microform or electronic images are not available to fill their orders on an expedited basis, and the order will be filled as a request for regular service with an appropriate adjustment and/or credit for fees paid.

Customers are reminded that expedited service is provided on a "local basis" for those orders: (1) placed through the PTO's Public Service Windows located in the Patent Search Room and the Trademark Search Library; (2) hand-delivered to the Office of Public Records' (OPR) Service Counter in the North Tower building; (3) transmitted via fax directly to the Certification Division; or (4) received from an overnight delivery service at the OPR Service Counter. Requests for expedited service received through the US mail will be processed as regular orders.

In those cases where Certification Division cannot fill a customer order within 30 days of receipt due to unavailability of media or the source document itself, customers will be provided with a certified letter documenting their request and the Office's inability to fill the order as requested. These letters

will be provided at no charge. The order itself will be closed and a full refund or credit made to the customer.

Customers placing orders for certified copies may use the following as guidelines for expected turnaround times from initial receipt of an order in PTO to mailing date from the Office:

Certified Product	*Days to Mail*
Patent Application-As-Filed, Expedited (microfiche available)	7
Patent Applications-As-Filed, Regular	17
Patent Related File Wrapper	25
Patent Copy	10
Trademark Application-As-Filed, Expedited (microfiche available)	7
Trademark Application-As-Filed, Regular	17
Trademark Related File Wrapper	25
Trademark Registration	10
Trademark Registration, Expedited	3

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessiblity. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

November 2, 1995 WESLEY H. GEWEHR
Administrator for Information Dissemination

[1180 OG 121]

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(64) Use of Symbol "Ø" in Patent Applications

The Greek letter Phi has long been used as a symbol in equations in all technical disciplines. It further has special uses which include the indication of an electrical phase or clocking signal as well as an angular measurement. The recognized symbols for the upper and lower case Greek Phi characters, however, do not appear on most typewriters. This apparently has led to the use of a symbol composed by first striking a zero key and then backspacing and striking the "cancel" or "slash" key to result in "Ø" which is an approximation of accepted symbols for the Greek character Phi. In other instances the symbol is composed using the upper or lower case letter "O" with the "cancel" or "slash" superimposed thereon by backspacing or is simply handwritten in a variety of styles. These expedients result in confusion because of the variety of type sizes and styles available on modern typewriters.

In recent years, the growth of data processing has seen the increasing use of this symbol ("Ø") as the standard representation of zero. The "slashed" or "cancelled zero" is used to indicate zero and avoid confusion with the upper case letter "Ø" in both text and drawings.

Thus, when the symbol "Ø" in one of its many variations, as discussed above, appears in patent applications being prepared for printing, confusion as to the intended meaning of the symbol arises. Those (such as examiners, attorneys, and applicants) working in the art can usually determine the intended meaning of this symbol because of their knowledge of the subject matter involved, but editors preparing these applications for printing have no such specialized knowledge and confusion arises as to which symbol to print. The result, at the very least, is delay until the intended meaning of the symbol can be ascertained.

Since the Office does not have the resources to conduct a technical editorial review of each application before printing, and in order to eliminate the problem of printing delays associated with the usage of these symbols, any questions about the intended symbol will be resolved by the editorial staff of the Office of Publications by printing the symbol "Ø" whenever that symbol is used by the applicant. Any Certificate of Correction necessitated by the above practice will be at the patentee's expense (37 CFR 1.323) because the intended symbol was not accurately presented by the Greek upper or lower case Phi letters (I, Ø) in the patent application.

Dec. 20, 1978 RICHARD J. SHAKMAN
Assistant Commissioner for Administration.

[978 O.G. 152]

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(65) U.S. Accession to Hague Convention Abolishing the Requirement of Legalization for Foreign Public Documents

On Oct. 15, 1981, the Hague "Convention Abolishing the Requirement of Legalization for Foreign Public Documents" entered into force between the United States and twenty-eight foreign countries that are parties to the Convention. The Convention applies to any document submitted to the United States Patent and Trademark Office for filing or recording, which is sworn to or acknowledged by a notary public in any one of the member countries. The Convention abolishes the certification of the authority of the notary public in a member country by a diplomatic or consular officer of the United States and substitutes certification by a special certificate, or apostille, executed by an officer of the member country. Accordingly, the Office will accept for filing or recording a document sworn to or acknowledged before a notary public in a member country if the document bears, or has appended to it, an apostille certifying the notary's authority. The requirement for a diplomatic or consular certificate, specified in 37 CFR 1.66 and note 1 of 37 CFR 3.45, will not apply to a document sworn to or acknowledged before a notary public in a member country if an apostille is used.

The member countries that are parties to the Convention are:

Austria	Italy	Spain
Bahamas	Japan	Suriname
Belgium	Lesotho	Swaziland
Botswana	Liechtenstein	Switzerland
Cyprus	Luxembourg	Tonga
Fiji	Malawi	U.K. of Great
France	Malta	Britain and
Germany	Mauritius	N. Ireland
Fed. Rep. of	Netherlands	United States
Hungary	Portugal	Yugoslavia
Israel	Seychelles	

The Convention prescribes the following form for the apostille:

Model of certificate

The certificate will be in the form of a square with sides at least 9 centimetres long

APOSTILLE
(Convention de La Haye du Oct. 5, 1961)

1. Country: .....
This public document
2. has been signed by .....
3. acting in the capacity of .....
4. bears the seal/stamp of .....
.....

Certified

5. at..... 6. the.....
7. by.....
8. No.....
9. Seal/stamp: 10. Signature: .....
.....

Nov. 5, 1981 GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks

[1013 O.G. 3]

(66) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1 [Docket No. 71008-7208]

Variety Denomination Requirements for Plant Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office proposes to amend certain of the rules of practice applicable to the patenting of plants. Under the proposed rules of practice, an applicant for such a patent would, in addition to any requirements for obtaining a patent, also be required to record an identifying variety denomination for the plant. These proposed rules fulfill an obligation imposed by the Convention of the International Union for the Protection of New Plant Varieties (the UPOV Convention), to which the United States adheres.
Dates: Comments on the proposed rules must be submitted by Jan. 8, 1988, to assure their consideration in formulating the rules put into effect. A public hearing will be held on Jan. 15, 1988, beginning at 9:30 A.M., in the Commissioner's Conference Room, Crystal Plz. 3, the Patent and Trademark Office.
Addresses: Address comments to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231. All comments received will be publicly available in the Patent and Trademark Office, Crystal Plz. 3, Arlington, Va., Rm. 11C28.
For Further Information Contact: Mr. Stanley D. Schlosser, Office of Legislation and International Affairs, by telephone at (703) 557-3065 or by mail addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The UPOV Convention became applicable to the United States on Nov. 8, 1981, as a consequence of the President's exercise of authority to adhere to this international agreement. Under Articles 6 and 13 of the UPOV Convention, each plant variety for which protection is sought must be given a variety denomination and that denomination recorded ("registered" in the language of the Convention) at least by the time the patent is granted. It is left to each of the UPOV member states to determine how recordation is effected. For the United States, the issuance of a patent which includes the denomination of the variety would constitute recordation and registration for the purposes of compliance with UPOV Convention. The patent examining process would include consideration of the suitability for recordation of the proposed variety denomination.

Attention is called to two earlier Commissioner's Notices on this subject. The Notice of Oct. 20, 1981 (46 FR 51426) stated that appropriate rules for the registration of variety denominations, as required by the UPOV Convention, would be issued. The Commissioner's Notice, published in the Federal Register on Aug. 16, 1985, 50 FR 33062, proposed amendments to the Patent and Trademark Office's rules of practice to carry out this requirement. In light of public comments received, the earlier proposed rules are being withdrawn from consideration and replaced by these revised proposed rules. These would apply to plants patented under either 35 U.S.C. 101 or 161, but would not apply to any protection sought under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), administered by the United States Department of Agriculture.

These proposed rules, in accordance with the patent law requirements for providing a descriptive title for a patent application, would require the variety denomination proposed for recordation to be included in the title of the application. The denomination would be judged for recordability by the examiner assigned the application for examination, who would consult with appropriate trademark examination officials to determine if there exists a possibly conflicting trademark registration or application for registration.

The recordation of a variety denomination for purposes of compliance with UPOV Convention Article 13 is not to be understood as conveying any legal rights in that denomination. Recordation does no more than establish a prima facie case that can be asserted as evidence of the possible generic nature of the variety denomination, if genericness is not already established by its usage in the commercial market, advertising or publication.

Under the proposed rules, the Patent and Trademark Office in examining the recordability of variety denominations will, in addition to its trademark records, utilize the Office's compilation of denominations obtained from horticultural, agricultural, floral and other professionalsocieties, national breeders' rights offices, the UPOV Union's Secretariat, standard references and other available sources. Article 13 of the UPOV Convention requires that the variety denomination must enable the plant variety to be identified, that the denomination not consist solely of numbers except if this is shown to be an established practice for designating plant varieties, and that the denomination not be liable to mislead or cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. No specific naming system is required by the Article. While a portion of the consuming public and others might prefer plant variety names conforming to the International Code of Nomenclature for Cultivated Plants or the UPOV Guidelines, common usage, code systems or other ways of identifying plants cannot be ignored.

The Patent and Trademark Office would accept for recordation a variety denomination complying with the requirements of the UPOV Convention's Articles 13(2) and 13(4). A number of variety denomination systems currently in use, such as the system described in the 1980 revision of the International Code of Nomenclature for Cultivated Plants, the UPOV Guidelines and various code systems may also meet these requirements. Sexually reproduced varieties could be named in compliance with the requirements of the Federal Seed Act. In the event the examiner does not approve a proposed variety denomination for recordation, the applicant could petition the Commissioner for approval. Thus, the examination and approval of variety denominations will be handled in the same way as other procedural and administrative requirements not relating to the merits of the invention, such as the requirement to provide an abstract of the disclosure or the requirement to provide a title. A final refusal by the Commissioner on petition would require submission of another proposed denomination for recordation.

The petition to the Commissioner will be subject to a fee and the other requirements relating to petitions. The Commissioner may in appropriate cases delegate to the Assistant Commissioner for Trademarks or other appropriate trademark officials the decision of such petitions, under 37 C.F.R. 1.181(g).

The UPOV Convention requires the applicant to identify the patented variety by the same variety denomination (or a translation thereof) in all UPOV member states. A different denomination may be recorded in a particular member state, however, in cases where the denomination registered in another member state is unsuitable for business or other reasons. An applicant may during the course of examination be required to inform the Office of any other denomination by which the variety is known.

While these rules provide for the recordation of variety denominations, they recognize at the same time that, in cases of conflict, previously established proprietary rights are paramount. Recordation is in legal effect, therefore, no more than publication of a denomination which is or may become the generic name of a plant variety.

Trademark owners, owners of other proprietary rights and patent applicants share a common interest in knowing as early as possible if a variety denomination proposed for recordation possibly conflicts with a trademark or other proprietary rights. Accordingly, each denomination proposed for recordation, along with the genus and species to which the variety belongs, shall be published in the *Official Gazette* as soon as reasonably possible after receipt of the application in the Office. The Commissioner has determined that publication of such information constitutes special circumstances under 35 U.S.C. 122.

The public may provide information to the Office concerning the recordability of a proposed denomination. Such information would be entered in the official file wrapper of the application and be available to the examiner. Such information shall be called to the attention of the applicant by the Office.

Also, the *Official Gazette* would list newly recorded denominations in United States patents in order for trademark owners to assert their rights in appropriate cases through private negotiations or judicially, as they may now do in trademark cases. Proceedings in the Office in regard to the registration of variety denominations, however, will be conducted ex parte.

Under the proposed rules, each applicant would be required to specify in an application for protection of a plant variety the date of first use of the denomination if used prior to filing

of the patent application, or later to provide information about the date of first commercial use during pendency of the application. In cases of conflict between a trademark and a proposed variety denomination, the variety denomination will not be accepted for recordation unless its first commercial use clearly antedates another's established rights.

If a patentee learns of a conflict between a trademark and the recorded variety denomination after issuance of the patent, the patentee in order to resolve the conflict will be permitted to record a different denomination by means of the Certificate of Correction procedure. Also, a variety denomination found after issuance of a patent to be commercially unsuitable or ill-advised could be changed in a similar manner.

The Office now permits plants and plant varieties to be patented both specifically and broadly under patent 35 U.S.C. 101. In some cases, however, claims in an application will not be limited to a specific variety. These proposed rules would apply only to applications where a specific variety or varieties are claimed. Only these need be identified by a variety denomination, except where the number of varieties involved makes this impractical. In such a case, each claim directed to a specific variety would include its variety denomination, but these variety denominations could be omitted from the title of the patent. Variety denominations would not be required for microorganisms or microscopic plant parts.

Other Considerations: The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This rule contains a collection of information requirement subject to the Paperwork Reduction Act. This colletion of information requirement has been cleared by OMB under control No. 0651-0011.

The General Counsel of the Department Commerce has certified to the Small Business Administration that the proposed rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The variety denomination requirement will not impose extra work on patent applicants (whether small or large businesses or individuals). The rules will help avoid burdensome and expensive litigation over trademark rights.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out in the preamble, 37 CFR Part 1 is proposed to be amended by revising §§ 1.72, and 1.17 and adding a new § 1.168 as set forth below. All proposed additions are printed between arrows.

PART 1 -RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

AUTHORITY: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is proposed to be amended by adding the following items in numerical order to the list in paragraph (h) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(h) * * *

▶§ 1.168(d) For petitioning the Commissioner to record a plant variety denomination . . .
§ 1.168(g) For petitioning the Commissioner to record a substitute plant variety denomination . . .◀

3. Section 1.72 is proposed to be amended by adding the following paragraph:

§ 1.72 Title and abstract.

* * *

▶(c) In the case of an application for the patenting of a plant variety under the provisions of 35 U.S.C. 101 or 161, the title of the application must include a variety denomination for the specific new variety claimed, except as provided for in§ 1.168(b). The granting of the patent will be deemed the recordation of the variety denomination for purposes of compliance with Article 13 of the International Convention for the Protection of New Varieties of Plants, as revised on Oct. 23, 1978.

4. A new § 1.168 is proposed to be added, to read as follows:

▶§ 1.168 Variety denomination, submission to the Office, examination.
(a) The variety denomination submitted by the patent applicant under § 1.72 will be examined for compliance with the International Convention for the Protection of New Varieties of Plants. Specifically, the denomination:

(1) must enable the plant variety to be identified;
(2) must not be likely to cause confusion, to cause mistake or to deceive concerning the characteristics, value or identity of the plant variety or the identity of the breeder;
(3) must not consist solely of numbers except if this is an established practice for designating plant varieties; and
(4) must not be likely to cause confusion or mistake or to deceive as to any prior right of a third party, and shall not affect prior rights of third parties.

(b) If a proposed variety denomination is not included as part of the title of the application, when filed, the examiner shall set a period of not less than thirty days to provide a variety denomination. If a plurality of plant varieties are claimed, which make it impractical to include each variety denomination in the title of the application, each claim directed to a specific plant variety shall instead include the denomination of the claimed plant variety. In cases where no specific plant variety is claimed, for example, a patent directed to the improvement of a plant species, the denomination requirement applicable to the patenting of a plant variety or varieties will be waived.
(c) If the examiner determines that a proposed variety denomination is not suitable for recordation, the examiner shall refuse recordation thereof and shall set forth in an Office action the reasons for such refusal. An applicant disagreeing with the reasons for such refusal may request reconsideration and withdrawal of the refusal, giving the reasons therefor. If the examiner's refusal to record a proposed variety denomination is repeated and made final, the examiner shall at the same time require the applicant to propose another variety denomination for recordation.
(d) After a final requirement by the examiner for submission of a proposed new variety denomination, the applicant, in addition to making any response due on the remainder of the action, may in lieu of proposing another variety denomination petition the Commissioner for review of the examiner's holding, upon payment of the fee set forth in § 1.17(h).
(e) The applicant is required to submit for recordation the same variety denomination (or, if not in English, a translation or transliteration thereof) as that previously registered or recorded, or proposed for registration in an earlier filed application for protection of the same variety in another member state of the International Union for the Protection of New Varieties of Plants. The applicant may submit another denomination for recordation, however, upon a showing satisfactory to the examiner as to why the denomination originally submitted or registered in another member state of the said Union is unsuitable for recordation in the United States. During pendency of an application, the examiner may require the applicant to provide information regarding all denominations for the same variety registered or proposed for registration in other member states of the said Union before the application was filed in the United States.
(f) The applicant shall indicate in the application the date of first commercial use in the United States if any, of the variety denomination proposed for recordation; or, if not commercially used prior to filing of the application, indicate during pendency of the application when the denomination has first been commercially used in this country. No variety denomination will be recorded if first commercially used after the establishment of third party proprietary rights to the denomination.
(g) A patentee in order to avoid a conflict between a recorded variety denomination and a trademark or other proprietary right, or where the recorded variety denomination is likely to be confused with another, or where business or marketing considerations dictate, may propose for recordation a substitute variety denomination for that already recorded. Such a proposal shall be in the form of a petition to the Commissioner together with the fee set forth in § 1.17(h). The proposed substitute denomination will be examined in the same manner as the denomination originally recorded, and upon recordation shall be promptly published in the *Official Gazette*. A Certificate of Correction indicating such substitute denomination shall be issued for the patent. If the patent has been assigned, only the assignee of record may apply for recordation of a substitute denomination.
(h) The Commissioner shall upon its receipt in the Office promptly publish in the *Official Gazette* each variety denomination proposed for recordation and the genus and species of the plant involved. Correspondence from the public objecting to the recordation of such denomination, if accompanied by reasons therefor, will be placed in the official file and considered by the examiner in an ex parte manner. An objection to recordation may be based on an earlier recorded or unrecorded variety denomination, a registered or common law trademark, a trade name or trade indicia, or other alleged prior right timely called to the Office's attention. The applicant shall be notified by the Office of the receipt of such correspondence. The secrecy of any pending application will be preserved in accordance with 35 U.S.C. 122◀

Sept. 18, 1987

RENE TEGTMEYER
Assistant Commissioner for Patents

[1085 OG 13]

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(67) Summary Results of 1991 Patent Action Survey

The Patent and Trademark Office conducted a survey in the March-June 1991 period to gather information from patent practitioners and other Office "customers" about the quality of Office actions. Approximately 27,000 questionnaires (survey forms) were mailed with Office actions. Each survey form included 10 specific questions and provided space to make general comments. Each survey form identified only the Examining Group to which the application was assigned so that all responses would be completely anonymous.

Approximately 4,200 survey forms were returned (16% return rate).

Results

I. A tabulation of respondents' answers to the 10 specific questions revealed the following compliance rates relative to the accompanying Office actions:

35 U.S.C. 103 Rejections:

1. 72% identify portion of references relied on.
2. 70% indicate how teachings of references are modified or combined.
3. 65% communicate the rationale why the claimed invention would have been obvious.

35 U.S.C. 112, 1st para. rejections:

4. 58% sufficiently explain "new matter" position.
5. 67% sufficiently explain "non-enabling" disclosure position.

Final Rejection Practice:

6. 56% respond to applicant's arguments.
7. 52% of Advisory Actions identify new issues and/or new matter when denying entry.

Allowance Practice:

8. 90% of reasons for allowance were clear.

Miscellaneous:

9. 45% clearly communicate reasons for finding declarations/affidavits unpersuasive.
10. 54% of Examiner's Answers address appellant's arguments.

The questions relating to "Final Rejection Practice" and to the "Miscellaneous" topic areas asked whether examiners respond to attorney arguments and how attorneys interpret the examiners' responses to their arguments. These topic areas and others where there are relatively low compliance rates have been identified as areas of Office practice needing improvement.

The responses to the 10 survey questions show that continuous improvement has been achieved in several areas. For example, the high percentage of affirmative responses in the area of explaining 35 U.S.C. 103 rejections (72%, 70%, and 65%) reflects a clear improvement over internal surveys made within the last several years, and reflects the effectiveness of recent extensive Office training programs in this area. It is also apparent there is still room for further improvement. Another positive result was that 90% of respondents, commenting on Reasons for Allowance, felt that the reasons given were clear.

II. Analysis of respondents' general comments:

Over 1800 survey forms were returned with comments (43% of total responses). While these comments were directed toward many different areas, two major categories were apparent:

Category A: 62% of the comments expressed the need for additional quality improvement of actions.

The most commonly expressed comments in this category indicate that the quality of Office actions can be improved by giving a better explanation of the rationale or reasons in support of rejections. Examples of comments received include: all elements of claims are not addressed in 35 U.S.C. 102(b) rejections; one of the references used in a 35 U.S.C. 103 rejection is not explained; features of dependent claims were not treated; claim limitations were ignored; "boilerplate" 35 U.S.C. 103 rejections were being given; and it was difficult to understand the rationale for the rejection, and, therefore, to file a proper and meaningful response.

The second most common type of comment in this category indicated that examiners misunderstand an essential feature. For example: actions reflect a misunderstanding by the examiner of

the scope and content of the prior art, the presently claimed invention, or the original disclosure. Further, comments indicate that some cited references seem to have no bearing on the claimed invention because the rejection of the claims is not supported by the disclosure of the applied reference.

Category B: 20% of the comments had compliments about the quality of Office actions.

The compliments acknowledged actions which presented a thorough analysis of the claim language with respect to the prior art references; which included suggestions for amendments to the claims so as to place the application in condition for allowance; and/or which gave a "tough" examination which would result in a stronger patent.

It is significant that the most common type of comment indicated that enhanced explanations would improve the quality of Office actions, while, at the same time, the second most common type of comment indicated that the quality of Office actions is considered to be very good in this regard. This seems to indicate that the quality of many Office actions are good, but that additional emphasis is still needed in this area.

Planned Initiatives:

The answers to the 10 questions and the comments are considered vital to current Office efforts to improve the quality of patent examination. The data, where statistically reliable, has been analyzed on an examining corps and individual group basis and the following initiatives have been, or will be, taken:

1. Update our continuing legal education program for experienced examiners with extra emphasis being placed on areas where improved performance is needed, such as the need for better motivation statements in rejections. Specific courses have been developed to provide tailored training in important areas, such as treatment of algorithms in claims, evaluating evidence submitted by applicants, and responding to applicant's arguments.
2. Enhance the Patent Academy curriculum for training junior examiners to place greater emphasis on the areas of examination where improved performance is needed, such as in responding to amendments after final rejection.
3. Implement focused training in each Examining Group to address specific technological/group specific problems that have been indicated by the survey. The training has been implemented in a variety of ways including one-on-one, art unit and group level programs. Form paragraphs have been developed to help ensure that applicant's arguments are appropriately considered and responded to in Office actions.
4. Develop follow-up surveys in order to determine if the corrective actions were successful. In this regard the answers to the questions and the concerns raised by respondents in their comments will serve as baselines for improvement.

The relatively small number of responses (only 16%, 4,200 responses from 27,000 survey forms mailed) resulted in statistically insignificant data for analysis of some questions at the group level. In part, this may have been due to confusion with prior perception surveys, requiring only a single response from each practitioner involved. Unlike perception surveys, each Patent Action Survey is specific to the Office action that accompanies it, and requests a brief response for that action. Hence, a practitioner who received more than one Office action with a survey form was requested to complete a survey form for each accompanying Office action.

The Office is planning follow-up surveys in FY-1992 and 1993. These surveys will be more meaningful and reliable if respondents answer the questions in as objective a manner as possible. Thus, respondents should try to objectively evaluate the accompanying examiner's action to see if that particular action did or did not include the feature(s) addressed by the question rather than whether there is agreement or disagreement with the examiner's position. Further, since greater participation would yield more reliable statistics, patent practitioners are encouraged to respond to future surveys.

Questions about the FY-1991 Patent Action Surveys should be directed to John Terapane, Director Group 1200, or Carolyn Ballard, Patent Action Survey Coordinator, both at (703) 308-0193.

June 29, 1992

STEPHEN G. KUNIN
Deputy Assistant Commissioner for Patents

[1140 OG 62]

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(68) Report on the Quality Reinforcement Program

The Patent and Trademark Office (PTO) has instituted a Quality Reinforcement Program to identify services offered by the PTO that are in need of improvement. As a part of this program, the Office, in cooperation with the American Intellectual Property Law Association (AIPLA), has completed an evaluation of selected practices performed by both patent examiners and representatives of patent applicants during the examination process. The results of this evaluation are detailed in Volume I of the PTO Report of the Quality Reinforcement Program. A summary of the findings of this report is presented below. This summary is presented to report on the findings and to solicit suggestions from both the public and employees of the Patent & Trademark Office on steps that might be taken to raise the level of performance of those practices found to be in need of improvement. The full report and evaluation, which is quite extensive with over 350 pages, is available at the PTO.

Address: Comments and inquiries should be addressed to: The Commissioner of Patents and Trademarks, Washington, D.C. 20231, to the attention of Edward Kubasiewicz, Director, Examining Group 250, Rm. CP4-9D19.

Date: Comments should be submitted by June 16, 1987.

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks.

Summary of Volume 1-Report on Current Level of Performance of Selected Patent Examining Corps Practices

This is a summary of Volume I of the Quality Reinforcement Program Report, which addresses the current level of performance of selected Patent Examining Corps practices. This summary presents a background of the Quality Reinforcement Program and a synopsis of conclusions reached for each selected practice.

Background of the Quality Reinforcement Program

On Feb. 25, 1986, President Reagan issued an executive order establishing a comprehensive program for the improvement of productivity throughout all of government. From this executive order the Department of Commerce evolved a Productivity Improvement Program entitled PROJECT PRIDE. The program was announced as encompassing productivity, quality excellence and client satisfaction.

The role of U.S. Patent and Trademark Office (PTO) in PROJECT PRIDE centers around quality, and is entitled the Quality Reinforcement Program.

The goal of the PTO program is to improve the quality of patent examining functions and the timeliness and quality of other public services. In particular, the program focuses on improving the quality of practices performed in three different areas of the PTO, i.e., the Patent Examining Corps, the Office of Administration and the Office of Documentation.

The quality of an issued patent and the record before the PTO in the patented file are extremely important to the patent owner and to others who may be competitors or otherwise affected by the patent. Investment decisions and the recoupment of research, development and marketing expenditures often depend upon patent protection. Potential licensees and infringers need to know where they stand in regard to an issued patent. Patent owners and others need to be able to have a high degree of confidence in the validity of a patent. Valid patents and a clear and correct file record will help to eliminate unnecessary and expensive patent litigation costs which are currently estimated to total at least $800 million per year.

The concern for productivity and productivity improvement is not a recent development at the PTO. During the past quarter of a century one of the most pressing problems for the Office has been a large and growing backlog of unexamined patent applications and the resulting long pendency time between filing an application and issuance of a patent. The average pendency of patent applications in 1964 was 37 months. However, average pendency dropped steadily in the 1970s until it culminated in an average pendency of 18 months in 1977. This pendency was shortlived due to a loss of adequate resources. However, pendency is once again falling and it is expected that an average pendency of 18 months will be achieved in 1989.

Historically, the Office has successfully responded to situations similar to the one in which it presently finds itself. Beginning in the 1960s when the backlog of new applications exceeded 200,000, a program designed to drastically increase the productivity of the Corps was initiated. Part of that program was what has since become known as "compact prosecution". An increased staff of examiners was reinstructed to take a new approach toward examining in which patentable subject matter was looked for and indicated as early in the prosecution of the case as possible, references were automatically furnished with actions, attorneys were urged to originally file claims of the broadest possible range of scope, telephonic prosecution was instituted, first actions and application disposals became the measure of examiners' performance, preprinted first action forms were designed, etc.

The question before the Office now is whether sufficient attention is being given to quality. The intent of the Quality Reinforcement Program, as it applies to the Patent Examining Corps, is to take stock of the present situation and to consider whether any corrective action needs to be taken to improve the quality of the examination process.

The Office is currently using and improving various tools to assure a quality examined patent. These tools include the quality review program, supervisory reviews of examiner work through the performance appraisal system and through the promotion and signatory authority programs, improved and expanded examiner training, development of the automated patent system to improve the quality of examiner searching, recruitment of "top-of-the-class" new examiners, and detailed and clear guidlines on examining policy and procedure.

The Quality Reinforcement Program is a new quality tool for improving the actual quality of the patents issued as well as the record behind the issuance of these patents. This new program differs from the quality review program in that this program looks at the key pieces of the patent examining process that contribute to and make up the end product or patent rather than looking only at the end product. The Quality Reinforcement Program focuses on the effectiveness and consistency with which examiners apply existing law and procedures and how they communicate their findings to applicants. The program also focuses on the attorney's contribution to this work product. Lastly, the program focuses on the timeliness of some of the services provided by the Corps' clerical support staff. Such focusing is not intended to be carried out one time only. Rather, the methodology used in this program will be applied to any key pieces, identified by PTO personnel or the bar in the future, as needing a review of the type dictated by this program. The aim in short is to build quality and timeliness from the ground up and to maintain them at a high level.

This report presents and analyzes the findings of the Quality Reinforcement Program only as the findings relate to practices performed in the Patent Examining Corps. The portion of the program reported in this volume represents a cooperative effort between the Corps and the American Intellectual Property Law Association (AIPLA) through its Ad Hoc Committee on Quality. The focus is on certain practices involved in the prosecution, examination and processing of patent applications by both the PTO and by patent applicants and their representatives.

Methodology

The methodology adopted for the program comprises the following process:

1. select target practices,
2. determine the current quality or performance level of the target practices,
3. compare the current performance of the target practices to the desired level of performance,
4. implement, where appropriate, steps to raise the current level of performance to the desired level,
5. subsequently, determine the level of performance of the target practices, and
6. compare the current level of performance to the subsequently determined level of performance to determine what, if any, change has occurred.

Target Practices

A number of practices were targeted for the program as a result of complaints and concerns, raised by the bar and PTO personnel. The targeted practices are identified as follows:

A. Explanations of Rejections

This program targeted examiner "explanations of rejections" as a practice to be reviewed based in part on a deemphasis by the Office on the degree to which examiners were required to include detailed explanations of the supporting rationale behind their rejections during the 1970s. The PTO instituted the use of an abbreviated handwritten form (PTO-1142) for the preparation of first Office actions during the early 1970s. The form provided for a cryptic description of how the references were being combined in a § 103 rejection and provided little space for explanation of the supporting rationale behind rejections. The form was mandatory for all first actions, and was discontinued in 1982 primarily due to complaints from the patent bar and the courts that examiner explanations of rejections were not sufficient. The inclusion of "explanations of rejections" as a targeted practice for this program enables the evaluation of whether further improvement is needed in this area.

B. Final Rejection Practice

This program targeted "final rejection practice" for review based in part on the conflicting needs of PTO and patent applicants/attorneys in this area of practice. In order to reduce the time applicants must wait to obtain a patent and to increase efficiency of the examination process, the PTO uses various incentives for examiners to make their rejections final early in the prosecution.

To the contrary, patent applicants often desire to have the examiner repeatedly reconsider his or her position or to continue to amend the claims. These conflicting incentives often lead to disputes relating to the propriety and/or timeliness of final rejections and to whether amendments are entered after an action has been made final.

C. Information Disclosure Statements

This program targeted "information disclosure statements" for review based upon concerns expressed by both applicants/attorneys and by the Patent Examining Corps over the submission of these statement.

Patent examiners, in the interest of efficiency and productivity, are benefited by the disclosure to the Office of all material information relating to the patentability of the application prior to their first Office action. However, this must be balanced against the practical reality that applicants/attorneys often don't become aware of material information until later in the prosecution, and don't have readily available translations of foreign documents or copies of documents for submission to the PTO. This practice looks at the extent to which the practical needs of both the PTO and the applicant/attorney are served by

the procedures relating to "information disclosure statement".

D. Interviews

This program targeted "interviews" for review to determine the extent to which personal discussions are held between examiners and attorneys and to evaluate whether the parties consider personal interviews to be a productive or helpful means for clarifying issues that may not have been clearly communicated in earlier written communications. Selection of "interviews" as a targeted practice was based in part on isolated complaints by some examiners that interviews were not always productive for them and by some attorneys that some examiners are reluctant to hold interviews.

PTO procedures require that all business with the Office be conducted in writing (37 CFR § 1.2). To comply with this rule and still accommodate request for oral discussions with examiners, it is PTO policy that the substance of all personal interviews must be reduced to writing (see § 713.04 of the MPEP). Selection of "interviews" as a targeted practice was also based on concerns that the written record include an explanation of the substance of all oral interviews. Under this practice, the program focused on determining the perceptions of examiners and attorneys about interviews.

E. Responses by Applicant

This program targeted "responses by applicant" for review to determine the extent to which practitioners representing patent applicants submit responses to examiner actions that are complete and in compliance with current rules and procedures. Specific activities under this topic, such as the extent to which explanations of why claims are considered unobvious over the art cited by the examiner and the degree of compliance with 37 CFR § 1.116 when amendments are presented after a final rejection, were selected based upon some complaints by examiners about attorney responses in these areas.

F. Completeness of the Record

This program targeted "Completeness of the Record" for review based primarily upon the importance of a complete file record to those who must review patented files and make important decisions based upon the facts and determinations therein. The necessity of insuring a complete file record has been urged by such diverse interests as federal court judges, potential licensees, potential infringers, and those attempting to avoid infringement.

This topic looks at the extent to which examiners insure a complete file record by including a statement of reasons for allowance where appropriate, fully and properly record the search of the prior art, and check foreign priority information for accuracy and completeness. This topic does not look at the extent to which examiners explain their rejection; see targeted practice A, "Explanation of Rejections." The extent to which applicants file complete responses iscovered in targeted practice E, "Responses by Applicant."

G. Compact Prosecution

This program targeted "Compact Prosecution" for review based upon its importance as a key element in current PTO efforts to reduce pendency time of applications to an average of 18 months. The premise behind compact prosecution is that pendency time will be minimized if each stage of prosecution is fully and thoroughly conducted by both examiners and applicants. The demands of such a standard have inevitably led to complaints from each side relating to the completeness of considerations and the willingness to take that "extra step". Examiners have been criticized for confining searches to only what is literally claimed, and for failing to indicate possible areas of patentability at the earliest possible stage. Applicants have been criticized for failure to claim all limitations that might be considered patentable prior to the initial search by the examiner, for amending the claims to include these limitations only after first action, and for failing to correct significant formal deficiencies prior to initial examination.

H. Appeal Practice

This program targeted "Appeal Practice" for review primarily due to the recent and substantial increase in the backlog of appealed applications awaiting decision by the Board of Patent Appeals and Interferences. Primary emphasis was placed on determining the extent to which appellant's brief and the examiner's answer are formally complete so that expeditious consideration may be given by the Board.

As a result of the high priority being given by the PTO to reduce the backlog of cases at the Board, additional survey questions were included to determine the extent to which additional requirements beyond those currently in effect for the preparation of the appellant's brief and examiner's answer would be useful to examiners and the Board.

I. Allowances After Appeal Brief

This program targeted "Allowances after Appeal" for review in response to complaints that examiners often allow cases after appellant has filed a brief when the cases should have been allowed before the brief was filed.

J. Processing Times

This program targeted "Processing Times" for review based upon its importance to the PTO goal of reducing pendency of patent applications to 18 months.

DETERMINATION OF CURRENT LEVELS OF PERFORMANCE

The step of determining the current level of performance of the targeted practices was accomplished through a number of surveys.

One survey, called the Applications Survey, was an internal factual survey that involved selecting a sample of 150 applications on a random basis from all the examining groups. A survey team, comprising three Supervisory Patent Examiners (SPEs) and three reviewers from Quality Review, performed a detailed review of the applications according to a questionnaire, which was developed with the joint cooperation of the AIPLA Ad Hoc Quality Committee.

A second survey, called the AIPLA Survey, was an opinion questionnaire provided by the AIPLA to 5500 of its members. The questionnaire was developed jointly with the AIPLA Ad Hoc Quality Committee. The AIPLA questionnaire sought the perception of the attorneys of the quality of the work performed by the Corps relative to the targeted practices. Space was provided for the respondents to include comments on the questionnaire. Over 1100 attorneys responded to the questionnaire.

Another survey, called the Examiners Survey, was also an opinion questionnaire provided to all patent examiners and SPEs on a voluntary and anonymous basis. The questionnaire queried the examiners and SPEs about the practices of the practitioners before the PTO. Space was provided for the respondents to include comments on the questionnaire. Over 650 responses were received.

A fourth survey, called the Appeals Survey, was also an internal factual survey. The questionnaire was developed with the cooperation of the AIPLA Ad Hoc Quality Committee. The questionnaire sought data about the practices carried out in the appeal process in the PTO. For this survey, 60 applications were selected on a random basis from all the examining groups. The survey team performed a detailed review of the applications according to the questionnaire.

Three other surveys were used to gather data. All of these surveys were developed and conducted by the Office of Quality Review. Two surveys involved the review of 1878 allowed applications concerning information disclosure statements. Another survey involved the review of 290 applications allowed after appellant had filed an appeal brief, but before an examiner's answer was prepared.

Relative to the processing times, PALM reports were used to obtain data on the practices targeted for this activity.

COMPARISON OF CURRENT LEVELS TO DESIRED LEVELS

The step of comparing the current levels of performance to the desired or standard levels of performance was accomplished by setting out the desired or standard level for each target practice. Next, all the information provided by the surveys was analyzed for each target practice and compared to the desired or standard level for the target practice. The analysis resulted in the following general conclusions. (A detailed listing of all conclusions for each targeted practice is presented in Section VII of Volume I of the Quality Reinforcement Program Report.)

SUMMARY OF CONCLUSIONS

A. Explanations of Rejections

1. Identification of Statutory Basis for Rejection

Over 95% of the rejections under 35 USC §§ 103 and 112, second paragraph (clarity), cited the statutory basis for the rejection. With respect to rejections under 35 USC § 102, 92% of the rejections cited the statutory basis. Hence, no significant improvement is needed in specifying the statutory basis of a rejection based on 35 USC §§ 102, 103 or 112, second paragraph.

With respect to rejections under 35 USC § 112, first paragraph, 14-19% of the rejections based on a non-enabling disclosure and 42% of the rejections based on new matter failed to cite the statutory basis. Hence, improvement is needed in specifying that a rejection, based on new matter or the lack of an enabling disclosure, is under 35 USC § 112, first paragraph.

2. Explanation of Rejections Based on Prior Art

Approximately two-thirds of the rejections reviewed failed to explain why the claimed invention would have been obvious in view of the applied prior art. Over 75% of the attorneys responding to the AIPLA survey perceived rejections under 35 USC § 103 as lacking an explanation of why the claimed invention would have been obvious. Moreover, 70 comments from attorneys (the highest for any topic) were critical of the explanations of rejections under 35 USC § 103. Hence, significant improvement is needed to assure that rejections based on prior art appropriately communicate the rationale for such rejections.

3. Explanation of Rejections Under 35 USC § 112, First Paragraph, Non-Enabling Disclosure

Nineteen percent of all the non-enabling disclosure rejections reviewed failed to give reasons in support of the rejection. Hence, improvement is needed in explaining why a disclosure is non-enabling.

4. Explanation of Rejections Under 35 USC § 112, First Paragraph, New Matter

With respect to rejections based on new matter, 35% of the rejections reviewed failed to pointout the language considered to be new matter, and 40% of these rejections did not give a reason why the language was considered new matter. Hence, significant improvements are needed in pointing out the language that is considered to be new matter, and explaining why the new matter is not supported by the disclosure as originally filed.

5. Explanation of Rejections Under 35 USC § 112, Second Paragraph

Approximately 90% of the rejections reviewed pointed out the claim language considered unclear. Thus, no significant improvement is needed in pointing out *what* claim language is considered unclear in rejections under the second paragraph of § 112.

Twenty-three percent of the non-final rejections reviewed failed to explain why the language was considered unclear. In final actions, 8% of the rejections failed to explain why the language was considered unclear. Hence, improvement is needed in explaining *why* the claim language is considered unclear in rejections under the second paragraph of § 112.

6. Alternative Rejections Under 35 USC §§ 102/103

Three percent of the actions reviewed contained alternative rejections under 35 USC §§ 102, 103. Ten percent of the examiners' answers reviewed contained similar rejections. The number of alternative rejections under either § 102 or § 103 was sufficiently low so that no further action is required.

B. Final Rejection Practice

1. Timely Development of Issues in Examiner and Attorney Communications

The perception surveys indicate that examiner actions and attorney responses leading up to final rejection do not adequately develop the issues. The objective Applications Survey data indicate that 32% of examiners' non-final actions do not fully respond to all arguments raised by the applicant. Improvement is needed by both examiners and attorneys in fully developing the issues prior to final.

Final rejections were found to treat all claims, but were deficient in answering all arguments presented by the applicant and in treating affidavits and declarations submitted to overcome rejections. Improvement is needed in responding to all issues raised during the prosecution when making a final rejection.

2. Appropriateness of Final Rejection

Thirteen percent of the final actions surveyed were considered premature. However, 91% of the final rejections reviewed were considered to be reasonable. Thirty-nine percent of the attorneys responding to the AIPLA survey perceived final actions as proper only occasionally or rarely.

Though examiners appear to be doing an acceptable job in making reasonable and proper final rejections, some improvement is needed. However, attorney perception is substantially lower than the factual findings. This may be due to a desire by attorneys for a more liberal after final procedure rather than improper examiner application of the current procedure.

3. Advisory Actions

Advisory actions were found to be mailed in a timely manner.

Thirty-three percent of the amendments filed after final were improperly refused entry. Only 46% of the attorneys responding to the AIPLA survey perceived that reasons given by examiners for the non-entry of amendments after final were clear almost always or most of the time. Moreover, only 50% of these attorneys perceived their response to final rejections to have been given full consideration.

In only 39% of the instances when an amendment to existing claims was entered after final did the advisory action clearly specify the grounds of rejection applicable to the amended claims.

Hence, significant improvements are needed in assuring that amendments after final:

a. are not arbitrarily refused entry,
b. are given sufficient consideration, and
c. communicate the ground of rejection for any claim amended after the final rejection.

C. Information Disclosure Statements

1. Frequency and Timeliness of Submissions

Information disclosure statements are submitted either as statements in the specification or as separate papers in approximately 60% of the applications. Eighty-two percent of the statements are submitted prior to the first action. However, 47% are filed more than three months from the filing date. In 1978, just after 37 CFR § 1.56 was amended, only 21% of the statements were filed more than three months after the filing date. Twelve percent of applications on appeal had statements filed after the final rejection. Two percent of the statements are filed after the application has been allowed.

Only 11% of the statements filed more than three months after the filing date contained an explanation for the delay.

Hence, significant improvements are needed for assuring that information disclosure statements are filed in a timely manner, and with an explanation for the delay when filed late.

2. Submission Includes Explanation of Relevancy of Documents

The explanation of the relevance of the art is substantially below standard whether the citation is incorporated in the specification or is in a separate paper. Hence, significant improvement is needed in assuring that explanations of the relevance of documents cited in information disclosure statements are provided.

3. Copy of Documents Supplied

Copies of cited documents, regardless of type, are not provided in approximately 60% of cases when statements are incorporated into the specification. Even when eliminating those statements citing only U.S. patent documents, the Applications Survey still shows a 25% level of noncompliance for specification-incorporated statements. There is a need for improvement in supplying copies of documents cited in specification- incorporated statements.

4. Translation of Foreign Documents Provided

Either a translation or a statement that a translation is not readily available is generally not provided when the citation is incorporated in the specification. While compliance with the standard is better when the citation is in a separate paper, compliance is still poor. Improvement is needed.

5. Form PTO-1449 or Equivalent

Since the use of PTO form 1449 is not mandatory, this section merely reports the degree to which the form is voluntarily used and is thus informational only. Form PTO-1449 is used in about 70% of disclosure statement submissions when the submission is in a separate paper. The form is used in about 25% of the disclosure statements incorporated in the specification.

6. Miscellaneous

Examiners considered art submitted prior to first action in 93% of cases reviewed. Improvement is needed to insure 100% compliance.

While the survey results indicate a perception by examiners that related copending applications are not being fully disclosed, no objective survey data was recorded on this topic. Since attorneys are only required to cite related applications that are *material*, the survey question does not measure perceived performance against the current standard. No conclusions can be reached based upon the survey data.

D. Interviews

1. Interviews in General

The results of the AIPLA survey indicate that, of the attorneys responding to the survey,

a. 75% perceived interviews as productive,
b. 89% perceived interviews to be kept as scheduled,
c. 68% perceived examiners to be adequately prepared, and
d. 85% perceived the interview summary form to be completed adequately.

The results of the Examiners Survey indicate that, of the examiners responding to the survey,

a. 53% perceived interviews as productive,
b. 96% perceived interviews to be kept as scheduled,
c. 88% perceived attorneys to be adequately prepared, and
d. 67% perceived attorneys as making the substance of the interview of record.

The survey results indicate that attorneys perceive that examiners are willing to grant at least one interview if timely requested. No need for improvement would appear necessary. A substantial number of attorneys(approximately 30%) feel that examiners are only occasionally or rarely willing to discuss and attempt to resolve substantive issues at interviews. However,examiners often express the desire to reserve commitments until after an interview so that full consideration of all points could be made. It cannot be concluded from the survey data whether examiners could be making more substantive commitments at interviews. No need for improvement is indicated. Some improvement is needed by attorneys in ensuring that an adequate written record of the substance of all interviews is provided.

2. Telephone Restriction

As a general policy, the examiner should telephone the attorney of record and request an oral election when making a restriction requirement. In 62% of the restriction requirements reviewed, the policy was followed. However, the telephone is not required to be used when examiners know that an election will not be made by phone. The number of instances of the remaining 38% where no restriction was made for this reason was not determined. Hence, while it appears that some improvement is needed, the degree of need for improvement cannot be determined without further study.

E. Responses by Applicant

1. Responses under 37 CFR § 1.111

Approximately 90% of the responses reviewed were technically fully responsive to Office actions. However, the percentage of responses that explained why the claimed invention would have been unobvious in view of the prior art was significantly lower. Moreover, some of the comments from examiners indicate that they feel responses often argue references individually rather than address the combination of references set forth in the prior Office action. At least part of this may be due to the lack of an examiner explanation in rejections how references are used and combined.

Hence, no significant improvement is needed in assuring that responses under § 1.1 treat all objections and rejections. However, significant improvement is needed in assuring that responses include an explanation of why it would have been unobvious to combine or modify the references in the manner suggested by the examiner.

2. Responses Under 37 CFR § 1.116

Only 16% of the amendments filed after a final rejection that were reviewed presented a showing of good and sufficient reasons why they were necessary and why they were not presented earlier. Moreover, 48% of the examiners and SPEs responding to the Examiners Survey perceived that attorneys generally do not start serious prosecution or make substantial amendments until after the final rejection.

Hence, significant improvement is needed in assuring that responses under § 1.116 explain why an amendment was not presented earlier.

3. Appeal Briefs-Responses to Rejections

Ninety-four percent of the briefs reviewed contained an explanation why the examiner's modification of the references would have been unobvious. Hence, no significant improvement is needed in assuring that briefs adequately communicate why the examiner's rejection is considered improper.

4. Affidavits/Declarations Submitted to Overcome Rejections

Approximately 20% of affidavits/declarations are not filed in a timely manner. Hence, improvement is needed in assuring that affidavits/declarations are submitted in a timely manner.

Examiner perception of the sufficiency of affidavits to either establish proper "nexus" when asserting commercial success or to present evidence to substantiate an allegation of "secondary considerations" was very low, indicating a need for at least some attorney improvement.

F. Completeness of the Record

1. Reasons for Allowance

In 22% of the applications reviewed, the reason for allowance was not clear from the record. Moreover, only 50% of the attorneys responding to the AIPLA Survey perceived the reason for allowance made of record by the examiner, as clearly establishing why the claims were allowed. Hence, significant improvement is needed in assuring that the record clearly explain why the claims were allowed.

2. Recordation of Searches

Eighty-five percent of the applications surveyed had search boxes properly filled out by the examiner. Approximately 45% of the applications, wherein an automated search was made, were lacking information about the automated search. Hence, improvements are needed in assuring that the search data are recorded in a complete and accurate manner.

3. Foreign Priority Data Verified

The priority/PCT data appearing on the face of the file wrapper were not verified in 23% of the applications reviewed. Hence, a significant improvement is needed in assuring that the priority/PCT data appearing on the file jacket are verified.

G. Compact Prosecution

1. Adequacy of Applications Prior to First Action

Applications should be devoid of obvious informalities. Significant improvement is needed in foreign origin applications since 70% of the examiners surveyed perceived foreign applications as containing substantial formal deficiencies almost always or most of the time. However, only 16% of the examiners perceived U.S. origin applications as containing substantial formal deficiencies.

The disclosure should be readily understandable and the claims should clearly define the invention to enable the examiner to conduct an adequate search. Improvement is needed in foreign origin applications since 20% of the examiners surveyed perceive such applications as lacking an adequate disclosure to permit examination almost always or most of the time. However, 97% of these examiners perceive U.S. origin applications as containing an adequate disclosure.

Claims should be presented that range from the broadest to the most detailed that applicant is willing to accept. Substantial improvement is needed in this area since the Applications Survey shows that only approximately 60% of the applications surveyed contained such a range of claims.

2. Searches

The first search should cover the invention as described and claimed. Substantial improvement is needed in conducting a more thorough search at the time of the first action since 50% of the applications surveyed revealed newly applied art in subsequent actions that should have been applied in a previous action.

A search should be made in the issuing class/subclass. Improvement is needed in this area because 11% of the allowed applications reviewed did not indicate that the issuing class/subclass was searched.

3. Indication of Allowable Subject Matter

Examiners should communicate certain aspects or features of applicant's invention that if properly claimed would receive favorable consideration. Significant improvement is needed in this area since only 59% of the applications that were deemed appropriate for an indication of allowable subject matter had such an indication.

H. Appeal Practice

1. Appellant's Brief-Format

Ninety-five percent of the briefs reviewed contained a concise explanation of the invention. However, only 46% of the explanations contained a reference back to the drawings and/or specification. Hence, a significant improvement is needed in assuring that appellant's explanation of the invention refers to the drawing and/or specification. Ninety-five percent of the briefs reviewed contained a copy of the claims. Hence, no significant improvement is needed in assuring that appellants provide a copy of the claims on appeal.

In addition, formal matters that are not currently required in briefs were found to be included in the surveyed briefs to the following extent,

a. 27% of the briefs included a separate summary of the issues on appeal,
b. 53% of the briefs included a citation of the references as well as an explanation of each reference,
c. 7% of the briefs included a reference back to the drawings or specification in the copy of the claims presented in the brief; however, 58% of the examiners surveyed thought that an appeal brief would be more useful if the claims on appeal were read on the drawings or specification, and
d. 2% of the briefs pointed out an exemplary claim; however 60% of the examiners surveyed thought that an appeal brief would be more useful if appellant is required to state whether all the claims on appeal stand or fall together.

The formal requirements of the brief should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in the brief.

2. Examiner's Answer-Format

Ninety percent of the answers surveyed identified the status of all the claims in the applications. One hundred percent of the answers cited all the references relied upon in the appeal and pointed out any deficiencies in the copy of the claims provided by appellant. Hence, no significant improvements are needed in the format of the examiners' answers, as measured against the formal requirements for examiner's answers.

In addition, formal matters that are not currently required in examiner's answers were found to be included in the surveyed answers to the following extent,

a. 15% of the answers included a summary of the issues on appeal,
b. 40% of the answers included an explanation of the invention, and
c. 28% of the answers included an explanation of the references.

The formal requirements of the examiner's answer should be reviewed to determine if these additional requirements would improve the manner in which issues on appeal and evidence in support thereof are set forth in

the examiner's answer.

3. Examiner's Answer-Completeness

Seventy-two percent of the answers reviewed responded to every significant argument raised in the briefs. Hence, a significant improvement is needed in assuring that examiners' answers respond to every significant argument/issue raised by appellants.

4. Post Examiner's Answer Practice

The Appeals Survey shows that a substantial number of reply briefs are merely noted with no further comment by the examiner. The findings are inconclusive regardingthe propriety of the reply briefs or whether reply briefs are being treated properly by examiners.

I. Allowance After Appeal Brief

Thirty-nine percent of applications allowed after an appeal brief had been filed were found to have no change in appellant's position. Hence, significant improvement is needed in assuring that applications are allowed at the earliest appropriate stage of prosecution.

J. Processing Times

1. 16 Mailing of Office Actions

Substantial improvement in mailing Office actions earlier than one month from the day when the examiners are given credit for the Office action has been accomplished since the inception of the Quality Reinforcement Program.

2. Mailing of Notices of Allowance

Substantial improvement in assuring that Notices of Allowances are mailed promptly has been accomplished since the inception of the Quality Reinforcement Program.

3. Responses to Amendments After Final

Substantial improvement in mailing responses to amendments after final has been accomplished since the inception of the Quality Reinforcement Program.

Perceptions

In addition to reaching conclusions on the current level of performance of each target practice, the program determined the opinions of patent examiners and representatives of applicants on various topics involved in the examination process. A summary of their perceptions is presented below.

Examiner legal proficiency was perceived by attorneys to be in definite need of improvement.

Examiner technical competency, care in doing the job, and neatness of attire were perceived by attorneys as more positive than negative, but in need of improvement.

Clerical competency and care in doing the job were perceived by attorneys to be in definite need of improvement.

Clerical functions including neatness of attire, cooperativeness, courteousness and availability were perceived as being more positive than negative, but with substantial room for improvement.

Attorney handling of foreign origin applications was perceived by examiners to be deficient in preparation of the case for examination. Attorney practices including continued prosecution after final, interview practice, submission of information disclosure statements and explanation of reasons for disagreement with § 103 rejections were also of concern to examiners.

[1078 OG 22]

(69) **Diligence in Filing Petitions to Revive and Petitions to Withdraw the Holding of Abandonment**

Once an application becomes inadvertently abandoned, it is incumbent on applicant to act with diligence in providing the response necessary to continue prosecution. Petitions to revive or to withdraw the holding of abandonment must be filed promptly after applicant is notified or otherwise becomes aware of the abandonment. Unless and until the Commissioner accepts applicant's response as sufficient and complete to revive the application or to withdraw the holding of abandonment, the application remains abandoned and the burden continues to rest with applicant to exercise diligence.

Some practitioners have demonstrated a lack of diligence in filing or renewing a petition to revive or a petition to withdraw the holding of abandonment. This appears to have been a conscious decision on the practitioners' part based on the belief that any delay in filing or renewing a petition could be cured by filing a terminal disclaimer equivalent to the period of delay in prosecuting the application. While the Office does have a policy of requiring a terminal disclaimer in those situations where there has been a delay of more than six months in filing a grantable petition to revive an application that has become abandoned [37 CFR 1.137(c), 1.316(d) and 1.317(c)], the terminal disclaimer has never been authorized or set forth in the rules as a substitute for diligence. Indeed, such an interpretation would be contrary to the traditional concept of reasonable diligence and is contrary to the explicit requirement of 37 CFR 1.137(a), 1.155(b), 1.181(f), 1.316(b) and 1.137(b) that a petition to revive be filed promptly. See *In re Application of Takao*, 17 USPQ2d 1155 (Comm'r. 1990).

JAMES E. DENNY
Assistant Commissioner for Patents-designate

[1124 OG 23]

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(70) **Patent and Trademark Office 37 CFR Part 1**

Changes in Procedures for Revival of Patent Applications and Reinstatement of Patents

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to: modify the petition requirements for reviving abandoned applications; extend the provisions for revival under the unintentional standard to applications abandoned under § 1.53(d); modify the requirements for a petition to accept late payment of a maintenance fee filed more than six months after expiration of a patent; modify the requirements for a petition to accept unavoidably delayed payment of a maintenance fee; and provide for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office is also establishing the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional.
Effective Date: Sept. 20, 1993. These rules will be applicable to all papers filed with the Office on or after the effective date.
For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register (57 FR 41899) on Sept. 14, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat. Office 8) on October 6, 1992, the Office proposed to amend §§ 1.17, 1.137, 1.155, 1.316, 1.317 and 1.378. In an Interim Rule published in the Federal Register (57 FR 56448 on November 30, 1992, and in the Patent and Trademark Office Official Gazette (1145 Off. Gaz. Pat. Office 339) on December 8, 1992, the Office, pursuant to Public Law 102-444 enacted October 23, 1992, established interim rules

for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office also established the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment was shown to the satisfaction of the Commissioner to have been unintentional. No oral hearing was held.

DISCUSSION OF SPECIFIC SECTIONS TO BE CHANGED OR ADDED:

(1) Post issuance fees. (§ 1.20)

Section 1.20(i) is amended to add a $1,500 surcharge fee for accepting the unintentionally delayed payment of a maintenance fee.

(2) Unavoidable or unintentional abandonment of an application

Sections 1.137, 1.155, 1.316 and 1 317 each provide for petitions to the Commissioner for relief from failure to timely comply with a requirement of the Office. Section 1.137 provides for petitions to revive patent applications abandoned for failure to prosecute where the delay in prosecution was unavoidable (§ 1.137(a)) or the delay was unintentional (§ 1.137(b)). Section 1.155 provides for petitions for acceptance of late payment of issue fees in applications for design patents as though no abandonment had ever occurred where the delay in payment was unavoidable (§ 1.155(b)) or unintentional (§ 1.155(c)). Section 1.316 provides for petitions for acceptance of late payment of issue fees in applications for patent as though no abandonment had ever occurred where the delay in payment was unavoidable (§ 1.316(b)) or unintentional (§ 1.316(c)). Section 1.317 provides for acceptance of late payment of the balance of issue fees in patents as though no lapse had ever occurred where the delay in payment was unavoidable (§ 1.317(b)) or unintentional (§ 1.317(c)).

In order to obtain relief under the unavoidable standard in the above-noted sections, the regulations continue to require the filing of a terminal disclaimer if the petition is filed more than six months after the date of abandonment. See §§ 1.137(c), 1.155(d), 1.316(d) and 1.317(d). The terminal disclaimer must disclaim a period equivalent to the period of abandonment. The period of abandonment is considered to be the number of months lapsed from the date of abandonment until the date of filing of a grantable petition.

Sections 1.137(c), 1.155(d) and 1.316(d) are amended to reflect the current practice that a terminal disclaimer filed for the purpose of reviving an application also applies to a patent granted on any continuing application entitled to the benefit of the filing date of the subject application under 35 U.S.C. 120.

Applicants may petition under the provisions of § 1.183 for a waiver of the requirement that a period equivalent to the period of abandonment be disclaimed if it can be shown that an extraordinary situation exists in which justice requires waiver of this requirement.

If petitions under the above-noted sections were not grantable because of insufficient evidence or petitioner's failure to comply with certain requirements, the Office dismissed the petitions. The dismissal indicated any missing items and warned petitioners that any renewed petition seeking reconsideration must be filed promptly. While the promptness requirement was not precisely defined, § 1.181(f) requires the filing of petitions within two months from an action complained of in order to avoid possible dismissal of the petition on the grounds that it was not timely filed. The above-noted sections are being amended to specify a two-month period or such time as may be set in the dismissal as being the appropriate deadline for requesting reconsideration. In those situations where petitioners require more time to gather additional evidence or items needed for reconsideration, an extension of time of up to four months may be obtained under the provisions of § 1.136(a). The filing of a renewed petition within the period specified in the decision or within the extended period permitted under § 1.136 will satisfy the promptness requirement of petitions under the unavoidable standard.

Upon failure to timely file a renewed petition under the unavoidable standard, the Office will require a showing of unavoidable delay for the entire period of abandonment. To be entitled to relief under the unavoidable standard, petitioner must be able to show unavoidable delay from a time prior to abandonment to the filing of a grantable petition. *In re Application of Takeo*, 17 USPQ2d 1155 (Comm'r Pat. 1990). Upon failure to timely file a renewed petition under the unintentional standard (see §§ 1.137(d), 1.155(e), 1.316(e) and 1.317(e)), petitioner may be subject to a loss of the right to proceed under the unintentional standard if more than one year lapsed between the date of abandonment and the date the renewed petition is filed.

The unintentional provisions specified in § 1.137(b) will apply to applications abandoned under § 1.53(d). Effective Nov. 5, 1990, the Commissioner waived, under § 1.183, the exception specified in § 1.137(b) as to applicability of petitions under the unintentional standards to applications abandoned under § 1.53(d). See "Petitions to Revive Patent Applications Waiver of Provisions of 37 CFR § 1.137(b)", 1121 Off. Gaz. Pat. Office 6 (Dec. 4, 1990). Section 1.137(b) is amended to incorporate this new practice into the regulations.

The Office is amending § 1.137(b) to clearly require applicant to state that the delay was unintentional, rather than the abandonment was unintentional. The Office has withdrawn its proposal that would have amended the rules of practice to require a terminal disclaimer if a grantable petition to reinstate an abandoned application was not filed within six months from the date of abandonment. The terminal disclaimer proposal was withdrawn because of the burden that such a requirement would impose on applicants and the Office and because it is unnecessary to achieve its intended purpose. The Office had suggested the terminal disclaimer proposal to ensure that any petition to revive was promptly filed. However, the proposed terminal disclaimer requirement is unnecessary to ensure prompt filing of the petition to revive since the first sentence of § 1.137(b) states that an application may be revived if the delay was unintentional. Accordingly, the specific requirements for the unintentional petition to revive have been amended to correspond to the existing rule provision that revival is available if the delay was unintentional, not just that the abandonment was unintentional. A person seeking revival should not make a statement that the delay was unintentional unless the entire delay, including the delay from the date it was discovered that the application was abandoned up until the petition to revive was actually filed, was unintentional. For example, a statement that the delay was unintentional would not be proper when applicant becomes aware of an abandonment and then intentionally delays filing a petition to revive the application under § 1.137.

The Office adopted a policy wherein, under certain strictly limited conditions, the one-year period for requesting revival of an unintentionally abandoned application could be waived. Accordingly, the prohibition against requests for waiver found in §§ 1.137(b), 1.155(c), 1.316(c) and 1.317(c) has been deleted. See "Petitions Under 37 CFR 1.183 to Waive the One Year Time Period Requirement in 37 CFR 1.137(b), 1.155(c) and 1.316(c)" at 1059 *Off. Gaz.* Pat. Office 4 (Oct. 1, 1985). However, applicants are cautioned that waiver of the one-year deadline under the unintentional standard will continue to be subject to strictly limited conditions.

(3) Issue and term of design patents (§ 1.155)

Section 1.155 is amended to be consistent with the changes to § 1.137. Paragraph (b) of § 1.155 is further modified to correct a typographical error. In the reference to the fee in § 1.17(1), the letter (l) should have appeared instead of the numeral (1).

(4) Application abandoned for failure to pay issue fee (§ 1.316)

Section 1.316 is amended to be consistent with the changes to § 1.137. Paragraph (b) of § 1.316 is further modified to correct a typographical error. In the reference to the fee in § 1.17(1), the letter (l) should have appeared instead of the numeral (1).

(5) Lapsed Patents; delayed payment of balance of issue fee (§ 1.317)

Section 1.317 contains a provision regarding issue fees paid prior to October 1, 1982. Prior to that date, the Office charged an initial base issue fee and, depending on the size of the specification and drawings printed, billed applicants for a balance of issue fee due. Subsequent to Oct. 1, 1982, all applicants were required to pay the same issue fee regardless of the size of the specification and drawings. Reference to the date in § 1.317 is being deleted at this point in time since it is no longer relevant to pending applications. However, practice under this section continues to be relevant when a fee change becomes effective before payment is received.

In order to satisfy the requirement of 35 U.S.C. 151, the Office mails out a Notice of Allowance which specifies the sum of the issue fee due. When the issue fee amount is changed, the sum specified on the Notice of Allowance is at times different from that required at the time payment is actually received in the Office. If applicants submit issue fee payments in the amount specified on the Notice of Allowance after the effective date of a fee increase, then a balance of issue fee is due. The Office will accept payment of the amount specified on the Notice of Allowance and process the application into a patent. In accordance with 35 U.S.C. 151 and 37 CFR 1.317, a notice is sent to applicants requesting payment of the balance of the issue fee due (the difference between the fee due at time of receipt of payment in the Office and the fee specified on the Notice of Allowance) and setting a three-month period for payment. See *In re Mills*, 12 USPQ2d 1847 (Comm'r Pat. 1989). Failure to pay the balance of the issue fee within the specified three-month period. result in lapse of the patent. Therefore, the reference to Oct. 1, 1982, in § 1.317 is being replaced by language specifying the consequences of failure to pay the issue fee due at the time payment is made.

Section 1.317 is amended to be consistent with the changes in § 1.137. Paragraph (b) of § 1.317 is further modified to correct a typographical error. In the reference to the fee in § 1.17(l), the letter (l) should have appeared instead of the numeral (1).

(6) Delayed payment of a maintenance fee (§ 1.378)

Public Law 102-444 amends subsection 41(c)(1) of title 35, United States Code, to permit the Commissioner to accept late payment of any maintenance fee filed within twenty-four months after the six-month grace period, if the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. In order to implement Public Law 102-444, paragraphs (a) and (c) of § 1.378 are amended to permit the filing of a petition to accept late payment of a maintenance fee, where the delay in payment was unintentional.

In addition to the timeliness deadline set forth in the preceding paragraph, a petition filed under the unintentional standard of § 1.378(c) would have to include the required maintenance fee set forth in § 1.20 (e) through (g), the surcharge for an unintentionally expired patent as set forth in § 1.20(i)(2), and a statement that the delay in payment of the maintenance fee was unintentional.

A person seeking reinstatement of an expired patent should not make a statement that the delay in payment of the maintenance fee was unintentional unless the entire delay, including the delay from the date it was discovered that the maintenance fee was not paid timely up until the maintenance fee was actually paid, was unintentional. For example, a statement that the delay in payment of the maintenance fee was unintentional would not be proper when patentee becomes aware of an unintentional failure to timely pay the maintenance fee and then intentionally delays filing a petition for reinstatement of the patent under § 1.378.

Petitions to accept delayed payment of a maintenance fee in an expired patent, prior to enactment of Public Law 102-444, required a showing of unavoidable delay. In the case of petitions filed more than six months after expiration of a patent, former § 1.378(c) further required a showing that the failure to timely pay the maintenance fee was beyond the control of the patentee. The Office had determined that the "beyond the control" standard did not find adequate support in the relevant statute (35 U.S.C. 41(c)) or in the legislative history of Public Law 97-247. See "Acceptance of Delayed Payment of Maintenance Fees in Expired Patents", 1115 Off. Gaz. Pat. Office 18 (June 12, 1990). Therefore, former § 1.378(c) has been deleted in its entirety to be replaced by the unintentional delay provisions discussed above. Additionally, § 1.378(b) is amended to provide that the unavoidable delay provisions are available at any time following expiration of a patent for failure to pay a maintenance fee.

Furthermore, the practice of accepting late payment of maintenance fees is modified to be more analogous to the practice of reviving abandoned applications and accepting late payment of issue fees. Additionally, the public interest is best served by prompt reinstatement of a patent in which there was an unavoidable or unintentional delay in the timely payment of the maintenance fee.

The requirements for a petition to accept late payment of a maintenance fee, where the delay was unavoidable, are outlined in paragraph (b) of § 1.378. In addition to the maintenance fee and surcharge previously required, paragraph (b) is amended to require prompt filing of a petition after the patentee is notified, or otherwise becomes aware, of the expiration of the patent.

Response to Comments on the Rules

Four comments were received.

Comment 1: One comment questioned the time limits in proposed § 1.378(c)(5).

Reply: The proposed time limits will not be adopted because Public Law 102-444 sets the time limit for filing a petition to accept the delayed payment of a maintenance fee at twenty-four months after the six-month grace period provided in 35 U.S.C. 41(c).

Comment 2: One comment questioned the proposed terminal disclaimer requirement for petitions to revive an abandoned application under the unintentional standard.

Reply: The proposed terminal disclaimer requirement for petitions to revive an abandoned application under the unintentional standard will not be adopted. First, it has been determined that the proposed terminal disclaimer requirement would have created an unduly complex procedure for both the applicant and the Office. Second, the terminal disclaimer requirement is unnecessary to address a delay in filing a petition for unintentional abandonment since § 1.137(b) already indicates that the application may be revived if the delay was unintentional. If a delay in filing a petition was intentional, the petition would be denied. Third, the requirements for a petition have been amended to add the requirement for a statement that the delay in responding was unintentional so as to be consistent with the requirements of the first sentence of § 1.137(b). Finally, applicants are cautioned against intentionally delaying the filing of a petition to revive an abandoned application because it may preclude any revival from an abandoned status. Applicants have delayed filing a petition under the unintentional standard until after expiration of the one-year period because of a miscalculation of the one-year period. This miscalculation resulted in the applicant being unable to show that the delay was unavoidable. *In re Application of S, 8 USPQ2d 1630 (Comm'r Pat. 1988).*

Comment 3: One comment questioned whether Public Law 102-444 and therefore 37 CFR 1.378(c) were applicable to patents that had expired prior to Oct. 23, 1992, for failure to timely pay the required maintenance fee.

Reply: Section 1.378 has been established in accordance with the statutory mandate. Public Law 102-444 and 37 CFR 1.378(c) are effective as to any patent that would be covered by the literal language of the sections. Public Law 102-444 and interim rule 37 CFR 1.378(c) were effective Oct. 23, 1992. Since Public Law 102-444 provides up to a twenty-four month period after the six-month grace period provided in 35 U.S.C. 41(c) to seek reinstatement of an expired patent where the delay was unintentional, any patent that expired on or after Oct. 23, 1990, for failure to timely pay a maintenance fee is eligible for relief under 37 CFR 1.378(c). However, it should be noted that a petition to reinstate an unintentionally expired patent, the required maintenance fee, and the unintentional surcharge (37 CFR 1.20(i)(2)) must be filed within twenty-four months after the six-month grace period to be eligible for relief under the new unintentional provision.

Comment 4: One comment protested that the $1,500 surcharge established in § 1.20(i)(2) was too high.

Reply: The $1,500 surcharge established in § 1.20(i)(2) is proper. The amount of $1,500 was determined by considering:

(1) the $1,170 petition fee for reinstating an unintentionally abandoned patent application, (2) the relationship imposed by statute between the $1,170 petition fee for reinstating an unintentionally abandoned patent application and the $110 petition fee for reinstating an unavoidably abandoned patent application, and (3) the $620 surcharge for reinstating an unavoidably expired patent. Additionally, the Office noted in its original request for comments on the desirability of permitting acceptance of unintentionally delayed payment of maintenance fees (see 1089 Off. Gaz. Pat. Office 55, April 26, 1988) that the surcharge to accept an unintentionally delayed payment of a maintenance fee would be substantially higher than the surcharge to accept an unavoidably delayed payment of a maintenance fee. Not only was there no comment adverse to the suggestion of a higher fee, one comment suggested that the surcharge to accept an unintentionally delayed payment of a maintenance fee be set extremely high so that the Office could be assured that the late payment was, in fact, unintentional. The Office, after taking all of the above into consideration, determined that $1,500 was an appropriate amount to charge as the surcharge to accept an unintentionally delayed payment of a maintenance fee.

OTHER CONSIDERATIONS

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate Public Law 102-444 into the regulations and will give relief to many small entities that do not now have a mechanism to reinstate their expired patent.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0016 and 0651-0031. The public reporting burden for these collections of information for abandoned applications and delayed maintenance fees is estimated to average 1.0 hour each including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Jeffrey V. Nase, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0011 and 0651-0016).

List of Subjects 37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, Part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (i) to read as follows:

§ 1.20 Post issuance fees.

• • • • •

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

• • • • •

3. Section 1.137 is revised to read as follows:

(a) § 1.137 Revival of abandoned application.

(a) An application abandoned for failure to prosecute may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. A petition to revive an abandoned application must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

(1) a proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed;

(2) the petition fee as set forth in § 1.17(1); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) An application unintentionally abandoned for failure to prosecute may be revived as a pending application if the delay was unintentional. A petition to revive an unintentionally abandoned application must be:

(1) accompanied by a proposed response to continue prosecution of that application, or the filing of a continuing application, unless either has been previously filed;

(2) accompanied by the petition fee as set forth in § 1.17(m);

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within one year of the date on which the application became abandoned; or

(ii) within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date on which the application became abandoned.

(c) Any petition pursuant to paragraph (a) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(d) Any request for reconsideration or review of a decision refusing to revive an application upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(e) The time periods set forth in this section cannot be extended, except that the three-month period set forth in para-

graph (b)(4)(ii) and the time period set forth in paragraph (d) of this section may be extended under the provisions of § 1.136.

4. Section 1.155 is amended by revising paragraphs (b) through (d) and adding paragraphs (e) and (f) to read as follows:

§ 1.155 Issue and term of design patents.

* * * * *

(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

(1) the issue fee, unless it has been previously submitted;

(2) the fee for delayed payment (§ 1.17(1)); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

(1) accompanied by the issue fee, unless it has been previously submitted;

(2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within one year of the date on which the application became abandoned; or

(ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the application became abandoned.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(i) of this section and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

5. Section 1.316 is amended by revising paragraphs (b) through (d) and adding paragraphs (e) and (f) to read as follows:

§ 1.316 Application abandoned for failure to pay issue fee.

* * * * *

(b) The Commissioner may accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

(1) the issue fee, unless it has been previously submitted;

(2) the fee for delayed payment (§ 1.17(1)); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the issue fee later than three months after the mailing of the notice of allowance as though no abandonment had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

(1) accompanied by the issue fee, unless it has been previously submitted;

(2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within one year of the date on which the application became abandoned; or

(ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the application became abandoned.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(ii) of this section and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

6. Section 1.317 is revised to read as follows:

§ 1.317 Lapsed patents; delayed payment of the balance of issue fee.

(a) If the issue fee paid is the amount specified in the Notice of Allowance, but a higher amount is required at the time the issue fee is paid, any remaining balance of the issue fee is to be paid within three months from the date of notice thereof and, if not paid, the patent will lapse at the termination of the three-month period.

(b) The Commissioner may accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if upon petition the delay in payment is shown to have been unavoidable. The petition to accept the delayed payment must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the lapse, and must be accompanied by:

(1) the remaining balance of the issue fee, unless it has been previously submitted;

(2) the fee for delayed payment (§ 1.17(l)); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(c) The Commissioner may, upon petition, accept the payment of the remaining balance of the issue fee later than three months after the mailing of the notice thereof as though no lapse had ever occurred if the delay in payment was unintentional. The petition to accept the delayed payment must be:

(1) accompanied by the remaining balance of the issue fee, unless it has been previously submitted;

(2) accompanied by the fee for unintentionally delayed payment (§ 1.17(m));

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay in payment was unintentional; and

(4) filed either:

(i) within one year of the date on which the patent lapsed; or

(ii) within three months of the date of the first decision on a petition under paragraph (b) of this section which was filed within one year of the date on which the patent lapsed.

(d) Any petition pursuant to paragraph (b) of this section not filed within six months of the date of lapse of the patent, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of the patent equivalent to the period of lapse of the patent.

(e) Any request for reconsideration or review of a decision refusing to accept the delayed payment upon petition filed pursuant to paragraphs (b) or (c) of this section, to be considered timely, must be filed within two months of the decision refusing to accept the delayed payment or within such time as set in the decision.

(f) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (c)(4)(ii) and the time period set forth in paragraph (e) of this section may be extended under the provisions of § 1.136.

7. Section 1.378, paragraphs (a), (b), (c) and (e) are revised to read as follows:

§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable (paragraph (b) of this section) or unintentional (paragraph (c) of this section) and if the surcharge required by § 1.20(i) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept an unavoidably delayed payment of a maintenance fee filed under paragraph (a) of this section must include:

(1) the required maintenance fee set forth in § 1.20(e) through (g)

(2) the surcharge set forth in § 1.20(i)(1); and

(3) a showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely and that the petition was filed promptly after the patentee was notified of, or otherwise became aware of, the expiration of the patent. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee, the date and the manner in which patentee became aware of theexpiration of the patent, and the steps taken to file the petition promptly.

(c) Any petition to accept an unintentionally delayed payment of a maintenance fee filed under paragraph (a) of this section must be filed within twenty-four months after the six-month grace period provided in § 1.362(e) and must include:

(1) the required maintenance fee set forth in § 1.20 (e) through (g);

(2) the surcharge set forth in § 1.20(i)(2); and

(3) a statement that the delay in payment of the maintenance fee was unintentional.

* * * * *

(e) Reconsideration of a decision refusing to accept a maintenance fee upon petition filed pursuant to paragraph (a) of this section may be obtained by filing a petition for reconsideration within two months of, or such other time as set in, the decision refusing to accept the delayed payment of the maintenance fee. Any such petition for reconsideration must be accompanied by the petition fee set forth in § 1.17(h). After decision on the petition for reconsideration, no further reconsideration or review of the matter will be undertaken by the Commissioner. If the delayed payment of the maintenance fee is not accepted, the maintenance fee and the surcharge set forth in § 1.20(i) will be refunded following the decision on the petition for reconsideration, or after the expiration of the time for filing such a petition for reconsideration, if none is filed. Any petition fee under this section will not be refunded unless the refusal to accept and record the maintenance fee is determined to result from an error by the Patent and Trademark Office.

Aug. 11, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1154 OG 35]

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(71) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 920670-2281]
RIN 0651-AA57

Changes in Procedures for Reinstatement of Patents

Agency: Patent and Trademark Office, Commerce
Action: Interim Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to provide for reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional. The Office is also establishing the amount for the surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional.
Dates: Interim rule effective Oct. 23, 1992. These rules will be applicable to all petitions to reinstate an expired patent filed with the Office on or after the effective date. The surcharge cited in sections 1.20(i)(2) and 1.378(c)(2) of title 37 of the Code of Federal Regulations will be effective thirty days from publication of this rulemaking in the *Federal Register* or the *Official Gazette* of the Patent and Trademark Office, whichever is later. Written comments on this rulemaking must be received on or before Jan. 8, 1993 to ensure consideration. An oral hearing will not be conducted.
Addresses: Address written comments on this interim rulemaking to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Jeffrey V. Nase. Correspondence may be sent by FAX to the attention of Jeffrey V. Nase at (703) 305-8825.
For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9282 or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the *Federal Register* (57 FR 41899) on Sept. 14, 1992, and in the Patent and Trademark Office *Official Gazette* (1143 Off. Gaz. Pat. Office 8) on Oct. 6, 1992, the Office proposed to amend the current regulations in the event that proposed statutory changes were enacted to allow for the reinstatement of a patent where the delay in timely payment of a maintenance fee was unintentional.

Section 41 of title 35, United States Code, establishes fees that the Commissioner shall charge for patent-related matters. A bill to amend title 35 with respect to the late payment of maintenance fees was introduced on June 4, 1992, in the House of Representatives as H.R. 5328 (hereafter, Bill). The Bill, as introduced, proposed to: (1) amend 35 U.S.C. § 41(c)(1) to permit reinstatement of a patent which expired unintentionally

for failure to timely pay the maintenance fee, provided that the payment is made within eighteen months after the six-month grace period specified in 35 U.S.C. § 41(b); and (2) amend 35 U.S.C. § 41(a)(7) to require a petition fee for an unintentionally delayed payment for maintaining a patent in force. The Bill, with amendments, was enacted as Public Law No. 102-444 (hereafter, Act).

The Act amends 35 U.S.C. § 41(c)(1) to permit reinstatement of a patent which expired unintentionally for failure to timely pay the maintenance fee, provided that the payment is made within twenty-four months after the six-month grace period specified in 35 U.S.C. § 41(b).

Since the Act is effective on enactment and since it differs significantly from the Bill, as introduced, it is necessary to promulgate this interim rulemaking. This interim rulemaking implements the procedures the Office will follow to accept the unintentionally delayed payment of a maintenance fee. All aspects of this rulemaking either confer a benefit or are clearly and directly related to the benefit conferred. Therefore, this rulemaking is exempt from the Administrative Procedures Act's rulemaking requirements under the proprietary matters exception, 5 U.S.C. § 553(a)(2). Furthermore, any delay in the implementation of this interim rulemaking would be contrary to the public interest in granting relief by ensuring that patents unintentionally expired for failure to pay the required maintenance fee are promptly reinstated.

Under the Act, the Commissioner has authority to set a surcharge for accepting the unintentionally delayed payment of a maintenance fee. The Commissioner has determined that an interim surcharge of $1,500 is appropriate. If a surcharge in a lower amount is finally adopted (after review of public comments in response to this interim rulemaking), patentees will be refunded any excess payment. The $1,500 interim surcharge was determined to be the appropriate amount when compared to the existing $620 surcharge for accepting the unavoidably delayed payment of a maintenance fee. The higher interim surcharge is appropriate since a petition to accept the unintentionally delayed payment of a maintenance fee will require only a statement that the delay in payment of the maintenance fee was unintentional, not a showing of facts sufficient to establish unavoidable delay. Furthermore, the higher amount for relief based on the unintentional delay relative to those based on unavoidable delay is similar to the statutory difference in fees for petitioning to revive an abandoned application.

The $1,500 interim surcharge will not take effect until the date thirty days from publication of this interim rulemaking in the *Federal Register* or the *Official Gazette* of the Patent and Trademark Office, whichever is later. Section 1.378(c)(2) is waived until the $1,500 surcharge becomes effective. However, petitions to accept the delayed payment of a maintenance fee should not be delayed for that thirty-day period. The surcharge for the acceptance of a maintenance fee resulting from a petition filed under this waiver will be due when the petition is granted.

One comment on the proposed § 1.378 has been received.

Comment: The comment questioned the time limits proposed for § 1.378(c)(5).
Reply: The proposed time limits will not be adopted because the Act sets the time limit for filing a petition to accept the delayed payment of a maintenance fee.

Any final rule will treat both the comments made to the proposed rules and to these interim rules.

DISCUSSION OF SPECIFIC SECTIONS TO BE CHANGED OR ADDED:

(1) Post issuance fees. (§ 1.20)

Section 1.20(i) is amended to add a $1,500 surcharge fee for accepting the unintentionally delayed payment of a maintenance fee. This amendment will not become effective until the date thirty days after Publication of this interim rulemaking in the *Federal Register* or in the *Official Gazette* of the Patent and Trademark Office, whichever is later.

(2) Delayed payment of a maintenance fee (§ 1.378)

The Act amends subsection 41(c)(1) of title 35, United States Code, to permit the Commissioner to accept late payment of any maintenance fee filed within twenty-four months after the six-month grace period, if the delay in payment is shown to the satisfaction of the Commissioner to have been unintentional. In order to implement the Act, paragraphs (a) and (c) of § 1.378 are amended to permit the filing of a petition to accept late payment of a maintenance fee, where the delay in payment was unintentional.

In addition to the timeliness deadlines set forth in the preceding paragraph, a petition filed under the unintentional standard of § 1.378(c) would have to include the required maintenance fee set forth in § 1.20(e) through (g), the surcharge for an unintentionally expired patent as set forth in § 1.20(i)(2), and a statement that the delay in payment of the maintenance fee was unintentional. The requirement of § 1.378(c)(2) that the petition must include the surcharge will be waived until the date thirty days after publication of this interim rulemaking in the *Federal Register* or in the *Official Gazette* of the Patent and Trademark Office, whichever is later. The surcharge for the acceptance of a maintenance fee resulting from a petition filed under this waiver will be due when the petition is granted.

A statement that the delay in payment of the maintenance fee was unintentional would not be appropriate unless the entire delay, up until the maintenance fee was actually paid, was unintentional. For example, a statement that the delay in payment of the maintenance fee was unintentional would not be proper when patentee becomes aware of an unintentional failure to timely pay the maintenance fee and then intentionally delays filing a petition for reinstatement of the patent under § 1.378.

Petitions to accept delayed payment of a maintenance fee in an expired patent, prior to enactment of the Act, required a showing of unavoidable delay. In the case of petitions filed more than six months after expiration of a patent, current § 1.378(c) further required a showing that the failure to timely pay the maintenance fee was beyond the control of the patentee. The Office has determined that the "beyond the control" standard does not find adequate support in the relevant statute (35 U.S.C. 41(c)) or in the legislative history of Public Law 97-247. See "acceptance of Delayed Payment of Maintenance Fees in Expired Patents", 1115 Off. Gaz. Pat. Office 18 (June 12, 1990). Therefore, current § 1.378(c) is being deleted in its entirety to be replaced by the unintentional delay provisions discussed above. Additionally, § 1.378(b) is amended to provide that the unavoidable delay provisions are available at any time following expiration of a patent for failure to pay a maintenance fee.

OTHER CONSIDERATIONS

The rule changes is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et. seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate the Act into the regulations and will give relief to many small entities that do not now have a mechanism to reinstate their expired patent.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain a collection of information requirement subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which has previously been approved by the Office of Management and Budget under Control Nos. 0651-011 and 0651-0016.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. § 6, part 1 of title 37 of the Code of Federal Regulations is amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (i) to read as follows:

§ 1.20 Post issuance fees.

*****

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been

(1) unavoidable	$620.00
(2) unintentional	$1,500.00

*****

3. Section 1.378, paragraphs (a), (b) and (c) are revised to read as follows:

§ 1.378 Acceptance of delayed payment of maintenance fee in expired patent to reinstate patent.

(a) The Commissioner may accept the payment of any maintenance fee due on a patent after expiration of the patent if, upon petition, the delay in payment of the maintenance fee is shown to the satisfaction of the Commissioner to have been unavoidable (paragraph (b) of this section) or unintentional (paragraph (c) of this section) and if the surcharge required by § 1.20(i) is paid as a condition of accepting payment of the maintenance fee. If the Commissioner accepts payment of the maintenance fee upon petition, the patent shall be considered as not having expired, but will be subject to the conditions set forth in 35 U.S.C. 41(c)(2).

(b) Any petition to accept an unavoidably delayed payment of a maintenance fee filed under paragraph (a) of this section must include:

(1) The required maintenance fee set forth in § 1.20 (e)-(g);

(2) The surcharge set forth in § 1.20(i)(1); and

(3) A showing that the delay was unavoidable since reasonable care was taken to ensure that the maintenance fee would be paid timely. The showing must enumerate the steps taken to ensure timely payment of the maintenance fee.

(c) Any petition to accept an unintentionally delayed payment of a maintenance fee filed under paragraph (a) of this section must be filed within twenty-four months after the six-month grace period provided in § 1.362(e) and must included:

(1) The required maintenance fee set forth in § 1.20(e)-(g);

(2) The surcharge set forth in § 1.20(i)(2); and

(3) A statement that the delay in payment of the maintenance fee was unintentional.

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Nov. 23, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner Patents and Trademarks

(72) **Withdrawing the Holding of Abandonment When Office Actions Are Not Received**

The purpose of this notice is to announce a practice that will minimize costs and burdens to the practitioner and the Office when an application has become abandoned due to a failure to receive an Office action.

A petition to withdraw the holding of abandonment in accordance with *Delgar Inc.* v. *Schuyler*, 172 USPQ 513 (D.D.C. 1971) is burdensome to the practitioner since the practitioner must overcome a strong presumption that an Office action duly addressed and indicated as mailed was timely delivered to the addressee. To overcome this presumption, a practitioner is currently required to submit a persuasive showing that would permit the Office to conclude that the Office action was not received. Accordingly, evidence which is typically required includes: copies of records which would disclose the receipt of other correspondence mailed from the Patent and Trademark Office on or about the mail date of the non-received Office action, but fail to disclose receipt of the Office action mailed that date; copies of records on which the Office action would have been entered had it been received (e.g., a copy of the outside of the file jacket maintained by the practitioner); and verified statements from persons who would have handled the Office action (e.g., mail clerks, docket clerks, secretary, etc.).

In order to minimize costs and burdens to the practitioner and the Office when an application has become abandoned due to a failure to receive an Office action, the Office is modifying the showing required to make a petition to withdraw the holding of abandonment grantable. The showing required to establish the failure to receive an Office actio must consist of a statement from the practitioner stating that the Office action was not received by the practitioner and attesting to the fact that a search of the file jacket and docket records indicates that the Office action was not received. A copy of the docket record where the non-received Office action would have been entered had it been received and docketed must be attached to and referenced in practitioner's statement.

The showing outlined above may not be sufficient if there are circumstances that point to a conclusion that the Office action may have been lost after receipt rather than a conclusion that the Office action was lost in the mail, e.g., if the practitioner has a history of not receiving Office actions. Two additional procedures are available for reviving an application that has become abandoned due a failure to respond to an Office Action: (1) a petition based on unintentional abandonment or delay; and (2) a petition based on unavoidable delay. See Manual of Patent Examining Procedure § 711.03(c).

Oct. 25, 1993

CHARLES E. VAN HORN
Patent Policy and Projects Administrator
Office of the Assistant Commissioner for Patents

[1156 OG 53]

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(73) **Viewing of Video Tapes During Interviews**

The Patent and Trademark Office has video tape equipment available in the facilities of the Patent Academy for viewing video tapes from applicants during interviews with patent examiners.

The video tape equipment may use VHS and UHS (3/4 inch tape) cassettes.

Attorneys or applicants wishing to show a video tape during an examiner interview must be able to demonstrate that the content of the video tape has a bearing on an outstanding issue in the application and its viewing will advance the prosecution of the application. Prior approval of viewing of a video tape during an interview must be granted by the SPE. Also, use of the room and equipment must be granted by the Training Manager to avoid any conflict with the Patent Academy.

Requests to use video tape viewing equipment for an interview should be made at least one week in advance to allow the Patent Academy staff sufficient time to ensure the availability and proper scheduling of both a room and equipment.

Interviews using Office video tape equipment will be held only in the Academy facilities located in One Crystal Park, Rm. 502. Attorneys or applicants should not contact the Patent Academy directly regarding availability and scheduling of video equipment. All scheduling of rooms and equipment should be done through and by the examiner conducting the interview.

May 6, 1986 RENE D. TEGTMEYER
Assistant Commissioner for Patents

[1067 OG 4]

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(74) **Procedures for Restarting Response Periods**

The purpose of this notice is to announce revised procedures for restarting response periods set in patent related matters. Occasionally, mail from the Patent and Trademark Office (PTO) is received late at the correspondence address or the mail is delayed in leaving the PTO.

The following revised procedures are effective immediately and will be followed in processing a petition to reset a period for response due to late receipt of a PTO action or due to a postmark date which is later than the mail date printed on a PTO action. The authority to decide such petitions is delegated to the Group Director, where the PTO action involved in the petition was mailed by a patent examining group.

Petition to reset a period for response due to late receipt of a PTO action

The PTO will grant a petition to restart the previously set period for response to a PTO action to run from the date of receipt of the PTO action at the correspondence address when the following criteria are met: (1) the petition is filed within two weeks of the date of receipt of the PTO action at the correspondence address; (2) a substantial portion of the set response period had elapsed on the date of receipt (e.g., at least one month of a two or three month response period had elapsed); and (3) the petition includes (a) evidence showing the date of receipt of the PTO action at the correspondence address (e.g., a copy of the PTO action having the date of receipt of the PTO action at the correspondence address stamped thereon, a copy of the envelope (which contained the PTO action) having the date of receipt of the PTO action at the correspondence address stamped thereon, etc.), and (b) a statement (verified if made by other than a registered practitioner) setting forth the date of receipt of the PTO action at the correspondence address and explaining how the evidence being presented establishes the date of receipt of the PTO action at the correspondence address.

There is no statutory requirement that a shortened statutory period of longer than thirty days to respond to a PTO action be reset due to delay in the mail or in the PTO. However, when a substantial portion of the set response period had elapsed on the date of receipt at the correspondence address (e.g., at least one month of a two or three month response period had elapsed), the procedures set forth above for late receipt of a PTO action are available. Where a PTO action was received with less than two months remaining in a shortened statutory period of three months, the period may be restarted from the date of receipt. Where the period remaining is between two and three months, the period will be reset only in extraordinary situations—e.g., complex PTO action suggesting submission of comparative data.

Petitions to reset a period for response due to a postmark date later than the mail date printed on a PTO action

The PTO will grant a petition to restart the previously set period for response to a PTO action to run from the postmark date shown on the PTO mailing envelope which contained the PTO action when the following criteria are met: (1) the petition is filed within two weeks of the date of receipt of the PTO action at the correspondence address; (2) the response period was for payment of the issue fee[1]; or the response period set was one month or thirty days[2]; and (3) the petition includes (a) evidence showing the date of receipt of the PTO action at the correspondence address (e.g., a copy of the PTO action having the date of receipt of the PTO action at the correspondence address stamped thereon, etc.), (b) a copy of the envelope which contained the PTO action showing the postmark date, and (c) a statement (verified if made by other than a registered practitioner) setting forth the date of receipt of the PTO action at the correspondence address and stating that the PTO action was received in the post-marked envelope.

The provision of 37 CFR 1.8 and 1.10 apply to the filing of the above-noted petitions with regard to the requirement that the petition be filed within two weeks of the date of receipt of the PTO action.

The showings outlined above may not be sufficient if there are circumstances that point to a conclusion that the PTO action may have been delayed after receipt rather than a conclusion that the PTO action was delayed in the mail or in the PTO.

February 3, 1994 CHARLES E. VAN HORN
Patent Policy and Projects Administrator
Office of the Assistant Commissioner for Patents

[1160 OG 14]

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(75) **Patent and Trademark Office**
37 CFR Parts 1 and 10
[Docket No. 910764-1306]
RIN: 0651-AA27

Duty of Disclosure

Agency: Patent and Trademark Office, Commerce
Action: Notice of final rulemaking.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to (1) clarify the duty of disclosure for information required to be submitted to the Office; (2) provide flexible time limits for submitting information disclosure statements including the requirement for a fee in certain cases; (3) eliminate consideration of duty of disclosure issues by the Office except in disciplinary and interference proceedings, and under other limited circumstances; and (4) eliminate the striking of patent applications which are improperly executed. The Office further is amending the Patent and Trademark Office Code of Professional Responsibility to define as misconduct a failure to comply with the rules on duty of disclosure. The rules as adopted strike a balance between the need of the Office to obtain and consider all known relevant information pertaining to patentability before a patent is granted and the desire to avoid or minimize unnecessary complications in the enforcement of patents.
Effective Date: March 16, 1992. These rules will be applicable to all applications and reexamination proceedings pending or filed after the effective date.
For Further Information Contact: By telephone Charles E. Van Horn (703-305-9054) or J. Michael Thesz (703-305-9384) or by mail addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, and marked to the attention of Charles E. Van Horn (Crystal Park 2 - Room 919).
Supplementary Information: A notice of proposed rulemaking on duty of disclosure and practitioner misconduct published in the Federal Register at 54 FR 11334 (March 17, 1989), and in the Patent and Trademark Office *Official Gazette* at 1101 Off. Gaz. Pat. Off. 12 (April 4, 1989), was withdrawn. On August 6, 1991, the Office published in the *Federal Register* a notice of proposed rulemaking relating to duty of disclosure. 56 FR 37321 The notice was also published in the *Official Gazette*. 1129 Off. Gaz. Pat. Off. 52 (August 27, 1991). Sixty written comments were received in response to the notice of proposed

[1] 35 USC 151 permits payment of the issue fee within three months of the date that the Notice of Allowance is mailed to the applicant.

[2] 35 USC 133 does not permit a response period to be less than thirty days from the date the PTO action is given or mailed to the applicant.

rulemaking. A public hearing was held on October 8, 1991. Eleven individuals offered oral comments at the hearing. The sixty written comments and a copy of the transcript of the hearing are available for public inspection in the Office of the Assistant Commissioner for Patents, Room 919, Crystal Park II, 2121 Crystal Drive, Arlington, VA.

Familiarity with the notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in writing and at the public hearing in response to the notice of proposed rulemaking are discussed.

The rules as adopted shall take effect as to all applications and reexamination proceedings either pending or filed on or after the effective date of these rules. Thus, any information disclosure statement that is filed on or after that date must comply with the provisions of §§ 1.97 and 1.98 to be entitled to consideration.

Changes in Text: The final rules contain several changes to the text of the rules as proposed for comment. Those changes are discussed below.

Section 1.17(i)(1) has been changed from the proposed text to reflect the recent increase in the amount of the fee for filing a petition from $120.00 to $130.00.

Section 1.56(a) has been clarified to indicate that the duty of an individual to disclose information is based on the knowledge of that individual that the information is material to patentability. A sentence has been added to § 1.56(a) to express the principle that the Office does not condone the granting of a patent on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. In addition, § 1.56(a) as proposed has been changed to indicate that if all information material to patentability of any claim issued in a patent is cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98, the Office will consider as satisfied the duty to disclose to the Office all information known to be material to patentability, as contrasted to the broader duty of candor and good faith. This rule does not attempt to define the spectrum of conduct that would lack the candor and good faith in dealing with the Office which is expected of individuals who are associated with the filing or prosecution of a patent application.

In § 1.56(b), the phrase "or being made of record" has been inserted to make it clear that information is not material to patentability within the meaning of § 1.56 if it is cumulative to either information already of record in the application or contemporaneously being made of record by applicant. For example, there would be no benefit to the Office for applicant to submit to the Office 10 different documents having the same teaching simply because the information was not cumulative to the information already of record.

The term "creates" has been replaced by the term "establishes" in § 1.56(b)(1). In addition, the definition of a prima facie case of unpatentability, as set out in the preamble of the notice of proposed rulemaking, has been incorporated into the rule itself. A prima facie case of unpatentability of a claim is established when the information compels a conclusion that the claim is unpatentable

(1) under the preponderance of evidence, burden-of-proof standard,
(2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
(3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

This prima facie standard conforms to the standard used by an examiner to determine whether a claim is prima facie unpatentable.

Section 1.56(b)(2) has been modified from the text of the proposed rule. The focus of this paragraph has been changed so that it now relates to information which either refutes, or is inconsistent with, a position that applicant takes in either

(1) opposing an argument of unpatentability relied on by the Office, or
(2) asserting an argument of patentability.

The change from the proposed rule makes clear that information is material when it either refutes, or is inconsistent with, a position taken by applicant before the Office.

Section 1.97(e) has been changed from the proposed text to make it clear that a certification could contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a search report from a patent office outside the U.S. not more than three months prior to the filing date of the statement. Under this certification, it would not matter whether any individual with a duty actually knew about any of the information cited before receiving the search report. In the alternative, the certification could state that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The changes to the text of § 1.97(e) as proposed place the appropriate priority on getting relevant information to the Office promptly, with minimum burden to applicant. The text of the proposal has also been changed by adding the phrase "after making reasonable inquiry" to make it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. For example, if an inventor gave a publication to the practitioner prosecuting an application with the intent that it be cited to the Office, the practitioner should inquire as to when that inventor became aware of the publication before submitting a certification under § 1.97(e)(ii) to the Office.

A new paragraph (h) has been added to the text of proposed § 1.97. The purpose of new paragraph (h) is to ensure that no one could construe the mere filing of an information disclosure statement as an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b). It is in the best interest of the Office and the public to permit and encourage individuals to cite information to the Office without fear of making an admission against interest.

In § 1.98(a)(2)(iii), the wording has been changed to make it clear that the requirement to submit a copy of each item of information listed in an information disclosure statement does not apply to the citation of a U.S. patent application.

The requirement in proposed § 1.98(a)(3) for a concise explanation of the relevance of each item of information has been substantially changed by limiting the requirement in two significant ways. First, as adopted, the requirement is limited to information that is not in the English language. Second, the explanation required is limited to the relevance as understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office, the requirement for a concise explanation of relevance is satisfied by submitting an English language version of the search report.

In § 1.98(d), the proposed text has been changed by adding the phrase "cited by or" to make it clear that legible copies of information listed in an information disclosure statement need not be submitted in a continuing application provided the information was either cited by or submitted to the Office in a prior application. A distinction between information cited by the Office or supplied by applicant to the Office serves no useful purpose in this situation.

The text of proposed § 1.555 has been modified to limit the definition of information material to patentability in a reexamination proceeding to the types of information that an examiner could use in a reexamination proceeding to determine whether a claim was patentable, and to adopt other changes that parallel changes made in § 1.56. Proposed § 1.555(a) has been divided into two paragraphs. Paragraph (a), as adopted, substantially parallels the text of § 1.56(a) as adopted. It indicates that the duty to disclose information to the Office in a reexamination proceeding is a part of the duty of candor and good faith that is owed to the Office by individuals transacting business with the Office. It further states one way that an individual may discharge the duty to disclose information material to patentability in a reexamination proceeding - i.e., by filing an information disclosure statement with the items listed in § 1.98(a) as applied to individuals associated with the patent owner in a reexamination proceeding. Finally, the text of the rule has been changed to add a sentence that expresses the principle that a

patent should not be granted on an application in connection with which fraud was practiced or attempted on the Office or there was any violation of the duty of disclosure through bad faith or intentional misconduct.

New paragraph (b) of § 1.555 has been adopted to define information material to patentability in a reexamination proceeding. Much like the definition in § 1.56(b), information is not material when it is cumulative to information of record or being made of record in the reexamination proceeding. Information is considered material when it satisfies either or both of the definitions in § 1.555(b). Under § 1.555(b)(1), information is material when it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim. This definition is limited to patents or printed publications because a reexamination proceeding must be based on patents or printed publications. 35 U.S.C. 302.

The definition of a prima facie case of unpatentability of a claim pending in a reexamination proceeding has been provided in the rule. A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the same principles that are applicable during ex parte examination of a patent application; namely

(1) under the preponderance of evidence, burden-of-proof standard,
(2) giving each term in the claim its broadest reasonable construction consistent with the specification, and
(3) before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

Finally, the definition of information material to patentability in § 1.555(b)(2) has been added to parallel the provision in § 1.56(b)(2).

After reviewing the Office policy on whether to consider duty of disclosure and other inequitable conduct issues in interference proceedings under 35 U.S.C. 135(a), including comments from the public directed to the statement in the notice of proposed rulemaking that the Office will not consider, evaluate, or decide fraud or other inequitable conduct issues during an interference proceeding, a new Office policy has been adopted. Effective October 24, 1991, fraud and inequitable conduct issues will be considered when properly raised inter partes in patent interference cases. 1132 Off. Gaz. Pat. Off. 33 (November 19, 1991). In addition, the Chairman of the Board of Patent Appeals and Interferences has issued a notice that provides guidance on how an issue of fraud or other inequitable conduct can be raised in an interference proceeding. 1133 Off. Gaz. Pat. Off. 21 (December 10, 1991).

Response to and Analysis of Comments: Sixty (60 written comments were received in response to the notice of proposed rulemaking. These comments, along with those made at the public hearing, have been analyzed. Some suggestions made in the comments have been adopted and others have been rejected. Responses to the comments follow.

Comment 1. Nine comments indicated that the Office should not amend § 1.56 since it in presently in conformance to the materiality standard being applied by the Court of Appeals for the Federal Circuit. One comment questioned what practical value of the proposed rule would justify the burden of the change.

Reply: The amendment to § 1.56 was proposed to address criticism concerning a perceived lack of certainty in the materiality standard. The rule as promulgated will provide greater clarity and hopefully minimize the burden of litigation on the question of inequitable conduct before the Office, while providing the Office with the information necessary for effective and efficient examination of patent applications.

Comment 2. One comment stated that the present rules should be maintained and strengthened since the public interest is hurt more by an unjustly issued patent than by an unjustly denied patent. Another comment disagreed and argued that an unjustly denied patent can do great harm to society.

Reply: The Office strives to issue valid patents. The Office has both an obligation not to unjustly issue patents and an obligation not to unjustly deny patents. Innovation and technological advancement are best served when an inventor is issued a patent with the scope of protection that is deserved. The rules as adopted serve to remind individuals associated with the preparation and prosecution of patent applications of their duty of candor and good faith in their dealings with the Office, and will aid the Office in receiving, in a timely manner, the information it needs to carry out effective and efficient examination of patent applications.

Comment 3. Two comments stated that the rule should not permit applicants to draft claims and a specification to avoid a prima facie case of obviousness over a reference and then to be able to withhold the reference from the examiner.

Reply: The comments reflect a correct reading of the rule in that information is not material unless it comes within the definition of § 1.56(b)(1) or (2). If information is not material, there is no duty to disclose the information to the Office. The Office believes that most applicants will wish to submit the information, however, even though they may not be required to do so, to strengthen the patent and avoid the risks of an incorrect judgment on their part on materiality or that it may be held that there was an intent to deceive the Office.

Comment 4. One comment stated that promulgation of the proposed rule would result in a significant decrease in the quantity of art cited to the Office because there will be no duty to cite art relevant to a pending claim.

Reply: The Office does not anticipate any significant change in the quantity of information cited to the Office after promulgation of amended § 1.56. Presumably, applicants will continue to submit information for consideration by the Office in applications rather than making and relying on their own determinations of materiality. An incentive remains to submit the information to the Office because it will result in a strengthened patent and will avoid later questions of materiality and intent to deceive. In addition, the new rules will actually facilitate the filing of information since the burden of submitting information to the Office has been reduced by eliminating, in most cases, the requirement for a concise statement of the relevance of each item of information listed in an information disclosure statement.

Comment 5. Several comments stated that an objective "but for" standard would be preferable to the proposed rule. The objective "but for" standard would presumably consider information as a court does in an infringement proceeding with a clear and convincing, burden-of-proof standard, giving the terms in each claim a narrow construction where necessary to uphold validity.

Reply: The Office believes that amended § 1.56 will provide a reasonable balance between the needs of applicants and of the Office. The suggested "but for" standard would not cause the Office to obtain the information it needs to evaluate patentability so that its decisions may be presumed correct by the courts. If the Office does not have needed information, meaningful examination of patent applications will take place for the first time in an infringement case before a district court. Courts will become increasingly less confident of the Office's product if they get the impression that practitioners and inventors can routinely withhold information from the Office, or that practitioners and inventors can make up their own minds about what is patentable. The Office should decide, in the first instance, what is patentable and any decision should be made with the best information available, including that known by the applicant. The Office notes that the House of Delegates of the American Bar Association twice, once in 1990 and again in 1991, refused to adopt a resolution favoring adoption of the "but for" standard.

Comment 6. One comment argued that proposed § 1.56 does not relate to "the conduct of proceedings in the Patent and Trademark Office" (35 U.S.C. 6(a)) since the Office does not intend to reject applications as indicated by the cancellation of paragraphs (c) through (i) of current § 1.56.

Reply: The amendment to § 1.56 comes within the authority of the Commissioner for establishing regulations. *Norton v. Curtiss*, 433 F.2d 779, 167 USPQ 532 (CCPA 1970). The Office has reserved its inherent authority to reject an application under appropriate circumstances where fraud or other inequitable conduct has occurred. Also, the Office will consider fraud and inequitable conduct when properly raised in interference proceedings under 35 U.S.C. 135(a). The Office will also consider fraud and inequitable conduct in connection with attorney conduct under § 10.23(c).

Comment 7. One comment stated that § 1.56 should require only anticipatory art to be submitted during examination of an application, with a procedure such as reexamination being used after discovery in any litigation on the patent has revealed all available art.

Reply: An application is examined under all appropriate sections of Title 35, United States Code, and a presumption of validity attaches to a patent with regard to all aspects of patentability, including anticipation. 35 U.S.C. 282. Therefore, § 1.56 should address more than just the submission of anticipatory information, including information relevant to patentability under 35 U.S.C. 103 and 35 U.S.C. 112.

Comment 8. One comment suggested that proposed § 1.56 has some dangerous implications since courts are going to find violations of the duty of disclosure if §§ 1.97 and 1.98 are not complied with completely.

Reply: Section 1.56 provides that the duty of disclosure can be met by submitting information to the Office in the manner prescribed by §§ 1.97 and 1.98. Sections 1.97 and 1.98 are being amended so that information will be submitted to the Office in the manner and at the time which will facilitate consideration by the examiner. Applicants are provided certainty as to when information will be considered, and applicants will be informed when information is not considered. The Office does not believe that courts should, or will, find violations of the duty of disclosure because of unintentional noncompliance with §§ 1.97 and 1.98. If the non-compliance is intentional, however, the applicant will have assumed the risk that the failure to submit the information in a manner that will result in its being considered by the examiner may be held to be a violation.

Comment 9. Two comments stated that the Office should not delete the offense of attempted fraud from the § 1.56. The comments stated that elimination of the reference to "gross negligence" in current § 1.56 would be sufficient to protect the practitioner who delays submission of information with no intent to deceive the Office. One of the comments stated that the disciplinary rules alone are not sufficient to deter attempted fraud or inequitable conduct.

Reply: The language of §§ 1.56(a) and 1.555(a) has been modified to retain the provisions of prior § 1.56(d) to indicate that the Office does not condone fraud, attempted fraud, or violation of the duty of disclosure through bad faith or intentional misconduct.

Comment 10. One comment stated that the appropriate standards for the duty of candor are analogous to fiduciary law which requires the fiduciary to disclose not only known facts, but also facts which it should have known, i.e., a negligence standard. The comment argued that it was undesirable to measure duty of candor or fraud by a reduced measure of "intent" instead of an objective negligence standard since the Office is not bound by the U.S. Court of Appeals for the Federal Circuit decision in *Kingsdown Medical Consultants, Ltd. v. Hollister, Inc.*, 863 F.2d 867, 9 USPQ2d 1384 (Fed. Cir. 1988) (*en banc*), *cert. denied*, 490 U.S. 1067 (1989), and since the proposed standard is no more objective than alternative standards but is simply narrower and more certain. Another comment suggested that the Office should indicate that there is no intention to change the *Kingsdown* ruling.

Reply: Section 1.56 has been amended to present a clearer and more objective definition of what information the Office considers material to patentability. The rules do not define fraud or inequitable conduct which have elements both of materiality and of intent. The Office does not advocate any change to the *Kingsdown* ruling.

Comment 11. Two comments stated that the proposed modification of § 1.56 would make submission of information to the Office an implied admission of the prima facie unpatentability of a claim. Several comments suggested that a sentence should be added to proposed § 1.56 to specify that submission of information to the Office under this section shall not be deemed to be an admission or representation that the information is material to patentability.

Reply: The suggestions in the comments have been adopted by modifying § 1.97 which deals with submission of information to the Office. Paragraph (h) of § 1.97 now provides that the filing of an information disclosure statement shall not be considered to be an admission that the information cited in the statement is, or is to be considered to be, material to patentability as defined in § 1.56.

Comment 12. One comment stated that the proposed § 1.56 definition would be difficult to apply in litigation in which a different burden-of-proof standard is applied.

Reply: The definition of information material to patentability includes standards which are familiar to the Federal courts and which are capable of being handled like other issues.

Comment 13. One comment suggested that the last sentence of proposed § 1.56(a), in which the Office encourages applicants to carefully examine prior art cited in foreign search reports and the closest known information, be removed from the rule and be placed in the preamble discussion so as to avoid the interpretation that the sentence creates a duty for applicants.

Reply: The suggestion is not adopted. The sentence does not create any new duty for applicants, but is placed in the text of the rule as helpful guidance to individuals who file and prosecute patent applications.

Comment 14. Three comments stated that the language of proposed § 1.56(a) required revision to remove all statements or suggestions which might allow a court to consider a pending (i.e., unissued) claim for the purpose of determining whether the duty of disclosure requirement was met in view of the fact that the proposed rule was intended to indicate that there is no duty to disclose information which is material to a pending claim unless that claim ultimately issues in a patent. One comment argued that a court might interpret "the duty of candor and good faith" to be broader than the particular duty of disclosure specified in other portions of the proposed rule.

Reply: The language of §§ 1.56 and 1.555 has been modified to emphasize that there is a duty of candor and good faith which is broader than the duty to disclose material information. Section 1.56 further states that "no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct."

Comment 15. One comment suggested that proposed § 1.56(a) be modified to clarify that both information and its materiality must be known before there is a duty to disclose the information.

Reply: The Office considers the language of § 1.56(a) to be sufficiently clear in referring to a "duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section." If information is known to be material, it inherently must be known. Likewise, if information is not known to an individual, there is no duty to disclose the information whether it is material or not.

Comment 16. One comment stated that it should be made clear that "known" is limited to contemporaneous knowledge since a practitioner may have known something ten years ago but may not remember it presently.

Reply: Section 1.56 states that each individual associated with the filing and prosecution of a patent application has a duty to disclose all information known to that individual to be material to patentability as defined in the section. Thus, the duty applies to contemporaneously or presently known information. The fact that information was known years ago does not mean that it was recognized that the information is material to the present application.

Comment 17. One comment suggested that proposed § 1.56(a) be modified to state that the duty of disclosure ends when an application becomes abandoned or allowed.

Reply: Paragraph (a) of § 1.56 states that the duty to disclose information exists until the application becomes abandoned. The duty to disclose information, however, does not end when an application becomes allowed but extends until a patent is granted on that application. The rules provide for information being considered after a notice of allowance is mailed and before the issue fee is paid (§ 1.97(d)) and for an application to be withdrawn from issue after the issue fee has been paid. An application may be withdrawn from issue because one or more claims are unpatentable (§ 1.313(b)(3)) or an application may be withdrawn from issue and abandoned so that information may be considered in a continuing application before a patent issues (§ 1.313(b)(5)).

Comment 18. Three comments stated that the first two sentences of proposed § 1.56(a) should be deleted since rules should simply instruct practitioners what to do without discussion of why they should do it or the philosophy involved.

Reply: The suggestion has not been adopted since the sentences aid in the understanding of the rule and will provide those involved in enforcing patents with an indication of the policy on which the rule is based.

Comment 19. One comment stated that §§ 1.56(a)(2) and (c)

should be modified to refer to "individuals substantively associated with" the filing or prosecution of the patent application.
Reply: The suggestion is not adopted since the proposed rule language is clear and the suggested modification would create a redundancy with the language of § 1.56(c)(3). The individuals designated in §§ 1.56(c)(1) and (2) as being associated with the filing or prosecution of a patent application within the meaning of the section are inherently substantively involved in the preparation or prosecution of the application.
Comment 20. One comment stated that proposed § 1.56(b) should be modified to clarify that information is not material if it is cumulative to information already of record in an application or to information concurrently being made of record.
Reply: The suggestion has been adopted by adding a reference to information being made of record with regard to cumulative information in §§ 1.56(b) and 1.555(b).
Comment 21. One comment stated that the preamble discussion (of § 1.56(b)) should indicate that test results in situations such as tests involving biological systems may properly be submitted as averages rather than as individual test runs.
Reply: Whether test results can be submitted as averages rather than as individual test runs depends on whether doing so would provide to the Office the information needed to make a proper determination on patentability. If the actual results are provided, the examiner can make an independent determination on whether some rejection is appropriate. In some cases providing averages might be misleading, but in other cases providing averages might be appropriate.
Comment 22. One comment stated that the definition of materiality in proposed § 1.56(b) imposes substantial new burdens on applicants who would be required to disclose failed experiments, papers published less than one year prior to filing and experimental public uses even if they clearly are refutable and will not affect patentability. One comment stated that the proposed rule would require applicants to incur added expense for affidavits and comparison tests. Five comments stated that the Office should not require applicants to present results from clearly invalid tests since this would be contrary to usual scientific practice. One comment argued that information should not be required to be submitted if there was no doubt that it would not preclude patentability, e.g., where common ownership existed so that the exception of 35 U.S.C. 103, second paragraph, would apply.
Reply: The definition of materiality in § 1.56 does not impose substantial new burdens on applicants, but is intended to provide the Office with the information it needs to make a proper and independent determination on patentability. It is the patent examiner who should make the determination after coesidering all the facts involved in the particular case. The comments reflect that the Office objective of clarifying what information the Office considers to be material has been accomplished by the amendment of the rules.
Comment 23. One comment suggested that § 1.56 should confine the duty of disclosure to references known to applicant or the practitioner representing applicant and not found in prior art materials in the Office.
Reply: This suggestion is not adopted since information may be in the Office but not in the application file. It is not reasonable to assume that an examiner knows of a particular item of information or appreciates its relevance to a particular invention simply because it exists somewhere in the Office.
Comment 24. One comment stated that the language "or in combination with other information" should be removed from proposed § 1.56(b)(1) because it was unworkable to require an applicant to combine references against its own claims, especially since, according to the commentator, examiners and the Board of Patent Appeals and Interferences frequently misapply the law. Another comment stated that the language creates an open field for litigators to claim that an inordinate number of references could be combined.
Reply: The rule does not require an applicant to combine references against its own claims. The applicant can submit information to the Office for the examiner's consideration whether the information is considered material or not. The fact that the teachings of a large number of references must be combined for a prima facie case of obviousness does not by itself weigh against a holding of obviousness. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).
Comment 25. Four comments stated that the definition of "prima facie case of unpatentability" § 1.56(b)(1)) should be included in the rule itself. One comment said that the definition should not be included in the rule.
Reply: The definition has been included in the rule for clarity.
Comment 26. One comment stated that the proposed § 1.56(b)(1) placed a burden on the practitioner to analyze references that is inappropriate and contradictory to a practitioner's responsibility to his client.
Reply: The rule itself does not place a burden on the practitioner to analyze references. Information can be submitted to the Office in accordance with §§ 1.97 and 1.98, and the examiner will consider the refereances.
Comment 27. One comment questioned whether an applicant would be charged with withholding material information if the "other information" (§ 1.56(b)(1)) necessary to cause an undisclosed reference to become material is unknown to the applicant. Another comment suggested that the language should be changed to read "other *known* information" to show that the information must be known to applicant to give rise to a duty of disclosure.
Reply: Paragraph (b) of § 1.56 defines information material to patentability. While information may be material under the definition, there is no duty on an individual to disclose the information if the information is unknown to the individual (§ 1.56(a)).
Comment 28. One comment suggested that defining materiality in § 1.56(b) in terms of prima facie unpatentability would permit a conspiracy of silence in which (1) the applicant knows of information but is incapable of making the legal analysis to determine whether the information is material and (2) the patent practitioner, who is equipped to determine whether information is material, does not know of the information and does not ask. Thus, it is argued there would be no violation of the duty of disclosure which requires knowledge of both information and its materiality.
Reply: The Office has set forth what information should be submitted so that the Office can make a proper determination on patentability. The term "conspiracy" has the connotation of unlawfulness which would not be consistent with the duty of candor and good faith required in dealings with the Office.
Comment 29. One comment suggested that proposed § 1.56(b)(1) should be revised to read "in combination with other information already of record in the application" to avoid the possibility that undisclosed material could be considered material in subsequent litigation when combined with information not known at the time of the prosecution to any person substantively involved in the preparation or prosecution of the application.
Reply: Paragraph (a) of § 1.56 makes it clear that the Office recognizes that the duty to disclose material information is limited to such information which is known by an individual substantively involved in the preparation or prosecution of the application. Thus, while information may be material under the definition of § 1.56(b)(1), there can be no duty to disclose the information if it is material only in combination with unknown information.
Comment 30. One comment stated that proposed § 1.56(b) should be modified so that paragraph (b)(1) refers to information that renders a claim unpatentable ("but for"), paragraph (b)(2) remains as proposed, and a paragraph (b)(3) is added to include the definition of materiality as "the closest information over which any pending claim patentably defines." This comment suggested that this modified definition would have the advantage of not requiring the applicant to submit references which applicant knows are immaterial and to then engage in "straw man" arguments based on such references.
Reply: The suggested modification to § 1.56 has not been adopted. The suggested language would seemingly require information to be filed in each application, whether the information is relevant or not, since the "closest information" would be required. Section 1.56 does not require information which is not relevant to be submitted, but only information which meets the definition of material as set out in the rule.
Comment 31. One comment stated that if proposed § 1.56(b)(1) is promulgated, there would be no need for proposed § 1.56(b)(2) with regard to information which would make a prima facie case of unpatentability and other information required by paragraph (b)(2) might be obscure. Another comment argued that paragraph (b)(2) was unnecessary, confusing

and ambiguous and suggested changes in the language to make the requirement clear and less ambiguous.
Reply: The suggestion as to the language change to § 1.56(b)(2) has been adopted. The final rule language avoids the perceived problem of requiring an applicant to submit information supporting a position taken by the examiner. It is not appropriate, however, to eliminate paragraph (b)(2) because it is an essential part of the definition of information material to patentability and will help to ensure that all material facts are brought to the attention of the examiner during the examination process.
Comment 32. One comment questioned the language of proposed § 1.56(b)(2) as to how an applicant could consider a prior art reference as supporting a position of unpatentability taken by the Office while at the same time disputing that interpretation.
Reply: The language of § 1.56(b)(2) has been modified to clarify that information is material to patentability if it refutes, or is inconsistent with, a position the applicant takes in (1) opposing an argument of unpatentability relied on by the Office, or (2) asserting an argument of patentability.
Comment 33. One comment stated that § 1.56(b)(2) was flawed in requiring a duty to conduct a file search to make sure that no information exists which even arguably contradicts a position taken or to be taken in response to the examiner, or which supports the examiner's position which may be improper.
Reply: Section 1.56(b)(2) does not require a search of files. Under § 1.56(a), the duty of disclosure is confined to that information which is known to an individual to be material as defined in paragraph (b).
Comment 34. One comment stated that proposed § 1.56(c) should be modified so that the duty of any individual designated as having a duty of disclosure would terminate when such individual ceases to be substantively involved in the preparation or prosecution of the application. The comment used, as an example, an inventor who would not be aware of art cited by the examiner which would cause information known to the inventor to fall within the definition of materiality for the first time.
Reply: The suggestion in the comment is not adopted. The duty to disclose information material to patentability rests on the individuals designated in § 1.56(c) until the application issues as a patent or becomes abandoned. Paragraph (a) of § 1.56 makes it clear, however, that each individual has a duty to disclose only information which is known to that individual to be material.
Comment 35. One comment stated that proposed § 1.56(c)(3) should not include the assignee, or anyone to whom there is an obligation to assign the application, in the class of those who have a duty to disclose material information since there might be a "witch hunt" during litigation to find one employee with knowledge of, or possession of, information that should have been disclosed.
Reply: No modification to § 1.56(c)(3) is needed since § 1.56 sets forth that only individuals who are associated with the filing and prosecution of a patent application have a duty of candor and good faith, including a duty to disclose to the Office all information known to be material to patentability.
Comment 36. One comment stated that proposed § 1.56(d) should be revised to expressly allow an inventor to satisfy the duty by disclosing information to the practitioner who prepares or prosecutes the application so that redundant information disclosure statements will not be required from both the inventor and the attorney or agent.
Reply: The suggestion in the comment is not adopted since the duty as described in § 1.56 will be met as long as the information in question was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98 before issuance of the patent. Statements from both an inventor and the practitioner are not required to be submitted.
Comment 37. One comment stated that proposed §§ 1.52(c) and 1.67(c) should be modified to either (1) expressly permit alterations to be made in an application subsequent to the signing of the oath or declaration if a supplemental oath or declaration is later submitted, or (2) more properly, prohibit such alterations since if alterations are desirable, they can be made and the application can be filed with an unsigned oath or declaration. Another comment stated that willfully filling out false oaths should never be condoned.
Reply: The Office does not condone willfully filling out false oaths. Further, § 10.23(c)(11) indicates that the Office considers it misconduct for a practitioner to knowingly file or cause to be filed an application containing a material alteration made after the signing of an accompanying oath or declaration without identifying the alteration. The Office will not consider striking an application in which an alteration was made, but a supplemental oath or declaration is required to be filed in an application containing alterations made after the signing of the oath or declaration.
Comment 38. One comment stated that the implementation of proposed §§ 1.63(b)(3) and 1.175(a)(7) allows for a two-month delay in the deadline for requiring declarations complying therewith.
Reply: The averments in oath or declaration forms presently in use that comply with the previous § 1.63 or § 1.175 will also comply with the requirements of the new rules. Therefore, the Office will continue to accept the old oath or declaration forms as complying with the new rules.
Comment 39. Five comments questioned the need for the proposed rules since statistics show that information disclosure statements are submitted early in prosecution and questioned what new service is being provided for the proposed fee in § 1.97.
Reply: The Office desires to continue to encourage information to be submitted promptly so that it can be considered by the examiner when the first Office action is prepared. Some people have expressed a desire to have the option of waiting to submit information until after the first Office action, without concern that they will be subject to a charge of inequitable conduct. Section 1.97(c), as amended, will provide this option to applicants in that information will be considered later than three months after the filing date of the application (§ 1.97(a) prior to amendment) without a showing of promptness (prior § 1.99). The fee will compensate the Office for the added expense caused by the late submission of the information and will serve as a disincentive to the intentional withholding of information even for a short period of time.
Comment 40. Two comments suggested that proposed § 1.97(a) be modified so that the mechanism of proposed § 1.98 would not be the only acceptable technique for submitting information.
Reply: The Office has set forth the minimum requirements for information to be considered in §§ 1.97 and 1.98. These rules will provide certainty for the public of exactly what the requirements are, when the Office will consider information and when the Office will not consider information. Thus, applicants are provided with means for complying with the duty of disclosure by following the rules. If information is submitted in a manner so that it is not considered by the Office, applicant will assume the risk that a court might find a violation of the duty of candor and good faith which includes the duty to disclose material information.
Comment 41. Four comments suggested that information which is recognized by applicant as being material after the period set in proposed § 1.97(b) as the result of prior art cited by the examiner should be permitted to be submitted to the Office without the fee set forth in 1.17(p), the certification or the petition fee required by § 1.97.
Reply: The suggestion in the comments is not adopted since it would require a certification, e.g., why the information was just recognized as being material, and would unduly complicate the rules and the procedures for considering information submitted by applicant. Applicants can avoid or, at least, minimize the problem by submitting information which is known to be relevant to the application even though it is not yet recognized as being required to be submitted because it is material to patentability. The fees charged are to compensate the Office for the additional work that will be necessary when information is submitted during an advanced stage of the examination process.
Comment 42. Two comments suggested that the period for submitting information set in proposed § 1.97(b) be changed to be two months from the issuance of the Official Filing Receipt to avoid information disclosure statements being misrouted in the Office.
Reply: The suggestion in the comment is not adopted. The date that the Filing Receipt is mailed is not maintained in the application file so there would be administrative difficulty in determining when a fee or certification is required to be filed under the new rule. An application can be filed with a self-

addressed return postcard so that applicant can obtain the serial number assigned to the application very soon after filing. Further, information may be filed under § 1.97(b) before the mailing of a first Office action on the merits even if this occurs later than three months after the application filing date.

Comment 43. One comment questions whether § 1.97(b) or § 1.97(d) applies in the event of issuance of a final rejection within three months of the filing of an application. The comment indicated that paragraph (b) should apply in this situation.

Reply: Paragraph (b) would apply in this situation since the paragraph specifies that information may be filed within three months of the filing date of the application or before the mailing date of a first Office action on the merits, whichever event occurs last. Thus, information would be considered pursuant to § 1.97(b) if it was filed within three months of the filing date of the application even if a final rejection was mailed prior to three months from the filing date.

Comment 44. One comment stated that proposed § 1.97(b)(1) should be clarified to indicate that "the filing of a national application" includes "a continuing application which replaces the original application."

Reply: The suggested modification has not been adopted since it is not necessary for clarity. The term "national application" includes continuing applications in this and the other patent rules. It is not desirable to add the suggested language to all occurrences of the term "application" in the rules or to raise the implication that continuing applications are not included in the term in other rules by adding the suggested language to this rule.

Comment 45. One comment stated that proposed § 1.97 should be changed to state that if a responsible party becomes aware of material information less than three months before issuance of an Office action, that information will be considered timely filed if it is submitted together with the response to the action. The comment also stated that the Office could go farther and implement a rule which specifies that such information will be considered timely submitted if it reaches the examiner before the response to the Office action is taken up for consideration. Three other comments stated that the Office should accept information disclosure statements with responses to Office actions, with one comment arguing that there is no benefit in submitting two papers where one would suffice.

Reply: The suggestions in the comments are not adopted. The rule as proposed and promulgated has the advantage of being relatively easy to comply with and administer. Information should be submitted promptly so that the examiner will have the option of reviewing the information and withdrawing or revising the Office action. Requiring information to be submitted promptly contributes to the efficiency of the examination process.

Comment 46. One comment stated that there should be no fee in § 1.97 associated with the filing of an information disclosure statement since this might impact negatively on the submission of material information; rather, it would be sufficient to permit material information submitted subsequent to a non-final action to support a final rejection in the next action, in the absence of the certification proposed in the rules. Another comment, however, stated that the proposed fee requirement would not be a disincentive to submission of prior art, but would force examiners to consider certain art which under current practice often is not made of record, but instead, requires the filing of a continuation application.

Reply: The fee required in the rule will serve both to cover additional expense caused the Office by the late submission of information and will also serve as a disincentive to failing to cooperate in submitting information early in the prosecution of an application rather than as a disincentive to submitting information at all.

Comment 47. One comment questioned whether information in an information disclosure statement submitted during the period set forth by proposed § 1.97(c) could be used by an examiner to make the next action final if the statement was submitted with a certification under § 1.97(e).

Reply: Information submitted with a certification during the period set forth in § 1.97(c) will not be used to make the next Office action final on unamended claims since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office.

Comment 48. One comment stated that it was unfair for the Office to require a fee for considering information pursuant to proposed § 1.97(c) and then also be able to use the information in making the Office action final.

Reply: The policy is not considered to be unfair. If information is submitted during the period set forth in § 1.97(c) without the certification, the fee will compensate the Office for extra work that may be caused by the failure to submit information promptly. If the cost for this extra work were not placed upon the applicant in this situation, the cost would have to be borne by all applicants through payment of higher fees. The possibility that the next Office action may be made final will further encourage prompt disclosure of information to the Office.

Comment 49. One comment suggested that information should be considered (§ 1.97(c)) after final rejection, since this is different from after allowance when the Office would have to go back and reconsider its work. Two comments stated that proposed § 1.97(c)(1) should not penalize applicants who receive a foreign search report after a final rejection is made in the application and that the certification under § 1.97(e) should be available until an advisory action after final rejection or a notice of allowability occurs in the application. Another comment stated that final action may not even be on the merits but merely administrative.

Reply: The suggestions in the comments are not adopted. Both a notice of allowance and a final rejection represent a final Office decision on patentability. Information considered after either of these actions may require the Office to alter its position. After either of these actions, information will be considered only if it is submitted promptly in accordance with § 1.97(d) or is submitted in a refiled application. It should be noted that information cited in a foreign search report, if cited to the Office within three months of the date on the search report, will be considered by the Office if filed before payment of the issue fee.

Comment 50. One comment stated that proposed § 1.97(d) would result in unequal treatment of U.S. inventors who file first in the Office as compared to foreign inventors who file first in a foreign country since the latter will have the results of the search made by the foreign examining country earlier in the pendency of the U.S. application. Six comments suggested that a U.S. inventor should have the ability to make the certification of § 1.97(e) and to have the Office consider the information, regardless of the stage of prosecution at which information from a foreign office is submitted.

Reply: It should be noted that the certification of § 1.97(e) can be made and information considered by the Office until the issue fee is paid on the application. After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. The application may be withdrawn from issue at this point, however, pursuant to § 1.313(b)(5) so that the information can be considered in a continuing application, or pursuant to § 1.313(b)(3) if applicant states that one or more claims are unpatentable over the information that is cited. It is further noted that it is applicants, not the Office, who make decisions on when and in which countries to file an application. U.S. inventors who may desire to seek patent protection in foreign countries have the ability to utilize the provisions of the Patent Cooperation Treaty and to delay the requirement to enter the national stage until after a search report on the invention is made.

Comment 51. One comment questioned whether a certification under § 1.97(e) could properly be made in situations where information known by the applicant but not considered material is cited by a foreign patent office more than three months later than the first knowledge by applicant.

Reply: The language of § 1.97(e) has been modified to permit a certification to be made in the situation described in the comment. If an item of information is submitted within three months of being cited in a communication from a foreign patent office in a counterpart foreign patent application, the certification can be properly made regardless of any individual's previous knowledge of the information.

Comment 52. One comment stated that the three-month time period for submitting information from foreign patent offices under proposed § 1.97(e) might be too short because not all foreign offices provide copies of references and that the Office should provide for a petition in unusual circumstances. Five comments stated that a three-month time limit for filing foreign search reports is not reasonable but rather that six months would be more reasonable.

Reply: The Office has chosen the three month time period as appropriate in view of all the factors involved in obtaining information and in the examination process. It should be noted that Office actions typically set a three-month shortened statutory period for response. A response to an Office action generally requires more time for preparation than is involved in the submitting of a foreign search report and copies of the documents cited.

Comment 53. Five comments suggested that § 1.97(e) should permit a certification to be made if an individual knew of information for more than three months before it was filed but did not recognize its materiality or relevance to the application.

Reply: The suggestion in the comments is not adopted. The Office desires to encourage prompt evaluation of information as to materiality by applicants and the Office so as to contribute to the efficiency and effectiveness of the examination process. It should be noted that an applicant is not required to delay the submission of information while evaluating materiality, but can submit the information pursuant to §§ 1.97 and 1.98.

Comment 54. One comment stated that proposed § 1.97(e) should be clarified to specify that the certificates can be made regardless of the source of the information being submitted, so long as it is disclosed within three months of receipt. One comment stated that the three-month period of proposed § 1.97(e) should be measured from the receipt date of a communication from a foreign patent office.

Reply: A certification under § 1.97(e) can be made if each item of information was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to filing the statement. A certification can also be made if no item of information was cited in a communication from a foreign patent office in a counterpart foreign application or was known to any individual designated in § 1.56(c) more than three months prior to filing the information disclosure statement. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. Although it is recognized that an individual actually becomes aware of the information in the communication from a foreign patent office sometime after it was mailed, the mailing date of such a communication, if it occurs prior to a first awareness of the same information, would determine the date for filing of an information disclosure statement without a fee. The Office is willing to absorb any additional cost in considering such information relevant to patentability after the time set in proposed paragraph (b) only when it is clear that an applicant is diligent in providing the information to the Office.

Comment 55. One comment stated that the cost of making a certification under § 1.97(e) would be more than the $200.00 fee proposed where no certification is made due to difficulties in obtaining information from foreign clients. The comment suggested that the rule provide for (1) the opportunity to provide documentation (as opposed to certification) illustrating when the information was received, and (2) the opportunity to submit information with increasing fees depending on when in the periods of § 1.97(c) and (d) the information is submitted.

Reply: The suggestions in the comment are not adopted since they would add undue complexity to the rules and procedures. Further, the suggested provision of documentation, which presumably would be reviewed by someone in the Office, would probably add considerably to the overall expense of filing an information disclosure statement. No other comments indicated a desire for increasing fees depending on when the information is submitted.

Comment 56. Two comments stated that proposed § 1.97(e) is ambiguous in using the language "to the knowledge of the person signing the certification" in that it could refer to "information and belief," "actual knowledge of the facts" or "no knowledge to the contrary." One comment stated that certifications should be able to be made on information and belief by a U.S. attorney or agent submitting a material reference received from a foreign patent attorney or agent, rather than requiring a certification from the foreign individual. Another comment suggested that the period should be calculated from when the applicant either knew or could have known of the reference because the U.S. attorney should not be penalized for delays from their foreign patent associates.

Reply: The certification under § 1.97(e) should be made by a person who has knowledge of the facts being certified. The certification can be made by a practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry.

Comment 57. One comment stated that the language of proposed § 1.97(e) would preclude the use of the certification in an application by corporations whose practitioners have over the years reviewed thousands of patents and technical publications, even though they are unaware of the relevance of any one thereof to the application.

Reply: The language of § 1.97(e) is not intended to preclude use of the certification by representatives of corporations. The certification can be based on present, good faith knowledge about when information became known without a search of files being made. The Office, however, does desire to have information considered promptly by applicants as to materiality and to have information submitted to the Office early in the prosecution of an application.

Comment 58. One comment suggested that proposed § 1.97(e) should permit certification only as to information submitted within four months of receipt from a foreign patent office, with all other late-submitted information requiring a fee so as to not open a legal quagmire implicit in the proposed certification requirement.

Reply: The suggestion in the comment is not adopted. The certification set forth in § 1.97(e) is preferable since it provides the avoidance of the payment of a fee by a person who is submitting information promptly to the Office. An applicant has the option under the circumstances described in § 1.97(c), however, to not make the certification and to pay the fee instead if so desired.

Comment 59. One comment suggested that proposed § 1.97(f) be modified to specify that *not less than one month will* be given if a bona fide attempt is made to comply with § 1.98 but part of the required content is omitted. Another comment suggested that § 1.97(f) should state that the Office will give (rather than may give) additional time for compliance with § 1.98.

Reply: The suggestions in the comments are not adopted. The language of § 1.97(f) parallels present § 1.135(c) since the practice and considerations are similar for both rules. The Office intends to provide one month to comply with § 1.98 where a bona fide attempt has been made to do so.

Comment 60. One comment stated that proposed § 1.97(f) should specify that the Office shall inform the applicant if a reference will not be considered due to noncompliance with § 1.98 so as to avoid any argument in litigation that a certain reference was not considered due to clerical noncompliance.

Reply: The Office plans to notify applicants in accordance with §§ 1.97(f) and (i) if submitted information will not be considered. The examiner will also indicate in the application record what information has been considered. Further details will appear in the Manual of Patent Examining Procedure in due course.

Comment 61. One comment suggested that proposed § 1.97(g) should be modified to state that the filing of an information disclosure statement shall not be construed as a representation that no other material information exists such as is set forth in current § 1.97(b).

Reply: The suggestion in the comment has not been adopted since referring to "no other material information" would imply that the information being submitted was admitted to be material. There is no requirement that information being submitted be material to the application.

Comment 62. One comment suggested that proposed § 1.97(h) be modified to state that information not considered by the Office will be deemed in all respects to have not been submitted by the applicant since this would make a noncompliant submission clearly not a fulfillment of the duty of candor.

Reply: The suggestion in the comment is not adopted. The Office has no need or desire to rule on lack of fulfillment of the duty of candor in such a situation. The rules are drafted such that § 1.56 sets forth what information is material to

patentability and §§ 1.97 and 1.98 set forth procedures to assure consideration of information by the Office.

Comment 63. One comment stated the Office has a duty to consider information even if this involves withdrawing an application from issue or publishing a cancellation notice and that proposed § 1.97(h) should be changed to so state. Another comment stated that it would be an abdication of the duty that the Office owes to the public for information in the file to be ignored since issuance of an invalid patent can be used to discourage others in the field. The comment suggested that the Office should leave in doubt whether the information will be considered or not.

Reply: It is necessary for the Office to balance its need and desire to consider all information relevant to an application with its need for an efficient operation and its capability to consider information at various stages in the prosecution of an application. The Office is setting forth when information will and will not be considered to provide certainty for the public.

Comment 64. One comment requested information on how a United States patent application or other information (§ 1.98(a)(1)(iii)) should be listed on a PTO 1449 form.

Reply: The PTO 1449 has been drafted so as to provide spaces for listing documents which are available to the public and which will be printed on the patent at issuance. Other information should be listed separately from the PTO 1449 form.

Comment 65. One comment stated that § 1.98(a)(2)(i) should not require the submission by applicants of United States patents listed in an information disclosure statement since the Office is better equipped to provide examiners with copies of those documents than inventors and their attorneys. Alternatively, the comment suggested that the Office should establish a procedure whereby an order for the Office to provide the copies of the patents at the usual fee can accompany the information disclosure statement.

Reply: At the present time, when the Automated Patent System has not been fully implemented, the overall cost of the Office obtaining copies of patents and associating them with application files would be greater than for applicants to provide copies with information disclosure statements. Presumably, the applicant would be using a copy of the patent in preparing the statement and could easily make a copy for submission to the Office.

Comment 66. One comment suggested that § 1.98(a)(2)(iii), as proposed, be clarified by substituting "except that no copy of a U.S. patent application need be included" for the proposed phrase "except a U.S. patent application."

Reply: The suggested clarification to the language of the rule has been adopted.

Comment 67. A number of comments objected to the requirement in § 1.98(a)(3) for a concise explanation of the relevance of all items of information being submitted.

Reply: In response to the comments, § 1.98(a)(3) has been modified to require a concise explanation only of patents, publications or other information listed in an information disclosure statement that are not in the English language. Applicants may, if they wish, provide concise explanations of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability.

Comment 68. Five comments stated that the proposed rules should be modified to state that if information is being submitted from a foreign search report, the requirement for a concise explanation in proposed § 1.98(a)(3) may be satisfied by submitting an English-language version of the search report.

Reply: The language of § 1.98(a)(3) has been modified so that no concise explanation is required for information submitted in the English language. The concise explanation requirement for non-English language information may be met by the submission of an English language version of the search report indicating the degree of relevance found by the foreign office. It is not necessary that this detail be included in the rule.

Comment 69. Five comments questioned whether the requirement in proposed § 1.98(a)(3) would be satisfied by a statement that the references were cited in the prosecution of a parent application.

Reply: The requirement in § 1.98(a)(3) for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent application. The concise explanation must explain the relevance as presently understood by the person designated in § 1.56(c) most knowledgeable about the content of the information.

Comment 70. One comment suggested that proposed § 1.98(a)(3) should be modified to require a concise explanation of "what is believed to be" the relevance of information listed to avoid the accusation of violation of duty of disclosure merely because more relevant portions of the information are later found. Another comment suggested that the concise explanation should state what is "reasonably understood by the person submitting the statement." Another comment stated that the applicant should be required to explain (1) only what is understood or believed about the item of information at the time the disclosure is made, or (2) why the item is listed.

Reply: The suggestions in the comments have been substantially adopted in modifying the language of § 1.98(a)(3).

Comment 71. One comment stated that proposed § 1.98(b) should not require the date (unless material) and place of publication of journal articles since such information is not given on search reports from foreign patent offices or on journals published by the American Chemical Society, which just give the year. Another comment indicated that sometimes it is not clear where the place of publication is.

Reply: The suggestions in the comments are not adopted. The date of publication is necessary for the Office to be able to determine if the information may be used in a rejection of the claims in an application. The place of publication refers to the name of the journal, magazine or other publication in which the article was published, which should be available in the vast majority of cases.

Comment 72. One comment suggested that § 1.98(c) should not require a translation of a non-English language document to be filed if a translation is within the possession, custody or control of an individual designated in § 1.56(c) because such person may not recall that there is a translation somewhere in the records of the individual, perhaps having been made for another application years earlier.

Reply: The requirement of the rule for a translation to be submitted under limited conditions is not a change in practice. See prior §§ 1.56(j) and 1.97(b). Since the requirement has caused little, if any, problem in the past, the suggestion of the comment is not adopted.

Comment 73. One comment suggested that § 1.98(c) should be revised to make it clear that a reference that is essentially cumulative to another reference need not be listed in an information disclosure statement.

Reply: The concept that cumulative information is not material is set forth in § 1.56(b). Section 1.98 does not deal with what information must be submitted, but provides an exception for cumulative information to the requirement for a copy to be submitted of each item of information listed in an information disclosure statement.

Comment 74. One comment stated that a sentence in the preamble discussion of proposed § 1.98(c) was burdensome because it would require submission of incomplete or inexact translations which may have been made of an item of information. The sentence in question reads:

> "But if the individual has the ability to translate the non-English language into English and has done so for the purposes of reviewing the information relative to the claimed invention, the translation would be considered 'readily available.'"

Another comment stated that proposed § 1.98(c) should be modified to require a translation if the non-English language document is to be considered by the examiner since the attorney would want to prepare an accurate translation of particularly relevant references. One comment suggested that § 1.98(c), or the preamble discussion, should make it clear that an English-language translation of a foreign language material reference need not be submitted where an individual merely reads in the reference in its original language and translates it mentally but does not prepare a written translation. Five other comments requested clarification on this point.

Reply: The Office does not intend to require translations unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. Applicants should note, however, that most examiners do not have the ability to understand information which is not in English and that the Office will not routinely translate information submitted in a non-English language. The examiner will consider the information insofar as it is understood on its face, e.g., drawings, chemical formulas, English-language abstracts, but will not have the information translated unless it appears to be necessary to do so. Applicants are required to aid the examiner by complying with the requirements for a concise explanation in § 1.98(a)(3) for information submitted in a non-English language.

Comment 75. One comment stated that § 1.98(d) should be clarified to state that a copy of an item of information listed in an information disclosure statement need not be submitted if the reference was cited by the Office or previously submitted to the Office in connection with a prior application.

Reply: The suggestion in the comment is adopted. The language of § 1.98(d) has been modified to state that a copy of an item of information is not required if it was previously cited by the Office or previously submitted to the Office in a prior application being relied on for an earlier filing date under 35 U.S.C. 120.

*Comment 76.*One comment suggested that proposed § 1.98(d) should be revise d to not require the submission of a copy of the information listed in an information disclosure statement if a copy of the information has previously been submitted to the Office in a prior application, whether or not the earlier application is being relied upon for an earlier filing date under 35 U.S.C. 120.

Reply: The suggestion in the comment is not adopted. The exception to the requirement for a copy of each item of information to be submitted has been made with regard to prior applications which will normally be available to, and considered by, the examiner. It would not be efficient for the examiner to be required to seek out unrelated application files to obtain a copy of an item of information when a copy could easily be submitted by applicant.

Comment 77. One comment questioned what would be considered "timely" under § 1.291 so that information would be considered by the examiner without payment of a fee, in contrast to proposed § 1.97 which may require a fee.

Reply: Section 1.291 has not been amended to redefine timeliness. The comment seems to imply that the fee requirements of § 1.97 can be avoided through the use of a protest submitting information, but such a course of action might raise questions regarding compliance with the duty of candor and good faith required in dealings with the Office.

Comment 78. One comment stated that the Office should not drop the acknowledgment of a protest having been filed under § 1.291 in a reissue application because the acknowledgment served as an indication that the protest had been received in the examining group from the mail room.

Reply: The suggestion in the comment is not adopted. Any perceived benefit from retaining the acknowledgment is outweighed by the administrative burden it causes. There is no good reason to treat the filing of protests in reissue applications differently from the filing of protests in original applications or from the filing of other papers in the Office.

Comment 79. One comment questioned whether an application could be withdrawn from issue pursuant to proposed § 1.313(b)(5) without admitting unpatentability.

Reply: There is no requirement that unpatentability must be admitted before an application can be withdrawn from issue pursuant to § 1.313(b)(5). The rule provides for applications to be withdrawn from issue and abandoned for consideration of information in a continuing application. This differs from a petition under § 1.313(b)(3) based on unpatentability of one or more claims.

Comment 80. One comment questioned whether, if an application is withdrawn from issue pursuant to proposed § 1.313(b)(5), an information disclosure statement can be submitted in the continuing application under § 1.97(b) without a certification.

Reply: A continuing application is treated like any other application with regard to the times set forth in § 1.97(b). Thus, for example, an information disclosure statement could be filed without a fee or certification in a continuing application within three months of the filing date of the continuing application.

Comment 81. One comment questioned whether an application withdrawn from issue pursuant to § 1.313(b)(5) could have new art and amendments considered in that application rather than in a continuing application. The comment also questioned the handling of applications withdrawn from issue pursuant to § 1.313(b)(3).

Reply: The language of § 1.313(b)(5) makes it clear that an application withdrawn from issue thereunder is to be abandoned without further prosecution. This differs from an application withdrawn from issue pursuant to § 1.313(b)(3) because applicant had admitted the unpatentability of one or more claims.

Comment 82. One comment questioned whether the continuing application mentioned in proposed § 1.313(b)(5) could be a file wrapper continuing application under § 1.62 and how applicants can accomplish the withdrawal from issue under proposed § 1.313(b) late in the prosecution of an application.

Reply: The continuing application mentioned in § 1.313(b)(5) can be a file wrapper continuing application under § 1.62. Even though § 1.62 requires a file wrapper continuing application to be filed before the payment of the issue fee, the Office will consider the filing of a petition to withdraw from issue under § 1.313(b)(5) as sufficient grounds to waive that requirement of § 1.62. Late in the prosecution of an application, the Office has difficulty in matching papers with the application file. Papers requesting that an application be withdrawn from issue after the issue fee is paid should be directed, or preferably hand-carried, to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

Comment 83. Seven comments suggested that § 1.555(a) should not be amended to require the submission of "all information material to patentability" since a reexamination proceeding is limited to consideration of patents and printed publications.

Reply: The suggestion in the comments has been adopted. A paragraph (b), which defines what information is material to patentability in a reexamination proceeding, has been added to the rule.

Comment 84. One comment suggested that proposed § 1.555(a) should be modified to make clear that there is no duty of disclosure on employees of a corporate patent owner if the employees are not substantively involved in the preparation of the reexamination request or the reexamination proceeding.

Reply: The suggestion in the comment to modify the language in § 1.555(a) has not been adopted. The rule refers to individuals who are substantively involved on behalf of the patent owner in a reexamination proceeding.

Comment 85. Two comments stated that the Office should consider fraud or other inequitable conduct issues in interference proceedings.

Reply: The suggestion in the comments has been adopted. The Office will consider inequitable conduct issues in interference proceedings as announced on November 19, 1991, in the *Official Gazette* of the Patent and Trademark Office at 1132 Off. Gaz. Pat. Off. 33.

Comment 86. One comment requested more examples with regard to proposed § 10.23(c)(10) of what alteration or combination of alterations in a declaration would be considered material.

Reply: It is not the function of the rules or the rulemaking process to provide a detailed listing of what alterations may be considered to be improper. This consideration will necessarily be made in view of the totality of the circumstances involved. Practitioners would be well advised to avoid filing applications which contain alterations which have not been initialed and dated.

Comment 87. Two comments stated that § 10.23(c)(10) should be amended to prohibit knowingly attempting to mislead the Office in the drafting or prosecution of a patent application. One comment stated that attempted fraud or inequitable conduct would not be prohibited by proposed 10.23(c)(10) because such conduct would not be a violation of proposed §§ 1.56 or 1.555.

Reply: No amendment is necessary to the language of § 10.23(c)(10). It should be noted that the duty of candor and good faith in dealing with the Office is included in §§ 1.56 and 1.555. This duty includes a prohibition against knowingly attempting to mislead the Office.

Comment 88. Five comments stated that it would be unfair to impose the new disclosure requirements and fees on applications that are pending before the Office on the effective date of the new rule. Another comment stated that the rules should be immediately effective for all pending applications with some grace period for making the initial disclosure without penalty and without fee.

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Reply: The Office will apply the new rules to all applications pending on, or filed on or after, the effective date of the rules. While this implementation may cause some burden on some applicants, other applicants will obtain benefits not otherwise available. This decision will also ease the administrative burden on the Office in implementing the new rules.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules as adopted do not require individuals to submit information that they are not already aware of and are not already under an obligation to provide to the Office. The rules further promote the efficiency of the examination process by encouraging a timely submission of an information disclosure statement and by substantially eliminating rejections based on inequitable conduct, thereby reducing the costs to all patent applicants.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, state or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity or innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

This rule contains a collection of information requirement subject to the Paperwork Reduction Act, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Each information disclosure statement is estimated to take approximately 30 minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the collection of information. The time estimate has been reduced from that stated in the proposal since the requirement for a concise explanation of the relevance of each item of information cited in an information disclosure statement has been limited to information submitted in a language other than English. Send comments regarding this burden estimate Patent and Trademark Office, Office of Management and Organization, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (Attention Paper Reduction Project 0651-0011)

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. In § 1.17, paragraph(i)(1) is revised and paragraph (p) is added to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph.....130.00

§ 1.12—for access to an assignment record.
§ 1.14—for access to an application.
§ 1.53—to accord a filing date.
§ 1.55—for entry of late priority papers.
§ 1.60—to accord a filing date.
§ 1.62—to accord a filing date.
§ 1.97(d)—to consider an information disclosure statement.
§ 1.103—to suspend action in application.
§ 1.177—for divisional reissues to issue separately.
§ 1.312—for amendment after payment of issue fee.
§ 1.313—to withdraw an application from issue.
§ 1.314—to defer issuance of a patent.
§ 1.334—for patent to issue to assignee, assignment recorded late.
§ 1.666(b)—for access to interference settlement agreement.

* * * * *

(p) For submission of an information disclosure statement under § 1.97(c)..... $200.00

3. Section 1.28, paragraph (d)(2) is revised to read as follows:

§ 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

* * * * *

(d)(1) * * *

(2) Improperly and with intent to deceive
(i) establishing status as a small entity, or
(ii) paying fees as a small entity

shall be considered as a fraud practiced or attempted on the Office.

4. Section 1.51, paragraph (b) is revised to read as follows:

§ 1.51 General requisites of an application.

* * * * *

(b) Applicants are encouraged to file an information disclosure statement. See §§ 1.97 and 1.98.

5. Section 1.52, paragraph (c) is revised to read as follows:

§ 1.52 Language, paper, writing, margins.

* * * * *

(c) Any interlineation, erasure, cancellation or other alteration of the application papers filed should be made before the signing of any accompanying oath or declaration pursuant to § 1.63 referring to those application papers and should be dated and initialed or signed by the applicant on the same sheet of paper. Application papers containing alterations made after the signing of an oath or declaration referring to those application papers must be supported by a supplemental oath or declaration under § 1.67(c). After the signing of the oath or declaration referring to the application papers, amendments may be made in the manner provided by §§ 1.121 and 1.123 through 1.125.

* * * * *

6. Section 1.56 is revised to read as follows:

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine: (1) prior art cited in search reports of a foreign patent office in a counterpart application, and (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) it refutes, or is inconsistent with, a position the applicant takes in:

(i) opposing an argument of unpatentability relied on by the Office, or

(ii) asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) each inventor named in the application;

(2) each attorney or agent who prepares or prosecutes the application; and

(3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

7. Section 1.63, paragraphs (b)(3) and (d) are revised to read as follows:

§ 1.63 Oath or declaration.

* * * * *

(b) * * *

(3) Acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in § 1.56.

(d) In any continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, the oath or declaration must also state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in § 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

8. Section 1.67 is amended by adding a new paragraph (c) to read as follows:

§ 1.67 Supplemental oath or declaration.

* * * * *

(c) A supplemental oath or declaration meeting the requirements of § 1.63 must also be filed if the application was altered after the oath or declaration was signed or if the oath or declaration was signed:

(1) in blank;

(2) without review thereof by the person making the oath or declaration; or

(3) without review of the specification, including the claims, as required by § 1.63(b)(1).

9. Section 1.97 is revised to read as follows:

§ 1.97 Filing of information disclosure statement.

(a) In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with § 1.98 should be filed in accordance with this section.

(b) An information disclosure statement shall be considered by the Office if filed:

(1) within three months of the filing date of a national application;

(2) within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or

(3) before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed after the period specified in paragraph (b) of this section, but before the mailing date of either

(1) a final action under § 1.113 or

(2) a notice of allowance under § 1.311,

whichever occurs first, provided the statement is accompanied by either a certification as specified in paragraph (e) of this section or the fee set forth in § 1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either

(1) a final action under § 1.113 or

(2) a notice of allowance under § 1.311,

whichever occurs first, *but before* payment of the issue fee, provided the statement is accompanied by:

(i) a certification as specified in paragraph (e) of this section,

(ii) a petition requesting consideration of the information disclosure statement, and

(iii) the petition fee set forth in § 1.17(i)(1).

(e) A certification under this section must state either

(1) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or

(2) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in § 1.56(c) more than three months prior to the filing of the statement.

(f) No extensions of time for filing an information disclosure statement are permitted under § 1.136. If a bona fide attempt is made to comply with § 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

(g) An information disclosure statement filed in accordance with this section shall not be construed as a representation that a search has been made.

(h) The filing of an information disclosure statement shall not be construed to be an admission that the information cited

in the statement is, or is considered to be, material to patentability as defined in § 1.56(b).

(i) Information disclosure statements, filed before the grant of a patent, which do not comply with this section and § 1.98 will be placed in the file, but will not be considered by the Office.

10. Section 1.98 is revised to read as follows:

§ 1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under § 1.97 shall include:

(1) A list of all patents, publications, or other information submitted for consideration by the Office;

(2) A legible copy of:

(i) Each U.S. and foreign patent;

(ii) Each publication or that portion which caused it to be listed; and

(iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included; and

(3) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.

(b) Each U.S. patent listed in an information disclosure statement shall be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication shall be identified by author (if any), title, relevant pages of the publication, date and place of publication.

(c) When the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of one of the patents or publications may be submitted without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. If a written English-language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in § 1.56(c), a copy of the translation shall accompany the statement.

(d) A copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120.

11. Section 1.99 is removed and reserved.

12. Section 1.175, paragraph (a)(7), is revised to read as follows:

§ 1.175 Reissue oath or declaration.

(a) * * *

(7) Acknowledging the duty to disclose to the Office all information known to applicants to be material to patentability as defined in § 1.56.

* * * * *

13. Section 1.193(c) is removed and reserved.

§ 1.193 Examiner's Answer.

14. Section 1.291, paragraphs (a) and (c), are revised to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:

(1) the protest is timely submitted; and

(2) the protest is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible.

Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.

* * * * *

(c) A member of the public filing a protest in an application under paragraph (a) of this section will not receive any communications from the Office relating to the protest, other than the return of a self-addressed postcard which the member of the public may include with the protest in order to receive an acknowledgment by the Office that the protest has been received. The Office may communicate with the applicant regarding any protest and may require the applicant to respond to specific questions raised by the protest. In the absence of a request by the Office, an applicant has no duty to, and need not, respond to a protest. The limited involvement of the member of the public filing a protest pursuant to paragraph (a) of this section ends with the filing of the protest, and no further submission on behalf of the protestor will be considered unless such submission raises new issues which could not have been earlier presented.

15. Section 1.313, paragraph (b), is revised to read as follows:

§ 1.313 Withdrawal from issue.

* * * * *

(b) When the issue fee has been paid, the application will not be withdrawn from issue for any reason except:

(1) a mistake on the part of the Office;

(2) a violation of § 1.56 or illegality in the application;

(3) unpatentability of one or more claims;

(4) for interference; or

(5) for abandonment to permit consideration of an information disclosure statement under § 1.97 in a continuing application.

16. Section 1.555 is revised to read as follows:

§ 1.555 Information material to patentability in reexamination proceedings.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective reexamination occurs when, at the time a reexamination proceeding is being conducted, the Office is aware of and evaluates the teachings of all information material to patentability in a reexamination proceeding. Each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding. The individuals who have a duty to disclose to the Office all information known to them to be material to patentability in a reexamination proceeding are the patent owner, each attorney or agent who represents the patent owner, and every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. The duty to disclose the information exists with respect to each claim pending in the reexamination proceeding until the claim is cancelled. Information material to the patentability of a cancelled claim need no be submitted if the information is not material to patentability of any claim remaining under consideration in the reexamination proceeding. The duty to disclose all information known to be material to patentability in a reexamination proceeding is deemed to be satisfied if all information known to be material to patentability of any claim in the patent after issuance of the reexamination certificate was cited by the Office or submitted to the Office in an information disclosure statement. However, the duties of candor, good faith, and disclosure have not been complied with if any fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct by, or on behalf of, the patent owner in the reexamination proceeding. Any information disclosure statement must be filed with the items listed in § 1.98 as applied to individuals associated with the patent owner in a reexamination proceeding, and should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible.

(b) Under this section, information is material to patentability in a reexamination proceeding when it is not cumulative to information of record or being made of record in the reexamination proceeding, and

(1) it is a patent or printed publication that establishes, by itself or in combination with other patents or printed publications, a prima facie case of unpatentability of a claim; or

(2) it refutes, or is inconsistent with, a position the patent owner takes in:

(i) opposing an argument of unpatentability relied on by the Office, or

(ii) asserting an argument of patentability.

A prima facie case of unpatentability of a claim pending in a reexamination proceeding is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) The responsibility for compliance with this section rests upon the individuals designated in paragraph (a) of this section and no evaluation will be made by the Office in the reexamination proceeding as to compliance with this section. If questions of compliance with this section are discovered during a reexamination proceeding, they will be noted as unresolved questions in accordance with § 1.552(c).

Part 10 - Representation of Others Before the Patent and Trademark Office

17. The authority citation for Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

18. Section 10.23, paragraphs (c)(10) and (c)(11), are revised to read as follows:

§ 10.23 Misconduct.

* * * * *

(c) * * *

(10) Knowingly violating or causing to be violated the requirements of § 1.56 or § 1.555 of this subchapter.

(11) Knowingly filing or causing to be filed an application containing any material alteration made in the application papers after the signing of the accompanying oath or declaration without identifying the alteration at the time of filing the application papers.

Jan 9, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1135 OG 13]

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(76) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1

[Docket No. 910764-1306]
RIN 0651-AA27

Duty of Disclosure

Agency: Patent and Trademark Office, Commerce
Action: Correcting amendments.

Summary: This document contains corrections to the final regulations which were published in the Federal Register on Friday, January 17, 1992 (57 FR 2021). The regulations related to changes regarding the duty of disclosure contained in parts 1 and 10.

Effective Date: March 16, 1992.

For Further Information Contact: Charles E. Van Horn by telephone at (703) 305-9054, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

Supplementary Information:

Background

The final regulations that are the subject of these corrections, make changes to the rules of practice relating to the duty of disclosure and the procedures for submitting information disclosure statements to the Office.

Need for Correction

As published, the final regulations contain an error, which may be misleading and is in need of clarification.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

PART 1 - RULES OF PRACTICE IN PATENT CASES

Accordingly, 37 CFR Part 1 is corrected by making the following correcting amendment:

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

§ 1.97(c)(2) [Corrected]

2. In § 1.97(c)(2), the fifth line down, is revised to read "certification as specified in paragraph (e) of this section . . ." instead of "(3) of this section."

June 17, 1994 CHARLES E. VAN HORN
Deputy Assistant Commissioner for Patent Policy and Projects

[1164 OG 54]

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(77) **Implementation of Rules on Information Disclosure Statements**

New rules on the duty of disclosure and information disclosure statements, effective March 16, 1992, were published in the *Federal Register* at 57 FR 2021 (Jan. 17, 1992) and in the *Official Gazette* at 1135 Off. Gaz. Pat. Office 13 (Feb. 4, 1992).

The procedures for handling information disclosure statements (37 CFR 1.97 and 1.98) will be set forth in Section 609 of the Manual of Patent Examining Procedure (MPEP). A copy of the instructions being given to examiners for handling information disclosure statements under the new rules is being published for the benefit of the public. Also being published is a sample declaration form which incorporates language conforming to the amendment to 37 CFR 1.63 contained in the new rules. Declaration forms acceptable under the rules in effect prior to the change effective March 16, 1992, will continue to be acceptable under the new rules.

The Office is considering changing its policy regarding the printing on patents of citations of information considered in patent applications. The proposed change will not affect consideration by the examiner of information submitted to the Office in compliance with 37 CFR 1.97(b)-(d) and 1.98. The proposed change affects only the information printed on the patent. Presently, as set forth in the last paragraph of the instructions which follow, information properly submitted by applicant and considered by the examiner will be printed on the patent along with the references cited by the examiner in Office actions. It

has been suggested that it would be more helpful to the Office and to the public in using a patent for future search purposes if only the references cited and/or relied upon by the examiner in Office actions were listed on the printed patent. Alternatively, it has been suggested that the references listed on a patent be differentiated as to whether they were cited and/or relied on by the examiner or cited by applicant but not relied on by the examiner. The Office has a preference for the option that lists only the information cited and/or relied on by the examiner because it reduces printing costs (some citations by applicants now add several additional pages to the patent grant) and minimizes processing problems associated with correcting incomplete or inaccurate citations before the patent is printed. Public comment on these proposals is welcomed and should be directed to J. Michael Thesz (703-305-9384) or by mail directed to Mr. Thesz in the Office of the Assistant Commissioner for Patents. Comments should be received before May 29, 1992.

April 20, 1992

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1138 OG 37]

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(78) Processing of Information Disclosure Statements Under the New Rules Effective March 16, 1992

Applicants and other individuals substantively involved with the preparation and/or prosecution of a patent application have a duty to submit to the Office information which is material to patentability as defined in 37 CFR 1.56. These individuals also may want the Office to consider information for a variety of other reasons, e.g., without first determining whether the information meets any particular standard of materiality, or because another patent office considered the information to be relevant in a counterpart or related patent application filed in another country, or to make sure that the examiner has an opportunity to consider the same information that was considered by the individuals that were substantively involved with the preparation or prosecution of a patent application.

An information disclosure statement filed in accordance with the provisions of 37 CFR 1.97 and 1.98 provides the procedure available to an applicant to submit information to the Office so that information will be considered by the examiner assigned to the application. The requirements for the content of a statement have been simplified in the new rules effective March 16, 1992, to encourage individuals associated in a substantive way with the filing and prosecution of a patent application to submit information to the Office so the examiner can determine its relevance to the claimed invention. The procedure for submitting an information disclosure statement under the new rules are designed to encourage individuals to submit information to the Office promptly.

In order to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with 37 CFR 1.98 as to content must be filed in accordance with the procedural requirements of 37 CFR 1.97. The requirements as to content are discussed in A below. The requirements based on the time of filing the statement are discussed in B below. Examiner handling of information disclosure statement is discussed in C below.

The Office has set forth the minimum requirements for information to be considered in 37 CFR 1.97 and 1.98. Once the minimum requirements are met, the examiner has an obligation to consider the information. These rules provide certainty for the public by defining what the requirements are, when the Office will consider information and when the Office will not consider information.

The filing of an information disclosure statement shall not be construed as a representation that a search has been made. 37 CFR 1.97(g). There is no requirement that an application for a patent make a patentability search. Further, the filing of an information disclosure statement shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in 37 CFR 1.56(b). 37 CFR 1.97(h). See MPEP 706.02(b) regarding admissions by applicant.

Multiple information disclosure statements may be filed in a single application, and they will be considered, provided each is in compliance with the appropriate requirements. Use of form PTO-1449, "Information Disclosure Citation," is encouraged as a means providing the required list of information. See C(2) below.

Information which is cited or submitted to the Office in the parent application of a file wrapper continuing application under 37 CFR 1.62 will be part of the file before the examiner and need not be resubmitted in the continuing application. Likewise, the examiner will consider information cited or submitted to the Office in a parent application when examining a continuing application and thus this information need not be resubmitted unless applicant desires the information to be printed on the patent.

A. Content

An information disclosure statement must comply with the provisions of 37 CFR 1.98 as to content in order to be considered by the Office. Each information disclosure statement must comply with the applicable provisions of A(1), A(2) and A(3) below.

A(1) Each information disclosure statement must include a list of all patents, publications, or other information submitted for consideration by the Office.

Paragraph (b) of 37 CFR 1.98 requires that each U.S. patent listed in an information disclosure statement be identified by patentee, patent number and issue date. Each foreign patent or published foreign patent application must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication must be identified by author (if any), title, relevant pages of the publication, date (at least month and year) and place of publication. The place of publication refers to the name of the journal, magazine or other publication in which the information being submitted was published.

The list may not be incorporated into the specification but must be submitted in a separate paper. A separate list is required so that it is easy to confirm that applicant intends to submit an information disclosure statement, and because it provides a readily available checklist for the examiner to indicate which identified documents have been considered. A copy of a separate list will also provide a simple means of communication to applicant to indicate the listed documents that have been considered and those listed documents that have not been considered. Use of form PTO-1449, "Information Disclosure Citation," is encouraged. See C(2) below.

A(2) In addition to the list, each information disclosure statement must also include a legible copy of:

(i) Each U.S. and foreign patent;
(ii) Each publication or that portion which caused it to be listed; and
(iii) All other information or that portion which caused it to be listed, except that no copy of a U.S. patent application need be included.

There are exceptions to this general rule that a copy must be provided. First, paragraph (d) of 37 CFR 1.98 states that a copy of any patent, publication or other information listed in an information disclosure statement is not required to be provided if it was previously cited by or submitted to the Office in a prior application, provided that the prior application is properly identified in the statement and relied upon for an earlier filing date under 35 U.S.C. 120. The examiner will consider information cited or submitted to the Office in a prior application relied on under 35 U.S.C. 120. This exception to the requirement for copies of information does not apply to information which was cited in an international application under the Patent Cooperation Treaty.

Second, paragraph (c) of 37 CFR 1.98 states that when the disclosures of two or more patents or publications listed in an information disclosure statement are substantively cumulative, a copy of the one of the patents or publications may be submitted without copies of the other patents or publications provided that a statement is made that these other patents or publications are cumulative. The examiner will then consider only the patent or publication of which a copy is submitted and will so indicate on the list or form PTO-1449 submitted, e.g., by crossing-out the listing of the cumulative information.

Paragraph (c) of 37 CFR 1.98 further states that if a written English language translation of a non-English language document, or portion thereof, is within the possession, custody or control of, or is readily available to any individual designated in 37 CFR 1.56(c), a copy of the translation shall accompany the statement. Translations are not required to be filed unless they have been reduced to writing and are actually translations of what is contained in the non-English language information. If no translation is submitted, the examiner will consider the information in view of the concise explanation and insofar as it is understood on its face, e.g., drawings, chemical formulas, English language abstracts, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches.

A(3) Each information disclosure statement must further include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is *not in the English language*. The concise explanation may be either separate from the specification or incorporated therein.

The requirement for a concise explanation of relevance is limited to information that is not in the English language. The explanation required is limited to the relevance as understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office. If a translation of the information into English is submitted with the foreign language information, no concise explanation is required. There is no requirement for the translation to be verified. Where the information listed is not in the English language, but was cited in a search report by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English language version of the search report which indicates the degree of relevance found by the foreign office. The requirement for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a parent, related, or copending United States application.

The concise explanation may indicate that a particular figure or paragraph of the patent or publication is relevant to the claimed invention. It might be a simple statement pointing to similarities between the item of information and the claimed invention. It is permissible but not necessary to discuss differences between the cited information and the claims.

Applicants may, if they wish, provide a concise explanation of why English-language information is being submitted and how it is understood to be relevant. Concise explanations are helpful to the Office, particularly where documents are lengthy and complex and applicant is aware of a section that is highly relevant to patentability or where a large number of documents are submitted and applicant is aware that one or more are highly relevant to patentability.

B. Time for Filing

The procedure and requirements for submitting an information disclosure statement are linked to four stages in the processing of a patent application: (1) within three months of filing, or before first Office action, whichever is later; (2) after the period in (1), but before final Office action or a Notice of Allowance, whichever is earlier; (3) after the period in (2) but on or before the issue fee is paid; and (4) after the period in (3) and up to the time the patent application can be effectively withdrawn from issue. The procedures and requirements apply to applications filed under 35 U.S.C. 111 (utility), 161 (plants), 171 (designs), and 251 (reissue), as well as international applications entering the national stage under 35 U.S.C. 371.

The requirements based on the time when the information disclosure statement is filed are summarized as follows:

Time when IDS is filed	37 CFR 1.97 Requirements
(1) Within 3 months of filing or before first Office action on the merits, whichever is later.	None (always considered).
(2) After (1) but before final action or notice of allowance.	Certification or 1.17(p) fee.
(3) After final action or notice of allowance and before payment of issue fee.	Certification, petition, and petition fee.

B(1) Statement filed BEFORE first action on the merits or within three (3) months of actual filing date (37 CFR 1.97(b)).

An information disclosure statement will be considered by the examiner if filed:

(i) within three months of the filing date of a national application;

(ii) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; or

(iii) before the mailing date of a first Office action on the merits, whichever event occurs last. A statement filed within this period requires neither a fee nor a certification of prompt filing.

The term "national application" includes continuing applications (continuations, divisions, continuations-in-part) so three-months will be measured from the actual filing date of an application as apposed to the effective date of a continuing application.

All information disclosure statements that comply with the content requirements of 37 CFR 1.98 and are filed within three months of the filing date will be considered by the examiner, regardless of whatever else has occurred in the examination process up to that point in time. Thus, in the rare instance that a final Office action or a notice of allowance is prepared and mailed prior to a date which is three months from the filing date, any information contained in a complete information disclosure statement filed within that three-month window will be considered by the examiner.

Likewise, an information disclosure statement will be considered if it is filed later than three months after the filing date but before the mailing date of a first Office action on the merits. An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirement (37 CFR 1.142) or just a requirement for additional fees to have a claim considered (37 CFR 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1.

An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10. An Office action is mailed on the date indicated in the Office action.

B(2) Statement filed after B(1), but BEFORE mailing of final action or Notice of Allowance (37 CFR 1.97(c)).

An information disclosure statement will be considered by the examiner if filed after the period specified in B(1) above, but before the mailing date of either

a final action under 37 CFR 1.113 or
a notice of allowance under 37 CFR 1.311,

whichever occurs first, provided: (1) the statement is accompanied by either a certification as specified in 37 CFR 1.97(e) or (2) the fee set forth in 37 CFR 1.17(p). If a final action or notice of allowance is mailed in an application and later withdrawn, the application will be considered as not having had a final action or notice of allowance mailed for purposes of considering an information disclosure statement.

(i) If information submitted during the period set forth in 37 CFR 1.97(c) with a certification is used in a new ground of rejection on unamended claims, the next Office action will not be made final since in this situation it is clear that applicant has submitted the information to the Office promptly after it has become known and the information is being submitted prior to a final determination on patentability by the Office. However, the information submitted with a certification can be used in a new ground of rejection and the next Office action made final. If the new ground of rejection was necessitated by amendment of the application by applicant. Where the information is submitted during this period with a fee, the examiner may use the information submitted, e.g., printed publication or evidence of public use, and make the next Office action final whether or not the claims have been amended, provided that no other new ground of rejection which was not necessitated by amendment to the claims is introduced by the examiner. See MPEP 706.07(a). If a new ground of rejection is introduced that is neither necessitated by an amendment to the claims nor based on the information submitted with the fee set forth in 37 CFR 1.17(p), the Office action shall not be made final.

(ii) A certification under 37 CFR 1.97(e) must state either

(a) that each item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the statement, or
(b) that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c), more than three months prior to the filing of the statement.

A certification can contain either of two statements. One statement is that each item of information in an information disclosure statement was cited in a communication, such as a search report, from a patent office outside the U.S. in a counterpart foreign application not more than three months prior to the filing date of the statement. Under this certification, it does not matter whether any individual with a duty of disclosure actually knew about any of the information cited before receiving the search report. The date on the communication by the foreign patent office begins the three-month period in the same manner as the mailing of an Office action starts a three-month shortened statutory period for response. The date starting the three-month period is not the date the communication was received by a foreign associate or the date it was received by a U.S. registered practitioner. Likewise, the statement will be considered to have been filed on the date the statement was received in the Office, or on an earlier date of mailing if accompanied by a properly executed certificate of mailing under 37 CFR 1.8, or Express Mail certificate under 37 CFR 1.10.

The term counterpart foreign patent application means that a claim for priority has been made in either the U.S. application or a foreign application based on the other, or that the disclosures of the U.S. and foreign patent applications are substantively identical (e.g., an application filed in the European Patent Office claiming the same U.K. priority as claimed in the U.S. application).

In the alternative, a certification can be made if no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after making reasonable inquiry, neither was it known to any individual having a duty to disclose more than three months prior to the filing of the statement.

The phrase "after making reasonable inquiry" makes it clear that the individual making the certification has a duty to make reasonable inquiry regarding the facts that are being certified. The certification can be made by a registered practitioner who represents a foreign client and who relies on statements made by the foreign client as to the date the information first became known. A registered practitioner who receives information from a client without being informed whether the information was known for more than three months, however, cannot make the certification without making reasonable inquiry. For example, if an inventor gave a publication to the attorney prosecuting an application with the intent that it be cited to the Office, the attorney should inquire as to when that inventor became aware of the publication and should not submit a certification under 37 CFR 1.97(e)(2) to the Office until a satisfactory response is received. The certification can be based on present, good faith knowledge about when information became known without a search of files being made.

Certification need not be in the form of an oath or a declaration under 37 CFR 1.68. Certification by a registered practitioner or any other individual that the statement was filed within the three-month period of either first citation by a foreign patent office or first discovery of the information will be accepted as dispositive of compliance with this provision in the absence of evidence to the contrary. For example, a certification could read as follows:

"I hereby certify that each item of information contained in this information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this statement.", or

"I hereby certify that no item of information in the Information Disclosure Statement filed herewith was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of this Information Disclosure Statement."

An information disclosure statement may include two list and two certifications, similar to the above examples, in situations where some of the information listed was cited in a communication from a foreign patent office not more than three months prior to filing the statement and some was not, but was not known more than three months prior to filing the statement.

A copy of the foreign search report need not be submitted with the certification, but an individual may wish to submit an English-language version of the search report to satisfy the requirement for a concise explanation where non-English language information is cited. The time at which information "was known to any individual designated in 37 CFR 1.56(c)" is the time when the information was discovered in association with the application even if awareness of the materiality came later. The Office wishes to encourage prompt evaluation of the relevance of information and to have a date certain for determining if a certification can properly be made. A statement on information and belief would not be sufficient. Examiners should not remind or otherwise make any comment about an individual's duty of candor and good faith, but questions about the adequacy of any certification received in writing by the Office should be directed to the Office of the Assistant Commissioner for Patents.

B(3) Statement filed after B(2), but Prior to Payment of Issue Fee (37 CFR 1.97(d)).

An information disclosure statement will be considered by the examiner if filed after the mailing date of either a final action under 37 CFR 1.113 or a notice of allowance under 37 CFR 1.311, whichever occurs first, but before or simultaneous with payment of the issue fee, provided the statement is accompanied by:

(i) a certification as specified in 37 CFR 1.97(e) (see the discussion in B(2)(ii) above),
(ii) a petition requesting consideration of the information disclosure statement, and
(iii) the petition fee set forth in 37 CFR 1.17(i)(1).

These requirements are appropriate in view of the late stage of prosecution when the information is being submitted, i.e., after the examiner has reached a final determination on the patentability of the claims presented for examination. The petition should be directed to the Group Director of the examining group handling the application. The petition need do nothing more than request consideration of the information being submitted. Payment of the petition fee (37 CFR 1.17(i)(1)) *and* submission of the appropriate certification (37 CFR 1.97(e)) are the essential elements for having information considered at this advanced stage of prosecution.

The requirements of 37 CFR 1.97 provide for consideration by the Office of information which is submitted within a reasonable time, i.e., within 3 months after an individual designated in 37 CFR 1.56(c) becomes aware of the information or within 3 months of the information being cited in a communication from a foreign patent office in a counterpart foreign application. This undertaking by the Office to consider information would be available throughout the pendency of the application until the point where the patent issue fee was paid. If an applicant chose not to comply, or could not comply, with the requirements of 37 CFR 1.97(d), a continuing application could be filed to have the information considered by the examiner. The parent application could be permitted to become abandoned by not paying the issue fee required in the Notice of Allowance, for example, or by the filing of a file wrapper continuing application under 37 CFR 1.62. It would not be proper to make final a first Office action in the continuing application if the information submitted is used in a new ground of rejection.

B(4) Statement filed after Payment of Issue Fee.

After the issue fee has been paid on an application, it is impractical for the Office to attempt to consider newly submitted information. Information disclosure statements filed after payment of the issue fee in an application will not be considered but will merely be placed in the application file. See C below. The application may be withdrawn from issue at this point, however, pursuant to 37 CFR 1.313(b)(5) so that the information can be considered in a continuing application. In this situation, a file wrapper continuing application under 37 CFR 1.62 could be filed even though the issue fee had already been paid. The Office will consider the filing of a petition under 37 CFR 1.313(b)(5) as sufficient grounds to waive the requirement that an application under 37 CFR 1.62 be filed before payment of the issue fee. Alternatively, for example, a petition pursuant to 37 CFR 1.313(b)(3) could be filed if applicant states that one or more claims are unpatentable. This statement that one or more claims are unpatentable over the information must be unequivocable. A statement that a serious question as to patentability of a claim has been raised, for example, would not be acceptable to withdraw an application from issue under 37 CFR 1.313(b)(3).

If an application has been withdrawn from issue under one of the provisions of 37 CFR 1.313(b)(1)-(4), it will be treated as though no notice of allowance had been mailed and the issue fee had not yet been paid with regard to the time for filing information disclosure statements. Petitions under 37 CFR 1.313(b) should be directed to the Office of Petitions in the Office of the Assistant Commissioner for Patents.

B(5) Extensions of Time (37 CFR 1.97(f))

No extensions of time for filing an information disclosure statement are permitted under 37 CFR 1.136(a) or (b). If a bona fide attempt is made to comply with the content requirements of 37 CFR 1.98, but part of the required content is inadvertently omitted, additional time may be given to enable full compliance.

C. Examiner Handling of Information Disclosure Statements

Information disclosure statements will be reviewed for compliance with the requirements of 37 CFR 1.97 and 1.98 as discussed in A and B above. Applicant will be notified of compliance and non-compliance with the rules as discussed below.

C(1) Non-complying statements

Pursuant to 37 CFR 1.97(i), submitted information, filed before the grant of a patent, which does not comply with 37 CFR 1.97 and 1.98 will be placed in the file, but will not be considered by the Office. Information submitted after the grant of a patent must comply with 37 CFR 1.501.

(i) If an information disclosure statement does not comply with the requirement based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, the statement will be placed in the application file, but none of the information will be considered by the examiner. The examiner may use form paragraph 6.49 which is reproduced below to inform applicant that the information has not been considered. Applicant may then file a new information disclosure statement or correct the deficiency in the previously filed statement but the date of that the statement or correction is filed will be the date of the statement for purposes of determining whether the requirements based on the time of filing the statement (37 CFR 1.97) have been complied with.

The examiner should write "not considered" on an information disclosure statement where none of the information listed complies with the requirements, e.g., no copies of listed items submitted. The paper containing the disclosure statement or list will be placed in the record in the application file. The examiner will inform applicant that the information has not been considered and the reasons why by using form paragraph 6.49. If the improper citation appears as part of another paper, e.g., an amendment, which may be properly entered and considered, the portion of the paper which is proper for consideration will be considered.

6.49 Information Disclosure Statement Not Considered

The information disclosure statement filed[1] fails to comply with the provisions of MPEP 609 because[2]. It has been placed in the application file, but the information referred to therein has not been considered as to the merits.

Examiner Note:
See MPEP 609 for situations where use of this paragraph would be appropriate.

(ii) If an information disclosure statement complies with the requirements based on the time of filing the statement as discussed in B above, including the requirements for fees and/or certification, but part of the content requirements as discussed in A above has been inadvertently omitted, the examiner may set a one-month time period to correct the omission. Form paragraph 6.51 may be used for this purpose.

6.51 Time Limit for Completing Information Disclosure Statement

The Information Disclosure Statement filed on[1] does not comply with the requirements of 37 CFR 1.98 because[2]. Since the submission appears to be bona fide, but through an apparent oversight or inadvertence failed to comply with the necessary requirements, applicant is required to complete the statement within a time limit of one month from the date of this letter. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to comply with this notice will result in the Information Disclosure Statement being placed in the application file with the non-complying information not being considered.

Examiner Note:
This practice does not apply where there has been a deliberate omission of some necessary part of an information disclosure statement or where the requirements based on the time of filing

the statement as set forth in 37 CFR 1.97 have not been complied with.

If a statement fails to comply with requirements as discussed in this section for an item of information, that item of information in the statement will not be considered and a line should be drawn through the citation to show that it has not been considered. However, other items of information that do comply with all the requirements will be considered by the examiner.

If information is listed in the specification rather than in a separate paper, or if the other content requirements as discussed in A above are not complied with, the examiner will notify applicant in the next Office action that the information has not been considered. It should be noted, however, that no copy of a U.S. patent application is required to be submitted. See A(2)(iii) above. Where a U.S. patent application is properly cited, the examiner should obtain access to that file within the Office.

C(2) Complying Statements

The information contained in information disclosure statements which comply with both the content requirements as discussed in A above and the requirements based on the time of filing the statement as discussed in B above will be considered by the examiner.

Applicants, patent owners, reexamination requesters, protesters and others are encouraged to use form PTO-1449, "Information Disclosure Citation," when preparing an information disclosure statement. A copy of this form is reproduced in this section to indicate how the form should be completed. This form will enable persons to comply with the requirements to list each item of information being submitted and to provide the Office with a uniform listing of citations and with a ready way to indicate that information has been considered.

Examiners must consider all citations submitted in conformance with the rules and this section and place their initials adjacent the citations on a list or in the boxes provided on a form PTO-1449. If the citations are submitted on a list other than on a form PTO-1449, the examiner may write "all considered" and his or her initials to indicate that all citations have been considered. If any of the citations are considered, a copy of the submitted list or form, as reviewed by the examiner, will be returned to the applicant with the next communication. The original copy of the form will be entered into the application file. The copy returned to applicant will serve both as acknowledgement of receipt of the information disclosure statement and as an indication that the references were considered by the examiner. Forms PTO-326 and PTOL-37 include a box to indicate the attachment of form PTO- 449.

Information which complies with requirements as discussed in this section but which is in a non-English language will be considered in view of the concise explanation submitted (A(3) above) and insofar as it is understood on its face, e.g., drawings, chemical formulas, in the same manner that non-English language information in Office search files is considered by examiners in conducting searches. The examiner need not have the information translated unless it appears to be necessary to do so. The examiner will indicate that the non-English language information has been considered in the same manner as consideration is indicated for information submitted in English. The examiner should not require that a translation be filed by applicant. The examiner should not make any comment such as that the non-English language information has only been considered to the extent understood, since this fact is inherent.

Since information is required to be listed in a separate paper rather than in the specification, there is no need to mark "All checked" or "Checked" in the margin of a specification containing citations.

If a statement fails to comply with the requirements as discussed in this section for an item of information, a line should be drawn through the citation to show that it has not been considered. The other items of information listed that do comply with the rules and this section will be considered by the examiner and will be appropriately initialed.

D. Information Printed on Patent

A citation listed on form PTO-1449 and considered by the examiner in accordance with this section will be printed on the patent. A citation listed in a separate paper, equivalent to but not on form PTO-1449, and considered by the examiner in accordance with this section will be printed on the patent if the list is on a separate sheet which is clearly identified as an information disclosure statement and the list lends itself to easy capture of the necessary information by the Office printing contractor, i.e., each item of information is listed on a single line, the lines are at least double-spaced from each other, the information is uniform in format for each lisred item, the list includes a column for the examiner's initials to indicate that the information was considered. If a citation is not printed on the patent but has been considered by the examiner in accordance with this section, the patented file will reflect that fact as noted in C(2) above.

[1138 OG 37]

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(79) **Department of Commerce**
Patent and Trademark Office

Request for Comments on the Chairman's Text of the Diplomatic Conference on Certain Copyright and Neighboring Rights Questions, to be held in Geneva from December 2 to 20, 1996.

Agency: Patent and Trademark Office, Commerce.
Action: Notice and request for public comments.
Summary: As the Administration prepares for the Diplomatic Conference on Certain Copyright and Neighboring Rights Questions, to be held in Geneva from December 2 to 20, 1996, we invite interested parties to submit written comments on the Chairman's text and to attend a public briefing to discuss the Chairman's text of the Diplomatic Conference. During the briefing, Jukka Liedes, Chairman of the Committee of Experts, will discuss the text and will be available to answer questions.
Dates: The briefing will be held on November 12, 1996, from 1 p.m. to 5 p.m.

Written comments on the Chairman's text are due on or before November 22, 1996.
Addresses: The briefing will be held in Marriott's Crystal Forum, a part of the Crystal City Marriott Hotel located in The Underground, 1999 Jefferson Davis Highway, Arlington, Virginia.

A transcript of the meeting will be made available for public inspection in room 902 of Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia. The transcript will also be made available through the Patent and Trademark Office's home page, which is located at www.uspto.gov.

Written comments should be submitted to the Commissioner of Patents and Trademarks, Box 4, Patent and Trademark Office, Washington, D.C. 20231, marked to the attention of Ms. Carmen Guzman Lowrey, Associate Commissioner for Governmental and International Affairs. Written comments may also be submitted electronically by sending them to Mr. Keith Kupferschmid at diploconf@uspto.gov.

All written comments received will be made available for public inspection in room 902 of Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Mr. Keith M. Kupferschmid by telephone at (703) 305-9300, by facsimile at (703) 305-8885, by electronic mail at diploconf@uspto.gov or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Box 4, Patent and Trademark Office, Washington, D.C. 20231. It is not necessary for interested parties to contact the PTO to request to attend the briefing.
Supplementary Information: The United States is committed to making progress in the World Intellectual Property Organization (WIPO) toward improving international protection for works protected by copyright and neighboring rights. We want to build upon the international intellectual property norms that were set in the Agreement on Trade-Related Aspects of Intellectual Property (TRIPs). This is essential, especially in view of the need to deal with the intellectual property issues associated with the Global Information Infrastructure (GII). To accomplish this goal, the members of WIPO, with the leadership of the United States, are working to establish three new international agreements, commonly referred to as —

• A Protocol to the Berne Convention for the Protection of Literary and Artistic Works, which would modernize the Berne Convention to take into account new forms of expression and new uses of copyrighted works that have evolved due to technological developments since the Berne Convention's most recent revision in 1971.

• A New Instrument for the Protection of Performers and Producers of Phonograms, which would improve international standards of protection for sound recordings, and protect the rights of certain performers in respect of their live performances.

• A Treaty for the Sui Generis Protection of Databases, which would ensure adequate incentives to invest in creating databases, through a new type of protection that would safeguard databases against destruction of their commercial value.

These agreements would provide the levels of protection for both copyright and neighboring rights that are critical to the development of the commercial potential of the GII.

Much progress has been made in the negotiations in WIPO through the submission of treaty proposals by the United States and other countries. Based on these submissions and the views expressed in meetings of the Committee of Experts, the Chairman of the Committee of Experts has prepared three draft treaties which address digital and conventional copyright issues. These proposed treaties will be taken up at a Diplomatic Conference on Certain Copyright and Neighboring Rights Issues to be convened December 2-20, in Geneva at WIPO headquarters.

As the Administration prepares for the Diplomatic Conference, we invite interested parties to submit written comments on the Chairman's text of the draft treaties. These comments should be received by the PTO no later than November 22, 1996.

In addition, to facilitate a better understanding of the text of the draft treaties, the PTO will hold a briefing to discuss them. During the briefing, Jukka Liedes, Chairman of the Committee of Experts, will discuss the text and will be available to answer questions.

Copies of the draft treaties and other information relevant to the Diplomatic Conference can be found at the PTO's home page, located at www.uspto.gov. Copies of the draft treaties will also be available at the briefing and upon request.

October 10, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1192 OG 17]

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(80) **Department of Commerce**
Patent and Trademark Office

Notice of Hearings and Request for Comments on Issues Relating to Patent Protection for Nucleic Acid Sequences

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Hearings and Request for Comments
Summary: The Patent and Trademark Office (PTO) will hold public hearings, and it requests comments, on issues relating to patent protection for nucleic acid sequences. Interested members of the public are invited to testify at public hearings and to present written comments on any of the topics outlined in the supplementary information section of this notice
Dates: Public hearings will be held on Tuesday, April 16, 1996, from 9:00 a.m. until 1:00 p.m., and Tuesday, April 23, 1996, from 9:00 a.m. until 1:00 p.m.

Those wishing to present oral testimony at any of the hearings must request an opportunity to do so no later than Friday, April 12, 1996, for the April 16 hearing, or Friday, April 19, 1996, for the April 23 hearing.

Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings no later than Monday, May 6, 1996.

Written comments will be accepted by the PTO until April 23, 1996.

Written comments and transcripts of the hearings will be available for public inspection on or about Monday, May 13, 1996.
Addresses: The April 16 hearing will be held from 9:00 a.m. until 1:00 p.m. at the University of California, San Diego, International Center, 9500 Gilman Drive, La Jolla, California.

The April 23 public hearing will be held from 9:00 a.m. until 1:00 p.m. in Suite 912, Commissioner's Conference Room, Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.

Requests to testify should be sent to Esther Kepplinger by telephone at (703) 308-2339, by facsimile transmission at (703) 305-3601, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231. No request for oral testimony will be accepted through electronic mail.

Written comments should be addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231, marked to the attention of Esther Kepplinger. Comments may also be submitted by facsimile transmission at (703) 305-3601, with a confirmation copy mailed to the above address, or by electronic mail over the Internet to sequences@uspto.gov.

Written comments and transcripts of the hearings will be maintained for public inspection in Suite 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia. Transcripts and comments provided in machine readable format will also be available through anonymous file transfer protocol (ftp) via the Internet (address: sequences@uspto.gov).
For Further Information Contact: Esther Kepplinger by telephone at (703) 308-2339, by facsimile transmission to (703) 305-3601, by electronic mail at ekepplin@uspto.gov, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231.

Supplementary Information:

I. Background

Biotechnology is projected to be an important growth industry from now until well into the twenty-first century, particularly in the United States, which has been a leader in this rapidly developing industry. The PTO has taken a very active role in working together with its customers to simplify and standardize PTO policies and procedures and to encourage and promote the growth of this industry. Nevertheless, PTO needs to continue to seek ways to improve its responsiveness to its customers and to more effectively address the needs of the industry. In order to address both current and future challenges, the PTO is seeking the assistance and advice of the public.

With the growth of the biotechnology industry have come significant changes in the process of research, development and commercialization of biotechnology inventions. For at least a decade, patent applications claiming nucleic acid sequences, such as genes composed of deoxyribonucleic acid ("DNA"), have been examined and granted patent rights by the PTO pursuant to 35 U.S.C. 131. These sequences typically encode known proteins or proteins for which an applicant has discovered a function. Scientific and technological advances have permitted researchers to identify large numbers of gene fragments rapidly. The ease of using automated techniques for sequencing large numbers of random nucleic acid fragments has resulted in the filing of a growing number of patent applications each claiming thousands of nucleic acid sequences. Handling patent applications containing large numbers of sequences creates a significant processing problem for the PTO. While the PTO has acquired sophisticated and costly computer hardware and software necessary to process and search applications containing such sequences, the search and examination of the sequences will significantly overtax the existing system and may necessitate the acquisition of many additional, expensive, massively parallel processor computers to complete the search of the prior art and examination in a reasonable time. Human resources to analyze the computer search results greatly exceeds the computer time necessary to run the search.

PTO estimates that the computer search time for one hundred sequences, each of which do not exceed several hundred nucleo-

tides in length, is about fifteen hours and the examiner time for evaluating the sequence search results is about sixty-five hours. Based on searching 100,000 sequences a year, the estimated cost for computer search time for one hundred sequences is $1,800. Although the number of cases involving large numbers of sequences presently before the PTO is relatively small, it is estimated that the cost to search and examine these cases alone will be $12 million. These estimates represent searches of commercially available databases by a massively parallel processor computer.

As in any technology, the PTO must search the entire scope of the claimed invention. Typical biotechnology patent applications drawn to DNA sequences claim the exact sequence disclosed but include various other broader claims. For example, typical claims include the sequence and any sequence having a certain percentage identity or homology to the sequence or any sequence which hybridizes to the sequence, with or without the conditions of binding being recited. Others recite the sequence or any fragment of the sequence having a particular length of nucleotides. These claims are largely responsible for the lengthy search and evaluation times and the high resultant costs to the PTO. Additionally, the presence of thousands of individual sequences per application represents an enormous search and examination challenge. This is particularly true if the sequences represent different proteins because the search for one sequence provides no useful data for another sequence.

The number of applications with large numbers of nucleic-acid sequences continues to grow and, because of technological advances in the identification of genes, it is believed that the growth will continue.

Applications that claim excessively long sequences present similar challenges, since the claimed sequence must be broken up into numerous smaller sequences in order to be searched.

Appropriate policies must be established to address these challenges in ways that help protect the inventions of all applicants without creating an imbalance in the appropriation of resources within and among the technologies and Examining Groups of the PTO. These policies must permit the timely and thorough examination of all applications which require the same physical and human resources for completion.

II. Issues for Public Comment

Interested members of the public are invited to testify or to present written comments related to the above topics, including the following issues:

1. Is there a more cost-effective way to search and examine applications containing large numbers of sequences or excessively long sequences, in view of the PTO's limited human and computer resources?

2. How should the significantly higher cost associated with searching applications claiming large numbers of sequences or very long sequences be underwritten? For example:

a) By fees from all applications?
b) By fees from the biotechnology industry applications only?
c) By fees from those specific applications involving large numbers of sequences or extraordinarily long sequences?

3. To assist PTO in addressing the described challenges, do you have any specific suggestions which would facilitate the implementation of short-term solutions? Do you have any suggestions on how the PTO can address long-term solutions?

III. Guidelines for Oral Testimony

Individuals wishing to testify at the hearings must adhere to the following guidelines:

1. Requests to testify must include the speaker's name, affiliation, title, phone number, fax number, mailing address, and Internet mail address (if available).

2. Speakers will be provided between seven and fifteen minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. All efforts will be made to accommodate requests presented before the day of the hearing for additional time for testimony.

3. Requests to testify may be accepted on the date of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

A schedule providing approximate times for testimony will be provided to all speakers the morning of the day of the hearing.

Speakers are advised that the schedule for testimony may be subject to change during the course of the hearings.

IV. Guidelines for Written Comments

Written comments should include the following information:

1. Name and affiliation of the individual responding.

2. If applicable, an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views.

3. If applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization) and general areas of interest.

Information that is provided pursuant to this notice will be made part of the public record. In view of this, parties should not provide information they do not wish publicly disclosed. Parties who would like to rely on confidential information to illustrate a point being made are requested to summarize or otherwise provide the information in a way that will permit its public disclosure.

Parties offering testimony or written comments should provide their comments in machine readable format, if possible. Such submissions should be provided by electronic mail messages over the Internet, or on a 3.5" floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine readable submissions should be provided as unformatted text (e.g., ACSII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh, DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

V. Guidelines for Comments via Internet

Comments received via the Internet should include the same information requested in the guidelines set out for written comments.

VI. Other Information

Questions regarding the facilities and lodging in the La Jolla, California, area should be directed to the University of California, San Diego. Special Events, by telephone at (619) 534-6386, or by fax to (619) 534-0905. Parking permits are required for on-campus parking and may be purchased in advance through the Parking Office or on April 16 at Information booths at the university. Questions regarding parking should be directed to the Special Events Parking Office at (619) 534-9682, or by fax to (619) 534-9685.

March 6, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 110]

(81) **Department of Commerce**
Patent and Trademark Office

Notice of Hearings and Request for Comments on Issues Relating to Patent Protection for Therapeutic and Diagnostic Methods.

Agency: Patent and Trademark Office, Commerce
Action: Notice of Hearings and Request for Comments.
Summary: The Patent and Trademark Office (PTO) will hold public hearings, and it requests comments, on issues relating to patent protection for therapeutic and diagnostic methods. Interested members of the public are invited to testify at public hearings and to present written comments on any of the topics outlined in the supplementary information section of this notice.
Dates: A public hearing will be held on Thursday, May 2, 1996, starting at 9:00 a.m. and ending no later than 5:00 p.m.

Those wishing to present oral testimony at the hearing must request an opportunity to do so no later than Friday, April 26, 1996.

Written comments on the topics presented in the supplementary information section of this notice will be accepted by the PTO until Friday, May 17, 1996.

Written comments and transcripts of the hearing will be available for public inspection on or about June 14, 1996. They will be maintained for public inspection in Room 902 of Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.
Addresses: The hearing will be held from 9:00 a.m. to 5:00 p.m. in Suite 912, Commissioner's Conference Room, Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.

Requests to testify should be sent to Richard Wilder by telephone at (703) 305-9300, by facsimile transmission at (703) 305-8885, or by mail marked to his attention addressed to the U.S. Patent and Trademark Office, Office of Legislative and International Affairs, Box 4, Washington, D.C. 20231.

Written comments should be addressed to Richard Wilder, U.S. Patent and Trademark Office, Office of Legislative and International Affairs, Box 4, Washington, D.C. 20231. Comments may also be submitted by facsimile transmission at (703) 305-8885, with a confirmation copy mailed to the above address.
For Further Information Contact: Richard Wilder by telephone at (703) 305-9300, by facsimile transmission to (703) 305-8885, or by mail marked to his attention addressed to the Office of Legislative and International Affairs, Box 4, Washington, D.C. 20231.

Supplementary Information:

I. Background

On March 3, 1995, H.R. 1127, the "Medical Procedures Innovation and Affordability Act," was introduced. H.R. 1127 would exclude from patentability any technique, method, or process for performing a surgical or medical procedure, administering a surgical or medical therapy, or making a medical diagnosis. In this notice, the foregoing subject matter is referred to collectively as "therapeutic and diagnostic methods." The bill would, however, allow claims to such techniques, methods, or processes that are performed by or as a necessary component of a machine, manufacture, or composition of matter that is otherwise patentable. On October 19, 1995, the Subcommittee on Courts and Intellectual Property, Committee on the Judiciary, U.S. House of Representatives ("Congressional Hearing") held a hearing on H.R. 1127.

On October 18, 1995, S. 1334, the "Medical Procedures Innovation and Affordability Act", was introduced. While S. 1334 would not exclude subject matter from patentability, as would H.R. 1127, it would grant limited immunity from patent infringement to certain persons. S. 1334 provides that a patient, physician, or other licensed health care practitioner, or a health care entity with which a physician or licensed health care practitioner is professionally affiliated, would be free to use or induce others to use a patented technique, method, or process for performing a surgical or medical procedure, administering a surgical or medical therapy, or making a medical diagnosis. This immunity would not extend, however, to the "use of, or inducement to use, such a patented technique, method, or process by any person engaged in the commercial manufacture, sale, or offer for sale of a drug, medical device, process, or other product that is subject to regulation under the Federal Food, Drug, and Cosmetic Act or the Public Health Service Act."

The critics of the patenting and/or enforcement of surgical and medical procedure patents believe that "it is unethical for physicians to seek, secure or enforce patents on medical procedures." "Report 1 of the Council on Ethical and Judicial Affairs (A-95), Patenting of Medical Procedures," p. 9, the American Medical Association (1995) ("AMA Report"). The bases for this belief are that such patents restrict access to patented procedures, increase costs of medical care, and interfere with patient confidentiality. See, AMA Report, pp. 3-6.

It is not the purpose of the PTO hearing to discuss the ethics of patenting therapeutic and diagnostic method patents. Nor is it the purpose of the hearing to consider economic analyses of patenting therapeutic and diagnostic method patents. Rather, the purpose of the hearing is to consider whether the problems identified by the proponents of H.R. 1127 and S. 1334, some of which are discussed above, can be solved administratively, rather than legislatively. In this regard, the AMA Report draws a distinction between inventions in the field of therapeutic and diagnostic methods that are "worthy" of patent protection and those that are not. The Report states, at p. 8, that

> rigorous application of the standard [of obviousness] would not only remove the procedures which are currently causing an uproar in the medical community from patent protection but would ensure that procedures worthy of patent protection could come into existence. It seems reasonable to assert that generally the procedures which were non-obvious would be the ones that required additional incentives and economic investment.

The requirement of non-obviousness, along with novelty, is one of the basic requirements to be met prior to a patent being granted. The novelty requirement ensures that a patent is not granted when the claimed invention is identical to an invention found in the "prior art." The purpose of the obviousness standard is to ensure that an invention, even though novel, is not granted patent protection if it would have been obvious at the time the invention was made to a person of ordinary skill in the art or technology to which the invention pertains.

Accordingly, at the Congressional Hearing, the Administration offered to hold hearings at the PTO to determine the extent to which and how the problems presented by the patenting of therapeutic and diagnostic methods can be solved by changes in standards and practices within the PTO. In a letter from The Honorable Carlos J. Moorhead, Chairman of the Subcommittee on Courts and Intellectual Property, House Committee on the Judiciary, to PTO Commissioner Bruce Lehman, Chairman Moorhead requested the PTO to convene hearings "to determine whether the problems identified by the proponents of H.R. 1127 could be solved administratively, rather than legislatively." Chairman Moorhead suggested several areas of inquiry for such PTO hearings and those areas of inquiry are identified in the following section.

II. Issues for Public Comment

Interested members of the public are invited to testify and/or present written comments on issues they believe to be relevant to the discussion topics outlined below. Questions following each topic are included to identify specific issues upon which the PTO is interested in obtaining public input.

Information that is provided pursuant to this notice will be made part of a public record. In view of this, parties should not provide information that they do not wish to be publicly disclosed. Parties who would like to rely on confidential information to illustrate a point being made are requested to summarize or otherwise provide the information in a way that will permit its public disclosure. Individuals with questions regarding submission of such information may contact Richard Wilder at the numbers listed above for further information.

A. Application of the Standards of Patentability, PTO Resources, and Reexamination

Chairman Moorhead, in his letter to Commissioner Lehman, stated the following:

> (At the Congressional Hearing) there appeared to be a great deal of concern that the PTO has issued patents in the field of therapeutic and diagnostic methods that fail to meet current patentability standards. This concern implies a need to inquire into the standards applied by the PTO, including obviousness, in determining whether or not to issue a patent. It also implies a need to examine the resources available to the PTO to be used in the examination process, including the prior art available to examiners. It may also be worthwhile to consider whether changes to the patent reexamination process may be useful.

1. Application of Patentability Standards by the PTO

In the field of therapeutic and diagnostic methods, as in any other technical field, the PTO applies the statutory standards for patentability, which include novelty, 35 U.S.C. 102, and non-obviousness, 35 U.S.C. 103. To receive a patent, an invention for which patent protection is sought must comply with all statutory requirements of patentability. The PTO examines each patent application on its own merits and does not apply per se rules regarding novelty, obviousness, or any other statutory requirement of patentability. Furthermore, the PTO strives to ensure that its examining practices reflect appropriate scientific and technological standards. The PTO thus seeks public input to help ensure that it is properly construing and applying the statutory requirements of patentability in the field of surgical and medical methods.

Are you aware of any problems related to the manner in which the requirements under 35 U.S.C. 102 and 103 are administered by the PTO for claims drawn to a therapeutic and diagnostic method? If so, please identify those problems with particularity, citing, if appropriate, specific situations or examples and providing steps that may be taken to solve the problems.

In responding to this question, you may wish to draw a distinction between problems caused by a lack of clarity of the legal standards governing 35 U.S.C. 102 and 103, as developed and interpreted by the Federal courts, and those caused by how those legal standards are applied by the PTO.

2. PTO Resources for the Search and Examination of Applications Directed to Therapeutic and Diagnostic Methods

In making a determination as to patentability under 35 U.S.C. 102 and 103, the examiner must compare the claimed invention with the prior art. The prior art can, inter alia, comprise knowledge, use, offer for sale, or a sale in the United States or U.S. or foreign patents or publications. Proponents of H.R. 1127 and S. 1334 argue that the PTO does not have access to all materials that comprise the prior art in the field of therapeutic and diagnostic methods. This is particularly so, they argue, in the case of prior uses of inventions that are not reported in journals, patents, or other publications. In this regard, testimony is solicited on the following points:

Do you believe that the prior art collection relating to therapeutic and diagnostic methods to which examiners in the PTO have access is deficient? If so, please suggest ways in which the prior art collection may be improved.

In responding to this question you may wish to draw a distinction between prior art that may not be included in a printed publication (including; for example, prior uses, including procedures performed in operating rooms and physicians' offices, prior knowledge, and prior sales) and prior art that is embodied in a printed publication. You may wish to comment on how the PTO can obtain access to obscure papers and other hard-to-obtain technical publications.

3. Reexamination of Patents in the Field of Therapeutic and Diagnostic methods

A person may conclude that a patent is invalid and want to challenge its validity on the basis of a "prior art" reference that was not considered by the PTO during the original examination. Proponents of H.R. 1127 and S. 1334 argue that it can be costly to challenge the validity of a patent in court. An alternative to challenging such a patent in court is to request that the patent be reexamined in the PTO on the basis of that newly discovered reference. 35 U.S.C. 301. The bases upon which reexamination may be sought and the degree of participation of a person seeking reexamination are currently quite limited. Proponents of H.R. 1127 and S. 1334 cite these limitations as dissuading third parties from seeking reexamination and relying on litigation instead when a patent they consider invalid is asserted against them.

Another bill before Congress, H.R. 1732, would provide a more effective reexamination procedure by permitting greater participation by reexamination requesters throughout a reexamination proceeding, with a right of appeal for the requester. The bill would also allow the PTO to consider matters under 35 U.S.C. 112, first paragraph, except for best mode affecting patent validity, in addition to those based on the prior art. Some persons practicing in the field of therapeutic and diagnostic methods suggest that the changes contemplated in H.R. 1732 are not sufficient. In particular, they suggest that the basis upon which reexamination may be requested should be expanded to include prior art consisting of unpublished prior use, including medical procedures performed in operating rooms and physicians' offices. This gives rise to the following question:

Do you think the current reexamination statute requires modification to solve the concerns of persons practicing in the field of therapeutic and diagnostic methods beyond those contemplated in H.R. 1732? If so,

(a) please identify with specificity the modifications deemed necessary to solve the concerns; and
(b) explain the implications of such modifications, not only for patent owners, but for the PTO.

B. Publication of Patent Information

Chairman Moorhead, in his letter to Commissioner Lehman, stated the following:

> We also heard from witnesses that patent protection in the field of therapeutic and diagnostic methods exercises a chilling effect on the publication or dissemination of knowledge in the field. I believe it would be worthwhile at the hearings you have proposed to look into ways in which information contained in patent documents could be made more easily and widely available to the medical community. Perhaps a discussion on the role of early publication of patent applications would be useful here.

Proponents of H.R. 1127 and S. 1334 contend that patenting therapeutic and diagnostic methods may have a chilling effect on the development of new medical knowledge by creating an atmosphere of secrecy among physicians to protect their proprietary interests. One of the basic requirements of the patent law is that an applicant must disclose his or her invention in a manner sufficiently clear so that others skilled in the art are taught how to make and use it. Once issued, a patent is published, and, thus, the public can read the information and learn from it. Another bill before Congress, H.R. 1733, would improve the information-dissemination function of patent documents. H.R. 1733 would require the PTO to publish patent applications no later than 18 months after the earliest effective filing date claimed by the patent applicant.

1. Does the medical community use information in granted U.S. patents or published foreign applications or patents, in particular such information concerning therapeutic and diagnostic methods?

(a) If not, why not? If so, in what way is that information used?
(b) In either case, are there ways in which the dissemination of such information can be improved, both in terms of the form in which it is presented and its channels of distribution? For example, would the publication of patent applications as contemplated by H.R. 1733 improve the information-dissemination function of patent documents?

2. Would the absence of patent protection for inventions of therapeutic and diagnostic methods lead to a reduction in the dissemination of information in that field due to a desire to protect such inventions as trade secrets?

3. Does the availability of patent protection for inventions in the field of therapeutic and diagnostic methods inhibit the publication or dissemination of knowledge in the field? If so, in what way and to what extent?

C. Experimental Use

Chairman Moorhead, in his letter to Commissioner Lehman, stated the following:

> The medical community has expressed concern that patent protection for therapeutic and diagnostic methods will have a chilling effect on the "peer review" of such procedures. Some of the proponents of H.R. 1127 have suggested that this concern may be overcome through a more expansive application of the "experimental use doctrine." An inquiry into this matter may be useful at the hearings that the Administration has proposed.
>
> (NOTE: The PTO has solicited written comments on the experimental use defense to patent infringement. See, Public Hearings and Request for Comments on Economic Aspects of the U.S. Patent System, 58 FR 68394 (December 27, 1993); Cancellation of Public Hearings on Economic Aspects of the U.S. Patent System, 59 FR 1935 (January 12, 1994); and Notice of Public Hearings and Request for Comments on Patent Protection for Biotechnological Inventions, 59 FR 45267, (September 1, 1994).)

A concern among medical professionals is that the existence of patents on therapeutic and diagnostic methods has a chilling effect on the study of such procedures. In particular, there is concern that the need to seek and obtain a license to practice a patented procedure will restrict "peer review" whereby experimentation and testing of such procedures are carried out to assess their quality and safety. It has been suggested that some of these concerns could be avoided by expansion of the "experimental use doctrine." See, *AMA Report*, p. 5. This doctrine would exempt from infringement certain acts considered purely experimental, unrelated to any commercial use of the patented invention. Yet, other than limited provisions allowing for testing of patented pharmaceutical products for purposes of regulatory approval (e.g., § 271 (e)(1) of title 35, United States Code), existing law does not provide a general, statutory defense against a charge of infringement for experimental use of patented technology.

Despite this, the Federal courts have recognized a limited defense to a charge of patent infringement based on use of the patented technology for experimental purposes. This defense, referred to as the experimental use defense, has been raised infrequently, and when considered has been construed very narrowly. There are few cases elaborating the nature of the defense, primarily because patent rights are not frequently enforced against members of the public that use the patented technology for purely experimental purposes. In these cases, the courts have not recognized the defense where the accused infringer has engaged in use of the patented invention for purposes of commercially exploiting the invention, rather than for increasing his or her understanding of the invention. In cases in which the defense has been raised successfully, the experimental use in question was to ascertain how the invention functioned or for purely philosophical or academic reasons.

Proponents of H.R. 1127 and S. 1334 contend that the need for an experimental use exception in the field of therapeutic and diagnostic methods is greater than in other fields of technology, including the fields of pharmaceuticals or medical devices. They argue first that, while the Food and Drug Administration has responsibility for regulating pharmaceuticals or medical devices, peer review serves as the primary regulatory mechanism for therapeutic and diagnostic methods. Second, they argue that a patent on a surgical or medical procedure acts as a barrier to peer review that could lead to a decrease in the quality and safety of such procedures. Given these two postulates, proponents of H.R. 1127 and 1334 conclude that an expanded form of the experimental use doctrine is needed.

The foregoing discussion raises the following questions:

1. Does the grant of patent protection for therapeutic and diagnostic methods impose a "chilling" effect on the peer review of such procedures?

2. If the answer to question 1 is "yes," explain how such patents have such a "chilling" effect.

3. If the answer to question 1 is "yes," do you think modification of the present experimental use exception would reduce or eliminate such a "chilling" effect?

4. If the answer to question 3 is "yes," how should the experimental use exception be modified to reduce or eliminate such a "chilling" effect? In particular,

(a) What activities involving a patented invention should be exempted from infringement under the experimental use exception?
(b) Which entities should be able to take advantage of such an experimental use exception? That is, should it be limited to physicians or health care providers or should it extend to legal entities with which physicians or health care providers are affiliated?
(c) What gains or losses to levels of basic research, inventive activity, and investment in research-intensive industries, if any, would you expect to occur if the nature of the present experimental use defense to infringement was modified as you suggest?

D. Foreign and International Experience

Chairman Moorhead, in his letter to Commissioner Lehman, stated the following:

> As you know, many countries, including developed industrialized countries, exclude therapeutic and diagnostic methods from patentability. I think it would be useful to invite testimony on the way in which exceptions from patentability of therapeutic and diagnostic methods are provided for in the laws of other countries, the ways in which those exclusions are implemented, and the effect such exclusions have on the medical community and industry.

The proponents of H.R. 1127 and S. 1334 have argued that many countries exclude therapeutic and diagnostic methods from patent protection and that the United States should follow their lead and "harmonize" our law with theirs. Testimony is invited in this regard in response to the following questions:

1. Identify countries that exclude therapeutic and diagnostic methods from patentability. As to such exclusions, identify:

(a) the way in which exceptions from patentability of therapeutic and diagnostic methods are provided for in the laws of other countries (for example, whether they are specifically excluded or defined as not being industrially applicable);

(b) the ways in which those exclusions are implemented (for example, whether they are strictly or liberally construed by offices in those countries that grant patents);

(c) the effect such exclusions have on the medical community and industry in countries that maintain them;

(d) any international obligations that would prevent such countries from continuing such exclusions; and

(e) the rationale for providing such exclusions.

2. Identify countries that grant limited immunity from patent

infringement to certain persons that practice therapeutic and diagnostic methods. As to such limited immunity, identify:

(a) the way in which such limited immunity is provided for in the laws of other countries (for example, whether it is part of such countries' patent law or general tort law);

(b) the ways in which such limited immunity is implemented in practice;

(c) the effect such limited immunity has on the medical community and industry in countries that provide for such immunity;

(d) any international obligations that would prevent such countries from continuing such limited immunity; and

(e) the rationale for providing such limited immunity from patent infringement.

III. Guidelines for Oral Testimony

Individuals wishing to testify must adhere to the following guidelines:

1. Anyone wishing to testify at the hearings must request an opportunity do so no later than Friday, April 26, 1996. Requests to testify may be accepted on the date of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

2. Requests to testify must include the speaker's name, affiliation, and title, phone number, fax number, and mailing address.

3. Speakers will be provided between 5 and 15 minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. All efforts will be made to accommodate requests for additional time for testimony presented before the day of the hearing.

4. Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings. These remarks should be provided no later than Friday, May 17, 1996.

5. Speakers must adhere to guidelines established for testimony. These guidelines will be provided to all speakers on or before Wednesday, May 1, 1996. A schedule providing approximate times for testimony will be provided to each speaker prior to the hearing. Speakers are advised that the schedule for testimony will be subject to change during the course of the hearings.

(Authority: 35 U.S.C. 6(a))

March 7, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1185 OG 64]

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(82) **Department of Commerce**
Patent and Trademark Office

Notice of Hearing and Request for Comments on a Technical Documentation Strategy

Agency: Patent and Trademark Office, Commerce
Action: Notice of a hearing and request for public comments
Summary: The Patent and Trademark Office (PTO) will hold a public hearing and is seeking written comments to obtain views of the public on the effort of the PTO to make technical documentation accessible to patent examiners and the public while adhering to certain constraints on financial and personnel resources. Interested members of the public are invited to testify at a public hearing and to present written comments on the topics outlined in this notice or on any aspect of this effort.

Dates: A public hearing will be held at 9:00 a.m. on Friday, May 31, 1996.

Requests to present oral testimony at the public hearing should be received on or before May 30, 1996.

Any written comments by those persons offering testimony at the hearings and related to that testimony should be submitted on or before May 30, 1996.

Other written comments will be accepted until June 7, 1996.
Addresses: The hearing will be held in the Commissioner's Conference Room (Room 912), Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia.

Persons wishing to speak at the hearings must notify Mr. Lee Schroeder, in writing marked to his attention at Commissioner of Patents and Trademarks, Box 4, Washington, DC 20231, or by telephone (703) 305-9300 or by telefax at (703) 305-8885, in order to be placed on a list of speakers for the hearing.

Persons wishing to offer written comments should address those comments to the Commissioner of Patents and Trademarks, Box 4, Patent and Trademark Office, Washington, DC 20231, marked to the attention of Mr. Lee Schroeder.

Written comments and transcripts of the hearing will be available for public inspection in Room 902 of Crystal Park Two, at 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Mr. Lee Schroeder by telephone at (703) 305-9300, by telefax at (703) 305-8395 or by mail marked to his attention and addressed to Commissioner of Patents and Tradermarks, Box 4, Patent and Trademark Office, Washington, DC 20231.

Supplementary Information:

1. Background

The PTO currently makes technical documentation (foreign and domestic patent and non-patent literature in many forms) available to persons within the PTO for use in the patent examination process. Much of the documentation is accessible through use of the United States Patent Classification System (USPCS). The same documentation is made available to members of the public for use as a source of technical information or for other patent-related uses.

To better use the limited financial and personnel resources available to the PTO, certain changes have been made in the documentation area. Less emphasis is being placed on the continuing reclassification of the documentation in the USPCS and the classification of new foreign patent copies and more reliance is being placed on the classification efforts of other countries and the use of more sophisticated electronic search tools.

To be more specific, the PTO is placing increased reliance on the many commercial data bases of technical information as well as data bases maintained by the PTO. These data bases cover foreign and domestic patent and non-patent literature. The PTO is also placing increased reliance on the classifying, abstracting and summarizing efforts of documentation by both domestic and foreign private entities and also by foreign government or intergovernmental entities. Consequently, less reliance is being placed on the reclassification effort within the PTO. Also, the PTO no longer classifies new foreign patents in the USPCS.

The public's views are sought on the increased reliance on the work of others in the classifying, abstracting and summarizing of documentation and less reliance on the USPCS and classification efforts of persons within the PTO. Public views are also sought on the increased reliance on computerized searching aids, be they full text data bases or data bases of abstracted material, classified or not. Public views are also sought on placing increased reliance on data bases and other sources to at least identify such documents after which a full-text copy of the document could be obtained.

Written comments may be offered on the questions posed below. Comments will also be accepted on any other aspects of the approach of the PTO to make technical information available both to patent examiners and the public.

2. Questions for the Hearing

The public hearing will be held to receive comments on the following specific questions:

A. Are the classification efforts of others (using systems or data bases of classification different from the United States Patent Classification System) able to replace, or partially replace the United States Patent Classification System?

B. Are the public users of the classified technical information systems of the Patent and Trademark Office willing to contribute, or contribute more, toward the ever increasing costs of maintaining these systems?

C. Since the usefulness of automated search tools is affected by the characteristics of the technology being searched, should the Patent and Trademark Office tailor the search system by technology rather than maintaining the USPCS for all technologies?

D. Since it is known that different search tools and techniques lead to different search results (e.g., different results from text or structure search vs. classified image search), are automated assisted searches acceptable if there is an overall improvement in the quality of the patentability search?

E. Advances contemplated in future search systems permit the examiner to add value to the data base while conducting a search by adding or changing classifications for a document, inserting markers and notes on a document, adding documents, etc. This value-added capability leads to search files that exist only in electronic form and which are constantly being upgraded.

1. Does the public need access to the examiner's search file.?
2. For post-prosecution/litigation purposes, does the public need to know what is in the examiner's search file at the time the examiner made the search?

F. How should the Patent and Trademark Office approach the issue of classification and retrieval of prior art in view of the current state of the art in the electronic document search and retrieval area, and expected developments in this area, including fully paperless patent and non-patent data bases?

April 26, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1186 OG 73]

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(83) **Department of Commerce**
Patent and Trademark Office
[Docket #: 950829221-5221-01]
RIN 0651-XX03

Request for Comments Concerning the Right of Priority (35 U.S.C. 119) and Electronic Exchange of Priority Documents

Agency: Patent and Trademark Office, Commerce.
Action: Notice; Request for Comments.
Summary: The Patent and Trademark Office (PTO) requests written public comment on various aspects of existing statutory and regulatory requirements for obtaining the right of priority of an earlier filed foreign application. The PTO also requests written public comment on issues associated with the electronic exchange of priority documents between the PTO, the European Patent Office (EPO), and the Japanese Patent Office (JPO).
Dates: Written comments on the topics presented in the supplementary section of this notice, or any related topics, will be accepted by the PTO until October 13, 1995.
Addresses: Those interested in presenting written comments on the topics presented in the supplementary information, or any related topics, may mail their comments to the Assistant Commissioner for Patents, Washington, D.C. 20231, marked to the attention of Box DAC. In addition, comments may also be sent by facsimile transmission to (703) 308-6916, with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to priority@uspto.gov.
For Further Information Contact: Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Box DAC, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Supplementary Information

I. Issues for Public Comment

The PTO is inviting written public comments on the administration and relevance of the existing statutory and regulatory requirements for obtaining the right of priority of an earlier filed foreign application and/or issues associated with the electronic exchange of priority documents between the Trilateral Offices (PTO, EPO, and JPO). Questions included at the end of this section are intended to illustrate the types of issues upon which the PTO is particularly interested in obtaining public comment. This notice has been determined to be not significant for the purposes of Executive Order 12866.
A. The Requirement for a Certified Copy of the Foreign Application Unless Deemed Necessary.

Currently, the Trilateral Offices are reconsidering the need that a certified copy of the foreign application be submitted in all cases. 35 U.S.C. 119 requires that a certified copy of a foreign application be submitted in all cases in order to obtain the right of priority. Specifically, 35 U.S.C. 119(b) requires that the applicant file a claim for the right of priority and a certified copy of the original foreign application before the grant of the patent, or at any time during the pendency of the application as required by the Commissioner, but not earlier than six months after the filing of the application in this country. The Commissioner may currently require a translation of the papers filed if not in the English language.

37 CFR 1.55, which implements 35 U.S.C. 119(b), requires that the claim for priority and the certified copy of the foreign application must be filed in all cases before the grant of the patent in order to be entitled to the right of priority, and requires a claim for priority or certified copy of the foreign application filed after payment of the issue fee to be accompanied by a petition (and fee under 37 CFR 1.17(i)) requesting entry. However, the certified copy of the foreign application may be required earlier during the pendency of the application in the case of an interference, when necessary to overcome the date of a reference relied upon by the examiner, or when specifically required by the examiner. If the certified copy of the foreign application is not in the English language, a translation will not be required except in the case of an interference, when necessary to overcome the date of a reference relied upon by the examiner, or when specifically required by the examiner.

Consequently, by statute and regulation, the certified copy of the foreign application must be filed in all cases during the pendency of the application even though it may be unnecessary to the examination of the application. Unless a substantive review of the certified copy of the foreign application, or a translation of such, is necessary to the examination of the application, *e.g.*, during an interference or when necessary to overcome an intervening reference, the claim to priority and the certified copy of the foreign application are merely reviewed to determine whether the certified copy of the foreign application corresponds in number, date, and country to the application identified in the oath or declaration and that there are no obvious formal defects. There is generally no examination of the certified copy of the foreign application to determine whether the applicant is entitled to the benefit of the foreign filing date on the basis of the disclosure of the document. Thus, an unnecessary burden is placed upon applicants to obtain certified copies of the priority documents from the appropriate office and then submit them to the PTO in instances in which the PTO does not substantively examine such documents, especially in view of the fact that such documents do not qualify as prior art in the United States. Further, an unnecessary burden is placed upon the PTO in the processing of such documents.

This right of priority originated in a multilateral treaty of 1883, *i.e.*, the Paris Convention for the Protection of Industrial Property (Paris Convention), to which the United States adhered

in 1887. The Paris Convention, however, merely requires that a person who wishes to take advantage of a previous filing make a declaration indicating the date of such filing and the country in which it was filed. The Paris Convention permits, but does not require, the countries of the Union to require a certified copy of the foreign application of the application as previously filed. Under the Paris Convention, the countries may also require that a translation accompany the certified copy of the foreign application. See Questions # 1, 2, and 3.

B. Electronic Exchange of Priority Documents.

The PTO also requests written public comment on issues associated with the electronic exchange of priority documents between the PTO, EPO, and JPO. Currently, the Trilateral Offices are considering the implementation of procedures that would allow for the direct exchange of priority documents in electronic form between the office of first filing and the offices of subsequent filings. See Question # 4. The PTO is interested in how the public views such electronic exchanges of priority documents, including the evidentiary effect of an electronic document constituting the official PTO record of the priority document. See Questions # 5 and 6.

It is anticipated that it will be some time before the PTO will have an electronic data base containing the content of applications-as-filed in a word-recognizable format, *e.g.*, applications captured by optical character recognition (OCR). As such, any electronic exchange, at least initially, would be in the form of digital images of the applications-as-filed.

It is contemplated that under a system authorizing the exchange of priority documents, an applicant would have to request that an office forward the priority document directly to another office in electronic form, rather than having the certified copy go to the applicant, who in turn would forward it to the other office. The PTO is also considering providing a return receipt to indicate to the applicant that the request to forward the priority document was received by the PTO and that the PTO has forwarded the priority document to the office(s) designated by the applicant.

The cost to the PTO of processing requests and forwarding priority documents to the designated office(s), and of generating and mailing return receipts, would be recovered through service fees. See Questions # 7 and 8.

Nevertheless, such a direct exchange of priority documents for a service fee should result in an overall reduction in costs and administrative work for applicants, as well as cost reductions in the conversion from paper to electronic form.

II. Questions

1. (a) Does the requirement that a certified copy of the foreign application be submitted in all cases before the grant of a patent in order to be entitled to the right of priority serve any useful purpose? If yes, please provide those useful purposes.

(b) Is your answer affected by the fact that such documents may qualify as novelty defeating prior art in other countries?

2. (a) Notwithstanding the existing requirements, when should an applicant be required to submit a certified copy of the foreign application?

(b) Would you continue to submit a certified copy of the foreign application even if not specifically required?

(c) Should any action taken by the U.S. Government be contingent on action in the other Trilateral countries?

3. When the foreign application is not in the English language and an English translation is deemed necessary, should both a certified copy of the foreign application and an English language translation accompanied by a verified statement that the translation is an accurate translation of the certified copy of the foreign application be required, or should only an English language translation of the foreign application accompanied by a verified statement that the translation is accurate be required?

4. What significant problems, either legal or technical, would need to be solved to permit the offices of subsequent filing to receive the priority documents directly from the office of first filing rather than from the applicant?

5. Should the PTO, EPO, and JPO electronically exchange priority documents at the request of applicant? Would most applicants take advantage of this service? What disadvantages, if any, are there in the electronic transmission of priority documents among the PTO, EPO, and JPO?

6. Will the filing of a priority document in electronic form by the office of first filing, rather than in paper form by the applicant, affect the legal admissibility of the priority document?

7. If there was a service fee for the direct exchange of priority documents among the PTO, EPO, and JPO, which was higher than the current fee charged for a certified copy of the application, would most applicants still take advantage of this service? At what fee amount would most applicants choose to request the direct exchange of priority documents?

8. If providing a return receipt resulted in an increase in the service fee for the direct exchange of priority documents among the PTO, EPO, and JPO, would a return receipt be desirable? Against the background that increasing the information provided on such a return receipt would increase the cost of generating such return receipt, and thus increase the service fee, what information should be included on the return receipt?

September 8, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1179 OG 34]

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(84) Using Certificate of Correction to Perfect Claim for Priority Under 35 USC 119

Under 35 USC 119, an applicant may assert a right of priority and claim the benefit of an earlier filing date in a foreign country. In this regard, 35 USC 119 states:

> No application for patent shall be entitled to this right or priority unless a claim therefor and a certified copy of the original foreign application, specification and drawings upon which it is based are filed in the Patent and Trademark Office before the patent is granted. . . .

The failure to perfect a claim to foreign priority benefits prior to issuance of the patent may be cured by filing a reissue application; Brenner v. State of Israel,158 USPQ 584 (CA DC 1968).

However, under certain conditions, this failure may also be cured by filing a Certificate of Correction request under 35 USC 255 and 37 CFR 1.323. For example, in the case of In re Van Esdonk, 187 USPQ 671 (Comr. 1975), the Commissioner granted a request to issue a Certificate of Correction in order to perfect a claim to foreign priority benefits. In that case, a claim to foreign priority benefits had not been filed in the application prior to issuance of the patent. However, the application was a continuation of an earlier application in which the requirements of 35 USC 119 had been satisfied. Accordingly, the Commissioner held that the "applicants' perfection of a priority claim under 35 USC 119 in the parent application will satisfy the statute with respect to their continuation application."

Although In re Van Esdonk involved the patent of a continuation application filed under 37 CFR 1.60, it is proper to apply the holding of that case in similar factual circumstances to any patented application having benefits under 35 USC 120. This is primarily because a claim to foreign priority benefits in a continuing application, where the claim has been perfected in the parent application, constitutes in essence a mere affirmation of the applicant's previously expressed desire to receive benefits under 35 USC 119 for subject matter common to the foreign, parent, and continuing applications.

In summary, a Certificate of Correction under 35 USC 255 and 37 CFR 1.323 may be requested and issued in order to perfect a claim to foreign priority benefits in a patented continuing application if the requirements of 35 USC 119 had been satisfied in the parent application prior to issuance of the patent and the requirements of 37 CFR 1.55(a) are met.

However, a claim to foreign priority benefits cannot be perfected via a Certificate of Correction if the requirements of 35 USC 119 had not been satisfied in the patented application, or its parent, prior to issuance and the requirements 37 CFR 155(a) are not met. In this latter circumstance, the claim to foreign priority benefits can be perfected only by way of a reissue application in accordance with the rationale set forth in Brenner v. State of Israel, supra.

July 25, 1986 RENE D. TEGTMEYER
Assistant Commissioner for Patents

[1169 OG 38]

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(85) Right of Priority in Patent and Trademark Applications Available in Taiwan

On the basis of a Memorandum of Understanding signed on April 10, 1996, between the American Institute in Taiwan and the Taipei Economic and Cultural Representative Office in the United States, U.S. applicants seeking patent protection in Taiwan may avail themselves of the right of priority based on patent applications filed in the United States, on or after April 10, 1996.

In accordance with the same Memorandum of Understanding, U.S. applicants seeking trademark protection in Taiwan may avail themselves of the right of priority based on applications for trademark registration filed in the United States, on or after December 24, 1993.

To receive the right of priority in Taiwan, applications for patents and trademark registrations must be filed there within such time period from the filing of the first application in the United States, as specified by the laws and regulations of Taiwan. The right of priority, on the basis of reciprocity, is also available to applicants from Taiwan seeking patent protection or trademark registration in the United States.

April 30, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1186 OG 50]

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(86) DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 70635-9174]
RIN: 0651-AA13
Deposit of Biological Materials for Patent Purposes

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending its rules of practice in patent cases to define procedures to govern the deposit of biological materials for patent purposes. Where an invention is or relies on a biological material which cannot be described in writing alone, and access to the biological material is necessary to satisfy the statutory requirements for patentability under 35 U.S.C. 112, these rules prescribe the procedures and conditions for making a deposit that will satisfy these requirements. These rules also preacribe examining procedures that will be used to address deposit issues, and the procedures pertaining to access to a deposit once a patent is granted.
Effective Date: January 1, 1990.
For Further Information Contact: Charles E. Van Horn or Harris A. Pitlick by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information:

Every patent must contain a written description of the invention sufficient to enable a person skilled in the art to which the invention pertains to make and use the invention. Where the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible or repeatable manner, access to the biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. The rules set forth examining procedures and conditions of deposit which must be satisfied in the event a deposit is required to provide the necessary access. The rules do not address the substantive issue of whether a deposit is required under any particular set of facts.

These rules will be effective for all applications filed on or after January 1, 1990, and for all reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Since most of the provisions reflect existing policy and practice, little change to existing practice or burden on applicants for patent and patent owners relying on the deposit of biological material is anticipated. Applicants and patent owners are encouraged to comply with these rules prior to the effective date.

The final rules on the deposit of biological materials for patent purposes have evolved over several years of actual experience in administering the guidelines set forth in Section 608.01(p) of the Manual of Patent Examining Procedure, including several administrative and judicial decisions, and interaction with interested public, bar and industry groups. A draft policy statement on the deposit of biological materials was circulated among interested bar and industry groups and published in the BNA-Patent, Trademark and Copyright Journal on May 22, 1986. An advance notice of proposed rulemaking setting forth rules being considered for deposits of biological material was published in the *Federal Register*, 52 FR 34080 (September 9, 1987), and in the *Official Gazette*, 1082 O.G. 47 (September 29, 1987). Finally, a notice of proposed rulemaking relating to the deposit of biological materials for patent purposes was published in the *Federal Register* 53 FR 39420 (October 6, 1988), and in the *Official Gazette*, 1095 O.G. 47 (October 25, 1988).

In this notice of final rulemaking, a description of the changes in the text of the proposed rules is provided along with an explanation of the reasons supporting the changes. In addition, comments received in response to the notice of proposed rulemaking are analyzed. Finally, an explanation of the content of the final rules is provided, together with a compilation of relevant comments and responses that have been made during the rulemaking process. This explanation and compilation of previous comments and responses will serve as a set of guidelines that will be reproduced in the Manual of Patent Examining Procedure in due course.

Changes in Text of Proposed Rules

Several changes have been made in the text of the final rules from the text of the proposed rules which were published for comment in the notice of proposed rulemaking. Those changes are discussed below.

Section 1.200 as proposed has been renumbered as § 1.801 as adopted and the term "patent purposes" as proposed has been replaced with the term "purposes of patents for inventions under 35 U.S.C. 101" as adopted to clarify that the regulations pertaining to the deposit of biological material do not apply for purposes other than patents for inventions. Thus, these regulations are not applicable to applications for plant patents under 35 U.S.C. 161-164.

Section 1.201 as proposed has been renumbered as § 1.802 as adopted and the term "or Opportunity" in the heading thereof has been inserted after "Need" to reflect the permissive nature of a deposit when not necessary to satisfy 35 U.S.C. 112.

Paragraph (a) thereof as proposed provided that where a claimed invention is or relies on a biological material, the disclosure may include a deposit of the biological material deposited in a depository and under conditions complying with these regulations, provided a precondition was satisfied. The precondition was that the biological material not be known and readily available to the public and not be describable in writing alone. Paragraph (a) as adopted eliminates this precondition, does not require that the biological material be, or be used for, a claimed invention, does not require that the deposit be made

in a depository and under conditions complying with these regulations, and more accurately states that the disclosure may include *reference* to a deposit, since the deposit is not physically part of the disclosure. Paragraph (a) as adopted merely provides that where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

Paragraph (b) of § 1.802 prescribes that biological material need not be deposited unless access to the material is necessary to satisfy 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Proposed paragraph (b) made no reference to 35 U.S.C. 112. Situations where a biological material is known and readily available to the public or can be made or isolated without undue experimentation are now listed as some, but not an exhaustive set, of the circumstances where deposit need not be made. The term "from known and readily available material" has been dropped from the end of the term "can be made or isolated without undue experimentation" as redundant. Paragraph (b) as adopted also prescribes that once deposited in a depository complying with these regulations, a biological material will be considered to be readily available even though some requirement of law or regulation permits access only under conditions imposed for safety, public health or similar reasons. Proposed paragraph (b) did not include the condition of deposit in a depository complying with these regulations.

Proposed paragraph (c) thereof was limited to reference to a specific organism or other biological material in a specification disclosure as not creating a presumption that the material was necessary to satisfy 35 U.S.C. 112 or that a deposit thereof is required. Paragraph (c) as adopted eliminates the term "specific organism or other" as redundant and also includes the act of deposit by an applicant or patent owner as not creating a presumption that the deposit is or was required.

Section 1.202 as proposed has been renumbered as § 1.803 as adopted.

Paragraph (a) thereof as proposed prescribed that a deposit shall be made in any International Depositary Authority (IDA) or any other depository recognized as suitable by the Office. Paragraph (a) as adopted now specifies that such deposits shall be recognized for the purpose of these regulations so as not to preclude deposits made for other reasons such as a gratuitous disclosure. Paragraph (a)(2) as adopted eliminates the requirement in the proposed rule that impartial consultants be from the biotechnology industry or governmental agencies. Paragraph (a)(2) as adopted also contains new sub-subparagraph (vii) as a requirement which a suitable depository must meet, *viz.*, that it promptly notify depositors of its inability to furnish samples, and the reasons why. This requirement appeared, in essence, in proposed § 1.204(a).

Proposed paragraph (b) thereof has not been adopted. Replacement of deposits is governed solely by § 1.805, infra.

Proposed paragraph (c) thereof has been adopted as paragraph (b). In subparagraph (2) thereof, "(b)" has been changed to "(a)(2)" to correct an inadvertent error in the proposed rule.

Proposed paragraph (d) thereof has been adopted as paragraph (c) except that the reference to paragraph (a) has been changed to paragraph (a)(2) to more clearly delineate which category of depository is intended to be covered by this paragraph of § 1.803 and all references to other paragraphs whose designations have been changed by adoption of these rules have been changed accordingly.

Proposed paragraph (e) thereof has been adopted as paragraph (d).

Section 1.203 as proposed has been renumbered as § 1.804 as adopted.

Paragraph (a) thereof prescribed that an original deposit of a biological material may be made before filing an application for patent or, pursuant to a requirement that will be made by the examiner no later than the date the Notice of Allowance and Issue Fee Due is mailed, during peadency of the application for patent. Paragraph (a) as adopted adds a precondition to making an original deposit that the biological material be specifically identified in the application as filed. Since proposed paragraph (a) did not address original deposits made during the pendency of an application that were not made pursuant to a requirement of an examiner, the rule as adopted states that original deposits may be made during pendency of an application for patent, subject to 1.809, *infra*, which prescribes, *inter alia*, when during the pendency of an application for patent a deposit shall be made when made pursuant to a requirement by the examiner.

Paragraph (b) thereof as proposed required a statement that, for an original deposit made after the effective filing date of an application for patent, the biological material deposited was the same biological material described in the application as filed. Paragraph (b) as adopted substitutes the word "a" for the word "the" since more than one biological material may be referred to in the application as filed, drops the word "same" and requires the statement that the biological material deposited is a biological material specifically identified in the application as filed.

Section 1.204 as proposed has been renumbered as § 1.805 as adopted and a reference to supplemental deposits has been added to the heading thereof. Paragraphs (a) and (b) of the section as proposed have been substantially rewritten as paragraphs (a), (b) and (c). New elements have been added and some eliminated, although some elements of the proposed rule on replacement deposits have been adopted, either with similar language or different language.

Elements of the proposed rule on replacement deposits which have not been adopted include a requirement that replacement deposits be made or be made within a specific time limit. Ramifications in Office proceedings from not making a replacement deposit, or in the case of a patent, not diligently making a replacement deposit, are stated.

A requirement in the proposed section that depositories promptly notify depositors of an inability to furnish samples has been adopted as 1.803(a)(2)(vii), *supra*.

Paragraph (a) of § 1.805 requires a depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, to notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making: an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized by the Office unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. The proposed rules did not provide for certificates of correction relating to replacement or supplemental deposits.

Paragraph (b) of § 1.805 prescribes that a request for certificate of correction under this section shall not be granted unless the certificate identifies the accession number for the replacement or supplemental deposit; the date of the deposit; and the name and address of the depository.

Paragraph (c) of § 1.805 preacribes that a certificate of correction under this section shall not be granted unless the request therefor is made promptly after the replacement or supplemental deposit has been made and includes a verified statement of the reason for making the replacement or supplemental deposit; a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited; a verified showing that the patent owner acted diligently - in the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or in the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification; a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

Paragraph (d) of § 1.805 prescribes that a depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) as adopted is identical to proposed paragraph (d) except that the word "the" before "patent" has been replaced with "a" because the term "the patent" had no antecedent basis, and the term "according to these regulations" has been inserted after the word "replaced" to make it clear that the rebuttable presumption according to this paragraph applies only where the replacement deposit has been made according to these regulations.

Paragraph (f) as adopted is substantially similar to proposed paragraph (e) with respect to an applicant's ability to make a replacement for any reason during the pendency of an application for patent. Paragraph (f) extends such applicant's ability to supplemental deposits as well. The first two sentences of proposed paragraph (e) prescribing when a replacement deposit shall be made while an application is still pending and that an applicant notify the Office when a replacement deposit is necessary have been adopted in § 1.805(a), *supra*.

Paragraph (g) as adopted is identical to proposed paragraph (f) except that supplemental deposits are also included and the reference to another section therein has been changed to reflect its renumbering.

Paragraph (h) as adopted is substantially similar to proposed paragraph (g) except for two changes. One is that the word "the" before "biological material" has been changed to "a" because the term "the biological material" had no antecedent basis. The other change is replacement of the term "viable deposit is in the depository" with the term "depository can furnish samples thereof". The term "in the depository" was not clear. The word "viable" before "deposit" would have excluded biological materials not capable of reproduction either directly or indirectly. For biological materials which are so capable of reproduction, samples of viable deposits thereof which become non-viable cannot be furnished by the depository.

Paragraph (i) as adopted modifies paragraph (h) as proposed. Whereas the proposed rule proscribed a patentee from replacing a viable deposit where the depository can furnish samples, the rule as adopted states that the Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

Section 1.205 as proposed has been renumbered as § 1.806 as adopted. The proposed rule had set the term of deposit as, *inter alia*, at least thirty years after the date of a viable deposit. The rule as adopted sets the thirty-year term to begin after a deposit, before or during pendency of an application for patent, is made. The term of a deposit made by a patent owner is not prescribed. However, § 1.805(a), *supra*, prescribes that a replacement or supplemental deposit made in connection with a patent will not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of § 1.805, one of which terms is a verified statement by the patent owner that the term of the new deposit expires no earlier than the term of the deposit being replaced or supplemented. An additional change in the rule as adopted is the replacement of the term "deposited biological material" with the word "deposit" since the former term had no antecedent basis.

Section 1.206 as proposed has been renumbered as § 1.807 as adopted. The rule as adopted is identical to the rule as proposed except for the reference to a rule which has been renumbered.

Section 1.207 as proposed has been renumbered as § 1.808 as adopted.

In paragraph (a) thereof, first word, "The" as proposed has been replaced with "A" because "The" had no antecedent basis.

In view of the non-adoption of proposed § 1.207(c), *infra*, paragraph (a)(2) as adopted refers to only paragraph (b), not paragraphs (b) and (c).

Paragraph (b)(1) as proposed permitted a depositor to require, *inter alia*, that a depository furnish samples only if a request for a sample is in writing and signed.

Paragraph (b) as adopted permits a depositor to require a request to be in writing or other tangible form. The signing requirement, however, has not been adopted.

Paragraph (b)(3) as proposed permitted a depositor to require, *inter alia*, that a depository furnish the depositor with a copy of the request. This requirement has not been adopted.

Paragraph (c) as proposed has not been adopted.

Paragraph (d) as proposed, with one change, has been adopted as paragraph (c). The change is the insertion of the term "made to the Office" after the term "Upon request" to make it clear that certification imposes no burden on a depository.

Section 1.208 as proposed has been renumbered as § 1.809 as adopted.

The term "required" when referring to "deposit" in proposed paragraphs (a), (b) and (c) thereof has been changed to "needed" as adopted for purposes of consistency with § 1.802. The term "in case one has not been made, or" as proposed in paragraph (a) has been replaced with "and if needed," as adopted for purposes of clarification. The statement as proposed that a deposit accepted in any acceptable depository under § 1.202(a) shall be accepted for patent purposes if made under conditions complying with § 1.207(a) has not been adopted. The statement is redundant in view of the provision in § 1.802(b) as adopted that a deposit necessary for the satisfaction of 35 U.S.C. 112 shall be acceptable if made in accordance with these regulations. Since the question of deposits may come up in reissue applications and reexamination proceedings as well as in applications for patents, paragraph (a) as adopted covers examination of all such applications and proceedings. Paragraph (a) as adopted also refers to supplemental deposits since issues of the need for a deposit may arise where a deposit has lost its capability to function as described in the specification. Paragraph (a) as proposed prescribed that affected claims would be rejected in an Office action. Paragraph (a) as adopted drops "in an Office action" and instead prescribes that the claims would be rejected "where appropriate."

Paragraph (b)(1) as proposed was limited to applicants. Paragraph (b)(1) as adopted covers applicants for patents and patent owners involved in specified Office proceedings. The provision for applicants for patents in paragraph (b)(1) as adopted is identical to the provision for applicants in paragraph (b)(1) as proposed except for the additional adoption of a reference to supplemental deposits. Paragraph (b)(1) as adopted additionally provides for patent owners responding to a rejection under paragraph (a) of this section by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805.

Paragraph (b)(2) as proposed has not been adopted. Subparagraph (3) has therefore been renumbered as (2) and the reference therein to paragraph (b)(2) has been eliminated. Two additions have been made. One, since the question of deposit may come up in connection with a reissue application or reexamination proceeding, the term "or patent" has been inserted after "application" in the first sentence. Two, since paragraph (a) provides for a rejection under 35 U.S.C. 112 when a deposit actually made cannot be accepted, it is considered an appropriate response that a deposit actually made should be accepted. Thus, the term "and/or why a deposit actually made should be accepted" has been inserted at the end of the first sentence of paragraph (b)(2) as adopted.

Paragraph (c) as proposed has been adopted except that the term "for patent" has been inserted after "application" in the first sentence to make it clear that this paragraph does not apply to other applications, such as applications for reissues. Additionally, the word "the" before the proposed term "required deposit" has been changed to "a" because the term "the required deposit" had no antecedent basis. Finally, the term "37 CFR" preceding "1.136" in the proposed rule has been replaced with "§" as adopted to be consistent with standard nomenclature.

Paragraph (d)(3) as proposed required a taxonomic description of the deposit. Paragraph (d)(3) as adopted requires a

description of the deposited biological material sufficient to specifically identify it and to permit examination. Paragraphs (d)(1), (d)(2), (d)(3) and (d)(4) have otherwise been adopted exce'pt for the addition of prefatory articles "The" or "A".

Response to and Analysis of Comments

Written comments from sixteen (16) sources were received in response to the notice of proposed rulemaking. Some suggestions made in comments have been adopted as presented or in modified form and others have not been adopted. A detailed analysis of the comments follows.

Comment: The proposed rule numbers, except § 1.200, are the same as those of the old interference rules, and it appears to be Office practice to normally avoid using rule numbers which end in "00," especially for a rule, viz., 1.200, which is the first of a group of rules. The rules, if adopted, should have different numbers.

Response: The suggestion has been adopted. Proposed §§ 1.200 through 1.208 have been renumbered as §§ 1.801 through 1.809 as adopted, respectively.

Comment: Two comments ask whether the rules will apply retroactively. One comment suggests that they should and further, that the benefits provided for depositors in proposed §§ 1.207(b) and (c) take effect immediately so that those patent applicants who would benefit from them will be encouraged not to delay in filing or obtaining a patent until a final rule takes effect.

Response: To the extent the rules codify existing Office practice, they are already effective. Otherwise, the rules will be effective in applications for patent or for reissue of patent filed on or after January 1, 1990, and in reexamination proceedings in which the request for reexamination was filed on or after January 1, 1990, except that deposits made prior to the effective date which are acceptable under current practice will be acceptable in such applications and proceedings. Applicants and patent owners are encouraged to comply now with those requirements of the rules not required by existing Office practice.

Comment: A sentence should be added at the end of proposed § 1.200 to clarify that the rule does not preclude the possibility of depositing other biological materials for patent purposes, such as plants per se, even though not within the scope of the term "biological material" as defined by the rule. Adding such a sentence would be consistent with previous concerns expressed to the Office over the possible requirement for deposits with respect to plant patents. With the added sentence, the rule would not address any kind of requirement for deposit in plant patents.

Response: In a response to a comment in the notice of proposed rulemaking, it was stated that the Office did not intend to propose rules on deposits under the Plant Patent Act (35 U.S.C. 161-164) at this time, nor will the Office take the position that a deposit is required under the present provisions of 35 U.S.C. 162. The text of the rule adopted in § 1.801 is the same as proposed in § 1.200 except that the rule now explicitly states that the regulations are for purposes of patents for inventions under 35 U.S.C. 101. Thus, these regulations do not and are not intended to address the question of deposits in plant patent applications.

Comment: One comment suggests that the language in § 1.200 should be expanded to make it clear that other biological materials, such as plants per se, are not precluded from being deposited. Another comment assumes that the Office intends to limit the scope of "biological material" as defined by this rule. The rules and commentary should indicate that the scope and effect of the rules are limited to biological materials as defined in the rules. This rule is acceptable provided it simply defines what constitutes biological material.

Response: None of the suggestions have been adopted. In a response to a comment in the notice of proposed rulemaking, it was stated that biological material is defined in the proposed rule in terms of a non-exhaustive list of what it includes and that no materials were explicitly excluded. The response also stated that the Office does not contemplate that there would be many situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit under these regulations but that an applicant was not precluded in any given case from attempting to show why such a material should be acceptable. Plants per se are an example of such materials.

Comment: The proposed rules do not, but should, address a problem associated with marine sponges and other marine macroorganisms. These materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment. But their taxonomy is in a developmental stage and scientific names are subject to revision. Deposit and maintenance of these materials in viable form is not practical. They can and have been deposited in non-viable form, preserved or fixated in a suitable non-destructive medium, where their shelf life is expected to be at least 30 years.

Response: See the response to the previous comment. As stated in a response to a comment in the advance notice of proposed rulemaking, the PTO Board of Patent Appeals and Interferences held that a description of the precise geographic location of marine tunicates used in a claimed invention was adequate to satisfy the enablement requirement of 35 U.S.C. 112. *Ex Parte Rinehart*, 10 USPQ2d 1719 (PTO Bd. Pat. App. & Int. 1985). It was also stated in that response that the term "readily" as used in the term "known and readily available" appearing in the proposed rules is considered appropriate to define that degree of availability which would be reasonable under the circumstances. Since the comment states that the subject materials and their natural location can be adequately described so that one skilled in the art could obtain them using the necessary equipment, the disclosure would appear to be sufficient to meet the enablement requirements of 35 U.S.C. 112 without a deposit so long as their degree of availability is reasonable under the circumstances.

Comment: In a response to a comment in the notice of proposed rulemaking which was in response to a solicitation for comments in the advance notice of proposed rulemaking on the setting of an appropriate minimum number of seeds to ensure availability of the seed through the enforceable life of the patent, it was stated that the Office does not intend to propose rules quantifying a minimum number of seeds but that the Office will consider 2500 to be a minimum number in the normal case and will provide an applicant an opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. One comment suggests that 2500 may present problems where the normal yield of a plant is only a few seeds. A more reasonable minimum is 1250. Another comment suggests that there be no minimum number but an obligation on the part of the depositor to replace a seed each time one is requested.

Response: Since the Office has stated that an applicant will be provided an opportunity to show why a lesser amount than 2500 seeds would be appropriate in a particular case, the policy of requiring minimum number of 2500 is adhered to. An obligation on the part of the depositor to replace a seed each time one is requested is simply impractical.

Comment: The title of proposed § 1.201 should be changed from "Need to make a deposit" to "Opportunity to make a deposit" since the provision states that "the disclosure may include a deposit of a biological material . . . ."

Response: The suggestion has been adopted in part. Since § 1.802 applies to situations both when a deposit may be made (optional) and when a deposit is necessary, the heading of the rule states both need and opportunity in the alternative.

Comment: Proposed § 1.201(a) should state that the disclosure may include reference to a deposit, rather than that the disclosure may include a deposit.

Response: The suggestion has been adopted in § 1.802(a).

Comment: Proposed § 1.201(a) does not clearly permit deposits where conditions enumerated therein do not apply. The proposed rule should be revised by eliminating the requirement that the biological material not be known and readily available to the public before a deposit may be made. The proposed revision would make clear that an applicant has a universal and unconditional right to make a deposit of a biological material whenever the biological material cannot be described in writing alone, regardless of whether the material is known and readily available. The rule as proposed is not consistent with the permissive use of deposits where they might not be mandated. The proposed revision would dispel any suggestion or implication that the legal standard under which deposits are mandated is that the biological material be neither known nor readily available. Obviously, such materials even if unknown and not readily available might be enabled solely through a written description, rendering deposit unnecessary.

Response: The suggestion has been adopted in § 1.802(a). In addition, the rule as adopted permits deposits even where the biological material can be described in writing alone and even where the claimed invention is not, or does not rely on, the biological material. Section 1.802(a) as adopted permits reference in the disclosure to a deposit of a biological material, the only precondition being that an invention is or relies on that material. The requirement in the proposed rule that the biological material not be known and readily available to the public and not be describable in writing alone, and that the material be, or be used for, the claimed invention, has notbeen adopted.

Comment: Two comments suggest that § 1.201(a) refer to 35 U.S.C. 112. One comment suggests that § 1.201(a) should make some reference to 35 U.S.C. 112 for completeness. Another comment suggests that proposed § 1.201(a) contains no standard and should thus make reference to 35 U.S.C. 112, for example, by inserting words to the effect that the biological material cannot be described in writing alone to satisfy the requirements of 35 U.S.C. 112.

Response: The suggestions have not been adopted. *But see* the response to the next comment.

Comment: Proposed § 1.201(b) should be revised by stating that biological material need not be deposited unless necessary for the satisfaction of the statutory requirements of 35 U.S.C. 112. Thus, the rule would state that the ultimate reason for a requirement for a deposit would be to satisfy 35 U.S.C. 112. Further, the rule should state one circumstance, among others, where a biological material need not be deposited, viz., where it is known and readily available to the public or can be made or isolated without undue experimentation. The last sentence of proposed § 1.201(b) should state a precondition that a deposit of the biological material be made in a depository complying with these regulations.

Response: The suggestions have been adopted in § 1.802(b).

Comment: Proposed § 1.201(c) should be revised by stating that the actual deposit of a biological material referred to in a specification disclosure also does not create a presumption that the material is necessary to satisfy 35 U.S.C. 112 or that the deposit is or was required. The proposed revision would recognize that the act of deposit does not and should not constitute an admission by the applicant that the deposit was made because it was necessary to satisfy 35 U.S.C. 112. For example, deposit may be necessary in the United States prior to the time a patent application is filed in order for an applicant to be entitled to assert a priority right under patent laws of a foreign country based on a United States application which makes reference to such deposit. Additionally, applicants ought to be encouraged to make deposits in questionable cases without such act being construed as an admission of any sort.

Response: The suggestion has been adopted in § 1.802(c).

Comment: The term "or other biological material" in proposed § 1.201(c) should be changed to "or any other biologial material" to make sure that all biological materials that would normally be considered for deposits are included.

Response: The comment is not understood. Nevertheless, it is moot. The term "specific organism or other biological material" in proposed § 1.201(c) has been changed to "biological material" in § 1.802(c) as adopted.

Comment: Two comments suggest that proposed § 1.202(a)(2) unnecessarily limits who may be consulted in determining the suitability of a depository to be recognized by the Office to those in the biotechnology industry or Government agencies. Views from academia may be wanted. One of the comments suggests, therefore, that the term "from the biotechnology industry or governmental agencies" be deleted from § 1.202(a)(2).

Response: The suggestions have been adopted in § 1.803(a)(2).

Comment: Proposed § 1.202(a) should be revised to state that a deposit shall be recognized for the purposes of these regulations if made in a depository according to subparagraph (1) or (2) thereof. The proposed revision would allow for deposits other than in Office-recognized depositories, but give deposits in Office-recognized depositories the "safe harbor" advantages of these regulations.

Response: The suggestion has been adopted in § 1.803(a). Simply put, the rules do not prohibit deposits made under any conceivable conditions. The Office will treat a deposit not made according to these regulations, however, as if no deposit had been made.

Comment: The provision set forth in proposed § 1.202(c)(3), i.e., that a depository seeking status under paragraph (a)(2) indicate that it intends to be available, for the purposes of deposit, to any depositor under these same conditions, should also be listed in § 1.202(a)(2), which enumerates the qualifications for a depository seeking recognition as suitable by the Office.

Response: The suggestion is not being adopted. The requirement in proposed § 1.202(a)(2)(v), and § 1.803(a)(2)(v) as adopted, that the depository be impartial and objective, is inclusive of a requirement that it be available, for purposes of deposit, to any depositor under these same conditions.

Comment: One comment suggests that the proposed rules do not adequately define the term "depositor". It could be the inventor, the assignee, one to whom the inventor has an obligation to assign, or the individual who signs the deposit form. In the case of joint inventors with different institutional ties, who is the depositor? Assuming that where the inventor is a university professor, the depositor is the university, deposit in that university's depository would be precluded by proposed § 1.202(a)(2)(ii) and possibly 1.202(a)(2)(v). An exception should be made for non-profit organizations. They should be allowed to "self-deposit" since it is highly improbable that they would refuse to provide samples to third parties. The availability of a strain from a university was found to satisfy 35 U.S.C. 112 in *Merck and Co., Inc. v. Chase Chemical Co.*, 273 F.Supp. 68, 77, 92, 155 USPQ 139, 146, 159 (D.N.J. 1967). Another comment suggests that it is not clear, where the depositor is a separate, independent division of a particular entity and the depository is another separate, independent division of the same entity, whether this arrangement meets the terms of proposed § 1.202(a)(2)(ii).

Response: None of the suggestions have been adopted. In § 1.803(a)(2)(ii) as adopted, a depository recognized to be suitable by the Office and not otherwise an IDA must exist independent of the control of the depositor. In a response to a comment in the notice of proposed rulemaking, it was stated that the term "depositor" is intended to include the party on whose behalf the deposit is made. It was further stated in that response that the rationale of the Office in requiring that a depository, if not an IDA, be independent of the depositor was adequately discussed in the advance notice of proposed rulemaking. The advance notice stated:

> The concept of an independent depository or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or an internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the free access to the biological material for any purpose once the term of the patent expires. Further, while the PTO is constrained to approve independent depositories other than an IDA, the PTO has neither the resources nor capability to assess the individual capability of any party that wishes to act as its own depository. The rules under consideration are intended to minimize depositories that will be found acceptable.

The above discussion applies to non-profit organizations as well as for-profit organizations. Moreover, it is clear from the discussion above that the scope of the term "depositor" is limited only by the requirement that the depositor have *no control* over the depository. Such a relationship is not necessarily inconsistent with one where there is some legal relationship between depositor and depository. The *Merck* case cited above does not stand for the proposition that a university is necessarily an acceptable depository because it makes available samples of a biological material. In *Merck*, the availability of the biological material from the university was evidence that the biological material was known and readily available. While a deposit by an applicant in a depository under the applicant's

control will not be recognized by the Office as a deposit under these regulations, an applicant is not precluded from showing that the deposited material, by virtue of conditions of public knowledge of unrestricted availability of samples of the deposit, is known and readily available to the public. However, depositors should be aware that relying on such a showing rather than making a deposit according to these regulations involves a risk that the biological material might in the future not be readily available. The university relied on in the Merck case, for example, eventually ceased its practice of making biological materials readily available.

Comment: Proposed § 1.202(b) is intended to apply in the event that a depository ceases to enjoy the status of a recognized depository. The manner of making a substitute deposit in such a situation would not seem to be fully explained by a reference to proposed § 1.204. For example, if a depository were to cease operation, it might not be able to, in the words of proposed 1.204(a), "promptly after having noted its inability to furnish samples, notify the depositor of such inability". Second, the rule as proposed is difficult to follow. For example, it indicates that a substitute deposit "must be viable if the biological material is of a kind capable of self-replication". The implication that certain deposits might be non-viable is at best confusing in the absence of a definition for viability.

Response: Proposed § 1.202(b) has not been adopted. Section 1.805, the rule as adopted on replacement deposits, puts the burden exclusively on the applicant or patent owner, whatever the case may be, to both make a replacement deposit and make the necessary showing that such a deposit complies with these regulations. Viability is dealt with exclusively by § 1.807 as adopted.

Comment: Three comments suggest that it be a requirement of the rules that the biological material have been in existence at the time of filing the patent application. One comment suggests that a sentence be added to proposed 1.208(a) to require that the application as filed state that the biological material is in existence. The other comments suggest that proposed § 1.203 require an averment that the deposited biological material was in existence at the time the application was filed.

Response: None of the suggestions have been adopted. Patent law does not require an actual reduction to practice as a condition precedent to filing a patent application. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. *But see* the response to the next comment.

Comment: Proposed § 1.203(a) should require that a biological material may be deposited only if an adequate antecedent basis exists in the specification as filed, i.e., the biological material to be deposited must be specifically identified therein.

Response: The suggestion has been adopted in § 1.804(a). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup* 517 F.2d 1351, 1355, 186 USpQ 108, 113 (CCPA 1975), *cert. denied*, 424 U.S. 912 (1976). *Accord, In re Lundak*, 773 F.2d 1216, 1221, 227 USPQ 90, 94 (Fed. Cir. 1985).

Comment: Two comments suggest that proposed § 1.203(a) be revised so that it addresses the permissible situation where a deposit is made during the pendency of an application for patent not pursuant to a requirement made by an examiner.

Response: The suggestion has been substantially adopted in § 1.804(a). An original deposit may be made, subject to § 1.809, during pendency of the application for patent. Where § 1.809 does not apply, i.e., where a deposit is ultimately not required, a deposit may be made at any time during pendency.

Comment: The Office should discuss in the commentary accompanying the notice of proposed § 1.203(b) as a final rule the meaning and intent behind the requirement that the deposited biological material be the "same" as the material described in the specification. For example, does the Office contemplate that the statement constitute a representation that the deposited material is in essentially the same form as was in existence at the time of the filing of the patent specification, and, accordingly as specifically described therein?

Response: Proposed § 1.203(b) has been adopted as § 1.804(b) but with the word "same" deleted and the term "described" replaced with "specifically identified." Under § 1.804(b), the biological material deposited must be a biological material specifically identified in the application as filed.

Comment: One comment asks whether a patent which is defective because of the lack of a deposit can be rectified by making the deposit in connection with a reissue application. Another comment points out that the issue of post-grant original deposits is not addressed by these regulations and the Office is urged to comment to this effect in the final promulgation of the rules.

Response: It is assumed from the comment that a deposit was necessary at the time the patent issued. A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. See *In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA), *cert. denied*, 429 U.S. 977 (1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is not addressed by this response. Nor do the rules address the question of post-issue original deposits, whether necessary or not to comply with the patent statutes.

Comment: Many comments were received regarding proposed § 1.204 and the subject of replacement deposits. One comment suggests that the time limits in proposed § 1.204(a) for making replacement deposits, specifically as they apply post-grant, are totally arbitrary. For example, a replacement deposit made four months after notice from the depository, without a suitable petition for extension of time, could not be relied on. A number of comments suggest that in proposed § 1.204(a), it is not clear who is required to petition whom in order to obtain an extension of time' in which to make a replacement deposit. A depository is not equipped to deal with the legalities of such matters. If the petition is filed with the Office, there will be administrative burdens. Another comment suggests that instead of specified time limits and petitions for extensions of time, the rule should state that where a patentee makes a replacement deposit, the patentee shall promptly request a certificate of correction identifying the particulars of the replacement deposit and that no certificate of correction shall be granted unless the request includes, *inter alia*, a verified showing that the patentee acted diligently in making the replacement deposit. A certificate of correction in providing the particulars of the new deposit (depository and accession number) would provide the simplest and most straightforward vehicle under which the patentee could assure continuing public notice (and accordingly public access) to particular biological materials described in the specification. Corrections to the issued patent would be made subject to all conditions of these deposit regulations and an additional specific requirement that the replacement deposit be made diligently after the notification is received that samples cannot be furnished from the deposit. This generalized requirement of diligence is preferable to the more rigid and cumbersome procedures set forth in the rules as proposed.

Response: The provisions of a three-month time limit for making a replacement deposit and petitioning for extensions of time t extend the limit in proposed § 1.204(a) applied by their terms only to patentees or patent owners. These provisions have not been adopted. Except in reexamination and reissue applications, it is beyond the rulemaking authority of the Office to regulate issued patents. Thus, instead of requiring patent owners to make replacement, or supplemental, deposits and to make them within a specified time, or to require them to request certificates of correction, paragraphs (a), (b) and (c) of § 1.805 as adopted specify that a replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be recognized in any Office proceeding unless the patent owner requests a certificate of correction under § 1.323 provided certain specified conditions are met, including that the patent owner acted diligently in making the replacement or supplemental deposit and promptly thereafter requested the certificate of correction.

Comment: The rules should indicate that replacement deposits made during the pendency of an application will be

treated in exactly the same way as any other deposit made after the filing date.

Response: The suggestion has been essentially adopted in § 1.805(a) which states, *inter alia*, that a replacement or supplemental deposit made in connection with an application for patent shall be accepted if it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b).

Comment: The rules should address a situation where the deposit is of a non-viable biological material, such as a marine sponge or other marine macroorganism. Filling requests for samples can ultimately consume the entire deposit. Two other comments suggest that a depositor be permitted to charge the requesting party a fee sufficient to cover the cost of replacing the deposit. A competitor could "drain off" the store of deposit and thereby require replacement at significant economic hardship to the depositor.

Response: Where the biological material deposited is capable of self-replication either directly or indirectly, exhaustion of the deposit would appear to be highly unlikely. Regardless of the type of biological material deposited, however, the depositor must assure that samples thereof be available beyond the enforceable life of any patent relying on the material.

Comment: Nothing in the regulations which define the suitability of a depository requires that the depository itself must provide notice to depositors in the event of an inability to furnish samples yet proposed 1.204(a) does.

Response: The suggestion has been adopted in § 1.803(a)(2)(vii).

Comment: A number of comments suggest that the legal ramifications of an additional deposit made pursuant to proposed § 1.204(h), i.e., made where an earlier deposit has become contaminated or has lost its capability to function as described in the specification, are not clear. Some of the same comments go on to suggest that the deposit provided for in § 1.204(h) be termed a "supplemental" deposit rather than an "additional" deposit to emphasize the relationship between it and the earlier deposit, that such a deposit have the same legal effect as the earlier deposit provided the patent holder provides a verified statement that it is identical to the earlier deposit, and that it have the same accession number as the earlier deposit, perhaps with a suffix modification. One comment suggests that the rules require that a deposit under paragraph (h) be assigned the same accession number but with an appropriate suffix. A depository commentator asks that where a deposit under paragraph (h) is made, which deposit — the earlier or the later one — should be made available to the public. Currently, this depository advises a requesting party that there are two deposits.

Response: The suggestion of replacing the term "additional" with the term "supplemental" has been adopted but in a somewhat different setting. Whereas proposed § 1.204(h) stated that nothing in the regulations was intended to prohibit a patentee from making an additional deposit, paragraphs (a), (b), (c), (f) and (g) of § 1.805 as adopted provide for patent owners as well as patent applicants making supplemental deposits of a biological material earlier deposited from which a depository can still furnish samples. These paragraphs provide for supplemental deposits similar to the provisions in these paragraphs for replacement deposits, including the requirement of showing diligence in making the deposit in connection with a patent, except that instead of making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, as in the case of a replacement deposit, the deposit is made after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification. While the rules specify that the Office in any Office proceeding will recognize supplemental deposits if made under certain conditions, it is not known what legal effect a court will give to such recognition. As far as what accession number a depository should give to a supplemental deposit, this is a matter within the discretion of the depository. As to which deposit, either an earlier deposit or a supplemental deposit, should be made available to the public, this would depend on the accession number requested. A supplemental deposit made according to these regulations would be freely available to the public to the same extent as an original deposit made according to these regulations. Obviously, nothing in these regulations prohibits a depository from advising a requesting party that there is more than one deposit of a particular biological material.

Comment: To the extent proposed § 1.204 regulates the effects on patents, in other than certain statutorily defined situations such as reexamination and reissue, for failure to make replacement deposits according to the rule, it exceeds the rulemaking authority of the Office. An example is proposed 1.204(c).

Response: Section 1.805 as adopted, to the extent it addresses replacement deposits made by patent owners, contains no affirmative provisions requiring or prohibiting replacement deposits. Rather, it prescribes what an applicant or patent owner may do vis-a-vis the Office if a replacement deposit is made and what the ramifications are in any Office proceeding if a replacement deposit is not made or improperly made. Proposed § 1.204(c) was, and § 1.805(d) as adopted is, limited to Office proceedings. The provision that a patentee may not replace a viable deposit where the depository can furnish samples in proposed 1.204(h) has been replaced in § 1.805(i) as adopted with the provision that the Office will not recognize in any Office proceeding a replacement deposit made by a patent owner where the depository could furnish samples of the deposit being replaced.

Comment: One comment suggests that the term of deposit in proposed § 1.205 is excessive. The term should be through the expiration of the patent plus 10 years. Another comment suggests that § 1.205 be adopted except that the last sentence should be deleted and the term "viable" before "deposit" be dropped. The term "visble" should be deleted as viability is dealt with elsewhere, e.g., proposed § 1.206. The last sentence should be deleted because, while the Office may set what it considers adequate terms of deposit on or before patent grant, it has no statutory authority or mechanism for supervising the term of the agreement of the deposit. The last sentence is also highly indefinite in failing to indicate how far beyond the enforceable life of a patent the deposit must be maintained.

Response: The suggestions have been adopted in part. Proposed § 1.205, including the last sentence, has been adopted as § 1.806 except that the thirty-year term applies to any deposit made before or during pendency of an application for patent. No requirement of viability is stated in the rule. The Office agrees that once a patent issues, it has no authority or mechanism for supervising the term of the agreement of the deposit. But the Office does have the authority to set the term of deposit while an application is still pending. That is all § 1.806 does. In almost all cases, the term of deposit as set forth in the first sentence of § 1.806 will extend beyond the enforceable life of the patent for which a deposit was made. The last sentence of § 1.806 is intended to cover those rare circumstances where extended prosecution in the Office results in expiration of the term of deposit as set forth in the first sentence while the patent is still enforceable. At this time, there appears to be no need to specify any finite time period beyond the enforceable life of a patent. If experience demonstrates that the public interest is not being served by the present provisions, an appropriate amendment will be proposed.

Comment: A depository commentator suggests that the requirement in proposed § 1.207(b)(1) that a request for a sample of the deposited material be signed poses an administrative burden on depositories which accept telephone, telex and electronic mail requests for samples. Requiring that a request be signed can and will delay the receipt of samples by many days. The signing requirement should not be adopted.

Response: The suggestion has been adopted in § 1.808(b)(1).

Comment: A depository commentator suggests that the requirement in proposed § 1.207(b)(3) that a copy of the request be provided to the depositor poses a problem since most requests also include a request for samples of many other deposited biological materials. For such a request, it would be necessary to send a copy to each depositor, blanking out the other deposits not made by that depositor. It should be sufficient that the depositor is notified to whom and the date a sample was provided. The cost will be much greater if a copy has to be supplied.

Response: The suggestion has been adopted in § 1.808(b)(3).

Comment: A depository commentator suggests that in proposed § 1.207(b), it is not clear, after the term of the patent, whether the deposit is again restricted as it was before the patent was granted, i.e., not furnished unless the requesting party has the proper authorization from the depositor or the Commissioner, or whether the deposit is no longer subject to

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subparagraphs (1), (2) and (3) thereof and can be furnished without any specific identification or notification. It is suggested that either a statement be added as to what happens after the term of the patent or the term "during the term of the patent" be deleted.

Response: The suggestions have not been adopted. Section 1.808(a)(2) requires that subject to paragraph (b) thereof, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. Paragraph (b), by its terms, is limited to the term of the patent. A contract between a depositor and a depository according to paragraph (b) but which extends beyond the term of the patent would violate paragraph (a)(2). It should be self-evident that for deposits in compliance with these regulations, samples of the deposit may be furnished without any specific identification or notification for requests made after the term of the patent.

Comment: While many comments suggest adoption of a rule restricting the transfer of a sample of a deposited material to a third party without the depositor's permission, such as proposed § 1.207(c), as well as the adoption of a rule requiring other restrictions on access to deposited material, two comments suggest that such rules not be adopted. The rationale is that if a deposit is basically a replacement for that which could not be adequately written in the patent specification itself, no specific statutory authority exists for restricting access to the deposited material any more than the patent law would countenance restrictions on access to the written description itself. If abuses exist by virtue of the absence of limitations on access to deposited materials, then the remedy for patent infringement is as applicable to deposited material as it is to infringers acting from knowledge of the written description itself. Accordingly, unrestricted access to deposits should be allowed. One of the comments suggests further that if there are to be some restrictions to access, proposed § 1.207(c) is otherwise problematic and ineffective. For example, the limitation on access applies to "derived" materials which could include wholly noninfringing derivatives which might themselves constitute a patentable invention of a third party requester. The proposed rule would deny the third party requester the right to what ought to be an unrestricted right to sell or otherwise dispose of this derivative material to third parties. Moreover, the proposed rule is remediless since the Office neither has continuing jurisdicton over the patentee nor a third party requester. Two depository commentators expressed reservations about proposed 1.207(c). One suggests that the first sentence therein is in direct contradiction to the long-standing policies of both NRRL and ATCC. Most depositories no longer require this type of guarantee from requesting parties as they find it almost impossible to enforce. The other suggests that the administrative burden to the depository in handling agreements made pursuant to the proposed rule will be great and the cost will be borne by the depositor. At $10 an agreement and 300 requests a year for a particular deposit, the cost to the depositor would be $3,000 a year. If § 1.207(c) is adopted, there should be some mention that if a depository charges a fee for this service, the fee must be paid or the depository will not be obligated to provide the service. In the European Patent Office (EPO), which has a similar provision, the EPO, not the depository, obtains the agreement and advises the depository to make the sample available. The comment asks if the Office is prepared to do this. Additional comments ask what rules govern a new deposit for patent purposes of the same or derived biological material by a requesting party if the substance of proposed § 1.207(c) is adopted. Some comments were in response to a solicitation in the notice of proposed rulemaking for alternative approaches and suggested appropriate definition of "essential characteristics" with respect to derived material in proposed § 1.207(c).

Response: The Office has decided not to adopt a rule permitting a depositor to require that a sample of a deposited biological material shall be furnished only if the requesting party has agreed not to make the material or a derivative thereof available to a third party without the depositor's permission. Thus, proposed § 1.207(c) has not been adopted. The Office agrees with many of the comments about shortcomings in the proposed rule. Fundamentally, however, the proposed rule has not been adopted in view of the rationale stated in the comment that no greater restriction on access to a deposit should be permitted than is permitted on access to the written description itself, even considering that the practical value of access to a deposit may be substantially greater than access to the written description and that infringement may be more difficult to police. While it might be argued that the adoption of proposed § 1.207(b) with revisions as § 1.808(b) is inconsistent with this rationale, the Office believes that permitting the depositor to require a requesting party, in essence, to identify itself is not unreasonable under the circumstances and is consistent with international practice as embodied in the Budapest Treaty.

Comment: Many comments which suggest the adoption of the substance of proposed § 1.207(c) also suggest the adoption of rules incorporating the recommendations made in the April 8, 1987 World Intellectual Property Organization (WIPO) report on the Industrial Property Protection of Biotechnological Inventions (1) to use the biological material only for experimental purposes concerning the invention, and (2) not to export the biological material except to a country for which a relevant patent has been granted. The reasons generally given were that it is necessary to protect the patentee and enhance the patentee's ability to enforce a patent relying on a deposited material. One comment suggests that incorporating the recommendation on experimental use would clarify what is permitted by law. In the Notice of Proposed Rulemaking, 53 Fed. Reg. at 39423-24, the Office described the difficulties in drafting a regulation incorporating these recommendations and requested specific suggestions as to how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law. No specific suggestions were received, although one comment suggests that where a deposited material is covered by an unexpired U.S. patent, a rule be adopted permitting the depositor to require the requesting party to agree to comply with the provisions of 35 U.S.C. 271. Another comment suggests that legislation is necessary to deal with the problems addressed by the WIPO recommendations. A restriction against exports could be considered to be violative of 35 U.S.C. 112 since foreign requesters would be denied access to deposits where a patentee had never sought foreign patent protection. A restriction to experimental purposes only, while more justifiable, raises two problems. One is that "experimental purposes" have not been defined and the term has been open to several interpretations. The other is that the proper redress for non-experimental use is a suit for patent infringement, not a suit based on the requester's promise to the depo comment suggests that a rule be adopted permitting the depositor to require that a requesting party acknowledge that the furnishing of a sample of the deposited biological material does not constitute a license, express or implied, to use that sample for any purpose.

Response: None of the suggestions have been adopted for essentially the same rationale discussed in the response to the previous comment. None suggest how to draft a regulation which both accomplishes the intended purpose and is not inconsistent with law, and which provides a compelling justification and rationale for departing from present policy and practice. The suggestion that a requesting party agree to comply with 35 U.S.C. 271 as a condition precedent to obtaining a sample of deposited biological material is interpreted as an agreement not to infringe a corresponding valid patent, something which a requesting party is already bound not to do under law. The suggestion that a depositor be permitted to require a requesting party to acknowledge that there is no express or implied license to use a sample for any purpose exceeds the rulemaking authority of the Office since certain unlicensed uses of patented subject matter have been found by the courts to be permissible.

Comment: Many of the comments suggesting adoption of the substance of § 1.207(c) and/or the WIPO recommendations on experimental use and export also suggest adoption of rules permitting additional restrictions. One comment suggests requiring the recipient of biological material to report, at least annually, to the patent holder, on the research and other results obtained by use of the biological material. The same commentator suggests that even after patent expiration, an unlicensed recipient should not be permitted to use the biological material for other than experimental purposes absent agreement from the depositor. The commentator would prohibit commercial use of the biological material without permission of the depositor. Another comment suggests that the policy consideration for permitting deposits is to insure that the patented invention can be practiced after patent expiration. Requiring a requesting party to enter into an agreement with the depositor defining

the terms and conditions under which a sample of the deposited material would be used making an accounting of such use, and proof of compliance, is neither unreasonable nor contrary to law. It would not place an administrative burden on the Office since the depository could be permitted to release samples only if the requesting party signs a license. Any attempt by the depositor to impose an unlawful restriction and withhold release would be a matter for the courts, not the Office. Another comment suggests various additional restrictions be adopted. These are (1) that the requesting party have residence in the U.S. or in the country where the depository is located, if different; (2) that the patentee be given the option to restrict furnishing of samples to independent experts only for the duration of the patent; and (3) that the deposit be released only if the depositor expressly consents (in the absence of which validity of the patent must be resolved without recourse to the deposit). Restriction (1) should be adopted so that the deposit cannot be legally exported to a country where the patent owner has no enforceable rights. Restriction (2) should be adopted to prevent access of the deposited material to potential infringers. Its adoption should be coupled with a statement that a deposit released to an expert shall be regarded as being available to the public. Restriction (3) should be adopted as an extension to the description in proposed § 1.201 that the disclosure "may include a deposit." In other words, the patentee at any time during the patent term should be able to rely on the written description alone for satisfying 35 U.S.C. 112, such as where the reasons for requiring a deposit originally no longer exist.

Response: None of the suggestions have been adopted for essentially the same reasons discussed in the responses to the previous two comments.

Comment: A depository commentator suggests that proposed § 1.207(d) needs further deliberation. Now, publication in a U.S. patent of a deposit and accession number is sufficient for that depository (ATCC) to make samples available. The Office should be prepared to receive several thousand requests for certification under § 1.207(d) if adopted. If the Office is going to certify the availability of deposits, it should certify the availability of all deposits. Easier than the proposed rule would be to include a statement in the patent that there is a deposit, its accession number and where it is deposited, and that it has been made under the condition that it is available upon publication of the issued patent.

Response: The suggestion has not been adopted. The comment appears to be interpreting the term "Upon request" at the beginning of proposed § 1.207(d) to mean "Upon request to a depository for a sample of a deposited material", or in other words, the commentator appears to have interpreted the proposed language as requiring the depository to request certification from the Office each time a request for a sample of a deposit is made. It was not intended to impose such a burden on depositories. Rather, it was intended that the term "Upon request" refer to a request made to the Office. Therefore, proposed § 1.207(d), revised by inserting the term "made to the Office" after "Upon request", has been adopted as § 1.808(c).

Comment: One comment suggests that there is no apparent reason for the use of the different words " [e]stablishing" and "[a]rguing", in proposed paragraphs (b)(2) and (b)(3), respectively, of § 1.208 since the same meaning is intended by each. Either word alone should be used in both subparagraphs (2) and (3). The same comment goes on to suggest that the reference to paragraph (b)(2) in the last sentence of proposed § 1.208(b)(3) is redundant since the examiner may be convinced that a deposit is not required where the applicant has established that the involved biological material is known and readily available to the public. A comment along the same lines suggests that paragraph (b)(2) is unnecessary. As a purely logical matter, an applicant ought to be entitled to reply to a rejection either by making an acceptable deposit or arguing why a deposit is not required under the circumstances. Proposed 1.208(b)(2) is merely one possibility for an argument that a deposit is not required.

Response: The suggestions have been adopted. Proposed § 1.208(b)(2) has not been adopted and proposed § 1.208(b)(3) has been substantially adopted as 1.809(b)(2). In addition, § 1.809(b)(2) provides for examination with respect to a patent, since deposit issues may arise in connection with a reissue application and/or a reexamination proceeding, and provides also for an argument that a deposit actually made should be accepted.

Comment: A number of comments suggest that the term "taxonomic description" in proposed § 1.208(d)(3) is unclear and inappropriate in some cases. One comment suggests that it is not clear how complete a description is required. If construed in its broadest sense, it could have the undesirable effect of delaying filing of an application until taxonomic characteristics have been determined. Some biological materials within the scope of the proposed rules, such as plasmids, are not susceptible of taxonomic description. The requirement that the specification contain a taxonomic description should not be adopted since such a description may not be possible and since the availability of a deposit makes such a description superfluous, since the taxonomy is inherent in the deposit. The response to comments made earlier regarding the taxonomic description requirement is inconsistent with the proposed rule. The response states that the extent to which a taxonomic description is required will depend on the facts of the case yet the proposed rule states that the specification *shall* contain such a description. The response states that the taxonomic description must be sufficient for purposes of 35 U.S.C. 112 yet the requirement of a deposit presupposes that a written description alone will not satisfy the statute. The need to verify that the deposited biological material is that disclosed in the specification arises only when the deposit is made after the filing date. That situation can be dealt with by deleting the taxonomic description requirement from § 1.208(d) and adding a new subparagraph (e) which would provide that in cases where a deposit is made after the filing date and where the nature of the material permits, a taxonomic description is required in addition to the items specified in subparagraph (d). Another comment suggests that the term "taxonomic" be deleted since it is irrelevant to many types of deposits and would provide greater clarity to the rules. Another comment suggests that the current language in proposed § 1.208 (d)(3) be replaced with "Fully identify and describe the deposited material".

Response: The suggestions have been adopted in part. Section 1.809(d)(3) as adopted requires a description of the deposited biological material sufficient to specifically identify it and to permit examination. While the rule does not by its terms require a taxonomic description, such a description should satisfy the rule as adopted in cases where the biological material deposited admits of a taxonomic description.

Comment: The Office should petition the Budapest Assembly to address the same issues dealt with in the proposed rules so that they apply to both U.S. and foreign filings. Uniformity in the rules is important, especially for U.S. inventors who file here and abroad.

Response: While uniformity in both U.S. and foreign rules is desirable, this is not deemed to be the appropriate forum in which to address the suggestion.

Discussion of Specific Sections

BIOLOGICAL MATERIAL [§ 1.801]:

The section indicates that the rules pertaining to deposits for purposes of patents for inventions under 35 U.S.C. 101 are intended to relate to biological material. For the purposes of these rules, the term "biological material" is defined in terms of a non-exhaustive list of representative materials which can be deposited in accordance with the procedures defined in these rules. Since these rules are intended to address procedural matters in the deposit of biological material for patent purposes, and are not designed to decide such substantive issues such as whether a deposit of a particular organism or material would be recognized or needed to be made for the purposes of satisfying the statutory requirements for patentability under 35 U.S.C. 112, the definition provided in this section is intended to be permissive - specifically defining materials which can be deposited.

Biological material includes material that is capable of self-replication either directly or indirectly. Direct self-replication includes those situations where the biological material reproduces by itself. Representative examples of materials capable of self-replication are defined in the rule. Indirect self-replication is meant to include those situations where the biological material is only capable of replication when another self-repli-

cating biological material is present. Self-replication after insertion in a host is one example of indirect self-replication. Examples of indirect replicating biological materials include viruses, phages, plasmids, symbionts, and replication defective cells. The list of representative examples of each type of replicating material includes viruses to demonstrate that the lists are not intended to be mutually exclusive.

Although plant material is included within the scope of the definition of biological material for purposes of patents for inventions under 35 U.S.C. 101, these rules on deposits are not applicable to applications filed under the Plant Patent Act (35 U.S.C. 161-164). The Office is of the view that a deposit is not required under the present provisions of 35 U.S.C. 162. Thus, no plant patent granted under the provisions of 35 U.S.C. 161-164 need be supported by a deposit. As with other biological material deposited for purposes of patents for inventions under 35 U.S.C. 101, the deposit of plant material together with the written specification must enable those skilled in the art to make and use the claimed invention.

As with some types of reproducible biological material, seeds can be reproduced only after a growing season which may be relatively long. Although the rules do not specify a specific number of seeds to be deposited to meet the requirements of these rules, the Office will consider 2500 to be a minimum number in the normal case, but will give an applicant the opportunity to provide justification why a lesser number would be suitable under the circumstances of a particular case. The Department of Agriculture requires a deposit of 2500 seeds for the grant of a Plant Variety Protection Certificate. As the reproduction of seeds will often take a substantial period of time, the Office will require, at a minimum, a number of seeds that is likely to satisfy demand for samples once the patent is granted.

Section 1.801 does not attempt to identify what biological material either needs to be or may be deposited to comply with the requirements of 35 U.S.C. 112. For the most part, this issue must be addressed on a case-by-case basis. Thus, while the Office does not presently contemplate that there would be any situations where a material that is not capable of self-replication either directly or indirectly would be acceptable as a deposit, an applicant is clearly not precluded in any given application, by these rules, from attempting to show why the deposit of such a material should be acceptable to satisfy the requirements of 35 U.S.C. 112.

NEED OR OPPORTUNITY TO MAKE A DEPOSIT [§ 1.802]

This section permits a deposit of a biological material to be referenced in a patent application where an invention is, or relies on, a biological material. The invention may rely on a biological material for the purposes of making or using the invention, either as a preferred mode or an alternative mode of operation. It is not necessary, for the purposes of paragraph (a), that a deposit be required to satisfy the requirements of 35 U.S.C. 112 before a reference to a deposit is permitted in the specification.

There is no necessary implication or presumption that can or should be made about the need for a deposit simply because reference to a deposit is made in an application disclosure. As noted in paragraph (b), biological material need not be deposited unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112 and that access is not otherwise available in the absence of a deposit. Where a deposit is required to provide the necessary access, a deposit is acceptable for patent purposes only where it is made in accordance with these regulations. Even where access to biological material is required to satisfy these statutory requirements, a deposit may not be necessary if access sufficient to satisfy these requirements is otherwise available.

For example, applicant could show that the biological material is known and readily available to the public. The concepts of "known and readily available" are considered to reflect a level of public accessibility to a necessary component of an invention disclosure that is consistent with an ability to make and use the invention. To avoid the need for a deposit on this basis, the biological material must be both known and readily available - neither concept alone is sufficient. A material may be known in the sense that its existence has been published, but is not available to those who wish to obtain that particular known biological material. Likewise, a biological material may be available in the sense that those having possession of it would make it available upon request, but no one has been informed of its existence.

By showing that a biological material is known and readily available or by making a deposit in accordance with these rules, applicant does not guarantee that such biological material will be available forever. Public access during the term of the patent may affect the enforceability of the patent. Although there is a public interest in the availability of a deposited biological material during and after the period of enforceability of the patent, the examiner need not be unduly concerned about continued access to the public. Unless there is a reasonable basis to believe that the biological material will cease to be available during the life of the patent, the examiner should accept current availability as satisfying the requirement. The incentives provided by the patent system should not be constrained by the mere possibility that a disclosure that was once enabling would become non-enabling over a period of time through no fault of the patentee. *In re Metcalfe*, 410 F.2d 1378, 161 USPQ 789 (CCPA 1969).

There are many factors that may be used as indicia that a biological material is known and readily available to the public. Relevant factors include commercial availability, references to the biological material in printed publications, declarations of accessibility by those working in the field, evidence of predictable isolation techniques, or an existing deposit made in accordance with these rules. Each factor may or may not be sufficient alone to demonstrate that the biological material is known and readily available. Those applicants that rely on evidence of accessibility other than a deposit take the risk that the patent may no longer be enforceable if the biological material necessary to satisfy the requirements of 35 U.S.C. 112 ceases to become accessible.

The Office will accept commercial availability as evidence that a biological material is known and readily available only when the evidence is clear and convincing that the public has access to the material. A product could be commercially available but only at a price that effectively eliminates accessibility to those desiring to obtain a sample. The relationship between an applicant relying on a biological material and the commercial supplier relied upon is one factor that would be considered in determining whether the biological material was known and readily available. However, the mere fact that the biological material was available only through the patent holder or the patent holder's agents or assigns shall not, by itself, justify a finding that the necessary material is not readily available, absent reason to believe that access to the biological material would later be improperly restricted.

The mere reference to a deposit or the biological material itself in any document or publication does not necessarily mean that the deposited biological material is readily available. Even a deposit made under the Budapest Treaty and referenced in a United States or foreign patent document would not necessarily meet the test for known and readily available unless the deposit was made under conditions which are consistent with those specified in these rules, including the one that requires, with one possible exception, that all restrictions on the accessibility will be irrevocably removed upon the granting of the patent.

Applicant may show that a deposit is not necessary even though specific biological materials are required to practice the invention if those biological materials can be made or isolated without undue experimentation. Deposits may be required to support the claims if an isolation procedure requires undue experimentation to obtain the desired biological material. *Ex Parte Jackson*, 217 USPQ 804 (PTO Bd. Pat. App. 1982) No deposit is required, however, where the required biological materials can be obtained from publicly available material with only routine experimentation and a reliable screening test. *Tabuchi v. Nubel*, 559 F.2d 1183, 194 USPQ 521 (CCPA 1977); *Ex Parte Hata*, 6 USPQ 2d 1652 (PTO Bd. Pat. App. & Int. 1987).

Once a deposit is made in a depository complying with these rules, and under conditions complying with these rules, a biological material will be considered to be readily available even though some requirement of law or regulation in the United States or in the country where the depository institution is located permits access to the material only under conditions imposed for health, safety or similar reasons. This provision

is consistent with the Budapest Treaty (Article 5) and is designed to permit the patenting of inventions involving materials having restricted distribution, where the restrictions are imposed for the public, as opposed to the private, welfare.

Paragraph (c) specifically provides that the mere reference to a deposit of biological material in the specification disclosure or the actual deposit of such material does not create any presumption that such referenced or deposited material is necessary to satisfy 35 U.S.C. 112, or that a deposit in accordance with these regulations is or was required. Since reference to a biological material cannot be added to a specification disclosure after filing an application without risking the prohibited introduction of new matter (35 U.S.C. 132), applicants must be permitted to address the need to make a deposit in accordance with these regulations without jeopardizing a filing date. Thus, the examiner has the burden of showing that a deposit is required to satisfy 35 U.S.C. 112, and cannot rely on whether a deposit has been made or has been referenced in the specification disclosure to establish a prima facie case that the disclosure does not comply with 35 U.S.C. 112 without deposit.

ACCEPTABLE DEPOSITORY [§ 1.803]

This section indicates that a depository will be recognized as acceptable for the purposes of these regulations if it is either an International Depositary Authority (IDA) established under the Budapest Treaty, or if it is a depository recognized as suitable by the Commissioner. After the effective date of these regulations, a deposit of biological material which is made in a depository which is not recognized as acceptable under this regulation will not be considered as satisfying the requirements of 35 U.S.C. 112. On the other hand, if a deposit is not required to satisfy the requirements of 35 U.S.C. 112, it is permissible to make reference to such a deposit even though it may not be in a depository or made under the conditions which are acceptable under these regulations. As new depositories are accepted under the Budapest Treaty or are recognized as suitable by the Commissioner, their identity will be announced in the *Official Gazette*.

An organization may be recognized as suitable by the Office if the procedure and conditions specified in paragraphs (a)(2) and (b) are followed. Generally, it is not the intention of the Office to recognize as suitable any organization where the need for a suitable depository for patent purposes is being met by depositories recognized as IDAs under the Budapest Treaty. Suitability will be judged by the Commissioner, based on need and the information supplied by the organization seeking status, and information obtained from other sources that may be consulted.

While there is a desire to provide flexibility to a patent applicant in selecting an appropriate depository, these rules are not intended to permit each patent applicant to become its own depository since both the patent owner and the public have an interest in the continued availability and accessibility of the deposit during the enforceable life of the patent, and the public has a continuing interest in its availability when the patent is no longer enforceable. The concept of a depository independent of the control of the depositor or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are substantially free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidentally alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the access to the biological material once the term of the patent expires.

When a depository having status under paragraph (a)(2) of this regulation seeks to change the kinds of biological materials that it will accept and maintain for the purposes of these rules, a communication requesting such a change should be directed to the Commissioner containing the information requested in paragraph (b). When such a change is requested, the requesting organization should provide a complete list of the kinds of biological materials it will accept.

Paragraph (d) of this section indicates that once a depository is recognized as suitable for the purposes of this rule, or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office. A current list of IDAs recognized under the Budapest Treaty is as follows:

Agricultural Research Culture Collection (NRRL) - USA
American Type Culture Collection (ATCC) - USA
Australian Government Analytical Laboratories (AGAL) - Australia
Centraalbureau Voor Schimmelcultures (CBS) - Netherlands
Collection Nationale De Culture De Micro-organismes (CNCM) - France
Commonwealth Agricultural Bureau (CAB), International - Mycological Institute - United Kingdom
Culture Collection of Algae and Protozoa (CCAP) - United Kingdom
Deutsche Sammlung Von Mikroorganismen (DSM) - FederalRepublic of Germany
European Collection of Animal Cell Cultures (ECACC) - United Kingdom
Fermentation Research Institute (FRI) - Japan
Institute of Micro-organism Biochemistry and Physiology of the USSR Academy of Science (IBFM) - Soviet Union
In Vitro International, Inc. (IVI) - USA
Mezogazdasagi Es Ipari Mikroorganizmusok Magyar Nemzeti Gyujtemenye (MIMNG) - Hungary
National Bank for Industrial Microorganisms and Cell Cultures (NBIMCC) - Bulgaria
National Collection of Industrial Bacteria (NCIB) - United-Kingdom
National Collection of Type Cultures (NCTC) - United Kingdom
National Collection of Yeast Cultures (NCYC) - United Kingdom
USSR Research Institute for Antibiotics of the USSR Ministry of the Medical and Microbiological Industry (VNIIAA) - Soviet Union
USSR Research Institute for Genetics and Industrial Microorganism Breeding of the USSR Ministry of the Medical and Microbiological Industry (VNII Genetika) Soviet Union

TIME OF MAKING AN ORIGINAL DEPOSIT [§ 1.804]

This section specifies the time for making an original deposit to fulfill the requirements of 35 U.S.C. 112. Paragraph (a) specifies not only a permissible time frame for making an original deposit, but also specifies that the biological material deposited must be specifically identified in the application for patent as filed. The requirement for a specific identification is consistent with the description requirement of the first paragraph of 35 U.S.C. 112, and to provide an antecedent basis for the biological material which either has been or will be deposited before the patent is granted.

The description in the Lundak application as filed (now patent 4,594,325) provides a suitable illustration of the specific identification and description which is required in an application for patent as filed. In that application, an immortal B-cell line was disclosed and claimed. The cell line was referred to in the application as filed as WI-L2-729 HF2. The methods of obtaining and using this cell line were also described in the application as filed. A deposit of the cell line was made with the American Type Culture Collection (ATCC) about a week after the application was filed in the United States. The United States Court of Appeals for the Federal Circuit held that the requirements of access by the Office to a sample of the cell line during pendency, and public access after grant, were met by Lundak's procedures. The Court further held that the addition of information designating the depository, accession number, and deposit date of the deposited cell line in ATCC after the filing date did not violate the prohibition against new matter in 35 U.S.C. 132. *In re Lundak*, 773 F.2d 1216, 227 USPQ 90 (Fed Cir. 1985). It must be clear from the application as filed that the invention claimed and described in the specification "was fully capable of being reduced to practice (i.e., no technological problems, the resolution of which would require more than ordinary skill and reasonable time, remained in order to obtain an operative, useful process)." *Feldman v. Aunstrup*, 517 F.2d

1351, 1355, 186 USPQ 108, 113 (CCPA 1975), *cert. denied*, 424 U.S. 912 (1976).

When the original deposit is made after the effective filing date of an application for patent, applicant is required to promptly submit a verified statement from a person in a position to corroborate that the biological material which is deposited is a biological material specifically identified in the application (the filing date of which is relied upon) as filed. The nature of this corroboration will depend on the circumstances in the particular application under consideration, including the length of time between the application filing date and the date of deposit. While few, if any, situations can be imagined where the description requirement of 35 U.S.C. 112 can be satisfied where the biological material was not in existence at the time of filing, the rules do not preclude such a situation. There is no requirement in the patent law that an actual reduction to practice occur as a condition precedent to filing a patent application. The requirement for a verified statement is not necessary under paragraph (b) of this section if the person making the statement is an attorney or agent registered to practice before the Office.

For the purposes of complying with the requirements of 35 U.S.C. 112, a deposit of a biological material may be made at any time before filing the application for patent or during the pendency of the application subject to the conditions of § 1.809. Where the deposit is needed to satisfy the requirement of 35 U.S.C. 112 and is made during the pendency of the application, it must be made no later than the time period set by the examiner at the time the Notice of Allowance and Issue Fee Due is mailed. A necessary deposit need not be made by applicant until the application is in condition for allowance so long as applicant provides a written assurance that an acceptable deposit will be made on or before the payment of the issue fee. This written assurance must provide sufficiently detailed information to convince the examiner that there is no outstanding issue regarding deposits that needs to be resolved.

Those applicants intending to file patent applications in a country foreign to the United States relying upon biological material that must be deposited to satisfy the requirements of 35 U.S.C. 112 when the application is filed in the United States are cautioned that in many countries the deposit must be made before the filing date of the priority application in order to obtain foreign priority rights. Thus, while the deposit of a biological material subsequent to the effective filing date of a United States application is sufficient to comply with 35 U.S.C. 112, an applicant may not be able to rely on the filing date of such a U.S. application if a patent is sought in a country foreign to the United States.

REPLACEMENT OR SUPPLEMENT OF DEPOSIT [§ 1.805]

This section relates to the deposit of a biological material to replace or supplement a previous deposit. The term "replacement" is directed to those situations where one deposit is being substituted for another. An applicant may have greater latitude in replacing a deposit during the pendency of an application than after the patent is granted. Replacement will typically take place where the earlier deposit is no longer viable. The term "supplement" is directed to those situations where the earlier deposit is still viable in the sense that it is alive and capable of replication either directly or indirectly, but has lost a quality (e.g., purity, functionality) it allegedly possessed at the time the application was filed. The procedures in these rules contemplate that only the original depositor would have a right to replace or supplement the original deposit.

Paragraph (a) relates to the procedure for replacing or supplementing a deposit with respect to a pending application or a patent. An applicant for patent or patent owner whose patent is the subject of a reissue application or reexamination proceeding is required to notify the Office when it obtains information that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification. When the Office is so notified or otherwise becomes aware of such information, the need for making a replacement or supplemental deposit will be determined by the same considerations used to determine the need for an original deposit under § 1.802(b).

A replacement or supplemental deposit made in connection with a pending application for patent will be accepted if it meets all the requirements for making an original deposit. It should be noted that for a pending application for patent, applicant need not replace or supplement the identical material previously deposited, but may make an original deposit of a biological material which is specifically identified and described in the application as filed. Whether this alternative deposit will meet the requirements of 35 U.S.C. 112 with respect to the claimed subject matter must be resolved by the examiner on a case-by-case basis.

A replacement or supplemental deposit made in connection with a patent, whether or not it is the subject of a pending reissue application or reexamination proceeding, shall not be recognized in any Office proceeding unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section. These paragraphs specify the procedures that a patent owner must follow to ensure both that a replacement or supplemental deposit will be recognized in any Office proceeding and that a certificate of correction under this section containing "up to date" information about a deposited biological material will be granted. The term "recognized in any Office proceeding" as used in this section includes the proceeding in which a request for certificate of correction under this section is acted upon. Paragraph (b) describes the information which must be contained in the certificate of correction, whereas paragraph (c) describes when the request must be made and the information which must be provided in the request to make the correction. The rules require, *inter alia*, that replacement or supplement of a deposit be made diligently, followed by prompt request thereafter for a certificate of correction, as conditions precedent to being recognized in any Office proceeding. Thus, for example, if a patent owner learns early during the term of the patent that the depository cannot furnish samples of a deposit described in the patent and the patent owner fails to both diligently make a replacement deposit and promptly thereafter request a certificate of correction under these rules, a replacement deposit made years later when the patent becomes the subject of a reissue application or reexamination proceeding will not be recognized by the Office nor will any request for certificate of correction in connection with that deposit be granted.

Where a proper request for certificate of correction is made and has been granted, any correction made to the original patent will be automatically incorporated into any reissued or reexamined patent unless changes are made during examination of the reissue application or reexamination proceeding.

Paragraph (d) of § 1.805 sets forth the Office position that the failure to make a replacement deposit or, in the case of a patent, diligently make a replacement deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after notification that samples of an earlier deposit cannot be furnished, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

Paragraph (e) thereof indicates that the Office will apply a rebuttable presumption of an identity between the replacement deposit and an original deposit where a patent making reference to the deposit is relied on during any Office proceeding. This means that where a replacement deposit is permitted and made, the examiner will assume that the same material as described in the patent is accessible from the identified depository unless evidence to the contrary comes to the attention of the Office.

An applicant for patent may make a replacement or supplemental deposit during the pendency of the application for any reason. The provisions of paragraph (f) of § 1.805 recognize that since an original deposit may be made during the pendency of the application subject to the conditions of § 1.809, a replacement or supplemental deposit logically cannot be held to any higher standard or any further requirements. Likewise, the provisions of paragraph (g) indicate that neither a replacement nor a supplemental deposit need be made where, at the point in time when replacement or supplement would otherwise be necessary, access to the necessary biological material was otherwise available. For example, a replacement or supplemental deposit would not be required under the circumstances where access to the necessary biological material was established through commercial suppliers.

The provisions of paragraph (h) of § 1.805 indicate that a replacement deposit is not required even though the depository cannot furnish samples, under certain conditions, to those requesting a sample outside of the jurisdiction where the depository is located. The conditions are specified in this paragraph as being limited to national security, health or environmental safety reasons.

Finally, paragraph (i) of this section indicates that the Office will not recognize in any Office proceeding a replacement deposit made by the patent owner where the depository could furnish samples of the deposit being replaced. The best evidence of what was originally deposited should not be lost through destruction or replacement if made in association with an existing patent. A supplemental deposit may be accepted in an Office proceeding, however, depending on the circumstances in each case.

TERM OF DEPOSIT [§ 1.806]

The term of deposit must satisfy the requirements of the Budapest Treaty which sets a term of at least 30 years from the date of deposit and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In the event that the 30-year term covers the 17-year term of the patent plus six (6) years to include the Statute of Limitations, no further requirement is necessary. The mere possibility of patent term extension or extended litigation involving the patent should not be considered in this analysis.

In the event that the 30-year term of deposit measured from the date of deposit would necessarily terminate within the period of enforceability of the patent (normally the 17-year term plus six (6) years), samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made. No requirement should be made as to any particular period of time beyond the enforceable life of the patent. The purpose of the requirement is to insure that a deposited biological material necessary for the practice of a patented invention would be available to the public after expiration of the patent for which the deposit was made. The term of the deposit must comply with the requirements of each sentence of § 1.806 whether or not the deposit is made under the Budapest Treaty. A specific statement that the deposit complies with the second sentence of this section is required only where the 30-year term would terminate within the enforceable life of the patent.

VIABILITY OF DEPOSITS [§ 1.807]

This section requires that the deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. This requirement for viability is essentially a requirement that the deposited material is capable of reproduction. For the purpose of making a deposit under these rules, there is no requirement that evidence be provided that the deposited material is capable or has the ability to perform any function described in the patent application. However, as with any other issue of description or enablement, if the examiner has evidence or reason to question the objective statements made in the patent application, applicants may be required to demonstrate that the deposited biological material will perform in the manner described.

Under the Budapest Treaty, there is a requirement that the deposit be tested for viability before it is accepted. Thus, a mere statement by applicant, an authorized representative of applicant or the assignee that the deposit has been accepted under the Budapest Treaty would satisfy § 1.807.

For each deposit which is not made under the Budapest Treaty, a viability statement must be filed in the patent application and contain the information listed in paragraph (b) of this section. Under paragraph (c), the examiner will accept the conclusion set forth in a viability statement which is issued by a depository recognized under § 1.803(a). If the viability test indicates that the deposit is not viable upon receipt, or the examiner cannot for scientific or other valid reasons accept the statement of viability received from the applicant, the examiner shall so notify the applicant stating the reasons for not accepting the statement and proceed with the examination process as if no deposit had been made.

FURNISHING OF SAMPLES [§ 1.808]

This section requires that the deposit of biological material be made under two (2) conditions:

(1) access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(2) with one exception, that all restrictions imposed by the depositor onthe availability to the public of the deposited biological material will be irrevocably removed upon the granting of the patent.

The one exception that is permitted is specified in paragraph (b) of this section which permits the depositor to contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent meets any one or all of the three conditions specified in this paragraph. These conditions are:

(1) the request is in writing or other tangible form and dated; and/or

(2) the request contains the name and address of the requesting party and

the accession number of the deposit; and/or

(3) the request is communicated in writing by the depository to the depositor along with the date on which the sample was furnished and thename and address of the party to whom the sample was furnished.

It should be noted that this exception to the general rule that all restrictions will be removed must be strictly followed and that no variations of this explicit exception will be accepted as meeting the conditions of this section. This exception is consistent with the provisions in the Budapest Treaty and its implementing regulations (Rule 11.4).

Since the mere description of a deposit or identity of a deposit in a patent specification is not necessarily an indication that a requirement for deposit was made or that a deposit which complies with these rules has been made, accessibility to a deposited material referenced in a patent may depend on the satisfaction of conditions not apparent on the face of the patent. For these reasons, and upon request made to the Patent and Trademark Office, the Office will certify whether a deposit has been stated to have been made under conditions which would make it available to the public as of the issue date of the patent grant provided the request is made to the Director of Patent Examining Group 180, and contains the following information:

(1) the name and address of the depository
(2) the accession number given to the deposit
(3) the patent number and issue date of the patent referring to the depositand
(4) the name and address of the requesting party.

For those deposits made pursuant to the Budapest Treaty, the World Intellectual Property Organization provides a form (Form BP-12) for requesting a certification of the availability of samples of deposited microorganisms pursuant to Rule 11.3(a) of the regulations under the Budapest Treaty. Copies of this form are available from the Director of Patent Examining Group 180.

EXAMINATION PROCEDURES [§ 1.809]

This section sets forth procedures that will be used by the examiner to address a deposit issue. Deposit issues may arise in the examination of claims in applications for patent and for reissue of a patent, and in the examination of new or amended claims in a reexamination proceeding. The burden is initially on the Office to establish that access to a biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. Once the Office has met this burden, the burden shifts to the applicant or patent owner to demonstrate that access to such biological material either is not necessary or is already available, or that a deposit of such

material is being or will be made, replaced or supplemented in accordance with these regulations.

Under paragraph (a) of this section, once the examiner has determined that access to a biological material is necessary, and that access is not presently available in accordance with these regulations, the examiner should make an appropriate rejection under 35 U.S.C. 112.

The applicant or patent owner may respond, pursuant to paragraph (b)(2) of this section, to a rejection made under paragraph (a) thereof by arguing why a deposit is not needed under the circumstances and/or why a deposit actually made should be acceptable. Other prescribed responses which are available to such a rejection depend upon whether the rejection is made in an application for patent, on the one hand, or in a proceeding involving a patent, i.e., an application for reissue patent or reexamination proceeding, on the other hand.

In an application for patent, applicant may respond, pursuant to paragraph (b)(1) of this section, by either making an acceptable original, replacement or supplemental deposit in accordance with these regulations, or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee. In a proceeding involving a patent, the patent owner may respond, pursuant to paragraph (b)(1) of this section, by requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. In all cases, any other response shall be considered non-responsive. The rejection will be repeated and made final until the requirements of paragraph (b)(1) of this section are satisfied or the examiner is convinced that a deposit. is not required for the claimed subject matter.

As set forth in paragraph (c) of this section, in the event that an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made, the Office will mail to the applicant a requirement that the needed deposit be made within three (3) months together with the Notice of Allowance and Issue Fee Due. Although the period for paying the issue fee cannot be extended under the provisions of § 1.136, the period for satisfying the requirement to make an acceptable deposit may be extended under the provisions of that section. Failure to make the needed deposit in accordance with this requirement may be considered a failure to prosecute the application under 35 U.S.C. 133 and result in abandonment of the application.

The type of written assurance which will be considered acceptable by the Office that an acceptable deposit will be made within the required time must include sufficient information to conclude that there is no outstanding issue with regard to the deposit of an appropriate biological material under conditions which satisfy these rules.

In a proceeding involving a patent, it may not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805. For example, if the patent owner is on notice that samples of an original deposit can no longer be furnished by the depository, failure to diligently make a replacement deposit will preclude grant of a certificate of correction. A replacement deposit subsequently made will not be recognized by the Office nor will a request for certificate of correction, even if made promptly thereafter, be granted. It would also not be possible to request a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805 where no original deposit was made before or during the pendency of the application which matured into the patent.

A patent defective because of lack of a necessary deposit is necessarily fatally defective for failure to comply with the first paragraph of 35 U.S.C. 112. Reissue is not available in such cases. *See In re Hay*, 534 F.2d 917, 189 USPQ 790 (CCPA 1976). Whether reissue is available where a biological material necessary for compliance with 35 U.S.C. 112 was known and readily available at the time of issuance of the patent and subsequently ceased to be readily available is problematic. Nevertheless, the rules do not provide for post-issue original deposits.

Where an applicant for patent has any doubt whether access to a biological material specifically identified in the specification is necessary to satisfy 35 U.S.C. 112 or whether such a material, while presently freely available, may become unavailable in the future, the applicant would be well-advised to make a deposit thereof before any patent issues. Similarly, where a patent owner has any doubt whether a deposit referred to in the specification is of a biological material necessary to satisfy 35 U.S.C. 112 and, if the material is necessary, whether it is otherwise known and readily available, the patent owner would be well-advised to follow the procedures set forth in paragraphs (b) and (c) of 1.805 after receiving the notice specified in those paragraphs.

Paragraph (d) of this section sets forth the requirements for the content of the specification with respect to a deposited biological material. Specifically, the specification shall contain the accession number for the deposit, the date of the deposit, the name and address of the depository, and a description of the deposited biological material sufficient to specifically identify it and to permit examination. The deacription must be sufficient to permit verification that the deposited biological material is in fact that disclosed. Once the patent issues, the description must be sufficient to aid in the resolution of questions of infringement. As a general rule, the more information that is provided about a particular deposited biological material, the better the examiner will be able to compare the identity and characteristics of the deposited biological material with the prior art.

OTHER CONSIDERATIONS

The rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel has certified to the Chief Counsel for Advocacy, Small Business Administration, that this rule change is not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The deposit practice will not impose extra work on patent applicants (whether small or large businesses or individuals).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has been approved by the Office of Management and Budget under Control No. 0651-0022. Public reporting burden for this collection of information is estimated to average one hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed to make a deposit or request a sample, and completing and reviewing the collection of information. It is further estimated that a respondent depository would spend about five hours collecting and submitting the necessary information to be recognized as a suitable depository by the Office. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Organization, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 2050 (Paperwork Reduction Project 0651-0022). No comments regarding this burden estimate or any other aspect of this collection of infomation, including suggestions for reducing this burden, were received in response to the notice of proposed rulemaking.

LIST OF SUBJECTS IN 37 CFR PART 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record-keeping requirements, Small business.

For the reasons set out in the preamble, 37 CFR Part 1 is being amended as follows:

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. A new Subpart G - Biotechnology Invention Disclosures, consisting of centered heading - Deposit of Biological Materials - and new §§ 1.801 to 1.809 are added to read as follows:

Subpart G - Biotechnology Invention Disclosures

Deposit of Biological Material

Sec.

1.801 Biological material.
1.802 Need or Opportunity to make a deposit.
1.803 Acceptable depository.
1.804 Time of making an original deposit.
1.805 Replacement or supplement of deposit.
1.806 Term of deposit.
1.807 Viability of deposit.
1.808 Furnishing of samples.
1.809 Examination procedures.

Subpart G - Biotechnology Invention Disclosures
Authority: 35 U.S.C. 6

Deposit of Biological Material

§ 1.801 Biological material.

For the purposes of these regulations pertaining to the deposit of biological material for purposes of patents for inventions under 35 U.S.C. 101, the term biological material shall include material that is capable of self-replication either directly or indirectly. Representative examples include bacteria, fungi including yeast, algae, protozoa, eukaryotic cells, cell lines, hybridomas, plasmids, viruses, plant tissue cells, lichens and seeds. Viruses, vectors, cell organelles and other non-living material existing in and reproducible from a living cell may be deposited by deposit of the host cell capable of reproducing the non-living material.

§ 1.802 Need or Opportunity to make a deposit.

(a) Where an invention is, or relies on, a biological material, the disclosure may include reference to a deposit of such biological material.

(b) Biological material need not be deposited unless access to such material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. 112. If a deposit is necessary, it shall be acceptable if made in accordance with these regulations. Biological material need not be deposited, *inter alia*, if it is known and readily available to the public or can be made or isolated without undue experimentation. Once deposited in a depository complying with these regulations, a biological material will be considered to be readily available even though some requirement of law or regulation of the United States or of the country in which the depository institution is located permits access to the material only under conditions imposed for safety, public health or similar reasons.

(c) The reference to a biological material in a specification disclosure or the actual deposit of such material by an applicant or patent owner does not create any presumption that such material is necessary to satisfy 35 U.S.C. 112 or that deposit in accordance with these regulations is or was required.

§ 1.803 Acceptable depository.

(a) A deposit shall be recognized for the purposes of these regulations if made in

(1) any International Depositary Authority (IDA) as established under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, or

(2) any other depository recognized to be suitable by the Office. Suitability will be determined by the Commissioner on the basis of the administrative and technical competence, and agreement of the depository to comply with the terms and conditions applicable to deposits for patent purposes. The Commissioner may seek the advice of impartial consultants on the suitability of a depository. The depository must:

(i) Have a continuous existence;

(ii) Exist independent of the control of the depositor;

(iii) Possess the staff and facilities sufficient to examine the viability of a deposit and store the deposit in a manner which ensures that it is kept viable and uncontaminated;

(iv) Provide for sufficient safety measures to minimize the risk of losing biological material deposited with it

(v) Be impartial and objective;

(vi) Furnish samples of the deposited material in an expeditious and proper manner; and

(vii) Promptly notify depositors of its inability to furnish samples, and the reasons why.

(b) A depository seeking status under paragraph (a)(2) of this section must direct a communication to the Commissioner which shall:

(1) Indicate the name and address of the depository to which the communication relates;

(2) Contain detailed information as to the capacity of the depository to comply with the requirements of paragraph (a)(2) of this section, including information on its legal status, scientific standing, staff and facilities;

(3) Indicate that the depository intends to be available, for the purposes of deposit, to any depositor under these same conditions;

(4) Where the depository intends to accept for deposit only certain kinds of biological material, specify such kinds;

(5) Indicate the amount of any fees that the depository will, upon acquiring the status of suitable depository under paragraph (a)(2) of this section, charge for storage, viability statements and furnishings of samples of the deposit.

(c) A depository having status under paragraph (a)(2) of this section limited to certain kinds of biological material may extend such status to additional kinds of biological material by directing a communication to the Commissioner in accordance with paragraph (b) of this section. If a previous communication under paragraph (b) of this section is of record, items in common with the previous communication may be incorporated by reference.

(d) Once a depository is recognized to be suitable by the Commissioner or has defaulted or discontinued its performance under this section, notice thereof will be published in the *Official Gazette* of the Patent and Trademark Office.

§ 1.804 Time of making an original deposit.

(a) Whenever a biological material is specifically identified in an application for patent as filed, an original deposit thereof may be made at any time before filing the application for patent or, subject to § 1.809, during pendency of the application for patent.

(b) When the original deposit is made after the effective filing date of an application for patent, the applicant shall promptly submit a verified statement from a person in a position to corroborate the fact, and shall state, that the biological material which is deposited is a biological material specifically identified in the application as filed, except if the person is an attorney or agent registered to practice before the Office, in which case the statement need not be verified.

§ 1.805 Replacement or supplement of deposit.

(a) A depositor, after receiving notice during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the deposit has become contaminated or has lost its capability to function as described in the specification, shall notify the Office in writing, in each application for patent or patent affected. In such a case, or where the Office otherwise learns, during the pendency of an application for patent, application for reissue patent or reexamination proceeding, that the depository possessing a deposit either cannot furnish samples thereof or can furnish samples thereof but the

deposit has become contaminated or has lost its capability to function as described in the specification, the need for making a replacement or supplemental deposit will be governed by the same considerations governing the need for making an original deposit under the provisions set forth in § 1.802(b). A replacement or supplemental deposit made during the pendency of an application for patent shall not be accepted unless it meets the requirements for making an original deposit under these regulations, including the requirement set forth under § 1.804(b). A replacement or supplemental deposit made in connection with a patent, whether or not made during the pendency of an application for reissue patent or a reexamination proceeding or both, shall not be accepted unless a certificate of correction under § 1.323 is requested by the patent owner which meets the terms of paragraphs (b) and (c) of this section.

(b) A request for certificate of correction under this section shall not be granted unless the certificate identifies:

(1) The accession number for the replacement or supplemental deposit;

(2) The date of the deposit; and

(3) The name and address of the depository.

(c) A request for a certificate of correction under this section shall not be granted unless the request is made promptly after the replacement or supplemental deposit has been made and:

(1) Includes a verified statement of the reason for making the replacement or supplemental deposit;

(2) Includes a verified statement from a person in a position to corroborate the fact, and shall state, that the replacement or supplemental deposit is of a biological material which is identical to that originally deposited;

(3) Includes a verified showing that the patent owner acted diligently—

(i) In the case of a replacement deposit, in making the deposit after receiving notice that samples could no longer be furnished from an earlier deposit, or

(ii) In the case of a supplemental deposit, in making the deposit after receiving notice that the earlier deposit had become contaminated or had lost its capability to function as described in the specification;

(4) Includes a verified statement that the term of the replacement or supplemental deposit expires no earlier than the term of the deposit being replaced or supplemented; and

(5) Otherwise establishes compliance with these regulations, except that if the person making one or more of the required statements or showing is an attorney or agent registered to practice before the Office, that statement or showing need not be verified.

(d) A depositor's failure to replace a deposit, or in the case of a patent, to diligently replace a deposit and promptly thereafter request a certificate of correction which meets the terms of paragraphs (b) and (c) of this section, after being notified that the depository possessing the deposit cannot furnish samples thereof, shall cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

(e) In the event a deposit is replaced according to these regulations, the Office will apply a rebuttable presumption of identity between the original and the replacement deposit where a patent making reference to the deposit is relied upon during any Office proceeding.

(f) A replacement or supplemental deposit made during the pendency of an application for patent may be made for any reason.

(g) In no case is a replacement or supplemental deposit of a biological material necessary where the biological material, in accordance with 1.802(b), need not be deposited.

(h) No replacement deposit of a biological material is necessary where a depository can furnish samples thereof but the depository for national security, health or environmental safety reasons is unable to provide samples to requesters outside of the jurisdiction where the depository is located.

(i) The Office will not recognize in any Office proceeding a replacement deposit of a biological material made by a patent owner where the depository could furnish samples of the deposit being replaced.

§ 1.806 Term of deposit.

A deposit made before or during pendency of an application for patent shall be made for a term of at least thirty (30) years and at least five (5) years after the most recent request for the furnishing of a sample of the deposit was received by the depository. In any case, samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made.

§ 1.807 Viability of deposit.

(a) A deposit of biological material that is capable of self-replication either directly or indirectly must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository. The test must conclude only that the deposited material is capable of reproduction. No evidence is necessarily required regarding the ability of the deposited material to perform any function described in the patent application.

(b) A viability statement for each deposit of a biological material defined in paragraph (a) of this section not made under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure must be filed in the application and must contain:

(1) The name and address of the depository;

(2) The name and address of the depositor;

(3) The date of deposit;

(4) The identity of the deposit and the accession number given by the depository;

(5) The date of the viability test;

(6) The procedures used to obtain a sample if the test is not done by the depository; and

(7) A statement that the deposit is capable of reproduction.

(c) If a viability test indicates that the deposit is not viable upon receipt, or the examiner cannot, for scientific or other valid reasons, accept the statement of viability received from the applicant, the examiner shall proceed as if no deposit has been made. The examiner will accept the conclusion set forth in a viability statement issued by a depository recognized under § 1.803(a).

§ 1.808 Furnishing of samples.

(a) A deposit must be made under conditions that assure that:

(1) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(2) Subject to paragraph (b) of this section, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent.

(b) The depositor may contract with the depository to require that samples of a deposited biological material shall be furnished only if a request for a sample, during the term of the patent:

(1) Is in writing or other tangible form and dated;

(2) Contains the name and address of the requesting party and the accession number of the deposit; and

(3) Is communicated in writing by the depository to the depositor along with the date on which the sample was furnished and the name and address of the party to whom the sample was furnished.

(c) Upon request made to the Office, the Office will certify whether a deposit has been stated to have been made under conditions which make it available to the public as of the issue date of the patent grant provided the request con tains:

(1) The name and address of the depository;

(2) The accession number given to the deposit;

(3) The patent number and issue date of the patent referring to the deposit; and

(4) The name and address of the requesting party.

§ 1.809 Examination procedures.

(a) The examiner shall determine pursuant to § 1.104 in each application for patent, application for reissue patent or reexamination proceeding if a deposit is needed, and if needed, if a deposit actually made is acceptable for patent purposes. If a deposit is needed and has not been made or replaced or supplemented in accordance with these regulations, the examiner, where appropriate, shall reject the affected claims under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed and/or why a deposit actually made cannot be accepted.

(b) The applicant for patent or patent owner shall respond to a rejection under paragraph (a) of this section by

(1) In the case of an applicant for patent, making an acceptable original or replacement or supplemental deposit or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee, or, in the case of a patent owner, requesting a certificate of correction of the patent which meets the terms of paragraphs (b) and (c) of § 1.805, or

(2) Arguing why a deposit is not needed under the circumstances of the application or patent considered and/or why a deposit actually made should be accepted. Other replies to the examiner's action shall be considered non-responsive. The rejection will be repeated until either paragraph (b)(1) of this section is satisfied or the examiner is convinced that a deposit is not needed.

(c) If an application for patent is otherwise in condition for allowance except for a needed deposit and the Office has received a written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the needed deposit be made within three months. The period for satisfying this requirement is extendable under § 1.136. Failure to make the needed deposit in accordance with this requirement will result in abandonment of the application for failure to prosecute.

(d) For each deposit made pursuant to these regulations, the specification shall contain:

(1) The accession number for the deposit;

(2) The date of the deposit;

(3) A description of the deposited biological material sufficient to specifically identify it and to permit examination; and

(4) The name and address of the depository.

Dated: July 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1106 OG 37]

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(87) **Means Or Step Plus Function Limitation Under 35 U.S.C. § 112, 6th Paragraph**

The following guidelines have been distributed to patent examiners for guidance on examining practice and procedure relating to limitations falling under 35 U.S.C. § 112, 6th paragraph, after *In re Donaldson*, 29 USPQ2d 1845 (Fed. Cir. 1994). These guidelines will be incorporated into the Manual of Patent Examining Procedure.

April 20, 1994

CHARLES E. VAN HORN
Patent Policy and Projects Administrator

Examination Guidelines For Claims Reciting A "Means or Step Plus Function" Limitation In Accordance With 35 U.S.C. § 112, 6th Paragraph

The purpose of this memo is to set forth guidelines for the examination of § 112, 6th paragraph "means or step plus function" limitations in a claim. The court of Appeals for the Federal Circuit, in its en banc decision *In re Donaldson*, 29 USPQ2d 1845 (Fed. Cir. 1994), decided that a "means-or-step-plus-function" limitation should be interpreted in a manner different than patent examining practice has dictated for at least the last forty-two years. The *Donaldson* decision affects only the manner in which the scope of a "means or step plus function" limitation in accordance with § 112, 6th paragraph, is interpreted during examination. *Donaldson* does not directly affect the manner in which any other section of the patent statutes is interpreted or applied. When making a determination of patentability under 35 U.S.C. §§ 102 or 103, past practice was to interpret a "means or step plus function" limitation by giving it the "broadest reasonable interpretation." Under the PTO's long-standing practice this meant interpreting such a limitation as reading on any prior art means or step which performed the function specified in the claim without regard for whether the prior art means or step was equivalent to the corresponding structure, material or acts described in the specification. However, in *Donaldson* the Federal Circuit stated that: Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patent ability determination.[1] Thus, effective immediately, examiners shall interpret a § 112, 6th paragraph "means or step plus function" limitation in a claim as limited to the corresponding structure, materials or acts described in the specification and equivalents thereof in accordance with the following guidelines.

I. Identifying a § 112, 6th paragraph limitation

Although there is no magic language that must appear in a claim in order for it to fall within the scope of § 112, 6th paragraph, it must be clear that the element in the claim is set forth, at least in part, by the function it performs as opposed to the specific structure, material, or acts that perform the function. Limitations that fall within the scope of § 112, 6th paragraph include: (1) a jet driving device so constructed and located on the rotor as to drive the rotor . . .[2] ["means" unnecessary]

(2) "printing means" and "means for printing" would have the same connotations[3]

(3) force generating means adapted to provide . . .[4]

(4) call cost register means, including a digital display for providing a substantially instantaneous display for . . .[5]

(5) reducing the coefficient of friction of the resulting film[6] [step plus function; "step" unnecessary], and

(6) raising the Ph of the resultant pulp to about 5.0 to precipitate . . .[7]

In the event that it is unclear whether the claim limitation falls within the scope of § 112, 6th paragraph, a rejection under § 112, 2d paragraph may be appropriate. *Donaldson* does not affect the holding of *In re Hyatt*, 708 F.2d 712, 218 USPQ 195 (Fed. Cir. 1983) to the effect that a single means claim does not comply with the enablement requirement of § 112, first paragraph. As *Donaldson* applies only to an interpretation of a limitation drafted to correspond to § 112, 6th paragraph, which by its terms is limited to "an element in a claim to a combination," it does not affect a limitation in a claim which is not directed to a combination.

II. Examining procedure

A. *Scope of the Search and Identification of the Prior Art*

As noted above, in *Donaldson* the Federal Circuit recognized that it is important to retain the principle that claim language should be given its broadest reasonable interpretation. This principle is important because it helps insure that the statutory presumption of validity attributed to each claim of an issued patent is warranted by the search and examination conducted by the examiner. It is also important from the standpoint that the scope of protection afforded by patents issued prior to *Donaldson* are not unnecessarily limited by the latest interpretation of this statutory provision. Finally, it is important from the

[1] *In re Donaldson*, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994).

[2] The term "device" coupled with a function is a proper definition of structure in accordance with the last paragraph of § 112. The addition of the words "jet driving" to the term "device" merely renders the latter more definite and specific. *Ex parte Stanley*, 121 USPQ 621 (Bd. App. 1958).

[3] *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967). However, the terms "plate" and "wing", as modifiers for the structureless term "means", specify no function to be performed, and do not fall under the last paragraph of § 112.

[4] De Graffenried v. U.S., 20 Cl. Ct. 458, 16 USPQ2d 1321 (Cl. Ct. 1990)

[5] Intellicall Inc. v. Phonometrics, Inc, 952 F.2d 1384, 21 USPQ2d 1383 (Fed. Cir. 1992).

[6] *In re Roberts*, 470 F.2d 1399, 176 USPQ 313 (CCPA 1973).

[7] *Ex parte Zimmerley*, 153 USPQ 367 (Bd. App. 1966).

standpoint of avoiding the necessity for a patent specification to become a catalogue of existing technology.[8]

The *Donaldson* decision thus does not substantially alter examining practice and procedure relative to the scope of the search. Both before and after *Donaldson*, the application of a prior art reference to a means or step plus function limitation requires that the prior art element perform the identical function specified in the claim. However, if a prior art reference teaches identity of function to that specified in a claim, then under *Donaldson* an examiner carries the *initial* burden of proof for showing that the prior art structure or step is the same as or equivalent to the structure, material, or acts described in the specification which has been identified as corresponding to the claimed means or step plus function.

The "means or step plus function" limitation should be interpreted in a manner consistent with the specification disclosure. If the specification defines what is meant by the limitation for the purposes of the claimed invention, the examiner should interpret the limitation as having that meaning. If no definition is provided, some judgment must be exercised in determining the scope of the limitation.

B. *Making a prima facie case of equivalence*

If the examiner finds that a prior art element performs the function specified in the claim, and is not excluded by any explicit definition provided in the specification for an equivalent, the examiner should infer from that finding that the prior art element is an equivalent, and should then conclude that the claimed limitation is anticipated by the prior art element. The burden then shifts to applicant[9] to show that the element shown in the prior art is not an equivalent of the structure, material or acts disclosed in the application. *In re Mulder*, 716 F.2d 1542, 219 USPQ 189 (Fed. Cir. 1983).[10]The factors to be considered when determining whether the applicant has successfully met the burden of proving that the prior art element is not equivalent to the structure, material or acts described in the applicant's specification are discussed below.

However, even where the applicant has met that burden of proof and has shown that the prior art element is not equivalent to the structure, material or acts described in the applicant's specification, the examiner must still make a § 103 analysis to determine if the claimed means or step plus function is obvious from the prior art to one of ordinary skill in the art. Thus, while a finding of non-equivalence prevents a prior art element from anticipating a means or step plus function limitation in a claim, it does *not* prevent the prior art element from rendering the claim limitation obvious to one of ordinary skill in the art.

Because the exact scope of an "equivalent" may be uncertain, it would be appropriate to apply a § 102/§ 103 rejection where the balance of the claim limitations are anticipated by the prior art relied on.[11] In addition, although it is normally the best practice to rely on only the best prior art references in rejecting a claim, alternative grounds of rejection may be appropriate where the prior art shows elements that are different from each other, and different from the specific structure, material or acts described in the specification, yet perform the function specified in the claim.

C. *Determining whether an applicant has met the burden of proving non-equivalence after a prima facie case is made*

If the applicant disagrees with the inference of equivalence drawn from a prior art reference, the applicant may provide reasons why the applicant believes the prior art element should not be considered an equivalent to the specific structure, material or acts disclosed in the specification. Such reasons may include, but are not limited to: 1) teachings in the specification that particular prior art is not equivalent, 2) teachings in the prior art reference itself that may tend to show non-equivalence, or 3) Rule 132 affidavit evidence of facts tending to show non-equivalence.

When the applicant relies on teachings in applicant's own specification, the examiner must make sure that the applicant is interpreting the "means or step plus function" limitation in the claim in a manner which is consistent with the disclosure in the specification. If the specification defines what is meant by "equivalents" to the disclosed embodiments for the purpose of the claimed means or step plus function, the examiner should interpret the limitation as having that meaning. If no definition is provided, some judgment must be exercised in determining the scope of "equivalents." Generally, an "equivalent" is interpreted as embracing more than the specific elements described in the specification for performing the specified function, [12]but less than any element that performs the function specified in the claim.

The scope of equivalents embraced by a claim limitation is dependent on the interpretation of an "equivalent." The interpretation will vary depending on how the element is described in the supporting specification. The claim may or may not be limited to particular structure, material or acts (e.g. steps) as opposed to any and all structure, material or acts performing the claimed function, depending on how the specification treats that question.

If the disclosure is so broad as to encompass any and all structure, material or acts for performing the claimed function, the claims must be read accordingly when determining patentability. When this happens the limitation otherwise provided by "equivalents" ceases to be a limitation on the scope of the claim in that an equivalent would be any structure, material or act other than the ones described in the specification that perform the claimed function. For example, this situation will often be found in cases where (1) the claimed invention is a combination of elements, one or more of which are selected from elements that are old per se, or (2) apparatus claims are treated as indistinguishable from method claims.[13]

On the other end of the spectrum, the "equivalents" limitation as applied to a claim may also operate to constrict the claim scope to the point of covering virtually only the disclosed embodiments. This can happen in circumstances where the specification describes the invention only in the context of a specific structure, material or act that is used to perform the function specified in the claim.

When deciding whether an applicant has met the burden of proof with respect to showing non-equivalence of a prior art element that performs the claimed function, the following factors may be considered. First, unless an element performs the identical function specified in the claim, it cannot be an equivalent for the purposes of § 112, 6th paragraph.[14]

Second, while there is no litmus test for an "equivalent" that can be applied with absolute certainty and predictability, there are several indicia that are sufficient to support a conclusion that one element is or is not an "equivalent" of a different element in the context of § 112, 6th paragraph. Among the indicia that will support a conclusion that one element is or is not equivalent of another are:

1) Whether the prior art element performs the function specified in the claim in substantially the same way, and produces substantially the same results as the corresponding element disclosed in the specification.[15]

2) Whether a person of ordinary skill in the art would have recognized the interchangeability of the element shown in the prior art for the corresponding element disclosed in the specification.[16]

3) Whether the prior art element is a structural equivalent of the corresponding element disclosed in the specification being examined.

[17]That is, the prior art element performs the function specified in the claim in substantially the same manner as the function is performed by the corresponding element described in the specification.

4) Whether the structure, material or acts disclosed in the specification represents an insubstantial change which adds nothing of significance to the prior art element.[18]

These examples are not intended to be an exhaustive list of the indicia that would support a finding that one element is or is not an equivalent of another element for the purposes of § 112, 6th paragraph. A finding according to any of the above examples would represent a sufficient, but not the only possible, basis to support a conclusion that an element is or is not an equivalent. There could be other indicia that also would support the conclusion.

In determining whether arguments or Rule 132 evidence presented by an applicant are persuasive that the element shown in the prior art is not an equivalent, the examiner should consider and weigh as many of the above-indicated or other indicia as are presented by applicant, and should determine whether, on balance, the applicant has met the burden of proof to show non-equivalence. However, under no circumstance should an examiner accept as persuasive a bare statement or opinion that the element shown in the prior art is not an equivalent embraced by the claim limitation. Moreover, if an applicant argues that the "means" or "step" plus function language in a claim is limited to certain specific structural or additional functional characteristics (as opposed to "equivalents" thereof) where the specification does not describe the invention as being only those specific characteristics, the claim should not be allowed until the claim is amended to recite those specific structural or additional functional characteristics.[19]

Finally, as in the past, applicant has the opportunity during proceedings before the Office to amend the claims so that the claimed invention meets all the statutory criteria for patentability. An applicant may choose to amend the claim by further limiting the function so that there is no longer identity of function with that taught by the prior art element, or the applicant may choose to replace the claimed means plus function limitation with specific structure material or acts that are not described in the prior art.

D. *Related issues under Section 112, first or secondparagraphs*

The *Donaldson* decision may create some uncertainty as to what applicant regards as the invention. If this issue arises, it should be addressed in a rejection under § 112, 2d paragraph. While § 112, 6th paragraph permits a particular form of claim limitation, it cannot be read as creating an exception either to the description, enablement or best mode requirements of the paragraph or the definiteness requirement of the 2d paragraph of § 112. *In re Knowlton*, 481 F.2d 1357, 178 USPQ 486 (CCPA 1973).

If a "means or step plus function" limitation recited in a claim is not supported by corresponding structure, material or acts in the specification disclosure, the following rejections should be considered: (1) under § 112, 1st paragraph, as not being supported by an enabling disclosure because the person skilled in the art would not know how to make and use the invention without a description of elements to perform the function;[20] (2) under § 112, 2d paragraph, as being indefinite because the element or step is not defined in the specification by corresponding structure, material or acts; and (3) under §§ 102 or 103 where the prior art anticipates or renders obvious the claimed subject matter including the means or step that performs the function specified in the claim. [Theory: since there is no corresponding structure, etc. in the specification to limit the means or step plus function limitation, an equivalent is any element that performs the specified function].

III. Avoid confusion with the doctrine of equivalents

An "equivalent" for the purposes of § 112, 6th paragraph, should not be confused with the doctrine of equivalents. The doctrine of equivalents, most often associated with *Graver Tank & Mfg. Co. v. Linde Air Products*, 339 U.S. 605, 85 USPQ 328 (1950), is sometimes applied to do equity among the parties before the court in an infringement action involving an issued patent. The doctrine typically involves a three-part inquiry - whether an accused device performs substantially the same function, in substantially the same way, to obtain substantially the same result as the claimed invention. Section § 112, 6th paragraph limits the scope of the broad language of "means or step plus function" limitations, in a claim to a combination, to the structures, materials and acts described in the specification and equivalents thereof. The doctrine of equivalents equitably expands exclusive patent rights beyond the literal scope of a claim.[21] Accordingly, decisions involving the doctrine of equivalents should not unduly influence a determination under § 112, 6th paragraph during *ex parte* examination.

[1162 OG 59]

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(88) **Department of Commerce**
Patent and Trademark Office

[Docket No. 950706172-5172-01]

Utility Examination Guidelines

Agency: Patent and Trademark Office, Commerce.
Action: Notice.
Summary: The Patent and Trademark Office (PTO) is publishing the final version of guidelines to be used by Office personnel in their review of patent applications for compliance with the utility requirement. Because these guidelines govern internal practices, they are exempt from notice and comment

[8]A patent specification need not teach, and preferably omits, what is well known in the art. Hybritech Inc. v. Monoclonal Antibodies. Inc., 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986).

[9]No further analysis of equivalents is required of the examiner until applicant disagrees with the examiner's conclusion, and provides reasons why the prior art element should not be considered an equivalent.

[10]See also, *In re Weiler*, 618 F.2d at 768, 205 USPQ at 407-08, (a case treating § 112, 6th paragraph, in the context of a determination of statutory subject matter and noting "If the functionally-defined disclosed means and their equivalents are so broad that they encompass any and every means for performing the recited functions . . . the burden must be placed on the applicant to demonstrate that the claims are truly drawn to specific apparatus distinct from other apparatus capable of performing the identical functions"); In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 229 (C.C.P.A. 1971)(a case in which the CCPA treated an improper a rejection under § 112, 2d paragraph, of functional language, but noted that "where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied on"); and *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980)(a case indicating that the burden of proof can be shifted to the applicant to show that the subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under § 102 or obviousness under § 103).

[11]A similar approach is authorized in the case of product-by- process claims because the exact identity of the claimed product or the prior art product cannot be determined by the examiner. *In re Brown*, 430 F.2d 531, 173 USPQ 685 (CCPA 1972).

[12]To interpret "means plus function" limitations as limited to a particular means set forth in the specification would nullify the provisions of § 112 requiring that the limitation shall be construed to cover the structure described in the specification and equivalents thereof. D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574, 225 USPQ 236, 238 (Fed. Cir. 1985).

[13]See, for example, *In re Meyer*, 688 F.2d 789, 215 USPQ 193 (1982); *In re Abele*, 618 F.2d at 768, 205 USPQ at 407-08; *In re Weiler*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (C.C.P.A. 1980); *In re Mancorp*, 609 F.2d 481, 203 USPQ 812 (C.C.P.A. 1979); *In re Johnson*, 589 F.2d 1070, 200 USPQ 199 (C.C.P.A. 1978); and *In re Freeman*, 573 F.2d at 1246, 197 USPQ at 471.

[14]Penwalt Corp. v. Durnad-Wayland, Inc., 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir 1987), cert. denied, 484 U.S. 961 (1988).

[15]Lockheed Aircraft Corporation v. United States, 193 USPQ 449, 461 (Ct. Cl. 1977). Graver Tank concepts of equivalents are relevant to any "equivalents" determination. Polumbo v. Don-Joy Co., 762 F.2d 969, 975, n. 4, 226 USPQ 5, 8-9, n. 4 (Fed. Cir. 1985).

[16]Lockheed Aircraft Corporation v. United States, 193 USPQ 449, 461 (Ct. cl. 1977). Data Line corp. v. Micro Technologies, Inc., 813 F.2d 1196, 1 USPQ2d 2052 (Fed. Cir. 1987).

[17]*In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

[18] Valmont Industries. Inc. v. Reinke Manufacturing Co. Inc., 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993).

[19] Otherwise, a claim could be allowed having broad functional language which in reality is limited to only the specific structure or steps disclosed in the specification. This would be contrary to public policy of granting patents which provide adequate notice the public as to a claim's true scope.

[20]The description of an apparatus with block diagrams describing the function, but not the structure, of the apparatus is not final under the enablement requirement of § 112, 1st paragraph, as long as the structure is conventional and can be determined without an undue amount of experimentation. *In re Ghiron*, 442 F.2d 985, 991, 169 USPQ 723, 727 (CCPA 1971).

[21]Valmont Industries Inc. v. Reinke Manufacturing Co., Ind.,

and delayed effective date rulemaking requirements under 5 U.S.C. § 553(b)(A).

Effective Date: July 14, 1995.

For Further Information Contact: Jeff Kushan by telephone at (703) 305-9300, by fax at (703) 305-8885, by electronic mail at kushan@uspto.gov, or by mail marked to his attention addressed to the Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.

Supplementary Information

I. Discussion of Public Comments

Forty-four comments were received by the Office in response to the request for public comment on the proposed version of utility guidelines published on January 3, 1995 (60 FR 97). All comments have been carefully considered. A number of changes have been made to the examining guidelines and the legal analysis supporting the guidelines in response to the comments received.

Many of the individuals responding to the request for public comments suggested that the Office address the relationship between the requirements of 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 101. The Office has amended the guidelines to provide a clarification consistent with these requests. The guidelines now specify that any rejection based on a "lack of utility" under § 101 should be accompanied by a rejection based upon § 112, first paragraph. The guidelines also specify that the procedures for imposition and review of rejections based on lack of utility under § 101 shall be followed with respect to the § 112 rejection that accompanies the § 101 rejection.

A suggestion was made that the guidelines should be modified to provide that an application shall be presumed to be compliant with § 112, first paragraph, if there is no proper basis for imposing a § 101 rejection. This suggestion has not been followed. Instead, the guidelines specify that § 112, first paragraph, deficiencies other than those that are based on a lack of utility be addressed separately from those based on lack of utility for the invention.

Several individuals suggested that the guidelines address how § 101 compliance will be reviewed for products that are either intermediates or whose ultimate function or use is unknown. The Office has amended the guidelines to clarify how it will interpret the "specific utility" requirement of § 101.

Some individuals suggested that the guidelines be amended to preclude Examiners from requiring that an applicant delete references made in the specification to the utility of an invention which are not necessary to support an asserted utility of the claimed invention. The guidelines have been amended consistent with this suggestion.

One individual suggested that the legal analysis be amended to emphasize that any combination of evidence from *in vitro* or *in vivo* testing can be sufficient to establish the credibility of an asserted utility. The legal analysis has been amended consistent with this recommendation.

A number of individuals questioned the legal status of the guidelines, particularly with respect to situations where an applicant believes that a particular Examiner has failed to follow the requirements of the guidelines in imposing a rejection under § 101. The guidelines and the legal analysis supporting the guidelines govern the internal operations of the Patent and Trademark Office. They are not intended to, nor do they have the force and effect of law. As such they are not substantive rules creating or altering the rights or obligations of any party. Rather, the guidelines define the procedures to be followed by Office personnel in their review of applications for § 101 compliance. The legal analysis supporting the guidelines articulates the basis for the procedures established in the guidelines. Thus, an applicant who believes his or her application has been rejected in a manner that is inconsistent with the guidelines should respond substantively to the grounds of the rejection. "Non-compliance" with the guidelines will not be a petitionable or appealable action.

Some individuals suggested that the guidelines and legal analysis be amended to specify that the Office will reject an application for lacking utility only in those situations where the asserted utility is "incredible." This suggestion has not been adopted. The Office has carefully reviewed the legal precedent governing application of the utility requirement. Based on that review, the Office has chosen to focus the review for compliance with § 101 and § 112, first paragraph, on the "credibility" of an asserted utility.

Some individuals suggested that the guidelines be amended to address how a generic claim that covers many discrete species will be assessed with regard to the "useful invention" requirements of §§ 101 and 112 when one or more, but not all, species within the genus do not have a credible utility. The guidelines have been amended to clarify how the Office will address applications in which genus claims are presented that encompass species for which an asserted utility is not credible. The legal analysis makes clear that any rejection of any claimed subject matter based on lack of utility must adhere to the standards imposed by these guidelines. This is true regardless of whether the claim defines only a single embodiment of the invention, multiple discrete embodiments of the invention, or a genus encompassing many embodiments of the invention. As cast in the legal analysis and the guidelines, the focus of examination is the invention as it has been defined in the claims.

Some individuals questioned whether the guidelines and the legal analysis govern actions taken by Examining Groups other than Group 1800 or the Board of Patent Appeals and Interferences. The guidelines apply to all Office personnel, and to the review of all applications, regardless of field of technology.

In addition to the changes made in response to comments from the public, the Office has amended the guidelines to clarify the procedure to be followed when an applicant has failed to identify a specific utility for an invention. The guidelines now provide that where an applicant has made no assertion as to why an invention is believed useful, and it is not immediately apparent why the invention would be considered useful, the Office will reject the application as failing to identify any specific utility for the invention. The legal analysis has also been amended to address evaluation of this question.

II. Guidelines for Examination of Applications for Compliance with the Utility Requirement

A. Introduction

The following guidelines establish the policies and procedures to be followed by Office personnel in the evaluation of any application for compliance with the utility requirements of 35 U.S.C. § 101 and § 112. The guidelines also address issues that may arise during examination of applications claiming protection for inventions in the field of biotechnology and human therapy. The guidelines are accompanied by an overview of applicable legal precedent governing the utility requirement. The guidelines have been promulgated to assist Office personnel in their review of applications for compliance with the utility requirement. The guidelines and the legal analysis do not alter the substantive requirements of 35 U.S.C. § 101 and § 112, nor are they designed to obviate review of applications for compliance with this statutory requirement.

B. Examination Guidelines for the Utility Requirement

Office personnel shall adhere to the following procedures when reviewing applications for compliance with the "useful invention" ("utility") requirement of 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph.

1. Read the specification, including the claims, to:

a) determine what the applicant has invented, noting any specific embodiments of the invention;

a) ensure that the claims define statutory subject matter (*e.g.*, a process, machine, manufacture, or composition of matter);

b) note if applicant has disclosed any specific reasons why the invention is believed to be "useful."

2. Review the specification and claims to determine if the applicant has asserted any credible utility for the claimed invention:

a) If the applicant has asserted that the claimed invention is useful for any particular purpose (*i.e.*, a "specific utility") and that assertion would be considered credible by a person of ordinary skill in the art, do not impose a rejection based on lack of utility. Credibility is to be assessed from the perspective of one of ordinary skill in the art in view of any evidence of record (*e.g.*, data, statements, opinions, references, etc.) that is relevant to the applicant's assertions. An applicant must provide only one credible assertion of specific utility for any claimed invention to satisfy the utility requirement.

b) If the invention has a well-established utility, regardless of any assertion made by the applicant, do not impose a rejection based on lack of utility. An invention has a well-established utility if a person of ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention (*e.g.*, properties of a product or obvious application of a process).

c) If the applicant has not asserted any specific utility for the claimed invention and it does not have a well established utility, impose a rejection under § 101, emphasizing that the applicant has not *disclosed* a specific utility for the invention. Also impose a separate rejection under § 112, first paragraph, on the basis that the applicant has not shown how to use the invention due to lack of disclosure of a specific utility. The § 101 and § 112, rejections should shift the burden to the applicant to:

— explicitly identify a specific utility for the claimed invention, and

— indicate where support for the asserted utility can be found in the specification.

Review the subsequently asserted utility by the applicant using the standard outlined in paragraph (2)(a) above, and ensure that it is fully supported by the original disclosure.

3. If no assertion of specific utility for the claimed invention made by the applicant is credible, and the claimed invention does not have a well-established utility, reject the claim(s) under § 101 on the grounds that the invention as claimed lacks utility. Also reject the claims under § 112, first paragraph, on the basis that the disclosure fails to teach how to use the invention as claimed. The § 112, first paragraph, rejection imposed in conjunction with a § 101 rejection should incorporate by reference the grounds of the corresponding § 101 rejection and should be set out as a rejection distinct from any other rejection under § 112, first paragraph, not based on lack of utility for the claimed invention.

To be considered appropriate by the Office, any rejection based on lack of utility must include the following elements:

a) A prima facie showing that the claimed invention has no utility.

A *prima facie* showing of no utility must establish that it is more likely than not that a person skilled in the art would not consider credible any specific utility asserted by the applicant for the claimed invention. A *prima facie* showing must contain the following elements:

i) a well-reasoned statement that clearly sets forth the reasoning used in concluding that the asserted utility is not credible;

ii) support for factual findings relied upon in reaching this conclusion; and

iii) support for any conclusions regarding evidence provided by the applicant in support of an asserted utility.

b) Specific evidence that supports any fact-based assertions needed to establish the prima facie showing.

Whenever possible, Office personnel must provide documentary evidence (*e.g.*, scientific or technical journals, excerpts from treatises or books, or U.S. or foreign patents) as the form of support used in establishing the factual basis of a *prima facie* showing of no utility according to items (a)(ii) and (a)(iii) above. If documentary evidence is not available, Office personnel shall note this fact and specifically explain the scientific basis for the factual conclusions relied on in sections (a)(ii) and (a)(iii).

4. A rejection based on lack of utility should not be maintained if an asserted utility for the claimed invention would be considered credible by a person of ordinary skill in the art in view of all evidence of record.

Once a *prima facie* showing of no utility has been properly established, the applicant bears the burden of rebutting it. The applicant can do this by amending the claims, by providing reasoning or arguments, or by providing evidence in the form of a declaration under 37 CFR 1.132 or a printed publication, that rebuts the basis or logic of the *prima facie* showing. If the applicant responds to the *prima facie* rejection, Office personnel shall review the original disclosure, any evidence relied upon in establishing the *prima facie* showing, any claim amendments and any new reasoning or evidence provided by the applicant in support of an asserted utility. It is essential for Office personnel to recognize, fully consider and respond to each substantive element of any response to a rejection based on lack of utility. Only where the totality of the record continues to show that the asserted utility is not credible should a rejection based on lack of utility be maintained.

If the applicant satisfactorily rebuts a *prima facie* rejection based on lack of utility under § 101, withdraw the § 101 rejection and the corresponding rejection imposed under § 112, first paragraph, per paragraph (3) above.

Office personnel are reminded that they must treat as true a statement of fact made by an applicant in relation to an asserted utility, unless countervailing evidence can be provided that shows that one of ordinary skill in the art would have a legitimate basis to doubt the credibility of such a statement. Similarly, Office personnel must accept an opinion from a qualified expert that is based upon relevant facts whose accuracy is not being questioned; it is improper to disregard the opinion solely because of a disagreement over the significance or meaning of the facts offered.

III. Additional Information

The PTO has prepared an analysis of the law governing the utility requirement to support the guidelines outlined above. Copies of the legal analysis can be obtained from Jeff Kushan, who can be reached using the information indicated above.

July 3, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1177 OG 146]

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(89) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 940965 - 4265]

RIN: 0651-AA67

Revision of Affidavits Under 37 CFR 1.131

Agency: Patent and Trademark Office, Commerce
Action: Notice of proposed rulemaking
Summary: The Patent and Trademark Office (Office) proposes to amend the rules of practice relating to submission of affidavits or declarations under 37 CFR 1.131 (a) to implement the relevant provisions of Public Law No. 103 - 182 and the GATT (General Agreement on Trade and Tariffs), and to provide relief in certain circumstances where a common assignee holds both an application and a patent claiming patentably indistinct, but not identical, inventions.
Date: Written comments must be submitted on or before December 1, 1994. No oral hearing will be held.
Addressees: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Charles E. Van Horn, Deputy Assistant Commissioner for Patent Policy and Projects, or by fax to (703) 305-8825.

For Further Information Contact: Charles E. Van Horn by telephone at (703) 305-9054 or Hiram Bernstein by telephone at (703) 305-9282 or by mail marked to the attention of Charles E. Van Horn, Deputy Assistant Commissioner for Patent Policy and Projects, and addressed as above.

Supplementary Information: Public Law No. 103-182 (November 4, 1993) implementing the North American Free Trade Agreement (NAFTA), amended 35 U.S.C. 104 to provide that for the purpose of obtaining a patent, an applicant can show a date of invention in the United States, or in a NAFTA country which occurred after the date of implementation (i.e., December 8, 1993). Although GATT enabling legislation has not been passed, these proposed rule changes assume that it will be passed, and therefore changes to 37 CFR 1.131(a) similar to NAFTA would be required. See Article 27, paragraph 1, of the Agreement on Trade-related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, of the GATT. In the event that the GATT enabling legislation is not enacted when the final rules are published, the proposed rule changes relative to the GATT will be withdrawn.

The Office proposes to amend 37 CFR 1.131(a), which is currently limited to facts showing a completion of the invention in the United States, to allow for a submission of facts in an affidavit or declaration that show completion of the invention in a NAFTA or a World Trade Organization (WTO) Member country. The WTO is established under the GATT agreement to resolve disputes between signatories to the agreement. The facts presented must demonstrate completion of the invention prior to the effective date of a reference thought to bar the grant of a patent or the patentability of a claim in a patent under reexamination.

Additionally, the Office recognizes that there is a potential conflict between existing 37 CFR 1.131(a) and 37 CFR 1.602(a). Section 1.131(a) prohibits affidavits or declarations thereunder when the same patentable invention as defined in 37 CFR 1.601(n) (i.e., patentably indistinct inventions) is claimed. An interference under 35 U.S.C. § 135, rather than antedating under § 1.131(a), is generally the available remedy. However, 37 CFR 1.602(a) provides that when the applications or the application and patent are owned by a single party, interferences are not declared or continued unless good cause is shown. This can result in a hardship where there is an issued patent that can no longer be amended as by filing a continuation-in-part application. Where there are two or more pending applications, the conflict can be avoided by filing a continuation-in-part application incorporating the conflicting inventions in a single application.

The Office proposes to amend 37 CFR 1.131 to broaden its application to a single party where inventions of a pending application and a patent held by the party are patentably indistinct but not identical. Under the proposed additions to § 1.131, an affidavit or declaration could be filed by a party to avoid a 35 U.S.C. § 103 rejection based on a 35 U.S.C. §§ 102(a) or (e) patent owned by that party, where the patent claimed an invention that was patentably indistinct, but not identical to an invention claimed in an application or patent undergoing reexamination.

The proposed addition to § 1.131 would not affect the use of the issued patent in a rejection based on double patenting. However, where patentably indistinct but not identical inventions are claimed, a double patenting rejection can be avoided by filing an appropriate terminal disclaimer. In addition, petitions under § 1.183 will be entertained for waiver of § 1.131 requirements in appropriate instances where two pending applications claiming patentably indistinct but not identical inventions are held by a single party.

Discussion of Specific Rules:

Section 1.131(a), if amended to (a)(1) as proposed, would allow a § 1.131 affiant or declarant to rely upon facts occurring in a NAFTA or a WTO Member country to show completion of the invention. The term "domestic" would be changed to "U.S." The section is proposed to be amended from a single sentence to three sentences.

Section 1.131(a)(2), if added as proposed, would limit the availability of acts showing completion of the invention in a NAFTA or WTO Member country to those acts occurring subsequent to the effective date of the agreements.

Section 1.131(a)(3), if added as proposed, would allow a showing of prior invention to be made in a pending application or a patent that is undergoing reexamination where a single party holds both the application or patent undergoing reexamination and another patent where the claimed inventions were, at the time the later invention was made, both owned by the single party or subject to an obligation of assignment to that party. Further, in order to rely on proposed § 1.131(a)(3), the inventions claimed in the application or in the patent undergoing reexamination and in the other patent must not be identical as set forth in 35 U.S.C. § 102.

Other Considerations:

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The Office of Management and Budget has determined that the proposed rule changes are not significant for the purposes of E.O. 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the proposed rules would affect only a small number of applications and would provide a streamlined and simplified procedure, eliminating the need for requesting waiver of the rules.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements.

For the reasons set forth in the preamble, and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, the Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below, with deletions indicated by brackets ([ ]) and additions indicated by arrows (▶◀).

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 C.F.R., Part 1, would continue to read as follows:

Authority: 35 U.S.C. § 6, unless otherwise noted.

2. Section 1.131 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a) ▶(1)◀ When any claim of an application or a patent under reexamination is rejected on reference to a [domestic] ▶U.S.◀ patent which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), as the rejected invention, or on reference to a foreign patent or to a printed publication, [and] the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the person qualified under §§ 1.42, 1.43 or 1.47, [shall make] ▶may overcome the patent or publication by filing an appropriate◀ oath or declaration ▶.◀ [as to] ▶The oath or declaration must include◀ facts showing a completion of the invention in this country ▶or in a NAFTA or WTO Member country◀ before the filing date of the application on which the [domestic] ▶U.S.◀ patent issued, or before the date of the foreign patent, or before the date of the printed publication [, then][.] ▶When an appropriate oath or declaration is made,◀ the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

▶(a)(2) A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before _____ in a WTO Member country other than a NAFTA country.

(a)(3) Notwithstanding the provisions of paragraph (a)(1), a showing may be made under this section where the inventions defined by a claim in an application or a patent under reexamination and by a claim in another U.S. patent are not identical as set forth in 35 U.S.C. 102, and where the inventions were, at the time the later invention was made, owned by the same person or subject to an obligation of assignment to the same person.◀

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September 26, 1994

BRADFORD R. HUTHER
Acting Assistant Secretary of Commerce and Acting Commissioner of Patents and Trademarks

[1167 OG 96]

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(90) Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

October 3, 1995

Patent and Trademark Office
United States Department of Commerce

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B. Classify the Invention as to Its Proper Statutory Category
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(a) "Data Structures" Per Se or Computer Programs Per Se
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(c) Natural Phenomena Such as Electricity and Magnetism

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(a) Statutory Products

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VI. Conclusion

Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

I. Introduction [Guidelines § I.A.]

The Office has developed *Proposed Examination Guidelines for Computer-Implemented Inventions*[1] and this legal analysis (collectively, the "guidelines") to assist Office personnel in the examination of applications drawn to computer-implemented inventions. The guidelines are based on the Office's current understanding of the law, and represent the official policy of the Patent and Trademark Office. Office personnel are to rely on these guidelines in the event of any inconsistent treatment of issues between these guidelines and any earlier provided guidance from the Office.

The guidelines alter the procedures Office personnel shall employ to examine applications drawn to computer-implemented inventions.

The guidelines also clarify the Office's position on certain patentability standards related to this field of technology. The positions set forth in these guidelines are believed to be fully

consistent with the binding precedent of the Supreme Court, and the Federal Circuit and its predecessor courts.

The Freeman-Walter-Abele[2] test, while of limited value, may still be relied upon in analyzing claims directed solely to a process for solving a mathematical algorithm. "Business methods" are to be analyzed the same way as any other process.

The appendix includes the proposed guidelines and a graphic overview of how Office personnel will conduct an examination to determine statutory subject matter.

II. Determine What Applicant Has Invented and Is Seeking to Patent [Guidelines § I.B.1.]

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Thus, Office personnel must raise any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Where possible, Office personnel should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Prior to focusing on any specific statutory requirements, Office personnel must begin examination by determining what, precisely, the applicant has invented and is seeking to patent,[3] and how the claims relate to and define that invention. Consequently, Office personnel will no longer begin examination by determining if a claim recites a "mathematical algorithm." Rather, they will review the complete specification, including the detailed description of the invention, any specific embodiments that have been disclosed, the claims and the specific utility that has been asserted for the invention.

A. Identify and Understand the Practical Utility Asserted for the Invention [Guidelines § I.B.1.(a)]

The subject matter sought to be patented must be a "useful" process, machine, manufacture or composition of matter. Accordingly, a complete disclosure should contain some indication of why the applicant believes the claimed invention is "useful." This "usefulness" of the invention is called the "specific" or "practical" utility of the invention. Specific or practical utility is simply a shorthand way of attributing "real world" value to the claimed subject matter, i.e., assuring there is some benefit to the public.[4] An invention that has some practical application satisfies the utility requirement.[5]

The applicant is in the best position to explain why an invention is believed useful. Office personnel should therefore focus their efforts on identifying statements made in the specification that identify a practical application for the invention. Office personnel should rely on such statements throughout the examination when assessing the invention for compliance with all statutory criteria. Deficiencies under the utility requirement will be rare, however. Further guidance in evaluating an asserted specific utility for compliance with § 101 is provided below and in the Utility Examination Guidelines.[6] If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility.

B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented [Guidelines § I.B.1(a)]

The written description will provide the clearest explanation of the applicant's invention, by exemplifying the invention, explaining how it relates to the prior art and by explaining the relative significance of various features of the invention. Accordingly, Office personnel should begin their evaluation of a computer-implemented invention as follows:

— determine what the programmed computer does when it performs the processes dictated by the software (i.e., the *functionality* of the programmed computer);[7]

— determine how the computer is to be configured to provide that functionality (i.e., what elements constitute the programmed computer and how are those elements to be configured to provide the specified functionality); and

— if applicable, determine the *relationship* of the programmed computer to other subject matter that constitutes the invention (e.g., machines, devices, materials, or process steps other than those that are part of or performed by the programmed computer).[8]

Patent applicants can assist the Office by preparing applications that clearly set forth these aspects of a computer-implemented invention.

C. Analyze the Claims [Guidelines § I.B.1.(b)]

The claims define the property rights provided by a patent, and thus require careful scrutiny. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated is the invention. Office personnel must analyze the language of a claim *before* determining if the claim complies with each statutory requirement for patentability.

Office personnel should begin claim analysis by identifying and evaluating each claim element. For processes, the claim elements will define steps or acts to be performed. For products, i.e., machines and articles of manufacture, the claim elements will define discrete physical structures. The discrete physical structures may be comprised of hardware or a combination of hardware and software.

As provided in the guidelines, Office personnel are to correlate each claim element to that portion of the disclosure that describes the claim element. This is to be done in all cases, i.e., whether or not the claimed invention is defined using means or step plus function language. The correlation step will ensure that Office personnel clearly understand the meaning and scope of each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope, and it is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that *suggests or makes optional* but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim element.

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims.[9] An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Office personnel should determine if the original disclosure provides a definition consistent with the applicant's assertions.[10] If the applicant asserts that a term has a meaning that conflicts with the term's art-accepted meaning, Office personnel should encourage the applicant to amend the claim to better reflect what applicant intends to claim as the invention.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure.[11] With the exception of claim elements defined in means or step plus function terminology, positive limitations on the scope of a claim cannot be read into the claims based on comments or explanations provided in the disclosure.[12] While it is appropriate to use the specification to determine what applicant intended a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of the claims by the Office will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant always has the opportunity to amend the claims during prosecution to better reflect the intended scope of the claim.

Finally, when evaluating the scope of a claim, *every* limitation in the claim must be considered.[13] Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements *in isolation*. Instead, each claimed element of the invention must be considered in the context of the claim as a whole.

III. Assess Claimed Invention for Compliance with 35 U.S.C. § 101 [Guidelines § I.B.1.(c)]

As the Supreme Court has held, Congress chose the expansive language of § 101 so as to include "anything under the sun that is made by man." Accordingly, § 101 of title 35, United States Code, provides:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[15]

As cast, § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent; namely, processes, machines, manufactures or compositions of matter. The latter three categories define "things" while the process category defines inventions that consist of "actions" (i.e., a series of steps or acts to be performed).[16]

Federal courts have held that § 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of § 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process.[17] Second, § 101 requires that the subject matter sought to be patented be a "useful" invention. Accordingly, a complete definition of the scope of § 101, reflecting Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. Subject matter *not* within one of the four statutory invention categories or which is not "useful" in a patent sense, accordingly, is not eligible to and cannot be patented.

The subject matter courts have found to be outside the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a *practical application or use* of an idea, a law of nature or a natural phenomenon is not patentable.[18]

Courts have expressed a concern over "preemption" of ideas, law of natures or natural phenomena.[19] The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. Such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract" idea is non-statutory because it does not represent a practical application of the idea, not because it would preempt the idea.

A. Determine Whether The Invention is "Useful"

To be patentable, an invention must be "useful" (i.e., it must have a practical application). The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.[20] The utility of an invention must be within the "technological" arts.[21] This requirement can be discerned from the variously phrased prohibitions against the patenting of abstract ideas, laws of nature or natural phenomenon. Courts have indicated that any technological or utilitarian purpose may serve as an appropriate utility.[22]

Office personnel should confirm that the utility asserted for an invention is a practical application of the invention. If the utility of an "invention" is only as an object of philosophical inquiry or to be appreciated in terms of its literary or artistic value, the claimed invention should be rejected under § 101.

Additionally, Office personnel have struggled with claims directed to methods of doing business. A method of doing business is to be treated like any other process.

B. Classify the Invention as to Its Proper Statutory Category

To properly assess compliance with the statutory invention requirements of § 101, Office personnel should classify each specifically claimed invention into *one* statutory or non-statutory category. If the subject matter falls into a non-statutory category, that should not preclude complete examination of the application for all other conditions of patentability. This classification is *only an initial finding* at this point in the examination process that will be again assessed after the examination for compliance with §§ 112, 102 and 103 and before issuance of any Office action.

1. Non-Statutory Subject Matter [Guidelines § I.B.1.(c)(i) & (ii)]

Claims that are clearly non-statutory are those that define:

— a "data structure" per se or computer program per se, i.e., information rather than a computer-implemented process or specific machine or computer readable memory manufacture;

— a compilation or arrangement of non-functional information or a known machine-readable storage medium that is encoded with such information;

— natural phenomena such as electricity and magnetism.

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are more complex to analyze and are addressed below. See section 3.

(a) "Data Structures" Per Se or Computer Programs Per Se

Computers manage data by arranging the data in a particular order or sequence. The relationship that exists among the ordered data elements (i.e., the individual facts or data) is called a "data structure." Data structures in this sense are not statutory products because they are not physical "things" nor are they statutory processes, as they are not "acts" being performed.[23] In other words, when defined without any physical structure, a "data structure" is nothing more than *information* that explains a relationship that exists among ordered data, and therefore is non-statutory. In contrast, a memory circuit whose structure represents a *practical application or* use of a data structure is a statutory manufacture. Accordingly, it is important to distinguish claims that define information per se from claims that define statutory inventions that are based on or use non-statutory information.

Similarly, computer programs per se are not physical "things," nor are they statutory processes, as they are not "acts" being performed. In contrast, a computer process that is implemented using a computer program, a specific computer reconfigured by a computer program, or a memory circuit whose structure is defined by a computer program are statutory.

If a computer program is recited in a claim, Office personnel should determine if the computer program is being used to *describe* the physical structure of a manufacture or machine, or steps to be performed by a computer, or is intended to be the object of the patent, *per se*.

If it is clear that the claim uses the computer program elements to define actions to be performed by a computer, Office personnel should treat the claim as a process claim. If the computer program elements are recited in conjunction with a physical structure, such as a computer memory, the claim should be treated as a product claim. If the claimed subject matter cannot be treated as a process and does not have any *physical* structure, then it is non-statutory "information."

If an applicant challenges the Office's classification of a claim containing computer program elements without any physical structure as a process rather than a product, the claim should be rejected under § 101. Office personnel should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

(b) Non-Functional Information

The term "information" is the "communication of data." It is also used to mean signals representing data. It is the latter definition that is used in these guidelines.

Certain information, such as music, literature, art, and photographs, as well as mere facts or data,[24] cannot impart functionality to a computer. Such "information" is not a process, machine, manufacture or composition of matter.

The policy that precludes the patenting of non-functional data would be easily frustrated if the same data could be patented as an article of manufacture. For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional data.

The non-functional content (e.g., words, images, or other information) cannot provide the practical utility for the manufacture. Function-imparting information is necessary to create a functional and useful physical manufacture (e.g., a computer memory encoded with data that causes a computer to function in a particular manner). If the utility for the encoded medium is dependent upon a human appreciating the artistic or other value of the information content, the claimed invention should be rejected under § 101.

(c) Natural Phenomena Such as Electricity and Magnetism

Claims that recite nothing but the physical characteristics of a form of energy, such as a specific radio frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are non-statutory. A claim directed to a natural phenomenon such as energy or magnetism, which does not recite the practical application of that phenomenon in a process or a product, is to be rejected under § 101.

2. Statutory Subject Matter

(a) Statutory Products

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product.[25]

(i) Product Claims—Claims Directed to Machines and Manufactures

Claims that define a computer-implemented invention as a specific machine or article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware and associated functional software. The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and software.

A computer-related "manufacture" will typically be a component of a specific computer, such as a logic circuit or a computer memory. A manufactured computer memory containing a physical structure representing encoded computer-readable instructions, such as a computer program, is a statutory article of manufacture because the encoded computer-readable instructions give the manufactured memory a new form or structure, and new qualities or properties (e.g., the ability to cause a computer to function in a particular, predefined manner).

To adequately define a computer memory with a particular functionality, the claim must identify the physical characteristics of the memory (e.g., a logic circuit or a storage medium), and the functionality of the memory. A computer memory may be defined in a claim as:

— a logic circuit that results when a programmed computer performs a series of steps dictated by a computer program;[26]

— a memory defined by its functional and/or structural characteristics;[27] or

— a memory whose physical structure is defined by the act of storing computer-executable program code on the memory.

(ii) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

A claim cast in product claim format that, when read in light of the specification, encompasses *any* computer implementation of a process should be examined on the basis of the underlying process. Such a claim can be recognized as it will:

— define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and

— encompass *any* product in the stated class (e.g., computer, computer-readable memory) *configured in any manner* to perform that process.

The following hypotheticals illustrate this distinction. Assume two applicants present a claim to the following process:

A process for determining and displaying the structure of a chemical compound comprising:

(a) solving the wavefunction parameters for the compound to determine the structure of a compound;

(b) displaying the structure of the compound determined in step (a).

In addition, each applicant claims an apparatus, and provides the noted disclosure to support the claims.

	Applicant A	*Applicant B*
Apparatus Claim	A computer system for determining the three dimen sional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for creating and displaying an image representing a three-dimensional perspective of the compound.	A computer system for determining the three dimen sional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for displaying the structure of the compound determined in step (a).
Disclosure	The disclosure describes computer program code segments that are to be employed in configuring a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means elements.	This disclosure states that it would be a matter of routine skill to select an appropriate computer system and implement the claimed process on that computer system. No specific disclosure is made regarding the two "means" elements recited in the claim (i.e., no computer program or logic circuit is described that can perform the indicated functions). The disclosure does provide an explanation of how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound.
Result	Claim defines specific computer, patentability stands independently from process claim.	Claim encompasses any computer embodiment of process claim; patent ability stands or falls with process claim.

	Applicant A	*Applicant B*
Explanation	Disclosure identifies the specific machine capable of performing the indicated functions.	In this scenario, the applicant has not provided any information that can serve to distinguish the "implementation" of the process on a computer from the factors that will govern the patentability determination of the process per se. As such, the patentability of this apparatus claim will stand or fall with that of the process claim.

Office personnel are reminded that finding a product claim to encompass any product embodiment a "process" invention simply means that the Office will *presume* that the product claim encompasses any product in the stated class that performs the specified set of functions. Because this is *interpretive* and *nothing more*, it does not provide any information as to the *patentability* of the applicant's underlying invention or the product claim.

If a claim is found to encompass any product embodiment of the underlying process, and if the underlying process is statutory, the product claim should be classified as a statutory product. By the same token, if the underlying process invention is found to be non-statutory, Office personnel should classify the "product" claim as a "non-statutory product." If the product claim is classified as being a non-statutory product on the basis of the underlying process, Office personnel should emphasize that they have considered all claim limitations and are basing their finding on the analysis of the underlying process.

(b) Statutory Processes [Guidelines § I.B.1.(c)(iii)]

A claim that requires one or more acts to be performed defines a process. Not all processes, however, are processes that fall within the definition of a statutory process under § 101. A *statutory* process is a series of one or more acts that manipulate physical matter or energy resulting in some form of a physical transformation.[28] Accordingly, a claimed process is statutory if it:

— manipulates some form of physical matter or energy; and

— results in a transformation or reduction of the subject matter manipulated into a different state or into a different thing to achieve a practical application.

(i) Appropriate Subject Matter for Manipulation Steps of a Process

Consistent with the expansive Congressional intent behind § 101, Office personnel shall consider any form of physical "matter" or "energy" to be the appropriate subject matter of the manipulation steps of a process. Importantly, the subject matter manipulated by a process does not have to be a physical object; it may be "intangible subject matter representative of or constituting physical activity or objects."[29] Thus, an electrical signal representing data corresponding to a physical object or physical activity is appropriate subject matter for manipulation by a process. If the "acts" of a process manipulate only numbers, abstract concepts or ideas, the acts are not being applied to appropriate subject matter. Thus, a process consisting solely of mathematical operations does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

(ii) Transformation or Reduction to a Different State or Thing

To be statutory, the claimed process when practiced must *physically transform* the subject matter manipulated—something must happen other than manipulating concepts or converting numbers to different numbers. The required transformation can take place during any step of the process (e.g., if a process requires three "acts" and only the last "act" transforms the subject matter to a different state or thing, a sufficient transformation has occurred). If the process does not result in any physical transformation, it is not statutory.

(iii) Examples of Statutory Computer-Implemented Processes

Three exemplary computer-performed processes that fully satisfy the requirements of § 101:

— A process that requires physical acts to be performed independent of the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attributes or structure;[30]

— A process that requires acts to be performed *on* the physical components of a computer (i.e., the process manipulates the components of the computer rather than data representing something external to the computer system) and the effect of the process is that the computer *operates* differently (such as an operating system process); and

— A process that requires acts to be performed *by* a computer on data in the form of an electrical or magnetic signal, where the data represents a physical object or activities external to the computer system (e.g., physical characteristics of a chemical compound or a person's heart rate), and where the process causes some transformation of the physical but intangible representation of the physical object or activities.[31]

3. Non-Statutory Processes

In practical terms, claims define non-statutory processes if they:

— consist solely of mathematical operations (i.e., a "mathematical algorithm"); or

— simply manipulate abstract ideas without some practical application (e.g., a bid, a bubble hierarchy).

(a) Mathematical Algorithm That Defines a Law of Nature or Natural Phenomenon or Describes an Abstract Idea

A process that consists solely of mathematical operations is non-statutory. Mathematical algorithms do not manipulate physical matter and cannot cause a physical effect. Courts have, however, recognized a distinction between types of mathematical algorithms, namely, some *define* a "law of nature" in mathematical terms and others merely *describe* an "abstract idea."

Certain mathematical algorithms have been held non-statutory because they represent a mathematical definition of a law of nature or a natural phenomenon. For example, the formula $E=mc^2$ is a "law of nature"—it defines a "fundamental scientific truth" (i.e., the relationship between energy and mass). To comprehend how the law of nature relates to any object, one invariably has to perform certain steps (e.g., multiplying a number representing the mass of an object by the square of a number representing the speed of light). If an applicant defines a process to consist solely of those steps that one must follow to solve the mathematical representation of the law of nature, the "process" is indistinguishable from the law of nature and would "preempt" the law of nature. A patent cannot be granted on such a process.

Other mathematical algorithms have been held non-statutory because they merely describe an abstract idea. An "abstract idea" may simply be *any* sequence of mathematical operations that are combined to solve a mathematical problem. The concern addressed by holding such subject matter non-statutory is that the mathematical operations merely describe an idea and do not define a process that represents a practical application of the idea.

Accordingly, when a claim is found to define non-statutory subject matter because of a mathematical algorithm, it is

important to determine whether the subject matter is a law of nature or natural phenomenon or abstract idea. A rejection under § 101 should indicate the type of deficiency relied upon to support the rejection.

(b) Evaluation of Certain Language Related to Mathematical Operation Steps of a Process

(i) Intended Use or Field of Use Statements

Claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim. Such language often will be presented in the preamble of claim, but may appear elsewhere in the body of the claim. Intended or field of use language appearing in the preamble will in most instances not limit the claim scope, and as such, Office personnel should be careful to properly interpret such language. For example, a claimed mathematical process "to be used in seismic prospecting..." is not limited by the seismic prospecting use statement (i.e., none of the steps were explicitly or implicitly limited to application to seismic prospecting activities).[33] In such a case, Office personnel should identify the claim language that constitutes the intended use or field of use statements and provide the basis for their findings. This will shift the burden to applicant to demonstrate otherwise.

(ii) Necessary Antecedent Step to Performance of A Mathematical Operation or Independent Limitation on a Claimed Process

In rare situations, certain acts of "collecting" or "selecting" data for use in a process consisting of one or more mathematical operations will not further limit a claim beyond the specified mathematical operation step(s). Such acts "merely determine values for the variables used in the mathematical operations used in making the calculations."[34] In other words, the acts are dictated by nothing other than the performance of a mathematical operation.[35]

If a claim requires acts to be performed to *create* data that will then be used in a process representing a *practical application* of one or more mathematical operations, those acts *must* be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps and as such constitute an independent limitation on the claim.

Examples of acts that independently limit a claimed process involving mathematical operations include:

— a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves *before* "summing" the values represented by the signals;[36] and

— a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular anti-aliasing algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computed tomography scanner).[37]

Examples of steps that do not independently limit one or more mathematical operation steps include:

— "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables;[38] and

— selecting a set of "arbitrary measurement point" values.[39] Such steps do not impose independent limitations on the scope of the claim beyond those required by the mathematical operation limitation.

(iii) Post-Mathematical Operation Step Uses Solution or Merely Conveys Result of Operation

In rare instances, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation step even if the acts are recited in the body of a claim. If, however, the claimed acts represent some *use* of the solution, those acts will invariably impose an independent limitation on the claim. Thus, if a claim requires that the direct result of a mathematical operation be evaluated and transformed into something else, Office personnel cannot treat the subsequent steps as being *indistinguishable* from the performance of the mathematical operation and thus not further limiting on the claim. For example, acts that require the conversion of a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three dimensional structure of the compound cannot be treated as being part of the mathematical operations that yield the wavefunction numbers. Office personnel should be especially careful when reviewing claim language that requires the performance of "post-solution" steps to ensure that actual claim limitations are not ignored.

Examples of steps found not to independently limit a process involving one or more mathematical operation steps include:

— step of "updating an alarm limit" found to constitute changing the number value of a variable to represent the result of the calculation;[40]

— final step of "magnetically recording" the result of a calculation;[41]

— final step of "equating" the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations;[42]

— final step of displaying result of a calculation "as a shade of gray rather than as simply a number" found to not constitute distinct step where the data were numerical values that did not represent anything;[43] and

— step of "transmitting electrical signals representing" the result of calculations.[44]

Office personnel are reminded to rely on the applicant's characterization of the significance of the "acts" being assessed to resolve questions related to their relationship to the mathematical operations recited in the claim and the invention as a whole.[45]

(c) Manipulation of Abstract Ideas Without A Practical Application

A process that consists solely of the manipulation of an abstract idea without any limitation to a practical application is non-statutory.[46]

In order to determine whether the claim is limited to a practical application of an idea, Office personnel must analyze the claim as a whole, in light of the specification, to understand what subject matter is being manipulated and how it is being manipulated. During this procedure, Office personnel must evaluate any statements of intended use or field of use, any data gathering step and any post-manipulation activity. *See* section (b) above.

IV. Issues Related to Compliance with Section 112, First and Second Paragraphs [Guidelines § I.B.2.]

Section 112 serves to ensure that the claims are clearly defined and are fully supported by the disclosure. Office personnel should focus their assessment of applications for compliance with § 112 on determining if the disclosure and claims clearly convey what the applicant has invented, permit others to determine what rights have been provided to the patentee, and enable one skilled in the art to the practice the invention without undue experimentation.

When evaluating applications, Office personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well known in the art, the applicant does not have to provide a disclosure that describes those elements.

Similarly, the applicant need not explicitly recite in the claims every feature of the invention. Rather, if the claims, interpreted in light of the disclosure reasonably apprise those of ordinary skill in the art what the invention is, they satisfy the requirements of § 112, second paragraph. For example, if an applicant indicates that the invention is a particular computer, the claim does not have to recite every element or feature of the computer. In fact, it is preferable for the claim to be drafted in a form that emphasizes what the applicant has invented (e.g., what is new rather than old).[47]

If deficiencies are discovered with respect to § 112, Office personnel must be careful to rely on the appropriate paragraph of § 112. Deficiencies under the second paragraph of § 112 exist if it is unclear what the claim defines (i.e., the claim fails to particularly point out and distinctly claim the invention),[48] or the claim as cast does not define what applicant has indicated to be the invention.[49] Deficiencies under the first paragraph of § 112 can arise where there is not an adequate written description that serves to identify what the applicant has invented, or the disclosure does not enable one skilled in the art to make and use the invention as claimed without undue experimentation. Deficiencies related to disclosure of the best mode for carrying out the claimed invention are not usually encountered during initial examination of an application.

A. Specification Fails to Show How to Make or Use Programmed Computer Element of Invention [Guidelines § I.B.2.(b)]

The disclosure must enable a person skilled in the art to configure the computer to possess the requisite functionality, and, if relevant, integrate the computer with other elements to yield the claimed invention, without the exercise of undue experimentation. If the specification fails to identify *how* to configure a computer to possess the requisite functionality or *how* to integrate the programmed computer with other elements of the invention, the claim is likely to be deficient under § 112, first paragraph.

For many computer-implemented inventions, it is not unusual for the claimed invention to involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement standard for each aspect of the invention.[50] As such, the disclosure must teach a person skilled in each art how to make and use the relevant aspect of the invention without undue experimentation. For example, to enable a claim to a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the disclosure must

— enable a person skilled in the art of molecular modeling to understand and practice the underlying molecular modeling processes; and

— enable a person skilled in the art of computer programming to create a program that directs a computer to create and display the image representing the three-dimensional structure of the compound.

In other words, the disclosure corresponding to each aspect of the invention must be enabling to a person skilled in each respective art.

B. Programmed Computer Is Defined As Composite of Functional Elements

In many instances, an applicant will describe a programmed computer by outlining the significant elements of the programmed computer using a functional block diagram. Office personnel should review the specification to ensure that along with the functional block diagram the disclosure provides information that adequately describes each "element" in hardware or software. If the functionally labeled elements of a programmed computer are not described further in the specification and one skilled in the art would not know what the elements are or how to make or use them to yield the claimed invention, a claim defining an invention requiring the use of that programmed computer is likely to be deficient under one or more requirements of § 112.

C. Elements of a Machine Defined Using Means Plus Function Language [Guidelines § I.B.2.(a) & (b)]

Where means plus function language is used to define the characteristics of a machine or manufacture invention, claim elements must be interpreted to read on only the structures or materials disclosed in the specification, and "equivalents thereof."[51] Thus, at the outset Office personnel must attempt to correlate means elements to some description of the elements in the written specification and drawings.

As noted earlier, there are many appropriate ways of describing the elements of a programmed computer. If the description makes it clear that a means element corresponds to the physical structure of a computer or computer component, that description will sufficiently define the claimed means element. Thus, a means element may be defined to be:

— a programmed computer with a particular functionality;

— a logic circuit or other component of a programmed computer that performs a series of specifically identified operations dictated by a computer program; or

— a computer memory encoded with executable instructions representing a computer program that can cause a computer to function in a particular fashion.

A claim patterned after a functional block diagram and defined using means plus function language may fail to particularly point out and distinctly claim the invention if the disclosure does not describe the specific materials or structures that correspond to the means elements. The scope of a "means" element is defined as the corresponding structure or material (e.g., a specific logic circuit) set forth in the written description and its equivalents. Where no structure or material is disclosed, the claim fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the function to be performed and provides no description of hardware or software that performs the function, the application has not disclosed any "structure" to correspond to the means. Such a claim should be rejected under § 112, second paragraph. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a computer program), the claim satisfies § 112, second paragraph.

Further guidance in interpreting the scope of equivalents of means elements is provided in the *Examination Guidelines For Claims Reciting A Means or Step Plus Function Limitation In Accordance With 35 U.S.C. 112, 6th Paragraph.*[52]

D. Claim Does Not Define Applicant's Invention [Guidelines § I.B.2.(a)]

To satisfy the second paragraph of § 112, the claims must define the invention in a manner consistent with the applicant's written description of the invention. If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility. When the claim recites a practical utility but fails to recite the necessary features to accomplish the asserted practical utility, the claim should be rejected under § 112, second paragraph. If a claim is so broad as to encompass non-statutory subject matter, the claim should be rejected under § 112 ¶ 2, as well as § 101. For example, if applicant has described the invention as a computer-implemented process, but the claim is broad enough to cover the mental performance of the process, then it should be rejected under both § 112 ¶ 2 and § 101.[53]

A claim *as a whole* that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if

recited in the claim, would render the claimed subject matter statutory.

E. Claim Defined Using Only Computer Program Code [Guidelines § I.B.2.(a)]

A claim defined *entirely* in computer program code, whether in source or object code format, may be deficient under § 112 ¶ 2 if one of ordinary skill in the art would not be able to ascertain the metes and bounds of the claimed invention. Such a claim should also be objected to under 37 CFR 1.52(a).[25] A computer programming language is not the English language, despite the fact that English words may be used in that language.

In certain circumstances, as where self-documenting programming code is employed, use of programming language in a claim would be permissible, since such program source code presents sufficiently high-level language and descriptive identifiers to make it universally understood to others in the art without the programmer having to insert any comments.[26]

Applicants should be encouraged to functionally define the steps the computer will perform rather than simply providing source or object code.

V. Issues Related to Compliance with § 103 [Guidelines § I.B.3.]

As is the case for inventions in any field of technology, assessment of a claimed computer-implemented invention for compliance with § 103 begins with a comparison of the claimed subject matter to what is known in the prior art. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies § 103. Factors and considerations dictated by law governing § 103 apply without modification to inventions in this field of technology.

If the difference between the prior art and the claimed invention is limited to information stored on or employed by a machine, one must determine what role the information plays with regard to the invention considered as a whole. Where the information imparts some degree of functionality to the claimed invention taken as a whole, it represents a critical element of the invention. As such, the information must be considered and addressed incident to application of § 103. Thus, a rejection of the claim as a whole under § 103 is inappropriate unless the functionality imparted by the information would have been suggested by the prior art. To establish a *prima facie* case of obviousness, Office personnel must explain *why* it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to impart the functionality of the programmed computer with that specific information.

However, where the information imparts no functionality to achieve the specific utility of the invention, it cannot serve to render the claimed invention, considered as a whole, non-obvious. Generally speaking, situations where information imparts no functionality will be limited to the following:

— a computer readable storage medium that differs from the prior art solely with respect to information encoded on the medium that does not alter its functionality considered as a whole,

— a computer that differs from the prior art solely with respect to information whose content does not alter how the machine functions (i.e., the information does not reconfigure the computer), or

— a process that differs from the prior art only with respect to information that does not alter *how* the process steps are to be performed to achieve the utility of the invention.

Thus, if the prior art suggests storing a song on a disk, merely choosing a *particular* song to store on the disk would be presumed to have been obvious as being well within the level of ordinary skill in the art at the time the invention was made. Such a difference is simply a rearrangement of non-functional information.

VI. Conclusion

Once Office personnel have concluded an analysis of the claimed invention under all the statutory provisions, including §§ 101, 112, 102 and 103, when composing any Official action, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed.

[1] *See Request for Comments on Proposed Examination Guidelines for Computer-Implemented Inventions*, 60 Fed. Reg. 28,778 (June 2, 1995).

[2] *In re Freeman*, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978); *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (CCPA 1980); *In re Abele*, 684 F.2d 902, 905-07, 214 USP Q 682, 685-87 (CCPA 1982).

[3] As the courts have repeatedly reminded the Office: "The goal is to answer the question "'What did applicants invent?'" *In re Abele*, 684 F.2d at 907, 214 USPQ at 687 (CCPA 1982). *Accord, e.g., Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992).

[4] *See Brenner v. Manson*, 383 U.S. 519, 534, 148 USPQ 689, 695 ("Whatever weight is attached to the value of encouraging disclosure and of inhibiting secrecy, we believe a more compelling consideration is that a process patent in the chemical field, which has not been developed and pointed to the degree of specific utility, creates a monopoly of knowledge which should be granted only if clearly commanded by the statute.")(emphasis added). *See also Nelson v. Bowler*, 626 F.2d 853, 856, 206 USPQ 881, 883 (CCPA 1980) (Specific utility is also called "practical utility.").

[5] *E.g., In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981)). *See also id.* at 1579 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854)); Arrhythmia 958 F.2d at 1057, 22 USPQ2d at 1036.

[6] 60 Fed. Reg. 36,263 (July 14, 1995).

[7] *Arrythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036:

It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.

[8] Many computer-implemented inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer-implemented invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process.

[9] *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (in banc).

[10] *See, e.g., In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-1388, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)).

[11] *See, e.g., In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms

reasonably allow . . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

[12] *See, e.g., In re Paulsen*, 30 F.3d at 1480, 31 USPQ2d at 1674 (although specification can be used to interpret what the patentee meant by a word or phrase in the claim, cannot add extraneous limitation from the specification when limitation is not needed to interpret any particular words or phrases in the claim).

[13] *See, e.g., Diamond v. Diehr*, 450 U.S. at 188-89, 209 USPQ at 9 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.").

[14] *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 206 USPQ 193, 196-97 (1980):

In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope. The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871). See *Graham v. John Deere Co.*, 383 U.S. 1, 7-10 (1966). Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952).

This perspective has been embraced by the Federal Circuit:

The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in § 102, 103, and 112. The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35 . . . . Thus, it is improper to read into § 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. [*In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556.]

[15] 35 U.S.C. § 101 (1994).

[16] *See* 35 U.S.C. § 100(b) ("The term "process" means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

[17] *E.g., In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556; *In re Warmerdam*, 33 F.3d at 1358, 31USPQ2d at 1757.

[18] *See, e.g., Rubber-Tip Pencil v. Howard*, 87 U.S. 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994) ("steps of 'locating' a medial axis, and 'creating' a bubble hierarchy describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'").

[19] The concern over preemption was expressed as early as 1852. *See Le Roy v. Tatham*, 55 U.S. 156, 175 (1852)("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, 76 USPQ 280, 282 (1988) (combination of six species of bacteria to be non-statutory subject matter).

[20] *In re Ziegler*, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993); *Brenner v. Manson*, 383 U.S. at 528-36, 148 USPQ at 693-696.

[21] *See, e.g., In re Musgrave*, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970), cited with approval in *In re Schrader*, 22 F3d 290, 297 (Fed. Cir. 1994) (Newman, J., dissenting). The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." Computer Dictionary 384 (2d ed. Microsoft Press 1994).

[22] *E.g., In re Waldbaum*, 457 F.2d 997, 1003, 173 USPQ 430, 434 (CCPA 1972) ("The phrase "technological arts," as we have used it, is synonymous with the phrase "useful arts" as it appears in Article I, Section 8 of the Constitution.").

[23] *See, e.g., In re Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (holding non-statutory a claim to a data structure *per se*).

[24] Computer Dictionary 210 (2d ed. Microsoft Press 1994):

The meaning of data, as it is intended to be interpreted by people. Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what that data represents.

[25] *See, e.g., In re Lowry*, 32 F.3d 1579, 1583, 32 USPQ2d 1031, 1034-35 (Fed. Cir. 1994); *In re Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 17 60.

[26] *In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759 (claim to computer having specific memory defined using product-by-process format).

[27] *In re Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

[28] *Diamond v. Diehr*, 450 U.S. at 183, 209 USPQ at 6 ("A statutory process is . . . a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing . . . The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.").

[29] *In re Schrader*, 22 F.3d 290, 295, 30 USPQ2d 1455, 1459 (Fed. Cir. 1994).

[30] *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8.

[31] *Arrythmia*, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38.

[32] *See, e.g., In re Meyer*, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("Scientific principles, such as the relationship between mass and energy, and laws of nature, such as the acceleration of gravity, namely, a=32 ft/sec.^{2}, can be

represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems. The presence of a mathematical algorithm or formula in a claim is merely an indication that a scientific principle, law of nature, idea or mental process may be the subject matter claimed and, thus, justify a rejection of that claim under 35 USC 101; but the presence of a mathematical algorithm or formula is only a signpost for further analysis."). *Cf. In re Alappat*, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is excluded from the scope of § 101 because it represents laws of nature, natural phenomena, or abstract ideas. *See Diehr*, 450 U.S. at 186 (viewed mathematicalalgorithm as a law of nature); *Benson*, 409 U.S. at 71-72 (treated mathematical algorithm as an "idea"). The Supreme Court also has not been clear as to exactly what kind of mathematical subject matter may not be patented. The Supreme Court has used, among others, the terms "mathematical algorithm," "mathematical formula," and "mathematical equation" to describe types of mathematical subject matter not entitled to patent protection standing alone. The Supreme Court has not set forth, however, any consistent or clear explanation of what it intended by such terms or how these terms are related, if at all.

[33] *In re Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Although the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting; they are drawn to improved mathematical methods for interpreting the results of seismic prospecting.").

[34] *In re Richman*, 563 F.2d 1026, 1030, 195 USPQ 340, 343 (CCPA 1977) ("In the present case too, notwithstanding that the antecedent steps are novel and unobvious, they merely determine values for the variables used in the mathematical formulae used in making the calculations. Thus, such antecedent steps do not suffice to render the claimed methods, considered as a whole, statutory subject matter.").

[35] In *In re Sarkar*, 588 F.2d 1330, 1335, 200 USPQ 132, 139 (CCPA the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to parenting as a "process" under § 101. Consideration of whether the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

[36] *In re Taner*, 681 F.2d 787, 788, 214 USPQ 678, 679 (CCPA 1982).

[37] *In re Abele*, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

[38] *In re Gelnovatch*, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process . . . . In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.").

[39] *In re Sarkar*, 588 F.2d at 1331, 200 USPQ at 135.

[40] *Parker v. Flook*, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978).

[41] *In re Walter*, 618 F.2d at 770, 205 USPQ at 409 ("If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step.").

[42] *In re Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7.

[43] *In re Abele*, 684 F.2d at 909, 214 USPQ at 688 ("This claim presents no more than the calculation of a number and display of the result, albeit in a particular format. The specification provides no greater meaning to "data in a field" than a matrix of numbers regardless of by what method generated. Thus, the algorithm is neither explicitly nor implicitly applied to any certain process. Moreover, that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claim.").

[44] *In re de Castelet*, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1967) ("That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of "post solution activity" found in Flook, supra, and does not transform the claim into one for a process merely *using* an algorithm. The final transmitting step constitutes nothing more than reading out the result of the calculations.").

[45] *See In re Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 ("post-solution" construction that was being modeled by the mathematical process not considered in deciding § 101 question because applicant indicated that such construction was not a material element of the invention).

[46] *E.g., In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759. *See also Schrader*, 22 F.3d at 295, 30 USPQ2d at 1458-59 (although the court determined that the subject matter was simply a mathematical algorithm, Schrader's process mere manipulated an abstract idea).

[47] *See, e.g., Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 941-43, 15 USPQ 2d 1321, 1328-1330 (Fed. Cir. 1990) (judgment of invalidity reversed for clear error where expert testimony on both sides showed that a programer of reasonable skill could write a satisfactory program with ordinary effort based on the disclosure); *DeGeorge v. Bernier*, 768 F.2d 1318, 1334, 226 USPQ 758, 762-63 (Fed. Cir. 1985) (invention was adequately disclosed for purposes of enablement even though all of the circuitry of a word processor was not disclosed, since the undisclosed circuitry was deemed inconsequential because it did not pertain to the claimed circuit); *In re Phillips*, 608 F.2d 879, 882-83, 203 USPQ 971, 975 (CCPA 1979) (computerized method of generating printed architectural specifications dependent on use of glossary of predefined standard phrases and error-checking feature enabled by overall disclosure generally defining errors); *In re Donohue*, 550 F.2d 1269, 1271, 193 USPQ 136, 137 (CCPA 1977) ("Employment of block diagrams and descriptions of their functions is not fatal under 35 U.S.C. § 112, first paragraph, providing the represented structure is conventional and can be determined without undue experimentation."); *In re Knowlton*, 481 F.2d 1357, 1366-68, USPQ 486, 493-94 (CCPA 1973) (examiner's contention that a software invention needed a detailed description of all the circuitry in the complete hardware system reversed).

[48] *See Miles Labs v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) ("test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification").

[49] *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969) (holding that claim did not comply with 35 U.S.C. § 112 ¶ 2 because it was admittedly beyond that which "applicant regard[ed] as his invention").

[50] *See In re Naquin*, 398 F.2d 86, 866, 158 USPQ 317, 319 (CCPA 1968) ("When an invention, in its different aspects, involves distinct arts, that specification is adequate which enables the adepts of each art, those who have the best chance of being enabled, to carry out the aspect proper to their specialty."). *See also Ex parte Zechnall*, 194 USPQ 461, 461 (Bd. App. 1973) ("appellants' disclosure must be held sufficient if it would enable a person skilled in the electronic computer art, in cooperation with a person skilled in the fuel injection art, to make and use appellants' invention").

[51] Two *in banc* decisions of the Federal Circuit have made clear that the Office is to interpret means plus function language according to 35 U.S.C. § 112 ¶ 6. In the first, *In re Donaldson*, F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994), the court held:

The plain and unambiguous meaning of paragraph six is that one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. Paragraph six does not state or even suggest that the PTO is exempt from this mandate, and there is no legislative history indicating that Congress intended that the PTO should be. Thus, this court must accept the plain and precise language of paragraph six.

Consistent with *Donaldson*, in the second decision, *In re Alappat*, 33 F.3d at 1540, 31 USPQ2d at 1554, the Federal Circuit held:

Given Alappat's disclosure, it was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing the function" recited, as it said it was doing, and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process. Contrary to suggestions by the Commissioner, this court's precedents do not support the Board's view that the particular apparatus claims at issue in this case may be viewed as nothing more than process claims.

[52] 1162 O.G. 59 (May 17, 1994).

[53] For example, in *In re Prater*, 415 F.2d at 1403-04, 162 USPQ at 549-50, the court considered a claim that was found to encompass both the mental and physical performance of a series of calculations (i.e., the claim was not limited to performance of a calculation on a machine). The applicant had argued that the invention was to be practiced using a machine. *Id.* The court found that while the claims defined a statutory process, they were deficient under the second paragraph of § 112. *Id.* The court emphasized that:

[W]hen read in the light of the specification, claim 9 does read on a mental process augmented by pencil and paper markings. We find no express limitation in claim 9 which, even when interpreted in the light of the specification, would support the conclusion that the claim is limited to a "machine process" or "machine-implemented process." This is particularly important in this case since the board noted that, in their brief before the board, appellants acknowledged that "[though] not practical for most of the needed applications, their method, theoretically, can be practiced by hand." . . . Inasmuch as claim 9, thus interpreted, reads on subject matter for which appellants do not seek coverage, and therefore tacitly admit to be beyond that which "applicant regards as his invention," we feel that the claim fails to comply with 35 USC 112 which requires that "[the] specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." (Emphasis added.) This is true notwithstanding appellants' disclosure of a machine-implemented process. [Id.]

The basis of this type of rejection is that the claim, as cast, is incomplete.

[54] If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. patent law.

[55] *See* 37 CFR § 1.52(a) ("The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section . . . . ") .

[56] *See* Computer Dictionary 353 (Microsoft Press 1994).

APPENDIX

I. Guidelines for Examination of Computer-Implemented Inventions

(Proposed)

60 Fed. Reg. 28,778 (June 2, 1995)

A. General Considerations

The following guidelines have been developed to assist Office personnel in their review of applications drawn to computer-implemented inventions. These guidelines respond to recent changes in the law that governs the patentability of computer-implemented inventions, and set forth the official policy of the Office regarding inventions in this field of technology.

It is essential that patent applicants obtain a prompt yet complete examination of their applications. The Office can best achieve this goal by raising any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis of a rejection. Where possible, examiners should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

B. Procedures to be Followed When Evaluating Computer-Implemented Inventions

The following procedures should be used when reviewing applications drawn to computer-implemented inventions.

1. *Determine what the applicant has invented by reviewing the written description and the claims.*

(a) Identify any specific embodiments of the invention that have been disclosed, review the detailed description of the invention and note the specific utility that has been asserted for the invention.

(b) Analyze each claim carefully, correlating each claim element to the relevant portion of the written description that describes that element. Give claim elements their broadest reasonable interpretation that is consistent with the written description. If elements of a claimed invention are defined in means plus function format, review the written description to identify the specific structure, materials or acts that correspond to each such element.

(c) Considering each claim as a whole, classify the invention defined by each claim as to its statutory category (i.e., process, machine, manufacture or composition of matter). Rely on the following presumptions in making this classification.

(i) A computer or other programmable apparatus whose actions are directed by a computer program or other form of "software" is a statutory "machine."

(ii) A computer readable memory that can be used to direct a computer to function in a particular manner when used by the computer [1] is a statutory "article of manufacture".

(iii) A series of specific operational steps to be performed on or with the aid of a computer is a statutory "process".

A claim that clearly defines a computer-implemented process but is not cast as an element of a computer readable memory or as implemented on a computer should be classified as a statutory "process." [2] If an applicant responds to an action of the Office based on this classification by asserting that subject matter claimed in this format is a machine or an article of manufacture, reject the claim under 35 U.S.C. § 112, second paragraph, for failing to recite at least one physical element in the claims that would otherwise place the invention in either of these two "product" categories. The Examiner should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

A claim that defines an invention as any of the following subject matter should be classified as non-statutory:

— a compilation or arrangement of data, independent of any physical element;

— a known machine-readable storage medium that is encoded with data representing creative or artistic expression (e.g., a work of music, art or literature) [3], [4];

— a "data structure" independent of any physical element (i.e., not as implemented on a physical component of a computer such as a computer readable memory to render that component capable of causing a computer to operate in a particular manner); or

— a process that does nothing more than manipulate abstract ideas or concepts (e.g., a process consisting solely of the steps one would follow in solving a mathematical problem [5]).

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Non-statutory claims should be handled in the manner described in section (2)(c) below.

2. *Analyze each claim to determine if it complies with § 112, second paragraph, and with § 112, first paragraph.*

(a) Determine if the claims particularly point out and distinctly claim the invention. To do this, compare the invention as claimed to the invention as it has been described in the specification. Pay particular attention to the specific utility contemplated for the invention—features or elements of the invention that are necessary to provide the specific utility contemplated for that invention must be reflected in the claims. If the claims fail to accurately define the invention, they should be rejected under § 112, second paragraph. A failure to limit the claim to reflect features of the invention that are necessary to impart the specific utility contemplated may also create a deficiency under § 112, first paragraph.

If elements of a claimed invention are defined using "means plus function" language, but it is unclear what structure, materials or acts are intended to correspond to those elements, reject the claim under § 112, second paragraph. A rejection imposed on this basis shifts the burden to the applicant to describe the specific structure, material or acts that correspond to the means element in question, and to identify the precise location in the specification where a description of that means element can be found. Interpretation of means elements for § 112, second paragraph purposes must be consistent with interpretation of such elements for §§ 102 and 103 purposes.

Computer program-related elements of a computer-implemented [6] invention may serve as the specific structure, material or acts that correspond to an element of an invention defined using a means plus function limitation. For example, a series of operations performed by a computer under the direction of a computer program may serve as "specific acts" that correspond to a means element. Similarly, a computer-readable memory encoded with data representing a computer program that can cause a computer to function in a particular fashion, or a component of a computer that has been reconfigured with a computer program to operate in a particular fashion, can serve as the "specific structure" corresponding to a means element.

Claims must be defined using the English language. See, 37 CFR 1.52(a). A computer programming language is not the English language, despite the fact that English words may be used in that language. Thus, an applicant may not use computer program code, in either source or object format, to define the metes and bounds of a claim. A claim which attempts to define elements of an invention using computer program code, rather than the functional steps which are to be performed, should be rejected under § 112, second paragraph, and should be objected to under 37 CFR 1.52(a).

(b) Construe the scope of the claimed invention to determine if it is adequately supported by an enabling disclosure. Construe any element defined in means plus function language to encompass all reasonable equivalents of the specific structure, material or acts disclosed in the specification corresponding to that means element. Special care should be taken to ensure that each claim complies with the written description and enablement requirements of 35 U.S.C. § 112.

(c) A claim *as a whole* that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. The review performed in step 1 should be used to gain this understanding.

(i) If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if recited in the claim, would render the claimed subject matter statutory.

(ii) If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. patent law.

An invention is not statutory if it falls within any of the non-statutory claim categories outlined in section (1)(c) above. Also, in rare situations, a claim classified as a statutory machine or article of manufacture may define non-statutory subject matter. Non-statutory subject matter (i.e., abstract ideas, laws of nature and natural phenomena) does not become statutory merely through a different form of claim presentation. Such a claim will (a) define the "invention" not through characteristics of the machine or article of manufacture claimed but exclusively in terms of a non-statutory process that is to be performed on or using that machine or article of manufacture, and (b) encompass any product in the stated class (e.g., computer, computer readable memory) configured *in any manner* to perform that process.

3. *Determine if the claimed invention is novel and nonobvious under §§ 102 and 103.* When evaluating claims defined using "mean plus function" language, refer to the specific guidance provided in the *In re Donaldson* guidelines [1162 OG 59] and section (3)(a) above.

C. Notes on the Guidelines

[1] Articles of manufacture encompassed by this definition consist of two elements: (1) a computer readable storage medium, such as a memory device, a compact disc or a floppy disk, and (2) data encoded on that storage medium in such a way that the storage medium causes a computer to operate in a specific and predefined manner. The composite of the two elements is a storage medium with a particular physical structure and function (e.g., one that will impart the functionality represented by the data onto a computer).

[2] For example, a claim that is cast as "a computer program" but which then recites specific steps to be implemented on or using a computer should be classified as a "process." A claim to simply a "computer program" that does not define the invention in terms of specific steps to be performed on or using a computer should not be classified as a statutory process.

[3] The specific words or symbols that constitute a computer program represent the expression of the computer program and as such are a literary creation.

[4] A claim in this format should also be rejected under § 103, as being obvious over the known machine-readable storage medium standing alone.

[5] A claim to a method consisting solely of the steps necessary to converting one set of numbers to another set of numbers without reciting any computer-implemented steps would be a non-statutory claim under this definition.

[6] This includes the software and any associated computer hardware that is necessary to perform the functions directed by the software.

[1180 OG 14]

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(91) **Department of Commerce**
Patent and Trademark Office
[Docket No. 950531144-5304-02]
RIN 0651-XX02

Examination Guidelines for Computer-Related Inventions

Agency: Patent and Trademark Office, Commerce.
Action: Notice.
Summary: The Patent and Trademark Office ("Office") is publishing the final version of the guidelines to be used in examination of computer-related inventions.
Effective Date: March 29, 1996.
For Further Information Contact: Karen A. Buchanan by telephone at (703) 305-8607, by facsimile at (703) 305-9373, by electronic mail at buchanan@uspto.gov, or by mail marked to her attention addressed to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215.
Supplementary Information:

A. Discussion of Public Comments

The Office received forty-six comments in response to the "Request for Public Comment on the Proposed Examination Guidelines for Computer-Implemented Inventions" published on June 2, 1995 (60 FR 28778) and the supporting legal analysis issued on October 3, 1995. The Office has carefully considered all of the comments, and a number of changes have been made in response

These changes include: (1) merging the guidelines and the legal analysis in support of the guidelines into a single document, (2) changing the subject title of the document from "computer-implemented" inventions to "computer-related" inventions, (3) clarifying the legal requirements for statutory subject matter, (4) segmenting the guidelines into separate statutory requirements for patentability, and (5) ensuring that the guidelines treated computer-related inventions in the same manner as inventions in other technologies to avoid creation of an artificial distinction between hardware-implemented and software-implemented inventions

Several suggestions have not been adopted. These include: (1) determining that claims for data structures per se and computer programs per se are statutory subject matter, (2) determining that claims for non-functional descriptive material embodied on computer-readable media are statutory subject matter, and (3) treating claims that infer functional descriptive material is embodied on computer-readable medium as claims limited to computer-readable medium embodying the functional descriptive material. The first two suggestions are addressed in detail in Section IV.B.1(a)-(c) and the last suggestion is addressed in detail in Section IV.B.2(d).

Several commentors encouraged the Office to improve its ability to conduct effective prior art searches. Such encouragement is consistent with the current Office plan to use automated search tools to effectively conduct such prior art searches

B. Examination Guidelines for Computer-Related Inventions

I. Introduction

These "Examination Guidelines for Computer-Related Inventions"[1] ("Guidelines") are to assist Office personnel in the examination of applications drawn to computer-related inventions.[2] The Guidelines are based on the Office's current understanding of the law and are believed to be fully consistent with binding precedent of the Supreme Court, the Federal Circuit and the Federal Circuit's predecessor courts.

These Guidelines do not constitute substantive rulemaking and hence do not have the force and effect of law. These Guidelines have been designed to assist Office personnel in analyzing claimed subject matter for compliance with substantive law. Rejections will be based upon the substantive law and it is these rejections which are appealable. Consequently, any failure by Office personnel to follow the Guidelines is neither appealable nor petitionable.

The Guidelines alter the procedures Office personnel will follow when examining applications drawn to computer-related inventions and are equally applicable to claimed inventions implemented in either hardware or software. The Guidelines also clarify the Office's position on certain patentability standards related to this field of technology. Office personnel are to rely on these Guidelines in the event of any inconsistent treatment of issues between these Guidelines and any earlier provided guidance from the Office.

The Freeman-Walter-Abele[3] test may additionally be relied upon in analyzing claims directed solely to a process for solving a mathematical algorithm.

Office personnel have had difficulty in properly treating claims directed to methods of doing business. Claims should not be categorized as methods of doing business. Instead, such claims should be treated like any other process claims, pursuant to these Guidelines when relevant.[4]

The appendix includes a flow chart of the process Office personnel will follow in conducting examinations for computer-related inventions.

II. Determine What Applicant Has Invented and Is Seeking to Patent

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement. Thus, Office personnel should state all reasons and bases for rejecting claims in the first Office action. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Whenever practicable, Office personnel should indicate how rejections may be overcome and how problems may be resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Prior to focusing on specific statutory requirements, Office personnel must begin examination by determining what, precisely, the applicant has invented and is seeking to patent,[5] and how the claims relate to and define that invention. Consequently, Office personnel will no longer begin examination by determining if a claim recites a "mathematical algorithm." Rather, they will review the complete specification, including the detailed description of the invention, any specific embodiments that have been disclosed, the claims and any specific utilities that have been asserted for the invention.

A. Identify and Understand Any Practical Application Asserted for the Invention

The subject matter sought to be patented must be a "useful" process, machine, manufacture or composition of matter, i.e., it must have a practical application. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.[6] Accordingly, a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful.

The utility of an invention must be within the "technological" arts.[7] A computer-related invention is within the technological arts. A practical application of a computer-related invention is statutory subject matter. This requirement can be discerned from the variously phrased prohibitions against the patenting of abstract ideas, laws of nature or natural phenomena. An invention that has a practical application in the technological arts satisfies the utility requirement.[8]

The applicant is in the best position to explain why an invention is believed useful. Office personnel should therefore focus their efforts on pointing out statements made in the specification that identify all practical applications for the invention. Office personnel should rely on such statements throughout the examination when assessing the invention for compliance with all statutory criteria. An applicant may assert more than one practical application, but only one is necessary to satisfy the utility requirement. Office personnel should review the entire disclosure to determine the features necessary to accomplish at least one asserted practical application.

B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented

The written description will provide the clearest explanation of the applicant's invention, by exemplifying the invention, explaining how it relates to the prior art and explaining the relative significance of various features of the invention. Accordingly, Office personnel should begin their evaluation of a computer-related invention as follows:

— determine what the programmed computer does when it performs the processes dictated by the software (i.e., the functionality of the programmed computer);[9]

— determine how the computer is to be configured to provide that functionality (i.e., what elements constitute the programmed computer and how those elements are configured and interrelated to provide the specified functionality); and

— if applicable, determine the relationship of the programmed computer to other subject matter outside the computer that constitutes the invention (e.g., machines, devices, materials, or process steps other than those that are part of or performed by the programmed computer).[10]

Patent applicants can assist the Office by preparing applications that clearly set forth these aspects of a computer-related invention.

C. Review the Claims

The claims define the property rights provided by a patent, and thus require careful scrutiny. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated is the invention. Office personnel must thoroughly analyze the language of a claim before determining if the claim complies with each statutory requirement for patentability.

Office personnel should begin claim analysis by identifying and evaluating each claim limitation. For processes, the claim limitations will define steps or acts to be performed. For products[11], the claim limitations will define discrete physical structures. The discrete physical structures may be comprised of hardware or a combination of hardware and software.

Office personnel are to correlate each claim limitation to all portions of the disclosure that describe the claim limitation. This is to be done in all cases, i.e., whether or not the claimed invention is defined using means or step plus function language. The correlation step will ensure that Office personnel correctly interpret each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation.[12]

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims.[13] An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Office personnel should determine if the original disclosure provides a definition consistent with any assertions made by applicant.[14] If an applicant does not define a term in the specification, that term will be given its "common meaning."[15]

If the applicant asserts that a term has a meaning that conflicts with the term's art-accepted meaning, Office personnel should encourage the applicant to amend the claim to better reflect what applicant intends to claim as the invention. If the application becomes a patent, it becomes prior art against subsequent applications. Therefore, it is important for later search purposes to have the patentee employ commonly accepted terminology, particularly for searching text-searchable databases.

Office personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well known in the art, the applicant does not have to provide a disclosure that describes those elements. In such a case the elements will be construed as encompassing any and every art-recognized hardware or combination of hardware and software technique for implementing the defined requisite functionalities.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure.[16] Where means plus function language is used to define the characteristics of a machine or manufacture invention, claim limitations must be interpreted to read on only the structures or materials disclosed in the specification and "equivalents thereof."[17] Disclosure may be express, implicit or inherent. Thus, at the outset, Office personnel must attempt to correlate claimed means to elements set forth in the written description. The written description includes the specification and the drawings. Office personnel are to give the claimed means plus function limitations their broadest reasonable interpretation consistent with all corresponding structures or materials described in the specification and their equivalents. Further guidance in interpreting the scope of equivalents is provided in the "Examination Guidelines For Claims Reciting A Means or Step Plus Function Limitation In Accordance With 35 U.S.C. 112, 6th Paragraph" ("Means Plus Function Guidelines").[18]

While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of a claim by Office personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant can always amend a claim during prosecution to better reflect the intended scope of the claim.

Finally, when evaluating the scope of a claim, every limitation in the claim must be considered.[19] Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered.

III. Conduct a Thorough Search of the Prior Art

Prior to classifying the claimed invention under § 101, Office personnel are expected to conduct a thorough search of the prior art. Generally, a thorough search involves reviewing both U.S. and foreign patents and non-patent literature. In many cases, the result of such a search will contribute to Office personnel's understanding of the invention. Both claimed and unclaimed aspects of the invention described in the specification should be searched if there is a reasonable expectation that the unclaimed aspects may be later claimed. A search must take into account any structure or material described in the specification and its equivalents which correspond to the claimed means plus function limitation, in accordance with 35 U.S.C. § 112, sixth paragraph and the Means Plus Function Guidelines.[20]

IV. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 101

A. Consider the Breadth of 35 U.S.C. § 101 Under Controlling Law

As the Supreme Court has held, Congress chose the expansive language of § 101 so as to include "anything under the sun that is made by man."[21] Accordingly, § 101 of title 35, United States Code, provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[22]

As cast, § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent; namely, processes, machines, manufactures and compositions of matter. The latter three categories define "things" while the first category defines "actions" (i.e., inventions that consist of a series of steps or acts to be performed).[23]

Federal courts have held that § 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of § 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process.[24] Second, § 101 requires that the subject matter sought to be patented be a "useful" invention. Accordingly, a complete definition of the scope of § 101, reflecting Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. Subject matter not within one of the four statutory invention categories or which is not "useful" in a patent sense is, accordingly, not eligible to be patented.

The subject matter courts have found to be outside the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable.[25]

Courts have expressed a concern over "preemption" of ideas, laws of nature or natural phenomena.[26] The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. In fact, such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract idea" is non-statutory because it does not represent a practical application of the idea, not because it would preempt the idea.

B. Classify the Claimed Invention as to Its Proper Statutory Category

To properly determine whether a claimed invention complies with the statutory invention requirements of § 101, Office personnel should classify each claim into one or more statutory or non-statutory categories. If the claim falls into a non-statutory category, that should not preclude complete examination of the application for satisfaction of all other conditions of patentability. This classification is only an initial finding at this point in the examination process that will be again assessed after the examination for compliance with §§ 102, 103 and 112 is completed and before issuance of any Office action on the merits.

If the invention as set forth in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate amendment of the claims. In such a case, Office personnel should reject the claims drawn to non-statutory subject matter under § 101, but identify the features of the invention that would render the claimed subject matter statutory if recited in the claim.

1. Non-Statutory Subject Matter

Claims to computer-related inventions that are clearly non-statutory fall into the same general categories as non-statutory claims in other arts, namely natural phenomena such as magnetism, and abstract ideas or laws of nature which constitute "descriptive material." Descriptive material can be characterized as either "functional descriptive material" or "non-functional descriptive material." In this context, "functional descriptive material" consists of data structures[27] and computer programs which impart functionality when encoded on a computer-readable medium. "Non-functional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are non-statutory when claimed as descriptive material per se. When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases.[28] When non-functional descriptive material is recorded on some computer-readable medium, it is not structurally and functionally interrelated to the medium but is merely carried by the medium. Merely claiming non-functional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance.[29] Thus, non-statutory music does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are more complex to analyze and are addressed below. See sections IV.B.2(d) and IV.B.2(e).

(a) Functional Descriptive Material: "Data Structures" Representing Descriptive Material Per Se or Computer Programs Representing Computer Listings Per Se

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are neither physical "things" nor statutory processes.[30] Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the medium which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things," nor are they statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed aspects of the invention which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program defines structural and functional interrelationships between the computer program and the medium which permit the computer program's functionality to be realized, and is thus statutory. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Computer programs are often recited as part of a claim. Office personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence non-statutory.

Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program

itself is not a process and Office personnel should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as non-statutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, Office personnel should treat the claim as a process claim. See Sections IV.B.2(b)-(e).When a computer program is recited in conjunction with a physical structure, such as a computer memory, Office personnel should treat the claim as a product claim. See Section IV.B.2(a).

(b) Non-Functional Descriptive Material

Descriptive material that cannot exhibit any functional interrelationship with the way in which computing processes are performed does not constitute a statutory process, machine, manufacture or composition of matter and should be rejected under § 101. Thus, Office personnel should consider the claimed invention as a whole to determine whether the necessary functional interrelationship is provided.

Where certain types of descriptive material, such as music, literature, art, photographs and mere arrangements or compilations of facts or data,[31] are merely stored so as to be read or outputted by a computer without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer, then such descriptive material alone does not impart functionality either to the data as so structured, or to the computer. Such "descriptive material" is not a process, machine, manufacture or composition of matter.

The policy that precludes the patenting of non-functional descriptive material would be easily frustrated if the same descriptive material could be patented when claimed as an article of manufacture.[32] For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional descriptive material. The purely non-functional descriptive material cannot alone provide the practical application for the manufacture.

Office personnel should be prudent in applying the foregoing guidance. Non-functional descriptive material may be claimed in combination with other functional descriptive material on a computer-readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of § 101. The presence of the claimed non-functional descriptive material is not necessarily determinative of non-statutory subject matter. For example, a computer that recognizes a particular grouping of musical notes read from memory and upon recognizing that particular sequence, causes another defined series of notes to be played, defines a functional interrelationship among that data and the computing processes performed when utilizing that data, and as such is statutory because it implements a statutory process.

(c) Natural Phenomena Such as Electricity and Magnetism

Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are non-statutory natural phenomena.[33] However, a claim directed to a practical application of a natural phenomenon such as energy or magnetism is statutory.[34]

2. Statutory Subject Matter

(a) Statutory Product Claims[35]

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product.[36]

A machine or manufacture claim may be one of two types: (1) a claim that encompasses any and every machine for performing the underlying process or any and every manufacture that can cause a computer to perform the underlying process, or (2) a claim that defines a specific machine or manufacture. When a claim is of the first type, Office personnel are to evaluate the underlying process the computer will perform in order to determine the patentability of the product.

(i) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

Office personnel must treat each claim as a whole. The mere fact that a hardware element is recited in a claim does not necessarily limit the claim to a specific machine or manufacture.[37] If a product claim encompasses any and every computer implementation of a process, when read in light of the specification, it should be examined on the basis of the underlying process. Such a claim can be recognized as it will:

— define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and
— encompass any and every product in the stated class (e.g., computer, computer-readable memory) configured in any manner to perform that process.

Office personnel are reminded that finding a product claim to encompass any and every product embodiment of a process invention simply means that the Office will presume that the product claim encompasses any and every hardware or hardware platform and associated software implementation that performs the specified set of claimed functions. Because this is interpretive and nothing more, it does not provide any information as to the patentability of the applicant's underlying process or the product claim.

When Office personnel have reviewed the claim as a whole and found that it is not limited to a specific machine or manufacture, they shall identify how each claim limitation has been treated and set forth their reasons in support of their conclusion that the claim encompasses any and every machine or manufacture embodiment of a process. This will shift the burden to applicant to demonstrate why the claimed invention should be limited to a specific machine or manufacture.

If a claim is found to encompass any and every product embodiment of the underlying process, and if the underlying process is statutory, the product claim should be classified as a statutory product. By the same token, if the underlying process invention is found to be non-statutory, Office personnel should classify the "product" claim as a "non-statutory product." If the product claim is classified as being a non-statutory product on the basis of the underlying process, Office personnel should emphasize that they have considered all claim limitations and are basing their finding on the analysis of the underlying process.

(ii) Product Claims—Claims Directed to Specific Machines and Manufactures

If a product claim does not encompass any and every computer-implementation of a process, then it must be treated as a specific machine or manufacture. Claims that define a computer-related invention as a specific machine or specific article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware or hardware and "specific software."[38] The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and specific software.

To adequately define a specific computer memory, the claim must identify a general or specific memory and the specific software which provides the functionality stored in the memory.

A claim limited to a specific machine or manufacture, which has a practical application in the technological arts, is statutory. In most cases, a claim to a specific machine or manufacture will have a practical application in the technological arts.

(iii) Hypothetical Machine Claims Which Illustrate Claims of the Types Described in Sections IV.B.2(a)(i) and (ii)

Two applicants present a claim to the following process:

A process for determining and displaying the structure of a chemical compound comprising:

(a) solving the wavefunction parameters for the compound to determine the structure of a compound; and
(b) displaying the structure of the compound determined in step (a).

Each applicant also presents a claim to the following apparatus:

A computer system for determining the three dimensional structure of a chemical compound comprising:

(a) means for determining the three dimensional structure of a compound; and
(b) means for creating and displaying an image representing a three-dimensional perspective of the compound.

In addition, each applicant provides the noted disclosures to support the claims:

	Applicant A	Applicant B
Disclosure	The disclosure describes specific software, i.e., specific program code segments, that are to be employed to configure a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means limitations.	The disclosure states that it would be a matter of routine skill to select an appropriate conventional computer system and implement the claimed process on that computer system. The disclosure does not have specific disclosure that corresponds to the two "means" limitations recited in the claim (i.e., no specific software or logic circuit). The disclosure does have an explanation of how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound.
Result	Claim defines specific computer, patentability stands independently from process claim.	Claim encompasses any computer embodiment of process claim; patentability stands or falls with process claim.
Explanation	Disclosure identifies the specific machine capable of performing the indicated functions.	Disclosure does not provide any information to distinguish the "implementation" of the process on a computer from the factors that will govern the patentability determination of the process per se. As such, the patentability of this apparatus claim will stand or fall with that of the process claim.

(b) Statutory Process Claims

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under § 101. To be statutory, a claimed computer-related process must either: (1) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in (i) below),[39] or (2) be limited by the language in the claim to a practical application within the technological arts (discussed in (ii) below).[40] The claimed practical application must be a further limitation upon the claimed subject matter if the process is confined to the internal operations of the computer. If a physical transformation occurs outside the computer, it is not necessary to claim the practical application. A disclosure that permits a skilled artisan to practice the claimed invention, i.e., to put it to a practical use, is sufficient. On the other hand, it is necessary to claim the practical application if there is no physical transformation or if the process merely manipulates concepts or converts one set of numbers into another.
A claimed process is clearly statutory if it results in a physical transformation outside the computer, i.e., falls into one or both of the following specific categories ("safe harbors").

(i) Safe Harbors

— Independent Physical Acts (Post-Computer Process Activity)

A process is statutory if it requires physical acts to be performed outside the computer independent of and following the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attribute or structure.[41] Thus, if a process claim includes one or more post- computer process steps that result in a physical transformation outside the computer (beyond merely conveying the direct result of the computer operation, see Section IV.B.2(d)(iii)), the claim is clearly statutory.

Examples of this type of statutory process include the following:

— A method of curing rubber in a mold which relies upon updating process parameters, using a computer processor to determine a time period for curing the rubber, using the computer processor to determine when the time period has been reached in the curing process and then opening the mold at that stage.
— A method of controlling a mechanical robot which relies upon storing data in a computer that represents various types of mechanical movements of the robot, using a computer processor to calculate positioning of the robot in relation to given tasks to be performed by the robot, and controlling the robot's movement and position based on the calculated position.

— Manipulation of Data Representing Physical Objects or Activities (Pre-Computer Process Activity)

Another statutory process is one that requires the measurements of physical objects or activities to be transformed outside of the computer into computer data,[42] where the data comprises signals corresponding to physical objects or activities external to the computer system, and where the process causes a physical transformation of the signals which are intangible representations of the physical objects or activities.[43]

Examples of this type of claimed statutory process include the following:

— A method of using a computer processor to analyze electrical signals and data representative of human cardiac activity by converting the signals to time segments, applying the time segments in reverse order to a high pass filter means, using the computer processor to determine the amplitude of the high pass filter's output, and using the computer processor to compare the value to a predetermined value. In this example the data is an intangible representation of physical activity, i.e., human cardiac activity. The transformation occurs when heart activity is measured and an electrical signal is produced. This process has real world value in predicting vulnerability to ventricular tachycardia immediately after a heart attack.
— A method of using a computer processor to receive data representing Computerized Axial Tomography ("CAT") scan images of a patient, performing a calculation to determine the difference between a local value at a data point and an average value of the data in a region surrounding the point, and displaying the difference as a gray scale for each point in the image, and displaying the resulting image. In this example the data is an intangible representation of a physical object, i.e., portions of the anatomy of a patient. The transformation occurs when the condition of the human body is measured with X-rays and the X-rays are converted into electrical digital signals that represent the condition of the human body. The real world value of the invention lies in creating a new CAT scan image of body tissue without the presence of bones.
— A method of using a computer processor to conduct seismic exploration, by imparting spherical seismic energy waves into the earth from a seismic source, generating a plurality of reflected signals in response to the seismic energy waves at a set of receiver positions in an array, and summing the reflection signals to produce a signal simulating the reflection response of the earth to the seismic energy. In this example, the electrical signals processed by the computer represent reflected seismic energy. The transformation occurs by converting the spherical seismic energy waves into electrical signals which provide a geophysical representation of formations below the earth's surface. Geophysical exploration of formations below the surface of the earth has real world value.
If a claim does not clearly fall into one or both of the safe harbors, the claim may still be statutory if it is limited by the language in the claim to a practical application in the technological arts.

(ii) Computer-Related Processes Limited to a Practical Application in the Technological Arts

There is always some form of physical transformation within a computer because a computer acts on signals and transforms them during its operation and changes the state of its components during the execution of a process. Even though such a physical transformation occurs within a computer, such activity is not determinative of whether the process is statutory because such transformation alone does not distinguish a statutory computer process from a non-statutory computer process. What is determinative is not how the computer performs the process, but what the computer does to achieve a practical application.[44]
A process that merely manipulates an abstract idea or performs a purely mathematical algorithm is non-statutory despite the fact that it might inherently have some usefulness.[45] For such subject matter to be statutory, the claimed process must be limited to a practical application of the abstract idea or mathematical algorithm in the technological arts.[46] For example, a computer process that simply calculates a mathematical algorithm that models noise is non-statutory. However, a claimed process for digitally filtering noise employing the mathematical algorithm is statutory.

Examples of this type of claimed statutory process include the following:

— A computerized method of optimally controlling transfer, storage and retrieval of data between cache and hard disk storage devices such that the most frequently used data is readily available.
— A method of controlling parallel processors to accomplish multi-tasking of several computing tasks to maximize computing efficiency.[47]
— A method of making a word processor by storing an executable word processing application program in a general purpose digital computer's memory, and executing the stored program to impart word processing functionality to the general purpose digital computer by changing the state of the computer's arithmetic logic unit when program instructions of the word processing program are executed.
— A digital filtering process for removing noise from a digital signal comprising the steps of calculating a mathematical algorithm to produce a correction signal and subtracting the correction signal from the digital signal to remove the noise.

(c) Non-Statutory Process Claims

If the "acts" of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

In practical terms, claims define non-statutory processes if they:

— consist solely of mathematical operations without some claimed practical application (i.e., executing a "mathematical algorithm"); or
— simply manipulate abstract ideas, e.g., a bid[48] or a bubble hierarchy,[49] without some claimed practical application.

A claimed process that consists solely of mathematical operations is non-statutory whether or not it is performed on a computer. Courts have recognized a distinction between types of mathematical algorithms, namely, some define a "law of nature" in mathematical terms and others merely describe an "abstract idea."[50]
Certain mathematical algorithms have been held to be non-statutory because they represent a mathematical definition of a law of nature or a natural phenomenon. For example, a mathematical algorithm representing the formula $E=mc^2$ is a "law of nature"—it defines a "fundamental scientific truth" (i.e., the relationship between energy and mass). To comprehend how the law of nature relates to any object, one invariably has to perform certain steps (e.g., multiplying a number representing the mass of an object by the square of a number representing the speed of light). In such a case, a claimed process which consists solely of the steps that one must follow to solve the mathematical representation of $E=mc^2$ is indistinguishable from the law of nature and would "preempt" the law of nature. A patent cannot be granted on such a process.
Other mathematical algorithms have been held to be non-statutory because they merely describe an abstract idea. An "abstract idea" may simply be any sequence of mathematical operations that are combined to solve a mathematical problem. The concern addressed by holding such subject matter non-statutory is that the mathematical operations merely describe an idea and do not define a process that represents a practical application of the idea.
Accordingly, when a claim reciting a mathematical algorithm is found to define non-statutory subject matter the basis of the § 101 rejection must be that, when taken as a whole, the claim recites a law of nature, a natural phenomenon, or an abstract idea.

(d) Certain Claim Language Related to Mathematical Operation Steps of a Process

(i) Intended Use or Field of Use Statements

Claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim, particularly when only presented in the claim preamble. Thus, Office personnel should be careful to properly interpret such language.[51] When such language is treated as non-limiting, Office personnel should expressly identify in the Office action the claim language that constitutes the intended use or field of use statements and provide the basis for their findings. This will shift the burden to applicant to demonstrate why the language is to be treated as a claim limitation.

(ii) Necessary Antecedent Step to Performance of a Mathematical Operation or Independent Limitation on a Claimed Process

In some situations, certain acts of "collecting" or "selecting" data for use in a process consisting of one or more mathematical operations will not further limit a claim beyond the specified mathematical operation step(s). Such acts merely determine values for the variables used in the mathematical formulae used in making the calculations.[52] In other words, the acts are dictated by nothing other than the performance of a mathematical operation.[53]
If a claim requires acts to be performed to create data that will then be used in a process representing a practical application of one or more mathematical operations, those acts must be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps and as such constitute an independent limitation on the claim.

Examples of acts that independently limit a claimed process involving mathematical operations include:

— a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves before "summing" the values represented by the signals;[54] and
— a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computer tomography scanner).[55]

Examples of steps that do not independently limit one or more mathematical operation steps include:

— "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables;[56] and
— selecting a set of arbitrary measurement point values.[57]

Such steps do not impose independent limitations on the scope of the claim beyond those required by the mathematical operation limitation.

(iii) Post-Mathematical Operation Step Using Solution or Merely Conveying Result of Operation

In some instances, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation step even if the acts are recited in the body of a claim. If, however, the claimed acts represent some "significant use" of the solution, those acts will invariably impose an independent limitation on the claim. A "significant use" is any activity which is more than merely outputting the direct result of the mathematical operation. Office personnel are reminded to rely on the applicant's characterization of the significance of the acts being assessed to resolve questions related to their relationship to the mathematical operations recited in the claim and the invention as a whole.[58] Thus, if a claim requires that the direct result of a mathematical operation be evaluated and transformed into something else, Office personnel cannot treat the subsequent steps as being indistinguishable from the performance of the mathematical operation and thus not further limiting on the claim. For example, acts that require the conversion of a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three-dimensional structure of the compound and the displaying of the three-dimensional structure cannot be treated as being part of the mathematical operations.
Office personnel should be especially careful when reviewing claim language that requires the performance of "post-solution" steps to ensure that claim limitations are not ignored.

Examples of steps found not to independently limit a process involving one or more mathematical operation steps include:

— step of "updating alarm limits" found to constitute changing the number value of a variable to represent the result of the calculation;[59]
— final step of magnetically recording the result of a calculation;[60]
— final step of "equating" the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations;[61]
— final step of displaying result of a calculation "as a shade of gray rather than as simply a number" found to not constitute distinct step where the data were numerical values that did not represent anything;[62] and
— step of "transmitting electrical signals representing" the result of calculations.[63]

(e) Manipulation of Abstract Ideas Without a Claimed Practical Application

A process that consists solely of the manipulation of an abstract idea without any limitation to a practical application is non-statutory.[64] Office personnel have the burden to establish a prima facie case that the claimed invention taken as a whole is directed to the manipulation of abstract ideas without a practical application.
In order to determine whether the claim is limited to a practical application of an abstract idea, Office personnel must analyze the claim as a whole, in light of the specification, to understand what subject matter is being manipulated and how it is being manipulated. During this procedure, Office personnel must evaluate any statements of intended use or field of use, any data gathering step and any post-manipulation activity. See section IV.B.2(d) above for how to treat various types of claim language. Only when the claim is devoid of any limitation to a practical application in the technological arts should it be rejected under § 101. Further, when such a rejection is made, Office personnel must expressly state how the language of the claims has been interpreted to support the rejection.

V. Evaluate Application for Compliance with 35 U.S.C. § 112

Office personnel should begin their evaluation of an application's compliance with § 112 by considering the requirements of § 112, second paragraph. The second paragraph contains two separate and distinct requirements: (1) that the claim(s) set forth the subject matter applicants regard as the invention, and (2) that the claim(s) particularly point out and distinctly claim the invention. An application will be deficient under § 112, second paragraph when (1) evidence including admissions, other than in the application as filed, shows applicant has stated that he or she regards the invention to be different from what is claimed, or when (2) the scope of the claims is unclear.

After evaluation of the application for compliance with § 112, second paragraph, Office personnel should then evaluate the application for compliance with the requirements of § 112, first paragraph. The first paragraph contains three separate and distinct requirements: (1) adequate written description, (2) enablement, and (3) best mode. An application will be deficient under § 112, first paragraph when the written description is not adequate to identify what the applicant has invented, or when the disclosure does not enable one skilled in the art to make and use the invention as claimed without undue experimentation. Deficiencies related to disclosure of the best mode for carrying out the claimed invention are not usually encountered during examination of an application because evidence to support such a deficiency is seldom in the record.

If deficiencies are discovered with respect to § 112, Office personnel must be careful to apply the appropriate paragraph of § 112.

A. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, Second Paragraph Requirements

1. Claims Setting Forth the Subject Matter Applicant Regards as Invention

Applicant's specification must conclude with claim(s) that set forth the subject matter which the applicant regards as the invention. The invention set forth in the claims is presumed to be that which applicant regards as the invention, unless applicant considers the invention to be something different from what has been claimed as shown by evidence, including admissions, outside the application as filed. An applicant may change what he or she regards as the invention during the prosecution of the application.

2. Claims Particularly Pointing Out and Distinctly Claiming the Invention

Office personnel shall determine whether the claims set out and circumscribe the invention with a reasonable degree of precision and particularity. In this regard, the definiteness of the language must be analyzed, not in a vacuum, but always in light of the teachings of the disclosure as it would be interpreted by one of ordinary skill in the art. Applicant's claims, interpreted in light of the disclosure, must reasonably apprise a person of ordinary skill in the art of the invention. However, the applicant need not explicitly recite in the claims every feature of the invention. For example, if an applicant indicates that the invention is a particular computer, the claims do not have to recite every element or feature of the computer. In fact, it is preferable for claims to be drafted in a form that emphasizes what the applicant has invented (i.e., what is new rather than old).

A means plus function limitation is distinctly claimed if the description makes it clear that the means corresponds to well-defined structure of a computer or computer component implemented in either hardware or software and its associated hardware platform. Such means may be defined as:

— a programmed computer with a particular functionality implemented in hardware or hardware and software;
— a logic circuit or other component of a programmed computer that performs a series of specifically identified operations dictated by a computer program; or
— a computer memory encoded with executable instructions representing a computer program that can cause a computer to function in a particular fashion.

The scope of a "means" limitation is defined as the corresponding structure or material (e.g., a specific logic circuit) set forth in the written description and equivalents.[6] Thus, a claim using means plus function limitations without corresponding disclosure of specific structures or materials that are not well-known fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the functions to be performed and provides no express, implied or inherent disclosure of hardware or a combination of hardware and software that performs the functions, the application has not disclosed any "structure" which corresponds to the claimed means. Office personnel should reject such claims under § 112, second paragraph. The rejection shifts the burden to the applicant to describe at least one specific structure or material that corresponds to the claimed means in question, and to identify the precise location or locations in the specification where a description of at least one embodiment of that claimed means can be found. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a defined computer program), the application has disclosed "structure" which corresponds to the claimed means.

When a claim or part of a claim is defined in computer program code, whether in source or object code format, a person of skill in the art must be able to ascertain the metes and bounds of the claimed invention. In certain circumstances, as where self-documenting programming code is employed, use of programming language in a claim would be permissible because such program source code presents "sufficiently high-level language and descriptive identifiers" to make it universally understood to others in the art without the programmer having to insert any comments.[6] Applicants should be encouraged to functionally define the steps the computer will perform rather than simply reciting source or object code instructions.

B. Determine Whether the Claimed Invention Complies with 35 U.S.C. § 112, First Paragraph Requirements

1. Adequate Written Description

The satisfaction of the enablement requirement does not satisfy the written description requirement.[6] For the written description requirement, an applicant's specification must reasonably convey to those skilled in the art that the applicant was in possession of the claimed invention as of the date of invention. The claimed invention subject matter need not be described literally, i.e., using the same terms, in order for the disclosure to satisfy the description requirement.

2. Enabling Disclosure

An applicant's specification must enable a person skilled in the art to make and use the claimed invention without undue experimentation. The fact that experimentation is complex, however, will not make it undue if a person of skill in the art typically engages in such complex experimentation. For a computer-related invention, the disclosure must enable a skilled artisan to configure the computer to possess the requisite functionality, and, where applicable, interrelate the computer with other elements to yield the claimed invention, without the exercise of undue experimentation. The specification should disclose how to configure a computer to possess the requisite functionality or how to integrate the programmed computer with other elements of the invention, unless a skilled artisan would know how to do so without such disclosure.[6]

For many computer-related inventions, it is not unusual for the claimed invention to involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement standard for each aspect of the invention.[6] As such, the disclosure must teach a person skilled in each art how to make and use the relevant aspect of the invention without undue experimentation. For example, to enable a claim to a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the disclosure must

— enable a person skilled in the art of molecular modeling to understand and practice the underlying molecular modeling processes; and
— enable a person skilled in the art of computer programming to create a program that directs a computer to create and display the image representing the three-dimensional structure of the compound.

In other words, the disclosure corresponding to each aspect of the invention must be enabling to a person skilled in each respective art.

In many instances, an applicant will describe a programmed computer by outlining the significant elements of the programmed computer using a functional block diagram. Office personnel should review the specification to ensure that along with the functional block diagram the disclosure provides information that adequately describes each "element" in hardware or hardware and its associated software and how such elements are interrelated.[10]

VI. Determine Whether the Claimed Invention Complies with 35 U.S.C. §§ 102 and 103

As is the case for inventions in any field of technology, assessment of a claimed computer-related invention for compliance with § 102 and § 103 begins with a comparison of the claimed subject matter to what is known in the prior art. If no differences are found between the claimed invention and the prior art, the claimed invention lacks novelty and is to be rejected by Office personnel under § 102. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies § 103. Factors and considerations dictated by law governing § 103 apply without modification to computer-related inventions.

If the difference between the prior art and the claimed invention is limited to descriptive material stored on or employed by a machine, Office personnel must determine whether the descriptive material is functional descriptive material or nonfunctional descriptive material, as described supra in Section IV. Functional descriptive material is a limitation in the claim and must be considered and addressed in assessing patentability under § 103. Thus, a rejection of the claim as a whole under § 103 is inappropriate unless the functional descriptive material would have been suggested by the prior art. Non-functional descriptive material cannot render nonobvious an invention that would have otherwise been obvious.[11]

Common situations involving non-functional descriptive material are:

— a computer-readable storage medium that differs from the prior art solely with respect to non-functional descriptive material, such as music or a literary work, encoded on the medium,
— a computer that differs from the prior art solely with respect to non-functional descriptive material that cannot alter how the machine functions (i.e., the descriptive material does not reconfigure the computer), or
— a process that differs from the prior art only with respect to non-functional descriptive material that cannot alter how the process steps are to be performed to achieve the utility of the invention.

Thus, if the prior art suggests storing a song on a disk, merely choosing a particular song to store on the disk would be presumed to be well within the level of ordinary skill in the art at the time the invention was made. The difference between the prior art and the claimed invention is simply a rearrangement of non-functional descriptive material.

VII. Clearly Communicate Findings, Conclusions and Their Bases

Once Office personnel have concluded the above analyses of the claimed invention under all the statutory provisions, including §§ 101, 112, 102 and 103, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed in an Office action. The Office action should clearly communicate the findings, conclusions and reasons which support them.

[1] These Guidelines are final and replace the "Proposed Examination Guidelines for Computer-Implemented Inventions," 60 FR 28,778 (June 2, 1995) and the supporting legal analysis issued on October 3, 1995.

[2] "Computer-related inventions" include inventions implemented in a computer and inventions employing computer-readable media.

[3] *In re Abele*, 684 F.2d 902, 905-07, 214 USPQ 682, 685-87 (CCPA 1982); *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (CCPA 1980); *In re Freeman*, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978).

[4] See, e.g., *In re Toma*, 575 F.2d 872, 877-78, 197 USPQ 852, 857 (CCPA 1978); *In re Musgrave*, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970). See also *In re Schrader*, 22 F.3d 290, 297-98, 30 USPQ2d 1455, 1461-62 (Fed. Cir. 1994) (Newman, J., dissenting); *Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc.*, 564 F. Supp. 1358, 1368-69, 218 USPQ 212, 220 (D. Del. 1983).

[5] As the courts have repeatedly reminded the Office: "The goal is to answer the question "'What did applicants invent?'" *Abele*, 684 F.2d at 907, 214 USPQ at 687. Accord, e.g., *Arrhythmia Research Tech. v. Corazonix Corp.*, *958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992)*.

[6] *Brenner v. Manson*, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96 (1966); *In re Ziegler*, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993).

[7] See, e.g., *Musgrave*, 431 F.2d at 893, 167 USPQ at 289-90, cited with approval in *Schrader*, 22 F.3d at 297, 30 USPQ2d at 1461 (Newman, J., dissenting). The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." Computer Dictionary 384 (Microsoft Press, 2d ed. 1994).

[8] E.g., *In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981)). See also id. at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 114-19 (1854)); *Arrhythmia*, 958 F.2d at 1056, 22 USPQ2d at 1036; *Musgrave*, 431 F.2d at 893, 167 USPQ at 289-90 ("All that is necessary, in our view, to make a sequence of operational steps a statutory 'process' within 35 U.S.C. 101 is that it be in the technological arts so as to be in consonance with the Constitutional purpose to promote the progress of 'useful arts.' Const. Art. 1, sec. 8.").

[9] *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036:
It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.

[10] Many computer-related inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer-related invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process.

[11] Products may be either machines, manufactures or compositions of matter. Product claims are claims that are directed to either machines, manufactures or compositions of matter.

[12] Examples of language that may raise a question as to the limiting effect of the language in a claim:

(a) statements of intended use or field of use,
(b) "adapted to" or "adapted for" clauses,
(c) "wherein" clauses, or
(d) "whereby" clauses.

This list of examples is not intended to be exhaustive.

[13] *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (in banc), cert. granted, 116 S. Ct. 40 (1995).

[14] See, e.g., *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)).

[15] *Id.* at 1480, 31 USPQ2d at 1674.

[16] See, e.g., *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed . . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

[17] Two in banc decisions of the Federal Circuit have made clear that the Office is to interpret means plus function language according to 35 U.S.C. § 112, sixth paragraph. In the first, *In re Donaldson*, 16 F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994), the court held:

The plain and unambiguous meaning of paragraph six is that one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. Paragraph six does not state or even suggest that the PTO is exempt from this mandate, and there is no legislative history indicating that Congress intended that the PTO should be. Thus, this court must accept the plain and precise language of paragraph six.

Consistent with *Donaldson*, in the second decision, *Alappat*, 33 F.3d at 1540, 31 USPQ2d at 1554, the Federal Circuit held:

Given Alappat's disclosure, it was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing the function" recited, as it said it was doing, and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process. Contrary to suggestions by the Commissioner, this court's precedents do not support the Board's view that the particular apparatus claims at issue in this case may be viewed as nothing more than process claims.

[18] 1162 O.G. 59 (May 17, 1994).

[19] See, e.g., *Diamond v. Diehr*, 450 U.S. at 188-89, 209 USPQ at 9 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.").

[20] See supra note 18 and accompanying text.

[21] *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 206 USPQ 193, 197 (1980):

In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope. The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871). See *Graham v. John Deere Co.*, 383 U.S. 1, 7-10 (1966). Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952).

This perspective has been embraced by the Federal Circuit:

The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in §§ 102, 103, and 112. The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35 . . . Thus, it is improper to read into § 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. [*Alappat*, 33 F.3d at 1542, 31 USPQ2d at 1556.]

[22] 35 U.S.C. § 101 (1994).

[23] See 35 U.S.C. § 100(b) ("The term 'process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

[24] E.g., *Alappat*, 33 F.3d at 1542, 31 USPQ2d at 1556; *In re Warmerdam*, 33 F.3d 1354, 1358, 31 USPQ2d 1754, 1757 (Fed. Cir. 1994).

[25] See, e.g., *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759 ("steps of 'locating' a medial axis, and 'creating' a bubble hierarchy . . . describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'").

[26] The concern over preemption was expressed as early as 1852. See *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, USPQ 280, 282 (1948) (combination of six species of bacteria held to be non-statutory subject matter).

[27] The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).

[28] Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having specific memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at (claim to a data structure per se held non-statutory).

[29] *In re Sarkar*, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978):

[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.

Quoted with approval in *Abele*, 684 F.2d at 907, 214 USPQ at 687. See also *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting").

[30] See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held non-statutory).

[31] Computer Dictionary 210 (Microsoft Press, 2d ed. 1994):

Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what that data represents.

[32] See supra note 29.

[33] *O'Reilly v. Morse*, 56 U.S. (15 How.) at 112-14.

[34] *Id.* at 114-19.

[35] Products may be either machines, manufactures or compositions of matter.

A machine is:

a concrete thing, consisting of parts or of certain devices and combinations of devices.

Burr v. Duryee, 68 U.S. (1 Wall.) 531, 570 (1863).

A manufacture is:

the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties or combinations, whether by hand-labor or by machinery.

Diamond v. Chakrabarty, 447 U.S. at 308, 206 USPQ at 196-97 (quoting *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931).

A composition of matter is:

a composition[] of two or more substances [or] . . . a[] composite article[], whether . . . [it] be the result of chemical union, or of mechanical mixture, whether . . . [it] be [a] gas[], fluid[], powder[], or solid[].

Diamond v. Chakrabarty, 447 U.S. at 308, 206 USPQ at 197 (quoting *Shell Development Co. v. Watson*, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff'd per curiam, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958).

[36] See, e.g., *Lowry*, 32 F.3d at 1583, 32 USPQ2d at 1034-35; *Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 1760.

[37] Cf. *In re Iwahashi*, 888 F.2d 1370, 1374-75, 12 USPQ2d 1908, 1911-12 (Fed. Cir. 1989), cited with approval in *Alappat*, 33 F.3d at 1544 n.24, 31 USPQ2d at 1558 n.24.

[38] "Specific software" is defined as a set of instructions implemented in a specific program code segment. See Computer Dictionary 78 (Microsoft Press, 2d ed. 1994) for definition of "code segment."

[39] See *Diamond v. Diehr*, 450 U.S. at 183-84, 209 USPQ at 6 (quoting *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877) ("A [statutory] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing . . . . The process requires that certain things should be done certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.").

[40] See *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1556-57 (quoting *Diamond v. Diehr*, 450 U.S. at 192, 209 USPQ at 10). see also *id.* at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) at 114-19).

[41] *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8.

[42] See *In re Gelnovatch*, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) (data-gathering step did not measure physical phenomenon).

[43] *Schrader*, 22 F.3d at 294, 30 USPQ2d at 1459 citing with approval *Arrhythmia*, 958 F.2d at 1058-59, 22 USPQ2d at 7-38; *Abele*, 684 F.2d at 909, 214 USPQ at 688; *In re Taner*, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982).

[44] See supra note 9.

[45] In *Sarkar*, 588 F.2d at 1335, 200 USPQ at 139, the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to parenting as a "process" under § 101. Consideration of whether the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

[46] See supra note 40.

[47] See, e.g., *In re Bernhart*, 417 F.2d 1395, 1400, 163 USPQ 611, 616 (CCPA 1969).

[48] *Schrader*, 22 F.3d at 293-94, 30 USPQ2d at 1458-59.

[49] *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759.

[50] See, e.g., *In re Meyer*, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("Scientific principles, such as the relationship between mass and energy, and laws of nature, such as the acceleration of gravity, namely, a=32 ft./sec.^{2}, can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems. The pres-

ence of a mathematical algorithm or formula in a claim is merely an indication that a scientific principle, law of nature, idea or mental process may be the subject matter claimed and, thus, justify a rejection of that claim under 35 USC § 101; but the presence of a mathematical algorithm or formula is only a signpost for further analysis."). Cf. *Alappat*, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is excluded from the scope of § 101 because it represents laws of nature, natural phenomena, or abstract ideas. See *Diehr*, 450 U.S. at 186 (viewed mathematical algorithm as a law of nature); *Benson*, 409 U.S. at 71-72 (treated mathematical algorithm as an "idea"). The Supreme Court also has not been clear as to exactly what kind of mathematical subject matter may not be patented. The Supreme Court has used, among others, the terms "mathematical algorithm," "mathematical formula," and "mathematical equation" to describe types of mathematical subject matter not entitled to patent protection standing alone. The Supreme Court has not set forth, however, any consistent or clear explanation of what it intended by such terms or how these terms are related, if at all.

[51] *Walter*, 618 F.2d at 769, 205 USPQ at 409 (Because none of the claimed steps were explicitly or implicitly limited to their application in seismic prospecting activities, the court held that "[a]lthough the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting; they are drawn to improved mathematical methods for interpreting the results of seismic prospecting."). Cf. *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1558.

[52] *Walter*, 618 F.2d at 769-70, 205 USPQ at 409.

[53] See supra note 45.

[54] *Taner*, 681 F.2d at 788, 214 USPQ at 679.

[55] *Abele*, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

[56] *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process . . . In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.").

[57] *Sarkar*, 588 F.2d at 1331, 200 USPQ at 135.

[58] See *Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 ("post-solution" construction that was being modeled by the mathematical process not considered in deciding § 101 question because applicant indicated that such construction was not a material element of the invention).

[59] *Parker v. Flook*, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978).

[60] *Walter*, 618 F.2d at 770, 205 USPQ at 409 ("If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step.").

[61] *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7.

[62] *Abele*, 684 F.2d at 909, 214 USPQ at 688 ("This claim presents no more than the calculation of a number and display of the result, albeit in a particular format. The specification provides no greater meaning to 'data in a field' than a matrix of numbers regardless of by what method generated. Thus, the algorithm is neither explicitly nor implicitly applied to any certain process. Moreover, that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claim.").

[63] *In re De Castelet*, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1977) ("That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of 'post solution activity' found in *Flook*, [437 U.S. 584, 198 USPQ 193 (1978)], and does not transform the claim into one for a process merely using an algorithm. The final transmitting step constitutes nothing more than reading out the result of the calculations.").

[64] E.g., *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759. See also *Schrader*, 22 F.3d at 295, 30 USPQ2d at 1459.

[65] See supra note 18 and accompanying text.

[66] Computer Dictionary 353 (Microsoft Press, 2d ed. 1994) (definition of "self-documenting code").

[67] See *In re Barker*, 559 F.2d 588, 591, 194 USPQ 470, 472 (CCPA 1977), cert. denied, *Barker v. Parker*, 434 U.S. 1064 (1978) (a specification may be sufficient to enable one skilled in the art to make and use the invention, but still fail to comply with the written description requirement). See also *In re DiLeone*, 436 F.2d 1404, 1405, 168 USPQ 592, 593 (CCPA 1971).

[68] See, e.g., *Northern Telecom v. Datapoint Corp.*, 908 F.2d 931, 941-43, 15 USPQ2d 1321, 1328-30 (Fed. Cir.), cert. denied, *Datapoint Corp. v. Northern Telecom*, 498 U.S. 920 (1990) (judgment of invalidity reversed for clear error where expert testimony on both sides showed that a programmer of reasonable skill could write a satisfactory program with ordinary effort based on the disclosure); *DeGeorge v. Bernier*, 768 F.2d 1318, 1324, 226 USPQ 758, 762-63 (Fed. Cir. 1985) (superseded by statute with respect to issues not relevant here) (invention was adequately disclosed for purposes of enablement even though all of the circuitry of a word processor was not disclosed, since the undisclosed circuitry was deemed inconsequential because it did not pertain to the claimed circuit); *In re Phillips*, 608 F.2d 879, 882-83, 203 USPQ 971, 975 (CCPA 1979) (computerized method of generating printed architectural specifications dependent on use of glossary of predefined standard phrases and error-checking feature enabled by overall disclosure generally defining errors); *In re Donohue*, 550 F.2d 1269, 1271, 193 USPQ 136, 137 (CCPA 1977) ("Employment of block diagrams and descriptions of their functions is not fatal under 35 U.S.C. 112, first paragraph, providing the represented structure is conventional and can be determined without undue experimentation."); *In re Knowlton*, 481 F.2d 1357, 1366-68, 178 USPQ 486, 493-94 (CCPA 1973) (examiner's contention that a software invention needed a detailed description of all the circuitry in the complete hardware system reversed).

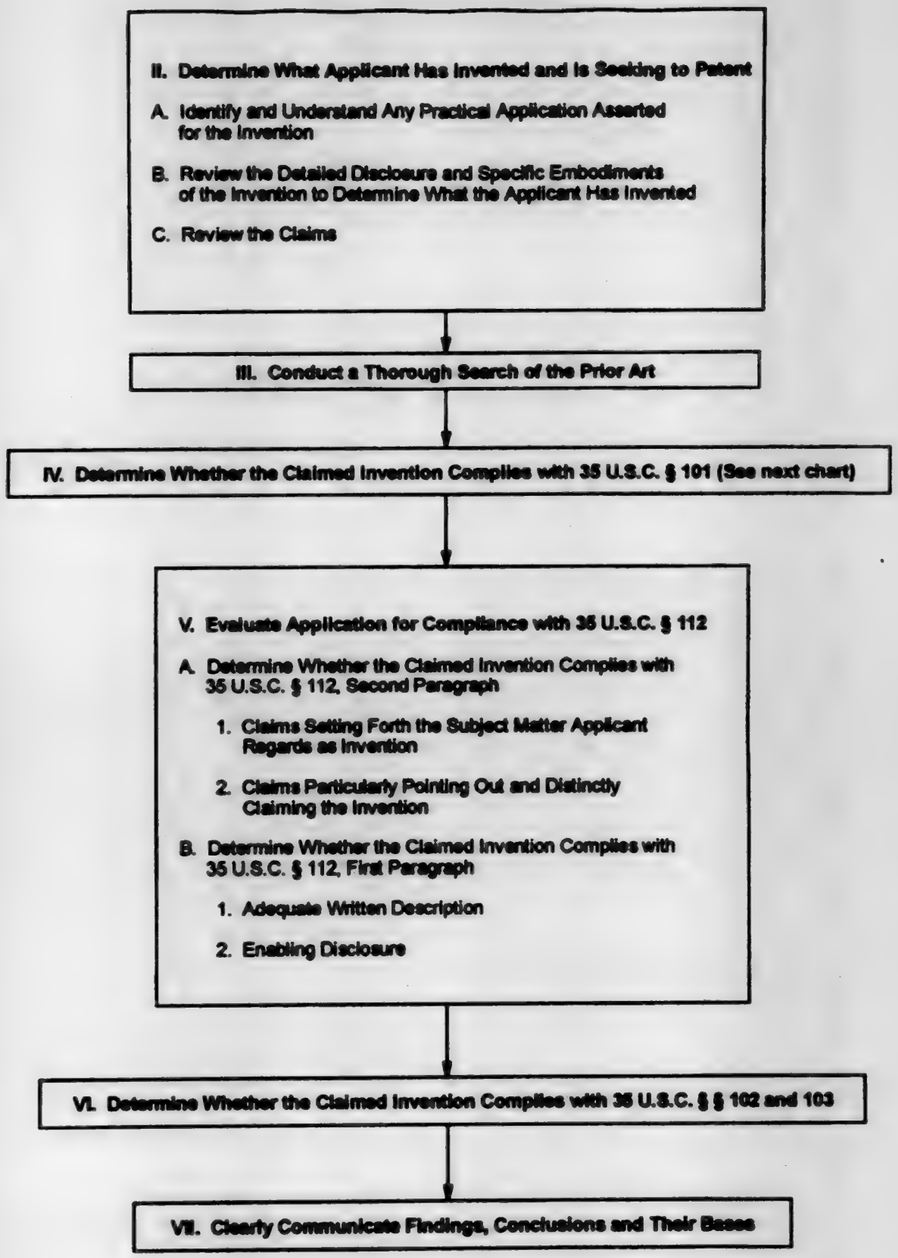
[69] See *In re Naquin*, 398 F.2d 863, 866, 158 USPQ 317, 319 (CCPA 1968) ("When an invention, in its different aspects, involves distinct arts, that specification is adequate which enables the adepts of each art, those who have the best chance of being enabled, to carry out the aspect proper to their specialty."); Ex parte *Zechnall*, 194 USPQ 461, 461 (Bd. App. 1973) ("appellants' disclosure must be held sufficient if it would enable a person skilled in the electronic computer art, in cooperation with a person skilled in the fuel injection art, to make and use appellants' invention").

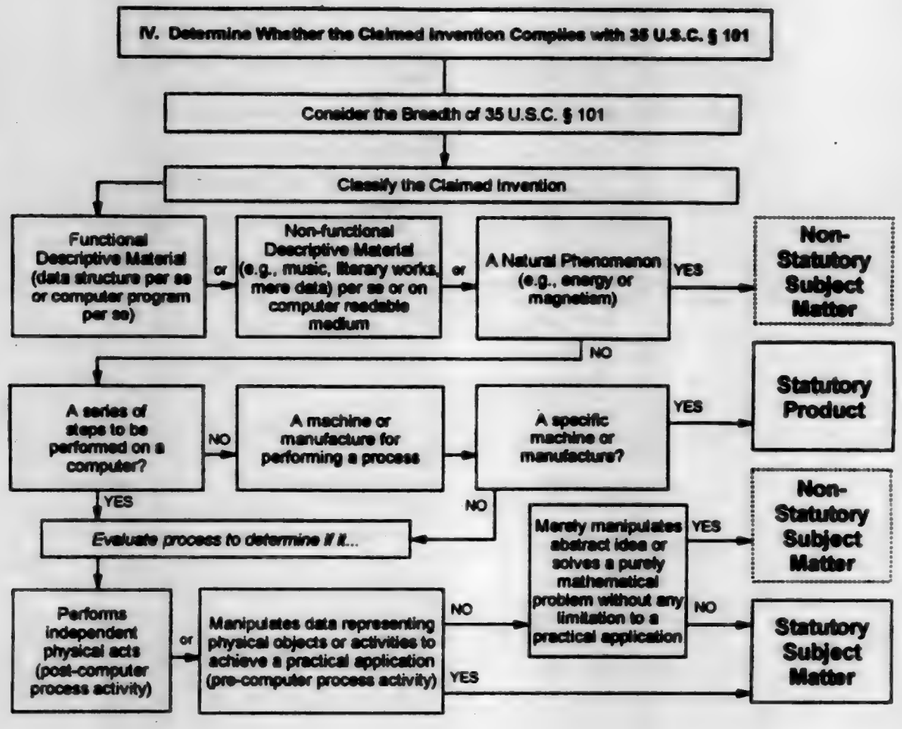
[70] See *In re Scarbrough*, 500 F.2d 560, 565, 182 USPQ 298, 301-02 (CCPA 1974) ("It is not enough that a person skilled in the art, by carrying on investigations along the line indicated in the instant application, and by a great amount of work eventually might find out how to make and use the instant invention. The statute requires the application itself to inform, not to direct others to find out for themselves (citation omitted)."); *Knowlton*, 481 F.2d at 1367, 178 USPQ at 493 (disclosure must constitute more than a "sketchy explanation of flow diagrams or a bare group of program listings together with a reference to a proprietary computer on which they might be run"). See also *In re Gunn*, 537 F.2d 1123, 1127-28, 190 USPQ 402, 405 (CCPA 1976); *In re Brandstadter*, 484 F.2d 1395, 1406-07, 17 USPQ 286, 294 (CCPA 1973); and *In re Ghiron*, 442 F.2d 985, 991, 169 USPQ 723, 727-28 (CCPA 1971).

[71] Cf. *In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) (when descriptive material is not functionally related to the substrate, the descriptive material will not distinguish the invention from the prior art in terms of patentability).

Appendix to Examination Guidelines for Computer-Related Inventions

Computer-Related Inventions





February 16, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 87]

(92) **Department of Commerce**
Patent and Trademark Office
[Docket No. 950921236-6049-03]
RIN 0651-XX04

Guidelines for Examination of Design Patent Applications For Computer-Generated Icons

Agency: Patent and Trademark Office, Commerce
Action: Notice
Summary: The Patent and Trademark Office (PTO) is publishing the final version of guidelines to be used by Office personnel in their review of design patent applications for computer-generated icons. Because these guidelines govern internal practices, they are exempt from notice and comment rulemaking under 5 U.S.C. 553(b)(A).
Effective Date: April 19, 1996.
For Further Information Contact: John Kittle by telephone at (703) 308-1495, by telefax at (703) 305-3600. by electronic mail through the INTERNET to "iconpat@uspto.gov," or by mail addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231, Attn: John Kittle, Director, Group 1100/2900, Crystal Plaza 3, 8D19.

Supplementary Information:

I. Discussion of Public Comments

Comments were received by the PTO from eleven different individuals in response to the request for comments on the interim guidelines for examination of design patent applications for computer-generated icons published October 5, 1995 (60 FR 52170). All comments have been carefully considered.

Two comments suggested the adoption of the interim guidelines as proposed. However, a number of changes have been made to the interim guidelines in response to the other comments.

One comment suggested that computer-generated icons are not "ornamental" designs within the meaning of 35 U.S.C. 171 because they are dictated by purely functional considerations. These guidelines do not address the procedures to be used by PTO personnel in assessing design ornamentality. Compliance with the ornamentality requirement of 35 U.S.C. 171 will be addressed on a case-by-case basis pursuant to prevailing laws, rules, and regulations. In this regard, prevailing case law, such as *Avia Group Int'l, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1563 (Fed. Cir. 1988), indicates that a distinction exists between the functionality of an article and the functionality of the design of the article that performs the function. Based on this distinction, the design of a computer-generated icon may not be dictated by the function associated with the computer-generated icon.

Many of the comments suggested that the PTO delete the requirement for a solid line depiction of the article of manufac-

ture on the ground that it is not legally required. The PTO has adopted this suggestion. The final guidelines simply require a depiction of an article of manufacture in either solid or broken lines.

Two comments suggested that the PTO delete any requirement to depict an article of manufacture on the ground that indication of an article of manufacture in the title should be sufficient. This suggestion was not adopted. The depiction of an article of manufacture is necessary to ensure that any design patent covers more than mere abstract, two-dimensional, surface ornamentation.

One comment suggested that the language in the guidelines be amended to clarify that the guidelines satisfy the "design for an article of manufacture" requirement of 35 U.S.C. 171. This suggestion has not been followed. Computer-generated icons are designs within the meaning of 35 U.S.C. 171, but must be embodied in an article of manufacture to satisfy the statute. These guidelines are directed to determining whether the icon is embodied in an article of manufacture, not whether it is a design.

One comment suggested that the guidelines be amended to clarify that the drawing must contain a sufficient number of views to constitute a complete disclosure of the appearance of the article as required by 37 CFR 1.152. This suggestion was based on the language in the interim guidelines that a computer-generated icon may be embodied in a portion of computer screen, monitor, or other display panel. This suggestion has been adopted. See footnote 6.

One comment suggested that the interim guidelines be modified to require the depiction of a central processing unit (CPU). This suggestion has not been adopted. The dependence of a computer-generated icon on a CPU for its existence is not a reason for requiring depiction of a CPU.

One comment suggested deleting the rejection under 35 U.S.C. 112, second paragraph for failure to depict the article of manufacture in solid lines. This suggestion has been adopted. Compliance with 35 U.S.C. 112, second paragraph, will be addressed on a case-by-case basis under the usual laws, rules, and regulations applied to such questions.

One comment suggested that the guidelines include a statement that a portion of a computer screen can be represented by a breakout of a screen portion without screen borders, and some shade lines adjacent to the icon in the breakout portion to indicate a glass surface. The suggestion for a statement regarding a breakout portion was not specifically adopted. However, a statement was added to footnote 6 indicating that the design drawing must meet the requirements of 37 CFR 1.84 which provides for exploded, partial, and sectional views.

One comment suggested that the guidelines include a statement that the characteristic feature statement can be an appropriate invention title and that the title could be repeated as the characteristic feature statement. This suggestion has not been adopted. The characteristic feature statement should describe a particular feature of the design that is considered a feature of novelty or non-obviousness over the prior art. The guidelines already suggest appropriate titles.

One comment suggested that some other form of intellectual property protection would be a more appropriate method of protecting rights in computer-generated icons. The availability of other forms of protection is not grounds for denying design patent protection to computer-generated icons which meet the requirements of section 171.

One comment suggested that the interim guidelines may be construed as substantive rulemaking. The final guidelines have been amended to indicate that they govern the internal operations of the PTO. The guidelines have been developed to assist PTO personnel in their review of design patent applications covering computer-generated icons for compliance with the "article of manufacture" requirement of 35 U.S.C. 171.

II. Guidelines for Examination of Design Patent Applications for Computer-Generated Icons

The following guidelines have been developed to assist PTO personnel in determining whether design patent applications for computer-generated icons comply with the "article of manufacture" requirement of 35 U.S.C. 171.[1]

A. General Principle Governing Compliance with the "Article of Manufacture" Requirement

The PTO considers designs for computer-generated icons[2] embodied in articles of manufacture to be statutory subject matter eligible for design patent protection under section 171. Thus, if an application claims a computer-generated icon shown on a computer screen, monitor, other display panel, or a portion thereof,[3] the claim complies with the "article of manufacture" requirement of section 171.[4]

B. Procedures for Evaluating Whether Design Patent Applications Drawn to Computer-Generated Icons Comply With the "Article of Manufacture" Requirement

PTO personnel shall adhere to the following procedures when reviewing design patent applications drawn to computer-generated icons for compliance with the "article of manufacture" requirement of section 171.

1. Read the entire disclosure to determine what the applicant claims as the design[5] and to determine whether the design is embodied in an article of manufacture. 37 CFR 1.71 and 1.152-54.

a. Review the drawing to determine whether a computer screen, monitor, other display panel, or portion thereof, is shown. 37 CFR 1.152.[6]

b. Review the title to determine whether it clearly describes the claimed subject matter.[7] 37 CFR 1.153.

c. Review the specification to determine whether a characteristic feature statement is present. 37 CFR 1.71. If a characteristic feature statement is present, determine whether it describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.[8]

2. If the drawing does *not* depict a computer-generated icon embodied in a computer screen, monitor, other display panel, or a portion thereof, in either solid or broken lines, reject the claimed design under section 171 for failing to comply with the article of manufacture requirement.

a. If the disclosure as a whole does *not* suggest or describe the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof, indicate that: (i) the claim is fatally defective under section 171; and (ii) amendments to the written description, drawings and/or claim attempting to overcome the rejection will not be entered because they would lack a written descriptive basis under 35 U.S.C. 112, first paragraph, and would constitute new matter under 35 U.S.C. 132.

b. If the disclosure as a whole suggests or describes the claimed subject matter as a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof; indicate that the drawing may be amended to overcome the rejection under section 171. Suggest amendments which would bring the claim into compliance with section 171.

3. Indicate all objections to the disclosure for failure to comply with the formal requirements of the Rules of Practice in Patent Cases. 37 CFR 1.71, 1.81-85, and 1.152-154. Suggest amendments which would bring the disclosure into compliance with the formal requirements of the Rules of Practice in Patent Cases.

4. Upon response by applicant:

a. Approve entry of any amendments which have support in the original disclosure; and

b. Review all arguments and the entire record, including any amendments, to determine whether the drawing, title, and specification clearly disclose a computer-generated icon embodied in a computer screen, monitor, other display panel, or portion thereof.

5. If, by a preponderance of the evidence,[9] the applicant has established that the computer-generated icon is embodied in a computer screen, monitor, other display panel, or portion thereof, withdraw the rejection under section 171.

III. Effect of the Guidelines on Pending Design Applications Drawn to Computer-Generated Icons

PTO personnel shall follow the procedures set forth in this Notice when examining design patent applications for computer-generated icons pending in the PTO as of the effective date of these Guidelines.

IV. Treatment of Type Fonts

Traditionally, type fonts have been generated by solid blocks from which each letter or symbol was produced. Consequently, the PTO has historically granted design patents drawn to type fonts. PTO personnel should not reject claims for type fonts under Section 171 for failure to comply with the "article of manufacture" requirement on the basis that more modern methods of typesetting, including computer-generation, do not require solid printing blocks.

V. Notes

1. Further procedures for search and examination of design patent applications to ensure compliance with all other conditions of patentability are found in the Manual of Patent Examining Procedure, Chapter 1500.

2. Computer-generated icons, such as full screen displays and individual icons, are two-dimensional images which alone are surface ornamentation. *See, e.g., Ex parte Strijland*, 26 USPQ2d 1259, 1262 (Bd. Pat App. & Int. 1992) (computer-generated icon alone is merely surface ornamentation).

3. Since a patentable "design is inseparable from the object to which it is applied and cannot exist alone merely as a scheme of surface ornamentation," a computer-generated icon must be embodied in a computer screen, monitor, other display panel, or portion thereof, to satisfy section 171. MPEP 1502; 1504.01.A.

4. "We do not see that the dependence of the existence of a design on something outside itself is a reason for holding it is not a design 'for an article of manufacture.'" *In re Hruby*, 153 USPQ 61, 66 (CCPA 1967) (design of water fountain patentable design for an article of manufacture). The dependence of a computer-generated icon on a central processing unit and computer program for its existence itself is not a reason for holding that the design is not for an article of manufacture.

5. Since the claim must be in formal terms to the design "as shown, or as shown and described," the drawing provides the best description of the claim. 37 CFR 1.153.

6. Although a computer-generated icon may be embodied in only a portion of a computer screen, monitor, or other display panel. the drawing "must contain a sufficient number of views to constitute a complete disclosure of the appearance of the article." 37 CFR 1.152. In addition, the drawing must comply with 37 CFR 1.84.

7. The following titles do not adequately describe a design for an article of manufacture under section 171: "computer icon;" or "icon." On the other hand, the following titles do adequately describe a design for an article of manufacture under section 171: "computer screen with an icon;" "display panel with a computer icon;" "portion of a computer screen with an icon image;" "portion of a display panel with a computer icon image;" or "portion of a monitor displayed with a computer icon image."

8. *See McGrady v. Aspenglas Corp.*, 487 F. Supp. 859, 861, 208 USPQ 242, 244 (S.D.N.Y. 1980) (descriptive statement in design patent application narrows claim scope).

9. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) ("After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.").

March 14, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 60]

(93) Guidance On Searching and Examining PCT Applications Drawn to Computer-Related Inventions

The following guidance should be applied when searching and examining a PCT application drawn to a computer-related invention:

Chapter I (Form 210 Search Report)

Under Chapter I, Office personnel conduct an international search and prepare an international search report on all subject matter searched and examined in U.S. national applications. Routinely, such subject matter includes *inter alia* computer-related inventions. Under the Examination Guidelines for Computer-Related Inventions (Guidelines), Office personnel conduct a complete examination, including a thorough search of the prior art, for *all* U.S. national applications drawn to computer-related inventions regardless of whether the claims recite statutory subject matter. *See* 61 Fed. Reg. 7478 (Feb. 28, 1996); 1184 OG 87 (March 26, 1996). Thus, Office personnel must conduct an international search, and prepare an international search report, on all PCT applications drawn to computer-related inventions.[1]

Office personnel are reminded that, when completing Section C. of the search report (Documents Considered To Be Relevant), the prior art references should be categorized as either "A", "X" or "Y" based on the claims read in light of the disclosure. Also, the citations should indicate which claims are relevant to the reference.

Chapter II (Form 408 Written Opinion and Form 409 IPER)

Under Chapter II, Office personnel conduct a preliminary examination and prepare an international preliminary examination report (IPER). In the examination, Office personnel determine whether the claimed invention satisfies the criteria for novelty, inventive step, and industrial applicability. For PCT applications drawn to computer-related inventions, Office personnel should use the Guidelines as an aid in determining whether the claimed invention satisfies the criteria for industrial applicability. Often, a claimed invention determined to be non-statutory under the Guidelines will not satisfy the criteria for industrial applicability because the claimed invention cannot be made or used in the technological sense in any kind of industry. *See* PCT Article 33(4).

Office personnel are reminded, however, that written opinions and IPERs should not cite U.S. statutes, regulations, or case law except those which pertain to PCT. In the same manner, written opinions and IPERs should not reference the Guidelines *per se*.

[1] Accordingly, Item 1. of Box I. in the search report is not applicable. However, in rare circumstances, Office personnel will be unable to conduct an international search, *e.g.*, it is impossible to determine the subject matter of the PCT application. In that circumstance, Item 2. of Box I. should be checked and explained, as it would be in a similar circumstance for non-computer-related subject matter.

July 22, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1189 OG 58]

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(94) Department of Commerce Patent and Trademark Office 37 CFR Parts 1 and 3

[Docket No. 950607-5607-01]
RIN: 0651-AA76

Changes to Implement 20-Year Patent Term and Provisional Applications

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases, Parts 1 and 3 of title 37,

Code of Federal Regulations, to establish procedures for: (1) filing and processing provisional application papers; (2) calculating the length of any patent term extension to which an applicant is entitled where the issuance of a patent on an application filed on or after June 8, 1995 (the implementation date of the 20-year patent term provisions of the Uruguay Round Agreements Act), other than for designs, was delayed due to interference proceedings, the imposition of a secrecy order and/or appellate review; and (3) implementing certain transitional provisions contained in the Uruguay Round Agreements Act.

Effective Date: June 8, 1995.

For Further Information Contact: Magdalen Y. Greenlief or John F. Gonzales, Senior Legal Advisors, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, by telephone at (703) 305-9285, by fax at (703) 308-6916 or by mail marked to their attention and addressed to the Commissioner of Patents and Trademarks, Box DAC, Washington, D.C. 20231.

Supplementary Information: The Uruguay Round Agreements Act (Public Law 103-465) was enacted on December 8, 1994. Public Law 103-465 amends 35 U.S.C. 154 to provide that the term of patent protection begins on the date of grant and ends 20 years from the filing date of the application. The amendment applies to all utility and plant patents issued on applications having an actual United States application filing date on or after June 8, 1995. Specifically, 35 U.S.C. 154(a)(2), as contained in Public Law 103-465, provides that the patent term will begin on the date on which the patent issues and will end twenty years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term will end twenty years from the date on which the earliest application referred to was filed. As amended by Public Law 103-465, 35 U.S.C. 154 does not take into account for determination of the patent term any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).

Under 35 U.S.C. 154(b)(1), as contained in Public Law 103-465, if the issuance of an original patent is delayed due to interference proceedings under 35 U.S.C. 135(a) or because the application is placed under a secrecy order under 35 U.S.C. 181, the term of the patent shall be extended for the period of delay, but in no case more than five (5) years.

Under 35 U.S.C. 154(b)(2), as contained in Public Law 103-465, if the issuance of a patent is delayed due to appellate review by the Board of Patent Appeals and Interferences or by a Federal court and the patent is issued pursuant to a decision in the review reversing an adverse determination of patentability, the term of the patent shall be extended for a period of time but in no case more than five (5) years. However, a patent shall not be eligible for extension under 35 U.S.C. 154(b)(2) if the patent is subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.

Under 35 U.S.C. 154(b)(3)(B) and 154(b)(3)(C), as contained in Public Law 103-465, the period of extension under 35 U.S.C. 154(b)(2) shall be reduced by any time attributable to appellate review before the expiration of three (3) years from the filing date of the application and for any period of time during which the applicant for patent did not act with due diligence, as determined by the Commissioner.

Under 35 U.S.C. 154(b)(4), as contained in Public Law 103-465, the total duration of all extensions of a patent under 35 U.S.C. 154(b) shall not exceed five (5) years.

The provisions for patent term extension under 35 U.S.C. 154(b) are separate from and in addition to the patent term extension provisions of 35 U.S.C. 156. The patent term extension provisions of 35 U.S.C. 154(b) are designed to compensate the patent owner for delays in issuing a patent, whereas the patent term extension provisions of 35 U.S.C. 156 are designed to restore term lost to premarket regulatory review after the grant of a patent. In order to prevent a term extension under 35 U.S.C. 154(b) from precluding a term extension under 35 U.S.C. 156, Public Law 103-465 amends 35 U.S.C. 156(a)(2) to specify that the term has never been extended under 35 U.S.C. 156(e)(1).

The 20-year patent term provision is contained in 35 U.S.C. 154, as amended by Public Law 103-465. Section 154 of title 35, United States Code, applies to utility and plant patents, but not to design patents. The term of a design patent is defined in 35 U.S.C. 173 as fourteen (14) years from the date of grant. Therefore, the patent term and patent term extension provisions set forth in 35 U.S.C. 154, as amended by Public Law 103-465, do not apply to patents for designs.

In addition, Public Law 103-465 establishes a domestic priority system. In accordance with the provisions of the Paris Convention for the Protection of Industrial Property, the term of a patent cannot include the Paris Convention priority period. Public Law 103-465 provides a mechanism to enable applicants to quickly and inexpensively file provisional applications. Applicants will be entitled to claim the benefit of priority in a given application based upon a previously filed provisional application in the United States. The domestic priority period will not count in the measurement of the term.

Section 111 of title 35, United States Code, was amended by Public Law 103-465 to provide for the filing of a provisional application on or after June 8, 1995. Section 41(a)(1) of title 35, United States Code, was amended by Public Law 103-465 to provide a $150.00 filing fee for each provisional application, subject to a fifty (50) percent reduction for a small entity. The requirements for obtaining a filing date for a provisional application are the same as those which previously existed for an application filed under 35 U.S.C. 111, except that no claim or claims as set forth in 35 U.S.C. 112, second paragraph, is required. Moreover, no oath/declaration as set forth in 35 U.S.C. 115 is required. The provisional application is also not subject to the provisions of 35 U.S.C. 131, 135 and 157, i.e., a provisional application will not be examined for patentability, placed in interference or made the subject of a statutory invention registration. Further, the provisional application will automatically be abandoned no later than twelve (12) months after its filing date and will not be subject to revival to restore it to pending status beyond a date which is after twelve (12) months from its filing date. A provisional application will not be entitled to claim priority benefits based on any other application under 35 U.S.C. 119, 120, 121 or 365.

Also, Public Law 103-465 amended 35 U.S.C. 119 to allow an applicant to claim the benefit of the filing date of one or more copending provisional applications in a later filed application for patent under 35 U.S.C. 111(a) or 363. The later filed application for patent under 35 U.S.C. 111(a) or 363 must be filed by an inventor or inventors named in the copending provisional application not later than 12 months after the date on which the provisional application was filed and must contain or be amended to contain a specific reference to the provisional application. The provisional application must disclose an invention which is claimed in the application for patent under 35 U.S.C. 111(a) or 363 in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the provisional application must be pending on the filing date of the application for patent under 35 U.S.C. 111(a) or 363 and the filing fee set forth in subparagraph (A) or (C) of 35 U.S.C. 41(a)(1) must be paid.

Since 35 U.S.C. 154(a)(3), as contained in Public Law 103-465, excludes from the determination of the patent term any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b), the filing date of a provisional application is not considered in determining the term of any patent.

Section 119(e)(1) of title 35, United States Code, provides that if all of the conditions of 35 U.S.C. 119(e)(1) and (e)(2) are met, an application for patent filed under 35 U.S.C. 111(a) or 363 shall have the same effect as though filed on the date of the provisional application. Thus, the effective United States filing date of an application for patent filed under 35 U.S.C. 111(a), and entitled to benefits under 35 U.S.C. 119(e), is the filing date of the provisional application. Any patent granted on such an application, is prior art under 35 U.S.C. 102(e) as of the filing date of the provisional application.

Likewise, the effective United States filing date of a patent issued on an international application filed under 35 U.S.C. 363, and entitled to benefits under 35 U.S.C. 119(e), is the filing date of the provisional application, except for the purpose of applying that patent as prior art under 35 U.S.C. 102(e). For that purpose only, 35 U.S.C. 102(e) defines the filing date of the international application as the date the requirements of 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) were fulfilled.

Public Law 103-465 further includes transitional provisions for limited reexamination in certain applications pending for two (2) years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). The transitional provisions also permit examination of more than one independent and distinct invention in certain applications pending for three (3) years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). These transitional provisions are not applicable to any application which is filed after June 8, 1995, regardless of whether the application is a continuing application.

The amendments to title 35 relating to 20-year patent term, patent term extension, provisional applications and the transitional provisions are effective on the date which is six (6) months after the date of enactment, i.e., on June 8, 1995.

A Notice of Proposed Rulemaking was published in the Federal Register at 59 FR 63951 (December 12, 1994) and in the Patent and Trademark Office Official Gazette at 1170 Off. Gaz. Pat. Office 377-390 (January 3, 1995).

Forty-nine written comments were received in response to the Notice of Proposed Rulemaking. A public hearing was held at 9:30 a.m. on February 16, 1995. Fourteen individuals offered oral comments at the hearing. The forty-nine written comments and a transcript of the hearing are available for public inspection in the Special Program Law Office, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, Room 520, Crystal Park I, 2011 Crystal Drive, Arlington, Virginia, and are available on the Internet through anonymous file transfer protocol (ftp), address: ftp.uspto.gov.

The following includes a discussion of the rules being added or amended, the reasons for those additions and amendments and an analysis of the comments received in response to the Notice of Proposed Rulemaking.

Changes in text: The final rules contain numerous changes to the text of the rules as proposed for comment. Those changes are discussed below. Familiarity with the Notice of Proposed Rulemaking is assumed.

Section 1.9(a)(1) is being changed for clarity to define a national application as a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371. Also, a new paragraph (a)(3) is being added to define the term "nonprovisional application" as a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

The proposed deletion of § 1.60 is being withdrawn. Therefore, § 1.17(i) is being changed to retain the reference to § 1.60.

Section 1.17(q) is being changed to delete the fifty (50) percent reduction for small entities in the $50.00 fee established for filing a petition under § 1.48 in a provisional application and a petition to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional application.

Sections 1.17(r) and (s) are being changed to include a fifty (50) percent reduction for small entities in the fees established for entry of a submission after final rejection under § 1.129(a) and for each additional invention requested to be examined under § 1.129(b). In the final rule, the fee required by §§ 1.17(r) and 1.17(s) from a small entity is $365.00. The fee required from other than a small entity is $730.00.

The elimination of the small entity reduction in § 1.17(q) and the addition of the small entity reduction in §§ 1.17(r) and (s) are the result of additional review, which resulted in the conclusion that the fees established for the transitional procedures in §§ 1.129(a) and (b) may be reduced by fifty (50) percent for small entities. However, the petition fees required by § 1.17(q) are not subject to the fifty (50) percent reduction for small entities.

The proposed deletion of the retention fee practice set forth in former § 1.53(d), now redesignated § 1.53(d)(1), is being withdrawn. Therefore, § 1.21(l) is being retained and amended to refer to § 1.53(d)(1). Also, the proposed change in the text to § 1.17(n) is being withdrawn, since § 1.60 is being retained.

Section 1.28(a) is being changed to clarify the procedure for establishing status as a small entity in a nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application. In such cases, applicants may file a new verified statement or they may rely on a verified statement filed in the prior application, if status as a small entity is still proper and desired. If applicants intend to rely on a verified statement filed in the prior application, applicants must include in the nonprovisional application either a reference to the verified statement filed in the prior application or a copy of the verified statement filed in the prior application. A verified statement in compliance with existing § 1.27 is required to be filed in each provisional application in which it is desired to pay reduced fees.

Section 1.45(c), first sentence, is being changed for clarity to refer to a "nonprovisional" application.

Section 1.48 is being changed to include a new paragraph (e) setting forth the procedure for deleting the name of a person who was erroneously named as an inventor in a provisional application. The procedure requires an amendment deleting the name of the person who was erroneously named accompanied by: a petition including a statement of facts verified by the person whose name is being deleted establishing that the error occurred without deceptive intention; the fee set forth in § 1.17(q); and the written consent of any assignee. The first sentences of §§ 1.48(a)-(c) are also being changed for clarity to refer to a "nonprovisional" application.

Section 1.51(a)(2)(i) is being changed to require that the provisional application cover sheet include the residence of each named inventor and, if the invention was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the name of the U.S. Government agency and Government contract number. The residence of each named inventor is information which is necessary to identify those provisional applications which must be reviewed by the PTO for foreign filing licenses. If the invention disclosed in the provisional application was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the security review for that application should already have been done by that agency of the U.S. Government. Therefore, identification of those particular provisional applications on the cover sheet will reduce the number of applications which the PTO must forward to other agencies of the U.S. Government for security review.

Section 1.53(b)(1) is being changed to retain the reference to § 1.60.

Section 1.53(b)(2)(ii) is being changed to require that any petition and petition fee to convert a § 1.53(b)(1) application to a provisional application be filed in the § 1.53(b)(1) application prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of twelve (12) months after the filing date of the § 1.53(b)(1) application, or the filing of a request for a statutory invention registration under § 1.293. Where the § 1.53(b)(1) application was abandoned before the expiration of twelve (12) months after the filing date of the application, a petition to convert the application to a provisional application may be filed in the § 1.53(b)(1) application if the petition to convert is filed prior to the expiration of twelve (12) months after the filing date of the § 1.53(b)(1) application and is accompanied by an appropriate petition to revive an abandoned application under § 1.137.

Section 1.53(b)(2)(iii) is being changed to indicate that the requirements of §§ 1.821-1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications.

Section 1.53(d)(1) is being changed to retain the retention fee practice. The proposal to delete the retention fee practice set forth in § 1.53(d) is being withdrawn.

The first sentences of §§ 1.55(a) and (b) are being changed for clarity to refer to a "nonprovisional" application. Also, §§ 1.55(a) and (b) are being changed to clarify that the nonprovisional application may claim the benefit of one or more prior foreign applications or one or more applications for inventor's certificate.

Section 1.59 is being changed to retain the reference to the retention fee set forth in § 1.21(l) and to clarify that the retention fee practice applies only to applications filed under § 1.53(b)(1).

The proposal to delete § 1.60 is being withdrawn. Therefore, § 1.60 is being retained and amended to clarify in the title of the section and in paragraph (b)(1) that the procedure set forth in the section is only available for filing a continuation or

divisional application if the prior application was a nonprovisional application and complete as set forth in § 1.51(a)(1). Also, paragraph (b)(4) is being amended to delete the requirement that the statement which must accompany the copy of the prior application include the language that "no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein." The requirement is unnecessary because any amendment filed to complete the prior application would be considered a part of the original disclosure of the prior application and, by definition, could not contain new matter. Also, paragraph (b)(4) is being amended to refer to § 1.17(i).

Section 1.62(a) is being changed to refer to a prior complete "nonprovisional" application and to clarify that a continuing application may be filed under § 1.62 after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application. Section 1.62(a) is also being changed to clarify the existing practice that the request for a § 1.62 application must include identification of the inventors named in the prior application.

Section 1.63(a) is being changed for clarity to refer to an oath or declaration filed as a part of a "nonprovisional" application.

Section 1.67(b) is being changed for clarity to refer to a "nonprovisional" application.

Sections 1.78(a)(1) and (a)(2) are being changed to refer to a "nonprovisional" application and to clarify that the nonprovisional application may claim the benefit of one or more prior copending nonprovisional applications or international applications designating the United States of America. Section 1.78(a)(1)(ii) is being changed to retain the reference to § 1.60. Section 1.78(a)(1)(iii) is being retained and amended to refer to §§ 1.53(b)(1) and 1.53(d)(1).

Sections 1.78(a)(3) and (a)(4) are being changed to refer to a "nonprovisional" application and to clarify that the nonprovisional application may claim the benefit of one or more prior copending provisional applications.

Section 1.78(a)(3) is also being changed to remind applicants and practitioners that when the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. Section 111(b)(5) of title 35, United States Code, states that a provisional application is abandoned twelve months after its filing date. Sections 119(e)(1) and (e)(2) of title 35, United States Code, require that a nonprovisional application claiming benefit of a prior provisional application be filed not later than twelve months after the date on which the provisional application was filed and that the provisional application be pending on the filing date of the nonprovisional application. Under §§ 1.6 and 1.10, no filing dates are accorded to applications on a Saturday, Sunday, or Federal holiday within the District of Columbia. Thus, if a provisional application is abandoned by operation of 35 U.S.C. 111(b)(5) on a Saturday, Sunday, or Federal holiday within the District of Columbia, a nonprovisional application claiming benefit of the provisional application under 35 U.S.C. 119(e) must be filed no later than the preceding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.78(a)(4) is also being changed to delete the requirement that the reference in the nonprovisional application to the provisional application indicate the relationship of the applications. As a result of the change, § 1.78(a)(4) provides that a nonprovisional application claiming benefit of one or more provisional applications must contain a reference to each provisional application, identifying it as a provisional application and including the provisional application number (consisting of series code and serial number). However, the section does not require the nonprovisional application to identify the nonprovisional application as a continuation, divisional or continuation-in-part application of the provisional application.

Section 1.83(a) is being changed to delete the proposed redesignation of paragraph (a) and to delete proposed paragraph (a)(2). Also, §§ 1.83(a) and (c) are being changed for clarity to refer to a "nonprovisional" application. Further, § 1.83(c) is being changed to remove the reference to paragraph (a)(1).

Section 1.101 is being changed for clarity to refer to a "nonprovisional" application.

Sections 1.129(a) and (b) are being changed to identify the effective date of 35 U.S.C. 154(a)(2) as June 8, 1995.

Further, § 1.129(a) is being changed to provide that the first and second submissions and fees set forth in § 1.17(r) must be filed prior to the filing of an Appeal Brief, rather than prior to the filing of the Notice of Appeal, and prior to abandonment of the application. The requirement that the fee set forth in § 1.17(r) be filed within one month of the notice refusing entry is being deleted. Section 1.129(a) is also being changed to provide that the finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). The language indicating that the submission would be entered and considered after timely payment of the fee set forth in § 1.17(r) "to the extent that it would have been entered and considered if made prior to final rejection" is being deleted. In view of the magnitude of the fee set forth in § 1.17(r), the next PTO action following timely payment of the fee set forth in § 1.17(r) will be equivalent to a first action in a continuing application. Under existing PTO practice, it would not be proper to make final a first Office action in a continuing application where the continuing application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The identical procedure will apply to examination of a submission considered as a result of the procedure under § 1.129(a). Thus, under § 1.129(a), if the first submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Likewise, if the second submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. In view of 35 U.S.C. 132, no amendment considered as a result of the payment of the fee set forth in § 1.17(r) may introduce new matter into the disclosure of the application.

Section 1.129(b)(1) is being changed to identify the date which is two months prior to the effective date of 35 U.S.C. 154(a)(2) as April 8, 1995. Section 1.129(b)(1) is also being changed to clarify in subsection (ii) that the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant.

Section 1.129(b)(2) is being changed to delete the identification of the period provided for applicants to respond to a notification under § 1.129(b) as one month. The time period for response will be identified in any written notification under § 1.129(b) and will usually be one month, but in no case will it be less than thirty days. The period may be extended under § 1.136(a). The language is also being changed to provide that applicant may respond to the notification by (i) electing the invention or inventions to be searched and examined, if no election has been made prior to the notice, and paying the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects, (ii) confirming an election made prior to the notice and paying the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected, or (iii) filing a petition under § 1.129(b)(2) traversing the requirement without regard to whether the requirement has been made final. No petition fee is required. The section is also being changed to provide that if the petition under § 1.129(b)(2) is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects.

Section 1.129(c) is being changed to clarify that the provisions of §§ 1.129(a) and (b) are not applicable to any application filed after June 8, 1995. However, any application filed on June 8, 1995 would be subject to a 20-year patent term.

Section 1.137 is being amended by revising paragraph (c) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.137(a) not filed within six (6) months of the date of the abandonment of the application. The language "filed before June 8, 1995" and "filed on or after June 8, 1995" as used in the amended rule, refer to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365. No change to § 1.137 was proposed in the Notice of Proposed Rulemaking. However, in all applications filed on or after June 8, 1995, except design applications, any delay in filing a petition under § 1.137(a) will automatically result in the loss of patent term. The loss of patent term will be the incentive for applicants to promptly file any petition to revive. Therefore, no need is seen for requiring a terminal disclaimer in such applications. It would amount to a penalty if a terminal disclaimer was required.

Section 1.316 is being amended by revising paragraph (d) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.316(b) not filed within six (6) months of the date of the abandonment of the application. Acceptance of a late payment of an issue fee in a design application is specifically provided for in § 1.155. Therefore, § 1.316 does not apply to design applications. The language "filed before June 8, 1995" as used in the amended rule, refers to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365. No change to § 1.316 was proposed in the Notice of Proposed Rulemaking. However, in all applications filed on or after June 8, 1995, except design applications, any delay in filing a petition under § 1.316(b) will automatically result in the loss of patent term. The loss of patent term will be the incentive for applicants to promptly file any petition under § 1.316(b). Therefore, no need is seen for requiring a terminal disclaimer in such applications. It would amount to a penalty if a terminal disclaimer was required.

Section 1.317 is being amended by removing and reserving paragraph (d) to eliminate the requirement that a terminal disclaimer accompany any petition under § 1.317(b) not filed within six (6) months of the date of lapse of the patent. No change to § 1.317 was proposed in the Notice of Proposed Rulemaking. However, the delay in filing a petition under § 1.317(b) does not result in any gain of patent term. Therefore, no reason is seen for requiring a terminal disclaimer in such cases.

Section 1.701(a) is being changed to identify the implementation date as June 8, 1995, and to clarify that a proceeding under 35 U.S.C. 135(a) is an interference proceeding.

Section 1.701(b) is being changed to provide that the term of a patent entitled to an extension under § 1.701 shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) and (d) of § 1.701 and the extension will run from the expiration date of the patent. The reference to a terminal disclaimer is being deleted to be consistent with § 1.701(a)(3) and to avoid any confusion.

Section 1.701(c)(1)(i) is being changed for clarity by deleting the phrase "if any" after the first occurrence of "interference" and by inserting the same phrase after the phrase "the number of days."

Section 1.701(c)(1)(ii) is being changed to clarify that the period referred to ends on the "date of the termination of the suspension" rather than on the date of the next PTO communication reopening prosecution.

Section 1.701(d)(1) is being amended to clarify that the "time" referred to is time "during the period of appellate review".

Section 1.701(d)(2) is being amended to clarify that the Commissioner, under the broad discretion granted by 35 U.S.C. 154(b)(3)(C), has decided to limit consideration of applicant's due diligence only to acts occurring during the period of appellate review. The supplementary information published in the Notice of Proposed Rulemaking contained examples of what might be considered a lack of due diligence for purposes of § 1.701(d)(2) as proposed. Specifically, the supplementary information identified requests for extensions of time to respond to Office communications, submission of a response which is not fully responsive to an Office communication, and filing of informal applications as examples. In view of the comments received and the language adopted in the final rules, those examples are withdrawn. Acts which the Commissioner considers to constitute prima facie evidence of lack of due diligence under § 1.701(d)(2) are suspensions at applicant's request under § 1.103(a) during the period of appellate review and abandonments during the period of appellate review.

Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Parts 1 and 3, are being amended as indicated below:

Section 1.1 is being amended to add a paragraph (i) to provide a special "Box Provisional Patent Application" address to assist the Mail Room in separating and processing provisional applications and mail relating thereto.

Section 1.9 is being amended to redesignate paragraph (a) as paragraph (a)(1) and to define a national application as a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371. A new paragraph (a)(2) is being added to define the term "provisional application" as a U.S. national application filed under 35 U.S.C. 111(b). Also, a new paragraph (a)(3) is being added to define the term "nonprovisional application" as a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

Sections 1.12 and 1.14 are being amended to replace the references to § 1.17(i)(1) with references to § 1.17(i).

Sections 1.16(a)-(e) and (g) are being amended to clarify that those sections do not apply to provisional applications. A complete provisional application does not require claims. However, provisional applications may be filed with one or more claims as part of the application. Nevertheless, no additional claim fee or multiple dependent claim fee will be required in a provisional application. Section 1.16(f) is being amended to insert the words "basic fee". Section 1.16(e) refers to "the basic filing fee". Current Office practice allows a design application to be filed without the design filing fee or the oath/declaration as set forth in § 1.53(d)(1). The change to § 1.16(f) is merely for clarification. In addition, § 1.16(a) is being amended to replace the word "cases" with the word "applications", since the word "applications" is used elsewhere in the rule.

Section 1.16 is also being amended to add a new paragraph (k) which lists the basic filing fee for a provisional application as $75.00 for a small entity (see §§ 1.9(c)-(f)) or $150.00 for other than a small entity as contained in Public Law 103-465. Since the filing fee for a provisional application is established by Public Law 103-465 as a 35 U.S.C. 41(a) fee, the filing fee for a provisional application will be subject to the fifty (50) percent reduction provided for in 35 U.S.C. 41(h).

Further, § 1.16 is being amended to add a new paragraph (l) which establishes the surcharge required by new § 1.53(d)(2) for filing the basic filing fee or the cover sheet required by new § 1.51(a)(2) for a provisional application at a time later than the provisional application filing date as $25.00 for a small entity or $50.00 for other than a small entity.

Section 1.17(h) is being amended to clarify that the $130.00 petition fee for filing a petition for correction of inventorship under § 1.48 applies to all patent applications, except provisional applications. Paragraph (i)(1) is being redesignated as paragraph (i) and paragraph (i)(2) is being removed. The fee for a petition under § 1.102 to make an application special has been placed in paragraph (i). The words "of this part", in § 1.17, paragraphs (h) and (i), are being deleted, since the paragraphs currently refer to sections in parts other than Part 1. Section 1.17(i) is also being amended to clarify that the fee set forth in paragraph (i) for filing a petition to accord a filing date under § 1.53 applies to all patent applications, except provisional applications.

A new § 1.17(q) is being added to establish a petition fee of $50.00 for filing a petition for correction of inventorship under § 1.48 in a provisional application and for filing a petition to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional applica-

tion. The petition fee set forth in § 1.17(q) is not reduced for a small entity.

New §§ 1.17(r) and (s) are being added to establish the fees for entry of a submission after final rejection under § 1.129(a) and for each additional invention requested to be examined under § 1.129(b), respectively. These fees have been set at $365.00 for a small entity and $730.00 for other than a small entity.

Section 1.21(l) is being amended to refer to § 1.53(d)(1).

Section 1.28(a) is being amended to clarify the procedure for establishing status as a small entity in a nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application. In such cases, applicants may file a new verified statement or rely on a verified statement filed in the prior application, if status as a small entity is still proper and desired. If applicants intend to rely on a verified statement filed in the prior application, applicants must include in the nonprovisional application either a reference to the verified statement filed in the prior application or a copy of the verified statement filed in the prior application. Status as a small entity may be established in a provisional application by complying with existing § 1.27.

Section 1.45(c) is being amended to clarify that the first sentence applies to a "nonprovisional" application. Section 1.45(c) is also being amended to add a second sentence relating to joint inventors named in a provisional application. The second sentence states that each inventor named in a provisional application must have made a contribution to the subject matter disclosed in the provisional application. All that § 1.45(c), second sentence, requires is that if a person is named as an inventor in a provisional application, that person must have made a contribution to the subject matter disclosed in the provisional application.

Sections 1.48(a)-(c) are being amended to specify that the procedures for correcting an error in inventorship set forth in those sections apply to nonprovisional applications. New paragraph (d) is being added to establish a procedure for adding the name of an inventor in a provisional application, where the name was originally omitted without deceptive intent. Paragraph (d) does not require the verified statement of facts by the original inventor or inventors, the oath or declaration by each actual inventor in compliance with § 1.63 or the consent of any assignee as required in paragraph (a). Instead, the procedure requires the filing of a petition identifying the name or names of the inventors to be added and including a statement that the name or names of the inventors were omitted through error without deceptive intention on the part of the actual inventor(s). The statement would be required to be verified if made by a person not registered to practice before the PTO. The statement could be signed by a registered practitioner of record in the application or acting in a representative capacity under § 1.34(a). The $50.00 petition fee set forth in § 1.17(q) would also be required. New paragraph (e) is also being added setting forth the procedure for deleting the name of a person who was erroneously named as an inventor in a provisional application. The procedure requires an amendment deleting the name of the person who was erroneously named accompanied by: a petition including a statement of facts verified by the person whose name is being deleted establishing that the error occurred without deceptive intention; the fee set forth in § 1.17(q); and the written consent of any assignee.

Section 1.51 is being amended to redesignate § 1.51(a) as § 1.51(a)(1) and to include a new paragraph (a)(2) identifying the required parts of a complete provisional application. As set forth in § 1.51(a)(2), a complete provisional application includes a cover sheet, a specification as prescribed in 35 U.S.C. 112, first paragraph, any necessary drawings and the provisional application filing fee. A suggested cover sheet format for a provisional application is included as an Appendix A to this Notice of Final Rulemaking and is available from the PTO free of charge to the public. However, the rule does *not* require the applicant to use the PTO suggested cover sheet. Any paper containing the information required in § 1.51(a)(2)(i) will be acceptable. The cover sheet is required to identify the paper as a provisional application and to provide the information which is necessary for the PTO to prepare the provisional application filing receipt. Also, the residence of each named inventor and, if the invention disclosed in the provisional application was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government, the name of the U.S. Government agency and Government contract number must be identified on the cover sheet.

Section 1.51(b) is being amended to indicate that an information disclosure statement is not required and may not be filed in a provisional application. Any information disclosure statements filed in a provisional application will either be returned or disposed of at the convenience of the Office. An information disclosure statement filed in a § 1.53(b)(1) application which has been converted to a provisional application will be retained in the application after the conversion, if the information disclosure statement was filed before the petition required by § 1.53(b)(2)(ii) was filed.

The title of § 1.53 and paragraph (a) are being amended to refer to application number, rather than application serial number. The term "application number" is found in current § 1.5(a).

Section 1.53(b) is being redesignated as § 1.53(b)(1) and is being amended to refer to § 1.17(i) rather than § 1.17(i)(1) to conform to the change therein.

A new § 1.53(b)(2) is being added to set forth the requirements for obtaining a filing date for a provisional application. Section 1.53(b)(2) states that a filing date will be accorded to a provisional application as of the date the specification as prescribed by 35 U.S.C. 112, first paragraph, any necessary drawings, and the name of each inventor of the subject matter disclosed are filed in the PTO. The filing date requirements for a provisional application set forth in new paragraph (b)(2) parallel the existing requirements set forth in former paragraph (b), now redesignated paragraph (b)(1), except that no claim is required. In order to minimize the cost of processing provisional applications and to reduce the handling of provisional applications, amendments, other than those required to make the provisional application comply with applicable regulations, are not permitted after the filing date of the provisional application.

Section 1.53(b)(2)(i) is being added requiring all provisional applications to be filed with a cover sheet identifying the application as a provisional application. The section also indicates that the PTO will treat an application as having been filed under § 1.53(b)(1), unless the application is identified as a provisional application on filing. A provisional application, which is identified as such on filing, but which does not include all of the information required by § 1.51(a)(2)(i) would still be treated as a provisional application. However, the omitted information and a surcharge would be required to be submitted at a later date under new § 1.53(d)(2).

Section 1.53(b)(2)(ii) is being added to establish a procedure for converting an application filed under § 1.53(b)(1) to a provisional application. The section requires that a petition requesting the conversion and a petition fee be filed in the § 1.53(b)(1) application prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of twelve (12) months after the filing date of the § 1.53(b)(1) application, or the filing of a request for a statutory invention registration under § 1.293. The grant of any such petition would not entitle applicant to a refund of the fees properly paid in the application filed under § 1.53(b)(1).

Section 1.53(b)(2)(iii) is being added to call attention to the provisions of Public Law 103-465 which prohibit any provisional application from claiming a right of priority under 35 U.S.C. 119 or 365(a) or the benefit of an earlier filing date under 35 U.S.C. 120, 121 or 365(c) of any other application. The section also calls attention to the provisions of Public Law 103-465 which provide that no claim for benefit of an earlier filing date may be made in a design application based on a provisional application and that no request for a statutory invention registration may be filed in a provisional application. Section 1.53(b)(2)(iii) further specifies that the requirements of §§ 1.821-1.825 are not mandatory for provisional applications. However, applicants are reminded that an invention being claimed in an application filed under 35 U.S.C. 111(a) or 365 which claims benefit under 35 U.S.C. 119(e) of a provisional application must be disclosed in the provisional application in the manner provided by the first paragraph of 35 U.S.C. 112. Voluntary compliance with the requirements of §§ 1.821-1.825 in the provisional application is recommended, in order to ensure that support for the invention claimed in the 35 U.S.C.111(a) application can be readily ascertained in the provisional application.

Section 1.53(c) is being amended to require that any request for review of a refusal to accord an application a filing date be made by way of a petition accompanied by the fee set forth in § 1.17(i), if the application was filed under § 1.53(b)(1), or by the fee set forth in § 1.17(q), if the application was filed under § 1.53(b)(2). This reflects the current practice set forth in the Manual of Patent Examining Procedure (MPEP), section 506.02 (Sixth Edition, Jan. 1995) with regard to any request for review of a refusal to accord a filing date for an application. The PTO will continue its current practice of refunding the petition fee, if the refusal to accord the requested filing date is found to have been a PTO error.

Section 1.53(d) is being redesignated as § 1.53(d)(1).

Section 1.53(d)(2) is being added to provide that a provisional application may be filed without the basic filing fee and without the complete cover sheet required by § 1.51(a)(2). In such a case, the applicant will be notified and given a period of time in which to file the missing fee, and/or cover sheet and to pay the surcharge set forth in § 1.16(l).

Section 1.53(e) is being redesignated as § 1.53(e)(1) and amended to refer to § 1.53(b)(1). Also, a new § 1.53(e)(2) is being added to indicate that a provisional application will not be given a substantive examination and will be abandoned no later than twelve (12) months after its filing date.

Sections 1.55(a) and (b) are being amended to clarify that the sections apply to nonprovisional applications and to clarify that a nonprovisional application may claim the benefit of one or more prior foreign applications or one or more applications for inventor's certificate. Also, § 1.55(a) is being amended to replace the reference to 35 U.S.C. 119 with a reference to 35 U.S.C. 119(a)-(d). In addition, the reference to § 1.17(i)(1) in § 1.55(a) is being replaced by a reference to § 1.17(i) to be consistent with the change to § 1.17. Section 1.55(b) is also being amended to refer to 35 U.S.C. 119(d) to conform to the paragraph designations contained in Public Law 103-465.

Section 1.59 is being amended to clarify that the retention fee practice set forth in § 1.53(d)(1) applies only to applications filed under § 1.53(b)(1).

Section 1.60 is being amended to clarify in the title of the section and in paragraph (b)(1) that the procedure set forth in the section is only available for filing a continuation or divisional application if the prior application was a nonprovisional application and complete as set forth in § 1.51(a)(1). Paragraph (b)(4) is being amended to delete the requirement that the statement which must accompany the copy of the prior application include the language that "no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein." The requirement is unnecessary because any amendment filed to complete the prior application would be considered a part of the original disclosure of the prior application and, by definition, could not contain new matter. Also, paragraph (b)(4) is being amended to refer to § 1.17(i).

Section 1.62(a) is being amended to clarify that the procedure set forth in the section is only available for filing a continuation, continuation-in-part, or divisional application of a prior nonprovisional application which is complete as defined in § 1.51(a)(1). Section 1.62(a) is also being amended to clarify that a continuing application may be filed under § 1.62 after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application and that the request for a § 1.62 application must include identification of the inventors named in the prior application. The phrase "Serial number, filing date" in § 1.62(a) is being changed to "application number."

Section 1.62(e) is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17. Also, the term "application serial number" in § 1.62(e) is being changed to "application number."

Section 1.63(a) is being amended to replace the reference to § 1.51(a)(2) with a reference to § 1.51(a)(1)(ii) in order to conform with the changes in § 1.51 and to refer to an oath or declaration filed as a part of a nonprovisional application.

Section 1.67(b) is being amended to replace the reference to § 1.53(d) with a reference to § 1.53(d)(1) in order to conform with the changes in § 1.53. Furthermore, the references to §§ 1.53(b) and 1.118 are being deleted to make clear that the new matter exclusion applies to all applications including those filed under §§ 1.60 and 1.62.Also, the section is being amended to refer to a nonprovisional application.

Sections 1.78(a)(1) and (a)(2) are being amended to clarify that the sections apply to nonprovisional applications claiming the benefit of one or more copending nonprovisional applications or international applications designating the United States of America. Section 1.78(a)(1)(iii) is being amended to refer to §§ 1.53(b)(1) and 1.53(d)(1). Section 1.78(a)(2) is also being amended to eliminate the use of serial number and filing date as an identifier for a prior application. The section will require that the prior application be identified by application number (consisting of the series code and serial number) or international application number and international filing date.

Sections 1.78(a)(3) and (a)(4) are being added to set forth the conditions under which a nonprovisional application may claim the benefit of one or more prior copending provisional applications. The later filed nonprovisional application must be an application other than for a design patent and must be copending with each provisional application. There must be a common inventor named in the prior provisional application and the later filed nonprovisional application. Each prior provisional application must be complete as set forth in § 1.51(a)(2), or entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee. Section 1.78(a)(3) also includes the warning that when the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. A provisional application may be abandoned by operation of 35 U.S.C. 111(b)(5) on a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, a nonprovisional application claiming benefit of the provisional application under 35 U.S.C. 119(e) must be filed no later than the preceding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.78(a)(4) is also being added to provide that a nonprovisional application claiming benefit of one or more provisional applications must contain a reference to each provisional application, identifying it as a provisional application and including the provisional application number (consisting of series code and serial number). The section does not require the nonprovisional application to identify the nonprovisional application as a continuation, divisional or continuation-in-part application of the provisional application.

Sections 1.83(a) and (c) are being amended to clarify that the sections apply to nonprovisional applications.

Section 1.97(d) is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.101(a) is being amended to indicate that the section applies to nonprovisional applications.

Section 1.102(d) is being amended to replace the reference to § 1.17(i)(2) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.103(a) is amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.129 is being added to set forth the procedure for implementing certain transitional provisions contained in Public Law 103-465. Section 1.129(a) provides for limited reexamination of applications pending for 2 years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). An applicant will be entitled to have a first submission entered and considered on the merits after final rejection if the submission and the fee set forth in § 1.17(r) are filed prior to the filing of an Appeal Brief and prior to abandonment of the application. Section 1.129(a) also provides that the finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). After submission and payment of the fee set forth in § 1.17(r), the next PTO action on the merits may be made final only under the conditions currently followed by the PTO for making a first action in a continuing application final. If a subsequent final rejection is made in the application, applicant would be entitled to have a second submission entered and considered on the merits under the same conditions set forth for consideration of the first submission. Section 1.129(a) defines the term "submis-

sion" as including, but not limited to, an information disclosure statement, an amendment to the written description, claims or drawings, and a new substantive argument or new evidence in support of patentability. For example, the submission may include an amendment, a new substantive argument and an information disclosure statement. In view of the fee set forth in § 1.17(r), any information disclosure statement previously refused consideration in the application because of applicant's failure to comply with § 1.97(c) or (d) or which is filed as part of either the first or second submission will be treated as though it had been filed within one of the time periods set forth in § 1.97(b) and will be considered without the petition and petition fee required in § 1.97(d), if it complies with the requirements of § 1.98. In view of 35 U.S.C. 132, no amendment considered as a result of the payment of the fee set forth in § 1.17(r) may introduce new matter into the disclosure of the application.

Section 1.129(b)(1) is being added to provide for examination of more than one independent and distinct invention in certain applications pending for 3 years or longer as of June 8, 1995, taking into account any reference to any earlier application under 35 U.S.C. 120, 121 or 365(c). Under § 1.129(b)(1), a requirement for restriction or for the filing of divisional applications would only be made or maintained in the application after June 8, 1995, if: (1) the requirement was made in the application or in an earlier application relied on under 35 U.S.C. 120, 121 or 365(c) prior to April 8, 1995; (2) the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant; or (3) the required fee for examination of each additional invention was not paid. Under § 1.129(b)(2), if the application contains claims to more than one independent and distinct invention, and no requirement for restriction or for the filing of divisional applications can be made or maintained, applicant will be notified and given a time period to (i) elect the invention or inventions to be searched and examined, if no election has been made prior to the notice, and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects, (ii) in situations where an election was made in response to a requirement for restriction that cannot be maintained, confirm the election made prior to the notice and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected, or (iii) file a petition under § 1.129(b)(2) traversing the requirement without regard to whether the requirement has been made final. No petition fee is required. Section 1.129(b)(2) also provides that if the petition is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects. Under § 1.129(b)(3), each additional invention for which the required fee set forth in § 1.17(s) has not been paid will be withdrawn from consideration under § 1.142(b). An applicant who desires examination of an invention so withdrawn from consideration can file a divisional application under 35 U.S.C. 121.

Section 1.129(c) is being added to clarify that the provisions of §§ 1.129(a) and (b) are not applicable to any application filed after June 8, 1995. However, any application filed on June 8, 1995, would be subject to a 20-year patent term.

Section 1.137 is being amended by revising paragraph (c) to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.137(a) not filed within six (6) months of the date of the abandonment of the application. The language "filed before June 8, 1995" and "filed on or after June 8, 1995" as used in the amended rule, refer to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365.

Section 1.139 is being added to set forth the procedure for reviving a provisional application where the delay was unavoidable or unintentional. Section 1.139(a) addresses the revival of a provisional application where the delay was unavoidable and § 1.139(b) addresses the revival of a provisional application where the delay was unintentional. Applicant may petition to have an abandoned provisional application revived as a pending provisional application for a period of no longer than twelve months from the filing date of the provisional application where the delay was unavoidable or unintentional. It would be permissible to file a petition for revival later than twelve months from the filing date of the provisional application but only to revive the application for the twelve-month period following the filing of the provisional application. Thus, even if the petition were granted to reestablish the pendency up to the end of the twelve-month period, the provisional application would not be considered pending after twelve months from its filing date. The requirements for reviving an abandoned provisional application set forth in § 1.139 parallel the existing requirements set forth in § 1.137.

Sections 1.177, 1.312(b), 1.313(a), and 1.314 are being amended to replace the references to § 1.17(i)(1) with references to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.316(d) is being amended to eliminate, in all applications filed on or after June 8, 1995, except design applications, the requirement that a terminal disclaimer accompany any petition under § 1.316(b) not filed within six (6) months of the date of the abandonment of the application. Acceptance of a late payment of an issue fee in a design application is specifically provided for in § 1.155. Therefore, § 1.316 does not apply to design applications. The language "filed before June 8, 1995" as used in the amended rule, refers to the actual United States filing date, without reference to any claim for benefit under 35 U.S.C. 120, 121 or 365.

Section 1.317(d) is being removed and reserved to eliminate the requirement that a terminal disclaimer accompany any petition under § 1.317(b) not filed within six (6) months of the date of lapse of the patent.

Section 1.666 is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Section 1.701 is being added to set forth the procedure the PTO will follow in calculating the length of any extension of patent term to which an applicant is entitled under 35 U.S.C. 154(b) where the issuance of a patent on an application, other than for designs, filed on or after June 8, 1995, was delayed due to certain causes of prosecution delay. Applicants need not file a request for the extension of patent term under § 1.701. The extension of patent term is automatic by operation of law. It is currently anticipated that applicant will be advised as to the length of any patent term extension at the time of receiving the Notice of Allowance and Issue Fee Due. Review of the length of a patent term extension calculated by the PTO under § 1.701 prior to the issuance of the patent would be by way of petition under § 1.181. If an error is noted after the patent issues, patentee and any third party may seek correction of the period of patent term granted by filing a request for Certificate of Correction pursuant to § 1.322. The PTO intends to identify the length of any patent term extension calculated under § 1.701 on the printed patent.

Section 1.701(a) is being added to identify those patents which are entitled to an extension of patent term under 35 U.S.C. 154(b).

Section 1.701(b) is being added to provide that the term of a patent entitled to extension under § 1.701(a) shall be extended for the sum of the periods of delay calculated under §§ 1.701(c)(1), (c)(2), (c)(3) and (d), to the extent that those periods are not overlapping, up to a maximum of five years. The section also provides that the extension will run from the expiration date of the patent.

Section 1.701(c)(1) is being added to set forth the method for calculating the period of delay where the delay was a result of an interference proceeding under 35 U.S.C. 135(a). The period of delay with respect to each interference in which the application was involved is calculated under § 1.701(c)(1)(i) to include the number of days in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application. An interference is considered terminated as of the date the time for filing an appeal under 35 U.S.C. 141 or civil action under 35 U.S.C. 146 expired. If an appeal under 35 U.S.C. 141 is taken to the Court of Appeals for the Federal Circuit, the interference terminates on the date of receipt of the court's mandate by the PTO. If a civil action is filed under 35 U.S.C. 146, and the decision of the district court is not appealed, the interference terminates on the date the time for filing an appeal from the court's decision expires. See section 2361 of the MPEP. The period of delay with respect to an application suspended by the PTO due to interference proceedings under 35 U.S.C. 135(a) not involving the application is calculated under § 1.701(c)(1)(ii) to include the number of days in the period beginning on the date prosecution in the application is suspended due to interference proceedings not involving the application and ending on the date of the termination of the suspension. The period of delay under § 1.701(a)(1) is the sum of the periods calculated under §§ 1.701(c)(1)(i) and (c)(1)(ii), to the extent that the periods are not overlapping.

Section 1.701(c)(2) is being added to set forth the method for calculating the period of delay where the delay was a result of the application being placed under a secrecy order.

Section 1.701(c)(3) is being added to set forth the method for calculating the period of delay where the delay was a result of appellate review. The period of delay is calculated under § 1.701(c)(3) to include the number of days in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.

Section 1.701(d) is being added to set forth the method for calculating any reduction in the period calculated under § 1.701(c)(3). As required by 35 U.S.C. 154(b)(3)(B), § 1.701(d)(1) provides that the period of delay calculated under § 1.701(c)(3) shall be reduced by any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination. The "filing date" for the purpose of § 1.701(d)(1) would be the earliest effective U.S. filing date, but not including the filing date of a provisional application or the international filing date of a PCT application. For PCT applications entering the national stage, the PTO will consider the "filing date" for the purpose of § 1.701(d)(1) to be the date on which applicant has complied with the requirements of § 1.494(b), or § 1.495(b), if applicable.

As contained in Public Law 103-465, 35 U.S.C. 154(b)(3)(C) states that the period of extension referred to in 35 U.S.C. 154(b)(2) "shall be reduced for the period of time during which the applicant for patent did not act with due diligence, as determined by the Commissioner." Section 1.701(d)(2) is being added to provide that the period of delay calculated under § 1.701(c)(3) shall be reduced by any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. Section 1.701(d)(2) also provides that in determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review. Acts which the Commissioner considers to constitute *prima facie* evidence of lack of due diligence under § 1.701(d)(2) are suspension at applicant's request under § 1.103(a) during the period of appellate review and abandonment during the period of appellate review.

Section 3.21 is being amended to provide that an assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) and to eliminate the use of serial number and filing date as an identifier for national patent applications in assignment documents. This change is intended to eliminate any confusion as to whether an application identified by its serial number and filing date in an assignment document is an application filed under § 1.53(b)(1), 1.60 or 1.62 or a design application or a provisional application since there is a different series code assigned to each of these types of applications.

Section 3.21 is also being amended to provide that if an assignment of a patent application filed under § 1.53(b)(1) or § 1.62 is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Further, § 3.21 is being amended to provide that if an assignment of a provisional application is executed before the provisional application is filed, it must identify the provisional application by name of each inventor and title of the invention so that there can be no mistake as to the provisional application intended.

Section 3.81 is being amended to replace the reference to § 1.17(i)(1) with a reference to § 1.17(i) to be consistent with the change to § 1.17.

Responses to and Analysis of Comments: Forty-nine written comments were received in response to the Notice of Proposed Rulemaking. These comments, along with those made at the public hearing, have been analyzed. Some suggestions made in the comments have been adopted and others have not been adopted. Responses to the comments follow:

General Comments

1. *Comment:* One comment questioned the use of the word "proposed" in the notice of proposed rulemaking in describing the statutory amendments contained in Public Law 103-465.
Response: The statutory changes contained in Public Law 103-465 were described as "proposed" changes in the Notice of Proposed Rulemaking because the President had not signed the legislation at the time the notice was prepared for publication. In fact, the legislation was signed by the President on December 8, 1994, which is the date of enactment.
2. *Comment:* Several comments urged the PTO to favorably consider the 17/20 patent term specified in H.R. 359 since this proposed legislation would overcome the existing impact of extended PTO prosecution and eliminate patent term extensions for prosecution delays. Furthermore, the proposed legislation is consistent with the Uruguay Round Agreements Act, Public Law 103-465.
Response: The administration and the PTO strongly believe that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The PTO will take steps to ensure that processing and examination of applications are handled expeditiously.
3. *Comment:* One comment stated that the proposed rules are premature in view of the Rohrabacher bill, H.R. 359.
Response: The proposed rules are not premature. Public Law 103-465 was signed into law on December 8, 1994, with an effective date of June 8, 1995, for the implementation of the 20-year patent term and provisional applications. The Commissioner must promulgate regulations to implement the changes required by Public Law 103-465.
4. *Comment:* One comment stated that there is nothing in the TRIPs agreement that requires the term to be measured from filing, nor that provisional applications be provided for, nor that new fees of $730 as set forth in §§ 1.17(r) and (s) be established. It is suggested that 35 U.S.C. 154 be amended to provide that "every patent (other than a design patent) shall be granted a term of twenty years from the patent issue date, subject to the payment of maintenance fees." It was also suggested that the section regarding maintenance fees be amended to add a new fee payable at 16.5 years of $5000 (for large entity)/$2500 (for small entity) for maintenance of patent between 17 and 20 years.
Response: The suggestion has not been adopted. The administration and the PTO strongly believe that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The establishment of a provisional application is not required by GATT. The provisional application has been adopted as a mechanism to provide easy and inexpensive entry into the patent system. The filing of provisional applications is optional. Provisional applications will place domestic applicants on an equal footing with foreign applicants as far as the measurement of term is concerned because the domestic priority period, like the foreign priority period, is not counted in determining the endpoint of the patent term. As to the §§ 1.17(r) and (s) fees, the statute authorizes the Commissioner to establish appropriate fees for further limited reexamination of applications and for examination of more than

one independent and distinct inventions in an application.

5. *Comment:* One comment suggested that the 20-year patent term of claims drawn to new matter in continuation-in-part (CIP) applications be measured from the filing date of the CIP application, irrespective of any reference to a parent application under 35 U.S.C. 120.

Response: The suggestion has not been adopted. The term of a patent is not based on a claim-by-claim approach. Under 35 U.S.C. 154(a)(2), if an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(a), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(a). For a CIP application, applicant should review whether any claim in the patent that will issue is supported in an earlier application. If not, applicant should consider canceling the reference to the earlier filed application.

6. *Comment:* One comment objected to the 20-year term provisions of Public Law 103-465 because it was believed that payment of maintenance fees would be required earlier under 20-year term than under 17-year term.

Response: The payment of maintenance fees are not due earlier under 20-year term than under 17-year term. Maintenance fees continue to be due at 3.5, 7.5 and 11.5 years from the issue date of the patent.

7. *Comment:* Several comments suggested that the expiration date be printed on the face of the patent.

Response: The suggestion has not been adopted. The expiration date will not be printed on the face of the patent. The PTO will publish any patent term extension that is granted as a result of administrative delay pursuant to § 1.701 on the face of the patent. The term of a patent will be readily discernible from the face of the patent. Furthermore, it is noted that the term of a patent is dependent on the timely payment of maintenance fees which is not printed on the face of the patent.

8. *Comment:* One comment suggested that, in order to aid the bar in advising clients as to whether a provisional application has had its priority claimed in a patent, the PTO should somehow link the provisional application number with the complete application number and/or the patent number.

Response: It is contemplated by the PTO that all provisional applications will be given application numbers, starting with a series code "60" followed by a six digit number, e.g., "60/123,456." If a subsequent 35 U.S.C. 111(a) application claims the benefit of the filing date of the provisional application pursuant to 35 U.S.C. 119(e) and the 35 U.S.C. 111(a) application results in a patent, the provisional application would be listed by its application number and filing date on the face of the patent under the heading "Related U.S. Application Data." The public will be able to identify an application under the above-noted heading as a provisional application by checking to see if it has a series code of "60."

9. *Comment:* Several comments suggested that the PTO consider modifying the rules to permit the filing of all applications by assignees. This would promote harmonization with other patent laws throughout the world and would eliminate one of the difficulties which will occur for the PTO in considering claims for priority based on the filing of a provisional application.

Response: Assignee filing was recommended in the 1992 Advisory Commission Report on Patent Law Reform. The PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken under advisement in that project.

10. *Comment:* Several comments stated that a complete provisional application should not be forwarded to a central repository for storage.

Response: In view of the relatively small filing fee for a provisional application and the fact that the provisional application will not be examined, PTO handling must be kept to a minimum and these provisional applications, once complete, will be sent to the Files Repository for storage rather than being kept in the examination area of the PTO.

11. *Comment:* One comment suggested that the provisional application be maintained with the 35 U.S.C. 111(a) application because the examiner may need it to determine whether the 35 U.S.C. 111(a) application is entitled to the benefit of the prior provisional application and in the event of 18-month publication, there will be a demand for accessibility by the public to the provisional and 35 U.S.C. 111(a) applications upon publication.

Response: The suggestion has not been adopted. Benefit of the same provisional application may be claimed in a number of 35 U.S.C. 111(a) applications. If the PTO is to maintain the provisional application file with one of several 35 U.S.C. 111(a) applications claiming benefit of the provisional application and the 35 U.S.C. 111(a) application containing the provisional application file were to go abandoned while one of the other 35 U.S.C. 111(a) applications issues, the public would be entitled to inspect the provisional application file but not the abandoned 35 U.S.C. 111(a) application file containing the provisional application file. This would create access problems.

12. *Comment:* One comment suggested that provisional applications be available in full to the public if the benefit of priority is being claimed.

Response: Section 1.14 relating to access applies to all applications including provisional applications. If the benefit of a provisional application is claimed in a later filed 35 U.S.C. 111(a) application which resulted in a patent, then access to the provisional application will be available to the public pursuant to § 1.14. The mere fact that a provisional application is claimed in a later filed 35 U.S.C. 111(a) application does not give the public access to the provisional application unless the 35 U.S.C. 111(a) application issues as a patent.

13. *Comment:* Several comments requested that the PTO clarify whether a 35 U.S.C. 111(a) application will be accorded an effective date as a reference under 35 U.S.C. 102(e) as of the filing date of the provisional application for which benefit under 35 U.S.C. 119(e) is claimed. If so, the comment questioned whether pending applications will be rejected under 35 U.S.C. 102(e) on the basis that an invention was described in a patent granted on a provisional application by another filed in the U.S. before the invention thereof by the applicant for patent.

Response: If a patent is granted on a 35 U.S.C. 111(a) application claiming the benefit of the filing date of a provisional application, the filing date of the provisional application will be the 35 U.S.C. 102(e) prior art date. A pending application will be rejected under 35 U.S.C. 102(e) on the basis that an invention was described in a patent granted on a 35 U.S.C. 111(a) application which claimed the benefit of the filing date of a provisional application by another filed in the U.S. before the invention thereof by the applicant for patent.

14. *Comment:* One comment suggested that the PTO issue a final rule stating that if a 35 U.S.C. 111(a) application claims the benefit of the filing date of a provisional application, the "inventive entity" for the purposes of 35 U.S.C. 102(e) will be the inventors listed on the issued patent, and the list of inventors in the provisional application shall have no effect on the identity of an "inventive entity" for the purposes of 35 U.S.C. 102(e).

Response: The suggestion has not been adopted. The "inventive entity" for the purpose of 35 U.S.C. 102(e) is determined by the patent and not by the inventors named in the provisional application. As long as the requirements of 35 U.S.C. 119(e) are satisfied, a patent granted on a 35 U.S.C. 111(a) application which claimed the benefit of the filing date of a provisional application has a 35 U.S.C. 102(e) prior art effect as of the filing date of the provisional application based on the inventive entity of the patent. It is clear from 35 U.S.C. 102(e) that the inventive entity is determined by the patent and a rule to this effect is not necessary.

15. *Comment:* One comment requested the PTO to express its position as to whether the filing of a provisional application with the subsequent filing of a 35 U.S.C. 111(a) application claiming benefit of the provisional application under 35 U.S.C. 119(e) creates a prior art date against other patent applicants under 35 U.S.C. 102(g).

Response: As to 35 U.S.C. 102(g), the filing of a provisional application with the subsequent filing of a 35 U.S.C. 111(a) application claiming benefit of the provisional application under 35 U.S.C. 119(e) creates a prior art date under 35 U.S.C. 102(g) as of the filing date of the provisional application.

16. *Comment:* One comment suggested that in view of the 20-year patent term measured from filing, § 1.103(a) should be deleted. The PTO should not have the right to suspend action on any application, thereby reducing applicant's term of protection.

Response: Section 1.103(a) refers to suspension of action as a result of a request by applicant. If applicant wishes to suspend prosecution and thereby reduce his/her term of protection, applicant should be permitted to do so.

17. *Comment:* One comment suggested that in order to avoid delays resulting from consideration of petitions to withdraw premature notices of abandonment, examiners should be required to contact an attorney of record prior to abandoning the application to find out if a response to an Office communication has been filed.

Response: The suggestion has not been adopted. However, in order to avoid loss of patent term, applicants are encouraged to check on the status in cases where applicants have not received a return postcard from the PTO within two (2) weeks of the filing of any response to a PTO action.

18. *Comment:* One comment asked whether there is a "cut-off" date after which patentees may lose the opportunity to choose 17 vs. 20-year patent term.

Response: The "cut-off" date is June 8, 1995. A patent that is in force on June 8, 1995, or a patent that issues after June 8, 1995, on an application filed before June 8, 1995, is automatically entitled to the longer of the 20-year patent term measured from the earliest U.S. effective filing date or 17 years from grant. This is automatic by operation of law. Patentees need not make any election to be entitled to the longer term. A patent that issues on an application filed on or after June 8, 1995 is entitled to a 20-year patent term measured from the earliest U.S. effective filing date.

19. *Comment:* One comment stated that there is no clear guidance as to a patentee's "bonus rights" that may arise because of the difference in a 17-year term vs. a 20-year term. Will parties that were previously in a licensing arrangement have to renegotiate terms for the bonus patent term?

Response: Section 154(c) of title 35, United States Code, states that the remedies of sections 283 (injunction), 284 (damages) and 285 (attorney fees) shall not apply to acts which were commenced or for which substantial investment was made before June 8, 1995, and became infringing by reason of the 17/20 year term and that these acts may be continued only upon the payment of an equitable remuneration to the patentee that is determined in an action brought under chapters 28 and 29 of Title 35. There is no guidance provided in the statute as to the meaning of "substantial investment" and "equitable remuneration." Licensing arrangements are between the parties to the agreement and are determined by the terms of the agreement and state law and are outside the jurisdiction of the PTO.

20. *Comment:* One comment questioned whether an international application designating the U.S. filed before June 8, 1995, with entry into the U.S. national stage on or after June 8, 1995, preserves the 17-year patent term measured from grant.

Response: An international application designating the U.S. that is filed before June 8, 1995, with entry into the U.S. national stage under 35 U.S.C. 371 on or after June 8, 1995, preserves the option for a 17-year patent term measured from date of grant.

21. *Comment:* One comment suggested that 35 U.S.C. 371(c) be amended because a declaration should not be required to obtain a filing date and a prior art date under 35 U.S.C. 102(e).

Response: The suggestion has not been adopted. This issue was not addressed in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

22. *Comment:* One comment suggested that §§ 1.604, 1.605 and 1.607 be amended to state that provisional applications are not subject to interference.

Response: The suggestion has not been adopted because it is unnecessary. By statute, 35 U.S.C. 111(b)(8), provisional applications are not subject to 35 U.S.C. 135, i.e., a provisional application will not be placed in interference.

23. *Comment:* One comment suggested that §§ 1.821-1.825 be amended so that (1) only unbranched sequences of ten or more amino acids and twenty or more nucleotides which are claimed have to be included in Sequence Listings, (2) previously published sequences can be omitted, and (3) the sequences of primers and oligonucleotide probes should not be included in a Sequence Listing if encompassed by another disclosed sequence.

Response: The suggestion has not been adopted. There was no change proposed to §§ 1.821-1.825 in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

24. *Comment:* One comment suggested that §§ 5.11 to 5.15 be amended to provide for the grant of a foreign license for a provisional application.

Response: The suggestion has not been adopted. The present language of §§ 5.11 to 5.15 already provides for the grant of a foreign license for a provisional application.

25. *Comment:* One comment suggested that in order to assist defense agencies in reviewing application for secrecy orders, PTO should (1) automatically impose a secrecy order on any application filed under 35 U.S.C. 111(a) if a secrecy order was previously imposed on corresponding provisional application, and (2) require applications filed under 35 U.S.C. 111(a) based on a previous provisional application to indicate changes made to the provisional application in the 35 U.S.C. 111(a) application by means of underlining and bracketing.

Response: The suggestions have not been adopted. The PTO cannot automatically impose a secrecy order on any 35 U.S.C. 111(a) applications even if a secrecy order was previously imposed on a provisional application, for which benefit under 35 U.S.C. 119(e) is claimed, unless the agency which imposed the secrecy order on the provisional application specifically requests the PTO to do so since the 35 U.S.C. 111(a) application could disclose subject matter which is different from that which is disclosed in the provisional application.

As to item (2), the PTO will not require applicants to identify the differences in subject matter disclosed in the 35 U.S.C. 111(a) application and the provisional application.

26. *Comment:* One comment suggested that in order to relieve defense agencies from possible liability for secrecy orders imposed for more than 5 years, the PTO should seek legislation setting patent term at 20 years from the earliest filing date or 17 years from the issue date, whichever is longer, for any patent application placed under secrecy order.

Response: The suggestion has not been adopted. The PTO strongly believes that the 20-year patent term as enacted in Public Law 103-465 is the appropriate way to implement the 20-year patent term required by the GATT Uruguay Round Agreements Act. The 5-year limit for patent term extension set forth in § 1.701(b) is required by statute, 35 U.S.C. 154(b).

Comments Directed To Specific Rules

27. *Comment:* One comment suggested that in order to eliminate the need for the expression "other than a provisional application" in other parts of the regulations, § 1.9 should be amended to identify a 35 U.S.C. 111(a) application by some term that can be used in the rules to distinguish that type of application from a provisional application.

Response: The suggestion has been adopted. The rules are being amended to include a definition of the term "nonprovisional application" in § 1.9(a) to describe an application filed under 35 U.S.C. 111(a) or 371. Further, the term "nonprovisional application" is being used in the final rules where the rule applies only to applications filed under 35 U.S.C. 111(a) or 371 and not to provisional applications.

28. *Comment:* One comment suggested that the rules be simplified if a "national application" could be defined in § 1.9 to exclude a provisional application.

Response: The suggestion has not been adopted. Section 1.9(a), prior to this rulemaking, defined a national application to include any application filed under 35 U.S.C. 111. A provisional application is an application filed under 35 U.S.C. 111. It is appropriate to define a provisional application as a special type of national application.

29. *Comment:* One comment requested an explanation of the showing required in a petition under §§ 1.12 and 1.14 for access to pending applications and to assignment records for pending applications.

Response: There was no substantive change proposed to either § 1.12 or 1.14 in the Notice of Proposed Rulemaking. Thus, the showing required in a petition under § 1.12 or 1.14 remains the same after this final rulemaking as before. A discussion of such a petition can be found in section 103 of the MPEP.

30. *Comment:* Several comments objected to the definition in § 1.45(c) of joint inventors in provisional applications as being those having made a contribution to "the subject matter dis-

closed" in the provisional application. Various language, such as, "the subject matter which constitutes the invention," "subject matter disclosed and regarded to be the invention," "disclosed invention," "the inventive subject matter disclosed" was suggested. Another comment requested guidance as to the determination of inventorship in a provisional application.

Response: The suggestion has not been adopted. The term "invention" is typically used to refer to subject matter which applicant is claiming in his/her application. Since claims are not required in a provisional application, it would not be appropriate to reference joint inventors as those who have made a contribution to the "invention" disclosed in the provisional application. If the "invention" has not been determined in the provisional application because no claims have been presented, then the name(s) of those person(s) who have made a contribution to the subject matter disclosed in the provisional application should be submitted. Section 1.45(c) states that "if multiple inventors are named in a provisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter disclosed in the provisional application." All that § 1.45(c) requires is that if someone is named as an inventor, that person must have made a contribution to the subject matter disclosed in the provisional application. When applicant has determined what the invention is by the filing of the 35 U.S.C. 111(a) application, that is the time when the correct inventors must be named. The 35 U.S.C. 111(a) application must have an inventor in common with the provisional application in order for the 35 U.S.C. 111(a) application to be entitled to claim the benefit of the provisional application under 35 U.S.C. 119(e).

31. *Comment:* Several comments suggested that it might be desirable to correct inventorship in a provisional application where an individual was erroneously named as an inventor and that the procedure for doing so should be set forth in § 1.48.

Response: Under 35 U.S.C. 119(e), as contained in Public Law 103-465, a later filed application under 35 U.S.C. 111(a) may claim priority benefits based on a copending provisional application so long as the applications have at least one inventor in common. An error in naming a person as an inventor in a provisional application would not require correction by deleting the erroneously named inventor from the provisional application since this would have no effect upon the ability of the provisional application to serve as a basis for a priority claim under 35 U.S.C. 119(e). However, in response to the comments, § 1.48 is being amended to include a new paragraph (e) which sets forth the requirements for deleting the names of the inventors incorrectly named as joint inventors in a provisional application, namely, a petition including a verified statement by the inventor(s) whose name(s) are being deleted stating that the error arose without deceptive intent, the fee set forth in § 1.17(q) and the written consent of all assignees.

32. *Comment:* One comment suggested that in order to make the procedures for provisional applications as simple as possible, there is no need to provide any rules to add inventor(s) or change inventorship in a provisional application since the whole concept of inventorship is meaningless without a claim. Error in inventorship can be corrected by the filing of a 35 U.S.C. 111(a) application within 12 months after the filing of a provisional application.

Response: The suggestion has not been adopted. One of the requirements of 35 U.S.C. 119(e) is that a 35 U.S.C. 111(a) application must have at least one inventor in common with a provisional application in order for the 35 U.S.C. 111(a) application to be entitled to claim the benefit of the filing date of the provisional application. In situations where there is no inventor in common between the 35 U.S.C. 111(a) application and the provisional application due to error in naming the inventors in the provisional application, procedures must be established to permit applicant to correct the inventorship in the provisional application.

33. *Comment:* One comment suggested that an individual who is the inventor of subject matter disclosed in a provisional application, but who is not named as an inventor in the provisional application because that subject matter was not intended to be claimed in a later filed 35 U.S.C. 111(a) application, could be added as an inventor pursuant to § 1.48(d) in the provisional application if the subject matter was later claimed in the 35 U.S.C. 111(a) application.

Response: The individual could be added as an inventor pursuant to § 1.48(d) in the provisional application so long as the individual was originally omitted without deceptive intent.

34. *Comment:* One comment questioned whether it would be proper for a registered practitioner who did not file the provisional application to sign the statement required by § 1.48(d) that the error occurred without deceptive intention on the part of the inventors.

Response: It would be proper for a registered practitioner who did not file the provisional application to sign the statement required by § 1.48(d), if the registered practitioner has a reasonable basis to believe the truth of the statement being signed.

35. *Comment:* One comment suggested that there should be no diligence requirement to correct inventorship in a provisional application.

Response: Diligence is not a requirement to correct inventorship in a provisional application in either § 1.48(d) or 1.48(e).

36. *Comment:* One comment suggested that § 1.48(a) be amended by deleting the requirements for "a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred" and for the written consent of any assignee.

Response: The suggestion has not been adopted. There was no substantive change proposed to § 1.48(a) in the Notice of Proposed Rulemaking. Since the correction of inventorship affects ownership rights, the existing rules are designed to provide assurances that all parties including the original named inventors and all assignees agree to the change of inventorship. If the requirements for verified statements of facts from the original named inventors and written consent of the assignees are to be deleted, the PTO would no longer have the assurances that all parties agree to the change.

37. *Comment:* One comment expressed concern that a provisional application filed without a claim will leave subsequent readers with little or no clue as to what the inventors in the provisional application considered to be their invention at the time the provisional application was filed and doubted that a provisional application filed without a claim defining the invention could ever provide a sufficient disclosure to support a claim for a foreign or U.S. priority date.

Response: Claims are not required by the statute to provide a specification in compliance with the requirements of 35 U.S.C. 112, first paragraph. However, if an applicant desires, one or more claims may be included in a provisional application. Any claim filed with a provisional application will, of course, be considered a part of the original provisional application disclosure.

38. *Comment:* One comment suggested that the PTO issue a specification format or guideline for a provisional application to enable an inventor to comply with 35 U.S.C. 112, first paragraph.

Response: The format of a provisional application is the same as for other applications and is set forth in existing § 1.77 which is applicable to provisional applications except no claims are required for provisional applications.

39. *Comment:* Several comments suggested that the PTO revise its rules to clarify that strict adherence to the enablement, description and best mode requirements of 35 U.S.C. 112, first paragraph, is not required in provisional applications.

Response: The suggestion has not been adopted. The substantive requirements of a specification necessary to comply with 35 U.S.C. 112, first paragraph, are established by court cases interpreting that section of the statute, not by rule. The case law applies to provisional applications as well as to applications filed under 35 U.S.C. 111(a).

40. *Comment:* Several comments suggested that the rules or comments published with the Final Rule indicate whether there is any requirement to update the best mode disclosed in the provisional application when filing the 35 U.S.C. 111(a) application.

Response: No rule was proposed to address the issue when going from a provisional application to a 35 U.S.C. 111(a) application because no current rule exists when going from one 35 U.S.C. 111(a) application to another 35 U.S.C. 111(a) application. The question of whether the best mode has to be updated is the same when going from one 35 U.S.C. 111(a) application to another 35 U.S.C. 111(a) application or from a provisional application to a 35 U.S.C. 111(a) application. Accordingly, the rationale of *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 U.S.P.Q.2d 1077 (Fed. Cir. 1994), would appear to be applicable. Clearly, if the substantive content of the application does not change when filing the 35 U.S.C. 111(a) application, there is no requirement to update the best mode. However, if subject matter is added to the 35 U.S.C. 111(a) application, there may be a requirement to update the best mode.

41. *Comment:* One comment suggested that § 1.51(c) be amended to permit a provisional application to be filed with an authorization to charge fees to a deposit account.

Response: Section 1.51(c) permits an application to be filed with an authorization to charge fees to a deposit account. Section 1.51(c) applies to provisional applications. Therefore, no change to § 1.51(c) is necessary.

42. *Comment:* One comment suggested that the PTO confirm that there will be no procedural examination of a provisional application other than to determine whether the provisional application complies with § 1.51(a)(2).

Response: The PTO intends to require compliance with the formal requirements of §§ 1.52(a)-(c) only to the extent necessary to permit the PTO to properly microfilm and store the application papers.

43. *Comment:* Several comments suggested that an English translation of a foreign language provisional application should not be required unless necessary in prosecution of the 35 U.S.C. 111(a) application to establish benefit. If an English translation is required, there is no useful purpose to require the translation at any time earlier than the filing of 35 U.S.C. 111(a) application claiming the benefit of the provisional application.

Response: Provisional applications may be filed in a language other than English as set forth in existing § 1.52(d). However, an English language translation is necessary for security screening purposes. Therefore, the PTO will require the English language translation and payment of the fee required in § 1.52(d) in the provisional application. Failure to timely submit the translation in response to a PTO requirement will result in the abandonment of the provisional application. If a 35 U.S.C. 111(a) application is filed without providing the English language translation in the provisional application, the English language translation will be required to be supplied in every 35 U.S.C. 111(a) application claiming priority of the non-English language provisional application.

44. *Comment:* One comment suggested that a new model oath or declaration form for use in claiming 35 U.S.C. 119(e) priority and a "cover sheet" for use in filing provisional applications be published as an addendum to the final rules.

Response: The suggestion has been adopted. See Appendix A for the sample cover sheet for filing a provisional application and Appendix B for the sample declaration for use in claiming 35 U.S.C. 119(e) priority.

45. *Comment:* One comment suggested that the statement in § 1.53(b)(2) that the provisional application will not be given a filing date if all the names of the actual inventor or inventor(s) are not supplied be deleted and § 1.41 be amended to make an exception for provisional applications. The comment suggested that 35 U.S.C. 111(b) is satisfied as long as the name of one person who made an inventive contribution to the subject matter of the application is given.

Response: The suggestion has not been adopted. Section 111(b) of title 35, United States Code, states that "a provisional application shall be made or authorized to be made by the inventor." This language parallels 35 U.S.C. 111(a). The naming of inventors for obtaining a filing date for a provisional application is the same as for other applications. A provisional application filed with the inventors identified as "Jones et al." will not be accorded a filing date earlier than the date upon which the name of each inventor is supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused. Administrative oversight is an acceptable reason. It should be noted that for a 35 U.S.C. 111(a) application to be entitled to claim the benefit of the filing date of a provisional application, the 35 U.S.C. 111(a) application must have at least one inventor in common with the provisional application.

46. *Comment:* One coenment suggested that a drawing should not be required to obtain a filing date for a provisional application. Whatever is filed should be given a serial number and filing date in order to establish status as a provisional application, regardless of what is in the specification or drawing. If the provisional application omitted drawings, has pages missing, or is otherwise incomplete, then applicant may not be able to rely on the filing date of the provisional application in a subsequently filed 35 U.S.C. 111(a) application. It should not be the job of the Application Branch to review compliance with § 1.81(a).

Response: Section 111(b) of title 35, United States Code, states that a provisional application must include a specification as prescribed by 35 U.S.C. 112, first paragraph and a drawing as prescribed by 35 U.S.C. 113. Drawings are required pursuant to 35 U.S.C. 113 if they are necessary to understand the subject matter sought to be patented. If a provisional application as filed omitted drawings and/or has pages missing, the provisional application is *prima facie* incomplete and no filing date will be granted. Application Branch currently reviews all applications to make sure that no filing date will be granted to an application that is *prima facie* incomplete. Application Branch will perform the same type of review with provisional applications. If a filing date is not granted to a provisional application because it is *prima facie* incomplete, applicant may petition the PTO under § 1.182 to grant a filing date to the provisional application as of the date of deposit of the application papers if it can be shown that the omitted items are not necessary for the understanding of the subject matter.

47. *Comment:* One comment objected to the requirement in § 1.53(b)(2)(i) for a cover sheet identifying the application as a provisional application because it is unnecessarily rigid and contrary to Congress' desire to keep the filing of provisional application as simple as possible.

Response: The requirement that a provisional application be specifically identified on filing as a provisional application is not seen to be burdensome on the applicant and is necessary for the PTO to properly process the papers as a provisional application. All an applicant is required to do in order to comply with the requirement of § 1.53(b)(2)(i) is to include a transmittal sheet identifying the papers being filed as a PROVISIONAL application.

48. *Comment:* Several comments suggested that in § 1.53(b)(2)(ii), as proposed, the phrase "the expiration of 12 months after the filing date of the provisional application" should read "the expiration of 12 months after the filing date of the § 1.53(b)(1) application".

Response: The suggestion has been adopted.

49. *Comment:* One comment objected to the requirement in § 1.53(b)(2)(ii) for a petition to convert an application filed under § 1.53(b)(1) to a provisional application and suggested that any confusion concerning applicant's intention could be handled informally without a petition or petition fee.

Response: The requirement for a petition and fee is intended to ensure that the cost of any PTO reprocessing is borne specifically by the applicant requesting the action.

50. *Comment:* Several comments suggested that the filing fee required in an application filed under 35 U.S.C. 111(a) claiming benefit of the filing date of an earlier 35 U.S.C. 111(a) application which has been converted to a provisional application under proposed § 1.53(b)(2)(ii) be reduced, since the $730/$365 filing fee was paid in the earlier application.

Response: The suggestion has not been adopted. The filing fee required in an application filed under 35 U.S.C. 111(a) is set by statute. The statute does not provide for the suggested reduction in the filing fee.

51. *Comment:* One comment suggested that proposed § 1.53(b)(2)(iii) should apply retroactively to permit applications filed between June 9, 1994, and June 8, 1995, to be converted to provisional applications.

Response: The suggestion has not been adopted. The statute does not permit a provisional application to have a filing date prior to June 8, 1995.

52. *Comment:* One comment suggested that § 1.53(b)(2)(ii) be revised to state that the petition requesting conversion must also be filed before (1) the application becomes involved in interference, or (2) notice by the PTO of intent to publish the application as a statutory invention registration. This suggestion conforms with 35 U.S.C. 111(b)(8).

Response: The suggestion has not been fully adopted. It is not necessary to include interference in § 1.53(b)(2)(ii) because if a 35 U.S.C. 111(a) application becomes involved in an interference proceeding and applicant files a petition requesting conversion of that 35 U.S.C. 111(a) application to a provisional application, the 35 U.S.C. 111(a) will be removed from the

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interference proceeding upon granting the petition to convert. When a subsequent 35 U.S.C. 111(a) application is filed based on the provisional application, the subsequent 35 U.S.C. 111(a) application could be placed in the interference proceeding if necessary. As to the reference to statutory invention registration, § 1.53(b)(2)(ii) is being amended to require the petition and the fee be filed prior to the earlier of the abandonment of the 35 U.S.C. 111(a) application, the payment of the issue fee, the expiration of 12 months after the filing date of the 35 U.S.C. 111(a) application, or the filing of a request for a statutory invention registration under § 1.293.

53. *Comment:* One comment suggested that the procedures for converting a 35 U.S.C. 111(a) application to a provisional application be explained in greater detail in § 1.53(b)(2)(ii) or in the discussion. If a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, and a second 35 U.S.C. 111(a) application is concurrently filed, how should this be done and how should the first sentence in the second 35 U.S.C. 111(a) application be worded. Furthermore, if a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, will it be necessary to file a second 35 U.S.C. 111(a) application on the same day, or else lose the priority claim.

Response: The suggestion has not been adopted. The language in § 1.53(b)(2)(ii) is clear relating to the requirements for converting a 35 U.S.C. 111(a) application to a provisional application. If applicant wishes to convert a 35 U.S.C. 111(a) application to a provisional application, applicant must file a petition requesting the conversion along with the petition fee set forth in § 1.17(q). The petition and the fee must be filed prior to the earlier of the abandonment of the 35 U.S.C. 111(a) application, the payment of the issue fee, the expiration of 12 months after the filing date of the 35 U.S.C. 111(a) application, or the filing of a request for a statutory invention registration under § 1.293. In the example noted in the comment, if a 35 U.S.C. 111(a) application is converted to a provisional application on the last day of the 12-month period, a second 35 U.S.C. 111(a) application must be filed on that same day, otherwise, applicant will lose the priority pursuant to 35 U.S.C. 119(e). An example of how the first sentence of the second 35 U.S.C. 111(a) application would read is, "This application claims the benefit of U.S. Provisional Application No. 60/—, filed—, which was converted from Application No.—."

54. *Comment:* One comment suggested that the PTO consider a rule mandating that any prior U.S. application that would have been eligible for conversion to a provisional application that is abandoned in favor of a continuing application within one year of the earliest priority date asserted be deemed constructively converted to a provisional application.

Response: The suggestion has not been adopted. Conversion of a 35 U.S.C. 111(a) application to a provisional will be permitted only by way of a petition and under the conditions set forth in § 1.53(b)(2)(ii). One reason for this is that the PTO plans to provide sufficient information on the printed patent to determine the end date of the 20-year patent term by identifying provisional applications using a unique series code, i.e., "60". Thus, a 35 U.S.C. 111(a) application converted to a provisional application will need to be reprocessed by the PTO with a new application number. The petition fee is intended to reimburse the PTO for the extra processing necessitated by the conversion.

55. *Comment:* One comment stated that § 1.53(b)(2)(ii) permits the conversion of a 35 U.S.C. 111(a) application to a provisional application. However, it is silent as to whether such a conversion would kill any benefit the 35 U.S.C. 111(a) application had of domestic and/or foreign priority.

Response: Section 111(b)(7) of title 35, United States Code, specifically states that a provisional application shall not be entitled to the right of priority of any other application under 35 U.S.C. 119 or 365(a) or to the benefit of an earlier filing date in the United States under 35 U.S.C. 120, 121, or 365(c). If a 35 U.S.C. 111(a) application is converted to a provisional application, the granting of the conversion will automatically eliminate any claim of priority which could have been made in the 35 U.S.C. 111(a) application.

56. *Comment:* Several comments suggested that it was inconsistent with the purpose of the provisional application to require any compliance with the Sequence Disclosure Rules §§ 1.821-1.823 and 1.825, since the provisional applications are not examined and there is no comparison of the sequences with the prior art.

Response: The Office agrees with the comments that a provisional application need not comply with the requirements of §§ 1.821 through 1.825. Section 1.53(b)(2)(iii) is being amended to indicate that the requirements of §§ 1.821 through 1.825 regarding sequence listings are not mandatory for a provisional application. However, applicants are cautioned that in order for a 35 U.S.C. 111(a) application to obtain the benefit of the filing date of an earlier filed provisional application, the claimed subject matter of the 35 U.S.C. 111(a) application must have been disclosed in the provisional application in a manner provided by 35 U.S.C. 112, first paragraph. Applicants are encouraged to follow the sequence rules to ensure that support for the invention claimed in the 35 U.S.C. 111(a) application can be readily ascertained in the provisional application.

57. *Comment:* One comment suggested that the language in § 1.53(e)(2) that a provisional application will become abandoned *no later than* twelve months after its filing date was misleading and that the words "no later than" should be deleted because it was believed that a provisional application could not be abandoned prior to twelve months after its filing date.

Response: The statute does not state that a provisional application can never be abandoned prior to twelve months after its filing date. In fact, a provisional application may be abandoned as a result of applicant's failure to timely respond to a PTO requirement. For example, if a provisional application which has been accorded a filing date does not include the appropriate filing fee or the cover sheet required by § 1.51(a)(2), applicant will be so notified if a correspondence address has been provided and given a period of time within which to file the fee, cover sheet and to pay the surcharge as set forth in § 1.16(l). Failure to timely respond will result in the abandonment of the application. This may occur prior to twelve months after its filing date. Furthermore, a provisional application may also be expressly abandoned prior to twelve months from its filing date.

58. *Comment:* One comment objected to the deletion of the "retention fee" practice in § 1.53(d) since it permits an applicant in a first application claiming benefits under 35 U.S.C. 119(a)-(d) or 120 to correct inventorship by filing a second application without having to pay the full filing fee in the first application.

Response: Since the comment indicated that there is a benefit to retain the retention fee practice, the proposal to eliminate the practice is withdrawn.

59. *Comment:* One comment stated that the language of §§ 1.53(d)(1) and (d)(2) indicates an intent by the PTO to mail the "Notice Of Missing Parts" to applicant's post office address and argues that the "Notice" should be mailed to the registered practitioner who filed the application on behalf of the applicant.

Response: The language in §§ 1.53(d)(1) and (d)(2) states that the applicant will be notified of the missing part, if a correspondence address is provided. This means that the "Notice" to applicant will be mailed to the correspondence address provided in the application papers. Under current PTO practice, if no specific correspondence address is identified in the application, the address of the registered practitioner who filed the application on behalf of the applicant is used as the correspondence address. If no specific correspondence address or registered practitioner is identified in the application, the post office address of the first named inventor is used as the correspondence address. No change in current PTO practice in this regard is required as a result of § 1.53(d)(2) nor is any change planned.

60. *Comment:* Several comments objected to the proposed deletion of § 1.60. One comment suggested that the deletion of § 1.60 was a major rule change and should have been proposed separate from the proposed rules dealing with the changes in practice required by Public Law 103-465.

Response: In view of the comments received, the proposal to delete § 1.60 is withdrawn. However, the proposal will be considered as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

61. *Comment:* One comment suggested that in view of the deletion of § 1.60, language should be incorporated in § 1.53(a)(1) to state that a copy of the prior application along with a copy of the declaration may be filed to obtain a filing date. Furthermore, full details and guidelines of the procedure should accompany the rule.

Response: The suggestion has not been adopted. The proposal to delete § 1.60 is withdrawn in view of several comments received objecting to the deletion.

62. *Comment:* One comment suggested that the removal of the stale oath practice be codified.

Response: The suggestion has not been adopted. Neither the statute nor the rules require a recent date of execution to appear on the oath or declaration. The PTO practice of objecting to an oath or declaration where the time elapsed between the date of execution and the filing date of the application is more than three months is found in section 602.05 of the MPEP. Therefore, the removal of the stale oath practice will be accomplished by amending the MPEP.

63. *Comment:* One comment questioned whether a copy of an application faxed to an attorney could be filed in the PTO as the application papers.

Response: Yes. While a patent application may not be faxed directly to the PTO, an application faxed to an attorney may be forwarded to the PTO by mail or courier as the application papers provided the papers meet the formal requirements of § 1.52. Effective November 22, 1993, § 1.4 was amended to include a new paragraph (d) to specify that most correspondence filed in the PTO, which requires a person's signature, may be an original, a copy of an original or a copy of a copy. Only correspondence identified in §§ 1.4(e) and (f) require the original to be filed in the PTO. Thus, an oath or declaration required by § 1.63, 1.153, 1.162 or 1.175 may be an original, a copy of an original or a copy of a copy. See 1156 Off. Gaz. Pat. Office 61 (November 16, 1993).

64. *Comment:* One comment suggested that applicant be permitted to use § 1.62 procedure to file the 35 U.S.C. 111(a) application which claims the benefit of a provisional application, at least in those situations where the 35 U.S.C. 111(a) application has been converted to a provisional application which is followed by the filing of a second 35 U.S.C. 111(a) application.

Response: The suggestion has not been adopted. Section 1.62 will not be amended to permit the filing a 35 U.S.C. 111(a) application based on a provisional application because the PTO sees this situation as a trap for applicants. The filing procedures would be made more complicated if an exception is provided to address situations where a 35 U.S.C. 111(a) application is converted to a provisional application and a second 35 U.S.C. 111(a) application is later filed. However, the suggestion will be taken under advisement when greater familiarity with provisional applications is developed.

65. *Comment:* One comment suggested that § 1.62 procedure be replaced with a simple petition procedure to reopen prosecution.

Response: The suggestion is not being adopted. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process.

66. *Comment:* One comment suggested that the language in § 1.62(a) that requires an identification of the "applicant's name of the prior complete application" is confusing and should be clarified.

Response: The suggestion has been adopted. Section 1.62 is being amended to require the identification of the "applicants named in the prior complete application."

67. *Comment:* One comment suggested that § 1.62 be amended to state that the refiling procedures set forth in § 1.62 may be used after the issue fee is paid when a petition under § 1.313(b)(5) is granted. This practice is permitted pursuant to the notice published in 1138 Off. Gaz. Pat. Office 40 (May 19, 1992).

Response: The suggestion has been adopted.

68. *Comment:* One comment suggested that § 1.62 be amended to clarify whether applicant need to re-list, in the § 1.62 application, all the references cited by the examiner and applicant in the parent application in order to get those references printed on the eventual patent.

Response: The suggestion has not been adopted. Section 609 of the MPEP (Sixth Edition, Jan. 1995) has been amended to clarify that in a § 1.62 application, references submitted and cited in the parent application need not be resubmitted. These references will be printed on the patent. However, in any continuing application filed under § 1.53(b)(1) or 1.60, a list of the references must be resubmitted if applicant wishes to have the references printed in the eventual patent.

69. *Comment:* One comment suggested that § 1.67 should go into more detail on when supplemental oaths are required in § 1.53 filings of continuation and divisional applications.

Response: The suggestion has not been adopted because it is seen to be unnecessary and no substantive change was proposed to § 1.67 in the Notice of Proposed Rulemaking.

70. *Comment:* One comment suggested that "not but" in § 1.67(b) should read "but not".

Response: The suggestion has been adopted.

71. *Comment:* Several comments suggested that a rule be provided to state that an application for patent is permitted to claim the benefit of the filing date of more than one prior provisional application so long as the applicant complies with all statutory provisions.

Response: The suggestion has been adopted. Section 1.78(a)(3) is being amended to indicate that applicants are permitted to separately claim the benefit of the filing date of more than one prior provisional application in a later filed 35 U.S.C. 111(a) application provided all statutory requirements of 35 U.S.C. 119(e) are complied with. It is noted that current practice permits an application to claim the benefits of the filing date of more than one prior foreign application under 35 U.S.C. 119(a)-(d) and of more than one prior copending U.S. application under 35 U.S.C. 120, without an explicit statement to that effect in the rules. Since the final rules are being amended to specifically permit applications filed under 35 U.S.C. 111(a) to claim the benefits of the filing date of more than one prior copending provisional application, corresponding changes are also being made to §§ 1.55 and 1.78(a)(1) relating to claims for the benefits available under 35 U.S.C. 119(a)-(d) and 120 to be consistent with § 1.78(a)(3).

72. *Comment:* Several comments requested that the PTO specify language to use in the first sentence of an application when priority is based on more than one provisional application.

Response: Section 1.78(a)(4) requires that "any application claiming the benefit of a prior filed copending provisional application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior provisional application, identifying it as a provisional application, and including the provisional application number." Where a 35 U.S.C. 111(a) application claims the benefit of more than one provisional application, a suitable reference would read, "This application claims the benefit of U.S. Provisional Application No. 60/—, filed— and U.S. Provisional Application No. 60/—, filed —." In addition, for an application which is claiming the benefit under 35 U.S.C. 120 of a prior application, which in turn claims the benefit of a provisional application under 35 U.S.C. 119(e), a suitable reference would read, "This application is a continuation of U.S. application No. 08/—, filed —, now abandoned, which claims the benefit of U.S. Provisional Application No. 60/—, filed —."

73. *Comment:* One comment suggested that the rules address the effect on patent term where an applicant in a continuing application deletes the reference to the prior filed application before the patent issues.

Response: An applicant has full control over claims to the benefit of an earlier filing date under 35 U.S.C. 120, 121 or 365(c). The 20-year patent term will be based upon the filing date of the earliest U.S. application that the applicant makes reference to under 35 U.S.C. 120, 121 and 365(c). Whether an applicant is entitled to the benefit of the filing date of an earlier application is something that an applicant should examine before the patent is issued. The PTO is not, unless it comes up as an issue in the examination process, going to determine whether any of the claims are entitled to the earlier filing date. Applicant however, should determine whether the claims are entitled to or require the benefit of the earlier filing date. If not, the applicant should consider canceling the reference to the earlier filed application to avoid having the 20-year patent term measured from that earlier filing date. An amendment adding or deleting a reference to an earlier filed application presented prior to a final action will be entered, however, the claims may be subject to possible intervening prior art.

74. *Comment:* One comment stated that in view of the fact that a provisional application is not entitled to claim the benefit of a prior filed copending national or international application as stated in § 1.53(b)(2)(iii), the phrase "other than a provisional application" in § 1.78(a)(2) is unnecessary.

Response: Section 1.78(a)(2) is being amended to state that "any nonprovisional application claiming the benefit of a prior copending nonprovisional or international application must

contain...." Section 1.78(a)(2) addresses a 35 U.S.C. 111(a) application which claims the benefit of a prior copending 35 U.S.C. 111(a) application or international application.

75. *Comment:* Several comments objected to the content requirements for drawings filed in a provisional application as originally set forth in proposed § 1.83(a)(2). One comment suggested that no rule was necessary to set forth the required content of drawings in a provisional application.

Response: In view of the comments received, the proposed amendment to § 1.83 is withdrawn. Under 35 U.S.C. 113, first sentence, applicant must furnish drawings in a provisional application "where necessary for the understanding of the subject matter sought to be patented." This requirement is also stated in existing § 1.81(a). Therefore, no further elaboration on the content of the drawings in a provisional application is believed necessary in the rules.

76. *Comment:* One comment suggested that the rules specify that formal drawings are not required in a provisional application.

Response: The suggestion has not been adopted. However, the PTO intends to examine provisional applications for requirements of form only to the extent that is necessary to permit normal storage and microfilming of the application papers. Formal drawings are usually not required for those purposes.

77. *Comment:* Several comments suggested that § 1.97(d) be amended to require the PTO to consider any information disclosure statement submitted after a final rejection or notice of allowance if an appropriate fee is paid.

Response: The suggestion has not been adopted because no substantive change to this rule was proposed in the Notice of Proposed Rulemaking. The existing rules are designed to encourage prompt submission of information to the PTO. To permit applicant to merely pay a fee to have any information disclosure statement submitted after a final rejection or Notice of Allowance would be contrary to the effort to encourage prompt submissions.

78. *Comment:* One comment suggested that § 1.97 be changed so that an Office action which uses a newly cited reference as a ground for rejection under 35 U.S.C. 102 or 103 cannot be made final.

Response: The suggestion has not been adopted because no substantive change to this rule was proposed in the Notice of Proposed Rulemaking.

79. *Comment:* One comment suggested that the words "which are not examined" in § 1.101 as proposed are unnecessary and could create a negative implication that some provisional applications are examined.

Response: The suggestion has not been adopted. By statute, provisional applications are not subject to 35 U.S.C. 131, i.e., the Commissioner is not permitted to examine a provisional application for patentability.

80. *Comment:* Several comments stated that it is unfair to require small entities to pay the full $730.00 fee set forth in proposed § 1.129. It is suggested that the fee be changed to $365.00 or less.

Response: Pursuant to Public Law 103-465, the Commissioner has the authority to establish appropriate fees for the further limited reexamination of applications and for the examination of more than one independent and distinct invention in an application. As a result of additional review, it was concluded that these fees may be reduced by 50% for small entities. Sections 1.17(r) and (s) are being amended to indicate that the fees are reduced by 50% for small entities, that is, $365.00 for small entities.

81. *Comment:* Several comments suggested that the transitional procedure set forth in § 1.129(a) as proposed is equivalent to filing one application, i.e., it provides for an extra examination and reexamination after the original final rejection, and, therefore, the requirement for two $730.00 fees, which is equivalent to two filing fees, is unwarranted. Another comment suggested that if the proposed $730.00 fee is adopted, the examiner should be instructed to treat the after-final amendment as any other initial filing, i.e., a new application, not as an amendment submitted after a non-final office action.

Response: Under existing PTO practice, it would not be proper to make final a first Office action in a continuing or substitute application where the continuing or substitute application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The identical procedure will apply to examination of a submission considered as a result of the procedure under § 1.129(a). Thus, under § 1.129(a), if the first submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Likewise, if the second submission after final rejection was initially denied entry in the application because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised, then the next action in the application will not be made final. Thus, the fee required by § 1.129(a) has been set at the amount required for filing an application because the procedure provided by the rule is equivalent to the filing of two applications. No new matter can be entered by payment of the fee set forth in § 1.17(r).

82. *Comment:* Several comments suggested that the fees required for filing a provisional application and those fees required by §§ 1.129(a) and (b) for the transitional procedures should not be greater than the average cost of processing such matters by the PTO. Two comments stated that the fee required by § 1.129(a) is excessive relative to PTO costs.

Response: The fee required for filing a provisional application is set by Public Law 103-465 and the PTO has no discretion with respect to the amount of that particular fee. As to the fee required by § 1.129(a), the procedures relating to the first submission provided by § 1.129(a) is equivalent to the filing of a file wrapper continuation application under § 1.62, and therefore, the fee required with the first submission is appropriately set at the same amount as a filing fee, which is $730.00. The $730.00 fee is subject to a 50% reduction for small entities. The second submission is equivalent to the filing of a second file wrapper continuation application and the fee for the second submission is appropriately set at the same amount as a filing fee. As to the fee required by § 1.129(b), the procedures set forth in § 1.129(b) permit applicants to retain multiple inventions in a single application rather than having to file multiple divisional applications. The fee for each independent and distinct invention in excess of one is appropriately set at the same amount as the filing fee for a divisional application, which is $730.00. The $730.00 fee is subject to a 50% reduction for small entities.

83. *Comment:* One comment suggested that the time period for the payment of the $730.00 fee for the transitional after-final practice be extended if applicant files a petition seeking reversal of the examiner's refusal to enter the amendment after final without fee, until one month after an unfavorable decision on the petition.

Response: If an earlier filed petition seeking reversal of the examiner's refusal to enter the amendment after final is granted by the Director finding that the final rejection was premature, but the petition had not been decided by the time the § 1.129(a) fee was due, applicant must submit the § 1.129(a) fee so as to toll the time period for response to the final rejection. Otherwise, the application would be abandoned. Upon granting of such a petition by the Director, the § 1.129(a) fee paid will be refundable to applicant on request. Applications that fall under § 1.129(a) are under final rejection and there is a time period running against the applicant. Applicant must toll that time period by paying the transitional after-final fee set forth in § 1.129(a) and any necessary extension of time fees and Notice of Appeal fee. Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) may be submitted before the filing of the Appeal Brief and prior to abandonment of the application.

84. *Comment:* One comment suggested that if it is decided that the transitional after-final practice is made permanent, the PTO should seek legislative authorization to provide reduced fees for small entities.

Response: If it is decided that the transitional after-final practice be made permanent, the PTO will propose legislation to accomplish this change.

85. *Comment:* Several comments suggested that §§ 1.129(a) and (b) should apply to all applications regardless of whether they were filed before or after June 8, 1995. Several comments suggested that the practices set forth in §§ 1.129(a) and (b) should be made permanent.

Several comments suggested that an applicant should be permitted to have a submission entered and considered after any final rejection upon payment of a fee as set forth in § 1.17(r), not just the first and second final rejections.

Response: The suggestions have not been adopted at this time. However, the PTO is undertaking a project to reengineer the entire patent process. These suggestions will be taken under advisement in that project.

86. *Comment:* One comment suggested that the PTO make an effort to treat applications in which a submission under § 1.129(a) has been filed on an expedited basis.

Response: Once the submission is filed and the fee set forth in § 1.17(r) is paid the finality of the last PTO action is withdrawn. The filing of the submission and the fee under § 1.129(a) is equivalent to the filing of a continuing application and will be treated in the same fashion and under the same turnaround time frame as a continuing application.

87. *Comment:* One comment suggested that PTO practice be changed so that a first Office action in a continuing application cannot be made final.

One comment suggested that PTO practice regarding second action final be relaxed.

Response: The suggestions have not been adopted at this time. However, the PTO is undertaking a project to reengineer the entire patent process. These suggestions will be taken under advisement in that project.

88. *Comment:* One comment stated that in proposed § 1.129, there is no express provision for the finality of the previous rejection to be withdrawn if applicant complies with the proposed rule. It is suggested that the proposed rule state that the finality of the previous action would be withdrawn if applicant complied with the rule when making a first or second submission after a final action.

Response: The suggestion has been adopted.

89. *Comment:* One comment requested that the PTO clarify whether § 1.129(a) required the first final rejection to be specifically withdrawn and a different final (i.e., one containing a new ground of rejection) rejection made before applicant is entitled to make a second submission.

Response: The final rule provides that the finality of the previous final office action is automatically withdrawn upon the timely filing of the first § 1.129(a) submission and the fee set forth in § 1.17(r). If the first PTO action following the payment of the § 1.17(r) fee is a non-final office action, a further response from applicant will be entered and considered as a matter of right without payment of the fee set forth in § 1.17(r). If the next office action or any subsequent action is made final, the finality of that office action will be automatically withdrawn upon the timely filing of a second § 1.129(a) submission and the fee set forth in § 1.17(r).

90. *Comment:* One comment suggested that the PTO not permit the first PTO action following the payment of the § 1.17(r) fee to be made final under any circumstances.

Response: The suggestion has not been adopted. The first PTO action following the payment of the § 1.17(r) fee may be made final under the same conditions that a first office action may be made final in a continuing application (see section 706.07(b) of the MPEP). However, it would not be proper to make final a first Office action in a continuing or substitute application where the continuing or substitute application contains material which was presented in the earlier application after final rejection or closing of prosecution but was denied entry because (1) new issues were raised that required further consideration and/or search, or (2) the issue of new matter was raised. The procedure set forth in section 706.07(b) of the MPEP will apply to examination of a submission considered as a result of the procedure under § 1.129(a).

91. *Comment:* Several comments suggested that the filing of the first submission under § 1.129(a) within the statutory period for response set in final rejection should toll the running of the six-month statutory period.

Response: The filing of a submission, e.g., an information disclosure statement or an amendment, after a final rejection without payment of the fee set forth in § 1.17(r) will not toll the period for response set in the final rejection. However, § 1.129(a) is being amended to provide in the rule that the finality of the previous Office action is automatically withdrawn upon the filing of the submission and the payment of the fee set forth in § 1.17(r). Thus, the filing of a submission and the payment of the fee set forth in § 1.17(r) and any extension of time fees and Notice of Appeal fee, if they are necessary to avoid abandonment of the application, will automatically toll the period for response set in the final rejection. It must be kept in mind that the provisions of § 1.129 apply only to an application, other than for reissue or a design patent, that has been pending for at least two years as of June 8, 1995, taking into account any reference made in such application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c).

92. *Comment:* One comment asked (1) whether it would be necessary to file a Notice of Appeal and appeal fee with or after the first submission and fee if the examiner acts on the first submission and before the end of the six months from the date of the final rejection issues (a) a notice of allowance, (b) a non-final action, or (c) a second final rejection; (2) would the Notice of Appeal and fee be due only at the end of the six months from the date of the final rejection regardless of whether the examiner has acted on the submission by then; and (3) if the Notice of Appeal and fee have once been paid following a first final rejection, would a second notice and fee need to be paid if a second final rejection were issued and applicant desired to file a second submission under § 1.129(a).

Another comment suggested that the appeal fee set forth in § 1.17(e) should not be required where the Notice of Appeal is filed with a § 1.129(a) submission and the fee set forth in § 1.17(r).

Response: As to questions (1) and (2) and the second comment, if the first submission and the proper fee set forth in § 1.17(r) are timely filed in response to the final rejection, the finality of the previous rejection will be automatically withdrawn and applicant need not file the Notice of Appeal or the appeal fee. For example, if the first submission and the proper fee set forth in § 1.17(r) were filed on the last day of the six-month period for response to the final rejection, applicant must also file a petition for three months extension of time with the appropriate fee in order to avoid abandonment of the application. In such case, applicant need not file the Notice of Appeal or the appeal fee if the proper fee set forth in § 1.17(r) was timely paid. However, under the same fact situation, if applicant failed to submit the proper fee set forth in § 1.17(r), the finality of the previous rejection would not be withdrawn and the time period for response would still be running against applicant. In such case, a Notice of Appeal and appeal fee must also accompany the papers filed at the six-month period in order to avoid abandonment of the application. The proper fee set forth in § 1.17(r) must be filed prior to the filing of the Appeal Brief and prior to the abandonment of the application.

As to question (3), if the Notice of Appeal and fee have once been paid following a first final rejection and applicant timely files a first submission and the proper fee set forth in § 1.17(r), the finality of the previous final rejection will be withdrawn and the appeal fee paid could be applied against any subsequent appeal. If the examiner issues a non-final rejection in response to applicant's first submission, a further response from applicant will be entered and considered as a matter of right. If any subsequent Office action is made final, applicant may file a second submission along with the proper fee pursuant to § 1.129(a). If the second submission and the proper fee set forth in § 1.17(r) are timely filed in response to the subsequent final rejection, the finality of the previous final rejection will be withdrawn. Any submission filed after a final rejection made in the application subsequent to the fee under § 1.129(a) having been paid twice will be treated as set forth in § 1.116. Applicant may, upon payment of the appeal fee, appeal a final rejection within the time allowed for response pursuant to § 1.191.

93. *Comment:* One comment questioned whether the "first submission" under § 1.129(a) has to be the first response filed after a final rejection or could it include subsequent responses to the same final rejection.

Response: The "first submission" under § 1.129(a) would include all responses filed prior to and with the payment of the fee required by § 1.129(a) provided the submission and fee are filed prior to the filing of the Appeal Brief and prior to abandonment of the application.

94. *Comment:* One comment suggested that § 1.129(a) be changed to permit the procedure to be available up until the filing of an Appeal Brief since it is not uncommon to file an amendment after a Notice of Appeal is filed but before the

filing of an Appeal Brief.

Response: The suggestion has been adopted.

Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) must be submitted before the filing of the Appeal Brief and prior to abandonment of the application.

95. *Comment:* One comment suggested that the transitional after-final practice be available at any time after final, including after the resolution of an appeal unfavorable to applicant in whole or in part.

Response: The suggestion has not been adopted. Section 1.129(a) is being amended to indicate that the submission and the fee set forth in § 1.17(r) must be submitted before the filing of the Appeal Brief and prior to abandonment of the application. The suggestion to extend the period to after the resolution of an appeal unfavorable to applicant in whole or in part has not been adopted because the suggestion would further unduly extend prosecution of the application.

96. *Comment:* One comment stated that if an examiner must withdraw the finality of the rejection as a result of the transitional provision, the examiner should be credited with two counts in order to be compensated for the additional work.

Response: The examiner credit system is not part of this rulemaking package. However, as part of the Public Law 103-465 implementation plan, some accommodation will be made for the extra work performed.

97. *Comment:* One comment stated that regarding the transitional after-final practice, the fee should not be required if the only reason is to have the PTO consider recently obtained art.

Response: Under current practice, if applicant submits prior art after final rejection but before the payment of issue fee, the art will be considered if applicant makes the required certification and submits a petition with the required petition fee of $130.00 (see section 609 of the MPEP). If applicant can make the certification, applicant would not have to rely on the transitional after-final procedure to have the prior art considered. In the event that applicant cannot make the certification, then the procedure under § 1.129(a) is available if applicant wishes the PTO to consider the prior art without refiling the application.

98. *Comment:* One comment suggested that the PTO modify existing restriction practice to make it more difficult for examiners to require restriction, for example, by requiring every restriction requirement to show two-way distinctness and separate status in the art established by means other than reference to the PTO's classification system.

Response: The suggestion has not been adopted. However, the PTO is undertaking a project to reengineer the entire patent process. This suggestion will be taken under advisement in that project.

99. *Comment:* One comment suggested that the pendency periods required by §§ 1.129(a) and (b) should be 18 months rather than 2-year and 3-year, respectively.

Response: The pendency periods set forth in the rule which establish eligibility for the transitional procedures are set forth in Public Law 103-465.

100. *Comment:* One comment suggested that § 1.129(a) be amended to permit prosecution to be reopened after a Notice of Allowance or final rejection upon the filing of a form requesting that prosecution be reopened and payment of the necessary fee.

Response: The procedures set forth in § 1.129(a) are not applicable to amendments filed after a Notice of Allowance. Amendments filed after the mailing of a Notice of Allowance are governed by § 1.312. The procedures set forth in § 1.129(a) are applicable to amendments filed after a final rejection. If applicant submits an amendment after final and the examiner notifies the applicant in writing that the amendment is not entered, § 1.129(a) permits applicant to submit a letter prior to abandonment of the application and prior to the filing of the Appeal Brief, requesting entry of the prior filed amendment along with the payment of the appropriate fee set forth in § 1.17(r). The letter requesting entry of the prior filed amendment would be equivalent to "a form" as suggested in the comment.

101. *Comment:* One comment suggested that the PTO liberalize its current practice under § 1.116 to make it easier for amendments or evidence to be entered and considered after a final rejection.

Response: The suggestion has not been adopted since no change was proposed to § 1.116 in the Notice of Proposed Rulemaking. However, the suggestion will be taken under advisement as part of a comprehensive effort being conducted by the PTO to reengineer the entire patent process. It should be noted that any change to liberalize the current practice under § 1.116 would necessitate increasing fees.

102. *Comment:* Several comments suggested that the transitional restriction provision be modified to state that no restriction requirement shall be made or maintained in any application pending for three years on the effective date of the legislation. The comment stated that if restriction requirements made prior to April 8, 1995, are permitted to be maintained then applicants will be forced to file divisional applications resulting in the automatic loss of term after June 8, 1995. A heavy penalty will be placed on the chemical, pharmaceutical and biotechnology industries, who have less than 4 months to search through the ancestors of all pending applications and to identify all restriction requirements and to file divisional applications before June 8, 1995. The comment further suggested that the current restriction practice be changed in view of the implementation of the 20-year term.

Response: The suggestion has not been adopted. The two-month date set forth in § 1.129(b)(1)(i) is from the Statement of Administrative Action, which is part of Public Law 103-465. Under section 102 of Public Law 103-465, "the statement of administrative action approved by the Congress shall be regarded as an authoritative expression by the United States concerning the interpretation and application of the Uruguay Round Agreements and this Act in any judicial proceeding in which a question arises concerning such interpretation or application." The Commissioner does not have any authority to establish rules which are inconsistent with the Act. It is noted that in cases where a restriction requirement was made prior to April 8, 1995, applicant will have sufficient time to file divisional applications prior to June 8, 1995, so as to retain the benefit of the 17-year patent term for those divisional applications.

The PTO is currently reviewing the restriction practice in view of the implementation of the 20-year patent term. It is noted that a change in restriction practice without changes to other fees would have a negative impact on funding needed to operate the PTO.

103. *Comment:* Several comments suggested that proposed exceptions (1) and (2) in § 1.129(b) ignore the mandatory language of section 532(2)(B) of Public Law 103-465 and should be deleted.

Response: The suggestion has not been adopted. The exceptions referred to are contained in the Statement of Administrative Action, which is part of Public Law 103-465. Under section 102 of Public Law 103-465, "the statement of administrative action approved by the Congress shall be regarded as an authoritative expression by the United States concerning the interpretation and application of the Uruguay Round Agreements and this Act in any judicial proceeding in which a question arises concerning such interpretation or application."

104. *Comment:* One comment asked whether "restriction" under § 1.129(b) apply to election of species under § 1.146.

Response: "Restriction" under § 1.129(b) applies to both requirements under § 1.142 and elections under § 1.146.

105. *Comment:* Several comments requested that clarification be made as to what constitutes "actions by the applicant" in § 1.129(b)(1) and specifically, whether a request for extension of time under § 1.136(a) constitutes such "actions" by the applicant.

Response: Examples of what constitute "actions by the applicant" in § 1.129(b)(1) are: (1) applicant abandons the application and continues to refile the application such that no Office action can be issued in the application, and (2) applicant requests suspension of prosecution under § 1.103(a) such that no Office action can be issued in the application. Extension of time under § 1.136(a) would not constitute such "actions by the applicant" under § 1.129(b)(1).

106. *Comment:* One comment suggested that the one-month period set forth in § 1.129(b) is insufficient to give an applicant time to file a petition under § 1.144 from a restriction requirement. Several comments suggested that § 1.129(b) be amended to permit applicant to challenge the restriction requirement by way of a petition before being required to pay the fees set forth in § 1.17(s).

Response: Section 1.129(b)(2) is being amended in the final rule package to indicate that applicant will be given "a time period" to (1) make an election, if no election has been previously made, and pay the fee set forth in § 1.17(s), (2) confirm an earlier election and pay the fee set forth in § 1.17(s), or (3) file a petition under § 1.129(b)(2) traversing the restriction requirement. If applicant chooses not to pay the fee set forth in § 1.17(s), applicant may file a petition under § 1.129(b)(2) requesting immediate review by the Group Director of the restriction requirement. No petition fee is required. A petition under § 1.129(b)(2) rather than under § 1.144 would be more appropriate under the circumstances since a petition under § 1.144 requires the examiner to make the restriction final before the petition can be considered.

107. *Comment:* One comment suggested that if applicant elects not to pay the fee set forth in § 1.17(s), applicant should be allowed to elect the invention to be examined.

Response: The suggestion has been adopted. Section 1.129(b) is being amended to indicate that if applicant chooses not to pay the fees for the additional inventions, applicant must elect the invention to be examined and the claims directed to the non-elected inventions for which no fee has been paid will be withdrawn from consideration.

108. *Comment:* One comment suggested that the PTO amend the rules to permit all, or at least several, inventions to be examined in a single application upon payment of an appropriate fee.

Response: The suggestion has not been adopted at this time. However, the PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken in advisement in this project.

109. *Comment:* One comment suggested that PTO follow the wording of 35 U.S.C. 121 and only require restriction where an application claims two or more independent *and* distinct inventions rather than two or more independent *or* distinct inventions.

Response: In making restriction requirements, the PTO has always followed the wording of 35 U.S.C. 121 to require restriction if two or more independent *and* distinct inventions are claimed in an application rather than independent or distinct as suggested by the comment. The term "independent" includes species and related inventions such as combination/subcombination and process and product. Restriction is proper if these independent inventions are patentably distinct (see section 802.01 of the MPEP).

110. *Comment:* One comment suggested that the standard for determining whether an application contains independent and distinct inventions should only be the "unity of invention" standard used for PCT applications.

Response: The suggestion has not been adopted. The current restriction practice for 35 U.S.C. 111(a) applications is governed by 35 U.S.C. 121 and §§ 1.141, 1.142 and 1.146. The PCT "unity of invention" standard only applies to PCT applications and applications filed under 35 U.S.C. 371. The PTO is currently reviewing the restriction practice in view of the implementation of the 20-year patent term. It is noted that a change in restriction practice without changes to other fees would have a negative impact on funding needed to operate the PTO.

111. *Comment:* One comment suggested that the PTO apply the PCT unity of invention standard as interpreted by the EPO and that § 1.475(b) be amended to permit a broad range of claims in a single application.

Response: The PTO is currently undertaking a project to reengineer the entire patent process. The suggestion will be taken under advisement in this project.

112. *Comment:* One comment suggested that the PTO examiner should not be permitted to issue a restriction requirement or an election of species requirement if the ISA and the IPEA have found that an application complies with the unity of invention requirement.

Another comment suggested that the PTO consider allowing applicants to retain all claims in a single application when the claims are related, e.g., method and apparatus claims.

Another comment suggested that all species be searched before the first Office action regardless of whether one species is found to be unpatentable.

Another comment suggested that election of species requirements be prohibited.

Response: The suggestions have not been adopted. These issues were not addressed in the Notice of Proposed Rulemaking. However, the PTO is currently undertaking a project to reengineer the entire patent process. The suggestions will be taken under advisement in that project.

113. *Comment:* One comment suggested that decisions on whether to issue a restriction requirement be made within two-three months of the application filing date, and, if the requirement is traversed, the examiner should determine within four-five months of the filing date whether to maintain the requirement. Decisions on petitions to withdraw a restriction requirement should be decided within one month.

Response: The suggestion has not been adopted. Current practice dictates that restriction requirements be made at the earliest appropriate time in the pendency of a given application, e.g., in the first Office action. It would be difficult to issue a restriction requirement within two-three months of the application filing date as suggested since a large number of applications are filed with missing parts and applicants are given a time period to submit the missing parts. Furthermore, applications must be processed by the Application Branch and must be screened by Licensing and Review for national security. Petitions to withdraw a restriction requirement should be acted on by the Group Director expeditiously.

114. *Comment:* One comment argued that the phrases, "so as to be pending for a period of no longer than 12 months" and "under no circumstances will the provisional application be pending after 12 months", in § 1.139 were repetitious and suggested that one or both of the phrases be deleted.

Response: The suggestion has not been adopted. The statements are included for emphasis.

115. *Comment:* One comment suggested that § 1.139 clearly state that if the revival petition is filed later than 12 months after filing of the provisional application, then the revival is for the sole purpose of providing copendency for a 35 U.S.C. 111(a) application filed during that 12-month period.

Response: The suggestion has not been adopted. The proposed language is not necessary.

116. *Comment:* One comment stated that 35 U.S.C. 154(b) as contained in Public Law 103-465 does not give the Commissioner any authority to decide the period of extension. Therefore, proposed § 1.701 is without statutory basis.

Response: 35 U.S.C. 6(a) gives the Commissioner authority to establish regulations not inconsistent with law.

Section 1.701 is consistent with 35 U.S.C. 154(b) and furthermore, the Commissioner has the authority under 35 U.S.C. 154(b)(3)(C) to establish regulations to address the standards for determining due diligence.

117. *Comment:* One comment questioned whether patent term extension under 35 U.S.C. 154(b) is available for patents issuing: (1) before June 8, 1995, with a 17-year patent term or a 17/20 year patent term; (2) on or after June 8, 1995, on applications filed before June 8, 1995, with a 17-year patent term or a 17/20 year patent term.

Response: None of the patents set forth in the examples are eligible for patent term extension. Under the terms of the statute, patent term extension is only available for patents issued on applications filed on or after June 8, 1995.

118. *Comment:* Several comments questioned whether a patent issued on a continuing application is entitled to a patent term extension under 35 U.S.C. 154(b) due to interference, secrecy order, or appellate review delays occurring in the examination of the parent application.

Response: If the delay in the parent application contributed to a delay in the issuance of a patent in the continuing application, the patent granted on the continuing application may be eligible for an extension under 35 U.S.C. 154(b).

119. *Comment:* One comment suggested that the patent term be extended for a period of time equal to the time necessary to revive an application improperly abandoned due to PTO error. Another comment suggested that patent term extension be available for other PTO delays.

Response: The suggestions have not been adopted. Section 154(b) of title 35, United States Code, only permits patent term extension for delays due to interferences, secrecy orders, and/or successful appeals.

120. *Comment:* One comment suggested that the period of an extension granted under § 1.701 be printed on the face of the patent.

Response: The PTO will publish on the face of the patent any

patent term extension that is granted pursuant to § 1.701.

121. *Comment:* One comment suggested that the word "interference" be inserted before the word "proceedings" in § 1.701(a)(1).

Response: The suggestion has been adopted.

122. *Comment:* One comment stated that the last sentence of § 1.701(b) is confusing because it suggests that patent term extension will be available in cases of terminal disclaimer and that the extension begins on the terminal disclaimer date rather than the original expiration date. This statement is contrary to 35 U.S.C. 154(b)(2) which does not permit any patent term extension for appellate delay if the patent is subject to a terminal disclaimer.

Response: In order to reduce confusion, the last sentence of § 1.701(b) is being amended to state that the extension will run from the expiration date of the patent. The reference to "terminal disclaimer" is being deleted.

123. *Comment:* Two comments stated that if an application involved in an interference proceeding contains uninvolved claims, those uninvolved claims should not be entitled to extension of patent term under proposed § 1.701 because applicant could cancel those uninvolved claims from the application and refile those claims in a continuation application. It is suggested that if an applicant leaves conclusively uninvolved claims (where no § 1.633(c)(4) motion is filed) in the application in interference, applicant does not get the benefit of the extension *for any claim.*

Response: The suggestion has not been adopted. The statute, 35 U.S.C. 154(b), grants patent term extension to a patent if the issuance of the patent was delayed due to interference proceeding under 35 U.S.C. 135(a). The statute does not exclude applications containing uninvolved claims. The Commissioner does not have the authority to establish regulations which are inconsistent with the law. Therefore, an application involved in an interference which contains uninvolved claims will be entitled to patent term extension if the issuance of the patent was delayed due to interference proceeding under 35 U.S.C. 135(a).

124. *Comment:* One comment asked whether applicant is entitled to patent term extension regardless of whether an interference involving applicant's application is ultimately declared.

One comment asked if the PTO ends the suspension without declaring an interference, and continued prosecution results in filing of a continuation or divisional application, are such subsequent cases entitled to the extension.

Response: An application will not be suspended unless it is decided that an interference can be declared involving that application. If prosecution of applicant's application is suspended due to an interference not involving applicant's application and an interference involving applicant's application is later declared, applicant will be entitled to patent term extension under § 1.701(c)(1)(ii) for the suspension period and under § 1.701(c)(1)(i) for the interference period. However, if prosecution of applicant's application is suspended due to an interference not involving applicant's application and if the PTO ends the suspension of the application without declaring an interference involving applicant's application, that application will be entitled to patent term extension under § 1.701(c)(1)(ii). If prosecution results in filing of a continuing application and if the delay in the parent application contributed to a delay in the issuance of a patent on the continuing application, the patent granted on the continuing application may be eligible for an extension under 35 U.S.C. 154(b).

125. *Comment:* One comment stated that delays in the issuance of a patent can exceed the five-year limit provided for in proposed § 1.701(b). Where the delay was not the fault of the applicant, why should there be this maximum?

Another comment stated that in a biotechnology application, if suspension of the application results in a declared interference, the period of delay calculated under § 1.701(c)(1)(i) will likely consume most of the five-year maximum extension. This renders the value of any time period measured under § 1.701(c)(1)(ii) negligible, thus diminishing the rights of applicant due to the unregulated suspension powers of the PTO.

Response: The five-year limit for patent term extension set forth in § 1.701(b) is required by statute, 35 U.S.C. 154(b).

126. *Comment:* One comment suggested that § 1.701(c)(1)(i) be amended to state that an application added after an interference is declared is entitled to an extension measured only from the date of redeclaration.

Response: The suggestion has not been adopted. The language in § 1.701(c)(1)(i) is clear that for an application that is added to an interference, that application is entitled to an extension measured from the date of redeclaration of the interference.

127. *Comment:* One comment stated that § 1.701(c)(1)(ii) does not address the case where a suspended application is added to the interference without the suspension being lifted.

Response: Section 1.701(c)(1)(ii) is being amended to reference the endpoint for the suspension period to the date of termination of the suspension. Where prosecution of an application is suspended due to interference proceedings not involving the application, the suspension is made pursuant to § 1.103(b). When that application is added to an interference, the suspension pursuant to § 1.103(b) will be automatically lifted. The application is entitled to patent term extension for the period of suspension pursuant to § 1.701(c)(1)(ii) and for the period of interference pursuant to § 1.701(c)(1)(i). Under § 1.701(c)(1)(ii), the period of suspension begins on the date the application is suspended and ends on the date the suspension under § 1.103(b) is terminated, which in this case would be the same date as the date of redeclaration of the interference.

128. *Comment:* One comment suggested that the phrase ", if any," in § 1.701(c)(1)(i) and (ii) is unnecessary.

Response: The suggestion has not been adopted. However, § 1.701(c)(1)(i) is being amended for clarity by deleting the phrase "if any" after the first occurrence of "interference" and by inserting the same phrase after the phrase "the number of days."

129. *Comment:* Several comments suggested that the phrase "was declared or redeclared" in § 1.701(c)(1)(i) be changed to —was first declared—.

Response: The suggestion has not been adopted. The language of the rule reads "with respect to each interference in which the application was involved, the number of days in the period beginning on the date the interference was declared or redeclared to involve the application in the interference...." An interference may be declared as A vs. B and later redeclared as A vs. B vs. C. Under the rule, the period of extension would be counted, with respect to applications A and B, from the date the interference was declared to involve the applications A and B. With respect to application C, the period of extension would be counted from the date the interference was redeclared to involve the application C. No ambiguity is seen in the language as originally proposed.

130. *Comment:* One comment suggested that the use of the phrase "appellate review" in reference to an action under 35 U.S.C. 145 or 146 is incorrect, since an action under 35 U.S.C. 145 or 146 is not considered as an "appellate review" and suggests that § 1.701(a)(3) be amended so that the introductory phrase reads "Appellate review by the Board of Patent Appeals and Interferences or review by a Federal court under 35 U.S.C. 141 or 145,...."

Response: The suggestion has not been adopted. The use of the phrase "appellate review" in reference to an action under 35 U.S.C. 145 or 146 is technically incorrect. However, Public Law 103-465 provides for extension of patent term for "delay due to appellate review by the Board of Patent Appeals and Interferences or by a Federal court". The introductory phrase referred to in the comment uses the exact language found in the statute.

131. *Comment:* One comment suggested that § 1.701(a) be amended to specify whether extensions for appellate delays are available for reissue applications.

Response: The suggestion has not been adopted. Under 35 U.S.C. 251, the term of a reissue patent is "for the unexpired part of the term of the original patent." Therefore, patent term extension for appellate delays is not available for reissue applications.

132. *Comment:* One comment suggested that § 1.701(d) be deleted.

Response: The suggestion has not been adopted. Section 1.701(d) sets forth the language found in the statute, 35 U.S.C. 154(b)(3) and further provides a standard for determining due diligence.

133. *Comment:* Several comments suggested that the lack of due diligence set forth in § 1.701(d)(2) be limited to the acts which occurred during the appellate period (after the filing of a Notice of Appeal) and not during prosecution.

Response: The suggestion has been adopted. Section 1.701(d) is being amended accordingly.

134. *Comment:* One comment suggested that the rules be made clear that a suspension under § 1.103 does not constitute a lack of due diligence under § 1.701(d)(2).

Response: The suggestion has not been adopted. A request for suspension pursuant to § 1.103(a) during the appellate review period will be considered to be prima facie evidence of lack of due diligence.

135. *Comment:* Several comments stated that the rules permit extensions of time and the filing of informal applications. These acts should not constitute lack of due diligence since the proposed rule defined the standard for determining due diligence is whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person. One comment suggested that the Office adopt a gross negligence standard.

Response: The examples of acts that may constitute lack of due diligence set forth in the Notice of Proposed Rulemaking (extensions of time, filing of nonresponsive submissions, and filing of informal applications) are being withdrawn. The suggestion regarding the adoption of a gross negligence standard has not been adopted. As set forth in § 1.701(d)(2), the standard for determining due diligence is whether applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during the appellate review period.

136. *Comment:* One comment stated that the PTO list in the rule all circumstances in which an applicant will be considered not to have acted with due diligence.

Another comment suggested that objective criteria for "diligence" be set forth in § 1.701(d)(2).

Response: The suggestion has not been adopted. Whether an action by the applicant constitutes lack of due diligence will be determined by the facts and circumstances of each case. Since lack of due diligence is determined on a case-by-case basis, it would not be possible to list all circumstances in the rule. Examples of acts which will constitute prima facie evidence of lack of due diligence are: (1) abandonment of the application during appellate review; and (2) suspension of action under § 1.103(a) during appellate review.

137. *Comment:* One comment suggested that guidance be provided in the comments to the Notice of Final Rules identifying in what circumstance is a patent issued "pursuant to an appellate decision reversing an adverse determination of patentability."

Several comments questioned whether the reversal of all rejections on one of several appealed claims would entitle applicant to an extension under § 1.701(a)(3). Two comments suggested that the rule be redrafted to allow appropriate extension of term where the Board or a court reverses at least "in part."

Response: Extension of patent term under § 1.701(a)(3) is applicable if all the rejections of any one claim are ultimately reversed. The rule is clear and no clarification is needed.

138. *Comment:* One comment stated that § 1.701 does not address the situation where applicant appeals with both allowed and rejected claims. In such case, patent term extension should be available for any claims that were allowed prior to appellate review, if the allowed claims were in the same application, whether or not the decision of the examiner on the rejected claims is ultimately reversed. Applicant should not have to refile the allowed claims and rejected claims in separate cases in order to take advantage of the patent term extension.

Response: If applicant chooses to keep the allowed claims with the rejected claims in the application on appeal, patent term extension pursuant to 35 U.S.C. 154(b)(2) is only available if a patent was issued pursuant to a decision reversing an adverse determination of patentability and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review. If the appellate review is not successful, applicant will not be entitled to patent term extension.

139. *Comment:* One comment questioned whether the phrase "if the patent is not subject to a terminal disclaimer" in § 1.701(a)(3) is intended to be limited to those applications in which a terminal disclaimer has actually been filed or encompass those applications in which a double patenting rejection has been made and a terminal disclaimer suggested by an examiner.

Response: The calculation of any applicable extension under § 1.701 will be made prior to the mailing of the Notice of Allowance and Issue Fee Due. At that time, any double patenting rejection would have been resolved and a terminal disclaimer would have been filed if one was required.

140. *Comment:* One comment stated that § 1.701(d)(1) is inconsistent with 35 U.S.C. 154(b)(2) and (b)(3), because the period of extension for appellate review would be calculated under § 1.701(d)(1) by first subtracting the period of appellate review occurring within three years of the filing date before the five-year limit is imposed. It is suggested that § 1.701 be modified to be consistent with 35 U.S.C. 154(b)(2) which requires the five-year limit to be imposed before the subtraction for appellate review occurring within three years of the filing date.

Response: The suggestion has not been adopted. Section 1.701 is not inconsistent with 35 U.S.C. 154(b)(2) and (b)(3). The period of extension referred to in 35 U.S.C. 154(b)(2) is defined in 35 U.S.C. 154(b)(3). Therefore, one must determine the period of extension in 35 U.S.C. 154(b)(3)(A), then reduce that period by the time determined in 35 U.S.C. 154(b)(3)(B) and (b)(3)(C). Then, according to 35 U.S.C. 154(b)(2), the resulting time period may not be more than five years.

141. *Comment:* One comment suggested that the Commissioner identify a senior person who is charged with approving all reductions in extension of patent term rather than leaving the decision to the examiner or the SPE.

One comment questioned who will make the calculation of the period of patent term extension under § 1.701 and whether that calculation can be challenged and by whom.

Response: It is contemplated that the period of patent term extension calculated and any reduction in the extension of patent term will not be made by an examiner. It is noted that the period of patent term extension will be identified in the Notice of Allowance and Issue Fee Due and if applicant disagrees with the period, applicant may request further review by way of a petition under § 1.181. If an error is noted after the patent issues, patentee or any third party may seek correction of the period of patent term extension granted by filing a request for a Certificate of Correction pursuant to § 1.322.

142. *Comment:* One comment questioned whether a challenge to the period of patent term extension calculated by the PTO under § 1.701 would be required to be made within a fixed period.

Response: No. However, the longer applicant delays filing a petition under § 1.181 challenging the period of extension calculated by the PTO, the less likely any error will be corrected before the patent is issued with the error printed on the patent. If the patent issues with an incorrect period of extension, applicant should file a request for a Certificate of Correction pursuant to § 1.322 instead of a petition under § 1.181.

143. *Comment:* One comment suggested that § 1.701(d)(2) be amended to require PTO to notify applicant in writing of any intent to reduce the term extension for lack of due diligence, stating the specific basis, and provide applicant with a reasonable opportunity to respond.

Response: The suggestion has not been adopted. The period of patent term extension will be identified in the Notice of Allowance and Issue Fee Due and if applicant disagrees with the period, applicant may request further review by way of a petition under § 1.181.

144. *Comment:* One comment suggested that a cover sheet for use in recording assignments be included in the final rules package as an addendum.

Response: The suggestion has not been adopted. A sample cover sheet for use in recording assignments was published as Appendix B in the Federal Register on July 6, 1992, at 57 FR 29634 and in the Official Gazette on July 28, 1992, at 1140 Off. Gaz. Pat. Office 63 and may be obtained from Assignment Branch.

Other Considerations

This final rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. This final rule has been determined not to be significant for the purposes of E.O. 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief

Counsel for Advocacy, Small Business Administration, that these final rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to provide a procedure for domestic applicants to quickly and inexpensively file a provisional application. The filing date of the provisional application will not be used to measure the term of a patent granted on an application which claims the earlier filing date of the provisional application.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in E.O. 12612.

These final rules contain collections of information subject to the requirements of the Paperwork Reduction Act (Act). The provisional application has been approved by the Office of Management and Budget under control numbers 0651-0031 and 0651-0032. The cover sheet is approved under OMB control number 0651-0037. The cover sheet is necessary to expedite the processing of a provisional application and improve quality. Public reporting burden for the collection of information on the cover sheet is estimated to average 12 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to the Office of Assistance Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0031, 0651-0032, and 0651-0037).

List of Subjects

37 CFR Part 1
Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 3
Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 3 are amended as follows:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.1 is amended by adding new paragraph (i) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

* * * * *

(i) The filing of all provisional applications and any communications relating thereto should be additionally marked "Box Provisional Patent Application."

* * * * *

3. Section 1.9 is amended by revising paragraph (a) to read as follows:

§ 1.9 Definitions.

(a)(1) A national application as used in this chapter means a U.S. application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

(2) A provisional application as used in this chapter means a U.S. national application for patent filed in the Office under 35 U.S.C. 111(b).

(3) A nonprovisional application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

* * * * *

4. Section 1.12 is amended by revising paragraph (c) to read as follows:

§ 1.12 Assignment records open to public inspection.

* * * * *

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in secrecy under § 1.14, or any information with respect thereto, must

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

* * * * *

5. Section 1.14 is amended by revising paragraph (e) to read as follows:

§ 1.14 Patent applications preserved in secrecy.

* * * * *

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in secrecy pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

* * * * *

6. Section 1.16 is amended by revising paragraphs (a)-(g) and by adding new paragraphs (k) and (l) to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) $365.00
By other than a small entity 730.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) 38.00
By other than a small entity 76.00

(c) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes.):

By a small entity (§ 1.9(f)) 11.00
By other than a small entity 22.00

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) 120.00
By other than a small entity 240.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application, except provisional applications:

By a small entity (§ 1.9(f)) 65.00
By other than a small entity 130.00

(f) Basic fee for filing each design application:

By a small entity (§ 1.9(f)) 150.00
By other than a small entity 300.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) 245.00
By other than a small entity 490.00

* * * * *

(k) Basic fee for filing each provisional application:

By a small entity (§ 1.9(f)) 75.00
By other than a small entity 150.00

(l) Surcharge for filing the basic filing fee or cover sheet (§ 1.51(a)(2)(i)) on a date later than the filing date of the provisional application:

By a small entity (§ 1.9(f)) 25.00
By other than a small entity 50.00

* * * * *

7. Section 1.17 is amended by revising paragraphs (h) and (i), and by adding new paragraphs (q), (r) and (s) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(h) For filing a petition to the Commissioner under a section listed below which refers to this paragraph 130.00

§ 1.47 - for filing by other than all the inventors or a person not the inventor
§ 1.48 - for correction of inventorship, except in provisional applications
§ 1.84 - for accepting color drawings or photographs
§ 1.182 - for decision on questions not specifically provided for
§ 1.183 - to suspend the rules
§ 1.295 - for review of refusal to publish a statutory invention registration
§ 1.377 - for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent
§ 1.378(e) - for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent
§ 1.644(e) - for petition in an interference
§ 1.644(f) - for request for reconsideration of a decision on petition in an interference
§ 1.666(c) - for late filing of interference settlement-agreement
§§ 5.12, 5.13 and 5.14 - for expedited handling of a foreign filing license
§ 5.15 - for changing the scope of a license
§ 5.25 - for retroactive license

(i) For filing a petition to the Commissioner under a section listed below which refers to this paragraph 130.00

§ 1.12 - for access to an assignment record
§ 1.14 - for access to an application
§ 1.53 - to accord a filing date, except in provisional applications
§ 1.55 - for entry of late priority papers
§ 1.60 - to accord a filing date
§ 1.62 - to accord a filing date
§ 1.97(d)- to consider an information disclosure statement
§ 1.102 - to make application special
§ 1.103 - to suspend action in application
§ 1.177 - for divisional reissues to issue separately
§ 1.312 - for amendment after payment of issue fee
§ 1.313 - to withdraw an application from issue
§ 1.314 - to defer issuance of a patent
§ 1.666(b) - for access to interference settlement agreement
§ 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee

* * * * *

(q) For filing a petition to the Commissioner under a section listed below which refers to this paragraph 50.00

§ 1.48 - for correction of inventorship in a provisional application
§ 1.53 - to accord a provisional application a filing date or to convert an application filed under § 1.53(b)(1) to a provisional application

(r) For entry of a submission after final rejection under § 1.129(a):

By a small entity (§ 1.9(f)) 365.00
By other than a small entity 730.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) 365.00
By other than a small entity 730.00

8. Section 1.21 is amended by revising paragraph (l) to read as follows:

§ 1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

* * * * *

(l) For processing and retaining any application abandoned pursuant to § 1.53(d)(1) unless the required basic filing fee has been paid $130.00

* * * * *

9. Section 1.28 is amended by revising paragraph (a) to read as follows:

§ 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§ 1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to § 1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under § 1.27 and a request for a refund of

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the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under § 1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application may rely on a verified statement filed in the prior application if the nonprovisional application includes a reference to the verified statement in the prior application or includes a copy of the verified statement in the prior application and status as a small entity is still proper and desired. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to § 1.27 of this part unless the Office is notified of a change in status.

* * * * *

10. Section 1.45 paragraph (c) is revised to read as follows:

§ 1.45 Joint inventors.

* * * * *

(c) If multiple inventors are named in a nonprovisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter of at least one claim of the application and the application will be considered to be a joint application under 35 U.S.C. 116. If multiple inventors are named in a provisional application, each named inventor must have made a contribution, individually or jointly, to the subject matter disclosed in the provisional application and the provisional application will be considered to be a joint application under 35 U.S.C. 116.

11. Section 1.48 is revised to read as follows:

§ 1.48 Correction of inventorship.

(a) If the correct inventor or inventors are not named in a nonprovisional application through error without any deceptive intention on the part of the actual inventor or inventors, the application may be amended to name only the actual inventor or inventors. Such amendment must be diligently made and must be accompanied by:

(1) a petition including a statement of facts verified by the original named inventor or inventors establishing when the error without deceptive intention was discovered and how it occurred;

(2) an oath or declaration by each actual inventor or inventors as required by § 1.63;

(3) the fee set forth in § 1.17(h); and

(4) the written consent of any assignee. When the application is involved in an interference, the petition shall comply with the requirements of this section and shall be accompanied by a motion under § 1.634.

(b) If the correct inventors are named in the nonprovisional application when filed and the prosecution of the application results in the amendment or cancellation of claims so that less than all of the originally named inventors are the actual inventors of the invention being claimed in the application, an amendment shall be filed deleting the names of the person or persons who are not inventors of the invention being claimed. The amendment must be diligently made and shall be accompanied by:

(1) A petition including a statement identifying each named inventor who is being deleted and acknowledging that the inventor's invention is no longer being claimed in the application; and

(2) The fee set forth in § 1.17(h).

(c) If a nonprovisional application discloses unclaimed subject matter by an inventor or inventors not named in the application, the application may be amended pursuant to paragraph (a) of this section to add claims to the subject matter and name the correct inventors for the application.

(d) If the name or names of an inventor or inventors were omitted in a provisional application through error without any deceptive intention on the part of the actual inventor or inventors, the provisional application may be amended to add the name or names of the actual inventor or inventors. Such amendment must be accompanied by:

(1) a petition including a statement that the error occurred without deceptive intention on the part of the actual inventor or inventors, which statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office; and

(2) the fee set forth in § 1.17(q).

(e) If a person or persons were named as an inventor or inventors in a provisional application through error without any deceptive intention, an amendment may be filed in the provisional application deleting the name or names of the person or persons who were erroneously named. Such amendment must be accompanied by:

(1) a petition including a statement of facts verified by the person or persons whose name or names are being deleted establishing that the error occurred without deceptive intention;

(2) the fee set forth in § 1.17(q); and

(3) the written consent of any assignee.

12. Section 1.51 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.51 General requisites of an application.

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks.

(1) A complete application filed under § 1.53(b)(1) comprises:

(i) A specification, including a claim or claims, see §§ 1.71 to 1.77;

(ii) An oath or declaration, see §§ 1.63 and 1.68;

(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and

(iv) The prescribed filing fee, see § 1.16.

(2) A complete provisional application filed under § 1.53(b)(2) comprises:

(i) A cover sheet identifying:

(A) The application as a provisional application,

(B) The name or names of the inventor or inventors, (see § 1.41),

(C) The residence of each named inventor,

(D) The title of the invention,

(E) The name and registration number of the attorney or agent (if applicable),

(F) The docket number used by the person filing the application to identify the application (if applicable),

(G) The correspondence address, and

(I) The name of the U.S. Government agency and Government contract number (if the invention was made by an agency of the U.S. Government or under a contract with an agency of the U.S. Government);

(ii) A specification as prescribed by 35 U.S.C. 112, first paragraph, see § 1.71;

(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and

(iv) The prescribed filing fee, see § 1.16.

(b) Applicants are encouraged to file an information disclosure statement in nonprovisional applications. See §§ 1.97 and 1.98. No information disclosure statement may be filed in a provisional application.

* * * * *

13. Section 1.53 paragraphs (a)-(e) are revised to read as follows:

§ 1.53 Application number, filing date, and completion of application.

(a) Any application for a patent received in the Patent and Trademark Office will be assigned an application number for identification purposes.

(b)(1) The filing date of an application for patent filed under this section, except for a provisional application, is the date on which: a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No new matter may be introduced into an application after its filing date (§ 1.118). If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i) is filed which sets forth the reasons the delay in supplying the names should be excused. A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) may be filed under this section, § 1.60 or § 1.62. A continuation-in-part application may be filed under this section or § 1.62.

(2) The filing date of a provisional application is the date on which: a specification as prescribed by 35 U.S.C. 112, first paragraph; and any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No amendment, other than to make the provisional application comply with all applicable regulations, may be made to the provisional application after the filing date of the provisional application. If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the provisional application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(q) is filed which sets forth the reasons the delay in supplying the names should be excused.

(i) A provisional application must also include a cover sheet identifying the application as a provisional application. Otherwise, the application will be treated as an application filed under § 1.53(b)(1).

(ii) An application for patent filed under § 1.53(b)(1) may be treated as a provisional application and be accorded the original filing date provided that a petition requesting the conversion, with the fee set forth in § 1.17(q), is filed prior to the earlier of the abandonment of the § 1.53(b)(1) application, the payment of the issue fee, the expiration of 12 months after the filing date of the § 1.53(b)(1) application, or the filing of a request for a statutory invention registration under § 1.293. The grant of any such petition will not entitle applicant to a refund of the fees which were properly paid in the application filed under § 1.53(b)(1).

(iii) A provisional application shall not be entitled to the right of priority under § 1.55 or 35 U.S.C. 119 or 365(a) or to the benefit of an earlier filing date under § 1.78 or 35 U.S.C. 120, 121 or 365(c) of any other application. No claim for priority under § 1.78(a)(3) may be made in a design application based on a provisional application. No request under § 1.293 for a statutory invention registration may be filed in a provisional application. The requirements of §§ 1.821-1.825 regarding application disclosures containing nucleotide and/or amino acid sequences are not mandatory for provisional applications.

(c) If any application is filed without the specification, drawing or name, or names, of the actual inventor or inventors required by paragraph (b)(1) or (b)(2) of this section, applicant will be so notified and given a time period within which to submit the omitted specification, drawing, name, or names, of the actual inventor, or inventors, in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n). Any request for review of a refusal to accord an application a filing date must be by way of a petition accompanied by the fee set forth in § 1.17(i), if the application was filed under § 1.53(b)(1), or by the fee set forth in § 1.17(q), if the application was filed under § 1.53(b)(2).

(d)(1) If an application which has been accorded a filing date pursuant to paragraph (b)(1) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration and to pay the surcharge as set forth in § 1.16(e) in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application.

(2) If a provisional application which has been accorded a filing date pursuant to paragraph (b)(2) of this section does not include the appropriate filing fee or the cover sheet required by § 1.51(a)(2), applicant will be so notified if a correspondence address has been provided and given a period of time within which to file the fee, cover sheet and to pay the surcharge as set forth in § 1.16(l) in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which the required basic filing fee has not been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, cover sheet and to pay the surcharge as set forth in § 1.16(l) in order to prevent abandonment of the application.

(e)(1) An application for a patent filed under paragraph (b)(1) of this section will not be placed upon the files for examination until all its required parts, complying with the rules relating thereto, are received, except that certain minor informalities may be waived subject to subsequent correction whenever required.

(2) A provisional application for a patent filed under paragraph (b)(2) of this section will not be placed upon the files for examination and will become abandoned no later than twelve months after its filing date pursuant to 35 U.S.C. 111(b)(1).

* * * * *

14. Section 1.55 is revised to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant in a nonprovisional application may claim the benefit of the filing date of one or more prior foreign applications under the conditions specified in 35 U.S.C. 119(a)-(d) and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other cases, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy filed is not in the English language, a translation

need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

(b) An applicant in a nonprovisional application may under certain circumstances claim priority on the basis of one or more applications for an inventor's certificate in a country granting both inventor's certificates and patents. To claim the right of priority on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119(d), the applicant when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration. The affidavit or declaration must include a specific statement that, upon an investigation, he or she is satisfied that to the best of his or her knowledge, the applicant, when filing the application for the inventor's certificate, had the option to file an application for either a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

15. Section 1.59 is revised to read as follows:

§ 1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to § 1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§ 1.16) or, if the application was filed under § 1.53(b)(1), the processing and retention fee (§ 1.21(l)) has been paid. See § 1.618 for return of unauthorized and improper papers in interferences.

16. Section 1.60 is amended by revising paragraph (b) to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior nonprovisional application.

* * * * *

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C.120 or 121 and § 1.78(a)) if:

(1) the prior application was a nonprovisional application and a complete application as set forth in § 1.51(a)(1);

(2) applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (with claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application;

(3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application; and

(4) the application is filed before the patenting, or abandonment of, or termination of proceedings on the prior application.

The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior complete application. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. Except as provided in paragraph (d) of this section, if a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i) is filed which satisfactorily explains the delay in filing these items.

* * * * *

17. Section 1.62 is amended by revising paragraphs (a) and (e) to read as follows:

§ 1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior nonprovisional application which is complete as defined by § 1.51(a)(1), and which is to be abandoned, may be filed under this section before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application, or after payment of the issue fee if a petition under § 1.313(b)(5) is granted in the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the application number and the names of the inventors named in the prior complete application. If the continuation, continuation-in-part, or divisional application is filed by less than all the inventors named in the prior application a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation, continuation-in-part, or divisional application.

* * * * *

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.

* * * * *

18. Section 1.63 is amended by revising paragraph (a) to read as follows:

§ 1.63 Oath or declaration.

(a) An oath or declaration filed under § 1.51(a)(1)(ii) as a part of a nonprovisional application must:

(1) Be executed in accordance with either § 1.66 or § 1.68;

(2) Identify the specification to which it is directed;

(3) Identify each inventor and the residence and country of cituzenship of each inventor; and

(4) State whether the inventor is a sole or joint inventor of the invention claimed.

* * * * *

19. Section 1.67 is amended by revising paragraph (b) to read as follows:

§ 1.67 Supplemental oath or declaration.

* * * * *

(b) A supplemental oath or declaration meeting the requirements of § 1.63 must be filed when a claim is presented for matter originally shown or described but not substantially embraced in the statement of invention or claims originally presented or when an oath or declaration submitted in accordance with § 1.53(d)(1) after the filing of the specification and any required drawings specifically and improperly refers to an amendment which includes new matter. No new matter may be introduced into a nonprovisional application after its filing date even if a supplemental oath or declaration is filed. In proper cases, the oath or declaration here required may be made on information and belief by an applicant other than inventor.

* * * * *

20. Section 1.78 is amended by revising paragraphs (a)(1) and (a)(2) and by adding new paragraphs (a)(3) and (a)(4) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a)(1) A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior application must be:

(i) complete as set forth in § 1.51(a)(1); or

(ii) entitled to a filing date as set forth in § 1.53(b)(1), § 1.60 or § 1.62 and include the basic filing fee set forth in § 1.16; or

(iii) entitled to a filing date as set forth in § 1.53(b)(1) and have paid therein the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d)(1).

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

(3) A nonprovisional application other than for a design patent may claim an invention disclosed in one or more prior filed copending provisional applications. Since a provisional application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday. In order for a nonprovisional application to claim the benefit of one or more prior filed copending provisional applications, each prior provisional application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior provisional application must be:

(i) complete as set forth in § 1.51(a)(2); or

(ii) entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee set forth in § 1.16(k).

(4) Any nonprovisional application claiming the benefit of one or more prior filed copending provisional applications must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior provisional application, identifying it as a provisional application, and including the provisional application number (consisting of series code and serial number).

* * * * *

21. Section 1.83 is amended by revising paragraphs (a) and (c) to read as follows:

§ 1.83 Content of drawing.

(a) The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box).

* * * * *

(c) Where the drawings in a nonprovisional application do not comply with the requirements of paragraphs (a) and (b) of this section, the examiner shall require such additional illustration within a time period of not less than two months from the date of the sending of a notice thereof. Such corrections are subject to the requirements of § 1.81(d).

22. Section 1.97 is amended by revising paragraph (d) to read as follows:

§ 1.97 Filing of information disclosure statement.

* * * * *

(d) An information disclosure statement shall be considered by the Office if filed after the mailing date of either a final action under § 1.113 or a notice of allowance under § 1.311, whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(1) A certification as specified in paragraph (e) of this section;

(2) A petition requesting consideration of the information disclosure statement; and

(3) The petition fee set forth in § 1.17(i).

* * * * *

23. Section 1.101 is amended by revising paragraph (a) to read as follows:

§ 1.101 Order of examination.

(a) Nonprovisional applications filed in the Patent and Trademark Office and accepted as complete applications are assigned for examination to the respective examining groups having the classes of inventions to which the applications relate. Nonprovisional applications shall be taken up for examination by the examiner to whom they have been assigned in the order in which they have been filed except for those applications in which examination has been advanced pursuant to § 1.102. See § 1.496 for order of examination of international applications in the national stage.

* * * * *

24. Section 1.102 is amended by revising paragraph (d) to read as follows:

§ 1.102 Advancement of examination.

* * * * *

(d) A petition to make an application special on grounds other than those referred to in paragraph (c) of this section must be accompanied by the petition fee set forth in § 1.17(i).

25. Section 1.103 is amended by revising paragraph (a) to read as follows:

§ 1.103 Suspension of action.

(a) Suspension of action by the Office will be granted for good and sufficient cause and for a reasonable time specified upon petition by the applicant and, if such cause is not the fault of the Office, the payment of the fee set forth in § 1.17(i).

Action will not be suspended when a response by the applicant to an Office action is required.

* * * * *

26. A new, undesignated center heading and new section 1.129 are added to Subpart B - National Processing Provisions to read as follows:

Transitional Provisions

§ 1.129 Transitional procedures for limited examination after final rejection and restriction practice.

(a) An applicant in an application, other than for reissue or a design patent, that has been pending for at least two years as of June 8, 1995, taking into account any reference made in such application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c), is entitled to have a first submission entered and considered on the merits after final rejection under the following circumstances: The Office will consider such a submission, if the first submission and the fee set forth in § 1.17(r) are filed prior to the filing of an appeal brief and prior to abandonment of the application. The finality of the final rejection is automatically withdrawn upon the timely filing of the submission and payment of the fee set forth in § 1.17(r). If a subsequent final rejection is made in the application, applicant is entitled to have a second submission entered and considered on the merits after the subsequent final rejection under the following circumstances: The Office will consider such a submission, if the second submission and a second fee set forth in § 1.17(r) are filed prior to the filing of an appeal brief and prior to abandonment of the application. The finality of the subsequent final rejection is automatically withdrawn upon the timely filing of the submission and payment of the second fee set forth in § 1.17(r). Any submission filed after a final rejection made in an application subsequent to the fee set forth in § 1.17(r) having been twice paid will be treated as set forth in § 1.116. A submission as used in this paragraph includes, but is not limited to, an information disclosure statement, an amendment to the written description, claims or drawings and a new substantive argument or new evidence in support of patentability.

(b)(1) In an application, other than for reissue or a design patent, that has been pending for at least three years as of June 8, 1995, taking into account any reference made in the application to any earlier filed application under 35 U.S.C. 120, 121 and 365(c), no requirement for restriction or for the filing of divisional applications shall be made or maintained in the application after June 8, 1995, except where:

(i) the requirement was first made in the application or any earlier filed application under 35 U.S.C. 120, 121 and 365(c) prior to April 8, 1995;

(ii) the examiner has not made a requirement for restriction in the present or parent application prior to April 8, 1995, due to actions by the applicant; or

(iii) the required fee for examination of each additional invention was not paid.

(2) If the application contains more than one independent and distinct invention and a requirement for restriction or for the filing of divisional applications cannot be made or maintained pursuant to this paragraph, applicant will be so notified and given a time period to:

(i) elect the invention or inventions to be searched and examined, if no election has been made prior to the notice, and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects;

(ii) confirm an election made prior to the notice and pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in addition to the one invention which applicant previously elected; or

(iii) file a petition under this section traversing the requirement. If the required petition is filed in a timely manner, the original time period for electing and paying the fee set forth in § 1.17(s) will be deferred and any decision on the petition affirming or modifying the requirement will set a new time period to elect the invention or inventions to be searched and examined and to pay the fee set forth in § 1.17(s) for each independent and distinct invention claimed in the application in excess of one which applicant elects.

(3) The additional inventions for which the required fee has not been paid will be withdrawn from consideration under § 1.142(b). An applicant who desires examination of an invention so withdrawn from consideration can file a divisional application under 35 U.S.C. 121.

(c) The provisions of this section shall not be applicable to any application filed after June 8, 1995.

27. Section 1.137 is amended by revising paragraph (c) to read as follows:

§ 1.137 Revival of abandoned application.

* * * * *

(c) In all applications filed before June 8, 1995, and in all design applications filed on or after June 8, 1995, any petition pursuant to paragraph (a) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

* * * * *

28. Section 1.139 is added to read as follows:

§ 1.139 Revival of provisional application.

(a) A provisional application which has been accorded a filing date and abandoned for failure to timely respond to an Office requirement may be revived so as to be pending for a period of no longer than twelve months from its filing date if it is shown to the satisfaction of the Commissioner that the delay was unavoidable. Under no circumstances will the provisional application be pending after twelve months from its filing date. A petition to revive an abandoned provisional application must be promptly filed after the applicant is notified of, or otherwise becomes aware of, the abandonment, and must be accompanied by:

(1) the required response unless it has been previously filed;

(2) the petition fee as set forth in § 1.17(l); and

(3) a showing that the delay was unavoidable. The showing must be a verified showing if made by a person not registered to practice before the Patent and Trademark Office.

(b) A provisional application which has been accorded a filing date and abandoned for failure to timely respond to an Office requirement may be revived so as to be pending for a period of no longer than twelve months from its filing date if the delay was unintentional. Under no circumstances will the provisional application be pending after twelve months from its filing date. A petition to revive an abandoned provisional application must be:

(1) accompanied by the required response unless it has been previously filed;

(2) accompanied by the petition fee as set forth in § 1.17(m);

(3) accompanied by a statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional; and

(4) filed either:

(i) within one year of the date on which the provisional application became abandoned; or

(ii) within three months of the date of the first decision on a petition to revive under paragraph (a) of this section which was filed within one year of the date on which the provisional application became abandoned.

(c) Any request for reconsideration or review of a decision refusing to revive a provisional application upon petition filed pursuant to paragraphs (a) or (b) of this section, to be considered timely, must be filed within two months of the decision refusing to revive or within such time as set in the decision.

(d) The time periods set forth in this section cannot be extended, except that the three-month period set forth in paragraph (b)(4)(ii) of this section and the time period set forth in paragraph (c) of this section may be extended under the provisions of § 1.136.

29. Section 1.177 is revised to read as follows:

§ 1.177 Reissue in divisions.

The Commissioner may, in his or her discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for each division. Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts, subject to the provisions of §§ 1.83 and 1.84. On filing divisional reissue applications, they shall be referred to the Commissioner. Unless otherwise ordered by the Commissioner upon petition and payment of the fee set forth in § 1.17(i), all the divisions of a reissue will issue simultaneously; if there is any controversy as to one division, the others will be withheld from issue until the controversy is ended, unless the Commissioner orders otherwise.

30. Section 1.312 is amended by revising paragraph (b) to read as follows:

§ 1.312 Amendments after allowance.

* * * * *

(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in § 1.17(i) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

31. Section 1.313 is amended by revising paragraph (a) to read as follows:

§ 1.313 Withdrawal from issue.

(a) Applications may be withdrawn from issue for further action at the initiative of the Office or upon petition by the applicant. Any such petition by the applicant must include a showing of good and sufficient reasons why withdrawal of the application is necessary and, if the reason for the withdrawal is not the fault of the Office, must be accompanied by the fee set forth in § 1.17(i). If the application is withdrawn from issue, a new notice of allowance will be sent if the application is again allowed. Any amendment accompanying a petition to withdraw an application from issue must comply with the requirements of § 1.312.

* * * * *

32. Section 1.314 is revised to read as follows:

§ 1.314 Issuance of patent.

If payment of the issue fee is timely made, the patent will issue in regular course unless the application is withdrawn from issue (§ 1.313), or issuance of the patent is deferred. Any petition by the applicant requesting a deferral of the issuance of a patent must be accompanied by the fee set forth in § 1.17(i) and must include a showing of good and sufficient reasons why it is necessary to defer issuance of the patent.

33. Section 1.316 is amended by revising paragraph (d) to read as follows:

§ 1.316 Application abandoned for failure to pay issue fee.

* * * * *

(d) In all applications filed before June 8, 1995, any petition pursuant to paragraph (b) of this section not filed within six months of the date of abandonment of the application, must be accompanied by a terminal disclaimer with fee under § 1.321 dedicating to the public a terminal part of the term of any patent granted thereon equivalent to the period of abandonment of the application. The terminal disclaimer must also apply to any patent granted on any continuing application entitled under 35 U.S.C. 120 to the benefit of the filing date of the application for which revival is sought.

* * * * *

34. Section 1.317 is amended by removing and reserving paragraph (d):

§ 1.317 Lapsed patents; delayed payment of balance of issue fee.

* * * * *

(d) [Reserved]

* * * * *

35. Section 1.666 is amended by revising paragraph (b) to read as follows:

§ 1.666 Filing of interference settlement agreements.

* * * * *

(b) If any party filing the agreement or understanding under paragraph (a) of this section so requests, the copy will be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person upon petition accompanied by the fee set forth in § 1.17(i) and on a showing of good cause.

* * * * *

36. Section 1.701 is added to Subpart F to read as follows:

§ 1.701 Extension of patent term due to prosecution delay.

(a) A patent, other than for designs, issued on an application filed on or after June 8, 1995, is entitled to extension of the patent term if the issuance of the patent was delayed due to:

(1) interference proceedings under 35 U.S.C. 135(a); and/or

(2) the application being placed under a secrecy order under 35 U.S.C. 181; and/or

(3) appellate review by the Board of Patent Appeals and Interferences or by a Federal court under 35 U.S.C. 141 or 145, if the patent was issued pursuant to a decision reversing an adverse determination of patentability and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.

(b) The term of a patent entitled to extension under paragraph (a) of this section shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) and (d) of this section, to the extent that these periods are not overlapping, up to a maximum of five years. The extension will run from the expiration date of the patent.

(c)(1) The period of delay under paragraph (a)(1) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) with respect to each interference in which the application was involved, the number of days, if any, in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application; and

(ii) the number of days, if any, in the period beginning on the date prosecution in the application was suspended by the Patent and Trademark Office due to interference proceedings under 35 U.S.C. 135(a) not involving the application and ending on the date of the termination of the suspension.

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(2) The period of delay under paragraph (a)(2) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) the number of days, if any, the application was maintained in a sealed condition under 35 U.S.C. 181;

(ii) the number of days, if any, in the period beginning on the date of mailing of an examiner's answer under § 1.193 in the application under secrecy order and ending on the date the secrecy order and any renewal thereof was removed;

(iii) the number of days, if any, in the period beginning on the date applicant was notified that an interference would be declared but for the secrecy order and ending on the date the secrecy order and any renewal thereof was removed; and

(iv) the number of days, if any, in the period beginning on the date of notification under § 5.3(c) and ending on the date of mailing of the notice of allowance under § 1.311.

(3) The period of delay under paragraph (a)(3) of this section is the sum of the number of days, if any, in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.

(d) The period of delay set forth in paragraph (c)(3) shall be reduced by:

(1) any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination; and

(2) any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. In determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review.

Part 3— Assignment, Recording, and Rights of Assignee

37. The authority citation for 37 CFR Part 3 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

38. Section 3.21 is revised to read as follows:

§ 3.21 Identification of patents and patent applications.

An assignment relating to a patent must identify the patent by the patent number. An assignment relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456). An assignment relating to an international patent application which designates the United States of America must identify the international application by the international number (e.g., PCT/US90/01234). If an assignment of a patent application filed under § 1.53(b)(1) or § 1.62 is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended. If an assignment of a provisional application is executed before the provisional application is filed, it must identify the provisional application by name of each inventor and title of the invention so that there can be no mistake as to the provisional application intended.

39. Section 3.81 is amended by revising paragraph (b) to read as follows:

§ 3.81 Issue of patent to assignee.

* * * * *

(b) If the assignment is submitted for recording after the date of payment of the issue fee, but prior to issuance of the patent, the assignee may petition that the patent issue to the assignee. Any such petition must be accompanied by the fee set forth in § 1.17(i) of this Chapter.

April 17, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1174 OG 15]

(95)

Revised Sample Cover Sheet For Filing a Provisional Application For a Patent

A sample cover sheet for filing a provisional application for a patent was published as Appendix A to the Notice of Final Rulemaking to implement 20-year patent term and provisional applications in the Federal Register on April 25, 1995 (60 FR 20195) and in the Official Gazette on May 2, 1995 (1174 OG 15). The sample cover sheet for filing a provisional application did not specifically indicate that the provisional application is an application for a patent as provided in 35 U.S.C. 111(b)(1). In order to allay any uncertainty that a provisional application filed under 37 CFR 1.53(b)(2) is indeed an application for a patent, a revised sample cover sheet for filing a provisional application for a patent is included for clarification. However, it is noted that the regulations do not require applicant to use the sample cover sheet. Any cover sheet containing the information required in 37 CFR 1.51(a)(2)(i) will be acceptable.

November 21, 1995 STEPHEN G. KUNIN
Deputy Assistant Commissioner for Patent Policy and Projects

PTO/SB/16 (11-95)
Approved for use through 01/31/98. OMB 0651-0037
Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53 (b)(2).

Docket Number		Type a plus sign (+) inside this box -->	

INVENTOR(s)/APPLICANT(s)

LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)

TITLE OF THE INVENTION (280 characters max)

CORRESPONDENCE ADDRESS

STATE		ZIP CODE		COUNTRY	

ENCLOSED APPLICATION PARTS (check all that apply)

☐	Specification	*Number of Pages*		☐	Small Entity Statement
☐	Drawing(s)	*Number of Sheets*		☐	Other (specify)

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)

☐	A check or money order is enclosed to cover the filing fees	FILING FEE AMOUNT ($)	
☐	The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number:		

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☐ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

_____

Respectfully submitted,

SIGNATURE _____ Date / /

TYPED or PRINTED NAME _____ REGISTRATION NO. *(if appropriate)*

☐ Additional inventors are being named on separately numbered sheets attached hereto

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

Burden Hour Statement: This form is estimated to take .2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, DC 20231.

(96) **Provisional Applications for Patent Meet Paris Convention Requirements as Foreign Priority Documents**

In view of the recent question raised in the patent community regarding the adequacy of provisional patent applications filed under 35 USC 111(b) to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property, Commissioner Lehman decided to seek the advice of the World Intellectual Property Organization on that issue. Below is the resulting exchange of correspondence that should lay to rest any doubt that provisional patent applications are indeed sufficient for this purpose.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

NOV 17 1995

Dr. Arpad Bogsch
Director General
World Intellectual Property Organization
1211 Geneva 20
Switzerland

Dear Arpad,

Recently, a question arose regarding the adequacy of a provisional patent application, filed in accordance with section 111(b) of title 35, United State Code, to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property.

Although we are convinced that such an application is indeed sufficient for this purpose, we would be very interested in your opinion on this subject and request a reply at your earliest convenience.

Sincerely,

Bruce

Bruce A. Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

WORLD INTELLECTUAL PROPERTY ORGANIZATION

世界知识产权组织

ORGANIZACION MUNDIAL DE LA PROPIEDAD INTELECTUAL

ORGANISATION MONDIALE DE LA PROPRIÉTÉ INTELLECTUELLE

المنظمة العالمية للملكية الفكرية

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ

1970-1995 PCT WIPO-OMPI

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November 20, 1995

Dear Bruce,

I thank you for your letter of November 17, 1995, asking for our views concerning the claiming of priority under Article 4 of the Paris Convention for the Protection of Industrial Property, in respect of provisional patent applications filed with the USPTO.

As you know, the International Bureau is not in a position to give an official interpretation of the provisions of the Paris Convention. However, we offer the following considerations which may be helpful in order to reply to the question raised by you.

According to Article 4A(1) of the Paris Convention, the basis for priority under that Convention is a duly filed application for a patent.

Article 4A(2) of the Paris Convention states, in particular, that "Any filing that is equivalent to a regular national filing under the domestic legislation of any country of the Union ... shall be recognized as giving rise to the right of priority." In the case under consideration, the "domestic legislation" is the legislation of the United States of America. Therefore, it is that legislation which determines whether a "regular national filing" exists, subject to compliance with Article 4A(3) of the Paris Convention.

/...

Mr. Bruce A. Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks
Patent and Trademark Office
Box 4
U.S. Department of Commerce
Washington, D.C. 20231
United States of America

34, chemin des Colombettes, 1211 GENÈVE 20 (SUISSE), ☎ (022) 730 91 11 ; Fax-similé (41-22) 733 54 28 ; Télex CH - 412 912 ; Télégr. : OMPI
Banque : Crédit Suisse, Genève, compte OMPI N° 48 7080-81 Chèques postaux : OMPI N° 12-5000-8, Genève

2.

Mr. Bruce A. Lehman, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, Patent and Trademark Office, Washington, D.C. - November 20, 1995

Article 4A(3) of the Paris Convention states that "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, ..." As section 111(b) of title 35, United States Code, establishes such a filing date with respect to provisional patent applications, this requirement of the Paris Convention appears to be satisfied. To conclude otherwise would put into question the ability of domestic legislation to prescribe the requirements which must be fulfilled for a filing to be adequate to establish a filing date.

Article 4A(3) of the Paris Convention also states that "any filing that is adequate to establish the date on which the application was filed" is a regular national filing "whatever may be the subsequent fate of the application." Thus the question of whether a filing is to be considered as a "regular national filing" does not appear to depend on whether or not that filing may itself lead to the grant of a patent. Moreover, it is to be noted that applications for patents are recognized as giving rise to a right of priority under the Paris Convention even if it is clear from the outset that no patent can be granted upon such an application, for example, where the invention concerned is excluded from patenting.

Sincerely yours,

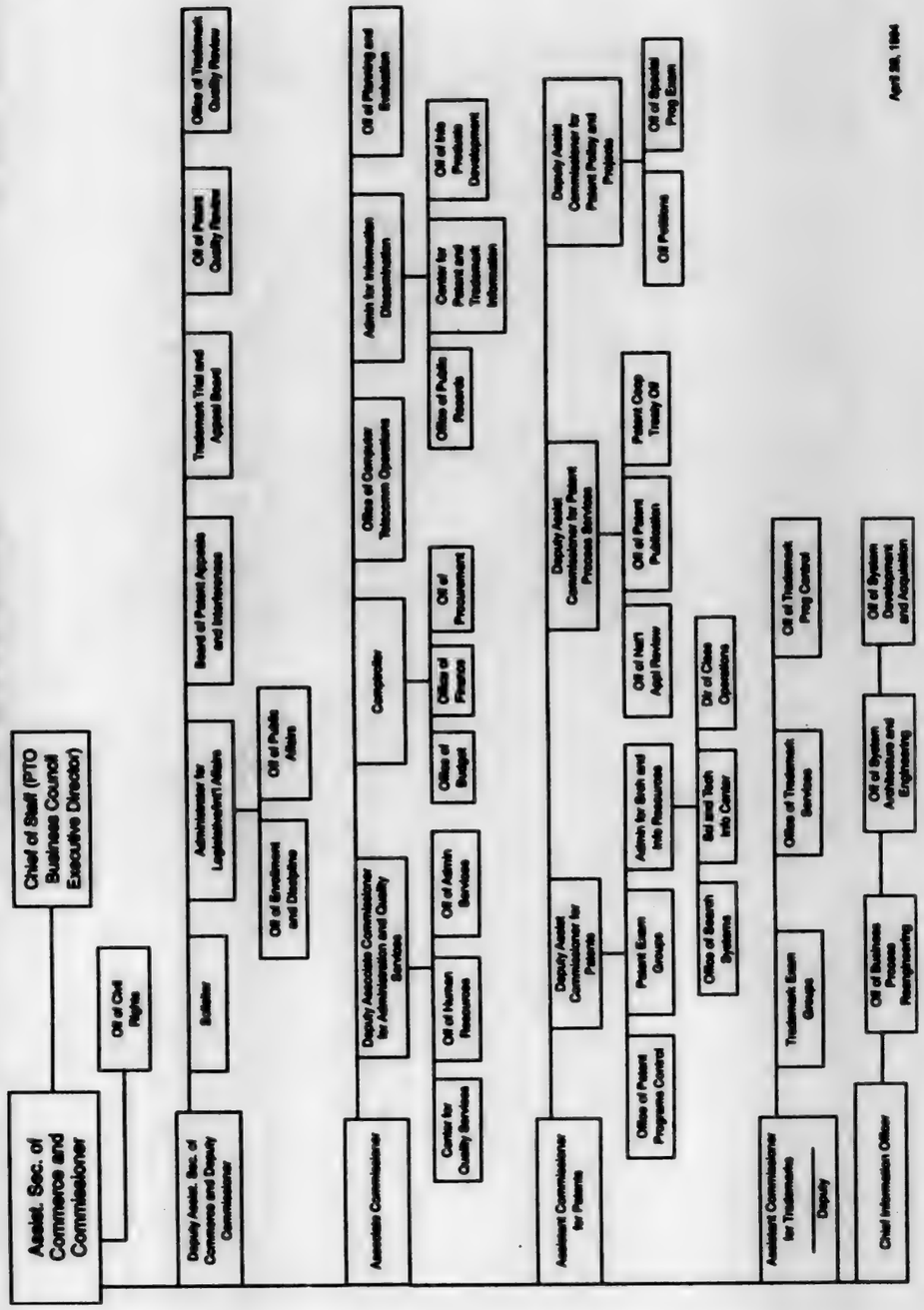
A. Bogsch

Arpad Bogsch
Director General

[1180 OG 131]

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EXHIBIT 1 to DOO 30-3



April 28, 1994

(97) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
Docket No. 950411099-5099-01
RIN: 0651-AA52

Amendment to Rules for Extension of Patent Term

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is revising the rules directed to the extension of patent term to implement the provisions of Pub. L. 103-179, § 5; 107 Stat. 2040 codified at 35 U.S.C. 156(d)(5) and to clarify the requirements for eligibility. The amended rules establish procedures for the Commissioner to issue an interim extension of the term of a patent where the original term would expire before a product covered by the patent has received regulatory approval for commercial marketing or use. The amended rules also clarify that an application for patent term extension must be based on regulatory activities performed by the patent owner or its agent.
Effective Date: July 11, 1995.
For Further Information Contact: Gerald A. Dost by telephone at (703) 305-9285 or by mail addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 marked to the attention of Mr. Dost, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, or by FAX to (703) 308-6916.
Supplementary Information: Patent term extension has been available under 35 U.S.C. 156 for patents that claim certain products that are subject to regulatory review before being commercially marketed or used. Prior to enactment of 35 U.S.C. 156(d)(5), eligibility for patent term extension was dependent on regulatory approval of the product before the original patent term expired. 35 U.S.C. 156(d)(5) has made it possible, under appropriate circumstances, to obtain interim extensions of patent term where the regulatory process is likely to extend beyond the expiration of the patent term.

One purpose of the amended rules is to revise the present regulations contained in 37 CFR Part 1, Subpart F, to include provisions for interim extension of the patent term prior to regulatory approval of the product that can now form the basis of patent term extension. The amended rules set forth procedures that govern the content and submission of applications for an interim extension of a patent term, and procedures governing the interim extension determination and issuance of interim patent term extension certificates by the Office.

The initial guidelines directed to the preparation and filing of applications for interim extensions of patent terms as authorized by 35 U.S.C. 156(d)(5), were published as "Guidelines For Interim Extension Under 35 U.S.C. § 156(d)(5) of a Patent Term Prior To Regulatory Approval of a Product For Commercial Marketing or Use - Public Law 103-179 (December 3, 1993)" in the Official Gazette at 1159 Off. Gaz. Pat. Office 12 (February 1, 1994). The Final Rule supplements these initial guidelines. To the extent that they conflict with the interim guidelines, the Final Rule governs.

It is important to keep in mind the distinction between an interim patent term extension under § 156(e)(2) and the interim patent term extension provided for by 35 U.S.C. 156(d)(5), under § 156(d)(5). The former applies *after* regulatory approval has occurred and is addressed in 37 CFR 1.760. Interim patent term extensions under § 156(e)(2) are not affected by the amendments to the rules. The latter applies *before* regulatory approval has occurred and is addressed in 37 CFR 1.780 and 1.790.

The eligibility criteria for obtaining an interim extension under § 156(d)(5) are substantially the same as for obtaining patent term extension under § 156 after regulatory approval has occurred. Under the provisions of 35 U.S.C. 156(d)(5), a patent owner or its agent may submit an application for an interim patent term extension within six months, but not later than 15 days, of the original expiration date of the patent. At the time the application is submitted, the regulatory review period must have advanced to the approval phase as defined in § 156(g), but must not have ended. For a new drug, for example, the approval phase is defined in § 156(g)(1)(B)(ii) as the period beginning on the date a new drug application was initially submitted for the new drug under § 505 of the Federal Food, Drug and Cosmetic Act.

The content of the application for interim extension is the same as for an application for patent term extension following regulatory review, with certain modifications necessitated by the circumstances. For example, the application for interim term extension will not be required to contain information about regulatory approval since that event has not occurred. A fee is required for each interim extension application filed before regulatory approval occurs - $400.00 for the initial application for interim extension and $200.00 for each supplementary application for interim extension.

The processing of an application for interim patent term extension under 35 U.S.C. 156(d)(5), will not require transmission of a copy of the application to the regulatory agency. However, it is contemplated that the Office will consult with the regulatory agency, as it has been doing for the past 10 years under § 156, on the question of eligibility for patent term extension.

If the patent is eligible for extension but for the fact that it is still under regulatory review, the Office can extend the patent term in one-year increments not to exceed five years from the expiration date. Any such extension would terminate 60 days after market approval. Before the 60-day period expires, the patentee could submit an application for patent term extension, supplying any additional information necessary to obtain any additional extension available under § 156.

The interim extension of patent term available under § 156(d)(5) cannot exceed the extension from the original patent term that would be available after regulatory approval. Thus, for example, a patent that was subject to the two-year extension limitation of § 156(g)(6)(C), could not obtain interim extension beyond two years from the original patent term expiration date. However, after an interim extension under § 156(d)(5) has been granted, the amount of patent term extension available after regulatory review is controlled by either § 156(d)(5) or § 156(g)(6)(A) or (B). In no case would the extension go beyond five years from the original expiration date of the patent. However, for those situations falling under § 156(g)(6)(C), where regulatory approval occurs within the two-year period after the original expiration date of the patent, the extension after approval is measured from the date on which the product receives permission for commercial marketing or use. § 156(d)(5)(E)(ii).

Review of recent applications for patent term extension has revealed that the provisions of 37 CFR 1.785(c) may be read as being inconsistent with 35 U.S.C. 156. The statute requires that an application for patent term extension be filed by the patent owner or its agent. 35 U.S.C. 156(d)(1). The statute further requires under § 156(d)(1)(D) a description of the activities undertaken by the applicant (i.e., the patent owner or its agent) during the regulatory review period, and specifies in § 156(d)(2)(B)(i) that the lack of due diligence by the applicant during the regulatory review period may be taken into account. Given these statutory requirements, the Office has held that in order to be eligible for patent term extension, the patent owner or its agent must have undertaken the activities that lead to regulatory approval. If a patent owner has not been involved, either directly or indirectly, in the regulatory review process, that patent owner has not lost any effective patent life since it never invested time and resources necessary to obtain approval for commercial marketing or use. Accordingly, to the extent that 37 CFR 1.785 could be interpreted to permit a patent owner to obtain a patent term extension where neither the patent owner nor its agent were responsible for activities leading to regulatory approval, it was misleading and contrary to both the letter and intent of § 156.

A notice of proposed rulemaking relating to Amendment to Rules for Extension of Patent Term was published in the Federal Register, 59 FR 56015, (November 10, 1994) and in the Official Gazette, 1169 Off. Gaz. Pat. Office 33 (December 13, 1994). A sole comment was received in response to this notice, but no change has been made in the text of the proposed amendments and additions to the rules.

The comment was directed to the proposed amendment to 37 CFR 1.785(c) when taken in light of 35 U.S.C. 156. The comment suggested that the party in interest before the regulatory agency (e.g., the Food and Drug Administration) should be the party to obtain a patent term extension, whether that

party is the patent owner or licensee, and regardless of any "agency" relationship which may exist between the two with respect to such regulatory proceedings. This may be accomplished, it was argued, by construing the term "applicant" in 35 U.S.C. 156(d)(1)(D) and (d)(2)(B)(i) to mean the "applicant for regulatory approval."

In response, it is clear that under 35 U.S.C. 156(a)(3) and (d)(1), the "applicant" for patent term extension shall be either the "owner of record of the patent" or the party which may be construed to be "its agent," which requirement is repeated in 35 U.S.C. 156(d)(5)(A) and (d)(5)(C) with regard to interim extensions. Indeed, to hold otherwise in the manner suggested in the comment would violate the plain meaning of 35 U.S.C. 156(c)(1), which requires that the patent term extension period be reduced by the time that the "applicant for patent extension did not act with due diligence during such period of the regulatory review period." This section not only cites 35 U.S.C. 156(d)(2)(B) but also is consistent with the required description of activities undertaken during the applicable regulatory period set forth in 35 U.S.C. 156(d)(1)(D). The statute thus specifically requires that the application for patent term extension contain a description of the activities performed by the patent owner or its agent before the regulatory agency with regard to such proceedings, 35 U.S.C. 156(d)(1)(D), and further specifies that the lack of due diligence by the patent owner or its agent during the regulatory review period may be taken into account, 35 U.S.C. 156(c)(1) and (d)(2)(B)(i).

In addition to the constraints of the statutory language, the comment fails to identify any justification for granting a term extension on a patent where the patent owner has not, either directly or indirectly, incurred either the significant costs associated with regulatory approval or any delay in the commercial marketing of a product. Since the patent term extension provisions of § 156 are intended to be remedial in nature, providing a patent term extension to a patent owner who has not been harmed by the delay and costs associated with regulatory approval of a product would provide an unintended benefit to such a patent owner. In addition, providing a patent term extension to a patent owner that did not participate in the regulatory review process could also frustrate an important purpose of the statute, that is, to encourage companies to make the significant investment necessary to obtain regulatory approval and distribute the pharmaceutical product to the public, rather than placing a non-participating patent owner in a position to keep the product off the market during the extended term, to the detriment of the party that made the significant investment necessary to obtain regulatory approval.

Accordingly, not only does the plain language of the statute prohibit the statutory interpretation suggested in the comment, but also the purpose of the statute would not be fulfilled by construing "applicant" to mean the applicant for regulatory review.

Discussion of Specific Rules:

Section 1.750 is being amended, as proposed, to provide for an eligibility determination which will be made on applications for interim extension filed in compliance with § 1.790. The section is further modified to limit the mailing of a notice of a final determination to applications filed in compliance with § 1.740 after the regulatory approval process is complete.

Section 1.760 is being amended, as proposed, to require that the title recite that the section is directed to requests for interim extensions of patent term under 35 U.S.C. 156(e)(2), to distinguish it from interim extensions available under 35 U.S.C. 156(d)(5), addressed in § 1.780.

Section 1.765(a) is being amended, as proposed, to change the phrase (two occurrences) "the Office of the Secretary" to read "the Office or the Secretary." The change provides that the applicant has a duty of disclosure to both the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture.

Section 1.780 is being amended, as proposed, to provide that a certificate of interim extension under 35 U.S.C. 156(d)(5) will be issued to the applicant. Section 1.780 also provides for notification of the issuance of the certificate of interim extension under 35 U.S.C. 156(d)(5), including the identity of the product currently under regulatory review, to be published in the Federal Register.

Section 1.785 is being amended, as proposed, to require the applicant for extension, i.e., the patent owner or its agent, to also have been the marketing applicant who obtained regulatory approval of the product for commercial marketing or use. While regulatory approval can be obtained by a party other than the patent owner, that other party must have been an agent of the patent owner when obtaining the regulatory approval in order for the patent owner to be eligible to apply for extension of the patent term.

Section 1.790 is being added, as proposed, to provide for one or more interim extensions for periods of up to one year for patents where the applicable regulatory review period described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of 35 U.S.C. 156(g) that began for the patented product may extend beyond the expiration of the patent term in effect.

Paragraph (a) of added § 1.790 defines the time periods in which the initial interim extension application and each subsequent interim extension application must be filed in the Office. In no event will interim extensions be granted under proposed § 1.790 for a period of extension longer than that to which the applicant would be entitled to under 35 U.S.C. 156(c).

Paragraph (b) of added § 1.790 establishes that the content requirements for the initial interim extension applications are substantially the same as the content requirements for a formal application for extension of patent term under § 1.740 and a complete application under § 1.741, except that the content requirements relate to a product currently undergoing regulatory review. In other words, the interim extension applications contain information available to the patent owner or its agent at the time the application is filed.

Paragraph (c) of added § 1.790 permits each interim extension application after the initial interim extension application to be limited to a request for a subsequent interim extension along with a statement that the regulatory review period has not been completed and any materials or information required under §§ 1.740 and 1.741 not present in the preceding interim extension application.

Section § 1.791 is being added, as proposed, to provide that any interim extension granted under 35 U.S.C. 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files additional information required under 35 U.S.C. 156(d)(1) not contained in the applications for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. 156.

Other Considerations:

These rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rules will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the rules would affect only a very small number of patents eligible for interim patent term extension.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 35 U.S.C. 156(d)(5) 3501 *et seq.*, which have previously been approved by the Office of Management and Budget under Control Number 0651-0020. The public reporting burden for this collection of information for Petition Extension is estimated to average 60 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding this burden estimate, or any other aspect of this collection of information, including suggestions for reducing the burden, to Gerald A. Dost, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0020).

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth, the preamble, Part 1 of Title 37 of the Code of Federal Regulations is amended to read as follows:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 C.F.R. Part 1, Subparts A and F continues to read as follows:

Authority: 35 U.S.C. § 6, unless otherwise noted.

2. Section 1.20 is amended by revising paragraph (j) to read as follows:

§ 1.20 Post-issuance fees.

• • • • •

(j) For filing an application for extension of the term of a patent

(1) Application for extension under § 1.740	$1,030.00
(2) Initial application for interim extension under § 1.790	$400.00
(3) Subsequent application for interim extension under § 1.790	$200.00

3. Section 1.750 is revised to read as follows:

§ 1.750 Determination of eligibility for extension of patent term

A determination as to whether a patent is eligible for extension may be made by the Commissioner solely on the basis of the representations contained in the application for extension filed in compliance with § 1.740 or § 1.790. This determination may be delegated to appropriate Patent and Trademark Office officials and may be made at any time before the certificate of extension is issued. The Commissioner or other appropriate officials may require from applicant further information or make such independent inquiries as desired before a final determination is made on whether a patent is eligible for extension. In an application for extension filed in compliance with § 1.740, a notice will be mailed to applicant containing the determination as to the eligibility of the patent for extension and the period of time of the extension, if any. This notice shall constitute the final determination as to the eligibility and any period of extension of the patent. A single request for reconsideration of a final determination may be made if filed by the applicant within such time as may be set in the notice of final determination or, if no time is set, within one month from the date of the final determination. The time periods set forth herein are subject to the provisions of § 1.136.

4. In § 1.760, the heading is revised to read as follows:

§ 1.760 Interim extension of patent term under 35 U.S.C. 156(e)(2)

5. Section 1.765(a) is revised to read as follows:

§ 1.765 Duty of disclosure in patent term extension proceedings

(a) A duty of candor and good faith toward the Patent and Trademark Office and the Secretary of Health and Human Services or the Secretary of Agriculture rests on the patent owner or its agent, on each attorney or agent who represents the patent owner and on every other individual who is substantively involved on behalf of the patent owner in a patent term extension proceeding. All such individuals who are aware, or become aware, of material information adverse to a determination of entitlement to the extension sought, which has not been previously made of record in the patent term extension proceeding must bring such information to the attention of the Office or the Secretary, as appropriate, in accordance with paragraph (b) of this section, as soon as it is practical to do so after the individual becomes aware of the information. Information is material where there is a substantial likelihood that the Office or the Secretary would consider it important in determinations to be made in the patent term extension proceeding.

6. Section 1.780 is revised to read as follows:

§ 1.780 Certificate of extension of patent term

If a determination is made pursuant to § 1.750 that a patent is eligible for extension and that the term of the patent is to be extended, a certificate of extension, under seal, or certificate of interim extension under 35 U.S.C. 156(d)(5) will be issued to the applicant for the extension of the patent term. Such certificate will be recorded in the official file of the patent and will be considered as part of the original patent. Notification of the issuance of the certificate of extension will be published in the Official Gazette of the Patent and Trademark Office. Notification of the issuance of the certificate of interim extension under 35 U.S.C. 156(d)(5), including the identity of the product currently under regulatory review, will be published in the Official Gazette of the Patent and Trademark Office and in the Federal Register. No certificate of extension will be issued if the term of the patent cannot be extended, even though the patent is otherwise determined to be eligible for extension. In such situations the final determination made pursuant to § 1.750 will indicate that no certificate will issue.

7. Section 1.785 is revised to read as follows:

§ 1.785 Multiple applications for extension of term of the same patent or of different patents for the same regulatory review period for a product

(a) Only one patent may be extended for a regulatory review period for any product § 1.720 (h)). If more than one application for extension of the same patent is filed, the certificate of extension of patent term, if appropriate, will be issued based upon the first filed application for extension.

(b) If more than one application for extension is filed by a single applicant which seeks the extension of the term of two or more patents based upon the same regulatory review period, and the patents are otherwise eligible for extension pursuant to the requirements of this subpart, in the absence of an election by the applicant, the certificate of extension of patent term, if appropriate, will be issued upon the application for extension of the patent term having the earliest date of issuance of those patents for which extension is sought.

(c) If an application for extension is filed which seeks the extension of the term of a patent based upon the same regulatory review period as that relied upon in one or more applications for extension pursuant to the requirements of this subpart, the certificate of extension of patent term will be issued on the application only if the patent owner or its agent is the holder of the regulatory approval granted with respect to the regulatory review period.

(d) An application for extension shall be considered complete and formal regardless of whether it contains the identification of the holder of the regulatory approval granted with respect to the regulatory review period. When an application contains such information, or is amended to contain such information, it will be considered in determining whether an application is eligible for an extension under this section. A request may be made of any applicant to supply such information within a non-extendable period of not less than one (1) month whenever multiple applications for extension of more than one patent are received and rely upon the same regulatory review period. Failure to provide such information within the period for response set shall be regarded as conclusively establishing that the applicant is not the holder of the regulatory approval.

(e) Determinations made under this section shall be included in the notice of final determination of eligibility for extension of the patent term pursuant to § 1.750 and shall be regarded as part of that determination.

8. Section 1.790 is added to read as follows:

§ 1.790 Interim extension of patent term under 35 U.S.C. 156(d)(5)

(a) An owner of record of a patent or its agent who reasonably expects that the applicable regulatory review period described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of subsection (g) that began for a product that is the subject of such patent may extend beyond the expiration of the patent term in effect may submit one or more applications for interim extensions for periods of up to one year each. The initial application for interim extension must be filed during the period beginning 6 months and ending 15 days before the patent term is due to expire. Each subsequent application for interim extension must be filed during the period beginning 60 days before and ending 30 days before the expiration of the preceding interim extension. In no event will the interim extensions granted under this section be longer than the maximum period of extension to which the applicant would be entitled under 35 U.S.C. 156(c).

(b) A complete application for interim extension under this section shall include all of the information required for a formal application under § 1.740 and a complete application under § 1.741. Sections (a)(1), (a)(2), (a)(4), and (a)(6) - (a)(17) of § 1.740 and § 1.741 shall be read in the context of a product currently undergoing regulatory review. Sections (a)(3) and (a)(5) of § 1.740 are not applicable to an application for interim extension under this section.

(c) The content of each subsequent interim extension application may be limited to a request for a subsequent interim extension along with a statement that the regulatory review period has not been completed along with any materials or information required under § 1.740 and § 1.741 that are not present in the preceding interim extension application.

9. Section 1.791 is added to read as follows:

§ 1.791 Termination of interim extension granted prior to regulatory approval of a product for commercial marketing or use

Any interim extension granted under 35 U.S.C. 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files an application for extension under § 1.740 and § 1.741 including any additional information required under 35 U.S.C. 156(d)(1) not contained in the application for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. 156.

* * * * *

May 8, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1175 OG 15]

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(98) GUIDELINES FOR INTERIM EXTENSION UNDER 35 U.S.C. § 156(d)(5) OF A PATENT TERM PRIOR TO REGULATORY APPROVAL OF A PRODUCT FOR COMMERCIAL MARKETING OR USE - PUBLIC LAW 103-179 (December 3, 1993)

This notice is intended to establish initial guidelines for patent owners who are seeking interim extensions of patent terms pursuant to newly enacted 35 U.S.C. § 156(d)(5). These guidelines will be in effect until further notice. These guidelines do not affect the rights of a patent owner or the procedures to request interim extensions under 35 U.S.C. § 156(e)(2).

Section 156(d)(5)(A) of Title 35, United States Code, provides that a patent owner seeking an interim extension of the terms of a patent pursuant to its provisions must submit an application to the Commissioner of Patents and Trademarks (Commissioner) within a certain defined period of time. Section 156(d)(5) specifies certain components the application is to contain, including "such patent or other information as the Commissioner may require." See 35 U.S.C. § 156(d)(5)(A)(v). Section 156(h) provides that the "Commissioner may establish such fees as the Commissioner determines appropriate to cover the costs to the Office of receiving and acting upon applications under this section." The purpose of this notice is to provide guidelines which a patent owner or its agent should use in (1) deciding whether the requirements for the submission of an application for an interim extension of the term of a patent are satisfied, and (2) making the submission of such an application to the Patent and Trademark Office.

This notice includes guidelines as to the actual content of an application for interim extension of the term of a patent. The guidelines should be used in determining whether a patent is subject to, and meets the conditions for interim extension of its term under section 156(d)(5). The guidelines should also be used in preparing and filing an application for interim extension of the patent term. If any application for interim extension of the term of a patent is filed in accordance with 35 U.S.C. § 156(d)(5), but is not in compliance with the requirements of this notice, applicant will be notified of the deficiences in the application and will be given a period of time within which to correct the deficiences.

GUIDELINES

A. Patents eligible for interim extension of the patent term.

(a) Any patent which claims a product as defined in paragraph (b) of this section, or a method of using such a product, is eligible for an interim extension of its patent term in accordance with 35 U.S.C. § 156(d)(5).

(b) The term "product" referred to in paragraph (a) of this section means a product as defined in 35 U.S.C. 156(f).

§ B. Conditions for interim extension of patent term.

A patent may be granted an interim extension of its term if:

(a) the patent claims a product or a method of using or manufacturing a product as defined in § A of this notice;

(b) the term of the patent has been extended under 35 U.S.C § 156(e);

(c) an application for interim extension under § 156(d) is submitted pursuant to § E of this notice;

(d) the product is currently undergoing a regulatory review as described in paragraph (1)(B)(ii), (2)(B)(ii), (3)(B)(ii), (4)(B)(ii), or (5)(B)(ii) of 35 U.S.C. § 156(g);

(e) the product has not received permission for commercial marketing or use; or, in the case of a patent claiming a method of manufacturing a product which primarily uses recombinant DNA technology in the manufacture of the product, no permission for commercial marketing or use has been granted for a product manufactured under the process claimed in the patent; and,

(f) the application is submitted during the period beginning 6 months, ending 15 days, before the expiration of the patent term; or, in the case of a subsequent interim extension, during the period beginning 60 days before, and ending 30 days before, the expiration of the preceding interim extension.

§ C. Applicant for interim extension of patent term.

Any application for interim extension of a patent term must be submitted by the owner of record of the patent or its agent and must comply with the requirements of § E of this notice.

§ D. Filing date of application for interim extension of patent term.

(a) The filing date of an application for interim extension of patent term is the date on which a complete application is received in the Patent and Trademark Office, or filed pursuant to the "Certificate of Mailing" provisions of 37 CFR § 1.8 or "Express Mail" provisions of 37 CFR § 1.10.

A complete application shall include:

(1) identification of the product then under regulatory review;

(2) identification of each Federal statute under which regulatory review is occurring;

(3) identification of the patent for which an interim extension is sought;

(4) identifiation of each claim of the patent which claims the product or a method of using or manufacturing the product then under regulatory review;

(5) sufficient information to enable the Commissioner to determine that, except for permission to market or use the product commercially, the patent would be eligible for an extension of its term under 35 U.S.C. § 156; and,

(6) a brief description of the activities undertaken by the applicant during the applicable regulatory review period with respect to the product or a method of using or manufacturing the product then under regulatory review and the significant dates applicable to such activities.

(b) If any application submitted pursuant to this section is held to be incomplete, applicant may seek to have this holding reviewed under 37 CFR § 1.181.

§ E. Application for interim extension of patent term.

(a) An application for interim extension of a patent term must be made in writing to the Commissioner of Patents and Trademarks.

(b) A formal application for interim extension of the patent term shall include:

(1) a complete identification of the product under regulatory review as by appropriate chemical and generic name, physical structure or characteristics, and, where the requested extension is based on a method claim, the method of using or method of manufacturing the product then under regulatory review;

(2) a complete identification of the Federal statute including the applicable provision of law under which the regulatory review is occurring;

(3) in the case of a human drug product, an identification of each active ingredient in the product and as to each active ingredient, a statement that it has not been previously approved for commercial marketing or use under the Federal Food, Drug and Cosmetic Act, the Public Health Service Act, or the Virus-Serum-Toxin Act, or a staement of when the active ingredient was approved for commercial marketing or use (either alone or in combination with other active ingredients) the use for which it was approved, and the provision of law under which it was approved;

(4) a statement that the application is being submitted within the period permitted for submission pursuant to § B of this notice, and an identification of the date of the first and last days on which the application could be submitted;

(5) a complete identification of the patent for which an interim extension is sought by the name of the inventor, the patent number, the date of issue, and the date of expiration;

(6) a copy of the patent for which an interim extension is sought, including the entire specification (with claims) and drawings;

(7) a copy of any disclaimer, certificate of correction, receipt of maintenance fee payment, or reexamination certificate issued in the patent;

(8) a statement that the patent claims the product or a method of using or manufacturing the product under regulatory review, and a showing which lists each applicable patent claim and demonstrates the manner in which each applicable patent claim reads on the product or a method of using or manufacturing the product under regulatory review;

(9) a statement beginning on a new page, of the relevant dates and information pursuant to 35 U.S.C. § 156(g) of the applicable current regulatory review period as follows:

(i) for a patent that claims a human drug, antibiotic, or human biological product, the effective date of the investigational new drug (IND) application and the IND number, and the date on which a new drug application (NDA) or a Product License Application (PLA) was initially submitted and the NDA or PLA number;

(ii) for a patent claiming a new animal drug, the date a major health or environmental effects test on the drug was initiated and any available substantiation of the date or the date of an exemption under subsection (j) of section 512 of the Federal Food, Drug and Cosmetic Act became effective for such animal drug; and the date on which a new animal drug application (NADA) was initially submitted and the NADA number;

(iii) for a patent claiming a veterinary biological product, the date the authority to prepare an experimental biological product under the Virus-Serum-Toxin Act became effective; and the date an application for license was submitted under the Virus-Serum-Toxin Act;

(iv) for a patent claiming a food or color additve, the date a major health or environment effects test on the additive was initiated and any available substantiation of that date; and the date on which a petition for product approval under the Federal Food, Drug and Cosmetic Act was initially submitted and the petition number;

(v) for a patent claiming a medical device, the effective date of the investigational device exemption (IDE) and the IDE number, if applicable, or the date on which the applicant began the first clinical investigation involving the device if no IDE was submitted and any available substantiation of that date; and the date on which any application for product approval or notice of completion of a product development protocol under section 515 of the Federal Food, Drug and Cosmetic Act was initially submitted and the number of the application;

(10) a brief description beginning on a new page of the significant activities undertaken by the applicant during the applicable regulatory review period with respect to the product under regulatory review and the significant dates applicable to such activities;

(11) a statement that applicant acknowledges a duty to disclose to the Commissioner of Patents and Trademarks any information which is material to the determination of entitlement to the interim extension sought;

(12) the prescribed fee for receiving and acting upon the application for extension (see § F of this notice);

(13) the name, address, and telephone number of the person to whom inquires and correspondence relating to the application for interim patent term extension are to be directed;

(14) a duplicate of the application papers, certified as such; and,

(15) an oath or declaration as set forth in paragraph (c) of this section.

(c) Any oath or declaration submitted in compliance with paragraph (b) of this section must be signed by the owner of record of the patent or its agent, specifically identify the papers and the patent for which an interim extension is sought and aver that the person signing the oath or declaration;

(1) is the owner, an official of a corporate owner authorized to obligate the corporation, or a patent attorney or agent authorized to practice before the Patent and Trademark Office and who has general authority from the owner to act on behalf of the owner in patent matters;

(2) has reviewed and understands the contents of the application being submitted pursuant to this section;

(3) believes the patent is eligible for extension pursuant to § A of this notice;

(4) believes an interim extension is justified under 35 U.S.C. § 156(d)(5) and the guidelines of this notice; and,

(5) believes the patent for which the extension is being sought meets the conditions for interim extension of the term of a patent as set forth in § B on this notice.

(d) If any application for interim extension of patent term submitted pursuant to this section is held to be informal, applicant may seek to have that holding reviewed by filing a petition with the required fee, as necessary, pursuant to 37 C.F.R. §§ 1.181, 1.182 or 1.183, as appropriate, within such time as may be set in the notice that the application has been held to be informal, or if no time is set, within one month of the date on which the application was held informal. The time periods set forth herein are subject to the provisions of 37 C.F.R. § 1.136.

§ F. Fees for receiving and acting on application filed pursuant to 35 U.S.C § 156(d)(5).

Pursuant to 35 U.S.C. § 156(h), the Commissioner has determined that the following fees are appropriate to cover the costs to the Patent and Trademark Office of receiving and acting upon applications for interim patent terms extension filed pursuant to 35 U.S.C. § 156(d)(5):

(a) for an initial application for "interim extension" under 35 U.S.C. § 156(d)5(A): $400.00; and,

(b) for each application requesting a "subsequent interim extension" under 35 U.S.C. § 156(d)(5)(C): $200.00.

The appropriate fee should accompany the application when filed. If a fee in a different amount is adopted in Title 37 of the Code of Federal Regulations, applicant will be refunded any excess or required to submit any deficiency.

§ G. Address for filing applications pursuant to 35 U.S.C. § 156(d)(5).

All applications for interim extension of the term of a patent and any communications relating thereto should be addressed to the Commissioner of Patents and Trademarks, Box Patent Ext., Washington, D.C., 20231. When appropriate, the communication should be marked to the attention of a particular individual.

§ H. Termination of Interim Extension.

Any interim extension granted under 35 U.S.C. § 156(d)(5) terminates at the end of the 60-day period beginning on the date on which the product involved receives permission for commercial marketing or use. If within that 60-day period the patent owner or its agent files additional information required under 35 U.S.C. § 156(d)(1) not contained in the application for interim extension, the patent shall be further extended in accordance with the provisions of 35 U.S.C. § 156.

§ I. For further information contact:

Charles E. Van Horn by telephone at (703) 305-9054 or Gerald A. Dost by telephone at (703) 305-8813; or by mail marked to their attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Summary

The initial guidelines set forth above are considered to be appropriate and authorized by 35 U.S.C. § 156. They will provide appropriate guidelines to patent owners and their agents pending appropriate changes which will be made in Title 37 of the Code of Federal Regulations.

Jan. 6, 1994 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1159 OG 12]

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(99) **Department of Commerce**
Patent and Trademark Office

Notice of two-year exclusivity period; DAYPRO® oxaprozin.

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Receipt of Notice of Entitlement under Section 2105 of the FDA Export Reform and Enhancement Act of 1996 (Chapter 1A of Pub. L. No. 104-134).
Summary: The Patent and Trademark Office has received notification from G. D. Searle & Co. that it claims entitlement under Section 2105 of the FDA Export Reform and Enhancement Act of 1996 (Chapter 1A of Pub. L. No. 104-134) for its drug product DAYPRO® oxaprozin.
For Information Contact: Karin Tyson by telephone at (703) 305-9285; by mail marked to her attention and addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or by fax marked to her attention at (703) 308-6916.
Supplementary Information: On April 25, 1996, the FDA Export Reform and Enhancement Act of 1996 (Act) (Chapter 1A of Pub. L. No. 104-134) was enacted. Section 2105 thereof grants specified exclusive rights to the owner of the right to market a specified nonsteroidal anti-inflammatory drug who has complied with the Act. The text of Section 2105 is as follows:

(a) IN GENERAL — Any owner on the date of enactment of this Act of the right to market a nonsteroidal anti-inflammatory drug that —

(1) contains a previously patented active agent;
(2) has been reviewed by the Federal Food and Drug Administration for a period of more than 120 months as a new drug application; and
(3) was approved as safe and effective by the Federal Food and Drug Administration on October 29, 1992, shall be entitled, for the 2-year period beginning on October 29, 1997, to exclude others from making, using, offering for sale, selling, or importing into the United States such active agent, in accordance with section 154(a)(1) of title 35, United States Code.

(b) INFRINGEMENT — Section 271 of title 35, United States Code shall apply to the infringement of the entitlement provided under subsection (a). No application described in section 271(e)(2)(A) of title 35, United States Code, regardless of purpose, may be submitted prior to the expiration of the entitlement provided under subsection (a).

(c) NOTIFICATION — Not later than 30 days after the date of enactment of this Act, any owner granted an entitlement under subsection (a) shall notify the Commissioner of Patents and Trademarks and the Secretary of Health and Human Services of such entitlement. Not later than 7 days after receipt of such notice, the Commissioner and Secretary shall publish an appropriate notice of the receipt of such notice.

On May 15, 1996, G. D. Searle & Co., filed a notice with the Commissioner of Patents and Trademarks of its claim for entitlement pursuant to Section 2105(c) of the Act. The notice states that G. D. Searle & Co. was the owner of the right to market the nonsteroidal anti-inflammatory drug oxaprozin on April 25, 1996, the date of enactment of the Act. Further, the notice states: that oxaprozin contains an agent that was patented and covered by U.S. Patent No. 3,578,671; that a New Drug Application (NDA) was filed on August 10, 1982, for oxaprozin and was reviewed for a period of more than 120 months; and that oxaprozin was approved as safe and effective by the Federal Food and Drug Administration on October 29, 1992.

May 16, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1187 OG 62]

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(100) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 3 and 5

[Docket #:]
RIN 0651-AA75

Changes to Implement 18-Month Publication of Patent Applications

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent cases primarily to implement changes related to the 18-month publication of patent applications in title 35, United States Code, contained in the Patent Application Publication Act of 1995 (H.R. 1733). Among the changes that are contained in H.R. 1733 would be the publication of patent applications after 18 months from the earliest filing date for which a benefit is sought, and the addition of provisional rights to the rights provided in a patent. These changes would apply to utility and plant applications other than provisional applications, but not to design applications. H.R. 1733 was introduced in the House of Representatives on May 25, 1995. The amendments to title 35 relating to 18-month publication, if enacted as proposed, would be effective on January 1, 1996.
Dates: A public hearing will be held on Tuesday, September 19, 1995, at the Holiday Inn - National Airport, 15th Street and Jefferson Davis Highway, Arlington, Virginia, at 9:30 a.m. Those wishing to present oral testimony must request an opportunity to do so no later than September 14, 1995. Written comments must be submitted on or before September 19, 1995.
Addresses: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Stephen G. Kunin, Deputy Assistant Commissioner for Patent Policy and Projects. In addition, written comments may also be sent by facsimile transmission to (703) 305-8825, with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to early-pub@uspto.gov.

Written comments should include the following information:

- name and affiliation of the individual responding;
- an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views; and
- if applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization).

Parties mailing written comments are asked to provide their comments in machine readable format. Machine-readable submissions may be provided on a 3 1/2 inch floppy disk formatted for use in either a Macintosh or MSDOS-based computer. Machine-readable submissions should be provided as unformatted text (*e.g.*, ASCII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh, DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

Written comments and transcripts of the hearings will be available for public inspection on or about October 2, 1995, in Room 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia, and will be available on or about October 2, 1995, through anonymous file transfer protocol (ftp) via the Internet (address: ftp.uspto.gov).

For Further Information Contact: Stephen G. Kunin by telephone at (703) 305-8850, by facsimile at (703) 305-8825, by electronic mail at rbahr@uspto.gov, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Stephen G. Kunin, addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information

This proposed rule change is designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733. A copy of this legislation may be obtained from the individuals identified in the "For Further Information Contact" section of the notice.

Section 122 of title 35, United States Code, currently provides that patent applications are maintained in confidence until a patent is granted. H.R. 1733, if enacted, would amend 35 U.S.C. 122 to provide that each application for patent, except for design applications filed under 35 U.S.C. 171 and provisional applications filed under 35 U.S.C. 111(b), shall be published "as soon as possible after the expiration of a period of 18 months from the earliest filing date for which a benefit is sought," but provides that applications that are no longer pending and applications that are subject to a secrecy order under 35 U.S.C. 181 shall not be published.

H.R. 1733 includes a provision (35 U.S.C. 122(b)(2)) that, upon request, an application of an independent inventor who has been accorded status under 35 U.S.C. 41(h) will not be published until three months after an Office action under 35 U.S.C. 132; however, applications filed under 35 U.S.C. 363 and applications claiming the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) are not eligible for such a request. In addition, H.R. 1733 provides that an applicant making such a request must certify that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country. H.R. 1733 provides that the Commissioner may establish appropriate procedures and fees for such a request.

H.R. 1733, if enacted, would further amend 35 U.S.C. 119 to provide that the claim and certified copy of the original foreign application must be filed in the Office at such time during the pendency of the application as required by the Commissioner, and that the Commissioner may consider the failure of the applicant to file a timely claim for priority as a waiver of any such claim. H.R. 1733, if enacted, would likewise amend 35 U.S.C. 120 to provide that the Commissioner may determine the time period during the pendency of the application within which an amendment containing the specific reference to the earlier filed application shall be submitted, and that the Commissioner may consider the failure of the applicant to file a timely claim for priority as a waiver of any such claim.

H.R. 1733, if enacted, would further amend 35 U.S.C. 102(e) to include applications published pursuant to 35 U.S.C. 122(b) within its scope. H.R. 1733, if enacted, would provide that the costs of early publication shall be recovered by adjusting the filing, issue and maintenance fees, by charging a separate publication fee, or by any combination of these methods. H.R. 1733, if enacted, would also provide that, upon issuance of the application as a patent, the patent shall, where the invention claimed in the patent is identical to the invention claimed in the published application, include provisional rights during the period from publication until issuance of the patent.

H.R. 1733 also includes amendments relating to 20-year patent term and provisional applications. Specifically, H.R. 1733 includes an amendment to 35 U.S.C. 119(e) to provide that if the day that is twelve months after the filing date of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, the period of pendency of the provisional application shall be extended to the next succeeding secular or business day. H.R. 1733 also includes an amendment to 35 U.S.C. 154(b) to: (1) include an unusual administrative delay by the Office in issuing the patent as a basis

for patent term extension; (2) provide that the total duration of all extensions under 35 U.S.C. 154(b) shall not exceed ten years, as opposed to the five year limit currently provided in Public Law 103-465; (3) provide that no patent that has issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371 shall be extended under 35 U.S.C. 154(b); (4) provide that no patent whose term has been disclaimed beyond a specified date shall be extended under 35 U.S.C. 154(b) beyond the expiration date specified in the terminal disclaimer, and (5) provide that any period of extension under 35 U.S.C. 154(b) shall be reduced by the period during which the applicant for patent did not engage in reasonable efforts to conclude processing or examination of the application, rather than the "due diligence" provision applicable to extensions under 35 U.S.C. 154(b)(2) in Public Law 103-465.

The current planning approach to the implementation of early publication is to create an electronic data base which captures the technical content, *i.e.*, the specification, abstract, claims and drawings, of the application-as-filed. A data capturing operation will enable the creation of a data base containing image and text equivalent of the technical contents of the application-as-filed. Application materials will be digital image and/or optical character recognition (OCR) scanned by the Office for entry into this electronic data base. This electronic data base will be used to provide a source for (a) meeting publication requirements for the applications, (b) providing a basis for electronic searching and retrieval of applications, and (c) providing a basis for producing copies of the technical contents of the application-as-filed. The publication of an application will take the form of publishing information necessary to identify the applicant and the technical subject matter of the application, *i.e.*, a Gazette Entry, in a separate *Gazette of Patent Application Notices*, with a one-page printed publication, *i.e.*, a Patent Application Notice or PAN, containing similar information for placement in the paper search files. Published applications will be assigned a sequential Patent Application Notice (PAN) number in the manner that issued patents are assigned a sequential patent number. In addition, a document including the Patent Application Notice and the technical contents of the application-as-filed, designated as the Technical Contents Publication, will be available to the public upon publication.

The digital images of the technical contents of the application- as-filed, *i.e.*, the Technical Contents Publication, will be available for public review. Paper copies of the Patent Application Notice and Technical Contents Publication will also be available for purchase similar to the way paper copies of patents are currently available for purchase. When budgetary and process considerations permit, text searching of the Patent Application Notice and Technical Contents Publication will be implemented.

The information provided to Patent and Trademark Depository Libraries will be expanded to include weekly issues of the *Gazette of Patent Application Notices* (provided by the Government Printing Office), and a CD-ROM collection of facsimile images of the Patent Application Notices and Technical Contents Publications. The public would also be able to place subscription orders to receive weekly paper copies of the Patent Application Notices and Technical Contents Publications published in specific classes and subclasses similar to the way such orders are currently placed for issued patents, as well as subscription orders to receive the CD-ROM collection of facsimile images of the Patent Application Notices and Technical Contents Publications.

H.R. 1733, as proposed, does not specifically exclude applications that are national security classified from those applications to be published. Executive Order 12356 and a number of statutes, *e.g.*, 42 U.S.C. 2011 *et seq.* (the Atomic Energy Act of 1954), 15 U.S.C. 1155 (provides that the Secretary of Commerce shall respect and preserve the security classification of inventions in the possession or control of the Department of Commerce), and 18 U.S.C. 798 (provides criminal sanctions for the disclosure of classified information) preclude the publication of a national security classified application. Further, the publication requirement in H.R. 1733, as proposed, provides some latitude to the Commissioner to publish applications later than 18 months from the earliest filing date for which a benefit is sought. Therefore, the publication of a national security classified application will be delayed until such application is either declassified, which will permit publication of the application, or subjected to a secrecy order pursuant to 35 U.S.C. 181, which will exclude the application from publication by the express terms of H.R. 1733, as proposed. In view of national security considerations, and the current statutory prohibitions on the disclosure of classified information, it is appropriate to specifically exclude those applications that are national security classified from publication under the provisions of H.R. 1733.

While H.R. 1733, if enacted, would not directly affect design applications, this notice of proposed rulemaking includes a proposed amendment to § 1.154 such that the arrangement for a design application will be consistent with the arrangements for a utility (§ 1.77) or plant (§ 1.163) application, as well as a proposed amendment to § 1.5 to provide that a paper concerning a provisional application must identify the provisional application as such and by application number. In addition, while this proposed rule change is designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733, a number of proposed rule changes set forth in this notice of proposed rulemaking would be desirable even in the absence of an 18-month publication system. Specifically, this proposed rule change is also designed to: (1) clarify which applications claiming the benefit of prior applications or prior applications for which a benefit is claimed in a later application will be preserved in confidence; (2) amend the rules pertaining to the format and standards for application papers and drawings to improve the standardization of patent applications; (3) broaden the application of § 1.131 to instances in which inventions of a pending application or patent under reexamination and a patent held by a single party are not identical, but not patentably distinct; (4) broaden the application of §§ 1.78(c) and (d) to patents under reexamination, (5) clarify the practice for the delivery or mailing of patents; (6) provide for the treatment of national security classified applications; (7) expedite the entry of international applications into the national stage; and (8) amend a number of rules for consistency and clarity. Since these proposed rule changes may be adopted as final rules even in the absence of an 18-month publication system, interested persons are advised to comment on any proposed rule change, regardless of whether H.R. 1733 is enacted. If H.R. 1733 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1733 is not enacted, the proposed rules that would implement publication of patent applications would be withdrawn.

In a Notice of Public Hearing and Request for Comments on 18-Month Publication of Patent Applications (18-Month Publication Notice) published in the *Federal Register* at 59 *FR* 63966 (December 12, 1994) and in the Patent and Trademark Office *Official Gazette* at 1170 *Off. Gaz. Pat Office* 390-94 (January 3, 1995), the Office requested public comment on the procedures the Office should adopt if an 18-month publication system was enacted. The 18-Month Publication Notice set forth the Office's planning approach for the implementation of 18-month (pre-grant) publication of patent applications, and specifically presented fourteen (14) questions on which comment was invited. An oral hearing was conducted on February 15, 1995.

Sixty-five (65) written comments, as well as two (2) Law Review articles concerning the pre-grant publication of pending patent applications, were submitted. Of the sixty-five (65) comments, forty (40) submitted comments directed to at least one of the questions presented in the 18-Month Publication Notice. Sixteen (16) persons testified at the public hearing conducted on February 15, 1995.

Response to Comments on the 18-Month Publication Notice

The following questions were presented in the 18-Month Publication Notice. Each question is followed by a summary of the comments submitted in response to the question, and the proposed disposition of the issue presented in the question.
1. Should the PTO require that all official application-related materials be delivered to a central location? Specifically, what problems would a requirement that all official application-related materials be delivered to a central location cause?

Summary: A slight majority of the comments opposed a requirement that all official application-related materials be delivered to a central location.

Response: As the Office currently considers the delivery of all official application-related materials to a central location to be unnecessary to the currently planned approach to implementation of 18-month publication, no change to the rules of practice to require that all official application-related materials be delivered to a central location will be proposed.

2. Should the PTO adopt a standard application format? If so, what portions of the application papers should the PTO require be submitted in a standard size and/or format, and what sanction (*e.g.*, surcharge) should be established for the failure to comply with these requirements?

Summary: A majority of the comments favored the implementation of a standard application format, so long as an applicant was given a time period in which to comply with this format, *i.e.*, failure to comply with the standard application format did not deprive the application of a filing date. In addition, a number of comments indicated that any additional requirements should not be inconsistent with European Patent Office (EPO) or Patent Cooperation Treaty (PCT) requirements, or in excess of those requirements necessary for the implementation of 18-month publication.

Response: The Office is proposing to change the rules of practice to institute only those additional standardizations which are consistent with the requirements set forth in PCT Rule 11, and are considered necessary for the digital image and OCR scanning of application materials into an electronic data base. Those additional standardizations are that: (1) applications be submitted on flexible, strong, smooth, non-shiny, durable and white paper (PCT Rule 11.3); (2) the papers be typewritten by a typewriter or word-processor, *i.e.*, hand-written application materials would no longer be acceptable, with 1 1/2 or double spaced lines (PCT Rule 11.9(c)), and in permanent "dark" ink (PCT Rule 11.9(d)) and portrait orientation, *i.e.*, with the shorter sides of the paper on the top and bottom (PCT Rule 11.2(d)); (3) the sheets of papers be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) (PCT Rule 11.5), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch) (PCT Rule 11.6(a)); (4) the pages of the application be numbered consecutively, with the numbers being centrally located above or below the text (PCT Rule 11.7); and (5) the claims be on a separate sheet (PCT Rule 11.4). Finally, §§ 1.52(b) and 1.84(x) are proposed to be amended to provide that no holes should be provided in the paper or drawing sheets due to the potential for their interference with the scanning operation.

Section 1.52(b) currently requires that application papers be written on but one side, and § 1.72(b) currently requires that the abstract be on a separate sheet. In an application filed without: (1) typewritten application papers on flexible, strong, smooth, non-shiny, durable and white paper; (2) 1 1/2 or double spaced lines in portrait orientation; (3) permanent "dark" ink typing; (4) sheets of papers of the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch); (5) the pages of the application including claims and abstract be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text; (6) application papers typed on but one side; and (7) an abstract and claims on a separate sheet, the applicant will be given a time period, non-extendable under § 1.136(a), in which to file a substitute specification in compliance with § 1.125 on application papers in compliance with §§ 1.52(a) and (b). The Office, however, does not propose to require a surcharge for the failure to comply with these standardizations on filing.

Additional standardizations to the rules of practice concerning drawings requirements are also being proposed. Currently, § 1.84(f) permits paper sizes of 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches), 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches), 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), and 21.0 cm. by 29.7 cm. (DIN size A4). Section 1.84(f), as proposed, would permit paper sizes of only 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). The use of these paper sizes, which correspond to the paper sizes required under § 1.52(b), as proposed, would not impact the current Automated Patent System (APS) database, and would permit a fully automatic scanning operation due to their similar size. To electronically store, display, and print drawings paper sheet sizes up to 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) would require modifications of the APS system hardware, software, displays, and printers. In addition, the digital image scanning of drawing paper sheet sizes up to 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) would require a semi-automatic scanning operation, thus increasing scanning costs significantly. Therefore, § 1.84(f), as proposed, would permit paper sheet sizes of only 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 on 21.0 cm. by 29.7 cm. (DIN size A4) sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) sheets (PCT Rule 11.6(c)). As PCT Rule 11.6(d) provides that the margin requirements apply to 21.0 cm. by 29.7 cm. (DIN size A4) sheets such that a copy of the drawings sheet on a 21.0 cm. by 29.7 cm. (DIN size A4) sheet leaves the required margin, the requirement for drawing sheet sizes of only 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) or 21.0 cm. by 29.7 cm. (DIN size A4) is not a substantive drawing limitation in excess of PCT Rule 11.

Currently, formal drawings are not required until an application has been allowed. As a drawing figure will be included in the Gazette Entry in the *Gazette of Patent Application Notices*, as well as the Patent Application Notice, drawings of sufficient quality for digital image scanning into an electronic data base will be necessary for the initial processing of the application. In instances in which an application is filed with drawings of such poor quality as to preclude their digital image scanning into the electronic data base, it will be necessary to set a time period, non-extendable under § 1.136(a), in which to file drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction by digital imaging.

Currently, a complete application under § 1.51(a) does not require an abstract on a separate sheet, claims on a separate sheet, application papers typed on but one side of the paper, or application papers or drawings of sufficient clarity, contrast, or quality or in the proper size or format for electronic reproduction, and, as such, an application may be filed under § 1.60 from a prior application not in a format necessary for the image and/or OCR scanning of the application materials into an electronic data base. Therefore, an amendment to § 1.60(d) is necessary to assure the prompt filing of application papers including an abstract and claims on a separate sheet, application papers typed on but one side of the paper, and application papers and drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Currently, the filing of the copy of the specification from the prior application, or a new specification, in an application filed under § 1.62 is considered improper. As applications filed prior to January 1, 1996, will not have been image- or OCR-scanned into the electronic data base, the technical contents of an application filed under § 1.62 in which the prior application was itself filed prior to January 1, 1996, will not be contained in the electronic data base. For applications under § 1.62 which do not add additional disclosure, *i.e.*, continuation or divisional applications, the Office will obtain the microfiche copy of the prior application and image or OCR scan it into the electronic data base. For applications under § 1.62 which add additional disclosure, *i.e.*, continuation-in-part applications, a substitute specification and drawings will be necessary for image or OCR scanning into the electronic data base. Therefore, an amendment has been proposed to § 1.62 to provide that, where the application is a continuation-in-part application, a substitute specification in compliance with § 1.125 and drawings will be required.

Section 1.62 currently provides that no copy of the prior application or new specification is required, and further provides that the filing of such a copy or specification will be considered improper, and a petition is necessary to obtain the date of deposit of the request for an application under § 1.62 as the filing date. Section 1.62, as proposed, would provide

that the failure to provide any required substitute specification would not affect the filing date of the application, but a time period, non-extendable under § 1.136(a), would be set for its filing. Section 1.62, as proposed, would further provide that any new specification filed in an application under § 1.62 would not be considered part of the original application papers, but would be treated as a substitute specification under § 1.125. Any request to treat a new specification filed in an application under § 1.62 as part of the original application papers may be by way of petition under § 1.182.

Finally, amendments to §§ 1.77, 1.154, and 1.163 have been proposed to provide a standard arrangement for utility, design, and plant applications, respectively. This standard arrangement will include, *inter alia*, a Fee Transmittal form for utility, design, and plant applications, a Utility Patent Application Transmittal form, a Design Patent Application Transmittal form, a Plant Patent Application Transmittal form, and a Plant Color Coding Sheet for plant applications. Standardized versions of the Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, as well as a standard Declaration form and Plant Patent Application Declaration form, are included as an Appendix A to this notice of proposed rulemaking.

3. Assuming that the entire application is not published, what information concerning the application should be publishedin the *Gazette of Patent Application Notices*?

Summary: A slight majority of the comments indicated that the printed publication should include the entire application, or at least the claims, each independent claim, or a claim of each statutory class in the application. The remaining comments that did not oppose pre-grant publication indicated that any Patent Application Notice should contain information similar to what is published in the *Official Gazette* or sufficient information to determine whether further investigation was warranted. Those comments that opposed any pre-grant publication opposed publication of any information other than the applicant's name, address and a "non-enabling" abstract of the invention.

Response: The Technical Contents Publication will include a copy of the Patent Application Notice, and the specification, abstract, claims and drawings of the application-as-filed. The Technical Contents Publication will be available for public review through video display terminals in the Public Search Room and through CD-ROM collections of facsimile images of Patent Application Notices and Technical Contents Publications in the Patent and Trademark Depository Libraries. Copies of the Patent Application Notices and Technical Contents Publications will also be available for purchase under the conditions that paper copies of patents are currently available for purchase. When budgetary and process constraints permit, text searching of the Patent Application Notices and Technical Contents Publications will be implemented.

H.R. 1733, if enacted, would not provide any appropriations to cover the costs of early publication, but would provide that these costs are to be recovered by adjusting the filing, issue and maintenance fees, by charging a separate publication fee, or by any combination of these methods, *i.e.*, that the patent applicant is to bear the costs of publication. A number of comments have criticized this method of allocating the publication costs as pre-grant publication provides no benefit to the patent applicant. The Office was required to balance the requests for a printed publication conveying the greatest amount of application information with those comments opposing additional publication costs. To provide the maximum amount of application information at the lowest cost to applicant, the specification, abstract, claims and drawings of the application-as-filed will be available for public review in the Technical Contents Publication.

4. Should the patent applicant receive a copy of the published application — either published notice and/or application content at time of publication?

Summary: A majority of the comments indicated that the applicant should receive a copy of the Patent Application Notice.

Response: The Office proposes to provide for the delivery of the Patent Application Notice similar to the current delivery of patents.

5. Should the PTO permit an accelerated examination? If so, under what conditions?

Summary: A majority of the comments favored permitting accelerated examination. A number of comments indicated that accelerated examination should be provided for applicants who either: (1) meet the current conditions for accelerated examination; or (2) pay a relatively high fee, *i.e.*, that the Office should add the payment of a high accelerated examination fee to the current conditions for providing an accelerated examination. A number of comments, however, indicated that adding the payment of a high accelerated examination fee to those conditions for providing an accelerated examination would benefit large companies at the expense of small entities.

Response: The Office will provide accelerated examination only under the current conditions set forth in § 1.102, as described in MPEP 708.02. Accelerated examination is currently provided depending upon the subject matter of the invention, medical condition of the applicant, business circumstances, or the willingness of the applicant to participate in a special accelerated examination procedure. Increasing the number of applications receiving accelerated examinations could diminish the availability or speed of accelerated examination to an individual applicant because there will be more applications receiving an accelerated examination. It would further delay the examination of applications not provided with accelerated examination. Adding a condition for providing accelerated examination which bears no relationship to the merits of the application or circumstances of the applicant, *i.e.*, for the mere payment of a fee, is not considered appropriate. Therefore, the Office does not propose to change the conditions under which the examination of an application will be accelerated.

The Office, however, will continue to make special an application under the conditions currently set forth in MPEP 708.02 (VIII), special examining procedures for certain new applications - accelerated examination. MPEP 708.02 (VIII) provides that a new application may be granted special status provided that the applicant: (1) submits a written petition to make special accompanied by the fee set forth in § 1.17(i); (2) presents all claims directed to a single invention, or if the Office determines that all the claims presented are not obviously directed to a single invention, will make an election without traverse as a prerequisite to the grant of special status; (3) submits a statement that a pre-examination search was made; (4) submits one copy each of the references deemed most closely related to the subject matter encompassed by the claims; (5) submits a detailed discussion of the references pointing out with the particularity required by § 1.111(b) and (c) how the claimed subject matter is distinguishable over the references; and (6) submits any affidavit or declaration under § 1.131 that is necessary to overcome the references before the application is taken up for action, but in no event later than one month after request for special status. An application granted special status under MPEP 708.02 (VIII) will be taken up by the examiner before all other categories of applications except those clearly in condition for allowance and those with set time limits, such as examiner's answers, etc., and will be given a complete first action which will include all essential matters of merit as to all claims.

6. Since the cost for publishing applications must be recovered from fees, how should the cost of publication be allocated among the various fees, including the possibility of charging a separate publication fee?

Summary: The overwhelming majority of comments opposed a separate publication fee. Most comments indicated that the costs of publication should be spread over the existing fees, with the remaining comments indicating that these costs should be absorbed by those accessing the published applications or the Office.

Response: H.R. 1733, if enacted, would not provide appropriations for the Office to absorb the publication cost, but provides that the "Commissioner shall recover the costs of early publication ... by adjusting the filing, issue, and maintenance fees, by charging a separate publication fee, or by any combination of these methods." Notwithstanding that H.R. 1733, if enacted, would not authorize the Office to recover the costs of publication through those seeking access to the published application, the demand for publication products, *e.g.*, Patent Application Notices and Technical Contents Publications, would not be consistent, and it would not be possible to project the demand for publication products with the degree of precision necessary to recover a substantial portion of the publication costs through the inclusion of such costs in the fees charged for the publication products. In addition, the Office will supply, *inter alia*, CD-ROM collections of facsimile images of the Patent Application Notices and Technical Contents Publications under the condition that CD-ROM collections of patent images are currently supplied. As the Office has no authority to control the further duplication of such images, it would not be practicable to attempt to recover publication costs through increases in the fees charged for publication products, since those persons desiring copies of Patent Application Notices or Technical Contents Publications would simply obtain them from the original purchasers of the CD-ROM collections, who need not include any publication costs in their prices. Therefore, the Office proposes to adjust the filing, issue, and maintenance fees to recover the costs of publication.

In a Notice of Proposed Rulemaking published in the *Federal Register* at 60 *FR* 27934 (May 26, 1995) and in the Patent and Trademark Office *Official Gazette* at 1174 *Off. Gaz. Pat Office* 134-50 (May 30, 1995), a number of changes to the rules of practice to, *inter alia*, adjust patent and trademark fees to reflect the fluctuations in the Consumer Price Index (CPI) pursuant to 35 U.S.C. 41(f) were proposed (Patent and Trademark Fee Notice of Proposed Rulemaking). The proposed patent and trademark fee adjustments, if adopted in final rules, would take effect on October 2, 1995 (October 1, 1995 being a Sunday), prior to the effective date of the fee increase in this notice of proposed rulemaking to recover the costs of publication. The proposed amendments to §§ 1.19(b)(1)(i) and 1.19(b)(1)(ii) are repeated in this notice of proposed rulemaking for clarity. The Office estimates that it will cost about $9 million to publish applications in Fiscal Year 1996. To allocate these costs among the filing fees of those applications which the Office anticipates will be filed in Fiscal Year 1996, the issue fee for those applications for which the Office anticipates payment of an issue fee in Fiscal Year 1996, and maintenance fees due at three (3) years and six (6) months, seven (7) years and six (6) months, and eleven (11) years and six (6) months for those patents for which the Office anticipates payment of the respective maintenance fees in Fiscal Year 1996, a further increase in the filing fee for an original nonprovisional (35 U.S.C. 111(a)) or reissue application to $780 ($390 for a small entity) and a plant application to $540 ($270 for a small entity), issue fee for an original or reissue application to $1280 ($640 for a small entity) and a plant application to $660 ($330 for a small entity), maintenance fee due at three (3) years and six (6) months to $1020 ($510 for a small entity), maintenance fee due at seven (7) years and six (6) months to $2020 ($1010 for a small entity), and maintenance fee due at eleven (11) years and six (6) months to $3020 ($1510 for a small entity) is necessary to recover the costs of publication in Fiscal Year 1996. A comparison of existing fee amounts, fee amounts proposed in the Patent and Trademark Fee Notice of Proposed Rulemaking, and fee amounts proposed in this notice of proposed rulemaking is included as an Appendix B to this notice of proposed rulemaking.

7. Should the PTO require an affirmative communication from a patent applicant indicating that the applicant does not wish the application to be published, or should failure to timely submit a publication fee be taken as instruction not to publish the application? That is, should an application be published unless the applicant affirmatively indicates that the application is not to be published, regardless of whether a publication fee has been submitted?

What latitude should the PTO permit for late submission of a publication fee?

Summary: An overwhelming majority of the comments (except for those who opposed any pre-grant publication) favored a requirement that an applicant affirmatively communicate that an application is being expressly abandoned to avoid publication of the application at 18 months.

Response: The Office does not process applications as abandoned until seven (7) months after the mailing date of an Office action to allow for extensions of time under § 1.136(a) and mailing delays. Where no response to an Office action setting a shortened statutory period for response of three (3) months mailed at 13 months after filing in an application is received, the application becomes abandoned by operation of 35 U.S.C. 133 at 16 months after filing, but is not recognized or processed by the Office as an abandoned application until 20 months after filing, and thus would be published in regular course at 18 months. Therefore, an applicant intending to permit an application to become abandoned for failure to respond to an Office action mailed within seven (7) months of the projected publication date must take affirmative action to avoid publication of the application.

The Office intends to indicate the projected date of publication on the filing receipt. Any person who wants to avoid publication of the application at 18 months must submit a letter of express abandonment in sufficient time to permit the Office to act on the letter. Likewise, any person who considers the projected date of publication on the filing receipt to be incorrect must submit a request to correct the projected date of publication in sufficient time to permit the Office to act on the request.

Currently, the Office considers two (2) months to be the minimum time necessary to avoid publication of an application. Therefore, any letter of express abandonment or request to withdraw the application from publication submitted less than two (2) months from the projected date of publication will not be considered effective to avoid publication of the application at the projected date of publication. The Office also intends to indicate on the filing receipt the date by which an application must be expressly abandoned to avoid its publication.

8. The delayed filing of either a claim for priority under 35 U.S.C. 119 or 120 may result in the delayed publication of the application. Should priority or benefit be lost if not made within a reasonable time after filing? What latitude should the PTO permit for late claiming of priority or benefit?

Summary: A large majority of the comments indicated that claims for priority under 35 U.S.C. 119 and 120 should be lost if not timely filed. A number of comments also indicated that there should be provisions for the acceptance of late claims for priority.

Response: The submission of a claim for priority under 35 U.S.C. 119 or 120 later than four (4) months prior to the publication date appropriate for an application claiming that priority date will result in delays in the publication of the application and will interfere with the publication process. Therefore, the Office proposes to change the rules of practice to provide that claims for priority under 35 U.S.C. 119 or 120 must be made within two (2) months of filing, or fourteen (14) months from the filing date for which a benefit is desired, whichever is later. To avoid a potential loss of patent rights to an applicant who inadvertently failed to present a timely claim for priority, the Office further proposes to provide for the acceptance of late claims for priority submitted during the pendency of the application with a surcharge, so long as the delay in submitting the claim for priority was unintentional.

9. Once the patent has issued, should the paper document containing information similar to that published in the Gazette of *Patent Application Notices, i.e.*, the Patent Application Notice, be removed from the search files, and should publication information be included on the issued patent?

Summary: A majority of the comments indicated that the Patent Application Notice should not be removed from the search files.

Response: The Office will not remove the Patent Application Notice from the search files upon issuance of the patent.

10. After publication, should access to the content of the application file be limited to the originally filed application papers?

If not, what degree of access should be permitted? Should access be limited to the content before publication, or should it extend to materials added after publication?

Summary: A majority of the comments indicated that, upon publication, the access to the content of the application file should not be limited.
Response: The Office proposes to change the rules of practice to provide that, upon publication, access to the entire content of the application file would be permitted. To avoid undue interference with the examination of the application, however, the public access to the application file of a pending published application is proposed to be limited to obtaining, upon the payment of the fee set forth in § 1.19(b)(2), a copy of the application file produced during non-working hours by the Office when the application file is made available by the appropriate patent application processing organization. The Office also proposes to provide, upon the payment of the fee(s) set forth in § 1.19(b)(4), as proposed, a copy of specifically identified document(s) contained in a pending published application.

The Office will provide public access to a database containing information concerning the status of a pending published application and the content of the application file similar to that contained in the Patent Application Location and Monitoring (PALM) system. Using this database, interested members of the public will be able to ascertain the status of a pending published application to determine whether obtaining a copy of the file wrapper and content of the application or any document(s) in the file wrapper is warranted. In addition, this database can also be used to permit specific identification of the document(s) of which a copy is desired, assuming that obtaining a copy of the entire file wrapper and content is not considered warranted.

The Office specifically proposes to provide a copy of a specifically identified document contained in a pending published application for a fee of $75.00. Each paper in the application file to which a separate paper number is assigned constitutes a document in the application. As the cost of obtaining a pending published application from its location in the various patent application processing organizations throughout the Office is a substantial portion of the cost of providing a copy of the file wrapper and content of a pending published application, the fee for providing a copy of the first requested document from a pending published application must recover the cost of obtaining the application. The Office, however, will provide copies of additional documents from the same application in the same request for a fee of $25.00 per document.

11. After publication, should assignment records of a published application also be made accessible to the public?

Summary: An overwhelming majority of the comments indicated that, upon publication, the assignment records of an application should be accessible to the public.
Response: The Office proposes to change the rules of practice to provide that, upon publication, the assignment records of the application would be available by both application and Patent Application Notice (PAN) number and open to public inspection through the existing Patent Assignment Search System. The Office further proposes to permit applicants to indicate on the assignment cover sheet whether they want assignment information to be printed on the Patent Application Notice. The Office, however, does not propose to require that any assignment information be printed on the Patent Application Notice.

12. After publication, should access include the deposit of biological materials as set forth in § 1.802 *et seq.*?

Summary: A majority of the comments indicated that, upon publication, any deposit of biological materials should be accessible to the public. A number of comments, however, indicated that such access should be limited in the manner similar to that in European or Japanese laws, or that such access should be limited to experimental use.
Response: Section 1.809(c) currently provides that the applicant need not provide any necessary deposit of biological materials until three (3) months from the mailing of the Notice of Allowance and Issue Fee Due. The deposit of biological materials on filing of an application are often required by foreign laws. Applicants may not be able to claim priority under these laws based upon an earlier United States application filed without any necessary deposit of biological materials. The laws and rules of practice of the United States, however, do not require an applicant to make any deposit of biological materials until the application is allowed. *See, In re Lundak*, 723 F.2d 1216, 227 USPQ 90 (Fed. Cir. 1985). Accordingly, the Office proposes to change the rules of practice to provide that, upon publication, any deposit of biological materials that has been made would be available after deposit under the same conditions that such deposit of biological material would be available for an issued patent.

13. What types of problems will be encountered if all amendments must be made by (a) substitute paragraphs and claims, (b) substitute pages, or (c) replacement of the entire application?

Summary: A majority of the comments indicated that, if the rules of practice regarding the submission of amendments were changed, a requirement for substitute paragraphs and claims, or substitute pages would be acceptable.
Response: The Office currently considers changes in the procedures for entering amendments into applications to be unnecessary to the current planning approach to implementation of 18-month publication, and, as such, no change to the rules of practice to require substitute paragraphs and claims, substitute pages, or replacement of the entire application is being proposed.

14. Should protest procedures be modified to permit the third-party submission of prior art only prior to a specific period after publication of the application? What action should be taken with respect to untimely submissions by a third party?

Summary: A majority of comments indicated that third party submissions of prior art patents and publications should be permitted for a limited period upon publication, but the overwhelming majority of comments opposed any pre-grant opposition procedure.
Response: The Office does not intend to institute any procedures that would amount to pre-grant opposition. H.R. 1732 was also introduced in the House of Representatives on May 25, 1995, and, if enacted, will expand reexamination, *i.e.*, post-grant opposition, proceedings to provide a third party requester with increased participation rights, including the right to appeal any decisions favorable to patentability to the Board of Patent Appeals and Interferences and to the courts. In view of the opposition to pre-grant third party participation, *i.e.*, support for the continued *ex parte* examination of pending applications, the Office proposes to change the rules of practice to limit the period for filing protests and petitions for the institution of public use proceedings.

The Office proposes to change the rules of practice concerning protests to provide that a submission by a third party in a pending application would be considered if: (1) it is submitted within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first; (2) the submission has been served on the applicant in accordance with § 1.248 if filed after the date the application was published, and the submission indicates such service; (3) the submission is accompanied by a $220 fee if submitted after publication of the application; and (4) the application is still pending when the submission and application file is brought before the examiner.

The $220 fee for a protest submitted after publication of the application is considered appropriate. Any party submitting a protest after publication has benefitted by the publication of the application. The third party should not obtain this benefit solely at the expense of the patent applicant, but should obtain this benefit only upon payment of a fee. In addition, it is expected that any protest submitted after publication of the application will be considered late in the prosecution of the application, which will cause inconvenience both to the patent applicant and the Office. Therefore, the requirement for the payment of a fee is considered appropriate to defray the costs of the belated consideration of any such submission and discourage the submission of protests having questionable merit.

Third parties may continue to submit information concerning prior public use of the invention in accordance with § 1.292.

Currently, § 1.292 does not set forth a time period within which a petition for the institution of public use proceedings must be filed. The Office proposes to further amend § 1.292 to provide that the public use petition will be entered if submitted within two months of the publication date of the application or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first.

The proposed changes to §§ 1.291 and 1.292 are intended to limit any right of third parties to have information entered and considered in a pending application. They do not vest the applicant with any right to prevent the Office from *sua sponte* making such information of record in the application or relying upon such information in subsequent proceedings in the application, *i.e.*, they do not limit the authority of the Office to reopen the prosecution of an application to consider any information deemed relevant to the patentability of any claim.

A number of miscellaneous comments concerning the 18-month publication of patent applications were also received.

Comment 1: A number of comments opposed any pre-grant publication of pending applications as an improper limiting of the right of a patent applicant to maintain trade secrets, or argued that any pre-grant publication should not occur prior to 24 or 60 months from the earliest filing date.
Response: H.R. 1733, if enacted, would require the Commissioner to publish pending applications at 18 months. The proposed changes to the rules of practice concern the implementation of an 18-month publication system mandated by statute, not the advisability of an 18-month publication system. If legislation containing provisions for the publication of pending applications is enacted, it is not expected that the Office would have the discretion to determine whether or when pending applications are to be published. That is, it is expected that any legislation containing provisions for the publication of pending applications will mandate whether and when applications are to be published.
Comment 2: A number of comments indicated that the publication of pending applications should be joined with provisional rights.
Response: H.R. 1733, as proposed, provides for provisional rights. This issue, however, was not treated in the 18-Month Publication Notice or this notice of proposed rulemaking since it does not affect the way business is conducted with or within the Office.
Comment 3: One comment indicated that the requirement under 35 U.S.C. 112, first paragraph, for a disclosure of a best mode should be eliminated in view of 18-month publication.
Response: The requirement in 35 U.S.C. 112, first paragraph, for a disclosure of a best mode is a statutory, not regulatory, requirement. Therefore, the Office has no authority to eliminate or limit this requirement of the patent statutes.
Comment 4: One comment indicated that any publication of patent applications should address the situation in which: (1) an applicant files a continuing application prior to receiving a patent, and then maintains the pendency of continuing application(s), which are maintained in confidence, to obtain claims of various scope; (2) a second party invests resources in developing a product which does not infringe the claims of the patent, but which the applicant could draft claims in the continuing application(s) to cover; and (3) the applicant then permits a continuing application having claims which covers the second party's product to issue, thus checkmating the second party.
Response: H.R. 1733, if enacted, would provide that applications shall be published "as soon as possible after the expiry of a period of 18 months from the earliest filing date for which a benefit is sought." Any continuing application which claims priority from any prior application would be published either 18 months after the filing date of the earliest filed prior application or as soon as possible after filing of the continuing application, and thus would not be maintained in confidence.
Comment 5: One comment indicated that applicants should obtain the defensive benefit of their filing date in a published application regardless of whether the application issues as a patent, either by statute or rule.
Response: H.R. 1733, if enacted, would provide that a published application is prior art under 35 U.S.C. 102(e) as of its filing date. As prior art is defined by statute, *i.e.*, 35 U.S.C. 102, the Office has no authority to promulgate regulations defining what does or does not constitute prior art.
Comment 6: One comment indicated that any rulemaking should be postponed until there is pending legislation, and it is clear as to what form 18-month publication will take.
Response: As legislation has been introduced, it is now appropriate to initiate the rulemaking process, the form that 18-month publication will likely take is known. As such, in light of the changes that would be necessitated by this legislation, the requirement for a rapid implementation, if enacted, and a desire on the part of the Office to receive public input prior to initiating the rulemaking process. If H.R. 1733 is amended during the legislative process, the final rules will comply with this legislation as enacted. If H.R. 1733 is not enacted, the proposed rules that would implement publication of patent applications would be withdrawn.
Comment 7: One comment indicated that it is unclear as to whether, when a restriction requirement is applied, each application will require a separate publication fee.
Response: No separate publication fee has been proposed. In accordance with current practice, each application would require separate filing, issue, and maintenance fees, which fees will be increased to recover the costs of publication.
Comment 8: Several comments indicated that the Office should not impose access fees for either copying the paper application files, or searching and copying a published application from any electronic data base.
Response: As discussed *supra*, the Office intends to provide free public access to images of the Patent Application Notices and Technical Contents Publications through video display terminals in the Public Search Room and through CD-ROM collections of facsimile images of Patent Application Notices and Technical Contents Publications in the Patent and Trademark Depository Libraries. Copies of the Patent Application Notices, Technical Contents Publications, or copies of the file wrapper and contents of the application will be available for a fee. The costs of publication have been allocated primarily to those applicants whose applications are being published. Since publication primarily benefits those seeking access to the published applications, it is reasonable to require such persons to pay a fee for making copies of the Patent Application Notices and Technical Contents Publications, or obtaining a copy of the file wrapper and application contents of a published application from the Office.
Comment 9: One comment indicated that the publication of applications may result in instances in which third parties will submit information to the applicant directly, rather than to the Office. In instances in which the applicant was previously aware of the information, but did not consider it material, the applicant cannot submit the information to the Office in that application (if after final or allowance), but will be charged with a § 1.56 violation if they do not file a continuation application to have it considered. Thus, § 1.56 should be amended such that an applicant in this situation no longer has a duty to submit information to the Office.
Response: Section 1.56 expressly provides that there is no duty to submit information which is not material to the patentability of any existing claim. Since the applicant previously determined that the information was not material, the fact that a third party has provided this previously known material to the applicant has no effect on the applicant's compliance with § 1.56. Second, since the applicant was previously aware of this information, the applicant is under a duty to bring such information to the attention of the Office if it is material, regardless of the actions of any third party, and the applicant is not under a duty to bring such information to the attention of the Office if it is not material, again regardless of the actions of any third party. In either instance, the third party's actions have no bearing on whether the applicant is in compliance with § 1.56. Therefore, no change to § 1.56 is being proposed.
Comment 10: One comment indicated that § 1.56 should be modified or abolished. Where information is brought to the attention of the applicant after allowance, the applicant should be considered to have met his or her duty of disclosure under § 1.56 if the applicant simply chooses to permit the patent to issue, as the public can take care of itself through reexamination or whatever opposition proceedings are instituted.
Response: As indicated *supra*, no change to § 1.56 is being proposed. In addition, the Office is proposing to limit third

party protest procedures, and is not proposing to develop any procedures amounting to pre-grant opposition. Since the Office is continuing the *ex parte* examination of applications, the proposed modification or abolition of § 1.56 is not considered appropriate.

Comment 11: One comment indicated that an applicant should be allowed to request early publication.

Response: Section 1.306(d) is being proposed to provide for petitions requesting early publication.

Comment 12: One comment indicated that the Office should require that the text of all applications be filed in digital form, and the publication of applications should be purely digital, *i.e.*, that Office should not print any publication.

Response: 35 U.S.C. 22 provides that "[t]he Commissioner may require papers filed in the Patent and Trademark Office to be printed or typewritten." Therefore, the Office does not currently have the authority to require that application papers be submitted in digital form. The Office is considering the legislative and regulatory changes that would be necessary to permit purely digital filing of application papers; however, requiring all applicants to submit application papers in digital form at this time would place an unnecessary burden on those applicants lacking word-processing resources. In addition, the Office received a substantial number of comments requesting a printed publication containing more information, as well as a number of comments opposing the promulgation of any regulations concerning a standard application format which were in excess of EPO and PCT regulations and not necessary to 18-month publication.

Comment 13: One comment indicated that the Office should clearly define or eliminate the "formal" pre-examination search requirement in MPEP 708.02.

Response: MPEP 708.02(VIII) provides that an application may be granted special status under the condition that, *inter alia*, the applicant:

> Submits a statement that a pre-examination search was made, and specifying whether by the inventor, attorney, agent, professional searchers, *etc.*, and listing the field of search by class and subclass, publication, Chemical Abstracts, foreign patents, *etc.* A search made by a foreign patent office satisfies this requirement.

This definition of a pre-examination search is reasonably clear as to what actions are necessary for an applicant to have satisfied this requirement of MPEP 708.02(VIII), and the requirement for a pre-examination search is basic to the justification for granting special status to an application on that basis. No changes to 37 CFR 1.102 are being proposed.

Comment 14: One comment indicated that the publication of applications at 18 months will create a security review problem, especially where a nonprovisional, *i.e.*, 35 U.S.C. 111(a), application claiming the benefit of a prior provisional application not subject to a secrecy order contains additional material which must be reviewed. Therefore, the Office should require that any nonprovisional applications claiming the benefit of a prior provisional application indicate any additional material by underlining and bracketing.

Response: Provisional applications will increase the number of applications requiring security screening. All provisional applications will require security screening immediately after filing in the same manner as nonprovisional applications due to the licensing provision of 35 U.S.C. 184. Any subsequent U.S. patent application claiming the benefit of a prior provisional application will also require security screening unless it is evident on its face that no additional subject matter is contained in the application beyond that in the provisional application. It would be beneficial for the applicant to provide this information to the Office upon filing of the nonprovisional application. Thus, the Office is considering suggesting that applicants employ a standard application transmittal letter similar to the standard transmittal letter for transmitting an international application to the United States Receiving Office (PTO-1382). This standard transmittal letter would indicate, *inter alia*: (1) any difference between a provisional application and a nonprovisional application claiming the benefit of the provisional application; (2) the residence of the inventor(s) to avoid the unnecessary screening of foreign origin applications; and (3) any Government interests in the application, which applications should be screened through contract provisions.

Comment 15: One comment indicated that the Office should automatically place a secrecy order on any nonprovisional application in which the prior provisional application was under a secrecy order.

Response: The Office does not have the authority to impose a secrecy order without a specific recommendation from a defense agency. 35 U.S.C. 181. Additionally, all secrecy orders include the provision that any other patent application already or hereafter filed in this or any foreign country which contains any significant part of the subject matter of the application under secrecy order also falls within the scope of the secrecy order and must be brought to the immediate attention of Licensing and Review. See § 5.2(d). All papers pertaining to such applications must be filed under the provisions of § 5.33, *i.e.*, to the attention of Licensing and Review. Thus, the applicant is obligated to maintain proper security of any nonprovisional application that claims benefit of a prior provisional application under a secrecy order.

Comment 16: One comment expressed concern that the defense agencies may not have sufficient time to complete national security review of applications made available to them under 35 U.S.C. 181 prior to publication at 18 months from the earliest filing date for which a benefit is sought, and suggested that applications not be published until they have been cleared by the defense agencies.

Response: H.R. 1733, if enacted, would provide for withholding an application from publication beyond 18 months from the earliest filing date for which a benefit is sought if the application is under a secrecy order or abandoned. There is no provision for delaying the publication of an application until a completion of all reviews under 35 U.S.C. 181. In addition, 35 U.S.C. 184 authorizes foreign filing of an application without the need for a license once the application has been on file for at least six (6) months. In view of 35 U.S.C. 184, the defense agencies must complete all security reviews within six (6) months of filing to prevent public disclosure. Thus, security review must be completed within six (6) months of the actual U.S. filing date. For those applications due for publication prior to six (6) months from the actual filing date, *e.g.*, those claiming the benefit of an earlier application filed more than 18 months prior and those which a petition for early publication has been granted, considerations of national security mandate a limited delay in publication. The Office will not pass an application for publication that is still under review by a defense agency unless it has been on file for at least six (6) months and the defense agency has been provided a minimum of three (3) months to review the application.

Comment 17: One comment indicated that the digitized images of the application file contents should be available in magnetic tape form in the morning of the day of publication.

Response: Digitized images of the Patent Application Notice and Technical Contents Publication will be available in magnetic tape form for a fee to all parties as soon as possible after publication similar to the way in which digitized images of granted patents are provided, assuming that there is interest in such products.

Comment 18: One comment indicated that it is unclear as to whether an examiner can cite the Patent Application Notice, and whether the examiner will be required to supply the full application specification.

Response: When an examiner cites a published application, a copy of the Technical Contents Publication will be provided with the Office action under the same conditions that a copy of the entire patent of any cited patent would currently be provided. That is, where an examiner would provide only those portions of a patent relied upon, rather than a copy of the entire patent due to its size, *i.e.*, in instances of jumbo patents, the examiner would similarly be expected to provide only those portions of a published application relied upon in instances of jumbo applications.

Comment 19: One comment indicated that the entire application as filed should be published, otherwise the abandoned published application must be permanently stored in a manner that would permit on-site retrieval.

Response: The Technical Contents Publication of any published application will be electronically available, without any necessity for retrieval of the actual application file. Therefore, a printed publication of the application-as-filed would not provide any information not electronically available. Nevertheless, the actual file of an abandoned application may be readily obtained regardless of where it is stored.

Comment 20: One comment indicated that the 18-Month Publication Notice did not set forth the capacity of Patent and Trademark Depository Libraries (PTDLs) to: (1) collect fees, (2) provide librarians of assistance, and (3) house new publications.

Response: Each PTDL sets its own service standard procedures. Any customer must directly contact the PTDL to ascertain its customer service standards and requirements. Nevertheless, as the Office proposes to publish only a Patent Application Notice, rather than the entire application-as-filed, in printed form, and further proposes to provide the Patent Application Notices and Technical Contents Publications to PTDLs through CD-ROM collections of facsimile images, this publication of applications would appear to alleviate, rather than exacerbate, any publication storage housing problems.

Comment 21: One comment indicated that the Office should provide a first Office action on the merits in all patent applications within 14 months of the actual filing date of the application in the United States.

Response: The ability of the Office to process application within any established time frame is entirely dependent upon the staff and resources allocated by Congress, the Office of Management and Budget (OMB), and the Department of Commerce (DoC). In January of 1995, the first Office action was mailed within 14 months of the actual filing date of the application in the United States in ninety-two (92) percent of all applications in which a first Office action was mailed, Any applicant who absolutely needs a first Office action on the merits mailed within 14 months of the actual filing date of the application should consider a petition to make special using the special examining procedure for certain new applications set forth in MPEP 708.02(VIII). In addition, any independent inventor meeting the requirements set forth in 35 U.S.C. 122(b)(2) and § 1.306(e), as proposed, may wish to consider filing the application with a petition under § 1.306(e).

Comment 22: One comment noted the current procedure of permitting applicants to submit trade secret material and later expunge the material if it is not necessary to patentability, and indicated that new procedures should be implemented in the content of pre-grant publication of pending applications.

Response: The current procedures for the treatment of petitions to expunge trade secret, proprietary, or protective order material are set forth in MPEP 724.05. Applicants are cautioned, in MPEP 724.05, that in instances in which a decision on the petition is not made prior to the date on which the application issues as a patent, any material in the application file will remain open to public inspection, and, as such, petitions to expunge must be filed as soon as possible. Under an 18-month publication system, any material in the application file on the date the application is published would likewise remain open to public inspection. However, as petitions to expunge are considered under § 1.182, *i.e.*, petitions not otherwise provided for, no change to the rules of practice regarding petitions to expunge is being proposed.

Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Parts 1, 3 and 5, are proposed to be amended as follows:

Section 1.4(a), as proposed, would add Patent Application Notices and Technical Contents Publications to those services and facilities which correspondence with the Office may comprise.

Section 1.5(a), as proposed, would provide that any letter concerning an application must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number) or serial number and filing date assigned to that application by the Office, or the international application number of the international application, regardless of whether the application is a published application. That is, the identification required for a pending or abandoned application would not change due to its status as a published application.

Section 1.5(f), as proposed, would provide that a paper concerning a provisional application must identify the application as such and by the application number.

Section 1.5(g), as proposed, would provide that a paper relating to a Patent Application Notice should identify it as such and by the Patent Application Notice number. That is, a paper concerning a published application must identify the application by application number, not Patent Application Notice number; however, a paper concerning the Patent Application Notice *per se* must identify it by Patent Application Notice number.

Section 1.9(a), as proposed, would define an international application in subparagraph (a)(4), rather than in paragraph (b).

Section 1.9(b), as proposed, would now define a published application as an application for patent which has been published pursuant to 35 U.S.C. 122(b).

A new § 1.9(h), as proposed, would define national security classified as specifically authorized under criteria established by Act of Congress or Executive Order to be kept secret in the interest of national defense or foreign policy and in fact properly classified pursuant to Act of Congress or Executive Order.

Section 1.11, as proposed, would provide that, like an issued patent or a statutory invention registration, the specification, drawings, and all papers relating to the case in the file of an abandoned published application would be open to inspection by the public. Section 1.11, as proposed, would further provide that a copy of the specification, drawings, and all papers relating to the case in the file of any published application, a patent, or statutory invention registration may be obtained upon the payment of the fee set forth in § 1.19(b)(2). That is, while the actual application file of an abandoned published application, patent, and statutory invention registration would be available for public inspection, the actual application file of a pending published application would not be available for public inspection, but a copy of the specification, drawings, and all papers relating to a pending published application would, upon the payment of the fee set forth in § 1.19(b)(2), be provided to any member of the public.

Section 1.12, as proposed, would provide that the assignment records relating to published applications are available and open to public inspection at the Office, and copies of those assignment records may be obtained upon request and payment of the fee. Section 1.12 would further exclude the assignment records of published applications from those records that are preserved in confidence. Finally, § 1.12, as proposed, would revise paragraph (c) to read "preserved in confidence under § 1.14" for consistency with § 1.14.

Section 1.13, as proposed, would provide that, like an issued patent, certified and non-certified copies of Patent Application Notices, Technical Contents Publications, and the file wrapper and contents of published applications would, upon payment of a fee, be furnished to any person.

Section 1.14, as proposed, would revise the title and paragraphs (a) and (e) to read "preserved in confidence" for consistency with the language in 35 U.S.C. 122.

Section 1.14(a), as proposed, would provide that published applications are excluded from those pending and abandoned applications which are maintained in confidence. Section 1.14(a), as proposed, would further change "the United States of America has been indicated as a Designated State in a published international application" to "a published international application in which the United States of America has been indicated as a Designated State" for clarity, and add "U.S. published application" to those documents in which identification of an application by application number or serial number and filing date would entitle the public to status information concerning the application. Section 1.14(a), as proposed, would further provide that reference to an application in a U.S. published application or patent, or identification of an application by application number or serial number and filing date in a published patent document or a published international application in which the United States of America has been indicated as a Designated State would entitle the public to the application number, filing date, and status information concerning any application claiming the benefit of the identified or referenced application. Finally, § 1.14(a), as proposed, would replace the phrase "serial number" with "application number or serial number and filing date" since the mere reference to a serial number without the series code (application number) or filing date would not constitute a reference to a specific single application.

Section 1.14(b), as proposed, would provide that published applications, as well as applications that are referred to in a published application, are excluded from those abandoned

applications which are not open to public inspection. Section 1.14(b), as proposed, would further provide that applications that are referred to in applications open to public inspection pursuant to this section and applications which claim the benefit of an application open to public inspection pursuant to this section are also excluded from those abandoned applications which are not open to public inspection. Finally, § 1.14(b), as proposed, would further remove applications that have been published pursuant to 35 U.S.C. 122(b) from those abandoned applications that may be destroyed after 20 years from their filing date.

Section 1.16(a), (h) and (g), as proposed, would increase the filing fee for an original nonprovisional (35 U.S.C. 111(a)) or reissue application to $780 ($390 for small entities), and plant application to $540 ($270 for small entities). The filing fee for a design application would not be affected by this proposed rule change.

Section 1.17(i), as proposed, would add petitions under § 1.306(d) for early publication of an application, petitions under § 1.306(e) for deferred publication of an application, and under § 1.701(f) for patent term extension based upon administrative delays not specifically provided for to the list of petitions for which the fee set forth in § 1.17(i) is required.

A new § 1.17(t), as proposed, would be added to establish the fee for submitting a protest under § 1.291 after publication of an application.

A new § 1.17(u), as proposed, would be added to establish the surcharge for accepting a late claim for priority under 35 U.S.C. 119(a)-(d) or for the benefit of a prior application under 35 U.S.C. 119(e), 120 or 121 filed during the pendency of the application.

Section 1.18(a) and (c), as proposed, would increase the issue fee for an original or reissue application to $1280 ($640 for small entities), and plant application to $660 ($330 for small entities). The issue fee for a design application would not be affected by this proposed rule change.

Section 1.19(a)(1), as proposed, would add Patent Application Notices to the documents that the Office would supply in the manner of a patent upon payment of a fee.

A new § 1.19(a)(4), as proposed, would add Technical Contents Publications to the documents that the Office would supply upon payment of a fee.

Section 1.19(b)(2), as proposed, would add the file wrapper and contents of published applications to the files that the Office would supply a copy of upon payment of a fee.

Current § 1.19(b)(4), as proposed, would be redesignated as § 1.19(b)(5), and would add the assignment records of published applications to the assignment records that the Office would supply upon payment of a fee.

A new § 1.19(b)(4), as proposed, would provide the fees for a certified or uncertified copy of documents contained in a pending application. Section 1.19(b)(4)(i), as proposed, would provide that the fee for a certified or uncertified copy of the first document contained in a pending application would be $75.00. Section 1.19(b)(4)(ii), as proposed, would provide that the fee for a copy of each commonly requested additional document contained in such pending application would be $25.00. That is, while the fee for the first document contained in a pending application would be $75.00, the fee for a copy of each additional document contained in the same pending application and requested together with the first document would be $25.00. Where, however, a person requests a first document from a pending published application, and subsequently requests an additional document, the additional document was not commonly requested with the first document, and the fee for the additional document would be $75.00. Nevertheless, the fee for any further additional document(s) commonly requested with the additional document would be $25.00 per additional document.

Section 1.19(c), as proposed, would provide that copies of all Technical Contents Publications published annually would also be provided to libraries upon payment of the fee for copies of all patents issued annually.

Section 1.20(e)-(g), as proposed, would increase the fee for maintaining an original or reissue patent in force beyond four years, eight years, and twelve years, respectively, to $1020, $2020, and $3020, respectively ($510, $1010, and $1510, respectively, for small entities).

Section 1.24, as proposed, would add the purchase of copies of Patent Application Notices and Technical Contents Publications to those documents for which the coupons set forth therein may be used.

Section 1.51(a)(1), as proposed, would further provide that a complete application comprises, *inter alia*, an abstract.

Section 1.52(a), as proposed, would provide that all papers which are to become a part of the permanent records of the Office must be legibly typed in permanent dark ink in portrait orientation on flexible, strong, smooth, non-shiny, durable and white paper. Currently, § 1.52(a) permits such papers to be hand-written, and does not limit the color of the ink or paper, quality of the paper, or orientation of the typing. Section 1.52(a), as proposed, would further provide that the application papers must be presented in a form having sufficient clarity and contrast between the paper and the typing thereon to permit electronic reproduction by use of digital imaging and optical character recognition, as well as the direct reproduction currently provided for. Section 1.52(a), as proposed, would further provide that substitute typewritten papers "will," rather than "may," be required if the original application papers are not of the required quality. As any substitute typewritten papers containing the subject matter of the originally filed application papers would constitute a substitute specification, the provisions of § 1.125 governing the entry of a substitute specification would be applicable, and § 1.52(a), as proposed, would include a specific reference to § 1.125.

Section 1.52(b), as proposed, would provide that the claims must be set forth on a separate sheet. Section 1.72(b) currently provides that the abstract must be set forth on a separate sheet. Thus, §§ 1.52(b), as proposed, and 1.72(b) would require that the abstract and claims be set forth on a separate sheet. Section 1.52(b), as proposed, would further provide that the sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and that no holes should be provided in the paper sheets. Section 1.52(b) currently provides that papers must be written on but one side, but this phrase is proposed to be changed to "typed on but one side" to conform to § 1.52(a) which, as proposed, would no longer permit hand-written or hand-printed ("written or printed") papers. Section 1.52(b), as proposed, would further provide that the lines "must," rather than "should," be 1 1/2 or double spaced, and that the pages "must," rather than "should," be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text. Finally, § 1.52(b), as proposed, would specifically reference drawings to clarify that drawings are part of the application papers, but that the standards for drawings are set forth in § 1.84.

Section 1.52(d), as proposed, would provide that where an application is filed in a language other than English, the verified English translation of the non-English-language application and the fee set forth in § 1.17(k) are required to be filed with the application or within such time period as may be set by the Office, and that extensions of time pursuant to § 1.136(a) would not be available for submitting the English translation.

Section 1.53(d)(1), as proposed, would further provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.53(d)(1), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Section 1.54(b), as proposed, would provide that the applicant will be informed of the application number, filing date, and projected publication date on a filing receipt. The phrase "application serial number" would be changed to "application number" for consistency with § 1.5(a).

Section 1.55(a), as proposed, would provide that any claim to priority under 35 U.S.C. 119(a)-(d) must be stated within two months of filing or within fourteen months of the date of the prior foreign application, whichever is later, and must identify the prior foreign application by specifying its application number, country, and day, month and year of its filing. The proposed amendment to § 1.55, however, would not affect claims to priority under 35 U.S.C. 172, and would not affect the time periods set forth in § 1.55(a) for the perfection of any claim for priority under 35 U.S.C. 119 (a)-(d), *i.e.*, the filing of a certified copy of the foreign application.

Section 1.55(c), as proposed, would provide a procedure for the acceptance of claim to priority under 35 U.S.C. 119(a)-(d) presented after the time period set in § 1.55(a). The procedure would require the filing of a petition during the pendency of the application requesting acceptance of the delayed claim, the surcharge set forth in § 1.17(u), and a statement that the delay was unintentional.

Section 1.55(d), as proposed, would provide that the time periods set forth in this section, *i.e.*, two months of filing or within fourteen months of the filing date of the prior foreign application as set forth in § 1.55(a), and during the pendency of the application as set forth in § 1.55(c), cannot be extended.

Section 1.58(b), as proposed, would be removed and reserved as unnecessary in view of the proposed amendments to §§ 1.52(a) and (b).

Section 1.58(c), as proposed, would delete the sentence "[i]f it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet" and "[h]and lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.)" to conform to the typing and paper size and orientation limitations in §§ 1.52(a) and (b), as proposed. Section 1.58(c), as proposed, would further provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.60(d), as proposed, would provide that the applicant will be given a time period, which is not extendable under § 1.136(a), within which to file an abstract and claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction where the papers of the prior application did not comply with §§ 1.52(a) and (b), as proposed, or the drawings of the prior application were of such poor quality as to preclude their digital image scanning into the electronic data base.

Section 1.62(d), as proposed, would provide that the applicant will be given a time period, which is not extendable under § 1.136(a), within which to file any substitute specification and drawings required under § 1.62(e)(2), discussed *infra*.

Section 1.62(e), as proposed, would be subdivided into paragraphs (e)(1) and (e)(2) for clarity. Section 1.62(e)(1), as proposed, would contain the first two (2) sentences of § 1.62(e) without change. Section 1.62(e)(2), as proposed, would provide that a substitute specification and drawings would be required when the application being filed under § 1.62 is a continuation-in-part application. Section 1.62(e) currently provides that no copy of the prior application or new specification is required, that the filing of a copy of the prior application or new specification is in fact considered improper, and that a petition with instructions to cancel the copy of the prior application or new specification is necessary to obtain the date of deposit of the request for an application under § 1.62 as the filing date. Section 1.62(e)(2), as proposed, would provide that any new specification filed will not be considered part of the original application papers, but will be treated as a substitute specification in accordance with § 1.125.

Section 1.62(f), as proposed, would amend "35 U.S.C. 122" to read "35 U.S.C. 122(a)" to reflect the changes in H.R. 1733, if enacted, would change "secrecy" to "confidence" as is found in § 1.14, as proposed, and would change "37 CFR 1.14" to "§ 1.14" for consistency.

Section 1.72(b), as proposed, would provide that the abstract should be prior to the first page of the specification, rather than following the claims, to conform to § 1.77, as proposed.

Section 1.75, as proposed, would include an amendment to paragraph (g), and would add two new paragraphs. Section 1.75(g), as proposed, would add the phrase "the least restrictive claim should be presented as claim number 1" to paragraph (g) to facilitate the selection of a representative claim. Section 1.75(h), as proposed, would provide that the claim or claims must be set forth on a separate sheet. Section 1.75(i), as proposed, would provide that where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation to facilitate the digital image and/or OCR scanning of the claim into the electronic data base.

Section 1.77, as proposed, would provide that the elements of the application, if applicable, should appear in the following order: (1) Utility Application Transmittal Form; (2) Fee Transmittal Form; (3) abstract of the disclosure; (4) title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used; (5) cross-reference to related applications; (6) statement regarding federally sponsored research or development; (7) reference to a "Microfiche appendix; (8) background of the invention; (9), brief summary of the invention; (10) brief description of the several views of the drawing; (11), detailed description; (12) claim or claims; (13) drawings; (14) executed oath or declaration; and (15) sequence listing. The phrase "if applicable" is proposed to be inserted in the heading, rather than associated with any particular listed element, to clarify that § 1.77 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.77. Section 1.77, as proposed, would further provide that the (1) abstract of the disclosure; (2) title of the invention; (3) cross-reference to related applications; (4) statement regarding federally sponsored research or development; (5) background of the invention; (6) brief summary of the invention; (7) brief description of the several views of the drawing; (8) detailed description; (9) claim or claims; and (10) sequence listing, should appear in upper case, without underlining or bold type, as section headings, and if no text follows the section heading, the phrase "Not Applicable" should follow the section heading. Finally, § 1.77, as proposed, would be amended to change the reference to § 1.96(b) in § 1.77(c)(2), § 1.77(a)(7) as proposed, to § 1.96(c) for consistency with § 1.96, as proposed.

Section 1.78(a)(2), as proposed, would provide that any claim to the benefit of any prior filed copending nonprovisional application or international application designating the United States of America must be stated within two months of filing or fourteen months from the filing date of the prior application, whichever is later, and must include an identification of the prior application by application number.

Section 1.78(a)(3), as proposed, would delete the sentence "[s]ince a provisional application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday." In view of the proposed amendment in H.R. 1733 to 35 U.S.C. 119(e), the provisions of § 1.7 would be applicable to a nonprovisional application claiming the benefit of a prior provisional application.

Section 1.78(a)(4), as proposed, would provide that any claim to the benefit of any prior filed copending provisional application must be stated within two months of filing or within fourteen months of the filing date of the prior application, whichever is later, and must include an identification of the prior application by application number.

Section 1.78(a)(5), as proposed, would provide a procedure for the acceptance of a delayed claim to priority under 35 U.S.C. 119(e), 120 or 121. The procedure would require the filing of a petition during the pendency of the application requesting acceptance of the delayed claim, the surcharge set forth in § 1.17(u), and a statement that the delay was unintentional.

Section 1.78(a)(6), as proposed, would provide that the time periods set forth in this paragraph, *i.e.*, two months of filing or within fourteen months of the filing date of the prior applica-

tion as set forth in §§ 1.78(a)(2) and (a)(4), and during the pendency of the application as set forth in § 1.78(a)(5), cannot be extended.

Section 1.78(c), as proposed, would change "two or more applications or an application and a patent" to "an application or a patent under reexamination and an application or a patent" such that the provisions of § 1.78(c) will also be applicable to a patent under reexamination. Section 1.78(c), as proposed, would further correct "inventors and owned by the same party contain conflicting claims" to read "inventors are owned by the same party and contain conflicting claims."

Section 1.78(d), as proposed, would change "obviousness-type double patenting rejection" to "non-statutory double patenting rejection" as current examining procedures authorize non- obviousness-type double patenting rejections, as well as obviousness-type double patenting rejections (MPEP 804(II)), and either may be obviated by filing a terminal disclaimer in accordance with § 1.321(b). Section 1.78(d), as proposed, would further change each instance of "application" to "application or a patent under reexamination" for consistency with § 1.321(b) and to clarify that double patenting is a proper consideration in reexamination (*Ex parte Obiaya*, 227 USPQ 58, 60-61 (Bd. Pat. App. & Inter. 1985)), and that a non-statutory double patenting rejection in a patent under reexamination may be obviated by filing a terminal disclaimer in accordance with § 1.321(b).

Section 1.84(c), as proposed, would provide that a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner of the drawing sheet, provided that reference appears within 1.5 cm. (9/16 inch) from the top of the sheet. As the back side of a drawing sheet will not be scanned into the electronic data base, an applicant can include other identifying indicia on the back side the drawing sheet.

Section 1.84(f), as proposed, would provide that the size of all drawing sheets in an application must be either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) to conform to the requirement in § 1.52(b) concerning papers in an application.

Section 1.84(g), as proposed, would be amended to delete the margin requirements for the sheet sizes that would no longer be acceptable if the proposed change to § 1.84(f) were adopted. Section 1.84(g), as proposed, would be further amended to provide that, to facilitate digital image scanning of the drawing sheets, the sheets should have scan targets (cross-hairs) on two cater-corner margin corners. Finally, § 1.84(g), as proposed, would increase the bottom and side margins such that each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

Section 1.84(j), as proposed, would provide that one of the views should be suitable for publication in the Patent Application Notice, and the *Gazette of Patent Application Notices*, as well as the *Official Gazette*, as the illustration of the invention.

Section 1.84(x), as proposed, would be amended to delete the provisions indicating the proper location for holes in a drawing sheet, and provide that no holes should be provided in the drawing sheets.

Section 1.85, as proposed, would provide that drawings must be suitable for "electronic" reproduction "by digital imaging" before being admitted for examination. As discussed *supra*, as a drawing figure will be included in the Gazette Entry in the *Gazette of Patent Application Notices* and the Patent Application Notice, drawings suitable for electronic reproduction by digital imaging would be necessary for the initial processing of the application.

Section 1.96, as proposed, would be amended to designate the text preceding current paragraph (a) as paragraph (a), and would redesignate current paragraphs (a) and (b) as paragraphs (b) and (c), respectively. New § 1.96(a), as proposed, would be further amended to insert a period between "specification" and "[a] computer," to change "these rules" to "this section," and to change "may be submitted in patent applications in the following forms" to "may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section.

New § 1.96(b), as proposed, would be further amended to change the sentences "[t]he listing may be submitted as part of the specification in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as "camera ready copy" when a patent is subsequently printed" and "[s]uch computer printout sheets must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 13 inches wide, and the sheets should be submitted in a protective cover" to "[a]ny listing submitted as part of the specification must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, and the sheets should be submitted in a protective cover," to delete the sentence "[w]hen printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page," and to delete the phrase "if the copy is to be used for camera ready copy." Section 1.96(a)(1), new § 1.96(b)(1) as proposed, currently provides that the requirements of § 1.84 apply to computer program listings submitted as sheets of drawings, and § 1.96(a)(2), new § 1.96(b)(2) as proposed, currently provides that the requirements of § 1.52 apply to computer program listings submitted as part of the specification. Section 1.52(b), as proposed, would require that the sheets of paper be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and § 1.52(a), as proposed, would require that application papers be legibly typed in permanent dark ink in portrait orientation.

New § 1.96(c), as proposed, would be amended to change the references to § 1.77(c)(2) in new § 1.96(c) to § 1.77(a)(7) for consistency with § 1.77, as proposed, to change "may" and "should" to "must," to delete the sentence "[a]ll computer program listings submitted on paper will be printed as part of the patent," to relocate the phrase "except as modified or clarified below" in subsection (c)(2), to change the phrase "computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards" to "computer-generated information submitted as a "microfiche appendix" to an application shall be in accordance with the standards" for clarity, to change to sentences "[e]ither Computer-Output-Microfilm (COM) ouput or copies of photographed paper copy may be submitted" and "[i] the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies" to "[c]omputer-Output-Microfilm (COM) ouput may be submitted in accordance with either NMA standard MS1 or MS2," to change "serial number" to "application number," and to provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.97(a)-(d), as proposed, would be amended to include the phrase "for an applicant for patent or for reissue of a patent, or an owner of a patent under reexamination" in paragraph (a) and "by the applicant or patent owner" to clarify that § 1.97 is not available for any third party seeking to have information considered in a pending application. Any third party seeking to have information considered in a pending application must proceed under §§ 1.291 or 1.292, both discussed *infra*. Section 1.97(c), as proposed, would be further amended to correct the phrase "certification as specified in paragraph (3) of this section" to read "certification as specified in paragraph (e) of this section."

Section 1.98, as proposed, would provide that any Patent Application Notice or Technical Contents Publication listed in an information disclosure statement must be identified by applicant, Patent Application Notice number or Technical Contents Publication number and publication date. Section 1.98, as proposed, would also limit those U.S. patent applications of which a copy need not be included to unpublished applications.

Section 1.107, as proposed, would provide that if domestic published applications are cited by the examiner, their Technical Contents Publication number, publication date, the names of the applicants must be stated. Section 1.107, as proposed, would be amended to delete the phrase "and the classes of inventions."

Section 1.108, as proposed, would further except published applications from those abandoned applications that will not be cited as references.

Section 1.131(a), as proposed, would include pending or patented U.S. published applications which substantially show or describe but do not claim the same patentable invention, as defined in § 1.601(n), and abandoned U.S. published applications as references to which the provisions of § 1.131 apply. Pending or patented U.S. applications would be treated in the same manner that U.S. patents are currently treated, *i.e.*, § 1.131 would apply only if the pending or patented application does not claim the same patentable invention. Abandoned U.S. published applications would be treated in the manner that foreign patents or printed publications are currently treated. As U.S. published applications, either pending, abandoned or patented, may constitute prior art under 35 U.S.C. 102(a) or (e), this change, and the change to § 1.132 *infra*, are necessary to accommodate such references.

In a Notice pf Proposed Rulemaking published in the Federal Register at 59 FR 49876 (September 30, 1994) and in the *Official Gazette* at 1167 Off. Gaz. Office 96-97 (October 25, 1994)(§ 1.131 Notice of Proposed Rulemaking), § 1.131(a) was proposed to be amended to *inter alia* broaden its application to instances in which inventions of a pending application or patent under reexamination and a patent held by a single party are not identical as set forth in 35 U.S.C. 102, but not patentably distinct, and changes to § 1.131 were adopted as a final rule. 60 FR 21043 (May 1, 1995); 1174 Off. Gaz. Pat. Office 155 (May 30, 1995).

An amendment to § 1.131(a) was proposed to avoid a potential conflict between § 1.131(a) and § 1.602(a) in instances in which § 1.131(a) prohibits the filing of affidavits or declarations thereunder when the same patentable invention as defined in § 1.601(n) is being claimed, but § 1.602(a) prohibits, unless good cause is shown, the declaration or continuance of an interference when the application(s) and patent are owned by a single party. While this conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, this conflict can result in hardship where there is a pending application and an issued patent that can no longer be merged by filing a continuation-in-part application.

Specifically, the proposed amendment to § 1.131(a) in the § 1.131 Notice of Proposed Rulemaking would have permitted the filing of an affidavit or declaration thereunder in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e) where the pending application or patent under reexamination and patent upon which the rejection was based were owned by a single party. This proposed amendment to § 1.131(a) in the § 1.131 Notice of Proposed Rulemaking, however, was withdrawn in the final rule to permit further study.

Section 1.131(a), as currently proposed, would permit a showing of prior invention in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e), where the application or patent under reexamination and the patent upon which the rejection is based are both owned by a single party, so long as the invention claimed in the pending application or patent under reexamination and in the other patent are not identical as set forth in 35 U.S.C. 102. Section 1.131(a)(3), as proposed, would not require common ownership at the time the latter invention was made, but consistent with § 1.602(a), would require only that there be common ownership when the § 1.131 affidavit or declaration is under consideration.

Where the patent upon which the rejection is based is not prior art under 35 U.S.C. 102(a) or (e), but is prior art only under 35 U.S.C. 102(f) or (g), to the pending application or patent under reexamination, and the invention claimed in the pending application or patent under reexamination is not identical as set forth in 35 U.S.C. 102, the issue is whether the subject matter of the other patent and the invention claimed in the pending application or patent under reexamination were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person, *i.e.*, whether the patent upon which the rejection is based is disqualified as prior art under the second paragraph of 35 U.S.C. 103, and §§ 1.78(c) and (d) are applicable to this issue. Where, however, the patent upon which the rejection is based is prior art under 35 U.S.C. 102(a) or (e), it cannot be disqualified as prior art under the second paragraph of 35 U.S.C. 103, and as such §§ 1.78(c) and (d) are inapplicable. Section 1.131(a)(3), as currently proposed, would permit a showing of prior invention in an application or patent under reexamination where the application or patent under reexamination and patent upon which the rejection was based were owned by a single party.

As the conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, § 1.131(a)(3), as proposed, provides only for a showing of prior invention to avoid a rejection based upon a patent. In situations in which two pending applications claiming patentably indistinct but not identical inventions are held by a single party but cannot be merged into a single application, petitions under § 1.183 will be entertained for waiver of the § 1.131 requirement that the rejection be based upon a patent.

Section 1.131, as proposed, would not affect a statutory or non- statutory double patenting rejection. Specifically, affidavits or declarations under § 1.131 will continue to be ineffective where the claims of the pending application or the patent undergoing reexamination are rejected under 35 U.S.C. 101 for double patenting and the claims of the pending application or the patent under reexamination claim the identical invention of a patent. However, where patentably indistinct but not identical inventions are claimed, a non-statutory double patenting rejection can be overcome by filing an appropriate terminal disclaimer.

Section 1.132, as proposed, would change "domestic" to "U.S." for consistency with § 1.131, and would include U.S. pending published applications which substantially show or describe but do not claim the invention, and abandoned published applications as references to which the provisions of § 1.132 apply for the reasons discussed *supra*.

Section 1.136(a), as proposed, would provide that extensions under § 1.136(a) are not available where the response is to a requirement for an English translation, an abstract or claims on a separate sheet, or substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction submitted pursuant to §§ 1.52(d), 1.53(d), 1.60(d), 1.62(d), 1.494(c), or 1.495(c), or an oath or declaration submitted pursuant to §§ 1.494(c) or 1.495(c).

Section 1.138, as proposed, would add "or publication" to the end of the sentence that "express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue" to clarify that the express abandonment must be filed in sufficient time to permit its correlation with the application file and the termination of the publication process. Section 1.138, as proposed, would further provide that an applicant seeking to abandon an application to avoid publication of the application must submit a proper letter of express abandonment at least two months prior to the projected date of publication to allow sufficient time to permit the appropriate officials to recognize the abandonment and remove the application from the publication process, and that unless an applicant receives written acknowledgement of the letter of express abandonment prior to the projected date of publication, applicant should expect that the application will be published in due course.

Section 1.154, as proposed, would provide that the elements of a design application, if applicable, should appear in the following order: (1) Design Application Transmittal Form; (2) Fee Transmittal Form; (3) preamble, stating name of the applicant and title of the design; (4) cross-reference to related applications; (5), statement regarding federally sponsored research or development; (6) description of the figure or figures of the drawing; (7) description; (8) claim; (9) drawings or photographs; and (10) executed oath or declaration. The phrase "[t]he following order of arrangement should be observed in framing design specifications" is proposed to be changed to "[t]he elements of the design application, if applicable, should appear in the following order" to clarify that § 1.154 does not per se require that an application include all of the listed elements,

but merely provides that any listed element included in the application should appear in the order set forth in § 1.154.

A new § 1.163(c), as proposed, would be added to provide that the elements of a plant application, if applicable, should appear in the following order: (1) Plant Application Transmittal Form; (2) Fee Transmittal Form; (3) abstract of the disclosure; (4) title of the invention; (5) cross-reference to related applications; (6) statement regarding federally sponsored research or development; (7) background of the invention; (8) brief summary of the invention; (9) brief description of the drawing; (10) detailed botanical description; (11) claim; (12) drawings (in duplicate); (13) executed oath or declaration; and (14) Plant Color Coding Sheet. The phrase "if applicable" is proposed to be included in the heading, rather than associated with any particular listed element, to clarify that § 1.163 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.163.

A new § 1.163(d), as proposed, would be added to define a plant color coding sheet. A plant color coding sheet is a sheet that specifies a color coding system as designated in a recognized color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure. The plant color coding sheet will provide a means for applicants to uniformly convey detailed color characteristics of the plant. Providing this information is a systematic manner will facilitate the examination of the application.

Section 1.291, as proposed, would provide that a protest must be filed within two months of the date the application is published or prior to the mailing of a Notice of Allowance, whichever occurs first, to be considered timely, and that any protest submitted after publication must be accompanied by the fee set forth in § 1.17(t). In addition, § 1.291(a)(2), as proposed, would require that any protest filed after the date the application was published be served upon the applicant in accordance with § 1.248, *i.e.*, filing two copies of the protest in the Office would not be acceptable. As a protest cannot be considered subsequent to issuance of the application as a patent, § 1.291(b), as proposed, would provide that the protest will be considered if the application is still pending when the protest and application file is brought before the examiner, *i.e.*, that the application was pending at the time the protest was filed would be immaterial to its ultimate consideration. Finally, § 1.291, as proposed, would further locate the sentences "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and [p]rotests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office" in paragraph (b).

Section 1.292, as proposed, would be amended to delete the phrase "is filed by one having information of the pendency of an application" as applications will no longer necessarily be maintained in confidence throughout their entire pendency, and would move the requirement for the fee set forth in § 1.17(j) from paragraph (a) to paragraph (b) where the conditions for entry of a petition for the institution of public use proceedings are set forth. Section 1.292, as proposed, would further require that any petition filed after the date the application was published be served on the applicant in accordance with § 1.248. Finally, § 1.292, as proposed, would provide that a petition to institute public use proceedings must be filed within two months of the date the application is published or prior to the mailing of a Notice of Allowance, whichever occurs first, to be considered timely.

Sections 1.305 through 1.309 are proposed to be added to set forth the procedures for the 18-month publication of patent applications.

Section 1.305, as proposed, would provide that applications may be withdrawn from publication at the initiative of the Office or upon request by the applicant. The basis for the withdrawal of an application from publication would be limited to: (1) a mistake on the part of the Office, *e.g.*, the application is abandoned or has issued as a patent, or the projected publication date is not at 18 months from the earliest filing date for which a benefit is sought; (2) the application is either national security classified or subject to a secrecy order pursuant to 35 U.S.C. 181; or (3) express abandonment of the application.

Section 1.306(a), as proposed, would provide that applications under 35 U.S.C. 111(a), 161 or 371 will be published as soon as possible after the expiration of a period of 18 months from the filing date, including the earliest filing date for which a benefit is sought, but excludes applications that: (1) are national security classified or subject to a secrecy order pursuant to 35 U.S.C. 181; (2) have issued as a patent; (3) are recognized by the Office as no longer pending, *i.e.*, are abandoned; or (4) were previously published through early publication.

Section 1.306(b), as proposed, would provide that the publication of an application will include a notice designated as a "Gazette Entry" containing information such as the application number, filing date, title, inventor's name, abstract, a drawing figure, a representative claim, and U.S. and IPC classification in a *Gazette of Patent Application Notices*, and a printed publication designated as a Patent Application Notice or PAN containing information such as the application number, filing date, title, inventor's name, correspondence address, abstract, a drawing figure, a representative claim, and U.S. and IPC classification. In addition, § 1.306(b), as proposed, would provide that the publication of an application will include a document designated as a Technical Contents Publication containing the Patent Application Notice, and the specification, abstract, claims, and drawings of the original application papers. Finally, § 306(b), as proposed, would provide that publication would include public access to a copy of the specification, drawings, and all papers relating to the application file in accordance with § 1.11.

Section 1.306(c), as proposed, would provide that provisional applications under 35 U.S.C. 111(b) shall not be published, and that design applications under 35 U.S.C. 171 and reissue applications under 35 U.S.C. 251 shall not be published pursuant to § 1.306. H.R. 1733, if enacted, would not authorize the publication of design applications (prior to their issuance as patents) or provisional applications. Reissue applications are currently published through the announcement in the *Official Gazette* of the filing of the reissue application, and the opening of the application to public inspection in accordance with § 1.11(b).

Section 1.306(d), as proposed, would provide for the early publication of applications. Any request for early publication of an application should be filed as soon as possible, and must be by way of petition, including the fee set forth in § 1.17(i). In addition, any application must include an abstract and claims on a separate sheet, any substitute specification or drawings required pursuant to §§ 1.53(d), 1.60(d), or 1.62(d), and any English translation required pursuant to § 1.52(d). The Office cannot assure publication of an application on any certain date, and, as such, requests for publication on a date certain will be treated as a request for publication as soon as possible. Finally, as H.R. 1733, if enacted, would not authorize the publication of provisional applications, no consideration will be given to any request for the early publication of a provisional application.

Section 1.306(e), as proposed, would implement the provisions in H.R. 1733 (35 U.S.C. 122(b)(2)) for, under limited circumstances, not publishing an application under 35 U.S.C. 122(b) until three months after an Office action under 35 U.S.C. 132. Section 1.306(e), as proposed, would specifically provide that an applicant who is an independent inventor and has been accorded status under 35 U.S.C. 41(h) in an application that does not claim the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) may request that the application not be published until three months after an action on the merits, and that a petition requesting that the application not be published until three months after an action on the merits must be submitted on filing, and accompanied by the petition fee set forth in § 1.17(i) and a certification that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country, which certification must be verified if made by a person not registered to practice before the Patent and Trademark Office.

Section 1.307, as proposed, would provide for the delivery of the printed publication, *i.e.*, the Patent Application Notice or PAN, to the correspondence address of record, which is the manner in which a patent is currently delivered to the patentee.

Section 1.308, as proposed, would provide for the correction of the printed publication, but such correction would be granted

only for a significant mistake made by the Office which is apparent from Office records.

Section 1.315, as proposed, would change "the attorney or agent of record, if there be one; or if the attorney or agent so requests, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so requests" to "the correspondence address of record. See § 1.33(a)" for simplicity as patents are currently mailed to the patentee at the correspondence address of record.

Section 1.321(c), as proposed, would change "double patenting rejection" to "non-statutory double patenting rejection" for consistency with § 1.78(c), as proposed, and to clarify that the filing of a terminal disclaimer is ineffective to overcome a statutory double patenting rejection.

Section 1.492(a), as proposed, would increase the basic national fee for international applications entering the national stage under 35 U.S.C. 371 to: (1) $710 ($355 for a small entity) where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the Office; (2) $780 ($390 for a small entity) where no international preliminary examination fee as set forth in § 1.482 has been paid to the Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the Office as an International Searching Authority; (3) $1040 ($520 for a small entity) where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the Office; (4) $120 ($60 for a small entity) where the international preliminary examination fee as set forth in § 1.482 has been paid to the Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)); and (5) $910 ($455 for a small entity) where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office.

Section 1.494(c) and (g), as proposed, would provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.494(c), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an English translation, oath or declaration, abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

Section 1.495(c) and (h), as proposed, would provide that the applicant will be given a time period within which to file an abstract and claims on a separate sheet, or substitute specification in compliance § 1.125 with papers typed on but one side of the paper or new sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality, and in a proper size and format for electronic reproduction in instances in which the application papers did not comply with §§ 1.52(a) and (b), as proposed, or the drawings were of such poor quality as to preclude their digital image scanning into the electronic data base. Section 1.495(c), as proposed, would further provide that extensions of time pursuant to § 1.136(a) would not be available for filing an English translation, oath or declaration, abstract and claims on a separate sheet, and a substitute specification with papers typed on but one side of the paper and sheets of drawings, each of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction.

The proposed rules to implement 18-month publication provide that extensions of time pursuant to § 1.136(a) are not available for submissions which will affect the publication of the application. Section 1.53(d)(1), as proposed, does not exclude extensions of time pursuant to § 1.136(a) for the filing of an oath or declaration as the absence of an oath or declaration for an application filed under 35 U.S.C. 111(a) does not affect the publication of the application. Section 1.306(a), as proposed, does not provide for the publication of a national application for patent which resulted from an international application until after compliance with 35 U.S.C. 371, and an international application is not in compliance with 35 U.S.C. 371 until an oath or declaration is filed. See 35 U.S.C. 371(c)(4). Therefore, the absence of an oath or declaration will affect the publication of an application under 35 U.S.C. 371. Accordingly, §§ 1.494(c) and 1.495(c), unlike § 1.53(d)(1), provide that the period for filing the oath or declaration cannot be extended pursuant to § 1.136(a) to consistently provide that extensions of time pursuant to § 1.136(a) are not available for submissions which will affect the publication of the application.

Section 1.497(a), as proposed, would be amended to provide that an applicant in an international application must file an oath or declaration that: (1) is executed in accordance with either §§ 1.66 or 1.68, (2) identifies the specification to which it is directed, (3) identifies each inventor and the country of citizenship of each inventor, and (4) states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought, rather than an oath or declaration in accordance with § 1.63, to enter the national stage pursuant to §§ 1.494 or 1.495. Currently, the failure to file an oath or declaration in strict compliance with § 1.63 results in non-compliance with § 1.497, and thus 35 U.S.C. 371, which in turn delays the entry of the international application into the national stage. To expedite the entry of international applications into the national stage, § 1.497(a), as proposed, would require only an oath or declaration that is properly executed, identifies the specification to which it is directed, and, as required by 35 U.S.C. 115, identifies each inventor and the country of citizenship of each inventor and states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

Section 1.497(b), as proposed, would be subdivided into paragraphs (b)(1) and (b)(2). Section 1.497(b)(1), as proposed, would provide that the oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47. Section 1.497(b)(2), as proposed, would change "[i]f the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by § 1.63 to state" to "[i]f the person making the oath or declaration is not the inventor (§§ 1.42, 1.43 or 1.47), the oath or declaration shall state the relationship of the person to the inventor and, upon information and belief, the facts which the inventor is required to state" such that § 1.497(b), as proposed, would be parallel to § 1.64.

Section 1.497(c), as proposed, would be added to provide that the oath or declaration must comply with the requirements of § 1.63. Section 1.497(c), as proposed, would further provide that in instances in which the oath or declaration does not comply with § 1.63, but meets the requirements of § 1.497(a) and (b), as proposed, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c), thus permitting the application to enter the national stage and the assignment of dates under 35 U.S.C. 102(e) and 371(c). A supplemental oath or declaration in compliance with § 1.63, however, will be required in accordance with § 1.67.

Section 1.701(a), as proposed, would add "an unusual administrative delay by the Office" to the bases for extension of patent term due to prosecution delay. H.R. 1733 provides that the Commissioner shall prescribe regulations to govern the particular circumstances deemed to be an unusual administrative delay. Section 1.701(a)(4)(i), as proposed, would set forth the failure to act on a reply under § 1.111 or appeal brief under § 1.192 within six months of the date it was filed; the failure to act on an application within six months of the date of a decision under § 1.196 by the Board of Patent Appeals and Interferences where claims stand allowed in an application or the nature of the decision requires further action by the examiner; and the failure to issue a patent within six months of the date that the issue fee was paid and all outstanding requirements

were satisfied as circumstances constituting a *prima facie* unusual administrative delay. In an application entitled to an extension under § 1.701(a)(3), however, any unusual administrative delay during the appellate proceeding would be disregarded under § 1.701(a)(4) in accordance with the "not overlapping" provision in § 1.701(b). Requests for patent term extension based upon circumstances not specifically set forth in § 1.701(a)(4)(i) as a *prima facie* unusual administrative delay must be specifically requested by petition and would be considered on a case-by-case basis. Section 1.701(a), as proposed, would further add "subject to the provisions of this section" and delete the phrase "if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review" from paragraph (a)(3).

Section 1.701(b), as proposed, would add paragraph (c)(4) to those paragraphs summed in calculating the period of extension, and change the maximum extension from five years to ten years in accordance with H.R. 1733.

Section 1.701(c), as proposed, would provide that the period of delay is the sum of the number of days, if any, in the period of unusual delay by the Office. That is, the ordinary delay in processing and examining an application would not be included under § 1.701(c), as proposed, in determining the extension under § 1.701(b). For example, (1) where there was a failure to act on a reply under § 1.111 within six months of the date it was filed, the period of delay is the number of days in excess of six months, if any, in the period beginning on the date a reply under § 1.111 was filed and ending on the mailing date of an action in response thereto, (2) where there was a failure to act on an appeal brief under § 1.192 within six months of the date it was filed, and the application is not entitled to an extension under § 1.701(a)(3), the period of delay is the number of days in excess of six months, if any, in the period beginning on the date an appeal brief under § 1.192 was filed and ending on the mailing date of either a notification under § 1.192(d) or examiner's answer under § 1.193, and (3) where there was a failure to issue a patent within six months of the date that the issue fee was paid and all outstanding requirements were satisfied, § 1.701(a)(3), the period of delay is the number of days in excess of six months, if any, in the period beginning on the date the issue fee was paid or all outstanding requirements were satisfied, whichever is later, and the date the patent was issued.

Section 1.701(d), as proposed, would change "[t]he period of delay set forth in paragraph (c)(3)" to "[t]he period set forth in paragraph (c)," as the limitation on patent term extension in H.R. 1733 based upon an applicant's failure to engage in reasonable efforts to conclude processing or examination of the application is not limited to extension under 35 U.S.C. 154(b)(2), *i.e.*, delays during appellate proceedings. Section 1.701(d), as proposed, would further delete "any time during the period of appellate review that occurred before three years from the filing date of the first national application for a patent presented for examination." Public Law 103-465 provides that extensions under 35 U.S.C. 154(b)(2) shall be reduced by any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination, where H.R. 1733 provides only that no patent shall be extended under 35 U.S.C. 154(b) that has issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, or 365(c).

Section 1.701(d), as proposed, would further change "any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence" and "[i]n determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review" to "any time during the processing or examination of the application, as determined by the Commissioner, during which the applicant for patent failed to engage in reasonable efforts to conclude processing or examination of the application," "[i]n determining whether an applicant failed to engage in reasonable efforts to conclude processing or examination of the application, the Commissioner may examine the facts and circumstances of the applicant's actions during the entire prosecution of the application to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application," and "[c]ircumstances constituting a failure to engage in reasonable efforts to conclude processing or examination of the application include: (1) requesting suspension of action under § 1.103, and (2) abandonment of the application."

H.R. 1733 provides that the period of extension under 35 U.S.C. 154(b) shall be reduced by a period equal to the time during the processing or examination of the application leading to the patent in which the applicant failed to engage in reasonable efforts to conclude processing or examination of the application and that the Commissioner shall prescribe regulations establishing the circumstances that constitute a failure of an applicant to engage in reasonable efforts to conclude processing or examination of an application. Section § 1.701(d) specifically sets forth requesting suspension of action under § 1.103 and abandonment of the application as examples of *prima facie* failures to engage in reasonable efforts to conclude processing or examination of the application. In determining whether an applicant engaged in reasonable efforts to conclude processing or examination of the application, however, the facts and circumstances of applicant's actions during the entire prosecution of the application will be considered on a case-by-case basis to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application. As such, it is not possible to list all of the specific circumstances in § 1.701(d). That is, circumstances other than the examples specifically set forth § 1.701(d) may, on a case-by-case basis, be considered the failure to engage in reasonable efforts to conclude the processing or examination of the application.

A new § 1.701(e), as proposed, would provide that no patent shall be extended under this section: (1) beyond the expiration date specified in a terminal disclaimer in a patent whose term has been disclaimed in such terminal disclaimer, or (2) an instance in which the patent issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, or 365(c). H.R. 1733 provides these limitations on extensions under 35 U.S.C. 154(b).

A new § 1.701(f), as proposed, would provide that any extension of patent term under § 1.701(a)(4) on the basis of an administrative delay other than one specifically set forth in §§ 1.701(a)(4)(i)(A)-(C) must be requested by petition. Due to the necessity for individualized determinations of patent term extensions based upon prosecution delay due to an unusual administrative delay by the Office not specifically provided for, such extensions of patent term under § 1.701(a)(4) must be specifically requested by petition in a timely manner. Section 1.701(f), as proposed, would specifically provide that any petition for patent term extension based upon § 1.701(a)(4) for an unusual administrative delay by the Office other than one specifically set forth in §§ 1.701(a)(4)(i)(A)-(C) cannot be filed prior to the mailing of a notice of allowance under § 1.311 and must be accompanied by a statement of the facts involved, the administrative delay by the Office to be reviewed, the period of extension requested, and the fee set forth in § 1.17(i). The petition may include a request that the petition fee be refunded if an extension of the patent term under § 1.701(a)(4) is granted.

Section 1.808(a), as proposed, would provide that upon the publishing of the application, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed, subject to provisions of § 1.808(b).

Section 3.31, as proposed, would provide that the assignment cover sheet may, but need not, include an indication that the assignment information is to be printed on the Patent Application Notice. Section 3.31, as proposed, would further provide that, due to constraints in the publication process, any such indication not submitted within two months of filing or fourteen months from the earliest filing date for which a benefit is claimed, whichever is later, may result in the assignment information not being printed on the Patent Application Notice.

Section 5.1, as proposed, would include a new paragraph (c) which would provide defense agencies adequate time to complete national security review under 35 U.S.C. 181 before an application would be released for publication under § 1.306. Specifically, the period for completion of a defense agency review would be six (6) months from the actual U.S. filing date for applications filed under 35 U.S.C. 111(a) or three (3) months from the date the application was made available to the defense agency for review, whichever is later.

Section 5.1, as proposed, would further include a new paragraph (d) which would set forth the current practice that applications on inventions not made in the United States and on inventions in which the Federal Government has a known property interest are not made available to defense agencies under § 5.2(b).

A new § 5.9, as proposed, would set forth the procedures for the treatment of national security classified applications. The procedures set forth in this section, except for those pertaining to the publication of applications pursuant to § 1.306, are the current procedures for the treatment of national security classified applications. It is, however, considered appropriate to implement these procedures through the rulemaking process.

35 U.S.C. 181 authorizes the withholding of the grant of a patent on an application that has been placed under a secrecy order; however, title 35, United States Code, does not specifically authorize the withholding of the grant of a patent on an application that is national security classified, but not placed under a secrecy order. Nevertheless, the Office is prohibited by Executive Order and statute from disclosing a national security classified application. Therefore, procedures for obtaining a secrecy order pursuant to 35 U.S.C. 181 on a national security classified application, or the declassification of such application, are necessary.

Section 5.9(a), as proposed, would provide that patent applications and papers that are national security classified and contain authorized national security markings of "Confidential," "Secret" or "Top Secret" are accepted by the Office, that national security classified documents mailed to the Office must be addressed in compliance with § 5.33, and that national security classified documents may be hand-carried to Licensing and Review.

Section 5.9(b), as proposed, would provide that a national security classified patent application will not be published pursuant to § 1.306 or allowed pursuant to § 1.311 of this chapter until the application is declassified.

Section 5.9(c), as proposed, would clarify that, in a national security classified application, it is the applicant's responsibility to either obtain a secrecy order pursuant to § 5.2, or have the application declassified by the relevant department or agency. Section 5.9(c), as proposed, would further provide that in a national security classified patent application filed without a notification pursuant to § 5.2(a), *i.e.*, a recommendation for imposition of a secrecy order from the relevant department or agency, the Office will set a time period within which the application must be declassified, a secrecy order must be obtained, or evidence of a good faith effort to obtain a secrecy from the relevant department or agency must be presented in order to prevent abandonment of the application.

Section 5.9(d), as proposed, would provide for instances in which, after an effort to obtain a secrecy order, the national security classified application has not been declassified and a secrecy order has not been obtained. Section 5.9(d), as proposed, would specifically provide that in each instance in which the national security classified application has not been declassified and a secrecy order has not been obtained, but the applicant has presented evidence of a good faith effort to obtain a secrecy order, the Office will again set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to again obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application. This process will reiterate until the application becomes abandoned, *e.g.*, through a lack of a good faith effort to obtain a secrecy order or failure to prosecute under 35 U.S.C. 133, the application is declassified, or a secrecy order is obtained.

Other Considerations

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes is to require that application papers be filed in a format which permits their digital image and OCR scanning into an electronic data base, and that claims for the benefit of the filing date of prior foreign and domestic applications be submitted promptly to permit publication of the application at 18 months from the earliest filing date for which a benefit is sought.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These proposed rule changes contain a collection of information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The initial patent application filing is currently approved by the Office of Management and Budget under Control No. 0651-0032. Public reporting burden for the collection of information for filing the initial patent application is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form, and Plant Patent Application Declaration form will reduce the burden and uncertainty associated with the submission of an application and related information, and enhance the Office's ability to use standardized automation routines (optical character recognition, *etc.*) to record and process information concerning applications. Public reporting burden for these collections of information is estimated to average:(1) 12 minutes per response for the Fee Transmittal form, (2) 12 minutes per response for the Utility Patent Application Transmittal form, (3) 12 minutes per response for the Design Patent Application Transmittal form, (4) 12 minutes per response for the Plant Patent Application Transmittal form, (5) 12 minutes per response for the Plant Color Coding Sheet, (6) 24 minutes per response for the Declaration form, and (7) 24 minutes per response for the Plant Patent Application Declaration. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

The assignment cover sheet is currently approved by the Office of Management and Budget under Control No. 0651-0027. Public reporting burden for the collection of information on the assignment cover sheet is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of Assistance Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0027 and 0651-0032). The Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form, and Plant Patent Application Declaration form have been submitted to the Office of Management and Budget for clearance under

the Paperwork Reduction Act. See 60 FR 35174 (July 6, 1995). Written comments and recommendations for the proposed information collection should be sent to Maya A. Bernstein, OMB Desk Officer, room 10236, New Executive Office Building, Washington, D.C. 20230.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office proposed to amend Title 37 of the Code of Federal Regulations as set forth below.

List of Subjects

37 CFR Part 1
Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

37 CFR Part 3
Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

37 CFR Part 5
Classified information, foreign relations, inventions and patents.

For the reasons set forth in the preamble, 37 CFR Parts 1, 3 and 5 are proposed to be amended as follows, with removals indicated by brackets ([]) and additions by arrows (►◄):

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.4 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§ 1.4 Nature of correspondence and signature requirements.

(a) Correspondence with the Patent and Trademark Office comprises:

(1) Correspondence relating to services and facilities of the Office, such as general inquiries, requests for publications supplied by the Office, orders for printed copies of patents ►, patent application notices, technical contents publications◄ or trademark registrations, orders for copies of records, transmission of assignments for recording, and the like, and

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3. Section 1.5 is proposed to be amended by revising paragraph (a) and adding paragraphs (f) and (g) to read as follows:

§ 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, ►including a published application,◄ it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; *e.g.*, 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason, returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patents should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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►(f) When a paper concerns a provisional application, it should identify the application as such and include the application number.

(g) A paper relating to a patent application notice should identify it as such and include the patent application notice number.◄

4. Section 1.9 is proposed to be amended by revising paragraphs (a) and (b) and adding a paragraph (h) to read as follows:

§ 1.9 Definitions.

(a)(1) A national application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111, or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

(2) A provisional application as used in this chapter means a U.S. national application for patent filed in the Office under 35 U.S.C. 111(b).

(3) A nonprovisional application as used in this chapter means a U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a), or which entered the national stage from an international application after compliance with 35 U.S.C. 371.

►(4)◄[(b)] An international application as used in this chapter means an international application for patent filed under the Patent Cooperation Treaty prior to entering national processing at the Designated Office stage.

►(b) A published application as used in this chapter means an application for patent which has been published pursuant to 35 U.S.C. 122(b).◄

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►(h) National security classified as used in this chapter means specifically authorized under criteria established by Act of Congress or Executive order to be kept secret in the interest of national defense or foreign policy and in fact properly classified pursuant to Act of Congress or Executive order.◄

5. Section 1.11 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.11 Files open to the public.

(a) [After a patent has been issued or a statutory invention registration has been published, the] ►The◄ specification, drawings, and all papers relating to the case in the file of ►an abandoned published application, a◄ [the] patent ►,◄ or ►a◄ statutory invention registration are open to inspection by the public ►,◄ [, and copies may be obtained upon paying the fee therefor.] ►A copy of the specification, drawings, and all papers relating to the case in the file of a published application, a patent, or statutory invention registration may be obtained upon the payment of the fee set forth in § 1.19(b)(2).◄ See § 2.27 for trademark files.

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6. Section 1.12 is proposed to be amended by revising paragraphs (a)-(c) to read as follows:

§ 1.12 Assignment records open to public inspection.

(a)(1) Separate assignment records are maintained in the Patent and Trademark Office for patents and trademarks. The assignment records, relating to original or reissue patents, including digests and indexes, for assignments recorded on or after May 1, 1957, ►published applications,◄ and assignment records relating to pending or abandoned trademark applications and to trademark registrations, for assignments recorded on or after January 1, 1955, are open to public inspection at the Patent and Trademark Office, and copies of those assignment records may be obtained upon request and payment of the fee set forth in § 1.19 and § 2.6 of this chapter.

(2) All records of assignments of patents recorded before May 1, 1957, and all records of trademark assignments recorded before January 1, 1955, are maintained by the National Archives and Records Administration (NARA). The records are open to public inspection. Certified and uncertified copies of those assignment records are provided by NARA upon request and payment of the fees required by NARA.

(b) Assignment records, digests, and indexes relating to any pending or abandoned application ►which has not been published pursuant to 35 U.S.C. 122(b)◄ are not available to the public. Copies of any such assignment records and information with respect thereto shall be obtainable only upon written authority of the applicant or applicant's assignee or attorney or agent or upon a showing that the person seeking such information is a bona fide prospective or actual purchaser, mortgagee, or licensee of such application, unless it shall be necessary to the proper conduct of business before the Office or as provided by these rules.

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in ►confidence◄ [secrecy] under § 1.14, or any information with respect thereto, must

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

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7. Section 1.13 is proposed to be revised to read as follows:

§ 1.13 Copies and certified copies.

(a) Non-certified copies of patents ►, patent application notices, technical contents publications, file wrapper and contents of published applications,◄ and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public, will be furnished by the Patent and Trademark Office to any person, and copies of other records or papers will be furnished to persons entitled thereto, upon payment of the fee therefor.

(b) Certified copies of the patents ►, patent application notices, technical contents publications, file wrapper and contents of published applications,◄ and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public or persons entitled thereto will be authenticated by the seal of the Patent and Trademark Office and certified by the Commissioner, or in his name attested by an officer of the Patent and Trademark Office authorized by the Commissioner, upon payment of the fee for the certified copy.

8. Section 1.14 is proposed to be amended by revising paragraphs (a)-(b) and (e) to read as follows:

§ 1.14 Patent applications preserved in ►confidence◄ [secrecy].

(a) Except as provided in § 1.11(b) ►,◄ pending patent applications ►which have not been published pursuant to 35 U.S.C. 122(b)◄ are preserved in ►confidence.◄ [secrecy.] No information will be given by the Office respecting the filing by any particular person of an application for a patent, the pendency of any particular case before it, or the subject matter of any particular application, nor will access be given to or copies furnished of any pending application or papers relating thereto, without written authority in that particular application from the applicant or his assignee or attorney or agent of record, unless the application has been identified by ►application number or◄ serial number ►and filing date◄ in a published patent document ►, a U.S. published application,◄ or ►a published international application in which◄ the United States of America has been indicated as a Designated State [in a published international application], in which case status information such as whether it is pending, abandoned, or patented may be supplied, ►or unless the application claims the benefit of the filing date of an application that has been referred to in a U.S. published application or patent, or identified by application number or serial number and filing date in a published patent document or a published international application in which the United States of America has been indicated as a Designated State, in which case the application number, filing date, and status information such as whether it is pending, abandoned, or patented may be supplied,◄ or unless it shall be necessary to the proper conduct of business before the Office or as provided by this part. Where an application has been patented, the patent number and issue date may also be supplied.

(b) [Except as provided in § 1.11(b), abandoned] ►Abandoned◄ applications ►which have not been published pursuant to 35 U.S.C. 122(b)◄ are likewise not open to public inspection, except ►as provided in § 1.11(b) and as set forth below.◄ [that if] ►If◄ an application referred to in a U.S. ►published application or◄ patent, ►application open to public inspection pursuant to this section, application which claims the benefit of the filing date of an application open to public inspection pursuant to this section,◄ or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§ 1.51(a)) which are abandoned ►and have not been published pursuant to 35 U.S.C. 122(b)◄ may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

• • • • •

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in ►confidence◄ [secrecy] pursuant to paragraphs (a) and (b) of this section, or any papers relating thereto, must

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i), or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

9. Section 1.16 is proposed to be amended by revising paragraphs (a) and (g)-(h) to read as follows:

§ 1.16 National application filing fees

(a) Basic fee for filing each application for an original patent, except provisional, design or plant cases:

By a small entity (§ 1.9(f)) .....►$390.00◄ [$365.00]
By other than a small entity .....►780.00◄ [730.00]

• • • • •

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§1.9(f)).....►270.00◄ [245.00]
By other than a small entity.....►540.00◄ [490.00]

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) .....►390.00◄ [365.00]

By other than a small entity ..... ▶780.00◀ [730.00]

• • • • •

10. Section 1.17 is proposed to be amended by revising paragraph (i) and adding new paragraphs (t) and (u) to read as follows:

§ 1.17 Patent application processing fees

• • • • •

(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph 130.00

§ 1.12 - for access to an assignment record.
§ 1.14 - for access to an application.
§ 1.53 - to accord a filing date.
§ 1.55 - for entry of late priority papers.
§ 1.60 - to accord a filing date.
§ 1.62 - to accord a filing date.
§ 1.97(d) - to consider an information disclosure statement.
§ 1.102 - to make application special
§ 1.103 - to suspend action in application.
§ 1.177 - for divisional reissues to issue separately.
§ 1.312 - for amendment after payment of issue fee.
§ 1.313 - to withdraw an application from issue.
▶§ 1.306(d) - for early publication of an application.
§ 1.306(e) - to defer publication of an application.◀
§ 1.314 - to defer issuance of a patent.
§ 1.666(b) - for access to interference settlement agreement.
▶§ 1.701(f) - for patent term extension based upon administrative delay not specifically provided for.◀
§ 3.81 - for patent to issue to assignee, assignment submitted after payment of the issue fee.

• • • • •

▶(t) For filing a protest under § 1.291 in an application after the date the application was published 220.00

(u) For the acceptance of a late claim for priority under 35 U.S.C. 119(a)-(d) or for acceptance of a late claim for the benefit of a prior application under 35 U.S.C. 119(e), 120 or 121 filed during the pendency of the application.... 1500.00◀

11. Section 1.18 is proposed to be amended by revising paragraphs (a) and (c) to read as follows:

§ 1.18 Patent Issue Fees

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) ..... ▶$640.00◀ [$605.00]
By other than a small entity ..... ▶1280.00◀ [1210.00]

• • • • •

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) ..... ▶330.00◀ [305.00]
By other than a small entity ..... ▶660.00◀ [610.00]

12. Section 1.19 is proposed to be amended by revising paragraphs (a)-(d) to read as follows:

§ 1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of patents ▶, patent application notices, and technical contents publications◀:

(1) Printed copy of a ▶patent application notice,◀ patent, including a design patent, statutory invention registration, or defensive publication document, except plant or statutory invention registration containing color drawing:

(i) Regular service $3.00
(ii) Overnight delivery to PTO Box or overnight fax ... 6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two workdays 25.00

(2) Printed copy of a plant patent in color 12.00
(3) Copy of a utility patent or statutory invention registration containing color drawing (see § 1.84(a)(2)) 24.00
▶(4) Copy of a technical contents publication ..... 9.00◀

(b) Certified and uncertified copies of Office documents:

(1) Certified or uncertified copy of patent application as filed:

(i) Regular service ..... ▶15.00◀ [12.00]
(ii) Expedited local service ..... ▶30.00◀ [24.00]

(2) Certified or uncertified copy of ▶published application or◀ patent-related file wrapper and contents 150.00
(3) Certified or uncertified copy of Office records, per document ▶,◀ except ▶those contained in a pending application and◀ as otherwise provided in this section 25.00
▶(4) Certified or uncertified copy of documents contained in a pending application:

(i) First document contained in a pending application 75.00
(ii) For each commonly requested additional document contained in such pending application 25.00

(5)◀ [(4)] For assignment records, abstract of title and certification, per ▶published application or◀ patent 25.00

(c) Library service (35 U.S.C. 13): For providing to libraries copies of all patents issued annually ▶and technical contents publications published annually◀, per annum 50.00
(d) For list of all United States ▶published applications,◀ patents and statutory invention registrations in a subclass 3.00

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13. Section 1.20 is proposed to be amended by revising paragraphs (e)-(g) to read as follows:

§ 1.20 Post-issuance fees

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(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By small entity (§ 1.9(f)) ..... ▶510.00◀ [480.00]
By other than a small entity ..... ▶1020.00◀ [960.00]

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f)) ..... ▶1010.00◀ [965.00]
By other than a small entity ..... ▶2020.00◀ [1930.00]

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f)) ..... ▶1510.00◀ [1450.00]
By other than a small entity ..... ▶3020.00◀ [2900.00]

• • • • •

14. Section 1.24 is proposed to be revised to read as follows:

§ 1.24 Coupons.

Coupons in denominations of three dollars, for the purchase of patents, ▶patent application notices and technical contents publications,◀ designs, defensive publications, statutory invention registrations, and trademark registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The three-dollar coupons are sold individually and in books of 50 for $150.00. These coupons are good until used; they may be transferred but cannot be redeemed.

15. Section 1.51 is proposed to be amended by revising paragraph (a)(1) to read as follows:

§ 1.51 General requisites of an application.

(a) Applications for patents must be made to the Commissioner of Patents and Trademarks.

(1) A complete application filed under § 1.53(b)(1) comprises:

(i) A specification, including ▶an abstract and◀ a claim or claims, see §§ 1.71 to 1.77;
(ii) An oath or declaration, see §§ 1.63 and 1.68;
(iii) Drawings, when necessary, see §§ 1.81 to 1.85; and
(iv) The prescribed filing fee, see § 1.16.

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16. Section 1.52 is proposed to be amended by revising paragraphs (a)-(b) and (d) to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly [written,] typed [, or printed] in permanent ▶dark◀ ink ▶in portrait orientation on flexible, strong, smooth, non- shiny, durable and white paper.◀ [or its equivalent in quality.] All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the [writing,] typing [, or printing] thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes ▶and electronic reproduction by use of digital imaging and optical character recognition◀. If the papers are not of the required quality, substitute typewritten [or printed] papers of suitable quality ▶will◀ [may] be required. ▶See § 1.125 for filing substitute typewritten papers constituting a substitute specification.◀

(b) ▶Except for drawings, the◀ [The] application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§ 1.42, 1.43, 1.47, etc.) and also papers subsequently filed, must be plainly ▶typed◀ [written] on but one side of the paper ▶, with the abstract and claims set forth on a separate sheet. See §§ 1.72(b) and 1.75(h)◀. The [size of all] sheets of paper ▶must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).◀ [should be 8 to 8 1/2 by 10 1/2 to 13 inches (20.3 to 21.6 cm. by 26.6 to 33.0 cm.).] ▶Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and no holes should be provided in the sheets.◀ [A margin of at least approximately one inch (2.5 cm.) must be reserved on the left-hand of each page. The top of each page of the application, including claims, must have a margin of at least approximately 3/4 inch (2 cm.).] The lines must [not be crowded too closely together; typewritten lines should] be 1 1/2 or double spaced. The pages of the application including claims and abstract ▶must◀ [should] be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text. ▶See § 1.84 for drawings.◀

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(d) An application may be filed in a language other than English. A verified English translation of the non-English-language application and the fee set forth in § 1.17(k) are required to be filed with the application or within such time ▶period◀ as may be set by the Office. ▶The period for filing the verified English translation cannot be extended pursuant to § 1.136(a).◀

17. Section 1.53 is proposed to be amended by revising paragraph (d)(1) to read as follows:

§ 1.53 Serial Number, filing date, and completion of application.

• • • • •

(d)(1) If an application which has been accorded a filing date pursuant to paragraph (b)(1) of this section does not include the appropriate filing fee ▶, ◀[or]an oath or declaration by the applicant, ▶an abstract on a separate sheet, claims on a separate sheet, papers typed on but one side of the paper, or application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction,◀ applicant will be so notified, if a correspondence address has been provided ▶. The applicant will be◀ [and] given a period of time within which to ▶correct the deficiencies◀ [file the fee, oath or declaration] and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or the oath or declaration by the applicant◀ in order to prevent abandonment of the application. A copy of the "Notice to File Missing Parts" form mailed to applicant should accompany any response thereto submitted to the Office. If the required filing fee is not timely paid, or if the processing and retention fee set forth in § 1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the basic filing fee, oath or declaration ▶, abstract or claims on a separate sheet, papers typed on but one side of the paper, papers and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction,◀ and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or the oath or declaration by the applicant◀ in order to prevent abandonment of the application; or, if no basic filing fee has been paid, one year from the filing date to pay the processing and retention fee set forth in § 1.21(l) to prevent disposal of the application. ▶The period for filing an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a).◀

• • • • •

18. Section 1.54 is proposed to be amended by revising paragraph (b) to read as follows:

§ 1.54 Parts of application to be filed together; filing receipt.

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(b) Applicant will be informed of the application [serial] number ▶,◀ [and] filing date ▶, and projected publication date◀ by a filing receipt.

19. Section 1.55 is proposed to be amended by revising paragraph (a) and adding paragraphs (c)-(d) to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant in a nonprovisional application may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 (a)-(d) and 172. The claim to priority ▶under 35 U.S.C. 172◀ need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. ▶The claim to priority under 35 U.S.C. 119(a)-(d) must be presented within two months of filing or fourteen months from the filing date of the prior foreign application, whichever is later, must identify the prior foreign application by specifying its application number, country, and the day, month and year of its filing, and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63.◀ The [claim for priority and the] certified copy of the foreign application specified in 35 U.S.C. 119(b) must be filed in the case of an interference (§ 1.630), when necessary to overcome the date of a reference relied upon by the examiner, when specifically required by the examiner, and in all other cases, before the patent is granted. If the [claim for priority or the] certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i). If the certified copy filed is not in the English language, a translation need not be filed except in the case of interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

• • • • •

▶(c) If a claim to priority under 35 U.S.C. 119(a)-(d) is presented after the time period provided by paragraph (a) of this section, the claim may be accepted if the claim identifying the prior foreign application by specifying its application number, country, and the day, month and year of its filing is filed during the pendency of the application and the delay in stating the claim was unintentional. A petition to accept a delayed claim to priority under 35 U.S.C. 119(a)-(d) must be accompanied by:

(1) The surcharge set forth in § 1.17(u); and,
(2) A statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional.

(d) The time periods set forth in this section cannot be extended.◀

20. Section 1.58 is proposed to be amended by removing and reserving paragraph (b) and revising paragraph (c) to read as follows:

§ 1.58 Chemical and mathematical formulas and tables.

• • • • •

(b) ▶[Reserved]◀ [All tables and chemical and mathematical formulas in the specification, including claims, and amendments thereto, must be on paper which is flexible, strong, white, smooth, non-shiny, durable in order to permit use as camera copy when printing any patent which may issue. A good grade of bond paper is acceptable; watermarks should not be prominent. India ink or its equivalent, or solid black typewriter, should be used to secure perfectly black solid lines.]

(c) To facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to ▶12.7 cm. (5 inches)◀ [5 inches (12.7 cm.)] so that it may appear as a single column in the printed patent. [If it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet.] Typewritten characters used in such formulas and tables must be from a block (nonscript) type font or lettering style having capital letters which are at least ▶2.1 mm. (0.08 inch)◀ [0.08 inch (2.1 mm.)] high (*e.g.*, elite type). [Hand lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.)]. A space at least ▶.64 cm. (1/4 inch)◀ [1/4 inch (6.4 mm.)] high should be provided between complex formulas and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with high degree of legibility.

21. Section 1.60 is proposed to be amended by revising paragraph (d) to read as follows:

§ 1.60 Continuation or divisional application for invention disclosed in a prior application.

• • • • •

(d) If an application filed pursuant to paragraph (b) of this section is otherwise complete, but does not include the appropriate filing fee, a true copy of the oath or declaration from the prior complete application, showing the signature or an indication it was signed, ▶or the prior application did not include an abstract and claims on a separate sheet, and application papers typed on but one side of the paper with application papers or sheets of drawings of sufficient clarity, contrast, or quality in the proper size and format for electronic reproduction,◀ a filing date will be granted and applicant will be so notified and given a period of time within which to file the fee, or the true copy of the oath or declaration ▶, an abstract and claims on a separate sheet, substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction,◀ and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or the copy of the oath or declaration from the prior application◀ in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. ▶The period for filing an abstract and claims on a separate sheet and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality for electronic reproduction cannot be extended pursuant to § 1.136(a).◀

22. Section 1.62 is proposed to be amended by revising paragraphs (d)-(f) to read as follows:

§ 1.62 File wrapper continuing procedure.

• • • • •

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, ▶or any substitute specification and drawings pursuant to subparagraph (e)(2) of this section,◀ applicant will be so notified and given a period of time within which to file the fee, oath[,]or declaration ▶, substitute specification, and drawings◀ and to pay the surcharge as set forth in § 1.16(e) ▶if the application did not include the basic filing fee or oath or declaration◀ in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section. ▶The period for filing a substitute specification cannot be extended pursuant to § 1.136(a).◀

(e)▶(1)◀ an application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application [serial] number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section.

▶(2)◀ No copy of the prior [application or new] specification ▶or drawings◀ is required ▶, unless the application is a continuation-in-part application containing any additional disclosure, in which case a substitute specification in compliance with § 1.125 and drawings are required. Any new specification filed will not be considered part of the original application papers, but will be treated as a substitute specification in accordance with § 1.125◀. [The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.]

(f) The filing of an application under this section will be construed to include a waiver of ▶confidence◀ [secrecy] by the applicant under 35 U.S.C. 122▶(a)◀ to the extent that any member of the public who is entitled under the provisions of ▶§◀ [37 CFR] 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

• • • • •

23. Section 1.72 is proposed to be amended by revising paragraph (b) to read as follows:

§ 1.72 Title and abstract.

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(b) A brief abstract of the technical disclosure in the specification must be set forth on a separate sheet, preferably ▶prior to the first page of the specification◀ [following the claims] under the heading "Abstract of the Disclosure". The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

24. Section 1.75 is proposed to be amended by revising paragraph (g) and adding paragraphs (h) and (i) to read as follows:

§ 1.75 Claim(s).

• • • • •

(g) ▶The least restrictive claim should be presented as claim number 1, and all◀ [All] dependent claims should be grouped together with the claim or claims to which they refer to the extent possible.

▶(h) The claim or claims must be set forth on a separate sheet.

(i) Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.◀

25. Section 1.77 is proposed to be revised to read as follows:

§ 1.77 Arrangement of application elements.

▶(a)◀ The elements of the application ▶, if applicable,◀ should appear in the following order:

[(a)] ▶(1) Utility Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Abstract of the disclosure.
(4)◀ Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention may be used.

▶(5)◀[(c)(1)] Cross-reference to related applications [, if any].

▶(6)◀ [(2)] ▶Statement regarding federally sponsored research or development.

(7)◀ Reference to a "Microfiche appendix" [if any].

(See § 1.96 ▶(c)◀ [(b)]). The total number of microfiche and total number of frames should be specified.

▶(8)◀ [(d)] ▶Background of the invention

(9)◀ brief summary of the invention.

▶(10)◀ [(e)] Brief description of the several views of the drawing [, if there are drawings].

▶(11)◀ [(f)] Detailed description.

▶(12)◀ [(g)] Claim or claims.

▶(13)◀ [(h) Abstract of the disclosure.
(i) Signed oath or declaration.
(j)] Drawings.

▶(14) Executed oath or declaration.

(15) Sequence Listing (See § 1.821 *et seq.*).

(b) The elements set forth in subparagraphs (a)(3)-(a)(6), (a)(8)-(a)(12) and (a)(15) should appear in upper case, without underlining or bold type, as section headings. If no text follows the section heading, with the phrase "Not Applicable" should follow the section heading.◀

26. Section 1.78 is proposed to be amended by revising paragraphs (a) and (c)-(d) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a)(1) A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior application must be:

(i) complete as set forth in § 1.51(a)(1); or
(ii) entitled to a filing date as set forth in § 1.53(b)(1), § 1.60 or § 1.62 and include the basic filing fee set forth in § 1.16; or
(iii) entitled to a filing date as set forth in § 1.53(b)(1) and have paid therein the processing and retention fee set forth in § 1.21(l) within the time period set forth in § 1.53(d)(1).

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must ▶, within two months of filing or within fourteen months of the filing date of the prior application, whichever is later,◀ contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

(3) A nonprovisional application other than for a design patent may claim an invention disclosed in one or more prior filed copending provisional applications. [Since a provisional

application can be pending for no more than twelve months, the last day of pendency may occur on a Saturday, Sunday, or Federal holiday within the District of Columbia which for copendency would require the nonprovisional application to be filed prior to the Saturday, Sunday, or Federal holiday.] In order for a nonprovisional application to claim the benefit of one or more prior filed copending provisional applications, each prior provisional application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, each prior provisional application must be:

(i) complete as set forth in § 1.51(a)(2); or
(ii) entitled to a filing date as set forth in § 1.53(b)(2) and include the basic filing fee set forth in § 1.16(k).

(4) Any nonprovisional application claiming the benefit of one or more prior filed copending provisional applications must ▶, within two months of filing or within fourteen months of the filing date of the prior application, whichever is later,◀ contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior provisional application, identifying it as a provisional application, and including the provisional application number (consisting of series code and serial number).

▶(5) If a claim to the benefit of any prior filed copending nonprovisional application or international application designating the United States of America is presented in a nonprovisional application after the time period provided by subparagraph (a)(2) of this section, or if a claim to the benefit of any prior filed copending provisional application is presented in a nonprovisional application other than for a design patent after the time period provided by subparagraph (a)(4) of this section, the claim may be accepted in the application if the claim identifying the prior application by application number or international application number and international filing date is filed during the pendency of the application and the delay in stating the claim was unintentional. A petition to accept a delayed claim to the benefit of a prior filed copending application must be accompanied by:

(i) The surcharge set forth in § 1.17(u); and,
(ii) A statement that the delay was unintentional. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The Commissioner may require additional information where there is a question whether the delay was unintentional.

(6) The time periods set forth in this paragraph cannot be extended.◀

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(c) Where ▶an◀ [two or more] application[s,]▶or a patent under reexamination◀ [or an application] and ▶an application or◀ a patent naming different inventors ▶are◀ [and] owned by the same party ▶and◀ contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should or should not be declared.

(d) Where an application ▶or a patent under reexamination◀ claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application ▶or a patent under reexamination◀. ▶A non-statutory◀ [An obviousness-type] double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(b).

27. Section 1.84 is proposed to be amended by revising paragraphs (c), (f)-(g), (j) and (x) to read as follows:

§ 1.84 Standards for drawings.

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(e) *Identification of drawings.* Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page. ▶In addition, a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner, provided that the reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.◀

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(f) *Size of paper.* All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

[(1) 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches),
(2) 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches),
(3) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), or
(4)] ▶(1)◀ 21.0 cm. by 29.7 cm. (DIN size A4) ▶, or
(2) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)◀.

(g) *Margins.* The sheets must not contain frames around the sight; *i.e.,* the usable surface[.]▶, but should have scan target points, *i.e.,* cross-hairs, printed on two catercorner margin corners.◀ [The following margins are required:

(1) On 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches) drawing sheets, each sheet must include a top margin of 5.1 cm. (2 inches), and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).
(2) On 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 29.8 cm. (8 by 11 3/4 inches).
(3) On 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets, each sheet must include a top margin of 2.5 cm. (1 inch) and bottom and side margins of .64 cm. (1/4 inch) from the edges, thereby leaving a sight no greater than 20.3 cm. by 24.8 cm. (8 by 9 3/4 inches).
(4) On 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, each] ▶Each◀ sheet must include a top margin of at least 2.5 cm. ▶(1 inch)◀, a left side margin of ▶at least◀ 2.5 cm. ▶(1 inch)◀, a right side margin of ▶at least◀ 1.5 cm. ▶(9/16 inch)◀, and a bottom margin of ▶at least◀ 1.0 cm. ▶(3/8 inch)◀, thereby leaving a sight no greater than 17.0 cm. by 26.2 cm ▶on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets◀.

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(j) *View for Official Gazette.* One of the views should be suitable for publication in the *Official Gazette* ▶, the patent application notice, and the *Gazette of Patent Application Notices*◀ as the illustration of the invention.

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(x) *Holes.* ▶No holes should be provided in the drawing sheets.◀ [The drawing sheets may be provided with two holes in the top margin. The holes should be equally spaced from the respective side edges, and their center lines should be spaced 7.0 cm. (2 3/4 inches) apart.]

(See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

28. Section 1.85 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.85 Corrections to drawings.

(a) The requirements of § 1.84 relating to drawings will be strictly enforced. A drawing not executed in conformity thereto, if suitable for ▶electronic◀ reproduction ▶by digital imaging◀, may be admitted for examination but in such case a new drawing must be furnished.

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29. Section 1.96 is proposed to be revised to read as follows:

§ 1.96 Submission of computer program listings.

▶(a)◀ Descriptions of the operation and general content of computer program listings should appear in the description portion of the specification ▶.◀ a computer program listing for the purpose of ▶this section◀ [these rules] is defined as a printout that lists in appropriate sequence the instructions, routines, and other contents of a program for a computer. The program listing may be either in machine or machine-independent (object or source) language which will cause a computer to perform a desired procedure or task such as solve a problem, regulate the flow of work in a computer, or control or monitor events. Computer program listings may be submitted in patent applications ▶as set forth in paragraphs (b) and (c) of this section.◀ [in the following forms:]

▶(b)◀ [(a)] *Material which will be printed in the patent.* If the computer program listing is contained on 10 printout pages or less, it must be submitted either as drawings or as part of the specification.

(1) *Drawings.* The listing may be submitted in the manner and complying with the requirements for drawings as provided in § 1.84.

At least one figure numeral is required on each sheet of drawing.

(2) *Specification.* (i) The listing may be submitted as part of the specification in accordance with the provisions of § 1.52, at the end of the description but before the claims.

(ii) ▶Any◀ [The] listing [may be] submitted as part of the specification [in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets] must be original copies from the computer with dark solid black letters not less than 0.21 cm high, on white, unshaded and unlined paper, [the printing on each sheet must be limited to an area 9 inches high by 13 inches wide,] and the sheets should be submitted in a protective cover. [When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page.] Any amendments must be made by way of submission of a substitute sheet ▶.◀ [if the copy is to be used for camera ready copy.]

▶(c)◀ [(b)] *As an appendix which will not be printed.* If a computer program listing printout is 11 or more pages long, applicants ▶must◀ [may] submit such listing in the form of microfiche, referred to in the specification (see § 1.77 ▶(a)(7)◀ [(c)(2)]). Such microfiche filed with a patent application is to be referred to as a "microfiche appendix." The "microfiche appendix" will not be part of the printed patent. Reference in the application to the "microfiche appendix" ▶must◀ [should] be made at the beginning of the specification at the location indicated in § 1.77 ▶(a)(7)◀ [(c)(2)]. Any amendments thereto must be made by way of revised microfiche. [All computer program listings submitted on paper will be printed as part of the patent.]

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

(2) *Submission requirements.* ▶Except as modified or clarified below, computer-generated◀ [Computer-generated] information submitted as ▶a "microfiche appendix"◀ [an appendix] to an application [for patent] shall be in [the form of microfiche in] accordance with the standards set forth in the following American National Standards Institute (ANSI) or National Micrographics Association (NMA) standards (Note: As new editions of these standards are published, the latest shall apply):

ANSI PH 1.28-1976-Specifications for Photographic Film for Archival records, Silver-Gelatin Type, on Cellulose Ester Base.
ANSI PH 1.41-1976 Specifications for Photographic Film for Archival Records, Silver-Gelatin Type, on Polyester Base.
NMA-MSI (1971) Quality Standards for Computer Output-Microfilm.
ANSI/NMA MS2 (1978) Format and Coding Standards for Computer Output Microfilm.
NMA MS5 (ANSI PH 5.9-1975) Microfiche of Documents.
ANSI PH 2.19 (1959)-Diffuse Transmission Density.

[except as modified or clarified below:]

(i) [Either] Computer-Output-Microfilm (COM) output [or copies of photographed paper copy] may be submitted ▶in accordance with either◀ [. In the former case,] NMA ▶standard◀ [standards] MS1 ▶or◀ [and] MS2 ▶.◀ [apply; in the latter case, standard MS5 applies.]

(ii) Film submitted shall be first generation (camera film) negative appearing microfiche (with emulsion on the back side of the film when viewed with the images right reading).

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least ▶0.13 mm (.005 inches)◀ [.005 inches (0.13 mm)] and not more than ▶0.23 mm (.009 inches)◀ [.009 inches (0.23 mm)] for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most 1/3 (50 mm x 12 mm) of the header or title area of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply ▶application◀ [serial] number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application identification such as the title and/or the first inventor's name. The attorney's docket number may be included. The final right-hand portion of the microfiche shall contain sequence information for the microfiche, such as 1 of 4, 2 of 4, *etc.*

(vii) Additional requirements which apply specifically to microfiche of filmed paper copy:

(A) The first frame of each microfiche submitted shall contain a standard test target which contains five NBS Micro-copy Resolution Test Charts (No.1010A), one in the center and one in each corner. See illustration on page 2 of NMA Recommended Practice MS104, Inspection and Quality Control of First Generation Silver Halide Microfilm. See also paragraph 7 of NMA-MS5.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) Pagination of the microfiche frames shall be from left to right and from top to bottom.

(E) At a reduction of 24:1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduc-

tion copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.

(F) Background density of negative appearing camera master microfiche of filmed paper documents shall be within the range of 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19.

(G) An index, when included, should appear in the last frame (lower right hand corner when data is right-reading) of each microfiche. See NMA-MS5, paragraph 6.6.

(viii) Microfiche generated by Computer Output Microfilm (COM).

(A) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.5 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH2.19.

(B) The first frame of each microfiche submitted should contain a resolution test frame in conformance with NMA standard MS1.

(C) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(D) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(E) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, *i.e.*, from top to bottom and from left to right, is also acceptable.

(F) An index, when included, should appear on the last frame (lower right hand corner when data is right reading) of each microfiche.

(G) Amendment of microfiche must be made by way of replacement microfiche.

30. Section 1.97 is proposed to be amended by revising paragraphs (a)-(d) to read as follows:

§ 1.97 Filing of an information disclosure statement.

(a) In order ▶for an applicant for patent or for reissue of a patent, or an owner of a patent under reexamination◀ to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with § 1.98 should be filed in accordance with this section.

(b) An information disclosure statement shall be considered by the Office if filed ▶by the applicant or patent owner◀:

(1) Within three months of the filing date of a national application;
(2) Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or
(3) Before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed ▶by the applicant or patent owner◀ after the period specified in paragraph (b) of this section, but before the mailing date of either:

(1) A final action under § 1.113 or
(2) A notice of allowance under § 1.311,whichever occurs first, provided the statement is accompanied by either a certification as specified in paragraph ▶(e)◀ [(3)] of this section or the fee set forth in § 1.17(p).

(d) An information disclosure statement shall be considered by the Office if filed ▶by the applicant or patent owner◀ after the mailing date of either:

(1) A final action under § 1.113 or
(2) A notice of allowance under § 1.311, whichever occurs first, but before payment of the issue fee, provided the statement is accompanied by:

(i) A certification as specified in paragraph (e) of this section,
(ii) A petition requesting consideration of the information disclosure statement, and
(iii) The petition fee set forth in § 1.17(i).

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31. Section 1.98 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

§ 1.98 Content of information disclosure statement.

(a) Any information disclosure statement filed under § 1.97 shall include:

(1) list of all patents, publications or other information submitted for consideration by the Office;
(2) A legible copy of:

(i) Each U.S. ▶patent application notice, technical contents publication and U.S.◀ and foreign patent;
(ii) Each publication or that portion which caused it to be listed; and
(iii) All other information or that portion which caused it to be listed, except that no copy of ▶an unpublished◀[a]U.S. patent application need be included; and

(3) A concise explanation of the relevance, as it is presently understood by the individual designated in § 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language. The concise explanation may be either separate from the specification or incorporated therein.

(b) Each U.S. patent listed in an information disclosure statement shall be identified by patentee, patent number and issue date. ▶Each U.S. patent application notice or technical contents publication listed in an information disclosure statement shall be identified by applicant, patent application notice number or technical contents publication number and publication date.◀ Each foreign patent or published foreign patent application shall be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application. Each publication shall be identified by author (if any), title, relevant pages of the publication, date, and place of publication.

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32. Section 1.107 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.107 Citation of references.

(a) If domestic patents are cited by the examiner, their numbers and dates, and the names of the patentees [, and the classes of inventions] must be stated. ▶If domestic published applications are cited by the examiner, their technical contents publication number, publication date, and the names of the applicants must be stated.◀ If foreign published applications or patents are cited, their nationality or country, numbers and dates, and the names of the patentees must be stated, and such other data must be furnished as may be necessary to enable the applicant, or in the case of a reexamination proceeding, the patent owner, to identify the published applications or patents cited. In citing foreign published applications or patents, in case only a part of the document is involved, the particular pages and sheets containing the parts relied upon must be identified. If printed publications are cited, the author (if any), title, date, pages or plates, and place of publication, or place where a copy can be found, shall be given.

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33. Section 1.108 is proposed to be revised to read as follows:

§ 1.108 Abandoned applications not cited.

Abandoned applications as such will not be cited as references ▶,◀ except those which ▶are published applications or◀ have been opened to inspection by the public following a defensive publication.

34. Section 1.131 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a)(1) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 102(a) or (e), or 35 U.S.C. 103 based on a U.S. patent ▶or pending or patented published application◀ to another which is prior art under 35 U.S.C. 102 (a) or (e) and which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), or on reference to a foreign patent ▶, an abandoned U.S. published application,◀ or to a printed publication, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the party qualified under §§ 1.42, 1.43, or 1.47, may submit an appropriate oath or declaration to overcome the patent ▶, published application◀ or publication. The oath or declaration must include facts showing a completion of the invention in this country or in a NAFTA or WTO member country before the filing date of the ▶U.S. published application or the◀ application on which the U.S. patent issued, or before the date of the foreign patent, or before the date of the printed publication. When an appropriate oath or declaration is made, the patent ▶, published application◀ or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent ▶, published application◀ or publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

(2) A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before January 1, 1996, in a WTO member country other than a NAFTA country.

▶(3) Notwithstanding the provisions of paragraph (a)(1), a showing may be made under this section where the inventions defined by a claim in an application or a patent under reexamination and by a claim in U.S. patent or pending or patented published application are not identical as set forth in 35 U.S.C. 102, and where the inventions are owned by the same party, unless the date of such patent or published application is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.◀

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35. Section 1.132 is proposed to be revised to read as follows:

§ 1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a [domestic] ▶U.S.◀ patent ▶or pending U.S. published application◀ which substantially shows or describes but does not claim the invention, or on reference to a foreign patent, ▶an abandoned U.S. published application,◀ or to a printed publication, or to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative or lacking in utility, or frivolous or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

36. Section 1.136 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a)(1) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless:

(i) Applicant is notified otherwise in an Office action,
(ii) ▶The response is to a requirement for an English translation, an abstract or claims on a separate sheet, or substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction submitted pursuant to §§ 1.52(d), 1.53(d), 1.60(d), 1.62(d), 1.494(c) or 1.495(c), or an oath or declaration submitted pursuant to §§ 1.494(c) or 1.495(c),
(iii)◀ The response is a reply brief submitted pursuant to § 1.193(b),
▶(iv)◀ [(iii)] The response is a request for an oral hearing submitted pursuant to § 1.194(b),
▶(v)◀ [(iv)] The response is to a decision by the Board of Patent Appeals and Interferences pursuant to § 1.196, § 1.197 or § 1.304, or
▶(vi)◀ [(v)] The application is involved in an interference declared pursuant to § 1.611.

(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to ▶the filing of an English translation pursuant to §§ 1.52(d), 1.494(c) or 1.495(c), the filing of an abstract or claims on a separate sheet, substitute specification or sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction pursuant to §§ 1.53(d), 1.60(d), 1.62(d), 1.494(c), or 1.495(c), the filing of an oath or declaration pursuant to §§ 1.494(c) or 1.495(c), or◀ proceedings pursuant to §§ 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings and § 1.645 for extension of time in interference proceedings.

37. Section 1.138 is proposed to be revised to read as follows:

§ 1.138 Express abandonment.

An application may be expressly abandoned by filing in the Patent and Trademark Office a written declaration of abandonment signed by the applicant and the assignee of record, if any, and identifying the application. An application may also be expressly abandoned by filing a written declaration of abandonment signed by the attorney or agent of record. A registered attorney or agent acting under the provision of § 1.34(a), or of record, may also expressly abandon a prior application as of the filing date granted to a continuing application when filing such a continuing application. Express abandonment of the application may not be recognized by the Office unless it is actually received by appropriate officials in time to act thereon before the date of issue ▶or publication. An applicant seeking to abandon an application to avoid publication of the application must submit a proper letter of express abandonment more than two months prior to the projected date of publication to allow sufficient time to permit the appropriate officials to recognize the abandonment and remove the application from the publication process, and unless an applicant receives written acknowledgement of the letter of express abandonment prior to the projected date of publication, applicant should expect that the application will be published in regular course◀.

38. Section 1.154 is proposed to be revised to read as follows:

§ 1.154 Arrangement of specification.

▶(a) The elements of the design application, if applicable, should appear in the following order◀ [The following order of arrangement should be observed in framing design specifications]:

▶(1) Design Application Transmittal Form.
(2) Fee Transmittal Form.

(3)◀ [(a)] Preamble, stating name of the applicant and title of the design.
▶(4) Cross-reference to related applications.
(5) Statement regarding federally sponsored research or development.◀
▶(6)◀ [(b)] Description of the figure or figures of the drawing.
▶(7)◀ [(c)] Description [, if any].
▶(8)◀ [(d)] Claim.
▶(9) Drawings or photographs
(10)◀ [(e)] Executed oath or declaration (See § 1.153(b)).

39. Section 1.163 is proposed to be amended by adding new paragraphs (c) and (d) to read as follows:

§ 1.163 Specification

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▶(c) The elements of the plant application, if applicable, should appear in the following order:

(1) Plant Application Transmittal Form.
(2) Fee Transmittal Form.
(3) Abstract of the disclosure.
(4) Title of the invention.
(5) Cross-reference to related applications.
(6) Statement regarding federally sponsored research or development.
(7) Background of the invention.
(8) Brief summary of the invention.
(9) Brief description of the drawing.
(10) Detailed Botanical Description.
(11) Claim.
(12) Drawings (in duplicate).
(13) Executed oath or declaration.
(14) Plant color coding sheet.

(d) A plant color coding sheet as used in this section means a sheet that specifies a color coding system as designated in a recognized color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure.◀

40. Section 1.291 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:

(1) The protest is [timely] submitted ▶:

(i) prior to the date the application was published or the mailing of a notice of allowance under § 1.311, whichever occurs first, or
(ii) within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first, if accompanied by the fee set forth in § 1.17(t)◀; and

(2) The protest is either served upon the applicant in accordance with § 1.248, or ▶, if submitted prior to the date the application was published,◀ filed with the Office in duplicate in the event service is not possible.
[Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.]
(b) A protest submitted in accordance with the second sentence of paragraph (a) of this section will be considered by the Office if ▶the application is still pending when the protest and application file are brought before the examiner and◀ it includes (1) a listing of the patents, publications, or other information relied upon; (2) a concise explanation of the relevance of each listed item; (3) a copy of each listed patent or publication or other item of information in written form or at least the pertinent portions thereof; and (4) an English language translation of all the necessary and pertinent parts of any non-English language patent, publication, or other item of information in written form relied upon. ▶Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office.◀

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41. Section 1.292 is proposed to be amended by revising paragraphs (a)-(b) to read as follows:

§ 1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations [and the fee set forth in § 1.17(j), is filed by one having information of the pendency of an application and] is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.
(b) The petition and accompanying papers [should either: (1) Reflect that a copy of the same has been served upon the applicant or upon his attorney or agent of record; or (2) be filed with the Office in duplicate in the event service is not possible. The petition and accompanying papers], or a notice that such a petition has been filed, shall be entered in the application file [.] ▶if:

(1) The petition is accompanied by the fee set forth in § 1.17(j);
(2) The petition is served on the applicant in accordance with § 1.248, or, if submitted prior to the date the application was published, filed with the Office in duplicate in the event service is not possible; and,
(3) The petition is submitted within two months of the date the application was published or prior to the mailing of a notice of allowance under § 1.311, whichever occurs first.◀

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42. A new, undesignated center heading and new sections 1.305 through 1.308 are proposed to be added to Subpart B-National Processing Provisions to read as follows:

▶PUBLICATION OF APPLICATIONS

§ 1.305 Withdrawal from publication.

Applications may be withdrawn from publication at the initiative of the Office or upon request by the applicant. An application will not be withdrawn from publication for any reason except:

(a) A mistake on the part of the Office;
(b) The application is either national security classified (see § 5.9(b)) or subject to a secrecy order pursuant to 35 U.S.C. 181; or,
(c) Express abandonment of the application pursuant to § 1.138.

§ 1.306 Publication of application.

(a) A U.S. national application for patent which was either filed in the Office under 35 U.S.C. 111(a) or which resulted from an international application after compliance with 35 U.S.C. 371, or an application filed in the Office under 35 U.S.C. 161 will be published as soon as possible after the expiration of a period of 18 months from the filing date, including the earliest filing date for which a benefit is sought, unless:

(1) The application is national security classified (see § 5.9(b)) or subject to a secrecy order pursuant to 35 U.S.C. 181;
(2) The application has issued as a patent;
(3) The application is recognized by the Office as no longer pending; or,
(4) The application was previously published pursuant to paragraph (d) of this section.

(b) The publication of an application shall consist of:

(1) A notice designated as a "Gazette Entry" containing information such as the application number, filing date, title, inventor's name, abstract, a drawing figure (if appropriate), a representative claim, and U.S. and International Patent Classification (IPC) classification(s) in a *Gazette of Patent Application Notices*;
(2) A printed publication designated as a "patent application notice" containing information such as the application number, filing date, title, inventor's name, correspondence address, abstract, a drawing figure (if appropriate), a representative claim, and U.S. and International Patent Classification (IPC) classification(s);
(3) A document designated as a "technical contents publication" containing the patent application notice and the specification, abstract, claim(s), and drawing(s); and
(4) Public access to a copy of the specification, drawings, and all papers relating to the application file in accordance with § 1.11(a).

(c) Provisional applications filed in the Office under 35 U.S.C. 111(b) shall not be published, and design applications filed in the Office under 35 U.S.C. 171 and reissue applications filed in the Office under 35 U.S.C. 251 shall not be published pursuant to this section.
(d) Applications that will be published pursuant to paragraph (a) of this section may be published earlier than as set forth in paragraph (a) upon petition by the applicant. Any petition requesting early publication of an application must be accompanied by the fee set forth in § 1.17(i) and filed as soon as possible. No consideration will be given to requests for early publication in an application lacking an abstract or claims on a separate sheet, any English translation required pursuant to § 1.52(d), or substitute specification or drawings required pursuant to §§ 1.53(d), 1.60(d), or 1.62(d). No consideration will be given to requests for publication on a certain date, and such requests will be treated as a request for publication as soon as possible.
(e) An applicant who is an independent inventor and has been accorded status under 35 U.S.C. 41(h) in an application that will be published pursuant to paragraph (a) of this section and does not claim the benefit of an earlier filing date under 35 U.S.C. 119, 120, 121, 365(a) or 365(c) may request that the application not be published until three months after an action on the merits. A petition requesting that the application not be published until three months after an action on the merits must be submitted with the filing of the application and be accompanied by:

(1) The petition fee set forth in § 1.17(i); and,
(2) A certification that the invention disclosed in the application was not or will not be the subject of an application filed in a foreign country. The certification must be verified if made by a person not registered to practice before the Patent and Trademark Office.

§ 1.307 Delivery of the printed publication.

The patent application notice will be delivered or mailed on the day of its publication to the correspondence address of record. See § 1.33(a).

§ 1.308 Correction of the printed publication.

A request for a certificate of correction for the patent application notice will only be granted when the Office makes a significant mistake which is apparent from Office records.◀

43. Section 1.315 is proposed to be revised to read as follows:

§ 1.315 Delivery of patent.

The patent will be delivered or mailed ▶upon issuance◀ [on the day of its date] to ▶the correspondence address of record. See § 1.33(a).◀ [the attorney or agent of record, if there be one; or if the attorney or agent so requests, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so requests.]

44. Section 1.321 is proposed to be amended by revising paragraph (c) to read as follows:

§ 1.321 Statutory disclaimers, including terminal disclaimers.

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(c) A terminal disclaimer, when filed to obviate a ▶non-statutory◀ double patenting rejection in a patent application or in a reexamination proceeding, must:

(1) Comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;
(2) Be signed in accordance with paragraph (b)(1) of this section if filed in a patent application or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and
(3) Include a provision that any patent granted on that application or any patent subject to the reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

45. Section 1.492 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.492 National stage fees.

• • • • •

(a) • • • • •

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....▶$355.00◀ [$330.00]
By other than a small entity .....▶710.00◀ [660.00]

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)) .....▶390.00◀ [365.00]
By other than a small entity .....▶780.00◀ [730.00]

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) .....▶520.00◀ [490.00]
By other than a small entity .....▶1040.00◀ [980.00]

(4) Where the international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims

presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) ..... ▶60.00◀ [46.00]
By other than a small entity ..... ▶120.00◀ [92.00]

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f)) ..... ▶455.00◀ [425.00]
By other than a small entity ..... ▶910.00◀ [850.00]

46. Section 1.494 is proposed to be amended by revising paragraphs (c) and (g) to read as follows:

§ 1.494 Entering the national stage in the United States of America as a Designated Office.

• • • • •

(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) ▶,◀ [and/or]
(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497),
▶(3) An abstract or claims on a separate sheet (see §§ 1.72(b) and 1.75(h)),
(4) Papers typed on but one side of the paper (see § 1.52(b)), and/or
(5) Application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction (see §§ 1.52(a) and (b) and 1.85(a)),◀ applicant will be so notified and given a period of time within which to file the ▶English◀ translation ▶,◀ [and/or] oath or declaration ▶, abstract or claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 20 months after the priority date. ▶The period for filing the English translation, oath or declaration, an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a).◀ A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

• • • • •

(g) An international application becomes abandoned as to the United States 20 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 20 months from the priority date where the United States has been designated but not elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 20 months from the priority date but any required translation of the international application as filed ▶,◀ [and/or] the oath or declaration ▶, abstract or claims on a separate sheet, and/or substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

47. Section 1.495 is proposed to be amended by revising paragraphs (c) and (h) to read as follows:

§ 1.495 Entering the national stage in the United States of America as an Elected Office

• • • • •

(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) ▶,◀ [and/or]
(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497),
▶(3) An abstract or claims on a separate sheet (see §§ 1.72(b) and 1.75(h)),
(4) Papers typed on but one side of the paper (see § 1.52(b)), and/or
(5) Application papers or sheets of drawings of sufficient clarity, contrast, and quality, and in the proper size and format for electronic reproduction (see §§ 1.52(a) and (b) and 1.85(a)),◀ applicant will be so notified and given a period of time within which to file the ▶English◀ translation ▶,◀ [and/or] oath or declaration ▶, abstract or claims on a separate sheet, and a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. ▶The period for filing the English translation, oath or declaration, an abstract and claims on a separate sheet, and a substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction cannot be extended pursuant to § 1.136(a).◀ A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

• • • • •

(h) An international application becomes abandoned as to the United States 30 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 30 months from the priority date where the United States has been elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 30 months from the priority date but any required translation of the international application as filed ▶,◀ [and/or] the oath or declaration ▶,abstract or claims on a separate sheet, and/or a substitute specification in compliance with § 1.125 with papers typed on but one side of the paper and sheets of drawings, each of the substitute specification and sheets of drawings of sufficient clarity, contrast, and quality and in the proper size and format for electronic reproduction◀ are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

48. Section 1.497 is proposed to be revised to read as follows:

§ 1.497 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application [, if the inventor,] desires to enter the national stage under 35 U.S.C. 371 pursuant to §§ 1.494 or 1.495, he or she must file an oath or declaration ▶that:
(1) Is executed in accordance with either §§ 1.66 or 1.68,
(2) Identifies the specification to which it is directed,
(3) Identifies each inventor and the country of citizenship of each inventor, and
(4) States that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.◀ [in accordance with § 1.63.]

(b) ▶(1) The oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47.

(2)◀ If the ▶person making the oath or declaration is not the inventor (§§ 1.42, 1.43 or 1.47),◀ [international application was made as provided in §§ 1.422, 1.423 or 1.425,] the ▶oath or declaration shall state the relationship of the person◀ [applicant shall state his or her relationship] to the inventor and, upon information and belief, the facts which the inventor is required [by § 1.63] to state.

▶(c) The oath or declaration must comply with the requirements of § 1.63; however, if the oath or declaration meets the requirements of paragraphs (a) and (b) of this section, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c). If the oath or declaration does not meet the requirements of § 1.63, a supplemental oath or declaration in compliance with § 1.63 will be required in accordance with § 1.67.◀

49. Section 1.701 is proposed to be revised as follows:

§ 1.701 Extension of patent term due to prosecution delay.

(a) A patent, other than for designs, issued on an application filed on or after June 8, 1995, is ▶, subject to the provisions of this section,◀ entitled to extension of the patent term if the issuance of the patent was delayed due to:

(1) interference proceedings under 35 U.S.C. 135(a); and/or
(2) the application being placed under a secrecy order under 35 U.S.C. 181; and/or
(3) appellate review by the Board of Patent Appeals and Interferences or by a Federal court under 35 U.S.C. 141 or 145, if the patent was issued pursuant to a decision reversing an adverse determination of patentability ▶; and/or◀ [and if the patent is not subject to a terminal disclaimer due to the issuance of another patent claiming subject matter that is not patentably distinct from that under appellate review.]

▶(4) an unusual administrative delay by the Office.

(i) Circumstances constituting an unusual administrative delay by the Office include the failure to:

(A) act on a reply under § 1.111 or appeal brief under § 1.192 within six months of the date it was filed;
(B) act on an application within six months of the date of a decision under § 1.196 by the Board of Patent Appeals and Interferences where claims stand allowed in an application or the nature of the decision requires further action by the examiner (§ 1.197); and
(C) issue a patent within six months of the date that the issue fee was paid or all outstanding requirements were satisfied, whichever is later.◀

(b) The term of a patent entitled to extension under paragraph (a) of this section shall be extended for the sum of the periods of delay calculated under paragraphs (c)(1), (c)(2), (c)(3) ▶, (c)(4)◀ and (d) of this section, to the extent that these periods are not overlapping, up to a maximum of ▶ten◀ [five] years. The extension will run from the expiration date of the patent.
(c)(1) The period of delay under paragraph (a)(1) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) with respect to each interference in which the application was involved, the number of days, if any, in the period beginning on the date the interference was declared or redeclared to involve the application in the interference and ending on the date that the interference was terminated with respect to the application; and
(ii) the number of days, if any, in the period beginning on the date prosecution in the application was suspended by the Patent and Trademark Office due to interference proceedings under 35 U.S.C. 135(a) not involving the application and ending on the date of the termination of the suspension.
(2) The period of delay under paragraph (a)(2) of this section for an application is the sum of the following periods, to the extent that the periods are not overlapping:

(i) the number of days, if any, the application was maintained in a sealed condition under 35 U.S.C. 181;
(ii) the number of days, if any, in the period beginning on the date of mailing of an examiner's answer under § 1.193 in the application under secrecy order and ending on the date the secrecy order and any renewal thereof was removed;
(iii) the number of days, if any, in the period beginning on the date applicant was notified that an interference would be declared but for the secrecy order and ending on the date the secrecy order and any renewal thereof was removed; and
(iv) the number of days, if any, in the period beginning on the date of notification under § 5.3(c) and ending on the date of mailing of the notice of allowance under § 1.311.

(3) The period of delay under paragraph (a)(3) of this section is the sum of the number of days, if any, in the period beginning on the date on which an appeal to the Board of Patent Appeals and Interferences was filed under 35 U.S.C. 134 and ending on the date of a final decision in favor of the applicant by the Board of Patent Appeals and Interferences or by a Federal court in an appeal under 35 U.S.C. 141 or a civil action under 35 U.S.C. 145.
▶(4) The period of delay under paragraph (a)(4) of this section is the sum of the number of days, if any, in the period of unusual delay by the Office.◀

(d) The period [of delay] set forth in paragraph (c)[(3)] shall be reduced by ▶any time during the processing or examination of the application, as determined by the Commissioner, during which the applicant for patent failed to engage in reasonable efforts to conclude processing or examination of the application. In determining whether an applicant failed to engage in reasonable efforts to conclude processing or examination of the application, the Commissioner may examine the facts and circumstances of the applicant's actions during the entire prosecution of the application to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, an applicant for patent seeking to conclude the processing or examination of the application. Circumstances constituting a failure to engage in reasonable efforts to conclude processing or examination of the application include:

(1) requesting suspension of action under § 1.103, and
(2) abandonment of the application.◀ [:

(1) any time during the period of appellate review that occurred before three years from the filing date of the first national application for patent presented for examination; and
(2) any time during the period of appellate review, as determined by the Commissioner, during which the applicant for patent did not act with due diligence. In determining the due diligence of an applicant, the Commissioner may examine the facts and circumstances of the applicant's actions during the period of appellate review to determine whether the applicant exhibited that degree of timeliness as may reasonably be expected from, and which is ordinarily exercised by, a person during a period of appellate review.]

▶(e) No patent term shall be extended under this section:

(1) beyond the expiration date specified in a terminal disclaimer in a patent whose term has been disclaimed in such terminal disclaimer;
(2) in a patent issued before the expiration of three years after the filing date of the application or entry of the application into the national stage under 35 U.S.C. 371, whichever is later, not taking into account any claim to the benefit of the filing date of any application under 35 U.S.C. 120, 121, 365(c).

(f) Any extension of patent term under paragraph (a)(4) of this section on the basis of an administrative delay other than one specifically set forth in paragraphs (a)(4)(i)(A)-(C) must

be requested by petition. A petition for an extension of patent term based upon unusual administrative delay by the Office other than one specifically set forth in paragraphs (a)(4)(i)(A)-(C) cannot be filed prior to the mailing of a notice of allowance under § 1.311 and must be accompanied by:

(1) a statement of the facts involved, the administrative delay by the Office to be reviewed, and the period of extension requested; and,

(2) the fee set forth in § 1.17(i). The petition may include a request that the petition fee be refunded if an extension of the patent term under paragraph (a)(4) of this section is granted.◀

50. Section 1.808 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.808 Furnishing of samples.

(a) A deposit must be made under conditions that assure that:

(1) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122▶(a)◀, and

(2) Subject to paragraph (b) of this section, all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the ▶publication of the application under § 1.306 or◀ granting of the patent.

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PART 3 - ASSIGNMENT, RECORDING, AND RIGHTS OF ASSIGNEE

51. The authority citation for 37 CFR Part 3 would continue to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6.

52. Section 3.31 is proposed to be amended by redesignating paragraph (b) as paragraph (c) and adding a new paragraph (b) to read as follows:

§ 3.31 Cover sheet content.

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(b) ▶For a patent application, the cover sheet may include an indication that the assignment information is to be printed on the patent application notice. If the assignment and cover sheet containing the above-mentioned indication is not submitted within two months of filing or fourteen months from the earliest filing date for which a benefit is claimed, whichever is later, the assignment information may not be printed on the patent application notice.

(c)◀ A cover sheet may not refer to both patents and trademarks.

PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

53. The authority citation for 37 CFR Part 5 would continue to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*; the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*; and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*; and the delegations in the regulations under these Acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

54. Section 5.1 is proposed to be amended by adding new paragraphs (c) and (d) to read as follows:

§ 5.1 Defense inspection of certain applications.

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▶(c) Defense agency inspection must be promptly completed to enable those applications due for publication under § 1.306 of this chapter to be published in regular course. Applications under defense agency review will be released for publication six months from the actual U.S. filing date or three months from the date the application was made available to a defense agency under paragraph (b) of this section, whichever is later.

(d) Applications on inventions not made in the United States and on inventions in which the U.S. Government has a property interest will not be made available to defense agencies under § 5.2(b).◀

55. A new section 5.9 is proposed to be added to Part 5 to read as follows:

▶§ 5.9 National security classified applications.

(a) Patent applications and papers relating thereto that are national security classified and contain authorized national security markings of "Confidential," "Secret" or "Top Secret," as appropriate, are accepted by the Office. National security classified documents mailed to the Office must be addressed in compliance with § 5.33. National security classified documents may be hand-carried to Licensing and Review.

(b) A national security classified patent application will not be published pursuant to § 1.306 or allowed pursuant to § 1.311 of this chapter until the application is declassified.

(c) The applicant in a national security classified patent application must obtain a secrecy order pursuant to § 5.2. In a national security classified patent application filed without a notification pursuant to § 5.2(a), the Office will set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application.

(d) Where evidence of a good faith effort to obtain a secrecy order pursuant to § 5.2 from the relevant department or agency is presented within the time period set by the Office, but the application has not been declassified and a secrecy order pursuant to § 5.2 has not been obtained, the Office will again set a time period within which the application must be declassified, a secrecy order pursuant to § 5.2 must be obtained, or evidence of a good faith effort to again obtain a secrecy order pursuant to § 5.2 from the relevant department or agency must be presented in order to prevent abandonment of the application.◀

July 27, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1177 OG 61]

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(101) **Examination of Patent Applications Containing Nucleotide Sequences**

I. Introduction

Biotechnology is expected to be an important growth industry from now until well into the twenty-first century, particularly in the United States, one which will produce new therapeutics for the benefit of mankind. The Patent and Trademark Office (PTO) has taken a very active role in working together with its customers to simplify and standardize PTO policies and procedures and to encourage and promote the growth of this industry for the benefit of humanity.

For at least a decade, researchers in the biotechnology industry have been filing patent applications claiming isolated DNA or RNA sequences of nucleotides, referred to as nucleotide or nucleic acid sequences. Scientific and technological advances now permit researchers to identify large numbers of gene sequences rapidly. The ease of using automated techniques for sequencing large numbers of nucleotides in a nucleic acid has resulted in the filing of a growing number of patent applications, many of which recite thousands of individual nucleotide sequences with each sequence reciting at least several hundred nucleotides. The examination of these applications presents unprecedented search and examination challenges, even with the most modern, up-to-date equipment.

Faced with these challenges, the PTO held public hearings on issues relating to patent protection of nucleotide sequences on April 16, 1996, in San Diego, California and on April 23, 1996, in Arlington, Virginia. At those hearings, the PTO received several recommendations that restriction practice pursuant to 35 U.S.C. § 121 should be applied to patent applications claiming nucleotide sequences.

This Notice responds to comments received during the hearings. This Notice clarifies PTO's policy for examination of patent applications that claim large numbers of nucleotide sequences.

II. The PTO Will Permit Applicants to Claim Up to Ten Independent and Distinct Nucleotide Sequences In One National Application

By statute, "[i]f two or more independent and distinct inventions are claimed in one application, the Commissioner may require the application to be restricted to one of the inventions." 35 U.S.C. § 121. Pursuant to this statute, the Rules of Practice in Patent Cases provide that "[i]f two or more independent and distinct inventions are claimed in a single application, the examiner in his action shall require the applicant . . . to elect that invention to which his claim shall be restricted." 37 CFR 1.142(a). See also 37 CFR 1.141(a).

Nucleotide sequences encoding different proteins are structurally distinct chemical compounds and are unrelated to one another. These sequences are thus deemed to normally constitute independent and distinct inventions within the meaning of 35 U.S.C. § 121. Absent evidence to the contrary, each such nucleotide sequence is presumed to represent an independent and distinct invention, subject to a restriction requirement pursuant to 35 U.S.C. § 121 and 37 CFR 1.141 *et seq.* Nevertheless, to further aid the biotechnology industry in protecting its intellectual property without creating an undue burden on the Office, the Commissioner has decided *sua sponte* to partially waive the requirements of 37 CFR 1.141 *et seq.* and permit a reasonable number of such nucleotide sequences to be claimed in a single application.

Accordingly, in most cases, up to ten (10) independent and distinct nucleotide sequences will be examined in a single application without restriction. It has been determined that normally ten sequences constitute a reasonable number for examination purposes. The PTO believes that allowing applicants to claim up to ten (10) independent and distinct nucleotide sequences in a single application will promote efficient, cost-effective examination of these types of applications. In addition to the specifically selected sequences, those sequences which are patentably indistinct from the selected sequences will also be examined. Furthermore, nucleotide sequences encoding the same protein are not considered to be independent and distinct inventions and will continue to be examined together.

In some exceptional cases, the complex nature of the claimed material, for example a protein amino acid sequence reciting three dimensional folds, may necessitate that the reasonable number of sequences to be selected be less than ten (10). In other cases, applicants may petition pursuant to 37 CFR 1.181 for examination of additional nucleotide sequences by providing evidence that the different nucleotide sequences do not cover independent and distinct inventions.

III. Under the Unity of Invention Standard in an International Application or National Stage Application Filed Under 35 U.S.C. § 371, Up to Ten Nucleotide Sequences Will Be Searched and/or Examined Without Payment of An Additional Fee

International applications filed under the Patent Cooperation Treaty (PCT) and national stage applications filed under 35 U.S.C. § 371 will be treated in a similar manner. Under 37 CFR 1.475 and 1.499 *et seq.*, when claims do not comply with the requirement of unity of invention, i.e., when the claimed subject matter does not involve "one or more of the same or corresponding special technical features," 37 CFR 1.475(a), an additional fee is required to maintain the claims in the same application. 37 CFR 1.476(b).

The Commissioner has decided *sua sponte* to partially waive 37 CFR 1.475 and 1.499 *et seq.* to permit applicants to claim up to ten (10) nucleotide sequences which do not have the same or corresponding special technical feature, without the payment of an additional fee. The PCT permits inventions which lack unity of invention to be maintained in the same international application for the payment of additional fees. Thus, in international applications, for each group for which applicant has paid additional international search and/or preliminary examination fees, the PTO has determined that up to four (4) such additional sequences per group is a reasonable number for examination. Further, claims directed to the selected sequences will be examined with claims drawn to any sequence combinations which have a common technical feature with the selected sequences. Nucleotide sequences encoding the same protein are considered to satisfy the unity of invention standard and will continue to be examined together.

IV. Examples of Nucleotide Sequence Claims That Are the Subject of this Notice

Examples of typical nucleotide sequence claims impacted by this Notice include:

(1) an isolated and purified DNA fragment comprising DNA having at least 95% identity to a DNA sequence selected from SEQ ID Nos. 1-1,000;

(2) a combination of DNA fragments comprising SEQ ID Nos. 1-1,000; and

(3) a combination of DNA fragments, said combination containing at least thirty different DNA fragments selected from SEQ ID Nos. 1-1,000.

Applications claiming more than ten (10) individual independent and distinct nucleotide sequences in alternative form, such as set forth in example 1, will be subject to a restriction requirement. Only the ten (10) nucleotide sequences selected in response to the restriction requirement and any other claimed sequences which are patentably indistinct therefrom will be examined.

Applications claiming only a combination of nucleotide sequences, such as set forth in example 2, will generally not be subject to a restriction requirement. The presence of one novel and nonobvious sequence within the combination will render the entire combination allowable. The combination will be searched until one nucleotide sequence is found to be allowable. The order of searching will be chosen by the examiner to maximize the identification of an allowable sequence. If no individual nucleotide sequence is found to be allowable, the examiner will consider whether the combination of sequences taken as a whole renders the claim allowable.

Applications containing only composition claims reciting different combinations of individual nucleotide sequences, such as set forth in example 3, will be subject to a restriction requirement. Applicants will be required to select one combination for examination. If the selected combination contains ten or fewer sequences, all of the sequences of the combination will be searched. If the selected combination contains more than ten sequences, the combination will be examined following the procedures set forth above for example 2. More specifically, the combination will be searched until one nucleotide sequence is found to be allowable with the examiner choosing the order of search to maximize the identification of an allowable sequence. The identification of any allowable sequence(s) will cause all combinations containing the allowed sequence(s) to be allowed.

In applications containing all three claims set forth in examples 1-3, the PTO will require restriction of the application to ten sequences for initial examination purposes. Based upon the finding of allowable sequences, claims limited to the allowable sequences as in example 1, all combinations, such as in examples 2 and 3, containing the allowable sequences and any patentably indistinct sequences will be rejoined and allowed.

Rejoinder will be permitted for claims requiring any allowable sequence(s). Any claims which have been restricted and non-selected and which are limited to the allowable sequence(s) will be rejoined and examined.

V. Other Possible Solutions

The PTO is pursuing other possible ways to efficiently examine applications that claim large numbers of nucleotide sequences, including the following:

A. *Software Development* - Using private contractors, the PTO will attempt to identify, modify or develop software tools to aid in searching and the analysis of search results.

B. *Feedback* - The PTO will pursue and evaluate suggestions from applicants, members of the bar, industry, scientists, government, and inventors.

C. *International Cooperation* - The PTO will encourage greater cooperation between the other patent offices of the world in the area of biotechnology. The PTO will work with these offices to share resources thereby minimizing duplication of search and examination.

D. *PTO Outside Search Center* - The PTO will explore the possibility of establishing an outside search center which would perform standard searches for all patent applicants submitting applications containing nucleotide sequences.

E. *Search Standards* - The PTO will explore the possibility of establishing quality and proficiency standards for prior art searches so that applicants can perform their own pre-examination searches. Applicants could then submit their searches with their applications, and the PTO could examine applications based on applicants' searches.

F. *Communication* - The PTO will communicate its procedures for searching the prior art and how the current hardware and software have been optimized for examination needs.

Any questions, comments or suggestions regarding this Notice should be directed to Esther M. Kepplinger, Supervisory Primary Examiner, Group Art Unit 1302: by mail to Box Comments-Patents, Assistant Commissioner for Patents, Washington, DC 20231; by FAX to (703) 305-3601; or by electronic mail addressed to ekepplin@uspto.gov.

October 17, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1192 OG 68]

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(102)

Department of Commerce
Patent and Trademark Office

37 CFR Part 1
[Docket No: 960828235-6235-01]
RIN: 0651-AA88

Changes Implementing Nucleotide and/or Amino Acid Sequence Listings

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking and Request for Comments.
Summary: The Patent and Trademark Office (PTO) is proposing to amend the rules for submitting nucleic acid or amino acid sequences in computer readable form (CRF) for patent applications to simplify the requirements of the rules, to rearrange portions of the rules for better understanding and to establish consistent rules to permit a single internationally acceptable computer readable form. The Sequence Listing will be presented in an international, language neutral format using numeric identifiers rather than the current subject headings and the paper Sequence Listing will be a separately numbered section of the patent application. Sequences which contain fewer than four (4) specifically identified nucleotides or amino acids will no longer be required to be submitted in computer readable form.
Date: Written comments must be received by December 3, 1996.
Addresses: Address written comments to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, DC 20231, Attention: Esther M. Kepplinger or by Fax to (703) 305-3601 to her attention. Comments may be sent by mail message over the Internet addressed to seqrule@uspto.gov. The written comments will be available for public inspection in Suite 520, Crystal Park One, 2011 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Esther M. Kepplinger, by telephone at (703) 308-2339 or by mail addressed to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, DC 20231 marked to her attention or by Fax to (703) 305-3601 or by electronic mail at ekepplin@uspto.gov.
Supplemental Information: The existing sequence rules (37 CFR 1.821-1.825) provide a standardized format for the description of nucleotide and amino acid sequence data in patent applications and require the submission of such sequences in computer readable form (CRF). The existing sequence rules have provided the following benefits to the PTO: (1) improved search capabilities; (2) improved interference detection; (3) more efficient examination; (4) cost savings for the input of the sequence data; (5) more efficient and accurate printing of sequences in patents; (6) exchange of the sequence data with other patent offices electronically and (7) improved public access to the sequences electronically.

In an effort to streamline and reduce the procedural requirements of the existing rules and to respond to the needs of our customers while establishing an internationally acceptable standard, the PTO proposes to modify the current rules requiring the submission of computer readable forms for nucleotide and amino acid sequences.

To decrease the burden on applicants who file applications containing nucleotide and amino acid sequence information under the Patent Cooperation Treaty (PCT), the PTO entered into discussions at the PCT Meeting of International Authorities (MIA) in November 1994 on changing the applicable rules for submission and transfer of Sequence Listings. Under the current PCT rules, each International Searching Authority and national Office may set the standard for submission of the paper and electronic Sequence Listing information. This may impose a burden on applicants of providing several different formats of Sequence Listings in different languages during the international and national phases of the PCT procedure.

Under the current PCT practice, the applicant serves as the data repository for requests during each stage of the PCT practice for new electronic copies of the Sequence Listings.

Under national practice, a Sequence Listing may be required to be translated into the national language at considerable cost and posing the danger that the data could be inadvertently altered.

At the November 1994 MIA to address these problems, rule changes were proposed to require a language neutral Sequence Listing submission which would suffice for PCT and national stage sequence information processing. Initial Trilateral meetings and correspondence suggest that such a sequence submission would be acceptable under European Patent Office (EPO) and Japanese Patent Office (JPO) procedures, thus further lessening the burden on applicants.

These sequence rules are proposed to be revised in concert with World Intellectual Property Organization (WIPO) International Standards ST.23 and ST.24 for the paper and electronic submission of sequence information in patent applications, as well as PCT requirements. This should result in an applicant having to produce a single Sequence Listing that would satisfy the filing requirements in all countries, as well as permitting an applicant to submit only a single electronic Sequence Listing in PCT applications.

In an effort to profit from the experiences of the nucleotide database information providers which pioneered the electronic submission of sequence information, the PTO discussed with them the possible simplification of the PTO sequence submission rules. In response to their advice (which confirmed the

PTO experience), the number of mandatory data elements is proposed to be reduced.

Thus, the proposed rule changes include:

(1) use of numeric identifiers to replace the language subject headings within the submission;

(2) elimination of unnecessary and confusing data elements;

(3) movement of the paper Sequence Listing to the end of the application as a section with separately numbered pages;

(4) modification of 37 CFR § 1.77 to include the paper Sequence Listing as a part of the specification and to provide a place for the paper Sequence Listing in the printed patent;

(5) elimination of the requirement to provide a submission for sequences with fewer than four specifically defined nucleotides or amino acids;

(6) use of *lower-case* one-letter codes for nucleotide bases;

(7) rearrangement of portions of the rules to improve their context; and

(8) clarification and simplification of the rules to aid in understanding of the requirements that they set forth.

Request For Comments:

The PTO is particularly interested in receiving comments on three queries. Currently sequences containing D-amino acids need not be provided in the "Sequence Listing", but the PTO has accepted voluntary submissions of sequences containing D-amino acids.

The commercially available sequence searching software used to search prior art databases is not capable of discerning D-amino acids since they do not have distinct designators. It is for this reason that the rules do not require a computer readable form for the disclosure of sequences which contain D-amino acids.

Those seeking to volunteer the information in accordance with these rules might be seeking assurance that a machine search of the closest prior art will be conducted by the PTO or they consider the information useful and wish it to be in the database. If the PTO does not accept voluntary submissions, that would exclude information from the databases that at least some applicants believe to be valuable information.

The potential conflict created by accepting these D-amino acid-containing sequences is that the published database will contain sequences with D-amino acids and those using the published database may be operating on the assumption that it does not, given the indication in § 1.821(a)(2) that D-amino acid-containing sequences are not intended to be included. For this reason, there may be an advantage to having the D-amino acids indicated by Xaa to alert the user that the Feature section must be consulted. A disadvantage of voluntary submissions is that they will result in the generation of a database which is incomplete and cannot be relied upon to provide a complete search of the U.S. patent literature including sequences containing D-amino acids.

The PTO seeks comments on the following query:

(1) Should the PTO accept voluntary submissions of computer readable forms and Sequence Listings where a D-amino acid is contained in the sequence? If such voluntary submissions are accepted, should there be a restriction on the choice of identifying a D-amino acid by an Xaa or by its L-amino acid counterpart abbreviation?

Section 1.821(c) will continue to require that all sequence information contained in a disclosure, including in the specification, drawings or claims, be presented in the Sequence Listing in accordance with §§ 1.821 - 1.825. This provision does not discriminate between prior art sequences and "new" sequences. The PTO has received comments in the past and is seeking additional comments on this issue. The suggestion has been made that sequences which are prior art, and/or are contained in a database at the time of filing, need not be provided to the PTO in computer readable form since the sequence information is obtainable by other means. Responsive to these public comments, the PTO is considering amending the rules to permit omission of some sequences from the Sequence Listing if these sequences are admitted prior art to applicant and are in a publicly available, electronic, sequence database and the database accession number is supplied.

The suggestion to exclude prior art sequences was made when §§ 1.821 - 1.825 were originally adopted. 55 FR 18230, 18237 (1990). The final rules, however, required the submission of all sequence information in computer readable form. The reasons for that decision include: 1) the assessment of whether a particular sequence falls within the requirements of the current rules is simple; 2) the general public is assured that all patents which contain any sequence information contain all of the sequence information in the Sequence Listing and all sequences are available in a computer accessible form; 3) as a publication, the contextual association of new and old information is potentially unique to the patent and very valuable to anyone assessing the state of the art at the time of a patented invention, and thus are desirable to be present in electronic form in association with that patent; and 4) these rules do not require any information to be disclosed in the form of a sequence, but rather require a particular format whenever information is presented in the form of a sequence. These reasons continue to be relevant.

The PTO is concerned about how such a provision would be drafted without creating difficult questions. A provision which excludes sequences whenever a sequence is prior art and has previously been included in a publicly available, electronic, sequence database appears to be straightforward; however, many technical and legal issues would result. What constitutes a publicly available, electronic, sequence database? Would the USPTO and the other patent offices which have similar rules be required to produce a list of internationally accepted databases? What would be the criteria for such acceptance? An additional issue would exist involving electronic records maintenance: is there any assurance that once information is contained in a database that it will be retained and available indefinitely without alteration? Changes to the information in nucleic acid sequence databases resulting from the discovery of sequencing errors are well-known. Does the mere existence of the sequence information in such a record constitute reasonable means of retrieval? Would not one need some text basis or other identifier to retrieve the information?

Concerns have been voiced that the redundancy of including old sequences in the PTO database creates electronic searching problems, such as increased cost and reduced speed. Upon investigation, it has been found that requiring all disclosed sequences to be included in the Sequence Listing does not cause search processing problems at the PTO or incur increased costs.

The PTO seeks comments on the following query:

(2) Should the provisions of 37 CFR 1.821(c) be altered to exclude some prior art sequences from inclusion in the Sequence Listing even though they are presented in a patent application disclosure as sequences? Should the reference to an accession number of an admitted prior art sequence in a publicly available, electronic, sequence database suffice and exclude that sequence from the requirements of the sequence rules?

At the November 1994 MIA, it was proposed that the Sequence Listings submitted in an international application filed under the PCT would no longer be published on paper. It was suggested that the Sequence Listings be published electronically and be available in the electronic form from several sequence repositories throughout the world. These repositories would have the Sequence Listings available in electronic form at the time of publication of the PCT pamphlet.

The PTO seeks comments on the following query:

(3) Should Sequence Listings filed in an international application filed under the PCT be published only electronically and made available for retrieval electronically by an accession number from several sequence repositories?

Written comments will be available for public inspection and will be available on the Internet (address: www.uspto.gov). Commentators should note that since their comments will be made publicly available, information that is not desired to be made public, such as the address and phone number of the commentator, should not be included in the comments. A public hearing will not be conducted.

Discussion of Specific Rules

Section 1.77 is proposed to be amended by revising paragraph (g), which would provide for a reference to a Sequence Listing Annex, if any exists. In the application as filed, on a separate page immediately before the claims, reference would be made to a Sequence Listing Annex and the Sequence Listing would be provided as a separately numbered section or Annex to the application. In a printed patent the Sequence Listing would appear immediately before the claims.

Section 1.77 is proposed to be amended to redesignate existing paragraphs (g) - (j) as paragraphs (h) - (k) and add an additional paragraph (l) Sequence Listing Annex. In the application as filed, the Sequence Listing would be provided by applicants as a separately numbered section or Annex of the application. The pages of the Sequence Listing Annex should be numbered independently from the specification using sequential integers preceded by "A" to identify them as a part of the Annex and to prevent any confusion which might arise from using numbers already used in the specification. In a printed patent the Sequence Listing would be printed immediately before the claims. In cases where the Sequence Listing is voluminous, the files are difficult to handle. This change would permit easier storage of very large Sequence Listings apart from the main part of the application during pendency. The presentation of the Sequence Listing as a separate Annex would also facilitate compliance with PCT requirements and other national patent office rules.

Sections 1.821(a)(1) and (2) are proposed to be amended by referring to sections in World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.23, paragraphs 8 through 12, April 1994, herein incorporated by reference, rather than to paragraphs in § 1.822. The WIPO Standard ST. 23 (April 1994) is consistent with § 1.822 except for certain corrections which are noted herein and the requirement of the use of the lower case for the one-letter code for nucleotide bases. The proposed rule states that the incorporation has been approved. This language is required by the Federal Register. This incorporation by reference will be reviewed by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51 before any Final Rule is adopted. Copies may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

Section 1.821(a) is proposed to be amended so that sequences with fewer than four specifically defined amino acids or nucleotides would be expressly excluded from this rule. "Specifically defined" means those amino acids other than "Xaa" and those nucleotide bases other than "N" defined in accordance with WIPO Standard ST.23.

This change is being proposed to reduce the burden on applicants for those sequences that contain only a minimal amount of sequence information. For example, if an amino acid sequence is disclosed as being entirely "Xaa" residues, the 1990 version of the sequence rules would require this sequence to be submitted in computer readable form. However, this sequence has no value as sequence information because each of the positions is represented as a "wild card." Such low-information sequences are not very useful in any sequence matching and alignment algorithm. In order to minimize the inclusion of such low-information-value sequence data in the database and to relieve the burden on applicants to submit low-information-value sequences, the Office proposes this change to the sequence rules. If applicants should wish to voluntarily submit a CRF for such sequences, they would be accepted and entered in the PTO's database.

It is not necessary that any of the non-N or non-Xaa residues be adjacent to any other non-N or non-Xaa residue in order for a sequence to be subject to § 1.821(a).

Sections 1.821(a)(2) and 1.822(b) are proposed to be amended by changing "elsewhere in the 'Sequence Listing'" to "in the Feature section." The purpose of this change is to enhance clarity of the rule. The only place in the "Sequence Listing" where additional information is permitted is in the Feature section. The current language implies that there are other acceptable portions of the "Sequence Listing" appropriate for additional information and thus is ambiguous and misleading.

Section 1.821(a)(2) will continue to indicate that sequences containing D-amino acids need not comply with the provisions of §§ 1.822 - 1.825. To date, the PTO has accepted voluntary submissions of sequences which contain D-amino acids. The sequence information has either indicated as Xaa at each occurrence of a D-amino acid or has indicated the amino acid (or imino acid) by abbreviation as if it were an L-amino acid (or imino acid) and explained the existence of the D-amino acid in the Feature section associated with that sequence.

Section 1.821(c) is proposed to be amended by clarifying and establishing a language neutral format sequence listing. Specifically, the use of integer identifiers is proposed for identifying sequences. Where a sequence integer identifier is intentionally omitted, it must be noted by applicant to avoid confusion in the published document.

Section 1.821(d) is proposed to be amended by changing "assigned identifier" to "integer identifier" to be consistent with the term used in § 1.821(c).

Section 1.821(d) is proposed to be amended by adding the phrase, "preceded by 'SEQ ID NO:' ". This change is necessitated by the change to § 1.821(c). Since the integer identifier in the "Sequence Listing" would be defined now as a numeral only, it is necessary that any reference to a particular sequence in the specification and claims be preceded by "SEQ ID NO:". It is not acceptable to use only a numeric identifier, such as "<200>" or "<400>"- see infra Sequence Listing table, in the description or the claims because one reading a patent may not reasonably be presumed to be familiar with the meanings of numeric identifiers.

Section 1.821(e) is proposed to be amended by setting forth the procedure for transferring an accepted computer readable Sequence Listing from one application to a subsequently filed application. The existing rules did not adequately describe the process of transferring a computer readable Sequence Listing into a new application if an identical CRF was previously accepted by the PTO for another application. A further description of the intended procedures has been added for purposes of clarity. This section is intended to describe that if a computer readable Sequence Listing is identical to one that is error-free and already on file at the PTO, an applicant has two options. A new diskette may be submitted, or an applicant may submit a statement clearly directing the PTO to use the previously submitted CRF since they are identical, and that the paper copy of the Sequence Listing in the new application is identical to the disk in the previous application.

Section 1.821(g) is proposed to be amended by correcting the reference to 35 U.S.C. 111(a) applications. Section 1.821(h) is proposed to be amended by clarifying that this rule applies to all international applications searched and examined by the PTO. In addition to international applications filed in the United States Receiving Office, the United States is a competent International Searching Authority (ISA) for applications filed in receiving Offices of, or acting for, Brazil, Israel, Mexico, and Trinidad and Tobago. The United States is also a competent ISA for applications filed in the International Bureau where at least one of the applicants is a resident or national of the United States or a resident or national of Barbados. In addition, the United States acts as an International Preliminary Examining Authority for certain applications searched in the EPO. The language change regarding the time limit for compliance and statement accompanying the submission are necessary to conform with the language found in PCT Rule 13ter.1.

Section 1.822 is proposed to be revised for clarity and better organization and to accommodate an international request for the use of *lower case* one-letter codes for nucleotide bases.

Section 1.822 (b) is proposed to be amended to refer to WIPO Standard ST.23 (April 1994) and incorporate the information therein. The reorganization groups all nucleotide and all amino acid formats together.

Section 1.822 (c)(1) is proposed to be amended by requiring the use of lower case one-letter code for the nucleotide bases. This change would put the PTO requirements in conformance with most large databases. Additionally, the use of lower case letters in a sequence makes the confusion of "g" for "c" and vice versa less likely.

Current paragraph (d) is proposed to be redesignated as a part of paragraph (c)(3) and current paragraph (e) is proposed to be deleted with the substance of the paragraph being incorporated into (d)(1). Current paragraph (f) is proposed to be redesignated as paragraph (c)(2); current paragraph (g) is proposed to be redesignated as paragraph (c)(3) and amended to incorporate current paragraph (d). Current paragraph (h) is proposed to be redesignated as paragraph (d)(2). Current paragraphs (i) and (j) are proposed to be redesignated as (c)(4) and (c)(5). Current paragraph (k) is proposed to be redesignated as (d)(3). Current paragraph (l) is proposed to be redesignated as (c)(6) and current paragraph (m) is proposed to be redesignated as (d)(4). Current paragraph (n) is proposed to be redesignated as (c)(7) and amended to delete a sentence, the substance of which is incorporated into (d)(4).

Paragraph (d)(1) is proposed to be added to include a reference to WIPO Standard ST.23 (April 1994). Paragraphs (d)(2-4) incorporate the material from current paragraphs (h), (k), (m) and a sentence of (n). Paragraph (d)(5) is proposed to be added to clarify that the use of terminator symbols is not acceptable in amino acid sequences either as "internal" terminator symbols or following the carboxy terminal amino acid of a peptide or polypeptide.

Current paragraph (o) is proposed to be redesignated as paragraph (e) and amended to recite integer identifier to be consistent with § 1.821 (c) and to permit the language neutral submission.

Current paragraph (p) is proposed to be deleted.

The lists of nucleic acid and amino acid abbreviations and the lists of modified base controlled vocabulary and the modified and unusual amino acids would be replaced by reference to WIPO Standard ST.23 RECOMMENDATION FOR THE PRESENTATION OF NUCLEOTIDE AND AMINO ACID SEQUENCE LISTINGS IN PATENT APPLICATIONS AND IN PUBLISHED PATENT DOCUMENTS (April 1994) to simplify and shorten the rules. This information will also appear in an appropriate section of the Manual of Patent Examining Procedure to assist applicants in preparing Sequence Listings. For purposes of facilitating review of these proposed rule changes, appropriate corrected excerpts of paragraphs 8, 9, 11 and 12 of WIPO Standard ST.23 are provided below.

WIPO Standard ST.23, paragraph 8, provides that the bases of a nucleotide sequence should be represented using the following one-letter code for nucleotide sequence characters.

Symbol	Meaning	Origin of designation
A	A	Adenine
G	G	Guanine
C	C	Cytosine
T	T	Thymine
U	U	Uracil
R	G or A	puRine
Y	T/U or C	pYrimidine
M	A or C	aMino
K	G or T/U	Keto
S	G or C	Strong interactions 3H-bonds
W	A or T/U	Weak interactions 2H-bonds
B	G or C or T/U	not A
D	A or G or T/U	not C
H	A or C or T/U	not G
V	A or G or C	not T, not U
N	(A or G or C or T/U) or (unknown or other)	aNy

WIPO Standard ST.23, paragraph 9, provides: Modified bases may be represented as the corresponding unmodified bases in the sequence itself if the modified base is one of those listed below and the modification is further described elsewhere in the Sequence Listing. The codes from the list below may be used in the description or the Sequence Listing but not in the sequence itself.

Symbol	Meaning
ac4c	4-acetylcytidine
chm5u	5-(carboxyhydroxylmethyl)uridine
cm	2'-O-methylcytidine
cmnm5s2u	5-carboxymethylaminomethyl-2-thiouridine
cmnm5u	5-carboxymethylaminomethyluridine
d	dihydrouridine
fm	2'-O-methylpseudouridine
gal q	*beta, D-galactosylqueosine
gm	2'-O-methylguanosine
i	inosine
i6a	N6-isopentenyladenosine
m1a	1-methyladenosine
m1f	1-methylpseudouridine
m1g	1-methylguanosine
m1i	1-methylinosine
m22g	2,2-dimethylguanosine
m2a	2-methyladenosine
m2g	2-methylguanosine
m3c	3-methylcytidine
m5c	5-methylcytidine
m6a	N6-methyladenosine
m7g	7-methylguanosine
mam5u	5-methylaminomethyluridine
mam5s2u	5-methoxyaminomethyl-2-thiouridine
man q	*beta, D-mannosylqueosine
mcm5s2u	5-methoxycarbonylmethyl-2-thiouridine
mcm5u	5-methoxycarbonylmethyluridine
mo5u	5-methoxyuridine
ms2i6a	2-methylthio-N6-isopentenyladenosine
ms2t6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl) carbamoyl) threonine
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methylcarbamoyl) threonine
mv	uridine-5-oxyacetic acid-methylester
o5u	uridine-5-oxyacetic acid (v)
osyw	wybutoxosine
p	pseudouridine
q	*queosine
s2c	2-thiocytidine
s2t	5-methyl-2-thiouridine
s2u	2-thiouridine
s4u	4-thiouridine
t	5-methyluridine
t6a	N-((9-beta-D-ribofuranosylpurine-6-yl)-carbamoyl)threonine
tm	2'-O-methyl-5-methyluridine
um	2'-O-methyluridine
yw	wybutosine
x	3-(3-amino-3-carboxy-propyl)uridine, (acp3)u

* Indicates a correction of minor typographical errors.

WIPO Standard ST.23, paragraph 11, provides that the amino acids should be represented using the following three-letter code with the first letter as a capital.

Symbol	Meaning
Ala	Alanine
Cys	Cysteine
Asp	Aspartic Acid
Glu	Glutamic Acid
Phe	Phenylalanine
Gly	Glycine
His	Histidine
Ile	Isoleucine
Lys	Lysine
Leu	Leucine
Met	Methionine
Asn	Asparagine
Pro	Proline
Gln	Glutamine
Arg	Arginine
Ser	Serine
Thr	Threonine
Val	Valine

Symbol	Meaning
Trp	Tryptophan
Tyr	Tyrosine
Asx	Asp or Asn
Glx	Glu or Gln
Xaa	unknown or other

WIPO Standard ST.23, paragraph 12, provides: Modified and unusual amino acids may be represented as the corresponding unmodified amino acids in the sequence itself if the modified amino acid is one of those listed below and the modification is further described elsewhere in the Sequence Listing. The codes from the list below may be used in the description or the Sequence Listing but not in the sequence itself.

Symbol	Meaning
Aad	2-Aminoadipic acid
bAad	3-aminoadipic acid
bAla	beta-Alanine, beta-Aminopropionic acid
Abu	2-Aminobutyric acid
4Abu	4-Aminobutyric acid, piperidinic acid
Acp	6-Aminocaproic acid
Ahe	2-Aminoheptanoic acid
Aib	2-Aminoisobutyric acid
bAib	3-Aminoisobutyric acid
Apm	2-Aminopimelic acid
Dbu	*2,4- Diaminobutyric acid
Des	Desmosine
Dpm	2,2'-Diaminopimelic acid
Dpr	2,3-Diaminopropionic acid
EtGly	N-Ethylglycine
EtAsn	N-Ethylasparagine
Hyl	Hydroxylysine
aHyl	allo-Hydroxylysine
3Hyp	3-Hydroxyproline
4Hyp	4-Hydroxyproline
Ide	Isodesmosine
*aIle	allo-Isoleucine
MeGly	N-Methylglycine, sarcosine
*MeIle	N-Methylisoleucine
MeLys	6-N-Methyllysine
MeVal	N-Methylvaline
Nva	Norvaline
Nle	Norleucine
Orn	Ornithine

* Indicates a correction of a minor typographical error.

Section 1.823(a) is proposed to be amended to provide for a reference to a Sequence Listing Annex in the application immediately before the claims and to provide the paper Sequence Listing as an Annex, which is a separately numbered section of the application. This is an internationally desired change and also would facilitate easier storage of very large Sequence Listings separate from the main part of the file during pendency of the application.

Section 1.823(b) is proposed to be amended to insert a table to depict items of information (data elements) which are to be included in the Sequence Listing and to indicate whether they are mandatory or optional. The proposed revisions reflect the change to a language neutral submission. The English language data elements headings would be replaced by numeric identifiers. The numeric identifiers are similar to INID codes ("Internationally agreed Numbers for the Identification of Data" as per WIPO Standard ST.9, December 1990) already utilized internationally in patent documents. This change would facilitate a single international standard which would eliminate the need for translations into non-English languages. Large portions of Section 1.823(b) are proposed to be deleted to lessen the burden on applicants and to eliminate collections of material which is of limited use to the Office. The following items are typical of material which would be deleted:

(1)(vi)(C) CLASSIFICATION;
(2)(i)(C) STRANDEDNESS;
(2)(ii) MOLECULE TYPE through (2)(vii)(C) UNITS; and
(2)(ix)(C) IDENTIFICATION METHOD.

In order to clarify the rule, the proposed change would identify specifically those items which can be enumerated once in a Sequence Listing.

It is proposed that the recommended designation be eliminated, leaving only mandatory and optional elements. Accordingly, it is proposed to change element ◀140▶ Correspondence Address and elements ◀150▶ through ◀154▶ from mandatory to optional. Elements ◀100▶ General Information, ◀200▶ Information for SEQ ID NO, and ◀400▶ Sequence Description: SEQ ID NO have been clarified as mandatory. In element ◀193▶, it is proposed to change TELEX to Electronic mail address to be current with technology.

It is proposed to eliminate Strandedness because the information is of limited use to the Office. It is proposed to limit the response for Topology to linear or circular because any other response does not permit an adequate search. Because it is essential to the search to know whether the sequence is circular, providing one of these two responses to this data element is mandatory in the Sequence Listing. Consistent with the international desire for eliminating language in the Sequence Listing, Topology would be identified as L (linear) or C (circular), and sequence Type would be N (nucleotide) or A (amino acid).

It is proposed to change Feature from a recommended to a mandatory element if the sequence contains "N", "Xaa", a modified or unusual L-amino acid or a modified base. This change would highlight the presence of an unusual residue in the sequence which is important to anyone using Sequence Listing information.

Section 1.824 is proposed to be amended by revising the current paragraphs (a) through (h) into paragraphs (a) through (c).

Specifically, the following changes are proposed for § 1.824:

Current § 1.824, paragraph (a), is proposed to be redesignated as paragraph (a)(1). In addition, the term "series of diskettes" would be added to indicate the acceptability of receiving numerous disks for large submissions. Current paragraph (b) is proposed to be redesignated as paragraph (a)(2). Current paragraph (c) is proposed to be redesignated as paragraph (a)(3). Current paragraph (d) is proposed to be deleted because it is incorporated into paragraph (a)(1). Current paragraph (e) is proposed to be deleted since the PTO has not found it to be necessary and feels it should not be a requirement placed on the applicant, although the applicant may optionally continue the practice of using write-protection if desired. In proposed paragraph (a)(4), a "compressed file" format would be introduced as an acceptable means to submit a large sequence listing, and in proposed paragraph (a)(5), directions on suppressing page numbering on the computer readable form version would be added for clarity.

The text of current paragraph (f) is proposed to be deleted, but the list of computer readable files is proposed to be redesignated as paragraphs under new (b) and (c). In proposed paragraph (b), the explanation for "pagination" is proposed to be revised to reflect the correct format required. Proposed paragraph (b)(1) is proposed to be revised by deleting diskettes from PS/2 operating system as an accepted format. In proposed paragraph (c), the diskette requirements are proposed to be rearranged so that the most common diskette size used for submissions is at the top of the list. Also in proposed paragraph (c)(2), "format" is proposed to be amended to accommodate the current PTO equipment, and in proposed new paragraphs (c)(3), (4), and (5), additional items would be added to the list of acceptable media types due to the changes in available equipment at the PTO.

Current paragraph (g) is proposed to be redesignated as paragraph (d).

Current paragraph (h) is proposed to be deleted because the text is proposed to be incorporated into paragraph (a)(6). The label requirements would be rewritten more concisely than with the previous rules. In addition, fewer items would be required to be placed on the label under this proposed paragraph because the other items are no longer deemed necessary by the PTO.

Current Appendix A is proposed to be rewritten to reflect the correct format of a Sequence Listing. The proposed Appendix A is presented to provide a sample listing in the correct format as described in the Table of amended § 1.823(b). This sample includes the use of numeric identifiers which reflect the change to a language neutral submission. Current Appendix B is proposed to be deleted as the information it presents is no longer valid under changes in this proposed rule.

Review Under the Paperwork Reduction Act of 1995

This proposed rule change contains information collection requirements which are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995, 44 U.S.C. 3501, *et seq.* The title, description and respondent description of the information collection is shown below with an estimate of the annual reporting burdens. Included in the estimate is the time for reviewing instructions, gathering and maintaining the data needed, and completing and reviewing the collection of information.

With respect to the following collection of information, the PTO invites comments on: (1) whether the proposed collection of information is necessary for the proper performance of the PTO's functions, including whether the information will have practical utility; (2) the accuracy of the PTO's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (3) ways to enhance the quality, utility, and clarity of the information to be collected; and (4) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques, when appropriate, and other forms of information technology.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

OMB Number: 0651-0024
Title: Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures
Form Numbers: None
Type of Review: Revision of currently approved collection
Affected Public: Individuals or households, business or other for-profit institutions, not-for-profit institutions, and Federal Government
Estimated Number of Respondents: 4,600
Estimated Time Per Response: 80 minutes
Estimated Total Annual Burden Hours: 6,133

Needs and Uses: The PTO requires biotechnology patent applicants to submit sequence information to enable the PTO to properly examine and process their applications.

As required by the Paperwork Reduction Act of 1995, 44 U.S.C. 3507(d), the PTO has submitted a copy of this proposed rulemaking to OMB for its review of this information collection. Interested persons are requested to send comments regarding these information collections, including suggestions for reducing this burden, to the Office of Information and Regulatory Affairs of OMB, New Executive Office Bldg., 725 17th Street, N.W., Room 10235, Washington, D.C. 20503, Attn: Desk Officer for the Patent and Trademark Office.

OMB is required to make a decision concerning the collection of information in these proposed regulations between 30 and 60 days after the publication of this document in the Federal Register. Therefore, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication. This does not affect the deadline for the public to comment to the PTO on the proposed regulations.

Other Considerations

This proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* It has been determined that this proposed rule is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that this proposed rule change would not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*). The principal effect of this rule change is to simplify and clarify the rules governing the submission of Sequence Listings for patent applications containing nucleic acid and/or amino acid sequences.

The PTO has also determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record-keeping requirements, Small businesses.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the PTO proposes to amend 37 CFR Part 1 as set forth below. Removals are indicated by brackets ([]) and additions indicated by arrows (▶◀).

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.77 is proposed to be amended by redesignating current paragraphs (g) through (j) as paragraphs (h) through (k) and by adding new paragraphs (g) and (l) to read as follows:

§ 1.77 Arrangement of application elements.

• • • • •

▶(g) Reference to Sequence Listing Annex.◀
[(g)]▶(h)◀ Claim or claims.
[(h)]▶(i)◀ Abstract of the disclosure.
[(i)]▶(j)◀ Signed oath or declaration.
[(j)]▶(k)◀ Drawings.
▶(l) Sequence Listing Annex.◀

3. Section 1.821 is proposed to be amended by revising paragraphs (a) and (c)-(h) to read as follows:

§ 1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

(a) Nucleotide and/or amino acid sequences as used in §§ 1.821 through 1.825 are interpreted to mean an unbranched sequence of four or more amino acids or an unbranched sequence of ten or more nucleotides. Branched sequences are specifically excluded from this definition. ▶Sequences with fewer than four specifically defined nucleotides or amino acids are specifically excluded from this rule. "Specifically defined" means those amino acids other than "Xaa" and those nucleotide bases other than "N" defined in accordance with the World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.23: Recommendation for the Presentation of Nucleotide and Amino Acid Sequence Listings in Patent Applications and in Published Patent Documents, paragraphs 8 through 12, April 1994, herein incorporated by reference. (Hereinafter "WIPO Standard ST.23 (April, 1994)"). This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ST.23 may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.23 may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, D.C. ◀ Nucleotides and amino acids are further defined as follows:

(1) *Nucleotides* are intended to embrace only those nucleotides that can be represented using the symbols set forth in [§ 1.822(b)(1)] ▶WIPO Standard ST.23 (April 1994), paragraph 8◀. Modifications, *e.g.*, methylated bases, may be described as set forth in [§ 1.822(b)] ▶WIPO Standard ST.23 (April

1994), paragraph 9◀ , but shall not be shown explicitly in the nucleotide sequence.

(2) *Amino acids* are those L-amino acids commonly found in naturally occurring proteins and are listed in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11◀. Those amino acid sequences containing D-amino acids are not intended to be embraced by this definition. Any amino acid sequence that contains post-translationally modified amino acids may be described as the amino acid sequence that is initially translated using the symbols shown in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11◀ with the modified positions; *e.g.*, hydroxylations or glycosylations, being described as set forth in [§ 1.822(b)] ▶WIPO Standard ST.23 (April 1994), paragraph 12◀, but these modifications shall not be shown explicitly in the amino acid sequence. Any peptide or protein that can be expressed as a sequence using the symbols in [§ 1.822(b)(2)] ▶WIPO Standard ST.23 (April 1994), paragraph 11◀ in conjunction with a description [elsewhere in the "Sequence Listing"] ▶in the Feature section◀ to describe, for example, modified linkages, cross links and end caps, non-peptidyl bonds, etc., is embraced by this definition.

(b) * * *

(c) Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure on paper copy, hereinafter referred to as the "Sequence Listing," a disclosure of the nucleotide and/or amino acid sequences and associated information using the symbols and format in accordance with the requirements of §§ 1.822 and 1.823. Each sequence disclosed must appear separately in the "Sequence Listing." Each sequence set forth in the "Sequence Listing" shall be assigned a separate ▶integer◀ identifier [written as SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, etc]. ▶The integer identifiers shall begin with 1 and increase sequentially by integers. If no sequence is present for an integer identifier, the words "This sequence omitted" shall appear following the integer identifier.◀

(d) Where the description or claims of a patent application discuss a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the [assigned] ▶integer◀ identifier, ▶preceded by "SEQ ID NO:"◀ in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application.

(e) A copy of the "Sequence Listing" referred to in paragraph (c) of this section must also be submitted in computer readable form in accordance with the requirements of § 1.824. The computer readable form is a copy of the "Sequence Listing" and will not necessarily be retained as a part of the patent application file. If the computer readable form of a new application is to be identical with the computer readable form of another application of the applicant on file in the Office, reference may be made to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application ▶if the computer readable form in the other application was compliant with all of the requirements of these rules◀. The new application shall be accompanied by a letter making such reference to the other application and computer readable form, both of which shall be completely identified. ▶In the new application, applicant must also request the use of the compliant computer readable "Sequence Listing" that is already on file for the other application and must state that the paper copy of the "Sequence Listing" in the new application is identical to the computer readable copy filed for the other application.◀

(f) In addition to the paper copy required by paragraph (c) of this section and the computer readable form required by paragraph (e) of this section, a statement that the content of the paper and computer readable copies are the same must be submitted with the computer readable form. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(g) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing under 35 U.S.C. 111 ▶(a)◀or at the time of entering the national stage under 35 U.S.C. 371, applicant has one month from the date of a notice which will be sent requiring compliance with the requirements in order to prevent abandonment of the application. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission includes no new matter. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing [,in the United States Receiving Office,] an international application under the Patent Cooperation Treaty (PCT) [applicant has one month from the date of a notice which] ▶, which application is to be searched by the United States International Searching Authority or examined by the United States International Preliminary Examining Authority, applicant◀ will be sent ▶a notice◀ requiring compliance with the requirements [,or such other time as may be set by the Commissioner, in which to comply] ▶within a prescribed time period◀. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission does not include [new] matter [or go] ▶which goes◀ beyond the disclosure in the international application as filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office. If applicant fails to timely provide the required computer readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be performed ▶and the United States International Preliminary Examining Authority shall examine only to the extent that a meaningful examination can be performed◀.

* * * * *

4. Section 1.822 is proposed to be revised to read as follows:

§ 1.822 Symbols and format to be used for nucleotide and/or amino acid sequence data.

(a) The symbols and format to be used for nucleotide and/or amino acid sequence data shall conform to the requirements of paragraphs (b) through [(p)] ▶(e)◀ of this section.

(b) The code for representing the nucleotide and/or amino acid sequence characters shall conform to the code set forth in the tables in [paragraphs (b)(1) and (b)(2) of this section] ▶WIPO Standard ST.23 (April 1994), paragraphs 8 and 11. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ST.23 may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.23 may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202; or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC ◀. No code other than that specified in [this section] ▶these sections◀ shall be used in nucleotide and amino acid sequences. A modified base or ▶modified or unusual◀ amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or ▶modified or unusual◀ amino acid is one of those listed in [paragraphs (p)(1) or (p)(2) of this section] ▶WIPO Standard ST.23 (April 1994), paragraphs 9 and 12◀ and the modification is also set forth [elsewhere in the Sequence Listing (for example, FEATURES § 1.823(b)(2)(ix))] ▶in the Feature section◀. Otherwise, all bases or amino acids not appearing in paragraphs [(b)(1) or (b)(2) of this section] ▶8 and 11 of the WIPO Standard ST.23 (April 1994)◀ shall be listed in a given sequence as "N" or "Xaa," respectively, with further information, as appropriate, given [elsewhere in the Sequence Listing] ▶in the Feature section◀.

[(1) Base codes:

Symbol	Meaning
A	A; adenine
C	C; cytosine
G	G; guanine
T	T; thymine
U	U; uracil

Symbol	Meaning
M	A or C
R	A or G
W	A or T/U
S	C or G
Y	C or T/U
K	G or T/U
V	A or C or G; not T/U
H	A or C or T/U; not G
D	A or G or T/U; not C
B	C or G or T/U; not A
N	(A or C or G or T/U) or (unknown or other)

(2) Amino acid three-letter abbreviations:

Abbreviation	Amino acid name
Ala	Alanine
Arg	Arginine
Asn	Asparagine
Asp	Aspartic Acid
Asx	Aspartic Acid or Asparagine
Cys	Cysteine
Glu	Glutamic Acid
Gln	Glutamine
Glx	Glutamine or Glutamic Acid
Gly	Glycine
His	Histidine
Ile	Isoleucine
Leu	Leucine
Lys	Lysine
Met	Methionine
Phe	Phenylalanine
Pro	Proline
Ser	Serine
Thr	Threonine
Trp	Tryptophan
Tyr	Tyrosine
Val	Valine
Xaa	Unknown or other]

(c) ▶Format representation of nucleotides:

(1)◀ A nucleotide sequence shall be listed using the ▶lower-case letter for representing the◀ one-letter code for the nucleotide bases[, as] ▶set forth◀ in [paragraph (b)(1) of this section] ▶WIPO Standard ST.23 (April 1994), paragraph 8◀.

[(d) The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.

(e) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in paragraph (b)(2) of this section.]

[(f)] ▶(2)◀ The bases in a nucleotide sequence (including introns) shall be listed in groups of 10 bases except in the coding parts of the sequence. Leftover bases, fewer than 10 in number, at the end of noncoding parts of a sequence shall be grouped together and separated from adjacent groups of 10 or 3 bases by a space.

[(g)] ▶(3)◀ The bases in the coding parts of a nucleotide sequence shall be listed as triplets (codons). ▶The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.◀

[(h) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.]

[(i)] ▶(4)◀ A nucleotide sequence shall be listed with a maximum of 16 codons or 60 bases per line, with a space provided between each codon or group of 10 bases.

[(j)] ▶(5)◀ A nucleotide sequence shall be presented, only by a single strand, in the 5' to 3' direction, from left to right.

[(k) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.]

[(l)] ▶(6)◀ The enumeration of nucleotide bases shall start at the first base of the sequence with number 1. The enumeration shall be continuous through the whole sequence in the direction 5' to 3'. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for the bases, and giving the number of the last base of that line.

[(m) The enumeration of amino acids may start at the first amino acid of the first mature protein, with the number 1. The amino acids preceding the mature protein, *e.g.*, pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, when presented, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids.]

[(n)] ▶(7)◀ For those nucleotide sequences that are circular in configuration, the enumeration method set forth in paragraph [(l)] ▶(c)(6)◀ of this section remains applicable with the exception that the designation of the first base of the nucleotide sequence may be made at the option of the applicant. [The enumeration method for amino acid sequences that is set forth in paragraph (m) of this section remains applicable for amino acid sequences that are circular in configuration.]

▶(d) Representation of amino acids:

(1) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in WIPO Standard ST.23 (April 1994), paragraph 11.

(2) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.

(3) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.

(4) The enumeration of amino acids may start at the first amino acid of the first mature protein, with the number 1. The amino acids preceding the mature protein, *e.g.*, pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, when presented, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids. The enumeration method for amino acid sequences that is set forth in this section remains applicable for amino acid sequences that are circular in configuration.

(5) An amino acid sequence that contains internal terminator symbols, *e.g.*, "Ter", "*", or ".", etc., may not be represented as a single amino acid sequence, but shall be presented as separate amino acid sequences.

(e)◀ [(o)] A sequence with a gap or gaps shall be presented as a plurality of separate sequences, with separate [sequence] ▶integer◀ identifiers, with the number of separate sequences being equal in number to the number of continuous strings of sequence data. A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence.

[(p) The code for representing modified nucleotide bases and modified or unusual amino acids shall conform to the code set forth in the tables in paragraphs (p)(1) and (p)(2) of this section. The modified base controlled vocabulary in paragraph (p)(1) of this section and the modified and unusual amino acids in paragraph (p)(2) of this section shall not be used in the nucleotide and/or amino acid sequences; but may be used in the description and/or the "Sequence Listing" corresponding to, but not including, the nucleotide and/or amino acid sequence.

(1) Modified base controlled vocabulary:

Abbreviation	Modified base description
ac4c	4-acetylcytidine.
chm5u	5-(carboxyhydroxylmethyl)uridine.
cm	2'-O-methylcytidine.
cmnm5s2u	5-carboxymethylaminonethyl-2-thioridine.
cmnm5u	5-carboxymethylaminomethyluridine.

Abbreviation	Modified base description
d	dihydrouridine.
fm	2'-O-methylpseudouridine.
galq	beta,D-galactosylqueosine.
gm	2'-O-methylguanosine.
i	inosine.
i6a	N6-isopentenyladenosine.
m1a	1-methyladenosine.
m1f	1-methylpseudouridine.
m1g	1-methylguanosine.
m1l	1-methylinosine.
m22g	2,2-dimethylguanosine.
m2a	2-methyladenosine.
m2g	2-methylguanosine.
m3c	3-methylcytidine.
m5c	5-methylcytidine.
m6a	N6-methyladenosine.
m7g	7-methylguanosine.
mam5u	5-methylaminomethyluridine.
mam5s2u	5-methoxyaminomethyl-2-thiouridine.
manq	beta,D-mannosylqueosine.
mcm5s2u	5-methoxycarbonylmethyluridine.
mo5u	5-methoxyuridine.
ms2i6a	2-methylthio-N6-isopentenyladenosine.
ms2t6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl)carbamoyl)threonine.
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N-methylcarbamoyl)threonine.
mv	uridine-5-oxyacetic acid methylester.
o5u	uridine-5-oxyacetic acid (v).
osyw	wybutoxosine.
p	pseudouridine.
q	queosine.
s2c	2-thiocytidine.
s2t	5-methyl-2-thiouridine.
s2u	2-thiouridine.
s4u	4-thiouridine.
t	5-methyluridine.
t6a	N-((9-beta-D-ribofuranosylpurine-6-yl)carbamoyl) threonine.
tm	2'-O-methyl-5-methyluridine.
um	2'-O-methyluridine.
yw	wybutosine.
x	3-(3-amino-3-carboxypropyl)uridine, (acp3)u.

(2) Modified and unusual amino acids:

Abbreviation	Modified and unusual amino acid
Aad	2-Aminoadipic acid.
bAad	3-aminoadipic acid.
bAla	beta-Alanine, beta-Aminopropionic acid.
Abu	2-Aminobutyric acid.
4Abu	4-Aminobutyric acid, piperidinic acid.
Acp	6-Aminocaproic acid.
Ahe	2-Aminoheptanoic acid.
Aib	2-Aminoisobutyric acid.
bAib	3-Aminoisobutyric acid.
Apm	2-Aminopimelic acid.
Dbu	2,4-Diaminobutyric acid.
Des	Desmosine.
Dpm	2,2'-Diaminopimelic acid.
Dpr	2,3-Diaminopropionic acid.
EtGly	N-Ethylglycine.
EtAsn	N-Ethylasparagine.
Hyl	Hydroxylysine.
aHyl	allo-Hydroxylysine.
3Hyp	3-Hydroxyproline.
4Hyp	4-Hydroxyproline.
Ide	Isodesmosine.
alle	allo-Isoleucine.
MeGly	N-Methylglycine, sarcosine.
MeIle	N-Methylisoleucine.
MeLys	N-Methylvaline.
Nva	Norvaline.
Nle	Norleucine.
Orn	Ornithine.]

5. Section 1.823 is proposed to be revised to read as follows:

§ 1.823 Requirements for nucleotide and/or amino acid sequences as part of the application papers.

(a) The "Sequence Listing" required by § 1.821(c), setting forth the nucleotide and/or amino acid sequences, and associated information in accordance with paragraph (b) of this section, must begin on a new page and be titled "Sequence Listing" [and appear] ▶. On a separate page of the application specification,◀ immediately prior to the claims [.▶, there shall be a reference to the presence of the "Sequence Listing" in a "Sequence Listing Annex." The "Sequence Listing" shall appear in the "Sequence Listing Annex," which is numbered independently of the numbering of the remainder of the application and shall be placed in the application file. Upon printing the application as a patent, the "Sequence Listing Annex" containing the paper "Sequence Listing" shall be printed immediately before the patented claims.◀ Each page of the "Sequence Listing" shall contain no more than 66 lines and each line shall contain no more than 72 characters. A fixed-width font shall be used exclusively throughout the "Sequence Listing."

(b) The "Sequence Listing" shall, except as otherwise indicated, include, in addition to and immediately preceding the actual nucleotide and/or amino acid sequence, the [following items of information.] ▶ numeric identifiers and their accompanying information as shown in the following table. The numeric identifier shall be used only in the "Sequence Listing."◀ The order and presentation of the items of information in the "Sequence Listing" shall conform to the arrangement given below [,except that parenthetical explanatory information following the headings (identifiers) is to be omitted]. Each item of information shall begin on a new line [, enumerated with the number/numeral/letter in parentheses as shown below, with the heading (identifier) in upper case characters, followed by a colon, and then followed by the information provided] ▶ beginning with the numeric identifier enclosed in angle brackets as shown◀. Except as allowed below, no item of information shall occupy more than one line. [Those items of information that are applicable for all sequences shall only be set forth once in the "Sequence Listing."] The submission of those items of information designated with an "M" is mandatory. [The submission of those items of information designated with an "R" is recommended, but not required.] The submission of those items of information designated with an "O" is optional. ▶Numeric identifiers ◀100▶ through ◀193▶ shall only be set forth at the beginning of the "Sequence Listing."◀ Those items designated with "rep" may have multiple responses and, as such, the item may be repeated in the "Sequence Listing."

[(1) GENERAL INFORMATION (Application, diskette/tape and publication information):

(i) APPLICANT (maximum of first ten named applicants; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - M/rep):

(ii) TITLE OF INVENTION (title of the invention, as elsewhere in application, four lines maximum - M):

(iii) NUMBER OF SEQUENCES (number of sequences in the "Sequence Listing" (M):

(iv) CORRESPONDENCE ADDRESS (M):

(A) ADDRESSEE (name of applicant, firm, company or institution, as may be appropriate):

(B) STREET (correspondence street address, as elsewhere in application, four lines maximum):

(C) CITY (correspondence city address, as elsewhere in application):

(D) STATE (correspondence state, as elsewhere in application):

(E) COUNTRY (correspondence country, as elsewhere in application):

(F) ZIP (correspondence zip or postal code, as elsewhere in application):

(v) COMPUTER READABLE FORM (M):

(A) MEDIUM TYPE (type of diskette/tape submitted):

(B) COMPUTER (type of computer used with diskette/tape submitted):

(C) OPERATING SYSTEM (type of operating system used):

(D) SOFTWARE (type of software used to create computer readable form):

(vi) CURRENT APPLICATION DATA (M, if available):

(A) APPLICATION NUMBER (U.S application number, including a series code, a slash and a serial number, or U.S. PCT application number, including the letters PCT, a slash, a two-letter code indicating the U.S. as the Receiving Office, a two-digit indication of the year, a slash and a five-digit number, if available):

(B) FILING DATE (U.S. or PCT application filing date, if available; specify as dd-MMM-yyyy):

(C) CLASSIFICATION (IPC/US classification or F-term designation, where F-terms have been developed, if assigned, specify each designation, left justified, within an eighteen-position alpha numeric field - rep, to a maximum of ten classification designations):

(vii) PRIOR APPLICATION DATA (prior domestic, foreign priority or international application data, if applicable - M/rep):

(A) APPLICATION NUMBER (application number; specify as two-letter country code and an eight-digit application number; or if a PCT application, specify as the letters PCT, a slash, a two-letter code indicating the Receiving Office, a two-digit indication of the year, a slash and a five-digit number):

(B) FILING DATE (document filing date, specify as dd-MMM-yyyy):

(viii) ATTORNEY/AGENT INFORMATION (O):

(A) NAME (attorney/agent name; SURNAME comma OTHER NAMES and/or INITIALS):

(B) REGISTRATION NUMBER (attorney/agent registration number):

(C) REFERENCE/DOCKET NUMBER (attorney/agent reference or docket number):

(ix) TELECOMMUNICATION INFORMATION (O):

(A) TELEPHONE (telephone number of applicant or attorney/agent):

(B) TELEFAX (telefax number of applicant or attorney/agent):

(C) TELEX (telex number of applicant or attorney/agent):

(2) INFORMATION FOR SEQ ID NO: X (rep):

(i) SEQUENCE CHARACTERISTICS (M):

(A) LENGTH (sequence length, expressed as number of base pairs or amino acid residues):

(B) TYPE (sequence type, i.e., whether nucleic acid or amino acid):

(C) STRANDEDNESS (if nucleic acid, number of strands of source organism molecule, i.e., whether single-stranded, double-stranded, both or unknown to applicant):

(D) TOPOLOGY (whether source organism molecule is circular, linear, both or unknown to applicant):

(ii) MOLECULE TYPE (type of molecule sequenced in SEQ ID NO:X (at least one of the following should be included with subheadings, if any, in Sequence Listing - R)):

- Genomic RNA;
- Genomic DNA;
- mRNA
- tRNA;
- rRNA;
- snRNA;
- scRNA;
- preRNA;
- cDNA to genomic RNA;
- cDNA to mRNA;
- cDNA to tRNA;
- cDNA to rRNA;
- cDNA to snRNA;
- cDNA to scRNA;
- Other nucleic acid;

(A) DESCRIPTION (four lines maximum):

- protein and
- peptide.

(iii) HYPOTHETICAL (yes/no - R):

(iv) ANTI-SENSE (yes/no - R):

(v) FRAGMENT TYPE (for proteins and peptides only, at least one of the following should be included in the Sequence Listing - R):

- N-terminal fragment;
- C-terminal fragment and
- internal fragment.

(vi) ORIGINAL SOURCE (original source of molecule sequenced in SEQ IDNO:X - R):

(A) ORGANISM (scientific name of source organism):

(B) STRAIN:

(C) INDIVIDUAL ISOLATE (name/number of individual/isolate):

(D) DEVELOPMENTAL STAGE (give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern):

(E) HAPLOTYPE:

(F) TISSUE TYPE:

(G) CELL TYPE:

(H) CELL LINE:

(I) ORGANELLE:

(vii) IMMEDIATE SOURCE (immediate experimental source of the sequence in SEQ ID NO:X - R):

(A) LIBRARY (library -type, name):

(B) CLONE (clone(s)):

(viii) POSITION IN GENOME (position of sequence in SEQ ID NO:X in genome - R):

(A) CHROMOSOME/SEGMENT (chromosome/segment - name/number):

(B) MAP POSITION:

(C) UNITS (units for map position, i.e., whether units are genome percent, nucleotide number or other/specify):

(ix) FEATURE (description of points of biological significance in the sequence in SEQ ID NO:X -R/rep):

(A) NAME/KEY (provide appropriate identifier for feature - four lines maximum):

(B) LOCATION (specify location according to syntax of DDBJ/EMBL/GenBank Feature Tables Definition, including whether feature is on complement of presented sequence; where appropriate state number of first and last bases/amino acids in feature - four lines maximum):

(C) IDENTIFICATION METHOD (method by which the feature was identified, i.e., by experiment, by similarity with known sequence or to an established consensus sequence, or by similarity to some other pattern - four lines maximum):

(D) OTHER INFORMATION (include information on phenotype conferred, biological activity of sequence or its product, macromolecules which bind to sequence or its product, or other relevant information - four lines maximum):

(x) PUBLICATION INFORMATION (Repeat section for each relevant publication - O/rep):

(A) AUTHORS (maximum of first ten named authors of publication; specify one name per line: SURNAME comma OTHER NAMES and/or INITIALS - rep):

(B) TITLE (title of publication):

(C) JOURNAL (journal name in which data published):

(D) VOLUME (journal volume in which data published):

(E) ISSUE (journal issue number in which data published):

(F) PAGES (journal page numbers in which data published):

(G) DATE (journal date in which data published; specify as dd-MMM-yyyy, MMM-yyyy or Season-yyyy):

(H) DOCUMENT NUMBER (document number, for patent type citations only; specify as two-letter country code, eight-digit document number (right justified), one letter and as appropriate, one number or a space as a document type code; or if a PCT application specify as the letters PCT, a slash, a two-letter code indicating the Receiving Office, a two-digit indication of the year, a slash and a five-digit number; or if a PCT publication, specify as the two letters WO, a two-digit indication of the year, a slash and a five-digit publication number):

(I) FILING DATE (document filing date, for patent-type citations only; specify as dd-MMM-yyyy):

(J) PUBLICATION DATE (document publication date; for patent-type citations only, specify as dd-MMM-yyyy):

(K) RELEVANT RESIDUES In SEQ ID NO:X (rep): FROM (position) TO (position)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:X:]

▶

Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
◀100▶	General Information	Leave blank after ◀100▶	M
◀110▶	Applicant	Max. of 10 names; one name per line; use format: Surname, Other Names and/or Initials; rep	M
◀120▶	Title of Invention	Four lines maximum	M
◀130▶	Number of Sequences	Use an integer as a response	M
◀140▶	Correspondence Address	◀140▶ must be present if subheadings ◀141▶-◀146▶ are used	O
◀141▶	Addressee		O
◀142▶	Street	Four lines maximum	O
◀143▶	City		O
◀144▶	State or Province		O
◀145▶	Country		O
◀146▶	Zip or Postal Code		O
◀150▶	Computer Readable Form	Leave blank after ◀150▶	O
◀151▶	Medium Type	Type of diskette/tape submitted	O
◀152▶	Computer	Type of computer used to create diskette/tape	O
◀153▶	Operating System	Type of operating system on computer	O
◀154▶	Software	Type of software used to create computer readable form	O
◀160▶	Current Application Data	Leave blank after◀160▶; ◀160▶ must be present if subheadings ◀161▶ & ◀162▶ are used	M, if available
◀161▶	Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if available
◀162▶	Filing Date	Specify as: dd-MMM-yyyy	M, if available
◀170▶	Prior Application Data	Insert heading/subheadings only if applicable; leave blank after◀170▶; ◀170▶ must be present if subheadings ◀171▶ & ◀172▶ are used; rep.	M, if applicable
◀171▶	Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if applicable
◀172▶	Filing Date	Specify as: dd-MMM-yyyy	M, if applicable
◀180▶	Attorney/Agent Information	Leave blank after ◀180▶	O
◀181▶	Name	Use format: Surname, Other Names and/or Initials	O
◀182▶	Registration Number		O
◀183▶	File Reference/Docket Number		O
◀190▶	Telecommunication Information	Leave blank after ◀190▶	O
◀191▶	Telephone		O
◀192▶	Telefax		O
◀193▶	Electronic mail address		O
◀200▶	Information for SEQ ID NO:#:	Response shall be an integer representing the SEQ ID NO shown; rep.	M
◀210▶	Sequence Characteristics	Leave blank after ◀210▶	M
◀211▶	Length	Respond with an integer expressing the number of bases or amino acid residues	M
◀212▶	Type	Whether presented sequence molecule is nucleotide or amino acid, indicated by N or A	M
◀214▶	Topology	Whether presented sequence molecule is linear or circular, indicated as L or C	M

Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
◀290▶	Feature	Description of points of biological significance in the sequence; leave blank after ◀290▶; rep.	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀291▶	Name/Key	Provide appropriate identifier for feature; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀292▶	Location	Specify location within sequence; where appropriate state number of first and last bases/amino acids in feature; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀294▶	Other Information	Other relevant information; four lines maximum	M, if "N", "Xaa", or a modified or unusual L-amino acid or modified base was used in the sequence
◀300▶	Publication Information	Leave blank after ◀300▶; rep.	O
◀301▶	Authors	Maximum of ten named authors of publication; specify one name per line; use format: Surname, Other Names and/or Initials	O
◀302▶	Title		O
◀303▶	Journal		O
◀304▶	Volume		O
◀305▶	Issue		O
◀306▶	Pages		O
◀307▶	Date	Journal date in which data published; specify as dd-MMM-yyyy, MMM-yyyy or Season-yyyy	O
◀308▶	Patent Document Number	Document number; for patent-type citations only	O
◀309▶	Filing Date	Document filing date, for patent-type citations only; specify as dd-MMM-yyyy	O
◀310▶	Publication Date	Document publication date, for patent-type citations only; specify as dd-MMM-yyyy	O
◀311▶	Relevant Residues	FROM (position) TO (position)	O
◀400▶	Sequence Description: SEQ ID NO:#:	Response shall be an integer representing the SEQ ID NO shown; rep.	M

◀

6. Section 1.824 is proposed to be revised to read as follows:

§ 1.824 Form and format for nucleotide and/or amino acid sequence submissions in computer readable form.

(a) The computer readable form required by § 1.821(e) shall [contain a printable copy of the "Sequence Listing," as defined in §§ 1.821(c), 1.822 and 1.823, recorded as] ▶meet the following specifications:

(1) The computer readable form shall contain◀ a single [file on] ▶"Sequence Listing" as◀ either a diskette, [or a magnetic tape] ▶series of diskettes, or other permissible media outlined in § 1.824(c)◀. [The computer readable form shall be encoded and formatted such that a printed copy of the "Sequence Listing" may be recreated using the print commands of the computer/operating-system configurations specified in paragraph (f) of this section.]

[(b)] ▶(2)◀ The [file] ▶"Sequence Listing"◀ in paragraph (a) ▶(1)◀ of this section shall be [encoded in a subset of the] ▶submitted in◀ American Standard Code for Information Interchange (ASCII) ▶text◀. [This subset shall consist of all printable ASCII characters including the ASCII space character plus line-termination, pagination and end-of-file characters associated with the computer/operating-system configurations specified in paragraph (f) of this section.] No other [characters] ▶formats◀ shall be allowed.

[(c)] ▶(3)◀ The computer readable form may be created by any means, such as word processors, nucleotide/amino acid sequence editors or other custom computer programs; however, it shall [be readable by one of the computer/operating-system configurations specified in paragraph (f) of this section, and shall] conform to [the] ▶all◀ specifications [in paragraphs (a) and (b) of] ▶detailed in◀ this section.

[(d)The entire printable copy of the "Sequence Listing shall be contained within one file on a single diskette or magnetic tape unless it is shown to the satisfaction of the Commissioner that it is not practical or possible to submit the entire printable copy of the "Sequence Listing" within one file on a single diskette or magnetic tape.

(e) The submitted diskette or tape shall be write-protected such as by covering or uncovering diskette holes, removing diskette write tabs or removing tape write rings.

(f) As set forth in paragraph (c), above, any means may be used to create the computer readable form, as long as the following conditions are satisfied. A submitted diskette shall be readable on one of the computer/operating-system configurations described in paragraphs (1) through (3), below. A submitted tape shall satisfy the format specifications described in paragraph (4), below.]

▶(4) File compression is acceptable when using diskette media, so long as the compressed file is in a self-extracting format that will decompress on one of the systems described in paragraph (b) of this section.

(5) Page numbering shall not appear within the computer readable form version of the "Sequence Listing" file.

(6) All computer readable forms shall have a label permanently affixed thereto on which has been hand-printed or typed: the name of the applicant, the title of the invention, the name and type of computer and operating system used, and application serial number and filing date, if known.

(b) Computer readable form files submitted must meet these format requirements:◀

(1) Computer: IBM PC/XT/AT, ▶or compatibles◀ [IBM PS/2 or compatibles]▶,or Apple Macintosh◀;

[(i)]▶(2)◀operating System: [PC-DOS or] MS-DOS [(Versions 2.1 or above)]▶, Unix or Macintosh◀;

[(ii)]▶(3)◀ Line terminator: ascii carriage Return plus ASCII Line Feed;

[(iii)]▶(4)◀ Pagination: [ASCII Form Feed or Series of Line Terminators] ▶Continuous file (no "hard page break" codes permitted)◀;

[(iv) End-of-File:ASCII SUB (Ctrl-Z);

(v)Media:]

▶(c) Computer readable form files submitted may be in any of the following media:◀

[(A) Diskette - 5.25 inch, 360 Kb storage;

(B) Diskette - 5.25 inch, 1.2 Mb storage;

(C) Diskette - 3.50 inch, 720 Kb storage;

(D) Diskette - 3.5 inch, 1.44 Mb storage;]

▶(1) Diskette: 3.50 inch, 1.44 Mb storage;
3.50 inch, 720 Kb storage;
5.25 inch, 1.2 Mb storage;
5.25 inch, 360 Kb storage;

[(vi) Print Command: PRINT filename.extension;

(2) Computer: IBM PC/XT/AT, IBM PS/2 or compatibles;

(i) Operating system: Xenix;

(ii) Line Terminator: ASCII Carriage Return;

(iii) Pagination: ASCII Form Feed or Series of Line Terminators;

(iv) End-of-File: None;

(v) Media:

(A) Diskette - 5.25 inch, 360 Kb storage;

(B) Diskette - 5.25 inch, 1.2 Mb storage;

(C) Diskette - 3.50 inch, 720 Kb storage;

(D) Diskette - 3.5 inch, 1.44 Mb storage;

(vi) Print Command: Ipr filename;

(3) Computer: Apple Macintosh;

(i) Operating System: Macintosh;

(ii) Macintosh File Type: text with line termination

(iii) Line Terminator: Pre-defined by text type file;

(iv) Pagination: Pre-defined by text type file;

(v) End-of-File: Pre-defined by text type file;

(vi) Media:

(A) Diskette - 3.50 inch, 400 Kb storage;

(B) Diskette - 3.50 inch, 800 Kb storage;

(C) Diskette - 3.50 inch, 1.4 Mb storage;

(vii) Print Command: Use PRINT command from any Macintosh Application that processes text files, such as Mac-Write or TeachText;

(4) Magnetic tape: 0.5 inch, up to 2400 feet;

(i) Density: 1600 or 6250 bits per inch, 9 track;

(ii) Format:raw, unblocked;

(iii) Line Terminator: ASCII Carriage Return plus optional ASCII Line Feed;

(iv) Pagination: ASCII Form Feed or Series of Line Terminators;

(v) Print Command (Unix shell version given here as sample response -mt/dev/rmt0; lpr/dev/rmt0):]

▶(2) Magnetic tape: 0.5 inch, up to 24000 feet;
Density: 1600 or 6250 bits per inch, 9 track;
Format: Unix tar command; specify blocking factor (not "block size")
Line Terminator: ASCII Carriage Return plus ASCII Line Feed;

(3) 8mm Data Cartridge:
Format: Unix tar command; specify blocking factor (not "block size")
Line Terminator: ASCII Carriage Return plus ASCII Line Feed;

(4) CD-ROM:
Format: ISO 9660 or High Sierra Format

(5) Magneto Optical Disk:
Size/Storage Specifications: 5.25 inch, 640 Mb◀

[(g)]▶(d)◀ computer readable forms that are submitted to the Office will not be returned to the applicant.

[(h) All computer readable forms shall have a label permanently affixed thereto on which has been hand-printed or typed, a description of the format of the computer readable form as well as the name of the applicant, the title of the invention, the date on which the data were recorded on the computer readable form and the name and type of computer and operating system which generated the files on the computer readable form. If all this information cannot be printed on a label affixed to the computer readable form, by reason of size or otherwise, the label shall include the name of the applicant and the title of the invention and a reference number, and the additional information may be provided on a container for the computer readable form with the name of the applicant, the title of the invention, the reference number and the additional information affixed to the container. If the computer readable form is submitted after the date of filing under 35 U.S.C. 111, after the date of entry in the national stage under 35 U.S.C. 371 or after

the time of filing, in the United States Receiving Office, an international application under the PCT, the labels mentioned herein must also include the date of the application number, including series code and serial number.]

7. Section 1.825 is proposed to be amended by revising paragraphs (a), (b) and (d) to read as follows:

§ 1.825 Amendments to or replacement of sequence listing and computer readable copy thereof.

(a) Any amendment to the paper copy of the "Sequence Listing" (§ 1.821(c)) must be made by the submission of substitute sheets. Amendments must be accompanied by a statement that indicates support for the amendment in the application, as filed, and a statement that the substitute sheets include no new matter. Such a statement must be averified statement if made by a person not registered to practice before the Office.

(b) Any amendment to the paper copy of the "Sequence Listing," in accordance with paragraph (a) of this section, must be accompanied by a substitute copy of the computer readable form (§ 1.821(e)) including all previously submitted data with the amendment incorporated therein, accompanied by a statement that the copy in computer readable form is the same as the substitute copy of the "Sequence Listing." Such a statement must be a verified statement if made by a person not registered to practice before the Office.

(c) • • •

(d) If, upon receipt, the computer readable form is found to be damaged or unreadable, applicant must provide, within such time as set by the Commissioner, a substitute copy of the data in computer readable form accompanied by a statement that the substitute data is identical to that originally filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office.

8. Appendix A to Subpart G is proposed to be revised to read as follows:

Appendix A To Subpart G Of Part 1 - Sample Sequence Listing

[(1) GENERAL INFORMATION:

(i) APPLICANT: Doe, Joan X, Doe, John Q

(ii) TITLE OF INVENTION: Isolation and Characterization of a Gene Encoding a Protease from *Paramecium sp.*

(iii) NUMBER OF SEQUENCES: 2

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Smith and Jones

(B) STREET: 123 Main Street

(C) CITY: Smalltown

(D) STATE: Anystate

(E) COUNTRY: USA

(F) ZIP: 12345

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Diskette, 3.50 inch, 800 Kb storage

(B) COMPUTER: Apple Macintosh

(C) OPERATING SYSTEM: Macintosh 5.0

(D) SOFTWARE: MacWrite

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 09/999,999

(B) FILING DATE: 28-FEB-1989

(C) CLASSIFICATION: 999/99

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: PCT/US88/99999

(B) FILING DATE: 01-MAR-1988

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Smith, John A

(B) REGISTRATION NUMBER: 00001

(C) REFERENCE/DOCKET NUMBER: 01-0001

(ix) TELECOMMUNICATIONS INFORMATION:

(A) TELEPHONE: (909) 999-001

(B) TELEFAX: (909) 999-0002

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 954 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(iii) HYPOTHETICAL: yes

(iv) ANTI-SENSE: no

(vi) ORIGINAL SOURCE:

(A) ORGANISM: Paramecium sp

(C) INDIVIDUAL/ISOLATE: XYZ2

(G) CELL TYPE: unicellular organism

(vii) IMMEDIATE SOURCE:

(A) LIBRARY: genomic

(B) CLONE: Para-XYZ2/36

(x) PUBLICATION INFORMATION:

(A) AUTHORS: Doe, Joan X, Doe, John Q

(B) TITLE: Isolation and Characterization of a Gene Encoding a Protease from *Paramecium sp.*

(C) JOURNAL: Fictional Genes

(D) VOLUME: I

(E) ISSUE: 1

(F) PAGES: 1-20

(G) DATE: 02-MAR-1988

(K) RELEVANT RESIDUES IN SEQ ID NO: 1: FROM 1 TO 954

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

```
ATCGGGATAG TACTGGTCAA GACCGGTGGA CACCGGTTAA CCCCGGTTAA GTACCGGTTA   60

TAGGCCATTT CAGGCCAAAT GTGCCCAACT ACGCCAATTG TTTTGCCAAC GGCCAACGTT  120

ACGTTCGTAC GCACGTATGT ACCTAGGTAC TTACGGACGT GACTACGGAC ACTTCCGTAC  180

GTACGTACGT TTACGTACCC ATCCCAACGT AACCACAGTG TGGTCGCAGT GTCCCAGTGT  240

ACACAGACTG CCAGACATTC TTCACAGACA CCCC ATG ACA CCA CCT GAA CGT CTC   295
                                      Met Thr Pro Pro Glu Arg Leu
                                                          -30

TTC CTC CCA AGG GTG TGT GGC ACC ACC CTA CAC CTC CTC CTT CTG GGG     343
Phe Leu Pro Arg Val Cys Gly Thr Thr Leu His Leu Leu Leu Leu Gly
        -25                 -20                 -15

CTG CTG CTG GTT CTG CTG CCT GGG GCC CAT          GTGAGGCAGC AGGAGAATGG 393
Leu Leu Leu Val Leu Leu Pro Gly Ala His
    -10                 -5

GGTGGCTCAG CCAAACCTTG AGCCCTAGAG CCCCCCTCAA CTCTGTTCTC CTAG GGG Gly 450
CTC ATG CAT CTT GCC CAC AGC AAC CTC AAA CCT GCT GCT CAC CTC ATT     498
Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His Leu Ile
 1               5                  10                  15

GTAAACATCC ACCTGACCTC CCAGACATGT CCCCACCAGC TCTCCTCCTA CCCCTGCCTC  558

AGGAACCCAA GCATCCACCC CTCTCCCCCA ACTTCCCCCA CGCTAAAAAA AACAGAGGGA  618
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GCCCACTCCT ATGCCTCCCC CTGCCATCCC CCAGGAACTC AGTTGTTCAG TGCCCACTTC  678

TAC CCC AGC AAG CAG AAC TCA CTG CTC TGG AGA GCA AAC ACG GAC CGT   726
Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr Asp Arg
                20                  25                  30

GCC TTC CTC CAG GAT GGT TTC TCC TTG AGC AAC AAT TCT CTC CTG GTC   774
Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu Leu Val
        35                  40                  45

TAGAAAAAAT AATTGATTTC AAGACCTTCT CCCCATTCTG CCTCCATTCT GACCATTTCA 834

GGGGTCGTCA CCACCTCTCC TTTGGCCATT CCAACAGCTC AAGTCTTCCC TGATCAAGTC 894

ACCGGAGCTT TCAAAGAAGG AATTCTAGGC ATCCCAGGGG ACCCACACCT CCCTGAACCA 954
```

(2) INFORMATION FOR SEQ ID NO: 2:
(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 82 amino acids
(B) TYPE: amino acid
(C) TOPOLOGY: linear
(ii) MOLECULE TYPE: protein
(ix) FEATURE:
(A) NAME/KEY: signal sequence
(B) LOCATION: -34 to -1
(C) IDENTIFICATION METHOD: similarity to other signal sequences, hydrophobic
(D) OTHER INFORMATION: expresses protease

(x) PUBLICATION INFORMATION:
(A) AUTHORS: Doe, Joan X, Doe, John Q
(B) TITLE: Isolation and Characterization of a Gene Encoding a Protease from *Paramecium sp.*
(C) JOURNAL: Fictional Genes
(D) VOLUME: I
(E) ISSUE: 1
(F) PAGES: 1-20
(G) DATE: 02-MAR-1988
(H) RELEVANT RESIDUES IN SEQ ID NO:2: FROM -34 TO 48

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

```
Met Thr Pro Pro Glu Arg Leu Phe Leu Pro Arg Val Cys Gly Thr Thr
                -30                 -25                 -20

Leu His Leu Leu Leu Leu Leu Gly Leu Leu Leu Val Leu Leu Pro Gly Ala
        -15                 -10                 -5

His Gly Leu Met His Leu Ala His Ser Asn Leu Lys Pro Ala Ala His
    1                   5                   10

Leu Ile Tyr Pro Ser Lys Gln Asn Ser Leu Leu Trp Arg Ala Asn Thr
15                  20                  25                  30

Asp Arg Ala Phe Leu Gln Asp Gly Phe Ser Leu Ser Asn Asn Ser Leu
                35                  40                  45

Leu Val ]
```

▶

◀100▶
◀110▶ Doe, Joan X, Doe, John Q
◀120▶ Isolation and Characterization of a Gene Encoding a Protease from Paramecium sp.
◀130▶ 2
◀140▶
◀141▶ Smith and Jones
◀142▶ 123 Main Street
◀143▶ Smalltown
◀144▶ Anystate
◀145▶ USA
◀146▶ 12345
◀150▶
◀151▶ Floppy disk
◀152▶ IBM PC compatible
◀153▶ PC-DOS/MS-DOS
◀154▶ PatentIn Release #2.00
◀160▶
◀161▶ 09/999,999
◀162▶ 28-FEB-1989
◀170▶
◀171▶ PCT/US/88/99999
◀172▶ 01-MAR-1988
◀180▶
◀181▶ Smith, John A
◀182▶ REGISTRATION NUMBER: 00001
◀183▶ 01-0001
◀190▶
◀191▶ (909) 999-0001
◀192▶ (909) 999-0002
◀200▶ 1
◀210▶
◀211▶ 954 base pairs
◀212▶ N
◀214▶ L
◀290▶
◀291▶ CDS
◀292▶ join(275..373, 448..498, 679..774)
◀290▶
◀291▶ mat_peptide
◀292▶ join(451..498, 679..774)
◀300▶
◀301▶ Doe , Joan X, Doe, John Q
◀302▶ Isolation and Characterization of a Gene Encoding a Protease from Paramecium sp.
◀303▶ Fictional Genes
◀304▶ 1
◀305▶ 1
◀306▶ 1-20
◀307▶ 02-MAR-1988
◀308▶ FROM 1 TO 957
◀400▶ 1


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atcgggatag  tactggtcaa  gaccggtgga  cacccggttaa  ccccggttaa  gtaccggtta  60

taggccattt  caggccaaat  gtgcccaact  acgccaattg  ttttgccaac  ggccaacgtt  120

acgttcgtac  gcacgtatgt  acctaggtac  ttacggacgt  gactacggac  acttccgtac  180

gtacgtacgt  ttacgtaccc  atcccaacgt  aaccacagtg  tggtcgcagt  gtcccagtgt  240

acacagactg  ccagacattc  ttcacagaca  cccc atg      aca cca cct  gaa cgt   292
                                    Met          Thr Pro Pro  Glu Arg
                                                              -30

ctc ttc ctc  cca agg gtg  tgt ggc acc  acc cta cac  ctc ctc ctt  ctg    340
Leu Phe Leu  Pro Arg Val  Cys Gly Thr  Thr Leu His  Leu Leu Leu  Leu
             -25                 -20                 -15

ggg ctg ctg  ctg gtt ctg  ctg cct ggg  gcc cat      gtgaggcagc  aggaaatgg  393
Gly Leu Leu  Leu Val Leu  Leu Pro Gly  Ala His
        -10                 -5

ggtggctcag  ccaaaccttg  agccctagag  ccccccttcaa  ctctgttctc  ctag ggg      450
                                                            Gly

ctc atg cat  ctt gcc cac  agc aac ctc  aaa cct gct  gct cac ctc  att    498
Leu Met His  Leu Ala His  Ser Asn Leu  Lys Pro Ala  Ala His Leu  Ile
1                5                   10                  15

gtaaacatcc  acctgaccta  ccagacatgt  ccccaccagc  tctcctccta  ccccctgcctc  558

aggaacccaa  gcatccaccc  ctctcccccca  actttccccca  cgctaaaaaa  aacagaggga  618

gcccactcct  atgcctcccc  ctgccatccc  ccaggaactc  agttgttcag  tgcccactic  678

tac ccc agc  aag cag aac  tca ctg ctc  tgg aga gca  aac acg gac  cgt    726
Tyr Pro Ser  Lys Gln Asn  Ser Leu Leu  Trp Arg Ala  Asn Thr Asp  Arg
             20                  25                  30

gcc ttc ctc  cag gat ggt  ttc tcc ttg  agc aac aat  tct ctc ctg  gtc    774
Ala Phe Leu  Gln Asp Gly  Phe Ser Leu  Ser Asn Asn  Ser Leu Leu  Val
        35                  40                  45

tagaaaaaat  aattgatttc  aagaccttct  ccccattctg  cctccattct  gaccatttca  834

ggggtcgtca  ccacctctcc  tttggccatt  ccaacagctc  aagtcttccc  tgatcaagtc  894

accggagctt  tcaaagaagg  aattctaggc  atcccagggg  acccacacct  cectgaacca  954
```

◀200▶ 2
◀210▶
◀211▶ 82 amino acids
◀212▶ A
◀214▶ L
◀400▶ 2

```
Met Thr Pro  Pro Glu Arg  Leu Phe Leu  Pro Arg Val  Cys Gly Thr  Thr
             -30                 -25                 -20

Leu His Leu  Leu Leu Leu  Gly Leu Leu  Leu Val Leu  Leu Pro Gly  Ala
        -15                 -10                 -5

His Gly Leu  Met His Leu  Ala His Ser  Asn Leu Lys  Pro Ala Ala  His
    1                   5                   10

Leu Ile Tyr  Pro Ser Lys  Gln Asn Ser  Leu Leu Trp  Arg Ala Asn  Thr
15                  20                  25                  30

Asp Arg Ala  Phe Leu Gln  Asp Gly Phe  Ser Leu Ser  Asn Asn Ser  Leu
                35                  40                  45

Leu Val ◀
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VOL 1194 ISS JA 1997 UMI

9. Appendix B to Subpart G is proposed to be removed.
[Appendix B To Subpart G of Part 1- Headings For Information Items In § 1.823
(1) GENERAL INFORMATION:
(i) APPLICANT:
(ii) TITLE OF INVENTION:
(iii) NUMBER OF SEQUENCES:
(iv) CORRESPONDENCE ADDRESS:
(A) ADDRESSEE:
(B) STREET:
(C) CITY:
(D) STATE:
(E) COUNTRY:
(F) ZIP:
(v) COMPUTER READABLE FORM:
(A) MEDIUM TYPE:
(B) COMPUTER:
(C) OPERATING SYSTEM:
(D) SOFTWARE
(vi) CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(C) CLASSIFICATION:
(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(viii) ATTORNEY/AGENT INFORMATION:
(A) NAME:
(B) REGISTRATION NUMBER:
(C) REFERENCE/DOCKET NUMBER:
(ix) TELECOMMUNICATIONS INFORMATION:
(A) TELEPHONE:
(B) TELEFAX:
(C) TELEX:
(2) INFORMATION FOR SEQ ID NO: X:
(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH:
(B) TYPE:
(C) STRANDEDNESSS:
(D) TOPOLOGY:
(ii) MOLECULE TYPE:
- Genomic RNA;
- Genomic DNA;
- mRNA;
- tRNA;
- rRNA;
- snRNA;
- scRNA;
-preRNA;
- cDNA to genomic RNA;
- cDNA to mRNA;
- cDNA to tRNA; - cDNA to rRNA;
- cDNA to snRNA;
- cDNA to scRNA;
- Other nucleic acid;
(A) DESCRIPTION:
- protein and
- peptide.
(iii) HYPOTHETICAL:
(iv) ANTI-SENSE:
(v) FRAGMENT TYPE:
(vi) ORIGINAL SOURCE:
(A) ORGANISM:
(B) STRAIN:
(C) INDIVIDUAL ISOLATE:
(D) DEVELOPMENTAL STAGE:
(E) HAPLOTYPE:
(F) TISSUE TYPE:
(G) CELL TYPE:
(H) CELL LINE:
(I) ORGANELLE:
(vii) IMMEDIATE SOURCE:
(A) LIBRARY:
(B) CLONE:
(viii) POSITION IN GENOME:
(A) CHROMOSOME/SEGMENT:
(B) MAP POSITION:
(C) UNITS:
(ix) FEATURE:
(A) NAME/KEY:
(B) LOCATION:
(C) IDENTIFICATION METHOD:
(D) OTHER INFORMATION:
(x) PUBLICATION INFORMATION:
(A) AUTHORS:
(B) TITLE:
(C) JOURNAL:
(D) VOLUME:
(E) ISSUE:
(F) PAGES:
(G) DATE:
(H) DOCUMENT NUMBER:
(I) FILING DATE:
(J) PUBLICATION DATE:
(K) RELEVANT RESIDUES:
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:X:]

September 23, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1191 OG 168]

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(103) **Applicant Aid for Biotechnology Computer Readable Form (CRF) Sequence Listings Submissions**

The Patent and Trademark Office (PTO) has developed a computer program, called Checker, that will aid applicants in identifying and correcting errors prior to making submissions for compliance with the Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures (sequence rules: 37 CFR 1.821 through 1.825). (Final rules were published in the *Federal Register* (55 FR 18230) on May 1, 1990, and in the PTO *Official Gazette* (1114 Off.Gaz.PatOffice 29) on May 15, 1990.)

Checker is a DOS-based software program that is intended to assist users in determining whether errors may be present in the sequence listings, and is not intended to guarantee that the submission is error-free.

The most current version of the software will be available via computer downloading (details below). Copies on diskette are also available. Updated software versions will not be automatically mailed out; any updates will be announced in the PTO *Official Gazette*.

The software can be accessed/requested in the following locations:

1)Dial-up access to the Patent and Trademark Office Bulletin Board System. Phone number: 703-305-8950
Cost: Free-of-charge

2) Dial-up access through the Internet. FTP site: ftp.uspto.gov
Login as "anonymous". Software is in directory /pub/checker
Cost: Free-of-charge

3) For diskette copies, telephone requests to 703-308-0322.
Cost: $25.00

For Further Information Contact: Meredith Beckhardt at 703-308-4212.

February 14, 1995 STEPHEN G. KUNIN
Deputy Assistant Commissioner for Patent Policy and Projects

[1172 OG 33]

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(104) **Notice of Meeting to Provide Information to the Public about the Sequence Search Systems Utilized by the Patent and Trademark Office**

The Commissioner of Patents and Trademarks is authorized under 35 U.S.C. 131 to cause an examination to be made of patent applications. The PTO has received a small number of patent applications each of which claim thousands of nucleic acid sequences. The search and examination of these applications will require the dedication of human and computer resources far in excess of normal workloads. These relatively few applications alone will require a large share of resources from both the sequence searching staff of the PTO Scientific and Technical Information Center (STIC) and the biotechnology examining staff for over a year. In an effort to get public suggestions on how the PTO can best meet this challenge, the PTO is establishing a dialog with its customers. On April 3, 1996, from 9:00 a.m. to 1:00 p.m. the PTO will host an open house meeting to provide information about our current sequence search systems, including the hardware and software utilized, types of claims found in typical biotechnology applications, and the search times and costs associated with the volume of sequences which have been filed. The meeting will take place in the PTO Patent Academy, Crystal Square 4, Suite 700, 1745 Jefferson Davis Highway, Arlington, Virginia, 22202. PTO would welcome recommendations from the public on available search systems, strategies, automated solutions or suggestions for efficiencies to address these search and examination challenges.

Space is limited and reservations will be allotted on a first come, first served basis. Individuals interested in participating should contact John Doll, Director, Patent Examining Group 1800, by telephone at (703) 308-1123, by fax at (703) 308-4930, by mail marked to his attention addressed to the Assistant Commissioner for Patents, Box Comments-Patents, Washington, D.C. 20231 or over the Interet to seqmeet@uspto.gov. A request for participation should include the names and addresses of attendees, the number of spaces requested, affiliation, the area of expertise for each attendee and telephone number. PTO will confirm your participation by telephone.

March 1, 1996 LAWRENCE J. GOFFNEY
Acting Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 62]

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(105) **Petitioning to Make Applications Relating to Biotechnology Special**

This notice is intended to highlight the procedures which are available to applicants and, in particular, to applicants seeking patents on inventions relating to biotechnology, so as to have their applications accorded "special" status. A new interim procedure is also hereby established. Applications which have been made special will be advanced out of turn for examination and, subject alone to diligent prosecution by the applicant, will continue to be treated as special throughout the entire course of prosecution in the Patent and Trademark Office.

The Office accords special status to patent applications by granting petitions to make special on a number of grounds. These grounds include, for example, prospective manufacture of the invention, actual infringement of the invention, that the invention will materially enhance the quality of the environment and for inventions relating to safety of research in the field of recombinant DNA. See 37 CFR 1.102 and Manual of Patent Examining Procedure (MPEP) section 708.02 for details. Applicants seeking patents on inventions relating to biotechnology may petition based on any of the above grounds if they meet the appropriate criteria.

A new application (one which has not received any examination by the examiner) may be granted special status under the accelerated examination program. As set forth in MPEP 708.02, applicants are not subject to any of the above-mentioned criteria under this program but merely must 1) submit a written petition and the fee set forth in 37 CFR 1.17(i) which presently is $72.00; 2) present all claims directed to a single invention; 3) submit a statement that a pre-examination search was made, specifying by whom the search was made and listing the field of search; 4) submit one copy of each of the references deemed most closely related to the subject matter encompassed by the claims; and 5) submit a detailed discussion of the references pointing out how the claimed subject matter is distinguishable over the references. In those instances where the petition for this special status does not meet all the prerequisites set forth above, applicant will be notified of the defects and will be given an opportunity to perfect the petition.

In addition to the above-noted procedures to have biotechnology applications accorded special status, a new interim procedure is hereby established whereby applicants who are small entities may request that their biotechnology applications be granted special status. To take advantage of this interim special status for biotechnology inventions, an applicant must file a petition with the petition fee under 37 CFR 1.17(i) requesting the special status and must (1) state that small entity status has been established or include a verified statement establishing small entity status; (2) state that the subject of the patent application is a major asset of the small entity; and (3) state that the development of the technology will be significantly impaired if examination of the patent application is delayed including an explanation of the basis for making the statement. This newly established interim procedure will remain in effect until further notice in the *Official Gazette*. It is intended that a notice discontinuing this procedure will be published as the average pendency approaches the 18 month goal in this area. If the number of requests for making applications special under this procedure is too great, the procedure may have to be limited or discontinued.

The Office is continuing to work to reduce the pendeacy time for all applications. Special efforts are being made to reduce the pendeacy of biotechnology applications where filings are increasing rapidly and an already large backlog exists. Meanwhile, applicants who so desire can petition to have their applications made special as noted above. Questions concerning petitions to make special should be directed as follows:

1) to the Office of the Assistant Commissioner for Patents for petitions based on the grounds of prospective manufacture or infringement;
2) to the Board of Patent Appeals and Interferences for petitions on applications within the jurisdiction of the Board; or
3) to the appropriate Examining Group for petitions to make special on all other grounds.

June 22, 1988 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1092 OG 55]

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(106) **Petitioning to Make Patent Applications Relating to HIV/AIDS and Cancer Special**

Pursuant to 37 CFR 1.102, new patent applications are taken up for examination in the order of their effective United States filing date and are not advanced out of turn unless the Commissioner has so ordered to expedite the business of the Office, the head of some department of the Government requests immediate action on a patent application deemed of peculiar importance to some branch of the public service under 37 CFR 1.102(b), or a petition to make a patent application special under 37 CFR 1.102(c) or (d) has been granted. In view of the importance of developing treatments and cures for HIV/AIDS and cancer and the desirability of prompt disclosure of advances made in these fields, the Patent and Trademark Office is establishing a new category for petitions to accord "special" status to patent applications relating to HIV/AIDS and cancer. Applications which have been made special will advanced out of turn for examination and will continue to be treated as special throughout their pendency by the Patent and Trademark Office.

Applicants who desire that an application relating to HIV/AIDS or cancer be made special should file a petition, with the fee under 37 CFR 1.17(i) which is presently $130.00, requesting the Patent and Trademark Office to make the application special. The petition for special status should be made in writing, should identify the application by serial number and filing date, and should be accompanied by a statement explaining how the invention contributes to the diagnosis, treatment or prevention of HIV/AIDS or cancer. Such statement

must be set forth in oath or declaration form unless it is signed by a registered practitioner. The petition will be decided by the Director of the patent examining group to which the application is assigned.

This new category for a petition to make an application special will be added to the other categories discussed in section 708.02 of the Manual of Patent Examining Procedure.

February 23, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1172 OG 57]

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(107) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 5
Patent Law Foreign Filing Amendments

Agency: Patent and Trademark Office, Commerce
Action: Notice of Final Rulemaking
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418. The rules reflect changes made to 35 U.S.C. 184 which specify that a license is not required to, file amendments, modifications, and supplements containing additional subject matter to a previously licensed foreign patent application if such amendments, modifications, and supplements do not change the general nature of the invention disclosed in the application in a manner which would require a corresponding United States patent application to be made available for national security inspection under 35 U.S.C. 181. These regulatory changes are applicable to most existing foreign filing license holders if their patent application did not undergo security inspection under 35 U.S.C 181. Also, under the rules, a retroactive foreign filing license may be granted in situations where a proscribed foreign filing occurred through error and without deceptive intent as opposed to the earlier standard of inadvertence.
Effective Date: Feb. 19, 1991.
Supplementary Information: A notice of proposed rulemaking was published in the *Federal Register* at 55 Fed. Reg. 24270-24275 (June 15, 1990) and at 1116 Official Gazette 21-25 (July 10, 1990). No oral hearing was held. Three written comments on the proposed rulemaking were received. The comments received and replies thereto are listed below.

The rules are intended to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418 (hereinafter the Act), which amended §§ 184, 185 and 186 of Title 35, United States Code, in order to simplify the procedures for United States inventors filing and prosecuting patent applications in foreign countries. The Office has not made any rule changes to implement the amendments to 35 U.S.C. 185 or 186 since these changes affect matters outside its jurisdiction.

Section 184 of Title 35 is intended to protect United States national security interests by preventing the disclosure of potentially sensitive inventions made in the United States to foreign nationals by the act of filing a patent application in foreign countries. An inventor may not apply for a foreign patent on an invention made in the United States until at least six (6) months after the inventor has filed a United States patent application unless the inventor receives a license from the Office permitting an earlier foreign filing. This six month period assures the Office the opportunity to screen applications for information the disclosure of which might be detrimental to the national security. Also, § 184, as originally enacted, authorized the Office to grant a retroactive license for an unlicensed foreign filing of a patent application if the foreign filing was inadvertent and if the disclosure of the subject matter in the application would not be detrimental to United States security interests.

The original regulatory implementation of 35 U.S.C. 184 required applicants to obtain a license not only for the original foreign patent application but also for the filing of almost any information in support of the application, thereby creating administrative problems for United States inventors seeking foreign patent protection. For example, foreign patent offices often demand that additional technical data, such as the melting point of a chemical, be added to a patent application. An additional foreign filing license was usually required before the inventor could submit modifications, amendments, or supplements to a previously licensed foreign patent application, regardless of how trivial the change might be.

Recognizing the problems involved in obtaining these additional licenses, the Office promulgated rules in 1984 (see § 5.15(a) and 49 Fed. Reg. 13456 (April 4, 1984)) to streamline the licensing procedure. The 1984 rule change provided that an inventor could obtain in applications, the disclosure of the content of which is not potentially detrimental to United States security interests, a license which permitted the foreign filing of modifications, amendments, and supplements without further licensing if such changes were within the scope or character of the originally licensed invention (§ 5.15(a)). The 1984 rule change, however, could not be made retroactive, and therefore had no effect on licenses granted under the old system. If an applicant wished to broaden a pre-April 4, 1984, foreign filing license to the scope allowed by§ 5.15(a), this involved filing a seperate petition under§ 5.15(c) in each application.

The present Act clarifies the statutory basis for the current Patent and Trademark Office rules by providing that inventors, in most circumstances, are not required to obtain an additional license to file modifications, amendments, and supplements to their foreign applications for which a foreign filing license has been obtained under § 5.15(a). Unlike the previous Office rules, these rules broaden the scope of most existing licenses, provided that the conditions contained in the Act are met.

The Act and these rules also address difficulties associated with attempts to procure a retroactive foreign filing license. Some applicants faced loss of their patent rights due to improper foreign filings even though they believed, in good faith, that a license was not necessary for certain minor changes to their foreign application. Court decisions have held that supplemental information filed abroad was exempt from the license requirement only when it was recited *verbatim* in the United States patent application, or was so commonly known that it could have been said to have been expressly disclosed in the United States application. *In re Gaertner*, 604 F.2d 1348, 202 USPQ 714 (CCPA 1979). If a patent applicant did not obtain a foreign filing license from the Office, any corresponding United States patent was at risk of being held invalid under 35 U.S.C. 185 if technical information was added to the foreign application, even if the technical information was completely unrelated to United States security interests.

Loss of United States patent rights subsequent to an "inadvertent" unlicensed foreign filing could be avoided if a retroactive license was obtained under 35 U.S.C. 184. *Twin Disc, Inc. v. United States*, 10 Cl. Ct. 713, 231 USPQ 417 (Ct. Cl. 1986) and *Minnesota Mining and Manufacturing Co. v. Norton Co.*, 366 F.2d 238, 151 USPQ 1 (6th Cir. 1966), cert. denied, 385 U.S. 1005 (1967). While the *Gaertner* decision defined a broad range of circumstances under which a foreign filing license would be required, other court decisions made correction of licensing errors difficult by setting forth various strict interpretations of the standard of "inadvertence." Compare *Iron Ore Co. of Canada v. Dow Chemical Co.*, 177 USPQ 34 (D. Utah 1972), *aff'd*, 500 F.2d 189, 182 USPQ 520 (10th Cir. 1974) and *Reese v. Dann*, 391 F. Supp. 12, 185 USPQ 492 (D.D.C. 1975). An inventor could fail to meet the standard of "inadvertence" even if the information disclosed was not significant in nature and did not contain any sensitive national security information. For example, one decision suggested that the filing of information abroad was intentional because the inventor first considered the applicability of § 184. *Shelco, Inc. v. Dow Chemical Co.*, 322 F. Supp. 485, 168 USPQ 395 (N.D. Ill. 1970), *aff'd*, 466 F.2d 613, 173 USPQ 451 (7th Cir. 1972), *cert. denied*, 409 U.S. 876 (1972). Under the Shelco standard, if supplemental information had been filed abroad as a considered, willful act, even though done through error in the belief that the information disclosed abroad did not exceed the scope of the disclosure in the United States patent application, the filing would not be "inadvertent"; and, therefore, the subject information could not qualify for a retroactive license.

The Act addresses these problems, and the rules implement the intention of the Act. The Act changes the language of the statute to provide that an inventor may receive a retroactive license if the inventor can show that the premature filing of a foreign patent application, or the submission of supplemental information in support of a foreign patent application, was made "through error and without deceptive intent." This criterion is equivalent to that for reissue of a patent under 35 U.S.C. 251 to correct errors made without any deceptive intention. The reissue error requirement has been considered by the courts. See, e.g., *In re Weiler*, 790 F.2d 1576, 229 USPQ 673 (Fed. Cir. 1986) and *In re Wadlinger* 496 F.2d 1200, 181 USPQ 826 (CCPA 1974). The applicant for a retroactive license also must show that the foreign filing did not disclose any information detrimental to the national security and that diligence was exercised in seeking a retroactive license once the applicant became aware of the proscribed foreign filing.

The Act became effective on August 23, 1988, but it does not affect any final decision made by the Office or a court, nor the rights or liabilities of any party under a patent in a case pending before a court on the above date or under any subsequent patent deriving priority rights from such patent under 35 U.S.C. 120 or 121. Therefore, the retroactive effect of the Act and the rules is limited.

Comments on the Proposed Rules

Comment
One comment stated that the discussion in the proposed rulemaking of the modification of the standard for obtaining a retroactive license from inadvertence to "through error and without deceptive intent" should have included a reference to *In re Wadlinger*, 492 F.2d 1200, 181 USPQ 826 (CCPA 1974) rather than to *In re Weiler*, 790 F.2d 1576, 229 U8PQ 673 (Fed. Cir. 1986) The comment stated that *Wadlinger* was a more appropriate and illustrative case because it discusses more fully the meaning of the term "error" as encompassing "inadvertence, accident or mistake" and as having a very broad meaning. The comment also noted that *Wadlinger* was referenced in comments made in the hearing on the proposed legislation as indicative of the reissue standard being applied to retroactive license requests
Reply
A citation to *In re Wadlinger* has been added to the citation of *In re Weiler* in the discussion of the final rules. It was not the intent of the Office by citing the *Weiler* case to suggest that decisions on petitions for the grant of retroactive licenses would be limited by that case. Decisions are based on the particular facts in each case and the entire body of law with respect to the standard of "through error and without deceptive intent."
Comment
A comment stated that the Office should provide additional examples in the explanatory text in the final rule as to changes that may be made to foreign applications that have been licensed under 37 CFR 5.15(a) without obtaining any additional license. The comment pointed out that examples were given in the 1984 rulemaking.
Reply
The list of examples presented at the time that 37 CFR 5.15(a) was adopted in 1984 was not intended to be all-inclusive. The Office is not aware of any judicial decisions setting limits to changes that may be made under a 5.15(a) license. Depending on the nature and the criticality, changes in temperature, portions, size, etc., outside of a previously disclosed value or range that do not change the general nature of the invention from what was previously disclosed are within the scope of a § 5.15(a) license. However, if the newly disclosed value or range does change the general nature of the invention from that of the originally disclosed value or range, then a separate license is required. Likewise, new species or subcombinations of a previously disclosed genus or combination would appear to require an additional license to include such a change in a foreign application.
Comment
One comment stated that the Office should provide clarification of the attorney's ability to make decisions as to whether or not the added subject matter, in his opinion, changes the general nature of the invention.
Reply
Not only does the attorney have the ability to make the decision as to whether or not the additional subject matter changes the general nature of the invention, the attorney has the responsibility to do so. The Office will not give advisory opinions on whether an additional license is necessary, and will treat any provisional requests for a prospective or retroactive license as a request for a license. The procedure of the Office resolving any questions as to the security inspection status of any changes to previously licensed material is intended to apply only to those changes that have been submitted to the Office, i.e., the Office will reply to any inquiry as to whether previously submitted subject matter underwent, or should have undergone, security review.
Comment
One comment questioned what would happen if an attorney on considered judgment, honestly believed that a supplement did not change the general nature of a licensed invention, but that judgment later proved to be erroneous.
Reply
The Act and the rules now provide for a retroactive license to be granted in situations where it can be shown that a filing was made without a license through error and without deceptive intent. Thus, a retroactive license could be sought under § 5.25.

Discussion Of Specific Rule Changes

Section 5.11(a), as amended, specifies when a license is required before filing any foreign application for patent, including any modifications, amendments and supplements or divisions thereof. Section 5.11(a) adopts the statutory definition of "application" in 35 U.S.C. 184. Also, the rule, as amended, clarifies that the provisions of this section apply only to inventions made in the United States as stated in 35 U.S.C. 184. However, where an improvement or modification to a foreign-origin invention is made in the United States, a license would be required for the additional subject matter. The language proposed for § 5.11(e)(3) has been redrafted for clarity but still provides that an inventor need not obtain a supplemental license to file modifications, amendments and supplements containing subject matter not disclosed in, or divisions of, a foreign application for which an initial foreign filing license was not required, as long as the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1 and the changes did not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. The need for a supplemental license depends on whether the changes altered the general nature of the invention, rather than the label applied to the changes, i.e., "Continuation", "Continuation In-Part", "Division", etc.

Authorized parties may determine whether a particular application was forwarded to the defense agencies for inspection under 35 U.S C. 181 either by reviewing the filing receipt to determine if a license is or was granted, in which case security inspection did not occur, or by reviewing the file wrapper to determine if an access acknowledgment under 35 U.S.C. 181 is present, in which case security inspection did occur. If verification of the security inspection status of an application is needed, the authorized parties may submit a written request therefor to the Office, directed to the attention of Licensing and Review. A written response from the Office will be issued. In the event Office records are not available, a *de novo* determination by the Office will be made of the need for defense agency inspection under the present national security standards. If security inspection was not required under 35 U.S.C. 181, then the provisions of the Act will convert a previously granted or implied license into one having the scope of proposed § 5.15(a).

Section 5.15(a), as amended, adopts the specific provisions of the Act and clarifies the existing rules by expressly stating that the license provisions of the paragraph are applicable to United States applications which were not required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The inspection provisions of 35 U.S.C. 181 delegate to the Commissioner of Patents and Trademarks the authority to decide which

applications will be forwarded to United States defense agencies for national security inspection when the Government has no property interest in the invention. The fact that an application was forwarded to the defense agencies does not necessarily mean that the application was properly within the inspection scope of 35 U.S.C. 181. Thus, if an application was not required to be inspected but was inspected by mistake, it is eligible for such a license. The changes to the regulation expressly apply to modifications, amendments, and supplements to a previously licensed foreign application, and divisions thereof, provided the not alter the general nature of the invention in a manner which would require a corresponding United States application to have been made available for inspection under 35 U.S.C. 181.

The language of § 5 15(a)(1) also has been clarified. If the filing of the foreign application was pursuant to a license granted under § 5.15 and issued prior to publication of the notice in the Federal Register at 49 Fed. Reg. 13456 (April 4, 1984) for subject matter which was not appropriate for inspection under 35 U.8.C. 181, the license is now expanded to cover amendments, modifications, and supplements thereto, or divisions thereof, which do not change the general nature of the invention in a manner which would require such application to be made available for security inspection under 35 U.S.C. 181. Also, paragraphs (a)(3) and (a)(4) of § 5.15 have been merged in order to more clearly define the type of subsequent changes to a previously licensed foreign patent application which may be filed without any additional license. In particular, it is made clear that these changes must not be such as to require the application to be made available for security inspection. Any questions about the security inspection status of any application or amendments, modifications, and supplements thereto, or divisions thereof, will be handled in the manner as described above.

Section 5.15(b), as amended, clarifies the existing rule by expressly stating that the license provisions of § 5.12(b) are applicable to United States applications which were required to be made available for inspection under 35 U.S.C. 181 and§ 5.1. The amendments also clarify the language of the paragraph and indicate that the more restrictive license under this paragraph includes authority to take actions in the foreign or international application, provided subject matter additional to that covered by the license is not involved Section 5.15(c), as amended, clarifies the existing rule by expressly stating that the granting of a § 5.15(a) scope to a license under § 5.15(b) and conversion provisions of this paragraph are only applicable to material submitted under § 5.13 or United States applications, which are not, or were not, required to be made available for inspection under 35 U.S.C. 181 and § 5.1.

Sections 5.15(e) and (f), as amended, substitute a reference to § 5.15(a)(3) rather than to § 5.15(a)(4) which has been eliminated as a separate paragraph. Paragraph (e) also has been amended to state that changes to the general nature of the invention, which would require the application to have been made available for inspection under 35 U.S.C. 181 and § 5.1, require a separate license.

Section 5.25(a), as amended, provides that the inventor may receive a retroactive license if the inventor can show that the premature filing of papers in a foreign patent office was made through error and without deceptive intent. This criterion is the same as that for "error without any deceptive intention" for reissue of a patent and replaces the previous standard of inadvertence. This section also has been amended to clarify that each country in which a proscribed filing occurred must be listed in a petition for retroactive license. Also, the rule has been amended to define a verified statement as being in the form of either an oath or a declaration. Finally, the rule has been clarified by defining the period over which error without deceptive intent must be shown as being the time leading up to and including the proscribed foreign filing

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Acting Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the rules simplify the procedures for all United States inventors who file and prosecute applications in foreign countries.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rules contain a collection of information requirement subject to the Paperwork Reduction Act which has previously been approved by the Office of Management and Budget under Control No. 0651-0011 with an expiration date of March 31, 1993. The average time for each petition for license under § 51.12(b) or § 5.25 is estimated to be approximately thirty (30) minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the petition submission. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization, Washington, D.C. 20231, and the Office of Management and Budget, Washington, D.C. 20503 (Attention: Paperwork Reduction Project 0651-0011).

List Of Subjects

37 CFR Part 5
Classified information, Exports, Foreign relations, Inventions and patents.

For the reasons set forth in the preamble, 37 CFR Part 5 is amended as set forth below.

PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

1. The authority citation for Part 5 is revised to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S. C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U. S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

2. Section 5.11, paragraphs (a) and (e), are revised to read as follows:

§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent including any modifications, amendments, or supplements thereto or divisions thereof or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if the invention was made in the United States and:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

* * * * *

(e) No license pursuant to paragraph (a) of this section is required:

(1) If the invention was not made in the United States, or

(2) If the corresponding United States application is not subject to a secrecy order under § 5.2, and was filed at least six months prior to the date on which the application is filed in a foreign country, or

(3) For subsequent modifications, amendments and supplements containing additional subject matter to, or divisions of, a foreign patent application if:

(i) a license is not, or was not, required under paragraph (e)(2) of this section for the foreign patent application;

(ii) the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1; and

(iii) such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which would require any corresponding United States application to be or have been available for inspection under 35 U.S.C. 181 and § 5.1.

* * * * *

3. Section 5.15, paragraphs (a), (b), (c), (e) and (f), are revised to read as follows:

§ 5.15 Scope of license.

(a) Applications or other materials reviewed pursuant to § 5.12 through 5.14, which were not required to be made available for inspection by defense agencies under 35 U.S.C. 181 and § 5.1, will be eligible for a license of the scope provided in this paragraph. This license permits subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application, if such changes to the application do not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. This license also covers the inventions disclosed in foreign applications which had been granted a license under this part prior to April 4, 1984, and which were not subject to security inspection under 35 U.S.C. 181 and § 5.1. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any patent agency orinternational patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority:

(1) To export and file all duplicate and formal application papers in foreign countries or with international agencies;

(2) To make amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application; and

(3) To take any action in the prosecution of the foreign or international application provided that the adding of subject matter or taking of any action under paragraphs (a)(1) and (2) of this section does not change the general nature of the invention disclosed in the application in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 by including technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121 through 130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) Applications or other materials which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1 will be eligible for a license of the scope provided in this paragraph. Grant of this license authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to export and file all duplicate and formal papers in foreign countries or with foreign and international patent agencies and to make amendments, modifications, and supplements to, file divisions of, and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under § 5.12(b) pursuant to § 5.13 or § 5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. No such petition will be granted if the copy of the material filed pursuant to § 5.13 or any corresponding United States application was required to be made available for in-spection under 35 U.S.C. 181 and § 5.1. The change in the scope of a license will be effective as of the date of the grant of the petition.

* * * * *

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 or which involves the disclosure of subject matter listed in paragraphs (a)(3)(i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under § 5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)(3)(i) or (ii) of this section is not introduced, and

(2) In the case where at least one of the licenses was obtained under § 5.12(b), additional subject matter is not introduced.

* * * * *

4. Section 5.25, paragraph (a), is revised to read as follows:

§ 5.25 Petition for retroactive license

(a) A petition for a retroactive license under 35 U.S.C. 184 shall be presented in accordance with § 5.13 or § 5.14 (a), and shall include:

(1) A listing of each of the foreign countries in which the unlicensed patent application material was filed,

(2) The dates on which the material was filed in each country,

(3) A verified statement (oath or declaration) containing:

(i) An averment' that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order,

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was filed abroad through error and without deceptive intent without the required license under § 5.11 first having been obtained, and

(4) The required fee (§ 1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of action through error and without deceptive intent. The showing of facts as to the nature of

the error should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute error without deceptive intent should cover the period leading up to and including each of the proscribed foreign filings.

* * * * *

Nov. 28, 1990 HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner of Patents and Trademarks

[1123 OG 20]

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(108)

Department of Commerce
Patent and Trademark Office
37 CFR Part 150
[Docket No. 71038-8108]

Requests for Presidential Proclamations Under the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2)

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is adding a new Subchapter C, Part 150 to its rules to implement the Presidential proclamation provisions of the Semiconductor Chip Protection Act of 1984, 17 U.S.C. 902(a)(2). The rules establish procedures for the evaluation of requests by foreign governments for the issuance of Presidential proclamations granting protection in the United States to mask works of foreign origin. The rules also permit the Commissioner of Patents and Trademarks independently to initiate an evaluation. The effect of the rules will be to establish a regime of protection for foreign mask works in the United States, provided mask works of U.S. origin are adequately protected in the country requesting a Presidential proclamation.
Effective Date: August 1, 1988
For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703)557-3065, or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231.
Supplementary Information: The Semiconductor Chip Protection Act of 1984 (SCPA) established a new form of intellectual property protection for mask works that are fixed in semiconductor chips. Mask works are defined as a "series of related images, however fixed or encoded," that represent the three-dimensional pattern in the layers of a semiconductor chip. Thus, the subject matter of protection under the SCPA are the layout designs of semiconductor chips, known in some countries as "integrated circuit layout designs" or as "semiconductor topographies." The SCPA provides a ten-year term of protection for original mask works measured from their date of registration or first commercial exploitation anywhere in the world. To maintain protection, mask works must be registered in the United States Copyright Office within two years of first commercial exploitation.

Protection for foreign mask works may be granted under both section 902 and section 914 of the SCPA. Section 902 sets out three different ways that foreign mask works may become eligible for protection in the United States. First, on the date the work is registered or is first commercially exploited anywhere in the world, the mask work is protectible if its owner is a national, domiciliary or sovereign authority of a foreign nation that is a party to a treaty that provides protection of mask works and to which the United States is also a party, or if a stateless person, wherever domiciled. Second, foreign mask works may be protected when they are first commercially exploited in the United States. The third way, set forth in section 902(a)(2), is where the foreign mask work comes within the scope of a Presidential proclamation. The President may issue a proclamation upon finding that a foreign nation extends to mask works of owners who are U.S. nationals or domiciliaries, protection (1) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (2) on substantially the same basis as provided in the SCPA. Pursuant to Executive Order 12504, 50 FR 4849 (Feb. 4, 1985), requests for issuance of Presidential proclamations are to be presented to the President by the Secretary of Commerce.

Section 914 was included in the SCPA as a transitional provision, intended by Congress to encourage other countries to pass laws extending protection to this new form of intellectual property. Once laws were in place, it was reasoned, permanent protection for foreign mask works could be conferred under section 902 or through a multilateral treaty that extended coverage to mask works. Section 914 gives the Secretary of Commerce authority to issue orders extending interim protection to foreign mask work owners upon the satisfaction of certain conditions. First, the Secretary must find that the foreign nation is making good faith efforts and reasonable progress toward entering into a treaty with the United States, or toward enacting legislation that will protect U.S. mask works on the same basis as domestic mask works, or at a level similar to that provided under the SCPA. Second, the Secretary must determine that nationals, domiciliaries and sovereign authorities of the foreign nation are not engaged in the misappropriation, unauthorized distribution, or unauthorized commercial exploitation of mask works. Finally, the Secretary must determine that issuance of an interim order would promote the purposes of the SCPA and international comity with respect to the protection of mask-works.

By Amendment 1 to Department Organization Order 10-14, issued Dec. 3, 1984, the Secretary of Commerce delegated to the Assistant Secretary and Commissioner of Patents and Trademarks the authority under section 914 to make pertinent findings and to issue orders for the interim protection of foreign mask works. Amendment 2 to Department Organization Order 10-14, issued Sept. 28, 1987, expanded the earlier delegation to include responsibility for prescribing regulations for the presentation to the President of requests for issuance of proclamations under section 902.

The Commissioner has issued orders granting interim protection under section 914 for mask works produced in Australia, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. All of the interim protection orders were recently extended until May 31, 1989. See *Extension of Previously-Granted Interim Orders Under the Semiconductor Chip Protection Act of 1984*, 53 FR 16308 (May 6, 1988).

This proceeding was initiated by a Notice of Proposed Rulemaking published at 53 FR 5588-90 (Feb. 25, 1988). The notice set forth proposed regulations for the submission and evaluation of requests that the Secretary of Commerce recommend the issuance or revocation of a Presidential proclamation granting U.S. protection to foreign mask works under section 902(a)(2) of the SCPA. Comments on the proposed rules were received from the Commission of the European Communities and the U.S. Semiconductor Industry Association.

Discussion of Specific Rules

Section 150.1 of the new rules sets forth relevant definitions. Section 150.2 specifies the conditions under which an evaluation of recommending the issuance, revision, suspension or revocation of a section 902 proclamation will be initiated by the Commissioner. Section 150.2(a) provides that the Commissioner must initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government. Section 150.2(b) gives the Secretary the discretion to initiate independently an evaluation concerning issuance, revision, suspension or revocation of a proclamation, or as directed by the Secretary of Commerce.

Section 150.3(a) states that requests for the issuance of a section 902 Presidential proclamation shall be made by "foreign governments." The definition of "foreign government" in section 150.1 of the rules makes clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

Section 150.3(b) lists the documentation that must accompany requests for issuance of a proclamation. The laws, legal rulings, regulations, and administrative orders submitted must be in unedited, full-text form. Where possible, the materials submitted should be reproduced from the original document, *e.g.*, from court reports or statutory instruments. Abstracts, summaries and commentaries are not acceptable. If the documents are not in English, a certified English translation must accompany them.

Section 150.4 sets out the procedure the Commissioner will follow after a request for issuance of a proclamation has been submitted, or following a decision independently to initiate an evaluation. If a foreign government requests a section 902 proclamation before a section 914 proceeding has taken place, under section 150.4(a) the Commissioner may initiate such a proceeding to compile a record of necessary information and, where appropriate, to provide interim protection in the United States while the section 902 request is pending. Section 150.4(b) provides that the information obtained during a section 914 proceeding, if one has been held, will be considered by the Commissioner in determining whether to recommend the issuance of a Presidential proclamation.

Section 150.4(c) provides that requests for Presidential proclamations, and notices of the Commissioner's determination independently to initiate section 902 evaluations, will be published in the *Federal Register*. Written comments will be requested. Section 150.4(d) requires the Commissioner to notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation. Under section 150.4(e), a hearing may be scheduled if the written comments raise issues that cannot be resolved through informal contacts Section 150.4(f) provides that the record to be considered by the Commissioner in determining whether to recommend a Presidential proclamation will be the request from a foreign government, if any, written comments received, the record of any section 914 proceedings, and the information obtained in a hearing, if one is held.

Sections 150.4(g) and (h) provide that the Commissioner will forward the draft recommendation to the Secretary, who will then forward a recommendation regarding issuance of a proclamation to the President. Section 150.5(a) makes clear that the recommendation for issuance of a proclamation may include terms and conditions regarding the duration of the proclamation. Section 150.5(b) provides that interested parties may request the revision, suspension or revocation of Presidential proclamations.

Comments on the Proposed Rules

Comments on the proposed rules were submitted by the Commission of the European Communities and the U.S. Semiconductor Industry Association (SIA). The Commission of the European Communities noted that any request for a proclamation in favor of mask works produced in the Member States will be made by the Commission. The Commission requested a clarification that the term "foreign governments" as used in section 150.3(a) includes international intergovernmental organizations which have been empowered by their member states to request Presidential proclamations granting U.S. protection to mask works produced in such states.

The PTO adopts the Commission's suggestion. The rules are not intended to preclude foreign governments from having requests for Presidential proclamations presented on their behalf by an international or regional intergovernmental organization. Accordingly, a definition of "foreign government" is added as section 150.1(b) of the rules, making clear that international intergovernmental organizations may request Presidential proclamations on behalf of their member states.

In its comments, the SIA requested that section 150.4(c) be amended to require that the Commissioner hold a public hearing when requested by any interested party after an evaluation has begun. As proposed, section 150.4(e)(2)(ii) gives the Commissioner discretion to hold a hearing to gather additional information if material issues raised in written comments cannot be resolved less formally. SIA also requested that section 150.4(f) be amended to include information obtained in public hearings in the list of materials to be evaluated by the Commissioner. SIA suggested that section 150.4(c) specify a time period of thirty (30) days after publication of a request for comments in the *Federal Register* during which written comments and requests for a hearing may be submitted.

The PTO does not agree that the Commissioner should be required to hold a hearing as part of every section 902 evaluation whenever requested. Section 150.4(b) provides that information obtained during section 914 proceedings will be used in evaluating requests for Presidential proclamations. Moreover, under section 150.4(a) the Commissioner may institute section 914 proceedings if an interim order has not been issued in favor of mask works from such a requesting nation. Given the thoroughness with which section 914 proceedings are generally conducted, the Commissioner is expected to have available a substantial record concerning the degree of protection for U.S. mask works in the subject country. A separate hearing might only serve to cause delay in such cases.

Moreover, effective public participation in the section 902 evaluation process is not dependent on whether the Commissioner holds a hearing. The rules proceed from the assumption that any material issues relating to protection of U.S. mask works in a requesting foreign country can be raised in written comments, and that these issues can be resolved flexibly through informal *inter partes* contacts. Where issues cannot be resolved through such informal contacts, section 150.4(e)(ii) gives the Commissioner discretion to hold a hearing to obtain additional views and to assist in resolving the issues. It is not evident that a mandatory hearing upon request of interested parties would provide an opportunity for exchange of views or information that is not otherwise available under section 150.4(e).

The PTO agrees that, if the Commissioner elects to hold a hearing, the information obtained should be included in the record. Accordingly, section 150.4(f) is amended to make this clarification. It is also proper that the rules specify a time period for the submission of comments following publication in the *Federal Register* of the request for a proclamation or the Commissioner's determination to initiate independently a section 902 evaluation. Thus, to ensure that all interested parties have sufficient time to investigate and prepare complete written comments, section 150.4(c) is amended to specify that comments must be submitted within sixty (60) days of *Federal Register* publication.

Discussion of Principal Changes

A new section 150.1(b) has been added to the rules as proposed to clarify that international or regional intergovernmental organizations may request Presidential proclamations on behalf of their member states, provided the member states have empowered the organization to make such requests. Proposed sections 150.1(c)-(g) have been redesignated as sections 150.1(d)-(h). The definition of "mask work" in section 150.1(d) (proposed section 150.1(c)) has been modified slightly to conform to the language in section 901(a)(2) of the SCPA. The definition of "Presidential proclamation" in section 150.1(e) (proposed section 150.1(d)) has been changed slightly by substituting the words "applying for" for the word "making" before the word "registrations." The purpose of this change is to conform the language of the rule to section 908 of the SCPA, which relates to mask work registration. The definition of "request" in section 150.1(f) (proposed section 150.1(e)) has been changed to indicate that the Commissioner is not required to treat request revision, suspension or revocation of a Presidential proclamation in the same way as requests for issuance of such proclamations (*see* discussion of section 150.5(b), *infra*).

Section 150.2(a) has been expanded to make clear that the Commissioner may initiate independently an evaluation of recommending the revision, suspension, or revocation of a Presidential proclamation, as well as an evaluation of recommending the issuance of a proclamation. This change reflects the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987, which clarifies that the President has the authority to revise, suspend or revoke, as well as issue, proclamations extending protection to foreign mask works.

Section 150.3(b) has been changed to state that requests for issuance of a Presidential proclamation must be accompanied by "a copy" of laws, legal rulings, regulations or administrative orders, rather than "an official copy" of such materials, as was proposed. This change is made to avoid confusion arising from

the fact that the meaning of "official copy" may vary from country to country. Section 150.3(b)(5) has been redesignated as section 150.3(b)(6), and a new section 150.3(b)(5) has been added to specify that the copies submitted to the PTO must be in full text, unedited, and where possible, be reproduced from the original document.

Section 150.4(c) has also been changed. The proposed rule stated that notices of requests by foreign governments for the issuance of Presidential proclamations will be published in the *Federal Register*. Language has been added to make clear that notices of the Commissioner's determination independently to initiate evaluations will also be published in the *Federal Register*. Section 150.4(c) has also been changed to provide that comments shall be submitted to the Commissioner within sixty (60) days of publication of the *Federal Register* notice. Section 150.4(f) has been modified to include information obtained in a public hearing held pursuant to section 150.4(e)(ii), if such a hearing is held, in the list of materials to be evaluated by the Commissioner.

Section 150.5(b) has been changed to reflect the amendment to section 902(a)(2) made by the Semiconductor Chip Protection Act Extension of 1987. The first sentence provides that any interested party may request the "revision, suspension or revocation" of a proclamation. The second sentence has been modified to provide that "requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation." The word "substantially" has been added to indicate that the Commissioner need not initiate a formal evaluation in every case where a request is made for the revision, suspension or revocation of a Presidential proclamation, in contrast to situations where a foreign government requests the issuance of such a proclamation. While good faith requests for the revision, suspension or revocation of a proclamation will be accorded fair procedural treatment, it is proper that the Commissioner have flexibility at the outset to consider such requests on a case-by-case basis as experience is gained under these rules. If necessary, the PTO may amend the rules at a later time to provide additional procedures for consideration of requests for revision, suspension or revocation of Presidential proclamations.

Stylistic changes have also been made in sections 150.2(a), 150.3(b)(6) (proposed section 150.3(b)(5)) and 150.5(a), but these changes are for purposes of clarity and are not substantive in nature.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources. This rule is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980,44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the proposed rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*) The economic impact of a Presidential proclamation on small entities will be beneficial, since such proclamations may be issued only upon a finding that a foreign nation extends reciprocal protection to U.S. mask works.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less that $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. By extending protection to foreign mask work owners, the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets will be enhanced.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3510 *et seq.*, since no record-keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Subchapter C

Administrative practice and procedure, Authority delegations, Semiconductor chips, Mask works.

For the reasons set out in the preamble, Chapter 1 of Title 37 CFR is amended by adding a new Subchapter C, Part 150, as follows:

Subchapter C - PROTECTION OF FOREIGN MASK WORKS

Part 150 - REQUESTS FOR PRESIDENTIAL PROCLAMATIONS PURSUANT TO17 U.S.C. 902(a)(2)

Sec.
150.1 Definitions.
150.2 Initiation of Evaluation.
150.3 Submission of Requests.
150.4 Evaluation.
150.5 Duration of Proclamation.
150.6 Mailing Address.

Authority: 35 U.S.C. 6; E.O. 12504, 50 FR 4849, 3 CFR, 1985 Comp., p. 335.

Section 150.1 Definitions.

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.
(b) "Foreign government" means the duly-constituted executive of a foreign nation, or an international or regional intergovernmental organization which has been empowered by its member states to request issuance of Presidential proclamations on their behalf under this part.
(c) "Interim order" means an order issued by the Secretary of Commerce under 17 U.S.C. 914.
(d) "Mask work" means a series of related images, however fixed or encoded-

(1) having or representing the predetermined, three dimensional pattern of metallic, insulating, or semiconductor material present or removed from the layers of a semiconductor chip product; and
(2) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product.

(e) "Presidential proclamation" means an action by the President extending to foreign nationals, domiciliaries and sovereign authorities the privilege of applying for registrations for mask works pursuant to 17 U.S.C. 902.
(f) "Request" means a request by a foreign government for the issuance of a Presidential proclamation.
(g) "Proceeding" means a proceeding to issue an interim order extending protection to foreign nationals, domiciliaries and sovereign authorities under 17 U.S.C. Chapter 9.
(h) "Secretary" means the Secretary of Commerce.

Section 150.2 Initiation of Evaluation.

(a) The Commissioner independently or as directed by the Secretary, may initiate an evaluation of the propriety of recommending the issuance, revision, suspension or revocation of a section 902 proclamation.
(b) The Commissioner shall initiate an evaluation of the propriety of recommending the issuance of a section 902 proclamation upon receipt of a request from a foreign government.

Section 150.3 Submission of Requests.

(a) Requests for the issuance of a section 902 proclamation shall be submitted by foreign governments for review by the Commissioner.
(b) Requests for issuance of a proclamation shall include:

(1) A copy of the foreign law or legal rulings that provide protection forU.S. mask works which provide a basis for the request.
(2) A copy of any regulations or administrative orders implementing the protection.

(3) A copy of any laws, regulations or administrative orders establishing or regulating the registration (if any) of mask works.
(4) Any other relevant laws, regulations or administrative orders.
(5) All copies of laws, legal rulings, regulations or administrative orders submitted must be in unedited, full-text form, and if possible, must be reproduced from the original document.
(6) All material submitted must be in the original language, and if not in English, must be accompanied by a certified English translation.

Section 150.4 Evaluation.

(a) Upon submission of a request by a foreign government for the issuance of a section 902 proclamation, if an interim order under section 914 has not been issued, the Commissioner may initiate a section 914 proceeding if additional information is required.
(b) If an interim order under section 914 has been issued, the information obtained during the section 914 proceeding will be used in evaluating the request for a section 902 proclamation.
(c) After the Commissioner receives the request of a foreign government for a section 902 proclamation, or after a determination is made by the Commissioner to initiate independently an evaluation pursuant to section 150.2(a) of this part, a notice will be published in the Federal Register to request relevant and material comments on the adequacy and effectiveness of the protection afforded U.S. mask works under the system of law described in the notice. Comments should include detailed explanations of any alleged deficiencies in the foreign law or any alleged deficiencies in its implementation. If the alleged deficiencies include problems in administration such as registration, the respondent should include as specifically as possible full detailed explanations, including dates for and the nature of any alleged problems. Comments shall be submitted to the Commissionerwithin sixty (60) days of publication of the *Federal Register* notice.
(d) The Commissioner shall notify the Register of Copyrights and the Committees on the Judiciary of the Senate and the House of Representatives of the initiation of an evaluation under these regulations.
(e) If the written comments submitted by any party present relevant and material reasons why a proclamation should not issue, the Commissioner will:
(1) Contact the party raising the issue for verification and any needed additional information;
(2) Contact the requesting foreign government to determine if the issues raised by the party can be resolved; and,

(i) If the issues are resolved, continue with the evaluation; or,
(ii) If the issues cannot be resolved on this basis, hold a public hearing to gather additional information.

(f) The comments, the section 902 request, information obtained from a section 914 proceeding, if any, and information obtained in a hearing held pursuant to subsection (e)(ii) of this section, if any, will be evaluated by the Commissioner.
(g) The Commissioner will forward the information to the Secretary, together with an evaluation and a draft recommendation.
(h) The Secretary will forward a recommendation regarding the issuance of a section 902 proclamation to the President.

Section 150.5 Duration of Proclamation.

(a) The recommendation for the issuance of a proclamation may include terms and conditions regarding the duration of the proclamation.
(b) Requests for the revision, suspension or revocation of a proclamation may be submitted by any interested party. Requests for revision, suspension or revocation of a proclamation will be considered in substantially the same manner as requests for the issuance of a section 902 proclamation.

Section 150.6 Mailing Address.

Requests and all correspondence submitted pursuant to these guidelines shall be addressed to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

June 23, 1988

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1092 OG 52]

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(109) **Errors in Notice of Allowance**

The purpose of this notice is to clarify existing Office practice with respect to providing a new issue fee due date. Sometimes errors appear on the Notice of Allowance, such as an incorrect number of claims, the misspelling of an inventor's name, an incorrect inventorship, or an incorrect title. A duplicate Notice of Allowance correcting the errors may be requested from the Group that mailed the Notice. However, a new issue fee due date will not be provided if the information on the original Notice of Allowance is sufficient to allow a reasonable practitioner to timely file a proper issue fee in the correct application. Specifically, the mere filing of a request for a corrected or duplicate Notice of Allowance will not act to stay the period for paying the issue fee.

June 12, 1985

JAMES E. DENNY
Deputy Assistant Commissioner for Patents

[1056 OG 35]

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(110) **Guidance on Treatment of Product and Process Claims in light of *In re Ochiai*, *In re Brouwer* and 35 U.S.C. § 103(b)**

The purpose of this Notice is to provide guidance to Patent and Trademark Office personnel and to the public on the proper consideration of certain claims in light of *In re Ochiai*, 71 F. 3d 1565, 37 USPQ2d 1127 (Fed. Cir. 1995) and *In re Brouwer*, ** F.3d **, 37 USPQ2d 1663 (Fed. Cir. 1996) and the passage of 35 U.S.C. § 103(b), which became effective November 1, 1995. *Ochiai*, *Brouwer* and § 103(b) relate to how process claims directed to making or using nonobvious products are to be treated.

The Court in *Ochiai* and *Brouwer* addressed the issue of whether an otherwise conventional process could be patented if it were limited to making or using a nonobvious product. In both cases, the Federal Circuit held that the use of *per se* rules is improper in applying the test for obviousness under the 35 U.S.C. § 103. Rather, § 103 requires a highly fact-dependent analysis involving taking the claimed subject matter *as a whole* and comparing it to the prior art. To support a rejection under § 103, the collective teachings of the prior art must have suggested to one of ordinary skill in the art that, at the time the invention was made, applicant's claimed invention would have been obvious. In applying this test to the claims on appeal, the Court held that there simply was no suggestion or motivation in the prior art to make or use the nonobvious products to which the claims were limited and consequently overturned the rejections based upon § 103.

Interpreting a claimed invention as a whole requires consideration of *all* claim limitations. Thus, language in a process claim which recites making or using a nonobvious product must be treated as a material limitation, and a motivation to make or use the nonobvious product must be present in the prior art for a § 103 rejection to be sustained.

In light of *Ochiai* and *Brouwer*, Office personnel will consider all claim limitations when analyzing process claims which make or use nonobvious products under § 103. Office personnel will focus on treating claims as a whole and follow the analysis set forth in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966).

Accordingly, to facilitate examination under § 103, where product and process claims are presented in the same application, applicant may be called upon under 35 U.S.C. § 121 to elect claims to either the product or process. The claims to the non-elected invention will be withdrawn from further consideration. However, in the case of an elected product claim, rejoinder will be permitted when a product claim is found allowable and the withdrawn process claim depends from or otherwise includes all the limitations of an allowed product claim. Withdrawn process claims not commensurate in scope with an allowed product claim will not be rejoined. In the event of rejoinder, the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104 - 1.106. If the application containing the rejoined claims is not in condition for allowance, the subsequent Office action may be made final, or, if the application was already under final rejection, the next Office action may be an advisory action.

35 U.S.C. § 103(b) is applicable to biotechnological processes only. Section 103(b) precludes a rejection of process claims which involve the use or making of certain nonobvious biotechnological compositions of matter under § 103(a). Section 103(b) requires that:

1. the biotechnological process and composition of matter be contained in either the same application or in separate applications having the same effective filing date;

2. both the biotechnological process and composition of matter be owned or subject to an assignment to the same person at the time the process was invented;

3. a patent issued on the process also contain the claims to the composition of matter used in or made by the process, or, if the process and composition of matter are in different patents, the patents expire on the same date;

4. the biotechnological process falls within the definition set forth in § 103(b); and

5. a timely election be made to proceed under the provisions of § 103(b).

In view of the Federal Circuit's decisions in *Ochiai* and *Brouwer*, an applicant's need to rely upon § 103(b) should be rare. Consequently, the Patent and Trademark Office will treat § 103(b) elections on a case-by-case basis by way of petition under 37 CFR 1.182. That petition must establish that all the requirements set forth in § 103(b) have been satisfied. An election will normally be considered timely if it is made no later than the earlier of either (1) the payment of the issue fee, or (2) the filing of an appeal brief in an application which contains a composition of matter claim which has not been rejected under 35 U.S.C. §§ 102 or 103.

In an application where at least one composition of matter claim has not been rejected under 35 U.S.C. §§ 102 or 103, a § 103(b) election may be made by submitting the petition and an amendment requesting entry of process claims which correspond to the composition of matter claim.

For applications pending on or after November 1, 1995, in which the issue fee has been paid prior to the date of this Notice, the timeliness requirement for an election under § 103(b) will be considered satisfied if the conditions of 37 CFR 1.312(b) are met. However, if a patent is granted on an application entitled to the benefit of § 103(b) without an election having been made as a result of error without deceptive intent, patentees may file a reissue application to permit consideration of process claims which qualify for § 103 (b) treatment.

Any questions, comments or suggestions regarding petitions under 37 CFR 1.182 filed pursuant to this Notice should be directed to the Special Program Law Office, attention: Hiram Bernstein, Senior Legal Advisor. All other questions, comments or suggestions regarding this Notice should be directed to the Solicitor's Office, attention: Craig Kaufman, Associate Solicitor.

February 28, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 86]

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(111)

Public Law 98-622
Signed November 8, 1984
Ninety-eighth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-third day of January, one thousand nine hundred and eighty-four

An Act

To amend title 35, United States Code, to increase the effectiveness of the patent laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I-PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE

THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

§ 157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant:

"(1) meets the requirements of section 112 of this title;

"(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;

"(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and

"(4) pays application, publication, and other processing fees established by the Commissioner.

If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.

"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.

"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.

"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures."

(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration.".

(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:

"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."

(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.".

EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.

(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.

(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.

(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

TITLE II-PATENT AND TRADEMARK OFFICE PROCEDURES

BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Section 7 of title 35, United States Code, is amended to read as follows:

§ 7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.

"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title. Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.

"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Apeals and Interferences, theCommissioner may designate any patent examiner of the primary examiner grade or higher, having the

requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maximum rate of basic pay payable for grade GS 16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made."

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office."

APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended-

(1) in the first sentence-

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out, "thereby waiving his right" and inserting in lieu thereof. "By filing such an appeal the applicant waives his or her right";

(2) in the second sentence-

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof "in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case."

(b) Section 145 of title 35, United States Code, is amended-

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may,"and

(2) in the second sentence by striking out "Appeals " and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent interefereances on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interferenace".

TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended-

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" "after oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended-

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph-

(1) by striking out "Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences";

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended-

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interferences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

TITLE III-NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

MEMBERSHIP OF COMMISSION

SEC. 302. (a) The Commission shall be composed of

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives apointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman. Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limimtation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and producitivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recomendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.

DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons employed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS- 16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated $250,000 to carry out this title.

EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985.

TITLE IV- MISCELLANEOUS PROVISIONS

INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended-

(1) in the first sentence-

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: ", unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended-

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out ", except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty."

(c) Section 371(c)(2) of title 35, United States Code, is amended-

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty.".

(e) Section 372(b) of title 35, United States Code, is amended-
(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and
(2) by adding at the end thereof the following:

"(3) the Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English.".

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).

(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".

(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"TV. Patent Cooperation Treaty.....351"

PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97 247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.

(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97-247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after August 27, 1982.

TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:

"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS-16 of the General Schedule under section 5332 of title 5."

EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.

(b) The amendments made by sections 401, 402, and of this Act shall take effect six months after the date of the enactment of this Act.

[1050 OG 316]

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(112)

Department of Commerce
Patent and Trademark Office
37 CFR Part 1

[Docket No: 950620162-6014-02]
RIN 0651-AA75

Miscellaneous Changes in Patent Practice

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to implement a number of miscellaneous changes proposed in the rulemaking entitled "Changes to Implement 18-Month Publication of Patent Applications" (Notice of Proposed Rulemaking), published in the *Federal Register* at 60 FR 42352 (August 15, 1995), and in the Patent and Trademark Office *Official Gazette* 1177 *Off. Gaz. Pat. Office* 61 (August 15, 1995), that are not directly related to the 18-month publication of patent applications. While the proposed rule changes in the Notice of Proposed Rulemaking were designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733, these miscellaneous proposed changes clarify current rules of practice, without regard to the publication of patent applications.
Effective Date: September 23, 1996.
Sections 1.52(a) and (b), 1.58, 1.72(b), 1.75(g), (h) and (i), 1.77, 1.84(c), (f), (g) and (x), 1.96, 1.154, and 1.163 of 37 CFR apply to applications filed on or after September 23, 1996.
For Further Information Contact: Stephen G. Kunin by telephone at (703) 305-8850, by facsimile at (703) 305-8825, by electronic mail at rbahr@uspto.gov, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Stephen G. Kunin, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231. For copies of the forms discussed in this final rule package, contact the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214.

Supplementary Information

This final rule package is designed to implement the miscellaneous changes set forth in the proposed rulemaking entitled "Changes to Implement 18-Month Publication of Patent Applications" (Notice of Proposed Rulemaking) that are not directly related to 18-month publication of patent applications and that are considered desirable even in the absence of an 18-month publication system.

The Notice of Proposed Rulemaking indicated that, in addition to implementing the 18-month publication of patent applications, the Office also proposed to: (1) clarify which applications claiming the benefit of prior applications, or which prior applications for which a benefit is claimed in a later application, will be preserved in confidence; (2) amend the rules pertaining to the format and standards for application papers and drawings to improve the standardization of patent applications; (3) provide for those instances in which inventions of a pending application or patent under reexamination and inventions of a patent held by a single party are not identical, but not patentably distinct; (4) clarify the practice for the delivery or mailing of patents; (5) expedite the entry of international applications into the national stage; and (6) amend a number of rules for consistency and clarity. The Notice of Proposed Rulemaking stated that these proposed rule changes may be adopted as final rules even in the absence of an 18-month publication system, and advised interested persons to comment on any proposed rule change, regardless of whether H.R. 1733 is enacted.

To avoid delays in the implementation of rule changes considered desirable even in the absence of an 18-month publication system, this final rule package provides for changes to 37 CFR §§ 1.12(c), 1.14, 1.52(a) and (b), 1.54, 1.58, 1.62(e) and (f), 1.72(b), 1.75(g), 1.77, 1.78(a) and (c), 1.84(c), (f), (g) and (x), 1.96, 1.97, 1.107, 1.110, 1.131, 1.132, 1.154, 1.163, 1.291, 1.292, 1.315, 1.321 and 1.497, and adds new §§ 1.5(f), 1.75(h) and (i), and 1.130, all of which are based upon the changes proposed in the Notice of Proposed Rulemaking.

Implementation of 18-month publication held in abeyance pending Congressional action on H.R. 1733

The Notice of Proposed Rulemaking also proposed changes to 37 CFR §§ 1.4, 1.5(a), 1.9, 1.11, 1.12(a) and (b), 1.13, 1.16, 1.17, 1.18, 1.19, 1.20, 1.24, 1.51, 1.52(d), 1.53, 1.55, 1.60, 1.78(a), 1.84(j), 1.85, 1.98, 1.108, 1.136, 1.138, 1.492, 1.494, 1.495, 1.701, 1.808, 3.31, 5.1, new §§ 1.5(g), 1.306 through 1.308 and 5.9, and further changes to §§ 1.14, 1.54, 1.62, 1.107, 1.131, 1.132, 1.291 and 1.292 to implement the 18-month publication of patent applications as contained in H.R. 1733 and provide procedures for the treatment of national security classified applications. The adoption of changes to these rules is held in abeyance pending Congressional action on H.R. 1733.

The proposed rule changes in the Notice of Proposed Rulemaking to provide new procedures for the treatment of national security classified applications are also being held in abeyance. These proposed rule changes are separable from the implementation of 18-month publication; however, they are sufficiently related to the implementation of 18-month publication that they are also being held in abeyance pending Congressional action on H.R. 1733.

In the event that H.R. 1733 is enacted, a final rule package to implement this legislation will be published. Final rules to implement 18-month publication of patent applications based upon the Notice of Proposed Rulemaking and the comments received in response to the Notice of Proposed Rulemaking may be adopted without either an additional public hearing or an additional proposal being published for comment.

Implementation of the miscellaneous changes proposed in the Notice of Proposed Rulemaking

The following paragraphs of this section include: (1) a discussion of the rules being added or amended in this final rule package, (2) the reasons for those additions and amendments, and (3) an analysis of the comments received in response to the Notice of Proposed Rulemaking.

Changes to proposed rules: These final rules contain a number of changes to the text of the rules as proposed for comment. The significant changes are discussed below. Familiarity with the Notice of Proposed Rulemaking is assumed.

Sections 1.14(a) and (b) have been re-written for clarity. Section 1.14(a)(1) provides that patent applications are generally preserved in confidence. Section 1.14(a)(2) sets forth the circumstances under which status information concerning an application may be supplied, and § 1.14(a)(3) sets forth the circumstances under which access to, or copies of, an application may be provided. Section 1.14(b) provides that abandoned applications may be destroyed after 20 years from their filing date. The reference to paragraph (b) in § 1.14(e) has been deleted for consistency with the changes to paragraphs (a) and (b) of § 1.14.

Section 1.52(a) is being changed to provide that all papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly "written either by a typewriter or mechanical printer in permanent dark ink or its equivalent," rather than "typed in permanent dark ink." This change will permit the filing of papers printed by any computer operated printer, such as a laser printer which uses toner rather than ink, and will avoid a conflict between § 1.52(a) and Patent Cooperation Treaty (PCT) Rule 11.9. The phrase "when required by the Office" was also added to § 1.52(a).

Section 1.52(b) is being changed to provide that: (1) the application papers must be plainly written with each page printed on only one side of a sheet of paper, with the claim or claims commencing on a separate sheet and the abstract commencing on a separate sheet; (2) the lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced; and (3) the pages of the specification including claims and abstract must be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text. This change will clarify: (1) the separate sheet requirement for both the claims and abstract, (2) that the lines of the papers not comprising the specification and amendments thereto need not be 1 1/2 or double spaced, and (3) that the specification, and not the transmittal sheets or other forms, must be numbered.

Section 1.58 is being changed to provide that chemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. This replaces the requirement that "[t]o facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent." However, chemical and mathematical formulae and tables must still otherwise comply with §§ 1.52(a) and (b). This change will avoid a conflict between § 1.58 and PCT Rule 11.10(d). Section 1.58 is also being changed to require "0.21 cm." rather than "2.1 mm." to ensure consistency.

Section 1.72 is being changed to provide that the abstract must commence on a separate sheet, preferably following the claims. This change will avoid renumbering pages of a specification submitted in the arrangement set forth in § 1.77 when filing the application as an international application.

Section 1.75(h) is being changed to provide that the claim or claims must commence on a separate sheet. This change will clarify that § 1.75 requires that the claim or claims commence or begin on a separate sheet, rather than requiring that all of the claims must be on a single separate sheet or that each claim must be on a separate sheet.

Section 1.77 is being changed to position the abstract as element "(12)" following the claims, rather than element "(3)" prior to the first page of the specification to conform to § 1.72.

Section 1.78(a)(2) is being changed to replace the reference to § 1.14(b) with a reference to § 1.14(a).

Section 1.78(c) is being changed to replace the phrase "[w]here an application or a patent under reexamination and an application or a patent" with the phrase "[w]here an application or a patent under reexamination and at least one other application," since conflicting claims between an application or a patent under reexamination and a patent will be provided for in new § 1.130. Section 1.78(c) is also being changed to delete the sentence "[i]n addition to making said statement, the assignee may also explain why an interference should or should not be declared," since the Office will not, unless good cause is shown, declare or continue an interference when the application(s) and patent are owned by a single party.

Section 1.78(d) is removed. The provisions of § 1.78(d), as proposed, are in new § 1.130(b), since § 1.130 provides for conflicting claims between an application or a patent under reexamination and a patent.

Section 1.84(x) is being changed from "[n]o holes should be provided in the drawings sheets" to "[n]o holes should be made by the applicant in the drawing sheets" to clarify that the application papers, including drawings, should be submitted by the applicant without holes provided therein, but that the Office will drill holes through the application papers during the pre-examination processing of the application.

Section 1.96(b) is being changed to provide that a listing submitted as part of the specification "must be direct printouts (*i.e.*, not copies) from the computer's printer" for clarity.

Section 1.96(c) is being changed to substitute a reference to 36 CFR Part 1230 (Micrographics) for the enumerated American National Standards Institute (ANSI) and National Micrographics Association (NMA) standards. As 36 CFR Part 1230 sets forth the micrographic requirements for government records, it is appropriate to reference this provision, rather than promulgate separate standards for micrographics employed in patent applications.

Section 1.97 is being changed to delete any reference to a reexamination proceeding or a patent owner. The submission of an information disclosure statement during a reexamination proceeding is governed by § 1.555(a).

Section 1.97(a) is being changed from "[i]n order for an applicant for patent or for reissue of a patent to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with

§ 1.98 should be filed in accordance with this section" to "[i]n order for an applicant for a patent or for a reissue of a patent to have an information disclosure statement in compliance with § 1.98 considered by the Office during the pendency of the application, it must satisfy paragraph (b), (c), or (d) of this section" for clarity. Sections 1.97(c) and (d) are also being changed to clarify the conditions in § 1.97(c) under which a certification as specified in § 1.97(e) or the fee set forth in § 1.17(p) is required, and the conditions in § 1.97(d) under which a certification as specified in § 1.97(e), a petition, and the petition fee set forth in § 1.17(i) are required.

Section 1.110 is amended to change the reference to § 1.78(d) to a reference to § 1.130 for consistency.

The proposed addition of a new § 1.131(a)(3) is being withdrawn in this final rule package. This proposed change, as well as the provisions of former § 1.78(d), has been re-written as a new § 1.130. New § 1.130(a) will provide a procedure for the disqualification of a commonly owned patent claiming a patentably indistinct but not identical invention. New § 1.130(b) will include the provisions of former § 1.78(d).

Section 1.131(a) is being changed to replace the phrase "U.S. patent to another" with "U.S. patent to another or others." Section 1.154(a)(7) is being changed to add "[f]eature" prior to "[d]escription," and § 1.154(a)(8) is being changed to add "a single" prior to "claim."

Section 1.163 is being changed to position the abstract as element "(11)" following the claims, rather than element "(3)" prior to the first page of the specification. This change will parallel the change to § 1.77. In addition, § 1.163(c)(10) is being changed to add "a single" prior to "claim."

Section 1.497(b)(2) is being changed to provide that "[i]f the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state" to better set forth the requirements of an oath or declaration by a person who is not the inventor. Section 1.497(c) is being changed to delete the initial phrase "[t]he oath or declaration must comply with the requirements of § 1.63; however," since it is unnecessary.

Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Part 1 is amended as follows:

Section 1.5(f) is added to provide that a paper concerning a provisional application must identify the application as such and by the application number.

Section 1.12 is amended to revise paragraph (c) to read "preserved in confidence under § 1.14" for consistency with § 1.14.

Section 1.14 is amended to revise the title and paragraphs (a) and (e) to read "preserved in confidence" for consistency with the language in 35 U.S.C. 122.

Section 1.14(a) is amended to add a paragraph (a)(1) to provide that patent applications are generally preserved in confidence pursuant to 35 U.S.C. 122, and that no information will be given concerning the filing, pendency, or subject matter of any application for patent, and no access will be given to, or copies furnished of, any application or papers relating thereto, except as set forth in § 1.14.

Section 1.14(a) is also amended to add a paragraph (a)(2) to provide that status may be supplied: (1) concerning an application or any application claiming the benefit of the filing date of the application, if the application has been identified by application number or serial number and filing date in a published patent document; (2) concerning the national stage application or any application claiming the benefit of the filing date of a published international application, if the United States of America has been indicated as a Designated State in the international application; or (3) when it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office. Status information includes information such as whether the application is pending, abandoned, or patented, as well as the application number and filing date. The inclusion of applications claiming the benefit of the filing date of applications so identified is to avoid misleading the public in instances in which the application identified as set forth in § 1.14(a)(2) is abandoned, but an application claiming the benefit of the filing date of the identified application (*e.g.*, a continuing application) is pending.

Section 1.14(a) is also amended to add a new paragraph (a)(3) to provide that access to, or copies of, an application may be provided: (1) when the application is open to the public as provided in § 1.11(b); (2) when written authority in that application from the applicant, the assignee of the application, or the attorney or agent of record has been granted; (3) when it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office, or (4) to any person on written request, without notice to the applicant, when the application is abandoned and available and is: (a) referred to in a U.S. patent, (b) referred to in an application open to public inspection, (c) an application which claims the benefit of the filing date of an application open to public inspection, or (d) an application in which the applicant has filed an authorization to lay open the complete application to the public.

Section 1.14(b) is amended to provide that complete applications (§ 1.51(a)) which are abandoned may be destroyed and hence may not be available for access or copies as permitted by paragraph (a)(3)(iv) of this section after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. The sentence in § 1.14(b) concerning the non-return of abandoned applications is deleted as duplicative of the provision in § 1.59, which provides that papers in an application which has received a filing date will not be returned, and is unrelated to the preservation of applications in confidence under § 1.14.

Section 1.52(a) is amended to provide that all papers which are to become a part of the permanent records of the Office must be legibly written by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, non-shiny, durable and white paper. Section 1.52(a) is further amended to provide that the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit electronic reproduction by use of digital imaging and optical character recognition, as well as the direct photocopy reproduction currently provided for. Section 1.52(a) is further amended to provide that substitute typewritten or mechanically printed papers "will" be required if the original application papers are not of the required quality. As any substitute typewritten or mechanically printed papers containing the subject matter of the originally filed application papers would constitute a substitute specification, the provisions of § 1.125 governing the entry of a substitute specification would be applicable, and § 1.52(a) is amended to include a specific reference to § 1.125.

Section 1.52(b) is amended to provide that the claim or claims must commence on a separate sheet and the abstract must commence on a separate sheet. Section 1.72(b) provides that the abstract must commence on a separate sheet, and § 1.75(h) provides that the claim or claims must commence on a separate sheet. Section 1.52(b) is amended to provide that the sheets of paper must all be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and that no holes should be made in the submitted paper sheets. Section 1.52(b) is further amended to provide that the lines of the specification, and any amendments to the specification, "must" be 1 1/2 or double spaced, and that the pages of the specification "must" be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text. Finally, § 1.52(b) is amended to specifically reference drawings to clarify that drawings are part of the application papers, but that the standards for drawings are set forth in § 1.84.

The proposed changes to §§ 1.52(a) and (b), 1.58, 1.72(b), 1.75(g), (h), and (i), 1.77, 1.84(c), (f), (g), and (x), 1.96, 1.154, and 1.163 pertaining to the format and standards for application papers and drawings in the Notice of Proposed Rulemaking are considered desirable, regardless of whether H.R. 1733 is enacted.

While the vast majority of applications currently comply with §§ 1.52(a) and (b), 1.58, 1.72(b), 1.75(h), 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule, those applications which do not comply with §§ 1.52(a) and (b), 1.58, 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule (*e.g.*, applications containing hand-written papers) create an inordinate administrative burden on the Office during the initial processing, examination, and publishing of the application as a patent. In addition, the Office plans to replace or augment the current microfilming process with electronic data capture of at least the technical content (*i.e.*, the specification, abstract, claims and drawings) of the application-as-filed for internal Office use, regardless of whether H.R. 1733 is enacted. Therefore, the Office will no longer permit these relatively few applicants to submit application papers and drawings that do not meet the standards set forth in §§ 1.52(a) and (b), 1.58, 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule.

The application format set forth in §§ 1.75(g) and (i), 1.77, 1.154, and 1.163 as adopted in this final rule merely expresses the Office's preferences for format of utility, design and plant applications. They do not set forth mandatory requirements for application papers and drawings.

Section 1.54(b) is amended to change "application serial number" to "application number" for consistency with § 1.5(a).

Section 1.58(b) is removed and is reserved as unnecessary in view of the amendments to §§ 1.52(a) and (b).

Section 1.58(c) is amended to provide that chemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Section 1.58(c) is further amended to delete the following sentences to conform to the writing and paper size and orientation limitations in §§ 1.52(a) and (b): (1) "[t]o facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent"; (2) "[i]f it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet"; and (3) "[h]and lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.)." Section 1.58(c) is further amended to insert "chosen" between "must be" and "from a block (nonscript) type font." Section 1.58(c) is further amended to provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.62(e) is amended to change "application serial number" to "application number" for consistency with § 1.5(a).

Section 1.62(f) is amended to change "secrecy" to "confidence" as is found in 35 U.S.C. 122 and § 1.14, and change "37 CFR 1.14" to "§ 1.14" for consistency.

Section 1.72(b) is amended to provide that the abstract must "commence," rather than "be set forth," on a separate sheet. This change will conform the "separate sheet" requirement for the abstract with that for the claims.

Section 1.75 is amended to include an amendment to paragraph (g), and would add two new paragraphs. Section 1.75(g) is amended to add the phrase "[t]he least restrictive claim should be presented as claim number 1" to the beginning of the paragraph. Section 1.75(h) is added to provide that the claim or claims must commence on a separate sheet. Section 1.75(i) is added to provide that where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

Section 1.77 is amended to provide that the elements of the application, if applicable, should appear in the following order: (1) Utility Application Transmittal Form; (2) Fee Transmittal Form; (3) title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) reference to a "Microfiche appendix; (7) background of the invention; (8), brief summary of the invention; (9) brief description of the several views of the drawing; (10) detailed description of the invention; (11) claim or claims; (12) abstract of the disclosure; (13) drawings; (14) executed oath or declaration; and (15) sequence listing. The phrase "if applicable" is inserted in the heading, rather than associated with any particular listed element, to clarify that § 1.77 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.77. Section 1.77 is further amended to provide that the (1) title of the invention; (2) cross-reference to related applications; (3) statement regarding federally sponsored research or development; (4) background of the invention; (5) brief summary of the invention; (6) brief description of the several views of the drawing; (7) detailed description of the invention; (8) claim or claims; (9) abstract of the disclosure; and (10) sequence listing, should appear in upper case, without underlining or bold type, as section headings, and if no text follows the section heading, the phrase "Not Applicable" should follow the section heading. Finally, § 1.77 is amended to change the reference to § 1.96(b) in § 1.77(a)(6) to § 1.96(c) for consistency with § 1.96.

Section 1.78(a)(2) is amended to replace the reference to § 1.14(b) with a reference to § 1.14(a) for consistency with §§ 1.14(a) and (b) as amended.

Section 1.78(c) is amended to change "two or more applications, or an application and a patent" to "an application or a patent under reexamination and at least one other application" such that the provisions of § 1.78(c) will also be applicable to a patent under reexamination. Section 1.78(c) is also amended to correct "inventors and owned by the same party contain conflicting claims" to read "inventors are owned by the same party and contain conflicting claims." Section 1.78(c) is also amended to delete the sentence "[i]n addition to making said statement, the assignee may also explain why an interference should or should not be declared."

Section 1.78(d) is removed. The provisions of former § 1.78(d), as proposed, are in new § 1.130(b).

Section 1.84(c) is amended to provide that a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner of the drawing sheet, provided that reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.

Section 1.84(f) is amended to provide that the size of all drawing sheets in an application must be either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches) to conform to the requirement in § 1.52(b) concerning papers in an application.

Section 1.84(g) is amended to delete the margin requirements for the sheet sizes that are no longer acceptable in view of the changes to § 1.84(f). Section 1.84(g) is further amended to provide that the sheets should have scan targets (cross-hairs) on two catercorner margin corners. Finally, § 1.84(g) is amended to increase the bottom and side margins such that each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

Section 1.84(x) is amended to delete the provisions indicating the proper location for holes in a drawing sheet, and provide that no holes should be provided in the drawing sheets.

Section 1.96 is amended to designate the text preceding current paragraph (a) as paragraph (a) "*General,*" and would redesignate current paragraphs (a) and (b) as paragraphs (b) and (c), respectively. New § 1.96(a) is further amended to insert a period between "specification" and "[a] computer," to change "these rules" to "this section," and to change "may be submitted in patent applications in the following forms" to "may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section."

New § 1.96(b) is further amended to: (1) change the sentences "[t]he listing may be submitted as part of the specification in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as 'camera ready copy' when a patent is subsequently printed" and "[s]uch computer printout sheets must be original copies from the computer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 13 inches wide, and the sheets should be submitted in a protective cover" to "[a]ny listing submitted as part of the specification must be direct printouts (*i.e.*, not copies) from the computer's printer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, and the sheets should be submitted in a

protective cover"; (2) delete the sentence "[w]hen printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page"; and (3) delete the phrase "if the copy is to be used for camera ready copy." New § 1.96(b)(1) provides that the requirements of § 1.84 apply to computer program listings submitted as sheets of drawings, and new § 1.96(b)(2) provides that the requirements of § 1.52 apply to computer program listings submitted as part of the specification.

New § 1.96(c) is amended to: (1) change the references to § 1.77(c)(2) in § 1.96(c) to § 1.77(a)(6) for consistency with § 1.77; (2) change "may" and "should" to "must"; (3) delete the sentence "[a]ll computer program listings submitted on paper will be printed as part of the patent"; (4) relocate the phrase "except as modified or clarified below" in subsection (c)(2); (5) change the phrase "computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards" to "computer-generated information submitted as a 'microfiche appendix' to an application shall be in accordance with the standards" for clarity; (6) change the references to the specific American National Standards Institute (ANSI) or National Micrographics Association (NMA) standards with 36 CFR Part 1230; (7) change "serial number" to "application number"; and (8) provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.97(a) is amended to include the phrase "for an applicant for patent or for reissue of a patent." Paragraphs (a)–(d) are amended to include the phrase "by the applicant" to clarify that § 1.97 is not available for any third party seeking to have information considered in a pending application. Any third party seeking to have information considered in a pending application must proceed under §§ 1.291 or 1.292. As discussed *supra*, §§ 1.97(a), (c) and (d) are also being amended for clarity. Section 1.97(c) is further amended to correct the phrase "certification as specified in paragraph (3) of this section" to read "certification as specified in paragraph (e) of this section."

Section 1.107 is amended to delete the phrase "and the classes of inventions."

Section 1.110 is amended to change the reference to § 1.78(d) to a reference to § 1.130 for consistency with the removal of § 1.78(d), and the location of the provisions of former § 1.78(d) in § 1.130(b).

A new paragraph (a)(3) in § 1.131 was proposed in the Notice of Proposed Rulemaking to permit a showing of prior invention in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e), where the application or patent under reexamination and the patent upon which the rejection is based are both owned by a single party, so long as the invention claimed in the pending application or patent under reexamination and in the other patent are not identical as set forth in 35 U.S.C. 102. Upon further study, it is considered appropriate to disqualify such patents, and provide for the obviation of judicially created double patenting rejections in an application or a patent under reexamination by the filing of a terminal disclaimer in accordance with § 1.321(c), in a separate § 1.130.

New § 1.130(a) provides that when any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 103 on a U.S. patent to another or others which is not prior art under 35 U.S.C. 102(b), and the inventions defined by the claims in the application or patent under reexamination and by the claims in the patent are patentably indistinct but not identical as set forth in 35 U.S.C. 101, and the inventions are owned by the same party, the applicant or owner of the patent under reexamination may disqualify the patent as prior art. Section 1.130(a) specifically provides that the patent can be disqualified as prior art by submission of: (1) a terminal disclaimer in accordance with § 1.321(c), and (2) an oath or declaration stating that the application or patent under reexamination and the patent are currently owned by the same party, and that the inventor named in the application or patent under reexamination is the prior inventor under 35 U.S.C. 104.

Where inventions defined by the rejected claims in the application or a patent under reexamination and by the claims in the patent upon which the rejection is based are patentably distinct, the rejection may be overcome pursuant to § 1.131. Since § 1.130 applies only when inventions defined by the claims in an application or a patent under reexamination and by the claims in the patent are patentably indistinct, § 1.130 expressly provides that an oath or declaration submitted pursuant to § 1.130 to disqualify a patent must be accompanied by a terminal disclaimer in accordance with § 1.321(c).

As the conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, § 1.130 is limited to rejections based upon a patent.

New § 1.130(b) includes the provisions of former § 1.78(d), as proposed in the Notice of Proposed Rulemaking. Former § 1.78(d) was proposed to be amended to change "obviousness-type double patenting rejection" to "non-statutory double patenting rejections" as current examining procedures authorize non-obviousness-type double patenting rejections, as well as obviousness-type double patenting rejections (*See* section 804(II) of the Manual of Patent Examining Procedure (MPEP)), and either may be obviated by filing a terminal disclaimer in accordance with § 1.321(c). The phrase "non-statutory double patenting rejection," however, is being replaced with "judicially created double patenting rejection" to better set forth the legal basis for the rejection.

Section 1.78(d) was also proposed to be amended to change each instance of "application" to "application or a patent under reexamination" for consistency with § 1.321 and to clarify that double patenting is a proper consideration in reexamination (*Ex parte Obiaya*, 227 USPQ 58, 60-61 (Bd. Pat. App. & Inter. 1985)), and that a judicially created double patenting rejection in a patent under reexamination may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

New § 1.130(b) specifically provides that where an application or a patent under reexamination claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application or a patent under reexamination, and that a judicially created double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

Section 1.131 is amended to change "U.S. patent to another" to "U.S. patent to another or others" to parallel the language in 35 U.S.C. 102(a), as well as 35 U.S.C. 102(e).

Section 1.132 is amended to change "domestic patent" to "U.S. patent," and "does not claim the invention" to "does not claim the same patentable invention, as defined in § 1.601(n)" for consistency with § 1.131.

Section 1.154 is amended to provide that the elements of a design application, if applicable, should appear in the following order: (1) Design Application Transmittal Form; (2) Fee Transmittal Form; (3) preamble, stating name of the applicant and title of the design; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) description of the figure or figures of the drawing; (7) feature description; (8) a single claim; (9) drawings or photographs; and (10) executed oath or declaration. The phrase "[t]he following order of arrangement should be observed in framing design specifications" is changed to "[t]he elements of the design application, if applicable, should appear in the following order" to clarify that § 1.154 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.154. This amendment to § 1.154, however, does not modify the current requirement that an application for a design patent have but a single claim.

A new § 1.163(c) is added to provide that the elements of a plant application, if applicable, should appear in the following order: (1) Plant Application Transmittal Form; (2) Fee Transmittal Form; (3) title of the invention; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) background of the invention; (7) brief summary of the invention; (8) brief description of the drawing; (9) detailed botanical description; (10) a single claim; (11) abstract of the disclosure; (12) drawings (in duplicate); (13) executed oath or declaration; and (14) Plant Color Coding Sheet. The phrase "if applicable" is included in the heading, rather than associated with any particular listed element, to clarify that § 1.163 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.163. This amendment to § 1.163, however, does not modify the current requirement that an application for a plant patent have but a single claim.

A new § 1.163(d) is added to define a plant color coding sheet. A plant color coding sheet is a sheet that specifies a color coding system as designated in a color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure. The plant color coding sheet will provide a means for applicants to uniformly convey detailed color characteristics of the plant. Providing this information in a systematic manner will facilitate the examination of the application.

Section 1.291 is amended to provide that a protest must be filed prior to the mailing of a Notice of Allowance to be considered timely. As a protest cannot be considered subsequent to issuance of the application as a patent, § 1.291(b) is amended to provide that the protest will be considered if the application is still pending when the protest and application file are provided to the examiner (*i.e.*, that the application was pending at the time the protest was filed would be immaterial to its ultimate consideration). Finally, the sentences "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and "[p]rotests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office" in § 1.291 are changed to "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and "[p]rotests which do not adequately identify a pending patent application will be returned to the protestor and will not be further considered by the Office," respectively, and are located in paragraph (b). The Office will acknowledge protests prior to their entry into the application file or return to the protestor, as appropriate.

Section 1.292 is amended to delete the phrase "is filed by one having information of the pendency of an application" as unnecessary, and would move the requirement for the fee set forth in § 1.17(j) from paragraph (a) to paragraph (b) where the conditions for entry of a petition for the institution of public use proceedings are set forth. Section 1.292 is amended to further require that any petition be served on the applicant in accordance with § 1.248, or be filed with the Office in duplicate in the event that service on the applicant is not possible. Finally, § 1.292 is amended to provide that a petition to institute public use proceedings to be considered timely must be filed prior to the mailing of a Notice of Allowance.

Section 1.315 is amended to change "the attorney or agent of record, if there be one; or if the attorney or agent so request, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so request" to "the correspondence address of record. See § 1.33(a)." This change is to simplify § 1.315, and because patents are currently mailed to the patentee at the correspondence address of record.

Section 1.321(c) is amended to change "double patenting rejection" to "judicially created double patenting rejection" for consistency with § 1.78(c) and to clarify that the filing of a terminal disclaimer is ineffective to overcome a statutory double patenting rejection.

Section 1.497(a) is amended to provide that an applicant in an international application must file an oath or declaration that: (1) is executed in accordance with either §§ 1.66 or 1.68, (2) identifies the specification to which it is directed, (3) identifies each inventor and the country of citizenship of each inventor, and (4) states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought, rather than an oath or declaration in accordance with § 1.63, to enter the national stage pursuant to §§ 1.494 or 1.495. Currently, the failure to file an oath or declaration in strict compliance with § 1.63 results in non-compliance with § 1.497, and thus 35 U.S.C. 371, which in turn delays the entry of the international application into the national stage. To expedite the entry of international applications into the national stage, § 1.497(a) is amended to require only an oath or declaration that is properly executed, identifies the specification to which it is directed, and, as required by 35 U.S.C. 115, identifies each inventor and the country of citizenship of each inventor and states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

Section 1.497(b) is subdivided into paragraphs (b)(1) and (b)(2). Section 1.497(b)(1) is amended to provide that the oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47. Section 1.497(b)(2) is amended to change "[i]f the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by § 1.63 to state" to "[i]f the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state."

Section 1.497(c) is added to provide that the oath or declaration must comply with the requirements of § 1.63. Section 1.497(c) further provides that in instances where the oath or declaration does not comply with § 1.63, but meets the requirements of § 1.497(a) and (b), the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c), thus permitting the application to enter the national stage and the assignment of dates under 35 U.S.C. 102(e) and 371(c). A supplemental oath or declaration in compliance with § 1.63, however, will be required in accordance with § 1.67.

Response to Comments

Two hundred and forty-two written comments were received in response to the Notice of Proposed Rulemaking. A public hearing was held on September 19, 1995. Eight persons testified at the public hearing.

The written comments, and the testimony at the public hearing, have been analyzed. In the event that H.R. 1733 is enacted, the comments directed to the proposed changes to the rules of practice to implement the 18-month publication of patent applications will be considered and addressed in the final rule package to implement 18-month publication. Responses to the comments germane to the changes in this final rule package follow.

Comment (1): One comment suggested that, in the absence of an 18-month publication system, the proposed rules relating to application format and standardization of applications be republished to give the public an opportunity to comment on the desirability of these changes in the absence of an 18-month publication system.

Response: The Notice of Proposed Rulemaking specifically stated that the proposed rules relating to application format and standardization of applications may be adopted as final rules even in the absence of an 18-month publication system, and specifically advised interested members of the public to comment on the advisability of the proposed rules relating to application format and standardization of applications, regardless of the legislative action on H.R. 1733. Thus, the public was given an opportunity to comment on the desirability of these changes in the absence of an 18-month publication system. Because the standardization of applications is generally favored and will substantially improve the Office's ability to efficiently and effectively process applications, delaying their adoption as final rules is not justified.

Comment (2): One comment stated that the Office has the authority to require that applications be submitted in computer-readable form, and in fact requires sequence listings to be submitted in such form. The comment suggested that the cost of electronically scanning application papers, as well as errors in scanning the application papers, can be avoided by requiring applicants to provide the specification in computer-readable form. Another comment stated that the Office has the authority to permit electronic filing, and electronic filing should be permitted. Several other comments indicated that scanning an application into a data base, rather than permitting applicants to provide a copy of the application on an electronic medium, is more costly, and is further more likely to introduce errors that could render text searching unreliable. And, several comments suggested that the scanning and typesetting costs associated with the current publication process for issued patents could be reduced by the acceptance of electronic media in place of

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or in addition to the paper medium currently provided for in the rules of practice. These comments further suggested that the Office should establish fees that reflect the reduced cost to the Office when a copy of an application is provided on an electronic medium (*i.e.*, should establish reduced fees for those who submit a copy of their application on an electronic medium), which fee structure would provide an incentive to supply a copy of an application on an electronic medium.

Response: As discussed in the Notice of Proposed Rulemaking, while the Office is considering the legislative and regulatory changes that would be necessary to permit purely electronic filing of application papers, it does not currently have in place an automated system for the acceptance and processing of application papers in electronic form, other than for sequence listings. Moreover, the Office does not currently have the statutory authority to rebate statutory patent filing fees to reflect any reduced cost to the Office due to the submission of a copy of an application on an electronic medium. The Office will give the comments further consideration as it designs and develops the Patent Application Management (PAM) system.

Comment (3): Several comments noted that §§ 1.52(a) and (b) impose a standard on applicants not currently observed by the Office, and questioned whether papers in the application file prepared by the Office will comply with §§ 1.52(a) and (b).

Response: Sections 1.52(a) and (b) apply to the application papers, and amendments or corrections thereto. As such, §§ 1.52(a) and (b) do not apply to those papers in the application file prepared by the Office, since they do not become part of the printed patent.

Comment (4): One comment noted that proposed § 1.52 appears to be neutral with regard to numbering the lines (*e.g.*, a line number every five lines) of the specification, and suggested that line numbering is a beneficial practice which should be permitted, and even encouraged.

Response: Section 1.52 neither requires nor prohibits line numbering. Applicants are encouraged, but not required, to number the lines of the specification. The Office will give the suggestion further study and consideration in future rulemaking.

Comment (5): One comment noted that when paragraphs are separated by a blank line only (*i.e.*, no indentation) and end between pages, it is not possible to tell that a paragraph break occurred. The comment suggested that the application format requirements should additionally require an indentation at the beginning of each new paragraph.

Response: It is desirable that a specification include an indentation at the beginning of a new paragraph. This requirement, however, was not proposed for comment in the Notice of Proposed Rulemaking. In addition, PCT Rule 11 does not require that the beginning of each new paragraph in the specification be indented.

Comment (6): One comment noted that § 1.52(a) would prohibit handwriting or hand-printing on papers which are to become permanent Office records. The comment questioned whether this requirement would also apply to papers issued in the Office. The comment suggested revising Office practice to prohibit an examiner from handwriting comments on official papers (*e.g.*, advisory actions or interview summary records) because: (1) the handwriting is not always decipherable, and (2) the handwriting as it comes through on the carbon copies furnished to applicants is frequently too light at least in part to be decipherable.

Response: The Office's goal is to create a readable administrative record of the prosecution of every application. The Office is currently designing, testing and implementing electronic forms and Office action writing software to avoid or minimize the need for hand-writing/printing in Office communications. Any applicant receiving an Office communication in which the handwriting is not decipherable, or does not adequately appear on the carbon copies to be decipherable, should request a legible copy of such communication from the Office.

Comment (7): Several comments noted that the limitations in §§ 1.52(a) and (b) regarding "typed" and "ink" appear to exclude computer and laser printers, as well as commercially or mechanically printed papers such as declaration forms. Another comment noted that the limitations in §§ 1.52(a) and (b) regarding "typed" and "ink" are more restrictive than PCT Rule 11.9(a) and (d).

Response: The phrase "printed" was proposed to be deleted since it could be read to mean that hand-printing is acceptable. Section 1.52(a) will require, in part, that "[a]ll papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written either by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, nonshiny, durable, and white paper." This will clarify that papers printed by a computer-operated laser, or any mechanical printer are acceptable, but that hand-printed papers are not. This change will also avoid inconsistencies with the requirements of PCT Rule 11.9.

Comment (8): One comment noted that the proposed changes to § 1.52(a) did not include any limitations regarding permissible type fonts. The comment questioned, since the purpose of the proposed rule change was to permit optical character recognition (OCR) scanning of the application papers, whether script fonts would be permissible.

Response: Section 1.52(a) does not include any express prohibition against the use of script fonts. Nevertheless, § 1.52(a) requires that "the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit . . . electronic reproduction by use of digital imaging and optical character recognition." Any application papers, including application papers containing a script font, that are not in a form having sufficient clarity and contrast between the paper and the writing thereon to permit electronic reproduction by use of digital imaging and optical character recognition will be objected to as not in compliance with § 1.52(a). Therefore, the Office cautions applicants not to submit application papers having script fonts.

Comment (9): One comment noted that § 1.52(b) would require that all papers (including drawings per proposed § 1.84) be limited to either DIN size A4 or 8 1/2 by 11 inches, which would eliminate the currently allowed paper sizes of 8 1/2 by 13 or 14 inches. The comment questioned whether this would also apply to the official papers issued by the Office, noting that the Office currently issues papers having a paper size mix of 8 1/2 by 11, 13, and 14 inches, which presents problems for applicants. The comment suggested that the Office should not issue papers of a size not permitted in § 1.52.

Response: The Office is currently in the process of standardizing to either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

Comment (10): One comment suggested that the Office should not issue papers with writing on the back side in accordance with § 1.52(b).

Response: The Office currently includes informational language on the back side of certain forms. The alternatives to issuing such forms with writing on the back side are: (1) not providing this information to applicants, (2) reducing the print size to permit all of the information to be located on the front of the form, or (3) routinely providing multiple page forms. Since none of the alternatives are preferable to simply including informational language on the back side of certain forms, the Office will continue to include information language on the back of papers issued by the Office, until it fully transforms all of its forms to electronically generated forms.

Comment (11): One comment questioned whether the phrase "claims on a separate sheet" in § 1.52(b) means that: (1) all of the claims must appear on a single separate sheet, (2) each claim must appear on a separate sheet, or (3) the claims (claim 1) must begin or commence on a separate sheet. The comment suggested the PCT wording that the claims shall commence on a separate sheet if the rule is intended to require that the claims (claim 1) must begin or commence on a separate sheet.

Response: The phrase has been changed to "the claim or claims commencing on a separate sheet" to clarify that the claims must begin or commence on a separate sheet to parallel PCT requirements. Thus, §§ 1.52(b) and 1.75(h) require that the claims (claim 1) must begin or commence on a separate sheet. Sections 1.52(b) and 1.75(h) do not require that all of the claims be set forth on a single sheet, or that each claim be set forth on a separate sheet.

Comment (12): One comment questioned whether the phrase "abstract and claims on a separate sheet" in § 1.52(b) means that the abstract is to be on one separate sheet, and the claims are to be (or commence) on another separate sheet.

Response: The phrase has been changed to "the claim or claims commencing on a separate sheet and abstract commencing on a separate sheet" to clarify that the claims must commence on one separate sheet and the abstract must commence on another separate sheet.

Comment (13): One comment noted that the requirement in § 1.52(b), as proposed, will require that the lines in the oath or declaration, as well as quotations from the rules, the MPEP, and court decisions in subsequently filed amendments, be 1 1/2 or double spaced, and is inconsistent with the forms included for comment with the Notice of Proposed Rulemaking.

Response: Section 1.52(b) has been changed to require, *inter alia*, that "[t]he lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced." The requirement for 1 1/2 or double spacing will not apply to oaths or declarations, pre-printed forms, or all of the statements in the "Remarks" section of an amendment. Applicants are nevertheless requested to submit papers with lines 1 1/2 or double spaced, except in standardized forms or where single-spacing may be stylistically necessary (*e.g.*, block quotations).

Comment (14): One comment questioned whether the requirement in § 1.52(b), as proposed, that papers have lines 1 1/2 or double spaced will apply to Office actions. The comment suggested that not placing block quotations from the statutes and regulations in single spacing will decrease the readability of Office actions.

Response: As discussed *supra*, §§ 1.52(a) and (b) are designed to facilitate patent printing and do not apply to Office actions. Section 1.52(b) has been changed to require, *inter alia*, that "[t]he lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced." Therefore, the requirement for 1 1/2 or double spaced lines will not apply to Office actions.

Comment (15): Several comments objected to the requirement that tables be in portrait orientation as inconsistent with PCT rules, and as causing tables to be split over multiple pages.

Response: The suggestions are adopted. Section 1.58 will state that "[c]hemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation," rather than "[t]o facilitate camera copying when printing, the width of formulae and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent."

Comment (16): One comment stated that § 1.72 is contrary to PCT Rule 11.4(a), and will require renumbering of the application pages for laser filing of that application in the European Patent Office (EPO) or under the PCT.

Response: Section 1.72, as proposed in the Notice of Proposed Rulemaking, provided that the abstract be "preferably prior to the first page of the specification," and, as such, merely expressed the Office's preference for the location of the abstract as prior to the first page of the specification. Nevertheless, to avoid the undesirable result of requiring an applicant who submitted an application in the format set forth in § 1.77 to renumber the specification pages for filing that application in the EPO or under the PCT, § 1.72 is changed to state that the preferable location of the abstract is following the claims.

Comment (17): One comment stated that requiring that the rarely used section headings (*e.g.*, statement regarding federally sponsored research and development) be followed by the phrase "not-applicable" is confusing.

Response: Section 1.77 is permissive rather than mandatory. As such, any applicant finding the format suggested therein to be confusing is at liberty to simply include those section headings applicable to the particular application. The use of each section heading, even when the section is "not-applicable," is desirable in that it apprises the Office that the section at issue has been considered and deemed inapplicable. Simply not providing a section heading is ambiguous as to whether the applicant considers the section inapplicable or has not considered whether the section is applicable to the application. In addition, the use of such section headings will be of greater benefit when the Office implements procedures to permit the electronic filing of patent applications.

Comment (18): One comment stated that the requirements set forth in § 1.77 are in addition to those required by the PCT. The comment argued that the Office cannot require international applications entering the national stage under 35 U.S.C. 371 to comply with these requirements.

Response: As discussed *supra*, § 1.77 merely expresses the Office's preference for the arrangement of the application elements. The Office may advise an applicant that the application does not comply with the format set forth in § 1.77, and suggest this format for the applicant's consideration; however, the Office will not require any application to comply with the format set forth in § 1.77. Therefore, there is no conflict between § 1.77 and the PCT.

Comment (19): One comment noted that §§ 1.154 and 1.163 apply to design and plant applications, and, as such, they are not in conflict with PCT Rules. The comment suggested that it would, however, be preferable that all types of U.S. applications maintain the same order of application elements, and that this order be the order set forth by the PCT Rules.

Response: As discussed *supra*, the arrangement of the elements of an application set forth in § 1.77 is not mandatory, and, as such, § 1.77 is not in conflict with the PCT or PCT Rules. Section 1.77 merely expresses the Office's preference for the arrangement of the elements of an application. The Office's preference for the format of design applications (§ 1.154) and plant applications (§ 1.163) is the same as the Office's preference for utility applications (§ 1.77).

Comment (20): One comment stated that in the absence of statutory requirements for the application elements proposed in §§ 1.77, 1.154, and 1.163, the rule should clearly state that these application elements or arrangements are preferred but not mandatory.

Response: Sections 1.77, 1.154, and 1.163 employ the phrase "should" rather than "must," which is the language of a precatory statement. Therefore, §§ 1.77, 1.154, and 1.163 currently state that these application elements or arrangements are preferred, but are not mandatory.

Comment (21): One comment questioned whether the Application Transmittal Form, and Fee Transmittal Form set forth in § 1.77 should be numbered pages 1 and 2 pursuant to § 1.52, and further questioned where the drawings and oath or declaration are to be numbered.

Response: Section 1.52 has been changed to provide that the pages of the specification, not the application, should be consecutively numbered beginning with page 1. The Application Transmittal Form, and Fee Transmittal Form set forth in § 1.77 are not part of the specification. As such, they should not be numbered as pages 1 and 2, respectively. Likewise, the drawings and oath or declaration are not part of the specification, and need not be numbered.

Comment (22): One comment stated that the failure to include the phrase "not applicable" by all of the application elements not required by statute or regulation rendered it unclear as to whether the Office would object to the lack of an application element for which the phrase "not applicable" is not included.

Response: The Office anticipates that an applicant choosing to use the Transmittal forms provided by the Office will arrange his or her application in the format suggested by the Office. The patent statutes and regulations set forth the requirements for a complete application, as well as the requirements for obtaining a filing date in an application. Applications are examined for compliance with the patent statutes and regulations, not for consistency with any particular transmittal form.

Comment (23): One comment noted, in regard to § 1.84(c), that the drawings of an international application, which are often used for processing in the Office, will have the World Organization (WO) publication number and International Bureau (IB) publication date on the top of the drawing.

Response: The WO publication number and IB publication date placed on the top of the drawing of an international application is not objectionable under § 1.84(c).

Comment (24): One comment stated that the scan target points conflict with PCT Rule 11.6(e). As such, the scan target points would have to be removed from applications to be filed as an international application. The comment further stated that these target points are unnecessary in view of the paper size and margin requirements.

Response: Section 1.84(g) states that drawings "should," and not "must," have scan target points printed on two catercorner margin corners. Thus, § 1.84(g) merely expresses the Office's preference for scan target points on the drawings for filming and printing purposes, which are considered desirable due to the different sights on 21.0 cm. by 29.7 cm. (DIN size A4) and 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

An applicant wishing to provide scan target points on drawings that will later be filed in the EPO may simply copy the drawings to be filed in the EPO, place the scan target points only on the Office copy of the drawings, and submit the copy of the drawings containing the scan target points to the Office. Likewise, applicants filing drawings that were previously filed in the EPO should simply add scan target points only to the copy of the drawings to be filed in the Office. Nevertheless, as § 1.84(g) merely expresses a preference for scan target points for Office filming and printing purposes, an applicant intending to later file the application in the EPO, or any applicant, is at liberty to not include such scan target points on the drawings. The Office will not object to the absence of scan target points on any drawings filed in the Office. Therefore, § 1.84(g) does not include a requirement in excess of, or inconsistent, with PCT Rules.

Comment (25): One comment stated that the term "catercorner" is slang, and suggested that it be replaced in § 1.84(g) with a phrase such as "diagonally opposite."

Response: The term "catercorner" is not slang. While there are a number of acceptable English phrases to denote diagonally opposite, the term "catercorner" was selected to avoid using a multiple word phrase where a single word will suffice.

Comment (26): One comment stated that the language proposed to be added to § 1.97 regarding a reexamination or patent owner is inconsistent with § 1.533 and suggested that it be deleted.

Response: The suggestion is adopted.

Comment (27): One comment stated that § 1.131 does not specify whether the phrase "application" includes provisional applications. The comment suggested that § 1.131 be amended to state "unless the date of such patent or publication is more than one year prior to the *earliest* date on which the inventor's or patent owner's application *or provisional application from which that application claims priority therefrom* was filed in this country."

Response: The proposed change to § 1.131 is not adopted. It is well established that the filing date of any abandoned application co-pending with and referred to in a patent is the effective date of the patent with respect to the common subject matter disclosed in the patent and abandoned application. *See In re Switzer*, 166 F.2d 827, 77 USPQ 156 (CCPA 1948). Section 1.131 does not make a specific reference to nonprovisional applications for which a benefit is claimed under 35 U.S.C. 120; however, it is understood that the effective date of any patent sought to be antedated pursuant to § 1.131 is the earliest filing date of any application to which the patent is entitled to under 35 U.S.C. 120 with respect to the common subject matter disclosed in the patent and the application. The provisions of title 35, except for 35 U.S.C. 115, 131, 135 and 157, apply to provisional applications. 35 U.S.C. 111(b)(8). It is therefore likewise unnecessary to specifically reference provisional applications in § 1.131.

Comment (28): Several comments objected to §§ 1.291 and 1.292 as pre-grant opposition, especially in view of the pre-grant publication of pending applications that would be provided for in H.R. 1733, if enacted, and the expanded reexamination that would be provided for in H.R. 1732, if enacted. The comments either suggested that the protest and public use proceeding provisions of §§ 1.291 and 1.292 be severely limited or abolished.

Response: The changes to §§ 1.291 and 1.292 place greater obligations on third parties seeking to use these sections. As such, this rule change does not add to any third party's ability to participate in the prosecution of a pending application. Nevertheless, as neither H.R. 1732 nor H.R. 1733 has presently been enacted, analysis of whether modification of §§ 1.291 and 1.292 in addition to that proposed in the Notice of Proposed Rulemaking is desirable in a pre-grant publication or expanded reexamination system is held in abeyance pending enactment of H.R. 1733 or 1732.

Comment (29): One comment noted that any standardization of patent applications should not include pre-printed forms taking eleven hours to complete. The comment further suggested that word-processor versions of any collection of information, rather than pre-printed forms, would be of greater assistance to members of the public.

Response: Initially, the Notice of Proposed Rulemaking indicated that the initial patent application (*e.g.*, the specification, drawings, as well as the standard forms), not merely the proposed standardized forms, is a collection of information estimated to average eleven hours to complete. The Notice of Proposed Rulemaking stated that the public reporting burden for these collections of information is estimated to average: (1) twelve minutes per response for the Fee Transmittal form, (2) twelve minutes per response for the Utility Patent Application Transmittal form, (3) twelve minutes per response for the Design Patent Application Transmittal form, (4) twelve minutes per response for the Plant Patent Application Transmittal form, (5) twelve minutes per response for the Plant Color Coding Sheet, (6) twenty-four minutes per response for the Declaration form, and (7) twenty-four minutes per response for the Plant Patent Application Declaration. Nevertheless, the final rules do not require the use of any standardized form. The Office publishes standardized forms only as an aid to practitioners and applicants.

Comment (30): One comment questioned whether use of the standardized versions of the various forms would be required. Another comment stated that the Office has no authority to require the use of the published forms in the absence of statutory authority.

Response: Use of the forms included for comment with the Notice of Proposed Rulemaking is not mandatory. That is, an applicant need not use the standardized versions of the Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form and Plant Patent Application Declaration form, and need not use any fee transmittal form, application transmittal form, or plant color coding sheet. These forms were created to assist applicants in filing a patent application and to help ensure the filing of a complete application accompanied by the appropriate fees, thereby avoiding unnecessary delays in the examination of the application.

Comment (31): One comment stated that the Office should not require the use of mandated forms, and if the Office requires the use of mandated forms, the Office should revise the forms to render them readily reproducible by conventional software, and should arrange for versions of these forms in various formats to be distributed by the Internet, bulletin board, or floppy disk. Another comment suggested that the Office should make its form or templates available for electronic copying.

Response: Copies of the standard forms provided by the Office may be obtained by contacting the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214. Also, many standardized forms have been loaded on the Office's Internet Website and may be electronically copied via the Internet through anonymous file transfer protocol (ftp) (address: ftp.uspto.gov). Nevertheless, use of the forms included for comment with the Notice of Proposed Rulemaking is not mandatory.

Comment (32): One comment questioned why there is a box with an instruction to type a plus sign in the box at the very top of the standardized forms.

Response: As discussed *supra*, the Office plans to replace or augment the current microfilming process with an electronic data base which captures at least the technical content of the application-as-filed for internal Office use. Typing a plus sign (+) into this box will facilitate the image scanner in aligning the remaining typing on the form during the scanning process.

Comment (33): One comment questioned: (1) why the application transmittal forms do not have a place for applicant to indicate the type of new utility application being transmitted (*e.g.*, a provisional, original, continuation, division, continuation-in-part, reissue), and (2) how the Office official will obtain this information for entry in the official use "application type" box.

Response: The Utility Patent Application Transmittal form sets forth instructions for filing utility applications under § 1.53 in the arrangement set forth in § 1.77. All non-reissue, nonprovisional utility applications (*i.e.*, original, continuation, divisional, and continuation-in-part applications) filed under § 1.53 should be submitted using the Utility Patent Application Transmittal form. The Design Patent Application Transmittal form sets forth instructions for filing design applications in the arrangement set forth in § 1.154. All non-reissue design applications should be submitted using the Design Patent Application Transmittal form. The Plant Patent Application Transmittal form sets forth instructions for filing plant applications in the arrangement set forth in § 1.163. All non-reissue, nonprovisional plant applications should be submitted using the Plant Patent Application Transmittal form.

A Reissue Patent Application Transmittal form is also available, and all applications for the reissue of a patent should be submitted using the Reissue Patent Application Transmittal form. The cover sheet provided for in § 1.53(b)(2)(i) for a provisional application functions as a transmittal sheet for a provisional application. As such, the standardized Provisional Application Cover Sheet is the transmittal form for a provisional application. The provisional application cover sheet was published in the rulemaking entitled "Changes to Implement 20-Year Patent Term and Provisional Applications," in the *Federal Register* at 60 FR 20230-31 (April 25, 1995), and in the Patent and Trademark Office *Official Gazette* at 1174 *Off. Gaz. Pat Office* 45-46 (May 2, 1995).

To provide a place on the Application Transmittal form for claims under 35 U.S.C. 119, 120, or 121 would require the use of an unacceptably smaller font on the Application Transmittal form. The Declaration forms provide a place for stating claims under 35 U.S.C. 119, 120 or 121. The inclusion on filing of an executed or unexecuted Declaration form containing this information would assist the Office in ascertaining whether the application is an original, continuation, divisional, or continuation-in-part application. In addition, in the event that H.R. 1733 is enacted, and the proposed changes to §§ 1.55(a) and 1.78(a)(2) are adopted substantially as proposed, the routine inclusion of claims for priority under 35 U.S.C. 119, 120, or 121 in an executed or unexecuted declaration form accompanying the application papers would be an excellent mechanism for avoiding an inadvertent failure to timely submit a claim for priority under 35 U.S.C. 119, 120, or 121.

Comment (34): One comment noted that the heading "DECLARATION" does not state the types of applications with which the declaration form could be used. The comment questioned whether it is intended to be used with any type of nonprovisional application except plant applications for which a separate form is proposed.

Response: The declaration form containing the heading "DECLARATION" is intended to be used with any type of nonprovisional application except plant applications, for which a separate Plant Declaration form is provided.

Comment (35): One comment suggested that in the foreign priority claim section of the Declaration form, the last line, the phrase "having a filing date before that of the application on which priority is claimed" should be changed to "for which priority is not claimed," to cover those foreign applications which have a filing date after that of the application on which priority is claimed and the benefit of which applicant does not want to claim. The comment also indicated that, frequently, an application is filed after the Convention Year.

Response: The suggestion is not adopted. Section 1.63(c) requires that an oath or declaration in any application in which a claim for priority is made pursuant to § 1.55 identify . . . "any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month, and year of its filing." Thus, the language in the Declaration form aids applicants in submitting a declaration in compliance with § 1.63(c). Any foreign application having a filing date before that of the application on which priority is claimed is, by definition, a foreign application for which priority is not claimed.

Comment (36): One comment suggested that in the foreign priority claim section, the right hand columns, the heading should be corrected to "Certified Copy Attached" since the Office does not routinely want uncertified copies.

Response: The suggestion is adopted. The Declaration form has been modified accordingly.

Comment (37): One comment noted that the Fee Calculation and Application Transmittal are currently on a single sheet/form, where the proposed forms provide a separate sheet/form for each. The comment also noted that the current Declaration form is a single sheet, where the proposed Declaration form contains multiple sheets.

Response: The Office currently receives application transmittals, fee calculations/transmittals and declarations in a variety of forms and in a multitude of formats. The proposed forms were developed as a result of an analysis of the current practices and requirements of applicants, as well as the Office's plans to scan application data from these forms into an electronic data base. The Fee Transmittal form was created to aid applicants in submitting the fees due on filing a new patent application, as well as the fees that may be due throughout the prosecution of the application. The Application Transmittal serves to both aid applicants in filing a complete application, and simplify the pre-examination processing of the application. To permit the inclusion of additional fee calculation and application transmittal information on the standardized forms, and to provide a Fee Transmittal form for use throughout the prosecution of the application, a separate Fee Transmittal form and Application Transmittal form were developed. A multi-page Declaration form is necessary to accommodate the Office's plans to scan application data from this Declaration form into an electronic data base.

Comment (38): One comment indicated that the meaning or purpose of "suffix" in the inventor signature block is unclear, and requested an explanation as to whether it refers to "Jr." or "II," or whether it is a place to put the mother's name for those inventors whose family name is followed by their mother's name.

Response: The field on the Declaration form labeled (inventor) "suffix" is intended to provide the applicant with an option to indicate family position relative to age. Examples of an inventor's suffix are: Jr., Sr., and III. This information is tracked by the Office and is necessary to print patents which accurately reflect bibliographic information about the inventor. The use of this field and the data expected will be clarified and specified in the form instructions.

Comment (39): One comment questioned the meaning or purpose of "Applicant Authority" in the last line of the inventor data block.

Response: The phrase "Applicant Authority" indicates the authority that the applicant has in executing the application (*e.g.*, inventor, executor (§ 1.42), assignee (§ 1.47(b)). This field is an optional field for the applicant to complete. The electronic versions of the proposed standard declaration forms would provide the applicant with directions and a list of valid codes that correspond with a specific identification of the authority the applicant retains (*e.g.*, the Authority Code for an executor will be "04").

Comment (40): One comment stated that due to the spacing and small fonts on the fee transmittal form, this sheet cannot be used with a conventional word processor.

Response: To accommodate all the fee descriptions on a one-page fee transmittal it was necessary to use smaller fonts in the form's design. These fonts are available in Word and WordPerfect. An electronic version of the fee transmittal will be available from the Office soon.

Comment (41): One comment stated that the "one form fits all" mentality of the fee transmittal form should be reconsidered since certain fees are submitted only once during the prosecution of an application.

Response: The proposed standard one-page fee form is primarily to facilitate and simplify the fee payment process. The one-page fee transmittal is intended to aid applicants in providing complete fee information to the Office for each application and paper submission. This will enable the Office to more efficiently process and record fee payments, which will avoid delays in the prosecution of an application.

Other Considerations

This final rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* It has been determined that this final rule is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that this rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal effect of this rule change is to simplify and clarify the rules governing the form of patent application papers.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the

National Government and the States as outlined in Executive Order 12612.

Notwithstanding any other provision of law, no person is required to respond to nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

This final rule package contains a collection of information subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* This collection of information is currently approved by the Office of Management and Budget under Control No. 0651-0032. This collection of information includes the initial patent application filing, the Fee Transmittal form, the Utility Patent Application Transmittal form, the Design Patent Application Transmittal form, the Plant Patent Application Transmittal form, the Plant Color Coding Sheet, the Declaration form, and the Plant Patent Application Declaration form. The above-mentioned forms will reduce the burden and uncertainty associated with the submission of an application and related information, and enhance the Office's ability to use standardized automation techniques (optical character recognition, *etc.*) to record and process information concerning applications. The public reporting burden for these collections of information is estimated to average: (1) ten hours per response for the specification and drawings of an application, (2) twelve minutes per response for the Fee Transmittal form, (3) twelve minutes per response for the Utility Patent Application Transmittal form, (4) twelve minutes per response for the Design Patent Application Transmittal form, (5) twelve minutes per response for the Plant Patent Application Transmittal form, (6) twelve minutes per response for the Plant Color Coding Sheet, (7) twenty-four minutes per response for the Declaration form, and (8) twenty-four minutes per response for the Plant Patent Application Declaration. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Data Administration Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0032).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

For the reasons set forth in the preamble, 37 CFR Part 1 is amended as follows:

PART 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.5 is amended by adding paragraph (f) to read as follows:

§ 1.5 Identification of application, patent or registration.

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(f) When a paper concerns a provisional application, it should identify the application as such and include the application number.

3. Section 1.12 is amended by revising paragraph (c) to read as follows:

§ 1.12 Assignment records open to public inspection.

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(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in confidence under § 1.14, or any information with respect thereto, must:

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i); or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

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4. Section 1.14 is amended by revising the section heading and paragraphs (a), (b), and (e) to read as follows:

§ 1.14 Patent applications preserved in confidence.

(a)(1) Patent applications are generally preserved in confidence pursuant to 35 U.S.C. 122. No information will be given concerning the filing, pendency, or subject matter of any application for patent, and no access will be given to, or copies furnished of, any application or papers relating thereto, except as set forth below.

(2) Status information, which includes information such as whether the application is pending, abandoned, or patented, as well as the application number and filing date, may be supplied:

(i) Concerning an application or any application claiming the benefit of the filing date of the application, if the application has been identified by application number or serial number and filing date in a published patent document,

(ii) Concerning the national stage application or any application claiming the benefit of the filing date of a published international application, if the United States of America has been indicated as a Designated State in the international application, or

(iii) When it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office.

(3) Access to, or copies of, an application may be provided:

(i) When the application is open to the public as provided in § 1.11(b),

(ii) When written authority in that application from the applicant, the assignee of the application, or the attorney or agent of record has been granted,

(iii) When it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office, or

(iv) To any person on written request, without notice to the applicant, when the application is abandoned and available and is:

(A) Referred to in a U.S. patent,

(B) Referred to in an application open to public inspection,

(C) An application which claims the benefit of the filing date of an application open to public inspection, or

(D) An application in which the applicant has filed an authorization to lay open the complete application to the public.

(b) Complete applications (§ 1.51(a)) which are abandoned may be destroyed and hence may not be available for access or copies as permitted by paragraph (a)(3)(iv) of this section after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation.

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(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in confidence pursuant to paragraph (a) of this section, or any papers relating thereto, must:

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i); or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

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5. Section 1.52 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written either by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, non-shiny, durable, and white paper. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes and electronic reproduction by use of digital imaging and optical character recognition. If the papers are not of the required quality, substitute typewritten or mechanically printed papers of suitable quality will be required. See § 1.125 for filing substitute typewritten or mechanically printed papers constituting a substitute specification when required by the Office.

(b) Except for drawings, the application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§1.42, 1.43, 1.47, *etc.*) and also papers subsequently filed, must have each page plainly written on only one side of a sheet of paper, with the claim or claims commencing on a separate sheet and the abstract commencing on a separate sheet. See §§ 1.72(b) and 1.75(h). The sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and no holes should be made in the sheets as submitted. The lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced. The pages of the specification including claims and abstract must be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text. See § 1.84 for drawings.

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6. Section 1.54 is amended by revising paragraph (b) to read as follows:

§ 1.54 Parts of application to be filed together; filing receipt.

• • • • •

(b) Applicant will be informed of the application number and filing date by a filing receipt.

7. Section 1.58 is amended by removing and reserving paragraph (b) and revising the section heading and paragraph (c) to read as follows:

§ 1.58 Chemical and mathematical formulae and tables.

• • • • •

(b) [Reserved]

(c) Chemical and mathematical formulae and tables must be presented in compliance with § 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Typewritten characters used in such formulae and tables must be chosen from a block (non-script) type font or lettering style having capital letters which are at least 0.21 cm. (0.08 inch) high (*e.g.*, elite type). A space at least 0.64 cm. (1/4 inch) high should be provided between complex formulae and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with a high degree of legibility.

8. Section 1.62 is amended by revising paragraphs (e) and (f) to read as follows:

§ 1.62 File wrapper continuing procedure.

• • • • •

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.

(f) The filing of an application under this section will be construed to include a waiver of confidence by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of § 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

• • • • •

9. Section 1.72 is amended by revising paragraph (b) to read as follows: § 1.72 Title and abstract.

• • • • •

(b) A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

10. Section 1.75 is amended by revising paragraph (g) and adding paragraphs (h) and (i) to read as follows:

§ 1.75 Claim(s).

• • • • •

(g) The least restrictive claim should be presented as claim number 1, and all dependent claims should be grouped together with the claim or claims to which they refer to the extent practicable.

(h) The claim or claims must commence on a separate sheet.

(i) Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

11. Section 1.77 is revised to read as follows:

§ 1.77 Arrangement of application elements.

(a) The elements of the application, if applicable, should appear in the following order:

(1) Utility Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention.

(4) Cross-reference to related applications.

(5) Statement regarding federally sponsored research or development.

(6) Reference to a "Microfiche appendix." (See § 1.96 (c)). The total number of microfiche and total number of frames should be specified.

(7) Background of the invention.

(8) Brief summary of the invention.

(9) Brief description of the several views of the drawing.

(10) Detailed description of the invention.

(11) Claim or claims.

(12) Abstract of the Disclosure.

(13) Drawings.

(14) Executed oath or declaration.

(15) Sequence Listing (See §§ 1.821 *et. seq.*).

(b) The elements set forth in paragraphs (a)(3) through (a)(5), (a)(7) through (a)(12) and (a)(15) of this section should appear in upper case, without underlining or bold type, as section headings. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading.

12. Section 1.78 is amended by removing paragraph (d) and revising paragraphs (a)(2) and (c) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross references to other applications.

(a) • • • • •

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(a)).

• • • • •

(c) Where an application or a patent under reexamination and at least one other application naming different inventors are owned by the same party and contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor.

13. Section 1.84 is amended by revising paragraphs (c), (f)-(g), and (x) to read as follows:

§ 1.84 Standards for drawings.

• • • • •

(c) *Identification of drawings.* Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page. In addition, a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner, provided that the reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.

• • • • •

(f) *Size of paper.* All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

(1) 21.0 cm. by 29.7 cm. (DIN size A4), or

(2) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

(g) *Margins.* The sheets must not contain frames around the sight; *i.e.*, the usable surface, but should have scan target points, *i.e.*, cross-hairs, printed on two catercorner margin corners. Each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

• • • • •

(x) *Holes.* No holes should be made by applicant in the drawing sheets.

(See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

14. Section 1.96 is revised to read as follows:

§ 1.96 Submission of computer program listings.

(a) *General.* Descriptions of the operation and general content of computer program listings should appear in the description portion of the specification. A computer program listing for the purpose of this section is defined as a printout that lists in appropriate sequence the instructions, routines, and other contents of a program for a computer. The program listing may be either in machine or machine-independent (object or source) language which will cause a computer to perform a desired procedure or task such as solve a problem, regulate the flow of work in a computer, or control or monitor events. Computer program listings may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section.

(b) *Material which will be printed in the patent.* If the computer program listing is contained on ten printout pages or less, it must be submitted either as drawings or as part of the specification.

(1) *Drawings.* If the listing is submitted as drawings, it must be submitted in the manner and complying with the requirements for drawings as provided in § 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) If the listing is submitted as part of the specification, it must be submitted in accordance with the provisions of § 1.52, at the end of the description but before the claims.

(ii) Any listing submitted as part of the specification must be direct printouts (*i.e.*, not copies) from the computer's printer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, and the sheets should be submitted in a protective cover. Any amendments must be made by way of submission of substitute sheets.

(c) *As an appendix which will not be printed.* If a computer program listing printout is eleven or more pages long, applicants must submit such listing in the form of microfiche, referred to in the specification (see § 1.77(a)(6)). Such microfiche filed with a patent application is to be referred to as a "microfiche appendix." The "microfiche appendix" will not be part of the printed patent. Reference in the application to the "microfiche appendix" must be made at the beginning of the specification at the location indicated in § 1.77(a)(6). Any amendments thereto must be made by way of revised microfiche.

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

(2) *Submission requirements.* Except as modified or clarified in this paragraph (c)(2), computer-generated information submitted as a "microfiche appendix" to an application shall be in accordance with the standards set forth in 36 CFR Part 1230 (Micrographics).

(i) Film submitted shall be a first generation (camera film) negative appearing microfiche (with emulsion on the back side of the film when viewed with the images right-reading).

(ii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iii) At least the left-most third (50 mm. x 12 mm.) of the header or title area of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply an application number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application identification such as the title and/or the first inventor's name. The attorney's docket number may be included. The final right-hand portion of the microfiche shall contain sequence information for the microfiche, such as 1 of 4, 2 of 4, *etc.*

(iv) Additional requirements which apply specifically to microfiche of filmed paper copy:

(A) The first frame of each microfiche submitted shall contain a test target.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) Pagination of the microfiche frames shall be from left to right and from top to bottom.

(E) At a reduction of 24:1, resolution of the original microfilm shall be at least 120 lines per mm. (5.0 target).

(F) An index, when included, should appear in the last frame (lower right-hand corner when data is right-reading) of each microfiche.

(v) Microfiche generated by Computer Output Microfilm.

(A) The first frame of each microfiche submitted should contain a resolution test frame.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, *i.e.*, from top to bottom and from left to right, is also acceptable.

(E) An index, when included, should appear on the last frame (lower right-hand corner when data is right-reading) of each microfiche.

15. Section 1.97 is amended by revising paragraphs (a) through (d) to read as follows:

§ 1.97 Filing of information disclosure statement.

(a) In order for an applicant for a patent or for a reissue of a patent to have an information disclosure statement in compliance with § 1.98 considered by the Office during the pendency of the application, it must satisfy paragraph (b), (c), or (d) of this section.

(b) An information disclosure statement shall be considered by the Office if filed by the applicant:

(1) Within three months of the filing date of a national application;

(2) Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or

(3) Before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed by the applicant after the period specified in paragraph (b) of this section, provided that the statement is accompanied by either a certification as specified in paragraph (e) of this section or the fee set forth in § 1.17(p), and is filed before the mailing date of either:

(1) A final action under § 1.113; or

(2) A notice of allowance under § 1.311, whichever occurs first.

(d) An information disclosure statement shall be considered by the Office if filed by the applicant after the period specified in paragraph (c) of this section, provided that the statement is filed on or before payment of the issue fee and is accompanied by:

(1) A certification as specified in paragraph (e) of this section;

(2) A petition requesting consideration of the information disclosure statement; and

(3) The petition fee set forth in § 1.17(i).

• • • • •

16. Section 1.107 is amended by revising paragraph (a) to read as follows:

§ 1.107 Citation of references.

(a) If domestic patents are cited by the examiner, their numbers and dates, and the names of the patentees must be stated. If foreign published applications or patents are cited, their nationality or country, numbers and dates, and the names of the patentees must be stated, and such other data must be furnished as may be necessary to enable the applicant, or in the case of a reexamination proceeding, the patent owner, to identify the published applications or patents cited. In citing foreign published applications or patents, in case only a part of the document is involved, the particular pages and sheets containing the parts relied upon must be identified. If printed publications are cited, the author (if any), title, date, pages or plates, and place of publication, or place where a copy can be found, shall be given.

• • • • •

17. Section 1.110 is revised to read as follows:

§ 1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§ 1.78(c) and 1.130.

18. A new § 1.130 is added after the undesignated center heading "Affidavits Overcoming Rejections" to read as follows:

§ 1.130 Affidavit or declaration to disqualify commonly owned patent as prior art.

(a) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 103 in view of a U.S. patent which is not prior art under 35 U.S.C. 102(b), and the inventions defined by the claims in the application or patent under reexamination and by the claims in the patent are not identical but are not patentably distinct, and the inventions are owned by the same party, the applicant or owner of the patent under reexamination may disqualify the patent as prior art. The patent can be disqualified as prior art by submission of:

(1) A terminal disclaimer in accordance with § 1.321(c), and

(2) An oath or declaration stating that the application or patent under reexamination and the patent are currently owned by the same party, and that the inventor named in the application or patent under reexamination is the prior inventor under 35 U.S.C. 104.

(b) When an application or a patent under reexamination claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application or a patent under reexamination. A judicially created double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

19. Section 1.131 is amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a)(1) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 102(a) or (e), or 35 U.S.C. 103 based on a U.S. patent to another or others which is prior art under 35 U.S.C. 102(a) or (e) and which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), or on reference to a foreign patent or to a printed publication, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the party qualified under §§ 1.42, 1.43, or 1.47, may submit an appropriate oath or declaration to overcome the patent or publication. The oath or declaration must include facts showing a completion of the invention in this country or in a NAFTA or WTO member country before the filing date of the application on which the U.S. patent issued, or before the date of the foreign patent, or before the date of the printed publication. When an appropriate oath or declaration is made, the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which

the inventor's or patent owner's application was filed in this country.

(2) A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before January 1, 1996, in a WTO member country other than a NAFTA country.

• • • • •

20. Section 1.132 is revised to read as follows:

§ 1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a U.S. patent which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), on reference to a foreign patent, on reference to a printed publication, or on reference to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative, lacking in utility, frivolous, or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

21. Section 1.154 is revised to read as follows:

§ 1.154 Arrangement of specification.

(a) The elements of the design application, if applicable, should appear in the following order:
(1) Design Application Transmittal Form.
(2) Fee Transmittal Form.
(3) Preamble, stating name of the applicant and title of the design.
(4) Cross-reference to related applications.
(5) Statement regarding federally sponsored research or development.
(6) Description of the figure or figures of the drawing.
(7) Feature Description.
(8) A single claim.
(9) Drawings or photographs.
(10) Executed oath or declaration (See § 1.153(b)).
(b) [Reserved]

22. Section 1.163 is amended by adding new paragraphs (c) and (d) to read as follows:

§ 1.163 Specification.

• • • • •

(c) The elements of the plant application, if applicable, should appear in the following order:
(1) Plant Application Transmittal Form.
(2) Fee Transmittal Form.
(3) Title of the invention.
(4) Cross-reference to related applications.
(5) Statement regarding federally sponsored research or development.
(6) Background of the invention.
(7) Brief summary of the invention.
(8) Brief description of the drawing.
(9) Detailed Botanical Description.
(10) A single claim.
(11) Abstract of the Disclosure.
(12) Drawings (in duplicate).
(13) Executed oath or declaration.
(14) Plant color coding sheet.
(d) A plant color coding sheet as used in this section means a sheet that specifies a color coding system as designated in a color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure.

23. Section 1.291 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:
(1) The protest is submitted prior to the mailing of a notice of allowance under § 1.311; and
(2) The protest is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible.
(b) Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be returned to the protestor and will not be further considered by the Office. A protest submitted in accordance with the second sentence of paragraph (a) of this section will be considered by the Office if the application is still pending when the protest and application file are brought before the examiner and it includes:
(1) A listing of the patents, publications, or other information relied upon;
(2) A concise explanation of the relevance of each listed item;
(3) A copy of each listed patent or publication or other item of information in written form or at least the pertinent portions thereof; and
(4) An English language translation of all the necessary and pertinent parts of any non-English language patent, publication, or other item of information in written form relied upon.

• • • • •

24. Section 1.292 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.
(b) The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file if:
(1) The petition is accompanied by the fee set forth in § 1.17(j);
(2) The petition is served on the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible; and
(3) The petition is submitted prior to the mailing of a notice of allowance under § 1.311.

• • • • •

25. Section 1.315 is revised to read as follows:

§ 1.315 Delivery of patent.

The patent will be delivered or mailed upon issuance to the correspondence address of record. See § 1.33(a).

26. Section 1.321 is amended by revising paragraph (c) to read as follows:

§ 1.321 Statutory disclaimers, including terminal disclaimers.

• • • • •

(c) A terminal disclaimer, when filed to obviate a judicially created double patenting rejection in a patent application or in a reexamination proceeding, must:
(1) Comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;
(2) Be signed in accordance with paragraph (b)(1) of this section if filed in a patent application or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and
(3) Include a provision that any patent granted on that application or any patent subject to the reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

27. Section 1.497 is revised to read as follows:

§ 1.497 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application desires to enter the national stage under 35 U.S.C. 371 pursuant to §§ 1.494 or 1.495, he or she must file an oath or declaration that:
(1) Is executed in accordance with either §§ 1.66 or 1.68;
(2) Identifies the specification to which it is directed;
(3) Identifies each inventor and the country of citizenship of each inventor; and
(4) States that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.
(b) (1) The oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47.
(2) If the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state.
(c) If the oath or declaration meets the requirements of paragraphs (a) and (b) of this section, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c). However, if the oath or declaration does not also meet the requirements of § 1.63, a supplemental oath or declaration in compliance with § 1.63 will be required in accordance with § 1.67.

August 13, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1190 OG 67]

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(113) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1, Part 5 and Part 10
[Docket No. 920779-3226]
RIN 0651-AA34

Miscellaneous Changes in Patent Practice

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to: expand the authority to sign a terminal disclaimer in a patent application or a disclaimer in a patent; eliminate some formal requirements for an appeal brief for an appellant appearing without counsel; prohibit fee extensions of time to file reply briefs and requests for oral hearing; clarify the requirements for claiming foreign priority; specify the manner in which the fee deficiency is computed when applicants seek to correct an error in claiming small entity status; and correct errors in published regulations.
Effective Date: Jan. 3, 1994. The time periods and extension of time provisions of §§ 1.193 and 1.194 for filing reply briefs and requests for oral hearing will be applicable where the examiner's answer was mailed on or after the effective date.

For Further Information Contact: Abraham Hershkovitz by telephone at (703) 305-9282, or by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to: Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 43412 (September 21, 1992) and in the Patent and Trademark Office Official Gazette at 1143 Off. Gaz. Pat. Office 33-40 (October 13, 1992), the Office proposed to amend several rules of practice in patent and trademark cases. This rulemaking includes changes in § 1.9(d) which were not part of the proposed rules. The changes in § 1.9(d) were made in order to update the information pertaining to establishing small entity status as a small business. No substantive changes have been made in § 1.9(d). The proposed rule requiring that the specification of a design application describe the nature and intended use of the article being claimed has been withdrawn. Additionally, the proposed rule prohibiting a fee extension of time to file corrected drawings after allowance has been withdrawn.

Written comments were submitted by 13 firms, one association and one individual. An oral hearing was not conducted.

The following includes a discussion of the rules being changed and the reasons for those changes and an analysis of the comments received in response to the notice of proposed rulemaking.

Discussion of Specific Sections to be Changed or Added:

(1) Definitions (Section 1.9)

Section 1.9(d) is amended in order to update the information therein regarding the regulations of the Small Business Administration (SBA). The SBA's rule for defining a small business has been modified. Section 1.9(d) will no longer repeat the SBA rule in its entirety. Rather, § 1.9(d), as adopted, contains a short summary of the SBA definitions. The size limit of 500 employees (including those of its affiliates) for a small business concern has not been changed. Information on size standards for a small business concern may be obtained from the Small Business Administration by calling (202) 205-6618, or by writing to: Small Business Administration, Size Standards Staff, 409 Third Street, S.W., Washington, D.C. 20416.

(2) Copies of Papers (Section 1.13)

Section 1.13(a) is amended to clarify that the paragraph pertains to non-certified copies, and that copies of patents, trademark registrations and other papers within the jurisdiction of the Office, as opposed to being within the jurisdiction of another agency, may be obtained from the Office upon payment of the fee therefor.

Section 1.13(b) is amended to clarify that certified copies of the above items may be obtained from the Office upon payment of the fee for a certified copy.

(3) Patent Applications Preserved in Secrecy (Section 1.14)

Section 1.14(b) is amended to correct a typographical error in that the second and third sentences of this section were inadvertently deleted during an earlier revision of this section. See 50 Fed. Reg. 9378 (March 7, 1985) and 1053 Off. Gaz. Pat. Office 10-26 (April 2, 1985). Section 1.14(b) is amended by restoring the deleted sentences and by changing, in the first sentence, the plural "applicants" to the singular "applicant".

(4) Effect on Fees of Failure to Establish Status, or Change Status, as Small Entity (Section 1.28)

Section 1.28(c) is amended to reflect Office practice in calculating fee deficiencies when fees have been improperly paid as a small entity. The Office receives deficiency payments that differ based on varying interpretations of § 1.28(c). Some simply double the small entity fee in effect when the fee was originally paid in error in the small entity amount, while others compute the difference between the fee already paid and the other than small entity fee level in effect at the time the deficiency is paid. The Office requires payments to be based on

fee levels in effect at the time the other than small entity fee is paid.

Since 1989, fee levels have been adjusted annually. In view of these adjustments, there are frequently situations where the fee amount has changed since it was originally paid erroneously at the small entity rate. Calculation of deficiency amounts based on fee levels in effect at the time the deficiency is paid conforms with the general concept that fees to be paid are those in effect at the time of receipt of the fees. Section 1.28(c) is amended to reflect this practice of calculating the amount of the deficiency based on the fee level in effect at the time of the deficiency payment.

(5) Claim for Foreign Priority (Section 1.55)

Section 1.55(a) is amended to incorporate the limitations of 35 U.S.C. 119, which provides that the claim for priority and the appropriate copy of the foreign application must be filed before the patent is granted. Additionally, some applicants did not realize that submission of priority papers after payment of the issue fee, but before the grant of the patent, required the filing of a petition to accept submission of priority papers after payment of the issue fee. After a patent is granted, applicants may still be able to establish priority benefits by filing a reissue application to correct the failure to perfect the claim for priority. *Brenner v. State of Israel*, 400 F.2d 789, 158 USPQ 584 (D.C. Cir. 1968). Section 1.55(a) lists separately those instances when priority documents must be filed prior to payment of the issue fee to receive the benefit of the filing date of a prior foreign application. Furthermore, § 1.55(a) is amended to clarify when a verified English language translation of priority application not in the English language must be filed and to require a statement from the translator that the translation of the priority document is accurate. *Krenitsky v. Utagawa*, 215 USPQ 713 (Comm'r Pat. 1981).

(6) Claiming Benefit of Earlier Filing Date and Cross References to other Applications (Section 1.78)

Section 1.78(a) is amended to correct a typographical error. In the reference to the fee in § 1.21(l), the letter (l) should have appeared instead of the numeral (1). Section 1.78(a) is further amended to be consistent with § 1.5(a), by permitting the identification of the prior application by application number or serial number and filing date.

(7) Prohibition of Fee Extensions of Time (Section 1.136(a))

Section 1.136(a) is amended by adding two additional situations in which applicants would no longer be able to use fee extensions. Section 1.136(a) is rearranged so that referenced sections appear in numerical order. The new prohibitions will apply to situations where the request to extend the time is: (1) to permit filing reply briefs under § 1.193(b); and (2) to permit filing requests for oral hearing under § 1.194(b) before the Board of Patent Appeals and Interferences (Board). Fee extensions of time to file reply briefs or requests for oral hearing delay transfer of jurisdiction of the appeal to the Board and unnecessarily delay final disposition of the appeal.

The Office has considered changing the practice to require payment of the fee and filing the request for an extension of time before the period set for response expires in the situations addressed in this rulemaking, but did not adopt that approach because of the complexity that it would introduce into the system.

Under the previous rules, applicants could request a maximum four-month extension of time under § 1.136(a) to file reply briefs or request oral hearings. Since the backlog of cases awaiting a decision by the Board has been reduced, these extension requests have resulted in unnecessary delays in transmitting appeals to the Board and increased pendency of applications. The periods specified in1.193(b) and 1.194(b), as adopted, are considered sufficient to file a reply brief or request an oral hearing. Extensions of time for cause may be available under § 1.136(b). Therefore, § 1.136(a) is amended to prohibit fee extensions of time to file a reply brief or request an oral hearing.

(8) Appeal to the Board of Patent appeals and Interferences (Section 1.191)

Section 1.191(d) is amended to be consistent with the changes to 1.136(a).

(9) Appellant's Brief (Section 1.192)

Sections 1.192(a) and (d) are amended by moving the last sentence of current § 1.192(d) to § 1.192(a) to highlight that the Board may refuse consideration of any arguments or authorities not included in the brief.

Section 1.192(c) is amended to eliminate some of the formal requirements for an appeal brief for a pro se appellant, that is, an appellant appearing without counsel. An appellant appearing without counsel means there is no attorney or agent of record in the application or reexamination proceeding, the brief was not prepared by a registered practitioner, and the brief was not signed by a registered practitioner. Paragraph (c) is amended to allow a pro se appellant's brief to be accepted provided it is at least in substantial compliance with the requirements of subparagraphs (1), (2), (6) and (7) of paragraph (c). If a pro se appellant's brief is accepted, it will be presumed that a rejected group of claims stand or fall together unless an argument is included in the brief that presents reasons as to why appellant considers one or more claims in the rejected group of claims to be separately patentable from the other claims in the group.

(10) Examiner's Answer (Section 1.193)

Section 1.193(b) is amended to clarify the consequence of failure to file a reply brief in response to an expressly stated new ground of rejection made in an examiner's answer. The failure to file a reply brief will result in dismissal of the appeal as to the claims made subject to the expressly stated new ground of rejection. If the dismissal of the appeal applies to all claims in the application, the application will be abandoned. Additionally, this section is amended to change the period for filing a reply brief to two months from the date of the examiner's answer, regardless of whether the examiner's answer includes a new ground of rejection. The change to two months will avoid confusion in those cases in which there is a disagreement as to whether the examiner's answer in fact states a new ground of rejection and will provide an adequate period of time to file a reply brief without the need to request an extension of time. Finally, this section is amended to be consistent with the changes to § 1.136(a).

(11) Oral Hearing (Section 1.194)

Section 1.194(b) is amended to be consistent with the changes to 1.136(a). Under the previous rule, if a new ground of rejection was made in an examiner's answer, two months were permitted for filing a reply brief and, if a reply brief was filed, an applicant was permitted three months after the date of filing a reply brief to file a request for an oral hearing. In order to provide a more consistent approach vis-a-vis time periods for filing reply briefs and requests for oral hearing and to permit earlier decisions of issues on appeal, the period for filing a request for oral hearing has been changed to two (2) months from the date of an examiner's answer, regardless of whether the examiner's answer includes a new ground of rejection. This period should be sufficient to request an oral hearing without the need to request an extension of time.

(12) Decision by the Board of Patent Appeals and Interferences (Section 1.196)

Section 1.196(f) is amended to refer to § 1.550(c) for extensions of time in reexamination proceedings.

(13) Action Following Decision (Section 1.197)

Section 1.197(b) is amended to refer to § 1.550(c) for extensions of time in reexamination proceedings.

(14) Amendments After Allowance (Section 1.312)

Section 1.312(b) is amended to clarify that the fee required for a petition under this section is that specified in § 1.17(i)(1).

(15) Statutory Disclaimers, Including Terminal Disclaimers (Section 1.321).

The title of section 1.321 is amended to clarify that this section applies to terminal disclaimers, as well as to statutory disclaimers in general. Section 1.321 is further amended to permit the signing of a disclaimer in a patent by the patentee, or an attorney or agent of record, whereas, persons permitted to sign a disclaimer in a patent application will be any person specified in § 1.33(a)(1)-(4). The person signing the disclaimer must state the present extent of the disclaiming party's (i.e., patentee's or assignee's) interest in the patent or patent application. Naturally, a disclaimer signed on behalf of a party who no longer has an ownership interest in the patent or patent application cannot be accepted since 35 U.S.C. 253 requires a disclaimer to be signed by the owner of the whole or any sectional interest in the patent or patent application.

Section 253 of Title 35 of the United States Code states that disclaimer of any complete claim in a patent may be made by the patentee. Furthermore, any terminal part of the patent granted or to be granted may be disclaimed by the patentee, or applicant, respectively. It was the recent policy of the Office to accept disclaimers only if signed by the owner of record. This policy was too restrictive in that it precluded authorized patent practitioners from signing disclaimers. Furthermore, it was often difficult to ascertain whether the person signing was in fact an officer of the entity owning rights to the application. Accordingly, the rules as adopted, permit an attorney or agent of record to sign terminal disclaimers.

If the patent or patent application is assigned to an organization, such as a corporation, partnership, university, Government agency, or similar entity, and the disclaimer is signed by the assignee, the assignee must comply with § 3.73(b). See "Taking Action in a Patent Matter Before the Office by the Assignee under 37 CFR 3.73", at 1150 Off. Gaz. Pat. Office 62 (May 25, 1993). However, the rules, as adopted, permit an attorney or agent of record to sign a terminal disclaimer without the need to comply with § 3.73(b). Paragraph (a) of this section is further amended to refer only to disclaimers filed in patents. The Office does not record a disclaimer of part of a claim or claims. Hence, paragraph (a) of this section is amended to indicate that a disclaimer which does not disclaim a complete claim or claims will be refused recordation, rather than "may be refused recordation" as the rule read previously.

Paragraph (b) of this section is amended to refer only to terminal disclaimers filed in a patent application. Section 1.321(b) is also amended to include a reminder that the disclaimer is binding upon the grantee and its successors or assigns.

Paragraph (c) of this section incorporates the language of former paragraph (b) of this section concerning terminal disclaimers to obviate a double patenting rejection. This paragraph also includes reference to terminal disclaimers filed in reexamination proceedings for the same purpose.

(16) Publication of Notice of Proposed Amendments (Section 1.352(a))

Section 1.352(a) is amended to delete the language "and in other cases whenever practicable" so that the Office may engage in expedited rulemaking when publication of a notice of proposed amendments to regulations is not required by law.

(17) Time for Payment of Maintenance Fees (Section 1.362)

Section 1.362 is amended to clarify applicability and due dates for payment of maintenance fees. Paragraph (c)(3) of § 1.362 indicates that the actual filing date of a continuing application determines applicability of maintenance fees, while paragraph (c)(4) indicates that in the case of a reissue application, the filing date of the original non-reissue application determines applicability of maintenance fees. Some patentees and patent practitioners expressed confusion with respect to applicability of maintenance fees in the case of a continuing application of a reissue application. Uncertainty has been expressed as to whether this type of application would fall within paragraph (c) (3) or (c) (4). The amendment to 1.362(c)(4) clarifies that continuing reissue application of a reissue application is subject to maintenance fees only if the original (non-reissue) patent would be subject to such fees. These amendments also remove any confusion that may have existed with regard to the due dates for payment of maintenance fees in reissued patents by adding § 1.362(h) to specify that the due dates for payment of maintenance fees in such reissued patents are computed from the date of grant of the original (non-reissue) patent. The due dates for payment of maintenance fees in a reissued patent are computed from the date of grant of the original (non-reissue) patent. Note the distinction between a continuing reissue application of a reissue application, and a regular continuing application of a reissue application as discussed *In re Bauman*, 683 F.2d 405, 214 USPQ 585 (CCPA 1982).

In a notice entitled "Revision of Patent and Trademark Fees" published in the Federal Register at 56 FR 65142 (December 13, 1991), the Office announced an amendment to its rules of practice. Included in that notice was a change to paragraph (e) of § 1.362 which was not intended. See 56 FR at 65146. The portion of paragraph (e) which was not intended to be amended is changed back to its earlier version.

(18) Request by Applicant for Interference With Patent (Section 1.6077)

Section 1.607(a)(5) (i) is amended to correct a typographical error in the spelling of the word "count".

(19) Export of Technical data (Section 5.19)

Section 5.19(a) is amended to correct the citations set forth in the rule and to update the name of the office in the Department of Commerce.

(20) Sharing legal fees (Section 10.48)

Section 10.48(b) is amended to correct a typographical error in the spelling of the word "deceased".

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment: One comment inquired as to why the phrase by "serial number and filing date" was used in § 1.78(a), where as the phrase "application number (consisting of the series code and serial number, e.g., 07/123,456), or the serial number and filing date" was used in § 1.5(a).

Response: The inconsistency has been removed by having section 1.78(a) changed to use terminology consistent with § 1.5(a).

Comment: A number of comments directed to § 1.85(c) expressed concern that applications would become abandoned as a result of the proposal that fee extensions of time under § 1.136(a) could not be obtained for filing corrected drawings.

Response: The proposal that fee extensions of time under § 1.136(a) not be permitted for filing corrected drawings has been withdrawn.

Comment: Regarding § 1.85(c), one comment recommended that the Notice of Draftman's Patent Drawing Review (PTOL-948) include seperate boxes for each drawing objection (e.g., a seperate box for each of "pale," "rough," "blurred," and "jagged"); that drafting personnel be better trained to more completely communicate the objection to any particular drawing; and that the Notice of Allowability indicate for which specific figure formal drawings are required.

Response: The proposed rule changed to § 1.85(c) has been withdrawn. Questions concerning the Notice of Draftman's Patent Drawing Review may be referred to the Official Draftman at (703) 305-8335, and questions concerning any requirement on a Notice of Allowability should be directed to the examiner.

Comment: Regarding §§ 1.153 and 1.154, a number of comments objected to the proposed requirement that the specification of a design application contain a statement of the nature and intended use of the article claimed.

Response: The proposed rule change regarding §§ 1.153 and 1.154 has been withdrawn. The Office will continue its current practice of mailing a request for information where the nature or intended use of the article is not evident in the application file.

Comment: Regarding § 1.153, one comment stated that the language of the proposed rule is unclear as to whether an abstract is required. The comment recommended that the Office should require an abstract and require it to provide the necessary information.

Response: As discussed above, the proposed rule change regarding §§ 1.153 and 1.154 has been withdrawn. The present rules do not require an Abstract. Suggestions concerning this issue may be directed to the Director of Examining Group 2900.

Comment: Regarding §§ 1.193(b) and 1.194(b), one comment opposed the elimination of fee extensions in the filing of reply briefs and requests for oral hearings, as one month, while often a sufficient time to file a reply brief, is insufficient where counsel must communicate with a patent department or foreign applicants, especially where there is a delay between the time the Office mails the communication and it is received by counsel.

Response: The period for filing a reply brief or request for oral hearing has been changed to two months from the date of the examiner's answer. The period was extended to two months in this rulemaking, as adopted, to provide appellants adequate time to take appropriate action, and to provide a uniform period in the rules to file a reply brief or request an oral hearing. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

Comment: Regarding §§ 1.193(b) and 1.194(b), one comment opposed the elimination of fee extensions in the filing of reply briefs and requests for oral hearings, as a one-month period for response is insufficient for sole practitioners and persons who do not maintain offices for the sole purpose of responding to Office communications.

Response: As discussed above, the period for filing a reply brief or request for oral hearing has been changed to two months from the date of the examiner's answer. This two-month period should be an adequate period of time for filing a reply brief or a request for an oral hearing. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

Comment: Regarding §§ 1.193(b) and 1.194(b), one comment deemed it reasonable and necessary that the Board have at its disposal all possible arguments. The refusal to enter a reply brief was characterized as an impediment to a decision based upon a complete record. Additionally, the comment argued that the refusal to enter a reply brief would result in attempts to enter the arguments under another guise, such as during oral argument or by filing a memorandum of oral argument.

Response: An appellant should present all arguments for patentability in the appeal brief. A reply brief should not be necessary to present a complete record, and would be inappropriate except in those case where the examiner has introduced a new point of argument or new ground of rejection in the examiner's answer.

Comment: Regarding §§ 1.193(b) and 1 194(b), one comment noted that fee extensions for filing reply briefs and requests for oral hearings do not create any more of a delay in the final disposition of an appeal than a fee extension for filing the Notice of Appeal or the brief in support of the appeal.

Response: The comment reflects a misunderstanding of the appeal process and the handling of applications in which an appeal has been filed. Under the existing rules before this rulemaking, appellants were able, with the maximum four-month fee extension, to file reply briefs or request oral hearings up to six months after an examiner's answer. As a result, appeals otherwise ready for a decision were either held in the examining group for that period of time before transmittal to the Board or when transmitted to the Board earlier, were occasionally file a reply brief or request an oral hearing, and the Office minimizes the delay necessary before transmitting the appeal to the Board for decision.

Comment: Regarding § 1.193(b), one comment stated that an appeal should not be dismissed for failure to file a reply brief to a new ground of rejection made in the examiner's answer, unless the examiner's answer expressly states that there is a new ground of rejection. The comment suggests that this rule should recite "If the examiner's answer *expressly* states a new ground of rejection *is being made*...."

Response: The proposal has been adopted to the extent that the final rule, as adopted, states "If the examiner's answer expressly states that it includes a new ground of rejection, appellant must file a reply thereto within two months from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection."

Comment: Regarding § 1.193(b), one comment recommended that appellants should be given three months to respond to a new ground of rejection in an examiner's answer, as the current two-month time period is inadequate, and this period would be equal to the period given for response to rejections under § 1.106.

Response: This recommendation is not adopted. The Office experience has shown that the two-month period from the date of an examiner's answer has been an adequate period of time for filing a reply brief in response to a new ground of rejection. Also, it is desirable to set a uniform period of time in the rules to file a reply brief. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

Comment: One comment recommended that appellants should be permitted to obtain fee extensions where the examiner's answer includes a new ground of rejection.

Response: This recommendation is not adopted. As indicated above, fee extensions for filing reply briefs have resulted in unnecessarily prolonging the pendency of applications. Extensions of time for cause under § 1.136(b) will be available for those rare situations when an extension is necessary.

Comment: Regarding §§ 1.193(b) and 1.194(b), one comment suggested that the rule be modified to permit the filing of a request for an oral hearing concurrently with a reply brief as one cannot appropriately determine the necessity for an oral hearing until a reply brief is drafted.

Response: Under the proposed rules, the time period for filing a request for an oral hearing was the later of one month from the date of an examiner's answer, or the date of filing a timely reply brief. Under the rules as adopted, an appellant has two months from the date of the examiner's answer to file a reply brief and request an oral hearing. Therefore, a request for oral hearing may be filed concurrently with a reply brief.

Comment: Regarding § 1.312, one comment recommended that amendments under § 1.312 be processed expeditiously, as the current system for the processing of such amendments is inadequate.

Response: Examiners are instructed to act promptly on all amendments under § 1.312. Any problems should be brought to the attention of the Group Director.

OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to permit persons other than the assignee of a patent application or patent to sign certain disclaimers, incorporate existing Office policy into the regulations

industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which has previously been approved by the Office of Management and Budget under Control No. 0651-0011. Public reporting burden for these collections of information is estimated to average 0.1 hours each for fee extensions of time under § 1.136(a), and 0.2 hours each for disclaimers under § 1.321, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates, or any other aspect of this collection of information, including suggestions for reducing the burden, to Abraham Hershkovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project No. 0651-0031).

LIST OF SUBJECTS
37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements.

37 CFR Part 5

Classified information, Exports, Foreign relations, Inventions and patents.

37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, Parts 1, 5 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.9, paragraph (d) is revised to read as follows:

§ 1.9 Definitions.

* * * * *

(d) A small business concern as used in this chapter means any business concern as defined by the regulations of the Small Business Administration in 13 CFR 121.1301 through 121.1305, which define a small business concern as one whose number of employees, including those of its affiliates, does not exceed 500 persons and which has not assigned, granted, conveyed, or licensed, and is under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an

3. Section 1.13 is revised to read as follows:

§ 1.13 Copies and certified copies.

(a) Non-certified copies of patents and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public, will be furnished by the Patent and Trademark Office to any person, and copies of other records or papers will be furnished to persons entitled thereto, upon payment of the fee therefor.

(b) Certified copies of the patents and trademark registrations and of any records, books, papers, or drawings within the jurisdiction of the Patent and Trademark Office and open to the public or persons entitled thereto will be authenticated by the seal of the Patent and Trademark Office and certified by the Commissioner, or in his name attested by an officer of the Patent and Trademark Office authorized by the Commissioner, upon payment of the fee for the certified copy.

4. Section 1.14, paragraph (b) is revised to read as follows:

§ 1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application in which the applicant has filed an authorization to open the complete application to the public, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Complete applications (§ 1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

5. Section 1.28, paragraph (c) is revised to read as follows:

§ 1.28 Effect on fees of failure to establish status, or change status, as a small entity.

* * * * *

(c) If status as a small entity is established in good faith, and fees as a small entity are paid in good faith, in any application or patent, and it is later discovered that such status as a small entity was established in error or that through error the Patent and Trademark Office was not notified of a change in status as required by paragraph (b) of this section, the error will be excused (1) if any deficiency between the amount paid and the amount due is paid within three months after the date the error occurred or (2) if any deficiency between the amount paid and the amount due is paid more than three months after the date the error occurred and the payment is accompanied by a statement explaining how the error in good faith occurred and how and when the error was discovered. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. The deficiency is based on the amount of the fee, for other than a small entity, in effect at the time the deficiency is paid in full.

* * * * *

6. Section 1.55, paragraph (a) is revised to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign

(3) when specifically required by the examiner; and
(4) in all cases, before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by a petition requesting entry and by the fee set forth in § 1.17(i)(1). If the certified copy filed is not in the English language, a translation need not be filed except in the case of an interference; or when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner, in which event an English language translation must be filed together with a statement that the translation of the certified copy is accurate. The statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

* * * * *

7. Section 1.78, paragraph (a) is revised to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross references to other applications.

(a)(1) An application may claim an invention disclosed in a prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must name as an inventor at least one inventor named in the later filed application and disclose the named inventor's invention claimed in at least one claim of the later filed application in the manner provided by the first paragraph of 35 U.S.C. 112. In addition, the prior application must be
(i) complete as set forth in § 1.51; or
(ii) entitled to a filing date as set forth in § 1.53(b) and include the basic filing fee set forth in § 1.16; or
(iii) entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21 (1) within the time period set forth in § 1.53(d).
(a)(2) Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by application number (consisting of the series code and serial number), or serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(b)).

* * * * *

8. Section 1.136, paragraph (a) is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time for cause.

(a)(1) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless
(i) applicant is notified otherwise in an Office action,
(ii) the response is a reply brief submitted pursuant to§ 1.193(b),
(iii) the response is a request for an oral hearing submitted pursuant to § 1.194(b),
(iv) response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304, or
(v) the application is involved in an interference declared pursuant to § 1.611.)
(a)(2) The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.193(b), 1.194, 1.196 or 1.197. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See § 1.550(c) for extension of time in reexamination proceedings and § 1.645 for extension of time in interference proceedings.

* * * * *

9. Section 1.191, paragraph (d) is revised to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences.

* * * * *

(d) The time periods set forth in §§ 1.191 and 1.192 are subject to the provisions of § 1.136 for patent applications and § 1.550(c) for reexamination proceedings. The time periods set forth in §§ 1.193, 1.194, 1.196 and 1.197 are subject to the provisions of § 1.136(b) for patent applications or § 1.550(c) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

* * * * *

10. Section 1.192, paragraphs (a), (c) introductor text and (d) are revised to read as follows:

§ 1.192 Appellant's brief

(a) The appellant shall, within 2 months from the date of the notice of appeal under § 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief may be refused consideration by the Board of Patent Appeals and Interferences.
(b) ***
(c) The brief shall contain the following items under appropriate headings and in the order here indicated unless there is no attorney or agent of record in the application or reexamination proceeding, the brief was not prepared by a registered practitioner, and the brief was not signed by a registered practitioner, wherein the brief will be accepted as complying with this paragraph provided it is at least in substantial compliance with the requirements of paragraphs (1), (2),(6) and (7):

* * * * *

(d) If a brief is filed which does not comply with the requirements of paragraph (c) of this section, the appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If the appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will be dismissed.

11. Section 1.193, paragraph (b) is revised to read as follows:

§ 1.193 Examiner's answer.

* * * * *

(b) The appellant may file a reply brief directed only to such new points of argument as may be raised in the examiner's answer, within two months from the date of such answer. The new points of argument shall be specifically identified in the reply brief. If the examiner determines that the reply brief is not directed only to new points of argument raised in the examiner's answer, the examiner may refuse entry of the reply brief and will so notify the appellant. If the examiner's answer expressly states that it includes a new ground of rejection, appellant must file a reply thereto within two months from the date of such answer to avoid dismissal of the appeal as to the claims subject to the new ground of rejection; such reply may be accompanied by any amendment or material appropriate to the new ground. See § 1.136(b) for extensions of time for filing a reply brief in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

* * * * *

12. Section 1.194, paragraph (b) is revised to read as follows:

§ 1.194 Oral hearing.

* * * * *

(b) If appellant desires an oral hearing, appellant must file a written request for such hearing accompanied by the fee set forth in § 1.17(g) within two months after the date of the examiner's answer. If appellant requests an oral hearing and submits therewith the fee set forth in § 1.17(g), an oral argument may be presented by, or on behalf of, the primary examiner if considered desirable by either the primary examiner or the Board. See § 1.136(b) for extensions of time for requesting an oral hearing in patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

* * * * *

13. Section 1.196, paragraph (f) is revised to read as follows:

§ 1.196 Decision by the Board of Patent Appeals and Interferences

* * * * *

(f) See 1.136(b) for extensions of time to take action under this section in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

14. Section § 1.197, paragraph (b) is revised to read as follows:

§ 1.197 Action following decision.

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See § 1.136(b) for extensions of time for seeking reconsideration in a patent application and § 1.550(c) for extensions of time in a reexamination proceeding.

* * * * *

15. Section 1.312, paragraph (b) is revised to read as follows:

§ 1.312 Amendments after allowance.

* * * * *

(b) Any amendment pursuant to paragraph (a) of this section filed after the date the issue fee is paid must be accompanied by a petition including the fee set forth in § 1.17(i)(1) and a showing of good and sufficient reasons why the amendment is necessary and was not earlier presented.

16. Section 1.321 is revised to read as follows:

§ 1.321 Statutory Disclaimers, including Terminal Disclaimers.

(a) A patentee owning the whole or any sectional interest in a patent may disclaim any complete claim or claims in a patent. In like manner any patentee may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted. Such disclaimer is binding upon the grantee and its successors or assigns. A notice of the disclaimer is published in the *Official Gazette* and attached to the printed copies of the specification. The disclaimer, to be recorded in the Patent and Trademark Office, must:
(1) be signed by the patentee, or an attorney or agent of record;
(2) identify the patent and complete claim or claims, or term being disclaimed. A disclaimer which is not a disclaimer of a complete claim or claims, or term will be refused recordation;
(3) state the present extent of patentee's ownership interest in the patent; and
(4) be accompanied by the fee set forth in § 1.20(d).
(b) An applicant or assignee may disclaim or dedicate to the public the entire term, or any terminal part of the term, of a patent to be granted. Such terminal disclaimer is binding upon the grantee and its successors or assigns. The terminal disclaimer, to be recorded in the Patent and Trademark Office, must:
(1) be signed:(i) by the applicant, or
(ii) if there is an assignee of record of an undivided part interest, by the applicant and such assignee, or
(iii) if there is an assignee of record of the entire interest, by such assignee, or
(iv) by an attorney or agent of record;
(2) specify the portion of the term of the patent being disclaimed;
(3) state the present extent of applicant's or assignee's ownership interest in the patent to be granted; and
(4) be accompanied by the fee set forth in § 1.20(d).
(c) A terminal disclaimer, when filed to obviate a double patenting rejection in a patent application or in a reexamination proceeding, must:
(1) comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;
(2) be signed in accordance with paragraph (b)(1) of this section if filed in a patent application, or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and
(3) include a provision that any patent granted on that application or any patent subject to that reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

17. Section 1.352 is amended by revising paragraph (a) to read as follows:

§ 1.352 Publication of notice of proposed amendments.

(a) Whenever required by law, notice of proposed amendments to the regulations in this part will be published in the *Official Gazette* and in the *FEDERAL REGISTER*. If not published with the notice, copies of the text will be furnished to any person requesting the same. All comments, suggestions, and briefs received within a time specified in the notice will be considered before adoption of the proposed amendments which may be modified in the light thereof.

* * * * *

18. Section 1.362 is amended by revising paragraphs (c)(4)and (e) and adding paragraph (h) to read as follows:

§ 1.362 Time for maintenance fees.

* * * * *

(c) * * *
(4) For a reissue application, including a continuing reissue application claiming the benefit of a reissue application under 35 USC 120, the United States filing date of the original non-reissue application on which the patent reissued is based.

* * * * *

(e) Maintenance fees may be paid with the surcharge set forth in 1.20(h) during the respective grace periods after:

(1) 3 years and 6 months and through the day of the 4th anniversary of the grant for the first maintenance fee.

(2) 7 years and 6 months and through the day of the 8th anniversary of the grant for the second maintenance fee, and

(3) 11 years and 6 months and through the day of the 12th anniversary of the grant for the third maintenance fee.

* * * * *

(h) The periods specified in §§ 1.362(d) and (e) with respect to a reissue application, including a continuing reissue application thereof, are counted from the date of grant of the original non-reissue application on which the reissued patent is based.

19. Section 1.607, paragraph (a)(5)(i) is revised to read as follows:

§ 1.607 Request by applicant for interference with patent.

(a) ***

(5) ***

(i) Identified as corresponding to the count, and

* * * * *

PART 5 - CLASSIFIED INFORMATION, FOREIGN RELATIONS,INVENTIONS, AND PATENTS

20. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418,102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

21. Section 5.19, paragraph (a) is revised to read as follows:

§ 5.19 Export of technical data

(a) Under regulations (15 CFR 770.10(j)) established by the U.S. Department of Commerce, Bureau of Export Administration, Office of Export Licensing, a validated export license is not required in any case to file a patent application or part thereof in a foreign country if the foreign filing is in accordance with the regulations (37 CFR 5.11 through 5.33) of the Patent and Trademark Office.

* * * * *

PART 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

22. The authority citation for 37 CFR Part 10 continues to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

23. Section 10.48, paragraph (b) is revised to read as follows:

§ 10.48 Sharing legal fees

* * * * *

(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the deceased practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

* * * * *

Oct. 15, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1156 OG 54]

(114) **U.S. Department of Commerce**
Patent and Trademark Office
Special Status for Patent Applications
Relating to Superconductivity

On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that *"to most of us laymen, superconductivity was a completely new term,* but it wasn't long before we learned of the great promise it held out to alter our world for the better - a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 5, 1987 DONALD J. QUIGG
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1082 TMOG 7]

(115) **Preparation for Processing High Temperature Superconductor Technology**

In response to the President's Superconductivity Initiative announced on July 28, 1987 and with the expectation of the filing of increasing numbers of patent applications relating to higher temperature superconductors, the U.S. Patent and Trademark Office has taken a number of steps to prepare for the effective handling of applications on this subject matter.

These actions include (1) establishing a special Task Force to prepare for the *processing of patent applications for higher temperature* superconductor technology; (2) making patent applications relating to this technology special on request of the applicant and (3) renewing support for legislation providing for an expanded scope of protection for process patents to cover products made by the patented process.

The responsibilities of the Task Force are to (1) coordinate the development of a Patent and Trademark Office capability to examine the expected large number of patent applications in this area and (2) provide an information resource and sounding board for legal and practice questions and policy development in this area. The Task Force has been assigned a number of specific tasks, such as developing a complete search file on superconductivity technology for the use of Examiners and the public, establishing a training program for examiners on the technology and assuring a uniform and consistent application

of the patent law to the technology in the U.S. Patent and Trademark Office.

Sept. 16, 1987 RENE D. TEGTMEYER, for
DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1083 OG 16]

(116) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90143-9144]
RIN 0651-AA35

Amendment of Patent and Trademark Rules concerning Judicial Review of Decisions of the Board of Patent Appeals and Interferences and the Trademark Trial and Appeal Board and other Miscellaneous Matters.

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, relating to (1) decisions of the Board of Patent Appeals and Interferences (BPAI), (2) requests for reconsideration of decisions of the BPAI and the Trademark Trial and Appeal Board (TTAB), (3) extensions of time in proceedings after a decision by the BPAI under §§ 1.196 and 1.197, (4) practices concerning judicial review of final decisions of the BPAI and TTAB, (5) extensions of time for seeking judicial review of BPAI and TTAB decisions and (6) miscellaneous changes in the practice before the BPAI and housekeeping amendments.

Two recent decisions of the U.S. Court of Appeals for the Federal Circuit have held that even though the BPAI includes a new ground for rejection in its decision under 37 CFR § 1.196(b)(3), appellants may appeal directly to the Federal Circuit without first seeking reconsideration at the BPAI. Where judicial review is sought without requesting reconsideration, the arguments against the new ground of rejection are developed for the first time during court proceedings. The amendments require that appellants seek reconsideration of the new ground of rejection prior to appeal or commencement of a civil action.

Experience under the previous rules relating to judicial review of final board decisions indicated that the rules may have been confusing in certain respects relating to the time in which judicial review must be sought and the manner in which extensions of time for seeking judicial review may be obtained. The rules eliminate any confusion as to when judicial review must be sought and standardize the manner of obtaining extensions of time to seek judicial review.

The rules also make clarifying and housekeeping amendments with respect to practice before the BPAI.
Effective Date: August 20, 1989.
For Further Information Contact: Richard E. Schafer by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information:

Background

A notice of proposed rulemaking was published in the *Federal Register* at 54 Fed. Reg. 11009 (March 16, 1989) and at 1101 *Official Gazette* 6 (April 4, 1989). No oral hearing was held and no written comments were received.

Discussion of Specific Rules

(1) Decisions of the BPAI and requests for reconsideration of BPAI and TTAB decisions

Only final decisions of the BPAI and TTAB are subject to judicial review. 35 U.S.C. §§ 141, 145; U.S.C. § 1071; 28 U.S.C. § 1295 (a)(4)(A) and (B).

Section 1.196(b) provides that if the BPAI has knowledge of any grounds, not involved in the appeal, for rejecting any appealed claim, it may include in its decision a statement to that effect. The statement then constitutes a new rejection of the claims. The previous rules permitted appellants to treat the decision as a final decision in the case and thus immediately appealable. 37 CFR § 1.196(b)(3) (1988). Therefore, when an appellant proceeded under this option, arguments against the new rejection were presented for the first time to the reviewing court.

A recent decision by the U.S. Court of Appeals for the Federal Circuit rejected the Commissioner's argument that an appellant should not be permitted to contest the BPAI's new ground for rejection because it had not requested reconsideration of that ground by the BPAI. *In re Evanega*, 829 F.2d 1110, 1113, 4 USPQ 2d 1249, 1252 (Fed. Cir. 1987). *See also In re Nielson*, 816 F.2d 1567, 1570, 2 USPQ 2d 1525, 1527 (Fed. Cir. 1987). In *Evanega*, the Commissioner urged that requiring appellants to request reconsideration, where the BPAI adopts a new ground for rejection, would provide the BPAI with an opportunity to consider appellant's arguments and correct any errors while the case was still in the PTO. This conserves judicial resources, and in any event, obtains the benefit of the BPAI's view should judicial review ultimately be sought. The court held, however, that in view of PTO regulations (37 CFR § 1.196(b)(3)) which "expressly provide that the board's decision, even if based on a new ground, is a final determination and thus may be appealed without seeking reconsideration," appellant could not be required to request reconsideration by the BPAI. *Id.*

The new rule changes eliminate 37 CFR § 1.196(b)(3). By removing § 1.196(b)(3), appellants no longer have the option of treating a new ground of rejection as final and immediately appealable. Appellants' options are limited to requesting remand to the examiner or requesting reconsideration by the BPAI as set forth in §§ 1.196(b)(1) and 1.196(b)(2). The preamble of § 1.196(b) has been amended to specifically recite that a new ground of rejection shall not be considered a final decision for judicial review.

Appellants still may elect further prosecution before the examiner under 37 CFR § 1.196(b)(1) or request reconsideration under 1.196(b)(2). The option of § 1.196(b)(2) requires that any request for reconsideration address the new ground of rejection and specifically state the reasons why the new ground was in error. Section 1.196(b)(2) also provides that the BPAI will reconsider the new rejection and, if necessary, render a new decision. The decision on reconsideration will be deemed to incorporate the earlier decision except for any portions of the earlier decision specifically withdrawn.

Reconsideration or remand need not be requested if appellant does not contest the new ground. Appellants may seek judicial review as to claims not subject to the new ground.

Section 1.196(a) expressly provides for remands to the examiner for further consideration. The BPAI has inherent authority, as part of its role in reviewing standards of patentability applied in the PTO, to remand applications to the examiner for further consideration. *Cf.* Manual of Patent Examining Procedure (MPEP) §§ 1211 and 1212. The change merely makes express that which is inherent.

The amendments also delete the portion of former § 1.196(d) which provides (1) that any decision which includes a remand shall not be a final decision for the purposes of judicial review and (2) that upon conclusion of the proceedings on remand the BPAI may enter an order making its decision final. Those provisions have been included as new § 1.196(e). Under this paragraph, decisions pursuant to § 1.196(b) would not be final as to the claims subject to a new rejection.

The last sentence of former § 1.196(b)(1) has been deleted and placed in new § 1.196(e).

(2) Requests for reconsideration of BPAI and TTAB decisions

Section 1.197(b) provides that any request for reconsideration must specifically state the points believed to have been misapprehended or overlooked in the BPAI's decision. Experience has shown that many requests for reconsideration are

nothing more than reargument of appellant's position on appeal. The provision, as adopted, limits requests to the points of law or fact which appellant feels were overlooked or misapprehended by the BPAI.

The amendments also clarify the exception found in the first sentence of § 1.197(b) by including specific references to the "original decision" and the "decision on reconsideration." Some confusion had been noted with respect to the meaning of the current language. In order to simplify calculation of times for requesting reconsideration of the decisions of the boards, §§ 1.658(b), 2.129(c), and 2.144 specify a period of one month rather than the periods expressed in days. Section 1.197(a) already specified a one-month period.

(3) Extensions of time after a decision by the BPAI to take action under §§ 1.196 and 1.197

Appellants in patent cases may no longer use fee extensions under § 1.136(a) to extend the time for making an election under § 1.196(b) or seeking reconsideration under § 1.197.

Under previous rules appellants could request reconsideration of a BPAI decision up to five months after a decision or file a response to a new ground of rejection up to six months after the decision. This inordinately delayed final disposition of appeals. Section 1.136(a) provides that fee extensions are not available to file responses to a BPAI decision pursuant to §§ 1.196, 1.197 or 1.304. One month is deemed to be ample time to submit a request for reconsideration. Note that Fed. R. Civ. P. 59 provides 10 days and Fed. R. App. P. 40 provides 14 days for similar requests. Extensions under § 1.136(b) will be available to extend the time to file a response under §§ 1.196 and 1.197. Section 1.304(a) exclusively governs extensions of time to file a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action. See further discussion below.

Section 1.136(a) specifically refers to § 1.136(b) for extensions of time to file responses under §§ 1.196 and 1.197 and refers to § 1.304 for extensions of time to initiate judicial review. Sections 1.196(f) and 1.197(b) correlatively reference § 1.136(b) for extensions of time.

Fee extensions are not available to extend the time for electing further prosecution before the examiner under § 1.196(b)(1). Where an appellant elects further prosecution before the examiner, fee extensions under § 1.136(a) remain available to respond to the primary examiner's Office actions.

(4) Time for seeking judicial review of decisions of the BPAI and TTAB

Under previous rules, judicial review of final decisions of the BPAI or TTAB had to be sought within sixty days of the decision or thirty days after a decision on reconsideration. However, where a decision on reconsideration was, in effect, a new decision, it was not always clear whether the time for appeal was thirty or sixty days. Sections 1.304(a) and 2.146(d)(1) provide a two-month period to appeal from either the date of the decision or the decision on a timely filed request for reconsideration.

Some problems have been noted with respect to the time for seeking judicial review in days. Miscalculations of the statutory sixty-day time period have resulted in filing untimely requests for judicial review. In order to simplify calculation of the time for seeking judicial review, §§ 1.304(a) and 2.145(d)(1) specify two months. The two-month period meets the sixty-day requirement of 35 U.S.C. §§ 142, 145 and 146 and 15 U.S.C. §§ 1071(a)(2) and (b)(1) except for time periods which include February 28. In order to comply with the sixty-day requirement, §§ 1.304(b) and 2.145(d)(2) provide that an additional day shall be added to any two-month period for initiating judicial review which includes February 28. Appeals will always be timely if the judicial review is initiated within two months of the final decision.

Previously, the rules did not specify a time period for filing a cross-appeal or cross-action in *inter partes* cases. The absence of such a time period made it difficult for parties and their attorneys to make appropriate plans for judicial review. For example, in an interference where there has been a split judgment, one of the parties may be satisfied with the judgment but may desire to appeal the adverse judgment only if an appeal is noted by the other party. Where the appeal is filed on the last possible day, a cross-appeal is precluded. Sections 1.304(a) and 2.145(d)(1) specify that the time for filing a cross-appeal or commencing a cross-action expires (1) fourteen days after service of the notice of appeal or the summons and complaint or (2) two months after the decision to be reviewed, whichever is later.

Similarly, no provision for filing a cross-action was provided where an appellee elects to have further proceedings conducted in the district court pursuant to 35 U.S.C. § 146 or 15 U.S.C. § 1071(a)(1). Section 1.304(c) and 2.145(d)(3) provide that the time for filing a cross-action expires 14 days after service of the summons and complaint. The district court will determine whether any cross-action was timely filed since neither the complaint nor cross-action is filed in the PTO.

(5) Extensions of time to seek judicial review

In the past, standards for granting requests for extensions of time to take an appeal or commence a civil action varied depending upon which board was involved and upon the particular type proceeding before the board. For example, extensions relating to patent applications could be obtained by paying the appropriate fee under 1.136(a). However, in reexamination proceedings or when judicial review was sought from a decision of the TTAB, the requester must demonstrate sufficient cause under § 1.550(c) or § 2.145(d)(1). The rules standardize the manner in which an extension of time to initiate judicial review may be obtained. The PTO has adopted a standard which is similar to the standard used in the Federal courts for granting extensions. Under the rules the Commissioner may extend the time (1) for good cause if requested before the expiration of the time provided for initiating judicial review or (2) upon a showing of excusable neglect in failing to initiate judicial review if requested after the expiration of the time period. This standard will be applicable in both trademark and patent proceedings (§§ 1.304(a) and 2.145(e)) once the "last" decision, i.e., either the decision (in circumstances where no timely reconsideration is sought) or the decision on reconsideration, of either board has been entered. In patent cases, extensions of time under § 1.136(b) and § 1.550(c) and fee extensions under 37 CFR § 1.136(a) are no longer available to extend the time for the purpose of judicial review once a decision or a decision on reconsideration has been entered. Section 1.304(a) states that the provisions of §§ 1.136 and 1.550(c) are not available to extend the time to initiate judicial review. Sections 1.136(a), 1.136(b), 1.191(d), 1.550(c), 1.645(a) and (b) refer to § 1.304 for extensions of time for seeking judicial review after a decision has been entered. Section 1.645(a) has been amended by (1) adding the introductory phrase "Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action," to the first sentence and (2) deleting the references to filing a notice of appeal or commencing a civil action in the second sentence.

In view of the amendments to §§ 1.197 and 1.304, relating to extensions of time to seek reconsideration or initiate judicial review, § 1.191(d) does not refer to §§ 1.196 and 1.197.

(6) Miscellaneous amendments

In the past, appellants could use fee extensions to delay the time for requesting an oral hearing at the BPAI. This delays final disposition of the appeal and causes administrative problems and duplication of effort due to the transfer of the appeal to the hearing docket. Section 1.191(d) no longer refers to § 1.194. Fee extensions are no longer available to extend the time for requesting an oral hearing. Extensions under § 1.136(b) are available to extend the time to request an oral hearing.

Section 1.191(b) has been rewritten as one sentence without any change in substance.

Some confusion has resulted as to who has jurisdiction over a patent application after a notice of appeal to the BPAI has been filed. Problems arose, for example, as to the appropriate PTO official to decide certain petitions and other matters after an appeal has been filed. MPEP § 1210 indicates that jurisdiction over the application normally passes at one of five possible times listed therein. Section 1.191 includes a new section (e) which provides that jurisdiction transfers to the BPAI when the application or reexamination file including all briefs and examiner's answers is transmitted to the BPAI. Thus, jurisdiction transfers to the BPAI when all written submissions by the applicant and the examiner have been entered and the application papers have been forwarded to the BPAI.

New paragraph 1.191(e) also includes a provision that the Commissioner, prior to the time the BPAI renders its decision, may *sua sponte* order that an application be remanded to the examiner for further consideration. This provision merely makes explicit the inherent authority of the Commissioner to direct and supervise the examination of patent applications.

Under previous rules there was some confusion as to when "termination of proceedings" occurs. Section 1.197(c) provides that proceedings are "terminated" when the Federal Circuit's mandate is received by the PTO or after the time for appeal from the judgment of the district court in a civil action under 35 U.S.C. § 145 has expired. The language "In such cases," in the second sentence of former 1.197(c) has been eliminated since it was superfluous and may have been confusing.

The rules delete the phrase "that he or she elects" and substitutes "electing" therefor in §§ 1.304(c) and 2.145(c)(3), as amended. The amendment merely changes wording without any change in substance.

Section 1.196(b) changes the verb "make" to "makes" to conform the verb to the singular subject of the sentence.

Sections 1.301, 1.303, 2.145(a)(2) and 2.145(c)(3) no longer refer to transmittal of the certified list and certified copies of the notice of election to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. § 141 or 15 U.S.C. § 1071(a)(1). These procedures are required by applicable statutes or Court Rules and are unnecessary in the PTO's regulations.

Sections 1.304(a), 1.304(c), 2.145(c)(3) and 2.145(d)(1) include a statement that the certificate of mailing provisions of § 1.8 are *not applicable*. No substantive change is involved since the inapplicability of § 1.8 is already stated in §§ 1.8(a)(2)(viii) and (ix).

Sections 1.304(b) and 2.145(d)(2) recite "Federal holiday in the District of Columbia" rather than "legal holiday." These changes merely conform the language of these sections with the language of 35 U.S.C. § 21(b) and 37 CFR § 1.7.

Section 2.145(c)(2) and (3) include changes in wording without any change in substance.

Other Considerations

These rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 350 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354]. The rule change requiring appellants to request reconsideration under the specific circumstances set forth is not expected to result in an increase of fees charged by attorneys and agents to entities, including small entities, since the rule change is intended to eliminate erroneous grounds for rejection prior to appeal and in some instances is expected to eliminate the need for appeal.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the national government and the states as outlined in Executive Order 12612. The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR, Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

List of Subjects in 37 CFR, Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.136 is revised to read as follows:

§ 1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a nonstatutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in § 1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action, (2) the application is involved in an interference declared pursuant to § 1.611 or (3) the response is to a decision by the Board of Patent Appeals and Interferences pursuant to §§ 1.196, 1.197 or 1.304. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See § 1.136(b) for extensions of time relating to proceedings pursuant to §§ 1.196 or 1.197, § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See § 1.304 for extension of time to appeal to the U.S. Court of Appeals for the Federal Circuit or to commence a civil action, § 1.645 for extension of time in interference proceedings and § 1.550(c) for extension of time in reexamination proceedings.

3. Section 1.191 is amended by revising paragraphs (b) and (d) and adding paragraph (e) to read as follows:

§ 1.191 Appeal to Board of Patent Appeals and Interferences

* * * * *

(b) The appeal in an application or reexamination proceeding must identify the rejected claim or claims appealed, and must

be signed by the applicant, patent owner or duly authorized attorney or agent.

* * * * *

(d) The time periods set forth in §§ 1.191 through 1.193 are subject to the provisions of § 1.136 for patent applications or § 1.550(c) for reexamination proceedings. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

(e) Jurisdiction over the application or patent under reexamination passes to the Board of Patent Appeals and Interferences upon transmittal of the file, including all briefs and examiner's answers, to the Board. Prior to the entry of a decision on the appeal, the Commissioner may *sua sponte* order the application remanded to the examiner.

4. Section 1.196 is amended by revising paragraphs (a), (b) and (d) and adding new paragraphs (e) and (f) to read as follows:

§ 1.196 Decision by the Board of Patent Appeals and Interferences

(a) The Board of Patent Appeals and Interferences, in its decision, may affirm or reverse the decision of the examiner in whole or in part on the grounds and on the claims specified by the examiner or remand the application to the examiner for further consideration. The affirmance of the rejection of a claim on any of the grounds specified constitutes a general affirmance of the decision of the examiner on that claim, except as to any ground specifically reversed.

(b) Should the Board of Patent Appeals and Interferences have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in the decision a statement to that effect with its reasons for so holding, which statement shall constitute a new rejection of the claims. A new rejection shall not be considered final for the purpose of judicial review. When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may exercise either of the following two options with respect to the new ground:

(1) The appellant may submit an appropriate amendment of the claims so rejected or a showing of facts, or both, and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

(2) The appellant may have the case reconsidered under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. The request for reconsideration shall address the new ground for rejection and state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. Where request for such reconsideration is made the Board of Patent Appeals and Interferences shall reconsider the new ground for rejection and, if necessary, render a new decision which shall include all grounds upon which a patent is refused. The decision on reconsideration is deemed to incorporate the earlier decision, except for those portions specifically withdrawn on reconsideration, and is final for the purpose of judicial review.

* * * * *

(d) Although the Board of Patent Appeals and Interferences normally will confine its decision to a review of rejections made by the examiner, should it have knowledge of any grounds for rejecting any allowed claim it may include in its decision a recommended rejection of the claim and remand the case to the examiner. In such event, the Board shall set a period, not less than one month, within which the appellant may submit to the examiner an appropriate amendment, a showing of facts or reasons, or both, in order to avoid the grounds set forth in the recommendation of the Board of Patent Appeals and Interferences. The examiner shall be bound by the recommendation and shall enter and maintain the recommended rejection unless an amendment or showing of facts not previously of record is filed which, in the opinion of the examiner, overcomes the recommended rejection. Should the examiner make the recommended rejection final the applicant may again appeal to the Board of Patent Appeals and Interferences.

(e) Whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, the Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

(f) See § 1.136(b) for extensions of time to take action under this section.

5. Section 1.197 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.197 Action following decision

* * * * *

(b) A single request for reconsideration or modification of the decision may be made if filed within one month from the date of the original decision, unless the original decision is so modified by the decision on reconsideration as to become, in effect, a new decision, and the Board of Patent Appeals and Interferences so states. The request for reconsideration shall state with particularity the points believed to have been misapprehended or overlooked in rendering the decision and also state all other grounds upon which reconsideration is sought. See 37 CFR § 1.136(b) for extensions of time for seeking reconsideration.

(c) Termination of proceedings. Proceedings are considered terminated by the dismissal of an appeal or the failure to timely file an appeal to the court or a civil action (§ 1.304) except: (1) where claims stand allowed in an application or (2) where the nature of the decision requires further action by the examiner. The date of termination of proceedings is the date on which the appeal is dismissed or the date on which the time for appeal to the court or review by civil action (§ 1.304) expires. If an appeal to the court or a civil action has been filed, proceedings are considered terminated when the appeal or civil action is terminated. An appeal to the U.S. Court of Appeals for the Federal Circuit is terminated when the mandate is received by the Office. A civil action is terminated when the time to appeal the judgment expires.

6. Section 1.301 is revised to read as follows:

§ 1.301 Appeal to U.S. Court of Appeals for the Federal Circuit.

Any applicant or any owner of a patent involved in a reexamination proceeding dissatisfied with the decision of the Board of Patent Appeals and Interferences, and any party to an interference dissatisfied with the decision of the Board of Patent Appeals and Interferences, may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal: (a) In the Patent and Trademark Office file a written notice of appeal directed to the Commissioner (see §§ 1.302 and 1.304); and (b) in the Court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

7. Section 1.303 is amended by revising paragraph (c) to read as follows:

§ 1.303 Civil Action under 35 U.S.C. 145, 146, 306.

* * * * *

(c) If any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an interference proceeding files notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (§ 1.302), that he or she elects to have all further proceedings conducted as provided in 35 U.S.C. 146. The notice of election must be served as provided in § 1.646.

8. Section 1.304 is revised to read as follows:

§ 1.304 Time for appeal or civil action.

(a) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time provided under § 1.197(b) or § 1.658, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later. The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or 1.645(a) or (b). The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal. See 1.8(a)(2)(ix).

(b) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of the time specified for appeal of commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal of cross-appeal. See 1.8(a)(2)(viii).

9. Section 1.550 is amended by revising paragraph (c) to read as follows:

§ 1.550 Conduct of reexamination proceedings

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action.

* * * * *

10. Section 1.645 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.645 Extension of time, late papers, stay of proceedings

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the examiner-in-chief before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an examiner-in-chief sets a time for taking action will not normally constitute good cause. A motion seeking additional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proven through the witness.

(b) Any paper belatedly filed, will not be considered except upon motion (§ 1.635) which shows sufficient cause why the paper was not timely filed. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

* * * * *

11. Section 1.658 is amended by revising paragraph (b) to read as follows:

§ 1.658 Final Decision

* * * * *

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any reply to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Where reasonably possible, service of the request for reconsideration shall be such that delivery is accomplished by hand or "Express Mail." The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision.

* * * * *

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

12. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

13. Section 2.129 is amended by revising paragraph (c) to read as follows:

§ 2.129 Oral argument; reconsideration

* * * * *

(c) Any request for rehearing or reconsideration or modification of a decision issued after final hearing must be filed within one month from the date of the decision. A brief in response must be filed within fifteen days from the date of service of the request. The times specified may be extended by order of the Trademark Trial and Appeal Board on motion for good cause.

14. Section 2.144 is revised to read as follows:

§ 2.144 Reconsideration of decision on ex parte appeal

Any request for rehearing or reconsideration, or modification of the decision, must be filed within one month from the date

of the decision. Such time may be extended by the Trademark Trial and Appeal Board upon a showing of sufficient cause.

15. Section 2.145 is amended by revising paragraphs (a), (c)(2), (c)(3), (d)(1), (d)(2) and (d)(3) and adding new paragraph (e) to read as follows:

§ 2.145 Appeal to court and civil action.

(a) Appeal to U.S. Court of Appeals for the Federal Circuit. An applicant for registration, or any party to an interference, opposition, or cancellation proceeding or any party to an application to register as a concurrent user, hereinafter referred to as inter partes proceedings, who is dissatisfied with the decision of the Trademark Trial and Appeal Board and any registrant who has filed an affidavit or declaration under section 8 of the Act or who has filed an application for renewal and is dissatisfied with the decision of the Commissioner (§§ 2.165, 2.184), may appeal to the U.S. Court of Appeals for the Federal Circuit. The appellant must take the following steps in such an appeal:

(1) In the Patent and Trademark Office give written notice of appeal to the Commissioner (see paragraphs (b) and (d) of this section);

(2) In the court, file a copy of the notice of appeal and pay the fee for appeal, as provided by the rules of the Court.

* * * * *

(c) * * *

(2) Any applicant or registrant in an ex parte case who takes an appeal to the U.S. Court of Appeals for the Federal Circuit waives any right to proceed under section 21(b) of the Act.

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119. The certificate of mailing practice of § 1.8 is not available for filing a notice of election. See § 1.8(a)(2)(viii).

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later. The certificate of mailing practice of § 1.8 is not available for filing a notice of appeal or cross-appeal See § 1.8(a)(2)(ix).

(2) The times specified in this section in days are calendar days. The times specified herein in months are calendar months except that one day shall be added to any two-month period which includes February 28. If the last day of time specified for an appeal, or commencing a civil action falls on a Saturday, Sunday or Federal holiday in the District of Columbia, the time is extended to the next day which is neither a Saturday, Sunday nor a Federal holiday.

(3) If a party to an inter partes proceeding has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under section 21(a)(1) of the Act electing to have all further proceedings conducted under section 21(b) of the Act, the time for filing a civil action thereafter is specified in section 21(a)(1) of the Act. The time for filing a cross-action expires 14 days after service of the summons and complaint.

(e) Extensions of time to commence judicial review. The Commissioner may extend the time for filing an appeal or commencing a civil action (1) for good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or (2) upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

June 21, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1105 OG 5]

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(117) **Advance Notice of Changes to MPEP § 1206 and § 2309**

This memorandum is to provide advance notice of changes that will be made to MPEP § 1206 and § 2309 relating, respectively, to the requirements for an appeal brief and preparation of interference papers by an examiner. These changes will appear in the next revision of the Manual. The changes will be based on the final rules relating to patent appeal and interference proceedings, which were published in the *Federal Register* on March 17, 1995 at 60 FR 14488 and in the *Official Gazette* on April 11, 1995 at 1173 Off. Gaz. Pat. Office 36. The effective date of these rule changes is April 21, 1995.

37 CFR 1.192(c) relating to the content of an appeal brief has been changed so that it does not apply to *pro se* applicants, and in that two additional items have been added. In particular, the appellant must identify in the brief, the real party in interest and any related appeals and interferences. Accordingly, examiners must review appeal briefs filed *on or after April 21, 1995* for the presence of the following items under appropriate headings: (1) Real party in interest; (2) Related appeals and interferences; (3) Status of claims; (4) Status of amendments; (5) Summary of invention; (6) Issues; (7) Grouping of claims; (8) Argument; and (9) Appendix. Examiners should continue to refer to MPEP § 1206 (6th ed., Jan. 1995) for the standards for reviewing items (3) through (9). Under the revised rules, a brief filed by a *pro se* applicant should be evaluated on a case-by-case basis.

Examiners should not be unduly rigid in reviewing appeal briefs for compliance with the requirements of the rule. For example, if no amendment has been filed after final rejection, a new brief should not be required solely because the brief omits having some statement after the heading for item (4), status of amendments.

37 CFR 1.192(d) has been amended to indicate that "the appeal will stand dismissed" if the appellant does not timely file an amended brief, or files an amended brief which does not overcome all the reasons for noncompliance of which the appellant was notified.

Regarding the preparation of interference papers by the examiner, 37 CFR 1.609(b)(1) has been amended to require the examiner to explain why the counts define different patentable inventions if there is more than one count proposed. 37 CFR 1.609(b)(2) has been amended to require the examiner to identify the claims of any application or patent which correspond to each count and explain why each claim designated as corresponding to a count is directed to the same patentable invention as the count. 37 CFR 1.609(b)(3) has been amended to require the examiner to identify the claims in any application or patent which do not correspond to each count and to explain why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count.

The above changes will take effect on April 21, 1995.

April 18, 1995

J. MICHAEL THESZ, Editor
Manual of Patent Examining Procedure

[1174 OG 91]

(118) **Patent and Trademark Office**
37 CFR Part 1
Patent Interference Practice - Separate Patentability of Claims

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office (PTO) proposes to amend its rules of practice in patent interference cases. *In re Van Geuns*, interpreted patent interference rules in a manner different from the manner in which the rules are interpreted by the Commissioner. The Federal Circuit held that the rules authorize a party to argue the separate patentability of claims that the PTO designates as corresponding to a single count. Under PTO rules, however, every claim designated to correspond to a count shall be directed to a single inventive concept. PTO proposes to amend the interference rules to specifically overcome the Federal Circuit's interpretation of the rules in *Van Geuns*. PTO proposes to specify that unless a party files a preliminary motion to contest the designation of a claim as corresponding to a count, the party shall be deemed to have conceded that all claims designated as corresponding to a count are unpatentable if any claim designated as corresponding to the count is held to be unpatentable and may not argue to an examiner-in-chief or the separate patentability of claims designated to correspond to the count. PTO also proposes to specify that when an examiner-in-chief in an interference becomes aware of a reason why a claim corresponding to a count may not be patentable, the examiner-in-chief may enter an order notifying the parties of the reason and set a time within which each party may present its views, which may include a preliminary motion. The rules would further specify that an opponent may file an opposition to any preliminary motion and that the party would file a reply to an opposition.

These rules will apply prospectively except when an examiner-in-chief notifies a party in an interference to the contrary. If a party is notified, the party will be given an opportunity to respond regarding the patentability of a count in the interference.

Dates: Comments must be submitted on or before Sept. 24, 1993.

Addresses: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Fred E. McKelvey, Solicitor. Written comments will be available for public inspection in Suite 918, on the 9th floor of Crystal Park II, located at 2121 Crystal Drive, Arlington, Va.

For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The Patent and Trademark Office (PTO) conducts interference proceedings to determine who, as between two or more applicants for patent or one or more applicants and one or more patentees, is the first inventor of a patentable invention.

A primary examiner determines in the first instance whether the claims in an application interfere with the claims in another application or a patent. When the examiner is of the view that an interference exists, the Board of Patent Appeals and Interferences (Board) is notified. 37 CFR § 1.609. An examiner-in-chief, i.e., a member of the Board, is assigned to each interference. The interference is declared by the examiner-in-chief. 37 CFR § 1.610(a).

Each separately patentable invention involved in the interference is defined by a count. The count is a vehicle for contesting priority of invention (i.e., who made the invention defined by the count first) and determining the evidence relevant to the issue of priority. *Squires v. Corbett*, 560 F2d. 424, 433, 194 USPQ 513, 519 (CCPA 1977); *Case v. CPC Int'l, Inc.*, 730 F.2d 745, 749, 221 USPQ 196, 200 (Fed. Cir.), *cert. denied*, 469 U.S. 872 (1984); *In re Van Geuns*, 988 F.2d at 1184, 26 USPQ2d at 1058-59 (Fed. Cir. 1993).

Each claim of any application or patent to be involved in the interference is designated to correspond to the count or not to correspond to the count. A preliminary determination is made by the PTO as to which claims should be designated to correspond to the count. The claims that are initially determined to define the same patentable invention as the count are designated to correspond to the count. All other claims are designated as not corresponding to the count. The designation of claims as corresponding or not corresponding provides a starting point in an interference. Under PTO practice, there is a presumption that the designation of a claim as corresponding or not corresponding to a count is correct.

The rules authorize a party to file a preliminary motion to redefine an interference by designating a claim as corresponding or not corresponding to a count. 37 CFR § 1.633(c)(3) and (4). Prior to *Van Geuns*, the PTO had interpreted the rules to require a preliminary motion to designate a claim as not corresponding to a count as a condition to being able to argue to an examiner-in-chief or the Board that the claim is separately patentable from the other claims designated to correspond to the count. *See Brooks v. Street*, 16 USPQ2d 1374, 1378, (Bd. Pat. App. & Int. 1990); *Flehmig v. Giesa* 13 USPQ2d 1052, 1054, (Bd. Pat. App. & Int. 1989); *Kwon v. Perkins*, 6 USPQ2d 1747, 1751 (Bd. Pat. App. & Int. 1988), *aff'd on other grounds*, 886 F.2d 325, 12 USPQ2d 1308 (Fed. Cir. 1989); *see also Lamont v. Berquer*, 7 USPQ2d 1580, 1582 (Bd. Pat. App. & Int. 1988). In *Van Geuns*, however, the Federal Circuit interpreted the rules differently, stating:

"[T]he position of the Commissioner that claims designated as corresponding to a count stand or fall with the patentability of the subject matter of the count is overbroad."
988 F.2d at 1185, 26 USPQ2d as 1060. The Federal Circuit further stated:

"[W]e conclude that a party to an interference, who has failed to timely contest the designation of claims corresponding to a count, has not conceded that the claims corresponding to a count are anticipated or made obvious [i.e., are unpatentable] by the prior art when the subject matter of the count is determined to be unpatentable for obviousness. The PTO must determine, based n the actual prior art reference or references, whether claims not [designated as] corresponding exactly to the count are unpatentable."
Id. at _, 26 USPQ2d at 1060. The Federal Circuit still further stated:

"The interference rules do not specify whether a party may argue the patentability of claims separately to the EIC [examiner-in-chief] and the board."
Id. at _, 26 USPQ2d at 1060.

The changes proposed to the interference rules are designed to overcome the Federal Circuit's statement.

Subsection (f) of 37 CFR § 1.601, as proposed to be amended, would clarify that claims are designated to correspond to a count. The designation constitutes a rebuttable presumption that, with respect to patentability, the claims stand or fall with the count.

Subsection (f) would also eliminate the "but which defines the same patentable invention as the count" language, thereby eliminating the definition of "same patentable invention" in 37 CFR § 1.601(n) from the designation of claims that correspond substantially to a count. The purpose of the proposed changes is to overcome the Federal Circuit's *Van Geuns* statement that "[i]f a party does not timely contest the designation of claims, there is in effect a concession that all of the designated claims would be anticipated or made obvious if the count were actually prior art." Id. at _, 26 USPQ2d at 1060.

Finally, the definition of a "phantom count" would be revised to clarify that it is unpatentable to the parties under 35 U.S.C. § 112.

Subsection (k) of 37 CFR § 1.633, as proposed to be amended, would provide that a party who fails to contest, by way of a timely preliminary motion under 37 CFR § 1.633, the designation of a claim as corresponding to a count may not subsequently argue to an examiner-in-chief or the Board the separate patentability of claims designated to correspond to a count.

The first sentence of section 1.641, as proposed to be amended, would be redesignated subsection (a) and would clarify that the Examiner-in-Chief would notify the parties by order of the unpatentability of claims designated as corresponding to a count. The word "corresponding" would be changed to "designated to correspond" to conform with the proposed revision to subsection 1.601(f). Proposed subsection (a) would also indicate that responses to the order may include argument and any preliminary motion permitted under § 1.633(c), (d), or (h) as well as any supporting evidence.

A new subsection (b) would be added to section 1.641 that would specify that the opposition and reply practice undersection 1.638 applies to a preliminary motion filed in response to the Examiner-in-Chief's order under subsection (a) of this section.

Finally, the last sentence of the current section, 1.641 would be redesignated as subsection (c) and would include a reference to the preliminary motions under section 1.633 permitted under the revision to subsection (a) of this section.

These rules will apply prospectively except when an examiner-in-chief notifies a party in an interference to the contrary. If a party is notified, the party will be given an opportunity to respond regarding the patentability of a count in the interference.

OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes would be to clarify the procedure for arguing the patentability of claims corresponding to a count in patent interferences and thereby eliminate any confusion, delay, or redundancy that might result from misinterpretation of the current rules.

The Office has determined that this proposed rule change is not a major rule change, under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act. 1980, 44 U.S.C 3501 *et seq.*, since no record-keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents. For the reasons set out in the preamble, it is proposed to amend 37 CFR part 1 wherein removals are indicated by brackets ([ ]) and additions by arrows (▶◀) as follows:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.601 is proposed to be amended by revising Paragraph (f) to read as follows:

§ 1.601 Scope of rules, definitions.

* * * * *

(f) A "count" defines the interfering subject matter between:
(1) two or more applications or
(2) one or more applications and one or more patents.

When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent [which] ▶that is designated to◀ correspond[s] to a count is a claim involved in an interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or invention ▶that◀ [which] is identical to a count is said to "correspond exactly" to the count. A claim of a patent or application ▶that◀ [which] is not identical to a count [, but which defines the same patentable invention as the count,] is said to correspond substantially" to the count. When a count is broader in scope than all claims ▶that◀ [which] correspond to the count, the count is a "phantom count." A phantom count is not patentable to any party under 35 U.S.C. 112.

* * * * *

3. Section 1.633 is proposed to be amended by adding a new paragraph (k) to read as follows:

§ 1.633 Preliminary motions.

* * * * *

(k) A party who fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count may not subsequently argue to an Examiner-in-Chief or the Board the separate patentability or the lack of separate patentability of claims designated to correspond to the count.

4. Section 1.641 is proposed to be revised as follows:

Unpatentability Discovered by Examiner-in-Chief

▶(a)◀ During the pendency of an interference, if the examiner-in-chief becomes aware of a reason why a claim ▶designated to correspond◀ [corresponding] to a count may not be patentable, the examiner-in-chief may [notify] ▶enter an order notifying◀ the parties of the reason and set a time within which each party may present its views, ▶which may include argument and any appropriate preliminary motion under § 1.633(c), (d), or (h), including any supporting evidence◀.

▶(b) If a party timely files a preliminary motion in response to the order of the examiner-in-chief, any opponent may file an opposition pursuant to § 1.638(a). If an opponent files an opposition, the party may file a reply pursuant to § 1.638(b).◀

▶(c)◀ After considering any timely filed views, ▶including any timely filed preliminary motions under § 1.633,◀ the examiner-in-chief shall decide how the interference shall proceed.

July 16, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1153 OG 59]

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(119) **Availability of Interference Files and InterferenceRelated Application and Patent Files**

This notice describes simplified procedures for inspecting and/or obtaining copies of interference files and related application and patent files. Prior to April, 1995, pending and terminated interference files and other files involved in pending interferences could be inspected and released for copying at the self-service copy center located at the Board of Patent Appeals and Interferences. Because of (1) repeated and substantial file integrity problems with released files and (2) the growing space needs of the Board, this facility was discontinued. Copies of files could only be obtained through Certification Division. In order to improve the availability of these files this procedure has been modified. The new procedures are described below.

Terminated Interferences

Subject to statutory and regulatory limitations on availability (35 U.S.C. § 122; 37 C.F.R. §§ 1.11 and 1.14) terminated interference files and application and patent files involved in terminated interferences may be inspected at and copies obtained through the Files Information Unit. ((703) 308-2733.)

Pending Interferences

As a general matter, pending applications and interference files are not available to the public. 35 U.S.C. § 122; 37 C.F.R. §§ 1.11(e) and 1.14. The parties to an interference or their representatives (e.g., those having a duly executed power to inspect) may inspect pending interference files and involved application and patented files, by appointment, at the Board of Patent Appeals and Interferences. Appointments should be made with the Clerk of the Board at (703) 308-9797. The parties to a pending interference or their representatives may obtain copies of pending interference files and involved files by placing an order through Certification Division ((703) 308-9726 in the Washington, D.C., Metro Area or (800) 972-6382 outside Washington, D.C.).

BRUCE H. STONER, JR.
Acting Chief Administrative Patent Judge

[1184 OG 15]

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(120) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 1
[Docket No. 950207044-5044-01]
RIN: 0651-AA71

Patent Appeal and Interference Practice

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent cases relating to patent appeal and interference proceedings. The changes include amendments to conform the interference rules to new legislative requirements and a number of clarifying and housekeeping amendments.
Effective Date: This document is effective April 21, 1995, except section 1.11(e), which is effective March 17, 1995.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 603-3361 or by mail marked to the attention of Fred E. McKelvey at P. O. Box 15647, Arlington, Virginia 22215.
Supplementary Information: A Notice of Proposed Rulemaking was published in the **Federal Register** (59 FR 50181) on October 3, 1994, and in the *Official Gazette* of the Patent and Trademark Office (1167 Off. Gaz. Pat. Office 98) on October 25, 1994. In response to a request for written comments, twenty-six written comments were received. A public hearing was held on December 7, 1994, at which four witnesses testified. The written comments and the suggestions made at the public hearing represent the views of fifteen individuals and corporations and three patent law associations, namely, the Committee on Interferences of the American Bar Association, the Interference Committee of the American Intellectual Property Law Association and the Japan Intellectual Property Association. These comments and suggestions are addressed below in the discussion of the rule changes to which they pertain. A number of suggested rule changes, though meritorious, cannot be adopted at this time because they are believed to be outside the scope of the present rulemaking. Accordingly, those suggestions will be the subject of a future rulemaking.

The provisions of the rules, as amended, will be applied in pending interferences to the extent reasonably possible. However, it is the desire of PTO to avoid applying the rules, as adopted, to pending interferences where substantial prejudice would result. For example, generally speaking, in cases where the periods for filing preliminary motions and preliminary statements have been set, the current preliminary motion and preliminary statement rules will apply, although parties are free to voluntarily comply with the rules as amended. Generally speaking, in cases where the testimony periods have been set, the current testimony and record rules will apply. The question of whether substantial prejudice will result in a particular case is a matter within the discretion of the administrative patent judge or the Board.

I. Amendments Responsive to Adoption of Public Laws 103-182 and 103-465.

As indicated in the Notice of Proposed Rulemaking, several of the amendments to the interference rules (i.e., 37 CFR 1.601 *et seq.*) are responsive to Public Law 103-182, 107 Stat. 2057 (1993) (North American Free Trade Agreement Implementation Act, hereinafter NAFTA Implementation Act), which amended 35 U.S.C. 104 to permit an applicant or patentee, with respect to an application filed on or after December 8, 1993, to rely on activities occurring in a "NAFTA country" to prove a date of invention no earlier than December 8, 1993, except as provided in 35 U.S.C. 119 and 365. On December 8, 1994, which was subsequent to publication of the Notice of Proposed Rulemaking, Public Law 103-465, 108 Stat. 4809 (1994) (Uruguay Round Agreements Act) was signed into law, which further amended 35 U.S.C. 104 to permit an applicant or a patentee, with respect to an application filed on or after January 1, 1996, to rely on activities occurring in a WTO member country to prove a date of invention no earlier than January 1, 1996, except as provided in 35 U.S.C. 119 and 365. Section 104, as amended by Public Law 103-465, reads as follows:

§ 104. Invention made abroad

(a) IN GENERAL.–

(1) PROCEEDINGS.–In proceedings in the Patent and Trademark Office, in the courts, and before any other competent authority, an applicant for a patent, or a patentee, may not establish a date of invention by reference to knowledge or use thereof, or other activity with respect thereto, in a foreign country other than a NAFTA country or a WTO member country, except as provided in sections 119 and 365 of this title.

(2) RIGHTS.– If an invention was made by a person, civil or military–

(A) while domiciled in the United States, and serving in any other country in connection with operations by or on behalf of the United States,

(B) while domiciled in a NAFTA country and serving in another country in connection with operations by or on behalf of that NAFTA country, or

(C) while domiciled in a WTO member country and serving in another country in connection with operations by or on behalf of that WTO member country,

that person shall be entitled to the same rights of priority in the United States with respect to such invention as if such invention had been made in the United States, that NAFTA country, or that WTO member country, as the case may be.

(3) USE OF INFORMATION.– To the extent that any information in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention has not been made available for use in a proceeding in the Patent and Trademark Office, a court, or any other competent authority to the same extent as such information could be made available in the United States, the Commissioner, court, or such other authority shall draw appropriate inferences, or take other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the proceeding.

(b) DEFINITIONS. -- As used in this section–

(1) the term 'NAFTA country' has the meaning given that term in section 2(4) of the North American Free Trade Agreement Implementation Act; and

(2) the term 'WTO member country' has the meaning given that term in section 2(10) of the Uruguay Round Agreements Act.

Section 2(4) of the NAFTA Implementation Act is codified at 19 U.S.C. 3301; § 2(10) of the Uruguay Round Agreements Act is codified at 19 U.S.C. 3501.

The Notice of Proposed Rulemaking proposed adding a new paragraph (r) to § 1.601 defining "NAFTA country" to mean "NAFTA country" as defined in section 2(4) of the NAFTA Implementation Act and "non-NAFTA country" to mean a country other than a NAFTA country. One comment questioned whether "NAFTA country" should be defined in the rules to include the United States. The answer is no. "NAFTA country" as used in 35 U.S.C. 104 has the meaning given that term in section 2(4) of the NAFTA Implementation Act, which refers to only Canada and Mexico. Another comment observed that the proposed terms "NAFTA country" and "non-NAFTA country" do not appear to contemplate that inventive acts may occur in a foreign place that is not part of any "country" and suggested either using the phrase "outside the United States or a NAFTA country" instead of "non-NAFTA country" or else defining "non-NAFTA country" to mean "a *place* other than the United States or a NAFTA country." The comment is well taken. In view of the comment and the amendment of 35 U.S.C. 104 by the Uruguay Round Agreements Act to permit reliance on activities in WTO member countries, the proposed term "NAFTA country" is replaced in §§ 1.622, 1.623, 1.624 and 1.628, which set forth the requirements for preliminary statements and for correcting preliminary statements, by the phrase "NAFTA country or WTO member country" and the proposed term "non-NAFTA country" is replaced by the phrase "place other than the United States, a NAFTA country or a WTO member country." Furthermore, the references in §§ 1.622(b) and 1.623(a) to the "second sentence of 35 U.S.C. 104" have been changed to "35 U.S.C. 104(a)(2)" to reflect the fact that 35 U.S.C. 104 as amended by the Uruguay Round Agreements Act includes paragraphs (a)(1), (2) and (3). For example, § 1.622(b) is revised to read:

(b) The preliminary statement shall state whether the invention was made in the United States, a NAFTA country (and, if so, which NAFTA country), a WTO member country (and if so, which WTO member country), or in a place other than the United States, a NAFTA country, or a WTO member country. If made in a place other than the United States, a NAFTAcountry, or a WTO member country, the preliminary statement shall state whether the party is entitled to the benefit of 35 U.S.C. 104(a)(2).

For the above-stated reasons, § 1.601 is revised by adding new paragraph (r), which, as proposed, defines "NAFTA country" to have the meaning given that term in section 2(4) of the North American Free Trade Act Implementation Act, Pub. L. 103-182, 107 Stat. 2060 (1993). However, since, as noted above, the term "non-NAFTA country" is not being adopted, the proposal to also define that term in § 1.601(r) is hereby withdrawn. Section 1.601 is also revised to include a new paragraph (s) that defines "WTO member country" to have the meaning given that term in section 2(10) of the Uruguay Round Agreements Act, Pub. L. 103-465, 108 Stat. 4813 (1994).

Section 1.684, which relates to the taking of testimony in a foreign country, is removed and reserved in view of the amendments to §§ 1.671-72. Section 1.672 is amended by revising paragraph (a), revising current paragraph (b) and redesignating parts of it as new paragraphs (b), (c) and (d), removing and reserving paragraph (c) and redesignating it as new paragraph (e), revising paragraphs (d) and (e) and redesignating them as new paragraphs (f) and (g), and redesignating paragraph (f) as new paragraph (h).

Specifically, the Notice of Proposed Rulemaking proposed amending § 1.672(a) to require that "testimony not compelled under 35 U.S.C. 24 or compelled from a party or in another country" be taken only by affidavit. Several comments questioned whether the term "compelled" also applies to the phrase "in another country" and suggested inserting "compelled" before that phrase if that is the intent. Inasmuch as the comment correctly states the intent, the suggestion in the comment is being adopted.

One comment supported limiting non-compelled direct testimony to affidavits on the ground that it will reduce the cost of submitting testimony-in-chief and will eliminate economic harassment by a more affluent party of a less affluent opponent, since the less affluent opponent will no longer be required to pay the expense of counsel to attend depositions called by the more affluent party for taking direct testimony. Several comments were opposed, maintaining that affidavits are inherently less credible than live testimony. One comment states:

> Ours is the only country that supports interferences and we should be proud of it, because it demonstrates our commitment to the concept that it is more important to seek right and justice than to settle for a single arbitrary rule of convenience, no matter how convenient. Even if we don't always secure the right result, at least we try. As we invite the rest of the world to become full participants in this uncommon philosophy, we should endeavor to present it in its best light.
>
> How we conduct a trial is a centerpiece of our judicial system. Our interference trial by deposition is a reasonable compromise from a trial in a courtroom type setting. But a trial by affidavit is no trial at all! Affidavits are inevitably contrived, artificial, and often argumentative. They cannot substitute for the extemporaneous words of a witness (even if well coached), and cross-examination is not likely to reconstruct the real truth. Even if it is just in a nuance of expression, it is gone.
>
> The current approach of providing a choice between deposition and affidavit testimony is difficult to accept, but at least it is justifiable on the basis that so many patent attorneys simply don't know how to conduct a deposition, while they do have some experience with affidavits. But the proposal to make affidavits mandatory for direct testimony is contrary to my understanding of American jurisprudence.

Direct testimony on behalf of a party by oral deposition is said to be advantageous to the opponent in that the testimony is the witness' own, the demeanor of the witness can be observed by the opponent (but demeanor is not observed by any member of the Board), and cross-examination can be carried out without a period during which it is said that the witness can be coached in preparation for cross-examination. However, under current practice a party can elect to deprive its opponent of these advantages by electing to use affidavits. Deposition testimony is also said to be advantageous to the party offering the testimony, who may find it more convenient to present the witness at a single deposition for direct and cross-examination than to first prepare an affidavit for direct testimony and later produce the witness at a deposition for cross-examination by an opponent. These supposed advantages are believed to be outweighed by the advantages of requiring that direct non-compelled testimony be in affidavit form. As recognized by those who favor direct testimony by affidavit, there are at least two advantages to taking direct testimony by affidavit, i.e., (1) reducing the cost of presenting a party's own direct testimony and (2) avoiding the expense of attending an opponent's depositions for direct testimony. There are a number of other advantages when direct testimony is taken by affidavit rather than deposition. First, because an opponent will have seen all of the party's direct testimony prior to beginning cross-examination, the opponent should be able to carry out a more pointed and efficient cross-examination, thereby avoiding the need to recall a witness for further examination during the opponent's rebuttal case, which can be costly in time and expense to both the party and the opponent. Second, a party presenting direct testimony by affidavit is less likely to inadvertently, and perhaps fatally, omit an essential part of its proofs than when presenting direct testimony by oral deposition. Third, affidavit testimony will be advantageous to the Board because affidavit testimony can be evaluated more expeditiously than can deposition transcripts, which frequently present the facts in an incoherent manner and too often include a considerable amount of disruptive attorney colloquy. Fourth, in the case of direct testimony by persons testifying in a foreign language, testimony by affidavit (in the English language) should be considerably less cumbersome than testimony by oral deposition through translators.

Two comments suggested that there may be cases in which both parties find it mutually convenient to present their direct testimony by oral deposition and that under these circumstances the administrative patent judge should be allowed to authorize such depositions. The suggestion is not being adopted, because it would eliminate the above-noted advantages of reducing the likelihood of omitting an essential part of the proofs and having the Board consider direct testimony presented in a more coherent form.

Another comment suggested that there appears to be no need why all testimony abroad must be by oral deposition, noting, for example, that a third-party witness may be willing to give an affidavit comprising the direct testimony, provided cross-examination will be conducted in the witness's home country. Still another comment asked how the parties should handle a situation where a party's witness residing in a foreign country, due to health or other serious impediment, is unable to travel to the United States for cross-examination, but is willing to testify in the foreign country, which allows testimony, for example, only by written interrogatories. The answer in both situations, as well as in other unusual situations not provided for by the rules, is to file a motion (§ 1.635) for permission to take the testimony in a manner other than by deposition. The motion may or may not be granted depending on the particular circumstances. In order to make it clear that the administrative patent judge and the Board have discretion in unusual circumstances to grant appropriate relief, § 1.672 is further revised by adding a new paragraph (i) reading as follows:

(i) In an unusual circumstance and upon a showing that testimony cannot be taken in accordance with the provisions of this subpart, an administrative patent judge upon motion (§ 1.635) may authorize testimony to be taken in another manner.

Section 1.672(b), as it was proposed to be revised in the Notice of Proposed Rulemaking, includes a requirement that a party presenting testimony of a witness by affidavit, within the time set by the administrative patent judge for serving affidavits, file a copy of the affidavit. Since, for reasons discussed *infra*, § 1.671(e) is being retained in modified form rather than being removed and reserved, as was proposed, § 1.672(b) as adopted, like current § 1.672(b), permits a party to file a copy of the affidavit or, if appropriate, a notice under 1.671(e). If the affidavit relates to a party's case-in-chief, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-chief. If the affidavit relates to a party's case-in-rebuttal, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-rebuttal. A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document.

As proposed in the Notice of Proposed Rulemaking, a new paragraph (c) is added to § 1.672 stating that where an opponent objects to the admissibility of any evidence contained in or submitted with an affidavit, the opponent must file and serve objections stating with particularity the nature of the objection. Any objection should identify the specific Federal Rule of Evidence that renders the evidence inadmissible and shall explain why the Rule applies to the evidence sought to be introduced. No oppositions to the objections are authorized. Rather, the party may respond by filing supplemental evidence in the form of affidavits, official records and printed publications. Alternatively, the party may determine that the objection is without merit and do nothing. One comment suggested that "supplemental affidavits and supplemental official records and printed publications" in the third sentence of § 1.672(c) as proposed be changed to "one or more supplemental affidavits, official records or printed publications." The suggestion is being adopted. The same or similar changes have been made in the third sentence of § 1.682(c) and in the third sentence of § 1.683(b); in the third sentence of § 1.688(b) "supplemental affidavits" has been changed to "one or more supplemental affidavits." Section 1.672(c) further provides that any objections to the admissibility of any evidence contained in or submitted with a supplemental affidavit shall be made only by a motion to suppress under § 1.656(h).

As proposed in the Notice of Proposed Rulemaking, § 1.672 is revised by adding a new paragraph (d) requiring any cross-examination of an affiant to be by deposition at a reasonable location within "the United States," which is defined in § 1.601(p) and 35 U.S.C. 100(c) to mean "the United States of America, its territories and possessions." For purposes of the interference rules, the term "territories and possessions" is broadly construed to refer to all territories and possessions of the United States, including, for example, the Commonwealth of Puerto Rico.

An opponent who believes that a party is producing an affiant for cross-examination in an "unreasonable" location may move (§ 1.635) for entry of an order by an administrative patent judge to set the location of the deposition for cross-examination. Paragraph (d) also requires that the party whose witness is to be cross-examined give notice of the deposition under § 1.673(e), obtain a court reporter and provide a translator if the witness will not testify in English. Although not expressly set forth in the rules as amended, it should be understood that any party attending the deposition can bring its own translator or the parties can agree to share the cost of a single mutually agreeable translator.

Comments were received against the proposal that § 1.672(d) require cross-examination of affiants to be conducted by oral deposition "at a reasonable location within the United States." One comment suggested that requiring a witness who resides in a foreign country to travel to the United States for cross-examination will be extremely inconvenient where the witness is a key person for a company. The comment also suggested that the term "United States" be amended to additionally include U.S. embassies and/or consulates in foreign countries, at least for purposes of conducting cross-examination. The suggestion is not being adopted. Given the time differences between the United States and Europe or the United States and Asia, it is highly likely that administrative patent judges would not be on duty to rule on telephonic requests for admissibility of evidence. Furthermore, a party whose witness is to testify on cross-examination at a "trial" (i.e., interference proceeding) in the United States should produce the witness for cross-examination at a reasonable location within the United States. Finally, in view of PTO's general lack of experience regarding procedures for, and difficulties which may arise in, taking deposition testimony in a foreign country, PTO has decided, at least for the time being, to take a conservative approach regarding taking testimony in a foreign country. The approach will be reevaluated after PTO gains some experience with foreign deposition testimony taken pursuant to § 1.671(h).

One comment suggested inserting a comma after "reporter" in the fifth sentence of proposed § 1.672(d), as well as in the fifth sentences of proposed §§ 1.682(d), 1.683(c) and 1.688(c). The suggestion is being adopted.

The Notice of Proposed Rulemaking proposed to redesignate current § 1.672(d) ("When a deposition is authorized under this subpart, if the parties agree in writing, the deposition may be taken before any person authorized to administer oaths, at any place, upon any notice, and in any manner, and when so taken may be used like other depositions.") as § 1.672(f). One comment questioned whether § 1.672(f) (former § 1.672(d)) applies to cross-examination deposition testimony authorized by §§ 1.672(d), 1.673(a), 1.682(d), 1.683(c) and 1.688(c). Implicit in the comment is a question of whether proposed § 1.672(f) would authorize the parties, with respect to deposition testimony that has been authorized by the rules or by an administrative patent judge to be taken in the United States, to agree to take the deposition outside the United States. For the reasons discussed above, the parties may not agree, absent the permission of an administrative patent judge or the Board, to take a deposition outside the United States. Accordingly, § 1.672(f), as amended, provides that depositions authorized to be taken within the United States are to be taken within the United States: "When a deposition is authorized to be taken within the United States under this subpart and if the parties agree in writing, the deposition may be taken in any place within the United States, before any person authorized to administer oaths, upon any notice, and in any manner, and when so taken may be used like other depositions."

Current § 1.672(e), which is being redesignated as § 1.672(g), reads as follows: "If the parties agree in writing, the testimony of any witness may be submitted in the form of an affidavit without opportunity for cross-examination. The affidavit shall be filed in the Patent and Trademark Office." Although not proposed in the Notice of Proposed Rulemaking, this section is revised to be consistent with the other amendments to §§ 1.671-73 so as to read as follows: "If the parties agree in writing, the affidavit testimony of any witness may be submitted without opportunity for cross-examination."

As proposed in the Notice of Proposed Rulemaking, current § 1.672(f), which concerns the filing of agreed statements setting forth how a particular witness would testify if called or the facts in the case of one or more of the parties, is redesignated as § 1.672(h).

In addition to the proposed amendments discussed above, current § 1.672(b) is revised, as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking, by deleting the third sentence, which specifies the type of paper to be used for affidavits, as superfluous in view of § 1.677(a); and in paragraph (d), the fifth sentence ("A party electing to present testimony of a witness by deposition shall notice a deposition of the witness under § 1.673(a).") is removed as superfluous in view of the second sentence of new § 1.672(d).

In § 1.671, the Notice of Proposed Rulemaking proposed to amend paragraph (a) to read as follows: "Evidence consists of testimony and exhibits, official records and publications filed under § 1.682, testimony from another interference, proceeding, or action filed under § 1.683, and discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent: . . . ." One comment suggested that "and discovery" be changed to "discovery" in order to remove an unnecessary "and." The suggestion is being adopted. Another comment suggested inserting "and exhibits" after "testimony" in the phrase "testimony from another interference, proceeding, or action under § 1.683." The suggestion is being adopted, but with the term "exhibits" prefaced by "referenced" to make it clear that it relates only to exhibits referred to by a witness in an affidavit or during an oral deposition. Clarification is necessary because, as noted in the discussion of § 1.653(c)(5), *infra*, the term "exhibit" also includes official records and printed publications relied on under § 1.682, which are not referred to by a witness in an affidavit or during an oral deposition. For the same reason, "referenced" is also inserted before the first occurrence of "exhibits" in § 1.671(a). A similar clarifying amendment is also made to § 1.683(a).

The Notice of Proposed Rulemaking proposed to revise § 1.671(f) to state that "[t]he significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by *the* witness" (emphasis added) in order to clarify that the requirement for the significance of documentary and other exhibits to be discussed with particularity by a witness applies only to documentary and other exhibits identified by a witness in an affidavit or during oral deposition. One comment indicated that proposed § 1.671(f) fails to recognize that a witness may be called merely to authenticate a piece of evidence, e.g., a photograph, which is to be discussed with particularity by another witness. The comment is well taken. Accordingly, § 1.671(f) is revised to read as follows: "The significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by *a* witness." Thus, § 1.671(f) does not apply to official records and printed publications submitted into evidence pursuant to § 1.682(a).

The Notice of Proposed Rulemaking proposed that § 1.671(g), which currently requires a party to file a motion (§ 1.635) to obtain permission prior to taking testimony or seeking documents or things "under 35 U.S.C. 24," be revised to require a motion "prior to compelling testimony or production of documents or things under 35 U.S.C. 24 or from a party." One comment suggested that the requirement to obtain permission from an administrative patent judge before noticing an employee of one's opponent as a hostile witness is important. Another comment took issue with the requirement and the statement in the Notice of Proposed Rulemaking that "all depositions for a case-in-chief would have to be approved by an administrative patent judge" (59 FR at 50191), stating:

> I suppose that means by motion with an explanation of what the deposition will cover. Such a procedure will destroy the ability to obtain effective testimony from an adverse witness, because of the need to reveal the strategy. Particularly in a derivation contest, the ability to obtain unrehearsed testimony of the adverse party will be lost, and he [sic; his testimony] may be the only corroboration available. Heretofore, taking the deposition of one's adverse party to obtain evidence for one's case-in-chief has been a matter of right on serving proper notice. It is essential that this right be preserved. Obviously, this procedure should not be used to discover a senior party's case-in-chief, and that limitation is easily protected by objection to any such questions that are not also related to the junior party's case-in-chief, and then either (a) calling the judge for an immediate ruling, or (b) refusing to answer the question.

Assuming for the sake of argument that the current interference rules permit a party to notice the deposition of an opponent's witness in order to take direct testimony of the type described above without first obtaining permission from an administrative patent judge, the interference rules do not provide any sanction for the failure of the witness to appear at a noticed deposition. Consequently, even under the current rules the party seeking the testimony of an opponent's witness, as a practical matter, must obtain an order from an administrative patent judge or the Board requiring the witness to appear so that the opponent can be sanctioned under § 1.616 if the witness fails to appear.

One comment suggested that the proposed new last sentence for § 1.671(g) ("The testimony of the witness shall be taken on oral deposition.") be omitted as superfluous in view of § 1.672(a) as amended. The suggestion is being adopted.

A comment suggested that § 1.671(g) be modified to expressly apply to an entity or witness under the opponent's control. The modification is not believed to be necessary. The term "party" is defined in § 1.601(l) to include an inventor's legal representative or assignee. The term "opponent," while not defined per se in the rules, is a "party" who happens to be a "second" party opponent of a "first" party. Section 1.671(g) applies where a witness is under the control of a party opponent's assignee.

As proposed in the Notice of Proposed Rulemaking, a new paragraph (h) is added to § 1.671 providing that a party seeking to compel testimony or production of documents or things in a foreign country must file a motion (§ 1.635) to obtain permission from an administrative patent judge. The motion must show that the witness has been asked to testify in the United States and has refused to do so or that the individual or entity having possession, custody, or control of the document or thing has refused to produce the document or thing in the United States, even though the moving party has offered to pay the expenses involved in bringing the witness or the document or thing to the United States. When permission has been obtained from the administrative patent judge, the party, after also complying with the requirements for an oral conference (§ 1.673(g)), and service of documents and a proffer of access to things (§ 1.673(b)), must notice the deposition under § 1.673(a).

With respect to the requirements for a motion to compel testimony or production of documents or things in a foreign country, one comment suggested that the phrase "possession, custody and control" in proposed § 1.671(h)(2)(iii) appears to include a typographical error and should be changed to read "possession, custody *or* control." The suggestion is being adopted.

Another comment suggested that the administrative patent judge would benefit from being additionally advised of (1) the foreign country where the witness, document or thing is located, (2) a summary of the procedures proposed to be followed to compel the testimony or production of documents or things in the foreign country, and (3) the time likely to be required to complete the procedures. In support, the comment notes that compelling testimony or production of documents in a foreign country can be so time-consuming that it may outweigh the benefit of allowing the testimony or documents to be obtained, considering their likely probative value and other relevant considerations. The comment continues that in order to allow the administrative patent judge to supervise the progress of the interference and to allow establishment of an appropriate schedule for the interference, the rules should require the suggested procedural information. These suggestions are being adopted. Adoption of these suggestions, however, should not be construed as a policy determination by PTO that it intends to approve of, or tolerate, unwarranted delays in obtaining testimony in a foreign country. The spirit of 35 U.S.C. 104 requires that evidence be obtainable in a foreign country essentially on the same basis that it is obtainable in the United States. When the laws and procedures in a foreign country make it so time-consuming to obtain evidence that the evidence is essentially not available in a reasonable manner, then the "adverse inferences" provision of new § 1.616(c) may be appropriately applied.

Another comment notes that proposed § 1.671(h)(1)(iv) for witnesses and § 1.671(h)(2)(iii) for documents and things assume that it will be possible to request the holder of the evidence to voluntarily produce it and obtain a definitive response to the request, whereas it is said that discovery experience in foreign countries shows that those possessing evidence often evade contact or, when contacted, evade giving a definitive response. Accordingly, the comment suggested that these provisions be reworded as follows:

> § 1.671(h)(1)(iv). Demonstrate that the party has made reasonable efforts to secure the agreement of the witness to testify in the United States but has been unsuccessful in obtaining the agreement, even though the party has offered to pay the expenses of the witness to travel to and testify in the United States.
>
> § 1.671(h)(2)(iii). Demonstrate that the party has made reasonable efforts to obtain the agreement of the individual or entity having possession, custody, or control of the document to produce the document or thing in the United States but has been unsuccessful in obtaining that agreement, even though the party has offered to pay the expenses of producing the document or thing in the United States.

The suggestion is being adopted. The expenses of a witness traveling to the United States means the round-trip travel expenses.

The Notice of Proposed Rulemaking proposed the addition to § 1.671 of a new paragraph (j), which is patterned on paragraph (e) of § 1.684 (removed and reserved). Section 1.671(j), as it was proposed, reads as follows:

> (j) The weight to be given testimony taken in a foreign country will be determined on a case-by-case basis. Little, if any, weight may be given to testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence (1) that giving false testimony in an interference proceeding is punishable as perjury under the laws of the foreign country where the testimony is taken and (2) that the punishment in a foreign country for giving such false testimony is similar to the punishment for perjury committed in the United States.

A number of comments were received in response to the proposal. Two comments questioned whether § 1.671(j) is intended to apply to affidavit testimony as well as deposition testimony. One comment suggested that the rule be expressly limited to deposition testimony, since testimony by affidavit (including declarations) can be taken in foreign countries under the perjury provisions of 28 U.S.C. 1746(1), and is additionally subject to the safeguard of cross-examination in the United States under proposed § 1.672(d). For these reasons, and also because current § 1.684(e), on which § 1.671(j) is patterned, applies only to deposition testimony in a foreign country in the form of interrogatories answered under oath, the suggestion to expressly limit § 1.671(j) to deposition testimony is being adopted.

Two comments stated that the party taking testimony in a foreign country should not have the burden of proving that the giving of false testimony is punishable as perjury under the law of the foreign country, as it may be difficult or impossible to prove or may not even be in dispute, and that the burden is especially unfair where a party is being forced to take testimony abroad by circumstances beyond its control. Both comments suggested putting the burden instead on the opponent to show that the requirements are not similar, such as by moving under § 1.635 to accord the testimony little weight or moving under § 1.656(h) to suppress the testimony altogether. Section 1.671(j), as proposed in the Notice of Proposed Rulemaking, does not alter who has the burden of proof with respect to testimony in a foreign country; the burden remains on the party offering the testimony, just as under current § 1.684(e).

Another comment questioned whether the first sentence of the rule as it was proposed, because it states that the weight of testimony "will be determined on a case-by-case basis," might be construed as allowing the effect to be given testimony in a particular foreign country in a given interference to be decided without regard to the effect given in prior interferences to testimony given in that country. The comment stated that the rule as proposed might be contrary to the goals of equal treatment of similarly situated parties and predictability of outcome, which would best be served by a system in which the Board publishes decisions making findings as to the adequacy of the testimonial procedures in particular foreign countries and then follows those decisions in subsequent cases, and suggested changing "on a case-by-case basis" to read "in view of all the circumstances, including the laws of the foreign country governing the testimony." The suggestion is being adopted.

Another comment suggested that the "clear and convincing evidence" standard in the second sentence of proposed § 1.671(j) inappropriately implies that the determination of content of the law of a foreign country is a question of fact. PTO intends to treat the determination of the content of the law of a foreign country as a question of fact. Accordingly, the language "as a matter of fact" is inserted in § 1.671(j). The same comment further indicates that the proposed second sentence is troublesome because it (1) requires a showing that giving false testimony is punishable as "perjury" under the laws of the foreign country rather than under some other name, (2) does not on its face allow the foreign offense to be applicable only when false testimony is given with the appropriate intent, and (3) requires that the foreign punishment be "similar to" United States punishment, when comparable or greater punishment would seem to serve the purpose of the proposed rule. The comment suggested that the foregoing problems can be avoided by replacing the proposed second sentence with the following sentence:

> Little, if any, weight may be given to oral testimony given in a foreign country unless it is demonstrated (1) that the giving of false testimony in the interference proceeding would be punishable under the laws of the foreign country where the testimony was taken under circumstances similar to those defined as perjury under the laws of the United States and (2) that the punishment in the foreign country for giving such false testimony is comparable to or greater than the punishment for perjury committed under the laws of the United States.

The comment additionally suggested adding a third sentence patterned on the second and third sentences of Fed. R. Civ. P. 44.1 and reading as follows: "Such a demonstration may be made by any relevant material or source, including testimony, whether or not admissible under this subpart." To address the comments, which are believed to be well taken, the proposed second sentence is replaced with the following two sentences:

> Little, if any, weight may be given to deposition testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence, as a matter of fact, that knowingly giving false testimony in that country in connection with an interference proceeding in the United States Patent and Trademark Office is punishable under the laws of that country and that the punishment in that country for such false testimony is comparable to or greater than the punishment for perjury committed in the United States. The administrative patent judge and the Board, in determining foreign law, may consider any relevant material or source, including testimony, whether or not submitted by a party or admissible under the Federal Rules of Evidence.

The finally adopted language is also responsive to another comment requesting clarification of the term "similar" in order

to assist practitioners, and possibly foreign governments in promulgating laws in harmony with 35 U.S.C. 104 and § 1.671.

In addition to the above amendments, § 1.671(a), which identifies the various types of testimony, is revised as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking, by changing "*evidence* from another interference, proceeding, or action filed under § 1.683" to "*testimony* from another interference, proceeding, or action filed under § 1.683" in order to be consistent with the terminology of § 1.683. Sections 1.671(c)(6) and (c)(7) are revised by changing "by oral deposition or affidavit" to "by affidavit or oral deposition."

Section 1.673 is also amended as proposed in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking. Specifically, § 1.673(b) is revised by (1) changing the time for service of evidence to be relied on at an oral deposition from "at least three days" prior to the conference required by § 1.673(g) when service is by hand or by Express Mail to "at least three working days" prior to the conference, (2) changing the time for service by any other means from 10 days to 14 days prior to the conference and (3) removing the quotation marks around "Express Mail."

The second sentence of § 1.673(d) is removed, as proposed in the Notice of Proposed Rulemaking, as unnecessary, because all depositions for a case-in-chief require approval by an administrative patent judge.

Section 1.673(e) is revised, as proposed, by changing "party electing to present testimony by affidavit" to "party who has presented testimony by affidavit."

One comment suggested amending § 1.673(g) to state that a party, prior to serving a notice of deposition and after complying with paragraph (b) of § 1.673, shall contact the administrative patent judge, who shall then have an oral conference with the party and all opponents. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. In any event, it is expected that in most cases the parties will be able to agree on a time and place for depositions without the need for participation by an administrative patent judge.

Concerning the first sentence of § 1.673(a), one comment suggested deleting the term "single" from "single notice of deposition" on the ground that the current language might be construed to mean that a party must file only a single notice of deposition listing all depositions. The same suggestion was offered with respect to paragraph (e) of § 1.673. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

The Notice of Proposed Rulemaking proposed to amend § 1.616 by adding a new paragraph (c), patterned after 35 U.S.C. 104(b), stating that to the extent that any information under the control of an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention has been ordered to be produced by an administrative patent judge or the Board (§ 1.671(h)), but is not produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference. Section 1.616(c) further provides that this "other action" may include the imposition of appropriate sanctions under § 1.616(a).

One comment questioned whether the failure of an individual or entity located in a NAFTA country or a WTO member country to provide the information requested by a party can result in the imposition of sanctions against an opponent from that country even though the opponent is not at fault. The answer is yes. One purpose of 35 U.S.C. 104 is to ensure that evidence for interferences is available in foreign countries in essentially the same manner that it is available in the United States. If the evidence is not available, then the appropriate inference provisions of 35 U.S.C. 104 shall be applied by PTO.

After the Notice of Proposed Rulemaking was published, it became apparent that the term "ordered" in the phrase "to the extent that any information under the control of an individual or entity located in a NAFTA country or a WTO member country . . . has been ordered to be produced by an administrative patent judge or the Board" may not be appropriate. Neither an administrative patent judge nor the Board can order testimony or production of documents and things in a foreign country from a witness who, or an entity that, is neither a party nor under the control of a party. Instead, an administrative patent judge or the Board can only authorize a party to seek to compel testimony or production in a foreign country from a witness or entity not under the control of a party. Accordingly, § 1.616(c) as adopted reads instead as follows:

> (c) To the extent that an administrative patent judge or the Board has authorized a party to compel the taking of testimony or the production of documents or things from an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention (§ 1.671(h)), but the testimony, documents or things have not been produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference, including imposition of appropriate sanctions under paragraph (a) of this section.

As proposed in the Notice of Proposed Rulemaking, § 1.647, which currently requires a party who relies on a non-English language document to provide an English-language translation and an affidavit attesting to its accuracy, is revised to extend these requirements to any non-English language documents that a party is required to produce via discovery. One comment expressed the concern that the proposed amendment might impose an unnecessary financial burden on a non-U.S. party by requiring translations of compelled documents that are very long and have little or no relevance. The concern is believed to be misplaced. First, discovery in interferences, like discovery under the Federal Rules of Civil Procedure, is limited to evidence that is relevant. Second, as to relevant evidence, the scope of discovery under the interference rules is considerably narrower than the discovery available under the Federal Rules of Civil Procedure. Another comment stated that the general practice is that a party proffering a document is responsible for the cost of translation. The comment nevertheless suggested that in the case of documents offered to be produced during discovery, including cross-examination discovery pursuant to § 1.687(b), the documents be produced in the foreign language, with the recipient then indicating which documents it wishes to have translated and costs to be borne equally by the parties. The suggestion is not being adopted. In implementing practice under 35 U.S.C. 104, as amended, it is PTO's initial view that a correct policy is the one which the commentator says is the "general practice." Whether a different policy might be appropriate at some future time is something that will be tested with experience.

II. Compensatory Attorney Fees and Expenses.

Section 1.616, in addition to the amendments discussed above, also is revised by redesignating current paragraphs (a) through (e) as paragraphs (a)(1) through (a)(4) and (a)(6) and adding new paragraphs (a)(5) and (b).

Section 1.616(a)(5), as amended, authorizes the award of compensatory (as opposed to punitive) expenses and/or compensatory attorney fees as a sanction for failing to comply with the rules or an order. This sanction shall apply only to conduct occurring in an interference on or after the effective date of § 1.616 as amended. It is believed that there may be occasions when an award of compensatory expenses and/or compensatory attorney fees would be more commensurate in scope with the infraction than the sanctions that are currently authorized.

There are administrative decisions which seemingly hold that the tribunals of PTO do not have authority to award expenses and attorney fees. *See, e.g., Driscoll v. Cebalo*, 5 USPQ2d 1477, 1481 (Bd. Pat. Int. 1982) (the rules do not provide us with the jurisdiction to award expenses and we know of no authority which does), *aff'd in part, rev'd in part*, 731 F.2d 878, 221 USPQ 745 (Fed. Cir. 1984); *Clevenger v. Martin*, 1 USPQ2d 1793, 1797 (Bd. Pat. App. & Int. 1986) (we do not have authority under the rules to award attorney's fees); *MacMillan Bloedel, Ltd. v. Arrow-M Corp.*, 203 USPQ 952, 953 (TTAB 1979) (the TTAB is without authority to award expenses and attorney's fees); *Fisons, Ltd. v. Capability Brown, Ltd.*, 209 USPQ 167, 171 (TTAB 1980) (request for attorney's fees denied because good cause not shown and the TTAB has no authority to grant such requests); *Jonergin Co. v. Jonergin Vermont, Inc.*, 222 USPQ 337, 340-41 (Comm'r Pat. 1983) (TTAB did not err in refusing to award reasonable expenses and attorney's fees under 37 CFR 2.116(a), 2.120 and Fed. R. Civ. P. 37(a)(4)); *Anheuser-Busch, Inc. v. Major Mud & Chemical Co.*, 221 USPQ 1191, 1195 n.9 (TTAB 1984) (request for costs and attorneys fees was denied, inter alia, on the ground that the TTAB had no authority to award such fees and costs); *Luehrmann v. Kwik Kopy Corp.*, 2 USPQ2d 1303, 1305 n.4 (TTAB 1987) (the TTAB has no authority to grant monetary relief); *Fort Howard Paper Co. v. G.V. Gambina, Inc.*, 4 USPQ2d 1552, 1554 (TTAB 1987) (the TTAB has no authority to order costs or attorney's fees); *Paolo's Associates Ltd. Partnership v. Bodo*, 21 USPQ2d 1899, 1904 n.3 (Comm'r Pat. 1990) (the TTAB was correct in holding that 37 CFR 2.127(f) denies the TTAB authority to either award attorney's fees or costs to any party in a cancellation and opposition proceeding); *Nabisco Brands, Inc. v. Keebler Co.*, 28 USPQ2d 1237, 1238 (TTAB 1993) (the TTAB held, inter alia, that it did not have authority to award fees under 37 CFR 2.127(f)).

None of the decisions mentioned above provide any reasoned analysis or rationale to explain why the Commissioner lacks authority to promulgate a rule which would authorize imposition of monetary sanctions in appropriate cases. In view of the existence of the decisions, however, it is believed that a discussion of the Commissioner's authority to promulgate a rule authorizing the Board to award compensatory monetary sanctions is appropriate.

The Commissioner has been delegated the authority by the Congress to "establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office." 35 U.S.C. 6(a).

The U.S. Court of Appeals for the Federal Circuit upheld the authority of the Commissioner to issue regulations imposing sanctions in interference cases. In *Gerritsen v. Shirai*, 979 F.2d 1524, 24 USPQ2d 1912 (Fed. Cir. 1992), the Federal Circuit noted that 37 CFR 1.616 was a permissible exercise of the Commissioner's authority under 35 U.S.C. 6(a) and complied with the limitation on sanctions of the Administrative Procedure Act. The court stated (979 F.2d at 1527 n.3, 24 USPQ2d at 1915 n.3):

> 35 U.S.C. § 6(a) (1988) permits the Commissioner of Patents and Trademarks to "establish regulations, not inconsistent with law, for the conduct of proceedings in the Patent and Trademark Office." Congress thus delegated plenary authority over PTO practice, including interference proceedings, to the Commissioner. On its face, 37 CFR § 1.616 represents a permissible exercise of that authority. Since the decision to impose a sanction . . . was authorized by law, it comports with the Administrative Procedure Act, 5 U.S.C. § 558(b) (1988).

In *Gerritsen*, the Federal Circuit held that the particular rule violation was sanctionable, but that the specific sanction chosen by the Board was too severe. Accordingly, the sanction was vacated and the case was remanded to the Board for imposition of a more appropriate sanction.

In *Abrutyn v. Giovanniello*, 15 F.3d 1048, 1050, 29 USPQ2d 1615, 1617 (Fed. Cir. 1994), the Federal Circuit again upheld the authority of the Board or an administrative patent judge to impose sanctions, including imposition of the most severe sanction, granting judgment against one of the parties:

> The Board or EIC [Examiner-in-Chief, now administrative patent judge] may impose an appropriate sanction, including granting judgment in an interference, against a party who fails to comply with the rules governing interferences, including filing deadlines. 37 CFR § 1.616 (1993).

Gerritsen and *Abrutyn* judicially establish that the Commissioner has authority under 35 U.S.C. 6(a) to promulgate regulations which impose a spectrum of sanctions, including imposition of the ultimate sanction of judgment or dismissal.

As a general matter, agencies are given broad authority in the selection of an appropriate sanction. The choice of sanction within agency statutory limits will be upheld unless it constitutes an abuse of discretion. *Butz v. Glover Livestock Comm'n Co.*, 411 U.S. 182 (1973); *Lawrence v. Commodity Futures Trading Comm'n*, 759 F.2d 767, 774 (9th Cir. 1985). Current § 1.616 authorizes an administrative patent judge or the Board to impose a spectrum of sanctions. The sanctions range from holding certain facts established for purposes of the interference (37 CFR § 1.616(a)) to granting judgment against the party who violated a regulation or an order (37 CFR § 1.616(e)). As indicated above, the Federal Circuit has upheld the Commissioner's authority to promulgate § 1.616 and impose the specified sanctions (*Gerritsen*, 979 F.2d at 1527 n.3, 24 USPQ2d at 1915 n.3), including granting judgment against a party (*Abrutyn*, 15 F.3d at 1050, 29 USPQ2d at 1617). Judgment and dismissal are the most severe forms of sanction. *See National Hockey League v. Metropolitan Hockey Club*, 427 U.S. 639, 643 (1976); *Poulis v. State Farm Fire and Casualty Co.*, 747 F.2d 863, 867 (3d Cir. 1984); *Cine Forty-Second St. Theatre Corp. v. Allied Artists Pictures Corp.*, 602 F.2d 1062, 1066 (2d Cir. 1979). Consistent with these cases, the Federal Circuit has held that a holding by the Board that a party is not entitled to a patent directed to certain claims is an extreme sanction. *Gerritsen*, 979 F.2d at 1532 n.12, 24 USPQ2d at 1919 n.12.

The imposition of monetary sanctions is manifestly a lesser sanction than judgment or dismissal. Indeed, reimbursement of expenses incurred as a result of inappropriate action by the opposing party has been held to be a mild form of sanction. *Cine Forty-Second St.*, 602 F.2d at 1066. More stringent sanctions include orders striking out portions of a pleading, orders prohibiting the introduction of evidence on a particular point, and orders deeming a disputed issue determined adversely to the position of a disobedient party. *Id.*

Since the imposition of a monetary sanction is a lesser sanction than judgment against a party, the inclusion of an "appropriate" monetary sanction in § 1.616, as adopted, is not outside the Commissioner's rulemaking authority and would not be inconsistent with the sanctions already present in § 1.616.

Whether a monetary sanction is appropriate depends on the purpose of the sanction. Civil sanctions may be categorized as penal and remedial. One is not to be subjected by an agency to a penal sanction unless the words of the statute plainly authorize imposition of a penal sanction. *Commissioner v. Acker*, 361 U.S. 87, 91 (1959). Thus, a statute must plainly authorize an agency's power to impose penalties. *Pender Peanut Corp. v. United States*, 20 Cl. Ct. 447, 453-55 (1990). Agencies have no inherent authority, based solely on their enabling statute, to impose penal sanctions. That authority must be expressly given in the statute. *Pender Peanut Corp.*, 20 Cl. Ct. at 453-55 (1990); *Gold Kist, Inc. v. Department of Agriculture*, 741 F.2d 344, 348 (11th Cir. 1984); Koch, *Administrative Law and Practice* § 6.81 (1985). A penal sanction has been defined as one which inflicts a punishment. *United States v. Frame*, 885 F.2d 1119, 1142 (3d Cir. 1989).

On the other hand, an explicit grant of power from Congress need not underpin each exercise of agency authority. *See Zols v. Interstate Commerce Commission*, 889 F.2d 508, 516 (3d Cir. 1989), *citing Amoskeag Co. v. Interstate Commerce Commission*, 590 F.2d 388, 392 (1st Cir. 1979). Where the enabling statute authorizes the agency to make such rules and regulations as may be necessary to carry out the provisions of an act -- the regulation will be sustained so long as it is reasonably related to the purpose of the act. *Mourning v. Family Publications Service, Inc.*, 411 U.S. 356, 369 (1973). Under its enabling legislation, an agency has inherent power to impose administrative sanctions that are not "penalties" as long as the sanctions are reasonably related to the purpose of the enabling statute. *Gold Kist*, 741 F.2d at 348. Accordingly, in evaluating whether the imposition of a sanction is within an agency's inherent powers, it is necessary to determine whether the sanction is remedial or punitive. *Frame*, 885 F.2d at 1142. Remedial sanctions may be within the agency's inherent powers if reasonably related to the purpose of enabling legislation. A remedial sanction is one whose purpose is not to stigmatize or punish wrongdoers. *Frame*, 885 F.2d at 1143.

Thus, in the absence of express statutory authority, the Commissioner's authority to impose monetary sanctions is limited to sanctions which are remedial in nature rather than punitive.

In addition, the sanctions must be reasonably related to the purpose of enabling statute under which PTO operates. Under these guidelines, the Commissioner would appear to be without authority to issue a regulation which permits a penal sanction to be imposed against a party or an attorney for violation of a rule or order. Fines payable to Government, including PTO, are manifestly intended to punish wrongdoing and are thus punitive in nature. Assessment to redress an injury to the public is in the nature of a penalty. *Republic Steel Corp. v. National Labor Relations Board*, 311 U.S. 7, 12-13 (1940). On the other hand, the imposition of costs or expenses, including attorneys' fees, incurred by an opposing party due to the violation of a rule or order, may properly be considered remedial. Imposing costs or attorneys' fees serves to defray the expenses actually incurred by the opposing party for the violation of a rule or order by an opponent. *See Poulis*, 747 F.2d at 869 (non-dilatory party will not have to bear the brunt of the attorney's delay). Monetary sanctions would enhance the Board's ability to protect the integrity of its proceedings. *See Zola* 889 F.2d at 516 (ICC justified in imposing monetary sanctions in acting to protect the integrity of its jurisdiction). Monetary sanctions would also allow the Board to maintain control of its docket to maximize the use of limited resources. *See Griffin & Dickson v. United States*, 16 Cl. Ct. 347, 351 (1989) (case management responsibilities require broad inherent authority to impose [non-penal] sanctions). Imposition of monetary sanctions is the only sanction both mild enough and flexible enough to use in day-to-day enforcement of orderly and expeditious litigation. *Eash v. Riggins Trucking, Inc.*, 757 F.2d 557, 567 (3d Cir. 1985) (in banc). Thus, monetary sanctions are reasonably related to the Commissioner's plenary authority to promulgate regulations for the conduct of proceedings, including interference proceedings in PTO.

Section 1.616(b), as proposed to be amended, would have authorized the imposition of a sanction, including a sanction in the form of compensatory expenses and/or attorney fees, against a party for taking or maintaining a frivolous position. A number of comments were received opposing the authorization of sanctions for taking or maintaining frivolous positions (§ 1.616(b)). Several comments suggested that the question of what is "frivolous" is inherently highly subjective and will therefore be frequently raised, substantially increasing costs and delaying decisions on more substantive issues. PTO believes, however, consistent with other comments received during the comment period, that inasmuch as a groundless motion for sanctions would itself be grounds for sanctioning the movant for taking or maintaining a frivolous position, it is expected that motions for sanctions will only be filed in clear cases. One comment suggested that § 1.616(b) be reworded to parallel Rule 11 of the Federal Rules of Civil Procedure so that sanctions would only be imposed upon motion by an opponent, subject to a twenty-one day "safe harbor" withdrawal provision, and would explicitly apply only to frivolous positions taken in writing. Another comment, while supportive of the proposed amendment on the ground that it should reduce the number of frivolous papers, cautioned against treating as frivolous "that which is simply born of ignorance." The suggestion to have § 1.616(b) authorize sanctions imposed only on motion by a party is not being adopted. There may be situations in which the Board believes it would be appropriate to award compensatory fees or expenses even in the absence of a motion by a party. The suggestion that Fed. R. Civ. P. 11 permits sanctions only upon motion is believed to be incorrect; for example, Fed. R. Civ. P. 11(c)(1)(b) authorizes sanctions on the court's initiative. The suggestion to use the "safe harbor" approach of Fed. R. Civ. P. 11(c)(1)(A), which provides that a motion for sanctions shall be served but not filed unless, within 21 days after service of the motion, the challenged position is not withdrawn or appropriately corrected, is not being adopted. The administrative patent judge and the Board should know the reason why a party has withdrawn or corrected a position. Nevertheless, in order to make it clear that sanctions will not be imposed for mistakenly taking an erroneous position that is withdrawn or corrected as soon as the error becomes apparent, the proposed phrase "for taking *or* maintaining a frivolous position" is changed to "for taking *and* maintaining a frivolous position."

The suggestion that § 1.616(b) sanctions be limited to frivolous positions taken in writing is based on the Advisory Committee Note on the 1993 amendments to Fed. R. Civ. P. 11. The Note states in pertinent part: "The rule applies only to assertions contained in papers filed with or submitted to the court. It does not cover matters arising for the first time during oral presentations to the court, when counsel may make statements that would not have been made if there had been more time for study and reflection." For the reason given in the Advisory Committee Note, the suggestion is being adopted. Accordingly, § 1.616(b) as adopted is limited to a frivolous position taken and maintained in papers filed in the interference and shall apply only to frivolous positions taken and maintained after the effective date of § 1.616 as amended.

Other comments questioned how the Board intends to handle proof of amounts of compensatory expenses and/or attorney fees and expressed the hope that attorney fee awards will not be *de facto* discriminatory as between highly paid outside counsel and in-house counsel without fees or billing records. The matter of how to prove amounts of compensatory expenses and/or attorney fees will be handled on a case-by-case basis. Another comment suggested that an administrative patent judge or the Board be required to issue an order to show cause prior to imposing a sanction, since a party may be able to explain why a sanction should not be imposed. The suggestion is presumably based on Fed. R. Civ. P. 11(c)(1)(B) and directed to cases in which an administrative patent judge or the Board on its own initiative determines that a sanction is appropriate. The suggestion is being adopted and implemented in a new paragraph, § 1.616(d). In addition, paragraph (d) expressly provides that a party may file a motion (§ 1.635) requesting the imposition of sanctions, the drawing of adverse inferences or other action under paragraph (a), (b) or (c) of § 1.616.

III. Certificates of Prior Consultation.

Section 1.637(b) currently requires that a miscellaneous motion under § 1.635 contain a certificate stating that the moving party has conferred with all opponents in a good faith effort to resolve by agreement the issues raised by the motion and indicating whether any other party plans to oppose the motion. In the Notice of Proposed Rulemaking, it was proposed to amend paragraph (b) to extend the requirement for such a certificate to preliminary motions filed under § 1.633 and other motions filed under § 1.634. It also was proposed to require the certificate to indicate that the reasons and facts in support of the motion were discussed with each opponent and, if an opponent has indicated that it will oppose the motion, to identify the issues and/or facts believed to be in dispute.

The rationale offered in the Notice of Proposed Rulemaking for the amendment was an expectation that consultation would result in a reduction in the number of issues raised by motions under §§ 1.633-34, as well as a reduction in the number of motions filed under those rules. All but one of many comments received in response to the proposal urged that the proposed rule not be adopted. In support, it was said that the proposed rule would unnecessarily increase the time and costs required to file motions under §§ 1.633-34, particularly preliminary motions. PTO, upon reflection, agrees with the comments. Accordingly, the proposal to extend the consultation requirement of § 1.637(b) to §§ 1.633-34 motions is withdrawn. The withdrawal of the proposed rule, however, should not be interpreted as precluding an administrative patent judge from holding a conference call prior to the date preliminary motions are due for the purpose of discussing which preliminary motions the parties plan to file or from entering an order requiring prior consultation as to a particular motion.

Several comments, citing experience with the consultation requirement for § 1.635 motions, suggested that § 1.637(b) be dropped altogether, or be limited at most to motions requesting extensions of time. The suggestion is not being adopted. However, there are circumstances where it may be appropriate to suspend the requirements of § 1.637(b). An example is a multi-party interference where one party may need to consult with a large number of opponents. Another example is a motion filed after a hearing before an administrative patent judge, where filing of the motion was authorized at the hearing. Accordingly, while the suggestion to delete the requirement for consultation altogether is not being adopted, the language "Unless otherwise ordered by an administrative patent judge or the Board" is added at the beginning of the first sentence of § 1.637(b).

Several comments were received which were also critical of the proposal to amend § 1.637(b), even if applied only to § 1.635 motions, to require that the certificate "indicate that the reasons and facts in support of the motion were discussed with each opponent and, if an opponent has indicated that it will oppose the motion, identify the issues and/or facts believed to be in dispute." One comment suggested that the proposal is unworkably vague with respect to: (1) the form of the information a party must provide to the opponent (e.g., a draft motion, an outline of the motion, a verbal statement of the motion, the evidence in support of the motion); (2) what form the opponent must use to provide its reasons for opposing (i.e., written or oral); and (3) whether the moving party can change the arguments in the motion in response to the reasons given by the opposing party without the need for another consultation. Other comments noted that an opponent may not have sufficient time before the due date for motions in which to take a reasoned position on the motion. Another comment observed that it is very difficult for the movant to identify the issues or facts believed to be in dispute, unless it is a very cursory exercise. According to the comment, the party cannot know what the opponent is really thinking, and suggested instead that there be an in-person conference involving the parties and the administrative patent judge in order to discuss all intended (or filed) motions. The comments are believed to be well taken and the proposal in the Notice of Proposed Rulemaking to amend § 1.637(b) to require that the motion, "if an opponent has indicated that it will oppose the motion, identify the issues and/or facts believed to be in dispute" is withdrawn.

IV. Service of a "Developing Record."

In addition to the amendments to § 1.672 discussed above under the heading "Amendments responsive to adoption of Public Laws 103-182 and 103-465," §§ 1.672, 1.682, 1.683 and 1.688 are amended, as proposed (with a few minor modifications discussed *infra*), to require each party to serve on each opponent a "developing record" that will evolve into the record required to be filed under § 1.653.

As noted above, the Notice of Proposed Rulemaking proposed to amend paragraph (b) of § 1.672 to provide that a party presenting testimony of a witness by affidavit shall, no later than the time set by the administrative patent judge for serving affidavits, file (and serve) the affidavit, whether it is a new affidavit or an affidavit previously filed by that party during ex parte prosecution of an application or under § 1.608 or 1.639(b). Furthermore, in view of the proposed amendment to § 1.672(b), it was also proposed to remove and reserve, as superfluous, § 1.671(e), which requires a party to give notice of intent to rely on an affidavit filed by that party during ex parte prosecution of an application or an affidavit under § 1.608 or 1.639(b). An oral comment suggested that § 1.671(e) notice practice be retained with respect to § 1.639(b) affidavits, so that a party does not have to refile (and re-serve) a previously submitted § 1.639(b) affidavit on which it intends to rely at final hearing. The comment further suggested that for the same reason § 1.671(e) notice practice should be extended to patents and printed publications filed and served pursuant to § 1.639(b). The suggestions are being adopted. Section 1.671(e) thus revised reads as follows:

> (e) A party may not rely on an affidavit (including any exhibits), patent or printed publication previously submitted by the party under § 1.639(b) unless a copy of the affidavit, patent or printed publication has been served and a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit, patent or printed publication. When proper notice is given under this paragraph, the affidavit, patent or printed publication shall be deemed as filed under §§ 1.640(b), 1.640(e)(3), 1.672(b) or 1.682(a), as appropriate.

Furthermore, in order to ensure that the evidence submitted under § 1.639(b) includes sequential numbering of the type required of other evidence filed under § 1.672(b), § 1.639(b) is revised to require the use of sequential numbering, which, for the reasons discussed *infra*, is required to be used only to the extent possible.

As explained *supra*, in view of the retention of § 1.671(e) in amended form, § 1.672(b), as adopted, permits a party to file an affidavit or, if appropriate, a notice under § 1.671(e).

Sections 1.682, 1.683 and 1.688 are revised, substantially as proposed, to parallel the amendments to § 1.672. Section 1.682(a) as proposed to be amended provides that a party may introduce into evidence, if otherwise admissible, an official record or printed publication not identified in an affidavit or on the record during an oral deposition of a witness, by filing (and serving) a copy of the official record or publication no later than the time set for filing affidavits under § 1.672(b), thereby eliminating the current requirement for filing a notice of intent to rely on the official record or printed publication. In view of the retention of § 1.671(e) in amended form to permit a party to file a notice of intent to rely on patents and publications previously filed by the party under § 1.639(b), § 1.682(a), as adopted, permits a party to file a copy of an official record or printed publication or, if appropriate, a notice under § 1.671(e). Section 1.683(a) is amended, as proposed, to provide that a party may introduce into evidence, if otherwise admissible, testimony by affidavit or oral deposition from another interference, proceeding, or action involving the same parties by filing (and serving) a copy of the affidavit or a copy of the deposition transcript no later than the time set for filing affidavits under § 1.672(b), thereby eliminating the current requirement for a party for filing a motion under § 1.635 for leave to rely on such testimony. Section 1.688(a) is amended, as proposed, to provide that, if otherwise admissible, a party may introduce into evidence an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer no later than the time set for filing affidavits under § 1.672(b). Thus, all evidence filed under §§ 1.672, 1.682, 1.683 and 1.688 that relates to a party's case-in-chief should be filed (and served) or noticed under § 1.671(e) no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-chief and all evidence under those sections that relates to the party's rebuttal should be filed (and served) or noticed under § 1.671(e) no later than the date set for the party to serve affidavits under § 1.672(b) for its case-in-rebuttal.

The Notice of Proposed Rulemaking proposed that the pages of all affidavits and deposition transcripts that a party enters into evidence pursuant to §§ 1.672, 1.682, 1.683 and 1.688 shall include sequential page numbers, which shall also serve as the record page numbers for the affidavits and deposition transcripts in the party's record when it is filed under § 1.653. Likewise, the Notice of Proposed Rulemaking proposed that exhibits identified in the affidavits and deposition transcripts and any official records and printed publications served under § 1.682(a) shall be given sequential numbers, which shall serve as the exhibit numbers when the exhibits are filed under § 1.653(i) with the party's record. The major benefit of sequential page numbering is that a particular page of an affidavit or exhibit will be referred to in a consistent manner throughout the record. Thus, when an affiant is subject to cross-examination about the affiant's affidavit or another person's affidavit, the record will be clear as to the material which is the subject of the cross-examination. Correlation of pages of affidavits and/or exhibits will no longer be necessary.

Regarding the sequential numbering of affidavits, one comment noted that:

> while this might be of some minor convenience to the PTO, it is inconvenient for the public, and may be difficult to be accomplished in practice. Due to severe PTO time constraints in preparing affidavits, it is usually essential to amend, add to, rewrite and execute declarations and affidavits in parallel. Often, the declarants are in different physical locations. Modern offices do not have the old fashioned manual impact typewriters that would be required to superpose new page numbers on executed documents. Declarations are already clearly identifiable, by the name of the declarant and the page of his or her declaration. . . .

The comment apparently assumes, incorrectly, that the required sequential numbers are to be used in lieu of the usual page numbers that appear in affidavits and deposition transcripts. The sequential numbers are in addition to the usual page numbers and are typically added to the pages by a sequential numbering device (e.g., a "Bates" stamp).

Since a party may decide not to rely at final hearing on a previously filed § 1.639(b) affidavit (including any exhibits), or on patents and printed publications that it previously filed under § 1.639(b) in connection with a motion, there may be gaps in the sequential numbers of the affidavit pages and exhibits that are relied on at final hearing. *Compare, e.g.*, Federal Circuit Rule 30(c)(2) with respect to pages omitted from an appendix. Furthermore, due to circumstances beyond the party's control it may not be possible to submit the § 1.639(b) affidavits and accompanying exhibits into evidence in the proper order. Finally, the exhibits referred to in testimony under § 1.683 from another proceeding will obviously already have the exhibit numbers assigned to them in that proceeding. When possible, those planning to use exhibits and testimony from a previous interference may wish to avoid using an exhibit number used in the previous interference, thereby minimizing the possibility of confusion which can exist when two exhibits in the same record have the same exhibit number. For these reasons, the proposal to amend § 1.672 to require that testimony pages and exhibits "shall be given sequential numbers" is changed to a requirement that testimony and exhibits "shall be given sequential numbers to the extent possible." This change also applies to evidence submitted under §§ 1.682, 1.683 and 1.688 as amended, which state that the pages of affidavits and deposition transcripts served under those paragraphs and any new exhibits served therewith shall be assigned sequential numbers by the party in the manner set forth in § 1.672(b). In order to take into account that there may be gaps in page numbers in the record and in the exhibit numbers, § 1.653(d) is revised to state that the pages of the record shall be consecutively numbered "to the extent possible." Sections 1.677(a) and (b) are revised in a similar manner. That is, paragraph (a) is revised to limit its requirement for consecutive page numbering, which the rule currently applies to "the entire record of each party," to the pages of each transcript. Paragraph (b) is revised to require that exhibits be numbered consecutively "to the extent possible."

Section 1.672(a) affidavits and § 1.683(a) testimony shall be accompanied by an index giving the name of each witness and the number of the page where the testimony of each witness begins. The exhibits shall be accompanied by an index briefly describing the nature of each exhibit and giving the number of the page of affidavit or § 1.683(a) testimony where each exhibit identified in an affidavit or during an oral deposition is first identified and offered into evidence.

An opponent who objects to the admissibility of any evidence filed under §§ 1.672(b), 1.682(b), 1.683(a) and 1.688(a) must file objections under §§ 1.672(c), 1.682(c), 1.683(b) and 1.688(b) no later than the date set by the administrative patent judge for filing objections to affidavits under paragraph § 1.672(c). An opponent who fails to challenge the admissibility of the evidence on a ground that could have been raised in a timely objection under §§ 1.672(c), 1.682(c), 1.683(b) or 1.688(b) will not be permitted to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection to evidence filed under §§ 1.672(b), 1.682(b), 1.683(a) or 1.688(a), the party may respond by filing one or more supplemental affidavits and, in the case of objections to evidence filed under §§ 1.672(b), 1.682(b) and 1.683(a), may also file supplemental official records or printed publications. No objection to the admissibility of supplemental evidence shall be made except as provided by § 1.656(h). A party submitting evidence in response to an objection is aware of the objection and should take whatever steps are necessary in presenting supplemental evidence to overcome the objection. Whether the steps were sufficient is determined at final hearing on the basis of a motion to suppress the evidence under § 1.656(h).

The pages of the supplemental affidavits shall be sequentially numbered beginning with the number following the last page number of the testimony served under §§ 1.672(b), 1.683(a) and 1.688(a), if possible. Likewise, any additional exhibits identified in the supplemental affidavits and any supplemental official records and printed publications shall be given sequential numbers beginning with the number following the last number of the previously identified exhibits, if possible. After the time expires for filing objections and supplemental affidavits, or earlier when appropriate, the administrative patent judge shall set a time within which any opponent may file a request to cross-examine an affiant on oral deposition.

If any opponent requests cross-examination of an affiant, the party shall notice a deposition at a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination. Ordinarily, the parties should be able to agree on a "reasonable" place within the United States. Whether a place is a reasonable place depends on the circumstances. Generally a reasonable place within the United States would be the place where a witness resides or the office of one of the counsel of record in the interference. In assessing the reasonableness of a place, the convenience of both parties should be considered. For example, in a two-party interference if an affiant normally resides in Ohio and counsel are located respectively in Illinois and New York, noticing a deposition for Arizona may not be reasonable. In the event agreement cannot be reached, a place will be set by the administrative patent judge for taking the deposition.

Any redirect and recross shall take place at the deposition.

Within 45 days of the close of the period for taking cross-examination (§ 1.678 is revised to change the time for filing certified transcripts from 45 days to one month), the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by a witness during a deposition. The pages of the transcripts served under this paragraph and the accompanying exhibits shall be sequentially numbered in the manner discussed above. The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b). At this point in time, the opponent will have been served with all of the testimony that will appear in the party's record (with the same page numbers) as well as all of the documentary exhibits that will accompany the record (with the same exhibit numbers).

In the first sentence of § 1.688(a), the comma proposed to be inserted after "evidence" is inserted instead after "admissible."

V. Miscellaneous Amendments.

Although not proposed in the Notice of Proposed Rulemaking, the authority citation for 37 CFR Part 1 is revised by changing it from "35 U.S.C. 6" to "35 U.S.C. 6 and 23."

Throughout the rules, the term "examiner-in-chief" is replaced by "administrative patent judge" to reflect the change in the title of the members of the Board. *See* Commissioner's Notice of October 15, 1993, "New Title for Examiners-in-Chief," 1156 Off. Gaz. Pat. Office 332 (Nov. 9, 1993). One comment correctly noted that the Notice of Proposed Rulemaking failed to apply the change to § 1.610(b). The omission has been corrected. Another comment, citing possible confusion over the meaning of the term "administrative patent judge," suggested adding one of the following provisions to § 1.601 to define "administrative patent judge" in either of the following ways:

> An administrative patent judge is a member of the Board of Patent Appeals and Interferences, or
>
> An administrative patent judge is an examiner-in-chief (35 U.S.C. 7) or the Commissioner, the Deputy Commissioner or, an Assistant Commissioner when acting as a member of the Board of Patent Appeals and Interferences.

Neither suggestion is being adopted. The members of the Board of Patent Appeals and Interferences are the Commissioner [Assistant Secretary and Commissioner of Patents and Trademarks], the Deputy Commissioner [Deputy Assistant Secretary and Deputy Commissioner of Patents and Trademarks] and the Assistant Commissioners [the Assistant Commissioner for Patents and the Assistant Commissioner for Trademarks], and the examiners-in-chief, now administrative patent judges, including the Chief Administrative Patent Judge and the Vice-Chief Administrative Patent Judge, 35 U.S.C. 7(a). While the rules talk in terms of administrative patent judge, it must be recognized that any member of the Board, including a Commissioner-member, may take action in an interference which can be taken by an administrative patent judge.

Section 1.11(e) is revised to allow access to the file of an interference involving a reissue application once the interference has terminated or an award of priority or judgment has been entered as to all counts. Although it was intended that the public have access to any interference that involves a case which is open to the public, and § 1.11(b) provides that a reissue application is open to the public, interferences involving reissue applications were inadvertently not included in current § 1.11(e).

Section 1.192(a), which specifies the contents of the brief of an appellant for final hearing in an ex parte appeal, is revised to state that arguments or authorities not included in the brief will be refused consideration by the Board unless good cause is shown. The rule previously stated that such arguments and authorities *may* be refused consideration by the Board, without specifying how the Board decides whether or not it should be considered. One comment suggested that the amendment, if adopted, would make PTO less "user friendly" and would increase the burden of mere technicalities on applicants. It is believed that the comment misapprehends the nature of the proposed change, inasmuch as the change would merely codify the "good cause" standard that is currently applied by the Board in determining whether a new argument or authority will be considered.

Section 1.192(c) is revised in several respects. A first amendment simplifies the language used in the rule to refer to a brief filed by an applicant who is not represented by a registered practitioner. A second amendment removes from paragraph (c) the requirement that such a brief be in substantial compliance with the requirements of paragraphs (c)(1), (2), (6) and (7). Experience has shown that it is better to evaluate pro se briefs on a case-by-case basis. Section 1.192(c) is also revised to redesignate current paragraphs (c)(1) through (c)(7) as paragraphs (c)(3) through (c)(9), and to add new paragraphs (c)(1) and (c)(2). The added paragraphs (c)(1) and (c)(2) require an appellant who has filed an appeal to the Board to identify the real party in interest and any related appeals and interferences. It is necessary to know the identity of the real party in interest so that members of the Board can comply with applicable ethics regulations associated with working on matters in which the member has an interest. The requirement to identify related appeals and interferences is derived in part from Federal Circuit Rule 47.5 and will minimize the chance that the Board will enter inconsistent decisions in related cases.

One comment suggested that the term "real party in interest" be replaced by "owner" in order to avoid confusion with the term "party in interest of record," which appears in PTO's Notice of Allowance and Issue Fee Due (PTO-85B). The suggestion is not being adopted, since it appears unlikely that any confusion will occur.

A comment on behalf of a large U.S. corporation having extensive overseas operations noted that the proposed requirement to identify the real party in interest will impose a substantial burden in appeals to the Board where the real party in interest is a corporation with international operations and many diverse and frequently changing affiliates. The comment was accompanied by a copy of a "Certificate of Interest" previously filed by the corporation in an appeal to the Federal Circuit, which named some three hundred subsidiaries and affiliates in which the corporation had an ownership interest of five percent or more. According to the comment, if ownership interests of less than five percent had been included, the list would have been about twice as long. The comment explained that because the corporation's business interests worldwide are frequently changing, the list would require updating for each and every appeal brief, and questioned whether this burden is justified. Upon consideration of the comment, it is believed, at this particular time, that the proposed rule would be burdensome on the public. Whether in the future more information might be required to the nature of a real party in interest is a matter which can await experience under a rule which requires identification only of the real party in interest. Accordingly, the suggestion is being adopted to the extent of requiring appellants to the Board to identify only the real party in interest. In this respect, § 1.192(c)(1) will parallel an equivalent requirement for briefs in inter partes cases. *See* § 1.656(b)(1)(ii), as amended.

One comment suggested revising proposed § 1.192(c)(9), which calls for an appendix including the claims on appeal, to include a statement that the rule sets forth the minimum requirements for a brief. According to the comment, the statement would make it clear that § 1.192 does not prohibit inclusion of other materials which an appellant may consider necessary or desirable, a point which the comment noted is explained in the Manual of Patent Examining Procedure § 1206, at 1200-6. The suggestion is not being adopted, since it is believed to be apparent from the rule that the requirements set forth therein are the minimum requirements.

Section 1.192 as proposed to be amended in the Notice of Proposed Rulemaking includes an amendment to current paragraph (a)(5) ("Grouping of claims"), proposed to be redesignated as paragraph (a)(7), that inadvertently was not discussed in the commentary in the Notice of Proposed Rulemaking. Specifically, it was proposed to amend that paragraph to state that for each ground of rejection which an appellant contests and which applies to more than one claim, the rejected claims shall stand or fall together with the broadest claim, and that only the broadest claim would be considered by the Board of Patent Appeals and Interferences unless a statement is included that the rejected claims do not stand or fall together and, in the argument under paragraph (c)(8), appellant presents reasons as to why appellant considers the rejected claims to be separately patentable from the broadest claim; merely pointing out what a claim covers is not an argument as to why the claim is separately patentable from the broadest claim. One comment suggested that it is not always clear which is the broadest claim, such as where there are two broad independent claims of differing scope (e.g., claims to ABCDE and ABCDF). The comment suggested that simply saying that the claims stand or fall together, as the current rule does, is probably the best one can do on a generic basis. The points raised by the comment are partly well taken. Paragraph (c)(7), as adopted, therefore reads as follows:

> *Grouping of claims.* For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

Where there is a "broadest" claim, that claim will normally be selected. Where there are two broad claims, such as ABCDE and ABCDF, as mentioned in the comment, the panel assigned to the case will select which claim to consider. The same would be true in a case where there are both broad method and apparatus claims. The rationale behind the rule, as amended, is to make the appeal process as efficient as possible. Thus, while the Board will consider each separately argued claim, the work of the Board can be done in a more efficient manner by selecting a single claim when the appellant does not meet the conditions of paragraph (c)(7) of § 1.192, as adopted. The choice of whether each claim will be considered separately or whether all claims will be considered on the basis of a single claim is a choice to be made by the appellant.

The term "subparagraph," which appeared in §§ 1.192(c)(7) and (c)(8) in their originally proposed form, has been replaced by "paragraph" in those sections as amended.

Section 1.601 in general defines a number of terms used throughout the interference rules. One comment noted that a consistent format is not used throughout the definitions. For example, in § 1.601(q) all defined terms are italicized and in § 1.601(n) the defined terms are in quotation marks. The comment is well taken that there should be uniformity. Accordingly, paragraphs (l), (m) and (n) are revised by italicizing the first occurrence of each of the following defined terms: "junior party", "same patentable invention" and "separate patentable invention."

The Notice of Proposed Rulemaking proposed amending paragraph (f) of § 1.601 in a number of respects, including adding the following sentence: "A count should be broad

enough to encompass the broadest corresponding patentable claim of each of the parties." One comment questioned whether the requirement is to be applied only at the time the interference is declared or throughout the interference. The comment notes that after an interference is declared, prior art may come to light which renders unpatentable all of the parties' claims that correspond to the count. The comment suggests that under these circumstances, requiring a count to be patentable over the prior art could mean that there might not be a proper count. According to the comment, a result might be that the Board, whose authority to enter judgments under the rules is limited to claims that correspond to a count (§§ 1.658 and 1.659), would be unable to enter judgment against the claims on the ground of unpatentability. Furthermore, since the Notice of Proposed Rulemaking was published, it has become apparent that § 1.601(f) could also be clarified in two other respects. First, the count should be broad enough to encompass *all* of the patentable claims that are designated as corresponding to the count, as opposed to solely each party's broadest corresponding patentable claim, i.e., where a party claims ABCDE in one claim and ABCDF in another claim and both claims are designated to correspond to the count. The current language of the rule can be argued to overlook the situation where a party has specific claims but no generic claim. Second, it should be made clear that the term "patentable" as used in § 1.601(f) in describing the scope of the count means patentable in view of the prior art, as opposed to unpatentability based on non-prior art grounds, e.g., the written description requirement of 35 U.S.C. 112, first paragraph. Accordingly, in lieu of the sentence proposed in the Notice of Proposed Rulemaking, § 1.601(f) is revised to include the following sentence: "At the time the interference is initially declared, a count should be broad enough to encompass all of the claims that are patentable over the prior art and designated to correspond to the count." A similar change is made in §§ 1.603 and 1.606. That is, instead of revising these rules to require that each application "must contain, or be amended to contain, at least one *patentable* claim that corresponds to the count," as proposed in the Notice of Proposed Rulemaking, these rules as amended require that each application "must contain, or be amended to contain, at least one claim that is *patentable over the prior art* and corresponds to the count."

The Notice of Proposed Rulemaking also proposed adding to § 1.601(f) a sentence stating: "A count may not be so broad as to be unpatentable over the prior art." Several comments questioned the meaning of the proposed sentence on the ground that a count, unlike a claim, does not have an effective filing date for purposes of establishing what is available against it as prior art. In view of the comments, the proposal to add the sentence is hereby withdrawn.

The Notice of Proposed Rulemaking proposed to amend the second sentence of § 1.601(f) by changing "which corresponds" to read "that is designated to correspond." This proposal should have referred instead to the third sentence, which is revised in the manner proposed. It was also proposed to revise the fourth and fifth sentences to read as follows, except that, for the reasons given above, the terms "correspond exactly" and "correspond substantially" are italicized rather than set off by quotation marks:

> A claim of a patent or application which is designated to correspond to a count that is identical to a count is said to *correspond exactly* to the count. A claim of a patent or application designated to correspond to a count that is not identical to a count is said to *correspond substantially* to the count.

On oral comment suggested that these sentences could be made clearer by revising them to read as follows:

> A claim of a patent or application that is designated to correspond to a count and is identical to the count is said to *correspond exactly* to the count. A claim of a patent or application that is designated to correspond to a count but is not identical to the count is said to *correspond substantially* to the count.

This suggestion is being adopted.

As proposed in the Notice of Proposed Rulemaking, the fifth sentence of § 1.601(f) is revised by removing the phrase "but which defines the same patentable invention as the count," which is used to describe a claim that corresponds to the count but is not identical to the count. The phrase is superfluous because a claim that corresponds to the count by definition is directed to the same patentable invention as the count.

The Notice of Proposed Rulemaking proposed to revise the last sentence of § 1.601(f) to state that: "A phantom count is unpatentable to all parties under the written description requirement of the first paragraph of 35 U.S.C. 112." One comment said that the sentence as proposed to be revised is inaccurate supposedly because a phantom count is not necessarily unpatentable to all parties for lacking written description support. According to the comment, a party may have written description support for a new claim identical to the count, yet choose not to present such a claim during the interference for tactical reasons, such as the desire to keep the count narrow enough to prevent an opponent from presenting priority evidence it might be able to produce with respect to a broader count. Another comment suggested that a phantom count be defined as a count that is "broader than the disclosure of any party to the interference." A third comment suggested that patentability under the enablement and best mode requirements be addressed along with patentability under the written description requirement. Apart from the comments, since patentability affects claims rather than counts, the proposal to amend the last sentence of § 1.601(f) is hereby withdrawn and the last sentence in its current form is removed.

One comment suggested counts serve little, if any, purpose under the new rules. The comment states that if PTO nevertheless feels compelled by tradition to have counts, each count should be the alternative union of *all* the parties' claims that are designated to correspond to the same invention. The suggestion that counts be abolished altogether, while superficially appearing to have considerable merit, is believed to be outside the scope of the present rulemaking and, for that reason, is not being adopted at this time. The suggestion that a count be the alternative union of all of the parties' claims that define the same patentable invention would not appear to require any change in the rules. The formulation of the count, whether by reference to particular claims in the parties' applications/patents or by describing the subject matter of the interference, is a matter within the discretion of PTO at this time.

The Notice of Proposed Rulemaking proposed amending § 1.601(g). Specifically, it was proposed to define the effective filing date of an application as the filing date of an earlier application accorded to the application or patent under 35 U.S.C. 119, 120, 121 or 365, or, if no benefit is accorded, the filing date of the application, and to define the effective filing date of a patent as the filing date of an earlier application accorded to the patent under 35 U.S.C. 120, 121, or 365(c) or, if no benefit is accorded, the filing date of the application which matured into the patent. The purpose of including the reference to 35 U.S.C. 121 is to eliminate any doubt that a divisional application may be entitled to an earlier filing date in accordance with 35 U.S.C. 121.

One comment suggested that the definition of effective filing date in § 1.601(g) should be expressly keyed to the claims rather than to the applications and patents, since different claims in the same application or patent may have different effective filing dates. The comment also suggested that the rules should be revised to make it clear that a motion under § 1.633(h) to add a reissue application need not be accompanied by a motion under § 1.633(f) for benefit of the patent sought to be reissued. Another comment suggested that the rule be revised to state that the effective filing date referred to in § 1.601(g) is the effective filing date of an application which constitutes a constructive reduction to practice of the subject matter of the count so as to make it clear that the rule is not referring to the effective filing date of an involved claim. These comments demonstrate that there is considerable uncertainty with respect to the interrelationship between benefit issues and priority proof issues, including, among other issues, (a) benefit for a claim, (b) benefit for a count, (c) constructive reductions to practice based on a species disclosed in an earlier application (foreign or domestic) when claims of the U.S. application are not supported under § 119 in the priority document (*see In re Gosteli*, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989) and *In re Scheiber*, 587 F.2d 59, 199 USPQ 782 (CCPA 1978), and compare to the so-called one species is sufficient for priority "rule"), and

(d) the fact that under interference practice since 1985, patentability is an issue which can be raised, whereas prior to 1985, priority was "not ancillary" and could not be raised. A notice of proposed rulemaking will be issued in due course to address the issue, as well as other issues raised in comments responding to the current Notice of Proposed Rulemaking. A comment that the language of the proposed amendment to § 1.601(g) fails to take into account the fact that a patent may be accorded benefit of the filing date of an earlier foreign application during the interference is, however, well taken. Accordingly, § 1.601(g) is revised to make clear that a patent may be entitled to benefit under 35 U.S.C. 119.

As proposed in the Notice of Proposed Rulemaking, § 1.601(j) is revised by changing "which" to "that." One comment suggested changing "that corresponds to a count" to "that is designated to correspond to a count" for clarity and consistency with the language in § 1.601(f). The suggestion is being adopted.

In § 1.601, paragraph (l) is revised, as proposed, by changing "assignee" to "assignee of record in the Patent and Trademark Office."

Paragraph (q) of § 1.601 is revised by deleting "a panel of" as superfluous.

Section 1.602 is revised by changing "within 20 days of" to "within 20 days after." One comment suggested clarification of the meaning of "any right, title and interest," noting involvement in several disputes over whether this includes a relationship such as a non-exclusive license, and also questioned whether the rule requires a party in a three-party interference to disclose that it is paying another party's expenses or attorney fees. The suggestion, which is outside the scope of the present rulemaking, is not being adopted at this time. The suggestion will be made the subject of a future notice of proposed rulemaking.

Sections 1.603 and 1.606 are revised, as proposed, by deleting the third sentence ("Each count shall define a separate patentable invention.") as redundant in view of the identical sentence in § 1.601(f) and by requiring that each application to be put into interference contain, or be amended to contain, at least one claim which is patentable over the prior art and which corresponds to each count. The introductory language in each of these sections ("Before an interference is declared . . .") makes it clear that the patentability requirement applies at the time that the interference is declared, as opposed to at all times during the interference.

One comment suggested that §§ 1.603 and 1.606 be further revised to require the examiner to examine all of the prior art in all of the potential parties' application and patent files in making a patentability determination. The suggestion is not being adopted. Ordinarily, the examiner determines that claims are patentable before an interference is declared. While there may be no express statement, consideration of whether claims are patentable in one application to be placed in an interference normally would involve consideration of prior art in a second application to be placed in the same interference.

In § 1.604, paragraph (a)(1) is revised by changing "his or her" to "its."

In § 1.605, paragraph (a) is revised for clarification essentially in the manner set forth in the Notice of Proposed Rulemaking. Part of the last sentence of the rules, however, is revised to require an applicant to "explain why the other claims would be more appropriate to be designated to correspond to a count in any interference which may be declared." In responding to a request by an examiner to copy a claim for purpose of a possible interference, an applicant should present the exact claim requested by the examiner. Often, however, an applicant may believe that the claim suggested by the examiner is not appropriate. For example, an applicant may believe it cannot support the exact claim requested by the examiner. Accordingly, while the applicant must present the exact claim requested by the examiner, the applicant is also free to suggest that the exact claim is inappropriate, but that other claims proposed by the applicant are more appropriate to be designated as corresponding to a count of any possible interference. Obviously, the applicant is also free to make a suggestion to the examiner as to what the count should be in any interference. The examiner can then determine whether an applicant's alternatively proposed claims are more appropriate than the exact claim suggested.

One comment suggested that § 1.605 further be revised "to include a reminder of the statutory prohibition against an *interference* copying claims from a patent issued more than one year, (as Rule 607 already does for applicants), since some examiners have been doing it" (original emphasis). The comment is understood to mean that examiners have suggested that applicants copy patent claims in violation of 35 U.S.C. 135(b). The suggested reminder is not incorporated into the rule, because it would not implement or interpret any requirement of law, and, while plausibly legitimate, is better made in administrative instructions, such as the Manual of Patent Examining Procedure.

Section 1.606 is also revised, as proposed, by adding a sentence stating that the claim in the application need not be, and most often will not be, identical to a claim in the patent.

One comment suggested that the last sentence of § 1.606, which the Notice of Proposed Rulemaking did not propose to revise, be revised to apply to application claims as well as patent claims and that the sentence be broken into two sentences for clarity, so as to read as follows:

> At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than (i) any application claim designated to correspond to the count and indicated in the form PTO-850 as allowable or (ii) any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

The suggestion is being adopted; however, because it is inappropriate to refer to a PTO form in a rule, the following language is used:

> At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any application claim that is patentable over the prior art and designated to correspond to the count or any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

One comment questioned why the declaration of interferences under § 1.606 is limited to unexpired patents, suggesting that there are rare cases where it would be very desirable to have an interference between an application and either a patent that has expired or a patent that has lapsed for failure to pay a maintenance fee. The enabling statute, however, authorizes interferences involving patents which are "unexpired." 35 U.S.C. 135(a).

In § 1.607, paragraph (a)(4) is revised to change "his or her" to "its" and to add a new paragraph (a)(6) requiring an applicant seeking an interference with a patent to demonstrate compliance with 35 U.S.C. 135(b), which provides:

> A claim which is the same as, or for the same or substantially the same subject matter as, a claim of an issued patent may not be made in any application unless such a claim is made prior to one year from the date on which the patent was granted.

Requiring an applicant to show compliance with 35 U.S.C. 135(b) before an interference is declared should prevent an interference from being declared where the applicant cannot satisfy § 135(b) with respect to any claim alleged to correspond to the proposed count. One comment suggested that requiring an applicant who has requested an interference with a patent to demonstrate compliance with § 135(b) is ultra vires. The comment argues that *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980), precludes an examiner from relying on § 135(b) to refuse to declare an interference and that *Sasse* can only be overruled by statute or decision of the Federal Circuit in banc, citing *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). The argument in the comment is not persuasive. *Sasse* held that a claim added in violation of § 135(b) cannot be rejected by PTO under that statute; it did not hold that PTO cannot refuse to declare an interference where all of an applicant's claims that are proposed to corre-

spond to the count fail to satisfy the statute. In fact, the court specifically held that the effect of § 135(b) is that "a *procedural* statutory bar arises proscribing the instigation of interferences after a specified time interval." 629 F.2d at 680, 207 USPQ at 110 (original emphasis).

In § 1.608, paragraphs (a) and (b) are revised in several respects, as proposed. First, both paragraphs are revised by removing the information about effective filing dates, which appears instead in § 1.601(g), as amended. Second, the current requirement of paragraph (a) for an affidavit filed by the applicant has been relaxed. Paragraph (a), as amended, permits a statement to be filed by the applicant or a practitioner of record. Third, "sufficient cause" in paragraph (b) of § 1.608 and in other interference rules is changed to "good cause" in order to make it clear that only one "cause" standard is intended. Fourth, "8 1/2 x 11 inches (21.8 by 27.9 cm.)" is changed to "21.8 by 27.9 cm. (8 1/2 x 11 inches)" to put the emphasis on the metric measurements. Fifth, the phrase "(§ 1.653(g) and (h)")" is revised to read "(§ 1.653(g))" in view of the removal and reservation of § 1.653(h).

One comment stated a belief that there may be some confusion regarding the application of § 1.608(b) when the basis upon which an applicant is entitled to judgment is not priority of invention. According to the comment, while § 1.608(b) appears to include derivation as a basis, it is uncertain whether it applies in a situation where the applicant believes the patent claims are unpatentable over prior art that does not also render unpatentable the applicant's claims. The suggested change is not necessary. The comment's statement that derivation (35 U.S.C. 102(f)) provides a basis for a showing under § 1.608(b) is correct. Section 1.608(b) requires an applicant to explain why the applicant is entitled to judgment *vis-a-vis* the patentee. As explained in the Notice of Final Rule, 49 FR 48416, 48421 (Dec. 12, 1984), "[t]he evidence may relate to patentability and need not be restricted to priority." Such evidence could be, for example, evidence relating to derivation as noted by the comment.

The Notice of Proposed Rulemaking proposed that § 1.609(b)(2), be revised to require the examiner's statement (i.e., currently Form PTO-850, also known as the initial interference memorandum) to explain why each claim designated as corresponding to a count is directed to the same patentable invention as the count. It was also proposed that § 1.609(b)(3) be revised to require the examiner's statement to explain "why each claim designated as not corresponding to a count is not directed to the same patentable invention as the count." The purpose of these amendments is to provide the Board and the parties with the benefit of the examiner's reasoning and to provide a better foundation for considering preliminary motions to designate claims as corresponding or as not corresponding to a count.

Paragraph (b)(2) is revised essentially as proposed in the Notice of Proposed Rulemaking. Upon further reflection, no need is seen for the examiner to indicate whether a claim corresponds exactly or substantially to a count.

One comment suggested that the proposed requirement of § 1.609(b)(3) may be unduly burdensome in multi-count interferences if it requires an examiner to explain not only why an involved claim corresponds to one count, but also why that claim does not correspond to each other count. Another comment, apparently construing the proposed language in the same way, suggested that the requirement could be made clearer by modifying the proposed language to read, "why each claim designated as not corresponding to *each* (or *the*) count is not directed to the same patentable invention as the count." To make it clear that such a requirement is not intended, the proposed amendment is withdrawn and paragraph (b)(3) is instead revised to read, "why each claim designated as not corresponding to *any* count is not directed to the same patentable invention as *any* count." Under § 1.609(b)(3), as adopted, the examiner's statement need not explain why a claim that is designated as corresponding to one count is not directed to the same patentable invention as another count in the interference.

One comment suggested that interferences involving patentees who are incontestably junior could be shortened by amending the rules to require a junior party patentee, prior to the preliminary motion period, to make a prima facie case of priority of the type currently required of junior party applicants by § 1.608. The suggestion is outside the scope of the present rulemaking and is not being adopted, but may be considered in a future notice of proposed rulemaking.

One comment suggested that §§ 1.609(b)(1) and 1.611(c)(6) also be revised to require that the examiner and the declaration notice explain, when there will be more than one count, why each count is patentably distinct from the other counts. The suggestion is being adopted.

Section § 1.610(a) is revised by deleting the language "a panel consisting of at least three members of" as superfluous and by deleting the reference to § 1.640(c), which is revised to allow a request for reconsideration under § 1.640(c) to be decided by an individual administrative patent judge rather than by the Board. Section 1.610(b) is also revised by deleting "Unless otherwise provided in this section," as unnecessary in light of the amendment to paragraph (a).

One comment suggested that § 1.610(a) be revised to provide that an interference is handled throughout, including final hearing, by a single administrative patent judge, thereby avoiding the delays that occur when an issue is deferred to final hearing for decision by a three-member panel. The comment also suggested that § 1.610(b) be revised to provide that, at the discretion of the administrative patent judge, a panel consisting of two or more administrative patent judges may sit at final hearing (as well as deciding interlocutory orders). The suggestions have not been adopted. First, the suggestions are outside the scope of the present rulemaking. Second, the suggestions could not be implemented without amendment of 35 U.S.C. 7(b), which requires that an interference must be decided by at least three members of the Board.

One comment suggested that the second sentence of § 1.610(c) ("Times for taking action shall be set, and the administrative patent judge shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.") be removed as wishful thinking that only confuses district court judges confronted with a motion to stay a civil action pending the outcome of an interference. The suggestion is not being adopted. The two-year period, while not always attainable, is nevertheless believed to be realistic.

The Notice of Proposed Rulemaking proposed amending § 1.611 by redesignating paragraph (c)(8) as paragraph (c)(9) and adding a new paragraph (c)(8) requiring that a notice of declaration of interference state "[w]hy each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to a count is not directed to the same patentable invention as the count." For the reasons given above in the discussion of § 1.609(b)(3), the proposed language is changed to read, "[t]he examiner's explanation as to why each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count." The examiner's explanation should assist the parties in deciding whether to move to have claims designated as corresponding or not corresponding to the count. Normally, parties can expect that a copy of the examiner's explanation will accompany the notice declaring the interference. It should be understood that in declaring the interference, the administrative patent judge is neither agreeing nor disagreeing with the examiner's explanation and that the explanation is not binding on the administrative patent judge or the Board in further proceedings in the interference. As proposed in the Notice of Proposed Rulemaking, the first word in each of paragraphs (d)(2) and (d)(3) is also capitalized.

One comment suggested deleting ", oppositions to the motions, and replies to the motions" from § 1.611(d)(3) as surplusage. The suggestion is being adopted. In addition, paragraphs (d)(1), (d)(2) and (d)(3) are revised to be separately indented under paragraph (d).

Paragraph (a) of § 1.612 is revised to change "opposing party's" to "opponent's" and to add a sentence referring to § 1.11(e) concerning public access to interference files. One comment suggested amending § 1.612(a) to provide for automatic access to an application referred to in an opponent's involved case rather than requiring a motion for access under § 1.635, as under the current rule. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

Regarding § 1.613, one comment suggested that paragraph (c) be revised to give an administrative patent judge the authority to decide disqualification questions rather than requiring such questions to be referred to the Commissioner. Under current practice, the authority to decide motions for disqualification of counsel in cases before the Board of Patent Appeals and Interference has been delegated by the Commissioner to the Chief Administrative Patent Judge. Administratively, it is more appropriate that authority to decide disqualification matters be capable of being delegated to specific individuals rather than being assigned to administrative patent judges generally through a rule. The comment also suggested that paragraph (d) be revised to clarify whether "attorney or agent of record" includes an attorney or agent who is merely "of counsel." The term "attorney or agent of record" in the interference rules should be construed in the manner it is defined in 37 CFR 1.34(b). The rules do not recognize, or use, the term "of counsel." Accordingly, the suggestions are not being adopted. Furthermore, each suggestion is outside the scope of the present rulemaking.

Paragraph (a) of § 1.614 is clarified, as proposed in the Notice of Proposed Rulemaking, by changing "the Board shall assume jurisdiction" to "the Board acquires jurisdiction." One comment suggested amending § 1.614(c) ("An administrative patent judge, where appropriate, may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.") by deleting the current language ", when appropriate," as surplusage in view of "may." The suggestion is being adopted.

In addition to amending § 1.616 to authorize an award of compensatory attorney fees and expenses in appropriate circumstances, as discussed above, current paragraph (b), which is redesignated as paragraph (a)(2), is revised to permit a party to be sanctioned for failing to comply with the rules or an order by entering an order precluding the party from filing "a paper." Current paragraph (b) permits entry of an order precluding the filing only of a motion or a preliminary statement. The term "paper" will be given a broad construction, and includes a motion, a preliminary motion, a preliminary statement, evidence in the form of documents, a brief, or any other paper.

Section 1.617(b) is revised, as proposed, to authorize a party against whom a § 1.617(a) order to show cause has been issued to respond with an appropriate preliminary motion under § 1.633(c), (f) or (g). The reason is that a preliminary motion under § 1.633(c) to redefine the interference, under § 1.633(f) for benefit of the filing date of an earlier application or under § 1.633(g) attacking the benefit accorded a patentee may be appropriate where the count set forth in the notice declaring the interference is not the same as the count proposed in the applicant's showing under § 1.608(b). A preliminary motion under § 1.633(f) or (g) may also be appropriate where the count set forth in the notice declaring the interference is the same as the count proposed in the applicant's showing under § 1.608(b), but the notice either fails to accord the applicant the benefit of the filing date of an earlier application whose benefit was requested in the § 1.608(b) showing or accords the patentee the benefit of the filing date of an earlier application whose benefit the § 1.608(b) showing argued should not be accorded the patentee.

One comment suggested that § 1.617(b) be revised to state that a change of counsel is not "good cause" for presenting additional evidence in response to a § 1.617(a) show cause order, noting the similar amendment proposed in the Notice of Proposed Rulemaking for § 1.655(b). The suggestion is not being adopted. Moreover, the statement that a change of attorney is not generally good cause is not being added to § 1.655(b) as proposed. Upon reflection, it is better to leave the term "good cause" to be decided on a case-by-case basis. The proposed amendments to the rules to state that a change of attorney is generally not good cause for considering an issue belatedly raised by a new attorney is generally correct. In fact, recent experience shows that parties often retain new counsel after they find that "they are in trouble in the interference." Retaining new counsel midway through the case is almost never a reason to subject the opponent to starting over again. On the other hand, the rules use the term "good cause" in various places and PTO does not want to incorrectly give the impression that change of attorney is not good cause only when specifically stated in a rule which uses the phrase "good cause." Nor does PTO want to have a per se rule which says that a change of attorney cannot be good cause in any instance, although it would be rare for a change of attorney to be good cause.

One comment suggested that the second sentence of § 1.617(d) be revised to indicate that any statement filed by an opponent may set forth views as to why any (c), (f) or (g) motion filed by the applicant should be denied. The suggestion is not being adopted. The first sentence of § 1.617(d) as revised authorizes an opponent to file an opposition to any (c), (f) or (g) motion filed by the applicant, which opposition should include views as to why any (c), (f) or (g) motion filed by the applicant should be denied.

Another comment suggested that § 1.617(d), which currently prohibits an opponent from requesting a hearing, be revised to permit such a request on the ground that a hearing is the opponent's best chance to prejudge the whole interference process. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

The Notice of Proposed Rulemaking proposed amending the first sentence of § 1.618(a), which currently reads "The Patent and Trademark Office shall return to a party any paper presented by the party when the filing of the paper is unauthorized by, or not in compliance with the requirements of, this subpart" to read: "An administrative patent judge or the Board shall enter an order directing the return to a party of any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart." The Notice of Proposed Rulemaking also proposed amending the second sentence of paragraph (a), which currently states that any paper returned "will not thereafter be considered by the Patent and Trademark Office in the interference," by deleting "by the Patent and Trademark Office." One comment questioned why the phrase "by the Patent and Trademark Office" is proposed to be removed. The reason is that the phrase is superfluous. Another comment questioned who is being ordered to return the paper and suggested that § 1.618(a) be revised to simply provide that the administrative patent judge shall return the unauthorized papers, with the understanding that it is the administrative patent judge's secretary who actually mails orders, opinions, etc. The suggestion is being adopted, but with the rule stating that the paper shall be returned by an administrative patent judge or the Board. Although not proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.618(a), which states that a party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an administrative patent judge, is revised to also allow the Board to set such conditions.

One comment suggested an amendment to § 1.622(a) to clarify that the inventors named in the preliminary statement do not have to be all of the inventors named in the party's case in interference, citing *Larson v. Johenning*, 17 USPQ2d 1610 (Bd. Pat. App. & Int. 1990). The comment alternatively suggested dropping preliminary statements altogether on the grounds that they are (a) useless and (b) a snare and a delusion. These suggestions are outside the scope of the present rulemaking and are not being adopted.

Section 1.625(a) is revised, as proposed, by deleting "the invention was made in the United States or abroad and" as surplusage.

Section 1.626 is revised, as proposed, by revising "earlier application filed in the United States or abroad" to read "earlier filed application." The same change is made in §§ 1.630, 1.633(f), 1.633(g), 1.637(c)(1)(vi), 1.637(e)(1)(viii), 1.637(e)(2)(vii) and 1.637(h)(4).

Section 1.628(a) is revised, as proposed, to change "ends of justice" to "interest of justice" to be consistent with the language used in §§ 1.628(a) and 1.687(c), since a single standard is intended. The "interest of justice" requirement will be applied only to corrected preliminary statements that are filed on or after the due date for serving preliminary statements. Where the moving party has not yet seen the opponent's statement, an opponent normally will not be prejudiced by the filing of a corrected statement. One comment raised the following question:

> What is the standard if the motion is filed *before* the time set by the APJ for service of preliminary motions [sic, statements]? If, as implied by the comments, amendments prior to that date can be made freely, why not simply provide

that the preliminary statements (if they are to be retained at all) are to be filed and served on the date set by the APJ pursuant to 37 CFR 1.628(a)? Particularly where it is obvious that the count(s) is or are going to be changed anyway, all of the parties' work preparing and the PTO's work in processing the original preliminary statement is wasted effort anyway.

(Original emphasis; footnote omitted.) The standard for a motion to amend that is filed before service of preliminary statements is that it be accompanied by an affidavit stating when the error occurred and be filed "as soon as practical after discovery of the error." The suggestion that preliminary statements be filed and served on the date set by the administrative patent judge pursuant to 37 CFR 1.628(a) is not understood, since that rule does not provide for setting such a date. Instead, the provisions relating to filing and serving preliminary statements appear in §§ 1.621(a) and 1.631, respectively. To the extent the comment is suggesting that these provisions be revised, the suggestion is outside the scope of the present rulemaking and is not being adopted.

As proposed in the Notice of Proposed Rulemaking, paragraphs (a), (c)(1) and (d) of § 1.629 are revised to make each consistent with the amendment of the definition of "effective filing date" in § 1.601(g). One comment suggested that in § 1.629(a), second sentence, the comma between "statement" and "as," which was proposed to be removed, be retained for clarity. As suggested, the comma is retained.

The first sentence of § 1.631(a) is revised by removing "by the examiner-in-chief" (first occurrence) as superfluous. The Notice of Proposed Rulemaking incorrectly proposed to remove the second occurrence of this phrase. Thus revised and with the remaining occurrences of "examiner-in-chief" changed to "administrative patent judge," the first sentence of § 1.631(a), as it was proposed to be revised, reads as follows: "Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633, any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement." (The proposed language set forth in the Notice of Proposed Rulemaking inadvertently omitted the phrase, "concurrently with entry of a decision on preliminary motions filed under § 1.633," which appears in the current rule and was not proposed to be removed.) In order to make it clear that the phrase "concurrently with entry of a decision on preliminary motions filed under § 1.633" modifies the succeeding phrase rather than the preceding phrase, the second comma is removed, so that the first sentence of § 1.631(a) as revised reads as follows: "Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633 any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement."

Section 1.632 is revised, as proposed, to more precisely state that a notice of intent to argue abandonment, suppression or concealment must be filed "within ten days after," rather than "within ten days of," the close of the testimony-in-chief of the opponent. One comment suggested that § 1.632 be further revised to (1) state what happens next and (2) provide a period for shifting the burden of proof. The suggestion is outside the scope of the present rulemaking, and is not being adopted.

Several comments were received with respect to § 1.633 in general. Two of the comments noted that § 1.642, which presumably was intended to allow an administrative patent judge to add a new party to an interference, has also been used to "request" addition of an application or patent of an already involved party, citing *Theeuwes v. Bogentoft*, 2 USPQ2d 1378 (Comm'r Pat. 1986). The two comments suggested that § 1.633 be revised to specifically provide for a motion to request addition of an application or patent of a party in order to make it clear that the standards for preliminary motions apply. Two other comments suggested amending §§ 1.633 and 1.637(h) to authorize a motion to *add* a claim to a party's application or an opponent's application (including a reissue application) to be designated as not corresponding to the count, thereby removing what is alleged to be one of the major drawbacks of the current rules. Still another comment suggested that in order to avoid the inefficiencies that result when prior art surfaces for the first time in a motion under § 1.633(a), which may render moot other preliminary motions, the parties should be required to file and serve all relevant prior art of which they are aware prior to the preliminary motion period. While some of the suggestions have merit, all are outside the scope of the present rulemaking and are not being adopted.

As proposed in the Notice of Proposed Rulemaking, paragraph (a) of § 1.633 is revised in several respects. The first is to specify that a claim shall be construed in light of the specification of the application or patent in which it appears. The amendment clarifies an ambiguity in PTO interference practice. Previously, the Federal Circuit had interpreted § 1.633 to require an ambiguous claim to be interpreted in light of the patent from which it was copied. *In re Spina*, 975 F.2d 854, 856, 24 USPQ2d 1142, 1144 (Fed. Cir. 1992). While this interpretation was a possible interpretation of previous § 1.633, PTO had intended that a copied claim be interpreted in light of the specification of the application or patent in which it appears. The rule, as adopted, will make ex parte and inter partes practice the same. A claim that has been added to a pending application for any purpose, including to provoke an interference, will be given the broadest reasonable interpretation consistent with the disclosure of the application to which it is added, as are claims which are added during ex parte prosecution. As explained *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989):

> [d]uring patent examination the pending claims must be interpreted as broadly as their terms reasonably allow. When the applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) (before the application is granted, there is no reason to read into the claim the limitations of the specification). The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. *Burlington Industries, Inc. v. Quigg*, 822 F.2d 1581, 1583, 3 USPQ2d 1436, 1438 (Fed. Cir. 1987); *In re Yamamoto*, 740 F.2d 1569, 1571, 222 USPQ 934, 936 (Fed. Cir. 1984).

If a party believes an opponent's claim corresponding to the count is ambiguous when construed in light of the opponent's disclosure, the party should move under § 1.633(a) for judgment against the claim on the ground of unpatentability under the second paragraph of 35 U.S.C. 112. In paragraph (a), "by reference to the prior art of record" is removed as unnecessary. Paragraphs (a)(1) and (a)(2) of § 1.633 are revised by deleting some unnecessary language from each paragraph and by changing "derivation" to "Derivation" in paragraph (a)(2). One comment suggested changing "corresponding to a count" in § 1.633(a) to "designated to correspond to a count" for consistency with § 1.601(f), as amended. The suggestion is being adopted.

Although not proposed in the Notice of Proposed Rulemaking, § 1.633(a) is also revised by adding a sentence requiring that the motion separately address each claim alleged to be unpatentable. For example, where a plurality of claims are alleged to be unpatentable over prior art, the motion must compare each of those claims to the prior art. As a result, a party would not be allowed to allege that all of the opponent's claims that correspond to the count are unpatentable simply because the opponent's claim that corresponds exactly to the count is anticipated by, or would have been obvious in view of, the prior art. At the time an interference is declared, it may appear (and the parties may then believe) that all claims designated as corresponding to a count are directed to the same patentable invention. Once additional prior art is discovered in the preliminary motion period, however, what was the case when the interference was declared may no longer be the case. Hence, a preliminary motion under § 1.633(a) alleging unpatentability over the prior art should address each claim believed to be unpatentable. In the case where a party has two claims, e.g., a genus and a species, if a preliminary motion under § 1.633(a) is filed by an opponent which argues that only the genus is unpatentable, the party will need only respond to the argument relative to the genus. Thus, to the extent there ever was a perception that all claims designated to correspond to a count stand or fall with the "patentability of the count," the rule as adopted attempts to overcome that perception. There is no presumption in an interference that because one claim designated to correspond to a count is unpatentable over the prior art (35 U.S.C. 102(a), (b) and (e)), that all claims are unpatentable over the same prior art. On the other hand, in deciding priority of invention, all claims designated to correspond to a count at the time priority is decided will stand or fall together on the issue of priority.

Section 1.633(b), which concerns motions for judgment on the ground of no interference-in-fact, was proposed to be revised to state that it is possible for claims of opponents presented in "means plus function" format to define separate patentable inventions even though the claims of the opponents contain the same literal wording. The reason is that the sixth paragraph of 35 U.S.C. 112, which is applicable to "means plus function" limitations in application claims and patent claims, provides that such limitations are to be construed as covering the corresponding structure disclosed in the associated application or patent and equivalents thereof. *In re Donaldson Co.*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994). The proposed change has been adopted, but with the proposed term "opponents" being replaced by "different parties." One comment suggested that in addition to *Donaldson*, support for the amendment can be found in *Blackmore v. Hall*, 1905 Dec. Comm'r Pat. 561 (Comm'r Pat. 1905), and the withdrawn opinion in *Rion v. Ault*, 455 F.2d 570, 172 USPQ 588 (1972) (Rion I), *modified*, 482 F.2d 948 (CCPA 1973) (Rion II), which the comment says stand for a proposition even broader than the one set forth in the proposed amendment. Inasmuch as Blackmore predates the statutory language in question and *Rion I* was withdrawn by the CCPA, the suggestion is not being adopted.

Paragraph (i) of § 1.633, which in its current form authorizes a party who opposes a preliminary motion under § 1.633(a), (b) or (g) to file a preliminary motion under § 1.633(c) or (d), is revised to additionally authorize a party-patentee to file a preliminary motion under § 1.633(h) to add to the interference an application for reissue of the party's involved patent. Because a reissue application can include an amended or new claim to be designated as corresponding to a count, paragraph (i) as revised gives a patentee an option similar to that afforded in the same situation to a party-applicant, who can file a preliminary motion under § 1.633(c)(2) to amend a claim in, or add a claim to, its involved application to be designated as corresponding to a count. One comment suggested further amending § 1.633(i) to authorize a § 1.633(c)(1) motion in response to an opponent's § 1.633(c)(1) motion. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

One comment suggested that § 1.636, as proposed to be revised, which requires that a motion under § 1.634 to correct inventorship of a patent or application "be diligently filed after an error is discovered," is ultra vires with respect to patents. The suggestion is outside the scope of the present rulemaking and is not being adopted. The suggestion will be considered in a future rulemaking.

The Notice of Proposed Rulemaking proposed amending paragraph (a) of § 1.637 to incorporate the essence of a notice of August 10, 1990, *published as* "Interferences - Preliminary Motions for Judgment," 1118 Off. Gaz. Pat. Office 19 (Sept. 11, 1990). Specifically, the Notice of Proposed Rulemaking proposed adding the following language at the end of the paragraph:

> If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is applicable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party. If the motion fails to include a sufficient explanation or evidence, the party will not be permitted to rely on any such explanation or evidence in response to or in any subsequent action in the interference.

Two comments suggested that the proposed last sentence is imprecise in that although it is presumably intended to preclude a party whose motion an administrative patent judge has held to include an insufficient explanation or evidence from later *supplementing* the explanation or evidence offered in the motion, the sentence is broad enough to be construed as also precluding the party from relying on the arguments and evidence that were offered in the motion. Accordingly, one of the comments suggested that the proposed last sentence be replaced by the following two sentences: "If the administrative patent judge holds that the motion fails to include a sufficient explanation or evidence as to why the cited prior art is not applicable to the party, the party will not be permitted to supplement any such explanation or evidence in any subsequent action in the interference. However, the party is not precluded from subsequently arguing that the administrative patent judge's decision was incorrect." The substance of the suggestions is believed to be correct, but the suggested language will not be adopted. Instead, § 1.637(a) is revised to read:

> A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Each motion shall include a statement of the precise relief requested, a statement of the material facts in support of the motion, in numbered paragraphs, and a full statement of the reasons why the relief requested should be granted. If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is applicable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party.

Rather than specify a particular sanction for failure of a party to comply with § 1.637(a), as adopted, it is more appropriate to rely on application of the provisions of § 1.616. A party who fails to timely include the explanation and/or evidence required by the rule runs a considerable risk that an explanation and/or evidence presented at a future time will be returned as untimely. See § 1.618(a). Papers which are returned are not considered part of the record.

Section 1.637(a) was proposed to be revised to state that the statement of material facts be "preferably in numbered paragraphs." One comment suggested that numbered paragraphs be a requirement, because it would make matters easier for opponents as well as administrative patent judges. The suggestion is being adopted. Ordinarily, it will be expected that each numbered paragraph will recite a single fact which can easily be "admitted" or "denied." The use of numbered paragraphs should make the decision-making process of the administrative patent judge easier.

Another comment suggested that § 1.637(a) be revised to require that motions, oppositions and replies be numbered sequentially, so that party X's opposition No. 1 will be its opposition to party Y's motion No. 1, etc. The suggestion, while having considerable merit, is outside the scope of the present rulemaking, and is not being adopted. The suggestion will be made the subject of a future rulemaking effort. In papers filed in PTO in interference cases, there is an increasing tendency for parties to use "long" titles, e.g., PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS TO BE UNPATENTABLE UNDER 37 CFR § 1.633(a). The opponent then responds with an opposition styled PARTY RAYMOND'S OPPOSITION TO PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS UNPATENTABLE UNDER 37 CFR § 1.633(a). The reply then tends to be PARTY SMITH'S REPLY TO PARTY RAYMOND'S OPPOSITION TO PARTY SMITH'S PRELIMINARY MOTION FOR DECLARATION OF PARTY OPPONENT RAYMOND'S CLAIMS UNPATENTABLE UNDER 37 CFR § 1.633(a). It should be apparent that the styling of the paper loses its significance. Accordingly, pending a further rulemaking effort parties in interference can simplify matters by voluntarily adopting the essence of the suggestion by replacing the styling of the three

papers identified above with the following: (1) SMITH'S PRELIMINARY MOTION NO. 1; (2) RAYMOND'S OPPOSITION NO. 1; and (3) SMITH'S REPLY NO. 1. If numerous motions are filed, then sequential numbers can be used. In a two-party interference, if the parties can agree, one can use numbers and the other letters. In any event, it would be of considerable help to the Board if the style of a paper does not exceed a single line.

As proposed in the Notice of Proposed Rulemaking, § 1.637(a) is also revised by changing "Every" in the second sentence to "Each."

Section 1.637(c)(1) sets forth the requirements for a preliminary motion to add or substitute a proposed count. The Notice of Proposed Rulemaking proposed amending paragraph (c)(1)(v) in two respects: (1) to require a moving party to show that the proposed count is patentable over the prior art; and (2) to specify that a proposed substitute count need only be shown to be patentably distinct from the other counts proposed to remain in the interference, since a proposed substitute count need not be patentably distinct from the count it is to replace. Several comments opposed amending § 1.637(c)(1)(v) to require a party to show that a proposed new count is patentable over the prior art, stating, *inter alia*, that the date of a count for purposes of determining what is available as prior art is not clear. The statements in the comment are well taken for the reasons given above in the discussion of § 1.601(f). Accordingly, the proposal to amend paragraph (c)(1)(v) to require the moving party to show the patentability of a proposed new count over the prior art is withdrawn. Paragraph (c)(1)(v) is revised only to require that a proposed substitute count must be shown to be patentably distinct from the other counts proposed to remain in the interference.

As proposed in the Notice of Proposed Rulemaking, § 1.637(c)(1)(vi) is revised to clarify that a preliminary motion under § 1.633(c)(1) need not be accompanied by a preliminary motion for benefit under § 1.633(f) unless the moving party seeks benefit with respect to the proposed count

In order to eliminate the need for an opponent to respond to a § 1.633(c)(1) motion with a preliminary motion under § 1.633(f) claiming benefit, which has the effect of delaying a decision on the § 1.633(c)(1) motion, the Notice of Proposed Rulemaking also proposed amending § 1.637 by adding a new paragraph (c)(1)(vii) reading as follows:

> If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

One comment suggested clarifying the first sentence by inserting "and if the movant desires a holding that its opponent is not entitled to the benefit of the filing date of the earlier filed application for the proposed count" after "interference." The same change was suggested for proposed new §§ 1.637(e)(1)(ix) and 1.637(e)(2)(viii), which are identical to § 1.637(c)(1)(vii). The suggestion is not being adopted. The rule, as amended, states that a moving party must take a positive action if it believes an opponent is not entitled to benefit for a new count. Failure to take the positive action creates a presumption. The rule, as amended, also states the consequences of not taking a positive action. Taking the positive action is the manner to procedurally attempt to overcome the presumption. Hence, the suggested "clarification" is not necessary.

As proposed, minor housekeeping amendments are made to §§ 1.637(c)(2)(ii) and (iii) for clarification, and §§ 1.637(c)(2)(iv) and 1.637(c)(3)(iii), which relate to § 1.633(f) motions for benefit, are removed and reserved as unnecessary, since motions under § 1.633(c)(2) and (3) do not affect the count. Section 1.637(c)(3)(ii), which applies to motions under § 1.633(c)(3) to designate a claim as corresponding to a count, is revised to have claims compared to claims, as is the case in § 1.633(c)(4)(ii), which applies to motions filed under § 1.633(c)(4) to designate a claim as not corresponding to a count. The amendment avoids the need to compare claims to counts.

Section 1.637(c)(4)(ii) was proposed to be revised to require that a party moving to designate a claim as not corresponding to a count must show that the claim could not serve as the basis for a preliminary motion under § 1.633(c)(1) to add a new count. As proposed to be, the rule precludes a party from moving to designate one of its claims as not corresponding to the count where an opponent's disclosure would support a similar claim. The supporting rationale is that the party could file a § 1.633(c)(1) preliminary motion proposing a claim to be added to the opponent's application and suggesting that the proposed claim and the party's claim in question be designated as corresponding to a proposed new count. One comment argues that the proposed amendment would unduly burden a party by requiring it to propose claims to be added to an opponent's application, whereas under the current rule the opponent, who has the option to propose such a count and add such a claim in a motion under § 1.633(c)(1), runs the risk of interference estoppel by not pursuing an interference on common patentable subject matter. Thus, the comment notes that the effect of the proposed requirement would be to require a party to prevent its opponent from possibly getting itself into an estoppel situation. The point of the comment is well taken. Accordingly, the proposal to amend § 1.637(c)(4) in the manner criticized by the comment hereby withdrawn.

As proposed in the Notice of Proposed Rulemaking, § 1.637(d)(4), which authorizes a party to file a motion for benefit together with a motion under § 1.633(d), is removed and reserved as unnecessary. Motions filed under § 1.633(d) do not affect the count. Sections 1.637(e)(1)(viii) and (e)(2)(vii) are revised to make it clear that a preliminary motion under §§ 1.633(e)(1) or (e)(2) need not be accompanied by a preliminary motion for benefit under § 1.633(f) unless the moving party seeks benefit with respect to the proposed count. As proposed, §§ 1.637(e)(1)(ix) and (e)(2)(viii) are added specifying that where a party is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, that party is presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

Section 1.637(f)(2) is revised, as proposed, by changing "abroad" to "in a foreign country" and removing both occurrences of "filed abroad" as superfluous.

The Notice of Proposed Rulemaking proposed to amend § 1.637(h) by adding a sentence stating that "[a] patentee may not move under § 1.633(h) to add a reissue application that includes new or amended claims to be designated as *not* corresponding to a count." The purpose of the proposal was to make clear that a preliminary motion to add a reissue application that includes a new or amended claim to be designated as not corresponding to a count will be given the same treatment as a preliminary motion proposing to amend a claim in, or add a new claim to, an involved application to be designated as not corresponding to the count, i.e., the preliminary motion will be dismissed. *See L'Esperance v. Nishimoto*, 18 USPQ2d 1534, 1537 (Bd. Pat. App. & Int. 1991) (interference rules do not authorize a motion by party-applicant to amend or add a claim to be designated as not corresponding to the count). Several comments were received in opposition to this proposal, one of which stated:

> As understood, this would prevent moving to add any reissue application to an interference if even a single claim of that reissue was independently patentable, i.e., properly not subject to the interference, even if some or most of the other claims were the same as, or patentably indistinct from, claims already subject to the interference.
>
> It is not seen why patent owners should be deprived of their statutory and normal ex parte right to have and maintain reissue applications with appropriate claims to inventions disclosed in their specifications, simply to meet a new interference rule requirement that appears to be solely for administrative convenience for the interference proceeding.

The statement in the comment is justified. The rule as proposed to be revised would unfairly preclude a patentee whose involved claims are all held to be unpatentable during the interference (e.g., under 35 U.S.C. 112, first paragraph, for lack of written description support) from adding a reissue application that contains new or amended claims to be designated as corresponding to a count simply because the reissue application also happens to include a new or amended claim to be designated as not corresponding to a count. Accordingly, the proposed amendment to paragraph (h) is hereby withdrawn.

As proposed in the Notice of Proposed Rulemaking, § 1.638(b) is revised by changing "a reply" to "any reply."

One comment suggested amending § 1.638(a) to take into account that an opposition may be based on material facts that are not set forth in the motion, by changing "(2) include an argument why the relief requested in the motion should be denied" to "(2) set forth in numbered paragraphs any material facts in support of the opposition not set forth in the motion and include an argument why the relief requested in the motion should be denied." A similar amendment was suggested for paragraph (b) as to replies. The suggestions, which are outside the scope of the present rulemaking, are not being adopted. The suggestions would appear to have considerable merit and will be made the subject of a future rulemaking effort.

Paragraph (a) of § 1.639, which currently requires that a motion, opposition or reply be accompanied by the evidence on which a party intends to rely in support of or in opposition to a motion, is revised as proposed in the Notice of Proposed Rulemaking to be consistent with paragraphs (c) through (g), which permit some types of evidence to be filed after filing of the motion, opposition or reply. In addition, paragraph (d)(1) is revised, as proposed, by changing "call" to "use."

One comment expressed concern about § 1.639(a) to the extent it is construed as requiring that all available evidence in support of a motion, opposition or reply must be filed and served with the motion, opposition or reply, which is presumed to be a reference to the construction given § 1.639 in *Iritani v. Petersen*, 18 USPQ2d 1362, 1368 (Bd. Pat. App. & Int. 1990):

> A good faith effort must be made to submit evidence to support a preliminary motion or opposition when the evidence is available. *Oritani v. Oomishi*, [10 USPQ2d 1996, 2000 n.12 (Comm'r Pat. 1989)]. Note the commentary [*Patent Interference Proceedings; Final Rule*,] 49 F.R. [48416], at 48442 (Dec. 12, 1984), 1050 O.G. [385], at 411 (Jan. 29, 1985)], [*corrections*] 50 F.R. 23122 (May 31, 1985), 1059 O.G. 27 (Oct. 22, 1985).

See also Okada v. Hitotsumachi, 16 USPQ2d 1789, 1790 (Comm'r Pat. 1990). Specifically, the comment notes that:

> [t]o permit testimony beyond the evidence filed with the motion, has been likened to "two bites of the apple". I think there is a misunderstanding here, it is not two bites.
>
> For example, a motion for summary judgment that is denied, [sic] does not preclude the party from proving his case at trial with additional evidence. Two bites comes if, after decision on motion, a party tries to bring a second *motion* with additional evidence or argument, or " after trial and judgment, the loser wants to introduce more evidence that was available all along. I see nothing wrong with an interference party submitting the prior art and arguing that "any fool can plainly see" the subject matter of the count is obvious. That's a sort of motion for summary judgment on the issue. If the APJ does not perceive the obviousness to be apparent, he or she should *invite* the parties to present additional testimony on obviousness during the testimony time, *not block it*. Obviously, the same reasoning would apply to enablement, operability, same patentable invention, etc.

(Original emphasis.) The suggestion that the rules be revised to permit a party to later submit evidence that it could have submitted in support of or in opposition to a preliminary motion is declined for the reasons given in *Hanagan v. Kimura*, 16 USPQ2d 1791, 1793 (Comm'r Pat. 1990) ("the new interference rules were not intended to permit routine requests to take testimony in lieu of presenting timely affidavits and other available proof of material [facts] with the motion"). *See also Stanchelin v. Secher*, 24 USPQ2d 1513, 1515 n.3 (Bd. Pat. App. & Int. 1992).

Another comment suggested amending the rules to permit the filing of a motion for "summary judgment" shortly (e.g., within two months) after the interference is declared on a matter that may be dispositive of the interference, such as the absence of an interference-in-fact, unpatentability of all of the parties' claims that correspond to the count or unpatentability of all of the opponent's claims that correspond to the count, with testimony being restricted to affidavits and counter-affidavits. *Compare* Fed. R. Civ. P. 56. The comment continues that if the motion is denied by the administrative patent judge, there would be no right of appeal; if the motion is granted, the opponent could appeal to a three-member panel of the board and, if the panel concurs with the decision of the administrative patent judge, the opponent could seek judicial review. To the extent the suggestion is seeking a rule authorizing motions for summary judgment like those provided for in Fed. R. Civ. P. 56, the suggestion is outside the scope of the present rulemaking and is therefore not being adopted. In a future rulemaking effort, PTO will consider whether there is an advantage to be gained by some form of "summary judgment" motion.

The Notice of Proposed Rulemaking proposed to amend § 1.640(b) in several respects. First, it was proposed to add a first sentence providing that "[u]nless an administrative patent judge or the Board is of the opinion that a decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing." One comment indicated that requiring deferral of non-dispositive motions may adversely affect settlement of interferences:

> Under the current procedure, where most motions are initially decided, if a party is faced with a particular decision on a non-dispositive motion, that decision may affect the party's willingness to settle with the opposing party, even knowing that the decision may be changed at final hearing. For example, if a party has proposed a new count that better fits its proofs and the motion proposing the new count is denied, the party may be willing to request adverse judgment (e.g., in exchange for a license) rather than try to prove invention of the original count for which its proofs are not as good, even knowing that there is a chance that the proposed count may be adopted at final hearing. Similarly, a party that has succeeded in having important claims designated as not corresponding to the count may be willing to settle on that basis, even though it may lose certain other claims. To the extent that early decisions on preliminary motions motivate settlement in that way, the proposed amendments will decrease the settlement rate of interferences, adding to the workload of the Board and of practitioners.

While the comment can be correct in some interferences, it may not be true in other interferences. In those interferences where decision on a preliminary motion is likely to lead to settlement, the parties should approach the administrative patent judge and discuss the matter. The administrative patent judge will then be in a position to make an informed decision on an "opinion that an earlier decision on a preliminary motion would material advance the resolution of the interference." Amending the rule, as proposed, will advance resolution of interferences where settlement is not likely, while at the same time giving the parties a means by which to inform the administrative patent judge that a decision on a particular motion would assist the settlement process.

One comment suggested that the proposed language could be clarified by changing "a decision" (first occurrence) to "an earlier decision" so that the sentence reads: "Unless an administrative patent judge or the Board is of the opinion that an earlier decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing." The suggestion is being adopted.

Another comment stated that the second sentence of § 1.640(b) as proposed to be revised ("Motions otherwise will be decided by an administrative patent judge.") is somewhat confusing and asks whether it is intended to mean that if the administrative patent judge decides not to defer a motion to final hearing, the administrative patent judge will then decide the motion. Any possible ambiguity is avoided by changing "otherwise" to "not deferred to final hearing."

Although not proposed in the Notice of Proposed Rulemaking, the sentence in § 1.640(b) which currently reads "[a]n administrative patent judge may consult with an examiner in deciding motions involving a question of patentability" is

changed to "[a]n administrative patent judge may consult with an examiner in deciding motions" to avoid any uncertainty that the administrative patent judge is free to consult with an examiner on any preliminary motion.

Still another comment suggested that the fourth sentence of § 1.640(b) as proposed to be revised ("An administrative patent judge may take up motions for decision in any order and may grant or deny any motion or take such other action which will secure the just, speedy, and inexpensive determination of the interference.") be changed to read as follows to make it clear that the goal of ensuring a just, speedy, and inexpensive determination of the interference applies to the choice of order of deciding motions: "An administrative patent judge may take up motions for decision in any order, may grant or deny any motion, and may take such other action which will secure the just, speedy, and inexpensive determination of the interference." The suggestion is being adopted. The rule is also revised to make absolutely clear that, among other things, an administrative patent judge may dismiss a motion, e.g., when a motion does not comply with a rule. The addition of the possibility of "dismissing" a motion augments the sanction available under § 1.618(a), i.e., return of a paper.

One comment suggested adding a provision to § 1.640(b) specifically recognizing the authority of the administrative patent judge, for the purpose of promoting the just, speedy and inexpensive resolution of the interference, "to schedule a final hearing on deferred preliminary motions prior to the time of testimony on priority, etc. See also § 1.654(a)." The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The suggestion will be considered in a future rulemaking effort, although it should be noted that nothing in the rules should be construed as precluding an administrative patent judge or the Board from ordering a "final" hearing on a particular issue. Whether such a "final hearing" is ordered is within the sound discretion of the administrative patent judge or the Board.

As proposed in the Notice of Proposed Rulemaking, § 1.640(b) is also revised to state that "[a] matter raised by a party in support of, or in opposition to, a motion that is deferred to final hearing will not be entitled to consideration at final hearing unless the matter is raised in the party's brief at final hearing." One comment questioned whether it will be sufficient to simply incorporate the deferred motion and reply into the brief. The answer is no. With the exception of a motion to suppress, which may be filed as a separate paper together with a party's brief (§ 1.656(h)), and papers properly belatedly filed after the brief has been filed, the brief must satisfy the requirements of § 1.656(b) with respect to all issues to be decided at final hearing, including the requirement for a statement of the issue (§ 1.656(b)(4)), a statement of the relevant facts (§ 1.656(b)(5)), and an argument (§ 1.656(b)(6)). It will be noted at this point, that the Board generally discourages the practice of incorporating an argument in one paper into a second paper. The reason is that the argument in the first paper can easily be overlooked in considering the second paper, i.e., when an administrative patent judge studies a motion, opposition, or reply at home only to find that the "incorporated paper" is not available.

As proposed in the Notice of Proposed Rulemaking, § 1.640(b) is revised to state that "[i]f the administrative patent judge determines that the interference shall proceed to final hearing on the issue of priority or derivation, a time shall be set for each party to file a paper identifying any decisions on motions or on matters raised sua sponte by the administrative patent judge that the party wishes to have reviewed at final hearing as well as identifying any deferred motions that the party wishes to have considered at final hearing." One comment questioned why the statement of matters to be reviewed at final hearing is limited to final hearings on "priority or derivation." The reason is that final hearings on priority and/or derivation are the only types of final hearing that will be scheduled pursuant to § 1.640(b). Final hearings that are requested in response to show cause orders under § 1.640(d) are set pursuant to § 1.640(e), which, as amended likewise requires statements identifying the matters to be reviewed at final hearing.

Section 1.640(b) was also proposed to be revised by adding as the last sentence: "Any evidence that a party wishes to have considered with respect to the decisions and motions identified by the party or by an opponent for consideration or review at final hearing, including any affidavit filed by the party under § 1.608 or 1.639(b), shall be served on the opponent during the testimony-in-chief period of the party." In order to be consistent with the terminology in the preceding sentence of § 1.640(b), the phrase "decisions and motions" in the proposed last sentence is replaced by "decisions and deferred motions." Furthermore, the last sentence, as adopted, has been worded to takes into account the retention and amendment of § 1.671(e) to permit a party to file a notice of intent to rely on affidavits, patents and printed publications previously submitted under § 1.639(b). Accordingly, the last sentence, as adopted, reads: "Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony-in-chief period of the party."

As proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.640(b)(1) ("After the time expires for filing any amendment and supplemental preliminary statement, the examiner-in-chief will, if necessary, redeclare the interference.") is changed to read: "At an appropriate time in the interference, and when necessary, an order will be entered redeclaring the interference." One comment requested clarification of the meaning of "when necessary" and suggested that redeclaration should be required when the order of parties is changed but the count remains the same, in order to make it clear who is junior and who is senior. The suggestion, which included no specific language for its implementation and is outside the scope of the present rulemaking, is not being adopted. It will be considered in a future rulemaking effort.

Section 1.640(b)(2), which currently states that a preliminary motion filed after a decision is entered on preliminary motions under § 1.633 will not be considered except as provided by § 1.655(b), is revised to state that a preliminary motion filed after the time expires for filing preliminary motions will not be considered except as provided by § 1.645(b) by changing "1.655(b)" to "1.645(b)." Section 1.645(b) relates to consideration of belatedly filed papers in general.

The Notice of Proposed Rulemaking proposed to amend § 1.640(c), which currently requires an administrative patent judge or the Board to specifically authorize an opposition to a request for reconsideration of a decision by an administrative patent judge, to authorize an opponent to file an opposition, thereby saving the administrative patent judge or the Board the time it would otherwise take to determine whether to authorize an opposition. An opposition is normally required before the Board will modify the decision of an administrative patent judge. One comment suggested that because the Board frequently dismisses or denies requests for reconsideration without requesting an opposition, the proposed amendment will have the effect of unnecessarily increasing costs by encouraging the filing of oppositions that the Board may frequently find unnecessary to consider. The point is well taken and the proposal to amend § 1.640(c) to authorize oppositions to be filed without leave of the administrative patent judge is therefore withdrawn.

As proposed in the Notice of Proposed Rulemaking, the last sentence of § 1.640(c) is removed in order to authorize a single individual administrative patent judge to decide a request for reconsideration and is also revised to require that a request for reconsideration be filed by hand or Express Mail. The amendment of the rule should not be construed as limiting the authority of the Board, in the discretion of an administrative patent judge or the Board, to decide a request for reconsideration.

One comment suggested amending the second sentence of § 1.640(c) to permit service by next-business-day courier, arguing that hand delivery is often impractical and Express Mail unduly difficult. The comment also suggested that paragraph (c) be revised to allow reconsideration of a decision on motions, which is currently limited to identifying points that have been "misapprehended or overlooked," on the additional ground that the decision is simply wrong on the merits, noting that decisions on reconsideration in several interferences agreed that a decision is wrong on the merits but refused to change it on the grounds that nothing was overlooked or misapprehended. Both of these suggestions are outside the scope of the present rulemaking and are not being adopted. However, pending a future rulemaking effort, the word "served by hand" in § 1.640(c) and elsewhere

in the rules should be construed to include service by next-business-day courier. In using a next-business-day courier, a party is serving the paper by hand, the "hand" being the courier service. Hence, service by hand will be construed to include service by any commercial courier which performs a service essentially equivalent to the Express Mail service provided by the U.S. Postal Service. Pending further rulemaking, the date of service shall be the date of delivery to the courier.

Section 1.640(d)(1), which currently states that an order to show cause under that section may be based on a decision on a motion which is dispositive of the interference against a party as to any count, is revised, as proposed in the Notice of Proposed Rulemaking, to also include decisions on dispositive matters raised sua sponte by an administrative patent judge.

Section 1.640(e) is revised, as proposed, to incorporate the substance of the Notice of December 8, 1986, *published as* "Interference Practice: Response to Order to Show Cause Under 37 CFR 1.640," 1074 Off. Gaz. Pat. Office 4 (Jan. 6, 1987), 1086 Off. Gaz. Pat. Office 282 (Jan. 5, 1988). Specifically, § 1.640(e), as amended, provides that where the order to show cause was issued under § 1.640(d)(1), the party may file a paper (i) requesting that final hearing be set to review the decision which is the basis for the order and identifying every other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing, or (ii) fully explaining why judgment should not be entered. Any opponent is permitted to file a response to the paper within 20 days of the date of service of the paper. Where the order was issued under § 1.640(d)(1), and the paper includes a request for final hearing, the opponent's response must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where the order was issued under § 1.640(d)(1) and the paper does not include a request for final hearing, the opponent's response may include a request for final hearing, which must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where an opponent's response includes a request for a final hearing, the party who filed the paper shall have 14 days from the date of service of the opponent's response in which to file a supplemental paper identifying any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing. The paper or the response thereto shall be accompanied by a motion (§ 1.635) requesting a testimony period if a party wishes to introduce any evidence to be considered at final hearing (§ 1.671), such as affidavits previously filed under § 1.639(b). A request for a testimony period will be construed as including a request for final hearing. If the paper contains an explanation of why judgment should not be entered in accordance with the order and no party has requested a final hearing, the decision that is the basis for the order shall be reviewed based on the contents of the paper and the response. If the paper fails to show good cause, the Board shall enter judgment against the party against whom the order issued.

One comment suggested that in view of the proposed addition to § 1.640(b) to create a presumption of deferral of nondispositive preliminary motions, a provision should be added allowing the parties to request that the Board also consider deferred preliminary motions at a § 1.640(e) final hearing. The comment has merit and, while not being adopted specifically at this time, will be made the subject of future rulemaking. In the interim, and consistent with the second sentence of § 1.601, the rules should be construed to give the administrative patent judge the maximum discretion to determine what issues might be considered at any final hearing set as a result of entry of an order to show cause.

One comment suggested that § 1.640(e)(1) be revised to automatically authorize the party who filed a paper in response to a § 1.640(d) show cause order to file a reply to an opponent's response in order to avoid the need for motions to file such replies. The suggestion is outside the scope of the present rulemaking and is not being adopted. Another comment suggested adding a provision to § 1.640(e) similar to the last sentence of proposed § 1.640(b) so that parties can include § 1.639 preliminary motion proofs in the record for consideration at a § 1.640(e) final hearing. The suggestion is being adopted. Accordingly, the penultimate sentence of § 1.640(e)(3), as adopted, reads: "Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony period of the party."

One comment suggested modifying the first sentence of proposed § 1.640(e)(4) ("If the paper contains an explanation of why judgment should not be entered in accordance with the order and no party has requested a final hearing . . . .") by changing "order and" to read "order, and if." The suggestion is being adopted.

Two comments suggested that interferences can be expedited and the costs reduced by amending the rules to formalize the procedure of having an administrative patent judge conduct a hearing after the filing of motions, oppositions and replies on issues that are potentially dispositive of the interference, as has been done on an experimental basis in several interferences. The comment indicates that such a procedure should reduce time and costs, encourage settlements, reduce issues, and help parties reach stipulations. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The suggestion will be the subject of future rulemaking. In the interim, there is nothing in the rules to preclude a party from requesting a hearing on a dispositive motion. Whether a hearing is conducted is a matter within the discretion of the administrative patent judge.

Section 1.641 currently provides that an administrative patent judge who becomes aware of a reason why a claim designated to correspond to a count may not be patentable should notify the parties of the reason and set a time within which each party may present its views. After considering the views, the administrative patent judge determines how the interference shall proceed. The Notice of Proposed Rulemaking proposed to amend § 1.641 to state that a party's views "may include argument or appropriate preliminary motions under § 1.633(c), (d) or (h), including any supporting evidence." After the Notice of Proposed Rulemaking was published it became apparent that the proposed language is ambiguous as to (1) whether evidence can be submitted in support of argument as well as in support of appropriate motions and (2) as to whether a party who agrees with the administrative patent judge's determination of unpatentability is entitled to file motions under §§ 1.633(c), (d) and (h). These possible ambiguities are avoided by amending the rule to state that a party's views may include argument, including any supporting evidence, and in the case of the party whose claim may be unpatentable, may also include one or more appropriate preliminary motions under § 1.633(c), (d) and (h), including any supporting evidence. The Notice of Proposed Rulemaking also proposed amending § 1.641 to state that "[a]fter considering any timely filed views, including any timely filed preliminary motions under § 1.633, the administrative patent judge shall decide how the interference shall proceed." Inasmuch as the proposed language fails to take into account any oppositions and replies for the motions, the rule is instead revised to read: "After considering any timely filed views, including any timely filed preliminary motions under § 1.633, oppositions and replies, the administrative patent judge shall decide how the interference shall proceed.

"One comment responded to the proposed amendments of § 1.641 as follows:

> The action taken by an administrative patent judge under this rule should be described as, in effect, a section 1.633(a) motion by the administrative patent judge. The action should point out that any party disagreeing with the administrative patent judge should respond in the same fashion as it would in opposing a section 1.633(a) motion including the submission of all available evidence underrule 1.639. By taking action under this rule, an administrative patent judge[*] becomes the (or an) adversary to at least one party in the interference and therefore any decision on such a motion by an administrative patent judge should be deferred to final hearing and the administrative patent judge who took the action should not be a member ofthe panel at final hearing. Other possibilities would be to remand the matter to the primary examiner for his or her decision as to whether there is any merit to the purported ground of unpatentability. If the purported ground of unpatentability applies to the claims of a patent involved in the interference, the primary examiner could determine whether the purported ground of unpatent-

ability is sufficient to institute a reexamination proceeding with respect to the patent. If the primary examiner's decision is adverse to one or more of the parties, that party or those parties would have the burden of showing that the primary examiner's decision was incorrect. Another possibility would be for the administrative patent judge to merely notice the issue and provide the parties with a period of time within which to submit a motion under section 1.633(a). If none of the parties submits a section 1.633(a) motion and the administrative patent judge considers the matter to be of sufficient importance, he or she could then remand to the attention of the primary examiner for his or her decision as previously indicated.

* Cf. *In re Van Geuns*, 20 USPQ2d 1291, 1295 (Fed. Cir.1991)"[a]s in all *ex parte* cases, the entity adverse to Van Geuns is the PTO Commissioner."

The suggestion that § 1.641 be revised to characterize an administrative patent judge's determination that a party's claim may be unpatentable as, in effect, a § 1.633(a) motion is not being adopted. Section 1.641, as proposed to be revised by the comment, could be construed as precluding an opponent who agrees with the determination from submitting argument and appropriate motions, including evidence, in support of the determination. The suggestion that the administrative patent judge who initially made the determination of unpatentability be precluded from serving as a member of the reviewing panel at final hearing is not adopted. Judges in various courts and judges in administrative proceedings routinely issue orders to show cause and consider views presented in response to those orders. In the case of a dispositive matter which results in the issuance of an order to show cause, the party receiving the order to show cause knows that in addition to the administrative patent judge issuing the order, at least two other administrative patent judges will consider the response. Moreover, it should be noted that resolving patentability in an interference and in ex parte proceedings is not the same. In ex parte examination of a patent application, the statute specifically contemplates an administrative appeal to the Board. 35 U.S.C. 134. In the case of interferences, the statute authorizes the Board, in the first instance, to make a patentability determination. 35 U.S.C. 135(a). Hence, the statute does not require that an administrative patent judge issuing an order to show cause not participate in ruling on the sufficiency of any response to the order. Efficient administration of interferences in PTO dictates that the administrative patent judge most likely to be familiar with the record participate in evaluating responses to orders to show cause.

Another comment suggested that a § 1.641 order authorizing views be identified in the rule as an order to show cause. The suggestion is not being adopted. If, after considering the parties' arguments, motions, oppositions and replies, the administrative patent judge concludes that all of the involved claims or one or both parties are unpatentable, the administrative patent judge may issue an order to show cause pursuant to § 1.640(d)(1) as amended, which expressly provides for a show cause order based on a decision on a matter raised sua sponte by an administrative patent judge.

Section 1.643(b) is revised, as proposed in the Notice of Proposed Rulemaking, for clarification and also to change "ends of justice" to "interest of justice" to be consistent with the language used in other interference rules, including §§ 1.628(a) and 1.687(c).

As proposed in the Notice of Proposed Rulemaking, § 1.644(a) is revised by changing "a panel consisting of more than one examiner-in-chief" to "the Board" and paragraphs (a)(1), (b) and (c) are revised by changing both occurrences of "panel" to "Board."

Section 1.644(a)(2) is revised by removing the statement concerning when parties are authorized to file a petition seeking to invoke the supervisory authority of the Commissioner. The times for filing petitions are set out in § 1.644(b).

Section 1.644(b) is revised to provide that a petition seeking to invoke the supervisory authority of the Commissioner shall not be filed prior to the party's brief for final hearing. Sections 1.644(a)(2) and (b) currently provide that such a petition shall not be filed "prior to the decision of the Board awarding judgment." Since promulgation of the "new" rules, 49 FR 48416 (Dec. 12, 1984), *reprinted* in 1050 Off. Gaz. Pat. Office 385 (Jan. 29, 1985), there have been relatively few petitions filed in interference cases, particularly petitions seeking to invoke supervisory authority. Thus, a result sought to be achieved under the "new" rules has been, in fact, achieved, i.e., fewer petitions. Under the rules, there should be few, if any, petitions to invoke supervisory authority. Section 1.644(a)(1), which authorizes important questions to be certified to the Commissioner, should be sufficient in most cases to resolve questions of interpretation of the rules. Section 1.644(a)(2) provides a vehicle for rule interpretation in those cases where certification is declined by the administrative patent judge and there remains, at the time briefs are filed for final hearing, a need to resolve the interpretation. The time for filing a petition to invoke supervisory authority is believed to be more appropriate before the Board enters a final decision, as opposed to after entry of a final decision—as required by current practice. Parties should not file petitions seeking to invoke supervisory authority in cases involving routine interlocutory orders which do not involve an interpretation of a rule. As noted in the notice of final rule:

> [a] final decision of the Board is reviewable in the U.S. Court of Appeals for the Federal Circuit or an appropriate U.S. district court. Any reviewing court can review all aspects of the decision including patentability, priority, and all relevant interlocutory orders, such as denials of discovery.

49 FR 48416, 48418 (Dec. 12, 1984), *reprinted* in 1050 Off. Gaz. Pat. Office 385, 387 (Jan. 29, 1985).

Section 1.644(b) is also revised, as proposed, by revising it to state that a petition under § 1.644(a) shall be considered timely if it is filed simultaneously with a proper motion under §§ 1.633, 1.634, or 1.635 when granting the motion would require waiver of a rule. In other words, a petition under § 1.644(a)(3) should seek waiver of a rule prospectively rather than retroactively. Parties should recognize that waiver of a rule is reserved for unusual circumstances. *Myers v. Feigelman*, 455 F.2d 596, 601, 172 USPQ 580, 584 (CCPA 1972) (waiver of rules on routine basis would defeat the purpose of the rules and substantially confuse interference practice). Nevertheless, since PTO cannot possibly contemplate all circumstances which can arise in interferences at the time a rule is promulgated, waiver of a rule may be entirely appropriate in unusual circumstances. By encouraging parties to file a petition when they know a rule must be waived, the opponent is put in the best position to address the matter and to take whatever action might be in the opponent's interest in the event a petition is granted. On the other hand, parties should not expect many petitions to be granted which seek to waive the rules.

The time for responding to a petition under § 1.644(a)(1) or (a)(2) is changed from (a) 15 to days (b) to 20 days. The time for responding to a petition under § 1.644(a)(3) is changed from (a) 15 days to (b) 20 days or the date an opposition is due to the accompanying motion, whichever is earlier. The change will permit an opponent to file an opposition to the motion and the petition on the same day and should eliminate different, but related, time periods from running concurrently.

Section 1.644(b), as proposed, would have authorized the petition to be made part of the motion, as does § 1.644(b) in its current form. Upon reflection, since the petition is decided by one PTO official and the motion by another, it will be more efficient for PTO if the petition and motion are filed as separate papers. Additionally, the fact that a petition has been filed is less likely to be inadvertently overlooked if the petition and motion appear in separate papers.

In § 1.644(d), the second sentence, as proposed, is removed as unnecessary. The Notice of Proposed Rulemaking also proposed amending this paragraph to provide that the statement of facts in a petition preferably should be in numbered paragraphs. One comment suggested that numbered paragraphs be required, rather than just preferred. The suggestion is being adopted. Another comment suggested inserting a comma after "Board" in the second sentence of § 1.644(d), as proposed to be revised. The suggestion is being adopted.

As proposed in the Notice of Proposed Rulemaking, § 1.644(f) is revised to change the "15 days" in which to request reconsideration of a decision by the Commissioner to "14 days."

In § 1.644(g), the quotation marks around "Express Mail" are removed, as proposed.

Section 1.645(b), which in its current form permits consideration of a belatedly filed paper only if accompanied by a motion under § 1.635 showing sufficient cause (§ 1.645(b)) for the belatedness, is revised in several respects, as proposed in the Notice of Proposed Rulemaking. First, "sufficient cause" is changed to "good cause" in order to provide a single "cause" standard throughout the interference rules. Second, paragraph (b) is revised to permit consideration of a belatedly filed paper if an administrative patent judge or the Board, sua sponte, is of the opinion that it would be in the interest of justice to consider the paper. An example would be where the delay is short (e.g., one day) and there is no prejudice to an opponent or where all parties and the Board act as though a paper is timely only to discover later that it was not. For purposes of sections other than § 1.645, a belatedly filed paper is considered "timely filed" if accompanied by a motion under § 1.635 to excuse the belatedness, which is granted.

Section 1.645(d) is revised, as proposed, by deleting "In an appropriate circumstance" as superfluous in view of the language "may stay proceedings," which indicates that the administrative patent judge has the discretion to stay an interference.

Section 1.646 is revised in the manner proposed in the Notice of Proposed Rulemaking. Specifically, § 1.646(a)(2) is revised by deleting the reference to § 1.684, which is removed. Section 1.646(c)(1) is revised by inserting "or causing a copy of the paper to be handed" after "By handing a copy of the paper" to make it clear that the paper need not be personally delivered by the party, i.e., that delivery by hand can be effected by a commercial courier, for example. When a next-business-day commercial courier is used, it should be understood that the party normally will deliver the paper to the courier on one day and the paper will be delivered to the office of counsel for the opponent on the next day. A certificate of service that states that the paper is being served "via the following commercial courier: [insert name]" is deemed to be a proper service within the meaning of § 1.646(c)(1), as amended. Pending further rulemaking, the date of service will be considered the date the paper is delivered to the courier.

In § 1.646(c)(4), "mail" (second occurrence)"is changed to "first class mail" to make it clear that the service date specified in that paragraph applies only to first class mail.

Section 1.646(c)(5) is redesignated as § 1.646(c)(6) and a new § 1.646(c)(5) is added which explains that a party may serve by Express Mail and that when service is effected by Express Mail, the date of service is considered to be the date of deposit with the U.S. Postal Service.

Section 1.646(d) is revised by removing the quotation marks around "Express Mail."

Section 1.646(e) is revised to state that the due date for serving a paper is the same as the due date for filing the paper in the Patent and Trademark Office.

One comment suggested amending § 1.646 to authorize service by next-business-day courier, with the date of service being the day the paper is given to the courier. The suggestion is not being adopted at this time, but will be considered in future rulemaking. In the interim, for the reasons given above, service by a next-business-day courier may be regarded as service by hand.

Section 1.651(a)(2) is revised, as proposed, by removing "(testimony includes testimony to be taken abroad under § 1.684)" in order to be consistent with the proposal to remove and reserve § 1.684 and by amending §§ 1.651(c)(2) and (c)(3) to be consistent with the amendment to the definition of "effective filing date" in § 1.601(g).

The Notice of Proposed Rulemaking proposed further amending § 1.651(d) by changing "abroad under § 1.684" to "in a foreign country." One comment noted that the term "foreign country" is unduly restrictive in that it does not include a foreign place that is not part of a "country" and suggested that the phrase "in a place outside the United States" be used instead. The suggestion is being adopted.

Section 1.653(a) is revised as proposed in the Notice of Proposed Rulemaking. First, the references to certain paragraphs of § 1.672 are revised to reflect the redesignation of those paragraphs. Second, "of fact" in the clause "agreed statements of fact under § 1.672(f)" is removed, because agreed statements under § 1.672(f), redesignated as § 1.672(h), can set forth either (1) how a particular witness would testify if called or (2) the facts in the case of one or more of the parties. Third, "under § 1.684(c)" is removed in view of the removal of § 1.684. Fourth, § 1.653(a) is revised to indicate that in addition to the types of testimony already set forth therein, testimony includes copies of written interrogatories and answers and written requests for admissions and answers, which might be obtained where a motion for additional discovery under § 1.687(c) is granted.

One comment suggested deleting "transcripts of interrogatories, cross interrogatories, and recorded answers" on the ground that this language is from § 1.684, which is removed. The suggestion is not being adopted, since there may be occasions when such testimony would be appropriate and authorized by an administrative patent judge or the Board.

Another comment suggested amending § 1.653 to provide that a party's record can include copies of videotapes of depositions and inter partes tests (in addition to the transcripts of the depositions), citing disparate treatment of this matter said to be occurring with different administrative patent judges. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The matter of videotapes and other forms of proof will be considered in a future rulemaking effort.

As proposed in the Notice of Proposed Rulemaking, § 1.653(b) is revised to be consistent with the redesignation of certain paragraphs of § 1.672 and to remove the reference to § 1.684(c), which is removed. Section 1.653(b) is also revised for clarity, while §§ 1.653(c)(1) and (4) are revised to make it clear that the only testimony to be included in a party's record is testimony submitted on behalf of the party. Having copies of the same testimony appear in both parties' records unnecessarily encumbers the records and is confusing in that a given page of testimony will have different page numbers in the different records, with the result that the briefs of the parties will refer to different record pages for the same testimony.

One comment suggested that either § 1.653(b) or § 1.672(h) be revised to specify when an "an original agreed statement under § 1.672(h)" is to be filed, since the due date for filing such a statement is not provided in the current rules. The suggestion is outside the scope of the current rulemaking and is not being adopted. In the interim, parties should plan on filing an agreed statement as soon as practical after it is agreed to, but an administrative patent judge shall have discretion to accept the agreed statement at any reasonable time.

Section 1.653(c)(5), which currently requires that the record filed by each party include each notice, official record and printed publication relied upon by the party and filed under § 1.682(a), is removed and reserved, as proposed. The requirement is unnecessary because notices, official records and printed publications are in the nature of exhibits under § 1.653(i), which are submitted with but not included in the record. The inclusion of exhibits in the record merely increases the size of the record without serving any useful purpose.

As proposed in the Notice of Proposed Rulemaking, § 1.653(g) is revised, and §§ 1.653(f) and (h) removed and reserved, to eliminate the current distinction between typewritten and printed records. Specifically, § 1.653(g) is revised by changing "8 1/2 x 11 inches (21.8 by 27.9 cm.)" to "21.8 by 27.9 cm. (8 1/2 x 11 inches)" in order to emphasize the metric dimension, by removing the requirement for justified margins, by requiring that the records be bound with covers at their left edges in such manner as to lie flat when open to any page and in one or more volumes of convenient size (approximately 100 pages per volume is suggested) and by requiring that when there is more than one volume, the numbers of the pages contained in each volume must appear at the top of the cover for each volume. Section 1.653(i) is revised, as proposed, to state that exhibits include documents and things identified in affidavits or on the record during the taking of oral depositions as well as official records and publications submitted pursuant to § 1.682(a).

Section 1.654(a) is revised, as proposed, by changing "shall" in the second sentence to "may" for clarity and also to reduce the time for oral argument by a party from 60 minutes to 30 minutes. Most hearings require no more than 30 minutes per side. A panel hearing oral argument retains discretion to grant more time at a hearing.

The Notice of Proposed Rulemaking proposed amending § 1.655(a) to state that the standard of review for interlocutory orders is "an abuse of discretion" rather than "erroneous or an

abuse of discretion." As explained in the Notice of Proposed Rulemaking, the recitation of a separate "error" standard is believed to be superfluous, because legal error is one of the alternative bases for finding an abuse of discretion. Specifically, an abuse of discretion may be found when (1) the decision of an administrative patent judge is clearly unreasonable, arbitrary or fanciful, (2) the decision is based on an erroneous conclusion of law, (3) the findings of the administrative patent judge are clearly erroneous, or (4) the record contains no evidence upon which the administrative patent judge rationally could have based the decision. *Compare, e.g., Heat and Control, Inc. v. Hester Industries, Inc.*, 785 F.2d 1017, 1022, 228 USPQ 926, 930 (Fed. Cir. 1986); *Western Electric Co. v. Piezo Technology, Inc. v. Quigg*, 860 F.2d 428, 430-31, 8 USPQ2d 1853, 1855 (Fed. Cir. 1988); *Abrutyn v. Giovanniello*, 15 F.3d 1048, 1050-51, 29 USPQ2d 1615, 1617 (Fed. Cir. 1994), all of which define the phrase "abuse of discretion." One comment stated that the rule, as proposed to be amended, in effect raises the standard of review because "abuse of discretion" includes "clear error" but not mere "error." In view of the above-cited Federal Circuit decisions, it is believed that the statement in the comment is not correct.

One comment suggested inserting a comma after "correct" in the penultimate sentence of § 1.655(a). The suggestion is being adopted.

Section 1.655(b) is revised to clarify the language concerning matters that a party is not entitled to raise for consideration at final hearing. Specifically, § 1.655(b), as amended, provides that a party shall not be entitled to raise for consideration at final hearing any matter which properly could have been raised by a motion under § 1.633 or 1.634 unless (1) the matter was properly raised in a motion that was timely filed by the party under § 1.633 or 1.634 and the motion was denied or deferred to final hearing, (2) the matter was properly raised by the party in a timely filed opposition to a motion under § 1.633 or 1.634 and the motion was granted over the opposition or deferred to final hearing, or (3) the party shows good cause why the issue was not properly raised by a timely filed motion or opposition. It was proposed in the Notice of Proposed Rulemaking to amend § 1.655(b) to state that "[a] change of attorneys during the interference generally does not constitute good cause." For the reasons already given, it has been decided not to adopt the proposed amendment to § 1.655(b).

The Notice of Proposed Rulemaking also proposed to amend § 1.655(b) to create a rebuttable presumption that all claims of a party that are designated as corresponding to a count are directed to the same patentable invention for the purpose of determining unpatentability in view of prior art. The Federal Circuit had interpreted the former rule to suggest that the presumption applied only where a party's claim corresponded exactly to a count and was anticipated by prior art. *In re Van Geuns*, 988 F.2d 1181, 1185, 26 USPQ2d 1057, 1060 (Fed. Cir. 1993). The proposed revised rule would have made it clear that the rebuttable presumption applies to all claims that are designated as corresponding to the count, regardless of whether the count is anticipated by (§ 102) or would have been obvious view of (§ 103) the prior art. Specifically, the Notice of Proposed Rulemaking proposed adding the following sentence: "A party who fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count may not subsequently argue to an administrative patent judge or the Board the separate patentability or lack of separate patentability of claims designated to correspond to the count." Comments were filed in opposition to the proposed amendment. One comment, for example, stated that the proposed amendment, as well as the accompanying commentary in the Notice of Proposed Rulemaking,

> falsely assumes that claims cannot be separately patentable merely because they have been designated as corresponding to the count, *i.e.*, merely because the claims are patentably indistinct from each other. The falsity of this proposition is apparent from the practice of the Patent and Trademark Office of designating as corresponding to the count both the patentable and unpatentable claims of a party.
>
> Two different comparisons are relevant: a party's claims with other claims of the party and the claims of a party with the prior art. The claims may be patentably indistinct *from each other* and, thus, provide no basis for a motion under § 1.633(c)(4), yet be separately patentable *over the prior art*.
>
> Accordingly, for example, a party should be able to respond to a motion for judgment on grounds of unpatentability over the prior art by arguing that *some*, but not necessarily all, of the designated claims are patentable over the prior art, even though the party had not previously moved to designate the separately patentable claims as not corresponding to the count. Indeed, it is entirely possible that no basis existed for making such a previous motion. The proposed amended rule, however, forecloses a party from responding to an attack on patentability of its claims by arguing that some, but not all, of the claims are patentable over the prior art.

(Emphasis in original.) The comment included several illustrative examples, including the following example said to be from an actual interference:

> The count is directed to a broad generic class of compounds. While the compounds are useful herbicides, the count and corresponding claims are directed to compounds per se. The applications of both parties contain designated claims substantially corresponding to the count as well as claims directed to species falling within the count.
>
> The application of party A contains a designated claim directed specifically to a species with [sic; within] the genus that possesses ordinary activity for compounds of the claimed class; *i.e.*, the species compound is not separately patentable over the genus. Thus, the claim to the species is not patentable over the count if the count were prior art and is properly designated as corresponding to the count.
>
> Party B, during the motion period, moves for judgment under § 1.633(a) on the basis of a reference that is not prior art against party B, only against party A. That reference discloses a single compound falling squarely within the genus of the count * * *, but that is significantly different structurally from the species claimed in A's application. Furthermore, the reference does not indicate that the disclosed compound has herbicidal properties and it is shown in opposition to the motion for judgment that the compound, in fact, possesses virtually no herbicidal activity.
>
> Under this set of facts, the compound of the reference anticipates party A's claim that corresponds * * * [exactly] to the count. Nevertheless, the reference has no significance with regard to the patentability of the species claim in party A's application.
>
> In this particular case, the EIC [Examiner-in-Chief] had no difficulty in partially granting the motion for judgment against party A as to the generic claim, but denying the motion as to the species claim. The interference was continued with the count unchanged (because the reference was not prior art as to party B), with party A ultimately prevailing on the issue of priority. Thus, neither party received a generic claim, but party A ultimately obtained a species claim that was patentably indistinct from the genus of the count. Presumably under the new rules, party B would have retained all its claims while all of party A's claims would be found unpatentable.
>
> This case clearly illustrates that a claim that is patentably indistinct from the count and from a claim corresponding * * * [exactly] to the count (*i.e.*, a claim that cannot be designated as not corresponding to the count), nevertheless can be patentable over prior art that renders unpatentable a claim corresponding precisely to the count. This case also illustrates that failure to file a motion to designate certain claims as not corresponding to the count cannot be taken as a concession that all of the designated claims are unpatentable merely because the count (or a claim corresponding precisely to the count) is unpatentable over the prior art. Moreover, this situation is not an unusual one. It happens often in chemical cases, particularly chemical cases dealing with biologically active compounds.

Another comment questioned when a party that has failed to contest the designation of a claim as corresponding to a count would ever have occasion to later argue a *lack* of separate patentability.

The above comments are well taken. Accordingly, the proposal to amend § 1.655(b) to preclude a party from arguing separate patentability or a lack of separate patentability of claims over prior art in the absence of a § 1.633(c) motion is hereby withdrawn. Instead, the rule is revised to read as follows: "A party that fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count, or *fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised*, will not be permitted to later argue the separate patentability of that claim with respect to that ground." Thus, a party that fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised will not be permitted to later argue the separate patentability of that claim with respect to that ground. As noted in the comment, often the first opportunity to address patentability is in an opposition to a preliminary motion for judgment under § 1.633(a). In addition, inasmuch as a party filing a motion under § 1.633(a) must separately address each claim alleged to be unpatentable, the opponent will be in a position to know how to prepare an opposition, whereas under the current rules preparation of an opposition separately addressing each claim is not clearly required by the rules. The basic idea is that an opponent should have a fair opportunity to address the patentability of any of the opponent's claims when a patentability issue is first raised. Patentability can be raised, for example, by a preliminary motion under § 1.633(a) or sua sponte by an administrative patent judge. However, a party is not entitled to wait until the 11th hour in an interference to belatedly raise for the first time an issue of separate patentability of claims corresponding to a count.

As proposed in the Notice of Proposed Rulemaking, § 1.655(c) is revised by changing "To prevent manifest injustice" to "In the interest of justice" to be consistent with the language used in other interference rules.

Section 1.656 is revised, as proposed, by redesignating paragraphs (b)(1) through (b)(6) as paragraphs (b)(3) through (b)(8), respectively, and adding new paragraphs (b)(1) and (b)(2) requiring the brief to include (1) a statement of interest identifying every party represented by the attorney in the interference and the real party in interest if the party named in the caption is not the real party in interest and (2) a statement of related cases indicating whether the interference was previously before the Board for final hearing and identifying any related appeal or interference which is pending before, or which has been decided by, the Board, or which is pending before, or which has been decided by, the Court of Appeals for the Federal Circuit or a district court in a proceeding under 35 U.S.C. 146. A related appeal or interference is one which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending interference. Appeals are mentioned because there have been numerous situations where related issues have been present before the Board simultaneously or sequentially in an ex parte appeal and an interference and vice versa. It was also proposed to amend current paragraph (b)(3), redesignated as paragraph (b)(5), to specify that statements of fact preferably should be presented in numbered paragraphs. One comment suggested that numbered paragraphs be required. The suggestion is being adopted.

As explained in the Notice of Proposed Rulemaking, § 1.656(b)(4), which is redesignated as § 1.656(b)(6), requires that the opening brief of the junior party contain the contentions of the party with respect to the "issues to be decided," which has been construed to include the matter of whether some of the senior party's evidence of conception was inadmissible hearsay. *Suh v. Hoefle*, 23 USPQ2d 1321, 1323 (Bd. Pat. App. & Int. 1991). As support, the Board in *Suh* relied on *Fisher v. Bouzard*, 3 USPQ2d 1677 (Bd. Pat. App. & Int. 1987), and *Moller v. Harding*, 214 USPQ 730 (Bd. Pat. Int. 1982). Both of these cases concern interferences declared under the "old" interference rules (i.e., § 1.201 *et seq.*), of which § 1.254 specified that the opening brief of the junior party shall "present a full, fair statement of the questions involved, including his position with respect to the priority evidence on behalf of other parties." Current § 1.656(b)(4) does not expressly require, and was not intended to imply, that the opening brief of the junior party must address the evidence of any other party with respect to the issue of priority or any other issue. In order to clarify that the opening brief of a junior party need not address the evidence of the other parties, § 1.656(b)(6), as adopted, is revised to require only that the junior party's opening brief contain the contentions of the party "with respect to the issues it is raising for consideration at final hearing." These issues would include the junior party's case-in-chief for priority with respect to an opponent or derivation by an opponent as well as matters raised in any denied or deferred motions of the junior party that are to be reviewed or considered at final hearing. Where the reply brief of the junior party is believed to include a new argument in response to the case-in-chief of the senior party as presented in the senior party's opening brief, the senior party may move under § 1.635 for leave to file a reply to the junior party's reply brief. The motion must be accompanied by a copy of the senior party's reply.

Section 1.656(d) is revised, as proposed, to state that unless ordered otherwise by an administrative patent judge, briefs shall be double-spaced (except for footnotes, which may be single-spaced) and shall comply with the requirements of § 1.653(g) for records except the requirement for binding. As a result, the current distinctions between printed and typewritten briefs are eliminated. Recent briefs filed in interference cases have been fairly long, e.g., 150 pages. The parties should make every effort to file briefs which, to borrow the words in one section of the patent statute, 35 U.S.C. 112, are "full, clear, concise, and exact." Consideration will be given in a future rulemaking effort as to whether it might be appropriate to require a party to submit both (1) findings of fact and conclusions of law and (2) a brief, wherein it might be presumed that the reader of the brief is familiar with the proposed findings/conclusions. So that members of the bar practicing before the Board in interference cases can be apprised of how briefs are used at the Board, the following comments are made. Briefs serve two purposes. First, briefs enable all three panel members to prepare for oral argument. During the time a member prepares for oral argument, often there is not time to become fully familiar with the record, particularly where the brief is being read at a location outside PTO, e.g., home. Second, when an opinion is authored by one panel member and reviewed by the other two panel members, the brief serves as a road map during the necessarily more thorough and more complete review of the record. Whereas there may not be time to "check" the record during the preparation phase before oral argument, there is time to "check" the record during the opinion writing and review period. An effective brief, with or without proposed findings/conclusions, is one which permits the members of the Board to accomplish both purposes mentioned above.

In § 1.656, paragraphs (e), (g) and (h) are revised, as proposed, to require an original and four copies (currently an original and three copies are required) of each brief, any proposed findings of fact and conclusions of law, any motion under 37 CFR 1.635 to suppress evidence and any opposition to a motion to suppress evidence.

The Notice of Proposed Rulemaking proposed amending the third sentence of § 1.656(g) to read as follows: "Any proposed findings of fact shall be in numbered paragraphs and supported by specific references to the record." One comment suggested that "and supported" be changed to "and shall be supported." The suggestion is being adopted.

Section 1.656(h) is revised, as proposed, to state that a party's failure to challenge the admissibility of the evidence of an opponent on a ground that could have been raised in a timely objection under §§ 1.672(c), 1.682(c), 1.683(b) or 1.688(b) constitutes a waiver of the right to move under § 1.656(h) to suppress the evidence on that ground at final hearing.

Section 1.656(i) currently provides that if a junior party fails to file an opening brief for final hearing, an order may be issued by the administrative patent judge requiring the junior party to show cause why the failure to file a brief should not be treated as a concession of priority, and further provides that judgment may be rendered against the junior party if the junior party "fails to respond" within a time period set in the order. The expression "fails to respond" has been misinterpreted by

some junior parties as meaning that the mere filing of a response of any kind to the order to show cause should be sufficient to avoid the entry of judgment. Such an interpretation was not intended and, if adopted, would effectively nullify § 1.656(i). As proposed in the Notice of Proposed Rulemaking, "respond" is changed to "show good cause" to make it clear that a junior party's failure to file a timely opening brief will not be excused unless good cause is shown to explain or justify the failure to file a brief. The language of the rule will then be consistent with the other interference rules concerning orders to show cause, e.g., §§ 1.640(c) and 1.652.

Section 1.657 is revised, as proposed, to be consistent with the changes to the definition of "effective filing date" in § 1.601(g). As revised, § 1.657 will also state that in an interference involving an application and a patent where the effective filing date of the application is after the date the patent issued, a junior party has the burden of establishing priority by clear and convincing evidence. In other interferences the junior party has the burden of establishing priority by a preponderance of the evidence. The amendment codifies the holding of *Price v. Symsek*, 988 F.2d 1187, 1190-91, 26 USPQ2d 1031, 1033 (Fed. Cir. 1993), as clarified by *Bosies v. Benedict*, 27 F.3d 539, 541-42, 30 USPQ2d 1862, 1864 (Fed. Cir. 1994).

Section 1.658(a) is revised, as proposed, to state that when the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision for the purpose of judicial review (35 U.S.C. 141-44, 146) unless a request for reconsideration under paragraph (b) of this section is timely filed.

Section 1.658(b) is revised, as proposed, by removing the phrases "[w]here reasonably possible" and "such that delivery is accomplished" as unnecessary, so that the sentence as revised reads as follows: "Service of the request for reconsideration shall be by hand or Express Mail." As proposed, a sentence is also added specifying that a decision on reconsideration is a final decision for the purpose of judicial review (35 U.S.C. 141-44, 146). Section 1.658(b) is further revised, as proposed, by changing "reply to a request for reconsideration" to "opposition to a request for reconsideration" in order to be consistent with the terminology employed in § 1.640(c), which concerns requests for reconsideration of decisions on preliminary motions.

One comment suggested amending § 1.658(b) to permit service of requests for reconsideration by next-business-day commercial courier. The suggestion is not being adopted at this time, but will be the subject of a future rulemaking effort. In the interim, see the discussion above concerning the interpretation to be given the phrase "service . . . by hand."

As proposed in the Notice of Proposed Rulemaking, § 1.660 has been revised by adding a new paragraph (e) explaining that the failure of a party to comply with the notice provisions of § 1.660 may result in sanctions under § 1.616 and that knowledge by, or notice to, an employee of the Office other than an employee of the Board, of the existence of the reexamination, application for reissue, protest, or litigation shall not be sufficient. It was also proposed to provide that the notice contemplated by this section is notice addressed specifically to an administrative patent judge or the Board. One comment suggested that rather than requiring the notice to be "addressed specifically to an administrative patent judge or the Board," the rule require that it be "addressed to the administrative patent judge in charge of the interference in which the application or patent is involved." The suggestion is being adopted.

Section 1.662(a) is revised, as proposed, by changing "filing by an applicant or patentee" in the second sentence to "filing by a party" to make it clear that a request for adverse judgment, including a written disclaimer of the invention defined by a count, a concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count and abandonment of the contest as to a count, can be signed by the party's attorney or agent of record. For the same reason, in the third sentence of paragraph (a), which concerns abandonment of an involved application "by an applicant" is removed and "applicant" is revised to read "application."

In § 1.662(b), the first sentence is revised, as proposed, by changing "omits all claims of the patent corresponding to the counts of the interference for the purpose of avoiding the interference" to read "does not include a claim that corresponds to a count" in order to make it clear that judgment may not be entered where the reissue application includes any claim that corresponds to a count, including a new or amended claim that should be designated as corresponding to the count. Similarly, "reissue other than for the purpose of avoiding the interference" is changed to "reissue which includes a claim that corresponds to a count," which means corresponds to the count or should be designated to correspond to the count.

Section 1.674(a), which specifies before whom depositions may be taken, the reference to "United States or a territory or insular possession of the United States" is removed, as proposed, in order to make the paragraph applicable to depositions for testimony compelled in foreign countries.

Section § 1.675(d), which concerns reading and signing of a transcript by the witness, is revised, as proposed, to take into account that the witness might refuse to read and/or sign the transcript of the deposition, in which case the circumstances under which the witness refused to sign must be noted on the certificate by the officer who prepared the certified transcript (§ 1.676(c)). One comment suggested that § 1.675 be revised to recognize the witness's right to make corrections to the transcript prior to signing, as in Fed. R. Civ. P. 30(e), second sentence. The suggestion, which is outside the scope of the present rulemaking, is not being adopted. The substance of the suggestion will be considered in a future rulemaking effort.

Section 1.676(a)(4) is revised, as proposed, by changing "opposing party" to "opponent."

Section 1.677(a), which in its current form specifies the required form for transcripts of depositions, is revised, as proposed, to also apply to affidavits, by removing the reference to "typewritten" matter, changing "pica-type" to "11 point type," and changing "8 1/2 x 11 inches (21.8 by 27.9 cm.)" to "21.8 by 27.9 cm. (8 1/2 x 11 inches)." For the reasons given above in the discussion of a "developing record," § 1.677(b), which concerns numbering of exhibits submitted with affidavits and deposition transcripts, is revised to change "consecutively" to "consecutively to the extent possible."

In § 1.678, the section heading is changed, as proposed, from "Transcript of deposition must be filed" to "Time for filing transcript of deposition" for clarity. The text is revised by changing the time for filing the certified transcript from 45 days to one month after the deposition.

Section 1.679 is revised as proposed by changing "transcript" to "transcript of a deposition" for clarity and "for printing (§ 1.653(g))" is removed as unnecessary.

In § 1.682, paragraph (a) is revised, as proposed, in the "Miscellaneous Amendments" part of the Notice of Proposed Rulemaking in the following respects. First, "identified during the taking of testimony of a witness" is changed to "identified in an affidavit or on the record during an oral deposition of a witness" for clarity. Second, § 1.682(a)(4) ("where appropriate, be accompanied by a certified copy of the official record or a copy of the printed publication (§ 1.671(d))") is removed and reserved as superfluous in view of Rules 901 and 902 of the Federal Rules of Evidence, which apply to interference proceedings (§ 1.671(b), and require authentication of evidence that is not self-authenticating. Third, the first word in each of paragraphs (a)(2), (a)(3) and (a)(4) is capitalized.

Section 1.685(d) is revised, as proposed, for clarification.

Section 1.687(c) is revised, as proposed, to refer to § 1.647 concerning translations of documents in a foreign language.

One comment stated that the lack of discovery available under § 1.687(c) has prevented some interferences from reaching the "correct" result. According to the comment, a different result might have been reached if the discovery available under the Federal Rules of Civil Procedure had been allowed. The comment suggests that PTO consider authorizing discovery similar to the Fed. R. Civ. P. in interferences. The suggestion, which is outside the scope of the present rulemaking, is not being adopted.

In § 1.690(a), "37 CFR, Subpart E of Part 1" is revised to read "this subpart."

Other Considerations: These rules conform with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Order 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The Office of Management and Budget has determined that these rule changes are not significant for the purposes of Executive Order 12866.

The Assistant Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the changes clarify existing rules setting forth the procedures used in patent appeals and interferences.

PTO has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and Patents.

For the reasons set out in the preamble, Part 1 of Title 37 of the Code of Federal Regulations is amended as set forth below:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 is revised to read as follows:

Authority: 35 U.S.C. 6 and 23, unless otherwise noted.

2. Section 1.11(e) is revised to read as follows:

§ 1.11 Files open to the public.

• • • • •

(e) The file of any interference involving a patent, a statutory invention registration, a reissue application, or an application on which a patent has been issued or which has been published as a statutory invention registration, is open to inspection by the public, and copies may be obtained upon paying the fee therefor, if:

(1) The interference has terminated or

(2) An award of priority or judgment has been entered as to all parties and all counts.

3. In § 1.192, paragraphs (c)(1) through (c)(7) are redesignated as paragraphs (c)(3) through (c)(9); paragraphs (a), (c) introductory text, newly designated paragraph (c)(7), introductory text of (c)(8), and (c)(8)(v), and (d) are revised; and paragraphs (c)(1) and (c)(2) are added to read as follows:

§ 1.192 Appellant's brief.

(a) Appellant shall, within 2 months from the date of the notice of appeal under § 1.191 or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in § 1.17(f) and must set forth the authorities and arguments on which appellant will rely to maintain the appeal. Any arguments or authorities not included in the brief will be refused consideration by the Board of Patent Appeals and Interferences, unless good cause is shown.

• • • • •

(c) The brief shall contain the following items under appropriate headings and in the order indicated below unless the brief is filed by an applicant who is not represented by a registered practitioner:

(1) *Real party in interest.* A statement identifying the real party in interest, if the party named in the caption of the brief is not the real party in interest.

(2) *Related appeals and interferences.* A statement identifying by number and filing date all other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) *Status of claims.* A statement of the status of all the claims, pending or canceled, and identifying the claims appealed.

(4) *Status of amendments.* A statement of the status of any amendment filed subsequent to final rejection.

(5) *Summary of invention.* A concise explanation of the invention defined in the claims involved in the appeal, which shall refer to the specification by page and line number, and to the drawing, if any, by reference characters.

(6) *Issues.* A concise statement of the issues presented for review.

(7) *Grouping of claims.* For each ground of rejection which appellant contests and which applies to a group of two or more claims, the Board shall select a single claim from the group and shall decide the appeal as to the ground of rejection on the basis of that claim alone unless a statement is included that the claims of the group do not stand or fall together and, in the argument under paragraph (c)(8) of this section, appellant explains why the claims of the group are believed to be separately patentable. Merely pointing out differences in what the claims cover is not an argument as to why the claims are separately patentable.

(8) *Argument.* The contentions of appellant with respect to each of the issues presented for review in paragraph (c)(6) of this section, and the basis therefor, with citations of the authorities, statutes, and parts of the record relied on. Each issue should be treated under a separate heading.

• • • • •

(v) For any rejection other than those referred to in paragraphs (c)(8)(i) to (iv) of this section, the argument shall specify the errors in the rejection and the specific limitations in the rejected claims, if appropriate, or other reasons, which cause the rejection to be in error.

(9) *Appendix.* An appendix containing a copy of the claims involved in the appeal.

(d) If a brief is filed which does not comply with all the requirements of paragraph (c) of this section, appellant will be notified of the reasons for non-compliance and provided with a period of one month within which to file an amended brief. If appellant does not file an amended brief during the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will stand dismissed.

4. Section 1.601 is amended by revising paragraphs (f), (g), (j), (k), (l), (m), (n), and (q) and adding new paragraphs (r) and (s) to read as follows:

§ 1.601 Scope of rules, definitions.

• • • • •

(f) A *count* defines the interfering subject matter between two or more applications or between one or more applications and one or more patents. At the time the interference is initially declared, a count should be broad enough to encompass all of the claims that are patentable over the prior art and designated to correspond to the count. When there is more than one count, each count shall define a separate patentable invention. Any claim of an application or patent that is designated to correspond to a count is a claim involved in the interference within the meaning of 35 U.S.C. 135(a). A claim of a patent or application that is designated to correspond to a count and is identical to the count is said to correspond exactly to the count. A claim of a patent or application that is designated to correspond to a count but is not identical to the count is said to correspond substantially to the count. When a count is broader in scope than all claims which correspond to the count, the count is a phantom count.

(g) The *effective filing date* of an application is the filing date of an earlier application, benefit of which is accorded to the application under 35 U.S.C. 119, 120, 121, or 365 or, if no benefit is accorded, the filing date of the application. The effective filing date of a patent is the filing date of an earlier application, benefit of which is accorded to the patent under 35 U.S.C. 119, 120, 121, or 365 or, if no benefit is accorded, the filing date of the application which issued as the patent.

• • • • •

(j) An *interference-in-fact* exists when at least one claim of a party that is designated to correspond to a count and at least one claim of an opponent that is designated to correspond to the count define the same patentable invention.

(k) A *lead* attorney or agent is a registered attorney or agent of record who is primarily responsible for prosecuting an interference on behalf of a party and is the attorney or agent whom an administrative patent judge may contact to set times and take other action in the interference.

(l) A *party* is an applicant or patentee involved in the interference or a legal representative or an assignee of record in the Patent and Trademark Office of an applicant or patentee involved in an interference. Where acts of a party are normally performed by an attorney or agent, "party" may be construed to mean the attorney or agent. An inventor is the individual named as inventor in an application involved in an interference or the individual named as inventor in a patent involved in an interference.

(m) A *senior party* is the party with the earliest effective filing date as to all counts or, if there is no party with the earliest effective filing date as to all counts, the party with the earliest filing date. A *junior party* is any other party.

(n) Invention "A" is the *same patentable invention* as an invention "B" when invention "A" is the same as (35 U.S.C. 102) or is obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A". Invention "A" is a *separate patentable invention* with respect to invention "B" when invention "A" is new (35 U.S.C. 102) and non-obvious (35 U.S.C. 103) in view of invention "B" assuming invention "B" is prior art with respect to invention "A".

• • • • •

(q) A *final decision* is a decision awarding judgment as to all counts. An *interlocutory order* is any other action taken by an administrative patent judge or the Board in an interference, including the notice declaring an interference.

(r) *NAFTA country* means NAFTA country as defined in section 2(4) of the North American Free Trade Agreement Implementation Act, Pub. L. 103-182, 107 Stat. 2060 (19 U.S.C. 3301).

(s) *WTO member country* means WTO member country as defined in section 2(10) of the Uruguay Round Agreements Act, Pub. L. 103-465, 108 Stat. 4813 (19 U.S.C. 3501).

5. Section 1.602 is amended by revising paragraph (c) to read as follows:

§ 1.602 Interest in applications and patents involved in an interference.

• • • • •

(c) If a change of any right, title, and interest in any application or patent involved or relied upon in the interference occurs after notice is given declaring the interference and before the time expires for seeking judicial review of a final decision of the Board, the parties shall notify the Board of the change within 20 days after the change.

6. Section 1.603 is revised to read as follows:

§ 1.603 Interference between applications; subject matter of the interference.

Before an interference is declared between two or more applications, the examiner must be of the opinion that there is interfering subject matter claimed in the applications which is patentable to each applicant subject to a judgment in the interference. The interfering subject matter shall be defined by one or more counts. Each application must contain, or be amended to contain, at least one claim that is patentable over the prior art and corresponds to each count. All claims in the applications which define the same patentable invention as a count shall be designated to correspond to the count.

7. Section 1.604(a)(1) is revised to read as follows:

§ 1.604 Request for interference between applications by an applicant.

(a) • • •

(1) Suggesting a proposed count and presenting at least one claim corresponding to the proposed count or identifying at least one claim in its application that corresponds to the proposed count,

• • • • •

8. Section 1.605(a) is revised to read as follows:

§ 1.605 Suggestion of claim to applicant by examiner.

(a) If no claim in an application is drawn to the same patentable invention claimed in another application or patent, the examiner may suggest that an applicant present a claim drawn to an invention claimed in another application or patent for the purpose of an interference with another application or a patent. The applicant to whom the claim is suggested shall amend the application by presenting the suggested claim within a time specified by the examiner, not less than one month. Failure or refusal of an applicant to timely present the suggested claim shall be taken without further action as a disclaimer by the applicant of the invention defined by the suggested claim. At the time the suggested claim is presented, the applicant may also call the examiner's attention to other claims already in the application or presented with the suggested claim and explain why the other claims would be more appropriate to be designated to correspond to a count in any interference which may be declared.

• • • • •

9. Section 1.606 is revised to read as follows:

§ 1.606 Interference between an application and a patent; subject matter of the interference.

Before an interference is declared between an application and an unexpired patent, an examiner must determine that there is interfering subject matter claimed in the application and the patent which is patentable to the applicant subject to a judgment in the interference. The interfering subject matter will be defined by one or more counts. The application must contain, or be amended to contain, at least one claim that is patentable over the prior art and corresponds to each count. The claim in the application need not be, and most often will not be, identical to a claim in the patent. All claims in the application and patent which define the same patentable invention as a count shall be designated to correspond to the count. At the time an interference is initially declared (§ 1.611), a count shall not be narrower in scope than any application claim that is patentable over the prior art and designated to correspond to the count or any patent claim designated to correspond to the count. Any single patent claim designated to correspond to the count will be presumed, subject to a motion under § 1.633(c), not to contain separate patentable inventions.

10. Section 1.607 is amended by revising paragraph (a)(4) and adding a new paragraph (a)(6) to read as follows:

§ 1.607 Request by applicant for interference with patent.

(a) • • •

(4) Presenting at least one claim corresponding to the proposed count or identifying at least one claim already pending in its application that corresponds to the proposed count, and, if any claim of the patent or application identified as corresponding to the proposed count does not correspond exactly to the proposed count, explaining why each such claim corresponds to the proposed count, and

• • • • •

(6) Explaining how the requirements of 35 U.S.C. 135(b) are met, if the claim presented or identified under paragraph (a)(4) of this section was not present in the application until more than one year after the issue date of the patent.

• • • • •

11. Section 1.608 is revised to read as follows:

§ 1.608 Interference between an application and a patent; prima facie showing by applicant.

(a) When the effective filing date of an application is three months or less after the effective filing date of a patent, before an interference will be declared, either the applicant or the applicant's attorney or agent of record shall file a statement alleging that there is a basis upon which the applicant is entitled to a judgment relative to the patentee.

(b) When the effective filing date of an application is more than three months after the effective filing date of a patent, the applicant, before an interference will be declared, shall file evidence which may consist of patents or printed publications, other documents, and one or more affidavits which demonstrate that applicant is *prima facie* entitled to a judgment relative to the patentee and an explanation stating with particularity the basis upon which the applicant is *prima facie* entitled to the judgment. Where the basis upon which an applicant is entitled to judgment relative to a patentee is priority of invention, the evidence shall include affidavits by the applicant, if possible, and one or more corroborating witnesses, supported by documentary evidence, if available, each setting out a factual description of acts and circumstances performed or observed by the affiant, which collectively would *prima facie* entitle the applicant to judgment on priority with respect to the effective filing date of the patent. To facilitate preparation of a record (§ 1.653(g)) for final hearing, an applicant should file affidavits on paper which is 21.8 by 27.9 cm. (8 1/2 x 11 inches). The significance of any printed publication or other document which is self-authenticating within the meaning of Rule 902 of the Federal Rules of Evidence or § 1.671(d) and any patent shall be discussed in an affidavit or the explanation. Any printed publication or other document which is not self-authenticating shall be authenticated and discussed with particularity in an affidavit. Upon a showing of good cause, an affidavit may be based on information and belief. If an examiner finds an application to be in condition for declaration of an interference, the examiner will consider the evidence and explanation only to the extent of determining whether a basis upon which the application would be entitled to a judgment relative to the patentee is alleged and, if a basis is alleged, an interference may be declared.

12. Section 1.609 is amended by revising paragraphs (b)(1), (b)(2) and (b)(3) to read as follows:

§ 1.609 Preparation of interference papers by examiner.

• • • • •

(b) • • •

(1) The proposed count or counts and, if there is more than one count proposed, explaining why the counts define different patentable inventions;

(2) The claims of any application or patent which correspond to each count, explaining why each claim designated as corresponding to a count is directed to the same patentable invention as the count;

(3) The claims in any application or patent which do not correspond to each count and explaining why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count; and

• • • • •

13. Section 1.610 is revised to read as follows:

§ 1.610 Assignment of interference to administrative patent judge, time period for completing interference.

(a) Each interference will be declared by an administrative patent judge who may enter all interlocutory orders in the interference, except that only the Board shall hear oral argument at final hearing, enter a decision under §§ 1.617, 1.640(e), 1.652, 1.656(i) or 1.658, or enter any other order which terminates the interference.

(b) As necessary, another administrative patent judge may act in place of the one who declared the interference. At the discretion of the administrative patent judge assigned to the interference, a panel consisting of two or more members of the Board may enter interlocutory orders.

(c) Unless otherwise provided in this subpart, times for taking action by a party in the interference will be set on a case-by-case basis by the administrative patent judge assigned to the interference. Times for taking action shall be set and the administrative patent judge shall exercise control over the interference such that the pendency of the interference before the Board does not normally exceed two years.

(d) An administrative patent judge may hold a conference with the parties to consider simplification of any issues, the necessity or desirability of amendments to counts, the possibility of obtaining admissions of fact and genuineness of documents which will avoid unnecessary proof, any limitations on the number of expert witnesses, the time and place for conducting a deposition (§ 1.673(g)), and any other matter as may aid in the disposition of the interference. After a conference, the administrative patent judge may enter any order which may be appropriate.

(e) The administrative patent judge may determine a proper course of conduct in an interference for any situation not specifically covered by this part.

14. Section 1.611 is amended by redesignating paragraph (c)(8) as paragraph (c)(9); adding a new paragraph (c)(8); and revising paragraphs (b), (c)(6), (c)(7), and (d) to read as follows:

§ 1.611 Declaration of interference.

• • • • •

(b) When a notice of declaration is returned to the Patent and Trademark Office undelivered, or in any other circumstance where appropriate, an administrative patent judge may send a copy of the notice to a patentee named in a patent involved in an interference or the patentee's assignee of record in the Patent and Trademark Office or order publication of an appropriate notice in the *Official Gazette*.

(c) • • •

(6) The count or counts and, if there is more than one count, the examiner's explanation why the counts define different patentable inventions;

(7) The claim or claims of any application or any patent which correspond to each count;

(8) The examiner's explanation as to why each claim designated as corresponding to a count is directed to the same patentable invention as the count and why each claim designated as not corresponding to any count is not directed to the same patentable invention as any count; and

• • • • •

(d) The notice of declaration may also specify the time for:

(1) Filing a preliminary statement as provided in § 1.621(a);

(2) Serving notice that a preliminary statement has been filed as provided in § 1.621(b); and

(3) Filing preliminary motions authorized by § 1.633.

• • • • •

15. Section 1.612 is amended by revising paragraph (a) to read as follows:

§ 1.612 Access to applications.

(a) After an interference is declared, each party shall have access to and may obtain copies of the files of any application set out in the notice declaring the interference, except for affidavits filed under § 1.131 and any evidence and explanation under § 1.608 filed separate from an amendment. A party seeking

access to any abandoned or pending application referred to in the opponent's involved application or access to any pending application referred to in the opponent's patent must file a motion under § 1.635. See § 1.11(e) concerning public access to interference files.

• • • • •

16. Section 1.613 is amended by revising paragraphs (c) and (d) to read as follows:

§ 1.613 Lead attorney, same attorney representing different parties in an interference, withdrawal of attorney or agent.

• • • • •

(c) An administrative patent judge may make necessary inquiry to determine whether an attorney or agent should be disqualified from representing a party in an interference. If an administrative patent judge is of the opinion that an attorney or agent should be disqualified, the administrative patent judge shall refer the matter to the Commissioner. The Commissioner will make a final decision as to whether any attorney or agent should be disqualified.

(d) No attorney or agent of record in an interference may withdraw as attorney or agent of record except with the approval of an administrative patent judge and after reasonable notice to the party on whose behalf the attorney or agent has appeared. A request to withdraw as attorney or agent of record in an interference shall be made by motion (§ 1.635).

17. Section 1.614 is amended by revising paragraphs (a) and (c) to read as follows:

§ 1.614 Jurisdiction over interference.

(a) The Board acquires jurisdiction over an interference when the interference is declared under § 1.611.

• • • • •

(c) The examiner shall have jurisdiction over any pending application until the interference is declared. An administrative patent judge may for a limited purpose restore jurisdiction to the examiner over any application involved in the interference.

18. Section 1.615 is revised to read as follows:

§ 1.615 Suspension of ex parte prosecution.

(a) When an interference is declared, ex parte prosecution of an application involved in the interference is suspended. Amendments and other papers related to the application received during pendency of the interference will not be entered or considered in the interference without the consent of an administrative patent judge.

(b) Ex parte prosecution as to specified matters may be continued concurrently with the interference with the consent of the administrative patent judge.

19. Section 1.616 is revised to read as follows:

§ 1.616 Sanctions for failure to comply with rules or order or for taking and maintaining a frivolous position.

(a) An administrative patent judge or the Board may impose an appropriate sanction against a party who fails to comply with the regulations of this part or any order entered by an administrative patent judge or the Board. An appropriate sanction may include among others entry of an order:

(1) Holding certain facts to have been established in the interference;

(2) Precluding a party from filing a paper;

(3) Precluding a party from presenting or contesting a particular issue;

(4) Precluding a party from requesting, obtaining, or opposing discovery;

(5) Awarding compensatory expenses and/or compensatory attorney fees; or

(6) Granting judgment in the interference.

(b) An administrative patent judge or the Board may impose a sanction, including a sanction in the form of compensatory expenses and/or compensatory attorney fees, against a party for taking and maintaining a frivolous position in papers filed in the interference.

(c) To the extent that an administrative patent judge or the Board has authorized a party to compel the taking of testimony or the production of documents or things from an individual or entity located in a NAFTA country or a WTO member country concerning knowledge, use, or other activity relevant to proving or disproving a date of invention (§ 1.671(h)), but the testimony, documents or things have not been produced for use in the interference to the same extent as such information could be made available in the United States, the administrative patent judge or the Board shall draw such adverse inferences as may be appropriate under the circumstances, or take such other action permitted by statute, rule, or regulation, in favor of the party that requested the information in the interference, including imposition of appropriate sanctions under paragraph (a) of this section.

(d) A party may file a motion (§ 1.635) for entry of an order imposing sanctions, the drawing of adverse inferences or other action under paragraph (a), (b) or (c) of this section. Where an administrative patent judge or the Board on its own initiative determines that a sanction, adverse inference or other action against a party may be appropriate under paragraph (a), (b) or (c) of this section, the administrative patent judge or the Board shall enter an order for the party to show cause why the sanction, adverse inference or other action is not appropriate. The Board shall take action in accordance with the order unless, within 20 days after the date of the order, the party files a paper which shows good cause why the sanction, adverse inference or other action would not be appropriate.

20. Section 1.617 is amended by revising paragraphs (a), (b), (d), (e), (g) and (h) to read as follows:

§ 1.617 Summary judgment against applicant.

(a) An administrative patent judge shall review any evidence filed by an applicant under § 1.608(b) to determine if the applicant is *prima facie* entitled to a judgment relative to the patentee. If the administrative patent judge determines that the evidence shows the applicant is *prima facie* entitled to a judgment relative to the patentee, the interference shall proceed in the normal manner under the regulations of this part. If in the opinion of the administrative patent judge the evidence fails to show that the applicant is *prima facie* entitled to a judgment relative to the patentee, the administrative patent judge shall, concurrently with the notice declaring the interference, enter an order stating the reasons for the opinion and directing the applicant, within a time set in the order, to show cause why summary judgment should not be entered against the applicant.

(b) The applicant may file a response to the order, which may include an appropriate preliminary motion under § 1.633(c), (f) or (g), and state any reasons why summary judgment should not be entered. Any request by the applicant for a hearing before the Board shall be made in the response. Additional evidence shall not be presented by the applicant or considered by the Board unless the applicant shows good cause why any additional evidence was not initially presented with the evidence filed under § 1.608(b). At the time an applicant files a response, the applicant shall serve a copy of any evidence filed under § 1.608(b) and this paragraph.

• • • • •

(d) If a response is timely filed by the applicant, all opponents may file a statement and may oppose any preliminary motion filed under § 1.633(c), (f) or (g) by the applicant within a time set by the administrative patent judge. The statement may set forth views as to why summary judgment should be granted against the applicant, but the statement shall be limited to discussing why all the evidence presented by the applicant does not overcome the reasons given by the administrative patent judge for issuing the order to show cause. Except as required to oppose a motion under § 1.633(c), (f) or (g) by the applicant, evidence shall not be filed by any opponent. An opponent may not request a hearing.

(e) Within a time authorized by the administrative patent judge, an applicant may file a reply to any statement or opposition filed by any opponent.

• • • • •

(g) If a response by the applicant is timely filed, the administrative patent judge or the Board shall decide whether the evidence submitted under § 1.608(b) and any additional evidence properly submitted under paragraphs (b) and (e) of this section shows that the applicant is *prima facie* entitled to a judgment relative to the patentee. If the applicant is not *prima facie* entitled to a judgment relative to the patentee, the Board shall enter a final decision granting summary judgment against the applicant. Otherwise, an interlocutory order shall be entered authorizing the interference to proceed in the normal manner under the regulations of this subpart.

(h) Only an applicant who filed evidence under § 1.608(b) may request a hearing. If that applicant requests a hearing, the Board may hold a hearing prior to entry of a decision under paragraph (g) of this section. The administrative patent judge shall set a date and time for the hearing. Unless otherwise ordered by the administrative patent judge or the Board, the applicant and any opponent will each be entitled to no more than 30 minutes of oral argument at the hearing.

21. Section 1.618 is amended by revising paragraph (a) to read as follows:

§ 1.618 Return of unauthorized papers.

(a) An administrative patent judge or the Board shall return to a party any paper presented by the party when the filing of the paper is not authorized by, or is not in compliance with the requirements of, this subpart. Any paper returned will not thereafter be considered in the interference. A party may be permitted to file a corrected paper under such conditions as may be deemed appropriate by an administrative patent judge or the Board.

• • • • •

22. Section 1.621 is amended by revising paragraph (b) to read as follows:

§ 1.621 Preliminary statement, time for filing, notice of filing.

• • • • •

(b) When a party files a preliminary statement, the party shall also simultaneously file and serve on all opponents in the interference a notice stating that a preliminary statement has been filed. A copy of the preliminary statement need not be served until ordered by the administrative patent judge.

23. Section 1.622 is amended by revising paragraph (b) to read as follows:

§ 1.622 Preliminary statement, who made invention, where invention made.

• • • • •

(b) The preliminary statement shall state whether the invention was made in the United States, a NAFTA country (and, if so, which NAFTA country), a WTO member country (and if so, which WTO member country), or in a place other than the United States, a NAFTA country, or a WTO member country. If made in a place other than the United States, a NAFTA country, or a WTO member country, the preliminary statement shall state whether the party is entitled to the benefit of 35 U.S.C. 104(a)(2).

24. Section 1.623 is amended by revising the section heading and paragraph (a) introductory text to read as follows:

§ 1.623 Preliminary statement; invention made in United States, a NAFTA country, or a WTO member country.

(a) When the invention was made in the United States, a NAFTA country, or a WTO member country, or a party is entitled to the benefit of 35 U.S.C. 104(a)(2), the preliminary statement must state the following facts as to the invention defined by each count:

• • • • •

25. Section 1.624 is amended by revising the section heading and paragraphs (a) and (c) to read as follows:

§ 1.624 Preliminary statement; invention made in a place other than the United States, a NAFTA country, or a WTO member country.

(a) When the invention was made in a place other than the United States, a NAFTA country, or a WTO member country and a party intends to rely on introduction of the invention into the United States, a NAFTA country, or a WTO member country, the preliminary statement must state the following facts as to the invention defined by each count:

(1) The date on which a drawing of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(2) The date on which a written description of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(3) The date on which the invention was first disclosed to another person in the United States, a NAFTA country, or a WTO member country.

(4) The date on which the inventor's conception of the invention was first introduced into the United States, a NAFTA country, or a WTO member country.

(5) The date on which an actual reduction to practice of the invention was first introduced into the United States, a NAFTA country, or a WTO member country. If an actual reduction to practice of the invention was not introduced into the United States, a NAFTA country, or a WTO member country, the preliminary amendment shall so state.

(6) The date after introduction of the inventor's conception into the United States, a NAFTA country, or a WTO member country when active exercise of reasonable diligence in the United States, a NAFTA country, or a WTO member country toward reducing the invention to practice began.

• • • • •

(c) When a party alleges under paragraph (a)(1) of this section that a drawing was introduced into the United States, a NAFTA country, or a WTO member country, a copy of that drawing shall be filed with and identified in the preliminary statement. When a party alleges under paragraph (a)(2) of this section that a written description of the invention was introduced into the United States, a NAFTA country, or a WTO member country, a copy of that written description shall be filed with and identified in the preliminary statement. See § 1.628(b) when a copy of the first drawing or first written description introduced in the United States, a NAFTA country, or a WTO member country cannot be filed with the preliminary statement.

26. Section 1.625 is amended by revising paragraph (a) introductory text to read as follows:

§ 1.625 Preliminary statement; derivation by an opponent.

(a) When a party intends to prove derivation by an opponent from the party, the preliminary statement must state the following as to the invention defined by each count:

• • • • •

27. Section 1.626 is revised to read as follows:

§ 1.626 Preliminary statement; earlier application.

When a party does not intend to present evidence to prove a conception or an actual reduction to practice and the party intends to rely solely on the filing date of an earlier filed

application to prove a constructive reduction to practice, the preliminary statement may so state and identify the earlier filed application with particularity.

28. Section 1.627(b) is revised to read as follows:

§ 1.627 Preliminary statement; sealing before filing, opening of statement.

• • • • •

(b) A preliminary statement may be opened only at the direction of an administrative patent judge.

29. Section 1.628 is revised to read as follows:

§ 1.628 Preliminary statement; correction of error.

(a) A material error arising through inadvertence or mistake in connection with a preliminary statement or drawings or a written description submitted therewith or omitted therefrom may be corrected by a motion (§ 1.635) for leave to file a corrected statement. The motion shall be supported by an affidavit stating the date the error was first discovered, shall be accompanied by the corrected statement and shall be filed as soon as practical after discovery of the error. If filed on or after the date set by the administrative patent judge for service of preliminary statements, the motion shall also show that correction of the error is essential to the interest of justice.

(b) When a party cannot attach a copy of a drawing or written description to the party's preliminary statement as required by § 1.623(c), § 1.624(c) or § 1.625(c), the party shall show good cause and explain in the preliminary statement why a copy of the drawing or written description cannot be attached to the preliminary statement and shall attach to the preliminary statement the earliest drawing or written description made in or introduced into the United States, a NAFTA country, or a WTO member country which is available. The party shall file a motion (§ 1.635) to amend its preliminary statement promptly after the first drawing, first written description, or drawing or written description first introduced into the United States, a NAFTA country, or a WTO member country becomes available. A copy of the drawing or written description may be obtained, where appropriate, by a motion (§ 1.635) for additional discovery under § 1.687 or during a testimony period.

30. Section 1.629 is amended by revising paragraphs (a), (c)(1) and (d) to read as follows:

§ 1.629 Effect of preliminary statement.

(a) A party shall be strictly held to any date alleged in the preliminary statement. Doubts as to definiteness or sufficiency of any allegation in a preliminary statement or compliance with formal requirements will be resolved against the party filing the statement by restricting the party to its effective filing date or to the latest date of a period alleged in the preliminary statement, as may be appropriate. A party may not correct a preliminary statement except as provided by § 1.628.

• • • • •

(c) * * *

(1) Shall be restricted to the party's effective filing date and

• • • • •

(d) If a party files a preliminary statement which contains an allegation of a date of first drawing or first written description and the party does not file a copy of the first drawing or written description with the preliminary statement as required by § 1.623(c), § 1.624(c), or § 1.625(c), the party will be restricted to the party's effective filing date as to that allegation unless the party complies with § 1.628(b). The content of any drawing or written description submitted with a preliminary statement will not normally be evaluated or considered by the Board.

• • • • •

31. Section 1.630 is revised to read as follows:

§ 1.630 Reliance on earlier application.

A party shall not be entitled to rely on the filing date of an earlier filed application unless the earlier application is identified (§ 1.611(c)(5)) in the notice declaring the interference or the party files a preliminary motion under § 1.633 seeking the benefit of the filing date of the earlier application.

32. Section 1.631(a) is revised to read as follows:

§ 1.631 Access to preliminary statement, service of preliminary statement.

(a) Unless otherwise ordered by an administrative patent judge, concurrently with entry of a decision on preliminary motions filed under § 1.633 any preliminary statement filed under § 1.621(a) shall be opened to inspection by the senior party and any junior party who filed a preliminary statement. Within a time set by the administrative patent judge, a party shall serve a copy of its preliminary statement on each opponent who served a notice under § 1.621(b).

• • • • •

33. Section 1.632 is revised to read as follows:

§ 1.632 Notice of intent to argue abandonment, suppression or concealment by opponent.

A notice shall be filed by a party who intends to argue that an opponent has abandoned, suppressed, or concealed an actual reduction to practice (35 U.S.C. 102(g)). A party will not be permitted to argue abandonment, suppression, or concealment by an opponent unless the notice is timely filed. Unless authorized otherwise by an administrative patent judge, a notice is timely when filed within ten (10) days after the close of the testimony-in-chief of the opponent.

34. Section 1.633 is amended by revising paragraphs (a), (b), (f), (g) and (i) to read as follows:

§ 1.633 Preliminary motions.

• • • • •

(a) A motion for judgment against an opponent's claim designated to correspond to a count on the ground that the claim is not patentable to the opponent. The motion shall separately address each claim alleged to be unpatentable. In deciding an issue raised in a motion filed under this paragraph (a), a claim will be construed in light of the specification of the application or patent in which it appears. A motion under this paragraph shall not be based on:

(1) Priority of invention by the moving party as against any opponent or

(2) Derivation of the invention by an opponent from the moving party. See § 1.637(a).

(b) A motion for judgment on the ground that there is no interference-in-fact. A motion under this paragraph is proper only if the interference involves a design application or patent or a plant application or patent or no claim of a party which corresponds to a count is identical to any claim of an opponent which corresponds to that count. See § 1.637(a). When claims of different parties are presented in "means plus function" format, it may be possible for the claims of the different parties not to define the same patentable invention even though the claims contain the same literal wording.

• • • • •

(f) A motion to be accorded the benefit of the filing date of an earlier filed application. See § 1.637 (a) and (f).

(g) A motion to attack the benefit accorded an opponent in the notice declaring the interference of the filing date of an earlier filed application. See § 1.637 (a) and (g).

• • • • •

(i) When a motion is filed under paragraph (a), (b), or (g) of this section, an opponent, in addition to opposing the motion, may file a motion to redefine the interfering subject matter under paragraph (c) of this section, a motion to substitute a different application under paragraph (d) of this section, or a motion to add a reissue application to the interference under paragraph (h) of this section.

• • • • •

35. Section 1.636 is revised to read as follows:

§ 1.636 Motions, time for filing.

(a) A preliminary motion under § 1.633 (a) through (h) shall be filed within a time period set by an administrative patent judge.

(b) A preliminary motion under § 1.633 (i) or (j) shall be filed within 20 days of the service of the preliminary motion under § 1.633 (a), (b), (c)(1), or (g) unless otherwise ordered by an administrative patent judge.

(c) A motion under § 1.634 shall be diligently filed after an error is discovered in the inventorship of an application or patent involved in an interference unless otherwise ordered by an administrative patent judge.

(d) A motion under § 1.635 shall be filed as specified in this subpart or when appropriate unless otherwise ordered by an administrative patent judge.

36. Section 1.637 is amended by revising paragraphs (a), (b), (c)(1)(v), (c)(1)(vi), (c)(2)(ii), (c)(2)(iii), (c)(3)(ii), (c)(4)(ii), (d) introductory text, (e)(1)(viii), (e)(2)(vii), (f)(2), and (h)(4); removing paragraphs (c)(2)(iv), (c)(3)(iii), and (d)(4); and adding paragraphs (c)(1)(vii), (e)(1)(ix), and (e)(2)(viii) to read as follows:

§ 1.637 Content of motions.

(a) A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Each motion shall include a statement of the precise relief requested, a statement of the material facts in support of the motion, in numbered paragraphs, and a full statement of the reasons why the relief requested should be granted. If a party files a motion for judgment under § 1.633(a) against an opponent based on the ground of unpatentability over prior art, and the dates of the cited prior art are such that the prior art appears to be applicable to the party, it will be presumed, without regard to the dates alleged in the preliminary statement of the party, that the cited prior art is applicable to the party unless there is included with the motion an explanation, and evidence if appropriate, as to why the prior art does not apply to the party.

(b) Unless otherwise ordered by an administrative patent judge or the Board, a motion under § 1.635 shall contain a certificate by the moving party stating that the moving party has conferred with all opponents in an effort in good faith to resolve by agreement the issues raised by the motion. The certificate shall indicate whether any opponent plans to oppose the motion. The provisions of this paragraph do not apply to a motion to suppress evidence (§ 1.656(h)).

(c) * * *

(1) * * *

(v) Show that each proposed count defines a separate patentable invention from every other count proposed to remain in the interference.

(vi) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier filed application, if benefit of the earlier filed application is desired with respect to a proposed count.

(vii) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(2) * * *

(ii) Show that the claim proposed to be amended or added defines the same patentable invention as the count.

(iii) Show the patentability to the applicant of each claim proposed to be amended or added and apply the terms of the claim proposed to be amended or added to the disclosure of the application; when necessary a moving party applicant shall file with the motion a proposed amendment to the application amending the claim corresponding to the count or adding the proposed additional claim to the application.

(3) * * *

(ii) Show the claim defines the same patentable invention as another claim whose designation as corresponding to the count the moving party does not dispute.

(4) * * *

(ii) Show that the claim does not define the same patentable invention as any other claim whose designation in the notice declaring the interference as corresponding to the count the party does not dispute.

• • • • •

(d) A preliminary motion under § 1.633(d) to substitute a different application of the moving party shall:

• • • • •

(e) * * *

(1) * * *

(viii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier filed application, if benefit is desired with respect to a proposed count.

(ix) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(2) * * *

(vii) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of an earlier filed application, if benefit is desired with respect to a proposed count.

(viii) If an opponent is accorded the benefit of the filing date of an earlier filed application in the notice of declaration of the interference, show why the opponent is not also entitled to benefit of the earlier filed application with respect to the proposed count. Otherwise, the opponent will be presumed to be entitled to the benefit of the earlier filed application with respect to the proposed count.

(f) * * *

(2) When the earlier application is an application filed in the United States, certify that a complete copy of the file of the earlier application, except for documents filed under § 1.131 or § 1.608, has been served on all opponents. When the earlier application is an application filed in a foreign country, certify that a copy of the application has been served on all opponents. If the earlier filed application is not in English, the requirements of § 1.647 must also be met.

• • • • •

(h) * * *

(4) Be accompanied by a motion under § 1.633(f) requesting the benefit of the filing date of any earlier filed application, if benefit is desired.

37. Section 1.638 is revised to read as follows:

§ 1.638 Opposition and reply; time for filing opposition and reply.

(a) Unless otherwise ordered by an administrative patent judge, any opposition to any motion shall be filed within 20 days after service of the motion. An opposition shall identify any material fact set forth in the motion which is in dispute and include an argument why the relief requested in the motion should be denied.

(b) Unless otherwise ordered by an administrative patent judge, any reply shall be filed within 15 days after service of

the opposition. A reply shall be directed only to new points raised in the opposition.

38. Section 1.639 is amended by revising paragraphs (a), (b), (c), and (d)(1) to read as follows:

§ 1.639 Evidence in support of motion, opposition, or reply.

(a) Except as provided in paragraphs (c) through (g) of this section, proof of any material fact alleged in a motion, opposition, or reply must be filed and served with the motion, opposition, or reply unless the proof relied upon is part of the interference file or the file of any patent or application involved in the interference or any earlier application filed in the United States of which a party has been accorded or seeks to be accorded benefit.

(b) Proof may be in the form of patents, printed publications, and affidavits. The pages of any affidavits filed under this paragraph shall, to the extent possible, be given sequential numbers, which shall also serve as the record page numbers for the affidavits in the event they are included in the party's record (§ 1.653). Any patents and printed publications submitted under this paragraph and any exhibits identified in affidavits submitted under this paragraph shall, to the extent possible, be given sequential exhibit numbers, which shall also serve as the exhibit numbers in the event the patents, printed publications and exhibits are filed with the party's record (§ 1.653).

(c) If a party believes that additional evidence in the form of testimony that is unavailable to the party is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of any proposed testimony as specified in paragraphs (d) through (g) of this section. If the administrative patent judge finds that testimony is needed to decide the motion, the administrative patent judge may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

(d) * * *

(1) Identify the person whom it expects to use as an expert;

* * * * *

39. Section 1.640 is amended by revising paragraphs (a), (b), (c), (d) introductory text, (d)(1), (d)(3) and (e) to read as follows:

§ 1.640 Motions, hearing and decision, redeclaration of interference, order to show cause.

(a) A hearing on a motion may be held in the discretion of the administrative patent judge. The administrative patent judge shall set the date and time for any hearing. The length of oral argument at a hearing on a motion is a matter within the discretion of the administrative patent judge. An administrative patent judge may direct that a hearing take place by telephone.

(b) Unless an administrative patent judge or the Board is of the opinion that an earlier decision on a preliminary motion would materially advance the resolution of the interference, decision on a preliminary motion shall be deferred to final hearing. Motions not deferred to final hearing will be decided by an administrative patent judge. An administrative patent judge may consult with an examiner in deciding motions. An administrative patent judge may take up motions for decision in any order, may grant, deny, or dismiss any motion, and may take such other action which will secure the just, speedy, and inexpensive determination of the interference. A matter raised by a party in support of or in opposition to a motion that is deferred to final hearing will not be entitled to consideration at final hearing unless the matter is raised in the party's brief at final hearing. If the administrative patent judge determines that the interference shall proceed to final hearing on the issue of priority or derivation, a time shall be set for each party to file a paper identifying any decisions on motions or on matters raised sua sponte by the administrative patent judge that the party wishes to have reviewed at final hearing as well as identifying any deferred motions that the party wishes to have considered at final hearing. Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified by the party or by an opponent for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony-in-chief period of the party.

(1) When appropriate after the time expires for filing replies to oppositions to preliminary motions, the administrative patent judge will set a time for filing any amendment to an application involved in the interference and for filing a supplemental preliminary statement as to any new counts which may become involved in the interference if a preliminary motion to amend or substitute a count has been filed. Failure or refusal of a party to timely present an amendment required by an administrative patent judge shall be taken without further action as a disclaimer by that party of the invention involved. A supplemental preliminary statement shall meet the requirements specified in §§ 1.623, 1.624, 1.625, or 1.626, but need not be filed if a party states that it intends to rely on a preliminary statement previously filed under § 1.621(a). At an appropriate time in the interference, and when necessary, an order will be entered redeclaring the interference.

(2) After the time expires for filing preliminary motions, a further preliminary motion under § 1.633 will not be considered except as provided by § 1.645(b).

(c) When a decision on any motion under §§ 1.633, 1.634, or 1.635 or on any matter raised sua sponte by an administrative patent judge is entered which does not result in the issuance of an order to show cause under paragraph (d) of this section, a party may file a request for reconsideration within 14 days after the date of the decision. The request for reconsideration shall be filed and served by hand or Express Mail. The filing of a request for reconsideration will not stay any time period set by the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. No opposition to a request for reconsideration shall be filed unless requested by an administrative patent judge or the Board. A decision ordinarily will not be modified unless an opposition has been requested by an administrative patent judge or the Board. The request for reconsideration normally will be acted on by the administrative patent judge or the panel of the Board which issued the decision.

(d) An administrative patent judge may issue an order to show cause why judgment should not be entered against a party when:

(1) A decision on a motion or on a matter raised sua sponte by an administrative patent judge is entered which is dispositive of the interference against the party as to any count;

* * * * *

(3) The party is a junior party whose preliminary statement fails to overcome the effective filing date of another party.

(e) When an order to show cause is issued under paragraph (d) of this section, the Board shall enter judgment in accordance with the order unless, within 20 days after the date of the order, the party against whom the order issued files a paper which shows good cause why judgment should not be entered in accordance with the order.

(1) If the order was issued under paragraph (d)(1) of this section, the paper may:

(i) Request that final hearing be set to review any decision which is the basis for the order as well as any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at final hearing or

(ii) Fully explain why judgment should not be entered.

(2) Any opponent may file a response to the paper within 20 days of the date of service of the paper. If the order was issued under paragraph (d)(1) of this section and the party's paper includes a request for final hearing, the opponent's response must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. If the order was issued under paragraph (d)(1) of this section and the paper does not include a request for final hearing, the opponent's response may include a request for final hearing, which must identify every decision of the administrative patent judge that the opponent wishes to have reviewed by the Board at a final hearing. Where only the opponent's response includes a request for a final hearing, the party filing the paper shall, within 14 days from the date of service of the opponent's response, file a reply identifying any other decision of the administrative patent judge that the party wishes to have reviewed by the Board at a final hearing.

(3) The paper or the response should be accompanied by a motion (§ 1.635) requesting a testimony period if either party wishes to introduce any evidence to be considered at final hearing (§ 1.671). Any evidence that a party wishes to have considered with respect to the decisions and deferred motions identified for consideration or review at final hearing shall be filed or, if appropriate, noticed under § 1.671(e) during the testimony period of the party. A request for a testimony period shall be construed as including a request for final hearing.

(4) If the paper contains an explanation of why judgment should not be entered in accordance with the order, and if no party has requested a final hearing, the decision that is the basis for the order shall be reviewed based on the contents of the paper and the response. If the paper fails to show good cause, the Board shall enter judgment against the party against whom the order issued.

40. Section 1.641 is revised to read as follows:

§ 1.641 Unpatentability discovered by administrative patent judge.

(a) During the pendency of an interference, if the administrative patent judge becomes aware of a reason why a claim designated to correspond to a count may not be patentable, the administrative patent judge may enter an order notifying the parties of the reason and set a time within which each party may present its views, including any argument and any supporting evidence, and, in the case of the party whose claim may be unpatentable, any appropriate preliminary motions under §§ 1.633(c), (d) and (h).

(b) If a party timely files a preliminary motion in response to the order of the administrative patent judge, any opponent may file an opposition (§ 1.638(a)). If an opponent files an opposition, the party may reply (§ 1.638(b)).

(c) After considering any timely filed views, including any timely filed preliminary motions under § 1.633, oppositions and replies, the administrative patent judge shall decide how the interference shall proceed.

41. Section 1.642 is revised to read as follows:

§ 1.642 Addition of application or patent to interference.

During the pendency of an interference, if the administrative patent judge becomes aware of an application or a patent not involved in the interference which claims the same patentable invention as a count in the interference, the administrative patent judge may add the application or patent to the interference on such terms as may be fair to all parties.

42. Section 1.643(b) is revised to read as follows:

§ 1.643 Prosecution of interference by assignee.

* * * * *

(b) An assignee of a part interest in an application or patent involved in an interference may file a motion (§ 1.635) for entry of an order authorizing it to prosecute the interference. The motion shall show the inability or refusal of the inventor to prosecute the interference or other cause why it is in the interest of justice to permit the assignee of a part interest to prosecute the interference. The administrative patent judge may allow the assignee of a part interest to prosecute the interference upon such terms as may be appropriate.

43. Section 1.644 is amended by revising paragraphs (a) introductory text, (a)(1), (a)(2), (b), (c), (d), (f) and (g) to read as follows:

§ 1.644 Petitions in interferences.

(a) There is no appeal to the Commissioner in an interference from a decision of an administrative patent judge or the Board. The Commissioner will not consider a petition in an interference unless:

(1) The petition is from a decision of an administrative patent judge or the Board and the administrative patent judge or the Board shall be of the opinion that the decision involves a controlling question of procedure or an interpretation of a rule as to which there is a substantial ground for a difference of opinion and that an immediate decision on petition by the Commissioner may materially advance the ultimate termination of the interference;

(2) The petition seeks to invoke the supervisory authority of the Commissioner and does not relate to the merits of priority of invention or patentability or the admissibility of evidence under the Federal Rules of Evidence; or

* * * * *

(b) A petition under paragraph (a)(1) of this section filed more than 15 days after the date of the decision of the administrative patent judge or the Board may be dismissed as untimely. A petition under paragraph (a)(2) of this section shall not be filed prior to the party's brief for final hearing (see § 1.656). Any petition under paragraph (a)(3) of this section shall be timely if it is filed simultaneously with a proper motion under §§ 1.633, 1.634, or 1.635 when granting the motion would require waiver of a rule. Any opposition to a petition under paragraphs (a)(1) or (a)(2) of this section shall be filed within 20 days of the date of service of the petition. Any opposition to a petition under paragraph (a)(3) of this section shall be filed within 20 days of the date of service of the petition or the date an opposition to the motion is due, whichever is earlier.

(c) The filing of a petition shall not stay the proceeding unless a stay is granted in the discretion of the administrative patent judge, the Board, or the Commissioner.

(d) Any petition must contain a statement of the facts involved, in numbered paragraphs, and the point or points to be reviewed and the action requested. The petition will be decided on the basis of the record made before the administrative patent judge or the Board, and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record in the interference shall not be submitted with the petition or opposition.

* * * * *

(f) Any request for reconsideration of a decision by the Commissioner shall be filed within 14 days of the decision of the Commissioner and must be accompanied by the fee set forth in § 1.17(h). No opposition to a request for reconsideration shall be filed unless requested by the Commissioner. The decision will not ordinarily be modified unless such an opposition has been requested by the Commissioner.

(g) Where reasonably possible, service of any petition, opposition, or request for reconsideration shall be such that delivery is accomplished within one working day. Service by hand or Express Mail complies with this paragraph.

* * * * *

44. Section 1.645 is amended by revising paragraphs (a), (b) and (d) to read as follows:

§ 1.645 Extension of time, late papers, stay of proceedings.

(a) Except to extend the time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, a party may file a motion (§ 1.635) seeking an extension of time to take action in an interference. See § 1.304(a) for extensions of time for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action. The motion shall be filed within sufficient time to actually reach the administrative patent judge before expiration of the time for taking action. A moving party should not assume that the motion will be granted even if there is no objection by any other party. The motion will be denied unless the moving party shows good cause why an extension should be granted. The press of other business arising after an administrative patent judge sets a time for taking action will not normally constitute good cause. A motion seeking addi-

tional time to take testimony because a party has not been able to procure the testimony of a witness shall set forth the name of the witness, any steps taken to procure the testimony of the witness, the dates on which the steps were taken, and the facts expected to be proved through the witness.

(b) Any paper belatedly filed will not be considered except upon motion (§ 1.635) which shows good cause why the paper was not timely filed, or where an administrative patent judge or the Board, sua sponte, is of the opinion that it would be in the interest of justice to consider the paper. See § 1.304(a) for exclusive procedures relating to belated filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit or belated commencement of a civil action.

• • • • •

(d) An administrative patent judge may stay proceedings in an interference.

45. Section 1.646 is amended by revising paragraphs (a)(1), (a)(2), (b), (c) introductory text, (c)(1), (c)(4), (d) and (e); redesignating paragraph (c)(5) as paragraph (c)(6) and revising it; and adding a new paragraph (c)(5) to read as follows:

§ 1.646 Service of papers, proof of service.

(a) • • •

(1) Preliminary statements when filed under § 1.621; preliminary statements shall be served when service is ordered by an administrative patent judge.

(2) Certified transcripts and exhibits which accompany the transcripts filed under § 1.676; copies of transcripts shall be served as part of a party's record under § 1.653(c).

(b) Service shall be on an attorney or agent for a party. If there is no attorney or agent for the party, service shall be on the party. An administrative patent judge may order additional service or waive service where appropriate.

(c) Unless otherwise ordered by an administrative patent judge, or except as otherwise provided by this subpart, service of a paper shall be made as follows:

(1) By handing a copy of the paper or causing a copy of the paper to be handed to the person served.

• • • • •

(4) By mailing a copy of the paper by first class mail; when service is by first class mail the date of mailing is regarded as the date of service.

(5) By mailing a copy of the paper by Express Mail; when service is by Express Mail the date of deposit with the U.S. Postal Service is regarded as the date of service.

(6) When it is shown to the satisfaction of an administrative patent judge that none of the above methods of obtaining or serving the copy of the paper was successful, the administrative patent judge may order service by publication of an appropriate notice in the *Official Gazette*.

(d) An administrative patent judge may order that a paper be served by hand or Express Mail.

(e) The due date for serving a paper is the same as the due date for filing the paper in the Patent and Trademark Office. Proof of service must be made before a paper will be considered in an interference. Proof of service may appear on or be affixed to the paper. Proof of service shall include the date and manner of service. In the case of personal service under paragraphs (c)(1) through (c)(3) of this section, proof of service shall include the names of any person served and the person who made the service. Proof of service may be made by an acknowledgment of service by or on behalf of the person served or a statement signed by the party or the party's attorney or agent containing the information required by this section. A statement of an attorney or agent attached to, or appearing in, the paper stating the date and manner of service will be accepted as *prima facie* proof of service.

46. Section 1.647 is revised to read as follows:

§ 1.647 Translation of document in foreign language.

When a party relies on a document or is required to produce a document in a language other than English, a translation of the document into English and an affidavit attesting to the accuracy of the translation shall be filed with the document.

47. Section 1.651 is amended by revising paragraphs (a), (c)(1), (c)(2), (c)(3) and (d) to read as follows:

§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an administrative patent judge shall set a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and testimony periods for taking any necessary testimony.

• • • • •

(c) • • •

(1) The administrative patent judge orders the taking of testimony under § 1.639(c);

(2) The party alleges in its preliminary statement a date of invention prior to the effective filing date of the senior party;

(3) A testimony period has been set to permit an opponent to prove a date of invention prior to the effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to that date; or

• • • • •

(d) Testimony, including any testimony to be taken in a place outside the United States, shall be taken and completed during the testimony periods set under paragraph (a) of this section. A party seeking to extend the period for taking testimony must comply with §§ 1.635 and 1.645(a).

48. Section 1.652 is revised to read as follows:

§ 1.652 Judgment for failure to take testimony or file record.

If a junior party fails to timely take testimony authorized under § 1.651, or file a record under § 1.653(c), an administrative patent judge, with or without a motion (§ 1.635) by another party, may issue an order to show cause why judgment should not be entered against the junior party. When an order is issued under this section, the Board shall enter judgment in accordance with the order unless, within 15 days after the date of the order, the junior party files a paper which shows good cause why judgment should not be entered in accordance with the order. Any other party may file a response to the paper within 15 days of the date of service of the paper. If the party against whom the order was issued fails to show good cause, the Board shall enter judgment against the party.

49. Section 1.653 is amended by removing and reserving paragraphs (c)(5), (f) and (h) and by revising paragraphs (a), (b), (c) introductory text, (c)(1), (c)(4), (d), (g) and (i) to read as follows:

§ 1.653 Record and exhibits.

(a) Testimony shall consist of affidavits under §§ 1.672(b), (c) and (g), 1.682(c), 1.683(b) and 1.688(b), transcripts of depositions under §§ 1.671(g) and 1.672(a) when a deposition is authorized by an administrative patent judge, transcripts of depositions under §§ 1.672(d), 1.682(d), 1.683(c) and 1.688(c), agreed statements under § 1.672(h), transcripts of interrogatories, cross-interrogatories, and recorded answers and copies of written interrogatories and answers and written requests for admissions and answers under § 1.688(a).

(b) An affidavit shall be filed as set forth in § 1.677. A certified transcript of a deposition, including a deposition cross-examining an affiant, shall be filed as set forth in §§ 1.676, 1.677 and 1.678. An original agreed statement shall be filed as set forth in § 1.672(h).

(c) In addition to the items specified in paragraph (b) of this section and within a time set by an administrative patent judge, each party shall file three copies and serve one copy of a record consisting of:

(1) An index of the names of the witnesses for the party, giving the pages of the record where the direct testimony and cross-examination of each witness begins.

• • • • •

(4) Each affidavit by a witness for the party, transcript, including transcripts of cross-examination of any affiant who testified for the party and transcripts of compelled deposition testimony by a witness for the party, agreed statement relied upon by the party, and transcript of interrogatories, cross-interrogatories and recorded answers.

• • • • •

(d) The pages of the record shall be consecutively numbered to the extent possible.

• • • • •

(g) The record may be produced by standard typographical printing or by any other process capable of producing a clear black permanent image. All printed matter except on covers must appear in at least 11 point type on opaque, unglazed paper. Footnotes may not be printed in type smaller than 9 point. The page size shall be 21.8 by 27.9 cm. (8 1/2 by 11 inches) (letter size) with printed matter 16.5 by 24.1 cm. (6 1/2 by 9 1/2 inches). The record shall be bound with covers at their left edges in such manner as to lie flat when open to any page and in one or more volumes of convenient size (approximately 100 pages per volume is suggested). When there is more than one volume, the numbers of the pages contained in each volume shall appear at the top of the cover for each volume.

(i) Each party shall file its exhibits with the record specified in paragraph (c) of this section. Exhibits include documents and things identified in affidavits or on the record during the taking of oral depositions as well as official records and publications filed by the party under § 1.682(a). One copy of each documentary exhibit shall be served. Documentary exhibits shall be filed in an envelope or folder and shall not be bound as part of the record. Physical exhibits, if not filed by an officer under § 1.676(d), shall be filed with the record. Each exhibit shall contain a label which identifies the party submitting the exhibit and an exhibit number, the style of the interference (e.g., Jones v. Smith), and the interference number. Where possible, the label should appear at the bottom right-hand corner of each documentary exhibit. Upon termination of an interference, an administrative patent judge may return an exhibit to the party filing the exhibit. When any exhibit is returned, an order shall be entered indicating that the exhibit has been returned.

• • • • •

50. Section 1.654 is amended by revising paragraphs (a) and (d) to read as follows:

§ 1.654 Final hearing.

(a) At an appropriate stage of the interference, the parties will be given an opportunity to appear before the Board to present oral argument at a final hearing. An administrative patent judge may set a date and time for final hearing. Unless otherwise ordered by an administrative patent judge or the Board, each party will be entitled to no more than 30 minutes of oral argument at final hearing. A party who does not file a brief for final hearing (§ 1.656(a)) shall not be entitled to appear at final hearing.

• • • • •

(d) After final hearing, the interference shall be taken under advisement by the Board. No further paper shall be filed except under § 1.658(b) or as authorized by an administrative patent judge or the Board. No additional oral argument shall be had unless ordered by the Board.

51. Section 1.655 is revised to read as follows:

§ 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue, including priority of invention, derivation by an opponent from a party who filed a preliminary statement under § 1.625, patentability of the invention, admissibility of evidence, any interlocutory matter deferred to final hearing, and any other matter necessary to resolve the interference. The Board may also consider whether entry of any interlocutory order was an abuse of discretion. All interlocutory orders shall be presumed to have been correct, and the burden of showing an abuse of discretion shall be on the party attacking the order. When two or more interlocutory orders involve the same issue, the last entered order shall be presumed to have been correct.

(b) A party shall not be entitled to raise for consideration at final hearing any matter which properly could have been raised by a motion under §§ 1.633 or 1.634 unless the matter was properly raised in a motion that was timely filed by the party under §§ 1.633 or 1.634 and the motion was denied or deferred to final hearing, the matter was properly raised by the party in a timely filed opposition to a motion under §§ 1.633 or 1.634 and the motion was granted over the opposition or deferred to final hearing, or the party shows good cause why the issue was not properly raised by a timely filed motion or opposition. A party that fails to contest, by way of a timely filed preliminary motion under § 1.633(c), the designation of a claim as corresponding to a count, or fails to timely argue the separate patentability of a particular claim when the ground for unpatentability is first raised, may not subsequently argue to an administrative patent judge or the Board the separate patentability of claims designated to correspond to the count with respect to that ground.

(c) In the interest of justice, the Board may exercise its discretion to consider an issue even though it would not otherwise be entitled to consideration under this section.

52. In § 1.656, paragraphs (a), (d), (e), (g), (h) and (i) are revised; paragraphs (b)(1) through (b)(6) are redesignated as paragraphs (b)(3) through (b)(8); newly designated paragraphs (b)(5) and (b)(6) are revised; and new paragraphs (b)(1) and (b)(2) are added to read as follows:

§ 1.656 Briefs for final hearing.

(a) Each party shall be entitled to file briefs for final hearing. The administrative patent judge shall determine the briefs needed and shall set the time and order for filing briefs.

(b) • • •

(1) A statement of interest indicating the full name of every party represented by the attorney in the interference and the name of the real party in interest if the party named in the caption is not the real party in interest.

(2) A statement of related cases indicating whether the interference was previously before the Board for final hearing and the name and number of any related appeal or interference which is pending before, or which has been decided by, the Board, or which is pending before, or which has been decided by, the U.S. Court of Appeals for the Federal Circuit or a district court in a proceeding under 35 U.S.C. 146. A related appeal or interference is one which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending interference.

• • • • •

(5) A statement of the facts, in numbered paragraphs, relevant to the issues presented for decision with appropriate references to the record.

(6) An argument, which may be preceded by a summary, which shall contain the contentions of the party with respect to the issues it is raising for consideration at final hearing, and the reasons therefor, with citations to the cases, statutes, other authorities, and parts of the record relied on.

• • • • •

(d) Unless ordered otherwise by an administrative patent judge, briefs shall be double-spaced (except for footnotes, which may be single-spaced) and shall comply with the requirements of § 1.653(g) for records except the requirement for binding.

(e) An original and four copies of each brief must be filed.

• • • • •

(g) Any party, separate from its opening brief, but filed concurrently therewith, may file an original and four copies of concise proposed findings of fact and conclusions of law. Any proposed findings of fact shall be in numbered paragraphs and shall be supported by specific references to the record. Any proposed conclusions of law shall be in numbered paragraphs and shall be supported by citation of cases, statutes, or other authority. Any opponent, separate from its opening or reply brief, but filed concurrently therewith, may file a paper accepting or objecting to any proposed findings of fact or conclusions of law; when objecting, a reason must be given. The Board may adopt the proposed findings of fact and conclusions of law in whole or in part.

(h) If a party wants the Board in rendering its final decision to rule on the admissibility of any evidence, the party shall file with its opening brief an original and four copies of a motion (§ 1.635) to suppress the evidence. The provisions of § 1.637(b) do not apply to a motion to suppress under this paragraph. Any objection previously made to the admissibility of the evidence of an opponent is waived unless the motion required by this paragraph is filed. A party that failed to challenge the admissibility of the evidence of an opponent on a ground that could have been raised in a timely objection under § 1.672(c), 1.682(c), 1.683(b) or 1.688(b) may not move under this paragraph to suppress the evidence on that ground at final hearing. An original and four copies of an opposition to the motion may be filed with an opponent's opening brief or reply brief as may be appropriate.

(i) When a junior party fails to timely file an opening brief, an order may issue requiring the junior party to show cause why the Board should not treat failure to file the brief as a concession of priority. If the junior party fails to show good cause within a time period set in the order, judgment may be entered against the junior party.

53. Section 1.657 is revised to read as follows:

§ 1.657 Burden of proof as to date of invention.

(a) A rebuttable presumption shall exist that, as to each count, the inventors made their invention in the chronological order of their effective filing dates. The burden of proof shall be upon a party who contends otherwise.

(b) In an interference involving copending applications or involving a patent and an application having an effective filing date on or before the date the patent issued, a junior party shall have the burden of establishing priority by a preponderance of the evidence.

(c) In an interference involving an application and a patent and where the effective filing date of the application is after the date the patent issued, a junior party shall have the burden of establishing priority by clear and convincing evidence.

54. Section 1.658 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.658 Final decision.

(a) After final hearing, the Board shall enter a decision resolving the issues raised at final hearing. The decision may enter judgment, in whole or in part, remand the interference to an administrative patent judge for further proceedings, or take further action not inconsistent with law. A judgment as to a count shall state whether or not each party is entitled to a patent containing the claims in the party's patent or application which correspond to the count. When the Board enters a decision awarding judgment as to all counts, the decision shall be regarded as a final decision for the purpose of judicial review (35 U.S.C. 141-144, 146) unless a request for reconsideration under paragraph (b) of this section is timely filed.

(b) Any request for reconsideration of a decision under paragraph (a) of this section shall be filed within one month after the date of the decision. The request for reconsideration shall specify with particularity the points believed to have been misapprehended or overlooked in rendering the decision. Any opposition to a request for reconsideration shall be filed within 14 days of the date of service of the request for reconsideration. Service of the request for reconsideration shall be by hand or Express Mail. The Board shall enter a decision on the request for reconsideration. If the Board shall be of the opinion that the decision on the request for reconsideration significantly modifies its original decision under paragraph (a) of this section, the Board may designate the decision on the request for reconsideration as a new decision. A decision on reconsideration is a final decision for the purpose of judicial review (35 U.S.C. 141-144, 146).

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55. Section 1.660 is amended by adding paragraph (e) to read as follows:

§ 1.660 Notice of reexamination, reissue, protest, or litigation.

• • • • •

(e) The notice required by this section is designed to assist the administrative patent judge and the Board in efficiently handling interference cases. Failure of a party to comply with the provisions of this section may result in sanctions under § 1.616. Knowledge by, or notice to, an employee of the Office other than an employee of the Board, of the existence of the reexamination, application for reissue, protest, or litigation shall not be sufficient. The notice contemplated by this section is notice addressed to the administrative patent judge in charge of the interference in which the application or patent is involved.

56. Section 1.662 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.662 Request for entry of adverse judgment; reissue filed by patentee.

(a) A party may, at any time during an interference, request and agree to entry of an adverse judgment. The filing by a party of a written disclaimer of the invention defined by a count, concession of priority or unpatentability of the subject matter of a count, abandonment of the invention defined by a count, or abandonment of the contest as to a count will be treated as a request for entry of an adverse judgment against the applicant or patentee as to all claims which correspond to the count. Abandonment of an application, other than an application for reissue having a claim of the patent sought to be reissued involved in the interference, will be treated as a request for entry of an adverse judgment against the applicant as to all claims corresponding to all counts. Upon the filing by a party of a request for entry of an adverse judgment, the Board may enter judgment against the party.

(b) If a patentee involved in an interference files an application for reissue during the interference and the reissue application does not include a claim that corresponds to a count, judgment may be entered against the patentee. A patentee who files an application for reissue which includes a claim that corresponds to a count shall, in addition to complying with the provisions of § 1.660(b), timely file a preliminary motion under § 1.633(h) or show good cause why the motion could not have been timely filed or would not be appropriate.

• • • • •

57. Section 1.664 is revised to read as follows:

§ 1.664 Action after interference.

(a) After termination of an interference, the examiner will promptly take such action in any application previously involved in the interference as may be necessary. Unless entered by order of an administrative patent judge, amendments presented during the interference shall not be entered, but may be subsequently presented by the applicant subject to the provisions of this subpart provided prosecution of the application is not otherwise closed.

(b) After judgment, the application of any party may be held subject to further examination, including an interference with another application.

58. Section 1.671 is amended by revising paragraphs (a) introductory text, (c)(1), (c)(2), (c)(6), (c)(7), (e), (f) and (g); redesignating paragraph (h) as paragraph (i) and revising it; and adding new paragraphs (h) and (j) to read as follows:

§ 1.671 Evidence must comply with rules.

(a) Evidence consists of testimony and referenced exhibits, official records and publications filed under § 1.682, testimony and referenced exhibits from another interference, proceeding, or action filed under § 1.683, discovery relied upon under § 1.688, and the specification (including claims) and drawings of any application or patent:

• • • • •

(c) • • •

(1) *Courts of the United States, U.S. Magistrate, court, trial court,* or *trier of fact* means administrative patent judge or Board as may be appropriate.

(2) *Judge* means administrative patent judge.

• • • • •

(6) *Before the hearing* in Rule 703 of the Federal Rules of Evidence means before giving testimony by affidavit or oral deposition.

(7) *The trial or hearing* in Rules 803(24) and 804(5) of the Federal Rules of Evidence means the taking of testimony by affidavit or oral deposition.

• • • • •

(e) A party may not rely on an affidavit (including any exhibits), patent or printed publication previously submitted by the party under § 1.639(b) unless a copy of the affidavit, patent or printed publication has been served and a written notice is filed prior to the close of the party's relevant testimony period stating that the party intends to rely on the affidavit, patent or printed publication. When proper notice is given under this paragraph, the affidavit, patent or printed publication shall be deemed as filed under §§ 1.640(b), 1.640(e)(3), 1.672(b) or 1.682(a), as appropriate.

(f) The significance of documentary and other exhibits identified by a witness in an affidavit or during oral deposition shall be discussed with particularity by a witness.

(g) A party must file a motion (§ 1.635) seeking permission from an administrative patent judge prior to compelling testimony or production of documents or things under 35 U.S.C. 24 or from an opposing party. The motion shall describe the general nature and the relevance of the testimony, document, or thing. If permission is granted, the party shall notice a deposition under § 1.673 and may proceed to take testimony.

(h) A party must file a motion (§ 1.635) seeking permission from an administrative patent judge prior to compelling testimony or production of documents or things in a foreign country.

(1) In the case of testimony, the motion shall:

(i) Describe the general nature and relevance of the testimony;

(ii) Identify the witness by name or title;

(iii) Identify the foreign country and explain why the party believes the witness can be compelled to testify in the foreign country, including a description of the procedures that will be used to compel the testimony in the foreign country and an estimate of the time it is expected to take to obtain the testimony; and

(iv) Demonstrate that the party has made reasonable efforts to secure the agreement of the witness to testify in the United States but has been unsuccessful in obtaining the agreement, even though the party has offered to pay the expenses of the witness to travel to and testify in the United States.

(2) In the case of production of a document or thing, the motion shall:

(i) Describe the general nature and relevance of the document or thing;

(ii) Identify the foreign country and explain why the party believes production of the document or thing can be compelled in the foreign country, including a description of the procedures that will be used to compel production of the document or thing in the foreign country and an estimate of the time it is expected to take to obtain production of the document or thing; and

(iii) Demonstrate that the party has made reasonable efforts to obtain the agreement of the individual or entity having possession, custody, or control of the document to produce the document or thing in the United States but has been unsuccessful in obtaining that agreement, even though the party has offered to pay the expenses of producing the document or thing in the United States.

(i) Evidence which is not taken or sought and filed in accordance with this subpart shall not be admissible.

(j) The weight to be given deposition testimony taken in a foreign country will be determined in view of all the circumstances, including the laws of the foreign country governing the testimony. Little, if any, weight may be given to deposition testimony taken in a foreign country unless the party taking the testimony proves by clear and convincing evidence, as a matter of fact, that knowingly giving false testimony in that country in connection with an interference proceeding in the United States Patent and Trademark Office is punishable under the laws of that country and that the punishment in that country for such false testimony is comparable to or greater than the punishment for perjury committed in the United States. The administrative patent judge and the Board, in determining foreign law, may consider any relevant material or source, including testimony, whether or not submitted by a party or admissible under the Federal Rules of Evidence.

59. Section 1.672 is revised to read as follows:

§ 1.672 Manner of taking testimony.

(a) Unless testimony must be compelled under 35 U.S.C. 24, compelled from a party, or compelled in a foreign country, testimony of a witness shall be taken by affidavit in accordance with this subpart. Testimony which must be compelled under 35 U.S.C. 24, compelled from a party, or compelled in a foreign country shall be taken by oral deposition.

(b) A party presenting testimony of a witness by affidavit shall, within the time set by the administrative patent judge for serving affidavits, file a copy of the affidavit or, if appropriate, notice under § 1.671(e). If the affidavit relates to a party's case-in-chief, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-chief. If the affidavit relates to a party's case-in-rebuttal, it shall be filed or noticed no later than the date set by an administrative patent judge for the party to file affidavits for its case-in-rebuttal. A party shall not be entitled to rely on any document referred to in the affidavit unless a copy of the document is filed with the affidavit. A party shall not be entitled to rely on any thing mentioned in the affidavit unless the opponent is given reasonable access to the thing. A thing is something other than a document. The pages of affidavits filed under this paragraph and of any other testimony filed therewith under §§ 1.683(a) and 1.688(a) shall, to the extent possible, be given sequential numbers which shall also serve as the record page numbers for the affidavits and other testimony in the party's record to be filed under § 1.653. Exhibits identified in the affidavits or in any other testimony filed under §§ 1.683(a) and 1.688(a) and any official records and printed publications filed under § 1.682(a) shall, to the extent possible, be given sequential exhibit numbers, which shall also serve as the exhibit numbers when the exhibits are filed with the party's record. The affidavits, testimony filed under §§ 1.683(a) and 1.688(a) and exhibits shall be accompanied by an index of the names of the witnesses, giving the number of the page where the testimony of each witness begins, and by an index of the exhibits briefly describing the nature of each exhibit and giving the number of the page where each exhibit is first identified and offered into evidence.

(c) If an opponent objects to the admissibility of any evidence contained in or submitted with an affidavit filed under paragraph (b) of this section, the opponent must, no later than the date set by the administrative patent judge for filing objections under

this paragraph, file objections stating with particularity the nature of each objection. An opponent that fails to object to the admissibility of the evidence contained in or submitted with an affidavit on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files objections, the party may, within 20 days of the due date for filing objections, file one or more supplemental affidavits, official records or printed publications to overcome the objections. No objection to the admissibility of the supplemental evidence shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits filed under this paragraph shall, to the extent possible, be sequentially numbered beginning with the number following the last page number of the party's testimony submitted under paragraph (b) of this section. The page numbers assigned to the supplemental affidavits shall also serve as the record page numbers for the supplemental affidavits in the party's record filed under § 1.653. Additional exhibits identified in supplemental affidavits and any supplemental official records and printed publications shall, to the extent possible, be given sequential numbers beginning with the number following the last number of the exhibits submitted under paragraph (b) of this section. The exhibit numbers shall also serve as the exhibit numbers when the exhibits are filed with the party's record. The supplemental affidavits shall be accompanied by an index of the names of the witnesses and an index of exhibits of the type specified in paragraph (b) of this section.

(d) After the time expires for filing objections and supplemental affidavits, or earlier when appropriate, the administrative patent judge shall set a time within which any opponent may file a request to cross-examine an affiant on oral deposition. If any opponent requests cross-examination of an affiant, the party shall notice a deposition at a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under paragraphs (b) and (c) of this section, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of the transcripts served under this paragraph shall, to the extent possible, be sequentially numbered beginning with the number following the last page number of the party's supplemental affidavits submitted under paragraph (c) of this section. The numbers assigned to the transcript pages shall also serve as the record page numbers for the transcripts in the party's record filed under § 1.653. Additional exhibits identified in the transcripts, shall, to the extent possible, be given sequential numbers beginning with the number following the last number of the exhibits submitted under paragraphs (b) and (c) of this section. The exhibit numbers assigned to the additional exhibits shall also serve as the exhibit numbers when those exhibits are filed with the party's record. The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in paragraph (b) of this section.

(e) [Reserved]

(f) When a deposition is authorized to be taken within the United States under this subpart and if the parties agree in writing, the deposition may be taken in any place within the United States, before any person authorized to administer oaths, upon any notice, and in any manner, and when so taken may be used like other depositions.

(g) If the parties agree in writing, the affidavit testimony of any witness may be submitted without opportunity for cross-examination.

(h) If the parties agree in writing, testimony may be submitted in the form of an agreed statement setting forth how a particular witness would testify, if called, or the facts in the case of one or more of the parties. The agreed statement shall be filed in the Patent and Trademark Office. See § 1.653(a).

(i) In an unusual circumstance and upon a showing that testimony cannot be taken in accordance with the provisions of this subpart, an administrative patent judge upon motion (§ 1.635) may authorize testimony to be taken in another manner.

60. Section 1.673 is amended by revising paragraphs (a), (b) introductory text, paragraphs (c) through (e) and (g) to read as follows:

§ 1.673 Notice of examination of witness.

(a) A party authorized to take testimony of a witness by deposition shall, after complying with paragraphs (b) and (g) of this section, file and serve a single notice of deposition stating the time and place of each deposition to be taken. Depositions to be taken in the United States may be noticed for a reasonable time and place in the United States. A deposition may not be noticed for any other place without approval of an administrative patent judge. The notice shall specify the name and address of each witness and the general nature of the testimony to be given by the witness. If the name of a witness is not known, a general description sufficient to identify the witness or a particular class or group to which the witness belongs may be given instead.

(b) Unless the parties agree or an administrative patent judge or the Board determine otherwise, a party shall serve, but not file, at least three working days prior to the conference required by paragraph (g) of this section, if service is made by hand or Express Mail, or at least 14 days prior to the conference if service is made by any other means, the following:

• • • • •

(c) A party shall not be permitted to rely on any witness not listed in the notice, or any document not served or any thing not listed as required by paragraph (b) of this section:

(1) Unless all opponents agree in writing or on the record to permit the party to rely on the witness, document or thing, or

(2) Except upon a motion (§ 1.635) promptly filed which is accompanied by any proposed notice, additional documents, or lists and which shows good cause why the notice, documents, or lists were not served in accordance with this section.

(d) Each opponent shall have a full opportunity to attend a deposition and cross-examine.

(e) A party who has presented testimony by affidavit and is required to notice depositions for the purpose of cross-examination under § 1.672(b), shall, after complying with paragraph (g) of this section, file and serve a single notice of deposition stating the time and place of each cross-examination deposition to be taken.

• • • • •

(g) Before serving a notice of deposition and after complying with paragraph (b) of this section, a party shall have an oral conference with all opponents to attempt to agree on a mutually acceptable time and place for conducting the deposition. A certificate shall appear in the notice stating that the oral conference took place or explaining why the conference could not be had. If the parties cannot agree to a mutually acceptable place and time for conducting the deposition at the conference, the parties shall contact an administrative patent judge who shall then designate the time and place for conducting the deposition.

• • • • •

61. Section 1.674 is amended by revising paragraph (a) to read as follows:

§ 1.674 Persons before whom depositions may be taken.

(a) A deposition shall be taken before an officer authorized to administer oaths by the laws of the United States or of the place where the examination is held.

• • • • •

62. Section 1.675 is amended by revising paragraph (d) to read as follows:

§ 1.675 Examination of witness, reading and signing transcript of deposition.

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(d) Unless the parties agree in writing or waive reading and signature by the witness on the record at the deposition, when the testimony has been transcribed a transcript of the deposition shall, unless the witness refuses to read and/or sign the transcript of the deposition, be read by the witness and then signed by the witness in the form of:

(1) An affidavit in the presence of any notary or

(2) A declaration.

63. Section 1.676 is amended by revising paragraph (a)(4) to read as follows:

§ 1.676 Certification and filing by officer, marking exhibits.

(a) • • •

(4) The presence or absence of any opponent.

• • • • •

64. Section 1.677 is revised to read as follows:

§ 1.677 Form of an affidavit or a transcript of deposition.

(a) An affidavit or a transcript of a deposition must be on opaque, unglazed, durable paper approximately 21.8 by 27.9 cm. (8 1/2 by 11 inches) in size (letter size). The printed matter shall be double-spaced on one side of the paper in not smaller than 11 point type with a margin of 3.8 cm. (1 1/2 inches) on the left-hand side of the page. The pages of each transcript must be consecutively numbered and the name of the witness shall appear at the top of each page (§ 1.653(e)). In transcripts of depositions, the questions propounded to each witness must be consecutively numbered unless paper with numbered lines is used and each question must be followed by its answer.

(b) Exhibits must be numbered consecutively to the extent possible and each must be marked as required by § 1.653(i).

65. Section 1.678 is revised to read as follows:

§ 1.678 Time for filing transcript of deposition.

Unless otherwise ordered by an administrative patent judge, a certified transcript of a deposition must be filed in the Patent and Trademark Office within one month after the date of deposition. If a party refuses to file a certified transcript, the administrative patent judge or the Board may take appropriate action under § 1.616. If a party refuses to file a certified transcript, any opponent may move for leave to file the certified transcript and include a copy of the transcript as part of the opponent's record.

66. Section 1.679 is revised to read as follows:

§ 1.679 Inspection of transcript.

A certified transcript of a deposition filed in the Patent and Trademark Office may be inspected by any party. The certified transcript may not be removed from the Patent and Trademark Office unless authorized by an administrative patent judge upon such terms as may be appropriate.

67. Section 1.682 is revised to read as follows:

§ 1.682 Official records and printed publications.

(a) A party may introduce into evidence, if otherwise admissible, an official record or printed publication not identified in an affidavit or on the record during an oral deposition of a witness, by filing a copy of the official record or printed publication or, if appropriate, a notice under § 1.671(e). If the official record or printed publication relates to the party's case-in-chief, it shall be filed or noticed together with any affidavits filed by the party under § 1.672(b) for its case-in-chief or, if the party does not serve any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-chief. If the official record or printed publication relates to rebuttal, it shall be filed or noticed together with any affidavits filed by the party under § 1.672(b) for the its case-in-rebuttal or, if the party does not file any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-rebuttal. Official records and printed publications filed under this paragraph shall be assigned sequential exhibit numbers by the party in the manner set forth in § 1.672(b). The official record and printed publications shall be accompanied by a paper which shall:

(1) Identify the official record or printed publication;

(2) Identify the portion thereof to be introduced in evidence; and

(3) Indicate generally the relevance of the portion sought to be introduced in evidence.

(b) [Reserved]

(c) Unless otherwise ordered by an administrative patent judge, any written objection by an opponent to the paper or to the admissibility of the official record or printed publication shall be filed no later than the date set by the administrative patent judge for the opponent to file objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to object to the admissibility of the official record or printed publication on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond by filing one or more supplemental affidavits, official records or printed publications, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental affidavits under § 1.672(c). No objection to the admissibility of the supplemental evidence shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(d) Any request by an opponent to cross-examine on oral deposition the affiant of a supplemental affidavit submitted under paragraph (c) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit served by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file notice of a deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

68. Section 1.683 is revised to read as follows:

§ 1.683 Testimony in another interference, proceeding, or action.

(a) A party may introduce into evidence, if otherwise admissible, testimony by affidavit or oral deposition and referenced exhibits from another interference, proceeding, or action involving the same parties by filing a copy of the affidavit or a copy of the transcript of the oral deposition and the referenced exhibits. If the testimony and referenced exhibits relate to the party's case-in-chief, they shall be filed together with any affidavits served by the party under § 1.672(b) for its case-in-chief or, if the party does not file any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-chief. If the testimony and referenced exhibits relate to rebuttal, they shall be filed together with any affidavits served by the party under § 1.672(b) for its case-in-rebuttal or, if the party does not file any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to file affidavits under § 1.672(b) for its case-in-rebuttal. Pages of affidavits and deposition transcripts served under this paragraph and any new exhibits served therewith shall be assigned sequential numbers by the party in the manner set forth in § 1.672(b). The testimony shall be accompanied by a paper which specifies with particularity the exact testimony to be used and demonstrates its relevance.

(b) Unless otherwise ordered by an administrative patent judge, any written objection by an opponent to the paper or the admissibility of the testimony and referenced exhibits filed under this section shall be filed no later than the date set by the administrative patent judge for the opponent to file any objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to challenge the admissibility of the testimony or referenced exhibits on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond with one or more supplemental affidavits, official records or printed publications, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental evidence under § 1.672(c). No objection to the admissibility of the evidence contained in or submitted with a supplemental affidavit shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(c) Any request by an opponent to cross-examine on oral deposition the affiant of an affidavit or supplemental affidavit submitted under paragraph (a) or (b) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit filed by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file a notice of deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

69. Section 1.684 is removed and reserved.

70. Section 1.685 is amended by revising paragraphs (d) and (e) to read as follows:

§ 1.685 Errors and irregularities in depositions.

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(d) An objection to the deposition on any grounds, such as the competency of a witness, admissibility of evidence, manner of taking the deposition, the form of questions and answers, any oath or affirmation, or conduct of any party at the deposition, is waived unless an objection is made on the record at the deposition stating the specific ground of objection. Any objection which a party wishes considered by the Board at final hearing shall be included in a motion to suppress under § 1.656(h).

(e) Nothing in this section precludes taking notice of plain errors affecting substantial rights although they were not brought to the attention of an administrative patent judge or the Board.

71. Section 1.687 is amended by revising paragraph (c) to read as follows:

§ 1.687 Additional discovery.

* * * * *

(c) Upon a motion (§ 1.635) brought by a party within the time set by an administrative patent judge under § 1.651 or thereafter as authorized by § 1.645 and upon a showing that the interest of justice so requires, an administrative patent judge may order additional discovery, as to matters under the control of a party within the scope of the Federal Rules of Civil Procedure, specifying the terms and conditions of such additional discovery. See § 1.647 concerning translations of documents in a foreign language.

* * * * *

72. Section 1.688 is revised to read as follows:

§ 1.688 Use of discovery.

(a) If otherwise admissible, a party may introduce into evidence an answer to a written request for an admission or an answer to a written interrogatory obtained by discovery under § 1.687 by filing a copy of the request for admission or the written interrogatory and the answer. If the answer relates to a party's case-in-chief, the answer shall be served together with any affidavits served by the party under § 1.672(b) for its case-in-chief or, if the party does not serve any affidavits under § 1.672(b) for its case-in-chief, no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-chief. If the answer relates to the party's rebuttal, the answer shall be served together with any affidavits served by the party under § 1.672(b) for the its case-in-rebuttal or, if the party does not serve any affidavits under § 1.672(b) for its case-in-rebuttal, no later than the date set by an administrative patent judge for the party to serve affidavits under § 1.672(b) for its case-in-rebuttal.

(b) Unless otherwise ordered by an administrative patent judge, any written objection to the admissibility of an answer shall be filed no later than the date set by the administrative patent judge for the opponent to file any objections under § 1.672(c) to affidavits submitted by the party under § 1.672(b). An opponent who fails to challenge the admissibility of an answer on a ground that could have been raised in a timely objection under this paragraph will not be entitled to move under § 1.656(h) to suppress the evidence on that ground. If an opponent timely files an objection, the party may respond with one or more supplemental affidavits, which must be filed together with any supplemental evidence filed by the party under § 1.672(c) or, if the party does not file any supplemental evidence under § 1.672(c), no later than the date set by an administrative patent judge for the party to file supplemental affidavits under § 1.672(c). No objection to the admissibility of the evidence contained in or submitted with a supplemental affidavit shall be made, except as provided by § 1.656(h). The pages of supplemental affidavits and the exhibits filed under this section shall be sequentially numbered by the party in the manner set forth in § 1.672(c). The supplemental affidavits and exhibits shall be accompanied by an index of witnesses and an index of exhibits of the type required by § 1.672(b).

(c) Any request by an opponent to cross-examine on oral deposition the affiant of a supplemental affidavit submitted under paragraph (b) of this section shall be filed no later than the date set by the administrative patent judge for the opponent to file a request to cross-examine an affiant with respect to an affidavit filed by the party under § 1.672(b) or (c). If any opponent requests cross-examination of an affiant, the party shall file a notice of deposition for a reasonable location within the United States under § 1.673(e) for the purpose of cross-examination by any opponent. Any redirect and recross shall take place at the deposition. At any deposition for the purpose of cross-examination of a witness, the party shall not be entitled to rely on any document or thing not mentioned in one or more of the affidavits filed under this paragraph, except to the extent necessary to conduct proper redirect. The party who gives notice of a deposition shall be responsible for providing a translator if the witness does not testify in English, for obtaining a court reporter, and for filing a certified transcript of the deposition as required by § 1.676. Within 45 days of the close of the period for taking cross-examination, the party shall serve (but not file) a copy of each deposition transcript on each opponent together with copies of any additional documentary exhibits identified by the witness during the deposition. The pages of deposition transcripts and exhibits served under this paragraph shall be sequentially numbered by the party in the manner set forth in § 1.672(d). The deposition transcripts shall be accompanied by an index of the names of the witnesses, giving the number of the page where cross-examination, redirect and recross of each witness begins, and an index of exhibits of the type specified in § 1.672(b).

(d) A party may not rely upon any other matter obtained by discovery unless it is introduced into evidence under this subpart.

73. Section 1.690 is amended by revising paragraphs (a), (b) and (c) to read as follows:

§ 1.690 Arbitration of interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thirty (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by the arbitration will be resolved in accordance with the procedures established in this subpart, as determined by the administrative patent judge.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an administrative patent judge.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner the issue or issues arbitrated and the disposition of each issue. The award may include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an administrative patent judge, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

* * * * *

March 3, 1995

BRUCE A LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1173 OG 36]

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(121) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 910514-1195]
[RIN: 0651-AA49]

Patent Interference Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its rules of practice in patent interference cases. The U.S. District Court for the District of Columbia recently decided *Kochler v. Mustonen*, Civil Action No. 90-1074 (D.D.C. Apr. 23, 1991). The District Court held that PTO practice regarding taking of testimony abroad was not clear. PTO rules require that a testimony period be set. The rules also require that testimony be taken during the testimony period. Rule 684 authorizes testimony to be taken abroad. However, rule 684 requires that a motion be filed for leave to take testimony abroad and that the motion be filed before the close of a party's testimony period. The District Court suggested that a motion to take testimony abroad, filed in PTO on the last day of the testimony period, could be considered timely even though taking of the testimony might occur after the testimony period. By this amendment, PTO will continue to authorize the filing of a motion to take testimony abroad. However, a party will have to file the motion within a time such that the testimony can be taken during the testimony period set under PTO rule 651.
Effective Date: Sept. 27, 1991
For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, DC 20231.
Supplementary Information: The PTO conducts interference proceedings to determine who as between two or more applicants for patent or one or more applicants and one or more patentees is the first inventor of a patentable invention. As part of its proofs in an interference, a party may request leave to take testimony abroad. 37 CFR § 1.684 (1990).

The U.S. District Court for the District of Columbia recently decided *Kochler V. Mustonen*, Civil Action No. 90-1074 (D.D.C. Apr. 23, 1991). The District Court held that PTO practice regarding taking of testimony abroad was not clear. PTO rule 651 (37 CFR § 1.651 (1990)) requires that a testimony period be set. Rule 651 also requires that testimony be taken during the testimony period. Rule 684 (37 CFR § 1.684 (1990)) authorizes testimony to be taken abroad. However, rule 684 requires that a motion be filed for leave to take testimony abroad and that the motion be filed before the close of a party's testimony period. The District Court suggested that a motion to take testimony abroad, filed in PTO on the last day of the testimony period, could be considered timely even though taking of the testimony might occur after the testimony period.

In a notice of proposed rule making published in the FEDERAL REGISTER on June 12, 1991 56 FR 26949, paragraphs (a) and (d) of rule 651 and rule 684 were proposed to be revised to require a party to file the motion to take testimony abroad within a time such that the testimony could be taken during the testimony period set under PTO rule 651.

One written comment was submitted by a Chief Executive Officer who stated his support of the proposed amendment. An attorney commented that the proposed amendment of § 1.684 appeared to foreclose the taking of testimony beyond any original time set under § 1.651. The attorney suggested

language be added to paragraph (c) stating the alternative that testimony abroad must be completed within the time set under § 1.651 or by the Examiner-in-Chief. This suggestion has been adopted.

Other Considerations: The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et. seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to clarify the need for taking testimony abroad during the testimony period. The rule changes include no additional or increased fees. Substantive rights are not adversely affected.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. Because most of the changes do not change burdens, there will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule change will not impose any additional burden under the paperwork Reduction Act of 1980, 44 U.S.C. 3501*et seq.*

The Office has also determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set forth in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, the PTO is amending 37 CFR part 1 as follows:

Part 1 —Rules of Practice in Patent Cases

1. The authority citation for 37 CFR part 1, Suspart E, continues to read as follows:

Authority: 35. U.S.C. 6, 23, 41 and 135.

2. Section 1.651 is revised as follows:

§ 1.651 Setting times for discovery and taking testimony, parties entitled to take testimony.

(a) At an appropriate stage in an interference, an examiner-in-chief shall set (1) a time for filing motions (§ 1.635) for additional discovery under § 1.687(c) and (2) testimony periods for taking any necessary testimony (testimony includes testimony to be taken abroad under § 1.684).

(b) Where appropriate, testimony periods will be set to permit a party to:

(1) Present its case-in-chief and/or case-in-rebuttal and/or

(2) Cross-examine an opponent's case-in-chief and/or a case-in-rebuttal.

(c) A party is not entitled to take testimony to present a case-in-chief unless:

(1) The examiner-in-chief orders the taking of testimony under § 1.639(c);

(2) The party alleges in its preliminary statement a date of invention prior to the earlier of the filing date or effective filing date of the senior party;

(3) A testimony period has been set to permit an opponent to prove a date of the invention prior to the earlier of the filing date or effective filing date of the party and the party has filed a preliminary statement alleging a date of invention prior to the date; or

(4) A motion (§ 1.635) is filed showing good cause why a testimony period should be set.

(d) Testimony, including any testimony to be taken abroad under § 1.684, shall be taken and completed during the testimony periods set under paragraph (a) of this section. A party seeking to extend the period for taking testimony must comply with § 1.635 and § 1.645(a).

3. Section 1.684 is revised as follows:

§ 1.684 Testimony in a foreign country.

(a) An examiner-in-chief may authorize testimony of a witness to be taken in a foreign country. A party seeking to take testimony in a foreign country shall, promptly after the testimony period is set, file a motion (§ 1.635):

(1) Naming the witness

(2) Describing the particular facts to which it is expected that the witness will testify.

(3) Stating the grounds on which the moving party believes that the witness will testify.

(4) Demonstrating that the expected testimony is relevant.

(5) Demonstrating that the testimony cannot be taken in this country at all or cannot be taken in this country without hardship to the moving party greatly exceeding the hardship to which all opposing parties will be exposed by the taking of the testimony in a foreign country.

(6) Accompanied by an affidavit stating that the motion is made in good faith and not for the purpose of delay or harassing any party.

(7) Accompanied by written interrogatories to be asked of the witness.

(b) Any opposition under § 1.638(a) shall state any objection to the written interrogatories and shall include any cross-interrogatories to be asked of the witness. A reply under § 1.638(b) may be filed and shall be limited to stating any objection to any cross-interrogatories proposed in the opposition.

(c) If the motion is granted, taking of the testimony abroad must be completed within the testimony period set under § 1.651 or within such time as may be set by the Examiner-in-Chief. The moving party shall be responsible for obtaining answers to the interrogatories and cross-interrogatories before an officer qualified to administer oaths in the foreign country under the laws of the United States or the foreign country. The officer shall prepare a transcript of the interrogatories, cross-interrogatories, and recorded answers to the interrogatories and cross-interrogatories and shall transmit the transcript to BOX INTERFERENCE, Commissioner of Patents and Trademarks, Washington, DC 20231, with a certificate signed and sealed by the officer and showing:

(1) The witness was duly sworn by the officer before answering the interrogatories and cross-interrogatories.

(2) The recorded answers are a true record of the answers given by the witness to the interrogatories and cross-interrogatories.

(3) The name of the person by whom the answers were recorded and, if not recorded by the officer, whether the answers were recorded in the presence of the officer.

(4) The presence or abscence of any party.

(5) The place, day, and hour that the answers were recorded.

(6) A copy of the recorded answers was read by or to the witness before the witness signed the recorded answers and that the witness signed the recorded answers in the presence of the officer. The officer shall state the circumstances under which a witness refuses to read or sign recorded answers.

(7) The officer is not disqualified under § 1.674.

(d) If the parties agree in writing, the testimony may be taken before the officer on oral deposition.

(e) A party taking testimony in a foreign country shall have the burden of proving that false swearing in the giving of testimony is punishable as perjury under the laws of the foreign country. Unless false swearing in the giving of testimony before the officer shall be punishable as perjury under the laws of the foreign country where testimony is taken, the testimony shall be entitled to the same weight as testimony taken in the United States. The weight of the testimony shall be determined in each case.

Aug. 22, 1991 HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner of Patents and Trademarks

[1136 OG 40]

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(122) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 921118-3184]
RIN: 0651-AA63

Patent Interference Practice Burden of Proof

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (PTO) is amending its rules of practice in patent interference cases. The amended rules specify that a party filing a motion has the burden of proof for that motion. The amended rules also more clearly state the nature of expert-witness and fact-witness evidence that must accompany a preliminary motion. Moreover, a definition of "interlocutory order," as contrasted with a final decision, is added to clarify the meaning of "interlocutory order."
Effective Date: Oct. 25, 1993. These rules will apply to all papers filed with the PTO on or after the effective date.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington D.C. 20231.
Supplementary Information: A Notice of Proposed Rulemaking was published in the *Federal Register* (58 FR 528) on Jan. 6, 1993, and in the *Official Gazette* of the PTO (1147 Off. Gaz. 11) on Feb. 2, 1993. Comments were due Mar. 8, 1993. Four comments were received.

The PTO proposed moving the presumption of correctness of an interlocutory order, which is presently in 37 CFR § 1.655(a), to a proposed new subsection 1.601(q). The PTO also proposed to make explicit in 37 CFR § 1.637(a) that a party filing a motion has the burden of proving why it is entitled to the relief sought in the motion.

The PTO proposed to amend 37 CFR § 1.639 to incorporate guidance provided in *Hanagan v. Kimura*, 16 USPQ2d 1791, 1794 (Comm'r Pat. 1990). Subsection (c) of § 1.639 was proposed to be amended to refer to "additional evidence in the form of testimony" so as to distinguish the evidence needed under subsection (c) from evidence submitted under subsections (a) and (b). Subsection (d) to 37 CFR § 1.639 was proposed to be added to specify that the nature of evidence that must be submitted when an opinion of an expert is needed. Subsection (e) was proposed to be added to specify the nature of evidence that must be submitted when a statement of a fact witness is to be relied upon. Subsection (f) was proposed to be added to specify the nature of a showing that should be made when a statement of an opponent is needed or evidence in possession of an opponent is needed. Subsection (g) was proposed to be added to specify the nature of evidence that must be supplied if inter partes tests are to be conducted.

Present 37 CFR 1.655(a) was proposed to be amended by deleting the last sentence, which would be moved to and be included in the proposed definition of interlocutory order in proposed subsection 1.601(g).

The PTO received one comment that endorsed the proposed rulemaking, but was otherwise directed to an earlier rulemaking.

The PTO received two comments regarding proposed subsection 1.601(q). One comment suggested that procedural rules should not be placed in a definition. The comment suggested that the last two sentences of proposed subsection 1.601(q), which deal with the presumed correctness of interlocutory orders, be in a new subsection of section 1.655. This suggestion is adopted in part. The last two sentences of subsection 1.601(q) will be moved to the end of subsection 1.655(a).

A second comment challenged the sufficiency of the notice in the proposed rulemaking. The comment noted that the word "manifest" was omitted from the portion of existing subsection 1.655(a) that was moved to new subsection 1.601(q) and that the word "manifestly" was omitted from the remainder of subsection 1.655(a). The comment argued that the Notice of Proposed Rulemaking did not provide sufficient notice of these omissions, which the comment characterized as substantive changes, and thus violates the requirements of 5 U.S.C. § 553. This comment is not adopted.

The Notice of Proposed Rulemaking gave specific notice of the actual terms of the proposed rule. *Cf.* § 553(b) (requiring "[g]eneral notice" of "either the terms or substance of the proposed rule or a description of the subjects and issues involved.") In any case, no change actually occurs because the omitted words, "manifest" and "manifestly", in 37 CFR § 1.655(a) are unnecessary. No board decision is known to have relied on the distinction between "error", "clear error", and "manifest error". In appellate courts, manifest error is an extremely deferential standard of review that is closely tied to the abuse-of-discretion standard. *See e.g., Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 827-28, 11 USPQ2d 1321, 1326 (Fed. Cir. 1989) (finding no manifest error). Board review of an examiner-in-chief's interlocutory orders is not an independent review of a final decision by a lower tribunal. The board is the only entity that may decide interferences, 35 U.S.C. § 135(a), and the examiner-in-chief, who is a member of the board, 35 U.S.C. § 7(a), is almost always a member of the panel that ultimately decides the interference. Thus, an extremely deferential standard of appeal in this context is inappropriate.

The PTO received one comment regarding proposed subsection 1.637(a). The comment noted that subsection 1.637(a) had been misprinted so that the text "a statement of the precise relief requested, (2)" had been omitted following the "(1)". The comment is correct, the omission was a misprint, and the omitted text has been restored.

The PTO received one comment regarding 37 CFR § 1.639(b). The comment suggested that all proofs introduced under subsection 1.639(b) remain in the record after the decision on the preliminary motions unless the proofs are expressly withdrawn. The opposing party could treat such proofs as subsection 1.672(b) declarations and request an opportunity to cross examine the declarants. The suggestion is not adopted because it is beyond the scope of the present rulemaking.

The PTO received one comment regarding subsection 1.639(c). The comment assumed that the word "needed" had been intentionally deleted from the end of the first sentence of subsection 1.639(c), but noted that the deletion was not mentioned in the summary. The assumption is correct. This deletion is grammatically required after the addition of the text amending subsection 1.639(c).

The PTO received two comments regarding codification of the *Hanagan* guidelines in subsections 1.639(d)-(g). One comment endorsed codification of the *Hanagan* guidelines, but suggested that the codification be reformulated to increase flexibility. In particular, the comment pointed to the unusual case described in the Notice of Proposed Rulemaking where an opponent to a preliminary motion was overwhelmed with evidence. The comment suggested that the mandatory requirements of subsection 1.639, as amended, be revised to state that the information required under the *Hanagan* guidelines "should ordinarily" be provided. The comment is not adopted.

When necessary, a party opposing a preliminary motion should request an extension of time to submit the information described in subsections 1.639(d) through (g), which do not require the submission of the actual testimony or evidence. In contrast, in the example discussed in the Notice of Proposed Rulemaking, the examiner-in-chief deferred consideration of the preliminary motion until the final hearing to allow the opponent time to prepare a full opposition, which included the actual evidence the opponent relied upon to support the opposition. As the Notice of Proposed Rulemaking pointed out, examiners-in-chief have, and should exercise, discretion to extend time or otherwise remedy problems that may arise when applying the requirements of section 1.639 in specific cases.

A second comment suggested that the requirements of subsections 1.639(d) and (e) duplicate the declarations submitted under 37 CFR § 1.672(b). The comment recommends that the rules be revised to require a subsection 1.672(b) declaration be submitted once, during the motions period, in support of an

opposition to a preliminary motion. The recommendation is not adopted.

Subsection 1.672(b) is directed to the technical requirements for submitting affidavits or depositions for testimony that will not be compelled. Subsection 1.639(c), which invokes the requirements of subsections 1.639(d) and (e), requires a description of the proposed testimony, not an affidavit or deposition of the testimony itself. A request under subsection 1.639(c) must describe the nature of the testimony being sought so the examiner-in-chief can determine whether the testimony is actually needed. *Hanagan*, 16 USPQ2d at 1794. Subsection 1.639(c) is intended to address the situation where evidence in the form of testimony is not available to the party asserting a need for the evidence. The *Hanagan* guidelines require such a party to justify the delay and inconvenience that may result by explaining what the party expects the testimony to prove. To this end, subsection 1.639(c) is revised to clarify that it only applies to testimony that is unavailable to the party seeking the testimony.

OTHER CONSIDERATION

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C.601 et seq.), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principle impact of these changes would be to clarify procedure in patent interferences and thereby eliminate ambiguity that may exist in current rules.

The Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no recordkeeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.601 is amended by adding paragraph (q) to read as follows:

§ 1.601 Scope of rules, definitions.

* * * * *

(q) A *final decision* is a decision awarding judgement as to all counts. An *interlocutory order* is any other action taken by an examiner-in-chief or a panel of the Board in an interference, including the notice declaring an interference.

3. Section 1.637 is amended by revising paragraph (a) to read as follows:

§ 1.637 Content of motions.

(a) A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion. Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

* * * * *

4. Section 1.639 is amended by revising paragraph (c) and by adding paragraphs (d) through (g) as follows:

§ 1.639 Evidence in support of motion, opposition, or reply.

* * * * *

(c) If a party believes that additional evidence in the form of testimony that is unavailable to the party is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of any proposed testimony as specified in paragraphs (d) through (g) of this section. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

(d) When additional evidence in the form of expert-witness testimony is needed in support of or opposition to a preliminary motion, the moving party or opponent should:

(1) identify the person whom it expects to call as an expert;

(2) state the field in which the person is alleged to be an expert; and

(3) state:

(i) the subject matter on which the person is expected to testify;

(ii) the facts and opinions to which the person is expected to testify: and

(iii) a summary of the grounds and basis for each opinion.

(e) When additional evidence in the form of fact-witness testimony is necessary, state the facts to which the witness is expected to testify.

(f) If the opponent is to be called, or if evidence in the possession of the opponent is necessary, explain the evidence sought, what it will show, and why it is needed.

(g) When inter partes tests are to be performed, describe the tests stating what they will be expected to show.

5. Section 1.655 is amended by revising paragraph (a) to read as follows:

§ 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under § 1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was erroneous or an abuse of discretion. All interlocutory orders shall be presumed to have been correct and the burden of showing error or an abuse of discretion shall be on the party attacking the order. When two or more interlocutory orders involve the same issue, the last entered order shall be presumed to have been correct.

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Sept. 16, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1155 OG 65]

(123) **Interference Practice: Matters Relating to Belated Preliminary Motions**

In some interference proceedings, evidence which would provide a basis for a preliminary motion under 37 CFR 1.633 does not come to light until after a decision on preliminary motions has been entered. For example, a party may conclude, after hearing the opponent's testimony, that the opponent's application or patent does not comply with the "best mode" requirement of 35 USC § 112, first paragraph; or a prior art reference may be found which the party could not previously have located. The purpose of this notice is to clarify the policy of the Board of Patent Appeals and Interferences as to what steps the party must take if it wishes to have an issue based on such evidence considered by the Board.

If the time for filing preliminary motions has expired, and then evidence comes to light which in the opinion of a party would provide basis for a preliminary motion under 37 CFR 1.633, that party may not simply raise the matter in its brief at final hearing for the Board's consideration. Rather, it is the policy of the Board that it will not consider the matter unless the party files promptly after the evidence becomes available:

(1) the appropriate preliminary motion under 37 CFR 1.633; and

(2) a motion under 37 CFR 1.635 showing sufficient cause why the preliminary motion was not timely filed, as required by 37 CFR 1.645(b). This motion must include the certificate required by 37 CFR 1.637(b).

If either party believes that additional evidence or discovery concerning the matter raised by the motion(s) is necessary, motions (1) and (2) should also be accompanied by or responded to by such other motions as may be appropriate, as for example, motions under 37 CFR 1.651(b) (4) or 1.687(c).

Oct. 6, 1992 SAUL I. SEROTA
Chairman, Board of Patent Appeals and Interferences

[1144 OG 8]

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(124) **Department of Commerce**
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103-7058]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: The Patent and Trademark Office is amending its rules to implement the arbitration provisions of section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622.
Effective Date: May 27, 1987.
For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The arbitration rule applies to all pending interferences.

The PTO published an advance notice of rulemaking in the Federal Register of Jan. 16, 1985 (50 FR 2294-2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985 (1051 O.G. 9-10). The notice also appeared in the Bureau of National Affairs' Patent, Trademark and Copyright Journal, Vol. 29, p. 310 (Jan. 24, 1985), hereinafter "BNA." Five written comments were received in response to the advance notice.

A notice of proposed rulemaking was published in the Federal Register on Sept. 15, 1986 (51 FR 32756-32762), in the *Official Gazette* on Oct. 21, 1986 (1071 O.G. 25-31), and in BNA's Patent, Trademark and Copyright Journal, Vol. 32, pp. 552-558 (Sept. 18, 1986). In response to the notice, three comments, two in writing and one by telephone, were received. These comments are discussed herein.

All written comments are available for public inspection in Rm. 10C01, Crystal Gateway 2, 1225 Jefferson Davis Hwy., Arlington, Va.

Discussion of the Rule

Under § 1.690 the arbitrator can determine issues of patentability as between the parties but a determination by him or her that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Revise and Caesar, *Interference Law and Practice*, section 861, p. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

* * * stipulation or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief may give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired

testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e) and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Section 1.690 requires that parties who intend to arbitrate an interference notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference". The agreement must be in writing a copy filed in the PTO within 20 days after its execution. The notification of intention to arbitrate must be made in a separate paper. Merely incorporating the notification in the agreement is not sufficient to comply with § 1.690(a). The parties also will be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard v. Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motion period, the examiner-in-chief will not normally grant an extension of time for the purpose. The parties will be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

Section 1.690(a) requires that an arbitration agreement include the following:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.

(2) The issues to be decided by the arbitrator.

(3) A provisions that the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

Section 1.690(c) requires that a copy of the arbitration award be filed within 20 days from the date of the award or by a date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it were accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interference. If the parties are to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and should include the following:

(1) The style (e.g., *Jones v. Smith*), the number of the interference and the names of the real parties in interest.

(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.

(3) The issues for decision before the arbitrator.

(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.

(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

(a) Where the award was procured by corruption, fraud, or undue means.

(b) Where there was evident partiality or corruption in the arbitrators, or either of them.

(c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any part have been prejudiced.

(d) Where the arbitrators exceeded their powers, or so imperfectly execute them that a mutual, final, and definite award upon the subject matter submitted was not made.

(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C. 11 reads as follows:

In either of the following cases, the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—

(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.

(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.

(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild and Co., Inc.* v. *Richmond, F. and P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would lie in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the practice of the PTO concerning arbitration.

Example 1

Arbitration Practice-Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611

for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with § 1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice-Testimony Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under § 1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) or (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with § 1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice-Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefore. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to establish vis-a-vis the public that the subject matter of the court is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(C)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examiner-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice—Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct * * * in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of § 1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral argument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with § 1.690(a), i.e., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616. Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey v. Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-In-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief would place both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with 1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Discussion of Comments

One commentor suggested that the expression "An interference or any aspect thereof shall be arbitrated" in part (b) of proposed § 1.690 might be construed as going beyond the terms of the statute by authorizing an examiner-in-chief to require the parties to arbitrate an interference, and proposed that the quoted language be changed to "An arbitration proceeding under this section shall be conducted." To eliminate any possible misconstruction of the rule, this proposal has been adopted.

A second commentor suggested, by telephone, that a provision be added to proposed § 1.690 requiring that the arbitrator be familiar with United States interference practice, and that United States law be applied by the arbitrator in making the determination. He expressed the fear that a foreign arbitrator might reach a result contrary to established domestic law.

This suggestion has not been adopted. It is incumbent upon the parties to select the arbitrator, and to satisfy themselves as to his or her qualifications. Presumably if the arbitrator's decision is contrary to established law, any resulting patent would be subject to attack on that ground by a third party in subsequent litigation.

Another commentor stated that, with the arbitration rule, the PTO was "attempting to apply a band-aid to a system which cannot be cured by application of a band-aid," and that the first-to-file system should be adopted in place of the first-to-invent system. This suggestion is obviously far beyond the scope of the rule change under consideration. The first-to-invent system is mandated by statute and could not be replaced merely by a change in the rules. The purpose of § 1.690 is to establish a specific procedure governing the optional arbitration of interferences provided by section 105 of Pub. L. 98-622.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) because arbitration intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effects on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is amended as follows:

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New § 1.690 is added to Subpart E to read as follows:

§ 1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than thrity (30) days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgment thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An arbitration proceeding under this section shall be conducted within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

Mar. 16, 1987

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[FR Doc. 87-9373 Filed 4-24-87; 8:45 am]
BILLING CODE 3510-16-M

[1080 OG 15]

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(125) **Disclosure Document Program**

This notice consolidates and supersedes the notices of Mar. 26, 1969 (862 O.G. 1) and Aug. 11, 1970 (878 O.G. 1) relating to the Patent Office Disclosure Document Program. Under this program the Patent Office accepts and preserves, for a period of two years, papers referred to as "Disclosure Documents." These papers may be used as evidence of the dates of conception of inventions.

The Program

A paper disclosing an invention and signed by the inventor or inventors may be forwarded to the Patent Office by the inventor (or by any one of the inventors when there are joint inventors), by the owner of the invention, or by the attorney or agent of the inventor(s) or owner. It will be retained for two years and then be destroyed unless it is referred to in a separate letter in a related patent application within said two years.

A Disclosure Document is not a patent application and the date of its receipt in the Patent Office will not become the effective filing date of any patent application subsequently filed. However, like patent applications, these documents will be kept in confidence by the Patent Office. If patent protection is desired, a patent application should be filed as soon as possible.

This program does not diminish the value of conventional witnessed and notarized records as evidence of conception of an invention, but it should provide a more credible form of evidence than that provided by the popular practice of mailing a disclosure to oneself or another person by registered mail. The program is made available as a service to those persons desiring to use it.

Content of Disclosure Document

Although there are no restrictions as to content and claims are not necessary, the benefits afforded by a Disclosure Document will depend directly upon the adequacy of the disclosure. Therefore, it is strongly urged that the document contain a clear and complete explanation of the manner and process of making and using the invention in sufficient detail to enable a person having ordinary knowledge in the field of the invention to make and use the invention. When the nature of the invention permits, a drawing or sketch should be included. The use or utility of the invention should be described, especially in chemical inventions.

The Disclosure Document must be limited to written matter or drawings on paper or other thin, flexible material, such as linen or plastic drafting material, having dimensions or being folded to dimensions not to exceed 8 1/2 by 13 inches. Photographs also are acceptable. Each page should be numbered. Text and drawings should be sufficiently dark to permit reproduction with commonly used office copying machines.

A $10 fee is charged for filing a Disclosure Document. Payment must accompany the Disclosure Document when it is submitted to the Patent Office.

In addition to the $10 fee, the Disclosure Document must be accompanied by a stamped, self-addressed envelope and a separate paper in duplicate, signed by the inventor, stating that he is the inventor and requesting that the material be received for processing under the Disclosure Document Program. The papers will be stamped by the Patent Office with an identifying number and date of receipt, and the duplicate request will be returned in the self-addressed envelope together with a warning notice indicating that the Disclosure Document may be relied upon only as evidence and that a patent application should be diligently filed if patent protection is desired. The inventor's request may take the following form:

"The undersigned, being the inventor of the disclosed invention, requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years."

Retention

The Disclosure Document will be preserved in the Patent Office for two years after its receipt and will then be destroyed unless it is referred to in a separate letter in a related patent application filed within the two-year period. The Disclosure Document must be referred to in the separate letter by title, number, and date of receipt. Acknowledgment of receipt of such letters will be made in the next official communication or in separate letter from the Patent Office. Unless it is desired to have the Patent Office retain the Disclosure Document beyond the two-year period, it is not required that it be referred to in a patent application.

Warning as to Limitations

The two-year retention period should not be considered to be a "grace period" during which the inventor can wait to file his patent application without possible loss of benefits. It should be recognized that in establishing priority of invention an affidavit or testimony referring to a Disclosure Document must usually also establish diligence in completing the invention or in filing the patent application since the filing of the Disclosure Document.

Inventors are also reminded that any public use or sale in the United States, or publication of the invention anywhere in the world, more than one year prior to the filing of a patent application on that invention will prohibit the granting of a patent on that invention.

If the inventor is not familiar with what is considered to be "diligence in completing the invention" or "reduction to practice" under the patent law, or if he has other questions about patent matters, the Patent Office advises him to consult an attorney or agent registered to practice before the Patent Office. Patent attorneys and agents may be found in the telephone directories of most major cities. Also, many large cities have associations of patent attorneys which may be consulted.

Jan. 4, 1971

RICHARD A. WAHL
Assistant Commissioner of Patents

[883 OG 3]

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(126) Changes to Disclosure Document Program

The PTO is revising and clarifying the Disclosure Document Program to improve processing and to simplify customer requirements. The following changes to the Disclosure Document Program are effective upon publication:

• Duplicate copies of documents are no longer required. Only the original document is required for submission.

• The original Disclosure Document will not be returned to the customer.

• A self addressed, stamped envelope is no longer required.

• A standard format for the disclosure Document is required:

1) The document must be written on one side only, on white letter-size (21.6 cm x 27.9 cm or 8 1/2 by 11 inches) or DIN Size A4 (21.0 x 29.7 cm) paper. (Oversized paper, although foldable to the above dimensions, is not acceptable.) 2) Drawings or sketches must be on paper the same size as the rest of the document.

• The fee for filing a Disclosure Document is $10.00. Documents submitted without the full fee will be returned.

• A copy of a Disclosure Document will be furnished upon receipt of a written request (from the inventor or attorney/agent only) and with a fee of $25.00. 37 CFR § 1.19(b)(3).

Section 1706 of the Manual of Patent Examining Procedures (MPEP) will be revised in accordance with this notice. The section also contains further information regarding the Disclosure Document Program.

July 21, 1995

JAMES O. THOMAS, JR.
Deputy Assistant Commissioner for Patent Process Services

[1177 O.G. 60]

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(127) Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

The Patent and Trademark Office (PTO) is adding Parts 15 and 15a to Title 37 of the Code of Federal Regulations. Part 15 concerns service of process on the Commissioner, the Patent and Trademark Office, and employees of the Patent and Trademark Office in their official capacity. Part 15a concerns the testimony of PTO employees regarding official matters and the production of official documents in legal proceedings. Parts 15 and 15a were effective upon publication in the Federal Register. 54 FR 3976-8 (Jan. 26, 1989).

In addition, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are amended, as indicated below, effective immediately.

Parts 15 and 15a, §§ 1701 and 1701.01 of the Manual of Patent Examining Procedure and §§ 1801 and 1801.01 of the Trademark Manual of Examining Procedure are published in this notice as a convenience to the public. In addition to these materials, the Patent and Trademark Office alerts the public to its position with respect to *Standard Packaging Corp.* v. *Curwood, Inc.*, 365 F. Supp. 134, 180 USPQ 234 (N.D. Ill. 1973). In the past, parties have attempted, based on Standard Packaging, to obtain answers to questions which the Patent and Trademark Office has regarded to be improper. While the Patent and Trademark Office believes Standard Packaging accurately states the law, the Office believes that the court misapplied the law to the precise questions in issue. Accordingly, the Office agrees with the Federal Circuit's observation in *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 432, 8 USPQ 2d 1853, 1857 (Fed. Cir. 1988), that there is considerable doubt whether Standard Packaging was correctly decided. The Patent and Trademark Office will not permit examiners to answer questions similar to those which the Standard Packaging court found acceptable.

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Department of Commerce
Patent and Trademark Office
37 CFR Parts 15 and 15a

[Docket No. 9106-9006]
Service of Process and Testimony of Employees of the Patent and Trademark Office and Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office.
Action: Final rule.
Summary: The Patent and Trademark Office is adding 37 CFR Parts 15 and 15a to supplement 15 CFR Parts 15 and 15a. These new parts prescribe policies and procedures to be followed with respect to service of process on the Patent and Trademark Office, the Commissioner of Patents and Trademarks, and employees of the Office, the testimony of Office employees regarding official matters, and the production of official documents in legal proceedings. These regulations serve as a statement of Office policy and provide comprehensive guidelines for the Office and its employees, outside agencies, and other persons regarding the appropriate procedures for service of process, testimony, and production of documents.
Effective date: Jan. 26, 1989.
For Further Information Contact: Associate Solicitor John W. Dewhirst by mail at Box 8, U.S. Patent and Trademark Office, Washington, D.C. 20231 and by phone at (703) 557-4035.
Supplementary Information: These regulations are designed to supplement, and be construed consistent with, 15 CFR Parts 15 and 15a. The regulations in Part 15a state the views of the Office with respect to the permissible scope of testimony which may be given by Office employees in connection with their performance of quasi-judicial patent and trademark matters. These Office views are consistent with *United States* v. *Morgan*, 313 U.S. 409, 422 (1941); *Western Electric Co., Inc.* v. *Piezo Technology, Inc.* v. *Quigg*, No. 88-1216, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. Nov. 1, 1988); *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969), and *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970).

Because these regulations concern agency management and personnel, they are not rules or regulations within the meaning of section 1(a) of Executive Order 12291, and they are not subject to the requirements of that Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

These regulations, relating to agency management and personnel, are exempt from all requirements of section 553 of the Administrative Procedure Act [5 USC 553] [including a delayed effective date and therefore will be effective immediately upon publication in the Federal Register.

Because a notice of proposed rule making and an opportunity for public comments are not required to be given for these regulations by section 553 of the APA, or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act [5 U.S.C. 603(a) and 604(a)].

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612.

This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

List of subjects in 37 CFR Parts 15 and 15a:

Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, 37 CFR is amended as follows:

1. Part 15 is added to read as follows:

Part 15
Service of Process

Sec.
15.1 Scope and purpose
15.2 Definitions
15.3 Acceptance of service of process
Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15.2(a).

§ 15.1 Scope and Purpose.

(a) This part supplements 15 CFR Part 15 and sets forth the procedures to be followed when a summons or complaint is served on the Office or the Commissioner or an employee of the Office in his or her official capacity. This part is to be construed consistent with 15 CFR Part 15.

(b) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding.

(c) This part does not apply to subpoenas. The procedures to be followed with respect to subpoenas are set out in Part 15a of this Title.

(d) This part does not apply to service of process made on an Office employee personally on matters not related to official business of the Office or to the official responsibilities of the Office employee.

§ 15.2 Definitions.

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.

(b) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, or an administrative law judge or hearing officer.

(c) "Office" means Patent and Trademark Office.

(d) "Office employee" means any officer or employee of the Office.

(e) "Official business" means the authorized business of the Office.

(f) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

§ 15.3 Acceptance of service of process

(a) Any summons or complaint to be served in person or by registered or certified mail or as otherwise authorized by law on the Office or the Commissioner or an Office employee in

his or her official capacity, shall be served on the Solicitor or an Office employee designated by the Solicitor.

(b) Any summons or complaint to be served by mail may be addressed to Solicitor, P.O. Box 15667, Arlington, Va. 22215. Any summons or complaint to be served by hand may be delivered to the Office of the Solicitor.

(c) Any Office employee served with a summons or complaint shall immediately notify and deliver the summons or complaint to the Office of the Solicitor.

(d) Any Office employee receiving a summons or complaint shall note on the summons or complaint the date, hour, and place of service and whether service was by personal delivery or by mail.

(e) When a legal proceeding is brought to hold an Office employee personally liable in connection with an action taken in the conduct of official business, rather than liable in an official capacity, the Office employee by law is to be served personally with process. Service of process in this case is inadequate when made upon the Solicitor or the Solicitor's designee. Any Office employee sued personally for an action taken in the conduct of official business shall immediately notify and deliver a copy of the summons or complaint to the Office of the Solicitor.

(f) An Office employee sued personally in connection with official business may be represented by the Department of Justice at its discretion. See 28 CFR 50.15 and 50.16 (1987).

(g) The Solicitor or Office employee designated by the Solicitor, when accepting service of process for an Office employee in an official capacity, shall endorse on the Marshal's or server's return of service form or receipt for registered or certified mail the following statement: "Service accepted in official capacity only." The statement may be placed on the form or receipt with a rubber stamp.

(h) Upon acceptance of service or receiving notification of service, as provided in this section, the Solicitor shall take appropriate steps to protect the rights of the Commissioner or Office employee involved.

2. Part 15a is added to read as follows:

Part 15a
Testimony by Employees and the Production of Documents in Legal Proceedings

Sec.
15a.1 Scope
15a.2 Definitions
15a.3 Office policy
15a.4 Testimony or production of documents; general rule
15a.5 Testimony of Office employees in proceedings involving the United States
15a.6 Legal proceedings between private litigants
15a.7 Procedures when an Office employee receives a subpoena

Authority: 5 U.S.C. 301; 15 U.S.C. 1501, 1512, 1513, 1515, and 1518; Reorganization Plan No. 5 of 1950; 44 U.S.C. 3101; 15 CFR 15a.1(e) and 15a.2(f).

§ 15a.1 Scope

(a) This part supplements 15 CFR Part 15a and prescribes the policies and procedures of the Office with respect to the testimony of Office employees as witnesses in legal proceedings and the production of documents of the Office for use in legal proceedings pursuant to a request, order, or subpoena. This part is issued pursuant to 15 CFR 15a.1(e) and is to be construed consistent with 15 CFR Part 15a.

(b) This part does not apply to any legal proceeding in which an Office employee is to testify, while on leave status, as to facts or events that are in no way related to the official business of the Office.

(c) This part is intended to ensure the orderly execution of the affairs of the Office and not to impede any legal proceeding and in no way affects the rights and procedures governing public access to records pursuant to the Freedom of Information Act or the Privacy Act. See 15 CFR 15a.4 and 37 CFR 1.15.

§ 15a.2 Definitions.

For the purpose of this part:

(a) "Commissioner" means Assistant Secretary and Commissioner of Patents and Trademarks.

(b) "Demand" means a request, order, or subpoena for testimony or documents for use in a legal proceeding.

(c) "Document" means any record, paper, and other property held by the Office, including without limitation official patent and trademark files, official letters, telegrams, memoranda, reports, studies, calendar and dairy entries, maps, graphs, pamphlets, notes, charts, tabulations, analyses, statistical or informational accumulations, any kind of summaries of meetings and conversations, film impressions, magnetic tapes, and sound or mechanical reproductions.

(d) "Legal proceeding" means a proceeding before a tribunal constituted by law, including a court, an administrative body or commission, an administrative law judge or hearing officer or any discovery proceeding in support thereof.

(e) "Office" means Patent and Trademark Office.

(f) "Office employee" means any officer or employee of the Office.

(g) "Official business" means the authorized business of the Office.

(h) "Solicitor" means the chief legal officer of the Office or other Office employee to whom the Solicitor has delegated authority to act under this part.

(i) "Testimony" means a statement given in person before a tribunal or by deposition for use before the tribunal or any other statement given for use before a tribunal in a legal proceeding, including an affidavit, declaration under 35 U.S.C. 25, or declaration under 28 U.S.C. 1746.

(j) "United States" means the Federal Government, its departments and agencies, and individuals acting on behalf of the Federal Government.

§ 15a.3 Office policy.

The Office policy is that its documents will not be voluntarily produced and Office employees will not voluntarily appear as witnesses or give testimony in a legal proceeding. The reasons for this policy include:

(a) To conserve the time of Office employees for conducting official business.

(b) To minimize the possibility of involving the Office in controversial or other issues which are not related to the mission of the Office.

(c) To prevent the possibility that the public will misconstrue variances between personal opinions of Office employees and Office policy.

(d) To avoid spending the time and money of the United States for private purposes.

(e) To preserve the integrity of the administrative process, minimize disruption of the decision-making process, and prevent interference with the Office's administrative functions.

§ 15a.4 Testimony or production of documents; general rule

(a) No Office employee shall give testimony concerning the official business of the Office or produce any document in any legal proceeding without the prior authorization of the Solicitor. Where appropriate, an Office employee may be instructed in writing by the Commissioner, Solicitor, or other appropriate Office employee not to give testimony or produce a document. Without prior approval, no Office employee shall answer inquiries from a person not employed by the Department of Commerce regarding testimony or documents subject to a demand or a potential demand under the provisions of this Part. All inquiries involving a demand or potential demand on an Office employee shall be referred to the Solicitor.

(b) A certified copy of a document, not otherwise available under Chapter I of this Title, will be provided for use in a legal proceeding upon written request and payment of applicable fees required by law.

(c)(1) *Request for testimony or document.* A request for testimony of an Office employee or document shall be mailed or hand-delivered to the Office of the Solicitor. The mailing address of the Office of the Solicitor is Box 8, Patent and Trademark Office, Washington, D.C. 20231.

(2) *Subpoenas.* A subpoena for testimony by an Office employee or a document shall be served in accordance with the Federal Rules of Civil or Criminal Procedure as appropriate, or applicable state procedure, and a copy of the subpoena shall be sent to the Solicitor.

(3) *Affidavit.* Every request and subpoena shall be accompanied by an affidavit or declaration under 28 U.S.C. 1746 or, if an affidavit or declaration is not feasible, a written statement setting forth the title of the legal proceeding, the forum, the requesting party's interest in the legal proceeding, the reasons for the request or subpoena, a showing that the desired testimony or document is not reasonably available from any other source, and if testimony is requested, the intended use of the testimony, a general summary of the testimony desired, and a showing that no document could be provided and used in lieu of testimony. The purpose of this requirement is to permit the Solicitor to make an informed decision as to whether testimony or production of a document should be authorized.

(d) Any Office employee who is served with a demand shall immediately notify the Office of the Solicitor.

(e) The Solicitor may consult or negotiate with an attorney for a party or the party, if not represented by an attorney, to refine or limit a demand so that compliance is less burdensome or obtain information necessary to make the determination required by paragraph (c) of this section. Failure of the attorney or party to cooperate in good faith to enable an informed determination to be made under this part may serve as the basis for a determination not to comply with the demand.

(f) A determination under this part to comply or not to comply with a demand is not an assertion or waiver of privilege, lack of relevance, technical deficiencies or any other ground for noncompliance. The Commissioner reserves the right to oppose any demand on any legal ground independent of any determination under this part.

§ 15a.5 Testimony of Office employees in proceedings involving the United States.

(a) An Office employee may not testify as an expert or opinion witness for any party other than the United States.

(b) When appropriate, the Solicitor may authorize an Office employee to give testimony as an expert or opinion witness on behalf of the United States. Expert or opinion testimony on behalf of the United States will not be authorized in any legal proceeding involving the validity or enforceability of a patent or registered trademark.

(c) Whenever, in any legal proceeding involving the United States, a request is made by an attorney representing or acting under the authority of the United States, the Solicitor will make all necessary arrangements for the Office employee to give testimony on behalf of the United States. Where appropriate, the Solicitor may require reimbursement to the Office of the expenses associated with an Office employee giving testimony on behalf of the United States.

§ 15a.6 Legal proceedings between private litigants

(a) Testimony by an Office employee and production of documents in a legal proceeding not involving the United States shall be governed by § 15a.4.

(b) If an Office employee is authorized to give testimony in a legal proceeding, the testimony, if otherwise proper, shall be limited to facts within the personal knowledge of the Office employee. An Office employee is prohibited from giving expert or opinion testimony, answering hypothetical or speculative questions, or giving testimony with respect to subject matter which is privileged. If an Office employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Office, that employee is further prohibited from giving testimony in response to questions which seek:

(1) Information about that employee's:
(i) Background.
(ii) Expertise.
(iii) Qualifications to examine or otherwise consider a particular patent or trademark application.
(iv) Usual practice or whether the employee followed a procedure set out in any Office manual of practice in a particular case.
(v) Consultation with another Office employee.
(vi) Understanding of:
(A) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(B) Prior art.
(C) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(D) Any Office manual of practice.
(E) Office regulations.
(F) Patent, trademark, or other law.
(G) The responsibilities of another Office employee.
(vii) Reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing the quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

§ 15a.7 Procedures when an Office employee receives a subpoena.

(a) Any Office employee who receives a subpoena shall immediately forward the subpoena to the Office of the Solicitor. The Solicitor will determine the extent to which an Office employee will comply with the subpoena.

(b) If the Office employee is not authorized to comply with the subpoena, the Office employee shall appear at the time and place stated in the subpoena, produce a copy of Part 15a of Title 15 and a copy of this part, and respectfully refuse to provide any testimony or produce any document. *United States ex rel. Touhy* v. *Ragen*. 340 U.S. 462 (1951).

(c) When necessary or appropriate, the Solicitor will request assistance from the Department of Justice or a U.S. Attorney or otherwise assure the presence of an attorney to represent the interests of the Office or an Office employee.

Dec. 23, 1988

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

Revisions to §§ 1701 and 1701.01 of MPEP

§ 1701 Office personnel not to express opinion on validity or patentability of patent

Every patent is presumed to be valid. 35 U.S.C. § 282, first sentence. Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity or invalidity of, or the patentability or unpatentability of any claim in any U.S. Patent, except to the extent necessary to carry out (a) examination of an application seeking to reissue the patent, (b) a reexamination proceeding to reexamine the patent, or (c) an interference involving the patent.

The question of validity or invalidity is otherwise exclusively a matter to be determined by a court. Members of the patent examining corps are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular patent should not have issued.

When a field of search for an invention is requested, examiners should routinely inquire whether the invention has been patented in the United States. If the invention has been patented, no field of search should be suggested.

Employees of the Patent and Trademark Office, particularly patent examiners who examined an application which matured into a patent or a reissued patent or who conducted a reexamination proceeding, should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain reference or other particular evidence was considered during the examination or proceeding and whether or not a claim would have been allowed over that reference or other evidence had it been considered during the examination or proceeding. Likewise, employees are cautioned against answering any inquiry concerning any entry in the

patent or reexamination file, including the extent of the field of search and any entry relating thereto. The record of the file of a patent or reexamination proceeding must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the patent examining corps. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity or patentability.

§ 1701.01 Office personnel not to testify

[Reprint:37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including patent examiners, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a patent examiner, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Patent examiners and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any patent.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a patent examiner or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least *ten working days* prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon a patent application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1853 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lange* v. *Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in § 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:
(A)Background.
(B)Expertise.
(C)Qualifications to examine or otherwise consider a particular patent or trademark application.
(D)Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations.
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.
(G) reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in writing . The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) if the party requesting the testimony further meets the following conditions:

(1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:

(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).
(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired. Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.
(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.
(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

* * * * *

Revisions to §§ 1801 and 1801.01 of TMEP

§ 1801 Office personnel not to express opinion on validity of registered trademark

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A certificate of registration of a trademark on the Principal Register is prima facie evidence of the validity of the registration. 15 U.S.C. § 1057(b). Public policy demands that every employee of the Patent and Trademark Office refuse to express to any person any opinion as to the validity of any registered trademark, except to the extent necessary to carry out *inter partes* proceedings at the Trademark Trial and Appeal Board in cancellation and similar proceedings authorized by law.

The question of validity of a registered trademark is otherwise exclusively a matter to be determined by a court. Members of the trademark examining operation are cautioned to be especially wary of any inquiry from any person outside the Patent and Trademark Office, including an employee of another Government agency, the answer to which might indicate that a particular registration should not have been published or issued.

Employees of the Patent and Trademark Office, particularly trademark examining attorneys who examined an application should not discuss or answer inquiries from any person outside the Patent and Trademark Office as to whether or not a certain registration or other particular evidence was considered during the examination of the application or whether a trademark would have been published or registered if the registration or other evidence had been considered during the examination. Likewise, employees are cautioned against answering any inquiry concerning any entry in the trademark registration file, including the extent of the field of search and any entry relating thereto. The record of the file of a trademark registration or *inter partes* proceedings before the Trademark Trial and Appeal Board must speak for itself.

Practitioners can be of material assistance in this regard by refraining from making improper inquiries of members of the trademark examining operation. Inquiries from members of the public relating to the matters discussed above must of necessity be refused and such refusal should not be considered discourteous or an expression of opinion as to validity of any registration.

§ 1801.01 Office personnel not to testify

[Reprint: 37 CFR 15a.1
37 CFR 15a.2
37 CFR 15a.3
37 CFR 15a.4
37 CFR 15a.5
37 CFR 15a.6
37 CFR 15a.7]

It is the policy of the Patent and Trademark Office that its employees, including trademark examining attorneys, will not appear as witnesses or give testimony in legal proceedings, except under the conditions specified in 37 CFR Part 15a. Any employee who testifies contrary to this policy will be *dismissed* or *removed*. The reasons for this policy are set out in 37 CFR 15a.3.

Whenever an employee of the Patent and Trademark Office, including a trademark examining attorney, is asked to testify or receives a subpoena, the employee shall immediately notify the Office of the Solicitor. Inquiries requesting testimony shall be also referred immediately to the Office of the Solicitor.

Trademark examining attorneys and other Patent and Trademark Office employees performing or assisting in the performance of quasi-judicial functions, are forbidden to testify as experts or to express opinions as to the validity of any registration.

Any individual desiring the testimony of an employee of the Patent and Trademark Office, including the testimony of a trademark examining attorney or other quasi-judicial employee, must comply with the provisions of 37 CFR Part 15a.

A request for testimony of an employee of the Patent and Trademark Office should be made to the Office of the Solicitor at least *ten working* days prior to the date of the expected testimony.

If an employee is authorized to testify, the employee will be limited to testifying about facts within the employee's personal knowledge. Employees are prohibited from giving expert or opinion testimony. *Fischer & Porter Co.* v. *Corning Glass Works*, 61 F.R.D. 321, 181 USPQ 329 (E.D. Pa. 1974). Likewise, employees are prohibited from answering hypothetical or speculative questions. *In re Mayewsky*, 162 USPQ 86, 89 (E.D. Va. 1969) (deposition of an examiner must be restricted to relevant matters of fact and must avoid any hypothetical or speculative questions or conclusions based thereon); *Shaffer Tool Works* v. *Joy Mfg. Co.*, 167 USPQ 170 (S.D. Tex. 1970) (deposition of examiner should be limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the examiner in acting upon an application). Employees will not be permitted to give testimony with respect to subject matter which is privileged. Several court decisions limit testimony with respect to quasi-judicial functions performed by employees. Those decisions include *United States* v. *Morgan*, 313 U.S. 409, 422 (1941) (improper to inquire into mental processes of quasi-judicial officer or to examine the manner and extent to which the officer considered an administrative record); *Western Electric Co.* v. *Piezo Technology, Inc.* v. *Quigg*, 860 F.2d 428, 8 USPQ 2d 1583 (Fed. Cir. 1988) (patent examiner may not be compelled to answer questions which probe the examiner's technical knowledge of the subject matter of a patent); *McCulloch Gas Processing Co.* v. *Department of Energy*, 650 F.2d 1216, 1229 (Temp. Emer. Ct. App. 1981) (discovery of degree of expertise of individuals performing governmental functions not permitted); *In re Nilssen*, 851 F.2d 1401, 7 USPQ 2d 1500 (Fed. Cir. 1988) (technical or scientific qualifications of examiners-in-chief are not legally relevant in appeal under 35 U.S.C. § 134 since board members need not be skilled in the art to render obviousness decision); *Lancev.-Commissioner*, 352 F. Supp. 166, 176 USPQ 162 (D.D.C. 1972) (technical qualifications of examiners-in-chief not relevant in Sec. 145 action).

In view of the discussion above, if an employee is authorized to testify in connection with the employee's involvement or assistance in a quasi-judicial proceeding which took place before the Patent and Trademark Office, the employee will not be permitted to give testimony in response to questions which seek:

(1) Information about that employee's:

(A) Background.
(B) Expertise.
(C) Qualifications to examine or otherwise consider a particular patent or trademark application.
(D) Usual practice or whether the employee followed a procedure set out in any Office manual of practice (including the MPEP or TMEP) in a particular case.
(E) Consultation with another Office employee.
(F) Understanding of:
(i) A patented invention, an invention sought to be patented, or patent application, patent, reexamination or interference file.
(ii) Prior art.
(iii) Registered subject matter, subject matter sought to be registered, or a trademark application, registration, opposition, cancellation, interference or concurrent use file.
(iv) Any Office manual of practice.
(v) Office regulations
(vi) Patent, trademark, or other law.
(vii) The responsibilities of another Office employee.
(G) Reliance on particular facts or arguments.
(2) To inquire into the manner in and extent to which the employee considered or studied material in performing a quasi-judicial function.
(3) To inquire into the bases, reasons, mental processes, analyses, or conclusions of that Office employee in performing the quasi-judicial function.

Any request for testimony addressed or delivered to the Office of the Solicitor shall comply with 37 CFR 15a.4(c). All requests must be in *writing*. The need for a subpoena may be obviated where the request complies with 37 CFR 15a.4(c) only if the party requesting the testimony further meets the following conditions:

(1) The party requesting the testimony identifies the civil action or other legal proceeding for which the testimony is being taken. The identification shall include:
(a) the style of the case,
(b) the civil action number,
(c) the district in which the civil action is pending,
(d) the judge assigned to the case, and
(e) the name, address, and telephone number of counsel for all parties in the civil action.

(2) The party agrees not to ask questions seeking information which is precluded by 37 CFR 15a.6(b).

(3) The party shall comply with applicable provisions of the Federal Rules of Civil Procedure, including Rule 30, and give ten working days notice to the Office of the Solicitor prior to the date a deposition is desired.

Fifteen working days notice is required for any deposition which is desired to be taken between Nov. 15 and Jan. 15.

(4) The party agrees to notice the deposition at a place convenient to the Patent and Trademark Office. The Conference Room in the Office of the Solicitor is deemed to be a place convenient to the Office.

(5) The party agrees to supply a copy of the transcript of the deposition to the Patent and Trademark Office for its records.

Absent a written agreement meeting the conditions specified in paragraphs (1) through (5), a party must comply with the precise terms of 37 CFR 15a.4(c) and the Patent and Trademark Office will not permit a deposition without issuance of a subpoena.

Feb. 7, 1989 FRED E. McKELVEY
Solicitor

[1099 OG 36]

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(128) **Department of Commerce**
Patent and Trademark Office

37 CFR Parts 15 and 15a
[Docket No. 960722200-6200-01]
RIN 0651-XX07

Service of Process; Testimony by Employees and the Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: This final rule removes parts dealing with service of process on Patent and Trademark Office (PTO) employees in their official capacity and with testimony by employees and production of documents in legal proceedings. The PTO will rely on analogous Commerce Department regulations found in title 15 of the Code of Federal Regulations.
Effective Date: August 19, 1996
For Further Information Contact: Kenneth Corsello by telephone at (703) 305-9041; by mail marked to his attention and addressed to the Office of the Solicitor, Box 8, Washington, D.C. 20231; by electronic mail to corsello@uspto.gov; or by fax marked to his attention at (703) 305-9373.
Supplementary Information: In March 1995, President Clinton issued a directive to Federal agencies regarding their responsibilities under his Regulatory Reform Initiative. This initiative is part of the National Performance Review and calls for immediate, comprehensive regulatory reform. The President directed all agencies to undertake, as part of this initiative, an exhaustive review of all of their regulations—with an emphasis on eliminating or modifying those that are obsolete or otherwise in need of reform. This final rule is part of the Regulatory Reform Initiative.

The Department of Commerce regulations dealing with service of process (15 CFR Part 15) and with employee testimony and the production of documents (15 CFR Part 15a) apply to the PTO. Therefore, the PTO is removing 37 CFR Parts 15 and 15a because they are unnecessary and duplicative.

This rule is not a significant rule for the purposes of Executive Order 12866. Notice and comment is not required for this rulemaking because it relates to agency management or personnel, 5 U.S.C. 553(a)(2), and thus no regulatory flexibility analysis is required, 5 U.S.C. 603(a). This rule does not change the paperwork burden imposed on the public. *See* 44 U.S.C. 3501 *et seq.*

List of Subjects

37 CFR Part 15

Attorneys, Administrative practice and procedure, Courts, Government employees.

37 CFR Part 15a

Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, 37 CFR Chapter I is amended as follows:

Part 15 — [Removed and Reserved]

1. Part 15 is removed and reserved.

Part 15a — [Removed and Reserved]

1. Part 15a is removed and reserved.

August 13, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1190 OG 46]

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(129) **Department of Commerce**
Patent and Trademark Office

United States Adherence to the International Union for the Protection of New Varieties of Plants (UPOV)

On Nov. 12, 1980, the United States deposited its instrument of acceptance of the 1978 text of the UPOV Convention. The United States was the second State to adhere to this text, New Zealand having earlier done so.

The UPOV Convention will take effect with respect to the United States and the other adherents to the 1978 text upon a total of five adherences, three of which must be by present member States (States adhering to the text of the Convention). We expect at least three present member States to adhere shortly and the 1978 text to take effect, therefore, during 1981.

The United States deposited its instrument of acceptance on the basis of the legal protection offered for asexually reproduced plants under the plant patent law (35 U.S.C. 161-164). Accordingly, the Convention will apply only to asexually reproduced plants protected under this law. Steps are now being taken, however, by the Plant Variety Protection Office of the Department of Agriculture to conform the implementation of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.) to the Convention's requirements. When this is done, the United States will notify the UPOV Secretariat that the Convention is also applicable in the United States to asexually reproduced plants protected under that Act.

Questions concerning the UPOV Convention may be directed to the Office of Legislation and International Affairs of the Patent and Trademark Office. This Office may be addressed as follows: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The Office's telephone number is (703) 557-3065.

Dec. 16, 1980 SIDNEY A. DIAMOND
Commissioner of Patents and Trademarks

[1002 O.G. 102]

(130) **Taking Effect in the United States of the International Convention for the Protection of New Varieties of Plants**

The International Convention for the Protection of New Varieties of Plants (the UPOV Convention) will take effect in the United States on Nov. 8, 1981. It will apply to all applications for the patenting of plants under the provisions of Title 35, United States Code, which are filed on or after Nov. 8, 1981. The actual filing date will govern in determining whether the Convention will apply to an application, even though the application may be entitled to an earlier effective date under section 119 or 120 of Title 35, United States Code.

In addition to the United States, the UPOV Convention will be in effect as of Nov. 8, 1981, in the following fourteen States: Belgium, Denmark, Federal Republic of Germany, France, Ireland, Israel, Italy, Netherlands, New Zealand, Republic of South Africa, Spain, Sweden, Switzerland, and the United Kingdom.

No changes in the patent law are needed to implement the UPOV Convention in the United States. An applicant for a plant patent will be required, however, to submit for registration a variety name for the plant to be patented. Registration is required by Article 13 of the UPOV Convention.

Registrability shall be determined in accordance with the International Code of Nomenclature for Cultivated Plants (1980). As an interim procedure pending the promulgation of an appropriate rule, inclusion of the variety name in the application will be accepted as a submission of the name for registration. No plant patent as a result of an application filed on or after Nov. 8, 1981, shall be issued without the registration of a variety name. Questions concerning this variety naming requirement or the UPOV Convention may be addressed to:

Mr. Michael K. Kirk, Director
Office of Legislation and
International Affairs Box 4
U.S. Patent and Trademark Office Washington, D.C. 20231

Mr. Kirk's telephone number is (703) 557-3065.

Oct. 15, 1981 GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks

[1011 O.G. 27]

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(131) **Announcement on the Starting Date of Operations under the Eurasian Patent Convention**

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that:

1. The starting date of operation under the Eurasian Patent Convention* which was done at Moscow on September 9, 1994, is January 1, 1996. As from that date, the Eurasian Patent Office receives Eurasian patent applications and Eurasian patents can be sought** in international applications under the Patent Cooperation Treaty (PCT).

Name of the Office:	Evraziiskoe patentnoe vedomstvo (EAPV) Eurasian Patent Office (EAPO)
Location and mailing address:	M. Cherkassky per. 2/6, EAPV Moscow Centre, GSP, 103621 Russian Federation
Telephone:	(70-95) 206 63 21
Facsimile:	(70-95) 921 24 23

The President of the Eurasian Patent Office is Mr. Viktor I. Blinnikov.

2. By December 31, 1995, the following nine States (hereafter referred to as "the Contracting States") have deposited their instruments of accession to, or ratification of, the Eurasian Patent Convention with the Director General of the World Intellectual Property Organization: Armenia, Azerbaijan, Belarus, Kazakstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan and Turkmenistan.***

3. The Convention allows anyone—irrespective of nationality or domicile—to obtain a Eurasian patent for invention, having effect in all the Contracting States, by filing a single application with, and making a single payment to, the Eurasian Patent Office in Moscow. The request part of an application for the grant of a Eurasian patent must be in Russian. Other parts of the Eurasian application may, at the moment of the filing of the application, be in Russian or in any other language. For any parts that are not in Russian, a Russian translation must be furnished by the applicant within two months following the date of receipt, by the Eurasian Patent Office, of the Eurasian application. The Eurasian Patent Office accepts the filing of applications by facsimile, but the signed original must reach the Office within 14 days.

4. The procedure in the Eurasian Patent Office follows the usual rules: there is an examination as to form; this is followed by search, publication after the expiry of 18 months from the priority date, substantive examination (which is done on the request of the applicant; such a request must be made before the expiry of six months from the date of publication of the search report), and grant or refusal of grant of the Eurasian patent.

5. If the grant of the Eurasian patent is refused, the applicant may transform his Eurasian application into national applications having the filing date and the priority date, if any, of the Eurasian application, in those Contracting States in which he wishes to obtain a national patent under the national procedure.

6. The granted Eurasian patent is not a bundle of national patents but has, in the Contracting States, a unitary legal effect governed by the Convention and the Patent Regulations adopted by the Administrative Council.

7. Any dispute concerning the validity in a given Contracting State, or an infringement in a given Contracting State, of a Eurasian patent will be decided by the national courts or other competent authorities of that State on the basis of the Convention and the Patent Regulations. Such a decision has legal effect only in the territory of that Contracting State.

8. In the case of a dispute, any national court or other competent authority of a Contracting State in which Russian is not a State language may require that the plaintiff furnish to it a translation of the Eurasian patent in the State language.

9. There is no requirement and no possibility to designate Contracting States in the Eurasian patent application. The Eurasian patent has effect on the territory of all Contracting States from the date of its publication by the Eurasian Patent Office. However, at the time when the annual maintenance fees are due and are paid, the owner of the patent must designate by name those Contracting States in which he wishes the effect of the patent to continue. Designations must be addressed to the Eurasian Patent Office, and the patent maintenance fees must be paid at the same time. A separate fee is payable in respect of each designated Contracting State.

10. Any person who has the right to be a representative before the national Patent Office of a Contracting State and who is registered with the Eurasian Patent Office as a patent agent may act as representative before the Eurasian Patent Office. Where the applicant does not have his residence or principal place of business in the territory of a Contracting State, he is required to be represented by a so registered patent agent.

11. The fee to be paid at the filing of a Eurasian application (so called "unitary procedural fee") is US$ 800, plus US$ 50 for each claim in excess of ten, if any. This fee covers also search and publication. This fee is reduced by 25% when the application, filed via the PCT, enters the regional phase before

the Eurasian Patent Office and is accompanied by an international (PCT) search report. A further amount of US$ 800 is payable when examination is requested. Finally, US$ 500 are payable when the Eurasian patent is granted.

12. The list of registered patent agents, the schedule of fees and printed application (and other) forms are available from the Eurasian Patent Office.

* For the text of the Eurasian Patent Convention, see Industrial Property Laws and Treaties, MULTILATERAL TREATIES - Text 2-013, *Industrial Property and Copyright*, July/August 1995.
** For designation of States party to the Eurasian Patent Convention, see PCT Newsletter No. 11/1995, pages 1 and 6.
*** As to the date of entry into force of the Convention for a given State, see the corresponding EAPC Notification issued by WIPO.

February 13, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1184 OG 40]

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(132) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 10
[Docket No. 9511277-5277-01]
RIN 0651-AA65

Cross-Appeals in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending a rule of practice in disciplinary cases to provide a time period for filing a cross-appeal to the Commissioner of Patents and Trademarks after the initial decision of the Administrative Law Judge (ALJ). This amendment will simplify the appeals practice in disciplinary cases by eliminating the need to file contingent appeals.
Effective Date: January 16, 1996.
For Further Information Contact: Karen L. Bovard, 703-308-5316.
Supplementary Information: The PTO issued a second notice of proposed rulemaking to amend a rule of practice in practitioner disciplinary proceedings. 60 FR 4395, Jan. 23, 1995. Under the existing practice, after the ALJ's initial decision, a party (either the respondent or the Director of the office of Enrollment and Discipline) might be obliged to file a contingent appeal to protect cross-appealable issues in the event the opposing party filed an appeal. The amended rule provides a time period for the party to file a cross-appeal after the opposing party has appealed to the Commissioner from the ALJ's initial decision.

No comment to the second notice of proposed rulemaking was received. The proposed rule is adopted.

Other Considerations

This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that the rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the first notice of proposed rulemaking, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive order 12612. The rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

Pursuant to the authority contained in 35 U.S.C. 6, the PTO amends 37 CFR part 10 as follows:

Part 10-Representation of Others Before the Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

§ 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later. An appeal or cross-appeal by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal or cross-appeal, the Director shall serve on the other party a copy of the appeal or cross-appeal. The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires thirty (30) days after the date of service pursuant to § 10.142 of an appeal, cross-appeal or copy thereof. If the Director files a reply brief, the Director shall serve on the other party a copy of the reply brief. Upon the filing of an appeal, cross-appeal, if any, and reply briefs, if any, the Director shall transmit the entire record to the Commissioner.

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December 7, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[182 OG 517]

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(133) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 10
[Docket No. 930366-4319]
RIN 0651-AA65

Cross-Appeals in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce.

Action: Proposed Rulemaking.

Summary: On July 21, 1993, the Patent and Trademark Office (PTO) proposed amending a rule of practice in practitioner disciplinary proceedings. 58 FR 38994. The proposed rule change provides for a time period for a party to a disciplinary proceeding to file a cross-appeal, after the other party (the respondent or the Director of the Office of Enrollment and Discipline) to the proceeding has appealed from the initial

decision of the administrative law judge (ALJ) to the Commissioner. Currently, PTO rules do not provide for such a time period. A party in a disciplinary proceeding may be interested in appealing only if the other party has appealed. Allowing a time period for filing a cross-appeal will give parties to disciplinary cases more flexibility after an initial decision by the administrative law judge and will avoid the necessity of filing a contingent appeal simply to preserve rights in the event the other party files an appeal.

One comment to the rule change proposed on July 21, 1993, was received suggesting substantive changes. This second notice adopts that suggested change.

Dates: Written comments must be received on or before [March 16, 1995] to ensure consideration. An oral hearing will not be conducted.

Addresses: Address written comments to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231, marked to the attention of Harry I. Moatz. Written comments will be available for public inspection in Suite 518, on the 5th floor of Crystal Park I, located at 2011 Crystal Drive, Arlington, Virginia.

For Further Information Contact: Harry I. Moatz by telephone at (703) 308-5273 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231.

Supplementary Information: A Notice of Proposed Rulemaking was published in the Federal Register (58 FR 38994) on July 21, 1993, and in the *Official Gazette* of the PTO (1153 Off. Gaz. 32) on August 10, 1993. Comments were due August 20, 1993. One comment was received. The comment suggested a substantive change to the original proposed rulemaking. The PTO has adopted the change and is now publishing a second notice requesting comments on the amended notice.

Pursuant to 37 CFR § 10.132 *et seq.*, the Director of the Office of Enrollment and Discipline within the PTO may initiate a disciplinary proceeding against a practitioner. If the proceeding is contested by the practitioner and the Director continues to prosecute, an ALJ for the Department of Commerce enters an initial decision which includes findings of fact, conclusions of law and an order. 37 CFR § 10.154.

Either party to the proceeding may appeal from the initial decision of the ALJ to the Commissioner within thirty (30) days of the date of the decision. 37 CFR § 10.155(a). However, prior to this proposed rule change, § 10.155(a) did not provide for the filing of a cross-appeal.

With regard to interference proceedings, 37 CFR § 1.304(a) addresses the filing of cross-appeals by stating in pertinent part that:

the time for filing a cross-appeal [to the Court of Appeals for the Federal Circuit] or cross-action [in a district court] expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

The proposed rule change is similar to the cross-appeal authorized in interference proceedings.

Response to and Analysis of Comment: The single comment suggested that the second sentence of the proposed § 10.155(a) be modified by adding "pursuant to § 10.142" after "(1) 14 days after service of the appeal" to make clear that the period for filing a cross-appeal or reply brief runs from service pursuant to § 10.142. The suggestion is being adopted. The comment further suggested that the fifth sentence in the rule proposed on July 21, 1993, be separated into three new sentences. The first and second new sentences make clear that "the other party to an appeal or cross-appeal may file a reply brief," and that a "reply brief by the respondent" is to be "served in duplicate with the Director." The third new sentence provides a date certain for filing any reply brief by avoiding uncertainty as to when "receipt" of an appeal, cross-appeal or copy thereof occurs, and by relying on the date of "service pursuant to § 10.142" of an appeal, cross-appeal, or a copy thereof. The suggestions have been adopted in the proposed rules.

Other Considerations: This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the original notice of proposed rulemaking published in the *Federal Register*, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. The Office of Management and Budget has determined that the rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the PTO proposes to amend 37 CFR part 10 as follows, wherein deletions are indicated by brackets ([]) and additions by arrows (►◄):

Part 10-Representation of Others Before The Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

§ 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. ►If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later.◄ An appeal ►or cross appeal◄ by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal ►or cross-appeal◄ , the Director shall serve ►on the other party◄ a copy of the appeal ►or cross-appeal◄. ►The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires◄ [Within] thirty (30) days after ►the date of◄ [receipt] ►service pursuant to § 10.142◄ of an appeal ►,cross-appeal◄ or copy thereof[, the other party may file a reply brief, in duplicate with the Director]. If the Director files [the] ►a◄ reply brief, the Director shall serve ►on the other party◄ a copy of the reply brief. Upon the filing of an appeal ►,cross appeal, if any,◄ and [a] reply brief►s◄, if any, the Director shall transmit the entire record to the Commissioner.

January 13, 1995 MICHAEL K. KIRK
Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks

[1171 OG 33]

(134)

Department of Commerce
Patent and Trademark Office
37 CFR Part 501

[Docket No. 80627-8127]

Uniform Patent Policy for Domestic Rights in Inventions Made by Government Employees

Agency: Under Secretary for Economic Affairs, Department of Commerce.
Action: Final rule.
Summary: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal employee inventions with respect to the Federal employee and the Government employer. The Delegation of Authority from the Secretary of Commerce dated Sept. 15, 1988 and effective Nov. 1, 1988, transferred administration of the provisions of Executive Order 10096 as amended by Executive Order 10930 from the Commission of Patents and Trademarks to the under Secretary for Economic Affairs in the Department of Commerce. This final rule establishes 37 CFR Part 501 which sets forth this delegation of authority to the Under Secretary. In addition, each Government agency is authorized to determine whether the results of research, development or other activity constitute an invention with the purview of Executive Order 10096, as amended by Executive Order 10930 and to determine initially the rights therein in accordance with the provisions of section 501.6 and 501.7 herein. By separate notice in today's *Federal Register* the Patent and Trademark Office is deleting 37 CFR Part 100.
Effective Date: Nov. 1, 1988.

However, all rights, determinations, and appeals submitted to the Commissioner prior to the effective date, will be reviewed by the Commissioner under the procedures of 37 CFR Part 100.

Address: Comments may be sent to Mr. Joseph P. Allen, Acting Director, Federal Technology Management Division, Office of the Under Secretary for Economic Affairs, United States Department of Commerce, Room 4839, Herbert C. Hoover Bldg., Washington, D.C. 20230.

For Further Information Contact: Mr. Joseph P. Allen, by telephone at (202) 377-8100 or Robert B. Ellert by telephone at (202) 377-5394.

Supplementary Information: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal Employee inventions with respect to the Federal employer and the Government employer. The Under Secretary for Economic Affairs of the Department of Commerce was delegated responsibility for oversight of the Executive Order on Sept. 15, 1988. Functions required by the Executive Order were previously performed by the Commissioner of Patents and Trademarks. This final rule is substantially the same as the rule set out in 37 CFR Part 100, except, the Secretary of Commerce is substituted for the Commissioner of Patents and Trademarks, and advance approval is given to agency heads to make final determinations relating to determinations of rights decisions of Government employee inventions, subject to employee appeal to the Secretary.

President Reagan in Executive Order 12591, on April 10, 1987 directed all Government agencies to facilitate the transfer of technology developed at federal laboratories to the private sector and to promote its commercialization. To accomplish the goals of E.O. 12591 it is necessary that rights to inventions made by government employees by determined as expidiously as possible. Accordingly, the Secretary has reviewed the existing procedures and policies under 37 CFR Part 100 and concluded that administration of the functions thereunder could be performed on a more efficient basis by confining the role of the Department of Commerce to appeals by employees from disputed agency determinations. Accordingly, under 37 CFR Part 501, each Government agency is given the authority to determine whether the results of research, development or other activates within the agency constitute an invention by an employee, and to determine initially the rights relating to ownership within the provisions of Executive Order 10096 as amended by Executive Order 10930. If no appeal is taken to the secretary by an employee under section 501.8, the initial determinstion of the agency will be final.

Notwithstanding the fact that this is a final rule, comments are requested.

Because this rule concerns agency management and personnel, it is not a rule or regulation within the meaning of section 1(a) of Executive Order 12291, and it is not subject to the requirements of the Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

Because notice of proposed rulemaking and an opportunity for public comments are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 533), or by any other law, no regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

The changes in the process of determining employee rights to inventions made by this rule do not have takings implications sufficient to require preparation of a Taking Implications Assessment under Executive Order 12630.

List of Subjects in 37 CFR Part 501

Uniform patent policy. domestic Rights in inventions, Inventions made by Government employees.

Oct. 3, 1988

ROBERT ORTNER
Under Secretary for Economic Affairs

* * * * *

For reasons set forth in the preamble 37 CFR is amended by adding Chapter V, consisting of Part 501, to read as follows:

CHAPTER V UNDER SECRETARY FOR ECONOMIC AFFAIRS, DEPARTMENT OF COMMERCE

PART 501 UNIFORM PATENT POLICY FOR DOMESTIC RIGHTS IN INVENTIONS MADE BY GOVERNMENT EMPLOYEES

Sec.

501.1 Purpose.
501.2 Scope.
501.3 Definitions.
501.4 Determination of Inventions and Rights therein.
501.5 Agency Liaison Officer.
501.6 Criteria for The Determination of Rights in andto Inventions.
501.7 Agency Determination.
501.8 Appeals by employees.
501.9 Patent protection.
501.10 Dissemination of this part and of implementing regulations.

Authority: Sec. 4, E.O. 10096, 3 CFR 1949-1953 Comp., p 292, as amended by E.O. 10930, 3 CFR 1959-1963 Comp., p. 456; and Delegation of Authority by the Secretary of Commerce, Sept. 15, 1988, DOO 10-9.

§ 501.1 Purpose

The purpose of this part is to provide for the administration of a uniform patent policy for the Government with respect to the domestic rights in inventions made by Government employees and to prescribe rules and regulations for implementing and effectuating such policy.

§ 501.2 Scope

This part applies to any invention made by a Government employee and to any action taken with respect thereto.

§ 501.3 Definitions

(a) The term "Secretary," as used in this part, means the Under Secretary of Commerce for Economic Affairs.

(b) The term "Government agency" as used in this part, means and Executive department or independent establishment of the Executive branch of the Government (including any independent regulatory commission or board, any corporation wholly owned by the United States, and the Smithsonian Institution), but does not include the Department of Energy for inventions made or conceived under the provisions of 42 U.S.C 2182.

(c) The term "Government employee," as used in this part, means any officer or employee, civilian or military, of any Government agency, including any part-time consultant or part-time employee except as may otherwise be provided for by agency regulation approved by the Secretary.

(d) The term "invention," as used in this part, means any art, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the Patent laws of the United States.

§ 501.4 Determination of Inventions and rights therein.

Each Government agency has the approval of the Secretary to determine whether the results of research, development, or other activity in the agency constitute an invention within the purview of E.O. 10096, as amended by E.O. 19030 and to determine the rights therein in accordance with the provisions of § 501.6 and 501.7 herein.

§ 501.5 Agency Liaison Officer

Each Government agency shall designate a liaison officer to represent the agency before the secretary. Provided, however, that the Departments of the Army, the Navy, and the Air Force may each designate a liaison officer.

§ 501.6 Criteria for the Determination of Rights In and To Inventions.

(a) The following rules shall be applied in determining the respective rights of the Government and of the inventor in and to any invention that is subject to the provisions of this part:

(1) The Government shall obtain, except as herein otherwise provided, the entire domestic right, title and interest in and to any invention made be any Government employee:
(i) During working hours, or
(ii) With a contribution by the Government of facilities, equipment, materials, funds or information, or of time or services or other Government employees on official duty, or
(iii) Which bears a direct relation to or is made in consequence of the official duties of the inventor.

Foreign patent rights are governed by the provisions of 37 CFR Part 101.

(2) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a)(1) of this section, to the inventor is insufficient equitable to justify a requirement of assignment to the Government of the entire domestic right, title, and interest in and to such invention, or in any case where the Government has insufficient interest in an invention to obtain the entire domestic right, title, and interest therein (although the Government could obtain same under paragraph(a)(1) of this section), the Government agency concerned shall leave title to such invention in the employees subject however, to the reservation of the government of a non-exclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, such reservation, in the terms thereof, to appear, where practicable, in any patent, domestic or foreign, which may issue on such invention. Reference is made to section 15 of the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710d) which requires a Government agency to allow the inventor to retain title to any covered invention where the agency does not intend to file a patent application or otherwise promote commercialization.

(3) In applying the provisions of paragraph (a)(1) and (2) of this section to the facts and circumstances relating to the making of a particular invention it shall be presumed that an invention made by an employee who is employed or assigned:

(i) To invent or improve or perfect any art, machine, design, manufacture or composition of matter,
(ii) To conduct or perform research, development work, or both
(iii) To supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or
(iv) To act in a liaison capacity among governmental or non-governmental agencies or individuals engaged in such research or development work, falls within the provisions of paragraph (a)(1) of this section, and shall be presumed that any invention made by any other employee falls within the provision of paragraph (a)(2) of this section. Either presumption may be rebutted by a showing of the facts and circumstances in the case and shall not preclude a determination that these facts and circumstances justify leaving the entire right, title, and interest in and to the invention in the Government employees, subject to the law.

(4) In any case wherein the Government neither:

(i) Obtains the entire domestic right, title and interest in and to an invention pursuant to the provisions of paragraph (a)(1) of this section nor
(ii) Reserves a non-exclusive, irrevocable, royalty-free license in the invention, with power to grant licenses for all governmental purposes, pursuant to the provisions of paragraph (a)(2) of this section.

The Government shall leave the entire right, title and interest in and to the invention in the government employee, subject to law.

§ 501.7 Agency determination.

(a) If the agency determines that the Government is entitles to obtain title pursuant to § 501.6(a)(1) and the employee does not appeal, no further review is required.

(b) In the event that a Government agency determines, pursuant to paragraph (a)(2) or (a)(4) of § 501.6, that title to an invention shall be left with the employee, the agency shall notify the employee of this determination.

(c) In the case of a determination under either paragraph (a) or (b) of this section, the agency shall promptly prepare, and preserve in appropriate files, accessible to the Secretary, a written, signed, and dated statement concerning the invention including the following:

(1) A description of the invention in sufficient detail to identify the invention and show its relationship to the employee's duties and work assignments;
(2) The name of the employee and employee status, including a detailed statement of official duties and responsibilities at the time the invention was made, and
(3) An explanation of the agency determination and reasons therefor. The agency shall, subject to considerations of national security, or public health, safety, or welfare, submit to the Secretary, if an appeal is taken, a copy of this written statement.

§ 501.8 Appeals by employees.

(a) Any Government employee who is aggrieved by a Government agency determination pursuant to § 501.6(a)(1) or (a)(2), may obtain a review of any agency determination by filing, within 30 days (or such longer period as the Secretary may, for good cause shown in writing. fix in any case) after receiving notice of such determination, two copies of an appeal with the Secretary. The Secretary shall then forward one copy of the appeal to the Government agency.

(b) On receipt of a copy of an appeal filed pursuant to paragraph (a) of this section, the agency official who made the agency determination being appealed shall, subject to consider-

ations of national security or public health, safety, or welfare, promptly furnish both the Secretary and the inventor with a copy of a report containing the following information about the invention involved in the appeal:

(1) A copy of a statement by the agency containing the information specified in § 501.7, and
(2) A detailed statement of the points of dispute or controversy, together with copies of any statements or written arguments filed with the agency, and of any other relevant evidence that the agency considered in making itsdetermination of Government interest. Within 25 days(or such longer periodthat the Secretary may, for good cause shown, fix in any case) after thetransmission of a copy of the agency report of the employee, the employeemay file a reply thereto with the Secretary and file one copy thereof withthe appropriate agency decision maker.

(c) After the time for the inventor's reply to the Government agency's report has expired and if the inventor has so requested in his or her appeal, a date will be set for hearing of oral arguments before the Secretary, by the employee (or by an attorney whom he or she designates by written power of attorney filed before, or at the hearing) and a representative of the Government agency involved. Unless it shall be otherwise ordered before the hearing begins, oral arguments shall be limited to thirty minutes for each side. The employee need not retain an attorney or request an oral hearing to secure full consideration of the facts and his or her arguments. The employee may expedite such consideration by notifying the Secretary when he or she doest not intend to file a reply to the agency report.

(d) After a hearing on the appeal, if a hearing was requested, or after expiration of the period for the inventor's reply to the agency report if no hearing is set, the Secretary shall issue a decision on the matter within 120 days, which decision shall be final after a thirty day period for requesting reconsideration expires or on the date that a decision on a petition for reconsideration is finally disposed of. Any request for reconsideration or modification of the decision must be filed within 30 days from the date of the original decision (or within such an extension thereof as may be set by the Secretary before the original period expires). The decision of the Secretary shall be made after consideration of the statements of fact in the employee's appeal, the agency's report, and the employee's reply, but the Secretary at his or her discretion and with due respect to the rights and convenience of the inventor and the Government agency, may call for further statements on specific questions of fact or may request additional evidence in the form of affidavits or depositions on specific facts in dispute.

§ 501.9 Patent protection.

(a) A Government agency, upon determination that an invention coming within the scope of § 501.6(a)(1) or (a)(2) has been made, shall thereupon determine whether patent protection will be sought in the United States by the Agency for such invention. A controversy over the respective rights of the Government and the employee in any case shall not delay the taking of the actions provided for in this section. In cases coming within the scope of § 501.6(a)(2), agency action looking toward such patent protection shall be contingent upon the consent of the employee.

(b) Where there is an appealed dispute as to whether § 501.6(a)(1) or (a)(2) applies in determining the respective rights of the Government and of an employees in and to any invention, the agency will determine whether patent protection will be sought in the united States pending the Secretary's decision on the dispute and, if it decides that an application for patent should be filed, will take such rights as are specified in § 501.6(a)(2), but this shall be without prejudice to acquiring the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

(c) Where an agency has determined to leave title to an invention with an employee under § 501.6(a)(2), the agency will, upon the filing of an application for patent take the rights specified in that paragraph without prejudice to the subsequent acquisition by the Government of the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

§ 501.10 Dissemination of this part and of implementing regulations.

Each Government agency shall disseminate to its employees the provisions of this part, and any appropriate implementing agency regulations and decisions. Copies of any such regulations shall be sent to the Secretary. If the Secretary identifies an inconsistency between this part and the agency regulations or delegation, the agency, upon being informed by the Secretary of the inconsistency, shall take prompt action to correct it.

[F.R. Doc. 88-23239 Filed 10-7-88; 8:45 am]
Billing Code 3510-EA-M

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(135) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 10
[Docket No. 960828233-6233-01]
RIN 0651-AA92

Registration Examination for Patent Practitioners and the Establishment of a Continuing Education Requirement and an Annual Fee for Registered Patent Practitioners

Agency: Patent and Trademark Office, Commerce.
Action: Advance notice of proposed rulemaking and notice of hearings.
Summary: The Patent and Trademark Office (PTO) will hold public hearings, and request comments, on issues relating to the administration and format of the Registration Examination for Patent Practitioners and to the establishment of a continuing education requirement and an annual fee for registered patent practitioners. Interested members of the public are invited to testify at public hearings and to submit written comments on the topics outlined in the supplementary information section of this notice.
Dates: Public hearings will be held on October 29, 1996, November 20, 1996, and December 3, 1996 starting at 9:00 a.m. and ending no later than 5:00 p.m.

Those wishing to present oral testimony at the hearings must request an opportunity to do so no later than October 22, 1996, for the October 29, 1996 hearing; November 13, 1996, for the November 20, 1996 hearing; or November 26, 1996 for the December 3, 1996 hearing. Written comments will be accepted by the PTO until December 6, 1996. Written comments and transcripts of the hearings will be available for public inspection on or about December 20, 1996.
Addresses: The October 29, 1996 hearing will be held in San Francisco, California. Additional information on location will be subsequently available from the PTO.

The November 20, 1996 hearing will be held in Dallas, Texas. Additional information on location will be subsequently available from the PTO.

The December 3, 1996 hearing will be held at the Crystal Forum, Crystal Mall 1, 1911 South Clark Place, Arlington, Virginia. Requests to testify and for additional information on hearing locations should be sent to G. Lee Skillington by facsimile transmission to (703) 305-8885, by mail marked to his attention addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231 or by Internet electronic mail to oedcommt@uspto.gov. Written comments should be sent via mail marked to the attention of G. Lee Skillington and addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231 or via Internet electronic mail to oedcommt@uspto.gov. They will be maintained for public inspection in Room 902 of Crystal Park 2, 2121 Crystal Drive, Arlington, Virginia. They will also be made available via the PTO's World Wide Web site at http://www.uspto.gov.
For Further Information Contact: G. Lee Skillington by telephone at (703) 305-9300, by facsimile transmission at (703) 305-8885, by mail marked to his attention addressed to Commissioner of Patents and Trademarks, Box 4, Washington, D.C. 20231, or by electronic mail at oedcommt@uspto.gov.

Supplementary Information:

I. Background

Pursuant to 35 U.S.C. 31 and 32, and 37 CFR Part 10, the PTO's Office of Enrollment and Discipline (OED) receives and acts upon applications for registration to practice before the PTO in patent cases, prepares and grades the Registration Examination for Patent Practitioners (Registration Examination), maintains a register of all individuals entitled to practice before the PTO in patent cases, conducts investigations into possible violations of the PTO's Disciplinary Rules by practitioners practicing before the PTO in all matters.

In recent years, the preparation and administration of the Registration Examination has taxed OED's resources. The PTO is seeking to restructure the administration and format of the Registration Examination in order to free resources needed to investigate and take appropriate action against individuals who no longer meet the qualifications necessary to represent others before the PTO. The Registration Examination restructuring should provide greater assurance to our patent applicants that registered practitioners possess the essential skills necessary to practice before the PTO in patent cases. Moreover, in furtherance of these goals, the PTO is seeking to establish continuing education requirements for registered patent practitioners and an annual registration fee. The annual fee would be used to support the costs associated with the continuing education program and with fulfilling OED's ongoing disciplinary responsibilities.

II. Issues for Public Comment

Interested members of the public are invited to testify and to present written comments on issues related to the discussion topics outlined below, including the specific issues identified in the questions following each topic.

A. Administration and Format of the Registration Examination for Patent Practitioners

The purpose of the Registration Examination is to determine whether individuals who seek to practice before the PTO in patent cases possess the necessary qualifications. At present, the Registration Examination consists of two parts: (1) a multiple-choice portion that tests knowledge of PTO practice and procedure, and (2) a portion that primarily tests claim drafting ability. OED prepares and grades the Registration Examination, regrades the Registration Examination when requested, and drafts reconsideration decisions of the regrades when requested.

The PTO is considering restructuring the PTO practice and procedure portion of the Registration Examination such that it is a computer-administered examination. At the completion of the computer-administered examination, an applicant would be immediately provided with a computer-graded score. The computer-administered examination would be offered numerous times throughout the year at various locations around the United States. Only applicants who have passed the computer-administered examination would be eligible to complete further requirements for registration.

As a further requirement for registration, the PTO is considering substituting the claim drafting portion of the Registration Examination with a comprehensive course on preparation and prosecution of patent applications, including drafting of specifications, claims, and responses to office actions. The PTO is also considering apprenticeships as alternatives to the comprehensive course. The PTO seeks public input on these considerations and other general matters relevant to restructuring the administration and format of the Registration Examination. In addition, the PTO seeks public input on the following particular questions:

1. Should the PTO give a computer-administered examination consisting of a bank of reusable questions?

2. Should the PTO develop the comprehensive course on preparation and prosecution of patent applications or, in the alternative, should the PTO just develop criteria for the course?

3. Should the PTO teach the course or, in the alternative, should the course be taught by non-PTO entities or individuals, such as universities and professional associations?

4. What qualifications should the course instructors have?

5. If the PTO does not teach the course, should the PTO certify the available courses?

6. Should former PTO examiners be required to pass the computer-administered examination if they wish to practice before the PTO in patent cases?

7. Should former PTO examiners be required to take the course or participate in an apprenticeship if they wish to practice before the PTO in patent cases?

B. Establishment of Continuing Education Requirement for Registered Patent Practitioners

The purpose of the continuing education requirement is to provide greater assurance to the PTO's patent applicants that individuals who practice before the PTO in patent cases possess the necessary qualifications. At present, the PTO does not require registered patent practitioners to continue their legal or technical education. The PTO seeks public input on the establishment of a continuing education requirement for registered patent practitioners and other general matters relevant to the requirement. In addition, the PTO seeks public input on the following particular questions:

1. Should the continuing education requirement mandate minimum requirements for legal, technical, and legal ethics education? Or, in the alternative, should the continuing education requirement mandate minimum requirements for continuing education that can be met with either legal, technical, or legal ethics education?

2. Should the PTO give credit to patent practitioners for relevant legal and ethics courses taken to meet a state bar's continuing education requirement?

3. What penalty should be imposed for failure to meet the continuing education requirement?

4. What is a reasonable number of required continuing education credits?

5. Should the qualifying legal education be limited to patent law?

C. Establishment of an Annual Fee To Maintain Registration

An annual fee would be used to support the costs associated with the continuing education requirement and to provide resources to OED to fulfill its ongoing disciplinary responsibilities. At present, the PTO does not require an annual registration fee for registered patent practitioners. The PTO seeks public input on the establishment of an annual fee for registered patent practitioners and other general matters relevant to an annual registration fee.

III. Guidelines for Oral Testimony Individuals wishing to testify at the hearings must adhere to the following guidelines:

1. Requests to testify must include the speaker's name, affiliation, title, telephone number, facsimile number, mailing address, and Internet mail address (if available).

2. Speakers will be provided between five and fifteen minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. Efforts will be made to accommodate requests made before the day of the hearing for additional time for testimony.

3. Requests to testify may be accepted on the day of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

4. A schedule including approximate times for testimony will be provided to all speakers on the morning of the day of the hearing. Speakers are advised that the schedule for testimony may change during the course of the hearings.

IV. Guidelines for Written Comments

Written comments should include the following information:

1. Name and affiliation of individual responding.

2. If applicable, an indication of whether comments offered represent the views of the respondent's organization or are the respondent's personal views.

3. If applicable, information on the respondent's organization, including the type of organization (business, trade group, university, non-profit organization, etc.), and the general areas of interest to the organization.

If possible, respondents should include a machine-readable submission of their written comments. Machine-readable submissions can be provided via Internet electronic mail or on 3.5" floppy disk formatted for use in either a Macintosh computer or MS-DOS based computer. The document should be formatted as either plain text, ACSII text, Microsoft Word (Macintosh, MS-DOS, or MS-Windows), or WordPerfect (Macintosh, MS-DOS, or MS-Windows).

Information that is provided pursuant to this notice will be made part of a public record and will be available via the Internet. In view of this, parties should not provide information that they do not wish to be publicly disclosed or electronically accessible. Parties who would like to rely on confidential information to illustrate a point being made are requested to summarize or otherwise provide the information in a way that will permit its public disclosure.

September 20, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1191 OG 78]

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(136) Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant

Under 37 CFR Part 10, a practitioner is responsible for taking reasonable steps to avoid foreseeable prejudice to the rights of a client/patent applicant. This responsibility exists in all circumstances including those where the practitioner is operating through a corporate liaison or foreign agent and has no direct contact with the client/patent applicant, who in most cases is the one being represented.

This notice is intended to clarify the appropriate course of action for a practitioner to follow when the practitioner is operating through such a corporate liaison or foreign agent. In such arrangements, the registered practitioner may rely upon the advice of the corporate liaison or the client/patent applicant's foreign agent as to the action to be taken so long as the practitioner is aware that the client/patent applicant has consented after full disclosure to be represented by the liaison or agent. It will be assumed by the Patent and Trademark Office that the client/patent applicant has an agreement with the liaison or agent, arrived at after full disclosure, to be represented by the liaison or agent. Registered practitioners, if they wish, however, may maintain a copy of the agreement in this regard between the client/patent applicant and the liaison or agent in practitioner's file of the application or other proceeding before the Office. If there is, in fact, no such agreement between the client/patent applicant and the liaison or agent, the registered practitioner must communicate to the client/patent applicant.

In circumstances where the practitioner is aware that there is an agreement between the client/patent applicant and the liaison or agent, the practitioner may fully rely upon the advice of the liaison or agent as to the wishes of the client/patent applicant. For example, if the registered practitioner is instructed by the client/patent applicant's liaison or agent to allow an application to go abandoned rather than to respond to an Office action within a set period for response, the practitioner may properly do so without any further notice to the client/patent applicant.

It is assumed that withdrawal from employment by a practitioner will remain a relatively rare occurrence, particularly in view of this clarification. This notice should not be taken to require or encourage withdrawal. If a practitioner should decide to withdraw, however, the practitioner must take reasonable steps to avoid foreseeable prejudice to the rights of the client/patent applicant including allowing time for employment of another practitioner (37 CFR 10.40). Therefore, at least thirty days would be required between the date of approval by the Office of the withdrawal and the later of the expiration date of the response period or the expiration date of the period which can be obtained by a petition for extension of time and fee under 37 CFR 1.136(a). This is necessary so that the client/patent applicant would have sufficient time to obtain other representation or to take other action. If a period has been set for response and the period may be extended without a showing of cause pursuant to 37 CFR 1.136(a) by filing a petition for extension of time and fee, the practitioner will not be required to seek such extension of time for withdrawal to be approved. In such a situation, however, withdrawal will not be approved unless at least thirty days would remain between the date of approval and the last date on which such a petition for extension of time and fee could properly be filed.

Dec. 10, 1987 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1086 OG 457]

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(137) Responsibilities of Practitioners Representing Clients in Proceedings Before The Patent and Trademark Office

This notice is intended to remind practitioners of certain aspects of their responsibilities in representing clients in proceedings before the Office. The Notice is also intended to supplement the discussion set forth in the *Official Gazette* Notice published at 1086 *Official Gazette* 457 (Jan. 12, 1988) entitled "Practitioner's Responsibility to Avoid Prejudice to the Rights of a Client/Patent Applicant" and to amplify and supersede the Helpful Hint published at 1084 *Official Gazette* 34 (Nov. 24, 1987) titled "Correspondence Address and/or Fee Address of Maintenance Fees."

Part 10 of title 37, Code of Federal Regulations, sets forth the Patent and Trademark Office (PTO) Code of Professional Responsibility. Each attorney or agent who practices before the PTO is subject to the rules set forth in Part 10 and should carefully study the rules promulgation originally published at 50 *Federal Register* 5158 (Feb. 6, 1985) and at 1052 *Official Gazette* 4 (Mar. 5, 1985) and reproduced as item number 172 in the Consolidated Listing of *Official Gazette* Notices, published at 1086 *Trademark Official Gazette* 3 (Jan. 5, 1988).

Practitioner's Client

During the promulgation of Part 10, 37 CFR, several individuals suggested that "it may be difficult to determine the identity of the 'client'. . ., particularly in corporate patent departments." The response to that suggestion was that "[t]he PTO will presume that practitioners know the identities of their clients . . .." 50 *Federal Register* 5163 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 356 (Jan. 5, 1988). For example, in a patent application, practitioner's client is ordinarily the inventor who gives practitioner a power of attorney to prosecute the application (37 CFR 1.31). A practitioner may represent only the assignee of the entire interest in a patent application if the assignee has filed a power of attorney and the assignee is conducting the prosecution of the application to the exclusion of the inventor. (37 CFR 1.32).

In the promulgation of Part 10, 37 CFR, a commenter raised a question of who is the client when an application is filed on behalf of an individual, but the individual's assignee pays practitioner's bill. The question was answered in the following manner:

> "Practitioners are expected to know the identities of their clients. If a practitioner is hired by a corporation and wishes to make that fact plain on the record of a patent application, the practitioner may file an assignment and a power of attorney signed by the assignee. If a dispute should then occur between the individual and the assignee, the record would be clear that the assignee is the client." 50 *Federal Register* 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988).

In some instances, practitioners deal with a corporate liaison or foreign agent. Such arrangements do not automatically change the person whom practitioner represents, e.g., the inventor or trademark owner. The fact that a U.S. practitioner receives instructions from the inventor or trademark owner through a foreign attorney or agent does not change the fact that the client is still the inventor or trademark owner rather than the foreign attorney or agent. See *Strojirenstvi* v. *Toyoda*, 2 USPQ 2nd 1222 (Comm'r Pat. 1986), which at 1223 cited *Yetter Manufacturing Co.* v. *Hiniker Co.*, 213 USPQ 119, 120 (D. Minn. 1981) for the principle that "when attorney served as local counsel for a law firm representing Hiniker Co., the attorney represented Hiniker and not the law firm" and also cited *Toulmin* v. *Becker*, 105 USPQ 511 (Ohio Ct. App. 1954) for the principle that "foreign patent agents or attorneys were not clients of U.S. patent attorney." The PTO expects practitioners to know the identities of their clients and to take reasonable steps to avoid foreseeable prejudice to the rights of their clients.

Obtaining Instructions Through Persons Other Than The Client

In practice, it is common for instructions relating to the application of an inventor or trademark owner, who is the client of the U.S. practitioner, to be passed to the U.S. practitioner through intermediaries, such as corporate liaisons or foreign agents. Clearly, a client may choose to use a corporate liaison or a foreign agent to convey instructions, etc., to a practitioner. In such an arrangement, the practitioner may rely upon instructions of, and accept compensation from, the corporate liaison or the foreign agent as to the action to be taken in a proceeding before the Office so long as the practitioner is aware that the client has consented to have instructions conveyed through the liaison or agent. See 37 CFR 10.68(a) and (b). An agreement between the client and the liaison or agent establishes an agency relationship between the liaison or agent and the client such that the U.S. practitioner can rely upon the liaison or agent as the representative of the client for the purpose of communicating the client's instructions about the proceeding to the U.S. practitioner. The PTO will assume that the client has an agreement with the liaison or agent to be represented by the liaison or agent. It is the responsibility of the client to notify the practi tioner that the agency relationship between the client and the liaison or agent has ceased to exist and that instructions from the liaison or agent should no longer be accepted.

A practitioner could secure evidence that such an agreement exists by having a patent or trademark applicant sign a statement to that effect at the same time that the power of attorney is executed. For example, the following language could be inserted in an oath, declaration, or power of attorney form:

> "The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned."

Without an agency relationship between the liaison or agent and the client, a practitioner would be bound by 37 CFR 10.68(b) to "not permit a person who recommends, employs, or pays the practitioner to render legal services for another, to direct or regulate the practitioner's professional judgment in rendering such legal services."

Practitioner's Responsibility to a Client After the Client's Patent Issues or Trademark is Registered

The Office has received inquiries from practitioners as to their responsibilites to a client (patent or trademark applicant) after the client's patent was issued or trademark has been registered. In response thereto, it is pointed out that a power of attorney given during prosecution of a patent or trademark application is considered to be viable after the patent is issued or the trademark is registered. See 50 *Federal Register* 5164 (Feb. 6, 1985); 1086 *Trademark Official Gazette* 357 (Jan. 5, 1988). While the Office considers such a power of attorney to be viable for purposes of the practitioner taking actions in proceedings before the Office if practitioner and the client so desire, the existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark does not establish whether practitioner has a responsibility, and a dutaffirmatively in a proceeding before the Office on behalf of the client after the patent issues or the trademark is registered.

Practitioner's responsibility to take affirmative action in a proceeding before the Office after the patent issues or the trademark is registered depends upon whether practitioner still has a practitioner-client relationship with the client which has continued after the patent issued or trademark is registered. The mere existence of the power of attorney to file and/or prosecute the application through issuance of the patent or registration of the trademark would not establish such a practitioner client relationship in the absence of other facts establishing such a relationship since the purpose for which the power of attorney was originally given has been accomplished.

Practitioner's Responsibility to a Former Client

While practitioner may no longer have a practitioner-client relationship with a client and therefore has no duty to represent the client in a proceeding before the Office, a practitioner nevertheless has certain obligations to a former client. These obligations are placed upon practitioner by the Office rules and are necessary for the proper conduct of proceedings before the Office. Under 37 CFR 10.23(c)(8), practitioners have a duty to inform a client or former client or timely notify the Office of an inability to notify a client or former client of certain correspondence received from the Office and also from the client's or former client's opponent in an *inter partes* proceeding before the Office. Practitioners have an obligation whether the client is a present client or a former client. Included among the items of correspondence of which practitioners have the obligation to inform clients or former clients are notices regarding maintenance fees, reexamination proceedings, and institution of *inter partes* patent and trademark proceedings.

Address to Which Correspondence is Sent Regarding Patent Maintenance Fees and Reexamination Proceedings

Under 37 CFR 1.33(d), a "correspondence address" or a change thereto may be filed with the Office during the enforceable life of a patent. This "correspondence address" will be used in any correspondence relating to maintenance fees unless a separate "fee address" has been specified solely for maintenance fee purposes as provided by 37 CFR 1.363. Practitioners who do not wish to receive correspondence relating to maintenance fees must change the correspondence address in the patented file or provide the PTO with a fee address to which the correspondence should be sent. It is not required that a practitioner file a request for permission to withdraw pursuant to 37 CFR 1.36 solely for the purpose of changing the correspondence address in a patent even though a withdrawal of a practitioner would change the correspondence address.

Since 37 CFR 1.33(c) specifies that all notices, official letters and other communications for the patent owner or owners in a reexamination proceeding will be directed to the attorney or agent of record in the patent file, a request for permission to withdraw pursuant to 37 CFR 1.36 must be filed in the patent

if the attorney or agent of record does not desire to receive correspondence relating to reexamination. For information on requests to withdraw, see the discussion in the Jan. 12, 1988 *Official Gazette* Notice cited above.

Contact Points For Information

If a practitioner has questions about the conduct of, or requirements relating to a particular proceeding before the Office, those questions should be directed to the particular area of the Office responsible for the proceeding. If practitioners have questions about their responsibilities to their clients, those questions should be directed to the Office of Enrollment and Discipline. The telephone number of that Office is (703) 557-2012.

May 25, 1988

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1091 OG 26]

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(138)

Department of Commerce
Patent and Trademark Office
37 CFR § 1.15
[Docket No. 98515 - 8209]

Requests for Identifiable Records

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: This final rule sets forth changes that the Patent and Trademark Office (PTO) is making to the rules governing requests for records not disclosed to the public as part of the regular informational activity of the PTO. The prior rule sets out the PTO Freedom of Information Act (FOIA) procedures. The final rule updates these procedures and specifies that FOIA requests will be processed in accordance with Department of Commerce regulations contained in Part 4 of 15 CFR (Public Information).
Effective Date: Dec. 30, 1988.
For Further Information Contact: Albin F. Drost by telephone at (703) 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: As presently written, 37 CFR 1.15 describes procedures for obtaining documents under the Freedom of Information Act that have been superseded. The purpose of this rule change is to bring the PTO FOIA procedures into conformity with the Department of Commerce FOIA rules. The final rule directly advises requesters that the PTO will follow the Department of Commerce rules for disclosure of information under FOIA.

A notice of proposed rulemaking was published on July 19, 1988 (53 Fed. Reg. 27 177). Interested parties were requested to submit written comments on or before Sept. 20, 1988. No comments were received.

Other Considerations

This rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources. This rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities [Regulatory Flexibility Act, Pub. L. 96-354] because no increase in fees or paperwork should result from this rule change.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12991. The annual effect to the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no federalism implications affecting the relationship between the National Government and the states as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. § 3501 et seq., since no record keeping or reporting requirement within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Records.

For the reasons set out in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. § 6, the Patent and Trademark Office amends Title 37 of the Code of Federal Regulations as set forth below:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

AUTHORITY: 35 U.S.C. § 6 unless otherwise noted.

2. Section 1.15 is revised as follows:

§ 1.15 Requests for identifiable records.

(a) Requests for records, not disclosed to the public as part of the regular informational activity of the Patent and Trademark Office and which are not otherwise dealt with in the rules in this part, shall be made in writing, with the envelope and the letter clearly marked "Freedom of Information Request." Each such request, so marked, should be submitted by mail addressed to the "Patent and Trademark Office, Freedom of Information Request Control Desk, Box 8, Washington, D.C. 20231," or hand delivered to the Office of the Solicitor, Patent and Trademark Office, Arlington, Virginia. The request will be processed in accordance with the procedures set forth in Part 4 of Title 15, Code of Federal Regulations.

(b) Any person whose request for records has been initially denied in whole or in part, or has not been timely determined, may submit a written appeal as provided in § 4.8 of Title 15, Code of Federal Regulations.

(c) Procedures applicable in the event of service of process or in connection with testimony of employees on official matters and production of official documents of the Patent and Trademark Office in civil legal proceedings not involving the United States shall be those established in parts 15 and 15a of Title 15, Code of Federal Regulations.

Nov. 21, 1988

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1097 OG 15]

Patent Cooperation Treaty Update

Withdrawal by Greece of its Chapter II Reservation

On June 7, 1996, Greece notified the World Intellectual Property Organization (WIPO) that it was withdrawing its declaration under Article 64(1)(a) of the Patent Cooperation Treaty (PCT). Thus, Greece will become bound by Chapter II of the PCT on

September 7, 1996, and nationals and residents of Greece may, from that date, submit demands for international preliminary examination of international applications filed by them, irrespective of whether the international application is filed before, on or after September 7, 1996.

Accession by Saint Lucia

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Saint Lucia deposited its instrument of accession of the PCT on May 30, 1996. Saint Lucia will become the 86th Contracting State of the PCT on August 30, 1996. Consequently, nationals and residents of Saint Lucia are entitled to file international applications under the PCT on and after August 30, 1996, and from the same date it is possible to file international applications designating and electing Saint Lucia (country code: LC).

Accession by Bosnia and Herzegovina

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Bosnia and Herzegovina deposited its instrument of accession of the PCT on June 7, 1996. Bosnia and Herzegovina will become the 87th Contracting State of the PCT on September 7, 1996. Consequently, nationals and residents of Bosnia and Herzegovina are entitled to file international applications under the PCT on and after September 7, 1996, and from the same date it is possible to file international applications designating and electing Bosnia and Herzegovina (country code: BA).

Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(1) Central African Republic[2]	Accession	15 September 1971	24 January 1978
(2) Senegal[2]	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi[2]	Accession	16 May 1972	24 January 1978
(5) Cameroon[2]	Accession	15 March 1973	24 January 1978
(6) Chad[2]	Accession	12 February 1974	24 January 1978
(7) Togo[2]	Ratification	28 January 1975	24 January 1978
(8) Gabon[2]	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany[3]	Ratification	19 July 1976	24 January 1978
(11) Congo[2]	Accession	08 August 1977	24 January 1978
(12) Switzerland[3]	Ratification	14 September 1977	24 January 1978
(13) United Kingdom[3]	Ratification	24 October 1977	24 January 1978
(14) France[3]	Ratification	25 November 1977	25 February 1978
(15) Russian Federation	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg[3]	Ratification	31 January 1978	30 April 1978
(18) Sweden[3]	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark[3]	Ratification	01 September 1978	01 December 1978
(21) Austria[3]	Ratification	23 January 1979	23 April 1979
(22) Monaco[3]	Ratification	22 March 1979	22 June 1979
(23) Netherlands[3]	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein[3]	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium[3]	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania[2]	Accession	13 January 1983	13 April 1983
(34) Sudan[2]	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali[2]	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy[3]	Ratification	28 December 1984	28 March 1985
(40) Benin[2]	Accession	26 November 1986	26 February 1987
(41) Burkina Faso[2]	Accession	21 December 1988	21 March 1989
(42) Spain[3]	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece[3]	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Côte d'Ivoire[2]	Ratification	31 January 1991	30 April 1991
(47) Guinea[2]	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991
(49) Czech Republic	Declaration[4]	18 December 1992	01 January 1993
(50) Ireland[3]	Ratification	01 May 1992	01 August 1992
(51) Portugal[3]	Accession	24 August 1992	24 November 1992

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration[4]	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration[4]	30 December 1992	01 January 1993
(56) Niger[2]	Accession	21 December 1992	21 March 1993
(57) Kazakstan	Declaration[4]	16 February 1993	25 December 1991
(58) Belarus	Declaration[4]	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991
(61) China	Accession	01 October 1993	01 January 1994
(62) Slovenia	Accession	01 December 1993	01 March 1994
(63) Trinidad and Tobago	Accession	10 December 1993	10 March 1994
(64) Georgia	Declaration[4]	18 January 1994	25 December 1991
(65) Kyrgyzstan	Declaration[4]	14 February 1994	25 December 1991
(66) Republic of Moldova	Declaration[4]	14 February 1994	25 December 1991
(67) Tajikistan	Declaration[4]	14 February 1994	25 December 1991
(68) Kenya[3]	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia	Declaration[4]	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland[5]	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda[5]	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan	Declaration[4]	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho[5]	Accession	21 July 1995	21 October 1995
(82) Azerbaijan	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996
(84) Israel	Ratification	01 March 1996	01 June 1996
(85) Cuba	Accession	16 April 1996	16 July 1996
(86) Saint Lucia	Accession	30 May 1996	30 August 1996
(87) Bosnia and Herzegovina	Accession	7 June 1996	7 September 1996

[1]Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2]Member of African Intellectual Property Organization (OAPI) regional patent system.

[3]Member of European Patent Convention (EPC) regional patent system.

[4]Declaration of continued application.

[5]Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

August 6, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1190 OG 4]

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(140) **Minimum Requirements for Acceptance of Applications Under 35 U.S.C. 371 (the National Stage of PCT)**

The Patent and Trademark Office is continuing to receive application papers which do not clearly identify whether the papers (1) are being submitted to enter the national stage of the Patent Cooperation Treaty (PCT) under 35 U.S.C. 371 or (2) are being filed as a regular national application under 35 U.S.C. 111.

Attention is directed *to the notice* in the Official Gazette at 1070 O.G. 11 titled "Unity of Invention Practice in International Applications and National Phase Applications Entered Under 35 U.S.C. 371" wherein at item eight it is stated

"(8) Applicants should clearly indicate on all application papers filed forentry under 35 U.S.C. 371 and 37 CFR 1.61 that the filing is being made under § 35 U.S.C. 371. Otherwise, the application papers will be treated as having been filed under 35 U.S.C. 111."

To clearly indicate an international application is being filed under 35 U.S.C. 371 the applicant should use the "Transmittal Letter for United States Designated Office" (Form PTO-1390) as the transmittal letter.

Alternatively, one of the following indications may be used:

1) the applicant shall clearly state in the transmittal or cover letter that he or she is filing under 35 U.S.C. 371 or entering the national stage under the PCT; or

2) the applicant clearly identifies in the oath or declaration the specification to which it is directed by referring to a particular international application by PCT Serial Number and International Filing Date and that he or she is executing the declaration as, and seeking a U.S. Patent as, the inventor of the invention described in the identified international application.

Applicants are cautioned that the identification of the international application, in the oath or declaration or otherwise, as a prior filed application for priority purposes is not considered to be an indication of an intention to file under 35 U.S.C. 371.

If there are any conflicting instructions as to which section of the statute (371 or 111) is intended the application will be accepted under 35 U.S.C. 111. It is strongly recommended that applicant use the Form PTO-1390 in all cases where a filing under 35 U.S.C. 371 is intended.

Mar. 16, 1987

RENE D. TEGTMEYER
Assistant Commissioner for Patents

[1077 OG 13]

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(141) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1 and 10
[Docket No. 920539-2313]
RIN: 0651-AA51

Revision of Patent Cooperation Treaty Provisions

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice relating to applications filed under the Patent Cooperation Treaty (PCT): (1) to amend the rules in accordance with revised regulations under the PCT; (2) to bring the rules regarding applications entering the national stage under 35 U.S.C. 371 more in line with existing regulations applicable to national applications filed under 35 U.S.C. 111; and (3) to clarify existing practice under the PCT. The changes will result in more streamlined and simplified procedures for filing and prosecuting international and national stage applications under the PCT.
Effective Date: May 1, 1993.
For Further Information Contact: Vincent Turner by telephone at (703) 305-9384 or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231 and marked to the attention of Vincent Turner (Crystal Park 2, room 919).
Supplementary Information: The Office published a notice of proposed rulemaking relating to revision of the Patent Cooperation Treaty provisions, in the *Federal Register*, 57 Fed. Reg. 29248 (July 1, 1992) and in the *Official Gazette*, 1140 Off. Gaz. Pat. Office 27 (July 14, 1992). No oral hearing was held. Eight individuals or organizations submitted written comments in response to the notice of proposed rulemaking. The eight written comments are available for public inspection in the Office of the Assistant Commissioner for Patents, room 919, Crystal Park II, 2121 Crystal Drive, Arlington, Va.

Familiarity with the notice of proposed rulemaking is assumed. Changes in the text of the rules published for comment in the notice of proposed rulemaking are discussed. Comments received in writing in response to the notice of proposed rulemaking are discussed.

This rule change will improve filing and processing procedures for applicants both in the filing of international applications and in the filing of national stage applications under 35 U.S.C. 371.

Background

During the first 14 years under the PCT, the annual volume of international patent applications filed in the U.S Receiving Office has increased from just under 100 to almost 10,000 in fiscal year 1991. The volume of U.S. national stage applications has shown similar growth to the point that the U.S. is now designated more than 10,000 times each year by applicants filing international applications under the PCT. Historically, approximately 60% of those applicants that designate the U.S. enter the national stage in the United States.

On July 8 to 12, 1991, representatives of the patent offices of the member countries, in a series of meetings held in Geneva, Switzerland, agreed upon several changes to the PCT regulations which are designed to make the PCT more user-friendly. These adopted changes require corresponding changes in Title 37, CFR.

The practice under the revised PCT regulations will permit an applicant to provide, in addition to at least one specified designation, a precautionary designation of all other PCT member countries and regions so that any intended designation which may have been overlooked on filing can be corrected within 15 months of the priority date by confirmation of the designation. Applicants are cautioned, however, that in order for the confirmation of a designation of the U.S. to be valid, the inventor must have been named in the application papers as filed, 37 CFR 1.421(b).

International applications are searched and published prior to the 20-month deadline for entry into the national stage. If a demand for preliminary examination is filed before expiration of 19 months from the priority date the time for entry into the national stage is extended to 30 months from the priority date and the international application will be subject to preliminary examination under Chapter II of the PCT. The practice under the revised PCT regulations permits an applicant to indicate in the demand that preliminary examination is to be based on an accompanying PCT Article 34 amendment and, if the amendment is not received with the demand, the applicant will be notified and given a time period within which to file the missing amendment. This new procedure will ensure that examination will go forward based on the desired PCT Article 34 amendment.

Also, the Office is aware that certain applicants have had difficulty in properly filing national stage applications due to the different requirements in the rules for PCT and U.S. national applications. Some differences cannot be avoided due to different procedures required under the PCT from U.S. national practice. It is desirable, however, to minimize these differences and to simplify national stage filing procedures.

International applications have become abandoned for failure to timely provide an oath or declaration, a filing fee and/or an accurate translation. In national practice under 35 U.S.C. 111, if any of these items was not presented at the time of filing, a notice would be mailed to the applicant setting a period of time to provide the missing item(s) and to pay a fee. The amendments to the rules governing entering the national stage will establish a greater degree of uniformity of practice and requirements for filing an application under 35 U.S.C. 111 and entering the national stage in an international application under 35 U.S.C. 371.

Amending sections 1.494 and 1.495 results in regulations much like the present section 1.53. The major exception is that a notification of any missing parts in sections 1.494 and 1.495 will only be mailed in those instances where the applicant has paid the basic national fee within 20 or 30 months from the priority date depending on whether election of the U.S. under Chapter II of the PCT has been made prior to 19 months. Applicants can no longer pay the basic national fee with a surcharge after the 20/30 months deadline. Failure to pay the basic national fee within 20/30 months from the priority date will result in abandonment of the application. Paying the fee gives a clear indication to the Office that the applicant desires to enter the national stage. If the required oath, declaration or translation has not been filed within 20/30 months from the priority date, as appropriate, the Office will send applicant a notice and provide a period of time to supply the deficiency. Upon paying the basic national fee within 20/30 months from the priority date, the applicant will have the opportunity to inform the Office of a U.S. correspondence address, if any. Thus, the Office will avoid unnecessary handling of approximately 40% of those applications that designate the U.S. but do not enter the national stage, and will be able to send a notice to a U.S. correspondence address in most cases.

Often at 20 or 30 months from the priority date, the only communication which has been received by the Office is a copy of the international application from the International Bureau with the address of the foreign attorney or agent who represented the applicant in the international stage. The foreign attorney or agent may not be conversant in English or knowledgeable about U.S. practice, factors which often contribute to

complicating the processing of applications. Thus, the new practice, which requires payment of the basic national fee on or before 20 or 30 months from the priority date, has several advantages: (1) it will enable the applicant to identify the U.S. attorney or agent for correspondence from the Office; (2) the Office, after a check of the national stage papers at 20 or 30 months, will mail a notice identifying any deficiencies and affording applicant a period for correction of those deficiencies; and (3) as in national practice under section 1.53, it will enable applicants to extend the period of time under section 1.136 for submission of a proper oath, declaration or translation.

The changes to sections 1.494 and 1.495 address the problems which have been most frequently encountered in entering the national stage in the United States. The new practice of notifying applicants of the omission of a proper oath, declaration or translation and setting an extendable period of time for correction will allow applicants greater flexibility in the time for submission of these documents, thus avoiding the consequence of abandonment and potential loss of rights in the United States.

Implementation

The rule changes which reflect corresponding amendments in the PCT regulations were implemented on 01 July 1992 when the amendments became effective. The remaining rule changes will be effective on 01 May 1993. Setting a date for the rules to take effect several months in the future will allow time for applicants to change their procedures to conform to these rules.

Those international applications entering the national stage under section 1.494 where 20 months from the priority date expires on, or before, 30 April 1993 are under the old rule (section 1.494 effective 01 July 1987) and those international applications entering the national stage under section 1.495 where 30 months from the priority date expires on, or before, 30 April 1993 are under the old rule (section 1.495 effective 01 July 1987). Those international applications entering the national stage under section 1.494 where 20 months from the priority date expires on, or after, 01 May 1993 are under the new rule (section 1.494 effective 01 May 1993) and those international applications entering the national stage under section 1.495 where 30 months from the priority date expires on, or after, 01 May 1993 are under the new rule (section 1.495 effective 01 May 1993). For example:

1) If a copy of an international application (which designates the U.S.) that has a priority date of 30 August 1991 is filed in the Office by 30 April 1993 (within 20 months from the priority date), applicant may enter the national stage under 37 CFR 1.494 by submitting any required English translation, the basic national fee and the oath or declaration not later than 30 June 1993. Of course, the payment of the surcharge and processing fee (37 CFR 1.492(e) and (f)) would also be due.

2) If a copy of an international application (which elected the U.S. before expiration of 19 months from the priority date) that has a priority date of 30 October 1990 is filed in the Office by 30 April 1993 (within 30 months from the priority date), applicant may enter the national stage by submitting any required English translation, the basic national fee and the oath or declaration not later than 30 June 1993. Of course, the payment of the surcharge and processing fee (37 CFR 1.492(e) and (f)) would also be due.

3) If a copy of an international application (which designates the U.S.) that has a priority date of 01 September 1991 is filed in the Office by 03 May 1993 (within 20 months from the priority date - 01-02 May 1993 being a Saturday and Sunday, respectively), then applicant must pay the basic national fee by 03 May 1993 to avoid abandonment of the application. If the basic national fee is timely paid, a notice will then be sent to applicant giving atime period within which to file the oath or declaration and any required translation (new section 1.494(c)).

4) Any international application having a priority date of 01 September 1991, or later, is under the new rule. Thus, if applicant files papers for the national stage indicated to be under the procedure of the old rule (section 1.494) in the Office before 01 May 1993 (i.e., before expiration of 20 months from the priority date) but omits the basic national fee, *the application will, nonetheless, become abandoned at midnight* on 03 May 1993 (after 20 months from the priority date - 01-02 May 1993 being a Saturday and Sunday, because applications where the 20-month deadline expires on after 01 May 1993 come under the new practice. In accordance with new section 1.494 (i) copy of the international application must be furnished to the Office, and (ii) the basic national fee must be paid before expiration of 20 months from the priority date.

Response to Comments on the Rules

Eight written comments were received in response to the notice of proposed rulemaking. All of the comments were considered in adopting the changes set forth herein. The comments and responses to the comments follow.

Comment 1. One comment stated that "The proposed addition to section 1.431(b)(1) of 'and the papers filed at the time of receipt of the international application [so] indicate' goes beyond the requirements set forth in the PCT and is contrary to PCT Administrative Instructions, Section 329." Two other similar comments were received and urged, in effect, that section 1.431(b)(1) be revised to adopt the procedure set forth in Section 329 of the PCT Administrative Instructions.

Response: The suggestion has not been adopted. The provisions adopted in section 1.431(b)(1) are consistent with, and required by, Article 11 of the PCT as interpreted by the Office. Section 329 of the PCT Administrative Instructions was issued by the International Bureau after the Bureau was advised that the Office believed new section 329 to be inconsistent with requirements of Article 11 of the Treaty and inconsistent with over 13 years of practice in the United States. In the opinion of the Office, PCT Administrative Instruction 329 is inconsistent with PCT Article 11 and Rule 20.4(a), which require the Office to promptly determine whether the applicant does not obviously lack, by reasons of residence or nationality, the right to file an international application. In accordance with PCT Rule 89.1(b), "The Administrative Instructions shall not be in conflict with the provisions of the Treaty, these regulations, ..." The United States will not follow Administrative Instruction 329.

Comment 2. One comment stated that in section 1.431(c), the reference to "PCT Rule 15.2" should be to "PCT Rule 15" because PCT Rule 15.1 is also relevant, and the reference to section 1.445 "should be changed to refer to" PCT Rules 14 and 16.1" because section 1.445 does not cover the European Patent Office (EPO) search fee which is also paid to the USPTO."

Response: The suggestion has not been adopted. The references to Rule 15.2 and section 1.445 are considered proper in the context in which they are used. The references to Rule 15.2 and section 1.445 are not new and have worked well in directing applicants regarding international application requirements. The EPO search fee is not mentioned in section 1.431, but is published in each issue of the *Official Gazette* for applicant's information.

Comment 3. One comment stated that in section 1.431(d), the words "one designation fee" should be deleted since this is covered by section 1.432(b) and that "timely made" in line 5 be changed to "paid within the one-month period" for clarity.

Response: The first suggestion in the comment is not adopted. The reference to "one designation fee" in section 1.431(d) is repeated in section 1.432(b) to add clarity on this important point. The second suggestion in the comment is not adopted since it would introduce error into section 1.431(d). Indeed, all the fees must be paid timely, and need not be paid within the one-month period set pursuant to section 1.431(c), e.g., some fee(s) may be paid prior to the one-month period. Presumably the one-month period mentioned in the comment refers to a period set pursuant to section 1.431(c) which may not need to be set in every case.

Comment 4. One comment indicated that (in the fourth paragraph of the Supplementary Information section) the discussion of new section 1.432 includes a reference to a "generic" designation of all countries which, instead, should refer to a precautionary designation of all countries except the required specified designation(s).

Response: The appropriate change has been made to the discussion of section 1.432 to clarify that an applicant may provide, in addition to at least one specified designation, a precautionary designation of all other PCT member countries and regions so that any intended designation which may have been overlooked on filing can be corrected within 15 months of the priority date.

Comment 5. One comment stated that in section 1.432(a) and (b) the word "request" should be capitalized in view of section 1.401(d). A corresponding comment was made with respect to section 1.451(a).

Response: This suggestion is adopted since PCT Rule 4.10 requires the designations to appear on the Request (form RO/101) and section 1.432 continues to require that the designation(s) be indicated in the Request on filing. Similarly, with respect to section 1.451(a), the suggestion is adopted.

Comment 6. One comment stated that in section 1.432(a) "or regions" should be changed to "for the purpose of obtaining national or regional patents."

Response: The suggestion is adopted to the extent that section 1.432(a) has been changed by replacing "or regions" with "including an indication that applicant wishes to obtain a regional patent, where applicable." The adopted wording is preferable since it is the same as the wording of PCT Rule 4.9(a)(ii).

Comment 7. One comment objected to the requirement contained in section 1.432(a) that designations in the international application shall be stated as provided in PCT Rule 4.9(a) and Section 115 of the Administrative Instructions Under the PCT. Also, the comment urged that the PCT Administrative Instructions should be reproduced in sections 1.432 and 1.451 so that applicants have access to them.

Response: Section 115 of the PCT Administrative Instructions makes reference to the names and abbreviations of all countries. Inclusion of such a long list would unnecessarily encumber section 1.432(a). The Administrative Instructions are readily available, and a list of countries is provided in the Manual of Patent Examining Procedure (Chapter 200). Applicants using a current Request form will inherently comply with PCT Rule 4.9(a) and Sections 110 and 115 of the PCT Administrative Instructions.

Comment 8. One comment asked "If an applicant does not pay the fee(s) set out in section 1.432(c)(2) or (3), will he/she be given an additional month to pay the fees described in section 1.432(b)(1) and (2)?"

Response: No extension of time is available to the 15-month deadline of section 1.432(c). The time period set under section 1.432(b) doesnot apply to section 1.432(c). If payment for the designations to be confirmed under section 1.432(c) is not received by 15 months from the priority date, those precautionary designations are considered to be withdrawn, PCT Rule 4.9(b).

Comment 9. One comment suggested adding references to PCT Rule 4.9(a) and (b) in various locations in section 1.432.

Response: The suggestion is adopted by adding appropriate references to PCT Rule 4.9(a) and (b).

Comment 10. One comment suggested that the last sentence in section 1.432(b) be moved to become the second sentence of section 1.432(b) and the third sentence be moved to become the last sentence of section 1.432(b).

Response: These suggestions are not adopted since they would not constitute an improvement to section 1.432(b).

Comment 11. One comment suggested that, in section 1.432(c)(3) unconfirmed designations indicated to be "considered withdrawn" should be changed to "regarded as withdrawn by the applicant."

Response: This suggestion has not been adopted because it does not further clarify section 1.432(c)(3). Unconfirmed designations are considered to be withdrawn by the applicant under PCT Rule 4.9(b)(ii) and are also considered to be withdrawn by the Office.

Comment 12. One comment suggested that section 1.446(d) should be expanded to indicate that a refund of the search fee will be given even after the search copy has been transmitted just so long as the withdrawal is effective before start of the international search.

Response: This suggestion has not been adopted since refunds may or may not be appropriate in the noted instance. For example, if the EPO acting as an international searching authority begins the search after withdrawal but before receipt of the withdrawal from the U.S. receiving office, a refund may not be made.

Comment 13. One comment suggested that in section 1.446(e) "demand" should be capitalized in view of section 1.401(g).

Response: This suggestion is adopted.

Comment 14. One comment suggested that the reference in section 1.451(a) to Section "201" of the Administrative Instructions should be changed to"115."

Response: This suggestion is adopted since Section "201" of the Administrative Instructions has been changed effective July 1, 1992, and is now Section "115.

Comment 15. One comment noted that the proposed change in section 1.455(a) does not reflect that a common representative need not be "appointed."

Response: A new sentence has been inserted into section 1.455(a) to address the situation where no common representative or agent has been appointed. Where no common representative or agent has been appointed, the first mentioned applicant who is entitled to file in the U.S receiving office is considered to be the common representative, PCT Rules 2.2bis and 90.2(b).

Comment 16. One comment noted that the proposed change in section 1.455(a) does not reflect that if a new common representative is appointed, the previous common representative is automatically revoked.

Response: The last sentence of section 1.455(a) has been changed to reflect that the later appointment of an attorney, agent or common representative revokes any earlier appointment unless otherwise indicated.

Comment 17. One comment suggested that "In sections 1.475(a), 1.488(a) and 1.499(e) reference should be added to PCT Rule 13, Administrative Instructions, Section 206, and possibly to Annex B of the Administrative Instructions."

Response: The suggestion is not adopted because it gives no reasons for the proposed change and it is not evident that the change is needed.

Comment 18. One comment stated that in the Supplementary Information discussion of section 1.475(b), the explanation of "specially adapted" was different from the explanation in Annex B, Part I of the Administrative Instructions.

Response: The discussion of section 1.475(b) has been revised to conform to Annex B, Part I of the Administrative Instructions.

Comment 19. One comment stated that in section 1.484(b) no need is seen for adding the last two sentences because "The provision relates only to International Searching Authority practice and is set forth in more detail by the PCT Rules."

Response: Section 1.484(b) is directed to conduct of the International Preliminary Examining Authority rather than theInternational Searching Authority. The explanation in section 1.484(b) is retained because, although it parallels PCT Rule 69.1(e), it informs applicants that delay in submission of an amendment will delay the start of examination. Applicants should be aware that, since the time for issuance of the final report is fixed by PCT Rule 69.2 and may not change, any delay in the start of examination may work to applicants' disadvantage. For example, the minimum time may have to be set for response to any opinions, there may be time for only one opinion and/or there may be less time for interviews.

Comment 20. One comment suggested that section 1.485 should be amended to take into account that amendments are permitted under PCT Rule 66.4b is even after the time period set by the International Preliminary Examining Authority.

Response: This suggestion is not adopted. Section 1.485 sets forth when an amendment may be filed so that it will be considered. Amendments filed at other times may not be considered.

Comment 21. One comment suggested that the beginning of section 1.492 should be changed to reflect that, in view of H.R. 3531, the national stage fees are under 35 U.S.C. 41(a) rather than under 35 U.S.C. 376.

Response: H.R. 3531 was enacted into law (Public Law 102-204). Accordingly, the suggestion in the comment has been adopted by revising the introductory language in section 1.492 to remove the reference to 35 U.S.C. 376.

Comment 22. One comment urged that in the Discussion of Specific Rules for sections 1.494(b) and 1.495(b), the discussion should be modified to clarify that the applicant need only

check "his or her" files to be sure that the Bureau's notice regarding transmittal of a copy of the international application has been received.

Response: The language has been revised to eliminate any ambiguity.

Comment 23. One comment suggested that "as filed" in section 1.494(c) should be set off by commas as in section 1.495(c).

Response: Section 1.494(c) has been changed as suggested.

Comment 24. One comment questioned the phrases "accurate translation" and "proper translation" as used in the Supplementary Information discussion and stated that these phrases do not further explain the word "translation" as used in the statute. Another comment suggested that the rule should provide for correction of errors in the translation without penalty of abandonment or surcharge.

Response: The statute (35 U.S.C. 371(c)(2)) requires that applicant file a translation of the international application to avoid abandonment (35 U.S.C. 371(d)). The Office has received purported translations which include amendments to the text of the international application and other inconsistencies with the text of the non-English language document. It is helpful to explain that a translation must be accurate and a proper translation. The Office does not inspect a purported translation for all errors, it only inspects for errors which are apparent on the face of the document. For example, where the non-English language international application has 6 claims and the purported translation has 8 claims, obviously the requirement for a proper translation has not been met. Submission of inaccurate translations require additional processing by the Office, thus the requirement for a processing fee is appropriate.

Comment 25. One comment stated that in the Supplementary Information discussion of sections 1.494 and 1.495 the reference to the U.S. correspondence address should be modified to add "if any" since none is required.

Response: The suggestion has been adopted.

Comment 26. One comment stated that in the preamble of section 1.495(e) there appears to be a contradiction in that the first sentence suggests a translation of the annex may be filed within the time period set under 1.495(c) whereas the second sentence suggests the translation of the annex must be filed by 30 months or "be considered cancelled."

Response: The sentences are compatible. The first sentence applies to the case where the translation, oath or declaration have not been submitted by 30 months. In such case, they (and any annex) may be submitted within the time period of paragraph (c). The second sentence applies to the case where the translation and oath or declaration have been submitted by 30 months, whereupon no additional time is set under paragraph (c). Thus, in the first instance, if applicants are given additional time to submit the translation or oath or declaration, they may also submit the annex in that same additional time. But where the translation and oath or declaration have been submitted by 30 months, an additional time period will not be provided simply for submitting a translation of the annex. Of course, applicant may submit a preliminary amendment under 37 CFR 1.121 including the subject matter of the annex.

Comment 27. One comment suggested that sections 1.494(b)(3) and 1.495(b)(3) should be amended to permit an extension of time for the basic national fee so that it may be submitted, like the declaration and translation, after 20 and 30 months.

Response: The suggestion is not adopted. Submission of the basic national fee gives the Office a clear indication that applicant intends to enter the national stage. This helps the Office to avoid processing of those 40% of the international applications which designate the U.S. but do not enter the national stage. Also, filing of the basic national fee by 20 or 30 months will ordinarily provide the Office with the correspondence address of the person prosecuting the national stage application. Without this correspondence address, the Office would send any notice of missing parts to the correspondence address in the international application (e.g., the person who prosecuted the international stage and who may not be qualified to prosecute the U.S. national stage). The rules as amended address the greatest hurdle for entry into the national stage which has been submission of the oath or declaration by the 22 or 32-month deadline.

Comment 28. One comment suggested that sections 1.494(d) and 1.495(d) should indicate that the PCT Article 19 amendments (which have not been received) are not only considered to be cancelled, but are also "disregarded under PCT Rule 49.5(c-bis)."

Response: The suggestion is not adopted because this additional reference to PCT Rule 49.5(c-bis) is not helpful. The indication that the PCT Article 19 amendments are cancelled is in accordance with 35 U.S.C. 371(d). It is standard practice in the examination of a patent application in the United States to disregard amendments that have been cancelled.

Comment 29. One comment suggested that, with respect to section 1.494, "The proposed rules do not make clear the relationship between paragraphs (c) and (g) as to the time period set for later furnishing of the translation into English."

Response: Paragraph (c) provides that applicant will be provided a period of time to file the translation (if the requirements of paragraph (b) have been met) and paragraph (g) provides that the application becomes abandoned if any required translation is not filed within the time period set in paragraph (c). Thus, where the other requirements have been met but the translation has not been provided, paragraph (c) provides a time period for submission of the translation and paragraph (g) provides the sanction (abandonment) for failing to comply within the set period.

Comment 30. One comment questioned whether the time period for translation of any PCT Article 19 amendments should be extendable with any extension for translation of the international application. A corresponding comment was made with respect to section 1.495.

Response: An extension of time for submission of the translation of any PCT Article 19 amendment is not possible in view of the provisions of 35 U.S.C. 371(d)

Comment 31. One comment suggested that sections 1.494(g) and 1.495(h) should be modified by replacing "the translation" with "any required translation."

Response: The suggestion is adopted. Translations are not required where the international application was filed in English.

Comment 32. One comment suggested that at the beginning of section 1.495(c) after "paragraph (b)" the word "of" should be added.

Response: The suggestion is adopted.

Comment 33. One comment suggested that section 1.495(d) could be deleted since under PCT Rules 70.16 and 74.1 relevant amendments under PCT Article 19 must be annexed to the international preliminary examining report and therefore must be translated under section 1.495(e). It was further noted that superseded PCT Article 19 amendments need not be translated.

Response: The suggestion is not adopted. Section 1.495(d) covers the situation where the PCT Article 19 amendment is not annexed. For example, where applicant enters the national stage in the U.S. and withdraws the international application before issuance of the final report. In this instance, translation of the PCT Article 19 amendments would have to be submitted by the date of commencement of the national stage (which cannot be later than 30 months) or be considered cancelled.

Comment 34. One comment observed that under section 1.495(e) if there is no time period to be set for submission of the translation of the international application and/or the oath or declaration, there is no possibility for extra time (after the 30-month deadline) for submission of translation of the annex. It was suggested that section 1.495(e) be reworded to permit extra time (after the 30-month deadline) for submission of a translation of the annex even where the translation of the international application and/or the oath or declaration had been submitted by 30 months.

Response: The suggestion is not adopted. Where the translation of the international application and/or the oath or declaration have been submitted by 30 months, it is appropriate to promptly forward the application for examination rather than delay examination for a translation of the annex (especially since often it appears that applicant does not wish to proceed on the basis of the annex). Some applicants prefer to submit preliminary amendments under section 1.121 (which may be done even after 30 months) rather than to submit a translation of the annex.

Comment 35. One comment urged that section 1.495(e) is inconsistent in that it states that the 30-month time limit may not be extended, and then states that if the translation of the international application is not filed within 30 months from the priority date additional time may be set under paragraph (c) of this section.

Response: The two statements are not contradictory. The time period for submission of the translation and oath or declaration is a new time period and is not a extension of the 30-month time limit. The fixed time limit for submission of the basic national fee is 30 months from the priority date. If the basic national fee is not paid by this 30-month deadline, the application is abandoned. If, on the other hand, the basic national fee is paid by 30 months from the priority date, the pendency of the international application continues past 30 months. If the translation or oath or declaration have not been filed by the 30-month deadline (but the basic national fee has been paid), the application is not abandoned and a time period is set for submission of the missing translation and oath or declaration.

Comment 36. One comment asked "Is it the intention of the Patent and Trademark Office to affect, in any way, the current practice of assigning a date on which the Section 371(c)(4) requirement (oath or declaration) will be deemed to have been met, if an applicant submits an oath or declaration in response to a Notice of Missing Parts, thereby ultimately affecting the Section 102(e) date to which the eventually granted U.S. patent will be entitled?"

Response: Nothing in the new rule will affect the 35 U.S.C. 102(e) date which will continue to be the date that the last of the 35 U.S.C. 371(c)(1), (2) and (4) requirements are fulfilled.

Comment 37. One comment suggested that section 1.821 be clarified to reflect that the notice requiring compliance with paragraphs (b) through (f) is sent by the international searching authority.

Response: The suggestion is not adopted. Section 1.821 does not specify who will send the notice and there is no need to do so in the rule.

Comment 38. One comment questioned as to section 10.9 whether a pro se applicant from Brazil, who is either an individual or a company, would have the right to practice before the U.S. as an international searching or international preliminary examining authority.

Response: Section 10.9 has been amended to clarify that it is not directed to pro se applicants.

Discussion of Specific Rules

The following is a table correlating PCT Rule changes with the new 37 CFR changes. Sections 1.431(b)(1), 1.431(b)(3)(ii), 1.451(a), 1.482(a)(2)(i), 1.492(e), 1.494 and 1.495, which are also amended, are not shown in the table because they are changes that are not required by PCT Rule changes.

Rule Correlation Table

37 CFR Change	PCT Rule Change
1.431(c)-(e)	16bis, 27.1
1.432(a)	4.1(b)(iv), 4.9
1.432(b)	5.5, 16bis
1.432(c)	15.5
1.434(a)	3.1
1.445(a)(4)	15.5
1.446(d)	15.6, 16.2
1.446(e)	57.6
1.455(a)	90, 2.2bis
1.475	13
1.476(a)	13
1.480(b)	53.1
1.482(b)	57.5
1.484(b)	60.1(g), 66, 69.1
1.485	60.1(g)
1.487	13
1.488(a)	13
1.499	13
1.821(h)	13ter.1(c)
10.9(c)	90

Section 1.431(b)(1) is amended to clarify that an international filing date will be accorded to an International application filed in the United States where at least one applicant is indicated to be a resident or national of the United States in the papers as filed. If the papers, as filed, indicate a residence or nationality for at least one applicant, the United States Receiving Office can promptly determine whether, as required by PCT Article 11, "the applicant does not obviously lack" the requisite residence or nationality to file an international application in the United States Patent and Trademark Office.

Section 1.431(b)(3)(ii) is amended to add a cross-reference to section 1.432 which sets forth the requirements regarding designations.

Section 1.431(c) is amended to reflect that the United States Receiving Office, rather than the International Bureau, will be responsible for collecting fees not paid in full at the time of filing the international application or within one month thereafter. The change reflects the procedural change under the new PCT Regulations that the Receiving Office, rather than the International Bureau, will be responsible for communicating deficiency notices to the applicant and collecting the necessary fees. Under the procedure in paragraph (c), a notice of any fee deficiency will be mailed by the Receiving Office setting a time period of one month for payment of the fee deficiency and a late payment fee equal to the greater of (1) 50% of the amount of the deficient fees up to a maximum amount equal to the basic fee, or (2) an amount equal to the transmittal fee. The time period of one month for response to this notice cannot be extended.

Section 1.431(d) is eliminated as unnecessary since the United States Receiving Office will take over the responsibility for collecting fees in place of the International Bureau.

Section 1.431(e) is redesignated as 1.431(d) and clarifies that the failure to timely pay the fees pursuant to paragraph (c) will result in the withdrawal of the international application.

Section 1.432(a) is amended to clarify that the applicant must specify, on filing, at least one national or regional designation in order to be granted a filing date for the international application. This specific designation is required whether or not all designations are indicated pursuant to paragraph (c) of this section. The reference to Section 201 of the Administrative Instructions has been changed to Section 115 to correspond to the change in the Administrative Instructions.

Section 1.432(b) is amended to establish a procedure for the late payment of fees for designations that were specified on filing an international application, and a procedure, pursuant to PCT Rule 16bis.1(c), in accordance with section 321 of the PCT Administrative Instructions for allocating fees, where the amount paid is insufficient to cover all the fees. The payment of the designation fees with a late payment fee (previously termed a "surcharge") is not new. Under the revised PCT regulations, however, the Receiving Office, rather than the International Bureau, will be responsible for communicating deficiency notices to the applicant. The designation fees may be paid, without necessity for a late payment fee, within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date. The applicant will be notified and given one month within which to pay any deficient designation fees plus a late payment fee. The amount of the late payment fee is equal to 50% of the deficient fees, but will not be less than the amount of the transmittal fee (currently $200) and will not exceed the amount of the basic fee (currently $525). The one-month time limit for payment of the deficient designation fees and late payment fee may not be extended. If, after expiration of the one-month time period, at least one designation fee has not been paid (with any late payment fee which is due), the international application will be withdrawn. If, after expiration of the one-month time period, at least one designation fee has been paid (with any late payment fee which is due) but the amount paid is not sufficient to cover the late payment fee and all the designation fees, the amount paid will be allocated, pursuant to PCT Rule 16bis.1(c), in accordance with section 321 of the Administrative Instructions. Section 321 of the Administrative Instructions provides that the amount will be allocated in accordance with any instructions received from the applicant or, if no instructions have been received, in the order in which the designations appear in the request part of the international application. Designations for which no designation fee is timely filed will be withdrawn. In section 1.432(b), the reference to

parenthetical numbers (1) and (2) used to describe the late payment fee as proposed has been deleted in the final rule to improve clarity.

New section 1.432(c) establishes a procedure wherein, in addition to the designation(s) under paragraph (a), the applicant could indicate, on filing, all designations permitted under the Treaty and confirm desired designations of countries or regions up to 15 months from the priority date. Section 1.432(c) as promulgated requires that applicant's indication of all designations permitted under the Treaty in addition to the designation(s) under paragraph (a) be made in the Request in accordance with PCT Rule 4.9(b). The confirmation must include both a written notice of the countries or regions being confirmed, the appropriate designation fees and a confirmation fee based on the number of countries or regions being confirmed. If the amount of the fees is insufficient, the Receiving Office will allocate the amount paid in accordance with any priority of designations specified by the applicant or, if no priority is specified, in accordance with section 321 of the Administrative Instructions. A notice reminding applicant of the 15-month deadline will not be provided. Unconfirmed designations will be considered withdrawn.

Section 1.434 is amended to allow applicants to develop their own computer-generated Request form so long as the forms comply with the requirements of sections 102(h) and (i) of the Administrative Instructions. Printed Request form will continue to be available from the United States Patent and Trademark Office.

New section 1.445(a)(4) defines the amount of the confirmation fee required for the designations confirmed under section 1.432(c). The confirmation fee is equal to 50% of the sum of the designation fees for the designations being confirmed. For example, a confirmation of four additional designations (at $127 per designation, or $508) would require a $254 confirmation fee. The total amount of the fees due would be $762, which is the sum of $508 and $254.

Section 1.446(d) is amended to clarify that the international (basic and designation, PCT Rule 15.1) and search fees may be refunded under certain circumstances linked to whether the record copy or search copy has been transmitted to the International Bureau or International Searching Authority, respectively. The transmittal fee and any late payment fees will not be refunded, but will be retained to cover Office processing costs. If the record copy or search copy has been transmitted, the Receiving Office cannot refund or authorize the refund of the international or search fees. Any request for a refund filed after the record copy or search copy has been transmitted should be directed to the International Bureau (for the international fee) or the International Searching Authority (for the international search fee) for consideration of whether a refund should be made.

New section 1.446(e) indicates that a refund of the handling fee by the International Preliminary Examining Authority is permitted only in the situations where the demand is considered not to have been submitted or upon withdrawal of the demand before the demand has been sent to the International Bureau. If the demand has been sent to the International Bureau, requests for refund of the handling fee should be directed to the International Bureau.

Section 1.451(a) is amended to clarify that the applicant must specify, on filing, the priority of a previously filed application in order to be granted priority in the international application. The right to priority is not necessarily lost if the claim is not on the Request form, but will be lost if the claim does not appear in the papers presented on filing of the application.

Section 1.455(a) is amended to clarify that the term "common representative" means an applicant appointed by the other applicants or considered to be the representative of the other applicants. Further, since attorneys and agents are registered to practice before the Office rather than licensed, section 1.455(a) has been amended by replacing the word "licensed" with "registered." The paragraph also clarifies who can represent applicants in an international application before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority, e.g., (1) an attorney or agent registered to practice before the Office, and (2) an attorney or agent not registered to practice before the Office, but authorized to practice before the national office with which the international application was filed and for which the United States is an International Searching Authority or International Preliminary Examining Authority. In the latter case, representation is restricted to practicing before the U.S. International Searching Authority and/or the U.S. International Preliminary Examining Authority. For example, if an international application is filed in the Brazilian Patent Office, an agent authorized to practice before the Brazilian Patent Office may prosecute that application before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority. Paragraph (a) also provides that, unless otherwise indicated, the appointment of an attorney, agent or common representative revokes any earlier appointment as specified in PCT Rule 90.6(b).

Section 1.475 is amended to adopt the unity of invention principles of PCT Rule 13, as amended. Section 1.475 is further amended to reflect that the same unity of invention principles are applied by the international searching and preliminary examining authorities and during the national stage. Duplicative provisions in sections 1.487 and 1.499 are deleted.

The principles of unity of invention are used to determine the types of claimed subject matter and the combinations of claims to different categories of invention that are permitted to be included in a single international or national stage patent application. The basic principle is that an application should relate to only one invention or, if there is more than one invention, that applicant would have a right to include in a single application only those inventions which are so linked as to form a single general inventive concept.

Section 1.475(a) is amended to contain both the definition of the requirement for unity of invention, and the unity of invention criteria that must be satisfied, where a group of inventions is claimed, in order to have a right to include multiple inventions in a single application. A group of inventions is linked to form a single general inventive concept where there is a technical relationship among the inventions that involves at least one common or corresponding special technical feature. The expression "special technical features" is defined as meaning those technical features that define the contribution which each claimed invention, considered as a whole, makes over the prior art. For example, a compound is the common technical feature in an application claiming (1) the compound per se, (2) a method of making the compound and (3) a method of using the compound. A corresponding technical feature is exemplified by a key defined by certain claimed structural characteristics which correspond to the claimed features of a lock to be used with the claimed key.

Section 1.475(b) is amended to define several combinations of different categories of claims which always fulfill the unity of invention requirements of section 1.475(a) where the same or corresponding special technical feature is claimed. There may be other combinations of different categories of claims which fulfill the requirement for unity of invention, but the determination of unity must be made under section 1.475(a), not section 1.475(b).

In section 1.475(b), a process is "specially adapted" for the manufacture of a product if the claimed process inherently produces the claimed product with the technical relationship defined in section 1.475(a) being present between the claimed process and the claimed product. The expression "specially adapted" as used in this section does not imply that the product could not also be manufactured by a different process.

In section 1.475(b), an apparatus or means is "specifically designed" for carrying out the process when the apparatus or means is suitable for carrying out the process with the technical relationship defined in section 1.475(a) being present between the claimed apparatus or means and the claimed process. The expression "specifically designed" does not imply that the apparatus or means could not be used for carrying out another process, nor does it imply that the process could not be carried out using an alternative apparatus or means.

Section 1.475(c) is amended to require that unity of invention might not be present if a combination of categories of invention different from those described in section 1.475(b) are presented in an application. The requirements of section 1.475(a) are always met by the combinations described in section 1.475(b) where the same or corresponding special technical feature is claimed. All other combinations must be tested against the unity of invention standard of section 1.475(a).

Section 1.475(d) is amended by deleting reference to the different combinations of categories of invention that always meet the unity of invention standard (now set forth in section 1.475(b)), and to make reference to the determination of the main invention where multiple products, processes of manufacture or uses are claimed. The significance of determining the main invention is set forth in section 1.476(c).

Section 1.475(e) is amended to require that the determination regarding unity of invention be made without regard to whether a group of inventions is claimed in separate claims or as alternatives within a single claim. The basic criteria for unity of invention are the same, regardless of the manner in which applicant chooses to draft a claim or claims.

Section 1.475(f) is deleted since PCT Rule 13 has been amended and the basic principles of unity of invention are incorporated into other portions of section 1.475.

Section 1.476(a) is amended to delete the reference to section 1.475(f) (which is deleted) and PCT Rule 13.

Section 1.480(b) is amended to allow applicants to develop their own computer-generated Demand form so long as the limitations in sections 102(h) and (i) of the Administrative Instructions are met. Printed Demand forms will continue to be available from the Office.

Section 1.482(a)(2)(i) is amended to clarify that an additional preliminary examination fee may be charged for lack of unity in Chapter II irrespective of whether there was a similar charge in Chapter I. Normally there will be a charge for lack of unity both in Chapter I and in Chapter II. In some instances, although a charge for the search of an additional invention is justified in Chapter I, the examiner chooses to proceed without charging for the search of the additional invention(s). However, circumstances may change (e.g., an amendment submitted with the Demand expanding the claims to the additional invention(s)) in Chapter II so as to warrant the examiner's requirement for an additional fee for examination of the additional invention(s).

Section 1.482(b) is amended to remove the reference to the supplement to the handling fee which had been collected for the benefit of the International Bureau and which has been deleted from the PCT regulations. At present, applicants must pay as many supplements to the handling fee as there are languages into which the elected Offices require translations of the international preliminary examination report. Under the new PCT regulations, all countries will accept an English translation of the international preliminary examination report, thus limiting the International Bureau's translation costs. Accordingly only one handling fee will need to be paid by the applicant, without any supplement, irrespective of the need for a translation of the report.

Section 1.484(b) is amended to permit an applicant to indicate in the demand that international preliminary examination is to begin based on the application as amended rather than on the application as filed. If a PCT Article 19 amendment is not received by the Office by 20 months from the priority date, preliminary examination will proceed. Where the demand indicates examination is to be based on an accompanying PCT Article 34 amendment, but the PCT Article 34 amendment has not been provided to the Office with the demand, the applicant will be notified and given a time period to submit the amendment. Thus, if the applicant wishes preliminary examination based on an amended version of the international application, the demand must so indicate and the amendment (PCT Article 19 or 34) must (1) accompany the demand; or (2) in the case of a PCT Article 19 amendment, be received by 20 months from the priority date; or (3) in the case of a PCT Article 34 amendment, be submitted within the non-extendable time period set by the Office.

Section 1.485 is amended to be consistent with section 1.484 and provides for amendments to be filed with the demand or within a time period set by the International Preliminary Examining Authority.

Section 1.487 is removed as unnecessary because the amendments to section 1.475 address the unity of invention principles to be applied by the International Preliminary Examining Authority.

Section 1.488(a) is amended to replace the reference to section 1.487, which is removed, with a reference to section 1.475.

Section 1.492 is amended to revise the introductory clause to eliminate the reference to 35 U.S.C. 376.

Section 1.492(e) is amended to eliminate the surcharge for filing the basic national fee after 20 or 30 months from the priority date. In accordance with the new practice under sections 1.494 and 1.495, the basic national fee must be filed no later than 20 months, or 30 months if a timely election was filed, from the priority date in order to avoid abandonment of the application.

Sections 1.494 and 1.495 is amended to modify the practice for entering the national stage as a designated or elected office by more closely aligning it with national application practice under section 1.53.

Section 1.494(a) is amended to clarify that absence of a Demand form is no longer the controlling event, but rather failure to elect the United States within 19 months of the priority date will trigger the time periods set forth in paragraphs (b) and (c) of this section.

Section 1.494(b) is amended to require that the basic national fee and a copy of the international application must be filed with the Office by 20 months from the priority date to avoid abandonment. The 22-month period for filing the basic national fee with a surcharge in previous rule 1.494(c) has been eliminated. The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies the applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage and applicant has received the notice from the International Bureau, applicant need only pay the basic national fee by 20 months from the priority date. The 20-month time limit for submission of the basic national fee and a copy of the international application is not extendable.

Section 1.494(c) is amended to provide that applicants who have provided the basic national fee and a copy of the international application by 20 months from the priority date but who omit a proper translation, oath or declaration will receive a notification setting a time period for submission of the omitted requirements. The time period set in the notice can be extended pursuant to section 1.136. Filing of the oath or declaration later than 20 months will require the payment of the surcharge set forth in section 1.492(e). Filing of the translation later than 20 months will require the payment of the processing fee set forth in section 1.492(f).

Section 1.494(d) is amended to clarify the existing practice that PCT Article 19 amendments must be submitted by 20 months from the priority date, which time may not be extended. Of course, the failure to do so does not result in loss of the subject matter of the PCT Article 19 amendments. The applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected.

Section 1.494(g) is removed in view of the amendments to sections (b), (c) and (d).

Section 1.494(h) is redesignated as 1.494(g) and is amended to specify when an application that fails to enter the national stage becomes abandoned. Abandonment occurs at 20 months from the priority date if the basic national fee and a copy of the international application have not been provided to the Office. If they have been provided to the Office within 20 months and the translation and/or oath or declaration are not filed timely, abandonment occurs upon expiration of the time limit set in the notification pursuant to paragraph (c). Thus, in the latter situation, abandonment would occur at the expiration of the time period set in the notice to file the missing translation, and/or oath or declaration. The phrase "where the United States has been designated but not elected *prior to* 19 months from the priority date" (emphasis added) has been changed to "where the United States has been designated but not elected *by the expiration of* 19 months from the priority date" (emphasis added) for clarity. A corresponding change has been made in section 1.495(h).

Section 1.495(a) is amended to clarify that the election of the U.S. need not be made in the Demand, but can be made subsequently if filed before expiration of 19 months from the priority date to start the time periods set forth in paragraphs (b) and (c) of this section.

Section 1.495(b) is amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. The 32-month period for filing the basic national

fee with a surcharge in previous rule 1.495(c) has been eliminated. The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date. The 30-month time limit for submission of the basic national fee and a copy of the international application is not extendable.

Section 1.495(c) is amended to provide that applicants who have provided the basic national fee and a copy of the international application by 30 months from the priority date, but who omit a proper translation, oath or declaration, will receive a notification setting a time period for submission of the omitted requirements. The time period set in the notice can be extended pursuant to section 1.136. Filing of the oath or declaration later than 30 months will require the payment of the surcharge set forth in section 1.492(e). Filing of the translation later than 30 months will require the payment of the processing fee set forth in section 1.492(f).

Section 1.495(d) is amended to clarify the existing and continuing practice that the PCT Article 19 amendments must be submitted by 30 months from the priority date. The deadline for submitting PCT Article 19 amendments may not be extended. The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected.

Section 1.495(e) is amended to specify that a translation into English of any annexes to the international preliminary examining report which are not received by 30 months from the priority date may only be submitted within the time period set in paragraph (c) for submission of any omitted translation of the international application, or oath or declaration. If any required translation of the international application and oath or declaration have been provided to the Office by 30 months, a notice under paragraph (c) will not be sent, and if the translation of annexes is not submitted within 30 months, the annexes will be considered cancelled.

Section 1.495(h) is removed in view of the amendments to sections (b), (c), (d) and (e).

Section 1.495(i) is redesignated as 1.495(h) and specifies when an application that fails to enter the national stage becomes abandoned if the United States was elected prior to 19 months from the priority date. Abandonment occurs at 30 months from the priority date if the basic national fee and a copy of the international application have not been provide to the Office. If they have been provided to the Office within 30 months and the translation and/or oath or declaration are not filed timely, abandonment occurs upon expiration of the time limit set in the notification pursuant to paragraph (c). Thus, in the latter situation, abandonment would occur at the expiration of the time period set in the notice to file the missing translation, and/or oath or declaration.

Section 1.499 is amended by removing paragraphs (a) through (e) because the amendments to section 1.475 address the unity of invention principles to be applied in the national stage. The reference to the official action being called a requirement for restriction has been eliminated as unnecessary.

Section 1.821(h) is amended to provide that if applicant fails to timely provide the required computer-readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be carried out.

Section 10.9 is amended to add a new paragraph (c) to be consistent with section 1.455, clarifying that an attorney or agent having the right to act before the national office with which the international application is filed may represent the applicant before the U.S International Searching Authority or the U.S. International Preliminary Examining Authority. An individual who has the right to practice before the national office with which an international application is filed, and who is not registered under section 10.6, may not prosecute patent applications in the national stage in the Office.

Other Considerations:

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)), because the rules provide more streamlined and simplified procedures for filing and prosecuting international and national stage applications under the PCT.

The Patent and Trademark Office has determined that these rule changes are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individual industries; Federal, state or local government agencies; or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, *et seq.* The paperwork burden imposed by adherence to the PCT is currently approved by the Office of Management and Budget under control number 0651-0021.

Notice is hereby given that pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, the Patent and Trademark Office amends Title 37 of the Code of Federal Regulations as set forth below.

List of Subjects
37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements, Trademarks.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.431 is amended by removing paragraph (e) and revising paragraphs (b)(1) through (b)(3)(ii), (c) and (d) to read as follows:

§ 1.431 International application requirements

* * * * *

(b) An international filing date will be accorded by the United States Receiving Office, at the time of receipt of the international application, provided that:

(1) At least one applicant (§ 1.421) is a United States resident or national and the paper filed at the time of receipt of the international application so indicate (35 U.S.C. 361(a), PCT Art. 11(1)(i)).

(2) The international application is in the English language (35 U.S.C. 361(c), PCT Art. 11(1)(ii)).

(3) The international application contains at least the following elements (PCT Art. 11(1)(iii)):

(i) An indication that it is intended as an international application (PCT Rule 4.2);

(ii) The designation of at least one Contracting State of the International Patent Cooperation Union (§ 1.432);

* * * * *

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) may be made in full at the time the international application papers required by paragraph (b) of this section are deposited or within one month thereafter. If the basic, transmittal and search fees are not pa-id within one month from the date of receipt of the international application, applicant will be notified and given one month within which to pay the deficient fees plus a late payment fee equal to the greater of (1) 50% of the amount of the defficient fees up to a maximum amount equal to the basic fee, or (2) an amount equal to the transmittal fee (PCT Rule 16bis). The one-month time limit set in the notice to pay deficient fees may not be extended.

(d) If the payment needed to cover the transmittal fee, the basic fee, the search fee, one designation fee and the late payment fee pursuant to paragraph (c) of this section is not timely made, the Receiving Office will declare the international application withdrawn under PCT Article 14(3)(a).

Section 1.432 is revised to read as follows:

§ 1.432 Designation of States and payment of designation fees.

(a) The designation of States including an indication that applicant wishes to obtain a regional patent, where applicable, shall appear in the Request upon filing and must be indicated as set forth in PCT Rule 4.9 and Section 115 of the Administrative Instructions. Applicant must specify at least one national or regional designation on filing of the international application for a filing date to be granted.

(b) If the fees necessary to cover all the national and regional designations specified in the Request are not paid by the applicant within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date, applicant will be notified and given one month within which to pay the deficient designation fees plus a late payment fee equal to the greater of 50% of the amount of the deficient fees up to a maximum amount equal to the basic fee, or an amount equal to the transmittal fee (PCT Rule 16bis). The one-month time limit set in the notification of deficient designation fees may not be extended. Failure to timely pay at least one designation fee will result in the withdrawal of the international application. The one designation fee may be paid:

(1) within one year from the priority date,

(2) within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date, or

(3) with the late payment fee defined in this paragraph within the time set in the notification of the deficient designation fees. If after notification of deficient designation fees the applicant makes timely payment, but the amount paid is not sufficient to cover the late payment fee and all designation fees, the Receiving Office will, after allocating payment for the basic, search, transmittal and late payment fees, allocate the amount paid in accordance with PCT Rule 16bis.1(c) and withdraw the unpaid designations. The notification of deficient designation fees pursuant to this paragraph may be made simultaneously with any notification pursuant to § 1.431(c).

(c) On filing the international application, in addition to specifying at least one national or regional designation under PCT Rule 4.9(a), applicant may also indicate under PCT Rule 4.9(b) that all other designations permitted under the Treaty are made. The latter indication under PCT Rule 4.9(b) must be made in a statement on the Request that any designation made under this paragraph is subject to confirmation (PCT Rule 4.9(c)) not later than the expiration of 15 months from the priority date by:

(1) filing a written notice with the United States Receiving Office specifying the national and/or regional designations being confirmed;

(2) paying the designation fee for each designation being confirmed; and

(3) paying the confirmation fee specified in § 1.445(a)(4). Unconfirmed designations will be considered withdrawn. If the amount submitted is not sufficient to cover the designation fee and the confirmation fee for each designation being confirmed, the Receiving Office will allocate the amount paid in accordance with any priority of designations specified by applicant. If applicant does not specify any priority of designations, the allocation of the amount paid will be made in accordance with PCT Rule 16bis.1(c).

4. Section 1.434 is amended by revising paragraph (a) to read as follows:

§ 1.434 The request.

(a) The request shall be made on a standardized form (PCT Rules 3 and 4). Copies of printed Request forms are available from the Patent and Trademark Office. Letters requesting printed forms should be marked "Box PCT."

* * * * *

5. Section 1.445 is amended by adding new paragraph (a)(4) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) * * *

(4) A confirmation fee (PCT Rule 96) equal to 50% of the sum of designation fees for the national and regional designations being confirmed (§ 1.432(c)).

* * * * *

6. Section 1.446 is amended by revising paragraph (d) and adding paragraph (e) to read as follows:

§ 1.446 Refund of international application filing and processing fees.

* * * * *

(d) The international and search fees will be refunded if no international filing date is accorded or if the application is withdrawn before transmittal of the record copy to the International Bureau (PCT Rules 15.6 and 16.2). The search fee will be refunded if the application is withdrawn before transmittal of the search copy to the International Searching Authority. The transmittal fee will not be refunded.

(e) The handling fee (§ 1.482(b)) will be refunded (PCT Rule 57.6) only if:

(1) the Demand is withdrawn before the Demand has been sent by the International Preliminary Examining Authority to the International Bureau, or

(2) the Demand is considered not to have been submitted (PCT Rule 54.4(a)).

7. Section 1.451 is amended by revising paragraph (a) to read as follows:

§ 1.451 The priority claim and priority document in an international application.

(a) The claim for priority must be made on the Request (PCT Rule 4.10) in a manner complying with Sections 110 and 115 of the Administrative Instructions.

* * * * *

8. Section 1.455 is amended by revising paragraph (a) to read as follows:

§ 1.455 Representation in international applications.

(a) Applicants of international applications may be represented by attorneys or agents registered to practice before the

Patent and Trademark Office or by an applicant appointed as a common representative (PCT Art. 49, Rules 4.8 and 90 and § 10.10). If applicants have not appointed an attorney or agent or one of the applicants to represent them, and there is more than one applicant, the applicant first named in the request and who is entitled to file in the U.S. Receiving Office shall be considered to be the common representative of all the applicants. An attorney or agent having the right to practice before a national office with which an international application is filed and for which the United States is an International Searching Authority or International Preliminary Examining Authority may be appointed to represent the applicants in the international application before that authority. An attorney or agent may appoint an associate attorney or agent who shall also then be of record (PCT Rule 90.1(d)). The appointment of an attorney or agent, or of a common representative, revokes any earlier appointment unless otherwise indicated (PCT Rule 90.6(b) and (c)).

9. Section 1.475 is revised to read as follows:

§ 1.475 Unity of invention before the International Searching Authority, the International Preliminary Examining Authority and during the national stage.

(a) An international and a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention"). Where a group of inventions is claimed in an application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art.

(b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) a product and a process specially adapted for the manufacture of said product; or

(2) a product and a process of use of said product; or

(3) a product, a process specially adapted for the manufacture of the said product, and a use of the said product; or

(4) a process and an apparatus or means specifically designed for carrying out the said process or

(5) a product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

(c) If an applicatioe contains claims to more or less than one of the combinations of categories of invention set forth in paragraph (b) of this section, unity of invention might not be present.

(d) If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories relate thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and § 1.476(c).

(e) The determination whether a group of iaventions is so linked as to form a single general inventive concept shall be made without regard to whether the inventions are claimed in separate claims or as alternatives within a single claim.

10. Section 1.476 is amended by revising paragraph (a) to read as follows:

§ 1.476 Determination of unity of invention before the International Searching Authority.

(a) Before establishing the international search report, the International Searching Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.475.

* * * * *

11. Section 1.480 is amended by revising paragraph (b) to read as follows:

§ 1.480 Demand for international preliminary examination.

* * * * *

(b) The Demand shall be made on a standardized form. Copies of printed Demand forms are available from the Patent and Trademark Office. Letters requesting printed Demand forms should be marked "Box PCT".

* * * * *

12. Section 1.482 is amended by revising paragraphs (a)(2)(i) and (b) to read as follows:

§ 1.482 International preliminary examination fees.

(a) * * *

(2) An additional preliminary examination fee when required, per additional invention:

(i) Where the International Searching Authority for the international application was the United States Patent and Trademark Office.....$140.00

* * * * *

(b) The handling fee is due on filing the Demand.

13. Section 1.484 is amended by revising paragraph (b) to read as follows:

§ 1.484 Conduct of international preliminary examination.

* * * * *

(b) International preliminary examination will begin promptly upon receipt of a Demand which requests examination based on the application as filed, or as amended by an amendment which has been received by the United States International Preliminary Examining Authority. Where a Demand requests examination based on a PCT Article 19 amendment which has not been received, examination may begin at 20 months without receipt of a PCT Article 19 amendment. Where a Demand requests examination based on a PCT Article 34 amendment which has not been received, applicant will be notified and given a time period within which to submit the amendment. Examination will begin after the earliest of:

(1) receipt of the amendment;

(2) receipt of applicant's statement that no amendment will be made; or

(3) expiration of the time period set in the notification.

No international preliminary examination report will be established prior to issuance of an international search report.

* * * * *

14. Section 1.485 is revised to read as follows:

§ 1.485 Amendments by applicant during international preliminary examination.

(a) The applicant may make amendments at the time of filing of the Demand and within the time limit set by the International Preliminary Examining Authority for response to any notification under § 1.484(b) or to any written opinion. Any such amendments must:

(1) Be made by submitting a replacement sheet for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled, and

(2) Include a description of how the replacement sheet differs from the replaced sheet.

(b) If an amendment cancels an entire sheet of the international application, that amendment shall be communicated in a letter.

15. Section 1.487 is removed.

§ 1.487 [Removed]

16. Section 1.488 is amended by revising paragraph (a) to read as follows:

§ 1.488 Determination of unity of invention before the International Preliminary Examining Authority.

(a) Before establishing any written opinion or the international preliminary examination report, the International Preliminary Examining Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.475.

* * * * *

17. Section 1.492 is amended by revising the introductory clause and paragraph (e) to read as follows:

§ 1.492 National stage fees.

The following fees and charges are established for international applications entering the national stage under 35 U.S.C. 371:

* * * * *

(e) Surcharge for filing the oath or declaration later than 20 months from the priority date pursuant to § 1.494(c) or later than 30 months from the priority date pursuant to § 1.495(c):

By a small entity (§ 1.9(f)) $65.00
By other than a small entity..... $130.00

* * * * *

18. Section 1.494 amended by removing paragraph (h) and by revising paragraphs (a), (b), (c), (d) and (g) to read as follows:

§ 1.494 Entering the national stage in the United States of America as a Designated Office.

(a) Where the United States of America has not been elected by the expiration of 19 months from the priority date (see § 1.495), the applicant must fulfill the requirements of PCT Article 22 and 35 U.S.C. 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application, the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 20 months from the priority date:

(1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) the basic national fee (see § 1.492(a)).

The 20-month time limit may not be extended.

(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits (1) a translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or (2) the oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 20 months after the priority date. A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 20 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 20 months from the priority date will be considered to be cancelled. The 20-month time limit may not be extended.

* * * * *

(g) An international application becomes abandoned as to the United States 20 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 20 months from the priority date where the United States has been designated but not elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 20 months from the priority date but any required translation of the international application as filed and/or the oath or declaration are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

19. Section 1.495 is amended by removing paragraph (i) and by revising paragraphs (a), (b), (c), (d), (e) and (h) to read as follows:

§ 1.495 Entering the national stage in the United States of America as an Elected Office.

(a) Where the United States of America has been elected by the expiration of 19 months from the priority date, the applicant must fulfill the requirements of 35 U.S.C. 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date:

(1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) the basic national fee (see § 1.492(a)).

The 30-month time limit may not be extended.

(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) a translation of the international application, as filed, into the English language, if it was originally filed language (35 U.S.C. 371(c)(2)) and/or

(2) the oath in another or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. A copy of the notification mailed to applicant should accompany any response thereto submitted to the Office.

(d) A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of 30 months from the priority date will be considered to be cancelled. The 30-month time limit may not be extended.

(e) A translation into English of any annexes to the international preliminary examination report, if the annexes were made in another language, must be furnished not later than the expiration of 30 months from the priority date. Translations of the annexes which are not received by the expiration of 30 months from the priority date may be submitted within any period set pursuant to paragraph (c) of this section accompanied by the processing fee set forth in § 1.492(f). Annexes for which translations are not timely received will be considered cancelled. The 30-month time limit may not be extended.

* * * * *

(h) An international application becomes abandoned as to the United States 30 months from the priority date if the requirements of paragraph (b) of this section have not been complied with within 30 months from the priority date and the United States has been elected by the expiration of 19 months from the priority date. If the requirements of paragraph (b) of this section are complied with within 30 months from the priority date but any required translation of the international application as filed and/or the oath or declaration are not timely filed, an international application will become abandoned as to the United States upon expiration of the time period set pursuant to paragraph (c) of this section.

20. Section 1.499 is revised to read as follows:

§ 1.499 Unity of invention during the national stage.

If the examiner finds that a national stage application lacks unity of invention under § 1.475, the examiner may in an Office action require the applicant in the response to that action to elect the invention to which the claims shall be restricted. Such requirement may be made before any action on the merits but may be made at any time before the final action at the discretion of the examiner. Review of any such requirement is provided under § 1.143 and 1.144.

21. Section 1.821 is amended by revising paragraph (h) to read as follows:

§ 1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

* * * * *

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing, in the United States Receiving Office, an international application under the Patent Cooperation Treaty (PCT), applicant has one month from the date of a notice which will be sent requiring compliance with the requirements, or such other time as may be set by the Commissioner, in which to comply. Any submission in response to a requirement under this paragraph must be accompanied by a statement that the submission does not include new matter or go beyond the disclosure in the international application as filed. Such a statement must be a verified statement if made by a person not registered to practice before the Office. If applicant fails to timely provide the required computer readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be performed.

* * * * *

22. The authority citation for 37 CFR Part 10 will continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

23. Section 10.9 is amended by adding new paragraph (c) to read as follows:

10.9 Limited recognition in patent cases.

* * * * *

(c) An individual not registered under § 10.6 may, if appointed by applicant to do so, prosecute an international application only before the U.S. International Searching Authority and the U.S. International Preliminary Examining Authority, provided: the individual has the right to practice before the national office with which the international application is filed (PCT Art. 49, Rule 90 and § 1.455).

Jan. 7, 1993

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patent and Trademarks

[1147 OG 29]

(142) Information Disclosure Statements In PCT National Stage Applications

The purpose of this notice is to announce a change in practice with regard to the need for applicants in a national stage application to filé an information disclosure statement with respect to documents cited in an international search report under certain circumstances.

When an international application is filed under the Patent Cooperation Treaty (PCT), prior art documents may be cited by the examiner in the international search report and/or the international preliminary examination report. When a national stage application is filed under 35 U.S.C. 371, or a national application is filed under 35 U.S.C. 111 claiming benefit of the filing date of the international application, it is often desirable to have the examiner consider the documents cited in the international application when examining the national application.

As a result of an agreement among the European Patent Office (EPO), Japanese Patent Office (JPO) and the United States Patent and Trademark Office (USPTO), copies of documents cited in the international search report issued by any one of these International Searching Authority Offices generally are being sent to the other Offices when designated in the international application. Accordingly, in many national stage applications where the international search was conducted by the EPO, JPO, or USPTO, copies of the documents cited in the international search report are made available to the examiner in the national stage application.

At this time, when all the requirements for a national stage application have been completed, applicant is notified (Form PCT/DO/EO/903) of the acceptance of the application under 35 U.S.C. 371, including an itemized list of the items received. The itemized list includes an indication of whether a copy of the international search report and copies of the references cited therein are present in the national stage file. The examiner will consider the documents cited in the international search report, without any further action by applicant under 37 CFR 1.97 and 1.98, when both the international search report and copies of the documents are indicated to be present in the national stage file. Otherwise, applicant must follow the procedures set forth in 37 CFR 1.97 and 1.98 in order to ensure that the examiner considers the documents cited in the international search report.

This notice applies only to documents cited in the international search report relative to a national stage application filed under 35 U.S.C. 371. It does not apply to documents cited in an international preliminary examination report that are not cited in the search report. It does not apply to applications filed under 35 U.S.C. 111 claiming the benefit of an international application filing date.

Practice relating to documents cited in a search report in an international application filed under the Patent Cooperation Treaty as set forth in § 609 of the Manual of Patent Examining Procedure will be modified in accordance with this notice.

Oct. 27, 1993

CHARLES E. VAN HORN
Patent Policy and Projects Administrator
Office of the Assistant Commissioner for Patents

[1156 OG 91]

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(143) Department of Commerce
Patent and Trademark Office

37 CFR Parts 1 and 10
[Docket No. 950403086-5086-01]
RIN 0651-AA72

Revisions of Patent Cooperation Treaty Provisions

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice relating to applications filed under the Patent Cooperation Treaty (PCT) in accordance with revised regulations under the PCT. The changes will result in a procedure whereby international applications improperly filed with the United States Receiving Office (RO/US) will, for a

fee, be forwarded for processing to the International Bureau as Receiving Office.
Effective Date: June 1, 1995
For Further Information Contact: Charles Pearson at (703) 308-6515.
Supplementary Information: In a Notice of Proposed Rulemaking published in the *Federal Register* at 59 FR 33707 (June 30, 1994) and in the Patent and Trademark Office *Official Gazette* at 1164 Off. Gaz. Pat. Office 77 (July 26, 1994), the Office proposed to amend several rules of practice in patent cases. Recent changes to the PCT Regulations include the addition of a new section (PCT Rule 19.4) which provides for transmittal of an international application to the International Bureau, acting in its capacity as Receiving Office, in certain instances. Under the regulations currently in effect, at least one applicant is required, on filing the international application in the United States, to be a resident or national of the United States.

The practice under the revised PCT Regulations permits an international application filed with the United States Receiving Office to be forwarded to the International Bureau for processing in its capacity as a Receiving Office if the international application does not name an applicant who is indicated as being a U.S. resident or national, but names an applicant who is indicated as a resident or national of another PCT Contracting State or if the indication of residence or nationality of the applicant is missing. The Receiving Office of the International Bureau will consider the international application to be received as of the date accorded by the United States Receiving Office. This practice will avoid the loss of a filing date in those instances where the United States Receiving Office is not competent to act, but where the international application is filed by an applicant who is a national or resident of a PCT Contracting State. Where questions arise regarding residence and nationality, e.g., where residence and nationality are not clearly set forth, the application will be forwarded to the International Bureau as Receiving Office. If all applicants are indicated to be residents and nationals of non-PCT Contracting States, PCT Rule 19.4 does not apply and the application is denied an international filing date.

Discussion of Specific Rules

Section 1.412(c)(6) is added to reflect that the United States Receiving Office, where it is not a competent Receiving Office under PCT Rule 19.1 or 19.2, could transmit the international application to the International Bureau for processing in its capacity as a Receiving Office.

Section 1.421(a) is amended to clarify that applications filed by applicants who are not residents or nationals of the United States, but who are residents or nationals of a PCT Contracting State or who indicate no residence or nationality, will, upon timely payment of the proper fee, be forwarded to the International Bureau for processing in its capacity as a Receiving Office.

Section 1.445(a)(5) is added to establish a fee equivalent to the transmittal fee in paragraph (a)(1) of this section for transmittal of an international application to the International Bureau for processing in its capacity as a Receiving Office.

Section 10.9 is amended to add a new provision consistent with PCT Rule 90.1, clarifying that an attorney or agent having the right to practice before the International Bureau when acting as Receiving Office may represent the applicant before the U.S. International Searching Authority or the U.S. International Preliminary Examining Authority. An individual who has the right to practice before the International Bureau when acting as Receiving Office, and who is not registered under § 10.6, may not prosecute patent applications in the national stage in the Office.

Response to Comments on The Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration. The comments and responses are discussed below.

Comment: One comment was received which approved of the proposed rule changes but noted other aspects of the U.S. National Phase filing procedures that could be changed to make the PCT more user-friendly.

Response: The Office is interested in making the PCT more user-friendly. Amendments to §§ 1.494 and 1.495, which were effective on May 1, 1993, removed many of the differences in practice involving the filing of a regular U.S. application under 35 U.S.C. 111 and the entry of the national stage under 35 U.S.C. 371. These regulations now provide for a notice of missing requirements, similar to a notice under § 1.53(d), where a defective oath or declaration or a defective translation is filed.

Comment: Regarding § 1.412(c), one comment suggested that the proposed rule should be made consistent with PCT Rule 19.4(b) which provides for the transmittal of international applications to the International Bureau as Receiving Office "unless prescriptions concerning national security prevent the international application from being so transmitted" by incorporating such language into the proposed rule.

Response: The Office has adopted the suggestion and modified the rule by incorporating the suggested language from PCT Rule 19.4(b) in the regulation.

Comment: One comment regarding § 1.445(a)(5) mentioned that the word "competent" should be deleted because it is not "necessary and may be inaccurate" when no applicant in an international application is a "resident or national of a PCT Contracting State."

Response: The Office has adopted the suggestion and modified the rule by deleting "competent" from § 1.445(a)(5). The second occurrence of the word "competent" has also been deleted from 37 CFR § 1.412(c)(6), for the same reasons.

Comment: Regarding § 10.9(c), there were a few comments which focus on the wording. Specifically, one comment noted that the word "appointed" is confusing because it is not clear if it includes "an officer or employee of a legal-entity patent applicant" in cases where the United States of America is not designated. An example was provided which noted "if the only applicant was XYZ Company, would the president of the Company be authorized to prosecute the application before the USPTO as an International Searching and Preliminary Examining Authority? In countries permitting assignee filing it is normal for any authorized officer or employee of the company to be able to represent the company without regard as to whether he is authorized to practice as an agent or attorney before the patent office."

Response: The proposed regulation is sufficiently clear on this point. If a person has the authority to represent an applicant, either a legal entity applicant or a real person, before the International Bureau as Receiving Office, then that person has the right to represent that applicant before the United States International Searching Authority and the United States International Preliminary Examining Authority.

Comment: Another comment about Rule 10.9(c) is that the word "only" is overlimiting and should be deleted from the Rule because it excludes Article 19 amendments filed before the International Bureau. It was suggested that the Rule be changed as follows: —. . . prosecute an International Application before the United States Patent and Trademark Office acting as an International Searching or Preliminary examining Authority, . . .—.

Response: The Office will not adopt the suggestion. The word "only" in the Rule signifies that such persons may not prosecute an international application in the national stage before the USPTO. The rule is not meant to control who may practice before the International Bureau. Such a person would clearly be allowed to file Article 19 amendments with the International Bureau by virtue of PCT Rule 90.1(a)

Comment: A final comment made about Rule 10.9(c) is that the last phrase added is "too broad" because it does not recite who is entitled to act before the International Bureau. It was suggested that the rule should be changed to include the phrase —. . . for a national Office of a Contracting State of which an applicant is a resident or national— at the end of the rule.

Response: The Office has adopted the suggestion to the extent that an explicit reference to PCT Rule 83.1^{bis} has been inserted in the regulation. Since PCT Rule 83.1^{bis} clearly sets forth who may practice before the International Bureau, it is not necessary to repeat that information here. Thus, the regulation clearly sets forth who may practice before the United States

International Searching and Preliminary Examining Authorities.

Other Considerations:

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 et seq., Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. These rule changes have been determined to be not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) , because the rules would affect only a small number of international applications and would provide more streamlined and simplified procedures for filing and prosecuting international applications under the PCT.

The Office has also determined that these rule changes have no federalism implications affecting the relationship between the National government and the States as outlined in Executive Order 12612.

These rule changes will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. The paperwork burden imposed by adherence to the PCT is currently approved by the Office of Management and Budget under control number 0651-0021.

List of Subjects
37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and record keeping requirements, Trademarks.

For the reasons set forth in the preamble, 37 CFR Parts 1 and 10 are amended to read as follows:

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.412 is amended by adding new paragraph (c)(6) to read as follows:

§ 1.412 The United States Receiving Office.

* * * * *

(c) * * *

(6) Reviewing and, where the United States Receiving Office is not the competent Receiving Office under § 1.421(a) and PCT Rule 19.1 or 19.2, transmitting the international application to the International Bureau for processing in its capacity as a Receiving Office unless prescriptions concerning national security prevent the application from being so transmitted (PCT Rule 19.4).

3. Section 1.421 is amended by revising paragraph (a) to read as follows:

§ 1.421 Applicant for International Application.

(a) Only residents or nationals of the United States of America may file international applications in the United States Receiving Office. If an international application does not include an applicant who is indicated as being a resident or national of the United States of America, and at least one applicant:

(1) has indicated a residence or nationality in a PCT Contracting State, or

(2) has no residence or nationality indicated; applicant will be so notified and, if the international application includes a fee amount equivalent to that required by § 1.445(a)(5), the international application will be forwarded for processing to the International Bureau acting as a Receiving Office. (See also § 1.412(c)(6)).

4. Section 1.445 is amended by adding new paragraph (a)(5) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) * * *

(5) A fee equivalent to the transmittal fee in paragraph (a)(1) of this section for transmittal of an international application to the International Bureau for processing in its capacity as a Receiving Office (PCT Rule 19.4).

* * * * *

5. The authority citation for 37 CFR Part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

6. Section 10.9 is amended by revising paragraph (c) to read as follows:

§ 10.9 Limited recognition in patent cases.

* * * * *

(c) An individual not registered under § 10.6 may, if appointed by applicant to do so, prosecute an international application only before the U.S. International Searching Authority and the U.S. International Preliminary Examining Authority, provided: the individual has the right to practice before the national office with which the international application is filed (PCT Art. 49, Rule 90 and § 1.455) or before the International Bureau when acting as Receiving Office pursuant to PCT Rules 83.1^{bis} and 90.1.

April 25, 1995 LAWRENCE J. GOFFNEY, JR.
Acting Assistant Secretary of Commerce and
Acting Commissioner of Patents and Trademarks

[1175 OG 88]

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(144) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 2
[Docket No. 960828232-6294-02]
RIN 0651-AA90

Establishment of Recordal Fees Associated with the Fastener Quality Act

Agency: Patent and Trademark Office, Commerce
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice to establish fees associated with recordation of insignia of manufacturers and private label distributors to ensure the traceability of a fastener to its manufacturer or private label distributor. This amendment is in accordance with the provisions of the Fastener Quality Act. 15 U.S.C. 5401 et seq.
Effective Date: November 25, 1996.
For Further Information Contact: Lizbeth Kulick by telephone at (703) 308-8900, or by fax at (703) 308-7220, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia, 22202-3513.
Supplementary Information: On August 17, 1992, the Department of Commerce issued a notice of proposed rulemaking to implement the Fastener Quality Act (Act). 57 FR 37032. In that notice, the PTO was identified as the Office within the Commerce Department with the responsibility for recording the fastener insignia of manufacturers and private label distributors as required by Section 8 of the Act. 57 FR 37033-35, August 17, 1992. The notice proposed that the costs of recording insignia be recovered by user fees. 57 FR 37035-36, August 17, 1992.

The PTO must publish a notice in the Federal Register of any change of its fees at least 30 days before the effective date thereof. 15 U.S.C. 1113(a). On September 17, 1996, a notice of proposed rulemaking was published in the *Federal Register*, at 61 FR 48872-73, to announce three proposed fees of twenty dollars each, to recover costs associated with the insignia recordal program. The PTO has received no comments regarding the proposed fees.

Additionally, the September 17th notice proposed to remove two rules from Part 2, 37 C.F.R. 2.53 and 2.189, because they were deemed not administratively necessary. Section 2.53 specifies the manner in which drawings must be transmitted. Section 2.189 simply states the Office's policy on publishing amendments to the rules. This policy is not changing, but will no longer be stated as a rule. No comments were received on the proposed removal of the two rules.

Other Considerations

This rule is not significant for the purposes of Executive Order 12866. The Office of Management and Budget approved the information collections required by this rule on October 1, 1996 (OMB number 0651-0028). This clearance expires October 31, 1999. The affected public is manufacturers and private label distributors of certain types of industrial fasteners. The estimated average number of responses is six hundred. The estimated time per response is ten minutes, so the estimated total annual burden is one hundred hours. The collected information is needed to ensure that a fastener can be traced to its manufacturer or private label distributor.

Notwithstanding any other provision of law, no person is required to respond to, nor shall a person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

This proposed fee does not require notice and comment under 5 U.S.C. 553 or any other statute, so no analysis or certification is required trader 5 U.S.C. 603(a).

List of Subjects in 37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set out in the preamble, 37 CFR Part 2 is amended as set forth below.

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.7 is added to read as follows:

§ 2.7 Fastener Recordal Fees
(a) Application fee for recordal of insignia $20.00
(b) Renewal of insignia recordal $20.00
(c) Surcharge for late renewal of insignia recordal $20.00

§ 2.53 [Removed]
3. Section 2.53 is removed.

§ 2.189 [Removed]
4. Section 2.189 and the undesignated center heading "Amendment of Rules" are removed.

October 23, 1996 BRUCE A LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

[1192 OG 19]

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(145) **Reengineering The Patent Process**

The U.S. Patent and Trademark Office (PTO) began a long term effort to reengineer the patent process in March of 1995, responsive to customer requests for greater flexibility,. and accelerated by the presidential mandates of the National Performance Review. The major goals of the project are to increase the quality of examination, reduce internal processing time, enhance customer satisfaction and improve employee morale.

Over 150 employees from throughout the patent examining corps and support areas participated in the development of a new concept of operations. This high level description of the reengineered patent process was completed in September of 1995. A major effort is now underway to plan for the transition from current practices to those envisioned in the concept of operations.

A necessary part of planning for the transition to the reengineered process is to prototype/pilot the proposed changes to determine their effectiveness and their contribution to the realization of PTO goals. A number of immediate initiatives have been identified for prototyping/piloting in the upcoming months. Several of these prototypes/pilots will involve the participation of patent process customers. As these immediate initiatives develop, additional Official Gazette notices will be published containing further details about the initiative and instructions for customers who may be participating in the prototype/pilot or may be affected by it.

As the reengineering effort unfolds in the future, it is expected that many new practices and procedures will be prototyped/piloted. As our customers, your participation, and your feedback, are welcomed.

Point of Contact for this Notice:

Name: Terri Davis
Telephone number: (703) 306-3104
Fax number: (703) 308-5192

May 10, 1996 EDWARD R. KAZENSKE
Deputy Assistant Commissioner
for Patents

[1187 OG 37]

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(146) **International Classification Designations for U.S. Design Patents:**

As part of the extensive re-engineering initiative proposed for the Design Examining Group (Group 2900) and to enrich patent bibliographic data, a Locarno International Classification will be included on U.S. Design Patents to supplement the United States Design Patent Classification effective June 30, 1996.

This addition will enhance quality of service to both internal and external customers as follows: The Locarno International Classification designation will aid Patent and Trademark Office personnel and the public by increasing on-line information access to foreign documents and facilitating accessibility of U.S. Design Patents in foreign search files as well as electronic

data bases that rely upon the Locarno System of Classification for Industrial Designs.

Any questions, comments or suggestions regarding this notice should be directed to Charles A. Rademaker, Design Patent Classification/International Classification, (703) 305-7988, CM2-300.

May 3, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1186 OG 98]

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(147) **Prototype for Examination in an Electronic Environment**

In an effort to support the re-engineering of the patent process at the U.S. Patent and Trademark Office (PTO), the PTO is implementing a limited prototype electronic processing and examination system. Effective immediately, a special box will be established for filing of correspondence related to this prototype. Additionally, *for purposes of this prototype only*, the requirement of 37 CFR 1.4(d) that correspondence must be signed in permanent ink is waived under 37 CFR 1.183 only to the extent that it will be permissible for a person to place "/s/" on the signature line of an electronic document as the original signature. The requirement of 37 CFR 1.4(d) that the original signature (i.e., "/s/") be personally signed by that person is not waived by this notice. The printing of that electronic document by PTO personnel will result in "/s/" being printed on the signature line of the paper copy which is placed in the official paper file wrapper. Patent process customers whose participation in this prototype is solicited by the PTO will be so notified by separate letter, including detailed instructions regarding prototype participation requirements.

Point of Contact for this Notice:

Name: Gerald Goldberg
Telephone number: (703) 308-5443
Fax number: (703) 305-3588

May 10, 1996 EDWARD R. KAZENSKE
Deputy Assistant Commissioner for Patents

[1187 OG 36]

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(148) **Patent Assistance Center**

In an effort to support the reengineering of the patent process at the Patent and Trademark Office (PTO) (see Official Gazette Notice entitled "Reengineering the Patent Process" at 1187 *Off. Gaz. Pat. Office* 37 (June 11, 1996)), the PTO is piloting a Patent Assistance Center to provide enhanced telephone service to patent customers. This pilot is the PTO's first step toward providing a "one-stop service." During the pilot, the Patent Assistance Center will be housed within the current General Information Services Division (GISD) located in Crystal Plaza 3, Room 2C02. Questions and inquires regarding technical assistance on patent applications that are beyond the scope/purview of the General Information Services Division will be answered by the Patent Assistance Center. Questions specific to a pending patent application will be directed to the assigned examiner. The Patent Assistance Center will be staffed by a highly qualified, experienced, and customer friendly personnel. Customers may contact the Patent Assistance Center from 8:30 a.m. to 5:00 p.m. EST by dialing GISD at 1-800 PTO-9199 or (703) 308-HELP.

The Patent Assistance Center will utilize a state-of-the-art telecommunications/PC integration system. This system will be used to gather data on customers' most frequently asked questions. These questions will be analyzed and an informational database will be developed to quickly provide answers. Customer Feedback Cards will be randomly sent to callers requesting feedback on their satisfaction with the products and services received.

Point of Contact for this Notice:

Name: Stuart S. Levy
Telephone Number: (703) 308-1295
Fax Number: (703) 305-3594

June 6, 1996 FRED SCHMIDT, *Director*
Office of Strategic Planning and Patent Reengineering

[1188 OG 124]

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(149) **Customer Feedback Card**

In an effort to support the reengineering of the patent process at the Patent and Trademark Office (PTO) (see Official Gazette Notice entitled "Reengineering the Patent Process" at 1187 *Off. Gaz. Pat. Office* 37 (June 11, 1996)), the PTO is piloting a Customer Feedback Card to measure customer satisfaction on various Patent Reengineering projects. The Customer Feedback Card prototype is intended to be a universal tool for gathering customer comments and is designed to promote a high-level response rate and encourage customer participation. The initial prototype will be used during the upcoming months to gather customer feedback concerning the Patent Assistance Center. Customers will be randomly selected to anonymously provide feedback on their satisfaction with PTO's products and services.

Point of Contact for this Notice:

Name: Stuart S. Levy
Telephone Number: (703) 308-1295
Fax Number: (703) 305-3594

June 5, 1996 FRED SCHMIDT, *Director*
Office of Strategic Planning and Patent Reengineering

[1188 OG 125]

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(150) **Training Materials on the Final Utility Examination Guidelines are Available**

Copies of materials developed to train Examiners on how to apply the Final Utility guidelines are now available to the public.

On January 3, 1995 the Patent and Trademark Office (PTO) published in the Federal Register (60 FR 97) proposed utility examination guidelines establishing the policies and procedures to be followed by Examiners when examining applications for compliance with the utility requirement of 35 U.S.C. § 101. Comments from interested members of the public were requested at that time. On July 14, 1995 the PTO published in the Federal Register (60 FR 36263) the final version of the guidelines to be used by Office personnel in their review of patent applications for compliance with the utility requirement of 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph.

Training materials to supplement the Legal Analysis and Utility Examination Guidelines are now available. The training materials include a brief synopsis designed to give quick generic guidance with regard to the most common situations where a question of utility under 35 U.S.C. § 101 and 35 U.S.C. § 112, first paragraph might arise. Examples which are frequent in the examining groups are presented for each of the six categories identified and have been drafted as raising various questions concerning the utility examination guidelines.

Requests for paper copies submitted by mail should be addressed to the Commissioner of Patents and Trademarks, marked to the attention of Jeff Kushan, Box 4, Patent and Trademark Office, Washington, D.C. 20231. Requests in person may be submitted in Room 902, Two Crystal Park, 2121 Crystal Drive, Arlington, Virginia. Requests may also be submitted by telephone at (703) 305-9300 and by telefax at (703) 305-8885.

The training materials are available for retrieval from the Internet (address: www.uspto.gov) or File Transfer Protocol (address: ftp.uspto.gov). This material can also be accessed on the PTO Bulletin Board System at (703) 305-8950 by using a computer with a modem and telecommunication software set at any speed from 1200 to 9600 baud, 8 character bits, no parity, and 1 start/stop bit.

August 4, 1995 STEPHEN G. KUNIN
Deputy Assistant Commissioner for Patent Policy and Projects

[1177 OG 171]

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(151) **Patent Examiner Legal Training**

In a notice which first appeared in the *Official Gazette* dated April 25, 1995 (1173 OG 426), the Patent and Trademark Office (PTO) set forth its intention to establish a Juris Masters (JM) Program to improve the legal competency of its patent professionals. That notice described the Program concept and requested public comment. In response to the notice, a total of four (4) written comments were received.

Based upon the comments received, PTO has determined that a legal studies program consisting of 6 or 7 core law school courses such as contracts, evidence and constitutional law should be offered as part of a JM Program. Consequently, the PTO has entered into an interagency agreement with the Department of Agriculture Graduate School (hereafter USDA) to arrange for an accredited law school to teach the courses and administer the JM Program.

Any accredited law school interested in participating in the Program or seeking further information should contact John Wells of the USDA Graduate School at (703) 308-5306 no later than October 31, 1995.

EDWARD R. KAZENSKE
Deputy Assistant Commissioner for Patents

[1179 OG 56]

TRADEMARK APPLICATION EXAMINATION AND CONTENT

(152) Interviews Involving Trademark Application

Interviews frequently result in a better understanding of the issues involved, shorten the prosecution and facilitate disposal of applications.

Interviews for discussion of registrability of the mark of a pending application will not be had before the first official Office action thereon and ordinarily not before filing the first response. Arrangements for an interview should be made in advance so that the Examiner may review the case and be familiar with the details involved.

Interviews on Friday will no longer be prohibited as a matter of policy but all interviews should be set at a time satisfactory to all parties concerned.

A memorandum summarizing the conclusions reached at the interview should be prepared by the Examiner and placed in the application file. The memorandum will be retained in the application file until the prosecution is completed. Such procedure will not, however, relieve the applicant of the responsibility of complying with the requirements of Trademark Rule 2.62.

July 6, 1964 — HORACE B. FAY, JR.
Assistant Commissioner of Patents

This supersedes the notice of Feb. 10, 1958. (728 O.G. TM 1)

[804 O.G. TM 147]

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(153) Trademark Examining Procedure for Amended Applications; Reporting Oldest Dates of Amended Trademark Applications

Effective immediately, the order in which amendments to trademark applications are examined is changed. Previously, Examiners have usually acted on amended cases in order of filing date of the application which the amendment concerned, i.e., amended cases with the oldest filing date were examined first. Under the new procedure, amended cases will normally be examined in the order in which the amendment or other response is received, i.e., amendments that are received first will normally be examined first.

Effective with this issue of the *Official Gazette* (Trademark Section) in order to reflect more accurately the condition of division dockets, the column reporting the date of the oldest amended application in each division has been changed to indicate the date of receipt of the oldest filed amendment. Under this new method of reporting the oldest date of receipt of a filed amendment upon which no action has been taken by an Examiner will be indicated for each division of the Trademark Examining Operation.

July 15, 1971 — RENE D. TEGTMEYER
Assistant Commissioner

[889 O.G. TM 6]

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(154) Trademark Office Actions

Effective immediately Applicants or their attorneys will be provided with only one carbon copy of any office action, and the mailing of an additional carbon copy will be discontinued.

This change is consistent with the current practice in the patent examining operations and should result in greater efficiency in the preparation and mailing of office actions.

Feb. 7, 1972 — ROBERT GOTTSCHALK
Commissioner of Patents

[895 O.G. TM 238]

(155) Petition to Make Trademark Applications Special

The practice of expediting the prosecution of new trademark applications on request of the applicant (accelerated prosecution) was rescinded, effective Aug. 1, 1971 (36 F.R. 13231, July 16, 1971; 825 O.G. 2). This action was taken after a careful study of the practice, including a recommendation of the Public Advisory Committee for Trademark Affairs that the Patent Office terminate accelerated prosecution of trademark applications. The study considered both the effect of the procedure on the workload of the Trademark Operations and the broader interest of examining trademark applications in an order which is equitable to all applicants.

Since the termination of this practice, the Office has experienced some increase in the number of petitions requesting the Commissioner to invoke his supervisory authority pursuant to Rule 2.146 in order to advance the examination of applications out of their regular order. This was to be expected since applicants who might have been able to show special circumstances entitling them to advanced examination could previously achieve this special treatment without resorting to a petition. However, some of the petitions now being received are not considered sufficient to justify the extraordinary relief of invoking the supervisory authority of the Commissioner for the purpose of advancing the applications out of their regular order.

In particular, a number of such petitions have been based on the ground that the applicant is about to embark on an advertising campaign or to commit advertising or promotional expenditures in which the mark applied for is material. Such a ground is not considered to constitute appropriate circumstances justifying the advancement of the application out of its regular turn and the petitions based on such ground have been and will continue to be denied. The principal reason for the denial is that these circumstances are applicable to a substantial portion of the trademark applications filed in the Patent Office. The supervisory authority of the Commissioner should be exercised only where an extraordinary reason for such action has been disclosed. See *Anderson & Dyer* v. *Lewry*, 89 O.G. 1861, 1899 C.D. 230, and *Wilputte* v. *Van Ackeren*, 103 USPQ 235. Thus, the extraordinary remedy of invoking the supervisory authority of the Commissioner is not considered appropriate under these circumstances.

In the interest of equitable treatment of all applicants, the policy of the Office in granting such petitions will be restricted to those cases in which particular and very special circumstances exist, such as a demonstrable possibility of loss of substantial rights, rather than circumstances which would be equally applicable to a large number of other applicants for trademark registration.

Mar. 13, 1972 — ROBERT GOTTSCHALK
Commissioner of Patents

[897 O.G. TM 2]

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(156) Title 37-Patents, Trademarks, and Copyrights

Chapter I-Patent Office, Department of Commerce

Parts 2 and 6-Rules of Practice in Trademark Cases
International Trademark Classification

A proposal was published at 37 F.R. 6404 to revise § 6.1 of the Rules of Practice in Trademark Cases. The Patent Office proposed to establish the "International Classification of Goods and Services to Which Trademarks Are Applied" (the subject of the "Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks" of 1957, as revised at Stockholm on July 14, 1967) as the primary classification of goods and services for registration of trademarks and service marks. Pursuant to the Notice, written comments have been received, and a public hearing was held on June 14, 1972. Full consideration has been given to all matter presented, and changes in the text of the original proposal have been made in view thereof. It has been determined that adoption of the international classification system is desirable.

The Patent Office has studied the international classification and, since Mar. 5, 1968, has indicated the appropriate international class in all publications and on all issued registrations and renewals as a subsidiary classification. Based on this experience and the comments received, it is now believed that adoption of the international schedule as the primary classification system is desirable. The international system is easier to administer because of fewer classes of goods and the availability of an alphabetical listing of goods and services.

The Nice Agreement provides for an International Committee of Experts whose objective is to keep the classification current. The classification of specific goods and services is set forth in the Alphabetical List entitled "International Classification of Goods and Services to Which Trademarks Are Applied" (published by the World Intellectual Property Organization). In addition, the International Trademark Classification List contains the names of the classes setting forth the basic contents of each class. The Alphabetical List also comprises explanatory notes which serve as guidelines for determining the appropriate international class for a specific product or service.

The alphabetical listing within the International Trademark Classification Manual is currently used by the Office as a guideline for determining the degree of particularity of identification of goods. See "Identification of Goods and Services in Trademark Applications," 36 F.R. 13232; July 16, 1971.

Applications for registrations filed on or after Sept. 1, 1973, and registrations issuing thereon, will be classified according to the international classification set forth in the new § 6.1. Accordingly, the international classification is adopted under Section 30 of the Trademark Act of all purposes under the statute and rules; and, therefore, will be the criterion for determining, inter alia, fees.

Applications for the registration of marks filed on or before Aug. 31, 1973, appeals or petitions to revive or oppositions filed in connection with said applications, and affidavits, renewals and petitions for cancellation filed in connection with registrations issuing thereon, will continue to be processed under the classification system existing at the time the mark was registered.

All applications which are published and registrations which are issued will carry both the appropriate international classification and existing U.S. classification number.

An insufficient fee, in connection with an appeal or opposition on any application or in connection with an affidavit or renewal filed in connection with any registration, will not render the same unacceptable, if the proper fee is submitted within a time limit set forth in a notification of the defect, providing the proper fee for at least one class has been originally submitted within the applicable time limit. This will be the case even if the full fee is not received within the sixth year in the case of an affidavit filed under Section 8 or before the end of the twentieth year, including the grace period, in the case of renewal applications, or within the six-month statutory response period in the case of an appeal, or within the thirty-day opposition period, or any extension thereof in the case of the filing of an opposition.

The existing classification system will continue to be used for searching registered and pending marks until all documents in the search file are organized on the basis of the international system of classification. Until this changeover is effected, the U.S. class designation will continue to be printed on all published applications and registrations issued under the existing or the international classification system to facilitate searching on the basis of the existing U.S. system of classification.

Until all applications filed on or before Aug. 31, 1973, have been disposed of, the trademark sections of the *Official Gazette*, which are organized by class, will include two sections: one for applications published or registrations issued on the basis of applications filed on or before Aug. 31, 1973, organized by class according to the U.S. schedule of classes; the other section for applications published or registrations issued on the basis of applications filed on or after Sept. 1, 1973, organized by class according to the new international schedule.

Certification marks and collective membership marks will continue to be classified as set forth in redesignated §§ 6.3 and 6.4.

Efforts will be made to have the International Trademark Classification List printed by the Government Printing Office or otherwise assure the availability of the List from local sources. Notification will appear in the *Official Gazette* when the List is available from local sources of the Government Printing Office.

The English edition of the "International Classification of Goods and Services to Which Trademarks Are Applied" can presently be ordered from:

Sales Branch, The Patent Office, Block C
Station Square House, St. Mary Cray
Orpington, Kent, England

Certain modifications and additions to the international trademark classification have been published as supplements and are also available from the British Office. In addition, and inasmuch as the World Intellectual Property Organization (WIPO) has issued the List in several languages, it is anticipated that an English version will be published by that organization.

We have been advised by the Patent Office of the United Kingdom that the only acceptable methods of payment for the International Trademark Classification List are by International Postal Money Order or by banker's draft payable in sterling and drawn on a bank in the United Kingdom.

* * * * *

May 14, 1973 — ROBERT GOTTSCHALK
Commissioner of Patents

BETSY ANCKER-JOHNSON
Assistant Secretary for Science and Technology

Published in 38 F.R. 41681, June 4, 1973

[911 O.G. TM 210]

(Note: Rule 2.85 (Classification schedules) was revised and Rule 6.1 (International schedule of classes of goods and services) was established as of September 1, 1973 by this notice: prior U.S. schedule of classes was redesignated as Rule 6.2.)

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(157) Wording In Verification or Declaration of Trademark Application

Applicants and attorneys are requested to use the following wording in the part of the verification or declaration of the trademark application which indicates the signer's belief that the mark applied for does not resemble another person's mark:

> —that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such mark in commerce either in the identical form thereof or in such near resemblance thereto *as to be likely when applied to the goods of such other person, to cause confusion, or cause likely, mistake, or to deceive*: —

The wording emphasized conforms to the language of both Sections 1(a)(1) and 2(d) of the Trademark Act of 1946.

Some applicants and attorneys, instead of using the wording emphasized above, are still using the now obsolete wording "as might be calculated to deceive" which was promulgated in the forms under the Trademark Act of 1905 and inadvertently continued by the Act of 1946 up to October 1962 in Section 1(a)(1) and in the forms connected with the Act. Section 1(a)(1) of the 1946 Act was amended by Act of October 9, 1962 (Public Law 772, 87th Congress, 76 Stat. 769) to conform it to the language of Section 2(d) of the 1946 Act, since the language of Section 2(d) reflects the thinking at the time the 1946 Act was written. The wording of the trademark forms for the 1946 Act has also been amended appropriately.

It is desirable that proper wording be used. However, since the differences in wording referred to above are considered to be differences of form rather than of substance. Examiners will not require new verifications or declarations. When the obsolete

wording is observed and a letter is to be written for other reasons, Examiners will at that time call attention to the fact that the wording is obsolete and should be modified in applications in the future.

Mar. 25, 1974 RENE D. TEGTMEYER
Assistant Commissioner for Trademarks

[921 O.G. TM 186]

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(158) Standardized Disclaimers

Beginning with the Nov. 9, 1982 issue of the *Official Gazette*, disclaimers in marks published for opposition and in those registered on the Supplemental Register will be printed in a standardized form, regardless of the text submitted. Certificates of registration for marks issued on the Supplemental Register will also contain the standardized disclaimer as of that date. Certificates of registration for marks issued on the Principal Register will contain the uniform statement beginning Feb. 1, 1983. The disclaimed matter will be taken from the disclaimer of record and inserted into a standardized disclaimer for printing and data base purposes. The new disclaimer text will take the following form:

No claim is made to the exclusive right to use apart from the mark as shown.

Aug. 30, 1982 MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1022 TMOG 44]

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(159) Trademark "Revivals" and "Reinstatements"

It would be of great assistance to the Office if the heading or caption of "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications carried the following identifying data:

1. Address Paper to the Attention of:
   Office of Director, Trademark Examining Operation
2. Serial Number
3. Mark
4. Applicant's Name
5. A title indicating the nature of the paper

Use of this heading for "Petitions to Revive" or "Requests for Reinstatement" of abandoned trademark applications will help ensure that the papers are promptly routed to the proper Office, which will prevent needless delay in its consideration.

Aug. 13, 1984 MARK M. NEWMAN
Director, Trademark Examining Operation

[1046 TMOG 13]

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(160) T-Search Printouts as Section 2(d) References

As part of its ongoing automation program, the PTO is pleased to announce that on or about July 1, 1986, Trademark Examining Attorneys will use the automated Trademark search system (T-Search) exclusively for searching word marks. The Examining Attorneys will use computer printouts to advise applicants about Section 2(d) references. The printouts will include computer-generated facsimiles of the drawing where appropriate. The printouts will be used for word marks, whether the word is depicted in a typed drawing or in stylized form. Photocopies of certificates of registration will continue to be used for design marks.

The Patent and Trademark Office, in consultation with the Public Advisory Committee for Trademark Affairs, has established accuracy standards for the computerized data. Data elements which are not essential for examiner searching are being systematically checked and corrected. The following data elements which are essential for examiner searching purposes are essentially complete:

1. MARK
2. SERIAL NUMBER
3. REGISTRATION NUMBER
4. FILING DATE
5. REGISTRATION DATE
6. GOODS AND SERVICES
7. INTERNATIONAL CLASS
8. U.S. CLASS

Subject to the above caveat, the printouts will contain all the information that appears on the certificate of registration with one exception. If an application for registration was based on Section 44, 15 U.S.C. 1126, the printout will indicate that the registration or application was filed under the provisions of Section 44 (using the notation "SECT 44"). The printout will also show the priority date if the application was filed under the provisions of Section 44(d). However, it will not indicate the country or certificate number of the foreign registration on which the U.S. registration was based.

The printouts will also contain additional registration information which was not provided under the non-automated system, as follows:

A. Change in registration—This will indicate that a registration was changed after registration, such as by an amendment of the mark or identification of goods/services. The current information will be displayed in the printout.

B. Affidavits—This indicates that a Section 8 affidavit of continued use was accepted, that a Section 15 affidavit of incontestability was acknowledged, or that a mark was republished under the provisions of Section 12(c).

C. Renewals—Applicable renewal information, such as "1st Renewal" or "2nd Renewal" will be shown.

D. Owner—In addition to listing the original registrant, the last known owner, as the change of ownership is acknowledged by the Office by virtue of examining an affidavit or renewal, will be included.

The following provides an explanation of the terms/symbols used in the printout:

1. Goods or services appearing in double parentheses "(( ))" were not included in a Section 15 affidavit.
2. Goods or services appearing in brackets "[ ]" were deleted after registration by amendment, correction, restriction or at the time of renewal.
3. Dates will appear as year, month and day. For example, June 20, 1983 will appear as 1983.06.20.
4. Goods and services will be indicated with the international class (IC), the prior U.S. classification (US), the identification, date of first use and date of first use in commerce.
5. Registrants (OWNER) will be listed showing the owner's name, entity designation (e.g., individual, partnership, corporation), country of citizenship or state or country of incorporation, and address.
6. Pseudo mark—This material is merely a search aid and has no bearing on the registration information.
7. Design search code—This is also merely an aid for computerized searching of design marks, by which a number is assigned to describe a particular design element. It has no bearing on the registration information.
8. Mark drawing code—This indicates the appearance of the mark, and again is not part of the registration data. There are six mark drawing codes.
   1—typed drawing
   2—design only
   3—words, letters and/or numbers and design
   4—words, letters and/or number in block form (block letters; not typed drawing)
   5—words, letters and/or numbers in a stylized form
   6—sound marks

An example of a computer printout and a facsimile of a stylized word mark follow.

June 23, 1986 MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

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Document 1 of 1 for SS 1: FD 1391766/RN,SN
WORD MARK                 LINEA ADRIANO
TRANSLATION               THE WORDS "LINEA ADRIANO" IN THE MARK MAY BE
                          TRANSLATED INTO ENGLISH AS "LINE ADRIANO"
GOODS AND SERVICES        IC 025: US 039: G & S: ARTICLES OF CLOTHING
                          FOR MEN, NAMELY JACKETS, COATS, SUITS,
                          TROUSERS, JUMPERS, SHIRTS AND TIES
MARK DRAWING CODE         (3) WORDS, LETTERS, AND/OR NUMBERS IN
                          STYLIZED FORM
SERIAL NUMBER             73-446950
FILING DATE               1983.10.06
CHANGE IN REGISTRATION    CHANGE IN REGISTRATION HAS OCCURRED
REGISTRATION NUMBER       1351766
REGISTRATION DATE         1985.07.30
OWNER NAME AND ADDRESS    (REGISTRANT) PITEX AG KLEIDERFABRIK ZOFINGEN
                          CORPORATION SWITZERLAND FUNKENSTRASSE 18
                          ZOFINGEN AARGAU SWITZERLAND
SECTION 44 INDICATOR      SECT 44
FOREIGN PRIORITY DATES    1983.06.20
DISCLAIMER                NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO
                          USE "LINEA" APART FROM THE MARK AS SHOWN
TYPE OF MARK              TRADEMARK
REGISTER                  PRINCIPAL

TMES9196                  73446950
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Linea Adriano

[1068 TMOG 7]

(161) Nonregistrability of Misleading Geographic Indications—Amendment of the Trademark Act by the North American Free Trade Agreement Implementation Act

Article 1712 of the North American Free Trade Agreement (NAFTA) requires the United States, Canada and Mexico to prohibit the use or Trademark registration of geographical indications in connection with goods that do not originate in the indicated territory, region or locality, if the public would be misled as to the geographical origin of the goods.1

President Clinton signed the "North American Free Trade Agreement Implemenation Act," Public Law 103-182, 107 Stat. 2057, on Dec. 8, 1993. The legislation. amending Sections 2(e), 2(f) and 23(a) of the Trademark Act, applies to applications filed on or after Dec. 8, 1993, and took effect on Jan. 1, 1994. The Act, entitled "An Act to provide for the registration and protection of trademarks in commerce, to carry out the provisions of certain international conventions, and for other purposes," approved July 5, 1946, commonly referred to as the Trademark Act of 1946, has been amended as indicated. Amendments are shown in italics:

I. Subsection 2(e) (15 U.S.C. 1052(e)):

"(e) Consists of a mark which (1) when used on or in connection with the goods of the applicant is merely descriptive or deceptively misdescriptive of them, (2) when used on or in connection with the goods of the applicant is primarily geographically descriptive of them, except as indications of regional origin may be registrable under section 4, (3) when used on or in connection with the goods of the applicant is primarily geographically deceptively misdescriptive of them, or (4) is primarily merely a surname."

II. Subsection (f) (15 U.S.C. 1052(f)):

"(f) Except as expresaly excluded in paragraphs (a), (b), (c), *(d), and (e)(3)* of this section, nothing herein shall prevent the registration of a mark used by the applicant which has become distinctive of the applicant's goods in commerce. The Commissioner may accept as prima facie evidence that the mark has become distinctive, as used on or in connection with the applicant's goods in commerce, proof of substantially exclusive and continuous use thereof as a mark by the applicant in commerce for the five years before the date on which the claim of distinctiveness is made. *Nothing in this section shall prevent the registration of a mark which, when used on or in connection with the goods of the goods of the applicant, is primarily geographically deceptively misdescriptive of them, and which became distinctive of the applicant's goods in commerce before the date of the enactment of the North American Free Trade Agreement Implementation Act."*

III. Section 23(a)(15 U.S.C 1091(a)):

"(a) In addition to the principle register, the Commissioner shall keep a continuation of the register provided in paragraph (b) of section 1 of the Act of March 19, 1920, entitled "An Act to give effect to certain provisions of the convention for the protection of trademarks and commercial names, made and signed in the city of Buenos Aires, in the Argentine Republic, August 20, 1910, and for other purposes", to be called the supplemental register. All marks capable of distinguishing applicant's goods or services and not register herein provided, except those declared to be unregistrable under subsections (a), (b), (c), *(d), and (e)(3)* of section 2 of this Act, which are in lawful use in commerce by the owner thereof, on or in coanection with any goods or services may be registered on the supplemental register upon the payment of the prescribed fee and compliance with the provisions of subsections (a) and (e) of section 1 so far as they are applicable. *Nothing in this section shall prevent the registration on the supplemental register of a mark, capable of distinguishing the applicant's goods or services and not registrable on the principal register under this Act, that is declared to be unregistrable under section 2(e)(3), if such mark has been in lawful use in commerce by the owner thereof, on or in connection with any goods or services, since before the date of the enactment of the North American Free Trade Agreement Implementation Act."*

A mark which is unregistrable on the Principal Register under 2(e)(3) of the Trademark Act, as amended, on the ground that it is primarily geographically deceptively misdescriptive of the goods or services, may be registered under 2(f) only if it became distinctive of the goods or services in commerce before December 8, 1993. Similarly, such a mark, capable of distinguishing the applicant's goods or services, may be registered on the Supplemental Register only if it has been in lawful use in commerce by the owner since before December 8, 1993. A mark that is unregistrable under 2 (e)(3) because it contains matter which is primarily geographically deceptively misdescriptive of the goods or services will not be rendered registrable by a disclaimer of the geographically deceptively misdescriptive component. Matter which is primarily geographically deceptively misdescrip- tive may be omitted or deleted from the drawing in appropriate cases.

1 The Article also prohibits any use constituting unfair competition within the meaning of Article 10bis (Unfair Competition) of the Paris Convention.

April 1, 1994 ROBERT ANDERSON
Acting Assistant Commissioner for Trademarks

[1162 TMOG 15]

**(162) Department of Commerce
Patent and Trademark Office**

**U.S. Patent and Trademark Office
Trademark Examining Groups**

EXAMINATION GUIDE NO. 1 - 95

Issued April 14, 1995

A. Examiner's Ameadments
B. Assertion of Use in "Interstate Commerce" by Foreign Applicants
C. Prior U.S. Classification
D. Disclaimers
E. Signatory Identified as Officer of Corporate Applicant
F. Apparent Discrepancies Between Dates of Use and Execution Dates

A. Examiner's Amendments

Previously, in order to initiate most examiners amendments, examining attorneys were required to contact the applicant or its attorney for approval. Examiner's amendments without the applicant's or attorney's authorization were permitted only for changes in classification prior to publication. TMEP §§ 1111 and 1111.02. Examining attorneys may now exercise discretion to amend applications by examiner's amendment without the applicant's prior approval in the following situations:

1. changes to international classification, **except where the change is made after publication and the change would require republication of the mark;**

2. deletion of "TM," "SM," "©" or "®" from the drawing;

3. addition of a formal description of the mark where it is necessary and **where the record already contains an informal indication of what the mark comprises;**

example: The cover letter with the application refers to the mark as a stylized golf ball design. If appropriate, the examining attorney could enter an amendment that "the mark consists of the stylized design of a golf ball."

4. amendment of the application to clarify that the mark is in typed form **when the record clearly indicates that the drawing is supposed to be in typed form;**

5. amendment of the method-of-use clause to insert a reference to the use shown by the specimens (including substitute specimens), where the application includes a method-of-use clause that does not refer to such use (The method-of-use clause need not be amended, however, if it specifies use "in other ways customary in the trade," and the specimens show a type of use customary in the trade, or if the clause includes other language that encompasses the use shown by the specimens.);

6. addition of lining and stippling statements, other than color lining statements, where such a statement is necessary, and **where the significance of the lining or stippling is indicated by specimens or other information of record;**

7. correction of obvious misspellings in the identification of goods and services.

example: The goods are recited as "T-shurtz." The examining attorney could amend to "T-shirts." However, "shirtz" could not be amended to "shirts" without calling the applicant, because "shirtz" might also be a misspelling of "shorts."

Disregard TMEP § 1111 to the extent that it conflicts with the above policy. Examining attorneys should continue to secure the applicant's approval for the above changes if calling the applicant on other matters, or if the record contains any ambiguity as to the applicant's intent.

Any applicant who disagrees with any of these changes should contact the examining attorney promptly after receipt of the examiner's amendment. See: TMEP § 804.10(d).

B. Assertion of Use in "Interstate Commerce" by Foreign Applicants

Examining Attorneys should discontinue issuing inquiries concerning the assertion of use in "interstate commerce" by foreign applicants under TMEP § 904.03(c).

C. Prior U.S. Classification

Examining attorneys no longer need to determine or enter the "correct" U.S. classes for goods and services. Effective March 2, 1995, all U.S. classes are automatically assigned by TRAM-2 based upon the International Class that has been assigned to the goods or services.

Whenever an International Class is added, dropped, or changed, TRAM-2 will update the U.S. Class with an automated table. Examining attorneys not only are not *expected* to modify the U.S. Class listing, but are not *able* to amend this field. This applies whether the amendment arises in a response or through an examiner's amendment.

D. Disclaimers

A disclaimer may be limited to pertain to only certain classes or certain goods or services.

E. Signatory Identified as Officer of Corporate Applicant

If the individual who signed an application or other document on behalf of a corporate applicant is identified as an officer of the applicant, the examining attorney need not require that the applicant specify the particular office held by that person. Disregard TMEP § 803.09 to the extent that it conflicts with this policy.

F. Apparent Discrepancies Between Dates of Use and Execution Dates

If an application, amendment to allege use or statement of use specifies a date of first use or first use in commerce only by the year, or by the month and year, and the date would be interpreted, according to TMEP § 904.07, as later than the date on which the document was signed, the Office will now presume that the date specified is the date of signing of the application, amendment to allege use or statement of use. In this case, it is unnecessary to amend to indicate the date more specifically or to secure a new declaration.

April 17, 1995 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1175 TMOG 64]

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(163) Trademark Drawings

Effective July 3, 1989, the requirement of Trademark Rule 2.52(c) (37 CFR 2.52(c)) that drawings in trademark applications be limited in size to 4 inches by 4 inches will be strictly enforced for the purpose of assigning a filing date, pursuant to Trademark Rule 2.21(a)(3) (37 CFR § 2.21(a)(3)). [This notice rescinds the prior notice concerning this issue in the *Official Gazette* of June 30, 1987, at 1079 TMOG 12.]

The drawing size limitation is necessary to permit entry of the drawing in the automated trademark search system (T-Search) as soon as possible after receipt of the application by the Patent and Trademark Office (PTO). Oversized or poor quality drawings require additional processing before they can be digitized (copied) and entered in T-Search. If the PTO must reduce a drawing, not only is there often a loss of detail and overall drawing quality, but drawing reduction processing lengthens the time before the mark and information about the application are available to the public. Furthermore, an oversized drawing that is not reduced by the PTO cannot be scanned in its entirety for entry in T-Search, resulting in the possible loss of portions of the mark.

Enforcement of the drawing size limitation rule as a requirement for receipt of a filing date will permit the PTO to expedite application processing and permit the applicant to control the reduction process and, thus, control the quality of the representation of the mark as it will appear in T-Search, in the *Official Gazette*, and on the registration certificate.

The Trademark Law Revision Act of 1988 [Title 1 of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)] will be implemented on Nov. 16, 1989. Two important provisions of the new law are that (1) an application for registration of the Principal Register may be filed based upon a bona fide intention to use a mark in commerce (15 U.S.C. 1051(b), as amended), and (2) for all applications filed on or after Nov. 16, 1989, upon the registration of a mark on the Principal Register, the application filing date becomes a constructive date of first use of the mark (15 U.S.C. 1057(c), as amended). Therefore, expedited processing to permit timely public notification of the filing of an application on the Principal Register will be particularly important.

Apr. 3, 1989 JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

[1102 TMOG 6]

**(164) Trademark Drawing Requirements
Trademark Rule 2.52, 37 C.F.R. § 2.52**

For an application to satisfy the filing date requirement under Trademark Rule 2.21(a)(3), 37 C.F.R. § 2.21(a)(3), it must include a drawing of the mark substantially meeting all the requirements of Trademark Rule 2.52, 37 C.F.R. § 2.52. Because the granting of a filing date to an application potentially establishes a date of constructive use of the mark, timely public notification of the filing of applications is important. Marks must be accurately and expeditiously entered into the automated search system and filed in the Trademark Search Library.

The purpose of this notice is to identify recurring problems which have resulted in the loss of filing dates for failure to comply with Rule 2.21(a)(3).

Color in the Mark

Rule 2.52(a) requires that every line and letter in a drawing, including color lining and lines used for shading, must be black. Color in a mark can be shown only by using the linings depicted in the color chart in Rule 2.52(e). This requirement is strictly enforced. The Office denies filing dates to applications where color appears on the drawing.

Drawing Size

The requirement of Rule 2.52(c) that the mark on a drawing be limited in size to 4 inches wide by 4 inches high continues to be strictly enforced. *In re Fuller-Jeffrey Broadcasting Corp. of Santa Rosa*, 16 USPQ2d 1456 (Comm'r Pats. 1990). See *Official Gazette Notice* at 1102 TMOG 6.

Two Drawings Submitted With One Application

A single application may seek registration of only one mark. Therefore, as a matter of policy, the Office denies a filing date to any application which is accompanied by two drawing, each displaying a different mark.

Heading

Rule 2.52(d) requires that the drawing include a heading which lists the applicant's name and address, the goods and services, the dates of first use of the mark for an application based on use in commerce under 15 U.S.C. § 1051(a), and the priority filing date for an application based upon a foreign application under 15 U.S.C § 1126(d). If the heading is committed in its entirety, a filing date is denied to the application. *See In re Hacksmack*, 16 USPQ2d 1895 (Comm'r Pats. 1990).

Two Page Drawings in Trademark Applications

The Office denies a filing date to any application in which the mark does not appear on the first page of the drawing.

Rule 2.52(d) requires that the drawing include a heading which lists, among other things, the goods and services for which registration is sought; and Rule 2.52(c) requires that there be a margin of at least one inch on the sides and bottom of the paper, and at least one inch between the mark and the heading.

Implicit in Rule 2.52 is a requirement that the mark and heading appear on a single page, in all but the most exceptional circumstances. There is an administrative need for a filing system that utilizes single page drawings, to expedite filing of mark drawings in the Trademark Search Library and entry of accurate information into the automated database. More importantly, there is a risk that the individual pages from multi-page drawings might become detached and separated in the Index of Pending Applications.

Historically, the Office has permitted the filing of drawings in which the heading continues onto a second page only where the goods and services covered by the application are so numerous that they cannot be listed within the heading margins on a single page. *Trademark Manual of Examining Procedure § 807.02*.

Although the Office prefers that the identification of goods or services in such cases be abbreviated so that the entire drawing will fit onto one page, the Office will continue to accept drawings on which the list of goods or services continues onto a second page, in appropriate circumstances.

If the goods and services are abbreviated in the drawing heading, as recommened here, this will in no way limit the goods and services covered by the application. For purposes of determining the goods and services covered by an application, the written application is always controlling. *See In re Tokiwa Mfg. Co. Ltd.*, 21 USPQ2d 1395 (Comm'r Pats. 1991).

If an applicant deems it to be necessary, the heading of a drawing may be continued onto a second page. However, in all cases, the mark and a portion of the heading must appear on the first sheet. The Office denies a filing date to any application which fails to display the mark, in accordance with the size and margin requirements of Rule 2.52(c), on the first page of the drawing. This requirement is strictly enforced.

May 8, 1992

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1139 TMOG 24]

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(165) **Waiver of Trademark Rule 2.76(a)**

Trademark Rule 2.76(a) now provides that an intent-to-use application under Section 1(b) of the Trademark Act may be amended to allege use of the mark in commerce, under Section 1(c) of the Act, at any time between the filing date of the application and either (1) the date the examining attorney approves the mark for publication or (2) the date of the expiration of the six-month period after issuance of a final refusal. Thus, if the examining attorney issues a final refusal and the applicant files an appeal to the Trademark Trial and Appeal Board six months thereafter, any amendment to allege use filed subsequently is considered untimely.

The Patent and Trademark Office has now had several years' experience with intent-to-use applications and with the filing of amendments to allege use and has had an opportunity to observe the effect of this rule in connection with the appeal process. We have found that the strict time limit set by the rule has forced some applicants to pursue appeals that might otherwise have been dismissed as moot. Thus, a Section 1(b) intent-to-use applicant cannot under the present rule, obtain a remand of its application from the Board to the examining attorney to allow consideration of an amendment to the Supplemental Register or a claim of acquired distinctiveness under Section 2(f). Even though such a remand is likely to lead to registration or to publication of the mark for oppostion the Board may not grant the request for remand unless the applicant filed an amendment to allege use before the expiration of the unable to grant remand, because use of the mark is a prerequisite to registration on the Supplemental Register and Rule 2.76(a) precludes the applicant from filing an amendment to allege use. The same result would follow where an intent-to-use applicant sought to assert acquired distinctiveness under Section 2(f). Because the Board has no discretion to remand applications in such situations, the rule has worked to delay or frustrate the registration process.

Accordingly, application of Rule 2.76(a) is hereby waived, in pertinent part, to eliminate the time limit during which an amendment to allege use may be filed after the examining attorney's final refusal to register. It should be noted that, although an amendment to allege use will now be considered timely even if filed during the pendency of an ex parte appeal, the Board retains jurisdiction over the application once an appeal is filed. The Board may, in its discretion, suspend action on the appeal and remand the application to the examining attorney for consideration of the amendment to the allege use; or it may continue action on the appeal, thus deferring examination of the amendment to allege use until after disposition of the appeal.

The Patent and Trademark Office will, in due course, publish a notice of proposed rulemaking to amend Trademark Rule 2.76(a).

Oct. 6, 1993

ROBERT M. ANDERSON
Acting Assistant Commissioner for Trademarks

[1156 TMOG 12]

(166) **Questions and Answers**

I. New Trademark Application Filing Requirements

The Trademark Law Revision Act of 1988, which was implemented on Nov. 16, 1989, contains the most significant amendments to the Lanham Act since its enactment in 1947. The Patent and Trademark Office has significantly revised the Trademark Rules of Practice to reflect the changes in the law. Additionally, the PTO has issued a supplement to Revision 7 of the *Trademark Manual of Examining Procedure* that reflects the changes in the law, rules, and Office policy and is available from the Government Printing Office.

The PTO's Office of the Assistant Commissioner for Trademarks has prepared a series of "Questions and Answers" about Office practice under the new law and rules. This first in the series concerns the requirements for the initial filing of an application. Subsequent "Questions and Answers" will address various examination issues, the statement of use, requests for extension of time to file the statement of use, the amendment to allege use and notice of allowance.

Q. What is an intent-to-use application?

A. The Trademark Law Revision Act of 1988 became effective on Nov. 16, 1989. It amended the Trademark Act to add a new basis for filing an application for Federal trademark registration on the Principal Register. A party with a bona fide intention to use a specific mark in commerce in relation to specific goods or services may now file an application. However, before the mark will be registered, the applicant must use the mark in commerce in connection with the specified goods or services and submit specimens evidencing use and a verified allegation concerning that use.

First, an intent-to-use application will be examined in relation to all substantive and procedural requirements, except use-related issues, and, if acceptable, published for opposition. If there is no opposition, or any opposition is resolved in the applicant's favor, the applicant will receive a notice of allowance.

The applicant must submit a statement of use within six months of that date, or request a six-month extension of time. The applicant may then request up to four additional six-month extensions of time in which to file the statement of use. The grant of such extensions is predicated, in part, upon the applicant's showing of "good cause" as to why the mark has not yet been used. Thus, an applicant may have up to 36 months from the mailing of the notice of allowance within which to file a statement of use. (See Trademark Rules 2.88 and 2.89 concerning the requirements for a statement of use and extension requests.) Upon filing, the statement of use will be examined and, if accepted, the mark will register.

Q. How does an intent-to-use application differ from an application based upon use in commerce?

A. The primary difference between the two types of applications is the basis for filing. Because of that difference, the filing requirements and processing of the two types of applications differ.

A party may not file an application based upon use of a mark in commerce until after that use has occured. Instead of asserting a bona fide intent to use the mark in commerce, the use-based application must include allegations concerning dates of use and specimens evidencing use as a filing requirement. The use-based application will be examined and, if acceptable, published for opposition. If the mark is not opposed, or any opposition is resolved in the applicant's favor, the mark will register. This procedure differs from the application procedure for an intent-to-use application, as noted above.

However, in all other respects the legal reasons for refusing registration (such as descriptiveness, likelihood of confusion, etc.) and the procedural requirements (such as specificity of identifications of goods, signature by applicant, etc.) are exactly the same for the two types of applications. Additionally, upon registration, the filing date of any application on the Principal Register is a constructive date of first use of the mark.

Q. What are the requirements for filing an intent-to-use application?

A. A complete intent-to-use application consists of a written application, a drawing of the mark, and the required filing fee for each class of goods. The requirements for a written intent-to-use application are set forth in Trademark Rule 2.33. The application must be made to the Commissioner of Patents and Trademarks, must include a request for registration, and must be signed and verified (sworn to) by the applicant.

The application must specify: the name and address of the applicant; information about the applicant's legal entity; a claim that the applicant has a bona fide intention to use the mark in commerce; the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark; the class of goods or services according to the official classification, if known to the applicant; and the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

The applicant must sign a verfication of the application which includes, in part, averments that the applicant is believed to be entitled to use the mark sought to be registered; that to the best of the declarant's knowledge and belief no other entity has the right to use the mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

Please note that Rule 2.33 differs form section 1(b) of the Act because the rule requires the above verification to include a statement that "the applicant is the owner of the mark" rather than that "the applicant believes it is entitled to use the mark." This specific requirement of the rule should be disregarded to the extent that it differs from the statute. The rule will be amended in due course.

Q. What are the minimum requirements for receipt of a filing date for an intent-to-use application?

A. Trademark Rule 2.21 sets forth the minimum requirements for receipt of a filing date for intent-to-use applications, as well as other types of applications. These minimum formal requirements do not include all of the requirements which may ultimately be necessary to obtain registration, but merely those which must be satisified to receive a filing date.

An intent-to-use application must include the following elements in order to receive a filing date: the name of the applicant, the name and address to which communications can be directed, a drawing of the mark substantially meeting all of the requirements of Trademark Rule 2.52, an identification of goods or services, *a claim of a bona fide intention to use the mark in commerce*, a verification or declaration under Trademark Rule 2.33(b) *signed by the applicant*, and the required filing fee for at least one class of goods or services. If an application lacks any one of these elements, it will be denied a filing date and all papers will be returned to the applicant as informal.

Q. Is there any change in the requirements for applications based upon either use in commerce or Section 44 of the Trademark Act?

A. Yes. Effective Nov. 16, 1989, an application *must* be signed in order to receive a filing date. Trademark Rule 2.21 has been amended to require that an application include a verification or declaration in accordance with Trademark Rule 2.33(b), signed by the applicant, to receive a filing date. This requirement applies to *all* applications filed after Nov. 16, 1989, regardless of the basis for filing. Unsigned applications will be returned to the applicant as informal. A verified assertion, signed by the applicant, of the basis for filing, is believed to be essential because of the importance of the filing date as a constructive date of first use of the mark for registration of the Principal Register.

All other filing requirements for use-based applications remain unchanged.

Concerning Section 44 which permits, under certain circumstances, the filing of an application in the United States based upon an application or registration in another country, there are two additional changes. Effective Nov. 16, 1989, an application

filed under Section 44(d) or Section 44(e) of the Trademark Act must include an allegation that the applicant has a bona fide intention to use the mark in commerce. However, Section 44 applicants will still be exempt from any use requirement as a condition to registration. In other words, Section 44 applicants are not required to file specimens evidencing use of the mark or an allegation of use in order to obtain registration.

As a requirement for obtaining a filing date, an application filed pursuant to Section 44(d) must include in the heading of the drawing the date of the foreign filing which forms the basis of its priority claim.

Q. Who can sign an application?

A. There are two issues that may arise with respect to the signature on an application: (1) whether the signature is sufficient for receipt of a filing date, and (2) whether the signature is that of the applicant.

The following persons can properly sign an application for an applicant: an individual applicant, a general partner of a partnership, or an officer of a corporation or association.

If an application is signed by an improper party, but the improper party had "color of authority" to act for applicant, the Office will require re-execution of the application, but will not invalidate the filing date. (See Trademark Rule 2.71(c) concerning "color of authority.") The Examining Attorney will determine whether the signatory had color of authority to sign the application for the applicant. A person has such color of authority if he or she has firsthand knowledge of the relevant facts and implied or actual authority to act on behalf of the applicant. A general manager may qualify under this standard. *The applicant's attorney will not ordinarily be regarded as possessing color of authority to sign on behalf of a client.* Attorneys, who are not employees of a corporate applicant, do not usually have firsthand knowledge of a client's business or the authority to act on behalf of a client, other than as legal representative.

If the signature is acceptable for the purpose of receiving a filing date (i.e., if the signatory had color of authority), but is not the signature of the applicant, a substitute verification by the applicant of the facts in the application will be required. If the person who signed did not have even color of authority, the Examining Attorney will refuse registration because the applicant did not meet the minimum requirements of Rule 2.21 for receipt of a filing date. An application signed by a party without color of authority is *void ab initio* and cannot be corrected by submission of a substitute declaration.

Q. Are "fax" copies of signatures acceptable?

A. The Trademark Operation does not have the equipment to accept documents transmitted by "fax" for purposes of receiving a filing date. However, the signature on a properly filed application may be a photocopy or "fax" copy of the original signature. The subsequent submission of the original document will be required by the Examining Attorney.

Q. What is the significance of the filing date?

A. Section 7 of the Trademark Act has been amended to provide that the filing date of an application of the Principal Register is a constructive date of first use of the mark in commerce, provided the application matures into a registration. Thus, filing affords the applicant nationwide priority over others, with the exception of parties who had used the mark before the applicant's filing date, parties who had filed before the applicant, or parties who are entitled to an earlier priority filing date based upon the filing of a foreign application under Section 44(d) of the Trademark Act.

Q. Can an application be based upon both use and intent-to-use?

A. No. Section 1(a) of the Trademark provides for the filing of applications based upon actual use in commerce, while Section 1(b) provides for the filing of applications based upon intent-to-use. Trademark Rule 2.33(d) states that an applicant may not file under both Sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under Section 1(a) of the Act amend to seek registration under Section 1(b). Any application filed under both Sections 1(a) and 1(b) of the Trademark Act will be denied a filing date and returned to the applicant.

Q. Can an applicant assert both a Section 44 claim and an intent-to-use or use claim in the same application?

A. Yes. Section 44(d) provides for applications based upon an application for registration filed in an applicant's country of origin, and section 44(e) provides for applications based upon a registration in applicant's country of origin. An application may be based upon both a foreign application or registration under Section 44 and either use in commerce under Section 1(a) or intent-to-use under Section 1(b).

Q. Since a Section 44 application contains a statement of a bona fide intent to use the mark in commerce, isn't this also an intent-to-use application?

A. No. The statement of a bona fide intent to use a mark is one of the statutory requirements for a Section 44 filing and the PTO will not consider the mere inclusion of such a statement to constitute the assertion of a basis for filing under Section 1(b) of the Act. In other words, once the requirements for Section 44 are met and the application successfully completes the opposition period, the mark will register (rather than a notice of allowance issuing in the application).

A Section 44 applicant may *also* assert an intent-to-use basis by explicitly stating, after its statement of a bona fide intent to use the mark in commerce, that it is also asserting a Section 1(b) basis for filing.

Q. Can an intent-to-use application be filed on the Supplemental Register?

A. No. An intent-to-use application initially filed on the Supplemental Register will be denied a filing date and returned to the applicant. No amendment of an intent-to-use application to the Supplemental Register will be accepted until after use has commenced and after the filing and acceptance of an amendment to allege use or a statement of use. In such a case, the effective filing date of the application will be changed to the date on which the applicant filed the amendment to allege use under Section 1(c) of the Trademark Act or the statement of use under Section 1(d) of the Act.

Q. Must an intent-to-use applicant begin using the mark before a registration will issue?

A. Yes. An intent-to-use application may not mature into a registration until use of the mark has begun. After use begins, the applicant must verify such use in either (1) an amendment to allege use or (2) a statement of use. In addition, applicant must submit specimens evidencing use and a fee of $100 per class of goods or services in the application.

Q. What is the difference between an amendment to allege use and a statement of use?

A. The primary difference between the amendment to allege use and the statement of use is the time of filing. The amendment to allege use may be filed during initial examination of the application, i.e., after the filing date of the application and before the date on which the Examining Attorney approves the mark for publication. If the amendment to allege use is accepted, the application will then be processed for publication and issuance in the same manner as a use-based application.

If no amendment to allege use is filed before the Examining Attorney approves the mark for publication, the mark will be published for opposition. After the successful completion of the opposition period, the PTO will issue a notice of allowance. The applicant will then have six months from the date of the notice of allowance in which it must file a statement of use, or file a written request for an extension of time in which to file the statement of use. Successive extensions of time, aggregating no more than 36 months from the notice of allowance, may be obtained pursuant to Trademark Rule 2.89.

Nov. 27, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1110 TMOG 622]

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(167) **Receipt of a Filing Date Under Section 44 of the Trademark Act - Claim of a Bona Fide Intention to Use the Mark in Commerce Required**

For purposes of receiving a filing date, applications filed in the United States based on prior registrations in an applicant's country of origin under Section 44(e) of the Trademark Act, 15 U.S.C. § 1126(e), and applications claiming the benefit of a priority filing date in the United States based on prior application in a Paris Convention country under Section 44(d) of the Act, 15 U.S.C. § 1126(d), must include a statement "that the applicant has a bona fide intention to use the mark in commerce." 15 U.S.C. 1126(d) and (e); Trademark Rules 2.21(a) (5) (ii) and (iii); 37 C.F.R. § 2.21(a) (5) (ii) and (iii).

The claim of a bona fide intention to use the mark in commerce is expressly required by the statute and cannot be waived by the Commissioner for any reason. The claim is required in all applications filed under Section 44, even if the applicant has commenced use of the mark in commerce, and even if the applicant is also filing on the basis of use in commerce under Section 1(a) of the Act.

Where a Section 44 applicant has used the mark in commerce, it may choose to submit for the record an additional statement regarding actual use. For example, an applicant could state that it "has a bona fide intention to use the mark in commerce, as evidenced by the fact that actual use in commerce with the United States has commenced." In this way, the application will contain the statutorily required language of a "bona fide intention to use the mark in commerce," as well as the additional clarifying language that, in this particular instance, the mark is actually in use in commerce.

Jan. 8, 1992 JEFFREY M. SAMUELS
Assistant Commissioner for Trademark

[1135 TMOG 44]

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(168) **Reminders Concerning the Revised Rules of Practice in Trademark Cases**

The Office offers the following reminders concerning certain requirements under the revised Rules of Practice in Trademark Cases to ensure proper and efficient processing of trademark papers.

1. Statement of A Bona Fide Intention to Use in Commerce

The Office has received a number of applications filed based on Trademark Act Section 44 which contain no claim of bona fide intention to use the mark in commerce. Sections 44(d)(2) and 44(e), and revised Trademark Rule 2.21 state the requirements for filing a trademark application based on a foreign application or registration. These sections require, among other things, that all applications filed pursuant to Section 44 state a bona fide intention to use the mark in commerce. Therefore if the application is filed based only on Section 44, and applicant has not recited a claim of bona fide intention to use the mark in commerce, the application will not be accorded a filing date and will be returned to the applicant.

This statement must include the words "in commerce." The statement should be set forth in its entirety prominently in the opening statement of the application to ensure that the application is accorded a filing date. The applicant may repeat the statement in the application declaration, if desired.

2. Assertion of Two Bases

If the applicant wishes to file based on both a bona fide intention to use the mark in commerce under Trademark Act Section 1(b) *and* a foreign application or registration under Trademark Act Section 44, the applicant must clearly indicate its intention to do so. In a Section 44 filing the Office will not presume Trademark Act Section 1(b) as an additional basis for filing by the mere statement of a bona fide intention to use the mark in commerce. If the applicant wishes to claim an additional basis under Section 1(b) of the Act it should indicate its intention with a separate statement claiming a basis under Section 1(b).

3. Filing Papers Before Notification of Serial Number

The Office recommends that applicants wait until they have received the filing fee receipt before filing any papers related to a trademark application. The filing fee receipt includes the assigned application serial number. The applicant should refer to the serial number in filing any paper to ensure that the paper is associated with the correct application file. For example, if applicant has filed a photocopy of its application in order to receive a filing date and follows up the photocopy with an original document, the applicant should wait for the filing fee receipt in order to have a serial number with which to reference the second document. Without the reference number, the papers may be returned to the applicant or the papers may be identified as a new filing, and accorded a new serial number.

In the same manner, it is preferable that amendments to allege use under Trademark Act Section 1(c) should not be filed until a filing fee receipt has issued and applicant can reference the serial number of the appropriate application when it submits its amendment to allege use.

The filing of an amendment to allege use has important ramifications in the publication of the mark and production of the *Official Gazette*. Therefore it is especially important that the Office be able to identify and process those papers promptly.

If the applicant files an amendment to allege use along with other amendments, it would be helpful if the applicant provides some indication that the filing is both an amendment to allege use and other amendments.

4. Section 8 Affidavit Requirements

Trademark Act Section 8, as amended, and revised Trademark Rule 2.162 requires, among other things, that registrants set forth the "goods or services recited in the registration on or in connection with which the mark is in use in commerce." The goods and services must also be set forth in any affidavit asserting excusable nonuse. Formerly, applicants were not required to set forth the specific goods and services. Applicant may meet the requirement to specify the goods or services *either* by listing the goods *or* services or by incorporating the goods and services by reference, e.g., "The registered mark is in use in commerce with all the goods and services listed in the registration." The list of goods and services or applicant's incorporation of the goods and services by reference should appear somewhere in the body of the affidavit.

Applicants should also take note of the revised requirement for a specimen or facsimile for each class of goods or services in the registration. The specimen or facsimile for each class must be filed prior to the end of the sixth year. Failure to meet these revised requirements may result in cancellation of all or part of a registration.

5. Filing of Miscellaneous Papers

Every paper filed with the Office which relates to an application or registration should include the serial number of the application or the registration number of the registration. The best practice would be to have the application number or registration number appear on every single sheet of paper which an applicant or registrant files with the Office, including any

substitute specimens which applicant may file. Those papers filed with the Office which do not have the application serial number or the registration number reference on them must be identified by Office personnel using alternative means such as looking up the mark or owner in the automated search system. However, if papers become detached, the information which the Office needs to join a particular piece of correspondence to the correct file may not be available.

6. Time for Filing Corrections to Amendments to Allege Use

Applicants should note that Rule 2.76(a) provides that filing an amendment to allege use of a mark in commerce under section 1(c) is only permitted be- tween the time of filing the application and the time the examiner approves the mark for publication. If applicant's amendment to allege use fails to meet the minumum requirements for an amendment to allege use as set out in Rule 2.76(e)(3), applicant must correct those defects prior to approval of the mark for publication or the application will be published without any consideration of the amendment to allege use. If the file is approved for publication before applicant can correct its amendment to allege use, applicant will be required to wait until a notice of allowance issues before it can file its affidavit of use. In these circumstances the fee applicant submitted for its original amendment to allege use will not be refunded or applied to the later filed statement of use.

Apr. 12, 1990 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1114 TMOG 31]

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(169) **Department of Commerce**
Patent and Trademark Office

37 CFR Parts 1, 2, and 7
[Docket No. 950501124-5185-02]
RIN 0651-AA74

Revision of Patent and Trademark Fees

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in patent and trademark cases, Parts 1, 2 and 7 of title 37, Code of Federal Regulations, to adjust certain patent and trademark fee amounts to reflect fluctuations in the Consumer Price Index (CPI) and to recover costs of operation, and is amending the requirements for recording documents on the Government Register. This rule also includes information relating to the availability of patent and trademark information products provided by the PTO.
Effective Date: October 1, 1995.
For Further Information Contact: Robert Kopson by telephone at (703) 305-8510, fax at (703) 305-8525, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: This rule change is designed to adjust PTO fees in accordance with the applicable provisions of title 35, United States Code; section 31 of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113); and section 10101 of the Omnibus Budget Reconciliation Act of 1990 (as amended by section 8001 of Public Law 103-66), all as amended by the Patent and Trademark Office Authorization Act of 1991 (Public Law 102-204).

The cover sheet referenced in 37 CFR 7.1 (c) must be in a format approved by the Office. The Office of Public Records will maintain a list of approved formats that will meet this requirement. Contact the Office of Public Records at (703) 308-9743 regarding specific questions relating to this requirement and to seek approval of additional formats.

BACKGROUND

Statutory Provisions

Patent fees are authorized by 35 U.S.C. 41 and 35 U.S.C. 376. A fifty percent reduction in the fees paid under 35 U.S.C. 41(a) and (b) by independent inventors, small business concerns, and nonprofit organizations who meet prescribed definitions is required by 35 U.S.C. 41(h).

Subsection 41(f) of title 35, United States Code, provides that fees established under 35 U.S.C. 41(a) and (b) may be adjusted on October 1, 1992, and every year thereafter, to reflect fluctuations in the Consumer Price Index (CPI) over the previous 12 months.

Section 10101 of the Omnibus Budget Reconciliation Act of 1990 (amended by section 8001 of Public Law 103-66) provides that there shall be a surcharge on all fees established under 35 U.S.C. 41(a) and (b) to collect $111 million in fiscal year 1996.

Subsection 41(d) of title 35, United States Code, authorizes the Commissioner to establish fees for all other processing, services, or materials related to patents to recover the average cost of providing these services or materials, except for the fees for recording a document affecting title, for each photocopy, and for each black and white copy of a patent.

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty (PCT).

Subsection 41(g) of title 35, United States Code, provides that new fee amounts established by the Commissioner under section 41 may take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the Patent and Trademark Office*.

Section 31 of the Trademark (Lanham) Act of 1946, as amended (15 U.S.C. 1113), authorizes the Commissioner to establish fees for the filing and processing of an application for the registration of a trademark or other mark, and for all other services and materials relating to trademarks and other marks.

Section 31(a) of the Trademark (Lanham) Act of 1946 (15 U.S.C. 1113(a)), as amended, allows trademark fees to be adjusted once each year to reflect, in the aggregate, any fluctuations during the preceding 12 months in the CPI.

Section 31 also allows new trademark fee amounts to take effect thirty days after notice in the *Federal Register* and the *Official Gazette of the United States Patent and Trademark Office*.

Recovery Level Determinations

This rule adjusts patent and trademark fees for a planned recovery of $643,014,000 in fiscal year 1996, as proposed in the Administration's budget request to the Congress.

The patent statutory fees established by 35 U.S.C. 41(a) and (b) are being adjusted on October 1, 1995, to reflect any fluctuations occurring during the previous 12 months in the Consumer Price Index (CPI-U). In calculating these fluctuations, the Office of Management and Budget (OMB) has determined that the PTO should use CPI-U data as determined by the Secretary of Labor. However, the Department of Labor does not make public the CPI-U until approximately 21 days after the end of the month being calculated. Therefore, the latest CPI-U information available is for the month of May 1995. In accordance with previous rulemaking methodology, the PTO uses the Administration's projected CPI-U for the 12-month period ending September 30, 1995, which is 3.2 percent. Based on this projection, patent statutory fees will be adjusted by 3.2 percent. Before the final fee schedule is published, the fees may be slightly adjusted based on actual data available from the Department of Labor.

Certain non-statutory patent processing fees established under 35 U.S.C. 41(d) and PCT processing fees established under 35 U.S.C. 376 are being adjusted to recover their estimated average costs in fiscal year 1996. Three patent service fees that are set by statute will not be adjusted. The three fees that are not being adjusted are assignment recording fees, printed patent copy fees and photocopy charge fees.

Certain trademark service fees established under 15 U.S.C. 1113 are being adjusted to recover their estimated average costs in fiscal year 1996.

The fee amounts were rounded by applying standard arithmetic rules so that the amounts rounded would be convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to an even number so that the comparable small entity fee would be a whole number.

Workload Projections

Determination of workloads varies by fee. Principal workload projection techniques are as follows:

Patent application workloads are projected from statistical regression models using recent application filing trends. Patent issues are projected from an in-house patent production model and reflect examiner production achievements and goals. Patent maintenance fee workloads utilize patents issued 3.5, 7.5 and 11.5 years prior to payment and assume payment rates of 79 percent, 55 percent and 32 percent, respectively. Service fee workloads follow linear trends from prior years' activities.

General Procedures

Any fee amount that is paid on or after the effective date of the fee increase would be subject to the new fees then in effect. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing or Transmission, where authorized under 37 CFR 1.8, will be considered to be the date of receipt in the PTO. A Certificate of Mailing or Transmission under Section 1.8 is not "proper" for items which are specifically excluded from the provisions of Section 1.8. Section 1.8 should be consulted for those items for which a Certificate of Mailing or Transmission is not "proper." Such items include, inter alia, the filing of national and international applications for patents and the filing of trademark applications. However, the provisions of 37 CFR 1.10 relating to filing papers and fees with an "Express Mail" certificate do apply to any paper or fee (including patent and trademark applications) to be filed in the PTO. If an application or fee is filed by "Express Mail" with a proper certificate dated on or after the effective date of the rules, as amended, the amount of the fee to be paid would be the fee established by the amended rules.

A notice of final rulemaking was published at 60 FR 20195 (April 25, 1995) wherein several new fee provisions were made to implement the 20-year patent term and provisional applications. Language changes were made in 37 CFR 1.16(a), (b), (d), (f), and (g) which are reproduced in this final rule package. In addition, fees involving 37 CFR 1.17(r) and (s) are being adjusted by changes in the CPI to remain equal to the basic filing fee for a utility patent application.

PTO Information Dissemination Products

The PTO provides information to the public in the Patent Search Room and the Trademark Search Library in Arlington, Virginia, and at 78 Patent and Trademark Depository Libraries around the country. A list of the libraries is included in each issue of the *Official Gazette of the Patent and Trademark Office*. In addition, a number of patent and trademark search tools and document-delivery products, published on paper and on various machine-readable media, are sold directly to the public.

Printed PTO publications may be ordered from the Government Printing Office (GPO) or one of its Book Stores located throughout the country. A list of patent and trademark-related publications with current prices and ordering information is available from the GPO (Subject Bibliography SB 021).

Superintendent of Documents
P.O. Box 371984
Pittsburgh, Pa. 15250-7954
Voice: 202-512-1800
Fax: 202-512-2250

Machine-readable publications, including magnetic tapes and CD-ROMs, may be ordered directly from the PTO. A printed catalog of machine-readable products, including current prices and ordering information, is available from the Office of Information Products Development.

US Patent and Trademark Office
Office of Information Products Development
Crystal Park 3, Room 412
Washington, D.C. 20231
Voice: 703-308-0322
Fax: 703-308-0493

The catalog of machine-readable products is published in the *Official Gazette of the Patent and Trademark Office* in late December each year and may also be viewed on, or downloaded from, the PTO electronic bulletin board (703-305-8950, 8/no/1) or from the PTO's home page on the Internet (http://www.uspto.gov/).

In order to ensure clarity in the implementation of the new fees, a discussion of specific sections is set forth below.

Discussion of Specific Rules

37 CFR 1.16 National application filing fees.

Section 1.16, paragraphs (a), (b), (d), and (f)-(i), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.16, paragraphs (a), (b), (d), and (g) include language changes relating to provisional patent applications (see 60 FR 20195, dated April 25, 1995).

37 CFR 1.17 *Patent application processing fees.*

Section 1.17, paragraphs (b)-(g) (m), (r), and (s), is revised to adjust fees established therein to reflect fluctuations in the CPI.

Section 1.17, paragraphs (j) and (n)-(p), is revised to adjust fees established therein to recover costs.

37 CFR 1.18 *Patent issue fees.*

Section 1.18, paragraphs (a)-(c), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.19 *Document supply fees.*

Section 1.19, paragraphs (a)(1)(ii) and (a)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 1.19, paragraph (b)(1), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.20 *Post-issuance fees.*

Section 1.20, paragraphs (c), (i), and (j), is revised to adjust fees established therein to recover costs.

Section 1.20, paragraphs (e)-(g), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 1.21 *Miscellaneous fees and charges.*

Section 1.21, paragraph (a)(1), is revised to adjust fees established therein to recover costs.

37 CFR 1.445 *International application filing, processing, and search fees.*

Section 1.445, paragraph (a), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.482 *International preliminary examination fees.*

Section 1.482, paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii), is revised to adjust the fees authorized by 35 U.S.C. 376 to recover costs.

37 CFR 1.492 *National stage fees.*

Section 1.492, paragraphs (a), (b) and (d), is revised to adjust fees established therein to reflect fluctuations in the CPI.

37 CFR 2.6 *Trademark fees.*

Section 2.6, paragraphs (b)(1)(ii) and (b)(1)(iii), is revised to amend the language to reflect the PTO's most recent business practices.

Section 2.6, paragraph (b)(2), is revised to adjust fees therein to recover costs.

37 CFR 7.1 Requirements

Section 7.1, is revised to designate the current language as paragraph (a), and to add new paragraphs (b)-(j) to clarify that the requirements for patent and patent application assignment documents, including the requirement for the fee set forth in § 1.21(h), submitted for recording also apply to instruments submitted for recording on the Government Register. Sections 7.1(b)-(d) and (f)-(i) contain language similar to that in §§ 3.21, 3.28, 3.31, 3.34, 3.26, 3.27, and 3.41, respectively.

Section 7.1(b), is added to provide that an instrument relating to a patent must identify the patent by the patent number, that an instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, e.g., 07/123,456) or the serial number and filing date, that an instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (e.g., PCT/US90/01234), and that if an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

Section 7.1(c), is added to provide that each instrument submitted to the PTO for recording must be accompanied by a cover sheet referring to those patent applications and patents against which the instrument is to be recorded, that one set of instruments and cover sheets to be recorded should be filed, and that if an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

Section 7.1(d), is added to provide that each cover sheet must contain: (1) the name of the party conveying the interest; (2) the name and address of the party receiving the interest; (3) a description of the interest conveyed or transaction to be recorded; (4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application; (5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed; (6) the number of applications or patents identified in the cover sheet and the total fee; (7) the date the instrument was executed; (8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and (9) the signature of the party submitting the instrument.

Section 7.1(e), is added that each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must: (1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7, and (2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

Section 7.1 (f), is added to provide for the correction of errors in the cover sheet. Specifically, § 7.1(e), provides that an error in a cover sheet recorded pursuant to this Part will be corrected only if: (1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and (2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

Section 7.1(g), is added to provide that the Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

Section 7.1(h), is added to provide that instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

Section 7.1(i), is added to provide that all requests, except as provided by paragraph (j) of this section, to record instruments must be accompanied by the recording fee set forth in § 1.21(h) of this chapter, and that the fee set forth in § 1.21(h) of this chapter is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

Section 7.1 (j), is added to provide that no fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943-1948 Comp.) to be filed if: (1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and (2) the cover sheet is filed in a format approved by the Office.

Response to Comments on the Rules

A notice of proposed rulemaking to adjust certain patent and trademark fee amounts and to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register was published in the *Federal Register* on May 26, 1995, at 60 FR 27934, and in the *Official Gazette of the United States Patent and Trademark Office* on May 30, 1995, at 1174 OG 134.

A public hearing was held June 29, 1995. Nine comments were received and considered in adopting the rules set forth herein. No oral testimony was presented.

Comments: Two respondents stated that the proposed inflationary increase of patent and trademark fees is unnecessary because the PTO is already operating at a surplus.
Response: Current PTO resources include carryover funds from fiscal year 1994. These carryover funds are partly unobligated balances to be carried forward, but primarily advanced fee payments for work to be done in fiscal year 1995. Furthermore, this carryover includes fee income generated from trademark-related products and services which, according to 35 U.S.C. 42(c), may be used only for trademark-related activities. Therefore, to recover all costs associated with the processing of patent applications, and to remain consistent with the current rate of inflation, the PTO is increasing certain patent fees by 3.2 percent as authorized by 35 U.S.C. 41(f).

In addition, two trademark service fees were proposed to be increased. The adopted fee amounts will recover the average cost of providing the service as authorized by 35 U.S.C. 41(d), and will also remain consistent with the equivalent patent service fee amounts.

Comments: Seven respondents objected to the proposal to amend the requirements for recording an assignment to apply to documents forwarded for recording on the Government Register. The respondents stated that not only are Government agencies required by Executive Order 9424 to forward an assignment to the PTO for recordation, but also the PTO lacks the authority under Title 35 of the United States Code to impose a fee for recording an assignment on the Government Register.
Response: 35 U.S.C. 41(d)(1) provides that the Commissioner shall charge a fee of $40 per property for recording any document affecting title. An assignment is a document affecting title. Therefore, the Office must require a $40 recording fee for recording any assignment, even those being recorded on the Government Register. If a document to be recorded on the Government Register does not affect title and if it is accompanied by the appropriate cover sheet, then no fee is required.

Other Considerations

This final rule change is in conformity with the requirements of Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. This rulemaking contains no information collection within the meaning of the Paperwork Reduction Act. This final rule has been determined not to be significant for purposes of Executive Order 12866.

The PTO has determined that this final rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the final rule change would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The final rule change increases fees to reflect the change in the CPI as authorized by 35 U.S.C. 41(f). Further, the principal impact of the major patent fees has already been taken into account in 35 U.S.C. 41(h), which provides small entities with a 50-percent reduction in the major patent fees.

A comparison of existing and new fee amounts is included as an Appendix to this notice of final rulemaking.

Lists of Subjects

37 CFR Part 1

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 7

Administrative practice and procedure, Inventions and patents, Reporting and record keeping requirements.

For the reasons set forth in the preamble, the PTO is amending title 37 of the Code of Federal Regulations, Chapter I, Part 1, as set forth below.

Part 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is amended by revising paragraphs (a), (b), (d), and (f) through (i), to read as follows:

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except provisional, design or plant applications:

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(b) In addition to the basic filing fee in an original application, except provisional applications, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $39.00
By other than a small entity $78.00

*****

(d) In addition to the basic filing fee in an original application, except provisional applications, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $125.00
By other than a small entity $250.00

(If the additional fees required by paragraphs (b), (c), and (d) of this section are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)

*****

(f) Basic fee for filing each design application

By a small entity (§ 1.9(f)) $155.00
By other than a small entity $310.00

(g) Basic fee for filing each plant application, except provisional applications:

By a small entity (§ 1.9(f)) $255.00
By other than a small entity $510.00

(h) Basic fee for filing each reissue application:

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:

By a small entity (§ 1.9(f)) $39.00
By other than a small entity $78.00

*****

3. Section 1.17 is amended by revising paragraphs (b) through (g), (j), (m) through (p), (r), and (s) to read as follows:

§ 1.17 Patent application processing fees.

*****

(b) Extension fee for response within second month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $190.00
By other than a small entity $380.00

(c) Extension fee for response within third month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $450.00
By other than a small entity $900.00

(d) Extension fee for response within fourth month pursuant to § 1.136(a):

By a small entity (§ 1.9(f)) $700.00
By other than a small entity $1,400.00

(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:

By a small entity (§ 1.9(f)) $145.00
By other than a small entity $290.00

(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:

By a small entity (§ 1.9 (f)) $145.00
By other than a small entity $290.00

(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in an appeal under 35 U.S.C. 134:

By a small entity (§ 1.9(f)) $125.00
By other than a small entity $250.00

*****

(j) For filing a petition to institute a public use proceeding under § !.292 ..... $1,430.00

*****

(m) For filing a petition:

(1) For revival of an unintentionally abandoned application, or

(2) For the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.9(f)) $625.00
By other than a small entity $1,250.00

(n) For requesting publication of a statutory invention registration prior to the mailing of the first examiner's action pursuant to § 1.104—$870.00 reduced by the amount of the application basic filing fee paid.

(o) For requesting publication of a statutory invention registration after the mailing of the first examiner's action pursuant to § 1.104—$1,740.00 reduced by the amount of the application basic filing fee paid.

(p) For submission of an information disclosure statement under § 1.97(c) $220.00

*****

(r) For entry of a submission after final rejection under §1.129(a):

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(s) For each additional invention requested to be examined under § 1.129(b):

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:

By a small entity (§ 1.9(f)) $625.00
By other than a small entity $1,250.00

(b) Issue fee for issuing a design patent:

By a small entity (§ 1.9(f)) $215.00
By other than a small entity $430.00

(c) Issue fee for issuing a plant patent:

By a small entity (§ 1.9(f)) $315.00
By other than a small entity $630.00

5. Section 1.19 is amended by revising paragraphs (a)(1)(ii), (a)(1)(iii), (b)(1)(i), and (b)(1)(ii) to read as follows:

§ 1.19 Document supply fees.

*****

(a) ***

(1) ***

*****

(ii) Overnight delivery to PTO Box or overnight fax $6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two workdays $25.00

*****

(b) ***

(1) ***

(i) Regular service $15.00
(ii) Expedited regular service $30.00

*****

6. Section 1.20 is amended by revising paragraphs (c), (e) through (g), (i)(1), (i)(2), and (j) to read as follows:

§ 1.20 Post issuance fees.

*****

(c) For filing a request for reexamination (§ 1.510(a)) $2,390.00

*****

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond four years; the fee is due by three years and six months after the original grant

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond eight years; the fee is due by seven years and six months after the original grant

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980, in force beyond twelve years; the fee is due by eleven years and six months after the original grant

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

*****

(i) ***

(1) unavoidable $660.00
(2) unintentional $1,550.00

*****

(j) For filing an application for extension of the term of a patent (§ 1.740) $1,060.00

7. Section 1.21 is amended by revising paragraph (a)(1) to read as follows:

§ 1.21 Miscellaneous fees and charges.

*****

(a) ***

(1) For admission to examination for registration to practice: fee payable upon application $310.00

*****

8. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing, processing and search fees.

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14) $220.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:

(i) No corresponding prior United States national application with basic filing fee has been filed $660.00
(ii) A corresponding prior United States national application with basic filing fee has been filed $430.00

(3) A supplemental search fee when required, per additional invention $190.00

*****

9. Section 1.482 is amended by revising paragraphs (a)(1)(i), (a)(1)(ii), and (a)(2)(ii) to read as follows:

§ 1.482 International preliminary examination fees.

(a) ***

(1) A preliminary examination fee is due on filing the Demand:

(i) Where an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority, a preliminary examination fee of $470.00
(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office, a preliminary examination fee of $710.00

(2) ***

(ii) Where the International Searching Authority for the international application was an authority other than the United States Patent and Trademark Office $250.00

*****

10. Section 1.492 is amended by revising paragraphs (a), (b), and (d) to read as follows:

§ 1.492 National stage fees.

*****

(a) The basic national fee:

(1) Where an international preliminary examination fee as set forth in § 1.482 has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $340.00
By other than a small entity $680.00

(2) Where no international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office, but an international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office as an International Searching Authority:

By a small entity (§ 1.9(f)) $375.00
By other than a small entity $750.00

(3) Where no international preliminary examination fee as set forth in § 1.482 has been paid and no international search fee as set forth in § 1.445(a)(2) has been paid on the international application to the United States Patent and Trademark Office:

By a small entity (§ 1.9(f)) $505.00
By other than a small entity $1,010.00

(4) Where an international preliminary examination fee as set forth in § 1.482 has been paid to the United States Patent and Trademark Office and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness), and industrial applicability, as defined in PCT Article 33 (1) to (4) have been satisfied for all the claims presented in the application entering the national stage (see § 1.496(b)):

By a small entity (§ 1.9(f)) $47.00
By other than a small entity $94.00

(5) Where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office:

By a small entity (§ 1.9(f)) $440.00
By other than a small entity $880.00

(b) In addition to the basic national fee, for filing or later presentation of each independent claim in excess of 3:

By a small entity (§ 1.9(f)) $39.00
By other than a small entity $78.00

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(d) In addition to the basic national fee, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:

By a small entity (§ 1.9(f)) $125.00
By other than a small entity $250.00

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Part 2 - Rules of Practice in Trademark Cases

1. The authority citation for 37 CFR Part 2 would continue to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by revising paragraphs (b)(1)(ii), (b)(1)(iii), (b)(2)(i), and (b)(2)(ii) to read as follows:

§ 2.6 Trademark fees.

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(b) ***

(1) ***

*****

(ii) Overnight delivery to PTO Box or overnight fax $6.00
(iii) Expedited service for copy ordered by expedited mail or fax delivery service and delivered to the customer within two work days $25.00

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(2) ***

(i) Regular service $15.00
(ii) Expedited local service $30.00

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Part 7 - Register of Government Interests in Patents

1. The authority citation for 37 CFR Part 7 would continue to read as follows:

Authority: E.O. 9424, February 18, 1944, 9 FR 1959; 3 CFR 1943-1948 Comp.

2. Section 7.1 is revised to read as follows:

a) Executive Order 9424 (3 CFR 1943-1948 Comp.) requires the several departments and other executive agencies of the Government, including Government-owned or Government-controlled corporations, to forward promptly to the Commissioner of Patents and Trademarks for recording all licenses, assignments, or other interests of the Government in or under patents or applications for patents.

(b) An instrument relating to a patent must identify the patent by the patent number. An instrument relating to a national patent application must identify the national patent application by the application number (consisting of the series code and the serial number, *e.g.*, 07/123,456) or the serial number and filing date. An instrument relating to an international patent application which designates the United States of America must identify the international application by the international application number (*e.g.*, PCT/US90/01234). If an assignment is executed concurrently with, or subsequent to, the execution of the patent application, but before the patent application is filed, it must identify the patent application by its date of execution, name of each inventor, and title of the invention so that there can be no mistake as to the patent application intended.

(c) Each instrument submitted to the Office for recording must be accompanied by at least one cover sheet as specified in paragraph (d) of this section referring to those patent applications and patents against which the instrument is to be recorded. Only one set of instruments and cover sheets to be recorded should be filed. If an instrument to be recorded is not accompanied by a completed cover sheet, the instrument and any incomplete cover sheet will be returned for proper completion of a cover sheet and resubmission of the instrument and a completed cover sheet.

(d) Each cover sheet required by paragraph (c) of this section must contain:

(1) the name of the party conveying the interest;
(2) the name and address of the party receiving the interest;
(3) a description of the interest conveyed or transaction to be recorded;
(4) each application number or patent number against which the instrument is to be recorded, or an indication that the instrument is filed together with a patent application;
(5) the name and address of the party to whom correspondence concerning the request to record the instrument should be mailed;
(6) the number of applications or patents identified in the cover sheet and the total fee;
(7) the date the instrument was executed;
(8) a statement by the party submitting the instrument that to the best of the person's knowledge and belief, the information contained on the cover sheet is true and correct and any copy submitted is a true copy of the original instrument; and
(9) the signature of the party submitting the instrument.

(e) Each patent cover sheet required by paragraph (c) of this section seeking to record a governmental interest as provided by paragraph (a) of this section must:

(1) indicate that the instrument is to be recorded on the governmental register, and, if applicable, that the instrument is to be recorded on the Secret Register. See § 7.7.
(2) indicate, if applicable, that the instrument to be recorded is not an instrument affecting title. See paragraph (j) of this section.

(f) An error in a cover sheet recorded pursuant to this Part will be corrected only if:

(1) the error is apparent when the cover sheet is compared with the recorded instrument to which it pertains, and
(2) a corrected cover sheet accompanied by the recording fee set forth in paragraph (i) of this section and either the original recorded instrument or a copy of the original recorded instrument is filed for recordation.

(g) The Office will accept and record non-English language instruments only if accompanied by a verified English translation signed by the individual making the translation.

(h) Instruments and cover sheets to be recorded should be addressed to the Commissioner of Patents and Trademarks, Box Assignment, Washington, D.C. 20231.

(i) All requests to record instruments must be accompanied by the appropriate fee. Except as provided in paragraph (j) of this section, a recording fee set forth in § 1.21(h) of this chapter fee is required for each application and patent against which the instrument is recorded as identified in the cover sheet.

(j) No fee is required for each patent application and patent against which an instrument required by Executive Order 9424 (3 CFR 1943 - 1948 Comp.) to be filed if:

(1) the instrument does not affect title and is so identified in the cover sheet (see paragraph (e) of this section); and
(2) the cover sheet is filed in a format approved by the Office.

August 4, 1995 BRUCE A. LEHMAN
Secretary of Commerce and
Commissioner of Patents and Trademarks

[1177 TMOG 171]

TRADEMARK POST REGISTRATION

(170) Trademark Rule 2.165 Requirement Where A Section 8 Affidavit Or Declaration Is Held Insufficient

Several recent Petitions to the Commissioner have indicated a failure on the part of registrants and their attorneys to follow the requirements of Trademark Rule 2.165. Therefore, reviewing certain basic elements of this rule is considered timely so as to alert registrants and attorneys to technical errors which might lead to the cancellation of a valuable trademark registration.

Part (*a*) of Rule 2.165 indicates that the examiner will notify the registrant when an affidavit or declaration of use under Section 8 of the Statute is insufficient and the reasons therefor. When the registrant wishes the examiner to reconsider the affidavit or declaration, or when the registrant has taken additional steps to rectify the deficiencies and desires to have the examiner reconsider the affidavit or declaration in light of those steps, the request for reconsideration must be submitted within 6 months of the date of mailing of the notice of insufficiency.

Note, however, that a supplemental or substitute affidavit or declaration required by Section 8 cannot be considered unless it is received before the expiration of the six year anniversary of the registration. Consequently, registrants should file their affidavits as early as possible during the sixth year following registration.

There are situations where correcting the deficiency in the affidavit or declaration requires recording an assignment with the Assignment Division of this Office. If the recording cannot be completed within 6 months, the registrant must at least respond to the examiner's notice of insufficiency within that period. The response must indicate the steps being taken to correct the deficiency. The examiner can then allow the registrant additional time or suspend action depending on the circumstances. Registrants must always observe the "six month response" period whenever responding to the examiner from an adverse action.

Part (*b*) of Rule 2.165 permits a registrant to request the Commissioner to review the action of the examiner when he is dissatisfied with that action. Review by the Commissioner should be sought only where it is believed that the examiner has erred in his action. In other words, the Commissioner's role is to review the correctness of the examiner's action and not to serve as an alter ego of the examiner before whom the registrant may seek to correct deficiencies.

When review by the Commissioner has been sought, the decision on that request constitutes the final action of the Patent and Trademark Office. If no review by the Commissioner is sought and if no request for reconsideration of an examiner's action is timely filed, the Commissioner will notify the registrant of the deficiency in the affidavit or declaration after the sixth year has expired. Such notice is never mailed prior to the expiration of the sixth year following registration nor until a reasonable time has elapsed following a six month period from the last action mailed by this Office. This notice constitutes the final action of the Patent and Trademark Office in those cases where the Commissioner's review has not been sought. Once this notice has been mailed, it is too late (under the Rules of Practice) to request the Commissioner to review the action of the examiner. Review would only be proper if an affiant could show circumstances sufficient to suspend the finality element of Rule 2.165(b) pursuant to Rule 2.148.

Registrants will be held to strict compliance with Rule 2.165 as it has been briefed above. Therefore, parties are urged to respond fully as soon as possible after an action is received from the examiner.

Dec. 12, 1977 BERNARD A. MEANY
Assistant Commissioner
for Trademarks.

[966 TMOG 80]

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(171) Late-Filed Renewal Fees

Sections 9 and 31 of the Lanham Act (15 U.S.C. §§ 1095 and 1113) require that an additional five dollar ($5.00) fee be submitted by a registrant who files a renewal application during the three-month period following expiration of its registration. The language of the statute requires that this additional fee be submitted within the three-month grace period. A number of registrants who have failed to submit the additional fee within the prescribed period have petitioned the Commissioner to allow their renewal applications. The Commissioner has granted petitions of this kind where the registrant or its attorney maintained a Patent and Trademark Office deposit account which contained, on the date the renewal application was filed, sufficient funds to cover the additional fee. Specifically, the Commissioner has exercised discretion under Trademark Rules 2.146(a)(3) and 2.147 to deem the authorizations to charge the deposit accounts to have taken place at the time the registrants filed their renewal applications, even though the authorizations were not confirmed until a later date. This Office policy was established by the Commissioner's decision in *In re Ralston Purina Co.*, 191 USPQ154 (Comr. Pats. 1976).

The policy established by the *Ralston Purina* decision is being changed. Henceforth, the Commissioner will no longer exercise discretion to charge deposit accounts *nunc pro tunc* for trademark renewal application fees. To allow an authorization to charge a deposit account to relate back to a date on which no actual authorization existed is, in effect, to allow late payment. It is inequitable to permit those registrants who have deposit accounts (or those whose attorneys have such accounts) to make late payment of renewal fees, while those without deposit accounts may not.

Petitions relying on *Ralston Purina* will, after the date of this notice, be denied, unless the events that gave rise to those petitions occurred before publication of this notice.

Feb. 20, 1981 MARGARET M. LAURENCE
Assistant Commissioner
for Trademarks

[1004 TMOG 29]

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(172) Renewal Applications and Section 8 Affidavits

There has been a noticeable increase in the number of petitions requesting provisional acceptance of defectively executed Section 8 Affidavits and Renewal Applications under 35 U.S.C. § 26, the most common problem being a lack of notarization or a Rule 2.20 declaration. Often, such petitions are necessitated by the failure of registration owners to file the documents early enough to leave time in which to correct should they prove defective.

Section 8 Affidavits may be filed beginning with the fifth anniversary of the registration. The period for filing expires on the sixth anniversary of the registration. The period for filing Renewal Applications begins six months before the twentieth anniversary of the registration and extends three months beyond the expiration of the twenty year term. While the Post Registration Division may allow up to six months to respond to a notice of defect, it may not allow corrective action beyond the period for filing established by the Trademark Act. It is therefore in the registrant's best interest to file such documents as close to the opening date as possible to allow time for correction, if necessary. Provisional acceptance under 35 U.S.C. § 26 has been, and will continue to be, given narrow application. Registrants should not rely on 35 U.S.C. § 26 as a means of acquiring an extension of time.

We have also become aware of many delays caused by defects in the chain of title. Registrants are encouraged to keep Patent and Trademark Office assignment records current with regard to ownership of registrations.

The filing of Post Registration documents at the earliest date and mainten ance of assignment records will help to avoid the cancellation or expiration of registrations of trademarks currently in use, and will result in a savings of time and expense for both the registrant and the Patent and Trademark Office.

Apr. 19, 1983 MARGARET M. LAURENCE
Assistant Commissioner
for Trademarks

[1030 TMOG 37]

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(173) Trademark Examining Operation

Effective Dec. 1, 1983, all requests presented to the Patent and Trademark Office under the provisions of Section 7 of the trademark statute (15 U.S.C. 1057) will be considered by the Post Registration Section of the Trademark Examining Operation.

Necessary telephone inquiries concerning procedure or status should be directed to 703-557-1986.

Dec. 2, 1983 MARGARET M. LAURENCE
Assistant Commissioner
for Trademarks

[1038 TMOG 256]

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(174) Helpful Hints

- *Trademark Post Registration - Failure to Specify Type of Commerce in Section 8 Affidavits or Declarations*—Section 8(a) of the Trademark Act requires that before the end of the sixth year following registration, an affidavit must be filed showing that the "mark is in use in commerce." [15 U.S.C. 1058a].

  The Trademark Rules require that all Section 8(a) affidavits or declarations "state that the registered mark is in use in commerce and specify the nature of such commerce." [37 C.F.R. Section 2.162(e)].

  The affidavit or declaration must be filed between the fifth and sixth year following the date of registration and it must contain a statement that the "mark is in use in commerce," with evidence thereof. There may be no extensions of time beyond the sixth year for submission of this state- ment and evidence of use of the mark in commerce. However, if the timely-filed affidavit or declaration does not set forth the type of commerce, the registrant will be given six months to submit that information even though the sixth year may have expired. The rules do not provide for any further exten-

sions of time beyond the six months. (Carlisle Walters, 703-557-3061)

• *Backlogs in Trademark Renewals and Section 8 Affidavits and Declarations*—Registrants are advised that a backlog currently exists in the processing of Trademark Renewals and Section 8 affidavits and declarations. While the Patent and Trademark Office conducts a preliminary review of critical elements in order to notify registrants of statutory deficiencies prior to the expiration of the statutory period for the submission of required documents, the ultimate responsibility for complying with the requirements of the statute and the rules rests with the registrant. (Carlisle Walters, 703-557-3061)

July 1, 1988 THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1092 TMOG 11]

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(175) **Section 8 Requirements For Trademark Registrations**

Any registrant who files in the Patent and Trademark Office, on or after November 16, 1989, an affidavit or declaration under Section 8 of the Trademark Act will be required to comply with the requirements of the Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U. S. C. 1051)], which takes effect on November 16, 1989. The Trademark Law Revision Act amends 15 U. S. C. 1058(a) by adding the requirement that a registrant submit an affidavit "setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark...."

For Section 8 affidavits or declarations filed on or after November 16, 1989, the Patent and Trademark Office will require registrants to specify the goods and services to which the Section 8 affidavit or declaration pertains. The registrant may comply with the requirement for specification of its goods and services by listing each of the goods and services to which the Section 8 affidavit or declaration pertains or by making an all-encompassing reference to the goods and services recited in the registration (e.g., *"The mark is in use in connection with all the goods and services recited in the registration." or The mark is in use in connection with all the goods and services recited in the registration, with the exception of ...*". The Patent and Trademark Office prefers that the registrant use an all-encompassing reference to its goods and services as the method of specification, especiallly where the mark is registered for numerous goods and services.

If the registrant fails to file, before the end of the sixth year following registration, a Section 8 affidavit or declaration that sets forth goods and services in connection with which the mark is in use, the registration will be cancelled. Similarly, those goods or services recited in the registration but not specified in a Section 8 affidavit or declaration filed before the end of the sixth year following registration will be deleted from the registration. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct registrant's failure to specify, or to specify completely, the goods and services on or in connection with which the mark is in use.

A Section 8 affidavit or declaration filed on or after November 16, 1989 must include a specimen or facsimile showing current use of the registered mark. The registrant will be required to file one specimen or facsimile for each class of goods or services to which the registration pertains. For a single-class registration covering multiple goods or services, only one specimen or facsimile showing current use of the mark on one of the goods or services in that class will be required. Similarly, for a mulitiple-class registration, the registrant will be required to file, for each class of goods or services covered by the multiple-class registration, one specimen or facsimile showing current use of the mark on one of the goods or services in that class.

If the registrant fails to file, before the end of the sixth year following registration, an affidavit or declaration that includes a proper specimen or facsimile for each class of goods or services to which the registration pertains, the registration will be cancelled as to that class of goods or services. After the end of the sixth year following registration, the Patent and Trademark Office will not accept a substitute Section 8 affidavit or declaration filed to correct the omission of a proper specimen or facsimile.

June 15, 1989 Jeffery M. Samuels
Assistant Commissioner for Trademarks

[1104 TMOG 22]

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(176) **Renewal of Trademark Registrations (Revised)**

This supersedes the notice that appeared in the *Official Gazette* on May 2, 1989; (1102 TMOG 5):

The Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], which takes effect on November 16, 1989, amends 15 U.S.C. 1059(a) to reduce the renewal term of a registration from twenty years to ten years from the end of the expiring period of the registration.

Any registration whose expiration date is prior to November 16, 1989, shall be renewed, upon proper application, from the end of the expiring period for:

(a) twenty years if the renewal is granted prior to November 16, 1989, or
(b) ten years if the renewal is granted on or after November 16, 1989, regardless of the renewal application filing date.

Any registration whose expiration date is on or after November 16, 1989, shall be renewed, upon proper application, for ten years from the end of the expiring period, regardless of the renewal application filing date.

The present practice of notification of renewal will continue. However, the updated renewal certificate issued by the PTO will be modified to specifically indicate the length of the renewal period. The notice of renewal appearing in the *Trademark Official Gazette* will be modified to indicate the date of the acceptance of renewal.

August 16, 1989 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1106 TMOG 25]

TRADEMARK INFORMATION AND CORRESPONDENCE

(177) **Powers of Attorney in Registered Trademark Files**

On and after Feb. 1, 1967, communications advising of changes in the powers of attorney for registered trademarks will be placed in the registration files, but will not be acknowledged by the Patent Office. The information will thus be available to those who inspect the files, but since these powers of attorney do not directly concern the Patent Office, acknowledgments are not believed to be necessary.

Jan. 30, 1967 C.M. WENDT
Director

[835 TMOG 95]

(178) **Patent and Trademark Office Services**

In order to provide improved services to trademark applicants, registrants, and the general public, the Patent and Trademark Office plans to implement a pilot program called the "Trademark Assistance Center." The Center will provide general information about the trademark registration process and will respond to inquiries pertaining to the status of specific trademark applications and registrations. The location of the Center is 2900 Crystal Drive, 4B10, Arlington, Va. 22202-3513. Assistance may be obtained in-person or by dialing (703) 308-9000, Monday through Friday, 8:30 a.m. to 5:00 p.m. Eastern time, except holidays. Opening of the Center is planned for October 3, 1994. Please note that personal assistance concerning trademark as well as patent matters will continue to be available at 308-HELP and recorded information will continue to be available at (703) 557-INFO. Also, automated information about the status of trademark applications and registrations will continue to be available at (703) 305-8747.

September 7, 1994 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1167 TMOG 27]

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(179) **Initial Processing of Application**

On Feb. 1, 1972, the operations of the Trademark Application Section of the Patent Office will be reorganized. The purpose of the reorganization is to provide the public and applicants with more current information concerning newly filed applications.

The prompt initial processing of trademark applications is necessary in order to fulfill one of the main Patent Office functions, that of producing a record, accessible to the public, of new trademark activity to facilitate the clearance of new marks for use, determine the registrability of proposed marks, and avoid conflicts with the rights of others. In order to maintain a record of marks applied for which reflects the most current information available to the Office concerning them, the early processing of drawings in order to have them placed in the search room is considered as a first priority. The processing of these drawings includes the assignment of serial numbers, initial classification, duplication of the drawing and the forwarding of copies of the drawing to the search room. Other functions which are necessary in the processing of applications, such as the processing and mailing of filing receipts, are secondary to the processing of drawings.

In past years, there have been delays in processing applications and forwarding application drawings to the search room. These delays have varied from several weeks to several months. In view of the importance, both to applicants and the public, of recording essential information concerning newly filed applications as quickly as possible, a reorganization of the workflow in the Application Section is being effected.

There is no change in the processing of applications through the mail room and finance branch to the Application Section. However, under the new plan, upon receipt in the Trademark Application Section, all applications will be stamped with a serial number, and the drawing of the mark will be reproduced immediately and placed in the search file. This processing will occur as soon as the application files reach the Application Section. Such procedures as determining whether or not an application will receive a filing date, preparation of the file jackets, and mailing of the filing receipt will take place at a later time.

Applicants who wish to be notified promptly of the date their papers were received in the office and their serial number, may send two self-addressed postcards with their application papers. The mail room will stamp both postcards with the date of receipt and return one to the applicant; the second postcard will be stamped with the serial number and forwarded to the applicant from the Application Section. The postcards should contain the applicant's name and the trademark which is the subject of the application. When more than one set of application papers are forwarded under one cover, postcards should be attached to each set of papers for which a receipt is desired.

Under the new system of processing application papers, your particular attention is directed to the following changes as compared to the present procedure.

1. Application drawings will be placed in the public search file prior to the mailing of the filing receipt.
2. By using the postcard system described above, applicants will be notified sooner of the date of receipt of their papers and the serial number of their application. Applicants are encouraged to use the postcard system.
3. Additional papers sent in by the applicant or attorney should be identified by serial number, thereby enabling the office to process these papers quickly.
4. When an application is accompanied by a petition to the Commissioner under § 2.146, the petition will not be considered until processing by the Application Section is complete.

Effective date. The procedure outlined in this notice will become effective Feb. 1, 1972.

Jan. 11, 1972 RICHARD A. WAHL
Acting Commissioner of Patents

JAMES H. WAKELIN, JR.
Assistant Secretary for Science and Technology

Published in 37 F.R. 942; Jan. 21, 1972

[895 O.G. TM 193]

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(180) **Dissemination Of Trademark Information**

In order to clarify the policy regarding Trademark Examiners giving out Trademark information to the general public, the following directive has been promulgated:

Trademark Examiners are reminded that they may only be responsive to questions regarding applications pending before them. All other questions regarding Trademark matters must be directed to the Director of the Trademark Examining Operation, 703-557-3268.

Feb. 15, 1978 BERNARD A. MEANY
Assistant Commissioner for Trademarks

[968 TMOG 9]

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(181) **Responsibility to Diligently Monitor Trademark Applications and Registrations**

The purpose of this notice is to remind trademark applicants and registrants of their responsibility to monitor the status of their application or registration in cases where a notice or action from the PTO is expected; and to apprise these parties that the *Trademark Manual of Examining Procedure, (TMEP)*, will be revised to indicate that inquiries regarding the status of pending matters should be made within six months of the filing or receipt of any document for which further action by the Office is expected.

The *TMEP* is under revision in its entirety. As a part of that revision, Section 411, entitled "Status Inquiries," will be amended. The current language of § 411 indicates that a party awaiting action by the Office should file a status inquiry within eighteen months from the filing date of the application, or from the filing of a response to an Office action. This eighteen-month period was based on Office pendency in 1971, which was approximately fourteen months to mailing of the first Office action. Currently, the Office is mailing first actions within three months. Accordingly, the eighteen month period is no longer appropriate and is being reduced to six months to more realistically reflect Office pendency. Adoption of a six-month due diligence standard may have implications with respect to filing petitions and requests for other relief.

The Office of the Assistant Commissioner for Trademarks receives a number of requests to reactivate applications and registrations occasioned by the loss of papers mailed to or from the PTO. In many of these cases, the applicant or registrant may have proof that papers mailed to the PTO were actually received, or can aver that notices sent from the PTO were never received. However, in some of these cases the request will be denied because the party seeking relief has waited too long before investigating the problem. The rationale for denial is that third parties may have relied to their detriment on the information available in the PTO files and databases that an application was abandoned or that a registration has been cancelled or expired.

The PTO generally processes applications, responses and other papers in the order in which they are received in the Office. Accordingly, applicants and registrations can expect to receive notice concerning these filings within predictable time periods. For example, a party filing an application for registration should expect to receive a filing receipt within four to six weeks and, in most cases, a "first action" within four to five months of the date of filing. Similarly, a registrant should expect to receive a notice of acceptance or rejection of a Section 8 affidavit of use or excusable nonuse within four to five months of submission, and a notice of acceptance or rejection of a renewal application within two to three months of submission. Only in rare cases would any of these time periods be longer than six months.

Since it is reasonable to expect some notice from the PTO about a pending matter within six months of the filing or receipt of any document, a party who has not received the expected written action or telephone call from the PTO within that time frame should be put on notice that the filing may have become lost. The party awaiting notification has the burden of inquiring as to the cause of the delay. **In order to be considered diligent in the monitoring of its application or registration, the party expecting notification from the PTO should inquire within six months.** Waiting until the end of the six-month period is not recommended. Parties should inquire as soon as they suspect that a problem exists.

Written status inquiries are discouraged. Whenever possible, status inquiries should be made by calling the Trademark Status Line, at (703) 305-8747 through 8752. The Status Line provides the current status and status date of all active federal applications and registrations, and is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

Examples of Situations Requiring Diligent Action

Applicant/registrant files an application, Section 8 affidavit, or Section 9 renewal application, accompanied by an acknowledgment postcard:

(a) No acknowledgement postcard, filing receipt or other acknowledgment is received within a reasonable time.

Diligent Action: Inquire within six months of mailing of the document to PTO.

(b) Acknowledgement post card received but no filing receipt or other acknowledgment is received within a reasonable time.

Diligent Action: Inquire within six months of receipt of the acknowledgement postcard.

(c) A filing receipt for the application is received but no Office action, telephone call from the examining attorney, or notice of publication is received within a reasonable time.

Diligent Action: Inquire within six months of receipt of the filing receipt.

(d) A response to an Office action is mailed to the PTO but no further Office action, telephone call, notice of publication, or other acknowledgment is received within a reasonable time.

Diligent Action: Inquire within six months of mailing of the response.

(e) A notice of publication is received for an application under Section 1(b), 15 U.S.C. § 1051(b) but no Notice of Allowance or notification of potential opposition is received within a reasonable time.

Diligent Action: Inquire within a six months of receipt of the notice of publication.

In the event that the party discovers that its application or registration is no longer active, or that a required paper has not been received by the PTO, the applicant or registrant should promptly file a petition to the Commissioner or take other appropriate action to rectify the situation. The time limits for filing petitions are strictly applied. A certificate of mailing in accordance with Trademark Rules 1.8 or 1.10, 37 C.F.R. §§ 1.8 or 1.10, is recommended.

To summarize, applicants and registrants have a duty to monitor the status of their applications and registrations. If nothing has been heard from the PTO within a six month period, the party awaiting notification has the burden of inquiring as to the status. Status inquiries should be made via the Trademark Status Line. Should the status inquiry reveal that the relevant document is lost, or some other problem exists, a petition to the Commissioner or other required action should be filed within 60 days. Trademark Rule 2.146(d), 37 C.F.R. § 2.146(d). Failure to act diligently and follow up with the appropriate action may result in denial of the requested relief.

Oct. 2, 1992 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1143 TMOG 73]

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(182) **Notice of Policy Change - Change in Time Requirement For Diligently Monitoring Trademark Applications and Registrations**

The timeliness standard for due diligence in trademark cases is extended to twelve months.

On October 27, 1992, the Assistant Commissioner for Trademarks announced that applicants and registrants had a duty to monitor the status of their pending trademark application and registration matters every six months. 1143 TMOG 73 (October 27, 1992); *see* Trademark Manual of Examining Procedure, § 413 (2d ed. May 1993). In response to public comment, and effective immediately, the Office is extending the timeliness standard for due diligence to twelve months.

The PTO generally processes applications, responses and other papers in the order in which they are received in the Office. In addition, examining attorneys are required to act on new cases within 14 days of receipt and amended cases within 21 days of receipt. Accordingly, applicants and registrants can expect to receive notice concerning their filings within predictable time periods. However, delays in processing certain types of trademark filings have led the Office to re-evaluate its policy regarding due diligence in trademark cases.

Since it is reasonable to expect some notice from the PTO about a pending matter within twelve months of the filing or receipt of any documents, a party who has not received the expected written action or telephone call from the PTO within that time frame is considered on notice that the filing may have become lost. The party awaiting notification has the burden of inquiring as to the cause of the delay. In order to be considered diligent in the monitoring of applications or registrations, parties expecting notification from the PTO should inquire within twelve months. **Waiting until the end of the twelve-month period is not recommended**. Parties should inquire as soon as they suspect that a problem exists.

If nothing has been received from the PTO within a twelve-month period, the party awaiting notification has the burden of inquiring as to the status. Should the status inquiry reveal that the relevant document is lost, or some other problem exists, a petition to the Commissioner, or other required action, should be filed within 60 days. 37 CFR § 2.146(d). Failure to act diligently and to follow up with the appropriate action may result in denial of the requested relief.

Whenever possible, status inquiries should be made by calling the Trademark Status Line at (703) 305-8747. The Status Line provides the current status and status date of all active federal trademark applications and registrations, and is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday. Status Line information is limited to Status Code items, e.g., whether or not an Office action has been mailed.

Although written status inquiries are discouraged, they may be appropriate when a party has difficulty interpreting the Status Line information. In lieu of written status inquiries, clarification and additional information regarding a file may be obtained by contacting the Trademark Assistance Center at (703) 308-9000.

For further information regarding this Notice, please contact Nancy Omelko, Administrator for Petitions, Office of the Assistant Commissioner for Trademarks, at (703) 308-8910, ext. 39.

December 9, 1996 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1193 TMOG 106]

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(183) **Availability of Trademark Status Line**

Beginning on Feb. 20, 1990, the U.S. Patent and Trademark Office provided access, via push button telephone, to current status and status date information for all federal trademark application and registration records maintained in the automated Trademark Reporting and Monitoring (TRAM) System. The Trademark Status Line will be available on (703)557-8747 from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

The Trademark Status Line may be used from any push button telephone by entering a seven-digit registration number and the "#" symbol or an eight-digit serial number and the "#" symbol after the welcoming message and the tone. All calls will be answered in the order received. Callers may request information for up to five serial number or registration number records per call.

When requesting information for registration numbers under one million, add sufficient leading zeros to the registration number so that a total of seven digits are entered. For example, to get status information for Reg. No. 88,725 enter 0088725#.

When requesting information for applications, enter an eight-digit serial number that consists of the two-digit series code followed by the six-digit serial number PTO. The series code is determined by the filing date of the application. All applications filed before Mar. 31, 1905 are series code 70. Applications filed between Apr. 1, 1905 and Dec. 31, 1955 are series code 71. Applications filed between Jan. 1, 1956 and Aug. 31, 1973 are series code 72. Applications filed between Sept. 1, 1973 and Nov. 15, 1989 are series code 73. All applications filed on or after November 16, 1989 are series code 74.

When requesting information for serial numbers under 100,000 in any series code, add sufficient leading zeros to the serial number so that a total of six digits are entered after the series code. For example, to get status information for serial number 92,132 in series code 73, enter 73092132#.

The TRAM System contains records for all active federal trademark registration and pending applications. The TRAM System also contains records for all federal trademark registrations and applications which became inactive after Mar. 31, 1982. Some earlier inactive records are also available.

The Trademark Status Line will provide current status information for all federal trademark application and registration records included in the TRAM System. The date that the record entered the current status is provided also. If additional information regarding the status of a trademark application or registration is required, call the Trademark Services division at (703)557-5249 and request a status check.

Feb. 8, 1990 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1112 TMOG 49]

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(184) **New Telephone Numbers for the Trademark Status Line**

On November 18, 1991, the local telephone company in Arlington, Va. will change many of the telephone numbers used by the U.S. Patent and Trademark Office, including the numbers for the Trademark Status Line. Effective on that date, the new telephone numbers for the Trademark Status Line will be (703) 305-8747 through (703) 305-8752.

The Trademark Status Line provides access, via touch tone telephone, to current status and status date information for all federal trademark application and registration records maintained in the automated Trademark Reporting and Monitoring (TRAM) System. The Trademark Status Line is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

The Trademark Status Line may be used from any touch tone telephone by entering a seven-digit registration number and the "#" symbol or an eight-digit serial number and the "#" symbol after the welcoming message and the tone. All calls will be answered in the order received. Callers may request information for up to five serial number or registration number records per call. If additional information regarding the status of a trademark application or registration is required, call the Office of Trademark Services at (703) 308-9400 and request a status check.

Oct. 23, 1991 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1132 TMOG 33]

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(185) **TRADEMARK STATUS INFORMATION AVAILABLE ON THE TRADEMARK STATUS LINE**

The Trademark Status Line (703) 557-8747 provides status and status date information for all Trademark applications and registrations to users with touch tone telephones. The Trademark Status Line is available from 6:30 A.M. to midnight (Eastern Standard Time), Monday through Friday.

The following is a listing of the status text provided by the Trademark Status Line for each corresponding status code in the TRAM system and the usual location of the file when it is in each status. All information in parenthesis is explanatory and is not part of the status text. All status codes followed by a "*" are within the blackout period for filing Amendments to Allege Use in Intent to Use applications. All status codes followed by a "^" apply to Intent to Use applications only.

Status Code	Status Text	Usual File Location
600	Abandoned-Incomplete Response	Warehouse
601	Abandoned-Express	Warehouse
602	Abandoned-Failure to Respond	Warehouse
603	Abandoned-After ex parte Appeal	Warehouse
604	Abandoned-After inter partes decision	Warehouse
605	Abandoned-After Publication	Warehouse
606^	Abandoned-No Statement of Use filed	Warehouse
607^	Abandoned-Defective Statement of use	Warehouse
608	Abandoned-After Petition Decision	Warehouse
609	Abandoned-Defective Divided Application	Warehouse

Status Code	Status Text	Usual File Location
612	Petition to Revive-received	TMEO Dir
614	Abandoned-Petition to revive denied	Warehouse
616	Revived-Awaiting Further Action	Law Office
618	Abandoned File-Backfile (Indicates the application existed when the TRAM database was created and it is abandoned but the reason for the abandonment is unknown.)	Warehouse
620	Backfile application added to database Status not recorded. (Indicates the application existed when the TRAM database was created and the status is unknown at this time.)	
622	Misassigned Serial Number (Indicates that the subject serial number was assigned in error and cancelled. File contents were returned to submitter or transferred to another serial number.)	File Cover Destroyed
624	Registered-Backfile (Indicates the registration existed when the TRAM database was created and remains registered at this time.)	Warehouse
625	Registration added to the data base. Status unclear (Indicates the registration status is unknown at this time.)	Warehouse
626	Registered-Backfile cancelled or expired (Indicates the registration is no longer active but the reason for this is unknown.)	Warehouse
630	New Application-Record initialized not assigned to examiner	Law Office
631	New Application-Divided-Initial processing (Indicates a divisional request has been received and is being processed.)	ITU Unit
632	Informal Application (Indicates that the application filed was incomplete.)	Pre-Exam
638	New Application-Assigned to an examiner	Law Office
640	Non-final action counted-Not mailed	Law Office
641	Non-final action-Mailed	Law Office
643	Previous action/approval count withdrawn (Indicates the Examiner has withdrawn an Office Action or approval.)	Law Office
644	Final refusal counted-Not mailed	Law Office
645	Final refusal-Mailed	Law Office
646	Examiner's amendment counted-Not mailed	Law Office
647	Examiner's amendment-Mailed	Law Office
648	Action continuing Final counted-Not mailed	Law Office
649	Action continuing Final-Mailed	Law Office
650	Suspension inquiry counted-Not mailed	Law Office
651	Suspension inquiry-Mailed	Law Office
652	Suspension letter counted-Not mailed	Law Office
653	Suspension letter-Mailed	Law Office
654	Report completed suspension check-Case still suspended	Law Office
661	Response after non-Final action-Entered	Law Office
663	Response after Final rejection-Entered	Law Office
665	Notice of unresponsive amendment-Counted	Law Office
666	Notice of unresponsive amendment-Mailed	Law Office
667	Refusal withdrawal letter-Counted (Refers to an Office Action which withdraws a refusal after an ex parte appeal has been filed.)	Law Office
668	Refusal withdrawal letter-Mailed. (Refers to an Office Action which withdraws a refusal after an ex parte appeal has been filed.)	Law Office
672	Reinstated-Awaiting further action (Refers to an application which was reinstated after an abandonment due to PTO error.)	Law Office
680*	Approved for publication (By the examiner)	Law Office
681*	Publication/Registration review complete (By the Law Office Clerk)	Pub. and Issue
686*	Published for Opposition	Pub. and Issue
688^	Notice of Allowance-Issued	ITU Unit
689*^	Notice of Allowance-Withdrawn	Pub. and Issue
690*^	Notice of Allowance-Cancelled	Pub. and Issue
692*	Withdrawn from publication	
693*	Withdrawn from registration-Jurisdiction restored (To Examiner)	Law Office

Status Code	Status Text	Usual File Location
694*	Withdrawn from registration	
700	Registered	Warehouse
701	Section 8-Accepted	Post Reg.
702	Section 8 and 15-accepted and acknowledged	Post Reg.
703	Section 15-acknowledged	Post Reg.
704	Partial Section 8 accepted	Post Reg.
705	Partial Section 8 and 15 accepted and acknowledged	Post Reg.
710	Cancelled-Section 8	Warehouse
711	Cancelled-Section 7(d)	Warehouse
712	Cancelled by court Order under Section 37	Warehouse
713	Cancelled-Section 18	Warehouse
714	Cancelled-Section 24	Warehouse
715	Cancelled-Restored to Pendency (Indicates the subject registration number was assigned in error and correction requires restoration of the appliaction to pendency)	Law Office
716	Inadvertently issued registration number-Cancelled (Indicates the subject registration number was assigned in error and has been cancelled.)	
718^	Request for first extension-Filed	ITU Unit
719^	Request for second extension-Filed	ITU Unit
720^	Request for third extension-Filed	ITU Unit
721^	Request for fourth extension-Filed	ITU Unit
722^	Request for fifth extension-Filed	ITU Unit
724^	Extension request refusal-Counted not mailed	ITU Unit
725^	Extension request refusal-Mailed	ITU Unit
730^	First Extension-Granted	ITU Unit
731^	Second Extension-Granted	ITU Unit
732^	Third Extension-Granted	ITU Unit
733^	Fourth Extension-Granted	ITU Unit
734^	Fifth Extension-Granted	ITU Unit
740	Post registration paper filed-Assigned to paralegal	Post Reg.
744^	Statement of Use-Filed	ITU Unit
745^	Statement of Use-Informal-Letter mailed	ITU Unit
746^	Statement of Use-Informal-Response entered	ITU Unit
747^	Statement of Use-ITU processing complete (Indicates pre-exam processing of the Statement of Use at the ITU Unit is complete.)	Law Office
748^	Statement of Use-To examiner(For Examination)	Law Office
752^	Statement of Use-Examiner statement counted-Not mailed	Law Office
753^	Statement of Use-Examiner Statement-Mailed	Law Office
756	Examiner statement counted-Not mailed	Law Office
757	Examiner statement-Mailed	Law Office
760	Ex parte appeal pending	TTAB
762	Ex parte appeal-Refusal reversed	TTAB
763	Ex parte appeal-Refusal affirmed	TTAB
764	Ex parte appeal dismissed as moot	TTAB
765*	Concurrant use proceeding terminated-Granted	TTAB
766*	Concurrant use proceeding terminated-Denied	TTAB
771*	Concurrent use proceeding pending	TTAB
772*	Interference proceeding pending	TTAB
773*	Interference proceeding terminated	TTAB
774*	Opposition pending	TTAB
775*	Opposition dismissed	TTAB
777*	Opposition terminated-See TTAB records	TTAB
778	Cancellation dismissed	TTAB
779*	Opposition sustained	TTAB
780	Cancellation terminated-See TTABrecords	TTAB
782^	Statement of Use-Opposition Decided-Entry of Judgement Deferred	TTAB
783^	Statement of Use-Cancellation Decided-Entry of Judgement Deferred	TTAB
784^	Statement of Use-Interference Decided-Entry of judgement deferred	TTAB
785^	Statement of Use-Concurrant Use Decided-Entry of Judgement Deferred	TTAB
790	Cancellation Pending	TTAB
794	Jurisdiction restored to examiner	Law Office
800	Renewed	Post Reg.
801*	Opposition instituted	TTAB
802*	Request for extension of time to file opposition	TTAB
803*	Amendment after publication	TM Service Division
806^	Statement of Use-Non-final action counted-Not mailed	Law Office
807^	Statement of Use-Non-final action-Mailed	Law Office

Status Code	Status Text	Usual File Location
808^	Statement of Use-Final refusal counted-Not mailed	Law Office
809^	Statement of Use-Final refusal-Mailed	Law Office
810^	Statement of Use-Examiner's amendment counted-Not mailed	Law Office
811^	Statement of Use-Examiner's amendment-Mailed	Law Office
812^	Statement of Use-Action continuing final counted-Not mailed	Law Office
813^	Statement of Use-Action continuing final-Mailed	Law Office
814^	Statement of Use-Response after non-final action-Entered	Law Office
815^	Statement of Use-Response after final rejection-Entered	Law Office
816^	Statement of Use-Notice of unresponsive amendment-Counted-Not mailed	Law Office
817^	Statement of Use-Notice of unresponsive amendment-Mailed	Law Office
818^	Statement of Use accepted-Approved for Registration (By the Examiner)	Law Office
819^	Statement of Use-Registration review complete (By the Law Office Clerk)	Pub. and Issue
900	Expired (Refers to registration that were not renewed.)	Warehouse

December 3, 1990

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1122 TMOG 568]

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(186) **Transmittals for Use of Deposit Accounts**

When statutory fees are to be charged to a deposit account, the processing of the application can be facilitated by submitting the applicant's transmittal letter or other correspondence specifying the account to be charged in triplicate. Submission of these documents in triplicate will eliminate the need for the Mail Room to photocopy the document and thereby reduce the processing time of incoming mail.

Nov. 21, 1983

THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1037 TMOG 15]

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(187) **Availability of Deposit Account Status Line**

Beginning on February 20, 1990, the U.S. Patent and Trademark Office will provide access, via push button telephone, to the current account balance information, and last deposit for the current month, if any. The Deposit Account status line will be available on (703)557-8735 or (703)557-8746 from 6:30 A.M. until midnight, Eastern time, Monday thru Friday.

The Deposit Account status line may be used from any push button telephone by entering your six digit account number and the pound sign after being told to do so by the greeting message that you receive whenever you dial in. All six digits and the pound sign must be entered.

Questions that may arise pertaining to the information received thru use of the status line must be referred to the Deposits Account Division at (703) 557-3227 during the hours 8 A.M. until 5 P.M. Eastern time, Monday thru Friday, except for Federal holidays.

Feb. 5, 1990

BRADFORD HUTHER
Assistant Commissioner for Finance and Planning

[1112 TMOG 49]

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(188) **Telephone Changes for Deposit Account Status Line**

Effective Nov. 18, 1991, new telephone exchange numbers will be made for the Deposit Account Status Line. On that date, Deposit Account Balance information can be obtained by calling **(703) 305-8735 or (703) 305-8746 from 6:30 a.m. until midnight**, Eastern time, Monday thru Friday, except for Federal holidays.

Questions that may arise pertaining to the information received through use of the status line may be referred to the Deposit Account Division at **(703) 308-6902**. Calls will be received on the answering machine 24 hours a day, seven days a week.

Oct. 31, 1991

BRADFORD HUTHER
Assistant Commissioner for Finance and Planning

[1132 TMOG 48]

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(189) **Notices of Abandonment**

The Trademark Operation has begun notifying trademark applicants when their pending applications have been abandoned by the Office. Under this new procedure, a computer-generated post card bearing the notice, serial number, applicant name and abandonment date will be sent to the correspondence address designated by the applicant. The post cards will be mailed within 2 to 4 weeks after the application is declared abandoned.

Jan. 13, 1986

MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1063 TMOG 4]

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(190) **Change of Correspondence Address in Trademark Applications**

Applicants are reminded that when an application is filed and a correspondence address is entered in the Official record,

correspondence will continue to be sent to such address until the applicant or party, or the attorney-at-law or other authorized representative of the applicant or party, indicates *in writing* that correspondence is to be sent to another address. 37 CFR Section 2.18. The filing of a response to an Office action on letterhead stationery that indicates a different address from the correspondence address of record is insufficient notice that correspondence is to be sent to another address. Specific language is needed which can reasonably be interpreted to be a request to change the address. See TMEP Section 603.

If a power of attorney has been filed in an application, a subsequently filed power of attorney will be regarded as a written request to change the correspondence address, even if there is no specific language changing the address or revoking the prior power of attorney. See TMEP Section 603.

May 15, 1986

MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1067 TMOG 7]

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(191) **Use of Restricted Deposit Account for Electronic Ordering of Patent and Trademark Copies**

Effective July 1, 1986, the restricted deposit account will be made available to those members of the public who wish to use it for electronic ordering of patent and trademark copies. The restricted deposit account requires maintenance of a minimum balance of $300.00 at the end of each month, as compared to the unrestricted account which requires a minimum balance of $1,000.00

In FY 1986, the Office established the restricted deposit account for use in charging subscriptions for copies of newly issued patents by subject matter classification. Establishment of a PTO deposit account is a prerequisite for subscription service.

Recently, the Office established an electronic ordering service (EOS), a method of ordering copies of patents and trademarks through the use of a computer terminal and modem. EOS is available only to PTO deposit account holders.

Many people who are interested in using EOS to order copies of patents and trademarks and who do not have PTO deposit accounts find the $1,000.00 balance required for the unrestricted account prohibitive. Therefore, the use of restricted account is being expanded to incorporate EOS ordering. Subscriptions and EOS ordering are the only two services for which restricted accounts may be used. If you have any questions on subscriptions or EOS, please call Mary Brown on (703) 557-3236. If you have questions on deposit accounts, please call Delores Riley on (703) 557-3227.

June 23, 1986

THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1068 TMOG 4]

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(192) **Trademark Search Tools Now Available on CD-ROM**

A variety of trademark search tools and references are now available for purchase from the U.S. Patent and Trademark Office on the *Trademarks ASSIST* CD-ROM. This new product offers the following text searchable applications:

- Trademark Manual of Examining Procedure
- Goods and Services Manual
- Trademark Trial and Appeal Board Manual of Procedure
- Trademark Statute and Rules (Trademark Law of 1946, as amended)
- Trademark Examination Guide and Notes
- Trademark Telephone Index
- Information Dissemination Organizations Products & Services Catalog

This product is available on a single-disc basis for $50. Updated editions will issue on an irregular basis when significant changes occur to the applications included.

For further information or to request an order form, please contact:

U.S. Patent and Trademark Office
Office of Electronic Information Products
Crystal Park 3, Suite 441
Washington, D.C. 20231

Phone: (703) 306-2600
Fax: (703) 306-2737

[1189 TMOG 90]

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(193) **Filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit in the Patent And Trademark Office**

This notice supersedes a notice entitled Filing of a Notice of Appeal to the Federal Circuit and Service of Court Papers on the Commissioner of Patents and Trademarks published at 1079 Off. Gaz. Office 72 (June 30, 1987).

A notice of appeal to the Court of Appeals for the Federal Circuit may be filed in the Patent and Trademark Office in any one of the following ways:

A. By first-class mail addressed as follows, in which case the notice of appeal must actually reach the Patent and Trademark Office by the due date:
Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

B. By "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 addressed as follows, in which case the notice of appeal is deemed filed on the date of the Express Mail certificate:
Box 8
Commissioner of Patents and Trademarks
Washington, D.C. 20231
Attention: Office of the Solicitor

C. By hand (on or before the due date) to the Office of the Solicitor. The Office of the Solicitor is located at:
Crystal Park II
Suite 918
2121 Crystal Drive
Arlington, Va.

D. By facsimile transmission to the Office of the Solicitor. The telephone number for accessing the Office of the Solicitor facsimile machine is (703) 557-9373. A notice of appeal will be deemed timely filed on the date the facsimile transmission is *received* by the Office of the Solicitor, provided an original notice of appeal is subsequently received in either of the following ways:

(1) An original, signed copy of the notice of appeal is actually received in the Office of the Solicitor within five calendar days of the facsimile transmission; or,

(2) An original, signed copy of the notice of appeal is mailed by "Express Mail" (U.S. Postal Service only) under 37 CFR § 1.10 on the day of the facsimile transmission.

The facsimile machine for receiving a notice of appeal is located in the Office of the Solicitor and is staffed during the business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, excluding holidays. Due to possible equipment failure

or maintenance requirements, precautions must be taken when relying on the availability of this service near the end of the time for filing a notice of appeal.

March 22, 1990 FRED E. McKELVEY
Solicitor

[1113 TMOG 29]

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(194) Service of Court Papers on the Commissioner of Patents and Trademarks

Court papers other than a notice of appeal to the U.S. Court of Appeals for the Federal Circuit may be served on the Commissioner in either of the following ways:

A. By *hand* between 8:30 a.m. and 5:00 p.m. at the Office of the Solicitor, located in Crystal Park II, Suite 918, 2121 Crystal Drive, Arlington, Va.

B. By *mail* in an envelope addressed as follows:
Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

While the above mail service address may be supplemented to include the name of the particular attorney assigned to the court case, it must *not* be supplemented to refer to either the Commissioner of Patents and Trademarks or the U.S. Patent and Trademark Office (PTO).

Court papers mailed to an address other than the above mail service address and court papers delivered by hand are deemed to have been served on the Commissioner when actually received in the Office of the Solicitor.

Papers which are not court papers and are intended to be filed in the PTO in connection with an application or other proceeding pending in the Office shall not be mailed to the Solicitor's mail service address. Any such papers which are mailed to the Solicitor's mail service address will not be considered to have been filed in the PTO. Instead, all such papers will be returned. No exceptions will be made to this policy.

Mar. 22, 1990 FRED E. McKELVEY
Solicitor

[1113 TMOG 30]

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(195) Appeals to the Federal Circuit from the PTO

This notice was originally prepared by the Solicitor and Associate Solicitor Richard E. Schafer for presentation at the Eighth Annual Judicial Conference of the U.S. Court of Appeals for the Federal Circuit. The notice discusses litigation philosophy of the Office of the Solicitor of the Patent and Trademark Office and other matters which may be helpful to appellants and others seeking judicial review of PTO decisions in the U.S. Court of Appeals for the Federal Circuit.

October 5, 1990 FRED E. McKELVEY
Solicitor

I. *Introduction*

This notice discusses the philosophy of the Office of the Solicitor when representing the Commissioner before the Federal Circuit and other courts. The notice is also designed to assist appellants and others seeking judicial review of Patent and Trademark Office (PTO) decisions in the Federal Circuit. Much of what is said in the notice is also applicable to those instances where judicial review is sought of PTO decisions in a district court.

II. *Solicitor's litigation philosophy*

The Office of the Solicitor and its attorneys start with the proposition that justice is done when the right result is reached. The Solicitor is not an advocate who needs to win to be satisfied. Rather, the public interest is served when:

(1) a patent issues on a patentable invention;
(2) a patent is refused on an unpatentable invention;
(3) a trademark is registered if entitled to registration under Title 15;
(4) a trademark is refused registration if not entitled to registration under Title 15; or
(5) PTO rules are properly applied within PTO and by reviewing courts.

Our litigation philosophy is expressed in *Berger v. United States*, 295 U.S. 78, 88 (1935):

> The . . . [Government attorney] is the representative not of an ordinary party to a controversy, but of a sovereignty whose obligation to govern impartially is as compelling as its obligation to govern at all; and whose interest . . . is not that it shall win a case, but that justice shall be done. As such, he is in a peculiar and very definite sense the servant of the law, the twofold aim of which is that guilt shall not escape or innocence suffer.

The Office of the Solicitor does more than simply "defend" an appeal. Rather, it will determine whether:

(a) appeals are ripe for judicial consideration;
(b) there are steps a party might take in PTO to obviate the appeal, e.g., amendments which might be made to claims to conform an argument to the subject matter being claimed - we often find that arguments in a brief are based on limitations which do not appear in the claims;
(c) there is material not in the record which might provide a full answer to an argument - particularly a new one - made in a brief; and/or
(d) the deciding official or board should be approached to see if it wishes to reevaluate its decision in view of a change in the law, acredible argument that the decision may not be correct, or a matter which may have been overlooked.

Most of the time, it takes more effort to implement this philosophy than it would take simply to brief and argue a matter.

Generally, in a Federal Circuit matter, the Office of the Solicitor - apart from designating an appendix -does not "get deeply into" a case until appellant's brief is filed. Exceptions occur, i.e., *inter partes* patent and trademark cases where the board opinion is reviewed to see if an *amicus* brief might be appropriate to assist the Federal Circuit with PTO practice.[1] This is not to say that an appellant should not feel free to discuss an appeal with an attorney in the Solicitor's Office. But, ordinarily in an *ex parte* case, we do not spend time until we see appellant's brief. The reason is that a large number of appeals are simply dismissed without the need for us to do much, if any, work.

Table 1, below, shows the disposition of appeals from October 1985 through April 1990. About 23%, i.e., 146, of the cases were dismissed with little, if any, work having been done by the Office of the Solicitor on the appeal. If we conducted a review of all appeals when filed, our Federal Circuit "workload" would increase about 23%. We do not have the resources to effectively carry on 23% more work.

We find a lot of cases are not ripe or otherwise ready for judicial review. When we determine that more work needs to be done before the Federal Circuit should consider a case, we generally move to remand. Fed. Cir. R. 27(c) provides that a remand generally should be requested prior to briefing. However, since we generally cannot efficiently take up cases until appellant's brief is filed, we now file motions to remand along

[1] *See e.g., Fujie v. Verhagen*, Fed. Cir. No. 89-1126; *Hahn v. Wong*, 13 USPQ2d 1211 (Bd. Pat. App. & Int.), *aff'd*, 892 F.2d 1028, 13 USPQ2d 1313 (Fed. Cir. 1989); *Perkins v. Kwon*, 886 F.2d 325, 12 USPQ2d 1308 (Fed. Cir. 1989); and *Wintler v. Guglielmino*, Fed. Cir. No. 89-1571. *See also Copeland's' Enterprises, Inc. v. CNV, Inc.*, 887 F.2d 1065, 12 USPQ2d 1562 (Fed. Cir. 1989) (en banc) and *Kellogg Co. v. Pack'em Enterprises, Inc.*, Fed. Cir. No. 90-1336.

with our brief. A merits panel is then in a position to evaluate whether it should hear the case on the merits or order a remand. There are a variety of reasons why we seek remands.

Table 1
Disposition of cases in the Courts of Appeals in which the Solicitor has appeared October 1985 through September 1990

	Pat	TM	Total
Disposed cases:			
Affirmed	300	47	347
Modified	10	0	10
Reversed	47	17	64
Remanded[2]	40	8	48
Dismissed	120	26	146
Amicus/intervene	7	2	9
Examiner testimony	1	0	1
Transfer	6[3]	0	6
Mandamus granted	0	0	0
Mandamus granted-in-Part	1	0	1
Mandamus denied	6	2	8
Mandamus dismissed	3	0	3
Totals:	541	102	643

A.

An appellant may argue that a certain feature of a claim is not shown in the prior art. Such an argument may prompt us to determine whether the feature is known. If we find the feature, we will probably ask for a remand for the purpose of making an additional rejection.[4] In like manner, based on our respective backgrounds or other cases handled by the Office of the Solicitor, we may know of prior art which strengthens a rejection.[5]

B.

Similarly, an appellant may argue that a certain fact is true. Upon looking into the matter, we have found literature from the appellant's assignee or other evidence which, in our opinion, demonstrates that the argument may not be factually correct.[6] Since the literature or other evidence is not part of the record, we have asked for a remand so that the case may be fully developed before a merits panel is required to consider the case. We have also filed a brief on the merits asking the Federal Circuit to take judicial notice of a fact while concurrently filing a contingent motion to remand in the event the merits panel believes that judicial notice is not appropriate.[7]

C.

We have had cases where the sole issue is whether a Rule 131, 37 CFR § 1.131, affidavit is sufficient to antedate a reference. When the sufficiency of a Rule 131 affidavit is in issue, we search for a foreign or other equivalent statutory bar. When an equivalent statutory bar is found, we move to remand suggesting that the issue on appeal may well be moot.[8]

D.

In re Steele, 305 F.2d 859, 134 USPQ 292 (CCPA 1962), suggests that indefiniteness should be taken care of prior to considering obviousness. There have been cases in which the claims are so indefinite that judicial review of an obviousness issue simply would not make sense. Remands, over appellant's objection, have been ordered.[9]

E.

There have been occasions where the Board, TTAB, or the Commissioner decides to change or reconsider a decision. A change of decision can occur, *inter alia*, due to:

1. new "law" as announced in a court or administrative decision,[10] or
2. a deciding official or tribunal determines that:
   (a) a decision may not be correct,
   (b) a matter was overlooked,[11] or
   (c) a decision otherwise needs to be reconsidered.[12]

F.

There have been cases where, although not argued by the appellant, it did not make sense to apply existing law in a particular context. We have moved to remand. In one instance, the Board reconsidered its position, established new law, and granted relief.[13]

G.

In its opinion, the Board - without entering a new ground of rejection under Rule 196(b), 37 CFR § 1.196 - may suggest that if there is to be further prosecution, an examiner may wish to look into several possible rejections. Generally in such a case the appellant will abandon or refile under 35 U.S.C.§ 120. On occasion, however, an appellant will seek judicial review. Ordinarily, we seek remands in such a case in order to avoid piecemeal judicial review.[14]

H.

We had one case in which an appellant "dropped" an appeal as to all but a dependent claim -only the independent claim had been discussed in appellant's brief to the Board and the Board discussed only the independent claim. We sought a remand - after the appellant's brief had been filed - so that PTO could articulate a rationale as to the sole claim left in appeal.[15] Alternatively, we could have argued the appeal on the basis of the independent claim. However, in the context of the particular case, that alternative did not make sense.

I.

We had a case where the application on appeal was deemed to be abandoned. We moved to remand to clarify the status of the application.[16] We also had a trademark appeal in which registration in the United States could not occur until registration took place abroad.[17] Obviously, there was no reason to proceed in the Federal Circuit until registration occurred in the foreign country. When an appeal is taken in a trademark case, we always check to be sure that the registration relied upon is "alive." Appellant also should be sure that the registration has not expired. In one trademark appeal, the likelihood of confusion issue became moot on appeal when we discovered that the registration cited against the appellant expired without being renewed.

Most attorneys representing appellants will agree to a remand when approached by an attorney in the Office of the Solicitor - regardless of the time a suggestion to remand is made. A remand saves appellant, the Federal Circuit and our office time and money and in the long run contributes to the effective administration of justice within PTO and the Federal Circuit. In some cases, our motions to remand have been opposed. In one pub-

[2] Approximately 80% of the remands were ordered based on motions to remand filed by the Office of the Solicitor. See the discussion on remands, *infra*.

[3] All transfers were from a regional court of appeals to the Federal Circuit.

[4] *In re Yashuhara*, Fed. Cir. No. 85-889. The reference added on remand was relied upon by the Federal Circuit in a later decision affirming the rejection made on remand. *In re Yashuhara*, Fed. Cir. No. 86-1634. *See also In re Merz*, Fed. Cir. No. 86-615, and *R. D. Werner Co. v. Quigg*, Civil Action No. 85-0945 (D.D.C.).

[5] *See e.g., In re Trogan*, Fed. Cir. No. 85-2724, *Fleirwat v. Quigg*, Civil Action No. 86-2666 (D.D.C.), *In re Nilssen*, Fed. Cir. No. 87-1349, In re Nilssen, Fed. Cir. No. 87 1392, and *Hepar Chimie v. Mossinghoff*, Civil Action No. 85-1912 (D.D.C.).

[6] *In re Weitz*, Fed. Cir. No. 85-879; *In re Lowrance Electronics, Inc.*, Fed. Cir. No. 88-1180.

[7] *In re Klang*, Fed. Cir. No. 85-2825.

[8] *In re Lochner*, Fed. Cir. No. 86-1269.

[9] *In re Jacobs*, Fed. Cir. No. 85-2210.

[10] *In re Eastin*, Fed. Cir. No. 90-1439.

[11] *In re Giordano*, Fed. Cir. No. 87-1029; *In re Raleigh Stores Corp.*, Fed. Cir. No. 87-1183; *In re Whaleco*, Fed. Cir. No. 87-1522.

[12] *In re Brown*, Fed. Cir. No. 86-617; *Groz v. Quigg*, Civil Action No. 87-1340 (D.D.C.); *London Laboratories v. Commissioner*, Civil Action No. 86-0914 (D.D.C.); *Hashimoto v. Quigg*, Civil Action No. 86-1595 (D.D.C.); and *Katrapat AG v. Quigg*, Civil Action No. 87-0250 (D.D.C.).

[13] *Papst-Motoren GMbH & Co. v. Quigg*, Civil Action No. 86-1168 (D.D.C.). The Board's decision on remand is published. *Ex Parte Papst-Motoren*, 1 USPQ2d 1655 (Bd. Pat. App. & Int. 1986).

[14] *See Tofe v. Winchell*, 645 F.2d 58, 63 [headnote 6], 209 USPQ 379, 384 (CCPA 1981). *See also Paradis v. Quigg*, Civil Action No. 87-1486 (D.D.C.) and *Clough v. Quigg*, Civil Action No. 87-2304 (D.D.C.).

[15] *In re Hyatt*, Fed. Cir. No. 85-2224.

[16] *In re Goodman*, Fed. Cir. No. 87-1056. The Commissioner's decision reviving the application is reported. *In re Goodman*, 3 USPQ2d 1866 (Comm'r Pat. 1987). *See also In re Greven*, Fed. Cir. No. 87-2341

[17] *In re Matsushita Electric*, Fed. Cir. No. 89-1526.

lished opinion, an opposed motion was granted notwithstanding appellant has filed its principal brief;[1] in another opinion, relief was denied.[2] It appears the Federal Circuit has adopted, as a general rule, the latter opinion. See Fed. Cir. R. 27(c).

We will not attempt to reconcile Fed. Cir. R. 27(c) with what we regard to be the better policy expressed in In re Gould. We will point out, however, that if an appeal proceeds in the face of a motion to remand,

(a) an appellant will have to spend money to have its attorney appear for oral argument,

(b) the merits panel will have to spend time preparing for oral argument, holding oral argument, and writing an opinion,

(c) PTO will have to expend resources preparing for and presenting oral argument, and

(d) prosecution on the merits may be reopened after a mandate is entered if a viable rejection remains to be considered.

It is possible, of course, that we might prevail on the merits, thereby obviating any need for a remand. However, if we do not prevail, PTO can - and often does - reopen prosecution of the application upon entry of the Federal Circuit's mandate to consider the matter raised by a motion to remand.[3]

Sometimes an appellant will decide to file a second application, i.e., a continuation application or another trademark application, and simultaneously pursue the appeal. We believe appellant has a responsibility to call our attention to the fact that a second application has been filed. Knowledge of the second application is material to steps we might take.

First, perhaps any appeal (or civil action) should be suspended pending outcome of proceedings on the second application or dismissed without prejudice to another appeal in the event a final adverse Board decision is entered in the second application. In effect, by filing a second application, appellant admits that there are available administrative remedies and that those remedies have not been exhausted.

Second, it is in PTO's best interest that the examiner handling the second application be aware of the existence of an appeal. The examiner may ask our office for assistance, as may the Board, during prosecution of the second application.

III. *Notice of appeal*

Recent amendments have been made to conform PTO practice as much as possible to Fed. R. App. 4. *See* 54 Fed. Reg. 29548 (July 13, 1989), *reprinted in*, 1105 Off. Gaz. Pat. Office 5 (Aug. 1, 1989).

A. Time for appeal

If an appeal from a PTO decision to the Federal Circuit is authorized by law, the time for filing a notice of appeal in PTO was changed in August 1989 to two (2) months or 60 days, whichever is longer. The time for seeking judicial review by civil action under 35 U.S.C. 145 or 146 is also two (2) months or 60 days, whichever is longer.

The filing of a request for reconsideration in PTO tolls the time for filing a notice of appeal. After a decision on re consideration is entered in PTO, the two month period begins to run.

The time for appeal to the Federal Circuit is set by the Commissioner. 35 U.S.C.§ 142; 15 U.S.C. § 1071(a)(2). The period for appeal must be at least 60 days. A notice of final rule was effective in August 1989 setting the time for appeal to two months or 60 days - whichever is longer. The dichotomy which used to exist between the 60-day period for initial decisions and the 30-day period for decisions on reconsideration[4] no longer exists.

B. Cross appeals

In *inter partes* cases, a cross-appeal may be filed within fourteen (14) days of service of an appeal or two months after the PTO decision being appealed, whichever is later.

C. Requests to extend time to appeal

A request for an extension of time to file a notice of appeal *before* the appeal period expires can be granted by the Commissioner upon a showing of good cause.

A request *after* the appeal period expires must establish excusable neglect. The "excusable neglect" standard applied by PTO is the same as that applied by the courts of appeals.

All requests for an extension of time to appeal should be directed to the attention of the Office of the Solicitor.

D. Where to file a notice of appeal

The *original* notice must be filed *in* PTO - filing *only* in the Federal Circuit does *not* perfect an appeal. However, a *copy* must also be filed in the Federal Circuit. Fed. Cir. R. 15. A copy of the decision being appealed, and any decision on reconsideration, should be attached to the copy of the notice of appeal filed in PTO and with the Federal Circuit.

The *original* notice may be filed in any of the following ways:

1. By hand-delivery to the Office of the Solicitor between 8:30 a.m. and 5:00 p.m. at:
   Office of the Solicitor
   2121 Crystal Drive
   Suite 918
   Arlington, Virginia

2. By first-class mail addressed to:
   Box 8
   Commissioner of Patents and Trademarks
   Washington, D.C. 20231
   Attention: Office of the Solicitor

3. By Express Mail under 37 CFR § 1.10 addressed to:
   Box 8
   Commissioner of Patents and Trademarks
   Washington, D.C. 20231
   Attention: Office of the Solicitor

A *certificate of mailing* under 37 CFR § 1.8 cannot be used to file a notice of appeal. A notice of appeal filed in PTO using a certificate of mailing under 37 CFR § 1.8 is deemed filed when *received* in PTO. *In re Thrifty Corp.*, 231 USPQ 560 (Comm'r Pat. 1986).

A notice of appeal mailed to the Solicitor's Postal Box in Arlington, Virginia is deemed filed when *received* in the Office of the Solicitor.

E. Content of notice of appeal

A notice of appeal should identify all parties appealing. Fed. R. App. P. 15(a). *See* Torres v. Oakland Scavenger Co., 487 U.S. 312, 317 (1988) [construing similar requirement of Fed. R. App. P. 3(c)] .

Thus, in a case where there are *joint* inventors, the notice of appeal should identify *all inventors*. The notice of appeal should not identify John Doe et al. as appellants; rather, it should identify as appellants all named inventors, i.e., "John Doe and Richard Roe appeal . . . ."

A notice of appeal need simply state that:

John Doe and Richard Roe appeal to the U.S. Court of Appeals for the Federal Circuit from a final decision entered by the Board of Patent Appeals and Interferences on June 15, 1990, and from a decision on reconsideration entered by the Board on July 15, 1990.

There is no need to give reasons in the notice of appeal. See 37 CFR §§ 1.4 and 1.5 for material which should appear in the "heading" of the notice of appeal.

IV. *Transmittal of certified list*

After a notice of appeal is received, a determination is made whether the notice was timely filed.

Appellant will be advised if the appeal is untimely. Fed. Cir. R. 15(b)(1) governs proceedings when a notice of appeal is not timely filed:

If the Commissioner notifies the clerk that the notice of appeal was not timely, the clerk shall order the appellant to show cause why the appeal should not be dismissed, and thereupon refer the response to the court.

In order to properly respond to the Federal Circuit, an appellant may wish to file a request for an extension of time, which should be filed in the Office of the Solicitor, and establish that the untimely filing of the notice of appeal was a result of excusable neglect. Any decision on the request will be copied to the Clerk of the Federal Circuit for such action as may be appropriate. A decision by the Commissioner *granting* a request to extend the time for filing the notice of appeal will discharge the show cause order entered by the Clerk.

A certified list, consisting of the contents of the application, interference, opposition, cancellation, or other proceeding is copied and forwarded to the Federal Circuit with a statement indicating whether the notice of appeal was considered timely filed. In *ex parte* patent appeals the certified list usually does not include the contents to any "parent" applications unless the application involved in the appeal is a "file wrapper continuation" under 37 CFR § 1.62.

A copy of the certified list is mailed to the appellant or, in the case of an *inter partes* proceeding, all parties.

In *ex parte* patent or trademark appeals, an attorney in the Office of the Solicitor is assigned to the appeal at the time the certified list is forwarded to the Federal Circuit. Counsel for appellant should initiate a discussion with the Solicitor's Office attorney assigned to the case to determine the contents of the appendix.

Upon receipt of the certified list, the appeal will be docketed by the Federal Circuit. An appeal number is assigned to each appeal by the Federal Circuit. Appellant's 60-day period for filing a brief runs from the later of the date the appeal is docketed by the Federal Circuit or the certified list is served. Fed. Cir. R. 31(a). Since the appeal is docketed after the certified list is served in the case of PTO appeals, the 60-day period almost always runs from the date the appeal is docketed.

V. *Service of court papers on the Solicitor*

The *mail* service address for the Solicitor is:
Office of the Solicitor
P. 0. Box 15667
Arlington, Virginia 22215

Only litigation papers should be mailed to the Post Office box address. Other papers intended for filing in PTO should be addressed as specified in 37 CFR § 1.1. Non-litigation papers will be *returned* and will *not* be forwarded to the Mail Room.

Litigation papers not served by hand must be mailed to our Post Office box. Litigation papers mailed or delivered to the Mail Room of PTO, left in PTO's night deposit box, or left with a PTO employee in an office other than the Office of the Solicitor, are deemed served when *received* in the Office of the Solicitor.

The Office of the Solicitor is open from 8:30 a.m. to 5:00 p.m. Litigation papers served by hand must be delivered between 8:30 a.m. and 5:00 p.m. to:
Office of the Solicitor
2121 Crystal Drive
Suite 918
Arlington, Virginia

Unless permitted by court rules or order, delivery does not include facsimile transmission.

VI. *Motions*

Motions are inevitable in Federal Circuit and other court practice. Before a motion is filed, appellant should contact the Solicitor's Office to see if there is agreement on the requested relief *and the proposed order*. If there is no opposition to a procedural order, it can be entered by the Clerk, thereby obtaining prompt relief and obviating the need for a judge or motions panel to consider the matter.

VII. *Appendix*

A. Designation

The Office of the Solicitor typically designates the following items for inclusion in the appendix in addition to the mandatory items specified in Fed. Cir. R. 30.

In *ex parte* patent cases, we generally designate:
(1) the specification;
(2) any drawings;
(3) the prior art supporting the rejection;
(4) the final rejection and any Office action referenced in the final rejection;
(5) the examiner's answer; and
(6) any evidence submitted to support patentability.

In *ex parte* trademark cases, we generally designate:
(1) the trademark application, including the drawing;
(2) specimens;
(3) the trademark examining attorney's statement; and
(4) registrations supporting the refusal and any other evidencerelied upon by the examining attorney or the TTAB.

It should be noted that Fed. Cir. R. 30(a)(2)(iii) prohibits the inclusion of briefs filed by an applicant in PTO without leave of the court. However, the examiner's answer and examining attorney's statement may be designated and included without leave. Fed. Cir. R. 30(a)(2).

While the items in the appendix differ from case to case, a typical appendix in an *ex parte* patent appeal contains the following items in the following order:
(1) table of contents;
(2) the initial decision of the Board;
(3) any decision on reconsideration;
(4) a copy of the certified list, which corresponds to the docket entries mentioned in Fed. R. App. P. 29(a)(1)] ;
(5) the specification;
(6) the final rejection;
(7) the examiner's answer;
(8) any prior art relied upon by PTO;
(9) any rebuttal evidence, e.g., affidavits under Rule 131, 37 CFR§ 1.131, or Rule 132, 37 CFR § 1.132; and
(10) a copy of the rejected claims.

With respect to the last item, Fed. Cir. R. 30(a)(3) provides:

> In appeals from . . . [PTO] , the appendix shall, unless the parties mutually agree to the contrary, include a copy of all rejected claims in an *ex parte* patent appeal, a copy of all counts in a patent interference appeal, and both a copy of the trademark sought to be registered or cancelled and a copy of any registration relied upon to refuse or oppose registration or to seek cancellation of a registered mark in an *ex parte* or an inter partes trademark appeal.

If the material designated as the appendix exceeds 100 pages, a draft copy of the appendix, with page numbers, should be sent to the Office of the Solicitor. Upon receipt, if we see any problem with the appendix, including any failure to comply with Federal Circuit rules, we promptly advise appellant. Preparation of a draft appendix will also insure that all briefs properly refer to pages of the appendix.

B. Page numbering

Fed. Cir. R. 30(c)(2) requires that page numbers be centered in the bottom margin of each page and that other pagination marks be redacted if necessary to avoid confusion. Numbering the appendix pages with a format such as "0001" generally avoids confusion with other page numbers.

If the designated appendix is less than 100 pages (which should be copied on both the front and back), the appendix is bound with appellant's principal brief. If the designated appendix is more than 100 pages, the appendix is filed separately within seven (7) days of the date the last reply brief is filed. Fed. Cir. R. 30(a)(4).

C. Legible materials

An appendix will often contain copies of materials which are illegible. In cases where counsel for an appellant does not have legible copies of materials which are available in PTO, contact the Office of the Solicitor and we will arrange to send a legible copy.

Handwritten notes in the margin of counsel's copy of Office actions should be removed. The proper place to argue a case is in a brief — not in notes in the margin.

VIII. *Briefs*

A. Statement of the facts

Fed. R. App. P. 28(a)(3) requires that an appellant file a statement of facts relevant to the issues presented for review. Fed. Cir. R. 28(b) provides that the appellee's statement of the case should be limited to the specific areas of disagreement with those of the appellant. Absent disagreement the appellee shall not include a statement of the case in his brief. *Id.* In our view these rules place the responsibility to provide a complete

[1] *In re Gould*, 673 F.2d 1385, 213 USPQ 628 (CCPA 1982). Relief in this case was ultimately granted in PTO. *Ex parte Gould*, 6 USPQ2d 1680 (Bd. Pat. App. & Int. 1987).

[2] *In re Hester*, 838 F.2d 1193, 5 USPQ2d 1832 (Fed. Cir. 1988). Relief on the merits was ultimately granted by the Federal Circuit in an unpublished opinion.

[3] *In re Ruschig*, 379 F.2d 990, 154 USPQ 118 (CCPA 1967); *In re Fisher*, 448 F.2d 1406, 171 USPQ 292 (CCPA 1971).

[4] 37 CFR§ 1.304(a) (1989); 37 CFR 2.145(d) (1989).

and *neutral* statement of facts on the appellant. Appellant should remember that it *lost* below. Hence, the "facts" are not those the appellant would like them to be; rather, the "facts" are those found by the Board. The statement of the facts in a brief is not the place to *argue* that the Board was clearly erroneous in making a finding of fact.

In our experience, appellants' statement of the facts invariably include argument; fail to describe all the facts relevant to the issues; state the facts in a light most favorable to appellant despite contrary findings below; or state conclusions - often without citation to the appendix. As a result, we typically find it necessary to include a detailed and, we believe, a complete and neutral statement of facts — with full citations to the appendix.

We particularly note that when "new" counsel is retained to handle the Federal Circuit appeal, the arguments on appeal often bear no resemblance to the arguments made to the Board. As a matter of logic, it would seem that the Board could not possibly have erred below on the basis of an argument made for the first time in the Federal Circuit. *See Keebler Co. v. Murray Bakery Products*, 866 F.2d 1386, 9 USPQ2d 1736 (Fed. Cir. 1989) (since Keebler failed to tell the TTAB it was interested in Murray's "intent," it could not use intent as a basis for showing "error" by the TTAB; prescience is not a required characteristic of the board and the board need not divine all possible afterthoughts of counsel that might be asserted for the first time on appeal).

B. References in brief to the appendix

All factual assertions made in the brief should be supported with citation to the appendix. How the Federal Circuit is supposed to know that an assertion is correct, when no reference is made to the appendix in support of the assertion, is something we have not been able to figure out. The Federal Circuit has often noted, with apparent disapproval, the absence of a citation to the appendix in support of a party's position.[22] Failure to cite to the appendix may affect an attorney's credibility before the Federal Circuit and diminish the impact of otherwise meritorious arguments. If counsel feels that it is necessary to make factual assertions and cannot point to the specific portion of the appendix supporting the assertion, consideration should be given to refiling the application. Argument which depends on factual assertions not supported by the record cannot have any relevance to any error in the decision under review.

Moreover, to the extent that we have influence within PTO to bring about a favorable result by way of settlement, we need to be convinced. Allegations, not supported by references to the appendix, are not likely to convince any attorney in the Office of the Solicitor of the merits of an appellant's position.

IX. *Oral argument*

A. When we appear

An attorney from the Solicitor's Office will appear and present argument in cases in which the appellant intends to present oral argument. We will submit on the briefs only (1) where appellant submits on brief *and* (2) no reply brief has been filed or we conclude that the reply brief does not require comment at the oral hearing. On the other hand, if a reply brief raises a substantial issue, particularly a "new" issue, we will appear even if appellant waives oral argument.

B. Discussing the [alleged] error

An appellant has a burden of showing that the Board erred in its decision.[23] Factual findings below must be shown to be clearly erroneous,[24] while legal conclusions are reviewed for correctness or error as a matter of law.[25] Having only a short time for oral hearing, typically fifteen minutes, appellants should direct their remarks to the purported errors in the Board's decision. Based upon the 60 to 80 cases we argue annually, we can assure appellants that Federal Circuit merits panels are familiar with the record and the proceedings under review. Counsel may not want to use part of the 15 minutes normally allocated for oral argument by:

(1) explaining that the case is an appeal from the Patent and Trademark Office (the merits panel already knows that because the briefs have been read),

(2) identifying the appellant or assignee (because it is essentially irrelevant),

(3) reviewing the facts of the case, etc.

However, counsel should be thoroughly familiar with the record and be prepared to identify the portions which support their arguments.

We suggest oral argument by an appellant should start by saying "The error below was . . ." and here's why.

C. Visual aides

Fed. Cir. R. 34(c) encourages the use of visual aids. If the visual aid was not used during the administrative proceeding, written notice of the proposed use must be given at least 15 days prior to the hearing. Any written objections must be filed at least 5 days before the hearing. The rule also provides that counsel may agree on the use of visual aids.

Whether or not we will agree depends on the particular facts. We ordinarily do not disagree with enlargements ("blow- ups") of portions of the record. Where the proposed visual aid is not part of the record, we will not agree until we have had an opportunity to see the visual aid.

X. *Petitions for rehearing*

Petitions for rehearing can be useful if properly used. But, in our experience, petitions for rehearing filed by appellants simply reargue the case. We do not believe this is a proper function of a petition for rehearing.

Generally we will file a petition for rehearing only when (a) we believe the merits panel has made a genuine mistake - not merely a "judgment" call which happens to differ from our judgment, or (b) even where the result is correct, an opinion contains language which we believe will seriously and adversely affect PTO's ability to properly and effectively administer the patent or trademark laws. *See* Markey, "Semantic Antics in Patent Cases," 88 F.R.D. 103, 108 (1980) (suggesting rehearing should be requested to modify opinion language which confuses the law of patents).

We suggest, and do not believe, that there is such a thing as a "routine" petition for rehearing. A truly extraordinary situation must exist before a petition for rehearing can be deemed proper.[26] The Office of the Solicitor has been relatively successful with petitions for rehearing. In a 20-year period before the CCPA and Federal Circuit, we can recall filing approximately 12 petitions for rehearing. Some form of relief has been granted in nine, i.e., claims found patentable in the original decision were found unpatentable on rehearing,[27] language was changed in the opinion,[28] relief was granted in part,[29] etc.

XI. *Issuance of mandates/termination of proceedings*

As provided in Fed. R. App. P. 41(a), the Court's mandate usually issues 21 days after the entry of its decision. A request for rehearing stays the mandate until seven days after an order by the merits panel denying rehearing. Unless there are allowable claims or the Court's decision requires further proceedings by the Office, the receipt of the mandate by PTO "terminates the proceedings" for purposes of continuity under 35 U.S.C. § 120. 37 CFR § 1.197(c), 54 Fed. Reg. 29548, 29552 (July 13, 1989) reprinted in, 1105 Off. Gaz. Pat. Office 5, 9 (Aug. 1, 1989). If an appellant contemplates filing a "continuing" application, it should be filed prior to the receipt of the mandate by PTO to preserve the benefit of the filing date of the parent application. Proceedings terminate on receipt of the mandate,

[22] *See e.g., Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 827, 11 USPQ2d 1321, 1325 (Fed. Cir. 1989), *cert. denied*, 110 S.Ct. 729 (1990).

[23] *In re Durden*, 763 F.2d 1406, 1409, 226 USPQ 359, 361 (Fed. Cir. 1985) (The burden is on appellant to persuade the court that the Board was wrong).

[24] *Stack Pot Restaurant v. Stockpot, Inc.*, 737 F.2d 1576, 1578, 222 USPQ 665, 667 (Fed. Cir. 1984) (findings of fact of the TTAB are reviewed under the clearly erroneous standard); *In re Caveney*, 761 F.2d 671, 674, 225 USPQ 1, 3 (Fed. Cir. 1985) (findings of fact by the Board of Patent Appeals and Interferences are reviewed under the clearly erroneous standard).

[25] *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

[26] In the case of a suggestion for rehearing en banc, we obtain approval from the Solicitor General

[27] *In re Tiffin*, 448 F.2d 791, 171 USPQ 294 (CCPA 1971).

[28] *Parks v. Fine*, 773 F.2d 1577, 227 USPQ 432 (Fed. Cir. 1985), opinion amended, 783 F.2d 1036, 228 USPQ 677 (Fed. Cir. 1986).

[29] *Newman v. Quigg*, 877 F.2d 1575, 11 USPQ2d 1340 (Fed. Cir.), *reh'g on costs granted in part*, 886 F.2d 329 (Fed. Cir. 1989).

not upon the expiration of the period for applying for certiorari to the Supreme Court.[30]

XII. *Costs*

In *ex parte* patent and trademark appeals from PTO, costs are not awarded for or against the Commissioner. See Fed. Cir. Practice Note to Fed. Cir. R. 39.[31] Hence, we do not file bills of costs in *ex parte* cases.

[1120 TMOG 22]

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(196) **Waiver of Certificate of Mailing Requirement Under 37 CFR 1.10**

The Patent and Trademark Office (PTO) will propose to amend 37 CFR 1.10, regarding the "Filing of papers and fees by 'Express Mail' with certificate" by, among other things, deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper.

Background of 37 CFR 1.10 and Rationale for Amendment

35 U.S.C. § 21 authorizes the Commissioner "by rule [to] prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service." 37 CFR 1.10 was promulgated to implement this provision.

Pursuant to 37 CFR 1.6, papers are stamped with the date of receipt in the PTO. An exception is made for papers filed in accordance with 37 CFR 1.10, which provides for the filing of papers and fees by Express Mail with a certificate. However, in order to claim the benefits of 37 CFR 1.10, a party must comply with its specific requirements that the papers have the number of the Express Mail label placed thereon prior to mailing, be properly addressed to the PTO (see "Change of Address For Trademark Applications and Trademark Related Papers," 1163 TMOG 80 (June 28, 1994), which waived 37 CFR 1.10 to the extent that certain trademark related papers could be addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513; and "Change of Address For Patent Applications and Patent Related Papers," 1173 OG 13 (April 4, 1995), which waived 37 CFR 1.10 to the extent that patent related papers could be addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231), and include a Certificate of Mailing by Express Mail which states the date of mailing and is signed by the person mailing the papers.

37 CFR 1.10 was promulgated in response to concerns that mail service was sometimes subject to delay and, except for hand-delivery, that there was no way to ensure the timely filing of time-critical documents with the PTO. "Express Mail" was chosen because, among other things, a person other than the filer, that is a disinterested third party working for the U.S.P.S., enters the date of deposit on the Express Mail label.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the PTO, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail and its apparent redundancy in purpose, inasmuch as the date of deposit has already been entered by a disinterested third party, the PTO will propose to delete this requirement from 37 CFR 1.10.

This notice applies *only* to correspondence actually received (not to papers lost or misplaced by the U.S.P.S.) at the PTO via Express Mail Post Office to Addressee service where there is a clear indication of the "date in" on the Express Mail label by the U.S.P.S. Filers are encouraged to continue the practice of placing a Certificate of Mailing by Express Mail on papers filed in the PTO by Express Mail since, in some cases, the certificate may provide useful evidence.

Interim Waiver of 37 CFR 1.10 for Documents Filed without Certificate of Express Mail

Because a significant period of time will elapse before any final rule change can be promulgated, and because there appears to be no harmful consequence to any party, effective as of the publication date of this notice, the PTO will, sua sponte, waive 37 CFR 1.10 to the extent of granting a filing date as of the "date in" entered on the Express Mail label by the U.S.P.S. employee (unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia; see § 1.6(a)) for all papers actually received at the PTO via Express Mail, regardless of whether the requirement for a Certificate of Mailing by Express Mail has been met provided all other requirements of 37 CFR 1.10 are met.

For all papers filed prior to the date of this notice, which were not in compliance with the Certificate of Mailing by Express Mail requirements under 37 CFR 1.10, a petition to the Commissioner will be required to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper. The petition should include a copy of the Express Mail label showing the "date in" entered by the U.S.P.S. employee and a declaration attesting to the contents of the envelope to which the Express Mail label was attached. See 37 CFR 1.183 or 2.146.

Summary

In summary, the PTO is waiving, sua sponte, the requirement of 37 CFR 1.10 for a Certificate of Mailing by Express Mail and will propose to amend 37 CFR 1.10 to delete the requirement for a Certificate of Mailing by Express Mail. This waiver becomes effective upon the publication of this notice. For all documents filed by Express Mail prior to this notice, but not in compliance with the Certificate of Mailing by Express Mail requirement, a petition to the Commissioner under either 37 CFR 1.183 or 2.146 must be filed to request that the date of deposit as shown by the "date in" entered on the Express Mail label be accorded as the filing date of the paper.

PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

EDWARD R. KAZENSKE
Deputy Assistant Commissioner for Patents

[1174 TMOG 92]

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(197) **Department of Commerce**
Patent and Trademark Office
37 CFR Parts 1, 5 and 10
[Docket No. 951006247-5247-01]
RIN 0651-AA70

Communications with the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking.
Summary: The Patent and Trademark Office (Office) is pro-

[30] *In re Jones*, 542 F.2d 65, 69, 191 USPQ 249, 252 (CCPA 1976) (when PTO receives CCPA mandate, proceedings in patent application are terminated); *Continental Can Co. v. Schuyler*, 326 F. Supp. 283, 168 USPQ 625 (D.D.C. 1970) (proceedings terminate within meaning of 35 U.S.C.§ 120 when mandate of CCPA was issued). See also In re Willis, 537 F.2d 513, 515, 190 USPQ 327, 329 (CCPA 1976). Once a mandate is issued, it is our experience that a motion to withdraw the mandate to secure "copendency" with a continuation will not be granted. *In re Iwashita*, Fed. Cir. No. 90-1162, *In re Nakahama*, Fed. Cir. No. 90-1166, and In re Nakahama, Fed. Cir. No. 90-1187.

[31] *See also In re Kochan*, Fed. Cir. No. 83-502 (May 25, 1983); In re Lobdell, Fed. Cir. No. 83-674 (Sept. 22, 1983); *In re Piasecki*, Fed. Cir. No. 84-775 (Nov. 9, 1984); *In re Shivvers*, Fed. Cir. No. 85-1544 (Dec. 19, 1985); *In re Wrenn*, Fed. Cir. No. 86-743 (July 17, 1986); and *In re Dow Chemical*, Fed. Cir. No. 87-1406 (Feb. 11, 1988).

posing to amend the rules of practice in patent and trademark cases to: (1) require that patent-related mail be addressed to the Assistant Commissioner for Patents; (2) require that most trademark-related mail be addressed to the Assistant Commissioner for Trademarks; (3) specify a separate address for mail related to disciplinary proceedings pending before the Administrative Law Judge or the Commissioner in the Office of the Solicitor; (4) provide a definition of "Federal holiday within the District of Columbia"; and (5) delete the requirement for a certificate for "Express Mail" in section 1.10 and incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Dates: Comments must be received by January 2, 1996. No hearing will be held.

Addresses: Address written comments to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Lynne G. Beresford. In addition, written comments may also be sent by facsimile transmission to (703) 308-7220 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to mail-rule@uspto.gov.

Written comments will be available for public inspection on [Insert date 75 days after date of publication in the FEDERAL REGISTER], in the Assistant Commissioner for Trademarks' suite on the 10th floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

For Further Information Contact: Lawrence E. Anderson (for patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Lynne G. Beresford (for trademark-related matters) by telephone at (703) 308-8900, extension 44, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Supplementary Information: Addresses for correspondence with the Office are proposed to be changed to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; and to add a separate mailing address in the Office of the Solicitor for disciplinary matters.

The proposed rulemaking entitled "Changes in Requirements for Addressing Trademark Applications and Trademark-Related Papers" (0651-AA73) has been merged with this notice of proposed rulemaking.

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. Notwithstanding the above, it is proposed that there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Because patent-related mail will be sent to the Assistant Commissioner for Patents, the requirement to designate patent application correspondence as "PATENT APPLICATION" is proposed to be deleted from section 1.5(a).

In addition, it is proposed that "Federal holiday within the District of Columbia" be defined as including Official closings.

It is further proposed that a "Certificate of Mailing by Express Mail" (currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper) no longer be required for correspondence actually received in the Office.

PATENT-RELATED MAIL

Section 1.1 is proposed to be amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice (Change of Address for Patent Applications and Patent Related Papers) published in the *Official Gazette* at 1173 Off. Gaz. Pat. Office 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board, patent services including patent copy sales, assignments, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the Official Gazette should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

TRADEMARK-RELATED MAIL

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. When trademark-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice (Change of Address for Trademark Applications and Trademark Related Papers) published in the Federal Register at 59 FR 29275 (June 6, 1994) and in the Trademark Office Official Gazette at 1163 Off. Gaz. Trademark Office 80 (June 28, 1994) (republished in 1170 Off. Gaz. Pat. Office 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the Official Gazette. In addition to addressing trademark-related mail as set forth above, the boxes should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

HAND-CARRIED CORRESPONDENCE

All correspondence with the Office, except for communications relating to pending litigation as specified currently in section 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia.

FEDERAL HOLIDAYS WITHIN THE DISTRICT OF COLUMBIA

When the Patent and Trademark Office is officially closed for an entire day (for reasons due to weather or other causes), the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.

Legal holidays considered "Federal holidays within the District of Columbia" are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25). In the past, the Office has published notices concerning unscheduled closings. *See, e.g.*, "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994," 1161 Off. Gaz. Pat. Office 12 (April 5, 1994) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office," 1097 Off. Gaz. Pat. Office 53 (December 20, 1988) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)). The proposed rule change will further implement the existing policy.

EXPRESS MAIL PROVISIONS

Section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper. The title of section 1.10 is proposed to be revised and section 1.10 is also proposed to be amended to incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the Office, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office proposes to delete this requirement from section 1.10.

MISCELLANEOUS CHANGES

Miscellaneous changes are proposed to change the word "communications" to "correspondence" for purposes of consistency. Also, since the certificate of mailing by "Express Mail" will no longer be a requirement of the proposed rules, the provisions of Part 10 relating to misconduct are proposed to be amended to delete reference to this requirement.

DISCUSSION OF SPECIFIC RULES

If revised as proposed, the heading of section 1.1 will be changed to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is proposed to be revised to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). It should be noted that the remaining paragraphs of section 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) is proposed to be added to set out the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) is proposed to be added to set out the new mailing address to which most trademark-related documents should be sent. The Solicitor's mailing address, formerly set out in paragraph (g) of the section is moved to a new paragraph (a)(3). Paragraph 1.1(g) is proposed to be removed and reserved.

Sections 1.1 and 1.3 are proposed to be amended so that the word "communications" is changed to "correspondence."

Section 1.5(a) is proposed to be amended by removing the requirement of the words "PATENT APPLICATION" on letters concerning patent applications.

Section 1.8 (a) is proposed to be revised to state that papers and fees must be addressed as set out in section 1.1 (a). For the purposes of 1.8 (a) (1) (i) (A), first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the U.S.P.S.

Section 1.9 is proposed to be amended to add a definition of "Federal holiday within the District of Columbia" to include Federal holidays and days when the Patent and Trademark Office is officially closed for the entire day (for reasons due to adverse weather or other causes).

Section 1.10 is proposed to be revised to state that "Express Mail" must be addressed as set out in § 1.1(a). The title of section 1.10 is proposed to be revised to reflect this change. Further, for all correspondence *actually received* in the Office, the Office will consider the correspondence filed on the date shown by the "date in" notation on the "Express Mail" label unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. Because of the reliance on the "date in" marked by the Postal Service, correspondence should be deposited directly with a person at the United States Postal Service, rather than in a drop box, to ensure that the person making the deposit receives a copy of the "Express Mail" label at the time of making the deposit to verify that the "date in" is accurately and clearly written by the Postal Service employee. Persons using an Express mail receptacle (such as a drop box) do so at the risk of not receiving an accurate and legible copy of the Express mail label at the time of deposit from which the Office may determine the "Express mail" "date in," and, therefore, may not later argue that they should be entitled to the date on which they deposited the correspondence into a receptacle. Moreover, if the "date in" is found to be illegible or unclear, a person dealing directly with a Postal Service employee must take corrective action to ensure that a clear and accurate date is marked at the time of deposit. Persons choosing to use a receptacle (or the like) obviously do not oversee the marking by a Postal Service employee and thus may not later argue for the benefit of a section 1.10 filing date if the "date in" on the "Express Mail" label is improperly or not clearly marked. The determinative factor is when the Postal Service marks the "date in" and the mere deposit into a receptacle does not entitle one to an "Express Mail" "date in" under section 1.10.

Paragraph (b) of section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) express mail service as the filing date of the paper.

Paragraph (c) of section 1.10 is proposed to be amended to set forth the requirements for the treatment of correspondence not received by the Office for which the "Express Mail" procedure was utilized. Correspondence not received by the Office will be considered filed in the Office on the date shown by

the "date in" notation entered by the Postal Service if the party who forwards the correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies an additional copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in section 10.1(r) of this chapter.

In addition, although the requirement for a certificate of express mail has been proposed to be eliminated from section 1.10, applicants are strongly encouraged to continue using the certificate of express mail, as well as the placement of the Express Mail label number in the upper right corner of the first page of each separate piece of correspondence and to retain a clearly marked Express Mail label, to facilitate complying with the requirements of paragraph (c) if the correspondence is not received in the Office or if reliance on the U.S.P.S. "date in" is not possible. Moreover, paragraph (d) is proposed to be added so that additional evidence may be required if the Office so determines.

Section 5.33 (entitled "Correspondence") is proposed to be amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is proposed to be revised to reflect the proposed change to section 1.10 that the certificate of mailing by "Express Mail" is no longer a requirement of the rules.

OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Information collection requirements are not affected by the change of address. This proposed rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The proposed rule change has no effect on patent fees.

These proposed rule changes contain collections of information subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which are currently approved by the Office of Management and Budget under Control No. 0651-0009 and 0651-0031. The public reporting burden for these collections of information for certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0031).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

37 CFR PART 10

Administrative Practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 5 and 10 are proposed to be amended as follows:

PART 1--RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by removing and reserving paragraph (g) and by revising the title and paragraph (a) to read as follows:

§ 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for those documents identified in paragraphs (1), (2) and (3) of this section, all correspondence intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks, Washington, D.C. 20231." When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence addressed to the wrong Post Office Box will not be filed elsewhere in the Patent and Trademark Office and might be returned.

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(g) [Reserved]

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3. Section 1.3 is proposed to be revised to read as follows:

§ 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5(a) is proposed to be revised to read as follows:

§ 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; *e.g.*, 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

5. Section 1.8(a)(1)(i)(A) is proposed to be revised to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) ***

(1) ***

(i) ***

(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

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6. Section 1.9 is proposed to be revised by adding a new paragraph (h) to read as follows:

§ 1.9 Definitions.

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(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business.

7. Section 1.10 is proposed to be revised to read as follows:

§ 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. See § 1.6(a). This procedure can be used to file any correspondence in the Office.

(b) Any correspondence filed by "Express Mail" must be addressed as set out in § 1.1(a) and should be deposited directly with the United States Postal Service to ensure that the person depositing the correspondence receives a copy of the "Express Mail" label at the time of deposit with the "date in" clearly marked thereon. Persons dealing indirectly with the United States Postal Service (such as by deposit in an Express Mail drop box) do so at the risk of not receiving their copy of the "Express Mail" label with the "date in" clearly marked.

(c) Any correspondence mailed to the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service, but not received by the Office, will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia (see § 1.6(a)), if the party who forwarded such correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies a copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, to the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(d) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the United States Postal Service on the date in question.

Part 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

8. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

9. Section 5.33 is proposed to be revised to read as follows:

§ 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Part 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

10. The authority citation for 37 CFR Part 10 continues to read as follows:
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

11. Section 10.23(c)(9) is proposed to be revised to read as follows:

§ 10.23 Misconduct.

*****

(c) ***

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(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

October 26, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1180 TMOG 122]

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(198) **Helpful Hints**

• *Correspondence with Certificate of Mailing Delivered by Commerical Carrier*—The benefits of 37 CFR 1.8 or 1.10 apply only to documents delivered to the PTO by the U.S. Postal Service.

A number of instances have been uncovered where individuals are certifying that documents were deposited with the U.S. Postal Service when, in fact, the documents were hand carried or delivered to the PTO via commerical mail service, e.g., "Federal Express," "DHL," "Purolator," "Air Borne," "UPS", etc. In those instances where documents include a certificate of mailing under 37 CFR 1.8 or 1.10, but were delivered to the PTO by other than U.S. Postal Service, Mail Room personnel are placing a notice indicating that fact on the correspondence involved to alert PTO personnel that the benefits of 37 CFR 1.8 or 1.10 do not apply.

[1080 TMOG 6]

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(199) **Helpful Hints**

• *Certificate of Mailing AND Return Post Card*—Use of the Certificate of Mailing Procedure is strongly encouraged.

37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is not received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

[1082 TMOG 8]

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(200) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office

Change of Address For Trademark Applications and Trademark Related Papers

Agency: Patent and Trademark Office, Commerce.
Action: Notice.
Summary: Commencing July 5, 1994, trademark applications and other trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark documents, should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513.
Dates: This new address will be effective July 5, 1994.
For Further Information Contact: Lynne G. Beresford at (703) 305-9464 or by mail marked to her attention and addressed to: Assistant Commissioner for Trademarks, Washington, D.C. 20231. After July 5, 1994, mail should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513.
Supplemental Information: As part of its emphasis on better service for trademark applicants and registrants, the responsibilty for receiving, opening and routing of trademark mail is being transferred to the Assistant Commissioner for Trademarks. In order to more efficiently process the mail, the Assistant Commissioner has determined that trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark application and registration documents, should be sent directly to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513, which is the location of the Trademark Operation. Having mail sent directly to that address should speed up processing and reduce the amount of lost or misrouted mail. The mail room at the South Tower Building will begin to receive and process mail on July 5, 1994. For a period after July 5, 1994, the Patent and Trademark Office (Office) will receive trademark-related mail at both the old address, Commissioner of Patents and Trademarks, Washington, D.C. 20231, and at the new address, Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va., 22205-3513. The Office is currently preparing a notice of proposed rulemaking to formally change the address for trademark-related papers. The Office will continue to maintain the following special boxes, Box Trademark Application, Box ITU, Box AAU, and Box 5, for expedited processing and distribution of specific types of documents. The Office encourages the continued use of these boxes with the new address.

People may continue to file both patent and trademark-related papers directly at the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Va.

Sections 1.8 and 1.10 of Title 2 of Section 37 of the Code of Federal Regulations are waived, to the extent that, on or after July 5, 1994, a certificate of mailing under §§ 1.8 or 1.10, for trademark applications and other trademark-related mail, except for trademark-related documents sent to the Assignment Branch for recordation and requests for certified copies of trademark application and registration documents, may be addressed either to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, or to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va., 22202-3513. Patent-related mail should continue to be sent to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Authority: 35 U.S.C. 6, 15 U.S.C. 1123

May 26, 1994 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1163 TMOG 80]

(201) **Special Boxes And "Fee/No Fee" Indicators For Trademark-Related Mail And Guidelines For Filing Requests To Extend Time To Oppose With The Trademark Trial And Appeal Board (TTAB)**

On July 5, 1994, the Patent and Trademark Office opened a mailroom to receive mail related to trademark applications, registrations and matters before the Trademark Trial and Appeal Board at the following addresses:

Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

To facilitate mail-handling in the new mailroom, the special box designations have been expanded so that incoming mail can be presorted more efficiently. In addition to these box designations, filers are encouraged to indicate whether the contents of an envelope contain a "FEE" or "NO FEE." As shown below, the "FEE" and "NO FEE" indicators should be set forth on the line below the box designation for easy visibility. Envelopes will be batched based on the "FEE/NO FEE" indicator and box designation and sent unopened to the appropriate employee in the Pre-exam area for processing.

The "SPECIAL BOXES FOR MAIL" page in the *Official Gazette* will be changed. Please note that the "BOX 5" designation for "'No fee' mail related to trademarks" has been discontinued. Furthermore, the box designation "Box Trademark Application" has been changed to "BOX NEW APP."

The following box designations and "FEE/NO FEE" indicators will now be available:

BOX NEW APP FEE	for any new trademark application. [All applications require fees; therefore a "NO FEE" indicator should not be used.]
BOX ITU FEE	for papers such as Statements of Use (SOU), and extensions requests therefor, to be filled with the Intent to Use (ITU) Unit. [All ITU papers require fees; therefore a "NO FEE" indicator should not be used.]
BOX TTAB FEE	for papers such as oppositions, cancellation petitions and ex parte appeals filed with the Trademark Trial and Appeal Board (TTAB).
BOX TTAB NO FEE	for TTAB papers with no fee, such as extension requests, interferences and motions.
BOX STATUS NO FEE	for written status inquiries. [Status inquiries do not require a fee; therefore a "FEE" indicator should not be used.]
BOX POST REG FEE	for post registration documents such as Section 8 affidavits and Section 9 renewals.
BOX RESPONSES NO FEE	for responses to Examining Attorneys' Office actions; and for responses to Post Registration Examiners' rejections.

For best results, these box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document. However, although not preferred procedure, filers may continue to include documents destined for more than one location in a single envelope, provided each document references the box designation and "FEE/NO FEE" indicator on the cover sheet or first page of the document; and provided each complete filing is stapled or secured in some fashion. The envelope should list all the box designations and "FEE/NO FEE" indicators for its contents.

This notice does not apply to trademark-related documents intended for recordation with the Assignment Branch or for requests for certified and uncertified copies of trademark application and registration documents. These papers and patent-related mail should continue to be sent to:
Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Labeling First Requests for Extensions of Time to Oppose

Although the Trademark Trial and Appeal Board reports to the Office of the Deputy Assistant Secretary of Commerce and Deputy Assistant Commissioner of Patents and Trademarks, it is located and receives its mail at the Arlington address of the Assistant Commissioner for Trademarks. As noted above, requests for extensions of time to oppose should be sent to BOX TTAB, including the "NO FEE" indicator.

Because first requests for extensions of time to oppose are critically time-sensitive documents, filers are encouraged to indicate on the cover sheet or first page of the extension request that the paper is a first request. The suggested title for these documents is: **First Request for Extension of Time to File a Notice of Oppositions.**

October 25, 1994 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1168 TMOG 89]

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(202) **Changes in How Papers May be Filed in the Patent and Trademark Office**

Beginning April 21, 1992, an improved service will be offered to people who wish to file papers directly with the Patent and Trademark Office (PTO) by extending the hours of operation for the Attorneys' Window located in Room 1B03 of Crystal Plaza Building 2, Arlington, Virginia. The current hours of operation are from 8:30 a.m. to 5:00 p.m., Monday through Friday, except Federal holidays within the District of Columbia. The change will extend the hours of operation until 12:00 midnight on Monday through Friday, except holidays, on a trial basis. If, after six months, usage does not warrant retaining operations until midnight, the hours of operation will be reduced.

This change will provide walk-up, personalized service to firms and individuals who are filing documents with the PTO. The PTO will continue to stamp postcard-type receipts to acknowledge the receipt of papers filed at the Attorneys' Window.

Also, effective on April 21, 1992, the PTO is discontinuing the use of drop boxes in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the main entrance of the Department of Commerce Building, Washington, D.C. (37 CFR 1.6(c)) as means for receiving papers.

These changes will provide improved services with respect to receipt and processing of documents while, at the same time, overcoming problems with the present arrangement.

Problems encountered with the present arrangement for the drop boxes have occasionally made it difficult to determine the dates of actual deposit of papers. For example, there have been many incidents of papers being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). On occasion, the PTO and/or filers have been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place in the lobby.

Provisions are also available for filing papers through the use of the certificate of mailing (37 CFR 1.8) and the Express Mail (37 CFR 1.10) procedures.

March 17, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1137 TMOG 7]

(203) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1, 2 and 10

[Docket No. 90671-3225]
RIN: 0651-AA55

Changes in Signature and Filing Requirements for Correspondence Filed in the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases to: specify the types of correspondence which will no longer require original signatures; provide for facsimile transmission of certain correspondence to the Office; discontinue use of the drop boxes at Crystal Plaza Building 3 and at the Department of Commerce building in Washington, D.C.; and clarify other provisions with respect to practice before the Office.
Effective Date: November 22, 1993. These rules will be applicable to all correspondence filed with the Office on or after the effective date.
For Further Information Contact: Abraham Hershkovitz by telephone at (703) 305-9282, by facsimile transmission at (703) 305-8825, or by mail marked to his attention and addressed to Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.
Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 36034 (August 12, 1992) and in the Patent and Trademark Office Official Gazette at 1142 Off. Gaz. Pat. Office 8-13 (September 1, 1992), the Office proposed to amend the rules of practice in patent and trademark cases to simplify the manner in which correspondence may be transmitted to the Office and clarify other provisions with respect to practice before the Office. This rulemaking includes changes to expand those situations where a party can use the Certificate of Mailing or Transmission procedure, and minor technical modifications in Part 2 of Title 37 of the Code of Federal Regulations which were not part of the proposed rulemaking. This rule making also expands the acceptability of facsimile transmissions to certain trademark documents which were not part of the proposed rulemaking.

Written comments were submitted by twenty-two law firms, five individuals, nine corporations, two organizations and three agencies. An oral hearing was not conducted.

The following includes a discussion of the rules being changed and the reasons for those changes, and an analysis of the comments received in response to the notice of proposed rulemaking.

Discussion of Specific Sections to be Changed or Added:

(1) Types of Correspondence No longer Requiring Original Signatures (Section 1.4)

Section 1.4 is amended to include a new paragraph (d) to specify that most correspondence filed in the Office, which requires a person's signature, may be an original, or a copy thereof. See §§ 1.4 (e) and (f) for types of correspondence where the original must be filed in the Office. The word original, as used in this rulemaking, is defined as correspondence which is personally signed in permanent ink by the person whose signature appears thereon. Where copies of correspondence are acceptable, photocopies or facsimile transmissions may be filed. For example, a photocopy or facsimile transmission of an original of an amendment, declaration, petition, issue fee transmittal form, authorization to charge a deposit account, etc., may be submitted in a patent or trademark application. Furthermore, where copies are permitted, second and further generation copies (i.e., copy of a copy) are acceptable. The original, if not submitted to the Office, should be retained as evidence of proper execution in the event that questions arise as to the authenticity of the signature reproduced on the photocopy or facsimile-transmitted correspondence. If a question of authenticity arises, the Office may require submission of the original.

Section 1.4(e) identifies types of correspondence in which an original must be submitted to the Office. Where an original is required, copies are not acceptable and will not be accorded a receipt date. Correspondence, as referred to in this section, includes application forms for registration to practice before the Office and data sheets for the register of patent attorneys and agents.

Section 1.4(f) provides that when a document that is required by statute to be certified must be filed (such as a certified copy of a foreign patent application, pursuant to 35 U.S.C. 119; a certified copy of an international application, pursuant to 35 U.S.C. 365; a certified copy of a foreign trademark registration, pursuant to 15 U.S.C. 1126(e); a certified copy of a final court order, pursuant to 15 U.S.C. 1119; or a certified copy of a U.S. trademark registration), a copy of the certification, including a photocopy or facsimile transmission, will not be acceptable. The requirement for an original certification does not apply to certifications such as required under §§ 1.8, 1.10, 1.60, 1.97(e) and 3.73(b), since these certifications are not required by statute.
(2) Identification of Applications (Section 1.5)

Section 1.5(a) is amended to make reference to the certificate procedure under § 1.8 consistent with the new title for § 1.8.
(3) Receipt of Correspondence (Section 1.6)

A descriptive heading is added to each paragraph of § 1.6 to identify the content of that paragraph.

The phrase "correspondence" is used in § 1.6 since the terms "papers", "letters" and "fees" all fall within the generic definition of "correspondence".

Section 1.6(a) is amended to clarify that correspondence transmitted by facsimile on weekends or Federal holidays within the District of Columbia, will be accorded the next business day as the date of receipt.

Sections 1.6 (b) and (c) are amended to clarify that weekdays refer to any day except a Saturday, Sunday, or Federal holiday within the District of Columbia.

Section 1.6(c) is amended to delete reference to the box locations in the lobby of Crystal Plaza Building 3, Arlington, Virginia, and at the Department of Commerce Building in Washington, D.C. The use of the drop boxes was discontinued on April 21, 1992, and the hours of operation for the attorney's window were extended to midnight, the same hours the drop boxes were available. The public can now deposit correspondence with the Office and obtain an acknowledgment of receipt after normal business hours. See "Changes in How Papers May Be Filed in the Patent and Trademark Office", 1137 Off. Gaz. Pat. Office 7 (April 7, 1992).

Use of the drop boxes at Crystal Plaza Building 3 and Department of Commerce Building locations had caused problems for both the public and the Office. Occasionally, it had been difficult to determine the dates of actual deposit of correspondence in the boxes. On occasion, Office employees and/or members of the public had been denied access to the drop box at the Department of Commerce by building security guards due to a special event taking place at the Department. Additionally, there were instances of correspondence being found outside of the drop boxes (e.g., on the floor of the main lobby of the Department of Commerce Building, on the guard's desk, on a nearby table, etc.). As a result, on occasion, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the boxes at Crystal Plaza Building 3 and at the Department of Commerce Building. Given these difficulties, and the fact that the necessity for these boxes has been greatly diminished as a result of the facsimile transmission and certificate of mailing procedures, § 1.6(c) is amended by deleting reference to the drop boxes at Crystal Plaza Building 3 and the Department of Commerce Building.

A new section 1.6(d) is added to specify the types of correspondence which may be transmitted by facsimile and former § 1.6(d) is revised to be consistent with § 1.8(b) and redesignated as § 1.6(e). The widespread use of facsimile transmission and the resulting time saved in correspondence between applicants and the Office prompted the Office to establish a trial program to accept facsimile transmission of certain correspondence. The policy on "Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1096 Off. Gaz. Pat. Office 30 (November 15, 1988) and was supplemented in the notice "Filing of Certain Papers with the Board of Patent Appeals and Interferences by Facsimile Transmission" published at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989). The policy on "Filing of Certain Trademark Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission" was published at 1123 Off. Gaz. TM. Office 18 (February 12, 1991). In light of the success of the trial program, a policy on acceptance of facsimile transmission is incorporated into § 1.6(d). The situations where transmission of correspondence by facsimile is permitted have been increased over those permissible under the trial program outlined above. The situations where transmissions by facsimile remain prohibited are identified in § 1.6(d)(1)-(9). Prohibitions cover situations where originals are required as specified in §§ 1.4 (e) and (f), and situations where accepting a facsimile transmission would be unduly burdensome on the Office. As a courtesy, the Office will attempt to notify senders whenever correspondence is sent to the Office by facsimile transmission that falls within one of these prohibitions. Senders are cautioned against submitting correspondence by facsimile transmission which is not permitted under § 1.6(d) since such correspondence will not be accorded a receipt date.

This final rulemaking expands the acceptability of facsimile transmission to certain patent interference proceedings, not included in the proposed rulemaking, to reflect the practice set forth at 1108 Off. Gaz. Pat. Office 15 (November 14, 1989).

This final rulemaking also expands the acceptability of facsimile transmission to certain trademark documents, not include in the proposed rulemaking. These addditional documents are:

(1) An affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

(2) An application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

(3) In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

The Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence listed in (1)-(3) above, nor to the filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority or to the filing, in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), of a request under section 1(d)(2) of the Trademark act, 15 U.S.C. 1051 (d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1). See § 1.8 (a)(2)(i)(E) and 1.8 (a)(2)(ii)(B), (C), (E) and (F). If the transmission of any of these documents is completed after midnight (Eastern time) of the due date, the papers are untimely.

Under § 1.6(d)(4) as adopted in this final rulemaking, drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21 may not be filed by facsimile in patent and trademark applications. The experience of the Office is that the quality of the drawings received by facsimile transmission is generally not sufficient to comply with the drawing requirements set forth in these rules. However, applicants may submit by facsimile transmission proposed drawing corrections for approval by the Office.

In trademark proceedings, the facsimile transmission of specimens in response to an Office action will be permitted. Facsimile-transmitted specimens must be legible in order to be accepted and examined as specimens. This final rulemaking also expands the acceptability of specimens filed in conjunction with amendments to allege use under section 1(c); statements of use under section 1(d); affidavits of use or excusable nonuse under section 8 (a) or (b) or 12(c); and applications for renewal under section 9 of the Trademark Act. 15 U.S.C. 1051 (c) and (d); 1058 (a) and (b); 1062(c) and 1059.

The date of receipt accorded to any correspondence permitted to be sent by facsimile transmission is the date the complete transmission is received by an Office facsimile unit, unless the transmission is completed on a Saturday, Sunday, or Federal holiday within the District of Columbia. Correspondence for which transmission was completed on a Saturday, Sunday, or Federal holiday within the District of Columbia, will be accorded a receipt date of the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia. For example, a facsimile transmission to the Office from California starting on a Friday at 8:45 p.m. Pacific time and taking 20 minutes, would be completed at 9:05 p.m. Pacific time. The complete transmission would be received in the Office around 12:05 a.m. Eastern time on Saturday. The receipt date accorded to the correspondence is the date of the following business day, which in this case, would be Monday (assuming that Monday was not a Federal holiday within the District of Columbia).

The following lists itemize types of correspondence which *may not* be filed by facsimile transmission, and, if submitted by facsimile, will not be accorded a date of receipt:

Correspondence Relative to Patents and Patent Applications Where Filing by Facsimile Transmission is Not permitted

(1) A document that is required by statute to be certified;

(2) A national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

(3) Drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, or 1.437;

(4) Correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

(5) Agreements between parties to an interference under 35 U.S.C. 135(c);

(6) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653;

(7) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1-5.8 of this chapter and directly related to the secrecy order content of the application;

(8) An international application for patent;

(9) A copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b);

(10) A request for reexamination under § 1.510.

Correspondence Relative to Trademark Registrations and Trademark Applications Where Filing by Facsimile Transmission is Not Permitted

(1) The filing of a trademark application;

(2) Drawings submitted under § 2.21;

(3) A petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

(4) Request for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(5) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal.

Correspondence Relative to Practitioner Registrations, Investigations, and Disciplinary Proceedings Where Filing by Facsimile Transmission is Not Permitted

Correspondence requiring a person's signature and relating to:

(1) Registration to practice before the Patent and Trademark Office in patent cases;

(2) Enrollment and disciplinary investigations: or

(3) Disciplinary proceedings.

(4) Certificate of Mailing or Transmission Procedure (Section 1.8)

The title of § 1.8 is changed from Certificate of Mailing to Certificate of Mailing or Transmission so as to include facsimile transmission.

Section 1.8(a) prescribes procedures for the use of a certificate of mailing or transmission to file papers or fees in the Office by first class mail or by facsimile transmission. The description of the Certificate of Mailing or Transmission practice is set forth in § 1.8(a)(1), and the list of exceptions to the

certificate practice is found in § 1.8(a)(2). The phrase "papers or fees" in § 1.8(a) is changed to "correspondence" since both "papers" and "fees" fall within the generic definition of "correspondence". Paragraphs (a) and (b) of § 1.8 are amended to include correspondence transmitted by facsimile. In the event that correspondence is filed by facsimile transmission, it is recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. This report should be retained by the applicant, along with the correspondence used as the original, as evidence of content and date of transmission. Paragraph (a)(2) of § 1.8 is amended to include separate headings for correspondence which relate to patents, trademarks and disciplinary proceedings. The sequence of some of the paragraphs found in § 1.8(a)(2) has been changed in order to have those paragraphs listed under the appropriate heading. The ability to use the Certificate of Mailing or Transmission procedures has been expanded to the filing of an affidavit under section 15, subsection (3) of the Trademark Act, 15 U.S.C. 1065(3), the filing of a notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or 15 U.S.C. 1071(a)(1), in response to another party's appeal to the Court of Appeals for the Federal Circuit, the filing of a notice and reasons of appeal under 35 U. S.C. 142 or a notice of appeal under 15 U.S.C. 1071(a)(2), and the filing of a statement under 42 U.S.C. 2182 or 42 U.S.C. 2457(c).

Paragraph (a)(2)(vi) of § 1.8 is redesignated as paragraph (a)(2)(x) and amended to refer to section 14(1) or 14(2) of the Trademark Act, 15 U.S.C. 1064, to conform with the numbering of the Trademark Law Revision Act of 1988. Other sections of paragraph (a)(2) of § 1.8 are amended to identify the types of correspondence which will not receive the benefit of a certificate of mailing or transmission.

Paragraph (b) of § 1.8 outlines procedures to be followed to document the timely filing of correspondence in accordance with § 1.8(a) where such correspondence is not received by the Office. The phrase "correspondence or fees" in § 1.8(b) is changed to "correspondence" since "fees" fall within the generic definition of "correspondence". Before adoption of this final rule, § 1.8(b) required that the party forwarding the correspondence or fee include a declaration, under §§ 1.68 or 2.20 of this chapter, attesting to the previous timely mailing or transmission. In order to be consistent with other sections in Parts 1 and 2 of this chapter, the practice under § 1.8(b) is amended to permit a practitioner, as defined in § 10.1(r), to submit a statement rather than an oath or declaration under §§ 1.68 or 2.20 of this chapter. New paragraph (c) of § 1.8 is added to explicitly provide for a requirement for additional evidence relating to the mailing or transmission of correspondence in accordance with paragraph (a) of this section. The Office may invoke this requirement when it is deemed appropriate to establish an actual date of mailing or transmission. See, e.g., In re Klein, 6 USPQ2d 1547 (Comm'r Pat. 1987), aff'd sub nom. Klein v. Peterson, 696 F. Supp. 695, 8 USPQ2d 1434 (D.D.C. 1988), aff'd 866 F.2d 412, 9 USPQ2d 1558 (Fed. Cir.), cert. denied, 490 U.S. 1091 (1989).

(5) Time for Appeal or Civil Action (Section 1.304) In section 1.304, paragraphs (a) and (c) are amended to delete a statement that use of the certificate procedure under § 1.8 is prohibited so as to be consistent with changes to § 1.8. Also, a cross reference to 1.658 in paragraph (a) is clarified.

(6) Submission of Maintenance Fees (Section 1.366) Section 1.366(b) is amended by deleting the words "of mailing" to conform with the new title for § 1.8.

(7) Filing Date of Application for Extension of Patent Term Section 1.741(a)Section 1.741(a) is amended to conform with the new title for the certificate procedure under § 1.8.

(8) Appeal to Court and Civil Action (Section 2.145) Sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with the revised list of types of correspondence excluded from the certificate of mailing or transmission procedure set out in § 1.8. Formerly, the notice of election to proceed by civil action in an inter partes proceeding under 35 U.S.C. 141 or section 21(a)(1) of the Trademark Act, 15 U.S.C. 1071(a)(1), and the filing of notice and reasons of appeal under 35 U.S.C. 142 or a notice of appeal under section 21(a)(2) of the Trademark Act, 15 U.S.C. 1071(a)(2), were specifically excluded, under §§ 1.8(a)(2) (viii) and (ix), respectively, from the certificate of mailing procedure. Since these notices are no longer excluded under amended § 1.8(a)(2), sections 2.145(c)(3) and 2.145(d)(1) are amended to conform with § 1.8 by deleting the last sentence which provided that the certificate of mailing procedure was not available.

(9) Reconsideration of Affidavit or Declaration (Section 2.165) Section 2.165(a)(1) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

(10) Signature and Certificate of Practitioner (Section 10.18) Section 10.18 is modified to clarify signature requirements for correspondence signed by practitioners. The reference to § 1.4 of this chapter will make it apparent that copies, including photocopies or facsimile transmissions, of correspondence signed by practitioners will be accepted under appropriate circumstances.

(11) Misconduct (Section 10.23(c)) Section 10.23(c) is amended to refer to the new title for the certificate procedure under § 1.8 of this chapter.

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment: In order to clarify how the Office will treat a copy of a paper, one comment suggested changing the second sentence in proposed § 1.4(d) to indicate that, except as provided in §§ 1.4 (e) and (f), a copy would be treated by the Office as if the original had been filed.

Response: While the suggested language was not adopted, the rule was modified to clarify that, except as provided in §§ 1.4 (e) and (f), an original or a copy thereof may be filed. The rules as stated in this final rulemaking are clear that, where an original is not required, a paper filed will be treated in the same way regardless of whether it is an original or a copy.

Comment: Five comments objected to a perceived requirement in § 1.4(d) that the color of ink used for signing a paper be different from the printing on the paper.

Response: Proposed § 1.4(d) did not require that the color of ink used for signing a paper be different from the printing on the paper. The suggested use of different colors of ink is a preferred procedure for distinguishing between an original and a copy. However, in order to avoid further confusion, the suggestion that a different color of ink be used has been deleted.

Comment: One comment recommended that the issue of signature authenticity end upon issuance of a patent in order to reduce the need to keep files in storage for long periods of time and to remove the burden on applicants of having to retrieve files from storage.

Response: Once a patent issues, the Office is not likely to inquire into any matters related to signature authenticity of correspondence filed in that patent application. Nevertheless, on rare occasions, a question of signature authenticity might arise after issuance of a patent. Applicants must therefore make their own decisions as to how long to retain originals.

Comment: Two comments questioned the justification for proposed § 1.4(e) requiring originals to be submitted in international patent applications.

Response: Section 1.4(e), as adopted, does not prohibit the filing of photocopies in an international patent application. With regard to facsimile transmissions, Patent Cooperation Treaty (PCT) Rule 92.4, as revised on July 1, 1992, permits the filing by facsimile of certain correspondence related to an international patent application. However, as indicated in §§ 1.6(d)(3), 1.8(a)(2)(iv) and 1.8(a)(2)(vi), the filing by facsimile is not permitted in the following situations relative to international applications for patent: (1) the filing of an international application for patent and (2) the filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in §§ 1.494(b) or 1.495(b).

Applicants are cautioned, however, that the Certificate of Mailing or Transmission provisions of § 1.8 do not apply to correspondence filed in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority, regardless of whether the correspondence was filed by mail or facsimile transmission. See § 1.8(a)(2)(5).

Comment: One comment suggested that, in applications filed under § 1.60, the certification that the application and papers being filed are true copies of those filed in the parent application should be excluded from the original signature requirement.

Response: Filing of copies of statements under § 1.60 as well as certifications under §§ 1.8, 1.10, 1.97(e) and 3.73(b) will be permitted. The certified documents referred to in § 1.4(f) are those which are required to be certified by statute (e.g., certified documents under 35 U.S.C. 119).

Comment: One comment questioned whether routine papers could be photocopied with a practitioner's signature thereon with appropriate information being filled in later by another person.

Response: Section 10.18(a) states that the signature of a practitioner, on correspondence filed, constitutes a certificate that the correspondence has been read by the practitioner. Accordingly, the photocopying of papers with a practitioner's signature thereon and subsequently having appropriate information filled in by another person, is not authorized or permitted under the rules.

Comment: One comment questioned whether a docket clerk could use a signature stamp of a registered attorney on a transmittal letter.

Response: Section 10.18(a) states that correspondence filed by a practitioner must be personally signed by that practitioner. Accordingly, use of a signature stamp of a registered attorney by a docket clerk would not be permitted.

Comment: Two comments suggested that the facsimile transmission practice be further liberalized to permit scanned-in signatures to be affixed to facsimile or electronically transmitted correspondence. The personal, handwritten signature would be affixed on a copy of the transmitted correspondence which would be kept by the applicant or his or her representative.

Response: The Office is actively considering acceptance of electronically filed applications and papers related thereto. See "Electronic Filing of Patent and Trademark Applications" published at 57 FR 56537 (November 30, 1992) and 1145 Off. Gaz. Pat. Office 378 (December 22, 1992). Until an acceptable program is established, every paper, requiring a signature, filed in the Office, regardless of the manner in which it was transmitted, will have to be a paper which was signed by the person whose signature appears thereon, or be a copy thereof. Scanned signatures affixed to papers which were not personally signed will not be permitted at this time.

Comment: One comment indicated that proposed § 1.5(a) appeared to be contrary to PCT Article 27(1) in that it added the additional requirement not set forth in the PCT of requiring correspondence concerning an international application to identify the international application number.

Response: PCT Rule 92.1 requires any paper relating to an international application to identify the international application to which it relates. In order to ensure prompt and proper association of correspondence with the intended application file, it is essential to use the application number on all papers. The practice (which was not a new one added in this rulemaking) is a mere implementation of the requirement in PCT Rule 92.1 and is not contrary to PCT Article 27(1) as no additional requirement is being placed on applicants.

Comment: Two comments recommended an increase from two weeks to 30 days or one month in the period provided in § 1.5(a) for resubmission of correspondence.

Response: The two-week period provided in § 1.5(a) is to enable applicants to provide the necessary identifying data where such data was not provided during the original submission. This is intended to permit immediate resubmission and no additional time is deemed to be necessary. Extending this period to 30 days would unnecessarily delay prosecution of applications.

Comment: Section 1.5(a) suggests that all letters directed to the Office concerning applications for patents should also state "Patent Application". One comment suggested that § 1.5(a) be amended to replace the restrictive reference to a "Patent Application" to read "identifying the correspondence a relating to a patent application".

Response: In order to make it easier for Office employees handling incoming correspondence to direct mail, § 1.5(a) recommends that letters relating to a patent application should state "Patent Application". The suggestion in the comment was not adopted since uniformity in the reference to "Patent Application" is desirable. Furthermore, this suggested labeling is not a requirement as evidenced by the use of the word "should" rather than "must".

Comment: Section 1.5(a) states that "No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office". One comment suggested that the phrase "notification of the application number" was not adequately defined as it was not clear if applicants had to wait for the official filing receipt before information disclosure statements or other papers could be filed.

Response: The phrase "notification of the application number" as used in § 1.5(a) includes any manner in which an applicant becomes aware of the application number. The phrase is purposely broad and is not limited to the mailing of an official filing receipt. Rather, it includes a return post card which has an application number stamped thereon. The reasoning behind the statement in § 1.5(a) that no correspondence should be filed prior to notification of the application number is that correspondence received without an application number is difficult to match with the appropriate file. Further defining the phrase "notification of the application number" in § 1.5(a) is not warranted.

Comment: One comment suggested defining a business day as Monday through Friday, except for Federal holidays in the District of Columbia.

Response: It is not clear which section the comment was directed to, but § 1.6 indicates that no correspondence will be received by the Office on Saturdays, Sundays or Federal holidays within the District of Columbia. Since the language has not created problems in the past, the suggestion will not be adopted.

Comment: Two comments suggested amending § 1.6(c) to indicate the hour of operation of the "walk-up window".

Response: Specifying in the regulations the hours of operation of the "walk-up window" is unnecessary. The hours of operation have been published in Official Gazette announcements and if those hours are changed in the future, the new schedule will published. Should the hours of operation of the "walk-up window" be changed due to unforeseen circumstances (i.e., snow emergency, etc.), a sign will be posted at the "walk-up window" giving an alternate location to deposit correspondence for the Office.

Comment: Two comments requested that the Office reconsider and withdraw the proposal to eliminate the mail drop box at the guard's desk at the Department of Commerce Building in Washington, D. C.

Response: As indicated in the notice of proposed rulemaking, members of the public were occasionally denied access to the drop box at the Department of Commerce. Additionally, the Office lacked confidence in assigning correct dates of receipt to correspondence deposited in the box as a result of instances when correspondence was found outside of the drop box. Further, since there are many ways to file papers with the Office (i.e., certificate of mailing or transmission, Express Mail, facsimile transmission, longer hours at the "walk-up-window"), there is no need to maintain an off-site drop box.

Comment: One comment suggested that the Office publish phone numbers for facsimile machines at various locations, (i.e., Publishing Division, various examining groups, etc.), in order to enable the public to direct their transmissions to a particular location, rather than a central location.

Response: The suggestion has been adopted. See "Patent and Trademark Office (PTO) Information Contacts", 1149 Off. Gaz. Pat. Office 67 (April 27, 1993). The Office will publish in the Official Gazette periodic updates of this list.

Comment: Three comments advocated a further expansion of the facsimile transmission practice to permit transmission of any paper which did not require an original signature. According to the comment, it was difficult to understand why the Office would not permit facsimile transmission of certain papers directly to the Office, but would accept those same papers if transmitted by facsimile to a third party who then hand-delivered the papers to the Office.

Response: The only papers, not requiring an original signature or certification, which the Office will not accept by facsimile transmission are those which, for various reasons, would cause an undue burden on the Office. For example, papers submitted for the purpose of obtaining an application filing date are often rather voluminous difficult to collate and would create ineffi-

ciencies in tying up the Office facsimile machines for long periods of time. In addition, there is a time and content criticality to papers filed for the purpose of obtaining a filing date which is not shared by other types of papers. Another example would be drawings submitted under §§ 1.81, 1.83-1.85, 1.152, 1.165, 1.174, 1.437, or 2.21. Experience has shown that the quality of drawings received by facsimile transmission would typically result in an objection by the Official Draftsman. Disputes might arise at that point as to whether the cause of the poor quality was applicant's transmitting unit or the receiving unit of the Office. Hence, the Office will continue to prohibit facsimile transmission of certain papers as specified in § 1.6(d). However, the suggestion has been adopted to the extent that the office will accept, via facsimile transmission, an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8(a) or (b) or section 12 (c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; and in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051 (d)(1).

Comment: Section 1.6(d) states that the receipt date accorded to a paper transmitted by facsimile will be the date on which the complete transmission is received in the Office. Three comments objected to this language by arguing that this practice discriminated against West Coast practitioners and gave an advantage to East Coast practitioners because the West Coast prac-titioners had only until 9 P.M. to complete a transmission in order to receive the benefit of that day's filing.

Response: The facsimile transmission practice is similar to regular mail practice. Thus, a West Coast practitioner depositing correspondence with the local postal service without a certificate of mailing will receive as a receipt date the date on which the Office receives the correspondence, rather than the date on which the correspondence was deposited. Similarly, a paper transmitted by facsimile will be accorded, as the date of receipt, the date on which the complete transmission was received in the Office, unless the date of receipt is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case, the date of receipt will be the next business day.

The certificate practice provided in § 1.8, on the other hand, permits the sender to indicate on the correspondence the date of mailing or transmission from the sender's perspective, which date would then be effective to meet a deadline set for response. Use of the certificate of mail or transmission is applicable to correspondence submitted by mail and correspondence transmitted by facsimile. If transmitted by facsimile, the person signing the certificate certifies the expectation that the transmission would be initiated before midnight, local time.

By way of example, a West Coast practitioner preparing a response on the last day of the period for response would have to use the § 1.8 certificate of mailing procedure or the § 1.10 Express Mail procedure, for the response to be considered timely, if the correspondence was sent by way of the U. S. Postal Service. If the practitioner chose to send the correspondence by facsimile on the last day for response and the transmission was started before 9:00 p.m. Pacific time, but was completed after 9:00 p.m. Pacific time, the Office would accord that correspondence a receipt date as of the next business day, which would be after the period for response expired because the Office would have received the correspondence after midnight Eastern time of the last day for response. However, if the practitioner affixed a certificate of transmission to the correspondence sent by facsimile transmission, indicating that the correspondence was being transmitted on the last day in the period for response, then the correspondence would be considered timely filed.

As another example, a transmission started before midnight, Pacific time, on the last day for response and having a certificate of transmission affixed thereto, would be considered timely filed even though the transmission was completed after midnight, Pacific time and was received in the Office the day after the deadline for response.

Comment: One comment suggested replacing "drawings" in § 1.6(d)(4) with "formal drawings" for clarity.

Response: The suggestion has not been adopted because the phrase "formal drawings" does not find support or antecedent basis in sections referred to in § 1.6(d)(4).

Comment: One comment objected to the perceived requirement for a certificate of transmission in order for a facsimile-transmitted document to be accorded a date of receipt.

Response: The receipt date accorded to correspondence eligible for facsimile transmission, whether containing a certificate of transmission or not, will be the date of receipt in the Office of the complete transmission (unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date accorded will be the next business day). The certificate of transmission, if used, is for purposes of establishing timely filing if the correspondence is transmitted within the period for response but is (1) received in the Office after expiration of the period for response, or (2) lost or (3) not received by the Office.

Comment: One comment requested clarification as to what constituted a "complete transmission" as used in §§ 1.6(d).

Response: The context in which the phrase "complete transmission" was used in § 1.6(d) was to indicate that the transmission was finished. For example, if page 1 of a ten-page facsimile transmission is received in the Office at 11:55 p.m. on a Tuesday and page 10 of that transmission is received at 12:05 a.m. Wednesday, the receipt date accorded to that correspondence will be the date of that Wednesday. (This example assumes that Wednesday is not a Federal holiday within the District of Columbia).

Comment: One comment questioned whether a confirmation in the sender's facsimile machine that the entire facsimile was received constituted sufficient proof that a transmission was complete.

Response: A confirmation by the sender's facsimile machine is evidence that a transmission was made. As such, the confirmation will be considered together with any other evidence presented when questions of filing by facsimile transmission arise. It is therefore suggested that a certificate of transmission be used to enable the sender to rely on the procedures set forth in § 1.8(b).

Comment: One comment requested clarification as to what constituted an incomplete, faulty or illegible facsimile. Also, if an incomplete transmission was sent near the end of the period for response, will the sender be able to rely on the date the facsimile was initially transmitted, or would the sender have to rely on § 1.137 to revive the application if it became abandoned?

Response: If an incomplete, faulty or illegible facsimile transmission is received, that correspondence will be treated by the Office in the same manner that a comparably incomplete, faulty or illegible piece of correspondence would be treated if the correspondence were hand-delivered or mailed to the Office. Whether the application would be held abandoned upon receipt of an incomplete facsimile transmission or whether an opportunity would be provided to complete the transmission will be decided on a case-by-case basis using the same standards that are currently used - for example, for incomplete *responses* to Office actions, see § 1.135(c).

Comment: One comment indicated that the proposed practice of not accepting papers related to international applications if transmitted by facsimile and the indication that papers transmitted by facsimile, when prohibited, may be disposed of is contrary to PCT practice wherein PCT expressly provides for facsimile transmission of such papers and when not acceptable, an opportunity to correct is provided.

Response: PCT does not mandate acceptance of facsimile transmissions; it merely authorizes their acceptance. See PCT Rule 92.4(h). Additionally, as indicated above, the suggestion that the Office permit facsimile transmission of correspondence relative to an already filed international application has been adopted to a large extent.

There is no provision in PCT to provide an opportunity for correction when correspondence is filed by facsimile in spite of a refusal by a national Office to accept that type of correspondence by facsimile. As with national applications, the Office will attempt to notify senders whenever a facsimile transmission received is of a type which the Office has not agreed to accept by facsimile. Senders are cautioned against submitting such correspondence by facsimile transmission since the correspondence will not be accorded a filing date or date of receipt in the Office.

Comment: One comment suggested changing the phrase "Certificate of Transfer" in § 1.8 to "Certificate of Transmittal" or "Certificate of Sending" because "transfer" typically implies transfer of ownership interest in patents or trademarks.

Response: While each phrase has its own advantages and drawbacks, the suggestion will not be adopted. Nevertheless, in order to avoid confusion, this rulemaking leaves the old "Certificate of Mailing" intact, while adding "or Transmission" to include correspondence filed by facsimile transmission.

Comment: In the notice of proposed rulemaking, it was recommended that the facsimile machine transmission report be retained by the sender along with the correspondence used as the original, as evidence of content and date of transfer. One comment indicated that the correspondence used as the original can only be retained using the older stand-alone type of facsimile machine, since there is no such physical document with the newer in-computer facsimile cards.

Response: Section 1.4(d)(2) provides for submission of copies, e.g., by facsimile, of originals as defined in § 1.4(d)(1). Section 1.4(d)(2) does not provide for transmission of unsigned correspondence from a computer. While § 1.4(d)(2) does not require the sender to retain the original, there may be occasions when the sender will have to document the date and content of a document previously filed by facsimile transmission. The recommendation made in the notice of proposed rulemaking will apply to any situation where a paper document served as the original from which a facsimile was transmitted. If a facsimile transmission by using a computer is desired, a paper copy of the document to be transmitted may be printed out, signed and retained by the sender as evidence of content of the document transmitted. Once signed, if filing of a copy is permitted, the document could be scanned into the computer and facsimile transmitted to the Office.

Comment: In proposed section 1.8(a)(1) published in the Federal Register, paragraphs (i) and (ii) were joined with the alternative "or" to indicate that correspondence could be filed by being deposited with the U. S. Postal Service or transmitted by facsimile. This same section was published in the Official Gazette, by having paragraphs (i) and (ii) joined with the connective "and". Numerous comments, received apparently from individuals who saw the proposed rules in the Official Gazette, objected to the requirement that, in order to receive benefits under § 1.8, correspondence transmitted by facsimile also had to be mailed.

Response: Section 1.8(a)(1) as published in the Federal Register was correct, while the version published in the Official Gazette contained a typographical error. Hence, §§ 1.8(a)(1)(i) (A) and (B), as adopted in this rulemaking, make clear that the certificate of mailing or transmission practice will be applicable to correspondence mailed or sent by facsimile. The Office discourages the practice of having the same papers submitted by both methods as this practice would result in unnecessary duplication of papers and processing requirements.

Comment: One comment indicated that since all facsimile transmissions include the date and time of the actual facsimile transmission, the Office should not require a certificate of transmission, in order to get the benefit of an earlier filing date under § 1.8(a), when correspondence is transmitted by facsimile.

Response: The Office is concerned that some older machines may not print the date and time of the actual transmission. Furthermore, even on the new machines the date and time printed by the sending unit may not always be correct, particularly after a temporary electrical disconnection, change in time, etc. Hence, for purposes of being considered timely filed, if the sender wishes to obtain the benefits of a date earlier than the date the complete transmission is received in the Office, the correspondence must include a certification in accordance with § 1.8(a). A suggested format for a Certificate of Mailing and a Certificate of Transmission under § 1.8, to be included with the correspondence, is reproduced below:

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231
on

_____ _____
Date Signature

_____
Typed or printed name
of person signing certificate

Certificate of Transmission

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office:

on _____ _____
Date Signature

_____
Typed or printed name
of person signing certificate

OTHER CONSIDERATIONS

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 et seq.), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et Seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of these changes is to incorporate existing Office policy into the regulations, permit the filing of certain correspondence without an original signature and permit the filing of certain correspondence by facsimile transmission.

The Office has determined that these rule changes are not major rules under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions because most of the changes reduce procedural burdens. There will be no significant effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Office has also determined that these changes have no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These rule changes contain collection-of-information requirements subject to the Paperwork Reduction Act of 1980, 44 U.S C. 3501 et seq., which have previously been approved by the Office of Management and Budget under Control Nos. 0651-0009 and 0651-0011. The public reporting burden for these collections of information for Certificates of Mailing or Transmission is estimated to average 0.1 hours each, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding these burden estimates, or any other aspect of these collections of information, including suggestions for reducing the burden, to Abraham Hershkovitz, Office of the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0011).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

37 CFR Part 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble, and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, parts 1, 2 and 10 of title 37 of the Code of Federal Regulations are amended as set forth below:

PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. In Section 1.4, the title is revised and paragraphs (d) through (f) are added to read as follows:

§ 1.4 Nature of correspondence and signature requirements.

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(d) Each piece of correspondence, except as provided in paragraphs (e) and (f) of this section, filed in a patent or trademark application, reexamination proceeding, patent or trademark interference proceeding, patent file or trademark registration file, trademark opposition proceeding, trademark cancellation proceeding, or trademark concurrent use proceeding, which requires a person's signature, must either:

(1) be an original, that is, have an original signature personally signed in permanent ink by that person; or

(2) be a copy, such as a photocopy or facsimile transmission (§ 1.6(d)), of an original. In the event that a copy of the original is filed, the original should be retained as evidence of authenticity. If a question of authenticity arises, the Patent and Trademark Office may require submission of the original.

(e) Correspondence requiring person's signature and relating to registration to practice before the Patent and Trademark Office in patent cases, enrollment and disciplinary investigations, or disciplinary proceedings must be submitted with an original signature personally signed in permanent ink by that person.

(f) When a document that is required by statute to be certified must be filed, a copy, including a photocopy or facsimile transmission, of the certification is not acceptable.

3. Section 1.5(a) is revised to read as follows:

§ 1.5 Identification of application, patent or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number, e.g., 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state "PATENT APPLICATION," the name of the applicant, the title of the invention, the date of filing the same, and if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

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4. In section 1.6, is revised, to read as follows:

§ 1.6 Receipt of correspondence.

(a) Date of receipt and Express Mail date of deposit.

Correspondence received in the Patent and Trademark Office is stamped with the date of receipt except as follows:

(1) No correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia;

(2) Correspondence filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or Federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia;

(3) Correspondence transmitted by facsimile to the Patent and Trademark Office will be stamped with the date on which the complete transmission is received in the Patent and Trademark Office unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

(b) Patent and Trademark Office Post Office pouch.

Mail placed in the Patent and Trademark Office pouch up to midnight on any day, except Saturdays, Sundays and Federal holidays within the District of Columbia, by the post office at Washington, D.C., serving the Patent and Trademark Office, is considered as having been received in the Patent and Trademark Office on the day it was so placed in the pouch by the U.S. Postal Service.

(c) Correspondence delivered by hand.

In addition to being mailed, correspondence may be delivered by hand during hours the Office is open to receive correspondence.

(d) Facsimile transmission.

Except in the cases enumerated below, correspondence, including authorizations to charge a deposit account, may be transmitted by facsimile. The receipt date accorded to the correspondence will be the date on which the complete transmission is received in the Patent and Trademark Office, unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia. See § 1.6(a)(3). To facilitate proper processing, each transmission session should be limited to correspondence to be filed in a single application or other proceeding before the Patent and Trademark Office. The application number of a patent or trademark application, the control number of a reexamination proceeding, the interference number of an interference proceeding, the patent number of a patent, or the registration number of a trademark should be entered as a part of the sender's identification on a facsimile cover sheet. Facsimile transmissions are not permitted and if submitted, will not be accorded a date of receipt, in the following situations:

(1) Correspondence as specified in § 1.4(e), requiring an original signature;

(2) Certified documents as specified in § 1.4(f);

(3) Correspondence which cannot receive the benefit of the certificate of mailing or transmission as specified in § 1.8(a)(2)(i)(A) through (D) and (F); 1.8 (a)(2)(ii)(A) and (D); and 1.8 (a)(2)(iii)(A);

(4) Drawings submitted under §§ 1.81, 1.83 through 1.85, 1.152, 1.165, 1.174, 1.437, 2.51, 2.52, or 2.72;

(5) A request for reexamination under § 1.510;

(6) Correspondence to be filed in a patent application subject to a secrecy order under §§ 5.1 through 5.8 of this chapter and directly related to the secrecy order content of the application;

(7) Requests for cancellation or amendment of a registration under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e); and certificates of registration surrendered for cancellation or amendment under section 7(e) of the Trademark Act, 15 U.S.C. 1057(e);

(8) Correspondence to be filed with the Trademark Trial and Appeal Board, except the notice of ex parte appeal;

(9) Correspondence to be filed in an interference proceeding which consists of a preliminary statement under § 1.621; a transcript of a deposition under § 1.676 or of interrogatories, cross-interrogatories, or recorded answers under § 1.684(c); or an evidentiary record and exhibits under § 1.653.

(e) Interruptions in U.S. Postal Service.

If interruptions or emergencies in the United States Postal Service which have been so designated by the Commissioner occur, the Patent and Trademark Office will consider as filed on a particular date in the Office any correspondence which is:

(1) Promptly filed after the ending of the designated interruption or emergency; and

(2) Accompanied by a statement indicating that such correspondence would have been filed on that particular date if it were not for the designated interruption or emergency in the United States Postal Service. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

5. Section 1.8 is revised to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) Except in the cases enumerated in paragraph (a)(2) of this section, correspondence required to be filed in the Patent and Trademark Office within a set period of time will be considered as being timely filed if the procedure described in this section is followed. The actual date of receipt will be used for all other purposes.

(1) Correspondence will be considered as being timely filed if:

(i) the correspondence is mailed or transmitted prior to expiration of the set period of time by being:

(A) deposited with the U.S. Postal Service with sufficient postage as first class mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231; or

(B) transmitted by facsimile to the Patent and Trademark Office in accordance with § 1.6(d); and

(ii) the correspondence includes a certificate for each piece of correspondence stating the date of deposit or transmission. The person signing the certificate should have reasonable basis to expect that the correspondence would be mailed or transmitted on or before the date indicated.

(2) The procedure described in paragraph (a)(1) of this section does not apply to, and no benefit will be given to a Certificate of Mailing or Transmission on the following:

(i) Relative to Patents and Patent Applications

A. The filing of a national patent application specification and drawing or other correspondence for the purpose of obtaining an application filing date;

B. The filing of correspondence in an interference which an examiner-in-chief orders to be filed by hand or "Express Mail";

C. The filing of agreements between parties to an interference under 35 U.S.C. 135(c);

D. The filing of an international application for patent;

E. The filing of correspondence in an international application before the U.S. Receiving Office, the U.S. International Searching Authority, or the U.S. International Preliminary Examining Authority;

F. The filing of a copy of the international application and the basic national fee necessary to enter the national stage, as specified in § 1.494(b) or § 1.495(b).

(ii) Relative to Trademark Registrations and Trademark Applications

A. The filing of a trademark application;

B. The filing of an affidavit showing that a mark is still in use or containing an excuse for nonuse under section 8 (a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c);

C. The filing of an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059;

D. The filing of a petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064;

E. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c); or the filing of a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1);

F. In an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), the filing of a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

(iii) Relative to Disciplinary Proceedings

A. Correspondence filed in connection with a disciplinary proceeding under Part 10 of this chapter.

B. Reserved.

(b) In the event that correspondence is considered timely filed by being mailed or transmitted in accordance with paragraph (a) of this section, but not received in the Patent and Trademark Office, and the application is held to be abandoned or the proceeding dismissed, terminated, or decided with prejudice, the correspondence will be considered timely if the party who forwarded such correspondence:

(1) informs the Office of the previous mailing or transmission of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(2) supplies an additional copy of the previously mailed or transmitted correspondence and certificate, and

(3) includes a statement which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely mailing or transmission. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter. If the correspondence was sent by facsimile transmission, a copy of the sending unit's report confirming transmission may be used to support this statement.

(c) The Office may require additional evidence to determine if the correspondence was timely filed.

6. Section 1.304 paragraphs (a) and (c) are revised to read as follows:

§ 1.304 Time for appeal or civil action.

(a)(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (§ 1.302) or for commencing a civil action (§ 1.303) is two months from the date of the decision of the Board of Patent Appeals and Interferences. If a request for reconsideration or modification of the decision is filed within the time period provided under § 1.197(b) or § 1.658(b), the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In interferences, the time for filing a cross-appeal or cross-action expires:

(i) 14 days after service of the notice of appeal or the summons and complaint, or

(ii) Two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

(a)(2) The time periods set forth in this section are not subject to the provisions of §§ 1.136, 1.550(c) or § 1.645 (a) or (b).

(a)(3) The Commissioner may extend the time for filing an appeal or commencing a civil action:

(i) For good cause shown if requested in writing before the expiration of the period for filing an appeal or commencing a civil action, or

(ii) Upon written request after the expiration of the period for filing an appeal or commencing a civil action upon a showing that the failure to act was the result of excusable neglect.

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(c) If a defeated party to an interference has taken an appeal to the U.S. Court of Appeals for the Federal Circuit and an adverse party has filed notice under 35 U.S.C. 141 electing to have all further proceedings conducted under 35 U.S.C. 146 (§ 1.303(c)), the time for filing a civil action thereafter is specified in 35 U.S.C. 141. The time for filing a cross-action expires 14 days after service of the summons and complaint.

7. Section 1.366(b) is revised to read as follows:

§ 1.366 Submission of maintenance fees.

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(b) A maintenance fee and any necessary surcharge submitted for a patent must be submitted in the amount due on the date the maintenance fee and any necessary surcharge are paid and may be paid in the manner set forth in § 1.23 or by an authorization to charge a deposit account established pursuant to § 1.25. Payment of a maintenance fee and any necessary surcharge or the authorization to charge a deposit account must be submitted within the periods set forth in § 1.362 (d), (e) or (f). Any payment or authorization of maintenance fees and surcharges filed at any other time will not be accepted and will not serve as a payment of the maintenance fee except insofar as a delayed payment of the maintenance fee is accepted by the Commissioner in an expired patent pursuant to a petition filed under § 1.378. Any authorization to charge a deposit account must authorize the immediate charging of the maintenance fee and any necessary surcharge to the deposit account. Payment of less than the required amount, payment in a manner other than that set forth in § 1.23, or the filing of an authorization to charge a deposit account having insufficient funds will not constitute payment of a maintenance fee or surcharge on a patent. The certificate procedures of either § 1.8 or § 1.10 may be utilized in paying maintenance fees and any necessary surcharges.

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8. Section 1.741, paragraph (a) is revised to read as follows:

§ 1.741 Filing date of application.

(a) The filing date of an application for extension of patent term is the date on which a complete application is received in the Patent and Trademark Office or filed pursuant to the "Certificate of Mailing or Transmission" provisions of 37 CFR 1.8 or "Express Mail" provisions of 37 CFR 1.10.

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PART 2- RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows:
Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 2.145 is amended by revising Paragraphs C(3) and D(1) to read as follows:

§ 2.145 Appeal to Court and Civil Action.

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(c) ***

(3) Any adverse party to an appeal taken to the U.S. Court of Appeals for the Federal Circuit by a defeated party in an inter partes proceeding may file a notice with the Commissioner within twenty days after the filing of the defeated party's notice of appeal to the court (paragraph (b) of this section), electing to have all further proceedings conducted as provided in section 21(b) of the Act. The notice of election must be served as provided in § 2.119.

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(d) Time for appeal or civil action.

(1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §§ 2.127(b), 2.129(c) or § 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire two months after action on the request. In inter partes cases, the time for filing a cross-action or a notice of a cross-appeal expires (i) 14 days after service of the notice of appeal or the summons and complaint; or

(ii) two months from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, whichever is later.

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11. Section 2.165(a)(1) is revised to read as follows:

§ 2.165 Reconsideration of Affidavit or Declaration

(a)(1) If the affidavit or declaration filed pursuant to § 2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the registration or from the date of publication under section 12(c) of the Act. The Certificate of Mailing or Transmission procedure provided by § 1.8 does not apply to affidavits or declarations or to supplemental or substitute affidavits or declarations filed under section 8(a) or (b) of the Act, but the certificate by "Express Mail" procedure provided by § 1.10 does apply thereto.

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PART 10- REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

12. The authority citation for 37 CFR Part 10 continues to read as follows:
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32 41.

13. Section 10.18, is revised to read as follows:

§ 10.18 Signature and certificate of practitioner.

(a) Except where a copy, including a photocopy or facsimile transmission, of a personally signed piece of correspondence is permitted to be filed pursuant to § 1.4 of this chapter, every piece of correspondence filed by a practitioner on behalf of himself or herself or representing an applicant or a party to a proceeding in the Patent and Trademark Office must bear an original signature personally signed in permanent ink by such practitioner except for correspondence which is required to be signed by the applicant or party. The signature of a practitioner on correspondence filed by the practitioner, regardless of whether the correspondence has an original signature or is a copy, including a photocopy or facsimile transmission, of correspondence bearing an original signature, constitutes a certificate that:

(1) The correspondence has been read by the practitioner;

(2) The filing of the correspondence is authorized;

(3) To the best of practitioner's knowledge, information, and belief, there is good ground to support the correspondence, including any allegations of improper conduct contained or alleged therein; and

(4) The correspondence is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See § 10.23(c)(15).

14. Section 10.23, paragraph (c)(9), is revised to read as follows:

§ 10.23 Misconduct

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(c) ***

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter or a certificate of "Express Mail" under § 1.10 of this chapter.

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Oct. 15, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

1157 TMOG 87]

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(204) **Unpaid Fee Checks**

Beginning Dec. 1, 1987, the Office will change the procedure for handling fee checks of attorneys and agents that are returned to the Office unpaid. Presently, when a check submitted as payment for an application, a processing, an issue or any other fee is returned to the Office unpaid, the Office of Finance sends a letter to the attorney or agent who represents the applicant, or to the applicant if unrepresented by an attorney or agent, enclosing the check and calling attention to the fact that the check was returned unpaid. Beginning Dec. 1, 1987, the Office of Finance will send a copy of its letter to the applicant if the letter is addressed to an attorney or agent. The prohibition of 37 CFR §§ 1.33 and 2.18 against double correspondence is waived in view of the submission of a check that is returned unpaid to the Office.

A registered patent attorney or agent who repeatedly submits checks that are returned unpaid through no fault of the bank may expect to have the matter referred to the Office of Enrollment and Discipline.

Oct. 5, 1987 DONALD W. PETERSON
Deputy Commissioner

[1083 TMOG 7]

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(205) **Weekly Summaries of Trademark Trial and Appeal Board Final Decisions**

The Patent and Trademark Office will begin publishing, in each issue of the Trademark Official Gazette, a weekly summary of final decisions issued by the Trademark Trial and Appeal Board. Publication of the summary is being undertaken on a discretionary basis, as a courtesy to interested members of the public.

Mar. 21, 1988 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1091 TMOG 6]

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(206) **Filing Receipt for Trademark Applications**

Effective immediately, the Trademark Examining Operation will replace its existing "FILING RECEIPT FOR TRADEMARK APPLICATIONS," PTO Form 100 (Rev. 8/78), with a filing receipt using a new format. The revised filing receipt will be printed on a single sheet of 8 1/2" x 11" paper and will contain information regarding the mark, applicant, International and U.S. classes, goods and/or services, and dates of use. If all of the information relating to a new application cannot be printed on the 8 1/2" x 11" filing receipt, it will be noted that additional information was contained in the application but was not printed. The addressee's name and address will be printed on the back of the filing receipt.

Sept. 6, 1988 JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

[1095 TMOG 6]

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(207) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1 and 2
[Docket No. 90363-9221]
RIN: 0651-AA40

Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, to set forth fees for public access to the text data bases resident on the Automated Patent System (APS) and the automated trademark search system (T-Search). Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for on-line access to the automated search systems.

The Office will provide on-line access to its USPAT data base (full text of U.S. patents issued after 1974), the U.S. classification data from 1790 to the present, and to English abstracts of Japanese and Chinese patents (to the extent they are available), hereinafter referred to as APS-Text, in its Patent Search Room and to T-Search in its Trademark Search Library, located in Arlington, Virginia. Except for a series of pilot experiments which may occur over the next one or two years, the Office does not plan to provide routine remote on-line access to these data bases at any other facilities at the present time. A separate rulemaking process will be followed when the Office determines to provide such remote on-line access.

Both search systems have been made available to the public free of charge since April 3, 1989, for the purposes of education and training (familiarization).

The paper and/or microfilm collections of U.S. patents, foreign patents documents and U.S. trademark registrations continue to be available to the public free of charge, as provided by section 104(b) of Pub. L. 100-703. The Office reaffirms its commitment to hold a public hearing prior to making any decision concerning the elimination of the paper files.

This final rule establishes fees for use of the on-line automated search systems. In addition, procedures for public use of the automated search systems, including training and charging of fees, are presented.

In response to the notice of proposed rulemaking published in the *Federal Register* on May 3, 1989 (54 FR 18907), and at a public hearing held on June 30, 1989, the Office received many comments regarding problems encountered by the public in the use of T-Search. The Office believes that T-Search has proven effective for searches performed by Trademark examining attorneys in connection with their examination of applications for the registration of marks. Although the Office is establishing a fee for accessing the T-Search system, the Commissioner is immediately suspending collection of that fee to provide additional time for the public to familiarize themselves with T-Search. The Office will provide the public with sixty days notice before starting to collect the fee.

Effective Date: February 12, 1990. Rule 2.6(w) will take effect February 12, 1990 but immediately be suspended by the Commissioner. The Office will provide written notice in the *Federal Register* sixty days before starting to collect fees for accessing T-Search.

For Further Information: Frances Michalkewicz by telephone at (703) 557-1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: The purpose of this final rule is to establish new fees for the on-line use by the public of APS-

Text, and T-Search that are to be provided in the Office's facilities in Arlington, Virginia. This final rule is consistent with the Office's Electronic Data Dissemination Policies and Guidelines, which were published in final form in the *Federal Register* on May 3, 1989, at 54 FR 18920. Establishment and adjustment of patent fees is provided for by section 6 and section 41 of Title 35, United States Code, and section 103(b) of Pub. L. 100-703. Establishment and adjustment of trademark fees is authorized by section 31 of the Trademark (Lanham) Act 1946, as amended (15 U.S.C. 1113), and section 103(a) of Pub. L. 100-703. Information on the procedures for public use of the automated systems, including training, waivers, and the charging of fees, also is presented.

Background: In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the Office prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would eventually replace the Office's all-paper patent and trademark files, and thereby improve the integrity and quality of Office records; and (2) would support searches, examinations, Office actions and other Office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Over 700,000 active Federal trademark registations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable trademark examining attorneys to search the data base for registered and pending trademarks and associated textual data, including marks containing designs, and to retrieve, display and print all information as a substitute for paper file searches. Trademark examining attorneys have been using T-Search exclusively since January 1988 via a network of approximately 40 terminals. After a six-month experimental T-Search evaluation program conducted between June and December 1988, the capability was deployed for public use in the Trademark Search Library on April 3, 1989.

The T-Search "dead data base", trademarks cancelled, expired or abandoned since March 1984, also is available to the public, but approximately 17,000 images are missing and an additional 184,000 registrations and applications have not been quality checked. Trademark examining attorneys do not search this data base in connection with examining activities.

An Automated Patent System (APS) was installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS, that is, large scale computers with conventional magnetic storage devices, a high-speed local data communications network, and electronic workstations equipped with two high resolution graphic displays and laser printers were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group.

On-line access to the full-text of all U.S. patents granted after 1974 and then to English language abstracts of Japanese patents was deployed to the patent examining staff beginning in 1986. On-line access to APS-Text permits examiners to search the text of approximately one million U.S. patents containing more than five billion words. Today, all examiners have been trained in the use of the full-text searching tool, and it has become a routine part of the patent examination process for many examiners. Searches are conducted from approximately 71 single screen text terminals located throughout the Office. The APS-Text capability was deployed to the public in the Patent Search Room on April 3, 1989.

The Office intends to enter the text of virtually all U.S. patents issued after 1970. In addition, selected tubular data and chemical and mathematical equations will be added to the current full text file. Ultimately, approximately 1.2 million U.S. patents will be available to both patent examiners and the public for search in full text form.

Public evaluation of the APS full-text search capability was conducted between January 11 and April 15, 1988. Forty-two (42) public users were trained an APS-Text during January 1988, and allowed first-come/first-serve access to several terminals. Reactions of public users to APS-Text were positive. Public users found APS-Text useful for pre-application and state-of-the-art searches. A total of 38 public users were trained on T-Search during a public evaluation period conducted between June and December 1988. Preliminary review indicated that public users considered T-Search to be useful both as a source for registrability searching and for verifying paper searches. In addition, T-Search was found to facilitate searches by class and ownership.

Pub. L. 100-703, enacted on November 19, 1988, allows the Commissioner to establish reasonable fees for public access to the automated search systems while it continues the requirements that no more than 30 percent of automation resources may be from user fees and that the Office may not enter into exchange agreements relating to automatic data processing resources.

Section 104(c) of Pub. L. 100-703 allows the Commissioner to waive the payment by an individual of fees for accessing the automated search systems upon a showing of need or hardship, and if such waiver is in the public interest.

The information contained in the automated data bases, which will be available to the public at the Patent and Trademark Office in Arlington, Virginia, is available free of charge at that location in paper form, and is substantially available through commercial vendors. The Office believes it to be in the public interest to waive the fee for public access to its text data bases in situations where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user.

A personal, educational purpose is one in which the person using the data base is attempting to satisfy a personal need, and is not conducting a search or otherwise using the data base for compensation in any form. Examples of appropriate waiver situations would include students or teachers doing a term paper, a university professor collecting background information for the preparation of an application for a research grant. An example of a situation where a waiver would not be appropriate would include an individual doing work for renumeration - e.g., a law student doing a pre-examination or infringement search for a law firm.

The Commissioner will further consider a fee waiver based on a genuine financial hardship. The person requesting a waiver will be required to provide information that would demonstrate a clear inability to pay the fee.

A waiver for the payment of fees is intended to be granted sparingly, and generally only when terminals are available. It is not anticipated that fees will be waived for any one individual more than once or twice each year. The Commissioner reserves the authority to control access to the data bases and deny a waiver to any individual. The waiver policy would apply only to use of the automated system, and not to the printing or sale of copies. Any abuse of the waiver policy could lead to a ban on the use of any public search facility for that individual.

Cost Calculations: The Office calculated unit costs for all fees based on OMB Circular A-25 "User Fees", and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, financial statements for the Office) and included direct and indirect costs to the Office of carrying out the activity, as directed by OMB Circular A-25. User charges for both APS-Text and T-Search were based on the marginal costs of providing these services to the public.

In calculating the costs of providing access to T-Search and APS-Text to the public, the Office followed Congressional direction that fees be resonable by reflecting the marginal cost for providing the new service and not include the costs of designing or installing the automated system for use by Office examiners, or the development of the new systems.

Prior to preparation of this final rule, all of the cost assumptions and cost calculations were reviewed and modified to ensure that they included the Office's best estimates and projections.

APS-Text

The Office is establishing the $40.00 fee for each hour of terminal session time on APS-Text. The marginal costs for one hour terminal session time on APS-Text include a portion of the lease cost of a new computer mainframe which originally was to be acquired in fiscal year 1990 for use by Office patent examiners. To meet public search requirements, the mainframe is being leased earlier than originally planned. That portion of lease costs for the three (3) month period March 1990 through May 1990 over and above the lease costs for a mainframe sized to meet only examiner needs is being passed on to the user. After May 1990, the mainframe was intended to be procured and installed to support APS. Therefore, no costs are being passed on to the public user after that time. When public usage reaches the level where a mainframe dedicated for public use is required, fee adjustments will be proposed to pass all of the costs of that mainframe on to the public.

The level of public use will affect the amount of main memory needed to support the additional search sessions. It is projected than an additional increment of main memory will be required in fiscal years 1991 and 1992. This increment would not be required to support the examiner workload alone.

The fee calculations for public access also include the costs for equipment: network interface units, text terminals, printer noise dampeners and text terminal printers.

Other costs include a portion of the license fees that must be paid to Chemical Abstracts Service for its proprietary text and structure search software; additional personnel for the Patent Search Room, and the Office of Information Systems; computer installation costs; supplies and equipment dedicated to public use; and general and administrative overhead.

The Office is providing free access time during training on the automated search systems in accordance with 104(c) of Public Law 100-703 which reads. "...a limited amount of free access shall be made available to all users of the systems for purposes of education and training."

The usage rate estimates are based on the three-month public user study performed from January through March 1988. For this study, 42 frequent Patent Search Room users were selected to be trained in the use of APS-Text. Three text terminals were made available to the trained public users at no charge. During the three-month study period, use of the three terminals averaged approximately 50 percent. While it is impossible to accurately predict future use by a more diverse group of public users, the cost calculations attempted to take into account the following factors and assumptions:

1. Future public users, on average, would use APS-Text less frequently than the 42 frequent users selected for the 1988 study, many of whom routinely used commercially available automated text search tools.

2. Collection of a fee for use (as opposed to the absence of any charge during the study) would reduce demand for text search services when compared with usage data obtained during the study period.

3. The potential universe of public users is expected to average no more than 300 per day.

4. The average length of a public user search session is projected to be approximately 22 minutes - the average length of a search session during the 1988 test of public use.

5. Based on the preceding assumptions, if all 300 potential public users conducted a single search session during a workday, a total of 110 hours of access would be required. Twenty-five text terminals available five days a week, twelve hours a day, would provide a maximum potential of 300 hours of available text search time. Under these assumptions, the number of text terminals appeared to be adequate for the foreseeable future.

6. For purposes of actual use of available text terminals, the following estimates were used:

(a) In fiscal year 1990, between four (4) and six (6) terminals would be available during the first quarter. An estimate of 45 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 10 in January 1990 and 20 in April 1990, an estimate of 40 percent utilization of available text terminal time was projected. By increasing the number of text terminals to 25 in July 1990, an estimate of 35 percent utilization of available text terminal time was projected.

(b) During fiscal year 1991 and beyond, stable levels of usage were projected to be achieved, yielding an estimated 35 percent average utilization of the 25 available terminals. This utilization rate equates to 105 session hours per day, or an average of 4.2 session hours per terminal per day. At an average of 22 minutes per session, a total of 286 search sessions per day.

Although usage rates since the system was made available to the public in April 1989 have been higher than projected, the Office believes these projections are valid fos the three-year fee cycle.

A summary of the fee calculations is as follows:

APS-Text
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 918,196
Hardware & Maintenance	$ 691,289
Software (license fees)	$ 295,676
Site Preparation	$ 38,118
Non-capital Furniture	$ 8,750
Supplies & Forms	$ 3,500
Sub-Total	$ 1,955,529
General & Administrative Overhead	$ 361,773
TOTAL COST	$ 2,317,302
Estimated Use (hours)	65,946
UNIT COST (per hour)	$ 35.14

The marginal cost for one hour of Office staff search assistance on APS-text includes the costs of personnel compensation and benefits.

A summary of the fee calculation is as follows:

APS-Text
Marginal Cost of One-Hour of
Office Staff Search Assistance
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Annual Compensation and Benefits	
TOTAL COST	$ 45,659
Work Hours (per annum)	1,776
UNIT COST (per hour)	$ 25.71

The marginal cost for a printed copy generated from APS-Text includes costs for compensation and benefits, printers, furniture for the printers, supplies and forms, and general and administrative overhead.

A summary is as follows:

APS-Text
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 173,472
Hardware & Maintenance	$ 13,483
Non-capital Furniture	$ 5,000
Supplies & Forms	$ 35,882
Sub-Total	$ 227,837
General & Administrative Overhead	$ 42,150
TOTAL COST	$ 269,987
Estimated Use (pages)	4,496,325
UNIT COST (per page)	$0.060

T-Search

The marginal cost for one hour of terminal session time on T-Search includes the costs of personnel in the Trademark Search Library, maintenance of the T-Search terminals, routine site preparation, supplies and forms, and general and administrative overhead. The Office is establishing the $40.00 fee for each hour of terminal session time on T-Search, but is immediately suspending collection of that fee in order to provide public users additional time to familiarize themselves with the system.

The comments submitted in response to the proposed rulemaking indicate that the public users have not adequately adjusted to the T-Search system. During the period collection of the fee is suspended, the public will have an opportunity to better learn the system so as to perform more effective searches than they may be experiencing now. The Office will publish a notice in the *Federal Register* sixty days before it begins collecting a fee for public access to T-Search.

Usage rates for T-Search during fiscal years 1990-1992 were projected to be 28 percent of the hours the system would be available to the public. This rate was extrapolated from actual usage rates during the T-Search public user pilot program which was conducted from June through December 1988. A total of 38 members of the public were trained on T-Search, and about 24 to 28 public users were active on T-Search each month. The overall usage rate of these active users was 14 percent of the hours the system was available to the public. In projecting usage rates on which to base a fee amount, it was anticipated that the overall number of users and the usage rate would double once T-Search was made available in the Trademark Search Library to all users of that search facility and training was provided on a routine basis. Although usage rates since the system was made available to the public in April 1989 have been higher projected, the Office believes these projections are valid for the three-year fee cycle.

A summary of the fee calculations are as follows:

T-Search
Marginal Cost of One-Hour of
Terminal Session Time
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 154,451
Hardware & Maintenance	$ 28,809
Site Preparation	$ 1,000
Supplies & Forms	$ 3,298
Sub-Total	$ 187,558
General & Administrative Overhead	$ 34,698
TOTAL COST	$ 222,256
Estimated Use (hours)	5,985
UNIT COST (per hour)	$ 37.14

The marginal cost for a printed copy generated from T-Search includes costs for compensation, and supplies and forms. A summary of the costs is as follows:

T-Search
Marginal Cost of
Each Printed Page
(December 1989-November 1992)

Cost Element	Public Share (Marginal Cost)
Personnel: Compensation and Benefits	$ 27,862
Hardware & Maintenance	$ 5,274
Supplies & Forms	$ 3,579
Sub-Total	$ 36,715
General & Administrative Overhead	$ 6,792
TOTAL COST	$ 43,507
Estimated Use (pages)	448,875
UNIT COST (per page)	$ 0.097

The proposed fee of $25.00 for each hour of Office staff search assistance to conduct a search using T-Search has been withdrawn. The T-Search system can be used by the public with routine assistance provided by the regular staff of the Trademark Search Library. This is similar to assistance on how to use the paper files now provided free of charge by the Trademark Search Library staff. Office employees will neither work one-on-one with members of the public in conducting searches, nor conducted searches for members of the public.

Rounding Procedures: Fee amounts were rounded so that the amount rounded would be de minimis and convenient to the user. This procedure is consistent with section 103(b) of Pub. L. 100-703 which allows the Office to adjust patent fees in the aggregate, and with section 103(a) of Pub. L. 100-703 which allows the Office to adjust trademark fees in the aggregate. The Office has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

PROCEDURES FOR PUBLIC USE OF APS-TEXT AND T-SEARCH

Patent Search Room Configuration

Initially four (4) text search terminals will be installed and available for public use in the Patent Search Room. A printer will be associated with each text search terminal. An additional terminal will be located in Patent Search Room employee office space for control and adminstrative activities. Up to twenty-one (21) more terminals and printers are planned to be added for public use during fiscal year 1990, if necessary.

Trademark Search Library Configuration

Initially three (3) T-Search terminals with associated printers all be installed and available for public use in the Trademark Search Library. The terminals will be clustered in one area of the Trademark Search Library. An additional terminal will be located in Trademark Search Library employee office space for control and administration activities. Additional terminals and printers will be added as demand warrants and space permits.

Training

To enable prospective public users to become effective on APS-Text, approximately fourteen (14) hours of free basic training is being offered. For those familiar with automated search systems, a shorter course of six (6) hours is provided. Ten (10) members of the public can be trained during each class. Training is being held at the Office's Arlington, Va. complex during normal work hours.

Four (4) hours of basic training is being offered on the use of T-Search. For those familiar with automated search systems, a shorter course of one (1) hour is available. T-Search training is being held in the Office's Arlington, Va. complex during morning, evening and weekend hours.

Enrollment in all training classes initially was on a lottery basis. Public users who wished to be trained on APS-Text or T-Search were required to submit an application form. The Office is now accepting requests for training and adding the names to the list. As of August 31, 1989, 696 people or 70 percent of all those requesting training have been trained.

System Use and Fee Procedures

To ensure equity of public access to the automated systems, as well an efficient operations, rules for use will be posted at the terminals. Users of the systems will be expected to comply with the rules and with all other regulations regarding the use of facilities.

Users are strongly encouraged to register in advance for system use. Each week, the next week's schedule will be available in the Patent Search room and the Trademark Search Library. Should requests for blocks of terminal time exceed the availability of terminals, limits on the amount of reserved time may be instituted. Up to three (3) of the initial four (4) terminals in the Patent Search Room and up to two (2) of the initial three (3) terminals in the Trademark Search Library will be allocated to public users with advance reserved times. The remaining terminal in the Patent Search Room will be available for walk-up users and for assisted searches for infrequent users. The remaining terminal in the Trademark Search Library will be available for walk-up users. The terminal time reservation system and the number of terminals available for walk-up public use and for assisted searches (in the Patent Search Room) is subject to change based upon operational experience.

All public use of APS-Text and T-Search, with the exception of scheduled training classes, is on a pre-payment basis. In pre-paying for use of the systems, the public may use a blank signed check, major credit card or charge to a deposit account. At the end of the search or the pre-paid amount of time, users will receive an accounting from Patent Search Room or Trademark Search Library staff for terminal time used and prints produced. The user must then finalized payment.

Discussion of Specific Rules

37 CFR 1.21 Miscellaneous fees and charges.

Section 1.21 is amended to add new paragraph (o) to set the fees for access to the Automated Patent System full-text search capability (APS-Text) and to provide for the waiver of fees under certain circumstances.

Section 1.21 is amended to add new paragraph (p) to set the fees for APS-Text search assistance by Office staff.

Section 1.21 is amended to add new paragraph (q) to set the fee for a printed copy from APS-Text.

37 CFR 2.6 Trademark fees

Section 2.6 is amended to add new paragraph (w) to set the fees for access to the automated trademark search system (T-Search) and to provide for the waiver of fees under certain circumstances.

Section 2.6 is amended to add new paragraph (x) to set the fee for a printed copy from T-Search.

A final rule package establishing two new fees under the provisions of Pub. L. 100-667, the Trademark Law Revision Act of 1988, has been published which added paragraphs (u) and (v) to section 2.6. Therefore, the rule has been modified from the proposal to add paragraphs (w) and (x) instead of paragraphs (u), (v) and (w).

Response to Comments on the Rules

A notice of proposed rulemaking to establish a basis for the charges for use of the on-line automated search systems in the Patent Search Room and Trademark Search Library located at the Patent and Trademark Office in Arlington, Virginia was published in the *Federal Register* on May 3, 1989; at 54 FR 18907. Corrections were published in the *Federal Register* on May 12, 1989, at 54 FR 20670. A notice also was published on May 30, 1989, in volume 1102 of the *Official Gazette* of the United States Patent and Trademark Office, pages 94 through 98 for patents, and pages 96 through 100 for trademarks.

A public hearing was conducted on June 30, 1989. A total of 25 comments were received: 24 respondents submitted written comments and five people presented oral testimony (four of whom also submitted written comments) at the public hearing. On the 25 comments, twelve (12) were from individuals, seven (7) from libraries, five (5) from organizations and one (1) from business. All of the written and oral comments were considered in adopting the rules set forth herein.

Many of the comments from the representatives of the Patent Depository Libraries raised questions or commented on the proposed rules from the perspective of their impact on Patent Depository Libraries. The proposed rules and policies set forth in the *Federal Register* Notice of May 3, 1989 are applicable only to the automated search systems provided in PTO's facilities located in Arlington, Virginia. When the Office is prepared to offer the automated search systems at the Patent Depository Libraries, a proposed notice will be published for public comment. Therefore, any comments relating to procedures for accessing the automated search systems in the Patent Depository Libraries will not be addressed at this time.

Comment: Overall, nine respondents acknowledged the usefulness of the automated search systems, particularly APS-Text. Although seven respondents alleged that T-Search is not adequate to meet the needs of the public, that its response time is too slow, and that it is not sufficiently accurate to meet the specific needs of the commentor, most of these respondents acknowledged that T-Search had the potential for being a useful tool. Documentaton of specific problems, for example, those associated with conducting a phonetic search, were provided. Two respondents said that T-Search is flawed and the decision to require examiners to use the system on an exclusive basis was ill-advised and regrettable.

Response: Trademark examining attorneys have been using T-Search for word mark searches since August 1987, and for word mark and design searches since January 1988. The public has been using the system since April 3, 1989.

The minutes to the September 27, 1988, meeting of the Public Advisory Committee for Trademark Affairs, express the view that: "...T-Search searches are more thorough than manual searches." The transcript to that meeting contains the following comments: "I don't think there is any question, but a T-Search [sic] properly done gives an excellent result" and "...from the corporate point of view, ... I am pleased to say that I like what I see. I like the very fast action we're getting on the first action." From the transcript to the February 23, 1988 meeting: "I'd like to start with a glowing report. I think that the registration process is working very well. From my own personal experience in terms of what the examiners are doing, they get an A plus. They're really doing a good job."

The concensus of the management of the Trademark Examining Operation is that the T-Search system meets the needs of the Office at this time. There is no indication in any records or activities in the PTO which would indicate that the use of T-Search has caused a deterioration in the quality of searches conducted by Trademark examining attorneys.

The difference between the perceptions of the Trademark examining attorneys and the public may be attributed to several factors; Trademark examining attorneys use the system on a daily basis; they know what the system can do and what it cannot do and avoid the latter; and they know how to utilize the system's functionalities to perform the best search possible. Further, Trademark examining attorneys do different types of searches, and have different needs, than the public. T-Search use statistics for the period April 1989 through August 1989 demonstrate that the public is making extensive use of the system. Following is a summary of those statistics:

Month	Available Hours	Hours Used By Public	Rate of Usage	Average Session Time
April	513	108	21%	13.02 min.
May	513	126	24%	12.25 min.
June	627	183	29%	10.84 min.
July	570	186	33%	12.51 min.
August	656	217	33%	9.66 min.

This usage rate compares favorably to the projected usage rate of 28 percent.

Comment: Seven respondents claimed that the paper Trademark files have been allowed to deteriorate and, therefore, are not reliable for use by the public.

Response: The Office contracts for file maintenance sevices in both the Trademark Search Library and the Patent Search Room. Among the tasks performed by the contractor in the Trademark Search Library are maintaining the pending files, filing newly registered Trademarks, pulling erroneous registrations from the file, etc. The contract for the Trademark Search Library includes a monitoring system based on MIL-STD 105, which is a sampling plan that provides a 97 percent accuracy level. Once the contractor completes a task, Office staff check the required sample levels to ensure that filing was performed accurately. The Office is constantly monitoring the status of the paper files, but notes that maintenance of paper file integrity is subject to inherent limitations.

Comment: In view of the above comments about the inadequacy of the Trademark paper search files and T-Search, six respondents advocated the need for T-Search, at no charge to the user, as an adjunct or back-up to the paper files. One respondent suggested a similar arrangement in the Patent Search Room.

Response: The Office has adopted the $40.00 fee amount for one hour of terminal session time on both APS-Text and T-Search. In order to give the public more time to become familiar with the T-Search system, the Commissioner is immediately suspending collection of that fee. This will enable users

to learn the system so as to perform more effective searches. The Office will publish a notice in the *Federal Register* announcing its decision regarding the imposition of the fee at least 60 days before starting to collect the fee amount. At that time, the Office also will publish validated cost estimates based on usage rates and actual costs documented from the present time to the time the decision to collect a fee is made.

Comment: Two respondents claimed that the objective of automation necessarily contemplated a free search system to give meaning to the constructive notice provisions of the Trademark Act.

Response: Registration of a trademark constitutes constructive notice and records of all active trademark registrations and pending applications are available for searching free of charge in the paper file and on TRAM (Trademark Reporting and Monitoring System) data base.

Comment: One respondent claimed that PTO is required to provide access to disclosed patent information as the information is made public; four respondents were opposed to the Office charging fees for accessing the automated search systms; two other respondents commented that the Office should not charge fees for using systems designed to be the sole searching source of the public records which the Office is charged by law to provide; and one respondent commented that the proposal to limit access to the automated data bases only to those who can pay a fee is deplorable policy at a time when there is concern about industrial competitiveness with Japan.

Response: The Office will continue to make the paper and/or microfilm collections of U.S. patents, foreign patent documents and U.S. trademark registrations available for pubic access free of charge. The Office also has adopted a policy whereby the hourly terminal session fee for access to the data base can be waived when it is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. In this way, the Office will continue to provide public access to all available information free of charge.

Comment: One respondent commented that user fees for electronic data is a form of dual taxation when information was gathered, organized and produced at taxpayers expense; and two respondents claimed that users of information have contributed up to 30 percent of the $120 milllion for development of the APS system to date — in other words, the public already has paid for APS.

Response: In calculating the proposed fees, the Office is consistent with the Office of Management and Budget's proposed policy on user charges for Government information products, as clarified in the June 15, 1989 *Federal Register* notice entitled "Second Advance Notice of Further Policy Development on Dissemination of Information." In that notice, OMB's stated policy is that user charges for Government Information products should be no higher than a level sufficient to recover the costs of disseminating, not collecting, the information.

The costs associated with the fees for accessing APS-Text and T-Search are directly related to the public's use of the systems; for example, the costs associated with the acquisition of the APS-Text terminals that are being used by the public. No costs associated with designing or installing the automated system for use by Office examiners, or the development of the new systems have been included. Neither have costs been included for gathering, organizing or producing information.

The *Federal Register* notice of June 15, 1989 (54 FR 25554, 25558) dealing with policy development on dissemination of information states that: "As to double taxation, OMB notes that user charges policy has a basis in statute (31 U.S.C. 9701), and the Congress has not viewed user charges as double taxation because they are applied when the recipient receives special benefits."

Comment: Two respondents stated that Government information is the same, whether it is provided in printed or electronic form.

Response: Charging fees for access to the automated search systems is consistent with PTO's fee policy. For example, fees are charged for manual search services (e.g., for a search of Office records or for a search of assignment records), and for printed copies of patents and trademarks and for copies of Office documents.

Comment: The Japanese system is available at four locations at no cost, and includes U.S. information made available at U.S. taxpayer expense.

Response: The Japanese automated search system, like the automated search systems in the PTO's search facilities, is being made available free of charge at the present time. The costs of such use, however, are being paid from general fee revenues collected by the Japanese Patent Office. Additionally, the APS-Text system currently includes Japanese English language abstracts and the Office is in the process of acquiring Japanese patent information in digital facsimile form.

Comment: One respondent commented that PTO has no responsibility to provide an expensive, complex, internal Government on-line value-added computer service, that this is far beyond the requirements of public access to patent files; and another respondent commented that it is in the public interest to have the same system that is being used by the examiners also available to the public.

Response: The Office agrees that it is in the public interest to provide the same search system capability to the public that is being used by the examiners.

Comment: One respondent stated that providing free access is not competing with the private sector, and that there always is a place for the private sector to provide value-added information.

Response: The user charges adopted for public access to the APS-Test and T-Search systems are consistent with OMB Circulars A-25 "User Charges" and A-130 "Management of Federal Information Resources", and with the PTO's Electronic Data Dissemination Policies and Guidelines. The PTO's user's fees are designed to recover the marginal costs associated with providing access to the automated search systems to the public.

Comment: Five respondents stated that the proposed fees are not "reasonable" and the Office does not have documented cost estimates and usage rates to support the proposed fee amounts.

Response: The Office is meeting Congressional direction to establish "reasonable" fees by recovering only the marginal costs associated with providing public access to the automated search systems. Costs and projected usage rates were determined from the best available records, for example, financial statements for the Office and the results of the public evaluations of the APS-Text and T-Search systems. A summary of the costs used in the fee calculations is included above under "Cost Calculations." Full details of these cost calculations are available for public inspection at the Patent and Trademark Office in Suite 904 of Building 2, Crystal Park, at 2121 Crystal Drive, Arlington, Virginia.

Comment: Two respondents questioned the proposed fees for search assistance. If the search assistance is similar to that which is provided free now, there should be no fee. If the search assistance entails doing searches, the Office should not be getting into that business.

Response: The PTO is withdrawing the proposed fee for staff search assistance to conduct a search using T-Search capabilities. The fee for staff search assistance to conduct a search using APS-Text capabilities is being adopted, because an untrained user cannot conduct a search without significant help from Office staff. Users of course, have the option of obtaining free training on the system.

Comment: One respondent commented that user fees cannot be justified under the theory that electronic search provides a new service or offers an enhancement to the public's ability to search the patent data base, and that the public has an option of paying the fee or using the paper files. Another respondent commented that APS-Text and T-Search represent enhancements to services already provided.

Response: The fees are specifically authorized under § 104 (c) of Pub. L. 100-703 and are calculated to allow recovery of only the marginal cost for providing the system to the public.

Comment: Two respondents claimed that the Office should ask Congress for funding to offer free access here and at the PDLs.

Response: It continues to be PTO policy, consistent with OMB Circular A-130, that costs for access to the automated search systems be borne by those who actually use the automated search systems.

Comment: One respondent claimed that the accuracy of the trademark data base is suspect.

Response: All of the backfile data base elements (registrations issued prior to September 9, 1980) have been corrected except owner information. As originally planned, the owner field will be cleaned up the active registrations issued prior to September 9, 1980. It is projected that this owner field will be cleaned up by the third quarter of fiscal year 1991.

Comment: Three respondents claimed that the public requires access to the dead data base.

Response: The Office will consider this proposal further. The dead data base is now available in electronic format for all applications and registrations that were active on January 1, 1983 and are now inactive. However, many of these records are of poor quality. Costs for cleaning up these records would be significant, and those costs would likely be reflected in the T-Search user fee.

Comment: Four respondents addressed the fee waiver policy. The proposal to waive fee appears inconsistent wih PTO's position that the free paper search files provide an equal and viable resource to anyone not wanting to pay for the automated files. If paper records are inferior, then anyone seeking access to T-Search should be able to qualify for the fee waiver. If the paper records are adequate, then there should be no need to waive the access fee for anyone.

Response: The waiver policy authorized by Pub. L. 100-703 is designed for those individuals who, for some reason in the public interest, such as an educational purpose, need the capabilities of the automated system, for example, to manipulate the data.

Comment: One respondent commented that the procedure to enroll people in training classes by the use of a lottery was unfair and that everyone who wants to be trained should be enrolled.

Response: The lottery was a method for establishing the initial schedules to provide training. Everyone who requests training will be trained. As of August 31, 1989, 449 out of 623 people requesting training on APS-Text, and 247 out of 376 people requesting training on T-Search have been trained.

Comment: One respondent commented that advance registration is an unrealistic approach for many searchers.

Response: At least one terminal in the Patent Search Room and one in the Trademark Search Library will be available for walk-up users. The other terminals will be available first for users with a reservation and then, if needed, for walk-up users. The system is designed to ensure equity of public access to the automated systems.

Comment: Two respondents asked for information justifying that this is not a "Major Rule" as defined by Executive Order 12291, and that the rule will not have a significant adverse impact on small entities.

Response: The no "major rule" determination and no significant adverse impact on small entities was based on the fact that the automated systems are being offered only at the Patent and Trademark Office's public search facilities located in Arlington, Virginia. The total number of users of these facilities averages less than 400 a day, and many of these users are members of law firms or commercial search services. The annual effect on the economy is expected to be about $1 million, far less than the $100 million annual threshold specified in the Executive Order. The fees for accessing the automated search systems are reasonable and should not burden small entities and, at the same time, the Office is continuing to maintain the paper search files which are available to the public free of charge. Finally, there should be no significant adverse effects on competition, because the systems are being offered only at one location, the Patent and Trademark Office in Arlington, Virginia, and the public may continue to use paper files without payment of any fee.

Comment: Five respondents commented that user fees burden small entities and run counter to a fundamental objective of the patent system which is to advance technology through dissemination of the technical information contained in patents.

Response: The Office does not believe that the fee amounts adopted will burden small entities or negatively impact the dissemination of technical information. The Office also will continue to maintain the paper search files using taxpayer funds, and provide access to the public free of charge. Further, the Office has adopted a fee waiver policy whereby the fee amount can be waived where access to the data base is needed for a personal, educational purpose by an individual or member of an educational or non-profit organization, or where payment of the fee would pose a genuine financial hardship to the user. Full details are included above under "Background".

Comment: One respondent commented that the Office needs a policy to ensure that no user of the patent and trademark information is disenfranchised due to an inability to pay for the services necessary to its access.

Response: The Commissioner will consider a fee waiver for users with a genuine financial hardship.

Other Considerations:

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501, et seq. There are no information collection requirements relating to patent and trademark fee rules.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The rules make the Office's on-line, automated patent full-text search and trademark search systems available to the public at rates significantly less than commercial systems.

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Parts 1 and 2

37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents, Lawyers, Reporting and record keeping requirements, Small businesses.

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the permeable, the Office is proposing to amend Title 37 of the code of Federal Regulations, Chapter 1, as set forth below.

PART 1-RULES OF PRACTICE IN PATENT CASES.

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.21 is amended by adding new paragraphs (o)-(q).

§ 1.21 Miscellaneous fees and charges.

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(o) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using Automated Patent System full-text search capabilities, prorated for the actual time used. The Commissioner may waiver the payment by an individual for access to the Automated Patent System full-text search capability (APS-Text) upon a showing of need or hardship, and if such waiver is in the public interest $40.00

(p) Marginal cost, paid advance, for each hour of Office staff search assistance to conduct a search using Automated

Patent System full-text search capabilities (APS-Text), prorated for the actual time used $25.00
(q) Marginal cost, for each printed page generated from the Automated Patent System text terminal $0.10

PART 2-RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.6 is amended by adding new paragraphs (w)-(x).

§ 2.6 Trademark fees

* * * * *

(w) Marginal cost, paid in advance, for each hour of terminal session time, including print time, using T-Search capabilities, prorated for the actual time used. The Commissioner may waive the payment by an individual for access to T-Search upon a showing of need or hardship, and if such waiver is in the public interest $40.00
(x) Marginal cost, for each printed page generated from the T-Search terminal $0.10

Dec. 4, 1989 JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

[1110 TMOG 601]

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(208) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Part 2
Patent and Trademark Automated Search System Fees

Agency: Patent and Trademark Office, Commerce
Action: Listing of suspension of final rule
Summary: The Patent and Trademark Office (Office), on December 11, 1989, amended the rules of practice in patent and trademark cases, Parts 1 and 2 of Title 37, Code of Federal Regulations, setting forth the fees for public access to the Office's text data bases: the Automated Patent System (APS) and the automated trademark search system (T-Search). 54 FR 50942. That final rule became effective on February 12, 1990. On that date, 37 CFR 2.6(w), dealing with T-Search fees, took effect, but was immediately suspended by the Commissioner.
The collection of the fee was initially suspended to permit users to become familiar with the T-Search system. The T-Search system has been available to the public since April 1989, a sufficient time for users to become familiar with the system. Therefore, as provided in the final rule, the Office now gives notice that the suspension is lifted. The Office will begin to collect the fees set forth in 37 CFR 2.6(w) sixty (60) days from the date of this notice. Cost estimates based on usage and actual costs are available for inspection in the Office of Long-Range Planning and Evaluation, Room 507, Crystal Park 1, Crystal Drive, Arlington, Virginia.
Dates: The suspension of 37 CFR 2.6(w) is lifted as of Nov. 13, 1990. The collection of fees under 37 CFR 2.6(w) will begin on November 13, 1990
For Further Information Contact: Frances Michalkewicz by telephone at (703) 557-1610 or by mail to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

September 4, 1990 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1119 TMOG 6]

(209) **Automated Trademark System (X-Search) Training for Public Users**

X-Search, an enhanced automated trademark searching system, is scheduled to become available in July 1993.
Several free training classes will be offered to the public. A four-hour class, consisting of a lecture session and hands-on instruction, will be conducted once a month from 4:00 to 8:00 p.m. This class is for users who have no experience with automated trademark seraching. A two-hour class will be conducted three times a week for users who have experience with automated trademark searching techaiques. These classes will be held from 5:30 to 7:30 p.m. on Tuesdays and Thursdays and from 9:00 to 11:00 a.m. on Saturdays.
Space in all sessions will be limited. A lottery-type drawing will be held to determine specific class assignments. To enter the lottery drawing, a completed application form including all information shown below may be deposited in the Trademark Search Library or submitted via mail or telefax. Applications received on or before June 25, 1993, will be included in the lottery for classes beginning in July.
Trainees who fail to appear at their scheduled class will not be reassigned until all persons scheduled on the original lottery have been accommodated. Subsequent lotteries will be offered periodically if demand requires.
Training for the new system is recommended, but not required. In addition to the formal training described above, informal demonstrations will take place during business hours in the Trademark Search Library, 2900 Crystal Drive, room 2B30. These sessions will be available for the first ten days following introduction of the X-Search system and will not require a reservation. Specific dates will be posted in the Trademark Search Library.

Patent and Trademark Office
Automated Trademark System (X-Search)
Application Form for Training

Name _____
First Last MI

Mailing Address _____

_____

Phone Number: _____
(Area Code)

Employer: _____

Prefer: Two-Hour Saturday Class Two-Hour Tuesday Class

Two-Hour Thursday Class Four-Hour Class

Applications should be deposited in the Trademark Search Library of forwarded via mail or telefax to:

Commissioner of Patents and Trademarks
Box PUTB
Washington, D.C. 20231
FAX: 703/305-7786

May 17, 1993 THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

[1151 TMOG 52]

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(210) **DEPARTMENT OF COMMERCE**
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
[Docket No. 921061-2261]
[RIN 0651-AA50]

Electronic Filing of Patent and Trademark Applications

Agency: Patent and Trademark Office Commerce
Action: Advance Notice of Proposed Rulemaking

Summary: This advance notice of proposed rulemaking is to inform the public that the Patent and Trademark office (PTO) is considering amending its rules of practice: (1) to allow for electronic filing of patent applications and trademark applications; and (2) to require applications filed in paper form to follow a prescribed order and format.
The PTO anticipates that permitting electronic filing of applications will improve the accuracy of the information relied upon in the examination of patent and trademark applications, eliminate delays caused by mailing and data entry, and, as a first step toward a fully-automated processing system, ultimately provide considerable cost savings. The cost savings realized could be used to help reduce the need for future fee adjustments and/or fund improvements in the delivery of services. Requiring applications filed on paper to follow a prescribed order and format will enable the PTO to convert these applications to electronic format.
The purposes of this notice are to: (1) invite interested parties to participate in pilot programs involving electronic filing of patent and trademark applications; and (2) encourage comments on this topic, in the form of responses to the questions posed in this notice, from industry, the patent and trademark bars, and members of the public.
Dates: Comments should be received on or before Feb. 28, 1993.
Addresses: Written comments should be addressed, if sent by mail, to the attention of Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, c/o Commissioner of Patents and Trademarks, Washington, D.C. 20231. If delivered by hand, comments should be brought to the Office of the Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, Room 906, Crystal Park 2, 2121 Crystal Drive, Arlington, Va.
For Further Information Contact: Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, (703) 305-8600.

SUPPLEMENTARY INFORMATION:

1. Pilot Programs

Currently, the PTO accepts patent and trademark applications delivered by mail or in person. These applications are in paper form or, in the case of patent applications for nucleotide sequences, a combination of computer-readable (see 37 CFR 1.821-1.825) and paper form.
The PTO is initiating a pilot program that would permit electronic filing of patent and trademark applications, using software now under consideration by the PTO. Initially, it is anticipated that participants in the pilot program would be required to use the PTO software to create a diskette, which would then be mailed to the PTO along with the paper application generated by the diskette. The diskette would serve the limited function of eliminating the initial data entry of applications into the PTO databases.
As part of a second pilot program, a separate group of participants is being solicited to file paper applications following a prescribed order and format. The paper applications would then be scanned and converted to electronic format. Data collected from the pilot programs will be evaluated to determine whether requiring submission of a paper application in a certain order and format facilitates data entry; whether any modifications to the electronic filing software are required; and more fundamentally, whether electronic filing is a feasible, cost-effective alternative to filing in paper form.

2. Paper Applications

The PTO contemplates that paper applications will be required to follow the order and format of the data elements (e.g., inventor, foreign priority information, in the case of a patent application; applicant, mark, in the case of a trademark application) entered in the electronic filing system. This would enable the PTO to scan and convert paper applications to electronic applications upon receipt at the PTO. Once the paper application is converted into electronic form, processing of the application will be done in a purely electronic format. The electronic form of the application would become the official file.

3. Electronic Filing

The PTO contemplates that applicants filing by electronic means would be required to use an "Authoring Program" developed by the PTO, which will be available to facilitate the preparation of an electronic submission and record the submission on electronic media. This "Authoring Program" will include a validation feature so that applicants, themselves, can test whether an electronic submission complies with all requirements.
The "Authoring Program" software under consideration by the PTO will be designed to be compatible with computers capable of creating files of standard ASCII (American Standard Code for Information interchange) text within one or more of the major operating systems environments (e.g., DOS, Windowsr, Unix®, and Apple MacIntosh®).
The format for text in patent applications will specify a set of mandatory data elements, similar to those required under the Patent Cooperation Treaty. The format for text in trademark applications will specify a set of mandatory data elements, similar to those required of a "written application" under 15 U.S.C. 1051. In both the patent and trademark software, specific formats will be required for non-textual elements, such as drawings, formulas, tables and specimens. These non-textual elements would be submitted in separate computer files called "Presentations," similar to the presentation of nucleotide sequence information in accordance with 37 CFR 1.821-1.825.
The PTO also contemplates that certain individuals be designated by the agency as qualified "electronic application transmitters." Upon application to the PTO, unlimited parties meeting specified requirements may be issued Personal Identification Numbers to enable them to transmit applications in electronic form on behalf of themselves or other individuals.
In an effort to facilitate public comment to the questions set forth below, the following background information is provided:

4. Background Specific to Electronic Patent Applications

Signature

Under 35 U.S.C. 111, a patent application must include an oath by the applicant. 35 U.S.C. 25 permits a declaration in lieu of oath. The applicant's signed oath or declaration is not required for receipt of a filing date, but may be submitted, upon payment of a surcharge, within a prescribed period.

Certified Copy of Foreign Patent Application

Under 35 U.S.C. 119, a U.S. patent application may be based on a foreign patent application, thus, potentially, conferring the benefit of the earlier foreign patent application's filing date. A certified copy of the foreign patent application is required to be filed in the PTO before the patent is granted.

5. Background Specific to Electronic trademark Applications

Signature

Under 15 U.S.C. 1051, a trademark application must be verified by the applicant. Prior to implementation of the Trademark Law Revision Act of 1988 (TLRA) on Nov. 16, 1989, the PTO permitted verification of the application to be provided at any time during the examination process. With implementation of the TLRA, the PTO amended its regulations with respect to the verification of an application. 37 CFR 2.21, which sets forth the minimum requirements for an application to receive a filing date, was amended to require that the application be signed by the applicant at the time of filing.

Specimen

Under 15 U.S.C. 1051, a trademark application based on "use in commerce" must include specimens or facsimiles of the mark as used. 37 CFR 2.21(a)(5) requires at least one

specimen or facsimile to be included with the "use" application in order to receive a filing date. Applications filed based upon a "bona fide" intention to use the mark in commerce, under 15 U.S.C. 1051(b), must be supplemented with specimens or facsimiles before the registration issues. In order to meet the minimum requirements for filing an amendment to allege use or statement of use, one specimen or facsimile must be submitted. 37 CFR 2.76(e)(2) and 2.88(e)(2).

Certification or Certified Copy of Foreign Registration

Under 15 U.S.C. 1126(e), "an application [based on a foreign registration] shall be accompanied by a certification or a certified copy of the registration of the country of origin of the applicant." 37 CFR 2.21(a)(5) requires the certification or certified copy to be included with the application in order to receive a filing date.

6. Comments on the following Questions and Any Other Related Matters Are Solicited

Questions Common to Patent and Trademark Applications

a. What benefits do you foresee for the applicant if electronic filing is adopted? What disadvantages do you foresee?
b. Should the PTO require paper applications to be filed in a specific order and format to facilitate conversion to electronic format? What advantages and disadvantages do you foresee?
c. Should the electronic file become the official agency file?
d. Should electronic filing be expanded to encompass amendments and other submissions to the PTO?
e. Should paper or electronic application filings receive a filing date only if they meet order and format requirements, or should compliance be subject to a surcharge?
f. Should the PTO accept electronic filing by diskette, on-line, or both?
g. Should applications filed in paper form be converted to electronic form by the PTO? Should the PTO charge a fee for this service?
h. If paper applications are converted to electronic form by the PTO, should the PTO destroy or retain the paper applications?
i. Should fees be processed electronically?
j. Should the PTO create a registry of "electronic application transmitters" capable of transmitting patent and trademark applications for others? If so, what, if any, criteria should be established before one could be "registered" as an "electronic application transmitter?"

Questions Related Solely to Patent Issues

k. Should the PTO require the oath or declaration to an electronically filed patent application be filed on paper to authenticate that applicants believe themselves to be original and first inventors of the subject matter of the electronically filed application?
If not, how should the filing of the oath or declaration be accomplished?
l. How should the filing of certified copies of foreign patent applications be accomplished for an electronically filed patent application?

Questions Related Solely to Trademark Issues

m. Should the PTO require electronically filed applications to include a scanned, signed declaration in order to receive a filing date? Should the PTO accept declarations in electronic form with some type of electronic signature?
If not, should 37 CFR 2.21 be amended to permit unverified applications to be accorded a filing date? if so, within what time period must an unverified application be ratified by the submission of a signed declaration?
How long should the PTO retain the signed declaration after it has been scanned and merged into the electronic file?
n. Should "use" applications submitted without a specimen be given a filing date?
If so, within what time period after filing must the specimens be submitted?
Should the number of required specimens be reduced?
How long should the PTO keep the specimens after they are scanned and merged into the electronic file?
o. Should Section 44(e) of the Trademark Act (15 U.S.C 1126(e)) beamended to permit applicants to submit a facsimile of the certification or certified copy of the foreign registration?
Alternatively, should the statute be amended to permit Section 44(e) applicants to obtain a filing date absent a certification or certified copy of the foreign registration? If so, within what time period must a Section 44(e) application be supplemented with a certificate or certified copy of the foreign registration?
How long should the PTO retain the certification or certified copy after it has been scanned and merged into the electronic application?

7. Candidates for the Pilot Programs

Any person interested in participating in one of the pilot programs identified above is requested to contact Edward R. Kazenske, Executive Assistant to the Commissioner and Director of Interdisciplinary Programs, c/o Commissioner of Patents and Trademarks, Washington, D.C. 20231. If delivered by hand, written statements of interest should be brought to Suite 906, Crystal Park 2, 2121 Crystal Drive, Arlington, Va. 22202. Telephone: (703) 305-8600. Please indicate which pilot program you wish to participate in and please be certain to include a telephone number where you may be reached.

Nov. 23, 1992 DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1145 TMOG 9]

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(211) United States Postal Service Interruption and Emergency in the State of California

A service interruption in United States Postal Service (USPS) in the State of California occurred on June 29, 1995, due to the action of the UNABOM bomber. The USPS will maintain heightened security procedures for mail originating in the State of California. These procedures will be in effect until further notice and are as follows:

Mail destined for California is not affected by these procedures.

For Express Mail, Priority Mail, First-Class Mail, international air mail and military mail items weighing less than 12 ounces, normal collection, distribution, and transportation will remain in effect.

Mail weighing 12 ounces or more which has been placed into California collection boxes will be returned to the sender. Postal Service window clerks will not accept Express Mail, Priority Mail, First-Class Mail, international air mail or military mail weighing 12 ounces or more.

Postal Service marketing and sales managers will work with known shippers to accept mail pieces weighing 12 ounces or more, but this mail will not be transported on scheduled passenger airlines.

Parcel post and international surface mail originating in California are not affected by these procedures.

The Patent and Trademark Office (PTO) is designating the interruption in the service of the USPS in the State of California caused by the UNABOM bomber as a postal service interruption and an emergency within the meaning of 35 U.S.C. 21(a). Any request to accept a paper or fee delayed by this emergency should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 30, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1176 TMOG 74]

TRADEMARK PUBLICATIONS

(212) Separation of the Patent and Trademark Sections of the Official Gazette

Effective February 2, 1971, the *Official Gazette* will be separated into two parts to be known as the *Patent Official Gazette* and the *Trademark Official Gazette*

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Orders for subscriptions should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Also effective February 2, 1971, the *Official Gazette* will no longer contain "Decisions in Patent and Trademark Cases." Decisions of the type heretofore found in the "Decisions in Patent and Trademark Cases" are published by non-Federal organizations such as, for example, the Bureau of National Affairs, Inc., 1231 25th St. NW., Washington, D.C. 20037, and West Publishing Co., 50 Kellogg Blvd., St. Paul, Minn. 55102.

Finally, the "Decisions Leaflet" of the *Official Gazette* will no longer be supplied as a separate subscription item after January 26, 1971. According to present plans, however, both the *Patent Official Gazette* and the *Trademark Official Gazette* will have identical "Patent Office Notices" sections containing notices of the various types heretofore published in the Gazette decision leaflet and Trademark Section. Those notices of particular interest to Patent Office employees will be accumulated and published approximately every fourth week, and distributed separately to employees.

Dec. 29, 1970 WILLIAM E. SCHUYLER, JR.
Commissioner of Patents

[882 O.G. TM 33]

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(213) Changes in Format for Publishing Trademarks for Opposition

Because of the adoption of the International classification of goods and services by the United States as of September 1, 1973 (see *Official Gazette* of June 26, 1973, 911 O.G. TM 210), it is necessary to change the arrangement in the *Official Gazette* of the marks published for opposition.

Beginning with the issue of May 7, 1974, the section of the *Official Gazette* entitled "Marks Published for Opposition" will be divided into four sections instead of the present two sections. (For the preceding change from one to two sections, see *Official Gazette* of October 13, 1964, 807 O.G. TM 51.) Sections 1 and 2 will be according to international classification and will contain marks in applications filed on or after September 1, 1973, and Sections 3 and 4 will be according to prior United States classification and will contain marks in applications filed on or before August 31, 1973.

In Section 1, all marks presented in combined applications filed on or after September 1, 1973 for registration in more than one international class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the international class numbers, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In Section 2, all marks presented in applications filed on or after September 1, 1973 for registration in a single class will be published in international class order.

In Section 3, all marks presented in combined applications filed on or before August 31, 1973 for registration in more than one prior United States class will be published with only one reproduction of each mark. The reproduction of the mark will be followed by the prior United States class numbers and titles, and under each class will appear the goods or services in connection with which the mark is used. If the date of first use applies to all classes, it will appear following the last class; otherwise, the dates of use will appear after each class.

In section 4, all marks presented in applications filed on or before August 31, 1973 for registration in a single class will be published in the prior United States class order.

The following explanation will appear under the heading "Marks Published for Opposition":

> The following marks are published in compliance with section 12(a) of the Trademark Act of 1946. Applications for the registration of marks in more than one class have been filed as provided in section 30 of said act as amended by Public Law 772, 87th Congress, approved Oct. 9, 1962, 76 Stat. 769. Opposition under Section 13 may be filed within thirty days of the date of this publication. See Rules 2.101 to 2.105.
>
> A separate fee of twenty-five dollars for opposing each mark in each class must accompany the opposition.

Sections 1 through 4 will appear immediately after the above explanation, the sections being designated as follows:

Section 1. International classification-Application in more than one class
Section 2. International classification-Application in one class
Section 3. Prior United States classification-Application in more than one class
Section 4. Prior United States classification-Application in one class

The same procedure of dividing into four sections will be followed in the notice of the issuance of registrations on the Supplemental Register.

Mar. 22, 1974 RENE D. TEGTMEYER
Assistant Commissioner for Trademarks

[921 O.G. TM 122]

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(214) Change in Official Gazette Entry to Show Cancellation of Fewer Than All Classes in a Multiple Class Registration

Effective with the *Official Gazette* issue of December 16, 1980, there will be a change in the *Official Gazette* listing entitled "Trademark Registrations Cancelled." Beginning with that issue, "Trademark Registrations Cancelled" will list:

(1) single class registrations cancelled;
(2) multiple class registrations cancelled in all classes;
(3) multiple class registrations cancelled in fewer than all classes.

For every entry in the listing, the specific classes cancelled will be included in parentheses, next to the registration number and mark.

For a single class registration and for a multiple class registration in which every class has been cancelled, the class number(s) shown in parentheses will represent every class to which the registration applied.

For a multiple class registration in which fewer than all classes have been cancelled, the *Official Gazette* entry will include the word "only" following the notation of classes in

parentheses, for example: (Int. Cls. 12 and 20, only). In this example, the addition of the word "only" would indicate that there are classes in the registration in addition to Classes 12 and 20, but only Classes 12 and 20 have been cancelled.

Oct. 29, 1980. MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1000 TM 21]

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(215) **Single Copies of the Trademark Official Gazette**

Members of the public ordering single copies of the Trademark Official Gazette from the Superintendent of Documents are reminded they must specify the date of the issue being ordered.

The date of the issue in which a mark will be published for opposition is shown on The Notice of Publication form mailed to applicants approximately two weeks before the publication date. This date must be included on each single copy order.

Orders received without an issue date may be filled from current weekly stock. The Superintendent of Documents cannot check on whether a particular mark is published in the issue then in stock. If the stock is exhausted at the time the order is received, the order will be returned unfilled.

Mar. 3, 1981 MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1004 TMOG 36]

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(216) **Inadvertently Issued Registration Numbers**

Effective Jan. 3, 1984, a new sub-section identified as "Inadvertently Issued Registration Numbers" will exist as the last category of cancellations listed under the "Trademark Registrations Canceled" section of the *Official Gazette*.

This new sub-section will provide public notice of the cancellation of registration numbers which have been inadvertently issued by the Patent and Trademark Office.

Nov. 15, 1983 MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1037 TMOG 16]

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(217) **Ordering the TMEP (2nd Edition)**

The U.S. Government Printing Office (GPO) ia accepting orders for the *Trademark Manual of Examining Procedure* (TMEP), 2nd edition. The second edition replaces the first edition (revision 7) and incorporates all changes in policy and procedure through March 1993.

New orders should be sent to:

Superintendent of Documents
United States Government Printing Office
P.O. Box 371954
Pittsburgh, Pa. 15250-7954

Stock Number - 903-010-00000-2
Price - $19.00

Orders may also be placed by phone using MASTERCARD® or VISA® by calling (202) 783-3238.

If there are any problems with an order, please call the Customer Adjustment Department of the GPO at (202) 512-2457.

July 9, 1993 ROBERT M. ANDERSON
Acting Assistant Commissioner for Trademarks

[1153 TMOG 13]

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(218) **Notice to Subscribers**

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. if a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

Aug. 3, 1984 THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1045 TMOG 24]

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(219) **Printing of Use in Another Form Claims**

Effective immediately, all claims of prior use of the subject mark in another form contained in applications for Trademark registrations will be printed in the *Official Gazette* and on the registration certificates according to the following formats:

First used in another form on
First used in commerce in another form on

July 15, 1986 MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1069 TMOG 4]

TRADEMARK MISCELLANEOUS

(220) **Recording of Documents Affecting Title**

The Patent Office is liberalizing its policy concerning the recording of documents, other than assignments, which affect title to trademark registrations and applications. Under Rule 2.185 of the Trademark Rules of Practice, instruments affecting title to a trademark registration or application, and licenses of

trademarks which are the subject of trademark registrations or applications, will be recorded even though the recording thereof may not serve as constructive notice under Section 10 of the Trademark Act of 1946, as amended (15 U.S.C. 1060).

June 16, 1971 WILLIAM E. SCHUYLER, JR.
Commissioner of Patents

Published in 36 F.R. 13231; July 16, 1971

[889 O.G. TM 2]

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(221) **International Protection of Government Emblems and Seals**

Change of Intent

The Patent and Trademark Office, Department of Commerce, intends to forward only the 50 State seals plus one department seal for each department listed in the publication "Seals and Other Devices in Use at the Government Printing Office" ("Seals") instead of the entire publication, as indicated on page 59366 of the Federal Register of Dec. 23, 1975.

Since the publication had been printed in 1975, it was assumed that few deletions and additions would be necessary. However, the response to the above notice, along with some necessary deletions, resulted in a large number of seals in the publication requiring deletion. This rendered the publication unacceptable for submission to the World Intellectual Property Organization (WIPO).

Therefore, the Patent and Trademark Office now intends to forward only the 50 State seals along with the departmental seal denoted "No. 1" for each department listed in the "Seals" publication. If this is not the preferred departmental or State seal, the department or State involved is requested to notify the Patent and Trademark Office by Sept. 21, 1976. This notification should either specify the number of the preferred seal, as it appears in the "Seals" publication, or provide a clear, black and white photograph, suitable for reproduction, of the preferred seal. The seal must be no larger than 1 1/2 inches in diameter.

These seals will then be forwarded to WIPO for protection under Article 6 of the Paris Convention for the Protection of Industrial Property.

Address all correspondence to: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Aug. 18, 1976 C. MARSHALL DANN
Commissioner of Patents and Trademarks

Published in 41 F.R. 35741

[950 O.G. TM 114]

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(222) **Recording of "Territorial Assignments" in the Assignment Division of the Patent and Trademark Office**

It has been the practice of the Assignment Division for many years to refuse to record "territorial assignments," that is, assignments purporting to transfer rights in a trademark registration (not a concurrent use registration) for less than the entire United States. Hereinafter, such documents will be recorded as long as the requirements of the Rules of Practice are met by the documents submitted.

The Office is not addressing the validity or effect of such documents by recording same, but is merely recognizing that such transfers may affect title to a registered mark and therefore ought to be recorded. At the time a Section 8 affidavit or declaration or an application for renewal is filed, the Examiner of Trademarks will consider the effect of such a document.

Oct. 7, 1977 BERNARD A. MEANY
Assistant Commissioner for Trademarks

[964 TMOG 8]

(223) **Helpful Hints**

Assignment Cover Sheets

The Office developed PTO Form 1594, Recordation Form Cover Sheet (Trademarks), and PTO Form 1595, Recordarion Form Cover Sheet (Patents), to facilitate submitting data required to record an assignment. The first versions of these forms have been available since Sept. 1992, and most assignments are now received with them. Both forms and their instructions will be updated later this year to remove ambiguities and incorporate suggestions received from customers. Until the revisions are completed, the Office will continue to work with practitioners to improve the utility of the current forms.

A practitioner recently noted that the current cover sheets for both patent and trademark assignments are not clear as to the proper entry of different execution dates (Item 3) when there are multiple assignors shown (Item 1). Pending redesign of the forms, the Office suggests when there are multiple assignors named in Item 1, number each assignor, and in Item 3, preface each execution date with the corresponding number. if all assignor information cannot be entered in the space provided for Item 1, enter "See Attached List" and proceed in the same manner. This will enable Assignment Branch staff to associate the correct date with the appropriate assignor.

Another practitioner called to our attention the fact that although the forms indicate "Total number of pages comprising cover sheet" (Item 9), Assignment Branch staff frequently cross out that entry and replace it with the total number of pages submitted, both in cover sheets and the assignment instrument itself. Soon after the forms were printed, Assignment Branch staff found they were better able to verify document integrity by using the total number of pages per submission. This number is then used as a cross-check as the assignment moves through the recordation process, receives reel and frame numbers, is microfilmed, and returned to the customer. Pending revisions to the forms, the preferred procedure is to indicate the total number of pages submitted, both in cover sheets and the attached assignment.

Additional comments or suggestions for improving either or both assignment cover sheets should be directed to Audrey Britt, Chief, Assignment Branch, at (703) 308-9706.

Mar. 8, 1993 THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

[1148 TMOG 304]

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(224) **Indexing Against a Recorded Assignment**

It has been the practice of the Patent and Trademark Office (PTO) to process requests for indexing against a recorded document by adding the newly requested property to the data base record for the previously recorded document, except if the previously recorded document was an assignment. The PTO only required a transmittal letter with the recording fee and not a copy of the previously recorded document to process the indexing request. While indexing the additional properties resulted in the assignment data base being updated, the indexing request itself was never microfilmed to become part of the official record.

Effective immediately, the PTO will no longer process such indexing requests. Such indexing requests do not comply with 37 CFR 3.11, 3.28, and 3.31 which require that each request for recordation include the document to be recorded and a cover sheet. Instead of filing an indexing request, a party should submit a cover sheet in conformance with 37 CFR 3.31, a true copy of the document, and the recording fee. PTO will assign a new recording date to that submission, update the assignment data base, and microfilm the cover sheet and document to become part of the official record.

Nov. 3, 1993 THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

[1157 TMOG 12]

(225) **Flexible Working Hours**

On Jan. 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6:30 a.m. or as late as 9:30 a.m., and end their workdays between 3:00 p.m. and 6:30 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8:30 a.m. to 5:00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9:30 a.m. to 3:00 p.m. The patent public search room will continue to operate from 8:00 a.m. until 8:00 p.m. and the trademark search room from 8:00 a.m. until 5:30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

Dec. 13, 1978

DONALD W. BANNER
Commissioner of Patents and Trademarks

[978 TMOG 141]

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(226) **THE RETENTION SCHEDULE FOR TRADEMARK RECORDS**

As with most government agencies, the Patent and Trademark Office disposes of old files, papers and records pursuant to a specific schedule. In an effort to clarify any questions concerning the procedures for disposing of Trademark records and in response to public inquiries, the present Retention Schedule for Trademark Records and other records including trademark matters which may be of interest to the public is set forth as follows:

International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports, records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interests of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.	PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Trademark Adversary Proceedings Files. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.	The past schedule to destroy after 10 years is in the process of being changed. At this time, these records are not being disposed of pending the new amendment to this section.
Canceled Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after the date of cancellation.
Expired Trademark Registration Files. Consists of original application and all related correspondence.	Destroy 2 years after expiration of registration.
Abandoned Trademark Application Files. Consists of original application and all related correspondence.	Destroy 2 years after date of abandonment.
Trademark Renewal Index. Index to trademark registration that are renewed.	PERMANENT. Offer to National Archives when no longer needed for reference.
Indexes to Trademark Applications. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.	
A. Applicant's Index.	PERMANENT. Offer to National Archives when no longer needed for reference.
B. Serial Index.	PERMANENT. Offer to National Archives when no longer needed for reference.
Proceedings Index to Trademark Adversary Proceedings. Index arranged by type of proceeding. Shows status of proceeding prior to and immediately after a decision by the Board.	Destroy 3 years after termination of the proceeding.
Trademark Adversary Proceeding Records. Card file showing records of Trademark Adversary Proceedings.	PERMANENT. Offer to National Archives when no longer needed for reference.
Trademarks Published in Official Gazette. Clippings of marks from Official Gazette.	
a. Those which have been opposed.	*Retain in agency until no longer needed for reference.*
b. All others.	*Destroy when mark is registered.*
Trademark Registrant's Index. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.	PERMANENT. Offer to National Archives when no longer needed for reference.
Class of Goods Index. Card index used to indicate into what class any conceivable goods may fall.	Destroy after information transferred to magnetic media.
Index to Trademark Trial and Appeal Board Cases. Record of trademark trial and appeal board cases.	PERMANENT. Offer to National Archives when no longer needed for reference.
Public Advisory Committee for Trademark Affairs Files.	
a. Agenda, minutes, correspondence, reports and related supporting files.	PERMANENT. Transfer to Federal Records when 10 years old. Offer to National Archives when 25 years old.
b. Paper and reference materials.	Destroy when 10 years old or no longer needed for reference, whichever is sooner.
Seminar in Trademark Practice and Procedure Files. Record set of training materials used in training trademark examiners.	PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 25 years old.
Trademark Petitions Files. Petitions to the Commissioner relating to trademarks with related materials.	
a. Original Petitions in trademark case file.	Dispose of with related case file.
b. Other copies.	Destroy when 2 years old.
Trademark Protest Letters. Letters of protest to the Commissioner related to trademarks.	Destroy when no longer needed or when three years old, whichever is earlier.
International Patent and Trademark Activities Case Files. Project case files showing Patent and Trademark Office activity relating to international patent and trademark programs.	PERMANENT. Transfer to office responsible for international affairs after case is closed.
a. Records that supplement the International Property Activities Case Files (Item 103).	Destroy 5 years after close of case or sooner if no longer needed.
b. Other materials.	PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.
International Intellectual Property Activities Case Files. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents, trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.	PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.
Proposed Intellectual Property Legislation Files. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts or legislation, reports to committees on introduced legislation, and comments on legislative proposals.	Destroy 30 days after applicant is notified that the specimens are unacceptable, unless picked up sooner by the applicant.

Bulky Trademark Specimens. Trademark applications specimens which do not strictly meet the basic requirements for physical form of specimens which state:

1. That they be made of material suitable for being placed inside a manila file wrapper.
2. That they be capable of being arranged flat, such as being folded.
3. That they be of a size not to exceed 8 1/2 inches wide by 13 inches long. (Rule 2.56).

These requirements provide for specimens which will fit inside the application file wrapper, which is 9 x 14 inches in size and which will conveniently expand to about one inch thickness.

Specimens which do not meet the above requirements are referred to as "bulky" specimens and the Examiner must require that they be replaced by specimens of acceptable size and shape.

February 28, 1979

SAUL LEFKOWITZ
Acting Assistant Commissioner for Trademarks

[980 TMOG 16]

(227) **Proposed Records Control Schedule**

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557-0183. Written comments should be mailed to:

John Hassett, Director
Patent and Trademark Office
Crystal Plz. 1, Lobby
Washington, D.C. 20231

June 17, 1986

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

Commissioner's and Deputy Commissioner's Records

1. *Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Tradmark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
2. *Reports to the Commissioner.* Reports received by the Commissioner from the Patent and Trademark Office staff and maintained as separate series.
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
3. *Index to Commissioner's Correspondence and Subject Files.* Card index to records described under Item 1.
   PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.
4. *Deputy Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
5. *Policy Documentation Files.* Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars, manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.
   PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.
6. *Work-Flow Control and/or Statistical Reports Files.* Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.
   Destroy when 5 years old or sooner if no longer needed.
7. *Production and Pendency Reports Files.* Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.
   a. Office of Assistant Commissioners or equivalent.
      Transfer to FRC when 5 years old. Destroy when 10 years.
   b. Other Offices.
      Destroy when updated report is received.
8. *Special Studies Files.* Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.
   PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
9. *Narrative and Statistical Reports Files.* Annual or other periodic narrative and statistical reports.
   a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.
      PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.
   b. Other Offices.
      Destroy when 5 years old.
10. *Internal Administrative Files.* Administrative operations files of organizational offices, consisting of:
    a. Correspondence concerning routine or temporary internal administrative matters.
       Destroy when 2 years old.
    b. Office personnel files.
       Destroy after separation of employee.
    c. Completed requisitions for services, supplies and equipment, and travel documents.
       Destroy 1 year after action is completed.
    d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.
       Destroy on completion of program.
    e. Hand receipt files.
       Destroy when property is accounted for.
    f. Suspense files.
       Destroy when purpose is served.
    g. Chronological files.
       Destroy when 2 years old.
11. *Program Planning and Evaluation Files.* Files showing the overall development of Patent and Trademark Office plans and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
12. *Surplus Property Case Files.* Case files on disposal of surplus real and related personal property.
    Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.
13. *Excess Real Property Reports.* Reports of real property with related papers.
    Destroy when 10 years old.
14. *Budget Policy and Procedure Correspondence Files.* Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.
15. *Budget Estimates Files.* File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.
    PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.
16. *Records Disposition Files.* Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating to revisions.
    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.
17. *Forms Files.* One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.
    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.
18. *Systems Development Program Files.* Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.
    PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.
19. *Systems Development Task Force, Committee, and Board Files.* Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.
    PERMANENT. Transfer to FRC 5 years after close of file. Offer to National Archives 20 years later or after 25 years old, whichever is sooner.
20. *Technical Report Files.* One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.
    PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.
21. *Systems Development Project Case Files.* Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.
    PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

ADP Records
(also in GRS 20)

22. *ADP Planning Documents Files.* Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.
    PERMANENT. When no longer needed or used offer to National Archives with related materials.
23. *ADP Program Management Files.* Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.
    PERMANENT. Offer to National Archives with related materials.
24. *ADP Standardizations Files.* Standardization files consisting of data elements and codes, standardization requests, and jusification for all data systems developed by or for the Patent Office.
    PERMANENT. Offer to National Archives with related materials.
25. *ADP Data Systems Planning Files.* Documents containing definition of the system.
    PERMANENT. Offer to National Archives with related materials.
26. *ADP Information Retrieval System Master Reference File.* Magnetic media containing an index to patents and trademarks and publications.
    PERMANENT. Offer to National Archives on termination of Patent and Trademark Office.
27. *Publication Tape File.* Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
    PERMANENT. Offer to National Archives whenpublication needs cease.

Patent Records

28. *Advertising Files.* Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
    Destroy when 25 years old.
29. *Complaint Files.* Case files relating to complaints made against attorneys registered to practice before the Patent Office.
    Destroy on death of attorney.
30. *Board of Appeals Decisions Files.* Copies of Board of Appeals decisions with related background materials.
    a. Cases patented.
       Destroy 10 years after patent issued.
    b. All others.
       Destroy 10 years after appeal is decided.
31. *Indexes to Appeal Cases.* Indexes, arranged in various ways, to the appeal cases.
    Destroy 30 years after date of appeal.
32. *Declaration of Assistance Received Files.* Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL-284).
33. *Academy Lecture Files.* Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
    a. Historical Sample
       PERMANENT. Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
    b. All other copies.
       Destroy when obsolete.
34. *Academy Training Sessions Files.* Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
    PERMANENT. Offer to National Archives when 25 years old.
35. *Academy Examinations Files.* Completed examinations of persons attending the Academy.
    Destroy when 1 year old.
36. *Academy Application Files.* Applications for training in the Academy, including memoranda of agreement and personal history statements.
    Destroy when 2 years old.
37. *Academy Correspondence File.* Correspondence relating to the courses offered by the Patent Office Academy.
    Destroy when 5 years old.
38. *Disclosure Document File.* Documents submitted by inventors as evidence of the date of conception of an invention.
    a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
       Dispose of with related patent application.
    b. Disclosure Documents not referred to.
       Destroy when 2 years old.
39. *Disclosure Documents Index.* Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
    Destroy with related DD's.
40. *Index to Patents Available for License or Sale.* Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
    Destroy when no longer needed for reference.
41. *General Correspondence File.* Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
    Destroy when 3 years old.
42. *Foreign Filing Licensing Documents.* Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
    Destroy 25 years after date of issue.
43. *Indexes to Foreign Filing Licensing Documents.* Indexes to licensing documents described in Item 43.
    Destroy 25 years after issue.
44. *Transmittals to Other Agencies Files.* Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
    Destroy when 1 year old.
45. *D-1 Files.* Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
    Destroy 35 years after date of receipt for review.
46. *Drawing Correction Slips.* Index arranged by serial number of application and used to locate orders for correction of drawings.
    Destroy when 2 years old.
47. *Inventor's Index to Patent Applications.* Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name

and address of the attorney, application serial number and the filing date of the application.
PERMANENT. Offer to National Archives when no longer needed for reference.

48. *Numerical (serial) Index to Patent Applications*. Index arranged by the serial number assigned to the application.
PERMANENT. Offer to National Archives when no longer needed for reference.

49. *Assignment Document Files and Index*. Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
PERMANENT. Offer to the National Archives when no longer needed for current business.

50. *Indexes to Government Interests*. Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
a. Government Agency Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Patent Number Index.
Destroy when no longer needed for reference.
c. Assignor Index.
Destroy when no longer needed for reference.

51. *Petitions to the Commissioner*. Petitions to the Commissioner concerning patent applications.
a. Original petitions in patent case file.
Dispose of with related case file.
b. Other copies.
Destroy when 2 years old.

52. *Patent Protest Letters*. Protest to the grant of a patent (Rule 291).
a. Letters filed in patent case file.
Dispose of with related case file.
b. Others.
Destroy when 5 years old.

53. *Patent Docket Cards*. Cards used to control patent applications.
Destroy when 6 months old.

54. *Classifications Definitions Files*. One copy of each issuance of Classifications Definitions, with related background papers.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

55. *Canceled Drawings*. Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
Destroy 5 years after filing date.

56. *Abandoned Patent Application Files*. Patent applications that did not result in a patent.
a. Those that are retained because they are referred to in another application that may have become patented.
Dispose of with patent file in which cited.
b. All others.
Destroy when 20 years old.

57. *Patent Files*. Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
b. All others.
Destroy when 35 years old.

58. *Patent File Charge-out Records*. Record showing name of person charging out a patent file.
Destroy after file is returned and all papers are determined to be in file.

59. *Statistical Reports on Patents to Printers Files*. Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
a. Original Report.
Destroy when 5 years old.
b. Operating Unit Copy.
Destroy when 2 years old.

60. *Quality Review of Sample of Allowed Applications*. Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
Destroy 1 year after ultimate disposition of related case.

61. *Sample Pull-Rate Files*. Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
Destroy when 1 year old.

62. *Printer-Waiting Register Files*. Register showing status of Query Disposition Records return to a group for reply.
Destroy when 1 year old.

63. *Query Disposition Record Files*. Form used to return printer-waiting cases to a group for answer to a specific query.
Destroy 6 months after query is returned.

64. *Batch Control Sheet for Allowed Cases Files*. Form uses as input to PALM System showing routing control and batch contents, such as PTO Form 1238-1.
Destroy when 1 year old.

65. *Checklist for Applications Allowed by Examiner File*. Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
Destroy when 1 year old.

66. *Patent Interference Files*. Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
a. Cases that reach the hearing stage.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
b. Cases that are abandoned before reaching a hearing.
Destroy when 40 years old.

67. *Board of Interference Decisions*. Copies of Board of Interference Decisions.
PERMANENT. Offer to the National Archives when 40 years old.

68. *Index to Patent Interferences*. Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.
PERMANENT. Offer to National Archives when 40 years old.

69. *Index to Interference Exhibits*. Describes exhibits in each interference.
Destroy when 40 years old.

70. *Proceedings Under AEC and NASA Acts*. Separate series of interference files relating to the SEC and NASA Acts.
Dispose of with related patent files.

71. *Settlement Agreements*. Files relating to the settlement agreed to by parties in the interference.
Dispose of with related interference case file.

72. *Court Cases*. Proceedings in cases where the Commissioner is a party of a civil suit.
a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.
PERMANENT. Offer to the National Archives when 30 years old.
b. All other cases.
Destroy when 30 years old.

73. *Index to Court Cases*. Card index to cases described under Item 72.
Retain in agency until no longer needed for reference.

74. *Roster of Registered Patent Attorneys and Agents*. Printout listing registered patent attorneys and agents.
Destroy after undated listing is received.

75. *Case Folders of Registered Attorneys and Agents*. Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.
Destroy on death of attorney or agent.

76. *Unsuccessful Application for Registration to Practice before the Patent and Trademark Office*. Application folders of those applicants who failed to be registered.
Destroy 5 years after date of examination.

77. *Examination Papers of Applicants for Registration*. Examination answer papers to applications for registration to practice before the Patent and Trademark Office.
Destroy after grades are recorded.

Trademark Records

78. *Trademark Examiners Work Reports*. Records showing amount of work processed by examiners in a given time. Used to evaluate examiners work and progress.
Destroy when 5 years old.

79. *Trademark Adversary Proceedings Files*. Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.
Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.

80. *Canceled Trademark Registration Files*. Consists of original application and all related correspondence.
Destroy 2 years after the date of cancellation.

81. *Expired Trademark Registration Files*. Consists of original application and all related correspondence.
Destroy 2 years after expiration of registration.

82. *Abandoned Trademark Application Files*. Consists of original application and all related correspondence.
Destroy 2 years after date of abandonment.

83. *Trademark Renewal Index*. Index to trademark registrations that are renewed.
PERMANENT. Offer to National Archives when no longer needed for reference.

84. *Indexes to Trademark Applications*. Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.
a. Applicant's Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Serial Index.
PERMANENT. Offer to National Archives when no longer needed for reference.

85. *Proceedings Index to Trademark Adversary Proceedings*. Index in the Trademark Public Search Library arranged by type of proceeding.
Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.

86. *Trademark Adversary Proceedings Records*. Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.
PERMANENT. Offer to National Archives when no longer needed for reference.

87. *Trademark Registrant's Index*. Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.
PERMANENT. Offer to National Archives when no longer needed for reference.

88. *Index to Trademark Trial and Appeal Board Ex Parte Cases*. Record of Trademark Trial and Appeal Board cases in ex parte appeals.
PERMANENT. Offer to National Archives when no longer needed for references.

89. *Public Advisory Committee for Trademark Affairs Files*. Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.
Destroy when 10 years old or no longer needed for reference.

90. *Trademark Petitions Files*. Petitions and decisions to the Commissioner relating to trademarks, with related materials.
a. Original Petitions in trademark case file.
Dispose of with related case file.
b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.
PERMANENT. Offer to the National Archives when no longer needed for references.
c. Other copies.
Destroy when 2 years old.

91. *Trademark Protest Letters*. Letters of protest to the Commissioner related to trademarks.
Destroy when no longer needed or when three years old, whichever is earlier.

Public Information and Service Records

92. *International Intellectual Property Activities Case Files*. Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.
PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.

93. *Proposed Intellectual Property Legislation Files*. Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.
PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

94. *Printed Articles Files*. Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.
Destroy when 10 years old.

95. *Public Affairs Report*. Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.
Destroy when 6 months old.

96. *Speakers Files*. Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.
Destroy when 3 years old.

97. *Exhibit Files*. Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

98. *Photograph Files*. Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.
PERMANENT. Offer for transfer to the National Archives when 20 years old.

99. *Publications Files*. Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.
PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

100. *Speech Files*. Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.
PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

101. *News Release Files*. Official records copy of each new release.
PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.

102. *Patents Received and Files Register*. Register showing date and number of patent cases received in search room and date filed.
Destroy 2 years after date of last entry in volume.

103. *Reports on Search Room Activities Files*. Weekly, monthly and other periodic reports showing production and general activities of the public search room, with related background papers.
a. Original Report.
Destroy when 1 year old.
b. Operating Office Copy.
Destroy when 2 years old.

104. *Patent and Trademark Reproduction Copy Files*. The master copy of patents and trademarks used for the photoreproduction of sales copies, includes original drawings and specifications.
Transfer to FRC when 10 years old. Destroy when 20 years old.

105. *Reprint Requisition File*. Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.
Destroy when 1 year old.

106. *Sales Journal*. Shows statistical information on sales of copies of patents and trademarks.
Destroy when 5 years old.

107. *Correspondence and Sale Control Records*. Records used to control the flow of correspondence and sale of printed materials.
Destroy when 1 year old.

108. *Requests for Publications*. Correspondence requesting copies of certain publications and other printed materials.
Return requests with ordered materials.

109. *Microform Files*. Microform copies of applications as filed, printed patent files and printed trademark files.
a. Master microfilm files. (Certified as processed under 41 CFR 101-11.504)
PERMANENT. Transfer to classified site. Offer to National Archives when 25 years old.
b. All other microform copies
Non-Records

110. *Charged-Out Slips File*. Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.
Destroy when records are returned.

111. *Binding Instructions*. Cards showing instructions on how the various publications received by the library are to be bound.
Destroy when no longer needed.

112. *Charge-out Files of Library Materials*. Sets of 3"x 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.
Destroy when obsolete or on return of book.

113. *Interlibrary Loans Files*. Records of books borrowed from other libraries.
Destroy 2 years after return of book.

114. *Library Serial Order Cards*. 3"x 5" cards used to record purchase of journals, magazines, etc.
Destroy when no longer needed for reference.

115. *Library Book Order Cards*. 3"x 5" cards showing book purchases.
Destroy when no longer needed for reference.

116. *Foreign Patent Accession Register*. Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.
Destroy when no longer needed for reference.

117. *Inventor's Index*. Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.
PERMANENT. Offer to National Archives when no longer needed for reference.

118. *PTO Procurement Files*. Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).
a. Procurement or purchase organization copy, and related papers.
1.Transactions of more than $10,000 and all construction contracts exceeding $2,000.
Destroy 6 years and 3 months after final payment.
2. Transactions of $10,000 or less and construction contracts under $2,000.
Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal years's files for destruction therewith.)
b. Obligation copy.
Destroy when funds are obligated.
c. Other copies of record described above used by component elements of a procurement office for administrative purposes.
Destroy upon termination or completion.

119. *Solicited and Unsolicited Bids and Proposals Files*.
a. Successful bids and proposals.
Destroy with related contract case files (see item 118 of this schedule.)
b. Solicited and unsolicited unsuccessful bids and proposals.
1. When filed separately from contract case files.
Destroy when related contract is completed.
2. When filed with contract case files.
Destroy with related contract case files (see item 118 of this schedule.)
c. Cancelled Solicitations Files.
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.
Destroy 5 years after date of cancellation.
2. Unopened Bids.
Return to bidder.
d. Lists or Card Files of Acceptable Bidders.
Destroy when superseded or obsolete.

120. *Public Printer Files*. Records relating to requisitions on the Printer, and all supporting papers.
a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.
Destroy 3 years after completion or cancellation of requisition.
b. Accounting copy of requisition.
Destroy 3 years after period covered by related account.

Non Record Materials

The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.

121. *Foreign Patents*. Copies of patents issued by foreign countries.

122. *Translation of Foreign Patents and Publications and Related Indexes*. Typewritten copies of translations and related indexes.

123. *Card Catalogs*. 3"x 5" cards used as finding aids to the library.

124. *Patent Examiner's Search Files*. Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class orsubclass.

125. *Printed Trademark Registrations Reference Files*. Digest of Registered marks consisting of a set of registered work marks arranged alphabetically and secondarily by trademark registrationnumber; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.

126. *Numerical Index to Patent Classification*. Arranged numerically by patent number and shows the class and subclass assignment of each patent.

127. *Shelf List of Classified Patents*. Listing of all U.S. Patentnumbers comprising, respectively, the "original" and "cross reference" classification of patents according to the officialclassification of the Patent and Trademark Office.

128. *Public Search Files of U.S. Patents*. Printed or microfilmcopies of U.S. Patents arranged in two series: 1) numerically byclass and subclass assignment, and secondarily by patent number and2) numerically by patent number.

129. *Legislative History Files*. Consist mainly of copies ofpublished materials relating to legislation that is of interest tothe Patent and Trademark Office. Includes copies of bills, publiclaws, Federal Register, Congressional Record, and similar materials.

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[1068 TMOG 5]

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(228) **U.S. DEPARTMENT OF COMMERCE**

Office of the Assistant Secretary and Commissioner of Patents and Trademarks

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Agency: Patent and Trademark Office, Comerce
Action: Notice of Committee Charter Amendment
Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that an amendment of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law. The charter amendment was signed on December 3, 1990.

The charter has been amended as follows to: (1) broaden the topics that the Committee may address to include international trademark law, (2) allow the membership of the Committee to be drawn from a wider range of the trademark community rather than soley from the regular, associate and supplementary membership of the United States Trademark Association (USTA), (3) increase the number of members on the Committee fron 15 to 18, (4) provide for the direct selection of the members and appointment of the chairman of the Committee by the Assistant Secretary and Commissioner of Patents and Trademarks rather than by the president of the USTA, and (5) set the term of membership at two years.
For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 557-7464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4217.
Supplementary Information: The Committee was first established in September 1970, and the latest charter renewal was signed on April 4, 1990. The charter amendment was approved on December 3, 1990, and provides for the following:

(1) The amendment broadens the objectives and duties of the Committee to specifically embrace international trademark law. The previous charter permitted the Committee to advise the Patent and Trademark Office only on the steps which could be taken to increase the efficiency and effectiveness of the administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government. Given the increased interest within the trademark community and the Patent and Trademark Office in international trademark law, especially in the Madrid Protocol and harmonization, it is desirable that the charter refer explicitly to international trademark law.

(2) Section 5(b)(2) of the Federal Advisory Committee Act requires that the membership of advisory committees be "fairly balanced in terms of the points of view represented...." The amendment furthers that goal by permitting the membership to be drawn from a wide range of the trademark community including users of the public search room, academia, members of the public at large, and the business community.

(3) The amendment increases the number of members on the Committee from 15 to 18. The increase was needed to permit additional members, from different sectors of the trademark community, to be added to the Committee without having to displace any of the current Committee members.

(4) Section 5(b)(2) of the Federal Advisory Committee Act requires that "the membership be fairly balanced in terms of the points of view represented..." The amendment futhers that goal by permitting the chairman to be appointed, and the members of the Committee to be selected by the Assistant Secretary and Commissioner of Patents and Trademarks.

(5) The charter of the Public Advisory Committee for Trademark Affairs did not set terms for members. In order to promote more orderly administration of the Committee, the amendment sets the terms of the members at two years. Members will serve at the discretion of the Assistant Secretary and Commissioner of Patents and Trademarks. Appointements, when vacancies occur, shall be for the remainder of the unexpired term.

Jan. 16, 1991 — HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1123 TMOG 20]

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(229) **U.S. Department of Commerce**
Office of the Assistant Secretary and Commissioner of Patents and Trademarks

Public Advisory Committee for Trademark Affairs

Agency: Patent and Trademark Office, Commerce
Action: Notice of Renewal
Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that the renewal of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law.
Supplementary Information: The Committee was first established in September 1970, and its latest renewal was signed on April 3, 1992. The Committee's purpose is to advise the Patent and Trademark Office concerning steps which can be taken to increase the efficiency and effectiveness of administration of the Trademark Act and to provide a continuing source of knowledge from the private sector to the Government in the area of international and domestic trademark law.

Committee members are drawn from the trademark bar, business and industry, academia, the public at large, and users of the public search room, and are selected by the Assistant Secretary of Commerce and the Commissioner of Patents and Trademarks to assure a balanced representation among members of the trademark community. The Committee will function solely as an advisory body, and in compliance with the provisions of the Federal Advisory Committee Act.
For Further Information Contact: Lynne Beresford, Committee Control Officer, Office of the Assistant Commissioner for Trademarks, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone: (703) 305-9464, or Jan Jivatodi, Committee Management Analyst, U.S. Department of Commerce, Washington, D.C. 20230, telephone: (202) 377-4299.

April 24, 1992 — HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner for Patents and Trademarks

[1138 TMOG 58]

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(230) **Advisory Committee for Patents and Trademarks; Establishment**

In accordance with the provisions of the Federal Advisory Committee Act (5 U.S.C. App. 2.) and General Services Administration Interim Rule on Federal Advisory Committee Management, 41 CFR Part 101-6, as amended, and after consultation with GSA, the Secretary of Commerce has determined that the establishment of the Advisory Committee for Patents and Trademarks is in the public interest in connection with the performance of duties imposed on the Department by law.

1. The Committee will advise the Patent and Trademark Office on broad policy issues involving both patents and trademarks, and the overall operation of the Office including matters concerning office-wide Automation programs.

2. The Committee will consist of at least 10 but no more than 18 members to be appointed by the Assistant Secretary and Commissioner of Patents and Trademarks to assure a balanced representation among patent and trademark attorneys, corporate executives, technical research directors, inventors, the judiciary, professional patent and trademark searchers, information specialists and publishers, automation experts, consumer groups, entrepreneurs, and educators. The Committee will function solely as an advisory body and in compliance with the provisions of the Federal Advisory Committee Act. Its charter will be filed under the Act, 15 days from the date of the publication of this notice.

Interested persons are invited to submit comments regarding the establishment of the Advisory Committee for Patents and Trademarks. Such comments, as well as any inquiries, may be addressed to the Executive Assistant to the Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Department of Commerce, Washington, D.C. 20231, phone: 703-557-3071, or the Department's Committee Management Analyst, phone: 202-377-4217.

Nov. 14, 1986 — DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[FR Doc. 86-26451 Filed 11-21-86; 8:45 am]
BILLING CODE 3510-16-M

[1073 TMOG 5]

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(231) **Certified Copies of Trademark Applications/Registrations**

The Trademark Operation is in the process of microfilming its records and, as this proceeds, requests for certified copies of applications and, eventually, registrations, will be furnished from the microfilmed records. Such certified copies will not contain copies of the file jacket.

Jan. 17, 1984 — MARGARET M. LAURENCE
Assistant Commissioner for Trademarks

[1039 TMOG 140]

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(232) **Notice of a Change in Procedure Regarding Requests for Certification Services**

The purpose of this notice is to inform the trademark community of a change of address for all requests for certification

services and to amend in part a previous notice entitled "Expedited Services for Certified Copies of Trademark Registration" published at 1070 TMOG 4 (Sept. 16, 1986).

All requests for certified and uncertified copies of trademark documents pertaining to applications and registrations (i.e., application files, file wrappers, trademark title and status reports, registrations, etc.) must now go to the Certification Division, Office of Public Records, at the following **mailing address:**

Commissioner of Patents and Trademarks
Box 10, Certification Division
Washington, D.C. 20231

Requests can also be **hand-carried** to any of the following three locations:

Attorney's Window
Crystal Plaza 4, First Floor
Arlington, Virginia 22202

Attorney's Window
South Tower, Second Floor
2900 Crystal Drive
Arlington, Virginia 22202

Office of Public Records
North Tower, Tenth Floor
2800 Crystal Drive
Arlington, Virginia 22202

In addition, requests with deposit account orders can be transmitted by **facsimile transmission** to (703) 308-7048.

There will no longer be a limit on the number of requests for certified trademark documents.

Turnaround times for all requests, except requests for regular service for certified copies of trademark registrations, will remain unchanged and will be based upon the date of receipt by the Certification Division. Requests for certified copies of trademark registrations will be processed and mailed back to the requester within ten calendar days from the date of receipt by the Certification Division from the Patent and Trademark Office mail room. Requests for expedited services for certified copies of trademark registrations will continue to be processed and mailed back to the requester within three working days after they are received by the Certification Division from the Patent and Trademark Office mail room.

Requests for **negative certificates** will continue to be handled by the Post Registration Section of the Office of Trademark Services.

Requests mailed to the prior address will be forwarded to the Certification Division. General inquires should be made to the above mailing address or to the Special Handling Section, Certification Division, at (703) 308-9726.

July 1, 1994 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1165 TMOG 13]

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(233) **Temporary Suspension of "At Cost" Services for Orders for Certified Copies**

Effective immediately, and until further notice, the Certification Division, Office of Public Records, will temporarily suspend accepting requests for "at cost" service for orders of certified copies of PTO documents except where the requester provides documentation that the copy is required for pending litigation.

The Certification Division's ability to provide "at cost" services is based upon the ready availability of source documents either on microform or via access to electronic images. Increased filings of both patent and trademark applications have resulted in more instances where requested documents are not yet available on film or electronic media to fill customer orders on an "at cost" basis efficiently and for a reasonable fee.

Orders for expedited service for certified copies of both patent and trademark applications-as-filed and trademark registrations will continue to be accepted. Customers will be advised within three working days if microform or electronic images are not available to fill their orders on an expedited basis, and the order will be filled as a request for regular service with an appropriate adjustment and/or credit for fees paid.

Customers are reminded that expedited service is provided on a "local basis" for those orders: (1) placed through the PTO's Public Service Windows located in the Patent Search Room and the Trademark Search Library; (2) hand-delivered to the Office of Public Records' (OPR) Service Counter in the North Tower building; (3) transmitted via fax directly to the Certification Division; or (4) received from an overnight delivery service at the OPR Service Counter. Requests for expedited service received through the US mail will be processed as regular orders.

In those cases where Certification Division cannot fill a customer order within 30 days of receipt due to unavailability of media or the source document itself, customers will be provided with a certified letter documenting their request and the Office's inability to fill the order as requested. These letters will be provided at no charge. The order itself will be closed and a full refund or credit made to the customer.

Customers placing orders for certified copies may use the following as guidelines for expected turnaround times from initial receipt of an order in PTO to mailing date from the Office:

Certified Product	*Days to Mail*
Patent Application-As-Filed, Expedited (microfiche available)	7
Patent Applications-As-Filed, Regular	17
Patent Related File Wrapper	25
Patent Copy	10
Trademark Application-As-Filed, Expedited (microfiche available)	7
Trademark Application-As-Filed, Regular	17
Trademark Related File Wrapper	25
Trademark Registration	10
Trademark Registration, Expedited	3

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessiblity. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

November 2, 1995 WESLEY H. GEWEHR
Administrator for Information Dissemination

[1180 TMOG 121]

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(234) **Change in Legal Holidays**

The Commissioner's Notice of Sept. 25, 1979, "Change in Legal Holidays," is hereby rescinded in view of Public Law 98-144, enacted Nov. 2, 1983, which amended the listing of legal public holidays in 5 USC § 6103. That amendment took effect in 1986 and added a new legal holiday relating to the birthday of Martin Luther King, Jr. This new holiday is designated for the third Mon. in Jan.

Section 6103, as amended, reads as follows:

New Year's Day, Jan. 1
Birthday of Martin Luther King, Jr., the third Mon. in Jan.
Washington's Birthday, the third Mon. in Feb.
Memorial Day, the last Mon. in May
Independence Day, July 4
Labor Day, the first Mon. in Sept.
Columbus Day, the second Mon. in Oct.
Veterans Day, Nov. 11
Thanksgiving Day, the fourth Thurs. in Nov.
Christmas Day, Dec. 25.

Each of the holidays enumerated will constitute a "Federal holiday within the District of Columbia," as referred to in Section 21, Title 35, United States Code. In accordance with 37 CFR 1.6(a) and 1.10(a), the Patent and Trademark Office will not receive papers on these holidays. Actions required to be taken on such days may be taken on the next succeeding day that the Office is open for business in accordance with 37 CFR 1.7.

July 15, 1986 DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

[1069 TMOG 5]

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(235) **Filing of Papers During Unscheduled Closings of the Patent and Trademark Office**

When the Patent and Trademark Office is officially closed by Executive Order of the President or by the Office of Personnel Management for an entire day because of some unscheduled event, such as adverse weather conditions, the Patent and Trademark Office will consider that day as a "federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due that day will be considered as timely for the purposes of, e.g., 35 U.S.C. §§ 119, 133 and 151, if the action is taken, or fee paid, on the next succeeding business day on which the Patent and Trademark Office is open. When the Patent and Trademark Office is open for business during any part of a business day between 8:30 a.m. and 5:00 p.m., papers are due on that day even though the Office may be officially closed for some period of time during the business day because of an unscheduled event. The procedures of 37 CFR 1.8 or 1.10 may be used, as appropriate, for the filing of papers. On any day the Office is open for at least part of the day, papers may also be deposited up to midnight in any boxes which are provided by the Patent and Trademark Office under 37 CFR 1.6(c).

Feb. 11, 1987 DONALD W. PETERSON
Acting Assistant Secretary and Commissioner of Patents and Trademarks

[1076 TMOG 6]

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(236) **Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities and Enforcement Procedures**

Agency: Patent and Trademark Office, Department of Commerce
Action: Notice
Summary: The Patent and Trademark Office is revising its regulations relating to use of Patent and Trademark Office records or search facilities and procedures for enforcing these regulations. These regulations and their enforcement are necessary to promote an atmosphere conducive to research and to maintain the integrity of the files and records in the Patent and Trademark Office.
Effective Date: July 1, 1987
For Further Information Contact: Theresa A. Brelsford, Assistant Commissioner for Administration, Patent and Trademark Office, Washington, D.C. 20231, (703) 557-2290.
Supplementary Information: The procedures will apply to all visitors to the Patent and Trademark Office.

Visitors are reminded that unauthorized removal of government material or property may be prosecuted as a criminal felony under the provisions of 18 U.S.C. 2071, in addition to the imposition of administrative sanctions contained in these procedures.

Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities

These regulations are established for all persons using the facilities of the Patent and Trademark Office (PTO), and will be appropriately enforced as specified herein.

Smoking within PTO is prohibited except in designated areas (41 CFR 101-20.109-10).

All persons using the facilities of the PTO are subject to regulations governing conduct on property under the charge of the General Services Administration which appear in 41 CFR Subpart 101-20.3 (41 CFR §§ 101-20.300 through 101-20.315).

Packages, briefcases and other personal effects brought into the PTO, as well as storage lockers provided for general use, are subject to search by authorized personnel for reasonable cause under the provisions of 41 CFR 101-20.301.

Unauthorized removal of PTO files, documents, reference materials, or any government property is prohibited. In addition to the administrative sanctions specified in these regulations, violators may also be subject to arrest and prosecution under the provisions of 18 U.S.C. 2071 which carries a possible "fine of $2,000 or imprisonment for not more than three years, or both", and/or the violator may be subject to discipline under the PTO Code of Professional Responsibility if he or she is a practitioner as defined in 37 CFR 10.1(r).

All persons must comply with posted Official Notices and with verbal requests made by PTO personnel for compliance with these regulations.

1. User Passes

a. Individuals visiting any area of the PTO must obtain a valid, non-transferable user pass and wear it visibly displayed at all times while on the premises.

b. Permanent User Passes may be obtained from the Manager of the Patent Public Search Room. The first Permanent User Pass is issued at no charge. Permanent User Passes subsequently issued as replacements will be provided at a charge of $5.00 per Pass. The holder of a Permanent User Pass may be issued one (1) Temporary User Pass, within a ninety (90) day period at no charge. A request for a second Temporary User Pass during the same ninety day period will require the purchase of a Permanent User Pass at the required replacement fee.

c. Temporary User Passes may be obtained by visitors at no charge from the managers of the Patent or Trademark Public Search Rooms and are valid through the expiration date stamped thereon.

d. Permanent and Temporary User Passes must be surrendered to the PTO upon request for cause.

2. Use of Search Areas

a. The Patent and Trademark Office facilities may be used by visitors only during the hours specified, Monday through Friday, and are closed to the public on Saturdays, Sundays and Legal Holidays:

Patent Public Search Rm., Mezzanine and Microfilm Center	8:00 a.m.-8:00 p.m.*
Trademark Public Search Rm.	8:00 a.m.-5:30 p.m.*
Assignment Search Rm., Public Service Center, and Scientific Library	8:30 a.m.-5:00 p.m.*
Patent Examining Organizations Trademark Examining Law Offices and all other public access areas of the PTO	8:30 a.m.-5:00 p.m.*

* Clearing of these areas would begin prior to this time to ensureall visitors are out of the building by the time designated.

b. Materials available for search purposes in the Patent and Assignment Search Rooms and patent application

file histories shall not be removed from those areas.

c. Trademark registrations in the Trademark Search Library shall not be removed from the secured bundles in the registered file. Photocopying from bound volumes of trademarks is prohibited.

d. Trademark files shall not be removed from PTO space in Crystal Plz. Bldg. 2.

e. Use of Patent Examining Group search areas is strictly limited to searching materials unavailable in the Patent Public Search Room or the Scientific Library. Examining Group search areas may be used only when such use does not conflict with the regular business of the organization.

f. Visitors to a Patent Examining Group Search Area must register with the designated Group Search Area representative indicating the times entering and leaving the area, User Pass number, and the class(es) and subclass(es) to be searched.

g. Documents removed from the files of Patent Examining Group search areas must be immediately returned to their proper location after use. Documents shall not be removed from the area in which they were obtained without specific written authorization from a Group Director or Supervisory Patent Examiner in the Examining Group where the material(s) reside. Such authorization will not be given for U.S. Patents and other material readily available through the Scientific Library.

3. PROHIBITIONS

The following are prohibited:

a. Conduct which is rude or abusive to PTO employees or others.

b. Smoking and consumption of food or beverages in other than designated areas.

c. Loud talking or any conduct which may be disruptive to others.

d. Use of radios, televisions, typewriters, photographic equipment, dictation equipment and other mechanical, electrical or electronic items without specific authorization from an Assistant Commissioner of the PTO.

e. Improper use, mutilation, destruction or unauthorized removal of PTO records, documents or government property.

f. Reserving seats or work areas.

g. Affixing messages to walls, telephone booths or other government property, except designated message boards.

h. Use of the PTO as a mailing address, use of PTO stationery, and use of PTO emblem or seal.

i. Use of PTO telephones and other office equipment, such as copiers, etc., except where specifically provided for public use. This includes the use of PTO telephones to receive incoming calls.

j. Use of any computer terminal other than the TRAM terminals provided for public use in the Trademark Search Library, and the CASPIR and FOUR-PHASE terminals (or CASSIS terminal if the FOUR-PHASE terminals are not operating) provided in the Patent Public Search Room for public use.

k. Placing PTO files or documents, government property or government owned reference materials in rental storage lockers.

l. Use of rental storage lockers without depositing the required fee or holding the key to a storage locker beyond the specified maximum period of use.

[1079 TMOG 7]

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(237) **Procedures for Enforcement of the Regulations Relating to the Use of Patent and Trademark Office Records or Search Facilities**

Under applicable statutes and regulations, including 40 U.S.C. 486(c), 41 CFR 101-20.3, and appropriate sections of Department Organization Orders 10-14 and 30-3 of the Department of Commerce, the procedures appearing below are established.

1. Violations involving unauthorized removal of PTO files, documents, records or government property.

a. Each observed or reported violation will be investigated.

b. Persons found in possession of PTO material or government property, other than in areas or under circumstances where possession is specifically authorized, shall be required to immediately surrender the material or property and if appropriate, their User Pass. An oral explanation for the possession of such material or property will be requested by the PTO.

c. Each incident involving unauthorized possession of PTO material or government property shall be immediately reported by telephone or in person to the Office or Group Director of the area from which the material or property was taken.

d. If it appears to the Office or Group Director that possession of the materials was inadvertent or otherwise unintentional, no further action will be taken. The materials will be replaced appropriately and the person's User Pass will be returned.

e. If it appears to the Office or Group Director that possession of the materials was intentional, all persons involved shall be required to submit written statements detailing the circumstances and, in the case of a PTO User/visitor, show cause why the User Pass and visitor privileges should not be suspended or revoked. Statements will also be obtained from other witnesses where appropriate. The material or property shall be secured for possible use as evidence by the Office or Group Director, if appropriate.

f. If the involved person possesses a Permanent User Pass, it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration. A Temporary User Pass may be issued as replacement by the Assistant Commissioner for Administration, pending action on an alleged violation.

g. If the involved person possesses only a Temporary User Pass it shall be retained and forwarded with the written statements to the Assistant Commissioner for Administration within two weeks of the incident. No replacement will be provided pending action by the Assistant Commissioner for Administration.

2. Other violations of public use regulations.

a. Each observed or reported violation will be investigated. The persons involved shall be informed of the nature of the violation and requested to comply with regulations.

b. If it appears that the violation was inadvertent or otherwise unintentional and the involved person immediately conforms to the regulations, no further action will be taken.

c. If the violation appears to be intentional or if the person involved refuses to comply with a verbal request from a PTO employee or continues to violate the regulations after being requested to comply, the person shall be required to surrender his or her User Pass to the PTO. A written report of each violation and the User Pass will be submitted to the Assistant Commissioner for Administration for a final decision. User Pass replacement procedures shall be as specified in paragraphs 1.f. or 1.g.

d. If the Assistant Commissioner for Administration determines that a reported violation was inadvertent or otherwise not intentional, the User Pass will be returned and no further action will be taken. In all other cases, the Assistant Commissioner for Administration will request the person involved to show cause in writing why his or her User Pass and visitor privileges should not be suspended or revoked.

e. A written decision will be rendered by the Assistant Commissioner for Administration after consideration of any timely submitted response.

f. In the case of a written decision by the Assistant Commissioner for Administration adverse to a practitioner as defined by 37 CFR 10.1(r), a copy of the written decision will be forwarded to the Director of the Office of Enrollment and Discipline for whatever further action, including sanctions, as may be appropriate under the PTO Code of Professional Responsibility.

3. Factors to be Considered in Assessing Penalties.

a. Penalties will be determined on a case by case basis.

b. Prior violations of regulations will be considered when assessing whether any violation is willful, deliberate or intentional, and when determining the penalty to be imposed.

c. Penalties may be assessed as follows, depending on circumstances:

(1) For a first offense: from a written warning to a 30 day suspension of the User Pass and visitor privileges.

(2) For a second offense: a suspension of the User Pass and visitor privileges from 5 days to one year.

(3) For a third or subsequent offense: from a suspension of 30 days to permanent revocation of the User Pass and visitor privileges.

(4) For any single serious or aggravated violation: suspension of the User Pass and visitor privileges for up to one year or permanent revocation of the User Pass and visitor privileges. A serious or aggravated violation is defined as *any instance involving multiple violations of regulations during a single event or acts which also constitute a violation of Federal or local criminal law.*

4. Record of Penalties Imposed.

A record of penalties imposed for given violations will be maintained by the Assistant Commissioner for Administration. These records will be made available to the public upon request.

5. Use of Public Facilities During Suspension or After Revocation of User Pass.

No individual will be permitted to use the facilities specified in these regulations while his or her User Pass is suspended or revoked.

6. Absence of Assistant Commissioner for Administration.

In the absence of the Assistant Commissioner for Administration, the Deputy Assistant Commissioner for Administration will carry out the responsibilities assigned by these regulations.

7. Absence of Designated PTO Officials.

In the absence of any Designated PTO Official, a Deputy or Acting Official will carry out the responsibilities assigned by these regulations.

8. Assistance.

PTO employees may, when necessary, request the Security Officer of the Patent and Trademark Office or the Federal Protective Service or their contractors to provide assistance in carrying out their assigned responsibilities in paragraphs 1 and 2.

9. Appeals.

Decisions rendered by the Assistant Commissioner for Administration may be reviewed on petition to the Commissioner.

May 11, 1987

THERESA A. BRELSFORD
Assistant Commissioner for Administration

[1079 TMOG 8]

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(238) **Rules Concerning Conduct on Patent and Trademark Premises**

1. *Applicability*

These rules apply to all premises under the charge and control of the U.S. Patent and Trademark Office (PTO) through the General Services Administration and to all persons entering such premises.

2. *Admission to Property*

Patent and Trademark Office facilities are closed to the public outside of normal working hours. During normal working hours, a valid User Pass is required to enter PTO premises.

The individual's User Pass must be displayed at all times while on PTO premises.

3. *Preservation of Property/Conduct on PTO Premises*

The following activities are prohibited on PTO premises:

a. Improperly disposing of rubbish; willfully destroying or damaging property; theft of property; creating a hazard to persons or things; and placing Government documents or materials in storage lockers.

b. The willfull and unlawfull concealment, removal, mutilation, obliteration or destruction, or attempts to do so, or, with intent to do so, or taking and carrying away of any record, book, paper, document, or other things from the facilities shall result in a fine of not more than $2,000 or imprisonment of not more than 3 years, or both. *See* 18 U.S.C. § 2071.

c. Removal of papers, materials, or other Government property from designated areas. Within a designated area, papers or other Government property must be returned to its proper location after use, unless otherwise posted.

d. Using PTO premises and facilities as a place of business. It is prohibited to reserve work areas, use PTO as a mailing address, use PTO stationery, or a PTO telephone number as a personal telephone number.

4. *Inspection*

Packages, briefcases, storage lockers and other containers in the possession of visitors, employees, or other persons arriving at, working at, visiting, or departing from the PTO are subject to inspection. *See* 41 CFR § 101-20.301.

5. *Disturbances*

Disorderly conduct or other conduct which creates a loud or unusual noise or a nuisance which impedes or disrupts the performance of official duties by Government employees or which prevents the public from obtaining the administrative services provided on the property in a timely manner is prohibited. See 41 CFR § 101-20.305.

6. *Conformity with signs and directions*

Persons on the PTO premises shall at all times comply with the official signs of a prohibitory, regulatory or directory nature and with the lawful direction of PTO employees.

No rude or abusive conduct to PTO employees and fellow users.

No food or beverages are permitted.

No smoking except in designated areas.

No mechanical or electronic equipment such as radios, televisions, typewriters, computers, or photographic equipment may be used without prior permission from the Assistant Commissioner for Administration.

No use of PTO telephone and office equipment, except as specifically designated for public use.

7. *Penalties and other laws.*

Nothing in these rules shall be construed to abrogate any other Federal laws or regulations or any State and local laws and regulations applicable to any area in which property under the charge and control of the PTO through the U.S. General

Services Administration is situated. *See* 40 U.S.C. §§ 318(c) and 486(c).

41 CFR § 101-20.315 provides that whoever is found guilty of violating the rules of conduct on Federal property contained in 41 CFR § 101-20.3 while on any property under the charge and control of the U.S. General Services Administration is subject to a fine of not more than $50, imprisonment of not more than 30 days, or both. *See* 40 U.S.C. § 318c.

Failure to follow these rules may result in immediate removal from the premises, suspension of user privileges, and/or enforcement of any criminal sanctions that may apply.

Aug. 30, 1991 THERSA A. BRELSFORD
Assistant Commissioner for Administration

[1131 TMOG 7]

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(239) **Department of Commerce**
Patent and Trademark Office

Changes in Practice Concerning Letters of Protest

After April 1, 1995, Letters of Protest filed prior to the publication of a mark for opposition will be granted only if there is sufficient evidence in the Letter of Protest to establish a *prima facie* case which supports a refusal of registration. In such a case, publication of the mark for opposition, without consideration of the issue and evidence presented in the Letter of Protest, might result in a clear error by the Office. Further, after April 1, 1995, FOIA requests for copies of letters of protest should be directed to the Office of the Assistant Commissioner for Trademarks, rather than to the Solicitor's Office.

Letter of Protest practice will change as follows: Under current practice, when a Letter of Protest is filed prior to the publication of a mark, the evidence in the letter is forwarded to the Examining Attorney whenever such evidence can properly be considered by an examining attorney during *ex parte* examination and the evidence supports any reasonable ground for refusal.

Under the revised practice, when a Letter of Protest is filed prior to the publication of a mark, the evidence in the letter will be forwarded to the Examining Attorney only if there is sufficient evidence in the Letter of Protest to establish a *prima facie* case which supports a refusal of registration such that publication of the mark for opposition, without consideration of the issue and evidence presented in the Letter of Protest, might result in a clear error by the Office.

The standard for the granting of a Letter of Protest filed or considered after publication of the mark in the *Official Gazette* is not changing. The standard is whether publication of the mark constituted clear error and whether the Letter of Protest was filed within thirty days of the publication of the mark. *In re Pohn*, 3 USPQ2d 1700 (Comm'r Pats. 1987), and *In re BPJ Enterprises Ltd.*, 7 USPQ2d 1375 (Comm'r Pats. 1988).

Because the Letter of Protest procedure, which permits a third party to introduce evidence during the *ex parte* examination of an application, is not mandated by statute or rule, the Office wants to clearly define the standards used for granting Letters of Protest and harmonize the standards used for granting these letters before and after publication of the mark. The new standard for prepublication Letters of Protest will discourage the filing of Letters of Protest which do not present sufficient evidence to support a *prima facie* case for refusal to register. As a result, fewer applications will be taken out of the normal order of processing for consideration of evidence in a Letter of Protest.

Requests for Copies of Letters of Protest

At the present time, copies of documents relating to Letters of Protest are requested pursuant to the Freedom of Information Act (FOIA) from the Solicitor's Office of the Patent and Trademark Office. After April 1, 1995, any party making a FOIA request for a complete copy of the Letter of Protest should file that request directly with the Office of the Assistant Commissioner for Trademarks by mailing it to 2900 Crystal Drive, Arlington, Va. 22202-3513 or by faxing it to (703) 308-7220. Such a request should be directed to the attention of the Administrator for Classification and Practice. Upon review of the Letter of Protest material, the Administator will usually forward a copy of the Letter of Protest and its attachment to the requester. Only in cases where the Letter of Protest or its attachments contain material that would potentially be expected from disclosure under the Freedom of Information Act will the Administrator not forward the requested material. If, in the opinion of the Administrator, any part of the Letter of Protest materials should be excepted from disclosure under FOIA, the matter will be forwarded to the Office of the Solicitor for further review.

February 21, 1995 PHILIP G. HAMPTON, II
Assistant Commissioner for Trademarks

[1172 TMOG 93]

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(240) **Notice of Change in the Method of Assigning Registration Numbers to Trademark Registrations**

As of October 10, 1995, in the *Trademark Official Gazette* sections titled TRADEMARK REGISTRATIONS ISSUED, TRADEMARK REGISTRATIONS ISSUED UNDER SECTION 1(D), and SUPPLEMENTAL REGISTER, registration numbers will be assigned in ascending serial number order. Currently registration numbers are assigned in ascending class order by ascending serial number inside each class, e.g., in Class 1, Ser. No. 100,000 might be assigned Reg. No. 1,900,001; and in Class 42, Ser. No. 000,001 might be assigned Reg. No. 1,903,456. Under the new system, registration numbers will be assigned in ascending serial number order regardless of class, e.g., Ser. No. 000,001 would be assigned Reg. No. 1,900,001; and Ser. No. 100,000 would be assigned Reg. No. 1,903,456.

August 30, 1995 ROBERT M. ANDERSON
Deputy Assistant Commissioner for Trademarks

[1179 TMOG 12]

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(241) **DEPARTMENT OF COMMERCE**

Patent and Trademark Office

Effect of December 1, 1993 Amendments to the Federal Rules of Civil Procedures on Trademark Trial and Appeal Board Inter Partes Proceedings

Trademark Rule 2.116(a) provides that, except as otherwise provided, and wherever applicable and appropriate, procedure and practice in Trademark Trial and Appeal Board (Board) inter partes proceedings shall be governed by the Federal Rules of Civil Procedures. Trademark Rule 2.120(a) provides, in part, that the provisions of the Federal Rules of Civil Procedure relating to discovery shall apply in opposition, cancellation, interference, and concurrent use registration proceedings except as otherwise provided in Trademark Rule 2.120; and that the opening of discovery is governed by the Federal Rules of Civil Procedure. Thus, where the Board has its own rule concerning a particular matter of practice or procedure, that rule governs; if there is no Board rule concerning the matter, the Federal Rules of Civil Procedure apply, where applicable and appropriate.

On December 1, 1993, certain of the rules in the Federal Rules of Civil Procedures were amended, and one new rule was added. Specifically, Rules 1, 4, 5, 11, 12, 15, 16, 26, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 50, 52, 53, 54, 58, 71A, 72, 73, 74, 75, and 76 were amended, and new Rule 4.1 was added.

Included in the amendments are changes in the discovery rules to require that the parties to a civil action: (1) make a series of automatic disclosures, during the pretrial stages of the proceedings, of certain evidence; (2) file the disclosures with the court; (3) meet, early in the proceeding, to discuss, inter alia, the automatic disclosure and to develop a plan for discovery; and, (4) transmit to the court a written report outlining the discovery plan. The timing of some of these matters is tied to the timing of a scheduling conference to be held, or a scheduling order to be issued, by the court. The timing and sequence of other of the matters depends upon the direction of the court. Further, parties are prohibited from seeking any of the traditional forms of discovery until after they have met and developed their discovery plan.

The Patent and Trademark Office (Office) believes that the application of the cited provisions in inter partes proceedings before the Board would increase the complexity and cost of the proceeedings and would be unduly burdensome both to the Board and the parties. For these reasons, the Office is now of the opinion that these provisions would have a detrimental effect on, and are not appropriate for, Board proceedings. Moreover, the Office's Public Advisory Committee for Trademark Affairs has recommended that incorporation of the amendments in Board practice be deferred until the Office can evaluate the effects of the amendments on civil actions. On the other hand, some of the provisions added by the amendments are not objectionable, and others so clearly do not apply in, and/or are not appropriate for, Board proceedings that they need not be mentioned.

Accordingly, application of Rule 2.120(a) is hereby waived, in pertinent part, to the extent that the following provisions of the Federal Rules of Civil Procedure, as amended, which otherwise arguably would apply in Board proceedings, and which would, in the opinion of the Office, have a detrimental effect on those proceedings, shall not be applied therein unless and until further notice is given:

1. **Rule 16(b)** [requirement that court issue a scheduling order, after consulting with parties by scheduling conference, telephone, mail, or other suitable means]

2. **Rules 26(a)(1)-26(a)(4)** [requirements for series of automatic disclosures of evidence]

3. Rule 26(b)(4) [requirements for taking discovery from a person identified, in automatic disclosure, as an expert whose opinions may be presented at trial]

4. **Rule 26(d)**, first sentence [prohibition against the taking of discovery before the parties have met to discuss, inter alia, the automatic disclosures and to develop a plan for discovery]

5. **Rule 26(e)(1)** [requirement for supplementation of automatic disclosures]

6. **Rule 26(f)** [requirement that the parties meet, early in the proceeding, to discuss, inter alia, the automatic disclosure and to develop a plan for discovery]

7. **Rule 26(g)(1)** [signature requirements for automatic disclosures]

8.**Rule 30(a)(2)(C)** [requirement that a party obtain leave of court or written stipulation to take a deposition prior to the Rule 26(f) meeting of the parties]

9. **Rule 33(a)**, last sentence [requirement that a party obtain leave of court or written stipulation to serve interrogatories prior to the Rule 26(f) meeting of the parties]

10. **Rule 34(b)**, last sentence of first paragraph [requirement that a party obtain leave of court or written stipulation to serve request for production of documents and things prior to the Rule 26(f) meeting of the parties]

11. **Rule 36(a)**, last sentence of first paragraph [requirement that a party obtain leave of court or written stipulation to serve request for admission prior to the Rule 26(f) meeting of the parties]

12. **Rule 37(a)(2)(A)** [provision of motion to compel disclosure and for sanctions for failure to make automatic disclosure]

13. **Rule 37(c)(1)** [description of sanctions which may be imposed for failure to make, or supplement, automatic disclosure]

14. **Rule 37(g)** [provision of sanctions for failure to participate in good faith in the framing of a discovery plan]

Discovery in Board inter partes proceedings will continue to open as it did prior to December 1, 1993 amendments to the Federal Rules of Civil Procedure, that is, as provided in those rules as they existed on November 30, 1993. Thus, interrogatories, requests for production of documents and things, and requests for admission may be served upon the plaintiff after the proceeding commences (i.e., after the notice of opposition or petition for cancellation is filed, and after the mailing by the Board of the notice of institution in an interference or concurrent use proceeding), and upon the defendant with or after service of the complaint by the Board. Discovery depositions generally may be taken by any party after commencement of the proceeding. Board's permission to take a discovery deposition must be obtained in certain situations, including a situation in which the plaintiff seeks to take a deposition prior to the expiration of 30 days after service of the complaint by the Board upon any defendant, except where a defendant has served a notice of taking deposition or otherwise sought discovery or where the notice of deposition: (1) states that the proposed deponent is about to go out of the United States and will be unavailable for examination unless the person's deposition is taken before expiration of the 30-day period, and, (2) sets forth facts to support the statement.

Similarly, the practice embodied in Rules 33(a), 34(b), and 36(a) of the Federal Rules of Civil Procedure, as they read on November 30, 1993, that a defendant may serve responses to interrogatories, requests for production of documents and things, and requests for admission either within 30 days after service of a discovery request [35 days if service of the request for discovery is made by first-class mail, "Express Mail," or overnight courier—Trademark Rule 2.119(c)], or within 45 days after service of the complaint upon it by the Board, whichever is later, will continue to be followed in Board proceedings.

The Patent and Trademark Office will, in due course, publish a notice of proposed rule making to amend, as may be necessary, the trademark rules governing practice and procedure in inter partes proceedings before the Board.

Jan. 15, 1994 ROBERT M. ANDERSON
Acting Assistant Commissioner for Trademarks

[1159 TMOG 14]

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(242) **Interlocutory Decisions by the Trademark Trial and Appeal Board**

Only final decisions of the Trademark Trial and Appeal Board are subject to judicial review. Some confusion may exist in *inter partes* trademark proceedings as to whether certain decisions of the Board are "final" fort purpose of judicial review.

An example where confusion may arise is a case in which (1) an opposition is filed, (2) applicant counterclaims for cancellation of a registration relied upon by an opposer, and (3) the Board renders a dicision (generally on summary judgment) on the opposition, but sets the counterclaim for trial. Under these circumstances, there is no final order of the Board, because a decision has not been entered on the counterclaim.

The party losing the opposition may feel compelled to seek judicial review within two months of the Board's decision to "prserve" its rights. But such an appeal appears to be premature under *Copeland's Enterprises, Inc.* v. *CNV, Inc.* 887 F.2d 1065, 12 USPQ2d 1563 (fed. Cir. 1989) (in banc). *Copeland's* is not the only appeal which has been dismissed because it was taken from an interlocutory decision of the Board. *See Cortex Corpo-*

ration v. *W.L. Gore & Associates, Inc.*, No. 91-1016 (Fed. Cir. January 14, 1991)(unpublished), and *Kellogg Co.* v. *Pack'em Enterprises, Inc.*, No. 90-1336 (Fed. Cir. Sept. 27, 1990) (unpublished).

In an effort to (1) minimize disruption in proceeding pending before the Board, (2) eliminate unnecessary appeals and filing of civil actions, only to have the appeal or civil action dismissed as premature, and (3) provide some certainty to parties and their attorneys as to when an appeal is timely, the Board will, when resolving a merits issue prior to final judgement, generally indicate that it has entered an "interlocutory" order in the proceeding and further set the time for seeking judicial review of the "interlocutory" order to expire two months from the date a final order is entered in the proceeding.

Jan. 22, 1991 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1123 TMOG 36]

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(243) **Patent and Trademark Office**
Trademark Trial and Appeal Board

New Title for Members of Trademark Trial and Appeal Board

The Chairman and Members of the Trademark Trial and Appeal Board have been authorized to use the respective titles Chief Administrative Trademark Judge and Administrative Trademark Judge for signing all correspondence and decisions, and for other business-related activities.

The respective titles of Chairman and Member will continue to be the official titles for personnel, budget and fiscal purposes.

Oct. 15, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1156 TMOG 32]

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(244) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 10
[Docket No. 930366-4319]
RIN 0651-AA65

Cross-Appeals in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Proposed Rulemaking.
Summary: On July 21, 1993, the Patent and Trademark Office (PTO) proposed amending a rule of practice in practitioner disciplinary proceedings. 58 FR 38994. The proposed rule change provides for a time period for a party to a disciplinary proceeding to file a cross-appeal, after the other party (the respondent or the Director of the Office of Enrollment and Discipline) to the proceeding has appealed from the initial decision of the administrative law judge (ALJ) to the Commissioner. Currently, PTO rules do not provide for such a time period. A party in a disciplinary proceeding may be interested in appealing only if the other party has appealed. Allowing a time period for filing a cross-appeal will give parties to disciplinary cases more flexibility after an initial decision by the administrative law judge and will avoid the necessity of filing a contingent appeal simply to preserve rights in the event the other party files an appeal.

One comment to the rule change proposed on July 21, 1993, was received suggesting substantive changes. This second notice adopts that suggested change.
Dates: Written comments must be received on or before [March 16, 1995] to ensure consideration. An oral hearing will not be conducted.
Addresses: Address written comments to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231, marked to the attention of Harry I. Moatz. Written comments will be available for public inspection in Suite 518, on the 5th floor of Crystal Park I, located at 2011 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Harry I. Moatz by telephone at (703) 308-5273 or by mail marked to his attention and addressed to Commissioner of Patents and Trademarks, Box OED, Washington, D.C. 20231.
Supplementary Information: A Notice of Proposed Rulemaking was published in the Federal Register (58 FR 38994) on July 21, 1993, and in the *Official Gazette* of the PTO (1153 Off. Gaz. 32) on August 10, 1993. Comments were due August 20, 1993. One comment was received. The comment suggested a substantive change to the original proposed rulemaking. The PTO has adopted the change and is now publishing a second notice requesting comments on the amended notice.

Pursuant to 37 CFR § 10.132 *et seq.*, the Director of the Office of Enrollment and Discipline within the PTO may initiate a disciplinary proceeding against a practitioner. If the proceeding is contested by the practitioner and the Director continues to prosecute, an ALJ for the Department of Commerce enters an initial decision which includes findings of fact, conclusions of law and an order. 37 CFR § 10.154.

Either party to the proceeding may appeal from the initial decision of the ALJ to the Commissioner within thirty (30) days of the date of the decision. 37 CFR § 10.155(a). However, prior to this proposed rule change, § 10.155(a) did not provide for the filing of a cross-appeal.

With regard to interference proceedings, 37 CFR § 1.304(a) addresses the filing of cross-appeals by stating in pertinent part that:

> the time for filing a cross-appeal [to the Court of Appeals for the Federal Circuit] or cross-action [in a district court] expires (1) 14 days after service of the notice of appeal or the summons and complaint or (2) two months after the date of decision of the Board of Patent Appeals and Interferences, whichever is later.

The proposed rule change is similar to the cross-appeal authorized in interference proceedings.

Response to and Analysis of Comment: The single comment suggested that the second sentence of the proposed § 10.155(a) be modified by adding "pursuant to § 10.142" after "(1) 14 days after service of the appeal" to make clear that the period for filing a cross-appeal or reply brief runs from service pursuant to § 10.142. The suggestion is being adopted. The comment further suggested that the fifth sentence in the rule proposed on July 21, 1993, be separated into three new sentences. The first and second new sentences make clear that "the other party to an appeal or cross-appeal may file a reply brief," and that a "reply brief by the respondent" is to be "served in duplicate with the Director." The third new sentence provides a date certain for filing any reply brief by avoiding uncertainty as to when "receipt" of an appeal, cross-appeal or copy thereof occurs, and by relying on the date of "service pursuant to § 10.142" of an appeal, cross-appeal, or a copy thereof. The suggestions have been adopted in the proposed rules.

Other Considerations: This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the original notice of proposed rulemaking published in the *Federal Register*, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612. The Office of Management and Budget has determined that the rule change is not significant for the purposes of Executive Order 12866.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.

For the reasons set out in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, the PTO proposes to amend 37 CFR part 10 as follows, wherein deletions are indicated by brackets ([]) and additions by arrows (►◄):

Part 10-Representation of Others Before The Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

§ 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. ►If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later.◄ An appeal ►or cross appeal◄ by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal ►or cross-appeal◄, the Director shall serve ►on the other party◄ a copy of the appeal ►or cross-appeal◄. ►The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires◄ [Within] thirty (30) days after ►the date of◄ [receipt] ►service pursuant to § 10.142◄ of an appeal ►,cross-appeal◄ or copy thereof[, the other party may file a reply brief, in duplicate with the Director]. If the Director files [the] ►a◄ reply brief, the Director shall serve ►on the other party◄ a copy of the reply brief. Upon the filing of an appeal ►,cross appeal, if any,◄ and [a] reply brief►s◄, if any, the Director shall transmit the entire record to the Commissioner.

January 13, 1995 MICHAEL K. KIRK
Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks

[1171 TMOG 33]

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(245) **Request for Information to Aid in the Implementation of the Recordation Requirements of Section 8 of the Fastener Quality Act**

Agency: Patent and Trademark Office, Commerce
Action: Notice; Request for Information
Summary: The Patent and Trademark Office(PTO) is seeking information concerning alphanumeric designations currently in use by manufacturers or distributors of industrial fasteners. These alphanumeric designations may be used to signify the physical characteristics, strength, chemical content, size or other information about the fastener upon which they appear or they may be used as common law trademarks to identify and distinguish the manufacturer or distributor of such fasteners. The PTO needs information concerning these alphanumeric designations in order to administer the proposed fastener recordal system published on Aug. 17, 1992, at 57 F.R. 37060, 37061 to implement the requirements of Section 8 of the Fastener Quality Act, Public Law 101-592. Therefore, the PTO is requesting from fastener industry associations, standards bodies, or individual manufacturers or distributors, any general or specific information available concerning alphanumeric designations currently in use within the industry, whether as unregistered trademarks, as marks required by a standard, or for any other purpose.

Date: Comments should be submitted on or before Sept. 27,1993. Comments received after this date will be considered if possible.

Addresses: All comments concerning alphanumeric designations should be addressed to Lynne G. Beresford, Trademark Legal Administrator, Commissioner of Patents and Trademarks, Washington, D.C. 20231, telephone number (703) 305-9464.

For Further Information Contact: Lynne G. Beresford, Trademark Legal Administrator, (703) 305-9464.

Supplementary Information: In 1990, Congress enacted the Fastener Quality Act, Public Law 101-592 (the Act) to protect public safety, deter introduction of non-conforming fasteners into commerce, improve the tracing of fasteners used in critical applications, and provide customers with greater assurance that fasteners meet stated specifications. The Act requires that certain fasteners sold in commerce conform to the specifications to which they are represented to be manufactured; provides for accreditation of laboratories engaged in fastener testing; and requires the inspection, testing and certification (in accordance with standardized methods) of fasteners covered by the Act.

Section 8 of the Act prohibits offering fasteners for sale that are required by an applicable standard or specification to bear a raised or depressed insignia identifying the manufacturer or private label distributor unless such manufacturer or distributor has complied with the requirements of a program of the Secretary of Commerce for the recordation of such insignia in order to ensure that the fasteners can be traced to the manufacturer or distributor.

The program for recordation of fastener insignias, established by the Secretary of Commerce and administered by the Patent and Trademark Office, will allow the owner of a mark, which is the subject of a duly filed trademark application or registration, to apply for recordal of that mark as its fastener insignia. However, if the manufacturer or private label distributor does not wish to use a trademark as its fastener insignia, it will be permitted to apply for a unique alphanumeric designation for that purpose.

The PTO wants to ensure that it does not inadvertently issue an alphanumeric designation that is either already in use by a manufacturer or distributor as its identifying insignia, or a designation already in use by the industry to signify the physical characteristics, strength, chemical content, size or other information about the fastener. For that reason, the PTO is requesting from fastener industry associations, standards bodies, or individual manufacturers or distributors, any general or specific information available concerning alphanumeric designations currently in use within the industry, whether as unregistered trademarks, as marks required by a standard, or for any other purpose. The PTO does not need information concerning specific registered alphanumeric trademarks; as that information is readily available from the PTO's database.

(Authority: 15 USC 5407)

July 15, 1993 MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1154 TMOG 9]

(246) **FEDERAL REGISTER NOTICE**
DEPARTMENT OF COMMERCE
Patent and Trademark Office

Notice of Hearings and Request for Comments on Preliminary Draft of the Report of the Working Group on Intellectual Property Rights

Agency: Patent and Trademark Office, Commerce
Action: Notice of hearings and request for public comments
Summary: The Working Group on Intellectual Property Rights of the White House Information Infrastructure Task Force has issued a preliminary draft of its report, "Intellectual Property and the National Information Infrastructure," and is soliciting public comment. Copies of the preliminary report may be obtained by calling the U.S. Patent and Trademark Office at (703) 305-9300 or by sending a written request to the Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231, marked to the attention of Terri A. Southwick, Office of Legislative and International Affairs. The Working Group will hold public hearings on the preliminary report in Washington, D.C., Chicago and Los Angeles.
Dates: The public hearing in Chicago will be held on September 14, 1994, from 9 a.m. to 5 p.m. The public hearing in Los Angeles will be held on September 16, 1994, from 9 a.m. to 5 p.m. The public hearing in Washington, D.C., will be held on September 22 and 23, 1994 from 9 a.m. to 5 p.m. Requests to present oral testimony at the Chicago or Los Angeles hearings must be received on or before September 7, 1994. Requests to present oral testimony at the Washington, D.C., hearings must be received on or before September 15, 1994. As announced in the previous notice regarding the submission of written comments on the preliminary report, published at 59 Fed. Reg. 35912 (July 14, 1994), all written comments must be submitted on or before September 7, 1994. Comments in reply to initial written comments may be submitted no later than September 28, 1994.
Addresses: The hearing in Chicago will be held at the University of Chicago, Ida Noyes Hall, 1212 East 59th Street, Chicago, Illinois. The hearing in Los Angeles will be held at the University of California at Los Angeles, 1100 Schoenberg Hall, 405 Hilgard Avenue (Southeast side of UCLA Campus), Los Angeles, California. The hearings in Washington, D.C. will be held at the Andrew W. Mellon Auditorium, Constitution Avenue between 12th and 14th Streets, N.W., Washington, D.C. Requests to present oral testimony should be submitted to the Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231, marked to the attention of Terri A. Southwick, Attorney-Advisor, Office of Legislative and International Affairs. Requests should specify the date and location of the hearing at which the requester wishes to present oral testimony, and should include the name, address, telephone number, fax number and professional affiliation, if any, of the requester.
The transcripts of the hearings will be made available for public inspection 10 days after the hearings at the Scientific and Technical Information Center of the Patent and Trademark Office, Room 2C01, Crystal Plaza 3/4, 2021 Jefferson Davis Highway, Arlington, Virginia, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except holidays. Information about obtaining copies of transcripts of the hearings may be obtained by calling (703) 305-9300 no sooner than 10 days after the hearings.
For Further Information Contact: Terri A. Southwick or Michael O'Neil, Office of Legislative and International Affairs, U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231. Telephone: (703) 305-9300; Fax: (703) 305-8885.
Supplementary Information: The Working Group on Intellectual Property Rights, chaired by Assistant Secretary of Commerce and Commissioner of Patents and Trademarks Bruce A. Lehman, was established as part of the White House Information Infrastructure Task Force. The Task Force, chaired by Secretary of Commerce Ronald H. Brown, was created to work with Congress and the private sector to develop comprehensive telecommunications and information policies aimed at articulating and implementing the Administration's vision for the National Information Infrastructure (NII).

"Intellectual Property and the National Information Infrastructure: A Preliminary Draft of the Report of the Working Group on Intellectual Property Rights" represents the Working Group's examination and analysis to date of the intellectual property implications of the NII, and includes the Group's draft findings and recommendations. While it addresses each of the major areas of intellectual property law, including patent, trademark and trade secret, the preliminary report focuses primarily on copyright law and its application and effectiveness in the context of the NII.
The Working Group solicited written comments from the public on the preliminary report in a notice published at 59 Fed. Reg. 35912 on July 14, 1994.

Dated: Aug. 12, 1994 Bruce A. Lehman
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1166 TMOG 17]

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(247) **Iraqi Sanctions Regulations**

On Jan. 18, 1991, the Department of the Treasury, Office of Foreign Assets Control (OFAC), published the Iraqi Sanctions Regulations (Regulations) (31 CFR Part 575). 56 Fed. Reg. 2112. The regulations implement Executive Orders 12722 (Aug. 2, 1990) and 12724 (Aug. 9, 1990) relating to certain property and transactions in which the Government of Iraq and persons in Iraq may have an interest.
It appears that the provisions of the Executive Orders and Regulations prohibit transactions relating to the filing or prosecution of applications for patents or for registration of trademarks, where an Iraqi interest is involved. The prohibited transactions, however, may be authorized by a specific license issued pursuant to the proceedures described in Section 575.801 of Subpart H of the Regulations.
This notice is intended to alert practitioners and applicants to the prohibitions which may apply to matters before the Patent and Trademark Office, (PTO) if Iraqi interests are involved. this notice is further intended to advise that where such interests or potential interests come to the attention of the PTO, an appropriate specific license from OFAC may be required.

Jan. 29, 1991 HARRY F. MANBECK, Jr.
Commissioner of Patents and Trademarks

[1123 TMOG 36]

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(248) **Notice Regardiag Patent and Trademark Rights in the Russian Federation**

Representatives of the Russian Federation met with representatives of the U.S. Government on Monday, February 24, 1992, at the U.S. Patent and Trademark Office. The Russian delegation sought information about the operation of the U.S. patent and trademark systems and provided information about the treatment of inventions, industrial designs, utility models, trademarks, service marks, and appellations of origin in the Russian Federation.
Following is the text of a statement from the Chairman of the Committee for Patents and Trademarks (ROSPATENT), outlining the status of industrial property protection in the Russian Federation and the plans for the future.

INFORMATION

by the Committee for Patents and Trademarks

Due to the fact that the draft laws on patents and on trademarks were approved in the first hearing by the Supreme Soviet of the Russian Federation and taking into account numerous

questions of domestic inventors, foreign patent offices and patent attorneys, the Committee for Patents and Trademarks (Rospatent) of the Ministry of Science, Higher School and Technical Policy of the Russian Federation hereby informs that:
1. Until the Patent Law and Trademark Law become effective, the provisions of the USSR Laws on Inventions, Industrial Designs and Trademarks, that are adopted as the normative base by the States party to the Provisional Agreement on the Industrial Property Protection, as signed in Minsk on Dec. 27, 1991, are applied in the territory of the Russian Federation.
According to the Provisional Agreement, the Russian Federation, as well as the other States party to it, recognizes the validity of titles of protection issued earlier pursuant to the USSR Laws in the territory of the Russian Federation.
Rospatent has submitted to the Government of the Russian Federation its proposals on issuing a normative act which is to certify the adoption by the Russian Federation of the said obligations arising out of the Provisional Agreement.
2. The applicants, who have filed applications for inventions, industrial designs and trademarks with the former USSR Gospatent, may, without losing the priority dates, wait until the Provisional Agreement on the Industrial Property Protection becomes effective, the Interstate Patent Office is established and its working procedures for issuing interstate titles of protection are elaborated.
3. In accordance with the abovesaid proposals by Rospatent, as submitted to the Government of the Russian Federation, any applicant wishing to obtain a patent (a trademark certificate) of the Russian Federation will be given the right to seek, on the basis of an application filed, for provisional protection in the territory of the Russian Federation.
Such provisional protection will be granted to inventions, industrial designs and trademarks claimed in the applications in respect of which the examiners have taken decisions on the possibility of issuing patents (certificates), and will last from the date when the data on an application are published in a special gazette to the date of issuance of a patent (certificate) of the Russian Federation.
The provisional protection in the territory of the Russian Federation will not impose legal barriers to obtaining, by the applicant, an interstate patent (certificate) after the Provisional Agreement on the Industrial Property Protection becomes effective. The priority date will still be considered as the date of filing the application either with the former USSR Gospatent or with Rospatent, with due regard to the conventional priority.
4. According to the Provisional Agreement on the Industrial Property Protection signed on Dec. 27, 1991, an inventor's certificate issued in the former USSR may not be exchanged for patents of the individual States party to the Provisional Agreement. The question of exchanging inventor's certificates for interstate patents will be finally resolved in the course of developing and concluding an Interstate Convention.
In this connection, Rospatent does not exchange inventors' certificates for patents if a petition to this extent was filed after Dec. 27, 1991.

V. Rassokhin
Chairman of Rospatent

Copies of unofficial translations of the draft laws referred to in the statement are available from Box 4, U.S. Patent and Trademark Office, Washington, DC 20231, the charge is $4.00 to cover the cost of duplication. Checks should be made payable to the Commissioner of Patents and Trademarks.

March 2, 1992 HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

[1136 TMOG 216]

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(249) **Regarding Industrial Property Protection in Ukraine**

The following announcement of Ukraine was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

ANNOUNCEMENT ON THE PROVISIONAL REGULATION CONCERNING THE LEGAL PROTECTION OF INDUSTRIAL PROPERTY IN UKRAINE

The President of Ukraine, by his Decree of Sept. 18, 1992, approved the Provisional Regulation on Legal Protection of Objects of Industrial Property and Rationalization Proposals in Ukraine ("Regulation"). The Regulation entered into force on Sept. 18, 1992.
The situation of industrial property protection in Ukraine, as resulting in particular from the transitional provisions of the Regulation, is summarized below.

I. The Transitional Provisions Concerning Priority and, in Respect of Applications for Patents of Inventions, the Carrying Out of Examination

(1) Any priority claimed within six months from the entry into force of the Regulation, i.e. until Mar. 18, 1993, on the basis of the first filing in a State party to the Paris Convention for the Protection of Industrial Property, will be recognized even if it is claimed after twelve months from the first filing in the case of patents for inventions, or six months from the first filing in the case of industrial designs or trademarks, provided that it is claimed not later than twenty-seven months from the first filing in the case of patents for inventions, or not later than twenty-one months from the first filing in the case of industrial designs and trademarks.
(2) The applicant or any other person may submit to the State Patent Office of Ukraine within five years from the filing date a request for the substantive examination of an application for a patent for invention. The request must be accompanied by a search report established by an International Searching Authority under the Patent Cooperation Treaty (PCT) or an organization registered with the State Patent Office of Ukraine as a Searching Authority, or by evidence that an action to grant a patent has been taken by a Patent Office which has a substantive examination system for granting patents.

II. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union

(3) An applicant of an application for a patent for invention, for an inventor's certificate, for an industrial design patent or certificate or for a trademark certificate filed with the Patent Office of the Soviet Union may request the State Patent Office of Ukraine within six months from the date of entry into force of the Regulation, i.e., until Mar. 18, 1993, that the said application be further processed according to the Regulation. The request must be accompanied by a copy of said application, including a copy of the request showing the filing date as sent back by the Patent office of the Soviet Union to the applicant, and by any available evidence showing that the said application still had effect on Dec. 24, 1991. The filing date and any priority date of the said application will be maintained.

III. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(4) Patents for inventions, industrial design patents and trademark certificates granted by the Patent Office of the Soviet Union prior to Dec. 25, 1991, will, after their registration by the State Patent Office of Ukraine at the request of the owner and upon furnishing of a document for payment of the prescribed fee (see paragraph (11), below), be considered as having the same effects for the remaining period of their validity as a patent for invention, industrial design patent or trademark certificate granted in accordance with the Regulation by the State Patent Office of Ukraine. The duration of the said validity is 20 years from the filing date of the application in the case of a patent for invention, 15 years from the filing date of the application in the case of an industrial design patent and, in the case of a trademark certificate, 10 years from the filing date of the application (if the period of validity of the certificate had not yet been extended by Dec. 24, 1991) or from the date of the request for extension of the period of validity (if the period of validity of the certificate had already been extended by Dec. 24, 1991). The request must be filed within six months from

the date of entry into force of the Regulation, i.e., until Mar. 18, 1993, and must be accompanied by a copy of the patent or certificate granted by the Patent Office of the Soviet Union.

(5) As regards inventors' certificates and industrial design certificates granted by the Patent Office of the Soviet Union in relation to which a 20-year term in the case of inventions, or a 15-year term in the case of industrial designs, both counted from the filing date of the application, has not expired before the entry into force of the Regulation, i.e., prior to Sept. 18, 1992, the State Patent Office of Ukraine will grant, at the request of the inventor (inventors) and with the consent of the applicant, a Ukrainian patent to the inventor himself, or to any other physical or legal person, with their consent, indicated in the request, or to the Ukrainian Inventions Foundation. In the case of inventions, if the said request is not made within the period of one year after the entry into force of the Regulation, i.e., until Sept. 18, 1993, inventors' certificates granted by the Patent Office of the Soviet Union shall be exchanged for Ukrainian patents granted to the Ukrainian Inventions Foundation. Any Ukrainian patent to which this paragraph applies will be valid until the expiration of 20 years from the filing date of the application in the case of inventions, and 10 years from the filing date of the application, with an opportunity of subsequent extension, upon request of the owner, but not longer than for another 5-year period in the case of industrial designs.

IV. Effects in Ukraine of International Applications under the Patent Cooperation Treaty (PCT)

(6)(a) On Sept. 21, 1992, Ukraine deposited a declaration of continuation the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Ukraine. Nationals and residents of Ukraine can therefore file international applications, and Ukraine can be designated and elected in international applications filed, from that date.

(b) On Sept. 29, 1992, the Assembly of the PCT Union adopted, with effect on Oct. 1, 1992, new Rules 32.1 and 32.2 in the Regulations under the PCT, concerning the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Ukraine, one has to distinguish between

(i) international applications designating the Soviet Union whichwere filed prior to Dec. 25, 1991 (see (d), below);

(ii) international applications—irrespective of the designations, they contain—which were filed between Dec. 25, 1991, and Nov. 23, 1992 (see (e) to (g), below);

(iii) international applications designating Ukraine filed on or after Sept. 21, 1992 (see (h), below).

(d) As regards any international application whose international filing date is prior to Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Ukraine of its declaration of continuation, be recognized in Ukraine (provided that the international-application has not lost its effect in the Soviet Union by Dec. 24, 1991). The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union, may continue to have effect in Ukraine are the following:

(i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union on the basis of the international application, the conditions described in paragraphs (4) and (5), above, are applicable;

(ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union but a patent for invention or an inventor's certificate had not been granted by the Patent Office of the Soviet Union without the application having been rejected by that Office, the applicant must, until Mar. 18, 1993,

—furnish to the State Patent Office of Ukraine a copy of the Russian translation submitted to the Patent Office of the Soviet Union and any available evidence showing that the application still had effect on Dec. 24, 1991,

—file the request referred to in paragraph (3), above, with the State Patent Office of Ukraine, and

—furnish to the State Patent Office of Ukraine a document for payment of the prescribed fee (see paragraph 11, below);

(iii) if the applicant has not entered the national phase before before the Patent Office of the Soviet Union and the time limit for entering the national phase before that Office had not expired on Dec. 24, 1991, the applicant must, until Mar. 18, 1993, furnish to the State Patent Office of Ukraine a translation of the international application into Ukrainian or Russian and a document for payment of the prescribed fee (see paragraph 11, below).

(e) As regards any international application whose filing date is later than Dec. 24, 1991, and earlier than Nov. 24, 1992[1], its effects may be extended to Ukraine (irrespective of the designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written requests for extension, extend the effects of the international application to Ukraine. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs, the request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to Ukraine will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Ukraine will be considered as having been designated in the international application on its international filing date. For entering the national phase before the State Patent Office of Ukraine, the applicant must furnish to that Office a translation of the international application into Ukranian or Russian and a document for payment of the prescribed fee (see paragraph 11, below) until Dec. 31, 1993, or within the following time limit if that time limit expires after Dec. 31, 1993:

(i) before the expiration of 21 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 31 months from the priority date if Ukraine is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose international filing date is later than Sept. 20, 1992, and in which Ukraine has been designated, the applicant, in order to enter the national phase before the State Patent Office of Ukraine, must furnish to that Office a translation of the international application into Ukrainian or Russian and a document for payment of the prescribed fee (see paragraph 11, below) to that Office within the following time limit:

[1]With the excepion of any such international application whose international filing date is later than Sept. 21, 1992, and in which Ukraine has been designated under Rule 4.9(a) of the Regulations under the PCT: in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) is applicable. It should be noted that only those international applications filed on or after Sept. 21, 1992, can specifically designate Ukraine.

(i) before the expiration of 21 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date;
(ii) before the expiration of 31 months from the priority date if Ukraine is not elected under Chapter II of the PCT within 19 months from the priority date.

V. Effects in Ukraine of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(7)(a) On Sept. 21, 1992, Ukraine deposited a declaration of continuation the effect of which is that the Madrid Agreement Concerning the International Registration of Marks is applied by Ukraine.

(b) On Sept. 29, 1992, the Assembly of Madrid Union adopted, with effect on Oct. 1, 1992, a new Rule 38 in the Regulations under the Madrid agreement, concerning the effect of international registrations in certain successor States.

(c) Pursuant to the deposit of the declaration of continuation and to the decision of the Assembly, certain international registrations may have effect in Ukraine subject to the conditions described below. Those international registrations are those which have territorial extension to the Soviet Union effective from a date prior to Dec. 25, 1991.

(d) The conditions referred to above are the following:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount which is 62 Swiss francs per international registration.

(e) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, continue the effect of the international registration to Ukraine. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(f) If the conditions described above are fulfilled, the international registration concerned will, with respect to Ukraine, have effect as from the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed in regard to such extension.

(g) For each international registration which has no territorial extension to the Soviet Union or whose international registration date is later than Dec. 24, 1991, protection in Ukraine can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. it is to be noted that requests for territorial extension to Ukraine are possible at present.

VI. Prior User Right

(8) Enterprises, organizations and institutions which have already started to use inventions or industrial designs for which protection can be obtained according to paragraph (5), above, prior to the entry into force of the Regulation, i.e., prior to Sept. 18, 1992, will have the right to a continued use of such inventions and industrial designs, but without increasing the volume of their utilization.

VII. New Applications

(9) From the date of entry into force of the Regulation, i.e. from Sept. 18, 1992, onward, applications for patents for inventions, for industrial design patents and for trademark certificates can be filed with the State Patent Office of Ukraine. The request as a part of the application must be filed in Ukrainian and be accompanied on the filing date by the prescribed fees. Other parts of the application may be presented in Ukrainian or Russian. they may also be presented in English, French or German, provided that a translation into Ukrainian is presented upon request of the state Patent Office of Ukraine

VIII. Procedural Provisions

(10) If an applicant does not have his ordinary residence or principal place of business in Ukraine, he must authorize a representative in Ukraine, and all applications and requests referred to in the present announcement must be filed through the intermediary of such a representative. The list of the persons who can act as representatives is available at the State Patent Office of Ukraine.

(11) The amounts of the fees which are referred to as "prescribed fees" in the present announcement as well as the kind of document which constitutes a "document for payment of the prescribed fee" will be published in a separate announcement.

IX. Address of the Patent Office

State Patent Office of Ukraine
4, Karl Leibknecht Street
252008 Kiev
Ukraine
Tel.: (7044) 293-2188
Fax.: (7044) 268-2588

Dec. 11, 1992

DOUGLAS B. COMER
Acting Assistant Secretary and
Acting Commissioner of
Patents and Trademarks

[1146 TMOG 680]

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(250) **Regarding Industrial Property Protection in the Czech Republic and the Slovak Republic**

The following announcements concerning industrial property protection in the Czech Republic and the Slovak Republic were furnished by the World Intellectual Property Organization (WIPO).

Announcement on the Protection of Industrial Property in the Czech Republic

In view of the fact that Czechoslovakia ceased to exist on Dec. 31, 1992, and that the Czech Republic and the Slovak Republic became independent States on Jan. 1, 1993, the situation of industrial property protection in the Czech Republic is summarized below.

I. Legal Basis

(1) The respective legal acts on the protection of industrial property of Czechoslovakia remain applicable in the Czech Republic.

II. Applications for Industrial Property Rights Filed with the Federal Office for Inventions of Czechoslovakia and Industrial Property Rights Granted by that Office,

(2) Applications for industrial property rights filed with the Federal Office for Inventions of Czechoslovakia and industrial property rights granted by that Office maintain their legal effect in both the Czech Republic and the Slovak Republic, it being understood that the next fees which are to be paid must be paid, for protection in both the Czech Republic and the Slovak Republic, to both the Industrial Property Office of the Czech Republic and the Industrial Property Office of the Slovak Republic.

III. International Treaties

(3) The Czech Republic has deposited, with effect on Jan. 1, 1993, a declaration the effect of which is that all those treaties

administered by WIPO to which Czechoslovakia was party continue to be applicable as far as the Czech Republic is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods, the Madrid Agreement Concerning the International Registration of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration, the Locarno Agreement Establishing an International Classification for Industrial Designs, the Patent Cooperation Treaty (PCT), the Strasbourg Agreement Concerning the International Patent Classification, the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the Berne Convention for the Protection of Literary and Artistic Works, and the Treaty on the International Registration of Audiovisual Works.

IV. Effects in the Czech Republic of International Applications under the Patent Cooperation Treaty (PCT)

(4)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, nationals and residents of the Czech Republic can file international applications, and the Czech Republic can be designated and elected in international applications filed, on or after Jan. 1, 1993.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT permit the extension of international applications to the Czech Republic.

(c) For the purpose of determining the status of international applications with respect to the Czech Republic, one has to distinguish between

(i) international applications specifically[1] designating Czechoslovakia which were filed prior to Jan. 1, 1993(see(d), below);

(ii) international applications not specifically1 designating the Czech Republic—irrespective of the other designations they contain—filed between Jan. 1, 1993, and Feb. 21, 1993 (see (e) to (g) below);

(iii) international applications specifically[1] designating the Czech Republic filed on or after Jan. 1, 1993 (see (h) below).

(d) As regards any international application whose *international filing date is prior to Jan. 1, 1993*, and in which *Czechoslovakia* is specifically *designated*, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by the Czech Republic of its declaration of continuation, be recognized in the Czech Republic (provided that the international application had not lost its effect in Czechoslovakia by Dec. 31, 1992). The conditions under which any such international application, or any patent resulting therefrom and granted by the Federal Office for Inventions of Czechoslovakia, may continue to have effect in the Czech Republic are the following:

(i) if a patent has been granted by the Federal Office for Inventions of Czechoslovakia on the basis of the international applications, paragraph (2), above, is applicable;

(ii) if the applicant has entered the national phase before the Federal Office for Inventions of Czechoslovakia but a patent for invention has not been granted by the Office without the application having been rejected by it, paragraph (2), above, is applicable;

(iii) if the applicant has not entered the national phase before the Federal Office for Inventions of Czechoslovakia and the time limit for entering the national phase had not expired on Dec. 31, 1992, the applicant must, before the expiration of the applicable time limit under PCT Article 22 or 39(1), furnish to the Industrial Property Office of the Czech Republic a translation of the international application into the Czech language and pay the prescribed fee.

(e) As regards any international application whose *international filing date is later than Dec. 31, 1992, and earlier than Feb. 22, 1993*,[2] and in which the *Czech Republic is not* specifically designated, its effects may be extended to the Czech Republic (irrespective of the other designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to the Czech Republic. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to the Czech Republic will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the condition described in (e) and (f), above, are fulfilled, the Czech Republic will be considered as having been designated in the international application on its international filing date. For entering the national phase before the Industrial Property Office of the Czech Republic, the applicant must furnish to that Office a translation of the international application into the Czech language and pay the prescribed fee within three months from the date of the request for extension or, if it expires later, within the following time limit:

(i) before the expiration of 21 months from the priority date if the Czech Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Czech Republic is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose *international filing date is later than Dec. 31, 1992*, and in which the *Czech Republic* is specifically *designated*, the applicant, in order to enter the national phase before the Industrial Property Office of the Czech Republic, must furnish to that Office a translation of the international application into the Czech language and pay the prescribed fee to that Office within the following time limit:

(i) before the expiration of 21 months from the priority date if the Czech Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Czech Republic is elected under Chapter II of the PCT within 19 months from the priority date.

V. Effects in the Czech Republic of International Registrations under the Madrid Agreement Concerning the International Registration of Marks.

(5)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, and pursuant to Rule 38 of the Regulations under the Madrid Agreement, any international registration with a territorial extension to Czechoslovakia

[1]In this announcement, an international application is regarded as "specifically" designating a State either if that State has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of that State has been confirmed under Rule 4.9(c) of those Regulations.

[2]With the exception of any international application whose international filing date is later than Dec. 31, 1992, and in which the Czech Republic is specifically designated; in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) is applicable.

effective from a date prior to Jan. 1, 1993, may have effect in the Czech Republic subject to the following conditions:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(b) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, obtain a continuation of the effect of the international registration in the Czech Republic. The notice will contain a request form (in French) and specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. The request must be made in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(c) If the conditions described above are fulfilled, the international registration concerned will, with respect to the Czech Republic, have effect as from the effective date of territorial extension to Czechoslovakia and benefit from any priority validly claimed in regard to such extension.

(d) For each international registration which has no territorial extension to Czechoslovakia or whose international registration date is later than Dec. 31, 1992, protection in the Czech Republic can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is to be noted that requests for territorial extension to the Czech Republic are possible at present.

VI. New Applications for Industrial Property Rights

(6) Applications for industrial property rights filed from Jan. 1, 1993, with the Industrial Property Office of the Czech Republic have no effect in the Slovak Republic. However, unless it is clear that the applicant does not seek protection in the Slovak Republic, the Industrial Property Office of the Czech Republic will, during a transitory period of a few months, invite the applicant to specify, within a time limit which will be fixed in the invitation, whether he wants to obtain protection in the Czech Republic only or both in the Czech Republic and in the Slovak Republic. In the latter case, the Industrial Property Office of the Czech Republic will transmit a copy of the application to the Industrial Property Office of the Slovak Republic and the filing date of the application with the Industrial Property Office of the Czech Republic will be recognized by the Industrial Property Office of the Slovak Republic.

(7) Applications requesting protection in the Czech Republic must be filed in the Czech language.

VII. General Provisions

(8) The fees to be paid to the Industrial Property Office of the Czech Republic are of the same amount as the fees which were payable to the Office of Czechoslovakia before Jan. 1, 1993.

(9) If an applicant does not have his ordinary residence or principle place of business in the Czech Republic, he must authorize a representative in the Czech Republic, and all applications to be filed with the Industrial Property Office of the Czech Republic must be filed through the intermediary of such a representative. The list of persons who can act as representatives is available at the Industrial Property Office of the Czech Republic.

VIII. Address of the Industrial Property Office of the Czech Republic

Industrial Property Office of the Czech Republic
Revolucni ulice 7
11346 Prague 1
Czech Republic
Tel.: (2) 28 96 (operator service)
Fax.: (2) 231 92 30
Teleprinter: 123 109 FUV

Announcement on the Protection of Industrial Property in the Slovak Republic

In view of the fact that Czechoslovakia ceased to exist on Dec. 31, 1992, and that the Czech Republic and the Slovak Republic became independent States on Jan. 1, 1993, the situation of industrial property protection in the Slovak Republic is summarized below.

I. Legal Basis

(1) Pending the enactment of new legislation, the respective legal acts on the protection of industrial property of Czechoslovakia remain applicable in the Slovak Republic.

II. Applications for Industrial Property Rights Filed with the Federal Office for Inventions of Czechoslovakia and Industrial Property Rights Granted by that Office

(2) Applications for industrial property rights filed with the Federal Office for Inventions of Czechoslovakia and industrial property rights granted by that Office maintain their legal effect in both the Czech Republic and the Slovak Republic, it being understood that the next fees which are to be paid must be paid, for protection in both the Czech Republic and the Slovak Republic, to both the Industrial Property Office of the Czech Republic and the Slovak Republic.

III. International Treaties

(3) The Slovak Republic has deposited, with effect on Jan. 1, 1993, a declaration the effect of which is that all those treaties administered by WIPO to which Czechoslovakia was party continue to be applicable as far as the Slovak Republic is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods, the Madrid Agreement Concerning the International Registrations of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Lisbon Agreement for the Protection of Appellations of Origin and their International Registration, the Locarno Agreement Establishing an International Classification for Industrial Designs, the Patent Cooperation Treaty (PCT), the Strasbourg Agreement Concerning the International Patent Classification, the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, the Berne Convention for the Protection of Literary and Artistic Works, and the Treaty on the International Registration of Audiovisual Works.

IV. Effects in the Slovak Republic of International Applications under the Patent Cooperation Treaty (PCT)

(4)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, national and residents of the Slovak Republic can file international applications, and the Slovak Republic can be designated and elected in international applications filed, on or after Jan. 1, 1993.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT permit the extension of international applications to the Slovak Republic.

(c) For the purpose of determining the status of international applications with respect to the Slovak Republic, one has to distinguish between

(i) international applications specifically[1] designating Czechoslovakia which were filed prior to Jan. 1, 1993 (see (d), below);

(ii) international applications not specifically[1]designating the Slovak Republic—irrespective of the other designations they contain—filed between Jan. 1, 1993 and Mar. 6, 1993 (see (e) to (g), below);

(iii) international applications specifically[1] designating the Slovak Republic filed on or after Jan. 1, 1993 (see (h), below).

(d) As regards any international application *whose international filing date is prior to Jan. 1, 1993*, and in which *Czechoslovakia* is specifically *designated*, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by the Slovak Republic of its declaration of continuation, be recognized in the Slovak Republic (provided that the international application had not lost its effect in Czechoslovakia by Dec. 31, 1992). The conditions under which any such international application, or any patent resulting therefrom and granted by the Federal Office for Inventions of Czechoslovakia, may continue to have effect in the Slovak Republic are the following:

(i) if a patent has been granted by the Federal Office for Inventions of Czechoslovakia on the basis of the international application, paragraph (2), above, is applicable;

(ii) if the applicant has entered the national phase before the Federal Office for Inventions of Czechoslovakia but a patent for invention has not been granted by the Office without the application having been rejected by it, paragraph (2), above, is applicable;

(iii) if the applicant has not entered the national phase before the Federal Office for Inventions of Czechoslovakia and the time limit for entering the national phase had not expired on Dec. 31, 1992, the applicant must, before the expiration of the applicable time limit under PCT Article 22 or 39(1),furnish to the Industrial Property Office of the Slovak Republic a translation of the international application into the Slovak language and pay the proscribed fee.

(e) As regards any international application whose *international filing date is later than Dec. 31, 1992, and earlier than Mar. 7, 1993*,[2] and in which the *Slovak Republic is not* specifically *designated*, its effects may be extended to the Slovak Republic (irrespective of the other designations it contains) through the performance of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to the Slovak Republic. The notification will, in particular, specify the modes of payment for the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be used for the purpose of requesting the extension to the Slovak Republic will be attached to the notification. The request for the extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO;if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the condition described in (e) and (f), above, are fulfilled, the Slovak Republic will be considered as having been designated in the international application on its international filing date. For entering the national phase before the Industrial Property Office of the Slovak Republic, the applicant must furnish to that Office a translation of the international application into the Slovak language and pay the proscribed fee within three months from the date of the request for the extension or, if it expires later, within the following time limit:

(i) before the expiration of 21 months from the priority date if the Slovak Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Slovak Republic is elected under Chapter II of the PCT within 19 months from the priority date.

(h) As regards any international application whose *international filing date is later than Dec. 31, 1992*, and in which the *Slovak Republic* is specifically *designated*, the applicant, in order to enter the national phase before the Industrial Property Office of the Slovak Republic, must furnish to that Office a translation of the international application into the Slovak language and pay the prescribed fee to that Office within the following time limit:

(i) before the expiration of 21 months from the priority date if the Slovak Republic is not elected under Chapter II of the PCT within 19 months from the priority date;

(ii) before the expiration of 30 months from the priority date if the Slovak Republic is elected under Chapter II of the PCT within 19 months from the priority date.

V. Effects in the Slovak Republic of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(5)(a) Pursuant to the deposit of the declaration of continuation referred to in paragraph (3), above, and pursuant to Rule 38 of the Regulations under the Madrid Agreement, any international registration with a territorial extension to Czechoslovakia effective from a date prior to Jan. 1, 1993, mayhave effect in the Slovak Republic subject to the following conditions:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(b) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, obtain a continuation of the effect of the international registration in the Slovak Republic. The notice will contain a request form (in French) and specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. The request must be made in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(c) If the conditions described above are fulfilled, the international registration concerned will, with respect to the Slovak Republic, have effect as from the effective date of the territorial extension to Czechoslovakia and benefit from any priority validly claimed in regard to such extension.

(d) For each international registration which has no territorial extension to Czechoslovakia or whose international registration date is later than Dec. 31, 1992, protection in the Slovak Republic can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is to be noted that requests for territorial extension to the Slovak Republic are possible at present.

VI. New Applications for Industrial Property Rights

(6) From Jan. 1, 1993, it is possible to file applications for industrial property rights with the Industrial Property Office of the Slovak Republic. Applications filed with the Industrial Property Office of the Czech Republic have no effect in the Slovak Republic. However, the following procedure will apply, during a transitory period of a few months, to applications filed with the Industrial Property Office of the Czech Republic: unless it is clear that the applicant does not seek protection in the Slovak Republic, the Industrial Property Office of the Czech office will invite the applicant to specify, within a time limit which will be fixed in the invitation, whether he wants to obtain protection in the Czech Republic only or both in the Czech Republic and the Slovak Republic. In the latter case, the Industrial Property Office of the Czech Republic will transmit a copy of the application to the Industrial Property Office of the Slovak Republic and the filing date of the application with the Industrial Property Office of the Czech Republic will be recognized by the Industrial Property Office of the Slovak Republic.

(7) Applications requesting protection in the Slovak Republic must be filed in the Slovak language.

VII General Provisions

(8) The fees to be paid to the Industrial Property Office of the Slovak Republic are of the same amount as the fees whichwere payable to the Office of Czechoslovakia before Jan. 1, 1993.

(9) If an applicant does not have his ordinary residence or principal place of business in the Slovak Republic, he must authorize a representative in the Slovak Republic, and all applications to be filed with the Industrial Property Office of the Slovak Republic must be filed through the intermediary of such a representative. The list of persons who can act as representatives is available at the Industrial Property Office of the Slovak Republic.

VIII. Address of the Industrial Property Office of the Slovak Republic

Industrial Property Office of the Slovak Republic
Nam. Slobody 29
81312 Bratislava
Slovakia
Tel: (7) 33 00 57
Fax.: (7) 31 44 61

Jan. 28, 1993

DOUGLAS B. COMER
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1147 TMOG 72]

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(251) **Regarding Industrial Property Protection in Kazakhstan**

The following announcement was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

ANNOUNCEMENT OF THE PROTECTION OF INDUSTRIAL PROPERTY IN KAZAKHSTAN

The situation of industrial property protection in Kazakhstan is summarized below.

I. Legislation

(1) On Aug. 5, 1992, the Patent Law of Kazakhstan entered into force. This Law deals with preliminary patents and patents for inventions, preliminary patents and patents for industrial designs and patents for utility models.

(2) The Law on Trade Marks, Service Marks and Appellations of Origin of Kazakhstan was adopted on Jan. 18, 1993. This said Law entered into force on Feb. 23, 1993.

(3) The National Patent Office of Kazakhstan was established on June 23, 1992. It is under the supervision of the Cabinet of Ministers.

II. Membership in Treaties

(4) The Government of Kazakhstan deposited on Feb. 16, 1993, a declaration to the effect that the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks and the Patent Cooperation Treaty continue to be applicable to Kazakhstan.

III. Applications for Industrial Property Rights Filed with the National Patent Office of Kazakhstan

(5) Applications for the grant of patents for inventions, patents for industrial designs and patents for utility models and applications for the registration of marks and appellations of origin have been able to be filed with the National Patent Office of Kazakhstan since Aug. 27, 1992.

IV. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(6) A patent for invention or inventor's certificate, an industrial design patent or industrial design certificate, or a trademark certificate, which was issued by the Patent Office of the Soviet Union may be registered by the National Patent Office of Kazakhstan at the request of the owner. Upon registration, such industrial property rights will be considered as having the same effects as a patent for invention, industrial design patent or trademark certificate issued by the National Patent Office of Kazakhstan. The duration is 20 years from the filing date of the application in the case of a patent for invention, 10 years from the filing date of the application in the case of an industrial design patent with the right to extend registration in the case of a trademark certificate. The filing date and any Dec. 1, 1993, in the case of inventions and industrial designs, and before Nov. 1, 1993, in the case of trademarks. It must be accompanied by the original or a copy, certified by a notary or any other competent authority, of the patent or certificate issued by the Patent Office of the Soviet Union and evidence that the prescribed fees have been paid to the National Patent Office of Kazakhstan.

V. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation Before Oct. 14, 1992

(7) The applicant of an application for a patent for invention or an inventor's certificate, for an industrial design patent or an industrial design certificate or for a trademark certificate which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Oct. 14, 1992, may request the National Patent Office of Kazakhstan before Dec. 1, 1993, in the case of an application for a patent for invention or an inventor's certificate, or for an industrial design patent or certificate, and before Nov. 1, 1993, in the case of an application for a trademark certificate, that the said application be further processed according to the Kazakh legislation. The request for further processing by the National Patent Office of Kazakhstan must be accompanied by a copy of the said application, including a copy of the request part of the said application showing the filing date as sent back to the applicant by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, by a declaration that the said application is, to the best knowledge of the applicant, still pending before the Patent Office of the Russian Federation, and by an application filed according to the Kazakh legislation.

(8) If the applicant has received from the Patent Office of the Soviet Union or from the Patent Office of the Russian Federation in respect of an application filed before Oct. 14, 1992, a decision on grant of protection, the request needs only to be accompanied by a copy, certified by a notary or any other competent authority, of the said decision, as well as, in the case of inventions, by the description, any drawings and the claims on which the decision is based and an abstract of the invention or, in the case of industrial designs, by five photographs, one of which must be certified by a notary or any other competent authority, and any drawings. The filing date and

any priority date of the application filed with the Patent Office of the Soviet Union or the Patent Office of the Russian Federation will be maintained.

VI. Effects in Kazakhstan of International Applications under the Patent Cooperation Treaty (PCT)

(9) (a) On Feb. 16, 1993, Kazakhstan deposited a declaration of continuation the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Kazakhstan. Nationals and residents of Kazakhstan can therefore file international applications, and Kazakhstan can be designated and elected in international applications filed, from the date.

(b) On Sept. 29, 1992, the Assembly of the PCT Union adopted, with effect on Oct. 1, 1992, new Rules 32.1 and 32.2 of the Regulations under the PCT, concerning the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Kazakhstan, one has to distinguish between:

(i) international applications designating the Soviet Union which were filed before Dec. 25, 1991 (see (d), below);

(ii) international applications—irrespective of the designations they contain—which were filed between Dec. 25, 1991, and Apr. 16, 1993 (see (e) to (g), below);

(iii) international applications specifically* designating Kazakhstan filed on or after Feb. 16, 1993 (see (h), below).

(d) As regards any international application whose international filing date is before Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Kazakhstan of its declaration of continuation, be recognized in Kazakhstan. The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, may continue to have effect in Kazakhstan are the following:

(i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation on the basis of international application, the conditions referred to in paragraph (6) above, are applicable;

(ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation but a patent for invention or an inventor's certificate has not been granted by any of those Offices, the conditions referred to in paragraph (7), above, are applicable, provided that the applicant must, before Dec. 1, 1993, file with the National Patent Office of Kazakhstan a request that the international application be further processed according to the Kazakh legislation; the request must be accompanied by a copy of the Russian translation of the international application submitted to the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and a declaration that the application is still pending before the Patent Office of the Russian Federation; however where a decision to grant a patent has issued, only the requirements referred to in paragraph (8), above, apply;

(iii) if the applicant has not entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and the time limit for entering the national phase had not expired on Dec. 24, 1991, the applicant must, before Dec. 1, 1993, or, if Kazakhstan is elected under Chapter II of the PCT within 19 months from the priority date, before Dec. 1, 1993, or the expiration of 31 months from the priority date whichever is later, furnish to the National Patent Office of Kazakhstan a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) has been paid to the latter Office.

(e) As regards any international application whose international filing date is later than Dec. 24, 1991, and earlier than Apr. 17, 1993,** its effect may be extended to Kazakhstan (irrespective of the designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable in Swiss francs.

(f) The applicant in respect of each and every international application to in (e), above, or his agent or common representative if there is one, will receive a written notification form the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to Kazakhstan. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the international application by its international application number. A form which may be issued for the purpose of requesting the extension to Kazakhstan will be attached to the notification. The request for extension must be English or French, and may be sent be telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made without waiting for the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Kazakhstan will be considered as having been designated in the international application on its international filing date. For entering the national phase before the National Patent Office of Kazakhstan, the applicant must furnish, within the following time limit, to that Office both a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) was paid:

(i) before Dec. 1, 1993, or the expiration of 21 months from the priority date, whichever is later, if Kazakhstan is not elected under Chapter II of the PCT before the expiration of 19 months from the priority date and item (iii) does not apply;

(ii) before Dec. 1, 1993, or the expiration of 31 months from the priority date, whichever is later, if Kazakhstan is elected under Chapter II of the PCT before the expiration of 19 months from the priority date;

(iii) before Dec. 1, 1993, or the expiration of 31 months from the priority date, whichever is later, if a request for extension to Kazakhstan is made after, but the demand was made before, the expiration of 19 months from the priority date, and a later election of Kazakhstan is made together with the request for extension or within three months from the date of the request for extension.

(h) As regards any international application whose international filing date is on or after Feb. 16, 1993, and in which Kazakhstan is specifically designated, the applicant, in order to enter the national phase before the National Patent Office of Kazakhstan, must furnish, within the following time limit, to that Office both a translation of the international application into Kazakh or Russian and evidence that the prescribed fee (see paragraph (12), below) has been paid to the said Office:

(i) before the expiration of 21 months from the priority date if Kazakhstan is not elected under Chapter II of the PCT with 19 months from the priority date;

(ii) before the expiration of 31 months from the priority date if Kazakhstan is elected under Chapter II of the PCT within 19 months from the Priority date.

VII. Effects in Kazakhstan of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

*In this announcement, an international application is regarded as "specifically" designating Kazakhstan either if Kazakhstan has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of Kazakhstan has been confirmed under Rule 4.9(c) of those Regulations.

**With the exception of any such international application international filing date is on or after Feb. 16, 1993, and in which Kazakhstan is specifically designated:in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) applies. It should be noted that Kazakhstan cab be specifically designated only in those international applications filed on or after Feb. 16, 1993.

(10) (a) On Feb. 16, 1993, Kazakhstan deposited a declaration of continuation the effect of which is that the Madrid Agreement Concerning the International Registration of Marks is applied by Kazakhstan.

(b) on Sept. 29, 1992, the Assembly of the Madrid Union adopted, with effect on Oct. 1, 1992, a new Rule 38 in Regulations under the Madrid Agreement, concerning the effect of international registrations in certain successor States.

(c) Pursuant to the deposit of the declaration of continuation and to the decision of the Assembly, certain international registrations may have effect in Kazakhstan subject to the conditions described below. Those international registrations are those which have territorial extensions to the Soviet Union effective from a date prior to Dec. 25, 1991.

(d) The conditions referred to above are the following:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(e) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO calling his attention to the fact that he can, by filing a written request, obtain the continuation of the effect of the international registration in Kazakhstan. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made without waiting for the notice of the International Bureau of WIPO.

(f) If the conditions described above are fulfilled, the international registration concerned will, with respect to Kazakhstan, have effect as from the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed in regard such extension.

(g) For each international registration which has territorial extension to the Russian Federation effective from a date prior to Apr. 17, 1993, the owner may request the National Patent Office of Kazakhstan before Nov. 1, 1993, that the said registration be processed as an application under the Kazakh legislation. The request must be accompanied by an extract from the International Register established by the International Bureau of WIPO, by a declaration that, to the best knowledge of the owner, the international registration still has effect in the Russian Federation, and by an application filed according to the Kazakh legislation.

(h) For each international registration not covered by (c) or (g), above, namely, for each international registration which has no territorial extension to the Soviet Union or to the Russian Federation or whose international registration date is later than Apr. 16, 1993, protection in Kazakhstan can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is noted that requests for territorial extension to Kazakhstan are possible at present.

VIII. Procedural Provisions

(11) If an applicant does not have his ordinary residence or principal place in business in Kazakhstan, he must authorize a representative in Kazakhstan, and all requests, applications and other documents must be filed through the intermediary of such a representative.

(12) The list of the persons who can act as representatives and the official fees applicable to the procedures referred to under paragraphs (5), (6), (7), (8), (9) and (10)(g) are available from the National Patent Office of Kazakhstan.

(13) The request part of any application referred to under paragraph (5), above, any request referred to under paragraphs (6), (7), (9)(d)(ii) and (10)(g), above, and any declaration referred to under paragraphs (7), (9)(d)(ii) and (10)(g), above, must be filed in Kazakh or Russian. Other parts of any application referred to under paragraph (5), above, may be presented in other languages, provided that a translation into Kazakh or Russian is presented within two months from the filing date.

(14) If an applicant, due to circumstances beyond his control, was unable to observe a time limit applicable under paragraph (6), (7), (9)(d), 10(g) or (13), above, the time limit may, upon request, be extended by two months by the National Patent Office of Kazakhstan.

IX. Address of the National patent Office of Kazakhstan

National Patent Office
Ablai-khan avenue 93/95
480091 Alma-Ata
Kazakhstan
Telex: (064) 251244 orlan su

June 11, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1153 TMOG 23]

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(252) **Regarding Industrial Property Protection in Belarus**

The following announcement was furnished by the World Intellectual Property Organization of Geneva, Switzerland.

ANNOUNCEMENT OF THE PROTECTION OF INDUSTRIAL PROPERTY IN BELARUS

The situation of industrial property protection in Belarus is summarized below.

I. Legislation

(1) On Feb. 5, 1993, the Law on Patents for Inventions, the Law on Patents for Industrial Designs and the Law on Trademarks and Service Marks of Belarus and the respective Parliamentary Decrees putting the said laws into effect were adopted and entered into force.

II. Membership in Treaties

(2) The Government of Belarus deposited on Apr. 14, 1993, a declaration to the effect that the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks and the Patent Cooperation Treaty continue to be applicable to Belarus. Belarus was already party to the Convention Establishing the World Intellectual Property Organization.

III. Industrial Property Rights Granted by the Patent Office of the Soviet Union

(3) A patent for invention, an industrial design patent or trademark certificate, which was issued by the Patent Office of the Soviet Union may be registered by the State Patent Office of Belarus at the request of the owner. Upon registration, such industrial property rights will be considered as having the same effects as a patent for invention, industrial design patent or trademark certificate issued by the State Patent Office of Belarus. The duration is 20 years from the filing date of the application with the patent Office of the Soviet Union in the case of a patent for invention, 15 years from the filing date of the application with the Patent Office of the Soviet Union in the case of an industrial design patent, and 10 years from the filing date of the request for registration by the State Patent Office of Belarus in the case of a trademark certificate, the

latter request to be filed before the expiry of the 10-year term from the filing date of the application with the Patent Office of the Soviet Union. The filing date and any priority date of the application with the Patent Office of the Soviet Union will be maintained.

(4) As regards inventors' certificates and industrial design certificates granted by the Patent Office of the Soviet Union in relation to which a 20-year term in the case of inventions, or a 15-year term in the case of industrial designs, both counted from the filing date of the application, has not expired, the State Patent Office of Belarus will grant for the remaining term a Belarusian patent for invention or industrial design patent upon the joint request of the applicant and the inventor (inventors). Failing the agreement between the applicant and the inventor (inventors), no patent will be granted.

(5) The request for registration by the State Patent Office of Belarus must be filed before Feb. 5, 1994, in the case of inventions and industrial designs, and before Oct. 5, 1993, in the case of trademarks. It must be accompanied by the original or a copy, certified by a the patent owner, or the applicant, or the patent attorney, of the patent or certificate issued by the Patent Office of the Soviet Union, and also by a copy of the document attesting that the fee for the preceding term has been paid.

(6) Any inventor's certificate which is not exchanged for a patent for invention will enjoy the legal status which had been applicable to the invention in question in the Soviet Union before July 1, 1991.

IV. Applications for Industrial Property Rights Filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation Before Feb. 5, 1993

(7) The applicant of an application for a patent for invention or an inventor's certificate, or of an application for an industrial design patent or an industrial design certificate which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Feb. 5, 1993, and in respect of which a decision to grant has been taken, may request the State Patent Office of Belarus to issue a Belarusian patent for invention or industrial design patent. The request must be filed before Aug. 5, 1993.

(8) The applicant of an application for a patent for invention or an inventor's certificate, of an application for an industrial design patent or an industrial design certificate, or of an application for a trademark certificate, which had been filed with the Patent Office of the Soviet Union or with the Patent Office of the Russian Federation before Feb. 5, 1993, and the processing of which has not been completed and in respect of which patents or certificates have not been granted, may request the State Patent Office of Belarus before Aug. 5, 1993, that the said application be further processed according to the Belarusian legislation and that the priority date of the said application be maintained, provided that the request is filed before the expiry of 27 months from the filing date of the first application in the case of inventions, and before the expiry of 21 months from the filing date of the first application in the case of industrial designs and trademarks.

V. Applications for Industrial Property Rights Filed, Before Apr. 14, 1993, with the Industrial Property Offices of States Party to the Paris Convention for the Protection of Industrial Property

(9) The State Patent Office of Belarus will recognize the priority date of the first application filed in a State party to the Paris Convention, provided that, in the case of inventions, the request for the grant of a Belarusian patent based on the said application is filed with the State Patent Office of Belarus before the expiry of 27 months from the filing date of the first application or, in the case of industrial designs and trademarks, the request for the grant of a Belarusian industrial design patent, or for the grant of a Belarusian trademark certificate, based on said application, is filed with the State Patent Office of Belarus before the expiry of 21 months from the filing date of the first application.

VI. Effects in Belarus of International Applications under the Patent Cooperation Treaty (PCT)

(10) (a) As mentioned in paragraph (2), above, on Apr. 14, 1993, Belarus deposited a declaration of continuation, the effect of which is that the Patent Cooperation Treaty (PCT) is applied by Belarus. Nationals and residents of Belarus can therefore file international applications, and Belarus can be designated and elected in international applications filed, from that date.

(b) Rules 32.1 and 32.2 of the Regulations under the PCT, allow the extension of international applications to certain successor States.

(c) For the purpose of determining the status of international applications with respect to Belarus, one has to distinguish between:

(i) international applications designated the Soviet Union which were filed before Dec. 25, 1991 (see (d), below);

(ii) international applications-irrespective of the designations they contain-which were filed between Dec. 25, 1991, and June 22, 1993 (see (e) to (g), below);

(iii) international applications specifically* designated Belarus filed on or after Apr. 14, 1993 (see (h), below).

(d) As regards any international application whose international filing date is before Dec. 25, 1991, and in which the Soviet Union has been designated, the "national filing effect" of any such application under Article 11(4) of the PCT will, pursuant to the deposit by Belarus of its declaration of continuation, be recognized in Belarus. The conditions under which any such international application, or any patent or inventor's certificate resulting therefrom and granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation, may continue to have effect in Belarus are the following:

(i) if a patent for invention or an inventor's certificate has been granted by the Patent Office of the Soviet Union or by the Patent Office of the Russian Federation on the basis of international application, the conditions referred to in paragraph (3) to (6) above, are applicable;

(ii) if the applicant has entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation but a patent for invention or an inventor's certificate has not been granted by either of those Offices, the conditions referred to in paragraphs (7) and (8), above, are applicable, provided that the applicant, before Aug. 5, 1993, files with the State Patent Office of Belarus a request that the international application be further processed according to the Belarusian legislation; the request must be accompanied by a copy of the Russian translation of the international application submitted to the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and a declaration that the application is still pending before the Patent Office of the Russian Federation, except where a decision to grant a patent has been made, in which case only the requirements referred to in paragraph (7), above, apply;

(iii) if the applicant has not entered the national phase before the Patent Office of the Soviet Union or the Patent Office of the Russian Federation and the time limit for entering the national phase had not expired on Dec. 24, 1991, the applicant must furnish to the State Patent Office of Belarus, within the following time limit, a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid to the latter Office.

—before Aug. 5, 1993, or before the expiration of 21 months from the priority date, whichever is later, if Belarus is not elected under Chapter II of the PCT within 19 months from the priority date;

—before Aug. 5, 1993, or before the expiration of 31 months from the priority date, whichever is later, if Belarus is

*In this announcement, an international application is regarded as "specifically" designating Belarus either if Belarus has been designated under Rule 4.9(a) of the Regulations under the PCT or if the designation of Belarus has been confirmed under Rule 4.9(c) of those Regulations.

elected under Chapter II of the PCT within 19 months from the priority date.

(e) As regards any international application whose international filing date is later than Dec. 24, 1991, and not later than June 22, 1993,** its effect may be extended to Belarus (irrespective of the designations it contains) through the performance by the applicant of the following acts:

(i) filing with the International Bureau of the World Intellectual Property Organization (WIPO) a request for extension;

(ii) paying to the International Bureau of WIPO an extension fee of 185 Swiss francs, payable only in Swiss francs.

(f) The applicant in respect of each and every international application referred to in (e), above, or his agent or common representative if there is one, will receive a written notification form the International Bureau of WIPO drawing his attention to the fact that he can, by filing a written request for extension, extend the effects of the international application to Belarus. The notification will, in particular, specify the modes of payment of the extension fee of 185 Swiss francs. The request for extension must contain the identification of the applicant's international application by its international application number. A form which may be issued for the purpose of requesting the extension to Belarus will be attached to the notification. The request for extension must be in English or French, and may be sent by telefax or telex. The request for extension and the corresponding payment must reach the International Bureau of WIPO before the expiration of three months from the date of the notification sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. It is recommended that applicants await the notification from the International Bureau of WIPO and use the form attached to it, but requests and payments may be made prior to receipt of the notification from the International Bureau of WIPO.

(g) If the conditions described in (e) and (f), above, are fulfilled, Belarus will be considered as having been designated in the international application on its international filing date. In order to enter the national phase before the State Patent Office of Belarus, the applicant must furnish to that Office, within the following time limit, both a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid:

(i) before Aug. 5, 1993, or before the expiration of 21 months from the priority date, whichever is later, if Belarus is not elected under Chapter II of the PCT within 19 months from the priority date and item (iii) does not apply;

(ii) before Aug. 5, 1993, or the expiration of 31 months from the priority date, whichever is later, if Belarus is elected under Chapter II of the PCT within 19 months from the priority date;

(iii) before Aug. 5, 1993, or the expiration of 31 months from the priority date, whichever is later, if a request for extension to Belarus is made after, but the demand for international preliminary examination was made before, the expiration of 19 months from the priority date, and a later election of Belarus is made together with the request for extension or within three months from the date of the request for extension.

(h) As regards any international application whose International filing date is on or after Apr. 14, 1993, and in which Belarus is specifically designated, the applicant, in order to enter the national phase before the State Patent Office of Belarus, must furnish to that Office, within the following time limit, both a translation of the international application into Belarusian or Russian and evidence that the prescribed fee (see paragraph (13), below) has been paid to the said Office:

(i) before the expiration of 21 months from the priority date if Belarus is not elected under Chapter II of the PCT with 19 months from the priority date;

(ii) before the expiration of 31 months from the priority date if Belarus is elected under Chapter II of the PCT within 19 months from the Priority date.

**With the exception of any such international application whose international filing date is on or after Apr. 14, 1993, and in which Belarus is specifically designated, in such a case, the procedure described in (e) to (g) is not applicable, and the procedure described in (h) applies. It should be noted that Belarus can be specifically designated only in those international applications filed on or after Apr. 14, 1993.

VII. Effects in Belarus of International Registrations under the Madrid Agreement Concerning the International Registration of Marks

(11) (a) As mentioned in paragraph (2), above, On Apr. 14, 1993, Belarus deposited a declaration of continuation, the effect of which was that the Madrid Agreement Concerning the International Registration of Marks is applied by Belarus.

(b) Pursuant to the deposit of the declaration of continuation and to Rule 38 of the Regulations under the Madrid Agreement, certain international registrations may have effect in Belarus subject to the conditions described below. The international registrations are those which have a territorial extension to the Soviet Union effective from a date prior to Dec. 25, 1991.

(c) The conditions referred to above are the following:

(i) the filing with the International Bureau of the World Intellectual Property Organization (WIPO) of a request;

(ii) the payment to the International Bureau of WIPO of a fee, the amount of which is 62 Swiss francs per international registration.

(d) The owner of each and every international registration concerned, or his representative (if the owner has a representative whose name appears in the International Register), will receive a written notice from the International Bureau of WIPO drawing his attention to the fact that he can, by filing a written request, obtain the continuation of the effect of the international registration in Belarus. The notice will, in particular, specify the modes of payment of the fee. The request must contain the identification of the international registration concerned by its international registration number. A form (in French) will be attached to the notice and may be used. The request must be in English or French, and may be sent by telefax or telex. The request and the corresponding payment must reach the International Bureau of WIPO before the expiration of six months from the date of the notice sent by the International Bureau of WIPO; if either the request or the fee is received later, the request will be refused. Requests and payments may be made upon receipt of the notice of the International Bureau of WIPO.

(e) If the conditions described above are fulfilled, the international registration concerned will, with respect to Belarus, have effect as of the effective date of the territorial extension to the Soviet Union and benefit from any priority validly claimed with regard to such extension.

(f) For each international registration which has a territorial extension to the Russian Federation effective as of a date between Dec. 25, 1991 and Apr. 14, 1993, the owner may request the State Patent Office of Belarus, before Aug. 5, 1993, that the said registration be processed as an application under the Belarusian legislation. The request must be accompanied by an extract from the International Register established by the International Bureau of WIPO, by a declaration that, to the best knowledge of the owner, the international registration still has effect in the Russian Federation, and by an application filed according to the Belarusian legislation.

(g) For each international registration not covered by (b) or (f), above, namely, for each international registration which has no territorial extension to the Soviet Union or to the Russian Federation or whose international registration date is later than Apr. 14, 1993, protection in Belarus can only be obtained by filing, through the intermediary of the national Office of the country of the owner, a request for territorial extension under Rule 20 of the Regulations under the Madrid Agreement. It is noted that requests for territorial extension to Belarus are possible at present.

VIII. Procedural Provisions

(12) If an applicant does not have his ordinary residence or principal place in business in Belarus, he must authorize a representative in Belarus, and all requests, applications and other documents must be filed through the intermediary of such a representative.

(13) The official fees applicable to the procedures referred to under paragraphs (3), (4), (5), (7), (8) (10) and (11)(f) are available from the State Patent Office of Belarus.

(14) Any request referred to under paragraphs (3), (4), (5), (7), (8), (10)(d)(ii) and (11)(f), above, and any declaration referred to under paragraphs (10)(d)(ii) and (11)(f), above, must be filed in Belarusian or Russian.

IX. Address of the National Patent Office of Belarus

State Patent Office of Belarus
66, pr. Skoriny
Minsk 220072
Belarus
Tel.: (70172) 395 840
Fax.: (70172) 394 130

June 11, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1152 TMOG 23]

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(253) **Regarding Patent and Trademark Rights in the Republic of Lithuania**

The State Patent Bureau of the Republic of Lithuania has provided the U.S. Patent and Trademark Office with information regarding the protection of inventions, industrial designs, and trademarks in the Republic of Lithuania.

Following is the unedited text of the SUMMARY OF INDUSTRIAL PROPERTY PROTECTION IN LITHUANIA, provided in English translation by the Government of Lithuania, outlining the status of industrial property protection in Lithuania pending enactment of new legislation.

"The system of industrial property protection in Lithuania functioned reasonably well until 1940 ('Law on Protection of Trademarks' of Jan. 27, 1925, 'Law on the Protection of Inventions and Improvements' of May 14, 1928, 'Law on the Protection of Industrial Models and Designs').

• Since 1940 industrial property protection in Lithuania had been based on legal acts of the Soviet Union.

• After Lithuania has declared it's independence it started establishing an independent national industrial property legislation. On Apr. 12, 1991, the Government of the Republic of Lithuania established the Lithuanian Patent Office, which is functioning under the name of the State Patent Bureau. On Dec. 1, 1991, the State Patent Bureau has proceeded the registration of Company Names of the Republic of Lithuania under the Regulations of Company Names.

Since Apr. 30, 1992 the Republic of Lithuania is a member of the World Intellectual Property Organization (WIPO).

• In order to ensure legal protection of industrial property (inventions, industrial designs and trademarks), rights of inventors, patent owners and investors on May 20, 1992 the Government of the Republic of Lithuania adopted a Decree No 362 on provisional measures until the laws of the Republic of Lithuania on inventions, industrial designs and trademarks are adopted. The contents of the provisional measures and their main consequences are summarized below.

INDUSTRIAL PROPERTY RIGHTS GRANTED BY THE PATENT OFFICE OF THE FORMER SOVIET UNION

1. Valid patents for inventions, as well as valid inventor's certificates, granted by the Patent Office of the former Soviet Union on the basis of applications filed beginning with Jan. 1, 1978, shall be registered as patents of the Republic of Lithuania for a period not longer than 15 years from the date of filing an application, provided that the inventor together with the applicant or the patent owner files a request to that effect with the State Patent Bureau no later than Sept. 30, 1993 and pays the prescribed State fee. Failing such a request, the patent or inventor's certificate will not have any effect in the Republic of Lithuania.
2. Industrial design for which valid industrial design patent or industrial design certificates granted by the Patent Office of the former Soviet Union on the basis of applications filed beginning with Jan. 1, 1983 shall be registered as industrial designs in the Republic of Lithuania for a period of 5 years with a possibility of renewing the registration for 5 consecutive years but not longer than for a period of 10 years from the date of filing an application provided that the creator of the industrial design together with the applicant or the patent owner files a request to that effect with the State Patent Bureau not later than Sept. 30, 1993 and pays the prescribed State fee. Failing such a request, the industrial design patent or certificate shall not have any effect in Lithuania.
3. A patent or industrial design, which has been registered under paragraph 1 or 2 above, will have no effect against any person who in the Republic of Lithuania, prior to the date of the request for registration was using the invention or industrial design protected by inventor's certificate or certificate or was making effective and serious preparation for such use.
4. Trademarks for which valid trademark certificates were granted by the Patent Office of the former Soviet Union shall be registered as trademarks in the Republic of Lithuania for a period of 10 years, provided that the owner of the trademark certificate files a request to that effect with the State Patent Bureau not later than Sept. 30, 1993 and pays the prescribed State fee. The same applies to international trademark registration effected under Madrid Agreement concerning the International Registration of Marks, for which valid trademark certificates had the territorial extension to the Former Soviet Union. Failing such a request, the trademark certificate will not have any effect in the Republic of Lithuania.
5. Priority rights may be claimed from May 20, 1992 onwards, but not later than Apr. 30, 1993, on the basis of previous patents, industrial design and trademark applications filed with the Patent Office of the former Soviet Union after Jan. 1, 1990, and which were pending on Jan. 31, 1992. Such priority rights are governed by the provisions of Article 4 of the Paris Convention for the Protection of Industrial Property.
6. Information regarding patents for inventions and industrial designs and trademark certificates shall be published in the OFFICIAL GAZETTE of the State Patent Bureau of the Republic of Lithuania.

NEW APPLICATIONS FOR INDUSTRIAL PROPERTY RIGHTS FILED WITH THE STATE PATENT BUREAU OF THE REPUBLIC OF LITHUANIA

7. Pending the enactment of industrial property legislation in Lithuania, it is possible to file patent applications and applications for the registration of industrial designs and of trademarks with the State Patent Bureau on the basis of legal acts of the Republic of Lithuania.

Foreign natural and legal persons, having their ordinary residence or principle place of business outside Lithuania, shall file requests and applications only through a patent attorney, registered in the Register of patent attorneys of the Republic of Lithuania.

Copies of the list of fees of the State Patent Bureau of the Republic of Lithuania and of the list of registered patent attorneys are available from Box 4, U.S. Patent and Trademark Office, Washington, D.C. 20231

July 7, 1993

MICHAEL K. KIRK
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks

[1153 TMOG 4]

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(254) **Regarding Industrial Property Rights in the Republic of Slovenia**

The Industrial Property Protection Office of the Republic of Slovenia has provided the U.S. Patent and Trademark Office (USPTO) with a consolidated text, in English, of the Law on Industrial Property of the Republic of Slovenia which regulates the grant and protection of patents, model rights and design rights, trademarks and service marks, and appellations of origin. In addition, the Industrial Property Protection Office has notified the USPTO that it has entered into an "extension agreement" with the European Patent Organisation that will enter into force in January 1994. After entry into force of the agreement, it will be possible to obtain patent protection in Slovenia through obtaining a European patent. The Republic of Slovenia also plans to ratify the Patent Cooperation Treaty administered by the World Intellectual Property Organization.

A copy of the consolidated text of the Slovenian industrial property law can be obtained by writing to the U.S. Patent and Trademark Office, Box 4, Washington, D.C. 20231.

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1154 TMOG 39]

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(255) **Regarding Industrial Property Rights In The Republic Of Croatia**

The State Patent Office of the Republic of Croatia has provided the U.S. Patent and Trademark Office with information regarding the protection of inventions, industrial designs, and trademarks and appellations of origin in the Republic of Croatia.

Following is the unedited text of the document provided in English translation by the Government of Croatia, outlining the status of industrial property protection.

"I. INTELLECTUAL PROPERTY IN THE REPUBLIC OF CROATIA

MEMBERSHIP IN INTERNATIONAL ORGANIZATIONS, CONVENTIONS AND TREATIES

The Republic of Croatia is a party to the following conventions:

•the Convention Establishing the World Intellectual Property Organization;
• the Paris Convention for the Protection of Industrial Property;
• the Madrid Agreement Concerning the International Registration of Marks;
•the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks;
•the Locarno Agreement Establishing an International Classification for Industrial Designs;
•the BERNE Convention for the Protection of Literary and Artistic Works based on the notifications confirmed by the Director General of the World Intellecutal Property Organization, in his letter of 29, July, 1992, considered to be effective from 8, October, 1991, the date of indepandance declaration of the Republic of Croatia.

This fact grants the continuity of membership of the Republic of Croatia in the aforementioned conventions, starting from the found state of former Socialist Federal Republic of Yugoslavia.

II. INDUSTRIAL PROPERTY IN THE REPUBLIC OF CROATIA

1. MAIN FEATURES OF INDUSTRIAL PROPERTY LAW IN THE REPUBLIC OF CROATIA

Industrial Property Law comprises:
•patents;
•designs;
•trademarks and service marks;
•appellations of origin.

According to this Law, which is basically in accordance with the aforementioned conventions and arrangements, the validity of patent is 20 years, and the validity of designs and marks 10 years upon the submission of the patent application. The validity of marks can be renewed without limitations. Foreign legal and physical persons are obliged to protect their industrial property rights in the Republic of Croatia by means of an authorized representative, either a Croatian citizen or a local legal entity.

3. INDUSTRIAL PROPERTY IN THE REPUBLIC OF CROATIA-PROSPECTS

A new law on industrial property is expected to be passed during 1994, conceding the use of the institution of complete examination of conditions for the grant of patents. Within general activities aimed at harmonization and unification of the legal provisions governing idustrial property rights, the State Patent Office will take up the activities concerning the admission to PCT and the European Patent Convention.

4. INDUSTRIAL PROPERTY RIGHTS GRANTED OR APPLIED FOR BY SUBMITTING AN APPLICATION, TO THE FORMER FEDERAL PATENT OFFICE FOR THE TERRITORY OF FORMER YUGOSLAVIA (SFRY)

4.1. The Industrial property rights granted through the former Federal Patent Office up to 8 October, 1991 are regulated in Article 10, paragraph 1 and 2 of the Law on Changes and Amendments of the Law on Protection of Inventions, Technical Improvements and Distinctive Signs ("Official Gazette of the Republic of Croatia", 2 April, 1992): 'All rights of industrial property which are granted by the decisions of the former Federal Patent Office up to 8 October 1991 are valid on the territory of the Republic of Croatia up to their expiration. Upon the request of the rightfull claimants from the aforementioned paragraph, the State Patent Office will enter this particular right into the corresponding register.'

4.2. Rights acquired in former Yugoslavia by the international registration of marks (International Bureau of WIPO, Geneve)

The Assembly of the Madrid Union on 29 September, 1992 adopted the new Rule No. 38, which apart from the Republic of Croatia applies to Solvenia and Ukraine, of the Regulations under the Madrid Arrangement, according to which the internationally registered marks with the territorial sign YU with the dates earlier 1 December, 1992 can be effective in the Republic of Coratia, provided that:
•a request is submitted to the International Bureau of WIPO, Geneve (on the basis of the written notification of the International Bureau of WIPO);
•a fee in the amount of 62 Swiss francs for each internationally registered mark is paid to the International Bureau.

The International Bureau will by the end of 1992 notify in written form each of the owners of the internationally registered mark with the sign YU, with the appeal to utilize the possibility provided by the Rule No. 38 prior to March 1, 1994.

4.3. The Industrial property rights applied for by submitting the application at the former Federal Patent Office before 8 October, 1991, which were not granted or declined, can be effected in the Republic of Croatia by submitting the same applications to the State Patent Office until 4 November, 1993 (this period was prolonged by the Regulation of the Government of the Republic of Croatia of 14 April, 1993)."

The address of the State Patent Office is:

State Patent Office
of the Republic of Croatia
Avenija Vukovar 78 41000 Zagreb
CROATIA

The State Patent Office of the Republic of Croatia has also provided a copy of the fees charged and a list of patent attorneys authorized to practice. Copies of these can be provided on request. Please send request to U.S. Patent and Trademark Office, Office of Legislation and International Affairs, Box 4, Washington, D.C. 20231.

Nov. 4, 1993

BRUCE A. LEHMAN
Assistant Secreaty of Commerce and Commissioner of Patents and Trademarks

[1156 TMOG 112]

(256) **Regarding Patent And Trademark Rights In The Former Yugoslav Republic Of Macedonia**

The Ministry of Development of the former Yugoslav Republic of Macedonia has provided the U.S. Patent and Trademark Office with information regarding the status of industrial property protection within the former Yugoslav Republic of Macedonia.

Following is the *unedited text* of the ANNOUNCEMENT ON THE PROTECTION OF INDUSTRIAL PROPERTY IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA, provided in English translation by the Ministry of Development.

"The present situation of industrial property protection in the former Yugoslav Republic of Macedonia is summarized below.

I. Legislation

(1) On July 14, 1993, the Industrial Property Act entered into force. An Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia will be set up within a few months.
(2) Pending the setting-up of the said Office, applications for patents for inventions, utility models, industrial designs, trademarks, service marks and appellations of origin may be filed with the Ministry of Development in order to establish a filing or priority date. Applications so filed will not, however, be processed to grant or refusal until the said Office has been established.

II. Application of International Treaties

(3) On July 23, 1993, the former Yugoslav Republic of Macedonia deposited a declaration the effect of which is that all those treaties administered by WIPO to which Yugoslavia was party continue to be applicable as far as the former Yugoslav Republic of Macedonia is concerned. Those treaties are: the Convention Establishing the World Intellectual Property Organization, the Paris Convention for the Protection of Industrial Property, the Madrid Agreement Concerning the International Registration of Marks, the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the Locarno Agreement Establishing an International Classification for Industrial Designs and the Berne Conventon for the Protection of Literary and Artistic Works.

(4) A further announcement will be made on the procedure to be followed to confirm the effect of international registrations to Rule 38 of the Regulations under the Madrid Agreement.

III. Applications for Industrial Property Rights Previously Filed with the Former Federal Patent Office in Belgrade and Industrial Property Rights Granted by the Former Federal Patent Office in Belgrade

(5) The applicant of any application for an industrial property right filed with the former Federal Patent Office in Belgrade prior to April 26, 1992, may file with the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia, after its establishment and prior to July 7, 1994, a request that the application be further processed.
(6) The owner of any industrial property right granted by the former Federal Patent Office in Belgrade and valid on July 7, 1993, may file with the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia, after its establishment and prior to July 7, 1995, a request to the effect that the granted industrial property right be considered for the remaining period of its validity as an industrial property right granted by the Office for the Protection of Industrial Property of the former Yugoslav Republic of Macedonia.

IV. Address of the Ministry of Development

Ministry of Development
Bote Bocevski 9
91000 Skopje
The former Yugoslav Republic of Macedonia

Telephone (3891) 220 678
Telefax (3891) 223 027

Nov. 4, 1993 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1156 TMOG 113]

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(257) **Regarding Industrial Property In The Kygyz Republic**

The following notice is reprinted from the December 1993 edition of "Industrial Property" published by the World Intellectual Property Organization, giving the status of industrial property protection in the Kyrgyz Republic:

The present situation of industrial property protection in the Kyrgyz Republic is summerized below.

I. Legislation

(1) Pending the enactment of the industrial property laws, the Government of the Kyrgyz Republic adopted, on August 2, 1993, the Provisional Regulations on Industrial Property, which cover inventions, utility models, industrial designs and trademarks. It is possible, as of August 2, 1993, to file applicastions for the grant of patents for inventions and for the registration of utility models, industrial designs and trademarks with the Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic.

II. Application of International Treaties

(2) The Kyrgyz Republic intends to become party to the Convention Establishing the World Intellectual Property Organization (WIPO), to the Paris Convention for the Protection of Industrial Property, to the Madrid Agreement Concerning the International Registration of Marks, to the Patent Cooperation Treaty (PCT) and to the Nice Agreement Concening the International Classification of Goods and Services for the Purposes of the Registration of Marks.
(3) Announcements will be made as soon as the Kyrgyz Republic becomes party to the treaties mentioned in paragraph (2), above, or to any other treaties administered by WIPO. Details will be given at that stage of the procedures to be followed to confirm the application to the Kyrgyz Republic of certain international applications under the PCT and certain international registrations under the Madrid Agreement.

III. Reregistration of Industrial Property Titles Granted by the Patent Office of the Soviet Union and Further Processing of Pending Applications

(4) The owner of a patent for invention, an inventor's certificate, an industrial design patent or certificate granted by the Patent Office of the Soviet Union and still in force may file directly with the Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic before May 1, 1994, a request for the grant of a Kyrgyz patent for invention, design patent or trademark certificate.
(5) An applicant of an application for a patent for invention, for an industrial design patent or for a trademark certificate filed before August 2, 1993, with the express or implied intention of obtaining protection also in the Kyrgyz Republic and pending with the Patent Office of the Russian Federation may file with Patent Department of the State Committee on Science and New Technologies of the Kyrgyz Republic before May 1, 1994, a request that the application be further processed under Kyrgyz legislation.

IV. Procedural Provisions

(6) The procedures referred to in paragraphs (1), (4) and (5) are subject to payment of the prescribed fees.

V. Address of the Patent Office

Patent Department of the State Committee on Science and New Technology
87, Isanov St.
720001 Bishkek
Kyrgyz Republic
Telephone: (3312) 21 54 86
21 54 94

Facsimile: (3312) 21 25 91

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1160 TMOG 14]

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(258) **Department of Commerce Patent and Trademark Office**

37 CFR Part 10
[Docket No. 9511277-5277-01]
RIN 0651-AA65

Cross-Appeals in Patent and Trademark Office Disciplinary Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (PTO) is amending a rule of practice in disciplinary cases to provide a time period for filing a cross-appeal to the Commissioner of Patents and Trademarks after the initial decision of the Administrative Law Judge (ALJ). This amendment will simplify the appeals practice in disciplinary cases by eliminating the need to file contingent appeals.
Effective Date: January 16, 1996.
For Further Information Contact: Karen L. Bovard, 703-308-5316.
Supplementary Information: The PTO issued a second notice of proposed rulemaking to amend a rule of practice in practitioner disciplinary proceedings. 60 FR 4395, Jan. 23, 1995. Under the existing practice, after the ALJ's initial decision, a party (either the respondent or the Director of the office of Enrollment and Discipline) might be obliged to file a contingent appeal to protect cross-appealable issues in the event the opposing party filed an appeal. The amended rule provides a time period for the party to file a cross-appeal after the opposing party has appealed to the Commissioner from the ALJ's initial decision.
No comment to the second notice of proposed rulemaking was received. The proposed rule is adopted.

Other Considerations

This rule change conforms with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12612 and 12866, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*
The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy of the Small Business Administration that the rule change will not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of the rule change is to provide a time period to file a cross-appeal in a PTO disciplinary proceeding. See the first notice of proposed rulemaking, 58 FR at 38996.

The PTO has determined that the rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive order 12612. The rule change is not significant for the purposes of Executive Order 12866.
The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 10

Administrative practice and procedure, Inventions and patents, Lawyers, Reporting and recordkeeping requirements.
Pursuant to the authority contained in 35 U.S.C. 6, the PTO amends 37 CFR part 10 as follows:

Part 10-Representation of Others Before the Patent and Trademark Office

1. The authority citation for 37 CFR part 10 would continue to read as follows:

Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

2. Section 10.155 is amended by revising paragraph (a) to read as follows:

§ 10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under § 10.154, either party may appeal to the Commissioner. If an appeal is taken, the time for filing a cross-appeal expires (1) 14 days after the date of service of the appeal pursuant to § 10.142 or (2) 30 days after the date of the initial decision of the administrative law judge, whichever is later. An appeal or cross-appeal by the respondent will be filed and served with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal or cross-appeal, the Director shall serve on the other party a copy of the appeal or cross-appeal. The other party to an appeal or cross-appeal may file a reply brief. A respondent's reply brief shall be filed and served in duplicate with the Director. The time for filing any reply brief expires thirty (30) days after the date of service pursuant to § 10.142 of an appeal, cross-appeal or copy thereof. If the Director files a reply brief, the Director shall serve on the other party a copy of the reply brief. Upon the filing of an appeal, cross-appeal, if any, and reply briefs, if any, the Director shall transmit the entire record to the Commissioner.

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December 7, 1995 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[182 TMOG 517]

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(259) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated January 9, 1996**

Since copies of the Trademark Official Gazette dated January 9, 1996, were not mailed until January 16, 1996, the thirty-day opposition period for marks published in the Trademark Official Gazette dated January 9, 1996, is extended from February 8, 1996, until February 15, 1996.

January 22, 1996 ROBERT M. ANDERSON
Deputy Assistant Commissioner for Trademarks

[1182 TMOG 581]

174-406 O.G.-97-18: QL3

(260) **Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated January 16, 1996**

Since copies of the Trademark Official Gazette dated January 16, 1996, were not mailed until January 19, 1996, the thirty-day opposition period for marks published in the Trademark Official Gazette dated January 16, 1996, is extended from February 15, 1996, until February 20, 1996.

January 22, 1996 ROBERT M. ANDERSON
Deputy Assistant Commissioner for Trademarks

[1182 TMOG 584]

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(261) **Closing of the Patent and Trademark Office on Monday, January 8, 1996 through Wednesday, January 10, 1996**

In view of the official closing of the Federal government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Monday, January 8, 1996 through Wednesday, January 10, 1996, the Patent and Trademark Office will consider each of those days, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21 and 37 C.F.R. §§ 1.6, 1.7 and 1.10. Any action or fee due on any of those days will be considered as being timely filed if the action is taken, or the fee paid, on the next succeeding business day on which the Patent and Trademark Office was open, that is, Thursday, January 11, 1996.

January 24, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1183 TMOG 59]

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(262) **Closing of the Patent and Trademark Office on Friday, January 12, 1996**

In view of the official closing of the Federal government offices in the Washington, D.C. metropolitan area, including the Patent and Trademark Office, on Friday, January 12, 1996, the Patent and Trademark Office will consider January 12, 1996, a "federal holiday within the District of Columbia" under 35 U.S.C. § 21 and 37 C.F.R. §§ 1.6, 1.7 and 1.10. Any action or fee due on that day will be considered as being timely filed if the action is taken, or the fee paid, on the next succeeding business day on which the Patent and Trademark Office was open, that is, Tuesday, January 16, 1996 (Monday, January 15, 1996, was a federal holiday, Martin Luther King, Jr's. Birthday).

January 24, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1183 TMOG 60]

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(263) **Right of Priority in Patent and Trademark Applications Available in Taiwan**

On the basis of a Memoradum of Understanding signed on April 10, 1996, between the American Institute in Taiwan and the Taipei Economic and Cultural Representative Office in the United States, U.S. applicants seeking patent protection in Taiwan may avail themselves of the right of priority based on patent applications filed in the United States, on or after April 10, 1996.

In accordance with the same Memorandum of Understanding, U.S. applicants seeking trademark protection in Taiwan may avail themselves of the right of priority based on applications for trademark registration filed in the United States, on or after December 24, 1993.

To receive the right of priority in Taiwan, applications for patents and trademark registrations must be filed there within such time period from the filing of the first application in the United States, as specified by the laws and regulations of Taiwan. The right of priority, on the basis of reciprocity, is also available to applicants from Taiwan seeking patent protection or trademark registration in the United States.

April 30, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1186 TMOG 50]

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(264) **United States Postal Service Emergency in the State of California Terminated**

The service interruption in United States Postal Service (USPS) in the State of California that occurred on June 29, 1995, due to the action of the UNABOM bomber, caused the USPS to maintain heightened security procedures for mail originating in the State of California. Currently there are no extraordinary restrictions being placed on Express Mail originating in the State of California. Therefore, the Patent and Trademark Office (PTO) is terminating the postal service interruption and emergency declared in the Official Gazette Notice entitled "United States Postal Service Interruption and Emergency in the State of California", 1176 *Off. Gaz. Pat. Office* 74 (July 18, 1995). Any questions regarding this Notice should be directed to Jeffrey V. Nase, Patent Legal Administrator, (703) 305-9285, PK1-520, for patent-related matters, and to Lynne G. Beresford, Trademark Legal Administrator, (703) 308-8900, 10B10 ST, for trademark-related matters.

June 4, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1188 TMOG 15]

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(265) **Department of Commerce Patent and Trademark Office**

Renewal and Amendment of the Charter of the Public Advisory Committee for Trademark Affairs

Agency: Patent and Trademark Office, Commerce.
Action: Notice.
Summary: In accordance with the provisions of the Federal Advisory Committee Act, 5 U.S.C. App. (1976), and after consultation with GSA, it has been determined that the renewal and amendment of the charter of the Public Advisory Committee for Trademark Affairs is in the public interest in connection with the performance of duties imposed on the Department by law. The charter was renewed on May 23, 1996. Charter amendments will allow the Assistant Secretary of Commerce and Commissioner of Patents and Trademarks (Assistant Secretary) to select organizations which are representative of the Intellectual Property community. Each selected organization will, in turn, be able to appoint a designated number of members to the Committee. Committee membership will be limited to no more than 15 members. These members will serve staggered 3-year terms.
Supplementary Information: The Committee was first chartered in January 1973 and is now being renewed and its charter amended. The Committee's purpose is to advise the Patent and Trademark Office (Office) on ways to increase the Office's efficiency and effectiveness and to provide a continuing flow of knowledge from the private sector to the Office in the areas of international and domestic trademark law.

The Office is amending the charter of the Committee to make the Committee more diverse and more representative of trademark owners, trademark practitioners and the Intellectual Property community as a whole. The Assistant Secretary will select representative organizations from among intellectual property organizations, bar groups, business-related organizations and academia, and determine the number of Committee members each organization can choose.

Allowing each representative organization to select its own Committee member(s) will ensure that the Committee represents the concern of each member organization. Member will serve staggered three-year terms. No member may serve more than two consecutive terms.

The size of the Committee is being reduced from its former level of 18 members to 15 members. After experience with both an 18-member and 15-member Committee, the smaller number seems to work better.

The Committee Chair will be selected by the Assistant Secretary and will serve a one-year term. No individual may be the Chair for more than two consecutive terms.
For Further Information Contact: Lynne G. Beresford at (703) 308-8900, by fax at (703) 308-7220, or by mail marked to her attention and addressed to:

Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Any organization which has an interest in the Committee should contact Ms. Beresford. A list of interested organizations will be maintained in the Office of the Assistant Commissioner for Trademarks.

June 26, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1188 TMOG 101]

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(266) **Department of Commerce Patent and Trademark Office**

37 CFR Part 2
[Docket No. 960621181-6181-01]
RIN 0651-AA89

Elimination of Requirement for Proof of Service in Consented Requests for Extensions of Time to File a Notice of Opposition

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule
Summary: This rule deletes the requirement for proof of service when a request for an extension of time to oppose registration of a trademark is based upon a statement that applicant has consented to the request. This rule will simplify opposition proceedings by eliminating an unnecessary requirement.
Effective Date: July 15, 1996. This rule will be applicable to all relevant correspondence filed with the Office on or after the effective date.
For Further Information Contact: David Sams by telephone at (703) 308-9330, by facsimile transmission at (703) 308-9333, or by mail marked to his attention and addressed to the Assistant Commissioner for Trademarks, Box TTAB, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
Supplementary Information: Section 2.102(c)(2), which provides for an extension of time for filing an opposition under 37 CFR Part 2, is revised to delete the requirement that proof of service be included in consented extension requests. This change permits potential opposers to request an extension of time to oppose aggregating more than 120 days from the date of publication based on a written statement that the applicant or its authorized representative has consented to the request. The Office believes that the requirement for proof of service is unnecessary when the applicant has assertedly consented to the filing of the extension request. The Trademark Trial and Appeal Board sends a copy of the request together with the Board's action thereon to the applicant, which may file a request for reconsideration of the Board's action if necessary.

The Patent and Trademark Office has determined that this revision is procedural and remedial in nature, and this revision is therefore being published as a final rule. 5 U.S.C. 553(b)(3)(A) & (B). This rule is not a significant rule for the purposes of Executive Order 12866. No notice of proposed rulemaking is required for this rule under 5 U.S.C. 553 or any other law, so a regulatory flexibility analysis is not required and has not been prepared. 5 U.S.C. 603(a).

List of Subjects in 37 CFR Part 2

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble, and pursuant to the authority contained in 15 U.S.C. 1123 and 35 U.S.C. 6, part 2 of title 37 of the Code of Federal Regulations is amended as set forth below:

PART 2 - RULES OF PRACTICE IN TRADEMARK CASES

1. The authority citation for 37 CFR Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Section 2.102(c)(2) is revised to read as follows:

§ 2.102—Extension of time for filing an opposition.

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(c) ***
(2) a written request by the potential opposer or its authorized representative stating that the applicant or its authorized representative has consented to the request, or

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July 2, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1189 TMOG 14]

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(267) **Department of Commerce Patent and Trademark Office**

37 CFR Parts 15 and 15a
[Docket No. 960722200-6200-01]
RIN 0651-XX07

Service of Process; Testimony by Employees and the Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: This final rule removes parts dealing with service of process on Patent and Trademark Office (PTO) employees in their official capacity and with testimony by employees and production of documents in legal proceedings. The PTO will rely on analogous Commerce Department regulations found in title 15 of the Code of Federal Regulations.
Effective Date: August 19, 1996
For Further Information Contact: Kenneth Corsello by telephone at (703) 305-9041; by mail marked to his attention and addressed to the Office of the Solicitor, Box 8, Washington, D.C. 20231; by electronic mail to corsello@uspto.gov; or by fax marked to his attention at (703) 305-9373.
Supplementary Information: In March 1995, President Clinton issued a directive to Federal agencies regarding their responsibilities under his Regulatory Reform Initiative. This initiative is part of the National Performance Review and calls for immediate, comprehensive regulatory reform. The President directed all agencies to undertake, as part of this initiative, an exhaustive review of all of their regulations—with an emphasis on elimi-

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nating or modifying those that are osbolete or otherwise in need of reform. This final rule is part of the Regulatory Reform Initiative.

The Department of Commerce regulations dealing with service of process (15 CFR Part 15) and with employee testimony and the production of documents (15 CFR Part 15a) apply to the PTO. Therefore, the PTO is removing 37 CFR Parts 15 and 15a because they are unnecessary and duplicative.

This rule is not a significant rule for the purposes of Executive Order 12866. Notice and comment is not required for this rulemaking because it relates to agency management or personnel, 5 U.S.C. 553(a)(2), and thus no regulatory flexibility analysis is required, 5 U.S.C. 603(a). This rule does not change the paperwork burden imposed on the public. *See* 44 U.S.C. 3501 *et seq.*

List of Subjects

37 CFR Part 15

Attorneys, Administrative practice and procedure, Courts, Government employees.

37 CFR Part 15a

Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, 37 CFR Chapter I is amended as follows:

Part 15 — [Removed and Reserved]

1. Part 15 is removed and reserved.

Part 15a — [Removed and Reserved]

1. Part 15a is removed and reserved.

August 13, 1996 — BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1190 TMOG 46]

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(268) **Department of Commerce**
Patent and Trademark Office

37 CFR Part 2
[Docket No. 960828232-6232-01]
RIN 0651-AA90

Recordal Fees Associated with the Fastener Quality Act

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking.
Summary: The Patent and Trademark Office (PTO) is proposing to establish fees associated with recordation of insignias of manufacturers and private label distributors to ensure the traceability of a fastener to its manufacturer or private label distributor. This proposal is in accordance with provisions of the Fastener Quality Act (Public Law 101-592, as amended by Public Law 104-113).
Dates: Written comments must be submitted on or before October 17, 1996. No meeting will be held.
Addresses: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Lizbeth Kulick, Office of the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513 or by fax to (703) 308-7220.
For Further Information Contact: Lizbeth Kulick by telephone at (703) 308-8900, or by fax at (703) 308-7220, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Va. 22202-3513.

Supplementary Information

The Department of Commerce issued a notice of proposed rulemaking to implement the Fastener Quality Act. 57 FR 37032, Aug. 17, 1992. Under that notice, the task of recording fastener insignia was assigned to the PTO. 57 FR 37033-35, Aug. 17, 1992. That notice provided for recovery of insignia costs through user fees. 57 FR 37035-36, Aug. 17, 1992. The PTO proposes three twenty-dollar fees to recover its costs associated with the insignia recordation program.

Cost Calculations

The cost of processing an application for recordal of an insignia is as follows:

Compensation and Benefits	1,000
Hardware and Software Costs	4,500
Subtotal	5,500
General and Administrative Overhead @ 17%	950
Total Costs	6,450
Estimated Workload	300
Fee Amount	21.50
Rounded Fee	**$20**

Two rules, 37 CFR §§ 2.53 and 2.189, are being removed because they are not necessary. Section 2.53 specifies the manner in which drawings must be transmitted. Section 2.189 simply states the Office's policy on publishing amendments to the rules. The policy is not changing, but does not have to be stated as a rule.

Other Considerations

It has determined that this rule is not significant for the purposes of Executive Order 12866. The information collections required by this proposed rule are pending approval before the Office of Management and Budget (OMB number 0651-0028). The affected public would be manufacturers and private label distributors of certain types of industrial fasteners. The estimated average number of responses is six hundred. The estimated time per response is ten minutes, so the estimated total annual burden is one hundred hours. The collected information is needed to ensure that a fastener can be traced to its manufacturer or private label distributor.

This proposed fee does not require notice and comment under 5 U.S.C. 553 or any other statute, so no analysis or certification is required under 5 U.S.C. 603(a).

Lists of Subjects

37 CFR Part 2

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble, the PTO proposes to amend 37 CFR part 2 as set forth below.

Part 2 - Rules Applicable to Trademark Cases

1. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

2. Part 2 is amended by adding Section 2.7 to read as follows:

§ 2.7 Fastener Recordal Fees

(a) Application fee for recordal of insignia.	$20.00
(b) Renewal of insignia recordal	$20.00
(c) Surcharge for late renewal of insignia recordal	$20.00

3. Section 2.53 is removed.

4. Section 2.189 is removed.

September 10, 1996 — BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1191 TMOG 49]

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(269) **Treatment of Correspondence Deposited as First Class Mail Pursuant to 37 CFR 1.8 and Returned by the U.S. Postal Service**

Due to heightened security concerns, effective September 1, 1996, the United States Postal Service (USPS) is requiring that all *domestic first-class mail, bearing stamps and weighing sixteen ounces, or more*, be presented to a retail clerk at a USPS office. All such mail that is not presented to a retail clerk at a USPS office (*e.g.*, placed in a mailbox) will be returned by the USPS. The USPS has posted notice of this requirement on mailboxes. The "Express Mail" service of the USPS is not affected.

37 CFR 1.8 provides that certain correspondence will be considered timely filed by the Patent and Trademark Office (PTO) if, among other things, it is deposited with the USPS by the due date, and includes a certificate of mailing that sets forth the date the person signing the certificate reasonably expected the correspondence to be mailed. Correspondence must be deposited with the USPS as first class mail in compliance with any and all applicable requirements of the USPS to be considered "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A). Correspondence presented to the USPS in a manner that does not comply with the applicable requirements of the USPS is not "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A) and is not entitled to any benefit under 37 CFR 1.8.

To alleviate hardships caused by this change in USPS requirements, the PTO will treat correspondence returned by the USPS because of its size as "[d]eposited with the U.S. Postal service" within the meaning of 37 CFR 1.8(a)(1)(i)(A), so long as the correspondence was otherwise originally deposited with the USPS in compliance with 37 CFR 1.8(a)(1)(i) on or before December 1, 1996. Returned mailed that is either resubmitted to the USPS for delivery, or hand-delivered to the PTO, will be stamped by the PTO with the actual date of receipt in the PTO. The correspondence will, however, be accorded the benefit of any certificate of mailing under 37 CFR 1.8.

Correspondence mailed after December 1, 1996, and returned by the USPS as not mailed in compliance with USPS requirements concerning mail weighing sixteen ounces or more will not be entitled to any benefit under 37 CFR 1.8.

Because this change in USPS requirements does not affect the "Express Mail" service of the USPS, it does not affect correspondence filed in compliance with 37 CFR 1.10. Persons filing correspondence in a manner other than by the procedures set forth in 37 CFR 1.8 or 1.10 do so at their own risk.

Questions concerning this notice should be directed to Senior Legal Advisor Robert W. Bahr at (703) 305-9285.

October 10, 1996 — BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1192 TMOG 43]

(270) **Department of Commerce**
Patent and Trademark Office

37 CFR Parts 1, 2, 5 and 10
[Docket No. 951006247-6255-02]
RIN 0651-AA70

Communications with the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending its rules of practice to (1) specify addresses for agency mail to expedite mail delivery, (2) define "Federal holiday within the District of Columbia," (3) clarify and simplify procedures for filing papers and fees by "Express Mail," and (4) remove certain exclusions from § 1.8(a)(2)(ii) to permit additional trademark documents to be considered timely filed if they are mailed or transmitted by the due date and in compliance with § 1.8(a)(1).
Effective Date: December 2, 1996.
For Further Information Contact: Lawrence E. Anderson (for patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Nancy L. Omelko (for trademark-related matters) by telephone at (703) 308-8910, extension 39, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
Supplementary Information: In a Notice of Proposed Rulemaking published in the Federal Register at 57 FR 55691 (November 2, 1995) and in the Patent and Trademark Office *Official Gazette* at 1180 *Off. Gaz. Pat. Office* 122 (November 28, 1995), the Office proposed to change addresses for correspondence with the Office to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; to add a separate mailing address in the Office of the Solicitor for disciplinary matters; and to delete the requirement for a certificate of mailing by Express Mail from § 1.10(b).

The following includes a discussion of the rules being changed, the reasons for those changes, and an analysis of the comments received in response to the Notice of Proposed Rulemaking.

General Mailing Addresses

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents, except for patent documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of patent documents, which should be addressed to the Commissioner of Patents and Trademarks; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents, which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. In addition, there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation. These addresses are set forth and discussed below.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Patent-Related Mail

Section 1.1 is amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice entitled "Change of Address for Patent Applications and Patent

Related Papers," published in the Patents *Official Gazette* at 1173 *Off. Gaz. Pat. Office* 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to § 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board (excluding Notices of Appeal and appeal briefs), patent services including patent copy sales, assignments, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the Patents *Official Gazette* should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Trademark-Related Mail

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. When trademark-related documents are filed with a certificate of mailing, pursuant to § 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice entitled "Change of Address for Trademark Applications and Trademark Related Papers," published in the *Federal Register* at 59 FR 29275 (June 6, 1994) and in the Trademarks *Official Gazette* at 1163 *Off. Gaz. Trademark Office* 80 (June 28, 1994) (republished at 1170 *Off. Gaz. Pat. Office* 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the Trademarks *Official Gazette*. Use of the boxes is encouraged, to expedite processing of incoming mail.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

Hand-Carried Correspondence

All correspondence with the Office, except for communications relating to pending litigation as specified in amended § 1.1(a)(3)(i), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia. Hand delivery of trademark papers and fees directly to the South Tower Building is recommended, to expedite processing.

Trademark Documents Filed With Certificates of Mailing or Transmission Under § 1.8

The Office is amending § 1.8(a)(2) to remove the exclusions listed in § 1.8(a)(2)(ii)(B) through (F). This will permit the following trademark documents to be considered timely filed if they are mailed or transmitted by the due date and in compliance with § 1.8(a)(1): (1) affidavits of continued use or excusable non-use, under 15 U.S.C. 1058; (2) renewal applications, under 15 U.S.C. 1059; (3) amendments to allege use, under 15 U.S.C. 1051(c); (4) statements of use, under 15 U.S.C. 1051(d)(1); (5) requests for extensions of time to file a statement of use, under 15 U.S.C. 1051(d)(2); and (6) petitions to cancel registered marks, under 15 U.S.C. 1064. This change is intended to make filing easier and less expensive because a significantly larger number of documents will be considered timely filed using the simpler, less expensive first class mailing provisions of § 1.8.

Section 2.165(a)(1), dealing with affidavits of use or excusable non-use filed under Section 8 of the Trademark Act, is amended by deleting the last sentence referencing the inapplicability of certificates of mailing provided by § 1.8.

It should be noted that § 1.6(d)(8), which provides that correspondence other than notices of ex parte appeal may not be transmitted by facsimile to the Trademark Trial and Appeal Board, will not change. Thus, while a cancellation petitioner may now ensure timely filing with the certificate of mailing procedure set forth in § 1.8(a)(1), the petitioner may not transmit the above-mentioned documents directed to the Trademark Trial and Appeal Board by fax or ensure timely filing with the certificate of facsimile transmission.

Section 1.8(a)(2)(ii)(A), which states that the Certificate of Mailing or Transmission Procedure does not apply to the filing of applications for registration of marks, will not change. The filing date of an application is considered to be much more critical than the filing dates of the papers accepted under § 1.8. For example, in Trademark applications, the granting of a filing date to an application potentially establishes a date of constructive use of the mark, and is also critical for determining whether foreign priority can be claimed under 15 U.S.C. 1126(d); therefore, entry of the date of deposit by a disinterested USPS employee is required.

Express Mail

Section 1.10 is being amended to simplify and clarify the procedures for filing correspondence by the "Express Mail Post Office to Addressee" (Express Mail) service of the United States Postal Service (USPS), by deleting the requirement for a Certificate of Mailing by Express Mail.

Section 1.10 was promulgated to implement 35 U.S.C. 21, under which the Commissioner may "by rule prescribe that any paper or fee required to be filed in the Patent and Trademark Office will be considered filed in the Office on the date on which it was deposited with the United States Postal Service."

Under the prior rule, the filer was required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Papers which did not include this certificate, or which included a certificate that did not meet the requirements of the rule, were given a filing date as of the

date received in the Office rather than the date of deposit as Express Mail. The lost filing date for a significant number of these papers resulted in the loss of substantive rights. In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail and its apparent redundancy in purpose, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office has deleted this requirement from § 1.10(b).

Under the new rule, Office personnel will routinely look to the Express Mail mailing label, and stamp the "date-in" or other official USPS notation as the filing date of the correspondence. If the USPS deposit date cannot be determined, the correspondence will be accorded the date of receipt in the Office as the filing date.

Section 1.10(b), as amended, provides that the Express Mail mailing label number should be placed on correspondence filed by Express Mail under § 1.10 prior to the original mailing. Correspondence *actually received* by the Office will not be denied a filing date as of the date of deposit with the USPS because the Express Mail mailing label number was not placed thereon prior to its original mailing. However, the absence of the number of the Express Mail mailing label will preclude a party from obtaining relief on petition, under §§ 1.10(c) through (e).

Section 1.10(b) also provides that correspondence should be deposited directly with an employee of the USPS to ensure that the person depositing the correspondence receives a legible copy of the Express Mail mailing label with the "date-in" clearly marked, and that persons dealing indirectly with the employees of the USPS (such as by deposit in an Express Mail drop box) do so at the risk of not receiving a copy of the Express Mail mailing label with the desired "date-in" clearly marked.

Sections 1.10(c) through 1.10(e) set forth procedures for petitioning the Commissioner to accord a filing date as of the date of deposit as Express Mail. Section 1.10(c) applies where there is a discrepancy between the filing date accorded by the Office and the "date-in" or other official notation entered by the USPS on the Express Mail mailing label; § 1.10(d) applies where the "date-in" is incorrectly entered by the USPS; and § 1.10(e) applies where correspondence deposited with the USPS as Express Mail is not received by the Office.

Miscellaneous Changes

Sections 1.3 and 5.33 are also being amended to change "communications" to "correspondence," and for consistency with §§ 1.1, 1.6, and 1.8.

Section 1.6(a)(2) is amended to provide that correspondence deposited as Express Mail in accordance with § 1.10 will be considered filed on the date of its deposit, regardless of whether that date is a Saturday, Sunday or Federal holiday within the District of Columbia.

Section 1.9 is amended to add a definition of a "Federal holiday within the District of Columbia" to include an official closing of the Office.

Since the certificate of mailing by Express Mail is no longer a requirement of § 1.10, the provisions of Part 10 relating to misconduct have been amended to delete reference to this requirement.

Discussion of Specific Rules

The heading of § 1.1 is amended to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is amended to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). The remaining paragraphs of § 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) sets forth the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) sets forth the new mailing address to which most trademark-related documents should be sent. It is noted that correspondence not addressed according to (a)(1) and (a)(2), but sent instead to the Commissioner of Patents and Trademarks, will not be refused consideration but may be delayed in processing. The Solicitor's mailing address, formerly set out in paragraph (g) of the section, is moved to a new paragraph (a)(3). Paragraph 1.1(g) is removed and reserved.

Sections 1.1 and 1.3 are amended so that the word "communications" is changed to "correspondence."

Section 1.5(a) is amended by removing the requirement that the words "PATENT APPLICATION" appear on letters concerning patent applications. The remainder of the section remains unchanged.

Section 1.6(a)(1) is amended to add the sentence "[t]he Patent and Trademark Office is not open for the filing of correspondence on any day that is a Saturday, Sunday or Federal holiday within the District of Columbia." In addition, § 1.6(a)(1) is further amended to add the phrase "[e]xcept for correspondence transmitted by facsimile as provided for in paragraph (a)(3) of this section" to the beginning of the sentence "[n]o correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia." Since the Office may "receive" a facsimile transmission under § 1.6(a)(3) on a Saturday, Sunday or Federal holiday within the District of Columbia, § 1.6(a)(1) is amended to add the phrase "[e]xcept for correspondence transmitted by facsimile as provided for in paragraph (a)(3) of this section" for clarity and consistency with § 1.6(a)(3). In addition, § 1.6(a)(1) is amended to begin with the sentence "[t]he Patent and Trademark Office is not open for the filing of correspondence on any day that is a Saturday, Sunday or Federal holiday within the District of Columbia" to clarify that any day that is a Saturday, Sunday or Federal holiday within the District of Columbia is a day that the Patent and Trademark Office is not open for the filing of applications within the meaning of Article 4(C)(3) of the Paris Convention.

Section 1.6(a)(2) is amended to delete the phrase "unless the date of deposit is a Saturday, Sunday or Federal holiday within the District of Columbia in which case the date stamped will be the succeeding day which is not a Saturday, Sunday or Federal holiday within the District of Columbia." Thus, § 1.6(a)(1) will provide that the Office is not open for the filing of correspondence on any day that is a Saturday, Sunday or Federal holiday within the District of Columbia, but that correspondence deposited as Express Mail with the USPS in accordance with § 1.10 will be considered filed on the date of its deposit, regardless of whether that date is a Saturday, Sunday or Federal holiday within the District of Columbia (under 35 U.S.C. 21(b) or § 1.7).

Section 1.8(a)(1)(i)(A) is revised to state that papers and fees must be addressed as set out in § 1.1(a). For the purposes of 1.8(a)(1)(i)(A), first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the USPS.

Section 1.8(a)(2)(ii) is revised to remove and reserve paragraphs (a)(2)(ii)(B) through (a)(2)(ii)(F). This will permit the following items to be filed in accordance with the procedures set forth in § 1.8(a): (1) an affidavit of continued use or excusable nonuse under section 8(a) or (b) or section 12(c) of the Trademark Act, 15 U.S.C. 1058(a), 1058(b), 1062(c); (2) an application for renewal of a registration under section 9 of the Trademark Act, 15 U.S.C. 1059; (3) a petition to cancel a registration of a mark under section 14, subsection (1) or (2) of the Trademark Act, 15 U.S.C. 1064; (4) in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), an amendment to allege use in commerce under section 1(c) of the Trademark Act, 15 U.S.C. 1051(c), or a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1); and (5) in an application under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), a request under section 1(d)(2) of the Trademark Act, 15 U.S.C. 1051(d)(2), for an extension of time to file a statement of use under section 1(d)(1) of the Trademark Act, 15 U.S.C. 1051(d)(1).

Section 1.9 is amended to add a definition of "Federal holiday within the District of Columbia" to include an official closing of the Office. When the entire Patent and Trademark Office is officially closed for business for an entire day, for reasons due to adverse weather or other causes, the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. 21. Any action or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.

This provision implements existing policy. In the past, the Office has published notices concerning unscheduled closings, stating that correspondence due on the date of the unscheduled

closing would be deemed timely if filed on the next succeeding business day that the Office is open. See, *e.g.*, "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994" published in the Patent *Official Gazette* at 1161 *Off. Gaz. Pat. Office* 12 (April 5, 1994) (republished at 1170 *Off. Gaz. Pat. Office* 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office" published in the Patent *Official Gazette* at 1097 *Off. Gaz. Pat. Office* 53 (December 20, 1988) (republished at 1170 *Off. Gaz. Pat. Office* 8 (January 3, 1995)).

Other legal holidays within the District of Columbia are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25).

The title of § 1.10 is revised to: (1) change "papers and fees" to "correspondence" and (2) remove the reference to a "certificate." These changes are for consistency with the amendment to § 1.10 in this final rulemaking.

Section 1.10(a) is amended to provide that: (1) any correspondence received by the Office that was delivered by the "Express Mail Post Office to Addressee" (Express Mail) service of the USPS will be considered filed in the Office on the date of deposit with the USPS, (2) the date of deposit with the USPS is the "date-in" or other official USPS notation on the Express Mail mailing label, and (3) if the USPS deposit date cannot be determined, the correspondence will be accorded a filing date as of the date of receipt in the Office.

The date of deposit or mailing with the USPS is defined by the USPS as: (1) For correspondence that is paid for at the time of deposit—the date the correspondence is presented and accepted for Express Mail delivery at designated post offices, branches, or stations, and (2) For correspondence that is prepaid (*i.e.*, with a completed mailing label and postage affixed)—the date the prepaid correspondence is accepted by the USPS collection employees or the USPS pickup service. USPS Domestic Mail Manual (DMM) 49, at D-38 (Sept. 1, 1995).

Section 1.10(b) is amended by deleting the requirement for a certificate of mailing by Express Mail. As amended, § 1.10(b) provides that the number of the Express Mail mailing label should be placed on each piece of correspondence prior to the original mailing. Correspondence that is *actually received* by the Office will not be denied a filing date as of the date of deposit because the number of the Express Mail mailing label was not placed thereon prior to the original mailing. However, if the number of the mailing label did not appear on the correspondence as originally filed, relief will not be granted on petition under §§ 1.10(c) through (e), even if the party who filed the correspondence satisfies the other requirements of § 1.10(c), § 1.10(d) or § 1.10(e).

Since the filing of correspondence under § 1.10 without the number of the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition. A party's inadvertent failure to comply with the requirements of a rule is not deemed to be an extraordinary situation that would warrant waiver of a rule under §§ 1.183, 2.146(a)(5) or 2.148, nor is such an inadvertent omission considered to be an "unavoidable delay," within the meaning of 15 U.S.C. 1062(b), 35 U.S.C. 133, § 1.137(a) or § 2.66(a). See *Honigsbaum v. Lehman*, 903 F. Supp. 8, 37 USPQ2d 1799 (D.D.C. 1995) (Commissioner did not abuse his discretion in refusing to waive requirements of § 1.10(c) in order to grant filing date to patent application, where applicant failed to produce Express Mail customer receipt or any other evidence that application was actually deposited with USPS as Express Mail); *Nitto Chemical Industry. Co., Ltd. v. Comer*, No. 93-1378, 1994 U.S. Dist. LEXIS 19211, at *13-14 (D.D.C. Mar. 7, 1994) (Commissioner's refusal to waive requirements of § 1.10 in order to grant priority filing date to patent application not arbitrary and capricious, because failure to comply with the requirements of § 1.10 is an "avoidable" oversight that could have been prevented by the exercise of ordinary care or diligence, and thus not an extraordinary situation under § 1.183); *Vincent v. Mossinghoff*, 230 USPQ 621 (D.D.C. 1985) (Misunderstanding of § 1.8 not unavoidable delay in responding to Office Action); *Gustafson v. Strange*, 227 USPQ 174 (Comm'r Pats. 1985) (Counsel's unawareness of § 1.8 not extraordinary situation warranting waiver of a rule); *In re Chicago Historical Antique Automobile Museum, Inc.*, 197 USPQ 289 (Comm'r Pats. 1978) (Since certificate of mailing procedure under § 1.8 was available to petitioner, lateness due to mail delay not deemed to be extraordinary situation).

Section 1.10(b) further provides that correspondence should be deposited directly with an employee of the USPS to ensure that the person depositing the correspondence receives a legible copy of the Express Mail mailing label with the "date-in" clearly marked, and that persons dealing indirectly with the employees of the USPS (such as by depositing correspondence in an Express Mail drop box) do so at the risk of not receiving a copy of the Express Mail mailing label with the desired "date-in" clearly marked. On petition, the failure to obtain an Express Mail mailing label with the "date-in" clearly marked will be considered an omission that could have been avoided by the exercise of due care, as discussed above.

Sections 1.10(c) through 1.10(e) set forth procedures for petitioning the Commissioner to accord a filing date as of the date of deposit as Express Mail. Such petitions are filed under § 1.181 for patent correspondence and § 2.146 for trademark correspondence. Section 1.10(c) sets forth procedures for filing a petition to the Commissioner for a filing date as of the date of deposit with the USPS, where there is a discrepancy between the filing date initially accorded by the Office and the "date-in" entered by the USPS. Such a petition should: (1) be filed promptly after the person becomes aware that the Office has accorded, or will accord, a filing date other than the USPS deposit date, (2) include a showing that the number of the Express Mail mailing label was placed on each piece of correspondence prior to the original mailing, and (3) include a true copy of the Express Mail mailing label showing the "date-in" or other official notation by the USPS.

Section 1.10(d) sets forth procedures for filing a petition to the Commissioner to accord a filing date as of the actual date of deposit with the USPS, where the "date-in" or other official notation is incorrectly entered by the USPS. Such a petition should: (1) be filed promptly after the person becomes aware that the Office has accorded, or will accord, a filing date based upon an incorrect entry by the USPS, (2) include a showing that the number of the Express Mail mailing label was placed on each piece of correspondence prior to the original mailing, and (3) include a showing that the correspondence was deposited as Express Mail prior to the last scheduled pickup on the requested filing date. The showing under Section 1.10(d) must be corroborated by (1) evidence from the USPS, or (2) evidence that came into being after deposit and within one business day of the deposit of the correspondence as Express Mail. Evidence that came into being within one day after the deposit of the correspondence as Express Mail may be in the form of a log book which contains information such as the Express Mail number; the application number, attorney docket number or other such file identification number; the place, date and time of deposit; the time of the last scheduled pick-up for that date and place of deposit; the depositor's initials or signature; and the date and time of entry in the log. Any statement submitted in support of such a showing must be verified if made by a person other than an employee of the USPS or a practitioner as defined in § 10.1(r) of this chapter.

The reason the Office considers correspondence to have been filed as of the date of deposit as Express Mail is that this date has been verified by a disinterested USPS employee, through the insertion of a "date-in," or other official USPS notation, on the Express Mail mailing label. Due to the questionable reliability of evidence from a party other than the USPS that did not come into being contemporaneously with the deposit of the correspondence with the USPS, § 1.10(d) specifically requires that any petition under § 1.10(d) be corroborated either by evidence from the USPS, or by evidence that came into being *after* deposit and within one business day after the deposit of the correspondence as Express Mail. A petition alleging that the USPS erred in entering the "date-in" will be denied if it is supported only by evidence (other than from the USPS) which was: (1) created prior to the deposit of the correspondence as Express Mail with the USPS (*e.g.*, an application transmittal cover letter, or a client letter prepared prior to the deposit of the correspondence), or (2) created more than one business day after the deposit of the correspondence as Express Mail (*e.g.*, an affidavit or declaration prepared more than one business day after the correspondence was deposited with the USPS as Express Mail). On the other hand, a notation in a log book, entered by the person who deposited the correspondence as Express Mail within one business day after such deposit, setting forth the items indicated above would be deemed on petition to be an adequate showing of the date of deposit under § 1.10(d)(3).

Section 1.10(d)(3) further provides that a party must show that correspondence was deposited as Express Mail before the last scheduled pickup on the requested filing date in order to obtain a filing date as of that date. This incorporates existing practice, as set forth in the *Manual of Patent Examining Procedure* (6th ed., January, 1995) § 513, and *Trademark Manual of Examining Procedure* (2nd ed., May, 1993) § 702.02(e) into the rule.

Section 1.10(e) sets forth procedures for filing a petition to the Commissioner to accord a filing date as of the date of deposit with the USPS, where correspondence deposited as Express Mail is never received by the Office. Such a petition should: (1) be filed promptly after the person becomes aware that the Office has no evidence of receipt of the correspondence, (2) include a showing that the number of the Express Mail mailing label was placed on each piece of correspondence prior to the original mailing, (3) include a true copy of the originally deposited correspondence showing the number of the Express Mail mailing label thereon, a copy of any returned postcard receipt, a copy of the Express Mail mailing label showing the "date-in" or other official notation entered by the USPS, and (4) include a statement, signed by the person who deposited the documents as Express Mail with the USPS, setting forth the date and time of deposit, and declaring that the copies of the correspondence, Express Mail mailing label, and returned postcard receipt accompanying the petition are true copies of the correspondence, mailing label and returned postcard receipt originally mailed or received. Any statement in support of a petition under § 1.10(e) must be verified if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

Section 1.10(e) provides for the filing of a petition to accord correspondence a filing date as of the date of deposit with the USPS as Express Mail only where the correspondence was mailed with sufficient postage and addressed as set out in § 1.1(a). There is no corresponding provision that correspondence be properly addressed and mailed with sufficient postage in §§ 1.10(a), (c) and (d), because these sections apply only to correspondence that is actually received by the Office. Correspondence mailed by Express Mail that is *actually received* by the Office will not be denied a filing date as of the date of deposit as Express Mail simply because the correspondence was not mailed with sufficient postage or not addressed as set out in § 1.1(a).

Section 1.10(e)(3) provides that if the requested filing date is a date other than the "date-in" on the Express Mail mailing label, the petition should include a showing under § 1.10(d)(3), as discussed above, that the correspondence was deposited as Express Mail before the last scheduled pickup on the requested filing date in order to obtain a filing date as of that date.

Section 1.10(f) provides that the Office may require additional evidence to determine whether the correspondence was deposited as Express Mail with the USPS on the date in question.

Section 2.165(a)(1), dealing with affidavits of use or excusable non-use filed under Section 8 of the Trademark Act, is amended by deleting the last sentence referencing the inapplicability of certificates of mailing provided by § 1.8.

Section 5.33 (entitled "Correspondence") is amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is revised to reflect the fact that the certificate of mailing by Express Mail is no longer a requirement of § 1.10.

Response to Comments on the Rules

The comments received in response to the notice of proposed rulemaking have been given careful consideration and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment 1: One comment suggested that the Office return to a single mailing address.
Response: Addressing correspondence to specific areas within the agency, in accordance with § 1.1, reduces the amount of sorting required. Except as set out in § 1.1(a)(3)(iv), mail will be delivered within the Office regardless of how it is addressed. Nevertheless, use of a specific address should produce faster results for correspondents and savings to the Office in terms of reduced time and cost. The suggestion to address mail to a single mailing address will not be adopted.
Comment 2: Three comments requested a clarification of the reference to "organizations reporting to the Assistant Commissioner for Patents" in § 1.1(a)(1), suggested that each organization be identified, and noted that the change of address from "Commissioner of Patents and Trademarks" to "Assistant Commissioner for Patents" is confusing.
Response: Section 1.1(a)(1) has not been amended to list "organizations reporting to the Assistant Commissioner for Patents." The vast majority of mail to be addressed to the Assistant Commissioner is intended for the Examining Groups. Furthermore, once a list of organizations is established in the rule, amendment to such a list would require implementation of a rule change. However, a list of papers that should be addressed to the Assistant Commissioner for Patents appears under the heading "Patent-Related Mail" in the Supplementary Information section.
Comment 3: Two comments requested clarification concerning how a new application incorrectly addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, will be treated. Two comments opposed the address change in § 1.1, if the benefit of obtaining a filing date is conditioned upon the correspondence address being addressed correctly.
Response: Except for certain mail addressed incorrectly to the Office of the Solicitor, there will be no penalty for addressing a document to the wrong area within the Office, as long as one of the approved addresses is used. Use of the specific addresses listed within § 1.1 is strongly encouraged because it will facilitate the process both for the Office and the filer. Accordingly, a new application incorrectly addressed to the Commissioner will be treated the same as if the application was addressed to the specific Assistant Commissioner.
Comment 4: One comment supported the separate mailing addresses for mail directed to the Assistant Commissioner for Patents, Assistant Commissioner for Trademarks, Solicitor and the Commissioner, but viewed the practice under § 1.1(a)(3) with respect to correspondence to the Office of the Solicitor as a penalty for correspondents who misaddress mail.
Response: While the language in the proposed rule was based on the existing rule, 37 CFR 1.1(g) (1996), which has been in effect since 1988, § 1(a)(3)(iv) has been reworded in the final rule to state that improperly addressed correspondence "may be returned." This language better represents the intent of the rule. The Post Office boxes are located off-site and mail to these boxes is handled directly by the Office of the Solicitor. The Office of the Solicitor cannot handle large volumes of mail from users who choose not to follow Office mailing rules.
Comment 5: One comment requested clarification on the distinction between § 1.1(a) which states that mail "must" be addressed to the Assistant Commissioner for Patents and § 1.1(a)(1) which states that mail "should" be addressed to the Assistant Commissioner for Patents, if any.
Response: The language of 1.1(a) has been amended to indicate that all correspondence must be addressed either to the "Commissioner of Patents and Trademarks, Washington, D.C. 20231" or to specific areas within the Office as set out in paragraphs (a)(1), (2) and (3) of § 1.1.
Comment 6: One comment questioned why it is now merely permissible to identify a patent application by its serial number and filing date whereas such information was previously mandatory.
Response: The only change to § 1.5 is the elimination of the requirement to include the words "PATENT APPLICATION" on letters concerning patent applications. Section 1.5 both before and after the proposed amendment provides that "[w]hen a letter...concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the

application number (consisting of the series code and the serial number; *e.g.*, 07/123,456) or the serial number and filing date assigned to that application...." Accordingly, correspondence must continue to identify a previously filed patent application by either (1) the application number, or (2) the serial number and filing date. The combination of the serial number and filing date is unique by itself.

Comment 7: One comment objected to the return of correspondence pertaining to an application that had not yet been accorded an application number because some correspondence may require immediate action. This person suggested that the Office search the computerized records given sufficient other identifying information, instead of returning the correspondence.

Response: If the correspondence is returned for failure to identify the correspondence with the appropriate information, the applicant has the option to return the correspondence with the appropriate information within two weeks of the date of the cover letter from the Office by utilizing the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 to obtain the benefit of the date of deposit with the USPS. There does not appear to be any situation where a file would require immediate action in applications where the application number had not been assigned. If an application number has already been assigned, it is within the filer's control to supply that information and avoid delays.

Comment 8: Seven comments opposed the addition of unscheduled closings of the Office to the definition of "Federal holidays within the District of Columbia." The comments noted that substantive rights would be at risk for persons filing provisional patent applications and applications asserting priority claims based on foreign applications should the date on which an application must be filed fall on a day that the Office is closed for unforeseen reasons. One comment noted that the substantive rights of applicants seeking to secure a filing date prior to divulging an invention may lose rights if a later filing date, resulting from an unscheduled closing of the Office, is subsequent to the date of divulgence. Some of the comments suggested amending § 1.9 to make an exception for provisional patent applications and applications asserting a claim of priority based on a foreign application so that the filing date would not be affected by an unscheduled closing of the Office. One comment also suggested that § 1.9 be amended to distinguish between the filing of applications and the filing of responses. One comment suggested that the Commissioner allow for filing of a non-provisional patent application on Federal holidays where the one year anniversary of the provisional application falls on a Federal holiday.

Response: Section 1.6(a)(2) is being amended to delete the phrase "unless the date of deposit is a Saturday, Sunday or Federal holiday within the District of Columbia in which case the date stamped will be the succeeding day which is not a Saturday, Sunday or Federal holiday in the District of Columbia." Section 1.6(a)(2) now provides that even if the Office is closed because it is a Saturday, Sunday or Federal holiday in the District of Columbia, correspondence deposited in the "Express Mail Post Office to Addressee" service of the USPS in accordance with § 1.10 will be considered filed on the date of deposit regardless of whether that date is Saturday, Sunday or a Federal holiday within the District of Columbia. Therefore, in light of the option to file an application under § 1.10 on any day and the amendment to § 1.6(a)(2), no substantive rights would be at risk, and the suggestions, set forth in the comments and noted above, have not been adopted.

Comment 9: Several comments objected to the requirement set forth in proposed § 1.10(b) which required deposit of Express Mail correspondence directly with the United States Postal Service (USPS) to ensure that a copy of the Express Mail label marked with the "date in" is received at the time of deposit. The reasons generally expressed by commenters were: (1) practitioners and applicants feel compelled to oversee the work of the USPS employee to make certain that the "date in" is marked accurately, legibly and in a timely fashion and perceive a loss of control over the filing of the document under § 1.10 as a result; (2) inefficiency and burden are imposed upon persons filing who must actually go to the post office, stand in line and generally be confined to fewer hours during the day to deposit the Express Mail correspondence directly with the USPS than the hours available for deposit in the Express Mail drop box; and (3) inequality of opportunity to deposit directly with the USPS for individual practitioners and small firms which employ fewer people than larger firms to handle. Two comments questioned the Office's use of the term "deposit" and whether the Office exceeded any authority in the perceived understanding that the proposed rule was requiring the applicants or practitioners to do something beyond "depositing" the correspondence with the USPS, namely, overseeing the act of acceptance of the Express Mail correspondence by the USPS.

Response: Section 1.10(b) has been amended so that direct deposit of correspondence with the USPS is a recommendation, rather than a requirement. While the Office strongly urges direct deposit of Express Mail correspondence in order to obtain a legible copy of the Express Mail mailing label, parties are not precluded from using Express Mail drop boxes. Parties who do use drop boxes can protect themselves from uncertainty due to illegible mailing labels by routinely maintaining a log of Express Mail deposits in which notations are entered by the person who deposited the correspondence as Express Mail within one business day after deposit with the USPS in a petition filed under § 1.10(c), (d) or (e). Evidence that came into being within one day after the deposit of the correspondence as Express Mail may be in the form of a log book which contains information such as the Express Mail number; the application number, attorney docket number or other such file identification number; the place, date and time of deposit; the time of the last scheduled pick-up for that date and place of deposit; the depositor's initials or signature; and the date and time of entry in the log. Any statement submitted in support of such a showing must be verified if made by a person other than an employee of the USPS or a practitioner as defined in § 10.1(r) of this chapter.

Comment 10: Several comments opposed the elimination of the certificate of mailing by "Express Mail" because it would eliminate a reliable mode of proving the date of deposit with the USPS.

Response: The elimination of the requirement for the certificate of mailing is adopted primarily to streamline the Office's processing of Express Mail correspondence. Under the old rule, the Office was required to scrutinize the certificate as well as the Express Mail label. Under the new rule, the "date in" on the Express Mail label would be the only date that the Office would look for to determine the filing date. Under the prior rule, the certificate of mailing by Express Mail only served as proof of a date of deposit when the certificate date was the same as the "date in" on the Express Mail label. The certificate did not afford protection to an applicant in the event that the certificate date differed from the Express Mail label date. Therefore, the elimination of the certificate of mailing requirement would not eliminate a reliable mode of proving the date of deposit.

Comment 11: Four comments suggested allowing Express Mail Corporate Account Mailing Statement of the USPS to serve as additional proof of the date of deposit.

Response: This suggestion has been adopted. Such records would be acceptable as additional proof of the date of deposit.

Comment 12: One comment requested clarification concerning whether deposit of correspondence as Express Mail in the Express Mail drop box must be done prior to the last scheduled pickup of the day in order to be entitled to the deposit date as the filing date of the correspondence.

Response: Correspondence sent by the "Express Mail Post Office to Addressee" service is considered filed in the Office on the "date-in" entered by the USPS. Accordingly, if the USPS enters the deposit date as its "date-in," the correspondence will receive the deposit date as its filing date. However, if the USPS enters a date later than the deposit date as its "date-in," the correspondence will receive the later date as its filing date. Section 1.10(d) permits the Office to correct a USPS "date-in" error when the correspondence is deposited in an Express Mail drop box prior to last scheduled pick up of the day, that is, the time clearly marked on the Express Mail drop box indicating when the box will be cleared for the last time on the date of deposit. Section 1.10(d) sets forth the procedures to be followed to be entitled to such a correction.

Other Considerations

The rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The rule change has no effect on patent fees.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

This rule change contains a collection of information subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*), which is currently approved by the Office of Management and Budget under Control No. 0651-0031. The public reporting burden for the certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503. (ATTN: Paperwork Reduction Act Project 0651-0031).

List of Subjects

37 CFR PART 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR PART 2

Administrative practice and procedure, Courts, Lawyers, Trademarks

37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

37 CFR PART 10

Administrative practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 2, 5 and 10 are amended as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is amended by removing and reserving paragraph (g) and by revising the heading and paragraph (a) to read as follows:

§ 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for §§ 1.1(a)(3)(i) and (ii), all correspondence intended for the Patent and Trademark Office must be addressed to either "Commissioner of Patents and Trademarks, Washington, D.C. 20231" or to specific areas within the Office as set out in paragraphs (a)(1), (2) and (3)(iii) of this section. When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence improperly addressed to a Post Office Box specified in paragraphs (a)(3)(i) and (ii) of this section will not be filed elsewhere in the Patent and Trademark Office, and may be returned.

* * * * *

(g) [Reserved]

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3. Section 1.3 is revised to read as follows:

§ 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5 is amended by revising paragraph (a) to read as follows:

§ 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to receipt of the application number from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; *e.g.*, 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied by a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mailing date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark

Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit with the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patents should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

5. Section 1.6 is amended by revising paragraph (a) to read as follows:

§ 1.6 Receipt of correspondence.

(a) *Date of receipt and Express Mail date of deposit.* Correspondence received in the Patent and Trademark Office is stamped with the date of receipt except as follows:

(1) The Patent and Trademark Office is not open for the filing of correspondence on any day that is a Saturday, Sunday or Federal holiday within the District of Columbia. Except for correspondence transmitted by facsimile as provided for in paragraph (a)(3) of this section, no correspondence is received in the Patent and Trademark Office on Saturdays, Sundays or Federal holidays within the District of Columbia.

(2) Correspondence filed in accordance with § 1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service.

(3) Correspondence transmitted by facsimile to the Patent and Trademark Office will be stamped with the date on which the complete transmission is received in the Patent and Trademark Office unless that date is a Saturday, Sunday, or Federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or Federal holiday within the District of Columbia.

* * * * *

6. Section 1.8 is amended by revising paragraphs (a)(1)(i)(A) and (a)(2)(ii) to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) * * *
(1) * * *
(i) * * *
(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

* * * * *

(2) * * *
(i) * * *
(ii) Relative to Trademark Registrations and Trademark Applications
(A) The filing of a trademark application.
(B) [Reserved]
(C) [Reserved]
(D) [Reserved]
(E) [Reserved]
(F) [Reserved]

* * * * *

7. Section 1.9 is amended by adding a new paragraph (h) to read as follows:

§ 1.9 Definitions.

* * * * *

(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business for the entire day.

8. Section 1.10 is revised to read as follows:

§ 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office (Office) that was delivered by the "Express Mail Post Office to Addressee" service of the United States Postal Service (USPS) will be considered filed in the Office on the date of deposit with the USPS. The date of deposit with the USPS is shown by the "date-in" on the "Express Mail" mailing label or other official USPS notation. If the USPS deposit date cannot be determined, the correspondence will be accorded the Office receipt date as the filing date. See § 1.6(a).

(b) Correspondence should be deposited directly with an employee of the USPS to ensure that the person depositing the correspondence receives a legible copy of the "Express Mail" mailing label with the "date-in" clearly marked. Persons dealing indirectly with the employees of the USPS (such as by deposit in an "Express Mail" drop box) do so at the risk of not receiving a copy of the "Express Mail" mailing label with the desired "date-in" clearly marked. The paper(s) or fee(s) that constitute the correspondence should also include the "Express Mail" mailing label number thereon. See paragraphs (c), (d) and (e) of this section.

(c) Any person filing correspondence under this section that was received by the Office and delivered by the "Express Mail Post Office to Addressee" service of the USPS, who can show that there is a discrepancy between the filing date accorded by the Office to the correspondence and the date of deposit as shown by the "date-in" on the "Express Mail" mailing label or other official USPS notation, may petition the Commissioner to accord the correspondence a filing date as of the "date-in" on the "Express Mail" mailing label or other official USPS notation, provided that:

(1) The petition is filed promptly after the person becomes aware that the Office has accorded, or will accord, a filing date other than the USPS deposit date;

(2) The number of the "Express Mail" mailing label was placed on the paper(s) or fee(s) that constitute the correspondence prior to the original mailing by "Express Mail;" and

(3) The petition includes a true copy of the "Express Mail" mailing label showing the "date-in," and of any other official notation by the USPS relied upon to show the date of deposit.

(d) Any person filing correspondence under this section that was received by the Office and delivered by the "Express Mail Post Office to Addressee" service of the USPS, who can show that the "date-in" on the "Express Mail" mailing label or other official notation entered by the USPS was incorrectly entered or omitted by the USPS, may petition the Commissioner to accord the correspondence a filing date as of the date the correspondence is shown to have been deposited with the USPS, provided that:

(1) The petition is filed promptly after the person becomes aware that the Office has accorded, or will accord, a filing date based upon an incorrect entry by the USPS;

(2) The number of the "Express Mail" mailing label was placed on the paper(s) or fee(s) that constitute the correspondence prior to the original mailing by "Express Mail"; and

(3) The petition includes a showing which establishes, to the satisfaction of the Commissioner, that the requested filing date was the date the correspondence was deposited in "Express Mail Post Office to Addressee" service prior to the last scheduled pickup for that day. Any showing pursuant to this paragraph must be corroborated by evidence from the USPS or that came into being after deposit and within one business day of the deposit of the correspondence in the "Express Mail Post Office to Addressee" service of the USPS. Any statement submitted in support of such a showing pursuant to this paragraph must be a verified statement if made by a person other than an employee of the USPS or a practitioner as defined in § 10.1(r) of this chapter.

(e) Any person mailing correspondence addressed as set out in § 1.1(a) to the Office with sufficient postage utilizing the "Express Mail Post Office to Addressee" service of the USPS but not received by the Office, may petition the Commissioner to consider such correspondence filed in the Office on the USPS deposit date, provided that:

(1) The petition is filed promptly after the person becomes aware that the Office has no evidence of receipt of the correspondence;

(2) The number of the "Express Mail" mailing label was placed on the paper(s) or fee(s) that constitute the correspondence prior to the original mailing by "Express Mail;"

(3) The petition includes a copy of the originally deposited paper(s) or fee(s) that constitute the correspondence showing the number of the "Express Mail" mailing label thereon, a copy of any returned postcard receipt, a copy of the "Express Mail" mailing label showing the "date-in," a copy of any other official notation by the USPS relied upon to show the date of deposit, and, if the requested filing date is a date other than the "date-in" on the "Express Mail" mailing label or other official notation entered by the USPS, a showing pursuant to paragraph (d)(3) of this section that the requested filing date was the date the correspondence was deposited in "Express Mail Post Office to Addressee" service prior to the last scheduled pickup for that day; and

(4) The petition includes a statement which establishes, to the satisfaction of the Commissioner, the original deposit of the correspondence, and that the copies of the correspondence, the copy of the "Express Mail" mailing label, the copy of any returned postcard receipt, and any official notation entered by the USPS are true copies of the originally mailed correspondence and original "Express Mail" mailing label, returned postcard receipt, and official notation entered by the USPS. Such statement must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(f) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the USPS on the date in question.

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

9. The authority citation for 37 CFR Part 2 continues to read as follows: Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

10. Section 2.165(a)(1) is revised to read as follows:

§ 2.165 Reconsideration of affidavit or declaration.

(a)(1) If the affidavit or declaration filed pursuant to § 2.162 is insufficient or defective, the affidavit or declaration will be refused and the registrant will be notified of the reason. Reconsideration of the refusal may be requested within six months from the date of the mailing of the action. The request for reconsideration must state the grounds for the request. A supplemental or substitute affidavit or declaration required by section 8 of the Act of 1946 cannot be considered unless it is filed before the expiration of six years from the date of the registration or from the date of publication under section 12(c) of the Act.

* * * * *

PART 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

11. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 et seq., the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 et seq., and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

12. Section 5.33 is revised to read as follows:

§ 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

PART 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

13. The authority citation for 37 CFR Part 10 continues to read as follows: Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

14. Section 10.23 is amended by revising paragraph (c)(9) to read as follows:

§ 10.23 Misconduct.

* * * * *

(c) * * *

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

* * * * *

October 24, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

[1192 TMOG 95]

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(271) **Status of Certification Services**

On November 28, 1995, the Office published an Official Gazette Notice entitled "Temporary Suspension of At Cost Services for Orders for Certified Copies" (1180 OG 121) to advise practitioners and the public of delays in filling orders for certified copies of PTO documents. This is an update of actual days to mail for orders filled during the month of February 1996:

Certified Product	Goal	Actual Calendar Days to Mail
Patent Application-As-Filed, Expedited	7	23
Patent Application-As-Filed, Regular	17	39
Patent Related File Wrapper	25	59
Patent Copy	10	13

Certified Product	Goal	Actual Calendar Days to Mail
Trademark Application-As-Filed, Expedited	7	27
Trademark Application-As-Filed, Regular	17	36
Trademark Related File Wrapper	25	55
Trademark Registration	10	18
Trademark Registration, Expedited	3*	8*

*Business Days

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessibility. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, DC Metro area).

March 7, 1996

WESLEY H. GEWEHR
Administrator for Information Dissemination

[1193 TMOG 39]

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 10, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 04, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,274,846 through 5,276,921
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 02, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,890,335 through 4,891,844
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on December 31, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,561,121 through 4,562,595
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED October 30, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,391	07/301,991	10/16/90
(4,780,674)	(06/946,034)	(10/25/88)
Re. 34,221	07/602,841	04/13/93
(4,780,080)	(07/000,533)	(10/25/88)
Re. 34,320	07/598,060	07/20/93
(4,779,862)	(07/067,946)	(10/25/88)
4,479,271	06/314,808	10/30/84
4,479,294	06/388,135	10/30/84
4,479,296	06/487,399	10/30/84
4,479,305	06/357,581	10/30/84
4,479,306	06/385,772	10/30/84
4,479,307	06/547,636	10/30/84
4,479,308	06/363,725	10/30/84
4,479,311	06/441,259	10/30/84
4,479,320	06/427,964	10/30/84
4,479,329	06/307,235	10/30/84
4,479,336	06/327,036	10/30/84
4,479,339	06/366,435	10/30/84
4,479,341	06/364,784	10/30/84
4,479,345	06/343,675	10/30/84
4,479,352	06/400,320	10/30/84
4,479,359	06/576,793	10/30/84
4,479,363	06/465,417	10/30/84
4,479,364	06/466,575	10/30/84
4,479,372	06/522,586	10/30/84
4,479,373	06/393,627	10/30/84
4,479,375	06/514,856	10/30/84
4,479,383	06/389,659	10/30/84
4,479,385	06/422,515	10/30/84
4,479,389	06/422,325	10/30/84
4,479,399	06/381,261	10/30/84
4,479,400	06/367,881	10/30/84
4,479,402	06/339,154	10/30/84
4,479,404	06/299,907	10/30/84
4,479,405	06/528,984	10/30/84
4,479,419	06/438,429	10/30/84
4,479,421	06/436,754	10/30/84
4,479,422	06/384,973	10/30/84
4,479,430	06/591,368	10/30/84
4,479,432	06/405,722	10/30/84
4,479,441	06/588,966	10/30/84
4,479,442	06/469,019	10/30/84
4,479,446	06/266,298	10/30/84
4,479,448	06/550,165	10/30/84
4,479,458	06/538,596	10/30/84
4,479,461	06/398,501	10/30/84
4,479,466	06/554,362	10/30/84
4,479,474	06/392,501	10/30/84
4,479,479	06/357,671	10/30/84
4,479,481	06/292,691	10/30/84
4,479,483	06/488,653	10/30/84
4,479,486	06/544,474	10/30/84
4,479,488	06/364,796	10/30/84
4,479,492	06/449,286	10/30/84
4,479,499	06/343,874	10/30/84
4,479,509	06/369,913	10/30/84
4,479,511	06/380,650	10/30/84
4,479,517	06/426,284	10/30/84
4,479,518	06/325,595	10/30/84

Patent Number	Serial Number	Issue Date
4,479,519	06/400,670	10/30/84
4,479,520	06/539,415	10/30/84
4,479,527	06/438,558	10/30/84
4,479,528	06/394,587	10/30/84
4,479,532	06/332,733	10/30/84
4,479,535	06/400,325	10/30/84
4,479,537	06/535,684	10/30/84
4,479,539	06/434,723	10/30/84
4,479,545	06/437,152	10/30/84
4,479,564	06/325,630	10/30/84
4,479,569	06/368,381	10/30/84
4,479,570	06/381,758	10/30/84
4,479,571	06/323,526	10/30/84
4,479,575	06/476,580	10/30/84
4,479,578	06/252,588	10/30/84
4,479,579	06/444,301	10/30/84
4,479,599	06/431,195	10/30/84
4,479,601	06/529,442	10/30/84
4,479,604	06/454,834	10/30/84
4,479,606	06/385,394	10/30/84
4,479,612	06/427,527	10/30/84
4,479,613	06/318,291	10/30/84
4,479,617	06/434,145	10/30/84
4,479,620	06/537,557	10/30/84
4,479,623	06/448,720	10/30/84
4,479,629	06/462,000	10/30/84
4,479,634	06/526,814	10/30/84
4,479,642	06/381,529	10/30/84
4,479,643	06/424,025	10/30/84
4,479,645	06/363,117	10/30/84
4,479,647	06/335,911	10/30/84
4,479,652	06/499,997	10/30/84
4,479,656	06/433,521	10/30/84
4,479,658	06/385,280	10/30/84
4,479,662	06/324,446	10/30/84
4,479,679	06/271,665	10/30/84
4,479,680	06/407,066	10/30/84
4,479,681	06/515,102	10/30/84
4,479,687	06/314,819	10/30/84
4,479,693	06/404,313	10/30/84
4,479,700	06/387,164	10/30/84
4,479,701	06/326,215	10/30/84
4,479,703	06/329,239	10/30/84
4,479,709	06/386,341	10/30/84
4,479,720	06/425,251	10/30/84
4,479,722	06/274,264	10/30/84
4,479,726	06/479,298	10/30/84
4,479,730	06/383,062	10/30/84
4,479,731	06/508,912	10/30/84
4,479,732	06/394,987	10/30/84
4,479,734	06/311,182	10/30/84
4,479,736	06/560,738	10/30/84
4,479,747	06/487,850	10/30/84
4,479,752	06/445,992	10/30/84
4,479,763	06/433,368	10/30/84
4,479,774	06/392,978	10/30/84
4,479,779	06/537,742	10/30/84
4,479,789	06/414,376	10/30/84
4,479,790	06/487,725	10/30/84
4,479,791	06/491,784	10/30/84
4,479,792	06/423,034	10/30/84
4,479,799	06/482,593	10/30/84
4,479,804	06/301,356	10/30/84
4,479,808	06/521,004	10/30/84
4,479,814	06/484,176	10/30/84
4,479,818	06/375,652	10/30/84
4,479,820	06/464,863	10/30/84
4,479,827	06/432,405	10/30/84
4,479,828	06/543,002	10/30/84
4,479,841	06/420,333	10/30/84
4,479,842	06/444,814	10/30/84
4,479,848	06/579,941	10/30/84
4,479,855	06/592,852	10/30/84
4,479,858	06/390,437	10/30/84
4,479,863	06/595,897	10/30/84
4,479,868	06/544,159	10/30/84
4,479,874	06/422,238	10/30/84
4,479,877	06/518,172	10/30/84
4,479,883	06/582,052	10/30/84
4,479,884	06/587,875	10/30/84
4,479,901	06/523,356	10/30/84
4,479,902	06/404,724	10/30/84
4,479,904	06/506,236	10/30/84
4,479,905	06/533,223	10/30/84
4,479,907	06/522,729	10/30/84
4,479,908	06/562,515	10/30/84
4,479,910	06/368,028	10/30/84
4,479,919	06/454,506	10/30/84
4,479,923	06/511,386	10/30/84
4,479,924	06/481,281	10/30/84
4,479,925	06/417,718	10/30/84
4,479,930	06/401,834	10/30/84
4,479,943	06/545,686	10/30/84
4,479,953	06/526,306	10/30/84
4,479,956	06/488,815	10/30/84
4,479,959	06/402,460	10/30/84
4,479,962	06/403,968	10/30/84
4,479,969	06/472,734	10/30/84
4,479,978	06/343,465	10/30/84
4,479,981	06/374,467	10/30/84
4,479,983	06/456,231	10/30/84
4,479,987	06/563,817	10/30/84
4,479,990	06/403,441	10/30/84
4,479,991	06/366,431	10/30/84
4,480,002	06/326,005	10/30/84
4,480,005	06/529,251	10/30/84
4,480,006	06/427,425	10/30/84
4,480,007	06/380,509	10/30/84
4,480,008	06/478,450	10/30/84
4,480,009	06/466,986	10/30/84
4,480,012	06/588,848	10/30/84
4,480,015	06/409,158	10/30/84
4,480,017	06/461,256	10/30/84
4,480,020	06/486,272	10/30/84
4,480,021	06/474,011	10/30/84
4,480,025	06/457,804	10/30/84
4,480,028	06/461,938	10/30/84
4,480,034	06/387,084	10/30/84
4,480,035	06/327,165	10/30/84
4,480,038	06/373,702	10/30/84
4,480,039	06/448,542	10/30/84
4,480,041	06/396,678	10/30/84
4,480,044	06/575,902	10/30/84
4,480,046	06/511,730	10/30/84
4,480,049	06/527,536	10/30/84
4,480,050	06/555,227	10/30/84
4,480,060	06/461,572	10/30/84
4,480,062	06/479,376	10/30/84
4,480,063	06/547,911	10/30/84
4,480,064	06/549,284	10/30/84
4,480,066	06/524,496	10/30/84
4,480,067	06/526,050	10/30/84
4,480,072	06/527,832	10/30/84
4,480,073	06/282,627	10/30/84
4,480,076	06/390,109	10/30/84
4,480,077	06/433,573	10/30/84
4,480,080	06/546,241	10/30/84
4,480,082	06/516,575	10/30/84
4,480,088	06/543,701	10/30/84
4,480,090	06/544,187	10/30/84
4,480,091	06/547,262	10/30/84
4,480,102	06/401,057	10/30/84
4,480,103	06/318,366	10/30/84
4,480,105	06/373,573	10/30/84
4,480,111	06/467,821	10/30/84
4,480,114	06/355,086	10/30/84
4,480,118	06/335,618	10/30/84
4,480,121	06/411,726	10/30/84
4,480,123	06/516,979	10/30/84
4,480,125	06/322,066	10/30/84
4,480,128	06/484,179	10/30/84
4,480,129	06/537,123	10/30/84
4,480,137	06/426,664	10/30/84
4,480,139	06/482,986	10/30/84
4,480,142	06/439,004	10/30/84
4,480,144	06/290,644	10/30/84

Patent Number	Serial Number	Issue Date
4,480,151	06/399,308	10/30/84
4,480,154	06/495,088	10/30/84
4,480,155	06/353,847	10/30/84
4,480,157	06/401,860	10/30/84
4,480,164	06/446,445	10/30/84
4,480,165	06/326,561	10/30/84
4,480,166	06/475,318	10/30/84
4,480,174	06/397,586	10/30/84
4,480,175	06/418,613	10/30/84
4,480,177	06/498,263	10/30/84
4,480,182	06/358,822	10/30/84
4,480,183	06/358,823	10/30/84
4,480,200	06/336,812	10/30/84
4,480,201	06/390,486	10/30/84
4,480,203	06/454,667	10/30/84
4,480,205	06/550,826	10/30/84
4,480,206	06/356,060	10/30/84
4,480,215	06/434,810	10/30/84
4,480,221	06/292,221	10/30/84
4,480,227	06/508,365	10/30/84
4,480,235	06/459,013	10/30/84
4,480,241	06/465,154	10/30/84
4,480,246	06/435,080	10/30/84
4,480,248	06/477,572	10/30/84
4,480,258	06/376,993	10/30/84
4,480,263	06/416,741	10/30/84
4,480,265	06/412,632	10/30/84
4,480,267	06/417,783	10/30/84
4,480,272	06/363,442	10/30/84
4,480,275	06/364,737	10/30/84
4,480,282	06/350,817	10/30/84
4,480,284	06/428,341	10/30/84
4,480,287	06/453,264	10/30/84
4,480,295	06/477,639	10/30/84
4,480,299	06/449,667	10/30/84
4,480,314	06/379,274	10/30/84
4,480,319	06/228,475	10/30/84
4,480,322	06/365,383	10/30/84
4,480,328	06/368,297	10/30/84
4,480,330	06/443,263	10/30/84
4,480,338	06/528,692	10/30/84
4,779,290	07/023,831	10/25/88
4,779,295	07/061,088	10/25/88
4,779,307	07/092,365	10/25/88
4,779,309	07/066,568	10/25/88
4,779,310	07/052,593	10/25/88
4,779,311	07/053,337	10/25/88
4,779,315	07/088,581	10/25/88
4,779,319	07/027,112	10/25/88
4,779,320	07/011,899	10/25/88
4,779,321	07/078,842	10/25/88
4,779,325	07/082,439	10/25/88
4,779,326	07/038,117	10/25/88
4,779,331	07/086,750	10/25/88
4,779,333	07/100,654	10/25/88
4,779,337	06/870,704	10/25/88
4,779,344	07/085,708	10/25/88
4,779,345	06/872,263	10/25/88
4,779,347	07/083,327	10/25/88
4,779,349	07/025,197	10/25/88
4,779,350	06/852,556	10/25/88
4,779,352	07/066,791	10/25/88
4,779,356	07/027,342	10/25/88
4,779,359	07/079,650	10/25/88
4,779,360	07/059,023	10/25/88
4,779,362	07/073,055	10/25/88
4,779,365	07/110,700	10/25/88
4,779,369	06/865,952	10/25/88
4,779,372	06/903,114	10/25/88
4,779,374	07/140,253	10/25/88
4,779,375	07/132,482	10/25/88
4,779,382	07/072,171	10/25/88
4,779,392	07/047,638	10/25/88
4,779,399	07/088,937	10/25/88
4,779,406	07/109,913	10/25/88
4,779,410	07/138,959	10/25/88
4,779,411	06/946,751	10/25/88
4,779,417	07/058,372	10/25/88
4,779,421	07/084,757	10/25/88
4,779,422	07/056,078	10/25/88
4,779,432	07/035,323	10/25/88
4,779,434	07/046,107	10/25/88
4,779,444	07/024,812	10/25/88
4,779,445	07/100,690	10/25/88
4,779,455	07/081,847	10/25/88
4,779,457	07/101,664	10/25/88
4,779,459	06/828,414	10/25/88
4,779,463	07/003,483	10/25/88
4,779,473	07/056,170	10/25/88
4,779,474	06/889,113	10/25/88
4,779,478	06/930,897	10/25/88
4,779,481	07/039,322	10/25/88
4,779,486	07/067,257	10/25/88
4,779,487	07/027,245	10/25/88
4,779,494	07/041,050	10/25/88
4,779,498	07/116,286	10/25/88
4,779,499	07/097,450	10/25/88
4,779,504	07/125,809	10/25/88
4,779,507	07/078,035	10/25/88
4,779,511	06/753,519	10/25/88
4,779,517	07/072,038	10/25/88
4,779,525	07/007,052	10/25/88
4,779,532	07/115,497	10/25/88
4,779,533	07/118,024	10/25/88
4,779,540	07/009,191	10/25/88
4,779,544	07/126,626	10/25/88
4,779,546	07/108,616	10/25/88
4,779,549	07/029,862	10/25/88
4,779,566	06/847,766	10/25/88
4,779,572	07/024,784	10/25/88
4,779,574	07/113,300	10/25/88
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5,518,199	07/705,657	10/27/92
5,518,202	07/665,266	10/27/92
5,518,204	07/832,176	10/27/92
5,518,208	07/699,574	10/27/92
5,518,214	07/667,468	10/27/92
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5,518,231	07/719,747	10/27/92
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5,518,257	07/792,683	10/27/92
5,518,264	07/660,348	10/27/92
5,518,267	07/713,525	10/27/92
5,518,272	07/501,158	10/27/92
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5,518,486	07/667,321	10/27/92
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5,518,493	07/707,770	10/27/92
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5,518,516	07/712,733	10/27/92
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5,518,599	07/557,720	10/27/92
5,518,600	07/695,873	10/27/92
5,518,602	07/836,416	10/27/92
5,518,604	07/724,093	10/27/92
5,518,610	07/582,339	10/27/92
5,518,613	07/266,897	10/27/92
5,518,617	07/687,342	10/27/92
5,518,626	07/675,002	10/27/92
5,518,636	07/316,005	10/27/92
5,518,642	07/504,922	10/27/92
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5,518,661	07/674,540	10/27/92
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5,518,894	07/603,368	10/27/92
5,518,900	07/779,448	10/27/92
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5,519,023	07/505,624	10/27/92
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5,519,146	07/754,538	10/27/92
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5,519,401	07/578,182	10/27/92
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5,519,614	07/770,231	10/27/92
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5,519,659	07/815,826	10/27/92
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5,519,663	07/753,832	10/27/92
5,519,671	07/246,433	10/27/92
5,519,674	07/526,544	10/27/92
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5,519,697	07/629,528	10/27/92
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5,519,708	07/680,968	10/27/92
5,519,709	07/427,844	10/27/92
5,519,710	07/783,723	10/27/92
5,519,711	07/469,137	10/27/92

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 11/08/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 34,045	07/585,887	09/20/90	08/25/92	11/08/96
4,641,127	06/696,467	01/30/85	02/03/87	11/14/96
4,762,004	06/911,369	09/25/86	08/09/88	11/14/96
4,955,709	07/042,037	04/24/87	09/11/90	11/14/96
4,998,317	07/380,154	07/13/89	03/12/91	11/12/96
5,019,861	07/419,963	10/11/89	05/28/91	11/12/96
5,089,975	07/464,346	01/12/90	02/18/92	11/14/96
5,093,130	07/412,846	09/26/89	03/03/92	11/12/96
5,125,898	07/776,843	10/15/91	06/30/92	11/13/96
5,127,880	07/595,455	10/10/90	07/07/92	11/12/96
5,139,040	07/743,177	08/09/91	08/18/92	11/14/96
5,184,019	07/709,566	06/03/91	02/02/93	11/12/96

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 11/15/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 34,892	07/662,668	12/05/90	04/04/95	11/19/96
4,658,805	06/649,424	12/03/84	04/21/87	11/20/96
4,663,964	06/811,868	12/20/85	05/12/87	11/20/96
4,673,240	06/345,619	02/04/82	06/16/87	11/19/96
4,727,041	06/852,645	04/16/86	02/23/88	11/18/96
4,731,458	06/855,720	04/25/86	03/15/88	11/18/96
4,749,109	06/911,398	09/25/86	06/07/88	11/22/96
4,888,995	07/269,357	11/10/88	12/26/89	11/19/96
4,953,473	07/466,770	01/18/90	09/04/90	11/21/96
5,042,280	07/507,222	04/11/90	08/27/91	11/18/96
5,049,373	07/553,166	07/13/90	09/17/91	11/21/96
5,066,328	07/491,260	03/09/90	11/19/91	11/20/96
5,071,831	07/300,284	01/19/89	12/10/91	11/21/96
5,080,153	07/644,112	01/18/91	01/14/92	11/15/96
5,093,921	07/452,358	12/19/89	03/03/92	11/21/96
5,102,337	07/465,312	01/16/90	04/07/92	11/21/96
5,108,141	07/435,806	11/13/89	04/28/92	11/21/96
5,110,584	07/601,296	10/22/90	05/05/92	11/22/96
5,112,315	07/592,623	10/04/90	05/12/92	11/20/96
5,118,114	07/745,387	08/15/91	06/02/92	11/20/96
5,119,988	07/545,399	06/28/90	06/09/92	11/22/96
5,122,055	07/726,117	06/26/91	06/16/92	11/18/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

Re. 35,364. Re. S.N. 08/700,610. Aug. 12, 1996. Cl. 340/825.690. CODING SYSTEM FOR MULTIPLE TRANSMITTERS AND A SINGLE RECEIVER FOR A GARAGE DOOR OPENER. Carl Heitschel, et. al., Owner of Record: *The Chamberlain Group Inc., Elmhurst, Ill.*, Attorney or Agent: Timothy E. Levstik, Ex. Gp.: 2211

5,190,609. Re. S.N. 08/680,279. July 11, 1996. Cl. 156. STABLE PRESSURE SENSITIVE SHRINK LABEL TECHNIQUE. Kenneth S.C. Lin, et. al., Owner of Record: *Avery*

Dennison Corp., Pasedena, Calif., Attorney or Agent: Douglas N. Larson, Ex. Gp.: 1301

5,344,418, Re. S.N. 08/711,685, Sept. 5, 1996, Cl. 606/9, OPTICAL SYSTEM FOR TREATMENT OF VASCULAR LESIONS, Shahriar Ghaffari, Owner of Record: *Inventor*, Attorney or Agent: Gary W. Hamilton, Ex. Gp.: 3309

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 318,309, Reexam. No. 90/004,470, Nov. 27, 1996, D21/147, TOY WATER GUN WITH TANK, Bruce M. D'Andrade, Owner of Record: *Lamari Ltd., Mt. Laurel, N.J.*, Attorney or Agent: Panitch, Schwarze, Jacobs & Nadel, Philadelphia, Pa., Ex. Gp.: 2902, Requester: Alan B. Amron, Syosset, N.Y.

4,228,263, Reexam. No. 90/004,460, Nov. 19, 1996, Cl. 222/183, COMBINED HOLDER FOR KEYS AND PROTECTIVE SPRAY, Albert P. Caruso, Owner of Record: *W. Simon Katz, Buffalo, N.Y.*, Attorney or Agent: None, Ex. Gp.: 3104, Requester: Michael O. Sturm, Des Moines, Iowa

4,293,245, Reexam. No. 90/004,463, Nov. 20, 1996, Cl. 405/272, STRUCTURAL SYSTEM AND STRUCTURAL ELEMENTS FOR USE AND CONSTRUCTION OF EARTH FILLED WALLS, Felix P. Jaecklin, Owner of Record: *Inventor*, Attorney or Agent: Hayes Soloway Hennessey Grossman & Hage, Manchester, N.H., Ex. Gp.: 3506, Requester: Bourque Law Offices, Manchester, N.H.

4,451,562, Reexam. No. 90/004,464, Nov. 22, 1996, Cl. 435/002, BLOOD OXYGENATOR, Roger J. Elgas, et. al., Owner of Record: *Cobe Laboratories, Inc., Lakewood, Colo.*, Attorney or Agent: John B. Phillips & John R. Ley, Englewood, Colo., Ex. Gp.: 1818, Requester: Owner

4,469,659, Reexam. No. 90/004,465, Nov. 22, 1996, Cl. 422/046, SAMPLING DEVICE FOR BLOOD OXYGENATOR, Gary Carson, et. al., Owner of Record: *Cobe Laboratories, Inc., Lakewood, Colo.*, Attorney or Agent: John B. Phillips & John R. Ley, Englewood, Colo., Ex. Gp.: 1312, Requester: Owner

4,691,811, Reexam. No. 90/004,471, Nov. 27, 1996, Cl. 188/290, ROTARY DAMPER, Masaru Arakawa, et. al., Owner of Record: *Nifco, Inc., Yokohama-Shi, Japan*, Attorney or Agent: Steven W. Weinrieb, Schwartz & Weinrieb, Arlington, Va., Ex. Gp.: 3103, Requester: Owner

5,162,409, Reexam. No. 90/004,467, Nov. 25, 1996, Cl. 524/262, TIRE TREAD RUBBER COMPOSITION, Tomasz S. Mroczkowski, Owner of Record: *Pirelli Armstrong Tire Corp., New Haven, Conn.*, Attorney or Agent: Ronald J. St. Onge & Mary M. Krinsky, St. Onge, Steward Johnston & Reens, Stamford, Conn., Ex. Gp.: 1505, Requester: Charles M. Cob, Pravel Hewitt Kimball & Krieger, Houston, Tex.

5,360,489, Reexam. No. 90/004,468, Nov. 26, 1996, Cl. 134/042, METHOD OF REMOVING CAULK, Kimberley A. Gaul, et. al., Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Barry E. Bretschneider, Fish & Richardson, Washington, D.C., Ex. Gp.: 1313, Requester: Owner

5,405,685, Reexam. No. 90/004,469, Nov. 26, 1996, Cl. 428/229, PAPERMACHINE CLOTHING, Sanjay R. Patel, Owner of Record: *Scapa Group PLC, Blackburn, U.K.*, Attorney or Agent: Keck Mahin & Cate, Chicago, Ill., Ex. Gp.: 1314, Requester: Joseph C. Sullivan, Kane Dalsimer Sullivan Kurucz Levy Eisele and Richard, New York., N.Y.

5,420,391, Reexam. No. 90/004,466, Nov. 22, 1996, Cl. 219/121.47, PLASMA TORCH WITH AXIAL INJECTION OF FEEDSTOCK, Lucian B. Delcea, Owner of Record: *Metcon Services Ltd., Abbotsford, Canada*, Attorney or Agent: Brian J. Wood, Bull, Housser & Tupper, Vancouver, Canada, Ex. Gp.: 2106, Requester: Finnegan Henderson Farabow Garrett & Dunner, Washington, D.C.

5,487,938, Reexam. No. 90/004,472, Nov. 29, 1996, Cl. 428/332, SILICA SUPPORTED TRANSITION METAL CATALYSTS, Lee Spencer, et. al., Owner of Record: *The Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Stephen P. Krupp, Freeport, Tex., Ex. Gp.: 1316, Requester: Owner

5,567,986, Reexam. No. 90/004,461, Nov. 19, 1996, Cl. 102/307, TUNGSTEN ENHANCED LINER FOR A SHAPED CHARGE, James W. Reese, et. al., Owner of Record: *Western Atlas International, Inc., Houston, Tex.*, Attorney or Agent: Richard A. Fagin, Western Atlas International, Inc., Houston, Tex., Ex. Gp.: 2204, Requester: Owner

5,570,616, Reexam. No. 90/004,462, Nov. 19, 1996, Cl. 081/063.1, RATCHETING SCREWDRIVER WITH REVERSING CAP HAVING PROJECTING PIN, Christopher D. Thompson, et. al., Owner of Record: *Snap-On Technologies, Inc., Crystal Lake, Ill.*, Attorney or Agent: Emrich & Dithmar, Chicago, Ill., Ex. Gp.: 3203, Requester: Beere Precision Medical Instruments, Inc., c/o Arthur J. Hansmann, Racine, Wis.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 09, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
107,494	71/083,718	12/07/1915
107,527	71/086,117	12/07/1915
107,568	71/084,601	12/07/1915
330,377	71/368,139	12/03/1935
330,383	71/368,250	12/03/1935
330,407	71/367,577	12/03/1935
330,410	71/367,497	12/03/1935
330,411	71/367,436	12/03/1935
330,426	71/367,310	12/03/1935
330,431	71/367,267	12/03/1935
330,443	71/368,050	12/03/1935
330,469	71/367,850	12/03/1935
330,481	71/361,095	12/03/1935
330,483	71/360,710	12/03/1935
330,484	71/360,362	12/03/1935
330,505	71/367,583	12/03/1935
330,529	71/365,810	12/03/1935
330,540	71/355,778	12/03/1935
330,546	71/366,736	12/03/1935
330,558	71/367,855	12/03/1935
617,025	71/620,623	12/06/1955
617,028	71/678,889	12/06/1955

Reg. Number	Serial Number	Reg. Date
617,029	71/617,436	12/06/1955
617,049	71/681,894	12/06/1955
617,054	71/683,434	12/06/1955
617,059	71/683,789	12/06/1955
617,064	71/684,418	12/06/1955
617,065	71/684,419	12/06/1955
617,068	71/632,850	12/06/1955
617,069	71/650,666	12/06/1955
617,073	71/670,756	12/06/1955
617,078	71/672,844	12/06/1955
617,082	71/678,907	12/06/1955
617,091	71/676,207	12/06/1955
617,094	71/682,910	12/06/1955
617,095	71/682,911	12/06/1955
617,114	71/675,932	12/06/1955
617,132	71/668,363	12/06/1955
617,133	71/668,364	12/06/1955
617,135	71/672,459	12/06/1955
617,144	71/687,303	12/06/1955
617,147	71/667,527	12/06/1955
617,150	71/670,886	12/06/1955
617,151	71/671,064	12/06/1955
617,152	71/673,429	12/06/1955
617,157	71/681,245	12/06/1955
617,158	71/681,635	12/06/1955
617,160	71/681,942	12/06/1955
617,163	71/682,325	12/06/1955
617,171	71/663,323	12/06/1955
617,175	71/669,289	12/06/1955
617,176	71/669,440	12/06/1955
617,178	71/670,778	12/06/1955
617,180	71/671,461	12/06/1955
617,185	71/679,097	12/06/1955
617,188	71/682,050	12/06/1955
617,197	71/668,135	12/06/1955
617,206	71/679,571	12/06/1955
617,207	71/680,481	12/06/1955
617,220	71/670,740	12/06/1955
617,227	71/649,358	12/06/1955
617,229	71/657,586	12/06/1955
617,233	71/660,244	12/06/1955
617,241	71/657,034	12/06/1955
617,245	71/665,106	12/06/1955
617,247	71/665,449	12/06/1955
617,253	71/633,743	12/06/1955
617,255	71/644,808	12/06/1955
617,260	71/664,244	12/06/1955
617,262	71/667,552	12/06/1955
617,265	71/672,505	12/06/1955
617,267	71/676,438	12/06/1955
617,279	71/673,357	12/06/1955
617,286	71/657,770	12/06/1955
617,290	71/669,478	12/06/1955
617,292	71/671,440	12/06/1955
617,296	71/678,643	12/06/1955
617,297	71/681,364	12/06/1955
617,305	71/673,888	12/06/1955
617,309	71/672,466	12/06/1955
617,313	71/678,908	12/06/1955
617,314	71/679,880	12/06/1955
617,317	71/655,824	12/06/1955
1,025,981	73/011,578	12/02/1975
1,025,989	73/030,088	12/02/1975
1,025,991	73/030,995	12/02/1975
1,025,992	73/035,207	12/02/1975
1,025,996	73/040,448	12/02/1975
1,025,998	73/044,783	12/02/1975
1,026,000	73/046,857	12/02/1975
1,026,004	73/012,860	12/02/1975
1,026,005	73/016,988	12/02/1975
1,026,006	73/020,899	12/02/1975
1,026,008	73/023,685	12/02/1975
1,026,011	73/024,950	12/02/1975
1,026,012	73/025,742	12/02/1975
1,026,013	73/031,245	12/02/1975
1,026,014	73/031,933	12/02/1975
1,026,016	73/033,310	12/02/1975
1,026,017	73/034,002	12/02/1975
1,026,018	73/039,706	12/02/1975
1,026,019	73/040,821	12/02/1975
1,026,020	73/041,117	12/02/1975
1,026,024	73/034,707	12/02/1975
1,026,025	73/034,791	12/02/1975
1,026,027	73/004,174	12/02/1975
1,026,029	73/016,469	12/02/1975
1,026,033	73/023,365	12/02/1975
1,026,035	73/025,573	12/02/1975
1,026,036	73/026,883	12/02/1975
1,026,037	73/026,884	12/02/1975
1,026,038	73/028,621	12/02/1975
1,026,039	73/028,623	12/02/1975
1,026,040	73/028,635	12/02/1975
1,026,041	73/031,905	12/02/1975
1,026,043	73/033,032	12/02/1975
1,026,044	73/034,116	12/02/1975
1,026,047	73/036,545	12/02/1975
1,026,048	73/037,228	12/02/1975
1,026,049	73/037,385	12/02/1975
1,026,050	73/037,600	12/02/1975
1,026,052	73/039,465	12/02/1975
1,026,055	73/041,114	12/02/1975
1,026,056	73/041,208	12/02/1975
1,026,058	73/041,718	12/02/1975
1,026,059	73/043,470	12/02/1975
1,026,065	73/006,612	12/02/1975
1,026,068	73/027,680	12/02/1975
1,026,074	73/028,048	12/02/1975
1,026,082	73/035,680	12/02/1975
1,026,084	73/041,043	12/02/1975
1,026,086	73/043,945	12/02/1975
1,026,090	73/026,908	12/02/1975
1,026,091	73/031,452	12/02/1975
1,026,092	73/005,114	12/02/1975
1,026,100	73/019,671	12/02/1975
1,026,108	73/029,247	12/02/1975
1,026,110	73/030,648	12/02/1975
1,026,111	73/031,382	12/02/1975
1,026,113	73/031,995	12/02/1975
1,026,115	73/032,594	12/02/1975
1,026,116	73/035,521	12/02/1975
1,026,117	73/035,522	12/02/1975
1,026,119	73/036,538	12/02/1975
1,026,120	73/037,145	12/02/1975
1,026,121	73/037,534	12/02/1975
1,026,122	73/038,367	12/02/1975
1,026,123	73/039,531	12/02/1975
1,026,125	73/042,289	12/02/1975
1,026,137	73/005,245	12/02/1975
1,026,138	73/006,703	12/02/1975
1,026,150	73/035,964	12/02/1975
1,026,154	73/043,495	12/02/1975
1,026,156	73/044,610	12/02/1975
1,026,158	73/017,678	12/02/1975
1,026,161	73/035,602	12/02/1975
1,026,162	73/037,064	12/02/1975
1,026,177	73/015,897	12/02/1975
1,026,182	73/021,524	12/02/1975
1,026,184	73/022,275	12/02/1975
1,026,185	73/023,658	12/02/1975
1,026,189	73/026,940	12/02/1975
1,026,190	73/028,455	12/02/1975
1,026,192	73/029,339	12/02/1975
1,026,199	73/043,436	12/02/1975
1,026,208	73/024,984	12/02/1975
1,026,209	73/015,856	12/02/1975
1,026,210	73/033,165	12/02/1975
1,026,216	73/035,366	12/02/1975
1,026,219	73/019,445	12/02/1975
1,026,222	73/033,586	12/02/1975
1,026,223	73/037,027	12/02/1975
1,026,225	73/038,033	12/02/1975
1,026,227	73/001,615	12/02/1975
1,026,229	73/005,236	12/02/1975
1,026,235	73/020,417	12/02/1975
1,026,238	73/022,431	12/02/1975
1,026,240	73/024,350	12/02/1975

Reg. Number	Serial Number	Reg. Date
1,026,242	73/032,409	12/02/1975
1,026,243	73/035,179	12/02/1975
1,026,246	73/039,404	12/02/1975
1,026,250	73/022,593	12/02/1975
1,026,252	73/027,865	12/02/1975
1,026,256	73/033,018	12/02/1975
1,026,261	73/040,001	12/02/1975
1,026,269	73/043,471	12/02/1975
1,026,272	73/043,530	12/02/1975
1,026,273	73/043,624	12/02/1975
1,026,274	73/043,625	12/02/1975
1,026,279	73/044,679	12/02/1975
1,026,283	73/045,462	12/02/1975
1,026,285	73/046,127	12/02/1975
1,026,287	73/046,407	12/02/1975
1,026,289	73/046,477	12/02/1975
1,026,293	73/026,858	12/02/1975
1,026,304	73/042,489	12/02/1975
1,026,305	73/042,956	12/02/1975
1,026,307	73/043,465	12/02/1975
1,026,313	73/020,160	12/02/1975
1,026,315	73/024,056	12/02/1975
1,026,318	73/029,730	12/02/1975
1,026,319	73/029,731	12/02/1975
1,026,320	73/029,733	12/02/1975
1,026,323	73/032,733	12/02/1975
1,026,326	73/039,942	12/02/1975
1,026,327	73/041,920	12/02/1975
1,026,328	73/043,870	12/02/1975
1,026,329	73/043,954	12/02/1975
1,026,336	73/030,139	12/02/1975
1,026,340	73/043,474	12/02/1975
1,026,341	73/043,602	12/02/1975
1,026,345	73/022,449	12/02/1975
1,026,348	73/028,695	12/02/1975
1,026,349	73/028,178	12/02/1975
1,026,351	73/033,991	12/02/1975
1,026,355	73/039,945	12/02/1975
1,026,357	73/040,428	12/02/1975
1,026,358	73/041,561	12/02/1975
1,026,360	73/043,736	12/02/1975
1,026,366	73/009,072	12/02/1975
1,026,367	73/019,883	12/02/1975
1,026,369	73/035,749	12/02/1975
1,026,371	73/038,948	12/02/1975
1,026,372	73/040,520	12/02/1975
1,026,376	73/026,699	12/02/1975
1,026,378	73/032,691	12/02/1975
1,026,384	73/027,197	12/02/1975
1,026,388	73/030,629	12/02/1975
1,026,390	73/002,571	12/02/1975
1,026,398	73/031,667	12/02/1975
1,026,399	73/034,579	12/02/1975
1,026,402	73/041,112	12/02/1975
1,026,403	73/042,142	12/02/1975
1,026,404	73/043,060	12/02/1975
1,026,406	73/044,202	12/02/1975
1,026,408	72/461,190	12/02/1975
1,026,410	72/463,513	12/02/1975
1,026,411	72/457,615	12/02/1975
1,026,414	72/462,036	12/02/1975
1,026,418	72/430,079	12/02/1975
1,026,420	72/446,445	12/02/1975
1,026,423	72/449,261	12/02/1975
1,026,428	72/451,396	12/02/1975
1,026,432	72/466,450	12/02/1975
1,026,433	72/445,337	12/02/1975
1,026,439	72/440,579	12/02/1975
1,026,442	72/415,328	12/02/1975
1,026,444	72/449,945	12/02/1975
1,026,448	72/448,330	12/02/1975
1,026,450	72/462,275	12/02/1975
1,026,453	72/352,425	12/02/1975
1,026,454	72/368,276	12/02/1975
1,026,455	72/453,791	12/02/1975
1,026,457	72/462,385	12/02/1975
1,026,458	72/350,159	12/02/1975
1,026,460	72/443,522	12/02/1975
1,026,469	73/016,726	12/02/1975
1,026,470	73/003,123	12/02/1975
1,026,474	73/050,152	12/02/1975
1,026,476	73/028,865	12/02/1975

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from October through December 1996. Information includes:

- subclasses established or abolished (major changes)
- subclass title, indent, or position change
- changes to existing classes and subclass definitions (minor changes)

This Reclassification Alert Report may appear from time to time in the Official Gazette and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

The general public may purchase copies of Classification Orders or Classification Definitions by contacting the Editorial Division at 703-305-6101 or 703-305-5099. Payment can be made through a Deposit Account, or by check made payable to "Commissioner of Patents and Trademarks" and sent to:

Chief, Editorial Division
Office of Classification Support
U.S. Patent and Trademark Office
Crystal Mall 2, Room 303
Washington, D.C. 20231

December 3, 1996

FREDERICK R. SCHMIDT
Administrator for Search and Information Resources

RECLASSIFICATION ALERT REPORT October—December 1996

Class	First Subclass	Last Subclass	Action	Order Number
2	2		ABOLISH	1624
2	455	468	ESTABLISH	1624

Class	First Subclass	Last Subclass	Action	Order Number
2	2.11	2.17	INDENT CHANGE	1624
15			DEFN CHANGE	1622
16			DEFN CHANGE	1619
24			DEFN CHANGE	1618
29			DEFN CHANGE	1618
29			DEFN CHANGE	1622
30	85	90	ABOLISH	1619
30	526	541	ESTABLISH	1619
33			DEFN CHANGE	1618
34			DEFN CHANGE	1618
34			DEFN CHANGE	1619
34			DEFN CHANGE	1622
40			DEFN CHANGE	1627
49			DEFN CHANGE	1618
52			DEFN CHANGE	1618
54			DEFN CHANGE	1624
73			DEFN CHANGE	1618
74			DEFN CHANGE	1618
74			DEFN CHANGE	1622
83	435.1		ABOLISH	1621
83	436		ABOLISH	1621
83	437		ABOLISH	1621
83	435.11	435.19	ESTABLISH	1621
83	435.21	435.27	ESTABLISH	1621
83	436.1		ESTABLISH	1621
83	436.15		ESTABLISH	1621
83	436.2	436.4	ESTABLISH	1621
83	436.45		ESTABLISH	1621
83	436.5		ESTABLISH	1621
83	436.55		ESTABLISH	1621
83	436.6		ESTABLISH	1621
83	436.7		ESTABLISH	1621
83	436.75		ESTABLISH	1621
83	436.8		ESTABLISH	1621
83	436.9		ESTABLISH	1621
83	437.1	437.7	ESTABLISH	1621
83	547		TITLE CHANGE	1621
84			DEFN CHANGE	1626
100			DEFN CHANGE	1618
100			DEFN CHANGE	1622
101			DEFN CHANGE	1622
106			DEFN CHANGE	1627
109			DEFN CHANGE	1624
116			DEFN CHANGE	1618
118			DEFN CHANGE	1618
118	644		ABOLISH	1622
118	645		ABOLISH	1622
118	647	662	ABOLISH	1622
123			DEFN CHANGE	1628
132			DEFN CHANGE	1619
134			DEFN CHANGE	1622
137			DEFN CHANGE	1622
160			DEFN CHANGE	1618
178			DEFN CHANGE	1620
178			DEFN CHANGE	1622
178	71		ABOLISH	1626
178	71.1		ESTABLISH	1626
178	71.11	71.14	ESTABLISH	1626
178	71.2	71.9	ESTABLISH	1626
186			DEFN CHANGE	1623
187			DEFN CHANGE	1628
188			DEFN CHANGE	1622
192			DEFN CHANGE	1622
198			DEFN CHANGE	1621
200			DEFN CHANGE	1618
204			DEFN CHANGE	1622
205			DEFN CHANGE	1620
206			DEFN CHANGE	1618
206			DEFN CHANGE	1619
206			DEFN CHANGE	1622
206			DEFN CHANGE	1625
210			DEFN CHANGE	1622
215			DEFN CHANGE	1625
219			DEFN CHANGE	1622
220			DEFN CHANGE	1618
220	306	310	ABOLISH	1625

Class	First Subclass	Last Subclass	Action	Order Number
220	352	358	ABOLISH	1625
220	309.1		ESTABLISH	1625
220	309.2		ESTABLISH	1625
220	310.1		ESTABLISH	1625
220	780	806	ESTABLISH	1625
221			DEFN CHANGE	1618
222			DEFN CHANGE	1625
224			DEFN CHANGE	1618
224			DEFN CHANGE	1624
226			DEFN CHANGE	1618
226			DEFN CHANGE	1622
229			DEFN CHANGE	1625
235			DEFN CHANGE	1618
235			DEFN CHANGE	1620
235			DEFN CHANGE	1622
235			DEFN CHANGE	1623
236			DEFN CHANGE	1622
239			DEFN CHANGE	1622
242			DEFN CHANGE	1618
242			DEFN CHANGE	1622
244			DEFN CHANGE	1628
246			DEFN CHANGE	1628
248			DEFN CHANGE	1618
248			DEFN CHANGE	1622
250			DEFN CHANGE	1618
250			DEFN CHANGE	1622
252			DEFN CHANGE	1627
261			DEFN CHANGE	1622
269			DEFN CHANGE	1622
270			DEFN CHANGE	1622
271			DEFN CHANGE	1618
271			DEFN CHANGE	1622
273			DEFN CHANGE	1624
280			DEFN CHANGE	1628
294			DEFN CHANGE	1618
303			DEFN CHANGE	1628
307			DEFN CHANGE	1620
307			DEFN CHANGE	1623
310			DEFN CHANGE	1626
312			DEFN CHANGE	1618
313			DEFN CHANGE	1618
315			DEFN CHANGE	1620
318			DEFN CHANGE	1626
318			DEFN CHANGE	1628
323			DEFN CHANGE	1622
324			DEFN CHANGE	1626
324			DEFN CHANGE	1627
326			DEFN CHANGE	1623
327			DEFN CHANGE	1618
327			DEFN CHANGE	1626
329			DEFN CHANGE	1620
329			DEFN CHANGE	1626
330			DEFN CHANGE	1626
332			DEFN CHANGE	1626
333			DEFN CHANGE	1626
334			DEFN CHANGE	1626
335			DEFN CHANGE	1626
340			DEFN CHANGE	1618
340			DEFN CHANGE	1620
340			DEFN CHANGE	1623
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340			DEFN CHANGE	1627
340			DEFN CHANGE	1628
341			DEFN CHANGE	1626
342			DEFN CHANGE	1618
342			DEFN CHANGE	1623
342			DEFN CHANGE	1626
342			DEFN CHANGE	1628
343			DEFN CHANGE	1623
343			DEFN CHANGE	1626
343			DEFN CHANGE	1628
345			DEFN CHANGE	1618
345			DEFN CHANGE	1623
345			DEFN CHANGE	1627
346			DEFN CHANGE	1618
346			DEFN CHANGE	1620

Class	First Subclass	Last Subclass	Action	Order Number
346			DEFN CHANGE	1622
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348			DEFN CHANGE	1628
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351			DEFN CHANGE	1618
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353			DEFN CHANGE	1622
354	1	354	ABOLISH	1618
354	400	486	ABOLISH	1618
355			DEFN CHANGE	1618
355			DEFN CHANGE	1620
355	200	328	ABOLISH	1622
355	400	408	ESTABLISH	1622
355			DEFN CHANGE	1623
356			DEFN CHANGE	1618
356			DEFN CHANGE	1622
356			DEFN CHANGE	1623
358			DEFN CHANGE	1618
358	310	348	ABOLISH	1620
358	350	352	ABOLISH	1620
358			DEFN CHANGE	1622
358			DEFN CHANGE	1623
358			DEFN CHANGE	1626
359			DEFN CHANGE	1618
359			DEFN CHANGE	1620
359			DEFN CHANGE	1622
359			DEFN CHANGE	1626
359	36	106	ABOLISH	1627
360	9.1		ABOLISH	1620
360	10.1	10.3	ABOLISH	1620
360	11.1		ABOLISH	1620
360	14.1	14.3	ABOLISH	1620
360	19.1		ABOLISH	1620
360	33.1		ABOLISH	1620
360	34.1		ABOLISH	1620
360	35.1		ABOLISH	1620
360	36.1		ABOLISH	1620
360	36.2		ABOLISH	1620
360	37.1		ABOLISH	1620
360	38.1		ABOLISH	1620
360			DEFN CHANGE	1623
360			DEFN CHANGE	1626
361			DEFN CHANGE	1618
361			DEFN CHANGE	1620
361			DEFN CHANGE	1622
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361			DEFN CHANGE	1626
362			DEFN CHANGE	1618
362			DEFN CHANGE	1622
362			DEFN CHANGE	1627
364			DEFN CHANGE	1618
364			DEFN CHANGE	1622
364	401	409	ABOLISH	1623
364	419.01	419.2	ABOLISH	1623
364			DEFN CHANGE	1626
364	424.01	424.03	ABOLISH	1628
364	424.05		ABOLISH	1628
364	424.1		ABOLISH	1628
364	426.02	426.04	ABOLISH	1628
364	431.05		ABOLISH	1628
364	431.06		ABOLISH	1628
364	433	435	ABOLISH	1628
364	444		ABOLISH	1628
364	449		ABOLISH	1628
364	423.098		ESTABLISH	1628
364	423.099		ESTABLISH	1628
364	424.012	424.019	ESTABLISH	1628
364	424.021	424.029	ESTABLISH	1628

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Class	First Subclass	Last Subclass	Action	Order Number
364	424.031	424.039	ESTABLISH	1628
364	424.045	424.049	ESTABLISH	1628
364	424.051	424.059	ESTABLISH	1628
364	424.08	424.098	ESTABLISH	1628
364	426.015	426.019	ESTABLISH	1628
364	426.021	426.029	ESTABLISH	1628
364	426.031	426.038	ESTABLISH	1628
364	426.041	426.046	ESTABLISH	1628
364	431.051	431.055	ESTABLISH	1628
364	431.061		ESTABLISH	1628
364	431.062		ESTABLISH	1628
364	444.1		ESTABLISH	1628
364	444.2		ESTABLISH	1628
364	449.1	449.5	ESTABLISH	1628
364	424.04		TITLE CHANGE	1628
364	448		TITLE CHANGE	1628
365			DEFN CHANGE	1620
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366			DEFN CHANGE	1618
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369			DEFN CHANGE	1622
369			DEFN CHANGE	1626
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370			DEFN CHANGE	1623
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370	13.1		ABOLISH	1626
370	14	16	ABOLISH	1626
370	16.1		ABOLISH	1626
370	17	32	ABOLISH	1626
370	32.1		ABOLISH	1626
370	33	49	ABOLISH	1626
370	49.5		ABOLISH	1626
370	50	57	ABOLISH	1626
370	58.1	58.3	ABOLISH	1626
370	59		ABOLISH	1626
370	60		ABOLISH	1626
370	60.1		ABOLISH	1626
370	61	65	ABOLISH	1626
370	65.5		ABOLISH	1626
370	66	68	ABOLISH	1626
370	68.1		ABOLISH	1626
370	69.1		ABOLISH	1626
370	70	84	ABOLISH	1626
370	85.1		ABOLISH	1626
370	85.11	85.15	ABOLISH	1626
370	85.2	85.9	ABOLISH	1626
370	91	93	ABOLISH	1626
370	94.1	94.3	ABOLISH	1626
370	95.1	95.3	ABOLISH	1626
370	97	99	ABOLISH	1626
370	100.1		ABOLISH	1626
370	101	103	ABOLISH	1626
370	104.1		ABOLISH	1626
370	105		ABOLISH	1626
370	105.1	105.5	ABOLISH	1626
370	106	109	ABOLISH	1626
370	110.1	110.4	ABOLISH	1626
370	111	125	ABOLISH	1626
370	200	546	ESTABLISH	1626
370	901	916	ESTABLISH	1626
371			DEFN CHANGE	1620
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374			DEFN CHANGE	1622
375	266		ABOLISH	1623
375			DEFN CHANGE	1623
375	205		ABOLISH	1626
377			DEFN CHANGE	1622
377			DEFN CHANGE	1623
378			DEFN CHANGE	1618
378			DEFN CHANGE	1622

Class	First Subclass	Last Subclass	Action	Order Number
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379			DEFN CHANGE	1622
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380			DEFN CHANGE	1622
380			DEFN CHANGE	1623
380			DEFN CHANGE	1626
381			DEFN CHANGE	1626
382			DEFN CHANGE	1618
382			DEFN CHANGE	1623
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385			DEFN CHANGE	1622
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395			DEFN CHANGE	1618
395			DEFN CHANGE	1620
395			DEFN CHANGE	1622
395	100		ABOLISH	1623
395	144	154	ABOLISH	1623
395	155	166	ABOLISH	1623
395	375		ABOLISH	1623
395	550		ABOLISH	1623
395	600		ABOLISH	1623
395	650		ABOLISH	1623
395	700		ABOLISH	1623
395	775		ABOLISH	1623
395	167	175	ESTABLISH	1623
395	201	245	ESTABLISH	1623
395	326	358	ESTABLISH	1623
395	376	395	ESTABLISH	1623
395	501	526	ESTABLISH	1623
395	527		ESTABLISH	1623
395	551	553	ESTABLISH	1623
395	555	560	ESTABLISH	1623
395	561	573	ESTABLISH	1623
395	580	591	ESTABLISH	1623
395	595	598	ESTABLISH	1623
395	601	622	ESTABLISH	1623
395	651	653	ESTABLISH	1623
395	670	678	ESTABLISH	1623
395	680	685	ESTABLISH	1623
395	701	710	ESTABLISH	1623
395	712		ESTABLISH	1623
395	751	760	ESTABLISH	1623
395	761	773	ESTABLISH	1623
395	774		ESTABLISH	1623
395	776	799	ESTABLISH	1623
395	801	807	ESTABLISH	1623
395	898		ESTABLISH	1623
395	899		ESTABLISH	1623
395	118		TITLE CHANGE	1623
395	406		TITLE CHANGE	1623
395	2.09	2.87	POSITION CHANGE	1623
395	101	143	POSITION CHANGE	1623
395	180		POSITION CHANGE	1623
395	182.01	182.22	POSITION CHANGE	1623
395	183.012	183.22	POSITION CHANGE	1623
395	184.01		POSITION CHANGE	1623
395	185.01	185.1	POSITION CHANGE	1623
395	186		POSITION CHANGE	1623
395	187.01		POSITION CHANGE	1623
395	188.01		POSITION CHANGE	1623
395	200.01	200.21	POSITION CHANGE	1623
395	280	312	POSITION CHANGE	1623
395	401	406	POSITION CHANGE	1623
395	410	420	POSITION CHANGE	1623
395	421.01	421.11	POSITION CHANGE	1623
395	427	496	POSITION CHANGE	1623
395	497.01	497.04	POSITION CHANGE	1623
395	500		POSITION CHANGE	1623
395	726	742	POSITION CHANGE	1623
395	750		POSITION CHANGE	1623
395	800		POSITION CHANGE	1623
395	821	894	POSITION CHANGE	1623
395	2.09	2.87	INDENT CHANGE	1623
395	80	99	INDENT CHANGE	1623

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Class	First Subclass	Last Subclass	Action	Order Number
395	101	117	INDENT CHANGE	1623
395	118	143	INDENT CHANGE	1623
395	406		INDENT CHANGE	1623
395			DEFN CHANGE	1626
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396	FOR 700	FOR 971	ESTABLISH	1618
396			DEFN CHANGE	1620
396			DEFN CHANGE	1622
399	1	411	ESTABLISH	1622
400			DEFN CHANGE	1623
404			DEFN CHANGE	1627
416			DEFN CHANGE	1626
422			DEFN CHANGE	1618
427			DEFN CHANGE	1622
427			DEFN CHANGE	1624
428			DEFN CHANGE	1627
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430			DEFN CHANGE	1620
430			DEFN CHANGE	1622
430			DEFN CHANGE	1627
431			DEFN CHANGE	1618
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434			DEFN CHANGE	1628
437			DEFN CHANGE	1618
437			DEFN CHANGE	1622
445			DEFN CHANGE	1618
451			DEFN CHANGE	1618
454			DEFN CHANGE	1622
455			DEFN CHANGE	1618
455			DEFN CHANGE	1620
455			DEFN CHANGE	1622
455			DEFN CHANGE	1626
473			DEFN CHANGE	1624
474			DEFN CHANGE	1622
475			DEFN CHANGE	1628
477			DEFN CHANGE	1628
482			DEFN CHANGE	1627
492			DEFN CHANGE	1618
492			DEFN CHANGE	1622
602			DEFN CHANGE	1624
902			DEFN CHANGE	1620
902			DEFN CHANGE	1623

Department of Commerce
Patent and Trademark Office

Paper Search File

The Patent and Trademark Office (PTO) is exploring options for relying less on paper as electronic search file enhancements are becoming readily and more cheaply available. These options would include adjustments to the paper files in the patent Public Search Room and patent examiners' search rooms. Options could simplify any possible future relocation of the PTO, and will take into consideration the automated data bases now available for searching by both the examiners and the public. The PTO wants to consider short term trade-off's, as well as options for the long term. A public meeting will be conducted to receive comments on all aspects or issues that should be included as part of this review.

The purpose of the meeting is to identify issues that should be considered as part of a review to minimize reliance on and use of paper files. Preliminary issues identified for review may include the following:

1. Should the PTO reduce redundant or underutilized U.S. and foreign paper search files for patents in the PTO? Additional questions for review include the following:

a. If there are redundant or underutilized paper search files of patents, what and where are they?

b. If the PTO reduces its reliance on the paper search files of patents, what should be the plan for doing so?

c. How should the PTO dispose of paper search files of patents found to be surplus? (i.e., destroy, send to a warehouse for storage, etc.)

2. Should the PTO change its policy on automated patent system access? Related questions for review include:

a. Should the PTO suspend the fees for using the automated patent search systems if the paper search files are removed from the public search facilities?

b. What is the relationship between quantity, location and availability of computer workstations needed and changes made to the availability of paper files of patents for both the public and examining corps?

c. Are automated patent image and text search acceptable substitutes for the paper files? If they are not acceptable, should the PTO establish additional criteria, and what should these be?

3. Should the PTO remove U.S. patents from the prosecution file histories which are stored in the files repositories?

The meeting will be held on February 11, 1997, beginning at 1:30 p.m. and ending no later than 4:00 p.m. It will be held in Suite 819 of Crystal Park 1, located at 2011 Crystal Drive, Arlington, Va. Written comments must be submitted on or before February 28, 1997.

Address written comments to the Commissioner of Patents and Trademarks, Attention: Wesley H. Gewehr, Administrator for Information Dissemination, Crystal Park 3, Suite 451, Washington, D.C. 20231, or fax to (703) 306-2737. Written comments should include suggestions on issues that should be a part of the PTO's review of options.

For Further Information Contact: Cheryl E. Kazenske, Manager, Public Search Services Division, by telephone at (703) 308-3040 or by mail to Patent and Trademark Office, Public Search Services Division, Crystal Plaza 3, Room 2C04, Washington, D.C. 20231.

December 10, 1996

LAWRENCE J. GOFFNEY, JR.
Acting Deputy Assistant Secretary of Commerce and Acting Deputy Commissioner of Patents and Trademarks

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Adverse Decisions In Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,835,230, Nitya P. Khasat, Birendra K. Patnaik, USE OF A CATIONIC POLYMERIZATION INITIATOR IN THE PREPARATION OF THERMOSET POLYMER, Interference No. 103,422, final judgment adverse to the patentees rendered September 27, 1996, as to claims 1-5.

Patent No. 4,877,805, Albert M. Kligman, METHODS FOR TREATMENT OF SUNDAMAGED HUMAN SKIN WITH RETINOIDS, Interference No. 102,638, final judgment adverse to the patentees rendered September 30, 1996, as to claim 5.

Patent No. 4,941,883, Aldo Venturini, DISPOSABLE SAFETY SYRINGE, Interference No. 103,359, final judgment adverse to the patentees rendered October 24, 1996, as to claims 1, 4-6, 8, 10, 12, 14, 15 and 17.

Patent No. 4,979,084, Martin Krauthamer, FINIAL SUPPORT FOR TABLE LAMP, Interference No. 102,878, final judgment adverse to the patentees rendered May 21, 1996, as to claims 1 and 3-5.

Patent No. 4,991,197, Walker C. Morris, METHOD AND APPARATUS FOR CONTROLLING TRANSMISSION OF VOICE AND DATA SIGNALS, Interference No.103,466, final judgment adverse to the patentees rendered September 25, 1996, as to claims 1-21.

Patent No. 5,013,134, Ronald T. Smith, GHOST-FREE AUTOMOTIVE HEAD-UP DISPLAY EMPLOYING A WEDGED WINDSHELD, Interference No. 103,070, final judgment adverse to the patentees rendered September 28, 1995, as to claims 1-16.

Patent No. 5,068,634, Karen P. Shrier, OVERVOLTAGE PROTECTION DEVICE AND MATERIAL, Interference No. 103,573, final judgment adverse to the patentees rendered September 30, 1996, as to claims 1-4, 10-12 and 15-20.

Patent No. 5,084,875, Joseph Weinberger, Gary Bricault, James Laird, SYSTEM FOR AUTOMATICALLY MONITORING COPIERS FROM A REMOTE LOCATION, Interference No. 103,166, final judgment adverse to the patentees rendered September 4, 1996, as to claims 1-9.

Patent No. 5,126,323, David T. Rogers, Neil M. Wolfman, Jasbir S. Seehra, HOMOGENEOUS PURIFIED K-FGF AND COMPOSITIONS CONTAINING THE SAME, Interference No. 103,464, final judgment adverse to the patentees rendered September 20, 1996, as to claims 1-8.

Patent No. 5,139,565, Fumio Kimura, Takahiro Haga, Nobuyuki Sakashita, Shigeo Murai, Yuji Nakamura, Shooichi Honzawa, SUBSTITUTED PYRIDENESULFONAMIDE COMPOUNDS, AND HERBICIDAL COMPOSITIONS CONTAINING THEM, Interference No. 103,406, final judgment adverse to the patentees rendered November 1, 1996, as to claims 1-9.

Patent No. 5,156,315, David T. Green, Henry Bolanos, Robert J. Geiste, Wayne P. Young, Stephen W. Gerry, Frank M. Rende, III, ARCUATE APPARATUS FOR APPLYING TWO-PART SURGICAL FASTENERS, Interference No. 103,319, final judgment adverse to the patentees rendered November 7, 1996, as to claims 1-16.

Patent No. 5,184,195, Eric L. Goldner, TRIAXIAL FIBER OPTIC SAGNAC INTERFEROMETER WITH SINGLE SOURCE AND DETECTOR, Interference 103,458, final judgment adverse to the patentees rendered October 16, 1996, as to claim 9.

Patent No. 5,195,969, James C. Wang, George T. Roberts, Brian A. Pederson Sr., CO-EXTRUDED MEDICAL BALLOONS AND CATHETER USING SUCH BALLOONS, Interference 103,502, final judgment adverse to the patentees rendered August 28, 1996, as to claims 1-10.

Patent No. 5,292,423, Joseph Wang, METHOD AND APPARATUS FOR TRACE METAL TESTING, Interference 103,679, final judgment adverse to the patentee rendered September 9, 1996, as to claims 1-7, 12-19, 24-30 and 33-46.

Patent No. 5,256,252, Jawed M. Sarkar, Martha R. Finck, METHOD FOR CONTROLLING PITCH DEPOSITS USING LIPASE AND CATIONIC POLYMER, Interference 103,627, final judgment adverse to the patentees rendered October 24, 1996, as to claims 1-20.

Patent No. 5,283,968, Christopher Williams, EDGELIT LUMINAIRES, Interference 103,690, final judgment adverse to the patentee rendered September 9, 1996, as to claims 1-9.

Patent No. 5,318,226, James A. Kime, Jeremy J. Margeson, DEPOSITION OF SNOW-ICE TREATMENT MATERIAL FROM A VEHICLE WITH CONTROLLED SCATTER, Interference 103,628, final judgment adverse to the patentee rendered August 26, 1996, as to claims 1-3.

Patent No. 5,420,217, Jo Ann M. Canich, PROCESS FOR PRODUCING AMORPHOUS POLY-ALPHA-OLEFINS WITH A MONOCYCLOPENTADIENYL TRANSITION METAL CATALYST SYSTEM, Interference 103,663, final judgment adverse to the patentee rendered August 15, 1996, as to claims 1-8.

OLIVIA M. DUVALL
Sup'v Legal Instruments Examiner
Board of Patent Appeals & Interferences
(703) 308-9846

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Dukes' Place Inc., Chicago, Ill., Reg. No. 1,112,492, for the mark "DUKES' PLACE" Can. No. 25,140.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner for Trademarks

Certificate of Correction
For Week of January 7, 1997

P. 09,405	5,435,877	5,504,845	5,522,882	5,534,336	5,543,804	5,553,077	5,563,805
P. 09,611	5,438,677	5,505,995	5,523,023	5,534,513	5,543,885	5,553,256	5,564,798
Re. 35,307	5,440,421	5,506,560	5,524,228	5,534,642	5,543,887	5,553,275	5,565,016
Re. 35,316	5,442,756	5,507,815	5,524,463	5,535,076	5,543,953	5,553,308	5,565,119
D. 364,234	5,444,499	5,508,272	5,524,839	5,535,235	5,544,017	5,553,507	5,565,429
D. 369,861	5,448,410	5,508,450	5,525,156	5,535,262	5,544,159	5,554,441	5,565,611
D. 370,905	5,448,633	5,509,006	5,525,909	5,535,708	5,544,183	5,554,525	5,565,925
D. 373,973	5,450,759	5,510,079	5,525,984	5,536,068	5,544,213	5,554,900	5,566,055
4,914,708	5,451,650	5,510,454	5,526,110	5,536,713	5,544,670	5,554,937	5,566,144
4,964,567	5,452,371	5,511,088	5,526,434	5,536,808	5,544,932	5,555,158	5,566,169
5,064,854	5,456,444	5,511,133	5,526,714	5,537,112	5,545,037	5,555,162	5,566,213
5,120,532	5,458,372	5,511,222	5,526,912	5,537,150	5,545,081	5,555,770	5,566,308
5,157,738	5,464,585	5,511,352	5,526,985	5,537,181	5,545,178	5,555,866	5,566,336
5,181,107	5,464,632	5,512,402	5,527,534	5,537,539	5,545,349	5,556,281	5,566,416
5,214,715	5,469,846	5,512,421	5,527,600	5,537,616	5,545,463	5,556,402	5,566,666
5,220,026	5,470,566	5,512,423	5,527,740	5,537,674	5,546,409	5,557,196	5,566,713
5,250,502	5,470,646	5,512,616	5,527,858	5,538,083	5,546,528	5,557,471	5,566,804
5,255,273	5,472,738	5,513,045	5,529,161	5,538,590	5,546,764	5,557,499	5,566,815
5,261,996	5,476,004	5,513,514	5,529,297	5,538,852	5,547,050	5,557,587	5,567,044
5,284,559	5,478,652	5,514,557	5,529,565	5,539,434	5,548,175	5,557,832	5,567,123
5,288,404	5,478,839	5,516,892	5,529,772	5,539,575	5,548,528	5,557,882	5,567,428
5,313,267	5,479,397	5,517,240	5,529,908	5,539,638	5,548,708	5,558,286	5,567,466
5,313,853	5,480,152	5,517,657	5,530,119	5,540,183	5,549,249	5,559,038	5,567,784
5,336,550	5,481,459	5,518,563	5,531,000	5,540,986	5,549,395	5,559,429	5,567,804
5,337,460	5,483,086	5,518,838	5,531,206	5,541,189	5,549,644	5,560,013	5,567,979
5,347,489	5,483,099	5,519,438	5,531,716	5,541,314	5,550,328	5,560,388	5,568,076
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5,356,755	5,491,499	5,520,261	5,532,378	5,541,555	5,550,562	5,561,228	5,568,915
5,359,225	5,495,338	5,520,576	5,532,581	5,541,894	5,550,568	5,561,809	5,569,194
5,367,041	5,495,818	5,520,821	5,532,811	5,542,145	5,550,657	5,561,949	5,570,096
5,384,502	5,496,990	5,520,827	5,532,871	5,542,348	5,550,679	5,562,201	5,570,103
5,409,694	5,500,142	5,520,877	5,533,072	5,542,516	5,551,010	5,562,545	5,570,476
5,414,221	5,500,306	5,521,123	5,533,397	5,542,761	5,551,019	5,562,813	5,571,907
5,420,134	5,501,864	5,521,234	5,533,489	5,542,769	5,551,077	5,562,934	5,572,408
5,422,073	5,502,476	5,521,758	5,533,746	5,542,893	5,551,304	5,563,135	5,572,637
5,427,202	5,503,432	5,522,036	5,533,940	5,543,095	5,551,724	5,563,240	5,573,641
5,427,807	5,504,008	5,522,556	5,534,070	5,543,389	5,552,484	5,563,345	5,573,708
				5,543,629	5,552,562	5,563,487	5,574,341
				5,543,753	5,552,865	5,563,650	5,574,399
					5,552,915	5,563,687	5,580,054

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
November 11-15, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-12	EX	74/173,959	Nanco, Inc	whether applicant has used the mark shown in its drawing [mutilation]	Refusal Affirmed		"SWEETWATER" [bottled drinking water]		No
11-13	EX	74/368,375	Good News Communications, Inc.	whether the matter asserted for registration is generic; if not, whether the mark is registrable under Section 2(f)	Refusal Affirmed (on both grounds)		"MOVIEGUIDE" [books, magazines and teaching materials on the subject of rating movies and videos in accordance with a Biblical world view]		No
11-14	OPP	87,869	Matthew Gloag & Sons Ltd. v. Nickerson	2(d)	Opposition Dismissed	"THE FAMOUS GROUSE" (and bird design) [Scotch whiskey]	"PARTRIDGE SCOTCH WHISKEY" (and bird design) [wine, Scotch and whiskey]		No
11-14	EX	74/500,776	Rayzist Photomask, Inc.	2(e)(1)	Refusal Affirmed		"CRYSTAL CARVER ASSOCIATION" [mail order catalog services featuring glass and stone products with customized sandblast decorations]		No
11-14	EX	74/587,088	Benetex Kiddie Corp.	2(d)	Refusal Affirmed		"IMAGINE" [wholesale goods sold exclusively to clothing retailers, namely, outerwear, including jackets, sweatshirts, etc.]	"IMAGINE" (and design) [jackets, sweatshirts, etc.]	No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

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● MISC68 100001 11:45:45 24-DEC-96

Date Issued	Type of Case*	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-14	EX	74/503,246	Stewart Electronics Corp.	2(d)	Refusal Affirmed		"STEWART ELECTRONICS" [consumer electronic audio products, namely, amplifiers, stereos, audio cassette recorders and players, CD players, and audio speakers for home and automobile use; and electrical connector cables for use in consumer and professional audio and video products, etc.]	"STEWART" [radios, tape recorders and tape players]	No
11-15	EX	74/481,308	American Oncologic Associates of Michigan	2(e)(2)	Refusal Affirmed		"MICHIGAN INSTITUTE FOR RADIATION ONCOLOGY" [medical treatment services]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Box _____
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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.

Please address mail as follows:

Box _____
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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 592-7000
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/02/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	08/09/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/17/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/15/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	01/30/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	01/30/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	06/08/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	03/01/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/10/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	05/15/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/17/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/13/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Director	308-1113	07/17/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	06/29/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/29/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/21/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/18/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of December 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/22/96	10/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/13/96	07/08/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/05/96	11/12/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/03/96	08/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/03/96	06/19/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/11/96	08/23/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/27/96	10/09/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/26/96	07/24/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/96	08/15/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bawman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	10/04/96	—0—
Renewals (All Classes)	10/11/96	—0—
Section 12(c) Publications (All Classes)	06/10/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

PATENTS

GRANTED January 7, 1997

ERRATA

For CLASS	See PATENT NO.
473–501	5,590,874
473–457	5,590,875
473–417	5,590,876
473–556	5,590,877
473–324	5,590,881
473–218	5,590,882
473–514	5,590,884
473–577	5,590,886
292–338	5,590,928
205–462	5,591,315
510–437	5,591,376
510–383	5,591,377
216–013	5,591,480
423–081	5,591,506
504–292	5,591,697
363–131	5,592,074
396–315	5,592,249
396–079	5,592,250
396–055	5,592,251
396–380	5,592,252
396–538	5,592,253
396–096	5,592,254
396–089	5,592,255
396–225	5,592,256
396–171	5,592,257
399–167	5,592,261
399–001	5,592,262
399–176	5,592,263
399–175	5,592,264
399–285	5,592,265
399–284	5,592,266
399–062	5,592,267
399–276	5,592,268
399–237	5,592,269
399–260	5,592,270
399–298	5,592,272
399–126	5,592,273

ERRATA–CONTINUED

For CLASS	See PATENT NO.
399–307	5,592,274
399–325	5,592,275
399–335	5,592,276
399–328	5,592,277
399–384	5,592,278
399–085	5,592,279
399–410	5,592,280
399–156	5,592,281
386–068	5,592,299
386–113	5,592,300
386–117	5,592,301
349–018	5,592,314
349–126	5,592,315
349–187	5,592,316
349–110	5,592,317
349–122	5,592,318
395–203	5,592,374
395–207	5,592,375
395–214	5,592,376
395–242	5,592,377
395–227	5,592,378
395–239	5,592,379
395–794	5,592,380
455–052	5,592,471
348–008	5,592,482
340–825	5,592,485

REEXAMINATIONS

JANUARY 7, 1997

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 Re. 33,128 (3095th)

PAPERBOARD CONTAINER FOR LIQUIDS INCLUDING MEANS TO PREVENT FITMENT ROTATION

Duane M. Nordstrom, Kelso, Wash., assignor to Longfibre Company, Longview, Wash.

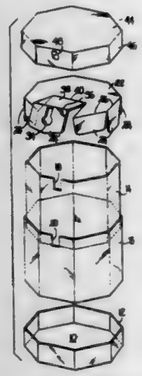
Reexamination Request No. 90/004,221, Apr. 11, 1996.

Reexamination Certificate for Reissue Patent Re. 33,128, issued Dec. 12, 1989, Ser. No. 182,716, Apr. 18, 1988.

Original No. 4,666,059, dated May 15, 1987, Ser. No. 766,535, Aug. 19, 1985.

Int. Cl.[6] B65D *90/04*

U.S. Cl. 220—465



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

6. A container for liquids, comprising:

(a) an upright tubular wall open at its top and bottom ends,

(b) a bottom cap member closing the bottom end of the tubular wall,

(c) a plurality of peripheral flaps extending outwardly from the bottom cap member and arranged to extend along the inner side of the tubular wall,

(d) registering fitment openings through one of the peripheral flaps of the bottom cap member and through the tubular wall,

(e) a flexible liquid impervious liner in the interior of the tubular wall,

(f) a fitment on the liner extending outwardly through the registering fitment openings in the flap and wall, the fitment having opposed flat external longitudinal surfaces and one or both of the registering openings in the flap and wall being configured to receive said flat external surfaces of the fitment to prevent rotation of the fitment, and

(g) a top cap member closing the top end of the tubular wall.

B1 4,618,831 (3096th)

POWER AMPLIFYING APPARATUS

Shunichiro Egami, and Makoto Kawai, both of Yokohama, Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Reexamination Request No. 90/004,146, Feb. 15, 1996.

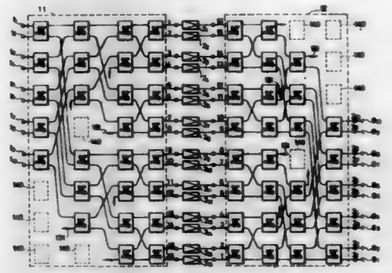
Reexamination Certificate for Patent 4,618,831, issued Oct. 21, 1986, Ser. No. 775,976, Sep. 13, 1985.

Claims priority, application Japan, Sep. 25, 1984, 59-200959

Int. Cl.[6] H03F *3/68*

U.S. Cl. 330—124 R

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims **1–4** is confirmed.

Claim **5** is determined to be patentable as amended.

Claims **6** and **7**, dependent on an amended claim, are determined to be patentable.

1. A power amplifying apparatus comprising:

a first multi-port hybrid coupler having M input terminals and N output terminals and formed by a stages of 90° hybrid couplers alone, the first of said stages including the number, M/2, of 90° hybrid couplers, the nth stage including the number, 2^{n-1}, of 90° hybrid couplers, and the first through nth stages of said 90° hybrid couplers being operative to distribute a signal input to any one of said M input terminals equally to said N output terminals, where N<M,N=2^n, is an integer that is at least equal to 2, and M/2 represents an integer having any decimal value of M/2 raised to a unit;

N amplifiers conneted directly to respective ones of said N output terminals of said first multi-port hybrid coupler;

a second multi-port hybrid coupler having N input terminals connected to the output sides of respective ones of said N amplifiers, said second multiport hybrid coupler having M output terminals and being formed by n stages of 90° hybrid couplers alone, the first stage in said second hybrid coupler including the number, 2^{n-1}, of 90° hybrid couplers, the nth stage in said second hybrid coupler including the number, M/2, of 90° hybrid couplers, and the first through nth stages of said 90° hybrid couplers of said second multi-port hybrid coupler being operative to combine the distributed signal components input to said N input terminals into one at the one of said M output terminals of said second multi-port hybrid coupler which corresponds to the one of said M input terminals of said first multi-port hybrid coupler; and

dummy loads connected to unused ones of said input and output terminals of the 90° hybrid couplers in said first and second multi-port hybrid couplers.

B1 4,815,892 (3097th)

DRAINAGE MATERIAL AND DRAINAGE CORE FOR A DRAINAGE SYSTEM

Keith F. Martin, Blackburn, Great Britain, assignor to Netlon Limited, Lancashire, Great Britain

Reexamination Request No. 90/004,011, Nov. 13, 1995.

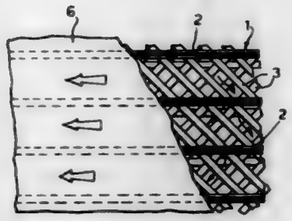
Reexamination Certificate for Patent 4,815,892, issued Mar. 28, 1989, Ser. No. 146,544, Jan. 21, 1988.

Int. Cl.[6] E02B *11/00*

U.S. Cl. 405—45

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **2** is cancelled.



Claims **1**, **10** and **11** are determined to be patentable as amended.

Claims **3–9**, dependent on an amended claim, are determined to be patentable.

New claims **12** and **13** are added and determined to be patentable.

1. A drainage system comprising:
a mesh structure defining a first face and a second face, having an overall, face-to-face thickness of at least 2.5 mm, and being capable of resisting a pressure over its faces of at least 100 kPa without catastrophic collapse, the mesh structure comprising generally parallel main strands interconnected by generally parallel subsidiary strands, the outer faces of the subsidiary strands being generally coplanar with one of said faces of the mesh structure and the main strands being spaced from said one face, thereby defining main flow channels between and parallel to the main strands and subsidiary flow channels between and parallel to the subsidiary strands, the ratio of **[**the**]** *a* free cross-sectional area of substantially each main flow channel to **[**the**]** *a* free cross-sectional are of substantially each subsidiary flow channel being at least 2.5:1, the main strands being at least twice as tall as the subsidiary strands;
a pervious member against the first face of the mesh structure; and
a pervious or impervious member against the second face of the mesh structure.

B1 4,858,704 (3098th)
GUIDED EARTH BORING TOOL
William J. McDonald; Gerard T. Pittard; William C. Maurer; Michael R. Watson, and William C. Herben, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.
Reexamination Request No. 90/004,001, Oct. 10, 1995.
Reexamination Certificate for Patent 4,858,704, issued Aug. 22, 1989, Ser. No. 94,937, Sep. 9, 1987.
Continuation of Ser. No. 863,957, May 16, 1986, Pat. No. 4,694,913.
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[6] E21B *4/14;4/20;7/08*
U.S. Cl. 175—61



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **5** and **6** are cancelled.

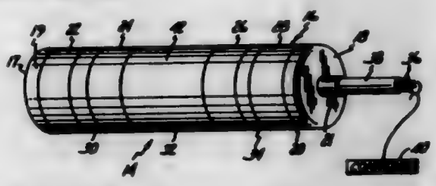
Claims **2** and **7** are determined to be patentable as amended.

Claims **3**, **4**, **8** and **9**, dependent on an amended claim, are determined to be patentable.

New claims **10–12** are added and determined to be patentable.

2. **[**A controllable earth drilling tool according to claim 1 in which**]** *A controllable tool for drilling in soft earth comprising:*
an elongated rigid supporting drill rod or pipe,
means supporting said drill rod or pipe for earth boring or piercing movement, including p1 means for moving said drill rod or pipe longitudinally for penetrating the earth,
means for rotating said drill rod or pipe while penetrating the earth, and
means for controlling the direction of movement of said drill rod or pipe along a straight or curved path,
said drill rod or pipe moving and rotating means being constructed to permit addition and removal of supporting drill rod or pipe during earth penetrating operation, and
an earth piercing member of substantially cylindrical shape,
said tool being operable to penetrate the earth upon longitudinal movement of said drill rod or pipe by said longitudinal rod or pipe moving means,
said cylindrical earth piercing member has an inclined plane **[**as**]** *terminating in* a forwardly extending *leading* face *providing piercing means for* (*a*) *solely mechanically* penetrating the earth on forward movement **[**and operable**]** to control the path of movement by reaction *of said plane* against the earth through which the tool is moved and (*b*) **[**effects**]** *effecting* a curved movement *of the drill rod or pipe* when not rotated and a substantially staight movement when rotated in a selected manner.

B1 5,314,465 (3899th)
INCONTINENCE ELECTRODE APPARATUS AND METHOD
Donald D. Maurer, Anoka, and Alexander Kipnis, Minneapolis, both of Minn., assignors to Empi, Inc., St. Paul, Minn.
Reexamination Request No. 90/004,059, Dec. 18, 1995.
Reexamination Certificate for Patent 5,314,465, issued May 24, 1994, Ser. No. 900,902, Jan. 14, 1993.
Continuation of Ser. No. 675,568, Mar. 26, 1991, Pat. No. 5,199,443.
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—138



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

New claims **8–33** are added and determined to be patentable.

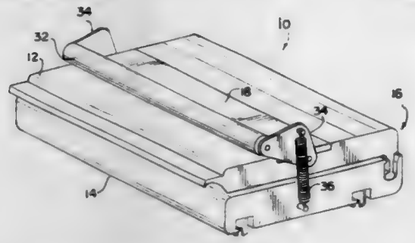
1. A urinary incontinence electrode for stimulation of vaginal musculature, the electrode comprising a resilient hollow cylindrical body having an outer surface, an inner surface and opposing sealed ends, the inner surface and opposing sealed ends defining an enclosed, generally cylindrical cavity, the body further having a first conductive region and a second conductive region disposed on the outer surface, the first and second conductive regions being separated by a non-conductive region and being configured for electrical connection to an electric power source, wherein upon being electrically connected to the electric power source, inserted into a vagina, and activated by the electric power source, the cylindrical body flexes inwardly in response to a contraction of the vaginal musculature.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED JANUARY 7, 1997

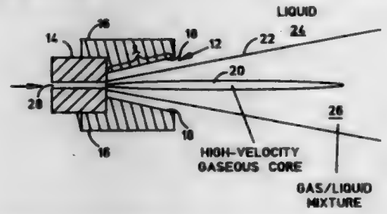
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1623
FROZEN BAG OF LIQUID THAWER UTILIZING HEAT AT AMBIENT TEMPERATURE
William S. Reed, 182 S. Lake St., Grayslake, Ill. 60030, and John M. Garcia, 11525 S. Nagle Ave., Worth, Ill. 60482
Filed Jun. 29, 1994, Ser. No. 268,906
Int. Cl.[6] H05B *3/06*
U.S. Cl. 219—524 **29 Claims**



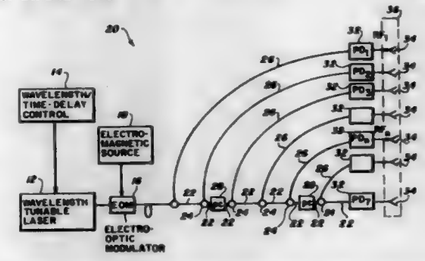
1. A device adapted to thaw frozen liquid contained in at least one bag comprising:
an upper contact plate having a size such that when the upper contact plate is at room temperature the upper contact plate contains a first quantity of room temperature heat;
a lower contact plate having a size such that when the lower contact plate is at room temperature the lower contact plate contains a second quantity of room temperature heat, the upper contact plate and the lower contact plate being sized such that the first quantity of room temperature heat combined with the second quantity of room temperature heat is capable of completely thawing the frozen liquid;
a hinge movably connecting the upper contact plate to the lower contact plate at a hinged location; and
means attached to the upper contact plate and the lower contact plate for biasing the upper contact plate towards the lower contact plate.

H1624
STABILIZER FOR SUBMERGED GASEOUS JETS IN LIQUIDS
T. Roger Ogden, and Eric W. Hendricks, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jun. 2, 1993, Ser. No. 73,017
Int. Cl.[6] F02M *67/00*
U.S. Cl. 261—123 **10 Claims**



1. An apparatus comprising:
an injector through which a gas flows at approximately the speed of sound into a liquid; and
a flow stabilizer having a planar face, said flow stabilizer being disposed at an exit end of said injector so that said planar face diverges in a direction normal to the flow of said gas through said injector, said flow stabilizer for reducing reverse flow of said gas.

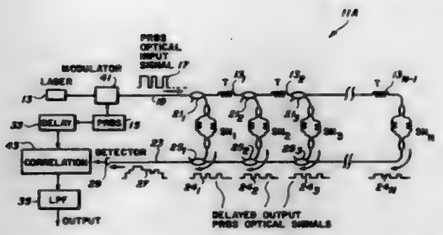
H1625
DISTORTION-COMPENSATED FIBER-OPTIC MULTI-TAP PROPORTIONAL TRUE TIME DELAY
Michael Y. Frankel, Crofton, Md., assignor to United States of America, Washington, D.C.
Filed Sep. 14, 1995, Ser. No. 528,083
Int. Cl.[6] H01Q *3/22*
U.S. Cl. 342—375 **4 Claims**



3. A fiber-optic true time-delay array antenna feed system comprising:
a wavelength tunable laser generator for generating an optical laser light beam having an optical spectrum;
a wavelength controller for controlling the wavelength of the laser generator;
a modulator for modulating the optical laser light beam with a radio frequency electromagnetic signal;
a first optical fiber for propagating the first modulated optical laser light beam comprised of a high-dispersion optical fiber for conducting and controlling a time-delay of the first modulated optical laser light beam;
a plurality of optical splitters positioned along the first optical fiber to direct a portion of the first optical laser light beam into a plurality of second optical fibers having zero-dispersion;
a phase conjugator for inverting the optical spectrum of the first modulated optical laser light beam about a predetermined inversion frequency located at one or more predetermined points along the first optical fiber;
a photodetector for converting the first modulated optical laser light beam and each of the plurality of optical light beams in the second optical fibers into an electromagnetic signal; and
a plurality of antenna elements, each antenna element associated with at least one photodetector for transmitting the electromagnetic signal.

H1626
FIBER OPTIC NETWORK SYSTEM WITH LOW CROSSTALK USING CODE-DIVISION MULTIPLEXING
Alan D. Kersey, 9305 Silvercreek Ct., Fairfax Station, Va. 22039, and Anthony Dandridge, 9514 Claychin Ct., Burke, Va. 22015
Filed Jan. 28, 1993, Ser. No. 10,252
Int. Cl.[6] H04J *13/02*
U.S. Cl. 370—479 **8 Claims**

1. A code-division multiplexed system comprising:
an optical source;



first means for developing and applying a pseudo-random bit sequence code to said optical source to cause said optical source to develop a unipolar coded optical signal;

means for dividing said unipolar coded optical signal into N optical paths separated from each other by associated successive integer multiples of a bit period T of delay;

N information signal sources for selectively encoding the unipolar coded optical signals in the respective N optical paths for producing N differently-delayed optical information signals;

means for combining said N differently-delayed optical information signals into an output optical signal comprised of an intensity sum of overlapping N differently-delayed unipolar optical information signals;

photodetection means responsive to said output optical signal for developing an input electrical signal corresponding to said sum of N overlapping unipolar optical information signals;

adjustable means responsive to said pseudo-random bit sequence code for producing at least one essentially bipolar reference code corresponding to the delay associated with an associated desired one of said N differently-delayed optical information signals; and

correlation means responsive to said input electrical signal and to said at least one essentially bipolar reference code for synchronously correlating said at least one essentially bipolar reference code with said input electrical signal to extract a desired electrical signal corresponding to the desired one of said N differently-delayed optical information signals and to substantially suppress any other electrical signal that is asynchronously aligned with said at least one essentially bipolar reference code.

H1627

METHOD OF AND APPARATUS FOR IMAGE PROCESSING USING A VARIABLE FOCAL SPOT SIZE

Alfred Brez, Marlboro, and William H. Green, Stow, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1994, Ser. No. 189,388

Int. Cl.[6] H05G *1/08*

U.S. Cl. 378—98.12 **4 Claims**

1. A method for the processing of converted images of an object in order to accentuate the fine structure detail of the object, comprising the steps of:

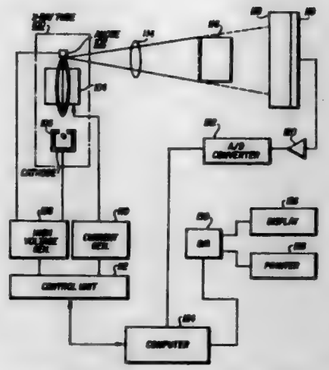
placing the object between an x-ray tube and an image conversion screen/device;

generating a mask image of said object using a large focal spot size of said x-ray tube;

generating a second image of said object using a small focal spot size of said x-ray tube;

decreasing the image noise and increasing the image signal-to-noise ratios for each of said mask and second images of said object;

subtracting said second image of said object from said mask image of said object to generate an image having accentuated fine structure detail, and



amplifying the gray levels of said image having accentuated fine structure detail thereby increasing the contrast of said image having accentuated fine structure detail.

H1628

TEA EXTRACT AND PROCESS

Athula Ekanayake, The Procter & Gamble Company, Miami Laboratories 8656 Birchbark Dr., Cincinnati, Ohio 45239-8707, and Edmund P. Pultinas, Jr., The Proctor & Gamble Company, Miami Valley Laboratories P.O. Box 398707, Cincinnati, Ohio 45239-8707

Continuation of Ser. No. 439,811, May 12, 1995, abandoned, which is a continuation of Ser. No. 178,702, Jan. 10, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 603,700

Int. Cl.[6] A23F *3/16*

U.S. Cl. 426—597 **9 Claims**

1. A process for producing a tea product comprising the steps of:

(a) Contacting green tea materials with water, at a ratio of tea materials to water, of from about 1:40 to about 1:3 at a temperature of from about 20° C. to about 45° C. for a period of time sufficient to produce an aqueous extract containing from about 0.75% to about 2.0% by weight, tea solids;

(b) Separating the aqueous extract of step (a) from solid tea materials residue;

(c) Contacting the solid tea materials residue of step (b) with water, at a ratio of tea materials to water, of from about 1:30 to about 1:7 at a temperature of from about 30° C. to about 65° C. for a period of time sufficient to produce an aqueous extract containing from about 0.50% about 2.0% by weight, tea solids;

(d) Separating the aqueous extract of step (c) from the solid tea materials residue;

(e) Combining the aqueous tea extract from step (b) and step (d);

(f) Mixing the extract from step (e), at a temperature of from about 40° C. to about 50° C., with from about 5% to about 35% by weight, based on the amount of soluble solids present in the extract, of an agent capable of precipitating insoluble tea components in the extract and consisting essentially of a protein selected from the group consisting of caseinates, whey protein, soy protein, soy protein isolates, albumins, and gelatin;

(g) Concurrently adding from about 0.15% to about 0.25% edible acid and from about 0.025% to about 0.075% edible buffering salt to the aqueous tea extract of step (f) to obtain a pH of from about 2.9 to about 3.4;

(h) Optionally separating any precipitate from the aqueous tea extract of step (g);

(i) Cooling the aqueous tea extract from step (g) or (h) to a temperature of from about 0° C. to about 20° C.;

(j) Separating any solid precipitate from the cooled extract of step (i).

H1629

POLY(AMINOAMIDEUREYLENE) RESIN, ITS SYNTHESIS, AND ITS USE IN PAPER AND PAPERBOARD MANUFACTURE

Richard J. Riehle, and Ronald R. Staib, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 194,601, Feb. 10, 1994, abandoned, which is a continuation of Ser. No. 177,111, Jan. 3, 1994, abandoned. This application Jan. 19, 1995, Ser. No. 375,063

Int. Cl.[6] C08F *283/04*

U.S. Cl. 525—426 **34 Claims**

1. A process for producing a polymer, comprising the steps of:

A. reacting (i) a diaminoamine, (ii) a dicarboxylic acid or a derivative thereof, and (iii) urea to produce a poly(aminoamideurylene); and

B. reacting the poly(aminoamideureylene) produced in step A. with an allyl halide to produce a quaternized allylated poly(aminoamideureylene) in a yield of ≦99.95.

H1630

DIAPER HAVING PLURAL UPSTANDING LEG CUFFS

Donald C. Roe, West Chester, and Kimberly A. Dreier, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 1, 1995, Ser. No. 396,949

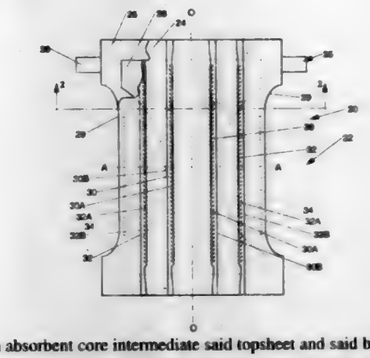
Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—385.2 **13 Claims**

1. A diaper having a longitudinal centerline, a lateral centerline orthogonal thereto, and a Z-direction perpendicular to said longitudinal centerline and said lateral centerline said diaper comprising:

a liquid pervious topsheet;

a liquid imperious backsheet at least partially peripherally joined to said topsheet;



an absorbent core intermediate said topsheet and said backsheet;

two generally longitudinally oriented outer barrier leg cuffs, upstanding from the plane of said topsheet, one of said outer barrier leg cuffs being disposed on each side of said longitudinal centerline;

two generally longitudinally oriented inner barrier leg cuffs upstanding from the plane of said topsheet, one of said inner barrier leg cuffs being disposed on each side of said longitudinal centerline, so that each said inner barrier leg cuff is disposed on the same side of said longitudinal centerline as one of said outer barrier leg cuffs corresponding thereto, each said corresponding outer barrier leg cuff and said corresponding inner barrier leg cliff being spaced apart 0.5 inches to 2.0 inches, said outer barrier leg cuffs having a greater extent in the Z-direction than said inner barrier leg cuffs; and

two gasket cuffs lying within the plane of said diaper, one said gasket cuff being disposed on each side of said longitudinal centerline.

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,418

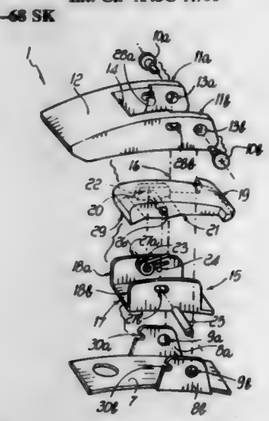
SECURING DEVICE, PARTICULARLY FOR FOOTWEAR

Dino Martignago, Via Bassananese 31, 31010 Maser, Italy

Original No. 5,172,454, dated Dec. 22, 1992, Ser. No. 793,883, Nov. 18, 1991. Application for reissue Dec. 22, 1994, Ser. No. 361,828

Int. Cl.[6] **A43C** *11/00*

U.S. Cl. 24—68 SK **5 Claims**



4. Device for securing a first flap and a second flap of an item of footwear, comprising a first base rigidly associable with said first flap, a pair of pivoting shoulders protruding from said first base and having pivotally connected thereto a lever arm, said lever arm having a pivot connected to a support provided with a ratchet system for engagement with a toothed tab, said support having a first slot, said lever having a second longitudinal slot, said first slot and said second longitudinal slot accommodating said pivot, said pivot selectively interacting with stop means, said stop means being defined on said shoulders, said toothed tab being removably associable with said second flap, said lever arm being provided with a pair of tabs defining a seat for the temporary positioning of said support provided with a ratchet system, said support being U-shaped and defining a second base, a pair of walls for accommodating said ratchet system protruding laterally from said second base, said ratchet system having a T-shaped body including a head and a steam, said head protruding rearward and laterally with respect to said pair of tabs, said stem having a free end, said free end of said stem interacting with said toothed tab and being directed in the same direction as the free end of said lever arm.

Re. 35,419

MEASUREMENT OF AN ENZYME MARKER AS AN AID TO DIAGNOSIS OF LIVER TRANSPLANT REJECTION

Cormac G. Kilty, 31 Monkstown Avenue, Monkstown County Dublin, and Seamus O'Byrne, 16 The Alders, Monkstown, Valley Monkstown, County Dublin, both of Ireland, assignors to Cormac G. Kilty, and Seamus O'Byrne, both of County Dublin, Ireland

Original No. 5,217,868, dated Jun. 8, 1993, Ser. No. 877,481, May 1, 1992. Application for reissue Oct. 5, 1993, Ser. No. 134,026

Int. Cl.[6] **C12Q** *1/48*

U.S. Cl. 435—7.4 **7 Claims**

1. Method for assisting in early diagnosis of liver transplant rejection, comprising measuring the level of alpha glutathione S transferase in a plasma or serum sample of a liver transplant patient, and comparing said level to a normal level, wherein an increase in said alpha glutathione S transferase level in said liver transplant patient in the absence of or preceding any change in plasma transaminase level or serum transaminase level is indicative of liver transplant rejection.

Re. 35,420

METHOD OF INCREASING CAPACITANCE BY SURFACE ROUGHENING IN SEMICONDUCTOR WAFER PROCESSING

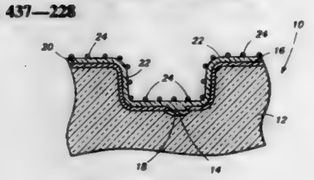
David A. Cathey; Mark E. Tuttle, and Tyler A. Lowrey, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

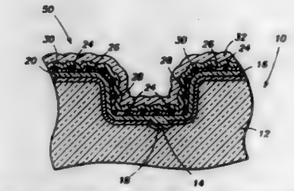
Original No. 5,244,842, dated Sep. 14, 1993, Ser. No. 812,061, Dec. 17, 1991. Continuation-in-part of Ser. No. 653,839, Feb. 11, 1991, Pat. No. 5,102,832, and Ser. No. 683,215, Apr. 10, 1991, Pat. No. 5,112,773. Application for reissue Jun. 19, 1995, Ser. No. 491,627

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[6] **H01C** *21/28*

U.S. Cl. 437—228 **37 Claims**





1. A method of increasing capacitance by surface roughening in semiconductor wafer processing comprising the following steps:

applying a first layer of material atop a substrate thereby defining an exposed surface;

incontinuously adhering discrete solid particles to the first layer exposed surface to roughen the exposed surface; and

applying a second layer of material atop the first layer and the adhered discrete solid particles to define an outer surface, the discrete solid particles adhered to the first layer inducing roughness into the outer surface thereby increasing its surface area and accordingly capacitance of the second layer in a final wafer structure.

Re. 35,421

AUTOMATIC CORNEAL SHAPER

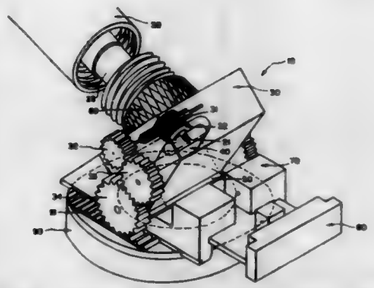
Luis A. Ruiz, 712 Sawdust Cir., Manakin Sabot, Va. 23103, and Sergio Lenchig G., Calle 125 No. 40-28, Int. 22, Bogotá, Colombia

Original No. 5,133,726, dated Jul. 28, 1992, Ser. No. 479,692, Feb. 14, 1990. Application for reissue Jul. 27, 1994, Ser. No. 280,673

Int. Cl.[6] **A61B** *17/32*

U.S. Cl. 606—166 **27 Claims**

11. An automatic microkeratome device for performing lamellar corneal resections comprising:



an eyeball retainer including an aperture through which a portion of the cornea is exposed, a guideway defining a linear path, and a first drive element;

a mobile body movably mounted on said eyeball retainer, said mobile body including at lease one follower element engaging said guideway to guide said mobile body along said linear path and across said aperture;

a blade mounted to said mobile body for movement therewith along said linear path, said blade having a cutting edge extending outward from said mobile body for resecting a portion of said cornea as said mobile body moves across said aperture;

a plate member including a bottom face extending forwardly beyond said cutting edge of said blade to contact said cornea prior to said cutting edge, said cutting edge being spaced downward relative to said bottom face of said plate member such that a vertical space is defined therebetween, said defined vertical space setting the depth of the corneal resection;

a second drive element attached to said mobile body and in engagement with said first drive element;

a power source; and

a transmission coupling operatively coupling said power source to said first and second drive elements to cause relative movement between said first and second drive elements to thereby move said mobile body along said linear path so that said blade resects a lamellar portion of the cornea.

PLANT PATENTS

GRANTED JANUARY 7, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,776

MINIATURE ROSE PLANT NAMED 'SWEET REVENGE'

Susan M. O'Brien, 489 Minot Ave., Chula Vista, Calif. 91910, and Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif.

Filed Jan. 2, 1996, Ser. No. 582,197
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—10.1 **1 Claim**

1. A new and distinct variety of miniature rose plant, named 'Sweet Revenge', hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described; characterized by its hybrid tea form blooms, ranging from near Chinese Coral to near Carrot Red with a deeper orange blush on the outermost petals of near Carrot Red to near Mars Orange, which are abundant on the bush and usually borne one to a stem but occasionally in sprays of 3 to 5 or more.

9,777

FLORIBUNDA ROSE PLANT NAMED 'MEIPOPUL'

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 9, 1995, Ser. No. 555,726
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of Floribunda rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive single scarlet red blossoms on a substantially continuous basis,
(b) exhibits a bushy growth habit,
(c) forms attractive very dense semi-glossy vegetation, and
(d) is particularly well suited for growing as ornamentation in the landscape;

substantially as herein shown and described.

9,778

PEACH TREE 'STAR-FIRE'

Chris F. Zaiger, 929 Grimes Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Oct. 30, 1995, Ser. No. 549,924
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—43.1 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, which is of large size, vigorous, upright growth, and is a regular and productive bearer of large, firm, yellow flesh, semi-freestone fruit with good flavor and eating quality; the fruit is further characterized by coloring 6 to 8 days before maturity, having a high degree of attractive red skin color, having good handling and shipping quality; and in comparison to Amparo Peach (U.S. Plant Pat. No. 6,472), the fruit is approximately 1 week later in maturity.

9,779

DAYLILY NAMED 'ROSY RETURNS'

Darrel A. Apps, Bridgeton, N.J., assignor to Centerton Nursery, Inc., Bridgeton, N.J.

Filed Nov. 6, 1995, Ser. No. 554,005
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinct cultivar of Hemerocallis of the dormant type, substantially as herein shown and described, which

(a) forms attractive rose-pink flowers having a substantial substance and a flat form,
(b) possesses a long blooming season with substantially continuous blooming,
(c) exhibits a propensity to readily display a plurality of fans, and
(d) readily forms a plurality of scapes per fan over the flowering season.

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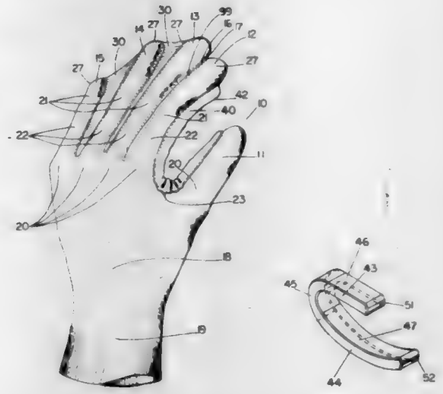
5,590,420

LOW FRICTION APPAREL

Robert T. Gunn, 360 E. 65th St., Apt. 11E, New York, N.Y. 10021

Filed Mar. 24, 1994, Ser. No. 217,490
Int. Cl.[6] A41B *11/00*
U.S. Cl. 2—69 35 Claims





1. An article of clothing having a treated area and an untreated area, the treated area including an area of high body surface to article of clothing contact and the untreated area including a remaining portion of the article of clothing, the treated area having incorporated therein a material having a low coefficient of friction characteristic which is of a non-temporary nature, which is functional over the lifetime of the article and which imparts to the treated area a coefficient of friction which is less than about 80% of the coefficient of friction of the untreated area, and wherein the article of clothing is hosiery, the specific area of high body to clothing contact includes a heel area, a pad area, an area extending from the pad to the right and left side of a foot or toe area.

5,590,421

DEVICE AND METHOD FOR TREATMENT OF HAND INVOLVED HABITS

James Craner, 395 Tenaya La., P.O. Box 1161, Verdi, Nev. 89439

Continuation of Ser. No. 124,103, Sep. 20, 1993, abandoned.
This application Jun. 2, 1995, Ser. No. 459,540
Int. Cl.[6] A61F *5/37*; A41D *19/00*
U.S. Cl. 2—161.7 20 Claims

20. A glove comprising:

means for reducing substantial independent movement between second and third digits of said glove;

blocking material located between the third and a fourth digit of said glove;

blocking material located between the fourth and a fifth digit of said glove;

means for reducing the ease of opposition between a first digit of said glove and the second digit of said glove; and

means for restricting flexion at proximal interphalangeal and metacarpalphalangeal joints of the second digit of said glove;

wherein said means for reducing the ease of opposition between said first and second digits comprises a generally U-shaped restrictor placed in said glove at a position between the first and second digits;

wherein said generally U-shaped restrictor comprises: first and second prongs joined in a continuous curved portion to form a generally continuous outer edge and a generally continuous inner edge; said inner and outer edges joined together at an end of each prong, said ends being tapered in thickness; said inner edge having a substantially flat surface and said outer edge having a concave surface; and said first prong being substantially straight and said second prong being substantially curved inwardly towards said first prong, said second prong having a greater overall length than said first prong.

5,590,422

COMBINED HEADBAND AND HAIR-RETAINER

Donna J. Henderson, 1405 Jasmine Cir., Rohnert Park, Calif. 94928

Filed Oct. 17, 1995, Ser. No. 544,863
Int. Cl.[6] A42C *5/02*
U.S. Cl. 2—171 6 Claims



1. An apparel item, comprising:

a closed-loop made at least partially of a fabric material and arranged to fit around a wearer's head for forming a headband; and

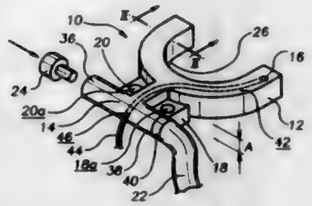
an elongated hair-retainer member having first and second ends and being attached at a region between said first and second ends thereof to said closed-loop, said hair-retainer member being sufficiently flexible that it may be deformed by hand from one shape into another, yet being sufficiently rigid that it will essentially retain whatever shape into which it is formed, whereby said first and second ends of said hair-retainer member may be wrapped around a portion of a wearer's hair, thereby retaining said hair-portion in a pony-tail form.

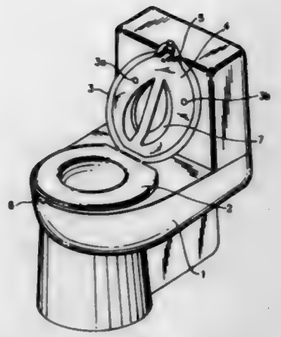
5,590,423

COMMODE ODOR EXTRACTOR

Dwight L. Boykin, 200 Wheeler Rd., Bay Minette, Ala. 36507

Filed Dec. 13, 1995, Ser. No. 571,542
Int. Cl.[6] E03D *9/04*
U.S. Cl. 4—213 **18 Claims**





1. A commode odor extractor comprising:
a U-shaped suction fitting having a central suction chamber defined in part by an upper and lower surface and having a lip on said lower surface that extends into an interior of a commode bowl a distance of a between one-half and one inch, said fitting having a plurality of suction apertures each formed through said bottom surface thereof and in communication with said central suction chamber;
a dual port vent hose fitting connected to said central suction chamber and having two connecting ports adapted for connection with a venting hose and having a cable aperture therein;
a momentary contact switch extending from said upper surface of said U-shaped suction fitting and having an insulated electrical connection cable running through said central chamber and into said vent hose fitting and out through said cable aperture of said vent hose fitting;
a first and second commode attachment plate having a mounting aperture formed therethrough for allowing passage of an existing commode seat attachment bolt therethrough, each of said first and second attachment plates extending between said U-shaped suction fitting and said vent hose fitting and extending past said bottom surface of said U-shaped fitting at least one-sixteenth of an inch such that upon mounting said plates on a commode, said bottom surface will be elevated said at least one-sixteenth of an inch above said commode to allow passage of air from said commode into said central suction chamber via said suction apertures;
a vent hose having a hose fitting connectable with either of said ports of said vent hose fitting in a manner such that a suction formed at a non-connected end of said vent hose will cause movement of air into said suction apertures, through said central suction chamber, through said vent hose fitting, and out through said vent hose when said other of said ports is blocked; and
a port plug sealingly connectable with the other of said ports of said vent hose fitting.

5,590,424

DEVICE FOR PROVIDING SANITARY COVERS FOR TOILET SEATS

Masahiro Matsunaga, Ube, and Hakuo Hamada, Nihonmatsu, both of Japan, assignors to M N Engineering Kabushiki Kaisya, Yamaguchi, and Ube Jushi Kakou Kabushiki Kaisya, Fukushima, both of Japan

Filed Jun. 8, 1994, Ser. No. 255,671
Claims priority, application Japan, Jun. 10, 1993, 5-166446
Int. Cl.[6] A47K *13/14*
U.S. Cl. 4—243.1 **11 Claims**

1. A device for providing at least one of a plurality of sanitary covers for a toilet seat, comprising:
a toilet seat cover having means for retaining said plurality of sanitary covers in contact with said toilet seat cover;
a toilet seat having means for clamping at least one of said plurality of sanitary covers upon said toilet seat cover making contact with said toilet seat;
said means for clamping said at least one of said plurality of sanitary covers including a sanitary cover clamping section;
said sanitary cover clamping section further including an upper clamping member having a front portion and a rear portion;
a lower clamping member having a front portion and a rear portion;
a spring member;
said upper clamping member being pivotally connected to said lower clamping member by a pivot pin;
said spring member being disposed between said upper clamping member rear portion and said lower clamping member rear portion;
said spring member holding said upper clamping member and said lower clamping member in a closed position whereby a portion of a lower area on said front portion of said upper clamping member and a portion of an upper area on said front portion of said lower clamping member make contact;
said portion of said lower area on said front portion of said upper clamping member having a friction area disposed thereon;
said portion of said upper area on said front portion of said lower clamping member having a friction area disposed thereon;
said lower area on said front portion of said lower clamping member having an engaging portion disposed thereon;
said sanitary cover clamping section being attached to a forward bottom portion of said toilet seat; and
means for positioning said at least one of said plurality of sanitary covers upon said toilet seat.

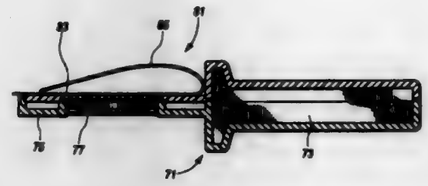
5,590,425

HYGIENE TOILET SEAT HANDLE

Ernest A. Janik, Jr., 325 N. St. Paul Suite 2626, Dallas, Tex. 75201

Continuation of Ser. No. 420,250, Apr. 11, 1995, abandoned, which is a division of Ser. No. 274,704, Jul. 14, 1994, abandoned. This application Jun. 5, 1996, Ser. No. 658,746
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—246.1 **6 Claims**

1. A toilet seat handle, comprising:
a wafer container for holding a wafer;
a handle, connected to the wafer container; and
a resilient spring clamp secured to the wafer container for removably attaching the container to a toilet seat, the clamp having a foldover cross-sectional configuration substantially corresponding to a cross-sectional configuration of an upper and lower surface of a toilet seat to which the container is to be attached by imposing a spring grip relation against the upper and lower surfaces of the toilet seat, the clamp having a lower arm attached to the wafer container and an upper arm attached at one end to the lower arm, wherein the upper arm and lower arm fit on opposite sides of a toilet seat, so as to locate the wafer container below the toilet seat with the handle extending outward beyond one edge of the toilet seat.

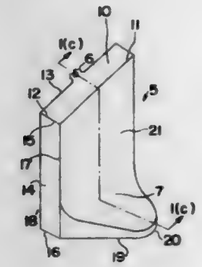


5,590,426

URINAL COVER

Mark C. Moffre, and Alyssa B. LaPointe, both of 71 Bridgewood La., Watervliet, N.Y. 12189

Filed Apr. 14, 1995, Ser. No. 421,962
Int. Cl.[6] E03D *13/00*
U.S. Cl. 4—301 **2 Claims**



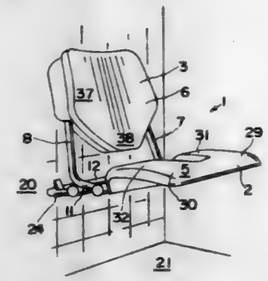
1. A cover for a vertically oriented wall urinal having an open area bound its bottom by a forward point; said cover having front and rear surfaces and comprising:
a top section having front and rear edges, side edges, and a flexible clamping means extending from the rear edge;
two side sections having top, bottom, front, and rear edges, each side section having the top edge abutting a side edge of the top section, each side section having an extension forwardly and inwardly directed from the top edge of each side section adjacent the bottom edge, which extensions meet a forward point of the urinal cover to form a convex protrusion;
a front section which abuts the front edge of the top section and the front edges of the side sections, the front section having a lower-front area which is convex upwardly and outwardly and joins the convex protrusion, the urinal cover being of such size and shape that when positioned on a urinal, it encloses the open area of the urinal including the convex protrusion covering the forward point.

5,590,427

SHOWER SITTING STRUCTURE

Wilhelmine M. M. Weterings, Raamsdonkveer; Franciscus J. M. Nieuwenhuis, Gouda, and Willem G. L. de Jong, Pijnacker, all of Netherlands, assignors to B.V. Linido, Pijnacker, Netherlands

PCT No. PCT/NL93/00015, § 371 Date Mar. 14, 1994, § 102(e) Date Mar. 14, 1994, PCT Pub. No. WO93/13702, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 15, 1993, Ser. No. 199,124
Claims priority, application Netherlands, Jan. 16, 1992, 9200074
Int. Cl.[6] A47K *3/12*
U.S. Cl. 4—611 **4 Claims**



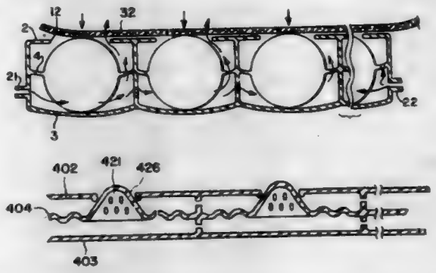
1. A shower sitting structure, which comprises:
a frame;
a seat mounted on said frame and comprised of user supporting portions spaced apart and disposed symmetrically with respect to a vertical plane, said user supporting portions merging into each other at said vertical plane, each user supporting portion supporting a user's thigh from a front support end to a rear support end thereof, said front support end disposed to lie proximate a user's knee, each user supporting portion extending to said user's buttock to a rear supporting end terminating short of said user's ischial tuberosities thereby forming an essentially free horizontal passage therebetween from front to back of user's perineum; and
a back support element mounted to said frame having a back support surface for a back region proximate user's sacrum.

5,590,428

AIR PRESSURIZED PERSON SUPPORTING DEVICE WITH VENTILATION

Amir Roter, Givatayim, Israel, assignor to Adelbar Importing and Marketing Ltd., Givatayim, Israel

Filed Jun. 24, 1994, Ser. No. 265,684
Int. Cl.[6] A47C *27/08*; A61G *7/057*
U.S. Cl. 5—726 **25 Claims**



1. A device particularly useful for comfortably supporting a person, comprising:

a hollow member including upper and lower walls having peripheries, said peripheries being joined to each other, and connectable to air pressuring means for pressuring air in the interior of said hollow member, said upper wall being made of a flexible material and formed with a plurality of openings at spaced locations thereof; and

a plurality of valve members respectively for said openings, each valve member being normally biased to a closed position with respect to its opening, but, when a person is supported by said hollow member, are movable to an open position for discharging air from its opening between said upper wall and said person,

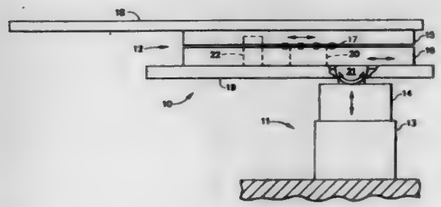
wherein said valve members project from an intermediate flexible plastic sheet disposed between said upper and lower walls and are joined thereto along outer peripheries to define at least one upper chamber between said upper wall and said intermediate sheets, and at least one lower chamber between said lower wall and said intermediate sheet.

5,590,429

ELECTROPHYSIOLOGY TABLE

Jonathan C. Boomgaarden, and Harold J. Kidd, both of Waukesha, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Sep. 13, 1995, Ser. No. 527,986
Int. Cl.[6] A61G *13/00*
U.S. Cl. 5—600 **10 Claims**



1. An electrophysiology table comprising in combination,

(a) a fixed support base,

(b) a table top support structure on said base,

(c) a dual section table top supported by said table top support structure,

(d) a lifting mechanism between said base and said table top support structure to vertically adjust said table top support structure with said dual section table thereon,

(e) said dual section table top comprising a pair of narrow elongated upper and lower table sections in superimposed planar to planar relationship with means for providing axial relative motion therebetween so that the upper one of said sections is movable over and supported by the lower section,

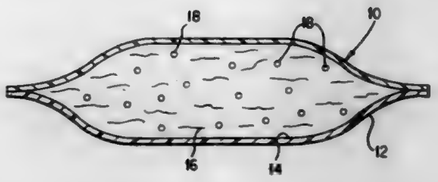
(f) and means for providing axial movement of said lower section along said table top support structure toner. her With said upper section thereon.

5,590,430

GEL FILLED DEFORMABLE CUSHION AND COMPOSITION CONTAINED THEREIN

Joel L. Sereboff, 204 E. Joppa Rd., Penthouse Suite 10, Towson, Md. 21286

Continuation-in-part of Ser. No. 136,273, Oct. 15, 1993, Pat. No. 5,475,882. This application Jun. 6, 1995, Ser. No. 466,785
Int. Cl.[6] A47C *16/00*
U.S. Cl. 5—655.5 **18 Claims**



14. A deformable low density gel cushion comprising:

(a) a fluid impervious flexible enclosure forming an internal chamber;

(b) a padding fluid composition within said internal chamber having a first predetermined density;

(c) a plurality of particulates dispersed within said padding fluid composition, said particulates being substantially spherical in contour and having a second predetermined density less than said first predetermined density of said padding fluid composition; and

(d) said gel composition has about 60–80% by weight of said padding fluid to about 20–40% by weight of said plurality of particulates

wherein said spherically contoured particulates are selected from the group consisting of plastic composition microspheres, ceramic composition microspheres and combinations thereof, thereby exhibiting a bounce effect; and

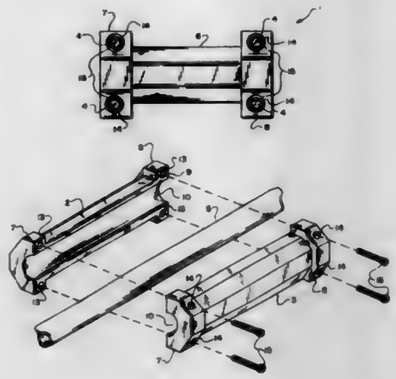
wherein said fluid padding composition is an emulsion selected from the group consisting of soybean oil, sunflower oil, canola oil, peanut oil and mixtures thereof with water and a thickening agent.

5,590,431

STRETCHER FRAME CLAMP

Kevin R. O'Connell, Carter Notch Rd., Box 394, Jackson, N.H. 03846

Filed Jul. 25, 1995, Ser. No. 506,786
Int. Cl.[6] A61F *5/04*
U.S. Cl. 5—658 **8 Claims**



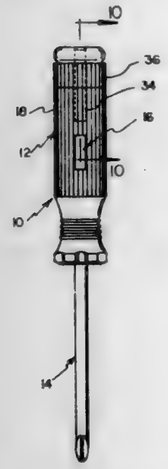
1. A stretcher frame clamp assembly for adapting orthopedic traction components to a movable bed unit having tubular frame rails, said assembly comprising: a plurality of clamp sections adapted to be joined together to surround a tubular frame rail section, said clamp assembly comprising a clamping area having a substantially octagonal outer cross section, and a means for joining said clamp sections in such a manner so as to firmly grip said bed unit frame rail section where it passes through said clamp assembly and prevents said assembly from rotating around said frame rail section.

5,590,432

FASTENER DRIVING WIRE UNCOILING TOOL

Aaron R. Taskey, Sr., 5859 E. County Rd. 1100 North, Seymour, Ind. 47274

Filed Apr. 3, 1995, Ser. No. 415,243
Int. Cl.[6] B25B *25/00*
U.S. Cl. 7—108 **7 Claims**



1. A fastener driving wire uncoiling tool comprising:

a handle means for being grasped and manipulated by an individual;

a driving means projecting from the handle means for engaging a fastener to effect manual rotation thereof and for coupling to a chuck of a drill;

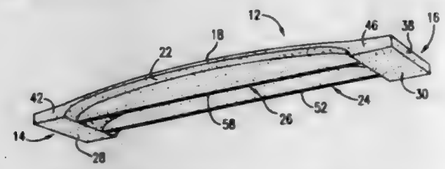
a wire engaging means coupled to the handle means for engaging an end of a length of wire wound in a spiral configuration such that the driving means can be engaged to a chuck of a drill, whereby rotation of the handle means and the associated wire engaging means can be accomplished to effect uncoiling of the wire from the spiral configuration.

5,590,433

MONOLITHIC CAST BRIDGE

Obed M. Fricke, 306 S. Aztec, Montezuma, Kans. 67867

Filed Sep. 15, 1995, Ser. No. 528,551
Int. Cl.[6] E01D *4/00;18/00*
U.S. Cl. 14—24 **2 Claims**



1. A bridge consisting essentially of a unitary, monolithic, cast concrete body having:

a pair of spaced haunches, each of said haunches presenting an underside for engaging a support for said bridge;

an arcuate span, said span presenting opposed upper and lower arcuate surfaces and a pair of opposed side surfaces, said span extending upwardly between said pair of haunches to present a highpoint relative to said haunches, said highpoint being on said span upper surface, said highpoint being generally midway between said haunches; and

at least one web for increasing the load-bearing capability of said span, said web extending downwardly from said span lower surface and axially along said span lower surface for the entire distance between said haunches, said web presenting opposed side surfaces and a bottom surface, said web side surfaces converging towards each other between said lower surface of said span and the web bottom surface, the height of said web being less than one-half the width of said span,

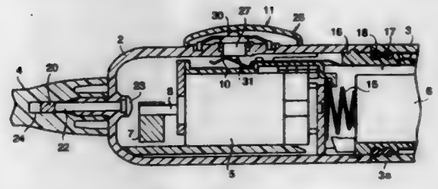
said bridge being configured for use as a golfcart bridge, a walkway bridge, or an agricultural bridge for center pivot sprinkler towers.

5,590,434

ELECTRIC TOOTHBRUSH

Kiyoshi Imai, Toyama, Japan, assignor to Kitano Co., Ltd., Toyama, Japan

Filed Jun. 6, 1995, Ser. No. 467,880
Claims priority, application Japan, Jun. 10, 1994, 6-008519 U; Jul. 1, 1994, 6-009603 U
Int. Cl.[6] A46B *13/02*
U.S. Cl. 15—22.1 **2 Claims**



1. An electric toothbrush comprising:

a cylindrical case body comprised of a front case and a rear case;

the front case having a front end and a rear end with an inside wall;

a motor having a rotating shaft and provided in the front case;

an eccentric weight secured to the rotating shaft of the motor for generating vibrations;

a battery mounted in the rear case for operating the motor;

a connecting shaft integrally formed on the front end of the front case and forwardly projected from the front end, the connecting shaft having an axial hole;

a metallic pin secured in the axial hole of the connecting shaft;

a brush attached to the front case by engaging with the connecting shaft;

a connecting cylinder secured to the inside wall of the rear end of the front case and extending into the rear case; and

a vibration absorbing member disposed between the connecting cylinder and the rear case for absorbing the vibration of the eccentric weight.

5,590,435

FLOOR COVERING STORAGE RACK WITH CLEANING DEVICE

John V. Kostigian, Cambridge, Canada, assignor to Galt Display Rack Company Limited, Cambridge, Canada

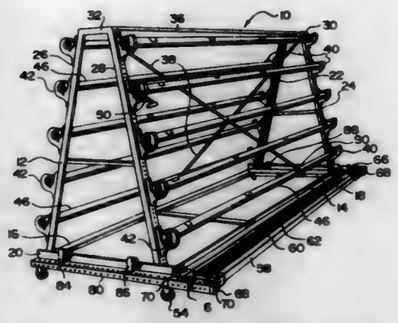
Filed Jun. 12, 1995, Ser. No. 489,374
Claims priority, application Canada, Mar. 24, 1995, 2145438
Int. Cl.[6] A47F *7/17;* **A47L** *13/50*
U.S. Cl. 15—40 **5 Claims**

1. A rack for use in retrieving, cleaning and storing floor covering for temporarily covering a floor to be protected, said rack comprising:

a frame having a rectangular base including two side edges, a front edge, and a rear edge; and

a lower frame member respectively at the front edge; and

a respective first and second upright sides secured each side edge of the base, the first and second upright sides being



joined at an upper end of said first and second upright sides by an top rail member; and

a plurality of rollers rotatably mounted between the first and second upright sides in a vertically spaced, parallel relationship above the front and rear edges of the frame; and

means for rotating a selected roller of the plurality of rollers;

ground engaging means on the base; and

an elongated cleaning head extending along the lower frame member at the front edge of the rectangular base, said cleaning head comprising a pair of mutually opposed brushes, and means for removably securing the brushes to the frame;

whereby a floor covering is passed between said mutually opposed brushes when said floor covering is returned to storage upon said selected roller by operating the means for rotating in order to clean the floor covering as it is being retrieved from the floor for storage.

5,590,436

TOOTHBRUSH

John R. Wright, Morpeth, United Kingdom, and David Balkwill, Nantes, France, assignors to Prelude UK Limited, Newcastle upon Tyne, United Kingdom

Filed May 23, 1995, Ser. No. 450,954

Claims priority, application United Kingdom, Apr. 7, 1995, 9507295

Int. Cl.[6] A46B *5/02;9/04*

U.S. Cl. 15—105 **14 Claims**



8. A toothbrush comprising a handle having

a first end;

a second end;

a central portion extending from said second end towards said first end to provide a manual grip in use of the toothbrush;

a further portion extending between said central portion and said first end;

a head portion carried at said first end of the handle;

bristles provided on said head portion;

mounting means provided on said central portion;

a separately formed figurine carried by said mounting means and extending from adjacent said second end and along said central portion, and co-planar outwardly excluding feet formed on the figurine and providing a stand portion for supporting the toothbrush in a substantially upright orientation relative to a surface.

5,590,437

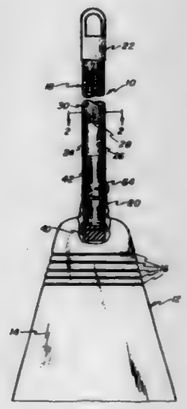
WOUND BROOM CONSTRUCTION

Kenneth L. McMillin, Dublin, Ohio, assignor to Vining Industries, Inc., Springfield, Ohio

Filed May 23, 1995, Ser. No. 449,795

Int. Cl.[6] A46B *5/02*

U.S. Cl. 15—143.1 **28 Claims**



24. A wound broom comprising:

an elongated tubular metal handle defining an interior surface and an exterior surface;

an extruded cover formed of a plastic copolymer material extending over said exterior surface;

a plurality of elongated ribs extending along the length of said handle and defined by alternating lands and grooves formed in said plastic cover;

each said land including substantially square edges to facilitate gripping of said handle within a collet chuck in a broom winding machine;

an elongated plastic plug located in contact with said interior surface at an end of said handle, said plug including a shaft portion and an enlarged end portion adjacent to said shaft portion and defining a shoulder engaging an end of said handle;

an elongated insert located in contact with said interior surface adjacent to said plug, said insert and said plug reinforcing said handle against forces applied radially inwardly on said handle;

bristles attached to said end of said handle by means of a winding wire spirally wound around said handle;

means defining an aperture through said end portion of said plug for receiving an end of said winding wire to facilitate initiation of a broom winding operation;

a pin member extending into said handle and said insert to form an anchor for an end of said winding wire opposite from the end of said winding wire received in said aperture through said plug; and

wherein a dimension of said lands in a circumferential direction is 68% to 100% of a dimension of said grooves in said circumferential direction, and said dimension of each of said lands in a circumferential direction is approximately 1.7 to 2.0 percent of the circumference of said cover.

5,590,438

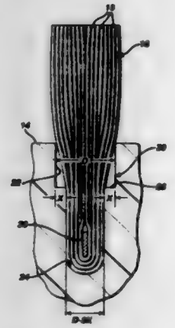
BRISTLED ARTICLE

Albert C. Chen, East Brunswick; Peter Hrinko, Jr., Fair Lawn; Kevin G. Yost, Short Hills, all of N.J., and John R. Kent, Yardley, Pa., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Continuation of Ser. No. 311,237, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 798,362, Nov. 21, 1991, abandoned. This application Jul. 27, 1995, Ser. No. 509,005

Int. Cl.[6] A46B *9/04*

U.S. Cl. 15—167.1 **5 Claims**



1. A toothbrush comprising:

(a) a plurality of bristles folded into tufts having free ends;

(b) at least one tuft cavity in a base having a surface contiguous to an open to end of said tuft cavity; and

(c) an anchoring means that holds the plurality of tufted bristles together inside the tuft cavity and the free ends of the tufted bristles remain outside of the tuft cavity wherein the cross-sectional area of said tuft cavity decreases such that said tuft cavity is broadest at the surface contiguous to the open to end of said cavity and narrows toward a closed bottom end of said cavity in a way that is effective to prevent playing of the free ends of the tufted bristles,

the cross sectional area of the tuft cavity occupied by the plurality of bristles as measured by the total cross-sectional area of the bristles in the tuft cavity divided by the cross-sectional tuft cavity area, excluding the anchoring means area, comprising a packing factor, said packing factor being greater in the narrower closed bottom end portion than the broader open top end portion of the tuft cavity.

5,590,439

APPARATUS FOR CLEANING BY SPREADING CLEANING LIQUID AND BY SUCTION OF THE USED LIQUID

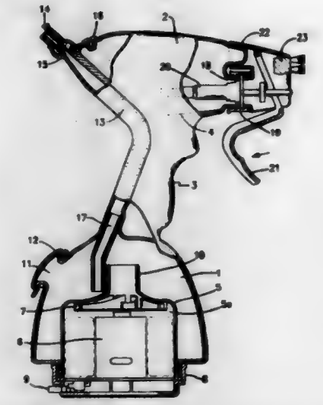
Jean Alazet, Paris, France, assignor to Famulus, Paris, France

Filed Dec. 28, 1994, Ser. No. 365,234

Claims priority, application France, Jan. 14, 1994, 94 00349

Int. Cl.[6] A47L *5/24*

U.S. Cl. 15—320 **6 Claims**



1. A hand-held apparatus for cleaning smooth surfaces, comprising: a reservoir (2) of cleaning liquid; pump means (20 for spraying the cleaning liquid from the reservoir (2) onto smooth surfaces being cleaned; means (14) for wiping used liquid from the smooth surfaces being cleaned; channel means (13) for receiving used liquid wiped from the smooth surfaces being cleaned; a reservoir (1) for said used liquid; additional channel means (17) for extending the channel means (13) into an interior of said reservoir (1) of used liquid; means for creating a vacuum in the reservoir (1) of used liquid; wherein said means for creating a vacuum are mounted inside a compartment (5*a*) formed by an internal part (5) of the used liquid reservoir; means (6, 7) in said compartment for creating a vacuum within said used liquid reservoir (1); air suction tubing (10) extending upwardly from said compartment for transmitting air from the used liquid reservoir (1) into said compartment for discharge outside said apparatus; said additional channel means (17) prolonging said channel means (13) down to the level of the base of said air suction tubing (10).

5,590,440

GRAB BAR ASSEMBLY

Thomas E. Pelt, Menomonee Falls, and Thomas G. Barnum, Fox Point, both of Wis., assignors to Bradley Corporation, Menomonee Falls, Wis.

Filed Mar. 23, 1995, Ser. No. 409,315

Int. Cl.[6] A47B *95/02*

U.S. Cl. 16—111 R **20 Claims**

1. A grab bar assembly that is attachable to a wall to assist a person to a standing position, comprising:

a grab bar to be grasped by the person;

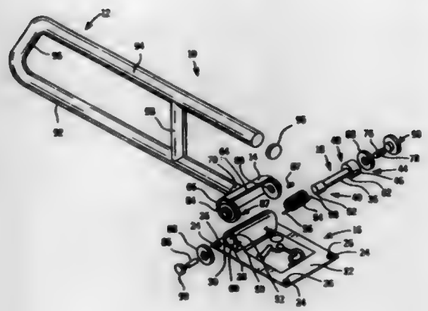
a base plate adapted to be attached to the wall;

a housing attached to the base plate and having a pair of open ends;

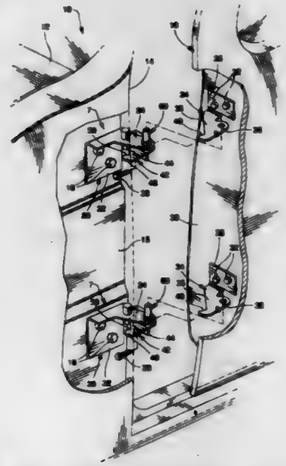
a shaft pivotably mounted within the cylindrical housing to pivot about a longitudinal axis;

a spring disposed within the cylindrical housing, the spring having a first end connected to the shaft and a second end connected to the housing; and

a swing arm connected to the grab bar, the swing arm having a pair of ends adapted to be disposed adjacent the open ends, the swing arm being connected to the shaft.

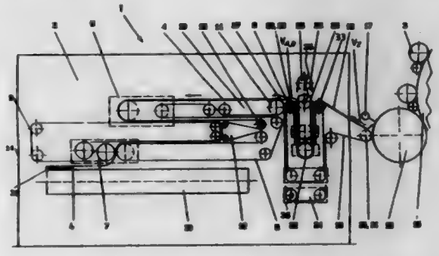


5,590,441
LIFT-OFF DOOR HINGE
Jeffrey C. Spencer, Macomb Township, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 27, 1995, Ser. No. 395,134
Int. Cl.[6] E05D *7/10*
U.S. Cl. 16—264 **5 Claims**



1. A lift-off type door hinge assembly for a door of an automotive vehicle which has a body with an opening frame, the hinge assembly comprising:
a body side hinge having a generally vertical leg for attachment with the opening frame, the body side hinge having joined to the vertical leg a horizontal leg extending outwardly, the horizontal leg having a stop pin aperture and spaced therefrom a pivot pin aperture;
an upper door side hinge having a generally vertical leg extending upwardly for attachment to the vehicle door, the upper door side hinge having joined to the vertical leg a horizontal leg extending therefrom, the horizontal leg having an aperture generally aligned with the pivot pin aperture in the generally horizontal leg of the body side hinge;
a lower door side hinge having a vertical leg generally downwardly extending, the vertical leg being connected to the door by a removable fastener, the lower door side hinge having joined to the vertical leg a horizontal leg extending therefrom sandwiching the horizontal leg of the body hinge between the horizontal legs of the upper and lower door side hinges, and the horizontal leg of the lower door side hinge having an aperture generally aligned with the pivot pin aperture in the generally horizontal leg of the body side hinge;
a pivot pin providing a thrust bearing for the upper door side hinge loosely fitted in the upper door side hinge pivot aperture to allow upward door removal, and the pivot pin permanently affixing the lower door side hinge horizontal leg to the body side hinge horizontal leg when the door is lifted up to be removed; and
a stop pin positioned in the stop pin aperture to limit opening of the door by contact on at least one of the upper or lower door side hinges horizontal leg.

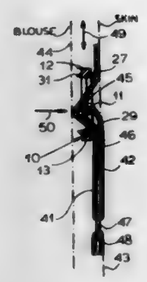
5,590,442
DEVICE FOR PRODUCING A NONWOVEN FABRIC MADE OF FIBER MATERIAL
Herwig Hirschek, Bobingen, and Manfred Schiffler, Merching, both of Germany, assignors to Autefa Maschinenfabrik GmbH Augsburg, Friedberg, Germany
PCT No. PCT/EP93/02430, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/05836, PCT Pub. Date Mar. 17, 1994
PCT Filed Sep. 8, 1993, Ser. No. 397,080
Claims priority, application Germany, Sep. 10, 1992, 9212215 U
Int. Cl.[6] D01G *25/00*
U.S. Cl. 19—163 **21 Claims**



1. A device for producing nonwoven fabric, the device comprising:
a web producing means for generating a nonwoven web from fiber;
a nonwoven fabric layering means for receiving the web from said web producing means and for layering the web, said nonwoven fabric layering means including a takeup carriage and a reciprocating layering carriage, said layering carriage moving in a reciprocating pattern;
web storage means positioned between said web producing means and said nonwoven fabric layering means, said web storage means storing a variable volume of the web.

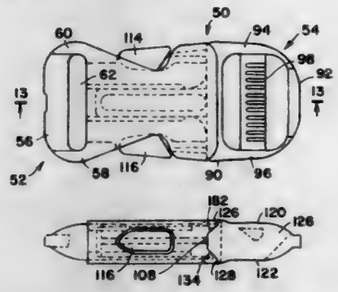
5,590,443
NONSLIP SLIDE BUCKLE
Gerhard Fildan, Wohnpark Alte Erlaa, Anton-Baumgartner Str. 44, C 2 21 01, A-1232 Vienna, Austria
Filed May 31, 1995, Ser. No. 455,274
Int. Cl.[6] A44B *11/02*
U.S. Cl. 24—200 **7 Claims**

1. A buckle for lingerie and corsetry, comprising:
a one-piece planar frame body formed with a pair of mutually parallel outer limbs, a central limb parallel to said outer limbs and disposed between them, a respective pair of bows connecting each of said outer limbs with said central limb, and a pair of elongated openings formed on opposite sides of said central limb and each defined by a respective outer limb, a respective pair of said bows and said central limb, whereby garment straps to be connected by said buckle pass through said openings and are looped around said outer limbs,



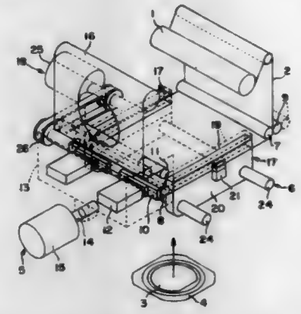
each of said outer limbs being formed with an inner edge thereof adjoining a respective one of said openings and an outer edge, said edges being defined by a respective pair opposite sides of each outer limb; and
at most three spaced apart elongated teeth formed along the respective inner edge and spaced from the respective outer edge, said teeth being formed on opposite sides of at least one of the outer limbs and projecting out of a plane of said body, each of said teeth being separated from an adjacent tooth by a respective gap and being formed with
a respective pair of flanks converging toward one another, and
a respective linear sharp ridge defined between the flanks and extending parallel to the inner edge of the respective outer limb.

5,590,444
SIDE RELEASE BUCKLE WITH IMPROVED DISTRIBUTION OF STRESS UNDER LOADS
Mark J. Krauss, East Greenwich, R.I., assignor to American Cord & Webbing Company, Inc., Woonsocket, R.I.
Filed Aug. 2, 1994, Ser. No. 284,182
Int. Cl.[6] A44B *11/26*
U.S. Cl. 24—625 **20 Claims**



1. A buckle comprising:
a male member including a base having top and bottom walls, first and second sides and an end surface between said top and bottom walls and said first and second sides, and first and second resilient arms extending from said end surface, said arms each having a protuberance at the free end thereof, said male member further having a portion extending from said base adjacent said first side; and
a female receptacle member including a body, an interior channel extending therein and a mouth defining an opening to said channel, first and second apertures formed within said channel through which said protuberances are exposed when said female and male members are in a locked position and said arms inserted into said opening, said female member further including means complementary in shape and position to said portion for receiving said portion,
said protuberances shaped so as to urge said resilient spring arm inwardly as said male member is inserted into said channel of said female member, said arm flexing outwardly when said protuberance aligns with and protrudes from said aperture.

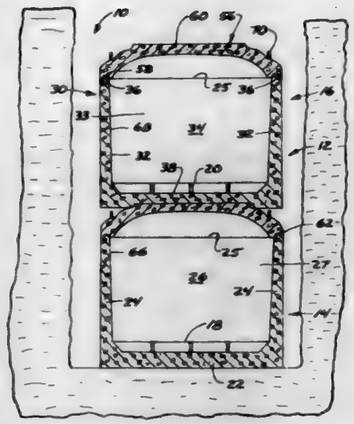
5,590,445
TAPE EXTENSION DEVICE FOR SEMICONDUCTOR PRODUCING APPARATUS AND SEMICONDUCTOR PRODUCING APPARATUS WITH TAPE EXTENSION DEVICE
Masahiro Lee, Sakai, Japan, assignor to Teikoku Seiki Kabushiki Kaisha, Osaka, Japan
Filed May 26, 1994, Ser. No. 249,770
Claims priority, application Japan, Mar. 22, 1994, 6-076542
Int. Cl.[6] D06C *3/00*
U.S. Cl. 26—51 **26 Claims**



1. A tape extension apparatus for use in applying a tape over a semiconductor wafer in manufacture of semiconductor wafers including a first frame for supporting a semiconductor wafer horizontally below said tape, longitudinal tension means for horizontally extending said tape maintained in a fixed position over said first frame in a down web direction of said tape, and means for pressing said tape and said semiconductor wafer against each other for cohesion, said tape extension apparatus comprising:
transverse tension means having two pairs of horizontal clamps with each clamp of each pair movable in opposing vertical directions parallel with each other for clamping said tape along edges of opposite sides for applying a tension on the tape in a cross web direction of said tape above said first frame, and transverse drive means for driving said pairs of clamps in the cross web direction to open and close a space therebetween after said clamps clamp said tape and a tape has been applied to said semiconductor wafer.

5,590,446
DOUBLE DEPTH CRYPT
Daniel J. Hicks, Ft. Lauderdale, Fla., assignor to Carlton Wilbert Vaults, Inc., Miami, Fla.
Filed Sep. 8, 1995, Ser. No. 525,272
Int. Cl.[6] A61G *17/00*
U.S. Cl. 27—1 **6 Claims**

1. A crypt arrangement for providing an individually sealable double depth crypt for burying in the ground comprising:
a lower crypt compartment forming a housing of size to contain a first coffin and having an upper edge;
an upper crypt compartment forming a housing of size to contain a second coffin and having an upper edge, the upper crypt compartment having a lower wall and a cover portion mounted integrally on the lower wall of the compartment, said cover portion being of size to enclose the lower crypt compartment and having edges that interlockingly mate with the upper edge of the lower crypt compartment to form a sealed



lower crypt compartment for the first coffin, the cover portion being arched and having downwardly extending edges formed to be spaced from the bottom wall of the upper crypt compartment along the cover portion edges and being joined to the bottom wall in center portions thereof, the interlocking upper edges of the lower crypt compartment and of the cover portion supporting the upper edges against inward pressures; and

a separate cover independently moveable relative to the upper crypt compartment for enclosing the upper crypt compartment without moving the upper crypt compartment and cover portion relative to the lower crypt compartment.

5,590,447

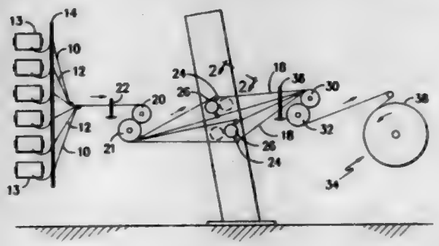
CONTINUOUS PROCESS FROM INTERLACING TO WARPING TO PROVIDE A HEATHER YARN

André M. Goineau, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 6, 1995, Ser. No. 540,156

Int. Cl.[6] D02G 1/18;1/16; D02J 1/08

U.S. Cl. 28—172.1 **7 Claims**



1. A method to continuously produce a warp beam of merged multifilament yarn from at least two false twisted textured yarns wound on individual bobbins having multifilament synthetic yarn thereon, comprising the steps of supplying at least two yarns from separate bobbins to a set of feed rolls, driving said set of feed rolls at a first rate to supply the two yarns to a commingling air jet, commingling the two yarns in the air jet to provide a merged, commingled yarn, providing a second set of feed rolls downstream of the air jet, driving the second set of feed rolls at a rate lower than that of the first set of feed rolls so that the yarns are supplied to the air jet at an overfeed of between 1 to 4%, supplying the commingled yarn from the second set of feed rolls to a warper and forcing a warp beam of commingled yarn on the warp beam.

5,590,448

ARRANGEMENT FOR PRODUCING SHORT WARPS WITH ORBITING THREAD LAYING DEVICE

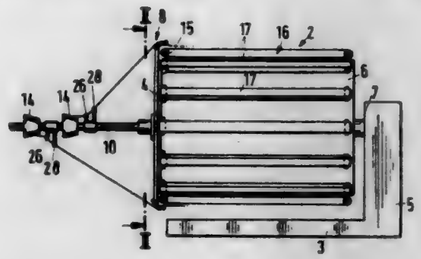
Josef Lenzen, Dulmen, and Herbert Wisniewski, Coesfeld-Letts, both of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed Jun. 20, 1995, Ser. No. 492,324

Claims priority, application Germany, Jun. 24, 1994, 44 22 098.7

Int. Cl.[6] D02H 9/02

U.S. Cl. 28—191 **13 Claims**



1. Arrangement for the production of short warps for woven patterns employing threads of different colors, comprising:

a winding arrangement adapted to receive said threads of different colors wound sequentially next to each other in a single layer;

a thread laying means mounted adjacent to an end face of said winding arrangement for orbiting said winding arrangement circumferentially at said end face for laying said threads in said single layer around said winding arrangement initially at a winding plane;

a spool magazine for holding a plurality of spools of thread located one behind the other on an axis running orthogonal to the winding plane; and

a feed arrangement positioned circumferentially on said winding arrangement and intersecting said winding plane, said feed arrangement transporting thread, wound in a sheet, perpendicular to the winding plane by an amount corresponding to growth of said single layer in a direction away from said winding plane, so that a thread sheet formed as an endless sheet band in a direction transverse to the winding direction can be cut open after completion of a thread warp.

5,590,449

APPARATUS FOR STRETCHING PLASTICIZING AND GATHERING A TOW OF FILTER MATERIAL FOR TOBACCO SMOKE

Firdausia Chehab, Hamburg; Stefan Fletkau, Westerau, and Peter-Franz Arnold, Hamburg, all of Germany, assignors to Hauni Maschinenbau AG, Hamburg, Germany

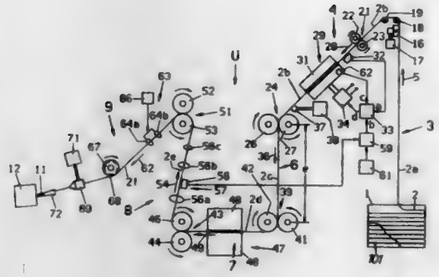
Filed Nov. 3, 1994, Ser. No. 334,181

Claims priority, application Germany, Nov. 24, 1993, 43 40 029.9

Int. Cl.[6] D02J 1/22;1/18

U.S. Cl. 28—240 **35 Claims**

1. Apparatus for treating at least one continuous tow of filamentary filter material for tobacco smoke, comprising means for advancing the at least one tow from a source along an elongated path in a predetermined direction; means for stretching the filaments of the at least one tow in a first portion of said path; means for applying at least one treating agent to the stretched filaments of the at least one tow in a second portion of said path downstream of and inclined relative to said first portion; and means for gathering the filaments of the at least one tow in a third portion of said path downstream of said second portion, said first, second and third portions together constituting a substantially U-shaped part of said path.



5,590,450

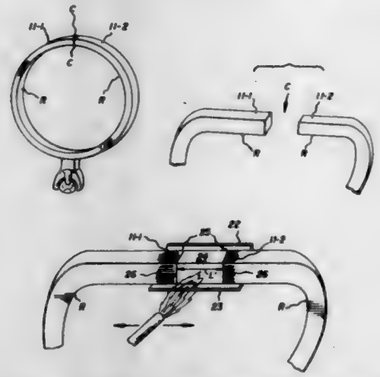
METHOD OF SIZING OBJECTS

Michael A. March, 96 Caveney Dr., Northfield, N.H. 03276

Filed Aug. 2, 1995, Ser. No. 510,243

Int. Cl.[6] B23P 13/00

U.S. Cl. 29—8 **10 Claims**



1. The method of sizing an annular object, which comprises the steps of:

(a) cutting through an arcuate portion of the object to be sized;

(b) separating and straightening the cut ends of said object; and

(c) placing sizing stock coated with solder in a holder; the stock being temporarily adhered to the holder; then placing the stock while held in the holder between the cut ends; and

(d) heating said holder and said stock to release said sizing stock from said holder and cause said solder paste to adhere said stock to said object between said cut ends.

5,590,451

MANUFACTURING METHOD FOR INK JET PRINTER HEAD

Kazushige Katsuumi, Shizuoka; Toshio Miyazawa, Mishima, and Toshihiro Tsukamoto, Gotenba, all of Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, and Toshiba-Emi Limited, Tokyo, both of Japan

Filed Jan. 16, 1996, Ser. No. 586,073

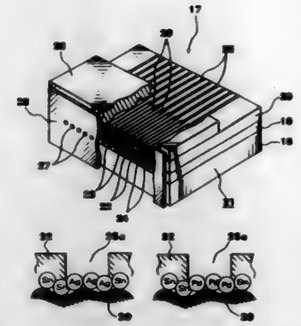
Claims priority, application Japan, Jan. 31, 1995, 7-014139; Dec. 15, 1995, 7-327132

Int. Cl.[6] H01L 41/22

U.S. Cl. 29—25.35 **10 Claims**

1. A manufacturing method for an ink jet printer head, comprising the steps of:

(A) forming a substrate composed of a plurality of layers including at least one piezoelectric member polarized across its thickness;



(B) forming a plurality of parallel channels and a plurality of side walls isolating said channels at given intervals, from an upper surface of said substrate, at least a part of each of said side walls being formed from said piezoelectric member;

(C) adsorbing Sn on the upper surface of said substrate including inner surfaces of said channels;

(D) forming a pattern resist film on the upper surface of said substrate on which said Sn has been adsorbed so that said pattern resist film covers a portion of the upper surface of said substrate except electrode forming portions on the inner surfaces of said channels and wiring pattern forming portions on the substrate;

(E) adsorbing Pd as a catalyst core for electroless plating on said electrode forming portions and said wiring pattern forming portions;

(F) separating said pattern resist film;

(G) immersing said substrate from which said pattern resist film has been separated into a plating liquid to deposit plating on said electrode forming portions and said wiring pattern forming portions, thereby forming electrodes and wiring patterns; and

(H) mounting on said substrate a top plate for covering upper openings of said channels and a nozzle plate for covering front openings of said channels to form a plurality of ink chambers.

5,590,452

JOINT SEPARATION APPARATUS

John Mead, Horsham, England, assignor to Mead Machinery Limited, West Sussex, Great Britain

Continuation of Ser. No. 273,011, Jul. 8, 1994, abandoned. This application Jan. 5, 1996, Ser. No. 583,540

Claims priority, application United Kingdom, Jul. 10, 1993, 9314281

Int. Cl.[6] B23P 19/04

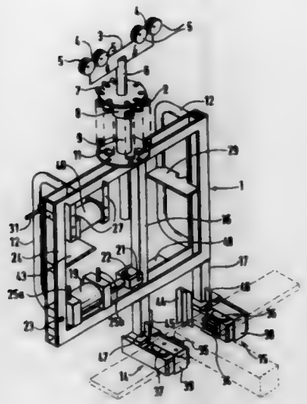
U.S. Cl. 29—239 **23 Claims**

1. A joint separating apparatus for separating discrete first and second elements of a joint which have been previously bonded together, the apparatus comprising:

a clamping mechanism including a plurality of clamping members, wherein the clamping members are mounted on arms readily movable one relative to the other to releasably clamp the first element of the joint between opposed surfaces of the clamping members; and

a pressure mechanism actuable to exert pressure on the second element to separate the elements at least partially, the pressure mechanism including:

a linear actuator provided on each of said arms of the apparatus, each actuator having a pressure plate for forcefully contacting the second element of the joint, wherein actuation of each actuator causes the pressure plate and the clamping members to apply opposite forces to the first and second elements of the joint to overcome the bonding between the first and second discrete elements.

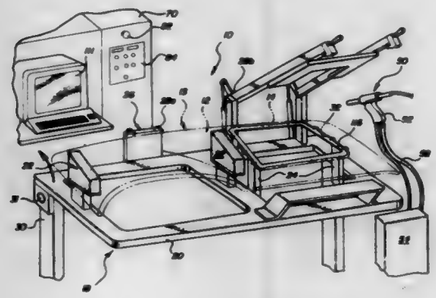


5,590,453

SYSTEM AND METHOD FOR ENSURING PROPER INSTALLATION OF BLIND RIVETS BY MEASURING THE LENGTH OF SPENT MANDRELS

Gerard H. Gajewski, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Aug. 2, 1995, Ser. No. 510,177
Int. Cl.[6] B21J *15/10*; B23Q *17/00*
U.S. Cl. 29—407.05 **28 Claims**



24. A method of ensuring the riveting together of first and second parts with rivets at a workstation, said rivets each including a body portion and a pulling mandrel, the method including the steps of:

positioning said first part and said second part on a support fixture at the workstation;

holding said first and second parts together on the support fixture;

applying said rivets to the two parts to connect the two parts to one another to form an assembly, and disposing the spent rivet mandrels;

detecting the spent rivet mandrels; and

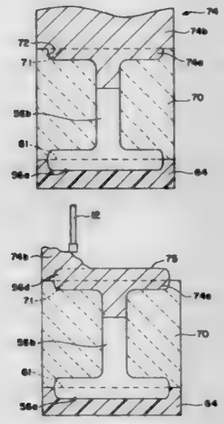
automatically determining the length of each spent rivet mandrel to verify proper installment of the rivets.

5,590,454

METHOD AND APPARATUS FOR PRODUCING PARTS BY LAYERED SUBTRACTIVE MACHINE TOOL TECHNIQUES

Kendrick E. Richardson, 451 N. Main St., P.O. Drawer 230, Six Mile, S.C. 29682

Filed Dec. 21, 1994, Ser. No. 361,123
Int. Cl.[6] B21B *1/42*
U.S. Cl. 29—527.4 **14 Claims**



1. A method of producing a three-dimensional object comprising the steps of:

depositing a first layer of mold material onto a support surface;

machining a first cavity into said first layer of mold material;

depositing a first layer of construction material onto said first layer of mold material such that an overlapping portion of said first layer of construction material fills said first cavity to form a first three-dimensional section of said object and such that a superposing portion of said first layer of construction material covers said first layer of mold material; and

machining said superposing portion of said first layer of construction material to form a second three-dimensional section of said object.

5,590,455

APPARATUS FOR MANUFACTURING A PRINTED CIRCUIT BOARD

Taku Kato; Yasunori Hiroshima; Akinao Adachi; Akira Nakano, and Kiyoshi Shimomura, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 18, 1995, Ser. No. 374,125
Claims priority, application Japan, Jan. 21, 1994, 6-022229
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—564.1 **18 Claims**

1. An apparatus for manufacturing a printed circuit board, comprising:

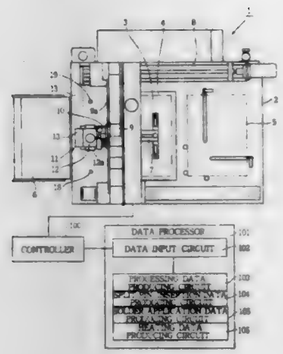
a work table for mounting a PCB substrate;

a work head for attaching a cutting tool for cutting the PCB substrate, and a pin dispenser for inserting a pin into a hole formed in the PCB substrate;

a driver for moving the work head in a horizontal direction and in a vertical direction;

a data processor for supplying data signals for operating the cutting tool, and pin dispenser;

controller means responsive to the data signals for controlling operation of the driver, cutting tool, and pin dispenser, whereby the PCB substrate is made into a printed circuit board.

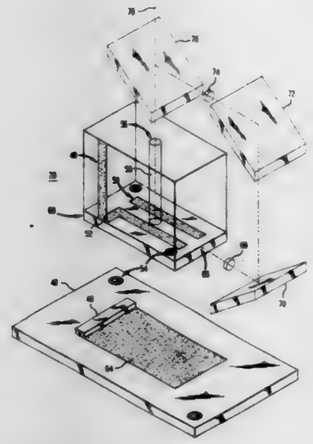


5,590,456

APPARATUS FOR PRECISE ALIGNMENT AND PLACEMENT OF OPTOELECTRIC COMPONENTS

Richard S. Armington, Hopewell, and Leroy D. L'Esperance, Erial, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 7, 1994, Ser. No. 350,766
Int. Cl.[6] B23P *19/04*; H05K *3/30*
U.S. Cl. 29—721 **17 Claims**



1. An apparatus for alignment and placement of a component on a substrate having a substrate support means for supporting said substrate thereon, said substrate configured to receive said component, comprising:

tool means for aligning and placing said component on said substrate, including a substantially light transparent portion and an electrically conductive portion configured to selectively energize said component to emit light; and

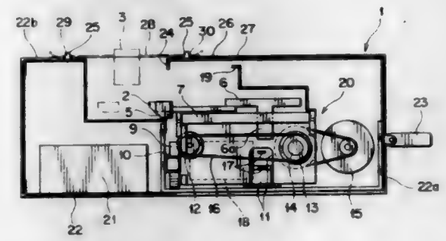
an image gathering optics system including at least one camera positioned relative to said tool means and said substrate for receiving positional information regarding said component and said substrate through said light transparent portion while said component is secured to said tool means by a holding means.

5,590,457

TERMINAL INSERTION GUIDING APPARATUS

Ryuji Ninchi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 15, 1995, Ser. No. 529,193
Claims priority, application Japan, Sep. 26, 1994, 6-229517
Int. Cl.[6] B23Q *15/00*; H01R *43/20*
U.S. Cl. 29—721 **8 Claims**



1. An apparatus for guiding the insertion of a terminal into a terminal cavity of a housing of a connector-receiving plate, said apparatus comprising:

a plurality of walls forming a case;

one of said walls containing an opening;

means on said case operative to attach said connector-receiving plate in overlying relation with respect to said opening;

an optical fiber sensor disposed within said case and mounted for movement in spaced underlying relation with respect to said housing;

a drive mechanism within said case operative to reversibly drive said optical fiber sensor along first and second orthogonal directions to position said sensor in alignment with selected cavities in said housing for illuminating the interior thereof; and

a controller for controlling said drive mechanism to selectively position said optical fiber sensor.

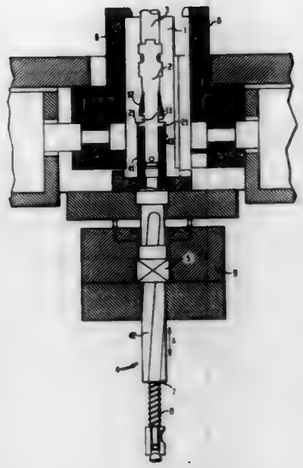
5,590,458

LOCKING SYSTEM FOR SECURING A CABLE TERMINAL IN A PLUG CASE

Heinrich Mohme, Vlotho, Germany, assignor to TSK Prüfsysteme GmbH, Porta Westfalica, Germany

Filed Jun. 22, 1995, Ser. No. 493,651
Int. Cl.[6] H01R *43/20*
U.S. Cl. 29—748 **5 Claims**

1. A locking system for securing a cable terminal in a plug case; comprising a turning tool defining an axis and insertable in the plug case, said turning tool having a sleeve exhibiting one cable terminal proximate end which can be brought in registry with locking pins of the cable terminal, and a nut secured against rotation relative to said sleeve and connected thereto via a tongue and groove joint in form of several circumferentially spaced, longitudinally twisted tongues and complementary grooves so that upon axial displacement, the turning tool is turned to effect a twisting of the locking pins for abutment against projections on the plug case, thereby securing the cable terminal in place and preventing a displacement of the cable terminal longitudinally in direction of said axis.

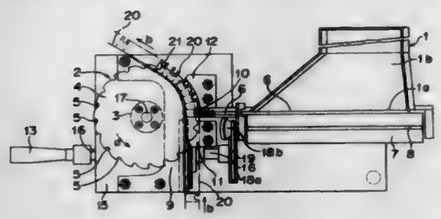


5,590,459

DEVICE FOR SUCCESSIVELY INSERTING RIVETS AND THE LIKE INTO A LONG CONTINUOUS RIVET-HOLDING BELT

Masatoshi Obuchi, and Shuichi Mizuta, both of Koriyama, Japan, assignors to Opt Engineering Co., Ltd., Koriyama, Japan

Filed Dec. 22, 1994, Ser. No. 361,732
Claims priority, application Japan, Jun. 8, 1994, 6-148753
Int. Cl.[6] B23Q *7/10*; B23P *19/00*
U.S. Cl. 29—809 **3 Claims**



1. A rivet-inserting device for inserting multiples of rivets each having a head of one diameter and a stem of another smaller diameter into a rivet-holding belt having an aligning device for vertically aligning said rivets in series, and an inserting device for continuously inserting said rivets received in a rivet-receiving wheel into a rivet-holding belt, and a driving device for driving said aligning device and said rivet-inserting device, and said aligning device further comprises:

a hopper containing said rivets;

a rivet-feeding route installed between said hopper and said rivet-receiving wheel, shaped in a slit having a width larger than the diameter of said stem portion of the rivet, but smaller than the diameter of said head portion of the rivet; and

a revolving roller located near said hopper across said rivet-feeding route, said revolving roller provided with a groove along an axial direction on the exterior thereof; and

said rivet-inserting device including a rivet-receiving wheel having a plurality of flanges installed on both sides of a core portion, said rivet-receiving wheel being provided with a series of grooves for holding said rivets one by one therein, above each periphery of said flanges, and said rivet-receiving wheel rotatably installed horizontally on a gear box;

a guide member shaped to have a gradually increased radius towards an exit of said rivet-holding belt, said guide member disposed between said flanges of said rivet-receiving wheel, said guide member guiding said rivet-holding belt along said rivet-receiving wheel; and

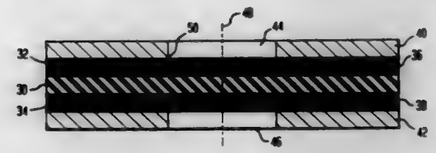
a rivet-squeezing member installed facing a peripheral portion of said rivet-receiving wheel, and pressing said rivets inserted in said grooves of said rivet-receiving wheel into said holding holes of said rivet-holding belt.

5,590,460

METHOD OF MAKING MULTILAYER CIRCUIT

Thomas H. DiStefano, Monte Sereno; John W. Smith, Palo Alto; Konstantine N. Karavakis, Cupertino; Zlata Kovac, Los Gatos, and Joseph Fjelstad, Sunnyvale, all of Calif., assignors to Tessera, Inc., San Jose, Calif.

Filed Jul. 19, 1994, Ser. No. 277,336
Int. Cl.[6] H05K *3/36*
U.S. Cl. 29—830 **34 Claims**



1. A method of making a multilayer circuit comprising the steps of:

(a) stacking a circuit panel and an interposer so that a first surface of said interposer confronts a surface of said panel, said interposer having a body and conductors having ends adjacent a surface of the body and having a contact at each said conductor end, each said contact including a peripheral portion surrounding the associated conductor end, said peripheral portions of said contacts confronting pads on the circuit panel; and

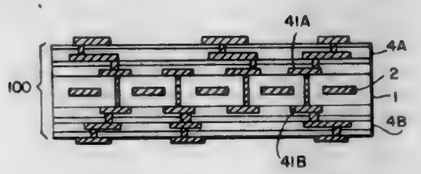
(b) compressing said stacked panel and interposer so as to forcibly engage said peripheral portions of said contacts with said contacts and expand the peripheral portion of each contact radially outwardly away from the associated conductor end so that each said peripheral portion moves horizontally with respect to the engaged pad and wipes the surface of the pad.

5,590,461

METHOD OF MAKING MULTI-LAYER WIRING BOARD

Hisashi Ishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 230,699, Apr. 21, 1994, Pat. No. 5,534,666.
This application Jun. 6, 1995, Ser. No. 467,809
Claims priority, application Japan, Apr. 21, 1993, 5-117954
Int. Cl.[6] H05K *3/36*
U.S. Cl. 29—830 **1 Claim**



1. A manufacturing method for multi-layer wiring boards, comprising the steps of:

(a) providing a base block by forming at least one wiring layer over one major surface of an insulating base substrate;

(b) providing at least one stacking block by forming a grounding layer and throughholes in an insulating hard substrate, and wiring layers over each major surface of said insulating hard substrate;

(c) forming selectively an adhesive layer on the top layer of one major surface of said base block and on a major surface of said at least one stacking block; and

(d) laminating said at least one stacking block over said base block and applying pressure to said blocks to bond said blocks to each other using said adhesive layer, to electrically and mechanically connect said blocks to each other.

5,590,462

PROCESS FOR DISSIPATING HEAT FROM A SEMICONDUCTOR PACKAGE

Michael J. Hundt, Double Oak, Tex., and Carlo Cognetti, Milan, Italy, assignors to SGS-Thomson Microelectronics s.r.l., Italy, and SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 144,300, Oct. 28, 1993, Pat. No. 5,489,752.
This application May 24, 1995, Ser. No. 449,675
Claims priority, application European Pat. Off., Feb. 15, 1992, 92830672
Int. Cl.[6] H05K *3/34*
U.S. Cl. 29—840 **5 Claims**



1. A method for attaching an integrated circuit package to a circuit board, comprising the steps of:

forming a dam on a first surface of a printed circuit board, wherein the dam defines a region;

forming a plurality of conductive pads on the first surface of a printed circuit board and adjacent the dam;

placing a packaged integrated circuit device onto the dam to define a cavity, and bonding leads of the device to the conductive pads;

injecting a thermally conductive material into the cavity to fill the cavity.

5,590,463

CIRCUIT BOARD CONNECTORS

Steven Feldman, and David C. Jenkins, both of Huntingdon, Pa., assignors to Elco Corporation, Huntingdon, Pa.

Filed Jul. 18, 1995, Ser. No. 503,694
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—844 **15 Claims**

1. A process for fabricating an electrical connector comprising:

providing a housing of thermoplastic material having a front surface which will constitute an exterior surface of the connector, a rear surface and a through hole extending in a direction between the front and rear surfaces;

installing a conductive contact member in the through hole, the conductive contact member having a first portion engageable with a contact of a mating connector and a second portion which is spaced from the first portion and which is held in place in the through hole by the housing so that the through hole is initially at least partially unobstructed between the front and rear surfaces; and

heating a portion of the housing to a softened state while applying a displacement force to displace the heated housing portion to a location to close the through hole, and then allowing the portion of the housing to cool and solidify at that location.



5,590,464

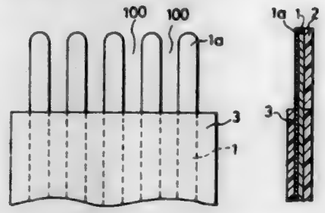
Patent Not Issued For This Number

5,590,465

METHOD OF MANUFACTURING CONNECTION TERMINALS OF FLEXIBLE WIRING PATTERN SUBSTRATES

Koulchi Santo, Obama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 181,470, Jan. 14, 1994, abandoned.
This application Mar. 15, 1996, Ser. No. 616,954
Claims priority, application Japan, Jan. 18, 1993, 5-005550
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—884 **1 Claim**



1. A method of manufacturing connection terminals of a flexible wiring pattern substrate comprising:

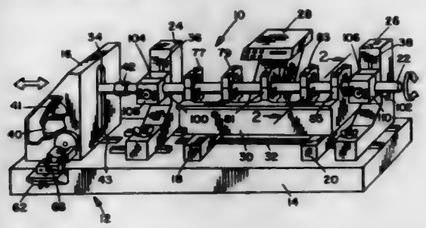
printing and writing a predetermined conductive metal wiring pattern with conductive paste on a first flexible insulation substrate,

plating metal on at least a portion of said conductive metal wiring pattern thereby defining plated connection terminals, said plated connection terminals being located at an end of said substrate,

covering said substrate excluding said plated connection terminals with an overriding, second flexible insulation substrate, and

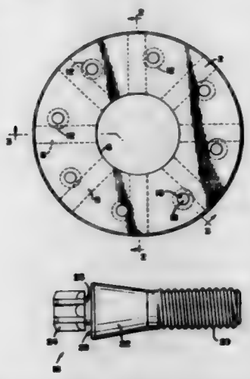
cutting out portions of said first flexible insulation substrate at said end of the substrate between said plated connection terminals by a press to separate said plated connection terminals.

5,590,466
METHOD FOR BORING OVERHEAD CAM ENGINE CYLINDER HEADS
Brice Harmand, 8604-H Via Mallorca, La Jolla, Calif. 92037
Continuation-in-part of Ser. No. 301,244, Sep. 6, 1994. This application Mar. 31, 1995, Ser. No. 414,507
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—888.011 **7 Claims**



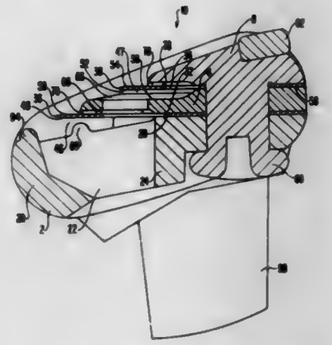
1. A method for repairing an overhead cam cylinder head, said cylinder head having two ends and a plurality of bearing towers for retaining a camshaft along an axis, each said tower comprising a base portion and a cap, said cap having an upper bearing surface and two flange surfaces lying in a flange plane on either side of said upper bearing surface, each said flange surface having a bore, and said base portion having a lower bearing surface, the method comprising the steps of:
removing each cap from said cylinder head;
removing material from said flange surfaces of each cap;
disposing a boring bar having a plurality of cutting bits on said lower bearing surface of each said tower;
replacing each cap on said cylinder head; and
boring each said tower along said axis to produce a cylindrical bearing surface.

5,590,467
METHOD OF MAKING A BLAST WHEEL
George Schloetzer, Sanford, N.C., assignor to The Wheelabrator Corporation, LaGrange, Ga.
Continuation of Ser. No. 31,813, Mar. 15, 1993, Pat. No. 5,423,715. This application Oct. 17, 1994, Ser. No. 323,635
Int. Cl.[6] B23P *17/00*
U.S. Cl. 29—889.21 **5 Claims**



1. A method for making a blast wheel comprising the steps of:
(a) providing a pair of side plates;
(b) locating a plurality of spacers between said side plates;
(c) locating a plurality of blades between said side plates;
(d) fixing the side plates to said spacers using bolts that will shear when a predetermined torque is applied, tightening said bolt until said predetermined torque is applied such that said bolts shear so as to be substantially flush with said side plates, and
(e) machining the side plates and bolts to create a smooth surface.

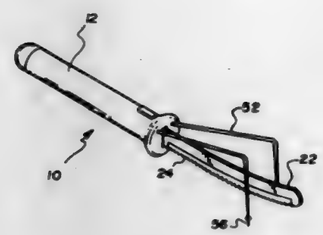
5,590,468
MOVABLE BLADE SHAVING CARTRIDGE WITH CONDITIONING BAR
Frank H. Prochaska, Waynesboro, Va., assignor to American Safety Razor Company, Verona, Va.
Continuation-in-part of Ser. No. 247,225, May 23, 1994, which is a continuation-in-part of Ser. No. 46,989, Apr. 16, 1993, Pat. No. 5,341,571. This application Jun. 7, 1995, Ser. No. 472,294
Int. Cl.[6] B26B *21/06*
U.S. Cl. 30—41 **18 Claims**



1. A flexible blade cartridge comprising a platform member defining a guard member and a cap member, a spacer and a blade means, wherein,
said blade means comprises a blade a forward and rearward section, said forward portion of said blade being flexible to a less aggressive position in response to applied shaving forces, said blade being flexible about its longitudinal axis, said rearward section of said blade permanently fixed between said guard member and said cap member,
said guard comprising a plurality of protrusions extending upwardly from an upper surface of said guard member, each of said protrusions having a longitudinal axis which extends substantially perpendicular to a front edge of said guard member, and each of said protrusions having a substantially elongated oval shape.

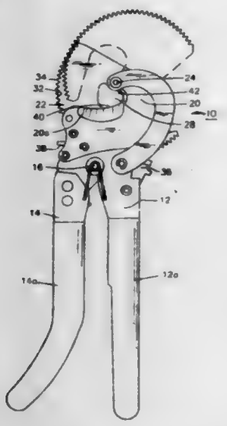
5,590,469
ONE-HANDED KNIFE
Allen L. Hoover, and Pamela A. Lyons, both of HCRI Box 145E, Free Union, Va. 22940
Filed Dec. 26, 1995, Ser. No. 578,016
Int. Cl.[6] B26B *7/00*
U.S. Cl. 30—135 **4 Claims**

1. A new and improved one-handed knife with associated claws for holding an object while being cut comprising, in combination:
an essentially cylindrical handle with a central linear axis formed of a rigid material having an open forward end and a closed rearward end with a cylindrical opening extending rearwardly from the open forward end;
a cutting blade having a central curved axis essentially co-extensive with the central axis of the cylindrical handle, the blade also having a downwardly facing cutting edge;



a cylindrical motor located within the handle adjacent to the open end with an associated cylindrical battery secured within the handle between the motor and the closed end to impart electrical power to the motor and with an associated switch on the exterior surface of the handle to selectively energize the battery to drive the motor;
a coupling member having a forward end secured to the blade and a rearward end secured to the motor to transmit a reciprocating motion of the motor to the blade for cutting purposes;
a radial enlargement on the handle adjacent to the open end with an annular bushing secured within the enlargement and encompassing the blade adjacent to its rearward end; and
a pair of resilient claws secured to the handle, the resilient claws extending forwardly toward the forward end of the blade at an angle upwardly and away from the blade at an angle of between about 10 and 20 degrees to a region above the blade, the resilient claws then extending downwardly essentially perpendicular to the blade axis from a location above the blade to a location beneath the blade and terminating in points, the resilient claws being located on opposite sides of the cutting blade and diverging equally and oppositely outwardly from the blade to provide a holding force to meat and other objects being cut during the reciprocation of the blade.

5,590,470
CABLE CUTTING TOOL HAVING AN IMPROVED CUTTING BLADE
Robert S. Erbrick, Doylestown, and Joseph E. Erbrick, Chalfont, both of Pa., assignors to Electroline Corp., Pipersville, Pa.
Filed Feb. 22, 1995, Ser. No. 393,306
Int. Cl.[6] B26B *13/06*
U.S. Cl. 30—250 **27 Claims**



1. A tool for cutting elongate cable having an inner circular core and an outer circular configuration surrounding said core, said core being formed of material having a hardness greater than the material of said outer configuration, said tool comprising:
a pair of opposed cutting blades pivotally connected at a pivot, said opposed blades defining an opening for accommodating said cable;
said cutting blades each having facing spirally curved cutting edges, said curved cutting edges spiralling inwardly towards said pivot;
each said cutting edge having an outer spiral portion for engagement with the outer configuration of said cable at two spaced locations and an inner spiral portion for engagement with said core of said cable at a location next adjacent said pivot.

5,590,471
BANDAGE CUTTER
Saul Wiezenthal, P. O. Box 440901, Miami, Fla. 33144
Filed Nov. 9, 1995, Ser. No. 555,603
Int. Cl.[6] B26B *29/02*
U.S. Cl. 30—294 **9 Claims**



1. A hand held cutter to slice a longitudinally extending opening between the ends of a generally sleeve-shaped item, such as a bandage of flexible, pliable material, while it is in position about a limb of a wearer, for easy removal by peeling open the sleeve-shaped item along the opening, said cutter comprising:
a handle portion with opposite generally planar parallel main surfaces to be gripped between the thumb and the middle finger of a user,
said handle portion having a first edge surface, an opposite edge surface, a top bearing surface, and a bottom surface, the distance between said top bearing surface and said bottom surface being about 2½ inches and 3½ inches,
said handle portion including a connecting portion with a top surface and a guide finger extending from the connecting portion, said finger being disposed in spaced relation along said first edge surface, said finger having a distal end zone with a terminal end, an outside surface, an inside surface confronting said first edge surface, and spaced side surfaces, said finger being symmetrical with said main faces of said handle portion and being thickened between the spaced side surfaces of said finger with respect to the thickness of said handle portion,
said terminal end of said finger being spaced about 1½ inches from said top bearing surface and being about 3/16 inch to ¼ inch in thickness between said finger side surfaces,
said top bearing surface and top surface of said connecting portion being symmetrical with respect to said handle portion and said top surfaces of said handle portion and top surface of said connecting portion including a thickened rim portion therealong said rim portion having side surfaces conterminous with the side surfaces of said finger,
said rim portion along said top bearing surface and said top surface of said connecting portion being curved defining a cradle extending into the handle portion in a depth-wise direction generally parallel to the guide finger to accommodate a pushing force applied to the top bearing surface of the cutter by an index finger of a user,

said first edge surface being curved upwardly from said bottom surface toward the terminal end of the finger to manipulate it for hooked-up engagement in the end of a sleeve-shaped item and defining a guide surface for tilting movement of the finger and defining a mouth between the distal end zone of the finger and the first edge surface to guide a sleeve-shaped item at one end into the space between the handle portion, finger and connecting portion, said space comprising a throat,

said first edge surface confronting said distal end zone of said finger being curved upwardly and the inside surface of said finger along said distal end zone to said terminal end forming diverging lips of said mouth,

a slicing blade with a sharpened edge embedded in the cutter and extending across the throat from the distal end zone of said finger to said connecting portion adjacent the juncture of the connecting portion and said handle portion, and

said handle portion along said first edge surface confronting said finger including thickened margins comprising together with said thickened finger a guard about the sharpened edge to protect the fingers and thumb of a user.

5,590,472

CUTLERY WHICH DOES NOT SOIL AND A METHOD FOR ITS PRODUCTION

Greenvurcel Yaakov, 28, Houtzot Hayotzer, Jerusalem 94117, Israel

Filed Mar. 14, 1995, Ser. No. 404,821
Claims priority, application Israel, Mar. 14, 1994, 108973
Int. Cl.[6] A47J *43/28*
U.S. Cl. 30—323 **8 Claims**



1. A piece of cutlery comprising:

a handle;

a utensil portion integral with the handle; and

a support integral with the handle as a one-piece construction, the support includes a folded cut-out of the handle extending downwardly relative to the handle, the support being positioned to raise the utensil portion and prevent contact thereof with a surface upon which the handle and the support are placed.

5,590,473

BOW SAW

Kuang-Pin Wang, No. 425, Ta-Tun 4th Street, Taichung, Taiwan

Filed Apr. 12, 1996, Ser. No. 631,016
Int. Cl.[6] B23D *51/03; B27B 21/02*
U.S. Cl. 30—512 **8 Claims**



1. A bow saw comprising:

a saw blade seat having a first end and a second end, an eccentrically rotary cover being pivotally connected with the first end of the saw blade seat and at least one saw blade being pivotally connected with the rotary cover, the saw blade seat being formed with a longitudinal channel for receiving said at least one saw blade and having an opening on one side for said at least one saw blade to be rotated out of the saw blade seat;

a handle which is substantially an elongated hollow tube formed with waved external surface for easy grip, a first end of the handle being open, whereby the second end of the saw blade seat can be axially extended thereinto; and

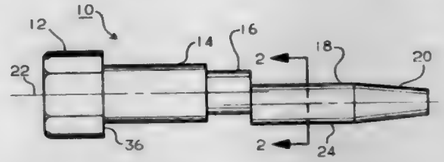
at least one locating member disposed near the first end of the handle for locating the second end of the saw blade seat, the handle being pivotable together with the saw blade seat contain an angle of about 90 degrees, permitting a second end of the handle to engage with the saw blade so as to form the bow saw in a working state, the locating member also serving to locate the saw blade seat when the handle axially receives a section of the saw blade seat.

5,590,474

FLANGE BOLT HOLE ALIGNMENT PIN

Douglas E. Lamb, Newport News, Va., assignor to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Aug. 8, 1995, Ser. No. 512,590
Int. Cl.[6] G01B *5/25;* **B23P** *19/04*
U.S. Cl. 33—645 **26 Claims**



1. A tool for use in aligning a pair of mating flanges, said flanges having a central axis, mating faces, and a plurality of bolt holes disposed in a circle around the circumference of the flanges, the tool comprising:

a pin round in cross-section and having a head, a central axis, successive longitudinal portions of decreasing diameter extending from said head along said central axis; and

one of said longitudinal portions comprising a cam means for aligning said mating flanges when said head is rotated around said central axis.

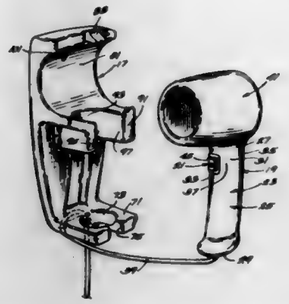
5,590,475

HAND HELD APPLIANCE AND HOLDER ASSEMBLY

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Continuation of Ser. No. 428,682, Apr. 25, 1995, abandoned.
This application Dec. 5, 1995, Ser. No. 567,400
Int. Cl.[6] A45D *20/00*
U.S. Cl. 34—97 **21 Claims**

1. A hand held appliance and holder assembly comprising a holder including means adapted for mounting to a supporting surface, a first end portion, a second end portion, and a cradle portion intermediate said end portions, and a hand held appliance including a handle portion including an inner end, an outer end engaged by one of said end portions, and an intermediate part located between said inner and outer ends, received in said cradle portion, and including an off-on switch including a member moveable between an off position and an on position and being displaceable to said off position incident to receipt of said intermediate part into said cradle portion, and an operating portion attached to said inner end of said handle portion and engaged by the other of said end portions.

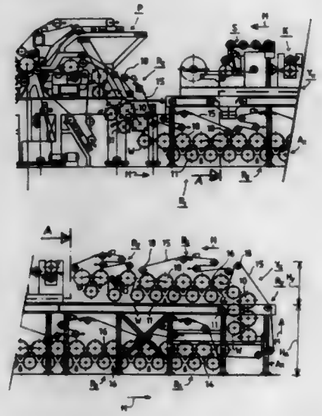


5,590,476

MULTI-STORY DRYER SECTION IN A PAPER MACHINE

Markku Alakoski; Antti Ilmarinen, both of Jyväskylä; Martti Tiusari, Jyskä, and Kyösti Uuttana, Jyväskylä, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Jun. 26, 1995, Ser. No. 494,944
Claims priority, application Finland, Jun. 28, 1994, 943096
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—117 **22 Claims**



1. In a paper machine hall having at least two stories, a dryer section of a paper machine including a plurality of dryer groups, each of said dryer groups having drying cylinders, reversing cylinders arranged between each pair of the drying cylinders and a respective wire which presses a web against cylinder faces of the drying cylinders and carries the web over the reversing cylinders, the dryer section comprising

at least one of said dryer groups being arranged in a first story of said at least two stories, the drying cylinders in said at least one dryer group in said first story being arranged in only a single substantially horizontal row such that the web is carried by the respective wire in said at least one dryer group in said first story in a single substantially uniform horizontal direction through said at least one dryer group in said first story,

at least another one of said dryer groups being arranged in a second story of said at least two stories, the drying cylinders in said at least one dryer group in said second story being arranged in only a single substantially horizontal row such that the web is carried by the respective wire in said at least one dryer group in said second story in a single substantially uniform horizontal direction through said at least one dryer group in said second story, and

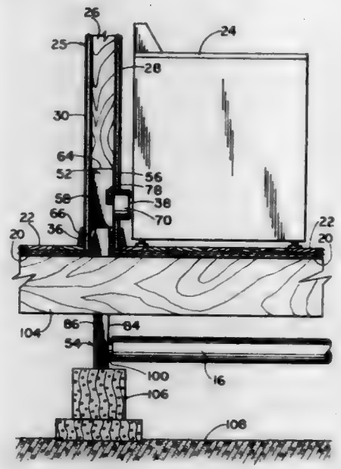
transfer means for transferring the web from said at least one dryer group in said first story to said at least one dryer group in said second story.

5,590,477

DRYER VENT BOX AND METHOD

Michael B. Carfagno, Sr., Rte. 1, Box 63, Wesley, Ark. 72773

Filed Jun. 6, 1995, Ser. No. 466,376
Int. Cl.[6] F26B *19/00*
U.S. Cl. 34—235 **18 Claims**



5. A clothes dryer venting system comprising a clothes dryer vent box including a first rectangular housing adapted to be received within a wall and having a cylindrical flange adapted to extend through an opening in a wall and receive a cylindrical dryer outlet, and a rectangular flange oriented perpendicular to said cylindrical flange, a second rectangular housing adapted to be at least partially received within a wall and having a rectangular opening adapted to receive said rectangular flange of said first housing, and a cylindrical flange oriented perpendicular to said rectangular opening and adapted to connect with a cylindrical pipe, a third rectangular housing adapted to received within a wall and placed between said first and second housings and having a rectangular opening at one end adapted to receive said rectangular flange of said first housing, and a rectangular flange at the other end adapted to be received in said rectangular opening of said second housing, and a cylindrical pipe adapted to be connected to said cylindrical flange.

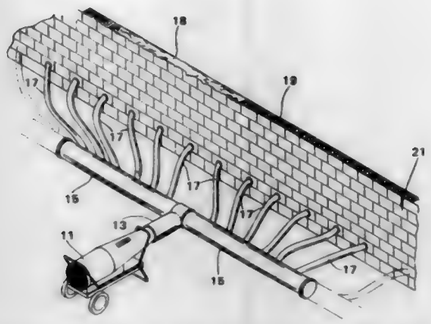
5,590,478

MASONRY HEATING SYSTEM

Frederick D. Furness, 603 Old Bethlehem Rd., Quakertown, Pa. 18951, assignor to Frederick D. Furness, Quakertown, and James L. Uhrich, Allentown, both of Pa.

Filed Feb. 20, 1996, Ser. No. 603,715
Int. Cl.[6] F26B *7/00*
U.S. Cl. 34—437 **10 Claims**

8. The method of heating a hollow block wall to accelerate the curing rate of drying cement in the joints of said wall, comprising the steps of:



laying a plurality of hollow blocks together with cemented joints, block upon block, to form a building wall having at least one substantially vertical side surface;

forming a plurality of temporary apertures in said side surface along the base of said wall;

providing a heat source; and

injecting hot air from said heat source into said apertures in the side surface of said hollow block wall, whereby said hot air travels upward through an internal cavity in said wall, thus applying heat to blocks and joint cement located above the level at which said hot air is applied.

5,590,479

METHOD FOR CONTINUOUSLY CRYSTALLIZING AND POLYMERIZING SYNTHETIC MATERIAL AND A DEVICE FOR IT

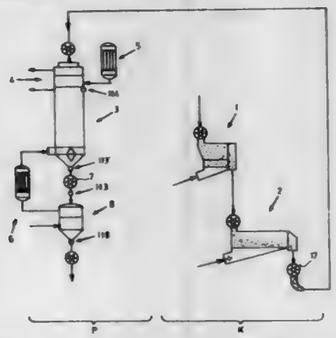
Arthur Ruf, Schwerzenbach; Brent A. Culbert, Wil, and Exzter Trenka, Niederuzwil, all of Switzerland, assignors to Bühler AG, Uzwil, Switzerland

Filed Aug. 11, 1993, Ser. No. 105,045

Claims priority, application Switzerland, Aug. 11, 1992, 02 516/92-0

Int. Cl.[6] F26B *17/00*

U.S. Cl. 34—589 **55 Claims**



1. A method for continuously crystallizing and polymerizing synthetic material including the steps of

crystallizing amorphous material at least partially,

preheating said material in a preheating zone with a preheating outlet area,

exposing the preheated material to a main heat treatment within a reactor, said reactor having a reactor outlet area,

cooling said material from said reactor within a cooler with a cooler outlet area,

analyzing said synthetic material in at least one of said outlet areas with an optical analyzing means including the step of determining at least one actual process parameter,

comparing at least one of said actual process parameters with at least one set value determined by at least one calibration procedure, and

deducing by said comparing a control value for controlling at least one control means.

5,590,480

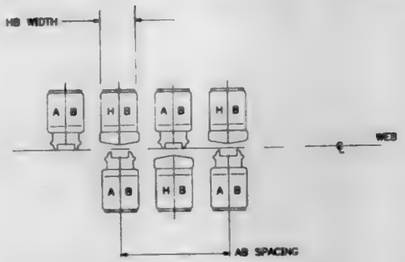
COMBINATION AIR BAR AND HOLE BAR FLOTATION DRYER

Michael P. Bria, and Jeffrey D. Quass, both of Green Bay, Wis., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 350,355, Dec. 6, 1994. This application Mar. 29, 1995, Ser. No. 412,428

Int. Cl.[6] F26B *9/00*

U.S. Cl. 34—629 **19 Claims**



1. Apparatus for floatingly drying a running web, said apparatus comprising an array of nozzles comprising, in combination, a plurality of flotation nozzles for floatingly supporting said web, and a plurality of direct impingement nozzles for drying said web, said direct impingement nozzles comprising a top surface having a plurality of apertures representing a total open area of from 1.8 to about 7.5% of the total area of said top surface, at least one of said direct impingement nozzles being opposed by a flotation nozzle and having a height/diameter ratio of from greater than 3 to about 10.

5,590,481

SPORT BOOT WITH A FASTENING DEVICE TO LIMIT REARWARD SWING OR FORWARD FLEX

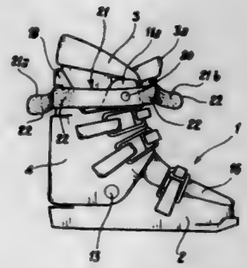
Franco Vaccari, Montebelluna, Italy, assignor to Dolomite S.p.A., Italy

Continuation of Ser. No. 303,988, Sep. 9, 1994, abandoned. This application May 14, 1996, Ser. No. 645,924

Claims priority, application European Pat. Off., Sep. 14, 1993, 93830376

Int. Cl.[6] A43B *5/04*

U.S. Cl. 36—118.8 **11 Claims**



1. An article of sport footwear having a shell with a main longitudinal spread and formed with two longitudinally opposite,

respectively forward and rearward, openings being so located on said shell as to respectively allow a leg of a user to lean forwards and rearwards, said openings extending from a shell entrance and defining two transversely opposite lateral sides on said shell, a bootleg pivoted on the shell and embracing said lateral sides at least partway, a means on the shell for limiting the pivoting bootleg rearward swing, characterized in that said means comprises at least one fastening device which extends between said lateral sides of the shell to bridge the rear opening, said fastening device comprising respective fastening elements attached to the corresponding lateral sides at a location close to said entrance and coupled adjustably together, said bootleg having a continuously closed rear portion bridging the rear opening, the fastening device extending over said continuous portion in order to adjustably limit the ability of the bootleg to swing backward, and said lateral sides being substantially rigid in the longitudinal direction so as to resist a pull applied thereto by the fastening device, and a fastening arrangement provided on said bootleg for closing the boot, said fastening arrangement being independent of said at least one fastening device.

5,590,482

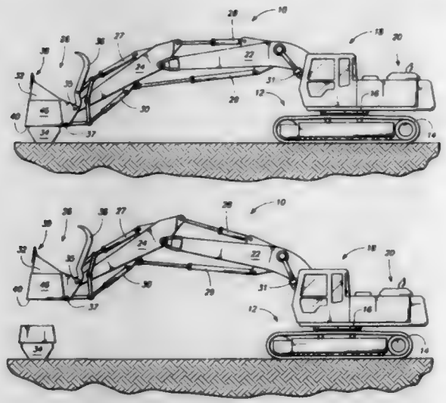
EXCAVATOR AND EARTHEN MATERIAL EXCAVATOR BUCKET APPARATUS

Randy S. Peterson, Spokane, Wash.; Thomas W. Steele, Twenty Nine Palms, Calif., and Robert D. Walker, Spokane, Wash., assignors to R. A. Hanson Company, Inc., Spokane, Wash.

Filed Jun. 27, 1995, Ser. No. 495,340

Int. Cl.[6] E02F *3/04;3/40*

U.S. Cl. 37—403 **17 Claims**



1. An earthen material excavator bucket apparatus comprising:

a rigid digging assembly having a fore earth working end, and an aft non-earth-working end, the digging assembly further comprising an internal, substantially enclosed throat positioned between the digging assembly fore and aft ends; and

a substantially rigid earthen material container releasably mounted relative to the non-earth-working end of the rigid digging assembly, the rigid earthen material container having a fore end which is removably received relative to the non-earth-working end of the rigid digging assembly, the fore end defining an opening which matingly cooperates with the throat, and an aft end which is effective to self-support the earthen material container in an upright condition when removed from the rigid digging assembly, and wherein the opening defined by the fore end of the rigid earthen material container faces generally upwardly away from the face of the earth when the container is released from the rigid digging assembly and positioned in self supporting relation on the face of the earth.

5,590,483

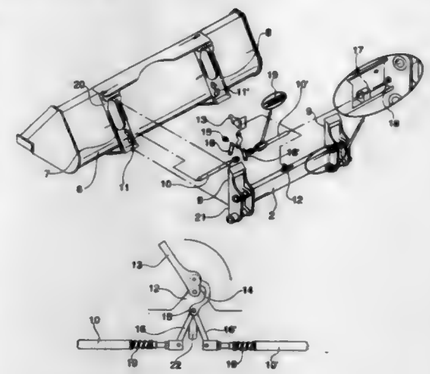
IMPLEMENT ATTATCHING DEVICE FOR CONSTRUCTION EQUIPMENT

Joon Y. Kim, Changwon, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 11, 1995, Ser. No. 501,222

Int. Cl.[6] E02F *3/96;* **A01B** *51/00*

U.S. Cl. 37—468 **1 Claim**



1. A device for detachably attaching an implement to an arm of construction equipment comprising:

an implement mount link hinged to said arm;

a first bracket provided on the rear wall of said implement and adapted for supporting said link vertically and horizontally;

a pair of key holes provided on opposite sides of said first bracket;

a pair of keys provided on said link such that the keys are horizontally movable relative to the link to be inserted into said key holes and thereby detachably attaching the implement to the implement mount link; and

means for linearly moving said keys horizontally including

a lever mount fixedly mounted to the top center of said implement mount link;

a lever pivoted to said lever mount at a bottom end of said lever;

a first link member pivoted to said lever at a top end of said link member;

a guide wheel rotatably mounted to a bottom end of said first link member and movably received in a guide slit of the implement mount link such that the guide wheel is vertically moved and guided by the guide slit in accordance with a turning motion of said lever; and

a pair of second link members, with top ends of said second link members being commonly pivoted to the bottom end of said first link member, and a bottom end of each of said second link members being pivoted to an inside end of a different one of said keys.

5,590,484

UNIVERSAL MOUNT FOR RIFLE

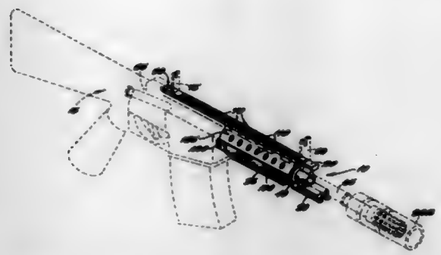
Aurelius A. Mooney, deceased, late of Columbia, S.C.; by Virginia R. Mooney, personal representative, 304 Park Springs Rd., Columbia, S.C. 29223; Edward P. Schnitter, 1631 Fuller Rd., Blythewood, S.C. 29016, and Richard Baker, 2701 W. Waters Ave., Apartment #1409, Tampa, Fla. 33614

Filed Aug. 17, 1995, Ser. No. 516,028

Int. Cl.[6] F41G *1/46*

U.S. Cl. 42—100 **21 Claims**

1. A universal mount for supporting at least one accessory device, said mount for use with a rifle, said rifle having an upper receiver, a gas block, a rear mount and a barrel nut, said upper



receiver having a notch formed thereon, said barrel nut having a counter bore and a plurality of projections, said universal comprising:

an upper rail having a receiver end and an opposing muzzle end, said upper rail extending from the rear of said upper receiver of said rifle to said gas block of said rifle, said upper rail having a top surface and a bottom surface, said upper rail having a notch formed in said bottom surface and proximate to said muzzle end;

a hand guard attached to said upper rail, said hand guard having opposing sides and a bottom portion, said hand guard surrounding said barrel of said rifle in spaced relation and attached to said rear mount and said gas block of said rifle, said hand guard having a plurality of heat dissipating holes formed along said opposing sides, said hand guard having a throughhole formed along said bottom surface, said hand guard having a plurality of side mounts extending therefrom;

a lower rail positioned between said barrel of said rifle and said bottom surface of said hand guard, said lower rail having a receiver end and a muzzle end, a top surface and a bottom surface, said lower rail having a pair of mounts formed in said bottom surface for receiving a grenade launcher, said lower rail having a channel formed along said bottom surface, said channel receiving said bottom portion of said hand guard;

a semi-circular retaining clip, said retaining clip received by said gas block of said rifle and within said notch of said upper rail to hold said upper rail to said gas block of said rifle; and

a heat shield attached to said hand guard, said heat shield having a bottom portion, said heat shield having at least one aperture formed in said bottom portion, said at least one aperture being aligned with at least one mount of said pair of mounts of said lower rail.

5,590,485

RIB FOR FIREARM AND METHOD OF MAKING A BARREL WITH RIB

Rudolf Brandl, Dornhan-Weiden, Germany, assignor to Heckler & Koch GmbH, Oberndorf/Neckar, Germany

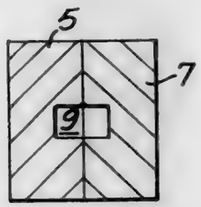
Filed Apr. 17, 1995, Ser. No. 423,290

Claims priority, application Germany, Feb. 17, 1995, 195 05 434.2

Int. Cl.[6] F41A *21/24*

U.S. Cl. 42—102 **4 Claims**

4. A method for manufacturing a barrel having an integral rib



comprising the steps of

providing a two-part mold having a cavity for accepting the barrel and a cavity for forming the rib;

placing the barrel into the mold;

placing a prepreg blanc including adhesive into the cavity for forming the rib; pressing the two-part mold together; and

curing the prepreg while in the mold.

5,590,486

EXTERNALLY MOUNTABLE LASER SIGHT FOR WEAPONS AND OTHER APPLICATIONS

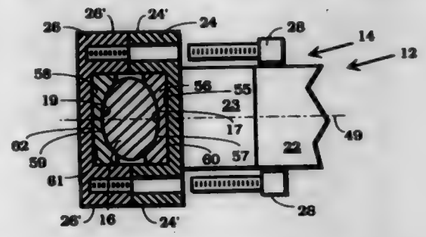
Larry Moore, Cottonwood, Ariz., assignor to Tac Star Industries, Inc., Cottonwood, Ariz.

Filed Dec. 27, 1994, Ser. No. 364,794

Int. Cl.[6] F41G *1/36*

U.S. Cl. 42—103 **46 Claims**

1. An external laser sight mounting assembly, for rugged stable



attachment to a mounting structure having a configuration with potential variations from a norm, the assembly comprising:

a laser module for selectively generating a light beam;

a first clamp portion coupled to the laser module, and having therein a first recess facing away from the laser module, the first recess having a bottom and sidewalls;

index means for providing predetermined relative orientation of a first end portion of the laser module and the first clamp portion;

a second clamp portion removably coupled to the first clamp portion and having therein a second recess facing toward the laser module when the first and second clamp portions are assembled together, the second recess having a bottom and sidewalls;

elastomeric inserts fixedly received in the recesses in substantial contact with the bottoms and sidewalls thereof so that significant movement of the inserts in any direction parallel to the bottoms of the recesses is prevented by the sidewalls of the recesses, adapted to receive said structure; and

tightening means for coupling the first and second clamp portions together and, with the mounting structure disposed between, biasing the elastomeric inserts against the mounting structure;

the inserts being formed of a material having predetermined hardness and compressibility characteristics such that the inserts are sufficiently deformable to conform to variations from the norm in the mounting structure configuration, but sufficiently hard to effect a rigid attachment to the mounting structure.

5,590,487

HUNTING TRAP DEVICE

Hallgeir Hovden, Søndre Vestsida veg 391, N-3670 Notodden, Norway

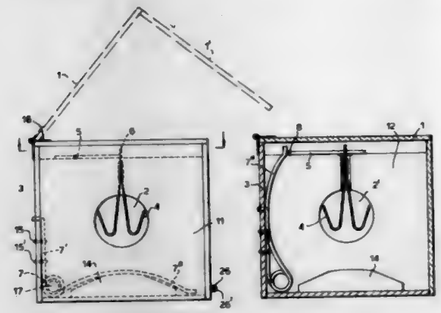
PCT No. PCT/NO93/00176, § 371 Date May 12, 1995, § 102(e) Date May 12, 1995, PCT Pub. No. WO94/12026, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 24, 1993, Ser. No. 433,502

Claims priority, application Norway, Nov. 25, 1992, 924559; Aug. 20, 1993, 932976

Int. Cl.[6] A10M *23/26*

U.S. Cl. 43—81 **6 Claims**



1. A device for a hunting trap, comprising a spring-tensioned arm adapted to rotate about an axis of rotation, and move, when in released state, across an opening forming an entrance to the trap, a trigger means for the arm disposed at the opening inside the trap, said opening being oval or circular and being formed in both a front wall and a partition positioned therebehind, the axis of rotation of the arm being located at a level below a lower edge of said opening, the arm being adapted to move in an intermediate space between the front wall and the partition, said arm being arcuate over a substantial portion of its length, with a curvature oriented opposite to a curved bottom of the opening in the hunting trap when the arm moves across said opening, the curved arm in its released and downward striking state capable of hitting and breaking a neck or spine of an animal located in said opening and lock the animal against said curved bottom of the opening, and the arm in its released striking state with said opening unobstructed by an animal being able to move down across said opening and past the lower edge of the opening.

5,590,488

SOD HANDLING

Gabriel Casimaty, Richmond, Australia; Gerardus J. Brouwer, Keswick, Canada, and Ian Fraser, Brunswick, Australia, assignors to StrathAyr Pty. Limited, Richmond, Australia

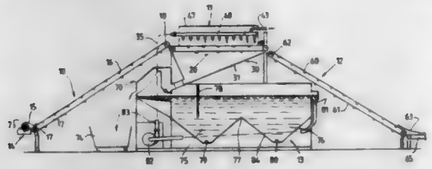
PCT No. PCT/AU93/00025, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/13648, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 21, 1993, Ser. No. 256,655

Claims priority, application Australia, Jan. 21, 1992, PL 0495/92; Feb. 21, 1992, PL 0988/92; Jul. 14, 1992, PL 3490/92

Int. Cl.[6] B26B *1/00*

U.S. Cl. 47—1.01 **14 Claims**



1. A sod washing system comprising, an inclined input conveyor means, a horizontal washing station and a declined output conveyor means, means for recycling of water including a tank, an inlet means, means for recycling of water including a tank, an inlet adjacent one end of the tank, an outlet adjacent the opposite end, the tank outlet being connected to a pump whereby the water from the tank can be passed to the washing station and expressed through nozzles to remove soil from sod located therebeneath, a receiver for the water and any soil removed from the sod, the receiver being in connection with the tank inlet, the tank having a formed position which has an outlet in or adjacent the floor of the tank through which soil which is deposited from the water can be removed from the tank.

5,590,489

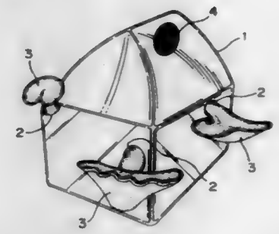
METHOD FOR GROWING FRUIT BODY OF *FISTULINA HEPATICA*

Ryuichi Hattori, and Hisashi Tanaka, both of Yotsukaido, Japan, assignors to House Foods Corporation, Higashi-Osaka, Japan

Filed Sep. 13, 1994, Ser. No. 305,353

Int. Cl.[6] A01G *1/04*

U.S. Cl. 47—1.1 **13 Claims**



1. A method of forming fruit bodies of *Fistulina hepatica*, which comprises:

a) filling a cultivation vessel having at least one side wall with a solid medium;

b) sterilizing said medium;

c) inoculating said sterilized medium with inocula of *Fistulina hepatica;*

d) allowing a spawn of said inocula to run through the medium;

e) inducing said spawn to form fruit body primordia; and,

f. exposing said fruit body primordia, to allow said fruit bodies to develop.

5,590,490

HYDROPONIC NUTRIENT SOLUTION CONTROL SYSTEM

Hiroshi Kikuchi, Tokyo-to, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 301,039, Sep. 6, 1994, which is a continuation of Ser. No. 145,305, Nov. 3, 1993, abandoned, which is a continuation of Ser. No. 622,968, Dec. 6, 1990, abandoned.

This application Jun. 1, 1995, Ser. No. 456,299

Claims priority, application Japan, Dec. 12, 1989, 1-320637

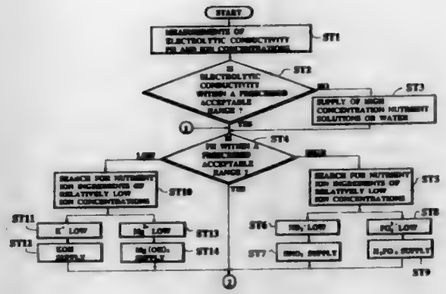
Int. Cl.[6] A01G *31/00*

U.S. Cl. 47—59 **12 Claims**

1. A method of hydroponic nutrient solution control for controlling nutrient solution to be supplied to plants to be grown, comprising the steps of:

providing nutrient solution tank means for containing the nutrient solution to be supplied to the plants, to which the nutrient solution supplied to the plants are returned;

measuring pH of the nutrient solution in the nutrient solution tank means by pH meter means;



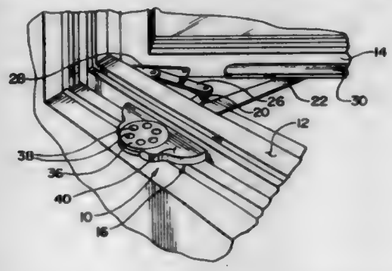
measuring an ion concentration of each nutrient ion ingredient of the nutrient solution in the nutrient solution tank means independent of every other nutrient ion ingredient of the nutrient solution in the nutrient solution tank means by ion analyzer means;

providing a plurality of acid solution tank means for containing acid nutrient ion ingredient solutions, each acid solution tank means separately containing an acid nutrient ion ingredient solution comprising a compound selected from the group consisting of HNO_3, H_3PO_4, and H_2SO_4, to be supplied to the nutrient solution in the nutrient solution tank means;

providing a plurality of alkali solution tank means for containing alkali nutrient ion ingredient solutions, each alkali solution tank means separately containing an alkali nutrient ion ingredient solution comprising a compound selected from the group consisting of KOH, $Ca(OH)_2$, $Mg(OH)_2$, and NH_4OH, to be supplied to the nutrient solution in the nutrient solution tank means; and

automatically controlling supplies of the acid nutrient ion ingredient solutions and the alkali nutrient ion ingredient solutions by selectively operating appropriate ones of the acid solution tank means and the alkali solution tank means, according to the pH measured by the pH meter means and the ion concentrations measured by the ion analyzer means.

5,590,491
WINDOW OPERATOR WITH DIAL INTERFACE
Stephen M. Piltingsrud, Owatonna, Minn., assignor to Truth Hardware Corporation, Owatonna, Minn.
Filed Oct. 24, 1994, Ser. No. 328,032
Int. Cl.[6] E05F *11/24*
U.S. Cl. 49—342 **49 Claims**



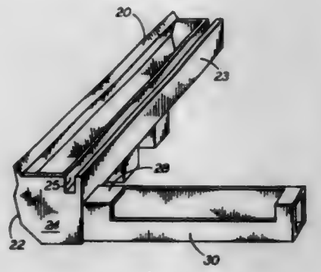
1. An operator for controlling pivoting of a window sash relative to a window frame, comprising:

a linkage pivotable about an axis and connectable to said window sash for controlling movement of said window sash relative to said window frame;

a drive input pivotable about a first axis fixable relative to said window frame, said drive input being substantially in a shape of an annular disk and including multiple recesses therein spaced substantially evenly about the first axis and engageable by multiple of a user's fingers to manually pivot the drive input; and

means drivably connecting the drive input to the linkage, said connecting means including a reduction ratio of at least 25:1.

5,590,492
ROOF DRAINAGE SYSTEM
Lewis P. Cucchiara; Francine A. Cucchiara, both of 141 Waldorf Ave., Rochester, N.Y. 14606, and Thomas C. Delgudico, 135 Brower Rd., Spencerport, N.Y. 14559
Filed Aug. 14, 1995, Ser. No. 514,803
Int. Cl.[6] E04D *13/00*
U.S. Cl. 52—15 **6 Claims**



1. A roof drainage system attach to a building having an overhanging roof with a fascia along the edge thereof and a soffit below the roof overhang, said drainage system including:

an eve trough including an elongated water channel with end walls keyed to fit onto the bottom edge of said fascia;

a corner post forming a drain spout therewithin and extending up a corner of said building: and

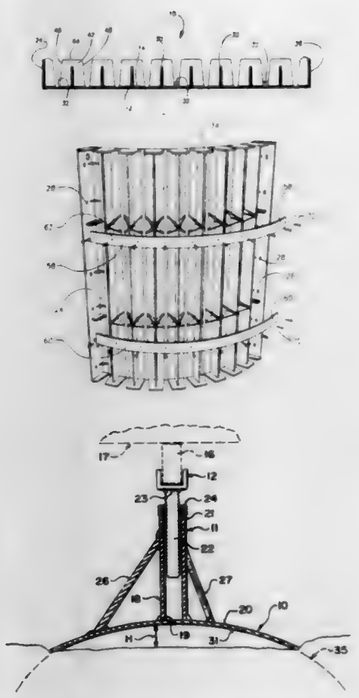
a soffit channel extending from said eve trough to said drain spout.

5,590,493
WALL STRUCTURES FOR SWIMMING POOLS
Jean Wilson, 12 Cherry Lane, Kirkland, Quebec, H9H 4K2, Canada
Filed Jul. 6, 1995, Ser. No. 498,576
Int. Cl.[6] E04B *2/00*
U.S. Cl. 52—108 **11 Claims**

1. A panel suitable for forming a side wall of an inground pool, the panel having a front face, a rear face, an upper peripheral edge, a bottom peripheral edge, and side peripheral edges, said front face having a substantially continuous surface, a plurality of reinforcing flanges extending outwardly from said rear face, and a plurality of lines of weakening extending substantially vertically between said upper peripheral edge and said bottom peripheral edge to thereby permit flexing of said panel, said lines of weakening comprising areas of diminished panel thickness.

5,590,494
SUPPORT FOUNDATION FOR A BUILDING STRUCTURE
Gerald Miller, Box 102, Mankota Saskatchewan, Canada
Filed Jan. 17, 1995, Ser. No. 372,923
Int. Cl.[6] E02D *27/28*
U.S. Cl. 52—169.9 **8 Claims**

1. A support foundation for a building structure comprising a soil base, a base pad placed directly on the soil base, an upstanding support member attached to the base pad, support means at an



upper end of the support member for engaging and supporting the building structure and brace means extending from the support member to the base pad and arranged such that the whole of the weight applied to the support means by the building structure is transmitted through the brace means and the support member to the base pad, the base pad being circular in plan view having a domed shape to define a convex upper surface and a concave lower surface resting on the soil surface, the soil base having a soil surface which is compressed by the base pad and forms a domed convex surface extending into the concave lower surface.

5,590,495
SOLAR ROOFING SYSTEM
Peter W. Bressler, and John D. Coleman, both of Philadelphia, Pa., assignors to Bressler Group Inc., Philadelphia, Pa.
Filed Jul. 6, 1995, Ser. No. 498,734
Int. Cl.[6] E04D *13/18*; H01L *31/05*
U.S. Cl. 52—173.3 **12 Claims**

1. A solar roofing system comprising:

a first longitudinally extending conductive bus;

a second longitudinally extending conductive bus spaced a predetermined distance from and substantially parallel to the first bus;

a plurality of separate photovoltaic modules laid out in a plurality of rows, each row extending between the first and second buses, each module for covering an exterior surface of a structure and having:

a carrier layer constructed from a non-porous building material and including first and second opposing lateral sides and upper and lower surfaces, the upper surface of the carrier layer defining a resting ledge extending inwardly a predetermined distance from the first side;

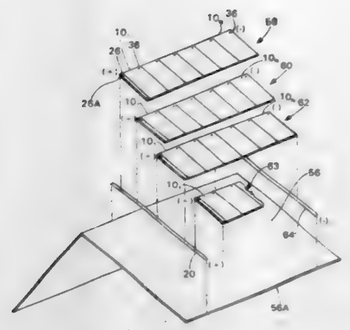
a photovoltaic layer at least partially laminated to the carrier layer, the photovoltaic layer for generating a DC voltage when exposed to light, the photovoltaic layer including first and second electrical connectors for outputting the DC voltage generated by the photovoltaic layer, the first connector being laminated on and forming a part of the resting ledge, the second connector extending beyond the second side of the carrier layer; and

a translucent layer laminated to the photovoltaic layer, the translucent layer covering all of the photovoltaic layer except for the first connector, a protruding portion of the translucent layer extending beyond the second side of the carrier layer a predetermined distance and being laminated to the second connector such that the protruding portion and the second connector form a protruding ledge;

the protruding ledge of each module being positioned to rest on the resting ledge of an immediately adjacent module such that the second connector on the protruding ledge is in electrical communication with the first connector on the resting ledge, each row having an outermost first connector on an outermost resting ledge and an outermost second connector on an outermost protruding ledge;

the first bus being in electrical communication with each outermost first connector on each outermost resting ledge, the second bus being in electrical communication with each outermost second connector on each outermost protruding ledge such that a DC row voltage appears across the first and second buses; and

a DC/AC converter in electrical communication with the first and second buses, wherein the DC/AC converter converts the DC row voltage into an AC voltage.



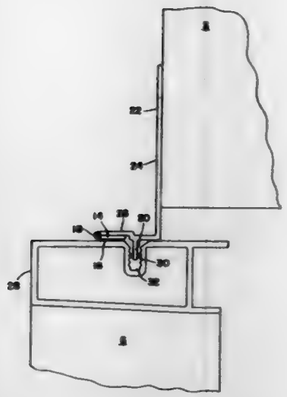
5,590,496
SHIPPING COVER HINGED NAILING FIN FOR USE WITH A FRAME ASSEMBLY
Jeffrey S. Martin, Cottage Grove, and Michael K. Hoffman, Cannon Falls, both of Minn., assignors to Amesbury Group, Inc., Amesbury, Mass.
Filed May 31, 1995, Ser. No. 455,062
Int. Cl.[6] E04B *1/04*
U.S. Cl. 52—213 **33 Claims**

1. For use with an assembly including a peripheral frame, a foldable shipping cover nailing fin comprising:

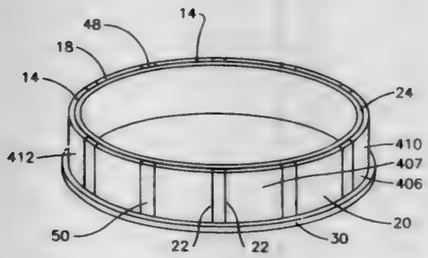
an L-shaped flange-like member formed of a generally stiff material configured to be directly attached to a support structure positioned adjacent to the peripheral frame, the L-shaped flange-like member further having thereon an integrally formed insertion leg for attaching the nailing fin to the peripheral frame;

a second member formed of a generally stiff material having an elongated edge parallel to and adjoining an elongated edge of the flange-like member; and

a flexible hinge mechanism joining the flange-like member and the second member together.



5,590,497
CIRCULAR OR GENERALLY CIRCULAR PRESTRESSED CONCRETE TANK AND METHOD OF CONSTRUCTING SAME
Richard G. Moore, 3722 SW. 82nd St., Gainesville, Fla. 32608
Continuation-in-part of Ser. No. 922,382, Jul. 31, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 309,204
Int. Cl.[6] E04H *7/20;* **E04G** *21/14*
U.S. Cl. 52—223.3 **30 Claims**



14. A tank of generally oval configuration having a wall created by a plurality of abutting precast wall panels, each said precast wall panel being of consistent preselected configuration utilizing a diaphragm liner, the diaphragm liner of each panel being of a generally rectangular configuration and uniform thickness, each diaphragm liner possessing a first face and a second face,

a plurality of elongate ducts disposed in a spaced, essentially parallel relationship at locations adjacent to the second face of each said diaphragm liner, with the duct spacing being in accordance with a consistent pattern,

concrete being utilized on a said second face of each diaphragm liner, such that the diaphragm liner as well as said ducts are covered by concrete to a substantially consistent depth,

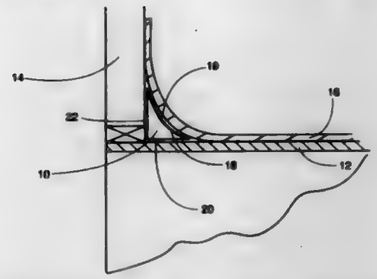
the concrete being shaped to an essentially consistent thickness and the surface of the concrete contoured to a finished condition, suitable for the exterior of the tank,

said precast wall panels grouped into a tank wall of generally oval configuration, with the abutting edges of the panels spaced closely together, and all of said ducts in generally horizontal alignment,

a horizontally disposed tensioning member extending through corresponding ducts of the several panels, and concrete utilized over the abutting edges and contoured to a finished condition,

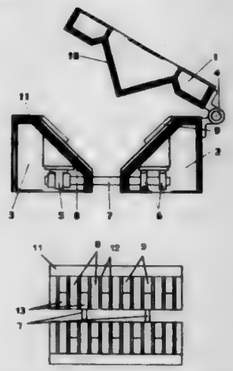
said tensioning members being secured in a tensioned condition to hold said panels tightly together.

5,590,498
ROOFING CANT STRIP
James A. Mokres, P.O. Box 23468, Santa Fe, N.M. 87502
Filed Apr. 5, 1995, Ser. No. 417,204
Int. Cl.[6] E04D *15/04; 13/14*
U.S. Cl. 52—287.1 **12 Claims**



1. A cant strip piece for support of a roofing membrane member comprising a structure having at least five sides wherein a first side and a second side are perpendicularly joined at one edge defining a right angle, a third side is joined to both the first and second sides at an edge on each of said first and second sides oppositely situated from the edge at which said first and second sides are perpendicularly joined, said third side defining a concave shaped surface adapted for the support of a roofing member transitioning from a horizontal plane to a vertical plane, said joined first, second and third sides defining a pair of end sides having surfaces situated in planes essentially perpendicular to either plane defined by said first or second sides, and a layer of a heat resistant material upon the surface defined by said third side.

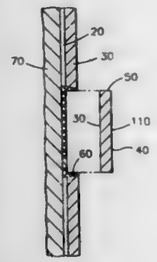
5,590,499
PROCESS AND ARRANGEMENT FOR MANUFACTURING A PREFABRICATED, INSULATING WALL ELEMENT
Dieter A. Pischel, Lottbekhcide 17, 22395 Hamburg, Germany
PCT No. PCT/DE92/00434, § 371 Date Apr. 18, 1994, § 102(e) Date Apr. 18, 1994, PCT Pub. No. WO92/21512, PCT Pub. Date Dec. 10, 1992
PCT Filed May 28, 1992, Ser. No. 150,164
Claims priority, application Germany, May 31, 1991, 41 17 820.3
Int. Cl.[6] E04C *2/10;* **B29C** *33/00*
U.S. Cl. 52—309.9 **11 Claims**



1. A process for producing an angular wall element consisting of an angular rigid foam panel with brick fillets which are bonded thereto and separated from one another by a mortar-like composition, characterized in that angular, one-part fillets are laid adjacent to one another with clearance interspaces between the fillets in a horizontal mold with an essentially V-shaped cross-section, in that the interspaces between the fillets are filled with a mixture of sand and isocyanate and in that, between reverse surfaces of the fillets and the sand and isocyanate mixture and a countermold, a rigid foam layer is introduced, a part of the rigid foam material partly penetrating the sand isocyanate mixture and the regions of the mixture not penetrated by the rigid foam material being removed after curing of the rigid foam material.



5,590,500
TILE SYSTEM
David L. McCue, 5832 Padua Dr., Huntington Beach, Calif. 92649
Filed Oct. 20, 1993, Ser. No. 139,452
Int. Cl.[6] E04F *13/00*
U.S. Cl. 52—311.2 **10 Claims**



1. A decorative and protective structural matrix covering a base surface comprising:

a plurality of tiles of a rigid material, each of the tiles providing a generally planar mounting surface for placement, in parallel proximity, to the base surface, and a generally planar display surface, the surfaces being joined by a peripheral edge defining an outline shape;

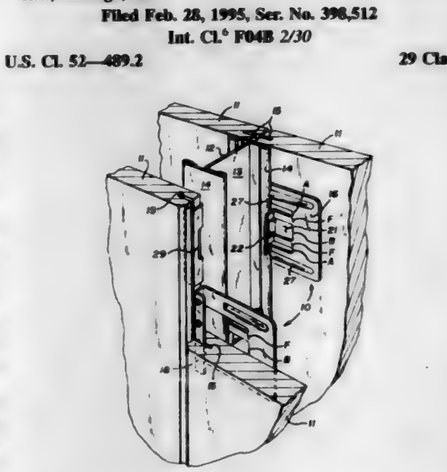
a first subset of the plurality of tiles, each being a fixed tile permanently attached by the mounting surface to the base surface by an adhesive means, each, further, being mutually separated from the next to define a space therebetween, a grout material filling each said space;

a second subset of the plurality of tiles, each being a removable tile, each providing a precast flexible grout sleeve of an elastomeric material, the sleeve shaped to conform to, and extend around, at least a portion of the peripheral edge;

each of the removable tiles positioned between fixed tiles such that each sleeve is compressed between the peripheral edges of the fixed and removable tiles to generate a compressive force for holding each removable tile in place adjacent the base surface.

5,590,501
INSULATION BARRIER AND A METHOD OF MAKING AN INSULATION BARRIER
John Stoddart, Eden Prairie, Minn., and George Cataldo, Des Moines, Iowa, assignors to Styro-Stop, Inc., Brooklyn Park, Minn.
Continuation-in-part of Ser. No. 388,218, Feb. 13, 1995, Pat. No. 5,516,552, which is a division of Ser. No. 173,693, Dec. 23, 1993, Pat. No. 5,414,970. This application Jun. 22, 1995, Ser. No. 493,771
Int. Cl.[6] E04B *5/00*
U.S. Cl. 52—406 **11 Claims**

1. An insulation system comprising:



a. a body of foamed polystyrene having a plurality of closed cells therein, and further having a bottom surface for laying on a substrate and an upper surface; and

b. a protective coating on at least said bottom surface of said body including a metallic-based inorganic material selected from the group consisting of aluminum oxide trihydrate, hydrated boron oxide, antimony oxide, titanium dioxide, magnesium hydroxide and mixtures of at least two of said materials.

5,590,502
PANEL ACCESS CLIP FOR RELOCATABLE PARTITIONS
Alan C. Wendt, Barrington, Ill., assignor to USG Interiors, Inc., Chicago, Ill.
Filed Feb. 28, 1995, Ser. No. 398,512
Int. Cl.[6] F04B *2/30*
U.S. Cl. 52—489.2 **29 Claims**

1. A snap engageable clip for use in wall panel partition assemblies comprising:

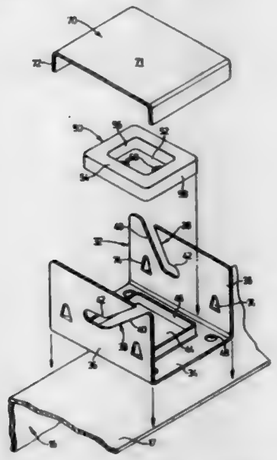
a generally planar base portion having means for engaging the edge of a panel, said base portion including a central cut-out and integral rearward cut-out, resiliently engageable means extending upwardly from said base portion and including means for snap-engaging support members of a wall panel partition assembly, said means for a snap-engaging disposed over said central cut-out and rearward cut-out, said base portion further including elongate slots of said central cut-out extending rearwardly of said resiliently engageable means, reinforcing ribs projecting from said base portion laterally of said elongate slots, and said base portion including a planar portion rearwardly of said elongate slots and rearward cut-out.

5,590,503

NON-COMPOSITE PANEL

John R. Sproule, Calgary, Canada, assignor to Semper Sealing Systems Inc., Alberta, Canada

Filed Oct. 26, 1993, Ser. No. 141,504
Int. Cl.[6] E04C *5/16*
U.S. Cl. 52—677 **12 Claims**



1. A bracket for attaching a wythe to a structural support, said bracket comprising a first member having a base with a pair of oppositely directed surfaces and a pair of spaced legs extending from one surface of said pair of oppositely directed surfaces of said base, said base having an aperture therein and a marginal wall about the periphery of said aperture, a second member received between said legs and having a central portion received within said aperture and a peripheral portion juxtaposed with said one surface of said base, said central portion being spaced from said marginal wall and having an abutment surface to contact said marginal wall and maintain said peripheral portion in sliding relationship with said one surface of said base and thereby permit relative sliding movement between said wythe and said support, each of said legs including a slot having an entrant portion extending inwardly from a periphery of said leg to receive a reinforcing bar embedded in said wythe.

5,590,504

MOUNTING DEVICES

Robert A. H. Heard, and Terry Waite, both of Bristol, United Kingdom, assignors to Signfix Limited, United Kingdom

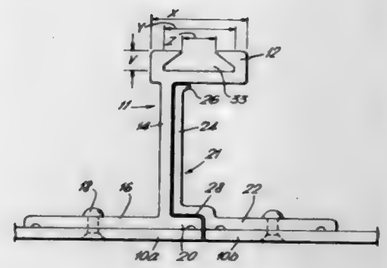
PCT No. PCT/GB92/02093, § 371 Date Jul. 14, 1994, § 102(e) Date Jul. 14, 1994, PCT Pub. No. WO93/10517, PCT Pub. Date May 27, 1993
PCT Filed Nov. 12, 1992, Ser. No. 240,745
Claims priority, application United Kingdom, Nov. 12, 1991, 9123958; May 29, 1992, 9211385
Int. Cl.[6] G09F *7/18*
U.S. Cl. 52—730.1 **6 Claims**

4. A sign comprising:

(i) a plurality of sign panels abutted edge-to-edge;

(ii) a main, elongate, co-operating, reinforcing member having a cross-section defining a transverse head attached to a mounting device for the sign, and a depending leg terminating in an offset foot portion secured to a rear of a first of said sign panels adjacent an abutting edge of said first panel; and

(iii) a second, elongate, co-operating, reinforcing member having a generally L-shaped cross-section comprising a foot portion secured to a rear of a second of said sign panels at an edge abutting the first panel, and an upright portion abutting



the leg of the main reinforcing member, wherein a top of the upright portion of the second reinforcing member is offset to engage under the head of the main reinforcing member,

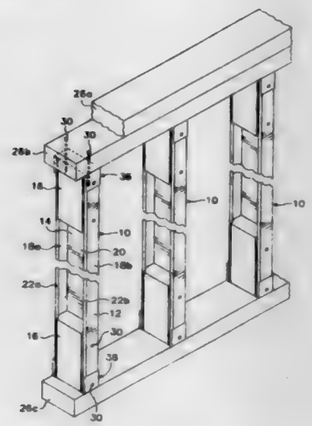
one of the reinforcing members having a flange at the foot portion projecting into a recess in the foot portion of the other reinforcing member.

5,590,505

CONSTRUCTION MEMBER AND ASSEMBLIES THEREOF

D. Dennis Bogle, 109 NW. 106th St., Vancouver, Wash. 98685

Filed Oct. 7, 1994, Ser. No. 319,947
Int. Cl.[6] E04C *3/292*
U.S. Cl. 52—731.9 **20 Claims**



1. A construction member for framing, comprising:

an elongate support channel having a first end, a second end, a pair of substantially parallel opposing channel forming side walls, and an interconnecting side wall; and

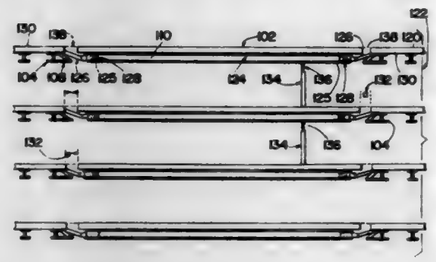
a pair of end caps fixedly attached to respective ends of said support channel so as to prevent relative movement between said end caps and said support channel, each said end cap having an end portion and at least two tabs substantially perpendicular to said end portion and disposed adjacem respective opposing side walls of said support channel, said tabs being attached to said respective opposing side walls.

5,590,506

EARTHQUAKE-RESISTANT ARCHITECTURAL SYSTEM

John Cunningham, 35 Loughberry Rd., Saratoga Springs, N.Y. 12866

Filed May 3, 1993, Ser. No. 57,126
Int. Cl.[6] F16M *13/00;* **E04H** *9/02*
U.S. Cl. 52—741.3 **4 Claims**



1. A method for isolating an architectural element within an architectural structure, said method comprising the steps of:

providing the architectural structure with a frame having a pair of laterally spaced apart opposing members;

suspending a fixed bearing support from a lower surface of each of the frame members in opposing relationship;

forming each of said bearing supports with a bearing surface for engaging an elongated elastic member;

selecting a pair of elongated elastic members each capable of bending from an equilibrium position to assume a more downwardly inclined position when the elastic member is supported at a distance spaced inwardly from its outer end and a load is applied to its inner end;

connecting an inner end of each of said elastic members to opposing sides of an architectural element;

arranging said architectural element between said pair of bearing supports with the outer ends of said elastic members extending longitudinally beyond said pair of bearing supports; and

placing said elastic members in engagement with bearing surfaces on their respective bearing supports to enable said outer ends of said elastic members to slidably move relative to their respective bearing supports in response to a bending of an inner end of one of said elastic support members or in response to external forces applied to one of the bearing supports.

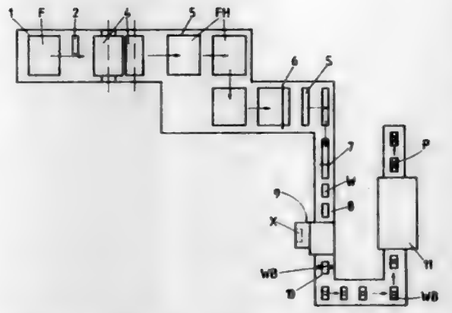
5,590,507

PROCESS AND APPARATUS FOR PROCESSING SHEETS OF NOTES TO FORM BUNDLES OF NOTES

Hans Wyssmann, Zurich, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Sep. 7, 1994, Ser. No. 301,475
Claims priority, application Switzerland, Sep. 30, 1993, 02 941/93
Int. Cl.[6] B65B *13/02;57/00*
U.S. Cl. 53—399 **6 Claims**

1. Process for processing sheets of notes having a fixed number N of note prints, which are arranged on each sheet in transverse rows and longitudinal rows, to form bundles of notes (WB) from numbered individual notes of value and to form packs of notes (P), which contain a particular number of bundles of notes and in which all the notes have a consecutive, complete sequence of numbers, the process includes cutting sheets of notes and registration of misprints established on the sheets of notes, in which process, after registration of the misprints established on them, the sheets of notes run through a numbering machine (4), in which only the satisfactory note prints are numbered, excluding the misprints, and in which process, after the cutting of the sheets of notes, the misprints are segregated, wherein the distribution of the misprints (X) on each sheet of a sequence of at least H sheets is established and stored before their numbering, wherein then a sequence of H successive sheets is numbered as a function of this stored misprint distribution in such a way that all the satisfactory note prints of this sequence receive a consecutive sequence of numbers, the satisfactory note prints which have the same note position on successive sheets being consecutively numbered and all the sequences of numbers of the in each case H note prints in adjacently lying note positions of the same row receiving a consecutive numbering, the sequences of numbers of the note prints in all the note positions of a row continuing the sequences of numbers of the note prints in the note positions of a neighboring row, and the next sequence of H sheets receiving the subsequent sequence of numbers, wherein at the output of the numbering machine (4) stacks of sheets (FH) having H sheets each are formed, these stacks of sheets are cut into stacks of strips (S) and these stacks of strips are cut into stacks of notes (W) and the stacks of notes occurring one after the other in rows are successively sent through at least one segregation and bundling device (9), in which the misprints (X) are removed and in each case H successive satisfactory notes are combined to form a bundle (WB) having a complete sequence of numbers, bundles following one another having notes with successive sequences of numbers.



5,590,508

METHOD FOR APPLYING A BAND ABOUT A SHEET OF MATERIAL AND A POT OR FLORAL GROUPING

Donald E. Weder, Highland; William F. Straeter, Breese, and Joseph G. Straeter, Highland, all of Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

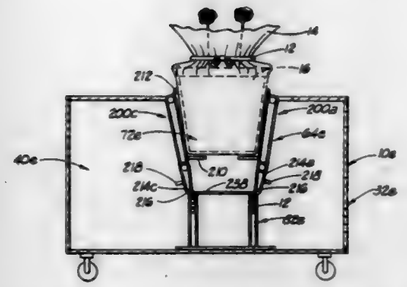
Continuation of Ser. No. 176,931, Jan. 3, 1994, Pat. No. 5,465,552, which is a continuation of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 934,832is a continuation-in-part of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, which is a continuation of Ser. No. 530,491, which is a continuation of Ser. No. 315,169. This application Jun. 1, 1995, Ser. No. 457,936
Int. Cl.[6] B65B *25/02;49/00;51/04*
U.S. Cl. 53—399 **1 Claim**

1. A method for placing a band about a sheet of material for cooperating to hold the sheet of material in position extending about at least a portion of an outer peripheral surface of a pot means, the pot means having an upper end and a lower end, comprising:

providing a pot frame with a pot receiving space;

providing means for providing a band;

placing the pot means with the sheet of material disposed about at least a portion of the pot means in the pot receiving space of the pot frame; and



removing the band from the means for providing a band and positioning the band about at least a portion of the outer peripheral surface of the pot means to provide a decorative cover for the pot means, wherein the step of moving the pot means and the sheet of material into the pot receiving space of the pot frame comprises moving the pot means and the sheet of material into the pot receiving space of the pot frame whereby at least a portion of the sheet of material is disposed about at least a portion of the pot means and wherein the step of placing the band about the sheet of material is defined further as automatically removing the band from the means for providing a band and automatically positioning the band about the sheet of material to hold the sheet of material about the pot means.

5,590,509

PROCESS AND MACHINE FOR CONDITIONING ANY PRODUCTS IN CONTAINERS SUCH AS BARQUETTES

Robert Esteves, Champhol, and Michel Fruchard, Leves, both of France, assignors to W. R. Grace & Co-Conn., Duncan, S.C.

Filed Mar. 23, 1994, Ser. No. 216,394
Int. Cl.[6] B65B *31/02*
U.S. Cl. 53—432 **10 Claims**



1. A process for packaging a product on a receptacle wherein the product and the receptacle are surrounded by a film, with a forward end the process comprising:

(A) advancing a tubing of film on a conveyor, the tubing housing the receptacle having the product thereon;

(b) sealing the tubing of film on the forward end;

(C) sending a gaseous mixture into the tubing;

(D) blowing heated air onto an outer surface of the sealed forward end of the film, so that a forward region of the tubing of film, from the sealed forward end of the tubing to the middle of the receptacle, is pre-shrunk, whereby a rearward expulsion of the gaseous mixture inside the forward region occurs;

(E) applying a vacuum inside the tubing from a rearward portion of the tubing of film, so that the expulsion of the gaseous mixture is completed, the expulsion of the gaseous mixture facilitating the welding of the tubing of film at the rear portion of the container;

(F) obturating the tubing of film by heat sealing the tubing of film in the area of a rearward end of the receptacle, whereby an obturated film tube portion is produced, the obturated film tube portion surrounding the receptacle having the product thereon;

(G) separating the obturated tubing film portion from a remainder of the tubing film; and

(H) heat-shrinking the obturated tubing film portion.

5,590,510

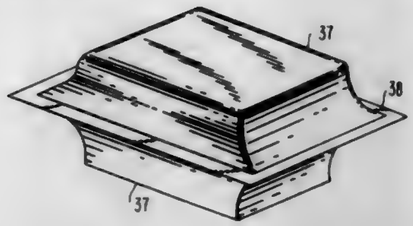
INK-JET RECORDING APPARATUS AND INK TANK CARTRIDGE THEREOF

Seiji Mochizuki; Kuzuhisa Kawakami; Masahiro Nakamura; Keiichi Ohshima, and Masanori Yoshida, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 157,592, Nov. 23, 1993, Pat. No. 5,477,963, which is a continuation of Ser. No. 928,936, Aug. 11, 1992, Pat. No. 5,488,401. This application Apr. 17, 1995, Ser. No. 422,975

Claims priority, application Japan, Jan. 28, 1992, 4-12834; Feb. 19, 1992, 4-32226; Mar. 16, 1992, 4-58151; Jun. 26, 1992, 4-193402

Int. Cl.[6] B65B *31/00*
U.S. Cl. 53—434 **12 Claims**



1. A method for packing an ink tank cartridge for storage having an ink absorbing member impregnated with ink at a pressure below atmospheric pressure, comprising the steps of:

wrapping the ink tank cartridge with a fuse bondable film essentially impermeable to air;

fuse bonding the free ends of the film to form an air sealable container having a space therein; and

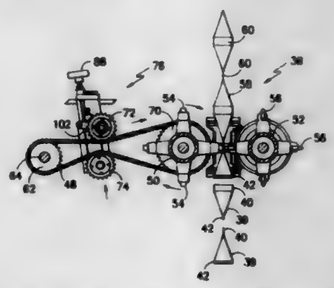
at least partially decompressing the container as it its fuse bonded so that the pressure in said space is lower than the atmospheric pressure and higher than the pressure at which the ink absorbing member was impregnated with ink.

5,590,511

AUTOMATIC CUTTER ADJUSTMENT

Robert Morrison, Spartanburg, S.C., assignor to Milliken Packaging Corporation, Whitestone, S.C.

Filed Aug. 22, 1995, Ser. No. 520,660
Int. Cl.[6] B65B *9/20;51/16;51/26*
U.S. Cl. 53—552 **5 Claims**



1. Apparatus to produce a filled package having transverse seals at both ends thereof comprising: means to supply a tube of packaging material, a second means to supply material to be packaged into said tube of said packaging material, a third means to form a transverse seal in said tube of material, a fourth means downstream of said third means severing said transverse seal to form a separated filled package and a bottom seal for said tube of material being moved towards said fourth means, said fourth means including a blade member and a back-up member to sever said transverse seal therebetween, said blade member and said back-up member each being mounted on a rotatably mounted support, said supports being driven by a chain member driven from a gear box, sprocket means engaging said chain member between said gear box and said rotatably mounted support members and means operably associated with said sprocket means to move said sprocket means up or down to rotate the cutting position of said blade and back-up members.

5,590,512

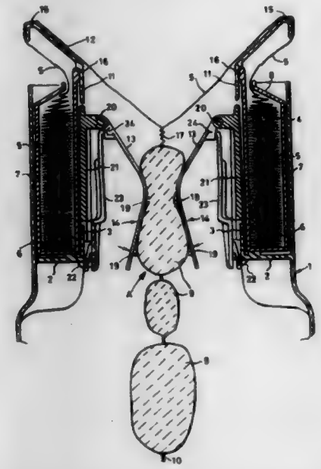
APPARATUS FOR USING PACKS OF FLEXIBLE TUBING IN PACKAGING

David C. Richards, Berkshire; Maurice S. Williams, Cranleigh, and Brian Ward, Berkshire, all of United Kingdom, assignors to Melrose Products Limited, Guernsey, United Kingdom

Filed Aug. 24, 1995, Ser. No. 518,993

Claims priority, application United Kingdom, Aug. 26, 1994, 9417373

Int. Cl.[6] B65B *9/10*
U.S. Cl. 53—567 **6 Claims**



1. An apparatus for packaging a series of objects respectively in individual packages distributed along an unbroken length of flexible substantially non-resilient tubing providing the walls of the packages, the apparatus comprising

tubular guide means including a flared entrance funnel formed with a rim at its wide end and shaped to receive said series of objects as they are manually inserted into said flared entrance funnel, said flared entrance funnel having a tubular wall tapering to a narrower end,

a guide cylinder providing a continuation of said flared entrance funnel, said guide cylinder being aligned with said narrower end to lead said series of objects therethrough,

means for receiving a cylindrical gathered pack of said flexible tubing when mounted to surround said tubular guide means and to enable the end of said tubing to be drawn away from an end of said gathered pack and to the end sealed and pasted over and through the entire peripheral surface of said rim into and over said tapering tubular wall of said flared entrance funnel and thence through said guide cylinder, whereby the outer surface of said tubing becomes the inside surface thereof inside said tubular guide means and whereby manual pressure on a soiled object to be packaged in the tubing towards said end of said tubing causes said tubing to pass over said rim and along said tubular guide means while more tubing is withdrawn from the pack in a fresh and untouched state, allowing the user the advantage of touching a clean surface of the flexible tubing,

means mounted within said guide cylinder for holding the soiled object when in the tubing against rotation about its axis while said withdrawn tubing is manually twisted to close a package containing that soiled object,

said holding means comprising a plurality of clamping elements which are normally in a closed and contacting position, each clamping element being movable between a closed position blocking passage of said object and an open position permitting the object to pass,

means for resiliently biasing the clamping elements towards the closed position and

said flared entrance funnel being rotatable about its axis by manual application of torque to said rim thereby to twist said tubing to close a package held against rotation by said holding means.

5,590,513

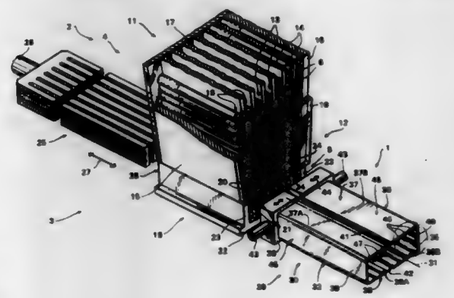
DEVICE FOR WRAPPING GROUPS OF CIGARETTES

Bruno Belvederi, S. Martino Di Monte, Italy, assignor to G. D. Societa' Per Azioni, Bologna, Italy

Filed Jul. 6, 1995, Ser. No. 499,021

Claims priority, application Italy, Jul. 13, 1994, B094A0329

Int. Cl.[6] B65B *19/24*
U.S. Cl. 53—575 **5 Claims**

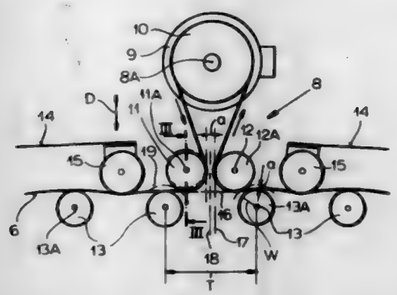


1. A device (**1**) for wrapping groups (**5**) of cigarettes (**6**) forming the content of respective packets; the wrapping device (**1**) comprising at least one folding spindle (**29**) in turn comprising a tubular shell (**30**) for receiving a respective said group (**5**) and about which is wrapped a sheet (**50**) of wrapping material; and the shell (**30**) being substantially in the form of a rectangular parallelepipedon, and comprising externally flat, relatively thin walls (**37–40**); characterized in that at least one of said walls (**37–40**) presents a number of inner longitudinal reinforcing ribs (**46**), each engaging, in use, the longitudinal gap (**48**) defined by two adjacent peripheral cigarettes (**6**) in the group (**5**).

5,590,514
FLAT-BELT DRIVE SYSTEM FOR RING-SPINNING MACHINE

Peter Mann, Süssen, and Thomas Benkert, Deggingen, both of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

Filed Jan. 17, 1996, Ser. No. 587,580
Claims priority, application Germany, Jan. 20, 1995, 195 01 626.2
Int. Cl.[6] D01H *13/00*
U.S. Cl. 57—104 **4 Claims**



1. In combination with a ring-spinning machine having a longitudinally extending row of spindles spaced apart in a longitudinal direction of the machine and rotatable about parallel spaced axes on a frame, a drive comprising:

an endless flat belt tangentially engaging all of the spindles;

a pair of deflector rollers between two successive spindles of the row and rotatable about respective axes parallel to the respective spindle axes and spaced apart in said longitudinal direction along the belt;

a drive wheel rotatable about a drive wheel axis parallel to and spaced transversely from the rollers, said drive wheel axis being further spaced from respective spindle axes transversely to said longitudinal direction, the belt at each drive wheel passing initially around a respective one of the deflector rollers, then around the drive wheel, and then around the other of the deflector rollers; and

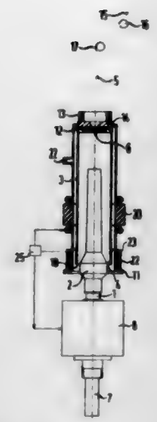
motor means for rotating the drive wheel about the wheel axis, said drive wheel, said deflector rollers and said spindles all being engaged by said belt in a single belt plane.

5,590,515
SPINNING APPARATUS AND CONTROL ARRANGEMENT THEREFOR

Karl Boden, Jülich, Germany, assignor to Forschungszenlrum Jülich GmbH, Jülich, Germany

Filed Dec. 19, 1995, Ser. No. 575,694
Claims priority, application Germany, Jun. 30, 1993, 43 21 757.5; Aug. 26, 1993, 43 28 710.7
Int. Cl.[6] D01H *1/04;7/86*
U.S. Cl. 57—264 **13 Claims**

1. A spinning apparatus comprising: a rotatable spindle, a package mounted on said spindle for receiving a yarn, a first yarn guide arranged coaxially with said package for receiving said yarn, a rotatable radially symmetrical tubular element concentrically surrounding said package, said tubular element being supported at its end surrounding said package by an axially passive radially active magnetic bearing which surrounds said tubular element and, at its opposite end by a radially stable axially instable magnetic bearing, a second yarn guide arranged on the inside of said tubular element so as to be rotatable therewith, said second yarn guide receiving the yarn which, during rotation of said tubular element, abuts its inner surface and guiding it to said package for winding it onto said package with a winding speed corresponding to the speed difference between said spindle and said tubular element, sensors



disposed adjacent said tubular element for sensing any axial deviation of said tubular element from its predetermined position, and an electronic arrangement associated with said sensors and receiving therefrom signals corresponding to said axial deviations, said electronic arrangement to amplify said signals to represent tensional forces effective in the yarn and utilize them to control the spinning apparatus.

5,590,516
JEWELRY CHAIN

Tibor Schwartz, 1554 46th St., Brooklyn, N.Y. 11219

Filed Oct. 23, 1995, Ser. No. 553,766
Int. Cl.[6] F16G *13/00*
U.S. Cl. 59—80 **15 Claims**



1. A decorative chain link, comprising:

a first quarter link having a first central base portion, a first pair of legs extending from said first base portion, each one of said first pair of legs extending to a first free end portion, said first pair of legs defining a first open mouth extending between each first free end portion;

a second quarter link having a second central base portion connected to said first central base portion of said first quarter link so as to form a first half link having a first V-shaped profile formed with a first vertex defined between said first and second base portions, a second pair of legs extending from said second base portion, each one of said second pair of legs extending to a second free end portion, said second pair of legs defining a second open mouth extending between each second free end portion;

a third quarter link having a third central base portion, a third pair of legs extending from said third base portion, each one of said third pair of legs extending to a third free end portion, said third pair of legs defining a third open mouth extending between each third free end portion;

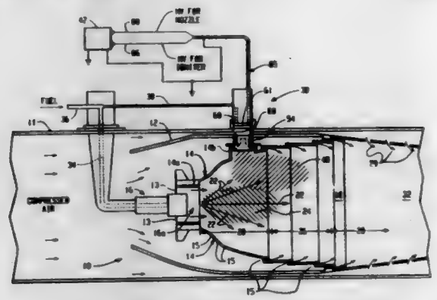
a fourth quarter link having a fourth central base portion connected to said third central base portion so as to form a second half link having a second V-shaped profile formed with a second vertex defined between said third and fourth base portions, a fourth pair of legs extending from said base portion, each one of said fourth pair of legs extending to a fourth free end portion, said fourth pair of legs defining a fourth open mouth extending between each fourth free end portion; and

said first and second half links being rigidly united at said first, second, third and fourth free end portions such that said first V-shaped profile is perpendicular to said second V-shaped profile.

5,590,517
IGNITION METHODS AND APPARATUS FOR COMBUSTORS

Dennis M. DeFreitas, Oxford, N.Y., assignor to Simmonds Precision Engine Systems, Inc., Akron, Ohio

Division of Ser. No. 67,652, May 26, 1993, Pat. No. 5,515,681. This application Jun. 6, 1995, Ser. No. 470,403
Int. Cl.[6] F02C *7/26*
U.S. Cl. 60—39.06 **6 Claims**



1. A method for igniting fuel in a combustor comprising the steps of:

a. mixing fuel from a main fuel supply with air to produce a main air/fuel spray, and delivering the main air/fuel spray into the combustor;

b. using an electrostatic nozzle to atomize fuel provided from a second fuel supply to produce an atomized fuel spray separate from the main air/fuel spray;

c. using an igniter to ignite said separate atomized fuel spray; and

d. using the ignited electrostatically atomized fuel spray to ignite said main air/fuel spray in the combustor.

5,590,518
HYDROGEN-RICH FUEL, CLOSED-LOOP COOLED, AND REHEAT ENHANCED GAS TURBINE POWERPLANTS

Clarence W. Janes, Sacramento, Calif., assignor to California Energy Commission, Sacramento, Calif.

Continuation-in-part of Ser. No. 182,661, Jan. 12, 1994, Pat. No. 5,490,377, which is a continuation-in-part of Ser. No. 139,525, Oct. 19, 1993, abandoned. This application Oct. 23, 1995, Ser. No. 546,729
Int. Cl.[6] F02C *3/28*
U.S. Cl. 60—39.12 **15 Claims**

1. A gas turbine driven powerplant, comprising:

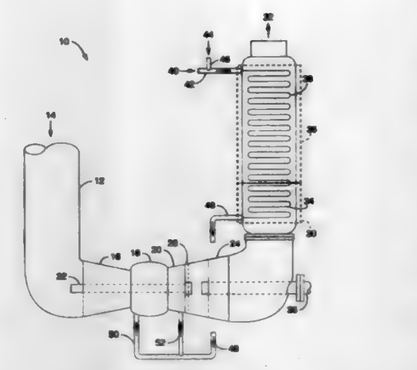
(a) compressor means for producing a downstream flow of air;

(b) a combustor positioned downstream of said compressor means;

(c) a first turbine positioned downstream of said combustor, said turbine coupled to said compressor by a shaft;

(d) a reheat combustor positioned downstream of said turbine; and

(e) a second turbine positioned downstream of said reheat combustor;

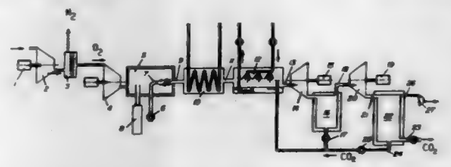


(f) said reheat combustor receiving a flow of hydrogen-rich fuel through cooling orifices in said first turbine, wherein said hydrogen-rich fuel auto-ignites upon discharge from said cooling orifices into the flow of air from said first turbine to said second turbine.

5,590,519
COMBINED COMBUSTION AND EXHAUST GAS CLEANSING PLANT

Göran Almlöf, Malung, and Folke Lillichöök, Skanör, both of Sweden, assignors to BAL AB, Malung, Sweden

PCT No. PCT/SE93/00626, § 371 Date Jan. 10, 1995, § 102(e) Date Jan. 10, 1995, PCT Pub. No. WO94/01724, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 13, 1993, Ser. No. 362,596
Claims priority, application Sweden, Jul. 13, 1992, 9202155
Int. Cl.[6] F02C *7/00*
U.S. Cl. 60—39.33 **12 Claims**



1. A combined combustion and exhaust gas filter plant comprising:

a combustion chamber (**5**) for pressurized combustion of combustible substances;

supply means (**3**, **8**) for supplying up to 100 percent oxygen enriched combustion air to said combustion chamber (**5**);

a scrubber (**10**, **12**) for pressurized cooling and washing with water of exhaust gases produced by said combustion chamber (**5**), said scrubber (**10**, **12**) separating environmentally endangering materials and other contaminants from the exhaust gases and including deducting means for deducting the washing water and the environmentally endangering materials and other contaminants captured, dissolved or condensed in the washing water;

expansion means (**14**, **20**), coupled to said scrubber (**10**, **12**), for expanding remaining exhaust gases in one or more steps such that a sufficiently low temperature is achieved at an output of said expansion means (**14**, **20**) for condensing remaining environmentally endangering materials and other contaminants contained in the remaining exhaust gases;

separating means (**16**, **22**), coupled to said expansion means (**13**, **20**), for separating the condensed remaining environmentally endangering materials and other contaminants from the remaining exhaust gases and for collecting the condensed

remaining environmentally endangering materials and other contaminants in solid or liquid form; and

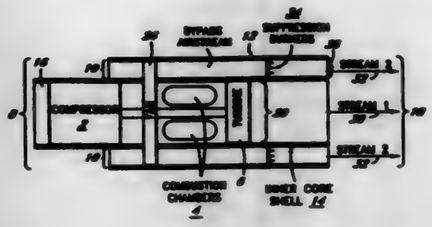
pump means (27), coupled to the separating means (22), for sucking out the remaining exhaust gases from said separating means (22) at a predetermined pressure close to 0 bar.

5,590,520

METHOD OF ELIMINATING MACH WAVES FROM SUPERSONIC JETS

Dimitri Papamoschou, Mission Viejo, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed May 5, 1995, Ser. No. 435,345
Int. Cl.[6] F02K 1/34
U.S. Cl. 60—204 **10 Claims**



1. A method of avoiding the generation of Mach waves from an operating jet engine, said method comprising the steps of:

(a) intaking air into a first end of a jet engine;

(b) heating a first stream of said air to a first temperature; accelerating said first stream of said air to supersonic speeds and expelling said first stream out a second end of said jet engine;

(c) heating a second stream of said air to a calculated second temperature;

(d) maintaining the velocity of, accelerating or decelerating said second stream of air to a predetermined air velocity;

(e) expelling said second stream out said second end of said jet engine at a position adjacent to said first stream of air such that there is no gap between said first stream and said second stream; and

(f) assuring that a speed and temperature of said second stream satisfy the following conditions:

the difference in air velocities between said first stream of air and said second stream is less than the speed of sound in said second stream; and

the difference in air velocity between said second stream and air flow surrounding said second stream is less than the speed of sound in said air flow;

the temperature of the second stream is greater than:

$$(B*M_1/(1+M_2))^2*T_1;$$

and the temperature of said second stream is less than:

$$T_a*((1+M_a)/(B*M_2))^2;$$

where M_1=air velocity of said first stream divided by a first speed of sound in said first stream;

M_2=air velocity of said second stream divided by a second speed of sound in said second stream;

M_a=air velocity of ambient, unheated air surrounding said second stream, divided by ambient speed of sound;

T_1=temperature of air in said first stream;

T_a=temperature of ambient, unheated air surrounding said second stream; and

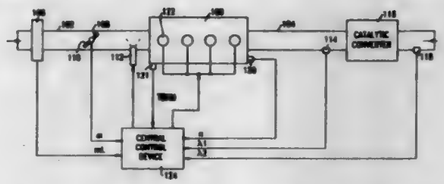
B=eddy velocity/stream velocity; wherein B may range between 0.5 and 0.95.

5,590,521

METHOD AND DEVICE FOR FORMING A SIMULATED SIGNAL OF THE TEMPERATURE OF THE EXHAUST GAS, EXHAUST GAS SENSOR OR CATALYTIC CONVERTER

Eberhard Schnaibel, Hemmingen; Erich Schneider, Kirchheim, and Frank Blaschke, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 10, 1994, Ser. No. 336,959
Claims priority, application Germany, Nov. 10, 1993, 43 38 342.4
Int. Cl.[6] F01N 3/20
U.S. Cl. 60—274 **12 Claims**



1. A method for forming a simulated signal representing a temperature of at least one of exhaust gas, an exhaust gas sensor, and a catalytic converter of an internal combustion engine, the method comprising the steps of:

a) using operating characteristics of the internal combustion engine to simulate the temperature; and

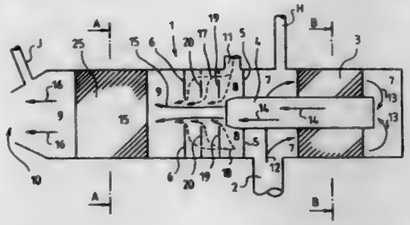
b) using at least one liquid signal as one of the operating characteristics, the at least one liquid signal being indicative of an occurrence of liquid in at least one of an exhaust gas channel of the internal combustion engine and the catalytic converter.

5,590,522

CATALYTIC COMBUSTION ENGINE EXHAUST GAS PURIFIER WITH ADDITIONAL AIR SUPPLY

Eero Kyntälehto, Kiiminki, and Eero Aitta, Jokioinen, both of Finland, assignors to Fläkt Katalyt Oy, Oulu, Finland

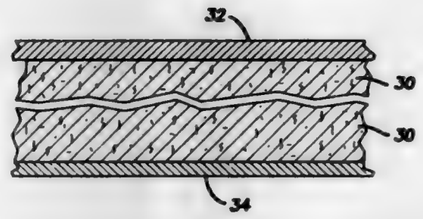
PCT No. PCT/FI93/00217, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO93/24745, PCT Pub. Date Dec. 9, 1993
PCT Filed May 24, 1993, Ser. No. 343,430
Claims priority, application Finland, May 25, 1992, 922384
Int. Cl.[6] F01N 3/28; 3/34
U.S. Cl. 60—299 **7 Claims**



1. In a catalytic combustion engine exhaust gas purifier with additional air supply having a housing structure accommodating an exhaust gas inlet, at least one catalyst element, laminarizing means for laminarizing flow of the exhaust gas in first direction, means for dividing the housing structure into several chambers, and an exhaust gas outlet, the improvement comprising:

means for supplying additional air into the housing structure in a second flow direction, and

at least one suction plate in the housing structure after the laminarizing means in the first direction of the exhaust gas flow and in the vicinity of the means for supplying the additional air, the suction plate having an exhaust gas port and an additional air port, and being arranged across the first and second directions of the exhaust gas and additional air flows so that the additional air is sucked through the additional air port and from the suction plate into the exhaust gas flow through the exhaust gas port.



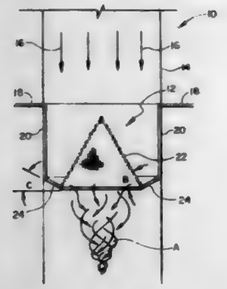
causing said shield to damp vibrational energy, said shield being adapted to be fixed in relationship to said high temperature portion so as to provide said air gap.

5,590,523

FLOW FOCUSING AND MIXING DEVICE

Bryce J. Fox, 3165 Hafner Ct., St. Paul, Minn. 55126

Filed Jun. 10, 1994, Ser. No. 258,257
Int. Cl.[6] F01N 3/30; F02M 29/00
U.S. Cl. 60—307 **26 Claims**



1. Apparatus for use with internal combustion engines for converging and mixing fluid flow, comprising:

a. a generally cylindrical housing containing fluid flow entering the housing, the housing have a first end and a second end, wherein the flow enters the first end substantially parallel to a longitudinal axis of the housing;

b. means, located within the housing, for converging and mixing the flow downstream from said means for converging and mixing at a central area and generally proximate the housing longitudinal axis; and

c. annular means, occluding space between the housing and said means for converging and mixing, for deflecting flow radially inwardly from a wall defining the housing toward the means for converging and mixing.

5,590,524

DAMPED HEAT SHIELD

Dan T. Moore, III, Cleveland Heights; Austin W. Moore, Shaker Heights, and Maurice E. Wheeler, Ashtabula, all of Ohio, assignors to Soundwich, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 102,158, Aug. 4, 1993, Pat. No. 5,347,810, which is a continuation of Ser. No. 883,279, May 14, 1992, Pat. No. 5,233,832. This application Jun. 13, 1994, Ser. No. 258,962
The portion of the term of this patent subsequent to Aug. 10, 2010, has been disclaimed.
Int. Cl.[6] F01N 7/10
U.S. Cl. 60—323 **43 Claims**

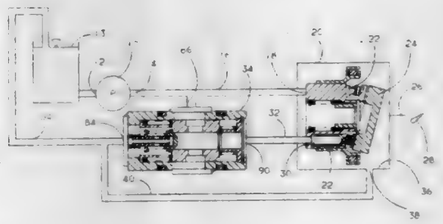
1. A damped heat shield for an exhaust system of an internal combustion engine, comprising two metal layers shaped to conform generally to the shape of a high temperature portion of said exhaust system while being spaced away therefrom by an air gap, said metal layers having substantially the same shape and extending in face-to-face adjacency, a layer of sound and heat shielding material positioned between said two metal layers, one of said metal layers having a first predetermined thickness and having a first resonant frequency, the other of said metal layers having a second predetermined thickness substantially different from said first predetermined thickness and having a second resonant frequency substantially different from said first resonant frequency causing said shield to damp vibrational energy, said shield being adapted to be fixed in relationship to said high temperature portion so as to provide said air gap.

5,590,525

METHOD OF PREVENTING CAVITATION IN AN AXIAL PISTON PUMP DURING AN AIDING LOAD AND SYSTEM AND VALVE EMPLOYING THE SAME

Magdy A. Kandil, Milford, N.J., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 1, 1993, Ser. No. 70,272
Int. Cl.[6] F16D 31/02; 39/00
U.S. Cl. 60—460 **13 Claims**



1. In a hydraulic system including a fluid reservoir, a hydraulic supply pump connected to the reservoir, an axial piston hydraulic motor adapted to drive a load or be driven by a load and including supply return and case ports, the supply port being connected to said pump, the case port being connected to said reservoir and the return port being connectable to said reservoir, means for preventing cavitation in said motor when said motor is being driven by a load and comprising:

first means for connecting said return port to said reservoir when pressure at said return port exceeds pressure at said case port by a predetermined amount; and

second means for connecting said return port to said supply port when pressure at said case port exceeds pressure at said return port.

5,590,526

BURNER FOR STIRLING ENGINES

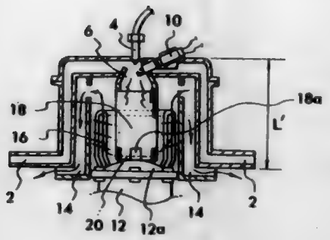
Kwan Shik Cho, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed May 8, 1995, Ser. No. 436,605
Int. Cl.[6] F02G 1/04
U.S. Cl. 60—517 **6 Claims**

1. A burner for a Stirling engine, comprising:

a combustion chamber for forming an air-fuel mixture by mixing air and fuel supplied from a plurality of air inlet passageways and a fuel injection nozzle;

an igniter for igniting said air-fuel mixture within said combustion chamber;



a heater tube having an overall length extending in a direction toward said combustion chamber for absorbing high-temperature heat generated by combustion of said air-fuel mixture;

a plurality of exhaust gas passageways for discharging an exhaust gas to the outside; and

a heating duct extending from said combustion chamber along substantially the overall length of said heater tube, said heating duct having a plurality of combustion gas passageways therein for allowing high temperature combustion gas to pass therethrough to said heater tube.

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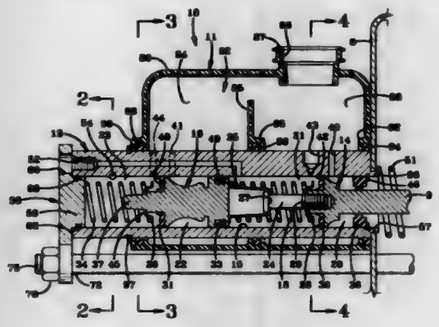
MASTER CYLINDER WITH TIE ROD MOUNTED END PLATE

Schuyler S. Shaw, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1995, Ser. No. 523,173

Int. Cl.[6] B60T *11/26*; F15B *7/08*; B01D *19/00*

U.S. Cl. 60—585 **6 Claims**



1. A master cylinder comprising:

a body having a longitudinal bore and a substantially constant cross sectional profile with a first end and a second end;

an end plate sealingly closing the first end of the body;

a reservoir slidingly received over the master cylinder body and sealingly engaging the master cylinder body; and

a tie rod engaging the end plate and extending substantially parallel to the master cylinder body from the first end.

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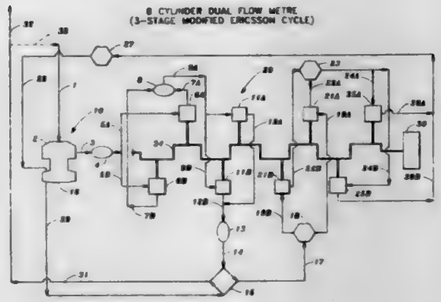
TURBOCHARGED RECIPROCATION ENGINE FOR POWER AND REFRIGERATION USING THE MODIFIED ERICSSON CYCLE

Fermin Viteri, 3058 Kadema Dr., Sacramento, Calif. 95864

Filed Oct. 19, 1993, Ser. No. 137,980

Int. Cl.[6] F02C *1/10*

U.S. Cl. 60—684 **19 Claims**



1. A two (2) stage modified Ericsson cycle supercharged reciprocating gas power system comprising in combination:

at least one dynamic compressor having an input adapted to receive gas from a supply and having a discharge, said dynamic compressor including a means to raise a pressure of the gas to a value greater than at said input;

a first intercooler including means for receiving the gas from one said dynamic compressor discharge, and having an output, said first intercooler including means to cool the gas;

at least one reciprocating compressor having an input adapted to receive the gas from said first intercooler output and having a discharge, said reciprocating compressor including a means to raise the pressure of the gas to a value greater than at said input;

a regenerator having a high pressure gas inlet in fluid communication with a high pressure gas outlet, said high pressure gas inlet adapted to receive the gas from said discharge of one of said reciprocating compressors having a highest pressure, said regenerator including means to heat the gas passing into said high pressure gas inlet;

a first heater including a means for receiving the gas from said high pressure gas outlet of said regenerator and having an outlet, said first heater including a means for variable heating of the gas;

at least one reciprocating expander including a means for receiving the gas from said first heater outlet and having an exhaust, at least one of said at least one reciprocating expanders adapted to drive a corresponding one of said at least one reciprocating compressors;

a last heater including a means for receiving the gas from one said reciprocating expander exhaust and having an outlet, said last heater including a means for variable heating of the gas; and

at least one dynamic turbine including a means for receiving the gas from said last heater outlet and having a low pressure exhaust, at least one of said at least one dynamic turbines adapted to drive a corresponding one of said at least one dynamic compressors;

said regenerator including a means for receiving the gas from said at least one dynamic turbine low pressure exhaust, means to transfer heat from said at least one dynamic turbine low pressure exhaust to the gas between said high pressure gas inlet and said high pressure gas outlet, and a low pressure outlet, and

wherein at least one of said at least one reciprocating expanders is coupled to a means to output power from said system.

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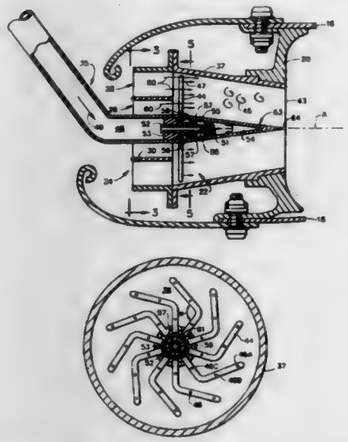
AIR FUEL MIXER FOR GAS TURBINE COMBUSTOR

Narendra D. Joshi, Cincinnati; Michael J. Epstein, West Chester, both of Ohio, and Michael E. Ewbank, Pittsburgh, Pa., assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 26, 1994, Ser. No. 312,373

Int. Cl.[6] F02C *1/00*

U.S. Cl. 60—737 **16 Claims**



1. An apparatus for premixing fuel and air prior to combustion in a gas turbine engine, comprising:

(a) a mixing duct having a longitudinal axis extending therethrough;

(b) a set of inner and outer counter-rotating swirlers adjacent the upstream end of said mixing duct;

(c) a fuel nozzle located axially along and forming a centerbody of said mixing duct; and

(d) a plurality of fuel spokes extending radially outward from said fuel nozzle, each of said fuel spokes having a plurality of fuel insection holes formed therein, wherein said fuel spokes have a nonlinear configuration when viewed in an axial cross-section of said mixing duct in order to minimize distance between adjacent fuel injection holes within said mixing duct;

wherein high pressure air from a compressor is injected into said mixing duct through said swirlers to form an intense shear region and fuel is injected into said mixing duct from said fuel spokes so that the high pressure air and the fuel is uniformly mixed therein so as to produce minimal formation of pollutants when the fuel/air mixture is exhausted out the downstream end of said mixing duct into the combustor and ignited.

5,590,530

FUEL AND AIR MIXING PARTS FOR A TURBINE COMBUSTION CHAMBER

Ashley J. Owen; Michael L. Carlisle, and Christopher S. Parkin, all of Derby, England, assignors to Rolls-Royce plc, London, England

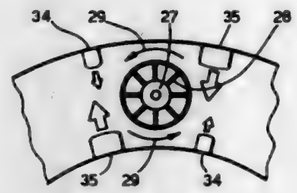
Filed Mar. 14, 1995, Ser. No. 404,151

Claims priority, application England, Apr. 8, 1994, 9407029

Int. Cl.[6] F02C *7/00*

U.S. Cl. 60—748 **4 Claims**

1. A gas turbine engine combustion apparatus comprising an annular combustion chamber having an upstream end and a plurality of fuel nozzles at said upstream end to direct a mixture of fuel and air into said chamber, each of said fuel nozzles defining a longitudinal axis and being configured so as to swirl the fuel and air mixture directed therefrom in a given direction about said longitudinal axis, said combustion chamber being defined by radially inner and outer generally axially extending annular walls, each of said radially inner and outer walls being provided with ports at least in an upstream region thereof, for the entry of air into said combustion chamber, said ports being arranged in circumferentially extending arrays with a radially inner located port being substantially aligned with a radially outwardly located port and spaced apart circumferentially so that one of said radially inner and one of said radially outer located ports are disposed substantially on opposite sides of a said longitudinal axis, at least some of said array of ports being of different diameters and arranged such that a port of smaller diameter is radially substantially aligned with a port of larger diameter located radially outwardly thereof in said radially outer combustion chamber wall so that the air exhausted from said arrays of ports opposes said given direction of swirl of said fuel and air mixture directed from each of said fuel nozzles.



5,590,531

PERFORATED WALL FOR A GAS TURBINE ENGINE

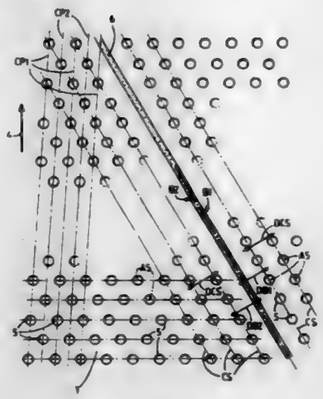
Michel A. A. Desaulty, Vert Saint Denis, France; Denis J. M. Sandelis, Nangis, and Pierre M. V. E. Schreer, Brunoy, all of France, assignors to Societe National D'Etdue et de Construction de Moteurs D'Aviation S.N.E.C.M.A., Paris Cedex, France

Filed Dec. 14, 1994, Ser. No. 355,474

Claims priority, application France, Dec. 22, 1993, 93 15394

Int. Cl.[6] F23R *3/06*

U.S. Cl. 60—752 **8 Claims**



1. A gas turbine engine having an annular wall bounding a chamber containing gases at elevated temperatures wherein the wall extends about a longitudinal axis of symmetry having an upstream edge and a downstream edge located in planes extending substantially perpendicular to the longitudinal axis of symmetry and comprising: a plurality of cooling orifices defined by the wall, the plurality of cooling orifices each having a common diameter D and located in a plurality of alternating odd and even transverse rows, each row having a plurality of cooling orifices located in a plane extending substantially perpendicular to the longitudinal axis of symmetry, the cooling orifices of each odd row being circum-

ferentially offset from the cooling orifices of the adjacent upstream odd row a distance d such that $0.5D \leq d \leq D$ wherein cooling orifices in the odd rows lie on first main lines extending obliquely to the longitudinal axis of symmetry and the cooling orifices of each even row being circumferentially offset from the cooling orifices of the adjacent upstream even row a distance d such that $0.5D \leq d \leq D$ wherein orifices in the even rows lie on second main lines extending obliquely to the longitudinal axis of symmetry.

5,590,532

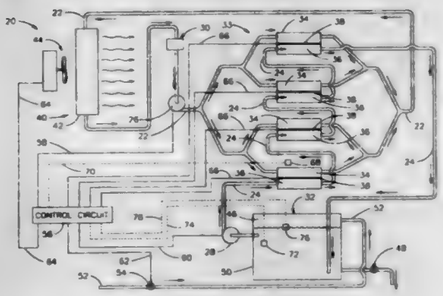
SOLID STATE LIQUID TEMPERATURE PROCESSOR

Wesley J. Bachman, Auburn, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Continuation-in-part of Ser. No. 191,616, Feb. 4, 1994, abandoned. This application Jul. 13, 1995, Ser. No. 502,004

Int. Cl.[6] F25B *21/02*; B67D *5/62*

U.S. Cl. 62—3.3 **14 Claims**



1. A water cooling system for reducing the temperature of potable water to a temperature range of substantially on the order of 35–70 degrees F., said water cooling system comprising:

a cool water reservoir having an outlet for dispensing cooled water and an inlet for receiving water for cooling;

a warm water flow path comprising tube means passing in close proximity to said cool water reservoir;

a warm water pump operatively associated with said warm water flow path for moving warm water along said warm water flow path tube means;

a cool water flow path at least passing through said cool water reservoir;

a cool water pump operatively associated with said cool water flow path for moving cool water along said cool water flow path;

a warm water heat transfer section including a plurality of segments respectively communicating with parallel portions of said warm water flow path tube means, water flowing through said warm water flow path thermally communicating with said warm water heat transfer section segments for removing heat energy therefrom;

a cool water heat transfer section including a plurality of segments positioned in said cool water reservoir and respectively communicating with connected portions of said cool water flow path, all water flowing through said cool water flow path thermally communicating with all said portions of said cool water flow path in said cool water heat transfer section; and

a plurality of Peltier heat transfer devices respectively disposed between said warm water heat transfer section segments and said cool water heat transfer section segments for promoting flow of heat energy from said cool water reservoir to said warm water flow path through said cool water heat transfer section segments and said warm water heat transfer section segments.

5,590,533

REFRIGERATOR HAVING REGENERATOR

Hiroshi Asami, Yokohama, and Mitsuru Suzuki, Hiratsuka, both of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

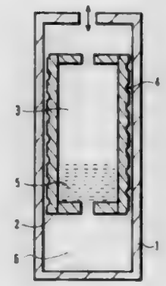
Filed Jun. 7, 1995, Ser. No. 479,114

Claims priority, application Japan, Jun. 16, 1994, 6-134642

The portion of the term of this patent subsequent to Jan. 9, 2013, has been disclaimed.

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 **10 Claims**



1. A cryogenic equipment comprising:

at least one refrigerator with a regenerator; and

a holder for holding said refrigerator;

said refrigerator comprising:

a cylinder having an inner circumferential surface with a circular tube shape and a diameter;

a displacer having an outer circumferential surface with a circular tube shape having a diameter slightly smaller than the diameter of the inner circumferential surface of said cylinder, said tube having a longitudinal axis and axially opposite ends, said displacer being disposed in said cylinder to be reciprocally movable in an axial direction of said cylinder and forming an expansion space near one end of an inside of said cylinder;

a groove pattern formed on one of (i) the outer circumferential surface of said displacer and (ii) the inner circumferential surface of said cylinder, for forming an auxiliary gas passage for supplying gas into the expansion space of said cylinder and recovering the gas from the expansion space, said groove pattern including a groove at least partially formed along a direction intersecting the axial direction of said displacer, said groove pattern extending along the axial length of said displacer and extending from a position near one end of said displacer to a position near the other end of said displacer, said groove pattern allowing a gas to flow therethrough from one end to an opposite end of the outer circumferential surface of said displacer to positively heat-exchange with said cylinder and said displacer;

a main gas passage for supplying the gas to the expansion space of said cylinder and recovering the gas from the expansion space thereof; and

a regenerating material disposed at least partially in the main gas passage;

a gas supplying and recovering means for supplying a gas having a periodically varying gas pressure to each expansion space through said groove pattern and through said main gas passage, and recovering the gas from the expansion space through said groove pattern and through said main gas passage; and

said holder supporting said refrigerator (i) to direct the axial direction of said cylinder in a vertical direction and to form the expansion space at an upper end of the inside of said cylinder, or (ii) to direct the axial direction of said cylinder in an oblique direction relative to the vertical direction.

5,590,534

STIRLING COOLER

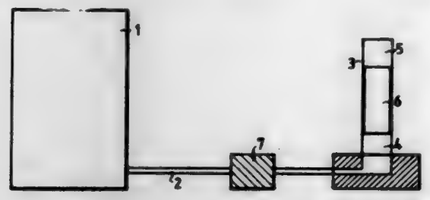
Antonius A. J. Benschop, Wassenaar, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jul. 18, 1995, Ser. No. 503,473

Claims priority, application Netherlands, Aug. 1, 1994, 9401251

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 **5 Claims**



1. A stirling cooler, comprising:

a compressor for generating a time-varying pressure in a gaseous medium;

a cooling element which is not mounted on the compressor, the cooling element being provided with at least a displacer and at least a regenerator;

a split tube which connects the compressor with the cooling element;

wherein at least one additional regenerator is mounted in an enlargement of the split tube.

5,590,535

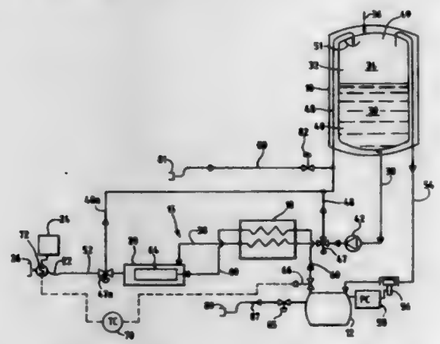
PROCESS AND APPARATUS FOR CONDITIONING CRYOGENIC FUEL TO ESTABLISH A SELECTED EQUILIBRIUM PRESSURE

George D. Rhoades, LaGrange, Ill., assignor to Chicago Bridge & Iron Technical Services Company, Oak Brook, Ill.

Filed Nov. 13, 1995, Ser. No. 557,992

Int. Cl.[6] F17C *9/02*

U.S. Cl. 62—50.2 **28 Claims**



1. A method of conditioning cryogenic fuel comprising the steps of:

(a) withdrawing liquefied cryogenic fuel from a primary storage tank at a low pressure and at a temperature close to the boiling point of the liquefied cryogenic fuel;

(b) warming the liquefied cryogenic fuel by feeding the fuel through means for warming the fuel;

(c) withdrawing vapor from a vapor space in the primary storage tank and feeding the vapor to a vapor storage tank at a selected pressure higher than the pressure in the primary storage tank;

(d) feeding the vapor from the vapor storage tank to the means for warming the liquefied cryogenic fuel wherein heat is indirectly transferred from the vapor to the liquefied cryogenic fuel and the vapor is subsequently condensed;

(e) subsequently feeding the liquefied cryogenic fuel through means for dispensing the liquefied cryogenic fuel into a vehicle fuel tank;

(f) measuring a temperature of the cryogenic fuel in the dispensing means; and

(g) providing the cryogenic fuel to the vehicle fuel tank at a selected equilibrium pressure by varying a flow rate of the vapor withdrawn from the vapor storage tank and fed into the means for warming the liquefied cryogenic fuel in response to the temperature of the liquefied cryogenic fuel in the dispensing means.

5,590,536

BYPASS CRYOGENIC CURRENT LEADS EMPLOYING HIGH TEMPERATURE SUPERCONDUCTORS

Jing-Liang Wu, Murrysville Borough, Pa., assignor to Northrop Grumman Corp., Century City, Calif.

Filed Apr. 13, 1995, Ser. No. 420,994

Int. Cl.[6] F25B *19/00*

U.S. Cl. 62—51.1 **8 Claims**



1. A cryogenic bypass current lead providing a parallel magnet current pass for current to bypass the quenched magnets in a string of magnets in a superconducting super collider and exhibiting reduced heat escape associated with the bypass current lead during normal operating conduction which comprises:

a. a conducting body of a first thermal conductivity and having an upper end and a lower end;

b. an upper conductor terminal coupled with the upper end of the conducting body;

c. a high temperature superconductor section coupled with the lower end of the conducting body; and

d. a lower conductor terminal coupled with the high temperature superconductor section;

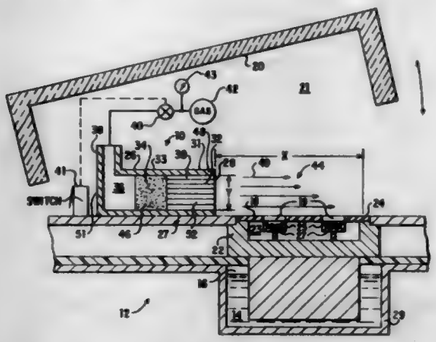
the upper conductor terminal and the lower conductor terminal each having a second thermal conductivity higher than the first thermal conductivity of the conducting body.

5,590,537

DRY GAS CURTAIN FOR CRYOGENIC SURFACE

Herman Vogel, Newtown, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 7, 1995, Ser. No. 524,555
Int. Cl.[6] F25B *19/00*
U.S. Cl. 62—51.1 **3 Claims**



1. An apparatus for providing a curtain of dry gas over a cryogenic working surface of a cryogenic device, comprising:

a housing duct formed of walls including a base wall and a parallel top wall having a spacing therefrom, the base wall extending contiguously from the working surface in a longitudinal direction substantially parallel to the cryogenic surface, the duct opening onto the working surface;

a honeycomb member filling a first section of the duct adjacent to the working surface, the honeycomb member being formed of a multiplicity of cells, with each honeycomb cell having a through channel in the longitudinal direction, a cross section with an average diameter, and an aspect ratio of channel length to average diameter;

a porous member with through porosity, the porous member filling a second section of the duct adjacent to the honeycomb member oppositely from the working surface, a plenum being delimited in the duct adjacent to the porous member oppositely from the honeycomb member; and

gas means connected to supply the plenum with a dry gas at a gas pressure selected cooperatively with the porosity, the spacing, the cross section and the aspect ratio to effect a flow of gas through the porous member and the honeycomb member with a gas velocity such that a laminar curtain of the gas is effected across the cryogenic working surface.

5,590,538

STACKED MULTISTAGE JOULE-THOMSON CRYOSTAT

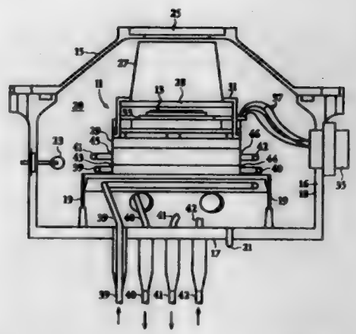
Ike C. Hsu, Los Altos, and Jay H. Ambrose, Los Gatos, both of Calif., assignors to Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif.

Filed Nov. 16, 1995, Ser. No. 558,875
Int. Cl.[6] F25B *19/02*
U.S. Cl. 62—51.2 **28 Claims**

1. A stacked multistage Joule-Thomson cryostat, comprising:

a plurality of supplies of different highly pressurized gas coolants with different boiling temperatures at ambient pressure, said supplies of coolants including a primary coolant with a lowest boiling temperature and at least one secondary coolant with an inversion temperature that is above ambient temperature,

a plurality of stages stacked one above the other in thermal isolation from each other, each stage including a thermally conductive material plate member with fluid passages formed therein, the fluid passages in each stage including two-phase reservoir passages associated with a different coolant from reservoir passages in the other stages and a restricting passageway in fluid communication with the high pressure gas supply of that associated coolant, said restricting passageway forming a Joule-Thomson throttle valve opening into said reservoir passages for isenthalpic expansion and liquefaction of the associated coolant, said reservoir passages of a coldest stage associated with said primary coolant being in heat exchange relation with a cold surface of that coldest stage, said cold surface adapted for mounting a device to be cooled thereto in thermal contact therewith, each stage other than said coldest stage also having high pressure coolant supply passages in heat exchange relation with said reservoir passages of that stage for precooling each gas coolant with a lower boiling temperature than the coolant associated with that stage.

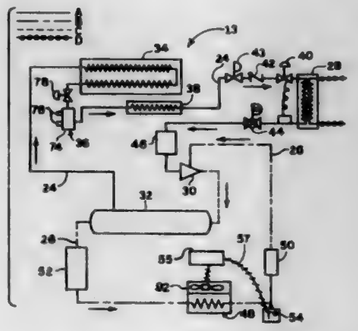


5,590,539

REFRIGERATION APPARATUS AND METHODS

Todd T. Marohl, Green Bay; Robert Martin, Oshkosh, and Russell Gomen, Soblecki, all of Wis., assignors to Omega Enterprises Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 158,021, Nov. 26, 1993, abandoned. This application Nov. 16, 1995, Ser. No. 558,740
Int. Cl.[6] F25B *43/02*
U.S. Cl. 62—84 **30 Claims**



1. A refrigeration system, comprising:

(a) a refrigerant loop subsystem, including a charge of refrigerant, and;

(b) an oil loop subsystem, including

(i) a charge of lubricating oil,

(ii) a compressor, having an inlet, and being adapted to provide a first source of motive power, to circulate the lubricating oil in the oil loop subsystem,

(iii) an oil separator,

(iv) an oil cooler for cooling said oil and exhausting heat obtained from said oil to a heat sink medium, said oil cooler having an inlet and an outlet, and comprising

(za) internal oil transport passages to carry said lubricating oil,

(zb) heat sink passages extending through said oil cooler for conveying elements of the heat sink medium through said oil cooler,

(zc) a fan, separate from said compressor, and providing a second source of motive power for causing the heat sink medium to flow through said heat sink passages in said oil cooler,

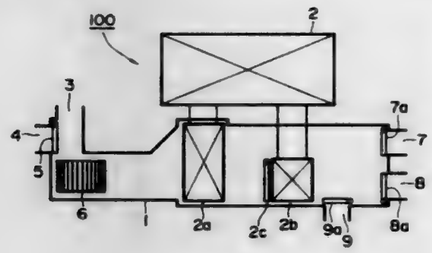
(zd) a temperature sensor for sensing the temperature of said lubricating oil; and (p3 (ze) a variable speed drive for driving said fan in response to the temperature sensed by said temperature sensor, to promote constancy of the temperature of said lubricating oil.

5,590,540

AIR CONDITIONER FOR VEHICLES

Susumu Ikeda; Toshimi Isobe; Atsuo Inoue, all of Isesaki; Toshihiko Fujita, Sawa; Akihiro Tajiri, Wako; Mitsuru Ishikawa, Wako; Choji Sakuma, Wako, and Nobuyuki Yuri, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and Sanden Corporation, Gunma, both of Japan

Filed Jun. 7, 1995, Ser. No. 484,485
Claims priority, application Japan, Jul. 6, 1994, 6-155027
Int. Cl.[6] B60H *1/00*
U.S. Cl. 62—180 **7 Claims**



1. An air conditioner for vehicles comprising:

outside-air inlet means for drawing in outside air, inside-air inlet means for drawing in inside air and outside/inside-air inlet means for drawing in both outside air and inside air;

manual switch means for manually selecting any one of said respective inlet means and automatic switch means for automatically selecting one of said respective inlet means;

heating-operation means for heating air drawn in by any one of said respective inlet means and supplied by a fan and cooling-operation means for cooling said air supplied by said fan;

an inside-air temperature sensor for detecting a temperature of air inside the vehicle and an outside-air temperature sensor for detecting a temperature of air outside the vehicle; and

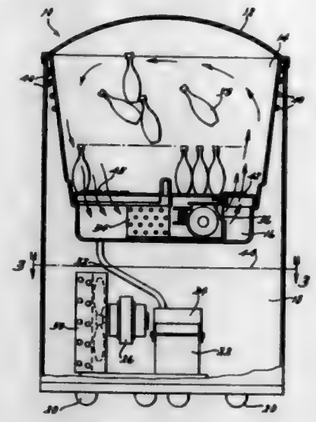
control means for selectively driving said respective inlet means based on a condition of said respective operation means, a condition of said respective switch means and a difference between the temperatures detected by said respective temperature sensors.

5,590,541

BARREL-TYPE REFRIGERATOR AND DRAIN PAN

Julius H. Rainwater, Conyers, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 16, 1995, Ser. No. 373,962
Int. Cl.[6] A47F *3/04*
U.S. Cl. 62—255 **9 Claims**



1. A refrigerator and drain pan system, including:

a refrigerated food product zone for holding a food product, said food product zone includes a clear insulated lid;

a system of cooling coils to cool the food product zone to a predetermined temperature, said cooling system includes wraparound coils and a finned coil system, said wraparound coils create a frost-feel at the top edge of the food product zone;

a coil-fan compressor compartment located adjacent and below the refrigerated food product zone, said coil-fan compartment is separated from the product zone by a false panel;

a compressor compartment located adjacent to and below the coil-fan compartment, said compressor compartment being separated from said coil-fan compartment by an insulated shelf;

a plurality of orifices located within said false panel to move air through said refrigerated product zone, said plurality of orifices include inlet orifices and air return orifices, said inlet orifices force air through the product zone and around the products, said air is returned to said coil fan compartment by the return orifices;

an electronic control system for controlling cycling of a compressor and all electronic functions of the system:

a drain conduit from said fan compartment to said compressor compartment; and

a drip pan system for evaporating water condensate within the system, said drip pan system including a drain pan located in an air flow of a condenser, said drain pan system including an overflow spout such that any overflow condensate will reach the floor and avoid the electronics of the refrigerator system, said drain pan is placed in close proximity to a compressor motor.

5,590,542

DUAL CANTEEN AND INTERIOR COOLER

Paul S. Wang, 22428 Steeplechase La., Diamond Bar, Calif. 91765

Filed Nov. 24, 1995, Ser. No. 562,416
Int. Cl.[5] F25D *3/08*
U.S. Cl. 62—457.3 **2 Claims**

1. A canteen including: a container for a first liquid drink having a cover; a capsule for a second liquid drink removably mounted on



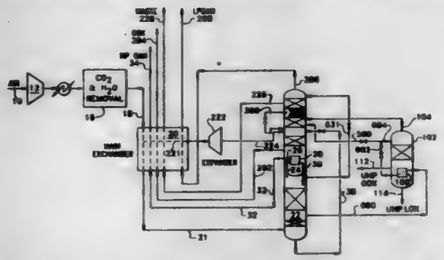
the underside of said cover and extending downwardly into the first liquid drink in said container, said capsule being adapted to be placed in a freezer prior to being mounted on the underside of said cover to freeze said second liquid drink so that said second liquid drink may serve as a coolant for said first liquid drink, in which said capsule has a neck section formed in the top thereof to serve as a drinking spout for the second liquid drink in said capsule.

5,590,543

PRODUCTION OF ULTRA-HIGH PURITY OXYGEN FROM CRYOGENIC AIR SEPARATION PLANTS

Rakesh Agrawal, Emmaus; Dona M. Herron, Fogelsville, and Thomas R. White, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 29, 1995, Ser. No. 520,451
Int. Cl.[6] F25J *3/04*
U.S. Cl. 62—643 **15 Claims**



1. A process for the fractionation of air by cryogenic distillation using a cryogenic distillation column system comprising at least one distillation column, wherein a feed air stream is compressed, cooled to near its dew point and fed to the distillation column system for rectification thereby producing a nitrogen-containing overhead and a crude liquid oxygen bottoms; wherein an oxygen-containing side-draw stream essentially free of heavier contaminants comprising hydrocarbons, carbon dioxide, xenon and krypton, is removed from the distillation column and stripped in an auxiliary stripping column to produce an ultra-high purity oxygen product at the bottom of the auxiliary stripping column; and wherein the oxygen-containing side-draw stream is removed from a location of the distillation column system primarily separating oxygen and nitrogen and has an oxygen concentration between 1% to 35% oxygen,

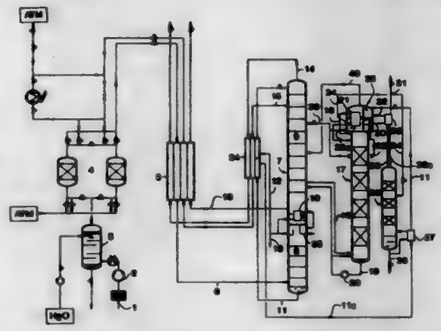
characterized in that a portion of liquid descending the distillation column system is removed from the distillation section of the distillation column system proximate to the location for withdrawing the oxygen-containing side-draw stream for the auxiliary stripping column thereby reducing the liquid to vapor ratio in the distillation section between where the oxygen-containing side-draw stream is withdrawn and where top-most heavies-containing feed is introduced.

5,590,544

PROCESS AND APPARATUS FOR RECOVERY OF PURE ARGON

Horst Corduan, Puchheim, and Wilhelm Rohde, Munich, both of Germany, assignors to Linde Aktiengesellschaft, Germany

Filed Feb. 23, 1995, Ser. No. 393,389
Claims priority, application Germany, Feb. 24, 1994, 44 06 049.1; Feb. 24, 1994, 44 06 069.6
Int. Cl.[6] F25J *3/00*
U.S. Cl. 62—656 **42 Claims**



1. A process for the recovery of pure argon comprising:

separating air in a rectification system, said rectification system comprising at least one air separating column, a crude argon column, and a pure argon column;

passing an argon-containing fraction into said crude argon column;

recovering an oxygen-depleted argon stream from said crude argon column;

subjecting said oxygen-depleted argon stream to indirect heat exchange with a first portion of a cooling medium whereby at least part of said oxygen-depleted argon stream is liquefied;

introducing an argon-enriched mixture of air gases into said pure argon column;

at least partly liquefying a head fraction from said pure argon column by indirect heat exchange with a second portion of said cooling medium; and

withdrawing a substantially nitrogen-free argon product from the lower region of said pure argon column;

wherein said first and second portions of said cooling medium each have an oxygen content of at least 10%, and said first and second portions of said cooling medium are jointly expanded upstream of said indirect heat exchanges.

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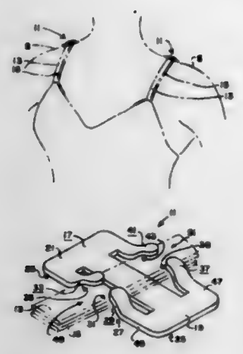
GARMENT STRAP RETAINER

J. Bernice Norris, 5102 Walnut Grove Rd., Memphis, Tenn. 38117

Filed Apr. 1, 1994, Ser. No. 221,522
Int. Cl.[6] A44C *25/00*; A41F *1/00*
U.S. Cl. 63—2 **1 Claim**

1. A retainer for holding a shoulder strap of a first garment in place on a wearer's shoulder, said retainer comprising:

(a) a body having a first end, a second end, and stabilizing means for contacting the wearer's shoulder and for holding said retainer stable on the wearer's shoulder; said stabilizing means including a first foot portion at said first end of said body and a second foot portion at said second end of said body; said first foot portion having a contact surface for contacting a first area of the wearer's shoulder; said second foot portion having a contact surface for contacting a second area of the wearer's shoulder; said contact surfaces of said first and second foot portions are coplanar with one another for simultaneously contacting the first and second areas, respectively, of the wearer's shoulder and for holding said retainer stable on the wearer's shoulder; and



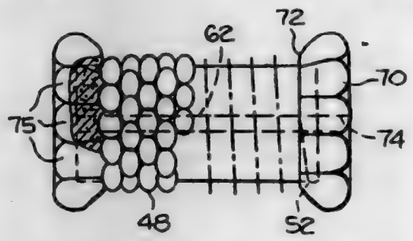
(b) grip means attached to said body adjacent said first and second ends of said body for gripping said shoulder strap and for securing said shoulder strap to said body; said grip means including a first arm means extending from body for forming a cavity between said body and said first arm means for receiving said shoulder strap; said grip means including a second arm means extending from said body for forming a cavity between said body and said second arm means for receiving said shoulder strap; said first arm means having a distal end; said second arm means having a distal end spaced apart from said distal end of said first arm means a distance to form a gap therebetween large enough to allow said shoulder strap to be inserted therethrough into said cavity between said body and said first arm means and said cavity between said body and said second arm means; said cavity formed between said first arm and said body for receiving said shoulder strap is located on a plane above said stabilizing means: and said cavity formed between said second arm and said body for receiving said shoulder strap is located on a plane above said stabilizing means.

5,590,546

JEWELRY BEADS INCLUDING MAIN BEADS MADE UP OF SMALL BEADS

Valerie Hector, 2064 N. Leavitt, Chicago, Ill. 60647

Filed Dec. 20, 1994, Ser. No. 360,163
Int. Cl.[6] A44C *25/00*
U.S. Cl. 63—2 **10 Claims**



1. A main bead for use in a string of beads, comprising,

an armature having two ends defining a longitudinal dimension therebetween and a means for receiving said string,

at least one strand of small beads wrapped on the armature such that at least two of said small beads are positioned adjacent one another along the longitudinal dimension of the of said armature, the small beads being in a range having ends adjacent the ends of the armature, and

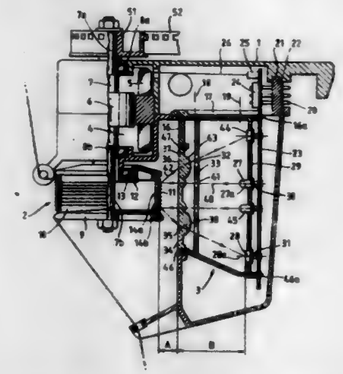
epoxy-resin adhesive material at the ends of the armature sufficient to hold the small beads on the armature.

5,590,547

YARN FEEDER DEVICE UTILIZING POSITION SENSORS TO MAINTAIN YARN WRAP

Fritz Conzelmann, Albstadt, Germany, assignor to Sipra Patententwicklungs-U.Beteiligungsgesellschaft mbH, Albstadt, Germany

Continuation of Ser. No. 230,704, Apr. 21, 1994, abandoned. This application May 8, 1995, Ser. No. 437,271
Claims priority, application Sweden, Apr. 21, 1993, 9301316
Int. Cl.[6] D04B *15/48*; B65H *51/20*; D03D *47/36*
U.S. Cl. 66—132 R **28 Claims**



1. A yarn feeder device for textile machines, comprising a rotary storage member having a yarn reserve supporting surface provided with a varying background of reflective and non-reflective surfaces; a motor for rotating said storage member; and sensing and control means taking into account said varying background and recognizing a presence or absence of yarn at least partially against the non-reflective surface of said yarn reserve supporting surface so as to control said motor such that a selected quantity of yarn can be maintained on said yarn reserve supporting surface.

5,590,548

CIRCULARLY KNIT LEGGED PANTY HAVING KNIT-IN SHAPING PANELS, AND A BLANK AND METHOD FOR MAKING SAME

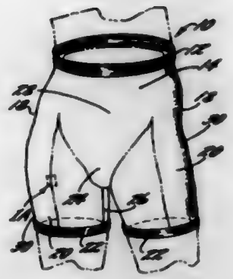
Harold G. Osborne, Boomer, N.C., assignor to Alba-Waldensian, Inc., Valdese, N.C.

Continuation-in-part of Ser. No. 382,864, Feb. 3, 1995. This application Jun. 7, 1995, Ser. No. 482,553
Int. Cl.[6] A41B *9/02*; *9/04*; *9/06*; A41C *1/00*
U.S. Cl. 66—177 **36 Claims**

1. A method of making a blank for a legged panty having a minimal number of pieces and seams comprising:

knitting a series of courses to form a cylindrical, tubular fabric portion in the form of a turned welt;

knitting to the turned welt a series of courses defining a tubular body portion including leg forming portions and while knitting the tubular body portion, periodically modifying the knit



structure to form non-circumferential discrete regions having a greater coursewise resistance to stretch than the remainder of the tubular body portion, said discrete regions defining body support panels; and then completing the blank by knitting to the body portion a series of courses defining a non-raveling edge.

5,590,549

DEVICE FOR FEEDING INTO AND WITHDRAWING FABRICS FROM AN AUTOCLAVE FOR CONTINUOUS DECATIZING

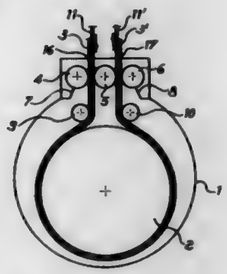
Pietro Alberto, Strada Masserano Caserio, 70, Biella, (Vercelli), Italy

PCT No. PCT/IT92/00114, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO94/10367, PCT Pub. Date May 11, 1994

PCT Filed Nov. 2, 1992, Ser. No. 416,766

Int. Cl.[6] D06B *23/18*

U.S. Cl. 68—5 E **10 Claims**



1. A device for feeding fabrics into and withdrawing fabrics from an autoclave (1) for continuous decatizing around a foraminous rotating cylinder (2) having guide rollers (9, 10) located at a beginning and at an end of a path of the fabric around the cylinder (2), with the fabric (11) being associated with a back cloth comprised of a compressible felt (3) having a thickness, the device comprising a rotating center cylinder (5) and first and second side cylinders (4, 6) located adjacent to the center cylinder in an autoclave opening such that nips are located between the center cylinder and each of the first and second side cylinders, the center cylinder and the first and second side cylinders each being made of a non-compressible material and being mounted for rotary movement about a stationary axis, the first side cylinder being adapted to bring the fabric (11) and the associated felt (3) into the autoclave and the second side cylinder (6) being located on an opposite side of the center cylinder from the first side cylinder and being adapted to remove the decatized fabric (11') and the associated felt (3') from the autoclave, the center cylinder (5) being recessed in the area of the fabric and the felt, with the recess having a depth which is less than the thickness of the felt (3, 3'), and peripheral sealing gaskets (7, 8) which contact the first and second side cylinders (4, 6) respectively, the peripheral sealing gaskets comprising resilient sheets, each having a free end which is adapted to slide in contact with a surface of a respective one of the first and second side cylinders along the whole length thereof.

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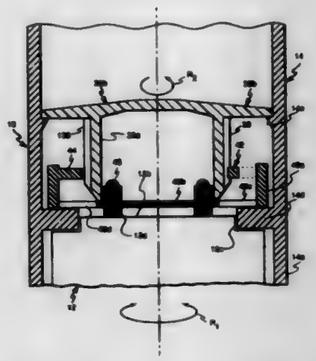
WASHER AUGER WITH FLEXIBLE RATCHET DRIVE

Sudhir D. Savkar, Schenectady, and Robert E. Sundell, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 7, 1995, Ser. No. 511,941

Int. Cl.[6] D06F *17/08*

U.S. Cl. 68—133 **13 Claims**



1. A drive mechanism for converting rotary oscillation of a washing machine clothes agitator to unidirectional rotation of a coaxially adjoining clothes auger comprising:

a one-piece ratchet wheel having a plurality of circumferentially spaced apart ratchet teeth thereon;

a one-piece pawl wheel having a plurality of circumferentially spaced apart pawls thereon positionable adjacent to said ratchet teeth for ratcheting engagement therewith;

each of said pawls including a proximal end integrally joined to said pawl wheel, an elastically flexible arm extending from said proximal end, a bulbous distal end extending from said arm, and a pawl tooth disposed on said distal end for ratcheting engagement with said ratchet teeth as said arm elastically flexes relative thereto; and

a plurality of support arms integrally joined to said pawl wheel and adjoining respective ones of said pawls coextensively with said pawl arms for providing abutting contact therealong to support said pawls under compression loading thereof.

5,590,551

WASHING MACHINE EQUIPPED WITH BUBBLE PRODUCING APPARATUS AND BUBBLE PRODUCING CONTROL METHOD THEREOF

Seog J. Hong, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

Filed Apr. 17, 1995, Ser. No. 423,534

Claims priority, application Rep. of Korea, Apr. 16, 1994, 8037/1994; Jun. 2, 1994, 12436/1994

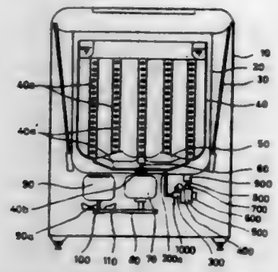
Int. Cl.[6] D06F *17/00*

U.S. Cl. 68—183 **5 Claims**

1. A washing machine equipped with a bubble producing apparatus, comprising:

a washing machine body;

an outer tub disposed inside said washing machine body for receiving detergent-containing water therein;



an inner tub disposed inside said outer tub for receiving said detergent-containing water and laundry therein and having a plurality of water drain holes formed in a circumferential surface thereof; and

bubble producing means disposed on a bottom of the outer tube for producing a plurality of bubbles,

wherein said bubble producing apparatus including;

a detergent-containing water guide tube, one end of which is connected to a portion of the outer tub;

a suction tube connected to another end of the detergent-containing water guide tube and having an air suction port formed on a circumferential surface thereof, said air suction port being directed to suck air therethrough;

a pump connected to the suction tube for sucking detergent-containing water from said detergent-containing water guide tube and air from said air suction port;

a motor disposed on a circumferential surface of the pump for providing said pump with a driving force;

a detergent-containing water suction tube, one end of which is connected to the pump; and

a mixer connected between the bottom of the outer tub and said detergent-containing water suction tube for producing a plurality of microbubbles.

5,590,552

CLOTHES WASHER HAVING A SUDS-REMOVAL SYSTEM

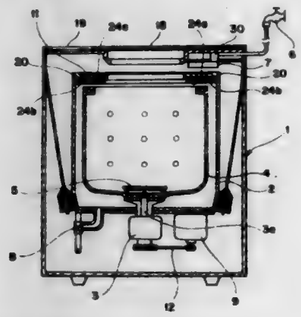
Young-Min Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 358,315

Claims priority, application Rep. of Korea, Jan. 29, 1994, 94-1697; Jul. 15, 1994, 94-17616

Int. Cl.[6] D06F *39/08*

U.S. Cl. 68—207 **7 Claims**



1. A clothes washing machine comprising:

a water tub;

a washing tub disposed within said water tub;

water supply means for supplying fresh water from a fresh water source into said water tub, and

water sprinkling means separate from said water supply means for sprinkling fresh water from the fresh water source into said water tub and into said washing tub, said water sprinkling means comprising a ring-shaped member disposed above an upper end of said washing tub and including water discharge holes formed in a bottom surface thereof, said holes spaced circumferentially apart with reference to a vertical axis of said washing tub; and

switching means for supplying said fresh water selectively to said water supply means and said water sprinkling means.

5,590,553

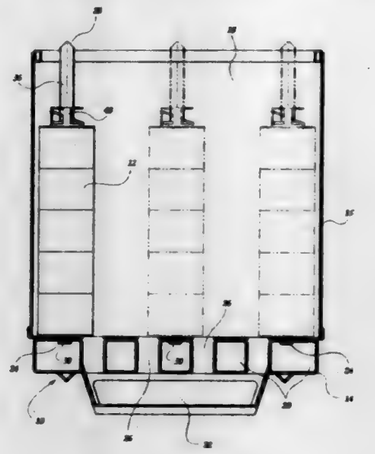
CARRIER FOR SUPPORTING TEXTILE MATERIAL PACKAGES IN A WET TREATMENT MACHINE AND PACKAGE RETAINING CAP FOR SAME

Clarence D. Pinckney, Stanley, N.C.; Vladimir M. Gerasimov, St. Petersburg, Russian Federation; Mark G. Barkan, and David R. Crawford, both of Stanley, N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Mar. 13, 1995, Ser. No. 402,812

Int. Cl.[6] D06B *5/18;23/00*

U.S. Cl. 68—212 **10 Claims**



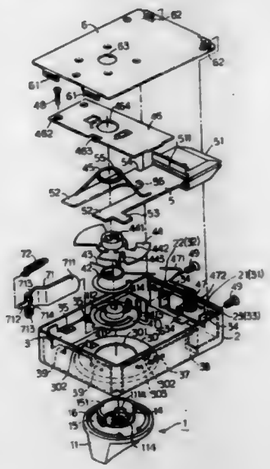
1. A carrier insertable into a vessel of a wet treatment machine for selectively supporting diverse numbers of annular textile material packages during wet treatment operations, the carrier comprising a base, at least one post extending outwardly from the base for mounting selectively differing numbers of the textile material packages in series about the post to be centrally supported thereabout, and a package retaining cap for mounting on the post, the cap comprising a base having an opening for receiving the post and a latch plate having an opening for receiving the post, the latch plate being selectively movable between a disengaged position wherein the latch plate is disposed in spaced parallel relation to the base with their respective openings aligned with one another to permit the cap to be slidably mounted to and demounted from the post for selective slidable positioning movement relatively freely along the post to differing package retaining positions therealong into and out of engagement with the outermost one of the annular textile material packages supported on the post and an engaged position wherein the latch plate is disposed in a sufficiently angular relation to the base to be braced against the post at the opening in the latch plate to prevent unintended sliding movement of the cap along the post during a wet treatment operation.

5,590,554

ENDLESSLY CLOCKWISE/COUNTERCLOCKWISE IDLY ROTATABLE BURGULARPROOF DOOR LOCK

I-Hui Ho, No. 29, Alley 7, Lane 428, Chong-Cheng N. Rd., San-Chong City, Taipei Hsien, Taiwan

Filed Jun. 5, 1995, Ser. No. 482,749
Int. Cl.[6] E05B 13/10; G05G 5/00
U.S. Cl. 70—221 5 Claims



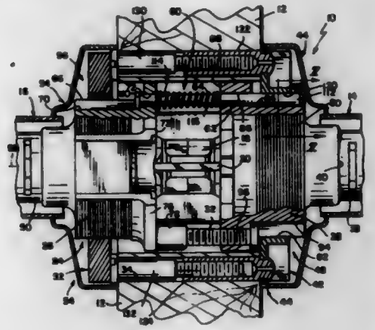
1. An endlessly clockwise/counterclockwise idly rotatable burglarproof door lock, comprising a rotary switch assembly, a door lock body, an inner housing disposed in the door lock body, a transmission plate, a brake plate, a pushing block having a lock block at a front end thereof, a shaft cover, a lock cover, an engaging block, a pulling spring, a clip ring, an engaging spring, a pushing spring and several screws, said burglarproof door lock being characterized in that a rotary switch of the rotary switch assembly is formed with a central projecting hub on a front surface thereof, the projecting hub having a recess frame, a notch and an engaging socket, the engaging socket being communicated with a central hole of the rotary switch, a lock core body being disposed in the central hole of the rotary switch and the engaging socket, a rotary plate being disposed on a lock core of the lock core body in cascade, a pushing plate being fixed thereon by two screws, the pushing plate having an arch projecting plate, the rotary plate having a lateral semicircular notch and a lateral arch projecting plate and a projecting block on a surface thereof, the arch projecting plate of the pushing plate being able to push the projecting block of the rotary plate, whereby when the arch projecting plate of the rotary plate is stopped in the recess frame of the projecting hub, the pushing plate and rotary plate are prevented from rotating, a first steel ball being disposed between the semicircular notch of the rotary plate and the notch of the projecting hub, a copper ring being disposed on the rotary switch, having a shaft hole and a semicircular engaging hole on a bottom edge of the shaft hole, the semicircular engaging hole cooperating with the notch of the projecting hub for receiving the first steel ball, the copper ring being fitted in an annular groove of the front surface of the rotary switch and fixed therein by a C-shaped clip, the engaging block being passed through a window of an L-shaped block of the inner housing, the engaging block having a rear stem passing through a lateral window of the door lock body and a hook-like front end having two hook claws defining an engaging recess therebetween, the engaging block having a projecting hook for hooking the pulling spring, the other end of the pulling spring being hooked on a projecting hook of the L-shaped block, whereby the engaging block can be used to control the pushing block to move inward and outward and locate the pushing block.

5,590,555

ANTI-ROTATION MECHANISM FOR LOCKSET CHASSIS

Steven A. Kester, Noblesville; Scott A. Gilbertson, Indianapolis, and John W. McIntire, Anderson, all of Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed May 1, 1995, Ser. No. 431,445
Int. Cl.[6] E05B 9/06
U.S. Cl. 70—224 25 Claims



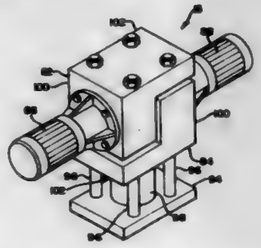
1. A lockset chassis assembly for use with a door latch, the assembly comprising
a rotatable spindle,
a chassis supporting the rotatable spindle, the chassis being formed to include a threaded outer surface and a chassis keyway interrupting the threaded outer surface,
a rose engaging the chassis, and
a locking pin lying in the chassis keyway and engaging the rose to block rotation of the chassis relative to the rose, the locking pin including a shaft having an enlarged head lying in the chassis keyway and engaging only the chassis.

5,590,556

APPARATUS FOR THE MANUFACTURE OF A THIN METALLIC STRIP

Eugene Fourie, 57 Herbert Baker Drive, Greenkloof, Pretoria; Mechiel N. Nieuwoudt, 246 Rosalind Avenue, Murrayfield, Pretoria, and Johannes H. Fehrsen, 20A Meyer Street, Oaklands, Johannesburg, all of South Africa

Filed Feb. 1, 1994, Ser. No. 189,704
Claims priority, application South Africa, Feb. 11, 1993, 93/0952
Int. Cl.[6] B21B 31/02
U.S. Cl. 72—237 9 Claims



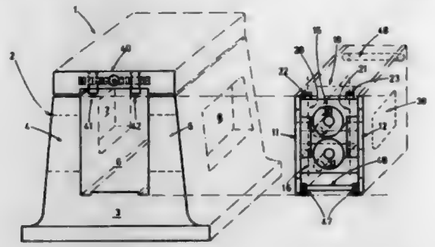
1. A forming roller arrangement which includes:
a first forming roller which is rotatable about a first rotational axis and has first and second ends;
a first bearing means for rotatably supporting the first roller, the first bearing means being located between the first and second ends of the first roller to provide an exposed end portion of the first roller at its first end;
a second forming roller having first and second ends which is rotatable about a second rotational axis;
a second bearing means for rotatably supporting the second roller, the second bearing means being located between the first and second ends of the second roller to provide an exposed end portion of the second roller at its first end;
with the rollers extending in opposite directions with their exposed end portions overlapping one another and being spaced apart to define a rolling region between them;
a first carrier in which the first bearing means is housed with the end portion of the first roller projecting therefrom;
a second carrier in which the second bearing means is housed with the end portion of the second roller projecting therefrom;
a support means for supporting the carriers in a relatively displaceable manner thereby to vary the spacing between the end portions, comprising a plurality of slide columns with one of the carriers being fixed to the columns and the other being slidable therealong.

5,590,557

ROLL STAND

Karl Keller, Hilchenbach; Konrad Hamraths, Kaarst; Erhard Affierbach, Bad Laasphe, and Dieter Klein, Siegen, all of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Nov. 28, 1994, Ser. No. 345,502
Claims priority, application Germany, Nov. 26, 1993, 43 40 313.1
Int. Cl.[6] B21B 31/10
U.S. Cl. 72—238 8 Claims



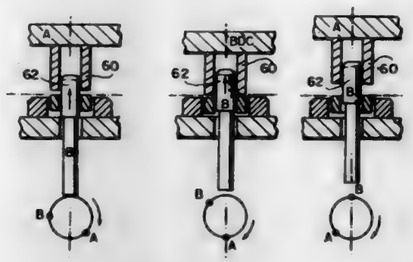
1. In a roll stand for a pair of work rolls, the roll stand comprising a base plate, a housing with two side walls mounted on the base plate, the housing having a top, the side walls having guide surfaces and defining therebetween a cube-shaped receiving space which is open toward the top and toward two sides for an insertable roll cassette, the work rolls having axes, the roll cassette comprising two side plates which extend parallel to each other and are spaced at a distance from the roll axes, the side plates having outer sides, the outer sides of the side plates being guided by the guide surfaces of the side walls, the side plates comprising guide means for two pairs of chocks for receiving the work rolls and bearings of the rolls, the improvement comprising pairs of adjusting spindles which absorb rolling forces for connecting a pair each of interacting chocks, wherein a distance between chocks is adjustable so as to produce preadjustable passes, the adjusting spindles comprising adjusting collars and the side plates having adjusting pieces compatible with the adjusting collars, the adjusting collars and the adjusting pieces being in engagement with each other and serving to secure the adjusting spindles in axial direction to a roll center, and spacer members extending transversely of the side plates for connecting the side plates to each other, such that a rigid cassette is formed by the spacer members and the side plates, wherein the adjusting spindles have upper ends projecting above upper chocks, the upper ends comprising coupling claws, a synchronous gear unit being mounted on and bridging over the side walls, the synchronous gear unit comprising four driven shafts which and are arranged in pairs, wherein the shafts of each pair rotate in opposite directions, the driven shafts comprising coupling heads for a positively locking engagement in the coupling claws of the upper ends of the adjusting spindles, and wherein the side walls have at openings thereof means for mounting preassembleable elements.

5,590,558

DRAW-PROCESSING OF CAN BODIES FOR SANITARY CAN PACKS

William T. Saunders, deceased, late of Weirton, and William H. Dalrymple, Weirton, both of W. Va., assignors to Weirton Steel Corporation, Weirton, W. Va.

Continuation-in-part of Ser. No. 596,854, Oct. 12, 1990, Pat. No. 5,343,729, and Ser. No. 866,661, Apr. 8, 1992, Pat. No. 5,409,130, which is a division of Ser. No. 573,548, Aug. 27, 1990, Pat. No. 5,119,657, said Ser. No. 155,511is a continuation-in-part of Ser. No. 14,263, Feb. 5, 1993, Pat. No. 5,263,354, which is a division of Ser. No. 831,624, Feb. 21, 1986, Pat. No. 5,014,536, which is a continuation-in-part of Ser. No. 712,238, Mar. 15, 1985, abandoned, said Ser. No. 155,511is a continuation-in-part of Ser. No. 53,458, Apr. 27, 1993, Pat. No. 5,347,839, which is a division of Ser. No. 490,781, Mar. 8, 1990, Pat. No. 5,209,099. This application Nov. 22, 1993, Ser. No. 155,511
Int. Cl.[6] B21D 22/20; 51/26
U.S. Cl. 72—347 11 Claims



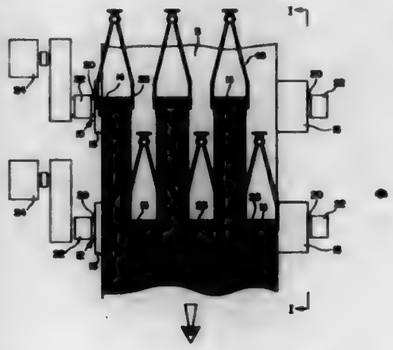
11. Process for fabricating a precoated cylindrical-configuration one-piece can body, comprising
supplying steel substrate which has been decreased in thickness gauge without a subsequent anneal, and Which has been precoated on both its planar surfaces with an outer surface coating, including an organic polymer and draw lubricant on each surface, and which has
a thickness gauge in the range of about 35 to about 85 pounds per base box,
cutting such precoated steel substrate to form a cut blank of preselected diameter,
drawing such preselected diameter cut blank, while clamping its periphery between planar clamping surfaces free of curvilinear surface clamping, to form a cup-shaped work product having an endwall and a unitary cylindrical sidewall with a diameter which is within a range between about 35% to about 50% of such cut blank diameter, and
redrawing such cup-shaped work product in redraw press means to decrease its diameter in a range between about 10% and about 30% to produce a finished can body, with
such redrawing of the cup-shaped work product being carried out by clamping precoated sheet metal between planar clamping surfaces free of curvilinear surface clamping, so as to decrease sidewall thickness gauge substantially uniformly over such redrawn can body sidewall height within a range of about 10% to about 25% of starting gauge for such precoated can stock.

5,590,559

METHOD AND APPARATUS FOR DOMAIN REFINING ELECTRICAL STEELS BY LOCAL MECHANICAL DEFORMATION WITH MULTIPLE SCRIBING ROLLS

Leroy R. Price, Allison Park, and James G. Benford, Pittsburgh, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Division of Ser. No. 977,595, Nov. 17, 1992, Pat. No. 5,408,856. This application Jan. 27, 1995, Ser. No. 379,415
Int. Cl.[6] B21B *27/02*
U.S. Cl. 72—366.2 **13 Claims**



1. A method for improving core loss of a grain-oriented silicon steel strip comprising the steps of:

causing different portions of the strip to be contacted by at least two rotatable scribing roll means arranged across one side of the strip,

subjecting the said side of the strip to pressure contact with projections formed on peripheral surfaces of said scribing roll means to impart mechanical scribing to said different portions of the strip as the strip is advanced passed said scribing rolls means,

supporting the strip, while being scribed, by rotatable anvil roll means arranged to contact and support the side of the strip opposite said one side thereof, in which said anvil roll means possesses substantially greater resistance to deflection than said scribing roll means during the scribing.

5,590,560

APPARATUS FOR MEASURING VISCOSITY OR THICKNESS, SURFACE TENSION AND SURFACE DILATIONAL ELASTICITY

Felipe M. Joos, Pittsford, N.Y., and Alfred K. Anders, North Fitzroy, Australia, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1995, Ser. No. 561,904
Int. Cl.[6] G01M *3/08*
U.S. Cl. 73—64.48 **8 Claims**

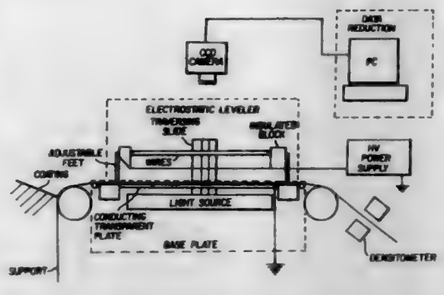
5. A method for determining surface dilational elasticity of a liquid comprising:

moving a transparent support at a speed s, having a liquid on the topside of the support, the liquid having a free surface and a thickness, d;

positioning an electrostatic leveler above the free surface of the liquid which includes:

a plurality of spaced apart wires extending in a direction parallel to the movement of the support;

applying a voltage to the spaced apart wires which produces a spatially non-uniform electric field E_y, with the amplitude of the variation of the square of the electric field represented by $\Delta(E_y^2)$, thereby creating a disturbance having an amplitude $\Delta\delta_{FS}$ in the free surface at a distance Z from



where the liquid is first exposed to the wires measured in the direction of motion of the support; and

determining the surface dilational elasticity by fitting the amplitude of the free surface disturbance $\Delta\delta_{FS}$ as it changes with distance to the following set of equations which contain the surface dilational elasticity e as the only unknown parameter:

$$\Delta\delta_{FS} = \frac{\Delta\delta_{FS\infty}}{2}\left[\left(1-\frac{1+3E}{D_{disc}}\right)e^{-\kappa_1 x}+\left(1+\frac{1+3E}{D_{disc}}\right)e^{-\kappa_2 x}-2\right]$$

wherein

$$D_{disc}=\sqrt{(1+3E)^2-9E}$$

$$\kappa_1=\frac{-3E+1-D_{disc}}{6}$$

$$\kappa_2=\frac{-3E+1+D_{disc}}{6}$$

$$E=\frac{e}{d^2}\cdot\frac{1}{\left[\rho g+\sigma\left(\frac{2\pi}{\lambda}\right)^2\right]}$$

$$\tau=\frac{d^2}{\mu s}\left(\frac{2\pi}{\lambda}\right)^2\left[\rho g+\sigma\left(\frac{2\pi}{\lambda}\right)^2\right]Z$$

and e=2.718282 . . . is the base of the exponential function;

$\Delta\delta_{FS}$ and $\Delta\delta_{FS\infty}$ are, respectively, the displacement of the free surface at each position Z and sufficiently far form where the coating is initially subjected to the electrostatic field so that the disturbance no longer changes;

ρ, μ and σ are, respectively, the density and viscosity of the liquid and the surface tension at the free surface between the liquid and the air;

g is the gravitational constant;

λ is the wavelength of the disturbance which coincides with the separation of the wires, these wires being aligned with the direction of motion of the moving support; and

e is the surface dilational elasticity in kg/s^2.

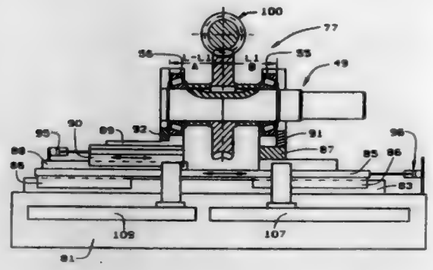
5,590,561

90 DEGREE SPEED REDUCER ASSEMBLY, PROCESS, AND MEASURING MACHINE

Oprea Duta, St. Louis, and Randy R. Pross, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 55,222, Apr. 30, 1993, Pat. No. 5,502,882. This application Sep. 19, 1994, Ser. No. 308,146
Int. Cl.[6] G01M *13/02*
U.S. Cl. 73—162 **13 Claims**

1. An apparatus for determining the location of the center of curvature of a worm gear, the worm gear being part of a worm gear assembly including two bearing assemblies, a shaft rotatably journaled in said bearing assemblies, and said worm gear, said worm



gear being on said shaft, said worm gear having a curvature generally parallel the axis of the shaft; said gauge comprising:

a base having a table movably mounted thereon, said table being movable horizontally relative to said base;

a worm gear bracket assembly on said table for removably receiving said worm gear assembly;

a vertical support mounted to said base including a worm bracket which receives a worm, said worm bracket being positioned such that said worm can be placed in meshing contact with said worm gear; said worm bracket being mounted to said support for vertical movement relative to said support;

a linear motion device operably connected to said table to move said table, and hence said worm gear assembly, relative to said base and said worm, such that, as said worm gear assembly is moved horizontally, said worm will move vertically;

a first measuring device on said base and operatively connected to said worm gear bracket assembly, said first measuring device outputting a signal indicative of the distance between predetermined surfaces of said worm gear assembly and the center of the worm;

a second measuring device on said vertical support, the second measuring device outputting a signal indicative of the vertical position of said worm; and

a computing means, said computing means receiving said signals from said first and second measuring devices to determine the location of the center of curvature of the worm gear relative to the predetermined surfaces of the worm gear assembly.

5,590,562

MANUAL PASSIVE QUICK ADJUSTMENT DEVICE

Georg Scheck, Weitramsdorf; Carsten Brandt, Weidach; Markus Fischer, Coburg; Jürgen Angermüller, Mitwitz; Hans Rampel, Ahorn-Schorkendorf, and Udo Dreher, Coburg, all of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Germany

Filed Sep. 27, 1994, Ser. No. 313,355
Claims priority, application Germany, Nov. 12, 1993, 43 38 737.3; Jun. 28, 1994, 44 22 529.6
Int. Cl.[6] G05G *5/12*; F16H *25/20*
U.S. Cl. 74—89.14 **18 Claims**

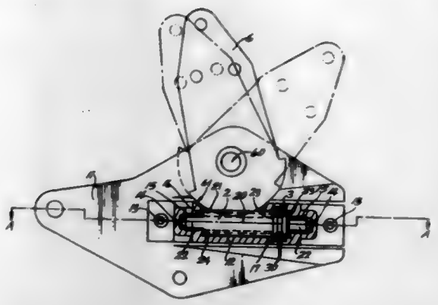
1. A manual quick adjustment device for adjusting elements in or on motor vehicles without a separate drive unit, the quick adjustment device comprising:

a housing;

a worm having a toothed section along a circumferential surface, the worm being rotatably disposed within the housing and having at least one locking region;

a toothed segment lever oriented opposite to the worm having a toothed section engaging the toothed section of the worm; and

a locking element disposed within the housing, the locking element being configured to engage the locking region of the worm to prevent rotational movement of the worm;



wherein the worm is rotated in the housing when a force is imposed on the toothed segment lever and when the locking element is not engaged with the locking region of the worm;

wherein rotation of the worm is prevented by engagement of the locking element with the locking region of the worm; and

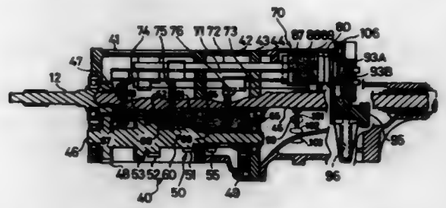
wherein the device is adapted so that a force imposed on the toothed segment, when the locking element is engaged with a locking region lever, is directed to the locking region.

5,590,563

ELECTRONICALLY CONTROLLED TRANSMISSION

Mitsunori Kuwahata, and Eiji Nakai, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Sep. 23, 1994, Ser. No. 311,014
Claims priority, application Japan, Sep. 27, 1993, 5-264218
Int. Cl.[6] F16H *59/02*
U.S. Cl. 74—337.5 **11 Claims**



1. In an electronically controlled transmission comprising:

first shaft means for providing torque transfer comprising an input shaft through which torque is input to the transmission and an output shaft, arranged coaxially with said input shaft, through which torque is output from the transmission,

a second shaft, arranged in parallel with the input shaft and the output shaft, through which rotation of said input shaft is transferred to said output shaft by one of a plurality of combinations of engagement between main gears mounted on said output shaft and counter gears mounted on said second shaft, and

a rotatable cylindrical shift drum for moving a plurality of shift rods in an axial direction of said shift drum so as to selectively cause any one of the plurality of combinations of engagement between said main gears and said counter gears thereby shifting said transmission into any desired gear,

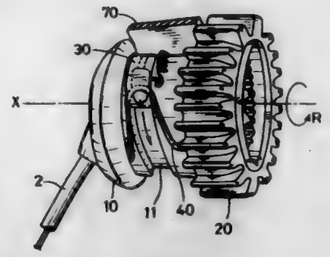
an improvement comprising said rotatable drum at least partly overlapping said first shaft means in an axial direction and having a center axis of rotation which extends in parallel with center axes of rotation of said first shaft means and said second shaft and is offset from a plane in which said center axes of rotation of said first shaft means and said second shaft lay.

5,590,564

BICYCLE CONTROL DEVICE

Hitoshi Kishimoto, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Nov. 20, 1995, Ser. No. 560,730
Int. Cl.[6] B62M *25/04*
U.S. Cl. 74—475 **23 Claims**



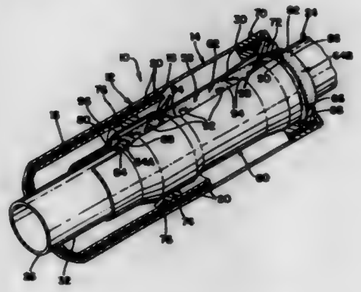
1. A bicycle control device comprising:
a base member (**10**) for attachment to a structural member (**3**) of the bicycle;
a control member (**20**) which moves relative to the base member (**10**);
an elongated member (**40**) having a first end secured relative to the base member (**10**) and a second end secured relative to the control member (**20**) so that movement of the control member (**20**) relative to the base member (**10**) causes the second end of the member (**40**) to move relative to the first end of the member (**40**); and
a linking member (**30**) disposed between the first end of the member (**40**) and the second end of the member (**40**) for movement with the member (**40**), the linking member (**30**) having a fixing location for fixing a control element (*2a*) of the bicycle to the linking member (**30**).

5,590,565

MOTOR VEHICLE STEERING COLUMN

Samuel R. Palfenier, El Paso, Tex.; Frank R. Kolpert, Bay City, Mich.; Howard D. Beauch; Leland N. Olgren, both of Frankenmuth, Mich., and William D. Cymbal, Freeland, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1995, Ser. No. 385,490
Int. Cl.[6] B62D *1/18*
U.S. Cl. 74—493 **5 Claims**



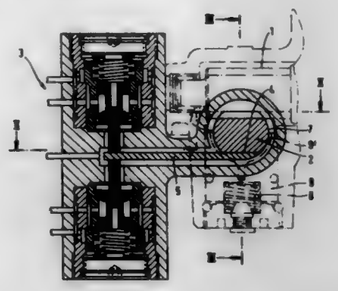
1. A motor vehicle steering column comprising:
a tubular stationary mast jacket,
a tubular adjustable mast jacket inside said stationary mast jacket,
a steering wheel,
means rotatably mounting said steering wheel on said tubular adjustable mast jacket, and
a self-adjusting bearing means mounting said tubular adjustable mast jacket on said tubular stationary mast jacket with continuously substantially zero lash therebetween for in and out bodily movement to effect horizontal adjustment of the position of said steering wheel relative to said stationary mast jacket including
a pair of inward facing frustoconical seats on said tubular stationary must jacket around said tubular adjustable mast jacket,
a pair of split sleeve bearings each having and annular end and a cylindrical side slidably bearing against a cylindrical outer wall on said tubular adjustable mast jacket and a frustoconical side facing a respective one of said pair of inward facing frustoconical seats on said tubular stationary mast jacket, and
a tubular spring consisting of a plastic sleeve having a pair of opposite ends bearing against respective ones of said annular ends of said pair of split sleeve bearings and a plurality of circumferential slots defining therebetween a plurality of resiliently flexible webs, said tubular spring biasing each of said pair of split sleeve bearings into respective ones of a pair of converging annuluses defined between said pair of inward facing frustoconical seats and said cylindrical outer wall on said tubular adjustable mast jacket.

5,590,566

SERVO-ASSISTED RACK-AND-PINION STEERING SYSTEM

Wolfgang Joerg, and Bernd Langkamp, both of Stuttgart, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jun. 28, 1995, Ser. No. 495,992
Claims priority, application Germany, Jun. 28, 1994, 44 22 556.3
Int. Cl.[6] B62D *5/09;3/12;5/22*
U.S. Cl. 74—498 **7 Claims**



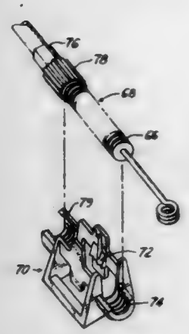
1. A rack-and pinion steering system assisted by a servomotor, comprising:
a helical-toothed rack;
a helical-toothed pinion cooperating with said helical-toothed rack;
wherein said rack is arranged for limited rotation relative to its longitudinal axis and turns in one direction or the other in dependence on a direction of force transmitted between said pinion and said rack; and
a control arrangement for controlling the servomotor of the rack-and-pinion steering system, wherein said limited rotation of said rack relative to its longitudinal axis actuates said control arrangement.

5,590,567

SNAP RETAINER AND RETAINER SYSTEM

Robert A. Marrs, Amboy; Kurt J. Hudoba, and John W. Willis, both of Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 14, 1995, Ser. No. 403,611
Int. Cl.[6] F16C *1/14;* **F16L** *3/13*
U.S. Cl. 74—502.4 **1 Claim**



1. A snap retainer system comprising:
an elongated object to be held, the object defining an axis and an external thread including a gear-like ratchet member;
an integral molded retainer having a base, axially spaced support members on the base and a pair of retaining elements carried between the support members;
the base having means for seating the object in a secure position:
each of the pair of retaining elements having snap means for rotation about a hinge axis spaced from the object and for engaging the object between the axis and the base, and resilient hinge means anchored to the support members for defining the hinge axis and for biasing the snap means to a closed position for holding the object in a secure position and for allowing movement to an open position;
the retainer includes a toothed gripping means for cooperatively engaging the external thread, whereby the axial position of the object in the retainer is adjustable by rotating the object about said axis in the retainer;
and a detent finger on the retainer for engaging the ratchet member, thereby resisting rotation of the object to hold the object in an adjusted position.

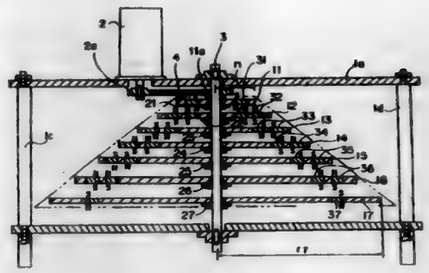
5,590,568

LAYERED BODY HAVING ROTATING ADJACENT LAYERS WITH MAGNETIC POLES ON FACING SURFACES

Muneaki Takara, 19-20, Oroku 1-chome, Naha-shi, Okinawa, Japan

PCT No. PCT/JP92/01300, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/07387, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 7, 1992, Ser. No. 211,385
Claims priority, application Japan, Oct. 7, 1991, 3-289275; Jun. 4, 1992, 4-170258; Jun. 5, 1992, 4-171887
Int. Cl.[6] F03G *3/08;* **F16C** *32/04*
U.S. Cl. 74—572 **13 Claims**

2. A device for rotating a layered body, comprising:
a plurality of rotating plates arranged in spaced layers and coaxially aligned about an axis of rotation and forming pairs of neighboring plates, wherein facing plate surfaces between each said pair of neighboring plates form a gap between each said pair of neighboring plates;



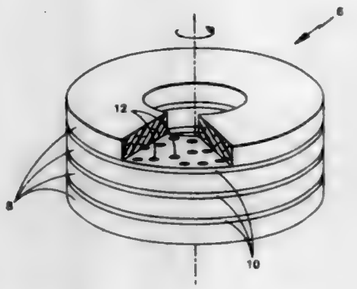
at least one magnetic pole on each plate surface that forms said gap, the magnetic poles being arranged such that the polarities of magnetic poles on said facing plate surfaces in each said gap are the same, and
wherein, when said plurality of rotating plates are stationary, the at least one magnetic pole on one plate is arranged to occupy an alternating position with a corresponding magnetic pole on said facing plate surface of a neighboring plate.

5,590,569

ENERGY STORAGE FLYWHEEL DEVICE

Vincent C. Nardone, South Windsor; Mark S. Thompson, Vernon, and Thomas G. Meyer, Lebanon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 128,319, Sep. 29, 1993, Pat. No. 5,452,625.
This application Jun. 7, 1995, Ser. No. 487,879
Int. Cl.[6] F16F *15/30*
U.S. Cl. 74—572 **13 Claims**



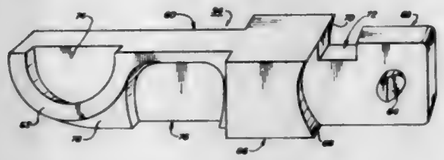
1. An energy storage flywheel device, comprising:
(a) at least one annular shaped composite section, and
(b) at least one annular shaped insert having a specific radial strength substantially greater than the composite section's specific radial strength, wherein the insert comprises a plurality of apertures filled with adhesive or metal that adheres the composite section to the insert,
wherein the composite section and the insert are stacked along a common axis such that they have a common axis of rotation and are bonded to each other such that radial load transfers between the composite section and insert.

5,590,570

ACTUATING FORCES TRANSMISSION LINK AND ASSEMBLY FOR USE IN SURGICAL INSTRUMENTS

Norman J. LeMaire, III, Taunton; Francis J. DiFrancesco, Foxboro; Paul DiCarlo, E. Falmouth; Peter D. Naugler, Manchester, and George J. Sikora, Brockton, all of Mass., assignors to Acufex Microsurgical, Inc., Mansfield, Mass.

Division of Ser. No. 779,431, Oct. 17, 1991, Pat. No. 5,366,477.
This application Oct. 21, 1994, Ser. No. 326,989
Int. Cl.[6] G05G *1/00*
U.S. Cl. 74—579 R 10 Claims



1. A link for transmitting actuating forces from an actuating member to a work member, comprising:

a link body having a distal end and a proximal end;

distal means, disposed at said distal end of said link body, for movably interconnecting said link body with the work member;

a proximal interconnection element, disposed on said proximal end of said link body, which pivotably interconnects said link body with the actuating member, and transmits a first actuating force from the actuating member to the work member; and

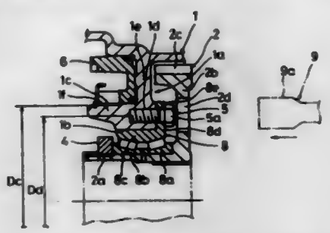
a shoulder, disposed on said link body, which engages a distal region of the actuating member when a second, greater actuating force is applied to the actuating member in a direction opposite to that of said first actuating force to transmit said second force to the work member.

5,590,571

STRUCTURE FOR MOUNTING AN OUTPUT GEAR AND BEARING TO A TRANSMISSION

Takeshi Tsuji, Tokyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 362,134
Claims priority, application Japan, Dec. 22, 1993, 5-324657
Int. Cl.[6] F16H *57/02*; F16C *35/077*
U.S. Cl. 74—606 R 3 Claims



1. In a mounting structure for mounting an output gear and a bearing to a transmission including a casing containing a planetary gear unit having a plurality of rotating elements and coupled to an input shaft, the output gear being rotatably supported by the bearing fitted in an axial hole which is formed in a partition wall extending inward from the casing and which extends along a longitudinal axis of the transmission, the improvement comprising:

said partition wall having a side surface in which a threaded hole extending along the longitudinal axis of the transmission is formed;

said bearing having a hole formed therein in alignment with the threaded hole;

said output gear having a boss fitted into the bearing and coupled to a corresponding one of the rotating elements of the planetary gear unit, and a flange extending from the boss along the side surface of the partition wall, the flange having a through hole formed therein for alignment with the threaded hole of the partition wall and the hole of the bearing; and

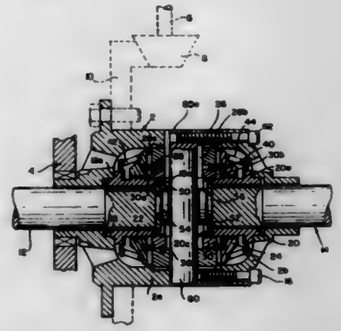
said mounting structure including a bolt for fixing the bearing to the side surface of the partition wall, the bolt adapted to be inserted through the through hole of the flange and the hole of the bearing and screwed into the threaded hole of the partition wall.

5,590,572

LOCKING DIFFERENTIAL INCLUDING ACCESS WINDOWS FOR C-CLIP RETAINERS

Paul J. Valente, Berkley, Mich., assignor to Titan Wheel International, Inc., Quincy, Ill.

Filed Jul. 28, 1995, Ser. No. 508,452
Int. Cl.[6] F16H *48/12*
U.S. Cl. 74—650 12 Claims



1. A differential apparatus of the automatic lock-out type for rotatably driving a pair of colinearly-arranged axially-spaced output shafts from a rotatably driven input shaft, the adjacent ends of the output shafts containing peripheral grooves for receiving C-shaped retainer members, respectively, comprising:

(a) a housing containing a chamber and including a pair of opposed openings for rotatably receiving the adjacent ends of the output shafts, respectively;

(b) a pair of annular side gears colinearly arranged for rotation within said housing chamber adjacent said openings for non-rotatable connection with the output shafts, respectively;

(c) a pair of annular clutch gear members arranged concentrically about, and splined for axial displacement relative to, said side gears, respectively;

(d) annular center driver gear means colinearly arranged between said side gears, said center driver gear means being non-rotatably connected with said housing;

(e) spring means normally biasing said clutch gear members together toward engaged positions relative to said center driver gear means;

(f) annular center cam means arranged concentrically relative to said center driver gear means between said side gears for disengaging one of said side gears from said center driver gear means when the associated output shaft overruns the other output shaft by a predetermined amount;

(g) annular holdout ring means for maintaining said one side gear in the disengaged condition relative to said center driver gear means as long as the overrunning condition exists; and

(h) spacer means removably connected with said housing for preventing axial displacement of the output shafts toward each other;

(i) said housing, said center driver means and said center cam means containing aligned radially-extending access windows,

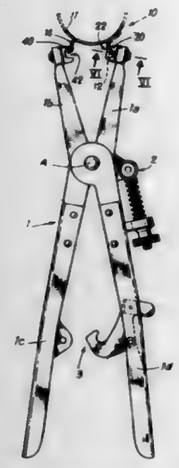
thereby to permit manual insertion of the C-clip retainers within the output shaft grooves, respectively.

5,590,573

PAIR OF JAW FITTINGS FOR MOUNTING ON PLIERS FOR CLAMPING A COLLAR

Pascal Detable, Gievres, France, assignor to Etablissements Caillau, Issy-Les-Moulineaux, France

Filed Mar. 31, 1995, Ser. No. 414,344
Claims priority, application France, Apr. 12, 1994, 94 04296
Int. Cl.[6] B25B *27/10*
U.S. Cl. 81—9.3 4 Claims



1. A pair of jaw fittings for mounting on the jaws of a pair of pliers for clamping a collar, said collar being constituted by a rolled-up metal strip and having two terminal portions each provided with a respective tab extending substantially radially outwards from the collar, each fitting in the pair having fixing means for fixing it to one of the jaws of the pliers and having a front face designed to come into abutment with one of said tabs of the collar, each of the front faces of the fittings have a recessed housing including an end wall, and a bottom wall and a top wall, that project from said end wall, with the recessed housing of a "second" one of the fittings extending transversely to a handle axis in a middle portion of the front face of said fitting and including a substantially plane end wall,

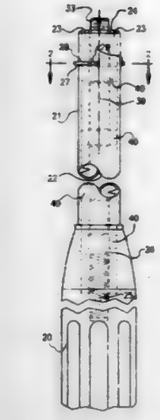
wherein the recessed housing of the other or "first" fitting is disposed transversely to a handle axis in a middle portion of the front face of said fitting and wherein the end wall of said recessed housing includes a substantially plane middle setback that leaves two substantially plane lateral portions remaining in said end wall, parallel to said setback and disposed on either side thereof.

5,590,574

DRIVER WITH AUTOMATIC FASTENER FEED

Thomas E. Lide, 5285 Sportsman's Way, Jacksonville, Fla. 32244

Filed Sep. 5, 1995, Ser. No. 523,771
Int. Cl.[6] B25B *13/06*
U.S. Cl. 81—124.1 18 Claims



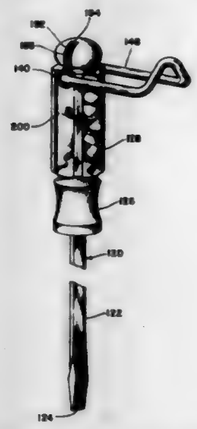
1. A combination self-feeding driver having a longitudinal axis and a fastener, said fastener having an enlarged head and a reduced elongated shaft portion with machine screw threads, said head having a plurality of grooves extending laterally to said shaft portion adjacent and spaced circumferentially around said head; said driver having an elongated tubular body disposed about said longitudinal axis, said body having an interior with a plurality of splines parallel to said longitudinal axis and spaced apart circumferentially, said splines fitting complementally said grooves of said head and engaging said shaft portion exterior of said head of said fastener while fully within said body, said body being adapted to contain a plurality of said fasteners stacked inside of said tubular body and to be axially slidable therein along said splines, said body having an open end, and releasable spring catch means adjacent said open end of said tubular body for engaging said fastener head to inhibit free passage of said fastener therefrom.

5,590,575

LEVER TOOL HANDLE

Andrew W. Ludy, 17 Sherwood Way, Landing, N.J. 07850

Filed Apr. 28, 1995, Ser. No. 432,370
Int. Cl.[6] B25B *23/16*
U.S. Cl. 81—177.5 10 Claims



1. A lever handle for a rotary hand tool having a shank with a tip configured to engage and turn a rotary fastener, the lever handle enabling operation with one hand to apply increased torque to the rotary fastener, the lever handle comprising:

(a) a grip member having a longitudinal axis, a generally cylindrical surface extending along the longitudinal axis and having a diameter suitable for hand grasping, opposite first and

second ends, the shank extending collinearly from the first end, the grip member having two collinear pivot holes transverse to the axis of the grip member, the pivot holes juxtaposed with the second end of the grip member;

(b) a lever member, the lever member having a one piece structure, being generally U-shaped and resilient, and including

(c) a pair of side elements, the side elements being generally parallel and including opposite first and second ends;

(d) a connecting element disposed between the first ends of the side elements and connected thereto;

(e) a pair of collinear pivot elements, each pivot element having opposite fixed and free ends, the fixed ends connected to and extending generally perpendicularly to the second ends of the side elements, the free ends pointing inward and pivotally engaging the pivot holes of the grip member, the pivot elements biased toward one another by the resilience of the U-shaped lever member to retain the pivot elements in the pivot holes, so that the lever member will be pivoted in an arcing path from a closed position alongside the grip member and substantially parallel to the longitudinal axis of the grip member wherein the rotary hand tool will be rotated freely and quickly, to an open position projecting outward from the grip member adjacent the second end of the grip member for enabling the rotary hand tool to be operated with one hand with increased torque to turn a rotary fastener; and

(f) a detent disposed on the side of the grip member, the detent including a projecting portion being one piece with the grip member, the projecting portion projecting outward into the path of the lever member as the lever member is moved between the open position and the closed position, such that the side elements of the U-shaped lever member, biased through the connecting element, expand resiliently apart from one another in response to passing over the projecting portion, and contract so as to be releasably held behind the projecting portion in the closed position.

5,590,576

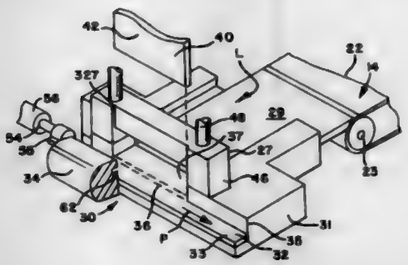
FEED ASSEMBLY FOR CONNECTOR TERMINATION APPARATUS

Peter Ingwersen, Gilberts; Lawrence M. Kurek, Elgin, and Douglas L. Heimer, Downers Grove, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Oct. 17, 1994, Ser. No. 324,813

Int. Cl.[6] B26D 7/06

U.S. Cl. 83—147 **17 Claims**



1. An apparatus for separating and feeding electrical connectors from a supply of electrical connectors to a processing station, said supply of electrical connectors including a plurality of electrical connectors with adjacent ones of said electrical connectors interconnected by webs, said supply of electrical connectors being generally linear, said separating and feeding apparatus comprising:

first guide means for guiding said supply of interconnected connectors along a first path to a separating station such that a lead connector of such supply is presented to said separating station;

second guide means for guiding said lead connector to said processing station after separation from said adjacent interconnected connector, said second guide means defining an elongated second path generally transverse to said first path, said second guide means comprising a channel defined by first and second generally parallel sidewalls and a lower surface interconnecting said sidewalls, said first sidewall having an opening therein aligned with said first path to permit said lead connector to enter said second guide means and said second sidewall for restricting movement of said lead connector along said first path and defining a registration position for said lead connector;

sensor means for verifying the presence of said lead connector at said registration position;

means to move said lead connector along said channel from said separating station to said processing station; and

severing means at said separating station for severing a web interconnecting said lead connector with an adjacent interconnected connector, said severing means including at least one substantially planar surface aligned with and positionable at said opening in said first sidewall of said second guide means to close said opening in said first sidewall and form a generally continuous guide surface for guiding said lead connector between said separating station and said processing station.

5,590,577

DEVICE FOR CUTTING A PAPER WEB IN A PRESS END OF A PAPER MACHINE

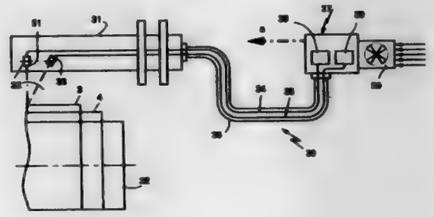
Gunther Ruf, Syrgenstein, and Hans-Jorg Burbach, Heidenheim, both of Germany, assignors to J.M. Voith GmbH, Germany

Filed May 19, 1993, Ser. No. 64,233

Claims priority, application Germany, May 20, 1992, 42 16 653.5

Int. Cl.[6] B26D 5/20

U.S. Cl. 83—371 **13 Claims**



10. A device for cutting through a web of paper in the press section of a papermaking machine, that has been torn while in the single-tier dryer end of the papermaking machine, the device having a paper cutter and at least one paper-tear detector, the device indicating the presence of the tear by the transmission a signal to the cutter; wherein:

a) the detector comprises a combination emitter-receiver unit, wherein the emitter-receiver unit communicates through an optical conductor with a remote unit in the immediate vicinity of the web, the remote unit having a first component that emits a beam of light, and a second component that absorbs light reflected from the felt through the tear in the paper;

b) the emitter-receiver unit detects and stores an initial color spectrum of drying felt at the dryer end whenever a new production cycle of the papermaking machine begins and whenever a tear is detected in the paper;

c) when the paper tears, the emitter-receiver unit detects the tearing of the paper by matching a second color spectrum of the dry-end felt which it detects through the tear, with the initial color spectrum stored in its memory, and in response, activates the paper cutter; and

d) the emitter-receiver unit analyzes and stores the color of the felt as a function of reflection properties in a form of standardized red, green and blue light values.

5,590,578

MUFFLER FOR BOOSTER

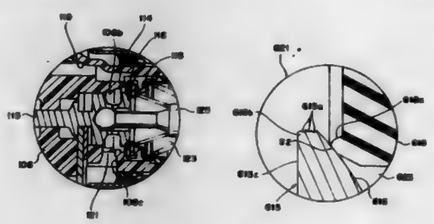
Masahiro Ikeda, Saitama-ken, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1995, Ser. No. 381,220

Claims priority, application Japan, Feb. 28, 1994, 6-054739; Mar. 31, 1994, 6-085788

Int. Cl.[6] F15B 9/10

U.S. Cl. 91—376 R **8 Claims**



1. In a booster including a tubular valve body slidably disposed within a shell, an annular first valve seat formed on an inner peripheral surface of the valve body, a valve plunger slidably fitted in the valve body, an annular second valve seat formed on the valve plunger, a valve element disposed within the valve body and urged by a spring so as to be seated upon either the first or the second valve seat in contact therewith, a constant pressure passage for providing a communication between a region which is located radially outward of a first seat defined by the contact between the first valve seat and the valve element and a constant pressure chamber which is partitioned within the shell, a pressure passage for providing a communication between a source of pressure fluid and a region which is located radially inward of a second seat defined by the contact between the second valve seat and the valve element, and a variable pressure passage for providing a communication between a region located intermediate the first seat and the second seat and a variable pressure chamber which is partitioned within the shell, said valve plunger including an annular flange which defines said second valve seat and a reduced diameter portion disposed forwardly adjacent said annular flange; the improvement comprising a muffler for the booster wherein an inner surface of the variable-pressure passage is formed with an uneven surface, said uneven surface defined by a plurality of annular grooves formed on an outer peripheral surface of said annular flange forwardly of said second valve seat.

5,590,579

HYDROSTATIC PUMP AND BEARING-CLOCKING MECHANISM THEREFOR

Mark F. Weber, Eden Prairie, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 31, 1995, Ser. No. 558,576

Int. Cl.[6] F01B 3/00

U.S. Cl. 92—12.2 **6 Claims**

1. A variable displacement axial piston hydraulic unit of the type having a housing defining a concave cradle surface; a swashplate disposed in the housing and having a convex surface, a roller bearing assembly disposed between the cradle surface and the convex surface, and including a plurality of roller bearing members intended for purely rolling engagement with the cradle surface and the convex surface as the swashplate is displaced between a neutral position and a maximum displacement position; and a bearing-clocking mechanism including a clocking link member in operable engagement with the housing, the swashplate, and the roller bearing assembly; characterized by:

(a) said clocking link member comprising a single, rigid, unitarily formed link member including first and second end portions and a clocking portion intermediate said first and second end portions;

(b) one of said housing and said swashplate defining a transversely-oriented bore and said first portion of said link member including a cylindrical portion disposed within said bore and closely spaced therein, permitting pivotal movement of said link member about said cylindrical portion;

(c) the other of said housing and said swashplate including an end surface defining an elongated slot, said second portion being slidably disposed within said slot, and being configured to maintain a substantially constant, close clearance within said slot as said swashplate is displaced between said neutral position and said maximum displacement position;

(d) said roller bearing assembly including a cage defining a slot, said clocking portion being rotatably disposed within said slot, and being configured to maintain a substantially constant, close clearance within said slot as said swashplate is displaced between said neutral position and said maximum displacement position.

6. A method of assembling a variable displacement axial piston hydraulic unit of the type having a housing defining an axis of rotation and further defining a concave cradel surface; a swashplate disposed in the housing and having a convex surface, a roller bearing assembly disposed between the cradle surface and the convex surface, and including a plurality of roller bearing members intended for purely rolling engagement with the cradle surface and the convex surface as the swashplate is displaced between a neutral position and a maximum displacement position; and a bearing-clocking mechanism including a clocking link member in operable engagement with the housing, the swashplate, and the roller bearing assembly; the method characterized by the steps of:

(a) providing said housing with a pair of transversely-oriented bores disposed adjacent said cradle surface and oppositely disposed about said axis of rotation;

(b) providing a pair of clocking link members, each comprising a single, rigid, unitarily formed link member having a cylindrical first end portion, a second end portion, and a clocking portion disposed intermediate said first and second end portions, said second end portion and said clocking portion comprising generally identical cylindrical portions;

(c) orienting said housing with said concave cradle surface facing upwardly, inserting said cylindrical first end portions in said transversely-oriented bores, and orienting said clocking link members generally vertically;

(d) providing a pair of bearing assemblies, each comprising a cage defining a slot, then placing said bearing assemblies onto said cradle surface with each slot passing over its respective second end portion and into a close clearance fit with its respective clocking portion; and

(e) providing a swashplate including transversely spaced apart end surfaces, each defining an elongated slot opening toward

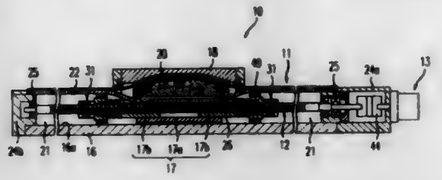
said convex surface of said swashplate, and placing said convex surface into engagement with said bearing assemblies, with each of said second end portions sliding into its respective elongated slot.

5,590,580

LOADING POSITIONING APPARATUS

Shigekazu Nagai, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan

Filed Feb. 2, 1995, Ser. No. 382,792
Claims priority, application Japan, Feb. 3, 1994, 6-031808
Int. Cl.[6] F01B *3/00;29/00;* F16H *27/02*
U.S. Cl. 92—33 **3 Claims**



1. A load positioning apparatus comprising a rodless cylinder including a piston adapted to reciprocate in a cylinder bore provided in the body of the apparatus by the action of a pressurized fluid and a load-mounting table slidable along the external surface of the body, with the piston and table joined together by a coupling device, a feed screw turned and driven by an electric motor, and a pressurized fluid control and supply device to supply a fluid of a desired pressure to the rodless cylinder;

the coupling device mechanically connecting the piston and table through a slit provided along the cylinder bore;

the feed screw being disposed to pass through the piston in the rodless cylinder and connected to the piston with a screw coupling mechanism which includes at least one screw thread cut in each of the piston and feed screw and multiple balls rotatably fitted between the screw threads (and provided at each end of the piston); and

said load positioning apparatus further comprising a thread sealing member to seal the space between the piston and feed screw at the screw thread on the feed screw which thread screwing member is provided (outside the screw coupling mechanism at each end of the piston,)

said thread sealing member including a helical piece surrounding the screw thread on the feed screw.

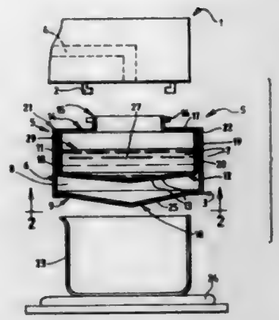
5,590,581

ASSEMBLY KIT FOR A FILTER COFFEE MAKER

Jürg Strub, Oberägeri, and Randy Gasser, Bürglen, both of Switzerland, assignors to Maxs AG, Sachseln, Switzerland

Filed Mar. 5, 1996, Ser. No. 611,221
Claims priority, application Germany, Mar. 9, 1995, 295 04 115.3
Int. Cl.[6] A47J *31/24*
U.S. Cl. 99—302 R **16 Claims**

1. An assembly kit for a filter coffee maker as an attachment (5) to an electrical espresso machine (1) having a filter carrier adapted to be attached via a bayonet-type coupling and having a coffee chamber (8) for receiving coffee powder, and suppling hot water and/or steam via a pressure channel (4) to the coffee chamber (8) of the filter carrier, the attachment (5) comprising a two-part design, with a first part (6) having a large-volume hot water chamber (7) following said pressure channel (4) for almost complete receipt of the water supplied via said pressure channel (4), with at least one through-opening (13) being formed in the bottom (12) of said first part (6), and said second part (3) being provided with said coffee chamber (8) disposed underneath said hot water



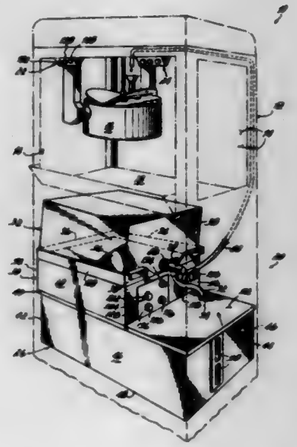
chamber (7) for receipt of the coffee powder, with the bottom (9) of said second part (3) being provided with a coffee filter (10).

5,590,582

OIL SUPPLY FOR POPCORN POPPERS

Ronald R. Weiss, Okeana, Ohio, assignor to Gold Medal Products Co., Cincinnati, Ohio

Filed Oct. 10, 1995, Ser. No. 541,469
Int. Cl.[6] A23L *1/18*
U.S. Cl. 99—323.5 **23 Claims**



1. Apparatus for supplying popping oil to a popcorn popping kettle comprising:

an oil reservoir to hold popcorn oil;

a first conduit adapted to couple the reservoir to a popcorn popping kettle whereby to supply popcorn oil from the reservoir to the kettle;

a first heater associated with the oil reservoir whereby to quickly melt popcorn oil in the reservoir having respective high and low heat outputs and to retain the popcorn oil in a melted state;

a shelf adapted to support a heatable container of popping oil whereby to melt popping oil in the container;

a second heater for heating said shelf; and

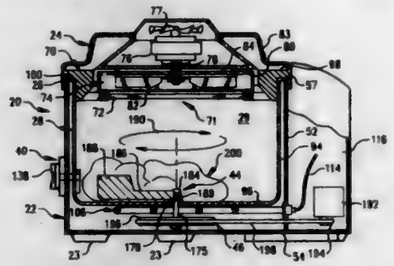
a second conduit adapted to couple the container of popping oil supported on the shelf to the reservoir whereby to supply melted oil from the container to the reservoir.

5,590,583

APPLIANCE FOR MAKING BREAD AND FOR COOKING BAGELS

Robert G. Harrison, Seattle, Wash., assignor to PMI International Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 372,518, Jan. 13, 1995, Pat. No. 5,526,734, and a continuation-in-part of Ser. No. 452,509, May 30, 1995. This application Jul. 24, 1995, Ser. No. 506,294
Int. Cl.[6] A21B *1/00;* A21D *8/00;* A47J *27/10;* A23L *1/00*
U.S. Cl. 99—327 **16 Claims**



1. A bread making and bagel cooking appliance which comprises:

an outer casing;

an inner casing with a compartment in which dough can be made and baked, said inner casing being irremovably installed in said outer casing;

dough mixing and kneading means removably installable in said compartment;

means providing a first, dough making, bagel boiling, and bread baking zone in said compartment;

means providing a second, bagel baking zone in said compartment;

a bagel support means removably installable in said compartment; and

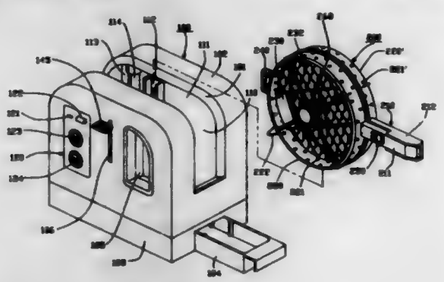
means housed in said compartment and operable with said support means installed for first shifting said support means to said first zone to boil uncooked bagels on said support means and then to said second zone to bake the boiled bagels.

5,590,584

BARBECUE

Boo H. Ahn, Seoul, Rep. of Korea, assignor to Shin Young Co., Ltd., Seoul, Rep. of Korea

PCT No. PCT/KR95/00036, § 371 Date Dec. 8, 1995, § 102(e) Date Dec. 8, 1995, PCT Pub. No. WO95/27427, PCT Pub. Date Oct. 19, 1995
PCT Filed Apr. 8, 1995, Ser. No. 564,089
Claims priority, application Rep. of Korea, Apr. 11, 1994, 1994/7536; Apr. 14, 1994, 1994/7722
Int. Cl.[6] A47J *37/00;37/04;37/06;* A23L *1/00*
U.S. Cl. 99—327 **35 Claims**



1. A barbecue comprising:

a cooking unit opened at least a top end thereof and having a vertical cooking chamber therewithin;

heating means disposed to each side of the cooking chamber for radiating cooking heat thereinto;

rotary grill means for holding food and insertable through the top end of the cooking unit so as to be disposed vertically within the cooking chamber between the heating means; and

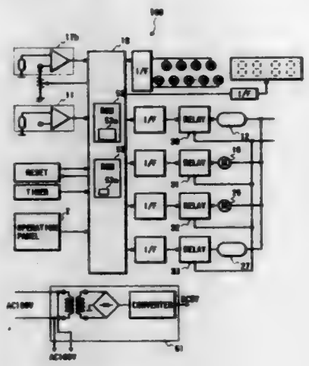
driving means for rotating the rotary grill means about a horizontal axis within the cooking chamber.

5,590,585

BREAD MAKER

Isaya Morishita, Daito, Japan, assignor to Funai Electric Co., Ltd., Japan

Filed May 28, 1996, Ser. No. 654,123
Claims priority, application Japan, May 29, 1995, 7-154009
Int. Cl.[6] A21B *1/00;* A21D *8/00;* A47J *27/00;37/00*
U.S. Cl. 99—327 **5 Claims**



1. A bread maker comprising:

a baking oven main body;

a bread baking case set in said baking oven main body;

a heater for heating said bread baking case;

an internal temperature sensor for detecting a heating temperature of said bread baking case;

temperature control means for comparing a current value of the heating temperature with a reference value corresponding to a target temperature and performing a heater-on/off control operation based on a difference between the current value of the heating temperature and the reference value to adjust the current value to the target temperature, said temperature control means controlling the heating temperature in a mixing and kneading process, a fermenting process, and a baking process; and

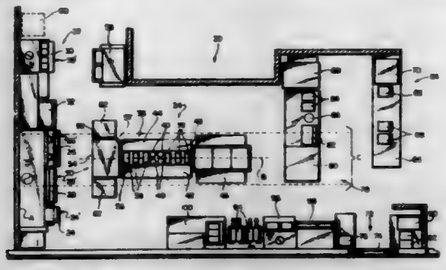
reference value setting means for updating the reference value corresponding to the target temperature so as to be a different value from the target temperature every heater-on/off control operation, to cause the reference value to turn off said heater before the heating temperature reaches the target temperature when the heating temperature is increasing based on the heater-on control operation, and to cause the reference value to turn on said heater before the heating temperature reaches the target temperature when the heating temperature is decreasing based on the heater-off control operation.

5,590,586

KITCHEN LAYOUT, SYSTEM

Kimberly A. Ulfig, Glen Ellyn, and Patricia A. Venetucci, Hawthorn Woods, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Filed May 12, 1995, Ser. No. 440,016
Int. Cl.[6] A21D *13/08*; A23L *1/31*; A47J *37/00*; G07F *11/00*
U.S. Cl. 99—339 **6 Claims**



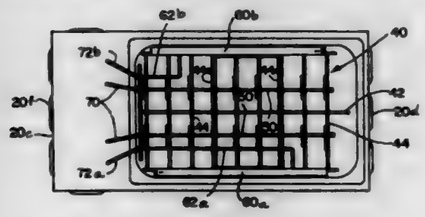
1. A kitchen for a commercial restaurant, comprising:
a food cooking area for cooking food items requiring subsequent processing including at least one final assembly step after cooking and before delivery to a customer, said food cooking area having at least one food cooking device contained therein;
a cooked-food processing area spaced apart from the food cooking area for assembling into individual sandwich portions the food items cooked in the food cooking area after the food items have been cooked; and
a cooked-food buffer area intermediate said food cooking area and said cooked-food processing area and proximally located to both the food cooking area and the cooked-food processing area, said cooked-food buffer area having a cooked-food buffer device located therein capable of holding a supply of the cooked food items at elevated temperature for extended periods of time while maintaining the taste, texture and appearance of the food items prior to subsequent processing, said cooked-food buffer device comprising a holding cabinet including a food inlet, a food outlet, and an interior for holding food items, said buffer device being positioned such that said food inlet provides a passageway for an operator in said food cooking area to insert cooked food items into the interior of said cabinet and said food outlet provides a passageway for an operator in said cooked-food processing area to remove the cooked food items from the interior of said device.

5,590,587

COOKER/RETHERMALIZER

Louis S. Polster, Alexandria, Va., assignor to Oliver Products Company, Grand Rapids, Mich.

Division of Ser. No. 65,627, May 21, 1993, Pat. No. 5,445,862.
This application May 25, 1995, Ser. No. 450,521
Int. Cl.[6] A47J *27/62;27/00*
U.S. Cl. 99—483 **2 Claims**



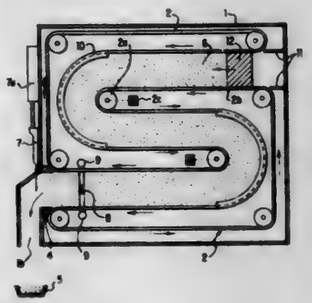
1. A thermalizing apparatus comprising:
a vessel having side and bottom walls for retaining a liquid bath therein and having a locator rack defining a plurality of heater zones of the bath;
a plurality of heaters for said vessel, in respective ones of said heater zones;
said vessel having said plurality of defined heater zones in a geometric location pattern, for supporting individual items to be thermalized in the bath;
said heaters being located at respective ones of said zones of said geometric location pattern;
a graphic control panel having individual controls for respective ones of said heaters, and indicators for each of said zones, said controls and indicators being arranged in a geometric control pattern directly visually simulating said geometric location pattern whereby a direct visual correlation between said panel and said zones and indication of the operating condition in each zone can be made, and whereby a thermal load in one zone does not materially drive the temperature in another zone up or down.

5,590,588

APPARATUS FOR SUPPLYING A PREDETERMINED AMOUNT OF FOOD STUFFS

Kazunari Tomimatsu, Mie, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 2, 1995, Ser. No. 397,694
Claims priority, application Japan, Mar. 3, 1994, 6-032761; May 30, 1994, 6-115796
Int. Cl.[6] A47J *37/10*
U.S. Cl. 99—423 **5 Claims**



1. A fixed quantity supply apparatus for supplying a predetermined amount of cooking materials to a cooking plate, comprising:
a material storage having a box shape,
a material supply path situated in the material storage and having an exit port, and
a pair of conveyer belts provided in a meandering state in the material storage to define the material supply path therebetween, said conveyor belts synchronously running along both sides of the material supply path, said conveyer belts being moved for a predetermined pitch so that the cooking materials filled in the material supply path between the belts are sent out through the exit port of the material supply path whenever a supply command is made.

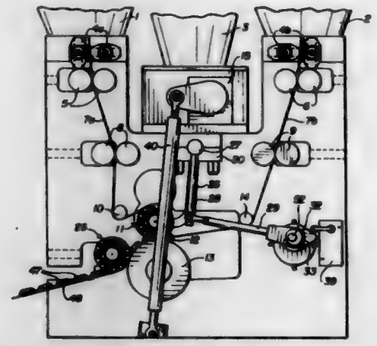
5,590,589

APPARATUS FOR PRODUCING SPECIALTY RAVIOLI CONFIGURATIONS

John Battaglia, 78 McKinley St., Hackensack, N.J. 07601

Filed Jan. 5, 1996, Ser. No. 583,681
Int. Cl.[6] A21C *9/00*; A23P *1/00*
U.S. Cl. 99—450.7 **4 Claims**

1. An apparatus for making specialty ravioli comprising:



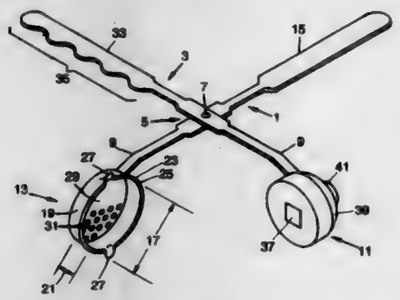
a filler material hopper and a pair of dough hoppers located one on each side of the filler hopper;
means for sheeting dough exiting from each dough hopper;
a female die-roll having a plurality of molds for forming the hoop-style ravioli, each mold comprising a raised outer wall, a base portion extending therefrom and a raised inner wall at the end of the base portion forming a raised island;
a drum roll in juxtaposition with the die roll and spacially oriented to be displaced vertically from the die roll;
means feeding a first dough sheet into a nip formed by the die roll and the drum roll, said first dough sheet being fed into the nip after passing over the die roll to form an oval dough lined cavity with a central aperture;
fill means for feed a filler material from the filler hopper into the dough lined cavity formed in the die roll, said means comprising a paired feed tube arrangement which pivots into the die on both sides of each raised island; and,
means for feeding a second dough sheet into the nip to seal the first and second dough sheets together by passing the sheets through the nip.

5,590,590

IMPLEMENT FOR SEPARATING THE LIQUID MEDIUM FROM THE SOLID CONTENTS OF CANNED FOODSTUFFS

Edward Zammit, 40 Jefferson St., Apt. 7E, Hackensack, N.J. 07601, assignor to Edward Zammit, Hackensack, N.J.

Filed Feb. 23, 1996, Ser. No. 606,062
Int. Cl.[6] A47J *19/06*; B30B *7/00;9/04;9/06*
U.S. Cl. 99—495 **11 Claims**



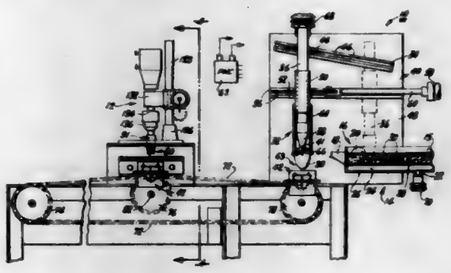
1. An implement for separating the liquid medium from the solid contents of canned foodstuffs comprising:
a first arm and a second arm pivotally connected together at a hinge member;
said first arm terminating at a first end thereof in a handle means, and terminating at a second end thereof in a can receptacle means;
said second arm terminating at a first end thereof in a handle means;
wherein said handle means of said first and second arms are formed into oppositely extending, cooperating handle means;
said second arm terminating at a second end thereof in a compression plate, substantially alignable with said can receptacle means;
having a periphery sized to permit insertion into said can containing a solid foodstuff in a liquid medium, the lid of which has been opened by separation from said can;
said periphery also being sized to permit said liquid to escape from said can around said plate when said plate applies a compressive force on said solid contents by actuation of said cooperating handle means;
the thickness of said plate also being sized so that a portion thereof protrudes from the top of said can after insertion of said plate and compression of said solid contents of said can is completed, whereby said
protruding portion of said plate may be used to strike a solid surface, converting and communicating the force thus generated into a further compressive force on said solid contents of said can in order to separate additional amounts of said liquid medium.

5,590,591

PRODUCT PROCESSING APPARATUS INCLUDING ORIENTATION AND CORING OF PRODUCE ITEMS

Sun Y. Kim, 2384 Lancaster Ct., Hayward, Calif. 94543

Filed Apr. 18, 1996, Ser. No. 634,245
Int. Cl.[6] A23L *1/00*; A23N *4/12;4/22;15/02*
U.S. Cl. 99—544 **18 Claims**



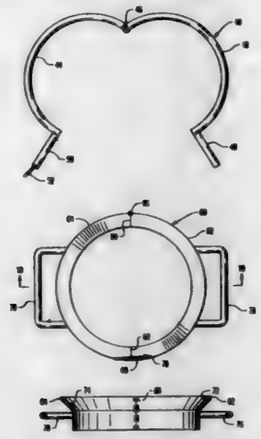
1. Produce processing apparatus for produce items having a calyx the processing apparatus comprising:
a.) a pickup station and a release station;
b.) produce feed means for conveying produce items having a calyx to the pickup station wherein individual produce items are located for pickup at the pickup station;
c.) vacuum means having a vacuum conduit with a vacuum orifice for engaging the calyx of an individual produce item located at the pickup station;
d.) displacement means for displacing the vacuum means between the pickup station wherein the vacuum orifice is positioned proximate an individual produce item when located at the pickup station; and
e.) vacuum control means for generating a vacuum in the vacuum conduit when the vacuum means is at the pickup station and breaking a generated vacuum in the vacuum conduit at the release station.

5,590,592

DEVICE FOR BANDING BRANCHES OF A PALM TREE

Gary Z. Irvin, 8665 Erie La., Parrish, Fla. 34219

Filed Dec. 14, 1995, Ser. No. 572,699
Int. Cl.[6] B65B *13/00*
U.S. Cl. 100—1 **12 Claims**



1. A device for temporarily inwardly compressing and banding branches of a palm tree comprising:

a split ring sized in circumference to be fitted around a trunk of the palm tree just below the branches;

means for securing said ring in a closed position when so fitted around the trunk;

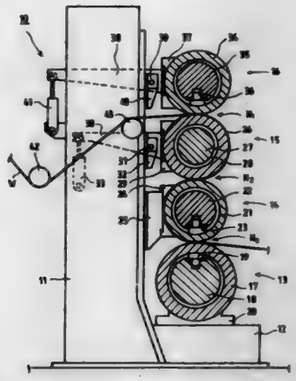
handle means connected and extending outwardly from said ring for grasping and manually forcibly urging said ring, when closed, upwardly to resiliently bend and gather the branches together in a bundle generally lengthwise to the trunk wherein the branches are temporarily secured by said ring during relocation of the palm tree.

5,590,593

MOUNTING ARRANGEMENT FOR CALENDAR ROLLS IN A CALENDER

Ville Korhonen, Jyväskylä; Timo Piirinen, Palokka, and Jorma Ranstedt, Vaajakoski, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Dec. 27, 1994, Ser. No. 364,120
Claims priority, application Finland, Dec. 29, 1993, 935912
Int. Cl.[6] D21G *1/00;* **B30B** *3/04*
U.S. Cl. 100—93 RP **17 Claims**



1. A calender for calendering a web, comprising

a calender frame,

a plurality of rolls stacked one above the other and mounted on said calender frame, said stack of rolls comprising at least four rolls each having a roll axle and situated such that the rolls of each pair of adjacent rolls are arrangeable in nip-defining relationship with each other to calender the web in said nip, said stack of rolls defining successively arranged first, second, third and fourth rolls whereby said first roll is the lowest roll of said at least four rolls in said stack of rolls, said at least four rolls comprising three variable-crown rolls and a heatable roll arranged between two of said three variable-crown rolls, said first roll said second roll and said fourth roll constituting said three variable-crown rolls and said third roll constituting said heatable roll, at least one of said three variable-crown rolls comprising a roll mantle rotatable around said roll axle and loading means arranged in said roll mantle for displacing said roll mantle relative to said roll axle in a direction of a plane containing a central axis of said roll axle and the nip defined in part by said at least one of said three variable-crown rolls,

means for fixedly mounting said axles of said first and second rolls on said calender frame to substantially prevent movement of said first and second rolls in a direction of a plane containing a respective central axis of said axles of said first and second rolls and the respective nip or nips defined in part by said first and second rolls, and

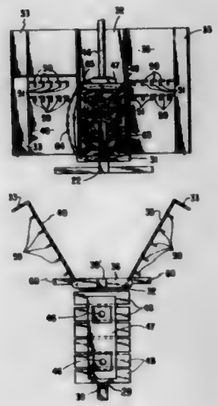
means for adjustably mounting said axles of said third and fourth rolls on said calender frame such that said axles of said third and fourth rolls are displaceable in a direction of a plane containing a respective central axis of said axles of said third and fourth rolls and the respective nip or nips defined in part by said third and fourth rolls.

5,590,594

TIRE BALING MACHINE

Les H. Pederson, 2602 W. Sixth St., Sioux City, Iowa 51103

Filed Aug. 31, 1995, Ser. No. 521,879
Int. Cl.[6] B30B *9/30*
U.S. Cl. 100—218 **11 Claims**



1. A baling machine comprising:

a base;

a first sidewall extending upward from a first side of said base;

an upright sidewall piece extending upward from a side of said base opposite to said first side, said upright sidewall piece forming at least part of a second sidewall opposite to said first sidewall, a front opening and a rear opening formed between the first sidewall and the second sidewall;

a front closure means and a rear closure means for closing the front opening and the rear opening between said first sidewall and said second sidewall, the front closure means and the rear closure means each including a main closure portion and a wing closure portion which extends transversely to the main closure portion, the two wing portions contacting the upright sidewall piece when the front closure means and the rear closure means are closed to complete the formation of the second sidewall, and thus forming a baling chamber;

vertical upright members on said base and extending upward therefrom;

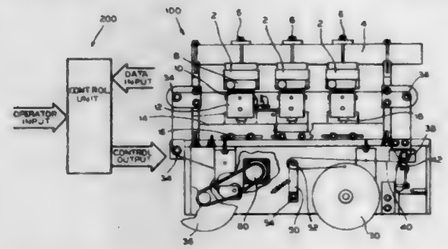
press means mounted on said upright members and including a pressure plate adapted to be moved by said press means inside said baling chamber to compress any material placed within said chamber.

5,590,595

METHOD AND APPARATUS FOR MULTI-PRINTHEAD INTERMITTENT MOTION IMPRINTING

James A. Thompson, Downers Grove; Charles R. Barczak, Justice, and Arthur D. Jezuit, Wood Dale, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Jul. 26, 1995, Ser. No. 507,764
Int. Cl.[6] B31F *1/07*
U.S. Cl. 101—10 **22 Claims**



1. A hot stamp imprinter, for imprinting ink from a print ribbon onto a substrate, comprising:

a plurality of printhead assemblies mounted upon a frame wherein each printhead has a heater element;

a plurality of backup assemblies mounted upon said frame and respectively corresponding to each one of said printhead assemblies wherein each one of said backup assemblies includes an air cylinder and a slider block operated by compressed air;

valve means fluidically connected to said air cylinders of said plurality of backup assemblies for conducting compressed air into and out of each one of said air cylinders such that said plurality of backup assemblies are movable toward said printhead assemblies from a rest position to an imprint position so as to transfer ink from a print ribbon onto a substrate when compressed air is conducted into said air cylinders, and said backup assemblies are movable from said imprint position to said rest position when compressed air is conducted out from said air cylinders; and

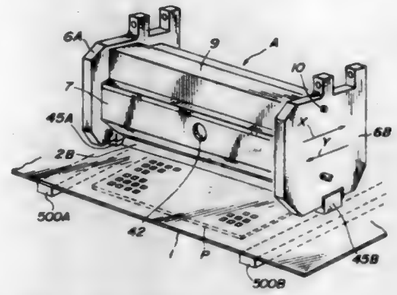
means selectively actuating said valve means in series and parallel modes for regulating the pressure of said compressed air, supplied to said backup assemblies through said valve means, so as to move said backup assemblies from said rest position to said imprint position in accordance with said regulated pressure so as to properly cause transfer of said ink from said print ribbon onto said substrate.

5,590,596

PRINTER SYSTEM FOR PRINTING CIRCUIT PATTERNS OR LIKE ON BASE BOARD

Okie Tani, Tokyo, and Takashi Nanzai, Fujisawa, both of Japan, assignors to Tani Electronics Industry, Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 237,364, May 3, 1994, Pat. No. 5,483,879. This application Aug. 31, 1995, Ser. No. 522,111
Claims priority, application Japan, May 12, 1993, 5-145326
Int. Cl.[6] B41F *15/42*
U.S. Cl. 101—123 **20 Claims**



1. A printer system comprising:

a base board;

a screen plate positioned above said base board;

a viscous conductive ink which is to be applied onto said screen plate to print a given pattern of the ink on said base board;

a printer device which moves horizontally on said screen plate to apply said viscous conductive ink onto said screen plate, said printer device including two spaced side walls;

two stationary parallel rails extending horizontally to respectively support, through said screen plate, said side walls of said printer device during the horizontal movement of said printer device, said screen plate being tightly placed on said rails; and

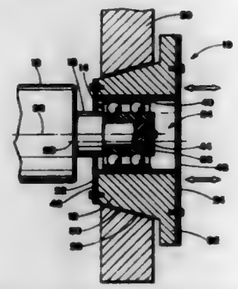
supporting means for stationarily supporting said base board under said screen plate.

5,590,597

TAPERED BEARING HOUSING SLEEVES

Frank A. Balow, Western Springs, Ill., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 8, 1995, Ser. No. 525,878
Int. Cl.[6] B41F *13/20;13/28*
U.S. Cl. 101—216 **11 Claims**



1. In a mounting apparatus for a printing cylinder in a printing press the improvement comprising: a tapered bearing housing sleeve adapted for axial insertion into, and retraction out of, a tapered bore formed in a support frame for the printing cylinder,

the tapered bearing housing sleeve having an outer circumferential surface that is generally conically shaped forming only part of a cone and an inner core that has a cylindrically shaped bore disposed therein, wherein the cone defining the outer circumferential surface of the bearing housing sleeve and the cylinder defining the bore are eccentric.

5,590,598

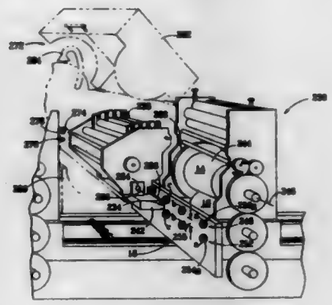
HORIZONTAL SHEET TRANSFER MULTIPLE COLOR OFFSET ROTARY PRINTING PRESS WITH HORIZONTAL SLIDE ACCESS

James J. Keller, 2410 E. Lenora St., Mesa, Ariz. 85213

Continuation-in-part of Ser. No. 205,288, Mar. 1, 1994, Pat. No. 5,477,780, which is a continuation-in-part of Ser. No. 33,313, Mar. 15, 1993, Pat. No. 5,289,768, which is a continuation-in-part of Ser. No. 902,875, Jun. 23, 1992, Pat. No. 5,193,458. This application Dec. 22, 1995, Ser. No. 577,124

Int. Cl.[6] B41F *1/34*

U.S. Cl. 101—479 **11 Claims**



1. A horizontal slide mechanism for removably replacing an inking unit set in a rotary offset printing press of the type having a plate cylinder, a blanket cylinder and an impression cylinder having parallel rotational axes; said horizontal slide mechanism comprising:

(a) a guide track rigidly mounted to said printing press adjacent and parallel to said plate, blanket and impression cylinders;

(b) a slide plate, supported in said guide track for guided movement parallel to said plate, blanket and impression cylinder transverse to the printing press;

(c) a pivot mount attached to said slide plate and pivotably attached to said inking unit, said pivot mount on said slide plate providing a single pivot axis parallel to said rotational axes of said plate, blanket and impression cylinders, and positioned spaced apart from said plate cylinder for pivoting said inking unit between a first and second pivot position with said first pivot position corresponding to inking engagement with said plate cylinder, and said second pivot position corresponding to a spaced apart disengaged position, at which said inking unit is not in operational engagement with said plate cylinder; and

(d) a latching mechanism by which said inking unit is releasably held and locked in said first position corresponding to inking engagement.

5,590,599

METHOD FOR REGULATING INK DISTRIBUTION IN A PRINTING MACHINE

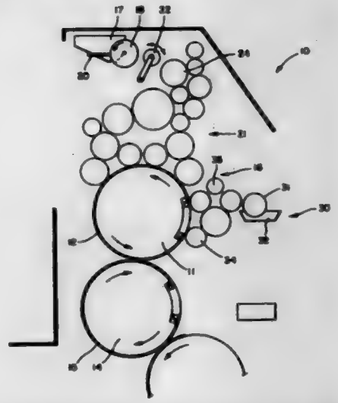
Joachim Muller, Pullach, and Rolf Braun, Offenbach, both of Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Oct. 13, 1995, Ser. No. 543,222

Claims priority, application Germany, Oct. 15, 1994, 44 36 953.0

Int. Cl.[6] B41F *31/04;31/14*

U.S. Cl. 101—483 **8 Claims**



1. A method for regulating ink distribution to a printing plate in a printing machine for a particular print order, the printing machine having an inking unit comprising an ink fountain, an ink fountain roller fluidically communicating with said ink fountain, whereby an ink film is generated on the ink fountain roller, a plurality of inking rollers for conveying ink from said ink fountain to said printing plate said ink fountain and said ink fountain roller having a plurality of adjustable ink metering elements disposed zonally along the width of said ink fountain for regulating the respective amounts of ink fed to individual respective printing zones across the width of the printing plate, said inking unit including means for transferring ink from said ink fountain roller to said plurality of inking rollers, at least one of said inking rollers being engageable with said printing plate, the machine including means for throwing said one inking roller onto and off of said printing plate and including means for driving said ink fountain roller and said inking rollers in the absence of continuous printing when said one inking roller is thrown off of the printing plate, the method comprising the steps of:

determining a compensating ink film thickness for said inking rollers to satisfy the inking requirements for said particular print order, said compensating ink film thickness being independent of the zonal ink requirements of the printing plate for said particular print order and corresponding to an ink film thickness necessary to produce a basic ink quantity equal to the total amount of ink continuously present in the printing unit during printing to satisfy the inking requirements for said particular print order after ink transport in said inking unit has reached a steady state printing condition;

adjusting each of said ink metering elements in accordance with said corresponding compensating ink film thickness; and

feeding ink to said inking rollers until the thickness of said ink on each of said inking rollers is substantially equal to said compensating ink film thickness while said one inking roller is thrown off of said printing plate;

wherein said compensating ink film thickness is determined by the steps of:

throwing said one inking roller off of said printing plate after ink transport in said inking unit has reached a steady state printing condition;

allowing the ink film thickness on each inking roller to equilibrate; and

measuring said equilibrated ink film thickness to thereby determine said compensating ink film thickness.

5,590,600

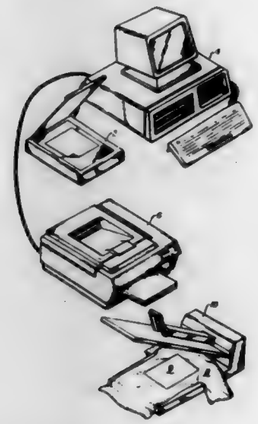
PERMANENT HEAT ACTIVATED ELECTROGRAPHIC PRINTING PROCESS AND COMPOSITION

Nathan Hale, and Ming Xu, both of Mt. Pleasant, S.C., assignors to Sawgrass Systems, Inc., Mt. Pleasant, S.C.

Division of Ser. No. 372,520, Jan. 13, 1995, which is a continuation-in-part of Ser. No. 299,736, Sep. 1, 1994, Pat. No. 5,488,907, which is a continuation-in-part of Ser. No. 195,851, Feb. 10, 1994, Pat. No. 5,431,501, which is a continuation-in-part of Ser. No. 724,610, Jul. 2, 1991, Pat. No. 5,302,223, which is a continuation-in-part of Ser. No. 549,680, Jul. 9, 1990, abandoned. This application May 29, 1996, Ser. No. 654,634

Int. Cl.[6] B41L *35/14*

U.S. Cl. 101—488 **8 Claims**



1. A method of printing a multiple color image by means of an electrographic device using heat activated dyes, comprising the steps of:

a. printing a full color image by means of an electrographic device, using heat activated dyes in at least three colors, onto a medium to form a full color image on said medium, wherein said printing of said full color image on said medium occurs at a temperature which is below the temperature at which said heat activated dyes activate;

b. applying mechanical means to said full color image which binds said full color image to said medium without activating a substantial portion of said heat activated dyes, wherein said mechanical means is part of said electrographic device;

c. removing said medium from said electrographic device; and

d. transferring said full color image from said medium to an object on which the image is to appear at a location which is remote from said electrographic device by the application of heat at a temperature which is above the temperature at which said heat activated dyes activate, so as to cause said heat activated dyes to transfer onto said object.

5,590,601

TRACK WORKING MACHINE

Josef Theurer, Vienna, and Herbert Wörgötter, Gallneukirchen, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 21, 1995, Ser. No. 576,154

Claims priority, application Austria, Jan. 3, 1995, A 8/95

Int. Cl.[6] E01B *29/00*

U.S. Cl. 104—2 **9 Claims**



1. A track working machine; comprising:

a machine frame extending in longitudinal direction along a track and supported by undercarriages for mobility in an operating direction along the track, said machine frame exhibiting a first work section situated between two undercarriages and a second work section immediately trailing the first work section in the longitudinal direction; and

a self-propelled transport unit traveling along guide rails that are mounted to the machine frame and extend in the longitudinal direction;

said machine frame being formed in the area of the first work section essentially by two parallel beams extending in the longitudinal direction and spaced transversely to the machine, and by a traverse heading positioned above the guide rails for connecting the parallel beams to one another, thereby providing the machine frame with a tunnel-like configuration for allowing said transport unit to move from the second work section underneath the traverse heading into the first work section while providing the machine frame with a sufficient stiffness.

5,590,602

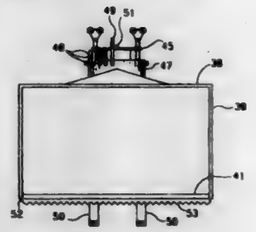
ARTICLE CARRIER FOR CONVEYOR SYSTEM

Richard O. Peck, Lakewood; Gary M. Pageau, Englewood; Colin B. Williams, Denver, all of Colo.; John T. Allen, San Diego, Calif.; Bernard G. Wickersham, Parker, Colo.; Leonard C. Bisgrove, Evergreen, Colo., and Bruce D. Sellers, Aurora, Colo., assignors to The Titan Corporation, San Diego, Calif.

Division of Ser. No. 33,392, Mar. 19, 1993, Pat. No. 5,396,974. This application Dec. 30, 1994, Ser. No. 366,838

Int. Cl.[6] B61B *3/00*

U.S. Cl. 104—88.01 **9 Claims**



1. An article carrier adapted for transport by an overhead conveyor having a track, the carrier comprising

a trolley adapted to ride on the conveyor track and coupled to the article carrier in such a manner as to rotatably suspend the article carrier;

a collar attached to the top of the article carrier, wherein the collar is rotatable in relation to the trolley and non-rotatable in relation to the article carrier; and

a series of pins attached to the collar, which pins are oriented so as to be vertically extended when the article carrier is suspended from the conveyor, wherein the pins are adapted to engage reorienting means disposed in relation to the conveyor track such that as the article carrier is being transported by the conveyor the pins are sequentially engaged by the reorienting means to rotate the article carrier.

5,590,603

TRANSPORTATION SYSTEM INCLUDING ELEVATED GUIDEWAY

VanMetre Lund, Northbrook, Ill., assignor to Autran Corp., Northbrook, Ill.

Filed Jun. 7, 1995, Ser. No. 477,182
Int. Cl.[6] B61L *3/18*
U.S. Cl. 104—88.04 **18 Claims**



1. A transportation system, comprising: a plurality of carrier vehicles, a guideway for guiding said carrier vehicles for movement therealong and having stop positions therealong, drive means carried by said carrier vehicles for coaction with said guideway for effecting movement of said carrier vehicles along said guideway, and control means for controlling said drive means to effect movement of each of said carrier vehicles from any one of said stop positions to another of said stop positions, said guideway being of generally tubular form and including a pair of side wall portions and a pair of upper wall portions extending inwardly from upper ends of said side wall portions and to ends in transversely spaced relation to define a narrow slot, support post means projecting upwardly from each of said carrier vehicles and through said narrow slot for supporting a load to be carried therefrom, wheel means on each of said carrier vehicles, and track means supported within said guideway for supporting said wheel means of said carrier vehicles, said wheel means including front and rear pairs of lower wheels and front and rear pairs of upper wheels, and said track means including a pair of lower tracks for underlying and supporting said lower wheels and a pair of upper tracks for engagement by said upper wheels to restrict upward and rocking movements of said carrier vehicle, and said carrier vehicle including means for urging said upper wheels upwardly into pressure engagement with said upper tracks.

5,590,604

TRANSPORTATION SYSTEM WITH HIGH SPEED VEHICLES AND AUTOMATIC CONTROL

VanMetre Lund, Northbrook, Ill., assignor to Autran Corp., Northbrook, Ill.

Filed Jun. 7, 1995, Ser. No. 481,771
Int. Cl.[6] B61L *3/18*
U.S. Cl. 104—88.04 **36 Claims**



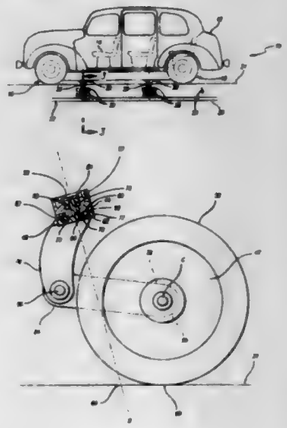
1. A transportation system, comprising: a plurality of carrier vehicles, a guideway for guiding said carrier vehicles for movement therealong and having stop positions therealong, means for supporting a load on each of said carrier vehicles, drive means carried by said carrier vehicles for coaction with said guideway for effecting movement of said carrier vehicles along said guideway, and control means for controlling said drive means to effect movement of each of said carrier vehicles from one of said stop positions to another of said stop positions, said guideway including right and left lower tracks and right and left upper tracks, and each of said carrier vehicles including a main frame, and front and rear bogies including front and rear frames connected to said main frame for pivotal movement of said front and rear bogies about front and rear vertical turn axes, each of said front and rear bogies including right and left lower wheels, lower bearing support means journaling said right and left lower wheels from said frame thereof for engagement with said lower tracks, right and left upper wheels, upper bearing support means journaling said right and left upper wheels from said frame thereof for engagement with said right and left upper tracks, and spring means supported on said frame thereof and acting to apply forces on said upper bearing support means to urge said right and left upper wheels into pressure engagement with said upper tracks.

5,590,605

CONVEYING DEVICE WITH SELF STEERING POWERED CASTER

Kenneth D. Salter, Glendale; Daniel A. Armstrong, Simi Valley, and Ted W. Fredrick, Saugus, all of Calif., assignors to The Walt Disney Company, Burbank, Calif.

Filed Nov. 20, 1995, Ser. No. 560,828
Int. Cl.[6] B61F *13/00;* **B61B** *12/02*
U.S. Cl. 104—139 **28 Claims**



1. A transport system for moving along a track on a support surface, comprising:

a body;

a guide system mounted to the body for cooperation with the track to apply lateral forces to the body to guide it along a predetermined path when a driving force is applied to the body; and

a powered self-steering caster assembly mounted to the body and having a pivot joint and a wheel,

the wheel rotatably mounted to the caster assembly and engaging the support surface, the wheel powered by a motor to roll the wheel about a center of rotation in a forward direction along the support surface, and

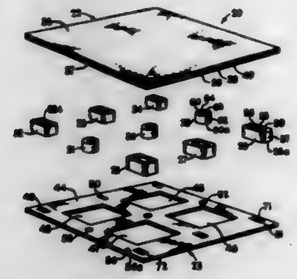
the pivot joint mounted for rotation of the wheel about a predetermined axis intersecting the support surface in front of the engagement between the wheel and the support surface to allow the wheel to rotate about the axis in response to frictional side slip forces between the wheel and the support surface, the wheel free of restraint from a steering linkage actively controlling the position of the wheel in response to the direction of the track.

5,590,606

SHIPPING PLATFORM APPARATUS

Mitchell S. Crews, Geneva; Wayne H. Kuhn, Palos Park, and M. Scott Bryll, Burbank, all of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Continuation of Ser. No. 876,572, Apr. 30, 1992, Pat. No. 5,388,531, which is a continuation of Ser. No. 634,426, Dec. 27, 1990, abandoned. This application Oct. 20, 1994, Ser. No. 326,544
Int. Cl.[6] B65D *19/00*
U.S. Cl. 108—51.3 **17 Claims**



1. A substantially recyclable shipping platform apparatus for supporting and transporting loads by conventional tined material handling devices, which apparatus is easily disposable and substantially recyclable after use, said shipping platform apparatus comprising:

substantially flat planar load-bearing platform means for supporting said load,

said platform means formed of a substantially paper material and having a top surface and a bottom surface opposite said top surface, wherein said load is capable of resting upon said top surface during the storage and transporting of said load;

substantially flat planar bottom panel means positioned substantially parallel to, and distally spaced below said platform means, for supporting and bearing the weight of both said platform means and said load,

said bottom panel means formed of a substantially paper material and having a top surface and a bottom surface opposite said top surface;

one or more tubular shaped pylon means formed of elements independent from said platform means and said bottom panel means, each of said pylon means being operably positioned between said platform means and said bottom panel means so as to facilitate the insertion, maintenance and removal of the tines of said conventional tined material handling devices therebetween,

each of said tubular shaped pylon means having a top end and a bottom end opposite said top end, an outer surface, and an interior region having an inner surface,

said top end of at least one of said tubular shaped pylon means being operably secured substantially adjacent to said bottom surface of said platform means, and said bottom end of said at least one of said pylon means being operably secured substantially adjacent to said top surface of said bottom panel means; and

pylon top attachment means for operably securing said top end of said at least one said tubular shaped pylon means adjacent to said bottom surface of said platform means and pylon bottom attachment means for operably securing said bottom end of said at least one said tubular shaped pylon means adjacent to said top surface of said bottom panel means,

said pylon bottom attachment means having a reinforced construction relative to the construction of said respective said pylon top attachment means so as to controllably provide for greater resistance to shear and torquing forces applied against said at least one tubular shaped pylon means, than the resistance of said pylon top attachment means to said forces;

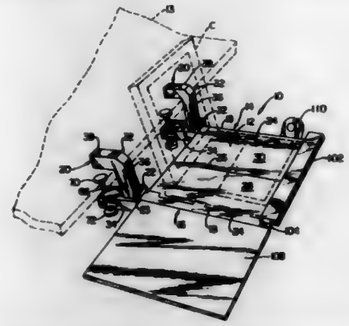
said greater resistance against said substantial shear and torquing forces of said pylon bottom attachment means controllably inducing failure of said pylon top attachment means before failure of said pylon bottom attachment means upon exposure to said forces, to preclude against the inadvertent cantilevering and collapse of said platform means and said supported load, relative to said bottom panel means.

5,590,607

PORTABLE SHELF FOR NOTEBOOK COMPUTERS

Thomas E. Howard, 4730 Nelson St., Wheat Ridge, Colo. 80033

Filed Sep. 1, 1994, Ser. No. 299,832
Int. Cl.[6] A47B *57/00*
U.S. Cl. 108—98 **39 Claims**



1. A portable shelf apparatus for releasably suspending a notebook computer from a stationary body, comprising:

a substantially flat support member for supporting said notebook computer; and

at least one hanger extending from an edge of said support member including cantilever suspension means for releasably engaging said stationary body for downward inclination of said support member from a point beneath said edge at a predetermined angle away from said stationary body, said suspension means including an upper suspension member and a lower stabilizer member with an elongated member slidable therein in vertically spaced confronting relation to one another and defining the only suspension members for suspension of said support member from and beneath said edge of said stationary body so as not to interfere with a computer user's legs in assuming a typing position with the legs extending beneath said support member.

5,590,608

LOCKABLE LOCK BOX MOUNTING ASSEMBLY AND METHOD

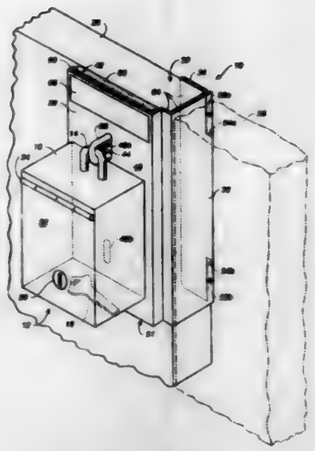
Thomas S. Yore, 5133 Adair Way, San Jose, Calif. 95124, and Jeffrey M. Wright, 1140 Littleoak Dr., San Jose, Calif. 95129

Continuation-in-part of Ser. No. 154,708, Nov. 19, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 407,643
Int. Cl.[6] E05G *1/00*
U.S. Cl. 109—59 **37 Claims**

1. A lock box mounting bracket comprising:

at least one U-shaped bracket formed for mounting to a hinge-edge of a door between said door and a door jamb, said U-shaped bracket including an outer leg portion, an inner leg portion and a central portion connecting said outer leg portion and said inner leg portion and formed to extend through a reveal space between said hinge-edge of said door and said door jamb when said door is in a closed position,

said outer leg portion having a lock box mounting eye-defining structure extending outwardly therefrom, said eye-defining



structure having an opening therein dimensioned to receive a lock box shackle member therethrough for coupling of a lock box to said bracket, and

said bracket further being formed with a hinge-receiving structure extending vertically and opening to an edge of said bracket, said hinge-receiving structure being dimensioned for slidable mounting over an edge of a door hinge, and said bracket and said hinge-receiving structure being further formed for opening of said door while said bracket is mounted on said door hinge.

5,590,609

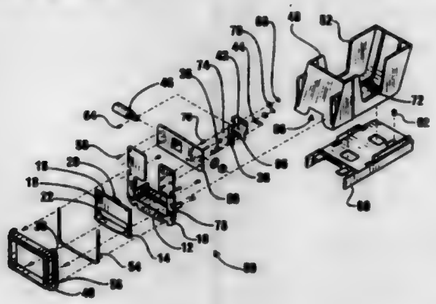
ENVELOPE DISPENSER DOOR MECHANISM FOR AUTOMATED TELLER MACHINE

Natarajan Ramachandran, Uniontown; Kim R. Lewis, Stow, and Richard C. Lute, Jr., Mogadore, all of Ohio, assignors to InterBold, North Canton, Ohio

Filed Sep. 30, 1994, Ser. No. 316,703

Int. Cl.[6] E05G *1/04*

U.S. Cl. 109—59 R **35 Claims**



1. An apparatus for an automated banking machine comprising:

a frame supported on said machine;

a door movably mounted on said frame, said door movable in a longitudinal direction between a first position and a second position, the door having a first face, said first face having a slot thereon, said slot generally extending in a plane parallel to said longitudinal direction, said slot including a first notch portion generally extending in said plane and in a transverse direction relative to the longitudinal direction, and a second notch portion generally extending in said plane and in said transverse direction, said second notch portion disposed in said longitudinal direction from the first notch portion, said slot further comprising a central portion generally extending in said plane between said first and second notch portions;

a first member engaged in said slot;

an actuator in operative connection with said first member, wherein said actuator is operable to selectively move said first member engaged in said slot in the transverse direction;

wherein in the first position of the door said first member is engageable in the first notch portion, and wherein in the second position of said door said first member is engageable in the second notch portion.

5,590,610

WASTE BURNING BOILER

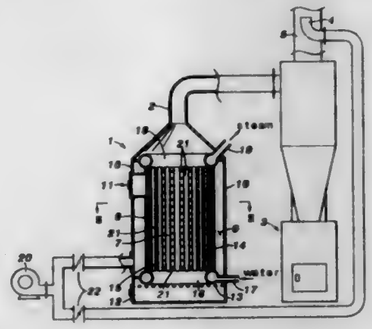
Yutaka Sanbonmatsu, 32-20 Negishidai 7-chome, Asaka-shi, Saitama-ken, Japan

Filed Sep. 30, 1994, Ser. No. 315,712

Claims priority, application Japan, Mar. 8, 1994, 6-065506; Mar. 8, 1994, 6-065507

Int. Cl.[6] F23B *7/00*

U.S. Cl. 110—234 **8 Claims**



1. A waste burning boiler, comprising:

a substantially enclosed outer wall;

a plurality of water pipes in a mutually spaced relationship extending between an inlet header and an outlet header inside said outer wall in the manner of a cage having an open top and an open bottom, and defining a combustion chamber therein and an annular chamber between said water pipes and said outer wall, the gaps between said water pipes being substantially closed by a plurality of plate members;

a fuel inlet provided in said outer wall so as to communicate with said combustion chamber for charging waste material to be burnt into said combustion chamber;

an exhaust outlet provided in said outer wall for expelling exhaust gas from said combustion chamber;

an ash outlet provided in a lower part of said outer wall for removing ash from said combustion chamber;

means for supplying pressurized air into said annular chamber, said means consisting of blower means;

means for injecting air conducted from said annular chamber into said combustion chamber from a plurality of nozzles;

water supply means for supplying water into said inlet header; and

steam delivery means for forwarding steam produced in said outlet header to an external user.

5,590,611

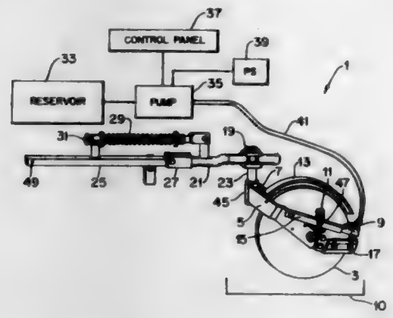
LIQUID FERTILIZER INJECTION SYSTEM

Casey P. Smith, 902 East Ave., Holdrege, Nebr. 68949

Filed Mar. 1, 1995, Ser. No. 397,412

Int. Cl.[6] A01C *23/00*

U.S. Cl. 111—127 **11 Claims**



1. A liquid fertilizer injection apparatus adapted to be connected to and towed by a propulsion vehicle for applying liquid fertilizer under pressure from a source carried by the vehicle to a furrow formed in the ground comprising:

a coulter blade assembly, including a coulter supporting bracket, a coulter blade mounted to said bracket for rotation about a central horizontal axis to form said furrow;

a tow arm having a forward end and a rearward end, said forward end adapted for connection to the tractor;

means on the rearward end of the tow arm for supporting the coulter blade assembly for rotation about a vertical axis, said means including a clamp mounted to the rearward end of the tow arm and a post mounted to said clamp; said coulter supporting bracket being mounted to said post and including a first support arm extending from said bracket for supporting said coulter blade for rotation about said central horizontal axis;

a bracket having a slot for adjustably positioning the height of a liquid fertilizer injection nozzle; said slotted bracket being mounted to said first support arm means for connecting said liquid fertilizer injection nozzle to the source of liquid fertilizer under pressure;

a second support arm, said second support arm having a first end, a second end and an intermediate section, said first end of said second support arm being pivotally connected to said first support arm, said nozzle being mounted to said second end of said second support arm;

and first means on the intermediate section of said second support arm positionable in said slot of the slotted bracket for adjustably positioning the height of said nozzle.

5,590,612

BAG MAKING MACHINE

Scott A. Brewer, 43029 Weyand Ct., Lancaster, Calif. 93534, and David E. Frye, 25464 Via Adorna, Valencia, Calif. 91355

Filed Jul. 31, 1995, Ser. No. 509,710

Int. Cl.[6] D05B *13/00*

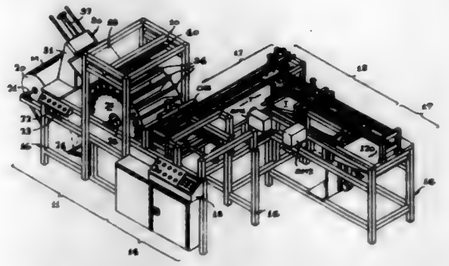
U.S. Cl. 112—10 **25 Claims**

1. A bag making machine for producing an open ended bag from a strip of bag material comprising;

supply means including a roll mandrel and means for supplying bag blank material;

means for forming successive folds of the bag blank material to define generally the finished bag size including one folded edge, an opening and two edges to be sewn;

means for successively cutting across the width of the bag blank material to define one edge of each bag blank;



means for transferring each successive folded bag blank from the cutting means to a sewing station;

a sewing head positioned along the first unsewn edge of each folded bag blank;

a pair of reciprocating carriages, one positioned at the sewing station before the sewing head and the second reciprocating carriage positioned beyond the sewing head;

means for actuating said reciprocating carriages to opposite positions with respect to said sewing head with the first reciprocating carriage carrying a bag blank and said second reciprocating carriage in a non-bag carrying condition whereby said first reciprocating carriage transports the bag blank through said sewing head to sew a first seam on said bag blank and said second reciprocating carriage is in position to receive the next bag blank for sewing of its first seam;

a third reciprocating carriage positioned for travel at a right angle with respect to the travel of said first and second reciprocating carriages;

means for grasping a bag blank after the sewing of the first seam after one of said first and second reciprocating carriages has transported a bag blank through said first sewing head;

a second sewing head; and

said third carriage transporting the folded, single seam sewn bag blank through said second sewing head to allow sewing of a second seam of the bag blank.

5,590,613

APPARATUS FOR FRAMING FABRIC IN EMBROIDERY HOOPS

Allan J. Head, 22 Webb Street, Wellington, New Zealand

PCT No. PCT/NZ93/00045, § 371 Date Jun. 8, 1995, § 102(e) Date Jun. 8, 1995, PCT Pub. No. WO94/13874, PCT Pub. Date Jun. 23, 1994

PCT Filed Jun. 1, 1993, Ser. No. 454,134

Claims priority, application New Zealand, Dec. 8, 1992, 245396

Int. Cl.[6] D05C *9/04*; D06C *3/08*

U.S. Cl. 112—103 **19 Claims**

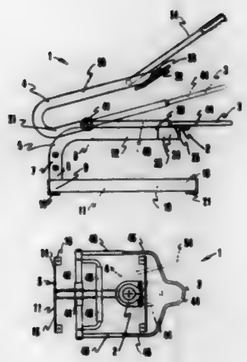
1. An apparatus for framing a portion of a fabric workpiece in an embroidery hoop, the apparatus comprising a hoop holder mount and a workpiece holder interconnected by way of a support frame, such that:

the hoop holder mount releasably mounts a hoop holder to the said apparatus, the hoop holder, when so mounted, being configured, positioned and arranged to be able to releasably locate a female portion of the embroidery hoop on the apparatus;

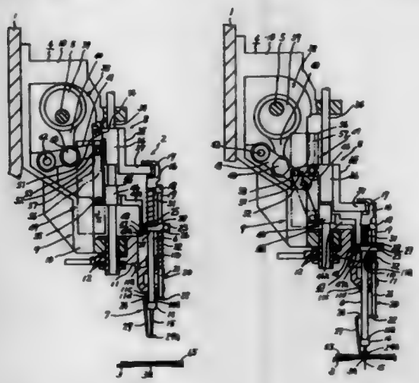
the support frame orients the workpiece holder and the hoop holder, when mounted to the apparatus, in a substantially common plane;

the workpiece holder is configured and arranged to be able to spread the fabric workpiece over the hoop holder when the hoop holder is mounted to the apparatus;

the apparatus being characterized by further comprising adjustment means, such that the hoop holder mount is fixed in position relative to the support frame, yet the position of the workpiece holder can be adjusted, using the adjustment means, to other positions in the substantially common plane.

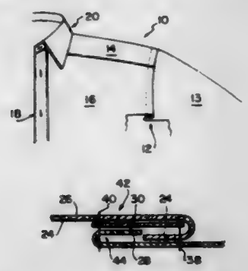


5,590,614
SEWING MACHINE
Yoshihiro Murata, Nagoya, and Masanori Shibata, Komaki, both of Japan, assignors to Kabushikikaisha Barudan, Japan
Filed Jul. 20, 1995, Ser. No. 504,872
Claims priority, application Japan, Jul. 20, 1994, 6-191133
Int. Cl.[6] D05B 29/00
U.S. Cl. 112—237 1 Claim



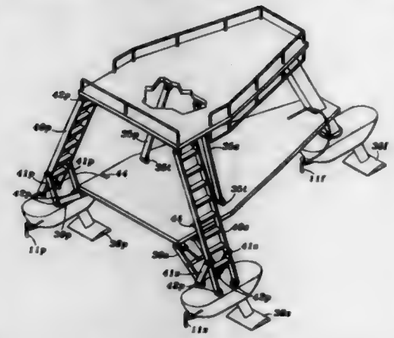
1. In a sewing machine having:
a bed for placing cloth;
a holding frame provided above said bed;
a needle bar installed in said holding frame for moving up and down and having a sewing needle attached at its lower end;
a presser foot holder installed in said holding frame for moving up and down, means for moving said presser foot holder downward, said presser foot holder having a presser foot attached to its lower end, said presser foot preventing the cloth from lifting up when the needle is pulled out of the cloth;
a retainer provided along said presser foot holder for moving up and down to retain said presser foot holder before the lower end of said presser foot touches the upper surface of the bed, said retainer having a cushion piece on its upper surface;
a driving mechanism for operating in synchronism with the up-and-down movement of said needle bar so that said retainer linked to the driving mechanism may reciprocate up and down in synchronism with the movement of said presser foot holder;
said presser foot holder being provided with an engaging portion for engaging with and separating from said retainer so that said retainer may cause said presser foot holder to move upward as said retainer moves upward under said engaging portion;
said needle bar provided with a lifting member for lifting said presser foot holder as said needle bar moves upward; and
said presser foot holder being provided with a contact member for engaging with said lifting member,
wherein said engaging portion of said presser foot holder is adapted to separate from said retainer when said needle bar moves upward to its upper limit with the aid of the engagement between said lifting member and contact member,
the improvement comprising:
said holding frame being provided with a stop member having a cushion piece attached on its upper surface so that the downward movement of said presser foot holder may be stopped when said retainer moves downward even when the cushion piece on the upper surface of said retainer is not present; and
said presser foot holder being provided with an abutting member for abutting against the upper surface of said stop member,
wherein said stop member and abutting member are relatively positioned in the vertical direction so that a clearance may be made for placing the cloth between the lower end of said presser foot and the upper surface of said bed when said abutting member abuts against said stop member.

5,590,615
PUCKER FREE GARMENT SEAM AND METHOD OF MANUFACTURE
John Wong, Cote St. Luc, Canada, assignor to TAL Apparel Ltd., Hong Kong, Hong Kong
Continuation of Ser. No. 245,122, May 17, 1994. This application Mar. 11, 1996, Ser. No. 613,656
Int. Cl.[6] D05B 1/18; A41O 27/10; B32B 7/08;7/12
U.S. Cl. 112—441 29 Claims



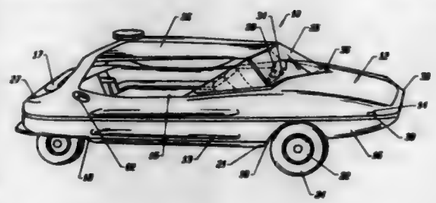
1. A method of manufacturing a pucker free garment seam between first and second garment components comprising the steps:
(a) providing a first garment component having an upper surface and a lower surface;
(b) providing a second garment component in a juxtaposed relationship with respect to the first garment component to be joined at a seam to the first garment component;
(c) providing a bonding element having an upper and lower surface and at least a thermal adhesive component and placing the bonding element along the seam formed by the positioning of the first garment component and the second garment component such that the lower surface of the bonding element contacts at the seam the upper surface of the first garment component;
(d) sewing a first set stitch along a side of the seam such that the first stitch traverses through the bonding element, the first garment component, and the second garment component; and
(e) folding the first garment component over the bonding element such that the upper surface of the first garment component is folded over and abuts an upper surface of the bonding element along the seam, the folded over portion of the first garment component is positioned such that it covers portions of the first stitch that protrude through the bonding element along its upper surface;
(f) sewing a second stitch running along a side of the seam opposite the first stitch such that the second stitch traverses through at least the folded over portion of the first garment component and the second garment component; and
(g) applying sufficient heat and pressure to the bonding element to cause the thermal adhesive to melt such that the adhesive flows onto the surfaces of at least the upper surface of the first garment component to provide a bond along the seam such that the bonded components will effectively reduce a tendency of the seam to pucker during laundering.

5,590,616
SURF-BOAT
Daniel Vera, 4322 Driftwood, Corpus Christi, Tex. 78411
Filed Jan. 6, 1995, Ser. No. 369,472
Int. Cl.[6] B63B 1/10
U.S. Cl. 114—61 7 Claims



1. A water going craft comprising:
(a) two generally triangular planer decks, being a lower deck, and an upper deck, each which have: top and under sides, leading and rear, port and starboard, sides and edges and leading and rear ends all respectively of an imaginary stem to stern centerline which extends from the center of the forward most part of the deck through the center of said rear edge of the decks being the rearward most part of the deck and an imaginary cross centerline which perpendicularly intersects and bisects the stem to stern centerline exactly midway between the front and rear ends of the decks and passes through the port and starboard edges of the decks the, said port and starboard sides of the craft being the portions of the craft to the left and right of said stem to stern centerline respectively, and wherein said triangular shaped decks are foreshortened whereby a flat front edge is created to be perpendicular to said stem to stern center line and port and starboard flat edges are created parallel to said stem to stern centerline;
(b) a first forward and a second and third port and starboard pontoons respectively wherein said pontoons have a top, top central area, bottom, rear edge, inboard side, and outboard side, inboard top edge, outboard top edge, wherein said inboard and outboard references relate to the deck so that an "inboard" reference refers to a pontoon side or edge or place closest to the deck's stem to stern centerline ,except for said forward pontoon wherein left and right designate inboard and outboard respectively; and
(c) five legs, each having relative length, width, tops, bottoms and midway points between the tops and bottoms, they are; one forward leg comprising a hollow column and four aft legs; said four aft legs, comprise a port pair of legs and a starboard pair of legs; each pair comprises one inboard leg and one outboard leg, said inboard legs being approximately half the length of said outboard legs; and
(d) one each port and starboard supporting struts; further comprising top and bottom ends, said struts are rigidly mounted to the rear edge of both said decks at a point between said decks' stem to stern centerline and extending from one to the other near the rear ends of said upper and lower decks respectively at or near said port and starboard flat edges, whereby when so mounted they support and hold the two decks apart; and
(e) port and starboard stiff bars comprised each of a pair of stiffening bars, said port and starboard stiff bars each are used to stiffen and hold the pontoons at an outwardly extended position by being attached adjacent to the inboard leg bottom pontoon inboard edge attaching point and to a pivot point on said
outboard leg between said outboard leg's midway point and its bottom, said decks each further comprise three leg mounting areas: a forward leg mounting area, a port aft leg mounting area and a starboard aft leg mounting area, wherein further the each of the aft said mounting areas and said forward edge have means for attaching said forward leg to said forward leg mounting area, and means for connecting the top of said outboard legs to said underside of said upper deck aft leg mounting areas and said inboard legs to said underside of said lower deck aft leg mounting areas; and
said upper deck leading end is attached to said forward leg between its midway point and the top of said forward leg and said said upper deck underside port and starboard aft mounting areas of said upper deck underside are attached to the tops of said outboard legs; and
said lower deck is attached to said forward leg at a point on said forward leg from said forward leg's midway point to its bottom and said lower deck's aft leg mounting areas are attached to the tops of said inboard legs;
said bottom of said forward leg is pivotally attached to the top central area of said forward pontoon, whereby said forward pontoon is steerable in a horizontal plane; and
said starboard outboard leg bottom is mounted near said outboard top edge of said starboard pontoon; and
said starboard inboard leg top being attached to said lower deck; said starboard inboard leg bottom is mounted near said inboard top edge of said starboard pontoon;
said port aft leg mounting areas of said upper and lower decks are attached to the remaining said port inboard and port outboard legs and the port pontoon in a mirror image of said starboard aft leg mounting areas to said starboard pontoons via said inboard and outboard legs.

5,590,617
AMPHIBIOUS VEHICLE
Gary M. Gere, Menlo Park; Russell L. Holder, Jr., Monterey; Louis J. Musetti, Seaside, and Ray Ramsey, Jr., Pebble Beach, all of Calif., assignors to Aquastrada International Corporation, Monterey, Calif.
Division of Ser. No. 384,461, Jan. 31, 1995, which is a continuation of Ser. No. 80,641, Jun. 21, 1993, abandoned, which is a continuation of Ser. No. 902,660, Jun. 23, 1992, abandoned. This application May 18, 1995, Ser. No. 444,110
Int. Cl.[6] B63B 35/00
U.S. Cl. 114—270 16 Claims



1. In an amphibious vehicle, the combination comprising:
(a) means for providing land motive force;

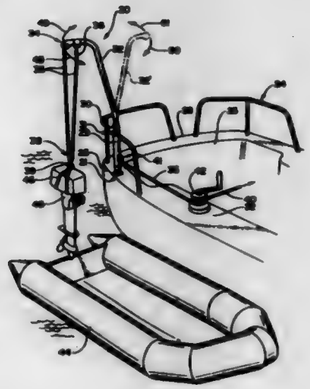
(b) means for providing marine motive force;
(c) an engine positioned within the vehicle and connected to provide power both to said land motive means and to said marine motive means;
(d) means operatively connected to said engine for directing engine power selectively to said land motive means and to said marine motive means;
(e) an engine management arrangement defining two or more sets of dependent relationships between various engine operating parameters, one of said sets determining engine operation when said engine power directing means directs said engine power to said land motive means and the other of said sets determining engine operation when said engine power directing means directs said engine power only to said marine motive means;
(f) a manually actuable switch positioned within said vehicle for activation by an operator of said vehicle for initiating shifting between land operation and marine operation; and
(g) means for sensing production of water pressure by said marine motive means, and wherein
said directing means is configured to direct said engine power to said marine motive means so long as said pressure sensing means detects the generation of an adequate amount of water pressure by said marine motive means for producing sufficient thrust to impart motion to said vehicle.

5,590,618

ROTATABLE TUBULAR METAL LIFTARM

Stephen R. Marshall, 20627 Mainland View La. NE., Sequamish, Wash. 98392

Continuation-in-part of Ser. No. 490,881, Jun. 14, 1995, abandoned, which is a continuation of Ser. No. 222,405, Apr. 4, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 573,483
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—343 **23 Claims**



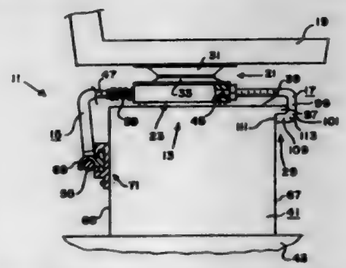
1. A cantilevered rotatable tubular metal liftarm assembly comprising, in combination:
a) a mounting socket and base assembly having a base plate and a tubular socket pivotably secured thereto for pivotal mounting about a horizontal axis, said base plate being fixedly securable to any suitable support surface;
b) a vertically extending mounting tube non-rotatably secured to said pivotable mounting socket, said mounting tube including:
i) a sheave box extending diametrically through said mounting tube adjacent the lower end thereof; and,
ii) a first inboard sheave journaled in said sheave box for rotation about a horizontal axis, said sheave projecting radially outward through and beyond said mounting tube;
c) means for clamping the upper end of said mounting tube to any suitable support structure for maintaining said mounting tube in a vertical position;
d) a tubular liftarm mounted in said mounting tube for rotation about a vertical axis, said tubular liftarm including:
i) a first lower linear portion for rotatable telescopic mounting within said mounting tube above said sheave box;
ii) a second cantilevered upper linear outboard portion having an outboard end; and,
iii) a third intermediate linear portion joined said first lower portion by smoothly curved regions;
said tubular liftarm being devoid of:
iv) internal sheaves and pulleys; and,
v) external supports, braces and struts for supporting said second cantilevered upper linear outboard portion of said tubular liftarm;
e) a fitting defining an outboard sheave assembly coupled to said outboard end of said second cantilevered upper linear outboard portion of said liftarm, said fitting having a second outboard sheave journaled therein for rotation about a horizontal axis;
f) a load line having free inboard and outboard ends, said free outboard end of said load line being secured to said cantilevered upper outboard portion of said liftarm, and said free inboard end of said load line being reeved:
i) through said outboard sheave assembly and about said second outboard sheave;
ii) through said upper, intermediate and lower portions of aid liftarm and through said mounting tube surrounding said lower portion of said liftarm; and,
iii) to and through said sheave box and about said first inboard sheave with said free inboard end of said load line extending laterally from said mounting tube and said sheave box projecting radially therefrom for attachment to any suitable winch;
whereby, the portion of said load line intermediate said free outboard end thereof which is secured to said second cantilevered upper outboard portion of said liftarm and said outboard sheave assembly defines a vertically oriented bight; and,
g) a sheave block containing a sheave journaled for rotation about a horizontal axis and a lift hook coupled to the lower end of said bight for raising and lowering loads as said load line is respectively paid in and out.

5,590,619

HOLDER FOR A BOAT SEAT CLAMP ASSEMBLY

Thomas R. Meador, 7876 Kirkwood Cove, Olive Branch, Miss. 38654, and Carl D. Gilmer, Jr., 782 Watson, Memphis, Tenn. 38111

Filed Aug. 21, 1995, Ser. No. 517,126
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—363 **9 Claims**



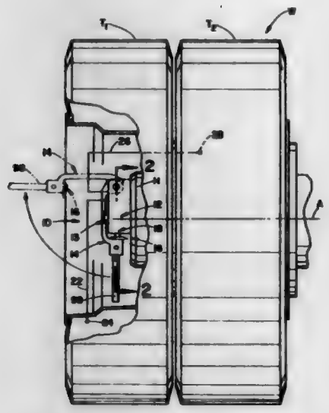
1. Holding means for use in holding a seat clamp assembly of the type including a first clamp having a first transverse arm onto a boat of the type including a transverse member having a top panel, and first and second spaced panels depending from said top panel, said holding means comprising:
(a) hook means for embracing said first transverse arm of said first clamp; and
(b) means for attaching to said hook means and for attaching to said first panel to prevent undesired separation of said first clamp from said first panel including:
i. a base member fixedly attached to said hook means,
ii. holder means having a slot for slidably receiving said base member, and
iii. attaching means for fixedly attaching said holder means to said first panel.

5,590,620

TIRE AIR PRESSURE WARNING DEVICE FOR WHEELED VEHICLES

Josef A. Bartos, Diamond Bar, Calif., assignor to Tire Inflation Systems Corp., Willoughby, Ohio

Filed Jan. 19, 1995, Ser. No. 375,582
Int. Cl.[6] B60C *23/02*
U.S. Cl. 116—34 R **46 Claims**



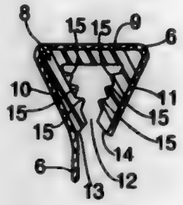
1. A tire air pressure warning device for first and second tires coaxially mounted on common hub means of a vehicle comprising, a housing for mounting on said hub means, first and second pressure sensing means in said housing respectively connected in flow communication with air under pressure in said first and second tires, first indicator means supported on said housing for displacement relative thereto between a stored position and an actuated position, said first indicator means in said actuated position indicating an unacceptable pressure in one of said first and second tires, means for displacing said first indicator means from said stored to said actuated position, said means for displacing being responsive to said first sensing means sensing an unacceptable pressure in said first tire as measured independently of the pressure in said second tire, said means for displacing also being responsive to said second sensing means sensing an unacceptable pressure in said second tire as measured independently of the pressure in said first tire, and second indicator means actuated in response to displacement of said first indicator means to said actuated position thereof for indicating the one of said first and second tires having an unacceptable pressure.

5,590,621

FUNERAL PROCESSION MOTORCADE SAFETY FLAG ASSEMBLY

Michael G. Sectish, 769 11th Ave., Paterson, N.J. 07514

Filed Aug. 14, 1995, Ser. No. 514,840
Int. Cl.[6] G09F *17/00*
U.S. Cl. 116—173 **16 Claims**



1. A funeral procession motorcade safety flag assembly comprising:
a fabric flag having a predetermined phrase thereon, said predetermined phrase identifying a motor vehicle in a motorcade as being in a funeral procession and requesting motorists not in said motorcade to not interfere with, or break into, said motorcade; and
an easy-on and easy-off snap-on holder having a length coextensive with the length of a predetermined edge of said fabric flag, said fabric flag having a portion adjacent said predetermined edge, said portion being bonded to said snap-on holder over the entire length of said fabric flag to detachably secure said fabric flag to an existing radio antenna of said motor vehicle in said motorcade and to properly display said predetermined phrase, said snap-on holder having a top surface, a bottom surface, an internal side surface, an external side surface, and a narrow opening extending from the external side surface to the internal side surface for permitting the antenna to be received therethrough, said internal side surface for securing said antenna therein, and said external side surface for engaging said fabric flag, said portion of said fabric flag completely covering said snap-on holder except for the top surface, the bottom surface, and the internal side surface, wherein when said snap-on holder is secured to said antenna, said snap-on holder completely covers said antenna the entire length of said snap-on holder except for at the narrow opening.

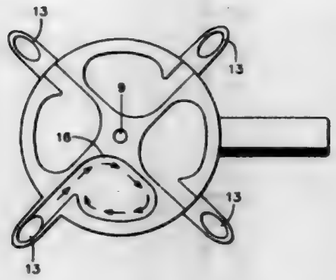
5,590,622

CLAW OF A MILKING MACHINE

Allan W. Wilson, and Jim F. Pharoah, both of Hamilton, New Zealand, assignors to Carter Holt Harvey Plastic Products Group Limited, Hamilton, New Zealand

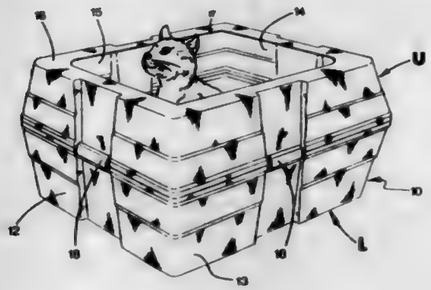
PCT No. PCT/NZ93/00034, § 371 Date Feb. 14, 1995, § 102(e) Date Feb. 14, 1995, PCT Pub. No. WO93/22901, PCT Pub. Date Nov. 25, 1993
PCT Filed May 6, 1993, Ser. No. 335,765
Claims priority, application New Zealand, May 11, 1992, 242686
Int. Cl.[6] A01J *5/00*
U.S. Cl. 119—14.54 **17 Claims**

1. A claw for use in a milking system, said claw comprising:
a claw bowl member defining a sump having a claw milk line outlet; and
a claw body member engageable with said claw bowl member and having an outer peripheral wall to define together with said sump a chamber, said claw body member having (i) four claw milk nipples extending from said peripheral wall, each providing an inlet to allow in use a stream of milk from each respective inlet inwardly into said chamber and (ii) surface defining means that partitions said chamber at least in part down in to said sump so as to isolate each stream from the



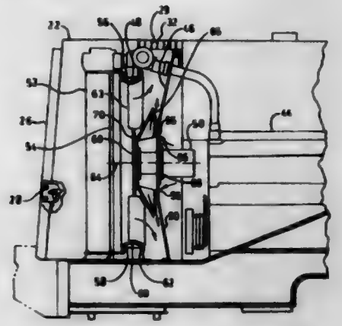
others at least substantially until pooling of milk occurs in said sump, said surface defining means nevertheless being so constructed and arranged to extend inwardly of the outer peripheral wall of said claw body member to define for each inlet stream a dedicated substantially straight and vertically arranged, radially extending surface onto which it can impinge in substantially a parallel manner, there being a continuation of each such surface that will provide a substantially non-turbulent milk flow locus that curves substantially only after reaching a position proximate to a radially central axis of the chamber, thereafter curving down onto an inside surface of said bowl member or the milk surface whichever in use is the higher.

5,590,623
CAT LITTER BOX
Robert D. Toole, and Anne-Melissa Rose, both of P.O. Box 24111, Ontario, Canada
Filed Apr. 13, 1995, Ser. No. 420,874
Int. Cl.[6] A01K *1/035*
U.S. Cl. 119—165 **14 Claims**



1. An improved cat litter box comprising:
a solid bottom wall molded with continuous side walls extending generally vertically upwardly from side edges of said bottom wall,
a peripheral lip projecting generally horizontally inwardly from the top edge of said side walls to define an opening for providing access to an interior of the box defined by said side walls and said bottom wall,
said side walls defining a width, a length, and a height of the box, said height of the box being more than one-half of the length of the box and being more than three-quarters of the width of the box, the height of the box being at least about 12 inches whereby an adult domestic cat can enter the interior of the box substantially only by jumping thereinto over said lip, and litter and excreta are retained in the box.

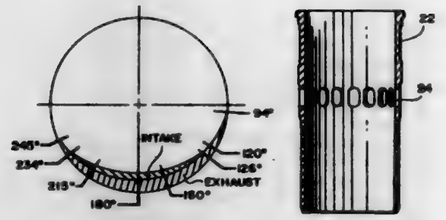
5,590,624
ENGINE COOLING SYSTEMS
Jean P. Emond, Plancenoit, Belgium, and Robert G. Saville, Lacon, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Mar. 31, 1995, Ser. No. 414,261
Int. Cl.[6] F01P *7/10*
U.S. Cl. 123—41.49 **7 Claims**



1. An engine cooling system arrangement for use with construction machinery to reduce noise, comprising:
an engine compartment adapted for enclosing an engine therein;
a cooling system compartment disposed adjacent to said engine compartment;
a noise barrier disposed between said engine compartment and said cooling system compartment, said noise barrier having a second peripheral portion extending outward of a third central portion;
said cooling system compartment including a first inlet in communication with a source of cooling air, a second inlet in communication with engine compartment air from said engine compartment and an outlet for exhausting the cooling air and the engine compartment air from said cooling system compartment;
a heat exchanger disposed in said cooling system compartment;
a fan disposed between said heat exchanger and said noise barrier, said fan being an axial flow fan, said axial flow fan having a first number of blades extending outward of a first central portion and imparting an axial velocity component to the flow of cooling air; and
a diffuser having a first peripheral portion extending outward of a second central portion and adjacent to said first number of blades, said second central portion being attached to said first central portion, a second number of blades extending radially inward of the first peripheral portion, each of said second number of blades extending from said first peripheral portion to within a predetermined small running clearance relative to said third central portion, said diffuser imparting a radial velocity component to the flow of cooling air;
said fan inducing the flow of cooling air from said first inlet, through said heat exchanger and across said fan to between said fan and said noise barrier and inducing the flow of engine compartment air from said second inlet to between said fan and said noise barrier, the cooling air and the engine compartment air being exhausted from between said fan and said noise barrier radially outward through said outlet.

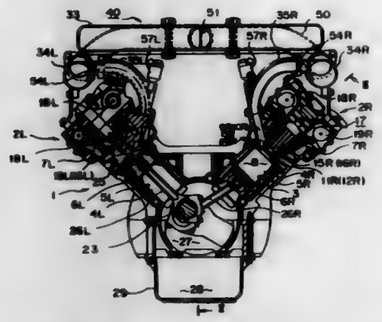
5,590,625
DIESEL ENGINE, MODIFICATION, AND METHOD
Jack L. Bivens, 1191 Morse Blvd., Riviera Beach, Fla. 33404
Filed Aug. 30, 1995, Ser. No. 521,530
Int. Cl.[6] F02B *75/04*
U.S. Cl. 123—65 R **9 Claims**

1. A two cycle diesel engine having a cylinder, a piston reciprocable in said cylinder, injection means for injecting a combustible



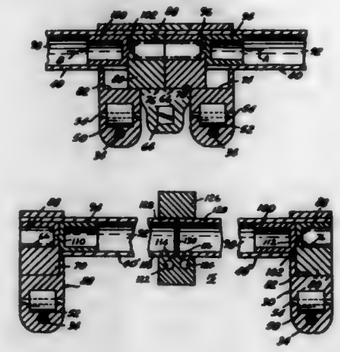
fluid into said cylinder, an exhaust valve openable by means independent of the cylinder, means for opening the exhaust valve in timed relationship to the reciprocation of the piston, a crank shaft, a connecting rod pivotally secured to the piston, and an intake port in the cylinder oriented to permit the ingress of air to the chamber defined by the piston and cylinder, and a blower for compressing air going into the chamber defined by the piston and the cylinder, the whole of the foregoing being activated in timed relationship throughout the 360° of each crank shaft rotation of said two cycle engine characterized by:
the power stroke commencing with the position of the piston at its maximum height within the cylinder being 0°, being in the range of 92° to 96° of crankshaft rotation from 0°,
the exhaust valve opening being timed to occur after 90° of crankshaft rotation from top dead center,
the intake port being positioned in a sidewall of the cylinder liner covering a space of degrees measuring from the opening of the exhaust valve which leads the opening of the intake port by 30°–34° after the opening of the exhaust valve.

5,590,626
RECIPROCATING ENGINE OF A SPARK IGNITION TYPE
Mitsuo Hitomi; Shunji Maeoda; Toshihiko Hattori; Kenji Kashiyama, and Jumeon Sasaki, all of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Division of Ser. No. 345,344, Nov. 21, 1994, Pat. No. 5,445,123, which is a continuation of Ser. No. 936,001, Aug. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 481,839
Claims priority, application Japan, Aug. 27, 1991, 3-240607
Int. Cl.[6] F01L *7/00*
U.S. Cl. 123—90.15 **17 Claims**



1. A spark ignition type reciprocating engine of a natural intake type system with an ignition plug disposed to face a combustion chamber defined and delimited by a piston inserted into a cylinder so as to move in a reciprocating way, further comprising:
means for reducing an effective compression ratio of the engine in a region where a load on the engine is relatively low so as to make the effective compression ratio lower than in a region where a load on the engine is relatively high;
wherein a ratio of a stroke of the piston to a bore size of the cylinder is chosen to be larger than 1 so that knocking in the engine tends not to occur in the region where the load on the engine is relatively high; and
wherein the engine has a compression ratio of at least 11.

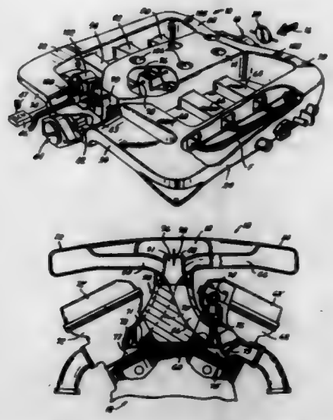
5,590,627
FLUID INLETTING AND SUPPORT STRUCTURE FOR A VARIABLE VALVE ASSEMBLY
Ronald Rygiel, Prospect Heights, Ill., and Antoni Szatkowski, Windsor, Canada, assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Jan. 2, 1996, Ser. No. 581,786
Int. Cl.[6] F01L *1/12;13/00*
U.S. Cl. 123—90.16 **5 Claims**



1. In a hydraulically activated variable valve timing and lift mechanism for a dual overhead camshaft type engine cylinder head having two valves per cylinder associated with each camshaft, an oil pressurization system to activate the mechanism comprising: a tubular shaft associated with each cylinder extending substantially parallel in an axial direction of an associated camshaft with adjacent shafts for side by side cylinders aligned in the axial direction; a boss projecting outward from the cylinder head forming a journal for supporting adjacent end portions of two shafts; means located within said boss and between said pair of end portions to separate the interiors of said adjacent shafts; fluid inletting means formed in said cylinder head boss and through each of said shaft's end portions for selective introduction of pressurized fluid into the shaft interior wherein both of said interiors of adjacent shafts can be independently pressurized.

5,590,628
MULTI-MODE INTAKE MANIFOLD ASSEMBLY FOR INTERNAL COMBUSTION ENGINES
Michael P. Patyl; William E. Hughes, both of Troy; Mary T. Chappell, West Bloomfield; Frederick B. Hummer, Troy, and Donald H. Keraka, Royal Oak, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Apr. 16, 1996, Ser. No. 639,041
Int. Cl.[6] F02M *35/00*
U.S. Cl. 123—184.55 **4 Claims**

1. An intake manifold for directing the flow of air into the combustion chambers of cylinders in banks of even firing cylinders of an internal combustion engine comprising a central plenum for disposition in a position intermediate the opposing cylinder banks and first and second plenums on opposite sides of the central plenum, an air inlet, a first passage connecting said inlet with said central plenum and said first side plenum, a second passage connecting said inlet with said central plenum and said second side



plenum, first long runners connecting said first side plenum directly to said combustion chambers of a first bank of cylinders while bypassing said central plenum, second long runners connecting said second side plenum to said combustion chambers of said second bank of cylinders while bypassing said central plenum and short runner valves movable between closed and open positions for directing air from said central plenum directly into said combustion chambers of said first and second banks of cylinders, a crossover passage forming one end of said manifold for operatively connecting said side plenums to one another for the acoustic balancing of said side plenums and a manifold tuning valve operatively mounted in said cross over passage so said cross over passage can be blocked and pressure waves in said side plenums can effect an increased flow of air through said long runners.

5,590,629

SPARK IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

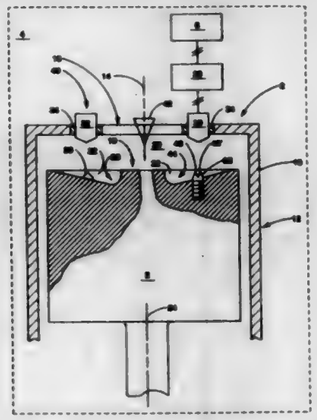
George Codina, North Hollywood, Calif.; Donald R. Krull, Galesburg, and J. Thomas Vachon, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 14, 1995, Ser. No. 528,176

Int. Cl.[6] F02P *15/02;15/04*

U.S. Cl. 123—310 **11 Claims**

1. A spark ignition system of an internal combustion engine



having a controllable spark initiation system, a piston having a face and a cylinder having an axis, a top and sidewalls, said piston being positioned within the cylinder with the piston face adjacent the cylinder top, said piston face, cylinder top and cylinder sidewalls defining a primary combustion zone, comprising:

said piston having a continuous depression formed on said face about the axis of the piston and defining a secondary combustion zone;

a step-up pulse transformer connectable to the controllable spark initiation system;

first and second spaced apart electrodes each extending through the cylinder top and into the primary combustion zone, said first electrode being connected to the step-up transformer and both electrodes being electrically isolated;

a third electrode connected to the piston at a location within the secondary combustion zone and adjacent the first electrode; and

a forth electrode connected to the piston at a location within the secondary combustion zone and adjacent the second electrode.

5,590,630

IDLING SPEED CONTROL SYSTEM AND THE METHOD THEREOF

Masaru Kurihara, and Masanori Igarashi, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

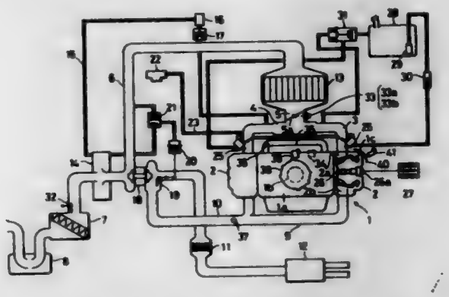
Filed Oct. 5, 1995, Ser. No. 539,354

Claims priority, application Japan, Oct. 17, 1994, 6-251075

Int. Cl.[6] F02D *41/16;43/04*

U.S. Cl. 123—339.17 **13 Claims**

1. A system for controlling an idling speed of an engine having



a cylinder, an injector for injecting fuel to be supplied to said cylinder, an intake passage, a throttle valve installed in said intake passage, a bypass passage bypassing said throttle valve and an idling speed control valve installed in said bypass passage for adjusting an amount of air flowing into said cylinder during an idling state of said engine, the system comprising:

engine speed detecting means for detecting an actual engine speed;

integration amount calculating means for calculating an integration amount based on an error between the actual engine speed and a predetermined target idling speed;

reference parameter calculating means for calculating a reference parameter based on the actual engine speed and the integration amount;

target physical amount providing means for providing an appropriate target physical amount which takes a balance between the engine torque and the engine friction around the predetermined target idling speed, depending on the reference parameter;

fuel injection amount calculating means for calculating a fuel injection amount in accordance with the target physical amount, the fuel injection amount being injected by the injector; and

opening degree determining means for determining an opening degree of the idling speed control valve in accordance with the target physical amount, the idling speed control valve being opened by the determined opening degree.

5,590,631

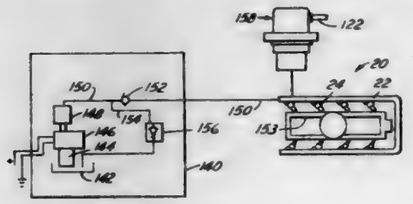
FUEL SYSTEM ACCUMULATOR

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation-in-part of Ser. No. 398,215, Mar. 2, 1995, Pat. No. 5,579,739, which is a continuation-in-part of Ser. No. 262,847, Jun. 21, 1994, Pat. No. 5,398,655, which is a continuation-in-part of Ser. No. 181,848, Jan. 14, 1994, Pat. No. 5,458,104. This application Apr. 21, 1995, Ser. No. 426,259

Int. Cl.[6] F02M *7/00*

U.S. Cl. 123—447 **27 Claims**



1. An accumulator for an automotive fuel delivery system for an engine having an air intake manifold and at least one fuel injector operably associated therewith and a fuel pump for supplying tank fuel to the injector, said accumulator comprising a housing, a flexible diaphragm defining in cooperation with said housing first and second chambers impermeably separated by said diaphragm, said diaphragm having a circumferentially continuous annular pleat portion surrounding a central portion of the diaphragm and sized to permit by gathering and ungathering thereof a predetermined full working travel of said diaphragm central portion in said chambers within said pleat portion, a spring in said second chamber and acting between said housing and said diaphragm central portion for yieldably biasing said diaphragm to resist that working travel of said diaphragm decreasing the volume of said second chamber, said housing having a reference port on one side of said diaphragm adapted for continuously communicating a source of reference air pressure related to operation of the engine with said second chamber for controlling the biasing force of said spring on said diaphragm, said housing having a fuel passage on the opposite side of said diaphragm having an inlet to said first chamber adapted for continuously communicating said first chamber with the fuel delivery system such that any volumetric increase in the fuel in the system between the fuel injector and said fuel passage inlet is accommodated within limits by that working travel of said diaphragm causing expansion of said first chamber against the biasing force of said spring, said spring acting against said diaphragm being operable during such first chamber expansion to cause an increase in the pressure of the fuel in the system communicating with said first chamber as modulated by the reference air pressure communicated via said port to said second chamber.

5,590,632

APPARATUS FOR COMPUTING THE AMOUNT OF INTAKE AIR IN INTERNAL COMBUSTION ENGINE

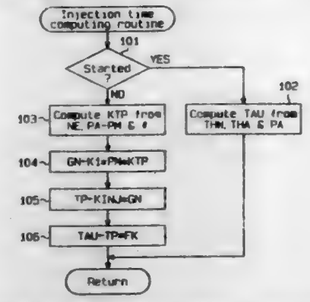
Senji Kato, Aichi-ken; Kouji Endo, Mizunami; Shigeru Sone, Toyota; Atsushi Goto, Toyota, and Nobuhisa Ohkawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 21, 1995, Ser. No. 391,180

Claims priority, application Japan, Mar. 10, 1994, 6-040113

Int. Cl.[6] F02D *13/02;41/34*

U.S. Cl. 123—480 **24 Claims**



1. A device for determining an amount of an air introduced to a cylinder of an engine, said cylinder communicating with an air-intake passage and an air-exhaust passage, said air-intake passage being arranged to introduce the air to the cylinder, said air-exhaust passage being arranged to exhaust gas from the cylinder, both passages respectively having an intake valve and an exhaust valve therein, both valves being respectively driven by an intake valve drive mechanism and an exhaust valve drive mechanism in accordance with a rotation of a crank shaft to alternatively and selectively open and close, and to remain open during a valve overlap period to open the passages to the cylinder, said engine including a variable valve timing mechanism, and wherein said variable valve timing mechanism controls an operational timing of at least one of the valve drive mechanisms with respect to the crank shaft in accordance with a running condition of the engine to vary a timing of the valve driven by at least one of the valve drive mechanisms, said device comprising:

first detecting means for sensing crank shaft rotation and detecting a rotational speed of the crank shaft;

second detecting means for detecting an intake pressure in the air-intake passage;

third detecting means for detecting the operational timing of at least one of the valve drive mechanisms;

calculating means for calculating a displacement of the operational timing according to the detected rotational speed of the crank shaft and the detected operational timing; and

first computing means for computing an amount of the air introduced to the cylinder in response to the rotational speed of the crank shaft, the intake pressure, and the displacement of the operational timing.

5,590,633

FUEL INJECTION CONTROL SYSTEM FOR ENGINE

Naoki Tominawa, and Hajime Hosoya, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed May 3, 1995, Ser. No. 434,391

Claims priority, application Japan, May 16, 1994, 6-100849

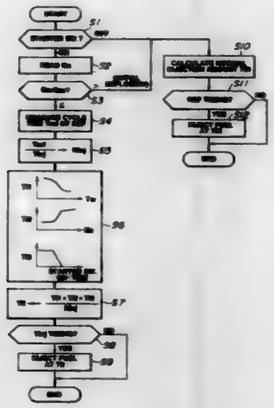
Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—491 **6 Claims**

1. A fuel injection control system for an engine, comprising:

fuel injection means for injecting fuel into an intake system of the engine;

initial explosion detecting means for detecting an initial explosion in the engine based on at least one of an intake air flow rate, a pressure within an intake air passage;



and a pressure within an engine cylinder;

starting control means for controlling fuel injection by said fuel injection means within a time period between initiation of engine cranking at engine starting and occurrence of the initial explosion detected by said initial explosion detecting means; and

normal operation control means for controlling fuel injection by said fuel injection means after the occurrence of the initial explosion.

5,590,634

EVAPORATIVE EMISSION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

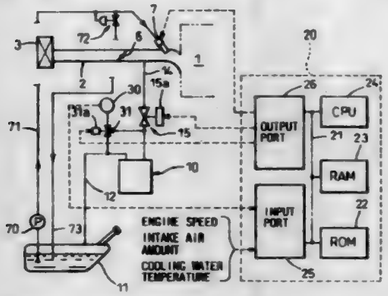
Susumu Shinohara, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 26, 1996, Ser. No. 605,485

Claims priority, application Japan, Feb. 27, 1995, 7-038467

Int. Cl.[6] F02M *39/04*

U.S. Cl. 123—520 **4 Claims**



1. An evaporative emission control system for an internal combustion engine comprising:

a fuel tank containing fuel for an internal combustion engine;

a canister containing an adsorbent for adsorbing fuel vapor;

a fuel vapor passage which connects the canister to the fuel vapor volume above the fuel level inside the fuel tank;

a purging passage which, when the engine is operated at predetermined conditions, communicates the canister and an intake air passage of the engine to direct the fuel vapor released from the adsorbent to the intake air passage of the engine;

a pressure detecting device which detects the pressure in the canister and the pressure in the fuel tank separately;

smoothing means for obtaining smoothed pressure values of the canister and the fuel tank by smoothing fluctuations of the pressure values of the canister and the fuel tank detected by said pressure detecting device;

failure detecting means for detecting failure in the canister and the fuel tank separately based on the smoothed pressure value of the canister and the smoothed pressure value of the fuel tank, respectively; and

wherein, said smoothing means obtains the smoothed pressure value of the fuel tank by smoothing fluctuations of the pressure values of the fuel tank at a higher degree of smoothing than the degree of smoothing of the fluctuations of the pressure values of the canister.

5,590,635

DEVICE FOR INTRODUCING FUEL INTO THE COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

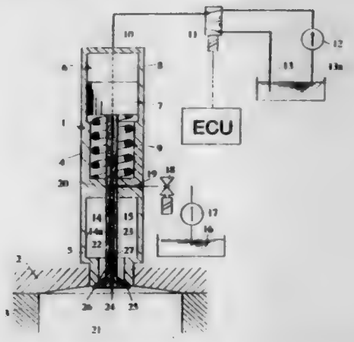
Walter Piock; Martin Wirth, both of Hitzendorf, and Günter K. Fraidl, Pirka, all of Austria, assignors to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. hans List, Graz, Austria

Filed Feb. 23, 1996, Ser. No. 605,893

Claims priority, application Austria, Feb. 23, 1995, 327/95

Int. Cl.[6] F02M *23/00*

U.S. Cl. 123—532 **7 Claims**



1. A device for introducing fuel into a combustion chamber of an internal combustion engine, comprising an injection valve for withdrawing compressed gas from a cylinder and injecting the gas together with a supplied fuel into said cylinder, with a mixing chamber in a front part of said valve for the purpose of gas storage, into which mixing-chamber fuel may be introduced by one or more fuel flow passages opening into said mixing chamber, said injection valve being provided with a lifting valve for control of the gas exchange between said combustion chamber and said mixing chamber in a front part of said valve, and a seat of said lifting valve separating said mixing chamber from said combustion chamber, an orifice of said fuel flow passage opening into said mixing chamber being located in the area of a seat of said lifting valve, wherein said fuel flow passage is constituted, at least in part, by a longitudinal bore in a valve stem of said lifting valve, the fuel being introduced into said valve stem in an area of said lifting valve distant from said valve seat, and wherein said fuel flow passage can be closed against the direction of fuel delivery by means of a check valve positioned in the area of said orifice opening into said mixing chamber.

5,590,636

VEHICLE SLIP CONTROL SYSTEM

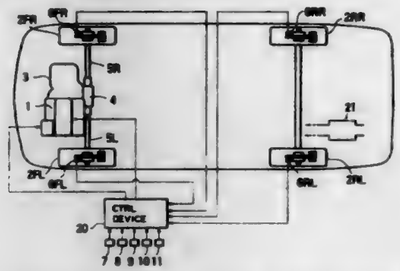
Tetsuhiro Yamashita, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Aug. 31, 1995, Ser. No. 113,693

Claims priority, application Japan, Sep. 1, 1992, 4-233897; Sep. 1, 1992, 4-233898

Int. Cl.[6] F02D *23/00*; **B60K** *31/00*

U.S. Cl. 123—564 **14 Claims**



1. In combination, a vehicle and a slip control system for the vehicle comprising:

an engine for producing an engine output;

an engine control device for controlling said engine output;

a drive wheel driven by said engine output;

a transmission for transmitting said engine output from said engine to said drive wheel;

a supercharger driven by said engine so as to produce supercharging pressure provided to said engine;

a supercharging pressure control device for controlling said supercharging pressure produced by said supercharger;

rotation speed detecting means for detecting a rotation speed of said drive wheel;

slip detecting means for detecting a slip amount of the drive wheel based on the rotation speed of the drive wheel;

supercharging condition detecting means for detecting an intake pressure supplied to said engine, a supercharging condition when said intake pressure is greater than a predetermined pressure and a non-supercharging condition when said intake pressure is not greater than said predetermined pressure: and

engine output restriction means for restricting the engine output by utilizing at least one of the supercharging pressure control device and the engine control device to reduce the slip amount of the drive wheel when the slip amount of the drive wheel exceeds a predetermined threshold value;

the engine output restriction means controlling the supercharging pressure by the supercharging pressure control device in the supercharging condition when the slip amount of the drive wheel exceeds the predetermined threshold value, the engine output restriction means controlling the engine output by means of the engine control device in the non-supercharging condition when the slip amount of the drive wheel exceeds the predetermined threshold value.

5,590,637

IGNITION COIL DEVICE

Shoji Motodate, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 488,432

Claims priority, application Japan, Nov. 4, 1994, 6-271521

Int. Cl.[6] F02P *3/02*

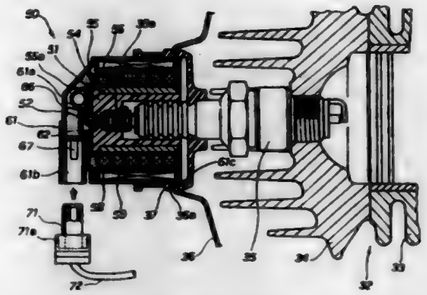
U.S. Cl. 123—634 **16 Claims**

1. An ignition coil device comprising:

a plug cap engaging a spark plug;

a secondary coil coaxially surrounding said plug cap;

a core mounted between said plug cap and said secondary coil, said core having a tubular shape and being integrally mounted on said plug cap;



a secondary coil bobbin coaxially surrounding and separate from said plug cap, said secondary coil being wound on said secondary coil bobbin;

a primary coil coaxially surrounding said secondary coil;

a cylindrical case surrounding said plug cap, said core, said secondary coil bobbin, said secondary coil and said primary coil;

a sealing member sealing an opening of said cylindrical case,

primary coil ends of said primary coil extending to a side of said cylindrical case opposite the spark plug; and

terminals extending substantially perpendicular to a longitudinal axis of the spark plug,

said primary coil ends being individually connected to said terminals.

5,590,638

FUEL METERING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

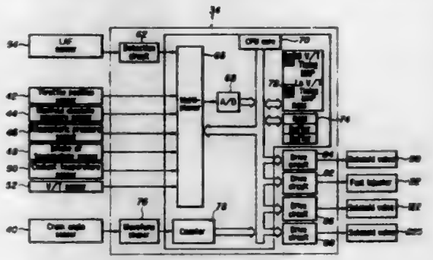
Yoichi Nishimura; Hidetaka Maki; Yusuke Hasegawa, and Shusuke Akazaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1995, Ser. No. 545,325

Claims priority, application Japan, Oct. 20, 1994, 6-281454; Dec. 30, 1994, 6-340021

Int. Cl.[6] F02D *41/00*

U.S. Cl. 125—687 **36 Claims**



1. A system for controlling fuel metering for a multi-cylinder internal combustion engine, including:

an air/fuel ratio sensor installed at an exhaust system of the engine;

engine operating condition detecting means for detecting engine operating conditions at least including engine speed and engine load;

fuel injection quantity determining means for determining a quantity of fuel injection Tim for individual cylinders at least based on the detected engine operating conditions;

a fuel injector for injecting fuel in the individual cylinders of the engine in response to the determined quantity of fuel injection; and

a feedback loop having an adaptive controller and an adaptation mechanism that estimates controller parameters $\hat{\theta}$, said adaptive controller correcting the quantity of fuel injection Tim to bring a controlled variable y at least obtained based on an output of said air/fuel ratio sensor to a desired value u;

wherein

said fuel injection quantity determining means determines the quantity of fuel injection Tim at a predetermined crank angular cycle; and

said adaptation mechanism is input with the controlled variable synchronously with a cycle longer than the predetermined crank angular cycle.

5,590,639

MASONARY CUTTING TOOL AND METHOD

Ronald Kempin, 3 Rodgers Place, Bullcreek Perth, Australia

PCT No. PCT/AU91/00328, § 371 Date Sep. 17, 1993, § 102(e) Date Sep. 17, 1993, PCT Pub. No. WO92/02345, PCT Pub. Date Feb. 20, 1992

PCT Filed Jul. 24, 1991, Ser. No. 117,165

Claims priority, application Australia, Jul. 25, 1990, PK1531

Int. Cl.[6] B28D *1/26*

U.S. Cl. 125—41 **2 Claims**



2. An article of manufacture, as a tool for cutting masonary, comprising:

a handle attached to and merging into a tapered tool end having a curved upper concave surface;

a flat distal lower surface angled to the extended longitudinal axis of said handle;

a bevel between said curved upper surface and said flat lower surface to form twin leading cutting edges, having a single upward bevel;

said cutting edges being distally flared and splayed outward in a V shape with a distal width greater than 15 mm;

a recess at the junction of the twin cutting edges.

5,590,640

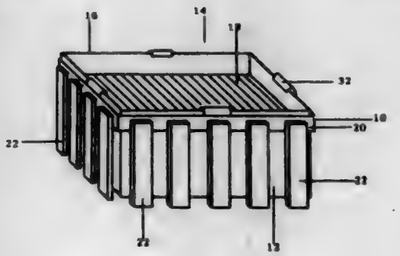
PROTECTIVE GUARD FOR OUTDOOR GRILL

Michael Kallias; Steve Addington, both of Wheaton, and Bud Kanak, Winfield, all of Ill., assignors to KAK Enterprises, Winfield, Ill.

Filed Oct. 7, 1994, Ser. No. 320,284

Int. Cl.[6] A47T *37/00*

U.S. Cl. 126—25 R **10 Claims**



1. A protective guard for an outdoor grill having an open-topped kettle, said protective guard comprising a support strip, and a plurality of protective spars connected to the support strip and suspending downward from the support strip towards the ground along the outer surface of the kettle, the uppermost edge of said support strip forming a continuous hook-shaped portion along substantially the entire length of the support strip, said continuous hook-shaped portion being adapted to engage the periphery of the opening of the kettle for mounting the protective guard onto the kettle.

5,590,641

ADAPTOR FOR INSTALLING FLUE LINERS TO DIRECT VENT FIREPLACE INSERTS

Luu Q. Duong, Ontario, Canada, assignor to CFM International Inc., Mississauga, Canada

Filed Jun. 5, 1995, Ser. No. 461,431

Claims priority, application United Kingdom, Jan. 26, 1995, 9501497

Int. Cl.[6] F24B *1/189*

U.S. Cl. 126—85 B **16 Claims**

1. A method of installing a direct vent gas fireplace insert, an exhaust flue liner and an inlet flue liner in an existing fireplace with a chimney, the direct vent gas fireplace insert comprising a firebox, a top panel defining an exhaust opening and an inlet opening formed in the top panel, and means for slidably receiving a plate flue collar, the method comprising the steps of:

(a) inserting the exhaust flue liner and inlet flue liner into the chimney whereby a lower end of the exhaust flue liner and a lower end of the inlet flue liner are accessible from the fireplace;

(b) aligning the plate flue collar on a fastener plate flue collar whereby an exhaust opening formed in the plate flue collar is above an exhaust opening formed in the fastener plate flue collar and an inlet opening formed in the plate flue collar is above an inlet opening formed in the fastener plate flue collar;

(c) coupling the lower end of the exhaust flue liner and the lower end of the inlet flue liner to the fastener plate flue collar, whereby the coupled lower end of the exhaust flue liner is over the exhaust opening formed in the fastener plate flue collar and the coupled lower end of the inlet flue liner is over the inlet opening formed in the fastener plate flue collar; and

(d) slidably mounting the plate flue collar onto the means for slidably receiving the plate flue collar while inserting the fireplace insert into the existing fireplace until the exhaust opening formed in the plate flue collar and the exhaust opening formed in the fastener plate flue collar are substantially aligned with the exhaust opening formed in the top panel and the inlet opening formed in the plase flue collar and the inlet opening formed in the fastener plate flue collar are substantially aligned with the inlet opening formed in the top panel; and

(e) forming a seal between the fastener plate flue collar and the top panel to seal the inlet opening from the exhaust opening.

5,590,642

CONTROL METHODS AND APPARATUS FOR GAS-FIRED COMBUSTORS

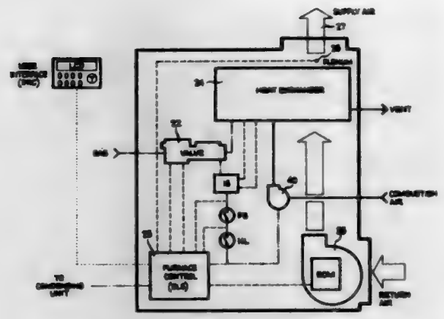
Robert A. Borgeson, Cleveland Heights, Ohio; Robert M. Rust, Los Altos Hills, Calif.; Larry A. Lincoln, Milpitas, Calif.; Thomas L. Webster, Piedmont, Calif.; Nir Merry, Albany, Calif., and William W. Bassett, Wheaton, Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 26, 1995, Ser. No. 378,516

Int. Cl.[6] F24H *3/00*

U.S. Cl. 126—116 A **17 Claims**

1. An apparatus for causing a circulating heat transfer medium to transfer heat and for delivering such heat to a space in response to a heating load being imposed on the space, comprising:



a burner for fluid fuels, operably connected to a source of fluid fuel;

means for modulating the flow of fluid fuel from the source to the burner;

means for enabling the transfer of heat from the burner to the heat transfer medium, operably associated with the burner;

means for circulating the heat transfer medium from the means for enabling transfer of heat, to a position remote from the burner, for transfer of at least some of the heat from the heat transfer medium, at the remote position, and for circulating the heat transfer medium back to the means for enabling transfer of heat; and

means for modulating the operation of the means for circulating the heat transfer medium, for varying the amount of heat transferred from the heat transfer medium,

the modulation of the fuel flow and the modulation of the circulation of the heat transfer medium each being of operably controlled by control means, between at least three respective rates of operation, other than a zero flow rate,

the modulation of the fuel flow and the circulation of the heat transfer medium further being controlled so as to be capable of occurring during a single heating cycle towards a continuous balancing of heat being supplied to the space with heating loads being imposed on the space.

5,590,643

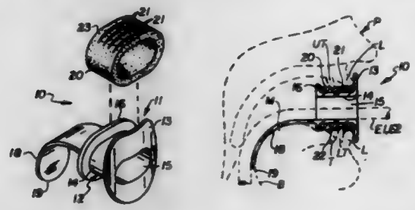
MANDIBULAR PROTRACTING ORAL INTUBATING AIRWAY

Gary H. Flam, 2244 Robinhood, Houston, Tex. 77005

Filed Jan. 17, 1995, Ser. No. 373,865

Int. Cl.[6] A61C *5/14*; A61M *16/00*; A62B *9/06*

U.S. Cl. 128—200.26 **5 Claims**



1. An airway device comprising:

a rigid tubular member (14) having rear and front flanges (16, 13), and an access port extending longitudinally through said tubular member, said front flange adapted to overlie a wearer's lips;

a resilient, annular tooth-engaging member (20);

mandible positioning means for positioning and maintaining a protracted mandibular position comprising a transversely arranged series of grooves on a top portion of said tooth-engaging member adapted to engage a wearer's upper teeth in a first position and a transversely arranged series of grooves on a bottom portion of said tooth-engaging member adapted to engage a wearer's lower teeth and position and maintain a wearer's mandible in a second, protracted position relative to said first position; and

tongue positioning means for positioning and maintaining the wearer's tongue in a forward position that does not obstruct the wearer's airway comprising a rigid and curved rearward extension on said rigid tubular member which is adapted to engage the top of the wearer's tongue.

5,590,644

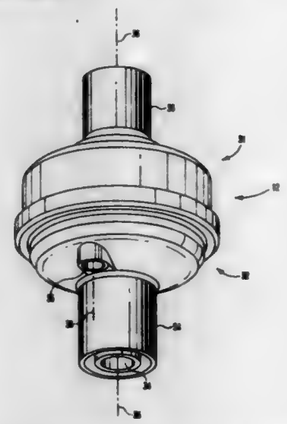
HEAT AND MOISTURE EXCHANGER FOR BREATHING

Terry G. Rosenkoetter, Greenwood, Ind., assignor to Med-Plastics, Intl., Inc., Indianapolis, Ind.

Filed Oct. 19, 1995, Ser. No. 545,353

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—201.13 **15 Claims**



1. A heat and moisture exchanger device for a breathing system and comprising:

a housing having a patient end port and a machine end port and a passageway in the housing providing communication between the ports through the housing passageway;

heat and moisture exchange media in the housing and extending entirely across the passageway defining a patient end chamber associated with the patient end port, and a machine end chamber associated with the machine end port; and

a first vane dividing the patient end chamber, and having a flat edge facing away from the media and bisecting the patient end port.

5,590,645

INHALATION DEVICE

Michael B. Davies, Ware; David J. Hearne, Luton; Paul K. Rand, Letchworth, and Richard L. Walker, Ware, all of England, assignors to Glaxo Group Limited, London, England

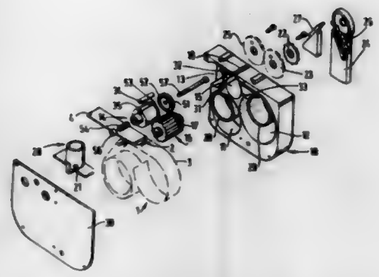
Continuation of Ser. No. 175,174, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 663,145, Mar. 1, 1991, abandoned. This application Nov. 2, 1995, Ser. No. 552,166

Claims priority, application United Kingdom, Mar. 2, 1990, 9004781

Int. Cl.[6] A61M *15/00*

U.S. Cl. 128—203.15 **19 Claims**

1. An inhalation device for use with a medicament pack having a plurality of containers for containing medicament in powder



form wherein the containers are spaced along the length of and defined between two peelable sheets secured to each other, said inhalation device comprising:

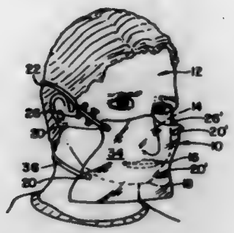
an opening station for receiving a container of a medicament pack being used with said inhalation device;

means positioned to engage peelable sheets of a container which has been received in said opening station for peeling apart the peelable sheets, to open such a container;

an outlet, positioned to be in communication with an opened container, through which a user can inhale medicament in powder form from such an opened container; and

indexing means for indexing in communication with said outlet containers of a medicament pack in use with said inhalation device.

5,590,646
EMERGENCY SAFETY MASK
Frank C. Murphy, 4703 Crest Oak Rd., Austin, Tex. 78744
Filed Dec. 14, 1995, Ser. No. 572,635
Int. Cl.[6] A62B *9/00*
U.S. Cl. 128—206.19 **8 Claims**



1. An emergency safety mask, comprising:

a) a flexible porus material capable of readily absorbing liquids and passing air therethrough, said material being generally rectangularly-shaped to cover the nose, mouth and chin of a user and having an upper portion and a lower portion;

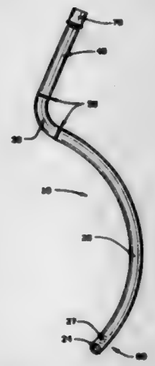
b) elongated elastic means formed as the letter "X" having four arms and joined at the intersection thereof;

c) affixing means disposed on the distal ends of said four arms of said elongated elastic means, two of said arms being affixed to said flexible porus material on said upper portion and two of said arms being affixed to said flexible porus material on said lower portion so as to form a flexible circularly-shaped band for placement over the head of a user;

d) first clip means for removably retaining a miniature source of light mounted on one of said upper portion affixing means; and

e) second clip means for removably retaining a frangible liquid container on the other of said upper portion affixing means.

5,590,647
METHOD OF PROVIDING ANESTHESIA WITH A SPECIALIZED TRACHEAL TUBE
Richard V. Nye, St. Louis, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.
Continuation of Ser. No. 885,691, May 19, 1992, Pat. No. 5,245,992. This application Sep. 21, 1993, Ser. No. 124,829
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—207.14 **21 Claims**



1. A method of providing anesthesia to a patient comprising:

providing a tracheal tube, said tracheal tube including a distal end portion for intubation into a patient; a flexible intermediate portion smoothly merged with said distal end portion; and a proximal end portion smoothly merged with said intermediate portion;

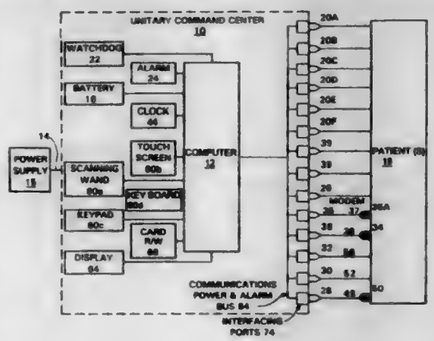
intubating the patient with said tracheal tube and establishing said proximal end portion in an initial position relative to the head and neck of the patient;

moving said proximal end portion via said flexible intermediate portion to a second position relative to the head and neck of the patient; and

establishing said proximal end portion in said second position;

wherein said step of moving is carried out without requiring re-intubation of the patient.

5,590,648
PERSONAL HEALTH CARE SYSTEM
Andrew Mitchell, Wilmington; Joseph L. Lardeau, Newark, and Dave I. Schonbach, Hockessin, all of Del., assignors to Tremont Medical, Aston, Pa.
Continuation-in-part of Ser. No. 982,993, Nov. 30, 1992, abandoned. This application Apr. 7, 1994, Ser. No. 224,444
Int. Cl.[6] A61B *5/00*; A61M *5/00*
U.S. Cl. 128—630 **33 Claims**



1. A personal health care system comprising:

a unitary command center for monitoring a patient and administering therapy to a patient;

a data processor within the unitary command center for receiving, storing, processing, and transmitting information;

a plurality of modules selected from the group consisting of a plurality of different patient monitoring sensor modules, a plurality of different therapy-providing modules, and a plurality of different accessory modules, each module being at least partially contained within a module housing; and

a plurality of interfacing ports positioned on the unitary command center and electrically connected to the data processor, each interfacing port for accepting one of the module housings and for electrically interconnecting the module associated with the accepted module housing to the data processor for sending and receiving information therebetween,

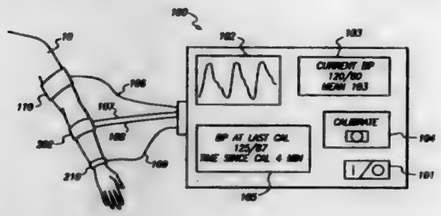
the data processor including means for providing programming instructions to the associated module for operating the associated module,

each sensor module for sensing and providing information on a condition of a patient, the data processor including means for monitoring the information provided by the sensor modules,

each accessory module for providing an accessory function,

each therapy-providing module for providing a therapy to a patient, the data processor including means for controlling provision of the therapy to the patient.

5,590,649
APPARATUS AND METHOD FOR MEASURING AN INDUCED PERTURBATION TO DETERMINE BLOOD PRESSURE
Richard G. Caro, and Mark H. Sher, both of San Francisco, Calif., assignors to Vital Insite, Inc., So. San Francisco, Calif.
Filed Apr. 15, 1994, Ser. No. 228,213
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—630 **26 Claims**



1. A monitor for determining a patient's physiological parameter, comprising:

a calibration device configured to provide a calibration signal representative of the patient's physiological parameter;

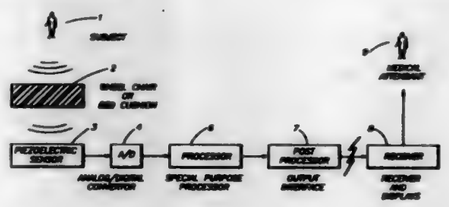
an exciter, positioned over a blood vessel of the patient, for inducing a transmitted exciter waveform into the patient;

a noninvasive sensor, positioned over said blood vessel, said noninvasive sensor configured to sense a hemoparameter and to generate a noninvasive sensor signal representative of said hemoparameter containing a component of a received exciter waveform;

a processor configured to determine a relationship between a property of said received exciter waveform and a property of the physiological parameter; and

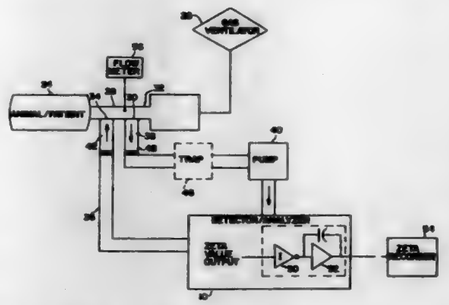
wherein said processor is connected to receive said calibration signal and said noninvasive sensor signal, said processor configured to determine said physiological parameter based at least in part on said calibration signal, said noninvasive sensor signal, and said relationship.

5,590,650
NON-INVASIVE MEDICAL MONITOR SYSTEM
James J. Genova, Alexandria, Va., assignor to Raven, Inc., Alexandria, Va.
Filed Nov. 16, 1994, Ser. No. 345,865
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—630 **8 Claims**



1. An apparatus operable for monitoring physiological vital signs of a human body as indicated by a movement and/or acoustical wave produced by the body without physically contacting the body; said apparatus comprising sensing means operable to transform a movement and/or acoustical wave produced by said body into an electrical signal; signal processing means coupled to said sensing means and operable to receive said electrical signal from said sensing means and to process said electrical signal adaptively using wavelet correlator analysis; said signal processing means having an output signal indicative of the movement and/or acoustical wave producing said electrical signal.

5,590,651
BREATHABLE LIQUID ELIMINATION ANALYSIS
Thomas H. Shaffer, Lansdowne; Marin R. Wolfson, Philadelphia; Thomas F. Miller, Philadelphia, and Raymond Foust, III, Philadelphia, all of Pa., assignors to Temple University - Of The Commonwealth System of Higher Education, Philadelphia, Pa.
Filed Jan. 17, 1995, Ser. No. 373,662
Int. Cl.[6] A61B *5/097*; A61M *16/00*
U.S. Cl. 128—632 **35 Claims**



1. A process for determining the amount of interaction in a mammalian lung between a breathable liquid in the lung and a respiratory gas flowing into and out of a pulmonary pathway in communication with the lung, said process comprising the steps of:

(a) sampling expired respiratory gas from the pulmonary pathway;

(b) passing the sampled gas through a measurement detector, the detector outputting a discrete value representative of a property of the gas;

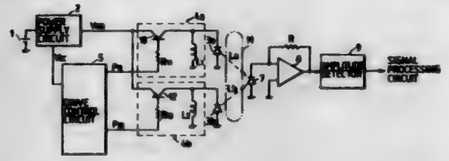
(c) comparing the discrete value to previously determined discrete values representative of respiratory gas fully saturated with vapors of breathable liquid and respiratory gas unsaturated by vapors of breathable liquid; and

(d) determining from the comparison the amount of interaction, wherein discrete values near the fully saturated discrete value indicates maximum interaction and discrete values near the unsaturated discrete value indicates minimum interaction.

5,590,652
DRIVE CIRCUIT FOR LIGHT-EMITTING DIODE IN PULSE OXIMETER

Takashi Inui, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Continuation of Ser. No. 76,746, Jun. 15, 1993, abandoned. This application Feb. 22, 1996, Ser. No. 605,583
Claims priority, application Japan, Jun. 15, 1992, 4-154805; Jun. 7, 1993, 5-135739
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—633 **31 Claims**

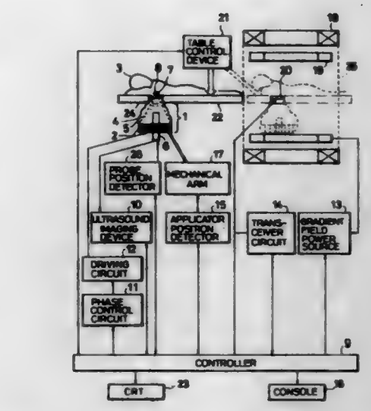


1. A drive circuit for use in a pulse oximeter for measuring a degree of oxygen saturation of arterial blood in a living tissue, said drive circuit comprising:
at least two light emitting elements different in wavelength for irradiating said living tissue containing said arterial blood;
a light receiving element for receiving light irradiated from said light emitting elements and traversing said living tissue directly and indirectly to said light receiving element;
means for intermittently applying an inverse bias voltage across said light emitting elements;
means including at least one inductor for applying an inverse electromotive voltage across said light emitting elements, said means for applying an inverse electromotive voltage being connected to said light emitting elements and to said means for intermittently applying an inverse bias voltage; and
signal processing means which is capable of calculating a ratio of a change of light absorption of at least two wavelengths transmitted alternatively from said light emitting elements,
wherein said ratio is based on signals output from said light receiving element and said ratio represents said degree of oxygen saturation of said arterial blood.

5,590,653
ULTRASONIC WAVE MEDICAL TREATMENT APPARATUS SUITABLE FOR USE UNDER GUIDANCE OF MAGNETIC RESONANCE IMAGING

Satoshi Aida, Tokyo; Mariko Shibata; Katsuhiko Fujimoto, both of Kanagawa-ken; Yoshiharu Ishihashi, Tokyo; Takuji Suzuki; Yasutoshi Ishihara, both of Kanagawa-ken, and Kazuya Okamoto, Saitama-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1994, Ser. No. 207,670
Claims priority, application Japan, Mar. 10, 1993, 5-049551
Int. Cl.[6] A61B 5/055
U.S. Cl. 128—653.2 **4 Claims**



1. An ultrasonic wave medical treatment apparatus, comprising:
MRI means for taking MR images of a patient in an MRI gantry; and
ultrasonic wave treatment means for treating a treatment target portion within the patient by irradiating ultrasonic waves thereon in accordance with the MR images taken by the MRI means, including an ultrasonic wave applicator for generating ultrasonic waves focused onto the treatment target portion which is integrally incorporated within a treatment table for carrying the patient into the MRI gantry by being fixedly attached below a treatment hole provided on the treatment table on which the patient is lying with the treatment target portion placed above the treatment hole;
wherein the MRI means includes an RF coil, which is attached at a circumference of the treatment hole of the treatment table, for transmitting RF signals and receiving MR signals in taking the MR images.

5,590,654
METHOD AND APPARATUS FOR MAGNETIC RESONANCE IMAGING OF ARTERIES USING A MAGNETIC RESONANCE CONTRAST AGENT

Martin R. Prince, 2745 Windwood Dr., Apt. 240, Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 71,970, Jun. 7, 1993, Pat. No. 5,417,213, Ser. No. 428,815, Apr. 12, 1995, and Ser. No. 378,384, Jan. 25, 1995, Pat. No. 5,553,619. This application Dec. 28, 1995, Ser. No. 580,195
Int. Cl.[6] A61B 5/055
U.S. Cl. 128—653.4 **45 Claims**

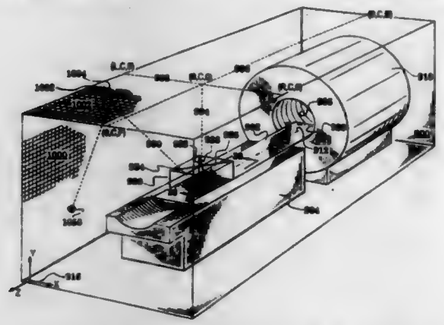


1. A method of imaging an artery of a patient using magnetic resonance imaging in conjunction with an administered magnetic resonance contrast agent, comprising,
detecting an elevated concentration of the administered magnetic resonance contrast agent in a region of interest; and
imaging at least a portion of the artery including collecting image data which is representative of at least a portion of a center of k-space after detecting the elevated concentration of magnetic resonance contrast agent in the region of interest.

5,590,655
FRAMELESS LASER GUIDED STEREOTACTIC LOCALIZATION SYSTEM

Karl L. Hussman, 1900 E. Ocean Blvd., #318, Long Beach, Calif. 90802

Continuation-in-part of Ser. No. 124,690, Sep. 20, 1993, Pat. No. 5,437,288, Ser. No. 139,934, Oct. 20, 1993, abandoned, and Ser. No. 172,888, Dec. 22, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 196,842
Int. Cl.[6] A61B 6/00
U.S. Cl. 128—653.1 **19 Claims**



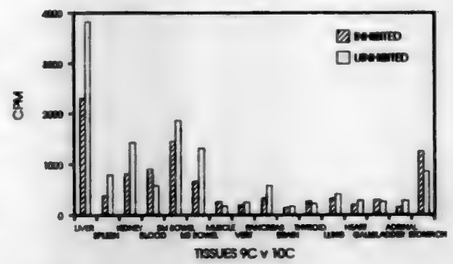
1. A method for guiding an instrument tip to a target point identified in a patient via an imaging modality, comprising the steps of:
establishing an imaging space coordinate system;
selecting an entry point;
placing an imaging visible marker at said entry point;
imaging said target point and said entry point to determine the imaging space coordinates thereof;
determining the coordinates of a retrograde point that lies on a line defined by said entry point coordinates and said target point coordinates wherein said entry point is between said retrograde point and said target point; and,
providing a retrograde laser having a retrograde laser beam and a medical instrument having said tip;
causing said retrograde laser beam to be directed along said line to illuminate said retrograde point; and,
guiding said instrument along said line by keeping said retrograde beam on said retrograde point to position said instrument tip proximate to said target point.

5,590,656
APPLICATION OF PEPTIDE/CELL RECEPTOR KINETICS UTILIZING RADIOLABELED SOMATOSTATIN CONGENERS IN THE IN SITU, IN VIVO DETECTION AND DIFFERENTIATION OF NEOPLASTIC TISSUE

Thomas M. O'Dorisio; M. Sue O'Dorisio, both of Worthington; Edward W. Martin, Jr., Delaware, all of Ohio, and Eugene A. Woltering, Kenner, La., assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 945,110, Sep. 15, 1992, abandoned. This application Aug. 31, 1993, Ser. No. 114,675
Int. Cl.[6] A61B 6/00
U.S. Cl. 128—654 **33 Claims**

1. A method for the detection and differentiation of neoplastic tissue in a patient suspected of having neoplastic tissue associative with a somatostatin congener and which neoplastic tissue may be occult, which comprises the steps of:
(a) administering a biochemical marker-inhibiting dose of unlabeled somatostatin congener to a patient;
(b) monitoring a biochemical marker associated with said neoplastic tissue to determine whether the administered somatostatin congener reduced the presence of said marker in said patient;

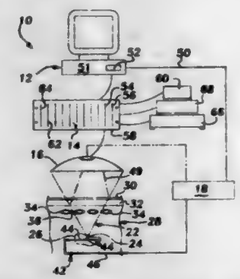


(c) if the monitored presence of said marker in said patient was reduced, then administering radiolabeled somatostatin congener to said patient;
(d) accessing said patient with a radiation detection probe for detecting and differentiating tissue exhibiting elevated levels of radiation; and
(e) extirpating tissue detected and differentiated in step (d).

5,590,657
PHASED ARRAY ULTRASOUND SYSTEM AND METHOD FOR CARDIAC ABLATION

Charles A. Cain; Emad S. Ebbini, and S. Adam Strickberger, all of Ann Arbor, Mich., assignors to The Regents of The University of Michigan, Ann Arbor, Mich.

Filed Nov. 6, 1995, Ser. No. 554,134
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—660.03 **39 Claims**



1. An ultrasound system for performing cardiac ablation on a patient, said ultrasound system comprising:
an array adapted for external positioning relative to the body of the patient, said array including a plurality of ultrasound transducers capable of producing ultrasonic energy in the form of a focused ultrasound beam, said beam being of sufficient energy to ablate a predetermined cardiac tissue volume of the patient;
control means for producing phased electrical control signals controlling production of phased ultrasound waves by individual ones of said transducers, said ultrasound waves cooperating to form said beam;
drive means coupled to said control means and said transducers for driving said transducers, said drive means amplifying said control signals and producing individual channels of phased electrical current, said electrical current being applied to individual ones of said transducers in accordance to said control signals; and
focus correcting means for refocusing said beam after defocusing by acoustical aberrations resulting from inhomogeneous tissue between said array and the predetermined cardiac tissue volume, said focus correcting means including sensor means for sensing said waves produced by said transducers after said waves have encountered said aberrations, said sensor means being coupled to said control means and providing feedback

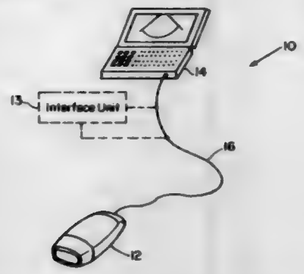
signals thereto indicative of said aberrations, whereby said control means determines and communicates compensating control signals to said drive means which accordingly drive said transducers in response thereto so as to produce and form a refocused beam on said predetermined cardiac tissue volume thereby compensating for said acoustical aberrations and enabling cardiac ablation to be performed.

5,590,658

PORTABLE ULTRASOUND IMAGING SYSTEM

Alice M. Chiang, Weston, and Steven R. Broadstone, Woburn, both of Mass., assignors to TeraTech Corporation, Burlington, Mass.

Filed Jun. 29, 1995, Ser. No. 496,804
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—661.01 **35 Claims**



1. A scan head for an ultrasound imaging system comprising:
an array of ultrasonic transducers that receives reflected ultrasonic signals from a region of interest, the transducers converting the received ultrasonic signals into analog electrical signals;
beam forming circuitry that receives the analog electrical signals and combines the electrical signals from the ultrasonic transducers, the beam forming circuitry including a delay circuit that generates an analog electrical representative of the region of interest;
a hand-held housing in which the ultrasonic transducers and the beam forming circuitry are housed; and
an interface over which a combined electrical representation from the beam forming circuitry is forwarded from the hand-held housing to processing circuitry in a second housing.

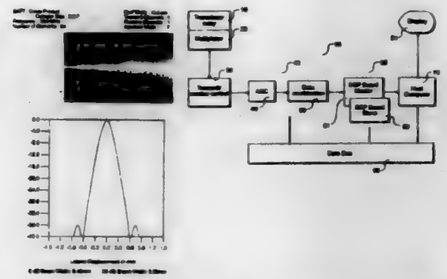
5,590,659

ULTRASONIC VISUALIZATION METHOD AND APPARATUS

Robin Hamilton, Fort William, Scotland; Patrick J. Ryan, Thames Ditton, England; Derek Kelly, Borehamwood, England, and Robert J. Dickinson, London, England, assignors to Intravascular Research Limited, London, England

Filed Jul. 17, 1995, Ser. No. 503,234
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—661.01 **25 Claims**

1. An ultrasound system comprising:
a transducer array having a plurality of transducer elements for transmitting ultrasound pulses and for receiving echo pulses in response thereto,
means for energizing each transducer element, or batches of elements of the array, in turn, to generate an ultrasound pulse, and for receiving echo signals from at least two transducer elements, resulting from transmission of an ultrasonic pulse from another transducer element, so that data used to create an image of the echo signals comes from said two transducer elements,



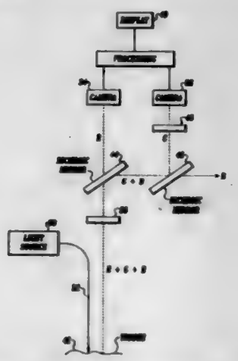
control means for controlling the order in which the transducers are energized and the order in which the transducers receive an echo pulse, so as to carry out the energization and reception sequentially,
means for acquiring sequentially the data in analog form for a whole aperture and for acquiring sequentially the data for successive apertures, and for processing the data for beam-formation for each aperture in correspondence with an analog echo pulse received by each transducer, such that appropriate data sets once acquired are used for beam formation of more than one aperture, said means for acquiring and processing including:
means for storing the acquired data, and
means for post-processing the stored data for beam-formation.

5,590,660

APPARATUS AND METHOD FOR IMAGING DISEASED TISSUE USING INTEGRATED AUTOFLUORESCENCE

Calum MacAulay; Branko Palcic; Stephen Lam, and Bruno Jaggi, all of Vancouver, Canada, assignors to Xillix Technologies Corp., Vancouver, Canada

Filed Mar. 28, 1994, Ser. No. 218,662
Int. Cl.[6] A61B 5/00;6/00;1/06
U.S. Cl. 128—664 **6 Claims**



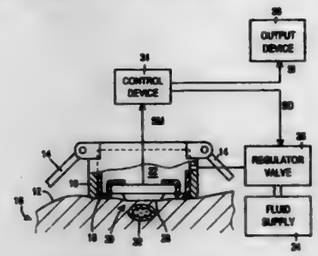
1. Apparatus for imaging diseases in tissue using autofluorescence, comprising:
a light source for producing a beam of excitation light that causes the tissue under examination to produce characteristic autofluorescence light in a range of wavelengths whereby the intensity of the autofluorescence light for healthy tissue is substantially different than for diseased tissue and for producing a beam of illumination light to generate remittance light that comprises reflected and back-scattered illumination light from the tissue under examination;
a fiber-optic endoscope for directing the excitation light and illumination light to the tissue under examination and for receiving autofluorescence light produced by the tissue and the remittance light from the tissue, wherein the autofluorescence light and the remittance light have an intensity that is proportional to the relative position of the fiber-optic endoscope and the tissue under examination;
beam splitting means for separating the autofluorescence light and the remittance light into separate light beams;
a first camera positioned to receive the beam of autofluoreacence light;
a second camera positioned to receive the beam of remittance light; and
a color monitor having a pair of color inputs, whereby one color input is coupled to receive an output signal produced by the first camera and another color input is connected to receive an output signal produced by the second camera in order to simultaneously produce a pseudo-color image of the relative intensities of the autofluorescence light and the remittance light, wherein the pseudo-color image is indicative of whether the tissue under examination is diseased.

5,590,661

BLOOD PRESSURE MEASURING APPARATUS

Kenji Ohmori, Yokohama; Kiyoyuki Narisawa, Kawagai, both of Japan, and Ikuo Kobayashi, Vanimo, Papua New Guinea, assignors to Colin Corporation, Komaki, Japan

Filed Jul. 29, 1994, Ser. No. 282,230
Int. Cl.[6] A61B 5/02
U.S. Cl. 128—672 **20 Claims**



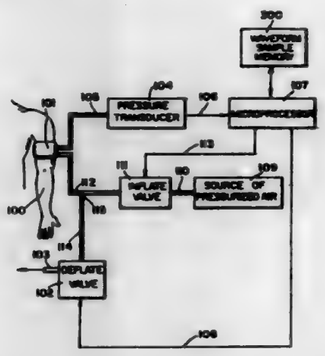
1. A blood pressure measuring apparatus, comprising:
a surface-pressure sensor having a press surface adapted to be pressed on a body surface of a living subject, and including at least one pressure sensing element provided in said press surface to detect a pressure at said press surface pressed on the body surface and generate a pressure signal representing the detected pressure, said pressure signal containing a plurality of successive pulses representing a pressure pulse wave which is produced from an artery of the subject under the body surface in synchronism with heartbeat of the subject and is propagated to said press surface of said sensor via the body surface;
a pressing device which generates a pressing force to press said surface-pressure sensor against the artery via the body surface;
a control device which changes the pressing force of said pressing device applied to said surface-pressure sensor, to partially flatten the artery under said sensor, and obtains the successive pulses of said pressure signal from said sensor while said pressing force of said pressing device is changed;
first straight line determining means for determining, in a two-dimensional orthogonal coordinate system defined by a first axis indicative of pressing forces of said pressing device and a second axis indicative of magnitudes of said pressure signal, a first straight line approximating a level portion of at least one of (a) an upper-peak curve which connects respective upper-peak magnitudes of said successive pulses of said pressure signal obtained by said control device, and (b) a lower-peak curve which connects respective lower-peak magnitudes of said successive pulses, said level portion corresponding to a first range of pressing forces of said pressing device;
second straight line determining means for determining, in said two-dimensional orthogonal coordinate system, a second straight line approximating an increasing portion of said at least one of (a) said upper-peak curve and (b) said lower-peak curve, said increasing portion corresponding to a second range of pressing forces of said pressing device which are greater than said first range of pressing forces; and
blood pressure determining means for determining at least one of a systolic and a diastolic blood pressure of the subject based on an intersecting point of said first and second straight lines determined by said first and second straight line determining means.

5,590,662

DETECTION OF OSCILLOMETRIC BLOOD PRESSURE COMPLEXES USING CORRELATION

Lawrence T. Hersh, and John W. Booth, both of Tampa, Fla., assignors to Johnson & Johnson Medical, Inc., New Brunswick, N.J.

Filed Feb. 15, 1995, Ser. No. 389,711
Int. Cl.[6] A61B 5/02
U.S. Cl. 128—681 **28 Claims**



1. An automated sphygmomanometer apparatus, comprising:
an inflatable and deflatable pressure cuff;
inflating means operatively coupled to said cuff for selectively applying a medium under pressure to said cuff for inflating and pressurizing said cuff;
cuff pressure sensing means coupled to said cuff for sensing cuff pressure including any arterial blood pressure oscillations therein;
deflating means operatively coupled to said cuff for selectively relieving pressure from said cuff;
control means for controlling said inflating means to inflate said cuff and said deflating means to deflate said cuff during respective blood pressure determinations of a patient at respective cuff pressure levels;
means for determining an oscillometric envelope comprising arterial blood pressure oscillations detected during said respective blood pressure determinations of said patient at said respective cuff pressure levels;
a waveform memory for storing waveform samples representing said oscillometric envelope; and
processing means for correlating said waveform samples stored in said waveform memory with a predetermined template representing attributes of a known arterial blood pressure oscillation of said patient, and for determining the presence of an arterial blood pressure oscillation in said waveform samples based on a result of said correlation.

5,590,663

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Patent Not Issued For This Number

5,590,665

METHOD OF DIAGNOSING CEREBRAL INFARCTION

Kazuyuki Kasai, Kasai, Japan, assignor to Toa Medical Electronics Company, Ltd., Kobe, Japan

Continuation of Ser. No. 997,537, Dec. 28, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 338,826
Claims priority, application Japan, Dec. 27, 1991, 3-358698
Int. Cl.[6] A61B *1/00*
U.S. Cl. 128—898 **2 Claims**

1. A method of diagnosing cerebral infarction, comprising the steps of:

obtaining a set of teaching data on each subject in a group of health subjects and subjects of cerebral infarction, each said teaching data set comprising an age of said subject, measurement of at least one coagulo-fibrinolytic molecular marker for said subject, and an index indicative of cerebral infarction for said subject;

modifying each said measurement of coagulo-fibrinolytic molecular marker in said teaching data in order to cause said measurements to be independent of age;

inputting each set of the modified teaching data into a neural network for use in diagnosing patients and making said neural network learn said teaching data;

obtaining a set of testing data on a patient to be diagnosed, said testing data comprising an age of said patient and measurement of said at least one coagulo-fibrinolytic molecular marker for said patient;

modifying each said measurement of coagulo-fibrinolytic molecular marker in said testing data in order to cause said measurements to be independent of age for purposes of said diagnosing;

inputting the modified testing data into said neural network and obtaining therefrom, as a diagnostic output for said patient, an index indicative of cerebral infarction which is specific to said patient; and

diagnosing cerebral infarction in said patient from said index.

5,590,666

Patent Not Issued For This Number

5,590,667

TOBACCO EXPANSION METHOD

John R. Wagner, and J. E. Howard Smith, both of Greensboro, N.C., assignors to SCW, Inc., Greensboro, N.C.

Filed Jul. 28, 1995, Ser. No. 508,441
Int. Cl.[6] A24B *3/18*
U.S. Cl. 131—291 **17 Claims**

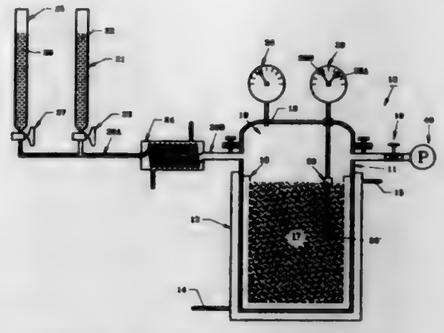
9. A method of expanding tobacco having resident liquids, comprising the steps of:

a. moistening the tobacco with a humectant solution to adjust the resident liquids weight of the tobacco to approximately 14–24%;

b. placing the moistened tobacco in a sealed chamber;

c. evacuating the chamber to about 10 mm (Hg) absolute:

d. placing the chamber in communication with a source of ethyl alcohol until the pressure of the chamber reaches no greater than 70 mm (Hg) absolute;



e. isolating the chamber from the ethyl alcohol source;

f. placing the chamber in communication with a hydrocarbon source until the chamber is restored to atmospheric pressure; and

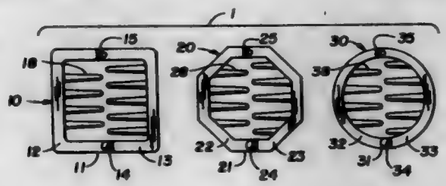
g. thereafter heating the tobacco to expand the same.

5,590,668

HAIR BRAIDING METHOD AND DEVICE

Joyce Macy, 8615 Millet, St. Louis, Mo. 63114

Filed Jun. 2, 1995, Ser. No. 458,514
Int. Cl.[6] A45D *7/00;8/30*
U.S. Cl. 132—200 **13 Claims**



2. A hair-braiding device comprising:

a plurality of hair retainers for holding separate groupings of hair;

each of said hair retainers comprising a perimeter member which is formed with an opening therein for insertion and securement of one of said hair groupings therein; and

each of said hair retainers having a connector thereon for releasable connection to one of the other hair retainers.

5,590,669

APPARATUS FOR REMOTELY HEATING AN EYELASH CURLING DEVICE

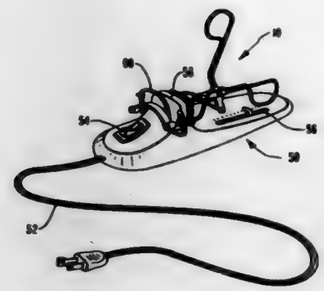
Alexandra McMullen, 673 Washington Blvd., Marina Del Rey, Calif. 90292

Filed Aug. 18, 1995, Ser. No. 516,934
Int. Cl.[6] A45D *2/48*
U.S. Cl. 132—217 **22 Claims**

1. A system for curling eyelashes comprising an eyelash curling device and a remote heating apparatus for heating the eyelash curling device, wherein the eyelash curling device is detachable from the remote heating apparatus such that the eyelash curling device is detached from the remote heating apparatus when used to curl the eyelashes, the remote heating apparatus including:

heating means disposed within the remote heating apparatus for heating a compression strip within the eyelash curling device to within a desired temperature range; and

means within the remote heating apparatus for maintaining heat from the heating means in the vicinity of the compression



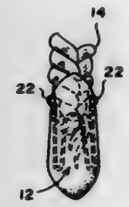
strip while the eyelash curling device is engaged with the remote heating apparatus.

5,590,670

BRAID TIP

Donald E. Allred, Box 619, El Prado, N.M. 87529

Filed May 1, 1995, Ser. No. 432,097
Int. Cl.[6] A45D *8/04;8/34;8/36*
U.S. Cl. 132—273 **9 Claims**



1. Hair braid tip device, for covering the end of a human hair braid, comprising:

(a) a hollow sleeve, having an inside diameter at least slightly exceeding the diameter of said human hair braid, and having an open upper end for receiving said end of said human hair braid, and having a principal longitudinal axis;

(b) a securing means, for securing said end of said human hair braid for insertion into said sleeve;

(c) a locking and release means, for holding said securing means within said sleeve, and for releasing said securing means when it is desired to remove said securing means from said sleeve;

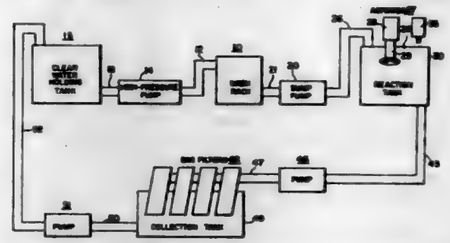
and wherein said securing means is a W-shaped insert, and wherein said insert has rounded projections on both upper sides of said insert, and wherein the width of said insert slightly exceeds the inside diameter of said sleeve and wherein said insert is made of a material having elasticity sufficient to allow said insert to be compressed sufficiently to be inserted within said sleeve, and wherein said sleeve has two retaining slots on opposite sides of said sleeve, near said upper end of said sleeve, said retaining slots being of a size sufficient to receive said rounded projections of said insert and wherein said locking and release means comprises the combination of said oversized width of said insert in relation to said inside diameter of said sleeve, said rounded projections on said upper sides of said insert and said retaining slots of said sleeve.

5,590,671

MOBILE BATTERY CLEANING SYSTEM

Robert S. Yachera, Mohnton, Pa., assignor to East Penn Manufacturing Co., Inc., Lyon Station, Pa.

Filed Sep. 25, 1995, Ser. No. 533,520
Int. Cl.[6] B08B *3/10*
U.S. Cl. 134—95.1 **4 Claims**



1. A mobile battery cleaning system for cleaning batteries on site with clean water which comprises,

a wash cabinet to support batteries to be cleaned,

a source of clean water under pressure to wash contaminants from said batteries,

said wash cabinet having means to collect said washwater from said batteries,

sump pump means to pump said washwater from said wash cabinet collection means,

a reaction tank connected to said sump pump means to receive said washwater for treatment,

agitation means to agitate said wash water in said reaction tank,

chemical treatment means to treat said wash water,

said chemical treatment means including ph neutralizer means and encapsulation and flocculation chemical means to encapsulate and flocculate said contaminants into floc particles,

filter means to separate out said floc particles from said washwater to provide clean water,

means to store said floc particles, and

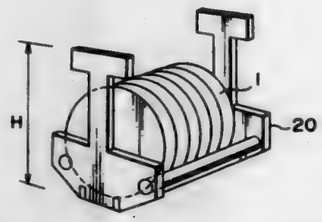
means to return said washwater to said clean water source for reuse.

5,590,672

SEMICONDUCTOR CLEANING APPARATUS AND WAFER CASSETTE

Masashi Ohmori; Hiroshi Tanaka; Akira Nishimoto; Hiroshi Sasai, all of Itami; Naohiko Fujino, and Satoru Kotoh, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

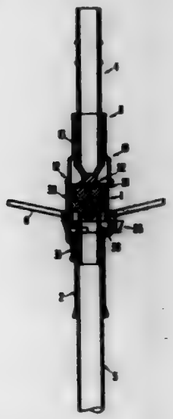
Division of Ser. No. 123,244, Sep. 20, 1993, Pat. No. 5,445,171. This application Jul. 17, 1995, Ser. No. 502,890
Claims priority, application Japan, Sep. 25, 1992, 4-256827; Sep. 10, 1993, 5-225611
Int. Cl.[6] B08B *11/02*
U.S. Cl. 134—201 **14 Claims**



1. A cleaning wafer cassette for accommodating a plurality of semiconductor wafers for immersion in a solution chamber of a cleaning apparatus comprising:

first and second support plates having opposing surfaces;
first and second wafer support rods extending in parallel in a lengthwise direction of the cassette between lower portions of the first and second support plates; and
a first handle connected to an upper portion of the first support plate and a second handle secured to an upper portion of the second support plate, each handle being coplanar with the support plate to which it is connected.

5,590,673
TILTING UMBRELLA FRAME
John M. Kershaw, Huddersfield, United Kingdom, assignor to Hoyland Bus Limited, Penistone, United Kingdom
Filed May 10, 1995, Ser. No. 438,498
Claims priority, application United Kingdom, May 11, 1994, 9409356
Int. Cl.[6] A45B *11/00*
U.S. Cl. 135—20.1 **10 Claims**



1. An umbrella frame, comprising:
an upper shaft member;
a lower shaft member;
a tiltable joint member joining said upper shaft member and said lower shaft member and permitting said upper shaft member alternatively to be aligned with said lower shaft member and to be tilted relative to said lower shaft member;
a location body slidably mounted on said lower shaft member, for supporting a plurality of stretchers extending to umbrella ribs to hold an umbrella cover taut; and
locking means actuable between a locked position in which said joint member is locked with said upper shaft member aligned with said lower shaft member, preventing tilting of said upper shaft member relative to said lower shaft member, and an unlocked position in which said joint member is unlocked, permitting tilting of said upper shaft member relative to said lower shaft member, said locking means being operable from below the attachment of the stretchers on said location body.

5,590,674
TENT AND TENT POLE SYSTEM
Lawrence C. Eppenbach, 119 Seward St., Juneau, Ak. 99801-1268
Filed Oct. 3, 1995, Ser. No. 539,530
Int. Cl.[6] E04H *15/40*
U.S. Cl. 135—114 **22 Claims**

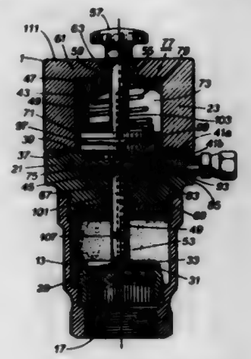
1. A tent pole comprising:
first and second elongated pole sections, each of said pole sections having an outer surface;



one end portion of said first pole section having a cavity which opens axially at one end of the first pole section, one end portion of said second pole section being receivable in said cavity;
a resilient member extending over positions of the outer surfaces of the first and second pole sections adjacent said one end of the first pole section, said resilient member being coupled to the first and second pole sections so that when said one end portion of the second pole section is received in said cavity the resiliest member resiliently retains such one end portion of the second pole section in said cavity, such one end portion being withdrawable from said cavity against the biasing force of the resilient member; and
said resilient member being sufficiently flexible so that when said one end portion of said second pole section is withdrawn from the cavity the resilient member can be folded to allow the first and second pole sections to be in side-by-side relationship.

5,590,675
ANTI-SIPHON VALVE
Matthew T. Babb, 2244 S. Santa Fe Ave., Unit A6, Vista, Calif. 92084
Filed Feb. 28, 1995, Ser. No. 396,129
Int. Cl.[6] F17D *1/14*; B67D *5/40*
U.S. Cl. 137—14 **21 Claims**

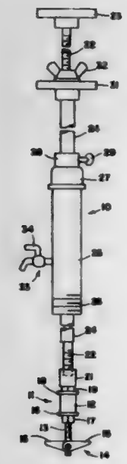
1. A method of valving a flow of pumped liquid, to prevent



siphoning of the flow when the pump is stopped, comprising the steps of:

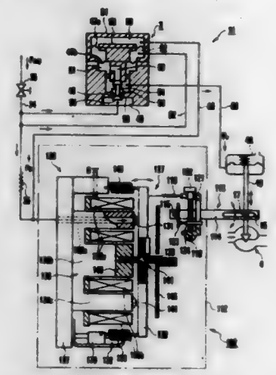
a) filling a chamber with liquid;
b) directing a small flow of pumped liquid into said chamber to increase its volume;
c) opening a main flow valve by said increase in chamber volume;
d) providing a leak in said chamber, into said main flow valve, to reduce the volume of liquid therein when the small flow of pumped liquid is terminated; and,
e) closing said main flow valve by said decrease in chamber volume.

5,590,676
STOPPER FOR OPENING IN GAS CONDUIT WALL
Dennis J. Wagner, 63 Wilson La., Bethpage, N.Y. 11714
Division of Ser. No. 267,668, Jun. 29, 1994, Pat. No. 5,511,578.
This application Jan. 22, 1996, Ser. No. 589,403
Int. Cl.[6] F16K *43/00*; F16L *55/12*
U.S. Cl. 137—15 **5 Claims**



1. A method for sealing an opening through the side wall of a linear pipe section for removal of a defective pipe fitting from the pipe section, wherein the pipe fitting is of the type having a cylindrical fitting part that includes a fitting passage which extends radially from the opening to be sealed at a right angle to the pipe section, which cylindrical fitting part has means for installation of a valve that has a valve passage extending as a linear continuation of the cylindrical fitting passage, comprising the steps of:
attaching a valve to the fitting so that the valve passage and the fitting passage are aligned along a line extending to the opening at a right angle to the pipe section;
inserting through the valve passage and fitting passage a stopper plug which includes pivotally adjustable toggle means for engaging an inner wall of the pipe section at the opening;
causing a radially expansible body of the stopper plug to expand to fill the fitting passage and seal the fitting passage above the opening and
removing the defective pipe fitting while leaving the stopper plug in position wherein a portion of the fitting passage is removed by severing the fitting passage while leaving a stub of the fitting passage on the pipe section around the stopper plug, securing a clamping device around the stub of the fitting passage, with closure means secured at one end of the clamping device for preventing any gas leakage that may leak past the stopper plug.

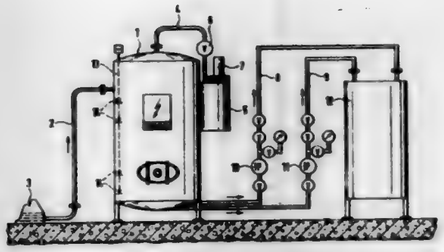
5,590,677
ELECTROPNEUMATIC POSITIONER
Masato Kuroda, Tokyo, Japan, assignor to Yamatake-Honeywell Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1995, Ser. No. 492,904
Claims priority, application Japan, Jun. 24, 1994, 6-143223
Int. Cl.[6] F15B *5/00*; *13/16*
U.S. Cl. 137—85 **6 Claims**



1. An electropneumatic positioner comprising:
an electropneumatic converter including a yoke having a central leg portion and a pair of side leg portions arranged on both sides of the central leg portion, said yoke having an E-shaped cross-section, a permanent magnet arranged on the central leg portion of said yoke, a pair of coils for exciting the side leg portions of said yoke to have opposite polarities, a nozzle, embedded in one of the side leg portions of said yoke, and supplied with air having a predetermined pressure, a stopper arranged on the other side leg portion of said yoke, and a flapper, arranged to swing on a fulcrum near the central leg portion of said yoke to oppose said nozzle and said stopper, for changing a nozzle back pressure by controlling an amount of air supplied from said nozzle in accordance with the swing, an arithmetic means for obtaining a deviation between an input signal and a feedback signal from a sensor means, and for outputting to the coil a driving pulse signal with about 50% duty when the deviation is zero, and said flapper being set to be parallel to said yoke when the deviation between the input signal and the feedback signal is zero;
amplification means for receiving a nozzle back pressure of said nozzle and amplifying an air pressure to output an amplified air pressure to air-mechanical conversion means which converts the air pressure into a mechanical displacement amount;
sensor means for detecting the displacement amount obtained by said air-mechanical conversion means and generating a feedback signal constituted by an electrical signal, and
wherein said nozzle and said stopper are set at the same level.

5,590,678
DEVICE FOR THE DISPOSAL OF LIQUID MEDIA
Hans-Peter Martinitz, Kuchen, Germany, assignee to F & F Filter- Und Fordertechnik GmbH, Ostfildern, Germany
Filed Aug. 4, 1995, Ser. No. 511,233
Claims priority, application Germany, Aug. 31, 1994, 44 30 959.7; Jan. 23, 1995, 19 501 921.0
Int. Cl.[6] F04F *3/00*
U.S. Cl. 137—205 **11 Claims**

1. A liquid media disposal system for cooling/lubricating liquids containing production residue, comprising:
a pressure resistant return reservoir disposed above ground level,
a liquid supply pipe line extending between a liquid media collection space located near or below ground level and an



upper area of the return reservoir for supplying liquid media to the return reservoir,

an evacuating device connected to an upper area of the return reservoir,

at least one liquid level detecting device in the return reservoir which controls at least one switch element operating the evacuating device,

and at least one outlet pipeline opening into a bottom area of the return reservoir and communicating with a liquid media return pump which pumps liquid media from the return reservoir into a collecting tank.

5,590,679

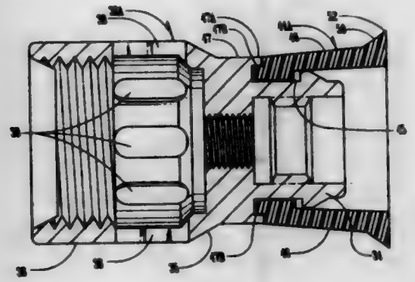
WALL WATER HYDRANT HAVING BACKFLOW AND BACK SIPHONAGE PREVENTOR

Lawrence Alaasy; James F. Shuler; Robert J. Vandepas, and William L. Carlson, all of Colorado Springs, Colo., assignors to WCM Industries, Inc., Colorado Springs, Colo.

Continuation-in-part of Ser. No. 88,889, Jul. 8, 1993. This application Dec. 6, 1994, Ser. No. 350,693

Int. Cl.[6] F16K *15/14;15/18*

U.S. Cl. 137—218 **16 Claims**



1. A valve casing and backflow preventor for a wall hydrant, comprising

a hollow valve casing of one piece construction having first and second ends,

a bell shaped flexible backflow preventor having open first and second ends,

said second end of said backflow preventor having a peripheral sealing surface,

said second end of said backflow preventor extending outwardly beyond the second end of said valve casing,

said valve casing having a tapered annular shoulder on its second end adapted to have the first end of said backflow preventor fitted thereover,

an annular groove in said valve casing adjacent said annular shoulder,

and an inwardly projecting annular shoulder on said first end of said backflow preventor mounted in tight engagement within the annular groove in said valve casing; said inwardly projecting annular shoulder being sufficiently large to be frictionally fitted over said tapered annular shoulder on said valve casing for insertion into the annular groove in said valve casing.

5,590,680

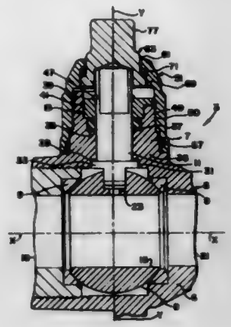
EXTERNAL VALVE OPERATING MEANS

Zbigniew H. Gugala, Spring Grove, and John N. Scapes, Schaumburg, both of Ill., assignors to Henry Valve Company, Melrose Park, Ill.

Filed Feb. 23, 1996, Ser. No. 604,750

Int. Cl.[6] F16K *41/04;43/00;* **F16J** *15/20;15/48*

U.S. Cl. 137—312 **5 Claims**



1. External valve operating means for operating a valve maintained under internal pressure and having a valve body and a rotatable valve stem, which comprises:

a hollow adjustable and removable operating seal cap having a top opening and a bottom opening and wherein the inner surface has threads for threaded engagement with the valve body;

an external valve stem drive having a lower end in mating operative engagement with an upper portion of said valve stem, said external valve stem drive having an upper end protruding through said top opening of said operating seal cap, said upper end of said external valve stem drive being shaped to be engaged by a tool whereby said valve stem may be rotated to operate the valve;

a first O-ring seal disposed between the lower end of said external valve stem drive and said operating seal cap in the proximity of said top opening so as to form a seal therebetween which is maintained by any unvented internal valve pressure;

a second O-ring seal disposed between a lower portion of said operating seal cap and said valve body adjacent said threaded engagement; and

means for venting said external valve operating means whereby said operating seal cap is movable along said lower end of said external valve stem drive and the portion of said valve body adjacent said threaded engagement to allow partial disengagement of said threaded engagement so that said venting means is established between said seal cap and said valve body when said second seal is in a non-sealing engagement with said valve body for venting internal pressure within said external valve operating means before removal thereof.

5,590,681

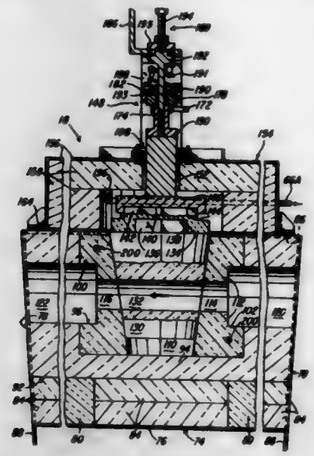
VALVE ASSEMBLY

Richard L. Schaefer; Carl W. D. Schaefer; James M. Williamson, all of Dayton, and Norman L. Miller, Huber Heights, all of Ohio, assignors to Frank W. Schaefer, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 86,882, Jul. 2, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 263,240

Int. Cl.[6] F16L *7/00*

U.S. Cl. 137—375 **37 Claims**



1. A valve assembly for use in a low pressure casting apparatus, said valve assembly comprising:

an elongate housing having a longitudinally-extending through bore;

a valve body assembly spanning said through bore and comprising a valve plate made from a non-wetting ceramic material and having a valve port centered about a vertical axis;

a valve closure member made from a non-wetting ceramic material and axially movable along said vertical axis to open and close said port;

and a valve drive mechanism for moving said valve closure member along said axis.

5,590,682

WATER FAUCET ROTATION PREVENTION DEVICE

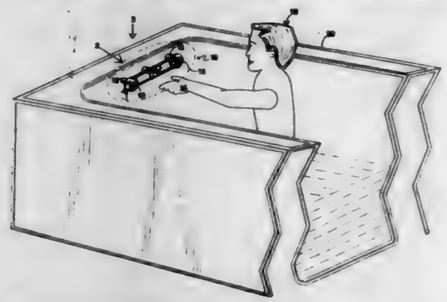
Christopher D. Fischer, 16516 Highway 62, Charlestown, Ind. 47111

Filed Mar. 28, 1996, Ser. No. 623,909

Int. Cl.[6] F16K *35/10;35/14*

U.S. Cl. 137—382 **20 Claims**

1. A water faucet rotation prevention device having an open



position and a closed position, comprising:

a) a pair of upper portions for removably receiving a part of a pair of spaced apart water faucets;

b) a pair of lower portions pivotally mounted to said upper portions for removably receiving a remaining part of the pair of spaced apart water faucets, so that when said water faucet rotation prevention device is in said open position the pair of spaced apart water faucets are accessible for rotation and when said water faucet rotation prevention device is in said closed position the pair of spaced apart water faucets are unaccessible for rotation;

c) a pair of extendable connecting means extending between said pair of upper and lower portions for allowing said pair of extendable connecting means to be simultaneously extended to the proper distance between said spaced apart water faucets

d) pivoting means for pivotally mounting one of said pair of said upper and lower portions, the other of said pair of upper and lower portions having removably engaging latch means that secures both pairs of the upper and lower portions around said spaced apart faucets in said closed position, wherein when said latch means is disengaged, said pair of extendable connecting means allow both of said upper and lower portions to pivot about said one pair of upper and lower portions and to be removed from said spaced apart faucets to said open position for accessible rotation to said spaced apart faucets; and

e) locking means disposed on at least one pair of said upper and lower portions for locking said water faucet rotation prevention device in said closed position, so that the pair of spaced apart water faucets are maintained unaccessible for rotation.

5,590,683

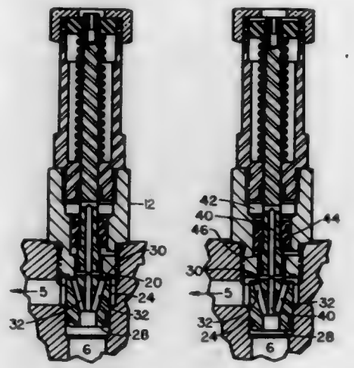
COMPENSATING RELIEF VALVE

Barry D. Bennett, 332 Courtland Ave., Harleysville, Pa. 19438

Filed Oct. 11, 1994, Ser. No. 320,666

Int. Cl.[6] F16K *17/04*

U.S. Cl. 137—454.5 **20 Claims**



1. A cartridge-type, compensating relief valve for use in a manifold cavity having entry and exit fluid ports defining a fluid path, said valve comprising:

1) a gland removably secured with at least a portion thereof within at least a portion of said manifold cavity, said gland having a circular valve seat in operative communication with said fluid path of said manifold cavity, said gland having a central cavity therethrough;

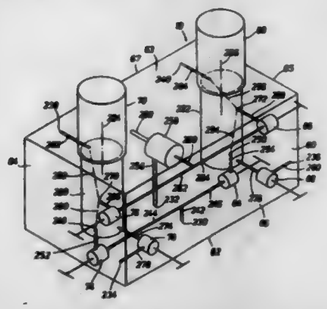
2) a valve stem extending through the central cavity of said gland and being moveable therein between an open valve position permitting fluid flow within said fluid path and a closed valve position prohibiting fluid flow within said fluid path, said valve stem further comprising:

a) a piston portion located at a first end of said valve stem extending into said manifold cavity and positioned within the fluid path of said manifold cavity, said piston portion having:
   i) an outward face in direct fluid communication with said entry fluid port of said manifold cavity, such that fluid preasure on the surface area of said outward face of said piston tends to hold said valve in a closed position, and
   ii) an inward face in operative contact with the valve seat of said gland when said valve is in the closed position and in direct fluid communication with said exit port of said manifold cavity when said valve is in an open position; and,
b) a plurality of piston ports open in both the outward face and the inward face of said piston, said piston ports being radially divergent from a central point on the outward face of said piston to points around the circumference of the inward face of the piston in the area of said valve seat;
3) at least one internal fluid chamber in direct pressure communication with said entry port of said manifold cavity, and permitting fluid pressure approximately equal to the fluid pressure directed against the outward face of said piston to be directed against at least one internal surface of said valve stem, exerting a force tending to hold the valve in an open position; and,
4) means to adjust the sensitivity of said valve.

5,590,684
DUAL PILOT MANIFOLD ASSEMBLY FOR A SAFETY RELIEF VALVE

Jack B. Alberts, Houston, and Michael D. McNeely, Katy, both of Tex., assignors to Keystone International Holdings Corporation, Houston, Tex.

Filed Sep. 1, 1995, Ser. No. 523,051
Int. Cl.[6] F16K *17/10*
U.S. Cl. 137—489 **27 Claims**



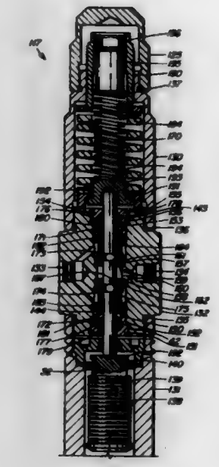
1. A manifold assembly for controlling actuation of a safety relief valve fluidly connected to a preasurized vessel, the safety relief valve including a safety relief valve housing having an upstream relief valve inlet port and a downstream relief valve outlet port, a relief valve member movable within the relief valve housing for controlling actuation of the safety relief valve, and a dome chamber within the relief valve housing normally maintained at substantially vessel preasure for acting on the relief valve member to maintain the safety relief valve closed, the manifold assembly comprising:
a manifold block having a block inlet port in fluid communication with the preasure vessel, a block dome pressure port in fluid communication with the dome chamber in the safety relief valve housing, and a first test port;
a first control cavity in the manifold block, the first control cavity including a first inlet port and a first dome pressure port;
a first inlet passageway in the manifold block fluidly connecting the block inlet port and the first inlet port;
a first inlet control valve mounted on the manifold block for selectively closing off the first inlet passageway within the manifold block;
a first dome pressure passageway in the manifold block fluidly connecting the block dome pressure port and the first dome pressure port;
a first dome pressure control valve mounted on the manifold block for selectively closing off the first dome pressure passageway within the manifold block;
a first test passageway in the manifold block for fluidly connecting the first test port and the first control cavity;
a first test control valve for selectively closing off the first test passageway;
a first vent passageway for venting fluid pressure from the first control cavity;
a first pilot valve responsive to pressure in the first inlet port, the first pilot valve being normally closed for maintaining fluid communication between the first inlet port and the first dome preasure port for supplying vessel pressure to the dome chamber in the relief valve housing and for prohibiting fluid communication between the first dome preasure port and the first vent passageway, and the first pilot valve opening to establish fluid communication between the first dome preasure port and the first vent passageway to relieve pressure from the dome chamber in the safety relief valve to open the safety relief valve when the vessel preasure reaches a selected value;
a second control cavity in the manifold block, the second control cavity including a second inlet port and a second dome pressure port;
a second inlet passageway in the manifold block fluidly connecting the block inlet port and the second inlet port;
a second inlet control valve mounted on the manifold block for selectively closing off the second inlet passageway within the manifold block;
a second dome pressure passageway in the manifold block fluidly connecting the block dome pressure port and the second dome pressure port;
a second dome pressure control valve mounted on the manifold block for selectively closing off the second dome pressure passageway within the manifold block;
a second vent passageway for venting fluid pressure from the second control cavity; and
a selector mechanism for mechanically preventing closing of the first inlet control valve and the firing dome pressure control valve when in a first position, and for mechanically preventing closure of the second inlet control valve and the second dome pressure control valve when in a second position.

5,590,685
HIGH-LOW INDICATOR

Clarence W. Johnson, Calgary, Canada, assignor to Barber Industries, Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 14,554, Feb. 8, 1993, Pat. No. 5,341,837. This application Aug. 29, 1994, Ser. No. 298,346
Int. Cl.[6] F16K *17/00*
U.S. Cl. 137—552 **4 Claims**

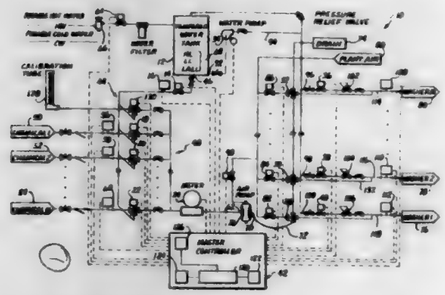
1. Indicator to non-destructively and repeatedly visually indicate whether a pilot valve has responded to a pressure condition above or below a pre-determined pressure range within a circuit, said pilot valve being operable to control a main valve, said visual indication for said pressure condition above said pre-determined range being different from said visual indication for said pressure condition below said pre-determined range, said visual indication for said low pressure condition being a first end of a spool protruding from a first side of a spool body, said visual indication for said high pressure condition being a second end of said pool protruding on a second side of said spool body.



5,590,686
LIQUID DELIVERY SYSTEMS

Frank T. Prendergast, Woodridge, Ill., assignor to Dober Chemical Corp., Middlothian, Ill.

Filed May 2, 1995, Ser. No. 433,933
Int. Cl.[6] G05D *7/06*
U.S. Cl. 137—597 **17 Claims**

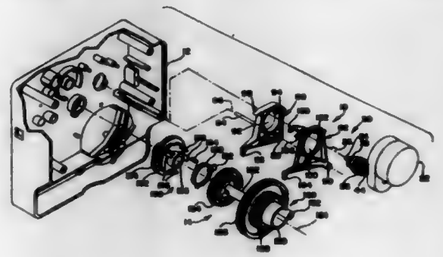


1. A liquid delivery system comprising:
a pump including a liquid inlet and a liquid outlet;
a plurality of valves, each valve located with respect to one of a plurality of containers adapted to hold liquid chemical, each of said valves adapted to control the flow of liquid chemical out of one of the containers;
a diluent valve located with respect to a diluent reservoir including a diluent outlet to control the flow of diluent out of the diluent reservoir through the diluent outlet;
a first liquid conduit assembly adapted to provide fluid communication between said diluent valve and said plurality of valves;
a second liquid conduit assembly adapted to provide fluid communication between said plurality of valves and said pump;
a total flow meter located and adapted to measure the volume flow of liquid being passed from said second liquid conduit assembly into said pump through said liquid inlet; and
a control assembly adapted to control said pump, said plurality of valves and said diluent valve, and for monitoring the volume flow of liquid measured by said total flow meter, said control assembly being adapted to close said diluent valve prior to opening any of said plurality of valves to allow liquid chemical to pass into said second liquid conduit assembly, to open one of said valves to allow liquid chemical from one of the containers to pass from one of the containers into said second liquid conduit assembly, and to thereafter close said one of said valves to prevent liquid chemical from one of the containers from passing into said second liquid conduit assembly, said one of said valves being closed to prevent liquid chemical from passing from one of the containers into said second liquid conduit assembly based on the volume flow of liquid monitored by said total flow meter during the time said one of said valves is open to allow liquid chemical to pass from one of the containers into said second liquid conduit assembly.

5,590,687
CONTROL MECHANISM FOR A WATER CONDITIONING SYSTEM

Don D. Vaughan, Brookfield, Wis., assignor to Fleck Controls, Inc., Brookfield, Wis.

Filed Jun. 7, 1995, Ser. No. 484,455
Int. Cl.[6] G05B *19/06*; **G04C** *23/26*
U.S. Cl. 137—624.13 **7 Claims**



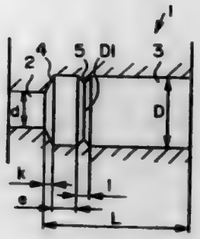
1. A drive mechanism for a water conditioning system control mechanism having a drive shaft, a regeneration cycle programming mechanism and a control valve positioning mechanism, said drive mechanism including:
a timing drive gear adapted to be rotationally driven by the drive shaft, said timing drive gear including a plurality of first gear teeth adapted to drive the regeneration cycle programming mechanism, and a first stem attached to said first gear teeth for conjoint rotation therewith;
a control valve drive gear including a plurality of second gear teeth adapted to selectively drive the control valve positioning mechanism, and a second stem attached to said second gear teeth for conjoint rotation therewith;
a clutch selectively coupling said control valve drive gear to said timing drive gear to provide selective conjoint rotation of said control valve drive gear with said timing drive gear, said clutch comprising a coupling member having a first end and a second end, said first end of said coupling member being wrapped around said first stem of said timing drive gear and said second end being wrapped around said second stem of said control valve drive gear;
a first cam arm selectively pivotal between a retracted position and an extended position, said first cam arm engaging said clutch to prevent conjoint rotation of said first end of said coupling member with said timing drive gear when said first cam arm is pivoted to said extended position;
whereby as the drive shaft rotates said timing drive gear, said first end of said coupling member grips said first stem of said timing drive gear and said second end of said coupling member grips said second stem of said control valve drive gear such that said coupling member couples said control valve drive gear to said timing drive gear for conjoint rotation, and whereby when said first end of said coupling member is prevented from rotating conjointly with said timing drive gear, said timing drive gear rotates independently of said control valve drive gear.

5,590,688

DEVICE PROVIDED WITH A GAS FLOW CHANNEL TO REDUCE NOISE CAUSED BY THROTTLING A GAS FLOW

Harri Pitkänen, Espoo, and Markku Simula, Vantaa, both of Finland, assignors to Neles-Jamesbury Oy, Helsinki, Finland

Filed Mar. 8, 1995, Ser. No. 401,096
Claims priority, application Finland, Mar. 9, 1994, 941116
Int. Cl.[6] F15D *1/02*
U.S. Cl. 138—39 **13 Claims**



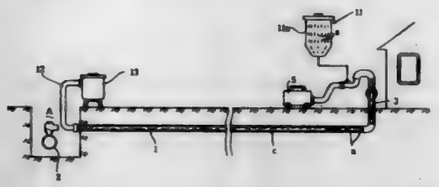
1. A device for reducing the noise caused by throttling a gas flow in a flow channel, said device comprising a channel having an entrance and an exit, a cross-section and a throttling part located along the flow channel, a portion of wider cross-section than said throttling part located between said throttling part and said exit, said throttling part including at least one deviation of the cross-section formed by a protrusion,said flow channel having a central axis and said protrusion tapering toward said central axis to form an acute angle so that, in a trans-sonic or supersonic flow passing over said protrusion, said protrusion will form a straight shock wave in the flow which will remain within a wide pressure drop ratio range to effect noise reduction.

5,590,689

METHOD FOR LINING THE INTERNAL SURFACE OF A PIPE

Shigeru Toyoda, Saitama-ken; Shuichi Yagi, Kanagawa-ken; Masaaki Itagaki, Kanagawa-ken; Nobukatsu Ike, Kanagawa-ken, and Kenji Ohshima, Kanagawa-ken, all of Japan, assignors to Tokyo Gas Co. Ltd., and Hakko Co., Ltd., both of Tokyo, Japan

Filed Mar. 1, 1996, Ser. No. 609,782
Claims priority, application Japan, Oct. 27, 1995, 7-280689
Int. Cl.[6] F16L *55/18*; B32B *35/00*
U.S. Cl. 138—97 **10 Claims**



1. A method for lining the internal surface of a pipe having a first open end and a second open end, said method comprising the steps of:

introducing a predetermined amount of a resin into the pipe through the first open end thereof;

causing the introduced resin to move through the pipe toward the second open end thereof, so as to form a resin lining layer on the internal surface of the pipe;

blowing into the pipe a predetermined amount of flake material and causing the flake material to adhere to the surface of resin lining layer in the pipe;

inserting into the pipe a ball-like pig having a predetermined diameter such that an even resin lining layer having a desired uniform thickness may be formed on the internal surface of the pipe; and

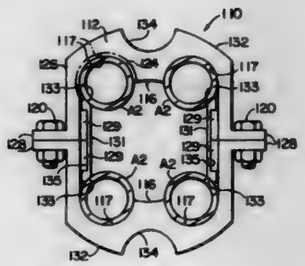
causing the inserted ball-like pig to move through the pipe along the entire length thereof, thereby embeding the above flake material into the resin lining layer, and forming on the pipe internal surface an even resin lining layer having a desired uniform thickness.

5,590,690

CENTERING SUPPORT FOR DOUBLE-CONTAINMENT PIPE ASSEMBLY

Christopher G. Zia, 9 Douglas St., Merrimack, N.H. 03054, assignor to Christopher G. Zia, Merrimack, N.H.

Continuation-in-part of Ser. No. 885,670, Aug. 17, 1992, Pat. No. 5,404,914. This application Apr. 10, 1995, Ser. No. 419,196
Int. Cl.[6] F16L *9/18*
U.S. Cl. 138—113 **18 Claims**



1. A centering support for a double-containment pipe assembly adapted to support a plurality of primary pipes within a containment pipe, comprising:

a first support half defining a plurality of curved support surfaces for supporting at least one primary pipe, including a first curved support surface and two second curved support surfaces located on opposite sides of the first curved support surface relative to each other and each being recessed within the first support half relative to the first curved support surface, each curved support surface being defined by a radius at least equal to the outside radius of the primary pipe to be supported by the respective support surface;

a second support half defining a plurality of curved support surfaces for supporting at least one primary pipe, including a first curved support surface and two second curved support surfaces located on opposite sides of the respective first curved support surface relative to each other and each being recessed within the second support half relative to the respective first curved support surface, each curved support surface being defined by a radius at least equal to the outside radius of the primary pipe to be supported by the respective support surface; and

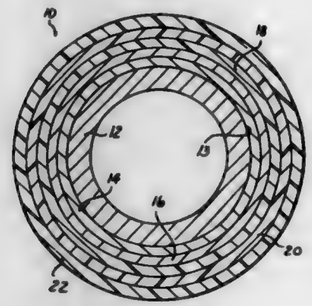
means for joining the first support half to the second support half and moving the first and second support halves toward each other to move the curved support surfaces toward the at least one respective primary pipe to fix and support the at least one primary pipe within the containment pipe.

5,590,691

EXTRUDED MULTIPLE PLASTIC LAYER COATING BONDED TO A METAL TUBE

Ralph A. Ioris, Bloomfield Hills; Robert M. Davis, Lapeer; James D. McDaniel, Ortonville; Frank L. Mitchell, Rochester, and Tao Nie, Macomb, all of Mich., assignors to ITT Corporation, New York, N.Y.

Filed May 2, 1994, Ser. No. 237,610
Int. Cl.[6] F16L *9/14*
U.S. Cl. 138—146 **20 Claims**



1. A multi-layer tube, comprising:

a metal tube having an outer surface;

a zinc layer bonded to the metal tube outer surface, wherein the zinc layer is selected from the group consisting of zinc plating, zinc nickel alloys, zinc cobalt alloys, zinc aluminum alloys, and mixtures thereof;

a surface treatment layer bonded to the zinc layer, wherein the surface treatment layer is selected from the group consisting of a zinc/aluminum/rare earth alloy, phosphate, chromate, and mixtures thereof;

a first polymeric layer bonded directly to the surface treatment layer, wherein the first polymeric layer is a thermoplastic material selected from the group consisting of thermoplastic elastomers, ionomers, nylons, fluoropolymers and mixtures thereof; and

a second polymeric layer bonded to the first polymeric layer, wherein the second polymeric layer is selected from the group consisting of, nylons, thermoplastic elastomers, fluoropolymers and mixtures thereof.

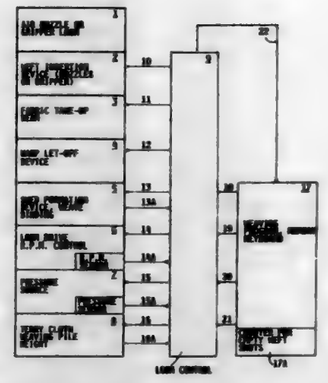
5,590,692

METHOD FOR AVOIDING FABRIC FAULTS DURING TRANSITIONAL LOOM OPERATING CONDITIONS

Peter D. Dornier, Neuneahorn; Adnan Wahhoud, Lindau; Peter Czura, Wangen, and Hans-Dieter Scorl, Lindau, all of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Germany

Filed Oct. 27, 1995, Ser. No. 549,624
Claims priority, application Germany, Oct. 29, 1994, 44 38 762.8
Int. Cl.[6] D03D *47/30*
U.S. Cl. 139—1 R **12 Claims**

1. A method for avoiding weaving defects that can be caused by transition operational conditions in smooth fabrics and in pile fabrics by transition operational conditions occurring during operation of a loom (1) having weft insertion elements (2), a reed (5), warp let-off elements (4), fabric take-up elements (3), and a main loom control (9) including a memory (17) for storing at least one loom control program and an input device for entering control information into said main loom control (9), said control information including rated operational parameters, comprising the following steps:



(a) providing during the operation of said loom a transition signal that signifies the presence and duration of a transition operational condition in the continuous operation of said loom,

(b) stopping in response to said transition signal an actual weft thread insertion during said duration of said transition operational condition while simultaneously performing empty weft insertion shots by said weft insertion elements (2) in response to said transition signal,

(c) controlling said warp let-off elements and said fabric take-up elements in response to said transition signal in such a way that a beat-up edge of the fabric is held in a position spaced from a beat-up position of said reed during said duration of said transition operational condition, and

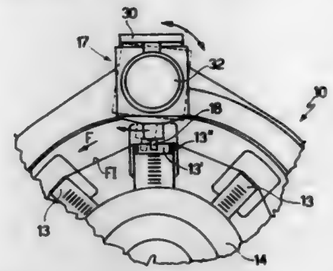
(d) resuming a normal loom operation at an end of said transition operational condition until a new transition operational condition occurs.

5,590,693

ROTATABLE THREAD ARRESTER FOR WEFT FEEDERS FOR AIR-JET LOOMS

Giovanni Pedrini, and Pietro Zenoni, both of Leffe, Italy, assignors to L.G.L. Electronics S.p.A., Bergamo, Italy

Filed Jul. 10, 1995, Ser. No. 499,844
Claims priority, application Italy, Jul. 19, 1994, TO94A0592; Feb. 21, 1995, TO95A0123
Int. Cl.[6] D03D *47/36*; B65H *51/22*
U.S. Cl. 139—452 **20 Claims**



1. A thread arrester for air-jet loom weft feeders comprising:

a thread arrester finger movable with respect to a feeder reel of a weft feeder from which thread is unwindable;

movement means for controlling movement of said arrester finger to a position for engaging the thread so as to stop unwinding of the thread from said reel and respectively for releasing said thread to unwind further from said reel;

support means for supporting said arrester finger such that said arrester finger is rotatably suspended about a rotation axis that is parallel to and arranged distally from a central longitudinal axis of said reel;

motor means for actuating said arrester finger to rotate said arrester finger about said rotation axis by a preset angular step in an unwinding direction of the thread so that the arrester finger follows said thread during an arresting phase whereby for damping a peak of mechanical tension generated on the thread upon contact with said arrester finger.

5,590,694

METHOD AND APPARATUS FOR WINDING AND FIXING BAND

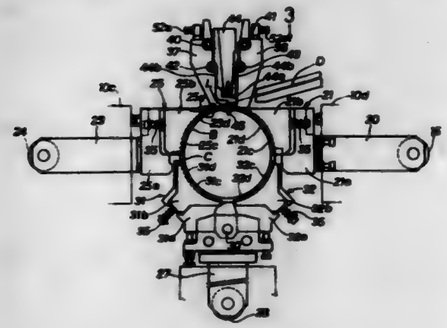
Shiro Naito; Tomohiko Yamamoto, and Tomonori Yamamoto, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1995, Ser. No. 404,233

Claims priority, application Japan, Nov. 1, 1994, 6-268789; Nov. 1, 1994, 6-268799; Nov. 1, 1994, 6-268808; Nov. 1, 1994, 6-268827; Nov. 1, 1994, 6-268835

Int. Cl.[6] B23P *19/04*

U.S. Cl. 140—93.2 **39 Claims**



1. A method for winding and fixing a band comprising the steps of:

using a lateral pair of upper clamping members and a lateral pair of lower clamping an members to surround a boot;

forming a gap between an inner surface of each of the clamping members and outer circumference of the boot;

inserting a band into the gap;

winding the band around the outer circumference of the boot;

overlapping part of the band on itself over the boot;

clamping the clamping members;

cutting off a section of said band surrounding the boot; and

welding the overlapping part of the band;

said gap forming step includes moving the inner surface of each of the clamping members adjacent each other to form an approximately round shape; and

said clamping step includes moving each of the lower clamping members upward and pressing a lower part of the band against the boot, then moving said pair of upper clamping members inward and moving the respective upper ends of the lower clamping members inward such that the movement of said lower clamping members clamps the band against the boot upwardly, and then moving each of said upper clamping members to clamp an upper part of the band.

5,590,695

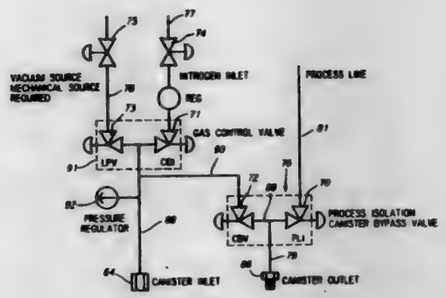
MANIFOLD SYSTEMS FOR HIGH PURITY CHEMICAL DELIVERY SYSTEMS

Stephen H. Siegele, Campbell; Craig M. Nash, Mountain View, both of Calif., and John N. Gregg, Marble Falls, Tex., assignors to Advanced Delivery & Chemical Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 345,244, Nov. 28, 1994, which is a continuation-in-part of Ser. No. 184,226, Jan. 19, 1994, which is a continuation-in-part of Ser. No. 54,597, Apr. 28, 1993, Pat. No. 5,465,766. This application Jun. 7, 1995, Ser. No. 485,966

Int. Cl.[6] F17C *13/00*

U.S. Cl. 141—21 **7 Claims**



1. A high purity chemical delivery system comprising a manifold, said manifold comprising a bulk container outlet line connected to an ampule refill line by a process isolation valve;

a carrier gas bulk container inlet line connected to a carrier gas source by a carrier gas isolation valve;

a low pressure vent valve connected between a low pressure line communicating with said carrier gas bulk container inlet line and a vacuum line; and,

a container bypass valve connected between said bulk container outlet line and said carrier gas bulk container inlet line; a first block valve comprising said container bypass valve and said process isolation valve, and a second block valve comprising said low pressure vent valve and said carrier gas isolation valve.

5,590,696

INFLATION SYSTEM UTILIZING A PRESSURIZED GAS INFLATION DEVICE AND ADAPTOR THEREFOR

Matthew L. Phillips, N. Easton, Mass.; Bert D. Heinzelman, Tenafly, N.J.; Paul J. Mulhauser, New York, N.Y.; David R. Schiff, Highland Park, N.J.; Christopher Brooks, Glen Head, N.Y., and Stanley H. Rembiszewski, Bolton, Mass., assignors to Reebok International Ltd., Stoughton, Mass.

Filed Jul. 14, 1994, Ser. No. 274,861

Int. Cl.[6] B65B *31/00*

U.S. Cl. 141—47 **29 Claims**

1. An inflation device, comprising:

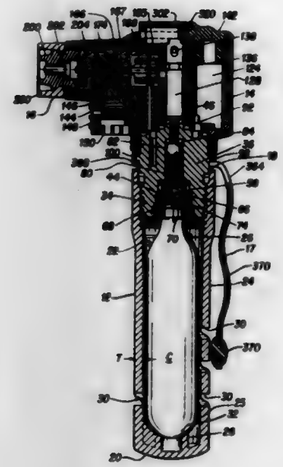
a source of pressurized gas;

a head unit, said head unit including an inlet and an outlet and a passageway extending between said inlet and said outlet;

a housing for maintaining said source of pressurized gas in fluid communication with said inlet of said head unit;

a nozzle in fluid communication with said outlet of said head unit such that a fluid pathway is established therebetween; and

a means for creating and delivering a predetermined bolus of gas to said nozzle, said means being disposed within said head unit.



5,590,697

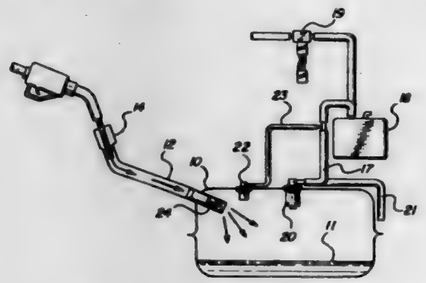
ONBOARD VAPOR RECOVERY SYSTEM WITH TWO-STAGE SHUTOFF VALVE

Robert P. Benjey, Dexter, and Rudolph Bergsma, Ann Arbor, both of Mich., assignors to G. T. Products, Inc., Ann Arbor, Mich.

Filed Aug. 24, 1994, Ser. No. 295,196

Int. Cl.[6] F16K *17/04*

U.S. Cl. 141—59 **2 Claims**



1. In a vehicle fuel system having a fuel tank, a dynamically-sealed filler pipe, and onboard vapor recovery apparatus such as a vapor canister, a fuel vapor venting control system comprising:

control valve means in the fuel tank for venting fuel vapor from the tank to the canister at a first higher rate when the fuel level is below a first level, at a second lower rate when the fuel level reaches the first level, and for closing when a second higher level is reached;

valve means in the fuel tank for maintaining a pressure head in the tank sufficient to induce filler nozzle shutoff when the control valve means is closed and for selectively venting fuel vapor to the canister independent of the control valve means; and

check valve means in a lower end of the filler pipe to close the filler pipe with respect to the fuel tank between refueling activity; wherein,

the control valve means comprises two stage coaxial valve means responsive to the level of liquid fuel in the tank, the coaxial valve means comprising a liquid level responsive float means, first and second valve means associated with the float means, and vent outlet means, the float means responsive to liquid fuel reaching the first level to force the first valve means to a position partially closing the vent outlet means, the first valve means being yieldably biased from the second valve means, the float means being responsive to liquid fuel level above the first level to force the second valve means against the bias of the first valve means to fully close the vent outlet means.

5,590,698

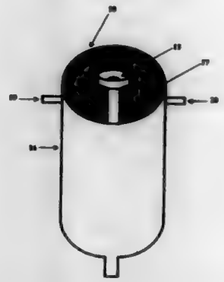
SPILL RECOVERY FILL SPOUT

Gerald E. Whitley, and Mary F. Whitley, both of Grimesland, N.C., assignors to Gerald Whitley, Grimesland, N.C.

Filed Sep. 5, 1995, Ser. No. 523,241

Int. Cl.[6] B65B *1/04;3/04*

U.S. Cl. 141—98 **1 Claim**



1. A spill recovery fill spout for use in refueling vessels, comprising:

a cylindrical fill spout having an open upper end adapted to receive the fill spout of a refueling nozzle, an open lower end, a sidewall extending between the upper and lower ends and a hole disposed in the sidewall;

a recapture tank surrounding a portion of the cylindrical fill spout, and having an open upper end and a lower end attached to the cylindrical fill spout at a point below said hole;

at least one horizontally disposed vent pipe attached to said recapture tank to vent the interior thereof; and

a concave perforated screen attached to the open upper end of said recapture tank and terminating at a point along the upper portion of said fill spout to prevent debris from entering the recapture tank and clogging said hole;

wherein, during filling, overfill and spray-back fuel is collected by the recapture tank and returned to the vessel via said hole.

5,590,699

MECHANISM FOR ROTATING A TREE-FELLING IMPLEMENT AND TREE-FELLING IMPLEMENT THEREWITH

Sylvain Gilbert, 1641 boul. St-Dominique, Roberval, Québec, Canada, and Michel Taillon, St-Félicien, Canada, assignors to Sylvain Gilbert, Canada

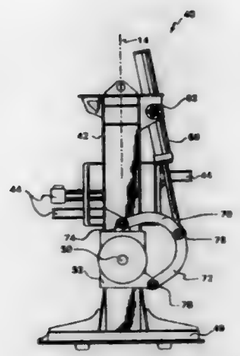
Continuation-in-part of Ser. No. 419,713, Apr. 10, 1995. This application Dec. 12, 1995, Ser. No. 571,076

Int. Cl.[6] A01G *23/08; E02F 3/32*

U.S. Cl. 144—34.1 **4 Claims**

1. A mechanism for rotating a tree-felling implement, the tree-felling implement comprising a frame rotatably connectable to a distal end of a boom of a logging vehicle by an implement pivot, the boom generally defining a boom plane, the mechanism comprising:

a first arc-shaped member extending substantially in a plane perpendicular to the boom plane and being convex with reference to the implement pivot, the first member having a first end rotatably connected to the frame of the implement at a given distance from the implement pivot;



a second arc-shaped member substantially coplanar with the first member and being convex with reference to the implement pivot, the second member having a first end rotatably connected to the second end of the first member and thereby defining an intermediary junction, and a second end rotatably connected to the distal end of the boom; and

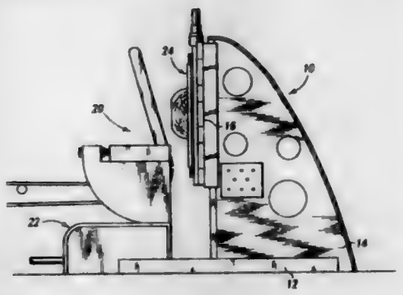
an actuator mounted on the frame of the implement, the actuator having an end rotatably connected to or adjacent to the intermediary junction for rotating the implement during operation of the actuator.

5,590,700

VACUUM FLITCH TABLE WITH SELF-CLEANING VACUUM VALVE

Robert D. Brand, Lawrence, Ind., assignor to Capital Machine Co., Inc., Indianapolis, Ind.

Filed Nov. 15, 1995, Ser. No. 559,296
Int. Cl.[6] B27L 5/06
U.S. Cl. 144—178 **19 Claims**



1. A vacuum flitch table with a self-cleaning vacuum system, comprising:

a flitch table with a plurality of vacuum cells for retention of a flitch,

a vacuum source connected with said plurality of vacuum cells,

a plurality of self-cleaning vacuum valves, each valve comprising,

a cylindrical valve body including a vacuum inlet and a vacuum outlet;

a piston disposed within the valve body for longitudinal movement between an open position and a closed position, the piston including port means for connecting the vacuum inlet and vacuum outlet when the piston is in the open position;

actuating means coupled to the piston for moving the piston between the open and closed positions; and

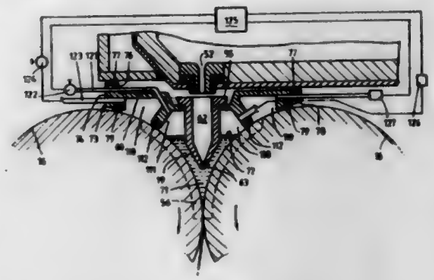
a debris cutting means coupled to the piston.

5,590,701

STRIP CASTER

Hisahiko Fukase, Tokyo, Japan, assignor to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan, and BHP Steel (JLA) Pty Ltd., Sydney, Australia

PCT No. PCT/AU93/00254, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/02269, PCT Pub. Date Feb. 3, 1994
PCT Filed May 31, 1993, Ser. No. 351,475
Claims priority, application Australia, Jul. 21, 1992, PL3713
Int. Cl.[6] B27D 11/00;11/06
U.S. Cl. 164—415 **10 Claims**



1. A metal strip casting apparatus, comprising:

a pair of parallel casting rolls forming a nip between them;

molten metal delivery means for delivery of molten metal into the nip to form a casting pool of molten metal in the nip;

pool confining members to engage the casting rolls at opposite ends of the nip to confine the casting pool in the nip;

roll drive means to drive the casting rolls in mutually opposite directions to form a metal strip from the casting pool and to pass the metal strip downwardly from the nip;

first chamber forming means comprising a first structure extending from the metal delivery means to the rolls to form a pressurizing chamber for gas pressurizing of the casting pool surface and forming pressurizing chamber seals with the casting rolls to each side of the casting pool;

second chamber forming means comprising a second structure disposed about said first structure and extending to the rolls to form a gas sealing chamber about the pressurizing chamber and forming sealing chamber seals with the casting rolls such that gas escaping the pressurizing chamber through the pressure chamber seals will enter the gas sealing chamber;

means for delivering a non-oxidizing gas to the pressurizing chamber to pressurize pressuring chamber with the non-oxidizing gas at superatmospheric pressure;

means for delivering a second gas to the sealing chamber to pressurize the sealing chamber with the second gas at superatmospheric pressure; and

pressure control means for regulating the non-oxidizing gas delivering means and the second gas delivering means to maintain the superatmospheric pressure of the second gas in the sealing chamber at a value which is equal to or slightly less than superatmospheric pressure of the non-oxidizing gas in the pressurizing chamber to inhibit leakage of the non-oxidizing gas from the pressurizing chamber.

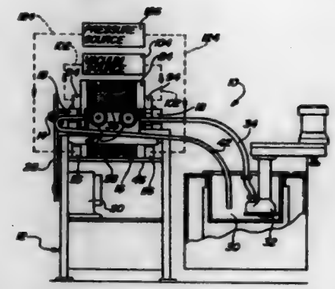
5,590,702

SEGMENTAL CASTING DRUM FOR CONTINUOUS CASTING MACHINE

Raymond L. Schenk, Marysville, Mich., assignor to Venture Enterprises, Incorporated, Grosse Pointe, Mich.

Filed Jun. 20, 1995, Ser. No. 492,480
Int. Cl.[6] B22D 11/06
U.S. Cl. 164—429 **25 Claims**

1. A continuous casting machine comprising:



a casting drum including a shaft, a cylindrical shell having a mold cavity on the outer peripheral surface thereof, and mounting means for mounting said shell for rotation with said shaft, said shell being assembled from a plurality of registrably interconnectable shell rings each having a segment of said mold cavity formed thereon;

a shoe having an outer surface overlying said mold cavity, an inlet, an outlet, a passageway extending between said inlet and outlet, and a discharge slot extending between said passageway and said outer shoe surface;

a source of molten casting material;

a supply line interconnecting said source of molten casting material to said shoe inlet;

a return line interconnecting said shoe outlet to said source of molten casting material;

means for rotating said shaft for moving said mold cavity past said discharge slot in said shoe surface; and

means for directing said molten casting material at a desired pressure and flow rate from said source through said supply line and said inlet to said passageway.

22. In a continuous casting machine of the type having a casting drum with a mold cavity formed on a surface thereof and which is movable relative to a shoe in fluid communication with a source of molten casting material, said casting drum including a plurality of flow passageways extending from at least one side of said drum and communicating with said mold cavity through openings extending from each passageway to said mold cavity.

5,590,703

ALUMINUM SURFACE TREATMENT

C. Edward Eckert, 260 Lynn Ann Dr., New Kensington, Pa. 15068

Filed Apr. 17, 1995, Ser. No. 423,544
Int. Cl.[6] B22D 11/12
U.S. Cl. 164—476 **22 Claims**

1. A method of removing a surface layer from a solidified body of aluminum alloy metal at an elevated temperature to remove surface defects therefrom, the method comprising:

(a) providing a solidified body having a surface, the body at a temperature greater than 200° F. and below the solidus temperature of the metal;

(b) contacting said surface with an abrasive material having a particle size in the range of 6 to 300 grit (U.S. Sieve Series); and

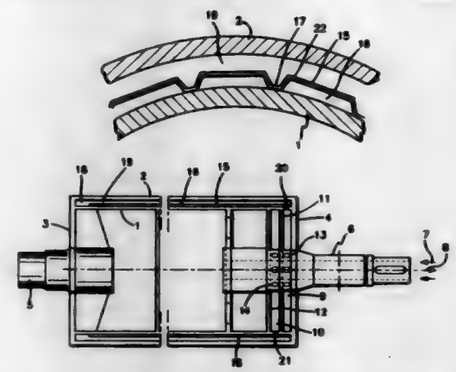
(c) applying said abrasive material at a flux sufficient to remove a surface layer of metal from said body, said surface layer of metal removed having a thickness in the range of 10 to 300 μm to provide a surface substantially free of said surface defects and then rolling said body.

5,590,704

METHOD OF HEATING A JACKETED WORKING SURFACE OF ROTATING ROLLER AND A ROTARY ROLLER

Gunnar Eriksen, Borgen, and Sissel W. Olsen, Tranby, both of Norway, assignors to Kvaerner Eureka A.S., Tranby, Norway

Filed Feb. 3, 1995, Ser. No. 383,229
Claims priority, application Norway, Feb. 21, 1994, 940588
Int. Cl.[6] F28F 5/02
U.S. Cl. 165—90 **7 Claims**



1. In a method of heating a jacketed working surface of a rotating roller by supplying heat to a fluid heat transfer medium immediately below the jacketed working surface by flowing a heating medium through a heat exchanger defining a glow path between an inlet and an outlet, the improvement which comprises flowing a first part of the heating medium into a blind space directly under said jacketed working surface, said blind space being hydraulically distinct from said flow path, and forming a buffer layer of heat transfer medium extending across the jacketed surface between the heat exchanger and the jacketed working surface.

3. A rotary roller comprising a jacketed working surface, a heat exchanger in a fluid heat transfer medium in an annular space immediately below the jacketed working surface, said heat exchanger comprising a system of ducts including connections to an inlet and an outlet for heating medium circulator, said heat exchanger being arranged such that a buffer layer of the fluid heat transfer medium forms between the heat exchanger and the jacketed working surface, said ducts having at a respective end spaced from the connections to the inlet and outlet, medium flow connection means to said annular space directly below said jacketed working surface.

5,590,785

DEVICE FOR GENERATING A HOT AIR FLOW

Alain Chevalier, Asnieres/Bourges, and Marc Bouchez, Saint-Doulchard, both of France, assignors to Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle, Paris, France

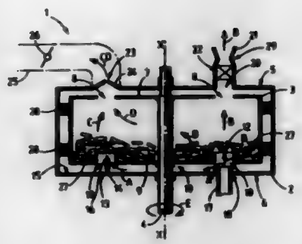
Filed Jun. 26, 1995, Ser. No. 494,704
Claims priority, application France, Jul. 12, 1994, 94 08618
Int. Cl.[6] F23L 15/02
U.S. Cl. 165—9 **9 Claims**

1. A device for generating a hot air flow, in particular for developing ramjets, comprising:

an air source generating an air flow at its outlet;

a heating system having at least one burner fed with combustible fluid, and an outlet;

a rotatable container having a rotation axis, an upper wall and a lower wall and containing heat-exchange elements capable of storing heat energy generated by said heating system, said



container being provided in said upper wall with a first annular opening, concentric with said rotation axis and in said lower wall with a second annular opening, also concentric with said rotation axis and facing said first annular opening; and

an enclosure, inside which said container is mounted so as to rotate relative to said enclosure, said enclosure having an upper wall and a lower wall, and said outlet of the air source and said outlet of the heating system being arranged at said lower wall of said enclosure, at diametrically opposite positions relative to said rotation axis of said container, and in front of said second annular opening of said container, said enclosure being provided, in its upper wall, with a first opening, arranged in front of said outlet of the air source, and with a second opening arranged in front of said outlet of the heating system.

5,590,706

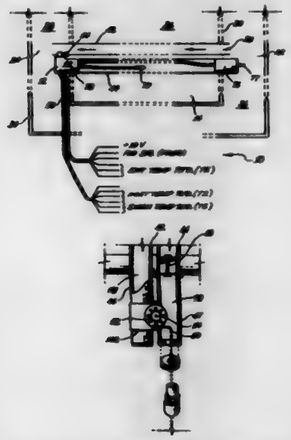
ON-LINE FOULING MONITOR FOR SERVICE WATER SYSTEM HEAT EXCHANGERS

John L. Tsou, Foster City, Calif., and John F. Garey, Marion, Mass., assignors to Electric Power Research Institute, Palo Alto, Calif.

Continuation-in-part of Ser. No. 165,750, Dec. 10, 1993, Pat. No. 5,429,178. This application Jul. 3, 1995, Ser. No. 497,959

Int. Cl.[6] F28G *13/00*

U.S. Cl. 165—11.1 **10 Claims**



1. A sensing apparatus adapted for use with a heat exchanger for use with a service water system comprising:

a) heat exchanger means having a shell side and a tube side comprising;

i) tube sheet means for providing a heat exchange surface between a coolant fluid zone and service water zone comprising a plurality of individual heat transfer tubes extending between an inlet header configured for separately introducing service water and coolant fluid into said heat exchanger means, and a discharge header configured for separately extracting exhaust service water and coolant fluid from said heat exchanger means; said tube sheet means comprising:

ii) tube means for monitoring flow including at least one heat transfer tube providing a fluid flow conduit; and

iii) tube means for monitoring temperature including at least one plugged heat transfer tube positioned immediately adjacent said means for monitoring flow;

b) combination means for individually sensing flow in said fluid flow conduit in combination with sensing temperature differentials in said plugged heat transfer tube, said combination means comprising a dual tube and plug apparatus connected to a discharge end of said tube means for monitoring flow adjacent said discharge header means and a discharge end of said tube means for monitoring temperature also adjacent said discharge header means, said dual tube and plug apparatus comprising:

i) a flow sensing device including a first flow assembly tube including a tubular conduit, and a flow sensor mounted in an inner chamber for directly measuring the coolant flow through the dual tube and a plug attachment for connection with the temperature monitoring tube;

ii) a second temperature assembly tube configured to plug the outlet of the temperature monitoring tube, for excluding coolant flow, immediately adjacent to the first flow assembly tube; and

iii) means for detecting shell side inlet water temperature and shell side outlet water temperature;

iv) means for detecting tube side inlet water temperature and tube side outlet water temperature;

d) means for sealing out coolant flow comprising at least one plug devices for attachment to the inlet end of the temperature monitoring tube;

e) monitor means for comparing temperature differential signals and flow signals from the dual tube probe and plug means first dual tube probe and plug assembly and for combining other flow and discharge temperature signals from additional dual tube devices connected to a microprocessor; and

f) microprocessor means for utilizing flow and temperature differential data provided by the flow sensor means and the temperature sensor means and continuously calculates, records and displays the individual tube heat transfer coefficient and flow velocity for the selected heat transfer tube.

5,590,707

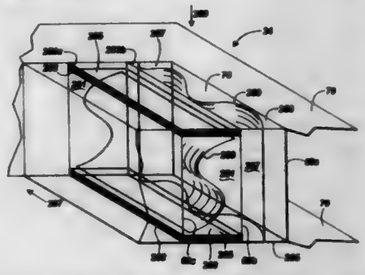
HEAT EXCHANGER

David Mauterer, Atlanta, Ga., assignor to Contaminant Separations, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 40,881, Mar. 31, 1993, Pat. No. 5,452,758. This application May 5, 1995, Ser. No. 435,362

Int. Cl.[6] F28F *9/22;3/00*

U.S. Cl. 165—145 **2 Claims**



1. A heat exchanger for transferring thermal energy between a process fluid and a refrigerant fluid, comprising:

an aligned and stacked first group of at least one plate-fin heat exchange module and a second group of at least one plate-fin heat exchange module, each heat exchange module comprising:

an inlet distribution manifold for receiving a refrigerant fluid from a supply;

a discharge distribution manifold for communicating the refrigerant fluid to the supply;

a core defined by a plurality of parallel closely spaced-apart plates brazed to the inlet and discharge manifolds to define a first group of discrete channels for flow of a process fluid in a first direction through the core and a second group of discrete channels for flow of the refrigerant fluid through the core transverse to the flow of the process fluid, the channels alternating in series whereby a channel for the process fluid is adjacent a channel for the refrigerant fluid, the channels for the process fluid open along transverse edges of the plates for receiving and discharging the process fluid, the channels for the refrigerant fluid open at longitudinal ends to the intake manifold and the discharge manifold for communicating the refrigerant through the core, the plates extending substantially the full width between planes defined by an inlet side of the core for receiving the process fluid and a discharge side of the core, whereby a rigorous flow path is defined by the discrete channels through the module from the inlet side to the discharge side;

fin stock sheets fixed between adjacent plates and oriented with the respective direction of flow through the respective channel defined by the plates, whereby thermal communication between the process fluid and the refrigerant fluid is facilitated;

the modules stacked and sequenced alternately with one of the modules of the first group adjacent one of the modules of the second group and communicating with the supply of the refrigerant fluid such that the refrigerant fluid flows in the transverse direction through the modules of the first group and in an opposite transverse direction through the modules of the second group;

supply means for communicating the refrigerant from the supply to the inlet distribution manifolds of the first and the second groups of modules;

discharge means for communicating the refrigerant from the outlet distribution manifolds of the first and the second groups of modules to the supply;

whereby the process fluid, being communicated through a flow path defined by the channels in the respective heat exchange modules, transfers thermal energy substantially uniformly across adjacent pairs of the modules.

5,590,708

HEAT EXCHANGER BLOCK

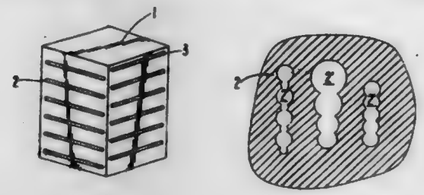
Heinz P. Ulrich, Frankfurt, Germany, assignor to Deutsche Carbone AG, Frankfurt, Germany

Filed Dec. 19, 1994, Ser. No. 358,813

Claims priority, application Germany, Dec. 17, 1993, 9319430 U

Int. Cl.[6] F28F *7/02*

U.S. Cl. 165—165 **17 Claims**



1. A heat exchanger block comprising:

a monoblock composed of a ceramic material and having two separate conduit systems for media flowing through said monoblock, at least one of the conduit systems including a conduit having a cross-sectional profile of an essentially oblong slot and having a plurality of walls, each wall having a cross-sectional profile of overlapping circular arcs, said circular arcs having differing radii.

5,590,709

HOUSINGLESS TYPE OIL COOLER AND METHOD FOR PRODUCING THE SAME

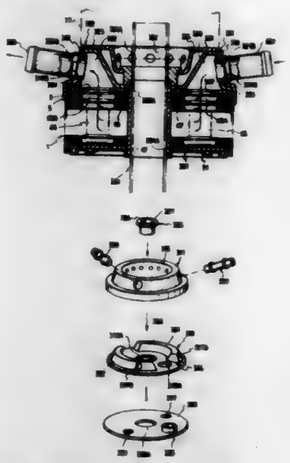
Makoto Tajima; Shinji Araki, and Kei Beppu, all of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

Division of Ser. No. 470,477, Jun. 6, 1995, Pat. No. 5,513,702, which is a division of Ser. No. 170,803, Dec. 21, 1993, Pat. No. 5,464,056. This application Feb. 16, 1996, Ser. No. 601,280

Claims priority, application Japan, Dec. 21, 1992, 4-340647; Mar. 15, 1993, 5-54172

Int. Cl.[6] F28F *3/08*

U.S. Cl. 165—167 **7 Claims**



1. A housingless type oil cooler comprising:

a core portion (1) constituted by a plurality of plates (3, 5) respectively having through-holes (43, 45) formed at their center portions, said plate (3, 5) being alternately laminated on one another so that cooling water passages (65) and oil passages (67) are alternately formed between said plates (3, 5);

one of an oil filter (77) and a sealed flange portion (401) mounted on said core portion (1) through a composite tank (302); and

an oil outflow pipe (47) inserted through said through-holes (3, 5) of said core portion (1) so as to make oil pass through said oil outflow pipe;

characterized in that:

said composite tank (302) is constituted by an upper tank (311) and a partition tank (313) which is disposed inside of said upper tank (311) so that a flat portion (314) of said partition tank (313) is arranged on said core portion (1);

said upper tank (311) is constituted by an annular top portion (315) for supporting said oil filter (77), an inner cylindrical portion (316), and an outer cylindrical portion (317), said portions (315, 316, 317) being continuously formed so that a gate shape of said portions (315, 316, 317) is made annular to thereby form a doughnut space inside said portions (315, 316, 317), said upper tank (311) having a plurality of oil communicating holes (318) formed through said inner cylindrical portion (316) and an opening portion

(319) formed through said inner cylindrical portion (316) in a position separated by a predetermined distance from said flat portion (314) of said partition tank (313) in a direction of an axis of said core portion;

said partition tank (313) has a through-hole (318A), an oil passage hole (319A), a first projection-like partition portion (321), and a second projection-like partition portion (323), said through-hole (38A) and said oil passage hole (319A) being formed through said flat portion (314), said first and second projection-like partition portions (321, 323) being formed on said flat portion (314) so as to support at their surfaces parts of said annular top portion (315) of said upper tank (311) and having an inlet tank chamber (320) and an outlet tank chamber (322) formed inside of said first and second projection-like partition portions (321, 323), respectively;

a seat connector (525) connected to said opening portion (319) of said upper tank (311) and to said flat portion (314) of said partition tank (313), said seat connector (325) having an opening hole (326) formed therethrough and being connected to an inlet end of said oil outflow pipe (47);

a cooling water inflow pipe (329) is provided so as to pass through said upper tank (311) and said first projection-like partition portion (321) and so as to open in said inlet tank chamber (320) of said partition tank (313), said cooling water inflow pipe (329) being connected to said upper tank (311) and said first projection-like partition portion (321) and

a cooling water outflow pipe (330) is provided so as to pass through said upper tank (311) and said second projection-like partition portion (323) and so as to open in said outlet tank chamber (322) of said partition tank (313), said cooling water outflow pipe (330) being connected to said upper tank (311) and said second projection-like partition portion (323).

5,590,710

HEAT EXCHANGER

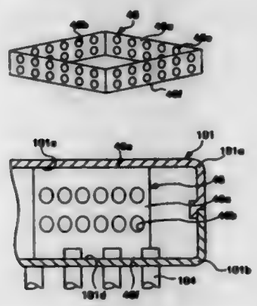
Kenichi Sasaki; Rei Oikawa; Tomohiro Chiba, and Jun Iwai, all of Isesaki, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 21, 1994, Ser. No. 361,302

Claims priority, application Japan, Dec. 21, 1993, 5-346145

Int. Cl.[6] F28F *9/02*

U.S. Cl. 165—173 **2 Claims**



1. A heat exchanger comprising a first tank and a second tank spaced apart from said first tank; a plurality of heat transfer tubes, each having a first and a second end, disposed between said first tank and said second tank, wherein each first end of said plurality of heat transfer tubes is connected to said first tank and each second end is connected to said second tank; at least one partition disposed within at least one of said first and said second tanks to divide said tank into at least two chambers; and reinforcing means disposed in at least one of said first and said second tanks for preventing deformation of said tank due to an increase of pressure within said tank and independent of said partition, wherein said reinforcing means include at least one reinforcement plate member securely joining an upper wall of said tank to a lower wall of said tank and including a plurality of holes therethrough, through which said heat exchanger medium flows and wherein said plate member comprises a plurality of first plate portions having a plurality of holes therethrough and a plurality of second plate portions having a plurality of holes therethrough and connected with said first plate portions.

5,590,711

HEAT TRANSFER TUBE FOR ABSORBER

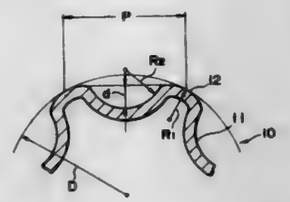
Seiji Ishida, Hatano, and Takashi Kuriyama, Tokyo, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 13, 1994, Ser. No. 357,275

Claims priority, application Japan, Dec. 14, 1993, 5-313861

Int. Cl.[6] F28F *1/42*

U.S. Cl. 165—179 **1 Claim**



1. A heat transfer tube for an absorber, said tube comprising a Wall having plurality of crest portions and trough portions extending in parallel to each other in substantially an axial direction of said tube, said crest portions and trough portions being arranged alternately in a circumferential direction of said tube, wherein, at least on an outer surface of said wall, the ratio d/P of a depth d of each of said trough portions to a pitch P of said crest portion defined as P=πD/n is set in the range of 0.1 to 0.4, the depth d is set in the range of 1.5 to 2.0 mm, the ratio R_2/d is set in the range of 2.5 to 6.0, and the ratio R_1/R_2 is set larger than 1, where n represents a positive integer, R_1 represents a radius of curvature of an outer top surface of said each crest portion, R_2 represents a radius of curvature of an outer bottom surface of said each trough portion, and D represents a diameter of a circumscribed circle of said crest portions.

5,590,712

HEAT SINK

Francis E. Fisher, Shaw; Robin D. Johnson, Bath; David G. Gove, and Michael D. Wade, both of Plympton, all of United Kingdom, assignors to Redpoint Thermalloy, Ltd., Swindon, United Kingdom

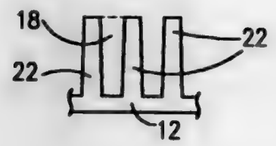
Division of Ser. No. 249,393, May 26, 1994. This application May 12, 1995, Ser. No. 439,875

Claims priority, application United Kingdom, May 27, 1993, 9310993

Int. Cl.[6] B23P *13/04*

U.S. Cl. 165—185 **3 Claims**

1. A heat dissipating element comprising an extruded longitudinally extending base member having a plurality of transversely spaced rows of longitudinally extending and spaced apart rib portions upstanding therefrom, wherein the rib portions taper progressively in a depthwise direction towards the extruded base member, said heat dissipating element having gaps between said spaced apart rib portions which are removed in a transverse punching operation, and wherein said base member and rib portions are formed of metal or other suitable thermally conductive material.



5,590,713

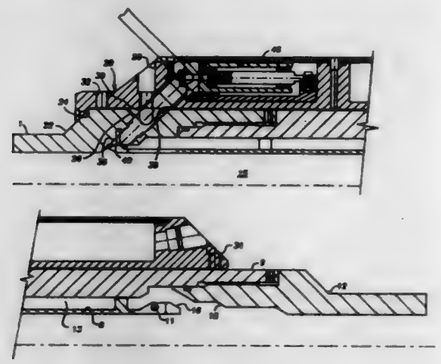
REMOTE CONTROL FOR WELL TOOL

John L. Baugh, Houston; Steven C. Owens, Katy; David E. Rothers, and Michael W. Holcombe, both of Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 68,513, May 27, 1993. This application Oct. 5, 1994, Ser. No. 318,266

Int. Cl.[6] E21B *23/08;33/05*

U.S. Cl. 166—53 **17 Claims**



1. A control apparatus for a single or multiple plug-dropping tool, comprising:

at least one signal transmitter for sending at least one signal over the air;

at least one signal receiver for receiving said signal from said transmitter and to provide an output;

at least one control system comprising a primary control element, said control system further comprises:

at least one final control element, said final control element selectively connected to the tool, whereupon actuation of said primary control element selectively permits actuation of said final control element to actuate the tool,

a selectively releasable potential energy storage mechanism;

a force transfer mechanism connected to said potential energy mechanism and said final control element; and

at lease one signal processor to use said output from said receiver to selectively remotely operate said control element to allow release of a plug from the apparatus by said system.

5,590,714

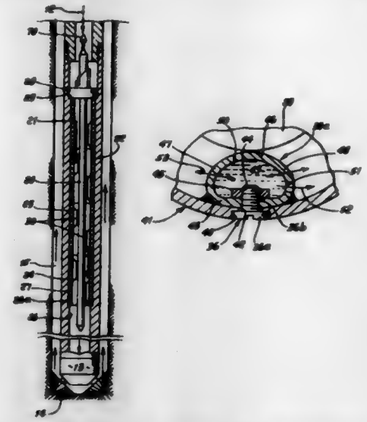
MULTI-MODE CUSHIONING AN INSTRUMENT SUSPENDED IN A WELL

Donald H. Van Steenwyk, San Marino; Raymond W. Teys, Pismo Beach, both of Calif., and Robert M. Baker, The Woodlands, Tex., assignors to Scientific Drilling International, Houston, Tex.

Continuation of Ser. No. 337,731, Nov. 14, 1994, Pat. No. 5,520,246. This application Feb. 15, 1996, Ser. No. 602,154

Int. Cl.[6] E21B *17/07;* G01D *11/10*

U.S. Cl. 166—242.1 **19 Claims**



1. In apparatus for the protection of instrumentation placed within a drill string in a well, as during drilling, the combination comprising

a) support structure, including a carrier sized for reception in the string, and

b) deflectible structure carried by said support structure and including multiple protrusions spaced about a longitudinal axis defined in the well, said protrusions exteading generally longitudinally, and protruding in directions radially of said axis to absorb radial loading and torsional loading exerted in directions about said axis, and to deflect in said directions of radial and torsional loading,

c) said apparatus being centrally open throughout the longitudinal length thereof.

5,590,715

UNDERGROUND HEAT EXCHANGE SYSTEM

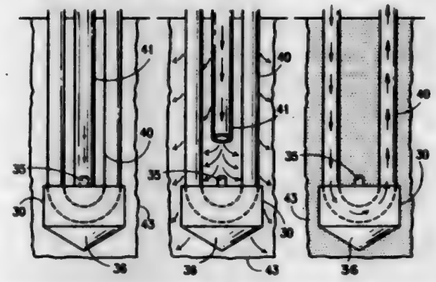
Thomas R. Amerman, 726 Montclair, Sugar Land, Tex. 77478

Filed Sep. 12, 1995, Ser. No. 527,114

Int. Cl.[6] E21B *33/13;* F28D *20/00*

U.S. Cl. 166—290 **20 Claims**

1. Apparatus for simultaneously introducing a loop of heat exchange pipe and a grout pipe into a wellbore, the apparatus comprising



a body member securable to a heat exchange pipe loop,
releasable means on the body member for holding and from which a grout pipe is selectively releasable, and
the body member with the heat exchange pipe loop and grout pipe connected thereto introducible into a wellbore and movable to a point in the wellbore at which point the grout pipe is releasable from the body member.

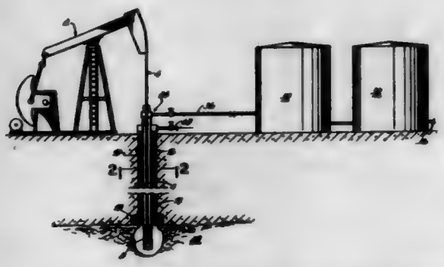
15. A method for installing a heat exchange pipe loop in a first wellbore, the method comprising
introducing into the first wellbore an apparatus, the apparatus for simultaneously introducing a loop of heat exchange pipe and a grout pipe into a wellbore, the apparatus comprising
a body member securable to a heat exchange pipe loop,
releasable means on the body member for holding and from which a grout pipe is selectively releasable, and
the body member with the heat exchange pipe loop and grout pipe connected thereto introducible into a wellbore and movable to a point in the wellbore at which point the grout pipe is releasable from the body member,
moving the apparatus down to a point within the first wellbore,
releasing the grout pipe from the releasable means on the body member,
removing the grout pipe from the body member and from the first wellbore, and
pumping grout into the first wellbore through the grout pipe as the grout pipe is removed from the first wellbore.

5,590,716

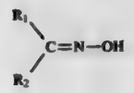
METHOD OF INHIBITING DOWNHOLE CORROSION OF METAL SURFACES

William D. Mansfield, Baker, La., assignor to Drew Chemical Corporation, Boonton, N.J.

Continuation of Ser. No. 322,935, Oct. 13, 1994, abandoned. This application Apr. 28, 1995, Ser. No. 431,274
Int. Cl.[6] E21B 41/02; C23F 11/08
U.S. Cl. 166—302 12 Claims



1. A method of inhibiting corrosion on metal surfaces of equipment used in extracting brine and crude oil mixtures from below ground and separating the crude oil from the brine, comprising:
injecting into the ground on a periodic basis in proximity to the equipment used in extracting brine and crude oil mixtures an effective corrosion inhibiting amount of an oxime compound having the formula:



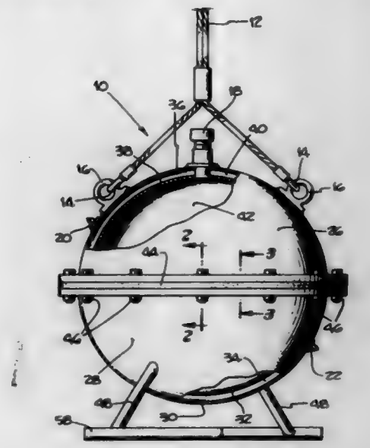
in which R_1 and R_2 are the same or different and are selected from hydrogen, lower alkyl groups of one to eight carbons or aryl groups.

5,590,717

FIRE EXTINGUISHING CAPSULE

Henry R. C. McBay, deceased, late of Atlanta, Ga., and by Ronald P. W. McBay, administrator, 2889 Seven Pines La., Atlanta, Ga. 30339-5801

Filed Dec. 11, 1995, Ser. No. 570,880
Int. Cl.[6] A62C 13/62
U.S. Cl. 169—52 14 Claims



1. A fire extinguishing capsule for cooling and extinguishing destructive fires, comprising:
a double-walled upper hemishape having an upper hemishape outer shell and an upper hemishape inner shell;
a vacuum space between said upper hemishape outer shell and said upper hemishape inner shell;
a double walled lower hemishape having a lower hemishape outer shell and a lower hemishape inner shell;
a vacuum space between said lower hemishape outer shell and said lower hemishape inner shell;
a window ring adapted to be interposed and sealed between said double walled upper hemishape and said double walled lower hemishape;
means for securing and sealing said double walled upper hemishape to said double walled lower hemishape;
a cooling extinguishant chamber formed between said double walled hemishapes by the securing and sealing together of said hemishapes;
means for filling said chamber with cooling fire extinguishant material.

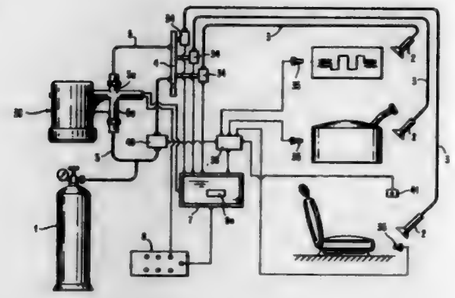
5,590,718

ANTI-FIRE SYSTEM FOR VEHICLES

Roberto Bertossi, Lungadige Campagnola, 2, Verona, Italy

Filed Oct. 13, 1995, Ser. No. 543,124
Claims priority, application Italy, Oct. 19, 1994, VR94A0087
Int. Cl.[6] A62C 3/07
U.S. Cl. 169—62 7 Claims

1. A fire extinguishing system which can be installed in a vehicle or a boat, the system comprising:
a fire extinguishing substance;
at least one fire extinguisher for containing and supplying the fire extinguishing substance;
at least one nozzle;
at least one distribution pipe connecting the at least one nozzle, to the at least one fire extinguisher;
at least one valve to control the flow of the substance through the at least one distribution pipe;
valve control means for opening each valve; and



an impact sensor for activating the valve control means in case of a collision of the vehicle, the impact sensor comprising a casing having an interior, an exterior, and two diametrically opposed holes through the casing, one hole being in communication with an external pipe section connected around the hole to the outside of the casing; a sliding piston inside the external pipe; the valve control means being located inside the external pipe for opening each valve when activated by the piston; a piston rod, integrated with the piston, having two ends each end supported in one of the opposed holes; a bottom which can be fixed to the casing; an upright cradle projecting from the bottom; a weighted ball movably held in said cradle; a lever having a fulcrum on the interior of the casing, a lever elastic end in contact with and supported by the ball for flexibly maintaining the ball on the cradle, a lever second end which is slidably connected to the piston rod; and a tensioned spring connected to the lever second end for moving the lever second end when a collision occurs which causes the ball to fall out of the cradle, releasing the lever elastic end and allowing the lever to pivot about the fulcrum, which movement of the lever second end slides the piston rod and the piston within the external pipe, such that the piston activates the valve control means.

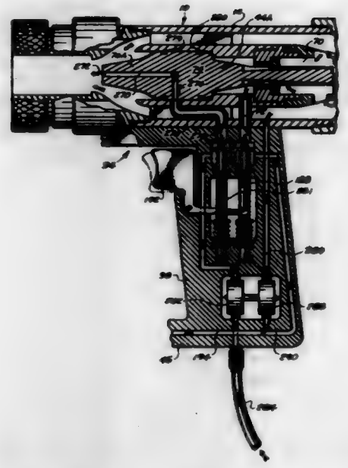
5,590,719

FIREFIGHTING NOZZLE WITH FOAM INJECTION SYSTEM

John E. McLoughlin, 26 Southern Blvd., Nesconset, and Neocles G. Athanasiades, 6 Maybeck Dr., East Setauket, both of N.Y. 11767

Continuation-in-part of Ser. No. 50,974, Apr. 19, 1993, Pat. No. 5,447,283, which is a continuation-in-part of Ser. No. 731,492, Jul. 17, 1991, Pat. No. 5,261,494. This application Dec. 6, 1993, Ser. No. 161,482
Int. Cl.[6] A62C 31/12
U.S. Cl. 169—70 9 Claims

1. A firefighting nozzle comprising a hollow nozzle body having:
a) an open inlet end for receiving liquid from a hose at a variable rate of flow;
b) an outlet end including a jet orifice, for discharging at least a portion of said liquid in the form of a circular solid stream having a variable diameter;
c) jet control means disposed within said jet orifice for selectively varying said diameter, said jet control means including
i) a valve body mounted for longitudinal translation within said nozzle body,
ii) a valve seat formed proximate said outlet end of said nozzle body, and
iii) drive means for moving said valve body relative said valve seat to vary said diameter;
d) a grip for facilitating handling of said nozzle; and
e) foam injection means for injecting foam concentrate into said solid stream at a low pressure point within said nozzle body, said foam injection means including
i) a reservoir containing the foam concentrate,



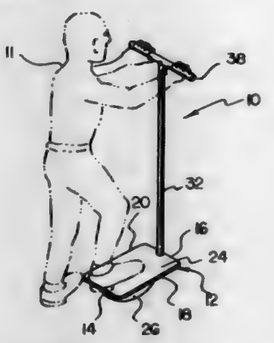
ii) passage means for conveying said foam concentrate from said reservoir to said nozzle, said passage means including an inlet communicating with said reservoir and an outlet located within said nozzle body,
iii) a discharge assistant for driving said foam concentrate out of said reservoir, through said passage means, and out said outlet, the discharge assistant including
a pump located within said grip, and
drive means for driving said pump, and
iv) foam control means for selectively controlling the injection of said foam concentrate into said stream.

5,590,720

LAWN EDGER APPARATUS

Dennis D. Downing, 7401 Hammond St., Caledonia, Mich. 49316

Filed Oct. 27, 1995, Ser. No. 548,962
Int. Cl.[6] A01D 34/00
U.S. Cl. 172—18 8 Claims



1. A lawn edger apparatus, comprising:
a foot plate member which includes a front edge, a rear edge, a first side edge, a second side edge, a bottom face, a top face, a plate length, and a plate width,
a blade member connected to said bottom face of said foot plate member, wherein said blade member lies in an orientation plane that intersects said foot plate member and that extends from said front edge to said rear edge, wherein said blade member has a blade length which is less than said plate

length, whereby said blade member is located between said front edge and said rear edge of said foot plate member, and

a handle assembly connected to said foot plate member adjacent to said rear edge, wherein said handle assembly includes a post portion which extends upward from said top face of said foot plate member and lies within said orientation plane,

wherein said blade member is positioned on said foot plate member medially between said front edge and said rear edge and medially between said first side edge and said second side edge, and

wherein said post portion has a central axis, said central axis intersecting said foot plate member proximal to said rear edge, said central axis lying in said orientation plane and passing through said foot plate member between said rear edge and said blade member.

5,590,721

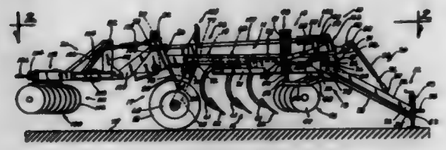
CONSERVATION TILLAGE TOOL

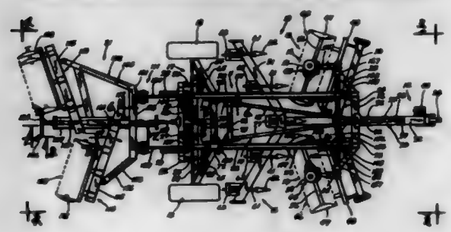
Michael D. Van Mill, Shell Rock, Iowa, assignor to Unverferth Manufacturing Co., Inc., Kalida, Ohio

Continuation of Ser. No. 306,753, Sep. 15, 1994, abandoned. This application Jan. 31, 1996, Ser. No. 594,599

Int. Cl.[6] A01B *63/32;35/18*

U.S. Cl. 172—138 **8 Claims**





1. In a tillage tool having a frame with a front and a rear, ground wheel means attached to and disposed to support said frame above a ground level, means for moving said ground wheel means relative to said frame to move said frame between a raised position and a lowered position, tongue means having one end pivotally connected to the front of said frame and having an opposite forward end adapted to be connected to a prime move, leveling means for maintaining said frame in a substantially level position as said frame is moved between said positions, a subframe pivotally movably attached to the rear end of said frame and carried thereby, a first implement mounted on the front of said frame for vertical movement relative thereto, a second implement mounted on said frame intermediate said front and rear, and a third implement mounted on said subframe, the invention comprising:

linkage means operably attached to and interconnecting said first implement and said third implement;

hydraulic means operably attached to said linkage means for controlling said linkage means for simultaneously raising or lowering said first and third implements;

first means interposed in said linkage means for permitting said third implement to move vertically relative to said first implement; and

said linkage means including second means pivotally connecting said subframe to said main frame rear for permitting said subframe to tilt about a horizontal axis and within a vertical plane;

and further wherein said linkage means includes a pair of elongated links mounted longitudinally of said frame, in parallel with each other, and each link inserted through said first means;

said first means including a pair of laterally spaced canisters operably connected to said hydraulic means, and a spring connected to each said link and compressible within a respective said canister upon movement of each said link forwardly of said frame, whereby said third implement may raise independently of said first implement;

and with said second means including a pair of flanges arranged in parallel relationship to each other, and each flange pivotally connected to said subframe and one of said links.

5,590,722

COMBINATION OF A REVERSIBLE PLOUGH AND SEED PREPARATION DEVICE

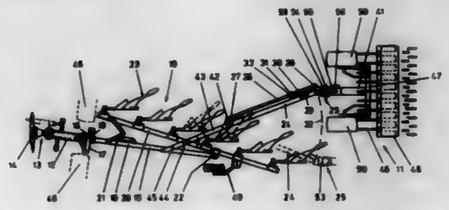
Tor Torgrimsen, Stavanger, Norway, assignor to Kverneland Klepp AS, Norway

Continuation of Ser. No. 284,408, Aug. 1, 1994. This application Feb. 6, 1996, Ser. No. 595,933

Claims priority, application Sweden, Mar. 10, 1992, 9200744; United Kingdom, May 8, 1992, 9209929

Int. Cl.[6] A01B *17/00*

U.S. Cl. 172—219 **14 Claims**



1. A combination of a semi-mounted reversible plough and a seed preparation device, said combination being drawn behind a propelling vehicle to carry out a ploughing action on ground and a seed preparation action during a single pass over the ground, wherein:

the plough comprises:

a towing frame having a forward hitch for coupling the plough to a rear of the propelling vehicle;

a carrying beam coupled with the towing frame and having pairs of reversible plough bodies mounted at spaced apart positions along a length of the carrying beam; and

means for coupling the carrying beam to the towing frame for adjustment between a first working position in which one of the plough bodies of each pair is in a ploughing position and a second working position in which the other plough body of each pair is in a ploughing position;

the seed preparation device is coupled with the plough so that the seed preparation device is towed behind the plough in order to carry out the seed preparation action on a ploughed ground when the plough bodies are in the first or the second working position; and

wherein the seed preparation device is coupled with the carrying beam of the plough via a coupling beam having a swivel connecting with said device which allows relative lateral displacement between the plough and the device, and also allows movement of the carrying beam between the first and second working positions so that the device can be adjusted to follow the plough bodies in either working position.

5,590,723

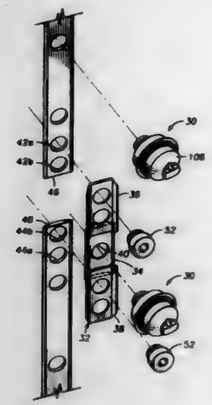
PERFORATING CHARGE CARRIER ASSEMBLY

Jerry L. Walker; Victor M. Carrera, both of Fort Worth, and Donald R. Carter, Burleson, all of Tex., assignors to Halliburton Company, Houston, Tex.

Filed Sep. 22, 1994, Ser. No. 311,284

Int. Cl.[6] E21B *43/116*

U.S. Cl. 175—4.6 **7 Claims**



1. A perforating assembly for use in a perforating gun, comprising:

a first elongated carrier configured to support a plurality of shaped charges spaced uniformly along the length of said first elongated carrier, said elongated carrier having a predetermined cross-section;

a second elongated carrier configured to support a plurality of shape charges spaced uniformly along the length of said second elongated carrier, the spacing between shape charges on said first carrier being generally the same as the spacing of shape charges on said second carrier, said second elongated carrier also having a predetermined cross-section;

a coupling plate coupled between said first and second elongated carriers to form an elongated strip assembly, said coupling plate having a first portion extending between first and second elongated carriers, and having second and third portions being laterally offset to one side of said first portion and longitudinally disposed on either end of said first portion, said coupling plate being able to hold at least one shape charge, such that said shape charges on said first carrier, said shape charges on said second carrier, and said at least one shape charge on said coupling plate together form a series of shape charges that are all uniformly spaced apart.

5,590,724

UNDERREAMING METHOD

Alexander V. Verdglikovsky, deceased, late of Moscow, Russian Federation, assignor to Russian-American Technology Alliance, Inc., Atlanta, Ga.

Filed Jun. 8, 1994, Ser. No. 255,417

Int. Cl.[6] E21B *7/28*

U.S. Cl. 175—57 **2 Claims**

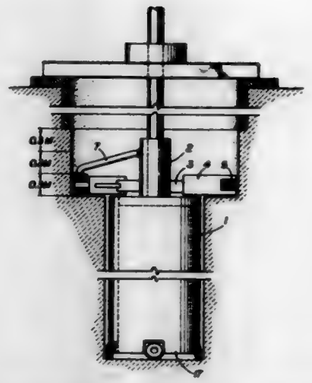
1. A process for sinking a bore of large diameter, comprising the steps of:

a. providing an underreamer, comprising:

(1) an expander body;

(2) a plurality of levers, each rotatably mounted to the expander body so it is adapted to rotate beyond the periphery of the expander body;

(3) a plurality of roller-cutters, each rotatably mounted to a lever; and



(4) a plurality of jacks, each mounted to a lever and adapted to apply pressure to the lever so as to force the roller-cutters against rock outside the periphery of the expander body;

b. attaching the expander body to a starter;

c. with the roller cutters of the underreamer folded inward, sinking a pilot hole approximately to the height of the roller cutters;

d. actuating the jacks to cause the roller cutters to underream the bore;

e. folding the roller cutters of the underreamer inward; and

f. repeating steps (c) through (e).

5,590,725

DRILLING COLUMN WITH SLEDGEHAMMER DRILLING HEAD

Franz Blickhan, Oberwaldstr. 12, D-64859 Eppertshausen, Germany

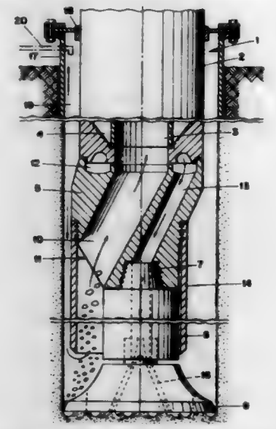
PCT No. PCT/EP94/00887, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/23175, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 22, 1994, Ser. No. 530,176

Claims priority, application Germany, Apr. 2, 1993, 43 10 726.5

Int. Cl.[6] E21B *21/12;4/14;17/18;10/38*

U.S. Cl. 175—100 **11 Claims**



1. A drilling column for supporting a percussive drilling head having a percussion crown on its lower end and a compressed air passage extending therethrough, said drilling column comprising:

a drill pipe having a first air supply duct and a first discharge channel extending downwardly therethrough;

a coupling piece including an upper end connected to a lower end of said drill pipe, and a lower end having a connector adapted for connection with a drilling head, a second air duct extending through said coupling piece and communicating at its upper end with said first air duct for supplying compressed air to the drilling head, a second discharge channel extending through said coupling piece and communicating at its upper end with said first discharge channel, a lower end of said second discharge duct being open to receive an upward flow of fluid to be discharged; and

a skirt extending downwardly from a lower end of said coupling piece for surrounding at least an upper portion of the drilling head and forming a space communicating at its upper end with said second discharge duct, said skirt being open at its bottom end for receiving the fluid to be discharged, a center axis of said skirt being offset eccentrically with respect to said connector, said offset being in a direction toward a lower inlet end of said second discharge channel.

5,590,726

DRILLING APPARATUS

Jorma Jarvela, Paavalinkuja 3 C 15, FIN-33380 Tampere, and Vesa Jarvela, Friislantie 34 A, Fin-02240, Espoo, both of Finland

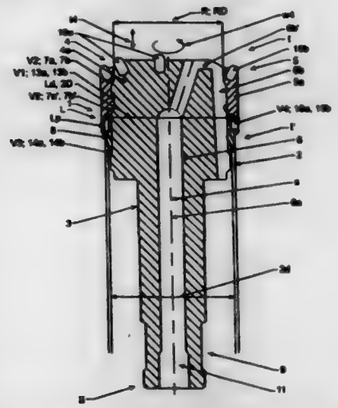
PCT No. PCT/FI93/00512, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO94/12760, PCT Pub. Date Jun. 9, 1994

PCT Filed Dec. 1, 1993, Ser. No. 446,870

Claims priority, application Finland, Dec. 3, 1992, 925491; Jul. 5, 1993, 933074

Int. Cl.[6] E21B *10/38;10/64*

U.S. Cl. 175—257 **8 Claims**



1. A drilling apparatus adapted to be fed into a hole to be drilled and extendable in a longitudinal direction, said drilling apparatus including a casing and a drilling unit essentially inside said casing at least during drilling, said drilling unit comprising a drilling head including:

a first drilling means for drilling a center hole;

a second drilling means for reaming the center hole for the casing, said first drilling means being connected to said second drilling means essentially at the drilling head and being detachable from said second drilling means for removal from the hole while said second drilling means is left in the hole;

a counterpart assembly for transmitting rotational and impact movement of said first drilling means to said second drilling means;

a coupling assembly for connecting said second drilling means with a head of the casing in a way that said second drilling means freely rotates centrically around a longitudinal axis with respect to said casing head;

a flushing means for removal of drilling waste, said flushing means comprising at least one first passage extending through said first drilling means to a drilling point, at least one flow channel in communication with said first passage for transferring flushing medium through said at least one first passage to a drilling surface of the first drilling means and further to said drilling point, and at least one second passage through which the drilling waste is removed, said at least one second passage essentially formed between said drilling surface of the first drilling means and a drilling surface of the second drilling means; and

a first component of the counterpart assembly located at the outer surface of the first drilling means, for locking said first and second drilling means together by means of a bayonet principle to rotate said first and second drilling means together and move said first and second drilling means together in both longitudinal directions; and

wherein said at least one second passage is partially formed by said first component of tile counterpart assembly.

5,590,727

TOOL COMPONENT

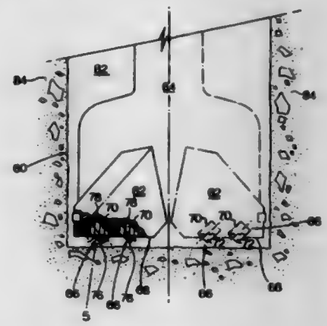
Klaus Tank, 9 Warbleton Avenue, Emerwold, Johannesburg, and Kevin P. Ashby, No. 2 Crane Close, Dreyersdal, Western Cape, both of South Africa

Filed Jun. 15, 1995, Ser. No. 490,770

Claims priority, application South Africa, Jun. 16, 1994, 94/4292

Int. Cl.[6] E21B *10/08;10/50*

U.S. Cl. 175—374 **12 Claims**



1. An earth boring bit comprising at least one rotatable cutter which is rotatably mounted on a shaft and which has a plurality of cutting inserts located in a working surface thereof, characterized in that at least some of the cutting inserts are tool components, wherein each tool component comprises an abrasive compact having a flat working surface presenting a cutting edge and an opposite surface bonded to a surface of a cemented carbide substrate to define an interface having at least two steps, the steps extending from one surface of the component to another surface and the interface being spaced from the working surface at one of the component surfaces a greater distance than at the other component surface, and each tool component having a longitudinal axis, and the tool components are so located in the cutter that the longitudinal axis is at an angle other than 90° to the working surface of the cutter.

5,590,728

ELEMENTS FACED WITH SUPERHARD MATERIAL

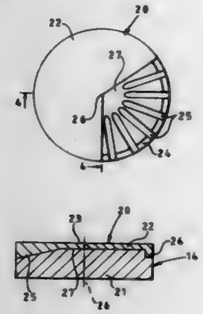
Terry R. Matthias, Longlevens; Nigel D. Griffin, Whitminster, and John M. Fuller, Nailsworth, all of England, assignors to Camco Drilling Group Limited, Stonehouse, England

Filed Nov. 9, 1994, Ser. No. 337,663

Claims priority, application United Kingdom, Nov. 10, 1993, 9323207; Jun. 18, 1994, 9412267

Int. Cl.[6] E21B *10/46*

U.S. Cl. 175—432 **37 Claims**



1. A preform element including a facing table of superhard material having a front face, a peripheral surface, and a rear surface bonded to a substrate which is less hard than the superhard material, the rear surface of the facing table being integrally formed with a plurality of ribs which project into the substrate and extend in directions outwardly away from an inner area of the facing table towards the peripheral surface thereof, at least part of the outer peripheral surface of the facing table being formed with a peripheral wall portion which projects rearwardly from the periphery of the facing table, and the outer ends of at least some of the aforesaid ribs intersecting the peripheral wall portion.

5,590,729

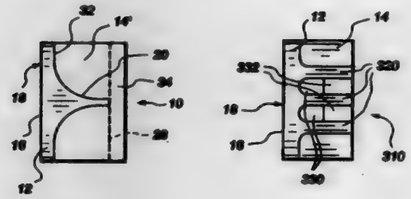
SUPERHARD CUTTING STRUCTURES FOR EARTH BORING WITH ENHANCED STIFFNESS AND HEAT TRANSFER CAPABILITIES

Craig H. Cooley, Bountiful; Gordon A. Tibbitts, Salt Lake City, and Wayne R. Hansen, Centerville, all of Utah, assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 164,481, Dec. 9, 1993, Pat. No. 5,435,403. This application Dec. 9, 1994, Ser. No. 353,453

Int. Cl.[6] E21B *10/46*

U.S. Cl. 175—432 **41 Claims**



1. A cutting element for a rotary drag bit for drilling subterranean formations, comprising:

a substantially planar table of superhard material; and

at least one elongated strut member comprising at least one strut including a web, said at least one strut extending rearwardly from said table and at least partially thereacross.

5,590,730

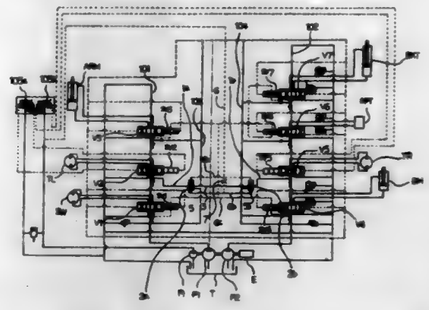
STRAIGHT TRAVELLING APPARATUS FOR CONSTRUCTION VEHICLES

Hae-Gyoon Chung, Pusan, Rep. of Korea, assignor to Samsung Heavy Industry Co., Ltd., Kyung Nam, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,542

Int. Cl.[6] B62D *11/02*; F16D *31/02*

U.S. Cl. 180—6.3 **3 Claims**



1. In a straight traveling apparatus for a construction vehicle, said vehicle having first and second hydraulic pumps of equal capacity, left and right traveling motors and actuators for working members, said traveling motors and actuators for the working members being operated by pressurized oil supplied from the first and second hydraulic pumps, wherein the improvement comprises:

selectable interconnection means having a first state in which the first and second hydraulic pumps supply oil to the left and right traveling motors respectively when only the left and right motors are being operated, and a second state in which the oil supplied by the first and second hydraulic pumps is joined together and supplied equally to the left and right traveling motors when at least one working member is to be operated at the same time as the left and right traveling motors;

wherein said selectable interconnection means include a left parallel line extending between said first pump and said left traveling motor, said left parallel line having a left directional selecting valve, a right parallel line extending between said second pump and said right traveling motor, said right parallel line having a right directional selecting valve, and a confluent line extending between the left and right directional selecting valves, each of said left and right directional selecting valves having internal passages selected by a movable spool, each of said left and right directional selecting valves being changed between the first state and the second state in accordance with internal passage selection by movement of the spools, said confluent line being closed in the first state so that the left and right parallel lines are not connected to each other, said confluent line being opened in the second state to connect said left and right parallel lines.

5,590,731

HYDRAULIC CONTROL SYSTEM PROVIDING PROPORTIONAL MOVEMENT TO AN ATTACHMENT OF A POWER MACHINE

Scott B. Jacobson, Kindred, N. Dak., assignor to Clark Equipment Company, Woodcliff Lake, N.J.

Filed May 5, 1995, Ser. No. 435,601

Int. Cl.[6] B60K *25/00*

U.S. Cl. 180—53.4 **10 Claims**

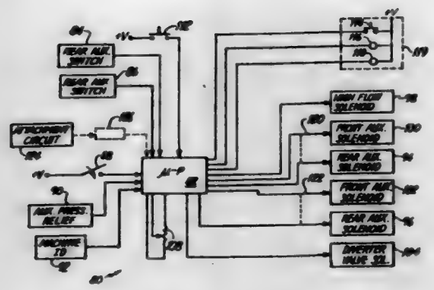
1. A skid steer loader, comprising:

a frame;

a plurality of ground engaging wheels supporting the frame;

an operator compartment supported by the wheels;

an engine operably coupled to the wheels;



a lift arm coupled to the frame; and

a control system including:

a hydraulic circuit providing a fluid under pressure;

a plurality of control valves coupled to the hydraulic circuit;

a plurality of operator input devices, each operator input device, when activated, providing an input signal indicating a desired operation; and

an electronic controller coupled to the operator input devices and the control valves, the electronic controller controlling the control valves such that, when the plurality of operator input devices are activated to indicate a plurality of desired and conflicting operations, only one of the plurality of desired and conflicting operations are performed according to a predetermined priority.

5,590,732

ELECTRICALLY ASSISTED POWER STEERING SYSTEM FOR MOTOR VEHICLES

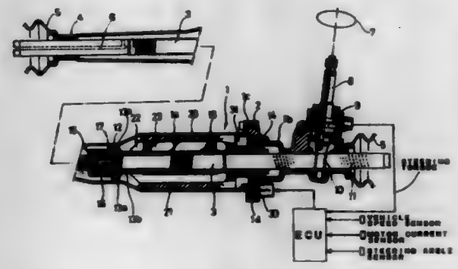
Mitsutaka Sugino, and Yasuo Shimizu, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,183

Claims priority, application Japan, Jul. 29, 1993, 5-187858

Int. Cl.[6] B62D *5/04*

U.S. Cl. 180—444 **14 Claims**



1. An electrically assisted power steering system for a motor vehicle, comprising:

a housing;

a shaft slidably supported in said housing;

a ball-and-nut mechanism operatively mounted on said shaft; and

an electric motor mounted in said housing for transmitting rotary force from said electric motor through said ball-and-nut mechanism to said shaft;

a sleeve disposed around said shaft and being rockably and rotatably supported at a single end in said housing in a cantilevered fashion,

said ball-and-nut mechanism including a nut mounted on an opposite end of said sleeve, rockable with said sleeve, and disposed freely with respect to said housing, and a plurality of balls movably held between said nut and a screw groove defined in said shaft; and

wherein said electric motor is disposed around said sleeve.

5,590,733

SHOCK ABSORBING AND SPRUNG SUSPENSION SYSTEM

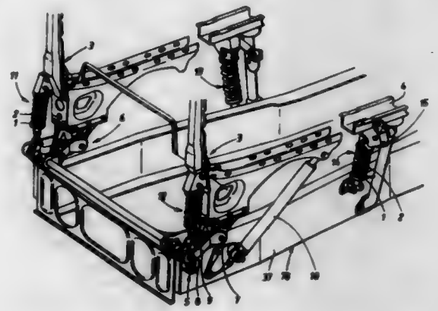
Bengt Ljunghohn, Angered; Nils Nilsson, Göteborg; Staffan Wendeberg, Torslanda; Anders Kärrberg, Lerum, and Mikael Schill, Göteborg, all of Sweden, assignors to AB Volvo, Sweden

PCT No. PCT/SE92/00222, § 371 Date Oct. 5, 1994, § 102(e) Date Oct. 5, 1994, PCT Pub. No. WO93/19973, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 7, 1992, Ser. No. 313,306

Int. Cl.[6] B62D *33/06*

U.S. Cl. 180—89.14 **12 Claims**



1. A shock absorber and suspension apparatus for supporting a tiltable vehicle cab on a chassis comprising at least one first shock absorber, a corresponding at least one spring member attached in parallel to said at least one first shock absorber, said at least one first shock absorber and corresponding at least one spring member being releasably coupled between said vehicle cab and said chassis, a first coupling member attached to said vehicle cab, a second coupling member attached to both said at least one first shock absorber and said at least one spring member, said first and second coupling members being releasably attachable to each other and including guiding means for ensuring coupling together of said first and second coupling members, said at least one first shock absorber including an upper portion including attachment means for attaching said upper portion of said at least one first shock absorber to said second coupling member, said attaching means including damping means for damping motion of said vehicle cab, said at least one spring member including an upper portion including a carrier member, whereby said carrier member can bear the static load acting on said shock absorber and suspension apparatus separately from said at least one first shock absorber, and at least one second shock absorber connecting said second coupling member to said chassis, arranged substantially transverse to said at least one first shock absorber, and arranged substantially perpendicular to a longitudinal axis of the chassis.

5,590,734

VEHICLE AND METHOD OF DRIVING THE SAME

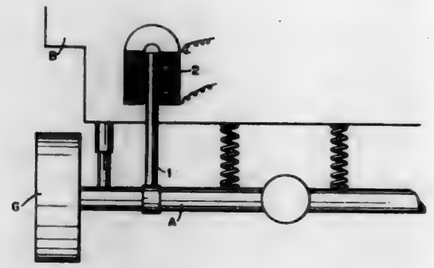
Richard Caires, 12 Kingdom Ridge Rd., Bedford, N.Y. 10506

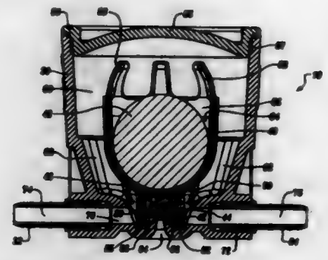
Filed Dec. 22, 1994, Ser. No. 362,243

Int. Cl.[6] B60K *1/00*

U.S. Cl. 180—165 **5 Claims**

1. A vehicle, comprising a body; ground engaging means which support said body and move relative to a ground so as to move said body; driving means supplying an energy to said ground engaging means and thereby driving said ground engaging means relative to the ground so that during movement of the vehicle said body is moved together with said ground engaging means in a traveling direction and at the same time said ground engaging means and said body also displace relative to one another in a substantially vertical direction; and means for converting the displacement of said ground engaging means and said body relative to one another in the substantially vertical direction into an additional electrical energy supplied to said ground engaging means for driving said ground engaging means, said converting means including a stator mounted on said body and a shaft formed as a purely linearly displacing rotor and mounted on said ground engaging means so that during the displacement of said ground engaging means and said body relative to one another said rotor purely linearly displaces relative to said stator and thereby the additional electrical energy is generated.





5,590,735

FORKLIFT TRUCK

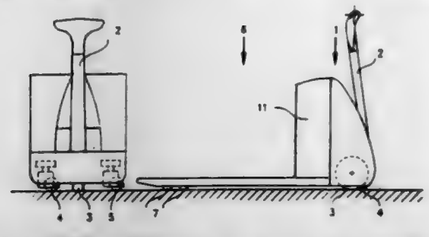
Guy Cartier, Loudun, France, assignor to Linde Aktiengesellschaft, Germany

Filed Mar. 23, 1993, Ser. No. 35,652

Claims priority, application Germany, Mar. 26, 1992, 42 09 862.9

Int. Cl.[6] B62D *63/00*

U.S. Cl. 180—210 **20 Claims**



1. A forklift truck having a drive wheel and a plurality of horizontally spaced and vertically adjustable support wheels, spring loaded means for independently vertically positioning each of said plurality of support wheels.

5,590,736

VEHICLE PNEUMATIC SEAT ROLLOVER SAFETY VENT VALVE

John M. Morris, Auburn, and Andrew F. Thompson, Seattle, both of Wash., assignors to GT Development Corporation, Seattle, Wash.

Filed Sep. 8, 1995, Ser. No. 525,822

Int. Cl.[6] B60R *21/13*

U.S. Cl. 180—282 **21 Claims**

1. In a pneumatic seat mounted in a vehicle, said pneumatic seat including at least one air bag and a control valve for controlling the quantity of air in said air bag, the improvement comprising a rollover vent valve coupled to said air bag for venting air from said air bag in the event the vehicle in which the pneumatic seat is mounted is severely titled or overturned, the rollover vent valve including a pressure chamber, a vent port formed in the pressure chamber and a valve member for normally closing the vent port, the valve member including a weight container located within the pressure chamber directly above the vent port when the rollover vent valve is in a normally closed position, a valve seal, and a weight movably mounted within the weight container, the valve seal contacting and sealing the vent port when the rollover vent valve is in the normally closed position and the weight placing a biasing force on the valve seal to maintain the rollover vent valve in the normally closed position when the vehicle is in an upright position, the weight moving within the container when the vehicle is severely tilted to cause the rollover vent valve to move to an open position in which the valve seal moves off of the vent port to open the vent port and allow air to flow out of said air bag.

5,590,737

TRAVELING TRANSMISSION FOR A VEHICLE

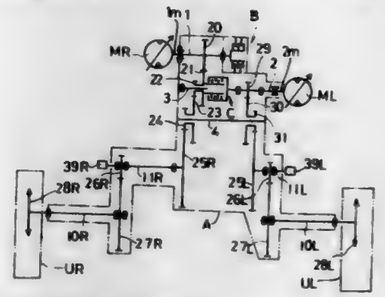
Toshiro Azuma; Masaaki Kojima; Masao Nakayachi; Toshiaki Okanishi, and Masashi Inanaga, all of Amagasaki, Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Sep. 19, 1994, Ser. No. 308,345

Claims priority, application Japan, Sep. 17, 1993, 5-232010

Int. Cl.[6] B60K *17/354*

U.S. Cl. 180—308 **35 Claims**



1. A transmission, comprising:

a transmission case;

a first hydraulic motor being disposed on a first side of said transmission case and having a first output shaft with a first rotary axis;

a second hydraulic motor being disposed on a second side of said transmission case and having a second output shaft with a second rotary axis;

first and second axles;

a pair of drive trains, said first and second hydraulic motors being independently drivingly connected to said first and second axles by said drive trains,

said first output shaft being disposed relative to said second output shaft such that said first rotary axis is offset from said second rotary axis,

one of said drive trains including a second side rotary member, said second side rotary member disposed within said transmission case, said second side rotary member being disposed coaxially with said first output shaft;

a clutch means disposed between said second side rotary member and said first output shaft, wherein said clutch means engages said drive trains when a number of rotations of said first out put shaft is substantially equal to a number of rotations of said second out put shaft; and

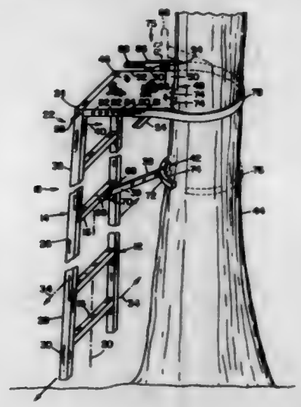
a parking brake disposed on said second output shaft.

5,590,738

HUNTING STAND AND GAME CARRIER COMBINATION

Argil G. Hunt, 282 Lynn Rd., and Randy A. Hunt, 232 Lynn Rd., both of Johnson City, Tenn. 37604

Filed Mar. 20, 1995, Ser. No. 406,550
Int. Cl.[6] A45F *3/00*
U.S. Cl. 182—116 **13 Claims**



1. An apparatus providing a game stand and game carrier combination comprising elongated, lightweight, rigid, frame means having substantially parallel side rail means interconnected by a plurality of cross-member means for providing ladder means and having a longitudinal axis, said frame means comprising an upper section having an outer end portion, an intermediate section, and a lower section having an outer end portion, said sections lying progressively along said longitudinal axis, said lower and intermediate sections and an adjacent portion of said upper section lying substantially contiguous the same general plane, wheel support means on said upper section for mounting wheel means thereon for transport of said apparatus, elongated stabilizer means having one of its ends mounted to said frame means and extending outwardly from one side of said general plane, the other end of said stabilizer means being provided with first gripping means for contact with an upright for laterally stabilizing said frame means in a generally upright posture with respect to said upright, said outer end portion of said upper section being provided with platform means extending outwardly from said one side of said general plane, and second gripping means provided on said apparatus at said upper section and spaced from said general plane to said one side thereof for contact with said upright for further laterally stabilizing said frame means at its upper section with respect to said upright, wherein said second gripping means is located on outer edge portions of said platform means and wherein said side rail means are pivotally jointed by hinge means within said intermediate section such that said lower section and upper section and the adjacent portions of said intermediate section can be folded toward each other about the axis of said hinge means and whereby said upper and lower sections can be positioned proximate each other at an acute angle with said platform means extending substantially between the said outer end portions thereof, and wherein cooperating components of connector means are provided on said outer end portion of said lower section and on said outer end portion of said upper section whereby said upper and lower sections, including said platform means can be rigidly interconnected in a generally triangular configuration to form a highly structurally stable game transporting trailer.

5,590,739

ADJUSTABLE EXTENSION STEPLADDER

DeWayne A. High, c/o 14407 SE. Yamhill, Portland, Oreg. 97233, and Timm J. Timmermann, 1736 E. Charleston Blvd., Suite 219, Las Vegas, Nev. 89104

Filed Nov. 1, 1994, Ser. No. 301,636
Int. Cl.[6] E06C *1/30*
U.S. Cl. 182—169 **1 Claim**



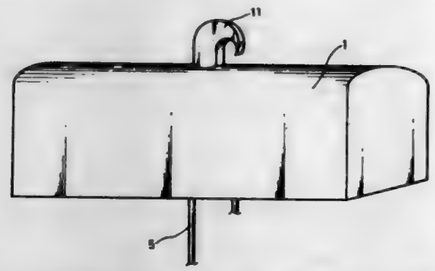
1. A motorized utility ladder comprising a main riser section and an upper riser section, means for raising and lowering the upper section relative to the main section comprising a motor, battery housing with up and down switch, and a sprocket attached to the main section and a strip gear attached to the upper section, said ladder further comprising a telescopic tripod leg having a foot pad, a quick release adjusting pin with a safety chain, a stop collar, the top of the tripod leg having a bracket comprising a sliding collar slidably attached to the tripod leg, connecting rods and collars for attachment to a top rung of the upper section, an adjustable horizontal telescopic arm having a collar at one end attached to the tripod leg, and a bracket with a sliding collar, connecting rods and collars attached to a lower rung of the upper section, a utility shelf pivotally attached to the top of the upper section by quick release pins to enable removal of the shelf from the ladder, a pair of side wing legs hinged to the bottom of the main section, said wing legs comprising a telescopic members forming a bottom telescopic rung for the main section, said ladder having a pair of transport wheels attached to the lower end of the main section by support brackets, a pair of spring assisted pivot locks with spring assisted front clips attached to a lower portion of the upper section for locking the upper and main section at selected extensions.

5,590,740

DESCENDING DEVICE FOR EMERGENT ESCAPE FROM A BUILDING

Shi-Cheng Mai, 13, Shour Nan Kern, Nan Kern, Pei Pu Shang, Hsinchu Sheng, Taiwan

Filed Jan. 9, 1995, Ser. No. 370,422
Int. Cl.[6] A62B *1/10*
U.S. Cl. 182—236 **1 Claim**



1. A descending device for emergent escape from a building comprising:

a frame, the frame having a hook engaged on the top thereof for hanging on fixed objects and having an opening on central bottom thereof,

two partition boards vertically positioned in the frame to divide the frame into three sections with the right and left sections being symmetric each other, each board having one hole in the central part thereof,

a principal shaft with a central spiral part for the winding of ropes, the principal shaft being through the hole of each partition board,

several friction plates separately positioned underneath the principal shaft, each plate being supported by a spring, the other end of the spring being against on the bottom of the frame,

two plates with one hole in each plate for coupling with one end of the principal shaft to position the shaft, and

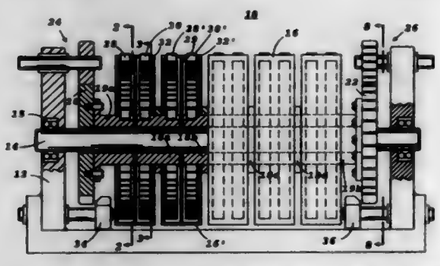
a rope winding on the central spiral part of the shaft with both ends of the rope streching from the opening of the frame.

5,590,741

SPRING MOTOR ASSEMBLY

Wayne W. Storms, 5720 Germany Rd., Verona, N.Y. 13478

Filed Apr. 14, 1995, Ser. No. 421,861
Int. Cl.[6] F03G *1/08*
U.S. Cl. 185—10 **8 Claims**



1. A spring motor assembly for selectively storing and releasing energy to power an apparatus including

a main supporting frame member;

a support shaft having first and second ends rotatably mounted in said frame member;

a plurality of individual springs positioned along said support shaft between said first and second ends thereof for rotary movement thereabout;

means interconnecting said plurality of individual meanings in series relationship comprising;

a plurality of modules;

each module having first and second springs;

each module having an input member connected to the center of said first spring;

each module having an output member connected to the center of said second spring;

the outer ends of said first and second springs in each module being connected together; and

said output member of each module being adapted to become the input member of a next adjacent module and be connected to the first spring of a next adjacent module;

first drive means mounted on said support shaft adjacent said first end thereof and operatively connected to one end of said plurality of modules adjacent said first end of said support shaft;

second drive means mounted on said support shaft adjacent said second end of said support shaft and operatively connected to another end of said plurality of modules adjacent said second end of said support shaft; and

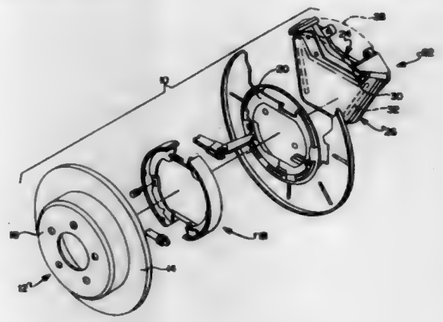
control means operatively connected to said first and second drive means for selectively introducing and withdrawing energy from said plurality of serially connected springs.

5,590,742

STAMPED CALIPER ADAPTER

Kenneth E. Gutelius, Orion, Mich., assignor to ITT Automotive, Inc., Auburn Hills, Mich.

Filed Jun. 7, 1995, Ser. No. 475,144
Int. Cl.[6] F16D *63/00*
U.S. Cl. 188—70 R **16 Claims**



1. A vehicle wheel brake system, comprising:

a rotor having a disc portion and a drum portion;

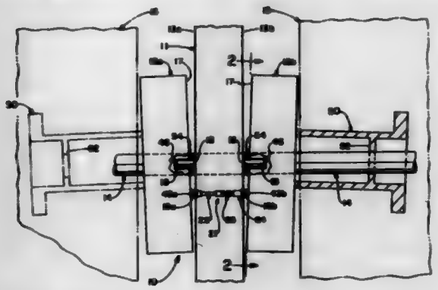
a disc brake assembly for acting on said disc portion of said rotor to effect a deceleration of said rotor;

a drum brake assembly for acting on said drum portion of said rotor to effect a parking brake function independent of said disc brake assembly;

a backing plate supportingly mounting said drum brake assembly within said rotor drum portion; and

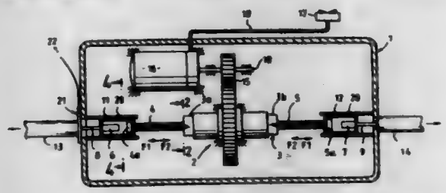
a two-piece adapter having a first portion made of a first metal and supportingly mounting said disc brake assembly about said rotor disc portion and a second portion fastened to said first portion, said second portion being made of a second metal and being fixed to said backing plate.

5,590,743
PRE-LOAD DEVICE FOR REDUCING AIRCRAFT BRAKE VIBRATION
James E. Hoenaard, Akron, and Dana J. Fehr, Uniontown, both of Ohio, assignors to Aircraft Braking Systems Corporation, Inc., Akron, Ohio
Filed Nov. 7, 1994, Ser. No. 335,294
Int. Cl.[6] B64C 25/44
U.S. Cl. 188—71.4 13 Claims



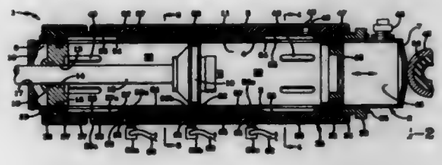
1. An improved wheel and brake assembly for an aircraft, the improvement comprising:
a strut member depending from the aircraft;
said strut member having an inboard side and an outboard side and torque take-out means extending orthogonally therefrom for transferring torque to said strut member;
at least one brake assembly being mounted on said strut member;
means for engaging said torque take-out means incorporated in said one brake assembly; and
means for pre-loading said means for engaging orthogonal to said brake assembly.

5,590,744
MOTOR VEHICLE ELECTRIC PARKING BRAKE
Jean-Marc Belmond, Les Fesses, France, assignor to Rockwell Light Vehicle Systems, France
Filed Nov. 2, 1995, Ser. No. 552,825
Claims priority, application France, Nov. 3, 1994, 94 13132
Int. Cl.[6] F16D 69/00
U.S. Cl. 188—265 13 Claims



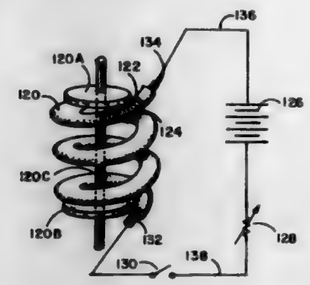
1. A motor vehicle parking brake in a braking system having first and second braking members, said parking brake comprising:
a housing containing a gearwheel, said gearwheel being mechanically linked to a screw-nut mechanism, said screw-nut mechanism aligned coaxial with said gearwheel, said screw-nut mechanism having driving and driven elements wherein said driving element is adapted to be driven in rotation by said gearwheel, and wherein said driven element is correspondingly driven in translation by said driving element relative to said driving element and said gearwheel, said driving element having first and second extensions extending axially on either side of said gearwheel and said driven element having first and second driven components,
first and second cables passing through said housing on either side of said gearwheel, said first cable having a first end and a second end, said second cable having a first end and a second end, said first end of said first cable connected to said first drives component and said first end of said second cable connected to said second drives component, said second end of said first cable connected to said first braking member and said second end of said second cable connected to said second braking member, and
an electric gear motor unit for driving said gearwheel in rotation, said motor unit connected to a control button actuable by an operator of the vehicle, wherein rotation of said gearwheel alternatively pulls said first and second cables together and alternatively allows said cables to move apart depending upon the direction of rotation of said motor unit and of said gearwheel to thereby alternately bring about application and release of said first and second braking members.

5,590,745
VIBRATION DAMPING DEVICE USING ER FLUIDS HAVING MULTIPLE ELECTRODES
John D. Reasel, Tallmadge, and David A. Weitzenhof, Akron, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Jun. 19, 1995, Ser. No. 491,514
Int. Cl.[6] F16F 15/03
U.S. Cl. 188—267 25 Claims



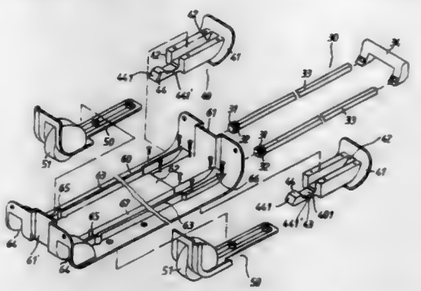
1. A vibration damping device using an electrorheological fluid (ER) including:
a metal cylindrical inner housing having an outer diameter and an inner diameter forming a piston chamber;
a piston axially movable within the piston chamber and dividing the piston chamber into two separate fluid chambers;
a cylindrical outer housing formed of a dielectric material having an inner diameter forming an inner cylindrical surface larger than the outer diameter of the cylindrical inner housing and an outer diameter surrounding at least a portion of the cylindrical inner housing, the outer housing including annular recesses in the inner diameter;
annular fluid transfer duct means formed between said inner and outer housings and surrounding said piston chamber providing fluid communication between said fluid chambers on opposite sides of said piston, said fluid chambers filled with an electrorheological (ER) fluid;
a plurality of spaced metal electrode bands, each band being mounted in the annular recesses of the cylindrical outer housing and being in communication with the duct means, for applying electric fields across portions of the duct means to increase the flow resistance of the ER fluid passing therethrough, each electrode band being isolated from the adjacent electrode band by an intervening band of dielectric material;
a piston rod connected at one end to the piston and extending beyond a first end of the damping device with another end of said piston being adapted to be connected to a first support structure;
electrical connector means extending through the outer housing electrically connected to the electrode bands for applying an electrical voltage to the metal electrode bands on the inner diameter of the outer housing; and
mechanical connection means mounted on a second end of the damping device for connecting said second end of said device to a second structure spaced from the first structure.

5,590,746
HELICAL VARIABLE MOTION DAMPENER
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Continuation of Ser. No. 265,957, Jun. 27, 1994, Pat. No. 5,497,861. This application Feb. 14, 1996, Ser. No. 599,951
Int. Cl.[6] F16F 15/03;6/00
U.S. Cl. 188—267 2 Claims



1. A motion dampener disposed between a first and second object comprising:
a flexible container having an inner wall;
means to interengage said container between said first and second objects;
electro-viscous fluid contained within said container;
a first and second electrode disposed along said inner wall in contact with said electro-viscous fluid; and
means in an on mode to pass current from one of said electrodes through said electro-viscous fluid to another electrode to cause said electro-viscous fluid to become more viscous to limit the movement of said container in relation to said first and second objects; and said means in an off mode to maintain the fluid nature of said electro-viscous fluid to allow freer movement of said flexible container and said first and second objects interengaged thereto wherein said container is a helical coil member having a first end, a second end and a hollow area defined therein, said helical coil member having electro-viscous fluid contained within said hollow area with one of said electrodes positioned at said first end and another electrode positioned at said second end, said helical coil member in said on mode stiffening the movement of said helical coil member and said helical coil member in said off mode loosening the movement of said helical coil member.

5,590,747
FORCE TRANSMISSION DEVICE SLIDEABLY MOUNTED TO DRUM BRAKE SHOE
Jean Claude Mery, 61, rue E. Zola, Pavillons sous Bois, France, and Pierre Presseco, 45, Rue E. Zola, La Courneuve, France
PCT No. PCT/FR93/00977, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO94/10472, PCT Pub. Date May 11, 1994
PCT Filed Oct. 5, 1993, Ser. No. 133,094
Claims priority, application France, Oct. 30, 1992, 92 13048
Int. Cl.[6] F16D 65/22
U.S. Cl. 188—326 4 Claims



1. A drum brake comprising a support plate on which is mounted slideably first and second shoes, each of said first and second shoes comprising a web and a rim, said rim having a face for receiving a friction lining, said friction lining being capable of being brought into frictional engagement with a drum by a hydraulic actuation device to effect a brake application, said hydraulic actuation device acting on a first end of said web of the first and second shoes, a strut of variable length for establishing a desired spacing between said first and second shoes, said strut being located in a vicinity of said hydraulic actuation device, said web of said first and second shoes having a second end which bears on a bearing component fastened securely to said support plate, characterised in that said brake comprises a mechanical actuation device acting between said first and second shoes and a first end of a force transmission device mounted slideably on said second shoe, said force transmission device being mounted slideably on pins carried by said web in said second shoe and sliding in oblong slits formed therein, said force transmission device having a second end which bears on said strut of variable length, said mechanical actuation device being located between said second end of said web of said first and second shoes and in the vicinity of said bearing component.

5,590,748
COLLAPSIBLE HANDLE FOR A WHEELED SUITCASE
Jui M. Chang, 2F, 903, Shiang Sin South Road., Taichung, Taiwan
Filed Mar. 20, 1995, Ser. No. 407,590
Int. Cl.[6] A45C 5/14;13/28
U.S. Cl. 190—18 A 2 Claims

1. A collapsible handle for a wheeled suitcase and comprising:
a bottom board disposed on a bottom of said suitcase, said bottom board having a first end and a second end, said first end thereof having a first wall extending upwardly therefrom, said first wall having at least one opening defined therein, said second end thereof having a second wall extending upwardly therefrom, said bottom board having at least one recess defined in a lower surface adjacent said second wall thereof, a protrusion and a side wall extending upwardly and separately from an upper surface of said bottom board from said first wall to said second wall and a passage defined between said protrusion and said side wall, said passage positioned such that said passage communicates with said opening, each of said protrusion and said side wall having an engaging recess formed in a side thereof defining said passage near said second wall;
a handle being a U-shaped element and comprising a handle portion from which at least one leg extends, said leg having a

head disposed at a distal end thereof, said head having at least one protrusion flexibly extending from a side thereof and corresponding to said one of said engaging recesses such that said protrusion is received in one of said engaging recesses when said leg is completely received in said passage;

a limit element having a U-shaped cross section and being disposed on said lower surface of said first end of said bottom board and having a first end and a second end, said first end thereof having an end plate, said end plate having a hole defined therein and aligned with said opening, said second end thereof having a tongue extending therefrom into said passage, said tongue having a block extending from an upper surface thereof and said block having two inclined surfaces formed on opposite sides along a longitudinal direction of said tongue; and

a wheel case disposed on said lower surface of said second end of said bottom board and having a first end and a second end, said second end thereof having a wheel rotatably engaged therein and said wheel received in said recess of said second wall.

5,590,749

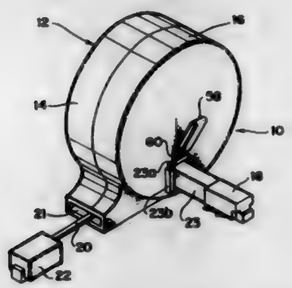
ELECTRICAL CORD RETRACTION DEVICE

Ronald D. Wagner, Signal Hill, and William L. Klima, Stafford, both of Calif., assignors to Magic Electrical Products L.L.C., Stafford, Va.

Continuation-in-part of Ser. No. 696,847, May 7, 1991, Pat. No. 5,241,593, which is a continuation-in-part of Ser. No. 493,233, Mar. 14, 1990, abandoned. This application Aug. 30, 1993, Ser. No. 112,973

Int. Cl.[6] H02G *11/02*

U.S. Cl. 191—12.4 **28 Claims**



1. A retractable electrical cord device for electrically connecting one electrical device to another electrical device, said device comprising:

a housing having an access opening;

a reel rotatably disposed within said housing;

a retractable electrical cord at least partially wound around said reel when stored, said retractable electrical cord having one end anchored to said reel and an opposite end extending through said access opening in said housing;

a first electrical connector extending through said housing for electrically connecting the retractable electrical cord device to the one electrical device;

a second electrical connector provided at said opposite end of said electrical cord for electrically connecting the retractable electrical cord device to the another electrical device;

a spring connected to said housing and said reel to provide means for retracting said electrical cord by winding said reel when said electrical cord is at least partially extracted from said housing; and

a third electrical connector electrically connecting together said retractable electrical cord and said first electrical connector to accommodate relative rotational movement between said housing and said reel during winding and unwinding of said retractable electrical cord on and off said reel, said third electrical connector comprising a first printed circuit board having a plurality of concentric conductor rings, and a second printed circuit board rotationally aligned and having a plurality of electrical contacts for electrically connecting corresponding said conductor rings of said first printed circuit board, said retractable electrical cord electrically connected to one of the said first and second printed circuit boards, and said first electrical connector electrically connected to the other of said first and second printed circuit boards.

5,590,750

TORSION DAMPER FOR A LOCK-UP CLUTCH, AND A LOCK-UP CLUTCH HAVING SUCH A TORSION DAMPER

Michel Graton, Paris; Fabrice Tauvron, Creteil; Rene Billet, Lamorlaye; Rabah Arhab, Perreuse; Michel Ginaldi, Paris, and Daniel Maingaud, Rigny Usse, all of France, assignors to Valeo, Paris, France

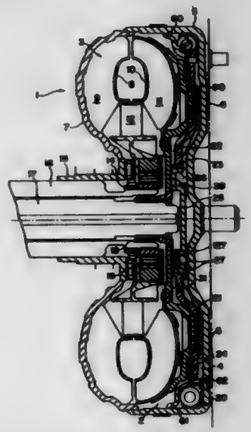
PCT No. PCT/FR93/00936, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO94/07058, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 24, 1993, Ser. No. 244,105

Claims priority, application France, Sep. 24, 1992, 92 11400; May 17, 1993, 93 05923; Aug. 16, 1993, 93 10004

Int. Cl.[6] F16H *45/02*; F16F *15/12*

U.S. Cl. 192—3.29 **25 Claims**



1. A torsion damper for a lock-up clutch (4) adapted to work between a driving element (2) and a driven element (10) of a fluid coupling apparatus (1), comprising two coaxial parts (40, 50) which are movable with respect to each other against circumferentially acting springs (50), namely an input part having a guide ring (40) and an output part (60) having a damper plate, in which the guide ring (40) comprises a retaining portion (42, 142, . . .) in the form of a half shell which is of annular form with a circular cross section and engagement portions (45, 145, . . .) for respectively retaining the springs (50) and engaging them, while the damper plate (60) also has engagement portions (65, 165, . . .) for providing engagement with the springs (50), characterised in that the damper plate (60) has a retaining portion (61, 161, . . .), for radially retaining the springs (50), being in the form of a half shell which is of annular form with a circular cross section in that said engagement portions of the damper plate (60) are carried by said retaining portion of the damper plate (60), and in that said retaining portions of the guide ring (40) and of the damper plate (60) are offset axially with respect to each other.

5,590,751

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

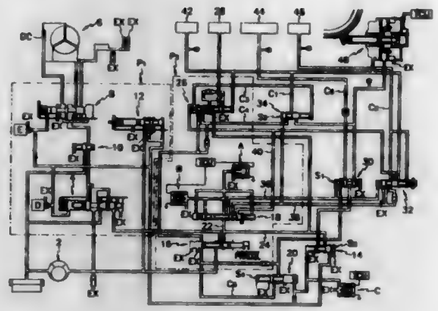
Jaeduk Jang; Donghoon Park, and Kibeen Lim, all of Kyungki-do, Rep. of Korea, assignors to Hyundai Motor Company, Seoul, Rep. of Korea

PCT No. PCT/KR93/00110, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO95/18025, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 29, 1993, Ser. No. 343,497

Int. Cl.[6] F16D *33/00*; B60K *41/10*

U.S. Cl. 192—3.29 **4 Claims**



1. A hydraulic pressure control system for an automatic transmission, the system comprising:

an oil pump for generating the hydraulic pressure;

a plurality of shift valves for controlling a plurality of clutch and brake means with the hydraulic pressure in accordance with a vehicle's drive and reverse speed and transmitting a torque of a torque converter to a gear of a multi-stage transmission gear mechanism;

a manual valve for selectively supplying the hydraulic pressure generated from the oil pump to each shift valve by changing ports thereof in accordance with a position of a shift lever;

a reducing valve for regulating the hydraulic pressure generated from the oil pump to be lower than a line pressure;

a pressure regulating valve for receiving a control pressure by communicating with the manual valve, and changing the line pressure by opening or closing an exhaust port thereof, the opening or closing of the exhaust port occurring when the valve spool of the pressure regulating valve is moved by the hydraulic pressure which is reduced at the reducing valve;

a rear clutch exhaust valve for directly supplying the hydraulic pressure supplied from the manual valve to a rear clutch in a first drive speed ratio of a drive "D" range;

two shift control solenoid valves, which are controlled to be turned "OFF" or "ON" by a transmission control unit, for supplying the hydraulic pressure supplied from the manual valve to second, third and fourth speed lines in second, third and fourth forward speed ratios, respectively;

a shift control valve for selectively opening the second, third and fourth speed lines by moving a valve spool thereof which is moved in accordance with the ON/OFF operation of the shift control solenoid valves; and

a damper clutch control valve for supplying the hydraulic pressure to a damper clutch engaging line or releasing line by moving a valve spool thereof which is moved in accordance with exhausting or cutting off the hydraulic pressure of the reducing valve.

5,590,752

CLUTCH DISC ASSEMBLY

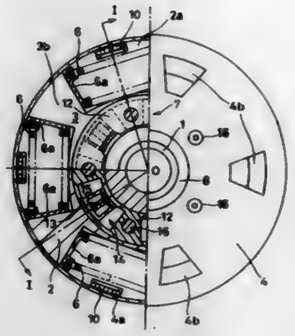
Yasushi Takehira, and Shinichi Noda, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Oct. 28, 1993, Ser. No. 144,682

Claims priority, application Japan, Oct. 30, 1992, 4-075538 U; Oct. 30, 1992, 4-075539 U

Int. Cl.[6] F16D *3/80;3/12*

U.S. Cl. 192—208 **7 Claims**



1. A clutch disc assembly comprising:

a hub having a flange on its outer circumference;

a disc-like plate rotatably mounted on said hub, said disc-like plate defining a fluid chamber which is filled with a fluid medium;

an elastic member located in said fluid chamber for elastically connecting said flange and said disc-like plate for a limited rotary displacement relative to each other;

an annular member connected to said disc-like plate and disposed radially inwardly of said elastic member within said fluid chamber, said annular member having an arcuate chamber;

a slider having opposing abutting portions, said slider being disposed in said arcuate chamber and being displaceable in circumferential directions;

a stop member connected to said flange and extended into said arcuate chamber and said slider, an inside portion of said slider being divided by said stop member into two first chambers, and said slider dividing said arcuate chamber into two second chambers, each of said abutting portions of said slider having a hole allowing said fluid medium flow therethrough;

said arcuate chamber being formed with a cutout which defines a first choke, said first choke allowing said fluid medium flow between said first and second chambers;

a second choke defined by said slider and said stop member and said hole, said second choke allowing said fluid flow between said first chambers and said second chambers through said hole, an amount of fluid flow in said second choke being smaller than that of said first choke; and

said first choke being opened in response to a first-angle of relative rotary displacement between said disc-like plates and said flange so that said fluid medium flows through said first choke, generating a first viscous resistance, and said first choke portion being closed in response to a second-angle of relative rotary displacement between said disc-like plates and said flange which is larger than said first-angle so that said fluid medium flows through said second choke, generating a second vicious resistance higher than said first viscous resistance.

5,590,753

RETAINING ELEMENT ON A CAROUSEL CONVEYOR WITH SEVERAL OUTLETS FOR SELECTIVE RETENTION OF CONVEYED CONTAINERS

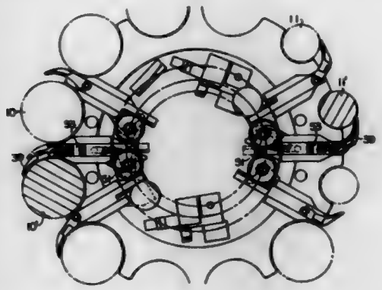
Peter Bertschi, Urdorf, and Peter Gyri, Bellikon, both of Switzerland, assignors to Elpatronic AG, Zug, Switzerland

Filed Sep. 30, 1994, Ser. No. 315,975

Claims priority, application Switzerland, Oct. 7, 1993, 3017/93; Nov. 8, 1993, 3355/93

Int. Cl.[6] B65G *47/84*

U.S. Cl. 198—441 **19 Claims**



1. Carousel conveyor comprising:

a plurality of outlets distributed about an axis of rotation of the carousel conveyor for containers released from the carousel conveyor,

a plurality of retaining means arranged in at least one common plane to execute a movement perpendicular to the axis of rotation in order to retain or release a container, each retaining means being arranged to contact a retained container and including a guide and a straight sliding part received in the guide by means of friction dampers, the sliding part being displaceable in a direction generally perpendicular to the axis of rotation, and further including a retaining finger mounted adjacent to one end of the sliding part and a cam associated with the other end of the sliding part in order to slidably displace the sliding part and retaining finger and move the retaining finger into or away from contact with the container, and

control members arranged below the common plane and associated with the cams, the control members selectively striking stops fixed relative to the carousel conveyor for selectively actuating the cams and moving the retaining means in order to retain or release the containers.

5,590,754

BLADE FEEDER CONVEYOR SYSTEM

Sterling W. Lowery, 4860 Sadler Rd., Glen Allen, Va. 23060

Filed May 1, 1995, Ser. No. 432,968

Int. Cl.[6] B65G *65/02*

U.S. Cl. 198—514 **12 Claims**

1. A conveyor system, comprising:

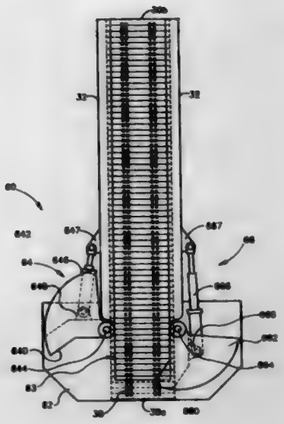
a frame;

a conveyor having an inlet end and a discharge end for conveying material received in the vicinity of said inlet end;

an apron having a planar surface mounted on said frame adjacent said inlet end for receiving material;

a first pusher blade having an outboard side edge and a pivot mount adjacent a first side of said conveyor adapted to pivot and sweep a first arc over said planar surface towards the vicinity of said inlet end for pushing said received material onto said conveyor at said vicinity of said inlet end;

a second pusher blade having an outboard side edge and a pivot mount adjacent a second side of said conveyor adapted to pivot and sweep a second arc over said planar surface towards



the vicinity of said inlet end for pushing said received material onto said conveyor at said vicinity of said inlet end; and

an arcurate skirt affixed to said outboard edge of each of said pusher blades that extends upward from said planar surface to prevent material being swept from said planar surface from entering behind said pusher blades.

5,590,755

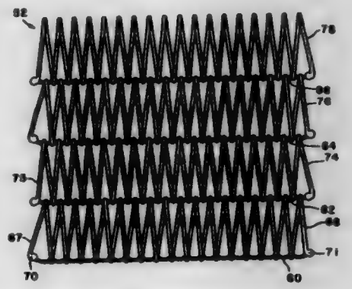
WOVEN-WIRE BELT WITH VERTICALLY-ORIENTED LATERAL EDGES AND CONVEYANCE METHODS AND APPARATUS

Ronald G. Darlinger, Cambridge, and Stephen D. Wilcox, New Market, both of Md., assignors to Maryland Wire Belts, Inc., Church Street, Md.

Continuation-in-part of Ser. No. 56,875, May 5, 1993, Pat. No. 5,375,695. This application Dec. 23, 1994, Ser. No. 363,332

Int. Cl.[6] B65G *21/18*

U.S. Cl. 198—778 **14 Claims**



1. Method for manufacturing an elongated woven-wire belt to enable selective increase of load-carrying capabilities in a helically-curved travel path while being driven by dynamic-frictional contact with a substantially-cylindrical drive surface along the inner perimeter of the belt, comprising

providing a plurality of elongated spirals formed by helically-winding wire shaped so as to present flattened internal and external surfaces for each of the helically-wound loops along the length of each elongated spiral,

the helically-wound loops being uniformly distributed along, and in symmetrical cross-sectional relationship with, a centrally-located axis of each elongated spiral,

each such loop having an elliptical configuration in a cross sectional plane which is perpendicularly transverse to such spiral axis,

the elliptical loop configuration having a major dimension between bight ends of each loop and a minor axis dimension in perpendicular relationship to such major axis, with each such loop presenting:

major axis leg portions extending in the lengthwise direction of the belt being assembled between bight ends of such elliptical configuration, and

minor axis leg portions at each bight end of such configuration, such minor axis legs extending between upper and lower surfaces of such elliptical configuration;

providing elongated metal connector rods of substantially uniform gage, each having an undulating configuration along its length defining a plurality of individually-recessed seat locations uniformly spaced along the length of each elongated connector rod;

interlinking connector rods and contiguous spirals along their lengths, by

placing a pair of elongated spirals such that internal configurations of the respective loops overlap at one bight end of each of the loops, such overlap extending along the length of each spiral,

each such spiral being capable of receiving a pair of connector rods,

one such rod to be joined at its distal ends to respective distal ends of a single spiral to form an integral unit consisting of a spiral and a connector rod, with

the remaining connector rod of such pair being interlinked with helical loops of, and having its distal ends joined to, the next lengthwise contiguous spiral, which has its helically-wound loops in overlapping relationship with corresponding loops of its next adjacent spiral so as to pivotally interconnect an additional integral unit to such first formed pivotally-interconnected integral unit,

such pivotal interconnection of lengthwise contiguous integral units enabling curvilinear movement of the woven-wire belt being assembled from one substantially planar linear path around a cylinder-like configuration to another substantially-planar linear path,

continuing such assembly of lengthwise adjacent pivotally interconnected integral units to establish a woven-wire belt of desired length;

such assembled belt defining a pair of oppositely-disposed substantially-planar surface areas extending in the lengthwise direction of assembly,

each such surface area being defined by flattened major axis external surfaces of helically-wound loops of such spirals of the pivotally interconnected integral units;

joining distal ends of the connector rods and spirals along each lateral side of the belt forming such pivotally-interconnected units defining a substantially uniform width of woven-wire belt as lengthwise-disposed in a substantially-planar form, with

major axis leg portions of the spiral loops being disposed in the lengthwise direction of the belt, and minor axis portions at bight ends of such loops being disposed in transverse relationship between the oppositely-disposed surface areas of such belt, and then,

turning portions of the assembled belt, including helically-wound loops of the spirals and associated connector rod portions along each lengthwise-directed lateral side of the belt, to present flattened-surface major axis portions of such helically-wound loops in a substantially vertically-oriented lateral edge surface along each such lateral side of the belt,

each such vertically-oriented lateral edge surface being in substantially perpendicular relationship to the planar surface defined by flattened major axis leg portions across the remaining width of the belt, between such lateral sides, which define a work product conveying surface area for such belt.

5,590,756

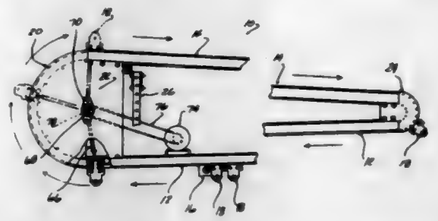
GRAVITY CONVEYOR WITH RETURN

James Zagurski, Jr., Drayton Plains, Mich., assignor to Knight Industries, Inc., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 381,499, Jan. 31, 1995, Pat. No. 5,549,192. This application Jul. 5, 1995, Ser. No. 498,353

Int. Cl.[6] B65G *35/08*

U.S. Cl. 198—795 **8 Claims**



1. In a gravity conveyor including upper and lower oppositely inclined sections connected to each other at diverging ends by a first radiused track end section, connected to each other at converging ends with a second radiused track end section, smaller sized than said first radiused track end section, and a plurality of trolleys having support rollers enabling said trolleys to roll down said upper section, around said first radiused track end section and down said lower section, a return mechanism for returning said trolleys from a lower end of said lower conveyor section up around said second radiused track end section to an upper end of said upper conveyor section, said return mechanism comprising:

a first rotary member mounted for rotation about the center of said first radiused track end section;

a first drive motor rotating said rotary member;

a spring-loaded engagement element mounted to said rotary member adapted to be retracted against a spring force urging at least a portion said element radially outwardly;

each of said trolleys including a recess in an upper portion thereof with said trolley on said lower conveyor section, said recess adapted to receive an end of said element as said first rotary member rotates to carry said first rotary element across an upper surface of a trolley disposed at said lower end of said lower conveyor section;

said spring-loaded engagement element moved radially outwardly into said recess, thereby establishing a driving engagement of said engagement element with said trolley to cause said trolley to be swept around said first track end section by rotation of said first rotary member and deposit said trolley onto said upper end of said upper conveyor section.

5,590,757

EXTENSIBLE CONTINUOUS HAULAGE SYSTEM

Scott A. Walter, Kittanning; Alan R. Polka, Slickville, and James J. Szalankiewicz, Indiana, all of Pa., assignors to S & S Slides, Inc., Kittanning, Pa.

Continuation-in-part of Ser. No. 125,598, Sep. 23, 1993, Pat. No. 5,353,920. This application Sep. 29, 1994, Ser. No. 314,881

Int. Cl.[6] B65G *21/14*

U.S. Cl. 198—812 **14 Claims**

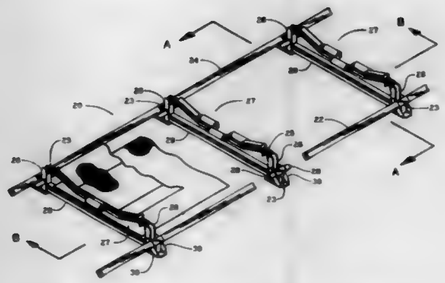
1. An extensible conveyor apparatus for a continuous haulage system, comprising:

a. a continuous conveyor belt for carrying mined material discharged from a continuous miner in an underground mine;

b. a top roller-slider for supporting said continuous conveyor belt;

c. a bottom belt return for supporting said continuous conveyor belt on its return cycle;

d. a holding frame for holding said top roller-slider, said holding frame comprising a plurality of floor-supported frame members held in position by belt tension;



e. rails for connecting and holding adjacent frame members in position by press-fit attachment of said rails to said frame members;

f. pins attached to said holding frame for bolt-free press-fit attachment of said rails to said frame members; and

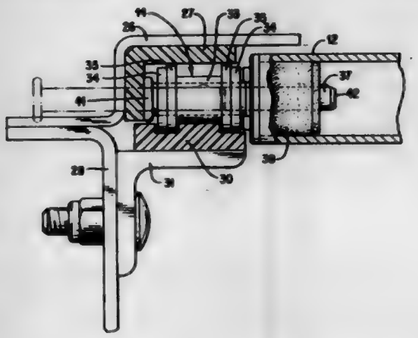
g. a rail continuity insert positioned between rail ends to provide and maintain a continuity in the rail top surface for wheels of a mobile bridge or other dolly or carriage to run on the top side of said rails, wherein said rails are rotatable to change the top wear surface.

5,590,758

SLAT SORTER

John J. Wilkins, and Walter L. Steffens, both of Cincinnati, Ohio, assignors to Western Atlas Inc., Hebron, Ky.

Filed Jun. 6, 1995, Ser. No. 467,844
Int. Cl.[6] B65G *47/46*
U.S. Cl. 198—890.1 **12 Claims**



1. A slat sorter having a series of platens slidably mounted on an array of slats which are driven by a pair of endless chains, the sorter comprising:

a pair of hollow pin chains comprising the endless chains, the hollow pin chains having hollow pins which are used to couple adjacent links of the chain together,

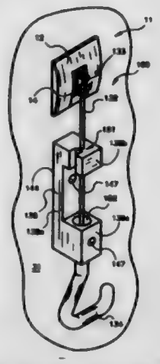
means for mounting the slats to the endless chain, said means for mounting comprising a separate pin which is slidably received by the hollow pin of the chain and removably received by the slat, said pin extending only a short distance into the slat to allow disconnection of the slat from the chain by withdrawing said pin from engagement with the slat by withdrawing said pin from the chain.

5,590,759

FIRE ALARM EXTENSION APPARATUS AND METHOD

J. Riley Hawkins, and Nicole E. Hawkins, both of Atlanta, Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Feb. 3, 1995, Ser. No. 383,413
Int. Cl.[6] H01H *17/14*
U.S. Cl. 200—331 **8 Claims**



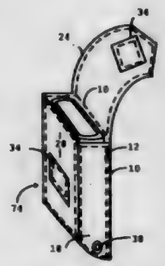
1. A remote actuator assembly for actuating a fire alarm switch mounted on a surface from a location on the surface remote from the location of the switch, said assembly comprising a clip engaging the fire alarm switch for actuating the switch upon movement of said clip, a cord extending from said clip to a distal end located remote from the location of the switch, a handle secured to said distal end of said cord, a mounting bracket for securing said cord to the surface at a location intermediate the fire alarm switch and said handle, said mounting bracket having at least one aperture through which said cord extends, said aperture being sized to impart sliding friction to said cord as said cord moves in said aperture for yieldably resisting movement of said cord in said aperture.

5,590,760

CRUSH-HEAT RESISTANT CASE FOR SPECTACLE PROTECTION

Nicholas L. Astarb, P. O. Box 181, Weyers Cave, Va. 24486

Filed Dec. 27, 1994, Ser. No. 364,254
Int. Cl.[6] B65D *81/02;85/18*
U.S. Cl. 206—6 **12 Claims**



1. A assembly for protecting small objects by providing heat and breakage resistance having

an exterior pocket, said exterior pocket having a pocket flap, said pocket flap having a length and a width,

a body front, said body front having a length and a width,

said length being less than that of said pocket flap and a pair of gussets, said pair of gussets having a length and a width, said length being equal to the length of said body front;

closure means, said closure means securing said pocket flap to said body front,

drainage means, said drainage means preventing water from accumulating within said pocket,

one of each of said gussets is secured along its length to either length side of said body front, giving a width slightly greater than the width of said body front, wherein securing said gussets and said body front to said pocket flap along the width, form pleats between said gussets and said body front

a rigid, shatterproof, protective case, said protective case being a hollow, non-circular cylinder, formed from mirror image halves, having one closed end and dimensioned to fit within said exterior pocket;

a non-abrasive, cushioning liner, said liner being a hollow, non-circular cylinder having one closed end, covering the interior and exterior of said protective case,

wherein said liner and protective case are placed within said exterior pocket.

2. The method of protecting small objects by providing heat and breakage resistance comprising,

an exterior pocket, said exterior pocket having

a pocket flap, said pocket flap having a length and a width,

a body front, said body front having a length and a width, said length being less than that of said pocket flap and

a pair of gussets, said pair of gussets having a length and a width, said length being equal to the length of said body front,

closure means, said closure means securing said pocket flap to said body front,

drainage means, said drainage means preventing water from accumulating within said pocket,

one of each of said gussets is secured along its length to either length side of said body front, giving a width slightly greater than the width of said body front, wherein securing said gussets and said body front to said pocket flap along the width, form pleats between said gussets and said body front;

a rigid, shatterproof, protective case, said protective case being a hollow, non-circular cylinder, formed from mirror image halves, having one closed end and dimensioned to fit within said exterior pocket;

a non-abrasive, cushioning liner, said liner being a hollow, non-circular cylinder having one closed end, covering the interior and exterior of said protective case;

comprising the steps of:

affixing said pocket to a user's clothing,

placing the closed end of the liner into the protective case until the closed end of the liner is in contact with the closed end of the protective case,

folding the remaining portion of the liner over the outside of the protective case,

affixing said securing means to secure said protective case within said liners,

placing said protective case, liner combination into said pocket,

placing eye glasses in said protective case,

securing said pocket flap to said body front to secure said protective case/liner combination within said pocket.

3. An assembly for protecting small objects by providing heat and breakage resistance, said assembly comprising,

an exterior pocket, said exterior pocket having

a pocket flap, said pocket flap having a length and a width,

a body front, said body front having a length and a width,

a pair of gussets, said pair of gussets having a length and a width and connecting said pocket flap and said body front along three sides,

closure means, said closure means removably affixing said pocket flap to said body front,

a protective case, said protective case having a length and width slightly less than said exterior pocket;

a liner, said liner being dimensioned and positioned to cover the interior and exterior of said protective case and having closure means to secured said protective case within said liner,

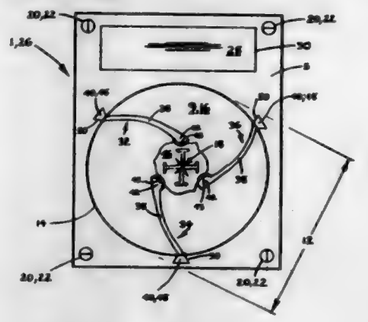
said liner and protective case being positioned within said exterior pocket, and said gussets being dimensioned to form a friction fit between said protective case and said exterior pocket to prevent slippages between said exterior pocket and said protective case.

5,590,761

COIN DISPLAY HOLDER

David B. Owen, 11513 River Dr. East, Carmel, Ind. 46033

Filed May 2, 1996, Ser. No. 640,541
Int. Cl.[6] A45C *11/24*
U.S. Cl. 206—0.82 **6 Claims**



1. A coin case comprised of:

a.) a dismantlable coin enshrouding array with a cavity which is accessible by dismantling said coin enshrouding array,

b.) said cavity being defined by a cavity thickness, a cavity peripheral width and cavity peripheral side walls, providing said coin case with an interior coin nesting void, said void having a central point,

c.) said coin enshrouding array being defined by a pair of outer frame pieces, these pieces being formed of rigid plastic bodies, said two outer frame pieces being transparent providing two opposing exterior see-through faces for the purpose of coin visibility, and two inward see-through faces,

d.) said outer frame pieces provided with a peripheral series of releasable holding means, and each of the said releasable holding means having force-applying means which operatively engage both of said outer frame pieces for drawing them toward one another, when they are assembled into said coin enshrouding array, to be a face-juxtaposed layered assembly,

e.) two or more transparent spring tension arms, each comprising an arm body having an outward end and an inward end and an arm thickness, said spring tension arms being substantially conjoined to said coin case, and said arms having a portion extending inward of said coin case into said cavity,

f.) the portion of each of said spring tension arms which lies within said cavity having its said arm thickness slightly less than said cavity thickness of said interior coin nesting void and having its said inward end relatively close to said central point of said coin nesting void,

g.) said arms being movable in an arc with said outward ends being substantially fixed and said inward ends capable of moving within said coin nesting void,

h.) said arms being in a relatively unstressed condition when said inward ends are relatively close to said central point of said coin nesting void,

i.) said arms being in a relatively stressed condition when said inward ends are moved further away from said central point than when said arms are in said relatively unstressed condition,

j.) said inward ends having grooves aligned parallel with said two opposing exterior see-through faces, said grooves allowing said spring tension arms to clamp a coin when said spring tension arms are in said relatively stressed condition, and,

k.) said spring tension arms with their said grooves being capable of clamping said coin and holding it substantially spatially centered with said coin nesting void by means of multiple, but generally equally resolved spring tension forces.

5,590,762

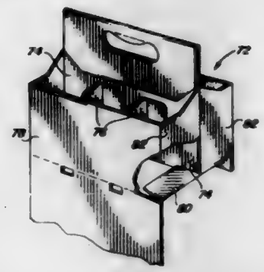
BASKET-STYLE CARRIER WITH RETAINER TABS

Glenn R. Harrelson, Roswell, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Continuation of Ser. No. 260,848, Jun. 16, 1994, abandoned. This application Nov. 2, 1995, Ser. No. 556,865

Int. Cl.[6] B65D *75/00*

U.S. Cl. 206—162 **7 Claims**



1. In an open-top basket-style article carrier having opposite side panels connected to a bottom panel, means for dividing the carrier into a plurality of cells, an article in each cell, the carrier being of the type formed from a unitary blank and required to be held open during loading of the articles until the articles enter the cells a sufficient distance so as to themselves be able to hold the carrier open, end panels connected to the side panels, each end panel being comprised of two adjacent end panel sections, each of said end panel sections having an interior face, an outer edge connected to an associated side panel and an inner edge foldably connected to an inwardly extending vertical support member, the improvement comprising:

each of said end panel sections of at least one of the end panels having an upper edge and a lower edge lower edge being a substantially horizontal edge; and

a tab connected along a fold line to each said substantially horizontal edge, each tab being in folded position engaging the interior face of an associated end panel section and an adjacent article, the tabs when folded to a position extending transversely of the associated end panel sections during loading of the articles into the carrier cells engaging the vertical support member to hold the carrier open.

5,590,763

PACKAGE COMPOSED OF PART PACKS AND PROCESS AND APPARATUS FOR PRODUCING IT

Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Division of Ser. No. 4,292, Jan. 14, 1993, Pat. No. 5,357,734. This application Jul. 22, 1994, Ser. No. 278,943

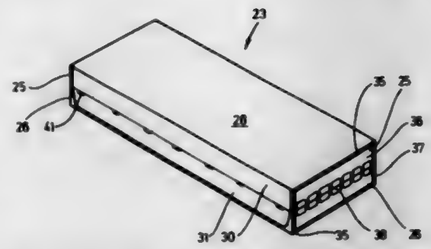
Claims priority, application Germany, Jan. 16, 1992, 42 00 921.9

Int. Cl.[6] B65D *85/10*

U.S. Cl. 206—271 **16 Claims**

1. A package composed of two cuboidal partial packages (25, 26) each for receiving a group (21, 22) of cigarette packs (20), wherein:

a) the partial packages (25, 26) adjoin one another with large-surfaced inner walls (27);



b) the partial packages (25, 26) comprise a common, one-piece blank (24) consisting of two partial blanks which correspond to the partial packages (25, 26);

c) the one-piece blank (24) is separable along a central connection line (32) therein which divides said inner walls (27);

d) the connection line (32) consists of a plurality of cuts interspersed with residual connections (34) in the blank;

e) remainders of the residual connections (34), which are present after the separation of the blank, are covered by tongues (41); and

f) said tongues (41) are punchings in inserts (31) adjoining narrow longitudinal side walls (30) of the partial packages, and, starting from a folding line between each side wall (30) and its insert (31), extend into the insert (31); and

g) the tongues (41) are spaced at the same distances as the residual connections (34) and cover them when the inserts (31) are folded into a gap between the inner walls (27).

5,590,764

PACKAGE DISPENSER FOR PLURALITY OF GARMENTS

Frederick Wood, 3110 Devon Rd., Medford, N.Y. 11763

Continuation of Ser. No. 229,639, Apr. 19, 1994, Pat. No. 5,456,354. This application Aug. 14, 1995, Ser. No. 514,699 The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.[6] B65D *85/18;85/14;81/20;* **A47G** *25/80*

U.S. Cl. 206—278 **26 Claims**



1. A package dispenser for the dispensing of a plurality of garments made of an elastic, expandable material for wear upon a body part, each of said garments having a distal closed end and an open end for insertion of the body part therein, wherein a vacuum is drawn from the elastic expandable material around the body part in order to expand the elastic expandable material in an open position for insertion of the body part therein to obtain an external protection over the body part, said package dispenser comprising:

a container, said container having a housing, said housing having a cavity therein, said cavity of said container having therein said plurality of the garments, each garment except an outermost garment of said plurality of garments being fitted inside of another of said garments;

said container having an open end, said open end of each of said garments being wrapped around said open end of said container, said plurality of garments covering said open end of said container from said distal closed end;

said plurality of garments being wrapped in a predetermined pattern so that an innermost garment is exposed to said open end of said container, and next subsequent garments of said plurality of garments being wrapped around said innermost garment;

said garments having an outermost garment enclosing said next subsequent garments and said innermost garment; and,

said container having an outside layer and an inelastic, gas-impermeable inside layer, said inelastic, gas-impermeable inside layer having a geometric shape conforming to a geometric shape of said outermost garment, wherein a vacuum is applied between said outermost garment and said inelastic gas-impermeable inside layer of said container for expansion of said garments in an open position against said inelastic, gas-impermeable inner layer in an expanded position for insertion of the body part therein upon release of the vacuum against said innermost garment, said innermost garment being collapsible onto said body part.

5,590,765

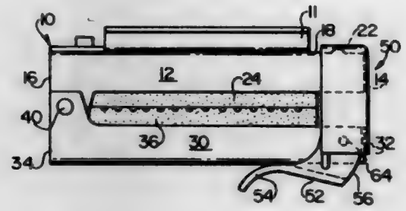
HANGER SUPPORT FOR GARMENT BAG COMPRISING A LATCHING DEVICE WITH A FRONT PLATE

Wallace London, Baltimore, Md., assignor to Clemco Products, Inc., Baltimore, Md.

Filed Nov. 17, 1995, Ser. No. 560,501

Int. Cl.[6] A45C *3/00;* **B65D** *85/18*

U.S. Cl. 206—289 **21 Claims**



1. A hanger support for a garment bag comprising:

a first and a second clamp jaw each having a rear end and a forward end,

a pivot pin pivotally connecting said clamp jaws adjacent the rear ends thereof to permit said clamp jaws to be in a closed, substantially parallel position or in an open, angularly related position, and

a latching device for releasably securing said clamp jaws in said closed position or for releasing said clamp jaws for pivotal movement to said open position comprising:

(i) an actuating lever,

(ii) a pivot structure pivotally connecting said actuating lever to a first said clamp jaw adjacent the forward end thereof, and

(iii) a retainer comprising in the closed and clamped position of said clamp jaws:

(a) a front plate forwardly of the forward end of said clamp jaws,

(b) a link engaging a surface of said second clamp jaw remote from said first clamp jaw and being adjacent the forward end of said second clamp jaw,

(c) pivot structure for pivotally connecting said link to said actuating lever, and

(d) connecting structure for connecting said front plate to said link.

5,590,766

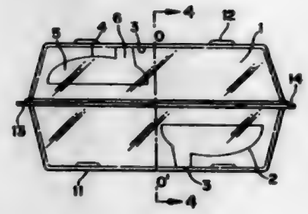
TRANSPARENT SHOE BOX

Garnett Carnahan; Caroline Carnahan, and Marvin R. Carnahan, all of Rte. 3, Box 18, Nixa, Mo. 65714

Filed Feb. 22, 1995, Ser. No. 392,174

Int. Cl.[6] B65D *85/18*

U.S. Cl. 206—296 **15 Claims**



15. A transparent shoe box, comprising:

a box body made of a transparent plastic;

a box cover made of a transparent plastic engaged with the box body;

a first shoe holder attached to the box body, wherein the first shoe holder is positionable inside a shoe to hold the shoe; and

a second shoe holder attached to the box cover, wherein the second shoe holder is positionable inside a shoe to hold the shoe, and

wherein the first shoe holder is attached to the box body by way of a dint connection between a protruding member and an outwardly elastically deformable recess which are formed in the protruding part of said first shoe holder and in said box body, and wherein the second shoe holder is attached to the box cover by way of a dint connection between a protruding member and an outwardly elastically deformable recess which are formed in the protruding part of said second shoe holder and in said box cover.

5,590,767

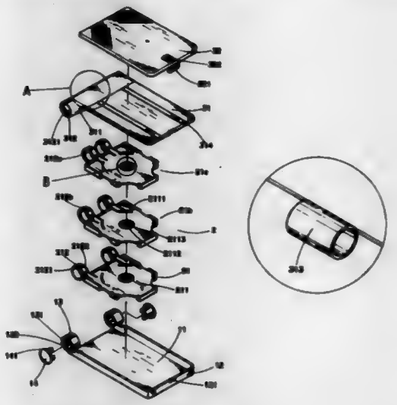
CD STORAGE BOX

Chin-Chu Li, No. 1-4, Wu Nan Rd., Wu Chi Chen, Taichung Hsien, Taiwan

Filed Jul. 28, 1995, Ser. No. 508,922

Int. Cl.[6] B65D *85/57*

U.S. Cl. 206—308.1 **2 Claims**



1. A CD storage box comprising:

a flat casing having a top storage chamber, a rear open end, two opposite barrels at said rear open end, a front close end, a

retaining hole on said front close end, each barrel of said flat casing having a plurality of longitudinal grooves;

a stack of individual CD holders received in said top storage chamber of said flat casing, each individual CD holder having two barrels spaced at one end, a CD seat, a hub raised from said CD seat for holding an individual CD in said CD seat, each barrel of said individual CD holders having an annular coupling flange and an annular coupling groove, the barrels of said individual CD holders being turnably connected in series by fitting the respective annular coupling flanges into the respective annular coupling grooves;

a cover pivotably connected to said casing and covering said individual CD holders, said cover comprising two end lugs respectively, turnably connected to the barrels of said casing, a barrel spaced between said end lugs and connected between the barrels of one individual CD holder, and a downward hook for hooking in the retaining hole on the front close end of said casing; and

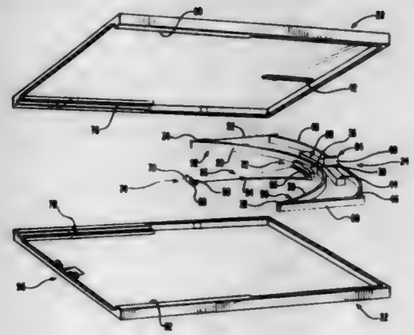
two locating knobs respectively fastened to the barrels of said casing to secure the end lugs of said cover to said casing, each locating knob having a plurality of locating legs respectively inserted through the end lugs of said cover into the longitudinal grooves of the barrels of said casing.

5,590,768

STORAGE CASE FOR DISK-SHAPED MEDIA HAVING A BI-STABLE EJECTION MECHANISM UTILIZING COMPLIANT DEVICE TECHNOLOGY

Lance Hilton, Provo, and Vicki S. Beal, Murray, both of Utah, assignors to Compliant Solutions, LC, American Fork, Utah

Filed Jan. 11, 1996, Ser. No. 585,783
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **37 Claims**



1. A disk-shaped media positioning mechanism for positioning a disk-shaped media between a retracted and an extended position with respect to a frame, the disk-shaped media positioning mechanism comprising:

a bi-stable movement assembly comprising first and second flexible and resilient members, each member having a fixed end and a moving end, and each moving end pivotally connected to the other and each fixed end pivotally attached to the frame such that the pivotally connected moving ends may move between the fixed ends to the retracted position and the extended position, each respective position lying on opposite sides of an imaginary line formed between each fixed end; and

means for holding the disk-shaped media functionally attached to the bi-stable movement assembly.

2. A bi-stable ejection mechanism for ejecting and retracting disk-shaped media into and out of a housing, the bi-stable ejection mechanism comprising:

a bi-stable movement assembly comprising first and second flexible and resilient members, each member having a fixed end and a moving end, and each moving end pivotally connected to the other and each fixed end pivotally attached to the housing at such position to allow the pivotally connected moving ends to pass therebetween, the bi-stable movement assembly being naturally in either a retracted position or an extended position;

means for holding the disk-shaped media, the holding means pivotally attached to first and second pivotally connected moving ends, whereby the bi-stable movement assembly will move the holding means such that when in the extended position an appreciable amount of the disk-shaped media will be outside of the housing and when in the retracted position no appreciable amount of the disk-shaped media will be outside the housing; and

means for urging the bi-stable movement assembly between the retracted and extended positions.

7. A storage container for disk-shaped media, the media having a bottom surface, a top surface, an outer edge, and a central hole having an inner edge, the storage case comprising:

a container housing, the housing capable of completely enclosing the disk-shaped media and the housing having an entrance/exit opening;

a bi-stable movement assembly comprising first and second flexible and resilient members, each member having a fixed end and a moving end, and each moving end pivotally connected to the other and each fixed end pivotally attached to the housing at a position to allow the pivotally connected moving ends to pass therebetween, the bi-stable movement assembly being naturally in either a retracted position or an extended position;

means for holding the disk-shaped media, the holding means functionally attached to the bi-stable movement assembly, whereby the bi-stable movement assembly will move the holding means such that when the bi-stable movement assembly is in the extended position an appreciable amount of the disk-shaped media will be outside of the housing at the housing entrance/exit opening where the disk-shaped media may be removed from or placed onto the holding means and when in the retracted position the disk-shaped media will be enclosed within the container housing; and

means for urging the bi-stable movement assembly from the retracted to the extended position.

22. A single-piece injection molded article of manufacture for making a container to hold disk-shaped media, the media having a bottom surface, a top surface, an outer edge, and a central hole having an inner edge, the article of manufacture comprising:

a first enclosure portion having an entrance/exit notch;

a second enclosure portion having an entrance/exit notch;

an ejection mechanism assembly portion capable of holding the disk-shaped media; and

the first enclosure portion, the second enclosure portion, and the ejection mechanism assembly portion connected to each other by folding hinge means and all portions capable of being folded together to make a container for holding disk-shaped media, the container capable of enclosing disk-shaped media, having an exit/entrance opening for the disk-shaped media, and having means for ejecting disk-shaped media through the exit/entrance opening.

5,590,769

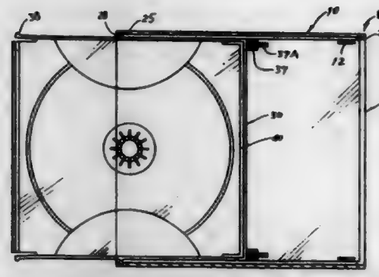
INDIVIDUAL CD CASE

Shi-Ping Lin, No. 86, Lane 284, Gong-zhen Road, Luodong, Yilan Hsien, Taiwan

Filed Mar. 20, 1996, Ser. No. 618,551
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **4 Claims**

1. An individual CD case comprising:

a case body formed of a bottom shell and a top cover shell covered on said bottom shell, said case body having a pair of opposing side walls, a top wall, a bottom wall, a back wall,



and a front opening, said opposing side walls having a respective locating groove at an inner side adjacent to said front opening;

a sliding plate slidably inserted into the front opening of said case body and retained inside said case body, said sliding plate having two headed retainer strips projecting from two opposite sides thereof and spring means at a rear end thereof, said headed retainer strips being respectively forced into engagement with the locating grooves of said case body to hold said sliding plate inside said case body when said sliding plate is inserted into the front opening of said case body, said spring means being stopped at the back wall of said case body and compressed when said sliding plate is retained inside said case body; and

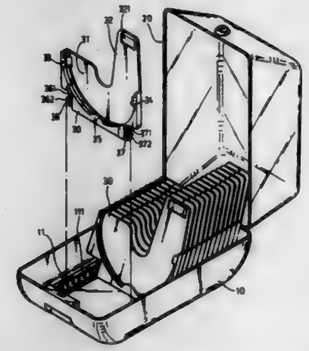
a CD holder plate mounted on said sliding plate, said CD holder plate having two arched openings symmetrically disposed at two opposite sides, a top side, and a keeper raised from the center of the top side for holding down an individual compact disk on the top side of said CD holder plate.

5,590,770

CD BANK

Sheng-Fu Yeh, P. O. Box 82-144, Taipei, Taiwan

Filed Apr. 15, 1996, Ser. No. 632,585
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **3 Claims**



1. A CD bank comprising a case; a transparent cover hinged to said case, and a plurality of individual CD holder plates mounted inside said case to hold individual compact disks respectively, wherein said case comprises two longitudinal rails bilaterally disposed on the inside, and longitudinally spaced pairs of transverse grooves respectively made on said longitudinal rails; said individual CD holder plates are respectively pivotably mounted in said longitudinally spaced pairs of transverse grooves between said longitudinal rails, each individual CD holder plate comprising a top side, a bottom side, a half-round recess defined between said top side and said bottom side for holding an individual compact disk, an arched opening at the periphery of said half-round recess for the insertion of the thumb, an extension board extending from said top side at one side of said arched opening, an index groove at said extension board for mounting an index sticker, a plurality of retaining lugs suspending above said half-round recess and spaced around the border thereof for holding down an individual compact disk within said half-round recess, and two springy rods respectively raised from said bottom side at two opposite ends and pivoted to one pair of said longitudinally spaced pairs of transverse grooves.

5,590,771

CONSOLIDATED MUSIC INSTRUMENT CASE WITH AMPLIFIER AND SPEAKERS

Jose G. Costa, 2928 E. LaMarche, Phoenix, Ariz. 85032

Filed Dec. 23, 1994, Ser. No. 363,603
Int. Cl.[6] A45C *11/00*
U.S. Cl. 206—314 **15 Claims**



1. A musical instrument case comprising: a substantially rectangular base portion having a recess configured to receive and retain a musical instrument therewithin; and first and second triangular cover members that are pivotally attached to said base portion, said first and second cover members having one or more speakers disposed therein, said first and second triangular cover members being adapted to completely cover said base portion, said first and second triangular cover members also being of certain thickness as defined by three rectangular side faces, one of said rectangular side faces on said first triangular cover member being adapted to complementally meet one of said rectangular side faces on said second triangular cover member in substantially surface to surface engagement so that no structural gaps are left exposed.

5,590,772

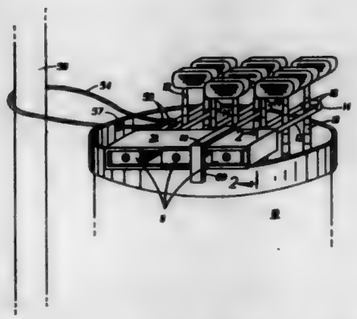
GOLF CLUB LOCK

Kevin Schuhlen, 14 Meadow Rd., East Longmeadow, Mass. 01028, and Matthew J. DeNucci, 52 Trinity Ave., Glastonbury, Conn. 06033

Filed Dec. 15, 1994, Ser. No. 356,511
Int. Cl.[6] A63B *55/00*
U.S. Cl. 206—315.3 **16 Claims**

1. A locking device for releasably securing a plurality of golf clubs therein, each golf club having a head disposed at an end of the a shaft, the shaft having a narrow region near the head and a wider region further from the head, the device comprising:

a plurality of elongated shackles each having generally parallel limbs extending from a bight portion and being separated from one another;



plurality of receivers with the limbs of each shackle being lockingly receivable by a respective receiver to secure a plurality of clubs therein; and

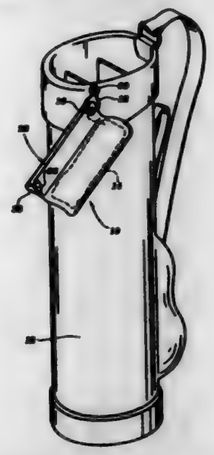
a unitary retainer for retaining said receivers therein wherein said receivers are disposed in slidably spaced relation within said retainer, whereby said receivers and said shackles, when lockingly received by a receiver, are alignable with individual compartments of a golf bag and whereby golf clubs received between the parallel limbs of a receiver cannot be removed from the receiver.

5,590,773

GOLF WET TOWEL CONTAINER

Gordon Robinett, 6 Bate Rd., Cranyville, N.Y. 12521

Filed Aug. 17, 1995, Ser. No. 516,258
Int. Cl.[6] B65D *85/20*
U.S. Cl. 206—315.1 **19 Claims**



1. A golf wet towel container for maintaining a moist towel therein for use during golfing activities, said golf wet towel container comprising:

an enclosure formed of a sheet of substantially waterproof material adapted for maintaining said towel in a moist state therein, said sheet being generally rectangular in shape and having a first edge opposing a second edge and a third edge opposing a fourth edge;

said sheet being bent along a line to form a first side of said enclosure, said sheet being bent such that a partial length of said first edge overlaps and is attached to another partial length of said first edge so as to form a second side of said enclosure, and that a partial length of said second edge overlaps and is attached to another partial length of said second edge so as to form a third side of said enclosure;

said third edge and said fourth edge being adapted to form an opening along said golf wet towel container for access to said enclosure;

a towel attached to said container; and

a connector for attaching said golf wet towel container to a golf bag.

5,590,774

SURGICAL NEEDLE DISCARD CONTAINER

Holly H. Roberts, 365 Broad St., Red Bank, N.J. 07701

Filed Jun. 6, 1995, Ser. No. 466,783
Int. Cl.[6] B65D *83/10*
U.S. Cl. 206—366 **20 Claims**



1. A surgical needle discard container for storing used surgical needles, comprising:

a container having a plurality of separate compartments defined therein, each compartment being sized so as to receive a surgical needle therein;

a lid rotatably attached to one end of said container, said lid having an aperture defined therein, said aperture being selectively aligned with each of said compartments as said lid is rotated relative to said container; and

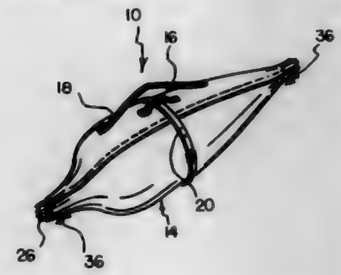
a mechanism associated with said container and said lid, said mechanism permitting incremental rotation of said lid relative to said container in only one direction to selectively align said aperture with said compartments.

5,590,775

CHRISTMAS TREE TRANSPORT AND STORAGE SATCHEL

Carter Moore, 101 Terrace Ave., Apt. 1K, Hasbrouck Heights, N.J. 07604

Filed Jul. 14, 1995, Ser. No. 502,474
Int. Cl.[6] B65D *85/52*
U.S. Cl. 206—423 **1 Claim**



1. A new and improved Christmas tree transport and storage satchel comprising, in combination:

a Christmas tree formed in a generally conical configuration and including an upper extent having a point and a lower extent having a stump;

a tarp fabricated of heavy duty nylon and formed in a generally elliptical configuration with two linear end edges and a rounded central region therebetween, the tarp having an inner surface and an outer surface, each linear end edge including a plurality of grommets extending therealong, the tarp having a first side edge and a second side edge, each side edge extending along the entire length of the tarp, each side edge including VELCRO coupling devices and zipper teeth, the first side edge adapted to be coupled on top of the second side edge whereby the first side edge forms a flap, the zipper teeth of the side edges adapted to be coupled together by a slidable zipper coupler, the outer surface of the tarp including a centrally positioned hand strap affixed thereto in an orientation perpendicular to the end edges, a shoulder strap being coupled adjacent to the hand strap in an orientation parallel to the hand strap, the shoulder strap being large enough to permit users to position an arm and shoulder therethrough, in an operative orientation the tarp being wrapped around a Christmas tree with the respective zipper teeth and VELCRO coupling devices being coupled together, a drawstring being positioned through the grommets of each end edge to enable users to close the ends by tightening the drawstrings so that debris from the Christmas tree does not escape from the apparatus; and

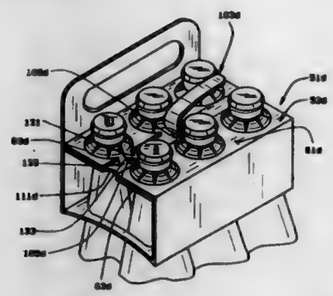
an adjustable belt formed in an elongated configuration with a first end and a second end, the first end including a buckle coupling device, the second end including a plurality of holes positioned along its length, in an operative orientation the user adjusting the belt around the approximate centerpoint of the tarp to stabilize an enclosed Christmas tree.

5,590,776

MULTI-PACK CARRIER FOR BOTTLES

Richard T. Galbierz, 10809 Forest Path, St. Louis, Mo. 63128, and Michael A. Galbierz, 5962 Pennbrooke Dr., St. Louis, Mo. 63129

Filed Oct. 6, 1995, Ser. No. 540,199
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—427 **43 Claims**



1. A carrier for holding a plurality of bottles; the bottles each having a body, a neck extending upwardly from the body, a mouth at a top of said neck, a closure closing said mouth, and a flange adjacent said mouth, said flange having a lower surface defining a chime at a point where said flange and said neck intersect; said carrier including a top panel and at least one side panel; said top panel including:

a first ply defining an array of surrounding apertures;

a second ply below said first ply, said second ply defining an array of container receiving apertures and having a plurality of slits extending radially from each of said container receiving apertures to define tabs; and release openings positioned between adjacent container receiving apertures and;

a release mechanism for releasing said bottles from said carrier;

said surrounding apertures of said first ply having a diameter substantially equal to the diameter of a circle defined by outer ends of said slits, said surrounding apertures defining fold points for said tabs;

said container receiving apertures having a diameter slightly smaller than the diameter of said bottle chime such that when a bottle is urged through said container receiving apertures, said tabs are urged upwardly;

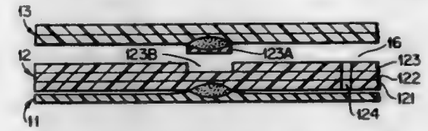
said release mechanism opening said surrounding apertures and effectively exposing said release openings when operated.

5,590,777

STERILIZABLE FLEXIBLE POUCH PACKAGE

Mark E. Weiss; Thomas J. Bauer, both of Denver, Colo., and Richard E. Johnson, Appleton, Wis., assignors to OnGard Systems, Inc., Denver, Colo., and American National Can Company, Chicago, Ill.

Continuation-in-part of Ser. No. 25,425, Mar. 1, 1993, Pat. No. 5,459,978. This application Dec. 21, 1994, Ser. No. 361,321
Int. Cl.[6] B65D *81/20*
U.S. Cl. 206—439 **13 Claims**



1. A flexible, steam-sterilizable pouch package comprising:

a flexible, steam-permeable non-woven lower barrier web;

a flexible impermeable plastic upper web; and

a flexible, plastic intermediate web having an interior steam-permeable region;

said intermediate web being bonded to said upper web by a first permanent line heat seal located peripherally outside said steam-permeable region, said first permanent line heat seal defining limits of a cavity between said upper web and said intermediate web for receiving an object to be sterilized, said first permanent line heat seal extending less than fully peripherally around said permeable region whereby a heat seal-free region of first permanent line heat seal provides an access opening for inserting an item to be sterilized into said cavity;

said intermediate web being bonded to said barrier web by a second permanent line heat seal peripherally outside said steam-permeable region of said intermediate web, said second permanent line heat seal being located such that, when the pouch is fully sealed, steam can penetrate into said cavity only by passing first through said barrier web and thereafter through said steam-permeable region of said intermediate web;

one of said intermediate and upper webs being a multi-layer web having a first heat sealable layer selected from the group consisting of polypropylene, polypropylene copolymers, and mixtures thereof, and a core layer bonded thereto selected from the group consisting of polyisobutylene-modified high density polyethylene (RMHDPE) and a blend of RMHDPE with polypropylene or polypropylene copolymer, and the other of said intermediate and upper webs being heat sealable to the heat sealable layer of said multi-layer web and being heat sealed thereto by said first permanent line heat seal;

the bond strength of said first permanent line heat seal being stronger than the bond strength between said first heat sealable layer and said core layer of said multi-layer web, and the bond strength between said first heat sealable layer and said core layer of said multi-layer web being greater than the tear strength of said first heat sealable layer of said multi-layer web, whereby a delamination failure peel seal is present

between said intermediate and upper webs in the region of at least a portion of said first permanent line heat seal.

11. A method of sterilizing an object which comprises:

(a) providing a flexible steam-sterilizable pouch comprising:

a flexible, sterilization steam-permeable non-woven lower barrier web;

a flexible impermeable plastic upper web; and

a flexible, plastic intermediate web having an interior steam-permeable region;

said intermediate web being bonded to said upper web by a first permanent line heat seal located peripherally outside said steam region, said first permanent line heat seal defining limits of a cavity between said upper web and said intermediate web for receiving an object to be sterilized, said first permanent line heat seal extending less than fully peripherally around said permeable region whereby a heat seal-free region of first permanent line heat seal provides an access opening for inserting an item to be sterilized into said cavity;

said intermediate web being bonded to said barrier web by a second permanent line heat seal peripherally outside said steam-permeable region of said intermediate web, said second permanent line heat seal being located such that, when the pouch is fully sealed, steam can penetrate into said cavity only by passing first through said barrier web and thereafter through said permeable region of said intermediate web;

one of said intermediate and upper webs being a multi-layer web having a first heat sealable layer selected from the group consisting of polypropylene, polypropylene copolymers, and mixtures thereof, and a core layer bonded thereto selected from the group consisting of polyisobutylene-modified high density polyethylene (RMHDPE) and a blend of RMHDPE with polypropylene or polypropylene copolymer, and the other of said intermediate and upper webs being heat sealable to the heat sealable layer of said multi-layer web and being heat sealed thereto by said first permanent line heat seal;

the bond strength of said first permanent line heat seal being stronger than the bond strength between said first heat sealable layer and said core layer of said multi-layer web, and the bond strength between said first heat sealable layer and said core layer of said multi-layer web being greater than the tear strength of said first heat sealable layer of said multi-layer web, whereby a delamination failure peel seal is present between said intermediate and upper webs in the region of said first permanent line heat seal;

(b) placing an object to be sterilized in the cavity of the pouch;

(c) sealing the pouch such that the object to be sterilized is sealed in said cavity and such that sterilizing fluid can penetrate into said cavity only by first passing through the lower web and then through the perforated region of the intermediate web; and

(d) sterilizing the sealed pouch with steam.

5,590,778

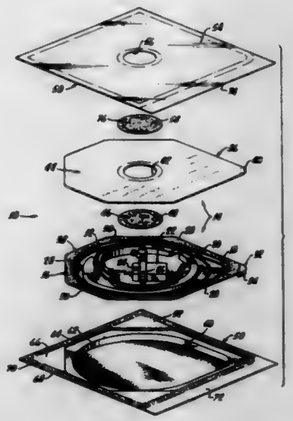
DOUBLE-STERILE PACKAGE FOR MEDICAL APPARATUS AND METHOD OF MAKING

Robert A. Dutchik, Laguna Niguel, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Jun. 6, 1995, Ser. No. 470,851

Int. Cl.[6] A61B *17/06;19/02*

U.S. Cl. 206—439 **12 Claims**



1. A double-sterile package comprising:

an inner shape-retaining container including a boundary wall impervious to microorganisms and being closed except for defining a hole, said boundary wall bounding a package volume for receiving an article;

a patch of gas-permeable micro-porous sheet material sealingly secured to said boundary wall of said inner container, said patch spanning and closing said hole in said inner container boundary wall and being sufficient to exclude environmental microorganisms from entering said inner container;

a conformal shape-retaining outer container receiving and nesting with said inner container, said outer container also having a boundary wall impervious to microorganisms and being closed except for defining a respective hole;

a patch of gas-permeable micro-porous sheet material sealingly spanning and closing said hole of said outer container, said patch of micro-porous sheet material of said outer container also being sufficient to exclude environmental microorganisms from entering said outer container;

said holes of said first and second containers being in gas-flow communication with one another;

whereby a sterilizing gas may be introduced into said package volume via said holes and the gas flow communication therebetween through said gas-permeable patches of said inner and outer containers to sterilize said article, environmental microorganisms being excluded from said article after this sterilizing by said micro-porous patches to maintain sterility of said article.

12. A method of making a double-sterile package, said method comprising steps of:

providing an inner container having a boundary wall impervious to microorganisms and being closed except for defining a hole;

using said boundary wall of said inner container to define a volume for receiving an article;

providing a patch of gas-permeable micro-porous sheet material;

sealingly securing said patch of gas-permeable micro-porous material to said boundary wall of said inner container to span and close said hole in said inner container boundary wall;

insuring that said patch of gas-permeable micro-porous material is sufficient to exclude environmental microorganisms from entering said inner container via said hole;

providing an outer container receiving and nesting with said inner container, providing said outer container also with a respective boundary wall impervious to microorganisms and being closed except for defining a respective hole;

providing a respective patch of gas-permeable micro-porous sheet material;

sealingly securing said respective patch of gas-permeable micro-porous sheet material to said boundary wall of said outer container to span and close said respective hole of said outer container;

insuring that said patch of micro-porous sheet material of said outer container is also sufficient to exclude environmental microorganisms from entering said outer container;

providing gas flow communication between said holes of said first and second containers;

introducing a sterilizing gas into said volume via said holes and the gas flow communication therebetween through said gas-permeable patches of said inner and outer containers to sterilize said article; and

thereafter using said micro-porous patches to exclude environmental microorganisms from said article to maintain sterility of said article.

5,590,779

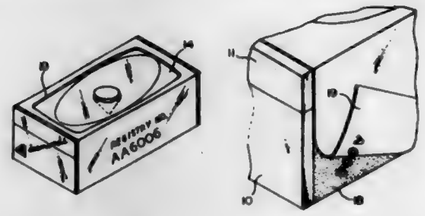
PROTECTIVE PACKAGING FOR VALUABLE ARTICLES

John L. Ramsey, 22407 78TH Ave. SE., Woodinville, Wash. 98072

Filed Sep. 30, 1994, Ser. No. 315,832

Int. Cl.[6] B65D *85/00*

U.S. Cl. 206—459.1 **7 Claims**



1. A tamper-evident packaging for a valuable article comprising in combination;

a multi-part rectangular cross section parallelepipeid container constructed from rigid plastic and having at least one transparent wall for viewing the article,

tamper-evident tape connecting the parts of said container and adhesively bonded to the outer surfaces thereof, said tamper-evident tape including an opening in the area of said transparent wall for viewing the article,

a shrink wrap plastic layer heat shrunk into superimposed relation on said container and overlaying said tamper-evident tape, said shrink warp layer being seamless and covering portions of all sides thereof, and

a compressible filler material within said container for holding said article in place adjacent said transparent wall.

5,590,780

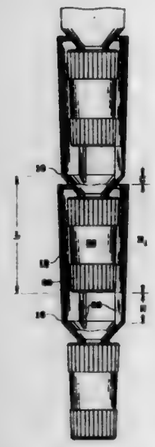
UNIT DOSE ASSEMBLY

John R. O'Meara, North Palm Beach, Fla., assignor to Wheaton Holding, Inc., Wilmington, Del.

Filed Jun. 22, 1995, Ser. No. 493,790

Int. Cl.[6] B65D *21/00*

U.S. Cl. 206—520 **5 Claims**



1. A container and closure assembly comprising a container having a body portion and a nozzle at one end of the body portion and having a reduced cross-section and a transition shoulder connecting the nozzle and body portion, a closure cap engagable over the nozzle portion, at least one internal rib in the container adjacent the juncture of the body portion and nozzle extending downwardly into the body portion a predetermined depth wherein when a plurality of said container and closure cap assemblies are nested, and the closure cap of a second said container and closure cap assembly engages interiorly the body portion of a first adjacent said container and cap assembly to a point where the second said container and closure cap assembly abuts the ribs of the first container and cap assembly, the length (L) between an upper portion of the container cap and transition shoulder of said second container and cap assembly is greater than the distance (H_1) from the lower most edge of said internal rib and the lower most terminal edge of the body portion of the container of said first container and cap assembly.

5,590,781

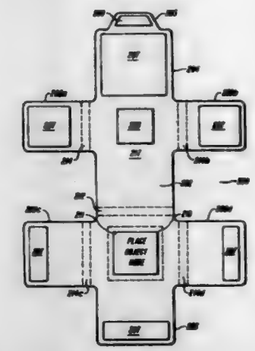
UNITARY CONFORMABLE SHIPPING CONTAINER

Elisabeth Shackelford, 5 Shaler La., Cambridge, Mass. 02138, and Nancy Jackson, 58 E. End Rd., Bolton, Mass. 01740

Continuation-in-part of Ser. No. 270,608, Jul. 5, 1994, and a continuation-in-part of Ser. No. 186,013, Jan. 24, 1994, abandoned. This application Jan. 23, 1995, Ser. No. 376,964

Int. Cl.[6] B65D *81/02;81/03*

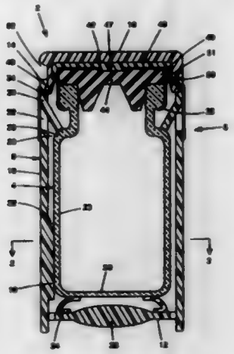
U.S. Cl. 206—521 **1 Claim**



1. A double cruciform shipping container for packaging a three-dimensional object of a given shape, comprising:

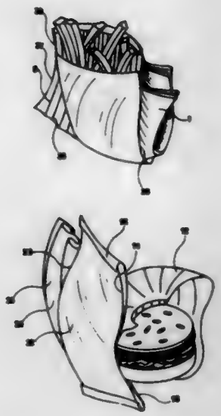
first and second flexible, padded container sections connected by a body section, said first container section having first and second opposing tabs with first and second adhesive strips, respectively, and a tail section with a third adhesive strip, said second container section having third and fourth opposing tabs with fourth and fifth adhesive strips, respectively, and a head section with a sixth adhesive strip, said second container section further including a pocket formed to receive written materials, wherein the object may be packaged by first placing the object in said first container section, then wrapping said first and second tabs and said tail section around the object and folding said second container section over the object and wrapping said third and fourth tabs and said head section around the object, and securing each of said tabs in place with the adhesive strips associated therewith, said container thereby adopting the shape of the object being packaged such that voids between the object and said container are eliminated.

5,590,782
VIAL HOLDER ASSEMBLY
Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.
Filed Apr. 17, 1995, Ser. No. 423,425
Int. Cl.[6] B65D *85/30;* A61B *19/02*
U.S. Cl. 206—528 25 Claims



1. A vial holder assembly comprising:
a vial containing a pharmaceutical, having a top, a vial sidewall and a bottom; and
a vial holder comprising:
a body having a body sidewall and a base defining an interior sized to house the vial therein, the body sidewall terminating at an open end;
a locating/shock absorbing member situated between the body sidewall and the vial sidewall;
a removable lid removably mounted to the upper end of the body sidewall so the vial is enclosed within a region defined by the body interior and the lid; and
means for effectively preventing the removal of the vial from the body.

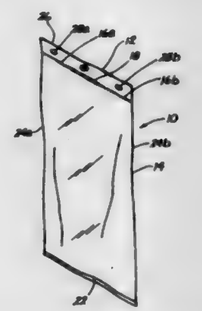
5,590,783
DEVICE COMBINING A DISPOSABLE NAPKIN WITH A FAST FOOD CONTAINER, AND METHOD FOR CONTINUOUSLY PRODUCING SAME
Gilbert Capy, La Botte 69640, Jarnioux, France, and Akiva Buchberg, 5030 Pine Tree Dr., Miami Beach, Fla. 33140
PCT No. PCT/FR94/00274, § 371 Date Sep. 13, 1995, § 102(e) Date Sep. 13, 1995, PCT Pub. No. WO94/21529, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 15, 1994, Ser. No. 522,295
Claims priority, application France, Mar. 16, 1993, 93 03241
Int. Cl.[6] B65D *75/04;85/72*
U.S. Cl. 206—542 5 Claims



1. A folded container for sandwiches which is made from a thin and flexible sheet (2) of rectangular shape, said sheet folded parallel to its width to form folds (16) having lateral ends and adjacent sheet surfaces and said folds being fixed to the adjacent sheet surfaces at the lateral ends in zones, the container having a longitudinal edge (15) characterized by the fact that the container being combined with a disposable folded napkin (1) contained in a pocket (5) having a longitudinal edge and being placed on the said folded container, the pocket being fixed via the longitudinal edges.

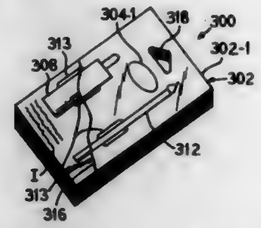
4. A folded container for products in loose form which is made from a thin and flexible sheet (33) having ends and being folded parallel to its width to form folds (8) and folded again perpendicular to the folds (8) in order to form a bag having an opening, characterized by the fact that the container is combined with a disposable napkin (1) placed on the sheet (33) of the container having small sides and covered with a plane thin sheet (9) having ends (34, 35) turned back and fixed on the small sides of the said container, the opening of the bag being between the small sides.

5,590,784
HEADER BAG DISPENSING COMBINATION
Mark E. Daniels, Redondo Beach, Calif., assignor to The Avantage Group, Inc., Redondo Beach, Calif.
Filed Jul. 6, 1995, Ser. No. 499,086
Int. Cl.[6] B65D *30/10;33/14*
U.S. Cl. 206—554 11 Claims



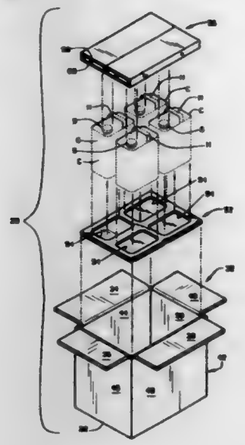
1. The combination of mounting means and a pack of coinciding plastic header bags, the mounting means comprising a pair of supported parallel hooking elements spaced from each other by a first predetermined distance and projecting upwardly in a common plane; and each of the bags of the pack of header bags, being formed of a pair of coinciding separate rectangular panels closed at their sides and at their bottom edges and perforated transversely along at least a portion of a line spaced from and parallel to its top edge, said perforations extending inwardly from each side of the bag for a second predetermined distance terminating at a point spaced from the termination of the other perforation by a third predetermined distance, and at least one elongated opening being provided along said perforation line and disposed between the terminations of said inwardly extending perforations, the portion of the bag defined by the perforation line and the upper edge of the header being orificed at two points spaced apart from each other by said first predetermined distance, thereby permitting the bags of the bag pack to be mounted on the hooking elements, and the last said portion of each bag being adhered to the similar portion of each adjacent bag in the pack.

5,590,785
FURNITURE FINISH COLOR SPOT REPAIR KIT AND METHOD OF MAKING THE SAME
Richard L. Seltzinger, 10755 S. Buffalo, Chicago, Ill. 60617, assignor to Richard L. Seltzinger, Chicago, Ill.
Division of Ser. No. 567,399, Dec. 5, 1995, abandoned, which is a continuation of Ser. No. 345,949, Nov. 28, 1994, abandoned. This application May 14, 1996, Ser. No. 645,916
Int. Cl.[6] B44D *3/04*
U.S. Cl. 206—575 11 Claims



1. A furniture finish color spot repair kit for matching the color of the finish of a damaged area to that of the color of the finish surrounding the damaged area on a piece of furniture, said repair kit comprising:
base means comprising a plurality of cards each including at least one planar surface and stacked to form a deck of cards;
a plurality of individually-different, soluble furniture color elements each attached to and carried on a respective one of said planar surfaces, and each of said color elements including powder pigment furniture stain different from the powder pigment furniture stains of the other such color elements;
a solvent source mounted to said base means, said solvent source including solvent for dissolving at least one color element so that the dissolved powder pigment stain may be applied to a damaged area on a piece of furniture; and
a color applicator mounted to said base means for applying the solvent to said at least one color element and the color so dissolved to the damaged area.

5,590,786
PACKAGE FOR LIQUID CONTAINERS
Donald L. Jaycox, 106 Zapata, Fenton, Mo. 63026
Filed Sep. 26, 1995, Ser. No. 533,733
Int. Cl.[6] B65D *81/02*
U.S. Cl. 206—587 11 Claims



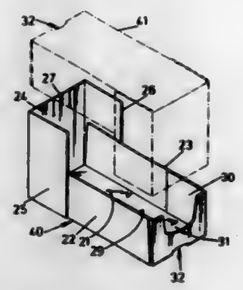
1. A package for holding a plurality of F-style containers, each having a generally rectangular cross section and a spout and an inverted U-shaped strap handle projecting from the top, the package comprising:
a box having top, a bottom, and a sidewall therebetween;
a bottom liner inside the box, adjacent the bottom, the bottom liner having a plurality of generally rectangular cutouts for receiving and retaining the bottoms of F-style containers;
a top liner inside the box, adjacent the top, the top liner comprising spaced apart upper and lower walls, the lower wall adapted to engage the tops of the containers held inside the box and having openings therein for receiving the spouts and handles of the containers held inside the box, the openings allowing the spouts and handles of the containers to project into the space between the walls.

5,590,787
UV LIGHT SENSITIVE DIE-PAC FOR SECURING SEMICONDUCTOR DIES DURING TRANSPORT
Joe Hodges, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.
Filed Jan. 4, 1995, Ser. No. 368,516
Int. Cl.[6] B65D *85/30;73/00*
U.S. Cl. 206—724 12 Claims



1. A structure for releasably holding a microcircuit die which comprises:
a plate having an upper face and formed from a material which is penetrable to light; and a layer of adhesive over a section of said upper face, said layer of adhesive having a coefficient of friction sensitive to light, whereby a die held in a fixed position with respect to said upper face by said layer of adhesive may be released by exposing said layer of adhesive to light through said section.

5,590,788
HOODED TRAY
Michael A. Inman, Bristol, United Kingdom, assignor to Ani Packaging Systems Unlimited, Bristol, United Kingdom
Continuation of Ser. No. 284,170, Sep. 3, 1994, abandoned. This application Apr. 5, 1996, Ser. No. 628,815
Claims priority, application United Kingdom, Sep. 3, 1991, 9118805
Int. Cl.[6] B65D *5/20*
U.S. Cl. 206—736 21 Claims



1. A hooded tray comprising

two open-top trays adapted for detachable open-top to open-top assembly into a closed transport configuration, wherein each tray has

a main panel supporting first and second opposed end walls and first and second opposed side walls,

the end and side walls of each tray are secured together by flaps at corners of the main panels, at least two of the flaps comprising opposing upstandable portions adjacent the first end wall,

the dimensions of the main panels of the two trays are substantially equal,

the widths of the first end walls of the two trays are substantially equal,

the widths of the second end walls of the two trays are substantially equal,

the height of each first end wall is greater than the height of each second end wall,

the width of each first end wall is greater than the width of each second end wall,

the width of the main panel adjacent the second end wall is less than the width of the first end wall, and

the width of the main panel adjacent the first end wall is greater than the width of the second end wall,

whereby when assembled the second end wall of each tray may be readily inserted between the upstandable portions of the other tray such that the second end wall of one tray abuts the first end wall of the other tray.

5,590,789

PROCESS AND DEVICES FOR SORTING THERMOPLASTIC COMPONENTS FROM A MIXED STREAM

Urban Stricker, Am Steinel 18, D-57271 Hilchenbach, and Martin Siebert, Holsteinische Strasse 15, D-12163 Berlin, both of Germany

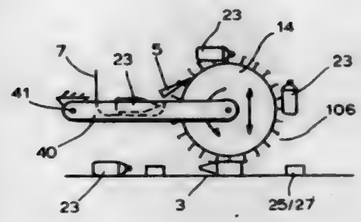
PCT No. PCT/EP93/00589, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/17852, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 6, 1993, Ser. No. 302,719

Claims priority, application Germany, Mar. 9, 1992, 42 07 398.7

Int. Cl.[6] B07B *13/00*

U.S. Cl. 209—11 **10 Claims**



1. A process for separating thermoplastic articles from a mixed stream of articles and sorting different types of thermoplastic articles from one another, said process comprising the steps of:

(A) heating said thermoplastic articles in said mixed stream and in different temperature zones depending upon the article type to respective softening temperatures;

(B) pressing surface formations of respective separating bodies into the respective thermoplastic articles at the respective softening temperatures thereof while applying a counterforce to said articles against said separating bodies so that said surface formations at least partially penetrate into the respective articles because of softening thereof but do not penetrate into nonsoftened portions of other articles, thereby selectively impaling penetrated articles on the respective separating bodies;

(C) thereafter removing impaled articles from the separating bodies; and

(D) limiting adhesion of softened thermoplastic articles to said separating bodies by coating same with an anti-adhesive coating.

5,590,790

APPARATUS INCLUDING A VACUUM PUMP FOR ASSESSING THE CONDITION OF A BANK NOTE BY MEASURING AIRFLOW DRAWN THROUGH THE BANK NOTE

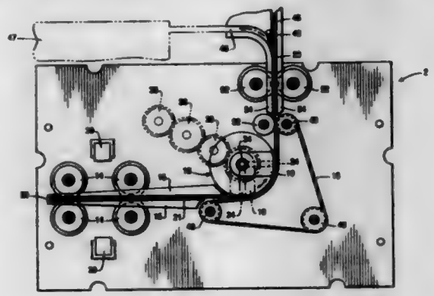
Andrew G. Saunders, Newport, Great Britain, assignor to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Dec. 19, 1994, Ser. No. 361,061

Claims priority, application United Kingdom, Jul. 19, 1994, 9414540

Int. Cl.[6] B07C *5/00*; G01N *15/08*; B65H *7/02*

U.S. Cl. 209—534 **10 Claims**



1. An apparatus for assessing the condition of a bank note, comprising:

pump means (4,6) for generating a reduced pressure;

a detector (8) for producing an electrical output indicative of air flow through said detector;

suction means (10) connected to said pump means (4,6) via said detector (8);

first feed means (14,16) for feeding a bank note from an entry location (50) along a first feed path (21) into cooperative relationship with said suction means (10) whereby said bank note covers, and is sucked against, said suction means (10);

electronic control means (20) coupled to said detector (8) and arranged to make a determination of the condition of said bank note based on said electrical output; and

said pump means including a vacuum pump (4) and a solenoid operated valve (6) which controls the connection of said vacuum pump (4) to said suction means (10), operation of said valve being controlled by said electronic control means (20);

sensor means (30) for sensing said bank note as it is fed along said first feed path (21);

timing means (32) associated with said first feed means (14,16);

means for varying the time which elapses between the sensing of said bank note by said sensor means and the operation of said valve (6); and

second feed means (16,52) for feeding said bank note along a second feed path (23) away from said suction means subsequent to said bank note having been sucked against said suction means.

5,590,791

METHOD AND APPARATUS FOR SORTING WASTE

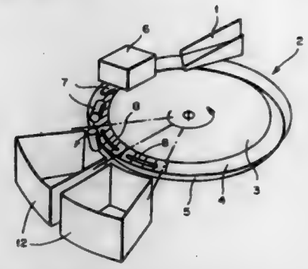
Karlheinz Gschweitl, Gruenpeesendorf, Austria, assignor to Binder & Co. Aktiengesellschaft, Gleisdorf, Austria

Filed Feb. 1, 1995, Ser. No. 382,243

Claims priority, application Austria, Feb. 1, 1994, 182/94; Feb. 18, 1994, 333/94

Int. Cl.[6] B07C *5/00*

U.S. Cl. 209—577 **14 Claims**



1. A method of sorting pieces of waste of material having different properties, which comprises the steps of

(a) feeding successive ones of the pieces to a conveying path revolving about a substantially vertical axis at a feeding station,

(1) the conveying path being concave in cross section and having an outer guide wall, and

(2) the revolution of the conveying path generating a centrifugal force holding the pieces against the outer guide wall,

(b) sensing the different properties of the successive pieces along the conveying path, and

(c) directing an upward and outward air stream from below the conveying path against single ones of the pieces at discharge stations dependent on the sensed properties of the pieces to remove said single pieces from the conveying path.

5,590,792

SCREENING MACHINE

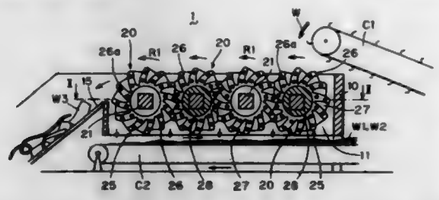
Yoshikazu Kobayashi, Ashina-gun, Japan, assignor to Kabushiki Kaisha Miike Tekkosho, Hiroshima, Japan

Division of Ser. No. 259,468, Jun. 14, 1994, Pat. No. 5,480,034. This application Jun. 7, 1995, Ser. No. 486,730

Claims priority, application Japan, Jun. 22, 1993, 5-176001; Dec. 1, 1993, 5-338816; Dec. 27, 1993, 5-353235; Feb. 7, 1994, 6-35368; Mar. 18, 1994, 6-73987; Mar. 18, 1994, 6-73988; May 12, 1994, 6-124600

Int. Cl.[6] B07B *13/05*

U.S. Cl. 209—667 **10 Claims**



1. A screening machine comprising a plurality of rotors (20) provided in a frame (10) such that axes of said rotors (20) are arranged parallel to one another from a supply side where objects to be screened (W) included mixed substances different at least in size are supplied from above by a conveying means (C1) to a discharge side where the remainders after screening are discharged, and such that said rotors (20) are rotated in the same direction by a rotating drive means (30) to feed the objects to be screened on said rotors (20) from the supply side to the discharge side, and each rotor (20) further comprises a plurality of large diameter sections (25) and a plurality of small diameter sections (28) alternately disposed in the axial direction of each rotor (20) and arranged in a staggered relation in the feeding direction to define gaps (G) having desired dimensions between said large and small diameter sections (25-28) and wherein said large diameter section (25) of said rotor (20) is formed by a wheel having a plurality of finger-shaped protrusions (26) which are curved backward in the rotor rotation direction and connected by connection webs (27) in the peripheral direction of said large diameter section (25), and said small diameter section (28) is formed by a small diameter wheel.

5,590,793

ROLL SCREEN WITH VARIABLE APERTURE

Jonny Johansson, Kiruna, Sweden, assignor to Luossavaara-Kiirunavaara AB, Kiruna, Sweden

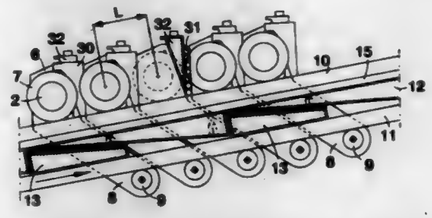
PCT No. PCT/SE94/00667, § 371 Date Jan. 31, 1996, § 102(e) Date Jan. 31, 1996, PCT Pub. No. WO95/01846, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 5, 1994, Ser. No. 592,340

Claims priority, application Sweden, Jul. 5, 1993, 9302316

Int. Cl.[6] B07B *1/14*

U.S. Cl. 209—668 **22 Claims**



1. A roll screen which has variable screening apertures and includes axle-fitted rolls (1) which are spaced at a variable distance from one another, and which further includes means for adjusting the roll spacing, said means acting-upon all rolls simultaneously so that the distance between the rolls will be adjusted to the same extent in relation to one another, characterized in that the means includes a first and a second running track (10, 11) which are parallel with one another and which have running surfaces which face away from one another and the distance between said tracks can be adjusted, a first device (7) for each roll (1) wherein the device is connected to said roll and can be moved along the first running surface as the distance between the tracks (10, 11) is changed, a second device (9) for each roll (1) which is able to move along said second running surface as the distance between the tracks (10, 11) is changed; and in that the two devices (7, 9) lie in two mutually separate planes as seen at right angles to the running surfaces.

5,590,794

SORTING MODULE INSTALLATION

Gordon E. Zachary, 61 E. Main St., Hagerstown, Ind. 47346

Filed Apr. 3, 1995, Ser. No. 415,482

Int. Cl.[6] B07C *7/02*

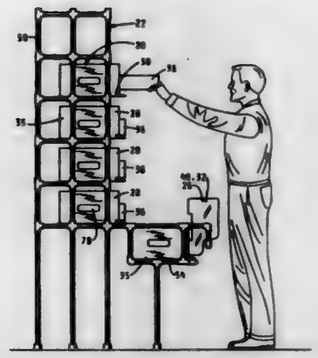
U.S. Cl. 209—702 **12 Claims**

1. A sorting module for use with an associated supporting structure, the sorting module comprising, in combination:

a shelf means,

a series of separator panel means,

a frontal connection means extending transversely of the shelf means, and movably connected to the series of separator panel means in a manner permitting them to move transversely of the shelf means and rotationally with respect to the frontal connector means,



a rearward connection means extending transversely of the shelf means, and movably connected to the series of separator panel means in a manner permitting them to move transversely of the shelf means,

the frontal connection means being supportively connected to the shelf means,

the connection of the series of separator panel means to the frontal connection means and the rearward connection means providing that the series of separator panel means may move into and between a sorting position extending fore-and-aft with respect to the shelf means and an upraised releasing position at least about 90° from the sorting position,

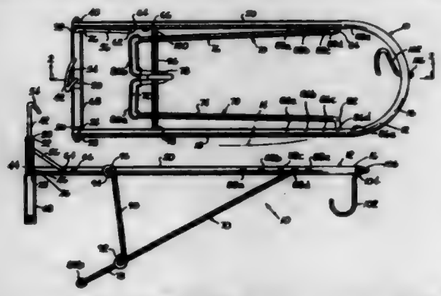
the arrangement being such that when the series of separator panel means is in its sorting position the separator panel means provides a transversely extending series of sorting regions extending from the shelf means upwardly therefrom, for the user to deposit work objects selectively in an appropriate sorting region, the shelf means providing a rest for the work objects, but the series of separator panel means may be then rotated from that sorting position to their releasing position, during which movement the work objects will remain resting on the shelf means, in a condition of sorting which has been given to the work objects by their being deposited into the respective sorting regions while the series of separator panel means is in its said sorting position, for subsequent removal of the work objects while they are still in their sorted condition.

5,590,795

SADDLE HOLDER

Jeffrey M. Wright, 23529 Pocahontas Dr., Gaithersburg, Md. 20882

Filed Jan. 19, 1995, Ser. No. 492,225
Int. Cl.[6] A47F 7/00
U.S. Cl. 211—104 **10 Claims**



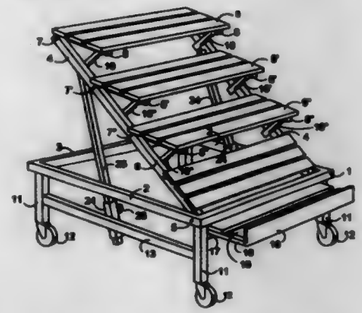
1. A portable collapsible saddle holder for supporting a saddle from a structure exterior to the portable collapsible saddle holder comprising a saddle support frame, connecting means operatively connected to said saddle support frame for connecting said saddle holder in a plurality of ways to said structure exterior to said saddle holder, said connecting means including a hook member and adjustable clamping means for connecting said saddle holder to said structure exterior to said saddle holder through a clamping action, said adjustable clamping means having a portion thereof serving to provide support to said saddle support frame when said hook member is connected to said structure exterior to said saddle holder.

5,590,796

MULTIPLE CONFIGURATION PRODUCE STAND

Richard J. Herman, 2809 Hampton Way, Hendersonville, N.C. 28739

Filed Jan. 17, 1995, Ser. No. 373,550
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—149 **17 Claims**



1. A rack for displaying merchandise comprising;

a bottom frame comprising;

a front member;

a pair of side members;

a display frame pivotally attached to said bottom frame wherein said display frame comprises;

side legs;

two parallel shelf arms pivotally attached to said side legs;

at least one cross-member attached to each of said two shelf arms such that said shelf arms remain parallel;

at least one swing support attached to each of said two shelf arms and said side legs;

at least one adjustable support rotatably mounted to said bottom frame and rigidly attached to said display frame wherein said adjustable support comprises;

a tube;

an elongated member slidably mounted to said tube;

a locking element for reversibly fixing the position of said elongated member relative to said tube.

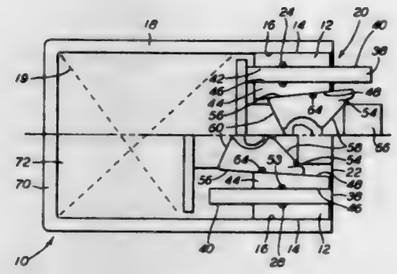
5,590,797

FRICTION CLUTCH MECHANISM FOR HIGH CAPACITY DRAFT GEAR ASSEMBLY AND METHOD OF RECONDITIONING DRAFT GEAR WITH SUCH FRICTION CLUTCH MECHANISM

James L. Duffy, Burr Ridge; David W. Dougherty, Jr., Bolingbrook; Wajih Kanjo, Lockport, and Rudi E. George, Forest Park, all of Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 10, 1995, Ser. No. 438,499
Int. Cl.[6] B01G 9/18
U.S. Cl. 213—33 **16 Claims**

1. An improved friction clutch mechanism for enabling a higher capacity rating to be achieved in a friction clutch type draft gear



assembly and for absorbing heat energy in such friction clutch type draft gear assembly which heat energy is generated during make-up of a train consist and in-track movement of such train consist, said friction clutch mechanism comprising:

(a) a pair of outer stationary plate members having a Brinell Hardness of between 429 and 495, an outer surface of each of said outer stationary plate members being engageable with a respective radially opposed portion of an inner surface of a draft gear housing member adjacent an open end of such housing member;

(b) a first elongated slot formed at a predetermined location in said each of said outer stationary plate members adjacent an inner surface thereof;

(c) a preselected first lubricating insert member disposed within said elongated alot to provide at least a first portion of a requisite amount of lubrication necessary to prevent detrimental sticking of said friction clutch mechanism after closure of such friction clutch type draft gear assembly and during a release cycle thereof;

(d) a pair of movable plate members, each of said movable plate members having at least a predetermined portion of an outer surface thereof frictionally engaged with a respective said inner surface of said pair of outer stationary plate members for absorbing at least a first portion of such heat energy generated during closure of such friction clutch type draft gear assembly;

(e) a pair of inner stationary plate members, each of said inner stationary plate members having an outer surface thereof frictionally engaged with at least a portion of a respective inner surface of said pair of movable plate members for absorbing at least a second portion of such heat energy generated during such closure of such friction clutch type draft gear assembly, an inner surface of said each of said inner stationary plate members being tapered at a first predetermined angle;

(f) a second elongated slot formed at a predetermined location in said each of said tapered stationary plate members adjacent an outer surface thereof;

(g) a preselected second lubricating insert member disposed within said second elongated slot to provide at least a second portion of a requisite amount of lubrication necessary to prevent such detrimental sticking of said friction clutch mechanism after such closure of such friction clutch type draft gear assembly and during such release cycle thereof;

(h) a pair of wedge shoe members having a Brinell Hardness of between 429 and 495, each of said wedge shoe members including

(i) a tapered outer surface frictionally engaged with a respective said inner surface of said tapered stationary plate members for absorbing a third portion of such heat energy generated during such closure of such friction clutch type draft gear assembly,

(ii) an upper surface tapered from a point disposed inwardly from said tapered outer surface inwardly toward and at an acute angle relative to a longitudinal axis of said friction clutch mechanism, said tapered upper surface being tapered at an angle of between 46.5 degrees and 48.5 degrees, and

(iii) a bottom surface tapered from a point disposed inwardly from said tapered outer surface inwardly toward and at an acute angle relative perpendicularly to said longitudinal axis of said friction clutch mechanism, said tapered bottom surface being tapered at an angle of between 21.0 degrees and 22.00 degrees;

(i) a third elongated slot formed at a predetermined location in said each of said wedge shoe members adjacent said tapered outer surface thereof;

(j) a preselected third lubricating insert member disposed within said third elongated slot to provide at least a third portion of a requisite amount of lubrication necessary to prevent such detrimental sticking of said friction clutch mechanism after closure of such friction clutch type draft gear assembly and during a release cycle thereof; and

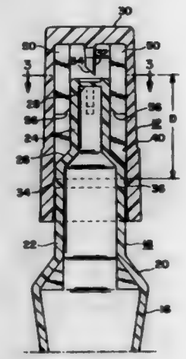
(k) a center wedge member, said center wedge member including a pair of correspondingly tapered surfaces frictionally engaged with an upper tapered surface of a respective one of said pair of wedge shoe members for absorbing at least a fourth portion of such heat energy generated during such closure of such friction clutch type draft gear assembly.

5,590,798

CONTAINER-CLOSURE ASSEMBLY

Richard O'Connell, Perrineville, N.J., assignor to Wheaton Holding, Inc., Wilmington, Del.

Filed Aug. 8, 1995, Ser. No. 512,291
Int. Cl.[6] B65D 1/02
U.S. Cl. 215—48 **6 Claims**



1. A cap and tube assembly comprising:

a tube for containing a product; a step nozzle at one end of the tube including a tip portion of reduced cross section connected to a lower portion by a wall portion;

means defining a thin wall portion forming a puncturable diaphragm in the axial end of the tip portion to provide a discharge opening for dispensing the product;

a cap engagable over the nozzle having puncturing means depending inwardly from top of the cap operable upon actuation of the cap relative to the nozzle to puncture the diaphragm; and

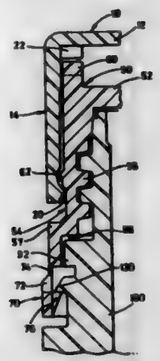
a plurality of circumferentially spaced ribs extending axially from the top of the cap to a point below the tip of the piercing element snuggling engaging the tip portion in the unarmed position of the cap with the tip portion spaced above the diaphragm.

5,590,799

CHILD-RESISTANT CLOSURE WITH CASTELLATIONS

Roger M. King, Latimer, United Kingdom, assignor to Beeson and Sons Limited, Herts, United Kingdom

Division of Ser. No. 388,201, Jan. 30, 1995, which is a continuation of Ser. No. 121,970, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 796,946, Nov. 22, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 484,604
Claims priority, application United Kingdom, Sep. 23, 1991, 9120264; Oct. 17, 1991, 9122097
Int. Cl.[6] B65D 55/02
U.S. Cl. 215—216 13 Claims



1. A child resistant closure comprising:
an inner part and an outer part;
a co-operating retaining projection on the inner and outer parts for retaining the inner part within the outer part, and for providing limited axial movement of the inner part within the outer part;
a first set of castellations on the inner part comprising a first castellation and an adjacent second castellation separated from each other by a space;
a third castellation on the outer part arranged to inter-engage the first set of castellations on the inner part by being inserted into said space when the outer part is moved axially towards the inner part to permit torque to be applied to the inner part;
a set of resilient blades extending slopingly from a first of the inner and outer parts towards a second of the inner and outer parts, said resilient blades bearing against said second of said inner and outer parts to urge said inner and outer parts axially away from each other such that said third castellation and first set of castellations are normally held out of inter-engagement so that said third castellation is not inserted within said space;
each of said resilient blades having a remote end and comprising an abutment surface at said remote end;
each of said resilient blades further comprising a sloping surface extending between said remote end of said blade and an opposite end at which said blade is joined to said first of said inner and outer parts;
said second of said inner and outer parts comprising a set of adjacent ratchet projections, each of said ratchet projections comprising a stop surface and a ramp surface, said stop surface being substantially radial and being constructed and arranged to engage the abutment surface of one of said resilient blades when the outer part is rotated in a first direction to apply the closure to a container neck, and each said ramp surface being constructed and arranged to cam one of the resilient blades over said ratchet projection when the outer closure part is rotated in a second direction opposite to said first direction so that said blades will slip relative to the projections if said outer closure part is rotated in said second direction without the third castellation and first set of castellations being in inter-engagement;
wherein said ratchet ramps and said resilient blades are arranged relative to each other such that when said third castellation and first set of castellations are held out of inter-engagement at an aligned orientation such that said third castellation is axially aligned with said space, said sloping surfaces of said resilient blades bear resiliently against said ramp surfaces of said ratchet projections to generate a rotational force between the inner and outer parts to urge said outer part away from said aligned orientation with said inner part, whereby said outer part is urged by said rotational force out of said aligned orientation in which said third castellation and said first set of castellations can be inter-engaged.

5,590,800

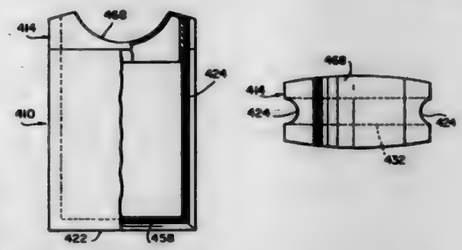
Patent Not Issued For This Number

5,590,801

LOCKABLE CONTAINER

Nell Cohen, 47-09 30th St., LIC, N.Y. 11101

Filed Dec. 16, 1992, Ser. No. 991,139
Int. Cl.[6] B65D 45/00
U.S. Cl. 220—315 1 Claim



1. In combination, a lock and a lockable container, said combination comprising:
said lock comprising:
a rigid U-shaped body having two linear, substantially parallel arms integrally joined together at one end by an arcuate bight, and
a linear, rigid locking bar having a lock mechanism therein, said locking bar, when locked onto the other end of said parallel arms, closing the open end of said U-shaped body;
said lockable container comprising:
body means for defining a cannister-type body, said body means including a sidewall, an open end, and a closed end;
said sidewall including first channel means for receiving said parallel arms; and
cap means for selectively opening and closing said open end of said body means, said body means including second channel means for receiving said locking bar, whereby when said first and second channel means have said parallel arms and said locking bar therein, respectively, and said locking bar is locked onto said U-shaped body, said lockable container is held closed and locked by said lock.

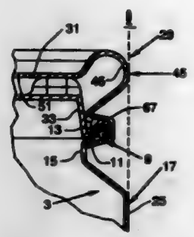
5,590,802

SALVAGE DRUM WITH PROTECTED CLAMPING

Donald J. Mitchell, Wellsburg, W. Va., assignor to Eagle Manufacturing Company, Wellsburg, W. Va.

Filed Aug. 28, 1995, Ser. No. 520,800
Int. Cl.[6] B65D 45/34; 53/00
U.S. Cl. 220—321 15 Claims

1. A salvage drum comprising:
a container body having a bottom wall and an upwardly extending side wall terminating to form a circular open top, with a radially outwardly extending body lip on said side wall about



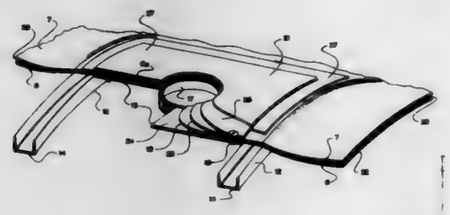
said open top, the side wall having a plurality of spaced outwardly extending vertical ribs spaced from and adjacent to said outwardly extending body lip;
a circular lid having a radially outwardly extending lip about the periphery thereof adapted to mate with said body lip, said circular lid having an outwardly extending protective shoulder thereabout, said protective shoulder having a radially outermost surface;
means for clamping said body lip and said lid lip together to seal the container, said means for clamping situated radially inwardly from upper outer surfaces of said vertical ribs and from the radially outermost surface of said protective shoulder.

5,590,803

COMPOSITE DOUBLE-WALL UNDERGROUND TANK STRUCTURE AND METHOD FOR MAKING SAME

Charles E. Kaempen, Orange, Calif., assignor to Charles R. Kaempen, Alta Loma, Calif.

Filed Jul. 6, 1994, Ser. No. 271,362
Int. Cl.[6] B65D 7/00
U.S. Cl. 220—461 30 Claims



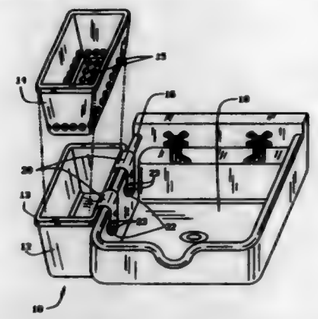
1. A multiple wall tank structure comprising in combination:
a metal frame having at least one outlet fitting plate;
an impermeable non-metallic primary container including a chemically resistant multiple-ply laminate structure surmounting and at least partially enclosing said metal frame;
said primary container including at least one primary outlet panel disposed in registration with, and bonded to at least one outlet fitting plate;
an impermeable non-metallic secondary container including a chemically resistant multiple-ply laminate structure surmounting and at least partially enclosing said primary container;
said secondary container including at least one corresponding secondary outlet panel disposed in registration with, and bonded to at least one primary outlet panel; and
at least one said outlet fitting plate, at least one said primary outlet panel and at least one said corresponding secondary outlet panel forming at least one pressure-resistant outlet seal.

5,590,804

DEVICE FOR DRAINING AND STORING ITEMS IN THE VICINITY OF A SINK

Donald Crane, 126 College Ave., and Marsha Crane, 818 W. Main St., both of Carlinville, Ill. 62626

Filed Sep. 2, 1994, Ser. No. 300,711
Int. Cl.[6] B65D 21/00
U.S. Cl. 220—483 19 Claims



1. A device for storing items used in and around a sink, said device comprising:
a sink
a bucket for holding contents therein, the bucket having a top rim;
a bracket pivotally connecting the bucket to the sink, the bracket being pivotal to enable the bucket to be pivoted between a first substantially upright position outwardly of and adjacent to the sink and a second tilting position in which the top rim of the bucket is elevated entirely over the top rim of the sink so that, in the second tilting position, the contents of the bucket are emptied solely into the sink.

5,590,805

FRUIT BOX

Robert Knous, Anoka, and Calvin S. Krupa, Hamel, both of Minn., assignors to Ultra Pac, Inc., Rogers, Minn.

Filed Feb. 8, 1994, Ser. No. 193,433
Int. Cl.[6] B65D 45/00
U.S. Cl. 220—508 18 Claims



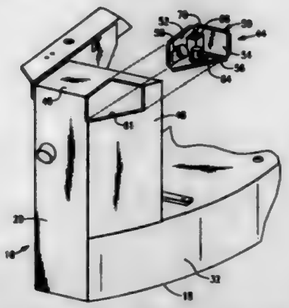
1. A stackable package for fruit or other perishables, said package including a cover member and a base member, each such member comprising:
(a) an outer edge extending around a perimeter of said member to provide rigidity to said member;
(b) a lip surface defining the horizontal surface of said member with a width and length axis in the center of said lip surface;
(c) a plurality of cups symmetrically positioned from said lip surface center and extending from said lip surface;
(d) a plurality of supports extending upward above said lip surface between each adjacent cup to provide a gap between said cover member and said base member when said cover member is secured to said base member; and
(e) a plurality of male and female locking means extending from the lip surface symmetrically positioned around the perimeter of said plurality of cups, said male and female locking means being positioned so that said cover member and said base

member can be secured together by the male locking means of said cover member engaging the female locking means of said base member and the female locking means of said cover member engaging the male locking means of said base member.

5,590,806
FUEL FILL PIPE SHELF FOR A GENERATOR SET FUEL TANK

Vincent D. Green, East Syracuse, and Mark W. Colton, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 26, 1995, Ser. No. 578,723
Int. Cl.[6] B65D *45/00*
U.S. Cl. 220—562 **7 Claims**



1. The combination of a fuel storage tank and a fill pipe assembly for the storage tank:

said tank comprising an upper end including a top and at least one lateral surface, said tank having an opening in the top thereof and an opening in said lateral surface thereof which cooperate with one another to define a cut out at the upper end of said tank;

said fill pipe assembly comprising: an insert adapted to be matingly received in said cut out, substantially within the confines of what would have been the interior of said tank before said cut out was made, said insert being further adapted to be attached to said openings in said top and lateral surface of said tank in fluid tight relationship;

said insert having a fuel fill opening therein.

5,590,807
REFORMED CONTAINER END

Randall Forrest, Hoffman Estates; Timothy Turner, Cary, both of Ill., and Don Thurman, Valparaiso, Ind., assignors to American National Can Company, Chicago, Ill.

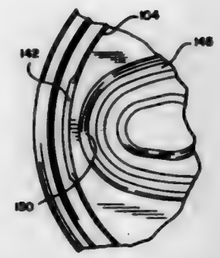
Continuation-in-part of Ser. No. 955,921, Oct. 2, 1992, Pat. No. 5,356,256. This application Nov. 1, 1993, Ser. No. 146,234
Int. Cl.[6] B65D *7/42*
U.S. Cl. 220—608 **6 Claims**

1. A circular container end comprising:

a center panel including a pour opening panel defined by scorelines on said center panel;

a substantially annular inner countersink wall surrounding a periphery of said center panel;

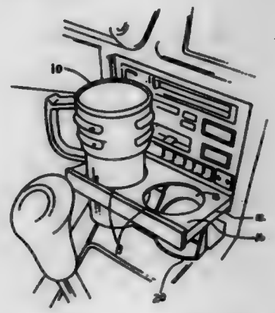
a substantially annular curved shoulder integrally joining said inner countersink wall to said center panel completely around said periphery of said center panel, a first segment of said annular shoulder which extends less than 360 degrees around said periphery of said center panel having a first radial distance from a center of said container end, and a second segment of said annular shoulder which extends less than 360 degrees around said periphery of said center panel having a second radial distance from said center of said container end wherein said first radial distance is greater than said second radial distance.



5,590,808
REUSABLE RIBBED BEVERAGE CONTAINER FOR USE WITH VEHICLE BEVERAGE HOLDERS

Thomas J. Scheeppi, 5650 Juneau La. North, Plymouth, Minn. 55446

Continuation of Ser. No. 123,866, Sep. 20, 1993, Pat. No. 5,344,040, which is a continuation of Ser. No. 991,993, Dec. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 895,400, Jun. 9, 1992, Pat. No. Des. 343,991, which is a continuation-in-part of Ser. No. 822,566, Jan. 16, 1992, Pat. No. Des. 339,029. This application Jan. 26, 1994, Ser. No. 187,601
Int. Cl.[6] B65D *71/00*
U.S. Cl. 220—737 **4 Claims**



1. A combination tall beverage container and vehicle beverage holder, comprising:

a) a vehicle beverage holder with a substantially planar surface attached to a vehicle at a readily accessible location in the vehicle for a vehicle operator, the planar surface having an aperture sized to receive and support a standard twelve ounce beverage can of approximately two and one half inches in diameter; and

b) a tall beverage container comprising:

i) a lower base hollow cylindrical portion having a first diameter approximating the diameter of the beverage can, a first height, and a closed lower end defining a substantial open interior and adapted to fit within the aperture of the vehicle holder;

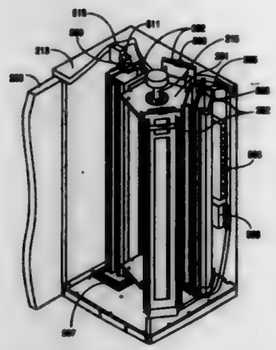
ii) an upper hollow cylindrical portion having a second diameter greater than the first diameter as to not be receivable within the holder aperture and a second height approximately one half the first height, the upper portion being coaxial with and integral with the lower base portion forming a size differentiating flange at their union for gripping and supporting supporting the beverage container, the upper portion having a top opening; and

iii) a grippable handle on one of the cylindrical portions.

5,590,809
METHOD OF CONTROLLING INVENTORY CAROUSEL IN VENDING MACHINE

Jack R. Prescott, Laguna Hills; Gregory Elliott, Tustin; Mark A. Hopkins, Laguna Niguel; Paul T. Rudewicz, Mission Viejo, and Thom Thomas, Ventura, all of Calif., assignors to KRh Thermal Systems, San Bruno, Calif.

Division of Ser. No. 231,195, Apr. 21, 1994, Pat. No. 5,503,300. This application Feb. 8, 1995, Ser. No. 388,334
Int. Cl.[6] B65G *59/00*
U.S. Cl. 221—1 **3 Claims**



1. In a vending machine, a method of rotating an inventory carousel so as to deliver a food product, the inventory carousel having a number of inventory magazines, a food product being deliverable whenever one of the inventory magazines is at an index position, the method comprising:

providing a motor and a drive mechanism for rotating the inventory carousel;

identifying a target inventory magazine which is to be moved to the index position;

delivering power to the motor to accelerate the inventory carousel;

before the target inventory magazine reaches the index position, reducing the power delivered to the motor in steps until the motor is receiving a predetermined percentage of the power that the motor was receiving before the step of reducing the power began, so as to reduce the acceleration force on the inventory carousel when the target inventory magazine reaches the index position; and

causing the inventory carousel to stop when the target inventory magazine reaches the index position.

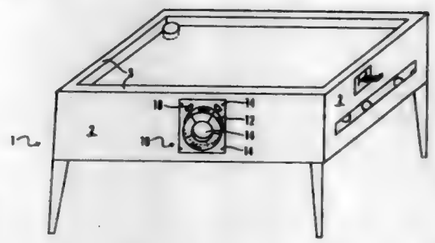
5,590,810
ORDER OF PARTICIPATION CONTROL DEVICE

Ali D. Wehbi, 343 E. College St., Murfreesboro, Tenn. 37130

Filed Oct. 19, 1995, Ser. No. 545,283
Int. Cl.[6] A63D *15/00*
U.S. Cl. 221—82 **6 Claims**

1. A device to facilitate control of the order of participation of persons in an activity, said device including:

a. plurality of indicator devices, each indicator device bearing an identifier indicia, each identifier indicia being distinct from every other identifier indicia and the identifier indicia of the plurality of indicator devices being in consecutive order;



b. a dispenser device, said dispenser device including a plurality of compartments, the number of compartments in the dispenser device equaling the number of indicator devices, said compartments marked with identifier indicia, each identifier indicia being next in sequence to the immediately preceding identifier indicia;

c. insertion means whereby one of the plurality of indicator devices can be inserted into a compartment regardless of the position of the dispensing device;

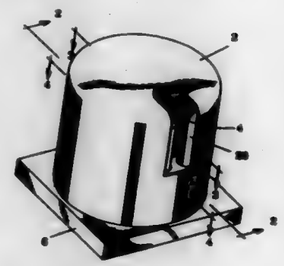
d. dispensing means whereby an indicator device placed within a compartment of said dispensing device can be removed from said dispensing device, but only when said compartment is in a predetermined location; and

e. means mounting said dispensing device for movement along a predetermined path whereby said compartments are placed in communication with said dispensing means serially.

5,590,811
CRAYON ORGANIZER

David Hill, c/o Dorlena Engfer 236 Mockingbird Rd., Box Elder, S. Dak. 57706

Filed Sep. 20, 1995, Ser. No. 530,942
Int. Cl.[6] B65D *83/00*
U.S. Cl. 221—89 **2 Claims**



1. A crayon organizer comprising:

(1) a cover having the general shape of a hollow cylinder, and the cover having a covered top and an open bottom and having a slot in its upper, outside quadrant which is an opening just large enough to allow access to the interior of said cover with the thumb and forefinger;

(2) a base slightly larger than said cover;

(3) a post aligned with the longitudinal axis of said cover and attached to the inner surface of the top of said cover at the center of the top; and the bottom of the post being rotatably attached to the base such that the bottom of said cover touches or nearly touches the top of said base and said cover may be rotated about said post; and

(4) a holder having the general shape of a thick-walled, hollow cylinder, the holder being slightly smaller than the inside of said cover and being aligned with said cover; the bottom of said holder being attached to the top of said base; said holder being of sufficient height that the top of said holder reaches a

point slightly below the lowest portion of the slot in said cover; and said holder containing a plurality of vertical holes within its wall which are open at the top and closed at the bottom and the same height as the height of said holder;

whereby crayons, chalks, or similar articles may be place through said slot in said cover and into the holes in said holder; and said cover rotated about said post thereby allowing access to individual crayons, chalks, or similar articles through said slot; and one and only one crayon, chalk, or similar article may be removed from the crayon organizer at a time.

5,590,812

PRODUCT-DELIVERY DEVICE FOR AUTOMATIC VENDING MACHINES

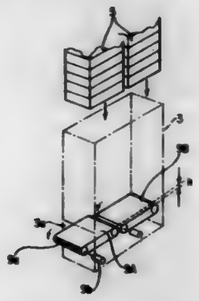
Tetsuya Miyao; Shozo Iwamoto; Kozo Matsushima; Koji Kawakami, and Masaki Inoue, all of Mie, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 10, 1995, Ser. No. 419,644

Claims priority, application Japan, Apr. 18, 1994, 6-078432; May 30, 1994, 6-115797

Int. Cl.[6] B65G *59/00*

U.S. Cl. 221—112 **13 Claims**



1. A product-delivery device for an automatic vending machine for delivering products stacked and accommodated in a product-accommodating box sequentially from a lowest position according to a sales command, comprising:

at least one horizontal conveyer installed on a lower side of the product-accommodating box and having a size to substantially support the products thereon so that said products are directly piled on and supported by said conveyer; and

a product delivery opening formed at a lower front part of the product-accommodating box and having a size to allow one of the products to pass therethrough so that the products disposed on the conveyer are delivered forward one by one from the product-accommodating box by means of the conveyer according to the sales command.

5,590,813

DISPENSER

Robert J. Abramczyk, 17699 Teppert, Detroit, Mich. 48234-3845

Filed May 22, 1995, Ser. No. 445,774

Int. Cl.[6] B65H *1/00*

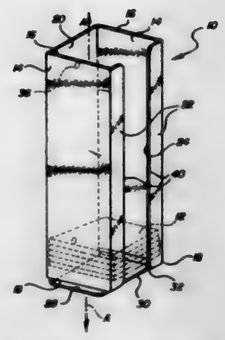
U.S. Cl. 221—197 **13 Claims**

1. A dispenser apparatus (10) for supporting and allowing withdrawal of a plurality of separate articles (12), said apparatus comprising:

a pair of opposing side walls (14) having upper (16) and lower (18) edges;

a back wall (20) integrally connected to said side walls (14);

said side walls (14) each including a front flange (22) integrally connected and substantially perpendicular to said side walls (14) and opposing said back wall (20) forming a portion of



front side of said apparatus (10), said front flanges (22) spaced from one another providing a longitudinal opening (24), said side walls and said back wall directly contacting the plurality of separate articles; and

a bottom wall (28) integrally connected to said back wall (20) and spaced from said lower edges (18) of said side walls (14) and directly contacting and supporting the plurality of separate articles.

5,590,814

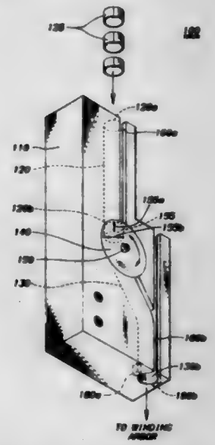
METHOD AND APPARATUS FOR LOADING BOBBIN CORES

Richard M. Prospero, Princeton; Erik Lunde, Morganville; Harry Swanson, Bloomfield, and Lee Adams, Flemington, all of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Filed Jan. 31, 1995, Ser. No. 382,224

Int. Cl.[6] B65G *59/00*

U.S. Cl. 221—266 **9 Claims**



1. An apparatus for dispensing bobbin cores, comprising:

(A) a first chute for holding a plurality of stacked bobbin cores, said first chute having a first end for receiving said plurality of stacked bobbin cores into said first chute, said first chute having a second end positioned adjacent to a rotatable hub;

(B) a second chute for dispensing cores from said plurality of stacked bobbin cores onto a bobbin winding device, said second chute having a first end positioned adjacent to said rotatable hub, said second chute having a second end positioned adjacent to said bobbin winding device;

(C) said rotatable hub having a bobbin core holder for carrying a bobbin core from said plurality of stacked bobbin cores from said second end of said first chute to said first end of said second chute;

(D) hub driving means for rotating said bobbin core holder from said second end of said first chute to said first end of said second chute;

(E) first sensor means for verifying movement of said bobbin core holder from said second end of said first chute to said first end of said second chute; and

(F) second sensor means for verifying passage of a bobbin core through said second chute.

5,590,815

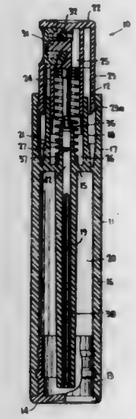
MINATURE PUMP SPRAYER

Pedro P. Montaner; Manuel R. Menegal, both of Barcelona, Spain; Ron E. Harriman, Montebello, Calif., and P. Lasserre, Coubron, France, assignors to Monturas S.A., Barcelona, Spain

Filed Jul. 13, 1995, Ser. No. 502,177

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—82 **17 Claims**



1. A ventless fingertip pump sprayer, comprising, a container of liquid product to be dispensed, a pump cylinder supporting a dip tube extending into said container, said cylinder and said dip tube being integrally formed with said container, a plunger head having a hollow piston in sliding sealing engagement with said cylinder for reciprocation between pressure and suction strokes, said piston and said cylinder defining a variable volume pump chamber, spring return means acting between said cylinder and said plunger head, said plunger head having a discharge passage including said hollow piston and terminating in a discharge spray means mounted on said head, an upstanding hollow tube formed integrally with said dip tube and extending into said cylinder for defining an inlet passage, a solid probe formed integrally with said head for sealingly engaging an upper inner end of said tube for valving said inlet passage closed upon initiation of each pressure stroke, a frangible shipper seal formed integrally within said hollow tube for sealing said inlet passage closed against leakage prior to initial actuation of said plunger head, said probe piercing through said shipper seal on the initial actuation of said plunger head for unsealing said inlet passage, and means on said probe for breaking said sealing engagement with said upper inner end of said tube during a continued pressure stroke upon said initial actuation to define an air passage through which unwanted air in said pump chamber is ejected under pressure into said container to assist in priming said pump chamber with the liquid product.

5,590,816

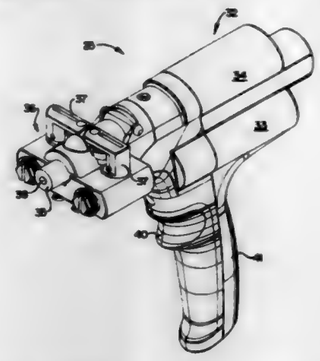
HAND HELD DISPENSER FOR FOAMABLE COMPOSITIONS AND DISPENSING SYSTEM

George T. Bertram, Newtown; John J. Corrigan, III, Washington; Patrick S. Lacombe, Sandy Hook, and Michael R. Knaak, New Fairfield, all of Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Dec. 21, 1994, Ser. No. 361,322

Int. Cl.[6] B67D *5/60*

U.S. Cl. 222—135 **27 Claims**



1. A hand held dispenser for dispensing foamable compositions and that is particularly useful for foam-in-place packaging systems, said hand held dispenser comprising:

a housing;

a motor in said housing;

a transmission in said housing and driven by said motor; and

a valving cartridge in said housing and driven by said transmission for dispensing foamable compositions upon demand;

said motor being positioned below said valving cartridge for providing a clear line of sight along the top of said housing.

5,590,817

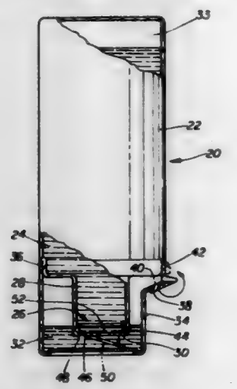
DISPENSER WITH FLOW CONTROL

John G. Kaufman, 858 Conder Drive, Burlington, Ontario, Canada

Continuation-in-part of Ser. No. 339,170, Nov. 10, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 555,946

Int. Cl.[6] B65D *37/00*

U.S. Cl. 222—185.1 **15 Claims**



1. A dispenser for liquids comprising:

a container for the liquid, the container having a bottom outlet;

a reservoir coupled to the container and containing the bottom outlet to maintain a pool of liquid about the outlet at a level above the outlet to thereby trap liquid in the container by establishing a negative pressure above the liquid in the container;

an outlet passageway leading from the reservoir to the outside of the container and including at least a portion of the outlet passageway above said outlet such that the liquid will not escape from the dispenser;

said bottom outlet, the reservoir and the outlet passageway being respective parts of a flow path along which liquid must pass to leave the dispenser;

the container including at least a portion which is resiliently deformable and operable to urge the flow of liquid outwardly along the flow path and upon release, to cause reverse flow inwardly after dispensing;

a flow controller positioned in the flow path and operable automatically in response to the direction of flow along the flow path to provide minimum resistance to flow as the liquid is urged to flow outwardly along the flow path and to provide a greater resistance to flow as the flow reverses and flows inwardly, whereby the inward flow is significantly slower than the outward flow to thereby control the rate of recovery of the dispenser so that the dispenser is not subjected to an unacceptable influx of air along with said inward flow.

5,590,818

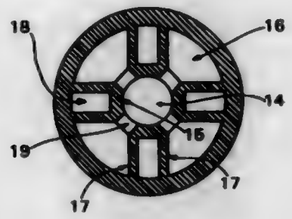
MULITSEGMENTED NOZZLE FOR DISPENSING VISCOUS MATERIALS

Charles E. Rabe, Westfield, and Joseph A. Gabriele, Whippany, both of N.J., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation of Ser. No. 358,930, Dec. 7, 1994. This application May 22, 1995, Ser. No. 446,387

Int. Cl.[6] B65D *5/72*

U.S. Cl. 222—575 **12 Claims**



1. A nozzle suitable for filling a flowable viscous material into a container, comprising a tubular body defined by an outer body wall, within the body there being a plurality of longitudinal channels for the longitudinal flow of the viscous flowable materials along with the nozzle, the longitudinal channels comprising:

a central channel, bounded by a central channel wall,

one or more first side channels, situated between the central channel wall and the outer wall, the first side channels having a cross section perpendicular to the longitudinal axis of the tubular body which narrows in the direction from the outer body wall towards the central channel, and,

one or more second side channels, situated between the central channel wall and the outer body wall, the second side channels having a cross section perpendicular to the longitudinal axis of the tubular body which does not narrow in the direction from the outer body wall towards the central channel,

all of the longitudinal channels being open at an outlet end of the nozzle.

5,590,819

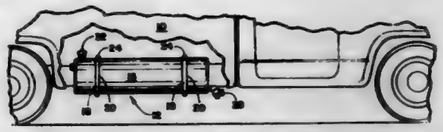
VEHICLE MOUNTABLE AUXILIARY WATER TANK

Robert C. Armstrong, 4774 Lee Ave., La Mesa, Calif. 91941

Filed Apr. 17, 1995, Ser. No. 422,796

Int. Cl.[6] B60R *11/00*

U.S. Cl. 222—609 **17 Claims**



1. A vehicle mountable water tank assembly which comprises:

an elongated closed tank having a width sized to fit between a motor vehicle frame member and a body panel;

at least two saddle members having a first side conforming to said tank and a second, opposite, side shaped to conform to said frame member;

at least two straps for wrapping around said width of said tank;

fastening means for securing ends of said straps to said frame member including means for reducing length of said strap and fastening means to bring said at least one saddle into pressure contact between said tank and said frame member;

a fill/dispense tube, having first and second ends, connected to said tank for admitting water into said tank and for dispensing water from said tank;

a valve in said fill/dispense tube between said first and second ends to open and close said tube; and

an overflow means connected to said tank on a side opposite said fill/dispense tube;

whereby said tank may be secured to said frame member with said fill/dispense tube lowermost and said overflow means uppermost.

5,590,820

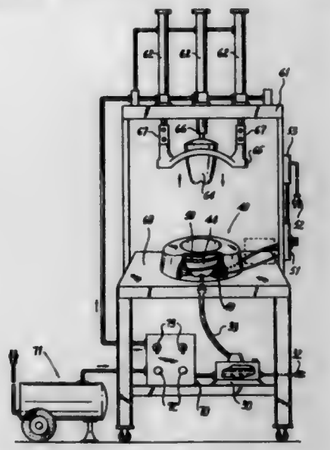
AUTO MOLD MACHINE FOR HATS

Mario A. Piastino, 40 Roneck Ct., Shirley, N.Y. 11967

Filed Feb. 9, 1996, Ser. No. 599,633

Int. Cl.[6] A42C *1/04*

U.S. Cl. 223—12 **21 Claims**



1. A hat molding machine using advanced features to produce a completed hat form from an unshaped felt, wool or straw configuration form to a completed hat form shape including a crown shape portion and a flange brim portion, comprising:

a male hat mold and a reciprocal female hat mold, said male hat mold having a first movable brim portion and a separate second movable crown portion, said first movable brim portion of said male hat mold advancable against a corresponding brim portion of said female hat mold, said second movable crown portion of said male hat mold separately advancable in sequence against said crown portion of said female hat mold, said male hat mold and said reciprocal female hat mold clamping the raw unshaped hat form in a tight cavity formed therebetween;

said tight cavity between said male hat mold and said female mold having means providing sequentially a source of heat and a source of moisture vapor,

said source of heat increasing the temperature of said male hat mold and said female mold to a predetermined temperature for a predetermined period of time;

said source of moisture supplying moisture vapor to said male hat mold at a predetermined pressure and temperature in a gaseous state for a second predetermined period of time;

said source of heat and said source of moisture vapor being provided sequentially for said first and said second predetermined periods of time sufficient to squeeze the raw hat form to the desired completed hat shape.

5,590,821

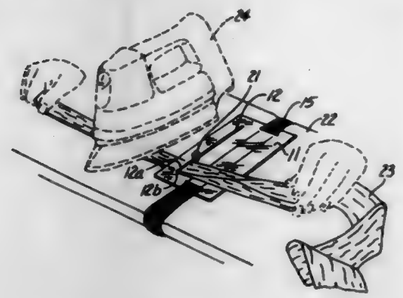
METHOD AND APPARATUS FOR FOLDING AND PRESSING BINDINGS AND RUFFLES

James K. Reber, 10481 NW. 107th Ave., Granger, Iowa 50109

Filed Feb. 6, 1995, Ser. No. 383,994

Int. Cl.[6] D05B *35/08*; D06J *1/00*

U.S. Cl. 223—34 **7 Claims**



1. A method of using a binding tool of a type including a tool body having a top side and a bottom side and a slot disposed through said body for receiving a strip of cloth to be folded comprising the steps of:

a) placing said body member onto top of an ironing board whereby said slot extends from the top of the ironing board upwardly through the top of the body member;

b) folding one end of a strip of cloth;

c) threading said one folded end of cloth through said slot;

d) placing a heated iron on a portion of said folded strip of cloth; and

e) pulling on said one end of folded cloth to pull the rest of the strip of cloth through the slot whereby it is folded and simultaneously pulling the folded portion of the cloth between the heated iron and the top surface of the ironing board whereby the cloth is folded and pressed to cause it to retain its folded condition.

5,590,822

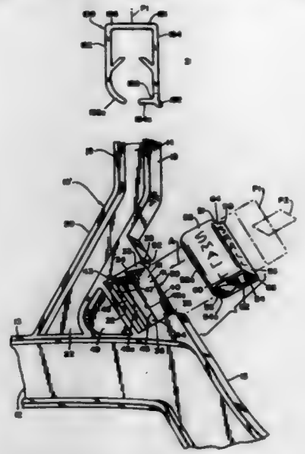
GARMENT HANGER INFORMATION TAB

Andrew M. Zuckerman, Forest Hills, N.Y., assignor to Different Dimensions Inc., Rego Park, N.Y.

Continuation of Ser. No. 121,266, Sep. 14, 1993, Pat. No. 5,407,109. This application Jan. 17, 1995, Ser. No. 373,746

Int. Cl.[6] A41D *27/22*; G09F *3/00*

U.S. Cl. 223—85 **12 Claims**



1. In a garment hanger information tab for use on a garment hanger having a tab holder, the tab holder including a ledge, said tab comprising a U-shaped body having a top wall, first and second sides, and first and second legs disposed between said sides and defining a slot and an internal channel therebetween, sa..id slot having a longitudinal axis, said body having first and second internal fingers extending inwardly from respective legs in said channel, said first and second fingers extending under the ledge of the tab holder to lock said body on the tab holder when said body is on the tab holder;

the improvement wherein said body is structurally bilaterally asymmetrical about both of two mutually perpendicular planes, both of said mutually perpendicular planes being perpendicular to said top wall, one of said mutually perpendicular planes being aligned with said slot longitudinal axis, and another of said mutually perpendicular planes being perpendicular to said slot longitudinal axis and bisecting said slot;

whereby opposite side-to-side orientations of said tab may be distinguished.

5,590,823

COLLAPSIBLE GARMENT HANGER SUITABLE FOR RAPID ONE-HANDED ENGAGEMENT WITH GARMENT

Mark H. Lunde, El Cajon, Calif., assignor to Donald J. Ervier, Brookfield, Wis.

Continuation-in-part of Ser. No. 269,541, Jul. 1, 1994, abandoned. This application Mar. 14, 1995, Ser. No. 403,644

Int. Cl.[6] A41D *27/22*; B25G *3/28*

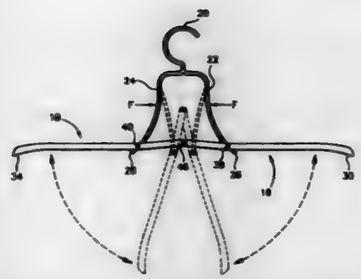
U.S. Cl. 223—94 **4 Claims**

1. A garment hanger comprising:

a hook;

a first tensioning element extending from said hook, said first tensioning element and said hook lying in a common plane, said first tensioning element terminating in a first distal tip;

a second tensioning element extending from said hook, said second tensioning element and said hook lying in a common plane, said second tensioning element terminating in a second distal tip;



a first shoulder element having a first end and a second end, a substantially middle region of said first shoulder element being located between said first end and said second end thereof, said substantially middle region having a hole located therein, said first shoulder element having said first end terminating in a slot, said slot having a first end and a second end, said first end of said slot having mutually parallel surfaces which extend into said second end, said second end having a hole which communicates with said slot;

said first shoulder element having a front surface;

a countersunk slot which is located in said front surface at said first end of said first shoulder element, said countersunk slot having a first end and a second end;

a first radial surface which is located at said first end of said countersunk slot;

a second radial surface which is located at said second end of said countersunk slot;

a bottom surface located between said first end and said second end of said countersunk slot, said bottom surface being perpendicular to said first and second radial surfaces of said countersunk slot;

a second shoulder element having a first end and a second end, a substantially middle region of said second shoulder element being located between said first end and said second end thereof, said substantially middle region having a hole located therein; and

wherein said first distal tip of said first tensioning element is rotatably connected to said first shoulder element at said hole therein, said second distal tip of said second tensioning element is rotatably connected to said second shoulder element at said hole therein.

5,590,824

INTERLOCK PANEL

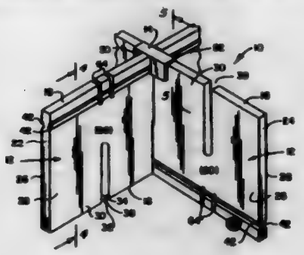
Bruce V. Weeks, 12998 Worthington Rd. NW., Pataskala, Ohio 43062

Filed Oct. 6, 1994, Ser. No. 318,963

Int. Cl.[6] B60R 7/00

U.S. Cl. 224—42.33 **10 Claims**

1. An interlock panel adapted to cooperate with at least one other



interlock panel to form a cargo space divider structure having a plurality of individual compartments of a desired size, and comprising:

a rigid unitary member having a base, a top surface, a central portion intermediate said base and said top surface, spaced first and second end surfaces which define a length of said member, spaced first and second side surfaces which define a thickness of said member;

a plurality of laterally spaced teeth formed in said member which project outwardly from said central portion of said member;

wherein each of said teeth has a pair of lateral sidewalls and a longitudinally-extending front tooth edge formed from a portion of said base;

wherein spaced lateral sidewalls of adjacent teeth define a lateral tooth slot having a bottom slot edge which joins said lateral sidewalls;

a stepped groove formed in each of said spaced first and second side surfaces below said top surface and extending substantially the length of said member, each said stepped groove having a first offset that forms an undersurface for contact with a user's finger or thumb when said interlock panel is grasped by a user for manual insertion into or manual withdrawal from cooperation with another interlock panel; and

wherein said stepped grooves each have a second offset adjacent and below said first offset, said second offset in-part forming a groove portion that is deeper than the undersurface formed by said first offset.

5,590,825

BACKPACK WITH CONVERTIBLE FRAME

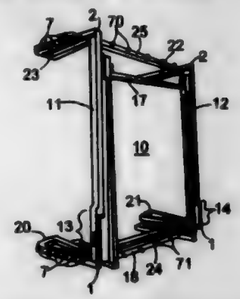
Douglas C. Murdock, 2648 Paden Pl., Birmingham, Ala. 35226

Filed Jul. 17, 1995, Ser. No. 503,441

Int. Cl.[6] A45F 4/06;4/08

U.S. Cl. 224—156 **4 Claims**

1. A convertible backpack frame comprising:



first, second, and third structural members, said first, second, and third structural members each having a proximal and a distal end, said first structural member being pivotally connected at its proximal end to the proximal end of said second structural member and said second structural member being pivotally connected at its distal end to the proximal end of said third structural member;

said first structural member having components including two spaced side support rails, a multiplicity of vertical support posts, and first and second cross member supports;

said side support rails of said first structural member being parallel and collaterally arranged on a plane in relation to one another as well as parallel and on opposite sides of a central axis running down the center of said first structural member from said distal to said proximal ends of said first structural member, said side support rails further extending the length of said first structural member such that one end of said side support rails is at said proximal end and the other end of said side support rails is at the distal end of said first structural member, said side support rails further having a cleft running along the length of one side of each rail for attaching a sleeping cot material;

one of said vertical support posts being connected to each end of each said side support rails such that said vertical support

posts are attached to said side support rails at an angle perpendicular to the plane of said side support rails, said vertical support posts further being parallel to one another and facing the same direction in relation to their extension away from said side support rails to which they are attached, said vertical support posts further having a multiplicity of snap pins for attaching backpack material to said frame;

said first cross member support being connected between said vertical support posts that are attached to the proximal end of said side support rails of said first structural member, said first cross member support further having a multiplicity of snap pins for attaching backpack material to said frame, said second cross member support being connected between said vertical support posts that are attached to the distal end of said side support rails of said first structural member, said second cross member support further having a multiplicity of snap pins for attaching either a sleeping cot material or backpack material to said frame;

said second structural member having components including two spaced side support poles, said side support poles of said second structural member being parallel and collaterally arranged in relation to one another as well as parallel and on opposite sides of a central axis running down the center of said second structural member from said distal to said proximal end of said second structural member, said side support poles further extending the length of said second structural member such that one end of said side support poles is at said proximal end and the other end of said side support poles is at the distal end of said second structural member, said second structural member's side support poles further having a cleft running along the length of one side of each of said side support pole for attaching a sleeping cot material;

said third structural member having components including two spaced side support tubes, two vertical support posts, and first and second cross supports;

said side support tubes of said third structural member being parallel and collaterally arranged on a plane in relation to one another as well as parallel and on opposite sides of a central axis running down the center of said third structural member from said distal to said proximal end of said third structural member, said side support tubes further extending the length of said third structural member such that one end of said side support tubes is at said proximal end of said third structural member and the other end of said side support tubes is at the distal end of said third structural member, said third structural member's side support tubes further having a cleft running along the length of one side of each of said side support tubes for attaching a sleeping cot material;

one of said vertical support posts of said third structural member being connected to the distal end of each said side support tubes such that said vertical support posts are attached to said side support tubes at an angle perpendicular to the plane of said side support tubes, said vertical support posts further being parallel to one another and facing the same direction in relation to their extension away from said side support tubes to which they are attached;

said first cross support of said third structural member being connected between said vertical support posts which are attached to the distal end of said side support tubes, said first cross support of said third structural member having a multiplicity of snap pins for attaching a sleeping cot material to said frame, said second cross support being connected to said side support tubes at the proximal end of said side supports tubes.

5,590,826

PROTECTOR

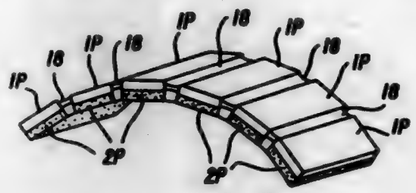
Yoichi Endo, 5-1-15, Jingumae, Shibuya-ku, Tokyo 150, Japan, assignor to Sakase Textile Co., Ltd., Sakai-gun, and Yoichi Endo, Tokyo, both of Japan

Continuation of Ser. No. 123,266, Sep. 20, 1993, abandoned. This application Feb. 3, 1995, Ser. No. 384,390

Claims priority, application Japan, Sep. 21, 1992, 4-294716; Apr. 22, 1993, 5-117597

Int. Cl.[6] A41F 15/02

U.S. Cl. 224—264 **12 Claims**



1. A protector for a shoulder of a wearer comprising:

an inner layer for contacting a shoulder of a wearer and made of a flexible buffer material and extending along a direction crossing a shoulder line connecting a neck portion and an arm portion of the wearer;

an outer layer formed on said inner layer and made of a rigid material and composed of a plurality of pieces disposed on the inner layer and being parallel with each other in the direction substantially along the shoulder line;

a strap member disposed on said outer layer to uniformly distribute the load_ applied on the outer layer entirely throughout the outer layer; and

a connection member connecting said pieces respectively,

wherein said pieces have inflexible property, said connection member is bent when the protector is worn on the shoulder of a user to fit therewith and the load locally applied on the outer layer is uniformly distributed by said strap member to thereby apply the distributed load uniformly on the shoulder through the inner layer.

5,590,827

COMPACT DISC ORGANIZER ON SUN VISOR

Roy Nimpoeno, Monterey Park, Calif., assignor to Scosche Industries, Inc., Moorpark, Calif.

Filed Mar. 3, 1995, Ser. No. 398,154

Int. Cl.[6] B60R 7/00;7/05

U.S. Cl. 224—312 **2 Claims**

1. A multiple disk recording organizing holder apparatus comprising:

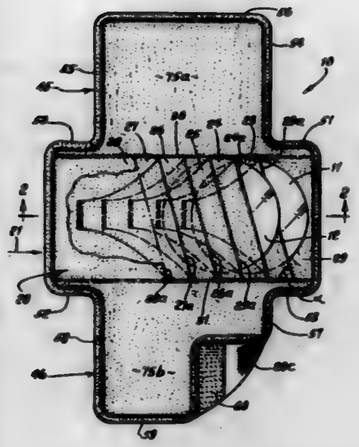
a) a substantially flat carder panel which is elongated in a longitudinal direction adapted to be attached to and carried by a vehicle sun visor, which is also longitudinally elongated, and flatly adjacent one side of the visor, said carrier panel having opposite sides and longitudinal sides,

b) there being a first series of disc recording storage pockets on said panel having entrances exposed at at least one side of said panel,

c) said pockets having entrance edges which are spaced apart longitudinally, and which define angles α relative to said longitudinal direction, where:

$$65° \leq \alpha < 85°,$$

d) means to connect said carrier panel to the one side of the visor, said means including two flaps each having a hinge connection to respective said longitudinal sides of said carrier panel adapted to fold over the visor at the opposite side thereof, said two flaps having approximately equal overall



length which is substantially less than the overall longitudinal length of said carrier panel,

e) each said flap being everywhere longitudinally spaced from said opposite ends of said carrier panel, each said overall longitudinal length of each said flap being greater than half the overall length of said carrier panel, whereby said carrier panel and said flaps in an unfolded condition have a cruciform shape, and

f) one of said two flaps includes a second series of disk recording storage pockets wherein the other of said two flaps overlaps said second series of pockets when folded over the visor.

5,590,828

APPARATUS FOR THE WIRE-STAPLING OF PRINTED PRODUCTS

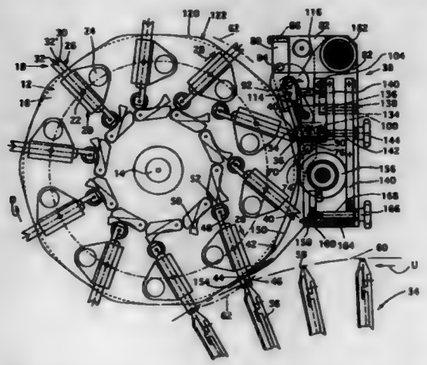
Hans-Ulrich Stauber, Grüt, Switzerland, assignor to Ferag AG, Switzerland

Filed Jul. 5, 1995, Ser. No. 498,359

Claims priority, application Switzerland, Jul. 6, 1994, 02 153/94

Int. Cl.[6] B42B 4/02

U.S. Cl. 227—81 **13 Claims**



1. An apparatus for wire-stapling of multiple-sheet printed products comprising:

a movable stapling head including a carry-along member;

a wire-section dispenser mounted adjacent to said movable stapling head, said wire-section dispenser including a wire guide for guiding a length of stapling wire that is adapted to be advanced in a stepwise manner along its longitudinal direction,

a cutting element located downstream of said wire guide, in the advancement direction of said stapling wire, said cutting element functioning to sever individual wire section from the advancing stapling wire,

a retaining device including retaining elements that define a gap for receiving said severed wire sections, said retaining elements being mounted on said wire-section dispenser such that they can move relative to one another from a rest position to a clamping position and back again, such that when said retaining elements are in said clamping position said gap has been narrowed,

said retaining device being arranged with respect to said wire guide such that the stapling wire moves with its leading end first, between the retaining elements which are in said rest position, and the retaining elements are then moved into the clamping position, before the cutting operation is performed;

said wire sections adapted to lie freely within said gap with a region outside the gap and to be carried along by said carry-along member of said stapling head, said stapling head is adapted to move past said retaining device in a direction that extends transverse with respect to the position of said wire section in the gap, such that action is performed on said free region of said wire section and said wire section is moved out of said gap which is open downstream in the movement direction.

5,590,829

MOVABLE BACKING SYSTEM

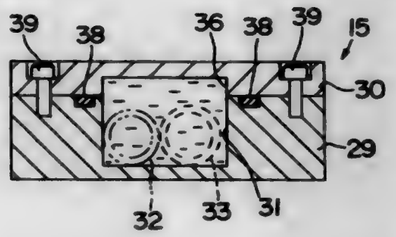
Akitoshi Masamura; Yuichi Kimura, and Akio Iwasaki, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP93/00893, § 371 Date Oct. 18, 1995, § 102(e) Date Oct. 18, 1995, PCT Pub. No. WO94/16856, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 27, 1993, Ser. No. 495,653

Int. Cl.[6] B23K 37/02

U.S. Cl. 228—50 **31 Claims**



1. A movable backing system for use in full penetration welding, placed at the underside of a workpiece during welding, the system comprising:

(a) a wheeled carriage movable along a weld line of a weld zone in the workpiece;

(b) a weld backing which is so supported on the wheeled carriage as to be movable toward the workpiece and which has a backing member disposed on the side facing the workpiece and cooling means disposed inside the weld backing, for cooling the backing member;

(c) follower elements attached to the weld backing, which are always in contact with the underside of the workpiece and which turn following the movement of the workpiece to keep a predetermined gap between the underside of the workpiece and the weld backing so that desired bead thickness can be obtained; and

(d) an elastic member for energizing the weld backing to bring the follower elements into contact with the underside of the workpiece constantly.

5,590,830

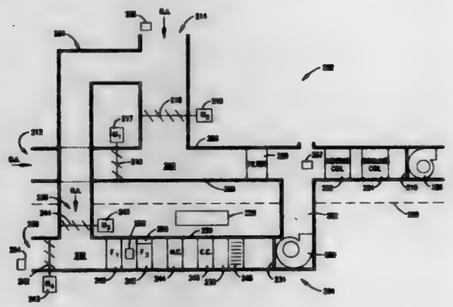
CONTROL SYSTEM FOR AIR QUALITY AND TEMPERATURE CONDITIONING UNIT WITH HIGH CAPACITY FILTER BYPASS

John P. Kettler, Shawnee, and James A. Reese, Overland Park, both of Kans., assignors to York International Corporation, Kansas City, Mo.

Division of Ser. No. 379,166, Jan. 27, 1995, Pat. No. 5,564,626. This application Oct. 4, 1995, Ser. No. 538,861

Int. Cl.[6] F24F 7/00

U.S. Cl. 236—49.3 **5 Claims**



5. A method for controlling an air conditioning unit that receives outside and return air to form mixed air and discharges supply air having a predetermined minimum quality and maximum enthalpy, said method comprising the steps of:

receiving adjustable amounts of outside and return air;

determining an energy cost required to maintain an enthalpy level of mixed air below a predetermined maximum enthalpy level when a maximum amount of outside air is included;

determining a filtration cost required to maintain a quality of said mixed air above a predetermined minimum quality when a maximum amount of return air is included therein; and

maximizing the use of outside air when said energy cost is less than said filtration cost.

5,590,831

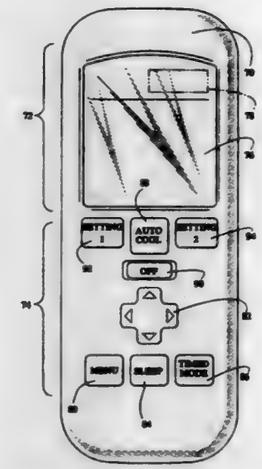
MENU DRIVEN REMOTE CONTROL FOR A ROOM AIR CONDITIONER

Larry J. Manson, Baroda; Jerry L. McColgin, St. Joseph; John Beatley, St. Joseph, and Mark Palmer, St. Joseph, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 325,886, Oct. 19, 1994. This application Nov. 23, 1994, Ser. No. 344,381

Int. Cl.[6] G05D 23/00; G08B 21/00

U.S. Cl. 236—51 **16 Claims**



1. A control unit for an air conditioner comprising:

a programmable processor capable of receiving user selections in the form of signals;

a display operatively associated with the processor and which is capable of displaying a multiple-way arrow icon; and

a directional controller operatively associated with the processor by means of which a user can enter selections which are received by the processor,

the processor being programmed to display the multiple-way arrow icon on the display, to associate different selectable functions with arrows of the arrow icon and the directional controller and to display with the multiple-way arrow icon labels identifying the functions associated with arrows of the arrow icon.

5,590,832

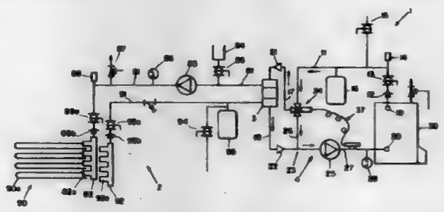
HYDRONIC HEATING SYSTEM WITH HIGH AND LOW TEMPERATURE SHOCK PROTECTION

Joachim Fiedrich, 20 Red Pine Dr., Carlisle, Mass. 01741

Filed Jul. 15, 1994, Ser. No. 275,492

Int. Cl.[6] F24D 3/00

U.S. Cl. 237—8 R **31 Claims**



11. A hydronic snow and ice melting (HSM) system having a boiler system supplying relatively hot supply water in a boiler supply line and a boiler return water line feeding relatively cool boiler system water to the boiler for heating in the boiler comprising:

(a) a three-way modulated valve in said boiler system for feeding some of said boiler supply water to said return water line to raise the temperature of said relatively cool boiler system water fed to the boiler for heating in the boiler,

(b) means for controlling said valve to vary the flow of said supply water fed to said return water line, including

(c) means responsive to said return water raised temperature,

(d) whereby said flow of said supply water fed to said return water line is increased when said return water raised temperature decreases.

5,590,833

EXPANSION JOINT FOR PART OF A RAILWAY TRACK

Sebastian Besenowski; Hubertus Hähne, both of Butzbach; Alfred Kais, Lich-Eberstadt, and Erich Nading, Aalen, all of Germany, assignors to BWG Butzbacher Weichenbau, GmbH, Butzbach, Germany

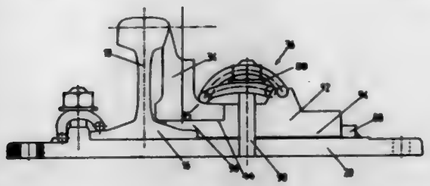
PCT No. PCT/EP93/01117, § 371 Date Nov. 8, 1994, § 102(e) Date Nov. 8, 1994, PCT Pub. No. WO93/23624, PCT Pub. Date Nov. 25, 1993

PCT Filed May 7, 1993, Ser. No. 325,304

Claims priority, application Germany, May 8, 1992, 42 14 756.5; May 8, 1992, 42 14 605.4; Sep. 1, 1992, 9211520 U

Int. Cl.[6] E01B 11/42

U.S. Cl. 238—171 8 Claims



1. An expansion joint for part of a railway track capable to compensate for changes in length disposed on a foundation comprising:

a first rail section having a contact area of predetermined length said first rail section being clamped to the foundation; a second rail section movable in relation to the first rail section; means for fastening said second rail section to be pressed against said first rail section over the predetermined contact area; said means for fastening causing bending of the second rail section; said first rail section having in said predetermined contact area in which said movable second rail section is pressed into contact, a curvature corresponding to the bending line of said movable second rail section;

said first rail section is a stock rail having a foot and a head; said second rail section having a foot, a head formed as a switch tongue and a web in a transitional section between said foot and head;

the means for fastening pressing the second rail section against the first rail section, includes a block fixed to the foundation, a clamp, a clamp spring, a bolt, and a nut,

the clamp being supported by the block and applying pressure to the foot and to the web of the second rail section so as to transmit force components in the direction of the foundation and the direction of the stock rail head; said second rail section sliding on a sliding surface of the block.

5,590,834

ONE-PIECE TRIGGER SPRAYER HOUSING

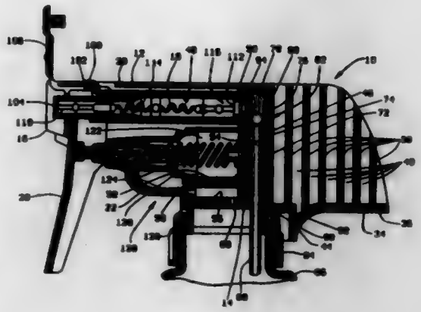
Donald D. Foster, St. Charles, Mo., assignor to Contico International, Inc., St. Louis, Mo.

Filed Jul. 22, 1994, Ser. No. 279,592

Int. Cl.[6] B05B 11/02

U.S. Cl. 239—333 20 Claims

16. A trigger sprayer housing for completing a trigger sprayer for dispensing a liquid substance from a container in response to actuation by a user's hand, the housing being comprised of a shroud having a pair of substantially vertical sides extending to an integral ergonomic saddle having a substantially horizontal surface extending between the substantially vertical sides add configured to rest upon the user's hand during trigger sprayer actuation, the saddle having an open top and a plurality of ribs extending between the pair of shroud sides.



5,590,835

ATOMIZATION ATTACHMENT FOR A LIQUID CONTAINER

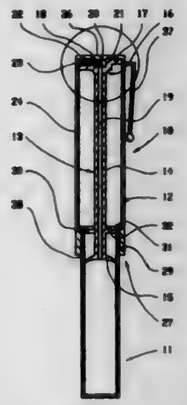
Karl-Heinz Rosenthal, Reichshof-Oberagger, and Tom Kitzing, Wiehl-Weiershagen, both of Germany, assignors to Aptar-Group S.A., Saint Germain en Laye, France

Continuation of Ser. No. 298,135, Aug. 30, 1994, abandoned. This application Apr. 10, 1996, Ser. No. 630,561

Claims priority, application Germany, Sep. 2, 1993, 43 29 707.2

Int. Cl.[6] B05B 9/043

U.S. Cl. 239—333 5 Claims



1. An atomization attachment (10) for a liquid container (11) suitable for discharging, inter alia, perfume samples wherein said container (11) is generally cylindrical and defines an upper end opening region (28), said attachment comprising:

(A) a closure-cap-like outer part (12) having a head wall (26) at one end defining an inner side and having an opposite end defining a container-receiving opening (27) for the container upper end opening region (28) whereby relative displacement may be effected between said outer part (12) and said container (11), and

(B) an inner part (13) with a riser tube (14) in the form of a piston rod having a distal end with a piston (15) which can be inserted into said container upper end opening region (28), said piston rod having an end opposite said piston (15) with a head plate (17) and a superatmospheric-pressure valve (16) carried in said head plate (17), the head plate (17) of the inner part (13) being retained fixedly on said inner side of said head wall (26) of the outer part (12), said inner part (13) and outer part 12 together defining a valve space (20) between the superatmospheric-pressure valve (16) of the inner part (13) and the head wall (26) of the outer part (12), said outer part (12) defining an outlet opening (23) establishing flow communication with said valve space (20), said inner part (13) head plate (17) defining an opening (35), and said outer part (12) including a protrusion (25) which is on said inner side of said head wall (26) and which is press-fitted into said opening (35) to retain said inner part (13) fixedly on said outer part (12).

5,590,836

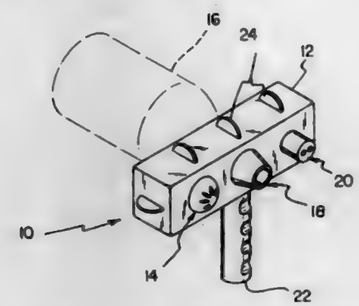
FLEXIBLE CONTAINER TOY NOZZLE

Dave Thielbar, 2267 Capps Rd., York, S.C. 29745

Filed Jan. 5, 1995, Ser. No. 369,152

Int. Cl.[6] B05B 1/16

U.S. Cl. 239—391 5 Claims



1. A flexible container toy nozzle comprising: a manifold; and, a first nozzle means secured to the manifold for coupling to a flexible container and for directing fluid forcibly expelled from the collapsible container in a first spray pattern and direction and further comprising a second nozzle means secured to the manifold for coupling to a flexible container and for directing fluid forcibly expelled from the collapsible container in a second spray pattern and direction, wherein the spray pattern of the first nozzle means is different than a spray pattern of the second nozzle means and further comprising a third nozzle means secured to the manifold for coupling to a flexible container and for directing fluid forcibly expelled from the collapsible container is a third splay pattern and direction, wherein the spray pattern of the third nozzle means is different from the spray pattern of the second nozzle means and further comprising a handle secured to and projecting downwardly from a lower surface of the manifold for permitting manual manipulation of the nozzle.

5,590,837

SPRAYER HAVING VARIABLE SPRAY PATTERN

R. Pat Grogan, Downey, Calif., assignor to Calmar Inc., City of Industry, Calif.

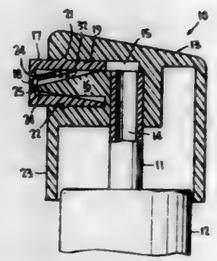
Filed Feb. 28, 1995, Ser. No. 395,851

Int. Cl.[6] B05B 1/34

U.S. Cl. 239—478 13 Claims

1. A pump sprayer comprising a pump body having a fluid discharge passage and a spinner probe, a nozzle cap on said probe, said cap having a discharge orifice and means including a spin chamber in communication with said orifice for imparting a spin at a given velocity to fluid to be discharged through said orifice in a spray pattern having a predetermined spray cone, means defining a first fluid path external to said probe and extending from said fluid passage to said orifice via said spin imparting means, the improvement wherein:

said probe has a through opening defining a second fluid path from said discharge passage to said spin chamber, said through opening extending at an angle relative to a central axis of said probe, between a distal end and an outer surface of said probe, said second fluid path being wholly independent of said first fluid path such that fluid flowing through said second fluid path negates the given velocity to produce a spray cone of reduced conicity compared to that of the predetermined spray cone.



5,590,838

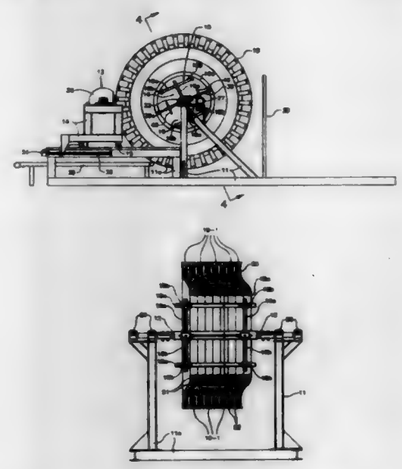
APPARATUS AND METHOD FOR REDUCING VEHICLE TIRES TO PARTICLES

John C. Brewer, Salt Lake City, Utah, assignor to Garb Oil & Power Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 909,838, Jul. 6, 1992, Pat. No. 5,299,748. This application Sep. 13, 1993, Ser. No. 122,000

Int. Cl.[6] B02C 19/12

U.S. Cl. 241—23 6 Claims



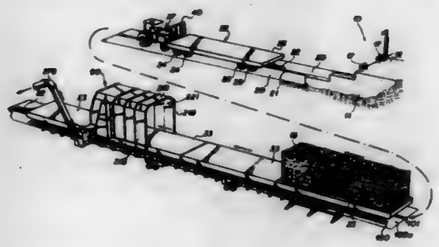
1. A method of cutting particles from discarded vehicle tires using cutter apparatus, comprising the steps of progressively cutting through the tread portions of such vehicle tires taken from a supply of same and worked on sequentially as each is rotated, leaving as residual, separate, beaded side wall portions of said tires worked on sequentially; grouping said separate, residual, beaded side wall portions of said tires face-to-face in nested relationship in a rotatable tire-holder with the tread ends thereof outermost; rotating said tire-holder; and using said cutter apparatus to cut the side wall parts of said separate side wall portions of the tires down to the beads thereof.

5,590,839

METHOD AND APPARATUS FOR DELIVERING COTTON MODULES AND COTTON THEREFROM INTO A COTTON GIN

Tommy H. Coudrey, P.O. Box 592, 100 Star Arlington Dr., Lake Providence, La. 71254

Filed Jan. 21, 1994, Ser. No. 184,943
Int. Cl.[6] B02C *23/02;23/08*
U.S. Cl. 241—27 29 Claims



11. The process for separating cotton from a cotton module comprising;

(a) passing a cotton module end first along a prescribed linear path of travel;

(b) disposing a feeder head in a stationary position in said path of travel for engaging said end of said module and for progressively removing cotton therefrom as said module is urged against said feeder head; wherein the improvement comprises:

(c) supporting said module on a cart having a platform and having wheels affixed to the underside of said platform and moving said cart with said module thereon along said linear path and beneath said feeder head;

(d) continuing the movement of said platform along said linear path for thereby urging said module toward said feeder head as said cart is moved progressively along said linear path beneath said feeder head so that feeder head progressively removes clumps of cotton from said module; and

(e) moving said platform on its wheels away from said linear path.

5,590,840

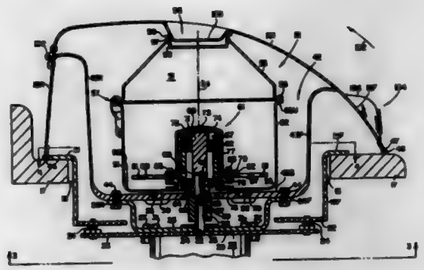
MEDICAL WASTE COLLECTION AND TREATMENT SYSTEM

Mathew J. Adams; Kenneth R. Lamaster, both of Indianapolis; David B. Mennel; Jeffrey C. Rapp, both of Greenwood, and Joseph H. Wilson, Speedway, all of Ind., assignors to Ecomed, Inc., Indianapolis, Ind.

Division of Ser. No. 208,989, Mar. 9, 1994, Pat. No. 5,516,052, which is a continuation-in-part of Ser. No. 73,758, Jun. 8, 1993, Pat. No. 5,465,841, which is a continuation-in-part of Ser. No. 882,915, May 19, 1992, Pat. No. 5,236,135, which is a continuation-in-part of Ser. No. 704,455, May 23, 1991, Pat. No. 5,240,187. This application Jun. 5, 1995, Ser. No. 465,544
Int. Cl.[6] B02C *13/26;18/18*
U.S. Cl. 241—99 24 Claims

1. In a medical waste treatment apparatus comprising closeable chamber, including a bottom, a sidewall and a top, for the collection and treatment of solid and soft medical waste, and a waste treatment assembly mounted for rotation within said closeable chamber, and a separate unit providing power for rotation of the waste treatment assembly, and an enclosure for said closeable chamber during operation of the waste treatment assembly, the improvement comprising:

a supporting plate within said enclosure, including a plurality of stops for engaging said closeable chamber and preventing its rotation during operation, said closeable chamber having a plurality of elastomeric feet for supporting the chamber and



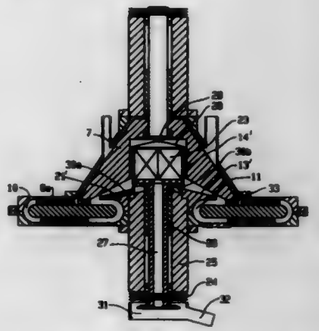
said plurality of stops having projecting corners for deformation and engagement of the elastomeric feet.

5,590,841

AGITATOR BALL MILL

Juergen Stein, Kurastrasse 4, Stadtbergen, Germany, and Robert Rosen, Neudeknerstrasse 14, Augsburg, Germany

Filed Jan. 27, 1995, Ser. No. 379,691
Claims priority, application Germany, Jan. 28, 1994, 44 02 609.9
Int. Cl.[6] B02C *17/16*
U.S. Cl. 241—171 10 Claims



1. Agitator ball mill for processing free-flowing materials, consisting of a grinding bin containing a rotating agitator whose surface, together with adjacent housing walls, forms at least one grinding zone having a beginning and an end and through which product suspension and grinding pearls flow, a product inlet on the grinding bin via which the product is fed to the grinding zone, a central separation zone containing a separating element that connects to the end of the grinding zone, and a connection between the end and the beginning of the grinding zone, whereby a first partial stream of product enters the separation zone and a second partial stream of product admixed with grinding pearls enters the beginning of the grinding zone, wherein:

a) the agitator (1) is disc-shaped;

b) the grinding bin is made up of a housing (2*a*, 2*b*) having housing walls located adjacent to said agitator,

c) the agitator (1) along with said adjacent housing walls forms an upper and a lower disc-shaped grinding chamber (8*a*, 8*b*) at upper and lower levels, respectively,

d) said grinding chambers are connected with one another around the periphery of the agitator (1), with a first zone connected radially to the inside area of the lower grinding chamber (8*b*) to define a first deflection zone (11), into which the product suspension with the grinding pearls is deflected

from the level of the lower grinding chamber (8*b*) to the level of the upper grinding chamber (8*a*); and

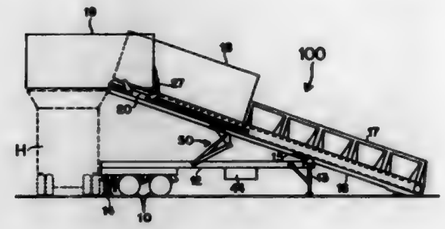
e) a branch channel (13,13') for said first partial product stream extends from between the deflection zone (11) and the upper grinding chamber (8*a*) radially inwardly to said separation zone (14, 14').

5,590,842

CONVEYOR WITH EXTENDING SHROUD

Melvin A. Zehr, Box 266, Middleton, Id. 83644

Filed Mar. 27, 1995, Ser. No. 410,700
Int. Cl.[6] B02C *13/286*
U.S. Cl. 241—186.35 2 Claims



1. A transportable conveyor system for use primarily with a pivot tub type hammermill comprising:

a transport frame;

wheel assemblies for transport attached to the transport frame;

front and rear jack assemblies attached to the transportable conveyor system for positioning and stabilizing the transportable conveyor system;

a conveyor frame pivotally attached to the transport frame, the conveyor frame having first and second sides and first and second ends;

means for inclining the conveyor frame relative to the transport frame;

a conveyor means installed within the conveyor frame, for transporting the material to be ground or pulverized to the hammermill;

rails located on either side and attached to the first end of the conveyor frame for containing the material to be ground or pulverized on the conveyor means;

a fixed shroud located at and attached to the second end of the conveyor frame extending upward from the frame and across the top of the conveyor means creating an enclosure through which the material to be ground or pulverized travels;

an extendable shroud slidably mounted on a pair of trolleys, extending upward from the trolleys and across the top of the fixed shroud, one trolley mounted on either side of the conveyor frame, each trolley traveling on a plurality of wheels, each wheel being in slidable engagement with one of a pair of tracks, the first track being attached to the conveyor frame first side and the second track being attached to the conveyor frame second side, the trolleys having means for driving the trolley wheels along the track causing the extendable shroud to extend past the second end of the conveyor frame; and

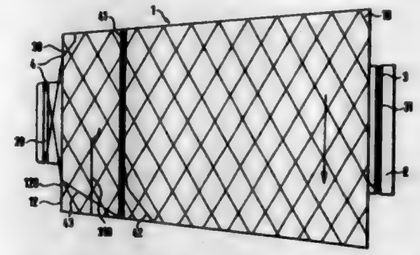
means for tilting the extendable shroud to level the shroud over the pivot tub of the hammermill.

5,590,843

PROCESS AND DEVICE FOR THE CONSTITUTION OF A YARN END RESERVE WINDING ON BOBBINS OF THE TEXTILE MACHINE

Dietmar Greis, and Walter Mayer, both of Ingolstadt, Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Division of Ser. No. 914,993, Jul. 16, 1992, Pat. No. 5,393,002, which is a continuation-in-part of Ser. No. 733,101, Jul. 19, 1991, abandoned. This application Aug. 8, 1994, Ser. No. 287,235
Claims priority, application Germany, Jul. 21, 1990, 40 23 291.3
Int. Cl.[6] B65H *54/00;18/28*
U.S. Cl. 242—18 EW 10 Claims



1. A process for producing a yarn end reserve on a cross wound yarn package carried on a package former which has end portions extending beyond the side of said cross wound yarn package comprising:

unwinding said package to withdraw a length of yarn from said package;

rotating said package in the normal winding direction;

winding a portion of the length of said withdrawn yarn in a defined non-cross wound pattern on the surface of said package in a manner so that said non-cross wound windings are maintained in position on the circumference of said package upon subsequent tensioning of the remaining portion of said length of withdraw yarn, said non-cross wound winding comprising winding said yarn essentially parallel to the edge of said package former;

deflecting said withdrawn yarn onto an end portion of said package former after said non-cross wound winding step as said package is rotated in the normal winding direction causing said yarn to wrap around said end portion;

deflecting said withdrawn yarn end over the side of said package for laying said withdrawn yarn end on the surface of said package; and

holding said withdrawn yarn under tension while said yarn is being deflected to be wrapped around said end portion of said package former and over the surface of said package, said non-cross wound winding allowing said withdrawn yarn to be held under tension.

5,590,844

BUNCH WINDING PROCESSING APPARATUS

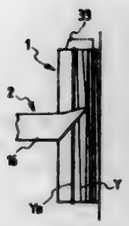
Yasunori Hatakeyama, Shiga-ken, and Kenichi Ueda, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 29, 1995, Ser. No. 496,443
Claims priority, application Japan, Jul. 8, 1994, 6-157297
Int. Cl.[6] B65H *54/00;63/00*
U.S. Cl. 242—18 EW 6 Claims

1. A bunch winding processing apparatus, comprising:

a take-up tube having an end portion with a peripheral surface that is provided with a bunch winding thereon;

a feed pawl member which abuts said peripheral surface of said end portion of said take-up tube;



means for moving said feed pawl member in a circumferential direction relative to said take-up tube and putting aside a yarn of the bunch winding on said take up tube; and

means for detecting whether said yarn is present or not at the point where said feed pawl member abuts said peripheral surface of said end portion.

5,590,845

YARN END FINDING APPARATUS AND METHOD

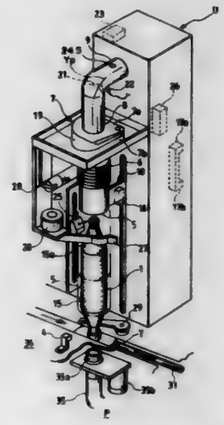
Takashi Nakagawa, Uji, and Yuji Todo, Nagaokakyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 22, 1994, Ser. No. 310,871

Claims priority, application Japan, Sep. 24, 1993, 5-238305; Nov. 10, 1993, 5-281585

Int. Cl.[6] B65H *69/04*

U.S. Cl. 242—35.6 E **17 Claims**



1. In a yarn end finding operation using a yarn end finding apparatus having a yarn feeding means for feeding yarn from a bobbin having an outermost layer of yarn with a yarn end to a winder, said yarn feeding means comprising:

a means for generating air current;

an air current control means for controlling an air current generated by said air current generating means by directing said air current to flow along a surface of said outermost layer of yarn of said bobbin, said air current control means being a hollow tube-like cylinder of various configurations disposed on said yarn finding apparatus so as to be movable up and down with respect to a yarn end finding position in which said bobbin is located during said yarn end finding operation and wherein said cylinder is capable of surrounding said bobbin at least partially depending on said configuration of said cylinder;

a yarn end sensor means for detecting said yarn end drawn out from said outermost layer of yarn of said bobbin;

a means for dually controlling said air current control means by stopping said air current control means from moving down over said bobbin located on said yarn end finding position to at least partially surround said bobbin when said yarn end sensor has detected said yarn end and by repeatedly moving said air current control means up and down a predetermined number of times over said yarn end finding position to at least partially surround said bobbin, depending on said configuration of said cylinder, until said yarn end sensor detects said yarn end has been drawn out from said outermost layer of yarn of said bobbin; and

a cutter means for cutting a length of yarn from said yarn end which has been drawn out from said layers of yarn by said air current wherein said cutter means is mounted to said air current control means.

5,590,846

SYSTEM AND METHOD FOR MONITORING PROGRESS OF WINDING A FIBER

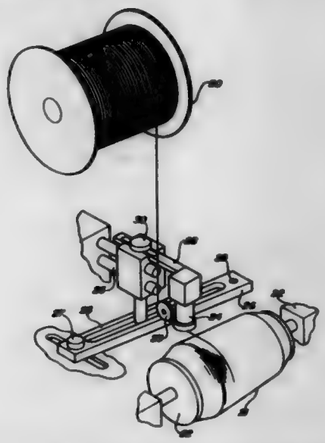
Ehud Dekel, Nofit, Israel, assignor to State of Israel, Ministry of Defence, Armament Development Authority, Haifa, Israel

Continuation-in-part of Ser. No. 83,010, Jun. 24, 1993, abandoned. This application Jul. 5, 1995, Ser. No. 498,174

Claims priority, application Israel, Jul. 20, 1992, 102559

Int. Cl.[6] B65H *57/28;54/00*

U.S. Cl. 242—158 R **7 Claims**



1. A system for monitoring the progress of the winding of a transparent optical fiber pack of a fiber of a diameter of 0.1 mm to 0.4 mm on a bobbin, comprising a winding device where the optical fiber is supplied from a supply reel at a determined tension to which there is attached an optical system which comprises a lens system which projects an enlarged image of the silhouette of the outermost fiber layer onto a CCD operatively connected to a TV screen, and then to the TV screen for viewing the silhouette images, means for shielding the bobbin from direct light by a dark background adjacent the fiber pack, a bright strip oriented parallel to the bobbin silhouette, located behind the fiber pack outline respective the optical system, means for operably tracking the movement of the fiber ending, operably connected to the optical system such that the optical system progresses along said bobbin, so as to provide the image of the said silhouette in a field of view during the winding procedure, where said optical fiber passes through the field of view of the optical system, out of focus of the optical system so as not to disturb the formed image, means enabling an operator to stop the winding in case of any irregularity of the winding, enabling the operator to correct any such winding defect, said system comprising means for the application of a thin layer of an adhesive to each fiber layer after each fiber layer is applied to the bobbin, and for repeating such application of further layers until the desired number of fiber layers is obtained.

5,590,847

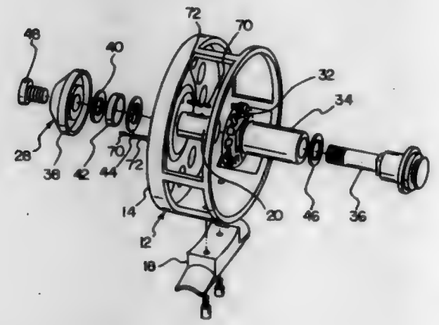
FLY REEL WITH ADJUSTABLE BRAKE ASSEMBLY

Weston H. Ament, P.O. Box 194, Mokelumne Hill, Calif. 95245

Filed Aug. 24, 1995, Ser. No. 518,683

Int. Cl.[6] A01K *89/015*

U.S. Cl. 242—317 **14 Claims**



1. A fly reel comprising:

a main housing having a rear plate;

a center hub projecting from a center interior surface of the rear plate of the main housing;

a spool rotatably mounted about the center hub;

a brake means interposed between the spool and the main housing for effecting adjustable retarding of a rotational motion of the spool relative to the main housing to allow the spool to rotate freely in a first direction, and to adjustably retard rotation of the spool in a second direction,

wherein the brake means comprises a brake plate rotatably positioned about the center hub of the main housing so as to abuttingly engage an interior surface of the rear plate thereof; a cylindrical bearing concentrically positioned and rotatably mounted about the center hub; a center axle projecting through a center of the center hub, the center axle being shaped so as to define an enlarged interior head at a first end thereof, and exterior threads extending about a second end thereof, the second end of the center axle projecting through the rear plate of the main housing; and an adjustment knob threadably engaged with the exterior threads of the center axle, with the spool being coupled to the brake plate so as to rotate therewith in at least one direction,

and wherein the brake means further comprises a first friction washer interposed between an interior surface of the adjustment knob and the main housing; a tension washer formed of a resiliently deformable material interposed between the interior surface of the adjustment knob and the main housing; and a second friction washer interposed between the enlarged interior head of the center axle and an axial end of the cylindrical bearing.

5,590,848

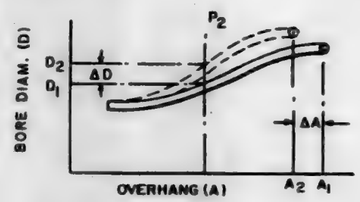
HIGH SPEED LAYING HEAD

Terence M. Shore, Princeton, and Harold E. Woodrow, Northboro, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Continuation-in-part of Ser. No. 233,315, Apr. 26, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 566,611

Int. Cl.[6] B21C *47/10;* **B21D** *11/00*

U.S. Cl. 242—361 **4 Claims**



1. In a rolling mill, a laying head for receiving a single strand product moving axially at a speed of at least 120 m/sec and for forming said product into a continuous series of rings, said laying head comprising:

a quill having a longitudinal axis;

first and second bearing assemblies encircling and supporting said quill for rotation about said axis, the centers of said first and second bearing assemblies being located respectively in first and second mutually spaced reference planes perpendicular to said axis;

means for rotating said quill about said axis; and

a laying pipe carried by said quill for rotation therewith about said axis, said laying pipe having an entry section lying on said axis between said first and second bearing assemblies and into which said product is directed, and having a three dimensionally curved intermediate section leading from said entry section across said second reference plane to terminate at a delivery end from which said product emerges to form said continuous series of rings, said delivery end being spaced radially from said axis to define a circular path of travel for said delivery end around said axis and being spaced from said second plane by an overhang distance which is less than the diameter of said circular path of travel.

5,590,849

ACTIVE NOISE CONTROL USING AN ARRAY OF PLATE RADIATORS AND ACOUSTIC RESONATORS

Frederic G. Pla, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1994, Ser. No. 359,162

Int. Cl.[6] G10K *11/16;* **F01D** *5/26*

U.S. Cl. 244—1 N **10 Claims**

1. An active noise control subassembly array for reducing source noise caused by a source independent of said array, said array comprising:

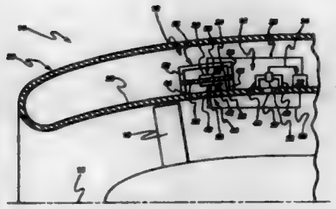
a) a pair of active noise control subassemblies each including:

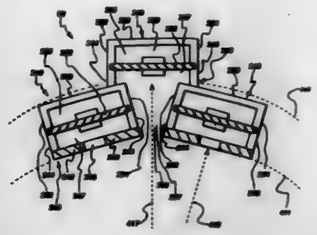
1) a piezoceramic-driven noise radiating panel bendably vibratable to generate a panel noise canceling at least a portion of the source noise and having a panel resonating frequency;

2) a front plate spaced apart from said panel, disposed generally between said source noise and said panel, and having a sound exit port;

3) a first pair of spaced-apart side walls each generally abutting said panel and said front plate so as to generally enclose a front cavity to define a resonator having a resonator resonating frequency;

4) a back plate spaced apart from said panel with said panel disposed generally between said source noise and said back plate; and





.5) a second pair of spaced-apart side walls each generally abutting said panel and said back plate so as to generally enclose a back cavity, wherein said pair of subassemblies are spaced apart to create a space between adjacent side walls of said pair of subassemblies; and

b) a third active noise control subassembly including:

1) a piezoceramic-driven noise radiating sheet bendably vibratable to generate a sheet noise canceling at least a portion of the source noise and having a sheet resonating frequency, said sheet spaced apart from said back plates of said pair of subassemblies; and

2) a third pair of spaced-apart side walls each generally abutting said sheet and a corresponding back plate of said pair of subassemblies so as to generally enclose a foreground cavity to define a resonator having a resonator resonating frequency and with said space defining a sound exit port.

5,590,850

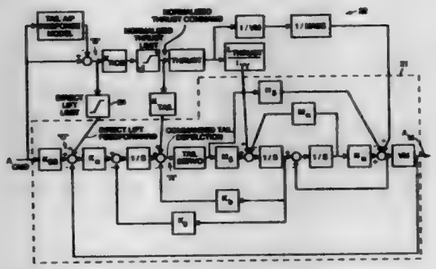
BLENDED MISSILE AUTOPILOT

James J. Cannon, Northridge, Calif., and Mark Elkanick, Tucson, Ariz., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Jun. 5, 1995, Ser. No. 463,683

Int. Cl.[6] F42B *15/01*

U.S. Cl. 244—3.15 **6 Claims**



1. A blended missile autopilot comprising:

a missile comprising a body, a plurality of rotatable tails disposed on the body aft of its center of gravity, a plurality of actuatable lateral force generating members disposed on the body forward of the center of gravity, and a plurality of controllable actuators coupled to the tails and lateral force generating members; and

a controller coupled to the plurality of actuators for the tails and lateral force generating members that implements a predetermined transfer function comprising a tail controlled autopilot for controlling the tails and a direct lift autopilot for controlling the lateral force generating members, and wherein the direct lift autopilot is coupled to the tail controlled autopilot by means of a blending filter.

5,590,851

LUGGAGE BINS FOR THE CABINS OF PASSENGER AIRCRAFT

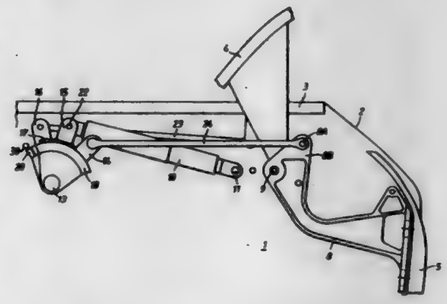
David Ackerman, Pulham, United Kingdom, assignor to Bridport-Gundry PLC, Bridport, England

Filed Jan. 30, 1995, Ser. No. 380,585

Claims priority, application United Kingdom, Feb. 1, 1994, 9401919

Int. Cl.[6] B64D *47/00*

U.S. Cl. 244—118.1 **10 Claims**



1. In a closure assembly for an overhead aircraft luggage bin including at least two doors, the combination comprising a single resilient strut device mounted on said bin and operable to bias the movement of two of said doors simultaneously between closed and open positions, differential means interconnecting said two doors and said resilient strut to permit simultaneous and limited relative movement of said respective doors, and latching means to selectively secure each of said respective doors in the closed position.

5,590,852

APPARATUS FOR CONTROLLING THE PARTIAL PRESSURE OF OXYGEN IN AN AIRCRAFT CABIN

Robert W. Olson, Tucson, Ariz., assignor to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 114,792, Aug. 31, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,642

Int. Cl.[6] B64D *13/00*

U.S. Cl. 244—118.5 **5 Claims**

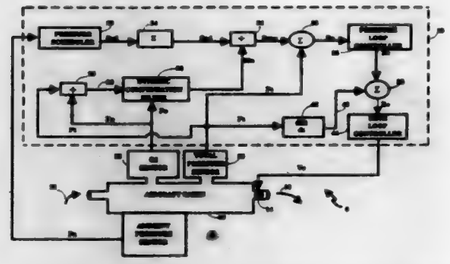
1. Apparatus for controlling the pressure of air in a pressurized aircraft cabin, said apparatus operable to maintain a preselected level of oxygen content in said air in the pressurized aircraft cabin without use of a separate source of concentrated oxygen for the cabin, comprising in combination:

first sensing means for acquiring data to produce a first output signal indicative of oxygen content in said air;

second sensing means for acquiring data to produce a second output signal indicative of total air pressure in said cabin;

electrical means for processing said output signals to produce a command signal; and

valve means responsive to said command signal for regulating outflow of said air from said cabin to adjust cabin pressure to maintain said preselected level of oxygen content in said air, and to maintain a minimum level of said total air pressure.



5,590,853

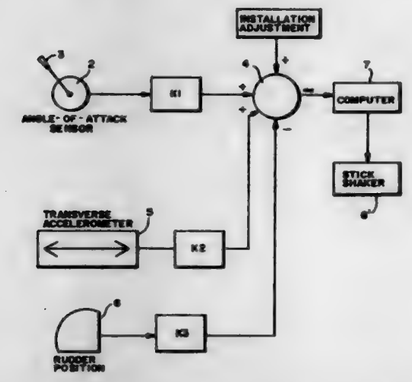
AIRCRAFT CONTROL SYSTEM

Leonard M. Greene, Scarsdale, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Feb. 3, 1992, Ser. No. 829,256

Int. Cl.[6] G05D *1/08;1/10;* B64C *9/00*

U.S. Cl. 244—184 **9 Claims**



1. A yaw compensated angle of attack system comprising means including an angle of attack sensor for generating a signal which is indicative of an aircraft's apparent angle of attack, means including a transverse accelerometer for generating a signal which is indicative of the yaw angle of the aircraft, means for summing said signals to thereby produce a signal which indicates a yaw compensated angle of attack and means for warning a pilot when the yaw compensated angle of attack exceeds a predetermined value.

5,590,854

MOVABLE SHEET FOR LAMINAR FLOW AND DEICING

Solomon Shatz, P.O. Box 523, Cupertino, Calif. 94015

Filed Nov. 2, 1994, Ser. No. 333,483

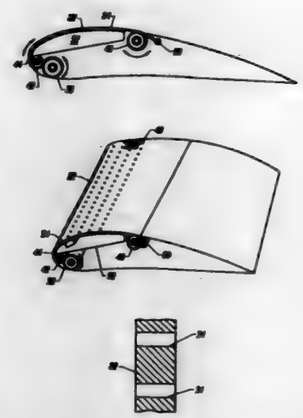
Int. Cl.[6] B64C *21/06;23/02*

U.S. Cl. 244—206 **68 Claims**

1. A movable sheet apparatus for covering a portion of a wing, wherein the apparatus comprises:

roller means including a roller rotatably mounted within the wing and extending spanwise with respect to the wing;

a movable sheet overlying the wing and extending scroll-like between and engaging the roller means, wherein the movable sheet is wrapped fully around the circumference of the roller; and



means for rotating the roller means, including means for rotating the roller through multiple revolutions to move the movable sheet.

5,590,855

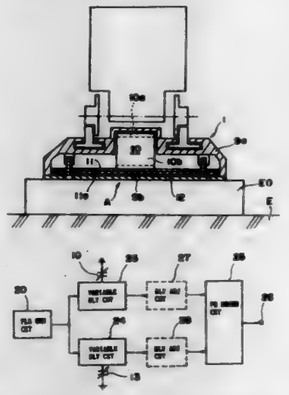
TRAIN DETECTION DEVICE FOR RAILROAD MODELS AND TRAIN CROSSING CONTROL APPARATUS UTILIZING THE TRAIN DETECTION DEVICE

Ryochi Kato; Umeko Kato, both of 2, Yachiyodai-Nishi 6-chome, Yachiyo-shi, Chiba-ken 276; Tomohiko Kato, 206, Kami-Arai 880-5, Tokorozawa-shi, Saitama-ken 359; Hideto Kato, Horinouchi 2512, Hachioji-shi, Tokyo 192-03, and Teruko Ichizuka, 10, Yachiyodai-Higashi 4-chome, Yachiyo-shi, Chiba-ken 276, all of Japan

Filed Jul. 12, 1994, Ser. No. 274,623

Int. Cl.[6] B61L *3/08*

U.S. Cl. 246—292 **4 Claims**



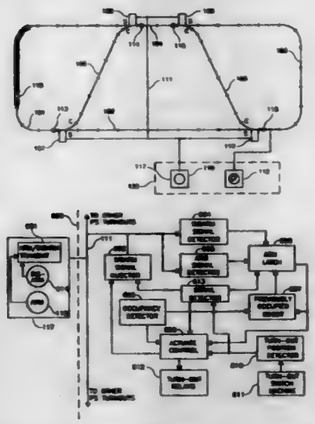
1. A model railroad crossing system, comprising:

a model railroad track section including rails and a case for supporting the rails thereon; and

a train detection device disposed inside said case between the rails for detecting the approach or passage of a model train running on the rails without directly contacting with the train, said train detection device including a capacitance sensor for detecting the approach and passage of the train by detecting changes in capacitance produced by changes in distance between the capacitance sensor and the train; and

the capacitance sensor including a generally flat, elongated detection electrode disposed within the case and between the rails, and extending generally parallel to the rails.

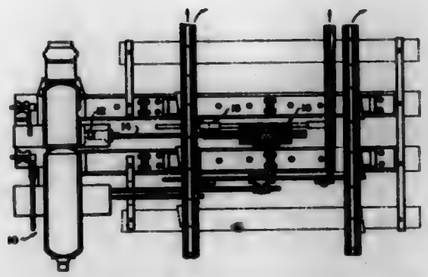
5,590,856
COMPLEX SWITCH TURN-OUT ARRANGEMENTS USING PROXIMITY SELECTION
Patrick A. Quinn, 20195 SW. Imperial Dr., Aloha, Oreg. 97006, and Frederick E. Severson, 945 SW. Perfecta Ave., Beaverton, Oreg. 97005
Division of Ser. No. 331,109, Oct. 28, 1994, Pat. No. 5,492,290. This application Jun. 7, 1995, Ser. No. 484,014
Int. Cl.[6] B61L *11/00*
U.S. Cl. 246—219 8 Claims



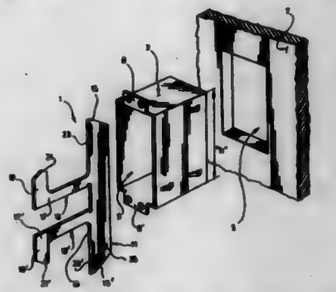
1. An automatic method of controlling one or more turn-outs in a branching pathway, said pathway directing the movement of moving objects, the method comprising the steps of:
providing one of at least two arming signals, each arming signal associated with a path branch direction for one or more turn-outs so as to enable the one or more turn-outs to toggle to a direction corresponding with the provided arming signal;
determining electronically whether or not the turn-out is occupied;
electronically detecting a moving object approaching the turn-out; and
if the turn-out is not occupied by a moving object, automatically toggling the turn-out in response to the object approaching the turn-out without operator intervention;
and then disarming all of the turn-outs so that only the first unoccupied turn-out approached by the object is toggled.

5,590,857
TRAILING DEVICE FOR A RAILROAD SWITCH LAYOUT
Harry A. Albrecht, Hobe Sound, Fla., and Daniel W. Van Alstine, Rochester, N.Y., assignors to General Railway Signal Corporation, Rochester, N.Y.
Filed Aug. 19, 1994, Ser. No. 293,242
Int. Cl.[6] E01B *7/02*
U.S. Cl. 246—318 3 Claims

1. Apparatus for operating railroad switches, having switch points, including operation in a trailing mode, comprising:
a throw rod, and a housing in which said throw rod is encased;
a switch machine, having a throw bar fixedly coupled to the housing for said throw rod, for enabling the throwing of said switch points into selected positions so as to control the switching of rolling stock;
a trailing device, including means for providing coupling of said throw bar with said throw rod, and for selectively enabling de-coupling thereof responsive to a wrong direction load impressed on said switch points, in which said means includes a bore with take-up space in said housing, said throw rod being movable in the bore relative to the throw bar; ball means which are immovable axially, pockets formed in said throw rod for normally receiving the ball means, and curved cam surfaces in the throw rod on either side of the respective pockets for receiving the ball means in the trailing mode.



5,590,858
DEVICE BOX SUPPORT
Alain Bourassa, Laval; Sylvain Poissant, Montréal; Alain Legris, LaSalle, and Claude Lacroix, Montréal, all of Canada, assignors to Temco Electric Products Co. Inc., Montréal, Canada
Filed Aug. 11, 1995, Ser. No. 514,181
Claims priority, application Canada, Jul. 5, 1995, 2153298
Int. Cl.[6] H02G *3/12*
U.S. Cl. 248—27.1 8 Claims



1. A support for mounting a device box of a given height into an opening of substantially the same height made in a panel, said support comprising:
an elongated bar-shaped member longer than the height of the device box, said bar-shaped member having opposite ends; and
two L-shaped members coplanar to and projecting from one side of the bar-shaped member, said L-shaped members having long arms of the same length connected at one end to the bar-shaped member, said L-shaped members also having short arms projecting from said long arms at a same distance from said bar-shaped member, said short arms having free ends extending away from each other;
wherein the distance between each one of the opposite ends of the bar-shaped member and the remote point on the one side of said bar-shaped member from which the remote L-shaped member projects is substantially equal to the height of the device box; and
wherein the distance between the free ends of the short arms of the L-shaped members is slightly smaller that the height of the device box;
whereby, in use, one can easily insert the bar-shaped member behind the panel through the opening made in said panel by first introducing one of the opposite ends of said bar-shaped member into the opening and moving said one end until the adjacent L-shaped member contacts the panel, and then rotating the support so that the other opposite end of the bar-shaped member pass through the opening, such being possible because of the above mentioned distance selection; fixation of the device box within the opening being subsequently completed by folding back into said box both of said L-shaped members in such a manner that the one side of the bar-shaped member bears against the panel behind the same, the free ends of the short arms of the L-shaped members folded back inside the box then keeping said bar-shaped member centered in bearing position behind this opening.

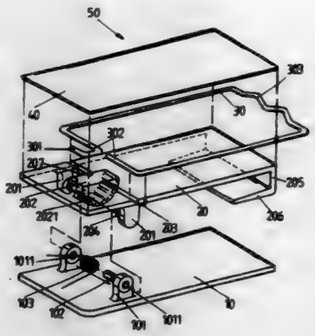
5,590,859
RATCHETING PIPE HANGER ASSEMBLY
Paul J. Lord, 72 Hillcrest Ave., Wethersfield, Conn. 06109
Filed Jan. 23, 1995, Ser. No. 376,814
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—62 27 Claims



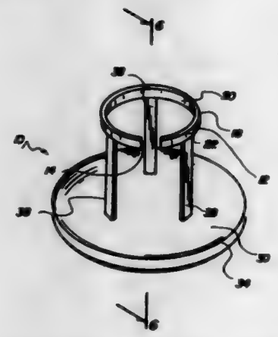
1. A pipe hanger assembly comprising:
a single piece pipe receiver having a through bore, said receiver frictionally swivelably and frictionally height adjustably connected to a single one piece pin, said pin passing through said through bore to support said receiver in a desired orientation and position subsequent to said pin being attached to a support structure.

5,590,860
CLIP STAND FOR MOBILE TELECOMMUNICATION DEVICES
Eagle Fan, No. 30, Lachang, Luchang Li, Chuhpei City, Hsin Chuh, Taiwan
Filed Apr. 24, 1995, Ser. No. 426,842
Int. Cl.[6] A47G *29/00*
U.S. Cl. 248—126 9 Claims

1. A clip stand adapted to be affixed to a mobile telephone or beeper comprising
a bottom cover,
a pair of shields attached to a surface of said bottom cover and spaced from each other, each of said shields having an opening on its outer surface, one of said shields having a pole affixed to and extending from the inner surface of said shield toward said other shield;
a coiled spring mounted on said pole,
a connected board having a pair of hooks depending from the bottom surface of said board, each of said hooks engaging the openings in the outer surfaces of said shields whereby said connected board is pivotally mounted on said bottom cover, said connected board having an opening therethrough,
a segment trough in communication with said opening and extending below said opening, said segment trough provided with a plurality of horizontally disposed protuberant strips,
said connected board having a pair of troughs extending laterally across said surface, each trough extending from a longitudinal edge of said connected board to said opening in said board;
an inlaid bar having a pair of end portions disposed within the respective troughs on said connected board, one of said end portions having a hook extending therefrom and engaging at least one of said protuberant strips of said segment trough,
said coiled spring having an end in contact with the upper surface of said bottom cover and its other end in contact with the bottom surface of said connected board,
and an upper cover affixed to said upper surface of said connected board to retain the end portions of said inlaid bar within said troughs and to retain said hook portion of said inlaid bar within the segment trough.



5,590,861
CUP HOLDER WITH A SPILL-COLLECTING PLATE
Sam Ardolino, 281 Kings Rd., Madison, N.J. 07940
Filed Nov. 10, 1994, Ser. No. 336,913
Int. Cl.[6] A47G *23/02*
U.S. Cl. 248—146 1 Claim



1. A new and improved cup holder with a spill-collecting plate comprising, in combination:

a support ring formed of a relatively rigid plastic material with limited resilient capabilities, the ring being formed essentially in a circle with an opening along one extent thereof for constituting less than ten percent of the circle to allow for expansion and retraction of the reminder of the ring the ring having a cylindrical side wall with an interior surface and an exterior surface of an extended length and with an upper edge and lower edge of limited width equal to about fifty percent of the height;

a dish shaped base plate having a central extent in a circular configuration with an upstanding peripheral side wall, the base plate being fabricated of a relatively rigid elastomeric material, the side walls being of a sufficient size to retain on the upper surface of the base plate liquid spilled therein;

three upstanding legs, the legs each having upper ends and lower ends, the legs including a central leg coupled at its upper end to the lower edge of the ring at a location diametrically opposed from the opening, the legs also including a pair of supplemental legs having their upper ends coupled to the lower edge of the ring and their lower edge coupled to the upper face of the plate whereby the legs are in a vertical orientation equally spaced 120 degrees around the periphery of the ring, the legs being made of a relatively rigid elastomeric material with limited resilience; and

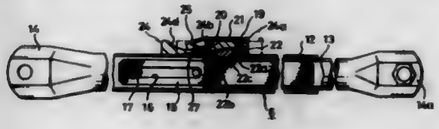
an elastomeric pad with a circular configuration secured to the lower surface of the dish to preclude inadvertent slipping thereof during operation and use.

5,590,862

DEVICE FOR ADJUSTING THE LENGTH OF A SUPPORT

Tatsuo Ono, 5-20-13 Matsugaoka, Funabashi Chiba, Japan

Filed Nov. 18, 1994, Ser. No. 342,342
Claims priority, application Japan, Nov. 25, 1993, 5-318940
Int. Cl.[6] E04G *25/00*
U.S. Cl. 248—354.1 6 Claims



1. A device for adjusting the length of a support, comprising:

an outer tube and an inner tube slidable inserted in said outer tube to jointly form the support, said outer tube having an opening extending radially therethrough at a given position;

a hollow housing mounted on said outer tube in confronting relation to said opening;

a spacer radially movably received in said opening and confronted with an outer surface of said inner tube, said spacer including an elongated spacer body with a toothed surface contactable with said outer surface of said inner tube, said elongated spacer body having a taper surface on a diametrically opposite side of said elongated spacer body from said toothed surface; and

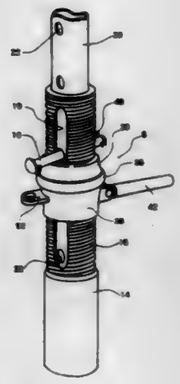
a wedge movably inserted in said housing and confronted with said spacer, said wedge including an elongated wedge body defining a recessed wedge portion formed on a first side of said wedge, said recessed wedge portion being receivable of said spacer, said wedge also including a taper surface formed on a section of said recessed wedge portion for sliding engagement with said taper surface of said spacer.

5,590,863

SUPPORT

Mitsuo Sasaki, 3-11-12 Yamato-higashi, Yamato-shi, Kanagawa-ken, Japan

Filed Oct. 31, 1994, Ser. No. 332,125
Claims priority, application Japan, Nov. 12, 1993, 5-306136; Aug. 1, 1994, 6-197148
Int. Cl.[6] E04G *25/06*
U.S. Cl. 248—354.3 11 Claims



1. A support comprising:

a support pipe means having a lower end and defining an external thread and a pair of elongated holes at an upper end portion thereof, the elongated holes penetrating from a first outer peripheral surface of the support pipe means on one side thereof to a second outer peripheral surface of the support pipe means on another side thereof and extending in an axial direction of the support pipe means;

a support ring means including

a main support ring member having an upper end, a lower end, an outer peripheral portion, and an inner peripheral portion with an internal thread formed therein,

an upper support ring member having a lower end,

upper thrust bearing means rotatably coupling the upper end of the main support ring member to the upper support ring member, the upper thrust bearing means including

an annular groove formed between a surface of the lower end of the upper support ring member and a surface of the upper end of the main support ring member when the lower end surface of the upper support ring member and the upper end surface of the main support ring member are opposed to each other with a gap therebetween,

plurality of balls rotatably inserted in the annular groove,

an annular protruded portion that is continuously formed between an outer peripheral surface of the lower end of the upper support ring member and an outer peripheral surface of the upper end of the main support ring member, and

an annular retainer member slidably fitted to a circumference of the annular protruded portion so as to cover the gap,

the internal thread of the main support ring member being engageable with the external thread of the support pipe means such that the support ring means is movable in the axial direction;

a rotary operation handle fitted to the outer peripheral portion of the main support ring member;

an insertion pipe means having a lower end portion movably insertable into the support pipe means and defining plural pairs of pin holes at intervals in the axial direction of the insertion pipe means which penetrate from a first outer peripheral surface of the insertion pipe means at one side thereof to a second outer peripheral surface of the insertion pipe on another side thereof; and

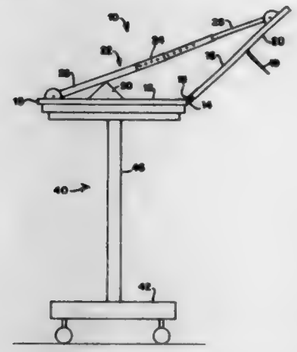
a support pin removably insertable into each of the pairs of pin holes, the support pin having such a length that both ends thereof protrude beyond the pair of elongated holes when the support pin is inserted in one of the pairs of pin holes of the insertion pipe means through the pair of elongated holes formed in the support pipe means while the insertion pipe means is inserted in the support pipe means, wherein the insertion pipe means can be supported by the support pipe means in a manner such that a height of the insertion pipe means can be adjusted when both ends of the support pin are placed on an upper end surface of the support ring means.

5,590,864

EASEL FOR HANDICAPPED ARTISTS

Leslie E. Menard, Apt. 213, 23 Highbrook Rd., Bar Harbor, Me. 04609

Filed Oct. 28, 1994, Ser. No. 326,274
Int. Cl.[6] A47G *1/24*
U.S. Cl. 248—454 19 Claims



1. A handicapped artist's easel comprising:

a substantially horizontal baseboard having a front end and a back end;

an easel board having a top end and a bottom end, wherein said bottom end is pivotally mounted to said front end of said baseboard for rotation of said easel board through substantially 180° relative to the baseboard between a substantially upright position and a horizontal position where, in said horizontal position, said easel board and said baseboard are placed in a co-planar relationship to one another, said easel board having a front side and a back side facing the baseboard;

at least one extendable and retractable arm coupled between the easel board and the baseboard, said arm being extendable and retractable through a sufficient distance for varying the angle of the easel board relative to the baseboard from an acute angle to an obtuse angle, said obtuse angle being great enough for presenting the front side of the easel board over the face of a reclining artist at an acute angle of the easel board relative to the plane of the reclining artist;

stop means for setting the length of the extendable and retractable arm at the appropriate length for the desired angle between the baseboard and easel board;

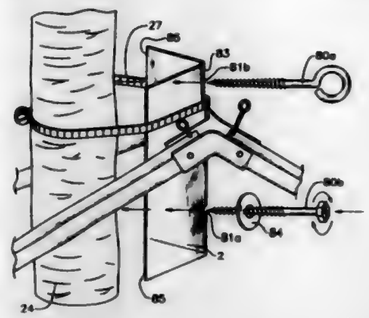
and support mounting means for securing the baseboard to a support and for holding the weight of the easel board when the easel board is set at an obtuse angle relative to the baseboard.

5,590,865

TREE STAND FASTENER

Harold A. Odom, Jr., P.O. Box 697, Missouri City, Tex. 77549-0697

Continuation-in-part of Ser. No. 16,737, Feb. 11, 1993, Pat. No. 5,492,302. This application Sep. 30, 1994, Ser. No. 316,794
Int. Cl.[6] F16M *13/00*
U.S. Cl. 248—524 13 Claims



1. A tree stand, as for a Christmas tree, adapted for assembly and disassembly and for adjustment to hold said tree in a vertical orientation when assembled and erected, said stand comprising:

(a) at least three legs, wherein two of said legs are each longer in length than said remaining legs;

(b) a central member comprising means for receiving the trunk of said Christmas tree, and interconnection means for the connection of the first end of each of said legs to said central member, wherein said interconnection means in combination with the lengths of said legs will orient the second ends of each of said legs approximately equidistant from each other and will orient the second ends of each of said legs approximately equidistant from the axis of the Christmas tree installed within said receiving means;

(c) adjustment means for changing the angle of at least one of said legs relative to the ground, thereby changing the orientation of the axis of the Christmas tree; and,

(d) at least one adjustable securing means for holding said Christmas tree within said receiving means comprising holes through the central member and threaded bolt means which pass through said holes and into said tree trunk to secure said tree.

5,590,866

MOUNTING MEANS AND METHOD FOR VIBRATION MEMBER

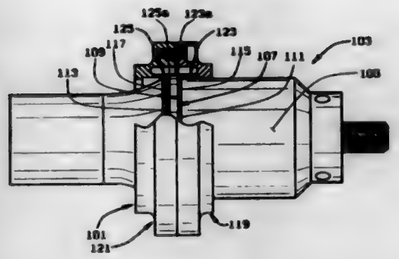
Patrick M. Cunningham, Bridgewater, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 194,108, Feb. 9, 1994, Pat. No. 5,443,240. This application Jul. 25, 1995, Ser. No. 507,053
Int. Cl.[6] F16M *3/00*
U.S. Cl. 248—638 8 Claims

1. Mounting means for a vibration member dimensioned to be resonant as a resonator for vibrations of predetermined frequency traveling longitudinally therethrough, and when resonant exhibiting two respective antinodal regions and a nodal region of said vibrations, the improvement comprising:

a flange extending radially from said vibration member substantially at said nodal region thereof, said flange including bearing surfaces;

a pair of mounting rings surrounding said vibration member generally at the location of said flange, each of said mounting rings having a flexural tube integral therewith and extending axially therefrom, said flexural tube having an end bearing against one of said respective bearing surfaces of said flange



such that relative movement between said end of said flexural tube and its respective said bearing surface is inhibited, said flexural tubes having an axial length and wall thickness dimensioned for enabling each tube to flex radially responsive to said member being resonant and thereby undergoing substantially radial motion at its nodal region; and

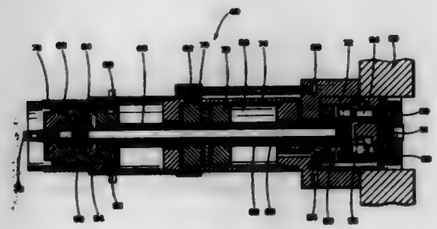
means for axially clamping said flexural tubes relative to said flange such that the ends of said flexural tubes bear against said bearing surfaces so as to decouple the vibrations of said vibration member from said means for clamping.

5,590,867

BLOWOUT PREVENTER FOR COILED TUBING

D. Wayne Van Winkle, Houston, Tex., assignor to Drexel Oil Field Services, Inc., Conroe, Tex.

Filed May 12, 1995, Ser. No. 440,525
Int. Cl.[6] E21B *33/06*
U.S. Cl. 251—1.3 **3 Claims**



1. A blowout preventer comprising:

a. housing with a bore extending through the housing;

b. a chamber extending laterally of the bore in the housing and communicating with the bore, the chamber defining an axis;

c. a pipe ram cylinder within the chamber;

d. a hydraulically actuated pipe ram piston within the pipe ram cylinder;

e. a hollow cylindrical pipe ram piston rod coupled to the pipe ram piston, the pipe ram piston rod coaxial with the axis of the chamber;

f. a front seal coupled to a first end of the pipe ram piston rod, the front seal capable of contacting a tubular member located within the bore;

g. a slip ram cylinder within the chamber, the slip ram cylinder positioned in tandem with the pipe ram cylinder;

h. a hydraulically actuated slip ram piston within the slip ram cylinder;

i. a slip ram piston rod coupled to the slip ram piston, the slip ram piston rod coaxial with the axis of the chamber and located within the pipe ram piston rod; and

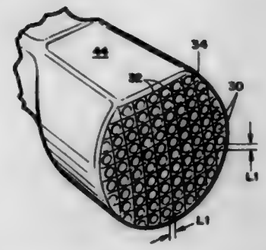
j. a slip insert coupled to a first end of the slip ram piston rod, the slip insert capable of contacting the tubular member located within the bore.

5,590,868

HAMMER HAVING A GRIPPING SURFACE WITH RECESSES

Paul W. Hebert, 6450 Lakeshore Dr., San Diego, Calif. 92119, and Ted Floyd, 453 Grand Ave., Spring Valley, Calif. 91977

Filed Nov. 24, 1995, Ser. No. 562,468
Int. Cl.[6] B25C *11/00*
U.S. Cl. 254—26 R **7 Claims**



1. A hammer comprising:

an elongated handle having a longitudinally extending Y-axis, a top end, a neck portion and a shank portion;

a hammer head assembly having a front end, a rear end, a head portion, a central portion, and a relieved connecting portion between said head portion and said central portion;

said central portion having a top surface, a bottom surface and a substantially rectangular bore hole that extends from said top surface to said bottom surface and the neck portion of said handle is received therein; said central portion having a front wall, a rear wall and laterally spaced side walls surrounding said bore hole;

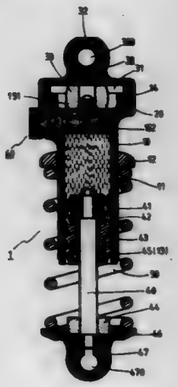
said head portion having a front surface and a longitudinally extending x-axis perpendicular to the front surface; a plurality of separate indentations that are not interconnected to each other formed in said front surface; said indentations cover at least 30 percent of said front surface, the depth of said indentations being in the range of 0.050–0.200 inches and the width of said indentations being in the range of 0.050–0.200 inches.

5,590,869

ADJUSTABLE BUFFER DEVICE FOR A BICYCLE

Paul Cheng, Tainan, Taiwan, assignor to Taiwan Hodaka Industrial Co., Ltd., Taiwan

Filed Dec. 19, 1995, Ser. No. 574,651
Int. Cl.[6] B62J *1/02*
U.S. Cl. 267—132 **2 Claims**



1. An adjustable buffer device comprising:

a hollow main body having a thread on an outer periphery of said main body, a circular recess on an inner lower periphery of said main body, a cover seat on an upper portion of said main body, and a valve seat beneath said cover seat;

an adjustable ring which passes through said thread of said main body disposed beneath said cover seat;

a seal ring disposed in said cover seat;

a hollow interior formed in said cover seat;

a shaft cover which has a soft pad therein and a top with a round hole;

said soft pad disposed between said shaft cover and said seal ring;

a shaft which is disposed in said main body inserted through a buffer ring, a hollow cylindrical seat, and a retaining ring;

said retaining ring inserted in said circular recess to restrict and position said cylindrical seat;

a top portion of said shaft inserted in a hollow piston to position said piston;

a lower portion of said shaft disposed outside said main body;

a shaft seat ring disposed on top of a shaft seat;

a cushion ring inserted in said shaft seat ring;

said cushion ring, said shaft seat ring and said shaft seat inserted by a lower portion of said shaft;

a spring which surrounds said main body being located between said adjustable ring and said shaft seat ring;

a valve seat having an inner chamber, a communicating hole and an oil hole communicating with said inner chamber;

said oil hole communicating with an interior of said main body;

a middle portion of said inner chamber having an inner thread;

a rear portion of said inner chamber having a positioning thread;

an adjustable valve inserted in said inner chamber;

said adjustable valve having a rotary knob, an adjusting rod, and a positioning seat with a tapered end;

an upper portion of said adjusting rod surrounded by said positioning seat;

a top portion of said adjusting rod covered by said rotary knob;

a threaded fastener fastening said rotary knob and said adjusting rod together;

said positioning seat engaging with said positioning thread;

a middle portion of said adjusting rod having an outer thread engaging with said inner thread;

an oil ring disposed on an opening of said inner chamber and positioned by said positioning seat; and

wherein said adjustable valve controls a volume of a passage between said oil hole and said communicating hole.

5,590,870

UNIVERSAL HOLDING SYSTEM FOR A CONTOURED WORKPIECE

Willy J. Goellner, Rockford, Ill., assignor to Advanced Machine & Engineering Co., Rockford, Ill.

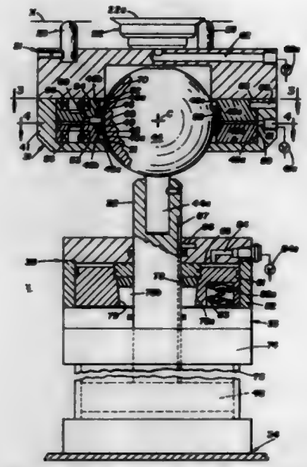
Filed Jun. 2, 1995, Ser. No. 460,848
Int. Cl.[6] B25B *11/00*
U.S. Cl. 269—21 **27 Claims**

1. A universal holding system for supporting and holding a workpiece having a contoured holding surface comprising, a spaced array of work holding fixtures on a base, each fixture including:

(a) a work engaging head including vacuum cup means having a peripheral work contacting rim and three work engaging projections spaced outwardly from the vacuum cup means and disposed in a work contact plane generally parallel to a plane through the peripheral work contacting rim of the vacuum cup means;

(b) a rod having a rod axis and means mounting the rod for axial movement relative to the base;

(c) ball and socket joint means mounting the work engaging head on the rod for tilting movement about axes orthogonal to the axis of the rod;



(d) the ball and socket joint means including casing means having a ball receiving cavity and ball clamp means on the casing means;

(e) a first ball clamp operating means for moving the ball clamp means into a ball clamp condition and a second ball clamp operating means for moving the ball clamp means to a ball release condition;

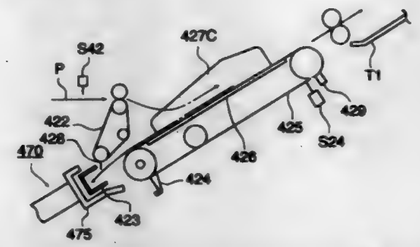
(f) rod clamp means on the rod mounting means, a first rod clamp operating means for moving the rod clamp means into a rod clamp condition, and a second rod clamp operating means for moving the rod clamp means to a rod release condition.

5,590,871

RECORDING SHEET FINISHING APPARATUS

Hirohiko Okabe, Tokorozawa; Masaaki Sekiguchi, Asaka; Shigemi Yukizane, Chofu; Toshitaka Matsumoto, Asaka, and Minoru Kawano, Hachioji, all of Japan, assignors to Konica Corporation, Japan

Filed Feb. 7, 1995, Ser. No. 384,912
Claims priority, application Japan, Feb. 14, 1994, 6-017519
Int. Cl.[6] B65H *29/60*
U.S. Cl. 270—58.27 **3 Claims**



1. A recording sheet finishing apparatus in use with an image forming apparatus, comprising:

a stacker for stacking recording sheets conveyed in a conveyance direction from the image forming apparatus so as to form a bundle of said recording sheets on said stacker;

an aligning member for aligning said bundle of said recording sheets on said stacker by said aligning member moving in a direction perpendicular to said conveyance direction;

a stapler for stapling said bundle of said recording sheets which are aligned by said aligning member;

a counter for counting a number of said recording sheets bundled on said stacker, and for generating a counting signal; and

a control for controlling said aligning member so that:

a) said aligning member aligns said bundle of said recording sheets a first predetermined time period after a last one of said recording sheets is aligned with other said recording sheets when said number of said recording sheets is less than a predetermined number; and

b) said aligning member aligns said bundle of said recording sheets a second predetermined time period, which is longer than said first predetermined time period, after a last said recording sheet is aligned with said other recording sheets when said number of said recording sheets bundled on said stacker is not less than said predetermined number.

5,590,872

SHEET REVERSING APPARATUS FOR A COPYING MACHINE

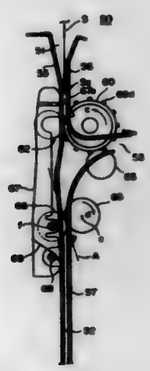
Tadichi Oominami, Chiryu; Toshio Sakata, Toyohashi; Masayoshi Kuroda, Toyokawa; Tomonobu Tamura, Toyokawa; Masami Nakane, Toyokawa, and Kazuhiko Nakatsuka, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Mar. 29, 1995, Ser. No. 412,961

Claims priority, application Japan, Mar. 31, 1994, 6-063552; Jul. 8, 1994, 6-157538; Mar. 17, 1995, 7-058786

Int. Cl.[6] B65H *43/00*

U.S. Cl. 271—176 **18 Claims**



9. A sheet reversing apparatus comprising:

a take-in path;

a reversing path which extends from the take-in path in a substantially same direction;

a take-out path which extends from a junction of the take-in path and the reversing path in a substantially perpendicular direction to the extending direction of the reversing path;

a first reversing roller which is disposed in an entrance portion of the reversing path, the first reversing roller being driven to rotate around an axis in a feed-back direction toward the take-in path at all times; and

a second reversing roller which is capable of coming into contact with and moving away from the first reversing roller, the second reversing roller being freely rotatable around an axis which is provided farther inside the reversing path than the axis of the first reversing roller;

wherein, a sheet is fed from the take-in path to the reversing path, and when a trailing edge of the sheet comes out of the take-in path, the sheet is fed back from the reversing path toward the take-out path.

5,590,873

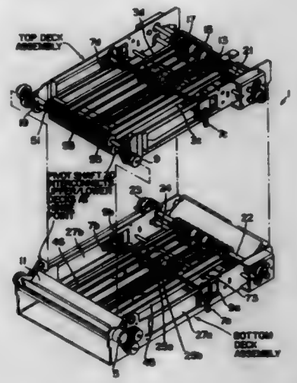
DOCUMENT SET ACCUMULATOR HAVING SHAFT-MOUNTED MULTI-GROOVED PULLEYS FOR TOOL-LESS ADJUSTMENT OF LATERAL BELT POSITIONING

Michael Smart, Easton, Pa., and Steven McCay, Raleigh, N.C., assignors to Bell & Howell Phillipsburg Company, Allentown, Pa.

Filed Oct. 18, 1995, Ser. No. 544,821

Int. Cl.[6] B65H *39/10*

U.S. Cl. 271—303 **8 Claims**



1. A document accumulator capable of tool-less adjustment to accomodate a plurality of paper sizes, comprising:

first and second shaft means laterally oriented across a paper path through said accumulator;

first and second multi-grooved pulley means affixed to said first and second shaft means, respectively;

at least one endless belt extending between said first and second shaft means, said endless belt engaging a first groove of said first multi-grooved pulley means and a first groove of said second multi-grooved pulley means, said belt being translatable without the use of tools into a second groove of said first multi-grooved pulley means and a second groove of said second multi-grooved pulley means for making a paper-size adjustment; and,

means for accumulating a series of documents into a stack of documents.

5,590,874

SAFETY BASE WITH ANCHOR, METHODS OF USING AND MAKING, AND ASSOCIATED TOOL

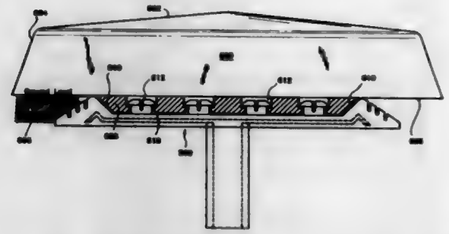
Roger E. Hall, P.O. Box 346, Elizabethtown, Pa. 17022-0346

Continuation-in-part of Ser. No. 448,634, May 15, 1995, which is a division of Ser. No. 940,752, Sep. 8, 1992, Pat. No. 5,415,394, which is a continuation of Ser. No. 669,088, Mar. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 595,577, Oct. 11, 1990, abandoned, which is a division of Ser. No. 442,465, Nov. 30, 1989, Pat. No. 4,979,740, which is a continuation of Ser. No. 194,276, May 16, 1988, abandoned, which is a continuation of Ser. No. 647,534, Sep. 5, 1984, Pat. No. 4,744,561, which is a continuation-in-part of Ser. No. 472,241, Mar. 4, 1983, Pat. No. 4,531,733, which is a continuation-in-part of Ser. No. 395,279, Jul. 6, 1982, Pat. No. 4,398,715, which is a continuation of Ser. No. 234,618, Feb. 17, 1981, abandoned, which is a division of Ser. No. 18,844, Mar. 8, 1979, Pat. No. 4,266,768, which is a continuation-in-part of Ser. No. 758,638, Jan. 12, 1977, abandoned. This application Jun. 7, 1995, Ser. No. 474,151

Int. Cl.[6] A63B *71/00*

U.S. Cl. 473—501 **1 Claim**

1. A ground support structure for releaseably securing an athletic device thereto, comprising:



an athletic device mounting surface;

a member extending below said athletic device mounting surface for securing the position of the ground support structure relative to the ground;

a peripheral rim having an outer beveled surface, said bevel extending upwardly and inwardly from a peripheral edge of said ground support structure, said rim having a peak defining an uppermost extent of said rim;

said athletic device mounting surface being disposed inwardly of said peripheral rim and at a level lower than said peak of said rim, thereby creating a recess at an interior portion of said ground support structure;

said athletic device mounting surface having at least one fastening element disposed thereon for releaseably fastening said athletic device thereto; and

wherein said outer beveled surface of said peripheral rim has at least one groove extending downwardly from the outer beveled surface around at least a portion of a periphery of said rim.

5,590,875

BASEBALL BAT

Gary Young, P.O. Box 1003, Westwego, La. 70094

Filed Aug. 8, 1995, Ser. No. 512,614

Int. Cl.[6] A63B *59/06*

U.S. Cl. 473—457 **6 Claims**



1. A baseball bat device, comprising:

a handle portion; and

a striking portion fixedly attached to said handle portion, said striking portion being provided with means for generating an audible signal as the baseball bat moves through the air, said means for generating the audible signal comprising a hollow tube positioned inside the striking portion, a movable element which slides within said hollow tube and means for allowing fluid communication between an interior of the hollow tube and exterior of the striking portion, and wherein a resilient spring is mounted in each of the opposite ends of the hollow tube, so that the movable element is urged to move in an opposite direction after it has contacted one of the springs.

5,590,876

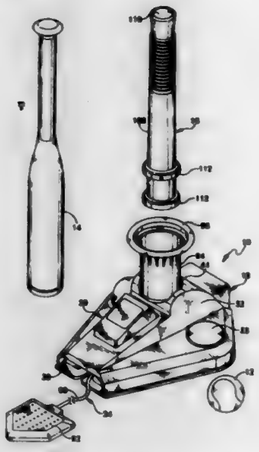
BALL TOSSING DEVICE

Joseph P. Sejnowski, Cumberland, R.I., assignor to Hasbro, Inc., Pawtucket, R.I.

Filed Apr. 3, 1995, Ser. No. 415,866

Int. Cl.[6] A63B *69/40*

U.S. Cl. 473—417 **7 Claims**



1. A ball tossing device for tossing a ball into the air comprising:

a base receivable on a supporting surface;

tossing means on said base for tossing said ball into the air in each of a plurality of selected tossing directions, said tossing means including direction control means including a launching tube which is selectively operable for alternatively causing said ball tossing means to toss said ball into the air from said launching tube in a first tossing direction which extends substantially vertically upwardly from said base or a different second tossing direction which extends upwardly and outwardly therefrom, said tossing means further including actuating means for remotely actuating said tossing means to toss said ball into the air; and

a batting tee receivable, in said launching tube when said launching tube is in a position corresponding to said first tossing direction for supporting said ball in upwardly spaced relation to said base.

5,590,877

RACKET STRING BRACING APPARATUS

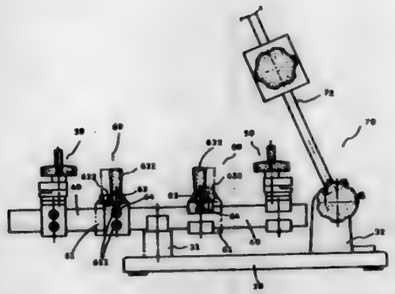
Ping-Sen Ho, P.O. Box 82-144, Taipei, Taiwan

Filed May 7, 1996, Ser. No. 646,091

Int. Cl.[6] A63B *51/14*

U.S. Cl. 473—556 **1 Claim**

1. A racket string bracing apparatus comprising a base, a work table mounted on said base, two internal racket frame holders and two external racket frame holders respectively mounted on said work table to hold down the racket frame to be strung with a string, and a string bracing mechanism mounted on said work table and turned to stretch the string, wherein:



said base comprises a column sleeve at one end, which holds said work table, permitting said work table to be turned thereabout, and a substantially U-shaped upright support at an opposite end, which holds said string bracing mechanism;

said string bracing mechanism comprises an axle horizontally mounted on the upright support of said base and turned on its own axis, a one-way rotary wheel mounted around said axle, a hand wheel fixedly mounted around said axle at one end, a gear fixedly mounted around said axle between said hand wheel and said one-way rotary wheel, a string holding-down mechanism fixedly mounted around said axle and controlled to hold down the string, a level coupled to said one-way rotary wheel for turning it, a pawl turned about a bolt on the upright support of said base and forced into engagement with said gear to stop said axle from reverse rotation;

each of said external racket frame holders comprises a slide slidably mounted on said work table and fixed in place by a tightening up screw, a transverse sleeve welded to said slide, two horizontal extension bars respectively and longitudinally slidably inserted into two opposite ends of said transverse sleeve and fixed in place by a respective tightening up screw, and two stop rods respectively perpendicularly fastened to said horizontal extension bars at respective locations remote from said transverse sleeve.

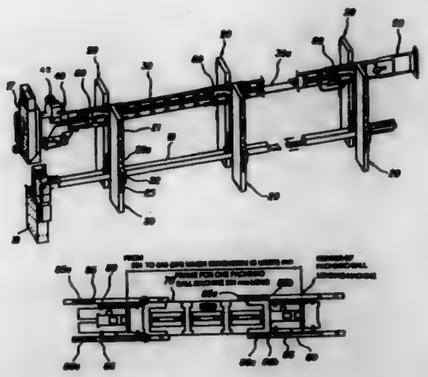
5,590,878
GAMING MACHINE ISLAND HAVING A BILL TRANSPORTER ADJUSTABLE TO MATCH THE BILL SLOTS OF GAMING MACHINES OF DIFFERENT DIMENSIONS

Takatoshi Takemoto, Tokyo; Hideyuki Kadomatsu, Odawara, and Etsuro Suzuki, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

PCT No. PCT/JP94/01538, § 371 Date May 19, 1995, § 102(e) Date May 19, 1995, PCT Pub. No. WO95/08373, PCT Pub. Date Mar. 30, 1995
PCT Filed Sep. 19, 1994, Ser. No. 433,411
Claims priority, application Japan, Sep. 20, 1993, 5-233188
Int. Cl.[6] A63F 7/36
U.S. Cl. 273—121 B 6 Claims

1. A gaming machine island comprising a gaming machine row consisting of a plurality of gaming machines, for players to play games with game play media, arranged in a row, game play media leading machines, each placed between the gaming machines for dispensing the game play media when a bill is inserted, and a bill transporter for transporting bills in a main bill transport passage formed along the gaming machine row, wherein the game play media leading machines and introduction passages are formed for guiding bills from the game play media leading machines to the main bill transport passage, characterized in that:

said bill transporter comprises introduction units, each having an introduction frame formed with at least said introduction passage, and transport units, each having a transport frame formed with at least a part of said main bill transport passage, said transport units being connected to said introduction units so as to enable the main bill transport passage of the transport



frames to receive bills passed through the introduction passages of said introduction units; in that

each of said introduction frames has a guide member extending in a direction parallel with the main bill transport passage; in that

each of said transport frames has a guided member extending in a direction parallel with the main bill transport passage and fitted into said guide member of said introduction frame; in that

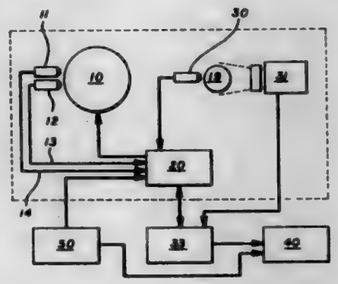
either of said guide and guided members is formed with a hole elongated in a direction parallel with the main bill transport passage; and in that

said guided member of said transport unit is fitted into said guide member of said introduction unit and a screw is inserted into the elongated hole made in one member of said guide and guided members and is screwed in the other member for connecting both the introduction and transport units in order for the position of the transport unit and introduction unit to be expanded or contracted for adjustment in a transport direction in order to match the outer frame dimensions of a respective gaming machine and game play media leading machine for proper bill transportation from the bill slot to the bill transporter.

5,590,879
METHOD AND APPARATUS FOR AUTOMATIC RANDOM SELECTION IDENTIFICATION

Warren W. Tripp, 2070 Driscoll Dr., Reno, Nev. 89509

Filed Jun. 12, 1995, Ser. No. 489,606
Int. Cl.[6] A63F 3/06
U.S. Cl. 273—144 R 6 Claims



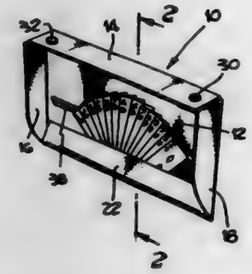
1. The method of selecting and displaying certain indicium at random from a plurality of indicia comprising: placing indicium on a plurality of items; mixing the items and holding the items in suspension in a chamber by blowing air within the chamber;

selecting items, one at a time, by an item selector means; placing each item, as selected, in a socket within a moving wheel carrying a plurality of sockets; detecting the accuracy of placement of each item within the appropriate socket by detection sensors; reading the indicium of each item as selected by an item detector; viewing the indicium of each item; and displaying each indicium, on a display board as the indicium is selected.

5,590,880
PLAYING CARD HOLDER

Frederick H. Flam, 31203 Via Margarita, Bonsall, Calif. 92003

Filed Oct. 23, 1995, Ser. No. 551,922
Int. Cl.[6] A63F 1/10
U.S. Cl. 273—150 5 Claims

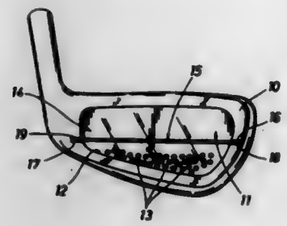


1. A playing card holder having a back, sides and a top, said sides and top substantially circumscribing and overhanging said holder back to form a shell; means forming a pocket within said shell and sized removably to receive a series of playing cards with their top edges exposed for view by the player of the cards; said top and sides shielding said playing cards from all but frontal view.

5,590,881
WEIGHTED GOLF IRON AND METHOD OF MAKING SAME

Doyle D. Jernigan, 3639 Rolling Forest, Spring, Tex. 77388

Filed Jul. 29, 1994, Ser. No. 282,970
Int. Cl.[6] A63B 53/04
U.S. Cl. 473—324 7 Claims



1. In a golf iron having a cavity defined by walls, the cavity filled with a plurality of weights and epoxy, an improvement comprising

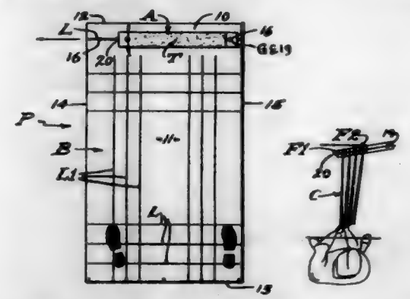
a divider dimensioned to be contained within and traverse the cavity from wall to wall; and

means for attaching the divider to wall portions of the cavity.

5,590,882
DIAGNOSTIC APPARATUS FOR GOLFCLUB SWING PRACTICE

John M. Todd, 7866 Hillary Dr., West Hills, Calif. 91304

Filed Jun. 5, 1995, Ser. No. 461,433
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—218 19 Claims



1. A diagnostic apparatus for golf club swing practice to determine the extent of any lateral forces applied during a swing at a golf ball position thereon, and including;

a platform comprised of a planar base member having a swing portion with a ball-to-target line, and having a stance portion for a golfer facing the swing portion,

a shiftable member with a turf simulating surface and frictionally engaged upon the base for free lateral displacement from said target line,

a golf club engageable force responsive means at the turf simulating surface of the shiftable member,

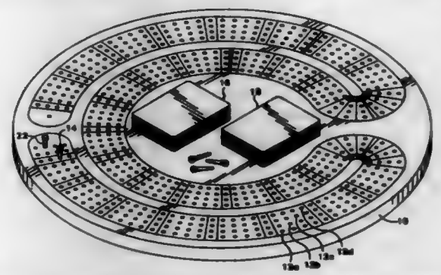
at least one foot placement line on the stance portion of the base member, said placement line being placed with respect to said target line and said ball position,

whereby the golfer's stance with respect to the turf simulating surface of the shiftable member is determined by the placement of the golfer's feet in a known proximity to at least one placement line, and by observing any lateral movement of the shiftable member after a golf club swing as may be caused by forceful engagement of the golf club head with the force responsive means.

5,590,883
CRIBBAGE GAME

Jeffrey D. Brewer, 11204 SE. Home Ave., Milwaukie, Oreg. 97222

Filed Jun. 16, 1995, Ser. No. 491,087
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—249 21 Claims

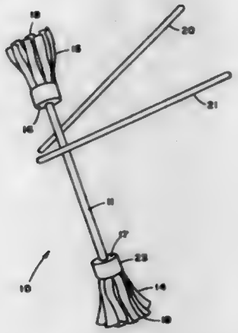


1. A combination of playing cards and a playing board for playing an improved game of cribbage comprising:

a game board having a plurality of predetermined positions defining parallel scoring tracks, said plurality of predeter-

mined positions including a plurality of peg card positions having indicia distinguishing said peg card positions from the remainder of said plurality of predetermined positions;
game pieces for marking each player's progress along the scoring tracks;
a deck of playing cards including four suits of cards including spades, hearts, diamonds and clubs, each suit including an ace having a value of one point, two through ten each having a point value equal to their face value, and a jack, queen, and king each having a value of 10 points; and
a deck of peg cards, each peg card bearing a specified change to the course of play which introduces an additional chance element into the game.

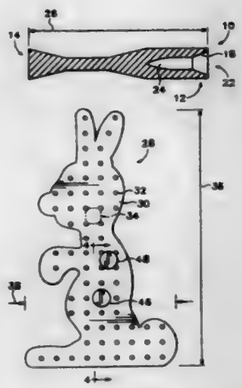
5,590,884
MANIPULATIVE STICK GAME
Ziv Goldberg, Ashdod, Israel, assignor to Stik-Tak, Ltd., Tel Aviv, Israel
Filed Jan. 2, 1996, Ser. No. 582,153
Int. Cl.[6] A63B *67/00*
U.S. Cl. 473—514 **12 Claims**



1. A game comprising a main stick connected at opposite ends thereof to respective endcaps each having a respective inner-facing surface, and a pair of manipulator sticks for holding by a player for manipulating the main stick at the inner-facing surface of one of the endcaps on either side of the main stick; wherein:
a total combined weight of the main stick and the endcaps lies within a range of 104.5±50 g,
the main stick has a length within a range of 52±20 cm,
the inner-facing surface of each endcap has a diameter within a range of 1.75 to 10.75 cm, and
the endcaps are separated by a distance of 40±20 cm.

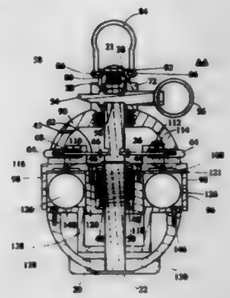
5,590,885
SAFETY DART BOARD GAME
Garnard E. Graham, and Mary E. Graham, both of P.O. Box 2318, Battle Ground, Wash. 98604-2318
Filed Nov. 29, 1995, Ser. No. 565,644
Int. Cl.[6] F41J *3/00*
U.S. Cl. 273—348.5 **8 Claims**

1. A safety dart game apparatus comprising:
a dart including an open leading end portion having a side wall that defines an interior cavity wherein the interior cavity has an open end at the leading end portion of the dart and a tapered end portion opposite the open end; and
a target including a base and a plurality of spaced, finger-like projections extending generally outwardly from the base, the projections having a diameter sized to frictionally engage the interior cavity of the dart when the dart is projected onto the target,



wherein the projections have tapered ends positioned opposite the base, the tapered end portion of the interior cavity of the dart.

5,590,886
REUSABLE PAINT BALL GRENADE, RELOADABLE WITH STANDARD .68 CALIBER PAINT BALLS
Craig L. Lush, 8148 Cliffview Ave., Springfield, Va. 22153
Filed Aug. 1, 1995, Ser. No. 510,101
Int. Cl.[6] A63B *65/00*
U.S. Cl. 473—577 **4 Claims**



1. A paint ball grenade comprising:
a base member comprising a generally semi-spherical hollow shell having a lining extending across the open end thereof;
a top member comprising a generally semi-spherical hollow shell having a planar member extending across the open end thereof, said planar member being located opposite to and in facing relationship with the lining, and a hollow tubular cap member defined by a wall centrally secured to and extending upwardly and outwardly from the top member shell, said cap having a pair of apertures located opposite each other in the wall thereof;
a post extending upwardly from the base member shell, through the hollow interiors of the base member shell and top member shell and into the tubular cap member, said post having a bore extending transversely there through the upper end thereof, said post being fixed relative to the base member shell and the top member and cap being slidably moveable along the post between a first position in which the liner and planar member are spaced apart by a gap sufficient to receive there between one or more paint balls and the apertures in the cap are aligned with the bore in the post, and a second position wherein said liner and planar member substantially abut for squeezing paint from any paint ball positioned therebetween;

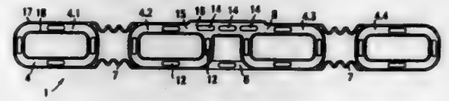
a spring connected between the post and top member for biasing the latter to the second position;
a depending guard member secured about the top member and extending toward the base member a distance sufficient to cover the gap when the top member is in the first position to guard against a user inserting a finger between the liner and planar members and to help retain any paint ball positioned in the gap within the grenade, said guard member having one or more paint dispersal ports to permit expulsion of paint from the interior of the grenade when the top member moves from the first to the second positions, and also having a door for insertion of paint balls into the gap when the top member is in the first position;
a safety pin for insertion through the apertures in the wall of the cap and bore of the post when the top member is in the first position for locking the top in that position against movement to the second position and;
means interacting between the top member and post for temporarily holding the top member in the first position when the pin is removed and for releasing the top member for movement to the second position under the influence of the spring upon the application of an impact force to the grenade;
whereby one or more paint balls may be inserted into the grenade through the door into the gap when the top is held in the first position by the pin, the pin may be removed and the grenade thrown, and upon impact the top member will slide along the post to close the gap, squeezing the paint balls to rupture them and release the paint therefrom for ejection through the ports.

5,590,887
SEALING APPARATUS
Masanobu Senda; Yasuhiko Ogino, and Toshikazu Funahashi, all of Aichi-ken, Japan, assignors to Toyoda Gosei Co., Ltd., Japan
Filed Dec. 21, 1993, Ser. No. 169,666
Claims priority, application Japan, Dec. 22, 1992, 4-342612
Int. Cl.[6] F16J *15/32*
U.S. Cl. 277—205 **2 Claims**



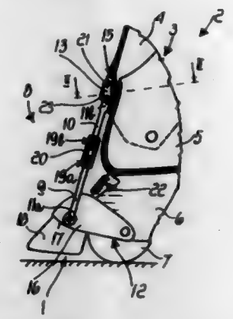
1. Apparatus for providing a sliding seal between a metal surface and a member sliding along said metal surface comprising:
a seal body formed from an ethylene-propylene polymer having alkyl lateral groups, said seal body being located on said sliding member,
said seal body having a sealing portion and an outer surface in sliding contact with said metal surface for sealing between said metal surface and said sliding member,
said outer surface having been treated by plasma to a depth from 10 to 1000 nm such that a portion of the hydrogen of the alkyl groups is replaced by fluorine so that the outer surface has a fluoride ratio from 0.1 to 1.2.

5,590,888
SEAL FOR THE GAS-TIGHT MOUNTING OF AN INTAKE MANIFOLD ON THE CYLINDER HEAD OF AN INTERNAL COMBUSTION ENGINE
Michael Brümmer, Laudenbach, and Klaus Döhring, München, both of Germany, assignors to Firma Carl Freudenberg, Germany
Filed Dec. 10, 1993, Ser. No. 165,150
Claims priority, application Germany, Dec. 11, 1992, 42 41 759.7
Int. Cl.[6] F16J *15/00*
U.S. Cl. 277—235 B **3 Claims**



1. A seal used to seal an intake manifold in a gas-tight manner on a cylinder head of an internal combustion engine, comprising:
a one-piece elastomeric seal element, said seal element comprising sealing surfaces sealable against a side of an intake manifold flange facing said cylinder head, said sealing surfaces sealingly surrounding a periphery of intake pipes of said intake manifold, said seal element further comprising at least one web segment interconnecting one of said sealing surfaces with another of said sealing surfaces, said at least one web segment providing linear tolerance compensation and being flexurally pliant, said at least one web segment having an undulated shape and being capable of folding together.

5,590,889
BRAKING DEVICE PARTICULARLY FOR SKATES
Alessandro Pozzobon, via Brigata Julia, 10 Giavera del Montello Prov. Treviso, Italy
Continuation of Ser. No. 184,705, Jan. 21, 1994, Pat. No. 5,462,296. This application Jul. 20, 1995, Ser. No. 504,534
Claims priority, application Italy, Jan. 29, 1993, TV93A0009
Int. Cl.[6] A63C *17/14*
U.S. Cl. 280—11.2 **13 Claims**



1. In a skate comprising
a longitudinally-extending frame adapted to support a plurality of wheels,
a quarter mounted above said frame for forward and rearward pivotal movement relative to said frame,
a braking element positioned rearwardly of said frame for upward and downward movement relative to said frame, and
an actuator interconnected between said quarter and said braking element such that said actuator causes said braking element to move towards and away from the ground in response to rearward and forward movement of said quarter relative to said frame,
that improvement wherein said actuator comprises:

a first member having a first end thereof connected to said quarter for pivotal movement relative to said quarter;

a second member having a first end thereof connected to said braking element for pivotal movement relative to said braking element,

a second end of said second member being connected to a second end of said first member such that said first and second members are pivotal relative to each other between (i) a first position in which said first and second members are generally aligned with each other and said first end of said first member is on the side of said second end of said second member opposite said first end of said second member and (ii) a second position,

the distance between said first end of said first member and said first end of said second member when said members are in said first position being greater than when said members are in said second position whereby said braking element is movable downwardly to interact with a braking surface upon a degree of backward movement of said support when said first and second members are in said first position, and said degree of backward movement is insufficient to cause said braking element to move a distance sufficient to interact with said braking surface when said first and second members are in said second position; and,

means for releasably maintaining said first member and said second member in said first position.

5,590,890

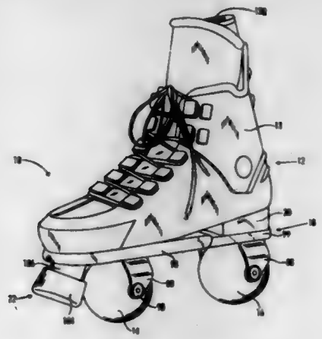
ROLLER SKATE

Francesco Rosso; Giuseppe A. Rosso, and Ettore Carenini, all of Turin, Italy, assignors to Jack L. Forcelledo, Los Angeles, Calif.

Continuation-in-part of Ser. No. 831,392, Feb. 7, 1992, Pat. No. Des. 337,985. This application May 12, 1993, Ser. No. 61,583

Int. Cl.[6] A63C *17/04*

U.S. Cl. 280—11.22 **12 Claims**



1. An improved skate device comprising:

(a) a plurality of wheels, each wheel having

(i) an axis of rotation,

(ii) a generally spherical outer peripheral shape with an indentation at each location at which the axis of rotation traverses the generally spherical outer periphery of the wheel, and

(iii) a core adjacent the generally spherical outer periphery of the wheel, the core having

(A) a generally hollow outer shell defining an inner peripheral surface and an outer peripheral surface,

(B) an axis of rotation in common with the axis of rotation of the wheel,

(C) a generally spherical shaped peripheral surface with a generally cylindrical indentation at each location at which the axis of rotation of the wheel traverses the peripheral surface of the shell,

(D) an axle housing extending along the axis of rotation of the wheel, and

(E) a plurality of spokes extending from the axle housing to the inner peripheral surface of the outer shell and extending along substantially the entire length of the axle housing; and

(b) a bracket coupled to the wheels, the bracket having a base and at least one arm associated with each wheel, the at least one arm being connected to its associated wheel inside one of said indentations.

5,590,891

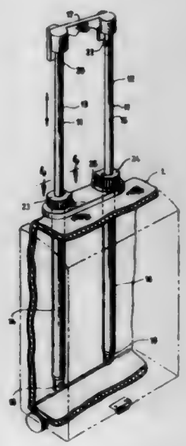
CART AND LUGGAGE HANDLE ASSEMBLY WITH ROTATABLE RELEASE MEMBER

Eugene A. Kazmark, Jr., Joliet, Ill., assignor to Remin Laboratories, Inc., Joliet, Ill.

Filed May 26, 1993, Ser. No. 67,223

Int. Cl.[6] B62B *3/02*

U.S. Cl. 280—37 **7 Claims**



4. A handle assembly for wheeled carts or luggage, said assembly comprising:

(a) a first tube assembly including first and second tubes, the first tube extending into the second tube in telescoping relation with the second tube;

(b) a second tube assembly including third and fourth tubes, the third tube extending into the fourth tube in telescoping relation with the fourth tube;

(c) said first and second tube assemblies disposed in substantially parallel relation;

(d) latching means disposed in the first and second tube assemblies for locking one tube of each assembly relative to the other tube;

(e) release means for each tube assembly, each of said release means cooperating with the corresponding tube assembly and disposed circumjacent the tubes of the assembly for rotation about an axis which lies generally parallel to the longitudinal axes of the tubes, said release means including means for unlatching the latching means and allowing sliding movement of the first relative to the second tube.

5,590,892

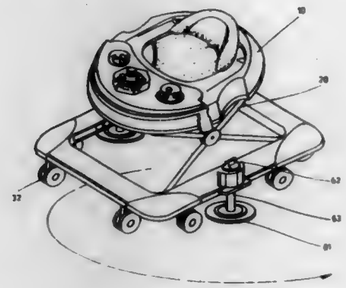
BABY'S CARRIAGE FOR TEACHING CHILDREN TO WALK

Stephen Hu, No. 2, Ta Tou Road, Hsinchu Industrial Area, Hu Kou, Hsinchu, Taiwan

Filed Mar. 1, 1995, Ser. No. 396,956

Int. Cl.[6] B62B *9/08*

U.S. Cl. 280—87.051 **5 Claims**



1. A carriage for teaching children to walk, comprising:

an upper support member;

a child's seat supported by said upper support member;

a lower support member having a front portion, a rear portion, two opposed lateral portions, and an opening formed therebetween for receiving the feet of a seated child;

at least two support rods for maintaining said upper support member at an elevated position relative to said lower support member;

a plurality of ground engaging wheels affixed to a bottom surface of each one of said opposed lateral portions of said lower support member; and

braking and slide-resisting means including a cylinder fixedly secured to one of said opposed lateral portions, a shaft rotatably received within said cylinder and extendible along a vertical axis from a lower end of said cylinder, a control member located at an upper end of said cylinder and rotatable about said vertical axis for extending and retracting said shaft relative to said cylinder, and a ground engageable pad rotatably attached to a lower end of said shaft, wherein said control member is adapted to extend said shaft downwardly to position said pad directly below said one lateral portion and to lift the plurality of wheels of said one lateral portion out of ground engagement, thereby permitting said carriage to rotate about said vertical axis extending through said shaft.

5,590,893

WHEELCHAIR FRAME ASSEMBLY

William G. Robinson, and James C. Thorpe, both of Fresno, Calif., assignors to No Limit Designs, Inc., Fresno, Calif.

Filed Dec. 28, 1994, Ser. No. 365,261

Int. Cl.[6] B62M *1/14*

U.S. Cl. 280—250.1 **22 Claims**

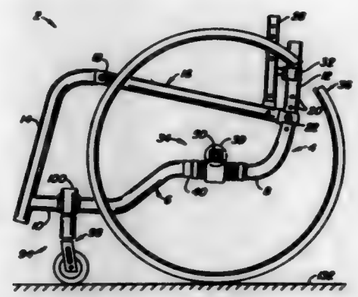
1. A wheelchair axle assembly, used to mount a wheelchair drive wheel to the frame of a wheelchair, comprising:

an axle adjustment member securable to the wheelchair frame and having an outer surface;

an axle housing, defining an axle bore, mounted to the axle adjustment member, the axle bore defining a drive wheel axis;

means for toollessly securing the axle housing to the axle adjustment member; and

said toollessly securing means including means for varying the angular attitude of the axle housing relative to the wheelchair frame thereby varying the angular attitude of the drive wheel axis and thus the camber of the drive wheel.



5,590,894

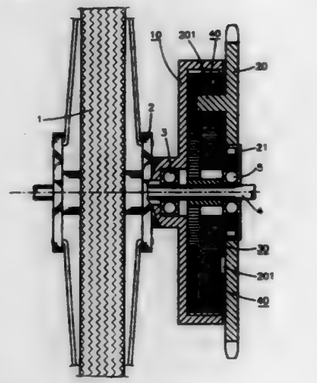
BICYCLE DRIVE DEVICE

Cheng-Tsu Wen, 2nd Fl., No. 140, Sec. 2, Hsingjen Rd., Chungli City, Taoyuan, Taiwan

Filed Jan. 10, 1994, Ser. No. 179,386

Int. Cl.[6] B62M *1/02*

U.S. Cl. 280—260 **1 Claim**



1. A bicycle drive system comprising:

a chain;

at least one wheel having opposing sides and a wheel axle;

a hub secured to said wheel and rotatively mounted on said wheel axle, said hub having an external gear drive mounting section;

a ring gear located within said external gear drive mounting section and fixedly secured to the hub of the wheel for rotation therewith about the wheel axle;

a rear chain wheel rotatively mounted on said wheel axle located external to and adjacent said ring gear, said rear chain wheel being engaged with the chain to be rotatively driven responsive to displacement of said chain, said rear chain wheel having three radially and equidistantly spaced base axles extending from one side thereof;

a sun gear mounted on said wheel axle for rotation around said axle in a unidirectional displacement, said sun gear being disposed in concentric relationship with said ring gear;

a unidirectional bearing rotatively mounted on said axle coupling said rear chain wheel and said sun gear thereby providing said unidirectional displacement of said sun gear: and,

three planet gears disposed between said ring gear and said sun gear, each of said three planet gears being rotatively coupled to a respective one of said three base axles and meshingly engaged with both said ring gear and said sun gear, said ring gear being driven by rotation of said planet gears relative to said sun gear responsive to displacement of the chain in a first rotative direction with said sun gear being locked against

rotation by said unidirectional bearing, said planet gears acting as idlers responsive to rotation of the chain in a second rotative direction, said second rotative direction being opposite said first rotative direction.

5,590,895

COLLAPSIBLE BICYCLE FRAME

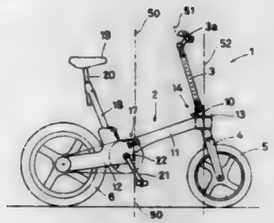
Koji Hiramoto, Hirakata, Japan, assignor to Exedy Corporation, Osaka, Japan

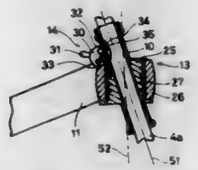
Filed Mar. 1, 1995, Ser. No. 396,831

Claims priority, application Japan, Mar. 8, 1994, 6-037040

Int. Cl.[6] B62K *15/00*

U.S. Cl. 280—278 **5 Claims**





1. A collapsible bicycle frame comprising:

a front frame member having a head tube frame member rigidly attached to a forward section thereof, said head tube frame member having a bore formed therein defining a first axis;

a rear frame member configured to support a rear wheel, hinged to said front frame member for rotation about a second axis that is generally vertical when the bicycle frame is upright and in a generally rideable position:

a rotatable support member supported within said head tube frame member to be rotatable about said first axis, said rotatable support member having a bore defining a third axis inclined at an acute angle with respect to said first axis such that said first axis and said third axis intersect at a single point within said head tube frame member;

a front fork stem configured to support a front wheel supported in said rotatable support member, said front fork stem being rotatable in said rotatable support member about said third axis;

a first locking mechanism disposed on said rotatable support member, said first locking mechanism having a lock position and a release position, said first locking mechanism restricting rotation of said rotatable support member with respect to said head tube frame member when in said lock position, said first locking mechanism permitting rotation of said rotatable support member with respect to said head tube frame member when in said release position; and

a second locking mechanism which selectively locks said front frame member and rear frame member restricting relative movement therebetween.

5,590,896

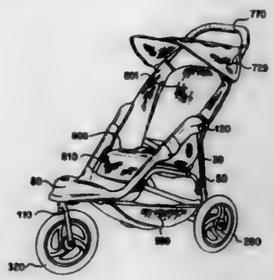
STROLLER

Anthony E. Eichhorn, East Amherst, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.

Filed Sep. 9, 1994, Ser. No. 304,663

Int. Cl.[6] B62B *3/02*

U.S. Cl. 280—642 **7 Claims**



1. A folding stroller having a frame with a substantially centered longitudinal axis, comprising:

a front wheel positioned substantially on the longitudinal axis;

a front member having a front wheel supporting portion for supporting said front wheel, and a pair of front member ends;

a rear handle member having a handle portion and a pair of handle member ends, pivotally coupled to said front member ends;

a pair of rear wheels both laterally offset from the longitudinal axis;

a rear support member having a pair of rear wheel supporting portions, each said rear wheel supporting portion supporting a respective one of said rear wheels, and said rear support member having a pair of rear support member ends pivotally connected to said handle member; and

a pair of side members each having a first side member end and a second side member end,

wherein, said rear support member ends and said first side member ends are each pivotally connected to said front member between said front wheel supporting portion and one said front member and, respectively, and said second side member ends are each pivotally coupled to said rear member between one said rear wheel supporting portion and are said rear support member end, respectively.

5,590,897

STRUCTURE OF CARRIAGE

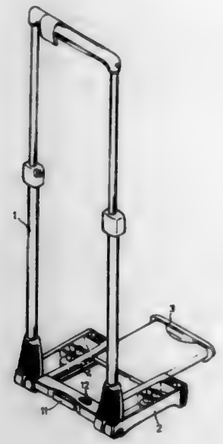
James Tsai, 103, Ta Ming 1 Rd., Tung Pao Tsun, Tun Tzu Hsiang, Taichung Hsien, Taiwan

Filed Dec. 6, 1994, Ser. No. 354,043

Int. Cl.[6] B62B *1/12*

U.S. Cl. 280—655 **2 Claims**

1. A carriage comprising wheels attached to said carriage a base frame and a retractable handle vertically mounted on said base frame, wherein said base frame comprises a track in the middle, a slide plate moved in and out of said track, spring means connected between said track and said slide plate to force said slide plate out of said track, and lock means controlled to lock said slide plate inside said track.



5,590,898

VEHICLE SUSPENSION SYSTEM

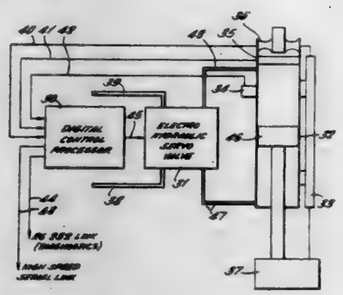
David A. Williams, Milton Keynes, United Kingdom, and Neil Jones, Palm City, Fla., assignors to Group Lotus PLC, United Kingdom

Continuation of Ser. No. 380,153, Jan. 30, 1995, abandoned, which is a continuation of Ser. No. 145,291, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 777,557, Feb. 12, 1992, abandoned. This application Sep. 21, 1995, Ser. No. 531,394

Claims priority, application United Kingdom, Jun. 15, 1989, 8913809

Int. Cl.[6] B60G *17/015*

U.S. Cl. 280—707 **6 Claims**



1. A vehicle suspension system comprising:

at least one vehicle suspension device attachable to a vehicle body and a wheel and at least one wheel and hub assembly for controlling displacement of the wheel and hub assembly relative to the vehicle body comprising:

hydraulic actuator means,

first attachment means connected to the hydraulic actuator means for attaching the hydraulic actuator means to the wheel and hub assembly,

second attachment means connected to the hydraulic actuator means for attaching the hydraulic actuator means to the vehicle body,

force measuring means for measuring force transmitted from the wheel and hub assembly to the vehicle body through the hydraulic actuator means when said hydraulic actuator means is attached by said first attachment means to the wheel and hub assembly and by said second attachment means to the vehicle body, the force measuring means generating a signal representative of the measured force,

displacement measuring means for measuring extension and contraction of the hydraulic actuator means and for generating a signal representative of the measured extension and contraction,

an electro-hydraulic servo-valve connected to the hydraulic actuator means and controllable by an electrical control input signal and connectable to fluid supply and return lines, and

first control means for processing the signals produced by the force measuring means and the displacement measuring means and for generating a first control signal for controlling the electro-hydraulic servo-value, the first control signal controlling the electro-hydraulic servo-valve to regulate flow of fluid to and from the hydraulic actuator means and thereby controlling the extension and contraction of the hydraulic actuator means;

second control means for generating a second control signal and located in the vehicle body; and

first connection means for connecting the vehicle suspension device to the second control means, the first connection means being operable to connect the force measuring means, the displacement measuring means and the first control means to the second control means;

wherein the first control means, the electro-hydraulic servo-valve, the hydraulic actuator means, the displacement measuring means and the force measuring means are all included in an autonomous exchangeable unit,

wherein the first control means, the electro-hydraulic servo-valve, the hydraulic actuator means, the displacement measuring means and the force measuring means together constitute means for simulating an independent spring and damper arrangement connected between the vehicle body and the wheel and hub assembly, the first control means using control algorithms to simulate the independent spring and damper arrangement and generating the first control signal which demands an extension of the hydraulic actuator means which is on average constant, and

wherein the first control means, the electro-hydraulic servo-valve, the hydraulic actuator means, the displacement measuring means and the force measuring means also constitute part of means for simulating modal springs and dampers for the vehicle when connected by the first connection means to the second control means;

wherein the vehicle suspension device further comprises means for combining the first control signal with the second control signal, and received via the first connection means, and responsively generating the electrical control input signal in such a way that the average extension of the hydraulic actuator means can be controlled by the second control signal.

5,590,899

AIRBAG DEVICE

Naoki Nakane, Toyota; Kazuo Sakakibara, Okazaki; Tadashi Ozaki, Gamagoori, and Koji Ohtaka, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 14, 1995, Ser. No. 421,968

Claims priority, application Japan, Apr. 18, 1994, 6-104809; Feb. 27, 1995, 7-064925

Int. Cl.[6] B60R *21/16;21/32*

U.S. Cl. 280—728.2 **22 Claims**

1. An airbag device comprising:

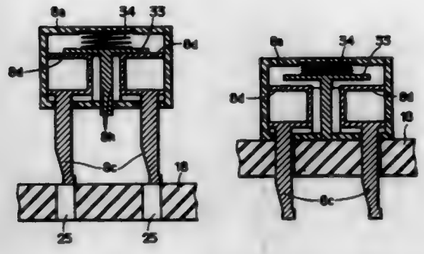
an inflator generating gas at time of operation;

an airbag which is deployed by the gas from said inflator;

deceleration detection means for detecting a deceleration in case of a vehicle collision and outputting a detection signal;

an electronic control circuit for determining based on the detection signal from said deceleration detection means whether the vehicle collision has occurred and outputting an operational signal to cause said inflator to operate;

a pad for containing said inflator, said airbag and said electronic control circuit;



connecting member having a plurality of terminals and attached to an end of the electronic control circuit side of a connecting cable transmitting the operational signal to the inflator; and

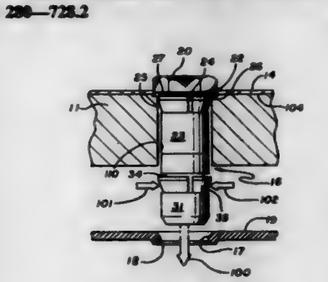
shorting member for short-circuiting said terminals at least until said terminals are electrically connected to the electronic control circuit, the electrical connection being made by inserting the terminals in attachment holes of a board on which said electronic control circuit is formed.

5,590,900

AIR BAG MOUNTING SYSTEM

John A. Duran, Glendora; Javier Vargas, Upland, both of Calif., and Merle K. Ricks, Layton, Utah, assignors to Avibank Mfg., Inc., Burbank, Calif., and Morton International, Inc., Chicago, Ill.

Filed Jul. 21, 1995, Ser. No. 505,622
Int. Cl.[6] B60R *21/20;* **F16B** *21/18;35/02*
U.S. Cl. 280—728.2 **32 Claims**





12. In an air bag module having a mounting plate, and a plurality of spaced bolt assemblies extending from said mounting plate, each of said bolt assemblies comprising:

a first bolt connected to said mounting plate having an integral shank portion and having a threaded portion on an interior thereof;

a second bolt having an enlarged head, said second bolt having an integral shank portion with a reduced neck portion between said shank portion and said head of said second bolt, a threaded portion extending from said shank portion of said second bolt threadably engaging said threaded portion in said shank portion of said first bolt; and

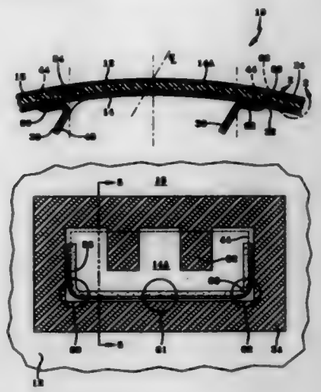
a split ring mounted in said reduced neck portion of said second bolt.

5,590,901

METHOD AND APPARATUS FOR VEHICLE TRIM PANEL HAVING HIDDEN AIR BAG DOOR

Cline J. MacGregor, Lancaster, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 14, 1994, Ser. No. 306,835
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.3 **14 Claims**



1. A trim panel in a motor vehicle having an inner side adapted to at least partially enclose an air bag supplemental restraint system, the panel having an outer side designed to be viewed by a passenger in the motor vehicle, the panel comprising:

a trim element disposed on the outer side of the trim panel having a first area being distinguished from the remainder of the trim element by a predetermined joint, the joint being obscured from view of the passenger, the trim element having slits therein from an outer side to an inner side along said joint, the trim element being made of a trim material being capable of changing the slits from an initial, open configuration to a second, closed configuration by moving opposing sides of the slits together, whereby the slits are undetectable by the passenger;

a substrate disposed on the inner side of the trim panel, the substrate having an opening therein for the deployment of the air bag;

a door bonded along its periphery to the substrate around the opening, the door being positioned beneath the joint; and,

foam material on the inner side of the panel disposed between the substrate and the trim element, the foam material being prevented from passing through the slits in the trim element due to the movement of the opposing sides of the slits.

13. A method of producing a trim panel in a motor vehicle, the panel having an inner side adapted to at least partially enclose an air bag supplemental restraint system, the method comprising the steps of:

forming a trim element of a trim material;

reinforcing an inner side of the trim element around a generally rectangular first area with a reinforcing member, the perimeter of the first area defining a joint;

cutting a slit in the trim element which extends from the inner side to an outer side of the trim element along the joint, the slit having a first configuration characterized by a wider gap in the inner side and a narrower gap in the outer side, the trim material being capable of moving opposing sides of the slit together so that the slit is imperceptible when the trim element is viewed from the outer side;

applying a release element to the inner side of the trim element along a portion of the joint, the release element at least covering the slit;

adhesively bonding a generally rectangular door to a periphery of an opening in a substrate;

loading the reinforced trim element into a mold;

loading the substrate into the mold so that the door bonded to the substrate will be aligned with the joint in the trim element upon closure of the mold; and,

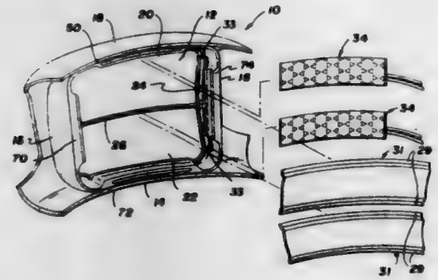
introducing adhesive foam onto the inner side of the trim element.

5,590,902

AIR BAG COVER HAVING A SWITCH ASSEMBLY DISPOSED THEREIN

Thomas L. Eckhout, Waterford, Mich., assignor to Larry J. Winget, Leonard, Mich.

Continuation-in-part of Ser. No. 140,669, Oct. 21, 1993, abandoned, and Ser. No. 248,556, May 24, 1994, abandoned, which is a continuation of Ser. No. 984,326, Dec. 2, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 407,925
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—728.3 **15 Claims**



1. A plastic molded, snap-on air bag cover mountable onto an air bag assembly including and open at a side position about the periphery of the rear panel a retaining member, the cover comprising:

a front cover having inner and outer surfaces adapted to overlie an uninflated air bag and being separable along a first prescribed tear pattern upon deployment of the air bag;

a switch assembly which includes a flexural material lying behind the inner surface of the front cover;

a rear panel secured to the inner surface of the front cover in containing relation to the switch assembly to form a hollow compartment for the switch assembly;

first and second side panels connected to opposite sides of said front cover;

a resilient clip member extending from each of said side panels, each clip member having an extending snap-on groove defined therein adapted to cooperate with said retaining member for affixing said air bag cover to said air bag container wherein the switch assembly is removably secured within the hollow compartment and wherein one of the first and second side panels includes a slot formed completely therethrough to remove the switch assembly from the cover to facilitate repair and replacement of the switch assembly.

5,590,903

DEPLOYMENT DOOR ASSEMBLY

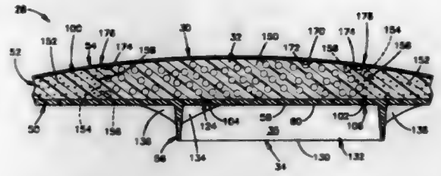
Jack A. Phillion, Shelby Township, and Scott A. Kelley, Algonac, both of Mich., assignors to TRW Vehicle Safety Systems, Inc., Lyndhurst, Ohio

Filed Sep. 29, 1995, Ser. No. 538,501
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—728.3 **15 Claims**

12. Apparatus for use with an inflatable vehicle occupant restraint, said apparatus comprising:

a deployment structure which is rupturable under the influence of the restraint when the restraint is being inflated, said deployment structure comprising a plastic part having a seam along which said plastic part is rupturable under stress induced by movement of the restraint forcefully against said deployment structure;

said plastic part including first and second bodies of plastic foam having first and second edges, respectively, said first and second edges adjoining each other and being bonded together to define an interface at which said first and second bodies of plastic foam are joined to each other, said interface defining said seam.

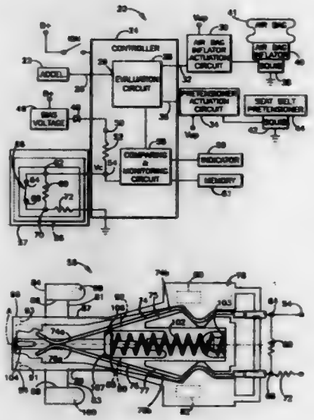


5,590,904

DUAL RESISTANCE SWITCH FOR BUCKLE CONFIRMATION

Robert P. Ellis, Almont; Robert E. Nill, Royal Oak, and Leon P. Niedzwiecki, Romeo, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Aug. 15, 1995, Ser. No. 515,131
Int. Cl.[6] B60R *21/32;22/46;22/48*
U.S. Cl. 280—735 **8 Claims**



1. An apparatus for restraining a vehicle occupant, said apparatus comprising:

a seat belt for extending across the vehicle occupant;

a tongue associated with said seat belt;

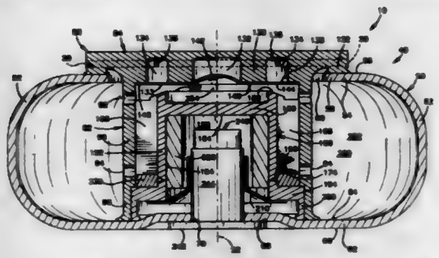
a buckle for receiving and latching said tongue in said buckle;

a seat belt buckle switch operatively connected to said buckle, said seat belt buckle switch having electrically conductive normally closed contacts;

a resistor network electrically connected to said normally closed contacts, said resistor network comprising a first resistor in series with said contacts and a second resistor in parallel with said contacts, said resistor network providing a first electrical signal having a first characteristic dependent upon the resistance value of said first resistor when said seat belt buckle switch is closed and a second electrical signal having a second characteristic dependent upon the resistance values of said first resistor and said second resistor when said seat belt buckle switch is open; and

a controller operatively connected to said resistor network for monitoring said first and second signals.

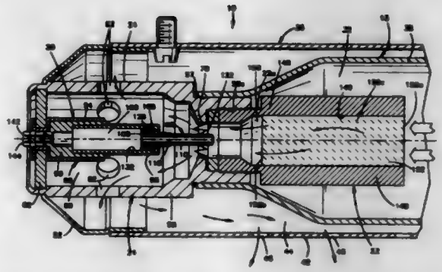
5,590,905
AIR BAG INFLATOR
Jess A. Cuevas, Scottsdale, Ariz., assignor to TRW Inc., Lyndhurst, Ohio
Filed Dec. 6, 1994, Ser. No. 349,944
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—737 **11 Claims**



1. An apparatus for inflating an inflatable vehicle occupant restraint, said apparatus comprising:
a housing comprising a center member and a shell member defining a stored gas chamber containing gas for inflating the inflatable vehicle occupant restraint, means for defining an outlet opening through which gas can flow from said stored gas chamber, and a closure member on said housing for closing said outlet opening;
a piston movable in said housing for opening said closure member; and
an igniter connected with said housing for, upon actuation, moving said piston to open said closure member;
said center member of said housing including a cylindrical side wall extending around an axis of said apparatus, said cylindrical side wall having first and second axial end portions;
said center member of said housing including an end wall that includes said means for defining an outlet opening and having a flange portion extending radially outward from said cylindrical side wall;
said shell member of said housing including an annular side wall which encircles said cylindrical side wall of said center member, said annular side wall of said shell member having a first wall portion welded to said flange portion of said center member at an annular first weld location, said annular side wall having a second wall portion welded to said second end portion of said center member at an annular second weld location spaced axially from said first weld location;
said piston having a first axial end portion with a cutting edge for opening said closure member and a second axial end portion welded at said second weld location to said shell member and to said center member.

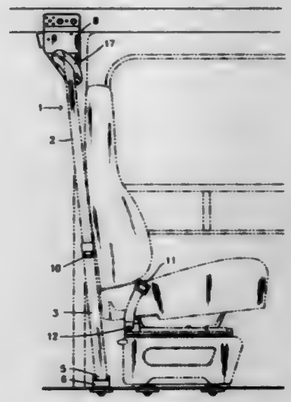
5,590,906
VEHICLE OCCUPANT RESTRAINT INFLATOR
Ernst M. Faigle, Imlay City; John H. Semchena, Royal Oak, and Richard J. Thompson, Imlay City, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Continuation of Ser. No. 135,786, Oct. 13, 1993, abandoned. This application Dec. 27, 1995, Ser. No. 579,450
Int. Cl.[6] B60R *21/28*
U.S. Cl. 280—741 **22 Claims**

1. An apparatus for inflating a vehicle occupant restraint such as an air bag, said apparatus comprising:
a container having a mixture of gases including a primary gas for inflating the vehicle occupant restraint and a combustible gas which, when ignited, heats the primary gas;



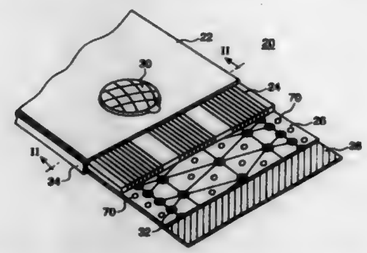
means for directing the mixture of gases from said container toward the vehicle occupant restraint;
means for igniting the combustible gas as it flows toward the vehicle occupant restraint to create a combustion reaction external to said container past which the primary gas flows; and
a combustion arrestor for substantially containing the combustion reaction within said means for directing to minimize the propagation of the combustion reaction into said container.

5,590,907
SEAT BELT POSITIONING DEVICE AND SYSTEM
Erwin S. McQueen, II, Beverly Hills, and Ervin R. Pilarczyk, Ocala, both of Fla., assignors to Vehicle Safety Systems, Inc., Ocala, Fla.
Filed Oct. 10, 1995, Ser. No. 541,604
Int. Cl.[6] A62B *35/00*
U.S. Cl. 280—801.1 **8 Claims**



1. A vehicle safety belt shoulder harness automatic positioning system comprising:
a mounting plate mounted on or near the roof of said vehicle,
a safety belt retractor mechanism mounted on said mounting plate,
a safety belt attached at one end on or near the vehicle floor and at another end to said safety belt retractor mechanism,
a seat belt buckle mounted to the vehicle, and
an adjustable tongue plate provided on said safety belt, said tongue plate adapted for locking engagement with said seat belt buckle, the segment of the seat belt above the tongue plate forming the shoulder harness segment of the seat belt,
wherein said mounting plate is provided with a convex guide surface over which said shoulder harness is fed during deployment,
said convex guide surface being positioned relative to said retractor mechanism and said seat belt buckle such that during deployment of said safety belt the movement of said safety belt tongue plate over a first, lower path causes the shoulder harness to be deployed from the lower end of the convex guide surface, and movement of the safety belt tongue plate over a second, higher path causes the shoulder harness to be deployed from the upper end of the convex guide surface.

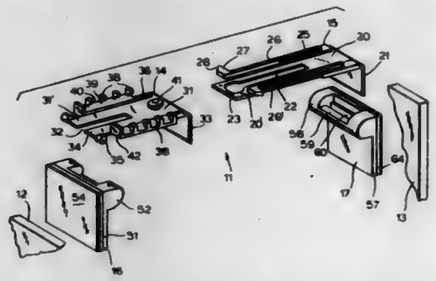
5,590,908
SPORTS BOARD HAVING A PRESSURE SENSITIVE PANEL RESPONSIVE TO CONTACT BETWEEN THE SPORTS BOARD AND A SURFACE BEING RIDDEN
Donald W. Carr, 836 Knox St., Birmingham, Mich. 48009
Filed Jul. 7, 1995, Ser. No. 499,132
Int. Cl.[6] A63C *5/00*
U.S. Cl. 280—809 **30 Claims**



19. A method of sensing contact of a sporting device with a medium being ridden, said method comprising steps of:
providing a sports board with a plurality of sensors on a surface thereof, each of said plurality of sensors providing a signal indicating a stressed condition of a respective area of a ridden surface of said sports board corresponding to a respective one of said plurality of sensors as said sports board is traversed on said medium;
continuously monitoring said plurality of sensors; and
processing stress information obtained from said plurality of sensors into sensory information.

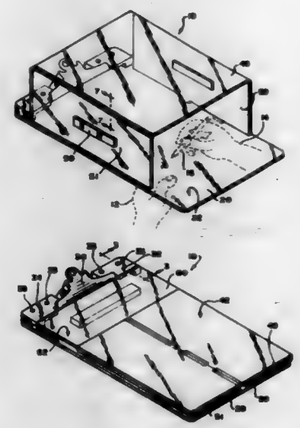
5,590,909
FILE COVER RESTRAINING DEVICE
Joseph Urban, Mountain View, Calif.; Richard Roig, Paterson, N.J., and Fikre Ayele, 1600 York Ave. #3G, New York, N.Y. 10128, assignors to Fikre Ayele, New York, N.Y.
Continuation-in-part of Ser. No. 344,289, Nov. 23, 1994, abandoned. This application Apr. 6, 1995, Ser. No. 422,010
Int. Cl.[6] B42D *1/00*
U.S. Cl. 281—20 **15 Claims**

1. A file cover restraining device for a loose leaf binder of the



type having a pair of substantially rigid cover members hingedly joined to respective opposite, parallel, longitudinal edges of a substantially rigid spine for receiving between them stacked papers and comprising a restraining member for maintaining the cover members closed spaced apart in parallel relation comprising first and second elongate strut members interengagable for relative longitudinal sliding movement thereby to adjust a length of the restraining member to substantially match a separation of the cover members to a width of the spine and manually operable, detent latching means on the strut members for latching the strut members in a selected position of adjustment, the first strut member having a first catch means on an end thereof remote from the second strut member, a first cover mounting portion pivotally connected to an end of the second strut member remote from the first strut member and having means for attachment to an inside surface of one cover member and, a second catch means releasably engagable with the first catch means and having a second cover mounting portion with means for attachment to an inside surface of another cover member; so that, when the respective mounting portions are attached to respective cover members adjacent respective free edges thereof remote from the spine, the first and the second strut members can be manually interengaged and slid relatively together to adjust a length of the restraining member to match a separation of the cover members to a width of the spine and the first and second catch means brought into releasable engagement by pivotal movement of the restraining member, so that the restraining member bridges the inside surfaces of the cover members retaining them in closed condition spaced apart in parallel relation.

5,590,910
COLLAPSIBLE ALL-WEATHER CLIPBOARD ASSEMBLY
Marc R. Meth, R.R. 1 Box 1527-38, Manchester Center, Vt. 05255
Filed Jul. 3, 1995, Ser. No. 497,799
Int. Cl.[6] B42D *3/00*
U.S. Cl. 281—45 **20 Claims**



1. A clipboard assembly suitable for use in inclement weather and in good weather, comprising:
a substantially planar base member providing a first writing surface for use in inclement weather;
a spring-biased clip mounted at an end of said planar base member;
a substantially planar end wall member hingedly mounted to said end of said planar base member;
a substantially planar top member having an end hingedly joined to said end wall member;
a first side wall hingedly joined to a first side of said top member;

a second side wall hingedly joined to a second side of said top member opposite to said first side;

engaging means for engaging said first and said second side walls with said base member, the engaging means being engageable to maintain each of said first and said second side walls in a perpendicular orientation, and said top member in a parallel spaced relationship, relative to said base member in an inclement weather configuration, and the engaging means being disengageable to form a substantially planar shaped collapsed configuration; and

spacing means for maintaining a substantially planar shape in the collapsed configuration, said substantially planar end wall member and said substantially planar top member form a substantially contiguous planar second writing surface for use in good weather, said second writing surface being spaced from and substantially parallel to said first writing surface in the collapsed configuration.

5,590,911

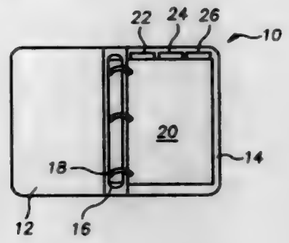
EVENT PLANNING SYSTEM

Linda D. Wilson, 8540 Huntington Park Dr., #218, New Orleans, La. 70127

Filed Nov. 30, 1995, Ser. No. 565,233

Int. Cl.[6] B42F *21/00*

U.S. Cl. 283—36 **20 Claims**



1. An event planning system comprising:

a front cover and a rear cover;

a business card holder defining card compartments for disposing business cards therein, said card holder being held between said covers;

a storage envelope for holding documents therein, said envelope being held between said covers;

a container for storing supplies therein, said container being held between said covers; and

a plurality of planning stage sections assembled in book-like form between said covers, each said planning stage section comprising:

a primary divider sheet provided with a projecting primary index tab bearing primary indicia thereon indicating a planning stage addressed by said section;

at least one instruction sheet having instructions printed thereon for performing said planning stage; and

preprinted forms having linear indicia adapted to record data regarding accomplishing said planning stage.

5,590,912

PERSONALIZED ENVELOPE ASSEMBLY FOR PRINTED PUBLICATION AND METHOD

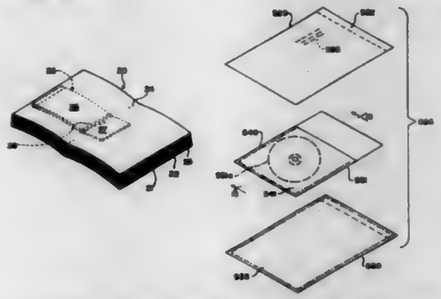
Scott A. Stevens, Downers Grove, Ill., assignor to Wallace Computer Services, Inc., Lisle, Ill.

Continuation-in-part of Ser. No. 91,321, Jul. 14, 1993, Pat. No. 5,419,587. This application Mar. 27, 1995, Ser. No. 408,990

The portion of the term of this patent subsequent to Jul. 14, 2013, has been disclaimed.

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—56 **8 Claims**



1. A personalized letter product in combination with a mailable publication product, said personalized letter product comprising: a sealed envelope assembly having a pair of outer plies enclosing at least an information-bearing disc each of said other plies having top, bottom and side edges, at least one of said outer plies being equipped with printed indicia relating to a specific person, geographic area or demographic group, and means associated with one of said edges for binding said envelope assembly into the interior of said publication, said publication product comprising a plurality of signatures arranged in superposed relation, each of said signatures being rectangular and having upper, lower and side edges, one of side edges being a bound edge and the other side edge being a free edge, said envelope assembly edge means including a binding portion bound in between two adjacent signatures along said signature bound edge, and said publication product being equipped with printed indicia corresponding to the envelope assembly printed indicia, said envelope assembly having an edge equipped with means for opening said envelope assembly, said opening means including a line of weakness in at least one of said outer plies.

5,590,913

PIPELINE CONNECTOR FOR CONNECTING A BRANCH PIPE TO A CARRIER PIPE

Bruce E. Morris, Houston, and Fred L. Avery, Spring, both of Tex., assignors to Big Inch Marine Systems, Houston, Tex.

Filed Apr. 26, 1995, Ser. No. 429,745

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—18 **33 Claims**

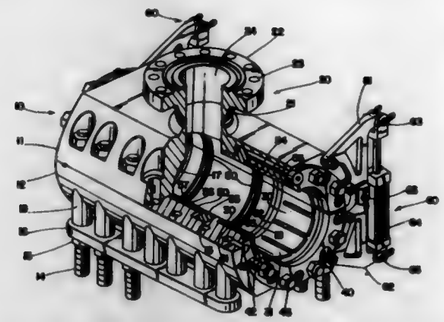
1. A clamp useful for connecting a tie-in line transversely to a carrier pipe, comprising:

a lower body portion and a upper body portion that when connected together define a tubular bore, the lower and upper body portions being adapted to clamp onto the carrier pipe;

a set of gripping collets positioned with the tubular sleeve bore proximate opposed ends of the upper and the lower body portions to engage such a carrier pipe;

a branch tap positioned between the gripping collets and extending from one of the body portions transversely to the tubular bore;

a first seal and a second seal for providing a seal between the carrier pipe and the upper and the lower body portions the first and second seal positioned within the transverse bore and between the gripping collets and the branch tap;



means for setting the first and second seal to provide a seal between the carrier pipe and the upper and lower body portions;

a set of axial seals to form axially extending seals between the upper and lower body portions during use and to connect the first and second seals during use; and

collet drivers at opposed ends of the upper and lower body portions for actuating the gripping collects, each collet driver comprising a collet driver sleeve and a collet driver flange.

5,590,914

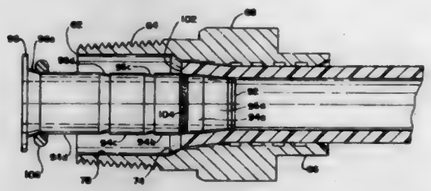
FIELD ASSEMBLED GAS RISER

David K. Platner, Concord; James M. Loreux, Madison; Michael J. Brennan, Jr., Perry, and Brent H. Carrick, Madison, all of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Jan. 5, 1995, Ser. No. 369,134

Int. Cl.[6] F16L *55/00*

U.S. Cl. 285—23 **13 Claims**



1. A field assembled riser comprising:

a plastic tubular gas line having an inner diameter, a preselected wall thickness, a preselected outer diameter, and a terminal end;

a generally cylindrical stiffener having a reduced diameter at a first end freely received in the gas line, a shoulder at a second end having an enlarged diameter substantially greater than the inner diameter of the gas line to prevent further insertion of the stiffener therein, and a series of spaced lands disposed between the first and second ends of the stiffener; and

an adapter received over the gas line adjacent the terminal end thereof, the adapter having a series of axially spaced, circumferential grooves defined along an inner diameter of the adapter, the grooves being interconnected by shoulders that extend radially inward from the grooves and are dimensioned for free sliding receipt over the outer diameter of the gas line, the adapter further including a series of stepped counterbores along the inner diameter between one end of the adapter and the grooves and shoulders, the counterbores having a diameter greater than the shoulders to cooperate with the stiffener to preliminarily hold the gas line between the stiffener and adapter as the stiffener is advanced axially further into the adapter and the outer diameter of the gas line is plastically deformed into the grooves of the adapter.

5,590,915

PIPELAY METHOD AND DEVICES

Carlos E. Recalde, Irvine, Calif., assignor to Stena Offshore Limited, Aberdeen, Great Britain

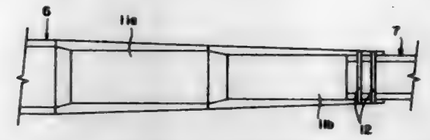
PCT No. PCT/GB92/01910, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/08422, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 16, 1992, Ser. No. 211,262

Claims priority, application United Kingdom, Oct. 17, 1991, 9122031

Int. Cl.[6] F16L *55/00*

U.S. Cl. 285—119 **15 Claims**



5. A transition joint for use in connecting a first pipe of first external diameter and a second pipe of second external diameter different from said first external diameter for spooling onto a reel in such a manner that said pipe is plastically deformed on spooling to conform to the reel, said transition joint comprising a straight, generally tubular member having a first end dimensioned for coupling to said first pipe of first external diameter, a second end dimensioned for coupling to said second pipe of second external diameter different from said first external diameter, and said member having a bending moment at least equal to the difference in bending moment between the first and second pipes.

5,590,916

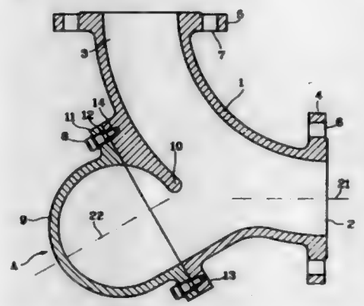
RENEWABLE WEAR-PROOF ELBOW WITH A DETACHABLE BUFFER CHAMBER

Chin-Fu Liu, 5 Fl., No. 7, Lane 20, Kang-Le St., Nei Hu District, Taipei, Taiwan

Filed Jun. 19, 1995, Ser. No. 492,163

Int. Cl.[6] F16L *43/00*

U.S. Cl. 285—127 **5 Claims**



1. A renewable wear-proof elbow to be connected to a pipe and become a part thereof, said pipe being designed for transporting particles of powdered material by means of compressed air, and said renewable wear-proof elbow comprising a main elbow portion and a buffer chamber, said main elbow portion comprising:

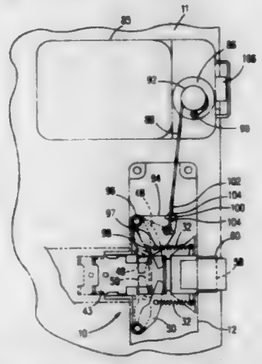
an inlet at one end of said main elbow portion having a first flange for connection with a first section of said pipe, said inlet having a central axis;

an outlet at another end of said main elbow portion having a second flange for connection with a second section of said pipe; and

a first side opening formed on a side wall of said main elbow portion opposite said inlet;

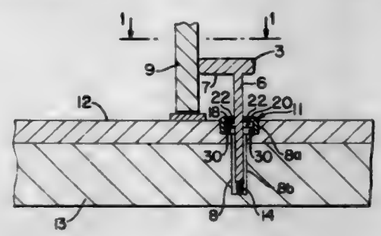
a third flange formed around said first side opening; wherein
said buffer chamber having a second side opening, a central axis and a fourth flange;
said fourth flange being formed around said second opening and engaged with said third flange and means for affixing said third and fourth flanges in said engagement so as to allow said buffer chamber to be removably affixed to said main elbow portion at said first side opening thereof; and
said main elbow portion further comprising a bent pipe wall section which includes said third flange surrounding said first side opening thereof so as to allow said buffer chamber to be affixed to said main elbow portion in a manner such that the central axis of said buffer chamber is offset with respect to the central axis of said inlet.

5,590,917
HIGH SECURITY PUSH-TO-EXIT PEDESTRIAN DOOR CONTROL
Harold L. Brooks; Thomas R. Clark, both of Lexington; Kun H. Kim, Louisville, all of Ky., and James W. Overbey, Jeffersonville, Ind., assignors to Mas-Hamilton Group, Lexington, and N T Monarch Hardware, Shepardsville, both of Ky.
Filed Sep. 13, 1995, Ser. No. 527,659
Int. Cl.[6] E05C *9/10*
U.S. Cl. 292—21 **5 Claims**



1. A pedestrian door push-to-exit control for controlling ingress to a secure area while permitting unrestricted egress through said door, comprising:
a combination lock having a lock bolt, said lock bolt having an extended and a retracted position;
a deadbolt having an extended position and a withdrawn position associated with said combination lock and having a deadbolt, said deadbolt connected by a lost motion connection with said lock bolt, permitting withdrawal of said deadbolt from said extended position without movement of said lock bolt;
a rotatable control associated with said deadbolt to withdraw said deadbolt from said extended position to said withdrawn position;
said combination lock operable to withdraw said deadbolt upon operation of said combination lock to withdraw said lock bolt;
a push-to-exit device for normally maintaining said door in a locked and secured condition from the exterior of said door, said push-to-exit device comprising:
a chassis;
a latchbolt, supported on said chassis, biased to an extended position;
a drawbar connected to said latchbolt;
a pair of drawbar cams pivoted on said chassis and engaging said drawbar;
a manually operable control, manipulable from outside said door and drivingly engagable with a first one of said drawbar cams;
a push bar mechanism mounted on an interior face of said door;
a pair of main cams, each pivoted on said chassis and drivingly engaged with said drawbar cams in one direction of movement of said main cams and disengagable in an opposite direction of movement;
a cam connector driven by said push bar mechanism in a withdrawing direction relative to said latchbolt and engaged with said main cams;
a bellcrank pivoted coaxially with a second one of said drawbar cams and one of said main cams and connected to said one of said main cams for movement with said one of said main cams;
a lost motion connection between said bellcrank and said rotatable control, drivingly connecting said bellcrank and said rotatable control in a direction for effecting withdrawal of said deadbolt and absorbing movement of said rotatable control resulting from operation of said combination lock,
whereby operation of said push-to-exit device will effect withdrawal of said latchbolt and simultaneous rotation of said rotatable control to effect withdrawal of said deadbolt, while operation of said manually operable control to withdraw said latchbolt will not effect the withdrawal of said deadbolt.

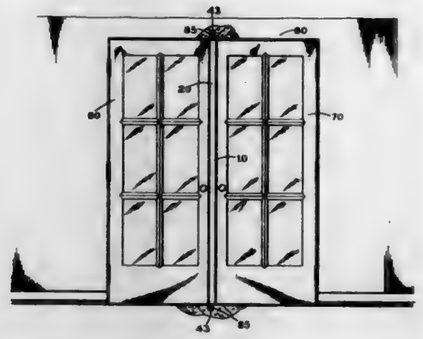
5,590,918
DEVICE AND METHOD FOR SECURING DOORS AGAINST FORCED BREAK-INS
Sergei Kambalov, 24 Beechwood Rd., Hartsdale, N.Y. 10530
Filed May 19, 1995, Ser. No. 444,695
Int. Cl.[6] E05C *5/02*
U.S. Cl. 292—60 **20 Claims**



1. A door securing device comprising
a cam having a periphery,
a shaft substantially perpendicularly connected to the cam,
a socket, adapted to be formed in a floor adjacent a door, said shaft being operatively pivotally mounted in said socket with the periphery of said cam abutable against the door preventing against pushing the door in constituting a door security condition, said shaft being pivotal in said socket while in said door security condition without removing said shaft from said socket from and to respective selected pivot positions of said shaft in said socket, and in the respective selected pivot positions of said shaft in said socket, respective portions of said periphery of said cam abut said door in a completely closed position of the door, and respectively, in at least one partially open position of the door, preventing against pushing the door in.

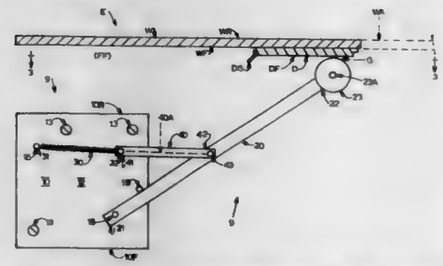
5,590,919
T-ASTRAGAL AND SLEEVE FOR DOOR
John P. Germano, 13015 SW. 85th Ave., Miami, Fla. 33156
Filed Jan. 17, 1995, Ser. No. 373,114
Int. Cl.[6] E05C *1/02*
U.S. Cl. 292—137 **16 Claims**

1. A locking t-astragal moulding assembly comprising:



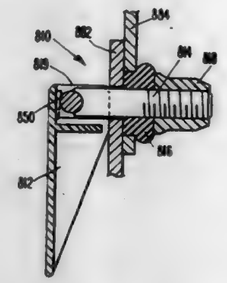
a first door having a first side edge and a second side edge, the first side edge having a door edge channel and said first side edge being capable to swing and pivot about the second side edge from an open position to a closed position;
a second door having a first side edge and a second side edge, the first side edge capable to swing and pivot about the second side edge from an open position to a closed position, wherein the first side edge of each door swings toward the other door;
a moulding having a front portion and a rear portion, the front portion having a moulding front portion channel and being fixably attached to the first side edge of the first door to form a joint between the door first side edge and the moulding front portion;
a metal sleeve in the moulding mounted partially within said door edge channel and partially within said moulding front portion channel such that said metal sleeve reinforces said joint between the first door first side edge and the moulding front portion against separation in shear;
a bolt slidably located in the sleeve, the bolt having an initial position and an extended position, wherein pushing the bolt from the initial position into the extended position when the first door is in the closed position prevents the first door from swinging.

5,590,920
FLOOR-MOUNTABLE RETRACTABLE ROLLER DEVICE
Brian W. Anderson, 431 W. 19th St., and David A. Push, 448 E. 1st St., both of Fremont, Nebr. 68025
Filed Mar. 28, 1994, Ser. No. 219,034
Int. Cl.[6] E05C *3/12*
U.S. Cl. 292—219 **4 Claims**



1. In environmental combination with a floor adjacent an open wall having a slidable-door therein, wherein said slidable-door has a frontal-plane, said frontal-plane of said slidable-door extending upwardly above said floor and being provided with a forwardly extending angular dog whose longitudinal direction is transverse and adjacent said floor and including a mountable retractable roller device mounted upon said floor and including a horizontal-roller extending toward said angular dog to maintain said slidable-door against said open-wall, and comprising:
(A) a base-plate having a horizontal lower-plane mounted on said floor and having a horizontal rear-side confronting said slidable-door frontal-plane, a horizontal front-side located forward of said base-plate rear-side, and extending parallel said base-plate rear-side;
(B) a horizontally elongate rear-arm having a trail-end portion pivotably attached in overlying relationship to said base-plate at an upright pivotal rear-station wherein said rear-arm extends forward from said trail-end toward a rear-arm lead-end there at provided with a horizontal-roller confrontably impinging against a said slidable-door angular dog;
(C) a spring-support means which extends from said base-plate;
(D) a helical spring horizontally overlying the base-plate upper-plane and extending horizontally from said spring-support means to a rearward-leg of a horizontal front-arm that overlies said base-plate;
(E) said horizontal front-arm extending horizontally along a front arm-axis thereof between a frontal-leg portion pivotably attached to said rear-arm and the rearward leg portion being slidable and adjustable where it is attached to said helical spring; and
(F) extending upright from said base-plate upper-plane and transversely extending between said rear-arm and the base-plate rear-side, a stop-means abutting said rear-arm, whereby said horizontal helical spring through said pivotably associated front-arm tends to maintain said horizontal-roller transversely impingeable toward the angular dog portion of said slidable-door.

5,590,921
SWELL LATCH ASSEMBLY
Eli J. Holtman, Narberth, and Edward A. McCormack, Media, both of Pa., assignors to Southco, Inc., Concordville, Pa.
Continuation-in-part of Ser. No. 88,263, Jul. 7, 1993, Pat. No. 5,368,347. This application Jul. 25, 1994, Ser. No. 280,394
Int. Cl.[6] B65D *45/30*
U.S. Cl. 292—257 **27 Claims**



1. A latch assembly for mounting in an aperture formed in a first member adapted for releasably retaining the first member against a corresponding second member and in a latched position, the latch assembly comprising
a handle member adapted for pivotal rotation;
a shaft pivotally engaging the handle member, the shaft defining a generally elongated first portion substantially perpendicular to a second portion, with the second portion being in pivotal engagement with the handle member, wherein the handle member is pivotally rotatable relative to the second portion of the shaft, with the handle member being adapted to facilitate axial movement of the shaft by the pivotal engagement of the handle member and the second portion of the shaft as the handle member is pivotally rotated between opened and closed positions;

latching means associated with the shaft adapted for axial movement corresponding with movement of the shaft, the latching means being adapted for releasably retaining the second member in engagement with the first member in the closed position of the handle member; and

retaining means associated with the shaft adapted for securing the latching means in association with the shaft for releasably retaining the latched position of the latch assembly;

the latch assembly further including means between and engaging the handle member and the second shaft portion to provide sufficient drag upon the second shaft portion for both preventing free pivotal rotation of the shaft relative to the handle member upon mounting in the aperture of the first panel member, and allowing pivotal rotation of the shaft relative to the handle member when the shaft and handle member are mounted in the aperture of the first panel member for operation of the latch assembly.

5,590,922

SECURITY DEVICE

Richard Hucknall, 3 Fairview Ave., Great Neck, N.Y. 11023

Filed Feb. 27, 1995, Ser. No. 394,584

Int. Cl.[6] C08C *19/00*

U.S. Cl. 292—300 **12 Claims**

2. A security device for attachment upon adjacent members, wherein one member is stationary and the other member is mounted for translation past said one member, comprising latch means with apertures for attachment to one of said members, and a locking assembly for attachment to the other of said members in a position adjacent to said latch means; said locking assembly including a mounting plate with a planar portion to be fastened to said other member, and an orthogonally projecting portion along one edge thereof, the distal end of said projecting portion being formed to support a pin aligned along an axis parallel to said edge; a pivotally mounted element attached by said pin for rotation about said axis, into latching engagement through said apertures; means on said orthogonally projecting portion of said mounting plate to limit the rotation of said pivotally mounted element; said pivotally mounted element including a plurality of locking lugs, each juxtaposed with an aperture in said latch means; the axis of said locking lugs forming an acute angle with the plane of said mounting plate when said security device is engaged; detent means on said locking assembly to discretely establish latching engagement and disengagement positions; and an actuating handle on said pivotally mounted element projecting along a plane substantially parallel to said mounting plate in said latching engagement position and at an outward angle therefrom in said disengagement position.

5,590,923

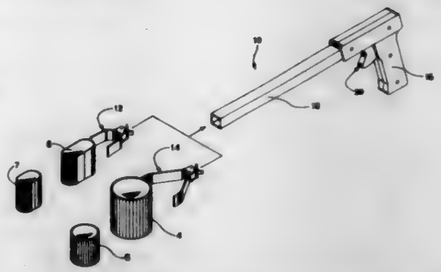
INTERCHANGEABLE JAW TONGS

Robert P. Berger, Encino, and Steven Benson, Simi Valley, both of Calif., assignors to Belle de St. Claire, Chatsworth, Calif.

Filed Feb. 14, 1995, Ser. No. 388,866

Int. Cl.[6] B25J *15/04*

U.S. Cl. 294—19.1 **20 Claims**



1. An apparatus for grasping an investment mold having an outer shape, comprising:

a handle;

a channel having a noncircular elongated interior, one end of the channel being connected to the handle and the channel having an opposite open end;

a jaw assembly removably engaged to the opposite end of the channel, the jaw assembly including a pair of jaws having facing palms shaped for engaging the outer shape of the investment mold, and a jaw frame having upper and lower portions each jaw having a wrist movably mounted between the upper and lower portions, the palm of each jaw extending out of the jaw frame, a tail extending from each wrist with the tails of the pair of jaws crossing each other;

a jaw closer connected to at least one of the jaws for effecting movement of the palms toward each other, the closer having a first pair of spaced apart members between which the crossed tails are inserted;

a trigger movably mounted to the handle; and

a linkage connected between the trigger and the closer for moving the closer to move the palms toward each other.

5,590,924

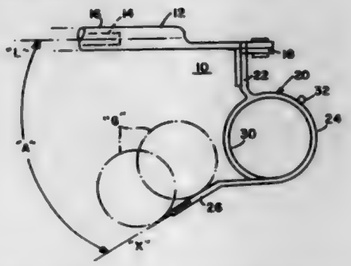
GOLF BALL RETRIEVAL RAKE

Edwin A. Quinn, and Mary L. Quinn, both of Naples, Fla., assignors to Deborah A. Quinn, Naples, Fla.

Filed Mar. 2, 1995, Ser. No. 397,484

Int. Cl.[6] A01D *7/06*; **A63B** *47/02*

U.S. Cl. 294—19.2 **1 Claim**



1. A golf ball retrieving rake for retrieving golf balls from areas of heavy vegetation, comprising:

an elongated handle having a proximal and a distal end;

a frame member attached to the distal end of the handle;

a plurality of tines attached to said frame member;

each of said tines having a first portion of generally semi-circular configuration, and a proximal end thereof attached to said frame member;

each of said tines having an elongated distal portion; and

each of said distal portions of said tines being of extended linear configuration, to permit them to extend well into long vegetation in retrieval of golf balls, said handle having a longitudinal axis, and said elongated distal portions of said tines being at least about 5 cms long and having an elongated longitudinal axis, which lies in a plane having an angle of about 20 degrees to about 45 degrees between said longitudinal axis of said handle and said elongated axis of said distal portion of said tines; and

wherein said frame member has a tine at each end thereof, each end tine having a further generally semi-circular portion said further generally semi-circular portion comprising a slightly elongated circle together with said first generally semi-circular portion of said line so as to define a cage between said slightly elongated circles at each end of said frame member, for any balls retrieved therewithin.

5,590,925

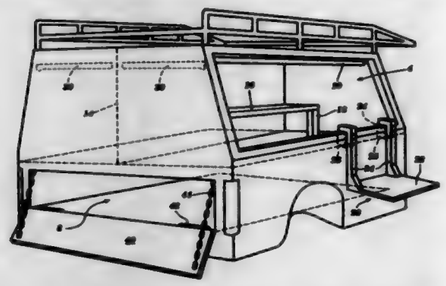
UTILITY FIXTURE FOR A TRUCK

Matthew J. Banks, Sr., 354 Plank Rd., Averil Park, N.Y. 12108

Filed Mar. 24, 1995, Ser. No. 410,223

Int. Cl.[6] B62D *33/04*

U.S. Cl. 296—24.1 **3 Claims**



1. A utility fixture for a truck, said utility fixture comprising:

an elongated hollow body adapted to overlie a rear portion of a chassis of the truck, said elongated hollow body having a top portion and a bottom portion;

a first compartment located within said top portion of said elongated hollow body;

a first door located on a side portion of said top portion of said elongated hollow body to provide access to said first compartment, said first door having first and second edges, each edge having a pin member extending therefrom and adapted to fit within a track member affixed to said elongated hollow body within said first compartment, wherein said pin members guide said first door along said track members and said first door is received within said first compartment into an open position, each edge further having an outwardly extending lip located proximate a respective said pin member, each of said outwardly extending lips being adapted to slide atop a roller affixed to said elongated hollow body proximate a respective said track member, wherein each of said outwardly extending lips and a respective said roller guide said first door into said first compartment;

a second compartment located within said bottom portion of said elongated hollow body, said second compartment underlying said first compartment and having substantially the same length and width dimensions of said elongated hollow body; and

a second door located on a rear portion of said bottom portion of said elongated hollow body to provide access to said second compartment.

5,590,926

STRUCTURE FOR ATTACHMENT OF WEATHER STRIP

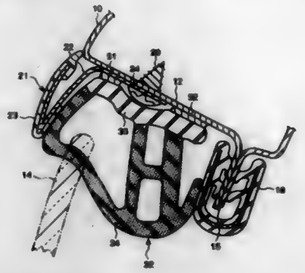
Masahiro Nozaki, Nakashima-gun, Japan, assignor to Toyoda Gosei Co., Ltd., Japan

Filed Feb. 21, 1995, Ser. No. 391,605

Claims priority, application Japan, Feb. 21, 1994, 6-046493; Apr. 30, 1994, 6-114597; Aug. 31, 1994, 6-232220

Int. Cl.[6] B60J *10/02*

U.S. Cl. 296—206 **3 Claims**



1. A structure for attaching a weather strip to a body wall along the side of a roof of a vehicle body, the weather strip having a tubular cross-sectional configuration and being comprised of a bottom portion and a sealing portion, the structure comprising:

a molding formed integrally with an outer end of said bottom portion for covering said sealing portion, said molding and said bottom portion being formed of a synthetic material;

a first double-sided adhesive tape bonding said molding to said body wall; and

a second double-sided adhesive tape bonding an inner part of said bottom portion to said body wall, said first double-sided adhesive tape being made of a material having a density less than that of the material forming said second double-sided adhesive tape.

5,590,927

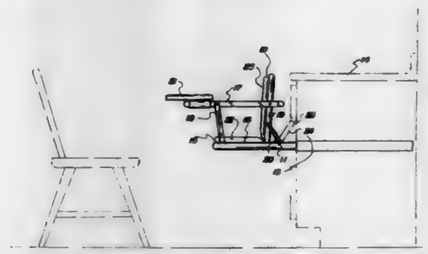
FOLD-AWAY HIGH CHAIR

Daniel A. Rapphahn, R.R. 1 Box 13 Middletown Rd., Londonderry, Vt. 05148

Filed Jan. 3, 1995, Ser. No. 367,896

Int. Cl.[6] A47C *9/06*

U.S. Cl. 297—143 **3 Claims**



1. A new and improved highchair unit which comprises in combination with a cabinet having a drawer receiving compartment: a foldable chair having a back rest member connected to a seat member by a snap lock hinge, said seat member disposed between and connected to a pair of elongated base members, a pair of elongated arm support members pivotally connected to said back rest and extending parallel with and superposed above said base members in a deployed use position, a pair of pivotally mounted support arms extending between said base members and said arm support members, said pair of arm support members supporting a snap-on removeable feeding tray in said deployed use

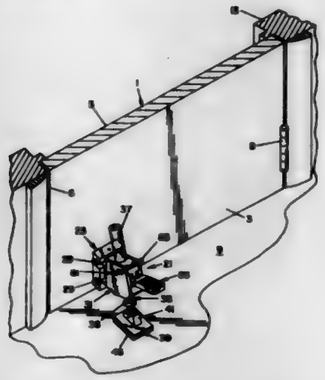
position; the back rest member positioned generally between said compartment and said seat member in said deployed use position such that a child seat occupant would face away from said compartment, and wherein the back rest member is folded downwardly toward said base member to a non-use position; a pair of full extension drawer slides mounted within said compartment and extendable therefrom though a compartment opening, said drawer slides engaging said pair of elongated base members which are slidably positioned therein for retraction of said chair into said compartment to a retracted non-use position; a conventional drawer front connected by a hinge at an upper edge thereof to an upper edge of said compartment opening and covering said opening when the highchair is in a retracted non-use position.

5,590,928

MECHANICAL DOOR STOP

Danut Volculescu, Cleveland, Ohio, assignor to Winner International Royalty Corporation, Sharon, Pa.

Filed Jun. 1, 1995, Ser. No. 456,479
Int. Cl.[6] E05C 3/12
U.S. Cl. 292—338 **26 Claims**



1. In combination with a security device adapted to be mounted on a hinged door to prevent opening thereof, said device including a housing, a planar friction surface movable into and out of frictional contact with the floor in proximity to the door, said friction surface joined to the lower end of an elongated rod, said rod extending into and through the housing, a leveraging mechanism for actuating the rod to urge the friction surface into pressure contact with the floor and for releasing the rod to return said friction surface to a position out of contact with the floor, said leveraging mechanism comprising:

(a) a lock lever pivotally mounted about a pivot axis within said housing and including:

(1) first biasing means for maintaining said lock lever in a normal first position about said pivot axis whereby axial movement of said rod is not impeded; and

(2) means at least partially surrounding the rod for incrementally moving said friction surface toward and into contact with the floor each time said lock lever is pivotally moved from said first position to a second position;

(b) a release mechanism including a

(1) a release handle pivotally mounted about a pivot axis within said housing and including:

(2) second biasing means for maintaining the release handle in a normal first position whereby axial movement of the rod in a vertical direction away from the floor is impeded; and

(3) means to permit the release handle to be pivoted from said first position to a second position whereby said rod is free to move in an axial direction away from the floor;

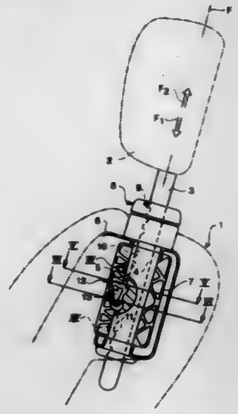
(c) third biasing means adapted to urge said rod in an axial direction away from the floor when said release handle is pivoted to its second position.

5,590,929

LOCKING SYSTEM FOR A DEVICE ADJUSTABLE BY TRANSLATIONAL MOTION, SUCH AS A HEADREST

Bruno Hamelin, Combs La Ville, France, assignor to Bertrand Faure Equipements S.A., Boulogne, France

Filed Jun. 15, 1995, Ser. No. 490,736
Claims priority, application France, Jun. 16, 1994, 94 07554
Int. Cl.[6] B60N 2/42
U.S. Cl. 297—216.12 **7 Claims**



1. In a vehicle headrest that is vertically adjustable and having at least one slider translationally mounted in a guide, a bistable headrest locking system comprising:

plurality of locking notches regularly spaced along the length of the slider;

a movably mounted locking means for normally resting in a stable unlocked position relative to the notches thus allowing adjustable translational displacement of the slider relative to the guide, and movable to a stable locked position relative to the notches thus inhibiting translational displacement of the slider relative to the guide;

resilient means mounted at a first end to a stationary member and at a second end to the locking means for maintaining the locking means in one of two bistable positions, namely, in a stable locked position or a stable unlocked position;

the resilient means overcoming a biasing force when in the stable unlocked position in response to rear impact to a vehicle and causing displacement of the locking means to the stable locked position.

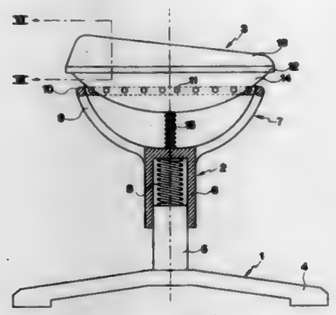
5,590,930

ACTIVE DYNAMIC SEAT

Josef Glöckl, Ammerseestrasse 6,, D-8011 Kirchheim, Germany

PCT No. PCT/EP93/00760, § 371 Date Feb. 24, 1994, § 102(e) Date Feb. 24, 1994, PCT Pub. No. WO93/19646, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 29, 1993, Ser. No. 150,105
Claims priority, application Germany, Mar. 27, 1992, 42 10 097.6
Int. Cl.[6] A47C 1/02
U.S. Cl. 297—313 **22 Claims**

1. An active dynamic seat, comprising a base, an intermediate piece connected to the base, a seat part connected to the intermediate piece and a restoring device, characterized in



that the intermediate piece is resilient in the vertical direction and has a head part having a bearing,

that the seat part has a lower seat shell having a surface convex in the downward direction, and

that the seat part is mounted to be supported in the vertical direction and to be tiltable into any other direction by the bearing engaging the seat shell, and

that the restoring device acts to restore the seat part into a neutral position and includes an elastic element attached approximately centrally to an under side of the seat shell and in an axis of at least one of the head part and the intermediate piece.

5,590,931

ARTICULATION HAVING A MEMORY OF AN ADJUSTMENT POSITION FOR A SEAT STRUCTURE

Francois Fourrey, and Sylvain Rager, both of Nogent Sur Vernisson, France, assignors to CESA-Compagnie Europeenne de Sieges pour Automobiles, Levallois-Perret Cedex, France

Filed Jun. 6, 1995, Ser. No. 466,198
Claims priority, application France, Jul. 5, 1994, 94 08297
Int. Cl.[6] B60N 2/02
U.S. Cl. 297—366 **11 Claims**



1. An articulation having a memory of an inclination adjustment position of a seat structure comprising a seat and a backrest which are relatively rotatively movable about an axis defined by a guiding arrangement of the articulation, whereby it is possible, either to progressively incline the backrest relative to the seat, or to swing over the backrest toward the seat, said articulation comprising:

a fixed plate with a first cavity for fixing to one of said seat and backrest;

a movable plate with a second cavity for fixing to the other of said seat and backrest, wherein said first and second cavities together define an inner chamber;

an intermediate plate which is placed in said chamber in such a manner as to be rotatable about said axis;

an inclination adjusting mechanism which is associated with said intermediate plate, which is cooperative with said fixed plate, and which is movable between an engaged position, in which said fixed and intermediate plates are coupled in rotation, and a disengaged position in which said fixed and intermediate plates are relatively uncoupled in rotation to allow an adjustment of the inclination;

a lock for preventing the backrest from swinging over toward the seat and inversely, said lock being associated with said intermediate plate, being cooperative with said movable plate, and being movable between an engaged position, in which said movable and intermediate plates are coupled in rotation, and a disengaged position in which said movable and intermediate plates are relatively uncoupled in rotation to allow the backrest to swing over toward the seat; and

a movable control device capable of acting on said mechanism and said lock in such a manner as, at will, to cause either one of said mechanism and said lock to pass from its engaged position to its disengaged position, whereby the intermediate plate is coupled with both said fixed and movable plates or is coupled with only one or the other of said fixed and movable plates, the intermediate plate being a plate with two opposite faces, said first cavity being defined by an axially extending first peripheral wall carrying teeth, and said second cavity being defined by an axially extending second peripheral wall;

said mechanism comprising at least one toothed block which is cooperative with said teeth carried by said first peripheral wall, and which is mounted on one of said two opposite faces by first guide means carried by said one opposite face;

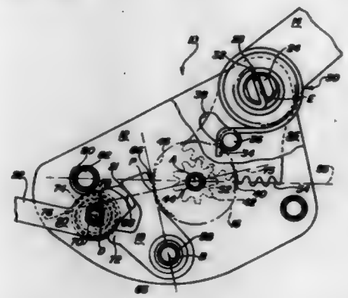
said lock comprising at least one bearing plate which is cooperative with a keeper carried by said second peripheral wall, and which is mounted on the other of said two opposite faces, by second guide means carried by said other opposite face.

5,590,932

ANTI-CHUCK SEAT RECLINER

Lawrence J. Olivieri, Lake Orion, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Nov. 7, 1994, Ser. No. 335,312
Int. Cl.[6] B60N 2/02
U.S. Cl. 297—367 **9 Claims**



1. A pivot mechanism for reducing chucking, comprising:

a quadrant adapted to be coupled with a seat back, said quadrant being pivotally mounted and having a set of teeth;

gear means pivotally mounted about a pivot, said gear means having a first and second set of teeth, said first set of teeth rotatably engaged with said quadrant teeth;

pawl means having a set of teeth engaging said gear means second set of teeth at a pitch point for releasably locking said gear means and quadrant in position, said pawl means pivotally mounted about a pivot and moving from a first position engaging said gear means to a second position disengaging said gear means and enabling movement of said gear means and said quadrant, said pawl means including a cam surface; and

an engagement means pivotally mounted on a pivot, said engagement means biased in a first position contacting said

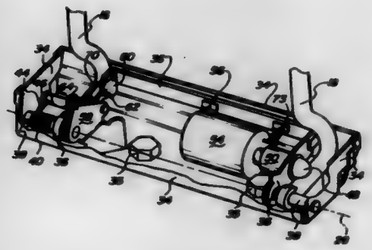
pawl means cam surface and exerting a locking force on said pawl means when said pawl means is in its first position and in a second position enabling rotation of said pawl means to its second position and when said pawl means is in its first position, said tooth engagement of said pawl means and gear means, when a horizontal divides said gear means into upper and lower halves, occurs only on the lower half of said gear means.

5,590,933

FOLDING HEADREST

Jan Andersson, Trollhättan, Sweden, assignor to Lear Seating Corporation, Southfield, Mich.

Filed Mar. 30, 1995, Ser. No. 521,264
Int. Cl.[6] A47C 7/38; B60N 2/48
U.S. Cl. 297—408 **17 Claims**



1. A vehicle seat assembly (**8**), comprising:
a generally horizontally disposed support surface and a backrest having a first end distal from said support surface;
a headrest mounting member (**34**) connected to said backrest (**10**) adjacent said backrest first end;
a headrest (**12**) pivotally coupled to said mounting member (**34**) for pivotal movement about a pivot axis (**28**) relative to said backrest (**10**) between a plurality of use positions (**30**) wherein said headrest (**12**) is an extension of said backrest (**10**) and a non-use position (**32**) wherein said headrest (**12**) is generally perpendicular to said backrest (**10**);
adjusting means (**60, 62**) operatively connected to said headrest (**12**) for adjusting the position of said headrest (**12**) about said pivot axis (**28**) between said plurality of use positions (**30**); and
a bracket (**36**) pivotally connected to said mounting member (**34**) for pivotal movement about said pivot axis (**28**); said adjusting means including a first member (**60**) disposed on said bracket (**36**) and moveable therewith about said pivot axis (**28**); and release means disposed on said bracket (**36**) and moveable therewith about said pivot axis (**28**) wherein said release means releasably interconnects said bracket and said headrest, for releasing said bracket and said adjusting means from said headrest, to allow said headrest to pivot about said pivot axis independently of said adjusting means to said non-use position.

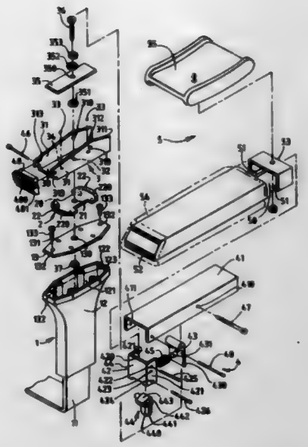
5,590,934

ADJUSTABLE CHAIR-ARMREST ASSEMBLY

Terence E. Gibbs, Grandview, N.Y., assignor to Shin Yeh Enterprise Co., Ltd., Taiwan

Filed Mar. 7, 1996, Ser. No. 612,316
Int. Cl.[6] A47C 7/54
U.S. Cl. 297—411.38 **4 Claims**

1. An adjustable chair-armrest assembly comprising:
an elongated coupling seat adapted to be attached to a chair seat and having a front end portion and a rear end portion;



an elongated tilting seat mounted pivotally on said coupling seat and rotatable about a horizontal axis, said tilting seat having a front end portion and a rear end portion;
an elongated armrest member mounted movably over said tilting seat and movable along the length of said tilting seat, in such a manner that said armrest member is in frictional contact with said tilting seat, said armrest member including a wrist receiving element attached to the front end portion of said tilting seat; and
an inclination adjusting device including:
a slot element which is fastened to the rear end portion of said coupling seat and which has a rearward surface formed with several horizontal slots extending in a direction transverse to said coupling seat;
an engagement member having an upper end portion pivoted to the rear end portion of said tilting seat, and a lower end portion provided with a projection protruding therefrom to engage a selected one of said slots in said slot element so as to determine an inclination angle of said armrest member relative to said coupling seat,
a spring biasing said projection of said engagement member to abut against said rearward surface of said slot element so as to engage said projection with the selected one of said slots; and
a pusher member mounted operatively on the rear end portion of said tilting seat so as to push said projection of said engagement member toward said rearward surface of said slot element, thereby engaging said projection within the selected one of said slots of said slot element, said pusher member being capable of being operated so that said projection can be moved forcibly from the selected one of said slots into another one of said slots when a force is applied to said armrest member in order to turn said wrist receiving element upward and downward.

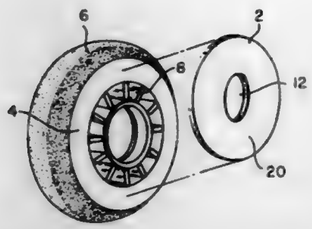
5,590,935

IN-LINE SKATE WHEEL COVER

Michael J. McAllister, 1504 Arbor Town Clr., #1117, Arlington, Tex. 76011

Filed Sep. 29, 1995, Ser. No. 536,260
Int. Cl.[6] B60B 7/01
U.S. Cl. 301—37.1 **6 Claims**

1. Apparatus for protecting a ball bearing casing of an in-line skate wheel, comprising
(a) a thin planar discoid element having inner and outer surfaces and an outer diameter corresponding with at least the outer diameter of the ball bearing casing and containing a central



opening having a diameter at least as great as the diameter of an axle of the wheel; and
(b) means for connecting said discoid element inner surface in sealing relation with a side of the wheel in superimposed relation over the ball bearing casing, whereby said discoid element rotates with the wheel and covers the ball bearing casing to prevent contaminants from contacting the wheel bearings.

5,590,936

HYDRAULIC ABS MODULATOR

David F. Reuter, Beavercreek, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 363,080, Dec. 23, 1994, abandoned. This application Jan. 23, 1996, Ser. No. 589,979
Int. Cl.[6] B60T 8/48
U.S. Cl. 303—116.1 **8 Claims**

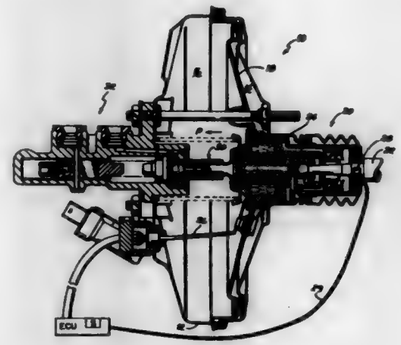
1. A brake system modulator having a master cylinder port, a wheel brake port and a bore comprising:
an isolation valve assembly including a piston slidably carried in the bore and having a first side and a second side, and including an obturator engageable with the first side of the piston and a spring engaging a spring side of the obturator biasing the obturator toward the piston with a first chamber defined in the bore on the first side of the piston, a second chamber defined in the bore on the second side of the piston and a third chamber defined in the bore on the spring side of obturator;
an ABS release solenoid valve movable between a closed and an open position and communicating with the bore at the second chamber on the second side of the piston through a first conduit extending from the isolation valve assembly to the ABS release solenoid valve;
a pump having an outlet check valve;
a continuously open flow path through the modulator between the master cylinder and the wheel brake port including an ABS apply orifice assembly with a thin element having an opening forming an ABS apply orifice positioned in the continuously open flow path; and
a second conduit extending from the ABS apply orifice to the first chamber of the isolation valve assembly wherein when the ABS release solenoid valve is moved to the open position to effect a pressure reduction at the wheel brake port the continuously open flow path remains open in both directions between the master cylinder port and the wheel brake port.

5,590,937

ELECTRONICALLY CONTROLLED VEHICLE BRAKING SYSTEM AND METHOD FOR OPERATING SAME

Helmut Heibel, Moechheim, Germany, assignor to Lucas Industries public limited company, United Kingdom

Filed Sep. 25, 1995, Ser. No. 533,011
Claims priority, application Germany, Oct. 14, 1994, 44 36 819.4
Int. Cl.[6] B60T 13/66
U.S. Cl. 303—125 **14 Claims**



1. An electronically controlled vehicle braking system comprising:
a brake booster (**10**) having an electromagnetically operable control valve arrangement (**20**),
an electronic control means (ECU) supplying the control valve arrangement (**20**) with control signals for initiating or cancelling an automatic braking sequence,
a load sensor (**28**) connected with the electronic control means (EUC) for sensing the pedal actuation force acting upon a brake pedal coupled with the brake booster (**10**), and
the electronic control means (ECU) adapted to effect a brake pressure relief depending upon a reduction of the pedal actuation force acting on the brake pedal after the initiation of an automatic braking sequence, and to use the pedal actuation force acting on the brake pedal as a criterion for the brake power to be applied to the vehicle brakes upon cancellation of the automatic braking sequence.

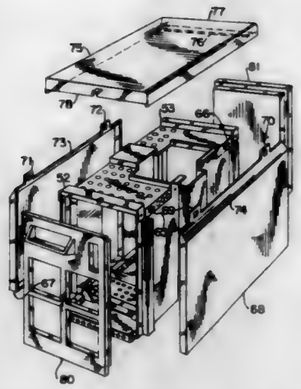
5,590,938

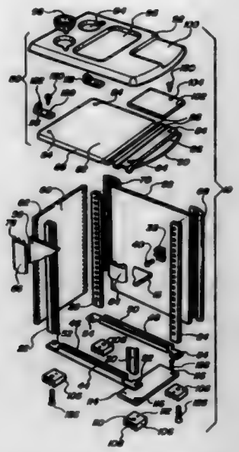
COMPUTER FRAME OF RIVETED MODULAR CONSTRUCTION

Renato De Andrea, Milna, Italy, assignor to Bull HN Information Systems Italia S.P.A., Caluso-Turin, Italy

Filed Mar. 23, 1995, Ser. No. 409,186
Int. Cl.[6] A47B 43/00; H05K 4/18
U.S. Cl. 312—257.1 **7 Claims**

1. A computer frame comprising:
a bottom panel of metal having a rim formation of rectangular configuration bent upwards from said bottom panel, said rim formation having two wings jutting out parallel with said bottom panel from opposed long sides of said rim;
a first pair of metal panels, each bent to provide a stiffening crosspiece and running between said opposed long sides having ends which overlap said jut-out wings and riveted to said bottom panel of metal and to said jut-out wings, each cross-





piece forming, with said bottom panel, a stiff box-type body having a supporting upper plate parallel with said bottom panel;

a second pair of vertical side panels of metal lying parallel with each other and having a lower edge and an upper edge and being bent to provide vertical stiffening and spacing ribs which extend outwards;

angle joining means formed on at least one of said side panels of metal, said crosspiece ends and said jut-out wings to secure, as by riveting, said lower edge of said side panels to said bottom panel;

a top frame panel of metal extending between said side panels parallel with said bottom panel and having edge portions which are at least bent to provide stiffening ribs extending crosswise between said side panels, and having vertical lips which are bent downwards and overlap said upper edge of said side panels and are riveted to the latter, and

wherein said bottom panel of metal is provided with four openings, each located near one corner of said rectangular rim configuration of said bottom panel, said frame further comprising a double pair of rest feet, each passed freely through one of said openings and supported on said supporting plate of said stiff box-type body.

5,590,939

RECONFIGURABLE SPACE FRAME CABINET

David P. Plontek, Canton, Mich., assignor to ASC Incorporated, Southgate, Mich.

Filed Nov. 7, 1994, Ser. No. 336,166
Int. Cl.[6] A47B *47/03*
U.S. Cl. 312—263 **43 Claims**

1. A reconfigurable cabinet, said reconfigurable cabinet comprising:

a first corner member, a second corner member and a third corner member, each corner member having a first side and a second side, said second side having mounting means for adjustably mounting a plurality of hardware fittings;

a first frame member removably mounted to a first pair of corner members;

a second frame member removably mounted to a second pair of corner members;

a first side panel removably supported by said first frame member and being disposed between said first pair of corner members;

a second side panel removably supported by said second frame member and being disposed between said second pair of corner members;

a top removably mounted to each corner member;

a first trim cover having an extension and an engagement means for removably engaging the first side of the first corner member;

a second trim cover having an extension and an engagement means for removably engaging the first side of the second corner member; and

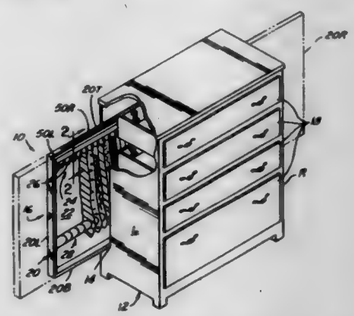
a third trim cover having an extension and an engagement means for removably engaging the first side of the third corner member, said trim covers removably securing said first and second side panels against said corner members with said extensions so that said trim covers and said first and second side panels can be readily removed from said corner members to reconfigure the cabinet into a different configuration.

5,590,940

SLIDING TIE RACK CABINET FOR DRESSERS

Michael B. Richard, 1012 ½ Scott Ave., Port Huron, Mich. 48060

Filed Dec. 14, 1995, Ser. No. 572,652
Int. Cl.[6] A47B *81/00*
U.S. Cl. 312—287 **19 Claims**



1. A tie rack cabinet for being installed with respect to a furniture piece, said tie rack cabinet comprising:

a cabinet member comprising:

a peripheral edge wall comprising a top edge wall, a bottom edge wall opposite said top edge wall, a left edge wall connected with said top and bottom edge walls, and a right edge wall opposite said left edge wall, said right edge wall being connected with said top and bottom edge walls;

a back wall connected to said peripheral edge wall, said back wall spanning said peripheral edge wall, said back wall and said peripheral edge wall collectively defining an interior depth of said cabinet member;

tie rack means connected with at least one of said peripheral edge wall and said back wall for holding a plurality of ties serially in predetermined spaced relation between said left and right edge walls;

tie restraint means connected with at least one of said peripheral edge wall and said back wall at a location remote from said tie rack means for preventing said ties from flapping when said cabinet member is slidably moved;

roller guide means for rollingly interfacing with said peripheral edge wall; and

means for connecting said roller guide means to a selected furniture piece to thereby provide sliding movability of said cabinet member with respect to the selected furniture piece within preselected limits of travel;

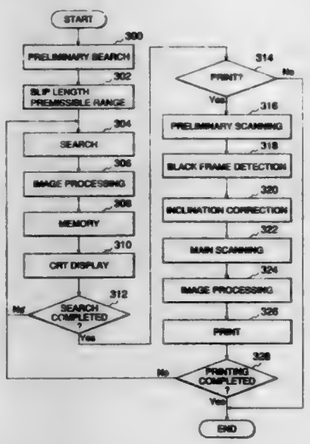
wherein said tie rack means comprises a plurality of hooks having a tie rest oriented substantially parallel with respect to said top edge wall and having an acute angle with respect to said back wall.

5,590,941

PRINTED MATERIAL READER AND SEARCH METHOD THEREFOR

Takahiro Hideshima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 6, 1996, Ser. No. 611,576
Claims priority, application Japan, Mar. 7, 1995, 7-072460
Int. Cl.[6] G03B *21/00*
U.S. Cl. 353—26 A **4 Claims**



1. A method for searching for a desired frame by detecting blips on a microfilm, comprising the steps of:

a) detecting lengths of all blips adjacent to frames on said microfilm;

b) determining permissible ranges for blip lengths from a frequency histogram reflecting relative distributions for said lengths of said blips that are detected; and

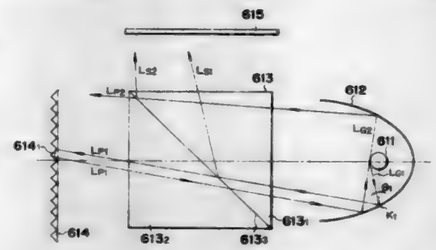
c) counting blips whose lengths fall within said permissible ranges, and searching for said desired frame on said microfilm.

5,590,942

POLARIZING CONVERSION UNIT, ILLUMINATING DEVICE AND PROJECTOR USING THEM

Kazumi Kimura, Atsugi; Hideaki Mitsutake, Tokyo, and Shigeru Kawasaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 118,460
Claims priority, application Japan, Sep. 11, 1992, 4-243703
Int. Cl.[6] G03B *21/00*
U.S. Cl. 353—34 **8 Claims**



1. An illuminating apparatus for illuminating an object with light, said apparatus comprising:

a light source;

a concave mirror for reflecting light from said light source, wherein said reflected light has a light beam illuminating the object and another light beam illuminating an area other than the object; and

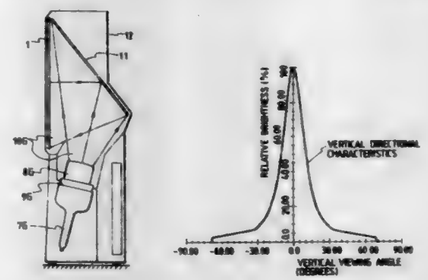
a corner cube for reflecting said another light beam toward said concave mirror so that a portion of said another light beam illuminates said object.

5,590,943

REAR PROJECTION TYPE IMAGE DISPLAY APPARATUS AND TRANSMISSION TYPE SCREEN USED THEREIN

Takahiko Yoshida, Miura; Koji Hirata, Kamakura; Atsuo Osawa; Kiyoshi Wada, both of Yokohama, and Hiroki Yoshikawa, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

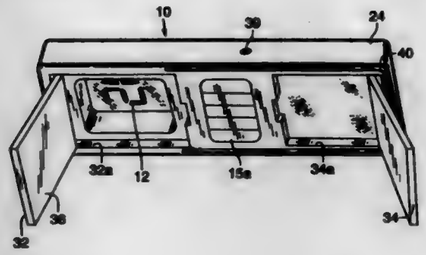
Filed Jun. 18, 1993, Ser. No. 77,780
Claims priority, application Japan, Jun. 19, 1992, 4-160516
Int. Cl.[6] G03B *21/28*
U.S. Cl. 353—74 **54 Claims**



12. A rear projection type image display apparatus comprising at least one image generation source for displaying images, at least one projection lens for enlarging images displayed on the at least one image generation source and a transmission screen for displaying the enlarged images projected onto a rear portion of the transmission screen, the transmission screen of the image display apparatus enabling display for images projected onto the transmission screen with a relative luminance of images located at a marginal portion of a picture plane of the transmission screen with

respect to a luminance of an image located at a center of the picture plane, which is not less than 30%, and enabling display of the image with a field angle within a range of at least 72° to less than 100°.

5,590,944
PROJECTABLE TIMER
William T. Stokes, 1125 Robin Way, Sunnyvale, Calif. 94087
Continuation-in-part of Ser. No. 724,200, Jul. 1, 1991, abandoned, which is a continuation of Ser. No. 400,158, Aug. 28, 1989, Pat. No. 5,035,502. This application Mar. 30, 1993, Ser. No. 40,538
Int. Cl.[6] G09B *19/00*
U.S. Cl. 353—122 **14 Claims**



1. A projectable timing device for use on an overhead projector, comprising:
a casing,
clock timing means in the casing for clocking progression of time for a selected interval,
clock set means on the casing for enabling a user to select and set a desired interval of time on the clock timing means, with activation means on the casing for enabling the user to start the time interval,
a liquid crystal display in the casing, connected to the clock timing means so as to display the setting of the desired interval of time as well as the progression of time over the selected interval,
the liquid crystal display being transparent through the casing so as to be projectable with an overhead projector when the casing is positioned over a light stage of the overhead projector, and
the casing including elevating means for supporting the casing at an elevated position above the light stage of the overhead projector, staged sufficiently above the light stage to allow air to circulate between the liquid crystal display and the light stage to the extent that the display is cooled and prevented from overheating from the heat of the light stage, the elevating means comprising a plurality of foldable legs connected to the casing such that the legs may be stored flat against a back side of the casing or opened to form leg supports,
whereby the start, progression and end of a timing interval may be displayed to a classroom for group.

5,590,945
ILLUMINATED LINE OF LIGHT USING POINT LIGHT SOURCE
Norman Simms, Barnegat, N.J., assignor to Industrial Devices, Inc., Hackensack, N.J.
Filed Jul. 26, 1995, Ser. No. 507,121
Int. Cl.[6] F21V *8/00*
U.S. Cl. 362—31 **23 Claims**

1. A light display device, comprising:
a light guide defining an elongated optical cavity;
said light guide having a first end and a second end:



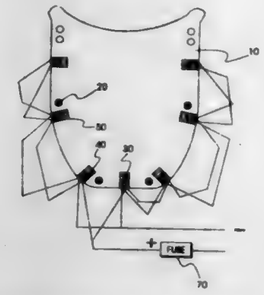
said light guide having opposing front viewing and rear reflecting surfaces:
said rear reflecting surface being curved over at least a substantial portion of said light guide;
a plurality of reflecting ridges disposed on said rear reflecting surface;
said ridges being substantially uniformly distributed along said substantial portion of said light guide;
at least one of said reflecting ridges extending across a width of said rear reflecting surface;
means adjacent to said first end of said light guide for introducing light into said light guide;
wherein said reflecting ridges of said rear reflecting surface reflect light introduced via said introducing means toward said front viewing surface to create a light display thereon.

5,590,946
GENERATOR FOR BICYCLE AND A LIGHT SYSTEM USING THE SAME
Ruey-feng Jung, No. 12, Changjung Rd., Kaoshu Hsiang, Pingtung Hsien, Taiwan
Filed Feb. 28, 1995, Ser. No. 396,461
Int. Cl.[6] B62J *6/06*
U.S. Cl. 362—72 **10 Claims**



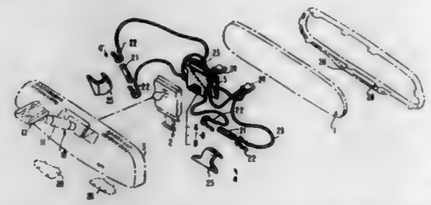
1. A generator for a bicycle having two seat stays extending to a hub of a wheel, comprising:
a laminated U-shaped core mounted on the seat stays and having two distal ends extending toward the hub of the wheel;
two series-connected windings secured on the ends of the U-shaped core; and
a plurality of rotor means mounted on the wheel in a position between the ends of the U-shaped core for causing the windings to induce an electric current when the wheel rotates.

5,590,947
ILLUMINATED WINDSCREEN FOR A MOTORCYCLE FAIRING
Larry W. Kidd, Jr., 9603 Muirkirk Rd., Apt. C-151, Laurel, Md. 20708
Filed Oct. 2, 1995, Ser. No. 538,282
Int. Cl.[6] B62J *6/00*
U.S. Cl. 362—72 **19 Claims**



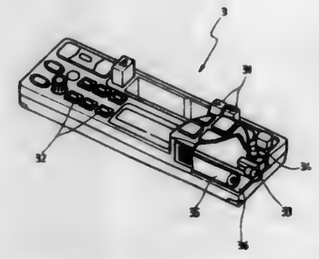
1. An illuminated windscreen for attachment to a motorcycle fairing, comprising:
a transparent windscreen having means for attaching said windscreen to said fairing; and
a plurality of light bulbs adjacently disposed along a lower edge contour of said windscreen for illuminating said windscreen.

5,590,948
COURTESY LIGHT FIXTURE OF REARVIEW MIRROR
Ricardo P. Moreno, Sao Bernardo do Campo, Brazil, assignor to Metagal Industria E Comercio Ltda., Diadema Sao Paulo, Brazil
Filed Jun. 13, 1995, Ser. No. 489,895
Claims priority, application Brazil, Feb. 9, 1995, 9403037
Int. Cl.[6] B60Q *1/04*
U.S. Cl. 362—83.1 **8 Claims**



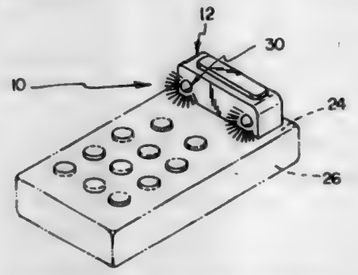
1. A rearview mirror, comprising a rearview mirror housing having recesses with supporting flaps; a courtesy light fixture for a driver and a second courtesy light fixture for a passenger located within a respective one of said recesses, each of said courtesy light fixtures including a lamp, two lamp holder-electrical connectors supporting and providing electrical connection to said lamp, an electric wire for feeding electrical current to said lamp and connected to said lamp holder-electrical connectors, an on/off switch connected with said electrical wire, a reflector, and a lens, each of said lamp holder-electrical connectors being formed by an elastic electrical conducting metal strip having a substantially inverted U-shape so that it can be formed and connected to said electrical wire by a progressive die, said metal strip having a first vertical portion, a second horizontal upper portion, and a third vertical portion located one after the other, said first and third vertical portions extending parallel to and being substantially equal to one another, said first vertical portion being provided with a device for connecting said electrical wire, said device for connecting said electrical wire being formed substantially by a pair of V-shaped flaps which extend outside a space defined between said vertical portions for receiving said lamp, said flaps extending from opposite edges and being turned outwards from said first vertical portion, said upper horizontal portion extending transversely relative to said vertical portions and having a part of a fixing device to be fitted to said lamp holder-electrical connector through said supporting flaps of said housing, with another part of said fixing device defined by said supporting flaps, said upper horizontal portion being provided with a hole for receiving an assembly means.

5,590,949
DETACHABLE FRONT PANEL FOR CAR STEREOS
Jeong-Eu Kim, 113 Yang-dong, Kwangchoo Kwangyuk-shi, 506-455, Rep. of Korea
Filed Oct. 27, 1995, Ser. No. 549,151
Claims priority, application Rep. of Korea, Sep. 4, 1995, 95-23927
Int. Cl.[6] H04S *7/00*
U.S. Cl. 362—86 **2 Claims**



1. A front panel for car stereos, detachably mounted to the front of a stereo's main body fixedly set in a dashboard of a car and including control means electrically connected to said main body to control the car stereo, further comprising:
means for lighting by electric power applied thereto from power supplying means, thereby allowing said panel to be selectively used as a lamp when said panel is separated from the fixed main body, said lighting means being set in a side of the panel; and
switching means for turning on or off said lighting means.

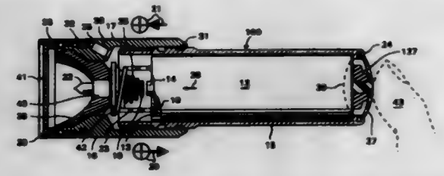
5,590,950
PORTABLE OBJECT ILLUMINATION DEVICE
Eduard Hildebrand, 1274 E. Santa Ana St., Anaheim, Calif. 92805
Filed Jul. 14, 1995, Ser. No. 502,814
Int. Cl.[6] F21V *33/00*
U.S. Cl. 362—109 **12 Claims**



1. A portable object illumination device comprising:
a housing having a front wall;

a mounting means secured to the housing for facilitating securement of the housing to an upper surface of a portable object;
an illumination means disposed within the front wall of the housing for illuminating the area in front of the front wall of the housing, the illumination means comprises a pair of lighting members mounted to the front wall and oriented so as to project substantially orthogonally therefrom; a switch projecting from the top wall of the housing and electrically coupled to the lighting members, the switch being electrically couplable to a battery; and a timer electrically interposed between the switch and the lighting members such that an activation of the switch will effect energization of the lighting members for a predetermined length of time.

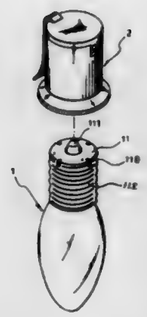
5,590,951
SWITCH-LESS FLASHLIGHTS
John W. Matthews, Corona del Mar, Calif., assignor to Laser Products Ltd., Fountain Valley, Calif.
Filed Dec. 21, 1994, Ser. No. 363,633
Int. Cl.[6] F21L *7/00*
U.S. Cl. 362—285 **34 Claims**



1. A switch-less flashlight using a battery having two opposite ends and having spaced first and second battery terminals on one of said ends, comprising in combination:
a tube for housing said battery; and
a lamp assembly mounted on an end portion of said tube and having spaced first and second lamp terminals adapted to contact said first and second battery terminals on said one end of the battery upon movement of said mounted lamp assembly relative to said tube in a first direction;
one of said first and second lamp terminals including a spring and being also adapted to disengage from a corresponding one of said first and second battery terminals upon movement of said mounted lamp assembly relative to said tube in a second direction.

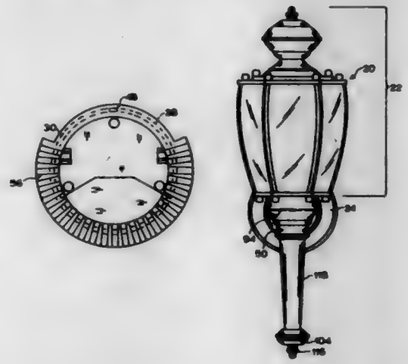
5,590,952
LAMP ASSEMBLY FOR CHRISTMAS TREE LIGHT SETS
You-Jen Cheng, and Tzu-Ling Cheng, both of P.O. Box 82-144, Taipei, Taiwan
Filed Nov. 15, 1995, Ser. No. 559,455
Int. Cl.[6] F21V *17/04*
U.S. Cl. 362—255 **1 Claim**

1. A lamp assembly for Christmas tree light sets, comprising a lamp socket having a positive metal contact plate and a negative metal contact plate, and a lamp bulb having a base threaded into said lamp socket, the base of said lamp bulb comprising a ring contact disposed in contact with said negative metal contact plate, and a tip contact disposed in contact with said positive metal contact plate, the negative metal contact plate having a plurality of vertically spaced raised portions for engagement with the ring contact of said lamp bulb, wherein said lamp bulb has a plurality of grooves spaced around a topmost edge of the ring contact, said grooves causing said negative metal contact plate to make sound when said grooves are moved over the raised portions of said negative metal contact plate during installation of said lamp bulb in said lamp socket, so that an operator can sense that the lamp bulb is threaded into position when no sound is produced; said lamp bulb has a patterned outside wall formed by: adhering patterned



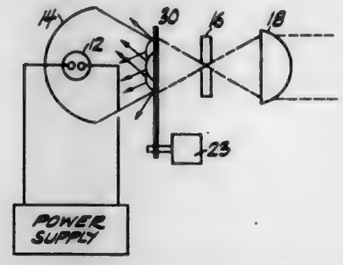
strips to the outside wall of said lamp bulb, then coating a color paint on the outside wall of said lamp bulb and said patterned strips, and then removing said patterned strips from said lamp bulb after the coating of said color paint is dried.

5,590,953
DIRECTABLE DECORATIVE LANTERN WITH MOTION SENSOR
Gary M. Haslam, Graham, and Simeon T. Lee, Burlington, both of N.C., assignors to Regent Lighting Corporation, Burlington, N.C.
Filed Apr. 27, 1995, Ser. No. 430,199
Int. Cl.[6] F21V *23/00*
U.S. Cl. 362—276 **20 Claims**



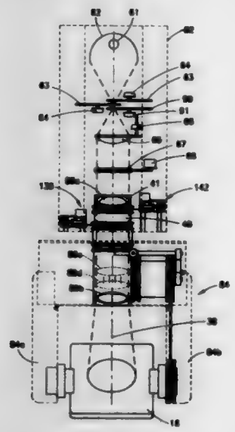
1. A decorative lantern having a decorative lamp portion and a mounting portion, and which is activated by motion, comprising:
(a) a cylindrical sensing module having a chamber;
(b) a motion sensor located in the chamber for detecting motion in a selected location around the lantern; and
(c) a lens piece positioned around the module and over the chamber, the lens piece having a uniform decorative appearance and extending all around the cylindrical sensing module; wherein the sensing module is rotatable to change the selected location of detection, which location of detection is not detectable by a person within the location.

5,590,954
DIMMER BLADE
Douglas A. Hanson, Arlington, and Timothy D. Stacy, Plano, both of Tex., assignors to Vari-Lite, Inc., Dallas, Tex.
Filed Jun. 15, 1994, Ser. No. 259,998
Int. Cl.[6] F21V *49/021*
U.S. Cl. 362—321 **14 Claims**



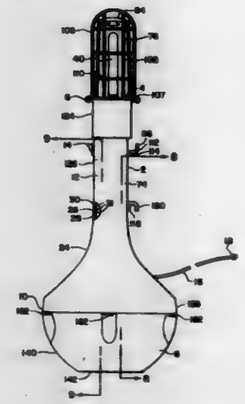
1. An intensity control device for a luminaire comprising:
an opaque dimmer blade having a first flat region defining a first plane;
a plurality of convex surfaces formed in said first flat region, the apexes of said convex surfaces defining a second plane, and;
a second flat region associated with said first flat region defining a third plane located between said first and second planes; said device further comprising a mounting region in said second flat region.

5,590,955
VARIABLE LIGHT MODIFIER
James M. Bornhorst, DeSoto; Bradley D. Ellis, Balch Springs, and Richard W. Hutton, Irving, all of Tex., assignors to Vari-Lite, Inc., Dallas, Tex.
Filed Aug. 27, 1993, Ser. No. 113,432
Int. Cl.[6] F21V *17/02*
U.S. Cl. 362—324 **40 Claims**



1. A stage lighting system, comprising:
a light source for generating a high intensity light beam and means for directing the beam along an optical axis; and
a separate light modifier disposed along the optical axis for redirecting the beam in a pan and in a tilt direction, said modifier comprising:
a reflector rotatable in 360 degrees about a first axis intersecting the optical axis and in 360 degrees about a second axis orthogonal to the first axis for reflecting said light beam,
a first drive for rotating said reflector about said first axis, and
a second drive for rotating said reflector about said second axis.

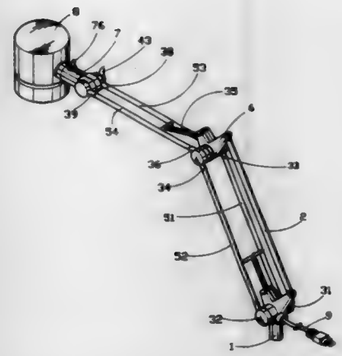
5,590,956
SELF-POSITIONING LAMP FIXTURE WITH STABILIZING BASE
Joseph Messana, New Lenox, and Thomas Maiman, Lombard, both of Ill., assignors to Wobble Light Inc., New Lenox, Ill.
Continuation-in-part of Ser. No. 19,491, Feb. 19, 1993, Pat. No. 5,381,325. This application Jan. 9, 1995, Ser. No. 370,372
Int. Cl.[6] F21V *21/06*
U.S. Cl. 362—410 **29 Claims**



1. A self-positioning lamp fixture comprising an elongated structure to be supported in vertical position on a horizontal surface, said elongated structure having a bottom portion in the form of a segment of a sphere and an elongated upper portion separate from said bottom portion, said upper portion having an outwardly flared lower support section mountable on said bottom portion, releasable fasteners for securing said upper portion in mounted position on said lower portion, a bulb-receiving lamp socket assembly mounted on an upper end of said elongated upper portion, means for electrically connecting said socket assembly to a power source, said bottom portion including a ballast for counterweighting the weight of the upper portion and the socket assembly mounted thereon in order to effect self-positioning of the elongated structure in a vertical position when placed on said horizontal surface and to return it to said vertical position when tipped away therefrom, and said upper portion being of smaller diameter than said lower portion for reducing the weight thereof and facilitating self-positioning of said elongated structure by said ballast.

5,590,957
LAMP SUPPORT ASSEMBLY
Franks Chen, 8F-6, 100, Sec. 2, Heping E. Rd., Taipei, Taiwan
Filed Jun. 29, 1995, Ser. No. 496,296
Int. Cl.[6] F21M *3/18*
U.S. Cl. 362—419 **4 Claims**

1. A lamp support assembly comprising:
a mounting base, said mounting base comprising a bottom plug rod for connection to a lamp stand, a coupling hole transversely disposed in the middle, a wire hole communicated with the coupling hole of said mounting base, and a lug raised from a top thereof;



a first cap having an annular cap body covered on the coupling hole of said mounting base at one end, a coupling stub tube radially extended from the cap body of said first cap;

a second cap having a solid cap body covered on the coupling hole of said mounting base at one end opposite to said first cap, a screw rod perpendicularly extended from the center of the cap body of said second cap and inserted through the coupling hole of said mounting base and the annular cap body of said first cap, and a coupling stub tube radially extended from the cap body of said second cap;

a first adjusting screw nut screwed up with the screw rod of said second cap to hold down said first cap in position, said first adjusting screw nut having a finger strip radially extended out for turning by hand;

a first metal tube having a first end coupled to the coupling stub tube of said first cap, and a second end;

a second metal tube having a first end coupled to the coupling stub tube of said second cap, and a second end;

a central housing, said central housing comprising a transverse coupling hole and a lug;

a link having a first pivot hole at one end pivotably connected to the lug on said mounting base by a pivot, and a second pivot hole at an opposite end pivotably connected to the lug on said central housing by a pivot;

a third cap having an annular cap body covered on the coupling hole of said central housing at one end, a coupling stub tube radially extended from the cap body of said third cap and coupled to the second end of said first metal tube;

a fourth cap having a solid cap body covered on the coupling hole of said central housing at one end opposite to said third cap, a screw rod perpendicularly extended from the center of the cap body of said fourth cap and inserted through the coupling hole of said central housing and the annular cap body of said third cap, and a coupling stub tube radially extended from the cap body of said fourth cap and coupled to the second end of said second metal tube;

a second adjusting screw nut screwed up with the screw rod of said fourth cap to hold down said third cap in position, said second adjusting screw nut having a finger strip radially extended out for turning by hand;

a first coupling having a coupling ring mounted around the screw rod of said fourth cap and retained between said central housing and said third cap, a coupling stub tube radially extended from the coupling ring of said first coupling;

a second coupling having a coupling ring mounted around the screw rod of said fourth cap and retained between said central housing and said fourth cap, and a coupling stub tube radially extended from the coupling ring of said second coupling;

a third metal tube having a first end coupled to the coupling stub tube of said first coupling, and a second end;

a fourth metal tube having a first end coupled to the coupling stub tube of said second coupling, and a second end;

a lamp holder, said lamp holder comprising a tubular casing, a transverse coupling hole at one end of said tubular casing, an annular groove at an opposite end of said tubular casing around the periphery, two separated metal contacts inside said tubular casing for connection to the two opposite terminals of a lamp;

a fifth cap having an annular cap body covered on the coupling hole of said lamp holder at one end, and a coupling stub tube radially extended from the cap body of said fifth cap and coupled to the second end of said third metal tube;

a sixth cap having a solid cap body covered on the coupling hole of said lamp holder at one end opposite to said fifth cap, a screw rod perpendicularly extended from the center of the cap body of said sixth cap and inserted through the coupling hole on said lamp holder and the annular cap body of said fifth cap, and a coupling stub tube radially extended from the cap body of said six cap and coupled to the second end of said fourth metal tube;

a third adjusting screw nut screwed up with the screw rod of said sixth cap to hold said fifth cap in position, said third adjusting screw nut having a finger strip for turning by hand;

a lampshade having a shade body and a mounting socket fastened to the annular groove on the tubular casing of said lamp holder to hold said shade body in place; and

a two-line electric wire having one end connected to the metal contacts inside said lamp holder and an opposite end inserted in proper order through the tubular casing of said lamp holder, said fifth cap, said third metal tube, said first coupling, said third cap, said first metal tube, said first cap, and the coupling hole of said mounting base, and then extended out of the wire hole on said mounting base for connection to an electric power supply outlet.

5,590,958

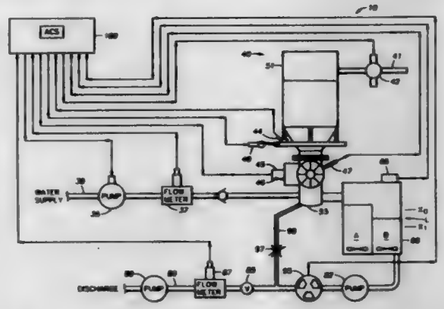
AUTOMATIC CEMENTING SYSTEM FOR PRECISELY OBTAINING A DESIRED CEMENT DENSITY

Michael P. Dearing, Sr., Cypress; Robert A. Baten, Friendswood; Greg L. Cedillo, Houston, and Bruce A. Vicknair, Baytown, all of Tex., assignors to Steward & Stevenson Services, Inc., Houston, Tex.

Division of Ser. No. 178,659, Jan. 7, 1994, which is a continuation-in-part of Ser. No. 969,944, Oct. 30, 1992, abandoned, which is a division of Ser. No. 389,923, Aug. 2, 1989, Pat. No. 5,281,023. This application Jun. 6, 1995, Ser. No. 470,976

Int. Cl.[6] B01F *15/04*

U.S. Cl. 366—20 **24 Claims**



11. An automatic cementing system, comprising:

a mixing chamber for receiving mix water and dry cement, and for mixing the liquid and dry cement together to form a cement slurry;

an input line with an input device for supplying the mix water at a particular rate;

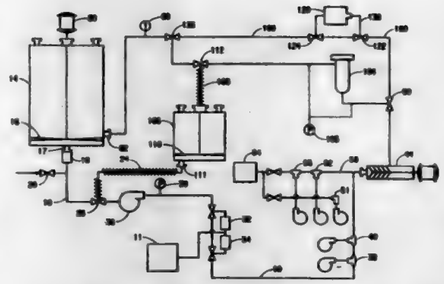
means for delivering the dry cement, which includes a regulating means for controlling the rate at which the dry cement is delivered;

a discharge line with a discharge pump and a discharge flow meter for measuring the rate at which slurry is discharged from the mixing chamber and for providing an output signal indicative of said rate;

a system controller electrically connected to the input device, the regulating means and the discharge flow meter, for receiving a discharge flow rate signal from the discharge flow meter and for providing control signals to the input device;

wherein the system controller provides a control signal to the input device to control the rate at which mix water is supplied to the mixing chamber based upon the discharge flow rate signal;

wherein the system controller determines the percentage of mix water in the cement slurry and the amount of mix water being discharged in the cement slurry from the mixing chamber, and modifies the input device to provide an equal amount of mix water into the mixing chamber.



5,590,959

CONTINUOUS MIXER AND ROTOR SEGMENT REMOVAL TOOL FOR THE SAME

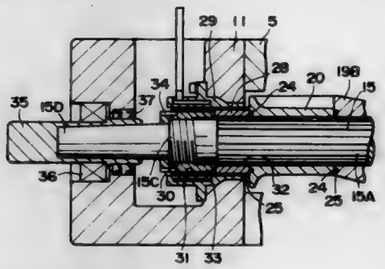
Hiroshi Ueda; Tsugushi Fukui; Kazuyoshi Imuta; Hirofumi Kimura; Shoji Yasuda; Shin Hotani; Kimio Inoue; Ryota Minato; Yoshimitsu Tanaka, and Katsunori Takahashi, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 19, 1995, Ser. No. 491,634

Claims priority, application Japan, Jun. 20, 1994, 6-137653

Int. Cl.[6] B29B *11/10*

U.S. Cl. 366—84 **7 Claims**



1. A continuous mixer comprising:

a barrel having a feed orifice at one end and a discharge orifice at the other end; and

a pair of rotors parallely mounted for rotation inside said barrel;

wherein each of said rotors comprises a rotor shaft, and a plurality of rotor segments fitted onto said rotor shaft,

wherein the rotor segment closest to the base portion of the rotor shaft is engaged with said rotor shaft, and neighboring segments are engaged with each other, through the engagement of projections protruding from the radial surface of one and matching holes formed on the radial surface of the other.

5,590,960

ONE TANK PAINT MAKEUP PROCESS USING A RECIRCULATION LOOP WITH LIQUID INJECTION

Peter M. Clinton, Media, Pa.; Nathan Cloud, and Frank Rohrbacher, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 396,041, Feb. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 146,815, Nov. 4, 1993, abandoned. This application Mar. 20, 1996, Ser. No. 619,875

Int. Cl.[6] B01F *15/02*

U.S. Cl. 366—134 **3 Claims**

1. An in-line process for preparing automotive finish comprising multi-staged introductions of materials including millbase, resins, dispersions, and solvents comprising the steps of

(a) introducing a first group of materials selected from the group consisting of millbase, resins, dispersions, solvents, and pigments into a processing vessel having mixing means therein,

(b) feeding said materials from an outlet port in said processing vessel to a circulation loop which extends from said processing vessel and returns to said processing vessel, said circulation loop having attached thereto a mixer having a rotor cooperating with a stator to produce a moderate shear mixing zone and at least one port discharging directly into the moderate shear mixing zone,

(c) feeding additional materials into said circulation loop through said port,

(d) passing all of the materials in said circulation loop through the moderate shear mixing zone in said circulation loop,

(e) filtering all of the materials, and

(f) recovering a finish having a uniform coloration from said circulation loop.

5,590,961

METHOD FOR INJECTING A FIRST FLUID INTO A SECOND FLUID AND AN APPARATUS FOR CARRYING OUT THE METHOD

Carsten O. Rasmussen, Glostrup, Denmark, assignor to Niro Holding A/S, Soborg, Denmark

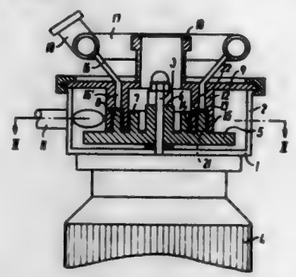
PCT No. PCT/DK93/00421, § 371 Date Mar. 14, 1995, § 102(e) Date Mar. 14, 1995, PCT Pub. No. WO94/13395, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 15, 1993, Ser. No. 403,816

Claims priority, application Denmark, Dec. 16, 1992, 1506/92

Int. Cl.[6] B01F *7/16*

U.S. Cl. 366—165.1 **14 Claims**



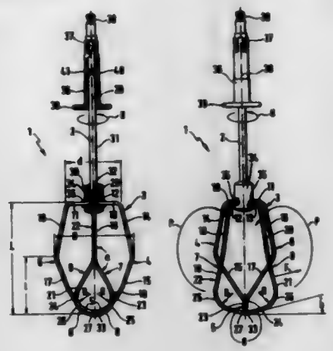
1. A method of injecting a first fluid into a second fluid by means of an injection apparatus having a casing including a stator part (9), a substantially disc-shaped rotor (5) positioned opposite said stator part in parallel and coaxial relationship thereto, a central product inlet, a peripheral product outlet, and an annular injection zone (13) above said disc-shaped rotor (5) and located between, but displaced from both said inlet (10) and said outlet (11), comprising the steps of; imparting to said second fluid a radial displacement effect from said product inlet (10) to said product outlet (11), injecting said first fluid into said zone, and exposing said second

fluid in said zone to a tangential dispersion effect in addition to said radial displacement effect, by forcing the second fluid through sharp-edged slots (19) extending substantially parallel to the rotor axis in opposed coaxial cylindrical wall parts (7, 14, 15) of said rotor (5) and said stator part (9).

5,590,962
ROTATING BEATER

Jose Millan; Desiderio Falco, and Emilio R. Soberino, all of Barcelona, Spain, assignors to Braun Aktiengesellschaft, Kronberg, Germany

Filed Apr. 20, 1995, Ser. No. 425,834
Claims priority, application Germany, Apr. 23, 1994, 44 14 228.5
Int. Cl.[6] B01F 7/32
U.S. Cl. 366—248 **15 Claims**

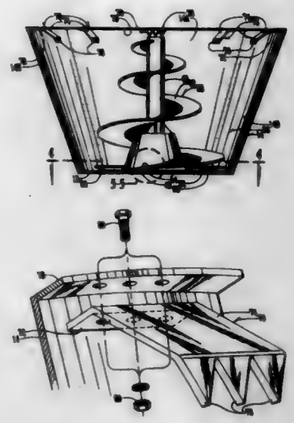


1. A rotary beater adapted to be rotated in a predetermined direction of rotation (U) by a drive motor comprising a drive shaft portion that is adapted to be coupled to said drive motor and that has a drive axis about which said beater is rotated by said drive motor, at least one wire-shaped beater element, which starts from said drive shaft portion, extends further from said drive shaft portion in the direction of said drive axis and, finally, after a plurality of changes in its direction of extension, is led back to said drive shaft portion, the course of said beater element being substantially subdivided into a first section extending generally parallel to said drive axis, a second section extending generally transversely to said drive axis, and a third section extending generally parallel to said drive axis, said first and third sections each including upper and lower segments having different directions of extension relative to said drive axis, said first and third sections each having an upper end and a lower end, each said upper end being adjacent said drive shaft portion and having an angular offset in said predetermined direction of rotation (U) of the beater from its corresponding said lower end that is remote from said drive shaft portion, and the direction of extension of said lower segment alone essentially producing said angular offset of said upper end relative to said lower end of each of said first and third sections.

5,590,963
VERTICAL FEED MIXER WITH HAY CLAWS

Reggie L. Schuler, Griswold, Iowa, assignor to Schuler Manufacturing & Equipment Co., Inc., Griswold, Iowa

Filed Apr. 9, 1996, Ser. No. 629,504
Int. Cl.[6] B01F 7/24; B02C 18/08
U.S. Cl. 366—302 **9 Claims**

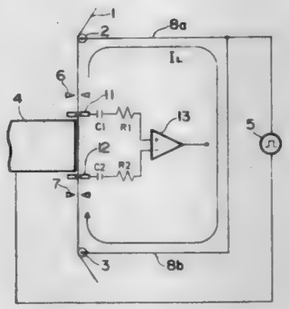


6. A method for cutting hay bales in a vertical feed mixer having a bottom wall and a sidewall defining a mixing chamber with an open upper end and a discharge opening, a vertically oriented auger rotatably mounted within the mixing chamber, and a plurality of claws extending inwardly from the sidewall adjacent the upper end of the mixing chamber, the method comprising:
loading at least one hay bale into the mixing chamber;
rotating the auger to cut and mix the hay bale in the chamber; and
retaining the hay bale and cut portions thereof in the chamber with the claws.

5,590,964
WIRE TEMPERATURE MEASURING METHOD FOR A WIRE ELECTRIC DISCHARGE MACHINE

Haruki Obara, Toyama; Yuki Kita, and Masaya Ito, both of Minamitsuru-gun, all of Japan, assignors to Fanuc Ltd, Minamitsuru-gun, Japan

PCT No. PCT/JP93/00972, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO94/02277, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 13, 1993, Ser. No. 199,287
Claims priority, application Japan, Jul. 21, 1992, 4-193889
Int. Cl.[6] G01K 1/14; 13/00; 7/16; B23H 5/00
U.S. Cl. 374—141 **4 Claims**

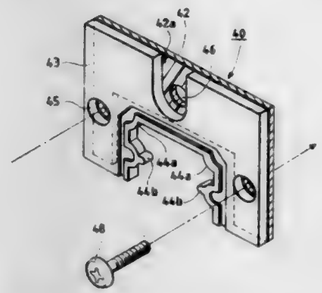


1. A method of measuring the temperature of a wire during a machining operation of a wire electric discharge machine on a workpiece, comprising:
supplying a discharge voltage to the wire via first and second feeders which position the wire, the first and second feeders connected to respective first and second feeder lines;
cutting off the discharge voltage;
obtaining a resistance value of the wire based on a loop current flowing, after the cutoff of the discharge voltage, as a result of impedance mismatching of the first and second feeder lines; and
obtaining the temperature of the wire based on the resistance value.

5,590,965
LINEAR GUIDE APPARATUS LUBRICATED WITH LUBRICANT-CONTAINING POLYMER

Toshikazu Yabe, Kanagawa; Soichiro Kato, and Ken Mamimatsu, both of Gunma, all of Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jan. 19, 1996, Ser. No. 587,714
Claims priority, application Japan, Jan. 20, 1995, 7-007312
Int. Cl.[6] F16C 29/06
U.S. Cl. 384—15 **12 Claims**



1. A linear guide apparatus comprising:
an axially extending guide rail having a first rolling groove on its outer surface;
a slider fitted loosely to the guide rail and including a circulation passage which is formed of a second rolling groove confronted with the first rolling groove, a curved path formed at an end of the second rolling groove, a return path coupled to the second rolling groove through the curved path;
a plurality of rolling elements loaded in the circulation passage to permit the slider to move relative to and along the guide rail; and
a seal device fixed to the slider in slidable contact with the outer surface of the guide rail for sealing a clearance existing between the guide rail and the slider, the seal device including a reinforcement plate and a lubricant-containing polymer member,
the reinforcement plate having a first surface fixed to the slider and a second surface which is formed of polyolefinic synthetic resin,
the lubricant-containing polymer member being formed of a polyolefinic polymer and a lubricant, and joined to the second surface of the reinforcement plate by one-piece molding.

5,590,966
SELF-ALIGNING SHAFT SUPPORT

Dmitry Cherny; Nicolai Cherny, and Dimitry Cherny, all of Maddington, Australia, assignors to Cherny Holdings Limited, Maddington, Australia

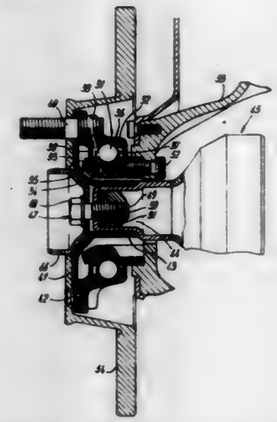
Filed Sep. 15, 1995, Ser. No. 522,393
Claims priority, application Australia, Mar. 17, 1993, PL 7860
Int. Cl.[6] F16C 31/02
U.S. Cl. 384—16 **16 Claims**

1. An apparatus for controlling the movement of a shaft, comprising:
a housing having an axis through the interior space of said housing and having a first axial face and a second axial face within the interior space of said housing;
a guide located within aid housing and having an axial passage for controlling the shaft in a direction substantially parallel to the axis of said housing, and wherein said guide permits reciprocation and rotation of the shaft within the axial passage through said guide;
a flange connected to said guide in a plane substantially perpendicular to the axial passage through said guide; and
a bearing in contact between said flange and the first axial face and the second axial face of said housing, wherein said bearing permits said flange to move within said housing in a direction substantially transverse to the axis of said housing, and wherein said bearing further permits said guide to move within said housing in an angular direction relative to the axis of said housing.

5,590,967
BEARING UNIT FOR A VEHICLE WHEEL

Hendrikus J. Kapaan, Nieuwegein, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

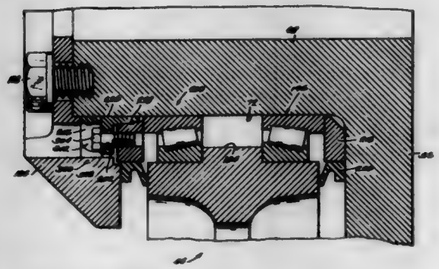
Filed May 3, 1995, Ser. No. 434,910
Claims priority, application Netherlands, May 6, 1994, 9400752
Int. Cl.[6] F16C 19/06
U.S. Cl. 384—448 **25 Claims**



1. Bearing unit for a vehicle wheel, comprising a three-point or four-point bearing with an inner race and an outer race, each of

said inner race and outer race having an axially inner end and an axially outer end, each of said inner race and outer race having a bearing groove containing a series of rolling elements, said inner race including at its axially inner end means for fixing the bearing to a vehicle suspension, said outer race including at its axially outer end a first flange pointing radially outwards relative to the outer race, said outward-pointing flange interacting with and/or being connected to a second flange pointing radially inwards relative to the outward-pointing flange.

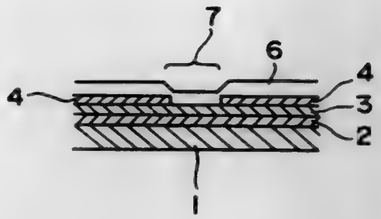
5,590,968
BEARING RETAINER ASSEMBLY
Andrew P. Dretzka, Cudahy, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.
Filed Sep. 18, 1995, Ser. No. 529,328
Int. Cl.[6] F16C *19/36*
U.S. Cl. 384—563 **19 Claims**



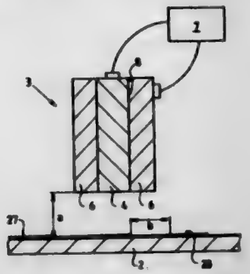
1. Apparatus comprising
an inner member having an axis and an axially extending outer surface,
an outer member having an axially extending inner surface, said inner and outer members being rotatable relative to each other about said axis,
a bearing between said inner and outer surfaces, said bearing having a radially extending bearing surface, and
a bearing retainer assembly including a first retainer which engages said bearing surface and which has a first tapered surface, a second retainer having a second tapered surface engaging said first tapered surface, an axially extending retainer surface engaging one of said inner and outer members, and a radially extending retainer surface, each of said first and second tapered surfaces tapering radially away from said one of said inner and outer members and axially away from said bearing, a spring engaging said retainer surface, and a cap which is fixed to said one of said inner and outer members and which engages said spring so that said spring is compressed between said cap and said retainer surface and exerts a force on said retainer surface whereby said second retainer is wedged between said first retainer and said one of said inner and outer members.

5,590,969
WEAR-RESISTANT PROTECTIVE FILM FOR THERMAL PRINTING HEADS
Masatoshi Nakayama; Masahiro Nakano, and Tsukimi Endo, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Continuation of Ser. No. 44,441, Apr. 6, 1993, abandoned.
This application Jun. 13, 1995, Ser. No. 372,691
Claims priority, application Japan, Sep. 28, 1992, 4-281079
Int. Cl.[6] B41J *2/335*
U.S. Cl. 400—120.01 **6 Claims**

1. A wear-resistant protective film for a thermal printing head, said film comprising Si, O, N and at least one element selected from the group consisting of Sr, Ba and Ra.



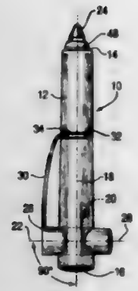
5,590,970
CONTACT-FREE DOUBLE-SHEET CONTROL DEVICE FOR A PRINTER
Andreas Hess, Neckargemünd, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Sep. 8, 1995, Ser. No. 526,113
Claims priority, application Germany, Sep. 8, 1994, 44 31 934.7
Int. Cl.[6] B41F *33/02*
U.S. Cl. 400—708 **12 Claims**



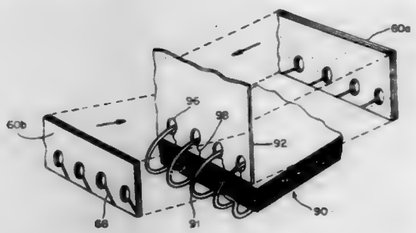
1. Contact-free double-sheet control device for a printing press, comprising a capacitively-operating measuring sensor for determining a sheet count of the printing press, a counter-electrode adjacent to said capacitively-operating measuring sensor, an evaluation circuit connected to the sensor, and an eddy-current measuring sensor connected to the capacitive measuring circuit, said eddy-current measuring sensor compensating for operating influences.

5,590,971
MARKING PEN AND CAP
Norman Melnick, Edison, N.J., assignor to Pentech International Inc., Edison, N.J.
Filed Jun. 26, 1995, Ser. No. 494,511
Int. Cl.[6] B43K *9/00*
U.S. Cl. 401—202 **20 Claims**

1. An improved marking pen, with cap attachment and storage means and a detachable tip sealing device, which comprises:
A. a pen barrel means extending longitudinally and including a first end means and a second end means spatially disposed with respect to one another, said pen barrel means defining a barrel axis extending longitudinally therethrough, said pen barrel means defining a cap retaining bore means therein oriented approximately perpendicularly with respect to said barrel axis;
B. a marking tip means positioned adjacent said first end means of said pen barrel means to facilitate marking use of said improved marring pen;
C. a cap means extending longitudinally and defining a cap axis extending longitudinally therethrough, said cap means being attachable with respect to said first end means of said pen barrel means in position with said cap axis and said barrel axis being coincident with respect to one another and with said cap means extending over said marking tip means to prevent marking therewith, said cap means being detachable with respect to said first end means to facilitate marking with said marking tip means, said cap means being detachably securable extending within said cap retaining bore means with said cap axis oriented approximately perpendicularly with respect to said barrel axis; and
D. an attachment means secured to said cap means and attached with respect to said pen barrel means to facilitate retainment of said cap means.

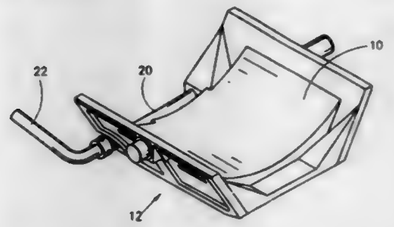


5,590,972
REINFORCEMENT STRIP AND KIT FOR USE IN ATTACHING A PAGE TO A WIRE BINDING OF A WIRE BOUND NOTEBOOK
Sharyn B. Shobin, 20 Thatch Pond Rd., Smithtown, N.Y. 11787
Filed Nov. 13, 1995, Ser. No. 555,871
Int. Cl.[6] B42F *13/00*
U.S. Cl. 402—79 **16 Claims**



1. A reinforcement strip for use in attaching a page to a wire binding of a wire bound notebook, the reinforcement strip comprising:
a reinforcement layer having a first surface, a second surface, and a plurality of apertures extending through said first surface to said second surface, said plurality of apertures positioned in generally a linear row adjacent a first edge of said reinforcement layer, said reinforcement layer having a plurality of slits extending through said first surface to said second surface, each of said slits extending from said first edge of said reinforcement layer to a second edge defining said aperture to form a passage for allowing a turn of a wire binding of a wire bound notebook to pass from said first edge of said reinforcement layer to said aperture, each of said slits being disposed at a non-perpendicular angle to said first edge of said reinforcement layer; and
means for attaching said first surface of said reinforcement layer to a page.

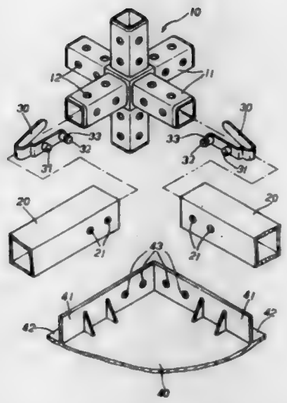
5,590,973
QUICK CONNECTOR
Yehuda Don-Yehiya, Kiryat Yam, Israel, assignor to State of Israel Rafael-Armament Development Authority, Haifa, Israel
Filed Feb. 6, 1995, Ser. No. 384,044
Claims priority, application Israel, Feb. 9, 1994, 108605
Int. Cl.[6] B25G *3/18;* **F16B** *21/00;* **A47B** *96/06;* **G03B** *29/00*
U.S. Cl. 403—325 **12 Claims**



1. A connector for detachably connecting a first body and a second body together, comprising:
(a) an insert member attached to the first body, said insert member having a first edge which features an outwardly inclining portion having a first planar contact area, said insert member further featuring an opposing edge which includes a protrusion; and
(b) a base member attached to the second body, said base member including a substantially horizontal rotatable shaft adjacent said first edge of said insert member when said insert member is seated in said base member, said base member further including an overhang adjacent said opposing edge of said insert member when said insert member is seated in said base member and directed toward said shaft, said shaft of said base member featuring a flattened locking region having a second planar contact area, said flattened locking region serving to lock said shaft into a locked position adjacent said insert member so that substantially all of said second planar contact area of said flattened locking region is contiguous with substantially all of said first planar contact area of said outwardly inclining portion of said first edge of said insert member, thus alternately securing said insert member by confining said outwardly inclining portion of said first edge of said insert member and said protrusion of said opposing edge of said insert member, and releasing said insert member, depending on the rotational position of said shaft.

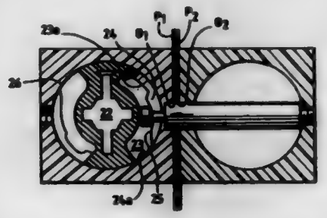
5,590,974
ASSEMBLING CONNECTOR STRUCTURE
Tian-Show Yang, No. 173, Pu Tzu Keng, Ping Lin Tsun, Tai Ping Hsiang, Taichung Hsien, Taiwan
Filed May 30, 1995, Ser. No. 452,493
Int. Cl.[6] F16B *21/08*
U.S. Cl. 403—327 **1 Claim**

1. An assembling connector structure comprising a multidirection connector having multiple square hollow insertion columns, multiple square connecting tubes and multiple substantially U-shaped leaf springs, each face of each insertion column being formed with two through holes and each end of each connecting tube being formed with two through holes, each leaf spring of said U-shaped leaf springs being disposed with an outward engaging boss and an inward engaging boss on a surface thereof, said outward engaging boss and said inward engaging boss being substantially cylindrical, whereby when assembled, the leaf spring is first inserted into and engaged with the insertion column and then the connecting tube is fitted around the insertion column with the through holes of the connecting tube aligned with the through holes of the insertion column, so that each said boss on the leaf spring passes by spring action through the aligned through holes to bound outside the connecting tube to assemble the connector



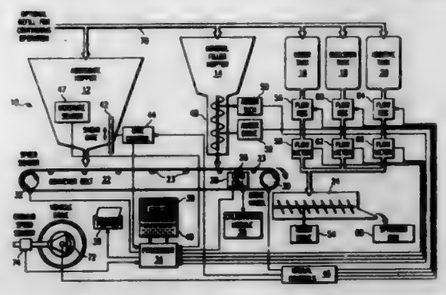
structure into a solid frame assembly having multiple square frames, several frame boards having rectangular frame walls and flanges on four sides being horizontally positioned in the square frames of the frame assembly for placing articles on the frame boards, said connector structure being characterized in that said outward boss of the leaf spring is longer than said inward boss, said outward boss being formed with an upper and a lower engaging recess symmetrically spaced apart on said outward boss, each said engaging recess passing by spring action into and engaging with through holes formed on four corners of the frame walls of the frame board so as to securely fix the frame board on the square frame and prevent the frame board from detaching and dropping therefrom.

5,590,975
FASTENING ASSEMBLY
Earl Horstvedt, 215 Cleveland Ave., Manitowoc, Wis. 54220
Filed Dec. 6, 1994, Ser. No. 349,972
Int. Cl.[6] F16G *11/00*; B25G *3/00*; A47B *88/00*; E04B *2/82*
U.S. Cl. 403—407.1 **19 Claims**



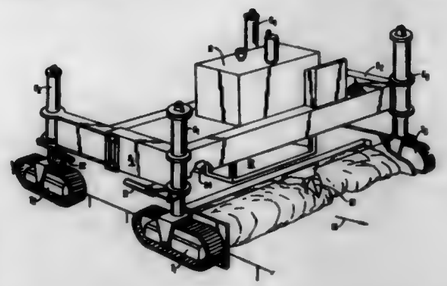
1. A fastening assembly securing a plate member with an opening to a support, said comprising: a plate member with a predetermined thickness; a post member with a first end portion for securing the post member with a first end portion for securing the post member to a support, said post member extending through an opening across the entire thickness of the plate member; a block housing member defining a contact surface for engaging the plate member, said housing member and said plate member being separate members; and a cam member mounted to the housing member, said cam member defining a camming surface; a second end portion of the post member engaging the camming surface and cooperating with the cam member to place the plate member in compression between the housing member and the support, the housing member being substantially smaller than the plate member.

5,590,976
MOBILE PAVING SYSTEM USING AN AGGREGATE MOISTURE SENSOR AND METHOD OF OPERATION
Kenneth E. Kilheffer; Calvin L. Stegemoeller, and Lesley T. Hays, all of Waco, Tex., assignors to Akzo Nobel Asphalt Applications, Inc., Waco, Tex.
Filed May 30, 1995, Ser. No. 453,454
Int. Cl.[6] E01C *19/00*
U.S. Cl. 404—72 **27 Claims**



22. A method of operating a mobile paving system to produce paving material, comprising:
- providing aggregate to be used in producing paving material;
- measuring an amount of moisture in the aggregate;
- determining a dry weight of aggregate used to produce paving material by converting from volume to dry weight using bulking effect data for the aggregate corresponding to the amount of moisture measured;
- controlling a flow of the aggregate to a mixer in response to the determined dry weight; and
- mixing remaining materials with the aggregate to produce the paving material.

5,590,977
FOUR TRACK PAVING MACHINE AND PROCESS OF TRANSPORT
Ronald M. Gunkert, Stockton; Steve Mickelsen, Chico, both of Calif., and J. Kenyon Schneller, Englewood, Colo., assignors to Gunkert & Zimmerman Constr. Div. Inc., Ripon, Calif.
Filed May 25, 1995, Ser. No. 450,242
Int. Cl.[6] E01C *19/12*
U.S. Cl. 404—101 **16 Claims**

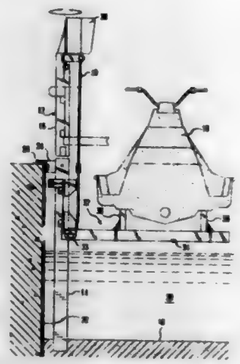


1. In a four track paver for paving along a paving path over ground, the four track paver comprising:
- a rectilinear frame having two sides extending parallel to the paving path of the paver, two spanning members extending normal to the paving path of the paver with four corners joining the sides and spanning members;
- four crawler tracks with one crawler track adjoining each of the four corners of the rectilinear frame, each crawler track being centrally pivotal to one of the four corners of the rectilinear frame to pivot at least 90° with respect to the frame corner from a position parallel to the paving path to a direction normal to the paving path;
- hydraulic cylinders fastened between the crawler tracks and frame for raising and lowering the rectilinear frame relative to the crawler tracks;
- a paving kit suspended from the rectilinear frame below the rectilinear frame and between the sides for finishing concrete on the ground in front of the paver;
- each side of the rectilinear frame extending parallel to the paving path of the paver is a side bolster including first and second telescoping members to enable the rectilinear frame to expand and contract along the paving path.

8. A process for configuring a four track paver for transport from a configuration for paving along a paving path over ground, the four track paver having,
- a rectilinear frame having two sides extending parallel to the paving path of the paver, two spanning members extending normal to the paving path of the paver along a longitudinal axis with four corners joining the sides and spanning members;
- four crawler tracks with one crawler track adjoining each of the four corners of the rectilinear frame;
- hydraulic cylinders fastened between the crawler tracks and frame for raising and lowering the rectilinear frame relative to the crawler tracks;
- a paving kit suspended from the rectilinear frame below the rectilinear frame and between the sides for finishing concrete on the ground in front of the paver; and,
- each side of the rectilinear frame including first and second telescoping members to enable the rectilinear frame to expand and contract along the paving path;
- the process of preparing the paver for transport including the steps of:
- elevating the frame relative to the crawler tracks to lift the paving kit free of the ground;
- providing a flat bed transport having a transportable dimension slightly exceeding a width of the flat bed;
- placing the flat bed transport between the paving kit and ground;
- lowering the kit and frame for support from the flat bed transport;
- raising the crawler tracks from the ground and above the flat bed transport; and,
- after the raising step reducing the lengths of the sides of the frame by contracting the first and second telescoping members to bring the crawler tracks within a transportable dimension of the flat bed transport.

5,590,978
ELEVATOR CONSTRUCTION FOR THE LAUNCHING AND RECOVERY OF PERSONAL WATERCRAFT
Vincent Urbank, 609 Elizabeth Ter., Toms River, N.J. 08753
Filed Apr. 3, 1995, Ser. No. 415,564
Int. Cl.[6] E02B *3/20*; B63C *3/06*
U.S. Cl. 405—3 **12 Claims**

1. In a launching and recovery device for watercraft to be installed adjacent a dock or seawall of the type including an elongated vertical post having separable upper and lower portions, of polygonal cross-section with the lower portion having a lower end for support on the bottom beneath the water adjacent a dock or seawall and an upper end to be disposed at the upper edge of the dock or seawall, and with the upper post portion having an upper end and a winch fixedly mounted on such upper end and rotatable therewith, a watercraft supporting cradle cantilevered on the elongated vertical post and extending laterally therefrom for vertically sliding movement therealong and between the upper and lower post portions and arranged to be disposed beneath a watercraft to lift the same, a hoist means extending between the winch and cradle for raising and lowering the cradle upon operation of the winch, and rollers disposed between the post and cradle for supporting the cradle on the post for vertical movement, the improvement comprising:



means for rigidly connecting the upper end of the lower post portion to the dock or seawall and for supporting the upper post portion on the lower post portion for rotatable movement therebetween about their common axis;

wherein said means includes a cylindrical tube enclosed within said upper post portion, having a first plurality of apertures vertically disposed along a length thereof;

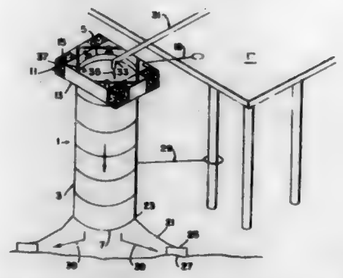
a second plurality of apertures vertically disposed along an upper end of said lower post portion;

an angle bracket including: a) a first horizontally extending surface to be secured to the dock or seawall, and having a third plurality of apertures horizontally spaced thereacross; b) a second vertically extending surface to be secured to said upper end of said lower post portion, and having a fourth plurality of apertures vertically spaced thereacross; and c) a third surface extending between said first horizontally extending surface and said second vertically extending surface;

first means for securing said first horizontally extending surface of said angle bracket to said dock or seawall via said third plurality of apertures; and

second means for securing said second vertically extending surface of said angle bracket, said cylindrical tube and said lower end of said upper post portion in alignment via said first, said second and said fourth plurality of apertures.

5,590,979
FLEXIBLE PIPE DIFFUSER AND METHOD OF USING THE SAME
Patrick K. Sullivan, Honolulu; Dayananda Vithanage, Kaneohe, and Warren E. Bucher, Mililani, all of HI., assignors to Oceanit Laboratories, Inc., Honolulu, HI.
Filed Jan. 31, 1995, Ser. No. 381,492
Int. Cl.[6] E02B *8/02*; *11/00*
U.S. Cl. 405—36 **20 Claims**



1. Apparatus for clarifying water flowing into a body of water, comprising a frame having a vertical opening extending there-

through, floatable material connected to the frame for floating the frame in a body of water, an elongated collapsible, flexible tube extending downward from the frame and having an upper end connected to the frame, an opening in the upper end of the tube for receiving water, and an opening in a lower end of the tube for releasing water into the body of water.

5,590,980

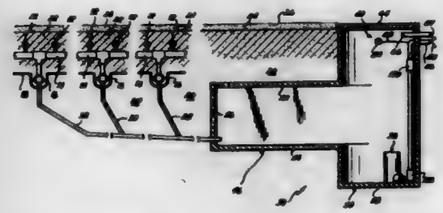
PLANTED SURFACE MOISTURE CONTROL SYSTEM

William H. Daniel, West Lafayette, Ind., assignor to Purdue Research Foundation, Lafayette, Ind.

Continuation of Ser. No. 865,070, Apr. 8, 1992, Pat. No. 5,350,251. This application Sep. 15, 1994, Ser. No. 306,774

Int. Cl.[6] E02B *11/00;13/00*

U.S. Cl. 405—37 **11 Claims**



1. A system for controlling the moisture content on and below a planted surface, the system comprising:

a layer of rooting medium on which the planted surface is grown;

a sand fill layer immediately below the layer of rooting medium; subsoil immediately below the sand fill layer;

a plurality of drain conduits located in the sand fill layer and the subsoil beneath the planted surface for collecting liquid from the planted surface;

a sealed collection tank coupled to the plurality of drain conduits, the collection tank having upper and lower portions and located beneath the planted surface, the upper portion of the collection tank being located in the sand fill layer and the lower portion of the collection tank being located in the subsoil, the collection tank collecting liquid passing through the sand fill layer and into the plurality of drain conduits, and the collection tank having a liquid level correlated to a liquid level in the sand fill layer; and

a vacuum pump located above the planted surface and operatively coupled to the upper portion of the collection tank for removing air from the collection tank, the vacuum pump providing a subatmospheric suction force in the collection tank and in the plurality of drain conduits to draw liquid and air from the planted surface, through the sand fill layer, the plurality of drain conduits and into the collection tank.

5,590,981

DOUBLE-CONTAINMENT UNDERGROUND PIPING SYSTEM

Keith J. Osborne, Glen Ellyn, Ill., assignor to Intelpro, Inc., Chicago, Ill.

Continuation of Ser. No. 286,893, Dec. 20, 1988. This application Jun. 6, 1995, Ser. No. 469,652

Int. Cl.[6] F16L *1/00*

U.S. Cl. 405—154 **8 Claims**

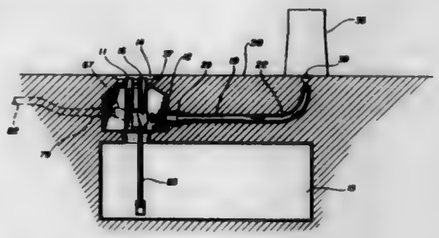
1. A secondarily contained piping system comprising:

(a) a flexible inner supply pipe;

(b) an outer secondary containment pipe;

(c) a first underground access chamber;

(d) a second underground access chamber spaced from the first underground access chamber;



(e) said flexible inner supply pipe positioned to provide a path of fluid communication between said first underground access chamber and said second underground access chamber;

(f) said flexible inner supply pipe having an exterior surface;

(g) said flexible inner supply pipe further having a first end and a second end;

(h) said secondary containment pipe surrounding at least a portion of the exterior surface of said inner supply pipe;

(i) a fluid source connected at the first end of the flexible inner supply pipe;

(j) a fluid outlet connected at the second end of the flexible inner supply pipe;

(k) a first coupling connecting the flexible inner supply pipe to the fluid source, the first coupling being disposed within the first underground access chamber; and

(l) a second coupling connecting the flexible inner supply pipe to the fluid outlet, the second coupling being disposed within the second underground access chamber.

5,590,982

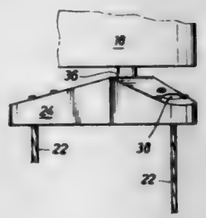
TENDON CLUSTER ARRAY

David A. Huete, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1994, Ser. No. 370,762

Int. Cl.[6] E02D *5/74;23/00*

U.S. Cl. 405—223.1 **14 Claims**



1. A tendon cluster for tethering a superstructure of a tension leg platform to an ocean floor, comprising:

a plurality of non-tubular tendons for anchoring to the ocean floor at their lower ends;

a substantially planar, substantially horizontally disposed tendon bracket receiving the upper ends of the tendons in tendon terminations;

a tendon bracket connection pivotally securing the tendon bracket to a downwardly disposed surface of the superstructure through a semispherical flexjoint at a normal load centroid of the tendon bracket; and

a jack mount disposed between the superstructure and the tendon bracket and arranged in radial alignment of the upper tendon connection and the normal load centroid.

5,590,983

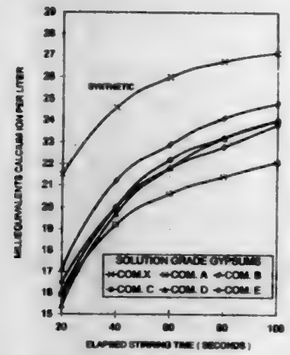
METHOD OF IMPROVING SOIL IRRIGATION WITH AN IMPROVED SOLUTION GRADE CALCIUM SULFATE DIHYDRATE

Edwin C. Angell, 7800 Hooper Ave., Bakersfield, Calif. 93308

Filed Sep. 5, 1995, Ser. No. 523,462

Int. Cl.[6] E02D *3/00;* **C01F** *11/46;* **C09K** *17/06*

U.S. Cl. 405—263 **19 Claims**



1. A method of improving ground soil irrigation by adding a soil additive to the soil to facilitate irrigation thereof and which soil additive comprises synthetic solution grade calcium sulfate dihydrate made by the process comprised of:

a) contacting a calcium compound having a calcium cation and an anion with a chemical agent enabling the calcium compound to yield calcium ions upon reaction thereof with the chemical agent and under conditions which enable the calcium cation to react with the anion of the chemical agent to form a second calcium compound;

b) reacting in the presence of water the second calcium compound with a sulfur containing acid capable of yielding sulfate containing moieties and which also causes a disassociation of the calcium cation and said anion;

c) allowing the reaction of the calcium cations and the sulfate containing moieties to form a hydrated calcium sulfate dihydrate.

3. The method of improving ground soil irrigation of claim 1 further characterized in that the calcium sulfate dihydrate is highly crystalline and will remain in suspension in water for a period of time exceeding three times the length of time that a conventional solution grade calcium sulfate dihydrate will remain in suspension in water.

5,590,984

METHOD AND SYSTEM FOR INSTALLING LOOSE INSULATION

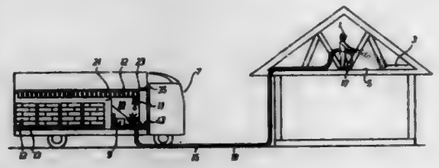
Göran Assarsson, Råå, Sweden, assignor to Isover Saint-Gobain, Paris La Défense, France

Filed Aug. 24, 1994, Ser. No. 293,954

Claims priority, application Sweden, Aug. 25, 1993, 9302749

Int. Cl.[6] B65G *53/44*

U.S. Cl. 406—32 **11 Claims**



10. A system for installing loose insulation comprising

equipment for fluffing insulation material fed thereinto and blowing the fluffed material onward, and

a conduit for transporting onward-blown insulation material from the equipment to the location where the insulation material is to be placed,

a storage and transport device for receiving and storing a number of units which each have compacted insulation material packed in a wrapping, the device being adapted to feed units successively and in a controlled manner to an emptying position for discharging the pertaining insulation material to the equipment for fluffing and onward blowing of the insulation material,

means for controlled cutting-open of units located in the emptying position, such that the insulation material contained therein can be discharged, and

control means for controlling the storage and transport device, cutting-open means and the equipment, the control means comprising remote-control means to be operated on the location where the insulation material is to be placed, such that overall control of the onward blowing of insulation material can be carried out from the location,

wherein the storage and transport device comprises means for suspending insulation material units, and means for successively feeding the suspension means in a controlled manner along a feed track to the emptying position, the suspension means suspending units such that the units hang above the fluffing and onward-blow equipment, the suspension means including carrier rods which are each adapted to be applied through an insulation material unit and/or its wrapping, the carrier rods being supported in a manner to permit feed thereof in the storage and transport device in a controlled manner, the wrapping being substantially parallelepipedal, the carrier rod being of sufficient size to pass through one end wall of the wrapping, then along and close to an inside of a long side of the wrapping and out through an opposite end wall of the wrapping, the cutting-open means being configured for making auxiliary cuts in the wrapping in an opposite long side of the wrapping in a transverse direction and adjacent a receptive end wall, the auxiliary cuts extending throughout a major part of the side and being extended in one direction into an adjoining side of the wrapping, and for making emptying cuts in the adjoining side across the auxiliary cuts, along and at a lower edge of the adjoining side.

5,590,985

DRILL WITH PNEUMATICALLY SELF-CLEARING CHUCK

Hans-Dieter Mack, Southeim, Germany, assignor to Gunter Horst Rohm, Southeim, Germany

Filed Mar. 28, 1995, Ser. No. 411,522

Claims priority, application Germany, Apr. 2, 1994, 44 11 523.7

Int. Cl.[6] B23B *45/00*

U.S. Cl. 408—56 **20 Claims**

1. A drill comprising:

a drive unit having

a front end and

an output shaft projecting from the front end and centered on and rotatable about an axis;

a chuck body fixed on the shaft and formed with

a rear end juxtaposed with the drive-unit front end,

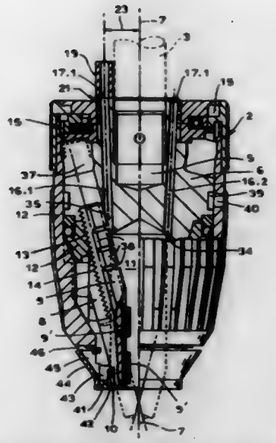
an axially forwardly open tool recess on the axis,

a plurality of angularly spaced and angled guides opening into the recess, and

at least one passage extending between the chuck rear end and the recess and opening backward toward the drive-unit front end;

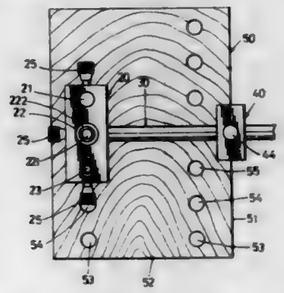
means including a fan driven by the shaft for creating a moving stream of air traversing a location at the drive-unit front end immediately behind the chuck rear end;

respective jaws displaceable in the guides and having front ends in the recess;



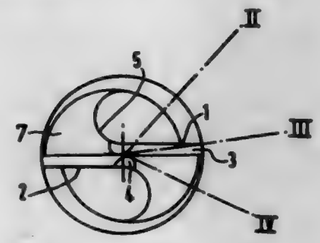
an adjustment sleeve rotatable about the axis on the body;
means including interengaging formations on the sleeve and on the jaws for displacing the jaws radially on rotation of the sleeve about the axis; and
means including a deflector at the location directing the air stream into the passage for conducting the air stream through the recess, whereby any chips or the like in the recess will be entrained therefrom by the air stream.

5,590,986
DRILL JIG FOR LOCATING HOLES TO BE DRILLED IN A WORKPIECE
Ber-Chang Juang, No. 3, Lane 14, Chen-Hsing Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed May 2, 1995, Ser. No. 433,923
Int. Cl.[6] B23B *49/00*
U.S. Cl. 408—115 R **3 Claims**



1. A drill jig for locating holes to be drilled in a workpiece, comprising:
an elongated guiding block having a top face which is formed with a plurality of through-bores for locating holes to be drilled in a workpiece, said through-bores being spaced apart and aligned in a longitudinal direction of said guiding block, a plurality of threaded holes, each of which communicates with a respective one of said through-bores in a direction that is transverse to axes of said through-bores, a bushing and a positioning pin extending removably through two of said through-bores, each of said threaded holes having a locking screw so that said bushing and said positioning pin can be releasably locked in said two through-bores by the corresponding locking screws when they are received in said two through-bores;
a guiding rod connected to a side face of said guiding block and extending in a direction that is transverse to said longitudinal direction of said guiding block; and
a positioning block having a bottom face, an abutting plate depeading from said bottom face of said positioning block, a top face which is formed with a threaded bore, a through hole through which said guiding rod slidably passes, said through hole communicating with said threaded bore in a direction that is transverse to an axis of said threaded bore, a locking bolt being threaded into said threaded bore so that said positioning block can be locked releasably to said guiding rod.

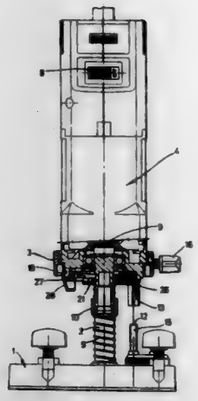
5,590,987
PRECISION TWIST DRILL BIT
Lucien Bouzounie, Pontault-Combault, France, assignor to Etablissements Recoules et Fils (S.A.), France
PCT No. PCT/FR93/01214, § 371 Date Aug. 4, 1994, § 102(e) Date Aug. 4, 1994, PCT Pub. No. WO94/13421, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 9, 1993, Ser. No. 284,513
Claims priority, application France, Dec. 9, 1992, 92 14820
Int. Cl.[6] B23B *51/02*
U.S. Cl. 408—230 **1 Claim**



1. A one piece twist drill comprising:
a cylindrical surface with an axis of symmetry, the cylindrical surface having two spiral flutes;
a cutting point defined by two diametrically opposed blades defining each blade having a first clearance, two lands each defining a second clearance, and a third clearance defined by two depressions formed in the first clearances, second clearances and flutes, each of said blades being formed with a lip and said depressions defining cutting edges formed in the first clearance, the cutting edges of the two depressions being symmetrical relative to the center of the drill, wherein said first clearance is in the range of 0.1 to 0.2 mm wide, wherein the blades are aligned symmetrically about the axis of symmetry and the drill is surface finished to a dimensional accuracy of less than 0.1 micron Ra.

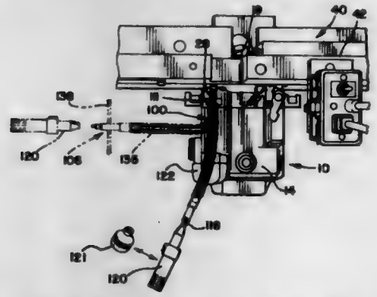
5,590,988
PLUNGE TYPE ROUTER
Maurizio Rusconi, Lecco, Italy, assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 2, 1995, Ser. No. 397,462
Claims priority, application United Kingdom, Mar. 2, 1994, 9404083
Int. Cl.[6] B23C *1/20*
U.S. Cl. 409—182 **9 Claims**

1. A plunge-type router comprising a motor housing having a driving motor provided therein, a motor drive shaft coupled for rotation by the driving motor, a base having a workpiece-engaging flange member and a support plate axially movable with respect to the flange member along substantially perpendicular guide means, the support plate being biased away from the flange member and provided with a bore to receive the motor housing and clamping



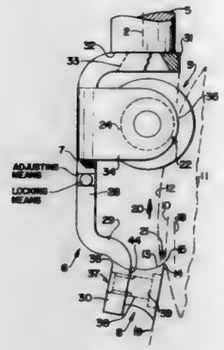
means to secure the housing in the bore, and locking means effective to prevent undesired separation of the motor housing from the support plate.

5,590,989
FLEXIBLE ROUTER HEIGHT-ADJUSTMENT MECHANISM
Ralph Mulvihill, 7757 Steeple Chase Dr., Frankfort, Ill. 60423
Filed Feb. 15, 1996, Ser. No. 602,234
Int. Cl.[6] B23C *1/20*; B27C *5/00*
U.S. Cl. 409—182 **20 Claims**



1. A height-adjustment mechanism for adjusting the operating height of a router mounted in a router table wherein the router table includes a flat top, an opening extending through the router table top, and wherein the router includes a router housing enclosing a router motor having a drive shaft which projects through said housing and which receives a router bit thereon, a router base interconnected to the router housing by means of at least one plunge rod and the router being attached to the router table at the router table opening by way of the router base so that the router bit is aligned with said router table opening when said router is attached to said router table, the router bit defining an axis of said router, a threaded shaft which extends parallel to the router axis between said router base and the router housing, and which engages an abutment of said router housing, the height-adjustment mechanism including an elongated flexible member having two opposing ends, the flexible member having a body portion extending between its two ends, the body portion being flexible for substantially its entire length, one of said ends including an engagement end having means for engaging said router housing threaded shaft and the other of said two ends including a driving end having means for engaging a driving means for driving said flexible member in rotation and in engagement with said threaded shaft, said flexible member being capable of flexing over any portions of said router housing which extend into the path of said flexible member when attached to said router.

5,590,990
TOOL FOR WORKING MATERIALS ON WORKPIECES, PARTICULARLY FOR MANUAL DEBURRING
David Hershkovitz, Nahariya, Israel, assignor to Vargus Ltd., Nahariya, Israel
Filed Sep. 13, 1994, Ser. No. 305,484
Claims priority, application Germany, Sep. 13, 1993, 43 30 879.1
Int. Cl.[6] B23D *9/00*; B26B *3/00*
U.S. Cl. 409—303 **39 Claims**



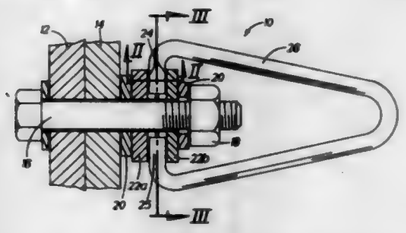
1. A tool (1) for material working on at least one work-piece (11) in at least one engagement area (21, 22) comprising:
a basic body (3) providing at least one holder (4) configured for grasping for operably holding said tool (1) and at least one working head (6) fixed to said holder, said at least one of working head providing at least at least one first working face and at least one second working face (13-15, 16) defining a supporting and working plane (10) when in working engagement with the workpiece (11), at least one of said working faces providing at least one machining face (13, 14, 16) defining at least one working zone (40) over which said machining face is machiningly engageable, apart from said machining face at least one of said working faces providing at least one supporting face (14, 16) for supporting said working head (6) on the workpiece (11) while performing an advance motion determining an advance direction (20) and while at least one of said machining face (13-15, 16) is in a machining engagement position, wherein said first and second working faces (13 to 15, 16) include means for machiningly applying said first working face (13-15) to the workpiece (11) in a plurality of continuously connecting machining engagement positions reciprocally displaced laterally to said advance direction (20) with respect to each succeeding position, wherein at least one of said supporting face (16) provides a recessed face having flanks (23) reciprocally oriented at a flank angle, said flank angle being larger than 90° to 100° and between substantially 110° and 140° at substantially 130°, said flanks (23) being substantially symmetrical on either side of a median plane (26) of said working zone (40) of at least one of said working member (8, 9), said median plane (26) being oriented substantially parallel to said advance direction (20).

5,590,991

LOCKING DEVICE

Andrea Garugilieri, Colle Brianza, Italy, assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 111,749, Aug. 25, 1993, abandoned.
This application Nov. 14, 1994, Ser. No. 338,985
Claims priority, application United Kingdom, Aug. 28, 1992, 9218366
Int. Cl.[6] F16B *19/00;43/00*
U.S. Cl. 411—354 5 Claims



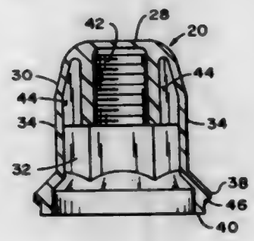
1. A locking device, said locking device comprising:
a bolt having a longitudinal axis;
a nut mounted near an end of said bolt;
first and second components through which said bolt passes;
a triangular-shaped lever which pivots about and is connected to said bolt;
two elliptical-shaped cams formed in a base of said triangular-shaped lever;
two cam followers through which said bolt passes, each located on an opposite side of said elliptical-shaped cams;
at least one pair of grooves formed in each of said cam followers for mating with said elliptical-shaped cams;
said lever is pivotable about an axis transverse to the bolt axis such that when said lever is pivoted, said elliptical-shaped cams contact a pair of said grooves and push said cam followers in opposite directions on said bolt, and
thereby cause any free space on said bolt to be taken up and further cause said two components to be pressed tightly together and lock.

5,590,992

COVER FOR A BOLT AND NUT

Vincent T. Russell, Middleburg Heights, Ohio, assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 401,731, Mar. 8, 1995. This application Apr. 18, 1995, Ser. No. 423,421
Int. Cl.[6] F16B *37/08*
U.S. Cl. 411—431 16 Claims



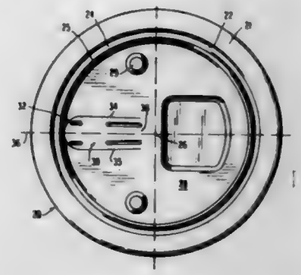
1. A one-piece, reusable cover for an assembly of a threaded bolt and an associated annular nut, wherein a portion of the bolt extends through the nut, said cover comprising:
(a) a closed top end portion; and
(b) a generally cylindrical sidewall extending from the closed top end portion so as to define a generally hollow cavity within the cover, wherein the exterior of the sidewall includes a plurality of adjacent planar surfaces and
(c) an internally threaded portion which extends into the cavity of the cover from an interior surface of the top end portion, which internally threaded portion is supported by a plurality of stiffening ribs extending inwardly from one or more inner surfaces of the sidewall, wherein a stiffening rib is provided at each intersection of adjacent planar surfaces; wherein the threads of the internally threaded portion are adapted to mate with external threads on the bolt, so that the cover may be attached to the portion of the bolt that extends through its associated nut by threaded engagement therewith, when the cover is installed over the bolt and nut assembly.

5,590,993

EASY-ACCESS SHEET METAL CONTAINER STRUCTURES

William T. Saunders, deceased, late of Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.

Continuation-in-part of Ser. No. 824,780, Jan. 17, 1992, abandoned, which is a division of Ser. No. 454,361, Dec. 21, 1989, abandoned. This application Jul. 29, 1993, Ser. No. 99,195
Int. Cl.[6] B21D *51/44*
U.S. Cl. 413—12 5 Claims



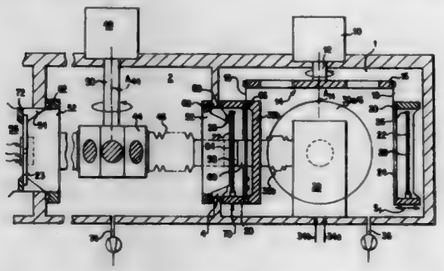
1. Method for fabricating an easy-access sheet metal end closure for a container, comprising
providing flat-rolled sheet metal;
fabricating such sheet metal to provide an endwall panel which is axially-recessed toward the interior of such container from chime seam flange metal which is used for hermetically sealing such end closure to the container, with an axially-oriented chuck wall which is unitary with such chime seam flange metal and endwall panel,
such endwall panel being substantially planar, and further including the steps of:
scoring such endwall panel to establish scoreline means at which thickness of such sheet metal is decreased,
such scoreline means defining an elongated narrow-width tear strip which is substantially symmetrical with relation to its central longitudinal axis,
such scoreline means including:
an arcuate-shaped scoreline and a pair of linearly extended scoreline legs,
such arcuate-shaped scoreline having its midpoint located at such central longitudinal axis,
such scoreline legs being symmetrically disposed one each on lateral sides of such axis, and extending from such arcuate-shaped scoreline with
the major component of direction of each such scoreline leg being substantially parallel to or converging at an angle of up to about one and one half degrees toward such central longitudinal axis of the tear strip;
providing buckle-resistant profiling for such endwall panel by forming a peripherally-located bead, of circular-configuration in plan view of the endwall panel,
such bead being contiguous with such chuck wall and axially-recessed in an internal direction in relation to such container;
forming a protruding bead, of circular-configuration in plan view of such endwall panel, which is radially-inwardly of and contiguous to such recessed bead;
such protruding bead extending in an axially external direction in relation to the endwall panel, and being positioned to substantially eliminate flexing of sheet metal at such endwall panel periphery to facilitate initiating of puncture rupturing of such arcuate-shaped scoreline;
impressing elongated shallow-depth rib means contiguous to such tear strip, as defined in the endwall panel sheet metal by the scoreline means, with the major component of direction of such rib means extending in substantially parallel relationship to such scoreline legs, and, in which
impressing of such elongated rib means is carried out contemporaneously with scoring such tear strip in such endwall panel;
providing an elongated sheet metal opener having a working end and a handle end at opposite longitudinal ends of its central longitudinal axis;
securing such opener to the elongated tear strip utilizing sheet metal which is contiguous to the working end of the elongated opener and sheet metal of the elongated tear strip contiguous to the arcuate-shaped scoreline,
such elongated opener being secured in overlaying relationship to such tear strip with the central longitudinal axis of such opener extending with its major component of direction substantially the same as the major component of direction of such central longitudinal axis of the elongated tear strip; and, in which
scoring of such endwall panel sheet metal to establish such scoreline means includes
locating the midpoint of such arcuate-shaped scoreline contiguous to such protruding bead of such endwall panel with such elongated scoreline legs being directed from radially inboard ends of the arcuate-shaped scoreline toward sheet metal which is approaching and contiguous to the geometric center of such endwall panel.

5,590,994

CHAMBER, AT LEAST FOR THE TRANSPORT OF WORKPIECES, A CHAMBER COMBINATION, A VACUUM TREATMENT FACILITY AS WELL AS A TRANSPORT METHOD

Roman Schertler, Wolfurt, Austria, assignor to Balzers Aktiengesellschaft, Liechtenstein

Filed Oct. 5, 1993, Ser. No. 131,669
Claims priority, application Switzerland, Oct. 6, 1992, 03119/92; Mar. 11, 1993, 757/93
Int. Cl.[6] B65G *49/07*
U.S. Cl. 414—217 12 Claims



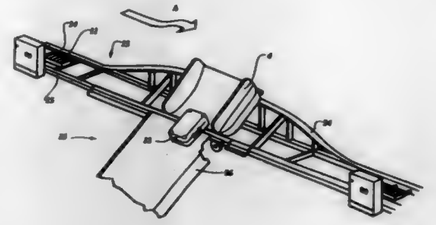
1. A vacuum chamber, comprising a transport rotor with at least two workpiece holders remote from and rotatable around an axis in the chamber, a rotor drive for driving the transport rotor, at least two openings in the wall of the chamber arranged such that each of said at least two workpiece holders is angularly alignable by rotation of said transport rotor with each of said at least two openings, a transport device centrally located with respect to said transport rotor and comprising at least two conveyors, wherein said at least two conveyors are arranged to be movable at least with a movement component in a radial direction with respect to said axis to and from said workpiece holders, each of said at least two conveyors being independently operable by a respective conveyor drive, so as to move a workpiece angularly aligned with one of said at least two openings by rotation of said transport rotor to and from said one opening.

5,590,995

CONVEYING RAIL SYSTEM FOR A TROLLY

Antonius J. H. Berkers, EP Heeze; Johannes F. G. Smits, LC Helmond, and Antonius A. P. Van De Ven, HX Eindhoven, all of Netherlands, assignors to Vanderlande Industries Nederland B.V., Veghel, Netherlands

Filed Dec. 19, 1994, Ser. No. 358,944
Claims priority, application Netherlands, Dec. 20, 1993, 9302211
Int. Cl.[6] B15G *67/24*
U.S. Cl. 414—357 14 Claims



1. A conveying system, which compriaes:
a rail system and a trolley accommodating goods, said trolley being movable along said rail system, wherein said rail system includes at least one discharge station discharging goods from said trolley, said discharge station having means for placing at least one supporting surface supporting said goods in a sloping position, such that goods present on said trolley are slidable from the trolley through an outlet opening of the trolley, transversely to a direction of movement of the trolley during operation, and at least one closing means is provided for opening and closing the outlet opening, at least in the discharge station;
drive means for driving said trolley wherein said means includes bar shaped means connected to said trolly;
conveyor means for engaging said bar shaped means and conveying said trolley in said direction of movement; and
a plurality of spring loaded rollers which engage said bar shaped means wherein said conveying means comprises an endless belt.

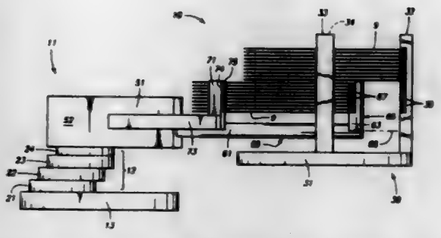
5,590,996

WAFER TRANSFER APPARATUS

Steven R. Thompson, Somers, and Rikki S. LaBere, Kalispell, both of Mont., assignors to Semitherm, Kalispell, Mont.

Filed Oct. 13, 1994, Ser. No. 322,754
Int. Cl.[6] B65G *65/00*
U.S. Cl. 414—416 65 Claims

36. A wafer transfer apparatus for transferring at least one wafer or other panel to or from a wafer station which holds a wafer station array, comprising:
a primary subassembly;



at least one proximal wafer contact head connected to the primary subassembly; said at least one proximal wafer contact head having at least one wafer support feature for supporting at least one wafer;

a secondary subassembly mounted upon said primary subassembly; said secondary subassembly having movable portions which can be moved relative to said primary subassembly;

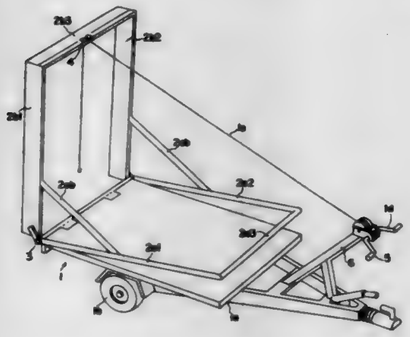
at least one distal wafer engagement head mounted upon said movable portions of the secondary subassembly; said at least one distal wafer engagement head having at least one wafer support feature for supporting a wafer;

an actuator connected to move the movable portions of the secondary subassembly relative to said primary subassembly; said actuator moving the at least one distal wafer engagement head between an upstanding engaging position and a laterally oriented retracted position.

5,590,997
BOAT TRAILER DEVICE

Mattias Fredriksson, Kalmar, and Martin Altnäs, Västervik, both of Sweden, assignors to Swedish Mercoring HB, Kalmar, Sweden

PCT No. PCT/SE93/00733, § 371 Date Jun. 13, 1995, § 102(e) Date Jun. 13, 1995, PCT Pub. No. WO94/06650, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 9, 1993, Ser. No. 397,071
Claims priority, application Sweden, Sep. 11, 1992, 9202615
Int. Cl.[6] B60P *3/10*
U.S. Cl. 414—541 **16 Claims**



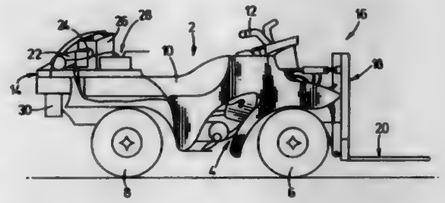
1. A trailer device for use on a trailer having a front and back end including a chassis supported by wheels and a coupling device located at the front of the trailer for connecting the trailer to a towing vehicle, comprising:

a lever having a first and second arm, which said first and second arms form an angle with respect to each other and are pivoted about an axis of rotation, said axis of rotation oriented transversally at the back end the trailer, at which the first arm of the lever points forward from the axis of rotation, the first arm having a length that exceeds a length of the second arm of the lever, the first and second arms comprised of parallel arm elements with ends, whose ends are connected to an end of the axis of rotation and which at their outer ends are linked to respective transversal beams, thereby the lever arms forming a "U" shape, a distance between the outer ends of the first arm exceeds a distance between the outer ends of the second arm, said distance between ends limiting the width of objects that can be loaded or unloaded from the trailer, the front end of the trailer including a winch tower and a winch, whereby a wire of the winch is adapted to run over the outer ends of the first and second arms, one end of the wire provided with lifting means for attachment to the object, said first and second arms also including means adapted to prevent motion between the first and second arms and the wire during predetermined stages of the loading or unloading of the object.

5,590,998
LIFTING DEVICE

Andrew J. Wilcox, RMB 6475, Shady Creek, Victoria 3821, Australia

Filed Jun. 26, 1995, Ser. No. 494,448
Claims priority, application Australia, Jun. 27, 1994, PM6485
Int. Cl.[6] B66F *9/06*
U.S. Cl. 414—607 **10 Claims**

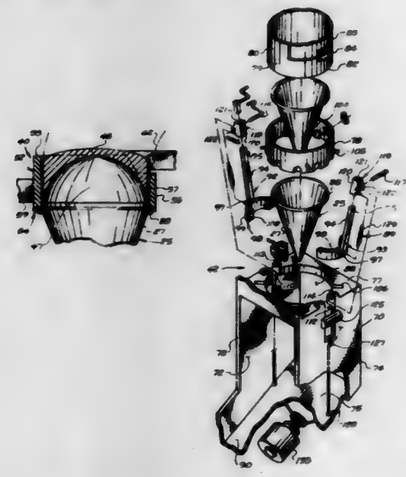


1. A lifting device in combination with a motor vehicle having a frame comprising upper and lower portions thereof, said lifting device being removably mounted to the vehicle frame and comprising removable mounting members therefor, said removable mounting members comprising an upper mounting bracket detachably coupled to the upper portion of the vehicle frame and a lower mounting bracket detachably coupled to the lower portion of the vehicle frame, said lifting device further comprising a mast pivotally connected to the lower mounting bracket for tilting said mast about a generally horizonal axis and a pair of forks and a fork lift ram for raising and lowering the forks relative to the mast, wherein said mast is coupled to the upper mounting bracket by a tilting ram positioned between and connecting the upper mounting bracket and the mast to provide said tilting movement of the mast about said axis, said lower mounting bracket includes a rear plate connected to side webs and a tubular shaft extending between the side webs, wherein a lower end of the lift ram is pivotally connected to said tubular shaft and said mast includes a pair of slotted hollow uprights and a pair of upright beams which are slidably mounted in respective ones of the hollow uprights with the forks being connected to said upright beams, said lower ends of the uprights being pivotally connected to the lower mounting bracket by a pin which passes through said tubular shaft, and wherein the upper ends of the upright beams are connected together by a top beam with an upper end of the lift ram being coupled to said top beam.

5,590,999
METHOD AND APPARATUS FOR MAKING SNOW CONES

James D. Murphey, 2438 W. Butler, Phoenix, Ariz. 85021

Division of Ser. No. 167,401, Dec. 13, 1993, Pat. No. 5,390,711, which is a continuation-in-part of Ser. No. 939,701, Sep. 2, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,773
Int. Cl.[6] B65B *1/04*
U.S. Cl. 414—795.6 **15 Claims**



1. An improved device comprising a snow cone making machine for making snow cones in cone shaped cups, wherein said improvement comprises a retaining collar moveable into engagement with a cone cup in a preparation compartment of the snow cone making machine, the retaining collar having a substantially cylindrical structure with an upper edge and a lower edge, said lower edge configured to interact with said cone cup so as to substantially eliminate relative movement between said retaining collar and said cone cup.

5,591,000
COMPRESSOR UNIT

Peter Fischer, Bad Neustadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 21, 1995, Ser. No. 561,576
Claims priority, application Germany, Jan. 5, 1995, 19500469.8
Int. Cl.[6] F04D *5/00*
U.S. Cl. 415—55.5 **6 Claims**

1. A compressor unit, comprising a plurality of side channel compressors disposed in an axially adjacent manner, each of said side channel compressors including:

a housing having:

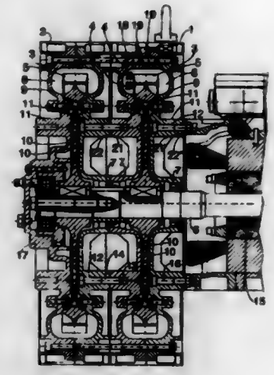
at least a outer and inner housing half, each of said outer and inner housing half having an outer periphery, such that said outer housing half is connected to said inner housing half by attachment elements introduced through a passthrough opening;

a housing wall;

a housing protrusion;

an axial extension coupled to said housing wall, said axial extension located between an axially extending hub extension and said housing protrusion,

such that the axial extension for each side channel compressor lies at the substantially the same radius and extends into a parting plane of the outer and inner housing halves;



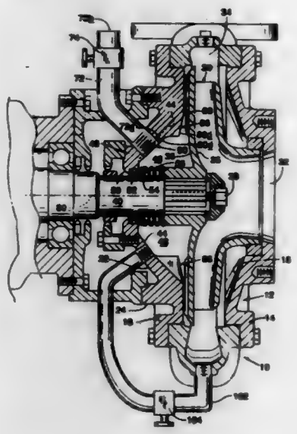
a centering rim located on said outer housing half, projecting beyond the parting plane, for matingly engaging a centering step on the axial extension of said inner housing half;

wherein the inner housing half of a side channel compressor is attached to the inner housing half of another side channel compressor at the axial extension.

5,591,001
AERATION SYSTEM

Robert B. Ray, Vancouver; Mark M. Qandil, Camas, both of Wash., and Gary L. Olin, Beaverton, Oreg., assignors to Cornell Pump Manufacturing Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 308,995, Sep. 6, 1994, Pat. No. 5,489,187. This application Oct. 6, 1995, Ser. No. 540,255
Int. Cl.[6] F04D *29/10;31/00*
U.S. Cl. 415—111 **9 Claims**



1. A method of conditioning a liquid by introducing air into the liquid using a rotating impeller for pumping the liquid comprising:

drawing liquid into the impeller at the front of the impeller and forcing the liquid over the front of the impeller toward the periphery of the impeller to produce a first liquid portion at the impeller periphery at a superatmospheric pressure,

transferring a fraction of the liquid drawn to the back of the impeller,

creating through rotation of the impeller a subatmospheric pressure in a region at the back of the impeller,

drawing atmospheric air into said subatmospheric pressure region at the back of the impeller,

mixing the transferred portion of the liquid through rotation of the impeller with this air to produce a liquid fraction containing air, and

transporting this liquid fraction, containing air to the periphery of the impeller with such then mixing with the first liquid portion.

3. A centrifugal pump comprising:

a casing and pump and seal chamber wails within the casing defining a pump chamber and a seal chamber, respectively, with the seal chamber to the rear of the pump chamber,

a rotatable impeller disposed within the pump chamber and the impeller having a back facing the seal chamber,

a shaft for the impeller supporting the impeller and the shaft extending through the seal chamber,

vane structure joined to the seal chamber wall projecting into the seal chamber, and

an air-introduction passage extending through the casing joining with said seal chamber at a region located to the rear of the back of the impeller, said passage admitting air into fluid in the seal chamber and said vane structure producing motion of fluid mixed with air outwardly from the seal chamber.

5,591,002

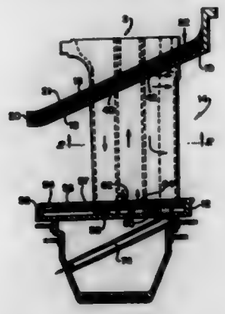
CLOSED OR OPEN AIR COOLING CIRCUITS FOR NOZZLE SEGMENTS WITH WHEELSPACE PURGE

Francisco J. Cunha, Schenectady, and Alan Walker, Ninkayuna, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Continuation-in-part of Ser. No. 414,697, Mar. 31, 1995, which is a continuation-in-part of Ser. No. 294,671, Aug. 23, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 509,917

Int. Cl.[6] F01D 9/06

U.S. Cl. 415—115 **12 Claims**



6. A closed circuit air-cooled stator vane segment comprising:

inner and outer walls spaced from one another;

a vane extending between said inner and outer walls and having leading and trailing edges, said vane including discrete leading edge, trailing edge and intermediate cavities between the leading and trailing edges and extending radially of said vane, first and second air inlets for supplying cooling air to said leading edge and trailing edge cavities, respectively;

an insert in said leading edge cavity for receiving cooling air from said first air inlet and having impingement openings for directing the cooling air against interior wall surfaces of said leading edge cavity for impingement cooling of the vane about said leading edge cavity;

an insert in said intermediate cavity for receiving cooling air and having impingement openings for directing the cooling air against interior wall surfaces of said intermediate cavity for impingement cooling of said vane about said intermediate cavity;

said trailing edge cavity through said vane lying in communication with said second inlet for receiving cooling air therefrom and having an outlet at a radially inner end thereof, said outlet including a passage for directing spent cooling air into a wheelspace between adjacent turbine stages; and

a discrete aft cavity between said intermediate cavity and said trailing edge cavity, an insert in said aft cavity for receiving cooling air and having impingement openings for directing the cooling air against interior wall surfaces of said vane adjacent said aft cavity for impingement cooling of said vane, a plurality of ribs projecting inwardly of said interior wall surfaces of each said leading edge cavity, said intermediate cavity and said aft cavity at spaced locations therealong to define flow chambers between said interior wall surfaces and said inserts, at least two of said inserts having at least one radially extending flow channel each in communication with said flow chambers formed by respective inserts for directing spent cooling air from the respective cavity.

5,591,003

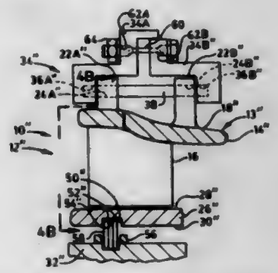
TURBINE NOZZLE/NOZZLE SUPPORT STRUCTURE

Gary L. Boyd, Alpine, Calif., and James E. Shaffer, Maitland, Fla., assignors to Solar Turbines Incorporated, San Diego, Calif.

Division of Ser. No. 166,188, Dec. 13, 1993, Pat. No. 5,441,385. This application Jun. 14, 1995, Ser. No. 427,540

Int. Cl.[6] F04D 29/44

U.S. Cl. 415—209.2 **2 Claims**



1. A turbine nozzle support structure comprising:

an outer, annular support ring structure having a plurality of accurately spaced, axial connector openings therein, said outer support ring comprising a first and second axially adjacent clamping rings having respective first and second clamping surfaces which are respectively engageable with said first and second connecting protrusions;

a nozzle outer structure disposed in closely spaced relationship with said outer support ring and including, an outer shroud having a radially inward surface, a radially outward surface, at least one connecting protrusion extending radially outwardly from said outward surface and having an axial connector opening therethrough being generally aligned with one of the axial connector openings in the outer, annular support ring, and a plurality of airfoil vanes extending radially inwardly from said inward surface for a predetermined distance and each having an unsupported inner end, said plurality of airfoil vanes being joined to the inward surface;

an inner, annular support ring structure disposed in free and unsupported spaced relation with said airfoil vanes;

an annular inner shroud disposed between said inner support ring structure and said airfoil vanes' inner ends, said annular inner shroud having an inner and an outer surface;

at least one of said inner support ring structure, inner shroud's outer surface, and inner shroud's inner surface having a groove therein which is bounded by end walls;

a locating projection extending into axial relationship with said end walls, said projection comprising at least one of (i) said vanes' inner ends, (ii) an appendage extending from said inner shrouds' inner surface, and (iii) an appendage extending from said inner support ring; and

a pin disposed in a connector opening of said outer support ring structure and an aligned connector opening of the nozzle outer structure.

5,591,004

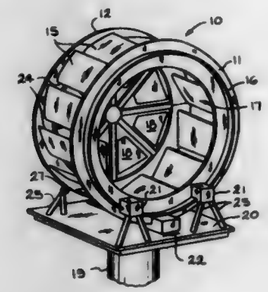
TURBINE SUPPORT AND ENERGY TRANSFORMATION

Elmo E. Aylor, 498 Hwy. 208, Yerington, Nev. 89447

Filed Apr. 6, 1995, Ser. No. 417,813

Int. Cl.[6] F03D 7/04

U.S. Cl. 416—42 **26 Claims**



1. An air driven turbine comprising

a rotor having a generally horizontal axis of rotation,

said rotor having a front portion providing a circular front face for said rotor and a back portion parallel to and spaced from said front portion providing a circular back face for said rotor,

a plurality of blades distributed in spaced side-by-side relation extending between said front and back portions about said axis of rotation,

said distributed blades defining an interior of said rotor,

said front face having an entry opening for air flow into said rotor interior for release from between said blades,

said blades across their width being shaped and angularly pitched to the flow of air therebetween to effect rotation of said rotor,

a system of support for said rotor including a pair of circular rotor-support rings concentric with said axis of rotation,

each of said rings being located on one of said faces near the outer circumferential edge of the respective face with which it is associated,

at least a first underlying rotatable support roll mounted in rotational supporting association with the support ring of one of said faces for support of one side of said rotor,

at least one additional rotatable support roll mounted in underlying rotational supporting association with the support ring of the face of said rotor opposite said one face for rotational support of the side of said rotor opposite said one side, whereby said rotor is rotationally supported at both its front and back sides for rotation about said generally horizontal axis subject to the forces of air blown into said rotor.

5,591,005

CEILING FAN BLADE COVER

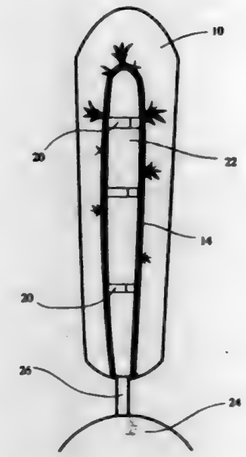
Dennis McCready, 13223 Hazelwood Ave., Lakewood, Ohio 44107

Filed Aug. 4, 1995, Ser. No. 511,456

Int. Cl.[6] F04D 29/70

U.S. Cl. 416—62 **10 Claims**

1. A fan blade cover for a fan blade of a ceiling fan, the fan blade being connected to a fan fan housing by a fan fan stem, said fan blade cover comprising:



a casing, said casing having an outer edge defining a main body, said main body having an outside surface and an inside surface, said outer edge being folded over toward said inside surface, and attached to said inside surface of said main body, thereby creating a passage;

an elastic band, said elastic band being threaded through said passage; and,

fastening means, said fastening means being attached to said casing in a manner as to selectively fix said fan blade cover to the fan blade.

5,591,006

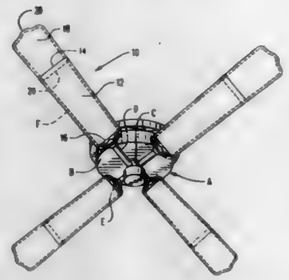
DECORATIVE COVER FOR CEILING FAN BLADE

Paul J. DeMeo, 1828 Edgewater Dr., Sarasota, Fla. 34234-8447, and Brian J. Billert, 3206 7th Ave. West, Brandenton, Fla. 34205

Filed Nov. 27, 1995, Ser. No. 562,527

Int. Cl.[6] F04D 29/70

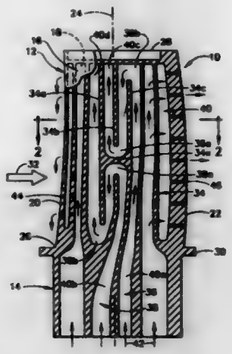
U.S. Cl. 416—62 **5 Claims**



1. A removable, washable decorative cover for each thin, flat fan blade of a ceiling fan comprising: an elastic fabric main sleeve having generally parallel side margins and substantially open at each end thereof; said main sleeve, when in a relaxed configuration, substantially smaller in transverse width than that of the fan blade; said main sleeve elastically expandable for form fitting sliding engagement over a preselected main portion in length of the fan blade, said main sleeve being shorter in length, when mounted on the fan blade, than the length of the fan blade whereby each said main sleeve open end slides over and past a distal end of the blade and is elastically fitted transversely around the fan blade; said main

sleeve, when mounted on the fan blade, elastically gripping the fan blade to maintain said main sleeve in stationary position on the fan blade when the ceiling fan is in operation.

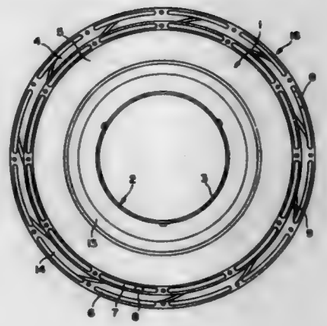
5,591,007
MULTI-TIER TURBINE AIRFOIL
Ching-Pang Lee; Sundaresa V. Subramanian, both of Cincinnati, and George A. Durgin, West Chester, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed May 31, 1995, Ser. No. 455,869
Int. Cl.[6] F01D *5/08*
U.S. Cl. 416—97 R **10 Claims**



1. A turbine airfoil comprising:
first and second sidewalls joined together at chordally spaced apart leading and trailing edges and extending longitudinally from a root to a tip; and
said sidewalls being spaced apart from each other between said leading and trailing edges and joined together by a plurality of internal ribs defining at least two independent serpentine cooling circuits arranged in part in different longitudinal tiers, with an outer tier circuit being disposed in part longitudinally above an inner tier circuit for differentially longitudinally cooling said airfoil.

5,591,008
FAN IMPELLERS
Günter Wrobel, Villingen-Schwenningen; Wolfgang Engel, Königfeld, and Raimund Engelberger, St. Georgen, all of Germany, assignors to Papst-Motoren GmbH & Co., KG, St. Georgen, Germany
Continuation of Ser. No. 787,409, Nov. 4, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,796
Int. Cl.[6] F04D *29/00*
U.S. Cl. 416—144 **20 Claims**

1. An impeller for a fan, the impeller having a central axis of rotation, and comprising a hub for engagement with a fan drive rotor, the hub being rotatable by means of said drive rotor about said axis of rotation, a plurality of fan blades supported by said hub for rotation thereby about said axis of rotation, and a support member for said fan blades, said support member extending substantially radially outwardly relative to said hub, wherein the impeller further comprises one or more arcuately shaped pockets formed in said support member and wherein the arcs of the arcuate shape are angularly disposed in a circular path about the axis of rotation of the hub, the pockets each being arranged to open in an axial direction substantially parallel to said axis of rotation, and said pockets being arranged for receiving balance weights.



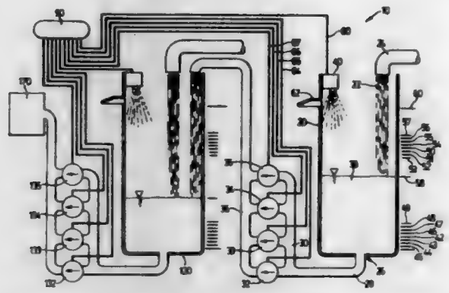
5,591,009
LASER SHOCK PEENED GAS TURBINE ENGINE FAN BLADE EDGES
Seetharamaiah Mannava; Albert E. McDaniel, both of Cincinnati; William D. Cowie, Zenia; Herbert Hallia, Cincinnati; James E. Rhoda, Mason, and James E. Gutknecht, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Jan. 17, 1995, Ser. No. 373,133
Int. Cl.[6] F01D *5/14*
U.S. Cl. 416—241 R **4 Claims**



1. A gas turbine engine fan blade comprising:
a metallic airfoil having a leading edge, a trailing edge, and a radially outer tip,
a first laser shock peened surface on a pressure side of said airfoil and a second laser shock peened surface on a suction side of said airfoil,
said laser shock peened surfaces extending radially along a portion of and chordwise from said leading edge,
laser shocked regions having deep compressive residual stresses imparted by laser shock peening (LSP) extending into said airfoil from said laser shock peened surfaces,
said portion centered about an intersection of said leading edge and a predetermined nodal line of said blade.

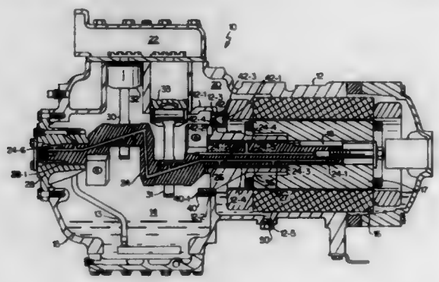
5,591,010
TIME SHIFT CONTROL OF WASTEWATER PUMPING SYSTEM
Ian D. Van Zyl, Peterborough, Canada, assignor to Milltronics Ltd., Peterborough, Canada
Filed Jan. 19, 1995, Ser. No. 375,022
Int. Cl.[6] F04B *49/00*
U.S. Cl. 417—12 **7 Claims**

1. In the combination of a reservoir containing fluent material, means for monitoring the level of fluent material in the reservoir, electrically powered displacement means associated with at least one of an inlet and an outlet of the reservoir for changing the level of fluent material in the reservoir in a first direction, and control means responsive to said monitoring means to initiate operation of said displacement means responsive to said monitored level moving beyond a first predetermined level in a second direction opposite to said first direction, and to terminate operation of said displacement means responsive to said monitored level moving beyond a second predetermined level in said first direction, the control means including a clock, the improvement wherein the



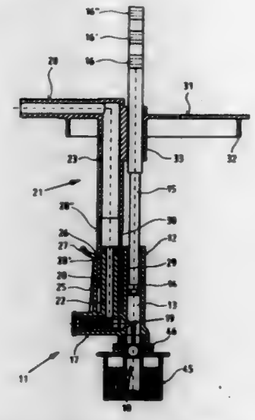
control means further implements a selection routine controlled by the clock to select different sets of first and second predetermined levels in different predetermined periods determined by the clock in which predetermined periods the price of electricity is different, a set of levels for use in periods in which the price of electricity is higher being displaced in said second direction relative to a set of levels for use in periods in which the price of electricity is lower.

5,591,011
MULTI-REFRIGERANT COMPRESSOR
Michael N. Mantooth, Liverpool; Kevin D. Williams, Syracuse, and Bruce A. Fraser, Manlius, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Sep. 18, 1995, Ser. No. 529,794
Int. Cl.[6] F04B *73/10;17/03;39/02*
U.S. Cl. 417—199.1 **2 Claims**



1. A semi-hermetic low side compressor means comprising:
casing means including partition means dividing said casing means into an oil sump and a suction plenum;
oil located in said oil sump;
a crankshaft having an axis and extending through said partition means;
main bearing means supporting said crankshaft in said partition means;
motor means located in said suction plenum and including a rotor which is secured to said crankshaft;
said crankshaft received by and coacting with a bearing head to define an oil pump for pumping said oil from said oil sump into an oil gallery located in said crankshaft;
an oil equalization port located in said partition means and providing continuous, restricted fluid communication between said oil sump and said suction plenum;
normally closed valve means located in said partition means and opening when pressure in said oil sump exceeds pressure in said suction plenum by an amount on the order of two to three pounds per square inch;
said main bearing means including a pair of axially spaced bearings receiving oil from said oil gallery;
vent structure including an annular chamber defined between said pair of axially spaced bearings and which is in fluid communication with an axial passage in said crankshaft communicating with said oil sump whereby rapid pressure equalization takes place between said oil sump and said suction plenum drawing outgassed refrigerant from said oil sump to said suction plenum.

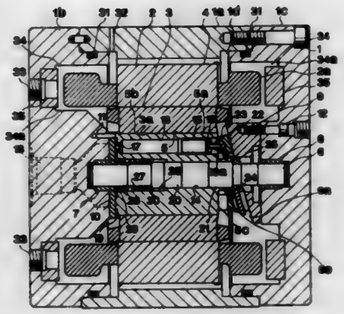
5,591,012
CONVEYING PUMP FOR SUPPLY CONTAINERS OF VARIOUS HEIGHTS
Peter Langguth, and Ewald Kille, both of Friedrichshafen, Germany, assignors to J. Wagner GmbH, Friedrichshafen, Germany
Filed Jul. 7, 1994, Ser. No. 271,523
Claims priority, application Germany, Jul. 15, 1993, 43 23 733.9
Int. Cl.[6] F04B *19/00*
U.S. Cl. 417—238 **22 Claims**



1. A pump for conveying material comprising:
a cylinder introducible into a reservoir, said cylinder being provided with an admission valve and a discharge valve, said discharge valve located in a valve housing;
a pump piston arranged in said cylinder and driveable by a motor via a drive element;
an ascending line connected to said valve housing, said ascending line having a longitudinal axis;
a discharge line connected to said ascending line to receive said conveyed material from said ascending line;
said ascending line being formed of two or more sections adjustable relative to one another along said longitudinal axis, said sections including means for releasably locking said sections at different heights along said longitudinal axis for varying a length of said ascending line.

5,591,013
FLUID PRESSURE GENERATING DEVICE
Kazunori Kawafune; Masaaki Suhara, and Masahito Hiraki, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan
PCT No. PCT/JP93/01083, § 371 Date Apr. 1, 1994, § 102(e) Date Apr. 1, 1994, PCT Pub. No. WO94/03726, PCT Pub. Date Feb. 17, 1994
PCT Filed Aug. 3, 1993, Ser. No. 211,315
Claims priority, application Japan, Aug. 6, 1992, 4-210313
Int. Cl.[6] F04B *1/22;35/04*
U.S. Cl. 417—271 **27 Claims**

1. A fluid pressure generating device comprising:
a casing;



a motor positioned in the casing and provided with a rotor having a fitting hole positioned substantially at a center thereof;

a cylinder block having a main shaft at substantially a center thereof and a plurality of cylinders on an outer peripheral portion, wherein pistons are slidably mounted in said cylinders, each piston having a head portion on one side of the cylinders, and the cylinder block further having ports with a sectional area smaller than the sectional area of the cylinders on the other side of the cylinders opposite to the pistons;

a piston actuator arranged opposite to the head portions and having an inclined surface on which the head portions slide; and

a valve plate arranged opposite to one end of the cylinder block opposite to the piston side and having a suction port and a discharge port communicating with a suction passage and a discharge passage, respectively;

wherein the cylinder block is fixedly fitted to the fitting hole of the rotor and the main shaft is supported by the casing, so that the rotor is rotatably supported by the casing via the cylinder block and the main shaft.

5,591,014

SCROLL MACHINE WITH REVERSE ROTATION PROTECTION

Frank S. Wallis, Sidney; Jean-Luc Caillat, Dayton; Francis M. Simpson; Gary J. Anderson, both of Sidney; Donald W. Rode, St. Paris, and Norman G. Beck, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Nov. 29, 1993, Ser. No. 158,754

Int. Cl.[6] F04B *49/00*

U.S. Cl. 417—310 **68 Claims**

1. A scroll machine comprising:

a first scroll member having a first spiral wrap projecting outwardly from an end plate;

a second scroll member having a second spiral wrap projecting outwardly from an end plate, said second spiral wrap intermeshed with said first spiral wrap, one of said scroll members being mounted for limited axial movement with respect to the other scroll member, said one scroll member being biased toward said other scroll member by a pressurized fluid;

a drive member for causing said scroll members to orbit relative to one another whereby said spiral wraps will create pockets of progressively changing volume between a suction pressure zone and a discharge pressure zone, said scroll machine including a leakage path disposed between two components of said scroll machine, said leakage path extending between said discharge pressure zone and said suction pressure zone, said leakage path being closed due to the influence of said pressurized fluid biasing said two components together;

a valve member for releasing said pressurized fluid to said suction pressure zone of said scroll machine whereby said leakage path between said discharge pressure zone and said suction pressure zone is opened.

5,591,015

CONSTRUCTIONAL UNIT CONSISTING OF A HYDRAULIC MACHINE (HYDRAULIC PUMP OR HYDRAULIC MOTOR) AND A SUPPORT

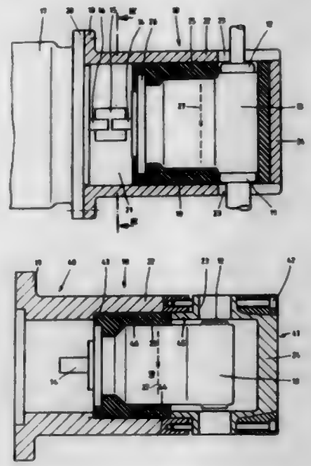
Jörg Dantlgraber, Lohr/Main, Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Germany

Filed May 9, 1995, Ser. No. 437,549

Claims priority, application Germany, May 10, 1994, 44 16 449.1

Int. Cl.[6] F04B *39/00*

U.S. Cl. 417—312 **15 Claims**



1. A constructional unit comprising

a hydraulic pump having a drive shaft,

solid conducted noise dampening material, and a drive motor by which the hydraulic pump is drivable via the drive shaft, and

a support via which the hydraulic pump is held on the drive motor, with interpositioning of the solid conducted noise dampening material which deadens solid-conducted noise,

wherein the support engages with an outside of the hydraulic pump in a direction of the shaft, and

the hydraulic pump is supported on the support via the solid conducted noise dampening material, the solid conducted noise dampening material being interposed between an outer wall surface of the pump and the support.

5,591,016

MULTISTAGE CANNED MOTOR PUMP HAVING A THRUST BALANCING DISK

Yasushi Kubota; Youhiaki Konishi, and Masaaki Eguchi, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

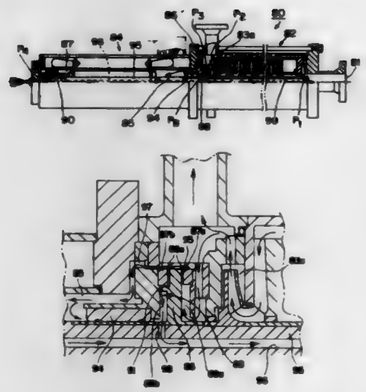
Filed Nov. 30, 1994, Ser. No. 347,034

Int. Cl.[6] F04B *17/00*

U.S. Cl. 417—365 **2 Claims**

1. A multistage canned motor pump comprising a pump section including a plurality of pump chambers and a motor section behind the pump section, wherein both the pump section and the motor section have a common single rotation shaft, and further comprising a balance disk between the pump and motor sections,

wherein an internal circulation system is provided so that part of a treating liquid discharged from a last stage pump chamber is circulated from a front rotor chamber through a pressure chamber accommodating the balance disk and placed behind and adjacent to the last stage pump chamber to a rear rotor chamber while the remaining part of the treating liquid is supplied to a rear bearing section for lubrication of the bearing section and is further circulated through a shaft through



hole provided in a rear end portion of a motor rotor shaft and to a pump suction port for cooling of the motor section,

wherein the pressure chamber is isolated into front and rear chambers through the balance disk by having on one outer side of the balance disk with a first balance sheet forming a face seal and on an opposite side of the balance disk a second balance sheet for forming an annular seal and wherein the balance disk is provided on its rear chamber side with a projecting portion for forming a balance chamber for sealing the inner peripheral verge of the rear side balance sheet, and

wherein the pressure chamber is provided with a passage connecting between a gap outside the rear side balance sheet and the front rotor chamber, and wherein the balance disk is provided with a balance through hole connecting the balance chamber and the shaft through hole.

5,591,017

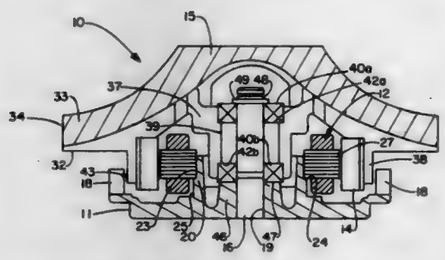
MOTORIZED IMPELLER ASSEMBLY

Mark K. Dwyer, Burlington, N.C., assignor to Ametek, Inc., Kent, Ohio

Filed Oct. 3, 1994, Ser. No. 317,174

Int. Cl.[6] F04D *29/58;29/00*

U.S. Cl. 417—366 **14 Claims**



1. A low profile motorized impeller assembly, comprising:

motor mounting means comprising an annular disc shaped motor mounting base having a shaft receiving aperture and a stator mounting boss;

a stator fixedly attached to said motor mounting means;

an impeller;

a rotor fixedly integrated with said impeller;

means for engaging said impeller with said motor mounting means comprising a shaft frictionally engaging said shaft receiving aperture of said motor mounting base, a bearing receiving boss, and a plurality of bearings mounted in said bearing mounting boss frictionally engaging said shaft so that said impeller may rotate relative to said motor mounting base; and

means for parking said rotor in an offset position relative to said stator.

5,591,018

HERMETIC SCROLL COMPRESSOR HAVING A PUMPED FLUID MOTOR COOLING MEANS AND AN OIL COLLECTION PAN

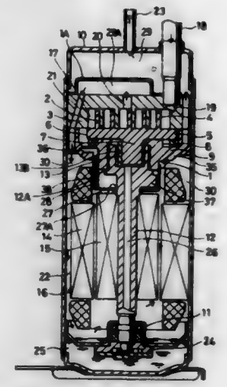
Yoshiharu Takeuchi, Otsu; Toshiharu Yasu, Yasu-gun; Manabu Sakai; Masahiro Tsubokawa, both of Kusatsu; Hideto Oka, Kouga-gun, and Osamu Aiba, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1994, Ser. No. 364,884

Claims priority, application Japan, Dec. 28, 1993, 5-337802; Dec. 28, 1993, 5-337808

Int. Cl.[6] F04B *39/06*

U.S. Cl. 417—366 **13 Claims**



1. A compressor comprising:

compression means disposed in a sealed container for compressing gas,

intake means for taking said gas into said compression means,

an electric motor disposed in said sealed container for driving said compression means,

a crank shaft disposed in said sealed container for transmitting a driving torque of said electric motor to said compression means,

discharge means disposed at a part of said compression means for passing said gas out of said sealed container,

a bearing support member having first and second sides in which a bearing for supporting said crank shaft is located, the compression means being located on the first side of the bearing support member,

a separate, enclosed oil collection pan located on the second side of the bearing support member around said crank shaft for temporarily collecting lubricating oil after lubrication of said compression means and said crank shaft, and

an oil passage means provided in said collection pan for passing oil therefrom.

5,591,019

VAPOR RECOVERY PUMP

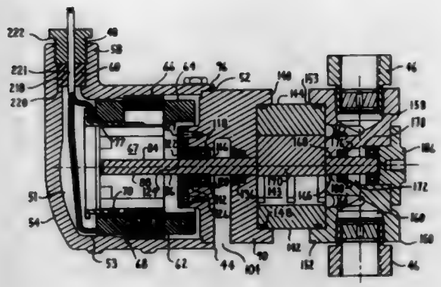
Stephen C. Brown, Kentwood, Mich., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Feb. 28, 1996, Ser. No. 608,573

Int. Cl.[6] F04B *35/04*

U.S. Cl. 417—422 **11 Claims**

1. A vapor pump including:



a pump unit, said pump unit having a pump cylinder in which a vacuum is drawn, an inlet port through which vapor is drawn into said pump cylinder and an outlet port through which vapor is discharged from said pump cylinder;

a motor assembly including a motor housing attached to said pump unit and a motor disposed in said motor housing for supplying a motive force to said pump unit;

a single-piece rotor shaft extending between said motor and said pump cylinder for transferring the motive power developed by said motor to said pump unit; and

a single-piece inboard head located between said pump cylinder and said motor housing for sealing said pump cylinder and sealing said motor housing, said inboard head being dimensioned to space said pump cylinder and said motor housing apart from each other, to define a rotor bore in which said rotor shaft is disposed so as to allow rotation of said rotor shaft, and said inboard head defining at least one opening that extends between said rotor bore and an outer surface of said inboard head located between said pump unit and said motor housing.

5,591,020

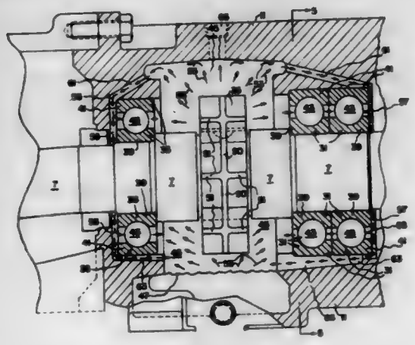
PUMP OIL MISTER

Robert E. Rockwood, Windham, N.H., assignor to Environamics Corporation, Hudson, N.H.

Filed May 19, 1994, Ser. No. 246,150

Int. Cl.[6] F04B *35/04*

U.S. Cl. 417—423.13 **13 Claims**



1. A motor driven pump comprising:

a pumping chamber in which fluid to be pumped is pumped between a fluid inlet and a fluid outlet;

a motor for driving a shaft having first and second ends, said first end affixed to said motor and said second end connected to a fluid pumping impeller, said impeller being disposed within said pumping chamber for pumping said fluid to be pumped from said fluid inlet toward said fluid outlet;

a main lubrication chamber housing a lubricating fluid disposed along said shaft, said lubricating fluid for lubricating a shaft bearing assembly rotatably supporting said shaft, said bearing assembly disposed adjacent said main chamber;

a dispenser affixed to said shaft within said main lubrication chamber for rotation therewith, said dispenser for dispersing said lubricating fluid housed in said main lubrication chamber throughout said main chamber and toward the inner side of said shaft bearing assembly, said inner side facing said dispenser;

a lubricating fluid circulatory passageway connecting said main lubrication chamber with an auxiliary lubrication chamber, said auxiliary chamber for allowing said lubricating fluid therein to lubricate the outer side of said shaft bearing assembly, and wherein said circulatory passageway permits said lubricating fluid to make its way from said main lubrication chamber to said auxiliary lubrication chamber disposed adjacent the outer side of said shaft bearing assembly so that both the inner and outer sides of said shaft bearing assembly are simultaneously lubricated by said lubricating fluid within said main and auxiliary lubrication chambers respectively thereby providing improved bearing lubrication and reduced friction so as to prolong the operating life of said bearing assembly; and

an inclined lubricating fluid return passageway directly connecting said auxiliary lubrication chamber to said main lubrication chamber such that lubricating fluid disposed within said auxiliary lubrication chamber is caused by gravity to flow back into said main lubrication chamber from said auxiliary lubrication chamber by way of said return passageway.

5,591,021

FUEL-INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

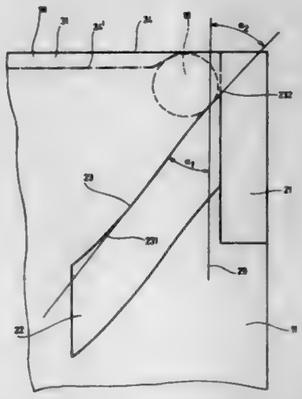
Josef Guentert, Gerlingen; Karsten Hummel, Bellstein; Guido Kampa, Althengstett; Axel Paetz, Filderstadt, all of Germany, and Karel Kolar, Czech, Czechoslovakia, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 22, 1995, Ser. No. 561,653

Claims priority, application Germany, Nov. 22, 1994, 44 41 506.0

Int. Cl.[6] F02M *43/00;45/06*

U.S. Cl. 417—494 **8 Claims**



1. An injection pump for an internal-combustion engine (1), comprising a pump piston (11) which is driven in a to-and-fro axial stroke movement in a pump cylinder (12) and which, by means of an end face (111), limits a pump working space (13) connected to a delivery conduit (14) and cooperates with at least one control bore (18, 19), connected to a fuel-filled suction space (20) and located in the pump cylinder (12), for determining the start of feed and end of feed, in such a way that an upper control edge (24) arranged on the end face (111) of the pump piston (11) determines the start of feed and a lower control edge (23), formed on an outer control groove (22) that extends obliquely over a part of a circumference of the pump piston (11) and constantly connected to the pump working space (13) determines the end of feed, and a feed-quantity regulating device (25) that rotates the pump piston (11) relative to the pump cylinder (12), the lower control edge (23) has, along its run, at least two portions (231, 232) with different angles of inclination (α_1, α_2) to the axis (29) of the pump piston (11), and in that the control-edge portion (232) with a larger angle of inclination (α_2) is provided in the region of the pump piston (11) which passes over the control bore (18) during the pump-piston stroke in a rotary position of the pump piston (11) for small feed quantities that is a lower load range of an internal combustion engine, the upper control edge (24) is formed on a lower groove flank of a groove (31) which is open towards the end face (111) of the pump piston (11) and runs over a part of a circumference of the pump piston (11) and which, in the region of the pump piston (11) which passes over the control bore (18) during the pump-piston stroke in a rotary position assumed by the pump piston (11) in the case of small feed quantities, runs obliquely towards the edge of the end face (111).

5,591,022

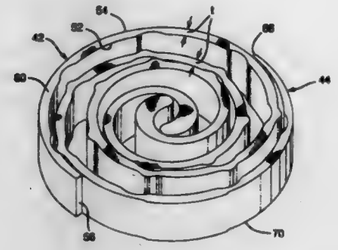
SCROLL COMPRESSOR WITH INTEGRAL ANTI ROTATION MEANS

Paul T. Protos, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 18, 1995, Ser. No. 544,686

Int. Cl.[6] F01C *1/04*

U.S. Cl. 418—55.3 **2 Claims**



1. In a scroll compressor of the type having a fixed spiral involute scroll having inner and outer wraps defined by a swing radius traveling about the axis of a generating circle and a similarly defined, congruent and symmetrical orbital scroll with inner and outer wraps and in which said scrolls are interfitted with their axes parallel and with a predetermined angular offset and a predetermined radial offset between said axes, and said orbital scroll is orbited relative to said fixed scroll while maintaining said radial offset and angular offset, an improved mechanism to prevent said orbital scroll from rotating relative to said fixed scroll and thereby maintain said angular offset, comprising,

a plurality of pairs of semi cylindrical, interfitting pairs of larger radius troughs and smaller radius, semi cylindrical ridges formed integrally on the contacting wraps of said scrolls at substantially equally angularly spaced locations along said wraps, said troughs and ridges having central axes that lie on a swing radius line at each equally spaced location and extending parallel to said scroll axes, said interfitting pairs of troughs and ridges being sufficient in number that at least two pairs of troughs and ridges are interengaged at all times as said scrolls orbit relative to one another, with the radius of said troughs being sufficiently larger than the radius of said ridges that the difference therebetween is equal to said predetermined radial offset,

whereby, when said fixed scroll and orbital scroll are moved axially together so as to interfit with said radial offset, said ridges of one scroll are able to move axially into the troughs the other scroll, and vice versa, only when said angular offset has been substantially achieved, and when said orbital scroll is orbitally driven relative to said fixed scroll while maintaining said radial offset between the two scrolls, successive ridges simultaneously move through and along respective troughs and prevent said scrolls form rotating relative to one another, thereby maintaining said predetermined angular offset during compressor operation.

5,591,023

ROTARY TYPE COMPRESSOR

Hideki Nakamura, Yonago; Keiji Yamasaki; Fujio Yamane, both of Yasugi; Toshiki Yoshida, Tochigi-ken; Tadashi Iizuka, Ashikaga, and Akihiko Ishiyama, Tochigi-ken, all of Japan, assignors to Hitachi Metals, Ltd., and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 10, 1995, Ser. No. 541,966

Int. Cl.[6] F01C *21/00*

U.S. Cl. 418—179 **4 Claims**





1. A rotary type compressor comprising a cylinder, a roller and a vane,

wherein the roller comprises a cast iron which has a hardness of HRC 50 or more after quenching and tempering heat treatment, said cast iron comprising not less than 5 area % of graphite and not less than 2 area % of eutectic structure including iron phosphide, and

the vane comprises an iron alloy which has a hardness of HRC 70 or more after quenching and tempering heat treatment, said iron alloy comprising not less than 25 area % of undissolved carbides and nitride particles in total, said undissolved carbides including not less than 10 area % of MC type carbides, said nitride particles including at least one of TiN and NbN of not less than 5 area %, said undissolved carbides and said nitride particles having a mean grain size of not more than 5 μm.

5,591,024

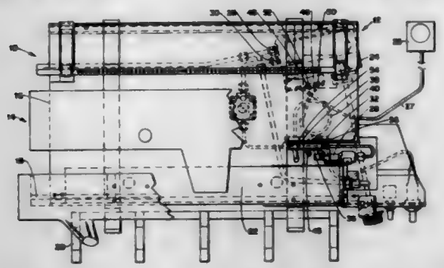
ASSEMBLY FOR CONTROLLING THE FLOW OF GAS FOR GAS FIRED ARTIFICIAL LOGS

Barry Eavenson, Asheville, and James S. Rice, Marshall, both of N.C., assignors to Appalachian Stove & Fabricators, Inc., Ashville, N.C.

Continuation-in-part of Ser. No. 104,668, Aug. 10, 1993, Pat. No. 5,397,233. This application Oct. 21, 1994, Ser. No. 327,394

Int. Cl.[6] F23Q *13/00*

U.S. Cl. 431—125 **19 Claims**



1. As assembly for controlling the flow of gas for gas fired artificial logs comprising:

a main burner and a pilot; a gas valve for controlling the flow of gas to said main burner and to said pilot; said pilot having an opening where flame is produced; said pilot connected to said gas valve; said pilot including a oxygen depletion sensor for extinguishing the pilot flame but not the flow of gas when the surrounding oxygen reaches a predetermined low level; a thermal responsive electrical generator; said generator generating at least 140 millivolts when under load; said generator connected to said gas valve; said generator including an outer barrel; said outer barrel being spaced apart from said pilot opening; the distance between said pilot opening and the point on said barrel nearest said pilot opening is such that said generator will generate sufficient voltage to operate said valve when flame is emanating from said pilot opening and is such that the gas coming from said pilot opening after the flame has been extinguish will not cause ignition about said barrel.

5,591,025

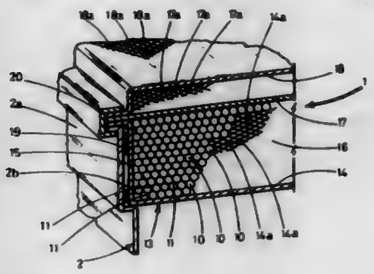
COMBUSTION HEAD, IN PARTICULAR FOR GAS BURNERS

Gianmario Invernizzi, Via Montesneri, 26, 22053 Lecco (LC), Italy

Filed Jul. 24, 1995, Ser. No. 506,361

Int. Cl.[6] F23D *14/14*

U.S. Cl. 431—329 **25 Claims**



1. A gas burner comprising:

an internally hollow mixing body (2),

means (3) for feeding a combustible gas-combustion air mixture into the mixing body (2),

a combustion head (1) provided with delivery ports (12) through which the combustible gas-combustion air mixture is ejected from the mixing body (2) and fired, said combustion head comprising:

a box-shaped holding body (13) received in a perimetric seat (2*b*) defined by an upper edge (2*a*) of said mixing body (2), said box-shaped body having at least one bottom (14) provided with a plurality of through apertures (14*a*) and at least one side wall (15) extending perimetrically from said bottom (14) with which it defines a housing (16) a plurality of granular elements (10) received in said housing (16) defined in the box-shaped body, said granular elements being physically interconnected with each other in succession at points of mutual tangency, to substantially define a filter bed having a lattice of hollow spaces (11) intercommunicating with each other and defining on an external surface (9) of the combustion head (1), a plurality of said delivery ports (12) distributed over the whole extension of the external surface itself.

5,591,026

BAKING OVEN HAVING A MINIMIZED ACCESS OPENING

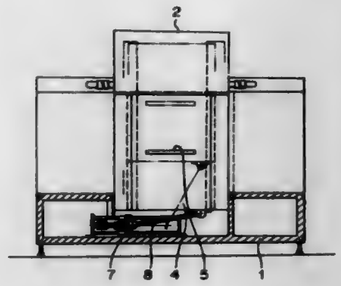
Kazuhiro Imai, Gunma-ken, Japan, assignor to Imai Seisakusho Co., Ltd., Japan

Filed Dec. 26, 1995, Ser. No. 576,964

Claims priority, application Japan, Sep. 6, 1995, 7-255617

Int. Cl.[6] F27D *3/00*

U.S. Cl. 432—239 **4 Claims**



1. A baking oven for baking a relatively planar work, comprising:

a base frame defining an upper surface;

an oven main body supported on said upper surface of said base frame, and having an open front end for allowing access into said oven main body;

a shutter door closing said open front end of said oven main body, and disposed on said oven main body so as to be moveable vertically along said front end of said oven main body, a horizontal slot dimensioned for passing a said work therethrough being defined in said shutter door;

actuating means for vertically moving said shutter door;

a rack placed inside said oven main body, and provided with a plurality of shelves each of which aligns with said slot when said shutter door is placed at a corresponding vertical position; and

feed/removal means for feeding a said work into each of said shelves through said slot, and removing a said work from each of said shelves through said slot.

5,591,027

DELIVERY SYRINGE FOR DENTAL COMPOUND

Ernst Muhlbauer, Elbgaustrasse 248, 22547 Hamburg, Germany

Filed Apr. 11, 1995, Ser. No. 420,354

Claims priority, application Germany, Apr. 15, 1994, 9406342 U

Int. Cl.[6] A61C *5/04*

U.S. Cl. 433—90 **2 Claims**



1. A delivery syringe for a dental compound, especially for fillings and veneers, comprising a syringe body (1) having an elongated cavity for holding the dental compound, said cavity having an internally threaded proximal end and a non-constricted distal delivery end contiguous with the elongated cavity, a removable end cap for closing said delivery end, a screw spindle (5) mounted on the body and having an external drive thread operatively associated with said internally threaded cavity for driving movement of the spindle relative to said body, and a plunger (2) mounted in the syringe body for displacement by the screw spindle (5), said spindle having a free end for rotatably driving the spindle relative to the body, said free end having thereon a color sample (8) for the dental compound (3) contained in the delivery syringe, said syringe body and said spindle being free of any lateral projection extending beyond the perimeter of said end cap.

5,591,028

DENTAL CUTTING TOOL HOLDER

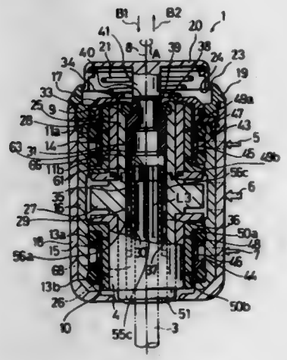
Setsuo Fujiki; Shozo Nakayama; Haruo Ogawa; Makoto Numakawa; Minoru Hayashida; Suezo Inoue, and Yasuhiro Higashida, all of Kyoto, Japan, assignors to J. Morita Manufacturing Corporation, Kyoto, Japan

Filed Dec. 27, 1994, Ser. No. 364,545

Claims priority, application Japan, Dec. 28, 1993, 5-335264; Apr. 13, 1994, 6-075134

Int. Cl.[6] A61C *1/14*

U.S. Cl. 433—129 **5 Claims**



1. A dental cutting tool holder comprising:

a collet chuck into which a dental cutting tool is inserted detachably, and which comprises a right cylindrical section and a plurality of arc-section segments which are contiguous to the cylindrical section and divided in a circumferential direction;

a rotor into which the collet chuck is inserted, and which is driven for rotation around the axis of rotation together with the collet chuck; and

a clamping member which intervenes between the collet chuck and the rotor to press the respective segments inward in a radial direction by the displacement thereof toward one axial end relative to the collet chuck while releasing the inward, radially pressed condition by the displacement thereof toward an other axial end,

wherein the respective segments are formed with a recess section located back from the outer circumference of the inserted cutting tool outward in a radial direction, and an axial protrusion section jutting out inward in a radial direction from an inner circumference of the recess section.

5,591,029

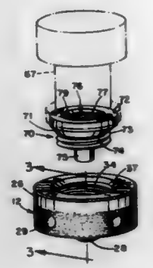
DENTAL IMPLANT SYSTEM

Max Zuest, San Diego, Calif., assignor to Zest Anchors, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 861,183, Mar. 31, 1992, abandoned, which is a continuation of Ser. No. 751,661, Aug. 22, 1991, Pat. No. 5,254,005, which is a continuation of Ser. No. 436,432, Nov. 14, 1989, abandoned. This application Aug. 5, 1993, Ser. No. 102,353

Int. Cl.[6] A61C *8/00*

U.S. Cl. 433—173 **45 Claims**



1. A dental implant assembly for supporting as a rest factor the distal end of a denture anchored elsewhere in the jaw, comprising:

implant means for embedding in the distal region of the jawbone including a first part for projecting into and osseointegrating with the jawbone and a second part for projecting up to just above the tissue level;

the first part being relatively thin and having a predetermined height less than the distance between the top of a patient's jawbone at the implant site and the underlying region of the mandibular nerve;

the second part having an upper rest surface for supporting but not being connected to overlying portions of a denture anchored elsewhere in the jaw to resist biting pressure on the tissue and bone; and

the first part comprising a thin disc-shaped member having a downwardly projecting annular rim and a central spigot projecting downwardly from the disc-shaped member.

5,591,030

DENTAL CERAMIC RESTORATION USING A MULTI-LAYERED STRUCTURE

Norbert Thiel, Harpolingen, and Susanne Weber, Schwörstadt, both of Germany, assignors to Vita Zahnfabrik H. Rauter GmbH & Co. KG, Bad Sackingen, Germany

Filed Jun. 27, 1994, Ser. No. 265,700

Claims priority, application Germany, Jun. 25, 1993, 43 21 100.3; Sep. 21, 1993, 43 32 025.2; Oct. 9, 1993, 43 34 493.3

Int. Cl.[6] A61C *13/08*

U.S. Cl. 433—212.1 **13 Claims**

1. A dental ceramic restoration having multiple layers disposed on a core obtained by:

a) applying to the core a ceramic opaque layer comprised of 50 to 60 wt.-% of SiO_2, 4 to 10 wt.-% of Na_2O, 0 to 2.5 wt.-% of CaO, 8 to 14 wt.-% of K_2O, 10 to 20 wt.-% of Al_2O_3, 0 to 6 wt.-% of B_2O_3, 5 to 12 wt.-% of TiO_2, and pigments, effecting a first assembly;

b) sintering the first assembly;

c) applying to the sintered first assembly a ceramic dentin-and-enamel layer comprised of 50 to 60 wt.-% of SiO_2, 4 to 10 wt.-% of Na_2O, 0 to 2.5 wt.-% of CaO, 8 to 14 wt.-% of K_2O, 10 to 20 wt.-% of Al_2O_3, 2 to 10 wt.-% of B_2O_3, and pigments, to obtain a second assembly; and

d) sintering the second assembly.

5,591,031

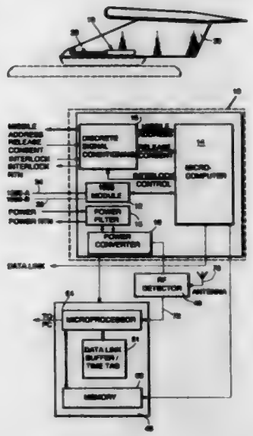
MISSILE SIMULATOR APPARATUS

Ronald W. Monk; David P. VanCleve, and Robert J. Curry, all of Tucson, Ariz., assignors to Hughes Electronics, Los Angeles, Calif.

Filed May 31, 1994, Ser. No. 251,067

Int. Cl.[6] G09B *19/00*

U.S. Cl. 434—14 **16 Claims**



1. A missile simulator apparatus for use with an aircraft having a fire control system adapted to generate a plurality of control signals and at least one missile station including a missile interface, the apparatus comprising:

a housing releasably attached to the aircraft;

receiving means for receiving said plurality of control signals from the aircraft fire control system, said receiving means disposed within said housing;

simulation means for selectively simulating a plurality of missile interface response signals, said simulation means being disposed within said housing and being operative to generate a response to said plurality of control signals received from said aircraft fire control system; and

electronic communication means for providing an umbilical interface between said simulation means and said aircraft fire control system;

whereby the apparatus is operative for testing the missile interface.

16. A missile simulator apparatus for an aircraft having a fire control system adapted to generate a plurality of control signals including discrete signals and at least one missile station having a missile interface, the apparatus comprising:

a portable training module operative to generate a response to data communications received from said fire control system and including:

(i) a housing;

(ii) receiving means disposed in said housing for receiving said plurality of control signals from the aircraft fire control system;

(iii) a microprocessor disposed in said housing;

iv) discrete signal conditioning means for filtering said discrete signals received from said fire control system; and

v) simulation means for substantially simulating a plurality of missile interface response functions of a missile in response to said plurality of control signals, said plurality of missile interface functions including a missile release function;

an umbilical interface for providing a data communication channel between said apparatus and said fire control system prior to a simulated launch of said missile;

an inert missile body adapted to be mounted to an aircraft missile station, said missile body having substantially equivalent physical dimensions and creating substantially equivalent static and aerodynamic load characteristics as an equivalent conventional missile, said portable training module being disposed within said missile body;

a data link interface for providing a data communication channel between said apparatus and said fire control system subsequent to a simulated launch of said missile; and

a data link and data capture module for processing and recording data communications between said fire control system and said apparatus;

whereby said fire control system and said training module interchange information by coded signals for testing of said missile interface.

5,591,032

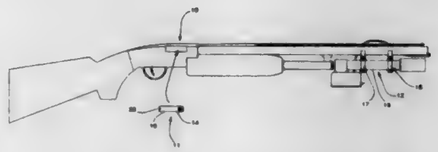
LASER WEAPON SIMULATOR APPARATUS WITH FIRING DETECTION SYSTEM

Richard L. Powell, 8711 NW. 121st St., Grimes, Iowa 50111, and W. Joe Jacobsen, Perry, Iowa, assignors to Richard L. Powell, Grimes, Iowa

Filed Mar. 23, 1995, Ser. No. 409,336

Int. Cl.[6] F41G *3/26*

U.S. Cl. 434—22 **6 Claims**



1. A laser weapon simulator apparatus for use with a firearm comprising a firing chamber, a firing pin adjacent said firing chamber, and a barrel having a first end proximal said firing chamber and a second end distal said firing chamber, the apparatus being for practice in the shooting of the firearm at a target having reflective material thereon, said apparatus comprising:

(a) a laser beam transmitter contained in a housing that is adapted for being positioned in the firing chamber of the firearm and is actuable to emit a laser beam of short duration;

(b) a laser beam receiver adapted for mounting on the exterior of the firearm for receiving a portion of said laser beam that is reflected from the target and processing said portion to produce a "hit" signal;

(c) means for detecting the emission of said laser beam and producing a "try" signal in response thereto; and

(d) display means that produces an output "hit" display signal upon the concurrent receipt of a "hit" signal from said receiver and a "try" signal from said detecting means.

5,591,033

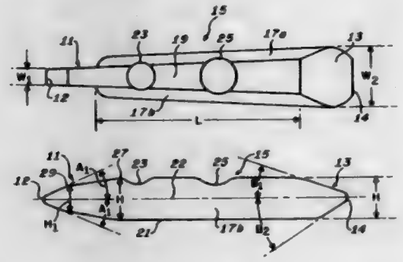
APPARATUS FOR EFFICIENT READING

Shirley S. Levine, 9B Weavers' Hill, Greenwich, Conn. 06831-4245

Filed Feb. 21, 1995, Ser. No. 391,771

Int. Cl.[6] G09B *17/00*

U.S. Cl. 434—178 **12 Claims**



1. A reading guide comprising:

first and second directors oppositely terminating said reading guide on a longitudinal axis, said first director having an end with a predetermined width along a lateral axis, said second director having an end with a predetermined width along said lateral axis which is greater than said predetermined width of said first director end, said first reading director having a beveled end edge formed by first and second tapers having first and second angles relative to said longitudinal axis, respectively, said first angle being greater than said second angle;

a separation section, having a predetermined longitudinal length, positioned between said first and second directors, said separation section having curved sides, and first and second planar surfaces positioned between said first and second curved sides, and located at a preselected distance apart along an axis perpendicular to said longitudinal and lateral axes,

said separation section being linearly tapered from a first lateral dimension at said first director to a second lateral dimension at said second director, said second lateral dimension being greater than said first lateral dimension.

5,591,034

THERMALLY CONDUCTIVE ADHESIVE INTERFACE

Joseph G. Ameen; Joseph E. Kerleski, both of Newark, Del.; William P. Mortimer, Jr., Conowingo, Md., and Victor P. Yokimcus, Landenberg, Pa., assignors to W. L. Gore & Associates, Inc., Newark, Del.

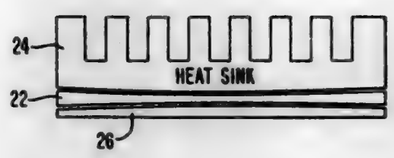
Continuation-in-part of Ser. No. 296,220, Aug. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 196,048, Feb. 14, 1994. This application Jul. 25, 1995, Ser. No. 506,700

Int. Cl.[6] H01R *4/00*

U.S. Cl. 439—91 **18 Claims**

1. A thermally conductive interface mounted between electronic component parts which comprises:

a porous fluoropolymer material having a first surface and a second surface;



thermally conductive particles embedded within the fluoropolymer material between the first and second surfaces; and

an adhesive material imbibed within the porous fluoropolymer material;

wherein the interface conforms to provide a tight thermally conductive interface between the component parts; and

wherein the interface is sufficiently conformable to form a tight thermally conductive interface under a pressure of less than about 147 kg/m^2 (30 psi).

5,591,035

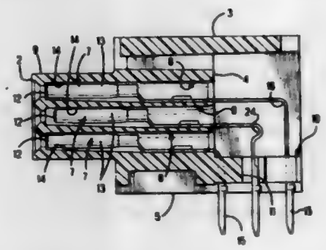
ELECTRICAL CONNECTOR WITH SHORTENED CONTACT

Shawn W. Burkholder, Roanoke, Va., and Gary L. Stonemetz, Mechanicsburg, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 6, 1994, Ser. No. 318,960

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—79 **16 Claims**



1. An electrical connector comprising:

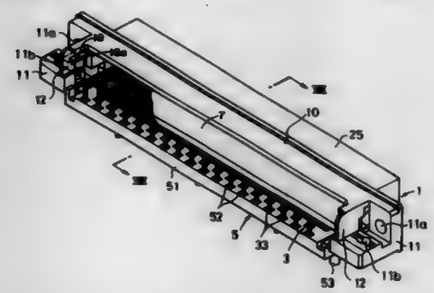
an insulating housing, and electrical contacts in respective contact receiving cavities in the housing, the contacts of at least a selected row thereof being initially identical in size and shape, the contacts having first portions for being received in interference fit in respective identical contact receiving cavities in the housing associated with said selected row, each of said contact first portions projecting to front ends adjacent a mating end of the connector, and each of said contact first portions in the housing being adapted to be configured with a bend remote from said front end thereof to effectively shorten said contact first portion, and to provide a combination of contacts within said selected row changeable during insertion of said first portions into respective said cavities to effect having said front ends at different distances from said mating end of the connector.

5,591,036

CIRCUIT BOARD CONNECTOR

Etsuro Doi, Saitama; Kiyoshi Ateh, Tokyo; Shoichi Mochizuki, and Masakazu Keino, both of Tama, all of Japan, assignors to Kel Corporation, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 390,971
Claims priority, application Japan, Feb. 21, 1994, 6-46398
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—79 **21 Claims**



1. An electrical connector of a right angle header type comprising a housing having a front, mating face, a rear face and a lower, board engaging face extending between the front face and the rear face, at least a part of the housing being insulating, a series of contact members mounted in the insulating part of the housing with connecting portions at the mating face and lead portions extending from the rear face, the lead portions being bent transversely intermediate their ends thereby forming medial portions extending rearward from the rear face and board connecting portions extending downward so that free ends of the board connecting portions are insertable into respective connecting through-holes of a circuit board by movement of the board engaging face of the housing into engagement with the circuit board; a lead locating and guiding member having a series of lead receiving apertures at positions corresponding to the connecting holes of the circuit board for receiving respective connecting portions and means on the housing and on the lead locating and guiding member cooperable for mounting the lead locating and guiding member on the housing for sliding movement from a first, lead locating position, receiving respective connecting portions at locations adjacent respective free ends thereof, to a second position, remote from the free ends, during movement of the board connecting portions progressively into respective connecting through-holes of the circuit board; and, a lead portion retaining member, means on the housing and the lead portion retaining member cooperable to releasably attach the lead portion retaining member to the housing to extend over upper sides of the medial portions remote from their free ends thereby to prevent upward movement of respective medial portions away from the circuit board during insertion of the end portions into the respective connecting through-holes, the lead portion retaining member being formed with a series of lead portion locating grooves which extend rearward from the rear face for snugly receiving medial portions of respective lead portions.

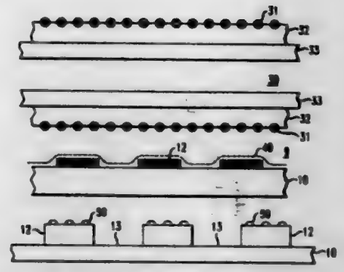
5,591,037

METHOD FOR INTERCONNECTING AN ELECTRONIC DEVICE USING A REMOVABLE SOLDER CARRYING MEDIUM

Sungho Jin, Millington, and Mark T. McCormack, Summit, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 31, 1994, Ser. No. 251,547
Int. Cl.[6] H01L 21/60
U.S. Cl. 439—91 **9 Claims**

1. A method for connecting an electronic device having one or more electrical contact pads to a second device comprising the steps of:



providing said electronic device having one or more contact pads;

contacting said device with an array of solder-coated magnetic particles disposed on a removable carrier sheet;

selectively adhering solder from said array to said contact pads;

removing said flexible carrier medium while leaving solder on said contact pads; and

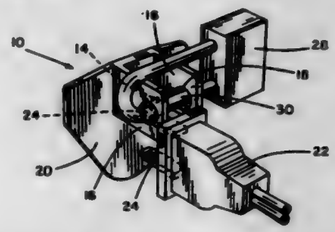
placing the solder carrying pads in contact with said second device.

5,591,038

PLUG LOCKOUT

Casimir M. Guzay, Jr., Hoffman Estates, and Shawn E. Whittaker, Lockport, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Feb. 17, 1994, Ser. No. 198,109
Int. Cl.[6] H01R 13/422
U.S. Cl. 439—133 **13 Claims**



1. An electrical plug lockout device lockably preventing unauthorized insertion of an electrical plug into an electrical outlet, comprising:

a one-piece lockout body member having a base including an integrally formed locking pin and a pair of opposing sidewalls vertically disposed on lateral edges of the base wherein the locking pin extends upwardly from the base and parallel to the sidewalls, and wherein the body member further includes an opening opposite said base; and

lock securing means disposed on said body member locking a prong of the plug to the body member.

5,591,039

SOCKET CONTACT WITH ARC ARRESTING MEMBER

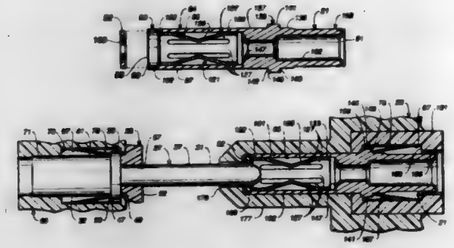
Russell H. Matthews, Modesto, Calif., assignor to Elcon Products International, Fremont, Calif.

Filed Jun. 1, 1995, Ser. No. 456,686
Int. Cl.[6] H01R 13/53
U.S. Cl. 439—181 **7 Claims**

1. A socket contact for mating with a pin contact, said socket contact comprising:

a section for attaching to an electrical component;

a tubular section forming a bore for receiving the pin contact;



a conductive area around an inner wall of the bore and having a contact portion for contacting the pin contact; and

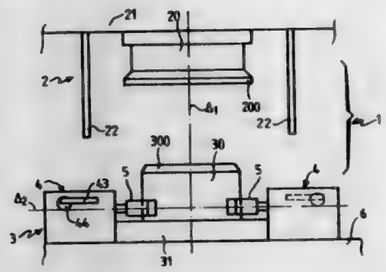
an elastic expansion member located adjacent to a forward opening in the tubular section, the expansion member having an opening smaller than the outer diameter of the pin contact for initially engaging the pin contact and establishing an electrical connection between the pin contact and socket contact, through the elastic expansion member and then expanding resiliently so as to let the pin contact pass therethrough into the bore, whereby the initial engagement and resulting electrical connection between the pin contact and the expansion member precludes deleterious electrical arcing between the pin contact and the conductive area.

5,591,040

FLOATING CONNECTOR WITH TEMPORARY LOCKING FACILITY AND SPACE APPLICATION THEREOF

Yves Dohan, Paris; Maurice Roubier, Viroflay, and Jacques-Henry Heulot, Cergy, all of France, assignors to Framatome Connectors International, Paris, France

Filed Feb. 16, 1995, Ser. No. 390,924
Claims priority, application France, Feb. 16, 1994, 94 01744
Int. Cl.[6] H01R 13/629
U.S. Cl. 439—248 **8 Claims**



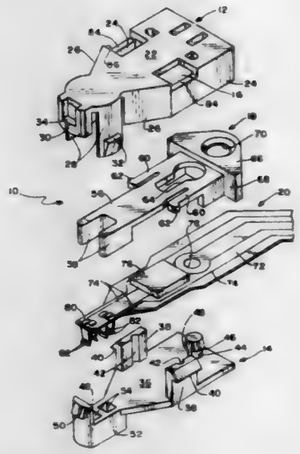
1. Floating connector comprising two parts adapted to be coupled together, namely, a first part comprising at least a floating base supporting at least a first connection member and a fixed second part comprising a second connection member for each first connection member paired therewith, a device for temporarily locking each floating base comprising means for locking said base prior to coupling, and control means for said locking means having a first locked state of each base and a second unlocked state, wherein said second part comprises actuator means operating on said control means during coupling to release each base when coupling of said first and second parts is completed.

5,591,041

ELECTRICAL CONNECTOR POSITION ASSURANCE SYSTEM

Paul D. Cecil, Jr., Joliet, and Scott P. Marceau, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Mar. 20, 1995, Ser. No. 407,304
Int. Cl.[6] H01R 13/627
U.S. Cl. 439—352 **18 Claims**



1. A connector position assurance system for an electrical connector adapted to mate with another mateable connecting device, comprising:

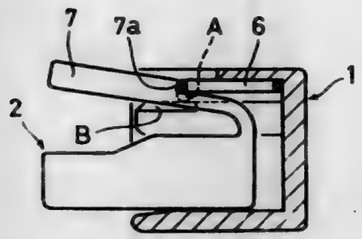
said connector including a housing and terminal means for mounting in said housing adapted for interconnection with appropriate terminal means of the mateable connecting device, the housing including an interior cavity;

a flexible locking arm on the housing adapted for locking engagement with appropriate lock means of the mateable connecting device, the locking arm being flexibly movable between a locking position when the connector is fully mated with the device inwardly to an unlocking position of incomplete mating of the connector with the mateable connecting device;

a locking member including an actuating portion exposed exteriorly of the housing, the locking member being movable between a first position allowing movement of the locking arm and mating of the connector and the device and a second position blocking inwardly movement of the locking arm away from its locking position when the connector and the device are fully mated, said locking member being integrally retained substantially within the interior cavity of the connector housing while the locking member is in the first position; and

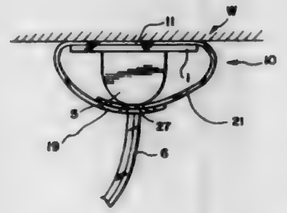
said locking arm in its unlocking position of incomplete mating of the connector with the device blocking movement of the locking member from its first position to its second position and thereby indicating that the connector and the device are not fully mated.

5,591,042
CONNECTOR ASSEMBLY
Kensaku Takata; Satoshi Takano, both of Osaka; Nori Inoue, Yokkaichi; Mitsuru Itoh, Yokkaichi; Hitoshi Okumura, Yokkaichi, and Masaji Suzuki, Yokkaichi, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, and Sumitomo Wiring Systems, Ltd., Yokkaichi, both of Japan
Filed Oct. 26, 1995, Ser. No. 548,472
Int. Cl.[6] H01R *13/73*
U.S. Cl. 439—354 **4 Claims**



1. A connector assembly comprising a first connector and a second connector having an integral, resiliently deformable locking arm and adapted to be inserted in said first connector, said locking arm having a shoulder portion and protrusions A on side surfaces thereof, said first connector having protrusions B on its surfaces that face said side surfaces when said second connector is inserted into said first connector, said protrusions B having top surfaces and bottom surfaces and being adapted to guide said protrusions A up onto said top surfaces when said second connector is inserted into said first connector, a spring mounted in said first connector and arranged so as to abut said shoulder portion of said locking arm when said protrusions A have been guided onto said top surfaces of said protrusions B, and to be compressed when said second connector is further pushed into said first connector, said protrusions A passing over said protrusions B and engaging inner ends of said protrusions B, and said shoulder portion disengaging from said spring when said second connector has been inserted completely into said first connector, said first connector having such a space as to allow said protrusions A to pass under said bottom surfaces of said protrusions B when said second connector is pulled out of said first connector while pressing down a free end of said locking arm.

5,591,043
CORD HOLDING ATTACHMENT FOR ELECTRICAL RECEPTACLE
Cory Kenney, P.O. Box 330, Hardin, Mont. 59034
Filed Feb. 23, 1995, Ser. No. 393,393
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—373 **15 Claims**

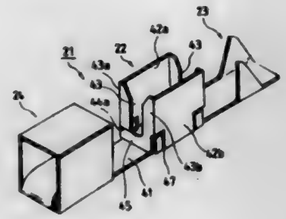


1. An improved cord holding attachment adapted for installation in conjunction with an existing electrical receptacle having a cover plate attached thereover, the cover plate including a first side edge and a second opposed side edge, said cord holding attachment comprising:

a) a body having first and second sides and attachable under the cover plate of the electrical receptacle, said body extending under the cover plate continuously from said first side to said second side thereof, said first and second sides edges of the cover plate aligned with the first and second sides of said body;

b) at least one flexible elongated appendage integrally formed with said body and extending laterally outwardly from at least one of said sides, said at least one flexible appendage being flexed inwardly over the cover plate and having means at a distal end of said flexible appendage attachable to an electrical cord coupled with the electrical receptacle to deter undesired uncoupling thereof.

5,591,044
PRESS-CONNECTING TERMINAL
Kimihiro Abe, and Katsuhiko Onoda, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 7, 1995, Ser. No. 568,880
Claims priority, application Japan, Dec. 8, 1994, 6-305075
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—397 **2 Claims**



1. A press-connecting terminal comprising:

a press-connecting blade cutting a sheath of a wire to be electrically connected to a conductor of the wire when the wire is press-fitted into said press-connecting blade, said press-connecting blade including:

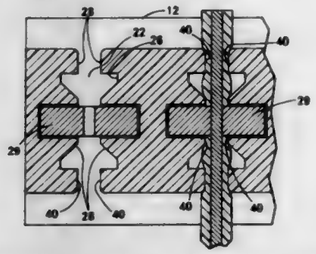
a pair of opposed plate portions spaced a predetermined distance from each other;

a first deformation prevention piece portion, having an L-shaped horizontal cross-section, formed below one of said two plate portions through a stepped portion formed at a lower end of said one plate portion, and

a second deformation prevention piece portion, having an L-shaped horizontal cross-section, formed at a lower end of the other of said two plate portions,

wherein said first deformation prevention piece portion is received in a second notch, formed below said other plate portion, to support part of said other plate portion from a lower side thereof, and said second deformation prevention piece portion is received in a space, disposed outwardly of said stepped portion, and a first notch, formed below said one plate portion, to support part of said one plate portion from a lower side thereof over an area of an L-shaped horizontal cross-section, to preventing said two plate portions from being deformed away from each other when the wire is press-fitted into said press-connecting blade.

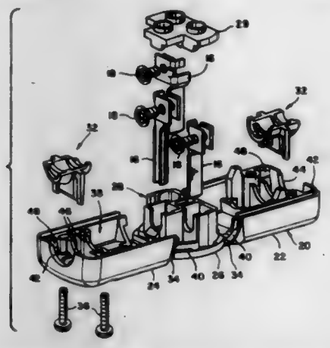
5,591,045
WIRE CONNECTING SYSTEM
Paul J. Pepe, Winston-Salem, and Steven W. Puckett, Thomasville both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.
Filed May 18, 1995, Ser. No. 443,964
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—460 **5 Claims**



1. A cross connect wiring block for electrically connecting a set of first conductors each having a predetermined diameter to an associated set of second conductors, the wiring block comprising:

an elongated housing containing plural cavities defined by opposing walls, a slotted beam contact disposed within each said cavity for electrically engaging a respective one of the first conductors, and each said cavity including four pairs of projections, the projections of each said pair extending toward each other from respective ones of said opposing walls, wherein a distance between the projections of each said pair is less than said predetermined diameter.

5,591,046
ELECTRICAL CORD CLAMP
Lawrence J. Klein, Ansonia, and Thomas R. J. Swift, Monroe, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.
Filed Jun. 7, 1995, Ser. No. 481,691
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—467 **36 Claims**

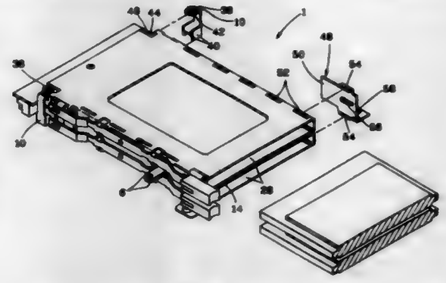


1. An electrical wiring device adapted to be coupled to an end of an electrical cord with a plurality of electrical conductors, comprising:

a housing including first and second cover halves pivotally coupled together to form an electrical cord receiving cavity therebetween, and a contact retainer body with terminals coupled therein; and

a cord clamp including a first clamping member tiltably coupled to said first cover half, and a second clamping member tiltably coupled to said second cover half, said first and second clamping members being positioned substantially opposite each other and arranged within said housing to automatically tilt upon engagement with the electrical cord in response to pivotal movement of said first cover half relative to said second cover half from an open position to a closed position to pull and secure the electrical cord within said electrical cord receiving cavity towards said terminals.

5,591,047
CARD EDGE CONNECTORS
Shoji Yamada, Machida, and Yoshitsugu Fujiura, Tokyo, both of Japan, assignors to The Whitaker Corporation, Wilmington, Del.
Continuation of Ser. No. 143,409, Oct. 26, 1993, Pat. No. 5,490,791. This application Oct. 19, 1995, Ser. No. 545,453
Claims priority, application Japan, Dec. 28, 1992, 4-92948
Int. Cl.[6] H01R *13/635;* **H05K** *7/10*
U.S. Cl. 439—541.5 **6 Claims**



1. A memory card connector for electrical connection to memory cards, comprising:

a main body member including frame members formed from sheet metal mounted one on top of the other forming a main cavity in said main body member, said frame members having sides with turned-in ends;

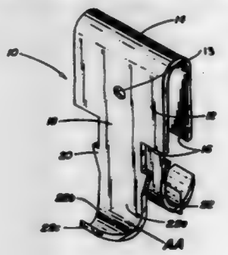
operating members slidably mounted along respective sides of said frame members;

ejecting devices mounted on respective frame members and operatively connected to respective operating members for ejecting a memory card from the main body member; and

fasteners mounted onto said frame members thereby maintaining the frame members in position forming said main cavity.

5,591,048
MULTIPLE FISH HOOK HOLD-DOWNS
Marlyn E. Hahn, York, Pa., assignor to Berg Technology, Inc., Reno, Nev.
Continuation of Ser. No. 240,917, May 10, 1994, abandoned. This application Dec. 11, 1995, Ser. No. 570,362
Int. Cl.[6] H01R *13/73*
U.S. Cl. 439—567 **17 Claims**

1. A hold-down for securing a connector housing to a circuit



assembly, the circuit assembly having a hold-down engagement hole defined by an inner wall, the hold-down comprising:

a top portion for contacting the connector housing and for securing the hold-down to the connector housing at a top surface of the connector housing; and

shoulder portions integral with said top portion having downwardly facing end surfaces projecting in a horizontal direction substantially parallel to the top surface to engage the connector housing;

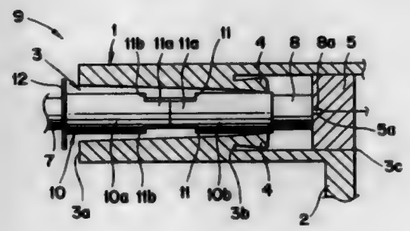
a plurality of fish hooks each integral with said top portion, each of said fish hooks having a proximal end adjacent to said top portion and a distal end opposite said proximal end, a portion near said distal end being angled with respect to an axis along a portion near said proximal end and said top portion and defining an angled tip, said angled tip adapted to resiliently engaged the inner wall of the hold-down engagement hole of the circuit assembly so as to have an interference fit, said projection of said top portion adapted to maintain said angled tip in engagement with the inner wall.

5,591,049

HIGH VOLTAGE CONNECTOR

Kiyoyuki Dohnishi, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 14, 1995, Ser. No. 421,939
Claims priority, application Japan, Apr. 21, 1994, 6-083352
Int. Cl.[6] H01R *13/424*
U.S. Cl. 439—595 **12 Claims**



1. A connector comprising:

a lead wire having a cap fixed to one end thereof;

a connector sleeve for receiving said lead wire, said connector sleeve being provided therein with biased protrusions for retaining said cap against withdrawal of said lead wire, thereby retaining said lead wire in said connector sleeve; and

a disengaging member having a bore receiving said lead wire, said disengaging member including a pair of members having opposing ends forming an interdigitating portion.

5,591,050

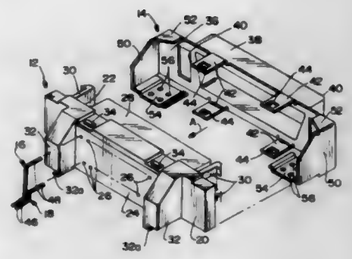
SHIELDED ELECTRICAL CONNECTOR

Satoshi Sasaka, Yamato, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Feb. 9, 1995, Ser. No. 386,031
Int. Cl.[6] H01R *13/00*
U.S. Cl. 439—607 **9 Claims**

1. A shielded surface mount electrical connector for mounting to a surface of a circuit board, comprising:

an elongated dielectric housing having a generally vertical front face and a rear face, the housing being adapted for mounting to the surface of said circuit board and including a mating portion projecting forwardly of the front face, said mating portion including a top, bottom and two side surfaces and, a plurality of terminal-receiving cavities extending between said mating portion and said rear face;



a plurality of terminals received in said cavities, each said terminal including a contact portion for mating with a complementary mating component, and a tail portion for soldering to the surface of said circuit board; and

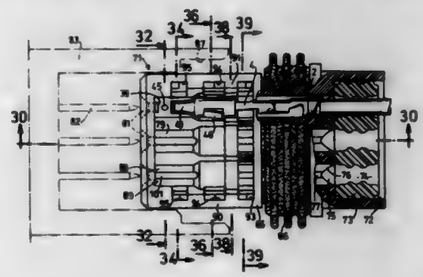
a metallic shield including a generally planar front flange with a projection therefrom surrounding the top, bottom and two side surfaces of the mating portion of the dielectric housing and including a pair of generally planar walls, each of said walls being positioned at opposite side ends of the housing, each of the walls projecting rearwardly substantially to a rear extremity of the housing and having a height substantially the same as the height of the housing, each of said walls being positioned generally perpendicularly to said front flange and including a generally planar surface mounting foot extending from each of said walls for connection to an appropriate pad on the circuit board, wherein said surface mounting feet extend toward each other and are generally perpendicular to said generally planar walls, the walls and feet being of sufficient mass to shift a center of gravity of the connector rearwardly and, thereby, facilitate balancing the housing in a front-to-rear direction, and a rigidify gusset extending generally perpendicularly from a top surface of each wall to rigidify the respective wall.

5,591,051

FEMALE ELECTRIC CONTACT MEMBER AND ELECTRIC CONNECTOR CASING ELEMENT ADAPTED TO RECEIVE SAME

Jean Ittah, Villeneuve la Garenne, France, assignor to Connecteurs Cinch, Societe Anonyme, Montigny le Bretonneux, France

Filed Nov. 23, 1994, Ser. No. 346,284
Claims priority, application France, Dec. 15, 1993, 93 15091
Int. Cl.[6] H01R *13/514*
U.S. Cl. 439—752 **18 Claims**



1. In combination, female electric contact members and a casing element adapted to receive said female electrical contact members; each female electric contact member comprising:

a first element cut out and bent to shape from a first metal strip that is a good conductor of electricity and comprising some elasticity, said first element including a body comprising at one end crimping lugs extended by a profile part that is in turn extended by a body terminated by two first elastic bars adapted to form a clamp to grip a corresponding male electric contact member, wherein said body of said first element comprises a circular cross-section and said two first elastic bars are flat; and

a complementary element cut out and bent to shape from a second metal strip that is a good conductor of electricity and comprising some elasticity, and being adapted to receive and be fixed to said body of said first element, said complementary element including two second elastic bars adapted to bear against said two first elastic bars of said first element to strengthen elastic action of said two first elastic bars, and a retaining flap comprising a free end facing towards said crimping lugs, wherein said complementary element comprises a corresponding circular cross-section and a free end, where in the vicinity of the free end, there is at least one boss; and

said casing element being adapted to cooperate with a complementary casing element, said complementary casing element containing male electric contact members, and said casing element comprising:

a plurality of channels, each of said plurality of channels adapted to receive a female electric contact member and each of said plurality of channels comprising at least one groove for guiding at least one boss of said complementary element; and

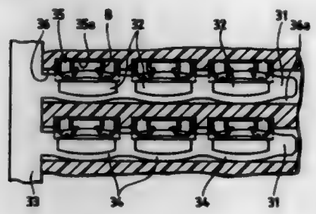
means for locking each said female electric contact member, said means for locking occupying a first, ready position in which each said female electric contact member can be fitted into a corresponding channel, and a second, locking position in which each said female electric contact member is immobilized.

5,591,052

CONNECTOR WITH A DOUBLE LOCKING MECHANISM

Tamio Watanabe, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jun. 23, 1995, Ser. No. 494,245
Claims priority, application Japan, Jun. 23, 1994, 6-141978
Int. Cl.[6] H01R *13/514*
U.S. Cl. 439—752 **6 Claims**



1. A connector with a double locking mechanism comprising:

a connector housing having a plurality of terminal accommodating chambers;

terminals insertable into said terminal accommodating chambers, respectively;

locking means for fixing said terminals in said terminal accommodating chambers, respectively, said locking means being provided within said terminal accommodating chamber; and

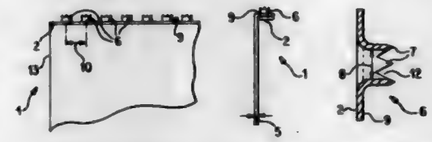
a locking pin detachably insertable into a locking pin insertion hole in an insertion direction from an outer side surface of said connector housing, said insertion hole being positioned between said terminals and a wall surface opposing said terminal, wherein said locking pin includes bridge elastic portions having elasticity in a direction normal to said insertion direction so as to press said terminals against an interior wall of said terminal accommodating chamber and wherein said bridge elastic portions are continuous and smooth without any cantilever-type fingers projecting therefrom in said insertion direction.

5,591,053

CURRENT TAPPING VANE AND METHOD FOR PRODUCING SAME

Otwin Imhof, Nuertingen; Holger Kistrup, Esslingen, and Wilhelm Kitzhoefer, Brilon, all of Germany, assignors to Deutsche Automobilgesellschaft mbH, and Daug-Hoppecke Gesellschaft fuer Batteriesysteme mbH, both of Germany

Continuation of Ser. No. 159,868, Dec. 1, 1993. This application Oct. 30, 1995, Ser. No. 550,519
Claims priority, application Germany, Dec. 1, 1992, 42 40 338.3
Int. Cl.[6] H01R *4/02*
U.S. Cl. 439—874 **11 Claims**



1. A current tapping vane of a battery for end-side electrical resistance welding to a connecting strap, comprising an end region of the current tapping vane to be welded configured with a transverse bent end region having a flat face and a plurality of weld regions provided across the bent end region to contact the connecting strap preliminary to welding, wherein the current tapping vane is provided, at least in the bent end region, on sides of the weld regions, with spaces therebetween defining reduced thickness portions having a depth greater than a predetermined amount of settlement of a portion of the welding region contacting the connecting region occurring during welding on such that, after welding, a full surface of the flat side rests against the connecting strap to establish electrical conductivity wherein the weld burls are tongues spaced from one another by interstices, extending beyond an angling off portion of the bent end region.

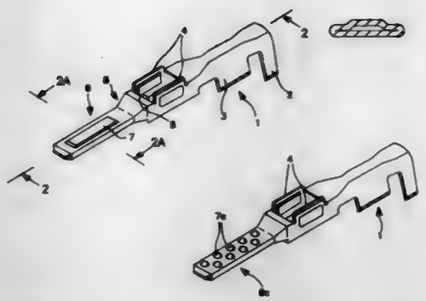
5,591,054

MALE TERMINAL FITTING AND METHOD OF PRODUCING THE SAME

Hajime Okada; Masaaki Kobayashi; Mitsuhiro Fujitani, and Hisashi Konoya, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Dec. 8, 1994, Ser. No. 351,614
Claims priority, application Japan, Dec. 8, 1993, 5-071673 U
Int. Cl.[6] H01R *13/04*
U.S. Cl. 439—884 **2 Claims**

1. An elongate male terminal fitting unitarily formed from a metal plate material having a selected thickness t, said male terminal fitting comprising opposed longitudinal ends, a barrel portion at one said longitudinal end for electrical connection to a wire, an engagement portion adjacent said barrel portion for engagement with a connector housing, a neck portion adjacent said engagement portion and tapering to a smaller cross-sectional dimension than said engagement portion, and a tab portion extending from said neck portion to the opposed longitudinal end for engagement in a mating female terminal fitting requiring a specified tab thickness T greater than twice t, said tab portion having opposed first and second longitudinally extending sides and opposed first and second layers, said second layer being formed from first and second coplanar lateral sections unitarily joined to said first layer along first and second folds extending from said

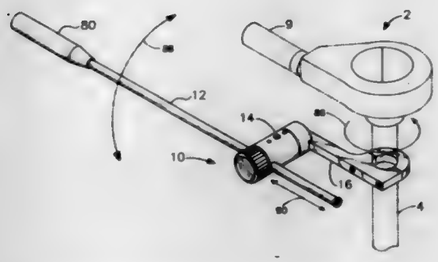


neck portion to the opposed end and defining the respective first and second longitudinally extending sides of said tab portion, said first layer having planar portions disposed in face-to-face relationship with said second layer, said first layer further being embossed with at least one projection between the planar portions thereof and disposed to electrically engage said female terminal fitting, regions of said tab portion having said projection thereon substantially equaling said specified thickness required by said mating female terminal fitting, said projection extending from said tab portion into said neck portion of said elongate male terminal fitting for enhancing strength for said elongate male terminal fitting in proximity to said tab portion and said neck portion.

5,591,055
CLUTCH CONTROLLED ADJUSTABLE STEERING DEVICE

Sal J. Ambrico, and Kathleen A. Ambrico, both of 2590 NW. 4th St., Fort Lauderdale, Fla. 33311

Filed Jan. 26, 1996, Ser. No. 592,230
Int. Cl.[6] B63H 5/12
U.S. Cl. 440—6 **18 Claims**



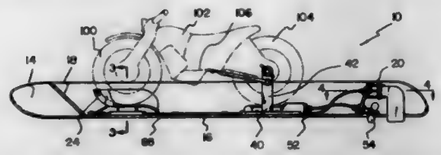
1. A steering device for a trolling motor having a vertical steering column for turning the trolling motor about its vertical axis attached to the bow or stern of a boat, comprising an adjustable clutch controlled steering device having an elongated steering arm connected to a cylindrical casing encompassed clutch mechanism connected horizontally to the vertical steering column,

said clutch mechanism having at least one clutch sleeve enclosed therein having an axial opening rotatably mounted on a longitudinal shaft extending therein, the arrangement being such that the vertical movement of the steering arm will rotate said clutch sleeve about said shaft causing drag on the shaft thereby positioning the steering arm at a desired vertical position, and that horizontal movement of the steering arm will turn the vertical steering column about its vertical axis to steer the boat.

5,591,056
MOTORCYCLE PROPELLED BOAT

Francisco Patino, 42-25 Hampton St. Apt. 706, Elmhurst, N.Y. 11373

Filed Nov. 22, 1995, Ser. No. 562,854
Int. Cl.[6] B63H 21/175
U.S. Cl. 440—12 **1 Claim**



1. A motorcycle propelled boat for providing a multipurpose vehicle for transportation of people comprising, in combination:

a boat portion comprised of a pair of elongated inflatable pontoons secured on opposing end portions of a boat deck, the boat deck having a front portion and a rear portion;

a front portion comprised of an upper ramp portion dimensioned to receive a front wheel of a motorcycle therein, the front portion having a rotating portion, the rotating portion having a lower portion secured to the boat deck inwardly of the front portion thereof, the upper ramp portion having a shoulder bolt secured to the lower portion, the rotating portion having an upper portion secured to the upper ramp portion disposed over the lower portion, the rotating portion having ball bearings between the upper portion and the lower portion;

a rear portion comprised of a pair of elongated rods extending upwardly from the boat deck inwardly of the rear portion thereof, the pair of elongated rods dimensioned to receive a rear wheel of a motorcycle therebetween, each of the rods having an adjustable clamp extending therethrough for coupling with an axle of the rear wheel, each of the rods having a support rod securable to a carriage of a motorcycle, the rear portion having a drive belt disposed between the pair of elongated rods positionable underneath a rear wheel of a motorcycle, the drive belt having a pair of rolling rods positioned within opposing ends thereof, the rear wheel of the motorcycle positionable on the drive belt whereby rotation of the rear wheel rotates the drive belt and the pair of rolling rods;

a propulsion portion comprised of a propeller secured to the rear portion of the boat deck, the propulsion portion having a gear box drivingly connected to the one of the rolling rods of the drive belt of the rear portion, the gear box having a drive cable extending therefrom to couple with the propeller;

a rudder rotatably coupled with the rear portion of the boat deck, the rudder having a pair of securement portions extending orthogonally therefrom;

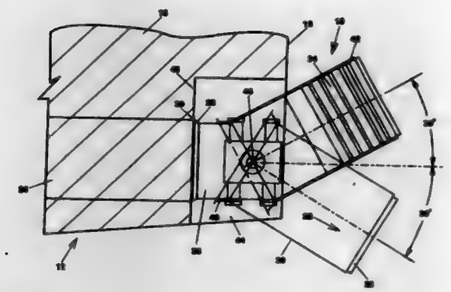
a steering mechanism comprised of a pair of elongated flexible cables, each of the cables having a first end and a second end, each first end secured to the upper portion of the rotating portion of the front portion, each second end secured to the pair of securement portions of the rudder.

5,591,057
HULL SUPPORTED STEERING AND REVERSING GEAR FOR LARGE WATERJETS

Charles M. Dai, Potomac, and John L. Allison, Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 313,612, Sep. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 314,301, Sep. 30, 1994, Pat. No. 5,476,401. This application Sep. 14, 1995, Ser. No. 527,994
Int. Cl.[6] B63H 11/113;11/117
U.S. Cl. 440—42 **13 Claims**

1. An apparatus for receiving flow discharged from a fixed nozzle of a waterjet propulsion system, the nozzle directing the



flow in a generally aft direction for propelling a vessel through water, said apparatus acting to redirect the flow received from the nozzle for providing maneuvering capability to the vessel, said apparatus comprising:

a hollow steering sleeve defining a flow passage, said flow passage having a lateral dimension associated therewith, said steering sleeve adapted to be pivotably mounted about a substantially vertical axis directly to a stern of the vessel independent of the nozzle, said steering sleeve being longitudinally separated from the nozzle so as to allow the flow discharged from the nozzle to form a free jet flow before entering said steering sleeve, said longitudinal separation being less than about 1.5 times said lateral dimension of said flow passage, said flow passage having an inlet with an internal dimension equal to or greater than an internal dimension of the nozzle, said flow passage having a rearwardly facing outlet, said flow passage from said inlet to said outlet being in axial alignment with the nozzle to receive at least a major portion of the free jet flow subsequent to the free jet flow exiting the nozzle, said steering sleeve further including an outwardly angled flange depending from a forward end of said steering sleeve and projecting towards said nozzle, said flange being angled to align with lateral sides of the free jet flow at port and starboard extremes of pivotal motion of said steering sleeve, wherein an angle of said angled flange is determined such that a port side of said angled flange is approximately parallel with a port lateral side of the free jet flow when said steering sleeve is fully rotated to port and a starboard side of said angled flange is approximately parallel with a starboard lateral side of the free jet flow when said steering sleeve is fully rotated to starboard; and

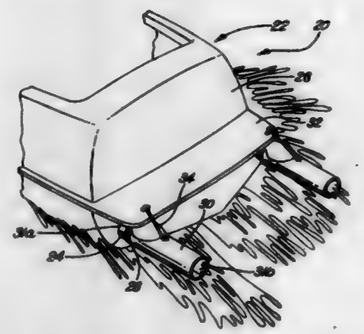
at least one reversing vane pivotably mounted to said steering sleeve and positioned entirely within said flow passage, said at least one reversing vane pivotal between a first substantially horizontal position wherein said at least one reversing vane functions as at least a portion of a bottom surface of said flow passage, and a second position wherein said at least one reversing vane closes said rearwardly facing outlet and defines an aperture in said bottom surface of said flow passage, the flow being deflected by said at least one reversing vane to an exterior of said steering sleeve through said aperture,

wherein said apparatus acts independently of the nozzle to redirect the flow received from the nozzle such that forces acting on said apparatus are transmitted directly to the vessel with none of said forces being transmitted to the waterjet propulsion system.

5,591,058
EXHAUST ACCESSORY FOR BOATS

Frederick G. Schriever, 19950 Harper Ave., P.O. Box 36117, Detroit, Mich. 48236, and Richard C. Mertz, Jr., 21711 Greater Mack, St. Clair Shores, Mich. 48080

Filed Aug. 18, 1995, Ser. No. 516,680
Int. Cl.[6] B63H 21/32
U.S. Cl. 440—89 **6 Claims**



1. An apparatus for preventing soiling of a boat transom by exhaust gases generated by an inboard engine which are emitted from an exhaust pipe outlet at the transom, said apparatus comprising:

an elongated normally flaccid tube having an inlet end communicating with the exhaust pipe outlet at the transom and an outlet end;

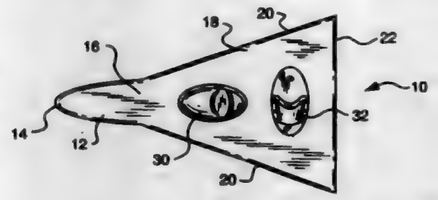
said tube becoming rigid and extending rearwardly from the transom upon pressurizing the interior of the tube by operation of the inboard engine discharging the exhaust gases through said tube; and

said outlet end of said tube being disposed sufficiently rearwardly from the transom, when said tube is rigid, to discharge the exhaust gases remote from the transom and prevent soiling.

5,591,059
WATER SKI

Peter Lehman, Evanston, Ill., assignor to SP Water Sports, Inc., Evanston, Ill.

Filed Mar. 7, 1995, Ser. No. 399,491
Int. Cl.[6] B63B 35/81
U.S. Cl. 441—68 **33 Claims**



1. A water ski having an upper surface and a lower surface and an elongated body of generally uniform thickness from its nose to its aft end, said body having a nose portion which inclines gradually upwardly in a forwardly direction, a forward body portion, and a rear body portion, and said forward body portion having a width which is generally uniform,

said rear body portion extending rearwardly from the forward body portion and having side edges which diverge outwardly and rearwardly toward the aft end of the ski, the width of the ski at its aft end being at least 150% of the width of said forward body portion,

the longitudinal length of said rear body portion being from 25 to 75% of the longitudinal length of the ski,

wherein the ski has three generally parallel, spaced-apart rudder elements mounted on said lower surface adjacent the aft end, the three rudder elements being shallow in depth, the middle one of said three rudder elements being longer than the other two of said three rudder elements, and

bindings on said upper surface, the longitudinal center of said bindings being to the rear of the longitudinal center of the ski.

5,591,060

RETENTION ASSEMBLY

Michael Forsyth, 1/15 Marine Parade, Manly NSW 2095, Australia

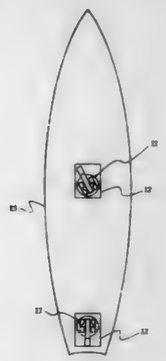
PCT No. PCT/AU92/00688, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO93/12969, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 31, 1992, Ser. No. 256,229

Claims priority, application Australia, Dec. 31, 1991, PL00200

Int. Cl.[6] A63C *15/00*

U.S. Cl. 441—75 **17 Claims**



1. A retention assembly for retaining a user's foot in engagement with a support surface to which the retention assembly is attached, said retention assembly including:

foot engagement means having a lower portion flexibly attached to said support surface for engagement by the side of a user's foot;

a distal upper portion for moving over a user's foot when force is applied to said lower portion by the user's foot whereby said foot engagement means abuts the upper areas of a user's foot when a substantially lateral force is applied to said lower portion by the user's foot; and

holding means for holding said distal upper portion in an upstanding attitude.

5,591,061

APPARATUS FOR MANUFACTURING ELECTRON SOURCE AND IMAGE FORMING APPARATUS

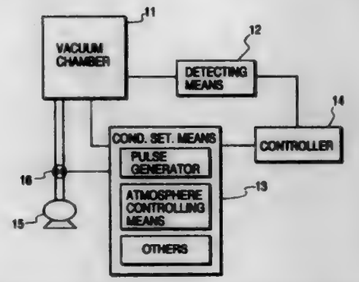
Setsuhito Ikeda, Atsugi; Masato Yamanobe, Machida; Hisaki Kawade, Yokohama; Toshikazu Ohnishi, Sagamihara, and Tetsuya Iwasaki, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1995, Ser. No. 499,579

Claims priority, application Japan, Jul. 12, 1994, 6-160885; Jul. 12, 1994, 6-160888; Sep. 21, 1994, 6-251548; Jun. 22, 1995, 7-177943; Jun. 26, 1995, 7-182048

Int. Cl.[6] H01J *9/02;9/42*

U.S. Cl. 445—3 **45 Claims**



1. A method of manufacturing an electron-emitting device having a pair of device electrodes and an electroconductive thin film including an electron emitting region arranged between the electrodes, characterized in that it comprises an activation process for increasing the emission current of the device and said activation process includes steps of a) applying a voltage (Vact) to the electroconductive thin film having a gap section under initial conditions, b) detecting the electric performance of said electroconductive thin film and c) modifying, if necessary, said initial conditions as a function of the detected electric performance of the electroconductive thin film.

5,591,062

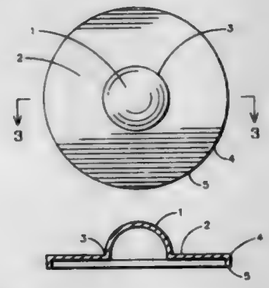
SPINNING TOY

Catherine A. Hettinger, P.O. Box 536564, Orlando, Fla. 32853

Continuation-in-part of Ser. No. 833,396, Feb. 10, 1992, abandoned. This application May 28, 1993, Ser. No. 68,569

Int. Cl.[6] A63H *27/00;1/02*

U.S. Cl. 446—46 **11 Claims**



1. A finger spinner comprising:

a thin, round, single thickness, primary sheet of plastic material molded to form a unitized central finger placement area means and a skirt balance means,

said central finger placement area means being a thin walled essentially spherical dome and a step demarcation joint where the central finger placement area means joins said skirt balance means extending radially outward from said step demarcation joint in an essentially flat plane so that said step demarcation joint aids a user in maintaining a finger in said central finger placment area means during spinning,

said thin walled essentially spherical dome having a radiused apex continuing to said step demarcation joint,

said skirt balance means providing a mass to balance said finger spinner to aid a user in keeping a finger in a stable spinning spot under said thin walled essentially spherical dome,

said skirt balance means formed from said sheet radially outward from said step demarcation joint to balance said spinner during use and providing sufficient mass to aid in maintaining a spin during use,

said skirt balance means further comprising a circular outer edge means depending downward and thereby comprising a bottom edge.

5,591,063

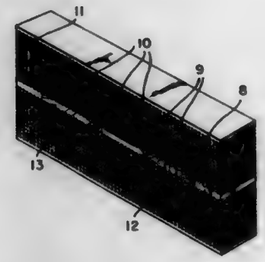
RAISED ORIENTATION PATTERN FOR NESTING BLOCKS FOR MEGACHILE ROTUNDATA

R. G. (Grant) McCarthy, St. Alberta, Canada, assignor to Beaver Plastics Limited, Edmonton, Canada

Filed Dec. 27, 1994, Ser. No. 364,652

Int. Cl.[6] A01K *47/00*

U.S. Cl. 449—4 **6 Claims**



1. A nesting block for leaf cutter bees comprising a rectangular block constructed of moldable thermal plastics material;

said block having two ends, two sides, a front face and a rear face;

said block including a plurality of open-ended parallel spaced apart nesting apertures;

said apertures extending through the entire thickness of said block from said front face to said rear face, and being substantially perpendicular to said front and rear faces;

said rear and said front faces being substantially smooth and planar;

the improvement being said front face includes a plurality of asymmetrical raised portions or projections on its surface, said portions or projections being of different geometrical configurations;

wherein, in field operation, said raised portions or projections serve to guide said bees to their respective nesting apertures.

5,591,064

BLASTING APPARATUS AND METHOD FOR BLAST CLEANING A SOLID SURFACE

William E. Spears, Jr., Lawrenceville, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

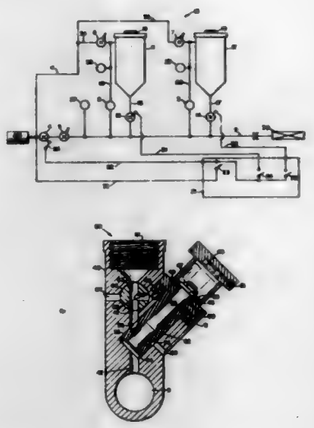
Filed Jun. 30, 1995, Ser. No. 497,106

Int. Cl.[6] B24C *3/00*

U.S. Cl. 451—2 **36 Claims**

1. A method of blast cleaning comprising the steps of:

a. containing a quantity of a first and a second blasting media in first and second blasting pots, respectively, wherein each blasting pot has a bottom with exit line in communication with a conveying line;



b. pressurizing each blasting pot and the conveying line to provide a differential pressure therebetween by a differential pressure metering system in communication with each blasting pot and the conveying line, wherein the differential pressure metering system joins each blasting pot and the conveying line to a source of pressurized gas;

c. feeding each blasting medium from each blasting pot through each exit line of each blasting pot to the conveying line, wherein each exit line has a variable size orifice for controlling flow of blasting media to the conveying line;

d. mixing blasting media with a stream of pressurized gas flowing within the conveying line at a uniform rate from the compressed gas source;

e. regulating the pressure in the pressure line and in the conveying line with a pressure regulator means to maintain a uniform differential pressure at a preselected level such that the pressure level within each pot is greater than the pressure within the conveying line;

f. sensing the pressure in each blasting pot and the conveying line with a sensor means connected to each blasting pot and conveying line for monitoring the differential pressure therebetween; and

g. discharging the mixture of blasting media and the stream of pressurized gas through a nozzle at an end of the conveying line at a uniform flow rate to a solid surface.

5,591,065

METHOD OF DRESSING HONING WHEELS

Sadao Mizuno, Nagoya; Akinori Hoshino, Chiryu; Akira Muraoka, Toyama, and Hiroyuki Takahashi, Shinminato, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi-ken, and Nachi-Fujikoshi Corp., Toyama-ken, both of Japan

Continuation of Ser. No. 289,476, Mar. 14, 1994, abandoned. This application Apr. 1, 1996, Ser. No. 625,092

Claims priority, application Japan, Mar. 17, 1993, 5-056991

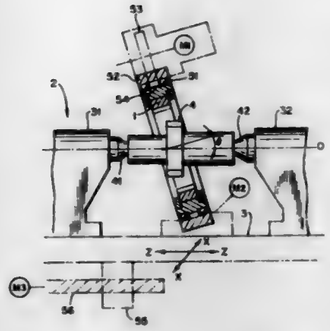
Int. Cl.[6] B24B *1/00*

U.S. Cl. 451—47 **2 Claims**

1. A method of dressing a hone in a honing wheel rotatably supported on a casing for honing a gear to be finished by means of a dressing tool secured on a table, said method comprising the steps of:

rotating said honing wheel using a motor on said casing;

bringing said honing wheel to be dressed into pressure contact with said dressing tool, said pressure contact step including sliding said casing in an in-feed direction relative to said table;



feeding said dressing tool transversely across a surface of said hone in said honing wheel, said feeding step including reciprocating said table in a transverse feed direction:

establishing and maintaining said feeding of said dressing tool with said hone in a first in-feed stage concurrent with said reciprocating of said table in the transverse feed direction, wherein said hone in said honing wheel is elastically deformed during said first in-feed stage, and an in-feed distance is gradually increased; and

maintaining said feeding of said dressing tool with said hone in a second in-feed stage, wherein said in-feed distance is held constant following said first in-feed stage.

5,591,066

ARRANGEMENT FOR BALL SHOT PEENING HELICAL COMPRESSION SPRINGS

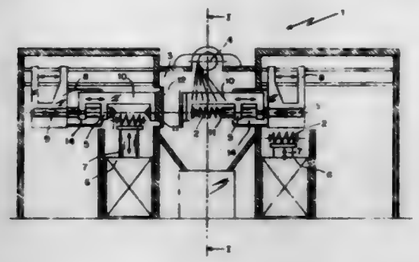
Hans Vondracek, Breckerfeld, Germany, assignor to Fried. Krupp AG Hoesch-Krupp, Essen, Germany

Filed Feb. 3, 1995, Ser. No. 383,246

Claims priority, application Germany, Mar. 15, 1994, 44 08 645.8

Int. Cl.[6] **B24C** *3/05*

U.S. Cl. 451—80 **7 Claims**



1. A shot-peening machine for helical compression springs, comprising: a spring-peening chamber having shot-impelling rotors, means for receiving and tensioning the springs, and means for loading the springs into and unloading the springs from said receiving and tensioning means; said receiving and tensioning means comprising at least one spring holder traveling back and forth horizontally into said spring-peening chamber; said loading and unloading means comprising belts directed perpendicular to said spring-peening chamber.

5,591,067

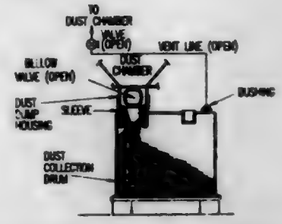
SEALED WASTE TRANSFER SYSTEM FOR VACUUM BLASTING

William S. McPhee, Arlington, and Stephen B. Mudd, Jr., Reston, both of Va., assignors to LTC Americas Inc., Sterling, Va.

Division of Ser. No. 339,199, Nov. 10, 1994, Pat. No. 5,529,530. This application Mar. 6, 1996, Ser. No. 611,816

Int. Cl.[6] **B24C** *9/00*

U.S. Cl. 451—88 **4 Claims**



1. A sealed waste container for a vacuum blasting system, which has a waste chamber and a waste chamber dump through which waste is removed from said waste chamber, comprising in combination:

said sealed waste container having an opening therein, said sealed waste container movable between a first position with said opening proximate said waste dump and a second position with said opening remote from said waste dump;

a flexible sleeve with one end secured to said sealed waste container around said opening and its other end adapted to be secured to said waste dump, forming a containment barrier between said waste dump and the interior of said sealed waste container; and

a vent opening in said sealed waste container adapted to be connected to a vent line that extends from said vent opening to said waste chamber.

5,591,068

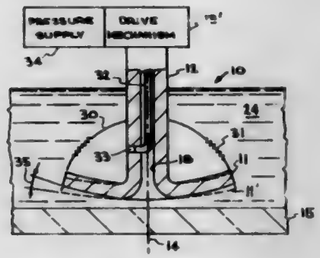
PRECISION NON-CONTACT POLISHING TOOL

John S. Taylor, Livermore, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Mar. 13, 1995, Ser. No. 403,835

Int. Cl.[6] **B24B** *31/00*

U.S. Cl. 451—104 **17 Claims**



1. A non-contact polishing tool, comprising:

a brim;

a shaft connected to said brim and having an opening therein;

means for directing a slurry through said opening in said shaft;

means for rotating at least said brim; and

means for changing at least the shape of an outer periphery of said brim;

whereby a slurry is adapted to flow through said opening in said shaft and onto an associated surface to be polished.

5,591,069

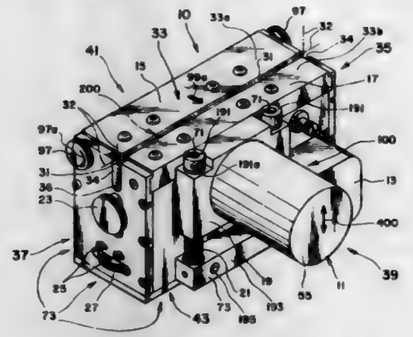
PORTABLE BLADE SHARPENER FOR ICE SKATES

Michael H. Wurthman, 30387 ConiferMt. Dr., Conifer, Colo. 80433

Filed Nov. 14, 1994, Ser. No. 339,399

Int. Cl.[6] **B24B** *7/00*

U.S. Cl. 451—241 **19 Claims**



1. A system for sharpening an elongated blade of an ice skate, the blade having a narrow width extending outwardly on each side of a first central plane, the system including:

(a) a grinding wheel having a rotational axis and a grinding surface extending outwardly on each side of a second central plane, said grinding wheel further having a center and a second axis passing through the center and lying in said second central plane of said grinding wheel; and

(b) means for guiding the blade across the surface of the grinding wheel with said first central plane of the blade substantially aligned with said second axis of said grinding wheel said guiding means including:

(i) at least a first beating surface and a second beating surface; wherein each of the first and second beating surfaces is formed by at least a pair of cylindrical roller beatings, each roller bearing having an axis of rotation and a race with an exterior surface, said exterior surfaces of each pair of roller beatings respectfully forming said first and second bearing surfaces, and wherein said guiding means further includes means for aligning the axes of said roller bearings in parallel, said bearing surfaces formed by said pair of cylindrical roller bearings preventing twisting and canting of said blade,

(ii) means for mounting the second beating surface opposite the first bearing surface at a distance spaced therefrom, said second axis of the grinding wheel lying between said bearing surfaces, said mounting means including means for adjusting the distance between the beating surfaces to form a sliding fit between the beating surfaces and the blade when the blade is inserted with the narrow width between the beating surfaces to thereby restrict the blade to sliding movement.

5,591,070

AIR TOOL WITH EXHAUST DIVERTING VALVE

Albert J. Kachich, Katy, Tex., assignor to Indresco Inc., Dallas, Tex.

Filed Aug. 8, 1994, Ser. No. 287,544

Int. Cl.[6] **B23B** *45/04;* **B24B** *23/02*

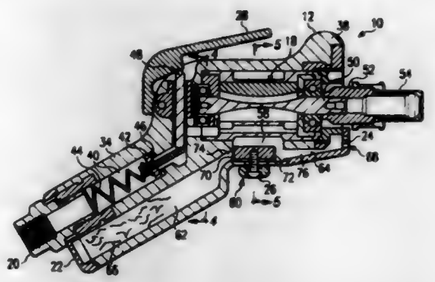
U.S. Cl. 451—295 **10 Claims**

1. A pneumatic power tool comprising:

a housing having a cavity, a supply air chamber, a rearward exhaust chamber, and a forward exhaust chamber;

a drive assembly;

an air motor disposed in the cavity and coupled to the drive assembly for rotating the drive assembly, the air motor producing exhaust air when in operation;



a throttle valve for controlling the operation and speed of the air motor;

an exhaust diverting valve for controlling the flow of exhaust air between the rearward exhaust chamber and the forward exhaust chamber;

an exhaust diverting valve selector having an exterior portion positioned on the exterior surface of the tool for adjusting the exhaust diverting valve;

wherein the housing further comprises a receiving chamber for receiving exhaust air from the air motor; and

wherein the exhaust diverting valve comprises:

an extended portion having a first end wall and a second end wall;

a first opening proximate the first end of the receiving chamber, the first opening in fluid communication with the rearward exhaust chamber;

a second opening proximate a second end of the receiving chamber, the second opening in fluid communication with the forward exhaust chamber; and

wherein the extended portion is disposed within and slidable within an opening formed in the housing and in the receiving chamber between a first position where the first edge wall seals the first opening and a second position where the second edge wall seals the second opening.

5,591,071

POLISHING DEVICE

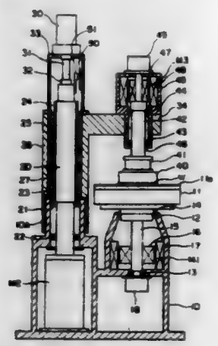
Shoichi Shin; Masafumi Tsunada; Yasuhiko Nagakura, and Toshio Oishi, all of Shizuoka-ken, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1994, Ser. No. 329,130

Claims priority, application Japan, Oct. 25, 1993, 5-288614; Nov. 2, 1993, 5-063619 U

Int. Cl.[6] **B24B** *55/00*

U.S. Cl. 451—276 **5 Claims**



1. A polishing device which comprises:

a surface table for polishing arranged horizontally;

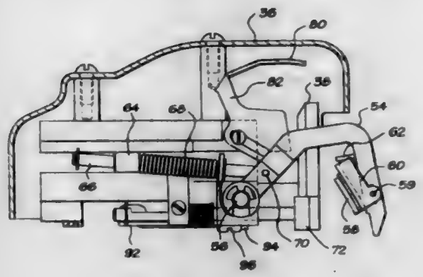
surface table rotation drive means for rotating the surface table provided with a first built-in type motor connected to the surface table;
polishing head arranged for rotation above said surface table;
polishing head rotating means for rotating the polishing head provided with a second built-in type motor connected to the polishing head;
an arm for rotatably supporting said polishing head;
polishing head lifting means for driving in up and down motion said polishing head relative to said surface table, where the polishing head lifting means is connected to an upper portion of the polishing head;
arm swinging means for swinging said arm in the horizontal plane, where the arm swinging means is comprised of a first column provided vertically at a lateral side of the surface table and mounted for rotation about an axis of rotation parallel to that of the surface table, a second column which engages the outer circumference of the first column so that rotation of the first column can be transmitted to the second column, said second column holds the arm in the horizontal direction;
first column rotation drive means for driving the first column in rotation is provided with a motor directly connected to the first column; and
said surface table rotation drive means and said polishing head rotating means each containing an outer periphery which is closed in a sealed condition.

5,591,072

SHARPENING DEVICE FOR FOOD SLICER

Brian A. Tweed, Dracut; Peter M. DeBakker; Michael W. Osborne, both of Hudson, all of Mass.; Richard P. Scherch, Piqua, Ohio; Harvey A. Kasinoff; Tom B. Heckman, both of Troy, Ohio; Danny J. Mitchell, Harrison, Ohio, and Mark Xie, Tipp City, Ohio, assignors to Premark FEG Corporation, Wilmington, Del.

Filed Apr. 10, 1995, Ser. No. 419,370
Int. Cl.[6] B24B *3/54*
U.S. Cl. 451—293 **21 Claims**



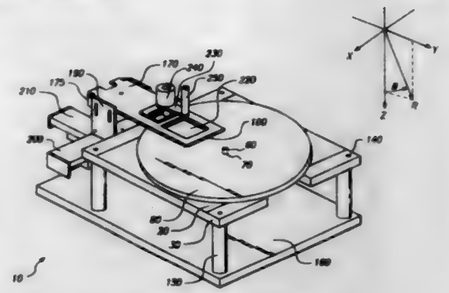
1. A sharpener for a knife of a food slicer comprising:
a base assembly and a sharpener assembly;
the base assembly including a lever mounted thereto on a pivot, the lever carrying a cam member which extends therefrom;
the sharpener assembly including a housing having a longitudinal cavity therein, a sharpening wheel mounted for rotation on an axle which reciprocates lengthwise in the cavity, a compression spring positioned in the cavity at a base portion of the axle, and an actuator which reciprocates in the cavity, said cavity being positioned on the side of the spring opposite the axle;
wherein upon moving the lever about its pivot, the cam contacts the actuator and moves the actuator in the direction of the axle and compresses the spring, the spring moves the plunger lengthwise within the cavity and urges the sharpening wheel against the knife.

5,591,073

METHOD AND APPARATUS FOR LAPPING SLIDERS

Carol R. Turgeon, Franklin, Mass., assignor to Quantum Corporation, Milpitas, Calif.

Filed Dec. 13, 1995, Ser. No. 571,660
Int. Cl.[6] B24B *29/02*
U.S. Cl. 451—314 **12 Claims**



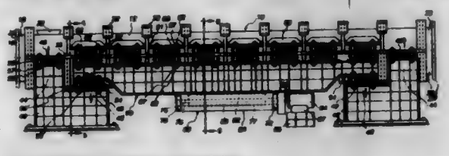
1. An apparatus for lapping a slider comprising:
a lapping contour plate having a concavely contoured top surface, a plurality of contour ribs integrally formed with a base region of the top surface and a plurality of interconnected air channels between the contour ribs,
a lapping plate positioned over the top surface and in a contact relationship with the contour plate, whereby the plate is guided into position by a guiding means,
an airtight peripheral seal formed between the lapping plate and the top surface of the contour plate,
vacuum means for supplying a negative air pressure to the air channels for deforming the lapping plate into the concavely contoured top surface and to contact the plurality of contour ribs so as to form a non-planar desired lapping geometry,
an arm structure for receiving, holding, and actuating a lapping fixture including at least one slider to be lapped during lapping operations, and
a loading force providing means on the arm structure for engaging the lapping fixture for applying a gram load force to the fixture to urge the slider toward the lapping plate during lapping operations.

5,591,074

VIBRATORY TUMBLING APPARATUS WITH REDUCED FORCE TRANSMISSION

Albert Munschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Apr. 19, 1995, Ser. No. 424,188
Int. Cl.[6] B02C *17/14*; **B24B** *31/06*;*41/02*
U.S. Cl. 451—328 **11 Claims**



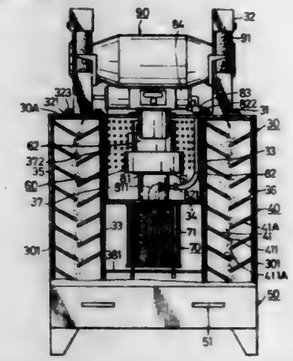
1. A vibratory system comprising:
a generally horizontally arranged container having a material supporting surface, said container having a longitudinal axis extending from an inlet end to a discharge end;
means having a spring rate for resiliently mounting said container relative to a mounting surface;
vibration generator means mounted on said container at a location offset on one side of the longitudinal axis of the container, said vibration generator means generating a vibratory force along a linear path offset from the longitudinal axis;
a bracket means;
means resiliently mounting said bracket means relative to a mounting surface;
resilient means acting between said bracket means and said container for transmitting said vibratory forces from said vibration generator means and said bracket means to said container; and
means for varying the spring rate of said resilient means for varying the vibratory forces acting on said container.

5,591,075

GRINDING MACHINE WITH A FIREPROOF DUST-COLLECTING SYSTEM

Chien-Yen Chang, No. 8, Alley 130, Lane 195, Chung-Hsiao Rd., Yung-Kang City, Tainan Hsien, Taiwan

Filed Sep. 6, 1995, Ser. No. 524,403
Int. Cl.[6] B24B *55/02*
U.S. Cl. 451—451 **3 Claims**



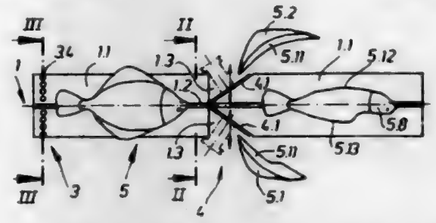
1. A grinding machine including a casing with a top plate unit disposed at a top end portion of said casing, two grinding units installed on two side portions of said top plate unit of said casing, a driving unit for activating said grinding units, and a filtering unit installed in said casing, wherein the improvement comprises:
each of said side portions of said top plate unit has a dust inlet slot formed therethrough so as to permit dropping of dust from a corresponding one of said grinding units into said dust inlet slot, said casing having two vertical side walls, two vertical partitions located between said side walls, two side chambers which are located in two sides of said casing under said two side portions of said top plate unit and which are respectively defined between one of said side walls and one of said partitions, a middle chamber defined between said partitions and receiving said filtering unit in a lower portion thereof, a dust-collecting chamber located in a bottom end portion of said casing and situated under and communicated with said side chambers and said middle chamber, two dust-guiding units disposed within said side chambers respectively so as to guide dust from said grinding units to said dust-collecting chamber through said side chambers, and an exhaust fan unit disposed in said middle chamber and located over said filtering unit so as to draw dust from said dust-collecting chamber in order to discharge dust from said casing, each of said dust-guiding units including a vertical row of inclined fireproof first guide fins fixed in a corresponding one of said side chambers and extending from and inclining downwardly from a corresponding one of said partitions, and a vertical row of inclined fireproof second guide fins fixed in the corresponding one of said side chambers and extending from and inclining downwardly from a corresponding one of said side walls in such a manner that each of said first guide fins has a lower end located between an adjacent pair of said second guide fins, while each of said second guide fins has a lower end located between an adjacent pair of said first guide fins.

5,591,076

APPARATUS FOR PROCESSING FLAT FISH

Reinhard Evers; Klaus-Werner Götz, both of Stockelsdorf; Karl-Dieter Reeps, Bad Schwartau; Olaf Schwarz, Wismar, and Conrad Torkler, Hakendorf, all of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & CO KG, Lubeck, Germany

Filed Apr. 21, 1995, Ser. No. 426,739
Int. Cl.[6] A22C *25/16*
U.S. Cl. 452—157 **20 Claims**



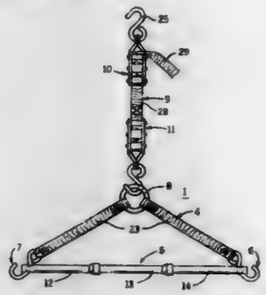
1. A method for automatically processing whole flat fish, which include a head, a body comprising a ventral cavity containing internal organs and defining a ventral and a dorsal edge with strips of fatty tissue located at each of said ventral and dorsal edges, and ventral and dorsal edge fins, the method comprising the steps of:
a) conveying said flat fish in their longitudinal direction,
b) performing electro-optical imaging of said fish to obtain image data comprising information regarding at least the relative positions of said dorsal and ventral edge fins with respect to the contour of said fish body and,
c) processing said image data in accordance with second data specific to the flat fish species to generate a control signal, and
d) utilizing said control signal for controlling at least one cut in said fish to remove strips of said fatty tissue together with the dorsal and ventral edge fins.

5,591,077

GAMBREL SUPPORT STRUCTURE FOR ANIMAL CARCASS

Jerry D. Rowe, P.O. Box 1076, 1595 S. Hwy. 789, Lander, Wyo. 82520

Filed Jan. 26, 1994, Ser. No. 187,655
Int. Cl.[5] A22B *5/00*
U.S. Cl. 452—189 **11 Claims**



1. A gambrel apparatus for supporting of animals and the like, comprising:
a spreader unit of a rigid construction having longitudinaliy spaced opposite end members, each said end member having a corresponding aligned lateral opening spaced from the end of the end member and define a substantially vertically oriented opening extending through the spreader unit;
a first hook unit secured within the said opening in a first of said end members, and a second hook unit secured within the said

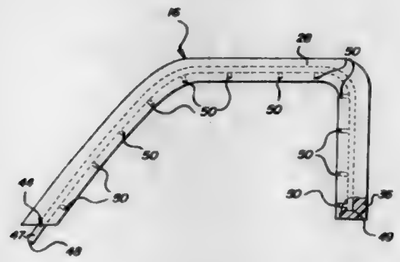
opening of the second of said end members, each hook unit being of an essentially corresponding construction, each of said hook units comprising a straight shank portion with an upper connector portion and a lower hook portion integrally formed at respective ends, said straight shank located within the opening of the end member and having a diameter smaller than said opening and allowing reorienting of the hook member within the opening, said straight shank portion having a length slightly greater than said opening, said straight shank portion being in parallel alignment with the opening, said hook portion including an extension of said shank extending outwardly at an acute angle from said straight shank portion and curved backwardly on itself to form an outer U-shaped hook leg including an outer curved leg portion, said upper connector portion being formed as aa extension of said shank substantially adjacent said end member and being extended inwardly to the opposite side of said shank from said U-shaped hooked leg, said hook units adapted to be impaled on spaced portions of an animal for supporting of said animal in a vertical orientation with said straight shank portion in a vertical orientation and adapted to be impaled by one of said hook units on a single portion of an animal for support of the last named animal in a vertical orientation with said straight shank portion at an acute angle to the orientation and said outer curved leg portion engaging the impaled portion of the animal, and a common connector having first and second connecting members connected one each to one of the upper connector portions and located generally centrally between said hook units.

5,591,078

AUTOMOTIVE INTERIOR TRIM HAVING INTEGRATED DEFROST DUCT

Scott M. Fillon, Newmarket, and Christopher Gallant, Greenland, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Sep. 29, 1995, Ser. No. 535,985
Int. Cl.[6] B60S 1/54
U.S. Cl. 454—124 **9 Claims**



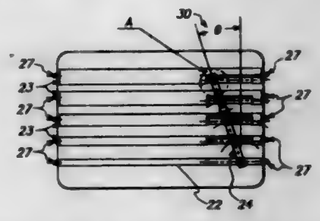
6. An interior trim molding component for covering the frame adjacent a window opening of an automotive vehicle, comprising:
an outer skin of flexible material;
an energy-absorbing foam core molded in place on a backside surface of said skin for absorbing the energy of an impact; and
at least one preformed air duct encapsulated by said foam core during said in-place moulding of said foam core and yieldable under the load of an impact so as not to detract from the energy-absorbing attribute of said foam core, said duct defining a sole air passage within said core having an inlet for admitting a flow of air into said passage and a plurality of longitudinally spaced outlets extending between said air passage and the exterior of said trim component for directing the flow of air out of said passage and onto an adjacent window of the vehicle.

5,591,079

VENTILATION LOUVER ASSEMBLY, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Yoshitaka Saida, Utsunomiay, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 292,201, Aug. 19, 1994, Pat. No. 5,520,579. This application Jun. 7, 1995, Ser. No. 485,101
Int. Cl.[6] B60H 1/34
U.S. Cl. 454—155 **17 Claims**



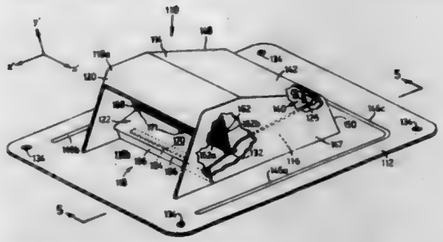
1. A louver assembly for directing airflow from an air duct opening, comprising:
a discharge outlet which, attaches to an air duct at an opening thereof;
a plurality of directional tourers pivotally attachable to said discharge outlet; means, connected to each of said directional louvers for selectively, simultaneously directing airflow from said air duct in a plurality of directions;
said directing means simultaneously acts on each of said directional louvers to orient each of said directional louvers at a unique angle relative to said discharge outlet; and
said directing means slidably engages with at least two of said directional louvers and is pivotable about another of said directional louvers.

5,591,080

EXHAUST VENT COVER

John F. Ward, Midhurst, Canada, assignor to Canplas Industries Ltd., Barrie, Canada

Filed Jul. 18, 1994, Ser. No. 276,582
Int. Cl.[6] F24F 7/02
U.S. Cl. 454—359 **14 Claims**



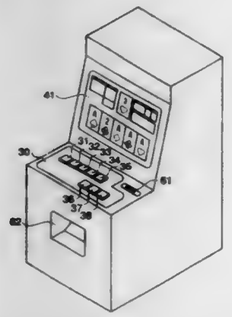
1. An exhaust vent cover comprising:
a peripheral flange for attaching the cover to a surface;
a hollow body extending upwardly from the flange and having an air passageway communicating with an open front, said body including an overhang extending beyond said open front;
a replaceable grill covering said open front, said grill including a plurality of water inhibiting fins, which inhibit water from entering the open front;
a flapper valve across said air passageway, said flapper valve being pivotally attached to said body closely adjacent one end of said flapper valve wherein, in response to a greater air pressure below said flapper valve, an end of said flapper valve distant from said pivotal attachment pivots upwardly to allow air to pass past said flapper valve and out of said open front, said flapper valve including an air deflection surface, facing towards said open front, to inhibit unwanted opening of said flapper valve;
said peripheral flange further including a plurality of attachment openings wherein each of said attachment openings is in the form of a slot, said slots having a longer axis and a shorter axis wherein the longer axis is oriented toward the center of the body to allow the body to expand and contract, to facilitate attachment of the vent cover to an underlying surface.

5,591,081

CARD GAME AMUSEMENT DEVICE

Hirokazu Suzuki, Tokyo, Japan, assignor to Sigma, Incorporated, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,533
Claims priority, application Japan, Jan. 13, 1994, 6-002158
Int. Cl.[6] A63F 1/00
U.S. Cl. 463—13 **20 Claims**



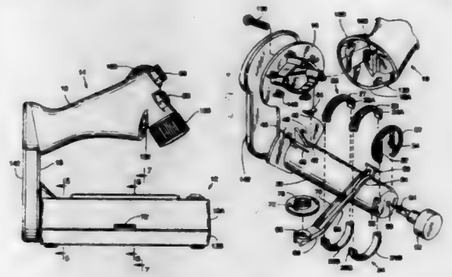
1. A card game amusement device simulating a card game to compete how many cards are moved from a first region to a second region on a predetermined graphic screen by arranging a plurality of cards on the first region from one deck of playing cards, designating one card from these plurality of the cards under predetermined conditions, moving the designated card onto said second region and filling a vacancy of said first region with one card from said deck of the playing cards, and repeating moving a card from said first region to said second region and filling said first region with a card until all of said deck of the playing cards are used or until the conditions for selecting the card on said first region are not fulfilled, said card game amusement device comprising:
first display controller for selecting a plurality of cards from one deck of playing cards and displaying these cards on a first screen region of said graphic screen;
movement determining unit for, when no card is displayed on a second screen region of said graphic screen, determining all of the cards displayed on said first screen region to be moveable cards, and when the card is displayed on said second screen region, checking whether a number or a suit of the card displayed on said second screen region matches with a number or a suit of each card displayed on said first screen region, if any of them matches, determining the matched card on said first screen region to be a moveable card and if they do not match, determining the unmatched card on said first screen region to be an unmovable card;
designation receiver for, when a player selects a certain card from the cards displayed on said first screen region and determined to be the movable cards by said movement determining means, receiving the designation of the certain card as a card to be moved;
second display controller for eliminating said card to be moved from said first screen region, selecting one card from said deck of the unselected playing cards, displaying the selected card on said first screen region instead of said card to be moved, and displaying said card to be moved on said second screen region; and
third display controller for displaying the current number of cards successively displayed on said second screen region by said second display controller on a third screen region.

5,591,082

SIDE-MOUNTED THROTTLE AND WEAPONS CONTROLLER FOR COMPUTER VIDEO GAMES AND FLIGHT SIMULATION

Christopher Jensen, Hillsboro, Oreg., and Robert L. Carter, Vancouver, Wash., assignors to Thrustmaster, Inc., Hillsboro, Oreg.

Filed Jan. 5, 1995, Ser. No. 368,585
Int. Cl.[6] A63F 9/22
U.S. Cl. 463—38 **18 Claims**



1. A video game controller for a video game comprising:
a base;
a longitudinal shaft mounted on the base for rotational movement about a longitudinal axis of the shaft;
a handle fixedly connected to the shaft, the shaft rotatable about the longitudinal axis responsive to pivotal movement of the handle about the longitudinal axis;
a first sidewall mounted on the base;
a second sidewall mounted on the base and parallel to the first sidewall and spaced therefrom to form a slot between the first and second sidewalls;
an annular ridge mounted on the shaft and received in the slot formed between the first and second sidewalls;
a potentiometer having a rotatable stem operatively coupled to the shaft so that the stem rotates responsive to rotation of the shaft, the potentiometer generating an electrical signal that is proportional to the rotational position of the stem; and
a cable coupled to the potentiometer for providing the electrical signal to the video game.

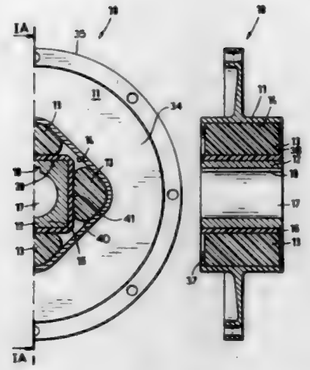
5,591,083

ELASTIC SHAFT COUPLING

Gerhard Kirschey, Wuppertal, Germany, assignor to Centa-Antriebe Kirschey GmbH, Haan, Germany

Filed Mar. 25, 1994, Ser. No. 218,325
Claims priority, application Germany, Mar. 26, 1993, 43 09 747.2
Int. Cl.[6] F16D 3/68
U.S. Cl. 464—83 **8 Claims**

1. A shaft coupling, comprising:
a drive-side flange member formed with an annular plate provided with peripheral holes adapted to be bolted to a drive, said plate being formed with a tubular element projecting axially on opposite sides of said plate and defining a central opening of a configuration of a first polygon centered on an axis of rotation of the flange member, said plate forming a



flange in one piece with said tubular element midway of the length thereof and between ends of the tubular element;

a driven-side hub member of the same axial length as said tubular element provided with an external configuration of another polygon geometrically similar to and smaller than said first polygon, said hub member being disposed in said tubular element, said other polygon being angularly offset from said first polygon whereby pockets are formed between polygon faces of said other polygon and vertices of said first polygon, said hub member having a keyway connectable to a shaft to be driven by rotation of said flange member;

a respective elastic coupling body received in each of said pockets for angularly coupling said hub member with said flange member for driving of said shaft upon rotation of said flange member; and

a sleeve composed of plastic lining said hub member complementary to the hub member and defining the other polygon and angularly coupled with the hub member but axially slidable relative thereto facilitating assembly of said hub member into said flange member, said sleeve having an outwardly turned shoulder lying in a plane perpendicular to said axis and said tubular element having an inwardly turned shoulder lying in a plane perpendicular to said axis, said shoulders engaging opposite ends of said coupling bodies.

5,591,084

TRANSMISSION JOINT BODY PORTION HAVING AN ENVELOPE WITH INTERIOR PERIPHERAL SURFACE PORTIONS EXTENDING OPPOSITE TO AND CONTOURED SUBSTANTIALLY THE SAME AS OPPOSITE REAR SURFACES OF BEARING TRACKS

Bernard Poulin, Conflans Ste Honorine, and Michel Margerie, Vetheuil, both of France, assignors to GKN Glaenzer Spicer, Poissy, France

Continuation-in-part of Ser. No. 778,480, Oct. 17, 1991, Pat. No. 5,279,522. This application Sep. 21, 1993, Ser. No. 124,220

Claims priority, application France, Oct. 22, 1990, 90 13038; Sep. 21, 1992, 92 11216

Int. Cl.[6] F16C *3/00*

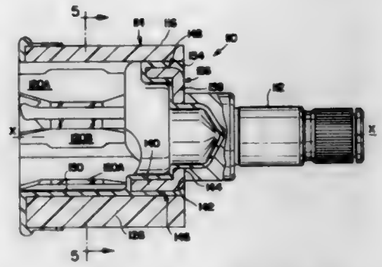
U.S. Cl. 464—111 **7 Claims**

1. A transmission joint portion, comprising:

an envelope having an axis and an interior peripheral surface;

a plurality of bearing paths inside said envelope, wherein each of said bearing paths is defined by and comprises bearing tracks inside said envelope, and wherein each one of said bearing tracks has a bearing path surface on one side thereof and an opposite surface facing said interior peripheral surface of said envelope;

an interior space defined between said interior peripheral surface of said envelope and each said opposite surface of said bearing tracks;



a filler material comprising a material selected from the group consisting of a thermosetting matrix and a thermoplastic matrix, said filler material being filled into said interior space between said interior peripheral surface and each said opposite surface;

wherein said interior peripheral surface of said envelope has contoured portions thereof extending opposite said opposite surfaces of said bearing tracks, each of said contoured portions having a contour substantially the same as the contour of the respective said opposite surface of one of said bearing tracks;

wherein each said bearing path comprises two said bearing tracks, each said bearing track having said bearing path surface thereof facing said bearing path surface of the other said bearing track;

wherein said interior peripheral surface of said envelope comprises a series of axial bosses, each of said bosses projecting inwardly toward said axis of said envelope and defining two of said contoured portions of said interior peripheral surface that extend opposite two of said opposite surfaces of two adjacent said bearing tracks of two different said bearing paths; and

an anchoring member connected to said envelope, said anchoring member having an axially extending lateral wall extending into said filler material, said lateral wall having an outer face with alternating convex and concave portions, and said axial bosses of said envelope extending into and having substantially the same contour as said concave portions of said lateral wall of said anchoring member.

5,591,085

TRIOPD CONSTANT VELOCITY UNIVERSAL JOINT INCORPORATING A RETENTION SYSTEM FOR THE ROLLER ASSEMBLIES

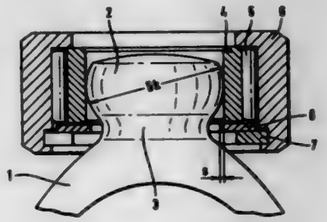
Eugen Stall, Neunkirchen, and Winfried Busch, Köln, both of Germany, assignors to GKN Automotive AG, Siegburg, Germany

Filed Aug. 11, 1994, Ser. No. 289,094

Claims priority, application Germany, Aug. 12, 1993, 43 27 036.0

Int. Cl.[6] F16D *3/205*

U.S. Cl. 464—111 **24 Claims**



1. A tripode constant velocity joint comprising:

an outer joint part defining an outer joint axis, said outer joint part being provided with three circumferentially distributed guiding grooves extending axially with respect to said outer joint axis;

an inner joint part defining an inner joint axis, said inner joint part being provided with three spherical arms corresponding with said guiding grooves and extending radially with reference to said inner joint axis;

a roller assembly arranged on each spherical arm of said inner joint part, each of said roller assemblies defining a respective roller axis and comprising:

an inner roller;

an outer roller disposed over said inner roller;

a needle bearing disposed between said inner and outer roller;

means for supporting said inner roller axially outwardly along said roller axis with respect to said outer roller; and

an axially inner pressure disc which supports said inner roller axially inwardly along said roller axis with respect to said outer roller, said inner pressure disc defining an inner bore having a minimal opening width which is smaller than the outer diameter of said spherical arm.

5,591,086

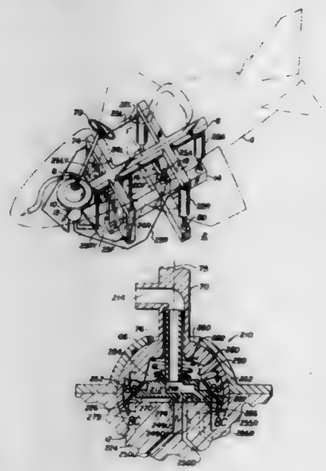
TOY MOTION SIMULATOR AND HYDRAULIC CONTROL VALVE FOR USE THEREIN

Howard B. Kaat, 7351 Cinnamon Woods Dr., West Chester, Ohio 45069

Division of Ser. No. 350,333, Dec. 6, 1994, Pat. No. 5,533,935. This application Dec. 6, 1995, Ser. No. 567,923

Int. Cl.[6] A63G *31/16*

U.S. Cl. 472—130 **10 Claims**



1. A hydraulic control valve comprising:

a pivotable slider block having an inlet and first and second supply ports,

said first and second supply ports are connected in fluid communication with said inlet by first passage and second passages respectively,

said slider block is constructed to proportionally direct hydraulic fluid from said inlet through said first passage and second passages respectively to said first and second supply ports,

said first supply port is alignable with not less than two first receiving ports and said second supply port is alignable with not less than two second receiving ports wherein said receiving ports are disposed in a fixed port block, and

said blocks have interface surfaces that are in smooth sliding and sealing relationship,

a partially spherical rotatable body disposed within a spherical shell and a shaft having a central axis connected to said rotatable body wherein said shaft is disposed though an aperture in said shell,

cams mounted on an inside of said rotatable body and angled with respect to said interface surfaces which are flat, and

cam follower surfaces disposed on said slider block which engage said cams wherein one of said cam surfaces is a conformal cam and pivot surface in the form of semi-circular notch which engages one of said cams with a generally cylindrical shape.

5,591,087

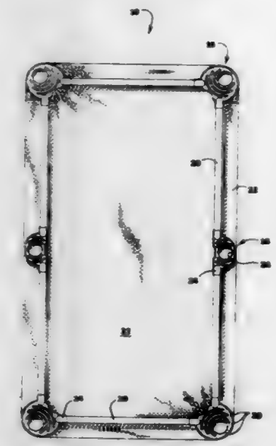
POOL TABLE

Lee G. Salinas, 2210 Fawn Mist La., San Antonio, Tex. 78248

Filed Feb. 7, 1994, Ser. No. 192,834

Int. Cl.[6] A63D *15/00*

U.S. Cl. 473—3 **3 Claims**



1. A pool table apparatus comprising:

a plurality of rails each having first and second rail ends, said rails are substantially linear, elongate plastic members of defining an interior face, and exterior face, an upper face and a lower face, said interior face and said exterior face defining spatially separate, but parallel first and second planes, and said upper face and said lower face defining spatially separate, but parallel third and fourth planes;

a plurality of ball ports, each said ball port comprising a side wall and a top section, each said side structure defining a substantially circular interior wall surface and a ball trap orifice and, on either side of said ball trap orifice, defining first and second rail connection means for respectively, connecting said ball port with a first rail end of one of said rails, and with a second rail, said first and second connection means being sized and shaped for telescopic mating with said first and second rails, said side wall further defining ridges which project into interior space defined by said side structure within said ball ports, said ridges being oriented substantially perpendicular to the long axis of said rails when said apparatus is assembled and with a ground plane defined by a surface upon which said apparatus is assembled;

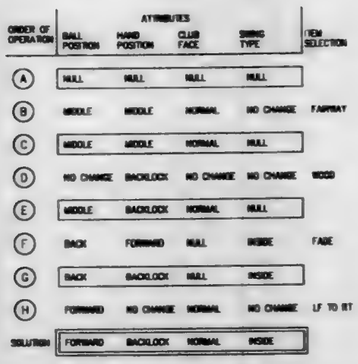
said rails and said ball ports being connected in such a manner to define a playing space perimeter;

a mat member, said mat member being constructed of indoor/outdoor carpet and sized and shaped to occupy a space substantially coextensive with said playing space as defined on a surface jointly by said ball ports and said rails;

a golf club; and

a plurality of playing balls, each said playing ball respectively bearing indicia corresponding to indicia of each ball in a standard set of billiard balls.

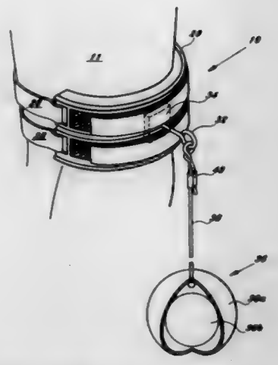
5,591,088
ELECTRONIC GOLFING AID
John L. Bianco, 7232 Laura Lee La., Seven Hills, Ohio 44131, and Michael J. Ference, 9324 Oxford Trail, Brecksville, Ohio 44141
Filed Aug. 29, 1995, Ser. No. 520,830
Int. Cl.[6] A63B *69/36;57/00;* **G06F** *15/00*
U.S. Cl. 473—131 **3 Claims**



1. A method for generating solutions sets in an electronic device, said method comprising:
providing a hierarchy of levels of decision parameters;
providing a corresponding solution overlay for each parameter;
choosing a desired parameter at each level;
successively overlaying each solution overlay corresponding to each desired parameter; and
providing a solution set corresponding to said overlayed solution overlays, said solution set including a series of items and said solution overlays each including a series of items that correspond to the series of items in the solution set, wherein said solution overlays include at least one of: dominant items that will replace previous items; no-change items that will not replace previous items; locked items that are locked from further change; or null items that null previous items.

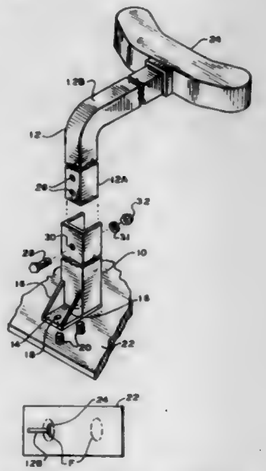
5,591,089
SWING TRAINER
Robert W. Huffines, Port St Lucie, Fla., assignor to Gehr - Huff Technologies, Inc., West Palm Beach, Fla.
Continuation-in-part of Ser. No. 379,268, Jan. 27, 1995, abandoned. This application Oct. 10, 1995, Ser. No. 541,372
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—215 **5 Claims**

1. An apparatus for training a user in proper swing mechanics, for use with respect to the games of golf, baseball, tennis, or similar sports, comprising:
a semi-circular, flexible sheath, said sheath having an outer surface, a concave inner surface, a top end a bottom end, and first and second sides;
means for releasably securing said sheath to a portion of the user's body;
an elongated rigid support member extending normal to said sheath outer surface, said support member terminating in a supporting end defining an aperture therein;
a flexible cord, having an upper end connected to said supporting end, and a lower end; and,



a weight means including a soft outer shell, said shell connected to said cord lower end, whereby said weight means is freely suspended by said flexible cord from said support member such that the user's body movements cause movement of said weight means, which movement provides positive feedback to the user for assisting the user in executing proper swing mechanics.

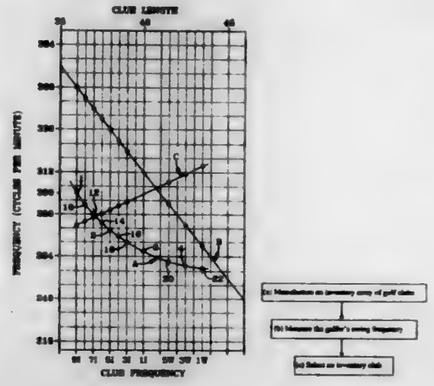
5,591,090
GOLF TRAINING DEVICE
Dean Kauffman, Jr., 40 Haller Dr., Cedar Grove, N.J. 07009
Filed Aug. 7, 1995, Ser. No. 512,101
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—271 **11 Claims**



1. A training device for a golfer, comprising:
a platform for the golfer to stand on; and
an upright having a footing mounted near an edge of said platform, said upright having an upper arm extending laterally a predetermined distance from said upright and a stationary upper rest mounted distally on said upper arm to over-hang said footing and provide (a) foot clearance underneath said upper arm for said predetermined distance inwardly over said platform from said upright, and (b) hip clearance to allow unrestricted hip rotation in either direction, said upper rest being sized and positioned to laterally engage a leg of said golfer, said upright having means for adjusting height for said upper rest from approximately below knee level to mid-thigh

level for said golfer, so that a golfer standing with a leg engaging said rest will tend to avoid swaying during a golf swing.

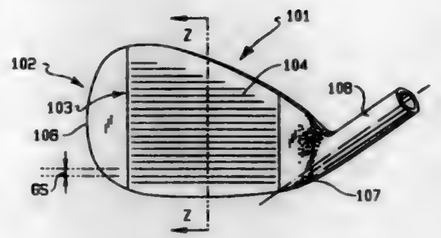
5,591,091
METHOD OF MATCHING A GOLFER TO A GOLF CLUB
Lloyd E. Hackman, 1322 Clubview Blvd. S., Worthington, Ohio 43085
Filed Aug. 3, 1995, Ser. No. 511,090
Int. Cl.[6] A63B *53/12*
U.S. Cl. 473—289 **12 Claims**



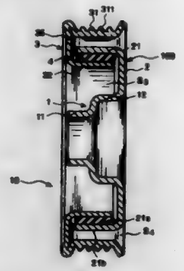
1. A method for matching a golfer to an inventory golf club, the method comprising:
(a) manufacturing an inventory array of golf clubs, each inventory club having attributes of club length and final natural frequency, the inventory of clubs including clubs at discrete intervals of length and at discrete intervals of frequency in a two dimensional array of club length and club frequency attributes; and then
(b) measuring the swing frequency of the golfer's swing with a test club having a club length substantially equal to the length of an inventory club; and then
(c) selecting for the golfer an inventory club having a length substantially equal to the test club length and having a natural frequency closer to the golfer's measured swing frequency than any other club in the inventory array which has length substantially equal to the test club length.

5,591,092
GOLF CLUBS WITH GROOVE CONFIGURATION
Peter J. Gilbert, Vista, Calif., assignor to Acushnet Company, Fairhaven, Mass.
Filed May 9, 1995, Ser. No. 438,422
Int. Cl.[6] A63B *53/04*
U.S. Cl. 473—330 **12 Claims**

1. An iron golf club set comprising a plurality of clubs being comprised of club heads having striking faces with varying lofts and groove spacings, in which the groove spacing of each club is equal to or less than the groove spacing for the next club in the set with less club loft and there are at least two different groove spacings within the set, wherein the set is comprised of long irons, middle irons and short irons and the groove spacing for the long irons is between 0.115 inches and 0.15 inches;
the striking faces also having varying groove depths, in which the groove depth of each club increases or remains the same as with the next club in the set with less loft and there are at least two different groove depths within the set.



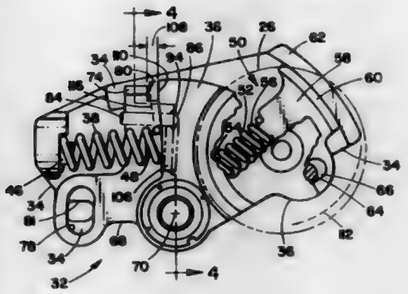
5,591,093
DAMPER PULLEY
Tomohito Asai, Gifu; Toru Isono, Kagamigahara, and Kazutoshi Miyake, Ichinomiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Japan
Filed Feb. 10, 1995, Ser. No. 386,724
Claims priority, application Japan, Mar. 18, 1994, 6-074432
Int. Cl.[6] F16D *3/00*
U.S. Cl. 474—94 **3 Claims**



1. A damper pulley comprising:
a central portion including a cylindrical boss portion having an axis, arranged to be fixed onto a rotary shaft, a main portion extending radially outwardly from said boss portion and a central portion flange extending axially from an outer periphery of said main portion, said central portion defining an annular space having a substantially U-shaped cross-section in profile,
a ring-shaped belt retaining portion made of metal plate having an outer wall, a wall portion radially extending from said outer wall, and a belt retaining flange extending axially from an outer periphery of said wall portion to produce a substantially U-shaped cross-section in profile in reverse to said space of the central portion,
said belt retaining flange being positioned so that an inside surface lies adjoining an inside surface of said central flange, and
a ring-shaped rubber or elastic member being positioned between said inner surface of said belt retaining flange and an inner surface of said central flange.

5,591,094
TENSIONER WITH ADJUSTABLE STOP FOR POWER TRANSMISSION BELT
Ian Farmer, Tecumseh, and Gregory A. St. Denis, Windsor, both of Canada, assignors to The Gates Corporation, Denver, Colo.
Filed Nov. 1, 1995, Ser. No. 551,506
Int. Cl.[6] F16H *7/14*
U.S. Cl. 474—117 **14 Claims**

1. A tensioner for tensioning a synchronous power transmission belt with belt teeth having height and spaced at a pitch for



engaging toothed pulleys, the tensioner of the type with a pivot-arm mounted with a pivot-pin to a support structure, a pulley rotatably mounted to the pivot-arm for engaging the power transmission belt, and a spring between the support structure and the pivot-arm for rotating the pivot-arm and biasing the pulley in pressing engagement against the belt wherein the improvement comprises:

an adjustable stop means spaced a predetermined distance from a rotated pivot-arm position where the pulley is statically biased in pressing engagement against a belt, the stop means for 1) allowing counter rotation of the pivot-arm and 2) stopping the pivot-arm from counter rotation beyond a predetermined angle.

5,591,895

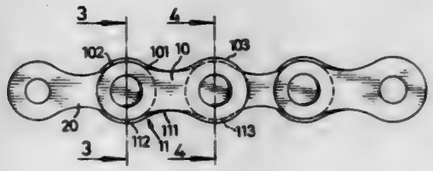
CHAIN FOR A BICYCLE WITH DERAILLEUR

Chia-long Wu, No 734, Chungshan Rd., Kueiren Hsiang, Tainan Hsien, Taiwan

Filed Feb. 6, 1996, Ser. No. 595,972

Int. Cl.[6] F16G *13/02*

U.S. Cl. 474—231 **3 Claims**



1. A bicycle drive chain comprising:

a plurality of pairs of alternate inside links and outside links, rollers and pins, each inside link being substantially dumbbell-shaped and including first and second ends each of which has a regular curvature and both of which are of the same diameter, each pair of outside links including a first outside link and a second outside link, both the first outside link and the second outside link being substantially dumbbell-shaped and having first and second ends each of which has a regular curvature; a roller disposed between each end of each of said pairs of inside links; each end of said pairs of inside and outside links having a pin hole defined therethrough; a pin disposed in each of said pin holes and rotatably connecting corresponding ends of alternating pairs of inside and outside links;

each of the second ends of the first outside links and the first ends of the second outside links have a diameter greater than that of the first ends of the first outside links and the second ends of the second outside links; and

the ends of the first outside link and the second outside link connected by the same pin have different diameters.

5,591,896

EMERGENCY RUNNING DRIVING ARRANGEMENT FOR A CHANGE-SPEED GEARBOX AUTOMATIC SELECTOR APPLIANCE

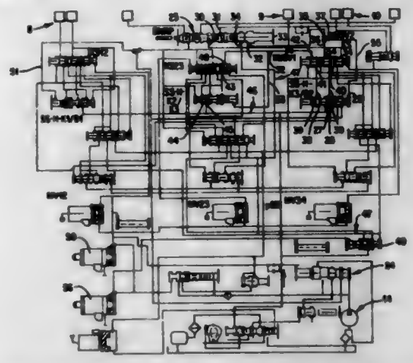
Gerhard Wagner, Remseck; Ludger Korteajann, Fellbach, and Bernd Bertsche, Tuttlingen, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed Sep. 15, 1995, Ser. No. 528,883

Claims priority, application Germany, Sep. 15, 1994, 44 32 851.6

Int. Cl.[6] F16H *3/44*

U.S. Cl. 475—119 **8 Claims**



1. An arrangement for driving an automatic selector appliance of a motor vehicle change-speed gearbox into a position for a forward gear specified for emergency running in the event of failure of an electronic control unit, comprising at least one selector actuator operable to select the forward gear by engagement of at least two frictional selector connections and being pressure medium driven, a pressure pump driven by an engine of a motor vehicle for generating a system pressure, a respective two-positional directional selector valve for subjecting the associated selector actuator to the system pressure, a main-pressure control valve for one of directly and indirectly regulating the system pressure, the selector valves are configured to be switchable over by an associated electromagnetically actuated 3/2-way control valve controllable by the electronic control unit, in association with an associated spring reset, a range selector valve configured to be manually moved into a position D for a selection program, including all forward gears, into a position N for a change-speed gearbox gear condition in which engine torque is not transmitted and into a position P for the engagement of a positive parking brake in a gearbox condition in which torque is not transmitted, at least one of the selector actuators for selecting the forward gear specified for emergency running is subjectable to a system pressure under control of an emergency running control valve having a valve inlet selectively subjectable to system pressure, a valve outlet for directly subjecting the selector actuator to pressure, a control pressure connection and a self-retention function for one of two positions thereof, said emergency running control valve being configured to be switchable over by a control pressure force, derived from the system pressure, in association with a spring reset between an emergency running position, in which the valve inlet and the valve outlet are connectable together and a shut-off position in which the valve inlet and the valve outlet are shut off from one another, the range selector valve having a valve inlet arranged to be put under system pressure and a valve outlet which is operatively connected to at least one of the selector actuators of the forward gear specified for emergency running and, in the D position, is also connected to the valve inlet, whereby, in a condition where electric current and pressure are not provided for the selector valves, respective basic settings of the electromagnetically actuated control valves and of the emergency running control valve and an association thereof with the range selector valve and with the selector actuators of the forward gear specified for emergency running are such that when the motor vehicle is at rest with the engine running, without a supply of current to the control valves and without torque transmission, the emergency running control valve is in an emergency running position in which movement of the range selector valve into the D position, positions the selector appliance for emergency running, in which all the relevant selector actuators are subjected to the system pressure, wherein the valve inlet of the range selector valve is configured to be put under system pressure and is operatively connected to the valve outlet of the emergency running control valve for indirectly subjecting the selector actuator to pressure, the range selector valve has a valve outlet connected to the control pressure connection of the emergency running control valve and valve connections corresponding with the valve outlet, with one of the valve connections being operable as a pressure-relieved null connection and the other of the valve connections arranged to be continuously put under a system pressure, the valve outlet being exclusively connected, in the P position, to a corresponding one of the valve connections, which initiates, on a basis of pressure level thereof, switchover of the emergency running control valve into the emergency running position and being connected to the other corresponding one of the valve connections in other positions of the range selector valve, and the self-retention function of the emergency running control valve is operable for the emergency running position, and the control pressure for the maintenance of the self-retention function is derivable from the pressure level at the valve outlet of the emergency running control valve for indirectly subjecting the selector actuator to pressure.

5,591,897

TRANSMISSION WITH A COUNTERSHAFT AND A PLANETARY REDUCTION GEAR UNIT

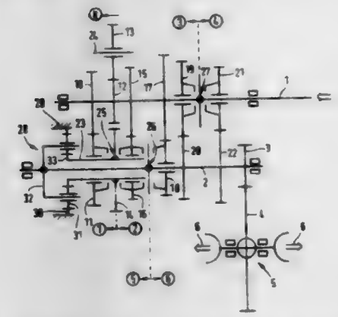
Hans Petri, Much, Germany, and Steven G. Thomas, Bloomfield Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1995, Ser. No. 567,695

Claims priority, application Germany, Nov. 15, 1994, 44 40 710.6

Int. Cl.[6] F16H *37/04*; **B60K** *17/08*

U.S. Cl. 475—207 **6 Claims**



1. A transmission with a planetary reduction gear unit, for automobiles, comprising:

an input shaft;

an output shaft disposed substantially parallel to the input shaft;

an intermediate shaft substantially coaxial with the output shaft;

multiple pairs of pinions and gears, the members of each pair being in continual mutual meshing engagement, a first member of each pair supported on the input shaft, a second member of each pair supported on one of the output driven by a pinion-gear pair and driven by ;

a planetary gear unit including a ring gear fixed against rotation, a sun gear driven by a pinion-gear pair and drivably connected to said intermediate shaft, a pinion carrier driveably connected to the output shaft; and

means for releasably connecting a member of each pinion-gear pair, respectively, to one of the input shaft, output shaft and intermediate shaft, including a first releasable connecting means located on the intermediate shaft releasably connectable to a first pinion-gear pair member carried on the intermediate shaft, and a second releasable connecting means located on the output shaft releasably connectable to said first pinion-gear pair carried on the intermediate shaft.

5,591,898

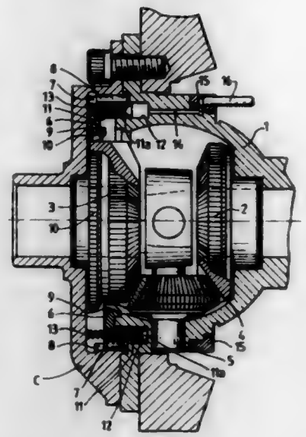
LOCKING DIFFERENTIAL

Peter R. Jones, The Basin, and Norman F. McDonald, Wandin, both of Australia, assignors to ARB Corporation Limited, Croydon, Australia

Filed Feb. 9, 1995, Ser. No. 386,269

Int. Cl.[6] F16H *48/20*

U.S. Cl. 475—231 **21 Claims**



1. A locking differential comprising

a differential carrier housing a pair of bevel ears and at least one pinion gear which meshes with said pair of bevel gears,

a locking means positioned within said differential carrier between said differential carrier and one of said bevel gears and keyed or splined to the carrier,

said locking means including locking teeth or spline means,

said one of said bevel gears being formed with co-operating teeth or spline means,

cylinder means formed in said differential carrier and housing an actuator position to cause movement of said locking means relative to said carrier, whereby said locking teeth or spline means on said locking means engage said teeth or spline means on said one bevel gear to prevent rotation of said one bevel gear relative to said carrier to thereby lock said differential,

said locking means and said cylinder means being positioned adjacent said one of said bevel gears, and

a shaped cover plate forming part of said differential carrier and structured and arranged to support said one of said bevel gears,

said cover plate comprising a cavity formed therein and in which said locking means is located,

wherein said locking means is positioned on only one side of said pinion gear,

said actuator and cylinder means are positioned on only one side of said pinion gear, and

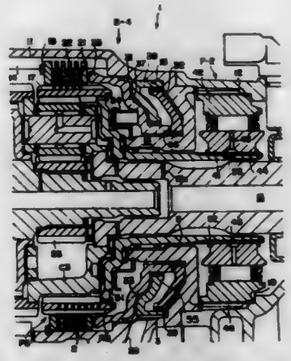
said locking means, actuator and cylinder means are all positioned on the same side of said pinion gear.

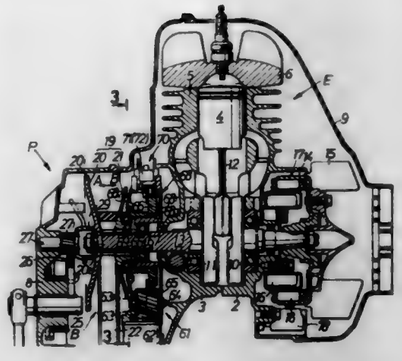
5,591,099

SHIFT MECHANISM FOR AUTOMATIC TRANSMISSION WITH LUBRICATING MEANS FOR ONE-WAY CLUTCH

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi, Anjo; Masanori Kadotani, Nishio, and Satoru Kasuya, Hekinan, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed May 16, 1995, Ser. No. 442,419
Claims priority, application Japan, May 16, 1994, 6-124697
Int. Cl.[6] F16H *3/62*
U.S. Cl. 475—318 **9 Claims**





1. A shift mechanism for an automatic transmission, comprising:
a casing;
a planetary gear unit comprising a plurality of cooperative elements inclusive of a ring gear;
frictional engagement means, housed within said casing for selectively locking one of said elements of said planetary gear unit to said casing;
a hydraulic servo unit for selectively engaging said frictional engagement means, said hydraulic servo unit having an annular configuration defining an inner circumferential side; and
a one-way clutch including an inner race, connected to said one element of said planetary gear unit through a sleeve shaft portion of a connection member axially extending along the inner circumferential side of said hydraulic servo unit, and an outer race mounted to said casing whereby said connection member and said inner race rotate with said one element,
said one-way clutch being located axially spaced from said frictional engagement element with said hydraulic servo unit mounted therebetween,
said inner race defining an inner surface splined to said sleeve shaft portion and having a circumferential oil groove around said inner surface and a radially extending lubricating oil passage therethrough, said lubricating oil passage opening at one end into said oil groove, said oil groove being in fluid communication with a source of lubricating oil through a radially extending oil port in said sleeve shaft portion.

5,591,100

CONTINUOUSLY VARIABLE TRANSMISSION VEHICLE

Akira Hayashi; Kunihiko Tanaka, and Gorooi Wakatsuki, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 64,157, Jul. 22, 1993. This application Mar. 15, 1996, Ser. No. 616,766
Claims priority, application Japan, Nov. 20, 1990, 2-315018
Int. Cl.[6] F16H *9/18;61/00*
U.S. Cl. 477—44 **14 Claims**

10. An improvement in a continuously variable transmission and power unit casing for a two-wheeled vehicle, the power unit casing enclosing and supporting both a travelling drive source and the transmission, and the power unit casing adapted to be pivotally mounted on a body frame of the vehicle, wherein the transmission includes:
a driving pulley comprised of a stationary pulley half and a movable pulley half with both the drive pulley halves being mounted on an input shaft driven by the travelling drive source, a driven pulley comprised of a stationary pulley half and a movable pulley half with both the driven pulley halves being mounted on an output shaft, and an endless belt wound around the driving pulley and the driven pulley the improvement comprising;
a gear shift ratio changing means for varying a gear shift ratio of the transmission by changing a width of a groove formed between the pulley halves of each of said pulleys, said gear shift changing means including a power source means for providing a driving force for causing said changing of the widths of the grooves, and said gear shift ratio changing means being contained within said casing with said power source means having a motor disposed in said casing in a space defined between said input shaft and said output shaft and adjacent said endless belt with said motor being intersected by a plane parallel to and passing through both said input shaft and said output shaft.

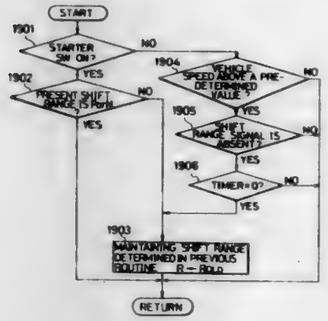
5,591,101

FAILURE DETECTING SYSTEM AND METHOD FOR AUTOMATIC TRANSMISSION

Ryuzo Sakakiyama, Tokyo; Kiminaga Shirakawa, Kitatsuru, and Kazunari Tezuka, Niiza, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 491,592, Jun. 16, 1995, which is a division of Ser. No. 282,310, Jul. 29, 1994, Pat. No. 5,486,147. This application Jan. 18, 1996, Ser. No. 588,412
Claims priority, application Japan, Jul. 29, 1993, 5-188196; Jul. 29, 1993, 5-188197; Aug. 30, 1993, 5-214284; Dec. 27, 1993, 5-332180
Int. Cl.[6] F16H *61/12;* B60K *41/04*
U.S. Cl. 477—99 **2 Claims**

1. A failure detecting system for an automatic transmission of a vehicle employing a speed shift range switch operation signal from a speed shift range switch as one of control signals to control said automatic transmission, the system comprising:
range detecting means for detecting a speed shift range from said speed shift range switch;
start signal generating means for generating a start signal indicating a starting state of a starter for expediting a start of an engine for said vehicle; and
automatic transmission control means for automatically controlling said automatic transmission so as to maintain said speed shift range in case where "P" or "N" range is not detected by said range detecting means when a start signal from said start signal generating means is "ON".

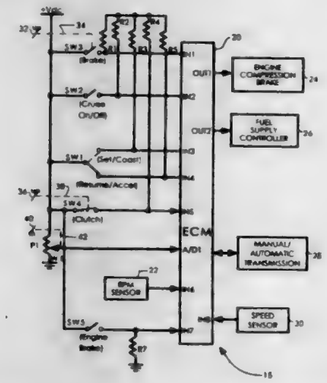


5,591,102

APPARATUS AND METHOD FOR CONTROLLING A MANUAL-AUTOMATIC TRANSMISSION AFTER A POWER RESET

Gregory R. White, Columbus; Bryan S. Gatewood, Westport; Mark L. Wilson, Columbus, all of Ind.; Peter L. Griffen, Richmond, United Kingdom; Richard E. Kleine, and Larry R. Webber, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 7, 1995, Ser. No. 473,721
Int. Cl.[6] B60K *41/04*
U.S. Cl. 477—107 **32 Claims**



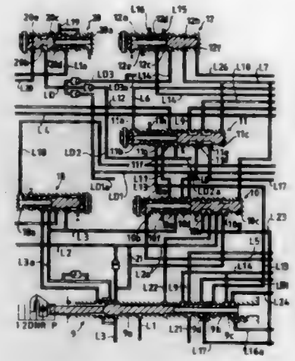
1. A method of electronically controlling a manual/automatic transmission after an electrical power reset in a vehicle having an engine engageable to the transmission and means for sensing vehicle speed, the transmission including both manually and electronically selectable gears and an electronically selectable neutral position, the method comprising the steps of:
(1) maintaining engagement of the gear commanded prior to the power reset for a first predetermined time period;
(2) performing steps (3)–(7) after said first predetermined time period elapses;
(3) sensing vehicle speed;
(4) commanding neutral position if said vehicle speed is less than a first predetermined vehicle speed;
(5) commanding the highest of the electronically selectable gears if said vehicle speed is above a second predetermined vehicle speed and the engine is not engaged to either of the two highest electronically selectable gears;
(6) sensing vehicle speed; and
(7) performing steps (5)–(6) until a second predetermined time period elapses.

5,591,103

HYDRAULIC CONTROL CIRCUIT FOR HYDRAULICALLY OPERATED VEHICULAR TRANSMISSION

Tatsuyuki Ohashi, and Tetsuya Mochizuki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,382
Claims priority, application Japan, Aug. 20, 1993, 5-206389
Int. Cl.[6] F16H *59/04;59/08*
U.S. Cl. 477—131 **4 Claims**



1. A hydraulic control circuit for a hydraulically operated vehicular transmission having at least five forward transmission trains, said hydraulic control circuit comprising:
three sets of first through third shift valves; and
first through fifth hydraulic engaging elements;
wherein said first shift valve controls a condition of communication between an oil supply passage which is in communication with a hydraulic oil pressure source and a first oil passage and a second oil passage which are both on a downstream side of said oil supply passage,
wherein said second shift valve controls a condition of communication between said first oil passage and a third oil passage which is on a downstream side of said first oil passage and also controls a condition of communication between said second oil passage and a fourth oil passage and a fifth oil passage which are both on a downstream side of said second oil passage, and
wherein said third shift valve controls a condition of communication between said fifth oil passage and a sixth oil passage and a seventh oil passage which are both on a downstream side of said fifth oil passage; and
wherein said first hydraulic engaging element is provided with a one-way transmission mechanism for allowing overrunning of an output side, said first hydraulic engaging element being connected to said hydraulic oil pressure source without passing through said first through third shift valves, said second hydraulic engaging element being connected to said third oil passage, said third hydraulic engaging element being connected to said fourth oil passage, said fourth hydraulic engaging element being connected to said sixth oil passage and said fifth hydraulic engaging element being connected to said seventh oil passage, respectively.

5,591,104

PHYSICAL EXERCISE VIDEO SYSTEM

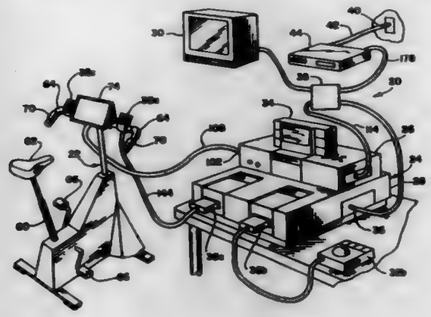
Bryan D. Andrus, Riverwoods, Ill.; Martin Sikes, Vancouver, Canada; Christopher D. G. Robertson, Vancouver, Canada; Roderick Armes, Vancouver, Canada; Mark J. Slemko, Vancouver, Canada; Andrew G. Maduza, Aurora, and Augustine Nieto, Winnetka, both of Ill., assignors to Life Fitness, Franklin Park, Ill.

PCT No. PCT/US93/00724, § 371 Date Apr. 26, 1993, § 102(e) Date Apr. 26, 1993, PCT Pub. No. WO94/16774, PCT Pub. Date May 4, 1994

PCT Filed Jan. 27, 1993, Ser. No. 75,589

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—7 **1 Claim**



1. A physical exercise video system, comprising:

a physical exercise machine including at least one sensor for generating an exercise signal indicating an exercise condition;

a video system including a control unit having a video output, video monitor means for displaying said video output, and at least one user-controlled game interface peripheral operatively associated with said control unit;

communications means for transmitting said exercise signal from said exercise machine to said control unit;

said control unit being adapted for selective operation in at least an exercise mode and a stand-alone mode, wherein:

in said exercise mode, said control unit generates said video output in response to said exercise signal and said game control peripheral; and

in said stand-alone mode, said control unit generates said video output in response to said game control peripheral.

5,591,105

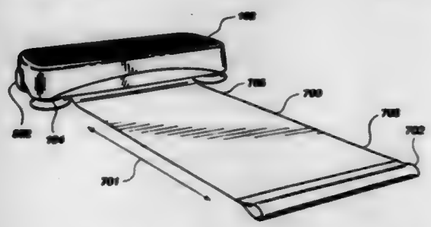
EXERCISE STEP BENCH WITH ADJUSTABLE LEGS

William T. Dalebout; Scott R. Watterson, both of Logan, Utah, and Paul Furner, Racine, Wis., assignors to ICON Health & Fitness, Inc., Logan, Utah

Filed Dec. 21, 1994, Ser. No. 360,565

Int. Cl.[6] A63B *5/00*

U.S. Cl. 482—52 **23 Claims**



1. A step bench for performing stair-step exercises, said step bench comprising:

a platform having a top surface for stepping on by a user and an underside surface;

a plurality of support members attached to said lower surface sufficient to stably support said step bench on a support surface, each of said plurality of support members having a pair of members moveable relative to each other axially and rotationally, said pair of members having means associated therewith to adjust their relative axial relationship and in turn the overall length of the respective support member;

a roller having first and second ends both disposed below and secured to said platform; and

a mat having a fixed end attached to said roller, said mat being rotatably wrappable about said roller and said mat having a free end which may be gripped and pulled by a user to unroll the mat from said roller a preselected distance on a support surface.

5,591,106

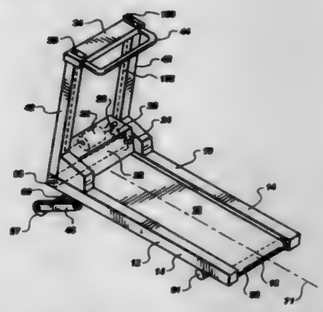
ADJUSTABLE INCLINE SYSTEM FOR EXERCISE EQUIPMENT

William T. Dalebout; S. Ty Measom, and Scott R. Watterson, all of Logan, Utah, assignors to ICON Health & Fitness, Inc., Logan, Utah

Continuation of Ser. No. 27,351, Mar. 8, 1993, Pat. No. 5,372,559, which is a continuation of Ser. No. 806,977, Dec. 12, 1991, Pat. No. 5,192,255, which is a continuation of Ser. No. 494,590, Mar. 16, 1990, abandoned, which is a continuation of Ser. No. 256,486, Oct. 12, 1988, Pat. No. 4,913,396. This application Dec. 12, 1994, Ser. No. 353,930

Int. Cl.[6] A63B *23/06*

U.S. Cl. 482—54 **4 Claims**



1. An adjustable incline system in combination with a treadmill, said adjustable incline system being adapted to lift and support said treadmill above an underlying floor selectively in different angular orientations relative to said underlying floor responsive to a user standing upright on said treadmill, said combination comprising:

a support means pivotally mounted to said treadmill for engaging an underlying floor and for lifting and supporting said treadmill above said underlying floor, said support means being movable along said underlying floor for varying an inclination of said treadmill relative to said underlying floor;

an adjustable pneumatic spring means mechanically associated with said support means and said treadmill for applying force against said support means, for urging said support means outwardly away from said treadmill and along said underlying floor, said adjustable pneumatic spring means including an actuation pin adapted for controlling said force exerted by said adjustable pneumatic spring means; and

control means mechanically associated with said adjustable pneumatic spring means for operating said actuation pin, said control means including a control member, linkage means and an actuating lever member, said actuating lever member being actuated by said control member and said linkage means to mechanically engage said actuation pin, said actuating lever member being displaceable to effect a corresponding displacement of said actuation pin, said control member be accessible by a user standing upright on said treadmill;

wherein said inclination of said treadmill is altered as said actuation pin is displaced and said user moves on said treadmill toward or away from said support means, said treadmill being releasably secured in a selected inclination by said user on said treadmill upon said user returning said actuation pin to its undisplaced condition by intermediation of said control member.

5,591,107

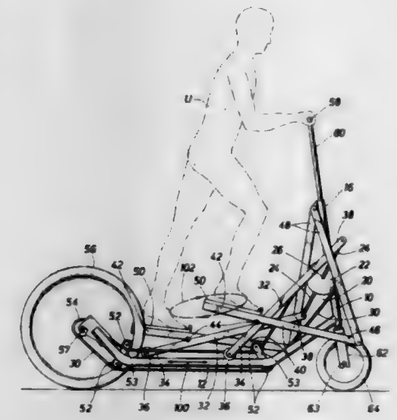
MOBILE EXERCISE APPARATUS

Robert E. Rodgers, Jr., 8011 Meadowcroft, Houston, Tex. 77063

Continuation-in-part of Ser. No. 522,178, Aug. 31, 1995, Pat. No. 5,527,246, which is a continuation-in-part of Ser. No. 426,467, Apr. 19, 1995, Pat. No. 5,549,529, which is a continuation-in-part of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,480. This application Feb. 23, 1996, Ser. No. 604,764

Int. Cl.[6] A63B *69/16*

U.S. Cl. 482—57 **17 Claims**



1. A mobile exercising apparatus comprising:

a frame having a top portion and a base portion and at least two wheels;

first and second reciprocating members, each reciprocating member having a first end and a second end, a portion of each said reciprocating member adapted for substantially linear movement along said base portion of said frame;

a coupling assembly supported within said frame and pivotally connected to said second end of each reciprocating member;

means for orienting the bottom of the foot of the user so that each foot follows a substantially elliptical path during operation, said orienting means includes a platform for each foot inclined at an acute angle relative to an axis extending from the first end of a corresponding reciprocating member to the second end of the same corresponding reciprocating member; and

means for rotatably engaging said coupling assembly with at least one of said wheels,

wherein reciprocating movement of said reciprocating members revolves each foot of the user in a substantially elliptical path and enables said rotating means to initiate rotation of at least one of said wheels.

5,591,108

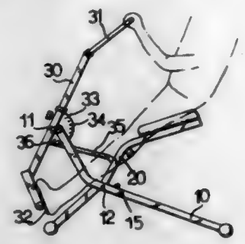
ADJUSTABLE HORSE-RIDING TYPE EXERCISER

Paul Chen, 5th Floor, No. 31, Gan Tzou 2nd St., Shi Tun Chu, Taichung, Taiwan

Continuation-in-part of Ser. No. 442,346, May 16, 1995, Pat. No. 5,507,710. This application Feb. 23, 1996, Ser. No. 605,866

Int. Cl.[6] A63B *69/06*

U.S. Cl. 482—95 **1 Claim**



1. A horse riding type exerciser comprising:

a base including a front portion having a pivot shaft provided therein, including a middle portion having a pivot pin provided therein,

a seat post including a lower portion pivotally coupled to said base at said pivot pin, including an upper portion having a seat cushion provided thereon, and including a middle portion,

a handle including a middle portion pivotally coupled to said base at said pivot shaft, including a hand grip device provided on top thereof and including a foot pedal device provided on a bottom thereof, said handle including at least one first pivot axle arranged above said pivot shaft and including at least one second pivot axle arranged below said pivot shaft,

a link including a first end pivotally coupled to said middle portion of said seat post and including a second end pivotally coupled to at least of said first and second pivot axles, and

a stop means for supporting said seat post and said seat cushion at a rest position and for allowing said seat post and said seat cushion to be rotated toward said handle,

wherein, said seat cushion is elevated when said second end of said link is coupled to said second pivot axle and when said hand grip is pulled toward said seat cushion; and said seat cushion is elevated when said second end of said link is coupled to said first pivot axle and when said hand grip is pushed away from said seat cushion.

5,591,109

QUICK-RELEASE RETAINING COLLAR ASSEMBLY FOR A BARBELL

George Strand, 131 Lawton Rd., Riverside, Ill. 60546

Continuation-in-part of Ser. No. 146,402, Nov. 1, 1993, abandoned, which is a continuation of Ser. No. 14,869, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 896,506, Jun. 2, 1992, abandoned, which is a continuation of Ser. No. 693,928, Apr. 29, 1991, abandoned. This application Jul. 14, 1994, Ser. No. 275,322

Int. Cl.[6] A63B *21/075*

U.S. Cl. 482—107 **7 Claims**

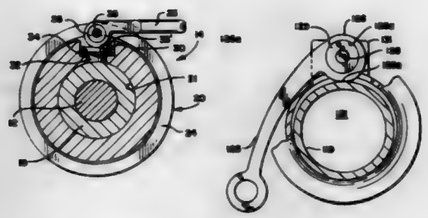
1. A quick-release retaining collar assembly for a barbell comprising:

a generally annular collar, the collar defining a bore adapted to receive an associated bar;

said collar further defining an opening that communicates with the bore;

a pivot member connected to said collar;

a locking assembly including a cam member movably connected to said pivot member, said cam member being movable on said pivot member generally in a plane transverse to the axis



of said bore between an unlocked position and a locked position, and being effective in the locked position to lock the locking assembly to retain the collar on the bar and resist movement relative to the bar; and

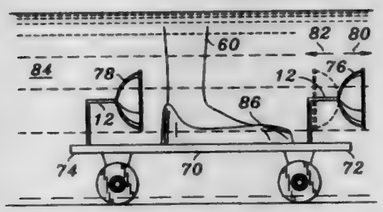
a sleeve made of resilient material on said pivot member interposed between said pivot member and said cam member said resilient sleeve being compressed as said cam member is moved into the locked position.

5,591,110

MULTI-PURPOSE FLEXIBLE REVERSIBLE RESISTANCE ELEMENT FOR EXERCISE DEVICES

Sanford S. Weissbuch, 2276 S. Beverly Glen Blvd., Los Angeles, Calif. 90064

Filed Mar. 2, 1995, Ser. No. 397,379
Int. Cl.[6] A63B *21/008*
U.S. Cl. 482—111 **25 Claims**



1. A device comprising:

a) a support;

b) a flexible substantially cup-shaped element operatively connected to the support; and

c) the element including a base, a rim and a first axis extending from the center of the base to the center of an area enclosed by the rim and being configured to be reversible about an axis perpendicular to said first axis without being removed from the support, and to be operable for a first function in a first position with the base being affixed to the support and the rim extending from the support and located in a position removed from the support and operable for a second function in a reversed second position with the base affixed to the support and the rim located spaced from the support and surrounding the support.

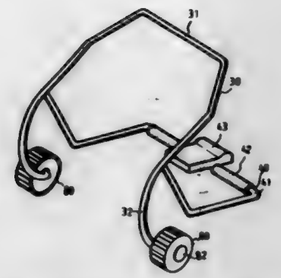
5,591,111

SIT-UP EXERCISE APPARATUS

Leao Wang, and Peter Wu, both of Taichung Hsien, Taiwan, assignors to Greenmaster Industrial Corp., Taichung Hsien, Taiwan

Filed Apr. 3, 1996, Ser. No. 626,931
Int. Cl.[6] A63B *23/02*
U.S. Cl. 482—140 **2 Claims**

1. A sit-up exercise apparatus, comprising:



a handle bar of a substantially inverted U-shaped structure, said handle bar having a middle straight section for gripping purposes and two side arms with curved lower sections, each end of said handle bar being fitted with a stop piece and a horizontally oriented hollow shaft, said shaft having a shaft hole and a transversely oriented slot of a predetermined length;

a support bar of a substantially U-shaped structure, said support bar having a middle straight section and two slightly bent side sections which are fixedly secured to said side arms of said handle bar at predetermined positions, a head rest being provided at said straight section thereof;

two rollers respectively fitted onto said shafts at both ends of said handle bar, each of said rollers having a side wall with a central shaft hole and multiple positioning holes and an annular wall extending from said side wall, a sector-like slot being formed from a notch of said annular wall to said central shaft hole, said sector-like slot communicating with said central shaft hole;

two springs fitted onto said shafts and accommodated within said annular walls of said rollers respectively, each of said springs having a first end engaging one of said positioning holes of said roller and a second end engaging said slot of said shaft;

two bolts, each of which is inserted downwardly from said sector-like slot of said roller into said shaft hole of said shaft such that said roller is restricted by said bolt to be located between said bolt and said stop piece; and

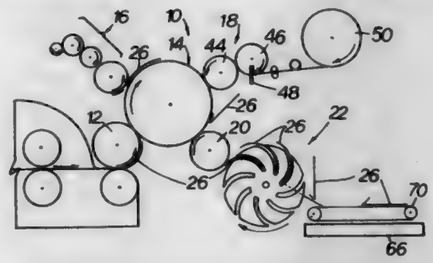
two covers tightly fitted onto said rollers respectively.

5,591,112

SEALING ASSEMBLY ATTACHMENT AND METHOD

H. Richard VerMehren, 3865 N. Palafox St., Pensacola, Fla. 32505

Continuation of Ser. No. 999,594, Dec. 31, 1992, abandoned, which is a division of Ser. No. 823,707, Jan. 21, 1992, Pat. No. 5,176,611. This application May 18, 1994, Ser. No. 245,467
Int. Cl.[6] B31B *21/26;21/90*
U.S. Cl. 493—213 **29 Claims**



1. A sealing apparatus, for use in preparing envelopes which will apply a gum to a top flap, place a piece of release paper over the gummed flap, fold and crease the top flap and deliver the envelope to be stacked and counted, comprising:

a means to feed envelopes into the sealing apparatus;

a vacuum cylinder within the sealing apparatus to transfer envelopes from the envelope feed means and through the sealing apparatus;

a gum pattern application means to apply gum to a top flap of the envelopes while being transferred by the vacuum cylinder;

a release paper application means after the gum pattern application means to place release paper over the gum applied to the top flap;

a flap fold cylinder to fold and crease the top flap; and

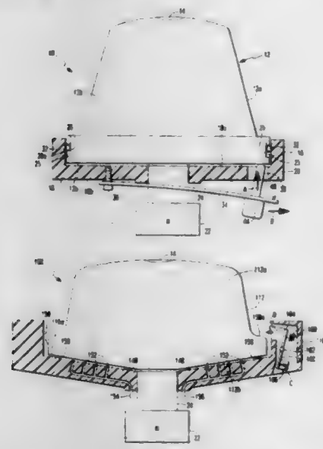
a delivery means to transfer the envelope from the sealing apparatus.

5,591,113

CENTRIFUGALLY ASSISTED CENTRIFUGE BOWL MOUNT

Lawrence Darnell, Cypress, Tex., and James Salter, Morietta, Ga., assignors to COBE Laboratories, Inc., Colo.

Filed Oct. 31, 1994, Ser. No. 332,820
Int. Cl.[6] B04B *15/00*
U.S. Cl. 494—12 **10 Claims**



1. A centrifuge comprising:

a centrifuge bowl having a chamber to contain material and at least one passage provided on the centrifuge bowl to allow for ingress and egress of the material to and from the centrifuge bowl;

a turntable having a surface for receiving the centrifuge bowl;

a motor coupled with the turntable for rotating the turntable; and

means provided on the turntable for securing the centrifuge bowl to the turntable in response to rotation of the turntable, the securing means comprising a resilient arm having a first end and second end, the resilient arm being mounted to the turntable adjacent the first end and being connected to a ballast adjacent the second end.

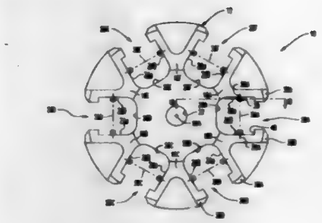
5,591,114

SWINGING BUCKET CENTRIFUGE ROTOR

William A. Romanauskas, Southbury, Conn., assignor to Sorvall Products, L.P., Newtown, Conn.

Filed Dec. 15, 1995, Ser. No. 573,078
Int. Cl.[6] B04B *5/02*
U.S. Cl. 494—20 **4 Claims**

1. A swinging bucket centrifuge rotor for use in a centrifuge instrument, the rotor comprising:



a body adapted for rotation about an axis of rotation extending vertically through the body, the body having a reference plane extending therethrough, the reference plane extending generally perpendicular to the axis of rotation,

the body having at least one pair of confronting planar sidewalls, the planar sidewalls being circumferentially spaced apart to define a generally axially extending slot sized to receive a swinging bucket therein,

each planar sidewall having a trunnion pin mounted thereon, each trunnion pin having an axis therethrough, the axis of each trunnion pin extending generally perpendicular to the planar sidewall on which it is mounted, the trunnion pins each being disposed a first predetermined radial distance from the axis of rotation,

each sidewall further having a generally cylindrical swinging bucket support surface thereon, the cylindrical support surface being disposed on each sidewall a second, greater, radial distance from the vertical axis than said first radial distance, each cylindrical support surface having an axis of generation that lies in the reference plane,

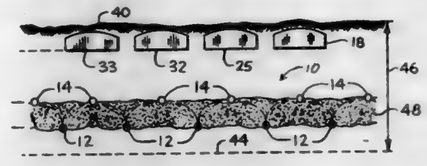
whereby a portion of each cylindrical swinging bucket support surface lies above and below the reference plane.

5,591,115

BARRIER FOR BLOCKING MOVEMENT OF CONTAMINANTS WITHIN AN AGGREGATE PARTICULATE SUBSTRATE

Pietro Raimondi, Verona; Willard P. Acheson, Oakmont, both of Pa., and William K. Overbey, Jr., Morgantown, W. Va., assignors to K & M Engineering & Consulting Corp., Washington, D.C., and BDM Federal, Inc., Morgantown, W. Va.

Filed Jan. 12, 1994, Ser. No. 180,916
Int. Cl.[6] A62D *3/00*
U.S. Cl. 588—249 **20 Claims**



1. A system for preventing the liquid transport of contaminants dissolved in the liquid through an aggregate particulate substrate in the vadose zone, comprising:

a drying system for removing about at least 75% of the saturation moisture from the aggregate particulate substrate in a generally horizontal drying zone below the contaminants whose liquid transport is to be barred by transporting a drying carrier through the drying zone; and

a generally horizontal barrier region of aggregate particulate formed and maintained by said drying system within the drying zone in the aggregate particulate substrate located below the contaminants, which is about less than 25% of saturation moisture so that said barrier region is impermeable to downward liquid transport of the dissolved contaminants therethrough, even if said drying system is temporally inoperative.

5,591,116

METHOD FOR TREATMENT OF SOLID WASTE TO MINIMIZE PERMEABILITY OF THE WASTE

Sherry A. Pierce, Dallas, Tex., assignor to Entact Corporation, Irving, Tex.

Filed Jun. 9, 1995, Ser. No. 488,946
Int. Cl.[6] A62D *3/00*; B09B *3/00*
U.S. Cl. 588—256 **24 Claims**

1. A method for producing a non-hazardous solid waste mixture having a low permeability coefficient comprising mixing a solid hazardous waste with sufficient quantities of monocalcium phosphate, so that under both acidic and non-acidic conditions the mixture will be substantially less permeable than the solid hazardous waste.

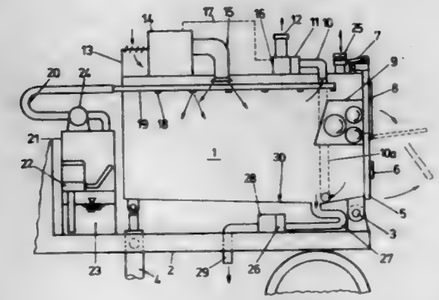
19. A non-hazardous solid waste mixture having a low permeability coefficient which may be safely disposed in a landfill comprising a solid hazardous waste mixed with a first agent, monocalcium phosphate, and a second agent, Portland Cement, in quantities sufficient so that under both acidic and non-acidic conditions the mixture will be substantially less permeable than the solid hazardous waste.

5,591,117

METHOD AND AN APPARATUS FOR THE DISPOSAL OF MATERIAL CONTAINING INFECTIVE MICROORGANISMS

Heinz Zeiss, Bgm.-Aurnhammer-Str. 13, 86199 Augsburg, Germany

Filed May 16, 1994, Ser. No. 243,453
Int. Cl.[6] A62D *3/00*
U.S. Cl. 588—258 **8 Claims**



1. A method for the disposal of material containing infective microorganisms, for example, bacteria, fungi and viruses, as well as for the disposal of waste from medical facilities, said method comprising the steps of:

introducing a substrate into a container capable of being charged with ozone;

comminuting the substrate upon introducing the substrate into said container;

charging said container with ozone;

exposing the substrate in said container, while moving the substrate relative to said container, to the action of the ozone, if necessary, via an uninterupted stream of ozone, until the infective microorganisms are killed;

discharging the ozone from said container;

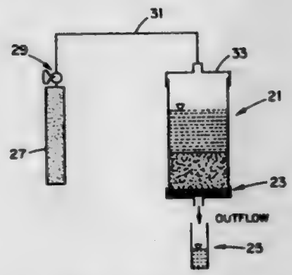
converting the ozone to a lower valence level; and, evacuating said container.

5,591,118

LOW PERMEABILITY WASTE CONTAINMENT CONSTRUCTION AND COMPOSITION CONTAINING GRANULAR ACTIVATED CARBON AND METHOD OF MAKING

Barnes R. Bierck, P.O.Box 18134, Washington, D.C. 20036

Filed Nov. 12, 1993, Ser. No. 151,241
Int. Cl.[6] A62D *3/00*
U.S. Cl. 588—259 **9 Claims**



1. In a low permeability containment structure composition for containment of waste material including inorganic and organic contaminants wherein the low permeability containment structure composition includes at least a clay component, the improvement comprising said composition further comprising about 2% by weight of a granular activated carbon based on a weight of said structure as an additive to said composition for retarding migration of said organic and inorganic contaminants through said containment structure, wherein said additive-containing composition has a permeability that approximates a permeability of said composition including at least said clay component without said additive; and

said additive-containing composition approximates the bulk density and slumping of said composition including at least said clay component without said additive.

5,591,119

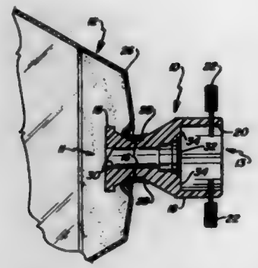
STERILE SURGICAL COUPLER AND DRAPE

Edwin L. Adair, 317 Paragon Way, Castle Pines Village, Colo. 80104

Filed Dec. 7, 1994, Ser. No. 350,682
Int. Cl.[6] A61B *1/04*
U.S. Cl. 600—112 **14 Claims**

1. An apparatus for optically coupling a sterile endoscope to an unsterile optical connector and enclosing an unsterile connector mounted to an unsterile camera having trailing cables in a sterile enclosure for use of an unsterile camera in a sterile surgical environment, said apparatus comprising:

a sterile coupler having a first end including a flared annular mounting for connection to an unsterile optical connector and having a second end including a mounting means for connection to a sterile endoscope, said coupler further having an optical path through which an image may be transmitted from an endoscope to a camera;



an optically clear window mounted transversely in said optical path;

a sterile drape having a open distal end positionable over said first end of said coupler and having a proximal end extendable over an unsterile optical connector, a camera and its trailing cables; and

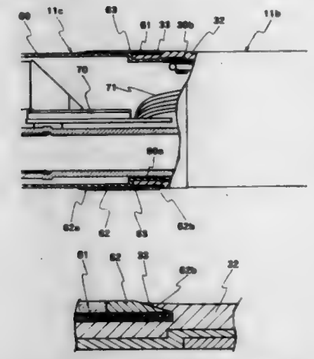
means for sealing said distal end of said drape to said coupler whereby said first end of said coupler is isolated from the sterile surgical environment outside said drape.

5,591,120

JOINT CONSTRUCTION FOR ANGLE SECTION OF ENDOSCOPIC INSERTION ROD

Mitunori Machida, and Mituo Kondo, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Nov. 21, 1995, Ser. No. 564,555
Claims priority, application Japan, Nov. 25, 1994, 6-314293
Int. Cl.[6] A61B *1/00*
U.S. Cl. 600—140 **5 Claims**



1. A joint construction for connecting a flexibly bendable angle section of an endoscopic insertion rod to an anteriorly or posteriorly adjoining section of said endoscopic insertion rod, including a line-wrapping layer tightly fastening an end of a resilient outer skin layer of an angle section against an underlying rigid structure at a joint with an adjoining section of an insertion rod, and a rigid cover ring fixedly fitted on said line-wrapping layer for protection thereof, characterized in that said joint construction comprises:

front and rear external bevel surfaces formed at front and rear ends of said rigid cover ring, respectively, by externally tapering front and rear end portions of said rigid cover ring; and

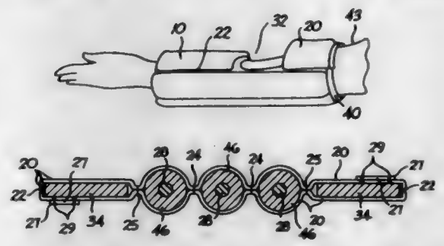
a forwardly tapered annular fin formed in and out of a resilient outer skin layer under said rigid cover ring at a position bordering on outer edges of said rear external bevel surface of said rigid cover ring and having an internal bevel surface complementarily to said rear external bevel surface on said rigid cover ring, said internal bevel surface of said annular fin being securely bonded on said rear external bevel surface of said rigid cover ring, embedding said rear external bevel surface under said resilient outer skin layer.

5,591,121

LIMB SPLINT AND RESTRAINT

Mary A. Cantrell, 3282 Kepley Rd., Georgetown, Ind. 47122

Filed Feb. 9, 1995, Ser. No. 386,003
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—5 **6 Claims**



1. A splint device adapted to be rolled into a tubular shape having a longitudinal central axis about the limb of a user, said device comprising:

a covering having a pair of opposite ends and a first fastener mechanism for releasably securing said opposite ends together to form said tubular shape about a user's limb, said covering having a plurality of spaced pockets running substantially parallel to said longitudinal central axis of said tubular shape, each of said spaced pockets having an opening along one side of said device for receiving a reinforcing member;

said reinforcing members positioned within said pockets having a shape that together with said covering define a plurality of parallel cylinders having tangential lines of contact with a user's skin, said parallel cylinders forming a plurality of channels lying between said tangential lines of contact and running along an inside surface of said tubular shape and substantially parallel to said longitudinal axis thereby permitting flow of air between the device and the user's limb along said channels when said device is wrapped around the user's limb; and

a second fastener mechanism forming a seam along said one side of said covering between said two ends and releasably closing said openings to permit removal of said reinforcing members.

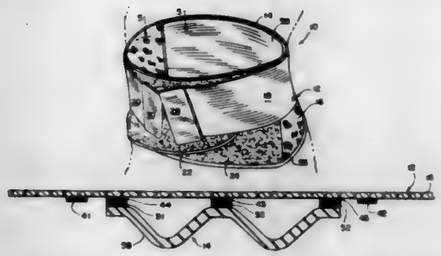
5,591,122

CONVERTIBLE SUPPORT BELT

Edward H. Yewer, Jr., 6259 N. Highway 83, Hartland, Wis. 53029

Filed Jul. 11, 1994, Ser. No. 273,524
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—19 **4 Claims**

1. In an abdominal support belt of the type which is worn around the waist of a human user and secured to increase the intra-abdominal pressure of said user, said belt having an interior side facing said user and an exterior side facing away from said user, the improvement wherein said belt includes a foundation and an insulator insert, said foundation being made of an open-weave, light weight breathable woven fabric material which is elastic in the circumferential direction around said user's waist and said insert is releasably secured against an interior surface of said foundation, said insert being removable from said interior surface of said foundation, said interior surface of said foundation including five spaced-apart vertically oriented strips of hook and loop type fastener material including a first strip adjacent to one vertical



edge of said insert, a second strip adjacent to the opposite vertical edge of said insert, a third strip disposed approximately halfway between said first and second strips and fourth and fifth vertically oriented strips, said fourth and fifth strips being spaced apart from each other and both said strips being inside of the first and second strips on the foundation, and an exterior surface of said insert including three spaced-apart vertically oriented strips of mating hook and loop type fastener material for removably securing said insert to said foundation including a first strip adjacent to one vertical edge of said insert, a second strip adjacent to the opposite vertical edge of said insert and a third strip disposed approximately halfway between said first and second strips for releasably engaging the corresponding first, second and third strips on said foundation, wherein said three strips on said insert may be placed in registration with said first, second and third strips on said foundation when said foundation and said insert are laid flat and in a relaxed state, wherein the first and second strips on the insert can be releasably attached to said fourth and fifth strips, respectively, and wherein said insert forms folds between said first and third and between said second and third strips when said first, second and third strips of said insert are secured to said fourth, fifth and third strips of said foundation, respectively, when said foundation is laid flat in a relaxed state.

5,591,123

PROGRAMMABLE CONTROL MOUNTING SYSTEM FOR TRANSDERMAL DRUG APPLICATOR

Dan Sibalis, Stony Brook, and Sanford Rosen, New York, both of N.Y., assignors to Drug Delivery Systems Inc., New York, N.Y.

Continuation of Ser. No. 858,685, Mar. 27, 1992, abandoned, which is a division of Ser. No. 711,589, Jun. 6, 1991, Pat. No. 5,135,479, which is a continuation of Ser. No. 396,746, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 555, Jan. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 839,050, Mar. 12, 1986, Pat. No. 4,640,689, which is a continuation of Ser. No. 702,486, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 660,192, Oct. 12, 1984, Pat. No. 4,622,031, which is a continuation-in-part of Ser. No. 542,252, Aug. 18, 1983, Pat. No. 4,557,723. This application Jan. 30, 1995, Ser. No. 381,141

Int. Cl.[6] A61N *1/30*

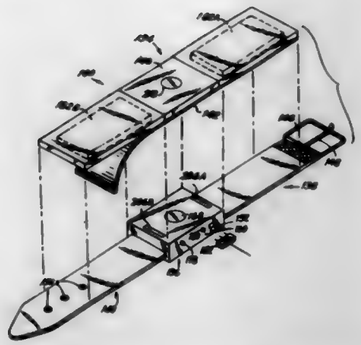
U.S. Cl. 604—20 **7 Claims**

1. A two-part replenishable drug applicator system for transdermal drug delivery of at least one drug to the systemic blood of a human being or animal through skin thereof comprising:

a reusable assembly having a computer control part of said drug applicator system removably mountable on said human or animal for control of transdermal delivery of at least one drug through the skin;

said computer control part including a source of electrical energy for electrically energizing said drug applicator system and effecting flow of current through the skin;

a drug containing cartridge comprising a replaceable drug reservoir for containing at least one drug and replaceably mountable on said computer control part in a separable assembly for replenishing said drug applicator system with at least one drug as required;



said drug reservoir having a permeable surface for contacting the skin of said human being or animal when said drug reservoir is mounted on said computer control part; and

means on said drug reservoir and means on said computer control part for cooperative association when said drug reservoir is mounted on said computer control part effectively establishing a current flow path from said computer control part to said drug reservoir and through the skin of said human being or animal for application of controlled electrical current to said drug reservoir for application of a drug through said surface thereof in contact with the skin of staid human being or animal.

5,591,124

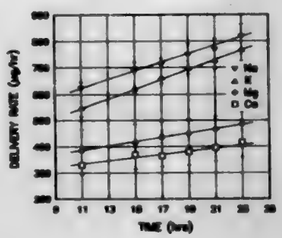
METHOD AND APPARATUS FOR CONTROLLED ENVIRONMENT ELECTROTRANSPORT

Joseph B. Phipps, Plymouth, Minn., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 173,149, Dec. 22, 1993, Pat. No. 5,443,442, which is a continuation of Ser. No. 831,804, Feb. 5, 1992, abandoned, which is a division of Ser. No. 502,232, Mar. 30, 1990, Pat. No. 5,125,894. This application May 26, 1995, Ser. No. 452,403

Int. Cl.[6] A61N *1/30*

U.S. Cl. 604—20 **5 Claims**



1. A method of controlling delivery of a species, having a polar form and a less polar form, from a reservoir; said method comprising the steps of:

(a) providing first and second electrode arrangements in electrically conductive contact with the reservoir;

(b) providing as a source of the species a target material;

(c) selectively operating the first and second electrodes to control pH of the reservoir in a manner obtaining selected relative concentrations of the polar and less polar forms of the species, to obtain selected delivery; and,

(d) selectively operating the electrode arrangements at termination of the delivery process to render excess target material therein in an inactive form.

5,591,125

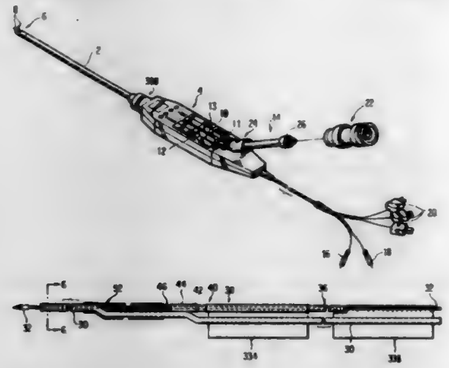
MEDICAL PROBE WITH STYLETS

Stuart D. Edwards, Los Altos; Hugh R. Sharkey, Redwood City; Ingemar H. Lundquist, Pebble Beach; Ronald G. Lax, Grass Valley, and James A. Baker, Jr., Palo Alto, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation of Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819, which is a continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, Pat. No. 5,366,490, and Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675. This application Jun. 6, 1995, Ser. No. 470,621

Int. Cl.[6] A61B *17/39*

U.S. Cl. 604—22 **11 Claims**



1. A medical probe device for use in a human body comprising a catheter having a control end portion and a probe end portion, the control end portion including handle means for permitting the probe end portion to be inserted into the body to perform a procedure therein, a longitudinally-extending flexible stylet slidably mounted in the probe end portion of the catheter, means carried by the handle means and connected to the flexible stylet for extending the flexible stylet outward from the probe end portion through intervening tissue to targeted tissue, the flexible styler including a radio frequency electrode and a non-conductive sleeve mounted about the radio frequency electrode and extending longitudinally thereof so as to expose a selected portion of the radio frequency electrode to the targeted tissue whereby upon the supply of radio frequency energy to the electrode the targeted tissue is ablated while the intervening tissue is protected by the non-conductive sleeve from radio frequency energy supplied to the electrode, the non-conductive sleeve being provided with a longitudinally-extending lumen for permitting a liquid to be delivered into the body.

5,591,126

Patent Not Issued For This Number

5,591,127

PHACOEMULSIFICATION METHOD AND APPARATUS

Billie J. Barwick, Jr., 85 Hull St., Beverly, Mass. 01915, and James H. Little, 6601 S. Country Club Dr., Oklahoma City, Okla. 73159

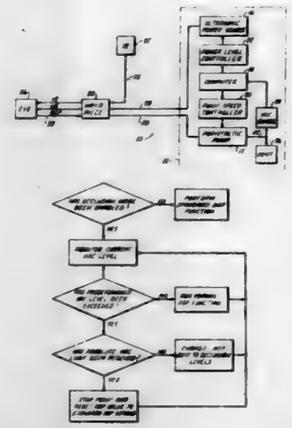
Filed Jan. 28, 1994, Ser. No. 188,188

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—66 **1 Claim**

1. A method of operating a phacoemulsification apparatus having a source of pulsed ultrasonic power, said method comprising the steps of:

(a) running the source of pulsed ultrasonic power at a first pulse duty cycle until a first predetermined power level is exceeded;



(b) then running the source of pulsed ultrasonic power at a second and greater pulse duty cycle until a second and greater predetermined power level is exceeded;

(c) then running the source of pulsed ultrasonic power at a third and still greater pulse duty cycle until a third and still greater predetermined power level is exceeded; and,

(d) thereafter running the source of pulsed ultrasonic power at a pulse duty cycle greater than said third pulse duty cycle.

5,591,128

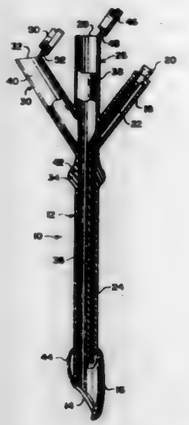
GASTROSTOMY TUBE

Deborah L. Sithole, 241-20 Northern Blvd.; Apt. 6C, Douglaston, N.Y. 11362

Filed Mar. 3, 1995, Ser. No. 397,916

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—96 **3 Claims**



1. An improved gastrostomy tube comprising:

a) a main conduit consisting of a hollow cylindrical upright channel having an upper end and a lower end with a slanted outlet port at said lower end;

b) a balloon affixed to said lower end of said main conduit enclosing said slanted outlet port leaving said slanted outlet port within said balloon, said balloon being kidney shaped when inflated and having an opening aligned and coextensive with said slanted outlet port;

c) a valve stem connected at an angle to said upper end of said main conduit:

d) a one-way valve affixed to an upper end of said valve stem;

e) an elongated filler pipe extending from said one-way valve through said valve stem and down through a wall of said main conduit into said balloon, so that a fluid can be forced through said one-way valve and said elongated filler pipe to inflate said balloon, thereby making it easier and safer to insert said lower end of said main conduit through an opening in a stomach from an opening in an external surface of a body of a person;

f) a primary conduit consisting of a hollow cylindrical upright channel having an inlet port at one end and fluidly connected at the opposite end to said upper end of said main conduit to permit supplementary nutrition to be inserted into said inlet port of said primary conduit to travel through said main conduit and out of said slanted outlet port and into the stomach of the person;

g) a secondary conduit consisting of a hollow cylindrical branch channel having an inlet port at one end and fluidly connected at the opposite end to the upper end of said main conduit to permit the insertion of medication into the inlet port of said secondary conduit to travel through said main conduit and out of said slanted outlet port and into the stomach of the person; and

h) stop member means integrally formed in the outer surface of said main conduit directly below the juncture of said valve stem, said primary conduit, and said secondary conduit to provide a fixed finger grip on said gastrostomy tube.

5,591,129

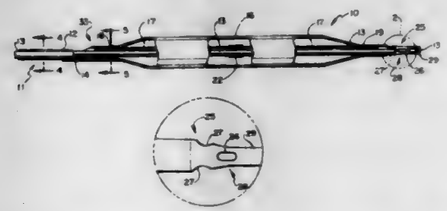
PERFUSION BALLOON ANGIOPLASTY CATHETER

Michael J. Shoup, Maple Grove; James E. Cox, Plymouth; Paul J. Fordenbacher, Minneapolis, and Gregory A. Boldenow, Plymouth, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation-in-part of Ser. No. 204,733, Mar. 2, 1994, abandoned. This application May 15, 1995, Ser. No. 441,618

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—96 **33 Claims**



1. In a balloon angioplasty catheter of the type having a balloon assembly carried at a distal end of an elongated catheter body and means for inflating a balloon envelope of said assembly, the balloon assembly including said balloon envelope and a perfusion lumen having a distal end extending through the balloon envelope to provide a blood flow passage during inflation of the balloon envelope; the improvement which comprises a projecting balloon assembly tip integrally formed with the balloon envelope and extending beyond the distal end of the perfusion lumen to define a discharge lumen, the integral projecting tip including a side wall, tapering radially inwardly in a distal direction, having at least one generally elliptical perfusion discharge orifice, elongated along an axis generally parallel to a longitudinal axis of the projecting balloon assembly tip, formed therein.

5,591,130

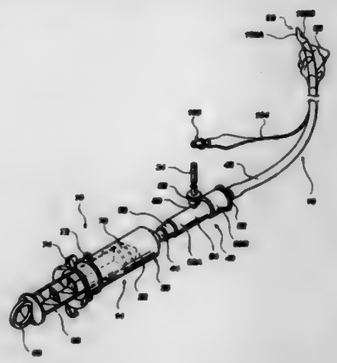
ESOPHAGEAL INTUBATION DETECTOR WITH INDICATOR

Marshall T. Denton, Salt Lake City, Utah, assignor to Wolfe Troy Medical, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 199,628, Feb. 22, 1994, Pat. No. 5,487,731. This application Jun. 7, 1995, Ser. No. 484,936

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—100 **39 Claims**



1. An intubation detection system for use in determining whether a tip of a tubular airway controlling device is in a patient's esophagus or in the patient's trachea, the system comprising:

the tubular airway controlling device including the tube tip:

a volume changing device connected to the tubular airway controlling device;

an indicator that is pneumatically connected to the volume changing device and that is activated in response to a significant pressure differential across the indicator;

whereby, if the tube tip is in the esophagus, the tube tip becomes occluded as the volume changing device increases in volume creating the significant pressure differential across the indicator which activates the indicator indicating that the tube tip is in the esophagus; and if the tube tip is in the trachea, the tube tip does not become occluded as the volume changing device increases in volume, the significant pressure differential across the indicator is not created, and the indicator is not activated.

5,591,131

SAFETY MINUTE DOSE HYPODERMIC SYRINGE

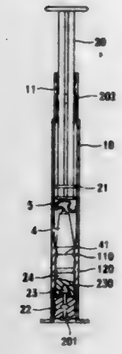
Long-Hsiung Chen, 5F, No. 91-3, Chung Cheng Rd., Sec. 1. Taipei, Taiwan

Filed Oct. 24, 1995, Ser. No. 547,365

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—110 **5 Claims**

1. A safety minute dose hypodermic syringe comprising a barrel having a front and and a rear end, a locking tip partially inserted into said front end of said barrel to hold a needle cannula, a locating stopper mounted inside said front end of said barrel and fixedly connected to said locking tip, a plunger inserted into said barrel from said rear end of said barrel, and a movable rubber stopper connected to said plunger and moved by said plunger to squeeze liquid medicine out of said barrel through said locating stopper and said needle cannula, wherein: said barrel comprises a first inside annular flange at said front end of said barrel, a second inside annular flange and a third inside annular flange at said rear end of said barrel, an inner diameter of said front end of said barrel being slightly smaller than an inner diameter of said rear end thereof, said second inside annular flange being to limit forward stroke of said plunger; said locking tip is partially inserted into said front end of said barrel and retained in place by said first inside annular flange of said barrel; said locating stopper has a retaining



hole at a rear end thereof remote from said locking tip; said movable rubber stopper has a retainer rod longitudinally disposed at center and connected to said plunger for engagement with said retaining hole of said locating stopper, said retainer rod having a breaking neck adjacent to said plunger; said retainer rod of said movable rubber stopper is forced into engagement with said retaining hole of said locating stopper after the injection, for permitting said locating stopper, said locking tip and said needle cannula to be pulled backwards to an inside of said barrel by said plunger through said movable rubber stopper and said retainer rod, so that said locking tip can be retained inside said barrel by said second inside annular flange and third inside annular flange of said barrel, and said plunger can be disconnected from said movable rubber stopper by breaking said breaking neck of said retainer rod, and then inserted into said front end of said barrel to deform said needle cannula.

5,591,132

EPIDURAL CATHETER

Len E. S. Carrie, 104 Cumnor Hill, Oxford 0X2 9HY, England

Filed Dec. 22, 1995, Ser. No. 577,019

Claims priority, application United Kingdom, Jan. 25, 1995, 9501424

Int. Cl.[6] A61M *5/178*

U.S. Cl. 604—158 **11 Claims**



9. An epidural catheter comprising an elongated tube with a patient end, wherein said patient end is closed and rounded, wherein said patient end forms into a coil in a plane including the length of the catheter in its natural state, and wherein the catheter has a plurality of side openings at said patient end along said coil.

5,591,133

FLEXING SAFETY SHIELD FOR HYPODERMIC NEEDLES

Art Feuerborn, and David Feuerborn, both of Camarillo, Calif., assignors to Lawrence R. Koh, Los Angeles, Calif.

Filed Jun. 9, 1994, Ser. No. 257,352

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—192 **3 Claims**



1. A shield for a hypodermic needle assembly, said assembly comprising a cannula having a tip end, said cannula further having a base end coupled to a hub, said shield comprising:

a sleeve having an initial rigidity comprising:

(a) a bore for slidably receiving said cannula;

(b) a lower rigid portion coupled to said hub;

(c) an upper rigid portion at least coextensive with said tip end when said sleeve is in a safe position;

(d) at least two slits extending longitudinally between said upper and said lower rigid portions forming at least two displaceable portions, each comprising:

i) a first hinging portion located where said upper rigid portion and said each of said at least two displaceable portions interface;

ii) a second hinging portion located where said lower rigid portion and said each of said at least two displaceable portions interface; and

iii) a third hinging portion located between said first and said second hinging portions;

wherein said sleeve possesses mechanical properties such that an axial force exceeding a threshold axial force must be applied to said upper rigid portion to overcome said initial rigidity, causing displacement of said at least two displaceable portions and slidably exposing said cannula thereby; and

wherein said third hinging portion comprises a slot in the radially inner surface of said displaceable portion at the edges formed by said two or more slits so that said threshold axial force is not so great as to interfere with smooth administration of an injection, but is still greater than axial forces created unintentionally.

5,591,134

PROTECTIVE NEEDLE COVER

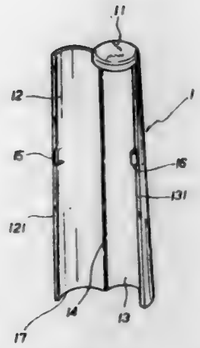
Han C. Shu, 5F, 205 Wu Shin Street, Taipei, Taiwan

Filed Jun. 28, 1995, Ser. No. 496,223

Int. Cl.[6] A61M *5/32*

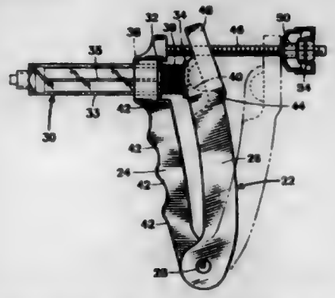
U.S. Cl. 604—192 **4 Claims**

1. A protective needle cover for covering a front end of a syringe over a pointed needle thereof, consisting essentially of a substantially cylindrical body which has a bottom rim having an inner diameter corresponding to an outer diameter of a projected seat in front of said syringe for fixing said needle thereto, and a fully circular top surface sealing a top end of said cylindrical body, said cylindrical body having a first half side wall and a second half side



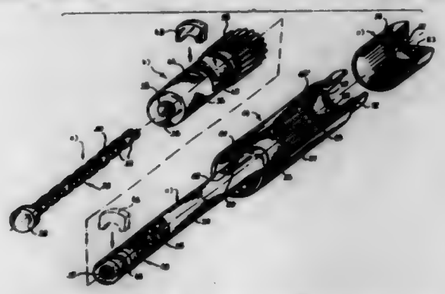
wall both axially extending a full length of said cylindrical body and being pivotally connected together at a first edge thereof by means of a connection portion axially extending between them, said first half side wall being formed at a second edge opposite to said first edge with at least a projected portion at a position corresponding to said retaining hole, said second half side wall being formed at a second edge opposite to said first edge with at least a projected portion at a position corresponding to said retaining hole on said first half side wall, whereby said retaining hole and said projected portion are engaged with each other when two opposed forces are applied on them and thereby join said second edges of said first half side wall with said second half side wall to close said cylindrical body, and said retaining hole and said projected portion are disengaged from each other to permit said first half side wall to pivotally turn about said connection portion to separate from said second half side wall and open said cylindrical body.

5,591,135
SYRINGE STROKE CONTROLLER WITH ELASTICALLY ENABLED SINGLE AXIS SLIDE ADJUSTMENT AND FINGER-MOLDED PISTOL GRIP
James J. Sullivan, P.O. Box 1799, Ojai, Calif. 93024
Continuation of Ser. No. 44,769, Apr. 12, 1993, abandoned. This application Apr. 21, 1995, Ser. No. 426,230
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—211 **30 Claims**



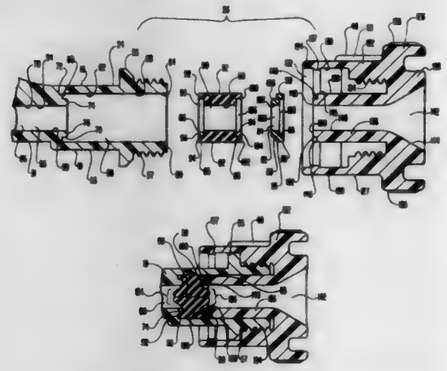
1. A stroke length regulating apparatus for use with a syringe-like dispenser, the dispenser having a barrel portion and a plunger portion, the apparatus comprising:
means for compressing the dispenser comprising a pair of interconnected supports movable relative to one another, one of said supports coupled to the barrel portion of the dispenser and the other of said supports coupled to the plunger portion of the dispenser;
means for arresting relative displacement of said pair of supports at a selected end point, comprising:
a threaded metering rod having a longitudinal axis of symmetry and fixed at one end thereof to a first one of said supports; and
a dual-mode elastically deformable rotatable nut comprising,
means for threadably engaging said threaded metering rod along a length thereof comprising a cylinder around said metering rod and plural elastically deformable leaves extending axially from an edge of said cylinder and surrounding a portion of said metering rod, wherein said leaves have threads facing and engagable with threads on said metering rod, wherein once engaged said engaging means facilitates longitudinal displacement along said rod by rotation of said nut about a rotational axis thereof in a first mode of said nut, and wherein said engaging means enables said elastically deformable nut to prevent movement of a second one of said supports away from the first one of said supports past said selected endpoint, and
means for permitting temporary elastic deformation of said elastic deformable nut so as to withdraw said engaging means away from threads on said metering rod and thereby permit free movement of said pair of supports relative to one another for stroke length adjustment of the dispenser in a second mode of said nut, said rod constraining said nut so as to maintain said rotational axis generally coincident with the longitudinal axis in both said first and second mode, and wherein said permitting means comprises an elastically deformable locking cap comprising a cylinder portion around said leaves urging said leaves toward said metering rod whereby to engage the threads thereof and means for deforming said locking cap whereby to withdraw said cylinder portion away from said leaves.

5,591,136
INJECTION DEVICE
Jochen Gabriel, Stuttgart, Germany, assignor to Medico Development Investment Company, Zürich, Switzerland
Continuation of Ser. No. 122,565, Sep. 30, 1993, abandoned. This application Oct. 27, 1995, Ser. No. 549,641
Claims priority, application Germany, Apr. 15, 1991, 41 12 259.3
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—211 **32 Claims**



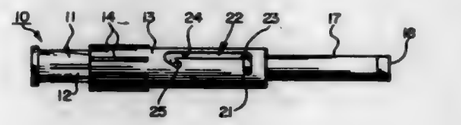
1. An injection device for injecting adjustable dose of an injection liquid (13), comprising:
a housing (11, 21) having a space therein for receiving a container (12) having a piston (14) displaceably arranged therein and containing the injection liquid (13);
an adjustable-length plunger (29, 38) in said housing, said plunger being axially displaceable in said housing between a first dosage-setting axial position and a second axial position;
said plunger acting upon the piston (14) in the container (12) when said plunger moves from said first dosage setting axial position to said second axial position thereof;
said plunger (29, 38) comprising adjustment means for selectively adjusting the effective length of said plunger, said plunger and adjustment means including a threaded member (38);
a threaded spindle (29) guided in an interior thread (35) of said threaded member (38);
a guide member (34) rotatably connected to said threaded member;
means (30, 31, 36) arranged between said guide member and said threaded spindle (29) for axially guiding said threaded spindle and for preventing rotation of said threaded spindle relative to said guide member (34);
enabling/disabling means (55, 56) automatically enabling said adjustment means when said plunger is in said first dosage setting axial position and automatically disabling said adjustment means when said plunger is in said second axial position, said enabling/disabling means being operatively arranged between said plunger (29, 38) and said housing (11, 21) and responsive to the axial position of said plunger relative to said housing,
whereby adjustment of the effective length of said plunger by said adjustment means is automatically disabled when said plunger is in said second axial position.

5,591,137
HEMOSTASIS VALVE WITH LOCKING SEAL
Brian Stevens, Pleasant Grove, Utah, assignor to Merit Medical Systems, Inc., South Jordan, Utah
Filed Jul. 14, 1995, Ser. No. 502,753
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—256 **30 Claims**



1. A hemostasis valve apparatus adapted for providing access to a cardiovascular or other intravascular system of a patient in a manner so as to control and desirably minimize loss of body fluids when accessing the cardiovascular or other intravascular system through the apparatus, comprising:
(a) body means for providing a lumen therethrough and which is adapted for accessing a patient's cardiovascular or other intravascular system, said body means comprising distal and proximal ends, and said body means further comprising an interior hollow compression chamber;
(b) resiliently deformable sealing means disposed in said compression chamber for selectively opening and closing said lumen in response to a compression force exerted on said sealing means, said sealing means comprising distal and proximal ends and a longitudinal passageway therethrough which communicate with and serves as an opening to said lumen of the body means, and said sealing means assuming a normally open position when not subjected to said compression force wherein said passageway provides an unobstructed opening to said lumen, and said sealing means responding to said compression force so as to progressively and uniformly reduce the size of said opening provided by said passageway until said opening is completely closed when desired;
(c) rotatable housing means, rotatably joined to the proximal end of said body means, for exerting a compression force on said sealing means when the housing means is rotated in one direction relative to the body means, and for releasing the compression force from the sealing means when rotated in an opposite direction relative to the body means;
(d) first means for interlocking the distal end of said sealing means within said compression chamber such that when said compression force is exerted on the sealing means, the distal end of the sealing means will remain firmly in place within the compression chamber and will not become displaced nor undesirably enter said lumen;
(e) second means for interlocking the proximal end of said sealing means such that when said compression force is exerted on the tubular member, the proximal end of the sealing means will remain firmly in place within the compression chamber and will not become displaced; and
(f) ring means, disposed between the proximal end of said sealing means and said rotatable housing means, for rotatable connection to said second means for interlocking so as to reduce rotation and twisting of said sealing means when said compression force is exerted on the sealing means.

5,591,138
PROTECTED NEEDLE ASSEMBLY
Vincent L. Vaillancourt, 14 Runyon Dr., Livingston, N.J. 07039
Filed Aug. 10, 1995, Ser. No. 513,538
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—263 **19 Claims**



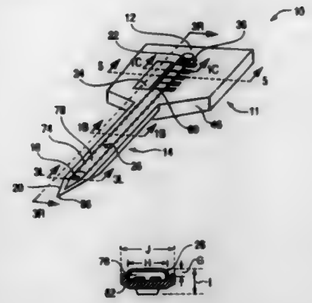
1. A protected needle assembly comprising
a housing including a hub at a proximal end for mounting on at least one of a drug delivery system, a syringe and a blood receiving receptacle and a rigid tube;
a needle mounted on said hub and within said tube, said needle extending beyond said tube;
a sheath disposed concentrically about said needle with one end extending beyond said needle in protective relation, said sheath being movable longitudinally of said needle and said tube between an extended position covering over said needle and a retracted position exposing said needle;
at least one projection on one of said sheath and said tube;
a guide slot in the other of said sheath and said tube receiving said projection, said guide slot having a circumferentially directed portion at one end receiving said projection in said extended position of said sheath and an inclined portion at an opposite end directed toward said one end to receive and retain said projection in said retracted position; and
resilient means for biasing said sheath from said retracted position to said extended position.

5,591,139

IC-PROCESSED MICRONEEDLES

Liwei Lin, and Albert P. Pisano, both of Berkeley, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 6, 1994, Ser. No. 254,328
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—264 **26 Claims**



1. A microstructure, comprising:
a substrate having an interface region and an elongated region extending from said interface region; and
a shell connected with said substrate along said elongated region and at least a portion of said interface region;
wherein said substrate and shell define a shaft having an enclosed channel.

5,591,140

RADIOFREQUENCY PLASMA TREATED POLYMERIC SURFACES HAVING IMMOBILIZED ANTI-THROMBOGENIC AGENTS

Pallassana V. Narayanan, Davie, and Kimberly D. Stanley, Florida City, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.

Division of Ser. No. 156,384, Nov. 22, 1993, Pat. No. 5,409,696, which is a continuation of Ser. No. 872,443, Apr. 23, 1992, abandoned, which is a division of Ser. No. 610,548, Nov. 8, 1990, Pat. No. 5,132,108. This application Apr. 6, 1995, Ser. No. 417,799
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—269 **14 Claims**

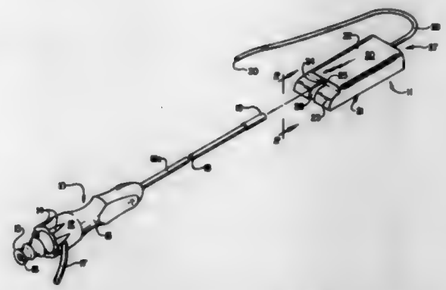
8. A medical device having a biocompatible polymeric surface, wherein said biocompatible polymeric surface comprises a surface which has been modified by subjecting the polymeric surface to radiofrequency discharge treatment within a water vapor plasma medium having in excess of about 90 volume percent water vapor, based upon the total volume of plasma medium, followed by treatment with a coupling agent and a spacer component having amine groups forming covalent linkages with the polymeric surface which had been subjected to radiofrequency discharge treatment with said plasma medium, and then by treatment with an anti-thrombogenic, fibrinolytic or thrombolytic agent having acid functionality contacting and covalently bonding with the spacer component-treated polymeric surface to provide the biocompatible polymeric surface.

5,591,141

SUCTION COAGULATOR BENDING TOOL

William S. Nettekoven, Sandy, Utah, assignor to MegaDyne Medical Products, Inc., Draper, Utah

Filed Sep. 15, 1995, Ser. No. 529,227
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—280 **12 Claims**



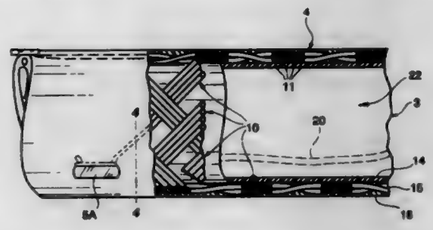
1. A suction coagulator comprising in combination:
(a) a suction instrument having a handle for manipulating said instrument, said instrument including a tubular extension having a proximal end mounted within said handle and a distal end extending away from said handle, said instrument including suction means communicating with said tubular extension for imparting suction thereto; and
(b) bending tool means cooperatively associated with said tubular extension for engaging and bending said distal end of said tubular extension, said bending tool means having a recess therein dimensioned for slidable engagement with exterior surface of said tubular extension, said bending tool means having mandrel means axially mounted within said recess for extending into the interior of said tubular extension when said tubular extension is inserted within said recess, said bending tool means additionally having a radially curved channel extending away from said recess for receiving a part of said exterior surface of said tubular extension and for imparting a radial curvature to said part of said exterior surface of said tubular extension when said tubular extension is fitted to said tool and bending force applied thereto.

5,591,142

CATHETER WITH WIRE REINFORCEMENT HAVING GOOD ELECTRICAL CONDUCTIVITY

Wilhelmus P. M. M. Van Erp, Leek, Netherlands, assignor to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 230,400, Apr. 20, 1994, abandoned. This application Apr. 25, 1995, Ser. No. 428,506
Claims priority, application Netherlands, Apr. 20, 1993, 9300670
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—282 **12 Claims**



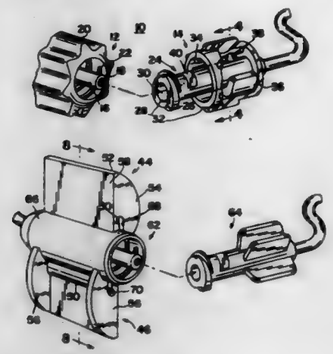
1. A catheter comprising a generally tubular body having a metal wire reinforcing layer defined by metal wires which are woven into a cylindrical weave of metal wire reinforcement incorporated into said catheter, said catheter having a distal end portion, a proximal end portion and at least one lumen in said catheter, at least one electrical operating element being mounted on said distal end portion and electrically connected to at least one of said wires, and an electrical connecting member being mounted on said proximal end portion and electrically connected to at least one of said wires, said metal wires including at least two bundles of single wires, the single wires in each bundle being arranged side by side with no single wire in a bundle overlying another single wire in said bundle to enable said tubular body to have a very thin wall and each single wire being made of a material which has sufficiently high mechanical strength to impart torque transmitting properties to said catheter and which also has good electrical conductivity.

5,591,143

LUER CONNECTOR WITH TORQUE INDICATOR

Frederick W. Trombley, III, Gibsonia, and Salvatore J. Dedola, McKees Rocks, both of Pa., assignors to Medrad Inc., Pittsburgh, Pa.

Filed Apr. 2, 1993, Ser. No. 43,911
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—283 **16 Claims**



1. A luer connector comprising:
a threaded male luer component;
a threaded female luer component rotationally engageable with said male luer component; and
a first protuberance comprising indication means connected to at least one of said luer components for tactilely indicating, after the male and female luer components have been connected, that a predetermined torque has been applied to said connector to complete a fluid-tight seal between the male and female luer components and to warn against overtightening of said connector; and
a second protuberance comprising deflectable means connected to at least one of said luer components for preventing further application of torque after said predetermined torque has been applied,
wherein said first protuberance and said second protuberance cooperate together to provide a tactile response.

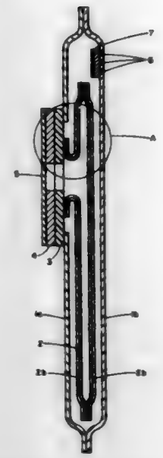
5,591,144

DRAINAGE BAG

Rory J. M. Smith, Hebden; Gillian R. Little, Billericay, and Nicholas S. Shelley, Burgess Hill, all of England, assignors to Welland Medical Limited, Crawley, England

PCT No. PCT/GB93/02452; § 371 Date Aug. 17, 1995, § 102(e) Date Aug. 17, 1995, PCT Pub. No. WO94/12128, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 29, 1993, Ser. No. 448,367
Claims priority, application United Kingdom, Dec. 1, 1992, 9225071
Int. Cl.[6] A61M *1/00*; A61F *5/44*
U.S. Cl. 604—327 **18 Claims**

1. A drainage bag for receiving bodily waste, the drainage bag comprising:
a water-impermeable outer bag formed from a material which acts as a barrier to flatus gases, the outer bag being provided with a flatus filter;
a water-impermeable inner bag enclosed within the outer bag, the inner bag being permeable to flatus gases, and being of a structure which is weakened upon immersion in a WC bowl such that it becomes limp and is less buoyant thereby enabling it to be flushed away easily;
and means defining an orifice to enable bodily waste to be received by the inner bag, and including a flange having first and second sides, on the first side of which is an adhesive for adhering the bag to a patient and on the second side of which are attached the inner and outer bags; and wherein the outer and inner bags being detachably secured together in the region of the orifice.

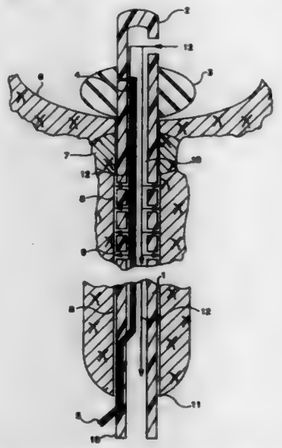


5,591,145

CATHETER WITH WALL PERFORATIONS

Hans-Ernst Sachse, Lerchenstrasse 55, 90425 Nueruberg, Germany

Filed Aug. 2, 1995, Ser. No. 510,567
Int. Cl.[6] A61F *5/44*
U.S. Cl. 604—349 **10 Claims**



1. A catheter for implantation in a bladder and urethra comprising a body having a lumen, said body having a first end and an opposite end and an inner wall and an outer wall,

means adjacent to the opposite end of the body for preventing expulsion from the bladder;

one or more windows in an area located between the first end and the opposite end, said windows interconnecting said inner wall and other wall of the body, said catheter being comprised of a material which is stiffer in the area where its windows are located than in the remainder of the catheter and;

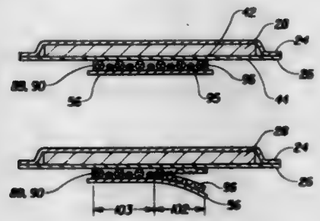
wherein the windows are adjacent to the walls of the urethra when installed in the patient and permit circulation of the urine from the lumen through the windows toward the urethral walls and back to the lumen.

5,591,146

SANITARY NAPKIN WITH PERFUME-BEARING MICROCAPSULE ADHESIVE

Margaret H. Hasse, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 17, 1996, Ser. No. 583,735
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—359 **16 Claims**



1. A sanitary napkin for placement in a wearer's undergarment, said sanitary napkin having a longitudinal axis, a lateral axis, longitudinal edges, end edges, and a central portion, said sanitary napkin comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined to said topsheet, said backsheet having and outer surface and an inner surface;

an absorbent core positioned between said topsheet and said backsheet;

an attachment system secured to said outer surface of said backsheet for securing said sanitary napkin to a wearer's undergarment, said attachment system comprising an adhesive layer having a release liner thereon to protect said adhesive layer prior to engagement of said sanitary napkin with a wearer's undergarment; and

a plurality of perfume-filled microcapsules being at least partially embedded within said attachment system, said microcapsules diffusely releasing perfume at a steady-state throughout the engagement of said sanitary napkin with a user's undergarment.

5,591,147

ABSORBENT ARTICLE HAVING AN OPPOSITELY BIASED ATTACHMENT FLAP

Laurie Couture-Dorschner, Greenville; Dede A. Hirt, Menasha; William G. Stoeger, Appleton, and Rebecca L. Dilnik, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

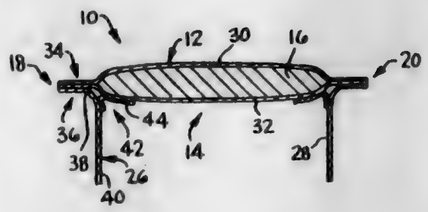
Filed Aug. 12, 1994, Ser. No. 289,814
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—369 **20 Claims**

1. An absorbent article having a pair of longitudinal sides, said absorbent article comprising:

a) a fluid-pervious cover;

b) a fluid-impervious baffle;

c) an absorbent between said cover and said baffle;



d) a flap extending inwardly from and positioned adjacent to one of said longitudinal sides, said flap having a fixed portion secured to said baffle and a free portion adjacent to said fixed portion; and

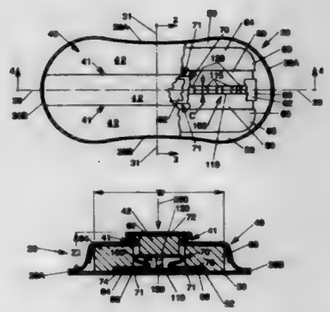
e) biasing means for urging said free portion of said flap in an outward direction relative to said longitudinal side wherein said biasing means is positioned adjacent to said flap, said biasing means having a crush resistance from about 5 grams to about 75 grams.

5,591,148

SANITARY NAPKIN HAVING AN INDEPENDENTLY DISPLACEABLE CENTRAL CORE SEGMENT

Ronald R. McFall, West Chester; Letha M. Hines, Cincinnati; David C. Oetjen, West Chester; John L. Hammons, Hamilton; Shirley L. Chow, Cincinnati; Patricia L. Lampson, Cincinnati; Megan R. Moore, Cincinnati, and James W. Cree, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 8, 1994, Ser. No. 225,191
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—378 **24 Claims**



1. A disposable absorbent article having a longitudinal centerline, a lateral centerline, and first and second longitudinally extending sides joining first and second laterally extending ends, the absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined to the topsheet; and

an absorbent core disposed intermediate the topsheet and the backsheet, the absorbent core having a longitudinal length and a lateral width, the absorbent core comprising:

a first longitudinally extending side core segment, the first side core segment disposed intermediate the longitudinal centerline of the disposable absorbent article and the first longitudinally extending side of the disposable absorbent article;

a second longitudinally extending side core segment, the second side core segment disposed intermediate the longitudinal centerline of the disposable absorbent article and the second longitudinally extending side of the disposable absorbent article; and

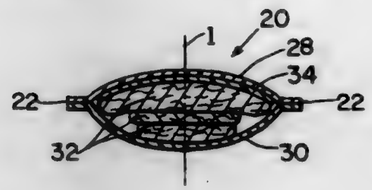
a central core segment extending along the longitudinal centerline of the disposable absorbent article, the central core segment separate from the first and second longitudinally extending side core segments and displaceable in the Z-direction relative to the first and second side core segments and the backsheet, and wherein the central core segment is displaceable in the Z-direction independently of the first and second side core segments from a first extended configuration to a second compressed configuration.

5,591,149

ABSORBENT ARTICLE HAVING MELTBLOWN COMPONENTS

James W. Cree, Cincinnati; Bruce Brown, Maineville, both of Ohio; Jennifer David, Urbana, Ill.; Julian A. Plumley, Satteldorf, Germany; Robert E. L. Marshall, III, Cincinnati, and John T. Cooper, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 7, 1992, Ser. No. 957,575
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—378 **7 Claims**



1. An absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined to said topsheet;

an absorbent core positioned between said topsheet and said backsheet, said absorbent core comprising a first layer and a second layer, said first layer comprising a web of meltblown fibers, said web of meltblown fibers comprising a plurality of micro-denier meltblown fibers having pores therebetween having a first average wet pore radius size under no load, said second layer comprising a material selected from the group consisting of: a tissue web, a carded nonwoven web, and a spunbonded nonwoven web; and a plurality of superabsorbent material particles between said first and second layers, wherein at least one of said first and second layers has been solvent-treated, and said first and second layers have been secured to each other at least partially by said superabsorbent material particles with heat and pressure bonds; and

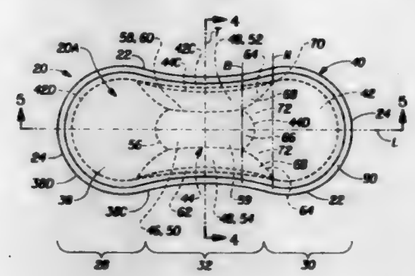
an acquisition layer positioned between said topsheet and said absorbent core, said acquisition layer having pores therein having a second average wet pore radius size under no load, wherein said second average wet pore radius size is greater than said first average wet pore radius size.

5,591,150

SANITARY NAPKIN HAVING A RESILIENT BODY-CONFORMING PORTION

Robb E. Olsen, Cincinnati, Ohio; Sandra R. Bittar, Sao Paulo/sp, Brazil; Letha M. Hines, Cincinnati, Ohio; William R. Vinnage, Jr., Cincinnati, Ohio; Melisse N. May, Cincinnati, Ohio; Thomas W. Osborn, III, Cincinnati, Ohio, and Nancy B. Doak, Cincinnati, Ohio, assignors to The Procter and Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 734,405, Jul. 23, 1991, Pat. No. 5,334,176, Ser. No. 915,133, Jul. 23, 1992, Ser. No. 915,285, Jul. 23, 1992, Pat. No. 5,382,245, Ser. No. 563,879, Nov. 21, 1995, Ser. No. 43,645, Apr. 6, 1993, Pat. No. 5,356,405, Ser. No. 444,079, May 17, 1995, Ser. No. 506,137, Jul. 24, 1995, Ser. No. 520,456, Sep. 19, 1995, Ser. No. 268,869, Jun. 30, 1994, abandoned, Ser. No. 439,931, May 12, 1995, abandoned, Ser. No. 192,240, Feb. 4, 1994, abandoned, and Ser. No. 238,191, May 4, 1994, abandoned, said Ser. No. 563,879is a continuation of Ser. No. 7,207, Jan. 22, 1993, abandoned, said Ser. No. 444,079is a continuation of Ser. No. 84,048, Jun. 28, 1993, abandoned, said Ser. No. 506,137is a continuation of Ser. No. 342,678, Nov. 21, 1994, abandoned, which is a continuation of Ser. No. 96,092, Jul. 23, 1993, abandoned, said Ser. No. 520,456is a continuation of Ser. No. 161,215, Dec. 2, 1993, abandoned, said Ser. No. 268,869is a continuation of Ser. No. 165,757, Dec. 13, 1993, abandoned, said Ser. No. 439,931is a continuation of Ser. No. 166,660, Dec. 13, 1993, abandoned. This application May 11, 1994, Ser. No. 241,430
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—385.1 **41 Claims**



1. An absorbent article for wearing in the crotch region of an undergarment, said absorbent article having a longitudinal centerline oriented in a longitudinal direction, a transverse centerline, a first end region, a second end region, and a central region disposed between said end regions, said absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined with said topsheet; and

an absorbent core disposed between said topsheet and said backsheet wherein

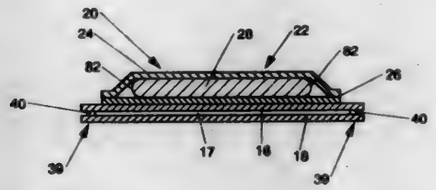
said absorbent article comprises a resilient portion that is resilient to transversely inwardly-oriented forces, said resilient portion being located in the central region of the absorbent article, said resilient portion comprising a central body, a pair of lateral side portions, a pair of longitudinal side edges and a pair of end edges, wherein at least one of said end edges has points of maximum displacement in the longitudinal direction and said end edge has gaps that are spaced longitudinally inward from said points of maximum displacement of said end edge, wherein said resilient portion has a substantially continuous transverse cross section longitudinally inboard of said gaps and said at least one of said end edges has an extension formed by said central body and at least one extension formed by one of said lateral side portions, and at least one gap is formed between said extension formed by said central body and said extension formed by said at least one of said lateral side portions.

5,591,151

GARMENT-LIKE DISPOSABLE ABSORBENT ARTICLE HAVING A BLOUSED OUTER COVER

Margaret H. Hasse, Wyoming, and Patrick J. Allen, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 176,855, Jan. 3, 1994. This application Jun. 6, 1995, Ser. No. 469,683
Int. Cl.[6] A61F *13/16*
U.S. Cl. 604—385.1 **5 Claims**



1. A garment-like disposable absorbent article for wearing about a wearer's lower torso, comprising:

a chassis having a front portion, a rear portion, a crotch portion, end edges, longitudinal side edges, a periphery adjacent to said end edges and said longitudinal side edges, and a central area inboard of said periphery, said chassis comprising an inner layer comprising a liquid pervious material;

an absorbent assembly comprising a liquid impervious backsheet joined to said inner layer, a liquid pervious topsheet joined to said backsheet, and an absorbent core positioned between said topsheet and said backsheet;

seams joining said longitudinal side edges of said front portion to said longitudinal side edges of said rear portion so as to form two leg openings and a waist opening substantially encircled by said end edges; and

an outer layer having a front portion, a rear portion, a crotch portion, end edges, longitudinal side edges, a periphery adjacent to said end edges and said longitudinal side edges, and a central area inboard of said periphery, at least a portion of said periphery of said outer layer being joined to at least a portion of said periphery of said inner layer such that said central area of said outer layer can blouse away from said central area of said inner layer at selected portions, said outer layer additionally having a pattern printed thereon, such that said inner layer with said absorbent assembly joined thereto is substantially unnoticeable to a viewer due to said pattern and said bloused central area of said outer layer.

5,591,152

ABSORBENT ARTICLE WITH DYNAMIC ELASTIC WAIST FEATURE HAVING A PREDISPOSED RESILIENT FLEXURAL HINGE

Kenneth B. Buell, Cincinnati; Sandra H. Clear, Maineville, and Daniella T. Falcone, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

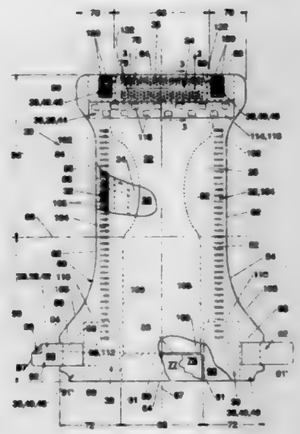
Division of Ser. No. 78,538, Jun. 17, 1993, Pat. No. 5,499,978, which is a continuation of Ser. No. 914,958, Jul. 16, 1992, Pat. No. 5,221,274, which is a continuation of Ser. No. 750,775, Aug. 22, 1991, Pat. No. 5,151,092, which is a continuation-in-part of Ser. No. 715,152, Jun. 13, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 466,535
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—385.2 **12 Claims**

1. A unitary disposable absorbent article comprising:

a containment assembly having end edges, longitudinal edges having leg edges, a longitudinal axis, a first waist region, and a second waist region, said containment assembly comprising:

a topsheet,

a backsheet joined with said topsheet, and



an absorbent core positioned between said topsheet and said backsheet; and

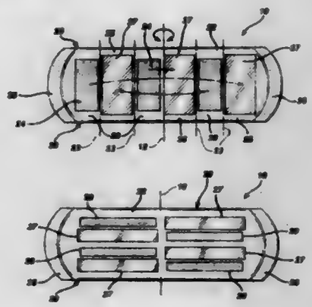
an elasticized side panel disposed on said containment assembly adjacent each longitudinal edge in said second waist region, each said elasticized side panel being elastically extensible in at least the lateral direction, each said elasticized side panel having differential extensibility, a non uniform degree of elastic extensional properties as measured in the direction of stretching at various points along an axis oriented substantially perpendicular to the direction of stretching, along the longitudinal axis when stretched in the lateral direction such that the lateral extensibility varies longitudinally from one portion of said elasticized side panel to an adjacent portion.

5,591,153

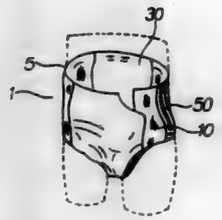
ABSORBENT ARTICLES WITH INTEGRAL RELEASE SYSTEM AND METHODS OF MAKING SAME

William B. Mattingly, III, Ithaca, N.Y., assignor to McNeil-PPC, Inc., Skillman, N.J.

Continuation of Ser. No. 569,103, Aug. 17, 1990, abandoned. This application Aug. 24, 1992, Ser. No. 935,145
The portion of the term of this patent subsequent to Jun. 8, 2010, has been disclaimed.
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—387 **22 Claims**



1. An absorbent article capable of being affixed to a user's undergarment, having a body facing side and a garment facing side, transverse ends and longitudinal edges, wherein the body facing side comprises an absorbent core, and wherein the garment facing side comprises a plurality of attachment zones longitudinally spaced there-along and a release zone for each of said attachment zones, said attachment zones and release zones alternating in the longitudinal direction, each of said attachment zones comprising attachment means and each of said release zones comprising release means, each of said attachment means and said release means being attached to said garment facing side with a bond, and at least one fold line along which said absorbent core is folded such that each of said attachment means contacts one of the release means and forms a releasable bond therewith, whereby said release means protects the attachment means prior to use.



5,591,154

DISPOSABLE ABSORBENT PRODUCT

Karen Dare, Binfield Bracknell Berkshire; Martin Rigwick, Marlow, both of United Kingdom; Gary F. Raykovitz, Flemington, and Charles W. Paul, Madison, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed May 24, 1995, Ser. No. 449,502
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—387 **12 Claims**



1. An absorbent product comprising an elongated absorbent pad having a body facing surface and a garment facing surface, a portion of the garment facing surface being coated with the hot melt adhesive composition comprising:

15 to 40% by weight of a styrene-butadiene-styrene block containing 30 to 50% styrene, the block copolymer having been polymerized so as to have a vinyl content greater than 35%

30 to 70% by weight of a tackifying resin selected from the group consisting of C5–C10 aliphatic or cycloaliphatic petroleum hydrocarbon resins having a Ball and Ring softening point of 70° to 150° C.; modified hydrogenated rosins; glycerol and pentaerythritol esters of modified hydrogenated rosins; copolymers and terpolymers of natural terpenes; polyterpene resins having a softening point, as determined by ASTM method E28-58T, of from about 80 to 150° C.; aromatic petroleum hydrocarbon resins and the hydrogenated derivatives thereof; and copolymers of aliphatic and aromatic monomers;

10 to 30% by weight of naphthenic or paraffinic oil; and

0.1 to 2% by weight of an antioxidant; characterized in that the viscosity of the adhesive is 1000 to 3500 cps at 160° C. and the adhesive exhibits substantially no transfer.

5,591,155

DISPOSABLE TRAINING PANT HAVING IMPROVED STRETCHABLE SIDE PANELS

Masaharu Nishikawa, Akashi; Keith W. Rollag, Ashiya, both of Japan; David M. Sageser, Cincinnati, Ohio, and Jiro Yamada, Kobeshi, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 338,609, Feb. 9, 1995, abandoned. This application Feb. 2, 1996, Ser. No. 597,552
Claims priority, application Japan, May 22, 1992, 4-155637
Int. Cl.[6] A61F *13/16*
U.S. Cl. 604—393 **1 Claim**

1. A disposable training pant comprising:

1) an absorbent chassis having side edges and a front and a back waist area, comprising:

a liquid-pervious topsheet,

a liquid-impervious backsheet, and

an absorbent core positioned between said topsheet and said backsheet; and

2) an elasticized side panel attached to and joining the front waist area and the back waist area along each longitudinal side of the absorbent chassis, said side panel being laterally stretchable, comprising:

a front elasticized member and a back elasticized member, each comprising:

(i) a non-elasticized laminate portion comprising at least one elongatable, non-elastic nonwoven layer and at least one elastic layer, said non-elasticized laminate portion forming an outboard edge and

(ii) an elasticized laminate portion; and

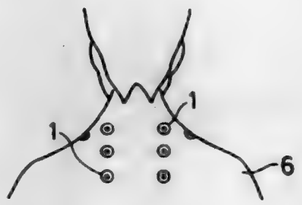
a side seam joining said outboard edges of said front elasticized member and said back elasticized member.

5,591,156

SEMICONDUCTOR MEDICAL TREATMENT INSTRUMENT

Toichi Chikuma, 4-11-9-703, Sendagaya, Shibuya-ku, Tokyo, 151, Japan

Filed Nov. 18, 1992, Ser. No. 977,968
Int. Cl.[6] A61B *17/00;17/38*
U.S. Cl. 606—1 **8 Claims**



1. A semiconductor medical treatment instrument, comprising:

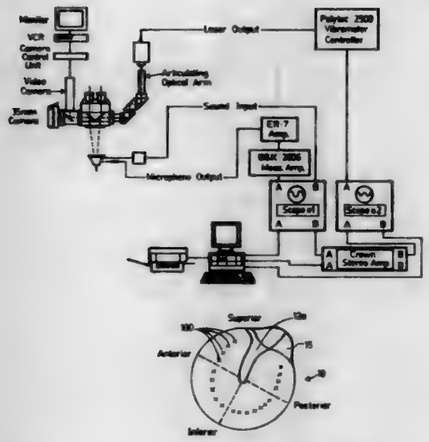
a first diode set having a first diode and a second diode in an antiparallel orientation relative to each other; and

a second diode set having a third diode and a fourth diode in an antiparallel orientation relative to each other, said third and fourth diodes being disposed orthogonally with respect to said first and second diodes.

5,591,157
METHOD AND APPARATUS FOR TYMPANIC MEMBRANE SHRINKAGE

David R. Hennings, 190 Welcome Rd., New Castle, Calif. 95658; Arthur V. Vassiliadis, 720 Morningside; Richard L. Goode, 440 Old Oak Ct., both of Los Altos, Calif. 94022; Bruce J. Sand, 24922 Jim Bridge Rd., Hidden Hills, Calif. 91302, and Stuart Harmon, 4321 Beechmont Ave., San Jose, Calif. 95136

Filed Sep. 7, 1994, Ser. No. 301,911
Int. Cl.[6] A61H *5/06*
U.S. Cl. 606—3 **42 Claims**



1. A method for treating the ear comprising supplying energy to a tympanic membrane, the energy having a collagen absorption coefficient in a range of 10 to 1 50 cm^{-1}, to shrink collagen tissue in the tympanic membrane without damaging the tympanic membrane due to ablation of a portion of the tympanic membrane, wherein the tympanic membrane being treated has a retraction pocket, and the energy is directed in a pattern around the retraction pocket to tighten this retraction pocket.

5,591,158

Patent Not Issued For This Number

5,591,159
TRANSCAVITARY MYOCARDIAL PERFUSION APPARATUS

Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221

Filed Nov. 9, 1994, Ser. No. 336,412
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—15 **7 Claims**



1. Method for the treatment of coronary artery disease which comprises the steps of:
effecting puncture of the femoral artery in the human heart by means of a needle and guide wire,
passing a thin walled sheet and introducer over the guide wire and directing same to the left ventricle of a patient,
removing the introducer and replacing same with a spring handled plunger having a capsule bearing a plurality of slit needles, each of which is anchored in a bulb,
activating the plunger, so causing the slit needles in said capsule to move forward in a plane normal to the plunger and into the myocardium of a patient,
withdrawing the plunger and the slit needles from the myocardium, and effecting perfusion of the myocardium.

5,591,160
FIBER OPTIC SLEEVE FOR SURGICAL INSTRUMENTS

Michael Reynard, 1301 - 20th St. #260, Santa Monica, Calif. 90404

Division of Ser. No. 125,774, Sep. 24, 1993. This application Jun. 5, 1995, Ser. No. 461,046
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—15 **15 Claims**

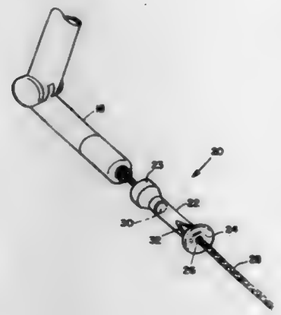
1. A phacoemulsification instrument and disposable fiber optic sleeve comprising, in combination:
a phacoemulsification instrument having a proximal end and a distal end having a hollow needle tip mounted in the proximal end of the instrument;
a disposable light transmitting sleeve mounted on the proximal end of the instrument and extending about said needle near the distal end thereof;
said sleeve being in the form of a generally tubular structure with proximal and distal ends removably mounted on said surgical instrument and formed of soft, flexible, non-toxic medical grade plastic material extending between inner and outer walls, said tubular structure further including inner and outer cylindrical surfaces; and
further including means for controlling and directing optical radiation internally between said walls and substantially along the sleeve between said ends of the tubular structure for illuminating the distal end of said needle.

5,591,161
ANGLED BEAM DELIVERY HANDPIECE FOR LASER OR OTHER MONOCHROMATIC LIGHT SOURCE

Charles C. Negus, and Stephen J. Linhares, both of Taunton, Mass., assignors to PLC Medical Systems, Inc., Milford, Mass.

Filed Oct. 25, 1995, Ser. No. 548,269
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—17 **8 Claims**

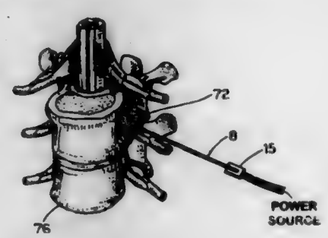
1. An angled beam delivery handpiece comprising:
a barrel for delivering a monochromatic light beam;
an apertured contact surface at the distal end of said barrel for contacting tissue; and
a refractive element in said barrel for diverting the beam carried by the barrel to exit said aperture at an angle relative to the laser beam in said barrel.



5,591,162
TREATMENT METHOD USING A MICRO HEAT PIPE CATHETER

Leroy S. Fletcher, College Station, Tex., and George P. Peterson, West Springfield, Va., assignors to The Texas A&M University System, College Station, Tex.

Division of Ser. No. 994,551, Dec. 21, 1992, Pat. No. 5,417,686, which is a continuation-in-part of Ser. No. 550,519, Jul. 10, 1990, Pat. No. 5,190,539. This application Mar. 21, 1994, Ser. No. 215,276
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—25 **24 Claims**



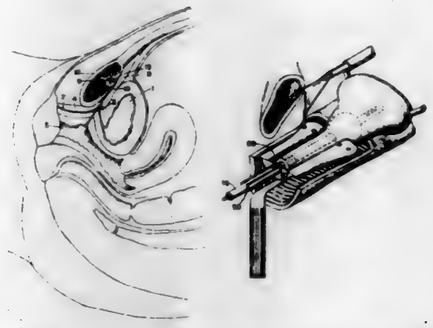
1. A method of treating diseased tissue comprising the steps of
inserting a needle-like end of a micro heat pipe catheter into said diseased tissue,
maintaining said needle-like end of said micro heat pipe catheter within a prescribed temperature range; and
using an insulative coating to thermally insulate a portion of said micro heat pipe catheter to protect healthy tissue from thermal damage.

5,591,163
APPARATUS AND METHOD FOR LAPAROSCOPIC URETHROPEXY

Ronald J. Thompson, Ft. Thomas, Ky., assignor to Incont, Inc., Ft. Thomas, Ky.

Filed Jun. 14, 1995, Ser. No. 490,463
Int. Cl.[6] A61B *17/38*
U.S. Cl. 606—29 **25 Claims**

14. A surgical method for performing urethropexy on a female patient, said surgical method comprising the steps of:
(a) providing first and second anchors, each of said anchors having a suture extending therefrom, each of said sutures having a pair of tails;
(b) securing said anchors within the abdominal cavity of said patient;
(c) positioning the surgical template of claim 7 within the vagina of the patient such that one of said wing members extends laterally away from either side of the patient's urethra adjacent the vaginal mucosa;
(d) passing a tail of one of said sutures through the periurethral fascia, the vaginal mucosa, and one of said guide apertures into the vagina;
(e) repeating step (d) for the remaining three tails and guide apertures, such that a single tail is pulled through each guide aperture;
(f) tying the two tails of each suture to each other within the vagina such that said sutures will elevate the urethra to the desired angle.



5,591,164
EXTERNAL FIXATION APPARATUS AND SYSTEM

Aniruddha A. Nazre, Warsaw, and Elson B. Fish, Lakeville, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

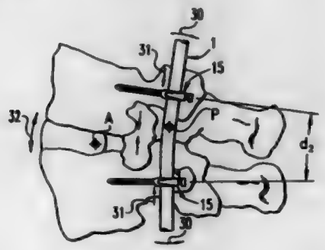
Filed Dec. 22, 1994, Ser. No. 361,779
Int. Cl.[6] A61B *17/64*
U.S. Cl. 606—59 **9 Claims**



1. A system for external fixation and stabilization of a fracture in a bone, comprising:
a plurality of fixation rods, each said fixation rod having a substantially identical exterior geometry;
at least two fixation pins attachable to the bone; and
at least two clamp assemblies, each said clamp assembly interconnecting at least one said fixation pin and a selected one of said fixation rods;
wherein said fixation rods have about the same bending and torsional stiffness from one said fixation rod to another, and

have a varying axial compression stiffness from one said fixation rod to another.

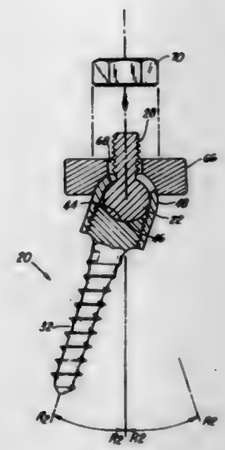
5,591,165
APPARATUS AND METHOD FOR SPINAL FIXATION AND CORRECTION OF SPINAL DEFORMITIES
Roger P. Jackson, Prairie Village, Kans., assignor to Sofamor, S.N.C., Rang-Du-Fliers, France
PCT No. PCT/US93/09919, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO94/10944, PCT Pub. Date May 26, 1994
PCT Filed Oct. 15, 1993, Ser. No. 244,435
Claims priority, application France, Nov. 9, 1992, 92 13476
Int. Cl.[6] A61B *17/70*
U.S. Cl. 606—61 **26 Claims**



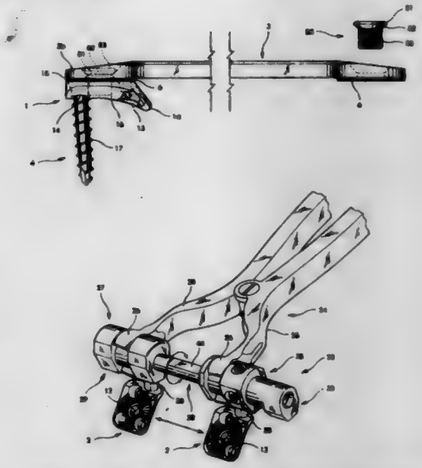
15. A method for correction of a spinal deformity comprising the steps of:
implanting a longitudinal member extending between a plurality of vertebrae along a portion of the length of the deformed spine of the patient;
engaging at least one bone anchorage element to each of the plurality of vertebrae;
connecting each bone anchorage element to the longitudinal member; and
manually bending the longitudinal member within the patient with the vertebrae connected thereto to thereby manipulate the vertebrae to correct the spinal deformity by the bending of the rod.

5,591,166
MULTI ANGLE BONE BOLT
Andrew Bernhardt, Cordova, and Matthew M. Morrison, Memphis, both of Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.
Filed Mar. 27, 1995, Ser. No. 411,532
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—61 **26 Claims**

1. An orthopedic bone bolt and bone plate construct comprising:
a) a bone plate member having at least one open portion, each open portion allowing placement of a series of fasteners therethrough at spaced apart positions along a length of each open portion;
b) a series of fasteners attachable to said plate member at said at least one open portion, at least one of said fasteners including a multi-angle fastener having a pair of fastener sections configured to be angled relative to one another;
c) said multi-angle fastener comprising;
an upper section having a central longitudinal axis, an externally threaded projection and an outer surface;
a lower section having a central longitudinal axis and an outer surface having bone attachment means configured to be surgically implantable into a patient's bone tissue;
joint means for connecting the upper and lower sections together, said joint means including corresponding mating surfaces configured to articulate with each other sufficiently to allow the upper and lower sections to angle relative to one another.

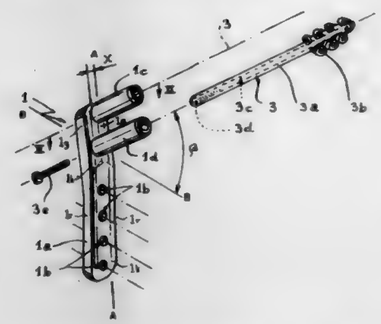


5,591,167
ANTERIOR DORSO-LUMBAR SPINAL OSTEOSYNTHESIS INSTRUMENTATION FOR THE CORRECTION OF KYPHOSIS
Jean-Marie Laurain, Pouilley les Vignes, France; Ronald L. DeWald, Chicago, Ill.; Jean-Francois D'Amore, Stella Plage, and Guy Deneuvillers, Merlimont, both of France, assignors to Sofamor, S.N.C., Rang du Fliers, France
Division of Ser. No. 196,517, Feb. 15, 1994, Pat. No. 5,487,743. This application May 26, 1995, Ser. No. 452,645
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—61 **5 Claims**



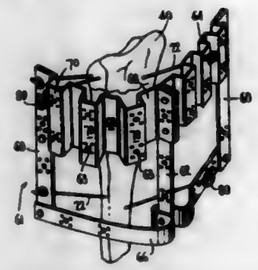
1. A piston assembly for placing in position two implants forming part of an anterior dorso-lumbar spinal osteosynthesis instrumentation, usable with forceps having two branches and first and second noses at the respective ends of said branches, comprising:
a first element including a body, a shaft extending from said body, an annular groove defined in said body for receiving a first nose of one branch of the forceps, and at least one radial aperture defined in said body;
a second element, longitudinal cavity defined in said second element permitting said second element to slide on said shaft of said first element, said second element including a second body, an annular groove defined in said second body for receiving a second nose of another branch of the forceps, and at least one aperture defined in said second body;
a pair of studs removably mountable within an aperture in a corresponding one of said first and second elements, said studs projecting from said first element and said second element and being insertable in complementary apertures in the two implants; and
means for limiting the relative longitudinal position of said body of said second element on said shaft and consequently the distance between said studs respectively mounted in said apertures of said first element and said second element.

5,591,168
DEVICE FOR STABILIZING FRACTURES OF THE UPPER END OF THE FEMUR
Thierry Judet, Ville d'Avray, and Gérard Saillant, Celle Saint Cloud, both of France, assignors to Tornier S.A., Saint-Ismier, France
Continuation of Ser. No. 328,665, Oct. 25, 1994, abandoned. This application May 7, 1996, Ser. No. 643,835
Claims priority, application France, Oct. 25, 1993, 93 12899
Int. Cl.[6] A61B *17/56;17/58*
U.S. Cl. 606—65 **6 Claims**



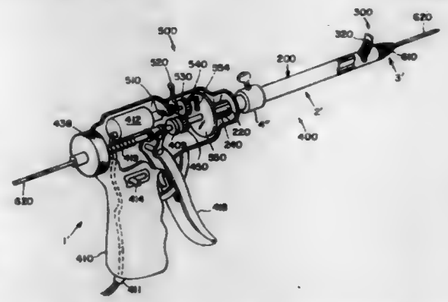
1. A device for stabilizing fractures of the upper end of the femur comprising, a plate having opposite side edges, a lower part having holes therethrough, an upper part and a middle portion between said upper and lower parts, said upper part having a front face, two parallel cylindrical barrels extending from said front face of said upper part which are offset both laterally at a first angle from a first plane extending perpendicularly to said front face and through said plate and generally parallel to said opposite side edges thereof and vertically at a second angle from a second plane extending through said middle portion of said plate generally perpendicularly to said front face and generally perpendicular to said first plane, and said two parallel cylindrical barrels being offset with respect to each other so that one of said barrels is positioned closer to one of said opposite side edges while the other of said barrels is positioned closer to the other of said opposite side edges.

5,591,169
DEVICE AND METHOD FOR POSITIONING AND HOLDING BONE FRAGMENTS IN PLACE
Louis Benoist, 111 Northbay Pl., Madison, Miss. 39110
Continuation-in-part of Ser. No. 260,412, Jun. 14, 1994, abandoned. This application Mar. 14, 1995, Ser. No. 403,628
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—69 **2 Claims**



1. A bone organizer for repairing a bone fracture comprising a plurality of wires for insertion into bone and a template made of a lightweight metal having a plurality of randomly dispersed holes for receiving and holding one end of said wires, said template comprising side bars and a central bar, said side bars being on a plane or planes different from the plane of said central bar, each of said bars being held together at a first end by a rectangular metal sheet having alternate furrows and ridges and at the second end by a thin metal strip, said ridges and side bars having a plurality of holes therein for receiving a fastener, said fastener having a body portion and a screw portion, said body portion having a central vertical opening for receiving said screw portion and a plurality of vertical openings adjacent to the central opening for receiving said plurality of wires, said screw portion having an enlarged head to hold said wires in fixed position.

5,591,170
INTRAMEDULLARY BONE CUTTING SAW
Alan R. Spievack, Cambridge, and Fernando A. de Toledo, Concord, both of Mass., assignors to Genesis Orthopedics, Cambridge, Mass.
Filed Oct. 14, 1994, Ser. No. 324,514
Int. Cl.[6] A61B *17/14;17/16*
U.S. Cl. 606—82 **67 Claims**



1. A saw for cutting a bone having an intramedullary canal comprising:
a tube having a longitudinal axis and a side wall with a slot therethrough, the tube positionable within the intramedullary canal of the bone;
a cutting blade movable transversely of the longitudinal axis of the tube and through the slot between a rest location within the tube and a working location outside the tube and within the bone;

an actuating mechanism coupled to the cutting blade for moving the cutting blade through the slot, alternately between the rest location and the working location; and

a motor coupled to the cutting blade to operate the cutting blade about the longitudinal axis of the tube to cut the bone when the cutting blade is in the working location.

5,591,171

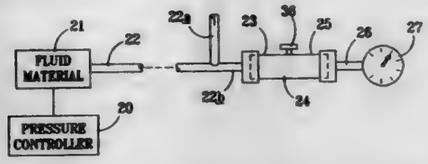
ADAPTER AND METHOD FOR MEASURING PRESSURES OF FLUID MATERIALS

Byron L. Brown, 2315 Hendricks, Fort Smith, Ark. 72903

Continuation of Ser. No. 315,675, Sep. 30, 1994, abandoned, which is a continuation of Ser. No. 988,808, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 715,406, Jun. 14, 1991, abandoned. This application May 15, 1995, Ser. No. 441,838

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—94 **8 Claims**



1. Apparatus for measuring pressures of uncontaminated medical polymerizing materials while maintaining the uncontaminated state of such fluid materials comprising:

(a) a source of said uncontaminated medical polymerizing materials having a communicating orifice therein for communicating said fluid materials therewithin;

(b) an adapter having a pair of opposed ends, and an internal passageway extending therethrough, from one end to the other end;

(c) means for interconnecting said one end of said adapter with said communicating orifice, thereby to expose said one of said ends to said uncontaminated medical fluid materials;

(d) an inflatable and expandable diaphragm means having an inner surface and an outer surface, said diaphragm means being affixed within said adapter for contacting said polymerizing materials with said inner surface, for preventing said polymerizing materials from traversing said internal passageway, and for defining a variable volume within said adapter, extending from said outer surface to said other end; and

(e) pressure measuring means connected to said other end and closing said other end, thereby to enclose said variable volume, said pressure measuring means measuring pressure within said variable volume.

5,591,172

TRANSLUMINAL IMPLANTATION DEVICE

Michel Bachmann, Rouanel, and Robert Nissels, Corbeyrier, both of Switzerland, assignors to AMS Medinvent S.A., Crissier, Switzerland

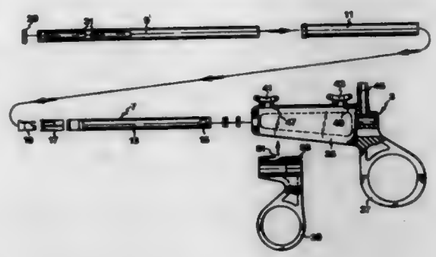
Continuation-in-part of Ser. No. 891,887, Jun. 1, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 207,324

Claims priority, application Sweden, Jun. 14, 1991, 9101841

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—108 **17 Claims**

1. A transluminal implantation device comprising a central tube surrounded by an outer tube axially displaceable relative to said central tube, the tubes being sized to form an annular space therebetween capable of accommodating a stent in an unexpanded state, said central tube having a distal end and further including sleeve means slidably positioned around and located proximate the distal end of said central tube and adapted for capturing at least a proximal portion of said stent restraining the proximal portion of



said stent against movement, said sleeve means further including releasable latching means comprising at least one member being biased into engagement with a recess in said central tube and coacting with said outer tube for maintaining said sleeve in a first position, wherein said outer tube includes means for releasing said latching means and for engaging said sleeve for rearward sleeve movement and stent release, and means for axial displacement of said outer tube and said sleeve relative to said central tube, wherein the proximal portion of said stent is adapted to remain stationary until release thereof by rearward displacement of said sleeve and said outer tube whereupon the stent becomes fully deployed.

5,591,173

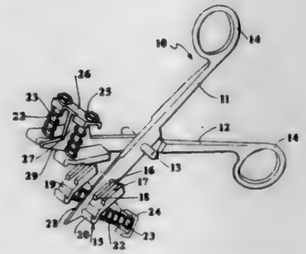
SCHIFANO OBSTETRIC SCISSORS

Michael Schifano, 5525 N. Stanton, El Paso, Tex. 79912, assignor to Michael Schifano, El Paso, Tex.

Filed Jul. 28, 1994, Ser. No. 281,935

Int. Cl.[6] A61B *17/42*

U.S. Cl. 606—120 **14 Claims**



5. An apparatus for severing a compressible body, the apparatus comprising:

a first handle having a first cutting edge;

a second handle having a second cutting edge constructed and arranged to pivotably rotate with respect to the first handle;

a clamp holder base arranged adjacent to each of the cutting edges;

a support member having a spring retainer; and

a spring shaft having a spring encircling the spring shaft, one end of the spring shaft being operatively connected to the support member so that the retainer maintains the spring on the spring shaft and the other end of the spring shaft being operatively connected to the clamp holder base so that the spring urges the clamp holder base away from the spring retainer to clamp at least one clamp to seal the compressible body prior to severing same.

5,591,174

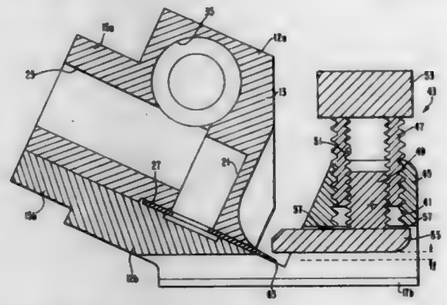
MICROKERATOME AND METHOD AND APPARATUS FOR CALIBRATING A MICROKERATOME

Raymond C. Clark, Caputa; Hilton L. Grisel, Sturgis, and Kent D. Reimann, Rapid City, all of S. Dak., assignors to Chiron Vision Corporation, Irvine, Calif.

Filed Feb. 2, 1994, Ser. No. 190,515

Int. Cl.[6] A61B *19/00; A61F 9/00*

U.S. Cl. 606—130 **15 Claims**



1. A method for measuring the blade extension of a microkeratome assembly having a blade defining a cutting edge and a gauge member defining a bottom surface spaced from the cutting edge, said method comprising:

positioning the microkeratome assembly adjacent a magnifying device defining a line of sight for the user and including a reticle visible in the line of sight, said reticle defining a linear marking, said microkeratome assembly being positioned within the line of sight such that the bottom surface of the gauge member lies in a plane parallel to the line of sight;

aligning the linear marking with one of the cutting edge or the bottom surface of the gauge member;

causing relative movement between the reticle and the microkeratome assembly in a direction perpendicular to the linear marking so that the linear marking is aligned with the other of the cutting edge or the bottom surface of the gauge member;

monitoring the relative movement with a measuring device; and

reading the amount of movement recorded by the measuring device to obtain the blade extension.

5,591,175

DEVICE FOR POSITIONING A PERSON'S HEAD IN A COORDINATE SYSTEM

Jan-Erik Juto, Linnégatan 86, S-115 23, Stockholm, Sweden

PCT No. PCT/SE93/00669, § 371 Date Feb. 10, 1995, § 102(e) Date Feb. 10, 1995, PCT Pub. No. WO94/04076, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 12, 1993, Ser. No. 382,049

Claims priority, application Sweden, Aug. 12, 1992, 9202334

Int. Cl.[6] A61B *19/00;5/103*

U.S. Cl. 606—130 **4 Claims**

1. A device for fixing a person's head in a coordinate system, comprising:

a plurality of pressure transducers, the pressure transducers being movable in the coordinate system and being adapted to be contacted with the person's head when fixing the person's head in the coordinate system;

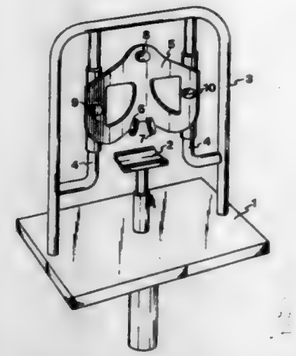
means, associated with each of the pressure transducers, for detecting when the transducers are acted on by at least one predetermined pressure from the person's head;

support means on which the plurality of pressure transducers is fixed;

a frame fixedly arranged in the coordinate system, the support means being movably mounted on the frame; and

means for recording positions of the pressure transducers in the coordinate system,

wherein the support means has the shape of a spectacle frame having two eye holes and two pressure transducers, the two



pressure transducers being arranged as pad bridges to be contacted with a nasal bone of the person's head by moving the nasal bone of the person's head into contact with the two pressure transducers.

5,591,176

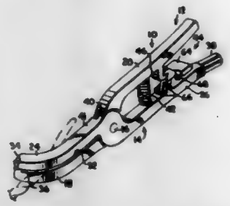
METHOD AND APPARATUS FOR LIVESTOCK CASTRATION

Lance S. Henderson, Edwards, and Randall C. Parks, Independence, both of Mo., assignors to Stone Manufacturing & Supply Co., Inc., Kansas City, Mo.

Filed Nov. 29, 1994, Ser. No. 346,481

Int. Cl.[6] A61D *1/06*

U.S. Cl. 606—137 **13 Claims**





12. A selectively lockable clamp for castrating livestock by twisting the spermatic cords until said cords break as a result of said twisting, said clamp comprising:

a pair of elongated, rigid members each having a longitudinal axis and opposed ends, said members being pivotally interconnected between their ends to present a pair of jaws and a pair of handles, said jaws being curved from the longitudinal axes of said members and adapted to be manipulated by the handles between a clamped position with opposed facing surfaces of the jaws grasping a spermatic cord and a released position allowing removal of said spermatic cord;

a projection carried on one of said jaws and engageable with the other of said jaws when the jaws are in said clamped position to maintain said opposed facing surfaces of the jaws apart a preselected distance to prevent severing of the spermatic cord by said opposed facing surfaces when the jaws are in said clamped position;

a latch carried by said members for holding the jaws in said clamped position grasping said spermatic cord, said latch being selectively manually operable to release the jaws from the clamped position to allow release of said spermatic cord; and

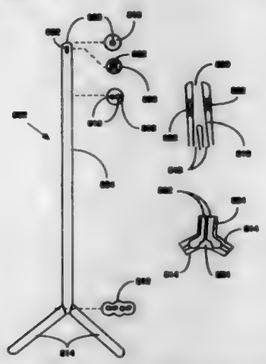
a shank on one of said handles for coupling said one handle with a source of torque for rotating the clamp to twist and break the spermatic cord when the jaws are in said clamped position with said spermatic cord gasped between said opposed facing surfaces of the jaws.

5,591,177

APPARATUS AND METHOD OF EXTRACORPOREALLY APPLYING AND LOCKING LAPAROSCOPIC SUTURE AND LOOP LIGATURES

Theodor Lehrer, 936 Intracoastal Dr., Apt. 21C, Ft. Lauderdale, Fla. 33304

Continuation-in-part of Ser. No. 164,462, Dec. 9, 1993, Pat. No. 5,536,273. This application Dec. 7, 1994, Ser. No. 351,550
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—139 **34 Claims**



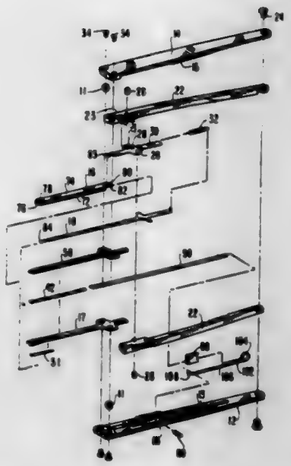
1. A ligator device for extracorporeally manipulating both suture strands of a slip knot and pushing hitch knots, comprising:
a shaft having a proximal end and a distal end, the shaft further comprising:
an aperture at its distal end;
a first side aperture located between the distal end and the proximal end;
an internal channel connecting the distal end aperture and the first side aperture; and
the distal end aperture, first side aperture and internal channel sized such that at least one suture strand can be slidably inserted into the distal end aperture and exit the first side aperture.

5,591,178

SURGICAL CLIP APPLIER

David T. Green, Westport; Henry Bolanos, East Norwalk; Daniel E. Alesi, Sherman, all of Conn., and Kenneth E. Tuso, Portchester, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 331,166, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 240,201, May 9, 1994, abandoned, which is a continuation of Ser. No. 959,201, Oct. 9, 1992, abandoned. This application Sep. 13, 1995, Ser. No. 527,698
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—143 **9 Claims**



1. A surgical clip applicator comprising:
a housing defining a proximal end and a distal end;
a pair of handles pivotally connected to said proximal end of said housing and being actuable in a tweezer like manner, each of said handles extending from said proximal end of said housing towards said distal end of said housing;
a jaw assembly defining a pair of jaws extending from said housing for receiving and deforming a clip therebetween, said jaw assembly including a clip carrier portion;
a cover means extending from said housing and positioned and said clip carrier portion in overlying relation for holding a series of clips therebetween;
a channel assembly slidably mounted in said housing and substantially enclosing said jaw assembly and said cover means, said channel assembly terminating adjacent said pair of jaws;
camming means operatively connected to a proximal end of said channel assembly for sliding said channel assembly in a distal direction in response to closing of said handles to move said jaws towards each other to deform a clip positioned therebetween;
feed bar means slidably mounted in said channel assembly in overlying relation to said carrier portion for feeding said clips into said jaws, said feed bar means including a camming portion at a proximal end thereof;
a pusher bar slidably mounted in said channel assembly for advancing said series of clips along said clip carrier portion;
first spring means connected between said camming means and said feed bar means for biasing said feed bar means in a distal direction and for further biasing said channel assembly in a proximal direction;
second spring means biasing said pusher bar in a distal direction to push a foremost clip from said plurality of clips to position a distalmost clip between said jaws in response to opening of said handles; and
clip retaining means for preventing movement of said plurality of clips into said jaws and being movable between a fist position which prevents movement of said clips and a second position which permits said clips to advance distally, said retaining means being movable from said first to said second position by engagement with said feed bar means;
wherein said handles are connected to said camming means to effect distal movement of said channel assembly, and further are engagable with said camming portion of said feed bar means to effect substantially simultaneous proximal movement of said feed bar means upon closing of said handles.

5,591,179

ANASTOMOSIS SUTURING DEVICE AND METHOD

Robert A. Edelstein, Boston, Mass., assignor to Applied Medical Resources Corporation, Laguna Hills, Calif.

Filed Apr. 19, 1995, Ser. No. 424,958
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—144 **18 Claims**



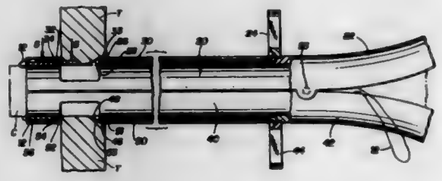
1. A surgical suturing device comprising:
an elongate body having a lumen, an outer surface, and an axis extending between a proximal end and a distal end;
a handle disposed at the proximal end of the body;
portions of the body defining a lumen having a generally axial portion extending to the proximal end and a transverse portion extending distally from the axial portion and exiting the body through the outer surface of the body;
the transverse portion of the lumen exiting the elongate body at an exit hole at the outer surface of the body and being sized and configured to receive a needle and a suture attached to the needle;
attachment means disposed at the distal end of the elongate body distally of the exit hole; and
means disposed in the axial portion of the lumen and movable through the lumen for deploying the needle and the suture from the lumen.

5,591,180

SURGICAL SUTURING APPARATUS

Peter W. J. Hinchliffe, New Haven, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Apr. 19, 1995, Ser. No. 425,130
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—144 **20 Claims**



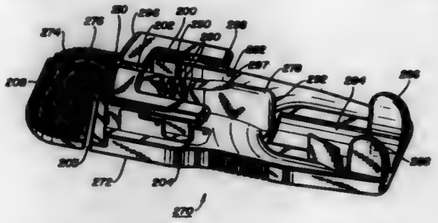
1. An apparatus for suturing body tissue comprising:
first and second elongated body halves detachably connected to one another, each body half having proximal and distal portions and defining a longitudinal axis such that when the body halves are connected, the respective proximal and distal portions are positionable substantially adjacent each other;
first and second needles movable with respect to the first and second body halves, respectively, each of the needles having a penetrating tip facing in a distal direction;
at least one actuator operatively associated with the first and second needles, wherein actuation of the at least one actuator advances the first and second needles into body tissue
a needle engaging member positioned in proximity to the distal portions; and
a suture attached to the needle engaging member.

5,591,181

SURGICAL SUTURING APPARATUS WITH LOADING MECHANISM

Corbett W. Stone, Newtown, Conn.; Stephen W. Zlock, Hawthorne, N.Y., and David A. Nicholas, Trumbull, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 293,233, Aug. 19, 1994, Pat. No. 5,478,344, which is a continuation-in-part of Ser. No. 134,145, Oct. 8, 1993, abandoned. This application Dec. 11, 1995, Ser. No. 570,150
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—144 **8 Claims**



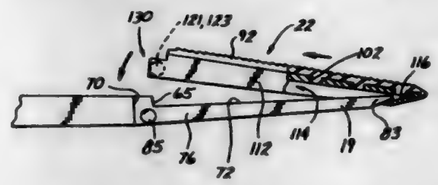
1. A loading unit for loading a needle into at least one of a pair of jaws of a surgical suturing apparatus comprising:
a body portion;
a needle releasably supported in the body portion;
wherein the body portion includes jaw receiving structure to receive at least one of the jaws of the suturing apparatus for loading the needle into at least one of the jaws.

5,591,182

ATRAUMATIC SURGICAL CLAMPING INSTRUMENT

Gary M. Johnson, Mission Viejo, Calif., assignor to Applied Medical Resources Corporation, Laguna Hills, Calif.

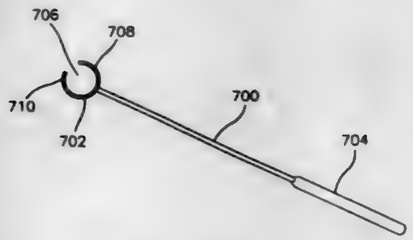
Filed Oct. 17, 1994, Ser. No. 324,418
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—151 **18 Claims**



1. A surgical clamping device for releasably engaging a body structure, including:
a first jaw;
a second jaw disposed in opposing relationship with the first jaw and movable relative to the first jaw between a first position wherein the first and second jaws have a proximate relationship to engage the body structure, and a second position wherein the first and second jaws have a spaced relationship to release the body structure;
the first jaw having a supporting surface facing generally toward the second jaw and an opposing surface facing generally away from the second jaw;
an insert removably mountable in operative disposition on the first jaw;
an insert base included in the insert, the base being sized and configured for disposition on the supporting surface of the first jaw;
an elastomeric material included in the insert and carried by the insert base;
means for attaching the insert base to the first jaw; and

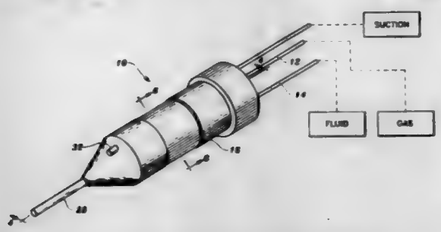
the attachment means engaging the first jaw and the insert base proximally of the supporting surface of the first jaw, without contacting said supporting surface, when the insert is operatively disposed on the first jaw.

5,591,183
DISSECTION APPARATUS
Albert K. Chin, Palo Alto, Calif., assignor to Origin Medsystems, Inc., Menlo Park, Calif.
Filed Apr. 12, 1995, Ser. No. 421,481
Int. Cl.[6] A61B 17/22
U.S. Cl. 606—159 **6 Claims**



1. A dissection device for isolating a vessel from connected tissue along the course of the vessel, the device comprising:
a slotted rigid ring having at least one tissue-dissecting edge extending substantially along the circumference of the ring, the slot in the ring having a width at least equal to the width of the vessel; and
an elongated, rigid support member connecting to and extending generally perpendicular to a plane formed by the ring.

5,591,184
FLUID JET SURGICAL CUTTING INSTRUMENT
Christopher McDonnell, Newtown; David L. Cortes, Brookfield; Kenneth H. Whitfield, New Haven, and Ian M. Scott, Ridgefield, all of Conn., assignors to Sentinel Medical, Inc., Norcross, Ga.
Filed Oct. 13, 1994, Ser. No. 322,882
Int. Cl.[6] A61B 17/32
U.S. Cl. 606—167 **23 Claims**



1. A fluid jet surgical cutting instrument comprising:
a housing connectable to a low pressure fluid source and a gas source;
a cannula extending from a distal end of said housing;
a gas pressure driven pressure amplifying mechanism disposed in said housing, said pressure amplifying mechanism including a piston disposed in an interior cavity within said housing, said cavity being divided by said piston into a drive chamber and a retract chamber, said piston being reciprocatingly movable within said cavity; and
an actuator for controlling said piston, said actuator including a first passageway situated within said housing for connecting said gas source with said drive chamber, and a second passageway situated within said housing for connecting said retract chamber with an exhaust vent in said housing to permit said piston to be driven in a distal direction to generate a high pressure fluid output from a distal end of said cannula from said low pressure fluid input.

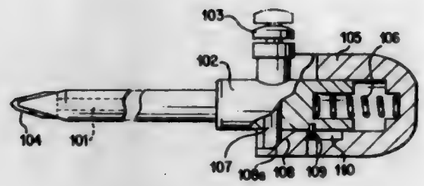
5,591,185
METHOD AND APPARATUS FOR REPROFILING OR SMOOTHING THE ANTERIOR OR STROMAL CORNEA BY SCRAPING
Lauren G. Kilmer, Tulsa; Robert E. Nordquist, Oklahoma City, both of Okla.; Michael Nadalsky, Redondo Beach, and David R. Gibson, Lake Forest, both of Calif., assignors to Corneal Contouring Development L.L.C., Tulsa, Okla.
Continuation-in-part of Ser. No. 170,679, Dec. 20, 1993, Pat. No. 5,368,604, which is a continuation of Ser. No. 939,856, Sep. 2, 1992, abandoned, which is a continuation of Ser. No. 894,162, Jun. 3, 1992, abandoned, which is a continuation of Ser. No. 592,601, Oct. 4, 1990, abandoned, which is a continuation-in-part of Ser. No. 450,672, Dec. 14, 1989, Pat. No. 5,063,942. This application Nov. 28, 1994, Ser. No. 345,245
Int. Cl.[6] A61F 9/00
U.S. Cl. 606—166 **25 Claims**



5. A method of smoothing an anterior or exposed stromal corneal surface that has been corrugated, rippled, roughened or hardened due to the performance of a corneal refractive procedure, which comprises rotating or oscillating a scraping tool upon said corrugated, rippled, roughened or hardened surface until said surface is smoothed, said scraping tool having at least one sharpened, substantially planar knife-edge scraper blade for placement substantially perpendicular relative to said surface.

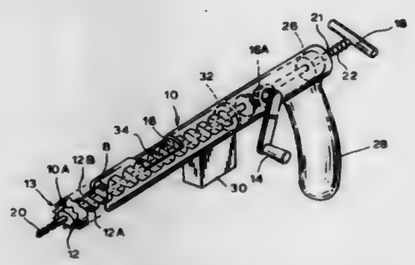
5,591,186
SELF-CUTTING TROCAR
Helmut Wurster, Mozartstrasse 28, 75038 Oberderdingen, and Gerd Buess, Klostermuehle 7, 72074 Tuebingen, both of Germany
Continuation of Ser. No. 240,586, May 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 887,151, May 22, 1992, abandoned. This application Mar. 13, 1996, Ser. No. 615,635
Claims priority, application Germany, May 22, 1991, 41 16 648.5
Int. Cl.[6] A61B 17/34
U.S. Cl. 606—170 **6 Claims**

5. A trocar comprising:
a sleeve having a conical tip area, a cutting tool in the conical tip area having at least one cutting blade and movable relative to the sleeve toward and away from an active cutting position,



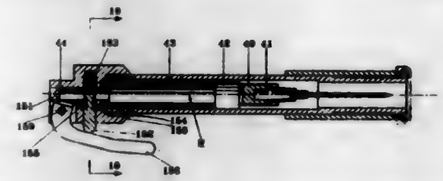
an actuating device having a first means actuatable to move the cutting tool relative to the sleeve in a longitudinal direction thereof distally into the active cutting position and away from the active position and a second means to disactuate the first means and move the cutting tool proximally into a non-cutting inoperative position such that the at least one blade is moved toward the active cutting position when the first means is engaged and is automatically moved away from the active cutting position when a distally directed pressing force on the trocar exceeds a predetermined value.

5,591,187
LAPAROSCOPIC TISSUE RETRIEVAL DEVICE AND METHOD
Moshe Dekel, 11 Ebbtide Ct., Oakdale, N.Y. 11769
Filed Jul. 14, 1995, Ser. No. 502,616
Int. Cl.[6] A61B 17/14
U.S. Cl. 606—180 **64 Claims**



1. A material retrieval instrument comprising:
a cylindrical sheath having a distal open end and a proximal end;
an auger disposed in the sheath for rotation therein, the auger having a cutting blade disposed thereon, the cutting blade extending from the distal open end of the sheath for engagement with material to be retrieved, the auger including a central longitudinal opening, the opening receiving an engaging member adapted to extend from the auger for engaging material to move the material into engagement with the cutting blade on the auger;
the auger being rotatable in the sheath and comprising a conveyor for moving cut material longitudinally along the auger in the sheath to a material receiving reservoir; and
a device coupled to the auger for rotating the auger.

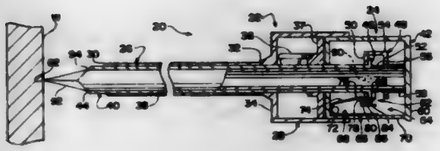
5,591,188
SURGICAL INSTRUMENT FOR IMPACT INSERTION OF AN INTRAOSSEOUS TROCAR-NEEDLE
Marc Waisman, Kiryat Bialik, Israel, assignor to Wais-Med Ltd., a subsidiary company of Teic Technion Enterpreneurial Incubator Ltd., Nesher, Israel
Filed Nov. 1, 1994, Ser. No. 332,860
Claims priority, application Israel, Apr. 12, 1994, 109294
Int. Cl.[6] A61B 10/00
U.S. Cl. 606—182 **14 Claims**



1. A surgical instrument for forcefully driving a trocar needle into a patient's bone through the skin and the tissue by the force of an expanding helical spring, and for releasing said trocar needle for connection of a syringe, an infusion or medication set to said trocar needle, the instrument including:
a longitudinal housing having a front end and a rear end, said housing being in the shape of a hollow cylinder including a smooth bore extending from its rear end to a stop close to its front end,
a screw cap closing the rear end of said housing, said screw cap having a rear portion extending beyond the rear end of said housing,
a trocar needle having a sharp front end for penetrating said bone and a rear end surrounded by an outstanding connecting flange, said needle being positioned, in a cocked state, in said housing with its sharp front end close to the front end of said housing,
a bolt slidingly positioned in said housing, having a first front portion provided with means for releasably holding the rear end of said trocar needle, a second portion of a diameter coextensive with said smooth bore in said housing positioned to the rear of said stop, a third portion of smaller diameter, and a rear portion provided with means for being held in said rear portion of said screw cap in the cocked state,
safety catch means positioned in said screw cap for engagement with said means for being held to releasably hold said rear portion of said bolt,
a helical spring surrounding said third portion of said bolt and being held in a compressed state between said second portion of said bolt and said rear portion of said screw cap,
whereby said bolt is shot in a forward direction by the force of said helical spring as it expands when said safety catch means releases said rear portion of said bolt, and is stopped by contact of said second portion with said stop in said housing, effecting release of said trocar needle from the front portion of said bolt.

5,591,189
SAFETY PENETRATING INSTRUMENT WITH SAFETY MEMBER MOVING DURING PENETRATION AND TRIGGERED SAFETY MEMBER PROTRUSION
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131
Continuation-in-part of Ser. No. 83,220, Jun. 24, 1993, Pat. No. 5,431,635, Ser. No. 83,728, Jun. 29, 1993, Pat. No. 5,466,224, and Ser. No. 115,152, Sep. 2, 1993. This application Sep. 7, 1994, Ser. No. 301,897
Int. Cl.[6] A61M 5/00
U.S. Cl. 606—185 **27 Claims**

1. A safety penetrating instrument for establishing a portal in the wall of an anatomical cavity comprising
a housing;



an elongate cannula mounted by said housing and having a distal end for introduction in the anatomical cavity and a proximal end for positioning externally of the anatomical cavity;

a penetrating member disposed in said cannula and fixed relative to said housing, said penetrating member having a distal end for penetrating the anatomical cavity wall;

a safety member disposed within said cannula and having a distal end, said safety member being movable relative to said housing between an extended position where said safety member distal end protrudes distally from said penetrating member distal end and a retracted position where said safety member distal end is disposed proximally of said penetrating member distal end to expose said penetrating member distal end;

extending means for moving said safety member distally relative to said housing from said retracted position to said extended position;

means for manually moving said safety member proximally relative to said housing from said extended position to said retracted position;

locking means for locking said safety member in said retracted position to prevent distal movement of said safety member relative to said housing from said retracted position to said extended position while permitting proximal movement of said safety member relative to said housing from said retracted position during penetration of the anatomical cavity wall;

bias means for biasing said safety member distally relative to said housing in said retracted position while permitting proximal movement of said safety member relative to said housing from said retracted position during penetration of the anatomical cavity wall and distally relative to said penetrating member upon introduction in the anatomical cavity; and

releasing means responsive to movement of said safety member distally upon introduction in the anatomical cavity for triggering release of said locking means to permit said extending means to move said safety member distally relative to said housing from said retracted position to said extended position.

5,591,190

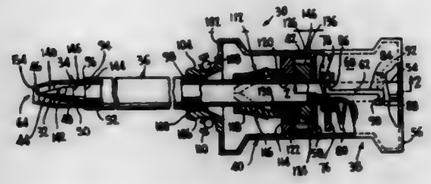
SAFETY TROCAR PENETRATING INSTRUMENT

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Continuation of Ser. No. 817,113, Jan. 6, 1992, Pat. No. 5,350,393. This application Sep. 26, 1994, Ser. No. 313,655

Int. Cl.[6] A61B *17/34*

U.S. Cl. 606—185 **9 Claims**



7. A safety trocar penetrating instrument comprising

an elongate, tubular portal sleeve having a distal end and a proximal end;

housing means coupled with said proximal end of said portal sleeve and having valve means therein for controlling fluid flow through said housing and said portal sleeve and for allowing passage of instruments therethrough;

a trocar disposed within said portal sleeve and having a proximal end and a solid distal end terminating at a sharp tip beyond said distal end of said portal sleeve for penetrating tissue;

a safety shield disposed between said portal sleeve and said trocar having a proximal end and a distal end and being movable between an extended position with said safety shield distal end protruding distally from said trocar tip and a retracted position with said safety shield distal end disposed proximally of said trocar tip to expose said trocar tip;

hub means abutting said housing means for receiving said proximal ends of said trocar and said safety shield, said trocar and said safety shield passing through said valve means in said housing means;

bias means for biasing said safety shield toward said extended position and for permitting said safety shield to move to said retracted position in response to a proximally directed force applied to said safety shield distal end, said bias means returning said safety shield to said extended position when the force applied to said safety shield distal end is removed; and

releasable locking means for selectively locking said safety shield in said retracted position.

5,591,191

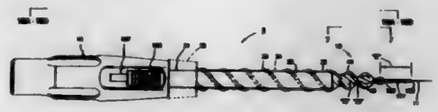
SURGICAL INSTRUMENT AND METHOD FOR HELICALLY INCISING A PATHWAY INTO THE INTERIOR OF THE BODY

Maciej J. Kieturakis, 372 Beverly Dr., San Carlos, Calif. 94070

Continuation-in-part of Ser. No. 187,753, Jan. 26, 1994, abandoned. This application Sep. 30, 1994, Ser. No. 316,164

Int. Cl.[6] A61M *29/00*

U.S. Cl. 606—185 **27 Claims**



1. A surgical instrument, comprising:

a longitudinally-extending sleeve; and

an incising assembly carried at a distal end of the sleeve, and comprising a blade member having at least one sharp helical blade edge capable of incising tissue and a cooperating slidable mating and interfitting shield member having an outer periphery not capable of incising tissue, the incising assembly thereby allowing relative helical movement between a non-incising end an incising position of the blade and shield members, wherein in the non-incising position the helical blade edge is not exposed, thereby to prevent incising of tissue by the blade edge and in the incising position the helical blade edge is exposed, thereby to allow incising of tissue by the blade edge;

a blade-exposing mechanism coupled to the blade and shield members of the incising assembly for exposing the blade member in the incising position; and

a shielding mechanism coupled to the blade and shield member of the incising assembly, thereby to move the incising assembly to the non-incising position from the incising position.

5,591,192

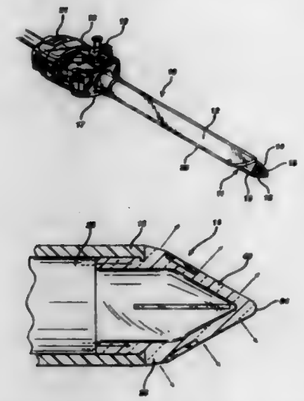
SURGICAL PENETRATION INSTRUMENT INCLUDING AN IMAGING ELEMENT

Salvatore Privitera, West Chester; Richard F. Schwemberger, and Ron Kolata, both of Cincinnati, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Feb. 1, 1995, Ser. No. 384,585

Int. Cl.[6] A61B *1/00*

U.S. Cl. 606—185 **20 Claims**



1. An imaging element adapted for use with a surgical penetration instrument, said instrument having an elongated, generally cylindrical shaft having a distal end and a shaft diameter, said shaft having a lumen therethrough for receiving an endoscope to deliver light for illumination of a body cavity and to transmit an illuminated image from said body cavity through a camera lens of said endoscope, said imaging element attached at said shaft distal end;

wherein said imaging element is hollow and comprises a generally circular base adjacent said shaft distal end, said base having a base diameter substantially the same as said shaft diameter; an exterior region extending distally from said base and having a surface configuration shaped to enlarge an opening as said instrument is advanced into bodily tissue, at least a portion of said exterior region being transparent; and an annular interior region descending proximally from said base, said annular interior region having an annulus diameter less than said base diameter, said annular interior region descending interiorly into said lumen of said shaft distal end;

wherein when said endoscope is received in said lumen of said shaft, said endoscope abuts said annular interior region of said imaging element, said light delivered from said endoscope for illumination of said body cavity is emitted directly into said hollow imaging element so as to avoid reflecting said light into said camera lens of said endoscope to lessen unwanted glare on said illuminated image.

5,591,193

RETRACTABLE SAFETY PENETRATING INSTRUMENT FOR PORTAL SLEEVE INTRODUCTION

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

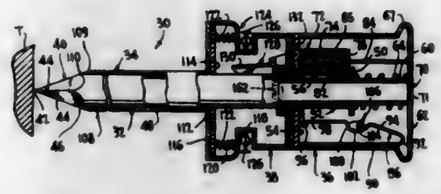
Division of Ser. No. 254,007, Jun. 3, 1994, Pat. No. 5,478,317, which is a continuation of Ser. No. 800,507, Nov. 27, 1991, abandoned. This application May 10, 1995, Ser. No. 438,581

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—185 **2 Claims**

1. A retractable safety penetrating instrument for forming a portal communicating with a cavity in the body to allow passage of instruments for performing least invasive medical procedures comprising

a hollow portal sleeve for providing a passage through a cavity wall and having a distal end for positioning in the body cavity, a proximal end for positioning externally of the body cavity and a lumen extending between said distal and proximal ends;



a housing mounting said proximal end of said sleeve;

means for permitting said portal sleeve to move proximally relative to said housing in housing in response to a proximal force from tissue contact at said distal end of said portal sleeve during penetration of the cavity wall and to move distally relative to said housing in response to removal of the proximal force upon entry of said distal end of said portal sleeve in the body cavity;

a penetrating member insertable through said housing to be disposed in said lumen of said sleeve and having a distal end for penetrating the cavity wall and a proximal end, said penetrating member being withdrawable from said housing and said sleeve following introduction of said sleeve in the body cavity;

retracting means for moving said penetrating member proximally relative to said sleeve from an extended position where said distal end of said penetrating member protrudes beyond said distal end of said sleeve to a retracted position to prevent contact of said distal end of said penetrating member with tissue; and

trigger means including an operating member extending proximally from said proximal end of said sleeve and being movable proximally therewith during penetration of the cavity wall and being movable distally therewith upon entry of said distal end of said sleeve in the body cavity, said trigger means including a trigger disposed proximally of said sleeve for being engaged by said operating member when said sleeve moves distally, to actuate said retracting means to move said penetrating member to said retracted position upon said distal end of said sleeve entering the body cavity.

5,591,194

TELESCOPING BALLOON CATHETER AND METHOD OF USE

William A. Berthiaume, Billerica, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 198,628, Feb. 18, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 485,655

Int. Cl.[6] A61M *29/00*

U.S. Cl. 606—192 **27 Claims**



1. A balloon dilatation catheter with a variable effective over-the-wire length, i.e. a variable guidewire lumen length, that is adapted to be utilized with a conventional length guidewire without resort to an exchange guidewire or a guidewire extension apparatus, comprising:

an elongated inflation shaft having open proximal and distal ends and a longitudinal inflation lumen extending therethrough;

an extension shaft disposed distal to said inflation shaft, said extension shaft having open proximal and distal ends and a lumen extending therethrough that is in fluid communication

with and extends said inflation lumen through the extent of said extension shaft and, said proximal end of said extension shaft connected to said distal end of said inflation shaft;

a guidewire shaft having open proximal and distal ends and a guidewire lumen extending therethrough, said guidewire shaft being coextensive with said extension shaft over the length of said extension shaft, said proximal end of said guidewire shaft being adjacent to said proximal end of said extension shaft, said guidewire shaft distal end extending distal of said extension shaft distal end, and said guidewire lumen sized to slidably receive said conventional length guidewire;

an inflatable balloon having a distal end and a proximal end, said proximal end of said balloon sealingly affixed to said distal end of said extension shaft, said distal end of said balloon sealingly affixed to said guidewire shaft at about said guidewire shaft distal end, and the interior of said balloon in fluid communication with said inflation lumen; and

telescoping means slidably mounted on said inflation shaft and said extension shaft for adjustably extending the length of said guidewire lumen.

5,591,195

APPARATUS AND METHOD FOR ENGRAFTING A BLOOD VESSEL

Syde Taheri, 268 Dan Troy, Williamsville, N.Y. 14221, and Howard J. Leonhardt, 13794 NW. 4th St., Bldg. #210, Sunrise, Fla. 33325

Filed Oct. 30, 1995, Ser. No. 549,880
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—194 **14 Claims**



1. An apparatus for engrafting a blood vessel comprising:

a hollow tubular graft of a preselected cross section having a proximal end, a distal end, and a middle portion; and said hollow tubular graft being capable of substantially deforming so as to conform to an interior surface of said blood vessel;

a compressible and expandable proximal spring perpendicularly located at said proximal end of said hollow tubular graft, and said proximal spring being capable of deforming so as to conform to

the interior surface of said blood vessel; said proximal spring containing sufficient outward force to exert continuous force against

and inner wall of said blood vessel; said proximal spring being comprised of nitinol;

a compressible and expandable distal spring perpendicularly

located at said distal end of said hollow tubular graft, and said distal spring being capable of deforming so as to conform to the interior surface of said blood vessel; said distal spring containing sufficient outward force to exert continuous force against the inner wall of said blood vessel; said distal spring being comprised of nitinol;

at least one flexible connecting bars for maintaining physical communication between said proximal and distal springs; said at least one connecting bars being comprised of nitinol;

a graft material; said graft material encasing said proximal spring, said distal spring, and said at least one connecting bars; said graft material being distensible at said distal and said proximal ends to facilitate expansion of said proximal and distal springs.

5,591,196

METHOD FOR DEPLOYMENT OF RADIALLY EXPANDABLE STENTS

Michael L. Marin, and Ralph Marin, both of New York, N.Y., assignors to Endovascular Systems, Inc., Cross River, N.Y.

Continuation of Ser. No. 196,278, Feb. 10, 1994, Pat. No. 5,443,477. This application Jan. 23, 1995, Ser. No. 376,352
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **13 Claims**



1. A method for intraluminally deploying a prosthesis at a desired location within a body passageway, comprising the steps of:

placing the prosthesis over a support comprising at least two movable wings mounted on a catheter;

delivering the prosthesis to the desired location by moving the catheter through the body passageway; and

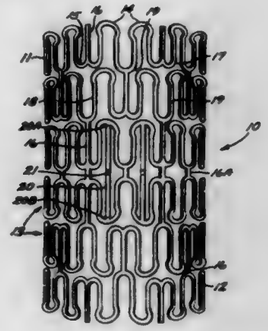
moving the wings radially outwardly to thereby deploy the prosthesis within the body passageway.

5,591,197

EXPANDABLE STENT FORMING PROJECTING BARBS AND METHOD FOR DEPLOYING

Geoffrey A. Orth, La Granada; Scott C. Anderson, Sunnyvale, and Peter S. Brown, Mountain View, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Mar. 14, 1995, Ser. No. 405,265
Int. Cl.[6] A61F *2/04*
U.S. Cl. 606—198 **27 Claims**



1. An expandable intraluminal stent for implanting in a body lumen, comprising:

a first stent section having at least one cylindrical element facing a first direction;

a second stent section having at least one cylindrical element facing a second direction opposite to said first direction;

a plurality of connecting members connecting said first section to said second section; and

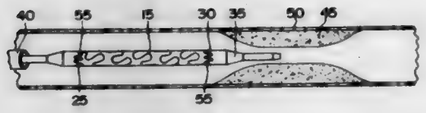
a weakened portion in at least some of said connecting members, said connecting members being deformable at said weakened portion to provide a plurality of projecting barbs, said weakened portion forming the apex of each of said projecting barbs.

5,591,198

MULTIPLE SINUSOIDAL WAVE CONFIGURATION STENT

William J. Boyle, Carlsbad; Rosalinda A. Wong, San Diego, and James M. Shy, Chula Vista, all of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 27, 1995, Ser. No. 429,975
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **21 Claims**



1. A radially expandable stent for implantation within a body vessel, comprising:

a first wire formed winding having a hollow cylindrical shape defining a lumen, the first winding including a preformed sinusoidal wave pattern wound into a continuous helix the length of the stent which permits even expansion of the first winding, the first winding having a proximal end and a distal end, each wave having a wave length and a wave amplitude such that the wave length and wave amplitude ratio results in unaligned wave apexes in adjoining waves of the first wire foraged winding;

a second wire formed winding having a hollow cylindrical shape defining a lumen, the second winding including a preformed sinusoidal wave pattern wound into a continuous helix which permits even expansion of the second winding, the second winding having a wave length which is less than the wave length of the first winding such that the second winding has more wire per unit surface area than the first winding, the second winding having a proximal end and a distal end attached to each other to form a ring, the second winding being attached to the proximal end of the first winding;

a third wire formed winding having a hollow cylindrical shape defining a lumen, the third winding including a preformed sinusoidal wave pattern wound into a continuous helix which permits even expansion of the third winding, the third winding having a wave length which is less than the wave length of the first winding such that the third winding has more wire per unit surface area than the first winding, the third winding having a proximal end and a distal end attached to each other to form a ring, the third winding being attached to the distal end of the first winding; and

a means extending longitudinally throughout the first, second and third winding lumens to expand the first, second and third windings.

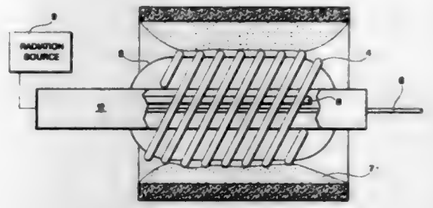
5,591,199

CURABLE FIBER COMPOSITE STENT AND DELIVERY SYSTEM

Christopher H. Porter, 19756 NE. 127th Pl., Woodinville, Wash. 98072; Robert Van Tassel, 6420 Bayview Pl., Excelsior, Minn. 55331; Curtis Amplatz, 546 N. Lexington Pky., St. Paul, Minn. 55104, and Michael Kasinkas, 11700 26th Ave. N., Plymouth, Minn. 55441

Filed Jun. 7, 1995, Ser. No. 477,759
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **25 Claims**

1. A stent for supporting a selected portion of a body lumen, comprising at least one flexible fiber composite which is formed to engage the wall of a body lumen, wherein the fiber composite comprises a plurality of fibers and a curable material in contact with the fibers, wherein said stent positioned within the body lumen and, upon curing of the curable material, the fibers are bonded together to form a rigid support structure.

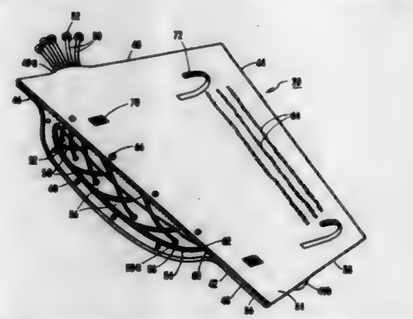


5,591,200

METHOD AND APPARATUS FOR APPLYING PRESSURE TO A BODY LIMB FOR TREATING EDEMA

Alan C. Cone, Encinitas; Ralph A. Loh, and Stuart A. Tenenbaum, both of San Diego, all of Calif., assignors to World, Inc., Reno, Nev.

Filed Jun. 17, 1994, Ser. No. 261,684
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—201 **22 Claims**



1. An apparatus for applying pressure to a patient's limb, comprising:

a source of pressure;

a sleeve surroundingly engageable with the limb, the sleeve including a plurality of individually inflatable bladders;

a plurality of electrically-operated bladder valves in fluid communication with the source of pressure, each bladder valve also being in fluid communication with a respective one of the bladders for selectively establishing a respective pathway for fluid communication between the source of pressure and the associated bladder;

a computer for individually controlling each valve to variably pressurize the bladders in a variable sequence; and

a timer for measuring the time period for filling at least one bladder and generating a timing signal in response thereto, wherein each bladder defines an annular ring when the sleeve is operably engaged with a limb, and the computer includes a determiner for determining the radius of at least one of the rings based on the timing signal.

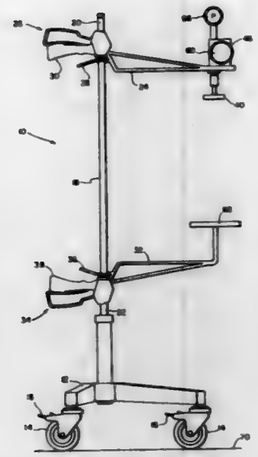
5,591,201

METHOD AND APPARATUS FOR HAEMOSTATIC COMPRESSION

Anthony H. Lam, 10151 - 74 Street NW., Edmonton, Alberta, Canada

Filed Nov. 1, 1994, Ser. No. 332,767
Int. Cl.[6] A61B *17/12*
U.S. Cl. 606—201 **3 Claims**

2. A floor-supported haemostatic compression apparatus for use with a patient supported on a generally horizontally extending bed, comprising:



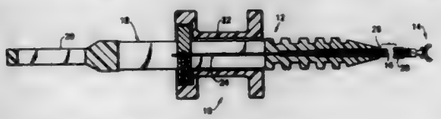
a wheel-supported base;
a support member extending upwardly from the base and being of sufficient length to extend above the patient;
upper and lower arms, each having inner and outer ends and being mounted at its inner end to the support member so as to be freely slidable therealong;
the upper arm extending horizontally and having sufficient length so that its outer end may be positioned over the patient when the support member is adjacent the bed, said upper arm carrying a downwardly extending, haemostatic compression member at its outer end;
the lower arm being generally L-shaped and comprising a horizontally extending first section and an upwardly extending second section, the first section having sufficient length so that the second section may be positioned beneath the patient, the second section having sufficient length to engage the underside of the bed while providing clearance of the first section relative to the bed;
means, associated with the upper arm, for disengagably locking it to the support member to prevent sliding movement therealong;
means, associated with the upper arm, for temporarily disengaging the upper arm locking means and incrementally advancing the upper arm downwardly along the support member; and
means, associated with the lower arm, for disengagably locking it to the support member to prevent sliding movement therealong.

5,591,202

ENDOSCOPIC INSTRUMENTS HAVING LOW FRICTION SHEATH

Charles R. Slater, Fort Lauderdale; Kevin W. Smith, Coral Gables; Matthew A. Palmer, Miami; Anthony I. Mazzeo, Ft. Lauderdale, and George Nunez, Miami, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Filed Apr. 28, 1994, Ser. No. 234,641
Int. Cl.[6] A61B *17/00;10/00*
U.S. Cl. 606—205 **15 Claims**



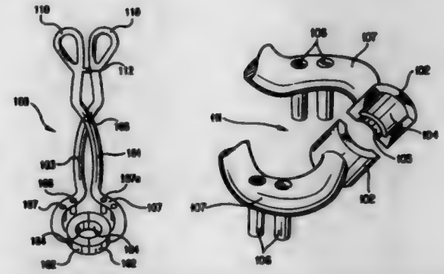
1. An endoscopic instrument comprising:
a) a cylindrical member having a proximal end and a distal end;
b) at least one end effector coupled to said distal end of said cylindrical member;
c) handle means coupled to said proximal end of said cylindrical member; and
d) a polyethylene sheath covering substantially all of said cylindrical member between said proximal and distal ends.

5,591,203

ANASTOMOSIS CUFF MANIPULATOR TOOL

Gregory M. Fahy, Gaithersburg, Md., assignor to Organ, Inc., and Life Resuscitation Technologies, Inc., both of Chicago, Ill.

Filed Mar. 24, 1995, Ser. No. 409,519
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—207 **21 Claims**



1. A device for grasping a cuff during an anastomosis procedure, comprising:
first and second gripping arms, each of the first and second gripping arms having a gripping finger at a first end thereof, wherein the first and second gripping arms are movable with respect to one another to bring mating surfaces of the gripping fingers together, and wherein the mating surfaces of each of the gripping fingers have an indentation such that an aperture is formed between the gripping fingers for receiving a cuff when the gripping fingers are brought together, each of the first and second gripping arms further having a main body portion and a first curved portion located between the main body portion and the gripping finger, and wherein the first curved portions of the first and second gripping arms form a viewing aperture between the first and second gripping arms, a plane of the viewing aperture being oriented substantially perpendicular to a longitudinal axis of the first and second gripping arms, the viewing aperture permitting a user to view a surrounding area beneath the gripping fingers when the device is grasping the cuff.

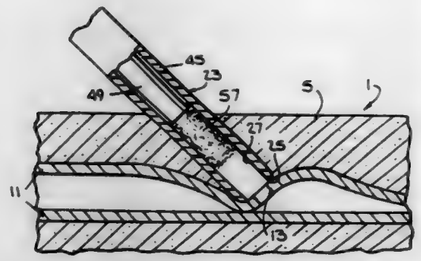
5,591,204

DEVICE AND METHOD FOR SEALING PUNCTURE WOUNDS

Ernst Jansen, GR Laren, Netherlands; Gunter Ruttgers, Stolberg, Germany, and Lawrence Saper, New York, N.Y., assignors to Datascope Investment Corp., Montvale, N.J.

Division of Ser. No. 746,339, Aug. 16, 1991, Pat. No. 5,391,183, which is a continuation-in-part of Ser. No. 634,478, Dec. 27, 1990, abandoned. This application Oct. 5, 1994, Ser. No. 318,381
Claims priority, application European Pat. Off., Sep. 21, 1990, 90118186
Int. Cl.[6] A61B *17/08;* A61D *1/00*
U.S. Cl. 606—213 **12 Claims**

1. A device for inserting hemostatic material inward through a tissue channel until it is disposed by an outside wall of a blood vessel of a patient, said blood vessel wall having a puncture having a predetermined width therein adjacent said tissue channel, said



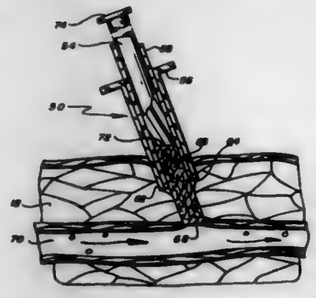
tissue channel and said puncture having been formed by an original procedure sheath, comprising:
(a) a charge of hemostatic material having a width greater than said predetermined width of said puncture, such that the material cannot enter the blood vessel,
(b) a hollow insertion sheath adapted to pass through said tissue channel and having an inner diameter, said inner diameter of said insertion sheath being larger than said predetermined width of said puncture whereby said charge of hemostatic material can slidably engage said inner diameter of said hollow insertion sheath.
(c) means for placing said hemostatic material in said hollow insertion sheath, and
(d) means for advancing said hemostatic material through said hollow insertion sheath inward to the outside of said vessel wall around said puncture.
whereby said charge of hemostatic material cannot enter said blood vessel through said puncture.

5,591,205

INSERTION ASSEMBLY AND METHOD OF INSERTING A VESSEL PLUG INTO THE BODY OF A PATIENT

Bradford C. Fowler, Woodinville, Wash., assignor to Quinton Instrument Company, Bothell, Wash.

Continuation of Ser. No. 340,507, Nov. 16, 1994, which is a continuation of Ser. No. 163,496, Dec. 6, 1993, Pat. No. 5,478,352, which is a continuation of Ser. No. 993,328, Dec. 18, 1992, Pat. No. 5,275,616, which is a continuation of Ser. No. 826,719, Jan. 28, 1992, Pat. No. 5,192,300, which is a continuation of Ser. No. 591,342, Oct. 1, 1990, Pat. No. 5,108,421. This application Jun. 6, 1995, Ser. No. 470,816
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—213 **14 Claims**



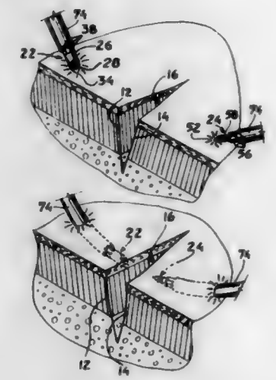
1. An assembly for sealing an incision formed in the body of a patient wherein the incision extends from the skin of the patient into a target organ or blood vessel of the patient, said assembly comprising:
an elongate vessel plug formed of a hemostasis promoting material and having distal and proximal portions and said vessel plug adapted to be received in the incision such that said distal portion is located at a first predetermined position in the incision adjacent to the outer surface of the target organ or blood vessel of the patient and said vessel plug is positioned in the incision to obstruct the flow of fluids therethrough; and
a removable positioning member having an outer diameter and a length sufficient to extend between the skin of the patient and the blood vessel of the patient to identify the location of the blood vessel through the incision and determine said first predetermined position therefrom.

5,591,206

METHOD AND DEVICE FOR CLOSING WOUNDS

Richard Moufarrège, 1111 St.Urbain, Suite M06, Montréal, Québec, Canada

Filed Sep. 30, 1993, Ser. No. 129,309
The portion of the term of this patent subsequent to Oct. 12, 2014, has been disclaimed.
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—215 **10 Claims**



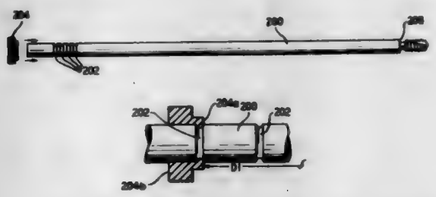
10. A method for holding together a pair of tissue edges defining a wound in the skin of a patient with a first locking element and a second locking element, said skin having an epidermic layer and a dermic layer, said first locking element having a first grasping means for grasping onto a skin portion adjacent said first locking element and said second locking element having a second grasping means for grasping onto a skin portion adjacent said second locking element, said method comprising the steps of:
inserting said first and second locking elements by a puncturing action, through said epidermic layer and into said dermic layer of said skin, on each side of said wound so that said first and second locking elements are embedded into said dermic layer;
locking said first and second locking elements together on each side of said wound with said first and second grasping means respectively grasping onto said portion of said dermic layer positioned adjacent said first locking element and said portion of said dermic layer positioned adjacent said second locking element, said first and second locking element thus closing said wound while being embedded into said dermic layer of said skin.

5,591,207

DRIVING SYSTEM FOR INSERTING THREADED SUTURE ANCHORS

R. Glen Coleman, Clearwater, Fla., assignor to Linvatec Corporation, Largo, Fla.

Filed Mar. 30, 1995, Ser. No. 413,568
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—232 2 Claims



1. A driver system for inserting a threaded bone anchor, said anchor having a cylindrical body provided with a threaded external surface, a driver-receiving portion for engaging a driver and a suture-receiving portion for engaging a suture, said driver system comprising:

a tubular guide provided with a cylindrical axial bore having a predetermined diameter and a predetermined length:

a tubular drive shaft rotatable within and relative to said tubular guide said drive shaft having a distal end and a proximal end, said distal end having an automatically releasable drive means for engaging said driver-receiving portion of said anchor, said tubular drive shaft having an outer diameter smaller than said predetermined diameter to enable said drive shaft to pass through said guide;

a stop means affixed to said drive shaft at a predetermined distance from said distal end thereof, said predetermined distance greater than said predetermined length said stop means preventing said drive shaft from moving longitudinally relative to said guide beyond a predetermined point while enabling said drive shaft to rotate relative to said guide and to be removed therefrom; and

bearing means interposed between said stop means and said guide for facilitating the contiguous rotation of said stop means relative to said guide.

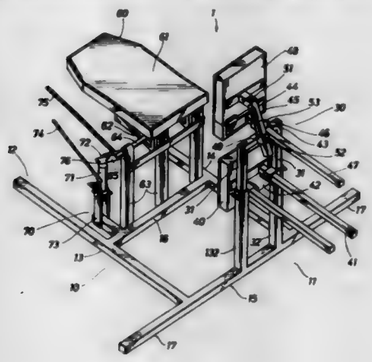
5,591,208

EXERCISING FRAME

Jeffery N. Knutson, 7915 N. Country Loop, Prineville, Oreg. 97754

Filed Apr. 27, 1995, Ser. No. 429,956
Int. Cl.[6] A61F 5/00
U.S. Cl. 606—241 7 Claims

1. An exercise frame for use by individuals with limited or no lower body muscle control, comprising:



a) a support framework having two sides a fore and aft end including a plurality of frame members coupled together to form a base,

b) first upright stationary support members secured to said fore end,

c) fore end extendable support means received within said first stationary support member,

d) second, third, and forth stationary support members secured to said aft end mounted adjacent one another with said second and fourth upright supports mounted on each side of said support framework and said third upright support mounted between said second and forth upright supports,

e) a knee pad projecting from said first upright support member and coupled to at least one extensible support arm and a means for securing said knee pad extensible support arm,

f) a hip pad having a top edge said hip pad projecting from said fore end extensible support means and coupled to at least one extensible support arm and a means for securing said hip pad extensible support arm,

g) a chest pad with a bottom edge and projecting from said fore end extensible support means and pivotally coupled to at least one extensible support arm and a means for pivotally securing said chest pad extensible support arm, further said hip and chest pads are hingedly secured to one another along the hip pad top edge and chest pad bottom edge,

h) a hydraulic pump means pivotally secured to said framework adjacent either said second or third upright supports including a hand pump lever and hydraulic pressure release means,

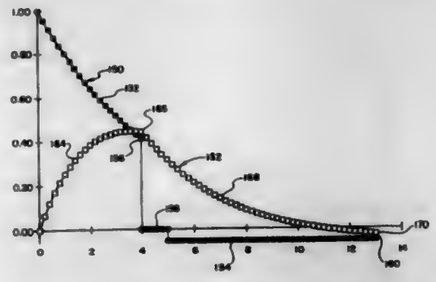
i) a seat support framework including a first member pivotally mounted between said second and forth upright support members and a second member pivotally mounted between said third and forth upright support members, means for pivotally coupling said piston to said first and second members, a seat pad secured to said first and second members.

5,591,209

IMPLANTABLE DEFIBRILLATOR SYSTEM FOR GENERATING AN ACTIVE BIPHASIC WAVEFORM

Mark W. Kroll, Minnetonka, Minn., assignor to Angeion Corporation, Plymouth, Minn.

Filed May 19, 1994, Ser. No. 246,807
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—5 17 Claims



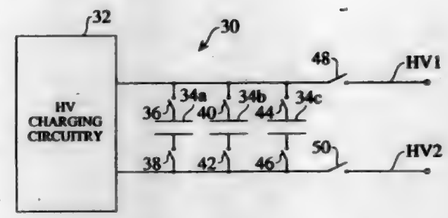
1. An implantable cardioverter defibrillator apparatus for discharging an active biphasic electrical countershock to an ailing human heart through at least two implantable electrodes located proximate the heart, the apparatus comprising:

an internal power source for providing electrical energy;

capacitance means, electrically connected between the power source and the electrodes, for generating a first phase of the biphasic countershock having a first polarity across the electrodes;

inverter means, separate from the capacitance means and electrically connected between the power source and the electrodes, for generating a second phase of the biphasic countershock having a second and opposite polarity across the electrodes and actively drawing low voltage electrical energy directly from the power source during delivery of the second phase; and

control means, operatively coupled to the power source, the capacitance means and the inverter means, for controlling delivery of the first phase of the biphasic countershock from the capacitance means and the second phase of the biphasic countershock from the inverter means in response to a sensing of a cardiac dysrhythmia.

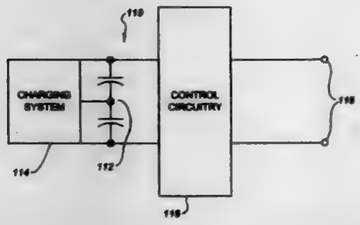


5,591,210

IMPLANTABLE DEFIBRILLATION SYSTEM AND METHOD FOR PRODUCING ONLY SHORT PULSE WAVEFORMS

Mark W. Kroll, Minnetonka, and Theodore P. Adams, Edina, both of Minn., assignors to Angeion Corporation, Plymouth, Minn.

Continuation of Ser. No. 953,485, Sep. 29, 1992, abandoned.
This application Aug. 24, 1994, Ser. No. 295,230
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—5 14 Claims



1. An improved process for operating an implantable defibrillator system to produce a monophasic truncated capacitive-discharge defibrillation countershock, the implantable defibrillator system being a self-contained human implantable device including a pulse-generating capacitor means for storing an electrical charge, means for internally charging the pulse-generating capacitor means, and means for selectively discharging the electrical charge in the pulse-generating capacitor for a specified pulse duration as a countershock to be delivered through electrodes implanted in a human patient in response to a sensing of a myocardial arrhythmia in the human patient, the improvement comprising the steps of:

selecting a capacitance value and a maximum charging voltage for the pulse-generating capacitor means such that a delivered energy of the countershock is less than 25 joules; and

controlling the means for selectively discharging the electrical charge so as to only deliver the countershock as a waveform having a maximum duration of less than 5.99 milliseconds and a tilt of greater than 50%.

5,591,211

DEFIBRILLATOR HAVING REDUNDANT SWITCHABLE HIGH VOLTAGE CAPACITORS

Mark J. Meltzer, San Francisco, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Dec. 9, 1994, Ser. No. 353,406
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—5 4 Claims

1. An implantable defibrillator including a high voltage output stage comprising:

high voltage charging circuitry;

a plurality of high voltage capacitors coupled in parallel;

a switching matrix coupled between said charging circuit and said capacitors to selectively couple at least one of said capacitors to said charging circuit;

means coupled to said capacitors for monitoring the charge time for each of said capacitors to determine the performance of each of said capacitors;

means coupled to said monitoring means for determining from said charge time whether a given capacitor exhibiting degraded performance should be replaced; and

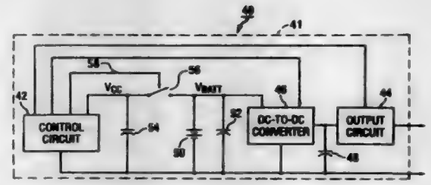
a pair of output terminals coupled to said at least one of said capacitors.

5,591,212

HYBRID BATTERY FOR IMPLANTABLE PULSE GENERATOR

John G. Keimel, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 21, 1995, Ser. No. 505,122
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—5 12 Claims



1. A cardioverter, comprising:

a battery;

a high voltage output circuit including a high voltage energy storage device, said output circuit being responsive to a triggering signal to apply voltage stored on said energy storage device to an output terminal of said cardioverter;

a charging circuit means, coupled to said high voltage output circuit and to said battery, responsive to a charging signal, for charging said high voltage energy storage device;

a control circuit, coupled to said charging circuit and to said output circuit, said control circuit comprising means for issuing said triggering signal and said charging signal;

a high energy density capacitor operatively coupled to deliver voltage stored thereon to power said control circuit and having a sufficient capacitance to allow continued operation of said control circuit for at least one second while said charging circuit means charges said energy storage device;

switch means for selectively coupling and uncoupling said high energy density capacitor and said control circuitry coupled thereto from said battery; and

means responsive to operation of said charging circuit for causing said switch means to uncouple said high energy density capacitor and said control circuit from said battery.

5,591,213

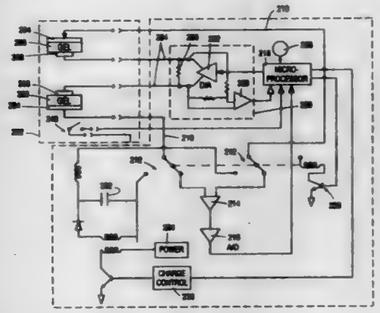
DEFIBRILLATOR SYSTEM CONDITION INDICTATOR

Carlton B. Morgan, Bainbridge Island, Wash., assignor to Heartstream, Inc., Seattle, Wash.

Continuation of Ser. No. 63,631, May 18, 1993, abandoned. This application Sep. 21, 1995, Ser. No. 532,863

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **32 Claims**



1. A defibrillator system comprising:

a defibrillator, the defibrillator comprising a defibrillator circuit and an electrode interface, the defibrillator circuit comprising an energy source, the electrode interface comprising conductors in electrical communication with the energy source;

means for periodically operating the energy source to discharge a test pulse through the conductors;

a patient simulator communicating with the conductors;

a test pulse analyzer communicating with the conductors and the patient simulator; and

a fault indicator communicating with the test pulse analyzer.

5,591,214

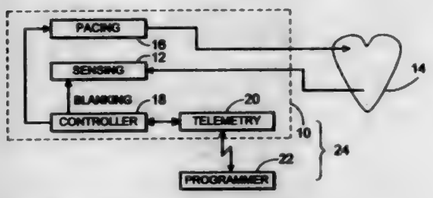
PACEMAKER WITH AUTOMATIC BLANKING PERIOD FUNCTION

Richard Lu, Highlands Ranch, Colo., assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Nov. 20, 1995, Ser. No. 560,733

Int. Cl.[6] A61N *1/00*

U.S. Cl. 607—9 **17 Claims**



1. A cardiac stimulation system comprising:

pacing means for generating cardiac pacing signals of a patient;

sensing means for sensing cardiac activity in a cardiac chamber, said sensing means generating sense signals corresponding said cardiac activity;

signal processing means for processing said sense signals;

blanking signal generating means for generating blanking signals, said blanking signals being provided for selectively blanking said signal processing means; and

automatic blanking determining means for determining a minimum duration of said blanking signals dependent on physiological characteristics of said heart wherein said automatic blanking determining means includes means for generating a test pacing signal for said heart and test sensing means for sensing activity in said heart responsive to said test pacing signal.

5,591,215

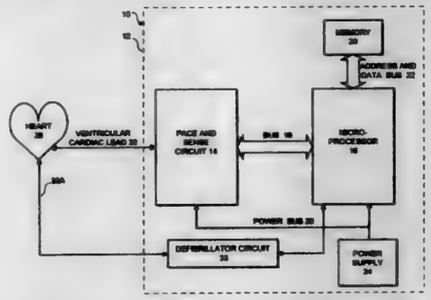
APPARATUS AND METHOD FOR DETECTION OF ATRIAL FIBRILLATION BY VENTRICULAR STABILITY AND VENTRICULAR PACING

Saul E. Greenhut, Aurora, Colo., and Anthony Murphy, Annandale, Australia, assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 347,279, Nov. 30, 1994, Pat. No. 5,480,413. This application Nov. 17, 1995, Ser. No. 560,447

Int. Cl.[6] A61N *1/365*; A61B *5/0452*

U.S. Cl. 607—14 **19 Claims**



1. An implantable cardiac device for stimulating a heart, said pacemaker comprising:

means for monitoring a ventricle of said heart to sense ventricular rate instability; and

means for pacing said ventricle;

wherein said means for monitoring detects atrial fibrillation based on a response of said ventricle to said ventricular pacing.

5,591,216

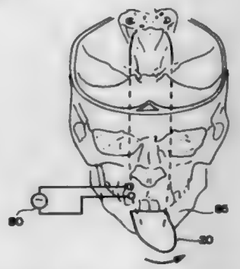
METHOD FOR TREATMENT OF SLEEP APNEA BY ELECTRICAL STIMULATION

Roy L. Testerman, New Hope, and Donald J. Erickson, Plymouth, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 19, 1995, Ser. No. 446,191

Int. Cl.[6] A61B *5/08*; A61N *1/372*

U.S. Cl. 607—42 **27 Claims**



1. In a method for opening an upper airway of a patient by applying electrical stimulation to the patient's hypoglossal nerve, the improvement comprising:

(a) selecting a portion of the patient's hypoglossal nerve;

(b) positioning an electrode into electrical contact with the selected portion of the patient's hypoglossal nerve;

(c) applying a stimulating electrical current from the electrode to the hypoglossal nerve;

(d) monitoring the patient for a desired response, the desired response selected from the group consisting of:

forward and contralateral extension of the patient's tongue; and

an increase in volume of the patient's oropharynx;

(e) repeating steps (c) and (d) while adjusting the position for electrial stimulation on the nerve until the desired response is observed.

5,591,217

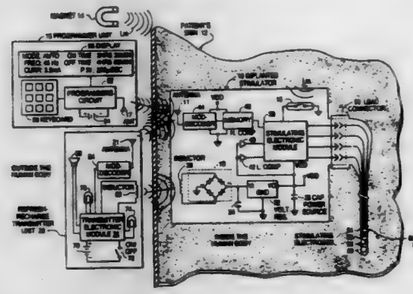
IMPLANTABLE STIMULATOR WITH REPLENISHABLE, HIGH VALUE CAPACITIVE POWER SOURCE AND METHOD THEREFOR

Francisco J. Barreras, Miami, Fla., assignor to Plexus, Inc., Miami, Fla.

Filed Jan. 4, 1995, Ser. No. 368,326

Int. Cl.[6] A61N *1/18*

U.S. Cl. 607—61 **25 Claims**



1. A system for delivering, in a controlled manner, one or more electric stimulation pulses to targeted tissue comprising:

an implantable stimulator, said stimulator capable of delivering, in a controlled manner, one or more electric stimulation pulses to targeted tissue;

a power source, contained within said implantable stimulator, sufficient to supply power to said implantable stimulator on an exclusive basis over at least an 8 hour period, said power source including a high value, small size capacitive energy storage unit having a capacitive rating of at least 0.1 farads; and

an inductor coil adapted to gather emf power transmissions, a rectifier and a voltage regulator, all electrically coupled to said capacitive energy storage unit and incorporated into said implantable stimulator, for supplying replenishing current to said capacitive energy storage unit.

5,591,218

CURRENT LIMITER FOR IMPLANTABLE ELECTRONIC DEVICE LEAD

Peter Jacobsen, Haguenau, France, assignor to ELA Medical, S.A., Montrouge, France

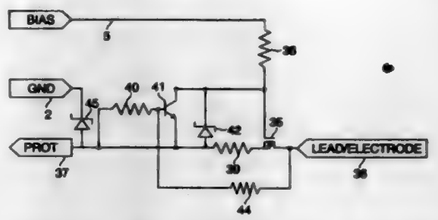
Filed Aug. 9, 1994, Ser. No. 287,835

Int. Cl.[6] A61N *1/08*

U.S. Cl. 607—63 **6 Claims**

1. A unidirectional current limiting circuit for use in series with the lead of an implanted medical device having low energy stimulation and detection electrodes, comprising:

an unprotected input and a protected output;



a current flow from the unprotected input to the protected output;

a reference potential corresponding to a ground potential;.

a bias voltage;

a first switch having an open circuit condition, a current limiting condition, and a closed circuit condition, the first switch having an input connected to the unprotected input and an output;

a low value resistor connected to the output of the first switch producing a first voltage in response to said current flow through the first switch;

a second switch having an open circuit condition and a closed circuit condition the second switch being operatively connected between the bias voltage and the protected output;

a voltage divider connected to the unprotected input and the protected output, said voltage provider and producing a control voltage corresponding to a voltage across the unprotected input and the protected output; and

a voltage clamp circuit connected between the reference potential and the protected output and operable to maintain the protected output voltage within a preset voltage range of the reference voltage;

wherein the first switch is biased in the closed circuit condition when the voltage of the low value resistor is below the bias voltage by a first predetermined amount, the first switch is biased in the current limiting condition when the voltage of the low value resistor is not below the bias voltage by the first predetermined amount, and wherein the second switch is automatically biased in the open circuit condition when the control voltage is less than a second predetermined amount and in the closed circuit condition when the control voltage is greater than the second predetermined amount, the second switch closed circuit condition effectively lowering the bias voltage to place and maintain the first switch in the open circuit condition.

5,591,219

FREQUENCY MODULATOR

Thomas E. Dungan, 5139 North Rd., North Street, Mich. 48049

Continuation-in-part of Ser. No. 847,294, Mar. 6, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 280,060

Int. Cl.[6] A61B *17/36*

U.S. Cl. 607—88 **14 Claims**

1. A therapeutic radiation device comprising:

(a) a housing, the housing comprising:

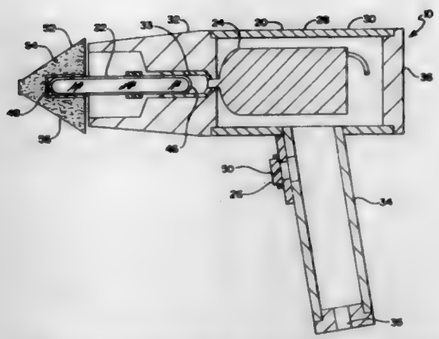
(1) a hollow body, the body having a first portion and a second portion; and

(2) a handle, the handle integrally formed with the body proximate the first portion;

(b) a resonator coil, the resonator coil being disposed within the housing;

(c) a radiation source, the radiation source being disposed within the housing, the radiation source having a first end and a second end, the first end of the radiation source being removably connected to the resonator coil, the second end of the radiation source extending beyond the housing, the radiation source energized by the resonator coil;

(d) an interchangeable lens module, the lens having a plurality of silicon and diamond granules, the silicon diamond granules being attached to each other, the lens module having a cavity



formed therein for enclosing the second end of the radiation source, the lens module being removably attached to the housing;

(e) means for energizing the resonator coil, the means for energizing being electrically connected to the resonator coil;

(f) a transformer, the transformer being electrically connected to the means for energizing, the transformer having a means to regulate the power flow to the radiation device; and

wherein the silicon granules and diamond granules cooperate to filter and diffuse the beam of radiation emitted by the radiation source.

5,591,220

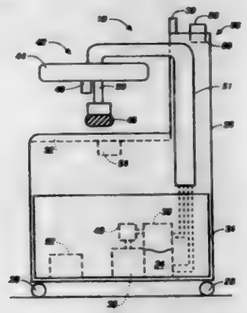
FLUID REPLACEMENT APPARATUS FOR USE WITH A PORTABLE HEATING AND COOLING SYSTEM

Imad Mahawili, 1603 Laraway Lake S.E., Grand Rapids, Mich. 49546

Continuation-in-part of Ser. No. 309,360, Sep. 20, 1994, Pat. No. 5,486,207. This application May 26, 1995, Ser. No. 452,307

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **12 Claims**



1. A fluid replacement apparatus for use with a portable body heating and cooling system for thermal treatment to selected body portions, said portable body heating and cooling system including a reservoir, interconnection means for connecting the reservoir to a thermal pad, and pump means for continually circulating fluid between the reservoir and the thermal pad, said fluid replacement apparatus comprising:

heat exchange means including a receptacle and means for thermostatically controlling the temperature of fluid in said receptacle to maintain fluid circulating through said receptacle at the desired temperature;

coupling means for releasably coupling the portable body heating and cooling system to said fluid replacement apparatus comprising a support means for supporting the reservoir of said portable body heating and cooling system and cover means for covering said reservoir to couple said fluid replacement apparatus to said portable body heating and cooling system, said coupling means further including said pump means for circulating fluid between said heat exchange means and the reservoir of said portable body heating and cooling system; and

connecting means for connecting said coupling means to said heat exchange means, said connecting means enabling said pump means to circulate fluid between said reservoir and said heat exchange means for maintaining fluid in said reservoir at the desired temperature.

5,591,221

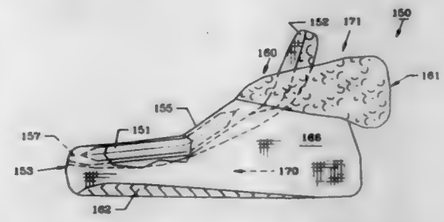
THERAPEUTIC FOOTWEAR METHOD

Byron C. Owens, Asheboro, N.C., assignor to Vesture Corporation, Asheboro, N.C.

Continuation of Ser. No. 246,625, May 20, 1994, abandoned, which is a division of Ser. No. 144,345, Nov. 1, 1993, Pat. No. 5,357,693, which is a continuation-in-part of Ser. No. 969,959, Dec. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 871,826, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 643,344, Jan. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 486,806, Feb. 26, 1990, abandoned. This application Sep. 25, 1995, Ser. No. 533,307

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—114 **14 Claims**



1. A method for heating a foot, comprising the steps of:

(a) introducing a liquid and a liquid absorbing means into a water impervious envelope wherein said liquid is absorbed by said liquid absorbing means;

(b) applying a vacuum to said envelope to substantially compress the liquid absorbing means;

(c) sealing said envelope while said liquid absorbing means remains substantially compressed to form a pad;

(d) subjecting said pad to microwave radiation; and

(e) positioning said pad proximate said foot wherein said pad warms said foot.

5,591,222

METHOD OF MANUFACTURING A DEVICE TO DILATE DUCTS IN VIVO

Takashi Sasawa, 13-2-309, Okubo-cho, Tanakakami, Sakyo-ku, Kyoto-shi, Kyoto-fu; Keiji Ioaki, 1-21, Wakakusa 2-chome, Kusatsu-shi, Shiga-ken; Hideo Tamai, 50-19, Miyake-cho, Moriyama-shi, Shiga-ken; Yoshihiko Shimizu, 39-676, Ogurayama, Kohata, Uji-shi, Kyoto-fu; Kaneto Shiraki, and Akihiro Sato, both of 19, Kitaotsubo, Nishimachi 3-chome, Ayabe-shi, Kyoto-fu, all of Japan

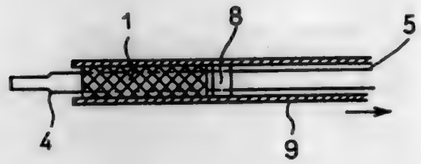
Continuation of Ser. No. 961,951, Oct. 16, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 219,301

Claims priority, application Japan, Oct. 18, 1991, 3-270810

Int. Cl.[6] A61F *2/06;2/04;* A61M *29/00*

U.S. Cl. 623—1 **16 Claims**

1. A method for manufacturing a device for dilating ducts in vivo by application of pressure by a balloon-tipped catheter, comprising the steps of: providing a cylindrical stent prepared by forming biodegradable fibers by a procedure selected from the group consisting of knitting or braiding or weaving; thermally setting said stent to a diameter corresponding to a diameter of an inflated balloon of a balloon-tipped catheter, subsequently reducing the diameter of the stent in a compressed fashion to one permitting reception on the balloon of said balloon-tipped catheter when deflated by inserting the stent into a tube whose diameter is smaller than the diameter of the stent, thermally setting said stent at said compressed diameter, and attaching the compressed stent to the balloon-tipped catheter.



5,591,223

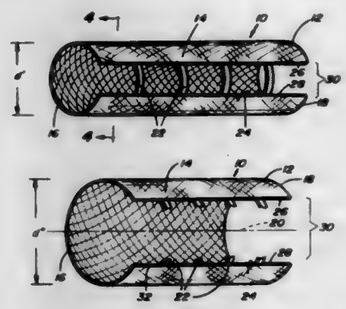
RE-EXPANDABLE ENDOPROSTHESIS

James E. Lock, Newton; Valerie Mandell, Brookline, and Stanton Perry, Swampscott, all of Mass., assignors to Children's Medical Center Corporation, Boston, Mass.

Division of Ser. No. 980,300, Nov. 23, 1992, Pat. No. 5,383,926. This application Jun. 23, 1994, Ser. No. 264,639

Int. Cl.[6] A61F *2/06;2/04*

U.S. Cl. 623—1 **13 Claims**



1. A radially expandable endoprosthesis device (**10**) comprising:

an elongated sleeve member (**12**) including a wall (**14**) and a longitudinal axis (**20**) extending through a length thereof, said sleeve member (**12**) being expandable radially outwardly relative to said longitudinal axis (**20**);

at least one lateral slot (**24**) parallel to said longitudinal axis (**20**) disposed in said wall (**14**) including a pair of opposing edges (**26, 28**) and defining an open region (**30**) between said opposing edges (**26, 28**) for circumferential growth of the vessel; and

expansion limiting means including at least one integral connecting strip (**22**) operatively connected at both ends thereof to said sleeve member for initially limiting the radially outward expansion of said sleeve member (**12**) to a first circumference said expansion limiting means comprised of a material that ruptures in a predetermined pressure selected from a range of four to ten atmospheres, said expansion limiting means being selectively removable to allow further radial outward expansion.

5,591,224

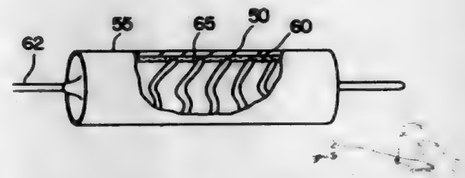
BIOELASTOMERIC STENT

Robert S. Schwartz, Rochester, and Rodney G. Wolff, Minnetonka Beach, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 79,222, Jun. 17, 1993, which is a continuation of Ser. No. 854,118, Mar. 19, 1992, abandoned. This application Sep. 15, 1994, Ser. No. 306,803

Int. Cl.[6] A61F *2/06;2/04;* A61M *29/00*

U.S. Cl. 623—1 **11 Claims**



1. A bioelastomeric intraluminal stent for implantation in a body lumen, the stent having an open-ended tubular shape defined by a structure comprising (a) elastin elements which are radially expandable to support the body lumen and (b) fibrin reinforced by elastin on a surface of the stent which is adapted to be retained in contact with a wall of the body lumen.

5,591,225

COMPOSITE ARTIFICIAL BLOOD VESSEL

Yasuhiro Okuda, Osaka, Japan, assignor to Vascular Craft Research Center Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 952,734, Nov. 30, 1992, abandoned. This application Nov. 23, 1994, Ser. No. 347,156

Claims priority, application Japan, Mar. 29, 1991, 3-066070

Int. Cl.[6] A61F *2/06;2/04*

U.S. Cl. 623—1 **5 Claims**



1. An artificial blood vessel comprising:

a tube formed from expanded polytetrafluoroethylene having a porosity of at least 70% and a pore diameter from 20 to 200 μm, said tube having an inner and an outer surface on which is grafted a compound having a functional group selected from the group consisting of hydroxyl, carboxyl, epoxy and amino, wherein said functional group has been introduced onto said tube by defluorinating said polytetrafluoroethylene with an alkali metal compound and grafting thereto a compound having said functional group; and

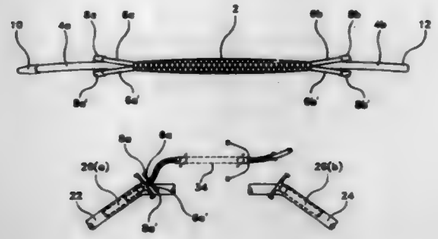
a material having cell adhesion and growth functions selected from the group consisting of proteins and peptides, covalently bonded through said functional groups to said inner and outer surfaces of said tube such that voids associated with the expanded polytetrafluoroethylene remain unclogged, and said material is present on said tube as a uniform, flexible and thin layer.

5,591,226

PERCUTANEOUS STENT-GRAFT AND METHOD FOR DELIVERY THEREOF

Scott O. Trerotola, Carmel, Ind., and Wade M. Johnson, Minneapolis, Minn., assignors to Schneider (USA) Inc., Plymouth, Minn.; Indiana University Foundation, Bloomington, Ind., and Johns Hopkins University, Baltimore, Md.

Filed Jan. 23, 1995, Ser. No. 377,849
Int. Cl.[6] A61F 2/06;11/00
U.S. Cl. 623—1 17 Claims



1. An apparatus comprising:

a body implantable self-expanding stent comprising a flexible tube of open weave construction having a first end and a second end, the ends being compressible into radially compressed states, the flexible tube having an elastic layer arranged along at least a portion of its length; and

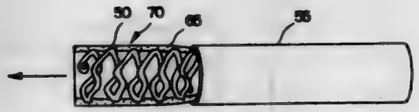
first and second removable retaining elements secured to the flexible tube proximate the first and second ends, respectively, for maintaining the first and second ends of the self-expanding stent in radially compressed states until removed, wherein each retaining element is a peel-away sheath adapted for insertion into vascular access means, said peel-away sheath comprising a tubular material attached to at least two leaves, the leaves upon an application of force being adapted to tear the tubular material thereby separating the sheath into removable pieces allowing the stent to self-expand.

5,591,227

DRUG ELUTING STENT

Thomas Q. Dinh, Minnetonka; Ronald J. Tuch, Plymouth, and Robert S. Schwartz, Rochester, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 306,785, Sep. 15, 1994, which is a continuation-in-part of Ser. No. 79,222, Jun. 17, 1993, which is a continuation of Ser. No. 854,118, Mar. 19, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 429,459
Int. Cl.[6] A61F 2/06;2/04
U.S. Cl. 623—1 11 Claims



1. A drug eluting intravascular stent comprising:

(a) a generally cylindrical stent body;

(b) a solid composite of a polymer and a therapeutic substance in an adherent layer on the stent body; and

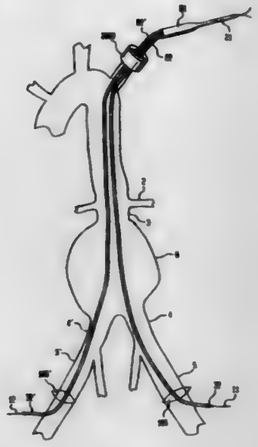
(c) fibrin in an adherent layer on the composite.

5,591,228

METHODS FOR TREATING ABDOMINAL AORTIC ANEURYSMS

John K. Edoga, 10 Franklin Pl., Morristown, N.J. 07960

Filed May 9, 1995, Ser. No. 437,368
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 26 Claims



1. A method of implanting an abdominal aortic graft into the body of a patient, said patient having an abdominal aorta which has an interior and an exterior, said abdominal aorta being joined at a proximal end by at least one renal artery and said abdominal aorta being joined at a distal end to a first and a second iliac artery, said first and said second iliac arteries having interiors and exteriors and being in fluid communication with said abdominal aorta said first and said second iliac arteries joining said abdominal aorta so as to form a divide and said divide being disposed distal to the junction of said abdominal aorta and said renal artery which is disposed above said divide, comprising the steps of:

providing access through first and second access points to open said interior of said first and second iliac arteries of said patient; providing access through a third access point to said interior of said abdominal aorta above said iliac divide and above said junction between said aorta and said renal artery of said patient;

introducing a bifurcated graft having an abdominal end, a first iliac end, and a second iliac end into said abdominal aorta and said iliac arteries through one of said access points;

positioning said bifurcated graft by manipulating said graft through at least said third access point and at least one of said first or said second access points;

and fixing said bifurcated graft in place.

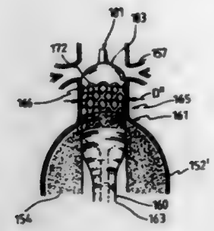
5,591,229

AORTIC GRAFT FOR REPAIRING AN ABDOMINAL AORTIC ANEURYSM

Juan C. Parodi, Mercedes 4255, Buenos Aires, Argentina

Division of Ser. No. 130,352, Oct. 1, 1993, which is a continuation-in-part of Ser. No. 535,745, Jun. 11, 1990, Pat. No. 5,360,443. This application Jun. 6, 1995, Ser. No. 466,356
Int. Cl.[6] A61F 2/06; A61M 29/00
U.S. Cl. 623—1 9 Claims

1. An aortic graft for intraluminal delivery to repair an abdominal aortic aneurysm in an aorta having two iliac arteries associated therewith at an aortic bifurcation, comprising:



a tube having first and second ends, an intermediate portion disposed between the first and second ends, and a wall surface disposed between the two ends, at least a portion of the tube adapted to be disposed within the abdominal aortic aneurysm, the intermediate portion of the tube being not substantially radially expandable, and the first end of the tube being radially expandable;

a first means for securing the first end of the tube to the aorta, the first securing means having a first diameter which permits intraluminal delivery of the first securing means into the aorta and the first securing means having a second, expanded diameter, to secure the first end of the tube to the aorta; and

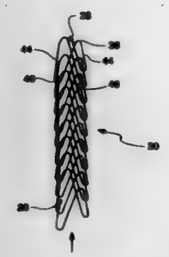
a second means for securing the second end of the tube at the aortic bifurcation, the second means for securing being disposed at the second end of the tube.

5,591,230

RADIALLY EXPANDABLE STENT

Joseph B. Horn, Niwot, Colo., and Ivan De Scheerder, St. Martens Latem, Belgium, assignors to Global Therapeutics, Inc., Broomfield, Colo.

Continuation-in-part of Ser. No. 456,087, May 31, 1995. This application Aug. 11, 1995, Ser. No. 514,869
Claims priority, application Belgium, Sep. 7, 1994, 09400801
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 28 Claims



1. An expandable stent for implantation within a blood vessel in a body, comprising:

a substantially cylindrical member formed from a continuous length of wire, wherein said substantially cylindrical member includes a plurality of interconnected, substantially circular, concentric loops disposed between a proximal and distal end thereof, wherein, when said substantially cylindrical member is implanted in the blood vessel, a plurality of said concentric loops, each having an angular-shaped bend with no more than one angular shaped bend being located in each quadrant of each of said loops, said bend in each of said plurality of concentric loops forming an angle, and, along a length of said substantially cylindrical member, a line bisects a plurality of said angles, and wherein, when said substantially cylindrical member is in place in the blood vessel, said line is maintained substantially parallel to a direction of blood flow through the blood vessel to reduce an impedance of said substantially cylindrical member to the blood flow.

5,591,231

Patent Not Issued For This Number

5,591,232

SURGICAL METHOD FOR REJUVENATING BODY MEMBERS OR FOR RESHAPING BODY MEMBERS OR FOR REJUVENATING AND RESHAPING BODY MEMBERS BY BONE GRAFTING

Houching Rahimi, 7550 Béique, Montreal, Québec, Canada, and Hamid Vossoughi, 50 Watertown St. #609, Watertown, Mass. 02172

Filed Apr. 17, 1995, Ser. No. 422,812
Int. Cl.[6] A61F 2/28
U.S. Cl. 623—16 16 Claims

1. A new method of surgery for rejuvenating or reshaping a body member, said method comprising:

(a) gradually injecting an amount of physiological serum, including local anesthesia, in a designated site of the body member;

(b) when a desired shape of the body member is achieved, photographing the body member and determining the injected amount of physiological serum which is equivalent to a quantity of bone graft mixture required for surgery, said bone graft mixture being a mixture of bone graft and hydroxylapatite;

(c) before injection. combining said bone graft mixture with normal saline to form a paste-like bone graft mixture;

(d) making a number of incisions and, from said number of incisions, making a tunnel to the designated site for reaching the designated site of the body member and for injecting the bone graft mixture;

(e) transporting with an instrument or injecting with a special syringe the paste-like bone graft mixture to the designated site;

(f) before transporting or injecting the paste-like bone graft mixture to the designated site, removing any extra normal saline from the paste-like bone graft mixture;

(g) combining the bone graft mixture with few milliliters of fresh venous blood from the patient and injecting said bone graft mixture combined with fresh blood at the designated site; and

(h) compacting the bone graft mixture gently in the designated site and closing the number of incisions by appropriate surgical sutures, while shaping the body member digitally by pressing on patient's outside skin until the desired shape is achieved.

5,591,233
METAL/COMPOSITE HYBRID ORTHOPEDIC IMPLANTS

David C. Kelman, Winona Lake, Ind., and Joseph D. Trentacosta, Wilmington, Del., assignors to Depuy Dupont Orthopaedics, Warsaw, Ind.

Continuation of Ser. No. 271,540, Jul. 7, 1994, abandoned, which is a continuation of Ser. No. 823,876, Jan. 14, 1992, abandoned, which is a continuation of Ser. No. 531,652, Jun. 1, 1990, abandoned. This application May 16, 1995, Ser. No. 442,072
Int. Cl.[6] A61F *2/28*
U.S. Cl. 623—16 **13 Claims**



1. An orthopedic device adapted for implantation within a body, the device comprising:

an intraosseous metal portion; and

an intraosseous composite portion of one or more layers and comprising (i) a first extension having a modulus and that is received within said metal portion and secured thereto and (ii) a second extension positioned outside said metal portion,

said composite portion having a length and comprising one or more filaments disposed about a longitudinal axis by winding or braiding each filament along said length at winding or braiding angles with respect to the longitudinal axis selected to provide the second extension with a modulus that is less than the modulus of the first extension the winding or braiding angle in some of the layers of the first extension being less than the winding or braiding angle in the same layers of the second extension, said filaments further being disposed within a polymer matrix.

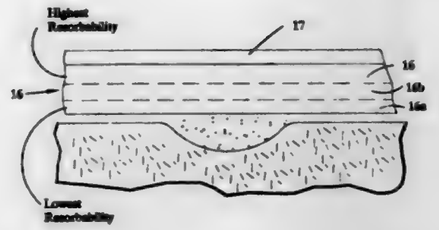
5,591,234
POST-SURGERY ORTHOPEDIC COVERING

Axel Kirsch, Talstrasse 23, D70794 Filderstadt, Germany, assignor to Axel Kirsch, Filderstadt, Germany

Continuation of Ser. No. 188,490, Jan. 28, 1994, abandoned. This application Sep. 19, 1995, Ser. No. 530,089
Claims priority, application Germany, Feb. 1, 1993, 43 02 709.1
Int. Cl.[6] A61F *2/28*
U.S. Cl. 623—16 **22 Claims**

1. A post-surgery orthopedic covering adapted to cover a bone defect point in endogenic bone tissue filled with an osteogenic material, said covering comprising:

a membrane adapted to be disposed adjacent said bone defect point and said endogenic bone tissue;



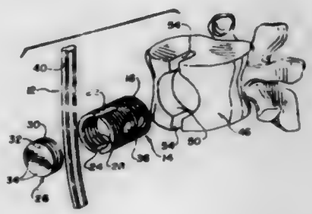
a stiffening layer connected to said membrane;

said membrane consisting of resorbable membrane material and comprising a plurality of layers having respectively different mechanical properties, giving said layers, in combination, a resorbability gradient from a first side of said membrane adapted to be remote from said endogenic bone to a second side of said membrane adapted to face said endogenic bone, said resorbability gradient increasing from said first side to said second side.

5,591,235
SPINAL FIXATION DEVICE

Stephen D. Kuslich, 10343 Dellwood Rd. North, Stillwater, Minn. 55082

Filed Mar. 15, 1995, Ser. No. 404,236
Int. Cl.[6] A61F *2/44*
U.S. Cl. 623—17 **10 Claims**



1. A surgically implantable system for correction of a spinal abnormality which comprises:

(a) a rod adapted to extend within vertebrae of a spinal section in need of correction;

(b) at least two substantially hollow cylindrical members each having a series of bone-engaging threads on the exterior surface of the cylindrical members, each of said cylindrical members including an upper an a lower rim, each of said upper rims including a pair opposing rod fixation slots to receive said rod transversely across said rim and to be below the plane of said rim, said rod being received in each rod fixation slot of each cylindrical member; and

(c) a locking cap secured to each of said cylindrical members at said upper rims to thereby lock said rod to each said cylindrical member.

5,591,236
POLYACRYLATE EMULSIFIED WATER/SOLVENT FABRIC CLEANING COMPOSITIONS AND METHODS OF USING SAME

Timothy C. Roetker, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 413,560, Mar. 30, 1995, abandoned. This application Oct. 17, 1995, Ser. No. 544,373
Int. Cl.[6] D06L *1/04;* C11D *3/37;3/43;7/50*
U.S. Cl. 8—137 **5 Claims**

1. A method for cleaning fabrics, comprising applying to said fabrics a dry cleaning and spot removal composition, comprising:

(a) from about 0.01%, to about 0.20%, by weight, of a polyacrylate emulsifier;

(b) from about 1% to about 30%, by weight, of an organic cleaning solvent selected from the group consisting of the monomethyl-, monoethyl-, monopropyl-, and monobutyl-ethers of propoxylated propanol, and mixtures thereof;

(c) optionally, from about 0.05% to about 5%, by weight, of detersive surfactant selected from the group consisting of amine oxides, alkyl ethoxy sulfates, ethoxylated alcohols, and mixtures thereof surfactants; and

(d) at least about 60%, by weight water.

5,591,237
FUEL ADDITIVE CONCENTRATE WITH ENHANCED STORAGE STABILITY

Donald R. Bell, Collinsville, Ill., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1995, Ser. No. 578,414
Int. Cl.[6] C10L *1/22*
U.S. Cl. 44—325 **13 Claims**

1. In a fuel additive concentrate package comprising a detergent/dispersant, an organic nitrate combustion improver, and a corrosion inhibitor comprising dimer and/or trimer acid, the improvement wherein said concentrate additionally comprises a shelf life stability amount of acid selected from the group consisting of nitric acid and hydrochloric acid, said shelf life stability amount of acid being sufficient to provide enhanced shelf life stability to said concentrate.

5,591,238
METHOD FOR PREPARING SYNTHESIS GAS USING NICKEL CATALYSTS

Alakananda Bhattacharyya, Wheaton; Wen-Dong Chang; Mark S. Kleefisch, both of Naperville, and Carl A. Udovich, Joliet, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 110,104, Aug. 20, 1993, Pat. No. 5,399,537, which is a continuation-in-part of Ser. No. 993,419, Dec. 21, 1992, abandoned. This application Dec. 9, 1994, Ser. No. 353,052
Int. Cl.[6] C01B *3/32;* B01J *21/16;29/04*
U.S. Cl. 48—198.7 **14 Claims**



containing gas in the presence of the catalyst at a temperature and pressure sufficient to form a synthesis gas comprising carbon monoxide and molecular hydrogen.

5,591,239
NONWOVEN ABRASIVE ARTICLE AND METHOD OF MAKING SAME

Eric G. Larson, Lake Elmo; Rufus C. Sanders, Jr., Burnsville; Brent D. Niccum, North St. Paul; Walter W. Pawlikowski, St. Paul, and Elizabeth C. Edblom, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1994, Ser. No. 297,807
Int. Cl.[6] B24D *3/02;* C09K *3/14*
U.S. Cl. 51—294 **57 Claims**

1. An open low-density abrasive article, comprising in combination:

(a) a lofty, open, nonwoven three-dimensional fibrous web comprising a plurality of interentangled randomly-extending polyamide staple fibers including points of intersection and contact between said fibers, said points of intersection and contact between said fibers being bonded together to form a three-dimensionally integrated structure throughout said web, wherein said fibers have surfaces and a fiber tenacity of less than 5 g/denier;

(b) a plurality of abrasive particles dipersed throughout said web and securely adhered to said surface of said fibers; and

(c) hardened resinous material dispersed throughout said web, said resinous material comprising (i) a phenolic resin comprising a cured product of a phernolic resing precursor, and (ii) a modifier comprising a rubber material in an amount effective to substantially prevent chemical degradation of said fibers.

5,591,240
POWDER PAINT BOOTH BACKFLOW FILTER APPARATUS

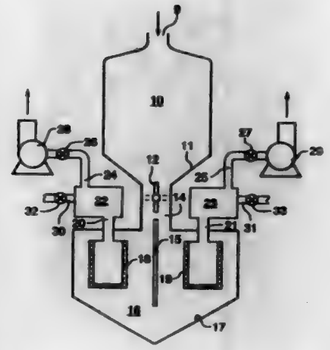
Hermann Ophardt, Lindenau 27, Issum, Germany, and Heiner Ophardt, 4743 Christie Dr., Beamsville, Ontario, Canada

Filed Apr. 20, 1995, Ser. No. 425,502
Claims priority, application Canada, Jun. 27, 1994, 2126802
Int. Cl.[6] B01D *46/00*
U.S. Cl. 55—217 **19 Claims**

1. An apparatus for depositing particulate matter on an article comprising,

housing chamber means for housing said article while said particulate matter is deposited thereon,

collection chamber means for collecting excess particulate matter entrained in gas, the collection chamber means including first outlet means, and second outlet means,



inletway means providing gaseous communication between said housing chamber and said collection chamber means,

inlet valve means operable to assume an open position permitting gas flow from said housing chamber means through said inletway means into the collection chamber means, and a closed position closing said inletway means,

vacuum means for evacuating said collection chamber means to a negative pressure,

particulate matter filtration means comprising first filter means across said first outlet means and second filter means across said second outlet means,

first conduit means including first conduit valve means operable to selectively connect the first outlet means to either:

(a) said vacuum means, whereby said vacuum means draws gas outwardly from said collection chamber means through said first filter means via said first outlet means, or

(b) a first source of gas at a pressure above pressure drawn by said vacuum means, whereby the first conduit means permits gas from the first source of gas to backflow into the collection chamber means through the first filter means via said first outlet means,

second conduit means including second conduit valve means operable to selectively connect the second outlet means to either:

(a) said vacuum means, whereby said vacuum means draws gas outwardly from said collection chamber means through the second filter means via the second outlet means, or

(b) a second source of gas at a pressure above pressure drawn by the vacuum means, whereby the second conduit means permits gas from the second source of gas to backflow into the collection chamber means through the second filter means via said second outlet means.

5,591,241

LIQUID VAPOR CONTACT APPARATUS

John T. Lavin, Guildford, England, assignor to The BOC Group plc, Windlesham, England

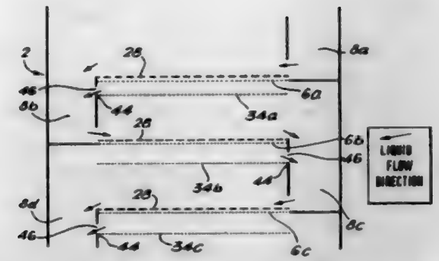
Continuation of Ser. No. 274,854, Jul. 12, 1994, abandoned. This application Jan. 30, 1996, Ser. No. 594,365

Claims priority, application United Kingdom, Jul. 19, 1993, 9315066

Int. Cl.[6] B01F *3/04*

U.S. Cl. 55—257.6 **8 Claims**

1. An apparatus comprising: a liquid-vapour contact column; an array of vertically spaced liquid-vapour contact trays and an arrangement of downcomers for conducting liquid from tray to tray down the array housed within said liquid-vapour contact column; and a liquid-vapour disengagement device situated within a vapour space located between one pair of adjacent trays, said liquid-vapour disengagement device having vapour passages therethrough, at least one surface for liquid flow thereacross, said at least one surface having at least one outlet in liquid flow communication with the lower tray of said pair, and deflectors adapted to impart to ascending liquid a horizontal component of velocity in the direction of said at least one outlet, the at least one outlet of the liquid-vapor disengagement device comprising a liquid outlet edge thereof communicating with the lower tray of the pair via a downcomer which in operation conducts liquid from the upper tray to said lower tray.



5,591,242

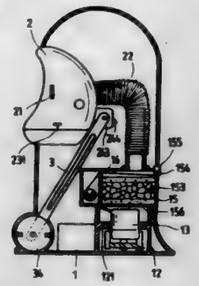
SMOKE PROCESSOR

Chi L. Kuo, P.O. Box 82-144, Taipei, Taiwan

Filed Sep. 7, 1995, Ser. No. 524,512

Int. Cl.[6] B01D *29/56*

U.S. Cl. 55—318 **5 Claims**



1. A smoke processor comprising:

a housing having a recess;

an exhaust fan arranged with said housing;

a filter mounted within said housing and located above said exhaust fan;

a smoke processing container fitted in the recess of said housing;

a flexible pipe connecting said smoke processing container with said filter;

a cigarette lighter mounted in said smoke processing container;

a linking rod having an upper end pivotally connected with said smoke processing container;

a rotating disc rotatably connected with a lower end of said linking rod; and

a fixed disc engaged with said rotating disc and mounted within said housing.

5,591,243

LIQUID TRAP FOR COMPRESSED AIR

Rafael A. Colussi, and Nestor J. Venica, both of Provincia de Santa Fe, Argentina, assignors to Col-Ven S.A., Provincia de Santa Fe, Argentina

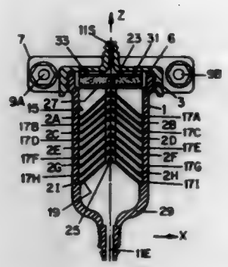
Filed Sep. 12, 1994, Ser. No. 304,761

Claims priority, application Argentina, Sep. 10, 1993, 325986

Int. Cl.[6] B01D *45/08; 50/00*

U.S. Cl. 55—321 **20 Claims**

1. A device for installation in a fluid transportation system for separating components from a fluid transported therethrough from



an upstream fluid source to downstream fluid receiving means, said components being relatively heavier than said fluid, said separating device comprising:

housing means having inlet means for coupling to said upstream fluid source and outlet means for coupling to said downstream means so that fluid transported by said system through said housing passes from said inlet means to said outlet means; and

means for separating the relatively heavy components from said fluid and comprising:

a plurality of deflector elements housed in said housing, said deflector elements positioned one after the other in spaced relationship in between said inlet and outlet means, wherein each of said plurality of deflector elements opens out towards said inlet means to provide a generally concave deflector surface for said fluid to impinge at an angle thereon, said deflector elements being aligned one after the other in a longitudinal direction extending from said inlet means to said outlet means, said concave surfaces operatively facing said inlet means and forming an oblique angle with the general direction of said fluid impinging therein, the plurality of deflector elements defining a plurality of respective apices aligned in said longitudinal direction and pointing towards said outlet means,

said separating means further comprising passage means through each deflector element and offset from the respective apex thereof and from the main direction of said fluid stream impinging thereon, passage means operatively communicating said deflector surface of the associated deflector element towards the deflector surface of the next downstream deflector element and said passages being generally out of line with each other, whereby said fluid, after entering said housing through said inlet means, alternatively and sequentially collides against said deflector surfaces and flows through said passage means.

5,591,244

SYSTEM FOR REMOVAL OF NOXIOUS FUMES

Anthony R. Vrona, Youngstown, Ohio, and George V. Fagan, Woodbridge, N.J., assignors to Simon Roofing and Sheet Metal Corp., Boardman, Ohio, and Aercology Incorporated, Old Saybrook, Conn.

Filed Jun. 7, 1995, Ser. No. 478,785

Int. Cl.[6] B01D *50/00*

U.S. Cl. 55—356 **22 Claims**

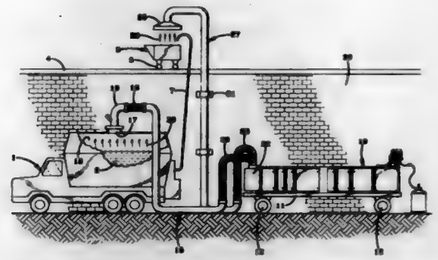
1. A system for reducing the transmission of noxious fumes into the surrounding air during the application of a liquid roofing product on a roof, said system including:

a mobile vessel adapted to contain a supply of a liquid roofing product;

a mobile filtration unit having an inlet and an outlet;

first duct means extending between the vessel and the filtration unit for drawing fumes accumulating above the roofing product within the vessel into the filtration unit;

a mobile carrier adapted to hold a quantity of the roofing product on a roof of a building adjacent the vessel and filtration unit;



second duct means extending between the carrier and the filtration unit for drawing fumes from the carrier into the filtration unit; and

blower means for moving the fumes from the carrier and vessel through the filtration unit to condition the fumes before discharging them into the surrounding atmosphere.

5,591,245

METHOD AND APPARATUS FOR DEVELOPING AND EDGE STRESS IN A WINDSHIELD IN A WINDSHIELD BENDING FURNACE

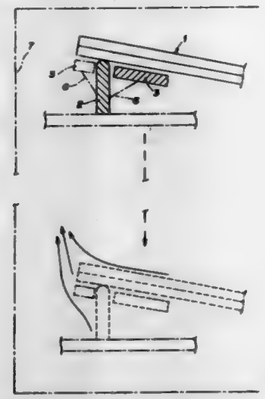
Tauno T. Saloneu, Tampere, Finland, assignor to Tamglass Engineering Oy, Tampere, Finland

Continuation of Ser. No. 39,480, Apr. 26, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 332,466

Claims priority, application Finland, Nov. 1, 1990, 905399

Int. Cl.[6] C03B *23/025*

U.S. Cl. 65—107 **20 Claims**



1. A method for developing an edge stress in a glass sheet in a glass sheet bending furnace, comprising the steps of:

supporting a glass sheet on a ring mould;

heating the supported glass sheet so that bending of the glass sheet occurs;

maintaining, at least during heating and bending of the glass sheet, substantially homothermal temperature conditions in an edge area of the glass sheet around an entire periphery of the glass sheet, the substantially homothermal temperature conditions being maintained with a metallic frame disposed adjacent to the ring mold and immediately beneath, but not contacting, the edge area of the glass sheet as it is heated and bent; and

developing a uniform compression stress in the edge area of the glass sheet after bending by causing cool air to flow around edges of the glass sheet while the metallic frame is disposed immediately beneath, but not contacting, the edge area of the glass sheet, the metallic frame maintaining substantially

homothermal temperature conditions in the edge area of the glass sheet around the entire periphery of the glass sheet as the uniform compression stress is developed.

5,591,246

Patent Not Issued For This Number

5,591,247

AGGLOMERATED PRODUCT WITH PAPER FIBERS

Philippe Dumont, Audergheim, and Robert Goffin, Troor, both of Belgium, assignors to Lhoist Recherche et Developpement S.A., Belgium

PCT No. PCT/BE92/00047, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/09257, PCT Pub. Date May 13, 1993

PCT Filed Oct. 30, 1992, Ser. No. 232,103

Claims priority, application Belgium, Oct. 30, 1991, 09101000

Int. Cl.[6] C22B *1/243;7/02*

U.S. Cl. 75—329 **4 Claims**

1. An agglomerated product based on metallurgical by-products consisting of:

2.5 to 3 % by weight, based on the total weight of product, of paper fibers;

5 to 10 % by weight, based on the total weight of product, of water;

$Ca(OH)_2$, the weight content being comprised between 9 and 25 % by weight, based on the total weight of product, and

the remaining part consisting of metallurgical by-products.

5,591,248

METHOD FOR MELTING METAL, ESPECIALLY NON-FERROUS METAL

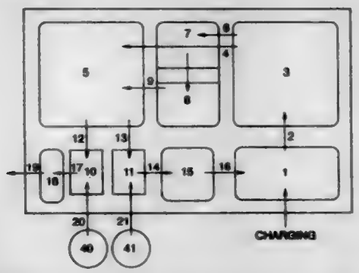
Lars H. M. Jåfs, and Daniel Jåfs, both of Helsingfors, Finland, assignors to AB Jafs Export Oy Holmsey, Finland

Filed Apr. 20, 1994, Ser. No. 230,120

Claims priority, application Finland, Apr. 20, 1993, 931786

Int. Cl.[6] C22B *9/16*

U.S. Cl. 75—414 **6 Claims**



1. A method for melting and processing in a melting furnace metal which comprises

a sealed inlet chamber for receiving solid metal material and having means for heating said solid metal to a molten state;

a sealed melt chamber connected to receive molten metal from said inlet chamber and having means for further heating molten metal contained therein,

a first pump and a second pump and means connecting each of said pumps to said melt chamber to permit molten metal to flow between said melt chamber and each of said pumps, each of said pumps comprising a sealed pump chamber for receiving molten metal from said melt chamber,

a first sealed splash chamber connected to receive molten metal from said first pump,

a second splash chamber connected to receive molten metal from said second pump and having a discharge opening for discharging therefrom molten metal pumped into said second splash chamber,

said first splash chamber being connected to said inlet chamber so as to permit the flow of molten metal from said first splash chamber to said inlet chamber,

said method comprising the steps of feeding solid metal to said inlet chamber, transferring molten metal from said inlet chamber to said melt chamber, transferring molten metal from said melt chamber to each of said pumps, thereafter transferring molten metal from each of said pumps to the splash chamber connected thereto at a first rate and simultaneously transferring molten metal from said pumps back to the melt chamber at a second rate, said first rate being approximately three to approximately fifteen times higher than said second rate.

5,591,249

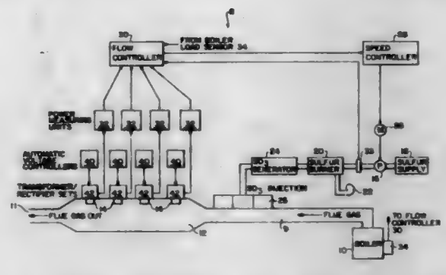
FLUE GAS CONDITIONING METHOD FOR INTERMITTENTLY ENERGIZED PRECIPITATION

William G. Hankins, Issaquah, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Continuation of Ser. No. 254,937, Jun. 7, 1994, abandoned. This application Mar. 22, 1996, Ser. No. 626,016

Int. Cl.[6] B03C *3/013*

U.S. Cl. 95—6 **15 Claims**



1. A method of controlling a flue gas conditioning system including a source of a conditioning agent, means for adding the conditioning agent to a flue gas, an electrostatic precipitator for treating the flue gas and having a set of electrostatic elements which receive an intermittent input power, a power supply which operates in an intermittent energization mode to deliver the intermittent input power to the electrostatic precipitator, and a controller, for controlling the amount of the conditioning agent added to the flue gas, said method comprising the steps of:

measuring first and second parameters of the intermittent input power delivered to the electrostatic precipitator;

deriving a power signal, indicative of the intermittent input power delivered to the electrostatic precipitator, from the first and second parameters; and

controlling the amount of conditioning agent added to the flue gas according to the power signal; wherein

the input power includes a plurality of energized and non-energized half-cycles; and

the step of measuring includes the step of (a) detecting the first parameter existing at the electrostatic precipitator during an energized half-cycle of the input power and (b) detecting the second parameter existing at the electrostatic precipitator during an energized half-cycle of the input power.

5,591,250

MATERIAL AND PROCESS FOR SEPARATING CARBON DIOXIDE FROM METHANE

S. Alexander Stern, Manlius, N.Y.; Hiroyoshi Kawakami, Hachioji, Japan; Ajay Y. Houde, and Guanghin Zhou, both of Syracuse, N.Y., assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 104,345, Aug. 9, 1993, abandoned. This application Jan. 5, 1995, Ser. No. 368,995

Int. Cl.[6] B01D *53/22;71/64*

U.S. Cl. 95—51 **14 Claims**

1. A process for separating a first gas, which is CO_2, from a second gas, which is CH_4, comprising the steps of:

(1) contacting one side of a semi-permeable gas separation membrane with a feed gas mixture containing at least the first gas and the second gas, wherein the membrane divides a separation chamber into a high-pressure side, into which the feed gas mixture is fed, and a low-pressure side;

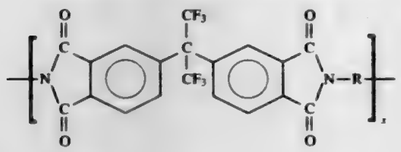
(2) maintaining a pressure differential across the membrane under conditions such that the first gas in the feed gas mixture selectively permeates through the membrane from the high-pressure side to the low-pressure side of the membrane;

(3) removing from the low-pressure side of the membrane permeated gas mixture which is enriched in the first gas and depleted in the second gas; and

(4) removing from the high-pressure side of the membrane a gas mixture which is enriched in the second gas and depleted in the first gas;

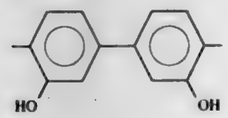
wherein the membrane comprises at least in part a thin discriminating layer of polyimide having the repeating formula

FORMULA 1



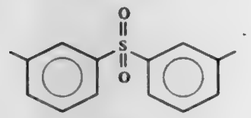
wherein R is:

FORMULA 2



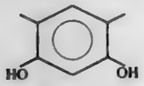
OR

FORMULA 3



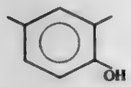
OR

FORMULA 4



OR

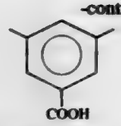
FORMULA 5



OR

-continued

FORMULA 6



and x is an integer.

5,591,251

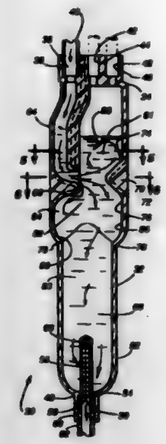
SIDE FLOW BUBBLE TRAP APPARATUS AND METHOD

James M. Bragger, Boulder, Colo., assignor to COBE Laboratories, Inc., Arvada, Colo.

Continuation-in-part of Ser. No. 305,749, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 158,928, Nov. 19, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 362,262

Int. Cl.[6] B01D *9/00;* **A61M** *1/14;3/00*

U.S. Cl. 95—242 **17 Claims**



1. A method of removing bubbles from blood flowing through a bubble trap apparatus in an extracorporeal blood treatment circuit, said apparatus including a housing having an upper housing end and a lower housing end, the housing defining a substantially vertical chamber extending substantially along a vertical longitudinal axis between said upper and lower housing ends, said chamber having a substantially cylindrical upper subchamber and a lower subchamber, said upper subchamber being offset from said lower subchamber and having upper and lower level indicator marks formed thereon, said method comprising the steps of:

introducing blood into the upper subchamber substantially transversely to the longitudinal axis of the chamber at a position intermediate between the upper and lower housing ends;

deflecting at least a portion of the blood introduced into the chamber with a frustoconical deflector above the position where the blood is introduced into the chamber to form a pool of blood in the chamber in the upper subchamber in a portion of the upper subchamber having a diameter wider than the diameter of the chamber adjacent the frustoconical deflector;

allowing bubbles in the blood to separate from the blood in the pool;

collecting the separated bubbles;

removing the blood from the chamber after the bubbles have been separated therefrom; and

maintaining an upper blood surface within the chamber between the upper and lower level indicator marks.

5,591,252

DEVICE AND METHOD FOR THE CONTINUOUS DEGASSING OF CASTING RESIN

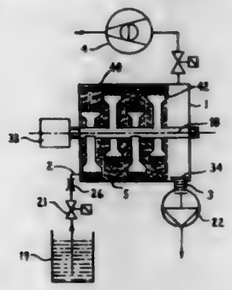
Erhard Haeuser, Schoeffengrund-Schwalbach, Germany, assignor to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG, Ehringshausen-Katzenfurt, Germany

Continuation of Ser. No. 409,666, Mar. 24, 1995, abandoned, which is a continuation-in-part of Ser. No. 200,293, Feb. 22, 1994, Pat. No. 5,409,523, which is a continuation of Ser. No. 916,358, Jul. 15, 1992, abandoned. This application Mar. 25, 1996, Ser. No. 621,326

Claims priority, application Germany, Jul. 19, 1991, 41 24 033.2

Int. Cl.[6] B01D *19/00*

U.S. Cl. 95—260 **11 Claims**



1. A method for the continuous degassing of casting resin, comprising the steps of:

creating and maintaining an atmosphere inside of a closed vessel which is at a pressure less than atmospheric pressure, said vessel having an inlet port and an outlet port and plural spatially related areas therebetween;

feeding the casting resin to the inlet port so that casting resin is present inside said vessel and at least in a first of said areas;

spreading the casting resin in a thin layer over a first degassing surface in said first area to cause any gas contained within the casting resin to surface and be removed from the vessel by reason of the maintaining of the negative pressure inside said vessel, the spreading step being accomplished by the use of a layer cleaving device which is movable relative to the first degassing surface; and

cleaving the casting resin by the layer cleaving device so that new surface areas in the casting resin are created and exposed directly to the atmosphere inside the closed vessel, the surface areas being sufficient to enhance any gas contained within the casting resin to surface and be removed from the vessel as aforesaid, the layer cleaving device also being movable relative to the second degassing surface; and

transferring the cleaved casting resin into a next adjacent one of the spatially related areas inside said vessel and, while the casting resin is in the next adjacent one of the areas, it is again spread in a thin layer over a second degassing surface in the next adjacent area and cleaved so as to allow any gas contained within the casting resin to surface and be removed from said vessel as aforesaid.

4. In a device for the continuous degassing of a casting resin comprising a hollow housing having an inlet port and an outlet port for facilitating a guiding of the casting resin therethrough, said housing including a connection means for providing a connection of an interior of said housing to a vacuum source for creating and maintaining an atmosphere inside the housing which is at a pressure less than atmospheric pressure, the improvement comprising means defining successive degassing areas through which the casting resin is successively guided to facilitate degassing, means for defining a degassing surface in each of the successive degassing areas, applying means for applying the casting resin in each degassing area to the degassing surface, so that the casting resin is degassed while applied to the degassing surface, the gas emanating from the casting resin being exhausted from the housing by the vacuum source, cleaving means for cleaving the casting resin applied to the degassing surface in each degassing area so that new surface areas in the casting resin are created and exposed directly to the atmosphere inside the housing, the surface areas being sufficient to enhance any gas contained within the casting resin to surface and be removed from the vessel through the connection means, and means for transferring the casting resin to the following degassing area, wherein said cleaving means include fastening means extending radially from a central shaft in said vessel, said fastening means having a portion whereat a layer cleaving device is arranged for cleaving the casting resin.

5,591,253

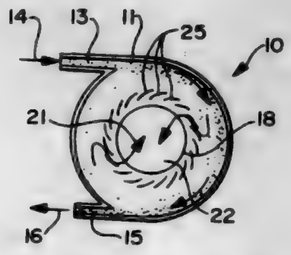
ELECTROSTATICALLY ENHANCED SEPARATOR (EES)

Ralph F. Altman, Chattanooga, Tenn.; S. Ronald Wynk, Stow, Mass.; Leo A. Susolensky, Concord, Mass., and Bruce H. Eason, Groton, Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 7, 1995, Ser. No. 399,732

Int. Cl.[6] B03C *3/15*

U.S. Cl. 96—61 **8 Claims**



1. An apparatus for separating particles from a gas stream comprising:

a separation vessel including a cylindrical-walled separation chamber bound at opposing ends, an inlet passage for admitting a particulate laden gas stream into said separation chamber and a particle outlet passage for expelling a concentrated stream of particles disentrained from said gas stream, said inlet passage and particle outlet passage both further comprising a thin elongated slit opening tangentially to cylindrical walls of said separation chamber and providing a substantially flush incoming flow path dispersed lengthwise along said wall;

two vortex finders suspended centrally within the separation vessel between the ends thereof and establishing an end-to-end outgoing clean flow path through the separation vessel and out from the ends thereof;

an elongated discharge electrode suspended centrally within the separation vessel between the ends thereof; and

a power supply connected between the cylindrical walls of the separation chamber of the separation vessel and the discharge electrode for establishing an electric potential therebetween which serves to charge the particles entrained in said incoming gas stream and repel charged particles in said separation vessel toward the wall of said separation chamber,

wherein a gas stream flowing into said inlet passage, through said separation chamber, and out from said particle outlet passage creates a vortex in said separation chamber which imparts a centrifugal force on the entrained particles toward the wall of said separation chamber, and said centrifugal force is augmented by said electrostatic force to propel said particles away from the entrance of the vortex finders and out through said outlet passage.

5,591,254

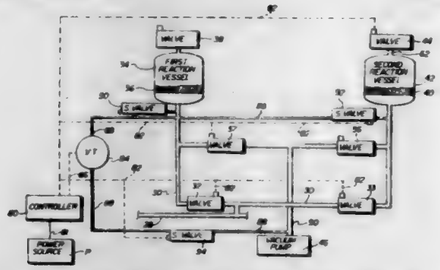
VAPOR RECOVERY SYSTEM WITH AUTOMATIC VALVE CONTROL

David L. Gibson, Louisville, Ky., assignor to Jordan Holding Company, Fisherville, Ky.

Filed Jul. 12, 1995, Ser. No. 501,353

Int. Cl.[6] B01D *53/047*

U.S. Cl. 96—113 **6 Claims**



1. An apparatus for recovering volatile liquid vapor from an air-volatile liquid vapor mixture, comprising:

first and second reaction vessels each including a bed of adsorbent for adsorbing volatile liquid vapor and producing relatively volatile liquid vapor-free air;

a vacuum pump for regenerating said absorbent bed in each of said first and second reaction vessels and releasing previously adsorbed volatile liquid vapor;

means for recovering volatile liquid vapor generated during bed regeneration;

means for circulating the air-volatile liquid vapor mixture through said apparatus between said first and second reaction vessels, vacuum pump and recovering means, said circulating means including main conduit means for the passage of the air-volatile liquid vapor mixture and valve means for directing the flow of the air-volatile liquid vapor mixture along said main conduit means; and

flow control means including an air pressure monitor for monitoring air pressure in said apparatus adjacent each bed of adsorbent and an inlet of said vacuum pump and control means responsive to said air pressure monitor for controlling operation of said valve means.

5,591,255

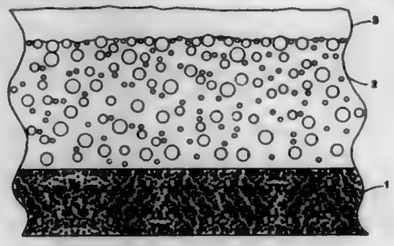
THERMOCHROMIC INK FORMULATIONS, NAIL LACQUER AND METHODS OF USE

Lyle D. Small, Ithaca, N.Y., and Gerald Highberger, Linden, N.J., assignors to Chromatic Technologies, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 175,898, Dec. 29, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 315,893

Int. Cl.[6] C09D *11/00*

U.S. Cl. 106—21 A **16 Claims**



1. A method of making a solvent based ink formulation including a thermochromic pigment, wherein said thermochromic pigment is formed of microcapsules each containing reversible thermochromic coloring material which exhibits a visible change in color between a first color state and a second color state in response to a change in temperature, comprising:

a) drying a slurry including thermochromic pigment to a solids concentration between 80% and 95%;

b) mixing said dried slurry in an appropriate mixing base that has an inherent or adjusted acid value lower than 100 and does not include anymore than trace amounts of the following solvents: ketones, diols, aldehydes, amines and aromatic compounds thereby making a base formulation, wherein said mixing base is selected from one or more of the following: 1) mixing varnish, 2) polyester resin vehicle; and 3) colloidal dispersion resin; and

c) adding any desired ink components to said base formulation wherein said ink components have an inherent or adjusted acid value that is below 100 and do not include any more than trace amounts of the following solvents: ketones, diols, aldehydes, amines and aromatic compounds.

5,591,256

HIGH PERFORMANCE SYNTHETIC ALKALI METAL ALUMINO-SILICATE, METHODS AND USES, COMPOSITIONS AND HIGH SOLIDS REACTION METHODS OF THEIR PREPARATION

Gary M. Freeman; Richard D. Carter; Thad T. Broome, all of Macon, and Kurt H. Moller, Warner Robins, all of Ga., assignors to J. M. Huber Corporation, Edison, N.J.

Filed Aug. 10, 1994, Ser. No. 288,532

Int. Cl.[6] C08K *5/00*

U.S. Cl. 106—483 **29 Claims**

1. A sodium alumino-silicate pigment having the following empirical formula in terms of oxide constituents:

$$(0.01\text{–}0.5)\ Na_2O{:}Al_2O_3{:}(2.01\text{–}3.0)SiO_2{:}(1.0\text{–}3.0)\ H_2O$$

said pigment being produced by the hydrothermal reaction of a sodium silicate and a clay in an aqueous medium at a molar ratio of sodium silicate (B) to clay (C) of 0.1:1 to 0.5:1,

said pigment having a total pore volume of at least 2.0 ml/gm, an oil absorption of less than about 115 gm/100 gm, a median particle size of 0.5–0.7 microns, as determined by x-ray sedigraph, and a differential pore volume greater than 1.0 ml/gm.

5,591,257

PIGMENT PREPARATIONS BASED ON MONOAZO PIGMENTS

Joachim Weide; Rüdiger Jung, both of Kelkheim, and Hans J. Metz, Darmstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 16, 1995, Ser. No. 559,572

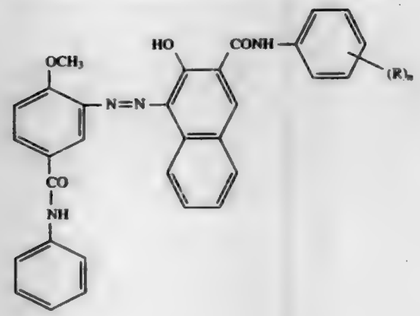
Claims priority, application Germany, Nov. 17, 1994, 44 40 928.1

Int. Cl.[6] C09B *29/20*; C09D *11/02*

U.S. Cl. 106—496 **10 Claims**

1. A pigment preparation comprising

a) at least one monoazo pigment of the formula (I)



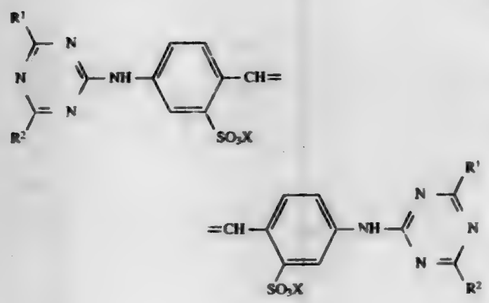
(I)

in which

R is identical or different at each occurrence and is C_1–C_3-alkyl, C_1–C_3-alkoxy, chlorine or hydrogen, and

n is a number from 1 to 3,

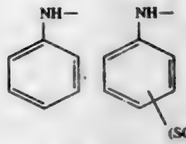
b) at least one compound of the formula (II)



(II)

in which

R^1 and R^2 are identical or different and are a radical of the formula



$(HOCH_2CH_2)_2N-$, $HOCH_2CH_2NH-$

or a five- to seven-membered, saturated or unsaturated, aliphatic or aromatic heterocyclic ring which includes from 1 to 3 heteroatoms from the group consisting of nitrogen, oxygen and sulfur,

m is the number 1 or 2, and

X is hydrogen, an alkali metal or a stoichiometric equivalent of an alkaline earth metal;

and, optionally,

c) further, conventional constituents and additives.

5,591,258

PREPARATION OF LINEAR, UNSUBSTITUTED QUINACRIDONE PIGMENTS OF THE β-PHASE

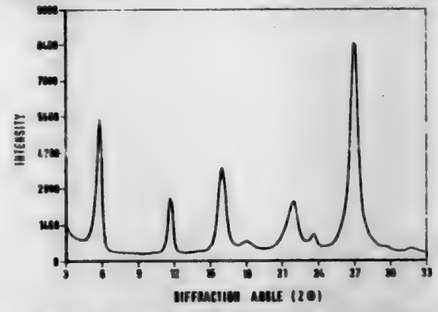
Manfred Urban, Wiesbaden, Germany, and Erwin Dietz, Wilmington, Del., assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 21, 1994, Ser. No. 342,773

Claims priority, application Germany, Nov. 25, 1993, 43 40 125.2

Int. Cl.[6] C09B *48/00*

U.S. Cl. 106—497 **17 Claims**



1. A process for preparing linear, unsubstituted quinacridone pigments or pigment preparations of the β-phase, which comprises

a) cyclizing 2,5-dianilinoterephthalic acid in polyphosphoric acid or in polyphosphoric ester to the quinacridone,

b) then hydrolyzing the quinacridone with water at a temperature of at least 40° C. to obtain a finely divided quinacridone crude pigment which is predominantly in the α-phase,

c) then optionally wet grinding the finely divided quinacridone crude pigment from b) to form a prepigment, and

d) then heating the crude pigment from b) or the prepigment from c) to a temperature between 120° and 200° C. in the presence of from 0.1 to 1.5 times the amount of an inorganic base, based on the weight of the crude pigment, in an inert liquid medium.

5,591,259

RAPID SETTING CEMENTITIOUS COMPOSITIONS AND METHOD

Lan Huang, Cleveland, and Stephen A. Farrington, Chardon, both of Ohio, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 309,373, Sep. 20, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 470,870

Int. Cl.[6] C04B *24/04*

U.S. Cl. 106—696 **9 Claims**

1 The method of rapidly forming in place a cementitious structure comprising mixing a cement composition with an amount of a water-soluble malate or water-soluble citramalate effective to accelerate the set of the cement in the presence of sufficient water for hydraulic setting of the cement, and delivering the resulting composition while fluid to the place for forming the cementitious structure, said amount of water-soluble malate or water-soluble citramalate being at least 4% by weight based on the weight of the cement.

5,591,260

METHOD FOR CRYSTAL GROWTH

Tadahiko Kishi, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan

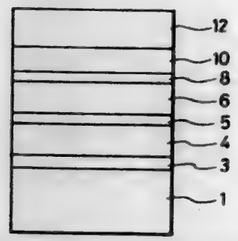
Filed Sep. 9, 1994, Ser. No. 302,009

Claims priority, application Japan, Sep. 20, 1993, 5-232669

Int. Cl.[6] C30B *25/02*

U.S. Cl. 117—104 **9 Claims**

1. A method for growing crystals comprising the steps of:



forming crystals including an indium containing crystal layer on a GaAs substrate by a thermal organic metal decomposition technique using trimethyl indium or triethyl indium as a source of indium; and

forming an Al, Ga_{1-y}, As ($0.3<y<0.7$) layer on top of said crystals,

trimethyl gallium being used as a source of gallium (Ga) in the second step.

5,591,261

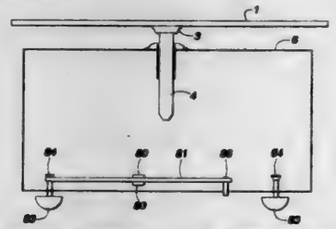
ELECTROMECHANICAL CAKE DECORATING APPARATUS

Charles F. Ciaramita, Raleigh, N.C., assignor to Too Sweet, Ltd., Atlanta, Ga.

Continuation-in-part of Ser. No. 346,617, Nov. 30, 1994, Pat. No. 5,547,507. This application Jun. 7, 1995, Ser. No. 477,218

Int. Cl.[6] A23G *7/00*

U.S. Cl. 118—13 **4 Claims**



1. An apparatus for supporting a food product being prepared and for measuring and displaying the weight of the food product being prepared, said apparatus comprising:

a turntable comprising a platen and a shaft, said platen for supporting the food product to be prepared, said shaft having a first end and a second end, said first end of said shaft being connected to said platen;

a base having an opening formed therein for receiving said shaft and for substantially preventing lateral movement of said turntable with respect to said base;

a weight sensor contained within said base, at least a portion of said weight sensor being in contact with said base for sensing the weight of a food product supported on said platen and for producing a voltage signal proportional to the weight of the food product supported on said platen wherein said weight sensor comprises a plurality of beams, each of said beams having a first end and a second end, wherein at least one transducer is attached to each of said beams at a location between the first and second ends of said beams for sensing strain in said beams and wherein each of said beams is attached to said base at a point at or near the second end of each beam and wherein of each beam is attached at or near the first end of each beam to a means for supporting said base to allow vertical movement of said base with respect to the first ends of said beams;

signal processing means connected to said weight sensor for receiving the voltage signal produced by said weight sensor and for processing the signal into display information for display;

display means connected to said signal processing means for receiving the display information from said signal processing means and for displaying a digital number which corresponds to the weight of the food product supported on said platen.

5,591,262

ROTARY CHEMICAL TREATER HAVING STATIONARY CLEANING FLUID NOZZLE

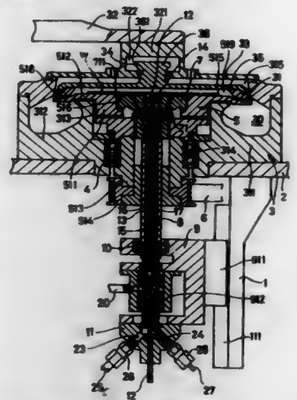
Hiroyoshi Sago; Hideya Koburi; Koji Ueda; Hidenori Miyamoto, all of Kanagawa-ken, and Ryuzo Takatsuki, Okayama-ken, all of Japan, assignors to Tazmo Co., Ltd., Okayama, and Tokyo Ohka Kogyo Co., Ltd., Kanagawa, both of Japan

Filed Mar. 24, 1995, Ser. No. 410,315

Claims priority, application Japan, Mar. 24, 1994, 6-054135

Int. Cl.[6] B05C *7/00*

U.S. Cl. 118—52 **17 Claims**



1. A rotary chemical treater, comprising:

a rotary inner cup;

an outer cup for receiving a drain from the rotary inner cup, the outer cup being disposed outside of the inner cup;

a vertical through passage defined in a rotary center of the inner cup;

a stationary cleaning fluid nozzle vertically disposed in the through passage;

a space being defined about the cleaning fluid nozzle within the passage such that said nozzle does not contact said rotary inner cup: and

said space being defined between an inner periphery of the vertical through passage and an outer periphery of the cleaning fluid nozzle, and forming at least one of a liquid waste passage and a gas supply passage in fluid communication with an interior space within the rotary inner cup.

5,591,263

WOOD PRESERVATIVE APPLICATOR

Chen-Woo Chin, Wheelers Hill, and Christopher N. McEvoy, Mount Martha, both of Australia, assignors to Sancish Pty Ltd, Victoria, Australia

PCT No. PCT/AU92/00115, § 371 Date Sep. 17, 1993, § 102(e) Date Dec. 22, 1993, PCT Pub. No. WO92/16341, PCT Pub. Date Oct. 1, 1992

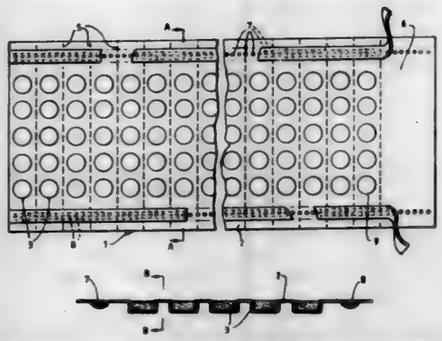
PCT Filed Mar. 17, 1992, Ser. No. 119,102

Claims priority, application Australia, Mar. 18, 1991, PK5164

Int. Cl.[6] B05C *11/00*; A01G *17/12*; B27K *3/14*

U.S. Cl. 118—200 **19 Claims**

1. A wood preservative applicator bandage for a wooden structure comprising a flexible matrix having a surface for contact with



the wooden structure, said flexible matrix having formed therein a plurality of individual reservoirs, one or more of said reservoirs each containing a solid tablet of at least one wood preserving chemical, solidified within, and substantially filling, said one or more reservoirs, said solid tablet contacting directly the wooden structure when said applicator bandage is applied to said wooden structure to supply said wood preserving chemical to said wooden structure, the plurality of reservoirs being arranged on the flexible matrix in an array of columns and rows, the rows extending the length of the applicator bandage, with the reservoirs being sufficiently spaced, to enable said matrix to be shaped to conform to the contour of the wooden structure.

5,591,264

SPIN COATING DEVICE

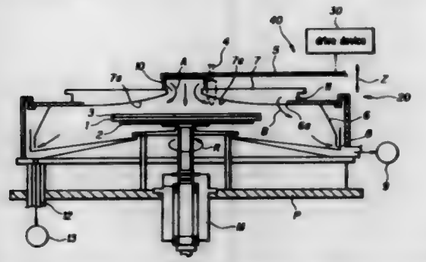
Emi Sugimoto, Tokyo; Akira Yoshio, Shizuoka, and Yoshinori Ito, Tokyo, all of Japan, assignors to Sony Corporation, Japan

Filed Mar. 16, 1995, Ser. No. 405,133

Claims priority, application Japan, Mar. 22, 1994, 6-075326; May 18, 1994, 6-129571

Int. Cl.[6] B05B *13/00*

U.S. Cl. 118—320 **18 Claims**



10. A spin coating device for a substrate for applying an application liquid on a substrate to form a substantially uniform thin film on the substrate, comprising:

a turntable for holding and rotating the substrate about a center;

an application liquid discharge nozzle for supplying the application liquid to the rotating substrate;

a splash preventing member, including a splash preventing cup and a splash preventing cover for preventing droplets of the application liquid from splashing, the splash preventing cup arranged at a periphery of the turntable in an area corresponding to peripheral edges of the substrate and the turntable, the splash preventing cover located above the substrate and arranged to face the substrate so that splashing of the application liquid is prevented; and

an opening and closing mechanism for opening and closing the splash preventing cup;

wherein the splash preventing cover has a hole for obtaining a flow of external air in a central portion of the splash preventing cover, the hole being formed so that the flow of external air is supplied to the substrate located above the turntable, and a bottom surface of the splash preventing cover faces the substrate, is above the turntable and is formed with an inclined portion which is configured to have an inclination which approaches the substrate from the hole in the central portion toward the periphery of the substrate.

5,591,265

PROTECTIVE COATING

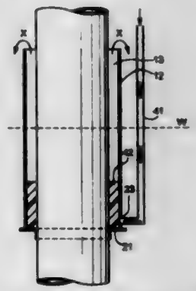
Klaus N. Tusch, London, England, assignor to Colebrand Limited

Continuation of Ser. No. 879,812, May 7, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,814

Claims priority, application United Kingdom, May 10, 1991, 9110097

Int. Cl.[6] B05C *3/02*; E02D *5/60*

U.S. Cl. 118—404 **8 Claims**



1. A system for applying a protective coating to a body having one end at least partially underwater, comprising:

(i) a formwork structured and arranged to be securely placed around the body, the formwork having at least a lower end partially underwater;

(ii) spacer means for spacing the formwork from the body to provide an annular space between the formwork and the body;

(iii) means structurally arranged adjacent the one end of the body to apply a resin material to said annular space whereby to provide the protective coating between the formwork and the body;

(v) seal means positioned between said means structurally arranged adjacent the one end of the body and the lower end of the formwork to prevent egress of said resin material from the the lower end of the formwork and to prevent ingress of water to said annular space; and

(vi) a support ring secured to the body in use to support the lower end of the formwork.

5,591,266

EXTRUSION TYPE COATING HEAD

Yoshihisa Onawa, Miyota-machi; Eino Tsunoda, Komoro; Ryuji Hasegaya, Saku; Akira Hatakeyama, Saku; Hideki Tanaka, Saku, and Seiichi Tobisawa, Hino, all of Japan, assignors to TDK Corporation, and Konica Corporation, both of Tokyo, Japan

Filed Mar. 22, 1995, Ser. No. 408,564

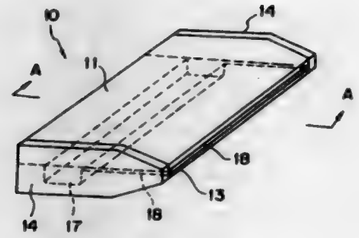
Claims priority, application Japan, Mar. 25, 1994, 6-077772

Int. Cl.[6] B05C *3/02*

U.S. Cl. 118—410 **7 Claims**

1. An extrusion coating head for applying a coating solution onto a support comprising,

a pocket storing the coating solution fed in the coating head temporarily for extruding the coating solution uniformly, and



a slit being connected to the pocket and serving as a delivery port for extruding the coating solution from the coating head and onto the support,

said pocket comprising an inner wall surface having a center line average roughness (Ra) of 3.5 μm or less.

5,591,267

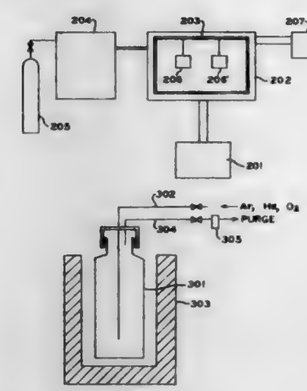
REDUCED PRESSURE DEVICE

Tadahiro Ohmi, 1-17-301, Komegabukuro, 2-chome, Aobe-ku, Sendai-shi, Miyagi-ken 980, Japan, and Masaru Umeda, 2-16, Nihonbashi-Muromachi 4-chome, Chuo-ku, Tokyo, 103, Japan

Division of Ser. No. 213,079, Mar. 15, 1994, which is a continuation of Ser. No. 97,861, Jul. 26, 1993, abandoned, Ser. No. 721,450, Aug. 8, 1991, abandoned, and Ser. No. 121,174, Sep. 13, 1993, Pat. No. 5,313,982, which is a continuation of Ser. No. 922,370, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 465,226, Mar. 5, 1990, abandoned, said Ser. No. 97,861is a continuation of Ser. No. 990,549, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 536,547, Jul. 10, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 458,894

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 **16 Claims**



1. A reduced pressure device including a reduced pressure chamber having exposed interior stainless steel surfaces, a passivation film on at least a portion of the exposed interior surfaces, said film having a thickness of more than 50 Å, said film including at least two layers, one said layer being located adjacent the interface of the stainless steel and the passivation film and containing mainly chrome oxide, a second said layer being located adjacent the surface of the passivation film and containing mainly iron oxide.

5,591,268

PLASMA PROCESS WITH RADICALS

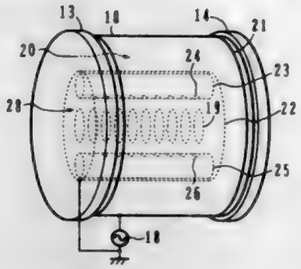
Kaoru Usui, Kawasaki, and Shou Chiba, Aizuwakamatsu, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 21, 1995, Ser. No. 505,151

Claims priority, application Japan, Oct. 14, 1994, 6-249333; Feb. 27, 1995, 7-038689

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 E **24 Claims**



1. An apparatus for manufacturing a semiconductor device comprising:

a process chamber capable of being evacuated;

field generator for generating an alternating magnetic field in said process chamber;

partition disposed in said process chamber for defining an inner space and generating another alternating magnetic field, said another alternating magnetic field cancelling a change in the alternating magnetic field generated in the inner space, and said partition allowing gas to be transported between the inner space and a space outside of the inner space;

a first gas passage for supplying process gas to said process chamber; and

second gas passage for exhausting gas from said process chamber.

5,591,269

VACUUM PROCESSING APPARATUS

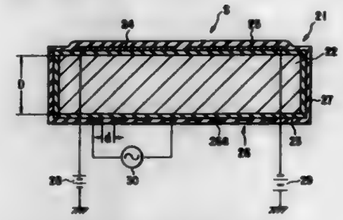
Junichi Arami, Tokyo; Kenji Ishikawa, Sagamihara; Youichi Deguchi, Machida; Hironori Yagi, Yokohama; Nobuo Kawada, and Isao Yanagiuwa, both of Asaoka, all of Japan, assignors to Tokyo Electron Limited, and Tokyo Electron Tohoku Limited, both of Japan

Filed Jun. 23, 1994, Ser. No. 265,134

Claims priority, application Japan, Jun. 24, 1993, 5-180851; Jun. 29, 1993, 5-185502; Jun. 29, 1993, 5-185503; Jun. 29, 1993, 5-185519; Sep. 28, 1993, 5-264412; Feb. 3, 1994, 6-031831

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 R **18 Claims**



1. A vacuum processing apparatus comprising:

a processing chamber for processing a target object in a vacuum;

a mounting member provided in said processing chamber and having a mounting surface for mounting said target object;

electrostatic chuck means, provided to said mounting surface of said mounting member, for chucking said target object;

heating means for heating said target object; and

processing gas supply means for supplying a processing gas for processing said target object into said processing chamber,

wherein said mounting member has a base, a first insulating layer formed on a surface of said base, and a second insulating layer formed on said first insulating layer, and has a conductive layer between said first insulating layer and said second insulating layer on a mounting surface side of said mounting member to obtain the electrostatic chuck means constituted by said first insulating layer, said second insulating layer, and said conductive layer, and

the heating means has a heating member provided between said first insulating layer and said second insulating layer on a surface side opposing said mounting surface of said mounting member.

5,591,270

LEAD OXIDE REMOVAL METHOD

Thomas F. D'Muhala, Raleigh, N.C., assignor to Corpex Technologies, Inc., Morrisville, N.C.

Filed Jul. 31, 1995, Ser. No. 508,381

Int. Cl.[6] C23G *1/02*; B08B *3/00*

U.S. Cl. 134—3 **9 Claims**

1. A method of removing lead oxide from a surface having the lead oxide deposited thereon, the method comprising contacting the article with a decontamination composition comprising about 0.01 to 5 percent, by weight, of a reductant, about 0.01 to 5 percent, by weight, of a compound selected from the group consisting of citric acid, alkali metal and ammonium salts of citric acid and mixtures thereof; 1 to 15 percent, by weight, of a compound selected from the group consisting of polyaminocarboxylic acid, alkali metal and ammonium salts of polyaminocarboxylic acid and the combination of a polyaminocarboxylic acid and a neutralizing compound and mixtures thereof; 0 to 1 percent, by weight, of a nonionic surfactant; 0 to 1 percent, by weight, of a dispersant; and 0 to 1 percent, by weight, of a corrosion inhibitor, and the balance water or other aqueous liquid.

5,591,271

PROCESS FOR CLEANING INDUCTOR CHANNELS OF FURNACES MELTING NON-FERROUS METAL ALLOYS

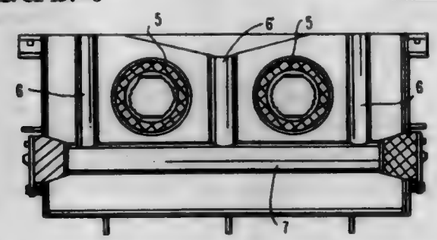
Ivo Baeck, Florencio Varela; Horacio H. Fernandez, Lomas de Zamora; Horacio Llano, Capital Federal, and Ricardo M. Ali, Monte Grande, all of Argentina, assignors to Comesi S.A.I.C., Buenos Aires, Argentina

Filed Mar. 30, 1995, Ser. No. 413,241

Claims priority, application Argentina, Aug. 26, 1994, 329233

Int. Cl.[6] B08B *5/02*; *9/00*; *9/04*

U.S. Cl. 134—8 **4 Claims**



1. A process for cleaning inductor channels, of furnaces melting non-ferrous metal alloys, comprising the steps of adding coating alloy having a minimum of zinc contents of 50% by weight to said inductor channels thereafter softening, diluting and floating of a slag thus obtained; removing the slag from the inductor channels by a mechanical scraping action of a movable lance having fins protruding therefor the removal of the slag aided by bubbling a nitrogen gas stream within the inductor channels, wherein said lance is provided with radial fins having predetermined shapes, for breaking the slag accumulated into the inductor channels, said lance moving and acting within the inductor channels to inject an inert gas against the slag, which slag has been previously broken by said radial fins of said lance and accumulated into the channels, wherein said radial fins have increasing variable diameters extending through a bore of the channels during several scraping-bubbling operations until said channels are cleaned, wherein further said lance with protruding radial fins is advanced against and through the slag by applying repeated hammer shocks by ramming hammers at a coupling end of said lance, for aiding in a penetration thereof into the slag accumulated within the channels.

5,591,272

METHOD FOR CLEANING AN OIL TANK

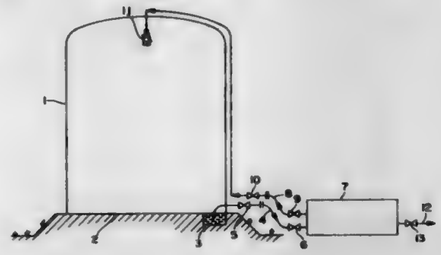
Jan S. Hummer, Charlottenlund, Denmark, assignor to Toftejorg Technology ApS, Ishoj, Denmark

Continuation of Ser. No. 146,194, Nov. 17, 1993, abandoned. This application Jul. 31, 1995, Ser. No. 508,398

Claims priority, application Denmark, Mar. 17, 1992, 0357/92

Int. Cl.[6] B08B *3/02*; *3/10*; *9/00*; *9/093*

U.S. Cl. 134—10 **5 Claims**



1. A method of removing oil residues from a tank containing an oil-containing liquid and a layer of oil residues and for converting the oil residues into a purified oil product, said method comprising the steps of:

(a) spraying a heated oil residue-containing liquid a product against the oil residues located in the tank above a surface of oil-containing liquid therein to fluidize the oil residues and form a fluidized oil residue-containing liquid mixture within the tank;

(b) discharging said fluidized oil residue-containing liquid mixture from the tank;

(c) purifying a first portion of said fluidized oil residue-containing liquid mixture from step (b) to form a purified oil product;

(d) recovering said purified oil product from step (c);

(e) heating a second portion of said fluidized oil residue-containing liquid mixture from step (b) to form a heated oil residue-containing liquid mixture having a temperature sufficiently high to fluidize said oil residues in said tank; and

(f) recycling said heated oil residue-containing liquid mixture from step (e) to step (a) to provide said heated, oil residue-containing product.

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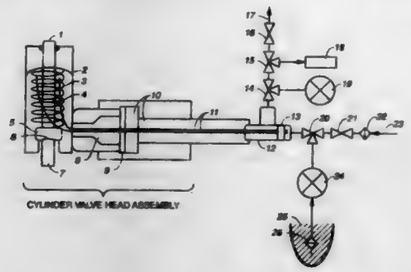
PROCESS FOR DISTRIBUTING ULTRA HIGH PURITY GASES WITH MINIMIZED CONTAMINATION AND PARTICULATES

Toshiyuki Tsukamoto, Ushiku; Norbert Fanjat, Tsukuba, and Jean Friedt, Tokyo, all of Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Dec. 30, 1994, Ser. No. 366,468

Int. Cl.[6] B08B *3/04*; *5/00*; *5/04*; *9/00*

U.S. Cl. 134—21 **25 Claims**



1. A process for distributing ultra high purity gases in a gas distribution network with minimized contamination and particulates, comprising the steps of: (a) purging said distribution network or any part thereof with dry inert high purity gas comprising less than 1 ppm of any impurity; (b) evacuating said distribution network or any part thereof at a pressure which is lower than 5×10^{-4} Pascal; (c) liquid drying the gas distribution network or any part thereof with H_2O desorbing liquid drying agent selected from a group consisting of acetone dimethylacetal, 2-2 dichloropropane or 2-2 dibromopropane, mixtures thereof and any equivalent thereof; and, (d) distributing an ultra high purity gas through the distribution network or any part thereof.

5,591,274

HEAT TREATMENT METHOD FOR METALS

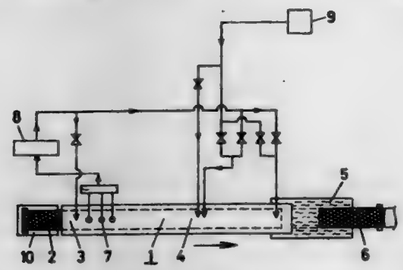
Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo K.K., Kawagawa-ken, Japan

Filed Aug. 3, 1995, Ser. No. 510,907

Claims priority, application Japan, Aug. 18, 1994, 6-228583

Int. Cl.[6] C21D *9/00*; *1/76*

U.S. Cl. 148—206 **6 Claims**



1. A method of heat treating metals during passage thereof through a heat treating furnace, including obtaining a first atmosphere gas during passage of the metals through a first portion of the furnace by dehydrating an exothermic gas generated by the combustion of a hydrocarbonic gas in said first portion of the furnaces, and which first gas is primarily composed of N_2 and CO_2, selectively adding to said first gas externally of said furnace a cracked or evaporated alcoholic gas, and feeding the combined first and alcoholic gases into the furnace at a desired second portion thereof so that the metals are heat treated in said gases.

5,591,275

COMPOSITION AND PROCESS FOR SURFACE TREATING METAL PRIOR TO COLD WORKING

Kazutomo Miyafuji, Izumi; Shigeo Tanaka, Yokohama, and Ryoji Morita, Hiratsuka, all of Japan, assignors to Henkel Corporation, Plymouth Meeting, Pa.

PCT No. PCT/US94/00212, § 371 Date Jul. 13, 1995, § 102(e) Date Jul. 13, 1995, PCT Pub. No. WO94/16119, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 11, 1994, Ser. No. 256,388

Claims priority, application Japan, Jan. 13, 1993, 5-019410

Int. Cl.[6] C23C *22/86*

U.S. Cl. 148—246 **10 Claims**

1. A process for forming a lubricating film on a metal surface, said process comprising steps of:

(I) forming on the metal surface a conversion coating by contacting the metal surface with a liquid aqueous conversion treatment composition that comprises (i) a base conversion treatment composition selected from the group consisting of phosphate treatment compositions, oxalate treatment compositions, and fluoride treatment compositions and (ii) from 0.1 to 50 g/L, measured as solids, of a total of organic cationic polymer having at least one cationic nitrogen atom per molecule and having a molecular weight of 1,000 to 1,000,000, salt of such an organic cationic polymer, or both polymer and salt thereof, and

(II) applying over the conversion coating formed in step (I) a lubricant film for cold working operations.

5,591,276

MAGNETIC ALLOY WITH ULTRAFINE CRYSTAL GRAINS AND METHOD OF PRODUCING SAME

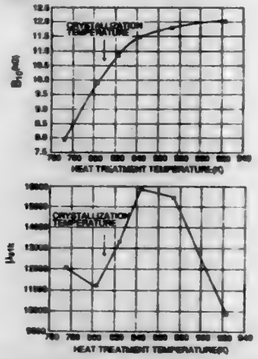
Yoshihito Yoshizawa, Fukaya; Yoshio Bizen; Shigekazu Suwabe, both of Kumagaya; Kiyotaka Yamauchi, Kumagaya, and Toshikazu Nishiyama, Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 896,878, Jun. 10, 1992, abandoned, which is a continuation of Ser. No. 616,979, Nov. 21, 1990, abandoned. This application Nov. 19, 1993, Ser. No. 154,715

Claims priority, application Japan, Nov. 22, 1989, 1-303617

Int. Cl.[6] C22C *38/16*

U.S. Cl. 148—304 **25 Claims**



4. A magnetic core consisting essentially of a soft magnetic alloy with ultrafine crystal grains having a composition represented by general formula consisting essentially of:

$$Fe_{100-x-y-z-b}M_xB_yX_zT_b \text{ (atomic \%)}$$

wherein

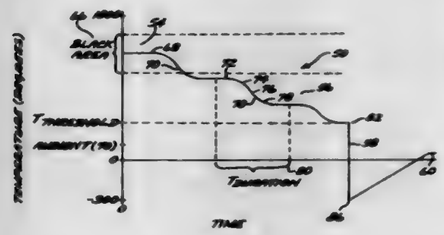
M represents at least one element selected from the group consisting of Ti, Zr, Hf, V, Nb, Mo, Ta, Cr, W and Mn,

X represents at least one element selected from the group consisting of Si, Ge, P, and Al,

T represents at least one element selected from the group consisting of platinum group elements, Co, Ni, Be, Mg, Ca, Sr

and Ba, $4 \leq x \leq 15$, $2 \leq y \leq 25$, $0 \leq z \leq 10$, $0 \leq b \leq 10$, $7 \leq x+y+z+b \leq 35$, at least 50% of the alloy structure being occupied by crystal grains having an average grain size of 240 Å or less, said crystal grains being based on a bcc structure, and said magnetic core having μ_{r1k} of 2900 or more and μ_{r1k}^{30}/μ_{r1k} of 0.62 or more wherein μ_{r1k} represents an effective permeability at 1 kHz and μ_{r1k}^{30} represents an effective permeability at 1 kHz after heat treatment at 600° C. for 30 minutes.

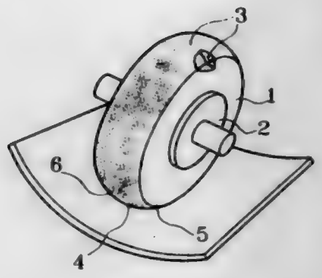
5,591,277
METHOD FOR THERMALLY CONDITIONING DISC DRIVE SWAGE MOUNTS
Stephen T. Braunheim, Santa Barbara, Calif., assignor to Intri-Plex Technologies, Inc., Santa Barbara, Calif.
Filed Jun. 28, 1995, Ser. No. 496,152
Int. Cl.[6] C21D *6/04*
U.S. Cl. 148—578 9 Claims



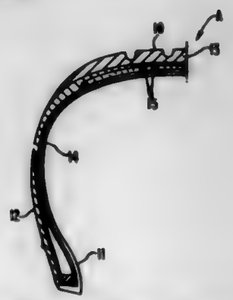
1. A method of thermally conditioning a disc drive torque retaining swage mount for increasing the frictional fastening and plate stiffening properties thereof, said swage mount formed from a metal having an initial coefficient of friction and an initial stiffness, said method including the steps of:
providing an oxygen depleted environment;
heating said environment to an initial constant temperature between 900° F. and 1740° F.;
exposing said swage mount to said environment;
cooling said swage mount by incrementally decreasing said initial constant temperature in a stepped-down fashion from said constant temperature to a reduced threshold temperature, said reduced threshold temperature being approximately 550° F. less than said initial constant temperature;
quenching said swage mount with a cryogenic quenching medium upon traversing said threshold temperature; and
restoring said swage mount to ambient temperature whereby said swage mount will exhibit enhanced coefficient of friction and stiffness properties greater than said initial coefficient of friction and said initial stiffness.

5,591,278
WHEELS FOR THE TUBULAR TRANSPORT
Mihail I. Marcu, 6 Norfolk St. N, Hamilton Ontario, Canada
Filed Oct. 5, 1994, Ser. No. 318,099
Int. Cl.[6] B60C *7/00*
U.S. Cl. 152—152.1 18 Claims

1. In a tubular transport device, the improvement comprising:
a wheel including a solid tire composed of:
a rigid, low hysteresis polymer material wherein any hysteresis and fatigue is concentrated at the surface of the tire;
a lubricant uniformly distributed inside of the rigid polymer material;
wherein the friction coefficient of the tire with a steel surface is less than 0.14.



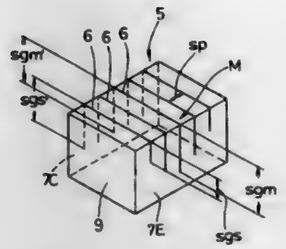
5,591,279
PNEUMATIC VEHICLE TIRE
Shingo Miderikawa; Masaaki Harada, and Takanori Kondoh, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Japan
Filed May 19, 1994, Ser. No. 246,276
Claims priority, application Japan, May 20, 1993, 5-118669; May 20, 1993, 5-118671
Int. Cl.[6] B60C *11/00*
U.S. Cl. 152—209 R 4 Claims



1. A pneumatic vehicle tire comprising a tread composed of:
(a) 100 parts by weight of a matrix rubber;
(b) 1 to 10 parts by weight of a low hardness rubber powder having an average particle size of 10 to 400 μm and containing 20 parts by weight or less of carbon black per 100 parts by weight of the rubber powder;
(c) 0.5 to 5 parts by weight of hollow particles having an average particle size of 10 to 120 μm and an average wall thickness of 0.1 to 15 μm;
(d) 1 to 15 parts by weight of short fibers having an average diameter of 0.05 μm or more, an average length of 1 to 5000 μm and an aspect ratio of 10 to 1000, said fibers being selected from the group consisting of polyamide short fibers, cellulose short fibers, carbon short fibers and polyester short fibers; and
(e) 5 to 50 parts by weight of a liquid polymer having a weight-average molecular weight of 6,000 to 60,000.

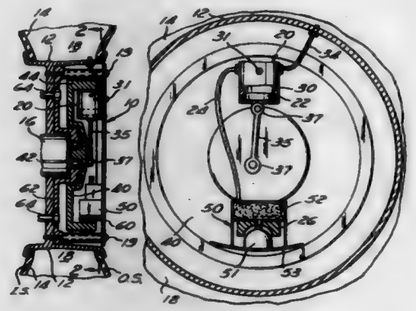
5,591,280
PNEUMATIC TIRE INCLUDING SIPES
Kazuo Asano, Hyogo-ken, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan
Filed Feb. 1, 1995, Ser. No. 382,154
Claims priority, application Japan, Feb. 2, 1994, 6-031786
Int. Cl.[6] B60C *11/12*
U.S. Cl. 152—209 R 6 Claims

1. A pneumatic tire comprising
a tread portion, said tread portion provided with circumferential grooves and axial grooves to form blocks each having a top



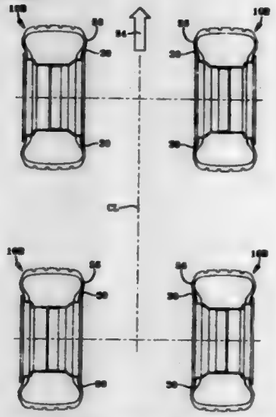
surface of which the centroid is located within the ground contacting width of the tread portion,
each said block provided with circumferentially spaced axially extending sipes, each said sipe having an axially inner open end and an axially outer open end, wherein,
in each said block, the depths of the sipes at their axially inner open ends are the same, but the depths at their axially outer open ends are gradually increased from both the circumferential edges of the block toward a circumferential central portion of the block so that at least one sipe, which has the deepest axially outer open end, exists in the circumferential central portion, and
the sipes gradually decreased in depth from the axially inner open end to the axially outer open end, excepting said at least one sipe which has the deepest axially outer open end, and the maximum depth of the sipes being in the range of from 0.6 to 0.9 times the depth of the circumferential grooves.

5,591,281
FLYWHEEL TIRE INFLATION DEVICE
Richard T. Loewe, 12882 Olympia Way, Santa Ana, Calif. 92705
Filed Aug. 9, 1995, Ser. No. 512,826
Int. Cl.[6] B60C *23/12*; F04B *17/06;19/22*
U.S. Cl. 152—418 9 Claims



1. A device for maintaining desired inflation pressure within a tire mounted on a rotating vehicle wheel, said device utilizing inertial forces from changes in vehicle speed, the device comprising:
a flywheel rotatably attached to said vehicle wheel such that said flywheel is disposed concentrically with respect to said wheel; and
a fluid compressor attached to the vehicle wheel in fluid communication with said tire, said compressor of the reciprocating piston type having a cylinder adapted to receive a sliding piston responsive to rotation of said flywheel relative the vehicle wheel, causing air to pass into the tire.

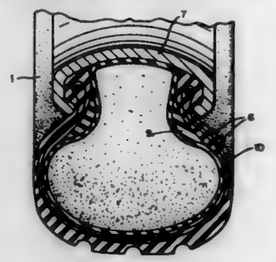
5,591,282
TIRE AND VEHICLE SYSTEM UTILIZING ASYMMETRIC SUPPORT MEMBER MOLDED TO INBOARD SIDEWALL
Michael J. Weber, Mogadore, Ohio, and Stuart D. Grant, Cumberland, Md., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 323,974, Oct. 17, 1994, abandoned. This application Aug. 23, 1995, Ser. No. 518,516
Int. Cl.[6] B60C *3/06;15/024*
U.S. Cl. 152—456 7 Claims



1. A vehicle/tire system designed for high speed use on paved road surfaces, the vehicle/tire system comprising a vehicle having two pneumatic front tires mounted thereon and two pneumatic rear tires mounted thereon, each of said tires having an annular support member molded on a lower portion of an inboard sidewall of each of said tires, an outboard sidewall of each of said tires having no support member, wherein said support member has a lower portion which is shaped to match a flange of a wheel on which said tire is mounted, and said lower portion comprises a widest portion of said support member, and said support member extends radially outward to substantially a widest cross section width of said tire and said support member becomes progressively narrower as it approaches a widest cross section width of said tire.

5,591,283
PNEUMATIC TIRE FOR BICYCLES WITH TIRE PADDING STRIPS
Rolf Mahling, Korbach, Germany, assignor to Continental Aktiengesellschaft, Hanover, Germany
Filed Mar. 21, 1995, Ser. No. 408,607
Claims priority, application Germany, Aug. 8, 1994, 44 27 894.2
Int. Cl.[6] B60C *5/02;15/00;15/06;19/12*
U.S. Cl. 152—501 15 Claims

1. A pneumatic bicycle tire to be operated with an inner tube,



said tire comprising:

a tread and two sidewalls;

a bead connected to a free end of each one of said sidewalls for mounting said tire on a wheel rim with rim flanges having a maximum standard height limit;

each one of said beads having a bead core;

a carcass embedded in said tire and extending between said beads, wherein free ends of said carcass are wound about said beads, said carcass comprising at least one carcass ply;

a padding strip embedded in each one of said sidewalls in the vicinity of said beads;

said padding strip positioned along a curved section of said sidewall, said curved section beginning at a center of said bead core and having a length equal to 40% to 210 % of said maximum standard height limit; and

said padding strip having a hardness of between 40 and 60 Shore A, a rebound resilience of below 80% measured at a frequency of 2,000 Hz and a thickness of at least 0.6 mm.

5,591,284

RADIAL TIRE WITH TRIANGULATED STEEL CORD BELT

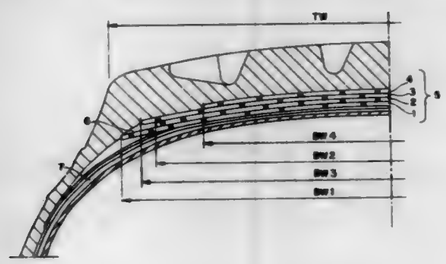
Yves Gaudin, Mailliet, France, assignor to Dunlop France SA, Paris, France

Filed Apr. 27, 1995, Ser. No. 429,565

Claims priority, application France, Apr. 28, 1994, 94 05148

Int. Cl.[6] B60C *9/00;9/18;9/20*

U.S. Cl. 152—532 **14 Claims**



1. A heavy duty radial tire comprising a ground contacting tread region reinforced by a belt comprising at least four breaker plies of strips of fabric comprising parallel metallic cords in which the cords of the radially innermost first ply and those of the third ply are inclined at a relatively small angle with respect to the equatorial plane of the tire, wherein the cords of the second ply, disposed radially between the first and third plies, are the only cords inclined at an inclination angle with respect to the equatorial plane in the range of 40° to 85°, and wherein the cords of the first and third plies are inclined in opposite directions to each other and have inclination angles with respect to the equatorial plane in the range of 5° to 40°.

5,591,285

FLUORINATED CARBON POLYMER COMPOSITES

Ali Afzali-Ardakani, Yorktown Heights, N.Y.; Juan Ayala-Esquilin, San Jose, Calif.; Bodil E. Braren, Hartsdale; Shahrokh Daljavad, Peekskill, both of N.Y.; Elizabeth Foster, Friendsville, Pa.; James L. Hedrick, Jr., Oakland, Calif.; Jeffrey C. Hedrick, Peekskill, N.Y.; Rodney T. Hodgson, Ossining, N.Y.; Ashit A. Mehta, Vestal, N.Y.; Steven E. Molis, Brewster, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Stephen L. Tisdale, Vestal, N.Y., and Alfred Viehbeck, Fishkill, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 346,766, Nov. 30, 1994, Pat. No. 5,556,899, which is a division of Ser. No. 929,313, Aug. 13, 1992, Pat. No. 5,397,863, which is a continuation-in-part of Ser. No. 759,377, Sep. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 759,388, Sep. 13, 1991, abandoned. This application Jul. 24, 1995, Ser. No. 475,670

Int. Cl.[6] B32B *31/28;27/16*

U.S. Cl. 156—62.2 **12 Claims**

1. A method for making a dielectric material of a fluoropolymer and fluorinated carbon comprising the steps of:

mixing a supply of fluorinated carbon particles in a supply of fluoropolymer with the fluorinated carbon to fluoropolymer being in the range of 2% to 60% by weight, and wherein said fluorinated carbon particles contain from 28 to 64 atomic weight percent of fluorine;

treating the mixture to form a composite thereof;

laminating said composite at a pressure in the range from about 100–200 psi and at a temperature in the range from 350° to 390° C.; and

exposing an area of said laminated composite to UV excimer laser radiation at a fluence in the range from 50 to 1000 mJ/cm^2 to partially defluorinate the fluorinated carbon and render said exposed area of the composite electrically conductive.

5,591,286

METHOD OF MAKING WINDOW FRAME FOR CONCRETE WALL PANEL

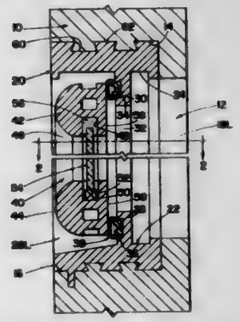
Tatuo Suenaga; Hiroaki Nakagawa; Shin Terauchi; Takeo Kikuchi; Shimosuke Aiba; Mikio Kobayashi; Yutaka Katsuta; Kenji Ago; Katsumi Kosuge; Yasuyuki Matsubara; Masato Tanasumi; Shunichi Sugishita; Hideki Ikeda; Toshio Furuya, all of Tokyo; Shigeyuki Akihama, Kanagawa, and Takahiro Arai, Saitama, all of Japan, assignors to Kajima Corporation, and Kabushiki Kaisha FRC, both of Tokyo, Japan

Division of Ser. No. 43,268, Apr. 6, 1993, Pat. No. 5,356,687. This application Jul. 20, 1994, Ser. No. 277,688

Claims priority, application Japan, Apr. 8, 1992, 4-87155

Int. Cl.[6] E06B *3/00;7/12*

U.S. Cl. 156—71 **2 Claims**



1. The method of securing a window frame in an opening in a concrete wall panel comprising the steps of:

(a) forming a wall panel mold to define a top, bottom, and side edges of said concrete wall panel;

(b) extruding lengths of concrete with outer faces having mortises and tenons, and inner faces having rectangular flanges with front faces;

(c) placing said extruded lengths of concrete together to form a window frame;

(d) temporarily fixing said window frame to said wall panel mold;

(e) pouring concrete grout in said wall panel mold, including

(f) pouring said concrete grout about said outer faces of said window frame so as to embed said mortises and tenons in said concrete grout and to form said concrete wall panel;

(g) permitting said concrete grout to harden about said window frame mortises and tenons to form mortise and tenon joints between said window frame and said hardened concrete grout of said concrete wall panel;

(h) forming sash portions with convex front faces, planar back faces, channeled upper and lower faces, and interior voids extending longitudinally through said formed sash portions;

(i) securing said sash portions to said window frame rectangular flanges by,

(j) securing sealing means to said front faces of said rectangular flanges; and

(k) securing said sash portions to said sealing means,

whereby said mortise and tenon joints create an air-tight, water-tight, and heat and fireproof bond between said hardened concrete grout of said concrete wall panel and said window frame.

5,591,287

PROCESS FOR PRODUCING LAYERED CERAMIC PRODUCT

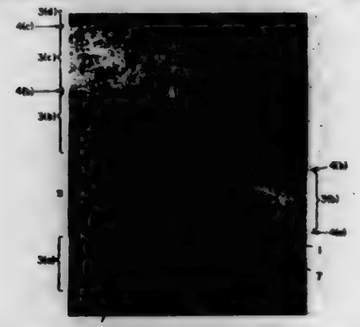
William J. Clegg, Chester, and Kevin Kendall, Runcorn, both of England, assignors to Tioxide Specialties Limited, London, England

Continuation of Ser. No. 653,270, Feb. 11, 1991, abandoned. This application Sep. 2, 1993, Ser. No. 115,674

Claims priority, application United Kingdom, Feb. 9, 1990, 9002986

Int. Cl.[6] C04B *37/00*

U.S. Cl. 156—89 **14 Claims**



1. A process for the production of a layered ceramic product having one or more zones of weakness, which process comprises

(a) providing at least one layer of a first composition which comprises a sinterable particulate, non-fibrous, ceramic material,

(b) providing at least one layer of a second composition which comprises a sinterable particulate, non-fibrous, ceramic material,

(c) modifying a surface of at least one of said layers of a first composition and a second composition by treating said surface with a treatment material,

(d) assembling a laminated structure containing at least one layer of a first composition and at least one layer of a second composition in which laminated structure said treatment material is positioned between said layers of a first composition and a second composition, and

(e) heating and pressing said laminated structure in order to sinter the particulate ceramic materials and to form a bond between said layers of a first composition and a second composition, said treatment material being a non-sinterable or weakly sinterable particulate ceramic material or precursor thereof present as a layer having a thickness after pressing of between 1 and 10 microns,

the treatment of said surface with said treatment material providing at least one zone of weakness between the layers of the first and second compositions in the sintered layered ceramic product thus formed whereby in use of the layered ceramic product the one or more zones of weakness serve to deflect a crack in the ceramic product propagating across the layers of sintered particulate material.

5,591,288

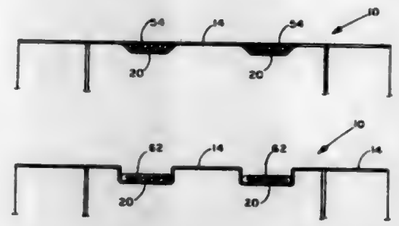
CONTOURED TIRE BUILDING DRUM AND METHOD OF BUILDING AN EXTENDED MOBILITY TIRE

Michael L. Becker, Akron; Klaus Beer, Stow, and Kenneth D. Conger, Munroe Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 92,214, Jul. 16, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 316,865

Int. Cl.[6] B29D *30/20;30/26*

U.S. Cl. 156—130.7 **13 Claims**



1. A method of building an extended mobility tire with inserts on a tire building drum, said inserts being significantly thicker than other adjacent tire components; said tire building drum having a cylindrical surface with grooves therein, said grooves containing inflatable circular bodies therein, said method comprising:

laying a liner on said surface of said drum, said inflatable circular bodies being in a first position in line with said cylindrical surface;

deflating said circular bodies to a second position below said cylindrical surface;

positioning first inserts in said grooves and on said circular bodies below said cylindrical surface and around said drum at insert locations spaced from each end of said drum;

laying a first ply of reinforcing material around said drum over said liner and said first insert;

positioning second inserts over said first ply at said insert locations spaced from each end of said drum;

laying a second ply of reinforcing material over said first ply and said second inserts;

positioning circular beads at each end of said drum;

expanding said drum to increase the diameter of said cylindrical surface and provide shoulders at each end of said drum;

turning edges of said first ply and said second ply over each of said beads;

positioning a belt and tread assembly around said second ply; and,

contracting said drum for removal of the assembled tire components from said drum.

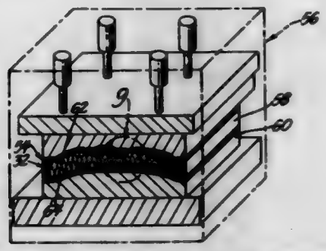
7. A method of building an extended mobility tire with inserts on a tire building drum, said inserts being significantly thicker than other adjacent tire components; said tire building drum having a

cylindrical surface with grooves therein, said grooves containing resilient compressible circular bodies therein, said method comprising:
- laying a liner on said surface of said drum;
- positioning first inserts over said grooves and on said circular bodies;
- depressing said first inserts into said resiliently compressible circular bodies;
- laying a first ply of reinforcing material around said drum over said cylindrical surface of said liner and said first insert;
- positioning second inserts over said first ply at insert locations spaced from each end of said drum;
- laying a second ply of reinforcing material over said first ply and said second inserts;
- positioning circular beads at each end of said drum;
- expanding said drum to increase the diameter of said cylindrical surface and provide shoulders at each end of said drum;
- turning edges of said first ply and said second ply over each of said beads;
- positioning a belt and tread assembly around said second ply; and,
- contracting said drum for removal of the assembled tire components from said drum.

5,591,289
METHOD OF MAKING A FIBROUS HEADLINER BY COMPRESSION MOLDING

Steven L. Sanders, Portsmouth, and Colin Frost, Dover, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Jun. 29, 1995, Ser. No. 496,314
Int. Cl.[6] B32B *31/04*
U.S. Cl. 156—148 **7 Claims**

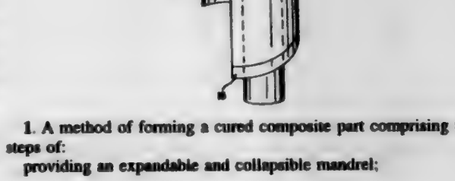


1. A method of making a motor vehicle passenger compartment headliner comprising the steps of:
providing a nonwoven batting of polymeric thermoplastic fibers having a minor percentage of low melting temperature binder fibers and a high loft that exceeds at least about 15 mm,
needling opposite sides of said batting to form an integral fibrous first skin layer of relatively high fiber density and substantial fiber entanglement on one of the sides and an integral fibrous second skin layer of relatively low fiber density and less fiber entanglement as compared to the first layer on the other side and wherein said integral fibrous skin layers are resultantly spaced a substantial distance apart by an integral fibrous intermediate layer of un-needled nonwoven fibers,
heating said batting to activate said binder fibers,
coating said first skin layer with a thermoset resin, laying a scrim against said resinated first skin layer, laying a cover with a heat activated adhesive against said second skin layer,
heating and pressing together said batting, said thermoset resin, said scrim and said cover in a compression molding operation to conform said scrim and said first skin layer to a desired back side contour and to facilitate curing of said thermoset resin and bonding of said scrim to said first skin layer to form a laminated assembly, wherein
said heating comprising heating the first layer, the thermoset resin and the scrim to one temperature to form a headliner backbone of substantial flexibility and resilience for supporting the shape of the headliner while heating said second skin layer and the cover to a lower temperature to conform said cover and said second skin layer to a desired appearance side contour with slight compression of the intermediate layer;
cooling and trimming said laminated assembly to form said headliner.

5,591,290
METHOD OF MAKING A LAMINATE HAVING VARIABLE ADHESIVE PROPERTIES

Peter A. Walter, Schaumburg, and Wayne E. Richter, Batavia, both of Ill., assignors to Wallace Computer Services, Inc., Hillside, Ill.

Filed Jan. 23, 1995, Ser. No. 376,742
Int. Cl.[6] B32B *31/16*; C09J *5/00*
U.S. Cl. 156—152 **30 Claims**

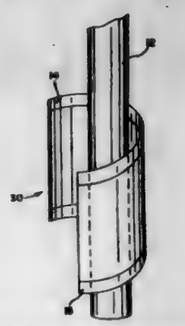


1. A method of making a laminate, comprising the steps of:
providing a substrate with a layer of a pressure sensitive adhesive and a release sheet releasably adhered to said pressure sensitive adhesive,
separating said release sheet from said pressure sensitive adhesive on said substrate to expose a surface of said pressure sensitive adhesive on said substrate,
applying a discontinuous layer of a non-adhesive material between said separated release sheet and substrate, and
relaminating said release sheet to said exposed surface of said pressure sensitive adhesive on said substrate with said discontinuous layer of non-adhesive material therebetween to modify adhesive properties of said pressure sensitive adhesive on said substrate.

5,591,291
METHOD OF FORMING ADVANCED CURED RESIN COMPOSITE PARTS

Richard D. Blackmore, 914 Dell Rd., Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 287,120, Aug. 8, 1994. This application Jun. 6, 1995, Ser. No. 467,020
Int. Cl.[6] B65H *81/00*
U.S. Cl. 156—173 **23 Claims**



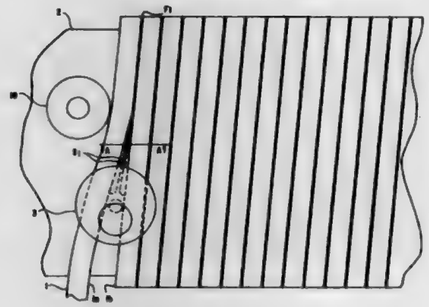
1. A method of forming a cured composite part comprising the steps of:
providing an expandable and collapsible mandrel;

wrapping a composite material impregnated with a heat curable resin around said mandrel, said composite material including a layer of electrically conductive fibers;
placing said mandrel and composite material in an outer forming shell having an interior surface corresponding to a desired shape of said cured composite part;
expanding said mandrel to compress said composite material between said mandrel and said outer shell;
causing an electric current of sufficient magnitude to resistively heat said composite material to cure said resin to flow through said conductive fibers in said composite material; and
collapsing said mandrel and removing said mandrel from an interior of said composite material, and removing said composite material from said outer shell.

5,591,292
WELDING METHOD IN THE MANUFACTURE OF A SPIRALLY WOUND TUBE AND A WELDING HEAD FOR PERFORMING THE METHOD

Gunnar Blomqvist, Helsingby, Finland, assignor to OY KWH Pipe AB, Vaas, Finland

PCT No. PCT/F193/00182, § 371 Date Oct. 4, 1994, § 102(e) Date Oct. 4, 1994, PCT Pub. No. WO93/22126, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 29, 1993, Ser. No. 313,046
Claims priority, application Finland, Apr. 30, 1992, 921967
Int. Cl.[6] B29C *53/78;65/40*
U.S. Cl. 156—244.13 **10 Claims**

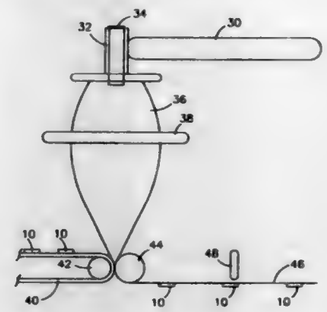


1. A welding method in the manufacture of a spirally wound tube, comprising the steps of:
winding a continuous thermoplastics hollow profile, having a substantially rectangular cross-section, helically around a welding drum;
inserting a welding keel of a welding head coupled to an extruder between a profile surface of the hollow profile entering the welding drum and an adjacent profile surface of a closest previous winding of said hollow profile around the welding drum, which profile surfaces are to be welded together;
blowing hot air out through two pairs of air openings provided at a front portion of the welding keel facing a rotational direction of the hollow profile against edge portions of said adjacent profile surfaces;
arranging a keel nose located between the two pairs of air openings to guide four hot-air streams from said two pairs of air openings and to prevent heating of a middle portion of said adjacent profile surfaces;
pressing out an extruded welding mass strand on each heated edge portion of the profile surfaces through two pairs of welding mass openings in a rear section of the welding keel, mainly onto a same level as the two pairs of air openings;
pressing said edge portions of the two adjacent profile surfaces coated with welding mass together by means of at least one press roller having an axis radially directed relative to the welding drum, such that a double weld seam is formed between each winding of the hollow profile; and
maintaining a welding pressure on a desired level by regulating friction between the hollow profile and the welding drum.

5,591,293
PROCESS FOR MANUFACTURING DRIP IRRIGATION SYSTEMS USING PLASTIC LAMINATION/EXTRUSION TECHNIQUES

David B. Miller, Fresno; John M. Langa, Alpine, and Rodney Rushin, San Francisco, all of Calif., assignors to Agrifim Irrigation International N.V., Netherlands Antilles

Filed Nov. 14, 1994, Ser. No. 339,593
Int. Cl.[6] B29C *47/02*; B05B *15/00*
U.S. Cl. 156—244.13 **12 Claims**



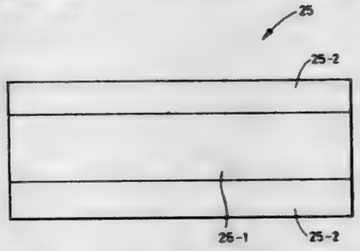
7. A process for making drip irrigation lines comprising:
providing a molded emitter body having a pressure-reducing passage extending through an inner surface of the emitter body,
extruding a plastic material through an extruder die to form an extruded plastic film sheet that passes between a pair of pressure rolls downstream from the extruder die, the extruded film sheet having a first surface and a second surface,
positioning the emitter units on a high speed transport device external to said extruded film sheet and inserting a sequence of the emitter units separately and independently from the high speed transport device into the nip of the pressure rolls and in contact with the first surface of the extruded plastic film sheet, and using the pressure of the pressure rolls and the heat of extrusion retained in the extruded plastic film sheet to apply pressure to the emitter units in sequence and heat-bond the inner surface of the emitter units to the first surface of the extruded plastic film sheet,
bonding the outer marginal edges of the extruded film sheet to form an elongated continuous flexible tubular conduit in which the first surface of the extruded film sheet faces the interior of the conduit, in which the second surface of the extruded film sheet forms the exterior of the conduit and in which the emitters are thereby bonded to the interior of the conduit, and
forming an exit hole in the plastic film sheet leading to the passage of each emitter unit on the tubular conduit so that water traveling in the interior of the conduit can pass through the pressure-reducing passage in the emitter and be discharged from the exterior of the conduit at a drip rate.

5,591,294

RECORDING SHEET MANUFACTURING AND STORING METHOD, RECORDING SHEET OBTAINED BY THE METHOD, AND INK JET RECORDING METHOD USING THE RECORDING SHEET

Mamoru Sakaki, Yamato; Miyuki Fujita, Tokyo, and Yasuyuki Ishii, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 274,828
Claims priority, application Japan, Jul. 16, 1993, 5-176776
Int. Cl.[6] B32B *31/18;31/22*
U.S. Cl. 156—250 14 Claims



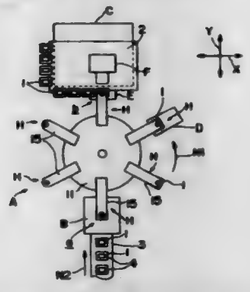
1. A method of manufacturing and storing a recording sheet comprising the steps of:
applying a coating solution on at least one surface of a base sheet;
drying the coating to form an ink receiving layer on the sheet;
cutting the coated sheet into cut sheets having a desired size; and
enclosing and sealing at least one of the cut sheets in a packaging material that is impermeable to moisture while the at least one of the cut sheets is maintained in a flat state, wherein the entirety of each of said drying step, said cutting step, and said enclosing and sealing step is effected in an atmosphere in which humidity does not exceed 50% RH.

5,591,295

BONDING APPARATUS FOR ELECTRONIC COMPONENTS

Yasuto Oaiseka, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 14, 1994, Ser. No. 338,413
Claims priority, application Japan, Nov. 16, 1993, 5-286576
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—363 5 Claims



4. An apparatus for boading electronic compoaents comprising:
(a) means for conveying electronic components;
(b) a table for positioning a substrate at a bonding position;
(c) a turn table between the conveying means and the table, the turn table comprising:
(1) a rotating body;
(2) a plurality of transfer heads placed on an outer portion of the rotating body, each transfer head comprising:
(i) a nozzle shaft moving up and down and rotating,
(ii) a nozzle at a lower end of the nozzle shall, the nozzle receiving the electronic component,
(d) a recognition device that senses a deviation in position between the electronic component and the substrate; and
(e) driving means for rotating the nozzle shaft according to the deviation in position sensed by the recognition device at the bonding position.

5,591,296

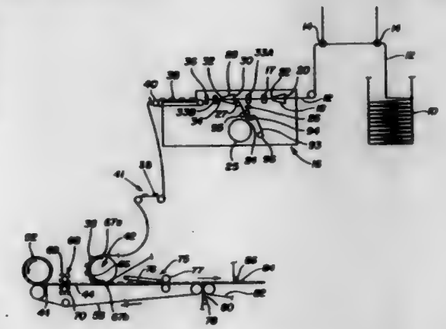
Patent Not Issued For This Number

5,591,297

PROCESS AND APPARATUS FOR MAKING AND INCORPORATING ACQUISITION/DISTRIBUTION INSERTS INTO ABSORBENT CORES

Nicholas A. Ahr, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 17, 1994, Ser. No. 341,583
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—521 16 Claims



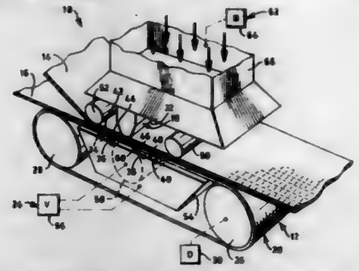
1. An apparatus for assembling a first member and a second member, the first member comprising a fluid distribution part and said second member comprising an absorbent core member having a window portion therein, said apparatus comprising:
a) conveyer means for forming a transport path;
b) first deposition means for placing a series of one of said first and second members in spaced apart relation on said conveyer means;
c) drum means rotatably mounted adjacent said conveyer means for carrying the other of said first and second members and for depositing said other of said first and second members onto said one of said first and second members on said conveyer means;
d) said drum means including means for supporting a series of said other of said first and second members on said drum means in spaced apart relation;
e) drive means for said conveyer means and said drum means for combining in timed relation said first and second members together on said conveyer means and for positioning a portion of said first member adjacent said window portion of said second member; and
f) means for disposing said first and second members between a liquid pervious topsheet and a liquid impervious backsheet.

5,591,298

MACHINE FOR ULTRASONIC BONDING

Steven L. Goodman, and Robert E. Vogt, both of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 679,713, Apr. 3, 1991, abandoned, which is a continuation of Ser. No. 382,448, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 145,781, Jan. 19, 1988, abandoned. This application Dec. 11, 1992, Ser. No. 990,824
Int. Cl.[6] B32B *31/16*
U.S. Cl. 156—580.1 5 Claims



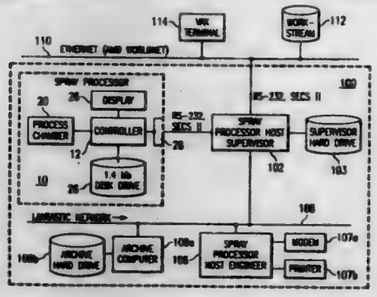
1. An ultrasonic bonding apparatus for ultrasonically bonding at least two continuously moving webs together, said apparatus comprising:
an ultrasonic horn means for transmitting ultrasonic energy, said horn means having a face;
a continuously moving anvil means underlying said horn means for perfecting bonding between said two continuously moving webs, said anvil means comprising a continuously moving, air-permeable, endless wire mesh defining a plurality of pronounced upwardly-projecting knuckles; a bonding area of said wire mesh directly below said face of said horn means; and
means for providing vacuum suction directly below said bonding area, whereby puckering and tearing of said two continuously moving webs at the bonding area are prevented.

5,591,299

SYSTEM FOR PROVIDING INTEGRATED MONITORING, CONTROL AND DIAGNOSTICS FUNCTIONS FOR SEMICONDUCTOR SPRAY PROCESS TOOLS

Jay J. Seaton; Michael Allen, both of Austin, Tex.; Donald Landis, Hollis, N.H.; Patrick Lee, Austin, Tex.; David Linzy, Merrimack, and Susan B. Luca, Hollis, both of N.H., assignors to Advanced Micro Devices, Inc., Austin, Tex.

Filed Apr. 28, 1995, Ser. No. 430,329
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—626.1 48 Claims



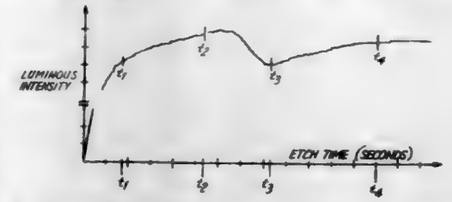
34. A method of providing integrated monitor and control functions for a semiconductor spray process tool, the method comprising:
collecting equipment status and process data generated by said spray process tool during each process run;
storing said collected equipment status and process data and a plurality of process recipes executable by said spray process tool on a first storage device;
generating control signals to said spray process tool for controlling operations thereof, said control signals including process recipe download requests for causing requested ones of said process recipes to be downloaded from said first storage device to said spray process tool for execution; and
displaying said collected equipment status and process data in at least one user-selected format.

5,591,300

SINGLE CRYSTAL SILICON DRY-ETCH ENDPOINT BASED ON DOPANT-DEPENDENT AND THERMALLY-ASSISTED ETCH RATES

Peter J. Schiller, Plymouth, Minn., assignor to VTC Inc., Bloomington, Minn.

Filed Jun. 7, 1995, Ser. No. 484,020
Int. Cl.[6] H01L *21/00*; H05H *1/00*; G01N *21/00*
U.S. Cl. 156—626.1 15 Claims



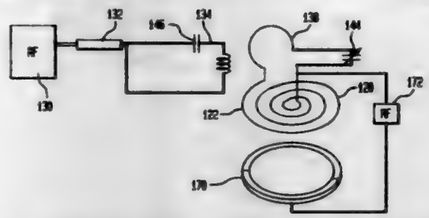
1. A process for detecting an endpoint in a dry etch process comprising:
monitoring the combination of a decreasing etch rate and an increasing surface thermal heating as the etch progresses between a heavily doped region of a single crystal silicon wafer and a lightly doped region of the single crystal silicon wafer; and
detecting a local minima of the effects of the decreasing etch rate and increasing surface thermal heating.

5,591,301

PLASMA ETCHING METHOD

Virinder S. Grewal, Fishkill, N.Y., assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 22, 1994, Ser. No. 362,398
Int. Cl.[6] H01L *21/00*; H05H *1/00*
U.S. Cl. 156—643.1 7 Claims



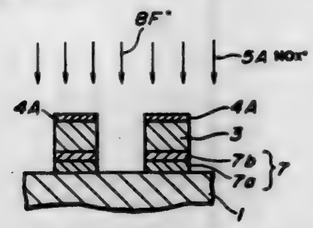
1. In a method for etching a substrate in a plasma comprising mounting a substrate to be etched in a vacuum chamber, introducing a precursor etch gas into the chamber while maintaining a vacuum pressure in the chamber, and resonating a radiofrequency current in a planar coil located outside of and adjacent to a dielectric window mounted in a wall of said chamber to form a planar plasma substantially parallel to the coil within said chamber, and applying a radiofrequency potential across the planar coil and applying a second, lower frequency radiofrequency potential to the substrate support within said chamber, whereby plasma ions and

radicals are accelerated in a direction normal to the planar substrate, the improvement comprising limiting the power to the planar coil to about 1–200 watts and limiting the power to the substrate support to 50–200 watts during the etching.

5,591,302
PROCESS FOR ETCHING COPPER CONTAINING METALLIC FILM AND FOR FORMING COPPER CONTAINING METALLIC WIRING

Keiji Shinohara, Kanagawa; Junichi Sato, Tokyo; Yukihiro Kaneide, and Toshiharu Yanagida, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 389,722, Feb. 15, 1995, Pat. No. 5,505,322, which is a continuation of Ser. No. 683,775, Apr. 11, 1991, abandoned. This application Jul. 25, 1995, Ser. No. 506,872
Claims priority, application Japan, Apr. 12, 1990, 2-097245
Int. Cl.[6] H01L *21/306*
U.S. Cl. 156—661.11 **3 Claims**



1. A method for forming a copper wiring in a semiconductor device, comprising the steps of:

sequentially forming a multilayer resist film which comprises an organic polymer film followed by an oxidation-resistant film directly on a copper containing metallic film;

anisotropically etching the organic polymer film by using the oxidation-resistant mask as an etching mask, and by using an etching gas comprising a mixed gas of a first and a second gas, the first gas being selected from a group consisting of a mixed gas of a nitrogen containing gas and an oxygen containing gas, and a nitrogen oxide (NO_x) containing gas, and the second gas being selected from a group consisting of a chlorine containing gas and a bromine containing gas; and

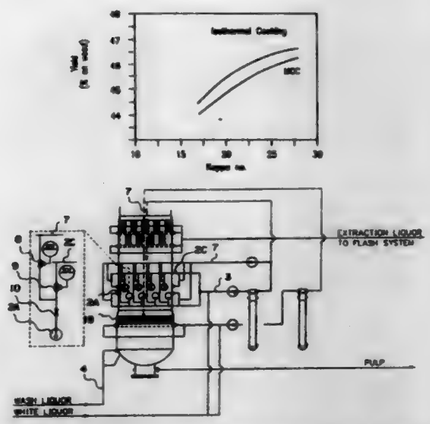
etching the copper containing metallic film by use of the etched organic polymer film.

5,591,303
PROCESS FOR OPERATING A DIGESTER

Finn Ollis; Ake Backlund, and Johanna Svanberg, all of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies AB, Karlstad, Sweden

Division of Ser. No. 92,420, Jul. 16, 1993, Pat. No. 5,470,437. This application Mar. 22, 1995, Ser. No. 408,706
Claims priority, application Sweden, Nov. 18, 1992, 9203462
Int. Cl.[6] D21C *3/26;7/12;7/14*
U.S. Cl. 162—19 **3 Claims**

1. A method of digesting cellulosic material comprising the steps of using a digester having a vessel having an interior surrounded by a wall where input of fiber material and cooking liquid takes place at the top of the digester in an upper concurrent cooking zone, withdrawal of spent cooking liquor is carried out from at least one digester screening system located between the top and the bottom of the digester in a counter current cooking zone, and fiber material is fed out from the bottom of the digester, and said at least one screening system being provided in the lower half of the digester, said at least one screening system has a plurality of screen members each having a non-circular screen face of which the total area is less than 1 m^2 and which are attached to the digester wall

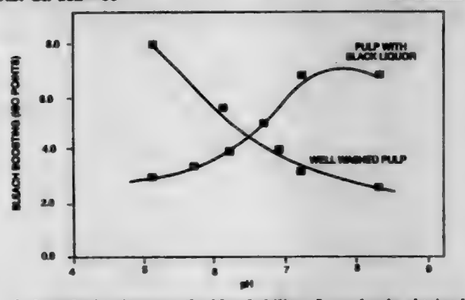


with seal means to form a sealed volume from which liquid only can be supplied and withdrawn through said screen face from said digester interior, said screening system including conduit means for providing an inlet and outlet for liquid, said conduit means penetrating the digester wall and communicating with said sealed volume and including the step of using at least two rows of said screening members with each of said rows extending about the interior wall of said digester and arranging said screening members in one of said rows in staggered relation to the screen members in the other of said rows and maintaining temperatures in the cooking zones so that the temperatures differ by at most +4° C. by using said screening members to control the temperature of the liquid in said counter current cooking zone of said digester.

5,591,304
METHOD FOR THE USE OF ENZYMES IN BLEACHING PAPER PULP

Jeffrey Tolan, and Brian Foody, both of Ottawa, Canada, assignors to Von Kreisler Selting Werner, Cologne, Germany

Continuation of Ser. No. 72,861, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 696,714, May 7, 1991, abandoned. This application Oct. 4, 1994, Ser. No. 317,828
Int. Cl.[6] D21C *9/10*
U.S. Cl. 162—60 **15 Claims**



1. A method to improve the bleachability of wood pulp obtained by standard pulping processes that produce incompletely washed brownstock of more than 1 Kg soda per ton of pulp, comprising treating said brownstock at a pH range of approximately 7.0 to 9.0 with a hemicellulase enzyme preparation having both a pH optimum for hemicellulase activity below 6.0, as measured by activity against a purified xylan substrate, and a low cellulase activity, as measured by the IEA standard filter paper assay, such that the total amount of cellulase added to the brownstock is not more than about 10,000 FPU per ton of pulp, wherein said hemicellulase enzyme preparation consists essentially of a xylanase produced

from a Trichoderma microorganism, and whereby said brownstock will exhibit increased bleachability as compared to said brownstock being treated with said hemicellulase enzyme at said pH optimum.

5,591,305
IMPRINTING FELT AND METHOD OF USING THE SAME

John H. Cameron, Appleton, Wis., assignor to The James River Corporation of Virginia, Richmond, Va.

Division of Ser. No. 252,449, Jun. 1, 1994. This application Mar. 31, 1995, Ser. No. 415,048
Int. Cl.[6] D21H *11/00*
U.S. Cl. 162—117 **6 Claims**



1. A method of making a paper base sheet comprising:

applying a wet web to an imprinting felt, wherein said imprinting felt has two sides and has a batting on at least a sheet side of said imprinting felt, said imprinting felt having been treated with a polymer in an amount of from 1 to about 50% by weight of the base fabric and batting, and wherein the combined weight of the sheet side batting and polymer is between 15 and 150 g/m^2;

pressing said wet web onto a dryer surface; and

removing said web from the dryer surface.

5,591,306
METHOD FOR MAKING SOFT TISSUE USING CATIONIC SILICONES

James M. Kaun, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 287,638, Aug. 8, 1994, Pat. No. 5,529,665. This application Mar. 18, 1996, Ser. No. 616,952
Int. Cl.[6] D21H *21/22*
U.S. Cl. 162—127 **5 Claims**

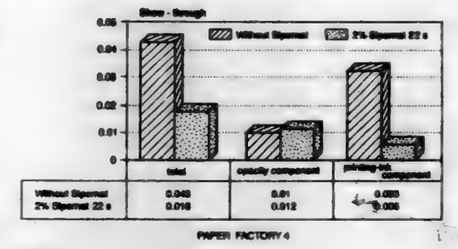
1. A method of making a soft, uncreped throughdried tissue sheet comprising the steps of: (a) forming an aqueous suspension of cellulosic papermaking fibers containing from about 0.01 to about 1 dry weight percent, based on the weight of the fibers, of a cationic silcone; (b) depositing the aqueous suspension onto a foraminous forming wire which retains the fibers to form a wet web; (c) dewatering the wet web; and (d) throughdrying the web without creping the web to a creping cylinder with a creping adhesive and (e) creping the web from the to form a soft tissue.

5,591,307
PAPER CONTAINING A FILLER

Arnold Storeck, Frankfurt, Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 322,362, Oct. 13, 1994, abandoned, which is a continuation of Ser. No. 185,076, Jan. 24, 1994, abandoned. This application May 31, 1995, Ser. No. 454,604
Claims priority, application Germany, Jan. 28, 1993, 43 02 293.6
Int. Cl.[6] D21H *17/68*
U.S. Cl. 162—181.6 **5 Claims**

1. Newsprint paper containing, as a filler, 0.5 to 3% by weight precipitated silica which has been spray-dried and ground wherein the precipitated, spray dried, ground silica has the following characteristics:

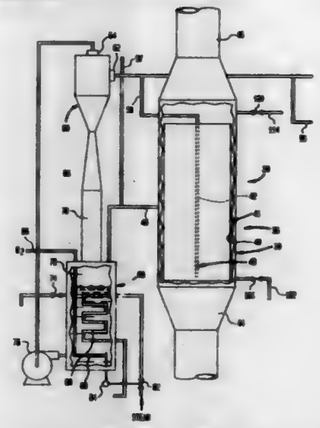


BET surface area	m^2/g		190
Average size of agglomerates	µm		7
Tapped Density	g/l		120
Loss on drying (2 hours at 105° C.)	%		6
Loss on ignition (2 hours at 1000° C.)	%		5
pH (in 5% aqueous dispersion)			6.3
DBP absorption	g/100 g		270.

5,591,308
WOOD PULP REACTOR

Mark J. Kirschner, Morristown, and Rustam H. Sethna, New Brunswick, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Division of Ser. No. 105,248, Aug. 12, 1993, Pat. No. 5,460,696. This application Jun. 28, 1995, Ser. No. 496,264
Int. Cl.[6] D21C *7/00;9/147*
U.S. Cl. 162—239 **7 Claims**



1. A wood pulp reactor for reacting a gas and wood pulp comprising:

coaxial elongated, outer and inner tubular members defining coaxial intermediate and internal passageways between said outer and inner tubular members and said inner tubular member, respectively;

said outer and inner tubular members having perforations sized to retain said wood pulp between said intermediate and internal passageways while admitting the gas; and

a body portion housing said outer and inner tubular members and having, an external passageway surrounding said outer and inner tubular members and therefore said intermediate and internal passageways, a wood pulp inlet in communication with one end of said intermediate passageway for introducing the wood pulp between said intermediate and internal passageways, a wood pulp outlet in communication with the opposite end of said intermediate passageway for discharging

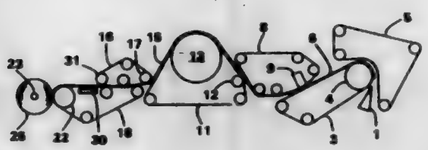
the wood pulp from the intermediate passageway, a gas inlet in communication with said external passageway for introducing the gas into said external passageway such that it passes through said perforations of said intermediate and internal passageways in an inward radial direction thereof and thereby mixes with the charge of wood pulp and collects in the internal passageway, and a gas outlet in communication with said internal passageway for discharging the gas.

5,591,309

PAPERMAKING MACHINE FOR MAKING UNCREPED THROUGHDRIED TISSUE SHEETS

James S. Rugowski; Michael J. Reknoke, both of Appleton, Wis.; Philip S. Lin, Taipa, Okla.; Ronald F. Gropp, St. Catharines, Canada, and Paul A. B. L. M. Arnold, Nancy, France, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 6, 1995, Ser. No. 384,307
Int. Cl.[6] D21F *5/02*; D21G *9/00*
U.S. Cl. 162—283 **4 Claims**



1. A papermaking machine for continuously making an uncreped throughdried paper web comprising:

(a) a headbox for depositing an aqueous suspension of papermaking fibers onto a forming wire;

(b) a continuous forming fabric for receiving the aqueous suspension of papermaking fibers to form a wet web;

(c) a continuous transfer fabric positioned adjacent to the forming fabric to enable the wet web to transfer from the forming fabric to the transfer fabric;

(d) means for effecting transfer of the wet web from the forming fabric to the transfer fabric;

(e) a rotatable throughdrying cylinder for drying the wet web;

(f) a continuous throughdrying fabric which at least partially wraps around the throughdryer and is positioned adjacent to the transfer fabric to enable transfer of the wet web from the transfer fabric to the throughdryer fabric;

(g) means for effecting transfer of the wet web from the transfer fabric to the throughdrying fabric;

(h) a rotatable reel for winding up the dried web;

(i) a reel drum adjacent to the reel for assisting in winding up the dried web; and

(j) means for transferring the dried web from the throughdrying fabric to the reel without an open draw

wherein the means for transferring the web from the throughdrying fabric to the reel comprises:

(a) a continuous first dry end transfer fabric positioned adjacent to the throughdryer fabric to enable transfer of the dried web to the first dry-end transfer fabric;

(b) a continuous loop of a second dry-end transfer fabric positioned adjacent to the first dry-end transfer fabric such that the dried web is sandwiched between the first and second dry-end transfer fabrics, wherein said second dry-end transfer fabric loops around the reel drum and has an air permeability of about 200 cubic feet per minute per square foot or greater; and

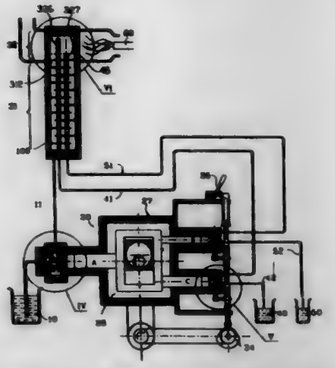
(c) an air foil positioned within the loop of the second dry end transfer fabric and adjacent to the second dry-end transfer fabric which creates air pressure to maintain the dried web in contact with the second dry-end transfer fabric.

5,591,310

DISTILLATION

Henrik G. Glrlk, Humlebaek, Denmark, assignor to Grundfos International A/S, Bjerringbro, Denmark

PCT No. PCT/DK92/00051, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO92/14531, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 21, 1992, Ser. No. 108,556
Claims priority, application Denmark, Feb. 22, 1991, 0310/91
Int. Cl.[6] B01D *3/42*
U.S. Cl. 202—160 **12 Claims**



1. An apparatus for distillation of a purifiable liquid near or above its critical point, wherein the purifiable liquid contains a dissolved solid, said apparatus comprising:

separation means for separating the liquid into a vapor phase in a supercritical state and a liquid residue separated by a liquid surface within a separation vessel;

heat exchange means, including a heat exchanger operably connected to the separation means, for transferring heat from the vapor phase and the liquid residue to the liquid within the separation vessel;

means for pumping the liquid into said heat exchanger and for feeding the liquid into said separation means for separating the liquid into the vapor phase and the liquid residue separated by the liquid surface; said separation vessel having a liquid inlet, a vapor outlet, and a residue outlet; said vapor outlet being positioned at the top of the separation vessel; said liquid inlet being positioned at the bottom of the separation vessel; said liquid residue outlet being positioned in the separation vessel between the liquid inlet and the vapor outlet and immediately below the surface of the liquid to maximize the concentration of the dissolved solid discharged through the liquid residue outlet;

means for establishing a pressure and a temperature in the separation means sufficient to bring the liquid to a state near or above the critical point so as to form the vapor phase and the liquid residue, and for establishing a temperature profile in the purifiable liquid which increases from the liquid at the liquid inlet to the vapor phase at the vapor outlet;

first means for discharge of the liquid residue and second means for discharge of a distillate.

5,591,311

PROCESS FOR PURIFYING A 2,6-DIALKYLPHENOL

Venkataraman Ramachandran, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed Oct. 26, 1995, Ser. No. 548,788
Int. Cl.[6] B01D *3/34*; C07C *37/68*
U.S. Cl. 203—36 **27 Claims**

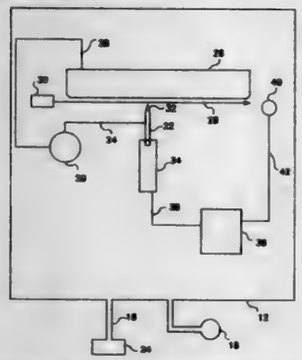
1. A process for the purification of an impure 2,6-diisopropylphenol mixture which contains at least one phenolic component having a boiling point below that of 2,6-diisopropylphenol and at least one phenolic component having a boiling point above that of 2,6-diisopropylphenol, said process comprising washing said mixture with aqueous alkali metal hydroxide solution and/or aqueous alkaline earth metal hydroxide solution in an inert atmosphere and separating the aqueous and organic phases, washing the resulting organic phase with water, and then subjecting the water-washed organic phase to distillation in an inert environment to recover purified 2,6-diisopropylphenol.

5,591,312

PROCESS FOR MAKING FULLERENE FIBERS

Richard E. Smalley, Houston, Tex., assignor to William Marsh Rice University, Tex.

Continuation of Ser. No. 958,929, Oct. 9, 1992, abandoned. This application May 15, 1995, Ser. No. 441,432
Int. Cl.[6] D01F *9/12*
U.S. Cl. 204—157.41 **31 Claims**



1. A process for making a carbon fiber comprising one or more fullerene tubes, comprising:

(a) establishing an electric field between a needle tip and an opposing electrode;

(b) providing vaporized carbon to the space around the electric field to form a growing carbon-containing precursor for fullerene which precursor contains carbon-carbon bonds that have a fullerene structure on the needle tip;

(c) focusing a laser beam between the growing precursor and the opposing electrode; and

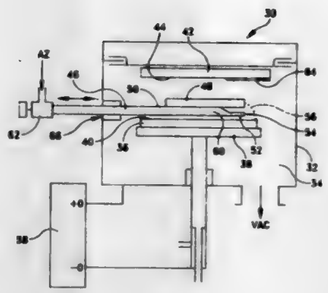
(d) withdrawing the needle tip from the opposing electrode while maintaining the electric field between the growing precursor and the opposing electrode and while providing vaporized carbon to the space around the electric field to form said carbon fiber.

5,591,313

APPARATUS AND METHOD FOR LOCALIZED ION SPUTTERING

Thomas A. Barber, Jr., Pawtucket; Lioudmila D. Kisterskaya, and Leonid L. Kistersky, both of Providence, all of R.I., assignors to Tabco Technologies, Inc., Pawtucket, R.I.

Filed Jun. 30, 1995, Ser. No. 496,888
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—192.12 **29 Claims**



3. A method for localized ion sputtering in a vacuum using bombardment of a cathode target, comprising the steps of:

disposing an anode and a cathode in closely spaced adjacency in a vacuum chamber, said cathode including a target surface, said anode having a leading edge which is positioned over a localized area of said target surface;

evacuating said vacuum chamber;

generating an electric field between the anode and the cathode whereby lines of force of the electric field are concentrated between the leading edge of the anode and the localized area of the target surface; and

creating a localized concentration of a plasma forming gas over said localized area of said target surface, said plasma forming gas having a localized pressure of between about 60 Pa to about 600 Pa in said localized area, whereby a localized ion current of up to about 50,000 Amperes per square meter is obtained in the localized area.

7. Apparatus for localized ion sputtering in a vacuum, comprising:

a vacuum chamber;

an anode and cathode disposed in closely spaced adjacency in said vacuum chamber, said cathode having a target surface, said anode having a first surface which faces said target surface of said cathode, and an opposing second surface, said anode including a layer of dielectric material disposed on said first surface, said anode further having a leading edge which is positioned over said target surface;

power supply means for generating an electric field between said anode and said cathode, said electric field having lines of force extending between the leading edge of said anode and a localized area of said target surface immediately adjacent to said leading edge of said anode;

a plasma forming gas nozzle disposed between said anode and said target surface for directing a stream of plasma forming gas onto the target surface, said nozzle having an outlet which is positioned adjacent to the localized area of the target surface for establishing a localized concentration of a plasma forming gas over said localized area, said outlet comprising a thin slit-shaped tip portion which is operative for creating an increased localized pressure of said plasma forming gas of between about 60 Pa to about 600 Pa within said localized area; and

means for moving a substrate to be coated adjacent to the second surface of said anode whereby sputtered material is received from said target surface onto the moving substrate adjacent to the leading edge of said anode.

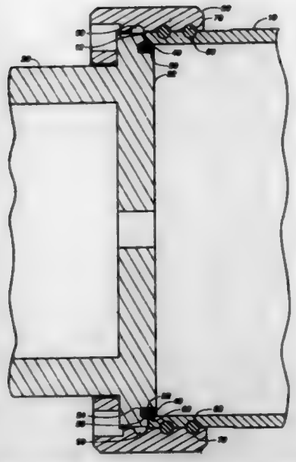
5,591,314

APPARATUS FOR AFFIXING A ROTATING CYLINDRICAL MAGNETRON TARGET TO A SPINDLE

Steven V. Morgan, 253 Mark West Station Rd., Windsor, Calif. 95492; Johan Vanderstraeten, Industrieszone E.376 Laan 75-59 B-9800, Deinze, Belgium; Erwin Vanderstraeten, Industrieszone E.376 Laan 75-59 B-9800, Deinze, Belgium, and Guy Gobin, Industrieszone E.376 Laan 75-59 B-9800, Deinze, Belgium

Filed Oct. 27, 1995, Ser. No. 549,246
Int. Cl.[6] C23C *14/35*
U.S. Cl. 204—298.22 **9 Claims**

1. An apparatus for affixing a rotating cylindrical magnetron target structure to a spindle, said target used to deposit sputtered coatings onto a variety of large substrates, said apparatus comprising:



a spindle member including a hollow shaft terminating in a flange portion having an end surface, said end surface including an O-ring in a circular O-ring groove, said flange portion having a diameter;

a cylindrical target structure having a threaded outside circumferential surface and an end surface, said target structure having a diameter generally equal to said spindle member flange portion diameter; and

a collar ring having a threaded inner circumferential surface, said collar ring adapted to fit over said spindle member flange portion to engage said cylindrical target threaded outside circumferential surface and releasably secure said cylindrical target end surface to said spindle member end surface adjacent said O-ring.

5,591,315

SOLID-COMPONENT MEMBRANES ELECTROCHEMICAL REACTOR COMPONENTS ELECTROCHEMICAL REACTORS USE OF MEMBRANES REACTOR COMPONENTS AND REACTOR FOR OXIDATION REACTIONS

Terry J. Mazanec, Solon; Thomas L. Cable, Newbury; John G. Frye, Jr., and Wayne R. Kliewer, both of Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 228,793, Apr. 15, 1994, abandoned, which is a division of Ser. No. 618,792, Nov. 27, 1990, Pat. No. 5,306,411, which is a continuation-in-part of Ser. No. 457,327, Dec. 27, 1989, abandoned, Ser. No. 457,384, Dec. 27, 1989, abandoned, and Ser. No. 510,296, Apr. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 357,317, May 25, 1989, abandoned, said Ser. No. 457,340is a continuation-in-part of Ser. No. 25,511, Mar. 13, 1987, Pat. No. 4,933,054. This application Feb. 24, 1995, Ser. No. 394,925

Int. Cl.[6] C25B *1/02;3/02*

U.S. Cl. 205—462 **27 Claims**

1. An electrochemical process for oxidizing a gas which reacts with oxygen characterized by

(A) providing an electrochemical reactor cell comprising first and second zones separated by a solid multi-component membrane element, wherein said element comprises

(1) a solid multi-component membrane characterized by a mixed metal oxide material having a perovskite structure, and

(2) a conductive coating, a catalyst, or a conductive coating comprising a catalyst

(B) heating the electrochemical cell to a temperature of from about 300° C. to about 1400° C.,



(C) passing a first gas in contact with said element in the first zone, and

(D) passing a second gas in contact with said element in the second zone.

5,591,316

ELECTROCOAT PAINTING METHOD USING GUARDED TUBULAR MEMBRANE ELECTRODE CELLS

H. Frederick Hess, Jr., Wheaton, Ill., and H. Frederick Hess, III, Valparaiso, Ind., assignors to UFS Corporation, Valparaiso, Ind.

Division of Ser. No. 311,825, Sep. 23, 1994, Pat. No. 5,468,361, which is a continuation of Ser. No. 66,991, May 24, 1993, abandoned, which is a continuation of Ser. No. 678,733, Apr. 1, 1991, Pat. No. 5,213,671. This application Jun. 5, 1995, Ser. No. 463,654

Int. Cl.[6] C25D *13/00*

U.S. Cl. 204—482 **25 Claims**



18. A method for electrocoat painting of a counter-electrode in a paint bath tank comprising the steps of:

positioning tubular membrane electrode cells in the paint bath tank, the membrane electrode cells having a membrane through which ions pass, wherein the membrane electrode cells have a tubular guard concentrically positioned around the membrane, the guard being positioned to prevent physical contact between the membrane and the counter-electrode or another object in the paint bath tank, the guard having a plurality of openings in the surface thereof, wherein the openings have substantially curved surfaces along portions of the periphery thereof;

positioning the counter-electrode in the paint bath tank;

inducing electrical current flow between the counter-electrode and the tubular membrane electrode cells through the tubular guard, wherein paint is deposited on the counter-electrode and ions pass through the membrane; and

removing the counter-electrode from the paint bath tank.

5,591,317

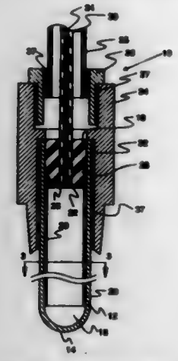
ELECTROSTATIC DEVICE FOR WATER TREATMENT

M. Michael Pitts, Jr., 6651 N. Campbell Ave., No. 171, Tucson, Ariz. 85718

Filed Feb. 16, 1994, Ser. No. 197,154

Int. Cl.[6] C25B *11/00;* B03C *5/00*

U.S. Cl. 204—667 **16 Claims**



1. An electrostatic-field generator for use in reducing scaling from water with a high dissolved-solid content, comprising:

(a) a vitrified ceramic tube of unibody construction having an integrally-sealed end defining an inner cavity with an inner wall;

(b) conductive material contained within said inner cavity and disposed in intimate contact with said inner wall;

(c) electrically-insulated sealing means for providing hermetic closure to said inner cavity; and

(d) electrical means for energizing said conductive material with a static electromotive force, said electrical means being adapted for creating an electrostatic field between said generator immersed in the water and an electrical ground.

5,591,318

METHOD OF FABRICATING A CONDUCTIVE POLYMER ENERGY STORAGE DEVICE

Changming Li, Vernon Hills; Ke K. Liao, Northbrook, and Han Wu, Barrington, all of Ill., assignors to Motorola Energy Systems, Inc., Northbrook, Ill.

Filed Feb. 1, 1996, Ser. No. 595,153

Int. Cl.[6] C23C *22/78;* C25D *5/34*

U.S. Cl. 205—210 **7 Claims**



1. A method of electrochemically depositing a conductive polymer electrode onto a non-noble metal current collecting substrate, said method comprising the steps of coating said substrate with a surfactant selected from the group consisting of perfluoroalkyl iodides, perfluoroalkyl alcohols, perfluoroalkyl methacrylates, perfluoroalkyl esters, perfluoroalkyl carbonyxlates, perfluoroalkyl phosphates, perfluoroalkyl polyethers and combinations thereof; and then electrochemically depositing said conductive polymer.

5,591,319

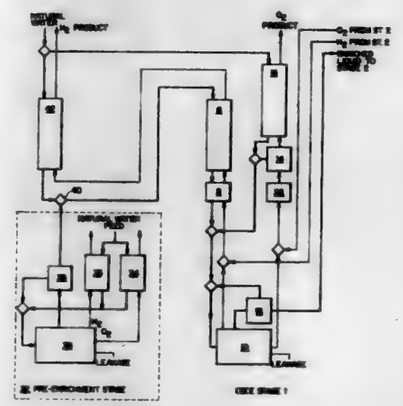
ELECTROLYTIC PRE-ENRICHMENT METHOD AND APPARATUS FOR THE COMBINED ELECTROLYSIS AND CATALYTIC EXCHANGE PROCESS

Alistair I. Miller, Deep River; Andrew T. B. Stuart, Etobicoke, and Allan E. Everatt, Deep River, all of Canada, assignors to Atomic Energy of Canada Limited/Energie Atomique Du Canada Limitee, Ontario, Canada

Filed May 10, 1995, Ser. No. 438,480

Int. Cl.[6] C25B *1/04;9/00;15/08*

U.S. Cl. 205—627 **8 Claims**



6. A method of operating a combined electrolysis and catalytic exchange ("CECE") heavy water production plant to accommodate fluctuations between periods of greater and reduced electrical power availability, said CECE plant having a series of cascaded stages, each stage comprising a catalytic exchange column for passing liquid water in deuterium exchange relation with hydrogen gas and electrolysis cells for evolving from the liquid water stream from said catalytic exchange column a deuterium enriched liquid condensate, hydrogen gas and oxygen gas, wherein said hydrogen gas is returned to said catalytic exchange column and a portion of said deuterium enriched liquid condensate is passed to the catalytic exchange column of the next CECE stage, said electrolysis cells being present in sufficient numbers to consume available electrical power during said periods of greater availability, comprising:

deploying a sufficient number of said electrolysis cells in said CECE stages to consume expected available electrical power during periods of reduced availability;

deploying in a pre-enrichment stage the balance of said electrolysis cells applying feed water that has not undergone catalytic exchange to the pre-enrichment stage electrolysis cells during periods of greater electrical power availability and evolving therefrom a deuterium enriched liquid stream or a hydrogen stream containing deuterium enriched water vapour; and

applying said pre-enrichment stream as a feed to the first CECE stage.

5,591,320

METHOD FOR OBTAINING WELL DEFINED EDGE RADII ON CUTTING TOOL INSERTS BY ELECTROPOLISHING TECHNIQUE

Ulf Rolander, Bromma, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Dec. 4, 1995, Ser. No. 566,952
Claims priority, application Sweden, Dec. 12, 1994, 9404326
Int. Cl.[6] C25F *3/16*
U.S. Cl. 205—664 **6 Claims**



1. An electropolishing method for edge rounding of cutting tool inserts of cemented carbide or titanium based carbonitride alloys in an electrolyte comprising 2–15 volume % of an acid selected from the group consisting of perchloric ($HC1O_4$) acid, sulphuric (H_2SO_4) acid and mixtures thereof, in an organic liquid carrier comprising;

submerging said inserts into the electrolyte;

providing an electrode of an acid resistant material within the electrolyte;

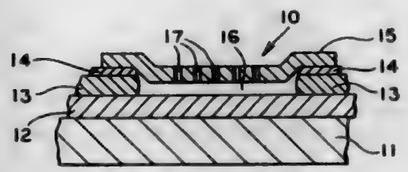
applying an electrical potential between the inserts and the electrode for a period of time sufficient to round the edges of said inserts to a desired degree.

5,591,321

DETECTION OF FLUIDS WITH METAL-INSULATOR-SEMICONDUCTOR SENSORS

Stephen C. Pyke, Sisters, Oreg., assignor to Electric Power Research Institute, Palo Alto, Calif.

Continuation-in-part of Ser. No. 147,802, Nov. 2, 1993, Pat. No. 5,417,821. This application May 16, 1995, Ser. No. 442,373
Int. Cl.[6] G01N *27/26*
U.S. Cl. 205—787 **35 Claims**



8. A method for detecting ethylene in a fluid utilizing a metal-insulator-semiconductor diode sensor comprising:

providing said sensor having an electrode consisting essentially of a composition selected from the group consisting of platinum, platinum/iridium alloy, platinum/tin alloy, palladium/nickel alloy, and mixtures thereof,

contacting the electrode with the fluid, and measuring the sensitivity of the electrode to ethylene.

5,591,322

DEWAXING PROCESS USING ZEOLITE SSZ-25

Stacey I. Zones, San Francisco; Dennis L. Holtermann, Crockett; Robert A. Innes, San Rafael; Theresa A. Pecoraro, Blackhawk; Donald S. Santilli, Larkspur, and James N. Ziemer, Hercules, all of Calif., assignors to Chevron U.S.A. Inc., San Francisco, Calif.

Division of Ser. No. 897,222, Jun. 11, 1992, Pat. No. 5,421,992, which is a continuation of Ser. No. 788,656, Nov. 6, 1991, Pat. No. 5,202,014, which is a continuation of Ser. No. 333,666, Apr. 5, 1989, abandoned, which is a division of Ser. No. 14,958, Feb. 17, 1987, Pat. No. 4,826,667. This application Jun. 7, 1995, Ser. No. 486,478
Int. Cl.[6] C10G *11/05*
U.S. Cl. 208—120 **1 Claim**

1. A dewaxing process comprising contacting the hydrocarbon feedstock under dewaxing conditions with a zeolite having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, iron oxide, boron oxide and mixtures thereof greater than about 20:1 and having the X-ray diffraction lines of Table 2.

5,591,323

PROCESS FOR SWEETENING PETROLEUM CUTS WITHOUT REGULAR ADDITION OF ALKALINE SOLUTION USING A BASIC SOLID CATALYST

Christian Marcilly, Houilles; Serge Leporq, Mantes la Ville, and Philippe Courty, Houilles, all of France, assignors to Institut Francais du Petrole, France

Continuation of Ser. No. 105,998, Aug. 13, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,766
Int. Cl.[6] C10G *27/00;27/04*
U.S. Cl. 208—207 **25 Claims**

1. A process for sweetening a petroleum cut containing mercaptans comprising subjecting said petroleum cut to oxidation conditions by contacting the cut with a porous catalyst in the presence of air, wherein said catalyst comprises 10 to 98% by weight of at least one solid mineral phase which is an alkaline zeolite or tectosilicate with a Si/Al atomic ratio which is less than or equal to 5, 1 to 60% by weight active carbon, 0.02 to 2% by weight of at least one metal chelate and 0 to 20% by weight of at least one mineral or organic binding agent, said catalyst having a basicity determined according to ASTM standard 2896 which is above 70 mg of potash per gram, a total BET surface area which is greater than 10 m^2g^{-1}, and inside its pore structure a hydration rate which is 0.1 to 40% by weight of dry catalyst.

5,591,324

HYDROPROCESSING SCHEME FOR PRODUCTION OF PREMIUM ISOMERIZED LIGHT GASOLINE

Reinaldo Monque, Caracas; Wolfgang Garcia, Edo Miranda; Roberto Gallasso, San Antonio, and Jose A. Perez, Edo Miranda, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Division of Ser. No. 247,319, May 23, 1994. This application May 17, 1995, Ser. No. 446,901
Int. Cl.[6] C10G *45/04*
U.S. Cl. 208—216 R **9 Claims**

1. A process for upgrading a sulfur rich heavy naphtha feedstock comprising the steps of:

providing a heavy naphtha feedstock having an initial sulfur content and an initial octane number; and

contacting said feedstock with a hydroconversion catalyst system under a hydrogen atmosphere at hydroisomerization temperature and pressure so as to provide a final product having a final sulfur content which is less than the initial sulfur content of the feedstock, and having a final octane number which is substantially equal to or greater than said initial octane number of the feedstock, and wherein the final product has an increased isomerized component and substantially no increase

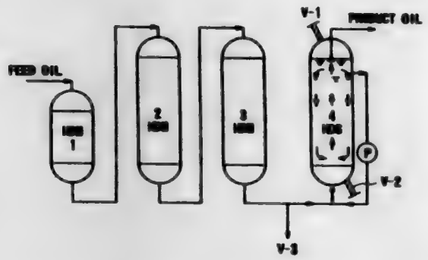
in aromatic content with respect to said feedstock said hydroconversion catalyst comprises (1) a catalytically active matrix, (2) a support medium distributed through the matrix, said support medium comprising a silicious molecular sieve material, and (3) a catalytically active phase supported on the support medium, said catalytically active phase comprising a first metal selected from group IIIA of the periodic table of elements and a second metal selected from group VIB of the periodic table of elements.

5,591,325

PROCESS FOR HYDROTREATING HEAVY OIL AND HYDROTREATING APPARATUS

Hidehiro Higashi, Kitakyushu, Japan, assignor to Catalysts & Chemicals Industries Co., Ltd., Japan

PCT No. PCT/JP94/01360, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO95/05434, PCT Pub. Date Feb. 23, 1995
PCT Filed Aug. 17, 1994, Ser. No. 335,886
Claims priority, application Japan, Aug. 18, 1993, 5-225177
Int. Cl.[6] C10G *45/00*
U.S. Cl. 208—251 H **15 Claims**



1. A process for hydrotreating a heavy oil where said heavy oil includes metals including vanadium and nickel (V+Ni), said heavy oil further including low reactive impurities having a low reactivity with hydrogen during said hydrotreating process and high reactive impurities having high reactivity with hydrogen during said hydrotreating process, said process comprising:

(a) a first step of feeding a heavy oil into a fixed-bed reactor packed with a hydrotreating catalyst and operating under mild operating conditions to thereby effect hydrotreating of the heavy oil so that vanadium and nickel (V+Ni) are removed from the heavy oil at a demetallization rate of not greater than 80% by weight based on the weight of the total of vanadium and nickel (V+Ni) contained in the heavy oil before hydrotreating, whereupon said high reactive impurities are removed from said heavy oil, followed by

(b) a second step of feeding the heavy oil hydrotreated in the step (a) into a suspended-bed reactor packed with a hydrotreating catalyst for hydrotreating the heavy oil and operating under mild operating conditions to thereby effect further hydrotreating of the heavy oil so that said low reactive impurities are removed and the resultant heavy oil has a content of metal, sulfur and nitrogen components smaller than that of the heavy oil hydrotreated in the step (a)

wherein undesirable coke deposition, dry sludge formation and thermal decomposition are avoided and an effective life of said catalyst is prolonged.

5,591,326

CATALYTIC PROCESS FOR CRUDE OIL DESALTING

Stuart S. Shih, Cherry Hill, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 1, 1994, Ser. No. 347,934
Int. Cl.[6] C10G *45/00*
U.S. Cl. 208—251 R **15 Claims**

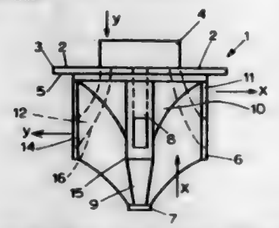
1. A process for the catalytic desalting of a whole crude feedstock, said process comprising contacting at a temperature below about 500° F. said whole crude feedstock with a catalyst comprising an inorganic, porous crystalline phase material having, after calcination, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18 Angstrom Units with a relative intensity of 100 and a benzene adsorption capacity of greater than 15 grams beazene per 100 grams of said material at 50 torr and 25° C.

5,591,327

FLOTATION EQUIPMENT

Jeremy P. A. Walters, Portion 83, Lindley, District Krugersdorp, Transvaal Province, South Africa

Filed Dec. 1, 1994, Ser. No. 348,291
Claims priority, application South Africa, Dec. 9, 1993, 93/9232
Int. Cl.[6] B03D *1/16*
U.S. Cl. 209—169 **2 Claims**



1. Froth flotation equipment comprising a container with an open top for containing a pulp to be subjected to a flotation process, and a multi-vaned rotor located in the container comprising a substantially circular top plate defining a rotor axis perpendicular to said plate at the center of the top, said plate having an upper side and a lower side, a plurality of radially extending vanes mounted to the lower side of the plate, a first arcuate surface located between each pair of adjacent vanes which curve inwardly and downwardly toward the axis from an outer top edge of said surface near the top of said vanes, said first surfaces are adapted to impart an upward movement of the pulp and eject the pulp in a direction transverse to the axis of said rotor, said rotor further includes passages therein, said passages extend from the upper side of said top plate to the outer edge of the vane at a position below the position at which the pulp is ejected from the rotor and comprise a second surface for moving air from above the rotor to the outer edge of the vane.

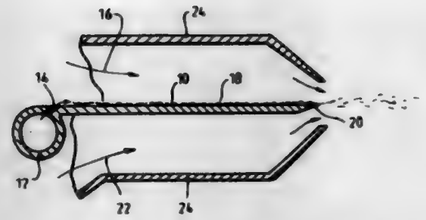
5,591,328

GAS PARTICLE FORMATION

George Bednarss, Western Australia, Australia, assignor to Atomaer Pty. Ltd., Perth, Australia

PCT No. PCT/AU91/00546, § 371 Date May 24, 1993, § 102(e) Date May 24, 1993, PCT Pub. No. WO92/09360, PCT Pub. Date Jun. 11, 1992
PCT Filed Nov. 25, 1991, Ser. No. 64,108
Claims priority, application Australia, Nov. 23, 1990, PK3534
Int. Cl.[6] B03D *1/24*; B01F *3/04*
U.S. Cl. 209—170 **14 Claims**

1. A method of gas particle formation in a liquid medium comprising the steps of:



forming a substantially continuous flowing film of gas on a surface having a discharge edge submerged in said liquid medium;

generating a first flow of liquid over said surface, adjacent to and co-current with said film of gas, directed towards said discharge edge;

generating a second flow of liquid which converges with said first flow from the opposite side of said film of gas at said discharge edge; and

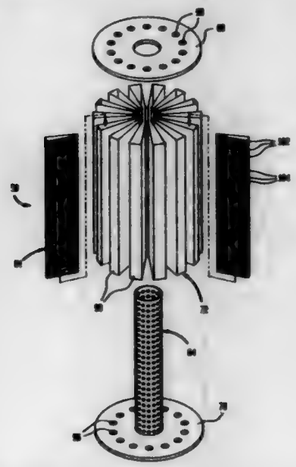
breaking the gas film into gas particles by shear forces as it approaches and/or escapes from said discharge edge.

5,591,329

FLUID FILTER WITH PLEATED SEPTUM

Donald R. Davidson, Chatham, N.J., assignor to H-Tech, Inc., Wilmington, Del.

Filed May 31, 1995, Ser. No. 456,156
Int. Cl.[6] B01D *37/02*
U.S. Cl. 210—193 **31 Claims**



1. A fluid filter, comprising:

(a) A hollow housing having a fluid inlet and a fluid outlet; and

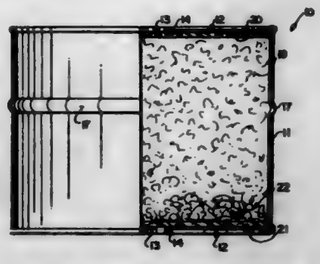
(b) a filter element formed of fluid permeable material disposed within said housing for filtering fluid entering said fluid inlet passing through said element and out said fluid outlet, said element having a generally cylindrical configuration with an axial hollow, said permeable material forming a plurality of elongated, radially extending pleats, each of said pleats having a pair of side walls terminating proximate said axial hollow, each of said pleats spaced from an adjacent said pleat where said side walls terminate proximate said axial hollow, said fluid permeable material extending between adjacent pleats and constituting a portion of the filter element for filtering fluid.

5,591,330

OIL FILTER CONTAINING AN OIL SOLUBLE THERMOPLASTIC ADDITIVE MATERIAL THEREIN

Byron Lefebvre, Ft. Lauderdale, Fla., assignor to T/F Purifiner, Inc., Boynton Beach, Fla.

Filed May 25, 1994, Ser. No. 249,272
Int. Cl.[6] B01D *35/02*
U.S. Cl. 210—283 **21 Claims**



1. An oil filter for engines, hydraulic equipment, or automatic transmissions, comprising:

a casing having first and second ends, and defining an interior volume, and having an opening adjacent said second end thereof;

a particle filtering material comprising loose fibers filling up over 90% of said interior volume;

a pad of interlocked fibers covering said opening adjacent said second end of said casing; and

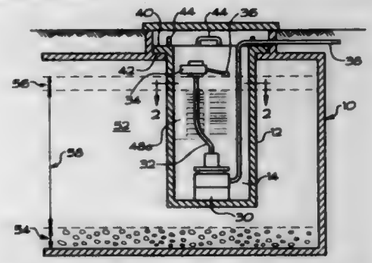
a plurality of discrete shapes of thermoplastic material which gradually dissolves in above ambient temperature oil, said thermoplastic material having oil oxidation and acidification arresting additives which are released into the oil over time as said thermoplastic material dissolves, said thermoplastic material disposed between said particle filtering material and said pad.

5,591,331

FILTER DEVICE INCLUDING A HOUSING WITH REMOVABLE SIDEWALLS HAVING A FILTERING CAPACITY

Harry L. Nurse, Jr., 10409 Watterson Trail, Louisville, Ky. 40299

Filed May 8, 1995, Ser. No. 436,105
Int. Cl.[6] B01D *29/62;29/96*
U.S. Cl. 210—232 **7 Claims**



1. A filter device in combination with a tank for separating solid material from a liquid wherein the filter device comprises:

a housing having a top, with an opening therein, a closed bottom, and a plurality of vertically extending sidewall sections, at least one of said sidewall sections including means to receive a pair of spaced, parallel removable vertically extending sidewall members, at least one of said removable vertically extending sidewalls being a filter means to retain solids of preselected size from a liquid; and,

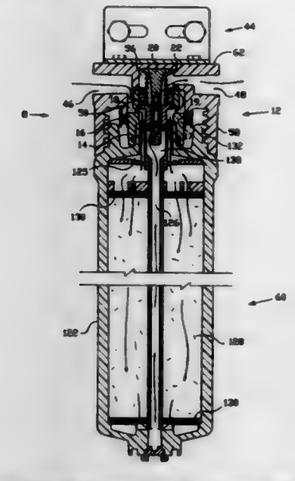
means to remove liquid from said housing through said opening in said top.

5,591,332

FILTER ASSEMBLY WITH AUTOMATIC SHUT-OFF AND QUICK-CONNECT FILTER CARTRIDGE

Roger P. Reid, and Lance J. Christiansen, both of Caldwell, Id., assignors to Omnipure Filter Co., Caldwell, Id.

Filed May 25, 1995, Ser. No. 450,229
Int. Cl.[6] B01D *35/153;27/10*
U.S. Cl. 210—235 **4 Claims**



1. A valve head for connection to a provided filter cartridge having an upper end, the valve head comprising:

a valve head outer surface;

a valve head inner surface defining a generally-cylindrical bore opening downward for receiving the filter cartridge upper end, the valve head inner surface having a bore too surface;

a fluid inlet passage extending from the valve head outer surface to the valve head inner surface;

a generally-cylindrical hollow closure member received in and generally coaxial with the said bore, the closure member having an exterior surface and an interior surface defining an interior space;

a stem member received in and generally coaxial with the interior space of the closure member but not attached to the closure member or to the valve head, the stem member having a top end, central body, and bottom end, the too end abutting the said bore top surface;

wherein the closure member is movable upward relative to the stem member to a first position and is movable downward relative to the stem member to a second position;

wherein the stem member central body is shaped to allow fluid flow through the closure interior space, when the closure member is in the first position;

means for forming a seal between the closure member exterior surface and the valve head inner surface when the closure member is in the second position to block the fluid inlet passage;

means for forming a seal between the closure member interior surface and the stem member when the closure member is in the second position to block fluid flow through the closure member interior space; and

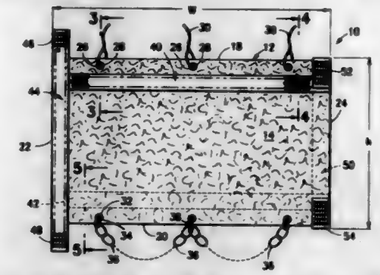
a spring contacting and extending between the stem member top end and the closure member, and wherein the spring forces the stem member top end up against the bore top surface and biases the closure member away from the stem member top end into the second position.

5,591,333

MODULAR SHORELINE OIL SPILL BARRIER ASSEMBLY

Michael P. Hobin, Basking Ridge, N.J.; Milo Johnston, Doylestown, Pa.; Mark Johnson, Montclair, and John Clement, Green Brook, both of N.J., assignors to Sorbent Products Co., Inc., Somerset, N.J.

Filed Feb. 24, 1995, Ser. No. 394,363
Int. Cl.[6] E02B *15/06*
U.S. Cl. 210—242.4 **16 Claims**



1. A barrier assembly for protecting structures that are partly submerged in water from oil spills floating on the water, said barrier assembly comprising:

at least one substantially rectangular sheet of flexible material comprising a first layer of oil-impermeable material and a second layer defining an integral fabric coextensive with and secured to said first layer, said integral fabric of said second layer being oleophilic and hydrophilic, said rectangular sheet having opposed top and bottom edges and opposed side edges, portions of said sheet adjacent said top and bottom edges being folded and secured to adjacent portions of said sheet to define top and bottom hems defining elongate pockets, said top and bottom hems each being formed respectively with a plurality of top and bottom notches providing access to the elongate pockets defined by the respective top and bottom hems, a tie down rope threaded through the elongate pocket defined by said top hem from one said notch in said top hem to the notches adjacent thereto, such that said rope is accessible at said notches along said top edge for securely attaching said sheet to said structure above the water, said bottom edge of said sheet having anchoring means for submerging portions of said sheet adjacent said bottom edge below the water.

5,591,334

APPARATUS FOR GENERATING NEGATIVE IONS

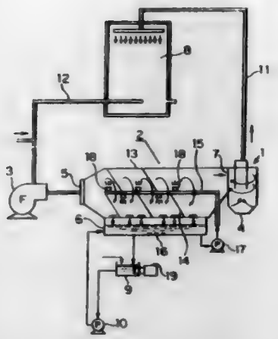
Shigeki Shimizu, Tokyo, Japan, and Bang W. Lee, Seoul, Rep. of Korea, assignors to Geochio Ltd., Tokyo, Japan

Filed Oct. 4, 1994, Ser. No. 322,306
Claims priority, application Japan, Oct. 19, 1993, 5-261396; Nov. 26, 1993, 5-295812
Int. Cl.[6] B01D *21/26;* **H05F** *3/00*
U.S. Cl. 210—243 **6 Claims**

1. A negative ion generating apparatus, comprising,

an air stream generating device,

a centrifugal force and Coriolis force generating device including a cylindrical air feeding conduit connected to the air stream generating device and being formed of concentric inner and outer cylinders, a spiral guide situated in the feeding conduit for providing a spirally flowing air stream in the feeding conduit along the spiral guide when air is supplied to the air feeding conduit from the air stream generating device, and liquid jetting nozzles situated in a space between the inner and outer cylinders of the feeding conduit to provide air inhaled into the outer cylinder with liquid from the jetting nozzles while air is spirally flowing in said space so that when the liquid is jetted into the spirally flowing air stream in the feeding conduit through the jetting nozzles, liquid drops ejected from the nozzles receive centrifugal force and Coriolis



force by the spirally flowing air stream to form liquid particles with negative ions in air, and

an air and liquid separation device attached to the cylindrical air feeding conduit for separating the liquid particles from air, said air passing through said space and entering into the inner cylinder to exit to the air and liquid separation device.

5,591,335

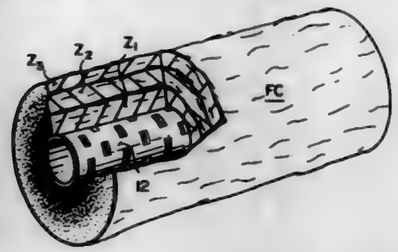
FILTER CARTRIDGES HAVING NONWOVEN MELT BLOWN FILTRATION MEDIA WITH INTEGRAL CO-LOCATED SUPPORT AND FILTRATION

Steven D. Barbour; Charles Hoffman, Jr., both of Baltimore, Md.; Clinton V. Kopp, Castle Hill, Australia; Robert J. Schmitt, Stewartstown, Pa., and Anthony C. Shucosky, Timonium, Md., assignors to Memtec America Corporation, Timonium, Md.

Filed May 2, 1995, Ser. No. 433,086

Int. Cl.[6] B01D *24/00*

U.S. Cl. 210—323.2 **23 Claims**



1. A filter cartridge having an axially elongate central hollow passageway, and a cylindrical filtration element surrounding said passageway which includes a mass of nonwoven melt blown continuous support and filtration fibers, said support fibers having on average relatively larger diameters as compared to said filtration fibers, wherein said relatively larger diameter support fibers define a random matrix of open areas in at least one annular zone of said filtration element, and wherein said filtration fibers are integrally co-located with said relatively larger diameter support fibers within said at least one annular zone of said filtration element so as to be disposed physically within said random matrix of open areas defined by said support fibers.

5,591,336

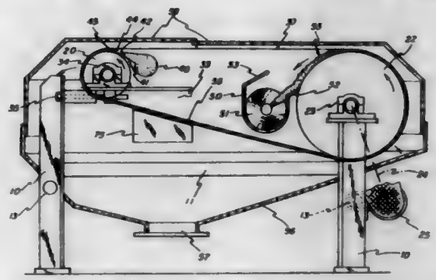
APPARATUS FOR DEWATERING AND OR WASHING PAPERMAKING STOCK

Peter Seifert; David E. Chapka, both of Middletown, Ohio, and Terry L. Bliss, Marietta, Ga., assignors to The Black Clawson Company, Middletown, Ohio

Continuation-in-part of Ser. No. 649,232, Jan. 29, 1991, Pat. No. 5,382,327, and a continuation of Ser. No. 649,231, Jan. 29, 1991, Pat. No. 5,384,231, which is a continuation of Ser. No. 278,105, Nov. 30, 1988, abandoned, said Ser. No. 649,232is a continuation of Ser. No. 264,118, Oct. 28, 1988, abandoned. This application Nov. 2, 1994, Ser. No. 333,206

Int. Cl.[6] B01D *33/00*

U.S. Cl. 210—386 **12 Claims**



1. In an apparatus for dewatering or washing a suspension of paper pulp in water, including a frame, first and second rolls rotatably mounted in spaced relation in said frame, an endless loop of wire tensioned around said rolls in wrapping relation with a substantial portion of the circumference thereof and cooperating therewith to define a space bounded by said rolls and opposed connecting runs of said wire, a headbox mounted on said frame in said space and including an outlet slot for the pulp suspension to be thickened, said headbox being so positioned that said outlet slot discharges the pulp suspension onto said wire approaching or wrapping said first roll, means for driving at least one of said rolls to cause said wire to travel around said rolls at a speed effecting the development of centrifugal force, and causing liquid to be expressed through the portion of said wire wrapping each of said rolls and thereby to cause partially dewatered pulp to collect on the inner surface of said wire, and a pulp collector mounted on said frame in said space between said wire runs in position to collect said partially dewatered pulp, the improvement comprising:

said first roll having a central shaft,

screw flight means mounted on said central shaft and extending across the width of said wire run,

said screw flight means defining a discontinuous cylindrical surface supporting said wire, and

the radial dimension of said screw flight means being at least twice the width of said headbox outlet slot.

5,591,337

APPARATUS FOR FILTERING LEUKOCYTES FROM BLOOD CELLS

Daniel R. Lyan, Spring Grove, Ill.; Billy W. Marshall, Mill Creek, Wash.; Allen R. Wons, and David P. Fisher, both of Antioch, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 121,344, Sep. 14, 1993, abandoned. This application Dec. 22, 1993, Ser. No. 178,383

Int. Cl.[6] B01D *29/56;29/58;* **B32B** *31/20*

U.S. Cl. 210—499 **9 Claims**

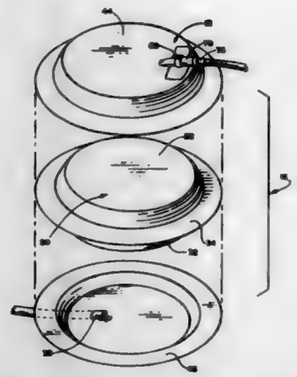
1. A blood filter device comprising

a filter pad assembly comprising

a first filter media layer having a periphery,

a second filter media layer having a periphery,

a third layer having a periphery, the third layer consisting essentially of a screen of woven mesh or knitted fiber,



a first heat and pressure sealed region that integrally bonds the peripheries of the first, second, and third layers together,

a flexible housing assembly comprising

a first generally flexible housing element comprising a sheet of flexible plastic material overlying the first filter media layer, the first housing element including a rim aligned with the first heat and pressure sealed region of the first filter media layer,

a second generally flexible housing element comprising a sheet of flexible plastic material overlying the third layer, the second housing element including a rim aligned with the first heat and pressure sealed region of the third layer,

a second heat and pressure sealed region, formed after the first heat and pressure sealed region, that joins the rims of the housing elements to the first heat and pressure sealed region, thereby forming a composite seal that encapsulates the filter pad assembly within the flexible housing assembly,

an inlet port in the first housing element spaced from the composite seal for conveying blood under positive fluid head pressure to the first filter media layer, the first generally flexible housing element expanding under the positive fluid head pressure to create a pressure manifold that distributes blood across the first filter media layer within the first generally flexible housing element, and

an outlet port in the second housing element spaced from the composite seal for conveying blood under negative head pressure from the third layer after filtration by the first and second filter media layers, the second generally flexible housing element collapsing against the third layer under the negative head pressure, the screen Of the third layer interrupting occluding surface contact between the collapsed second generally flexible housing element and the third layer.

5,591,338

FLUID FILTER

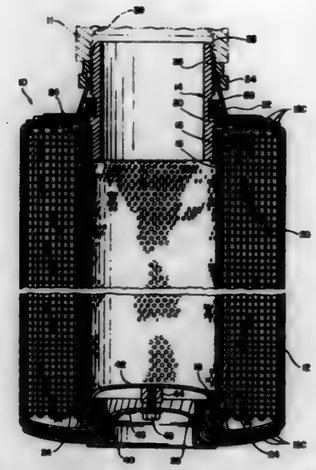
Dean M. Pruette, and Stephen E. Larson, both of Blacksburg, Va., assignors to Dellinger Corporation, Rich Creek, Va.

Continuation of Ser. No. 335,977, Nov. 3, 1994, abandoned, which is a continuation of Ser. No. 51,659, Apr. 26, 1993, abandoned. This application Jul. 7, 1995, Ser. No. 473,935

Int. Cl.[6] B01D *27/06*

U.S. Cl. 210—493.1 **6 Claims**

1. A fluid filter element comprising a tubular flow-through core, a wire cage surrounding the core, the wire cage being formed into radial pleats extending around the circumference of the core, and a filter medium to be fitted around the cage and over opposite ends of the cage, the filter medium comprising a sheet of filter material having a row of apertures adjacent each of a pair of opposite ends of the sheet and a drawstring threaded in each row of apertures whereby the sheet can be fitted around said cage in the form of a substantially cylindrical bag, the sheet can be pleated into and



around the pleats in the cage, and opposite pleated ends of the sheet can be folded over opposite ends of the cage and tied down by tightening the drawstrings, the filter elemeat further comprising sealing means for opposite ends of the core for sealing the opposite pleated, folded over and tied down ends of the filter medium against the opposite ends of the core, wherein the core includes a tubular fitting at one end thereof and wherein the sealing means for said one end of the core comprises an annular ring surrounding said fitting, one folded over and tied down end of the filter medium fitting over said annular ring, a threaded portion on said tubular fitting outwardly of the annular ring and a ring means for applying external pressure on said one folded over and tied down end of the filter medium to seal same against said annular ring, the ring means including a locking ring adapted to thread on said threaded portion of the tubular fitting.

5,591,339

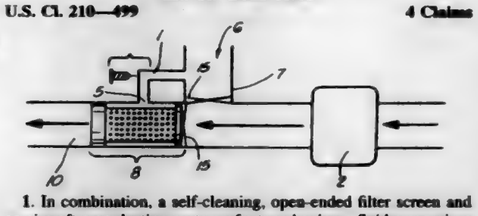
SELF-CLEANING FILTER SCREEN FOR VENTURI SUCK BACK PASSAGE

Webster Robinson, Rte. 1 Box 183 A4, Clayton, La. 71376

Filed Aug. 16, 1995, Ser. No. 515,982

Int. Cl.[6] B01D *35/02*

U.S. Cl. 210—499 **4 Claims**



1. In combination, a self-cleaning, open-ended filter screen and an aircraft crop dusting system of a type having a fluid reservoir, a spray boom connected to the wing of the aircraft, a supply line communicating said fluid reservoir with said spray boom, a pump communicating with said supply line for supplying fluid to said spray boom under pressure, a valve assembly mounted in said fluid supply line between said pump and said spray boom for controlling the flow of said fluid to the spray boom, a recirculating line communicating with the fluid supply line between said pump and said valve assembly for recirculating the fluid back into the reservoir when the valve is in a closed position, an aspiration passage communicating with said recirculating line and said fluid supply line, said aspiration passage having an inlet between said spray boom and valve assembly, whereby when the valve assembly is closed, fluid is drawn from the spray boom through the aspiration passage back into said recirculating line to the reservoir; said

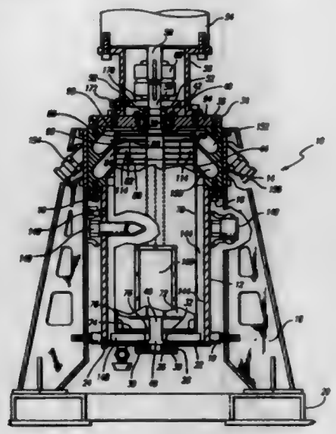
self-cleaning open-ended filter screen comprising a wire mesh sleeve mounted in the fluid supply line between the spray boom and valve assembly and communicating with said aspiration passage, whereby foreign particles are filtered out of the fluid being drawn from the spray boom, to thereby prevent blockage of said aspiration passage, the filtered foreign particles being purged from the filter and fluid supply line when the valve assembly is in an open position allowing the fluid to flow to the spray boom.

5,591,340

CENTRIFUGAL SEPARATOR

David H. Meikrantz, Carson City, Nev.; Lawrence L. Macaluso, Reseda; H. William Sams, III, Simi Valley, both of Calif.; Charles H. Schardin, Jr., Carson City, Nev., and Alfred G. Federici, Newbury Park, Calif., assignors to Costner Industries Nevada, Inc., Carson City, Nev.

Filed Sep. 1, 1995, Ser. No. 522,520
Int. Cl.[6] B01D 21/26
U.S. Cl. 210—512.3 8 Claims



1. A centrifugal separator comprising:

a housing having a generally cylindrical inner surface defining an interior chamber, said inner surface symmetrically disposed about an axis;

a hollow rotor disposed within said chamber for rotation about the axis, said rotor having upper and lower openings and a generally cylindrical rotor wall with an inner and an outer surface, said outer surface of the rotor wall spaced apart from the inner surface of the housing and defining an annular volume therebetween, said lower opening in the rotor in communication with the annular volume;

at least one inlet for introducing a liquid mixture having a density into the annular volume; and

separation means disposed adjacent to the upper opening of the rotor for directing a first component of the liquid mixture having a density greater than the mixture's density to a first outlet and for directing a second component of the liquid mixture having a density less than the mixture's density to a second outlet,

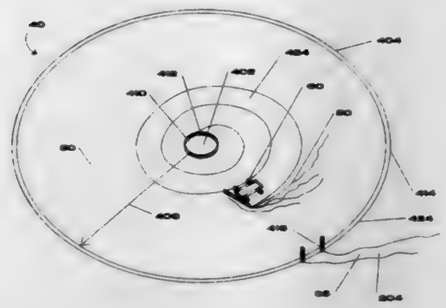
wherein said separation means includes an upper rotor assembly comprising a fixed weir ring and a removable weir ring axially spaced apart by a baffle assembly having a plurality of radial vanes.

5,591,341

METHOD AND SYSTEM FOR WATER BIOREMEDIATION UTILIZING A CONICAL ATTACHED ALGAL CULTURE SYSTEM

Kyle R. Jensen, 1168 Woodland Terrace Trail, Altamonte Springs, Fla. 32714

Continuation-in-part of Ser. No. 399,204, Mar. 6, 1995, which is a continuation-in-part of Ser. No. 893,246, Jun. 2, 1992. This application Jun. 7, 1995, Ser. No. 474,498
Int. Cl.[6] C02F 3/32
U.S. Cl. 210—602 22 Claims



1. A generally conical floway for cleansing water from a waterway of a pollutant, the floway having an inner central region, an outer circumferential edge, a radius, and a downward slope between the central region and the outer edge, the floway comprising:

means for admitting the water to be cleansed positioned at the central region;

means for retaining water within the floway positioned around the outer edge, the retaining means comprising means for discharging cleansed water from the floway, the discharging means movable between an open position and a closed position; and

a water-impervious bottom surface extending from the central region to the outer edge, the bottom surface having a texture conducive for growing a bed of algae to form an algal turf thereon;

wherein, in use, water is admitted into the floway from the waterway by the admitting means, is permitted to flow over the algal turf growing on the bottom surface, the algal turf serving as means for removing the pollutant from the water to be cleansed and thereby cleansing the water, and is discharged from the discharging means after a predetermined time in a cleansed condition.

17. A method for cleansing water from a waterway of a pollutant using a conical floway, the floway having an inner central region, an outer circumferential edge, a radius, a downward slope between the central region and the outer edge, and a bottom surface conducive for growing an algal turf thereon, the method comprising the steps of:

growing an algal turf on the bottom surface, the algal turf comprising an algal species capable of bioassimilating the pollutant;

flowing the water to be cleansed over the algal turf;

permitting the algal turf to bioassimilate the pollutant; and

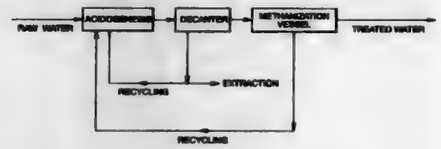
discharging water from the outer edge of the floway after a predetermined time.

5,591,342

PROCESS FOR THE ANAEROBIC DIGESTION OF LIQUID WASTES

Claude Delporte, Rueil-Malmaison, and Jean-Claude Jacquart, Paris, both of France, assignors to Degremont, Rueil-Malmaison, France

Continuation of Ser. No. 360,867, Dec. 20, 1994. This application Mar. 18, 1996, Ser. No. 620,755
Claims priority, application France, Dec. 30, 1993, 93 15928
Int. Cl.[6] C02F 3/28; 1/52
U.S. Cl. 210—603 4 Claims



1. An anaerobic digestion process for the removal of organic matter contained in waste water, comprising the steps:

subjecting the waste water to an acidogenesis stage;

subjecting resulting waste water to a sole settling stage of the process;

the settling stage causing separation of treated water from sludge;

recycling a portion of the settled sludge, after separation, back to the acidogenesis stage, and enriching the acidogenesis stage with previously treated sediment containing volatile fatty acids;

subjecting the remaining waste water to a methanogenesis stage;

recycling water from the methanogeneais stage to the acidogenesis stage, this recycled water being alkaline and contributing alkalinity to the acidogenesis step along with seeding of bacteria, to optimize;

production of volatile fatty acids during the acidogenesis stage which enables the methanization stage to increase the degree of treatment of the waste water as well as reducing

(a) the quantity of material needed to neutralize the acidity of the treated water;

(b) the time the waste need remain resident in the acidogenesis stage.

5,591,343

PROCESS FOR EXTRACTION OF CAROTENOIDS FROM BACTERIAL CELLS

Motomitsu Kitaoka; Akira Tsubokura, and Takashi Kiyota, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1995, Ser. No. 533,390
Claims priority, application Japan, Sep. 27, 1994, 6-231266
Int. Cl.[6] B01D 11/04
U.S. Cl. 210—634 5 Claims

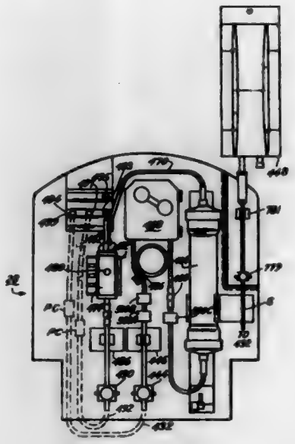
1. A process for extraction of a carotenoid compound from bacterial cells containing the carotenoid compound comprising the step of bringing the bacterial cells into contact with a supercritical fluid so as to extract the carotenoid compound from the bacterial cells, wherein an entrainer selected from the group consisting of methanol and isopropanol is used in combination with the supercritical fluid.

5,591,344

HOT WATER DISINFECTION OF DIALYSIS MACHINES, INCLUDING THE EXTRACORPOREAL CIRCUIT THEREOF

Rodney S. Kenley, Libertyville; Dennis M. Treu, Gurnee; Frederick H. Peter, Jr., Barrington; Thomas M. Feldstein, Palatine; Kenneth E. Pawlak, Vernon Hills; Wayne F. Adolf, Mt. Prospect, all of Ill., and Linda Roettger, Marblehead, Mass., assignors to Aksys, Ltd., Libertyville, Ill.

Filed Feb. 13, 1995, Ser. No. 388,275
Int. Cl.[6] A61L 2/00; B01D 36/00;65/00
U.S. Cl. 210—636 15 Claims



1. In a dialysis machine having a water treatment module, a dialysate circuit circulating dialysate to a dialyzer, and an extracorporeal circuit having an arterial line and a venous line connected to said dialyzer transporting body fluids from a patient to said dialyzer and back to the patient, a method of disinfecting said water treatment module, dialysate circuit and extracorporeal circuit against bacteriological substances by circulating water through said water treatment module, dialysate circuit and extracorporeal circuit that has been heated to a high level disinfection temperature below the water's boiling point sufficient to achieve disinfection without the use of chemical cleaning agents, comprising the steps of:

filtering water in said water treatment module through a reverse osmosis filter to produce filtered water;

heating said filtered water within said dialysis machine to said high level disinfection temperature below the boiling point of said filtered water to produce heated, filtered water;

placing said arterial and venous lines in fluid communication with said heated, filtered water;

circulating said heated, filtered water through said water treatment module, dialysate circuit and extracorporeal circuit including said arterial line, venous line and dialyzer for a sufficient amount of time at or above said high level disinfection temperature to achieve disinfection of said water treatment module, dialysate circuit and extracorporeal circuit including said arterial and venous lines and said dialyzer.

5,591,345

MEMBRANE FOR SEPARATING OFF SMALL MOLECULES AND METHOD FOR THE PRODUCTION THEREOF

Charles W. R. Engelen, Alkmaar, and Willem F. Van Leeuwen, Heiloo, both of Netherlands, assignors to Stichting Energieonderzoek Centrum Nederland, Petten, Netherlands

PCT No. PCT/NL93/00076, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO93/19841, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 29, 1993, Ser. No. 307,770

Claims priority, application Netherlands, Mar. 27, 1992, 9200575

Int. Cl.[6] B01D *71/02*

U.S. Cl. 210—640 **17 Claims**

14. Supported membrane suitable for separating small molecules



from a mixture, which membrane is asymmetric and is composed of:

i) a metal or ceramic support having pore dimensions of the order of 1–5 μm;

ii) a macroporous layer having a thickness of 10 –100 μm, having an average pore size larger than the effective pore size of a separating top layer, and consisting essentially of molecular sieve crystals, and

iii) said separating top layer having a thickness of 0.01–10 μm, having an effective pore size of less than 1.5 nm, and consisting of molecular sieve crystals of the same material as the macroporous layer.

5,591,346

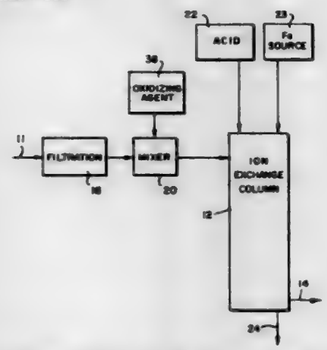
WATER TREATMENT PROCESS

James E. Etzel, Lafayette, and Joseph Kurek, Franklin, both of Ind., assignors to Heritage Environmental Services, Inc., Indianapolis, Ind.

Division of Ser. No. 181,844, Jan. 14, 1994, Pat. No. 5,453,201. This application Jun. 7, 1995, Ser. No. 476,731

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—668 **4 Claims**



1. A method for reducing arsenic concentration in a wastewater or drinking water stream contaminated with arsenic-containing contaminants comprising arsenate, said process comprising the step of contacting the contaminated water stream with an iron(III)-complexed cation exchange resin to form an acid exchangeable iron(III) arsenate complex immobilized on said cation exchange resin and an effluent stream having reduced arsenic concentration.

5,591,347

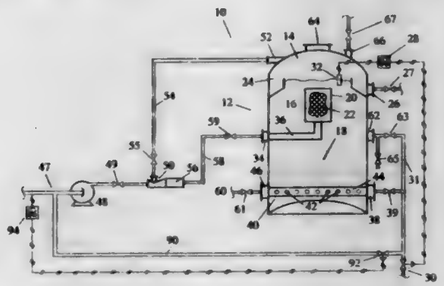
SINGLE CELL GAS FLOTATION SEPARATOR WITH FILTER MEDIA

John A. Cairo, Jr., and John A. Young, both of Baton Rouge, La., assignors to Unicel, Inc., Baton Rouge, La.

Continuation-in-part of Ser. No. 451,145, May 26, 1995, Pat. No. 5,516,434. This application Feb. 23, 1996, Ser. No. 604,880

Int. Cl.[6] C02F *9/00; 1/24*

U.S. Cl. 210—703 **22 Claims**



1. An apparatus for removing suspended particles from liquids by coalescing, flotation and filtering, comprising:

a vessel defining a single chamber, said vessel having inlet and outlet means;

means for introducing liquid containing suspended particles into said vessel via said inlet means;

means for inducing gas into said liquid containing suspended particles;

at least one riser tube located in the chamber defined by said vessel, said riser tube having an upper end in open communication with liquid contained in the chamber defined by said vessel;

coalescer means located within the chamber defined by said vessel and positioned above the upper end of the at least one riser tube;

means for introducing the gas-induced liquid containing suspended particles into said at least one riser tube;

liquid level control means for maintaining and changing the liquid level in said vessel;

means in an upper portion of the chamber defined by said vessel for collection and removal of a particle-laden froth from the surface of the liquid;

means for removal of particle-laden froth from said vessel;

means for collecting gas from the upper portion of the chamber defined by said vessel and means for recirculation of said gas to said means for inducing gas;

filtration means located within the chamber defined by said vessel for filtering liquid after the liquid exits said riser tube and after the liquid is subjected to flotation;

means for periodically cleaning said filtration means of filtered particles;

means for removing liquid from a lower portion of the chamber defined by said vessel via said outlet means, after the liquid has been treated by said filtration means.

5,591,348

DEVICE FOR THE CENTRAL FEEDING OF TANKS SUCH AS CIRCULAR GRIT TRAPS, GRIT CLASSIFIERS OR SETTLING TANKS OF CIRCULAR CONSTRUCTION

Anton Felder, Schlotthauerstrasse 5, D-8000 München 90, and Franz Valentin, Munich, both of Germany, assignors to Anton Felder, München, Germany

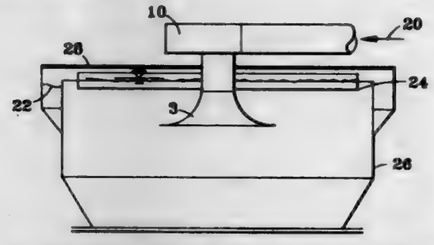
PCT No. PCT/EP93/01390, § 371 Date Aug. 16, 1994, § 102(e) Date Aug. 16, 1994, PCT Pub. No. WO94/02251, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 21, 1993, Ser. No. 204,172

Claims priority, application Germany, Jul. 21, 1992, 42 24 047.6

Int. Cl.[6] C02F *1/24;* **B01D** *21/26*

U.S. Cl. 210—704 **15 Claims**



1. A device for central feeding of a tank with fluid by utilization of the Coanda effect, comprising:

a vertical gravity outlet pipe oriented substantially vertically with respect to gravity, with a first end and a second end, said second end directed into a central portion of said tank;

a swirl chamber, said swirl chamber in flow communication, at an input end thereof, with input flow of said fluid and attached in flow communication, at an output end thereof, with said first end of said vertical gravity outlet pipe wherein fluid supplied to said swirl chamber is caused to move in a helical flow as it passes through said vertical gravity outlet pipe from said first end toward said second end of said vertical gravity outlet pipe;

a bell shaped body, trumpet-shaped in that said bell shaped body is configured similarly to a bell end of a trumpet and having a small diameter end and a fluid detachment end, said small diameter end connected to and adjoining said second end of said vertical gravity outlet pipe defining thereby a smooth and continuous region of transition from said second end of said vertical gravity outlet pipe to said small diameter end of said bell shaped body; and

said vertical gravity outlet pipe and said bell shaped body cooperating in such a manner that said fluid emerges from said fluid detachment end of said bell shaped body in a direction substantially radial relative to said vertical gravity outlet pipe, said direction of said emerging fluid being a result of said Coanda effect and into said tank wherein said fluid is caused to radially symmetrically drain-off from said tank.

5,591,349

MICROORGANISM REMOVING METHOD

Akira Ikeda; Naoki Nakatsugawa; Yumiko Yoshimura; Yasuhiro Tanimura, and Kenji Ezaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 43,434, Apr. 5, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 338,304

Claims priority, application Japan, Apr. 28, 1992, 4-109401; Apr. 28, 1992, 4-109801

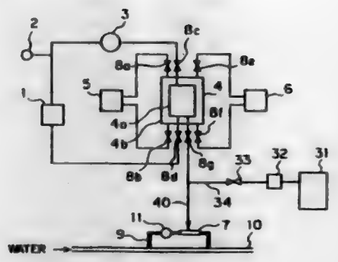
Int. Cl.[6] C02F *1/78*

U.S. Cl. 210—760 **6 Claims**

1. A microorganism removing method comprising the steps of:

causing water to flow through a water pipe;

causing water to flow through a branch water pipe branched from the water pipe;



generating ozone by an ozonizer;

storing the ozone in ozone adsorbent contained in a single ozone adsorber by cooling the single ozone adsorber;

desorbing the ozone from the ozone adsorbent by heating the ozone adsorbent;

intermittently mixing the desorbed ozone with the water flowing through the branch water pipe; and

mixing, in substantial synchronization with the intermittent mixing of the desorbed ozone with the water, carbon dioxide with the water flowing through the branch pipe, wherein the step of mixing carbon dioxide comprises the steps of:

intermittently sucking the ozonous gas desorbed from the ozone adsorbent and injecting the sucked ozonous gas into the water flowing through the branch water pipe;

supplying, in substantial synchronization with the intermittent sucking of the ozonous gas, the carbon dioxide into an ozonous gas supply pipe connected between the ozone adsorber and the branch water pipe, so that the carbon dioxide is mixed with the ozonous gas desorbed from the ozone adsorbent; and

mixing the mixed gas including the ozonous gas and the carbon dioxide with the water in the branch water pipe.

5,591,350

IODINE DISINFECTION METHOD USING A GASEOUS IODINE TREATED POROUS MEDIUM

Duane Piechocki, Pleasantville; Thomas J. Bornarth, Melville; Thomas C. Goell, Glen Head; Frank R. Pascale, and Vlado I. Matkovich, both of Glen Cove, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 227,876, Apr. 15, 1994, abandoned. This application Nov. 7, 1995, Ser. No. 554,757

Int. Cl.[6] A61L *2/00;* **A61K** *33/18;* **B01D** *37/00*

U.S. Cl. 210—764 **15 Claims**

1. A method for processing a biological fluid comprising:

passing the biological fluid into a flexible container comprising a blood bag, said container including a gaseous iodine treated porous medium;

contacting the gaseous iodine treated porous medium with the fluid.

5,591,351

AUTOMOBILE PARTS AND ENGINE CANISTERS

Toshio Hatayama; Mie Sasaki; Takeshi Kojima, and Kouichi Sakai, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 961,861, Oct. 15, 1992, abandoned. This application Jul. 21, 1994, Ser. No. 277,698

Claims priority, application Japan, Oct. 24, 1991, 3-303982; Oct. 28, 1991, 3-307186

Int. Cl.[6] B01D *35/00*

U.S. Cl. 210—767 **5 Claims**

4. A method for imparting oil resistance, chemical resistance, dimensional precision, gasoline resistance, hot water resistance, alkali resistance and acid resistance to an automobile part which,

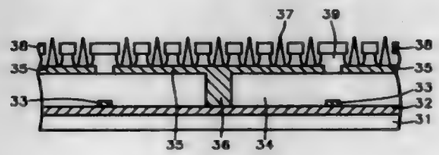
during operation of an automobile, comes into direct contact with fuel, oil or combustion gas, said method comprising forming the portion of the automobile part which comes into direct contact with at least one of a fuel, oil, or combustion gas, from an engineering plastic consisting of polybutylene naphthalene-2,6-dicarboxylate homopolymer or, said homopolymer and at least one additive, in an amount that does not impair the physical properties of the polybutylene naphthalene-2,6-dicarboxylate homopolymer, and having an intrinsic viscosity (η) of 0.6 to 1.2 dl/g as measured in o-chlorophenol at 35° C., and a tensile strength of 600 to 1100 kg/cm^2, and wherein said at least one additive, when present, is selected from the group consisting of fillers, stabilizers, coloring agents, ultraviolet absorbers, mold release agents, anti-static agents, crystallization promoters, nucleating agents, fire retardants and fire retardant aids and allowing said portion to come into direct contact with said fuel, oil or combustion gas.

5,591,352

HIGH RESOLUTION COLD CATHODE FIELD EMISSION DISPLAY METHOD

Chao-Chi Peng, Chiachu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Apr. 27, 1995, Ser. No. 429,730
Int. Cl.^{6} B44C *1/22*
U.S. Cl. 216—11 **2 Claims**



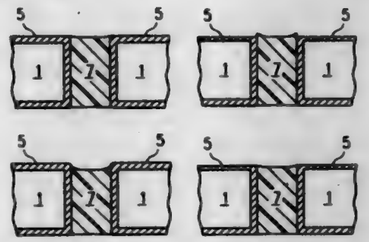
1. A method for manufacturing a cold cathode field emission display comprising:
providing an insulating substrate;
depositing a resistive layer onto said substrate;
depositing a cathode distribution mesh onto said resistive layer;
depositing a first dielectric layer onto said resistive layer and onto said cathode distribution mesh;
depositing and then patterning a conductive layer to form cathode columns on said first dielectric layer, disposed so as to underlap said cathode distribution mesh along one dimension;
forming gate lines for said display disposed as parallel, spaced conductors, over, and at an angle to, said cathode columns;
forming via holes through said first dielectric layer, said via holes being centrally located within the interstices of said cathode distribution mesh, thereby enabling conductive material from said cathode columns to connect to said resistive layer;
depositing a second dielectric layer, located between said cathode columns and said gate lines;
forming a plurality of openings, located at the intersections of said cathode columns and said gate lines and passing through said gate lines and said second dielectric layer;
planarizing the surface of said display; and
then forming a plurality of cone shaped field emission microtips, each centrally located within one of the openings, the base of each of said microtips being in contact with said conductive layer and the apex of each microtip being in the same plane as that of said gate lines.

5,591,353

REDUCTION OF SURFACE COPPER THICKNESS ON SURFACE MOUNT PRINTED WIRE BOARDS WITH COPPER PLATED THROUGH HOLES BY THE CHEMICAL PLANARIZATION METHOD

John J. Devignon, Austin; Don J. Jermain, Georgetown, both of Tex., and Leslie O. Connelly, Albuquerque, N.M., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 18, 1994, Ser. No. 292,474
Int. Cl.^{6} H05K *3/00*
U.S. Cl. 216—18 **20 Claims**



1. A method of making a printed wiring board comprising the steps of:
(a) providing a board having a pair of major opposing surfaces, a via having walls extending between said surfaces and a layer of electrically conductive material having thickness disposed on at least one said surface and extending along the walls of said via;
(b) protecting said electrically conductive material disposed in said via against a subsequent etching of said electrically conductive material on said at least one said surface; and
(c) reducing the thickness of said layer of electrically conductive material on said at least one said surface to a lesser finite thickness.

5,591,354

ETCHING PLASTICS WITH NITROSYLS

Gordhanbhai N. Patel, Somerset, and Subhash H. Patel, Hoboken, both of N.J., assignors to JP Laboratories, Inc., Middlesex, N.J.

Filed Oct. 21, 1994, Ser. No. 327,237
Int. Cl.^{6} B29C *71/00*
U.S. Cl. 216—83 **50 Claims**

1. A process of etching the surface of polymeric materials made of polymers having at least one oxidatively degradable functionality which comprises treating said surface with a solution of at least one member of the etchant group consisting of nitronium, nitrosonium ions and complexes thereof, in a solvent containing less than 40% by weight of water and nitroacidium ions and complexes thereof.

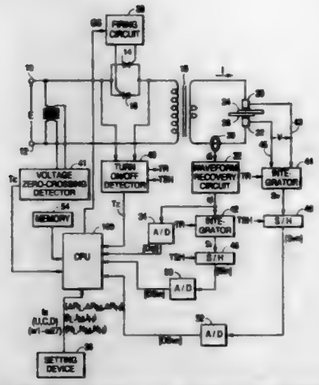
5,591,355

METHOD FOR CONTROLLING RESISTANCE WELDING USING FUZZY REASONING

Sakae Ishikawa, Chiba-ken, Japan, assignor to Miyachi Technos Corporation, Chiba-ken, Japan

Filed Feb. 9, 1995, Ser. No. 386,090
Claims priority, application Japan, Feb. 25, 1994, 6-053034
Int. Cl.^{6} B23K *11/24*
U.S. Cl. 219—110 **4 Claims**

1. A method for controlling resistance welding, comprising the steps of:
setting a plurality of antecedent membership functions for respective degrees of a change of resistance across welding electrodes under welding operation;



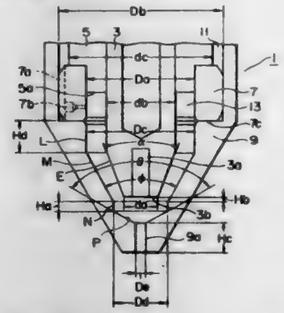
setting a plurality of conclusion membership functions corresponding to said antecedent membership functions for respective degrees of a change rate of a set value of welding current;
detecting said change of resistance across said welding electrodes during a welding operation; and
correcting said set value of welding current for the next welding operation based on said detected change of resistance in accordance with said antecedent membership functions and said conclusion membership functions.

5,591,356

PLASMA TORCH HAVING CYLINDRICAL VELOCITY REDUCTION SPACE BETWEEN ELECTRODE END AND NOZZLE ORIFICE

Shunichi Sakuragi, Naka-gun, and Naoya Tsurumaki, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP93/01706, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/12308, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 22, 1993, Ser. No. 446,723
Claims priority, application Japan, Nov. 27, 1992, 4-339490
Int. Cl.^{6} B23K *10/00*
U.S. Cl. 219—121.5 **18 Claims**



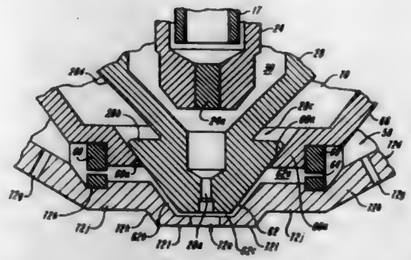
1. A plasma torch comprising:
an electrode having a longitudinal axis, an upper portion, an intermediate portion, a lower portion, and a lower end face, said lower end face having a diameter da;
an annular nozzle body having an upper portion, an intermediate portion, and a lower portion, said nozzle body being positioned coaxially with and about said electrode so as to form an annular entrance section between said intermediate portion of said nozzle body and said intermediate portion of said electrode and to form an annular tapered section between said intermediate portion of said nozzle body and said lower portion of said electrode;
an annular swirler member positioned coaxially with said electrode between said upper portion of said electrode and said upper portion of said nozzle body to form an annular gas passage between said swirler member and said electrode;
an annular insulating member positioned coaxially with said electrode between said upper portion of said electrode and said swirler member;
said swirler member having a plurality of ejection holes formed therein in a plane substantially perpendicular to said longitudinal axis, said ejection holes extending approximately tangential to said annular gas passage to generate jets therein with a swirling velocity component;
wherein said lower portion of said nozzle body has a nozzle orifice formed therein opening to an exterior of said nozzle body, said nozzle orifice having a diameter De and an axial length Hc;
wherein said lower portion of said nozzle body has a velocity reduction space formed therein between said electrode and said orifice and below said annular tapered section;
wherein said velocity reduction space is in the form of a cylindrically shaped space which is coaxial with said longitudinal axis and which has a diameter Dd and an axial height Ha;
wherein said diameter Dd of said velocity reduction space is greater than said diameter da of said lower end face of said electrode; and
wherein said diameter Dd of said velocity reduction space is greater than said axial height Ha of said velocity reduction space.

5,591,357

PLASMA ARC CUTTING PROCESS AND APPARATUS USING AN OXYGEN-RICH GAS SHIELD

Richard W. Couch, Jr., Hanover, N.H.; Nicholas A. Sanders, Norwich, Vt.; Lifeng Luo, Lebanon, and John Sohr, Enfield, both of N.H., assignors to Hypertherm, Inc., Hanover, N.H.

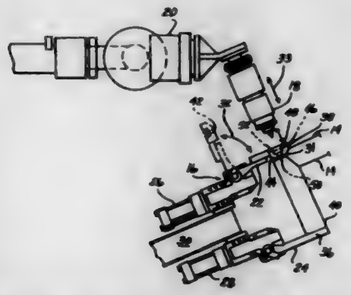
Division of Ser. No. 753,395, Aug. 30, 1991, Pat. No. 5,396,043, which is a continuation-in-part of Ser. No. 395,266, Aug. 17, 1989, Pat. No. 5,120,930, which is a continuation-in-part of Ser. No. 203,440, Jun. 7, 1988, Pat. No. 4,861,962, and a continuation-in-part of Ser. No. 682,991, Apr. 12, 1991, Pat. No. 5,170,033, and a continuation-in-part of Ser. No. 682,992, Apr. 12, 1991, Pat. No. 5,166,494, which is a continuation-in-part of Ser. No. 513,780, Apr. 24, 1990, Pat. No. 5,070,227.
This application Feb. 27, 1995, Ser. No. 394,707
Int. Cl.^{6} B23K *10/00*
U.S. Cl. 219—121.39 **15 Claims**



1. A method of operating a plasma arc cutting system including a plasma arc torch having a body, an electrode and a nozzle mounted at a first end of the body in a mutually spaced relationship that defines a plasma chamber in which a plasma arc is formed, the nozzle having a central passage and a nozzle exit orifice through which the plasma arc passes, the method comprising:
directing a plasma gas flow from a plasma gas inlet to the plasma chamber;
forming a secondary gas flow as a mixture of a non-oxidizing gas and at least 40% of an oxidizing gas, as measured by flow rate;

directing the secondary gas flow from a secondary gas inlet to a secondary gas flow path;
altering the secondary gas flow in the secondary gas flow path to facilitate the interaction of the secondary gas with the plasma arc; and
directing the secondary gas flow from a secondary gas flow path through secondary gas flow exit orifice and onto the plasma arc as the plasma arc passes through file nozzle exit orifice.

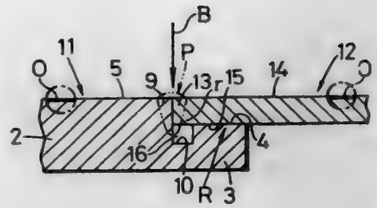
5,591,358
APPARATUS FOR CLAMPING AND LASER WELDING
James R. Quaglino, Livonia, Mich., assignor to Progressive Tool & Industries Co., Southfield, Mich.
Filed Mar. 23, 1994, Ser. No. 216,665
Int. Cl.[6] B23K 26/00
U.S. Cl. 219—121.63 **42 Claims**



1. A clamping apparatus in combination with a laser welder wherein the laser welder is connected to a programmable robotic arm and wherein said laser welder is independent and separate from said clamping apparatus, the clamping apparatus comprising:
means for releasingly clamping the sheet materials, and said clamping means moving in a clamp actuating plane when moving between a clamped position, wherein said clamping means provides opposing forces to the sheet materials to hold the sheet materials in continuous contact for welding, and an unclamped position, wherein said clamping means releases the sheet materials so that the sheet materials may be loaded and unloaded into said clamping means; and
means for defining an aperture within said clamping means wherein a side wall of said clamping means provides a sufficient amount of said side wall to receive and guide the laser welder to a proper location for welding the sheet materials, wherein said means for defining an aperture in said clamping means includes a cylindrical bore extending therethrough with a funnel-shaped opeaing such that a sufficient amount of said side wall is provided to receive and guide the laser welder to a proper location for welding the sheet materials.

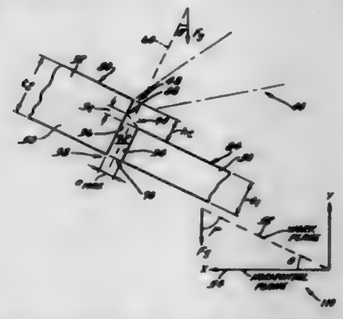
5,591,359
HIGH-DENSITY ENERGY BEAM WELDING PROCESS AND WELDED STRUCTURE
Yuuji Saitou; Minoru Mouka; Suguru Yoshida, and Kohki Sugawara, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 22, 1994, Ser. No. 278,896
Claims priority, application Japan, Jul. 23, 1993, 5-182313
Int. Cl.[6] B23K 26/00
U.S. Cl. 219—121.64 **14 Claims**

1. A method of welding metallic workpieces with a high-density energy beam, comprising the steps of:
providing a first metallic workpiece having a major portion and a positioning guide joined thereto, said major portion having a first weld area;



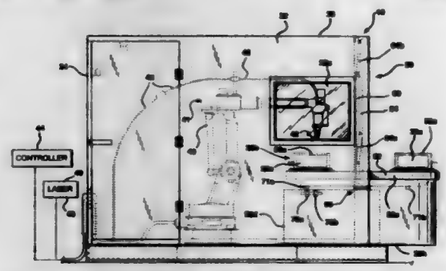
providing a second metallic workpiece having a second weld area;
bringing said first and second weld areas into abutment against each other, said second metallic workpiece having a surface superimposed on said positioning guide with a recess defined in said positioning guide and concealed under said surface of said second metallic workpiece;
applying a high-density energy beam to said first and second weld area, with said recess being unexposed to said high-density energy beam, thereby to form a molten pool in said first and second weld areas; and
growing said molten pool toward said positioning guide to force metallic oxide films formed on said first and second metallic workpieces into said recess.

5,591,360
METHOD OF BUTT WELDING
Jean C. Mombo-Caristan, Troy, Mich., assignor to The Twenty-first Century Corporation, Troy, Mich.
Filed Apr. 12, 1995, Ser. No. 420,654
Int. Cl.[6] B23K 26/02
U.S. Cl. 219—121.64 **52 Claims**



1. A method of welding using a high energy density radiation beam comprising:
(a) providing a pair of sheets with top and bottom surfaces and having sheet edges to be welded together and a high energy density radiation beam source capable of generating a high energy density radiation beam and focusing the beam onto at least one of the sheets;
(b) positioning one sheet in close proximity to the other sheet with their sheet edges adjacent to and facing each other in a butt-joint arrangement, defining a work plane generally tangent to one of the top surfaces of one of the sheets, and their top surfaces exposed toward the high energy deasity radiation source;
(c) orienting the sheets such that the workplane is acutely angled relative to a horizontal plane that is generally perpendicular to the direction of the local gravity;
(d) mismatching one of the sheets relative to the other of the sheets by offsetting a top surface of one sheet relative to a top surface of the other sheet such that the top surfaces of the sheets are not substantially coplanar and having an amount of mismatch between the mismatched sheet and the other sheet of at least about 10% of the cross sectional thickness of the thinnest sheet; and
(e) training at least a portion of a high energy density radiation beam onto the mismatched sheet for joining the sheets together by a butt-weld such that molten sheet material from the mismatched sheet fills in a joint fit-up gap between the sheet edges.

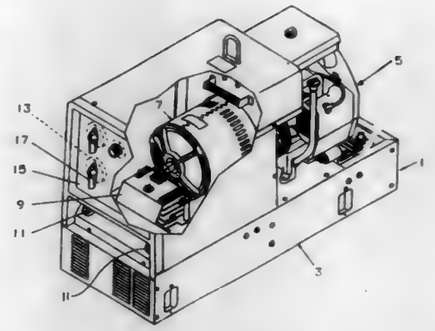
5,591,361
SEALING ARRANGEMENT FOR A LASER ENCLOSURE
Jonathan E. Hostler, Canton, Mich.; William H. DeCamp, Cincinnati, and Daniel W. Shanker, Huber Heights, both of Ohio, assignors to Motoman, Inc., West Carrollton, Ohio
Continuation of Ser. No. 113,227, Aug. 27, 1993, Pat. No. 5,464,963. This application Nov. 3, 1995, Ser. No. 552,566
Int. Cl.[6] B23K 26/02
U.S. Cl. 219—121.82 **20 Claims**



1. A laser system comprising:
a generator for generating and directing a laser beam to a laser workstation;
a housing having an inner cavity for containing said laser workstation, said housing including a section having an opening through which workpieces pass into and out of said inner cavity;
a transport device for moving said workpieces through said opening into and out of said inner cavity; and,
passive sealing apparatus movably coupled to one of said section and said transport device for sealing a portion of said transport device with a portion of said section to inhibit laser energy from exiting said housing through said opening.

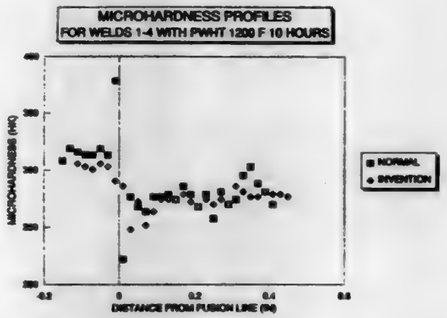
5,591,362
IDLE SOLENOID FOR ENGINE DRIVEN WELDER
Joseph E. Feldhausen, and Jeffery P. Schroeder, both of Appleton, Wis., assignors to The Miller Group, Ltd., Appleton, Wis.
Filed Feb. 3, 1995, Ser. No. 383,728
Int. Cl.[6] B23K 9/00
U.S. Cl. 219—133 **9 Claims**

1. In a self-contained welding machine having a generator, an internal combustion engine that rotates the generator to produce electrical power, a control circuit, and electrical components for converting the electrical power to welding power,
an idle solenoid assembly that sets an idle speed of the internal combustion engine in response to a lack of demand for welding power comprising:
a. a solenoid selectively actuated by the control circuit and having a body and a plunger and defining a longitudinal axis;
b. pin means for connecting the solenoid plunger to a governor arm of the internal combustion engine;
c. a bracket having a top wall, two side walls, and two feet extending outwardly from reapective side walls, the side walls securing the solenoid body immovably therebetween with the top wall overhanging the solenoid body and a substantial



portion of the plunger, each foot having a slot therethrough oriented in directions parallel to the solenoid longitudinal axis; and
d. fastener means for releasably fastening the bracket feet to a surface of the internal combustion engine, so that the fastener means can be loosened and the bracket slid on the engine surface, and the fastener means can be tightened to fasten the bracket to the engine surface at a location that produces the predetermined engine idle speed upon actuation of the solenoid.

5,591,363
OPTIMIZED WELDING TECHNIQUE FOR NIMOV ROTORS FOR HIGH TEMPERATURE APPLICATIONS
Dennis R. Amos, Rock Hill, S.C., and Jianqiang Chen, Winter Springs, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 2, 1995, Ser. No. 398,182
Int. Cl.[6] B23K 9/04
U.S. Cl. 219—137 PS **22 Claims**



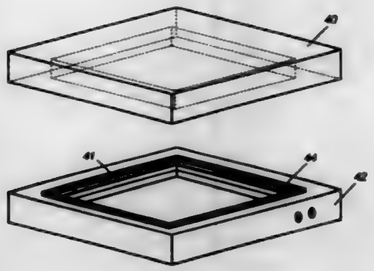
1. A method of repairing a surface of a ferrous NiMoV low alloy metal steam turbine component, comprising:
(a) depositing a first layer of weld metal on the surface using first levels of amperage, the first levels of amperage being selected to prevent a substantial increase in a level of hardness of a heat affected zone generated by the deposition of the first layer of weld metal; and
(b) depositing a second layer of weld metal onto the first layer using second levels of amperage, the second levels of amperage being greater than corresponding first levels of amperage and being selected high enough to temper the heat affected zone and being selected low enough to not overtemper the heat affected zone.

5,591,364

HOUSING WITH INTEGRAL OPENING FEATURE

Anthony B. Suppelsa, and Dale W. Dorinski, both of Coral Springs, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 264,551, Jun. 23, 1994, Pat. No. 5,536,917. This application Sep. 28, 1995, Ser. No. 535,370
Int. Cl.[6] H05B 1/00
U.S. Cl. 219—201 8 Claims



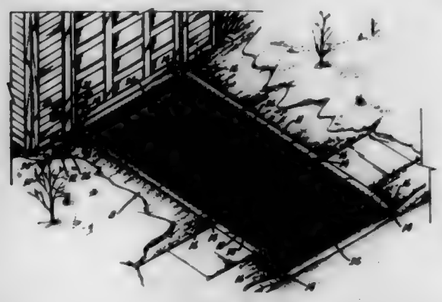
1. A two piece thermoplastic housing, comprising;
a first thermoplastic housing portion;
a second thermoplastic housing portion;
the two thermoplastic housing portions joined together by an ultrasonic weld, forming the two piece thermoplastic housing;
the two piece thermoplastic housing having an electrically resistive heating element embedded therein, the heating element strategically located so as to heat and soften only the ultrasonic weld when the heating element is energized, thereby allowing the two housing portions to be separated.

5,591,365

OPEN LATTICE SNOW MELTING APPARATUS

Christopher B. Shields, 3001 Ladue, Westlake Estates, Champaign, Ill. 61821

Filed Jul. 14, 1994, Ser. No. 273,122
Int. Cl.[6] H05B 1/00
U.S. Cl. 219—213 9 Claims



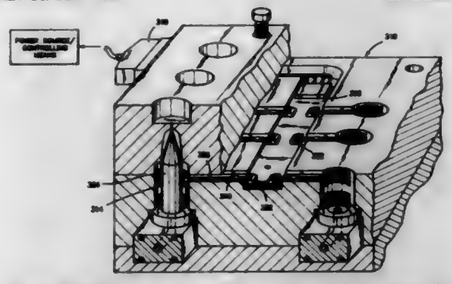
1. A heating apparatus for preventing the accumulation of snow and ice on an outdoor surface, said heating apparatus comprising:
a) a flexible heating mat configured as an open lattice arrangement, said heating mat having a weatherproof electrically insulative exterior casing, said mat including thin web portions running transverse to relatively thick web portions aligned within said lattice arrangement; and
b) an electric heating element sinusoidally arranged and embedded within said heating mat, said electric heating element being substantially encased in said thick web portions.

5,591,366

INJECTION MOLDING HEATER INCLUDING CIRCUIT BREAKING MEANS

Harald Schmidt, Georgetown, and Edward J. Jenko, Bolton, both of Canada, assignors to Husky Injection Molding Systems Ltd., Canada

Filed Jun. 23, 1994, Ser. No. 264,777
Int. Cl.[6] H05B 1/02
U.S. Cl. 219—494 25 Claims



1. An electric heater system for heating molding material to maintain the flowability of the material in an injection molding device, comprising:
a flow path means for directing the flow of the material in the injection molding device, wherein said flow path means is a mold manifold;
at least one heating means for heating said material for facilitating flow through said flow path means, said heating means positioned adjacent said flow path means;
an electrical circuit means in said mold manifold connected with said heating means for carrying electric current from a power source to said heating means to energize said heating means; and
a circuit breaking means for discontinuing the flow of electricity through said circuit means to prevent damage to the system, wherein said circuit breaking means is positioned in said electrical circuit means in said mold manifold between said source and said heating means, and for each one of said heating means in said circuit there is provided at least one of said circuit breaking means.

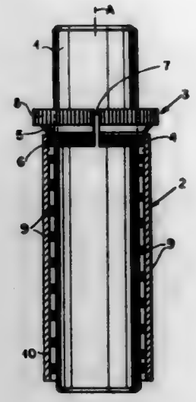
5,591,367

ELECTRICAL HEATER ASSEMBLY FOR CYLINDRICAL BODY

Eugen Schwarzkopf, Lüdenscheid, Germany, assignor to Hotset Heizpatronen U. Zubehor GmbH, Ludenscheid, Germany

Filed Mar. 9, 1995, Ser. No. 401,409
Claims priority, application Germany, Mar. 16, 1994, 44 08 915.5
Int. Cl.[6] H05B 3/58; F16L 21/00
U.S. Cl. 219—535 6 Claims

6. In combination with an injection-molding nozzle body having a substantially cylindrical outer surface and centered on an axis, a heater comprising:
a heatable generally cylindrical sleeve fittable over the body and having one end formed with an axially outwardly flared screwthread;
a helical resistive coil inside the sleeve externally outwardly engaging the sleeve and internally inwardly engaging the body outer surface; and
a split ring formed with a tapered screwthread generally complementary to the sleeve screwthread and threadable into the screwthread, the ring having an inside diameter that is somewhat greater than an outside diameter of the body when it is not screwed into the sleeve and an inside diameter that is the same as the outside diameter of the body when it is screwed into the sleeve, the ring inwardly bearing on the body when threaded into the sleeve.

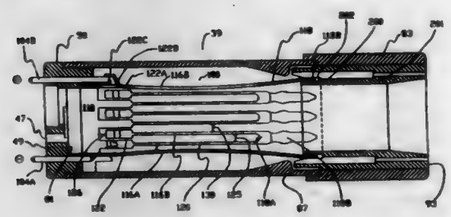


5,591,368

HEATER FOR USE IN AN ELECTRICAL SMOKING SYSTEM

Gr'er S. Fleischhauer, Midlothian; Patrick H. Hayes, Chester; Constance H. Morgan, Chesterfield; Mohammad R. Hajaligol, Richmond; Michael L. Watkins, Chester; Walter A. Nichols, Richmond; David E. Sharpe, Chesterfield, and Mary E. Counts, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 388,718, Jan. 30, 1995, which is a continuation of Ser. No. 118,665, Sep. 10, 1993, Pat. No. 5,388,594, and a continuation-in-part of Ser. No. 943,504, Sep. 11, 1992, Pat. No. 5,505,214, which is a continuation-in-part of Ser. No. 666,926, Mar. 11, 1991, abandoned. This application Apr. 20, 1995, Ser. No. 426,165
Int. Cl.[6] H05B 3/58; A24F 1/22
U.S. Cl. 219—535 44 Claims



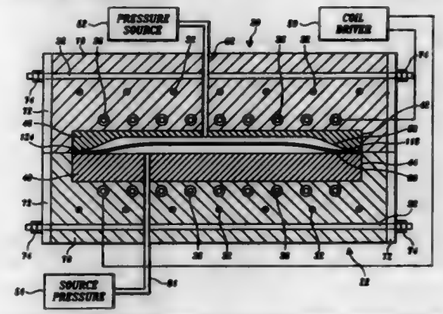
1. A heater for use in a smoking system having a source of electrical energy for heating a cigarette, the heater comprising:
a plurality of electrically resistive heater blades defining a receptacle to receive an inserted cigarette and extending alongside the inserted cigarette, each blade comprising a first heater blade leg having a first end and a second end, a second heater blade leg having a first end and a second end, and a connecting section comprising a connecting edge section connecting the second end of said first heater blade leg and the first end of said second heater blade leg;
wherein said first and second heater blade legs of each heater blade are separated by a respective gap; and
wherein the first ends of each first heater blade leg are in electrical contact with the source of electrical energy, wherein respective resistive heating paths are formed comprising said first heater blade leg, said connecting edge section, and said second heater blade leg to respectively heat each of said electrically resistive heater blades, which in turn heats the inserted cigarette.

5,591,369

METHOD AND APPARATUS FOR CONSOLIDATING ORGANIC MATRIX COMPOSITES USING INDUCTION HEATING

Marc R. Matsen; Paul S. Gregg; Howard Martinson, all of Seattle, and Robert Snyder, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 169,655, Dec. 16, 1993, Pat. No. 5,530,227, which is a continuation-in-part of Ser. No. 777,739, Oct. 15, 1991, Pat. No. 5,410,132, and Ser. No. 92,050, Jul. 15, 1993, Pat. No. 5,410,133, which is a division of Ser. No. 681,004, Apr. 5, 1991, Pat. No. 5,229,562. This application Jun. 5, 1995, Ser. No. 465,639
Int. Cl.[6] H05B 6/10
U.S. Cl. 219—633 4 Claims



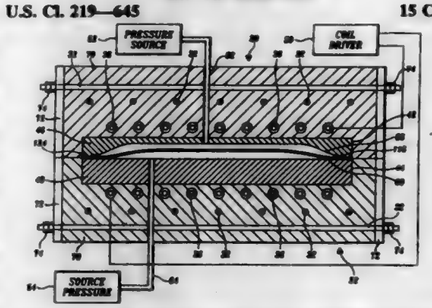
1. A method for consolidating an organic matrix composite panel having an organic matrix and reinforcing fibers, comprising the steps of:
(a) heating the panel in a die using induction heating to a consolidation temperature of the organic matrix in the panel; and
(b) consolidating the matrix at the consolidation temperature while maintaining the consolidation temperature and while applying pressure to the organic matrix through the die.

5,591,370

SYSTEM FOR CONSOLIDATING ORGANIC MATRIX COMPOSITES USING INDUCTION HEATING

Marc R. Matsen; Paul S. Gregg; Howard Martinson, all of Seattle, and Robert Snyder, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 169,655, Dec. 16, 1993, which is a continuation-in-part of Ser. No. 777,739, Oct. 15, 1991, Pat. No. 5,410,132, and a continuation-in-part of Ser. No. 92,050, Jul. 15, 1993, Pat. No. 5,410,133, which is a division of Ser. No. 681,004, Apr. 5, 1991, Pat. No. 5,229,562. This application Jun. 5, 1995, Ser. No. 460,786
Int. Cl.[6] H05B 6/10
U.S. Cl. 219—645 15 Claims



1. A system for doing at least one of consolidating and forming organic matrix composites by inductive heating, comprising:

(a) opposed dies formed of a ceramic or composite material not susceptible to inductive heating, having a low coefficient of thermal expansion, thermal shock resistance, high compression strength, and adapted to receive a workpiece on a forming surface;

(b) an induction coil embedded in at least one die adjacent the forming surface;

(c) a workpiece seated on the forming surface, the workpiece including a susceptor sealingly surrounding an organic matrix composite panel to define a pressure zone around the panel;

(d) a pressure source for supplying at least about 250 psi consolidation pressure to at least one side of the workpiece to form the workpiece against the forming surface of the die when the panel is at a forming and consolidation temperature; and

(e) means for energizing the induction coil to heat the susceptor inductively and thereby to heat the panel to the forming and consolidation temperature.

5,591,371

METHOD AND DEVICE FOR POURING MOLTEN METAL

John S. Barnes, Durham, England; Timothy Jones, Brussels, Belgium; Graham L. Thompson, and Adrianus C. M. Brengelmans, both of Cleveland, England, assignors to British Steel plc, England

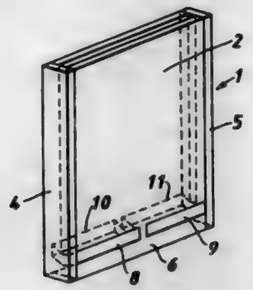
PCT No. PCT/GB93/00333, § 371 Date Nov. 10, 1994, § 102(e) Date Nov. 10, 1994, PCT Pub. No. WO93/16827, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 17, 1993, Ser. No. 284,666

Claims priority, application United Kingdom, Feb. 20, 1992, 9203613; Sep. 18, 1992, 9219882

Int. Cl.[6] B22D *41/50*

U.S. Cl. 222—607 **6 Claims**



1. Apparatus for controlling the delivery of liquid metal from a tundish to a mould for the continuous casting of thin slab disposed therebelow comprising an entry nozzle for transporting liquid metal from the tundish to the mould, wherein the nozzle has a hollow channel therethrough and a lower outlet end which is in plan section, of large aspect ratio of width to thickness thereby providing two elongate sides and is hollow substantially across its width, the entry nozzle being provided at positions at its lower outlet end arranged in operation to be submerged within the casting mould, with at least one exit port from the hollow channel disposed on each elongate side of the nozzle, and, with the nozzle in its operational disposition so shaped as to direct metal into the mould from the nozzle transverse to its vertical direction; and means for controlling the effective liquid metal pressure head of the liquid metal in the tundish.

5,591,372

PIEZOELECTRIC COMPOSITE WITH ANISOTROPIC 3-3 CONNECTIVITY

Venkat S. Venkataramani, Clifton Park, and Lowell S. Smith, Niskayuna, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1995, Ser. No. 531,840

Int. Cl.[6] C04B *35/00*

U.S. Cl. 252—62.9 R **8 Claims**



1. A composite having anisotropic 3-3 connectivity comprising:

a ceramic phase made from a slurry comprising ceramic particles, water, binder, and dispersant that is directionally solidified by freeze drying to form interconnected lamelli where the connectivity of the lamelli in a z direction is greater than the connectivity of the lamelli in a x and y direction and the connectivity of the lamelli in the x and y direction is equal, where the lamelli comprise from about 5 volume percent to about 80 volume percent of the composite and are about 200 microns or less in width, and lamelli are aligned substantially parallel to one another; and

an infiltrate phase formed in interconnected interlamellar regions wherein the interlamellar region comprises from about 20 volume percent to about 95 volume percent of the composite, is about 500 microns or less in width, and wherein the infiltrate phase is selected from a group consisting of a polymer, a low specific acoustic impedance glass, or a low specific acoustic impedance cement where the specific acoustic impedance of the glass or cement is less than or about 12 MRayls and where the polymer is an urethane, elastomer, silicone, or mixture thereof.

5,591,373

COMPOSITE IRON MATERIAL

Robert W. Ward, Anderson, and David E. Gay, Noblesville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 343,274, Nov. 22, 1994, abandoned, which is a continuation of Ser. No. 13,486, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 710,427, Jun. 7, 1991, Pat. No. 5,211,896. This application Feb. 15, 1996, Ser. No. 602,143

Int. Cl.[6] H01F *1/22*

U.S. Cl. 252—62.54 **5 Claims**

1. A soft magnetic core compression molded from a plurality of discrete iron particles each encapsulated in a polymer shell, said core having a density greater than about 7.25 g/cc and comprising a plurality of discrete soft magnetic iron particles in the size range of about 5 microns to about 400 microns distributed throughout a matrix of said polymer such that each of said particles is separated and electrically insulated one from the next solely by said polymer, said polymer consisting essentially of at least one amorphous, thermoplastic selected from the group consisting of polyethersulfones, polyetherimides and polyamideimides having heat distortion temperatures of at least about 200° C. and comprising about 0.25 percent to about one percent by weight of said core.

5,591,374

SALT MIXTURES FOR STORING THERMAL ENERGY IN THE FORM OF HEAT OF PHASE TRANSFORMATION

Rüdiger Knlep, Langenfeld; Hans Klein, Darmstadt, and Peter Kroeschell, Riedstadt, all of Germany, assignors to Merck Patent Gesellschaft Mit Beschranktor Haftung, Germany

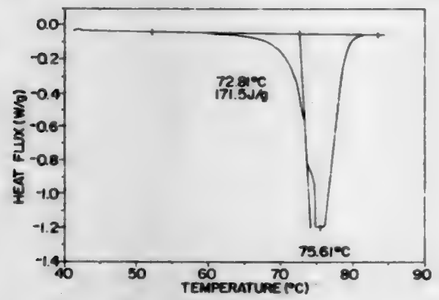
PCT No. PCT/EP92/02885, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO93/12193, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 13, 1992, Ser. No. 244,785

Claims priority, application Germany, Jan. 10, 1991, 42 03 835.9; Dec. 14, 1991, 41 41 306.7

Int. Cl.[6] C09K *5/06*

U.S. Cl. 252—70 **3 Claims**



1. A salt mixture of magnesium nitrate and lithium nitrate for storing and utilizing thermal energy in the form of heat of phase transformation.

5,591,375

ANTIFREEZE COMPOSITIONS AND USES

James A. Lott, 910 W. 3rd, Maryville, Mo. 64468, and David V. Kizer, 4112 N. 31st, St. Joseph, Mo. 64506

Continuation of Ser. No. 950,934, Sep. 24, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 410,415

Int. Cl.[6] C09K *3/18;5/00*

U.S. Cl. 252—70 **10 Claims**

1. A multi-component antifreeze composition comprised of:

part A comprised of a water containing solution of an alginic acid composition containing acid functional groups, the alginic acid composition being selected from the group consisting of sodium, potassium and ammonium salts of alginic acid, and a separate,

part B comprised of a water containing solution of a water containing solution of a polyvalent cation salt selected from the group consisting of soluble calcium, aluminum and iron salts,

the alginic acid composition being present in part A in an amount between about 0.1 to 20% by weight, and the polyvalent cation salt being present in part B in an amount between about 0.001 and 30% by weight, and wherein part A of the composition further includes about 10% by weight to about 50% by weight of a corrosion control agent selected from the group consisting of calcium carbonate, dolomite and magnesium carbonate,

part A and part B being effective to form a releasable gel film on a surface preventing ice from adhering to the surface and permitting ready removal of an ice containing material from the surface.

5,591,376

CLEANING COMPOSITIONS FOR HARD SURFACES

Eva Klewert, Duesseldorf; Peter Jeschke, Neuss; Birgit Middelhauve, Monheim, all of Germany, and Giuseppe Carrer, Milan, Italy, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/00875, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO93/20179, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 8, 1993, Ser. No. 325,323

Claims priority, application Germany, Mar. 30, 1992, 42 10 365.7

Int. Cl.[6] C11D *1/12;1/755;* **B08B** *9/00;3/14*

U.S. Cl. 510—437 **5 Claims**

1. A process for cleaning hard surfaces comprising contacting said hard surfaces with a low-foaming cleaning composition consisting of

(a) from 0.1 to 50% by weight, based on the weight of said composition, of an alkyl polyglucoside having the general formula R O Z_x wherein R is C_{8-10}, O is oxygen, x is an integer from 1 to 6, and Z is a sugar unit;

(b) from 0.001 to 30% by weight, based on the weight of said composition, of a C_{9-16} fatty alcohol alkoxylate having an HLB value greater than 10;

(c) from 0.001 to 15% by weight, based on the weight of said composition, of a C_{8-22} fatty acid; and

(d) the balance, water.

5,591,377

VISCOUS WATER-BASED SURFACTANT PREPARATION

Dieter Nickel, Erkrath, and Rainer Hofmann, Duesseldorf, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 211,852, Jun. 15, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 515,024

Claims priority, application Germany, Oct. 15, 1991, 41 34 077.9

The portion of the term of this patent subsequent to Nov. 29, 2013, has been disclaimed.

Int. Cl.[6] C11D *17/00;1/12;1/755*

U.S. Cl. 510—383 **20 Claims**

1. A viscous surfactant composition of low concentration in the form of a gel-like water-based mixture consisting essentially of:

(a) from about 2% by weight to about 15% by weight of an alkyl glycoside corresponding to the formula I

$$R^1—O(G)_n \quad (I)$$

wherein R^1 is an alkyl radical having from about 8 to about 22 carbon atoms, G is a glycose unit and n is a number of 1 to 10;

(b) from about 0.05% by weight to about 2% by weight of an anionic surfactant of the sulfate or sulfonate type selected from the group consisting of an alkyl sulfate, an alkane sulfonate, an α-sulfo fatty acid salt, a carboxylic acid ester of an α-sulfofatty acid with a C_{1-4} alcohol, the neutralized sulfonation product of an alkene or C_{8-22} unsaturated fatty acid and, mixtures thereof;

wherein the weight ratio of said alkyl glycoside to said anionic surfactant is from about 40:1 to about 5:1, and wherein said composition contains from about 83% by weight to about 97.95% by weight water.

5,591,378

SUBSTITUTED BENZONITRILES AND COMPOSITIONS USEFUL FOR BLEACHING

James E. Deline, Livermore; James W. Arbogast; Lafayette D. Foland, both of Dublin, and William L. Smith, Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jul. 6, 1994, Ser. No. 271,093
Int. Cl.[6] C09K *3/00*; C11D *3/395;7/38*
U.S. Cl. 252—186.38 19 Claims

1. A composition useful for bleaching, comprising:

(a) an aromatic bleach precursor the aromatic ring of which is substituted by at least one cyano group and additionally with at least one electron-withdrawing group other than cyano, wherein the electron-withdrawing group is selected from group (i) or group (ii), wherein group (i) is



where R_1, R_2 and R_3 are $C_{1\text{-}20}$ alkyl, $C_{1\text{-}20}$ alkyl aryl, or at least two of R_1, R_2, or R_3 joined to form a heterocycle; and where group (ii) is halo, nitro, sulfonic acid, sulfonyl chloride, sulfonate ester, carboxylate ester, and aryl substituted with one or more of halo, nitro, sulfonic acid, sulfonyl chloride, sulfonate ester, carboxylate ester; wherein when there is only one cyano group substituted on the aromatic ring of the precursor and when the electron-withdrawing group is selected from group (ii), then there are at least two of such electron-withdrawing groups selected from group (ii); and,

(b) a peroxygen source, wherein the precursor reacts with peroxygen to provide peroxyimidic acid.

5,591,379

MOISTURE GETTING COMPOSITION FOR HERMETIC MICROELECTRONIC DEVICES

A. Andrew Shores, Venice, Calif., assignor to Alpha Fry Limited, Croydon, England

Continuation of Ser. No. 549,854, Jul. 6, 1990, abandoned. This application Aug. 2, 1993, Ser. No. 100,181
Int. Cl.[6] C09K *3/18*
U.S. Cl. 252—194 7 Claims

1. A composition of matter useful as a desiccant in a hermetic electronic device, comprising a powder dispersed in a binder, wherein

said powder is selected from the group consisting of zeolite molecular sieves, activated alumina, silica gel, alkaline earth oxide, and alkali metal carbonate;

said binder is a continuous matrix of porous glass or porous ceramic; and

said powder to binder volume ratio is 0.001–2.

5,591,380

PREPARATION OF ALUMINA-SILICA SOL GEL COMPOSITIONS

Robert J. Wright, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 328,966, Oct. 24, 1994, abandoned, which is a continuation of Ser. No. 811,341, Dec. 20, 1991, abandoned. This application May 9, 1995, Ser. No. 437,486
Int. Cl.[6] B01J *13/00*
U.S. Cl. 252—313.1 24 Claims

1. A method for the preparation of a sol for the deposition of a coating comprising alumina and silica, said method consisting of:

a. Preparing an alumina sol by combining from about 50 to about 400 moles of water, from about 1.0 to about 2.0 moles of aluminum organo-metallic compound, from about 0.1 to about 0.5 moles of acid peptizer, and a vaporizable carrier, at a temperature of from about 175° to about 210° F., for sufficient time to form a clear sol;

b. Preparing a silica sol by combining from about 0.5 to about 2.0 moles of water, from about 3 to about 10 moles of alcohol, and from about 0.1 to about 0.5 moles of a silicon organo-metallic compound, for sufficient time to form a clear sol; and

c. Combining the alumina sol and the silica sol to obtain an alumina-silica sol having a ratio of alumina to silica of from about 2:1 to about 1:2.

5,591,381

CORROSION INHIBITING COMPOSITIONS AND METHODS

Michael L. Walker, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 965,106, Oct. 22, 1992, abandoned. This application Apr. 6, 1994, Ser. No. 224,102
Int. Cl.[6] C23F *11/18*
U.S. Cl. 252—389.54 10 Claims

1. A corrosion inhibiting composition which forms a protective coating on a metal surface when said metal surface is contacted therewith comprising:

a condensation product consisting essentially of a product prepared by reacting, in the presence of an aqueous base catalyst and at a reaction temperature in the range of from about 100° F. to about 300° F. for from about 4 to about 48 hours, from about 2 to about 7 equivalents of a group (i) constituent selected from the group consisting of acetophenone, mesityl oxide, 1-acetonaphthone, p-methoxyacetophenone, propiophenone, p-chloroacetophenone, isophorone, tetrolophenone, 2,4-pentanedione, a mixture of phenethyl alcohol and acetophenone, 2-acetylcyclohexanone, 2-acetonaphthone, 2-thienylketone, methyl isobutylketone, n-butyrophenone, acetone, 3,4-dihydro-1-(2H)-naphthalenone, 2-heptanone, diacetone alcohol, undecanone-2, and mixtures thereof, from about 2 to about 20 equivalents of a group (ii) constituent selected from the group consisting of formaldehyde, benzaldehyde, heptanal, propanal, hexanal, octanal, decanal, hexadecanal, cinnamaldehyde, aldehyde generating materials selected from the group consisting of paraformaldehyde, urotropin new, paraldehyde, acetals, hemiacetals and sulfite addition products, and mixtures thereof, and from about 0.2 to about 3 equivalents of a group (iii) constituent selected from the group consisting of rendered animal fat, octanoic acid, myristic acid, pelargonic acid, abietic acid, lauric acid, oleic acid, caprylic acid, tall oil acid, ethoxylated coco, fatty acid, ethoxylated oleic acid, ethoxylated rosin fatty acid, tall oil reacted with propylene oxide and ethylene oxide, 2-methyl pyridine, 4-methyl pyridine, 2-methyl quinoline, 4-methyl quinoline, and mixtures thereof;,

a metal compound selected from the group consisting of antimony compounds selected from the group consisting of antimony oxides, antimony halides, antimony tartrate, antimony citrate, alkali metal salts of antimony tartrate and antimony citrate, alkali metal salts of pyroantimonate, antimony adducts of ethylene glycol and mixtures thereof, bismuth compounds selected from the group consisting of bismuth oxides, bismuth halides, bismuth tartrate, bismuth citrate, alkali metal salts of bismuth tartrate and bismuth citrate, bismuth oxyhalogens, and mixtures thereof, and mixtures of said antimony compounds and said bismuth compounds; and

an aqueous liquid carrier in which said condensation product and said metal compound are dispersed or dissolved,

wherein said condensation product and said metal compound are present in said composition in a condensation product to metal compound weight ratio in the range of from about 1:8 to about 15:1 and

wherein none of said constituents is substantially identical to either of the other of said constituents.

5,591,382

HIGH STRENGTH CONDUCTIVE POLYMERS

Paul R. Nahass, Cambridge; Stephen O. Friend, Boxford, and Robert W. Hanneken, Lexington, all of Mass., assignors to Hyperion Catalysis International Inc., Cambridge, Mass.

Filed Mar. 31, 1993, Ser. No. 40,895
Int. Cl.[6] H01B *1/20;1/24*
U.S. Cl. 252—511 33 Claims

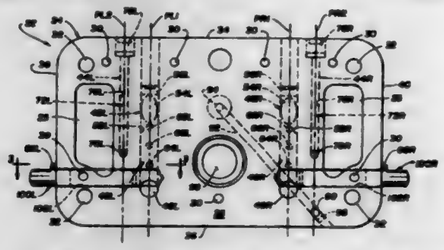
1. A polymeric composition comprising a polymeric binder and 0.25–50 wt % of graphite carbon fibrils, said fibrils being substantially cylindrical with a substantially constant diameter, having c-axes substantially perpendicular to their cylindrical axis, being substantially free of pyrolytically deposited carbon, and having a diameter between 3.5 and 70 nanometers, wherein said composition has IZOD notched impact strength greater than about 2 ft-lbs/in and volume resistivity less than about 1×10^{11} ohm-cm.

5,591,383

CARBURETOR AND METERING DEVICE THEREFOR

William R. Krup, 1000 Market St., Mt. Carmel, Ill. 62863

Continuation-in-part of Ser. No. 428,332, Apr. 25, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 477,762
Int. Cl.[6] F02M *19/06*
U.S. Cl. 261—34.1 17 Claims



1. A liquid fuel metering device for use between a liquid fuel reservoir and a main body of a carburetor to meter the fuel delivered to the main body from the fuel reservoir, the metering device comprising:

a block having a first face adapted for engagement with the fuel reservoir and a second face adapted for engagement with the main body;

a primary fuel supply path including a primary intake port in the first face of the block for intake of liquid fuel from the fuel reservoir, a primary exit port in the second face of the block through which fuel may pass into the main body, and a primary passage extending from the primary intake port to the primary exit port for transport of fuel from the primary intake port to the primary exit port;

a main air bleed associated with the block and constructed for receiving air, the main air bleed including means for delivery of air from the main air bleed to the primary passage for mixing air with fuel in the primary passage, said air delivery means comprising at least one conduit which extends between the main air bleed and the primary passage, said one conduit opening into the primary passage at a first location which is the location nearest to the primary intake port where air is introduced to the primary passage;

adjustable fuel flow control means for adjusting the effective cross sectional area of the primary passage at a second location between the first location where air is introduced into the primary passage and the primary intake thereby to selectively alter the flow of fuel through the primary passage, the block and said adjustable fuel flow control means being constructed and arranged for adjusting the flow of fuel through the metering device from a location exterior to the block when the first and second faces of the block are engaged with the fuel reservoir and the main body, respectively, said adjustable fuel flow control means comprising a rod received in the block and having a metering portion disposed in the primary passage at said second location, the rod being pivotable about its longitudinal axis between multiple discrete metering positions for adjusting the cross sectional area of the primary passage at said second location thereby to change the flow of fuel through the primary passage, each metering position corresponding to a predetermined jet number; and

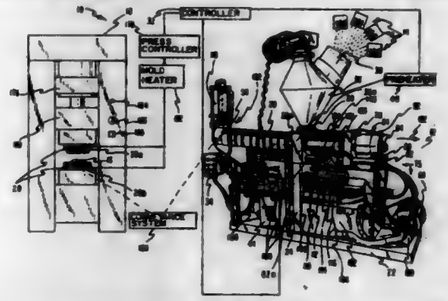
a detent mechanism for selectively holding the rod from pivoting about is longitudinal axis in a selected one of the multiple metering positions thereby to securely fix the rod in a selected one of the multiple metering positions, the detent mechanism comprising a detent movable with respect to the rod and block in directions non-parallel to the longitudinal axis of the rod for fixing and releasing the rod in the selected metering position.

5,591,384

METHOD FOR MOLDING PARTS

Fredric L. Abrams, and Robert F. Freund, both of Dayton, Ohio, assignors to Modern Technologies Corp., Dayton, Ohio

Filed Mar. 31, 1994, Ser. No. 220,906
Int. Cl.[6] B29B *11/10*; B29C *47/92*
U.S. Cl. 264—40.5 22 Claims



1. A method for creating a billet for molding a part comprising the steps of:

loading a barrel of a plasticator with a plurality of molding materials comprising a plurality of thermoplastic polymers and long reinforcing fibers, said barrel having a screw rotatably mounted therein;

heating said barrel;

rotatably driving said screw to blend said plurality of molding materials together to create a molten suspension in a storage area of said barrel such that a majority of said long reinforcing fibers remain intact;

axially retracting said screw in a first direction as said molten suspension is accumulated in said storage area;

axially driving said screw in a second direction to force said molten suspension out of said barrel, said second direction being opposite said first direction; and

severing said molten suspension to provide said billet.

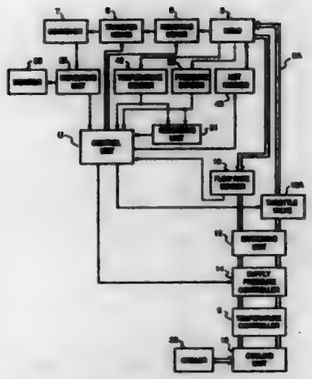
5,591,385

METHOD FOR COOLING INJECTION MOLDING MOLDS

Takashi Arai, Setsute, and Akira Furusawa, Kukizakimachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 361,234
Claims priority, application Japan, Dec. 28, 1993, 5-336010; Dec. 28, 1993, 5-336011; Dec. 28, 1993, 5-336012; Oct. 27, 1994, 6-263991
Int. Cl.[6] B29C *45/73*
U.S. Cl. 264—40.6 15 Claims

1. A continuous plastic molding method of injecting a predetermined resin into a cavity of a mold having a coolant line, cooling



the resin to a predetermined temperature, and removing a molded article, and having a cooling unit for cooling the coolant, a temperature control unit for maintaining a coolant to a predetermined temperature, and a flow rate measuring unit provided to a coolant return line extending from said mold are provided along said coolant line, and

said supply pressure control unit is controlled based on a measurement result of said flow rate measuring unit, wherein

in the cooling step of forcibly supplying the coolant cooled to a required temperature to said coolant line, a gradient of temperature calculated as (resin temperature during injection—molded article removing temperature)/cooling time, is set at an appropriate value, wherein the coolant is set to have a predetermined flow rate by the supply pressure control unit, to thereby maintain an equilibrium in the temperature of said mold as related to repeated cycles of a molding temperature and a removing temperature.

5,591,386

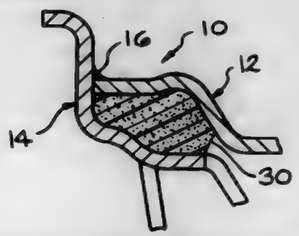
VEHICLE WHEEL WITH FILLER RING

Daniel F. Janssen, Saline; Thomas E. Heck, Monroe, and Charles A. Turner, Pinckney, all of Mich., assignors to Hayes Wheels International, Inc., Romulus, Mich.

Filed Mar. 17, 1994, Ser. No. 214,923

Int. Cl.[6] B60B *3/00*

U.S. Cl. 264—46.9 **5 Claims**



1. A method for producing a vehicle wheel comprising the steps of:

(a) providing a rim and a disc;

(b) securing the rim and the disc together to produce a wheel construction which defines a radially inwardly facing circumferential cavity;

(c) extruding a circumferential bead of a heat activated expandable filler material onto an annular surface of a generally hoop-like member and positioning the hoop-like member in the cavity;

(d) subsequent to step (c), applying heat to expand the filler material and fill a substantial portion of the cavity to prevent road material or other debris from accumulating therein.

5,591,387

METHOD OF DEMOLDING A GREEN BODY AND FINISHING SAME

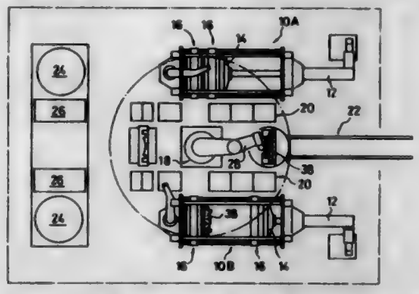
Hideo Takeuchi, and Kazuo Senda, both of Aichi, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Aug. 9, 1994, Ser. No. 288,204

Claims priority, application Japan, Aug. 23, 1993, 5-230836

Int. Cl.[6] B28B *1/26;11/00*

U.S. Cl. 264—86 **5 Claims**



1. A method of demolding and finishing a green body of a sanitary ware formed by slip casting, comprising:

preparing a green body of a sanitary ware in a casting machine, said green body being disposed between two split sections of a mold,

opening one split section of the mold to expose a rear portion of the green body with a hole forming portion,

holding the rear portion of the green body except the hole forming portion by a suction pad of a robot arm of a robot while sucking air through the suction pad,

bringing the green body held by the robot arm to a finishing station including a boring device and a deburring device, said robot arm being operated so that the green body is moved relative to the boring device to bore a hole at the hole forming portion and also moved relative to the deburring device to remove a burr on the green body, and

detaching the green body from the robot arm after finishing for further processing of the green body.

5,591,388

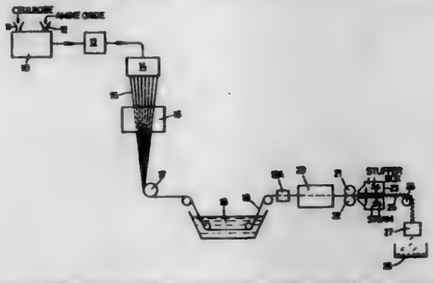
METHOD OF MAKING CRIMPED SOLVENT-SPUN CELLULOSE FIBRE

Alan Sellars, South Humberside; Patrick A. White, Leicestershire, both of England, and Philip L. Robinson, Coventry, United Kingdom, assignors to Courtaulds Fibres (Holdings) Limited, London, England

Continuation of Ser. No. 66,543, May 24, 1993, abandoned. This application Apr. 25, 1995, Ser. No. 428,424

Int. Cl.[6] D02G *1/12*

U.S. Cl. 264—168 **9 Claims**



1. A method of crimping solvent-spun cellulose filaments comprising passing a tow of continuous filaments of solvent-spun cellulose through the nip of a pair of rollers and thence into a stuffer box, crimping said tow in said stuffer box and injecting dry steam into the stuffer box to contact the filaments as they are crimped.

5,591,389

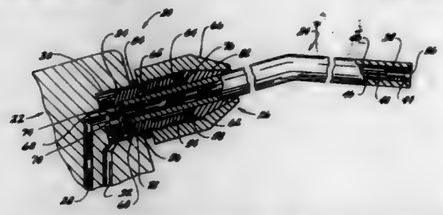
METHOD FOR MAKING DISPOSABLE TUBULAR DEVICE

Bernard S. Esrock, 320 Daugate Dr., Chesterfield, Mo. 63017

Division of Ser. No. 222,109, Apr. 4, 1994, Pat. No. 5,460,619. This application May 23, 1995, Ser. No. 447,894

Int. Cl.[6] B29C *47/06*

U.S. Cl. 264—171.12 **14 Claims**



1. A method of making a disposable tubular device adapted for releasable and sealing connection to a medical instrument for transporting fluid between a patient and the instrument, the instrument having a nipple for engagement with the tubular device, the device comprising a pliable elongate tube of resilient material and a tube-support structure having a stiffness greater than that of the tube and extending substantially the entire length of the tube, the tube and tube-support structure forming at least two distinct passageways, a first of the two passageways being formed by the tube and a second of the two passageways being formed by the tube and the tube-support structure, the method comprising:

extruding a first material through a first die to form the tube, the material being sufficiently pliable to form a seal around the nipple for sealing against fluid leakage between the nipple and the tube;

moving the tube through a second die while extruding a second material through the second die to form the tube-support structure;

the second material having a surface hardness which is greater than the surface hardness of the first material.

5,591,390

METHOD OF MANUFACTURING PACKAGING AND WRAPPING FILM

Kim L. Walton; Rajen M. Patel; Pak-Wing S. Chum, all of Lake Jackson, and Todd J. Obljeski, Houston, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 55,063, Apr. 28, 1993, which is a continuation-in-part of Ser. No. 776,130, Oct. 15, 1991, Pat. No. 5,272,236, Ser. No. 961,269, Oct. 14, 1992, and Ser. No. 24,563, Mar. 1, 1993. This application Jun. 7, 1995, Ser. No. 481,567

Int. Cl.[6] B29C *35/10*

U.S. Cl. 264—456 **23 Claims**

1. In an improved method of manufacturing a multilayer heat-shrinkable, puncture-resistant biaxially oriented film having shrink in both the machine and transverse directions comprising the steps of extruding a primary tube comprising an ethylene polymer; heating the ethylene polymer primary tube; biaxially orienting the heated primary tube using a double bubble method or a simple bubble hot blown film technique set at least at a 2.5:1 blow-up ratio, the improvement comprising using as the ethylene polymer at least one substantially linear ethylene polymer which has:

(A) a melt flow ratio, I_{10}/I_2, ≥ 5.63,

(B) a molecular weight distribution, M_w/M_n, defined by the equation:

$M_w/M_n \leq (I_{10}/I_2) - 4.63$, and

(C) a gas extrusion rheology such that the critical shear rate at onset of surface melt fracture for the at least one substantially linear ethylene polymer is at least 50 percent greater than the critical shear rate at the onset of surface melt fracture for a linear ethylene polymer, wherein the substantially linear ethylene polymer and the linear ethylene polymer are comprised of the same monomer or monomers, the linear ethylene polymer has an I_2, M_w/M_n and density within nine percent of the substantially linear ethylene polymer and the respective critical shear rates of the substantially linear ethylene polymer and the linear ethylene polymer are measured at the same melt temperature using a gas extrusion rheometer.

5,591,391

HIGH CHROMIUM FERRITIC HEAT-RESISTANT STEEL

Masaaki Igarashi, Hyogo; Hiroyuki Semba, Nishinomiya, and Kaori Miyata, Amagasaki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Sep. 18, 1995, Ser. No. 529,395

Claims priority, application Japan, Sep. 20, 1994, 6-224531

Int. Cl.[6] C22C *38/30;38/52*

U.S. Cl. 420—38 **16 Claims**

1. A high chromium ferritic heat-resistant steel showing excellent long term creep strength at elevated temperatures, excellent resistance to steam oxidation and excellent toughness, which has the following chemical composition:

C: 0.02 to 0.15%,	Si: 0 to 1.0%,
Mn: 0.05 to 1.5%,	Ni: 0 to 1.5%,
Cr: 8.0 to 13.0%,	W: 1.5 to 4.0%,
Mo: 0 to 1.0%,	Co: 2.5 to 8.0%,
V: 0.10 to 0.50%,	Ta: 0.01 to 0.50%,
Nb: 0 to 0.15%,	Nd: 0.001 to 0.24%,
Ca: 0 to 0.010%,	Mg: 0 to 0.010%,
N: 0.020 to 0.12%,	B: 0 to 0.030%,
sol. Al: 0.001 to 0.050%,	and

balance: Fe and incidental impurities,

wherein % means % by weight.

5,591,392

STEEL PLATE HAVING GOOD CORROSION RESISTANCE TO CONDENSED WATER

Akira Usami; Takashi Inoue, and Kouji Tanabe, all of Futtsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 156,345, Nov. 22, 1993, abandoned. This application Oct. 6, 1995, Ser. No. 539,495

Claims priority, application Japan, Nov. 24, 1992, 4-313797; Dec. 24, 1992, 4-344863

Int. Cl.[6] C22C *38/24;38/08;38/12*

U.S. Cl. 420—41 **4 Claims**

1. A steel plate having good corrosion resistance to condensed water consisting essentially of, by weight %,

C: 0.05% or less;

Mn: 0.2 to 1.6%;

S: 0.01% or less;

Cr: 7.0 to 9.8%;

V: 0.005 to 0.1%;

Ca: 0.0005 to 0.01%;

and the remainder being Fe and unavoidable impurities.

5,591,393

Patent Not Issued For This Number

5,591,394

ZIRCONIUM-BASED HYDROGEN STORAGE ALLOY USEABLE FOR NEGATIVE ELECTRODES FOR SECONDARY BATTERY

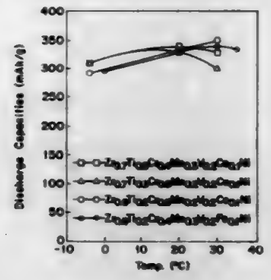
Jai Y. Lee, Hanbit Apt. 107-902, Ayeun-dong, Yuseong-ku, Taejeon, and Soo R. Kim, 363-1, Hongeun 3-dong, Seodaimun-ku, Seoul, both of Rep. of Korea

Filed Jun. 22, 1994, Ser. No. 263,745

Claims priority, application Rep. of Korea, Sep. 13, 1993, 93-18336

Int. Cl.[6] C22C *1600;3000*

U.S. Cl. 420—422 **5 Claims**



1. A single-phase, zirconium-based hydrogen storage alloy useable for second battery applications, having the composition formula consisting of:

$$Zr_{1-x}Q_xCr_{1-Y-Z-A-B}Mn_YFe_ZCo_AV_BNi \quad (I)$$

wherein Q is Ti or Hf; $0.1<x\leq 0.3$; $0<Y<1$; $0\leq Z$; $A<1$; $0<B<1$; $0<Y+Z+A+B<1$; and $Y+Z+A>0.2$; provided that Z and A are not 0 at the same time.

5,591,395

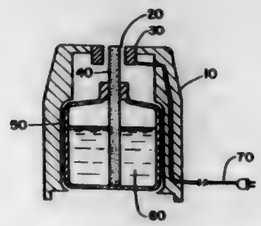
METHOD OF DISINFECTING AIR

John A. Schroeder, Mount Pleasant; Armin L. Clobes, Wind Point, and Arthur L. Hood, Mount Pleasant, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 3, 1995, Ser. No. 510,724

Int. Cl.[6] A61L *9/02;9/14*

U.S. Cl. 422—4 **10 Claims**



1. A method of disinfecting air comprising indirectly heating a porous wick having a top portion which is located in proximity to a source of heat and a bottom portion which is immersed in a liquid disinfecting composition such that the top portion of the wick has a temperature sufficient to generate particles of said disinfecting composition, which particles are then dispersed into air, wherein at least 90% of the particles which are generated have a particle size of no more than 5 microns and wherein the particles are effective to kill air borne bacteria.

5,591,396

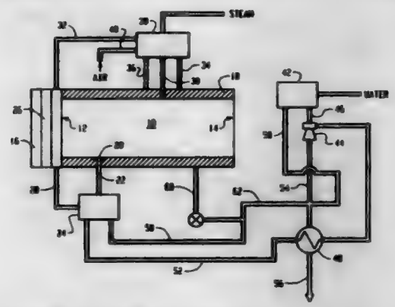
SELF CLEANING DRAIN SYSTEM AND MODULAR PLUMBING SYSTEM FOR A STERILIZING APPARATUS

Mark E. Chiffon, Erie; Kenneth J. Klobusnik, Lake City, and Anthony B. Ruffo, Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Apr. 7, 1995, Ser. No. 418,786

Int. Cl.[6] A61L *2/16*

U.S. Cl. 422—26 **7 Claims**



1. A sterilizing apparatus, comprising:

a sterilizing chamber connected to a source of sterilant and having a chamber drain, the sterilizing chamber having been utilized to sterilize agar;

a discharge outlet downstream of the chamber drain;

a first conduit connecting the chamber drain to the discharge outlet;

liquid agar contained in the first conduit;

the sterilizing chamber further having a door for opening and closing the chamber, the door comprising a door seal and a door seal activation space positioned between the door seal and the chamber said door seal activation space connected to a source of heated fluid;

a heated fluid within the door seal activation space at a pressure sufficient to activate the door seal to sealingly engage the door and the chamber;

a second conduit connecting the door seal activation space to the discharge outlet, wherein the heated fluid is also present within the second conduit; and

an exhaust manifold positioned between the chamber drain and the discharge outlet and between the door seal activation space and the discharge outlet, the manifold comprising the first and second conduits extending therethrough;

wherein the exhaust manifold is constructed of a suitable material to allow the transfer of sufficient heat from the heated fluid in the second conduit to the liquid agar in the first conduit to maintain the temperature of the liquid agar in excess of 45°–50° C. and thereby prevent solidification of the agar prior to the discharge of the liquid agar from the discharge outlet.

5,591,397

DOUBLE REDOX SYSTEM FOR DISINFECTING CONTACT LENSES

Ronald L. Schlitzer, Fort Worth; N. L. Dassanayake, and Rajkumar P. Bhatia, both of Arlington, all of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 107,268, Aug. 16, 1993, Pat. No. 5,462,713, which is a division of Ser. No. 928,643, Aug. 13, 1992, abandoned, which is a continuation of Ser. No. 526,759, May 22, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 481,905

Int. Cl.[6] A01N *59/08;59/12;* A61L *2/18*

U.S. Cl. 422—37 **7 Claims**

1. An improved method for rapidly and effectively disinfecting a contact lens, comprising:

(a) providing a contact lens to be disinfected;

(b) placing the lens in an aqueous solution;

(c) providing a source of a water soluble hypochlorite and providing a source of a water soluble iodide salt;

(d) forming a disinfecting solution by releasing an antimicrobial effective amount of hypochlorite and iodide in said aqueous solution, said hypochlorite and iodide reacting to form halogen species including iodine species, whereby the lens is rapidly and effectively disinfected by the combined actions of the hypochlorite and the halogen species;

(e) providing a source of ascorbate; and

(f) releasing an amount of ascorbate in said disinfecting solution sufficient to neutralize said iodine species.

5,591,398

METHOD FOR STERILIZING BONE GRAFTS

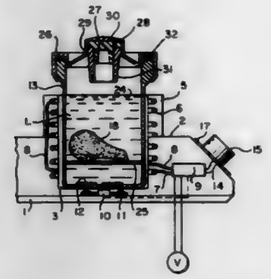
Harald Kaeppler, Beltershausen, and Thomas von Garrel, Marburg, both of Germany, assignors to Olaf Talanowski, Marburg, Germany

Division of Ser. No. 109,347, Aug. 20, 1993, Pat. No. 5,429,810. This application Apr. 7, 1995, Ser. No. 418,630

Claims priority, application Germany, Aug. 21, 1992, 42 27 830.9

Int. Cl.[6] A61L *2/04;* A01N *1/02;* A61F *2/28*

U.S. Cl. 422—38 **7 Claims**



1. A method for sterilizing a bone graft, comprising the steps of:

(a) measuring the geometry of a bone graft (**18**);

(b) placing the bone graft in a first container (**13**);

(c) adding to said container a quantity of a sterile liquid (L) sufficient to cover said bone graft and to reach a predetermined level (**24**) in the container;

(d) closing said container with a penetrable self-sealing closure member (**26**);

(e) heating the container at a given temperature for a predetermined first period of time, whereby the temperature of the sterile liquid approaches a preselected sterilizing temperature;

(f) maintaining said container at said given temperature for a second period of time that is a function of the measured geometry of said bone graft;

(g) cooling the container to room temperature;

(h) inserting one end of a transfer tube (**33**) through said penetrable closure member;

(i) withdrawing through said transfer tube the liquid contained in said first container and introducing the withdrawn liquid into a second container (**34**);

(j) removing said transfer tube from said closure member; and

(k) freezing said bone graft in said first container.

5,591,399

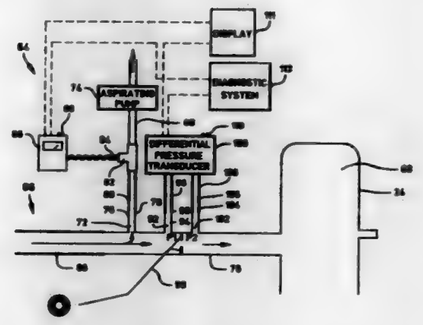
SYSTEM FOR DIAGNOSING OXYGENATOR FAILURE

Julian M. Goldman, 130 S. Hudson St., Denver, Colo. 80222, and Lyle Kirson, 3405 E. Eastman, Denver, Colo. 80210

Continuation of Ser. No. 137,578, Oct. 14, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,953

Int. Cl.[6] A61M *1/14*

U.S. Cl. 422—44 **17 Claims**



1. In an oxygenator system including an oxygenator having a ventilating gas inlet and oxygenator ventilating circuit means for supplying ventilating gas to said ventilating gas inlet of said oxygenator, said oxygenator for receiving and oxygenating a patient's blood, apparatus for assessing oxygen function comprising:

oxygen concentration measurement means, coupled between said oxygenator ventilating circuit means and said ventilating gas inlet of said oxygenator, for measuring the oxygen concentration of said ventilating gas at said ventilating gas inlet of said oxygenator; and

flow measuring means, coupled to said oxygenator system at or immediately adjacent to said ventilating gas inlet of said oxygenator, for measuring the flow of said ventilating gas supplied to said ventilating gas inlet of said oxygenator.

5,591,400

METHOD FOR PRODUCING AN IONIC SENSOR

John L. Dektar, Laguna Hills, and Sanjay L. Patil, Irvine, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 31, 1994, Ser. No. 332,244

Int. Cl.[6] G01N *21/64*

U.S. Cl. 422—57 **17 Claims**

1. A method of making an ionic sensor comprising:

(a) contacting a water-swellable ion-permeable matrix material with an aqueous-based bath of a sensing component, or precursor thereof, under conditions effective to covalently attach the sensing component, or precursor thereof, to the water-swellable ion-permeable matrix material; wherein the aqueous-based bath comprises water and an organic solvent in an amount effective to solubilize the sensing component, or precursor thereof;

(b) contacting the water-swellable ion-permeable matrix material having covalently attached sensing component, or precursor thereof, with an aqueous solution having a pH of at least about 10 and an ionic strength of at least about that of a 5% aqueous sodium chloride solution to form a sensing element; and

(c) coveting the sensing element with an opaque overcoat material.

5,591,401

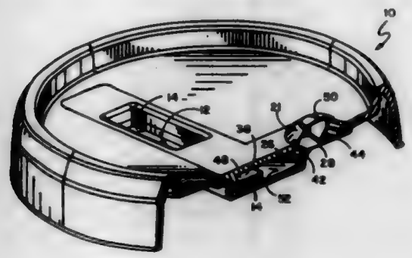
ONE-STEP TEST DEVICE

Philip W. Sayles, 172 Sycamore St., Watertown, Mass. 02172

Continuation-in-part of Ser. No. 497,539, Jun. 30, 1995, Pat. No. 5,501,837, which is a continuation-in-part of Ser. No. 275,256, Jul. 15, 1994, Pat. No. 5,429,804. This application Mar. 25, 1996, Ser. No. 621,254

Int. Cl.[6] G01N *21/01*

U.S. Cl. 422—58 **7 Claims**



1. An one-step test device having a test mode, said device having a cup for receipt of a fluid specimen to be tested and a cover lid above to be attached to said cup in a fluid-tight relationship, further comprising:

said cover lid having a top and a bottom, said cover lid having defined in said top thereof a reagent test strip chamber having a floor and first and second sides formed from said cover lid and a filling chamber having a floor formed from said cover lid, said reagent test strip chamber and said filling chamber in communication with one another;

a reagent test strip positioned in said reagent test strip chamber having a first end, a second end and a color change testing area disposed between said first and second ends;

an actuation cover having a top and a bottom, said actuation cover covering both said reagent test strip chamber and said filling chamber;

means to prevent said fluid from passing from said filling chamber into said reagent test strip chamber, said means providing for said first end of said reagent test strip to extend from said reagent test strip chamber protruding into said filling chamber;

a cutting chamber defined in said cover lid, said cutting chamber having a floor formed from said cover lid and being in fluid communication with said filling chamber;

means disposed on said bottom of said actuation cover, when activated, to pierce said floor of said cutting chamber, causing an aperture to be formed therein extending through said floor of said cutting chamber;

said cover lid when positioned on said fluid-filled cup and after said means to pierce said cutting chamber floor has been activated making an aperture therein, allowing fluid, when said test device is inverted, into said cutting chamber through said thus-formed aperture, said test device, when uprighted, allowing said fluid to drain from said cutting chamber and to pool in said filling chamber to come in contact with said first end of said reagent test strip to cause said fluid to be carried along said reagent test strip to said color change testing area; and

an open window defined in said actuation cover, said window disposed above said color change testing area, through which window the test results can be viewed.

5,591,402

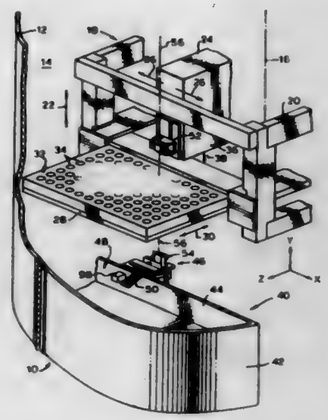
FLUID DISPENSING APPARATUS

Donald Jones, Sacramento, Calif., assignor to Dade MicroScan Inc., West Sacramento, Calif.

Division of Ser. No. 438,459, May 10, 1995, which is a continuation of Ser. No. 89,878, Jul. 9, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 460,609

Int. Cl.[6] G01N *35/02;35/10*

U.S. Cl. 422—65 **2 Claims**



1. A chemical analyzer having a carrier member and a detachable fluid dispensing head which may be selectively attached to the carrier member to effect fluid dispensing operations, said apparatus comprising:

a housing defining an incubation chamber;

a column member in said incubation chamber;

a carrier member vertically movable along said column member;

a shelf member horizontally extendable and retractable from said carrier member to extract a specimen tray having plural specimen recesses therein from said incubation chamber into said carrier member;

a shuttle member horizontally movable laterally on said carrier member along said specimen tray;

a reagent liquid dispensing assembly below said incubation chamber, said dispensing assembly including a fluid dispensing head, and holding means for said fluid dispensing head; and

said shuttle member and said fluid dispensing head defining cooperating docking means for selectively interengaging with and disengaging from one another in response to respective movements each consisting essentially of a horizontal relative movement of said shuttle member laterally of said carrier member in respective opposite directions; said cooperating docking means including each of said shuttle member and said fluid dispensing head respectively defining one of a docking fixture and a docking receptacle which are interengageable with and disengageable from one another in response to horizontal relative movements, said docking fixture including a support cavity which extends horizontally, and said docking receptacle including a support lug also extending horizontally and being supportingly receivable into said support cavity.

5,591,403

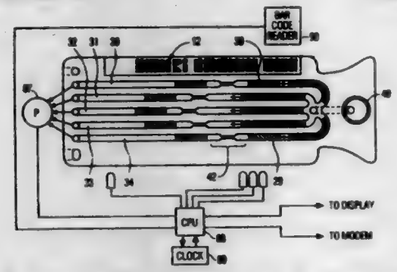
PORTABLE PROTHROMBIN TIME TEST APPARATUS AND ASSOCIATED METHOD OF PERFORMING A PROTHROMBIN TIME TEST

Michael Gavin, Warren; Catherine M. Cimini, Somerset; Ming Huang, Milltown; Anthony Kuklo, Jr., Bridgewater, all of N.J.; James A. Mawhirt, Brooklyn, N.Y.; Eduardo Marcelino, Edison, and Albert Simone, Fords, both of N.J., assignors to International Technidyne Corporation, Edison, N.J.

Division of Ser. No. 424,863, Apr. 19, 1995, Pat. No. 5,534,226, which is a division of Ser. No. 327,320, Oct. 21, 1994, Pat. No. 5,504,011. This application Mar. 18, 1996, Ser. No. 617,296

Int. Cl.[6] G01N *33/86*

U.S. Cl. 422—73 **13 Claims**



1. A cuvette used in performing a test on a blood sample, comprising:

a generally transparent member having a plurality of conduits contained therein:

a channel, common to all of said plurality of conduits through which a predetermined volume of a blood sample can be drawn into each of said conduits;

a normalizing control agent contained within a first one of said conduits, wherein said normalizing control agent reacts with a blood sample delivered to said first one of said conduits to counteract the effect of an anticoagulant in the blood sample thereby creating a normalized control blood sample; and

an anticoagulant contained within a second one of said conduits, wherein said anticoagulant reacts with the blood sample delivered to said second one of said conduits to produce a blood control sample having abnormal clotting characteristics.

5,591,404

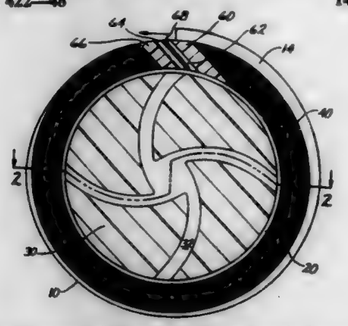
INTEGRATED LOW PRIMING VOLUME CENTRIFUGAL PUMP AND MEMBRANE OXYGENATOR

Wilfred Mathewson, 5420 Fairgreen Way, Bonsall, Calif. 92003

Continuation-in-part of Ser. No. 765,307, Sep. 25, 1991, Pat. No. 5,263,924. This application Jul. 23, 1993, Ser. No. 97,414

Int. Cl.[6] A61M *1/34*

U.S. Cl. 422—48 **14 Claims**



1. A mass transfer bed for effecting mass transfer between a first fluid and a second fluid, said mass transfer bed comprising:

a rigid housing;

a multiplicity of elongate, tubular gas permeable hollow fibers, each of said hollow fibers having a first end, a second end, an outer surface and a hollow lumen extending longitudinally therethrough, contained in said rigid housing;

means for passing a first fluid into said housing such that said first fluid will flow radially over the outer surfaces of said hollow fibers;

a manifold to facilitate passage of a second fluid through the lumens of said hollow fibers, said manifold comprising an enclosure having:

i) an inlet passageway in communication with the first ends of said hollow fibers to facilitate infusion of a second fluid into the lumens of said hollow fibers through the first ends thereof;

ii) an outlet passageway in communication with the second ends of said hollow fibers to receive said second fluid after it has passed through the lumens of said hollow fibers and out of the second ends thereof;

a second fluid inlet means extending into said housing and into communication with said inlet side of said manifold to facilitate passage of said second fluid through the inlet side of said manifold and into the lumens of said hollow fibers; and

a second fluid outlet means extending from the outlet side of said manifold through said housing to facilitate passage of said second fluid out of the lumens of said hollow fibers, through the outlet side of said manifold, and out of said housing;

said mass transfer bed being arranged in a generally circular ring with said manifold being located within said ring such that said manifold forms a segment of said ring, and wherein said hollow fibers extend circumferentially about said ring with the first ends of said fibers being connected to the inlet passageway of said manifold and the second ends of said fibers being connected to the outlet passageway of said manifold;

said mass transfer bed being thereby operative to effect mass transfer between a first fluid which is circulated radially over the outer surfaces of said fibers and a second fluid which is circulated circumferentially through the lumens of said fibers and around said ring.

5,591,405

Patent Not Issued For This Number

5,591,406

AUTOMATIC EXHAUST GAS ANALYZER FOR AN INTERNAL COMBUSTION ENGINE

Kenji Hirai, Kameoka; Akira Aono; Shinya Tsuneda, both of Kyoto; Hirokazu Matsumoto, Otsu; Yuji Yamashita, Suita; Hisayoshi Tanaka, Kyoto; Takanori Shiina, and Haruko Kaburagi, both of Utsunomiya, all of Japan, assignors to Shimadzu Corporation, Kyoto, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Continuation of Ser. No. 290,286, Aug. 15, 1994, abandoned. This application Sep. 13, 1995, Ser. No. 527,434

Claims priority, application Japan, Sep. 17, 1993, 5-254887

Int. Cl.[6] G01N *31/12;30/02;* G05D *9/00*

U.S. Cl. 422—80 **5 Claims**

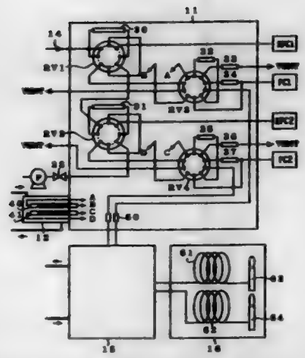
1. An automatic exhaust gas analyzer for analyzing both an exhaust gas of an internal combustion engine and a background gas simultaneously, the analyzer comprising:

a) a plurality of analyzing units;

b) two independent gas lines provided in each of the plurality of analyzing units for analyzing the exhaust gas and the background gas;

c) a gas-chromatographic column provided in each of the independent gas lines;

d) a gas-chromatographic detector connected with the column in each of the independent gas lines;



e) signal communication network means for interconnecting and conveying signals between each of the gas-chromatographic detectors;

f) analysis control means for sampling the exhaust gas and the background gas at the same time, the analysis control means supplies the sampled exhaust gas and the sampled background gas to the two independent gas lines respectively and for analyzing the exhaust gas and the background gas independently using the gas-chromatographic columns and the gas-chromatographic detectors under same analyzing conditions set by the signal communication network means; and

g) a separator provided in each of the two gas lines for separating a first gas including hydrocarbon components of C12 and less and a second gas including hydrocarbon components of C6 and less respectively from the exhaust gas and the background gas.

5,591,407

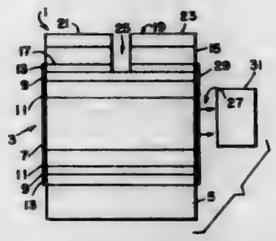
LASER DIODE SENSOR

Howard P. Greger, Gainesville, Fla.; Peter Lo, Blacksburg, Va.; Martin Weiss, New Port Richey, and Peter Zory, Gainesville, both of Fla., assignors to American Research Corporation of Virginia, Radford, Va.

Filed Apr. 21, 1995, Ser. No. 426,659

Int. Cl.[6] G01N *21/63*

U.S. Cl. 422—82.05 **33 Claims**



1. A surface-active laser chemical sensor for detecting chemical changes in an ambient environment comprising a substrate, a diode laser structure deposited on the substrate for generating a laser signal, the laser structure further comprising an active layer, a barrier layer on the active layer, a cladding layer on the barrier layer, and a reducing layer on the cladding layer, a contact layer formed on the reducing layer having a deposited electrode, a surface sensitive region adjacent to the electrode, wherein in the surface sensitive region the thickness of the cladding layer is from 0.5 microns to less than 0.05 microns to enable a tail of a lasing mode to have a finite value at the surface of the laser, such that the laser structure and the signal generated by the laser structure exhibit sensitivity to an analyte at the surface sensitive region, wherein the laser structure produces in the presence of the analyte a laser signal, and wherein the laser signal is detected by a detector.

5,591,408

REPETITION PIPETTE

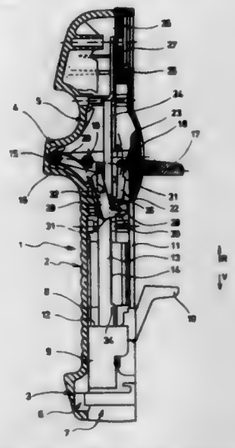
Herbert Belgardt; Klaus Schärbrock, both of Hamburg, and Rolf-Günter Meyer, Bendestorf, all of Germany, assignors to Eppendorf-Netheler-Hinz GmbH, Hamburg, Germany

Filed Apr. 10, 1995, Ser. No. 419,334

Claims priority, application Germany, Apr. 27, 1994, 44 14 760.0

Int. Cl.[6] B01L *3/02*

U.S. Cl. 422—100 **8 Claims**



1. A repetition pipette including a syringe receiving section (6) for a mounting portion of a syringe, said pipette comprising a receiving member (9) having a piston receiving portion for the mounting portion of a syringe piston, piston returning means (10) for moving said receiving member away from said piston receiving portion, piston advancing means (13,17,22) for advancing said receiving member towards said piston receiving portion in steps corresponding to the liquid volumes to be ejected by the syringe, step width adjusting means (24) for adjusting the width of the steps of said receiving member by means of an adjustment element (27), constant step means (29) for setting the width of the first step to a constant value independent of adjustments of said adjustment element (27) for the widths of following steps;

wherein said piston advancing means comprises a rack (13) connected to said receiving member (9) and a pawl (22) pivotally mounted to an actuating element (17), said pawl being adapted to engage the toothing (14) of the rack upon movements of the actuating element in the advancing direction (V) so as to drive the rack and to disengage from the rack upon movements of the actuating element in the returning direction (R), and said step width adjusting means comprises a first withholding element (24) displaceable along the rack (13) by said adjustment element (27) for restricting engagement of the pawl (22) with said toothing, and wherein said constant step means includes a second withholding element (29) adapted to be displaced between a withholding position for preventing said pawl (22) from engagement with said rack (13) and a release position enabling engagement of said pawl, with the movements of said second withholding element to said withholding position being controlled by returning movements of the receiving member (9) and the movements of said second withholding element to said release position being controlled by advancing movements of said receiving member (9), and the receiving member (9) being connected to an abutment element (34,38) said abutment element extends into the range of movements of at least one of said pawl (22) and said actuating element (17) when said receiving member (9) has been completely returned, and the receiving member is urged in the advancing direction (V) by at least one of said actuating element and said pawl in the end range of the movements of said actuating element so as to drive said receiving member said second withholding element is a lever (29) having a first leg which is pivotally mounted and a second leg (32) which includes a withholding surface (33) for said pawl (22), and said receiving member (9) includes a support surface (12, 36) adapted to be urged against said first leg (30) during returning movements and to pivot said lever (29) with said second leg (32) to said withholding position.

5,591,409

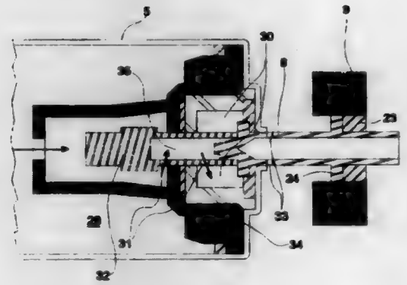
PROVIDING AROMAS

Carl J. Watkins, 2055 W. 25th Ave., Eugene, Oreg. 97405

Filed Aug. 15, 1995, Ser. No. 515,275

Int. Cl.[6] G05D *7/00*

U.S. Cl. 422—110 **15 Claims**



1. Apparatus for providing aroma emitting material to a predetermined region from time to time comprising

means for providing signals at selected times when an aroma is to be emitted,

means for containing an aroma producing material and confining the material therein except when actuated to release some of the material therefrom, and

means responsive to signals from the signal providing means for actuating the material containing means to release a controlled quantity of the material to the adjacent atmosphere;

the material-containing means comprising means for holding a supply of aroma producing fluid in a first compartment thereof and for moving a predetermined quantity of the fluid into a separate second compartment of the containing means;

the actuating means comprising means for releasing the moved fluid from the second compartment into the atmosphere and then actuating the holding and moving means to again move a like quantity of fluid from the first compartment to the second; and

the releasing means comprising solenoid means for opening an outlet in the second compartment when actuated by the signal providing means and then closing the outlet after a predetermined time; or comprising means for forming a bubble of vapor from the fluid in the second compartment and pushing the bubble through an outlet and into the atmosphere, the bubble forming means comprising means for heating the fluid in the second compartment so as to expand the fluid and force it through the outlet, and the actuating means comprising electrical heating means and means responsive to the signal providing means for furnishing an electric current to the heating means.

5,591,410

PROCESS FOR THE ON-LINE GRAFTING OF CARBOXYLIC ACID AND CARBOXYLIC ACID ANHYDRIDES CONTAINING AN ETHYLENIC UNSATURATION ONTO ETHYLENE HOMOPOLYMERS OR COPOLYMERS AND INSTALLATION FOR THE IMPLEMENTATION OF THIS PROCESS

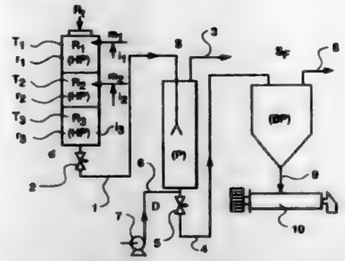
Joël Audureau, Nœux-les-Mines; Hocine Mehallo, Essars, and Thierry Pellerin, Lens, all of France, assignors to ECP-Enichem Polymeres France S.A., Courbevoie, France

Division of Ser. No. 371,575, Jan. 12, 1995, which is a continuation of Ser. No. 925,923, Aug. 7, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 478,849

Claims priority, application France, Aug. 14, 1991, 91 10327

Int. Cl.[6] C08F *255/02*

U.S. Cl. 422—131 **17 Claims**



1. An apparatus for the continuous production of an ethylene homopolymer, or of a copolymer of ethylene and at least one comonomer A, the homopolymer or copolymer being modified by grafting thereto at least one monomer B selected from carboxylic acids containing an ethylenic unsaturation, their anhydrides, and derivatives thereof, said apparatus comprising, in series:

at least one autoclave or tubular polymerization reactor (R) under high pressure;

a separator (S) capable of operating under an intermediate pressure P, or two separators (S1 and S2) in series, capable of operating under intermediate pressures P1 and P2 respectively, where P2<P1;

a low-pressure final separator (SF);

an extruder; and

a granulating device;

said apparatus having:

(co)polymer lines connecting said reactor (R) and said separators (S or S1 and S2, and SF);

let-down valves arranged on the outlets of said reactor (R) and said separators (S or S1 and S2), separating unreacted (co)monomer(s) from said (co)polymer formed;

at least one line for injection of the flow comprising said at least one grafting monomer B upstream of a let-down zone or a let-down zone containing the associated let-down valve;

pumping means being provided on the line(s) for the injection of the flow of said at least one grafting monomer flow.

5,591,411

CATAYLTIC CRACKING APPARATUS

Patrick H. Terry, Middletown; Gregory S. Sherowski, Whippany, both of N.J., and Philip Holmes, West Hornley, England, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

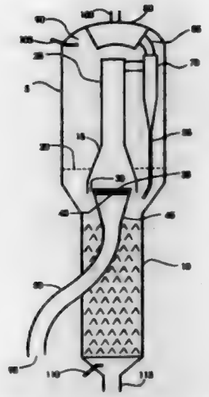
Continuation of Ser. No. 270,205, Jul. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 80,382, Jun. 21, 1993, Pat. No. 5,368,721, and a continuation-in-part of Ser. No. 80,261, Jun. 21, 1993, abandoned. This application May 5, 1995, Ser. No. 435,697

Int. Cl.[6] B01J *38/02*

U.S. Cl. 422—139 **6 Claims**

1. A fluid catalytic cracking reactor comprising

a reaction vessel;



a riser for supplying a reaction stream to the reaction vessel, wherein the reaction stream comprises a mixture of hydrocarbon, cracked hydrocarbon and catalytic cracking catalyst;

slip velocity decreasing means along the upper portion of the riser for decreasing the velocity of the reaction stream and forming a reaction stream having a negative slip velocity;

slip velocity increasing means for increasing the slip velocity of the negative slip velocity reaction stream to form a reaction stream having a positive slip velocity, wherein the slip velocity increasing means defines a riser outlet means within the reaction vessel;

collection and velocity reducing means within the reaction vessel in fluid connection with and positioned for collecting the positive slip velocity reaction stream from the riser outlet means and for reducing the slip velocity to react the hydrocarbon with the catalytic cracking catalyst;

close-coupled cyclone means in connection with the collection and velocity reducing means for separating and recovering the cracked hydrocarbon and cracking catalyst;

stripper section within the lower portion of the reaction vessel for receiving the cracking catalyst from the close-coupled cyclone means and for stripping hydrocarbon vapors from the catalyst; and

eduction means between the slip velocity increasing means and the collection and velocity reducing means for permitting stripped vapors from the stripper section to enter the collection and velocity reducing means.

5,591,412

ELECTROSTATIC GUN FOR INJECTION OF AN ELECTROSTATICALLY CHARGED SORBENT INTO A POLLUTED GAS STREAM

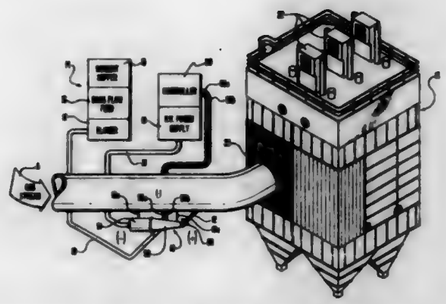
James T. Jones, Holladay, Utah; Larry M. Kersey, Scottsdale, Ariz., and Richard A. Steinke, Park City, Utah, assignors to Alnaco Environmental Resources Corp., Scottsdale, Ariz.

Filed Apr. 26, 1995, Ser. No. 429,082

Int. Cl.[6] B01D *50/00*; B01J *19/08*

U.S. Cl. 422—171 **17 Claims**

1. An electrostatic gun for use in a remediation process for the removing pollutants from a flue gas stream that provides for charging the individual particles of a flow of sorbent materials and injecting then into a flue gas stream to charge to agglomerize with pollution particles therein for later removal comprising: a gun having a housing that includes a straight open barrel; means for connecting said housing to a hopper system means for passing a flow of sorbent materials under pressure through said straight barrel; a discharge means formed across an open forward end of said straight barrel to pass a flow of sorbent materials therethrough and into a tube wherethrough a flue gas flow is directed, which said tube connects to a pollution removal apparatus means; a straight charging wand formed from an electrically conductive material



that is centered axially in said straight barrel; a high voltage source connected to said charging wand and means for controlling a voltage from said high voltage source flowing therefrom into said charging wand; corona enhancement means that is connected to an electrical power source to provide an opposite electrical charge from the charge on said charging wand and is mounted in said straight barrel to be spaced apart from said charging wand; and means for providing said electrical charge to said corona enhancement means.

5,591,413

METAL CARRIER FOR A CATALYTIC CONVERTER

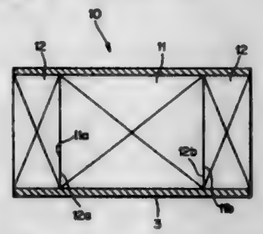
Tetsuro Toyoda, Akishima, Japan, assignor to Showa Aircraft Industry Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 460,881

Claims priority, application Japan, Jun. 13, 1994, 6-130154

Int. Cl.[6] B01D *53/34*

U.S. Cl. 422—180 **5 Claims**



1. A metal carrier for a catalytic converter comprising:

a first honeycomb structure in which flat sheet material composed of thin flat metal sheet in strip form and corrugated sheet material composed of thin metal sheet folded continuously into a corrugated surface in strip form are stacked in mutual contact and rolled about an axis into a spiral form without bonding to produce numerous air passages in a reticulate pattern, the surface of the air passages having a catalyst-carrying layer including at least one catalyst, said first honeycomb structure including axially spaced ends;

a cylindrical casing arranged coaxially with the first honeycomb structure and enclosing the first honeycomb structure without being bonded thereto;

two second honeycomb structures each of which comprising flat sheet material composed of thin flat metal sheet in strip form and corrugated sheet material composed of thin metal sheet folded continuously into a corrugated surface in strip form stacked in mutual contact, rolled about an axis into spiral forms to produce numerous air passages in reticulate pattern, said contacting portions being bonded by brazing filler metal, each said second honeycomb structure including axially spaced ends, one end of one of said second honeycomb structures positioned adjacent to one end of said first honeycomb structure and one end of the other second honeycomb structure positioned adjacent to the other end of said first

honeycomb structure, and said second honeycomb structures being bonded to the casing within the casing.

5,591,414

SORPTIVE CATALYST FOR THE SORPTIVE AND OXIDATIVE CLEANING OF EXHAUST GASES FROM DIESEL ENGINES

Eberhard Jacob, Tutzing, and Michael Harris, Münster, both of Germany, assignors to MAN Nutzfahrzeuge Aktiengesellschaft, München, Germany

Filed Jul. 7, 1995, Ser. No. 499,674

Claims priority, application Germany, Jul. 9, 1994, 44 24 235.2

Int. Cl.[6] B01D *53/34*; F01N *3/10*

U.S. Cl. 422—180 **12 Claims**

1. A sorption catalytic converter for combined sorptive and oxidative cleaning of exhaust gases of a diesel engine, said catalytic converter having a blocking activity for highly volatile organic exhaust gas components, mainly HC, as well as moderately and slightly volatile organic exhaust gas components, mainly HC, and said catalytic converter further having oxidative activity for CO and an inhibited oxidative activity for SO_2 and NO; said catalytic converter comprising:

a converter body consisting of a doped catalytically active material, said doped catalytically active material comprised of a solid acid system $V_2O_5/SiO_2/TiO_2/Al_2O_3/SO_4^{2-}/PO_4^{3-}$ of a high surface area doped with at least one metal oxide of a metal of the platinum group of the periodic table for increasing a blocking activity of said converter body.

5,591,415

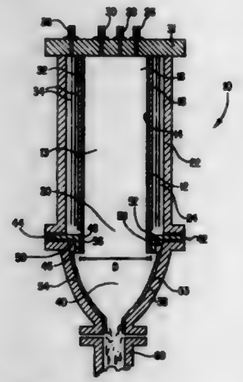
REACTOR FOR SUPERCRITICAL WATER OXIDATION OF WASTE

Mark W. Dassel, Wilmington, Del.; Donald C. Matter, Houston, Tex.; Donald H. Reaule, Murrysville, Pa.; Roy N. McBrayer, Jr., Austin; James E. Deaton, Georgetown, both of Tex., and Fred W. Thompson, Lexington Park, Md., assignors to RPC Waste Management Services, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 188,229, Jan. 27, 1994. This application Jun. 16, 1994, Ser. No. 260,954

Int. Cl.[6] B01J *19/00;3/00*; A62D *3/00*; B09B *3/00*

U.S. Cl. 422—241 **48 Claims**



1. A pressurized reactor, comprising:

a pressure vessel surrounding a reaction chamber, the reaction chamber substantially surrounding at least a portion of a reaction zone, the reaction chamber having an inside wall, an outside wall, a front end, and a back end opposite the front end, and wherein a first annulus is formed between the pressure vessel and the outside wall of the reaction chamber, the pressure vessel having a section which extends beyond the reaction chamber;

a reactant entry conduit coupled to the pressure vessel, the reactant entry conduit being coupled to introduce reactants into or through an upstream portion of the reaction chamber during use;

a reaction effluent conduit coupled to the said section of the pressure vessel, the reactant effluent conduit being coupled to carry reaction effluent from the pressure vessel during use;

a thermal insulator in the first annulus between the outside wall of the reaction chamber and the pressure vessel;

a chemical isolation system coupled to the first annulus, the chemical isolation system comprising an isolation fluid conduit coupled to the first annulus, the chemical isolation system being adapted to introduce isolation fluid from an isolation fluid source into the first annulus at a pressure greater than the pressure within the reaction chamber; and

wherein the reactor is coupled to a cooling system, the cooling system comprising a cooling fluid conduit and a cooling fluid source, the cooling fluid conduit being coupled to introduce cooling fluid from the cooling fluid source, through a passageway, and into the said section of the reactor to contact effluent from the reaction chamber during use.

5,591,416

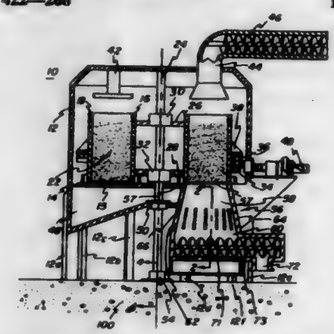
STATIONARY SCREEN EXTRACTOR

Timothy G. Kemper, Piqua, Ohio; Allan L. Moaroe, Sidel, Ill., and Tony L. Ritter, Sidney, Ohio, assignors to The French Oil Mill Machinery Co., Piqua, Ohio

Filed Jan. 13, 1995, Ser. No. 372,496

Int. Cl.[6] B01D *11/02;12/00*

U.S. Cl. 422—268 **16 Claims**



1. In a basket extractor of the type adapted to process extract bearing solid material from an upstream to downstream direction and having a plurality of cell members adapted to receive said extract bearing solid material, means for feeding said solid material to said cell members, means for feeding liquid solvent to said cell members, and screen means cooperating with said cell members for providing drainage of said liquid solvent and extractable material from said solid material to thereby separate said liquid solvent and said extractable material from said solid material, the improvement comprising discharge means positioned proximate said screen means and downstream from said means for feeding said solid material and said liquid solvent to said cell members for discharging separated solid material from said cell members, said discharge means comprising a hopper including an entry section and an exit section, said entry section having a cross sectional area smaller than the cross sectional area of said exit section wherein said hopper comprises a pair of opposed vertically inclined wall members, said opposed wall members extending from said entry section of said hoppper into said hopper exit section, said wall members being more closely spaced to each other in said entry section than in said exit section and wherein said wall members each comprises slots formed therein adapted to provide for additional drainage of

said liquid solvent and said extractable material therethrough and to thereby provide further separation of said liquid solvent and said extractable material from said solid material.

5,591,417

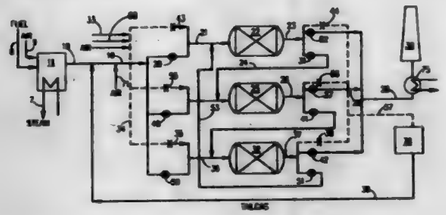
REMOVING SOX, CO AND NOX FROM FLUE GASES

John S. Buchanan, Trenton; Mark F. Mathias, Turnersville, both of N.J.; Joseph F. Sodomin, III, Landenberg, Pa., and Gerald J. Tennan, Vienna, Va., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 63,473, May 19, 1993, abandoned, and a continuation of Ser. No. 868,432, Apr. 15, 1992, Pat. No. 5,229,091. This application Jan. 21, 1994, Ser. No. 184,536

Int. Cl.[6] B01D *53/46;53/81;53/96*

U.S. Cl. 423—210 **29 Claims**



1. In a hydrocarbon fueled power plant wherein an oxygen-containing gas is fed to a combustor for combustion of a hydrocarbon fuel to water and carbon dioxide, a method of removing sulfur oxide, carbon monoxide and nitrogen oxide from a flue gas stream from said combustor using said fuel and an oxygen-containing gas comprising the steps of:

combusting said fuel in said combustor with an amount of oxygen-containing gas to convert all sulfur-containing species in said fuel to sulfur oxide and provide a sulfur oxide containing gas stream, and to partially convert said fuel to water and carbon dioxide, the amount of said oxygen-containing gas supplied to said combustor being from about 95% to about 110% of said stoichiometric amount to convert said fuel to carbon dioxide, the amount of said oxygen-containing gas being selected to maintain the concentration of carbon monoxide in said sulfur oxide containing gas stream at from about 500 ppm to about 5,000 ppm, the amount of nitrogen oxide in said sulfur oxide containing gas stream being an inverse function of the amount of carbon monoxide therein;

contacting said sulfur oxide containing gas stream and sufficient additional air with a solid adsorbent bed for adsorbing thereon the sulfur oxides in the form of inorganic sulfates or sulfur oxides or combinations thereof, the solid adsorbent containing a catalytic oxidation promoter for oxidizing the carbon monoxide in said sulfur oxide containing gas stream to carbon dioxide, thus forming a sulfur oxide and carbon monoxide depleted stream with the consequential reduced amount of nitrogen oxide for disposal; and

contacting said adsorbent bed with a reducing gas stream for regenerating said adsorbent bed by reducing said retained inorganic sulfates or sulfur oxides or combinations thereof to hydrogen sulfide and/or sulfur dioxide, and thereby forming a hydrogen sulfide and/or sulfur dioxide bearing stream.

5,591,418

PROCESS FOR REMOVING SULFUR OXIDES OR NITROGEN OXIDES FROM A GASEOUS MIXTURE

Alakananda Bhattacharyya, Wheaton; Michael J. Feral, Aurora, and William J. Reagan, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 252,175, Jun. 1, 1994, Pat. No. 5,426,083. This application Jun. 9, 1995, Ser. No. 488,872

Int. Cl.[6] C01B *21/00*

U.S. Cl. 423—239.1 **14 Claims**

1. A process for reducing at least one of (1) the sulfur oxide content of a sulfur-oxide containing gas, and (2) the nitrogen oxide content of a nitrogen oxide-containing gas which includes contacting said gas with a material at conditions effective to reduce at least one of (1) the sulfur oxide content of said gas and (2) the nitrogen oxide content of said gas, wherein at least a portion of said material is a composition produced by a process which comprises:

calcining at a temperature of at least about 450 degrees C. for about one hour or more a layered mixed hydroxide of the formula:

$$M^{2+}_{2}\,Al_{2-x}\,M^{2+}_{n}\,(OH)_{4+4-2}\,(J^{v-})_{\frac{k}{v}}\,(A^{q-})_{\frac{2-k}{q}}\cdot mH_2O$$

where M^{2+} is a divalent metal selected from the group consisting of magnesium, calcium, zinc, barium and strontium;

x is about 1.1 to about 3.5;

M^{3+} is a trivalent metal selected from the group consisting of cerium, lanthanum, iron, chromium, vanadium, and cobalt;

n is about 0.01 to about 0.4;

J is VO_3, HVO_4, VO_4, V_2O_7, HV_2O_7, V_3O_9, V_4O_{12}; WO_4, or MoO_4;

v is the net ionic charge associated with J;

k is about 0.01 to less than 2;

A is CO_3, OH, SO_3, SO_4, Cl, or NO_3;

q is the net ionic charge associated with A; and

m is a positive number;

to produce a dehydrated and at least partially collapsed composition which comprises solid solution microcrystallites having aluminum oxide dispersed in an oxide of the divalent metal and of spinel phase microcrystallites, each of the microcrystallites having the greatest linear dimension in the range of about 0.1 to about 30 nanometers.

5,591,419

OXIDATION-REDUCTION PROCESS

Derek McManus, Roselle, Ill.; Arthur E. Martell, College Station, and Dian Chen, Bryan, both of Tex., assignors to Wheelabrator Clean Air Systems Inc., Schaumburg, Ill.

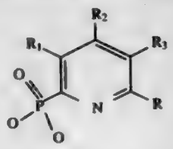
Filed Jan. 16, 1996, Ser. No. 586,257

Int. Cl.[6] B01D *53/52*

U.S. Cl. 423—576.6 **8 Claims**

1. A catalytic oxidation-reduction process for removing hydrogen sulfide gas from a gaseous fluid stream comprising the following steps, in combination,

(a) contacting a reactant gaseous stream containing hydrogen sulfide in a contact zone with an aqueous solution containing a polyvalent metal chelate catalyst having the following formula: ML_2 where L has the following formula:



R is COOH or $PO(OH)_2$ and R_1, R_2 and R_3 are each selected independently from the group consisting of H, OH, alkyl containing 1 through 3 carbon atoms, NO_2, SO_3H, Cl, Br, F, and CN and M is a polyvalent metal that exists in more than one oxidation state, to produce a gaseous stream having a reduced hydrogen sulfide concentration and an admixture containing solid sulfur and polyvalent metal chelate catalyst;

(b) regenerating the admixture of step (a) by contacting the admixture with an oxidant and producing regenerated polyvalent metal chelate catalyst; and

(c) recycling the regenerated polyvalent metal chelate catalyst to the contact zone.

5,591,420

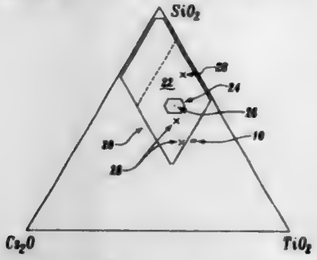
CESIUM TITANIUM SILICATE AND METHOD OF MAKING

Marl L. Balmer, West Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 25, 1995, Ser. No. 519,322

Int. Cl.[6] C01B *33/32;39/06;* **B09B** *3/00*

U.S. Cl. 423—700 **23 Claims**



1. A cesium silicotitanate material, comprising;

(a) a primary compound containing cesium,

(b) a secondary compound containing titanium,

(c) a tertiary compound containing silicon,

(d) oxygen forming a ternary compound of cesium titanium silicate pollucite, wherein a proportion of TiO_2 is less than 43 mole percent.

5,591,421

ZEOLITE SSZ-41

Stacey I. Zones, San Francisco, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.

Filed Jul. 11; 1994, Ser. No. 273,068

Int. Cl.[6] C01B *39/04;39/06;39/48*

U.S. Cl. 423—706 **11 Claims**

1. A zeolite comprising oxides of (1) silicon or a mixture of silicon and germanium, and (2) zinc, said zinc being present in an amount from about 2 wt % to about 5 wt % of zinc metal based on the total weight of metals in said zeolite, said zeolite having the X-ray diffraction lines of Table I and having an argon adsorption capacity of at least about 0.06 cc/gm at 87° K.

5,591,422

TEXAPHYRIN COMPLEXES HAVING IMPROVED FUNCTIONALIZATION

Gregory W. Hemmi, Sunnyvale, Calif.; Jonathan L. Sessler, Austin, Tex., and Tarak D. Mody, Sunnyvale, Calif., assignors to Pharmacyclics, Inc., Sunnyvale, Calif., and Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 459,333, Jun. 2, 1995. This application Jun. 6, 1995, Ser. No. 468,289

Int. Cl.[6] A61B *5/055;* **C07D** *257/00;* **A61K** *49/00*

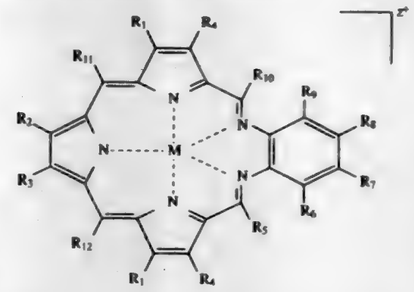
U.S. Cl. 424—9.362 **19 Claims**

1. A method of radiation therapy for a host harboring atheroma or neoplastic tissue, the method comprising:

administering to the host a texaphyrin, the texaphyrin having radiosensitization properties; and

administering ionizing radiation to the host in proximity to the atheroma or neoplastic tissue;

wherein the texaphyrin has the structure:



wherein

M is H, a divalent metal cation, or a trivalent metal cation;

R_1–R_4, R_7 and R_8 are independently hydrogen, halide, hydroxyl, alkyl, aryl, haloalkyl, nitro, formyl, acyl, hydroxyalkyl, oxyalkyl, oxyhydroxyalkyl, saccharide, carboxy, carboxyalkyl, carboxyamidealkyl, a site-directing molecule, a catalytic group, or a couple to a site-directing molecule or to a catalytic group;

R_6 and R_9 are independently selected from the groups of R_1–R_4, R_7 and R_8, with the proviso that the halide is other than iodide and the haloalkyl is other than iodoalkyl;

$R_5$and R_{10}–R_{12} are independently hydrogen, alkyl, aryl, hydroxyalkyl, oxyalkyl, oxyhydroxyalkyl, carboxyalkyl, carboxyamidealkyl or a couple to a saccharide, to a site-directing molecule or to a catalytic group;

at least one of R_5, R_6, R_9, R_{10}, R_{11} and R_{12} is other than hydrogen; and Z is an integer less than or equal to 5.

5,591,423

PIGMENTATION ENHANCER AND METHOD

Bryan B. Fuller, Edmond, Okla., assignor to The Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation of Ser. No. 943,998, Sep. 11, 1992, which is a continuation of Ser. No. 451,420, Dec. 15, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,162

Int. Cl.[6] A61K *7/42;7/40;31/52*

U.S. Cl. 424—59 **5 Claims**

1. A composition of matter for stimulating melanogenesis in melanocytes of human epidermis, the composition disposed in a pharmaceutical carrier capable of delivering the composition to the melanocytes under in vivo conditions, the composition consisting essentially of:

an effective amount of a phosphodiesterase inhibitor effective in increasing tyrosinase activity in the melanocytes to an amount sufficient to result in increasing levels of melanin in the melanocytes resulting in tanning of the epidermis.

5,591,424
ANTIPERSPIRANT GEL STICK COMPOSITIONS

Brian D. Hofrichter, Hunt Valley, Md.; John M. Gardlik; Philip A. Sawin, both of Cincinnati, Ohio; John P. Luebbe, Lawrenceburg, Ind., and Barton J. Bradbury, West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 85,424, Jun. 30, 1993, Pat. No. 5,429,816. This application Jun. 7, 1995, Ser. No. 481,780

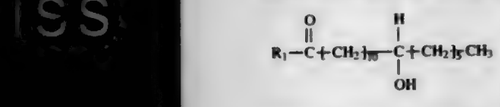
Int. Cl.[6] A61K *7/32;7/34;7/38*

U.S. Cl. 424—66 **22 Claims**

1. An antiperspirant gel stick composition comprising:

a. from about 0.5% to about 60%, by weight, of an antiperspirant active;

b. from about 1% to about 15%, by weight, of a gelling agent including: a primary gellant selected from the group consisting of 12-hydroxystearic acid, esters of 12-hydroxystearic acid, amides of 12-hydroxystearic acid, and mixtures thereof, said primary gellant having the formula:



wherein R_1 is OR_2 or NR_2R_3; and R_2 and R_3 are the same or different and are hydrogen, or an alkyl, aryl, or arylalkyl radical which are branched, linear or cyclic and have from about 1 to about 22 carbon atoms; and a secondary gellant which is an n-acyl amino acid amide derivative selected from the group consisting of n-acyl amino acid amides, n-acyl amino acid esters, and mixtures thereof; said composition having a ratio of primary gellant to secondary gellant of from about 1:2 to about 20:1;

c. from about 10% to about 95%, by weight, of a liquid base material capable of solubilizing the gelling agent, whereby a heated solution of said gelling agent and liquid base material forms a stick when cooled to ambient temperature.

5,591,425
TWO-PACKAGE PRETREATMENT AND HAIR RELAXER COMPOSITIONS

Tehsel Dhaliwal, Carrollton, Tex., assignor to Pro-Line Corporation, Dallas, Tex.

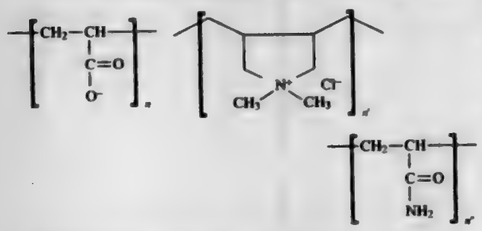
Continuation-in-part of Ser. No. 272,842, Jul. 8, 1994, abandoned. This application Mar. 23, 1995, Ser. No. 407,698

Int. Cl.[6] A61K *7/06;7/09*

U.S. Cl. 424—70.4 **12 Claims**

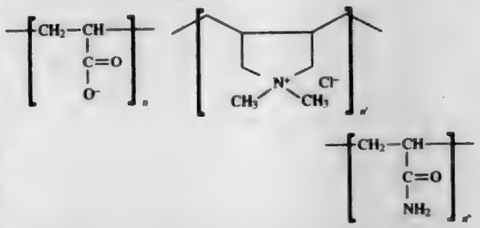
1. A two-package pretreatment and hair relaxer composition system comprising:

a first package comprising a non-alkaline pretreatment composition containing a polyampholyte terpolymer of the formula:



wherein n is 0.34; n' is 0.31; and n" is 0.35; said terpolymer having a weight average molecular weight of from about 4 thousand to 4 million, and being present in amounts sufficient to coat hair and prevent brittleness and roughness to relaxed hair;

a second package comprising a relaxer having an alkaline pH range of from about 11.5 to 11.7 containing calcium hydroxide in amounts sufficient to relax hair and a polyampholyte terpolymer of the formula:



wherein n is 0.34, n' is 0.31; and n" is 0.35; said terpolymer having a weight average molecular weight of from about 4 thousand to 4 million, and being present in amounts sufficient to impart moisture, softness and sheen to relaxed hair; and wherein said second package further includes nonoxynol-10-carboxylic acid.

5,591,426
OPHTHALMIC SOLUTION FOR ARTIFICIAL TEARS

Henry P. Dabrowski, Naples; Anil Salpekar, and O. William Lever, Jr., both of Pittsford, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 86,421, Jul. 2, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 380,931

Int. Cl.[6] A61K *31/16;31/395*

U.S. Cl. 424—78.04 **12 Claims**

1. An ophthalmic solution useful as artificial tears consisting essentially of:

polyvinylpyrrolidone (PVP);

hydroxypropyl methylcellulose (HPMC);

Sodium borate/boric acid buffer;

glycerin; and

an effective ophthalmic preservative, forming an aqueous solution having at 25° C., a viscosity of less than about 5 cps and a surface tension of less than about 40 dynes per centimeter.

5,591,427
HUMAN INTERLEUKIN-3(IL-3) VARIANTS AND THEIR USE TO PROMOTE OR ANTAGONIZE IL-3-MEDIATED PROCESSES

Mathew A. Vadas; Angel F. Lopez, and Mary F. Shannon, all of South Australia, Australia, assignors to Medvet Science Pty. Ltd., South Australia, Australia

PCT No. PCT/AU92/00535, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO93/07171, PCT Pub. Date Apr. 15, 1993

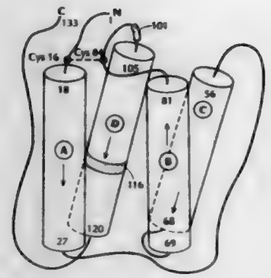
PCT Filed Oct. 7, 1992, Ser. No. 211,524

Claims priority, application Australia, Oct. 7, 1979, PK8742/91

Int. Cl.[6] A61K *38/21;* **C07K** *14/54;* **C12N** *15/24*

U.S. Cl. 424—85.2 **19 Claims**

1. A human IL-3 (hIL-3) variant having increased affinity, relative to native hIL-3, for the high-affinity IL-3 receptor, wherein the variations from native hIL-3 comprise the replacement of one or both of the residues Asp^{101} and Lys^{116} by other amino acids.



5,591,428
INTESTINE COLONIZING LACTOBACILLI

Stig Bengmark, Lund; Siv Ahrné, Bjärred; Göran Molin, and Bengt Jeppsson, both of Lund, all of Sweden, assignors to Probi AB, Lund, Sweden

Division of Ser. No. 989,830, Apr. 16, 1993, Pat. No. 5,474,932. This application Jun. 6, 1995, Ser. No. 470,483

Claims priority, application Sweden, Jul. 25, 1991, 9102238

Int. Cl.[6] C12N *1/20*

U.S. Cl. 424—93.45 **3 Claims**

1. A composition for prophylaxis or treatment of infections of the gastro-intestinal tract, comprising a conventional carrier and a strain of Lactobacillus having the ability to colonize human intestinal mucosa in vivo and having all the identifying characteristics of:

Lactobacillus plantatum 299 DSM 6595, or

Lactobacillus casei ssp rhamnosus 271 DSM 6594.

5,591,429
COMPOSITION CONTAINING 2-DEOXY-D-GLUCOSE AND *CANDIDA SAITOANA* AND A METHOD OF USE FOR THE BIOLOGICAL CONTROL OF POSTHARVEST DISEASES

Charles L. Wilson, and Ahmed E. Ghaouth, both of Frederick, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 26, 1993, Ser. No. 95,552

Int. Cl.[6] A01N *63/00;* **C12N** *1/16*

U.S. Cl. 424—93.51 **9 Claims**

1. A biologically pure culture of *Candida saitoana* having all of the identifying characteristics of deposited microorganism NRRL Y-21022, wherein the microorganism is antagonistic to fungal postharvest diseases of fruits and resistant to the fungicidal activity of 2-deoxy-D-glucose.

5,591,430
ISOLATED, MAGE-3 DERIVED PEPTIDES WHICH COMPLEX WITH HLA-A2 MOLECULES AND USES THEREOF

Alan Townsend; Judy Bastin, both of Headington, England; Thierry Boon-Falleur, Brussels, Belgium; Pierre van der Bruggen, Brussels, Belgium; Pierre Coulie, Brussels, Belgium, and Thomas Gajewski, Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, New York, N.Y., and The Chancellor, Masters and Scholars of the University of Oxford, Oxford, England

Continuation-in-part of Ser. No. 217,186, Mar. 24, 1994, Pat. No. 5,585,461. This application Jun. 17, 1994, Ser. No. 261,160

Int. Cl.[6] A61K *38/08;* **C07K** *14/82;* **C12N** *5/06*

U.S. Cl. 424—93.71 **6 Claims**

1. Isolated cytolytic T cell clone specific for a complex of HLA-A2 and a peptide selected from the group consisting of: SEQ ID NO: 2, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 10.

3. A method for treating a subject with a cancerous condition characterized by cancer cells which present complexes of HLA-A2 molecules and a peptide selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 10, comprising administering an amount of the isolated cytolytic T cell clone of claim 1 to said subject sufficient to lyse cancer cells.

5,591,431
ENHANCEMENT OF CLOT LYSIS

Charles S. Schasteen, University City; Kathleen C. Day, Kirkwood, and Rory F. Finn, Ballwin, all of Mo., assignors to G.D. Searle & Co., Chicago, Ill.

Filed Mar. 9, 1990, Ser. No. 495,008

Int. Cl.[6] A61K *37/02;37/54*

U.S. Cl. 424—94.64 **14 Claims**

1. A method for enhancing tPA mediated clot lysis which comprises administering a lysis enhancing amount of a peptide of the formula:

Ala—Gly—Arg—Ser—Leu—Asn—Pro—Asn—Arg—Val—Thr—Phe—Lys—Ala—Asn—Arg—Pro—Phe—Leu—Val—Phe—Ile,

with a lysis effective amount of tissue plasminogen activator.

5,591,432
ANTIBODY TO THE NEURAL CELL ADHESION MOLECULE AND METHODS OF USE

Duane D. Bronson, Chapel Hill, and John J. Hemperly, Apex, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 18,664, Feb. 17, 1993, abandoned. This application Mar. 16, 1995, Ser. No. 405,598

Int. Cl.[6] A61K *39/395;* **C12P** *21/04;* **C07K** *16/28;* **A61B** *17/04*

U.S. Cl. 424—130.1 **6 Claims**

1. Monoclonal antibody NCAM16.2.

5,591,433

ORAL ADMINISTRATION OF IMMUNOLOGICALLY ACTIVE BIOMOLECULES AND OTHER THERAPEUTIC PROTEINS

J. Gabriel Michael, and Allen Litwin, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Continuation of Ser. No. 994,932, Dec. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 719,160, Jun. 21, 1991, abandoned. This application Jan. 20, 1995, Ser. No. 405,694

Int. Cl.[6] A61K *39/00;9/16;13/00;45/00*

U.S. Cl. 424—184.1 25 Claims

1. An orally administrable therapeutic composition comprising an immunogen microencapsulated in the complete absence of organic solvents with a water based enteric coating wherein said immunogen has an immunotherapeutic effect against an allergen in a warm blood animal.

5,591,434

DNA SEQUENCE ENCODING SURFACE PROTEIN OF CRYPTOSPORIDIUM PARVUM

Mark C. Jenkins, Bowie; Ronald Fayer, Ellicott City, both of Md.; Michael Tilley, and Steven L. Upton, both of Manhattan, Kans., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 68,396, May 26, 1993, abandoned. This application Apr. 15, 1994, Ser. No. 229,393

Int. Cl.[6] A61K *39/002;39/395;* C07K *14/44;16/20;* C12N *15/30;1/21;* C12P *21/02;21/08*

U.S. Cl. 424—191.1 17 Claims

12. An isolated protein comprising the amino acid sequence of amino acids 1 through 158 of SEQ ID No. 2.

14. A method for protecting an animal against *Cryptosporidium parvum* comprising administering the isolated protein of claim 12 to said animal in an amount effective to elicit an immune response against *Cryptosporidium parvum* therein.

5,591,435

INSECTICIDAL OR INSECT BEHAVIORALLY ACTIVE PREPARATIONS FROM AROMATIC PLANTS

Florence Vaccarello-Dunkel, Bozeman, Mont.; David K. Weaver, Nova Scotia, Canada, and Theodore W. Weaver, III, Bozeman, Mont., assignors to The Research and Development Institute, Inc., Bozeman, Mont.

Continuation-in-part of Ser. No. 801,817, Dec. 6, 1991, Pat. No. 5,306,497. This application Apr. 25, 1994, Ser. No. 231,934

Int. Cl.[6] A01N *65/00*

U.S. Cl. 424—195.1 24 Claims

1. An insecticidal composition capable of killing insects, comprising an insecticidal amount of a composition made by a process of preparing a solid super critical CO_2 extract of dried leaves of mixtures of two or more aromatic plants selected from the group consisting of the mint family, the sagebrush genus Artemisia, *Geranium viscosissimum*, and *Balsamorhiza sagittata*; and vapors of said composition.

5,591,436

COMPOSITION FOR A DIETARY SUPPLEMENT FOR THE TREATMENT OF HEMORRHOIDS

Sam C. Pruthi, 2001 N. Ocean Blvd., #1602, Boca Raton, Fla. 33431

Filed Mar. 10, 1995, Ser. No. 401,856

Int. Cl.[6] A61K *35/78;47/00;9/08;9/20*

U.S. Cl. 424—195.1 6 Claims

1. A composition for a dietary supplement for use in treating the symptoms associated with hemorrhoids, comprising the following ingredients:

extract of Indian Barberry taken from boiled Indian Barberry plant parts in an amount of between 60% to 95% by weight of the composition;

powder of dried Nagkesar flowers in an amount of between 4.8% to 38% by weight of the composition; and

powder of dried Margosa Tree Leaves in an amount of 0.2% to 2% by weight of the composition.

5,591,437

COSMETIC OR PHARMECEUTICAL COMPOSITION CONTAINING A BLACK HOREHOUND EXTRACT

Frédéric Bonte; Alain Meybeck, both of Courbevoie, and Marc Dumas, Colombes, all of France, assignors to L.V.M.H. Recherche, Colombes Cedex, France

Division of Ser. No. 244,582, May 27, 1994, Pat. No. 5,514,374. This application May 16, 1995, Ser. No. 441,735

Claims priority, application France, Nov. 29, 1993, 91 14849

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 21 Claims

1. A method for treating accumulations of fat, comprising applying to areas of the body of a person suffering from accumulations of fat, of an effective amount for reducing said accumulations of fat of at least one extract of black horehound.

5,591,438

NATAMYCIN RECOVERY

Phillip T. Olson, Manitowoc; James R. Millis, Kohler, and Michael H. Reimer, Sheboygan, all of Wis., assignors to Bio-Technical Resources L.P., Manitowoc, Wis.

Continuation-in-part of Ser. No. 121,142, Sep. 17, 1993, abandoned, and Ser. No. 121,145, Sep. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 623,585, Dec. 7, 1990, abandoned. This application May 3, 1994, Ser. No. 237,473

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 20 Claims

1. A process for the recovery of natamycin from natamycin fermentation broth comprising in order the following steps:

(1) adding methanol to a natamycin feed stream comprising biomass, water, and at least 2 g/L of solid suspended natamycin to form an extraction medium, and maintaining the extraction medium at a temperature of 0°–25° C.;

(2) adjusting the pH of the extraction medium to 1.0 to 4.5 while maintaining the temperature at 0°–25° C. for 0.5–30 hours;

(3) removing solids from the extraction medium to form an extraction liquor;

(4) raising the pH of the extraction liquor to 6.0–9.0; and

(5) recovering the precipitated natamycin.

5,591,439

RECOMBINANT CYTOMEGALOVIRUS VACCINE

Stanley A. Plotkin, Paris, France; Robert P. Ricciardi, Glen Mills, and Ewa Gonczol, Rosemont, both of Pa., assignors to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Continuation of Ser. No. 17,130, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 666,471, Mar. 6, 1991, abandoned, which is a continuation of Ser. No. 328,406, Mar. 24, 1989, abandoned. This application Apr. 21, 1995, Ser. No. 426,673

Int. Cl.[6] A61K *39/12;39/235;39/245*

U.S. Cl. 424—199.1 11 Claims

1. A cytomegalovirus vaccine comprising:

a non-defective recombinant type 5 adenovirus genetically engineered to contain a Towne strain human cytomegalovirus envelope gB subunit gene, said gene being under the control of a sequence which controls expression of the gB gene product in vivo,

in a suitable pharmaceutical carrier.

5,591,440

HEPATITIS B VIRUS MUTANTS, REAGENTS AND METHODS FOR DETECTION

William F. Carman, Glasgow, Scotland; Richard H. Decker, Deerfield, Ill.; Lesley Wallace, Glasgow, Scotland; Larry T. Mimms, Lake Villa, and Larry R. Solomon, Mundelein, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 59,831, May 7, 1993. This application May 23, 1995, Ser. No. 447,591

Int. Cl.[6] A61K *39/29;* C12N *7/00;5/10*

U.S. Cl. 424—227.1 3 Claims

1. An isolated mutant hepatitis B virus, wherein the virus has a modified "a" determinant comprising an insertion of the amino acids Ash and Thr between positions 122 and 123 of the HBsAg sequence.

5,591,441

COMPOSITION FOR NONSPECIFIC CELLULAR IMMUNE STIMULATION

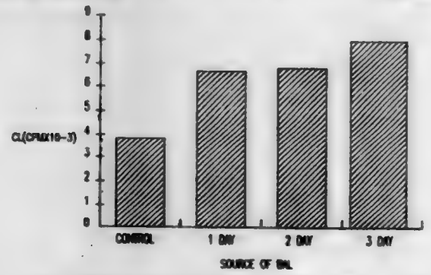
Anthony G. Gristina, Reston, Va., and Quentin N. Myrvik, Caswell Beach, N.C., assignors to Medical Sciences Research Institute, Herndon, Va.

Continuation of Ser. No. 885,301, May 18, 1992, Pat. No. 5,292,513. This application Feb. 16, 1994, Ser. No. 197,340

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.[6] A61K *9/14;* A61F *2/02;* A61L *9/04*

U.S. Cl. 424—401 11 Claims



1. A composition for enhancing non-specific cellular immunity, comprising:

a pharmaceutically acceptable carrier fluid which is injectable into a patient; and

an effective amount sufficient to prime macrophages in said patient for an enhanced oxidative burst within four days after administration of non-toxic, phagocytosable, biodegradable particles having a size ranging from 0.3 μm to 5.0 μm in diameter dispersed in said carrier fluid, said biodegradable particles lacking biocides and pharmaceuticals and consisting solely of materials selected from the group consisting of L-lactic acid/glycolic acid homopolymers, L-lactic acid/glycolic acid copolymers, gelatin particles, degradable starch complexes, hydrogels, hydroxybutyrate-hydroxyvalerate co-polymers, polyesters, chitin, cellulose, and mixtures thereof.

5,591,442

SKIN ANTISEPTIC AND HAND DISINFECTANT

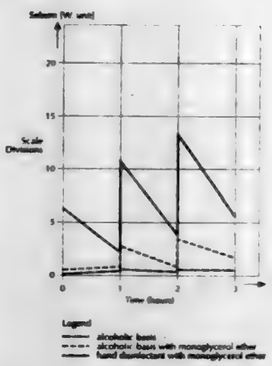
Karl H. Diehl, Norderstedt; Heinz Eggensperger, Hamburg; Peter Goroncy-Bermes, Ahrensburg; Peter Oltmanns, and Susanne Toefke, both of Hamburg, all of Germany, assignors to Reckitt & Colman Inc., Montvale, N.J.

Continuation of Ser. No. 979,715, Nov. 20, 1992, abandoned. This application Aug. 15, 1995, Ser. No. 513,420

Claims priority, application Germany, Dec. 9, 1991, 41 40 473.4

Int. Cl.[6] A61K *6/00;7/00*

U.S. Cl. 424—401 10 Claims



1. A method for cleaning and disinfecting the skin which comprises applying to the skin an aqueous antiseptic and disinfectant composition comprising from 15 to 85% by weight of an aliphatic C_1–C_6 alkyl alcohol and from 0.1 to 5% by weight of a glycerol 1-(C_5–C_{12} alkyl) ether.

5,591,443

SYNERGISTIC INSECTICIDE COMPOSITION

Ralph M. Heinicke, Louisville, Ky., assignor to Biotechnology Resources, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 980,176, Nov. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 652,868, Feb. 8, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 470,431

Int. Cl.[6] A01N *25/12*

U.S. Cl. 424—405 11 Claims

1. A relatively heat stable, up to about 85° C., lipophilic, phosphorous containing proteinaceous extract of kappa casein having neurotoxic, insecticidal properties when transferred across the membranes of insects, prepared from a kappa casein containing material with an extracting agent comprising a 50–80% solution of a C_1–C_4 alcohol or a C_2–C_4 acetone and recovering said extract, which is a calcium linked dimer with free sulfhydryl groups having a dimer molecular weight of about 38,000 Daltons.

5,591,444

USE OF AUTOLOGOUS DERMAL FIBROBLASTS FOR THE REPAIR OF SKIN AND SOFT TISSUE DEFECTS

William K. Bell, Jr., Cedar Grove, N.J., assignor to Isolagen Technologies, Inc., West Orange, N.J.

Filed Jul. 28, 1995, Ser. No. 508,773
Int. Cl.[6] A61F 2/02;2/10; A61M 31/00
U.S. Cl. 424—426 5 Claims

1. A method for the long-term augmentation of subcutaneous or dermal tissue in a human subject which comprises:

a) providing a suspension of autologous, passaged dermal fibroblasts, substantially free of immunogenic proteins;

b) identifying a defect that is susceptible to amelioration by augmentation of the subadjacent subcutaneous or dermal tissue; and

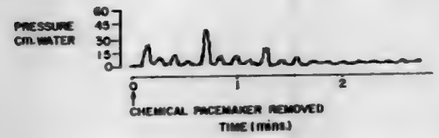
c) injecting an effective volume of the suspension into the subadjacent tissue so that the tissue is augmented.

5,591,445

SMOOTH MUSCLE CHEMICAL PACEMAKER

Michael Hoey, Shoreview, and Peter Gehlbach, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 372,587, Jan. 13, 1995, Pat. No. 5,498,254, which is a division of Ser. No. 987,748, Dec. 9, 1992, Pat. No. 5,383,873. This application Oct. 10, 1995, Ser. No. 540,456
Int. Cl.[6] A61F 2/02; A61K 9/22
U.S. Cl. 424—426 23 Claims



1. A porous biocompatible matrix comprising an interspersed neuroactive agent forming a shaped solid element, wherein the neuroactive agent has a therapeutic effect on a disorder associated with smooth muscle function in an organ peripheral to the central nervous system and wherein the concentration of the neuroactive agent is about 1 to 30% by weight of the element, so that localized drug delivery to those in need thereof is provided through a thin film of fluid which forms when the matrix is contacted with an organ surface in vivo.

5,591,446

METHODS AND AGENTS FOR THE PROPHYLAXIS OF ATOPY

Bodo C. Melnik, Gütersloh, and Gerd Plewig, München, both of Germany, assignors to Beiersdorf, A.G., Hamburg, Germany

Continuation of Ser. No. 7,171, Jan. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 503,821, Apr. 3, 1990, abandoned. This application Apr. 11, 1995, Ser. No. 420,334
Claims priority, application Germany, Apr. 4, 1989, 39 10 761.2; Apr. 4, 1989, 39 10 760.4; Sep. 14, 1989, 39 30 816.2
Int. Cl.[6] A61K 31/20
U.S. Cl. 424—439 14 Claims

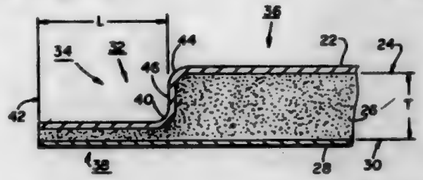
1. A method for atopy prophylaxis which comprises orally administering an atopy-prophylactic effective amount of an atopy-prophylaxis dietary supplement to a human child at a time before atopy is clinically manifest in the child and before conditioning and thorough maturation of a cellular immune system of the child is complete, the atopy-prophylaxis dietary supplement comprising at least one substance selected from the group consisting of γ-linolenic acid; and dihomo-γ-linolenic acid.

5,591,447

WOUND DRESSING HAVING A CONTOURED ADHESIVE LAYER

Ole R. Jensen, River Vale, N.J., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation of Ser. No. 760,167, Sep. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 590,684, Oct. 1, 1990, abandoned. This application Aug. 14, 1995, Ser. No. 514,905
Int. Cl.[6] A61F 13/00
U.S. Cl. 424—443 11 Claims



1. An improved wound dressing comprising an adhesive layer which in use contacts a wound and surrounding normal skin; and a thin, flexible, polymeric backing layer covering one side of said adhesive layer; said adhesive layer consisting essentially of from about 50 to 70% by weight of a water soluble or swellable hydrocolloid, or a mixture of such hydrocolloids, selected from the calcium carboxymethylcellulose, pectin, gelatin, high molecular weight carbowax, carboxypolymethylene, and polyvinyl alcohol, with said hydrocolloid or mixtures of hydrocolloids being dispersed in from about 30 to 50% by weight of a water-insoluble, viscous elastomer selected from the group consisting of polyisobutylene, natural rubber, silicone rubber, arcylonitrile rubber, and polyurethane rubber; said dressing including a body portion in which the thickness of adhesive layer exceeds 0.5 mm.; and a protective release layer removably attached to and covering the side of said adhesive layer opposite from said backing layer; wherein the improvement comprises

said dressing including a wide peripheral flange of reduced thickness extending outwardly beyond said body portion a distance of at least 10 mm and in which the thickness of said adhesive layer of said flange does not exceed about 0.5 mm, said flange being of substantially uniform thickness throughout its full extent.

5,591,448

ANTI-VIRAL THERAPEUTIC COMPOSITION

Slobodan Tepic, AO-Forschungsinstitut AISF Research Institute Clavadelerstrasse, CH-7270 Davos, Switzerland

Filed Nov. 21, 1994, Ser. No. 345,465
Int. Cl.[6] A61K 9/127
U.S. Cl. 424—450 7 Claims



1. A therapeutic composition of matter for use against viruses possessing an outer lipid envelope and an inner viral core, wherein said therapeutic composition is in the form of a liposome complex with a non-antigenic exterior, said therapeutic composition comprising:

a large liposome with an outer membrane and an aqueous fluid-filled interior;

a plurality of viral receptor proteins capable of reacting with the outer lipid envelope of the virus, wherein said viral receptor proteins are incorporated in said large lipid membrane;

a plurality of small liposomes, each with an outer membrane and an aqueous fluid-filled interior, wherein said outer membrane is substantially free of antigens except for a single first link protein; and

a plurality of second link proteins incorporated in said large lipid membrane, wherein each first link protein in a small lipid membrane is linked to a second link protein in the large lipid membrane so that most of the surface of the large lipid membrane is covered by the small lipid membranes leaving gaps large enough for the virus to pass between the small liposomes;

wherein said therapeutic composition is capable of engulfing said viruses by allowing the viruses to travel between the small liposomes and to for the viral lipid envelope to interact with the viral receptor protein and fuse with the large liposome membrane so that the core of the virus is trapped in the interior of the large liposome.

5,591,449

VESICLES, AND COSMETIC OR PHARMACEUTICAL COMPOSITIONS CONTAINING VESICLES, BOUNDED BY ONE OR MORE LAMELLAE COMPOSED OF A LIPID PHASE CONTAINING FLUORINE-CONTAINING, POLYGLYCEROLATED AMPHILIC SULPHUR COMPOUNDS

Eric Bolleau, Saint Maurice, and Claude Mahieu, Paris, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 99,488, Jul. 27, 1993, Pat. No. 5,459,165. This application Apr. 14, 1995, Ser. No. 502,463
Claims priority, application France, Jul. 29, 1992, 92 09404
Int. Cl.[6] C07C 323/12; H01F 17/42; A61K 9/127
U.S. Cl. 424—450 10 Claims

1. Cosmetic or pharmaceutical composition containing, dispersed in an aqueous dispersion phase, vesicles bounded by one or more lamellae composed of a lipid phase containing at least one compound of formula (I):

$$R_f—(CH_2)_m—S—G_n—H \quad (I)$$

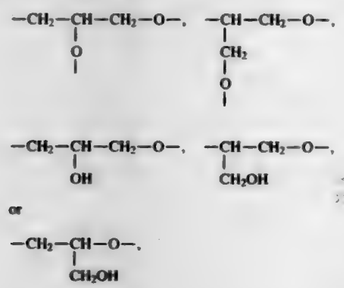
in which:

R_f denotes a linear C_6 to C_{10} perfluoroalkyl radical,

m represents 2;

n represents a statistical value or integer between 2 and 3;

G represents a unit chosen from:



each of the oxygen atoms being linked to a hydrogen atom or to another unit G.

5,591,450

L-CARNITINE SALT AND COMPOSITIONS CONTAINING SAME

Claudio Cavazza, and Paolo Cavazza, both of Rome, Italy, assignors to Advantgarde S.p.A., Rome, Italy

Filed Jun. 7, 1995, Ser. No. 473,208
Claims priority, application Italy, Jun. 28, 1994, RM94A0396
Int. Cl.[6] A61K 9/14;9/20;9/48;31/225
U.S. Cl. 424—451 8 Claims

1. L-carnitine glycolate.

5,591,451

OIL-BASED TABLETING METHOD

Pramod K. Gupta, Garnet; Francisco J. Alvarez, Lindenhurst, and Susan J. Sonia, Evanston, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 110,916, Aug. 24, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,693
Int. Cl.[6] A61K 9/20
U.S. Cl. 424—464 20 Claims

1. A pharmaceutical tablet for the systemic, sustained-release delivery of a therapeutically active compound prepared by a process comprising the steps of:

(a) dispersing the therapeutically active compound in an oil,

(b) mixing the compound/oil dispersion with a carrier silica; and

(c) forming the dispersion/carrier mixture into a tablet;

wherein the oil is present in an amount of between 5% and about 20% by weight and provides a prolonged or sustained release of compound from the tablet.

5,591,452

CONTROLLED RELEASE FORMULATION

Ronald B. Miller, Basel, Switzerland; Stewart T. Leslie, Cambridge, England; Sandra T. A. Malkowska, Cambridgeshire, England; Kevin J. Smith, Cambridge, England; Walter Wimmer, Limburg, Germany; Horst Winkler, Linter, Germany; Udo Hahn, Neuenhausen, Germany, and Derek A. Prater, Cambridge, England, assignors to Euro-Celtique, S.A., Luxembourg, Luxembourg

Filed May 10, 1994, Ser. No. 241,129
Claims priority, application Germany, May 10, 1993, 43 15 525.1; United Kingdom, Nov. 23, 1993, 9324045; Mar. 9, 1994, 9404544; Mar. 14, 1994, 9404928
Int. Cl.[6] A61K 9/22;9/26
U.S. Cl. 424—468 39 Claims

1. A controlled release oral pharmaceutical preparation suitable for dosing every 24 hours containing from about 50 mg to about 800 mg of tramadol or a pharmaceutically acceptable salt thereof, calculated as hydrochloride salt, in a controlled release matrix, the matrix comprising from about 1 to about 80% w/w of one or more hydrophilic or hydrophobic polymers, and having a dissolution rate in vitro when measured using the Ph. Eur. Paddle Method at 100 rpm in 900 ml 0.1N hydrochloric acid at 37° C. and using UV detection at 270 nm, from about 0 to about 50% tramadol released after 1 hour; from about 0 to about 75% tramadol released after 2 hours; from about 3 to about 95% tramadol released after 4 hours; from about 10 to about 100% after 8 hours; from about 20 to about 100% tramadol released after 12 hours; from about 30 to about 100% tramadol released after 16 hours; from about 50 to about 100% tramadol released after 24 hours; and greater than 80% tramadol released after 36 hours, by weight.

5,591,453

INCORPORATION OF BIOLOGICALLY ACTIVE MOLECULES INTO BIOACTIVE GLASSES

Paul Ducheyne, Rosemont, Pa.; Shulamith Radin, Voorhees, N.J., and Erick M. Santos, Philadelphia, Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 406,847, Mar. 17, 1995, which is a continuation-in-part of Ser. No. 281,855, Jul. 27, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 477,585

Int. Cl.[6] A61F *13/00*; A61K *47/02*

U.S. Cl. 424—484 **13 Claims**



1. A method for preparing a controlled-release carrier comprising silica-based glass having a porous matrix and biologically active molecules incorporated in said matrix comprising the steps of:

a) combining a silicon alkoxide precursor with deionized water to form a first mixture;

b) adding acid to form a second mixture having a pH in the range of from about 1 to about 4.5;

c) adding a calcium salt to said second mixture while stirring to form a third mixture;

d) adding said biologically active molecules to said third mixture while maintaining the pH within the range of from about 1 to about 4.5 to form a fourth mixture, said fourth mixture having a water/precursor molar ratio of from about 6:1 to about 20:1;

e) allowing the fourth mixture to form a gel at a temperature o from about 0° C. to about 40° C.

e) aging the gel at a temperature of from about 0° C. to about 40° C. for from about one day to about four weeks; and

f) drying the aged gel at a temperature of from about 15° C. to about 40° C. until a weight loss of from about 50 percent to about 80 percent is observed in said gel.

5,591,454

METHOD FOR LOWERING BLOOD GLUCOSE

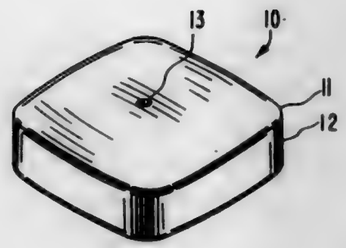
Anthony L. Kuczynski, Mountain View; Atul D. Ayer, and Patrick S.-L. Wong, both of Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 180,409, Jan. 11, 1994, which is a continuation-in-part of Ser. No. 650,822, Jan. 22, 1991, Pat. No. 5,545,413, which is a division of Ser. No. 402,314, Sep. 5, 1989, Pat. No. 5,024,843. This application May 16, 1995, Ser. No. 442,040

Int. Cl.[6] A61K *9/10*; *9/16*; *9/24*; *47/32*

U.S. Cl. 424—486 **3 Claims**

1. A method for treating hyperglycemia in a patient, wherein the method comprises administering to the patient a dosage form comprising 2 mg to 750 mg glipizide that is administered at a therapeutically effective dose of 10 ng to 25 mg over 24 hours from the dosage form comprising 1 mg to 300 osmagent and a hydrogel selected from the group consisting of poly(ethylene oxide) having a 4,000,000 to 8,000,000 molecular weight and a carboxymethylcellulose having a 200,000 to 1,000,000 molecular weight to the patient to produce the intended effect in the patient.



5,591,455

WET POWDER FILM-FORMING COMPOSITIONS

Charles A. Signorino, King of Prussia, Pa., assignor to Warner-Jenkinson Company, Inc., St. Louis, Mo.

Division of Ser. No. 73,795, Jul. 27, 1993, which is a continuation-in-part of Ser. No. 630,815, Dec. 20, 1990, abandoned. This application Feb. 1, 1995, Ser. No. 382,283

Int. Cl.[6] A61K *9/16*; *9/50*

U.S. Cl. 424—490 **14 Claims**

1. A wet powder, edible, clear, film-forming composition for use in coating tablets and capsules with a clear coating comprising a clear, film-forming, water soluble or water-dispersible, edible polymer and between approximately 1% and approximately 30% by weight of water, said composition being formed by applying water onto said polymer in atomized form and said composition being capable of forming a stable suspension upon dilution with additional water without the formation of fish eyes.

5,591,456

MILLED NAPROXEN WITH HYDROXYPROPYL CELLULOSE AS A DISPERSION STABILIZER

Nancy M. Franson, Collegeville, and Donald R. Snyder, Limerick, both of Pa., assignors to NanoSystems L.L.C., Collegeville, Pa.

Filed Feb. 10, 1995, Ser. No. 386,790

Int. Cl.[6] A61K *9/18*; *9/14*

U.S. Cl. 424—494 **11 Claims**

1. Particles consisting essentially of an NSAID having hydroxypropyl cellulose adsorbed on the surface thereof in an amount sufficient to maintain an average particle size of less than about 1000 nm, wherein said NSAID is selected from nabumetone, tiaramide, proquazone, bufexamac, flumizole, epirazole, tinoridine, timegadine, dapsone, aspirin, diflunisal, benorylate, fosfosal, diclofenace, alclofenac, fenclofenac, etodolac, indomethacin, sulindac, tolmetin, fentiazac, tilomisole, carprofen, fenbufen, flurbiprofen, ketoprofen, oxaprozin, suprofen, tiaprofenic acid, ibuprofen, naproxen, fenprofen, indoprofen, piroprofen, flufenamic, mefenamic, meclofenamic, niflumic, oxyphenbutazone, phenylburzone, apazone and feprazone, piroxicam, sudoxicam, isocam and tenoxicam.

5,591,457

METHOD OF INHIBITING THE AGGREGATION OF BLOOD PLATELETS AND STIMULATING THE IMMUNE SYSTEMS OF A HUMAN

Anthony E. Bolton, Sheffield, England, assignor to Vasogen Inc, Etobicoke, Canada

Continuation of Ser. No. 941,327, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 832,798, Feb. 7, 1992, abandoned. This application Dec. 1, 1994, Ser. No. 352,802

Int. Cl.[6] A01N *1/00*; A61K *33/00*; A61L *2/10*

U.S. Cl. 424—613 **9 Claims**

1. A method of treating Raynaud's Disease in a human patient with Raynaud's Disease, which comprises:

selecting an aliquot of from about 0.01 ml to about 400 ml of human blood of a type compatible with the blood of a human patient with Raynaud's Disease;

contacting the selected blood aliquot simultaneously with a blood platelet aggregation-inhibiting effective amount of ozone gas in admixture with oxygen gas, and ultraviolet radiation, while maintained at a temperature in the range from about 37° C. to about 43° C. for a period for about 0.5 minutes to about 10 minutes;

and administering the blood aliquot so treated to the human patient with Raynaud's Disease.

5,591,458

APPARATUS FOR MANUFACTURING GRANULATED MATERIAL

Reinhard Froeschke, Weinstadt-Beutelsbach, and Axel König, Stuttgart, both of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

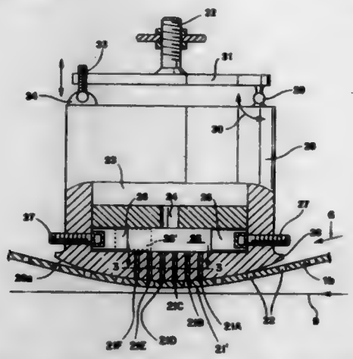
PCT No. PCT/EP94/02607, § 371 Date Jul. 24, 1995, § 102(e) Date Jul. 24, 1995, PCT Pub. No. WO95/09045, PCT Pub. Date Apr. 6, 1995

PCT Filed Aug. 5, 1994, Ser. No. 446,780

Claims priority, application Germany, Sep. 28, 1993, 43 32 952.7

Int. Cl.[6] B29B *9/10*

U.S. Cl. 425—6 **20 Claims**



1. Apparatus for manufacturing granulated material from a free-flowing viscous substance that is made into drops which solidify or gel, comprising:

a vessel charged with the free-flowing substance and having a discharge opening arrangement for discharging the substance; and

a belt perforated by openings and arranged to move across the discharge opening arrangement so that the belt openings periodically come into alignment with the discharge opening arrangement to open the latter and permit the free-flowing substance to flow therethrough;

the discharge opening arrangement comprising a plurality of rows of vessel openings, each row extending transversely of a longitudinal direction of belt travel across the vessel, the rows being spaced apart in the longitudinal direction of belt travel, the vessel openings of one row being offset by a transverse distance with respect to the vessel openings of at least one other row, the distance being such that any part of a belt opening disposed transversely outwardly with respect to a transverse edge of a vessel opening of the one row at the instant it passes the other row must travel across an opening of the other row.

5,591,459

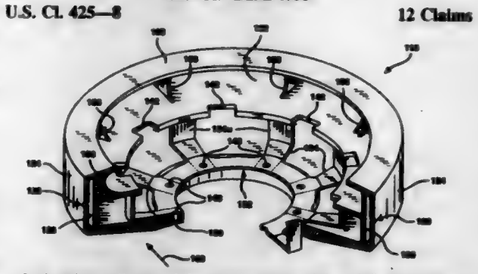
APPARATUS FOR REINFORCING A FIBER PRODUCING SPINNER

James G. Snyder, Newark, Ohio, assignor to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Feb. 28, 1995, Ser. No. 395,542

Int. Cl.[6] B29B *9/00*

U.S. Cl. 425—8 **12 Claims**



1. A spinner for receiving molten material and for generating fibers of said molten material by means of rotation of said spinner which comprises:

a spinner body having a bottom wall, an outer sidewall extending upwardly from the periphery of said bottom wall around a center of said spinner body, said outer sidewall having orifices through which molten material flows, and a generally horizontal flange extending inwardly from said outer sidewall; and

a reinforcement secured to said bottom wall of said spinner and engaging said generally horizontal flange.

5,591,460

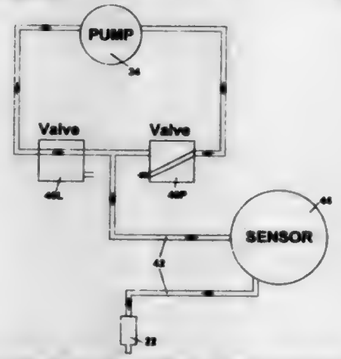
APPARATUS FOR AUTOMATED WINDSHIELD REPAIR

Kerry A. Wanstrath, and Daniel M. Wanstrath, both of 434 Turner Dr., Durango, Colo. 81301

Filed Mar. 28, 1995, Ser. No. 411,985

Int. Cl.[6] B32B *35/00*

U.S. Cl. 425—12 **26 Claims**



1. Apparatus for use in repairing a damaged area of a glass windshield by filling the damaged area with a repair material, said

apparatus comprising a reservoir means for holding a liquid repair material in communication with an interior part of the damaged area;

first pump means for applying vacuum to said damaged area,

second pump means for applying pressure to said repair material and to said damaged area,

control means for changing between application of vacuum and pressure by said pump means without operator intervention,

condition responsive means for generating a first signal indicative of the need for energizing of the first pump means for application of said vacuum at said damaged area and an alternative second signal indicative of the need for energizing of the second pump means for application of said pressure at said damaged area,

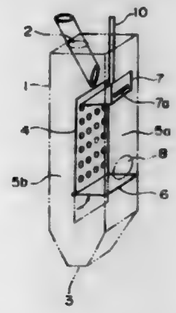
said control means being responsive to said condition responsive means to apply at least one cycle of applying vacuum for a controlled period of time and then applying pressure for a succeeding controlled period of time.

5,591,461

FORMING APPARATUS FOR A POWDERY SAMPLE

Takashi Komatsu; Hiroomi Uehara, and Syuji Shinkai, all of Saitama-ken, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1995, Ser. No. 385,506
Claims priority, application Japan, Feb. 8, 1994, 6-014478
Int. Cl.[6] B29C *43/00*; G01N *33/02*
U.S. Cl. 425—169 **4 Claims**



1. An apparatus for forming a powdery sample comprising:

a vertically elongated housing which has a sample inlet port at an upper portion thereof, a sample discharge port at a lower portion thereof, and a screen plate dividing an interior of the housing into longitudinal compartments;

a gate for opening and closing a bottom portion of one of said compartments;

a press member vertically movable in said compartment and cooperating with said gate for pressing the sample; and

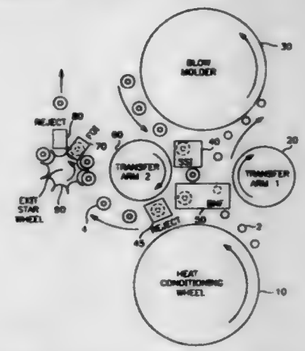
a window formed in a side wall of said compartment opened and closed by said gate.

5,591,462

BOTTLE INSPECTION ALONG MOLDER TRANSPORT PATH

Donald T. Darling, Palm Beach Gardens; Trent G. Francis; Brad L. Williams, both of Boynton Beach; Harold L. Dewar, Indialantic; David B. Delater, Stuart; Daniel B. Gold, West Palm Beach; Jerry Pentel, Tequesta, all of Fla.; Paul L. Wright, Marrieta, Ga.; Peter J. Sands, Leeds, and Phillip Cochran, Bessemer, both of Ala., assignors to Pressco Technology, Inc., Solon, Ohio

Filed Nov. 21, 1994, Ser. No. 343,015
Int. Cl.[6] B29C *49/78*
U.S. Cl. 425—173 **32 Claims**



20. A container inspection system in combination with a container manufacturing system, comprising:

molding means operable to form a container from a heated preform, the container having a top seal means on a neck formed with an opening, and a base;

transfer means positioned after the molding means along a transport path, and being operable to move containers away from molding means along the transport path toward an exit means, at least one of the molding means and the transfer means having a plurality of container engaging elements such that successive ones of the containers are engaged by different ones of the container engaging elements;

an optical inspection system disposed along the transport path between the molding means and the exit means, the optical inspection system being operable to capture an image of at least part of the container and being coupled to a processor for analyzing the image for defects in the container, the processor being operable to correlate defects detected in the container to particular ones of said container engaging elements.

5,591,463

APPARATUS FOR THE THERMOFORMING AND STACKING OF HOLLOW OBJECTS INCORPORATING A BASE FORMED FROM THERMOPLASTICS SHEET MATERIAL

Pietro Padovani, Verona, Italy, assignor to ISAP OMV Group S.p.A., Verona, Italy

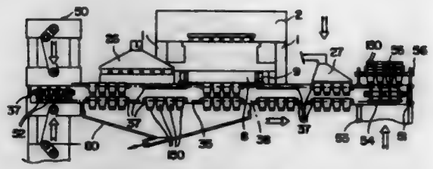
Continuation of Ser. No. 937,362, Aug. 28, 1992, abandoned. This application Mar. 23, 1994, Ser. No. 216,922
Claims priority, application Italy, Feb. 3, 1992, VR92A0012
Int. Cl.[6] B29C *51/20*
U.S. Cl. 425—359 **13 Claims**

1. Apparatus for thermoforming of hollow objects from a sheet of thermoplastic material, the apparatus comprising:

a support frame,

a male die mounted on the support frame,

a double female mold having female cavities thereof facing the male die to effect alternate transverse movements with respect to the male die between an operation position in which one half of the female mold is located in front of the male die and the other half is in an easily accessible side discharge position away from the male die;



driving means for controlling the alternate transverse movements of the double female mold;

a stepwise sheet feeder arranged to feed a sheet of thermoformable heated material between the male die and the double female mold;

actuation means to effect closing and opening movement between the male die and the double female mold when one half of the female mold is in said operation position, in a direction normal to the alternate transverse movements and in sequential synchronization therewith, thereby forming hollow objects;

a cutting device having control means for actuation during mating engagement between the male die and the female mold to cut out an object from the sheet of thermoformable material;

a stepwise endless chain conveyor having a sequence of plate formers each of which receives the object in one forming operation, the chain conveyor being arranged to operate in synchronization with the driving means;

at least one processing pick-up head capable of lifting a plurality of objects alternately from each half of the double female mold when in the discharge position and transferring the objects thus lifted into a respective plate former on the conveyor; and

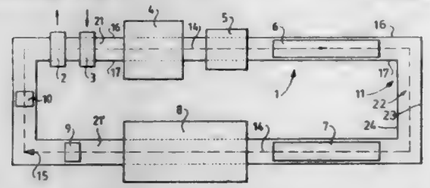
at least one processing station located along the conveyor for carrying out sequential processing each time of all of the objects while loaded in a plate former on the conveyor in synchronization with said driving means.

5,591,464

MOLDING PLANT FOR CONVEYING MOLDS FOR CHOCOLATE OR SIMILAR PRODUCTS

Cerboni Renzo, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Oct. 19, 1994, Ser. No. 325,890
Claims priority, application Italy, Oct. 21, 1993, MI93A2236
Int. Cl.[6] B29C *39/06*
U.S. Cl. 425—453 **20 Claims**



1. A molding plant for molding a product such as chocolate, said plant comprising:

a plurality of molds for holding the product to be molded, at least one of said molds having a lateral midline and a transverse midline and at least one lateral stud extending downwardly from the region of said lateral midline and at least one transverse stud extending downwardly from the region of said transverse midline;

at least one processing station for processing the product in said molds; and

a processing path; wherein:

said processing path has:

a first portion comprising a first set of parallel guides and a first drive shaft parallel to and positioned between said first set of parallel guides;

a second portion transverse to said first portion, said second portion of said processing path comprising a second set of parallel guides and a second drive shaft positioned between and parallel to said second set of parallel guides and transverse to said first drive shaft;

one of said first and second portions extends through said at least one processing station;

said first drive shaft conveys said molds along said first portion of said processing path in a direction substantially parallel to said lateral midline when said at least one lateral stud engages said first drive shaft;

said second drive shaft conveys said molds along said second portion of said processing path in a direction substantially parallel to said transverse midline when said at least one transverse stud engages said second drive shaft;

said at least one lateral stud is positioned such that when said at least one lateral stud engages said first drive shaft said at least one transverse stud is spaced from said first drive shaft; and

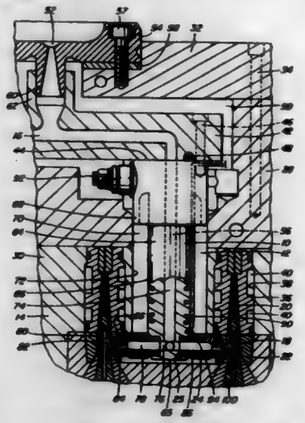
said at least one transverse stud is positioned such that when said at least one transverse stud engages said second drive shaft said at least one lateral stud is spaced from said second drive shaft.

5,591,465

SIDE GATED INJECTION MOLDING APPARATUS WITH RADIALLY MOUNTED GATE INSERTS

Denis L. Babin, Acton, Canada, assignor to Mold-Masters Limited, Georgetown, Canada

Filed Jun. 5, 1995, Ser. No. 463,921
Claims priority, application Canada, May 15, 1995, 2149385
Int. Cl.[6] B29C *45/20*
U.S. Cl. 425—549 **3 Claims**



1. In a side gated injection molding apparatus having at least one heated nozzle located in a mold, the at least one heated nozzle having a rear end, a front portion with a front end and a generally cylindrical outer surface extending through a central opening in the mold, the central opening in the mold having a generally cylindrical inner surface with an insulative air space provided between the outer surface of the front portion of the at least one heated nozzle and the inner surface of the central opening in the mold, the at least one heated nozzle having a melt channel extending therethrough to convey melt to fill a plurality of cavities spaced in the mold around the central opening, the melt channel having a central portion extending from the rear end of the at least one heated nozzle and a plurality of radial portions branching outwardly from the central portion adjacent the front end of the front portion of the at least one heated nozzle, each radial portion of the melt channel extend-

ing in alignment with a respective gate extending in the mold to one of the cavities, a plurality of spaced side gate seals, each having an inner end, an outer end, and a bore therebetween, the inner end being seated in the front portion of the at least one heated nozzle with the side gate seal extending outwardly across the insulative air space in alignment between a respective radial portion of the melt channel and a respective gate to convey melt outwardly from the melt passage to the gate to fill the cavity, the improvement wherein;

each cavity extends partially in a cavity insert mounted in the mold outwardly adjacent the central opening in the mold and partially in a gate insert mounted forwardly against the cavity insert, each side gate seal has an outer end extending a sufficient distance outwardly past the inner surface of the central opening to provide room for cooling conduits extending between the cavities and the central opening, each gate insert has a radial opening extending to the respective gate therein, each gate insert being radially mountable in and radially removable from a position wherein the outer end of a respective side gate seal extends into the radial opening in the inner surface in alignment with the gate therein.

5,591,466

APPARATUS FOR MAKING MULTI-SEGMENT PLASTIC COMPONENTS

Ulrich Bressler, Manchester, N.H., and Michael Brümmer, Landenbach, Germany, assignors to Freudenberg-NOK General Partnership, Plymouth, Mich.

Division of Ser. No. 182,571, Jan. 14, 1994, Pat. No. 5,435,960. This application May 1, 1995, Ser. No. 432,217

Int. Cl.[6] B29C *33/52*

U.S. Cl. 425—577 **5 Claims**



1. A core ring assembly for use in manufacturing a molded plastic component comprising:

a female core ring; and

a complementary male core ring for insertion via a rotating motion into said female ring such that said female and said male core rings are joined together to form a core ring assembly.

5,591,467

CONTAMINATION-RESISTANT ANIMAL FEEDSTUFFS

Bobby J. Bland, Buford; Kurt E. Richardson, Hoschton, both of Ga., and Jose E. Ferrer, Coral Gables, Fla., assignors to Anitox Corporation, Buford, Ga.

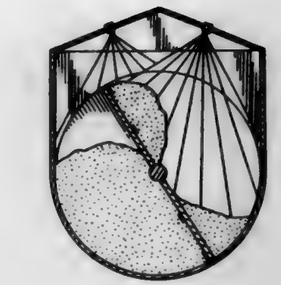
Division of Ser. No. 988,600, Dec. 30, 1992, Pat. No. 5,585,976. This application May 31, 1995, Ser. No. 455,720

Int. Cl.[6] A23K *1/00*; A23L *3/3463*

U.S. Cl. 426—2 **26 Claims**

8. A method of raising livestock comprising:

feeding livestock a diet consisting essentially of formaldehyde-treated which is substantially free of Salmonella and *E. coli* and is resistant to contamination by Salmonella and *E. coli*, said feedstuff comprising 100–1000 grams of hydrolyzable formaldehyde adduct per ton of feed distributed with a coefficient of variation of 7% or less and 1–20% water; wherein resistance to contamination means that challenge with 1000 colonies of Salmonella or *E. coli* per gram of feed results in 1 colony or less per 25 grams of feed after 24 hours incubation at 25° C.



5,591,468

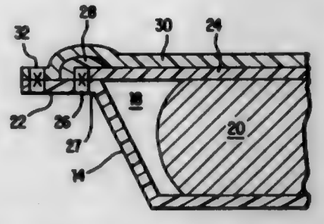
METHOD OF SHRINKING FILM TO APPLY LIDSTOCK AND PACKAGE MADE THEREFROM

Henry W. Stockley, III, and Art T. Krebs, both of Spartanburg, S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Jun. 6, 1995, Ser. No. 470,802

Int. Cl.[6] B65B *11/58;53/02*; B65D *51/18;85/50*

U.S. Cl. 426—106 **9 Claims**



1. A method for making a package for a product, comprising:

providing a support member, said support member having a cavity for receiving the product and a flange;

sealing an oriented, heat shrinkable, first film to an inner periphery of the flange, thereby forming a first seal;

trimming the oriented, first film outboard of the first seal, thereby forming an excess portion of the first film outboard of the first seal;

subjecting the oriented, first film to a sufficiently high temperature to shrink the excess portion and thereby expose a sealing area on the outer periphery of the flange; and

sealing a second film to the sealing area on the outer periphery of the flange, forming a second seal and whereby the second film encloses the first film.

5,591,469

PROCESS AND SYSTEM FOR REGULATING THE FAT CONTENT OF MILK AND CREAM

Karl-Heinz Zettler, Oelde, Germany, assignor to Westfalia Separator Aktiengesellschaft, Oelde, Germany

PCT No. PCT/EP93/03162, § 371 Date Jul. 10, 1995, § 102(e) Date Jul. 10, 1995, PCT Pub. No. WO94/16571, PCT Pub. Date Aug. 4, 1994

PCT Filed Nov. 11, 1993, Ser. No. 495,529

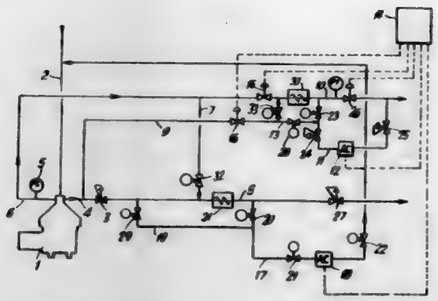
Claims priority, application Germany, Jan. 27, 1993, 43 02 165.4

Int. Cl.[6] A23C *9/00*; G01N *33/00*

U.S. Cl. 426—231 **4 Claims**

1. A process for controlling fat content in standardized milk and standardized cream, comprising the steps of:

separating whole milk in a centrifuge into high-fat cream and non-fat milk;



controlling the high-fat cream leaving the centrifuge to maintain the composition thereof constant;

controlling the non-fat milk leaving the centrifuge to maintain the composition thereof constant;

adding a first portion of the constant composition high-fat cream to a first portion of the constant composition non-fat milk to produce standardized milk;

adding a second portion of the constant composition non-fat milk to a second portion of the constant composition high-fat cream to produce standardized cream; and

regulating the fat content of the standardized cream by controlling the amount of the second portion of the constant composition non-fat milk added to the second portion of the constant composition high-fat cream.

5,591,470

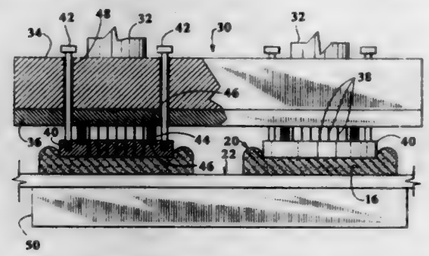
METHOD AND APPARATUS FOR DOCKING DOUGH

James Bartley, Alsip, Ill., assignor to A.M. Manufacturing Company, Dolton, Ill.

Filed Oct. 12, 1995, Ser. No. 542,454

Int. Cl.[6] A21C *11/12*

U.S. Cl. 426—391 **15 Claims**



11. A method of perforating a plurality of dough pieces comprising the steps of:

providing a docking station having a carrier plate supported by at least one retractable piston, at least one pin plate mounted to the carrier plate and having a multitude of pins, and at least one stripper plate through which the multitude of pins penetrate, the stripper plate being resiliently mounted to and below the carrier plate and the pin plate;

positioning at least one piece of dough having a relatively flat center portion and a circumferential rim below said at least one stripper plate such that the stripper plate overlies said flat center portion;

moving the pin plate so that the pins penetrate the relatively flat center portion without perforating the circumferential rim; and

retracting the pin plate and pins while maintaining the at least one stripper plate against the at least one piece of dough to prevent movement of the dough in a retraction direction by the pins.

5,591,471

PRODUCTION METHOD OF PUFFED FOOD AND PUFFED FOOD DOUGH

Shichiro Niwano, 6-10, Harukaze-cho, Koshien, Nishinomiya, Hyogo, and Norifumi Idomoto, Nabari, Japan, assignors to Shichiro Niwano, Hyogo, Japan

PCT No. PCT/JP94/01100, § 371 Date Mar. 6, 1995, § 102(e) Date Mar. 6, 1995, PCT Pub. No. WO95/01731, PCT Pub. Date Jan. 19, 1995

PCT Filed Jul. 6, 1994, Ser. No. 397,162

Claims priority, application Japan, Jul. 7, 1993, 5-193061

Int. Cl.[6] A21D *2/36*; A23L *1/0522*

U.S. Cl. 426—440 **10 Claims**

1. A puffed food dough comprising soybean protein, starch and dietary fiber in a ratio by weight of from 1:0.2 to 0.8: 0.01 to 0.4, respectively, and from 0.5 to 5 parts by weight of a vegetable foaming agent and from 150 to 300 parts by weight of water per 100 parts by weight in total of the soybean protein, starch, and dietary fiber. The dough does not contain a chemical leavening agent or yeast.

5,591,472

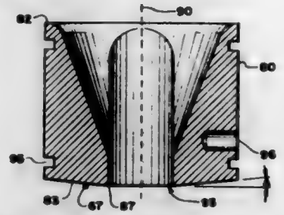
DOUGH CUT-OFF METHOD AND APPARATUS

Donald L. Cummins, deceased, late of Mechanicsville, Va., assignor to Cummins Eagle, Inc., Ashland, Va.

Continuation-in-part of Ser. No. 297,123, Aug. 29, 1994, Pat. No. 5,443,854. This application Aug. 17, 1995, Ser. No. 516,170

Int. Cl.[6] A21D *6/00*; A23P *1/00*

U.S. Cl. 425—503 **10 Claims**



1. Cut-off apparatus for a dough-handling machine comprising:

a) nozzle means comprising a sidewall surroundingly defining an internal channel and extending upon a center axis between an upper rim extremity and a lower constriction surface having a downwardly directed extrusion orifice centered therein, said orifice having a perimeter configuration that is oblong about a line of elongation, said constriction surface being tapered at least in portion downwardly and inwardly from said side wall to said orifice,

b) a taut cutting wire aligned in a direction parallel to said line of elongation and configured to move in a reciprocating manner across said orifice in a path transverse to said line of elongation and in sliding contact with the tapered portion of said constriction surface, and

c) means for moving said wire in said reciprocating manner.

5,591,473

PROTEIN-POLYSACCHARIDE COMPLEX COMPOSITION, METHOD OF PREPARATION AND USE

Blaise McArdle, R.R. 2, Mount Vernon, Me. 04352

Continuation-in-part of Ser. No. 263,001, Jun. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 89,268, Jul. 8, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 523,162

Int. Cl.[6] A23J *1/12;3/14*; A23L *1/053;1/0532*

U.S. Cl. 426—573 **17 Claims**

1. A protein-polysaccharide complex composition comprising:

between about 90% to 99.5% by weight of a water-soluble polysaccharide impregnated with between about 10% to 0.5% by weight of a substantially water-insoluble protein.

5,591,474

METHOD OF PREPARATION OF CHOCOLATE CRUMB

Van Miller, R.R. # 2, Brisbane, Erin Ontario, Canada

Filed Dec. 29, 1995, Ser. No. 581,133
Int. Cl.[6] A23G *1/00*
U.S. Cl. 426—580 **14 Claims**

1. A method of preparing chocolate crumb which is substantially anhydrous, wherein the prepared chocolate crumb will have a final analysis, expressed in weight units, as follows:

dried milk solids	23 to 34
sugar	50 to 55
anhydrous cocoa butter	8 to 12
anhydrous cocoa liquor	4 to 8
additional anhydrous butter fat	0 to 10
moisture	less than 1

wherein the total amount of dried milk solids and anhydrous butter fat is in the range of 30 to 34 weight units; and

wherein at least a first portion of the sugar constituent, which first portion is approximately 20 weight units, has been caramelized at an elevated temperature for flavor purposes;

wherein said method of preparing said chocolate crumb comprises the steps of

(a) mixing a first portion of liquid milk with said first portion of sugar, wherein said first portion of liquid milk comprises a first portion of milk solids and a first portion of water, which first portion of milk solids may include butter fat, and wherein said first portion of water is just sufficient so as to hydrate said first portion of sugar, so as to form a slurry batch of said hydrated sugar and liquid milk;

(b) heating said slurry batch to a temperature of about 105° C. to 115° C., and maintaining said slurry batch at that temperature for sufficient time so as to caramelize the sugar to a selected degree of caramelization and so as to substantially drive off said first portion of water, thereby leaving a caramelized slurry batch comprising caramelized sugar and said first portion of milk solids;

(c) maintaining said caramelized slurry batch at an elevated temperature so as to remain heated;

(d) obtaining a second portion of liquid milk, whereby the total weight of milk solids of said first portion of liquid milk together with the milk solids of said second portion of liquid milk is within the range of 23 to 34 weight units;

(e) mixing together said still heated caramelized slurry batch with at least some of said second portion of liquid milk so as to re-hydrate said caramelized sugar, and adding the remainder of said second portion of liquid milk if not already used so as to form a pre-crumb slurry;

(f) transferring said pre-crumb slurry to a conventional drier, and drying said pre-crumb slurry so as to obtain said total weight of milk solids as dried milk solids, together with said caramelized sugar;

(g) mixing said total weight of dried milk solids and said caramelized sugar together with the remaining sugar, the anhydrous cocoa butter, and the anhydrous cocoa liquor, so as to arrive at the selected analysis amounts of each;

(h) further adding additional anhydrous butter fat, if necessary, so as to bring the total amount of dried milk solids and anhydrous butter fat to the range of 30 to 34 weight units of the prepared chocolate crumb; and

(i) refining said prepared chocolate crumb, if necessary, for pasting and conching the prepared chocolate crumb, as necessary for recovery and further processing or storage thereof.

5,591,475

HIGHLY WATER ABSORBED RICE, METHOD FOR PRODUCING SAME AND APPLICATION OF SAME

Yukio Ishida, 1-15, Ejirihigashi 2-chome, Shimizu-shi, Shizuoka-ken, 424, Japan

Continuation of Ser. No. 137,807, Oct. 14, 1993, abandoned. This application Nov. 27, 1995, Ser. No. 562,754
Claims priority, application Japan, Feb. 19, 1992, 4-069814; Apr. 7, 1992, 4-113162
Int. Cl.[6] A23L *1/182*
U.S. Cl. 426—627 **3 Claims**

1. A process for producing a highly hydrated non-boiled rice for processing in a short period of time by using a microwave oven of which the water content has been controlled such that a delicious boiled rice is produced therefrom by said processing using a microwave oven in a short period of time with no addition of water thereto, which comprises the following steps:

(1) firstly preparing a rice absorbing water in the amount of 60 to 90 parts by weight per 100 parts by weight of raw rice by using raw rice or rice immersed in water and by using hot water having a temperature of 60° C. or more;

(2) freezing the rice obtained in step (1) at a temperature of −20° to −40° C.;

(3) immersing the resultant frozen hydrated rice obtained in step (2) in a liquid selected from the group consisting of water, broth, soup, and sauce, said liquid being maintained at a temperature of 15° to 25° C. whereby a total amount of hydrated in rice is rendered 110 to 120 parts by weight per 100 parts by weight of raw rice.

5,591,476

CONCHED CHOCOLATE

Roberto A. Capodieci, Glen Ellyn, Ill., assignor to Mars, Incorporated, McLean, Va.

Continuation of Ser. No. 273,709, Jul. 12, 1994, Pat. No. 5,460,840, which is a continuation of Ser. No. 24,268, Mar. 1, 1993, Pat. No. 5,332,588, which is a continuation of Ser. No. 862,972, Apr. 3, 1992, Pat. No. 5,200,220. This application Oct. 18, 1995, Ser. No. 545,264
Int. Cl.[6] A23G *1/00*
U.S. Cl. 426—631 **7 Claims**

1. A flowable conched chocolate having an optimized fat content and a preselected maximum viscosity of the conched chocolate which is low enough for enrobing the chocolate, the conched chocolate comprising chocolate refinings and a fat source which had been mixed together and subjected to conching conditions in order to form and to lower the viscosity of a finished flowable conched chocolate, said flowable conched chocolate having no additional fat source in excess of an amount needed to impart said preselected maximum viscosity to said flowable conched chocolate, said amount of the fat source being about 29 weight percent, based on the weight of the conched chocolate.

5,591,477

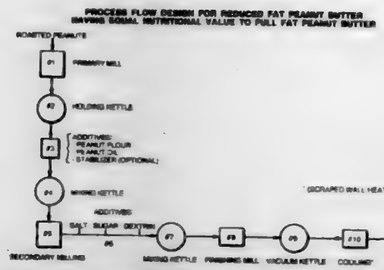
METHOD OF PRODUCING A REDUCED FAT PEANUT BUTTER WITHOUT NON-PEANUT SUPPLEMENTS AND PRODUCT THEREFROM

Ricky C. Boyce; Mona C. Jones; Wilbur A. Parker, all of Edenton, N.C., and Edward J. Festa, Atlanta, Ga., assignors to Seabrook Enterprises, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 266,936, Jun. 27, 1994. This application May 3, 1995, Ser. No. 434,802
Int. Cl.[6] A23L *1/38*
U.S. Cl. 426—633 **29 Claims**

1. A method for producing a peanut paste for use in making peanut butter, comprising the steps of:

(a) selecting a first amount of uncooked peanuts at a predetermined moisture level;



(b) conditioning the first amount of peanuts by heating them for not more than approximately two minutes so that the peanuts reach a final temperature of between 71°–99° C.;

(c) preheating an expelling device to a temperature of between 107°–132° C.;

(d) pressing the conditioned peanuts in the heated expelling device so that low-fat solid peanut cake and oil are separated;

(e) decreasing the size of the peanut cake particles to a size of less than 15 millimeters;

(f) roasting the peanut cake for 1 to 6 minutes at a temperature of between 200°–260° C.;

(g) grinding the roasted peanut cake to a size of less than or equal to 1000 microns to produce a peanut flour;

(h) reducing the size of a second amount of peanuts that have been roasted, wherein approximately one half of the second amount of peanuts has a size of less than or equal to 50 microns and the largest particles have a size of less than or equal to 750 microns;

(i) mixing the peanut flour with the second amount of peanuts and peanut oil in an amount of 0 to 10 percent by total weight while the second amount of peanuts and peanut oil are at a temperature of between 54°–66° C. to produce a peanut slurry; and

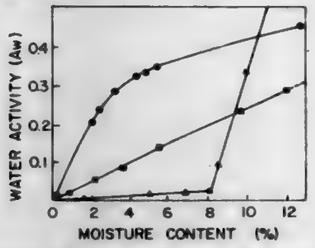
(j) milling the peanut slurry so that at least one half of the particles have a size of less than or equal to 50 microns and the largest particles have a size of less than or equal to 250 microns, wherein a peanut paste is produced.

5,591,478

DESICCANT, METHOD FOR PRODUCING THE SAME AND METHOD FOR USING THE SAME

Takahisa Tokunaga; Junko Kajihara; Masao Hirayama; Hidemasa Hidaka, all of Saitama; Hayami Itoh, Hyogo; Masao Hayashitani, Hyogo; Yoshihiro Kajibata, Hyogo, and Tatsuya Imura, Hyogo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, and Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, both of Japan

Continuation of Ser. No. 26,289, Mar. 4, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,585
Claims priority, application Japan, Jul. 15, 1992, 4-209523
Int. Cl.[6] A23G *3/00*
U.S. Cl. 426—658 **1 Claim**



1. A method for lowering the water activity of a food and maintaining the same, which comprises directly contacting a desiccant comprising crystalline, anhydrated nystose which contains 70% or more of nystose and 2% or less of moisture and is in the form of a crystalline powder, with the food or mixing the same with the food.

5,591,479

BRAIN PHOSPHOLIPID COMPOSITION AND METHOD OF MAKING FOR AN INFANT FORMULA

Yves Ponroy, Versailles, France, assignor to Institut de Recherche Biologique, France

Filed Jun. 29, 1995, Ser. No. 496,326
Int. Cl.[6] A23J *7/00*
U.S. Cl. 426—662 **12 Claims**

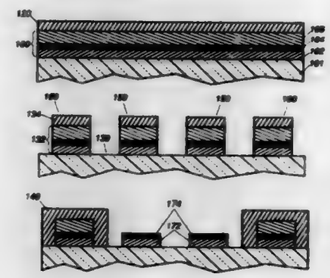
1. Food compositions which can be directly incorporated in the food of very young children useful as an infant formula, said food compositions comprising non-denatured mammalian brain phospholipids, said phospholipids having at least two fatty acids in the chain, in combination with or mixed with a food support suitable for such a food.

5,591,480

METHOD FOR FABRICATING METALLIZATION PATTERNS ON AN ELECTRONIC SUBSTRATE

Douglas H. Weisman, Sunrise; Thomas J. Swirbel, Davie, and John K. Arledge, Ft. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 21, 1995, Ser. No. 517,392
Int. Cl.[6] B05D *5/12*; C23C *14/00*; C25D *5/02*; H01L *21/465*
U.S. Cl. 216—13 **25 Claims**



1. A method for providing thin film metallization areas having varying thicknesses on an electronic substrate, comprising the steps of:

providing a substrate having a multilayer metal coating disposed on an upper surface thereof, the coating comprising a first aluminum layer on the substrate surface, a second titanium layer on top of the first layer, and a third aluminum layer on top of the second layer;

forming first and second metallization patterns in the multilayer metal coating by etching portions of the multilayer metal coating in a single step to reveal portions of the substrate upper surface;

applying a photoresist layer over the substrate sufficient to cover the first metallization pattern and to reveal the second metallization pattern;

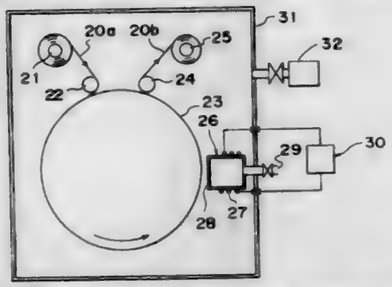
chemically etching the revealed second metallization pattern to remove only the third aluminum layer, thereby exposing the underlying second titanium layer; and

removing the photoresist layer after removing the third aluminum layer.

5,591,481
METHOD OF MANUFACTURING A MAGNETIC RECORDING MEDIUM INCLUDING FORMING A GRAFT POLYMER LUBRICANT LAYER BY IRRADIATING MONOMERS WITH RADICALS OR ATOMIC GAS

Kiyoshi Takahashi; Mikio Murai, both of Osaka; Masaru Odagiri, Hyogo, and Hideyuki Ueda, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 224,994, Apr. 8, 1994, abandoned, which is a continuation of Ser. No. 913,357, Jul. 15, 1992, abandoned. This application Sep. 27, 1995, Ser. No. 534,406
Claims priority, application Japan, Jul. 15, 1991, 3-173614
Int. Cl.[6] G11B *5/72*
U.S. Cl. 427—131 **3 Claims**



1. A method of manufacturing a magnetic recording medium comprising the steps of:
forming a ferromagnetic metal thin film on a nonmagnetic substrate;
forming a protection film on said ferromagnetic metal thin film;
forming a lubricant layer on said protection film, said lubricant layer consisting of monomers; and
forming graft polymers by irradiating said lubricant layer with radicals or atomic gas,
wherein the ratio of irradiation ions to the radicals and atomic gas for irradiating said lubricant layer is 7% or less.

5,591,482
CONDUCTIVE POLYURETHANE FOAM AND ITS MANUFACTURE

Fei-feng He, Shanghai, China; Toshihiro Yamamoto, and Miwako Yamamoto, both of Kanagawa, Japan, assignors to Inoac Corporation, Nagoya, Japan

Filed Feb. 17, 1994, Ser. No. 197,983
Claims priority, application Japan, Feb. 17, 1993, 5-051391; Jun. 23, 1993, 5-176190
Int. Cl.[6] B05D *5/12;3/00*
U.S. Cl. 427—244 **14 Claims**

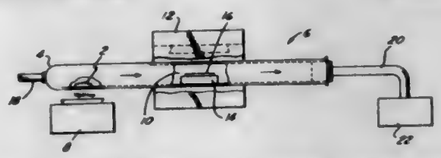


1. A method of manufacturing a conductive polyurethane foam comprising the steps of:
coating an oxidizer solution on surfaces of cells of a polyurethane foam having a plurality of open cells which are connected to each other;
perfectly removing a solvent of said oxidizer solution by vacuum drying;
polymerizing a compound with conjugated double bonds on the surfaces of the cells of said polyurethane foam, after said cells have been coated with said oxidizer in a vapor-phase atmosphere to form a conductive conjugated polymer layer of said compound on the oxidizer-coated surfaces of said cells; and
dipping said polyurethane foam formed with said polymer layer in an organic solvent which does not dissolve said polyurethane foam to extract any unpolymerized portion of said compound and said oxidizer, followed by vacuum drying.

5,591,483
PROCESS FOR THE PREPARATION OF METAL NITRIDE COATINGS FROM SINGLE SOURCE PRECURSORS

Charles H. Winter, Grosse Pointe Park; T. Suren Lewkebandara, Farmington, and Kumudini C. Jayaratne, Detroit, all of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Aug. 31, 1994, Ser. No. 298,764
Int. Cl.[6] C23C *16/00*
U.S. Cl. 427—248.1 **24 Claims**



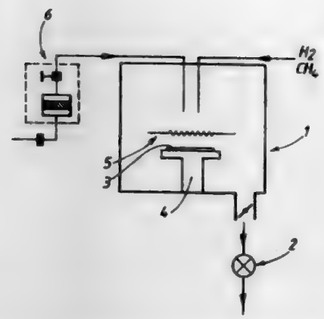
1. A process for coating a substrate with a coating of metal nitride by chemical vapor deposition from a single source precursor, comprising:
a) selecting as said precursor
i) the reaction product of a primary amine of the formula NH_2—R with a metal halide of the formula MX_5 where X is fluorine, chlorine, bromine, or iodine, or
ii) the reaction product of a primary amine of the formula NH_2—NR^1R^2 with a metal halide of the formula MX_4 where X is fluorine, chlorine, bromine, or iodine;
where M is a metal;
where R is selected from the group consisting of C_{1-8} alkyl, C_{3-8} cycloalkyl, C_{2-18} alkenyl, C_{3-8} cycloalkenyl, C_{6-10} aryl radicals, —NR^1R^2, and mixtures thereof;
where R^1 is selected from the group consisting of hydrogen, C_{1-18} alkyl, C_{3-8} cycloalkyl, C_{2-8} alkenyl, C_{3-8} cycloalkenyl, and C_{6-10} aryl radicals;
where R^2 is selected from the group consisting of hydrogen, C_{1-18} alkyl, C_{3-8} cycloalkyl, C_{2-18} alkenyl, C_{3-8} cycloalkenyl, and C_{6-10} aryl radicals; or
where R^1 and R^2 together with N form a cyclic C_{2-8} saturated or C_{3-8} unsaturated imine;
b) subliming said precursor at a pressure of from 0.0001 mm Hg to about 760 mm Hg; and
c) contacting said sublimed precursor with a substrate maintained at a temperature sufficient to effect decomposition of said precursor to metal nitride, whereby said coating of metal nitride is formed on said substrate.

5,591,484
PROCESS FOR MANUFACTURING LAYERS OF DIAMOND DOPED WITH BORON

Olivier J. C. Poncelet, and Jean-Jacques E. Garenne, both of Chalon, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1995, Ser. No. 537,483
Claims priority, application France, Nov. 30, 1994, 94 14612
Int. Cl.[6] C23C *16/00*; B05D *3/06*
U.S. Cl. 427—249 **16 Claims**

1. Process for manufacturing diamond doped with boron by chemical vapor deposition, which consists of forming on a support

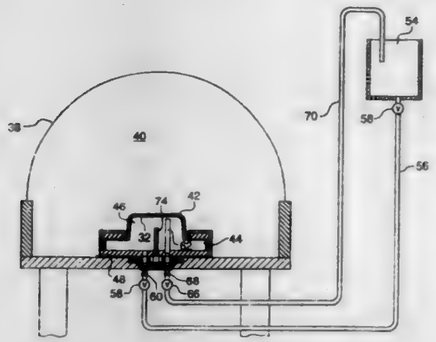


(3) placed in a reaction chamber (1) a diamond layer doped with boron using a gaseous mixture consisting of a carrier gas, at least one source of carbon and at least one boron precursor, the improvement wherein the boron precursor is an amino-borane.

5,591,485
METHOD AND APPARATUS FOR PRODUCING NICKEL SHELL MOLDS

Reinhart Weber, Highway 12 - P.O. Box 399, Midland, Ontario, Canada, and Robert E. Sheppard, 14 Rei Court, Midland, Ontario, Canada

Division of Ser. No. 238,282, May 5, 1994, Pat. No. 5,407,487. This application Apr. 14, 1995, Ser. No. 422,402
Claims priority, application United Kingdom, May 5, 1993, 93092492
Int. Cl.[6] C23C *16/06*
U.S. Cl. 427—250 **4 Claims**

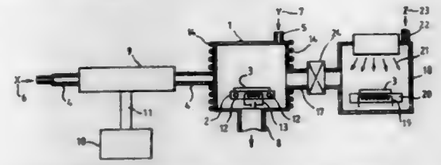


1. A method of nickel vapour deposition on a surface of a mandrel positioned in a deposition chamber comprising enclosing a side of the mandrel opposite the said surface to form a cavity substantially co-extensive with the mandrel, flooding the said cavity with a heating fluid, substantially discharging air from the cavity, uniformly heating said heating fluid in the cavity to a desired temperature for uniform heating of the mandrel surface in the deposition chamber and depositing nickel from nickel vapor onto said heated mandrel surface.

5,591,486
METHOD FOR FORMING A FILM ON A SUBSTRATE BY ACTIVATING A REACTIVE GAS

Haruo Okano, Tokyo; Sadahisa Noguchi, Fuchu, and Makoto Sekine, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Division of Ser. No. 323,693, Oct. 18, 1994, Pat. No. 5,458,919, which is a continuation of Ser. No. 283,757, Mar. 1, 1994, Pat. No. 5,385,763, which is a continuation of Ser. No. 917,531, Jul. 20, 1992, abandoned, which is a division of Ser. No. 686,283, Apr. 16, 1991, Pat. No. 5,156,881, which is a continuation of Ser. No. 169,577, Mar. 17, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 474,312
Claims priority, application Japan, Mar. 18, 1987, 62-61237; Mar. 18, 1987, 62-61238
Int. Cl.[6] C23C *16/00*; B05D *3/06*
U.S. Cl. 427—255.2 **1 Claim**

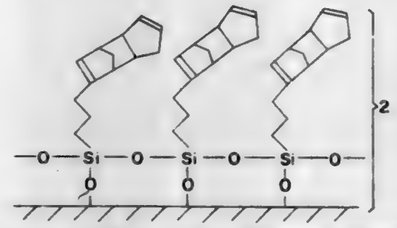


1. A thin film forming method, comprising the steps of:
providing a substrate, having a trench or an unevenness thereon, in a reaction vessel;
introducing a first reactive gas and a second reactive gas into the reaction vessel, the first and second reactive gases each being characterized by a respective phase diagram including a liquid phase region defined by a melting curve and an evaporation curve that intersect at a triple point; and
reacting the first and second gases to form a thin film containing elements of the first and second reactive gases on the substrate while retaining a pressure of at least one of the first and second reactive gases in the reaction vessel higher than the triple point of the phase diagram of said at least one of the first and second reactive gases, and retaining a temperature of the substrate within the liquid phase region of the phase diagram of said at least one of the first and second reactive gases.

5,591,487
INFORMATION RECORDING MEDIUM AND METHODS OF MANUFACTURING AND USING THE SAME

Tadashi Ohtake, Neysgawa; Norihisa Mino, Settsu, and Kazufumi Ogawa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

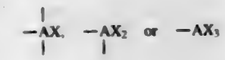
Division of Ser. No. 107,308, Aug. 17, 1993, Pat. No. 5,447,778. This application May 30, 1995, Ser. No. 453,506
Claims priority, application Japan, Aug. 25, 1992, 4-226204
Int. Cl.[6] B05D *1/18;3/00*
U.S. Cl. 427—299 **3 Claims**



1. A method of manufacturing an information recording medium comprising:
preparing a molecule comprising at least one functional group selected from the group consisting of a functional group of

Formula A, a functional group of Formula B, a halogenated sulfinyl group of Formula C, a halogenated sulfonyl group of Formula D and a cyano group (–CN), and ring-skeletons; and contacting and reacting said molecule to a substrate surface comprising an active hydrogen or an alkali metal, thus fixing said molecule to said substrate surface via a covalent bond in order to form an information recording layer on said substrate surface; wherein

Formula A is



where A represents C, Si, Ge, Sn, Ti or Zr; and X represents a halogen, an isocyanate group, a cyano group or an alkoxyl group;

Formula B is



where A' represents N or 0;

Formula C is



where X represents a halogen; and

Formula D is



where X represents a halogen.

5,591,488

PROCESS FOR TREATING PLASTIC SURFACES AND SWELLING SOLUTION

Claus Schäfer, and Hermann-Josef Midekke, both of Berlin, Germany, assignors to Atotech Deutschland GmbH, Berlin, Germany

PCT No. PCT/DE94/00877, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO95/04103, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 22, 1994, Ser. No. 411,752

Claims priority, application Germany, Jul. 30, 1993, 43 26 079.9

Int. Cl.[6] B05D *3/04;3/10*

U.S. Cl. 427—307 **17 Claims**

1. A process for treating polymer-containing workpiece surfaces, comprising the step of swelling the workpiece surfaces with a non-aging aqueous solution comprising effective swelling amounts of at least one suitable organic swelling agent, alkalizing agent, basic salt and at least one solubilizer for the swelling agent in the solution, wherein the solubilizer is an organic compound of the formula

HO—A(OH)—R,

where A represents a branched or unbranched alkane chain, R represents a branched or unbranched alkyl group or hydrogen, and A and R together contain at least three carbon atoms.

5,591,489

PROCESS FOR SURFACE SIZING PAPER OR PAPERBOARD

Louis R. Dragner, and John P. Farewell, both of Rock Hill, S.C., assignors to Sequa Chemicals, Inc., Chester, S.C.

Filed May 4, 1995, Ser. No. 434,600

Int. Cl.[6] B05D *3/12;3/02*

U.S. Cl. 427—364 **17 Claims**

1. A process for enhancing the printability of a paper or paperboard for ink jet printing comprising:

applying a surface sizing composition to the paper or paperboard surface to enhance ink jet printability, said composition comprising a mixture of starch and a surfactantless stable microemulsion of a vinyl polymer prepared by emulsion copolymerization of a styrens or styrene containing organic group with a C_2–C_8 acrylic or methacrylic ester which provides a Tg to the vinyl polymer of less than 50° C., with a dissolved alkali soluble, acid containing copolymer having a weight average molecular weight of from 4500 to 15,000 as a sole emulsifying agent, wherein the microemulsion has a particle size of 99% less than 0.3 microns diameter; and

drying the surface sizing composition.

5,591,490

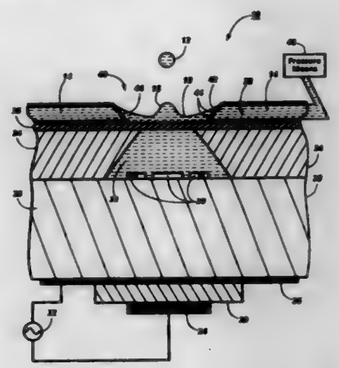
ACOUSTIC DEPOSITION OF MATERIAL LAYERS

Calvin F. Quate, Stanford, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 245,922, May 18, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 556,672

Int. Cl.[6] B01J *19/08*

U.S. Cl. 427—457 **6 Claims**



1. A method for coating a substrate comprising the steps of

providing a pool of a liquid having a free surface,

generating ultrasonic acoustic waves with at least one ultrasonic transducer,

focusing the generated ultrasonic acoustic waves to converge near the free surface of the pool of the liquid to eject liquid droplets using a plurality of acoustic lenses positioned adjacent to the at least one ultrasonic transducer, and

depositing the ejected liquid droplets onto the substrate to coat the substrate.

5,591,491

METHOD FOR MANUFACTURING BIODEGRADABLE MOLDED ARTICLES

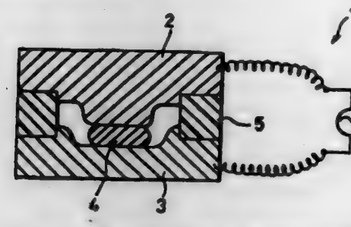
Sadamasa Ando, Minoo; Taizo Karasawa, Ibaraki, and Akio Ozasa, Kyoto, all of Japan, assignors to Nissei Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1995, Ser. No. 383,024

Claims priority, application Japan, Feb. 4, 1994, 6-012941

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—544 **22 Claims**



1. A method for manufacturing biodegradable molded articles, comprising the steps of:

molding biodegradable raw materials; and

heating the biodegradable raw materials by applying electroconductive heating to the biodegradable raw materials for an amount of time effective to foam and expand the biodegradable raw material to form the biodegradable molded article.

5,591,492

PROCESS FOR FORMING AND ETCHING A FILM TO EFFECT SPECIFIC CRYSTAL GROWTH FROM ACTIVATED SPECIES

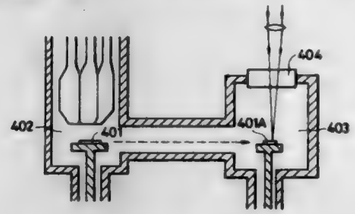
Yutaka Hirai, Hikone; Jinsho Matsuyama, and Shigeru Shirai, both of Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 193,632, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 3,938, Jan. 15, 1993, abandoned, which is a continuation of Ser. No. 690,330, Apr. 26, 1991, abandoned, which is a continuation of Ser. No. 341,263, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 37,958, Apr. 13, 1987, abandoned. This application Feb. 28, 1995, Ser. No. 396,865

Claims priority, application Japan, Apr. 11, 1986, 61-83924; Apr. 14, 1986, 61-85507; Apr. 14, 1986, 61-85508; Apr. 15, 1986, 61-86825

Int. Cl.[6] B05D *3/00;* **H05H** *1/02;* **C30B** *28/14*

U.S. Cl. 427—563 **6 Claims**



1. A process for forming a silicon containing polycrystalline deposited film on a substrate in a reaction space comprising:

(a) forming activated species (A) in an activation space (A) by decomposition of a compound (SX) containing silicon and at least one halogen, where said compound (SX) is a compound selected from the group consisting of chain silicon halides represented by Si_uY_{2u+2}, cyclic silicon halides represented by Si_uY_{2u}, and a chain or a cyclic compound represented by $Si_uH_vY_x$, where u is an integer of 1 or more, v is a integer of 3 or more, x+y=2u+2, and Y is at least one element selected from F, cl, Br and I;

(b) forming activated species (B) in an activation space (B) which is separate from the activation space (A), the activated species (B) formed from a chemical substance (B) selected from the group consisting of H_2 gas and halogen gas which is chemically reactive with said activated species (A) to effect film formation;

(c) forming the deposited film by reacting both of the activated species consisting essentially of the activated species (A) and the activated species (B) by introducing the activated species (A) and the activated species (B) into the reaction space wherein a flow rate ratio of said activated species (A) to said activated species (B) during said introducing is 10:1 to 1:10 such that said both activated species mix and chemically react with each other in the vicinity of the substrate to deposit said film thereon;

(d) exposing the film during film deposition to a gaseous substance (E) to etch the surface of the deposited film and thereby effecting crystal growth of polycrystals in a specific face direction; and

(e) irradiating the substrate and said gaseous substance (E) with photo-energy to increase etchant activity and to increase the polycrystals in grain size, wherein said polycrystalline deposited film is formed without use of an exciting plasma in the film forming space.

5,591,493

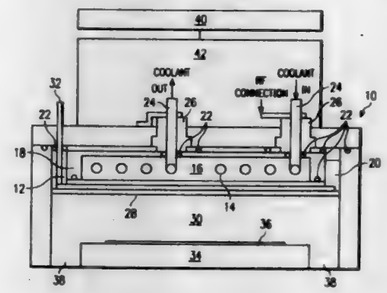
STRUCTURE AND METHOD FOR INCORPORATING AN INDUCTIVELY COUPLED PLASMA SOURCE IN A PLASMA PROCESSING CHAMBER

Ajit P. Paranjpe, Plano; Cecil J. Davis, Greenville, and Robert T. Matthews, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 269,414, Jun. 30, 1994. This application Jun. 7, 1995, Ser. No. 472,606

Int. Cl.[6] C23C *16/00*

U.S. Cl. 427—569 **7 Claims**



1. A method for incorporating an inductively coupled plasma source in a plasma processing chamber comprising the steps of:

providing a plasma processing chamber having a chuck for holding a wafer; encapsulating a spiral antenna in an epoxy;

surrounding said antenna and epoxy with a structurally rigid housing; hermetically sealing said epoxy;

attaching said housing to an internal wall of said plasma processing chamber; and providing a dielectric capping plate to a side of said housing.

5,591,494

DEPOSITION OF SILICON NITRIDES BY PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION

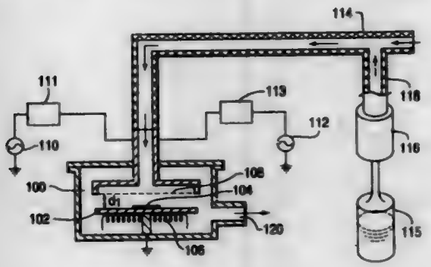
Tatsuya Sato; Atsushi Tabata, both of Narita, and Naoaki Kobayashi, Sakura, all of Japan, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 507,718, Jul. 26, 1995, Pat. No. 5,508,067, which is a continuation of Ser. No. 310,545, Sep. 22, 1994, abandoned. This application Feb. 12, 1996, Ser. No. 600,084

Claims priority, application Japan, Sep. 24, 1993, 5-238565

Int. Cl.[6] H05H *1/24*

U.S. Cl. 427—579 **8 Claims**



1. A process for depositing a silicon nitride film by plasma enhanced chemical vapor deposition comprising

supplying a precursor gas mixture comprising an inorganic silane, a nitrogen-containing organosilane and a nitrogen-containing gas to a vacuum chamber,

generating a plasma in the chamber from said precursor gases, and

depositing a silicon nitride compound on a substrate in said chamber.

5,591,495

COPOLYAMIDE BARRIER LAYER AND REUSABLE PACKAGING ELEMENTS MADE THEREWITH

Hans D. Torre, Ems, and Manfred Hewel, Rodels, both of Switzerland, assignors to EMS-INVENTA AG, Switzerland

Continuation of Ser. No. 238,584, May 5, 1994, abandoned, which is a continuation of Ser. No. 959,297, Oct. 9, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 488,832

Claims priority, application Germany, Oct. 10, 1991, 41 33 781.6; Dec. 6, 1991, 41 40 350.9

Int. Cl.[6] B32B *1/08;27/34;* C08G *69/26*

U.S. Cl. 428—35.7 **14 Claims**

1. A polyamide barrier layer for polycarbonate bottles consisting essentially of

(a) 50 molar parts of at least two alkyl substituted or unsubstituted aromatic dicarboxylic acids which are replaced by 2 to 60% by weight of at least one additional dicarboxylic acid selected from the group consisting of cycloaliphatic dicarboxylic acids having 8 to 24 carbon atoms, araliphatic dicarboxylic acids having 8 to 18 carbon atoms, and mixtures thereof, and

(b) 50 molar parts of hexamethylene diamine, which is replaced by 5% to 50% by weight of at least one additional diamine selected from the group consisting of alkyl substituted or unsubstituted aliphatic diamines having 4 to 20 carbon atoms, alkyl substituted cycloaliphatic diamines haveing 6 to 24 carbon atoms, araliphatic diamines having 8 to 18 carbon atoms, and mixtures thereof,

the acid groups and amino groups being present substantially in equimolar proportions, said copolyamide being transparent and having a dry state glass transition temperature of at least 135° C. and a conditioned glass transition temperature of at least 75° C.

5,591,496

METHOD OF MANUFACTURING COMPOSITE SHEET MATERIALS

Michael C. Anderson, West Yorkshire, Great Britain; Anthony J. Heap, Wilson, N.C., and Horst-Ditmar Grone, Schwanewede, Germany, assignors to Linpac Plastics International Limited, South Lincolnshire, England

PCT No. PCT/US91/07956, § 371 Date Jul. 13, 1993, § 102(e) Date Jul. 13, 1993

PCT Filed Oct. 28, 1991, Ser. No. 50,467

Claims priority, application Germany, Nov. 20, 1990, 40 37 018.6

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—36.5 **14 Claims**



1. A method of making a composite sheet material, comprising the steps of forming a first lamina of previously unused expanded polystyrene from a first extruder, simultaneously forming a second lamina of recycled expanded polystyreae from a second extruder, and promptly bonding the freshly extruded laminae to each other.

5,591,497

CHLORINATED POLYVINYL CHLORIDE RIGID PIPE AND METHOD OF FORMING SUCH PIPE

Joachim E. Hartitz, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 923,108, Aug. 31, 1992, abandoned, which is a division of Ser. No. 656,538, Feb. 15, 1991, Pat. No. 5,194,471. This application Feb. 28, 1996, Ser. No. 603,496

Int. Cl.[6] F16L *9/12*

U.S. Cl. 428—36.92 **21 Claims**

1. An extruded pipe, comprising: 100 weight parts of chlorinated polyvinyl chloride derived from a polyvinyl chloride polymer having an inherent viscosity of between about 0.4 and 1.6, said chlorinated polyvinyl chloride containing from about 63% to about 70% by weight chlorine, from about 5 to about 15 weight parts of a copolymer of a polydiene and one or more hardening monomers, said copolymer selected from of the groups consisting of an ABS copolymer and an non-ABS polydiene containing copolymer further comprising at least one incorporated comonomer selected from the group consisting of a vinyl aromatic, a methacrylate, an acrylate, methacrylonitrile, acrylonitrile, and mixtures thereof, from about 1 to about 10 weight parts of chlorinated polyethylene, a pigment, a stabilizer and a lubricant, wherein said pipe exhibits ductility under fixed drop dart impact at 20° F. (−6.6° C.) of at least 12 ft•lbf (16.25 N-m), and a hydrostatic design stress greater than about 500 psi (3.5 Mpa) at 180° F.

5,591,498

STRUCTURE OF RELEASING PART

Masaaki Arakawa, Osaka, Japan, assignor to Nitto Denko Corporation, Osaka, Japan

Filed May 20, 1993, Ser. No. 63,739

Claims priority, application Japan, Jun. 5, 1992, 4-171925

Int. Cl.[6] B32B *7/00;* A61F *13/60*

U.S. Cl. 428—40.1 **4 Claims**

1. A releasing part structure having a boundary component, wherein said boundary component comprises a pressure-sensitive adhesive layer and a long chain alkyl releasing agent layer, wherein said pressure-sensitive adhesive layer comprises a pressure-sensitive adhesive composition comprising an acrylic pressure-sensitive adhesive, wherein when the pressure-sensitive adhesive layer is released from the releasing agent layer, the sound



pressure level in releasing the pressure-sensitive adhesive layer from the releasing agent layer at all releasing speeds of at least 1×10^2 mm/minute is 80 Db or less and the difference between the maximum value and the minimum value of the releasing force in releasing at a releasing speed of 1×10^2 mm/minute is 200 g/25 mm or less.

5,591,499

Patent Not Issued For This Number

5,591,500

INFORMATION RECORDING MEDIUM

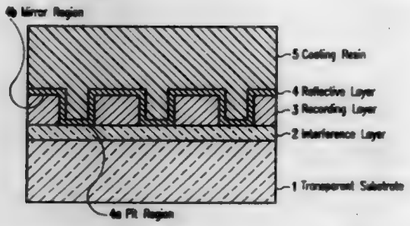
Yoshitaka Kawanishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 18, 1995, Ser. No. 516,631

Claims priority, application Japan, Aug. 26, 1994, 6-201807

Int. Cl.[6] B52B *5/00*

U.S. Cl. 428—641 **22 Claims**



1. An information recording medium, comprising:

a transparent substrate;

an interference layer formed on said transparent substrate;

a recording layer formed on said interference layer, said recording layer having a pit region and a mirror region;

a reflective layer formed on said recording layer; and

a coating resin formed on said reflective layer, wherein said interference layer has a refractive index of at least 3.0.

5,591,501

OPTICAL RECORDING MEDIUM HAVING A PLURALITY OF DISCRETE PHASE CHANGE DATA RECORDING POINTS

Stanford R. Ovshinsky, Bloomfield Hills, Mich., and Helmut Fritzsche, Chicago, Ill., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 20, 1995, Ser. No. 575,273

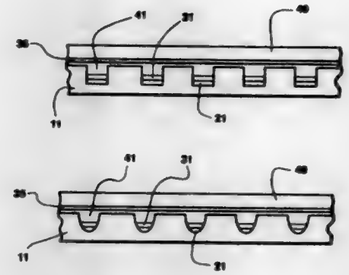
Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—64.1 **27 Claims**

1. A phase change optical recording medium including:

a substrate having a planar surface;

a plurality of discrete data recording points deposited upon said substrate, said discrete data recording points being formed from a phase change material which changes from a state of a first relative order to a state of a second relative order and visa versa upon the application of optical beam energy.



5,591,502

MAGNETIC RECORDING MEDIUM

Hideo Kaneko; Katsushi Tokunaga, and Yoshio Tawara, all of Kanagawa-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 72,469, Jun. 4, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 348,342

Claims priority, application Japan, Jun. 16, 1992, 4-181695

Int. Cl.[6] G11B *5/66;* B32B *5/16;3/02*

U.S. Cl. 428—65.3 **8 Claims**

1. A magnetic recording medium which comprises, as an integral body:

(a) a non-magnetic substrate which is a wafer of single crystal silicon grown by the Czochralski method, of which the surface is substantially in parallel with the crystallographic (100) plane of the single crystal; and

(b) a continuous layer of a ferromagnetic material as a magnetic recording layer having a thickness not exceeding 100 nm formed by a dry-process method on at least one surface of the non-magnetic substrate either directly or with an intermediate layer intervening between the substrate surface and the magnetic recording layer,

the surface of the non-magnetic substrate, on which the layer of the ferromagnetic material is formed, having a roughness Rp not exceeding 40 nm.

5,591,503

MAGNETIC RECORDING MEDIUM HAVING A THIN FILM MAGNETIC LAYER AND A SULFONAMIDE LUBRICANT

R. Garth Pews; Ted A. Morgan, and Kishore K. Kar, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 249,184, May 25, 1994, abandoned. This application May 10, 1995, Ser. No. 438,943

Int. Cl.[6] G11B *5/72*

U.S. Cl. 428—65.4 **17 Claims**

1. A magnetic recording medium, comprising a substrate having a thin film magnetic recording lamina deposited thereon, wherein the lamina comprises a magnetic layer and at least one sulfonamide, and wherein the at least one sulfonamide is present in an average thickness of 1 to 1000 ångströms, and wherein the sulfonamide contains up to 60 carbon atoms and is of formula $R_1—SO_2NR_2R_3$ wherein R_1 is an unsubstituted alkyl of up to 18 carbons or an aromatic moiety of up to 12 carbons which can be substituted by halo, methyl, ethyl, methoxy, ethoxy, trihalomethyl, trihalomethoxy or polyhaloethoxy and R_2 and R_3 are independently hydrogen or alkyl of up to 20 carbons with the proviso that no more than one of R_2 or R_3 can be hydrogen.

5,591,504

DISPOSABLE, BIODEGRADABLE AIR FRESHENING DEVICE AND FOOD PRESERVATIVE

Fred S. Lieberman, Rochester Hills, Mich., assignor to DJM No. 7, Inc., Mt. Clemens, Mich.

Continuation of Ser. No. 71,585, Jun. 2, 1993, abandoned. This application May 2, 1995, Ser. No. 434,323

Int. Cl.[6] B65D *81/26*

U.S. Cl. 428—68 **15 Claims**

1. A device for holding perishable food products comprising:

a container unit having an inner volume with a gaseous environment adapted to removably receive the perishable food products therein;

an elongated sheet present in said container, said elongated sheet having an upper face and a lower face, said sheet composed of numerous naturally occurring randomly intermeshed fibers, said fibers defining interstices in said sheet; and

an inorganic crystalline hygroscopic material attached to said sheet, said inorganic crystalline hygroscopic material directly interactive with said gaseous environment in said container unit, wherein a portion of said inorganic hygroscopic absorptive material is positioned in said interstices and a portion of said inorganic hygroscopic material is positioned around and is bonded directly to said naturally occurring randomly intermeshed fibers of said sheet and wherein, said inorganic crystalline hygroscopic material is water soluble and consists of sodium bicarbonate.

5,591,505

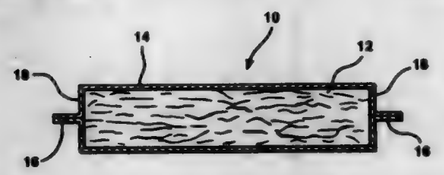
FIBROUS INSULATION PRODUCT HAVING INORGANIC BINDERS

Stanley J. Rusek, Jr., Newark; Albert B. Fisher, Columbus, and Carl R. Strauss, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jun. 7, 1995, Ser. No. 473,644

Int. Cl.[6] B32B *1/06*

U.S. Cl. 428—69 **9 Claims**



1. An insulation panel comprising a sealed evacuated outer jacket encasing a compressed fibrous board, said compressed fibrous board comprising a collection of fibrous material having a binder dispersed throughout said fibrous material, said binder having thermoplastic properties and comprising: (i) a glass-forming phosphate compound or a glass-forming boron compound, or (ii) a low-melting glass composition selected from the group consisting of solder glasses, glass frits, and glass enamels.

5,591,506

NON-POLLUTING ALKALI-METAL BISULFATE SYSTEM FOR PRODUCING TITANIUM DIOXIDE PIGMENT

Jorge Miller, and Miguel Kling, both of Bogota, Colombia, assignors to Kemicraft Overseas Limited, Douglas, Isle of Man

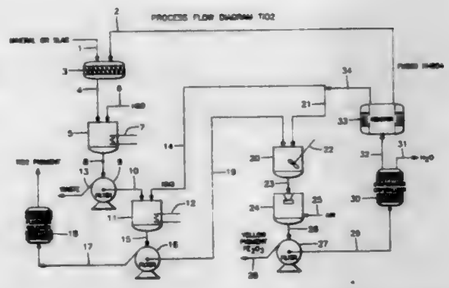
Filed May 10, 1995, Ser. No. 438,922

Int. Cl.[6] C01G *23/047;49/02*

U.S. Cl. 423—81 **14 Claims**

1. A process for producing titanium dioxide pigment from titanium mineral or slag, and which comprises the following steps:

a) admixing the titanium mineral or slag with alkali-metal bisulfate at an elevated temperature to solubilize any metal oxide therein,



b) dissolving soluble components of the product of step (a) in water,

c) filtering the product of step (b) to obtain a titanyl-sulfate-containing filtrate,

d) seeding the titanyl-sulfate-containing filtrate with ammonia,

e) hydrolozying the titanyl sulfate to form hydrated titanium dioxide and filtering to separate filtrate from thus-produced hydrated titanium dioxide,

f) neutralizing separated filtrate with ammonia to form ammonium and alkali-metal sulfates and metal hydroxide,

g) heating ammonium and alkali-metal sulfate crystals to evolve ammonia and to produce alkali-metal bisulfate,

h) recirculating evolved ammonia to at least one of steps (d) and (f), and

i) recycling alkali-metal bisulfate from step (g) to step (a).

5,591,507

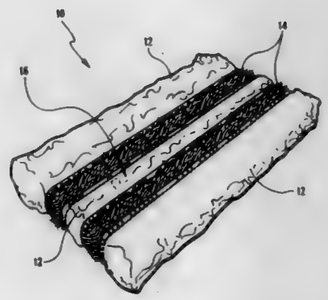
ABSORBANT CLOTH WITH AGITATING FEATURE

Samuel S. Jones, 745 Redbud La., Greenwood, Ind. 46142

Filed Apr. 4, 1995, Ser. No. 417,134

Int. Cl.[6] B32B *3/02*; A47L *13/12*; A47K *7/02*

U.S. Cl. 428—88 **13 Claims**



9. An absorbant cloth having an agitating feature, comprising:

a base material of absorbant fleece material; and

a plurality of spaced apart bands of rough material sewn to a surface of the base material such that the cloth comprises adjoining, alternating areas of absorbent material and rough material.

5,591,508

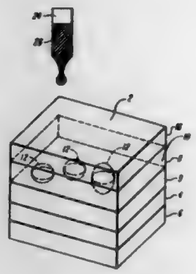
COATING METHODS AND COMPOSITIONS FOR PRODUCTION OF DIGITIZED STEREOSCOPIC POLARIZING IMAGES

Julius J. Scarpetti, Revere, Mass., assignor to Rowland Institute for Science, Cambridge, Mass.

Filed Jan. 31, 1995, Ser. No. 380,941

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—105 **32 Claims**



1. A treated sheet material for recording an image, the treated sheet material comprising

a substrate having a top surface and a bottom surface, and

a coating overlying the top surface of the substrate, the coating comprising an ink-permeable polymeric material for transporting ink molecules from an upper surface of the coating to the underlying substrate and for regulating imbibition of the ink molecules by the substrate.

5,591,509

SKI CONTAINING SHEETLIKE PLATES OR TAPES MADE OF A FIBER REINFORCED MATERIAL

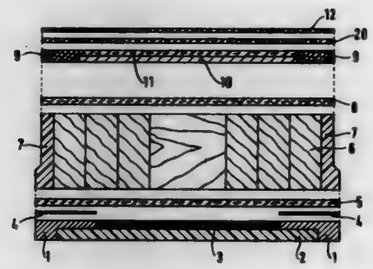
Georg M. Lorenz, Königstein/Taunus; Walter Fester, Saal/Donau; Ulrich Schuster, Regensburg; Erhard Leicht, Hofheim am Taunus, and Ralph Schäfer, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 20, 1991, Ser. No. 811,312

Claims priority, application Germany, Dec. 24, 1990, 40 41 740.9

Int. Cl.[6] B32B *5/28;27/02*

U.S. Cl. 428—107 **11 Claims**



1. A ski in layer construction wherein at least one of the layers comprises a plate or tape made of a fiber reinforced material construction having enhanced vibration dampening properties compared as to glass fibers comprising a textile material and a thermoset resin, the fiber reinforced material having a fiber content of from 40 to 60% by weight and the fiber material contained therein being at least 50% polyacrylonitrile fiber.

5,591,510

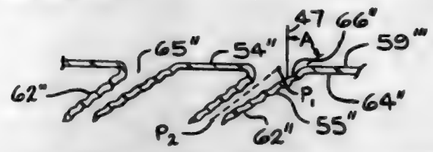
LAYERED FABRIC MATERIAL HAVING ANGLED CAPILLARIES

Stephen G. Junker, Terre Haute; Gregory M. Rieker, Clinton, and Paul E. Thomas, Terre Haute, all of Ind., assignors to Tredegar Industries, Inc., Richmond, Va.

Filed Jun. 14, 1994, Ser. No. 259,460

Int. Cl.[6] B32B *3/24*

U.S. Cl. 428—132 **19 Claims**



1. A layered fabric material that is breathable and has resistance to fluid penetration comprising:

a lightweight, breathable outer layer;

a first layer of non-woven material, said non-woven material being breathable; and

a thermoplastic film having a first surface and a second surface which is spaced apart from said first surface; the thermoplastic film having a plurality of perforations, each perforation forming an angled capillary having a side wall that extends from said second surface of said film, said capillary having a first opening in said first surface and a second opening at an end of said capillary that is spaced apart from said first surface; said first opening having a centerpoint P_1 that is displaced from a centerpoint P_2 of said second opening, a centerline extends through the centerpoints P_1 and P_2, said centerline is substantially parallel to said side wall and is disposed at an angle from about 5° to about 60° with respect to a plane that is perpendicular to said first surface of said film, said capillaries formed by said perforations allowing said film to be breathable while substantially preventing direct flow of liquid through said film.

5,591,511

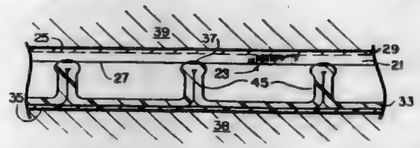
SUPERPLASTICALLY FORMED STRUCTURE HAVING A PERFORATED SKIN

Ken K. Yasui, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Division of Ser. No. 34,874, Mar. 19, 1993, Pat. No. 5,398,410. This application Oct. 17, 1994, Ser. No. 323,793

Int. Cl.[6] B64C *21/08*; B32B *3/24*

U.S. Cl. 428—138 **21 Claims**



1. An apparatus for laminar flow control of an aircraft structure which is capable of being formed from superplastic deformation of a forming pack of stacked sheets comprising:

a thin solid upper sheet,

a perforated sheet adjacent said upper sheet having perforations therethrough,

a core sheet adjacent said perforated sheet which is attached by a plurality of seam welds along said perforated sheet, and which provides a plurality of internal passages which communicate with the perforations in said perforated sheet, and

a solid lower face sheet,

wherein said solid upper sheet and said solid lower face sheet provide sealed surfaces so that the perforated sheet of the forming pack is capable of being internally pressurized for superplastic forming of the pack of stacked sheets, and

wherein said thin solid upper sheet is capable of being removed to expose the perforations of said perforated sheet, so that the plurality of internal passages are capable of being in communication through said perforated sheet with the atmosphere located adjacent the aircraft structure.

5,591,512

MAGNETIC RECORDING MEDIUM HAVING A MAGNETIC LAYER COMPRISING IRON POWDER AND AN UNDERLAYER COMPRISING NON MAGNETIC POWDERS HAVING SPECIFIED PARTICLE SIZE RATIOS

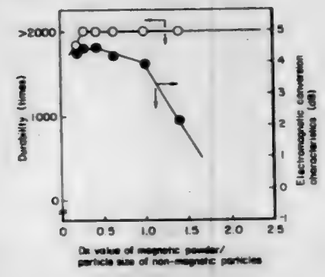
Kimihiko Kaneno, Nagaokakyo; Takuma Yuasa, and Hideki Fujimoto, both of Otokuni-gun, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka-fu, Japan

Continuation of Ser. No. 186,854, Jan. 27, 1994, abandoned. This application Jan. 24, 1996, Ser. No. 590,877

Claims priority, application Japan, Feb. 3, 1993, 5-040444

Int. Cl.[6] G11B *5/708*

U.S. Cl. 428—141 **5 Claims**



1. A magnetic digital recording medium comprising:

a non-magnetic support;

an intermediate layer on said non-magnetic support, said intermediate layer comprising carbon black and non-magnetic particles other than carbon black, a particle size ratio between said non-magnetic particles and said carbon black being from 1.0 to 4.0 in terms of a ratio of a diameter or a short axis size of said non-magnetic particles to a particle size of said carbon black; and

a magnetic layer on said intermediate layer, said magnetic layer having a thickness of from 0.2 to 1.0 μm, wherein said magnetic layer has a difference of an intensity between 102 mm^{-1} and 205 mm^{-1} in a frequency analysis of non-contact surface roughness in a range of from 9 dB to 15 dB, wherein said magnetic layer comprises a magnetic powder comprising iron powder containing 0.1 to 3.0% by weight of aluminum based on the weight of iron content, and a ratio of a Dx value (X-ray particle size) of said iron powder to the particle size of said non-magnetic particles in said intermediate layer is from 0.2 to 1.0 in terms of a ratio of the Dx value to a diameter or a short axis size of said non-magnetic particles in said intermediate layer, and wherein said non-magnetic support, said intermediate layer and said magnetic layer have a total thickness of no greater than 13 μm, said magnetic recording medium being suitable for digital recording.

5,591,513

RUBBER ARTICLE COMPRISING BASIC AMINO-GROUP CONTAINING, AROMATIC ANTI-OXIDANTS AND HAVING A NON-BLACK AREAL MEMBER

Rolf Mahling, Korbach, Germany, assignor to Continental Aktiengesellschaft, Hanover, Germany

Filed Sep. 9, 1994, Ser. No. 303,443

Claims priority, application Germany, Sep. 10, 1993, 43 30 700.0

Int. Cl.[6] B32B *5/16;* **B60C** *13/00*

U.S. Cl. 428—143 **21 Claims**



1. A rubber article comprising a rubber base body and a non-black areal member of rubber and/or plastic attached to the surface of said rubber base body, wherein said rubber base body contains at least one basic, amino-group containing, aromatic anti-oxidant, and wherein said non-black areal member comprises inorganic acidic components, wherein said at least one basic, amino-group containing, aromatic anti-oxidant and said inorganic acidic components form salts upon migration of said at least one basic, amino-group containing, aromatic anti-oxidant into said non-black areal member.

5,591,514

RECORDING PAPER, INK-JET RECORDING PROCESS AND RECORDING SYSTEM MAKING USE OF THE RECORDING PAPER

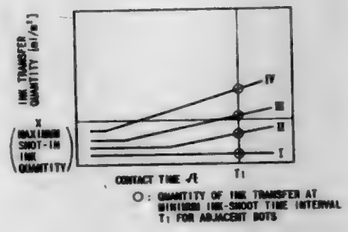
Mifune Hirose, Machida; Eiichi Suzuki, Asaka; Mamoru Sekaki, Yamato, and Masato Katayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1995, Ser. No. 398,764

Claims priority, application Japan, Mar. 8, 1994, 6-037004; Mar. 8, 1994, 6-037005; Mar. 8, 1994, 6-037006

Int. Cl.[6] B41J *2/21;* **B41M** *5/00*

U.S. Cl. 428—211 **14 Claims**



1. An ink-jet recording process comprising imparting ink droplets to a recording paper having a water extraction pH of 6 or more to make a record, wherein the recording paper comprises pulp fibers and a filler, i) having a surface where pulp fibers bared to the surface and pulp fibers covered with particles are present together in portions, and ii) wherein the quantity of ink transfer at a minimum ink-shoot time interval for adjacent dots with different colors as measured by Bristow's test method is not smaller than a maximum shot-in ink quantity per unit area of a recording system used.

5,591,515

MAGNETIC RECORDING MEDIUM WITH A RECORDING LAYER COMPOSED OF LAMINATE STRUCTURE OF MAGNETIC FILMS AND NON-MAGNETIC FILMS, AND METHOD FOR PRODUCING THE SAME

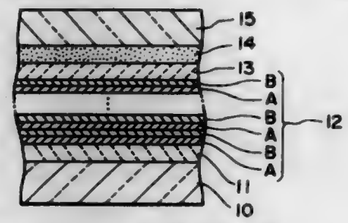
Yoichi Osato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 379,947, Jul. 14, 1989, abandoned. This application Jan. 23, 1995, Ser. No. 376,672

Claims priority, application Japan, Jul. 15, 1988, 63-174966

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—212 **11 Claims**



1. A magnetic recording medium, comprising:

a substrate;

a magnetic recording layer formed on said substrate, said magnetic recording layer comprising a first thin film comprising a rare earth-transition metal magnetic alloy and a second thin film comprising a non-magnetic material selected from the group consisting of Si_3N_4 and Al_2O_3,

wherein said first thin film and said second thin film are alternately laminated, and wherein a combined thickness of a laminated pair of said first thin film and said second thin film is 20 to 50 Å, and

wherein said magnetic recording layer comprises 5 to 130 of said laminated pairs.

5,591,516

DURABLE, PILL-RESISTANT POLYESTER FABRIC AND METHOD FOR THE PREPARATION THEREOF

Pamela J. Jaco, Rock Hill; Mark A. Anderson, Anderson; Michael G. Simmons, Rock Hill, all of S.C., and Terry G. Montgomery, Matthews, N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Jun. 7, 1995, Ser. No. 479,178

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—253 **17 Claims**



1. A method of making a pill-resistant polyester fabric comprising:

microsanding a substantially all-polyester fabric to abrade the fabric surface,

applying a finish comprising a self-crosslinking copolymer and a methylol derivative resin to the fabric, and

treating the fabric bearing said finish under conditions sufficient to crosslink said finish to thereby form a pill resistant fabric.

5,591,517

ANTIREFLECTION FILM

Naoki Takamiya, Chiba; Makoto Nakao, Ichikawa; Akira Yazawa, Matsudo, and Atumi Wakabayashi, Ichikawa, all of Japan, assignors to Sumitomo Osaka Cement Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 298,380, Aug. 30, 1994, abandoned. This application Aug. 7, 1995, Ser. No. 511,730

Claims priority, application Japan, Aug. 31, 1993, 5-240473

Int. Cl.[6] B32B *3/26*

U.S. Cl. 428—304.4 **20 Claims**

1. An antireflection film comprising:

a first transparent layer adhered onto a transparent base material, which layer has a refractive index N_1 of 1.45 to 2.10 and a thickness D_1 (nm) expressed by the following formula (1):

$$0<D_1<0.5\cdot L_1/N_1 \quad (1),$$

and

a second transparent layer adhered onto the first transparent layer, which has a refractive index N_2 at least 0.1 smaller than the refractive index N_2 of the first transparent layer, and a thickness D_2 (nm) expressed by the following formula (2):

$$0<D_2<0.5\cdot L_1/N_2 \quad (2),$$

(in the formulae (1) and (2), L_1 is a wavelength in the range of 400 to 800 nm and N_1 and N_2 are refractive indexes of the first transparent layer and the second transparent layer, respectively);

at least said first transparent layer containing at least one light absorber having a principal absorbing wavelength L_2 (nm) expressed by the following formulae:

$$(L_1+70)\leq L_2 \text{ or } (L_1-50)\geq L_2$$

wherein L_1 is as defined above, and the light absorption of said second layer does not exceed that of said first layer.

5,591,518

POLYESTER FILM FOR USE OF A LAMINATE WITH A METAL PLATE

Takashi Sumiya, Gifu; Iwao Tanaka, Hikone; Kunio Shibatsuji, Kusatsu; Hirokazu Kurome, Gifu; Seiya Sugiura, Takatsuki, and Wataru Ooe, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed May 25, 1995, Ser. No. 452,585

Claims priority, application Japan, Dec. 16, 1994, 6-334210; Dec. 16, 1994, 6-334211

Int. Cl.[6] B32B *9/00; 15/08; 27/06*

U.S. Cl. 428—318.4 **9 Claims**

1. A metal-film laminate comprising:

a metal plate; and

a polyester film heat bonded to said metal plate, said polyester film comprising a polyester-group resin containing a white pigment having a mean particle diameter of 0.01 to 1.8 μm at a content of 10 to 30% by weight, said film having

(a) a void ratio of 4 to 30%,

(b) a melting peak temperature of 150° to 245° C.,

(c) an amount of oligomer of not more than 3% by weight and

(d) an orientation degree of 0.7 to 4.0.

5,591,519

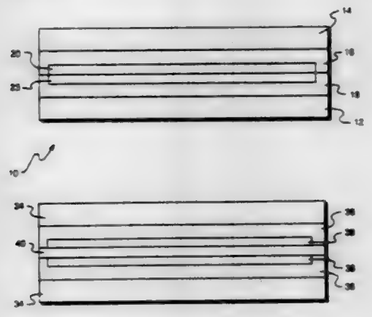
FABRICATION MULTILAYER COMBINED RIGID/FLEX PRINTED CIRCUIT BOARD

A. Roland Caron, Hudson; Lee J. Millette, Litchfield, both of N.H., and John G. King, N. Andover, Mass., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 349,254, Dec. 5, 1994, Pat. No. 5,505,321. This application May 25, 1995, Ser. No. 451,017

Int. Cl.[6] B32B 9/00

U.S. Cl. 428—344 7 Claims



1. A printed circuit basestock composite which allows for the preparation of two flexible circuit boards that can be separated, after imaging, comprising

a pair of conductor layers, a pair of insulating layers, and a pair of polyimide layers, wherein said conductor layers are laminated to said insulating layers wherein the insulating layers are both affixed to said polyimide layers and wherein said polyimide layers are not coextensive with the borders of the insulating layers, thereby forming a basestock composite which can be separated as between said polyimide layers after imaging.

5,591,521

Z-SHAPE PRESSURE-SENSITIVE ADHESIVE TAPES, AND FASTENING SYSTEM AND SANITARY ABSORPTIVE ARTICLES USING THE TAPES

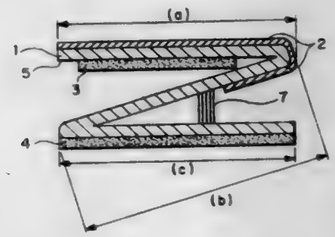
Masaaki Arakawa; Katsumi Hori, and Yoshiaki Makihara, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Oct. 14, 1994, Ser. No. 323,106

Claims priority, application Japan, Oct. 15, 1993, 5-258192; Sep. 20, 1994, 6-224549

Int. Cl.[6] C09J 7/02

U.S. Cl. 428—352 16 Claims



1. A Z-shape pressure-sensitive adhesive tape folded into a Z-shape and composed of an (a) portion, a (b) portion, and a (c) portion, wherein a releasing treatment layer is formed on the outside surface of the (a) portion of the Z-shape tape and the surface of the (b) portion extending to the (a) portion at an area of not more than 50% of the total surface thereof, a releasing treatment layer does not exist on the inside surface of the (c) portion, and a pressure-sensitive adhesive layer is formed on at least one surface of the inside surface of the (a) portion and the outside surface of the (c) portion

wherein in the pressure-sensitive adhesive tape folded into a Z-shape and composed of the (a) portion, the (b) portion, and the (c) portion, the surface of the (b) portion, wherein the releasing treatment layer does not exist, is temporarily joined to the facing inside surface of the (c) portion.

5,591,520

HIGH BARRIER FILM

Robert A. Migliorini, and Eldridge M. Mount, III, both of Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 78,498, Jun. 21, 1993, abandoned, which is a continuation of Ser. No. 805,177, Dec. 11, 1991, abandoned. This application Apr. 28, 1995, Ser. No. 430,701

Int. Cl.[6] B32B 15/08;27/32;27/34

U.S. Cl. 428—347 6 Claims

1. A stretched multi-layer oxygen gas barrier film combination comprising in the following order:

(a) a base layer of polypropylene homopolymer or copolymer at least one surface thereof comprising a maleic acid anhydride modified polypropylene homopolymer or copolymer;

(b) a skin layer of an amorphous polyamide directly bonded on said at least one surface comprising a maleic acid anhydride modified polypropylene homopolymer or copolymer; and

(c) a vacuum metallized layer on said polyamide skin layer.

5,591,522

INSULATING TAPE OR SHEET

Hirokazu Sakai; Takayuki Shimizu; Ryuzo Asano; Naotoshi Miyahara, all of Komaki; Kiyoshi Furukawa, Amagasaki; Masaaki Nagai, Amagasaki; Hiromasa Hosjo, Amagasaki, and Hiroyuki Kamibayashi, Amagasaki, all of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, and Mitsubishi Cable Industries, Ltd., Hyogo, both of Japan

PCT No. PCT/JP94/00458, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO94/22149, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 22, 1994, Ser. No. 347,435

Claims priority, application Japan, Mar. 23, 1993, 5-064058; Mar. 23, 1993, 5-064059; Mar. 23, 1993, 5-064060; Dec. 16, 1993, 5-316819

Int. Cl.[6] B32B 7/12

U.S. Cl. 428—353 7 Claims

1. An insulating tape or sheet comprising (1) a polyester film layer, (2) a polyolefin adhesive layer having a flexural modulus of 500–20000 kgf/cm$_2$, and (3) an anchor coat layer between the polyester film layer and the polyolefin adhesive layer, wherein the anchor coat layer comprises a silane-modified polyolefin or an organic titanium compound as a main component.

5,591,523

POLYESTER TOW

Arun P. Aneja, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1995, Ser. No. 497,495

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—357 1 Claim



1. A tow that is suitable for processing on a worsted or woollen system and that consists of continuous polyester filaments of average denier per filament up to 4.5, wherein said polyester is a chain-branched polymer, said filaments are a mixture of filaments of higher denier per filament and filaments of lower denier per filament, said lower denier is 0.5 to 2.5 denier per filament and said higher denier is 2 to 5 denier per filament and is at least 1.5 times said lower denier, and wherein the cross-sections of said filaments are of generally scalloped-oval shape with grooves, and said grooves run along the length of the filaments.

5,591,524

DEVICE FOR THE LAYING OF YARN ON A CROSS-WOUND BOBBIN

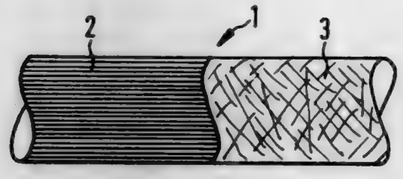
Romeo Pohn, Ingolstadt, and Siegmar Braun, Walting/Pfalzpaint, both of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Continuation of Ser. No. 410,853, Mar. 27, 1995, Pat. No. 5,447,795. This application Mar. 27, 1995, Ser. No. 410,853

Claims priority, application Germany, Aug. 19, 1992, 42 27 318.7

Int. Cl.[6] B32B 9/00

U.S. Cl. 428—367 8 Claims



1. A yarn guidance rod system for use in laying yarn on a bobbin on a textile machine, said system comprising a rod formed from a plurality of adjacently disposed longitudinal segments, at least two of said segments being carbon fiber reinforced material having a lower heat expansion property than that of a machine frame of the textile machine, at least one of said segments being a high heat expansion segment interposed between said two carbon fiber reinforced material segments, said high heat expansion segment being formed of a material having a higher heat expansion property than said carbon fiber reinforced material segments and the textile machine frame such that said rod comprises an overall heat expansion property essentially equal to that of the textile machine.

5,591,525

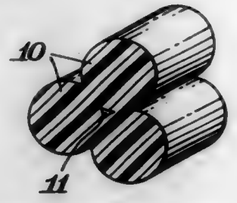
POLYMERIC CABLE

Robert A. Keller, Columbia, S.C., assignor to Shakespeare, Columbia, S.C.

Filed Apr. 7, 1994, Ser. No. 224,245

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—374 6 Claims



1. A cable structure comprising at least three oriented thermoplastic filaments arranged symmetrically about a central axis, each filament having a substantially circular cross-sectional configuration, wherein each filament is fused to at least one adjacent filament along about from 1 to 60% of its perimeter and wherein the central axis of the cable structure is a void.

5,591,526

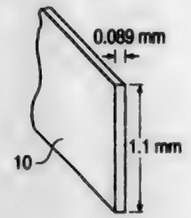
EXPANDED PTFE FIBER AND FABRIC AND METHOD OF MAKING SAME

Brad F. Abrams, Wilmington, Del.; Raymond B. Minor, Elkton, Md.; Gordon L. McGregor, Landenberg, and John W. Dolan, Boothwyn, both of Pa., assignors to W. L. Gore & Associates, Inc, Newark, Del.

Filed Jun. 15, 1994, Ser. No. 260,141

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—401 7 Claims



1. A fiber comprising:

a strand of expanded polytetrafluoroethylene (PTFE) of uniform dimensions in width along its entire length;

wherein the fiber has an outer surface of essentially rectangular to oblong cross-sectional dimension, the fiber being without folds so that its outer surface is fully exposed and is essentially flat;

wherein the fiber in an unfolded orientation comprises cross-section dimensions with a width of between about 0.5 to 3 mm and a thickness of at least 50 μm.

5,591,527

OPTICAL SECURITY ARTICLES AND METHODS FOR MAKING SAME

Shih-Lai Lu, Taipei, Taiwan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

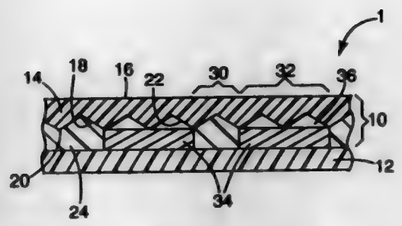
Filed Nov. 2, 1994, Ser. No. 333,276

Int. Cl.[6] B32B 9/04

U.S. Cl. 428—411.1 16 Claims

1. An optical security article comprising:

(a) a first layer substantially transparent to visible light and having a first refractive index, the first layer having a struc-



tured first surface comprising a plurality of adjacent geometric concavities and peaks and a substantially planar second surface;

(b) an adhesive layer coterminating with said first layer, the adhesive layer substantially filling and adhesively contacting a first number of the geometric concavities, the adhesive layer having a refractive index which is substantially equal to the refractive index of the first layer, thus forming at least one transparent area, and

(c) a separation layer disposed between the adhesive layer and a second number of the geometric concavities to prevent contact of the adhesive with the concavities and to define a plurality of pockets between the separation layer and the second number of concavities.

5,591,528

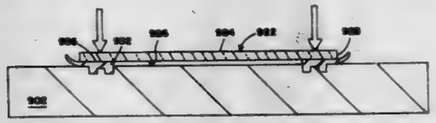
VEHICULAR PANEL ASSEMBLY AND METHOD FOR MAKING SAME

Daniel J. Fisher; Raj K. Agrawal; Douglas Crank, and John W. Carter, all of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Division of Ser. No. 898,894, Jun. 12, 1992, Pat. No. 5,443,673. This application Mar. 17, 1995, Ser. No. 405,966

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—411.1 **17 Claims**



1. A panel assembly comprising:

a panel having first and second surfaces and a peripheral edge;

a gasket formed separately from said panel and having an arciform body; and

a heat-activated primer composition between said panel and said gasket for bonding said arciform gasket to a single surface of said panel.

5,591,529

OPTICAL FILTER HAVING MULTI-LAYER COATING

Christoph Brantz, Hainburg; Joachim Szczyrbowski, Goldbach, and Anton Zmelty, Hösbach, all of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Mar. 7, 1995, Ser. No. 400,157

Claims priority, application Germany, Mar. 7, 1994, 44 07 502.2

Int. Cl.[6] B32B *15/04*

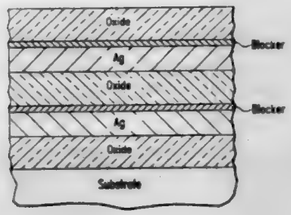
U.S. Cl. 428—457 **14 Claims**

1. Coated substrate comprising:

a transparent substrate,

a first layer of oxides of a metal alloy SnX deposited on the surface of the support, X being one of the metals Mg, Al, Zr, Ti or Ta and the content of X being 5 to 15 atomic percent,

a first silver layer deposited on the metal oxide layer,



a second metal oxide layer of a metal alloy SnY deposited over the first silver layer, Y being one of the metals Mg, Al, Zr, Ti, or Ta and the content of Y being 5 to 15 atomic percent,

a second silver layer deposited on the second metal oxide layer, and

a third metal oxide layer of a metal alloy SnZ deposited over the second silver layer, Z being one of the metals Mg, Al, Zr, Ti, or Ta and the content of Z being 5 to 15 atomic percent.

5,591,530

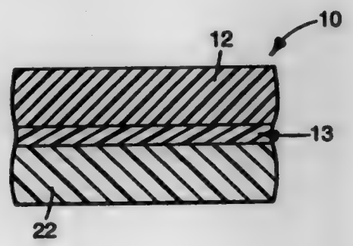
FLEXIBLE OPTICALLY UNIFORM SIGN FACE SUBSTRATE

Robert W. Warner, Woodbury; Robert C. Fitzer, North Oaks; David B. Redmond, and Ronald J. Tabar, both of St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 955,344, Oct. 1, 1992, Pat. No. 5,422,189. This application Apr. 14, 1995, Ser. No. 422,266

Int. Cl.[6] B32B *27/36*

U.S. Cl. 428—480 **7 Claims**



1. An optically uniform sign face substrate comprising sequential order:

(a) a first layer of durable thermoplastic sheeting;

(b) a multilayer scrim film; and

(c) a second layer of durable thermoplastic sheeting, wherein the optically uniform sign face substrate is clear, transparent or translucent and does not show a visible pattern when backlit and the first and second layer of durable thermoplastic sheeting comprises one or more layers of polyester, polyamide, polyimide, plasticized or non-plasticized polyvinyl chloride, polyethylene acrylic acid, polyurea, polyurethane, polypropylene, polyethylene methacrylic acid, thermoplastic rubber, polypropylene oxide, polystyrene, polystyrene-polydiene block copolymer, ionic thermoplastic elastomer, polyether, polyesteramide, polyetheresteramide, siloxane, ethylene vinyl acetate, polymethacrylic acid, acetate copolymer, PVDC, polycaprolactone, silicone rubber, fluorine-containing elastomers, polybutene, elastomeric block copolymers and blends and mixtures thereof.

5,591,531

ALUMINIZED STEEL ALLOYS CONTAINING CHROMIUM

Joseph C. Jasper, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Division of Ser. No. 230,042, Apr. 19, 1994, Pat. No. 5,447,754. This application May 23, 1995, Ser. No. 448,055

Int. Cl.[6] C21D *1/74*

U.S. Cl. 428—610 **11 Claims**

1. A preannealed ferritic steel alloy for aluminizing containing at least 0.5% chromium, said steel alloy preannealed in a box annealing furnace having a substantially pure hydrogen bright annealing atmosphere having a dew point less than −60° C. (−75° F.) at a temperature of about 675° C. to 785° C. (1250° F. to 1450° F.) with a soak time of at least 1 hour, said preannealed steel characterized by surface layers which are preserved for aluminizing having iron enrichment compared to surface layers of continuous annealed ferritic steel alloys.

5,591,532

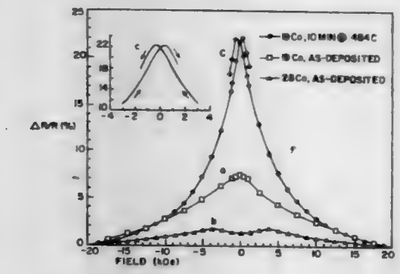
GIANT MAGNETORESISTANCE SINGLE FILM ALLOYS

Ami Berkowitz, Del Mar, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 889,431, Jun. 16, 1992, abandoned. This application Apr. 1, 1994, Ser. No. 221,924

Int. Cl.[6] B32B *15/00*

U.S. Cl. 428—611 **10 Claims**



1. A single layer film which exhibits giant magnetoresistance upon application of a magnetic field of about 100 Oersted or less, the film comprising:

a magnetic metallic matrix on a substrate, said magnetic metallic matrix having a first magnetic phase;

a plurality of magnet particles having a second magnetic phase of greater magnetism than said first magnetic phase suspended within said magnetic metallic matrix wherein each magnetic particle comprises a single magnetic domain having a size less than a mean free path within said magnetic particle and such that an amount of spin-dependent interfacial scattering from an outer surface of said magnetic particles is increased relative to an amount of bulk scattering within said magnetic particles to increase giant magnetoresistance in accordance with the relationship

$$MR = \frac{4p_s^2}{(1-p_s^2)^2 + 2\sigma(1+p_s^2)r_{MR} + \sigma^2 r_{MR}^2}$$

where

$$\sigma = \left(\frac{1-c}{\lambda_{MX}} + \frac{c}{\lambda_{MR}}\right)/3c\xi$$

and r_{MR} is an average radius of said magnetic particles, p_s is a spin-dependent ratio for scattering at a surface of said magnetic particles, λ_{MX} is a mean free path in said magnetic metallic matrix, λ_{MR} is a mean free path in said magnetic particles, ξ is a scattering strength for said surface of said magnetic particles, and c is a concentration of said magnetic particles; and

a biasing means comprising an antiferromagnetic film which is exchange coupled with said magnetic metallic matrix;

wherein exchange coupling is established between said first magnetic phase and said second magnetic phase.

5,591,533

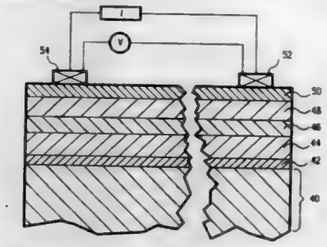
THIN FILM MAGNETIC TRANSDUCER HAVING A STABLE SOFT FILM FOR REDUCING ASYMMETRY VARIATIONS

Mustafa Pinarbasi, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 167,684, Dec. 14, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 458,862

Int. Cl.[6] B32B *15/04*; G11B *21/00*

U.S. Cl. 428—611 **8 Claims**



1. A magnetoresistive read transducer comprising:

a substrate having a top layer of Al_2O_3 or SiO_2 thereon;

a surface layer of partially oxidized chromium or tantalum deposited over and contiguous with the top layer of Al_2O_3 or SiO_2 , the surface layer material having a high resistivity;

a bias layer of soft magnetic material on said surface layer;

a layer of magnetoresistive material magnetically decoupled from and magnetostatically coupled to the soft magnetic material such that the soft magnetic material magnetically biases the magnetoresistive material, the layer of magnetoresistive material separated from said bias layer by a nonmagnetic spacer layer, and the material of said surface layer characterized by being substantially inert with respect to the soft magnetic material to provide a well defined surface for formation of said bias layer.

5,591,534

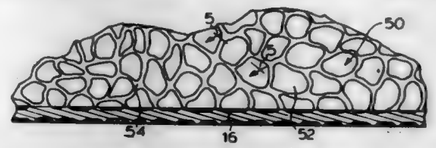
ENHANCED PROTECTIVE METALLIC COATING WEIGHTS FOR STEEL SHEET

Andre F. Vigeant, Cornwall, and Alain Bernard, Contrecoeur, both of Canada, assignors to Sorevco, Inc., Coteau-du-Lac, Canada

Filed Mar. 25, 1994, Ser. No. 218,869

Int. Cl.[6] B32B *15/18*

U.S. Cl. 428—612 **29 Claims**



1. In a hot dip coated steel sheet product having a protective coating layer of a protective metallic coating material selected from the group consisting of galvanized material, galvalume material and aluminized material, said protective material being applied over its entire surface, said steel sheet being roughened on at least

one side prior to hot dip application of protective material thereto, said protective material during said hot dip application reaction with said steel sheet to form a steel alloy which adheres said layer of protective material to said steel sheet,

the improvement being characterized by said roughened steel surface having a pattern which ensures consistent quantity of said protective coating during application of said protective material,

said pattern providing on said side a multitude of depressions defined by plurality of ridges, the upper surfaces of essentially all of said ridges for said side defining a plane for said side, said upper surfaces of aid ridges having a surface are less than one quarter the nominal surface area of said side,

each depression having a depth defined by a sidewall extending into said plane of said side, said sidewall sloping inwardly of said side plane at an angle greater than 45°, said depressions being on average approximately 500 to 700 microns deep,

said multitude of depressions on said side having picked up a sufficient quantity of said protective material to provide a consistent quantity of said protective material when solidified and adhered to said side steel sheet.

5,591,535

FERROMAGNETIC METAL POWDER

Seiichi Hisano; Kazuhisa Saito; Satoshi Aizawa; Kazushi Sano; Kazuyuki Matsumoto, and Kenji Murata, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 266,227, Jun. 27, 1994, Pat. No. 5,534,361. This application May 1, 1995, Ser. No. 432,467

Claims priority, application Japan, Jul. 1, 1993, 5-186578

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—694 RE **17 Claims**

1. Acicular ferromagnetic metal particles consisting essentially of iron, cobalt in an amount of 50 atm % or less based on the amount of iron, 0.1–10% atm % based on the total quantity of the metal elements present of yttrium or any other rare earth element, and 0.05 wt % or less of an element of Group Ia of the periodic table contained as an incidental component, said element of Group Ia being selected from the group consisting of lithium, sodium and potassium.

5,591,536

Patent Not Issued For This Number

5,591,537

SOLID OXIDE FUEL CELL

Carsten Bagger; Bruno Kindl, both of Roskilde, and Mogens Mogensen, Lynge, all of Denmark, assignors to Forskningscenter RISØ, Roskilde, Denmark

PCT No. PCT/DK94/00084, § 371 Date Oct. 26, 1995, § 102(e) Date Oct. 26, 1995, PCT Pub. No. WO94/20998, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 1, 1994, Ser. No. 513,823

Claims priority, application Denmark, Mar. 1, 1993, 0225/93

Int. Cl.[6] H01M *8/12*

U.S. Cl. 429—33 **5 Claims**

1. A solid oxide fuel cell, comprising:

a cathode,

a yttrium stabilized zirconium oxide—electrolyte, and

an anode,

where the cathode is a mixture of $La_{1-x}Sr_xMnO_3$ and yttrium stabilized zirconium oxide, the yttrium stabilized zirconium oxide of the cathode amounting to 20 to 75% by weight, and the yttrium stabilized zirconium oxide content of the cathode containing less Y_2O_3 than the yttrium stabilized zirconium oxide content of the electrolyte, wherein $0<x<1$.

5,591,538

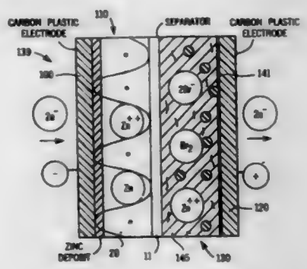
ZINC-BROMINE BATTERY WITH NON-FLOWING ELECTROLYTE

Phillip A. Eidler, Muskego, and Peter J. Lex, Wauwatosa, both of Wis., assignors to ZBB Technologies, Inc., Wauwatosa, Wis.

Filed Jul. 7, 1995, Ser. No. 499,144

Int. Cl.[6] H01M *6/00*

U.S. Cl. 429—122 **21 Claims**



1. A non-flowing electrolyte, zinc-bromine battery comprising:

a plurality of carbon plastic electrodes, each electrode having a first surface and a second surface;

one or more separators, each said separator having a first surface and a second surface and each said separator disposed in spaced, sandwich relation with respect to two of the plurality of carbon plastic electrodes;

a carbon coating applied on the first surface of each of the plurality of carbon plastic electrodes;

one or more anodic half-cells, each defined by the second surface of one carbon plastic electrode, and the first surface of one separator;

one or more cathodic half-cells, each defined by the second surface of one separator, and the first surface of one carbon plastic electrode;

an electrolyte disposed in each half-cell; and

a high surface area carbon material for facilitating the formation of a relatively uniform layer of bromine at or near the second surface of each carbon plastic electrode disposed in, and substantially completely filling, each cathodic half-cell;

wherein the plurality of carbon plastic electrodes and at least one separator form at least one electrochemical cell.

5,591,539

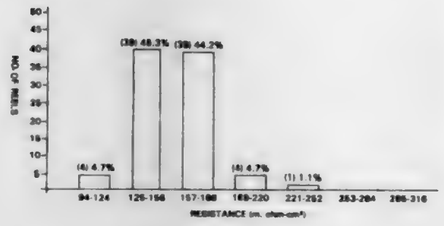
ELECTROLYTICALLY CONDUCTIVE BATTERY SEPARATOR POLYMERIC FILM

Peter J. Degen, Huntington, and Joseph Y. Lee, South Setauket, both of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Filed Apr. 13, 1993, Ser. No. 46,654

Int. Cl.[6] H01M *2/16*

U.S. Cl. 429—144 **10 Claims**



1. A lot of a polyethylene film for making separators for alkaline battery applications comprising a crosslinked low density polyethylene film having a thickness of from about 0.5 to about 5 mils and a monomer selected from the group consisting of acrylic and methacrylic acid radiation-grafted to the polyethylene film to an extent selected to satisfy the requirements for the alkaline battery application, said film having an electrolytic resistance in the range of 100 to 250 $m\Omega\text{-}cm^2$ and a uniformity index no more than 50 $m\Omega\text{-}cm^2$ as measured from eight samples taken equidistantly along at least a 100 foot lineal length of said lot of polyethylene film.

5,591,540

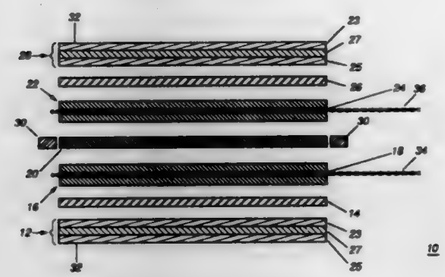
PACKAGING FOR AN ELECTROCHEMICAL DEVICE AND DEVICE USING SAME

Edmond Louie, Lawrenceville; Veronica R. Reichert, Bethlehem; Anuba A. Anani, Norcross, and Jinshan Zhang, Duluth, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1995, Ser. No. 494,463

Int. Cl.[6] H01M *2/02*

U.S. Cl. 429—163 **30 Claims**



1. A packaging material for an electrochemical charge storage device consisting of a multilayered polymeric material having a water vapor permeability of less than 2.0 g/m^2 day and an oxygen vapor permeability of less than 200 mL/m^2 day, wherein said electrochemical charge storage device is an aqueous battery, a gel battery, a solid state battery cell, or an electrochemical capacitor.

5,591,541

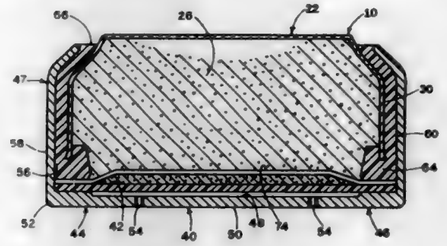
HIGH STEEL CONTENT THIN WALLED ANODE CAN

John E. Oltman, Mount Horeb, Wis., assignor to Rayovac Corporation, Madison, Wis.

Filed May 5, 1995, Ser. No. 435,185

Int. Cl.[6] H01M *2/02; 2/04*

U.S. Cl. 429—171 **113 Claims**



1. An anode can for use in an electrochemical cell, said anode can having an outer surface to be disposed outwardly on an electrochemical cell when said anode can is assembled thereinto and an inner surface to be disposed inwardly in an electrochemical cell when said anode can is assembled thereinto, said anode can comprising a structure having a first outer layer corresponding with the outer surface, a second inner layer corresponding with the inner surface, and a third layer disposed between said first and second layers, said third layer comprising about 77 percent by weight to about 91 percent by weight of said anode can and comprising stainless steel, said first and second layers, in combination, comprising about 9 percent by weight to about 23 percent by weight of said anode can, said first layer comprising nickel, and said second layer comprising copper.

5,591,542

BATTERY DIAPHRAGM AND BATTERY WITH SUCH A DIAPHRAGM

Takeshi Sakamoto; Koji Hara, and Akira Harada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

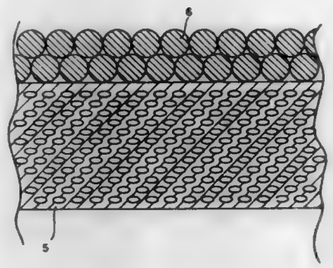
PCT No. PCT/JP94/00182, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO94/18711, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 8, 1994, Ser. No. 313,268

Claims priority, application Japan, Feb. 9, 1993, 5-021130

Int. Cl.[6] H01M *6/18*

U.S. Cl. 429—192 **37 Claims**

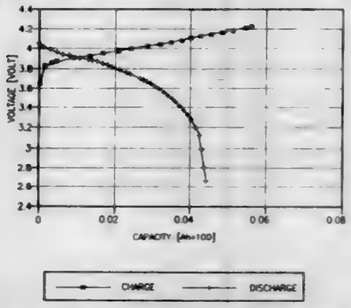


30. A battery comprising a positive electrode (2), a negative electrode (3) and a diaphragm (1), said diaphragm (1) comprising a hydrophilized tetrafluoroethylene drawn film (5); and ethylene-acrylic acid copolymer particles (6) carried on said film (5).

5,591,543
SECONDARY ELECTROCHEMICAL CELL

Emanuel Peled, Even Yehuda; Chen Menachem, Ariel, and Aharon Gorenshtein, Bat Yam, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Continuation-in-part of Ser. No. 122,385, Sep. 16, 1993, abandoned. This application May 15, 1995, Ser. No. 441,628
Int. Cl.[6] H01M *4/48;6/16*
U.S. Cl. 429—192 **12 Claims**



1. A secondary electrochemical lithium cell, wherein the cathode, in a discharged state, is based on a crystalline compound with an X-ray pattern of the formula:

$$Li_{1-x}Q_{x/n}ZO_m$$

produced by a solid/solid reaction at a temperature above 750° C., wherein:

Q is a member selected from the group consisting of calcium, barium, magnesium, strontium and a combination thereof,

x is smaller than 0.2,

Z is a member selected from the group consisting of cobalt, nickel, manganese, iron and vanadium,

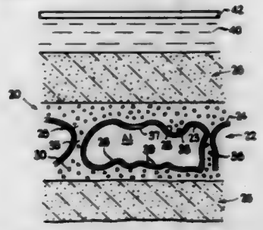
m is 2 for cobalt, nickel, manganese and iron, and,

m is 2.5 vanadium.

5,591,544
CURRENT COLLECTOR DEVICE

Denis G. Fauteux, Acton; Arthur A. Massucco, Natick; Ronnie D. Wilkins, Melrose, and Jie Shi, Arlington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 325,994, Oct. 19, 1994. This application Mar. 6, 1995, Ser. No. 399,192
Int. Cl.[6] H01M *4/64*
U.S. Cl. 429—209 **9 Claims**



1. A current collector device for use in a lithium electrolytic cell comprising:

a current collector constructed from aluminum, wherein the aluminum current collector has an interfacial impedance relative to current collection;

means for lowering the interfacial impedance of the aluminum current collector wherein the aluminum current collector has a surface with a reduced native oxide layer relative to a native oxide layer;

means for precluding re-growth of an oxide layer on the surface of the aluminum current collector to, in turn, maintain the lowered interfacial impedance,

the means for precluding re-growth of an oxide layer including a primer material devoid of water applied and adhered to at least a portion of the surface of the aluminum current collector.

5,591,545
CARBON MATERIAL AND METHOD FOR PRODUCING SAME

Kohichi Miyashita; Atsushi Demachi; Kenji Sato; Minoru Noguchi, and Naohiko Oki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

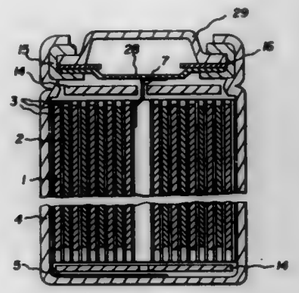
Continuation of Ser. No. 75,455, Jun. 18, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 347,226
Claims priority, application Japan, Nov. 20, 1991, 3-329675; Nov. 20, 1991, 3-329676; Feb. 28, 1992, 4-075874
Int. Cl.[6] H01M *4/58*
U.S. Cl. 429—218 **6 Claims**

3. A primarily amorphous carbon material obtained by heat-treating an organic, non-heterocyclic polymer compound under an inert gas atmosphere at a temperature of 500° to 1500° C., wherein said amorphous carbon material (1) has a hydrogen/carbon atomic ratio from 0.15 to 0.40, (2) a density from 1.3 to 2.1 g/cm^3, (3) an amorphous structure, (4) exhibits peaks in the vicinity of 1350 cm^{-1} and 1600 cm^{-1} and no clear peak in the vicinity of 2700 cm^{-1} in a Raman spectrum analysis using an argon ion laser beam having a wavelength of 5,145 Å, (5) exhibits a peak in the vicinity of 120 to 130 ppm, in NMR analysis, arising from aromatic cyclocondensation, and (6) has electrical conductivity, with a resistivity of 10^{-3} to 10^4 Ωcm at room temperature.

5,591,546
SECONDARY CELL

Toru Nagaura, Fukuoka, Japan, assignor to Hival Ltd., Fukuoka, Japan

Filed Apr. 20, 1995, Ser. No. 425,499
Claims priority, application Japan, Apr. 21, 1994, 6-121708
Int. Cl.[6] H01M *004/50*
U.S. Cl. 429—218 **6 Claims**

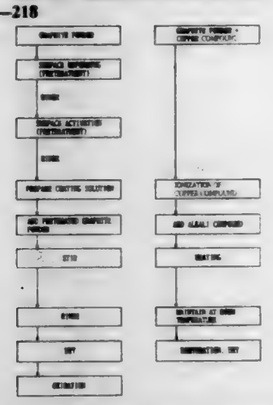


1. In a secondary cell comprising as encased in a closed container a positive electrode having a positive electrode collector, a negative electrode having a negative electrode collector and a nonaqueous electrolyte containing lithium ions, said nonaqueous electrolyte secondary cell characterized in that active materials forming the positive electrode and the negative electrode respectively are each a lithium-containing metallic oxide of the spinel type.

5,591,547
METHOD OF MANUFACTURING A NEGATIVE ELECTRODE FOR LITHIUM SECONDARY BATTERY

Tetsuya Yoneda, Nabari; Takehito Mitate, Yamatotakada; Naoto Nishimura, and Kazuo Yamada, both of Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1995, Ser. No. 459,166
Claims priority, application Japan, Jul. 29, 1994, 6-178300
Int. Cl.[6] H01M *10/38;10/36;10/40*
U.S. Cl. 429—218 **12 Claims**



1. A method of manufacturing a negative electrode for a lithium secondary battery, comprising the steps of:

mixing graphite particles, which as a main constituent permits intercalation and de-intercalation of lithium ions, and a compound including copper ions,

forming copper hydroxide at least of a part on the surface of at least a part of said graphite particles by a chemical reaction in a solution containing said compound including copper ions and an alkali compound,

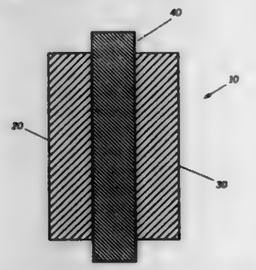
obtaining graphite composite powder having copper oxide particles formed at least on a part of the surface of at least a part of said graphite particles by dehydrating said copper hydroxide to convert the same into copper oxide particles, and

mixing a binding material into said graphite composite powder.

5,591,548
ELECTRODE MATERIALS FOR RECHARGEABLE ELECTROCHEMICAL CELLS AND METHOD OF MAKING SAME

Zhenhua Mao, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1995, Ser. No. 464,440
Int. Cl.[6] H01M *4/02*
U.S. Cl. 429—218 **23 Claims**



1. A method of fabricating a lithiated transition metal oxide electrochemical charge storage material, said method comprising the steps of:

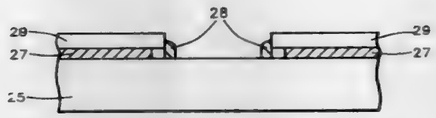
providing a first transition metal precursor material; mixing said transition metal precursor material with a lithium containing compound wherein either said first transition metal precursor or said lithium containing compound includes an oxidizing agent; and

heating the mixture of said first transition metal material and said lithium containing compound in an inert environment.

5,591,549
SELF ALIGNING FABRICATION METHOD FOR SUB-RESOLUTION PHASE SHIFT MASK

Ming-Tzong Yang, Hsin Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Sep. 16, 1994, Ser. No. 307,232
Int. Cl.[6] G03F *7/12*
U.S. Cl. 430—5 **12 Claims**



1. A method of forming a sub-resolution phase shift mask, comprising the steps of:

providing a transparent substrate;

forming a layer of first opaque material on said transparent substrate;

forming a layer of phase shifting material on said layer of first opaque material;

forming a layer of photoresist on said layer of first opaque material;

forming a pattern in said first opaque material by means of isotropic etching using said photoresist pattern and said phase shifting material pattern as a mask;

over etching by means of isotropic etching said first opaque material so that said phase shifting material pattern edges overhang said first opaque material pattern edges;

stripping said photoresist material;

forming a layer of second opaque material over the entire mask surface; and

anisotropically etching vertically said second opaque material to form spacers of said second opaque material at said phase shifting material pattern edges, whereby a space is left between said first opaque material pattern edges and said spacers.

5,591,550
PHASE SHIFT MASK AND METHOD FOR FORMING PHASE SHIFT MASK

Yong K. Choi, Seoul, and Young J. Song, Chungcheongbuk-do, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

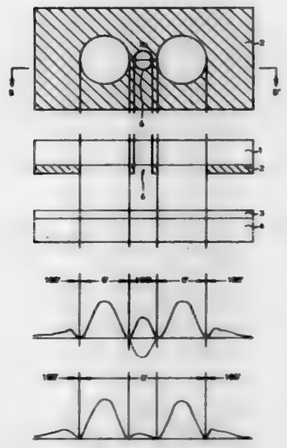
Filed Apr. 17, 1995, Ser. No. 423,113
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **9 Claims**

1. A method for forming a halftone phase shift mask comprising:

forming a halftone pattern material layer on a substrate;

defining positions on the halftone pattern material layer for forming two or more open regions of a desired pattern and for forming one or more dummy open regions, wherein each of the dummy open regions may offset a respective new side lobe formed by overlap of side lobes of light passing through the open regions; and

patterning the halftone pattern material layer to form the open regions and the dummy open regions at the defined positions.



5,591,551
UV/EB CURABLE BUTYL COPOLYMERS FOR LITHOGRAPHIC AND CORROSION-RESISTANT COATING APPLICATIONS

Jay D. Audett, Brown Deer, Wis., and Kenneth O. McElrath, Waterloo, Belgium, assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Division of Ser. No. 298,450, Oct. 27, 1994, which is a division of Ser. No. 982,104, Nov. 24, 1992, Pat. No. 5,736,503, which is a continuation of Ser. No. 631,610, Dec. 20, 1990. This application Jun. 7, 1995, Ser. No. 474,870
Int. Cl.[6] G03C *3/00*
U.S. Cl. 430—18 **1 Claim**

1. An etched article made by:

(a) coating at least a portion of a surface of an article with a composition comprising a random copolymer of an isoolefin of 4 to 7 carbon atoms and para-alkylstyrene comonomer, said isoolefin comprising 10 to 99.5 weight % of said copolymer and said para-alkylstyrene comprises 0.5 to 90 weight % of said copolymer, wherein about 0.5 to 55 weight % of said copolymer comprises para-alkylstyrene monomers having a photoinitiator substituted on the pendent alkyl group, said copolymer having a substantially homogeneous compositional distribution;

(b) selectively exposing said surface to gamma, UV, electron beam, visible, or microwave radiation to crosslink the copolymer "in the area exposed to said radiation";

(c) removing the uncrosslinked copolymer to develop a pattern of the crosslinked copolymer; and

(d) etching said surface not coated with said crosslinked copolymer to transfer said pattern into said surface.

5,591,552
TONER COMBINATION AND METHOD AND APPARATUS FOR USE

Roger N. Ciccarelli, Rochester; Jacques C. Bertrand, Ontario; Thomas R. Pickering, Webster, and Denise R. Bayley, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

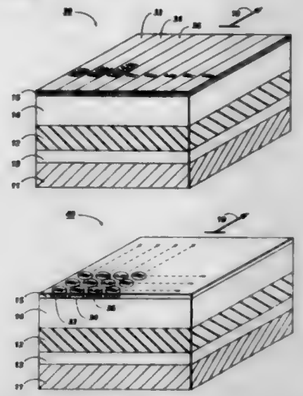
Filed Oct. 12, 1995, Ser. No. 542,232
Int. Cl.[6] G03G *9/09;13/01;15/01*
U.S. Cl. 430—45 **30 Claims**

27. An imaging process which comprises the generation of an electrostatic image on a photoconductive imaging member followed by the development thereof with a combination, set, or gamut of toners, and wherein four toners are selected, and which toners are comprised of a cyan toner, a magenta toner, a yellow toner, and a black toner, each of said toners being comprised of resin and pigment, and wherein the pigment for the cyan toner is a β type copper phthalocyanine, the pigment for the magenta toner is a quinacridone, the pigment for the yellow toners is a diazo benzidine, and the pigment for the black toner is carbon black, and wherein each of said cyan, magenta, and yellow pigments has a particle diameter size of agglomerate diameter size of from about 0.01 micron to about 3 microns and said black pigment is of a particle diameter size of from about 0.001 micron to about 0.1 micron, and wherein each of said cyan, magenta, and yellow pigments are dispersed by flushing said cyan, magenta or yellow pigment into said toner resin, wherein a cyan, magenta or yellow pigment water wet cake is mixed with toner resin and the water is removed to generate pigmented resin containing from about 2 to about 50 weight percent of pigment based on the weight percent of said toner resin and said pigment: and wherein each of the resulting pigmented resin concentrate product is mixed and diluted with additional toner resin to generate cyan, magenta and yellow toners containing each of said magenta, cyan or yellow pigment, respectively, in an amount of from about 20 to about 40 weight percent.

5,591,553
FILTERED PHOTORECEPTOR

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 602,586, Oct. 24, 1990, abandoned. This application Nov. 2, 1992, Ser. No. 970,435
Int. Cl.[6] G03G *5/12*
U.S. Cl. 430—46 **12 Claims**



1. An electrophotographic imaging method comprising providing an imaging member comprising a substrate, a unitary electrophotographic insulating layer which is electrically insulating in the dark and electrically conductive when struck by activating radiation and a continuous, substantially transparent film forming polymer phase, said layer having a surface facing away from said substrate, said surface facing away from said substrate comprising imbibed dye molecules, providing said surface facing away from said substrate with at least two sets of internal preformed dye color filter patterns, one of said sets of internal preformed dye color filter patterns having a different colored dye from the other set, forming a uniform charge on said imaging member, exposing said uniform charge on said imaging member in a single step to a multi-colored light image to discharge said imaging member in the non-image areas and to form at least one electrostatic latent image corresponding to a first of said sets of internal preformed dye color filtered patterns and at least one electrostatic latent image corresponding to a second of said internal preformed dye color filtered patterns, developing said electrostatic latent image corresponding to said the first of said sets of internal preformed dye color filtered patterns with marking particles of a second color to form a second toned image, said first and second toned images being formed in a single pass, and transferring in a single step said first toned image and said second toned image to a receiving member, and affixing said toned images to a receiving member to complete an imaging cycle.

5,591,554
MULTILAYERED PHOTORECEPTOR WITH ADHESIVE AND INTERMEDIATE LAYERS

Satchidanand Mishra; Robert C. U. Yu, both of Webster; Kathleen M. Carmichael, Williamson; Edward F. Grabowski, Webster; Anthony M. Horgan, Pittsford; William W. Limburg, Penfield; Sharon E. Normandin, Macedon; Damodar M. Pai, Fairport; Richard L. Post, Penfield; Charles C. Robinson, Fairport; Brian E. Springett; Donald P. Sullivan, both of Rochester, and Donald C. VonHoene, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1996, Ser. No. 587,120
Int. Cl.[6] G03G *5/047;5/14*
U.S. Cl. 430—59 **22 Claims**

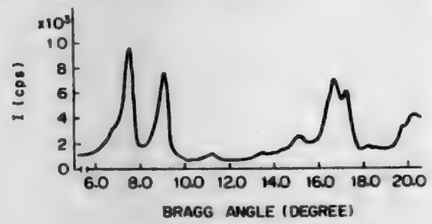
1. An electrophotographic imaging member comprising a support substrate having a two electrically conductive ground plane layer comprising a layer comprising zirconium over a layer comprising titanium, a hole blocking layer, an adhesive layer comprising a copolyester film forming resin, an intermediate layer in contact with said adhesive layer, said intermediate layer comprising a film forming carbazole polymer, a charge generation layer comprising a perylene or a phthalocyanine, and a hole transport layer, said hole transport layer being substantially non-absorbing in the spectral region at which the charge generation layer generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said charge generation layer and transporting said holes through said charge transport layer.

6. An electrophotographic imaging member according to claim 1 wherein said intermediate layer comprises said carbazole polymer and an arylamine charge transport molecule.

5,591,555
ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR INCLUDING A METAL-FREE PHTHALOCYANINE

Shinichi Tamura; Seishi Terasaki; Tadashi Mimura; Terunaki Kobayashi, and Youichi Tei, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jan. 10, 1995, Ser. No. 370,384
Claims priority, application Japan, Jan. 11, 1994, 6-001030
Int. Cl.[6] G03G *5/06*
U.S. Cl. 430—78 **1 Claim**



1. An electrophotographic photoconductor, comprising:

metal-free phthalocyanine as a charge-generating substance,

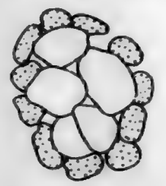
wherein the X-ray diffraction spectrum of said metal-free phthalocyanine as measured using CuKα as a radiation source includes intense diffraction peaks at Bragg angles (2θ±0.2°) of 7.5°, 9.0°, 16.6°, 17.2°, 21.5°, 22.2°, 23.8°, and 28.5°, and

wherein the infrared absorption spectrum of said metal-free phthalocyanine includes four absorption bands with the maximum absorption intensity at a wavenumber of 716 cm^{-1} between a wavenumber of 700 cm^{-1} and a wavenumber of 760 cm^{-1} and a characteristic absorption band at a wavenumber of 3,291±2 cm^{-1}.

5,591,556
TONERS FOR DEVELOPING ELECTROSTATIC IMAGE

Hiroyoshi Shimomura, Sano; Yukinobu Hasegawa, Kurobe; Hiroshi Seritzawa, Kazo, and Masatoshi Maruyama, Oyama, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 961,872, Oct. 15, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 356,575
Int. Cl.[6] G03G *9/087*
U.S. Cl. 430—109 **9 Claims**



1. A toner for developing an electrostatic image comprising secondary particles having a mean particle size B of 1.2 to 20 microns, each said secondary particle comprising a plurality of primary colored resin particles and a plurality of primary uncolored resin particles, said secondary particles comprising primary colored resin particles having a mean particle size A_1 of 0.6 to 10 microns and primary uncolored resin particles having a mean particle size A_2 of 0.6 to 10 microns,

said primary colored resin particles comprising a colorant and plural elementary resin particles consisting of one or more polymer materials,

said primary uncolored resin particles comprising one or more polymer materials, and

both or either of the primary colored resin particles and the primary uncolored resin particles containing a polar polymer; and.

$$\frac{1}{2} \geq \frac{A_1}{B} \geq \frac{1}{40}$$

or

$$\frac{1}{2} \geq \frac{A_2}{B} \geq \frac{1}{40}.$$

5,591,557
LIQUID DEVELOPER INCLUDING ORGANO TITANATE CHARGE CONTROL AGENT FOR ELECTROSTATOGRAPHY

Terence M. Lawson, Aldgate, and Stephen L. Nicholls, Willunga, both of Australia, assignors to Research Laboratories of Australia Pty Ltd., Eastwood, Australia

PCT No. PCT/AU94/00021, § 371 Date Jul. 21, 1995, § 102(e) Date Jul. 21, 1995, PCT Pub. No. WO94/17453, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 18, 1994, Ser. No. 500,884
Claims priority, application Australia, Jan. 22, 1993, PL6905
Int. Cl.[6] G03G *9/135*
U.S. Cl. 430—115 **6 Claims**

1. A liquid developer for electrostatography comprising a silicone fluid, marker particles and a compatible charge control agent comprising an organo titanate compound selected from the group consisting of tetra 2-ethylhexyl titanate, tetra octyl titanate, tetra n-butyl titanate and tetra isopropyl titanate.

5,591,558

IMAGE FORMING METHOD

Hiroshi Yamazaki; Takeo Oshibe, and Yoshihiko Etoh, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Feb. 20, 1996, Ser. No. 604,082
Claims priority, application Japan, Feb. 24, 1995, 7-036795
Int. Cl.[6] G03G *13/08*
U.S. Cl. 430—120 10 Claims

1. An image forming method comprising a development process in which an electrostatic latent image on a photoreceptor is developed by developer comprising a toner,

wherein the photoreceptor is an organic photoreceptor having a layer containing fine particles at the surface of the photoreceptor; the toner has at least binder resin, coloring agent and releasing agent, the releasing agent consisting of polyolefine of which a ratio (Mz/Mn) is 3–20, and Mz is 20,000–70,000, wherein Mz is Z-average molecular weight in terms of polypropylene and Mn is the number average molecular weight in terms of polypropylene.

5,591,559

SUPERCRITICAL TONER PROCESSES

Peter G. Odell, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1994, Ser. No. 314,745
Int. Cl.[6] G03G *9/08*
U.S. Cl. 430—137 20 Claims

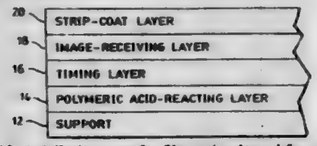
1. A process consisting essentially of subjecting a toner comprises of toner solids, which comprise of resin, pigment and charge additive to a particle size reduction in a hydrocarbon fluid; accomplishing supercritical carbon dioxide extraction of said hydrocarbon fluid with supercritical carbon dioxide in an amount, by weight, that is about 20 times a weight of said hydrocarbon fluid; and isolating said toner, wherein said size-reduced resin constitutes an amount of about 75 to about 98 weight percent of said toner solids, said pigment constitutes an amount of about 2 to about 25 weight percent of said toner solids, and said charge additive constitutes an amount of about 1 to about 3 weight percent of said toner solids; and an amount of said toner solids in said hydrocarbon fluid is from about 2 to about 60 weight percent of a total weight of said hydrocarbon fluid and said toner solids.

5,591,560

IMAGE-RECEIVING ELEMENT FOR DIFFUSION TRANSFER PHOTOGRAPHIC AND PHOTOTHERMOGRAPHIC FILM PRODUCTS

Agota F. Fehervari, 580 Concord Ave., Lexington, Mass. 02173; James A. Foley, 211 Weston Rd., Wellesley, Mass. 02181; Gia Y. Kim, 4732 Cabot La., Laverne, Calif. 91750; Diana R. Koretsky, 592 Highland Ave., Malden, Mass. 02148; Lloyd D. Taylor, One Maureen Rd., Lexington, Mass. 02173, and Kenneth C. Waterman, 25 Range Rd., Concord, Mass. 01742

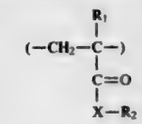
Filed Dec. 7, 1995, Ser. No. 568,937
Int. Cl.[6] G03C *8/24;8/50;11/12*
U.S. Cl. 430—203 18 Claims



10. A diffusion transfer film unit adapted for use in photographic and photothermographic processes, said film unit comprising:

a photosensitive element comprising a support carrying at least one silver halide emulsion;

an image-receiving element adapted to be separated from said photosensitive element following photoexposure and processing, said image-receiving element comprising in sequence: a support, an image-receiving layer, and a strip-coat layer overlying said image-receiving layer, said strip-coat layer comprising a copolymer including: 1) at least about 50% by weight of monomer units, the same or different, derived from an ethylenically unsaturated carboxylic acid or salt thereof, 2) at least about 15% by weight of monomer units of vinyl pyrrolidone, and 3) at least about 5% by weight of monomer units, the same or different, represented by the formula:



wherein R_1 of each monomer unit is independently selected from: hydrogen, a substituted or unsubstituted alkyl having 1 to 4 carbon atoms, cyano, and halogen; X of each monomer unit is independently selected from —NH— or —O—; and R_2 of each monomer unit is independently selected from a hydroxy substituted alkyl group.

5,591,561

METHOD FOR PROCESSING BLACK-AND-WHITE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Takeo Arai, and Junichi Fukawa, both of Hino, Japan, assignors to Konica Corporation, Japan

Filed Feb. 9, 1996, Ser. No. 599,024
Claims priority, application Japan, Feb. 15, 1995, 7-026596
Int. Cl.[6] G03C *5/30;5/305;5/31*
U.S. Cl. 430—264 14 Claims

1. A method for processing a black-and-white silver halide photographic light-sensitive material comprising the steps of

developing an imagewise exposed black-and-white silver halide photographic light-sensitive material with a developing solution in the presence of a complex forming compound,

fixing said developed light-sensitive material with a fixing solution,

washing or stabilizing said fixed light-sensitive material with water or a stabilizing solution, respectively, and

drying said washed or stabilized light-sensitive material,

wherein said light-sensitive material comprises a support and at least one silver halide emulsion layer and optionally one or more non-light-sensitive hydrophilic colloid layers provided on a first side of said support, and a layer provided on a second side opposite to said first side of said support, and

at least one of said silver halide emulsion layer and said non-light sensitive hydrophilic layer adjacent to said silver halide emulsion layer provided on said first side of said support contains a hydrazine compound,

at least one of said silver halide emulsion layer and said non-light sensitive hydrophilic layers provided on said first side of said support contains a redox compound capable of releasing a development inhibitor upon oxidation reaction,

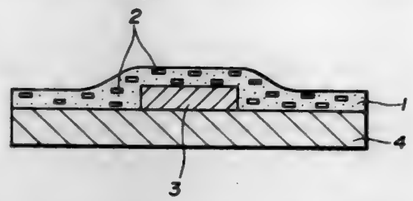
said layer provided on said second side of said support contains a sparingly water-soluble metal compound capable of releasing a base upon reaction with said complex forming compound.

5,591,562

WATER AND ACID DEVELOPABLE PHOTORESIST COMPOSITION EXHIBITING IMPROVED ADHESION

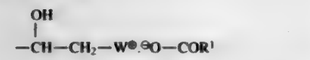
Nobuo Komatsu, Kanagawa; Ikuyo Kai; Nami Konishi, both of Tokyo; Naozumi Iwasawa, and Satoru Furusawa, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 13, 1994, Ser. No. 322,415
Claims priority, application Japan, Oct. 15, 1993, 5-258620
Int. Cl.[6] G03C *1/725*
U.S. Cl. 430—280.1 14 Claims

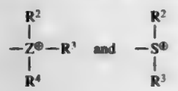


1. A photopolymerizable composition comprising:

(a) an aromatic epoxy resin derivative having from about 0.3 to about 10 mols/kg of polymerizable unsaturated groups and from about 0.1 to about 3 mols/kg of non-protonic onium salt containing groups having the formula:



wherein R^1 is hydrogen or a hydrocarbon group having 1 to 8 carbons optionally substituted with a hydroxy group, an alkoxy group, an ester group or a halogen group and $w^{\oplus}$ is selected from onium salt-containing groups having the formula:



wherein Z is N or P, R^2, R^3 and R^4 may be the same or different and are selected from organic groups containing 1 to 14 carbons and wherein R^2 and R^3 or R^2, R^3 and R^4 together, respectively, may form a heterocyclic group together with a nitrogen atom, phosphorus atom or a sulfur atom;

(b) from about 0.1 to about 10 parts by weight per 100 parts by weight of component (a) of a photopolymerization initiator; and

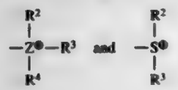
(c) from 10 to about 60 parts by weight per 100 parts by weight of component (a) of finely-divided mica having a mean particle size of from about 1 to about 10 μm.

5. A photopolymerizable composition consisting:

(a) an aromatic epoxy resin derivative having from about 0.3 to about 10 mols/kg of polymerizable unsaturated groups and from about 0.1 to about 3 mols/kg of non-protonic onium salt containing groups having the formula:



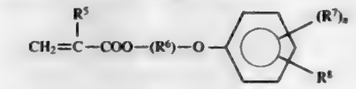
wherein R^1 is hydrogen or a hydrocarbon group having 1 to 8 carbons optionally substituted with a hydroxy group, an alkoxy group, an ester group or a halogen group and $w^{\oplus}$ is selected from onium salt-containing groups having the formula:



wherein Z is N or P, R^2, R^3 and R^4 may be the same or different and are selected from organic groups containing 1 to 14 carbons and wherein R^2 and R^3 or R^2, R^3 and R^4 together, respectively, may form a heterocyclic group together with a nitrogen atom, phosphorus atom or a sulfur atom;

(b) from about 0.1 to about 10 parts by weight per 100 parts by weight of component (a) of a photopolymerization initiators and

(c) from about 1 to about 15 parts by weight per 100 parts by weight or component (a) of a mono-functional polymerizable unsaturated monomer having the formula:



wherein R^5 is hydrogen or methyl, R^6 is an alkylene group having 1 to 12 carbons, R^7 is an alkyl group having 1 to 4 carbons, R^8 is an alkyl group having 5 to 12 carbons and n is an integer of 0 to 3, inclusive.

5,591,563

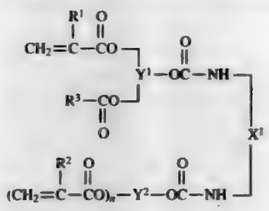
PHOTOCURABLE RESINS FOR STEREOLITHOGRAPHY AND COMPOSITIONS CONTAINING SAME

Toshiharu Suzuki; Tatsuhiko Ozaki, and Hirokazu Matsueda, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Japan

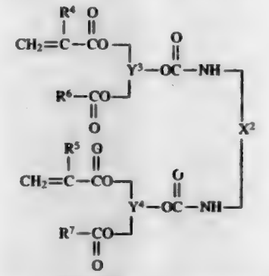
Filed Oct. 30, 1995, Ser. No. 550,563
Claims priority, application Japan, Dec. 28, 1994, 6-340048
Int. Cl.[6] C08F *26/06*
U.S. Cl. 430—284.1 12 Claims

1. A photocurable resin for stereolithography comprising unsaturated urethane shown by Formula (1) or Formula (2) given below:

(Formula 1)



(Formula 2)



and a vinyl monomer and a photoinitiator, said vinyl monomer being N-(meth)acryloyl selected from N-acryloyl morpholine, N-methacryloyl morpholine and a mixture thereof or a mixture of said N-(meth)acryloyl morpholine and di-ol di(meth)acrylate selected from di-ol diacrylate, di-ol dimethacrylate and a mixture thereof, the ratio between said unsaturated urethane and said vinyl monomer being 100/25–100/150 by weight, wherein X^1 and X^2 are each a residual group obtained by removing isocyanate groups from diisocyanate; Y^1, Y^3 and Y^4 are each a residual group obtained by removing hydroxyl groups from trihydric alcohol; Y^2 is a residual group obtained by removing hydroxyl groups from

dihydric or trihydric alcohol; R^1, R^2, R^4 and R^5 are each H or CH_3; R^3, R^6 and R^7 are each alkyl group with 5–21 carbon atoms; and n is either 1 or 2.

5,591,564

GAMMA RAY TECHNIQUES APPLICABLE TO SEMICONDUCTOR LITHOGRAPHY

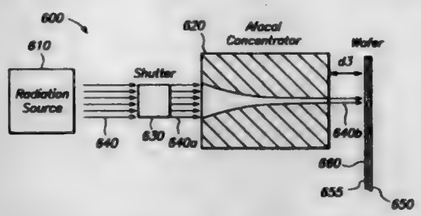
Michael D. Rostoker, Boulder Creek; Nicholas F. Pasch, Pacifica, and Joe Zelayeta, Saratoga, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 30, 1993, Ser. No. 56,340

The portion of the term of this patent subsequent to Apr. 30, 2013, has been disclaimed.

Int. Cl.[6] G21K *1/04;5/00;* G03F *7/20*

U.S. Cl. 430—311 **21 Claims**



1. Semiconductor lithography apparatus, comprising:

a) a source emitting gamma-radiation emissions towards a surface of a semiconductor wafer; and

b) apparatus, between said source and said wafer, for causing said gamma-radiation emissions to pattern a layer of resist material applied to the surface of said wafer.

5,591,565

SOLAR CELL WITH COMBINED METALLIZATION AND PROCESS FOR PRODUCING THE SAME

Konstantin Holdermann, Offingen; Adolf Münzer, Lohhof, and Hans-Josef Schmidt, Munich, all of Germany, assignors to Siemens Solar GmbH, Munich, Germany

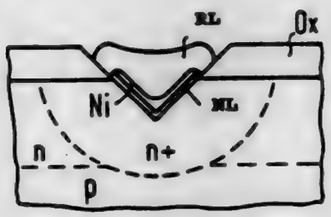
PCT No. PCT/DE93/00223, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994, PCT Pub. No. WO93/19492, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 10, 1993, Ser. No. 307,605

Claims priority, application Germany, Mar. 20, 1992, 42 09 170.5

Int. Cl.[6] H01L *31/0224;31/00*

U.S. Cl. 430—314 **12 Claims**



1. A process for producing front and rear side contacts on a solar cell including a silicon wafer having a flat p/n transition and a passivation layer on a front side which comprises the steps of:

producing a channel structure in the passivation layer;

producing a rear side contact by printing on and firing a silver-containing paste which additionally comprises oxidic additives and aluminum as a dopant;

treating the silicon wafer with an ionogenic palladium solution containing fluoride ions to produce a nucleation layer on a surface of the silicon wafer exposed in the channel structure;

reinforcing the nucleation layer by deposition of at least one further metal from the ionogenic palladium solution.

2. A process as claimed in claim 1, wherein said step of producing a channel structure includes:

defining the channel structure by photolithography and

forming the channel structure by wet chemical etching.

5,591,566

METHOD OF FORMING A RESIST PATTERN BY USING A SILICON CARBIDE ANTI-REFLECTIVE LAYER

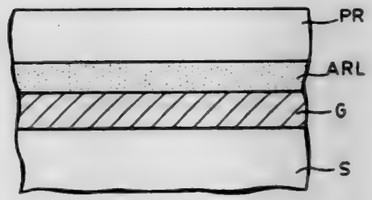
Tohru Ogawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 320,119, Oct. 11, 1994, Pat. No. 5,472,829, which is a continuation of Ser. No. 998,743, Dec. 30, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,888

Claims priority, application Japan, Dec. 30, 1991, 3-360521; Dec. 30, 1991, 3-360523; Mar. 11, 1992, 4-087911; Mar. 11, 1992, 4-087912; Aug. 20, 1992, 4-244314; Oct. 31, 1992, 4-316073

Int. Cl.[6] G03C *1/825*

U.S. Cl. 430—325 **18 Claims**



1. A method of forming a photoresist pattern, comprising the steps of:

forming a first layer, said first layer being selected from a group consisting of a refractory metal layer, a refractory metal silicide layer, metal layer, metal silicide layer, metal alloy layer and a silicon layer;

forming an anti-reflective layer of SiC on said first layer, said anti-reflective layer having a reflection refractive index n, an absorption refractive index k, and a film thickness d and wherein $2.1 \leqq n \leqq 3.36$; $0.14 \leqq k \leqq 1.10$; and $10\ nm \leqq d \leqq 60\ nm$;

forming a photoresist layer over said anti-reflective layer;

exposing said photoresist layer selectively by monochromatic light having a wavelength 150–450 nm; and

developing said photoresist layer after said exposing.

5,591,567

METHOD OF PROCESSING PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideki Komatsu, and Shoji Nishio, both of Tokyo, Japan, assignors to Konica Corporation, Japan

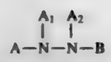
Filed Mar. 29, 1995, Ser. No. 412,750

Claims priority, application Japan, Apr. 7, 1994, 6-069718

Int. Cl.[6] G03C *5/18;5/26;1/06*

U.S. Cl. 430—399 **6 Claims**

1. A method of processing a black and white photographic light-sensitive material comprising a support, a silver halide emulsion layer provided thereon, and a backing layer on the support opposite the emulsion layer, the emulsion layer containing a hydrazine compound represented by Formula (2)



Formula (2)

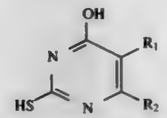
wherein A is aliphatic, aryl, or heterocyclic, B is acyl, alkylsulfonyl, arylsulfonyl, alkylsulfinyl, arylsulfinyl, carbamoyl, alkoxycarbonyl, aryloxycarbonyl, sulfamoyl, sulfinamoyl, alkoxysulfonyl, thioacyl, thiocarbamoyl, oxalyl, or heterocyclic; alternatively, B, A_2 and the nitrogen atom to which both are bonded may combine to form $—N{=}C(R_9)(R_{10})$ in which R_9 is alkyl, aryl, or heterocyclic, and R_{10} is hydrogen, alkyl, aryl, or heterocyclic; and A_1 and A_2 are both hydrogen, or one of A_1 and A_2 is hydrogen and the other is acyl, sulfonyl, or oxalyl, the method comprising

exposing the material;

developing the exposed material with developer, said developer being replenished with developer replenisher in an amount of not more than 200 ml per m^2 of the material; and

fixing the developed material,

wherein the backing layer contains in an amount of 5 to 200 mg/m^2 of a compound selected from the group consisting of compounds represented by the following Formulas (A), (B), and (C):



Formula (A)

wherein R_1 and R_2 independently represent an alkyl, aryl, aralkyl, hydroxy, carboxy, sulfo, phosphono, amino, nitro, cyano, alkoxycarbonyl, aryloxycarbonyl, carbamoyl, sulfamoyl or alkoxy group or a halogen atom, provided that R_1 and R_2 may combine to form a ring.



Formula (B)

wherein Z_{21} and Y_{21} independently represent an atomic group necessary to form an unsaturated 5- or 6-membered ring, provided that three or more nitrogen atoms are contained in Z_{21} and Y_{21} and one of Z_{21} and Y_{21} has a mercapto group as a substituent,



Formula (C)

wherein Z_{31} and Y_{31} independently represent an atomic group necessary to form an unsaturated 5- or 6-membered ring, provided that three or more nitrogen atoms are contained in Z_{31} and Y_{31} and one of Z_{31} and Y_{31} has a mercapto group as a substituent.

5,591,568

HIGH DYE STABILITY, HIGH ACTIVITY, LOW STAIN AND LOW VISCOSITY SMALL PARTICLE YELLOW DISPERSION MELT FOR COLOR PAPER AND OTHER PHOTOGRAPHIC SYSTEMS

Pranab Bagchi, Webster; James L. Edwards, Rochester, both of N.Y.; Danuta Gibson, Watford, United Kingdom; Thomas A. Rosick, Honeoye Falls, N.Y.; Brian Thomas, Fairport, N.Y., and Vincent J. Flew, III, Kendall, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

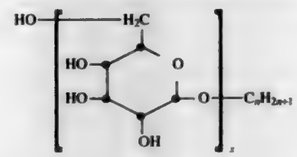
Division of Ser. No. 627,154, Dec. 13, 1990, Pat. No. 5,358,831. This application Sep. 6, 1994, Ser. No. 301,745

Int. Cl.[6] G03C *7/388;1/38*

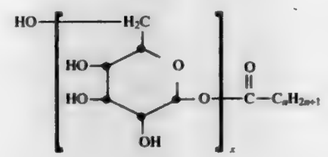
U.S. Cl. 430—449 **15 Claims**

1. A photographic dispersion composition comprising a small particle microprecipitated photographic material, gelatin, Type B preparation surfactant wherein

Type B is a surfactant whose hydrophobic segment is composed of an aliphatic or aromatic hydrocarbon moiety composed of between 6 to 22 carbon atoms and a hydrophilic segment comprising between 2 to 20 oxyethylene or glycedylether groups with or without termination by a sulfate or a sulfonate group, and at least one of the sugar surfactants



or



wherein

n=5 to 20 and

x=1 to 4, and

wherein

said small particle microprecipitated photographic material comprises coupler material and said small particle microprecipitated photographic material has a particle diameter of less than 100 nm.

5,591,569

PHOTOGRAPHIC ELEMENT CONTAINING AN AZOPYRAZOLONE MASKING COUPLER EXHIBITING IMPROVED KEEPING

Daniel L. Kapp, and Janet Younathan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 130,035, Sep. 30, 1993, abandoned. This application Oct. 5, 1995, Ser. No. 539,560

Int. Cl.[6] G03C *7/333;7/38;7/392*

U.S. Cl. 430—549 **34 Claims**

1. A photographic element comprising a light sensitive silver halide layer containing (1) a bicyclic azole coupler, which is a 1H-pyrazolo[3,2-c][1,2,4]-triazole containing a coupling-off group at the coupling position, (2) an azopyrazolone masking coupler, and (3) an aromatic electron-rich compound having ring substituents for which the sum of the individual Hammett sigma-para values is more negative than −0.80, wherein no more than one substituent of the aromatic electron rich compound is hydroxy, and wherein said aromatic electron-rich compound contains at least one alkyl, alkoxy, or amine substituent.

5,591,570

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION, SILVER HALIDE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL AND METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideki Takiguchi; Hiroshi Kashiwagi; Nobuaki Tsuji; Hó Socman, and Katsuhiko Heki, all of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 273,708, Jul. 12, 1994, abandoned. This application Oct. 20, 1995, Ser. No. 545,883

Claims priority, application Japan, Jul. 15, 1993, 5-175617; Aug. 20, 1993, 5-206601

Int. Cl.[5] G03C *1/035;1/12*

U.S. Cl. 430—567 **7 Claims**

1. A light-sensitive silver halide photographic emulsion comprising silver halide grains, wherein 70% or more of the total projected area of said silver halide grains is tabular grains having an average aspect ratio of a diameter to a thickness of 2 or more, each of said tabular grains containing parallel twin planes separated by at least one interplanar distance, one said interplanar distance being a longest distance, said longest distance being said interplanar distance when two twin planes are present in the grain or the longest interplanar distance when more than two twin planes are present in the grain, an average value of said longest distances being at least 0.008 μm, and a variation coefficient of the longest distances between parallel twin planes in said tabular grains is 35% or less, and wherein said silver halide emulsion is spectrally sensitized by adding a sensitizing dye, having a solubility in water of 2×10^{-4} to 4 to 10^{-2} mol per liter of water at 27° C., to said emulsion in the form of a dispersion of solid particles in an aqueous solution substantially free from an organic solvent or surfactant, said tabular grains having an average silver iodide content of 2 mol % or less, said tabular grains comprising a core and a shell.

5,591,571

Patent Not Issued For This Number

5,591,572

DETECTION OF MAMMALIAN IMMUNODEFICIENCY VIRUSES

Bruce E. Kemp, Kew; Carmel J. Hillyard, Paddington; Dennis B. Rylatt, Woodridge, and Peter G. Bundesen, Fig Treet Pocket, all of Australia, assignors to St. Vincents Institute of Medical Research Limited, Victoria, and Agen Limited, Queensland, both of Australia

PCT No. PCT/AU92/00280, § 371 Date Feb. 24, 1994, § 102(e) Date Feb. 24, 1994, PCT Pub. No. WO92/22573, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 12, 1992, Ser. No. 157,141

Claims priority, application Australia, Jun. 14, 1991, PK6711

Int. Cl.[6] C12Q *1/70;* **C07K** *14/15*

U.S. Cl. 435—5 **16 Claims**

1. A purified peptide of length up to about 35 amino acids that specifically binds to antibodies to feline immunodeficiency virus (FIV) and that corresponds to an immunodominant region of FIV gp40, wherein said peptide includes amino acids 699 to 706 of said gp40, optionally linked to form a disulfide loop.

5,591,573

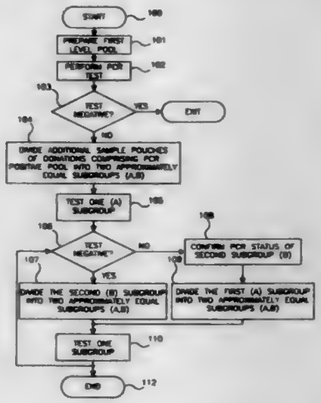
METHOD AND SYSTEM FOR TESTING BLOOD SAMPLES

John J. Whalen; Michael E. Chlebowski, both of Pasadena; Charles M. Heldebrant, Arcadia, and H. Edward Matveld, North Hollywood, all of Calif., assignors to Alpha Therapeutic Corporation, Los Angeles, Calif.

Filed Apr. 10, 1995, Ser. No. 419,620

Int. Cl.[6] C12Q *1/70;* **C12P** *19/34;* **C12N** *7/00*

U.S. Cl. 435—5 **31 Claims**



26. A process for testing a multiplicity of plasma donations to uniquely identify donations having a positive viral indication, the process comprising the steps of:

(a) providing a plurality of plasma donations, wherein a portion of each donation is contained in a tubing segment divided along its length by spaced apart seals, the tubing segment portions between the seals defining sequential pouches, wherein each pouch contains a plasma sample of said donation;

(b) removing a first pouch from each said tubing segment corresponding to each donation;

(c) forming the contents of each first pouch into a first pool;

(d) testing said first pool for a viral indication;

(e) when said first pool tests positive for said viral indication removing a next sequential pouch from each of the tubing segments used to form said first pool;

(f) dividing the next sequential pouches into two approximately equal next generation subgroups and separately forming the contents of the subgroup pouches into pools;

(g) testing one of said subgroup pools for the presence of a specific virus;

(h) when the tested subgroup pool tests negative for said virus removing a further sequential pouch from corresponding tubing segments used to form the untested subgroup;

(i) dividing said further sequential pouches into two approximately equal and successively smaller subgroups and separately forming the contents of the subgroup pouches into pools; and

(j) testing one of said subgroup pools for a viral indication.

5,591,574

PROBES, DIAGNOSTIC METHOD AND IMMUNIZATION METHOD BASED ON PAPILLOMAVIRUS TYPES HPV 49 AND HPV 50

Gerard Orth, Sceaux; Michel Favre; Dina Kremsdorf, both of Paris, and Gérard Pehau-Arnaudet, Montreuil, all of France, assignors to Institut Pasteur, Paris, France

Division of Ser. No. 240,497, May 10, 1994, Pat. No. 5,534,439, which is a continuation of Ser. No. 951,118, Sep. 25, 1992, Pat. No. 5,342,930, which is a continuation of Ser. No. 351,125, May 12, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,291

Claims priority, application France, May 13, 1988, 88 06486; Jun. 21, 1988, 88 08324

Int. Cl.[6] C12N *15/11;15/09;15/37*

U.S. Cl. 435—5 **20 Claims**

1. DNA of papillomavirus (HPV49) characterized by the restriction map of FIG. 1.

5,591,575

SUBTRACTION HYBRIDIZATION EMPLOYING AZIRIDINYLBENOQUINONE CROSS-LINKING AGENTS

Ian N. Hampson; Lynne Pope, both of Heywood, and John Butler, Stockport, all of United Kingdom, assignors to Amersham International PLC, Bucks, United Kingdom

Filed Apr. 7, 1993, Ser. No. 43,744

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **11 Claims**

1. In a subtraction hybridization process wherein single stranded cDNA derived from transcript RNA of a target cell source is reacted under hybridizing conditions with excess single stranded hybridization driver nucleic acid derived from transcript RNA of a reference source so as to cause substantially all said cDNA having a nucleotide sequence complementary to RNA that is common to both said sources to become bound in duplex molecules whereby the only single stranded cDNA then remaining is that having a sequence complementary to transcript RNA that is specific to the target cell source, that is, unique cDNA derived solely from said target cell source, the improvement which comprises the step of treating the reaction mixture with an aziridinylbenzoquinone interstrand crosslinking agent effective selectively to chemically crosslink the nucleotide strands in the duplex molecules, thereby increasing the stability of these molecules, without affecting the remaining unsubtracted single stranded unique cDNA, followed by further treatment of the mixture of crosslinked duplexes and unique single-stranded cDNA without separating the crosslinked duplexes and single-stranded cDNA from each other.

5,591,576

STEROL Δ14 REDUCTASE SCREEN

Margaret H. K. Lai, E. Brunswick; Donald R. Kirsch, Princeton, both of N.J., and Martin Bard, Carmel, Ind., assignors to American Cyanamid Company, Wayne, N.J.

Filed Aug. 16, 1993, Ser. No. 107,348

Int. Cl.[6] C12N *15/63;* **C12Q** *1/02;1/26;1/68*

U.S. Cl. 435—6 **21 Claims**

15. A method for screening for the presence or absence of sterol Δ14 reductase inhibition by a test sample, which comprises:

(a) first screening the test sample in a primary screen comprising the steps of:

(i) adding the test sample to a culture of a *Neurospora crassa* strain having an erg-3 mutation;

(ii) adding the test sample to a second culture of a *Neurospora crassa* strain having an erg-1 mutation;

(iii) incubating the test samples in the cultures for such time under such conditions sufficient to observe fungal cell growth in corresponding cultures containing no test sample;

(iv) comparing the extent of growth inhibition in the culture containing the erg-3 mutation with the extent of growth inhibition in the culture containing the erg-1 mutant; and

(v) identifying a positive test sample by observing that growth inhibition in the erg-3 culture containing the test sample exceeds growth inhibition in the erg-1 culture containing the test sample; followed by

(b) screening said positive test sample in a secondary screen comprising the steps of:

(vi) adding a positive test sample from the primary screen to a culture of a *Saccharomyces cerevisiae* strain into which has been introduced at high copy a gene encoding sterol Δ14 reductase;

(vii) adding the positive test sample to a culture of a corresponding *Saccharomyces cerevisiae* strain which does not have an introduced sterol Δ14 reductase gene;

(viii) incubating the samples in the cultures for such time under such conditions sufficient to observe yeast cell growth in corresponding cultures containing no test sample;

(ix) comparing the extent of growth inhibition in the culture having the reductase gene with the extent of growth inhibition in the corresponding culture having no introduced gene; and

(x) determining the presence of sterol Δ14 reductase inhibition by observation that inhibition in the culture having no introduced reductase gene exceeds growth inhibition in the corresponding culture having the introduced reductase gene.

5,591,577

MOBILE GENETIC ELEMENT ORIGINATED FROM BREVIBACTERIUM STRAIN

Makoto Tsuchiya; Mika Moriya, and Kiyoshi Miwa, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

PCT No. PCT/JP93/00380, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/18151, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 11, 1993, Ser. No. 146,010

Claims priority, application Japan, Mar. 11, 1992, 4-52694

Int. Cl.[6] C12Q *1/68;* **C12N** *15/64;15/77;15/52*

U.S. Cl. 435—6 **15 Claims**

1. The DNA fragment of SEQ ID NO: 3, wherein said fragment consists of nucleotide sequence represented by the following formula:

GGCCCTTCCG GTTTTGGGGT ACATCACAGA
ACCTGGGCTA GCGGTGTAGA CCCGAAAATA
AACGAGCCTT TTGTCAGGGT TAAGGTTTAG
GTATCTAAGC TAACCAAACA CCAACAAAAG
GCTCTACCCA TGAAGTCTAC CGGCAACATC
ATCGCTGACA CCATCTGCCG CACTGCGGAA
CTAGGACTCA CCATCACCGG CGCTTCCGAT
GCAGGTGATT ACACCCTGAT CGAAGCAGAC
GCACTCGACT ATACCTCCAC CTGCCCAGAA
TGCTTCCAAC CTGGGGTGTT TCGTCATCAC
ACCCACCGGA TGCTCATTGA TTTACCCATC
GTCGGGTTTC CCACCAAACT GTTTATCCGT
CTACCTCGCT ACCGCTGCAC CAACCCGACA
TGTAAGCAAA AGTATTTCCA AGCAGAACTA
AGCTGCGCTG ACCACGGTAA AAAGGTCACC
CACCGGGTCA CCCGCTGGAT TTTGCAACGC
CTTGCTATTG ACCGGATGAG TGTTCACGCA
ACTGCGAAAG CACTTGGGCT AGGGTGGGAT
TTAACCTGCC AACTAGCCCT CGATATGTGC
CGTGAGCTGG TCTATAACGA TCCTCACCAT
CTTGATGGAG TGTATGTCAT TGGGGTGGAT
GAGCATAAGT GGTCACATAA TAGGGCTAAG
CATGGTGATG GGTTTGTCAC CGTGATTGTC
GATATGACCG GGCATCGGTA TGACTCACGG
TGTCCTGCC CGGTTATTAGA TGTCGTCCCA
GGTCGTAGTG CTGATGCTTT ACGGTCCTGG
CTTGGCTCCC GCGGTGAACA GTTCCGCAAT
CAGATACGGA TCGTGTCCAT GGATGGATTC
CAAGGCTACG CCACAGCAAG TAAAGAACTC
ATTCCTTCTG CTCGTCGCGT GATGGATCCA
TTCCATGTTG TGCGGCTTGC TGGTGACAAG

-continued

	CTCACCGCCT	GCCGGCAACG	CCTCCAGCGG
GAGAAATACC	AGCGTCGTGG	TTTAAGCCAG	
	GATCCGTTGT	ATAAAAACCG	GAAGACCTTG
TTGACCACGC	ACAAGTGGTT	GAGTCCTCGT	
	CAGCAAGAAA	GCTTGGAGCA	GTTGTGGGCG
TATGACAAAG	ACTACGGGGT	GTTAAAGCTT	
	GCGTGGCTTG	CGTATCAGGC	GATTATTGAT
TGTTATCAGA	TGGGTAATAA	GCGTGAAGCG	
	AAGAAGAAAA	TGCGGACCAT	TATTGATCAG
CTTCGGGTGT	TGAAGGGGCC	GAATAAGGAA	
	CTCGCGCAGT	TGGGTCGTAG	TTTGTTTAAA
CGACTTGGTG	ATGTGTTGGC	GTATTTCGAC	
	GTAGGAGTCT	CCAACGGACC	AGTCGAAGCC
ATCAATGGAC	GCCTAGAACA	CCTCCGCGGA	
	ATCGCGCTTG	GATTCCGCAA	CCTCACCCAC
TACATCCTTC	GATGCCTCAT	CCACTCCGGA	
	CAGCTCACCC	ACAAAATCAA	TGCACTCTAA
AAACGGAAG	AGCC.		

5,591,578

NUCLEIC ACID MEDIATED ELECTRON TRANSFER

Thomas J. Meade, Altadena; Jon F. Kayyem, Pasadena, and Scott E. Fraser, Newport Beach, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 10, 1993, Ser. No. 166,036

Int. Cl.[6] C12Q *1/68*; C07H *21/02;21/04*

U.S. Cl. 435—6 **20 Claims**

1. A single-stranded nucleic acid containing one or multiple electron donor moieties and one or multiple electron acceptor moieties, wherein said electron donor and acceptor moieties are transition metal complexes covalently attached to the 2' or 3' position of a ribose of the ribose-phosphate backbone of said nucleic acid, said transition metal selected from the group consisting of Cd, Mg, Cu, Co, Pd, Zn, Fe and Ru, and wherein electron transfer can occur between said electron donor and acceptor moieties when said single stranded nucleic acid is hybridized to a target sequence.

5,591,579

INDICATOR CELL LINE FOR DETECTING RNA VIRUSES AND METHOD THEREFOR

Paul D. Olivo, and Sondra Schlesinger, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Filed Dec. 21, 1993, Ser. No. 171,214

Int. Cl.[6] C12Q *1/68*; C12N *5/16;15/00;7/00*

U.S. Cl. 435—6 **21 Claims**

1. A method for the detection of a positive strand RNA virus in a specimen, the method comprising:

incubating a mammalian cell stably transformed with a DNA molecule, said DNA molecule containing a cDNA of a structurally-defective positive strand RNA virus genome including a junction region wherein the cDNA is operably linked to a promoter capable of causing transcription of said cDNA into an RNA molecule in a mammalian cell wherein said cDNA contains a structural coding sequence encoding a reporter gene product which is downstream of and under the regulatory control of said junction region and which is sufficiently downstream from said promoter that the reporter gene product is not translated in the absence of an active virus which replicates through an RNA intermediate wherein the transcribed RNA molecule containing the reporter gone is replicated and the reporter gene product is translated only in the presence of said active virus, with a specimen suspected of containing a positive strand RNA virus for a period of time sufficient to permit said RNA virus suspected of being in said specimen to synthesize its transacting enzymes; and

detecting the expression of said reporter gene product which indicates the presence of a positive strand RNA virus in said specimen.

5,591,580

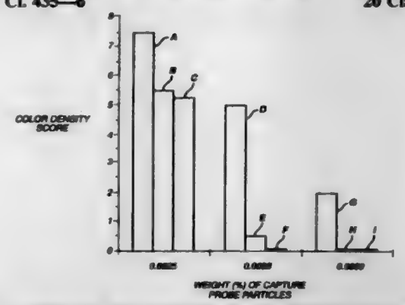
METHOD, TEST ELEMENT AND TEST KIT FOR SEMI-QUANTITATIVE DETECTION OF TARGET NUCLEIC ACID

Lynn Bergmeyer, and Thomas J. Cummins, both of Rochester, N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Filed Mar. 31, 1994, Ser. No. 221,818

Int. Cl.[6] C12Q *1/68*; C12P *19/34*

U.S. Cl. 435—6 **20 Claims**



1. A method for the semi-quantitative determination of a target nucleic acid comprising:

A) contacting a target nucleic acid having a specific binding ligand bound thereto with a water-insoluble support having affixed thereon a multiplicity of detection deposits,

each detection deposit comprising a mixture of water-insoluble first and second particles,

said first particles having affixed thereto a capture probe which is specific to and hybridizable with said target nucleic acid, and

said second particles being free of all capture probes,

said multiplicity of detection deposits having a varying weight ratio of said first particles to said second particles, but all of said detection deposits having about the same total weight of polymeric particles and the same configuration,

to capture said target nucleic acid strand on said detection deposits in proportion to the amount of said first particles in each detection deposit,

B) contacting said captured target nucleic acid strand in said detection deposits with a receptor for said specific binding ligand, said receptor being labeled with a reporter molecule, to complex said reporter labeled receptor with said captured target nucleic acid strand and thereby capture said reporter labeled receptor on each of said detection deposits in proportion to the amount of captured ligand labeled target nucleic acid strand in each of said detection deposits, and

C) detecting the reporter molecules on said detection deposits as a semi-quantitative determination of the presence of said target nucleic acid in a range of 0.08 to 1.25 pmol/ml nucleic acid.

5,591,581

ELECTROCHEMILUMINESCENT RHENIUM MOIETIES AND METHODS FOR THEIR USE

Richard J. Massey, Rockville; Michael J. Powell, Gaithersburg; Walter J. Dreesick, Gaithersburg; Jonathan K. Leland, Gaithersburg, all of Md.; Janet K. Hino, Arlington, Va.; Mohindar S. Poonian, and Leopoldo D. Clana, both of Gaithersburg, Md., assignors to IGEN, Inc., Rockville, Md.

Continuation of Ser. No. 533,931, Jun. 5, 1990, abandoned, which is a continuation of Ser. No. 117,017, Nov. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 858,354, Apr. 30, 1986. This application Apr. 15, 1994, Ser. No. 227,898

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **20 Claims**

1. A chemical moiety having the formula

$$(Re(P)_m(L^1)_n(L^2)_o(L^3)_p(L^4)_q)_t(B)_u$$

wherein

P is a bipyridyl ligand of Re;

L^1, L^2, L^3 and L^4 are monodentate ligands of Re, each of which may be the same as or not the same as each other ligand;

B is a whole cell, subcellular particle, polypeptide, nucleic acid, polysaccharide, alkaloid, steroid, vitamin, amino acid, or non-biological polymer which is conjugated to one or more of P, L^1, L^2, L^3 and L^4;

m is an integer equal to or greater than 1;

each of n, o, p and q is zero or an integer;

t is an integer equal to or greater than 1; and

u is an integer equal to or greater than 1;

P, L^1, L^2, L^3, L^4 and B being of such composition and number that the chemical moiety can be induced to electrochemiluminesce and the total number of bonds to Re provided by the ligands of Re being equal to the coordination number of Re.

5,591,582

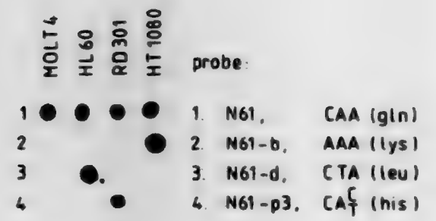
METHODS FOR DETECTING ACTIVATED RAS ONCOGENES

Johannes L. Bos, Leiden, and Alex J. van der Eb, Oegstgeest, both of Netherlands, assignors to The Board of Rijks Universiteit Leiden, Leiden, Netherlands

Continuation of Ser. No. 873,352, Apr. 21, 1992, abandoned, which is a continuation of Ser. No. 81,490, Aug. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 758,104, Jul. 23, 1985, Pat. No. 4,871,838. This application Jun. 23, 1994, Ser. No. 264,425

Int. Cl.[6] C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—6 **33 Claims**



1. A method for detecting an activated ras gene containing a mingle-base mutation in the codon at position 12, which mutation is in the first or second nucleotide position of the codon encoding an amino acid other than glycine which comprises:

(A) (1) (a) cleaving a human subject's genomic DNA with a restriction enzyme so as to produce DNA fragments, and

(b) treating the resulting fragments so as to obtain single-stranded DNA molecules, or

(2) isolating a human subject's poly A+ mRNA, and

(B) contacting the single-stranded DNA molecules, or the poly A+ mRNA from step (A) under hybridizing conditions with a labeled synthetic DNA molecule comprising 12 to 20 nucleotides having (i) the formula 5' B-Q-D 3' in the case of step (A)(1) or (A)(2), or (ii) a formula complementary to 5' B-Q-D 3' in the case of step (A)(1) so as to form hybridized molecules,

wherein B represents from 0 to about 9 nucleotides having a sequence complementary to a sequence present in the activated ras gene 5' of the codon in which the mutation present,

wherein D represents from 0 to about 12 nucleotides having a sequence complementary to a sequence present in the activated ras gene 3' of the codon in which the mutation present, and

wherein the number of nucleotides represented by the sum of B plus D is at least 9, and

wherein Q is complementary to the codon which encodes the amino acid at position 12, and

(C) treating the resulting hybridized molecules from step (B) under conditions permitting only fully complementary molecules to remain hybridized, and

(D) detecting the presence of the labeled synthetic DNA molecule in the hybridized molecules from step (C) and thereby detecting the activated ras gene.

5,591,583

HUMAN RESTRICTIN AND NUCLEIC ACID SEQUENCES

Robert A. Reid, Durham; Rhonda L. Ackley, Chapel Hill, and John J. Hemperly, Apex, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 15, 1995, Ser. No. 404,665

Int. Cl.[6] C12Q *1/68*; C12N *1/20;15/00*; C07H *21/04*

U.S. Cl. 435—6 **5 Claims**

1. A nucleic acid molecule consisting of a nucleotide sequence selected from the group consisting of SEQ ID NO:3, a complement of SEQ ID NO:3, a degenerate nucleotide sequence which encodes SEQ ID NO:4, and RNA equivalents thereof.

5,591,584

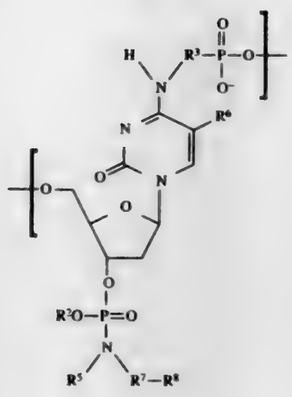
N-4 MODIFIED PYRIMIDINE DEOXYNUCLEOTIDES AND OLIGONUCLEOTIDE PROBES SYNTHESIZED THEREWITH

Chu-An Chang, Piedmont; Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 296,793, Aug. 25, 1994. This application Apr. 26, 1995, Ser. No. 429,196

Int. Cl.[6] C12Q *1/68;1/70;* C12P *19/34;* C07H *19/00*

U.S. Cl. 435—6 **23 Claims**



1. A polynucleotide probe containing a plurality of modified deoxynucleotides each having the structural formula

wherein:

R^2 is lower alkyl;

R^3 is C_1–C_{12} alkylene containing 0 to 6 linkages selected from the group consisting of —O—, —S— and —NR^{12}— wherein R^{12} is hydrogen or lower alkyl;

R^5 is hydrogen or lower alkyl;

R^6 is selected from the group consisting of hydrogen, methyl, bromo and iodo;

R^7 is C_1–C_{12} alkylene containing 0 to 6 linkages selected from the group consisting of —O—, —S— and —NR^{12}—, and bound to R^8 through an —O—, —S— or —NR^{12}— moiety; and

R^8 is a protecting group that can be removed and replaced, without affecting the remainder of the compound, by reduction with a reducing agent.

5,591,585

Patent Not Issued For This Number

5,591,586

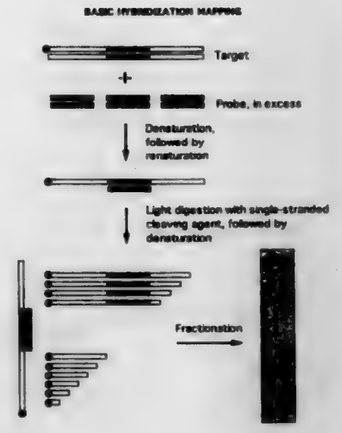
HYBRIDIZATION MAPPING OF NUCLEIC ACIDS

Hunner C. Lewis, 2111 Ashby Ave. #11, Berkeley, Calif. 94705

Filed Jun. 26, 1995, Ser. No. 494,928

Int. Cl.[6] C12Q *1/68;* C12N *15/00*

U.S. Cl. 435—6 **16 Claims**



1. A method of determining where at least one probe nucleic acid hybridizes with an end-labeled target nucleic acid comprising the steps of:

(a) preparing the target and probe nucleic acids so that they are single-stranded;

(b) hybridizing the single-stranded target and probe nucleic acids with one another, thereby forming hybridization products;

(c) digesting the hybridization products with a cleaving agent which preferentially cleaves single-stranded nucleic acids under such conditions that each hybridized nucleic acid which is cleaved in an unhybridized region is cleaved once, on average, and at random;

(d) fractionating the digested products by size to form a pattern of fractionation products;

(e) detecting the pattern of fractionation products by detecting said end-label; and

(f) determining where the probe nucleic acid hybridizes to the target by examining the pattern of labeled fractionation products.

5,591,587

POLYPEPTIDE-INDUCED MONOCLONAL RECEPTORS TO PROTEIN LIGANDS

Henry L. Niman, Pittsburgh, Pa., assignor to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 54,864, Apr. 28, 1993, abandoned, which is a continuation of Ser. No. 900,502, Jun. 16, 1992, which is a continuation of Ser. No. 780,415, Oct. 22, 1991, which is a continuation of Ser. No. 118,823, Nov. 9, 1987, which is a continuation-in-part of Ser. No. 39,534, Apr. 16, 1987, Pat. No. 5,015,571, which is a continuation-in-part of Ser. No. 736,545, May 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 701,954, Feb. 15, 1985, Pat. No. 5,030,565, which is a continuation-in-part of Ser. No. 713,410, Feb. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 524,084, Aug. 17, 1983, abandoned. This application Aug. 23, 1994, Ser. No. 294,879

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **4 Claims**

1. A method for determining antigenic reactivity in urine, comprising the steps of:

contacting a plurality of ligands, if present, of a urine sample with at least one receptor molecule wherein said receptor molecule binds to an oncoprotein or an oncoprotein related protein, and said plurality of ligands of said urine sample have been electrophoretically separated and transferred to solid support; and,

detecting or measuring the antigenic reaction, if any, of said separated plurality of ligands with said receptor molecule.

5,591,588

METHOD FOR THE DIAGNOSIS OF DEPRESSION BASED ON MONITORING BLOOD LEVELS OF ARGININE VASOPRESSIN AND/OR THYMOPOIETIN

Gideon Goldstein, 30 Dorison Dr., Short Hills, N.J. 07078, and Michael D. Culler, Easton, Pa., assignors to Gideon Goldstein, Short Hills, N.J.

Filed Sep. 20, 1994, Ser. No. 309,420

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **8 Claims**

1. A method for aiding the diagnosis of depression in humans, comprising:

providing a sample of serum or plasma from a first human subject suspected of having depression;

providing a range of arginine vasopressin (AVP) levels previously obtained from normal control subjects;

dissociating the AVP in the sample from its neurophysin carrier protein; and

measuring the level of AVP in said first subject's sample by immunoassay,

wherein detection of an AVP level in said first subject's sample which is statistically elevated over said normal control range is indicative of depression.

5,591,589

PROCESS FOR SEPARATING AND MEASURING GLYCOPROTEIN

Hideo Katoh; Kenji Nakamura, and Shinji Satomura, all of Amagasaki, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 14, 1994, Ser. No. 340,299

Claims priority, application Japan, Nov. 16, 1993, 5-309839

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **7 Claims**

1. A process for separating and measuring two or more forms of glycoproteins that are different in sugar chain structure but have substantially the same protein structure, which comprises reacting a sample containing two or more forms of glycoproteins with a lectin capable of recognizing the specific sugar chain structure of at least one of these glycoproteins to be measured, and a first antibody which has a property of binding to all the glycoproteins but does not bind to glycoprotein(s) having the lectin attached thereto; and separating and measuring glycoprotein(s) having the first antibody attached thereto and glycoprotein(s) having no first antibody attached thereto, by utilizing differences in properties between the former glycoprotein(s) and the latter glycoprotein(s).

5,591,590

NEURONAL NICOTINIC ACETYLCHOLINE RECEPTOR ASSAY

Stephen F. Heinemann, La Jolla, Calif.; James W. Patrick, Houston, Tex.; James R. Boulter, San Diego, Calif.; Evan S. Deneris, La Jolla, Calif.; John G. Connolly; Robert M. Duvoisin, both of Del Mar, Calif.; Eden D. Heinemann, San Luis Obispo, Calif.; Keiji Wada, Rockville, Md.; Marc C. Ballivet, Geneva, Switzerland, and Daniel J. Goldman, Ann Arbor, Mich., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Division of Ser. No. 349,956, Dec. 6, 1994, which is a division of Ser. No. 898,185, Jun. 12, 1992, Pat. No. 5,371,188, which is a continuation of Ser. No. 321,384, Mar. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,295, Mar. 18, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 472,989

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **10 Claims**

1. A method for screening substances to determine those substances which function as agonists for neuronal nicotinic acetylcholine receptors, said method comprising:

contacting a receptor with a substance wherein said receptor comprises a neuronal nicotinic acetylcholine receptor comprising at least one alpha receptor subunit and at least one beta subunit, wherein said alpha receptor subunit(s) is expressed from recombinant DNA, and is selected from the group consisting of alpha2, alpha3, alpha4.1, alpha4.2, and alpha5, and said beta subunit(s) is expressed from recombinant DNA, and is selected from the group consisting of beta2, beta3 and beta4, and

measuring the response of said receptor to said substance.

5,591,591

DIOXETANE COMPOUNDS FOR THE CHEMILUMINESCENT DETECTION OF PROTEASES, METHODS OF USE AND KITS THEREFORE

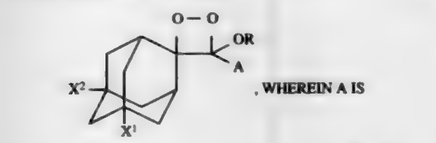
Irena Bronstein, Newton; Brooks Edwards, Cambridge; Christopher Martin, Belmont; Alison Sparks, North Andover, and John C. Voyta, Sudbury, all of Mass., assignors to Tropix, Inc., New Bedford, Mass.

Filed Feb. 9, 1995, Ser. No. 385,788

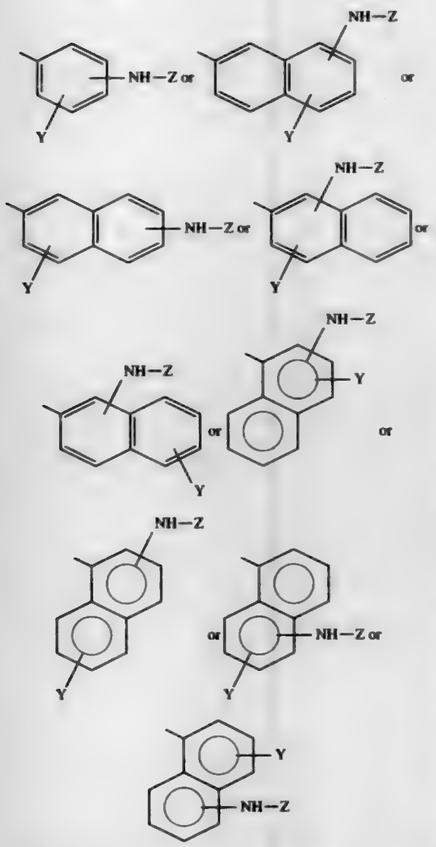
Int. Cl.[6] G01N *33/573;* **C07K** *5/06;5/08;5/10*

U.S. Cl. 435—7.4 **15 Claims**

1. A compound of the formula



, WHEREIN A IS



wherein X^1, X^2 and Y are independently hydrogen or an electron donating or electron withdrawing substituent, wherein R is an alkyl, straight-chain or branched chain of 1–20 carbon atoms or cycloalkyl or polycycloalkyl of 3–20 carbon atoms, and wherein Z is an amino acid, or a polypeptide, wherein Z is an enzyme-specific substrate.

8. A method of detecting the presence and/or amount of a protease in a sample, comprising adding the compound of claim 1 to said sample, incubating said sample and inspecting said sample for the generation of light, wherein light so generated is indicative of the presence and/or amount of said protease, wherein Z of said compound is an amino acid or polypeptide substrate for which said protease is specific.

5,591,592

METHOD FOR DETECTION OF FIBRONECTIN RECEPTOR LIGANDS

Erkki I. Ruoslahti, Rancho Santa Fe, Calif.; Guido Tarone, Turin, Italy; Filippo G. Giancotti, Del Mar, and Bruce E. Vogel, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 942,582, Sep. 9, 1992, abandoned, which is a division of Ser. No. 461,349, Jan. 5, 1990, Pat. No. 5,169,930. This application Jul. 22, 1994, Ser. No. 279,279

Int. Cl.[6] G01N *33/566;33/539;33/543*

U.S. Cl. 435—7.21 **6 Claims**

1. A method useful for determining whether a compound is a ligand for α,β_1 integrin comprising the steps of:

(a) contacting the compound with substantially purified α,β_1 integrin and

(b) determining whether the compound binds to α,β_1 integrin, the presence of binding indicating that the compound is a ligand for α,β_1 integrin.

5,591,593

MINIMUM RECOGNITION UNIT OF A PEM MUCIN TANDEM REPEAT SPECIFIC MONOCLONAL ANTIBODY AND DETECTION METHOD USING SAME

Nigel S. Courtenay-Luck, London, United Kingdom, assignor to Antisoma Limited, London, England

PCT No. PCT/GB92/00746, § 371 Date Sep. 29, 1993, § 102(e) Date Sep. 29, 1993, PCT Pub. No. WO92/18534, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 23, 1992, Ser. No. 122,546

Claims priority, application United Kingdom, Apr. 23, 1991, 9108652

Int. Cl.[6] G01N *33/53;* **C07K** *16/30;* **A61K** *51/10*

U.S. Cl. 435—7.23 **4 Claims**

1. A method for identifying or locating a mucin or a cell bearing said mucin wherein said mucin is capable of being selectively bound by a molecule having an exposed amino acid sequence EPPT (SEQ ID NO. 1) on the surface thereof, comprising exposing the cell or mucin to a molecule capable of binding mucin consisting of the amino acid sequence EPPT (SEQ ID NO:1) and further amino acids to form a peptide of up to 30 amino acids wherein said molecule is detectably labeled, and detecting binding of said molecule to said cell or mucin.

5,591,594

Patent Not Issued For This Number

5,591,595

DETECTION OF COMPLEXES WHICH INCLUDE BASEMENT MEMBRANE COMPONENTS AS DIAGNOSTIC OF CANCER AND OTHER DISEASES

Morgan Van Aken, and Stefan L. Paskell, both of Bainbridge Island, Wash., assignors to Bainbridge Sciences, Inc., Redmond, Wash.

Continuation of Ser. No. 178,219, Jan. 6, 1994, Pat. No. 5,512,657, which is a continuation of Ser. No. 96,490, Jul. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 721,756, Jun. 26, 1991, Pat. No. 5,264,370, which is a continuation-in-part of Ser. No. 283,397, Dec. 12, 1988, abandoned. This application Jun. 1, 1995, Ser. No. 457,285

Int. Cl.[6] G01N *33/574;33/53*

U.S. Cl. 435—7.23 **37 Claims**

1 A method for determining the presence or amount of a complex including basement membrane components, said complex being reactive with antibody 1B4 (ATCC no. 11389), and consisting of polypeptides with approximate molecular weights of 165,000; 140,000; 125,000; 98,000; 82,000; 74,000; 55,000; 43,000; 35,000; 26,000; and 16,000 as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis, said method comprising the steps of:

(a) isolating a urine sample from a warm-blooded animal, and

(b) detecting the presence or amount of said complex in said sample.

5,591,596

PROCESS FOR PREPARING A PURIFIED TREPONEMAL ANTIGEN AND USE THEREOF

Fumio Ishikawa, Takatsuki; Kouhei Nagahata, Kamaishi, and Mie Matsumoto, Moriyama, all of Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 271,776, Jul. 7, 1994, Pat. No. 5,474,900, which is a continuation of Ser. No. 985,346, Nov. 30, 1992, abandoned, which is a continuation of Ser. No. 704,526, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 669,479, Mar. 14, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 478,000

Claims priority, application Japan, Mar. 16, 1990, 2-67986

Int. Cl.[6] G01N *33/554;33/53;33/567;33/531*

U.S. Cl. 435—7.32 **8 Claims**

1. A process for preparing a diagnostic reagent for syphilis which comprises contacting an antigen originating from *Treponema pallidum* with an inert carrier having at least partial hydrophobicity on its surface in an aqueous medium containing 0.01 to 2.5% by weight of a surfactant and having pH 4.5 to 7.7 wherein said antigen is obtained by a process which comprises adsorbing an extract originated from *Treponema pallidum* on a hydroxyapatite gel, followed by elution with an aqueous buffer containing octylglucopyranoside.

5,591,597

Patent Not Issued For This Number

5,591,598

METHOD FOR QUANTITATING HYDRAZIDE GROUPS

Edward N. Granados, Vernon Hills; Daniel F. Heiman, Libertyville, both of Ill.; Herbert S. Chow, San Carlos, Calif., and Maria L. Thaler, Waukegan, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 113,145, Aug. 27, 1993, abandoned. This application Feb. 22, 1995, Ser. No. 391,876

Int. Cl.[6] C12Q *1/02;1/24*

U.S. Cl. 435—29 **2 Claims**

1. A method for quantitating the number of hydrazide groups that are on solid particles, semisolid particles or cells wherein said hydrazide groups are formed on said solid particles, semisolid particles or cells by reacting carboxylic acid groups located on the surface molecules of said solid particles, semisolid particles or cells with hydrazine groups in the presence of 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride, which quantitation method comprises reacting thiobutyrolactone with said hydrazide groups at a pH of about 5.0 to selectively convert said hydrazide groups to sulfhydryl groups, and adding 5,5'-dithio-bis(2-nitrobenzoic acid) to said sulfhydryl groups; whereby intensity of color development due to said 5,5-dithio-bis(2-nitrobenzoic acid) is correlated, based upon standards correlating color intensity to sulhydryl group quantity, with the quantity of sulfhydryl groups, and consequently the quantity of hydrazide groups, present on said solid particles, semisolid particles or cells.

5.591,599

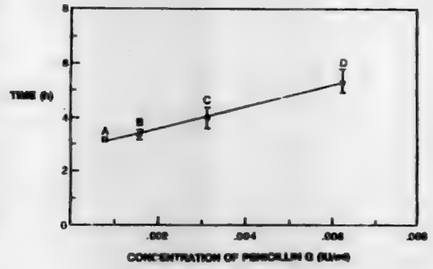
METHOD FOR DETECTING ANTIMICROBIAL COMPOUNDS

Tsung C. Chang, Taoyuan, and Hui C. Chen, Miaoly, both of Taiwan, assignors to Food Industry Research and Development Institute, China

Filed May 27, 1994, Ser. No. 250,285

Int. Cl.[6] C12Q *1/18*

U.S. Cl. 435—32 **20 Claims**



1. A method for determining the concentration of an antimicrobial compound in a sample, the method comprising the steps of:

adding the sample to a culture medium containing a microorganism;

growing said microorganism in the culture medium, the growth of said microorganism being susceptible to inhibition by the compound;

measuring an electrical parameter of said culture medium over a period of time;

determining a first time point at which an accelerating change of said electrical parameter occurs, said change resulting from the growth of said microorganism; and

comparing said first time point with a plurality of time points to determine the concentration of the compound, wherein each of said plurality of time points is determined under the same condition as said first time point is determined except that the compound is present in said culture medium at different known concentrations, and, further, preparing a linear curve from said plurality of time points in which a linear relationship exists between said plurality of time points and their corresponding concentrations and determining the concentration of said antimicrobial compound in said sample from said linear curve.

5,591,600

ANTISENSE INHIBITORS OF THE HUMAN IMMUNODEFICIENCY VIRUS

David J. Ecker, Carlsbad, Calif., assignor to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Division of Ser. No. 521,907, May 11, 1990, Pat. No. 5,166,195. This application Mar. 18, 1992, Ser. No. 852,322

Int. Cl.[6] C12N *5/10;15/63;* C12P *21/00*

U.S. Cl. 435—69.1 **8 Claims**

1. A method for modulating expression of HIV in vitro comprising contacting cells infected with HIV with an oligonucleotide or oligonucleotide analog comprising at least 6 contiguous subunits corresponding to one of the nucleotide sequences:

5' 3'

GGCTCCATTTCTTGCTCTCC

CATTTCTTGCTCTCCTCTGT

GCTATGTCGACACCCAATTC

CCGCCCCTCGCCTCTTGCCG

CGGGTCCCCTCGGGATTGGG.

5,591,601

DNA POLYMERASE GENE EXPRESSION SYSTEM UTILIZING AN RNA POLYMERASE CO-DELIVERED WITH THE GENE EXPRESSION VECTOR SYSTEM

Thomas E. Wagner, Albany; Xiaozhuo Chen, and Yunsheng Li, both of Athens, all of Ohio, assignors to Ohio University Edison Animal Biotechnology Institute, Athens, Ohio

Filed May 14, 1993, Ser. No. 62,657

Int. Cl.[6] C12N *5/16;15/18;15/85*

U.S. Cl. 435—69.1 **38 Claims**

19. A method for expressing an exogenous gene in mammalian cells comprising:

(a) co-delivering into mammalian host cells:

(i) a recombinant DNA molecule which comprises a coding sequence for an RNA polymerase having transcriptional activity that does not require mammalian host cell factors or a functional derivative thereof, operably linked to its cognate promoter;

(ii) a second recombinant DNA molecule which comprises a coding sequence for a gene of interest or a functional derivative thereof, operably linked to a second copy of the cognate promoter of (i); and

(iii) an exogenous RNA polymerase which transcribes said coding sequences from said cognate promoters; and

(b) inducing expression of the gene of interest in the cells.

5,591,602

NUCLEIC ACID ENCODING OPIOID RECEPTOR

Brian F. O'Dowd, 229 Catalina Drive, Scarborough, Ontario, Canada

Filed Nov. 5, 1993, Ser. No. 148,215

Int. Cl.[6] C12N *15/12;* C07K *14/705;* C07H *21/00*

U.S. Cl. 435—69.1 **14 Claims**

1. An isolated and purified polynucleotide that encodes an opioid receptor polypeptide comprising the amino acid residue sequence of SEQ ID NO: 2.

13. A process of preparing an opioid receptor polypeptide comprising:

(a) transfecting a cell with a polynucleotide that encodes a polypeptide comprising the amino acid residue sequence of SEQ ID NO: 2 to produce a transformed host cell; and

(b) maintaining the transformed host cell under biological conditions sufficient for expression of the polypeptide.

5,591,603

PROCESS FOR PREPARING APROTININ AND APROTININ ANALOGS IN YEAST CELLS

Soren E. Bjarn, Lyngby; Kjeld Norris, Hellerup; Viggo Dinesn, Charlottenlund; Leif Nørskov-Lauritsen, Kage; Niels D. Christensen, Kovenhavn; Claus Bregengaard; Fanny Norris, both of Hellerup, and Lars C. Petersen, Hørsholm, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 24,925, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 466,408, Jun. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 598,737, Nov. 19, 1990, Pat. No. 5,373,090, and a continuation-in-part of Ser. No. 827,687, Jan. 29, 1992, abandoned. This application Jun. 23, 1993, Ser. No. 84,718

Claims priority, application Denmark, Aug. 28, 1987, 4501/87; Apr. 26, 1988, 2254/88; Oct. 1, 1990, 2361/90; Jun. 12, 1991, 1118/91

Int. Cl.[6] C12N *15/81;15/15;* C07K *14/81;* C12P *21/02*

U.S. Cl. 435—69.2 **13 Claims**

1. A process for producing aprotinin or an analog thereof in yeast comprising culturing a yeast strain containing a replicable expression vector, the vector comprising a gene coding for aprotinin or an analog thereof and DNA sequences that allow for the expression of the aprotinin or analog thereof in a suitable nutrient medium and recovering the expressed aprotinin or analog thereof, in which the aprotinin or analog thereof has the following formula:

X-aprotinin(3-40)-Y_n-Z_m-aprotinin(43-58)

in which X is Arg-Pro, Pro or hydrogen, aprotinin(3-40) is the amino acid sequence from amino acid residue 3 to 40 in native aprotinin, Y is Lys, or a non-basic amino acid residue, Z is Arg or a non-basic amino acid residue, n and m are each 0 or 1, and aprotinin(43-58) is the amino acid sequence from amino acid residue 43 to 58 in native aprotinin.

5,591,604

RECOMBINANT ANTIBODIES AT THE SURFACE OF *E. COLI*

Patrick Fuchs, Heidelberg; Melvyn Little, Neckargemünd-Dilsberg; Frank Breitling, and Stefan Dübel, both of Heidelberg, all of Germany, assignors to Deutsches Krebsforschungszentrum Stiftung des offentlichen Rechts, Heidelberg, Germany

PCT No. PCT/EP92/01523, § 371 Date May 10, 1993, § 102(e) Date May 10, 1993, PCT Pub. No. WO93/01287, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 6, 1992, Ser. No. 982,744

Claims priority, application Germany, Jul. 8, 1991, 41 22 598.8

Int. Cl.[6] C12P *21/08;21/04;* C12N *5/12;1/20*

U.S. Cl. 435—69.7 **6 Claims**

4. A method for expressing a peptide or protein on the surface of bacteria comprising transforming said bacteria with a vector, said vector comprising a DNA sequence encoding said peptide or protein fused to a DNA sequence encoding the peptidoglycan associated lipoprotein, PAL, of *E. coli.*

5,591,605

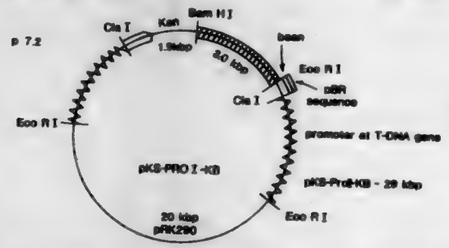
PLANT STRUCTURAL GENE EXPRESSION

Timothy C. Hall, College Station, Tex.; John D. Kemp, Las Cruces, N.M.; Jerry L. Slightom, Kalamazoo, Mich., and Dennis W. Sutton, Las Cruces, N.M., assignors to Mycogen Plant Science, Inc., San Diego, Calif.

Continuation of Ser. No. 32,826, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 741,834, Aug. 6, 1991, abandoned, which is a continuation of Ser. No. 144,775, Jan. 20, 1988, Pat. No. 5,102,796, which is a continuation of Ser. No. 485,614, Apr. 15, 1983, abandoned. This application Aug. 24, 1994, Ser. No. 296,073

Int. Cl.[6] C12N *15/29;15/84;* A01H *5/00;5/10*

U.S. Cl. 435—70.1 **58 Claims**



58. A method for expressing a plant structural gene in plant tissue, said method comprising providing a dicot cell transformed to express a heterologous plant structural gene under the control of a T-DNA promoter, said cell containing T-DNA wherein the tms locus or the tmr locus, or both of said loci, have been inactivated; and maintaining said cell in conditions where said cell proliferates and said plant structural gene is expressed.

5,591,606

PROCESS FOR THE PRODUCTION OF A83543 COMPOUNDS WITH *SACCHAROPOLYSPORA SPINOSA*

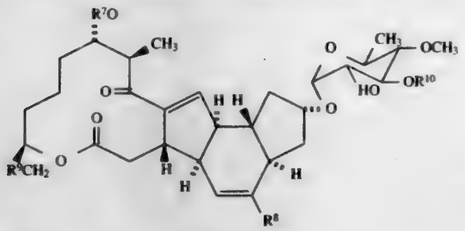
Jan R. Turner, Carmel; Mary L. B. Huber, Danville; Mary C. Broughton; Jon S. Mynderse, both of Indianapolis, and James W. Martin, Coatesville, all of Ind., assignors to Dow-Elanco, Indianapolis, Ind.

Continuation of Ser. No. 973,121, Jun. 11, 1992, abandoned. This application Mar. 2, 1995, Ser. No. 397,306

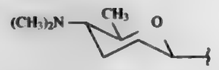
Int. Cl.[6] C12P *19/62;19/60*

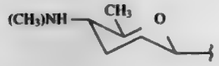
U.S. Cl. 435—76 **5 Claims**

1. A process for preparing a compound of Formula 2:

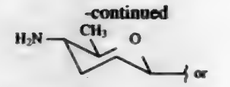


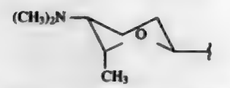
where R^7 is a group of formula


(a)

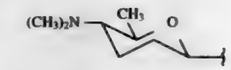

(b)

-continued


(c)


(d)

and R^8, R^9 and R^{10} are independently hydrogen or methyl; provided that when both R^7 is



and R^8 is hydrogen then R^9 and R^{10} are not both methyl, which comprises cultivating *S. spinosa* strain NRRL 18823 or a mutant thereof, in a suitable culture medium, under submerged aerobic fermentation conditions until a recoverable amount of a compound of Formula 2 is produced and then recovering said compound of Formula 2.

5,591,607

OLIGONUCLEOTIDE N3→P5' PHOSPHORAMIDATES: TRIPLEX DNA FORMATION

Sergei M. Gryaznov, San Mateo; Ronald G. Schultz, Fremont, and Jer-kang Chen, Palo Alto, all of Calif., assignors to Lynx Therapeutics, Inc., Hayward, Calif.

Division of Ser. No. 214,599, Mar. 18, 1994. This application Jun. 6, 1995, Ser. No. 478,470

Int. Cl.[6] C12P *19/34;* C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—91.1 **16 Claims**

1. A method of generating a triplex DNA molecule, comprising: contacting a target duplex DNA with an oligodeoxyribonucleotide comprising a sequence of nucleoside subunits that hybridize with said target duplex DNA, wherein:

(i) 100% of the inter-subunit linkages of said oligodeoxyribonucleotide are N3'→P5' phosphoramidate inter-subunit linkages of the formula:



where X is O^-, and

(ii) said oligodeoxyribonucleotide comprises at least eleven nucleosides.

5,591,608

Patent Not Issued For This Number

5,591,609

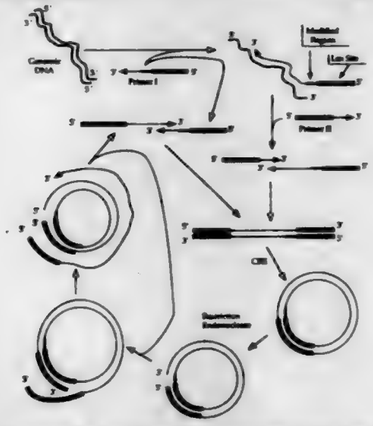
METHODS FOR THE ISOTHERMAL AMPLIFICATION OF NUCLEIC ACID MOLECULES

Jeffrey L. Auerbach, Rockville, Md., assignor to Replicon, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 933,945, Aug. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 924,643, Aug. 4, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,327

Int. Cl.[6] C12P *19/34*; C12Q *1/68*

U.S. Cl. 435—91.2 **15 Claims**



1. A method for amplifying a target polynucleotide region of a double-stranded nucleic acid molecule present in a sample, said method comprising:

(A) incubating said sample under conditions sufficient to separate the strands of said double-stranded molecule and thereby form single-stranded nucleic acid molecules;

(B) incubating said formed single-stranded nucleic acid molecules in the presence of first primer molecules, said first primer molecules being single-stranded, and comprising from 3' terminus to 5' terminus:

(1) a first polynucleotide region complementary to the 3' terminus of said target polynucleotide region;

(2) a second polynucleotide region containing modified nucleotides, said modified nucleotides being selected from the group consisting of methylated nucleotides and (α-thio)phosphorothioate nucleotides, wherein, if said second polynucleotide region were hybridized to a complementary polynucleotide, a double-stranded polynucleotide would thereby be formed that would contain one or more restriction endonuclease cleavage sites not present in said target polynucleotide region that would be recognized by a restriction endonuclease that is substantially incapable of cleaving a strand of a nucleic acid molecule that contains said modified nucleotides;

(3) a third polynucleotide region, wherein, if said third polynucleotide region were hybridized to a complementary polynucleotide, a double-stranded polynucleotide would thereby be formed that would contain a lox site;

wherein said incubation is conducted in the presence of a polymerase and nucleotides lacking the modification of the modified nucleotides present in said first primer, said incubation being under conditions sufficient to (i) permit said first polynucleotide region of said first primer molecules to hybridize to the 3' terminus of said target polynucleotide, and (ii) permit template dependent extension of said first primer molecules, to thereby form first primer extension products;

(C) incubating said first primer extension products under conditions sufficient to separate the strands of double-stranded nucleic acid molecules and thereby produce unhybridized first primer extension products;

(D) incubating said produced unhybridized first primer extension products in the presence of second primer molecules, said second primer molecules being single-stranded, and comprising from 3' terminus to 5' terminus:

(1) a first polynucleotide region having the sequence of the 5' terminus of said target polynucleotide;

(2) a second polynucleotide region, wherein, if said second polynucleotide region were hybridized to a complementary polynucleotide, a double-stranded polynucleotide would thereby be formed that would contain a lox site;

wherein said incubation is conducted in the presence of a polymerase and nucleotides lacking the modification of the modified nucleotides present in said first primer, said incubation being under conditions sufficient to (i) permit said unhybridized first primer extension products to hybridize to the 3' terminus of said second primer molecules, and (ii) permit template dependent extension of said first primer extension products, and of said second primer molecules, to thereby form linear double-stranded nucleic acid molecules having a lox site at each end, and containing said target polynucleotide that is to be amplified and a hemi-modified restriction site;

(E) incubating the linear double-stranded nucleic acid molecules of step (D) in the presence of Cre recombinase, said restriction endonuclease, said polymerase and said nucleotides lacking the modification of the modified nucleotides present in said first primer; wherein said incubation permits the following reactions to occur:

(1) said Cre circularizes said linear double-stranded nucleic acid molecules having a lox site at each end, to thereby form a double-stranded circular molecule;

(2) said restriction endonuclease cleaves a non-modified nucleotide-containing strand of said hemi-modified restriction endonuclease recognition site of said double-stranded circular molecule to thereby form an extendible 3' terminus; and

(3) said polymerase and said non-modified nucleotides mediate template dependent primer extension of said extendible 3' terminus to thereby cause displacement of a single-stranded polynucleotide containing said target polynucleotide region; said primer extension further resulting in the creation of a new hemi-modified restriction recognition site; and

(4) said restriction endonuclease cleaves a non-modified nucleotide-containing strand of said newly created hemi-modified restriction endonuclease recognition site to thereby form a new extendible 3' terminus, and permit the release of said single-stranded polynucleotide containing said target polynucleotide region, wherein said displacement and said release accomplishes said desired amplification of said target polynucleotide; and

(F) maintaining said incubation conditions of step (E) until a desired level of amplification of said target polynucleotide has been attained.

5,591,610

RNA RIBOZYME POLYMERASES, DEPHOSPHORYLASES, RESTRICTION ENDORIBONUCLEASES AND METHODS

Thomas R. Cech, Boulder; Arthur J. Zaug, Louisville, and Michael D. Been, Boulder, all of Colo., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 843,737, Feb. 28, 1992, Pat. No. 5,354,855, which is a continuation of Ser. No. 562,672, Aug. 3, 1990, Pat. No. 5,093,246, which is a division of Ser. No. 937,327, Dec. 3, 1986, Pat. No. 4,987,071. This application Jul. 21, 1994, Ser. No. 278,624

Int. Cl.[6] C12P *19/34*; C07H *21/02*

U.S. Cl. 435—91.31 **2 Claims**

2. A method of producing an enzymatic ribonucleic acid molecule comprising ribonucleotides having an endonuclease activity independent of any protein, said activity being specific for a nucleotide sequence of a single-stranded RNA target site in a separate first RNA molecule, comprising the steps of:

(i) identifying a second RNA molecule capable of intramolecular cleavage by transesterification resulting from nucleophilic attack at a phosphorous ester bond;

(ii) determining the substrate portion, the substrate binding portion, the portion having transesterification activity and the nucleophilic attacking group within said second RNA molecule; and

(iii) producing an enzymatic ribonucleic acid molecule comprising said portion having transesterification activity and said substrate binding portion, and lacking said substrate portion and said nucleophilic attacking group; wherein, in the case that the nucleotide sequence of the target site is not identical to the nucleotide sequence of the substrate portion of said second RNA molecule, said substrate binding portion has an altered sequence capable of specifically binding with the target nucleotide sequence; whereby said enzymatic ribonucleic acid molecule can only cleave by transesterification a single-stranded target sequence without forming a covalent bond between itself and any portion of the target sequence.

5,591,611

TREHALOSE-RELEASING ENZYME, AND ITS PREPARATION AND USES

Kazuhiko Maruta, Okayama; Michio Kubota, Osaka; Toshiyuki Sugimoto, and Toshio Miyake, both of Okayama, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Division of Ser. No. 253,171, Jun. 2, 1994, Pat. No. 5,472,863. This application Jun. 5, 1995, Ser. No. 464,522

Claims priority, application Japan, Jun. 3, 1993, 5-156338; Dec. 9, 1993, 5-340343; Mar. 28, 1994, 6-79291

Int. Cl.[6] C12P *19/12*; C12N *9/26;9/14;9/10*

U.S. Cl. 435—100 **21 Claims**

1. A process for preparing a composition containing trehalose, comprising:

(a) allowing a non-reducing saccharide-forming enzyme together with a trehalose-releasing enzyme to act on a solution containing one or more reducing partial starch hydrolysates having a degree of glucose polymerization of 3 or higher to form trehalose, said non-reducing saccharide-forming enzyme being capable of forming a non-reducing saccharide having a trehalose structure as an end unit and having a degree of glucose polymerization of 3 or higher, and said trehalose-releasing enzyme being capable of specifically hydrolyzing the linkage between a trehalose moiety and the remaining glycosyl moiety in said non-reducing saccharide;

(b) recovering the resultant trehalose together with or without other saccharide(s); and

(c) incorporating the trehalose together with or without other saccharide(s) into a material for composition.

5,591,612

TREHALOSE-RELEASING ENZYME, AND ITS PREPARATION AND USES

Kazuhiko Maruta, Okayama; Michio Kubota, Osaka; Toshiyuki Sugimoto, and Toshio Miyake, both of Okayama, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Division of Ser. No. 253,171, Jun. 2, 1994, Pat. No. 5,472,863. This application May 17, 1995, Ser. No. 443,352

Claims priority, application Japan, Jun. 3, 1993, 5-156338; Dec. 9, 1993, 5-340343; Mar. 28, 1994, 6-79291

Int. Cl.[6] C12P *19/12*; C12N *9/26;9/14;9/10*

U.S. Cl. 435—100 **25 Claims**

1. A process for preparing trehalose, comprising:

(a) allowing an enzyme to act on a solution containing a non-reducing saccharide having a trehalose structure as an end unit and having a degree of glucose polymerization of 3 or higher to form trehalose, said enzyme being capable of specifically hyudrolyzing the linkage between a trehalose moiety and the remaining glycosly moiety in said non-reducing saccharide;

(b) purifying the resultant trehalose; and

(c) recovering the purified trehalose.

5,591,613

METHOD FOR THE PREPARATION OF D-ARGININE AND L-ORNITHINE

Kyriakos Makrydeas, Radolfzell; Karlheinz Drauz, Freigericht, and Andreas Bommarius, Frankfurt/M, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 715,963, Jun. 17, 1991, Pat. No. 5,405,761. This application Dec. 29, 1994, Ser. No. 366,544

Claims priority, application Germany, Jul. 2, 1990, 40 20 980.6

Int. Cl.[6] C12P *13/10*

U.S. Cl. 435—114 **5 Claims**

1. A method for the preparation of D-arginine which comprises an enzymatic conversion of DL-arginine, in the presence of an L-arginase which selectively converts the L-arginine in DL arginine into L-ornithine, in an aqueous reaction medium, said method comprising the steps of:

a) adjusting the pH of said aqueous reaction medium to a range between 8.0 and 10.0 prior to the enzymatic conversion with an acid;

b) maintaining the pH between 8.0 and 10.0 during the enzymatic conversion with the same acid used in step (a);

c) adjusting the pH of said aqueous reaction medium after said enzymatic conversion to a range between 6.5 and 7.0;

(d) allowing an L-ornithine salt to crystallize from said aqueous reaction medium and recovering D-arginine.

5,591,614

PROCESS FOR THE ENZYMATIC PREPARATION OF MACROLACTONE

Francis Blanche, and Denis Thibaut, both of Paris, France, assignors to Rhone-Poulenc Rorer, S.A., Antony, France

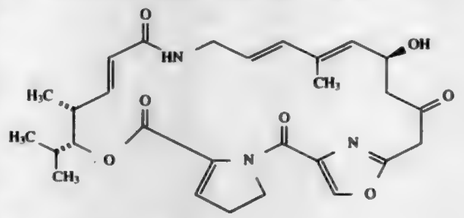
Continuation of Ser. No. 119,229, Sep. 28, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 417,445

Claims priority, application France, Mar. 28, 1991, 91 03779

Int. Cl.[6] C12P *17/14*

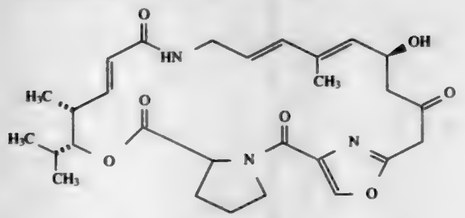
U.S. Cl. 435—120 **8 Claims**

1. A process for preparing a compound of formula (1),



said process comprising:

(a) incubating a compound of formula (2)



in an aerobic culture medium containing a microorganism,
wherein said microorganism is selected from the group consisting of *Streptomyces pristinaespiralis* ATCC 25486, *Streptomyces mitakaensis ATCC* 15297, *Streptomyces ostreogriseus* ATCC 27455, *Streptomyces olivaceus* ATCC 12019, and *Streptomyces loidensis* ATCC 11415;
wherein said incubating with said microorganism results in a bioconversion of the compound of formula (2) of about 50%,
wherein said microorganism oxidizes the 2–3 bond of D-proline of polyunsaturated macrolactones of group A streptogramins to dehydroproline; and
(b) recovering the compound of formula (1).

5,591,615

MUTANT OF *GEOTRICHUM CANDIDUM* WHICH PRODUCES NOVEL ENZYME SYSTEM TO SELECTIVELY HYDROLYZE TRIGLYCERIDES

Dena A. Oester, Cincinnati; Allen L. Hall, Amelia, and Stephen J. Vesper, Kettering, all of Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 918,328, Jul. 22, 1992, Pat. No. 5,470,741. This application Jun. 2, 1995, Ser. No. 458,317

Int. Cl.[6] C12N *15/01;1/14;9/20*

U.S. Cl. 435—172.1 **7 Claims**

1. A process for the production of a strain of *Geotrichum candidum* identified by ATCC deposit no. 74170. comprising the steps of:
a.) culturing *Geotrichum candidum* NRRL Y552 (ATCC 74169) in a nutrient medium;
b.) exposing the cultured strain to ultraviolet light for a sufficient period of time to induce mutation;
c.) incubating the resulting mutants with agitation in a nutrient broth suspension;
d.) freezing the suspension;
e.) thawing the suspension, and
f.) repeating steps a.) through e.).

5,591,616

METHOD FOR TRANSFORMING MONOCOTYLEDONS

Yokoh Hei, and Toshihiko Komari, both of Iwata-gun, Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

PCT No. PCT/JP93/00925, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO94/00977, PCT Pub. Date Jan. 20, 1994

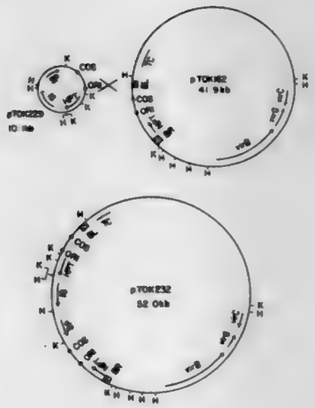
PCT Filed Jul. 6, 1993, Ser. No. 193,058

Claims priority, application Japan, Jul. 7, 1992, 4-204464

Int. Cl.[6] C12M *15/00;* C12R *1/41*

U.S. Cl. 435—172.3 **25 Claims**

1. A method for transforming a monocotyledon callus, comprising contacting a cultured tissue of a monocotyledon during dedifferentiation wherein said dedifferentiation is obtained by culturing an explant on a dedifferentiation-inducing medium for not less than 7 days or a dedifferentiated cultured tissue of a monocotyledon, with a bacterium belonging to the genus Agrobacterium containing a desired gene.



5,591,617

Patent Not Issued For This Number

5,591,618

G PROTEIN-COUPLED RECEPTOR KINASE GRK6

David Chantry; Patrick W. Gray, both of Seattle, and Meri F. Hoekstra, Snohomish, all of Wash., assignors to ICOS Corporation, Bothell, Wash.

Division of Ser. No. 221,817, Mar. 31, 1994, Pat. No. 5,532,151, which is a continuation-in-part of Ser. No. 123,932, Sep. 17, 1993, abandoned. This application May 30, 1995, Ser. No. 454,439

Int. Cl.[6] C12Q *1/68;* C12N *9/12;5/00;* C07H *19/00*

U.S. Cl. 435—194 **3 Claims**

1. A purified and isolated mammalian G protien-coupled receptor kinase 6(GRK6) enzyme.

5,591,619

AUREOBASIDIUM PULLULANS XYLANASE, GENE AND SIGNAL SEQUENCE

Li Xin-Liang, and Lars G. Ljungdahl, both of Athens, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Sep. 30, 1994, Ser. No. 315,695

Int. Cl.[6] C12N *1/19;15/55;15/62;* C12P *21/00*

U.S. Cl. 435—201 **16 Claims**

1. An isolated recombinant DNA molecule encoding a xylanase APX-II mature protein having the amino acid sequence set forth in SEQ ID NO:16 from amino acid 1 to 187.

5,591,620

METHODS OF DETECTING AND ISOLATING A RIPENING FORM OF A POLYPEPTIDE HAVING RHAMNOGALACTURONASE ACTIVITY

Wouter Musters, Maasluis; Hein Stam, Diemen; Maria E. Suykerbuyk, Utrecht; Jacob Visser, Wageningen, and Johannes M. Verbakel, Maasland, all of Netherlands, assignors to Unilever Patent Holdings, B.V., Vlaardingen, Netherlands

Division of Ser. No. 61,062, May 14, 1993. This application Sep. 29, 1995, Ser. No. 536,242

Claims priority, application European Pat. Off., May 15, 1992, 92201403

Int. Cl.[6] C12N *9/26*

U.S. Cl. 435—201 **4 Claims**

1. A method of detecting a ripening form of a polypeptide which cross reacts with an antibody which specifically binds to an antigenic determinant of rhamnogalacturonase comprising the steps of:
adding said antibody to a sample containing said polypeptide;
incubating said antibody with said sample such that said antibody binds to said polypeptide; and
detecting the presence of said polypeptide bound to said antibody.

5,591,621

Patent Not Issued For This Number

5,591,622

Patent Not Issued For This Number

5,591,623

OLIGONUCLEOTIDE MODULATION OF CELL ADHESION

C. Frank Bennett, Carlsbad, and Christopher K. Mirabelli, Encinitas, both of Calif., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 939,855, Sep. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 567,286, Aug. 14, 1990, abandoned. This application Jan. 21, 1993, Ser. No. 7,997

The portion of the term of this patent subsequent to May 7, 2013, has been disclaimed.

Int. Cl.[6] C12N *5/22;* C07H *21/04;* A61K *31/70;* C12Q *1/68*

U.S. Cl. 435—240.2 **4 Claims**

2. A method of inhibiting synthesis of intercellular adhesion molecules in a cell comprising contacting the cell in vitro with an oligonucleotide having SEQ ID NO: 22 wherein at least one of the linking groups between nucleotide units of the oligonucleotide comprises a phosphorothioate moiety.

5,591,624

RETROVIRAL PACKAGING CELL LINES

Jack R. Barber, San Diego; Douglas J. Jolly, La Jolla; James G. Respess, and Stephen M. W. Chang, both of San Diego, all of Calif., assignors to Chiron Viagene, Inc., Emeryville, Calif.

Continuation of Ser. No. 800,921, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,603, Sep. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 565,606, Aug. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,932, Aug. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 170,515, Mar. 21, 1988, abandoned. This application Nov. 23, 1993, Ser. No. 156,789

Int. Cl.[6] C12N *5/10;5/08*

U.S. Cl. 435—240.2 **9 Claims**

1. A retroviral packaging cell line, wherein the packaging cell line is generated from a human host cell line.

5,591,625

TRANSDUCED MESENCHYMAL STEM CELLS

Stanton L. Gerson, Pepper Pike; Arnold I. Caplan, and Stephen E. Haynesworth, both of Cleveland Heights, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Nov. 24, 1993, Ser. No. 158,000

Int. Cl.[6] C12N *5/10;5/08;15/86;* A61K *48/00*

U.S. Cl. 435—240.2 **21 Claims**

1. Isolated human mesenchymal stem cells which can differentiate into more than one connective tissue type transfected with exogenous genetic material encoding a protein to be expressed.

5,591,626

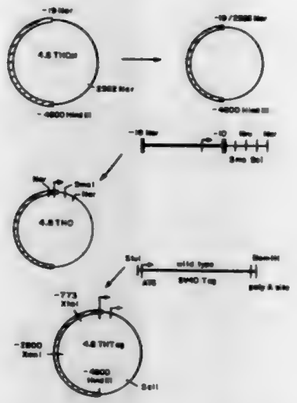
EXPRESSION OF A TARGET GENE IN TRANSGENIC MAMMALS WITH 5' FLANKING SEQUENCES OF THE RAT TYROSINE HYDROXYLASE GENE

Dona M. Chikaraishi, Boston, Mass., assignor to Trustees of Tufts College, Medford, Mass.

Continuation of Ser. No. 973,032, Nov. 6, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 292,926

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.2 **2 Claims**



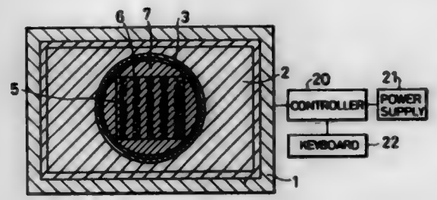
1. An immortalized catecholaminergic mouse central nervous system neuronal cell line, wherein the cell line is ATCC Accession No. CRL 11179.

5,591,627

APPARATUS FOR ARRANGING CELLS IN CULTURE MEDIUM

Shigeyuki Miyamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,886
Claims priority, application Japan, Oct. 6, 1993, 5-250250
Int. Cl.[6] C12N *5/00*
U.S. Cl. 435—240.23 **14 Claims**



1. An apparatus for arranging cells on a substrate by attaching said cells to said substrate in a liquid culture medium, said apparatus comprising:

said substrate having first and second patterns on a surface thereof, wherein said first pattern is more adhesive for said cells than said second pattern;

a container containing therein said substrate, said cells, and said liquid culture medium for incubating said cells; and

means for supporting and rotating or oscillating said container;

wherein said means for supporting and rotating or oscillating of said container, by rotating or oscillating said container, permits said cells to attach to said first pattern and prevents said cells from attaching to said second pattern.

5,591,628

METHOD OF DETERMINING THE PRESENCE OF ENDOTOXIN IN A SAMPLE

Leif Bæk, Heinesgade 1, 4.tv., 2200 Copenhagen N, and Claus Koch, Overgaden oven Van-det 26.1, 1415 Copenhagen, both of Denmark

Division of Ser. No. 295,213, Jan. 6, 1989, Pat. No. 5,316,911. This application May 28, 1990, Ser. No. 68,178
Claims priority, application Denmark, May 20, 1987, 2558/87
Int. Cl.[6] C12N *5/16*
U.S. Cl. 435—240.26 **27 Claims**

1. A monoclonal antibody which specifically binds to coagulogen of a limulus amoebocyte lysate, but does not bind to coagulogen of said limulus amoebocyte lysate which has been contacted with activated clotting enzyme of said limulus amoebocyte lysate.

5,591,629

MONOCLONAL ANTIBODIES WHICH PROMOTE CENTRAL NERVOUS SYSTEM REMYELINATION

Moses Rodriguez, and David J. Miller, both of Rochester, Minn., assignors to Mayo Foundation for Medical Education & Research, Rochester, Minn.

Filed Apr. 29, 1994, Ser. No. 236,520
Int. Cl.[6] C07K *16/28*; C12N *5/12*
U.S. Cl. 435—240.27 **2 Claims**

1. A monoclonal antibody capable of stimulating remyelination of central nervous system axons, said monoclonal antibody produced by the hybridoma having the ATCC accession No. CRL 11627.

5,591,630

MONOCLONAL ANTIBODIES THAT BIND INTERLEUKIN-15 RECEPTORS

Dirk M. Anderson, and Judith G. Giri, both of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 236,919, May 6, 1994, abandoned. This application Sep. 6, 1994, Ser. No. 300,983
Int. Cl.[6] C12N *5/20*; C07K *16/28*
U.S. Cl. 435—240.27 **5 Claims**

1. An antibody immunoreactive with a mammalian IL-15 receptor selected from the group consisting of a polypeptide having an amino acid sequence as set forth in SEQ ID NO:2, a polypeptide having an amino acid sequence as set forth in SEQ ID NO:7, a polypeptide having an amino acid sequence as set forth in SEQ ID NO:9, a polypeptide having an amino acid sequence as set forth in SEQ ID NO:11, a polypeptide having an amino acid sequence as set forth in SEQ ID NO:13, a polypeptide having an amino acid sequence as set forth in SEQ ID NO:14, and a polypeptide having an amino acid sequence as set forth in SEQ ID NO:15.

5,591,631

ANTHRAX TOXIN FUSION PROTEINS, NUCLEIC ACID ENCODING SAME

Stephen H. Leppla, Bethesda; Kurt R. Klimpel, Gaithersburg, both of Md.; Naveen Arora; Yogendra Singh, both of Delhi, Ind., and Peter J. Nicholls, Welling Kent, United Kingdom, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 12, 1993, Ser. No. 21,601
Int. Cl.[6] C07K *19/00*; C12N *15/31;15/70*
U.S. Cl. 435—252.3 **13 Claims**

1. A nucleic acid encoding a fusion protein, comprising a nucleotide sequence encoding the protective antigen (PA) binding domain of the native lethal factor (LF) protein and a nucleotide sequence encoding a polypeptide, wherein said fusion protein lacks the catalytic domain of LF.

5,591,632

RECOMBINANT BCG

Michael A. O'Donnell, Sudbury; Rosemary B. Duda, Carlisle; William C. DeWolf, Southborough; Anna Aldovini, and Richard A. Young, both of Winchester, all of Mass., assignors to Beth Israel Hospital, Boston, and Whitehead Institute For Biomedical Research, Cambridge, both of Mass.

Continuation-in-part of Ser. No. 711,334, Jun. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 367,894, Jun. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 361,944, Jun. 5, 1989, Pat. No. 5,504,005, which is a continuation-in-part of Ser. No. 223,089, Jul. 22, 1988, abandoned, and a continuation-in-part of Ser. No. 216,390, Jul. 7, 1988, abandoned, which is a continuation-in-part of Ser. No. 163,546, Mar. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 20,451, Mar. 2, 1987, abandoned. This application Jul. 22, 1993, Ser. No. 96,027
Int. Cl.[6] C12N *1/21;15/74*
U.S. Cl. 435—252.3 **28 Claims**

1. A recombinant mycobacterium having enhanced immunostimulatory properties in comparison with immunostimulatory properties of wild type mycobacterium, comprising DNA encoding a cytokine, wherein the DNA is expressed extrachromosomally under the control of a mycobacterial heat shock protein gene promoter or a mycobacterial stress protein gene promoter and the cytokine is secreted from said mycobacterium in a biologically active form.

5,591,633

NUCLEIC ACIDS ENCODING HUMAN PLACENTAL COAGULATION INHIBITOR (PCI)

Yushi Saino, Tokyo; Akio Iwasaki, Kawasaki, and Makoto Suda, Tsukuba, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Division of Ser. No. 807,623, Dec. 13, 1991, abandoned, which is a continuation of Ser. No. 156,822, Feb. 17, 1988, abandoned. This application Sep. 24, 1993, Ser. No. 125,746
Claims priority, application Japan, Feb. 20, 1987, 62-037227; Jul. 23, 1987, 62-184428
Int. Cl.[6] C12N *15/12;1/11;5/10*
U.S. Cl. 435—252.3 **6 Claims**

1. An isolated human DNA having a base sequence that encodes the following amino acid sequence:

Ala—Gln—Val—Leu—Arg—Gly—Thr—Val—Thr—Asp—Phe—Pro
Gly—Phe—Asp—Glu—Arg—Ala—Asp—Ala—Glu—Thr—Leu—Arg
Lys—Ala—Met—Lys—Gly—Leu—Gly—Thr—Asp—Glu—Glu—Ser
Ile—Leu—Thr—Leu—Leu—Thr—Ser—Arg—Ser—Asn—Ala—Gln
Arg—Gln—Glu—Ile—Ser—Ala—Ala—Phe—Lys—Thr—Leu—Phe
Glu—Arg—Asp—Leu—Leu—Asp—Asp—Leu—Lys—Ser—Glu—Leu
Thr—Gly—Lys—Phe—Glu—Lys—Leu—Ile—Val—Ala—Leu—Met
Lys—Pro—Ser—Arg—Leu—Tyr—Asp—Ala—Tyr—Glu—Leu—Lys
His—Ala—Leu—Lys—Gly—Ala—Gly—Thr—Asn—Glu—Lys—Val
Leu—Thr—Glu—Ile—Ile—Ala—Ser—Arg—Thr—Pro—Glu—Glu
Leu—Arg—Ala—Ile—Lys—Gln—Val—Tyr—Glu—Glu—Glu—Tyr
Gly—Ser—Ser—Leu—Glu—Asp—Asp—Val—Val—Gly—Asp—Thr
Ser—Gly—Tyr—Tyr—Gln—Arg—Met—Leu—Val—Val—Leu—Leu
Gln—Ala—Asn—Arg—Asp—Pro—Asp—Ala—Gly—Ile—Asp—Glu
Ala—Gln—Val—Glu—Gln—Asp—Ala—Gln—Ala—Leu—Phe—Gln
Ala—Gly—Glu—Leu—Lys—Trp—Gly—Thr—Asp—Glu—Glu—Lys
Phe—Ile—Thr—Ile—Phe—Gly—Thr—Arg—Ser—Val—Ser—His
Leu—Arg—Lys—Val—Phe—Asp—Lys—Tyr—Met—Thr—Ile—Ser
Gly—Phe—Gln—Ile—Glu—Glu—Thr—Ile—Asp—Arg—Glu—Thr
Ser—Gly—Asn—Leu—Glu—Gln—Leu—Leu—Leu—Ala—Val—Val
Lys—Ser—Ile—Arg—Ser—Ile—Pro—Ala—Tyr—Leu—Ala—Glu
Thr—Leu—Tyr—Tyr—Ala—Met—Lys—Gly—Ala—Gly—Thr—Asp
Asp—His—Thr—Leu—Ile—Arg—Val—Met—Val—Ser—Arg—Ser
Glu—Ile—Asp—Leu—Phe—Asn—Ile—Arg—Lys—Glu—Phe—Arg
Lys—Asn—Phe—Ala—Thr—Ser—Leu—Tyr—Ser—Met—Ile—Lys
Gly—Asp—Thr—Ser—Gly—Asp—Tyr—Lys—Lys—Ala—Leu—Leu
Leu—Leu—Cys—Gly—Glu—Asp—Asp.

5,591,634

MICROBIOLOGICAL METHOD FOR DISPOSING OF ORGANIC WASTE MATERIALS

Teruo Higa, 509, Aza Shimashi, Ginowan-shi, Okinawa-ken, Japan

Continuation of Ser. No. 82,094, Jun. 24, 1993, abandoned. This application Sep. 20, 1995, Ser. No. 531,124
Int. Cl.[6] C05F *9/00*; C12S *13/00*
U.S. Cl. 435—262 **3 Claims**

1. A microbiological method for microbiologically degrading an organic waste material comprising

a. adjusting the pH of the waste material to 3.0 to 5.0 with an organic acid;

b. incubating the organic waste material with at least one member of actinomycetes, one member of phototropic bacteria, one member of lactic acid bacteria, one member of mold fungi and one member of yeast, the at least one member of actinomycetes selected from *Streptomyces albus, Streptoverticillium baldaccii, Nocardia asteroides, Micromonospora chalcea* or *Rhodoccus rhodochrous*; the at least one member of phototrophic bacteria selected from *Rhodopseudomonas sphaeroides, Rhodospirillum rubrum, Chromatium okenii*, or *Chlorobium limicola*; the at least one member of lactic acid bacteria selected from the group *Lactobacillus bulgaricus, Propionibacterium freudenreichii, Pediococcus halophilus, Streptococcus lactis* or *Streptococcus faecalis*; and the at least one member of mold fungi selected from *Aspergillus japonicus, Aspergillus oryzae* or *Mucor hiemalis*; and the at least one member of yeast selected from the group *Saccharomyces cerevisiae, Saccharomyces lactis* or *Candia utili* and incubating said microorganisms with the organic waste material under airtight conditions at a temperature of 45° C. or less, and under conditions sufficient to degrade the organic waste material wherein

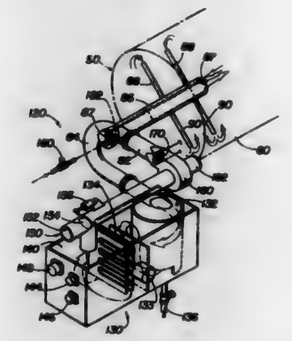
the organic waste material is selected from the group consisting of liquid wastes discharged in the process of alcohol production, garbage produced by households or eating establishments, wastes produced in the processing of agricultural or marine products, excrements of domestic animals and sewage.

5,591,635

METHODS AND APPARATUSES FOR RAPID COMPOSTING WITH CLOSED AIR LOOP CIRCULATION FOR POSITIVE CONTROL

Richard N. Young, Atlanta, Ga., and Thomas J. Irwin, II, Newton, Pa., assignors to DBS Manufacturing, Inc., Forest Park, Ga.

Filed Oct. 14, 1994, Ser. No. 323,451
Int. Cl.[6] G01N *33/00*
U.S. Cl. 435—286.1 **27 Claims**



1. A reaction vessel for biologically decomposing a material, comprising:

a. a frame;

b. an airtight housing, having a longitudinal axis, rotatably mounted on the frame, defining an enclosure therein, the enclosure having an upper portion and an opposite lower portion, the housing defining a first aperture for receiving the material into the enclosure and a second aperture for discharging the material from the enclosure;

c. means for controlling environmental conditions within the enclosure so that biological decomposition of the material can occur at a controlled rate;

d. means for rotating the housing about the longitudinal axis;

e. an elongated manifold, disposed coaxially with the longitudinal axis, having an air supply side and an opposite air return side, the air supply side and the air return side separated by a wall disposed therebetween, the manifold defining a first plurality of spaced apart openings diposed so that the lower portion of the enclosure is in fluid communication with the air supply side, the manifold also defining a second plurality of spaced apart openings disposed so the upper portion of the enclosure is in fluid communication with the air return side; and

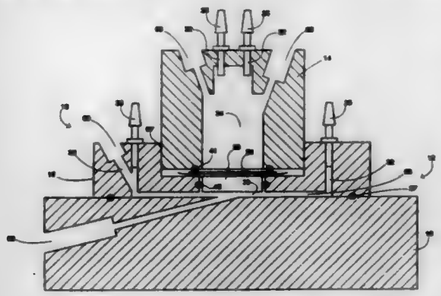
f. means for circulating air into the enclosure through the air supply side, through the material and out of the enclosure through the air return side.

5,591,636

MEMBRANE HOLDER

George M. Grass, Tahoe City, Calif., assignor to Precision Instrument Design, Tahoe City, Calif.

Continuation of Ser. No. 138,903, Oct. 18, 1993, abandoned. This application Jul. 24, 1995, Ser. No. 505,921
Int. Cl.[6] C12M *1/12;1/34*
U.S. Cl. 435—287.1 14 Claims



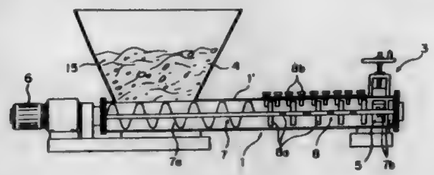
1. A device for holding a membrane, the device comprising:
a base comprising a lower plate and a center plate secured thereto, the center plate having an aperture extending therethrough;
an upper cap; and
an insert held between the upper cap and the center plate and extending into the aperture, the insert for holding the membrane between the base and the upper cap;
wherein the base defines a first volume for holding a first fluid in contact with the membrane;
wherein the upper cap defines a second volume for holding a second fluid in contact with the membrane; and
wherein a fluid path is defined at least in part by a gap between the lower plate and the center plate for continuously circulating the first fluid through the first volume.

5,591,637

METHOD FOR MANUFACTURING OF ORGANIC FERTILIZERS AND DEVICE THEREOF

Satoshi Inoue, 1214, Otso, Otso-Machi, Naka-Gun, Kanagawa, Japan

Division of Ser. No. 720,454, Jun. 25, 1991, Pat. No. 5,401,291. This application Dec. 29, 1994, Ser. No. 365,704
Int. Cl.[6] C05F *3/06;* C12M *1/16*
U.S. Cl. 435—290.2 3 Claims



1. Device for manufacturing of organic fertilizers which comprises a cylindrical primary treatment tank and a cylindrical secondary treatment tank, the front end of the cylindrical primary treatment tank being provided with a hopper for feeding of raw materials and the rear end, being connected to the rear end of the cylindrical secondary treatment tank which is equipped with an opening for taking out of products, through an open/close gate, wherein said primary treatment tank is further provided with a screw conveying system and a cutting/kneading system therein, and said secondary treatment tank is further provided with rotary blades for fine cutting therein.

5,591,638

METHOD FOR THE TRANSFORMATION OF CELLS, PARTICULARLY EUKARYOTES BY A DNA ORIGINATING FROM VIRUSES OF HEPATITIS, MORE PARTICULARLY FROM VIRUS OF B VIRAL HEPATITIS, AND PREPARATIONS CONTAINING THE EXPRESSION PRODUCTS OF SAID DNAS

Pierre Tiollais; Charles Chany, both of Paris; Marie-Francoise Dubois, Versailles; Christine Pourcel, and Anne Louise, both of Paris, all of France, assignors to Institut Pasteur and Institut Nationale de la Sante et de la Recherche Medicale, Paris, France

Continuation of Ser. No. 900,483, Jun. 18, 1992, abandoned, which is a division of Ser. No. 482,322, Apr. 5, 1983, Pat. No. 5,314,808, which is a continuation of Ser. No. 256,126, Apr. 21, 1981, abandoned. This application Jan. 25, 1994, Ser. No. 191,133
Claims priority, application France, Apr. 22, 1980, 80 09041; Dec. 9, 1980, 80 26132
Int. Cl.[6] C12N *15/51;* C07H *21/04;* C12Q *1/70*
U.S. Cl. 435—320.1 1 Claim

1. A recombinant DNA molecule, wherein said recombinant DNA molecule comprises:
more than two Hepatitis B virus (HBV) DNA sequences recombined with a vector,
wherein said vector comprises sequences of *E. coli* plasmid pBR322 and has an antibiotic resistance gene as a selective marker, wherein each of said HBV DNA sequences is comprised of full-length HBV DNA, and wherein said HBV DNA sequences are arranged in a head-to-tail tandem relationship.

5,591,639

RECOMBINANT DNA EXPRESSION VECTORS

Christopher R. Bebbington, Windsor, United Kingdom, assignor to Celltech Ltd, Berkshire, United Kingdom

Continuation of Ser. No. 896,797, Jun. 9, 1992, abandoned, which is a continuation of Ser. No. 339,615, Apr. 28, 1989, abandoned. This application Sep. 2, 1994, Ser. No. 300,063
Claims priority, application United Kingdom, Jul. 23, 1987, 8717430
Int. Cl.[6] C12N *15/00;* C07H *21/04*
U.S. Cl. 435—320.1 7 Claims

2. A recombinant expression vector comprising the promoter, enhancer and complete 5' untranslated region including the first intron of the hCMV-MIE gene operably linked to a heterologous coding sequence.

5,591,640

FUNCTIONAL DNA BLOCK AND PLASMID CODING FOR HIRUDIN, TRANSFORMED YEAST, METHOD FOR PREPARING HIRUDIN, HIRUDIN OBTAINED AND ITS PHARMACEUTICAL USE

Gérard Loison, Strasbourg; Yves Lemoine, Strasbourg-Neudorf; Nathalie Labat, Strasbourg, and Alain Balland, Truchtersheim, all of France, assignors to Behringwerke A.G., Marburg, Germany

Continuation of Ser. No. 264,241, Jun. 22, 1994, abandoned, which is a continuation of Ser. No. 967,546, Oct. 27, 1992, abandoned, which is a continuation of Ser. No. 623,256, Dec. 5, 1990, abandoned, which is a continuation of Ser. No. 430,954, Nov. 1 1989, abandoned, which is a continuation of Ser. No. 72,173, Jul. 10, 1987, abandoned. This application Mar. 16, 1995, Ser. No. 405,765
Claims priority, application France, Jul. 10, 1986, 86 10090; Dec. 1, 1986, 86 16722
Int. Cl.[6] C12N *15/64;15/52;* C07H *17/00;* C07K *14/815*
U.S. Cl. 435—320.1 1 Claim

1. An expression cassette for producing a hirudin variant protein from yeast which comprises:
a first DNA fragment encoding a precursor of a hirudin variant protein, wherein said first DNA fragment comprises the nucleotide sequence of FIG. 10 encoding a hirudin variant and a nucleotide sequence encoding an additional region having more than 2 amino acids and linked by a peptide bond to the N-terminal end of said hirudin variant, wherein said additional region comprises a single cleavage site which is the dipeptide Lys—Arg recognized by the yscF proteinase, which constitutes the C-terminal end of said additional region;
a second DNA fragment encoding a leader sequence wherein said second DNA fragment is directly linked in the same reading frame with the 5' end of said first DNA fragment; and
a third DNA fragment comprising an origin of replication functional in yeast and a promoter of a yeast gene other than the MFalpha 1 gene promoter wherein said third DNA fragment is linked to said first and second DNA fragments such that said first and second DNA fragments are expressed.

5,591,641

NUCLEIC ACID ENCODING THE GROWTH HORMONE RELEASING HORMONE RECEPTOR

Michael O. Thorner, North Garden; Bruce D. Gaylinn, Trevilians, both of Va.; John R. Zysk, French Town, N.J.; Kevin R. Lynch, Charlottesville, and Jeffrey K. Harrison, Keswick, both of Va., assignors to American Cyanamid Company, Wayne, N.J., and The University of Virginia Patent Foundation, Charlottesville, Va.

Continuation-in-part of Ser. No. 902,826, Jun. 23, 1992. This application Sep. 15, 1992, Ser. No. 946,232
The portion of the term of this patent subsequent to Jun. 10, 2013, has been disclaimed.
Int. Cl.[6] C12N *15/12;* C07K *14/705*
U.S. Cl. 435—69.1 12 Claims

6. An isolated and purified nucleic acid molecule encoding a polypeptide possessing a biological activity of growth hormone releasing hormone receptor having the amino acid sequence of SEQ ID NO: 8, wherein said activity is binding of growth hormone releasing hormone.

7. An expression vector comprising the nucleic acid molecule of claim 6, wherein said nucleic acid molecule is present in a vector capable of propagating in a prokaryotic or eukaryotic cell.

10. A method for recombinantly producing a growth hormone releasing hormone receptor having the amino acid sequence of SEQ ID NO:8, comprising transfecting the expression vector of claim 7 into a host cell, culturing the transfected host cell under conditions that would allow expression of the receptor and recovering the receptor.

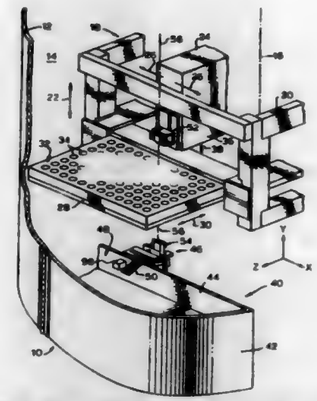
5,591,642

FLUID DISPENSING METHOD

Donald Jones, Sacramento, Calif., assignor to Dade MicroScan Inc., West Sacramento, Calif.

Division of Ser. No. 438,459, May 10, 1995, which is a continuation of Ser. No. 89,878, Jul. 9, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 460,358
Int. Cl.[6] G01N *35/02;35/10*
U.S. Cl. 436—43 4 Claims

1. In a chemical analyser having a vertically and horizontally movable carrier member and a fluid dispensing head with plural fluid dispensing nozzles which is removably received into a storage location therefor, a method of precisely and reliably attaching said fluid dispensing head supportingly and removably with said carrier member while said fluid dispensing head is in said storage location preparatory to vertical movement of said fluid dispensing head from said storage location with said carrier member and the dispensing from said fluid dispensing nozzles of said fluid dispensing head of fluid to preselected receptacles therefor; said method including the sequential steps of:
a) providing said carrier member and said fluid dispensing head with cooperating means for selectively supportingly securing said fluid dispensing head to said carrier member in response to a movement of said carrier member consisting essentially of a horizontal movement thereof while horizontally aligned with said fluid dispensing head;
b) configuring said cooperating means such that each of said carrier member and said fluid dispensing head respectively define one of a docking fixture and a docking receptacle which are inter-engageable with one another in response to relative movement along a horizontal axis;
c) forming said docking fixture to include a cavity which extends parallel with said horizontal axis, and forming said docking receptacle to include a support lug extending parrallel with said horizontal axis and which is supportingly receivable into said cavity;
d) moving said carrier member downwardly along a vertical axis to a position of alignment with said fluid dispensing head along said horizontal axis;
e) moving said carrier member horizontally to engage said carrier member with said fluid dispensing head while the latter is held in said storage location; and
f) moving said carrier member upwardly along said vertical axis to withdraw said fluid dispensing head from said storage location.



5,591,643

SIMPLIFIED INLET CHANNELS

Carol T. Schembri, San Mateo, Calif., assignor to Abaxis, Inc., Sunnyvale, Calif.

Filed Sep. 1, 1993, Ser. No. 115,162
Int. Cl.[6] B01D *21/26*
U.S. Cl. 436—45 9 Claims



1. A centrifugal rotor comprising:
a sample chamber containing a liquid;
an unvented receiving chamber positioned radially outward from the sample chamber;

a delivery channel connected to the sample chamber for removing the liquid from the sample chamber under centrifugal force;

a distribution channel directly connected to the delivery channel for removing the liquid from the delivery channel under centrifugal force;

an inlet channel connected to the unvented receiving chamber for receiving the liquid from the sample chamber through the delivery channel and the distribution channel;

wherein, the resistance to flow of the liquid in the delivery channel is greater than the resistance to flow of the liquid in the inlet and distribution channels such that the cross-sectional area of the liquid flowing through the inlet and distribution channels is less than the cross-sectional area of said inlet and distribution channels, whereby spinning the rotor effects the flow of the liquid from the sample chamber through the delivery channel, the distribution channel and the inlet channel to the receiving chamber such that air escapes from the receiving chamber through the inlet channel as the liquid enters the receiving chamber.

5,591,644

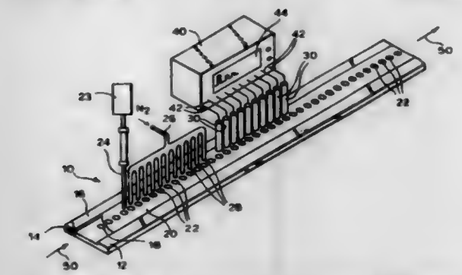
SENSITIVE ON LINE ASSAY OF CHROMATOGRAPHIC EFFLUENT

Arthur Karmen, Manhasset, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 552,147, May 11, 1990, abandoned. This application May 11, 1994, Ser. No. 241,662

Int. Cl.[6] G01N *35/08*

U.S. Cl. 436—53 **30 Claims**



1. A method for the on-line and continuous assay of a stream of changing composition, when both the times and magnitudes of the changes are of interest, for a compound of interest with a property requiring a time within the sensitive volume of a detector sufficient for measurable reaction, comprising the steps of:

(A) dividing the stream at first time intervals predetermined by the requirements for resolution into a plurality of discrete fractions which are prevented from subsequently mixing with each other;

(B) essentially continuously monitoring the stream on line by passing each fraction sequentially through each in a series of at least 10 adjacent detectors sensitive to the specified property so that each fraction spends a predetermined second time interval within the sensitive volume of each detector, is monitored continuously during such predetermined second time interval, and produces signals proportional to the property during such predetermined second time interval; and

(C) for each fraction computing the result of the assay by combining the signals from each detector during the predetermined second time interval the fraction is in the detector, taking into consideration the time of arrival of the fraction at the detector and its residence time within it;

the property being measured being one of bioluminescence or chemiluminescence, enzyme activity in an instance where it changes with respect to time, and biologic effect; and

the detectors are light detectors when the property is bioluminescence or chemiluminescence, spectrophotometric, colorimetric, fluorometric or electrochemical detectors when the property is enzyme activity, and optical detectors when the property is biologic effect.

5,591,645

SOLID PHASE CHROMATOGRAPHIC IMMUNOASSAY

Robert W. Rosenstein, Ellicott City, Md., assignor to Becton, Dickinson & Co., Franklin Lakes, N.J.

Continuation of Ser. No. 818,000, Dec. 30, 1991, abandoned, which is a continuation of Ser. No. 31,023, Mar. 27, 1987, abandoned. This application Apr. 20, 1993, Ser. No. 49,247

Int. Cl.[6] G01N *33/543;33/544;33/538;33/558*

U.S. Cl. 436—514 **23 Claims**

1. A test strip for determining the presence of an analyte in a liquid sample comprising a solid support, said solid support comprising at least a first portion and a second portion, said portions being in the same plane so as to permit capillary flow communication with each other;

said first portion being the site for application of the liquid sample and further comprising a tracer site, said tracer site consisting of a tracer movably supported therein wherein said tracer comprises a ligand, which specifically binds to the analyte, conjugated to a visible particulate marker; and

said second portion being the site for visually determining the presence of the visible particulate marker, said second portion consisting of a binder immobilized therein which specifically binds to the analyte.

5,591,646

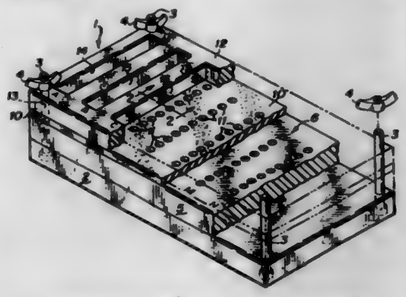
METHOD AND APPARATUS FOR PEPTIDE SYNTHESIS AND SCREENING

Derek Hudson, San Anselmo; Charles R. Johnson, Berkeley, and Lutz Giebel, Burlingame, all of Calif., assignors to Arris Pharmaceutical, San Francisco, Calif.

Filed Sep. 2, 1992, Ser. No. 939,065

Int. Cl.[6] G01N *33/543;* **C07K** *17/00*

U.S. Cl. 436—518 **25 Claims**



1. A method of synthesizing chemical polymer sequences on a continuous support substrate comprising the steps of:

(a) providing a reusable substrate plate having an ordered array of separated, discrete areas thereon which areas are functionalized so as to be reactive with at least one protected monomer contacted therewith;

(b) superimposing on said substrate plate a first block having a first top and a first bottom and a plurality of first slots disposed to extend vertically between said first top and bottom, each of said first slots being aligned with a first set of a plurality of said discrete areas in said ordered array to permit access thereto of a common monomer for simultaneous reaction with all of said first set of discrete areas aligned with and accessible via a given slot;

(c) adding a first solution of a preselected protected monomer to each of the first slots of said first block wherein the solution added to each slot is selected from a plurality of solutions, wherein each solution in said plurality of solutions comprises a different known protected monomer, said protected known monomer having a terminal functional group which reacts with the functionalized discrete areas of the substrate plate;

(d) reacting each of said first preselected protected monomer solutions with the sets of discrete areas of said substrate plate to attach the protected monomers in said monomer solutions to said sets of the discrete areas of said substrate to form a reacted substrate having a plurality of sets of reacted discrete areas each with a protected first monomer attached thereto;

(e) deprotecting the protected first monomers attached to said reacted substrate to provide a deprotected first monomer;

(f) removing said first block from said substrate;

(g) superimposing on said substrate a second block having a second top and a second bottom and a plurality of second slots disposed to extend vertically between said second top and bottom, said second block being oriented with its plurality of second slots aligned orthogonally to the direction of said plurality of first slots of said first block, each of said second slots being aligned with a second set of a plurality of discrete areas oriented orthogonally with respect to said first set of areas to permit access thereto of a common monomer for simultaneous reaction with all of said deprotected first monomers on said second set of discreet areas;

(h) adding a second solution of a preselected protected monomer to each of said second slots of said second block, wherein the solution added to each slot is selected from a plurality of solutions, wherein each solution in said plurality of solutions comprises a different known protected monomer, said monomers having corresponding terminal functional groups which react with said first plurality of preselected deprotected first monomers;

(i) reacting the second preselected protected monomer solutions with the deprotected first monomers attached to said second sets of reacted discreet areas on said substrate to attach the second protected monomer to the first deprotected monomers; and

(j) deprotecting said protected second monomer to form a deprotected array of discreet areas having polymer sequences of known monomers in known positions in said polymer sequences at known address locations in said array of areas to provide an Addressable Synthetic Biopolymer Combinatorial Library (ASBCL).

5,591,647

ANALYTE DETECTION BY COMPETITIVE INHIBITION OF ION CHANNEL GATING

Lionel G. King, North Ryde, Australia, assignor to Australian Membrane and Biotechnology Research Institute, Homebush, and The University of Sydney, Sydney, both of Australia

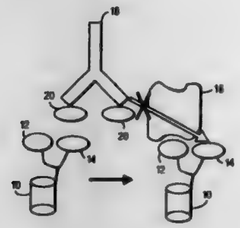
PCT No. PCT/AU93/00620, § 371 Date May 17, 1995, § 102(e) Date May 17, 1995, PCT Pub. No. WO94/12875, PCT Pub. Date Jun. 9, 1994

PCT Filed Dec. 2, 1993, Ser. No. 436,236

Claims priority, application Australia, Dec. 3, 1992, 6171

Int. Cl.[6] G01N *33/543*

U.S. Cl. 436—518 **4 Claims**



1. A membrane for use in the detection of an analyte, the membrane comprising a closely packed array of self-assembling amphiphilic molecules, a plurality of ionophores and a first and a second ligand attached to an end of the ionophore adjacent the surface of the membrane, wherein the binding of the first ligand to its specific binding partner prevents the flow of ions across the membrane via the ionophores and wherein binding of the second ligand to its specific binding partner prevents the binding of the first ligand to its specific binding partner.

5,591,648

ANTIBODIES FOR MEVALONIC ACID AND METHODS FOR IMMUNOLOGICAL DETERMINATION OF MEVALONIC ACID BY USING THEM

Akio Hayashi; Makoto Hiramatsu, and Nobuyuki Hamanaka, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 184,178, Jan. 21, 1994, Pat. No. 5,470,956. This application Aug. 23, 1995, Ser. No. 518,173

Claims priority, application Japan, Jan. 20, 1993, 5-024747

Int. Cl.[6] G01N *33/53*

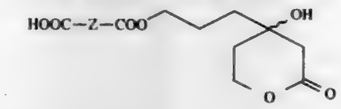
U.S. Cl. 436—518 **11 Claims**

1. A method of determining mevalonic acid in a sample, which method comprises

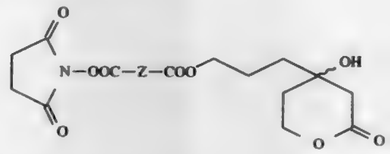
(a) competitively reacting a labeled antigen and the mevalonic acid in the sample with a first antibody and determining the amount of mevalonic acid by measuring the amount of labeled antigen bound or not bound to the first antibody, or

(b) competitively reacting an antigen immobilized on a solid phase and the mevalonic acid in the sample with the first antibody and determining the amount of mevalonic acid by measuring the amount of the first antibody bound or not bound to the antigen,

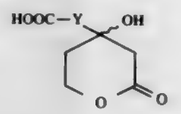
wherein the first antibody is an anti-mevalonic acid antibody which is obtained by using, as antigen, a conjugate of a protein selected from the group consisting of albumin, globulin, thyroglobulin, hemocyanin, edestin, and polylysine and a mevalonic acid derivative selected from the group consisting of the formula:



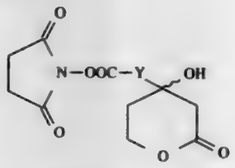
wherein Z is C_{2-6} alkylene,



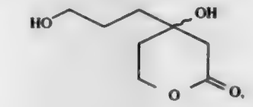
wherein Z is C_{2-6} alkylene,



wherein Y is C_{4-10} alkylene,

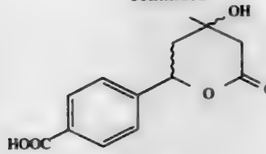


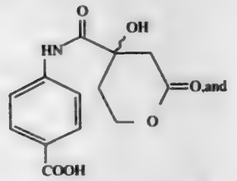
wherein Y is C_{4-10} alkylene.

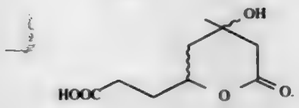


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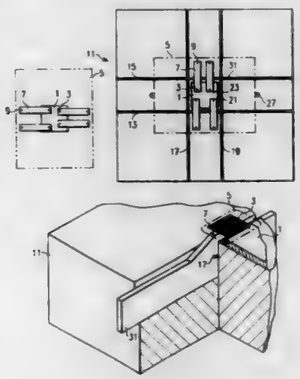


5,591,649

PROCESS OF REMOVING A TAPE AUTOMATED BONDED SEMICONDUCTOR FROM BONDED LEADS

Richard W. Arnold, Midland, and Lloyd W. Darnell, Denton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1995, Ser. No. 375,462
Int. Cl.[6] H01L 21/603;23/32;21/68
U.S. Cl. 437—8 24 Claims



1. A method of testing a semiconductor die by utilizing tab application and removal to the semiconductor die, comprising the steps of:

(a) providing a semiconductor die for testing having a plurality of die pads thereon;

(b) bonding a separate electrically conducting tab to each of said die pads;

(c) performing a test of the semiconductor die; and

(d) serially applying a force to said tabs that is sufficient to sever each of the bonds between the tabs and the die pads.

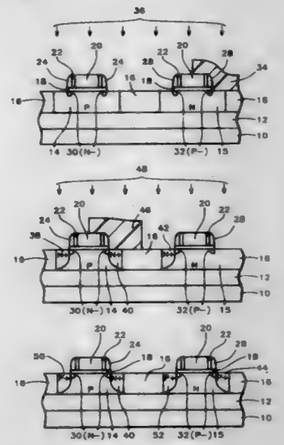
5,591,650

METHOD OF MAKING A BODY CONTACTED SOI MOSFET

(44) Ching-Hsiang Hsu, and Mong-Song Liang, both of Hsinchu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Jun. 8, 1995, Ser. No. 488,683
Int. Cl.[6] H01L 21/265;21/225;21/385
U.S. Cl. 437—21 23 Claims

(52)



(58)

1. The method of forming a silicon-on-insulator device having a p-channel body node and body node contact and an n-channel body node and body node contact comprising:

providing a first silicon oxide layer on the surface of a semiconductor substrate;

depositing a silicon layer over said first silicon oxide layer;

forming an n-channel active area and a p-channel active area within said silicon layer wherein said n-channel active area and said p-channel active area are isolated from one another by an isolation area;

forming a gate oxide layer over the surface of said silicon layer;

depositing a polysilicon layer overlying said gate oxide layer and patterning said polysilicon layer to form a gate electrode over each of said active areas wherein in each said active area, the portion of said active area directly underlying said gate electrode and extending downward to said first silicon oxide layer comprises said body node;

oxidizing said polysilicon layer to form a second silicon oxide layer over said gate electrodes;

forming first spacers on the sidewalls of said gate electrodes wherein said first spacers contain p-type impurities;

forming a first mask over said n-channel active area;

removing said first spacers on the sidewalls of said gate electrode in said p-channel area;

forming second spacers on the sidewalls of said gate electrode in said p-channel area wherein said second spacers contain n-type impurities;

removing said first mask;

driving in said impurities within said first and second spacers to form lightly doped areas underlying said first and second spacers within said n-channel and said p-channel active areas wherein said lightly doped areas do not extend all the way downward to said first silicon oxide layer;

forming a second mask over said p-channel active area except for a portion where said p-channel body node contact is to be formed;

implanting first ions into said active areas not covered by said second mask whereby first source and drain regions are formed in said n-channel active area and whereby said p-channel body node contact region is formed within said p-channel active area wherein said p-channel body node contact region contacts said p-channel body node;

forming a third mask over said n-channel active area except for a portion where said n-channel body node contact is to be formed and forming a third mask over said p-channel body node contact region;

implanting second ions into said active areas not covered by said third mask whereby second source and drain regions are formed in said p-channel active area and whereby said n-channel body node contact region is formed within said n-channel active area wherein said n-channel body node contact region contacts said n-channel body node; and

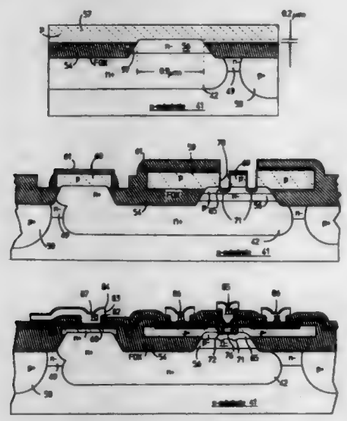
annealing said semiconductor substrate to complete formation of said silicon-on-insulator device having said body node contact in the manufacture of an integrated circuit.

5,591,651

METHOD OF MAKING A BIPOLAR STRIPE TRANSISTOR STRUCTURE

Yaw-Hwang Chen, Ft. Collins, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Division of Ser. No. 276,020, Jul. 15, 1994, Pat. No. 5,465,006.
This application Jul. 12, 1995, Ser. No. 501,757
Int. Cl.[6] H01L 21/265;21/302;21/304;21/76
U.S. Cl. 437—33 4 Claims



1. A method of manufacturing a transistor on a substrate comprising the steps of:

a) forming a collector on said substrate, said collector having a collector mesa region, a sub-collector channel region below said collector mesa region and a collector contact region adjacent to and isolated from said collector mesa region;

b) forming a base region in said collector mesa region;

c) forming a field oxide region having an upper surface and a lower surface on said sub-collector channel region, said field oxide region substantially surrounding said collector mesa region, said lower surface of said field oxide region being on said sub-collector channel region, said upper surface of said field oxide region extending above the junction between said collector mesa region and said base region;

d) forming an emitter region on said base region, said emitter region being smaller in diameter than said base region;

e) forming emitter isolation walls having an upper surface and a lower surface around said emitter region, said lower surface of said emitter isolation walls extending into said base region, said lower surface of said emitter isolation walls does not extend down into said base region far enough to intersect the plane of said upper surface of said field oxide region;

f) forming a base polysilicon layer, a collector polysilicon layer and an emitter polysilicon layer on said base region, said collector region and said emitter region, respectively, and

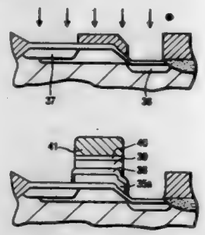
g) forming a base contact pad, a collector contact pad and an emitter contact pad on said base polysilicon layer, said collector polysilicon layer and said emitter polysilicon layer, respectively.

5,591,652

METHOD OF MANUFACTURING FLASH MEMORY WITH INCLINED CHANNEL REGION

Tadashi Matsushita, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 327,910, Oct. 24, 1994, Pat. No. 5,502,321.
This application May 30, 1995, Ser. No. 452,695
Claims priority, application Japan, Nov. 8, 1993, 5-278209
Int. Cl.[6] H01L 21/8247
U.S. Cl. 437—35 7 Claims



6. A method for forming a electrically erasable and programmable memory, the method comprising the steps of:

preparing a source region and a drain region in spaced-apart relation on a main surface of a semiconductor substrate;

providing a channel region between the source region and the drain region, at least a portion of the channel region being inclined so that the source region and the drain region are not vertically coextensive;

providing a gate insulating first film on the channel region;

forming a floating gate electrode on the gate insulating first film;

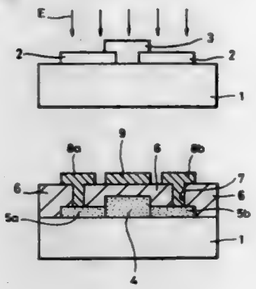
using the floating gate electrode as a mask for implanting impurity ions into at least one of the source region and the drain region.

5,591,653

METHOD OF MANUFACTURING SI-GE THIN FILM TRANSISTOR

Toshiyuki Sameshima; Masaki Hara; Naoki Sano; Dharam Pal Gosain, and Setsuo Usui, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 331,273, Oct. 28, 1994, which is a continuation of Ser. No. 36,285, Mar. 24, 1993, abandoned. This application May 15, 1995, Ser. No. 440,645
Claims priority, application Japan, Mar. 30, 1992, 4-074577
Int. Cl.[6] H01L 21/84
U.S. Cl. 437—40 5 Claims



1. A method for making a thin film transistor comprising the steps of:

providing a substrate having a surface;

depositing a p-doped Si layer on said surface;

patterning said p-doped Si layer to remove portions of said Si layer and to define a source region, a drain region and a channel region;

depositing a SiGe layer containing about 80 atomic % Ge by CVD using a mixed gas of SiH_4 and GeH_4 at a flow rate of $GeH_4/(GeH_4+SiH_4)$ of from about 0.3 to about 0.4;

patterning said SiGe layer and etching back so that only a portion of said SiGe layer remains in said channel region;

annealing said source, drain and channel regions by irradiation with an XeCl laser to crystallize the source, drain and channel regions;

depositing an insulation layer over said source, drain and channel regions;

patterning and etching the insulator layer to form a hole for said source and drain regions, respectively;

forming source and drain electrodes in the respective holes for said source and drain regions;

forming a gate electrode above said channel region by depositing a SiGe layer by CVD and patterning and etching the SiGe layer to provide said gate electrode, whereby a thin film transistor having a carrier mobility at 300° K of 1400 cm^2/Volt second or higher and a ratio of on-current to off-current from about 10^6 to about 10^7 is provided.

5,591,654

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND A RESIST COMPOSITION USED THEREIN

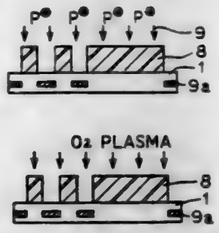
Shinji Kishimura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 128,287, Sep. 29, 1993. This application Oct. 13, 1994, Ser. No. 322,131

Claims priority, application Japan, Dec. 28, 1992, 4-348601

Int. Cl.[6] H01L *21/266*

U.S. Cl. 437—26 **15 Claims**



1. A method of manufacturing a semiconductor device for forming a buried impurity layer at a deep position of a semiconductor substrate, comprising the steps of:

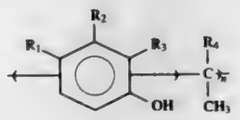
(a) preparing positive type resist solution containing

a phenol resin including at least 40 mole % of meta-cresol unit and having a weight-average molecular weight of at least 10000 in polystyrene conversion, and

a photosensitive agent having a quinone diazide portion,

wherein said quinone diazide portion is included by 0.40 mmol–0.55 mmol with respect to 1g of the whole resist solid,

wherein said photosensitive agent having a quinone diazide portion has a structural unit represented by the following formula



(wherein, in the formula, R_1, R_2, and R_3 represent OH, CH_3 or H and R_4 represents CH_3 or H), having a weight-average molecular weight of 500–2000 in polystyrene conversion,

wherein said hydroxyl group in said formula is partially or completely esterified by 1,2-naphthoquinone diazide-4-sulfonic acid or 1,2-naphthoquinone diazide-5-sulfonic acid,

(b) forming a resist film having a film thickness of at least 3 μm on said semiconductor substrate using said positive type resist solution,

(c) selectively exposing said resist film to form an image,

(d) baking said resist film at a temperature of 110° C.–130° C. after exposure and before developing,

(e) developing and then rinsing said resist film to form a resist pattern,

(f) baking said resist pattern at a temperature of 100° C.–130° C.,

(g) implanting impurity ions at high energy of 1 MeV or above to the main surface of said semiconductor substrate using said resist pattern as a mask to form a buried impurity layer at a deep position of said semiconductor substrate, and

(h) removing said resist pattern.

5,591,655

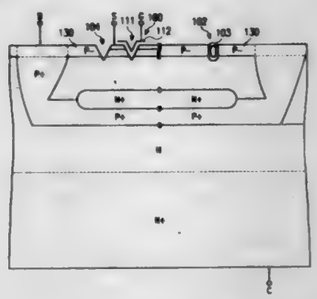
PROCESS FOR MANUFACTURING A VERTICAL SWITCHED-EMITTER STRUCTURE WITH IMPROVED LATERAL ISOLATION

Richard A. Blanchard, Los Altos, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Feb. 28, 1995, Ser. No. 397,710

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—31 **13 Claims**



1. A process for manufacturing a microelectronic structure which includes a vertical high-voltage bipolar power transistor, and which also includes a vertical low-voltage MOS power transistor structure extending to a front surface thereof, comprising the steps of:

a) on an N+ type substrate, growing a first high resistivity N-type epitaxial layer, to provide the collector of the bipolar transistor;

b) creating, near a first surface of said first epitaxial layer, a P+ region to provide a base of the bipolar transistor, and an N+ type region, which is shallower than said P+ region, to provide an emitter of the bipolar transistor;

c) growing at least one additional N-type epitaxial layer above said first epitaxial layer;

d) forming, on said additional epitaxial layer, a P-type epitaxial body region, and an N-type source region which is shallower than said body region, and a P+ sinker region which provides ohmic contact to said base region, and lateral dielectric isolation which laterally separates said sinker region from said body region, and additional recesses extending into said body region adjacent to said additional epitaxial layer; and

e) creating, in said recesses, an insulated gate electrode which is capacitively coupled to at least some portions of said body which are laterally adjacent to said source region.

5,591,656

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH SELF-ALIGNED SUPERHIGH SPEED BIPOLAR TRANSISTOR

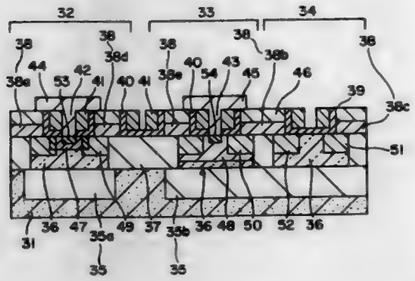
Shigeki Sawada, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Ltd., Osaka, Japan

Division of Ser. No. 384,694, Feb. 6, 1995, Pat. No. 5,504,368, which is a continuation of Ser. No. 936,117, Aug. 27, 1992, abandoned. This application May 30, 1995, Ser. No. 454,410

Claims priority, application Japan, Sep. 24, 1991, 3-243058

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—31 **2 Claims**



1. A method of fabricating a semiconductor integrated circuit device which has a bipolar transistor and an IIL device produced by using a self-aligned method comprising the steps of:

forming a semiconductor layer of a second conductive type on a semiconductor substrate of a first conductive type, wherein the semiconductor layer has at least a first and second semiconductor element region, said first semiconductor element region within said IIL device;

forming a first diffusion layer of the first conductive type in the first semiconductor element region on the semiconductor layer;

forming a first polycrystalline semiconductor film on the semiconductor substrate;

forming a first insulating film on the first polycrystalline semiconductor film;

introducing a first impurity of the first conductive type into the first polycrystalline semiconductor film;

forming a first opening by selectively etching and removing the first insulating film and first polycrystalline semiconductor film;

forming a second insulating film at least in the first opening;

forming a second diffusion layer of the first conductive type by introducing the first impurity into the semiconductor layer;

forming a second opening in the second insulating layer;

growing a second polycrystalline semiconductor film in the second opening;

introducing a second impurity of the first conductive type selectively into the second polycrystalline semiconductor film in the second semiconductor element region;

forming a third diffusion layer by introducing the second impurity into the semiconductor layer through the second opening;

introducing a third impurity of the second conductive type into the second polycrystalline semiconductor film;

and forming a fourth diffusion layer of the second conductive type by introducing the third impurity into the semiconductor layer through the second opening.

5,591,657

SEMICONDUCTOR APPARATUS MANUFACTURING METHOD EMPLOYING GATE SIDE WALL SELF-ALIGNING FOR MASKING

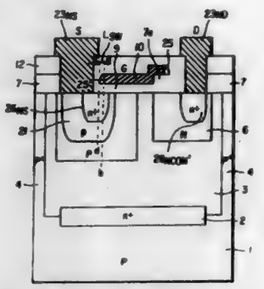
Naoto Fujishima; Yoshihito Nagayasu, and Akio Kitamura, all of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 26, 1994, Ser. No. 329,943

Claims priority, application Japan, Oct. 26, 1993, 5-266761; May 25, 1994, 6-110621

Int. Cl.[6] H01L *21/265;21/70;27/00*

U.S. Cl. 437—41 **24 Claims**



1. A manufacturing method for a semiconductor device, including a DMOS transistor with a channel of a first conduction type, comprising steps of:

forming a gate electrode-on gate insulation film deposited on a major face of a semiconductor region of the first conduction type located in a semiconductor substrate;

forming a base region of a second conduction type extending from said major face of said semiconductor region of the first conduction type and into said semiconductor region of the first conduction type by using said gate electrode as a mask for self-alignment; and

forming a source region of the first conduction type extending from a major face of said base region of the second conduction type and into said base region of the second conduction type, said step of forming a source region further comprising a step of self-aligning said source region of the first conduction type by using a side wall formed only on a side face of said gate electrode as a mask.

5,591,658

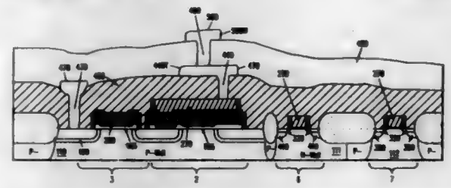
METHOD OF FABRICATING INTEGRATED CIRCUIT CHIP CONTAINING EEPROM AND CAPACITOR

Philip J. Cacharelis, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 298,239, Aug. 30, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,575

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **4 Claims**



1. A process of fabricating a memory transistor, said process comprising the steps of:

providing a semiconductor substrate;

forming a pair of source/drain regions at a surface of said substrate, said source/drain regions being separated by a channel region;

forming a gate oxide layer over said source/drain regions and said channel region;

etching said gate oxide layer to expose a portion of said surface of said substrate, said portion comprising a tunnel oxide region, said tunnel oxide region overlying one of said source/drain regions;

growing a tunnel oxide layer in said tunnel oxide region;

depositing a first conductive layer over said gate oxide layer and said tunnel oxide layer;

depositing an insulating layer over said first conductive layer;

forming a first mask over said insulating layer;

etching said insulating layer in areas thereof not covered by said first mask;

etching said first conductive layer to form a floating gate, said floating gate covering said tunnel oxide region and having a peripheral edge which surrounds said tunnel oxide region;

depositing a second conductive layer over said insulating layer;

forming a second mask over said second conductive layer; and

etching said second conductive layer in areas thereof not covered by said second mask to form a control gate, said control gate being sized and positioned such that a peripheral region of said floating gate extends laterally outward beyond said control gate along an entire length of said peripheral edge of said control gate.

5,591,659

PROCESS OF PRODUCING A SEMICONDUCTOR DEVICE IN WHICH A HEIGHT DIFFERENCE BETWEEN A MEMORY CELL AREA AND A PERIPHERAL AREA IS ELIMINATED

Taiji Ema, and Toshimi Ikeda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

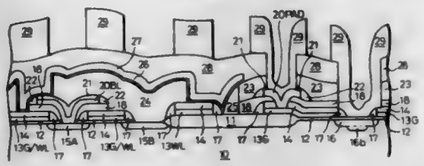
Continuation-in-part of Ser. No. 46,149, Apr. 15, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,261

Claims priority, application Japan, Apr. 16, 1992, 4-096726; Oct. 9, 1992, 4-271622; Aug. 29, 1994, 6-203663

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **10 Claims**

[STEP 11]



1. A process of producing a semiconductor device, said process comprising the steps of:

(A) forming a field oxide layer on a semiconductor substrate to define thereon a memory cell area in which a memory cell composed of a capacitor element is formed, and a peripheral circuit area in which a peripheral circuit for controlling said memory cell is formed;

(B) forming, on said semiconductor substrate including said memory cell area and said peripheral circuit area, a gate electrode in said peripheral circuit area and a word line conductor pattern in said memory cell area, said gate electrode and said word line conductor pattern having a top surface covered with a first protective layer;

(C) forming a pair of diffused regions in said semiconductor substrate by diffusing an impurity thereinto, using said word line conductor pattern, said gate electrode and said first protective layer covering said top surface as a mask;

(D) forming a second protective layer covering said surfaces of said word line conductor pattern and said gate electrode;

(E) forming a first insulating layer on said semiconductor substrate including said word line conductor pattern, said gate electrode and said diffused regions;

(F) selectively removing said first insulting layer by etching in the entire said memory cell area while leaving said first insulating layer unremoved in said peripheral circuit area and while leaving said word line conductor pattern unremoved together with said first protective layer and said second protective layer covering said top surface and said side surfaces of said word line conductor pattern and forming a first contact hole having a circumference defined by said second protective layer covering said side surfaces of said word line conductor pattern, said first contact hole exposing a counterpart of said pair of diffused regions in said memory cell area; and

(G) forming, in said memory cell area, a capacitor element composed of a storage electrode being connected therethrough to said counterpart of said diffused regions through said first contact hole, a counter electrode, and a dielectric layer effecting insulation and isolation between said storage electrode and said counter electrode.

5,591,660

METHOD OF SELECTIVELY MANUFACTURING A SOLID STATE IMAGING DEVICE HAVING EITHER A REGULAR OR MIRROR IMAGE OUTPUT

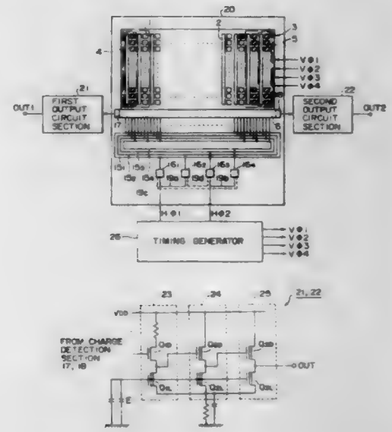
Kazuhide Fujikawa, and Eiji Komatsu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 20, 1994, Ser. No. 277,585

Claims priority, application Japan, Jul. 23, 1993, 5-202875

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—53 **6 Claims**



1. A process of manufacturing a solid state imaging device having either a regular image output or a mirror image output, comprising the steps of:

providing said solid state imaging device comprising an image section having a photoelectric transducer section in which a plurality of photoelectric transducer elements are linearly arranged, a horizontal charge transfer section connected to the image section, the horizontal charge transfer section further comprised of a plurality of transfer electrodes for horizontally transferring signal charge transferred thereto from said image section; and first and second charge detection sections provided at the opposite ends of said horizontal charge transfer section for detecting said signal charge horizontally transferred in said horizontal charge transfer section;

connecting groups of said plurality of transfer electrodes so that said signal charge is transferred to either the first charge detection section or the second charge detection section upon receiving a clock signal for driving said horizontal charge transfer section.

5,591,661

METHOD FOR FABRICATING DEVICES FOR ELECTROSTATIC DISCHARGE PROTECTION AND VOLTAGE REFERENCES, AND THE RESULTING STRUCTURES

Philip Shiota, 14270 Old Wood Rd., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 93,074, Aug. 20, 1993, Pat. No. 5,426,322, which is a division of Ser. No. 864,933, Apr. 7, 1992, Pat. No. 5,272,097. This application Dec. 29, 1994, Ser. No. 366,048

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—56 **38 Claims**



19. A method of fabricating a semiconductor structure comprising the steps of:

a) forming within a first bulk region of a first conductivity type, a lightly doped source/drain region of a second conductivity type opposite said first conductivity type;

b) forming within a second bulk region of said second conductivity type, a second conductivity type lightly doped portion of a first low breakdown voltage device;

c) forming within said second bulk region a lightly doped source/drain region of said first conductivity type;

d) forming within said first bulk region a first conductivity type lightly doped portion of a second low breakdown voltage device;

e) forming within said first bulk region a second conductivity type portion of said second low breakdown voltage device;

f) forming within said first bulk region a source/drain region of said second conductivity type;

g) forming within said second bulk region a second region of said first low breakdown voltage device, of said second conductivity type;

h) forming within said first bulk region a second region of said second low breakdown voltage device, of said first conductivity type;

i) forming within said second bulk region a source/drain region of said first conductivity type; and

j) forming within said second bulk region a first conductivity type portion of said first low breakdown voltage device,

wherein said first bulk region comprises a lightly doped source/drain MOS device and a diode having said second conductivity type region of said first low breakdown voltage device, formed within said first bulk region serving as a first terminal of said first low breakdown voltage device, and said first conductivity type region within said first bulk region serves as a second terminal of said diode, and

wherein said second bulk region comprises a lightly doped source/drain MOS device and a diode having said first conductivity type region of said second low breakdown voltage device, within said second bulk region serving as a first terminal of said diode and said second conductivity type region within said second bulk region serves as a second terminal of said diode.

5,591,662

METHOD OF MANUFACTURING A POWER INTEGRATED CIRCUIT (PIC) STRUCTURE

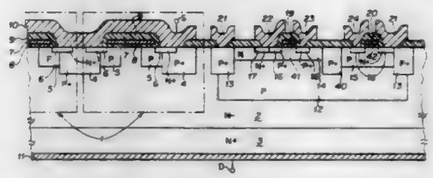
Raffaele Zambrano, San Giovanni La Punta, Italy, assignor to Consorizio Per La Ricerca Sulla Microelecttronica Nel Mezzogiorna, Catania, Italy

Division of Ser. No. 443,053, May 17, 1995. This application Jun. 7, 1995, Ser. No. 471,902

Claims priority, application European Pat. Off., May 19, 1994, 9483029

Int. Cl.[6] H01L *21/70*

U.S. Cl. 437—57 **14 Claims**



1. A process for manufacturing a PIC structure comprising a power stage and a driving and control circuit comprising first conductivity type-channel MOSFETs and second conductivity type-channel MOSFETs, the process comprising the steps of:

a) forming at least one buried region of a second conductivity type within a lightly doped semiconductor layer of a first conductivity type superimposed over a heavily doped semiconductor substrate of the first conductivity type constituting a first electrode of the power stage;

b) selectively introducing a dopant of the second conductivity type into the lightly doped semiconductor layer to form at least one well region of the second conductivity type;

c) selectively introducing a high dose of a dopant of the second conductivity type into the lightly doped semiconductor layer to simultaneously form heavily doped deep body regions for the power stage, at least one heavily doped annular region defining, with a respective buried region, a lightly doped isolated region of the first conductivity type isolated from the lightly doped semiconductor layer and containing at least one well region of the second conductivity type, and heavily doped regions at the sides of said at least one well region;

d) forming a gate oxide layer over the lightly doped semiconductor layer;

e) forming a polysilicon layer over the gate oxide layer;

f) selectively removing the polysilicon layer to form insulated gate regions for the MOSFETs of the driving and control circuit;

g) selectively introducing a dopant of the second conductivity type into the lightly doped semiconductor layer to form body regions of the second conductivity type for the power stage;

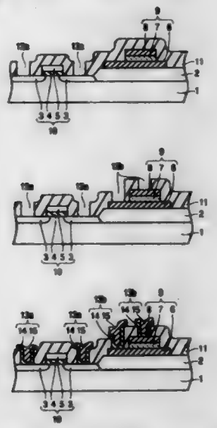
h) selectively introducing a high dose of a dopant of the first conductivity type into the body regions to form a heavily doped second electrode of the power stage, and into the well region, at the sides of the insulated gate regions, and the lightly doped isolated region to respectively form source and drain regions for the first conductivity type-channel MOSFETs of the driving and control circuitry, and to form a contact region to the lightly doped isolated region;

i) selectively introducing a high dose of a dopant of the second conductivity type into the lightly doped isolated region at the sides of the insulated gate regions to form heavily doped source and drain regions for the second conductivity type-channel MOSFETs of the driving and control circuitry.

5,591,663
METHOD OF MANUFACTURING FERROELECTRIC CAPACITOR WITH A HYDROGEN HEAT TREATMENT

Toru Nasu; Atsuo Inoue, both of Kyoto; Yoshihisa Nagano, Osaka; Akihiro Matsuda, Osaka, and Koji Arita, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 14, 1995, Ser. No. 388,582
Claims priority, application Japan, Feb. 15, 1994, 6-018284
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—60 11 Claims



1. A manufacturing method of a semiconductor device comprising the steps of:

(a) forming a ferroelectric capacitor made of a lower electrode, a ferroelectric film and an upper electrode, on a semiconductor substrate on which an integrated circuit having a diffusion layer is formed;

(b) forming an interlayer insulating film which covers said integrated circuit and said ferroelectric capacitor;

(c) forming a first contact hole which reaches said diffusion layer, on said interlayer insulating film;

(d) after forming said first contact hole, providing a heat treatment in hydrogen atmosphere;

(e) after providing said heat treatment, forming second contact holes which reach said lower and upper electrodes, on said interlayer insulating film;

(f) forming metal interconnection which reach said diffusion layer, said lower and upper electrodes, through said first and second contact holes.

5,591,664
METHOD OF INCREASING THE CAPACITANCE AREA IN DRAM STACKED CAPACITORS USING A SIMPLIFIED PROCESS

Chen-Jong Wang, and Jin-Yuan Lee, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Mar. 20, 1996, Ser. No. 618,618
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—60 23 Claims

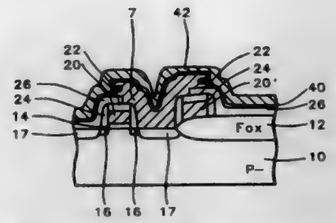
1. A method for fabricating a dynamic random access memory device having stacked storage capacitors, comprising the steps of:

providing a semiconductor substrate having field oxide areas in and on said substrate surface surrounding and electrically isolating device areas for field effect transistors;

forming a gate oxide on said device areas;

depositing a first polysilicon layer on said device areas and elsewhere on said field oxide areas;

depositing a first insulating layer on said first polysilicon layer; and



patterning said first insulating layer and said first polysilicon layer, and thereby forming gate electrodes over said device areas and word lines elsewhere over said field oxide areas;

doping by ion implantation said device areas adjacent to said gate electrodes, and thereby forming lightly doped source/drain regions;

blanket depositing and anisotropically etching back a sidewall spacer insulating layer, and thereby forming sidewall spacers on said gate electrodes;

doping by ion implantation said device areas adjacent to said sidewall spacers forming source/drain contact areas, and thereby completing said field effect transistors;

depositing a second insulating layer over said device areas and field oxide areas and then forming said stacked storage capacitors by,

etching contact openings in said second insulating layer to one source/drain contact area of each of said field effect transistors,

depositing a second undoped polysilicon layer, a third doped polysilicon layer, and a fourth undoped polysilicon layer on said second insulating layer and in said contact openings, wherein all said depositions are carried out consecutively in the same deposition tool by adding a dopant gas to the deposition gas during said third polysilicon layer deposition;

patterning by photoresist masking and anisotropic plasma etching said second, third, and fourth polysilicon layers leaving portions over the planned capacitor areas that include said contact openings, and

removing selectively by isotropic plasma etching and thereby recessing said third doped polysilicon layer under said patterned fourth polysilicon layer and thereby forming bottom electrodes for said stacked storage capacitors,

doping remaining portions of said bottom electrodes,

forming a conformal capacitor dielectric layer over said bottom electrodes,

depositing a fifth polysilicon layer over said bottom electrodes having said dielectric layer,

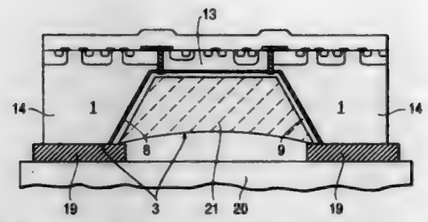
patterning said fifth polysilicon layer to complete said stacked storage capacitors.

5,591,665
PROCESS FOR PRODUCING A SEMICONDUCTOR STRUCTURE INCLUDING A PLURALITY OF VERTICAL SEMICONDUCTOR DEVICES AND AT LEAST ONE LATERAL SEMICONDUCTOR DEVICE INTEGRATED IN A SEMICONDUCTOR BODY

Alexander Bodenseiin, Hainburg, and Heinz Henkel, Obertshausen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

PCT No. PCT/EP93/00319, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO93/17459, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 10, 1993, Ser. No. 284,558
Claims priority, application Germany, Feb. 12, 1992, 42 04 004.3
Int. Cl.[6] H01L 21/302
U.S. Cl. 437—61 12 Claims

1. A method for producing a semiconductor structure having a plurality of vertical semiconductor devices and at least one lateral semiconductor device integrated in a semiconductor body, the



semiconductor body having a first surface and a second surface located opposite the first surface, the second surface having a crystal structure along a <100> plane, the vertical semiconductor devices extending between the first and second surfaces and the at least one lateral semiconductor device being disposed beneath the first surface, the method comprising the steps of:

a) forming at least one partial structure having the at least one lateral semiconductor device;

b) forming a plurality of doped regions on the first surface of the semiconductor body outside of the partial structure;

c) forming a plurality of partial regions embedded in the plurality of doped regions;

d) surrounding the partial structure with an electrically-insulating wall extending to a first predetermined depth into the semiconductor body from the first surface;

e) reducing a thickness of the semiconductor body to form a recess in the second surface in a region of the partial structure up to at least the electrically-insulating wall at the first predetermined depth from the first surface by etching the second surface using a KOH solution as an etching solution so that walls of the recess lie in a <111> plane of the semiconductor body;

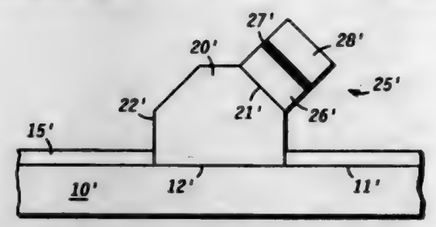
f) applying an insulating layer to a bottom of the recess; and

g) applying at least one of a metalization layer and passivation layer to the first and second surfaces for forming the at least one lateral semiconductor component and the vertical semiconductor components.

5,591,666
SEMICONDUCTOR DEVICE AND METHOD OF FABRICATION

Kumar Shiralagi, Chandler; Raymond K. Tsui, Phoenix, and Herbert Goronkin, Tempe, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Aug. 7, 1995, Ser. No. 511,776
Int. Cl.[6] H01L 21/20
U.S. Cl. 437—103 20 Claims



1. A method of fabricating semiconductor devices comprising the steps of:

providing a substrate with a planar surface;

defining an area on the surface of the substrate;

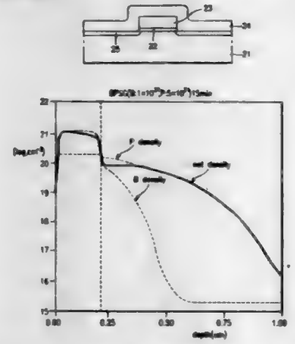
selectively growing, on the area, a crystalline material with at least one defined crystallographic facet, the crystalline material being selected and grown so that the crystallographic facet is positioned at an angle other than zero to the substrate; and

selectively growing a semiconductor device on the crystallographic facet.

5,591,667
METHOD FOR FABRICATING MOS TRANSISTOR UTILIZING DOPED DISPOSABLE LAYER

Jeong S. Byun, and Sang J. Choi, both of Chungcheongnam-do, Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Continuation of Ser. No. 208,348, Mar. 9, 1994, abandoned.
This application May 22, 1995, Ser. No. 445,580
Claims priority, application Rep. of Korea, Feb. 4, 1994, 2105/1994
Int. Cl.[6] H01L 21/225
U.S. Cl. 437—164 12 Claims



1. A method for fabricating an MOS transistor, comprising the steps of:

forming a gate insulating layer on a substrate of a first conductivity-type;

forming a gate on the gate insulating layer;

forming a disposable layer over an entire surface of the substrate and the gate, the disposable layer having a first conductivity-type impurity and a second conductivity-type impurity of a higher concentration than that of the first conductivity-type impurity; and

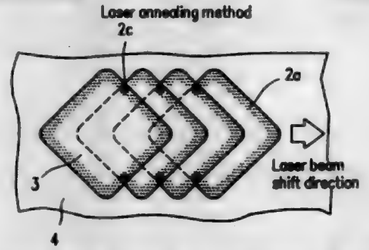
forming a source and drain area of the second conductivity-type impurity on the substrate by diffusing the second conductivity-type impurity of the disposable layer into the substrate by means of an annealing process;

wherein the disposable layer includes a BPSG layer.

5,591,668
LASER ANNEALING METHOD FOR A SEMICONDUCTOR THIN FILM

Shigeki Maegawa, Moriguchi; Tetsuya Kawamura; Mamoru Furuta, both of Hirakata, and Yutaka Miyata, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 13, 1995, Ser. No. 402,476
Claims priority, application Japan, Mar. 14, 1994, 6-042592
Int. Cl.[6] H01L 21/268
U.S. Cl. 437—174 13 Claims



1. A laser annealing method for a semiconductor thin film, for irradiating the semiconductor thin film with a laser beam having a

section whose outline consists of a plurality of straight-line portions which form sides of a square or a rectangle, so as to change the crystallinity of the semiconductor thin film,

wherein the semiconductor thin film is overlap-irradiated with the laser beam while the laser beam is shifted in a direction different from all directions along the plurality of straight-line portions.

5,591,669

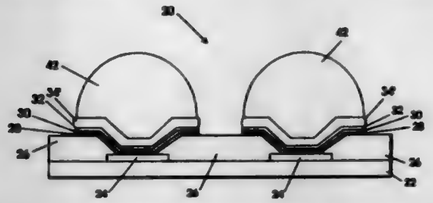
TRANSGENIC MICE DEPLETED IN A MATURE LYMPHOCYTIC CELL-TYPE

Paulus J. A. Krimpenfort, Amsterdam, and Antonius J. M. Berns, Spaarndam, both of Netherlands, assignors to GenPharm International, Inc., Palo Alto, Calif.

Continuation of Ser. No. 919,936, Jul. 27, 1992, Pat. No. 5,434,340, which is a continuation of Ser. No. 280,218, Dec. 5, 1988, Pat. No. 5,175,384. This application May 30, 1995, Ser. No. 454,834

Int. Cl.[6] C12N *15/00*

U.S. Cl. 800—2 **5 Claims**



1. A transgenic mouse having a phenotype characterized by a disruption of the expression of the Cμ and Cδ portions of the endogenous immunoglobulin heavy chain and an absence of plasma B cells producing naturally occurring mouse antibodies, the phenotype being conferred by an immunoglobulin heavy chain targeting transgene introduced into an ES target cell and integrated into somatic and germ cells of the tranegenic mouse or an ancestor thereof by homologous recombination with a cognate endogenous immunoglobulin heavy chain allele to yield a targeted immunoglobulin heavy chain allele which is not expressed, the immunoglobulin heavy chain targeting transgene comprising a stop codon, DNA sequences for identification and selection of ES cells containing the transgene in the targeted allele and DNA sequences of a mouse heavy chain immunoglobulin gene having sufficient sequence homology to recombine with the endogenous allele in said ES target cell.

5,591,670

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING SELF ALIGNED CONTACT HOLE

Won-mo Park, Seoul; Jung-hyun Shin, and Young-hun Park, both of Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 289,475, Mar. 14, 1994, Pat. No. 5,502,336. This application Jun. 5, 1995, Ser. No. 465,103

Claims priority, application Rep. of Korea, Mar. 13, 1993, 93-3842

Int. Cl.[6] H01L *21/44*

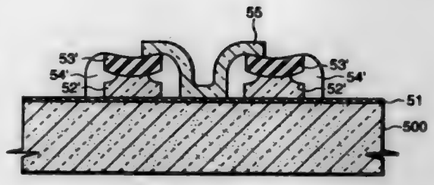
U.S. Cl. 437—187 **5 Claims**

1. A method for forming a semiconductor device comprising the steps of:

sequentially forming a first insulating film, a first conductive film and a second insulating film on a semiconductor substrate;

forming a second insulating film pattern by partially etching said second insulating film;

oxidizing said first conductive film to form an oxide film, using said second insulating film pattern as a mask;



removing said oxide film formed on said first conductive film using a wet etching process;

forming a first conductive film pattern having a chamfer-shaped upper edge, by etching portions of said first conductive film remaining on said first insulating film, using said second insulating film pattern as a mask;

forming a third insulating film on said semiconductor substrate;

forming a contact hole and a spacer on the sides of said second insulating film pattern and said conductive film pattern, by partially etching said third insulating film and said first insulating film; and

forming a second conductive film pattern buried in said contact hole.

5,591,671

METHOD FOR INTERCONNECTING LAYERS IN SEMICONDUCTOR DEVICE

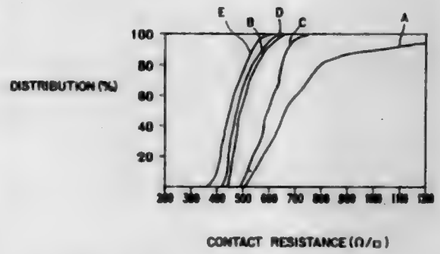
Young-sun Kim, Seoul, and Young-wook Park, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 18, 1995, Ser. No. 374,412

Claims priority, application Rep. of Korea, Jan. 18, 1994, 94-876

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—190 **12 Claims**



1. A method for interconnecting layers in a semiconductor device comprising the steps of:

forming a conductive layer on a semiconductor layer;

forming an insulating layer on said conductive layer;

forming an opening through said insulating layer, thereby exposing a portion of said conductive layer, said opening having an interior;

forming an ohmic contacting layer in the interior of said opening on said portion of said conductive layer and on said insulating layer leaving a first remainder of said opening partly unfilled;

forming a barrier layer on said ohmic contacting layer, thereby partly filling said first remainder of said opening, and thereby creating a resultant structure;

forming a refractory metal layer by completely filling said first remainder of said opening by depositing the refractory metal on said resultant structure; and

heat-treating said resultant structure at a temperature of 500° C. to 550° C. after forming said refractory metal layer so that oxidation of said ohmic contacting layer and said barrier layer is prevented.

5,591,672

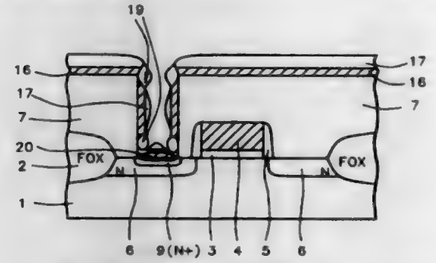
ANNEALING OF TITANIUM - TITANIUM NITRIDE IN CONTACT HOLE

Ching-Ying Lee, Hsin Chu; Shaw-Tzeng Hsia, Taipei, and Haw Yen, Hsin-chu, all of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-chu, Taiwan

Filed Oct. 27, 1995, Ser. No. 549,263

Int. Cl.[6] H01L *21/30*

U.S. Cl. 437—190 **26 Claims**



1. A method for fabricating a MOSFET device on a semiconductor substrate, using a contact hole, lined with an adhesive and barrier layers and filled with a metal, to provide electrical contact between an active device region in said semiconductor substrate, and an overlying metal interconnect structure, comprising the steps of:

providing device elements on said semiconductor substrate;

deposition of a dielectric layer on said semiconductor substrate, including deposition on said device elements;

photolithographic processing to open a region in photoresist, exposing said dielectric layer, directly over a specific region of said device element;

anisotropic etching of said dielectric layer, in opened region of said photoresist, to create a contact hole to said specific region of said device element;

ion implanting a first conductivity imparting dopant into said specific region of said device element, to create said active device region;

surface cleaning of said active device region;

deposition of an adhesive layer on said dielectric layer, on sides of said contact hole, and on surface of said active device region;

deposition of a barrier comprising a metal nitride layer on said adhesive layer;

after the deposition of the barrier layer, rapid thermal annealing in a nitrogen containing ambient thereby nitriding a portion of the adhesive layer;

deposition of said metal, on said barrier layer, completely filling said contact hole;

etchback of said metal to form a metal plug in said contact hole;

deposition of an interconnect metallization layer; and

patterning of said interconnect metallization layer to form said metal interconnect structure.

5,591,673

TUNGSTEN STUD PROCESS FOR STACKED VIA APPLICATIONS

Ying-Chen Chao; Chih-Heng Shen, and Yi-Doug Yan, all of Hsin-chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

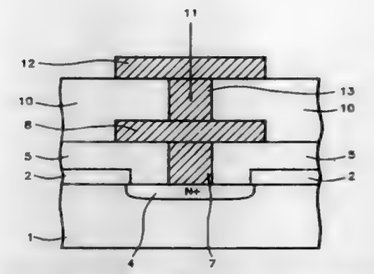
Filed Jul. 5, 1995, Ser. No. 498,356

Int. Cl.[6] H01L *21/283;21/302*

U.S. Cl. 437—192 **26 Claims**

12. A method for forming a stacked via structure, on a semiconductor substrate, consisting of planar metal interconnect structures, and planar metal via hole fills, with said planar metal via hole fills accomplished via direct deposition of tungsten on underlying silicon elements, comprising the steps of:

providing silicon elements, in said semiconductor substrate;



depositing a first silicon oxide layer, on said semiconductor substrate, and on said silicon elements;

opening a first via hole, in said first silicon oxide layer, to expose said silicon elements;

depositing a first tungsten layer, on said first silicon oxide layer, and directly on said silicon elements, in said first via hole, via use of LPCVD procedures, at a temperature between about 350° to 500° C.;

removing said tungsten layer from surface of first silicon oxide layer, to create a first tungsten stud, in said first via hole;

recessing said first tungsten stud, in said first via hole, to a level between about 1000 to 1500 Angstroms below the top surface of said first oxide layer;

removing between about 1000 to 2000 Angstroms of top portion of first silicon oxide layer;

depositing a first interconnect metallization layer, on said first oxide layer, and on said first tungsten stud, in said first via hole;

patterning said first interconnect metallization layer, to create a first interconnect metal structure;

depositing a second silicon oxide layer, on said first interconnect metal structure, and on said first silicon oxide layer, not covered by said first interconnect metal structure;

opening a second via hole, in said second silicon oxide layer, directly over said first via hole, to expose said first interconnect metal structure;

depositing a second tungsten layer, on said second silicon oxide layer, and on said first interconnect metal structure, in said second via hole;

removing said second tungsten layer from surface of second silicon oxide layer, to create a second tungsten stud, in said second via hole;

recessing said second tungsten stud, in said second via hole;

removing a top portion of said second silicon oxide layer;

depositing a second interconnect metallization layer, on said second silicon oxide layer, and on said second tungsten stud, in said second via hole; and

patterning said second interconnect metallization layer to create second interconnect metal structure.

5,591,674

INTEGRATED CIRCUIT WITH SILICON CONTACT TO SILICIDE

Kuo-Hua Lee, Lower Macungie Township, and Chen-Hua D. Yu, Allentown, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 30, 1991, Ser. No. 814,952

Int. Cl.[6] H01L *21/265;21/283*

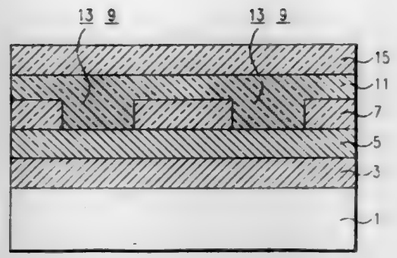
U.S. Cl. 437—193 **8 Claims**

1. A method of integrated circuit manufacturing comprising the steps of:

forming a layer of a metallic silicide;

depositing a layer of α:Si on said metallic silicide at a temperature less than the recrystallization temperature; and

increasing the conductivity of at least selected portions of said α:Si by ion implanting a species having the peak of its spatial distribution spaced from the α:Si-silicide interface and the α:Si surface.



5,591,675

INTERCONNECTING METHOD FOR SEMICONDUCTOR DEVICE

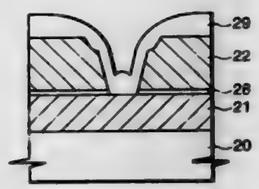
Jae-woo Kim, Suwon; Joon Kim, Seoul, and Jin-hong Kim, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 22, 1994, Ser. No. 361,835

Claims priority, application Rep. of Korea, Dec. 22, 1993, 93-29052

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—195 **4 Claims**



1. An interconnecting method for a semiconductor device comprising the steps of:

forming a first conductive layer containing aluminum on a lower structure;

forming an insulating layer on said conductive layer;

forming a photoresist pattern on said insulating layer which exposes said insulating layer on a portion where an opening is to be formed;

isotropically etching part of said insulating layer by wet etching, using said photoresist pattern as an etching mask;

anisotropically etching the remainder of said isotropically etched insulating layer by reactive ion etching using O_2 and CHF_3 as etching gases such that the diameter of said opening tapers downward;

over-etching the resulting structure using O_2 and CF_4 as etching gases to ensure complete exposure of said conductive layer by said opening;

RIE-sputtering the resulting structure using O_2 and CHF_3 as etching gases to remove a polymer and a non-volatile by-product and said photoresist pattern.

5,591,676

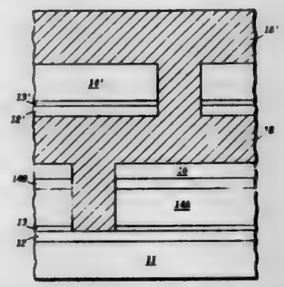
METHOD OF MAKING A SEMICONDUCTOR DEVICE HAVING A LOW PERMITTIVITY DIELECTRIC

Henry G. Hughes; Ping-Chang Lee, and Frederick J. Robinson, all of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 191,736, Feb. 4, 1994, Pat. No. 5,442,237, which is a continuation of Ser. No. 779,663, Oct. 21, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 405,056

Int. Cl.[6] H01L *21/3105*

U.S. Cl. 437—195 **7 Claims**



1. A method for making a semiconductor device comprising the teps of: providing a semiconductor substrate having electronic devices formed therein; forming a layer of fluorinated polymer on the substrate by applying a first fluorinated polymer layer, drying the first fluorinated polymer at a temperature less than 300° C. and applying an amorphous fluorinated polymer on top of the first fluorinated polymer layer; and sintering the substrate at a temperature in the range of 400°–500° C., such that crystallinity of said first fluorinated polymer layer is avoided.

5,591,677

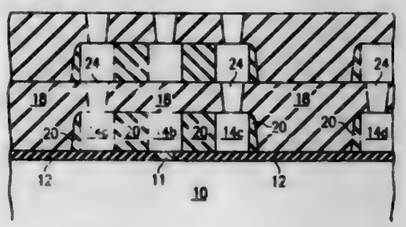
PLANARIZEED MULTI-LEVEL INTERCONNECT SCHEME WITH EMBEDDED LOW-DIELECTRIC CONSTANT INSULATORS

Shin-Puu Jeng, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 202,857, Feb. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 430,095, Apr. 26, 1995, Pat. No. 5,486,493, which is a continuation of Ser. No. 202,857, Feb. 25, 1994, abandoned. This application May 31, 1995, Ser. No. 455,765

Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—195 **16 Claims**



1. A method for forming an interconnect structure on a semiconductor body, comprising the steps of:

a. forming a plurality of spaced interconnect lines on said semiconductor body;

b. filling the space between all adjacent interconnect lines, having a distance therebetween no greater than a given distance, with an insulating material having a dielectric constant lower than the dielectric constant of silicon dioxide and greater than or equal to one, and leaving a sidewall spacer in at least partially open field area between adjacent interconnect lines, having a distance therebetween greater than said given distance; and

c. depositing a first layer of silicon dioxide over said interconnect lines, said open field area and said insulating material.

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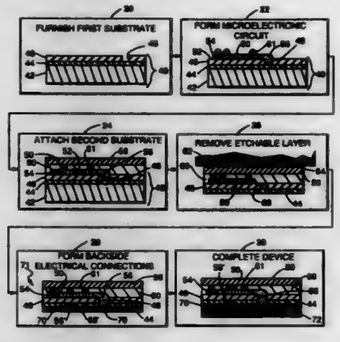
PROCESS OF MANUFACTURING A MICROELECTRIC DEVICE USING A REMOVABLE SUPPORT SUBSTRATE AND ETCH-STOP

Joseph J. Bendik, Carlsbad; Gerard T. Malloy, Oceanside, and Ronald M. Finnila, Carlsbad, all of Calif., assignors to HE Holdings, Inc., Los Angeles, Calif.

Continuation of Ser. No. 6,120, Jan. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 482,172

Int. Cl.[6] H01L *21/283;21/56;21/58;21/60*

U.S. Cl. 437—208 **18 Claims**



1. A method of fabricating a microelectronic device, comprising the steps of:

furnishing a first substrate having an etchable layer, an etch-stop layer overlying the etchable layer, and a wafer overlying the etch-stop layer;

forming a microelectronic circuit element in the exposed side of the wafer of the first substrate opposite to the side overlying the etch-stop layer;

attaching the wafer of the first substrate to a second substrate; and

etching away the etchable layer of the first substrate down to the etch-stop layer.

5,591,679

SEALED CAVITY ARRANGEMENT METHOD

Henrik Jakobsen, and Terje Kvisterøy, both of Horten, Norway, assignors to Sensonor A/S, Horten, Norway

Division of Ser. No. 421,665, Apr. 12, 1995. This application Jan. 30, 1996, Ser. No. 593,848

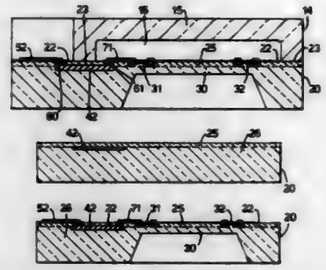
Int. Cl.[6] H01L *21/77;21/78*

U.S. Cl. 437—228 **18 Claims**

1. A method for providing a sealed cavity means coactively with the surface of a silicon wafer forming a substrate and with electrically insulated conductor means across a sealing area formed between a lid means defining part of said cavity means and said wafer surface to connect functional device means inside said cavity means to electrical terminals outside said cavity means, comprising:

a) providing an N type single silicon crystal substrate,

b) carrying out a photomask step in which buried conductors are formed by ion to implantation of boron, using a photoresist on top of said substrate as a mask layer, followed by a drive-in diffusion step, in order to provide surface doping of insulated P-type areas for said conductors and without any steps in the substrate surface at the location of PN junctions thus provided,



c) growing an epitaxial N type layer on top of said buried conductors and said top of said substrate adjacent said conductors to provide for said conductors being buried into single crystal silicon to be protected from surface effects,

d) forming P type contacts extending from the top level of said epitaxial layer down to each end of said buffed P type conductors by a photomasking and doping step,

e) providing a passivation layer on top of said epitaxial layer and and said contacts,

f) providing said functional device means and electrically connecting said functional device means to said contacts,

g) providing said lid means over said functional device means and part of said wafer surface, thereby positioning at least part of a rim of said lid means to lie above said buried conductors,

h) positioning said silicon wafer substrate and said lid means in a mutually aligned state on heating means,

i) applying an electric field between said wafer substrate and said lid means,

j) heating the combined wafer substrate and lid means structure to an elevated temperature to cause positive ions in said lid means to be mobile and drift under the influence of said electric field towards interface at said wafer substrate to create an electrostatic force which pulls said wafer substrate and said lid means together to atomic level intimate contact, and

k) cooling said combined structure to immobilize said ions to maintain at least part of said electrostatic force and bond said wafer substrate and said lid means together, and removing said applied electric field.

5,591,680

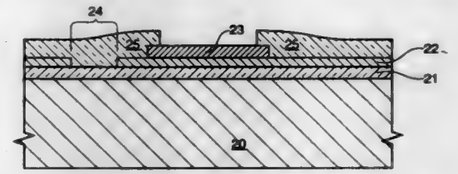
FORMATION METHODS OF OPAQUE OR TRANSLUCENT FILMS

Mark E. Tuttle, Boise, and Rickie C. Lake, Eagle, both of Id., assignors to Micron Communications, Boise, Id.

Division of Ser. No. 164,161, Dec. 6, 1993, abandoned. This application Aug. 22, 1994, Ser. No. 294,126

Int. Cl.[6] H01L *21/316;* **C23C** *14/10;* **G02F** *1/1333*

U.S. Cl. 437—238 **7 Claims**



1. In a process of semiconductor fabrication, forming an opaque film, the forming of said opaque film comprising the steps of:

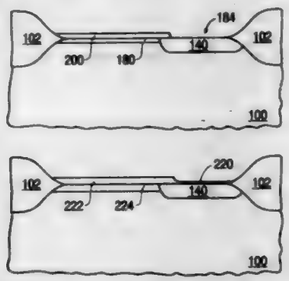
forming an insulating layer from a co-sputtering of SiN and SiO_2; and simultaneously introducing a light blocking pigment into said insulating layer.

5,591,681

METHOD FOR ACHIEVING A HIGHLY RELIABLE OXIDE FILM

Dirk J. Wristers; Dim-Lee Kwong, and H. Jim Fulford, Jr., all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 3, 1994, Ser. No. 253,771
Int. Cl.[6] H01L *21/3115*
U.S. Cl. 437—240 **32 Claims**



21. In an integrated circuit fabrication process suitable for EEPROM devices, a method of forming a high-quality tunnel oxide upon a surface region of a semiconductor body over a heavily-doped N+ type layer therein, comprising the steps of:

forming a N+ type layer in the semiconductor body;

oxidizing the semiconductor body a first time, under an oxidizing ambient, subsequent to the N+ type layer forming step, to form an oxide upon a surface region of the semiconductor body over the heavily-doped N+ type layer;

annealing the semiconductor body a first time, under a gettering ambient, subsequent to the first oxidizing step, to densify the oxide and to dope the oxide at its surface and for a portion thereinto adjacent the surface with a gettering agent;

oxidizing the semiconductor body a second time, under an oxidizing ambient, subsequent to the first annealing step, to thicken the oxide; and

annealing the semiconductor body for a second time, under an ambient consisting essentially of NO, subsequent to the second oxidizing step, thereby further thickening the oxide and forming a surface layer therein containing a concentration of nitrogen.

5,591,682

LOW EXPANSION TRANSPARENT GLASS-CERAMIC

Naoyuki Goto, Sagamihara, Japan, assignor to Kabushiki Kaisya Ohara, Japan

Filed Jun. 2, 1995, Ser. No. 458,345
Claims priority, application Japan, Sep. 13, 1994, 6-244683; Oct. 26, 1994, 6-285920
Int. Cl.[6] C03C *10/14*
U.S. Cl. 501—4 **4 Claims**

1. A low expansion transparent glass-ceramic formed by subjecting to heat treatment a glass consisting in weight percent of:

SiO_2+P_2O_5 55–70%
in which SiO_2 50–62%
P_2O_5 6–10%
Al_2O_3 22–26%
Li_2O 3–5%
MgO 0.6–2%
ZnO 0.5–2%
CaO 0.3–4%
BaO 0.5–4%
TiO_2 1–4%
ZrO_2 1–4%
As_2O_3 0–2%

wherein the ratio in weight of P_2O_5 to SiO_2 is between 0.08 and 0.02, said glass-ceramic containing β-quartz solid solution as a main crystalline phase, said glass-ceramic having a coefficient of thermal expansion of 0±5×10^{-7}/°C. within a temperature range of from –60° C. to +160° C., and a maximal variation of Δ1/1 curve (variation in relative length) of 10ppm or less.

5,591,683

PHASE-SEPARATED, NON-CRYSTALLINE OPAL GLASSES

John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 28, 1995, Ser. No. 563,877
Int. Cl.[6] C03C *1/04;3/118;3/087*
U.S. Cl. 501—32 **4 Claims**

1. A spontaneous, non-crystalline opal glass exhibiting a very dense, milky-white appearance, a softening point in excess of 700° C., a coefficient of thermal expansion (25°–300° C.) between about 65–85×10^{-7}/°C., a density of at least 2.4 g/cm^3, an opal liquidus no higher than 1200° C., and excellent resistance to weathering and attack by alkaline detergents consisting essentially, expressed in terms of weight percent on the oxide basis as calculated from the batch, of 1.9–3.6% K_2O, 4.2–7.3% Na_2O, 0.2–3.0% Li_2O, 0–1.2% MgO, 0–4.9% CaO, 0–12.5% BaO, 0–0.1% NiO, 0–4% ZnO 5.3–9.6% B_2O_3, 8.8–13.5% Al_2O_3, 57.2–64.4% SiO_2, 1–6% P_2O_5, and 1.0–2.2% F.

5,591,684

GLASS BUBBLES FOR USE AS FILLERS IN PRINTED CIRCUIT BOARD

Shinji Kawachi; Yoshifumi Sato, and Yasuhiro Nishimura, all of Shiga-ken, Japan, assignors to Nippon Electric Glass Co., Ltd., Otsu, Japan

Filed Oct. 3, 1994, Ser. No. 316,725
Int. Cl.[6] C03C *12/00*
U.S. Cl. 501—33 **11 Claims**

1. Glass bubbles for use in fillers for plastic resin articles and made by heating bubble-forming powders of a composition containing SO_3, said glass bubbles consisting essentially of, by weight, SiO_2 40.0–60.0%, Al_2O_3 5.0–22.0%, B_2O_3 1.0–15.0%, CaO 10.0–30.0%, BaO 0–15.0%, MgO 0–10.0%, ZnO 0–10.0%, SrO 0–10.0%, Na_2O+K_2O+Li_2O 0–1.9%, As_2O_3+Sb_2O_3 0–1.5%, V_2O_5 0–10.0%, TiO_2 0–10.0%, and SO_3 0.05–1.7%.

5,591,685

SUPERPLASTIC SILICON CARBIDE SINTERED BODY

Mamoru Mitomo, Ushiku; Hideki Hirotsuru, Tokyo, both of Japan, and Youngwook Kim, Seoul, Rep. of Korea, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Filed Oct. 4, 1995, Ser. No. 539,337
Claims priority, application Japan, Mar. 3, 1995, 7-070609
Int. Cl.[6] C04B *35/569*
U.S. Cl. 501—88 **16 Claims**



1. A superplastic silicon carbide sintered body which comprises at least 85 wt % and at most 98 wt % of silicon carbide grains and more than 2 wt % and less than 15 wt % of a grain boundary phase

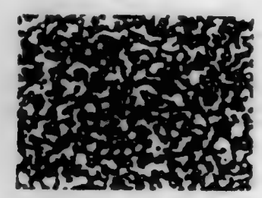
and which has a relative density of at least 95%, wherein the silicon carbide grains have an average grain size of at most 0.3 μm, the amount of grains having grain sizes exceeding 0.5 μm is at most 3 wt %, and the deformation rate of the sintered body is at least 10^{-4}/sec under a compression or tensile stress of from 50 to 2,000 kg/cm^2 within a temperature range of from 1,600 to 1,800° C.

5,591,686

GOLDEN-COLORED SINTERED PRODUCT AND METHOD OF PREPARING THE SAME

Hiroshi Hamashima, Sendai, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 191,939, Feb. 4, 1994, abandoned. This application Aug. 16, 1995, Ser. No. 516,014
Claims priority, application Japan, Feb. 5, 1993, 5-018656
Int. Cl.[6] C04B *35/58*
U.S. Cl. 501—96 **4 Claims**



1. A golden-colored sintered product having, as constituent elements, at least titanium, nitride and boron, and comprising 67 to 78% by weight of titanium, 6 to 15% by weight of nitrogen and 6.5 to 21.0% by weight of boron, the sintered product having a carbon content not greater than 3% by weight, titanium nitride and titanium boride are present as crystal phases in the sintered product, and crystal grains of the titanium nitride are linked to give the appearance of a chain, further comprising at least one of the metal elements of the Groups 4b, 5b and 6b of the periodic table in an amount not greater than 10% by weight, wherein the metal elements comprise Ta and Mo, and the sum of Ta and Mo is between 0.5 and 9.5% by weight.

5,591,687

SILICON NITRIDE BASED SINTERED PRODUCT

Hideki Kita; Wenjea J. Tseng, and Toshiyuki Yamada, all of Kanagawa, Japan, assignors to Isuzu Ceramics Research Insitute Co., Ltd., Japan

Filed Feb. 7, 1995, Ser. No. 384,981
Claims priority, application Japan, Feb. 7, 1994, 6-033288; Aug. 2, 1994, 6-280079
Int. Cl.[6] C04B *35/584*
U.S. Cl. 501—97 **8 Claims**

1. A silicon nitride based sintered product containing 0.005 to 15 wt % of Fe, characterized in that Fe compound grains having a grain size of at least 0.2 μm occupy 0.1 to 15% of the area of a two-dimensional 200×200 μm area in said product, and said Fe compound grains occupy less than 35% of the area of each of 400 10 μm×10 μm cell areas obtained by equally longitudinally and laterally dividing said 200×200 μm area.

5,591,688

PROCESS FOR THE PREPARATION OF FLUID BED VINYL ACETATE CATALYST

Patricia R. Blum, Macedonia; Larry M. Cirjak, Burton; Marc A. Pepera, Northfield, and Christos Paparizos, Willowick, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 200,130, Feb. 22, 1994, Pat. No. 5,466,652. This application Jun. 20, 1995, Ser. No. 376,180
Int. Cl.[6] B01J *23/04*
U.S. Cl. 502—330 **22 Claims**

1. A process of manufacturing a fluid bed vinyl acetate catalyst characterized by the following formula comprising Pd-M-A wherein M equals barium, gold, lanthanum, niobium, cerium, zinc, lead, calcium, strontium, antimony, or mixtures thereof; and A equals at least one alkali metal comprising impregnating a preformed substantially inert microspheroidal particulate support wherein at least 50% of the particles have a size below 100 microns with a solution comprising a halide-free metal salt of the palladium, M, and at least one alkali metal and drying the impregnated pre-formed support.

5,591,689

PREPARATION OF ISOMERIZATION CATALYST COMPOSITION

An-hsiang Wu, Bartlesville; Charles A. Drake, Nowata, and Ralph J. Melton, Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 23, 1995, Ser. No. 494,832
Int. Cl.[6] B01J *23/42*
U.S. Cl. 502—334 **20 Claims**

1. A method of preparing a solid Group VIII metal- and chlorine-containing composition which comprises:

(1) mixing dry aluminum chloride with a solid material which comprises (i) at least one Group VIII metal selected from the group consisting of platinum, palladium and nickel and (ii) alumina as the support;

(2) heating the mixture obtained in step (1) in a substantially inert gas atmosphere at a temperature of about 450°–700° C. for a time period of at least about 10 minutes; and

(3) treating the material obtained in step (2) with a hydrogen chloride-containing gas at a temperature of about 300°–700° C. for a time period of at least about 10 minutes;

wherein said solid material used in step (1) is a reduced material having been prepared by a method consisting essentially of the steps of:

(a) impregnating an alumina material with at least one compound of a Group VIII metal selected from the group consisting of platinum, palladium and nickel;

(b) drying and then calcining the impregnated alumina material obtained in step (a) at a temperature of about 300°–650° C. for a time period of at least about 10 minutes; and

(c) heating the calcined material obtained in step (b) with a reducing gas comprising free hydrogen at a temperature of about 200°–550° C. for a time period of at least about 10 minutes so as to obtain a reduced material.

5,591,690

SELF ASSEMBLED MOLECULAR MONOLAYERS ON HIGH SURFACE AREA MATERIALS AS MOLECULAR GETTERS

David E. King, Lakewood; Gregory C. Herdt, and Alvin W. Czanderna, both of Denver, all of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Filed Jun. 29, 1994, Ser. No. 267,715
Int. Cl.[6] B01J *20/22*
U.S. Cl. 502—401 **8 Claims**

1. A filter for the removal of pollutants from a specific environment comprising:

a substrate having a metal surface; and

a molecular monolayer formed on said metal surface; wherein said molecular monolayer comprises a compound having the general formula $SH(CH_2)_n$–R, wherein n is an integer of 5 or greater and R is a specific functional group that is chosen to react with a specific pollutant, and a permeable container to hold said substrate having said molecular monolayer formed on said surface.

5,591,691

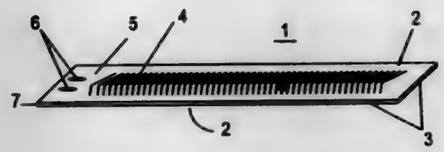
METAL FOIL CATALYST MEMBERS BY AQUEOUS ELECTROPHORETIC DEPOSITION

Semyon D. Friedman, Baltimore; Awdhoot V. Kerkar, Columbia, both of Md.; Ernest W. Hughes, Erie, Pa.; Rasto Brezny, Catonsville, Md.; John Wing-Keung Lau, Gaithersburg, Md., and Jacob Block, Rockville, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 247,436, May 23, 1994, abandoned. This application Jul. 15, 1994, Ser. No. 276,126

Int. Cl.[6] B01J *21/04;23/10*

U.S. Cl. 502—439 **16 Claims**



1. A catalyst support member comprising (1) a metal foil substrate having first and second primary surfaces and an edge surface, at least a portion of said substrate being corrugated, and (2) an electrophoretically deposited porous ceramic oxide catalyst support layer on at least said first primary surface, said porous ceramic oxide having been deposited directly on said portion of said substrate which has been corrugated, and said support layer being of substantially uniform thickness and having (i) a surface area of about 100–300 m^2/g based on the weight of said ceramic oxide, (ii) pore volume of 0.3–1.0 cc/g and (iii) a thickness of about 15–60 μm.

5,591,692

COMPOSITIONS AND METHODS FOR CONTROLLING THE GROWTH OF MICROBIALS IN AQUEOUS MEDIA

Ronald L. Jones, Norcross; Henry D. Caughman, Lithonia; Susan M. Shelor, Stone Mountain, and Ellwood L. Lines, Jr., Atlanta, all of Ga., assignors to Bio-Lab, Inc., Decatur, Ga.

Continuation of Ser. No. 69,122, May 28, 1993, abandoned, which is a continuation of Ser. No. 755,822, Sep. 6, 1991, abandoned. This application Dec. 13, 1994, Ser. No. 355,112

Int. Cl.[6] A01N *59/08;33/00*

U.S. Cl. 504—124 **15 Claims**

1. A method for disinfecting an aqueous system which comprises:

a. maintaining in the aqueous system a disinfecting concentration of total available chlorine by adding a chlorine-source composition other than chloroglycoluril; and

b. adding to the aqueous system an amount of a glycoluril-source composition sufficient to maintain a concentration in the aqueous system of from about 0.1 to about 40.0 ppm of glycoluril, said glycoluril-source composition being selected from the group consisting of unsubstituted glycoluril, alkyl-substituted glycoluril and phenyl-substituted glycoluril.

5,591,693

TURFGRASS MANAGEMENT COMPOSITIONS

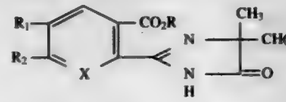
Prithvi R. Bhalla, East Windsor; Robert M. Herrick, Mercerville, both of N.J., and Donald W. Gates, Yardley, Pa., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 833,221, Feb. 10, 1992, Pat. No. 5,340,791, which is a division of Ser. No. 411,444, Sep. 22, 1989, Pat. No. 5,116,403, which is a continuation of Ser. No. 818,591, Jan. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 698,191, Feb. 4, 1985, abandoned. This application May 2, 1994, Ser. No. 235,937

Int. Cl.[6] H01N *43/42;43/40;43/50*

U.S. Cl. 504—130 **16 Claims**

1. A composition for retarding growth and suppressing seed heading in turfgrasses, comprising a synergistic effective amount of at least one compound having the structure:



wherein X is N or CH; R is H, C_1–C_4 alkyl, or a cation; R_1 and R_2 are each H, C_1–C_4 alkyl, C_1–C_4 alkyloxy, C_3–C_6 alkenyloxy, or R_1 and R_2 taken together with the carbons to which they are attached may form a 6 membered ring; and the optical isomer thereof, in combination with N-[2,4-dimethyl- 5[[(trifluoromethyl)-sulfonyl]amino]phenyl]acetamide.

5,591,694

HERBICIDAL SULFONYLUREAS

Gerhard Hamprecht, Weinheim; Horst Mayer, Ludwigshafen; Karl-Otto Westphalen, Speyer; Helmut Walter, Obrigheim; Matthias Gerber, Mutterstadt, and Uwe Kardorff, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP92/01879, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/05048, PCT Pub. Date Mar. 18, 1993

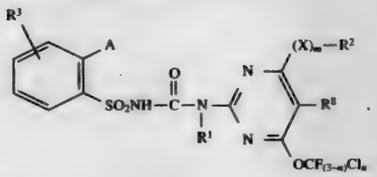
PCT Filed Sep. 25, 1992, Ser. No. 199,284

Claims priority, application Germany, Aug. 28, 1991, 41 28 441.0

Int. Cl.[6] C07D *239/52;239/69;* **A01N** *43/54*

U.S. Cl. 504—214 **6 Claims**

1. A substituted sulfonylurea of formula I



I

where

n and m are each 0 or 1;

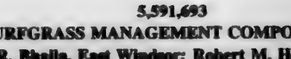
R^1 is hydrogen, C_1–C_4-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkynyl;

R^2 is halogen or trifluoromethyl when m is 0 or C_1–C_4-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkynyl when m is 1 or trifluoro- or chlorodifluoromethyl when X is O or S and m is 1;

X is O, S or N—R^4, where R^4 is hydrogen or C_1–C_4-alkyl;

R^3 is hydrogen, halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy or C_1–C_4-haloalkoxy;

A is NO_2, NH_2, OH, CN, SCN, $S(O)_pR^5$, $SO_2NR^6R^7$, a group ER^7, where E is O, S or NR^9,



C_1–C_4-alkyl which is unsubstituted or mono-, di- or trisubstituted by methoxy, ethoxy, SO_2CH_3, cyano, thiocyanato or SCH_3, or C_2–C_4-alkenyl which is unsubstituted or mono-, di- or trisubstituted by halogen, nitro or cyano;

R^5 is C_1–C_6-alkyl which may carry from one to three of the following radicals: halogen, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy, C_1–C_4-alkoxy-C_1- or C_2-alkoxy, C_3–C_7-cycloalkyl and/or phenyl; C_5–C_7-cycloalkyl which may carry from one to three C_1–C_4-alkyl groups; C_2–C_6-alkenyl or C_3–C_6-alkynyl;

R^6 is hydrogen, C_1- or C_2-alkoxy or C_1–C_6-alkyl, or, together with R^7, forms a C_4–C_6-alkylene chain in which a methylene group may be replaced with an oxygen atom or a C_1–C_4-alkylimino group;

R^7 is C_1–C_4-alkyl, C_2–C_4-alkenyl or C_3- or C_4-alkynyl, it being possible for the stated radicals to carry a further one to four halogen or C_1–C_4-alkoxy radicals, or is C_3–C_6-cycloalkyl, or where E is NR^9, is furthermore methylsulfonyl, trifluoromethylsulfonyl, ethylsulfonyl, acetyl which may carry one to three halogen atoms, or methoxycarbonyl, dimethylcarbamoyl or dimethylsulfamoyl;

o is 0, 1 or 2;

p and q are 0 or 1, and, where p is 0, q is likewise 0, and

R^8 is hydrogen or halogen;

R^9 is hydrogen, methyl or ethyl;

R^{10} is C_1–C_3-alkyl, C_1–C_3-haloalkyl, C_1- or C_2-alkoxy-C_1- or C_2-alkyl, C_2–C_4-alkenyl, C_3–C_6-cycloalkyl or C_2- or C_3-haloalkenyl, or, where p is 1 and q is 0, is furthermore C_1–C_3-alkylamino or di-(C_1- or C_2-alkyl)-amino,

and environmentally compatible salts thereof.

5,591,695

HERBICIDAL [1,3,4]OXADIAZOLES AND THIADIAZOLES

Trevor W. Newton, Schwabenheim, Germany, assignor to American Cyanamid Co., Madison, N.J.

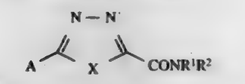
Filed May 24, 1995, Ser. No. 449,046

Claims priority, application European Pat. Off., Feb. 8, 1995, 95101695

Int. Cl.[6] C07D *271/10;285/12;* **A01N** *43/824*

U.S. Cl. 504—263 **9 Claims**

1. A compound of formula I



(I)

wherein

X represents an oxygen or sulphur atom;

A represents an optionally substituted C_{1-10} alkyl, optionally substituted C_{2-8} alkenyl, optionally substituted C_{3-8} cycloalkyl, optionally substituted C_{3-8} cycloalkenyl, optionally substituted di(C_{1-6} alkyl)amino, optionally substituted phenyl, optionally substituted pyridyl, optionally substituted furyl, or optionally substituted thienyl;

R^1 represents hydrogen, an optionally substituted C_{1-10} alkyl, or an optionally substituted C_{2-8} acyl group;

R^2 represents a group —$CH(R^3)R^4$;

R_3 represents hydrogen, methyl, or ethyl;

R^4 represents an optionally substituted phenyl group, an optionally substituted pyridyl, an optionally substituted furyl, an optionally substituted thiophenyl, or an optionally substituted benzothiophene;

said optionally substituted alkyl, alkenyl, cycloalkyl or cycloalkenyl moieties being unsubstituted or substituted with one to three halogen, phenyl, nitro, cyano, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkyl, C_{1-4} haloalkoxy, (C_{1-4} alkoxy)carbonyl, amino, C_{1-4} alkylsulphinyl, C_{1-4} alkylsulphenyl, C_{1-4} alkylsulphonyl, phenylsulphinyl, phenylsulphenyl, phenylsulphonyl, mono-(C_{1-4} alkyl)amino, or di-(C_{1-4} alkyl)amino groups;

said optionally substituted phenyl, pyridyl, furyl, thienyl, thiophenyl, or benzothiophene moieties being unsubstituted or substituted with one to five halogen, nitro, cyano, amino, hydroxyl, C_{1-4} alkyl, C_{1-4} haloalkyl, C_{1-4} alkoxy, or C_{1-4} haloalkoxy.

5,591,696

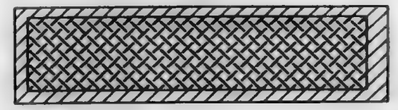
CHEMICALLY TAILORED CORROSION RESISTANT HIGH-T_C SUPERCONDUCTORS

John T. McDevitt; Ji-Ping Zhou, and Jianxi Zhao, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Oct. 6, 1994, Ser. No. 320,012

Int. Cl.[6] C04B *35/505;35/622;* **B32B** *18/00*

U.S. Cl. 505—234 **4 Claims**



1. A process for producing corrosion resistant superconductive $YBa_2Cu_3O_7$ material comprising encapsulating said superconductive material with a protective coating of $Y_{1-x}Ca_xBa_{2-y}La_yCu_3O_{7-d}$ where x and y are from about 0.1 to about 1.0 and d is 1 or less than 1.

5,591,697

PHYSIOLOGICALLY ACTIVE SUBSTANCES OF PLANT, PROCESS FOR THE PREPARATION THEREOF, AND UTILITIES THEREOF

Koji Hasegawa; Hideo Kakuta, and Junya Mizutani, all of Sapporo, Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

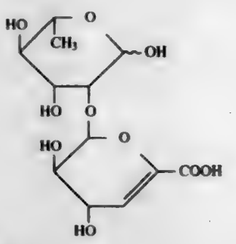
Division of Ser. No. 30,732, Mar. 12, 1993, Pat. No. 5,455,345. This application Apr. 28, 1995, Ser. No. 431,263

Claims priority, application Japan, May 22, 1992, 4-131505; Sep. 16, 1992, 4-246813; Nov. 30, 1992, 4-320898; Feb. 26, 1993, 5-62729

Int. Cl.[6] A01N *43/16*

U.S. Cl. 504—292 **7 Claims**

1. A method for culture, wherein an artificial soil or a culture solution contains the compound represented by the following formula (Ia):



(Ia)

or a salt thereof.

5,591,698

LOW TEMPERATURE (T LOWER THAN 950° C.) PREPARATION OF MELT TEXTURE YBCO SUPERCONDUCTORS

Steven Y. Song, and James R. Gaines, both of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed Dec. 29, 1994, Ser. No. 365,848
Int. Cl.[6] C04B *35/653;35/505*
U.S. Cl. 505—450 **11 Claims**



1. A method for making superconducting material comprising YBCO and silver comprising selecting CuO and at least one precursor selected from the group consisting of $BaCuO_2$ and Y_2BaCuO_5 , mixing said precursors with other precursors in stoichiometric proportions necessary to form the superconducting material, and with metallic silver to form a mixture to be processed, melt texturing said mixture by heating said mixture in a furnace region heating to no more than about 950° C., and moving said mixture slowly to a lower temperature region, then cooling a resulting sample in a controlled temperature environment, wherein during said process peritectic melting of $YBa_2Cu_3O_{7-y}$ is averted.

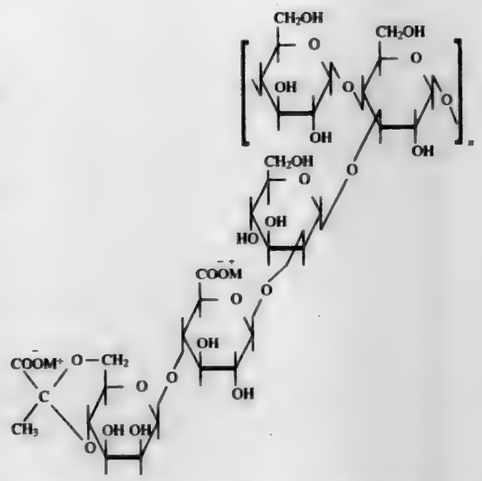
5,591,699

PARTICLE TRANSPORT FLUIDS THICKENED WITH ACETYLATE FREE XANTHAN HETEROPOLYSACCHARIDE BIOPOLYMER PLUS GUAR GUM

Richard M. Hodge, Ponca City, Okla., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 21,943, Feb. 24, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 360,558
Int. Cl.[6] F21B *43/26*
U.S. Cl. 507—213 **8 Claims**

1. A viscous aqueous particle transport fluid comprising:
(a) water,
(b) from about 0.08 to 1.0 weight percent of guar gum, and
(c) from about 0.02 to 0.25 weight percent of a non-acetylated but otherwise unmodified xanthan heteropolysaccharide polymer having the following formula in Haworth convention:



wherein M^+ can be a hydrogen ion or an alkali metal ion and wherein the ratio of guar gum employed to the amount of xanthan heteropolysaccharide polymer employed is between about 2:1 to about 5:1.

5,591,700

FRACTURING FLUID WITH ENCAPSULATED BREAKER

Phillip C. Harris; Ronald J. Powell, and Stanley J. Heath, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 22, 1994, Ser. No. 362,393
Int. Cl.[6] E21B *43/26*
U.S. Cl. 507—204 **15 Claims**

1. A method for fracturing a subterranean formation penetrated by a well bore comprising the step of pumping an aqueous hydraulic fracturing fluid down the well bore at a pressure and flow rate sufficient to fracture the subterranean formation wherein the fracturing fluid is comprised of a water soluble hydratable polymer, a proppant, and a particulate breaker that is encapsulated by a water soluble surfactant comprising at least one member selected from the group consisting of carboxylates, polyalkoxycarboxylates, alkylbenzenesulfonates, alkylarylsulfonates, lignosulfonates, naphthalenesulfonates, petroleum sulfonates, ethoxylated and sulfated alcohols, ethoxylated and sulfated alkylphenols, sulfated acids, amides and esters, sulfated natural oils and fats, phosphate esters, polyoxyethylene ethoxylates, alkylphenol ethoxylates, carboxylic acid esters, glycero esters, polyoxyethylene esters, ethoxylated natural fats, oils and waxes, glycol esters of fatty acids, carboxylic amides, polyalkylene oxide block copolymers, aliphatic mono, di and polyamines derived from fatty and rosin acids, that is solid at temperatures up to about formation temperatures and dissolves at formation temperatures.

5,591,701

ITERATED FOAM PROCESS AND COMPOSITION FOR WELL TREATMENT

Todd R. Thomas, Coraopolis, Pa., assignor to Clearwater, Inc., Pittsburgh, Pa.

Division of Ser. No. 6,791, Jan. 21, 1993, Pat. No. 5,385,206. This application Sep. 23, 1994, Ser. No. 311,393
Int. Cl.[6] C09K *7/02*
U.S. Cl. 507—240 **5 Claims**

1. A composition for well treatment comprising an aqueous solution of an amphoteric foaming agent and an anionic surfactant in a molar ratio of about 0.6:1 to about 1.4:1, said composition having a pH less than about 4 and being capable of forming a stable foam at a pH above 9.5.

5,591,702

STRIPPING COMPOSITIONS WITH MIXTURES OR ORGANIC SOLVENTS AND USES THEREOF

Donald P. Murphy, Rochester Hills, Mich., assignor to Henkel Corporation, Plymouth Meeting, Pa.

Filed May 25, 1995, Ser. No. 450,593
Int. Cl.[6] C11D *3/26;3/20*
U.S. Cl. 510—202 **20 Claims**

1. A composition of matter useful as an additive to alkaline stripping compositions to increase the speed of stripping thereof, said composition consisting of a combination of solvents selected from the group of combinations consisting of:
EGMFE and TPG, with a fraction by weight of TPG that is from about 0.40 to about 0.95;
DEGMPE and MEA, with a fraction by weight of MEA that is from about 0.10 to about 0.90;
DEGMPE and PG, with a fraction by weight of PG that is from about 0.50 to about 0.75;
DEGMPE and DPG, with a fraction by weight of DPG that is from about 0.10 to about 0.90;
TEGMME and MEA, with a fraction by weight of MEA that is from about 0.40 to about 0.80;
TEGMME and PG, with a fraction by weight of PG that is from about 0.15 to about 0.80;
TEGMME and DPG, with a fraction by weight of DPG that is from about 0.35 to about 0.95:
DPGMME and PG, with a fraction by weight of PG that is from about 0.05 to about 0.90;
DPGMME and DPG, with a fraction by weight of DPG that is from about 0.10 to about 0.90;
DPGMME and TPG, with a fraction by weight of TPG that is from about 0.25 to about 0.90;
DEGMnBE and MEA, with a fraction by weight of MEA that is from about 0.15 to about 0.90;
DEGMnBE and PG, with a fraction by weight of PG that is from about 0.20 to about 0.90;
DEGMnBE and DPG, with a fraction by weight of DPG that is from about 0.50 to about 0.95;
TEGMEE and MEA, with a fraction by weight of MEA that is from about 0.12 to about 0.80;
TEGMEE and PG, with a fraction by weight of PG that is either from about 0.10 to about 0.45 or from about 0.50 to about 0.90;
TEGMEE and DPG, with a fraction by weight of DPG that is from about 0.10 to about 0.95;
TEGMEE and TPG, with a fraction by weight of TPG that is from about 0.10 to about 0.90;
DEGMHE and PG, with a fraction by weight of PG that is about 0.20;
DEGMHE and DPG, with a fraction by weight of DPG that is from about 0.20 to about 0.81;
TEGMnBE and MEA, with a fraction by weight of MEA that is from about 0.45 to about 0.90;
TEGMnBE and PG, with a fraction by weight of PG that is from about 0.45 to about 0.90;
TEGMnBE and DPG, with a fraction by weight of DPG that is from about 0.10 to about 0.81;
TPGMME and DPG, with a fraction by weight of DPG that is from about 0.20 to about 0.95;
TPGMME and TPG, with a fraction by weight of TPG that is from about 0.50 to about 0.95;
TPGMnBE and MEA, with a fraction by weight of MEA that is from about 0.20 to about 0.80; and
TPGMnBE and PG, with a fraction by weight of PG that is about 0.20 or about 0.60.

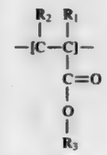
5,591,703

LIQUID OR GRANULAR AUTOMATIC DISWASHING DETERGENT COMPOSITIONS CONTAINING BUILDER, ENZYME AND LOW MOLECULAR WEIGHT, MODIFIED POLYACRYLATE COPOLYMERS

Eugene S. Sadlowski, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 172,627, Dec. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 53,620, Apr. 27, 1993, abandoned. This application May 15, 1995, Ser. No. 441,719
Int. Cl.[6] C11D *3/386;3/37;3/395*
U.S. Cl. 510—220 **21 Claims**

1. A solid automatic dishwashing detergent composition, comprising by weight:
(A) from about 15% to about 80% of a detergency builder selected from the group consisting of water soluble, alkali metal, ammonium, or substituted ammonium phosphates, polyphosphates, citrates, and mixtures thereof;
(B) from about 0.1% to about 10% modified polyacrylate copolymer having a molecular weight of from about 1,000 to about 5,000, said modified polyacrylate copolymer comprising from about 90% to 10% acrylic acid monomer or its salts and from about 10% to about 90% of a substituted acrylic monomer, said substituted acrylic monomer having the formula:



wherein at least one of said R_1–R_3 is a C_1–C_4 alkyl or hydroxyalkyl, R_1–R_2 may be hydrogen and R_3 may be hydrogen or alkali metal salt;
(C) from about 0.001% to about 5% detersive enzyme; and
(D) from about 0.01% to about 40% alkali metal silicate.

5,591,704

Patent Not Issued For This Number

5,591,705

RINSE-ACTIVE FOAM CONTROL PARTICLES

Alan D. Brinson, Tervuren; David X. Cumming, Brussels, both of Belgium, and David W. York, Newcastle Upon Tyne, Great Britain, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US92/10390, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/11216, PCT Pub. Date Oct. 6, 1993

PCT Filed Dec. 1, 1992, Ser. No. 244,444

Claims priority, application European Pat. Off., Dec. 3, 1991, 91203149

Int. Cl.[6] C11D *9/00*

U.S. Cl. 510—276 **10 Claims**

1. A particulate foam-control composition for inclusion in a detergent composition in powder form, consisting essentially of a soap of fatty acids selected from the group consisting of tallow soap, and tallow/coconut soap with a weight ratio of tallow to coconut not less than 70/30, of which at least 80 % contain from 16 to 18 carbon atoms, the geometric mean particle size of the particles being inferior to 1 mm, wherein said particulate foam-control composition becomes active primarily in the rinse cycle of a washing operation.

5,591,706

AQUEOUS PEROXIDE COMPOSITIONS WITH IMPROVED SAFETY PROFILE

Jan J. H. Plouman, Roermond, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands

Filed Aug. 3, 1990, Ser. No. 562,778

Claims priority, application European Pat. Off., Aug. 8, 1989, 89202052

Int. Cl.[6] C11D *7/54*

U.S. Cl. 510—372 **14 Claims**

1. An aqueous peroxide composition with improved safety profile comprising 25% –45% by weight of a solid, substantially water-insoluble organic peroxy acid stably suspended in an aqueous medium, wherein said aqueous medium comprises a safety booster selected from the group consisting of triethylene glycol, polyethylene glycol and mixtures thereof, said safety booster added in an amount which is at least one-half the weight percent of peroxy acid present in said aqueous medium.

5,591,707

PROCESS FOR PRODUCING FREE-FLOWING GRANULES WITH SUPERHEATED STEAM

Wilfried Raehse, Duesseldorf; Johann P. Fues, Grevenbroich, Herbert Pattberg, Hilden, and Kathleen Pantz, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/02703, § 371 Date Apr. 12, 1995, § 102(e) Date Apr. 12, 1995, PCT Pub. No. WO94/09109, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct 4, 1993, Ser. No. 416,760

Claims priority, application Germany, Oct. 12, 1992, 42 34 376.3

Int. Cl.[6] C11D *11/00*

U.S. Cl. 510—451 **14 Claims**

1. A process for producing free-flowing granules comprising the steps of:

(a) drying with a drying gas consisting of superheated steam an aqueous mixture containing at least one surfactant selected from the group consisting of anionic surfactants and nonionic surfactants to form carrier granules having a porous inner structure, and

(b) impregnating said porous inner structure of said carrier granules with an aqueous composition containing wetting agents selected from the group consisting of nonionic surfactants and anionic surfactants, cleaning agents selected from the group consisting of inorganic and organic builder components, and mixtures thereof, to form an impregnated carrier granule.

5,591,708

PINE OIL HARD SURFACE CLEANING COMPOSITIONS

Alan F. Richter, Branchburg, N.J., assignor to Reckitt & Colman Inc., Montvale, N.J.

Filed Sep. 5, 1995, Ser. No. 523,413

Claims priority, application United Kingdom, Aug. 4, 1995, 9516072

Int. Cl.[6] C11D *1/835;3/26;7/50;3/48*

U.S. Cl. 510—463 **12 Claims**

1 A liquid pine oil hard surface cleaning composition comprising:

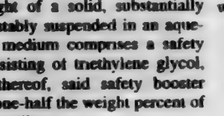
A) 0.1–4% wt. of a pine oil preparation containing at least approximately 60% by weight alpha-terpineol;

B) 0.1–10% wt. of a nonionic alkoxylated fatty primary alcohol or alkoxylated fatty secondary alcohol surfactant with a cloud point of 20° C. or less;

C) 0.1–15% wt. of a solubilizing agent selected from the group consisting of C_{1-8} alcohols, and alkylene glycols;

D) water; and

E) a germicidally effective amount of a quaternary ammonium compound according to the formula:



wherein

R_2 and R_3 are the same or different C_8–C_{12} alkyl, or R_2 is C_{12-16} alkyl and R_3 is benzyl, and

X is a halide or methosulfate.

5,591,709

COMPOSITIONS AND METHODS FOR TREATING WOUNDS

Ella Lindenbaum, Haifa, Israel, assignor to Life Medical Sciences, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 25,216, Mar. 2, 1993, abandoned, Ser. No. 937,486, Aug. 28, 1992, abandoned, and Ser. No. 158,808, Nov. 29, 1993, Pat. No. 5,461,030, which is a continuation of Ser. No. 752,849, Aug. 30, 1991, abandoned, said Ser. No. 25,216is a continuation-in-part of Ser. No. 937,486, which is a continuation-in-part of Ser. No. 752,849.

This application Jan. 18, 1995, Ser. No. 374,944

Int. Cl.[6] A61K *9/06;31/195;38/27;38/28*

U.S. Cl. 514—4 **38 Claims**

1. A method for treating a skin wound comprising applying to said wound a formulation comprising an effective amount of a mixture of non-steroidal anabolic hormones including insulin at a wound healing effective concentration within the range of about 500 ng/ml to about 100 ug/ml, growth hormone at a concentration of about 0.5 ng/ml to about 20 ng/ml and triiodothyronine or thyroxine at a concentration effective to enhance the healing of said wound in MCDB 153 nutrient medium, said formulation also including an amount of agarose, gelatin, collagen or a hydrophilic cellulose polymer effective to produce a gel for delivery to said wound.

5,591,710

COMPOSITIONS AND METHODS UTILIZING NITROXIDES TO AVOID OXYGEN TOXICITY, PARTICULARLY IN STABILIZED, POLYMERIZED, CONJUGATED, OR ENCAPSULATED HEMOGLOBIN USED AS A RED CELL SUBSTITUTE

Jen-Chang Hsia, 135 Starcrest, Irvine, Calif. 92715

Continuation-in-part of Ser. No. 107,543, Aug. 16, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 291,590

Int. Cl.[6] A61K *35/14;38/16;* C07K *14/805*

U.S. Cl. 514—6 **25 Claims**

1. A red cell substitute comprising:

stabilized hemoglobin in a physiologically compatible solution, and

a nitroxide covalently bound to the stabilized hemoglobin.

5,591,711

L-LYSYL-GLYCYL-L-HISTIDINE AND THERAPEUTIC AGENT FOR WOUND HEALING CONTAINING THE SAME

Masayoshi Koyama; Mikiko Takahashi, and Masayoshi Yanagawa, all of Saitama, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Filed May 19, 1995, Ser. No. 444,845

Claims priority, application Japan, May 27, 1994, 6-115161

Int. Cl.[6] C07K *5/09;* A61K *38/06*

U.S. Cl. 514—6 **11 Claims**

1. A tripeptide comprising an amino acid sequence L-lysyl-glycyl-L-histidine or a metal complex thereof.

5,591,712

Patent Not Issued For This Number

5,591,713

WATER-SOLUBLE COMPOSITION FOR SUSTAINED-RELEASE

Yasutaka Igari, Kobe; Minoru Yamada, Kawanishi, and Yasuaki Ogawa, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 909,160, Jul. 6, 1992, Pat. No. 5,416,071, which is a continuation-in-part of Ser. No. 847,188, Mar. 6, 1992, abandoned. This application Jan. 24, 1995, Ser. No. 377,392

Claims priority, application Japan, Mar. 12, 1991, 3-046735; Jul. 10, 1991, 3-170205

Int. Cl.[6] A61K *37/10*

U.S. Cl. 514—8 **14 Claims**

1. A water-soluble composition which comprises (a) a pharmacologically active polypeptide secreted by an animal body or its derivative or a chemically synthesized pharmacologically active substance, (b) a water-soluble species of hyaluronic acid or its non-toxi salt and (c) a water-soluble protein injectable into body fluids without showing any substantial pharmacological activity.

5,591,714

DERIVATIVES OF A82846

Ramakrishnan Nagarajan, and Amelia A. Schabel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

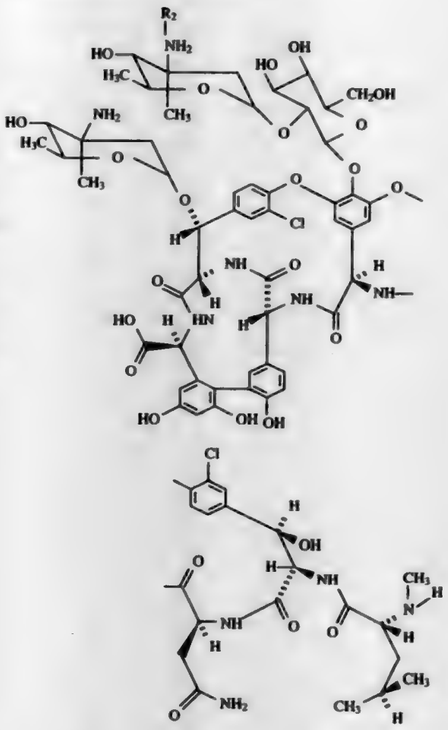
Continuation of Ser. No. 960,316, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 449,171, Dec. 13, 1989, abandoned. This application Oct. 13, 1994, Ser. No. 322,972

Int. Cl.[6] A61K *38/12;38/14;* C07K *9/00*

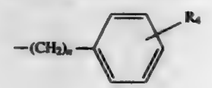
U.S. Cl. 514—9 **32 Claims**

1. A compound of the formula I

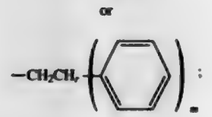
I



R_2 is C_8–C_{12} alkyl or a group of formula



or



wherein n is 1 to 3;

R_4 is hydrogen, halo, C_1–C_8 alkyl, or C_1–C_8 alkoxy;

m is 2 or 3 and r=3-m;

or a pharmaceutically acceptable salt thereof.

5,591,715

METHODS AND COMPOSITIONS FOR REDUCING MULTIDRUG RESISTANCE

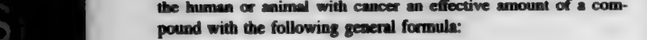
John S. Coon, Oak Park, Ill.; Manmeranny Balasubramanian, Roswell, Ga.; R. Martin Emanuele, Alpharetta, Ga., and Himanshu Shah, Atlanta, Ga., assignors to Rush Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Division of Ser. No. 445,191, May 19, 1995, which is a continuation-in-part of Ser. No. 246,837, May 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 982,766, Dec. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 805,186, Dec. 10, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 474,994

Int. Cl.[6] A61K *38/00;31/70;* A01N *43/04*

U.S. Cl. 514—10 9 Claims

1. A method of reversing multidrug resistance in a cancer in a human or animal with the cancer comprising the administration to the human or animal with cancer an effective amount of a compound with the following general formula:



$$H_3C(CH_2)_aXH_2CCH_2O(H_2CCHO)_bH_2CCH_2X(CH_2)_aCH_3$$

wherein the average of "a" is between approximately 10 and 30 and "b" is between 4 and 100 and X=CO—O (ester), CO—NH (amide) or CH_2—O (ether).

5,591,716

BENEFICIAL WOUND HEALING APPLICATIONS OF CALRETICULIN AND OTHER HYALURONAN-ASSOCIATED PROTEINS

John W. Siebert, New York, N.Y.; Harl G. Garg, Belmont, Mass., and Leslie I. Gold, New York, N.Y., assignors to New York University, New York, N.Y., and The General Hospital Corp., Boston, Mass.

Filed Nov. 19, 1993, Ser. No. 155,933

Int. Cl.[6] A61K *38/16;38/18*

U.S. Cl. 514—12 14 Claims

1. A method of promoting the scarless healing of a wound in a subject, comprising administering to said subject in need of such treatment an amount of calreticulin effective in promoting scarless healing of wounds.

5,591,717

BRANCHED APOGENIC PEPTIDE FOR INDUCING APOPTOSIS

Jennifer L. Rojko, 5 Duke Ct., Rockville, Md. 20850; James R. Hartke, 3065 Alton Darby Rd., Hilliard, Ohio 43026, and Carolyn M. Cheney, 351 ½ W. Hubbard Ave., Columbus, Ohio 43215

Filed Apr. 6, 1994, Ser. No. 224,632

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—12 18 Claims

1. A branched apogenic peptide comprising:

a. a core having at least 3 amino acids;

b. at least four peptide chains, connected to said core, each peptide chain having from 7 to 25 amino acids comprising the following amino acid sequence:

ZXXZXXZ, SEQ.ID.NO.6,

wherein: Z is arginine, lysine or any positively charged synthetic amino acid; and X is any amino acid; and

wherein the branched peptide induces apoptosis.

5,591,718

NEUTROPHIL ACTIVATING FACTORS

Alfred Walz, Feldrainstrasse 7, 3098 Koeniz, Switzerland

Division of Ser. No. 778,413, Oct. 16, 1991, Pat. No. 5,401,651. This application Nov. 15, 1994, Ser. No. 340,102

Int. Cl.[6] A61K *38/19;* C07K *14/52*

U.S. Cl. 514—12 6 Claims

1. An isolated polypeptide having the sequence of amino acids 1–78 set forth in Seq. ID No. 12.

5,591,719

METHOD FOR TREATING ACUTE AND CHRONIC INFLAMMATORY DISORDERS USING POLYPEPTIDES WITH FIBRONECTIN ACTIVITY

Lee T. Furcht; James B. McCarthy, both of Minneapolis, Minn.; Sharon M. Wahl, Gaithersburg, and Janice B. Allen, Wheaton, both of Md., assignors to Regents of the University of Minnesota, Minneapolis, Minn., and The United States of America as represented by the Secretary of Health and Human Services, Washington, D.C.

Filed Dec. 10, 1992, Ser. No. 990,296

Int. Cl.[6] A61K *38/00;* C07K *7/06;7/10*

U.S. Cl. 514—13 17 Claims

1. A method for treating arthritis in a mammal comprising: administering to said mammal to suppress inflammation an effective amount of a composition which includes a polypeptide corresponding to an amino acid sequence within the 33 kD carboxyl terminal, heparin-binding region located on the A chain of fibronectin, wherein the polypeptide has a formula selected from the group consisting of tyr-glu-lys-pro-gly-ser-pro-pro-arg-glu-val-val-pro-arg-pro-arg-pro-gly-val, lys-asn-asn-gln-lys-ser-glu-pro-leu-ile-gly-arg-lys-lys-thr, trp-gln-pro-pro-arg-ala-arg-ile, asp-glu-leu-pro-gln-leu-val-thr-leu-pro-his-pro-asn-leu-his-gly-pro-glu-ile-leu-asp-val-pro-ser-thr, and ser-pro-pro-arg-arg-ala-arg-val-thr.

5,591,720

OLIGONUCLEOTIDES FOR MODULATING THE EFFECTS OF CYTOMEGALOVIRUS INFECTIONS

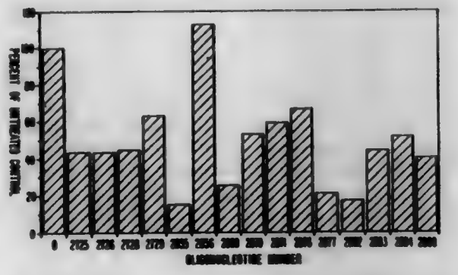
Kevin P. Anderson, Carlsbad, Calif., and Kenneth G. Draper, Richmond, Ohio, assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

PCT No. PCT/US91/05815, § 371 Date Nov. 19, 1992, § 102(e) Date Nov. 19, 1992

Continuation-in-part of Ser. No. 568,366, Aug. 16, 1990, abandoned. This PCT application Aug. 14, 1991, Ser. No. 927,506

Int. Cl.[6] A61K *31/70;* C07H *21/04*

U.S. Cl. 514—44 2 Claims



1. An oligonucleotide or oligonucleotide analog having 15 to 50 bases fully complementary to a target DNA or corresponding RNA or pre-messenger RNA sequence wherein said oligonucleotide is selected from group consisting of SEQ ID NO:s 3–21, 23 and 24 and said oligonucleotide analog is selected from the group consisting of: modified SEQ ID NO:s 3–21, 23 and 24 as set forth in Table 2.

5,591,721

METHOD OF DOWN-REGULATING GENE EXPRESSION

Sudhir Agrawal, Shrewsbury, Mass.; Robert B. Diasio, and Ruiwen Zhang, both of Birmingham, Ala., assignors to Hybridon, Inc., Worcester, Mass.

Filed Oct. 25, 1994, Ser. No. 328,520

Int. Cl.[6] A61K *31/70;31/795;* C07H *21/00*

U.S. Cl. 514—44 1 Claim

1. A method for introducing an intact oligonucleotide into a mammal, the method comprising the step of orally administering an oligonucleotide of about 15 to 25 nucleotides, the oligonucleotide comprising phosphorothioate internucleoside linkages between every nucleoside, and further comprising at least two 2'-O-methyl-ribonucleotides at each end, whereby the oligonucleotide is present in intact form in the systemic plasma and in liver tissue of the mammal at least six hours following oral administration.

5,591,722

2'-DEOXY-4'-THIORIBONUCLEOSIDES AND THEIR ANTIVIRAL ACTIVITY

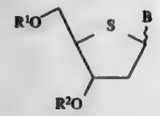
John A. Montgomery, and John A. Secrist, III, both of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Continuation of Ser. No. 35,689, Mar. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 408,040, Sep. 15, 1989, abandoned. This application Dec. 12, 1994, Ser. No. 354,313

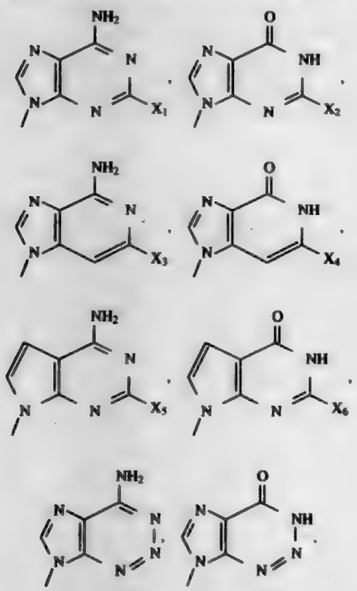
Int. Cl.[6] A61K *31/70;* C07H *17/02;5/10;* C07D *327/04*

U.S. Cl. 514—45 21 Claims

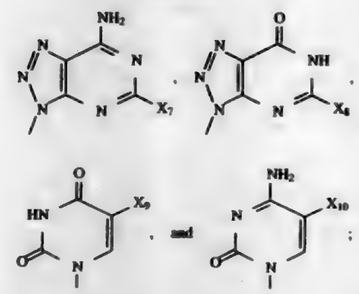
1. A compound having the formula



wherein B is selected from the group consisting of

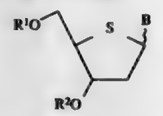


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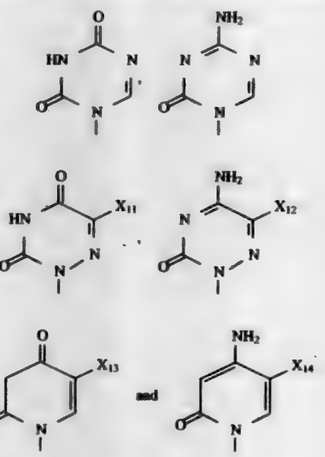


wherein X_{1-8} are selected from the group consisting of hydrogen, NH_2 and halogen; wherein X_9 is selected from the group of hydrogen, methyl; and X_{10} is selected from the group consisting of hydrogen, methyl and halogen; and wherein R^1 and R^2 are selected from the group of hydrogen, acyl protecting groups, and mixtures thereof.

16. A compound having the formula

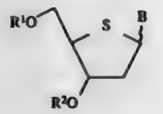


wherein B is a member selected from the group consisting of:



wherein X_{11-14} are selected from the group of H, CH3, and halogen, and R^1 and R^2 is selected from the group of hydrogen, acyl protecting groups, and mixtures thereof.

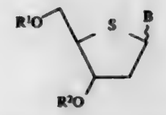
17. A compound having the formula



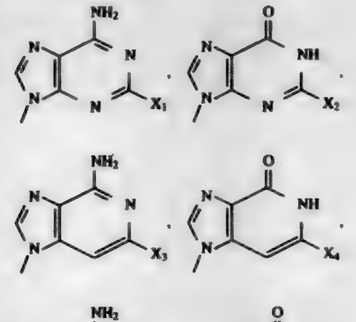
wherein B is selected from the group consisting of pyrimidine and purine nucleoside bases with the provision that when B is pyrimidine, B is not a uracil molecule having a halogen at the

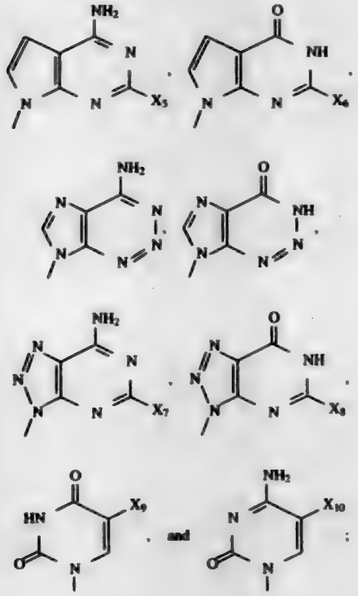
C^5-heterocyclic carbon of the molecule; and wherein R^1 and R^2 are selected from the group consisting of hydrogen, acyl protecting groups, and mixtures thereof.

18. A method for producing an antiviral effect against a virus that replicates in a virus-infected mammalian cell which method comprises contacting said cell with a compound according to the formula



wherein B is selected from the group consisting of





wherein X_{1-9} are selected from the group consisting of hydrogen, NH_2 and halogen; wherein X_9 is selected from the group consisting of hydrogen, methyl; wherein X_{10} is selected from the group consisting of hydrogen, methyl and halogen; and wherein R^1 and R^2 are selected from the group of hydrogen, acyl protecting groups, and mixtures thereof; said virus being herpes simplex virus or human cytomegalovirus.

5,591,723

Patent Not Issued For This Number

5,591,724

METHOD FOR TREATING THE URINARY BLADDER AND ASSOCIATED STRUCTURES USING HYALURONIC ACID

Alvaro Morales, Kingston, and Stanley J. Alkemade, Seaforth, both of Canada, assignors to Bioniche Inc., Canada

Filed Feb. 14, 1995, Ser. No. 388,838
Int. Cl.[6] A61K *31/73;47/36*
U.S. Cl. 514—54 **6 Claims**

1. A method of treating interstitial cystitis comprising the step of contacting the lining of the renal pelvis, ureters, urinary bladder and urethra in a mammal having interstitial cystitis by instillation of a solution containing hyaluronic acid having an average molecular weight of not less than 2×10^5 Daltons in a concentration from about 0.01 mg/ml to about 25 mg/ml in a volume from about 5 ml to about 100 ml.

5,591,725

WATER-IN-OIL DISPERSION

Ian T. Norton, Rushden, United Kingdom, assignor to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 87,361, Jul. 2, 1993, abandoned, which is a continuation of Ser. No. 756,028, Sep. 6, 1991, abandoned. This application Jun. 23, 1995, Ser. No. 494,606
Claims priority, application European Pat. Off., Sep. 7, 1990, 90309791
Int. Cl.[6] A01N *43/04;* **A23D** *7/00;* **A23K** *1/00*
U.S. Cl. 514—58 **6 Claims**

1. A plastic dispersion containing from 5 to 65 wt. % of a continuous fat phase comprising: a vegetable fat and a dispersed aqueous phase having from 95 to 35 wt. % of a polysaccharide agar present in a concentration exceeding a critical gelling concentration of the agar, the aqueous phase comprising from 0.04 to 0.3 wt. % of a protein selected from the group consisting of a dairy protein, a vegetable protein or mixtures thereof, and a viscosity enhancer selected from the group consisting of guar gum, non-gelling maltodextrin, sodium alginate, xanthan gum, locust bean gum and tragacanth, the viscosity enhancer present in a concentration below the critical gelling concentration thereof and the plastic dispersion being essentially free of gelatin.

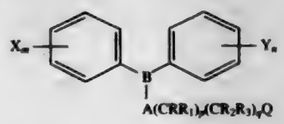
5,591,726

HETEROCYCLYLALKYL DIARYLBORON ESTER AND THIOESTER FUNGICIDAL AGENTS

Boni P. Patel, Bryn Mawr, Pa.; Henry Van Tuyl Cotter, Ingelheim, Germany, and Jerome M. Lavanish, Yardley, Pa., assignors to American Cyanamid Company, Madison, N.J.

Filed Sep. 26, 1994, Ser. No. 313,525
Int. Cl.[6] A61K *31/69;* **A01N** *55/08;* **C07F** *5/02*
U.S. Cl. 514—64 **21 Claims**

1. A compound having the structural formula



wherein

X and Y are each independently halogen, C_1–C_6alkoxy, C_1–C_6haloalkoxy, C_1–C_6alkyl or C_1–C_6haloalkyl;

m and n are each independently an integer of 0, 1, 2 or 3;

A is O or S;

p and q are each independently an integer of 0 or 1, provided that at least one of p and q is 1;

R, R_1, R_2 and R_3 are each independently hydrogen,

phenyl optionally substituted with one or more halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, cyano nitro $C(O)R_4$ or NR_5R_6 groups, or

when R and R_1 or R_2 and R_3 are taken together with the carbon atom to which they are attached, they may form a 5- or 6-membered cycloalkyl ring optionally substituted with one to three C_1–C_4alkyl, C_1–C_4haloalkyl or C_1–C_4alkoxy groups, or

when R or R_1 and R_2 or R_3 are taken together with the carbon atoms to which they are attached, they may form a 5- or 6-membered cycloalkyl ring optionally substituted with one to three C_1–C_4alkyl, C_1–C_4haloalkyl or C_1–C_4alkoxy groups;

Q is

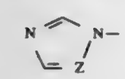


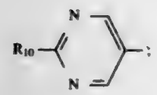
R_7 is C_1–C_3alkyl optionally substituted with one to three of the following

C_1–C_6alkyl optionally substituted with one phenyl group optionally substituted with one or more halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, cyano, nitro, $C(O)R_4$ or NR_5R_6 groups, or

phenyl optionally substituted with one or more halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, cyano, nitro, $C(O)R_4$ or NR_5R_6 groups;

W is





R_8 is hydrogen or C_1–C_6alkyl;

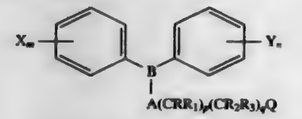
R_9 is C_1–C_6alkyl or phenyl optionally substituted with one or more halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, cyano, nitro, $C(O)R_4$ or NR_5R_6 groups;

R_4, R_5, R_6 and R_{10} are each independently hydrogen or C_1–C_6alkyl; and

Z is CH or N;

or the optical isomers or diastereomers thereof.

15. A method for the protection of a plant, plant seed or tuber from fungal infection and disease which comprises applying to the plant, plant part, plant seed or tuber, or to the soil or water in which it is growing, a fungicidally effective amount of a compound having the structural formula



wherein X, Y, A, R, R_1, R_2, R_3, Q, p, q, m and n are as described in claim 1.

16. The method according to claim 15 wherein

m and n are each independently an integer of 0, 1 or 2;

A is O;

p is 1;

q is 0 or 1;

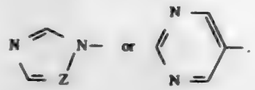
R and R_1 are each independently hydrogen,

phenyl optionally substituted with one or more halogen, C_1C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy or C_1C_4haloalkoxy groups;

R_2 and R_3 are hydrogen;

Q is -W; and

W is



5,591,727

INSECTICIDAL COMPOSITION

Franz Bencsits, Wehrenbachhalde 54, 8053 Zürich, Switzerland, assignor to Perycut-Chemie AG, and Franz Bencsits, both of Switzerland

Continuation of Ser. No. 988,922, Mar. 12, 1993, abandoned. This application Feb. 7, 1995, Ser. No. 386,126
Claims priority, application Germany, Sep. 12, 1990, 901300 U
Int. Cl.[6] A01N *65/00;53/02;53/04;53/10*
U.S. Cl. 514—68 **16 Claims**

1. An insecticidal composition comprising from 0.001 to 10% by weight of at least one pyrethroid, an effective amount of at least one UV-absorbing agent and an effective amount of at least one antioxidant, wherein the antioxidant is at least one mono-to tri-ester of citric acid with alkyl alcohols having 1 to 8 carbon atoms.

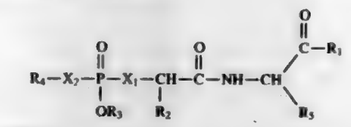
5,591,728

NEW PHOSPHONIC ACID COMPOUNDS

Guillaume de Nanteuil, Suresnes; Georges Remond, Versailles, and Tony Verbeuren, Vernouillet, all of France, assignors to Adir Et Compagnie, Courbevoie, France

Division of Ser. No. 267,971, Jun. 29, 1994, Pat. No. 5,481,030. This application Jul. 3, 1995, Ser. No. 497,811
Claims priority, application France, Jun. 30, 1993, 93 07927
Int. Cl.[6] A61K *31/675;31/66*
U.S. Cl. 514—80 **5 Claims**

1. A method for treating a mammal afflicted with a condition requiring an endothelin convertase inhibitor comprising the step of administering to the mammal an amount of a compound selected from those of formula (I):



(I)

in which:

R_1 represents hydroxyl, linear or branched (C_1–C_6) alkoxy, or amino which is unsubstituted or substituted with 1 or 2 linear or branched (C_1–C_6) alkyl,

R_2 represents linear or branched (C_1–C_6) alkyl, unsubstituted or substituted with phenyl or (C_3–C_7) cycloalkyl,

X_1 represents —NH—,

X_2 represents —O—,

R_3 represents hydrogen, linear or branched (C_1–C_6) alkyl, or phenyl,

R_4 represents linear or branched (C_1–C_6) alkyl which is substituted with one or more hydroxyl, benzyloxy, benzyloxycarbonylamino, amino linear or branched (C_1–C_6) mono- or dialkylamino, acetoxy, or 2,2-dimethyl-1,3-dioxolan-4-yl, such groups being identical or different,

R_5 represent 3-indolylmethyl, naphthylmethyl, linear or branched (C_1–C_6) alkyl, phenyl, or benzyl,

its enantiomers, diastereoisomers and epimers as well as its addition salts with a pharmaceutically-acceptable acid or base, which is effective for alleviation of said condition.

5,591,729

ARTHROPODICIDAL TETRAHYDROPYRIDAZINES

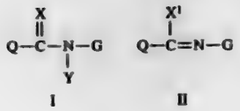
Charles R. Harrison, Newark; George P. Lahm, and Thomas M. Stevenson, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 945,965, Nov. 12, 1992, Pat. No. 5,308,718, which is a continuation-in-part of Ser. No. 570,183, Aug. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,697, May 15, 1990, abandoned. This application Jan. 4, 1995, Ser. No. 368,566

Int. Cl.[6] C07D *237/14*

U.S. Cl. 514—85 **9 Claims**

1. A compound selected from groups having Formulae I and II:

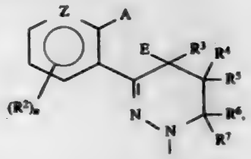


I

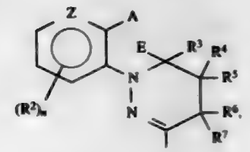
II

wherein:

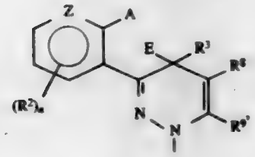
Q is selected from the group



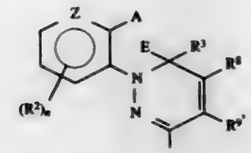
Q-1



Q-2

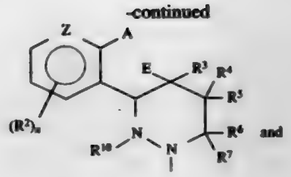


Q-3

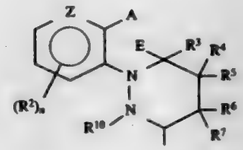


Q-4

-continued



Q-5 and

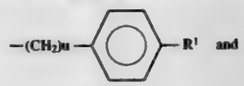


Q-6

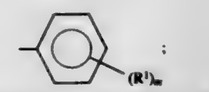
A is H;

E is selected from the group H and C_1–C_3 alkyl;

G is selected from the group



G-6 and



G-9;

X is selected from the group O, S and N-X^2;

X^1 is selected from the group Cl, Br, OR^{12}, SR^{12} and $NR^{12}R^{13}$;

X^2 is selected from the group R^{12}, OH, OR^{12}, CN, SO_2R^{12}, SO_2Ph, $OC(O)NR^{13}R^{14}$, $OC(O)OR^{12}$, $NR^{13}R^{14}$ and phenyl optionally substituted with R^{15};

Y is selected from the group H, C_1–C_6 alkyl, benzyl optionally substituted by a group selected from W, C_2–C_8 alkoxyalkyl, CHO, C_2–C_6 alkylcarbonyl, C_2–C_6 alkoxycarbonyl, C_2–C_6 haloalkylcarbonyl, C_1–C_6 alkylthio, C_1–C_6 haloalkylthio, phenylthio, $R^{16}OC(O)NR^{17}S$— and $R^{18}(R^{19})NS$—;

R^1 and R^2 are independently selected from the group H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, phenyl optionally substituted with 1 to 3 substituents independently selected from W, benzyl optionally substituted with 1 to 3 substituents independently selected from W, halogen, CN, N_3, SCN, NO_2, OR^{21}, SR^{21}, $S(O)R^{21}$, $S(O)_2R^{21}$, $OC(O)R^{21}$, $OS(O)_2R^{21}$, CO_2R^{21}, $C(O)R^{21}$, $C(O)NR^{21}R^{22}$, $SO_2NR^{21}R^{22}$, $NR^{21}R^{22}$, $NR^{22}C(O)R^{21}$, $OC(O)NHR^{21}$, $NR^{22}C(O)NHR^{21}$ and $NR^{22}SO_2R^{21}$; provided that when R^1, or R^2 is $S(O)R^{21}$, $S(O)_2R^{21}$, $OC(O)R^{21}$ or $OS(O)_2R^{21}$ then R^{21} is other than H;

R^3 is selected from the group H, N_3, NO_2, halogen, $N(R^{26})R^{27}$, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_8 alkoxyalkyl, C_3–C_8 alkoxycarbonylalkyl, CO_2R^{21}, OR^{23}, $C(O)R^{21}$, $C(O)NR^{21}R^{22}$, $C(S)NR^{21}R^{22}$, $C(S)R^{21}$, $C(S)SR^{21}$, CN, $Si(R^{32})$ $(R^{33})R^{31}$, $S(O)R^{31}$, SO_2R^{31}, $—P(O)(OR^{31})_2$, phenyl, phenyl substituted by $(R^{20})_p$, benzyl and benzyl substituted with 1 to 3 substituents independently selected from W; or R^3 is C_2–C_6 epoxyalkyl optionally substituted with a group selected from C_1–C_3 alkyl, CN, $C(O)R^{28}$, CO_2R^{28}, and phenyl optionally substituted with W, or R^3 is C_1–C_6 alkyl substituted with a group selected from $C(O)N(R^{29})R^{30}$, $C(O)R^{29}$, SR^{31}, $S(O)R^{31}$, SO_2R^{31}, SCN, halogen, CN, C_1–C_2 haloalkoxy, $Si(R^{32})$ $(R^{33})R^{31}$, $N(R^{26})R^{27}$, NO_2, and $OC(O)R^{29}$;

R^4 is selected from the group H, halogen, C_1–C_6 alkyl, CO_2R^{24}, phenyl, and phenyl substituted with a group selected from Cl, Br, F, CF_3, NO_2, OCF_3, OCF_2H or CN;

R^5 and R^7 are independently selected from the group H and C_1–C_2 alkyl;

R^6 is selected from the group H, C_1–C_6 alkyl, CO_2R^{24}, and phenyl optionally substituted with Cl, Br, F, CF_3, NO_2, OCF_3, OCF_2H or CN;

R^4 and R^5 can be taken together to form =O;

R^6 and R^7 can be taken together to form =O;

R^8 is selected from the group H and C_1–C_2 alkyl;

R^9 is selected from the group H, C_1–C_2 alkyl and C_1–C_2 alkylcarbonyl;

R^{10} is selected from the group H, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkylcarbonyl C_2–C_4 haloalkylcarbonyl, C_2–C_4 alkoxycarbonyl C_2–C_4 haloalkoxycarbonyl, C_2–C_5 alkylaminocarbonyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, C_4–C_7 alkylcycloalkyl, C_4–C_7 haloalkylcycloalkyl, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkylsulfonyl and SO_2Ph optionally substituted with Cl, Br or CH_3;

R^{12} is selected from the group C_1–C_3 alkyl, benzyl optionally substituted with a group selected from R^{15}, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_3 haloalkyl, C_2–C_4 haloalkenyl, C_3–C_6 cycloalkyl and C_1–C_3 alkyl substituted with OCH_3, OCH_2CH_3, NO_2, CN, CO_2CH_3, $CO_2CH_2CH_3$, SCH_3 or SCH_2CH_3;

R^{13} is selected from the group H, C_1–C_4 alkyl C_1–C_4 haloalkyl, C_2–C_4 alkoxycarbonyl, and phenyl optionally substituted with a group selected from R^{15}; or

R^{12} and R^{13} can be taken together to form $—(CH_2)_4—$ or $—(CH_2)_5—$ each of which is optionally substituted with 1 or 2 CH_3 groups;

R^{14} is selected from the group H and C_1–C_4 alkyl; or

R^{13} and R^{14} can be taken together to form $—(CH_2)_4—$ or $—(CH_2)_5—$ each of which is optionally substituted with 1 or 2 CH_3 groups;

R^{15} is selected from the group halogen, CN, C_1–C_3 haloalkyl and C_1–C_3 haloalkoxy;

R^{16} is C_1–C_6 alkyl;

R^{17} is C_1–C_4 alkyl;

R^{18} and R^{19} are independently C_1–C_4 alkyl; or

R^{18} and R^{19} can be taken together as $—CH_2CH_2CH_2CH_2CH_2—$;

R^{20} is selected from the group C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, phenyl optionally substituted with 1 to 3 substituents independently selected from W, benzyl optionally substituted with 1 to 3 substituents independently selected from W, halogen, CN, N_3, SCN, NO_2, OR^{21}, SR^{21}, $S(O)R^{21}$, $S(O)_2R_{21}$, $OC(O)R^{21}$, $OS(O)_2R^{21}$, CO_2R^{21}, $C(O)R^{21}$, $C(O)NR^{21}R^{22}$, $SO_2NR^{21}R^{22}$, $NR^{21}R^{22}$, $NR^{22}C(O)R^{21}$, $OC(O)NH^{21}$, $NR^{22}C(O)NHR^{21}$ and $NR^{22}SO_2R^{21}$; provided that when R^{20} is $S(O)R^{21}$, $S(O)_2R^{21}$, $OC(O)R^{21}$ or $OS(O)_2R^{21}$ then R^{21} is other than H;

R^{21} is selected from the group H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_3–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, and optionally substituted phenyl and benzyl wherein the substituents are 1 to 3 substituents independently selected from W;

R^{22} is selected from the group H and C_1–C_4 alkyl; or

R^{21} and R^{22}, when attached to the same atom, can be taken together as $—(CH_2)_4—$ or $—(CH_2)_5—$;

R^{23} is selected from the group H, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_2–C_4 alkylcarbonyl, C_2–C_4 alkoxycarbonyl and C_1–C_4 alkylsulfonyl;

R^{24} is C_1–C_3 alkyl;

R^{26} is selected from the group H, $C(O)C_1$–C_6 alkyl, CO_2C_1–C_6 alkyl, optionally substituted C_1–C_4 alkyl, optionally substituted C_2–C_4 alkenyl, and optionally substituted C_2–C_4 alkynyl, the substituents selected from C_1–C_2 alkoxy, CN, $C(O)R^{34}$ and CO_2R^{31};

R^{27} is selected from the group H, C_1–C_3 alkyl, phenyl, phenyl substituted with a group selected from W, benzyl and benzyl substituted with a group selected from W;

R^{28} is selected from the group H, C_1–C_4 alkyl, C_2–C_4 alkenyl and C_2–C_4 alkynyl;

R^{29} and R^{30} are independently selected from the group H and C_1–C_2 alkyl;

R^{31} is selected from the group C_1–C_3 alkyl, phenyl and pheayl substituted with a group selected from W;

R^{32} is C_1–C_3 alkyl;

R^{33} is C_1–C_3 alkyl;

R^{34} is selected from the group H, C_1–C_3 alkyl, pheayl and phenyl substituted with a group selected from W;

W is selected from the group halogen, CN, NO_2, C_1–C_2 alkyl, C_1–C_2 haloalkyl, C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio, C_1–C_2 alkylsulfonyl and C_1–C_2 haloalkylsulfonyl;

m is 1 to 3;

n is 1 to 3;

p is 1 to 3;

u is 1 or 2; and

Z is C

provided that when E and R^3 are both H, then X is other than S and R^1 is other than H.

5,591,730

INHIBITION OF URINARY CALCULI GROWTH

Marshall L. Stoller, and James S. Wolf, Jr., both of San Francisco, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Oct. 12, 1993, Ser. No. 134,564

Int. Cl.[6] A61K *31/66*

U.S. Cl. 514—108 **10 Claims**

1. A method of inhibiting the growth of urinary tract calculi in a patient, the method comprising administering to the patient a prophylactically effective amount of a pharmaceutical composition comprising a pharmaceutically acceptable carrier and a metal ion-bisphosphonate complex, wherein the metal can exist in at least a +2 oxidation state.

5,591,731

CRYSTALLINE AMIFOSTINE COMPOSITIONS

Paul E. Kennedy, Phoenixville, Pa.; Roger A. Rajewski, Lawrence, Kans., and John M. Baldoni, Glenmore, Pa., assignors to U.S. Bioscience, Inc., West Conshohocken, Pa.

Division of Ser. No. 99,298, Jul. 29, 1993, Pat. No. 5,424,471, which is a continuation-in-part of Ser. No. 922,929, Jul. 31, 1992, abandoned. This application Feb. 16, 1995, Ser. No. 389,386

Int. Cl.[6] A61K *31/66*; C07F *9/165*

U.S. Cl. 514—114 **37 Claims**

1. A dosage form of crystalline amifostine comprising thermally-stable, sterile, crystalline amifostine trihydrate exhibiting substantially the crystal structure having a space group of $P2_12_12_1$ and cell dimensions of about a=8.46 Å, b=21.55 Å and c=6.76 Å, which is suitable for reconstitution with a pharmaceutically acceptable vehicle into an injectable particulate-free drug product for parenteral administration to a subject.

14. A dosage form of crystalline amifostine comprising thermally-stable, sterile, crystalline amifostine, which is suitable for reconstitution with a pharmaceutically acceptable vehicle into an injectable particulate-free drug product for parenteral administration to a subject.

5,591,732

MEDICAMENT FOR INFLUENCING THE DEGREE OF ACTIVATION OF THE CENTRAL NERVOUS SYSTEM

Claudia Mattern, Enzianstrasse 4a, Starnberg D-82319, and Rudiger Hacker, Ledestrasse 2, Herrsching D-82211, both of Germany

PCT No. PCT/DE93/00473, § 371 Date Jun. 17, 1994, § 102(e) Date Jun. 17, 1994, PCT Pub. No. WO93/24128, PCT Pub. Date Dec. 9, 1993

PCT Filed May 28, 1993, Ser. No. 185,832

Claims priority, application Germany, Jun. 3, 1992, 42 18 292.1

Int. Cl.[6] A61K *31/56;31/68*

U.S. Cl. 514—170 4 Claims

1. A method of increasing psychophysiological capacity in a human by optimizing the degree of activation of the central nervous system, said method comprising a step of:

(a) administering to the human a medicament containing a therapeutically effective amount of mestanolone, 4-chloro-1-dehydromethyltestosterone, or a mixture thereof.

5,591,733

METHODS, COMPOSITIONS, AND COMPOUNDS FOR ALLOSTERIC MODULATION OF THE GABA RECEPTOR BY MEMBERS OF THE ANDROSTANE AND PREGNANE SERIES

Michael B. Bolger, Los Alamitos; Kelvin W. Gee, Irvine; Nancy C. Lan, South Pasadena; Robert H. Purdy, La Jolla; Seid Mirzadeghi, Rolling Hills, all of Calif.; Syed Hasan Tahir, Edmonton, Canada, and Delia Belelli, Kingsbarns by St. Andrews, Scotland, assignors to University of Southern California, Los Angeles, Calif.

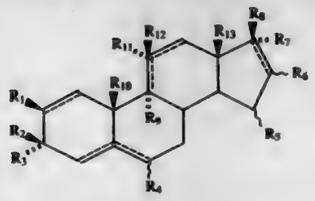
Continuation of Ser. No. 745,216, Aug. 13, 1991, Pat. No. 5,232,917, which is a continuation-in-part of Ser. No. 521,724, May 10, 1990, Pat. No. 5,120,723, which is a continuation-in-part of Ser. No. 379,847, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 89,362, Aug. 25, 1987, abandoned. This application Aug. 2, 1993, Ser. No. 101,497

The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.[6] C07J *9/00;21/00;43/00;* A61K *31/58;31/56*

U.S. Cl. 514—172 129 Claims

1. A method for modulating excitability of the central nervous system as mediated by the ability to regulate chloride ion channels associated with the GABA-benzodiazepine receptor complex comprising administering to an animal subject an amount, effective to modulate said central nervous system excitability, of a neuroactive steroid compound that activates the GABA-benzodiazepine receptor complex by attaching to a brain receptor site, of formula I:



wherein

A) R1, R4, R5, and R6 are individually selected from the group consisting of:

(1) hydrogen, hydroxyl, or thiol;

(2) pharmaceutically acceptable ether and thioether groups —Y—R14, wherein R14 is a C_1 halogenated or unhalogenated radical, a C_2–C_{10} saturated or unsaturated, halogenated or unhalogenated straight chain radical, a C_3–C_{10} saturated or unsaturated, halogenated or unhalogenated branched chain radial, a C_3–C_{10} cyclic aliphatic radical, a C_6–C_{10} aromatic radical, or a 4, 5, or 6 membered C- or N-attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms and Y is either a divalent oxygen or sulfur linkage;

(3) halogen atoms; and

(4) a C_1 halogenated or unhalogenated radical, C_2–C_8 saturated or unsaturated, halogenated or unhalogenated straight chain radicals, C_3–C_8 saturated or unsaturated, halogenated or unhalogenated branched chain radicals, or C_3–C_8 cyclic aliphatic radicals;

B) R2 is selected from the group consisting of

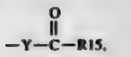
(1) hydrogen; and

(2) a C_1 halogenated or unhalogenated radical, C_2–C_4 saturated or unsaturated, halogenated or unhalogenated straight chain radicals, or C_3–C_4 saturated or unsaturated, halogenated or unhalogenated branched chain radicals;

C) R3 is selected from the group consisting of:

(1) hydroxyl or thiol;

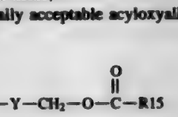
(2) pharmaceutically acceptable ester and thioester groups



wherein R15 is hydrogen or a C_1 halogenated or unhalogenated radical, a C_2–C_{20} saturated or unsaturated, halogenated or unhalogenated straight chain radical, a C_3–C_{20} saturated or unsaturated, halogenated or unhalogenated branched chain radical, a C_3–C_{10} cyclic aliphatic radical, a C_6–C_{10} aromatic radical, or a 4, 5, or 6 membered C- or N- attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms, and Y is as previously defined;

(3) pharmaceutically acceptable cleavable esters of natural or synthetic amino acids;

(4) pharmaceutically acceptable acyloxyalkyloxy or acyloxyalkylthio



radicals, wherein Y is R15 are as previously defined; and

(5) pharmaceutically acceptable esters or thioesters of the aforementioned hydroxyl or thiol groups with an acid selected from the group consisting of cinnamic, maleic, fumaric, ascorbic, pimelic, succinic, bismethylene-salicylic, methanesulfonic, ethanesulfonic, oxalic, tartaric, salicylic, acetyl salicylic, citric, gluconic, stearic, palmitic, itaconic, glycolic, p-aminobenzoic, benzenesulfonic, cyclohexylsulfamic, α-(2-hydroxyethylamino)-propionic, phosphoric, phosphonic, sulfuric, sulfonic, glucoronic, and 1-methyl-1,4-dihydro nicotinic;

D) R7 is selected from the group consisting of

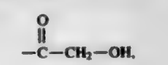
(1) hydrogen or hydroxyl; and

(2) a pharmaceutically acceptable C_1 halogenated or unhalogenated radical, C_2–C_4 saturated or unsaturated, halogenated or unhalogenated straight chain radicals, or C_3–C_4 saturated or unsaturated, halogenated or unhalogenated branched chain radicals;

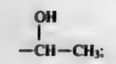
except when R8 is hydroxyl, R7 is not hydroxyl, and when the bond between carbons C16–C17 in formula I is a double bond, R7 is not present;

E) R8 is selected from the group consisting of:

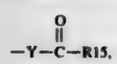
(1) hydroxyl, thiol, 2-hydroxyethanoyl



or 1-hydroxyethyl

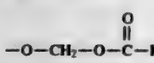


(2) pharmaceutically acceptable ester or thioester groups



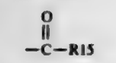
wherein Y and R15 are as previously defined;

(3) pharmaceutically acceptable



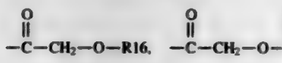
groups wherein R15 is as previously defined;

(4) pharmaceutically acceptable

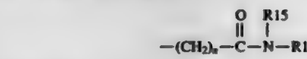


groups, wherein R15 is as previously defined;

(5) pharmaceutically acceptable

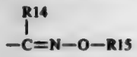


groups, wherein R16 is a C_1 halogenated or unhalogenated radical, a C_2–C_{10} saturated or unsaturated, halogenated or unhalogenated straight chain radical, a C_3–C_{10} saturated or unsaturated, halogenated or unhalogenated branched chain radical, a C_3–C_{10} cyclic aliphatic radical, a C_6–C_{10} aromatic radical, a 4, 5, or 6 membered C- or N-attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms, or an amide



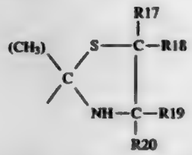
radical where n is 1–10, R15 is as previously defined, and each R15 is independently determined;

(6) pharmaceutically acceptable oxime



groups, where R14 and R15 are as previously defined;

(7) pharmaceutically acceptable thiazolidine derivatives having the formula:

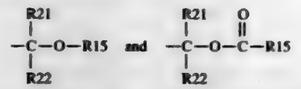


wherein any two or R17, R18, R19 and R20 are individually hydrogen or a C_1 halogenated or unhalogenated radical, a C_2–C_{10} saturated or unsaturated, halogenated or unhalogenated straight chain radical, a C_3–C_{10} saturated or unsaturated, halogenated or unhalogenated branched chain radical, a C_3–C_8 cyclic aliphatic radical, a C_6–C_8 aromatic radical, or a 4, 5, or 6 membered C- or N- attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms, and the remaining two of R17, R18, R19 and R20 are individually hydrogen; or one or more of R17, R18, R19, and R20 are individually



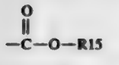
wherein R15 is as previously defined;

(8) pharmaceutically acceptable



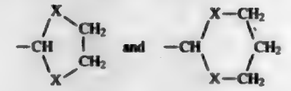
groups wherein one of R21 and R22 is hydrogen or methyl and the other is hydrogen or a C_1 halogenated or unhalogenated radical, a C_2–C_{10} saturated or unsaturated, halogenated or unhalogenated straight chain radical, a C_3–C_{10} saturated or unsaturated, halogeneated or unhalogenated branched chain radical, a C_3–C_{10} cyclic aliphatic radical, a C_6–C_{10} aromatic radical, or a 4, 5, or 6 membered C- or N- attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms, and R15 is as previously defined;

(9) pharmaceutically acceptable carboxylate



groups wherein R15 is as previously defined;

(10) pharmaceutically acceptable



groups wherein each X independently is oxygen, nitrogen, or sulfur;

(11) cyano —C≡N; and

(12) pharmaceutically acceptable esters of thioesters of the aforementioned hydroxyl or thiol groups with an acid selected from the group consisting of cinnamic, maleic, fumaric, ascorbic, pimelic, succinic, bismethylene-salicylic, methanesulfonic, ethanesulfonic, oxalic, tartaric, salicylic, acetyl salicylic, citric, gluconic, stearic, palmitic, itaconic, glycolic, p-aminobenzoic, benzenesulfonic, cyclohexylsulfamic, α-(2-hydroxyethylamino)-propionic, phosphoric, phosphonic, sulfuric, sulfonic, glucuronic, and 1-methyl-1,4-dihydro nicotinic;

or R7 and R8 combined are =CH—CH_3;

F) R9 is selected from the group consisting of

(1) hydrogen; and

(2) C_1–C_6 alkyl, halo-, dihalo-, and trihaloalkyl, or C_6 aryl, halo-, dihalo-, and trihaloaryl, except if the bond between carbons C9–C11 in formula I is a double bond, then R9 is not present;

G) R10 and R13 are individually selected from the group consisting of

(1) hydrogen; and

(2) C_1–C_6 alkyl, halo-, dihalo-, and trihaloalkyl, or C_6 aryl, halo-, dihalo-, and trihaloaryl; and

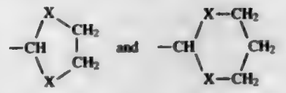
H) one of R11 and R12 is hydrogen, and the other is selected from the group consisting of

(1) hydrogen, hydroxyl, or thiol;

(2) C_1–C_{10} alkyloxy and alkylthio radicals, C_6–C_{10} aryloxy and arylthio radicals, or amino radicals;

(3) a C_1 halogenated or unhalogenated radical, C_2–C_{10} saturated or unsaturated, halogenated or unhalogenated straight chain radicals, C_3–C_{10} saturated or unsaturated, halogenated or unhalogenated branched chain radicals, C_3–C_{10} cyclic aliphatic radicals, C_5–C_{10} aromatic radicals, or a 4, 5, or 6 membered C- or N- attached heterocyclic radical containing 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, nitrogen, and sulfur, excluding heterocyclic radicals with two or more adjacent O or S atoms; and

(4) pharmaceutically acceptable



groups wherein each X independently is as previously defined; or together R11 and R12 make a double bond to oxygen or sulfur to form the ketone or thioketone; except if the bond between carbons C9–C11 or C11–C12 in formula I is a double bond, then R12 is not present.

5,591,734

17-(3-FURYL)-5β, 14β-ANDROSTANE DERIVATIVES ACTIVE ON THE CARDIOVASCULAR SYSTEM, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Luisa Quadri, Cernusco; Luigi Bernardi; Giuseppe Bianchi, both of Milan; Patrizia Ferrari, Varese; Piero Melloni, Bresso, and Loredana Valentino, Buccinasco, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

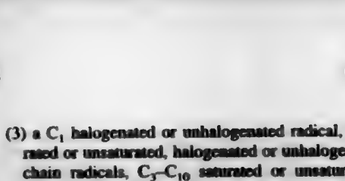
Filed Aug. 16, 1993, Ser. No. 106,893

Claims priority, application Germany, Aug. 20, 1992, 42 27 616.0

Int. Cl.[6] A61K *31/58*

U.S. Cl. 514—172 **4 Claims**

1. A 17-(3-furyl)-5β,14β-androstane derivative of formula (I):



wherein:

the symbol ~ means that the substituents in position can have an α or β configuration;

the symbol ⋯ represents a single or double bond;

Y is oxygen or guanidinoimino, when ⋯ in position 3 is a double bond;

Y is hydroxy, OR^4 or SR^4, when ⋯ in position 3 is a single bond and can have an α or β configuration;

R is a 3-furyl group;

R^1 is hydrogen; methyl; ethyl or n-propyl substituted by OH or NR^5R^6;

R^2 is hydrogen or together to R^3 is a bond of an oxirane ring;

R^4 is hydrogen or together to R^2 is a bond of an oxirane ring;

R^4 is hydrogen; methyl; C_2-C_6 alkyl or C_3-C_6 alkenyl or C_2-C_6 acyl, these alkyl, alkenyl and acyl groups being unsubstituted or substituted by a quaternary ammonium group or one or more OR^7, NR^8R^9, formyl, amidino, guanidinoimino or by NR^8R^9 and hydroxy;

R^5, R^6 are independently hydrogen; methyl; C_2-C_6 alkyl unsubstituted or substituted by one $NR^{10}R^{11}$, or $NR^{10}R^{11}$ and hydroxy, or R^5 and R^6 taken together with the nitrogen atom form a saturated or unsaturated penta- or hexa-monoheterocyclic ring, optionally containing another heteroatom chosen from oxygen or sulfur or nitrogen;

R^7 is hydrogen, methyl or C_2-C_4 alkyl, this alkyl being unsubstituted or substituted by one or more $NR^{10}R^{11}$ or by $NR^{10}R^{11}$ and hydroxy;

R^8, R^9 are independently hydrogen; methyl; C_2-C_6 alkyl or C_3-C_6 alkenyl, these alkyl and alkenyl groups being unsubstituted or substituted by one or more $NR^{10}R^{11}$, or $NR^{10}R^{11}$ and hydroxy, or R^8 and R^9 taken together with the nitrogen atom form a saturated or unsaturated penta- or hexa-monoheterocyclic ring, optionally containing another heteroatom chosen from oxygen or sulfur or nitrogen, or R^8 is hydrogen and R^9 is amidino;

R^{10}, R^{11} are independently hydrogen, C_1-C_6 alkyl, or R^{10} and R^{11}, taken together with the nitrogen atom form a saturated or unsaturated penta- or hexa-monoheterocyclic ring, including all of the possible stereoisomers, in particular Z and E isomers, optical isomers and their mixtures and the metabolites and the metabolic precursors of the compounds of formula (I).

5,591,735

ANDROSTANE DERIVATIVES SUBSTITUTED BY A QUATERNARY AMMONIUM GROUP IN 16-POSITION, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PROCESS FOR PREPARING SAME

Zoltan Tuba; E. Szilveszter Vizi, both of Budapest, Hungary; Francis F. Foldes, Key Biscayne, Fla., and Sandor Maho, Budapest, Hungary, assignors to Marvishi Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 27, 1993, Ser. No. 141,535

Claims priority, application Hungary, Nov. 2, 1992, P9203436

Int. Cl.[6] C07J *43/00*; A61K *31/58*

U.S. Cl. 514—172 **8 Claims**

1. A compound, selected from the group consisting of:

1-[17β-acetyloxy-2β-(1,4-dioxa-8-azaspiro[4.5]dec-8-yl)-3α-hydroxy-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide;

1-[3α,17β-bis(acetyloxy)-2β-(1,4-dioxa-8-azaspiro[4.5]-dec-8-yl)-5α-androstan-16β-yl]-1-methylpyrrolidinium bromide;

1-[3α,17β-bis(acetyloxy)-2β-(1,4-dioxa-8-azaspiro[4.5]-dec-8-yl)-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide;

1-[17β-acetyloxy-3α-hydroxy-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methylpyrrolidinium bromide;

1-[17β-acetyloxy-3α-hydroxy-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide;

1-[3α,17β-bis(acetyloxy)-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide;

1-[3α,17β-bis(acetyloxy)-2β-(4-acetyloxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methylpyrrolidinium bromide;

1-[17β-(acetyloxy)-3α-hydroxy-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methylpiperidinium bromide;

1-[3α,17β-bis(acetyloxy)-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methylpiperidinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(1,4-dioxa-8-azaspiro[4.5]-dec-8-yl)-5α-androstan-16β-yl]-1,1-dimethylpiperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(1,4-dioxa-8-azaspiro[4.5]-dec-8-yl)-5α-androstan-16β-yl]-1-methyl-1-(2-propenyl)piperazinium bromide;

4-[17β-acetyloxy-3α-hydroxy-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1,1-dimethylpiperazinium bromide;

4-[17β-acetyloxy-3α-hydroxy-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methyl-1-(2-propenyl)piperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-oxo-1-piperidinyl)-5α-androstan-16β-yl]-1,1-dimethylpiperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-oxo-1-piperidinyl)-5α-androstan-16β-yl]-1-methyl-1-(2-propenyl)piperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-hydroxy-1-piperidinyl)-5α-androstan-16β-yl]-1,1-dimethylpiperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-hydroxy-1-piperidinyl)-5α-androstan- 16β-yl]-1-methyl-(2-propenyl)piperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-acetyloxy-1-piperidinyl)-5α-androstan-16β-yl]-1,1-dimethylpiperazinium bromide;

4-[3α,17β-bis(acetyloxy)-2β-(4-acetyloxy-1-piperidinyl)-5α-androstan-16β-yl]-1-methyl-1-(2-propenyl)piperazinium bromide;

8-[3α,17β-bis(acetyloxy)-2β-(1-piperidinyl)-5α-androstan-16β-yl]-8-methyl-1,4-dioxa-8-azoniaspiro[4.5]decane bromide;

8-[3α,17β-bis(acetyloxy)-2β-(4-acetyloxy-1-piperidinyl)-5α-androstan-16β-yl]-8-methyl-1,4-dioxa-8-azoniaspiro[4.5]-decane bromide;

4-acetyloxy-1-[3α,17β-bis(acetyloxy)-2β-(4-acetyloxy-1-piperidinyl)- 5α-androstan-16β-yl]-1-methylpiperidinium bromide;

1-[3α-acetyloxy-2β-(1,4-dioxa-8-azaspiro[4.5]dec-8-yl)-17β-hydroxy-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide; and

1-[3α,17β-dihydroxy-2β-(1,4-dioxa-8-azaspiro[4.5]dec-8-yl)-5α-androstan-16β-yl]-1-(2-propenyl)pyrrolidinium bromide.

5,591,736

METHOD OF RETARDING THE PROGRESSION OF CHRONIC RENAL FAILURE

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 3, 1995, Ser. No. 497,958

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—178 **12 Claims**

1. A method of retarding the progression of chronic renal failure in human beings comprising administering to a human suffering from chronic renal failure an effective amount of dehydroepiandrosterone (DHEA).

5,591,737

SUBSTITUTED AZETIDINONES AS ANTI-INFLAMMATORY AND ANTIDEGENERATIVE AGENTS

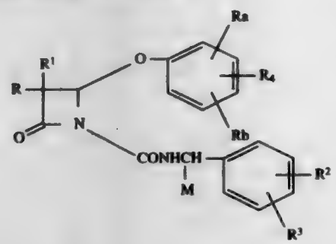
James B. Doherty, Montvale; Conrad P. Dorn, Plainfield; Philippe L. Durette, New Providence; Paul E. Finke, Milltown; Malcolm Maccoss, Freehold; Sander G. Mills, Woodbridge; Shrenik K. Shah, Metuchen; Soumya P. Sahoo, Old Bridge; Jeffrey J. Hale, Westfield; Thomas J. Lanza, Edison, and William K. Hagmann, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 991,838, Dec. 17, 1992, abandoned. This application Dec. 16, 1993, Ser. No. 168,903

Int. Cl.[6] C07D *205/08*; *405/12*; A61K *31/395*; *31/535*

U.S. Cl. 514—210 **31 Claims**

1. A compound of Formula (I):



or a pharmaceutically acceptable salt thereof wherein:

R is C_1-$_6$alkyl;

R^1 is C_1-$_6$alkyl or C_1-$_6$alkoxy-C_1-$_6$alkyl;

M is

(1) hydrogen,

(2) C_1-$_6$alkyl,

(3) hydroxy C_1-$_6$alkyl,

(4) halo C_1-$_6$alkyl,

(5) C_2-$_6$alkenyl, or

(6) C_1-$_6$alkoxy-C_1-$_6$alkyl;

Ra and Rb are each individually

(1) hydrogen,

(2) C_1-$_6$alkyl,

(3) halo,

(4) carboxy,

(5) C_1-$_6$alkoxy,

(6) phenyl,

(7) C_1-$_6$alkylcarbonyl,

(8) di-(C_1-$_6$alkyl)amino;

(9) hydroxy;

R^2 and R^3 are each independently

(1) hydrogen,

(2) C_1-$_6$alkyl,

(3) halo,

(4) C_1-$_6$alkoxy,

(5) phenyl,

(6) C_1-$_6$alkylcarbonyl,

(7) aminoC_2-$_3$alkyloxy carbonyl wherein the amino is optionally mono or di substituted with C_1-$_6$alkyl,

(8) aminoC_2-$_3$alkylamino carbonyl wherein the amino is optionally mono or di substituted with C_1-$_6$alkyl,

(9) hydroxy,

(10) aminocarbonyl wherein the amino is optionally mono or di substituted with C_1-$_6$alkyl,

(11) hydroxymethyl,

(12) aminocarbonyloxy C_1-$_3$alkyl, wherein the amino is optionally mono or di substituted with C_1-$_6$alkyl,

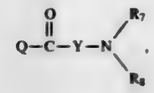
(13) cyano,

(14) morpholinocarbonylphenyl,

(15) amino wherein the amino is optionally mono or di substituted with C_1-$_6$alkyl, or

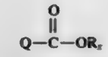
(16) morpholinocarbonyl, with the proviso that R^2 and R^3 may be joined together to form a methylenedioxy group or a furan ring,

R_4 is (a)



(b)

or



where R_x is carboxy C_1-$_6$alkyl, benzyloxycarbonylC_1-$_3$alkyl, or t-butoxycarbonylC_1-$_3$alkyl,

wherein

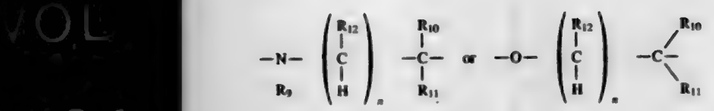
Q is a covalent bond, or



wherein

R^5 and R^6 are each individually C_1-$_3$alkyl or hydrogen.

Y is



R_{12} is hydrogen or C_{1-3}alkyl;
R_7 and R_8 are each individually
(a) hydrogen,
(b) C_{1-6}alkyl,
(c) C_{1-6}alkyloxy C_{2-3}alkyl,
(d) hydroxy C_{2-6}alkyl,
(e) polyhydroxyC_{2-6}alkyl,
(f) carboxamido C_{1-6}alkyl,
(g) C_{1-6}alkanoyl,
(h) substituted phenyl or phenyl C_{1-6}alkyl, wherein the substituents are X_1 and X_2 as defined immediately below,
(i) C_{2-6}alkenyl,
(j) C_{5-10}cycloalkenyl,
(k) heteroaryl C_{1-6}alkyl wherein the hetero aryl is selected from pyridinyl, imidazolyl, triazolyl, benzylimidazolyl, and furyl,
(l) carboxy C_{1-6}alkyl,
(m) carbo C_{1-6}alkoxy C_{1-3}alkyl,
(n) phenylsulfonyl,
(o) C_{1-6}alkylsulfonyl,
(p) benzyloxy,
(q) morpholinyl C_{1-3}alkylsulfonyl,
(r) tetrahydropyranyl,
(s) aminoC_{1-3}alkylsulfonyl wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(t) aminocarbonyl wherein the amino is optionally mono or disubstituted with C_{1-6}alkyl,
(u) aminocarbonyloxyC_{2-6}alkyl wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(v) azabicyclo of 7 to 12 atoms,
(w) di C_{1-3}alkylamino C_{2-6}alkyl wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(x) bicycloalkyl of 7 to 12 atoms,
(y) C_{3-10}cycloalkyl optionally substituted with C_{1-6}alkyl,
(z) pyrazolidinyl,
(aa) substituted piperidinyl or pyrrolidinyl wherein the substitutent is hydrogen, C_{1-3}alkyl, hydroxy C_{1-3}alkylbenzyl, carboxamido or amino wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(bb) substituted pyrrolidinyl wherein the substitutent is carboxamido or amino wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(cc) pyrimidinyl,
(dd) phosphonoC_{1-6}alkyl, or
(ee) α-C_{1-3}alkyl benzyl or mono or di substituted benzyl or mono or di substituted pyridylmethyl, wherein the substitutents are X_1 and X_2,

wherein
X_1 is
(1) hydrogen,
(2) halo,
(3) C_{1-6}alkyl,
(4) halo-C_{1-6}alkyl,
(5) C_{2-6}alkenyl,
(6) hydroxy-C_{1-6}alkyl,
(7) C_{1-6}alkylcarbonyl,
(8) C_{1-6}alkylcarbonylamino,
(9) CN,
(10) CF_3,
(11) CH_3O,
(12) amino wherein the amino is optionally mono or di substituted with C_{1-6}alkyl,
(13) carboxy, or
(14) phenylsulfonylaminocarbonyl;
X_2 is hydrogen, halo or C_{1-6}alkyl;
n is 1, 2, 3, 4 or 5;
R^9 is selected from hydrogen, C_{1-6}alkyl, and C_{1-3}alkoxyC_{2-3}alkyl; or phenyl, phenyl C_{1-3}alkyl, pyridyl, and pyridyl C_{1-3}alkyl; R_{10} and R_{11} are each independently selected from hydrogen, C_{1-6}alkyl, and C_{1-3}alkoxy C_{1-3}alkyl, or are together O═; or
wherein
R_7 and R_8 are joined together with the nitrogen to which they are attached to form mono or di substituted ring selected from
(1) piperidinyl or homopiperdinyl,
(2) piperazinyl,
(3) morpholinyl, thiomorpholinyl or 1,1-dioxo-4-thiomorpholinyl,
(4) pyrroylidinyl,
(5) pyrryl,
(6) imidazolyl,
(7) triazolyl,
(8) saturated azabicyclo of 7 to 12 atoms,
(9) azaspiro having 3 to 9 carbon atoms, said ring being saturated,
(10) tetrazolyl,
(11) pyrazolidinyl,
(12) azetidinyl, or
(13) diazabicyclo ring of 7–12 atoms,
wherein the substitutents are each selected from the group consisting of hydrogen and C_{1-3}alkyl, benzyloxycarbonyl,phenyl C_{1-3}alkyl amino carbonyl, hydroxy C_{1-3}alkyl, C_{1-6}alkyloxy, C_{1-4}alkyloxy carbonyl, aminocarbonyl wherein the amino is optionally mono or di substituted with
C_{1-6}alkyl, and oxo; or
—N(R7)R8 is
—NH—$(CH_2)_3$—C(H)(NH_2)—C(O)OH, or
NH_2—$(CH_2)_3$—C(H)(NH)—C(O)OH;
R_8 and R_9 are joined together to form a mono or di substituted saturated monocyclic ring of 6 to 7 atoms and having two hetero atoms which are the nitrogens to which R_8 and R_9 are attached; or R_9 and R_{10} are joined together to form a mono or di substituted monocyclic saturated ring of 5 to 7 atoms and having one hetero atom which is the nitrogen to which R_9 is attached; or wherein R_9 and R_{12} are joined together to form a mono or di substituted saturated monocyclic ring of 5, 6, or 7 atoms, said ring having one hetero atom which is the nitrogen to which R_9 is attached; or
wherein R_{10} and R_{12} are joined together with the carbons to which they are attached to form a mono or di substituted saturated monocyclic ring of 5, 6, or 7 carbon atoms; or
wherein R_8 and R_{11} are joined together to form a mono or di substituted saturated monocyclic ring of 5, 6, or 7 atoms, said ring having one hetero atom which is the nitrogen to which R_8 is attached, and the substituents are independently selected from hydrogen and C_{1-3} alkyl.

23. A pharmaceutical composition for the inhibition of human leukocyte elastase which comprises a nontoxic therapeutically effective amount of a compound which is
[S-(R*,S*)]-2-[4-[[4-methylpiperazin-1-yl]carbonyl]phenoxy]-3,3-diethyl-N-[1-(3,4-methylenedioxyphenyl)butyl]-4-oxo-1-azetidinecarboxamide or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

5,591,738

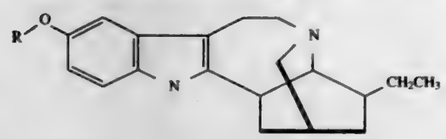
METHOD OF TREATING CHEMICAL DEPENDENCY USING β-CARBOLINE ALKALOIDS, DERIVATIVES AND SALTS THEREOF

Howard S. Lotsof, Staten Island, N.Y., assignee to NDA International, Inc., Staten Island, N.Y.

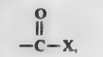
Filed Oct. 14, 1994, Ser. No. 322,490
Int. Cl.[6] A61K *31/55;31/44*
U.S. Cl. 514—214 **9 Claims**

1. A pharmaceutical composition for treating a chemical dependency disorder, an abuse syndrome or a combination thereof in a mammal, which comprises as an active ingredient an effective amount of:

a) a first compound, comprising a β-carboline alkaloid, hydrolyzable derivative thereof or a pharmaceutically acceptable salt thereof or mixture thereof; and
b) a second compound selected from the group consisting of a noribogaine compound of the formula:

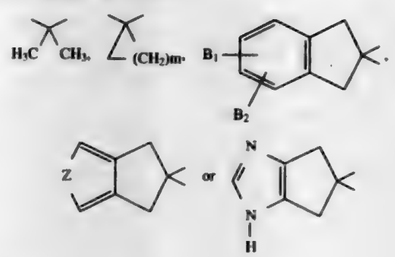


wherein R is hydrogen or a group of the formula



wherein X is an unsubstituted C_1–C_{12} group or a C_1–C_{12} group which is substituted by lower alkyl or lower alkoxy groups, and a pharmaceutically acceptable salt thereof.

Q is a group of the formula



wherein
Z is O, NH or S; and
m is an integer 1 to 5.

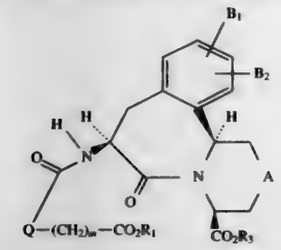
5,591,739

2-SUBSTITUTED INDANE-2-CARBOXYALKYL DERIVATIVES USEFUL AS INHIBITORS OF ENKEPHALINASE AND ACE

Alan M. Warshawsky, and Gary A. Flynn, both of Cincinnati, Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 163,235, Dec. 6, 1993, Pat. No. 5,457,196, which is a continuation-in-part of Ser. No. 129,484, Sep. 29, 1993, abandoned, which is a continuation of Ser. No. 929,482, Aug. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 767,289, Sep. 27, 1992, abandoned. This application Apr. 17, 1995, Ser. No. 423,675
Int. Cl.[6] A61K *31/55*
U.S. Cl. 514—214 **11 Claims**

1. A method of inhibiting enkephalinase in a patient in need thereof comprising administering to said patient an effective enkephalinase inhibitory amount of a compound of the formula



wherein
B_1 and B_2 are each independently hydrogen; hydroxy; —OR_2 wherein R_2 is a C_1–C_4 alkyl or an Ar—Y group wherein Ar is aryl and Y is a hydrogen or C_1–C_6 alkyl; or, where B_1 and B_2 are attached to adjacent carbon atoms, B_1 and B_2 can be taken together with said adjacent carbons to form a benzene ring or methylenedioxy;
A is a bond, methylene, oxygen, sulfur, NR_4 or $NCOR_5$ wherein R_4 is hydrogen, a C_1–C_4 alkyl or an Ar—Y— group and R_5 is —CF_3 or a C_1–C_{10} alkyl or an Ar—Y group;
R_3 is hydrogen or —$CH_2OC(O)C(CH_3)_3$;
R_1 is hydrogen, C_1–C_4 alkyl, or —$CH_2OC(O)C(CH_3)_3$;
m is an integer 1 to 3; and

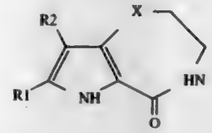
5,591,740

USE OF DEBROMOHYMENIALDISINE FOR TREATING OSTEOARTHRITIS

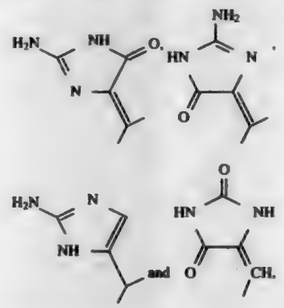
Stewart Chipman, Reading, Mass., and David J. Faulkner, La Jolla, Calif., assignors to OsteoArthritis Sciences, Incorporated, Cambridge, Mass., and The Reagents of the University of California, Oakland, Calif.

Filed Jun. 7, 1995, Ser. No. 472,902
Int. Cl.[6] A61K *31/55*
U.S. Cl. 514—215 **12 Claims**

1. A method of treating an individual or animal with osteoarthritis, comprising administering to the individual a composition comprising a therapeutically effective amount of a compound having the following structure:



wherein R1 and R2 are each independently selected from the group consisting of -H and a halogen; and
wherein X is selected from the group consisting of:



and physiologically active salts thereof.

VOL 1194 ISS JA 1997 UMI

5,591,741

FUNGICIDAL SPIROHETEROCYCLIC DERIVATIVES

Waldemar F. A. Pfrengle, Selbersbach, Germany, assignor to American Cyanamid Company, Madison, N.J.

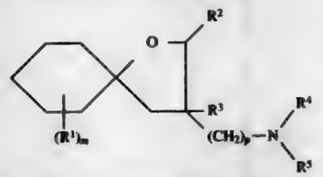
Filed Jul. 21, 1994, Ser. No. 278,447

Claims priority, application European Pat. Off., Jul. 22, 1993, 93111733

Int. Cl.[6] C07D 307/94;413/04;405/04; A61K 31/34

U.S. Cl. 514—231.5 10 Claims

1. A compound of the general formula I,



I

or an acid-addition salt thereof, in which

R^1 or each R^1 independently represents an optionally substituted alkyl, an optionally substituted cycloalkyl, an optionally substituted cycloalkylalkyl, an optionally substituted alkoxy, an optionally substituted cycloalkoxy, an optionally substituted alkoxyalkyl, an optionally substituted aralkyl, an optionally substituted aryl or an optionally substituted aryloxy group, or R^1 or each R^1, together with the ring to which they are attached, represents an optionally substituted polycyclic hydrocarbyl group,

R^2 represents a hydrogen atom or a C_{1-14} alkyl group,

R^3 represents a hydrogen atom, a hydroxy group or an optionally substituted alkoxy or an optionally substituted acyloxy group,

R^4 and R^5 each independently represents a hydrogen atom, an optionally substituted alkyl, an optionally substituted alkenyl, an optionally substituted alkynyl, an optionally substituted cycloalkylalkyl, an optionally substituted cycloalkyl, an optionally substituted bicycloalkyl, an optionally substituted tricycloalkyl, an optionally substituted alkoxyalkyl, an optionally substituted aryl, an optionally substituted aralkyl, an optionally substituted 4- to 6-membered heterocyclyl, an optionally substituted tetrahydrofurfuryl or an optionally substituted dioxolanyl group, or R^4 and R^5 together represent an optionally substituted, saturated or unsaturated carbon chain which may optionally contain one or more oxygen atoms and which may optionally be aryl- or cycloalkyl fused,

m represents zero or an integer from 1 to 6, and

p represents zero.

5,591,742

PYRIDOPYRIMIDINONE ANTIANGINAL AGENTS

Andrew S. Bell, and Nicholas K. Terrett, both of Sandwich, United Kingdom, assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP93/02897, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO94/05661, PCT Pub. Date Mar. 17, 1994

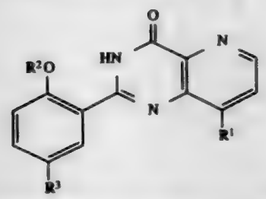
PCT Filed Aug. 4, 1993, Ser. No. 379,531

Claims priority, application United Kingdom, Aug. 28, 1992, 9218322

Int. Cl.[6] A61K 31/535;31/435; C07D 413/14;487/02

U.S. Cl. 514—234.5 9 Claims

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof,

wherein R^1 is H, C_1–C_4 alkyl, CN or $CONR^4R^5$;

R^2 is C_2–C_4 alkyl;

R^3 is $SO_2NR^6R^7$, NO_2, N_2, $NHCOR^8$, $NHSO_2R^8$ or $N(SO_2R^8)_2$;

R^4 and R^5 are each independently selected from H and C_1–C_4 alkyl;

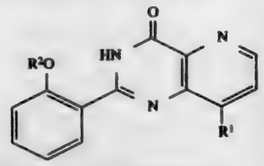
R^6 and R^7 are each independently selected from H and C_1–C_4 alkyl optionally substituted with CO_2R^9, OH, pyridyl, 5-isoxazolin-3-onyl, morpholino or 1-imidazolidin-2-onyl; or together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, morpholino, 1-pyrazolyl or 4-(NR^{10})-1-piperazinyl group wherein any of said groups may optionally be substituted with one or two substituents selected from C_1–C_4 alkyl, CO_2R^9, NH_2 and OH;

R^8 is C_1–C_4 alkyl or pyridyl;

R^9 is H or C_1–C_4 alkyl;

and R^{10} is H, C_1–C_4 alkyl or (hydroxy)C_2–C_3 alkyl.

9. A compoiund of formula (II):



(II)

wherein R^1 is CN or $CONR^4R^5$;

R^2 is C_2–C_4alkyl; and

$R^4$and R^5 are each independently selected from H and C_1–C_4 alkyl.

5,591,743

3,5-DIOXO-(2H,4H)-1,2,4-TRIAZINE DERIVATIVES AS $5HT_{1A}$ LIGANDS

Jean-Francois Patoiseau, Castres; Francoise Couret, Cerranac; Christian Faure, Toulouse; Elizabeth Dupont-Passelaigue, Castres, and Wouter Koek, Viviers-les-Montagnes, all of France, assignors to Pierre Fabre Medicament, Castres, France

PCT No. PCT/FR94/00772, § 371 Date Mar. 26, 1996, § 102(e) Date Mar. 26, 1996, PCT Pub. No. WO95/01965, PCT Pub. Date Jan. 19, 1995

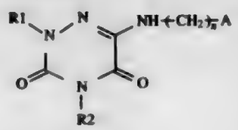
PCT Filed Jun. 27, 1994, Ser. No. 578,522

Claims priority, application France, Jul. 6, 1993, 93 08259

Int. Cl.[6] C07D 253/075; A01N 43/707

U.S. Cl. 514—242 12 Claims

1. A 3,5-dioxo-(2H,4H)-1,2,4-triazine compound selected from those of formula I



I

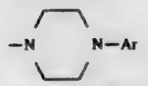
in which:

R_1 and R_2, which are identical or different, represent hydrogen or C_1–C_6 alkyl,

n is 2 to 6, inclusive,

A represents

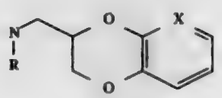
aryl piperazino



II

the Ar grouping representing phenyl, naphthyl, pyrimidyl, or pyridyl, unsubstituted or substituted by C_1–C_3 alkyl, C_1–C_3 alkoxy, hydroxy, trifluoromethyl, or halogen, or

benzodioxanyl-methyl-amino or pyridodioxanyl-methylamino



III

in which R represents hydrogen or C_1–C_3 alkyl and X represents a nitrogen or carbon atom,

and the therapeutically-acceptable organic or inorganic salts of these molecules and the enantiomers of those having an asymmetric carbon.

5,591,744

BENZOHETEROCYCLIC COMPOUNDS

Hiraki Ueda, Mishima; Hisashi Miyamoto; Hiroshi Yamashita, both of Tokushima, and Hitoshi Tone, Itano, all of Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo-to, Japan

Filed Apr. 8, 1988, Ser. No. 179,300

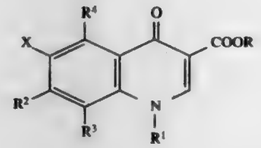
Claims priority, application Japan, Apr. 16, 1987, 62-94198; Apr. 24, 1987, 62-102351; Apr. 30, 1987, 62-108361; May 22, 1987, 62-126596; Jun. 16, 1987, 62-149544; Jul. 14, 1987, 62-176126; Nov. 9, 1987, 62-283776; Nov. 12, 1987, 62-287108

The portion of the term of this patent subsequent to Apr. 8, 2008, has been disclaimed.

Int. Cl.[6] A61K 31/47; C07D 401/04

U.S. Cl. 514—252 37 Claims

1. A compound of the formula:



wherein R^1 is a cyclopropyl which may be substituted by 1 to 3 of substituents selected from the group consisting of a C_1–C_6 alkyl and a halogen atom; a phenyl which may be substituted by 1 to 3 of substituents selected from the group consisting of a C_1–C_6 alkoxy, a halogen atom and hydroxy on phenyl ring; a C_1–C_6 alkyl which may be substituted by a halogen atom, a C_1–C_6 alkanoyloxy or hydroxy; a C_2–C_6 alkenyl; or thienyl,

R^2 is a 1-piperazinyl group which may have 1 to 3 substituents selected from the group consisting of a C_1–C_6 alkyl group, and a 2-oxo-1,3-dioxolenemethyl group which may be substituted by phenyl group or a C_1–C_6 alkyl group,

R^3 is a C_1–C_6 alkyl, or a halogen atom,

R^4 is a C_1–C_6 alkyl,

R is hydrogen atom or a C_1–C_6 alkyl, and

X is a halogan atom, or a pharmaceutically acceptable salt thereof.

5,591,745

(4-HETEROARYL)-1-[(2,3-DIHYDRO-1H-ISOINDOL-2-YL)ALKYL] PIPERIDINES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

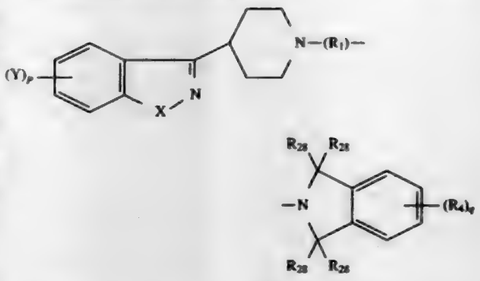
Joseph T. Strupczewski, Flemington; Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station, all of N.J.; Kenneth J. Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, and John J. Tegeler, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,365

Int. Cl.[6] A61K 31/495;31/55;31/505;31/44; C07D 401/00;403/00;417/00;419/00, 221/04;275/04;239/02

U.S. Cl. 514—254 28 Claims

1. A compound of the formula:



wherein, X is —O—, —S—, —NH—, or —$N(R_2)$—;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenysulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—$(CR_{23}R_{24})_n$—$CR_{24}R_{27}$— where n is 0, 1, 2, or 3; or

—CHR_{24}—CH═CH—CHR_{24}—,

—CHR_{24}—C≡C—CHR_{24}—,

—CHR_{24}—CH═CH—$CR_{23}R_{24}$—CHR_{24}—,

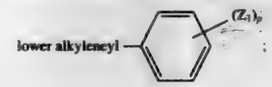
—CHR_{24}—$CR_{23}R_{24}$—CH═CH—CHR_{24}—,

—CHR_{24}—C≡C—$CR_{23}R_{24}$—CHR_{24}—, or

—CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24}—,

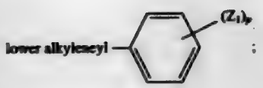
the —CH═CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18}) alkoxy, aryloxy, aryl (C_1–C_{18}) alkyloxy, (C_1–C_{18}) alkanoyloxy, hydroxy (C_1–C_6) alkyl, (C_1–C_{18}) alkoxy (C_1–C_6) alkyl, phenyl (C_1–C_6) alkoxy, aryl (C_1–C_{18}) alkyloxy (C_1–C_6) alkyl, (C_1–C_{18}) alkanoyloxy (C_1–C_6) alkyl, or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined; and

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy (C_1–C_6) alkyl, (C_1–C_{18}) alkoxy (C_1–C_6) alkyl, phenyl (C_1–C_6) alkyloxy, aryl (C_1–C_{18}) alkyloxy (C_1–C_6) alkyl, (C_1–C_{18}) alkanoyloxy (C_1–C_6)alkyl, or

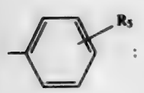


where Z_1 is as previously defined, and p is as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(=O)—(C_1–C_{18} straight or branched chain) alkyl or —C(=O)—aryl;

aryl is phenyl or



where R_5 is hydrogen, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

q is 1, 2, 3, or 4; and

R_{28} is hydrogen, (C_1–C_6) alkyl, aryl (C_1–C_6) alkyl, phenyl, or substituted phenyl, where aryl is as defined above and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_6–C_{18}) carboxylic group, in addition, any C_{18}) alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof;

or a pharmaceutically acceptable acid addition salt thereof.

5,591,746

TREATMENT OF DAMAGE FROM A STROKE USING 4-AMINO(4-METHYLIMPERAZIN-1-YL)-5-(2,3,5-TRICHLOROPHENYL)PYRIMIDINE

Alistair A. Miller; Malcolm S. Nobbs; Richard M. Hyde, and Michael J. Leach, all of Langley Court, Beckenham, Kent, England

Division of Ser. No. 444,963, Dec. 4, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,948

Claims priority, application United Kingdom, Dec. 7, 1988, 8828620; Apr. 14, 1989, 8908561; Aug. 18, 1989, 8918893

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—255 **12 Claims**

1. The method of alleviating cerebral ischaemic damage in a mammal who has had a stroke which comprises administering to said mammal an effective cerebral ischaemic damage-alleviating amount of 4-amino-2-(4-methylpiperazin-1-yl)-5-(2,3,5-trichlorophenyl)pyrimidine or a pharmaceutically acceptable acid addition salt thereof.

5,591,747

FUNGICIDAL MIXTURES

Karl Eicken, Wachenheim; Bernd Müller, Frankenthal; Hubert Sauter, Mannheim; Gisela Lorenz, Neustadt; Eberhard Ammermann, Heppenheim; Klaus Scheiberger, Gönnheim, and Reinhold Sour, Böhl-Iggelheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 305,396, Sep. 13, 1994, Pat. No. 5,508,283. This application Oct. 30, 1995, Ser. No. 550,540

Claims priority, application Germany, Sep. 13, 1993, 43 30 970.4

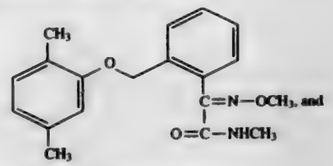
Int. Cl.[6] A01N *37/18;43/54*

U.S. Cl. 514—275 **6 Claims**

1. A fungicidal mixture containing in synergistic fungicidally effective amounts of:

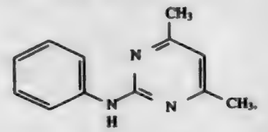
a) a compound of the formula IB

I.B



b) a pyrimidine of the formula II

II



wherein the weight ratio of the compound IB to the compound II is from 10:1 to 0.1:1.

5,591,748

IMMUNOMODULATORY AZASPIRANES

Alison M. Badger; Gary J. Bridger, both of Bryn Mawr, Pa., and David A. Schwartz, Encinitas, Calif., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 981,147, Nov. 24, 1992, abandoned, which is a continuation of Ser. No. 712,325, Jun. 7, 1991, abandoned. This application Jul. 19, 1994, Ser. No. 277,456

Int. Cl.[6] A61K *31/44*; C07D *401/04;453/00*

U.S. Cl. 514—278 **8 Claims**

1. A compound of the Formula:



(I)

in which:

R^1 and R^2 are the same or different and are selected from hydrogen or straight chain, branched chain or cyclic alkyl, provided that the total number of carbon atoms contained by R^1 and R^2 when taken together is 4–10; or R^1 and R^2 are joined together to form a cyclic alkyl group containing 3–7 carbon atoms;

A is absent or present as C_1–C_7 alkylene; and

R^3 is a heterocyclic ring selected from; pyrrolidine, piperidine, imidazole, and azabicyclo(3.2.1), wherein said heterocyclic ring is bonded through a carbon atom thereof and wherein each nitrogen atom of said heterocyclic ring is optionally substituted by a substituent selected from; hydrogen, —CH_3, —CH_2—CH_3, and —CH_2—CH_2—CH_3, —$CH(CH_3)_2$; provided that such nitrogen atoms are not substituted when they form part of a double bond or when they are attached to three carbon atoms in a azabicyclo(3.2.1.) ring system; or a pharmaceutically acceptable salt, hydrate or solvate thereof.

5,591,749

IMIDAZOPYRIDINES AS SEROTONERGIC 5-HT_3 -ANTAGONISTS

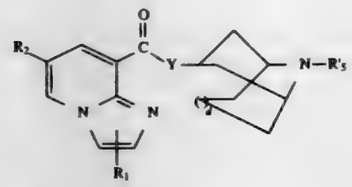
Daniel P. Becker, Glenview; Daniel L. Flynn, Mundelein; Alan E. Moormann, Skokie; Roger Nosal, Buffalo Grove, and Clara L. Villamil, Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 973,126, Nov. 6, 1992, Pat. No. 5,434,161, which is a continuation-in-part of Ser. No. 666,113, Mar. 7, 1991, Pat. No. 5,260,303. This application Apr. 19, 1995, Ser. No. 424,934

Int. Cl.[6] A61K *31/44*; C07D *471/04*

U.S. Cl. 514—300 **11 Claims**

1. A compound of the formula



the stereoisomers and pharmaceutically acceptable salts thereof

wherein R_1 is selected from the group consisting of H and C_{1-6} alkyl; R_2 is selected from the group consisting of H and halogen;

Y is selected from the group consisting of NH and O;

d is 0 or 1; and

R'_5 is C_{1-7} alkyl C_{3-8} cycloalkyl C_{3-8} cycloalkyl-C_{1-7}-alkyl, C_{2-7} alkenyl, C_{2-7} alkenyl-C_{1-4}-alkyl or phenyl-C_{1-6}alkyl.

5,591,750

Patent Not Issued For This Number

5,591,751

PERIPHERAL VASODILATORS

Takafumi Fujioka; Shuji Teramoto; Michinori Tanaka; Hiroshi Shimizu; Fujio Tabusa, and Michiaki Tominaga, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00157, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO94/19339, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 3, 1994, Ser. No. 318,801

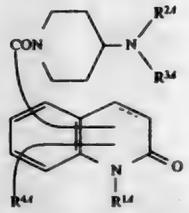
Claims priority, application Japan, Feb. 16, 1993, 5-026594

Int. Cl.[6] A61K *31/47*; C07D *215/227;215/48*

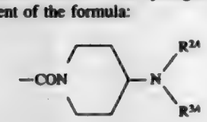
U.S. Cl. 514—312 **31 Claims**

1. A carbostyril compound of the general formula (1A):

(1A)



wherein, R^{1A} is a hydrogen atom or a lower alkyl group; and R^{3A} are each the same or different, and are each a hydrogen atom, a lower alkyl group, a phenylthio-lower alkyl group, a phenoxy-lower alkyl group having 1 to 3 substituents, in the phenyl ring, selected from the group consisting of a halogen atom and a lower alkoxy group or a phenyl-lower alkyl group; R^{4A} is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a nitro group, an amino group, or a phenyl-lower alkylamino group; and the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single bond or a double bond or a salt thereof; provided that when R^{1A} and R^{4A} are hydrogen atoms at the same time, the substituent of the formula:



is substituted at the 6-position in the carbostyril skeleton, and one of R^{2A} and R^{3A} is a hydrogen atom, a lower alkyl group or a phenyl-lower alkyl group, then the other of R^{2A} and R^{3A} should not be a hydrogen atom, a lower alkyl group or a phenyl-lower alkyl group.

5,591,752

QUINOLINE DERIVATIVE

Tomio Kimura, Niiza; Yoshio Kaku, Ube; Takashi Ikuta, Ube; Hiroshi Fujiwara, Ube; Hitoshi Ueno, Ube, and Eiji Oknari, Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

PCT No. PCT/JP94/00234, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO94/19345, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 16, 1994, Ser. No. 505,172

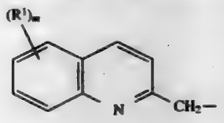
Claims priority, application Japan, Feb. 16, 1993, 5-026935

Int. Cl.[6] C07D *403/10;407/10;* A61K *31/47*

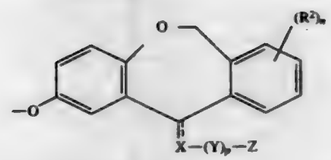
U.S. Cl. 514—314 **10 Claims**

1. A quinoline derivative represented by the formula

(I)



-continued



and a pharmaceutically acceptable salt thereof.

5,591,753

COMBINATION TREATMENT FOR OSTEOPOROSIS

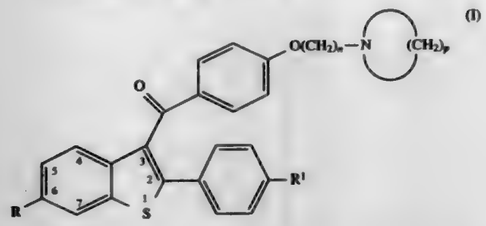
Larry J. Black, Indianapolis, and George J. Cullinan, Trafalgar, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 28, 1994, Ser. No. 189,399

Int. Cl.[6] A61K *31/445;31/415;31/38*

U.S. Cl. 514—324 **6 Claims**

1. A method for treating osteoporosis comprising administering:
1) a compound of formula I



(I)

wherein
R and R[1], independently, are hydrogen, hydroxyl, C_1–C_6-alkoxy, C_1–C_6 acyloxy, C_1–C_6 alkoxy-C_2–C_6-acyloxy, R^2-substituted aryloxy, R^2-substituted aroyloxy, R^3-substituted carbonyloxy or halo;
R^2 is C_1–C_3-alkyl, C_1–C_3-alkoxy, hydrogen or halo; and
R^3 is C_1–C_6-alkoxy or aryloxy;
n is 2, 3 or 4; and
p is 4, 5 or 6;
or a pharmaceutically acceptable salt or solvate thereof; together with
2) a progestin selected from medroxyprogesterone, norethindrone or norethynodrel, or a pharmaceutically acceptable salt thereof; in amounts such that the combination retains or increases bone density.

5,591,754

BENZOYLGUANIDINES, PHARMACEUTICAL COMPOSITION CONTAINING THEM AND TREATMENT OF ARRTHYTHMIAS THEREWITH

Hans-Jochen Lang, Hofheim/Taunus; Andreas Weichert, Frankfurt am Main; Heinz-Werner Kleemann, Bad Homburg; Heinrich Englert, Hofheim/Taunus; Wolfgang Scholz, Eschborn, and Udo Albus, Florstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 123,208, Sep. 20, 1993. This application May 5, 1995, Ser. No. 437,552

Claims priority, application Germany, Sep. 22, 1992, 42 31 658.8; Dec. 16, 1992, 42 42 587.5

Int. Cl.[6] A61K *31/165;31/445;* **C07C** *317/48;* **C07D** *211/28*

U.S. Cl. 514—331 **5 Claims**

1. A compound selected from the group consisting of:
4-N,N-diethylamino-3-methylsulfonylbenzoylguanidine hydrochloride,
4-(4-chlorophenoxy)-3-methylsulfonylbenzoylguanidine hydrochloride,
4-(4-fluorophenoxy)-3-methylsulfonylbenzoylguanidine hydrochloride,
4-(4-fluoroanilino)-3-methylsulfonylbenzoylguanidine hydrochloride,
4-(3-chloro-4-fluoro-anilino)-3-methylsulfonylbenzoylguanidine hydrochloride,
4-isopropyl-3-methylsulfonylbenzoylguanidine hydrochloride,
4-isopropyl-3-methylsulfonylbenzoylguanidine methanesulfonate,
3-methylsulfonyl-4-(2,6-cis-dimethylpiperidino)benzoylguanidine methanesulfonate,
4-(1-methylpropyl)-3-methylsulfonylbenzoylguanidine hydrochloride,
4-(2-methylpropyl)-3-methylsulfonylbenzoylguanidine hydrochloride, or a pharmacologically tolerable salt of any of said compounds.

5,591,755

PYRIDINYL THIADIAZOLYL COMPOUNDS FOR TREATING GLAUCOMA

Per Sauerberg, Valby, and Preben H. Olesen, Copenhagen, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

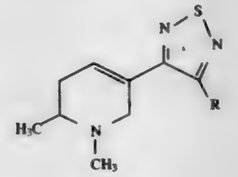
Continuation of Ser. No. 145,286, Oct. 29, 1993, abandoned, which is a division of Ser. No. 744,150, Aug. 13, 1991, Pat. No. 5,328,923. This application Jun. 7, 1995, Ser. No. 472,350

Claims priority, application Denmark, Aug. 21, 1990, 1984/90

Int. Cl.[6] C07D *417/04;* **A61K** *31/44*

U.S. Cl. 514—342 **6 Claims**

1. A method for treating glaucoma in a subject in need thereof, comprising administering topically to said subject an effective amount of a compound of formula I



(I)

R is —OR^5 or —SR^5, wherein R^5 is straight or branched C_{1-15}-alkyl, straight or branched C_{2-15}-alkenyl, straight or branched C_{2-15}-alkynyl, or straight or branched C_{1-15}-alkyl which is substituted with cyano or a phenyl group wherein the phenyl group is optionally substituted with CN; or
a pharmaceutically acceptable salt thereof.

5,591,756

LTB4 SYNTHESIS INHIBITORS

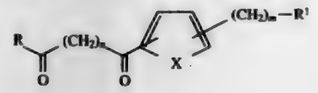
Stevan W. Djuric, Glenview; Richard A. Haack, and Julie M. Miyashiro, both of Chicago, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 271,381, Jul. 1, 1994, Pat. No. 5,508,309, which is a continuation of Ser. No. 707,522, May 30, 1991, Pat. No. 5,356,919. This application May 19, 1995, Ser. No. 445,155

Int. Cl.[6] A61K *31/44;31/34;* **C07D** *213/79;307/68*

U.S. Cl. 514—350 **9 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof
wherein X is oxygen, sulfur, or —CH=N—;
wherein R^1 is —CO_2R^2;
wherein R^2 is hydrogen, alkyl of 1 to 6 carbons or a pharmaceutically acceptable cation;
wherein R is an alkyl of from 13 to 20 carbons, —$(CH_2)_pCF_3$ or —$(CH_2)_qR^3$ wherein R^3 is alkoxy, phenoxy or alkoxy substituted phenoxy wherein the alkoxy group has from 1 to 8 carbons;
wherein p is an integer from 0 to 20;
wherein q is an integer from 1 to 20;
wherein n is 1; and
wherein m is 0, 1, 2, or 3.

5,591,757

DIHYDROPYRIDINE COMPOSITION

Takashi Fujikura; Noriki Ito, both of Saitama; Yuzo Matsumoto, Tokyo; Masaharu Asano, Tokyo, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 141,488, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 865,105, Apr. 8, 1992, abandoned, which is a division of Ser. No. 818,802, Jan. 9, 1992, abandoned, which is a division of Ser. No. 611,340, Nov. 13, 1990, Pat. No. 5,110,820, which is a continuation of Ser. No. 440,441, Nov. 21, 1989, abandoned, which is a continuation of Ser. No. 185,299, Apr. 19, 1988, abandoned, which is a continuation of Ser. No. 913,788, Sep. 30, 1986, abandoned, which is a division of Ser. No. 904,778, Sep. 5, 1986, abandoned, which is a continuation of Ser. No. 692,384, Jan. 17, 1985, abandoned. This application Apr. 4, 1995, Ser. No. 418,262

Claims priority, application Japan, Jan. 25, 1984, 59-11434

Int. Cl.[6] A61K *31/455*

U.S. Cl. 514—356 **1 Claim**

1. A pharmaceutical composition possessing both calcium (2+)-antagonistic and beta-receptor blocking activities which contains as the active ingredient thereof, 4-(2-hydroxy-3-phenoxypropylamino)butyl methyl 2,6-dimethyl-4-(m-nitrophenyl)-1,4-dihydropyridine-3,5 dicarboxylate.

5,591,758

ORGANIC NITRATES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN THE TREATMENT OF CARDIOVASCULAR DISEASES

Jean-Pierre Nallet, Montaney; Jacques Dreux, Lyons; Alain Berdeaux; Vincent Richard, both of Paris, all of France; Piero Marteraua, Bad Homburg, and Helmut Bohn, Schoneck, both of Germany, assignors to Laboratoires Hoechst, SA, Puteaux, France

PCT No. PCT/EP92/01746, § 371 Date May 4, 1993, § 102(e) Date May 4, 1993, PCT Pub. No. WO93/03037, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 1, 1992, Ser. No. 971,812

Claims priority, application France, Aug. 7, 1991, 91 10039

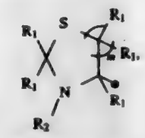
Int. Cl.[6] C07D *277/06;* **A01K** *31/425*

U.S. Cl. 514—365 **7 Claims**

1. Organic nitrates, of to the following formula I:

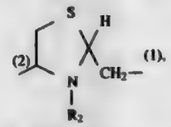
R—CO—A—YB (I)

in which:
R represents



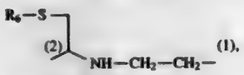
(radical C)

in which radical C:
R_1 represents a hydrogen atom, a (straight-chain, branched or cyclic) C_1 to C_6 alkyl group, an optionally substituted phenyl or an optionally substituted benzyl;
R_2 represents a hydrogen atom, a (straight-chain, branched or cyclic) C_1 to C_6 alkyl group, an optionally substituted phenyl, an optionally substituted benzyl, a C_1–C_6 acyl group, an optionally substituted benzoyl, an alkoxycarbonyl or a CO—X group in which X represents a radical C and m represents 1 or 2;
A represents a CH_2 group, an amino acid, group with the acid group bonded to Y and the amino group bonded to CO, or one of the following radicals:



(radical H)

in which radical H:
R_2 represents a hydrogen atom, a (straight-chain, branched or cyclic) C_1 to C_6 alkyl group, an optionally substituted pheayl, an optionally substituted benzyl, a C_1 to C_6 acyl group, an optionally substituted benzoyl, an alkoxycarbonyl group or a group CO—X in which X represents one of the radicals C, D, E, F or G as defined above for R,
(1) is the bond with Y, and
(2) is the bond with R—CO; or



(radical I)

in which radical I:
R_6 represents a hydrogen atom, a (straight-chain, branched or cyclic) C_1 to C_6 alkyl group, an optionally substituted phenyl, a substituted S-pheayl, an optionally substituted benzyl or one of the following groups: CH_3—CO—NH—CH_2, S—CH_2—CH—(CO—R_7)—NH—CH_2—CH_2—NH—B in which R_7 represents an OH group, a C_1–C_6 O-alkyl group, an optionally substituted O-phenyl group, an optionally substituted O-benzyl group, a radi-

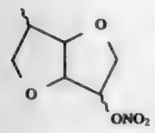
cal E as defined above or a radical Y—B, B and Y being as defined below, and

(1) and (2) have the same meaning as above;

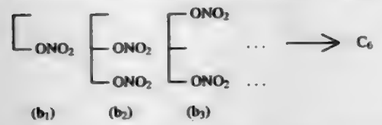
Y represents an oxygen atom or an NH group;

B represents:

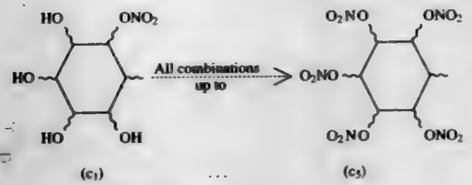
α) a 1,4:3,6-dianhydro hexitol mononitrate radical of formula (a)



β) a C_1 to C_6 itol nitrate radical of formulae (b) and



γ) an inositol "p"-nitrate radical, p being an integer from 1 to 5, of formula (c)



δ) one of the following groups:

a $—CH_2—C(CH_2—ONO_2)_3$ group, derived from pentaerythritol,

a $—CH_2—C(C_2H_5)(CH_2—ONO_2)_2$ group, derived from ethyltrimethylolmethane, or

a $—CH_2—CH_2—N(CH_2—CH_2—ONO_2)_2$ group, derived from triethanolamine,

with all OH and ONO_2 combinations.

(c) a stabilizing-effective amount, in the range of 0.001 to 0.1 part by weight based on one part by weight of the compound of formula (I), of 2,2-dibromo-2-nitroethanol.

5,591,760

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 4,5-DICHLORO-2-OCTYL-3-ISOTHIAZOLONE AND CERTAIN COMMERCIAL BIOCIDES

Jemin C. Hsu, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 131,849, Nov. 18, 1993, Pat. No. 5,468,759, which is a division of Ser. No. 810,602, Dec. 19, 1991, Pat. No. 5,292,763, which is a division of Ser. No. 591,316, Oct. 1, 1990, abandoned, which is a division of Ser. No. 431,367, Nov. 2, 1989, abandoned. This application Mar. 24, 1995, Ser. No. 410,165

Int. Cl.[6] A61K *31/425*

U.S. Cl. 514—372 **18 Claims**

1. A microbiocidal composition the first component of which comprises 4,5 -dichloro-2-octyl-3-isothiazolone and the second component of which comprises 3 -iodo-2-propynylbutylcarbamate, wherein the weight ratio of first component to second component is in the range of from about 32:1 to about 1:16.

5,591,761

THIOPHENYL-, FURYL-AND PYRROLYL-SULFONAMIDES AND DERIVATIVES THEREOF THAT MODULATE THE ACTIVITY OF ENDOTHELIN

Ming F. Chan; Bore G. Raju; Adam Kois; Erik J. Verner; Chengde Wu; Rosario S. Castillo; Venkatachalapathi Yalamoori, all of San Diego, and Vitukudi N. Balaji, Encinitas, all of Calif., assignors to Texas Biotechnology Corporation, Houston, Tex.

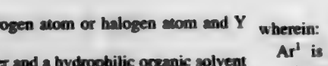
Continuation-in-part of Ser. No. 142,552, Oct. 21, 1993, Pat. No. 5,514,691, Ser. No. 142,159, Oct. 21, 1993, Pat. No. 5,464,853, Ser. No. 142,631, Oct. 21, 1993, abandoned, Ser. No. 100,565, Jul. 30, 1993, abandoned, Ser. No. 100,125, Jul. 30, 1993, abandoned, and Ser. No. 65,202, May 20, 1993, abandoned, said Ser. No. 142,159Ser. No. 142,552, and Ser. No. 142,631, , each is a continuation-in-part of Ser. No. 100,565, Ser. No. 100,125, and Ser. No. 65,202, said Ser. No. 100,565and Ser. No. 100,125, , each is a continuation-in-part of Ser. No. 65,202. This application Apr. 5, 1994, Ser. No. 222,287

The portion of the term of this patent subsequent to May 20, 2014, has been disclaimed.

Int. Cl.[6] A61K *31/42*; C07D *261/10*

U.S. Cl. 514—380 **93 Claims**

1. A sulfonamide compound of formula (I)



wherein:

Ar^1 is selected from the group consisting of isoxazole and isoxazoline groups; and

Ar^2 is a substituted or unsubstituted group selected from thiophenyl, furyl and pyrrolyl.

5,591,759

AQUEOUS ISOTHIAZOLONE FORMULATION

Yosuke Ito, Otsu; Yoichi Sano, Takatsuki; Katsuji Tauji, Kyoto, and Sakae Katayama, Osaka, all of Japan, assignors to Katayama Chemical, Inc., Osaka, Japan

Continuation of Ser. No. 892,679, Jun. 4, 1992, abandoned, which is a continuation of Ser. No. 524,036, May 16, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 185,272

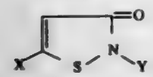
Claims priority, application Japan, May 17, 1989, 1-125370

Int. Cl.[6] A01N *31/02;43/80*; C02F *1/76*; C08J *3/00*

U.S. Cl. 514—372 **5 Claims**

1. An aqueous isothiazolone formulation consisting essentially of:

(a) 1–20% by weight of an isothiazolone compound represented by the formula (I):



where X represents a hydrogen atom or halogen atom and Y represents an alkyl group,

(b) water or a mixture of water and a hydrophilic organic solvent in an amount at least sufficient to dissolve the compound of the geaeral formula (I) described above, the amount of water in the formulation being at least 5% by weight; and

5,591,762

BENZIMIDAZOLES USEFUL AS ANGIOTENSIN-11 ANTAGONISTS

Norbert Hanel, Schemmerhofen; Berthold Narr, deceased, late of Biberach; Uwe Ries, Biberch; Jacobus C. A. van Meel, Mittelbiberach; Wolfgang Wienen, Biberach/Riss, and Michael Entzeroth, Warthausen, all of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

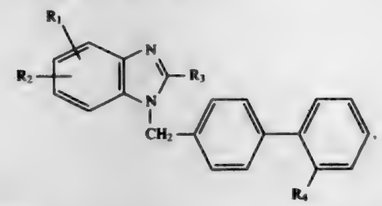
Division of Ser. No. 385,936, Feb. 9, 1995, which is a continuation-in-part of Ser. No. 201,139, Feb. 24, 1994, abandoned, and a continuation-in-part of Ser. No. 257,608, Jun. 9, 1994, abandoned, Ser. No. 237,477, May 3, 1994, abandoned, and Ser. No. 94,835, Jul. 20, 1993, abandoned, said Ser. No. 201,139is a continuation of Ser. No. 832,193, Feb. 6, 1992, abandoned, said Ser. No. 257,608is a continuation of Ser. No. 7,315, Jan. 21, 1993, abandoned, said Ser. No. 237,477is a continuation of Ser. No. 40,778, Mar. 31, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,204

Claims priority, application Germany, Feb. 6, 1991, 41 03 492.9; May 25, 1991, 41 17 121.7; Nov. 16, 1991, 41 37 812.1; Jan. 22, 1992, 42 01 554.5; Apr. 11, 1992, 42 12 250.3; Jun. 17, 1992, 42 19 782.1; Jul. 22, 1992, 42 24 133.2; Jul. 27, 1992, 42 24 752.7; Aug. 4, 1992, 42 25 756.5

Int. Cl.[6] A61K *31/42;31/415*; C07D *403/10;403/04*

U.S. Cl. 514—381 **8 Claims**

1. A compound of the formula I



wherein

R_1 is in the 4-position and represents a C1–4-alkyl, C_{3-7}-cycloalkyl or trifluoromethyl group,

R_2 represents a benzimidazol-2-yl group optionally substituted in the 1-position by C_{1-6}-alkyl or C_{3-7}-cycloalkyl group, whilst the phenyl nucleus of the above-mentioned benzimidazole groups may additionally be substituted by a fluorine atom or by a methyl or trifluoromethyl group,

R_3 represents a C_{1-5}-alkyl group or cyclopropyl, and

R_4 denotes a 1H-tetrazolyl group or an $R_aO—CO—$ group, wherein

R_a denotes a hydrogen atom or a straight-chained or branched C_{1-4}-alkyl group,

or a pharmaceutically acceptable salt thereof.

5,591,763

TREATMENTS FOR DISEASES CHARACTERIZED BY NEOVASCULARIZATION

Jose Halperin, Brookline, and Carlo Brugnara, Newton Highlands, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 18,840, Feb. 18, 1993, Pat. No. 5,512,591. This application Jun. 7, 1995, Ser. No. 480,794

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—399 **18 Claims**

1. A method for treating an angiogenic condition characterized by vascular smooth muscle cell proliferation comprising:

administering to a subject who has an angiogenic condition selected from the group consisting of diabetic retinopathy and neovascular glaucoma an imidazole selected from the group consisting of clotrimazole, miconazole, and econazole in an amount effective to inhibit said vascular smooth muscle cell proliferation.

5,591,764

N-ACYLATED PYRAZOLINES

Mohamed A. H. Fahmy, deceased, late of Wilmington; Charles R. Harrison, Newark; George P. Lahm, Wilmington, and Thomas M. Stevenson, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

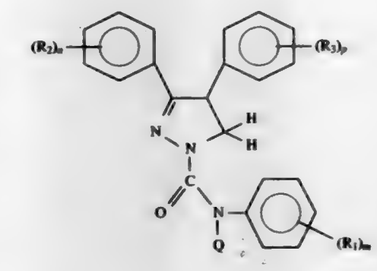
Division of Ser. No. 279,377, Jul. 22, 1994, Pat. No. 5,491,162, which is a continuation of Ser. No. 4,868, Jan. 15, 1993, abandoned, which is a division of Ser. No. 659,402, Mar. 12, 1991, Pat. No. 5,196,408, which is a continuation-in-part of Ser. No. 304,011, Jan. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,882, Sep. 27, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 468,394

Int. Cl.[6] A01N *43/56*; C07D *231/06*

U.S. Cl. 514—403 **4 Claims**

1. A compound of the formula:

I



wherein

R_1 is C_1 to C_6 haloalkylthio, C_1 to C_6 haloalkylsulfinyl or C_1 to C_6 haloalkylsulfonyl;

R_2, and R_3 are independently selected from R_4, halogen, CN, N_3, SCN, NO_2, OR_4, SR_4, $S(O)R_4$, $S(O)_2R_4$, $OC(O)R_4$, $OS(O)_2R_4$, CO_2R_4, $C(O)R_4$, $C(O)NR_4R_5$, $S(O)_2NR_4R_5$, NR_4R_5, $NR_5C(O)R_4$, $OC(O)NHR_4$, $NR_5C(O)NHR_4$ and $NR_5S(O)_2R_4$;

R_4 is selected from H, C_1 to C_6 alkyl, C_3 to C_6 cycloalkyl, C_3 to C_8 alkoxycarbonylalkyl, C_2 to C_6 alkenyl, C_3 to C_6 alkynyl, C_1 to C_6 haloalkyl, C_3 to C_6 haloalkenyl, C_1 to C_6 alkyl substituted with CN, CO_2CH_3, $CO_2CH_2CH_3$, OCH_3, OCH_2CH_3, SCH_3 , SCH_2CH_3 or NO_2, or R_4 is phenyl or benzyl, either optionally substituted with W; or R_4 and R_5 can be taken together as $(CH_2)_4$, or $(CH_2)_5$;

R_5 is selected from H, C_1 to C_4 alkyl, C_3 to C_4 alkenyl, C_3 to C_4 alkynyl or C_1 to C_4 haloalkyl;

m, n and p are independently 1 to 3;

W is halogen, CN, NO_2, C_1 to C_2 alkyl, C_1 to C_2 haloalkyl, C_1 to C_2 alkoxy, C_1 to C_2 haloalkoxy, C_1 to C_2 alkylthio, C_1 to C_2 haloalkylthio, C_1 to C_2 alkylsulfonyl or C_1 to C_2 haloalkylsulfonyl; and

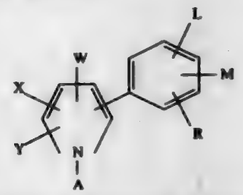
Q is C_2 to C_{22} alkoxycarbonyl, C_2 to C_{22} haloalkoxycarbonyl, C_7 to C_{15} phenoxycarbonyl optionally substituted with 1 to 3 substituents selected from W; C_7 to C_{15} phenyl carbonyl optionally substituted with 1 to 3 substituents independently selected from W; C_2 to C_{22} alkyl carbonyl, C_2 to C_{22} haloalkyl carbonyl, CHO, $C(O)CO_2R_5$, or C_8 to C_{12} benzyloxycarbonyl optionally substituted with 1 to 3 substituents independently selected from W; with the proviso that R_3 is other than CO_2R_4, $C(O)R_4$, $SO_2NR_4R_5$ or $CONR_4R_5$.

5,591,765
INSECTICIDAL AND SYNERGISTIC MITICIDAL COMPOSITIONS

James B. Lovell, Pennington, N.J., assignor to American Cyanamid Company, Madison, N.J.

Continuation of Ser. No. 973,893, Nov. 10, 1992, abandoned, which is a division of Ser. No. 634,289, Dec. 26, 1990, Pat. No. 5,187,184. This application Jul. 26, 1994, Ser. No. 280,403
Int. Cl.[6] A01N *43/36;43/58*
U.S. Cl. 514—406 16 Claims

1. A method for protecting growing plants from infestation and attack by plant mites comprising applying to the foliage and stems of said growing plants a sufficient amount of a synergistic miticidal mixture to provide said plants with from about 0.025 kg/ha to 0.80 kg/ha of a formula II compound, said formula II compound being N-(p-tert-butylbenzyl)- 4-chloro-3-ethyl-1-methylpyrazole-5-carboxamide, and about 0.025 kg/ha to 0.80 kg/ha of an arylpyrrole carbonitrile of formula I



(I)

wherein W is cyano and is located on the carbon in the 3-position of the pyrrole ring; X is halogen; Y is CF_3; A is C_1–C_4 alkyl substituted with C_1–C_4 alkoxy; L is hydrogen an M and R are each independently hydrogen or halogen; and wherein the ratio of the formula II compound to the formula I compound is about 1:1 to 2:1.

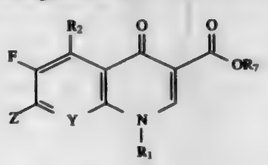
5,591,766
SOLID ORAL FORMULATIONS OF PYRIDONE CARBOXYLIC ACIDS

Won Y. Bang, Sungnam; Kyu J. Yeon, Seoul; Yeong O. Baik, Seowon; Young H. Kim, Seoul; Kwan H. Park, Kyunggi; Ki H. Lee, Seowon, and Jin W. Kim, Sungnam, all of Rep. of Korea, assignors to Cheil Foods & Chemicals, Inc., Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 160,821, Dec. 3, 1993, Pat. No. 5,527,910. This application Nov. 1, 1994, Ser. No. 332,780
Claims priority, application Rep. of Korea, Jul. 18, 1994, 94-17460
Int. Cl.[6] A61K *31/40*
U.S. Cl. 514—412 4 Claims

1. A solid oral pharmaceutical formulation obtained according to the process comprising:

mixing, to form a resulting mixture, 2.0–10.0% by weight of dry binder cellulose, wet bind povidone or a combination thereof, 0.0–35.0% by weight of disintegrating agent starch, 2.0–20.0% by weight of co-binder saccharide and 0.0–2.0% by weight of fluid-enforcing agent with 30.0–95.0 % by weight of at least one of a pyridone carboxylic acid compound of the following formula:



wherein

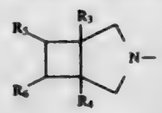
R_1 represents a lower alkyl, a halogen-substituted lower alkyl, a lower alkenyl, a cycloalkyl or a substituted or unsubstituted-phenyl;

R_2 represents a hydrogen atom, a lower alkyl or an amino group;

Y represents a nitrogen atom or the group C–X in which X is a hydrogen, a halogen, or an alkoxy group;

R_7 represents a hydrogen or a lower alkyl group; and

Z is a group having the following formula:



in which each of R_3 and R_4 represent independently a hydrogen or a lower alkyl group, with the proviso that one of R_3 and R_4 is a lower alkyl group; one of R_5 and R_6 is a hydrogen and another is a hydroxy, a lower alkoxy, or an amino group which is unsubstituted or substituted by a lower alkoxy or a lower alkyl group; and esters or salts thereof;

adding water to the resulting mixture to form granules; and drying, screening and mixing the granules with 0.0–3.0% by weight of lubricating agent.

5,591,767
LIQUID RESERVOIR TRANSDERMAL PATCH FOR THE ADMINISTRATION OF KETOROLAC

Judy M. Moir, Menlo Park; Richard W. Baker, Palo Alto, and Lisa A. Nakaji, San Jose, all of Calif., assignors to Pharmetrix Corporation, Menlo Park, Calif.

Continuation of Ser. No. 10,256, Jan. 25, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,659
Int. Cl.[6] A61K *31/40;9/70*
U.S. Cl. 514—413 16 Claims

1. A patch for the transdermal administration of ketorolac through a patient's skin for a period of 12 hours or more, said patch comprising:

(a) an occlusive backing layer having a skin-facing side and a peripheral edge,

(b) a porous membrane having a skin-facing side and a peripheral edge sealed to said peripheral edge of said backing layer and defining a drug depot therebetween, and

(c) said drug depot comprising:

i. ketorolac, and

ii. an enhancer combination in which said ketorolac is dispersed, said enhancer combination comprising a first portion of a plasticizing-type enhancer and a solvent-type enhancer, said plasticizing-type enhancer being a member selected from the group consisting of isopropyl myristate, caprylic triglyceride, capric triglyceride and glyceryl oleate, and said solvent-type enhancer being a member selected from the group consisting of ethanol, propanol and propylene glycol, and

(d) an adhesive layer comprising an adhesive and a second portion of said plasticizing-type enhancer, said adhesive layer being in contact with said skin-facing side of said porous membrane,

wherein said patch delivers ketorolac through the skin facing side of said patch and through said patient's skin at a flux rate of about 40 $\mu g/cm^2$-hr or more.

5,591,768
METHODS FOR TREATING CIRCADIAN RHYTHM PHASE DISTURBANCES

Alfred J. Lewy, and Robert L. Sack, both of Portland, Oreg., assignors to State of Oregon, Acting by and Through the Oregon State Board of Higher Education on Behalf of the Oregon Health Sciences University, Portland, Oreg.

Continuation-in-part of Ser. No. 842,723, Feb. 25, 1992, Pat. No. 5,242,941, which is a continuation of Ser. No. 621,866, Dec. 4, 1990, abandoned. This application Aug. 24, 1993, Ser. No. 110,878
Int. Cl.[6] A61K *31/40;31/405*
U.S. Cl. 514—415 45 Claims

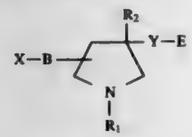
1. A method for achieving a circadian rhythm phase-shifting effect in a human comprising the step of administering an amount of melatonin to the human over a treatment period, the amount of melatonin being sufficient to achieve a phase-shifting effect in the human, at an administration time prior to an individual human's dim light melatonin onset time, wherein when the circadian rhythm phase-shifting effect is a phase advance, the administration time is from about CT 3 to about CT 22, and when the circadian rhythm phase-shifting effect is a phase delay, the administration time is from about CT 13 to about CT 6, and wherein the melatonin administration time on each day of melatonin administration can change during the treatment period, whereby the administration time remains at a constant time relative to the individual human's dim light endogenous melatonin onset time or melatonin phase response curve.

5,591,769
CYCLIC IMINO DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Frank Himmelsbach, Mittelbiberach; Volkhard Austel, Biberach; Helmut Pieper, Biberach; Wolfgang Eisert, Biberach; Thomas Mueller, Biberach; Johannes Weisenberger, Biberach; Guenter Linz, Mittelbiberach, and Gerd Krueger, Biberach, all of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Germany

Division of Ser. No. 365,336, Dec. 28, 1994, Pat. No. 5,541,343, which is a continuation of Ser. No. 783,065, Oct. 25, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 458,096
Claims priority, application Germany, Nov. 2, 1990, 40 35 961.1
Int. Cl.[6] C07D *207/00;207/02;207/48;* A61K *31/40*
U.S. Cl. 514—423 9 Claims

1. A compound of the formula Ia



(Ia)

wherein

R_1 represents a hydrogen atom,

a phenyl group optionally substituted by a chlorine or bromine atom, by an C_{1-2}-alkyl, C_{1-2}-alkoxy or trifluoromethyl group, by a carboxy, alkoxycarbonyl, aminocarbonyl, aminosulphonyl, alkylaminocarbonyl, dialkylaminocarbonyl, alkylsulphonylamino or alkanoylamino group,

an allyl group,

a C_{1-4}-alkyl group which may be substituted by two phenyl groups, by a C_{3-7}-cycloalkyl, naphthyl or phenyl group, whilst the latter may be substituted by a fluorine, chlorine or bromine atom, by a C_{1-4}-alkyl group, by a C_{1-4}-alkoxy group, by an alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, phenyl, phenylalkyl, phenylalkoxy, hydroxy or trifluoromethyl group, by two alkoxy groups or by two chlorine or bromine atoms,

a C_{2-4}-alkyl group substituted in 2-, 3- or 4-position by an alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, phenylsulphenyl, phenylsulphinyl, phenylsulphonyl, amino, alkanoylamino, benzoylamino, N-alkyl-alkanoylamino, alkanesulphonylamino, phenylsulphonylamino, hydroxy, alkoxy or phenoxy group,

a methyl group substituted by a carboxy, alkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, benzylaminocarbonyl, bis(2-methoxyethyl)aminocarbonyl or biphenylyl group,

a carbonyl group substituted by an alkyl, phenyl, alkoxyalkyl, amino, alkylamino, dialkylamino, aminoalkyl, carboxy, alkoxycarbonyl or dialkylaminocarbonyl group, or

a sulphonyl group substituted by an alkyl, dialkylamino, phenyl or alkoxyphenyl group;

R_2 represents a hydrogen atom or an optionally phenyl-substituted C_{1-4}-alkyl group,

B represents an amidino group optionally substituted by one or two C_{1-4}-alkyl groups, by a cyano, hydroxy, methoxy, benzyl, benzoyl, methoxybenzoyl, benzyloxycarbonyl, phenyloxycarbonyl or an C_{1-4}-alkyloxycarbonyl group,

a cyano, aminomethyl or guanidinomethyl group;

Y represents a straight-chained or branched C_{1-5}-alkylene group;

E represents a carbonyl group substituted by a hydroxy, C_{1-6}-alkoxy, amino, C_{1-4}-alkylamino, dialkylaminocarbonyl-alkoxy or phenylalkoxy group wherein the phenyl nucleus may additionally be substituted by one or two methoxy groups, and

X represents biphenylyloxy-C_{1-2}-alkylene group attached via the alkylene moiety to the pyrrolidinone ring in 4- or 5-position, wherein each phenylene moiety may be substituted by a fluorine, chlorine or bromine atom or by an alkyl, alkoxy, trifluoromethyl, alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, nitro, alkanoylamino or alkanesulphonylamino group or by another alkyl group,

wherein, unless otherwise stated, the above-mentioned alkyl, alkoxy and alkanoyl moieties may each contain from 1 to 3 carbon atoms,

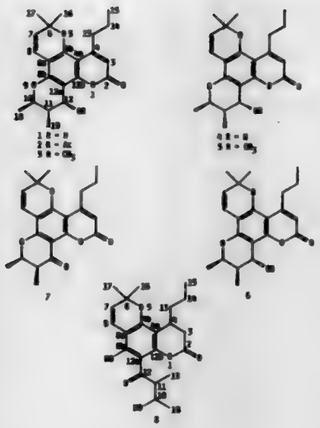
or a pharmaceutically acceptable salt thereof.

5,591,770
CALANOLIDE AND RELATED ANTIRETROVIRAL COMPOUNDS, COMPOSITIONS, AND USES THEREOF

Michael R. Boyd, Ijamsville; John H. Cardellina, II, Walkersville; Kirk R. Gustafson, Mt. Airy; James B. McMahon, Frederick; Richard W. Fuller, Tracy's Landing; Gordon M. Cragg, Bethesda, all of Md.; Yoel Kashman, Tel Aviv, Israel, and Doel Soejarto, Lombard, Ill., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C., and The Board of Trustees of the University of Illinois, Urbana, Ill.

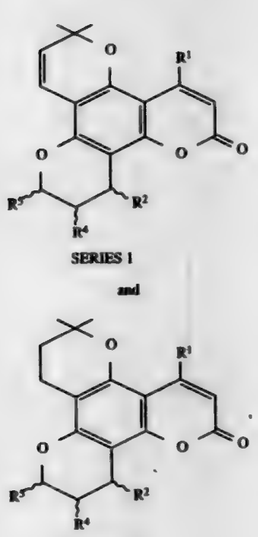
Continuation-in-part of Ser. No. 861,249, Mar. 31, 1992. This application May 21, 1993, Ser. No. 65,618
Int. Cl.[6] A61K *31/365;31/37;* C07D *493/22*
U.S. Cl. 514—453 24 Claims

1. A method of treating a HIV-1 infection, which method comprises administering to a human an anti-HIV-1 effective amount of at least one compound selected from the group consisting of:



SERIES 1

and



SERIES 2

wherein R^1 is C_1–C_6 alkyl or aryl; R^2 is ═ OH, ┈ OR^3, ┈ OR^3, ═ O_2CR^3, ┈ O_2CR^3, ═ O_2SR^3, or ┈ OH, ═ O_3SR^3 ; wherein R^3 is C_1–C_6 alkyl or aryl; and R^4 and R^5 are the same or different and are each ═ CH_3 or ┈ CH_3.

5,591,771

USE OF PROPOLIS COMPONENTS AS AN ADJUVANT

Maria Markowius, Johanneshov, Sweden, assignor to Michel Fockerman, Ljunghyhed, and Jasmine Fockerman Cederqvist, Stockholm, both of Sweden

Continuation-in-part of Ser. No. 809,420, Dec. 17, 1991, Pat. No. 5,449,794. This application Jun. 7, 1995, Ser. No. 474,103

Int. Cl.[6] A61K *31/35*

U.S. Cl. 514—456 **9 Claims**

1. A method of providing an adjuvant effect, comprising utilizing as an adjuvant, a compound selected from the group consisting of pinocembrin, pinobanksin-3-acetate, and naringenin.

5,591,772

TOCOTRIENOLS AND TOCOTRIENOL-LIKE COMPOUNDS AND METHODS FOR THEIR USE

Ronald H. Lane, Phoenix, Ariz.; Asaf A. Qureshi, Madison, Wis., and Winston A. Saiser, Pacific Palisades, Calif., assignors to Lipogenics, Inc., Scottsdale, Ariz.

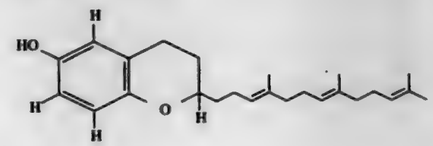
PCT No. PCT/US92/10277, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO93/09777, PCT Pub. Date May 27, 1993

Continuation-in-part of Ser. No. 796,686, Nov. 22, 1991, abandoned. This PCT application Nov. 20, 1992, Ser. No. 244,215

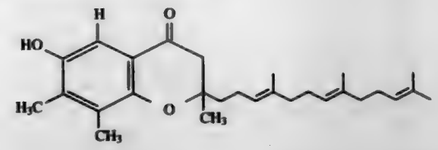
Int. Cl.[6] A61K *31/355*; C07D *311/22;311/72*

U.S. Cl. 514—458 **39 Claims**

1. A tocotrienol comprising 3,4-dihydro-2-(4,8,12-trimethyltrideca-3'(E), 7'(E), 11'-trienyl)-2H- 1-benzopyran-6-ol), and having the structure:



2. A tocotrienol comprising:



3. A composition comprising a tocotrienol compound resulting from a process comprising the steps of:

stabilizing a biological material by heating;

extracting the biological material with a solvent to obtain an oil;

eluting the oil from an HPLC colunto under the following conditions: 20 µl sample, µ-Porasil column (Waters column, 10µ, 4 mm×30 cm) using an isocratic system of hexane and isopropanol (99.75% :0.25%, v/v) at a flow rate of 1.3 ml/min.; and

collecting compounds having an HPLC elution time of greater than 22 minutes, said compounds being detectable at an excitation wave length of about 295 nm, and having an emission wave length of about 330 nm, UV absorption at about 295 nm, and an ability to inhibit the synthesis β-hydroxy-β-methyl glutaryl coenzyme A reductase.

5,591,773

INHIBITION OF CATARACT FORMATION, DISEASES RESULTING FROM OXIDATIVE STRESS, AND HIV REPLICATION BY CAFFEIC ACID ESTERS

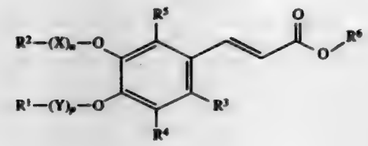
Deszider Grunberger, Teaneck, N.J., and Krystyna Frenkel, Woodmere, N.Y., assignors to The Trustees of Columbia University in the City of New York, and New York University, both of New York, N.Y.

Filed Mar. 14, 1994, Ser. No. 212,569

Int. Cl.[6] A61K *31/235*

U.S. Cl. 514—532 **30 Claims**

1. A method of inhibiting the formation of a cataract in an eye, which comprises contacting the eye with an effective cataract-inhibiting amount of a compound having the structure:



wherein

X and Y are independently carbonyl, C═S, S═O, or O═S═O;

n and p are independently 0 or 1;

R^1 and R^2 are independently hydrogen, linear or branched C_1–C_{18} alkyl, alkenyl, or alkynyl, either unsubstituted or substituted with halogen, including F, Cl, Br, and I, C_1–C_6 alkoxy, (C═O)R^7, or (C═O)OR^8; wherein R^7 and R^8 are independently C_1–C_6 linear or branched alkyl;

R^3, R^4, and R^5 are independently hydrogen, halogen, including F, Cl, Br, and I, trihalomethyl, C_1–C_{18} linear or branched alkyl, alkenyl, alkynyl, haloalkyl, alkoxy, alkoxyalkyl, alkylthio, or (C═O)R^9, (C═O)OR^{10}, O(C═O)R^{11}, (C═S)R^{12}, (C═S)OR^{13}, O(C═S)R^{14}, (S═O)R^{15}, (S═O)OR^{16}, or (O═S═O)OR^{17}; wherein R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, and R^{17} are independently C_1–C_{18} linear or branched alkyl, alkenyl, or alkynyl; and

R^6 is aryl or C_1–C_{18} branched or linear alkyl, alkenyl, or alkynyl, either unsubstituted or substituted with halogen, including F, Cl, Br, and I, C_1–C_6 alkoxy, (C═O)R^{18}, (C═O)OR^{19}, or aryl; wherein R^{18} and R^{19} are independently C_1– C_6 branched or linear alkyl;

or a pharmaceutically acceptable salt thereof.

5,591,774

METHOD OF TREATING WRINKLES USING MALIC ACID

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden La., Abington, Pa. 19001

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 5, 1995, Ser. No. 463,063

Int. Cl.[6] A61K *7/48;31/19*

U.S. Cl. 514—574 **10 Claims**

1. Method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising malic acid or a topically effective salt thereof, in an amount and for a period of time sufficient to visibly reduce said wrinkle, wherein said wrinkle is a facial wrinkle.

5,591,775

TRISUBSTITUTED NAPHTHYLALKYLAMIDES FOR DISORDERS OF THE MELATONINERGIC SYSTEM

Patrick Depreux, Armentieres; Hamid Ait Mansour, Roubaix; Daniel Lesieur, Gondecourt; François Lefebvre, Orleans; Pierre Renard, Versailles; Gérard Adam, Le Mesnil Le Roi, and Philippe Delagrange, Issy Les Moulineaux, all of France, assignors to Adir et Compagnie, Courbevoie, France

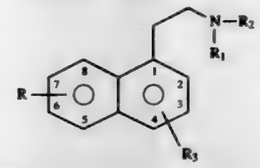
Filed Dec. 6, 1994, Ser. No. 349,914

Claims priority, application France, Dec. 7, 1993, 93 14630

Int. Cl.[6] A61K *31/16;31/17*; C07C *335/06;275/06*

U.S. Cl. 514—580 **17 Claims**

1. A compound of formula (I):



(I)

in which:

R represents hydrogen or a radical chosen from alkyl, substituted alkyl and —O—R'; with R' representing hydrogen or a radical selected from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, cycloalkylalkyl, substituted cycloalkylalkyl, phenyl, substituted phenyl, phenylalkyl, substituted phenylalkyl, diphenylalkyl and substituted diphenylalkyl;

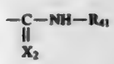
R_1 represents hydrogen or alkyl;

R_2 represents a)



in which X^1 represents sulfur or oxygen and R_{40} represents hydrogen or a radical chosen from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, cycloalkylalkyl, substituted cycloalkylalkyl, alkenyl, substituted alkenyl, alkynyl and substituted alkynyl;

or b)



in which X^2 represents sulfur or oxygen and R_{41} represents hydrogen or a radical chosen from alkyl, cycloalkyl and cycloalkylalkyl;

R_3 represents a radical chosen from:

(C_2–C_6) alkyl,

substituted (C_2–C_6) alkyl,

cycloalkylalkyl,

substituted cycloalkylalkyl,

alkenyl,

substituted alkenyl,

alkynyl,

substituted alkynyl,

hydroxyl in 3-position,

R_5-alkyl-, with R_5 being substituted or unsubstituted and representing a radical chosen from phenyl and naphthyl;

R_6—CO—O—,

and R_6—CO—,

with R_6 representing a radical chosen from (C_1–C_5)alkyl, substituted (C_1–C_5)alkyl, cycloalkyl, substituted cycloalkyl, cycloalkyl(C_1–C_5)alkyl, substituted cycloalkyl(C_1–C_5)alkyl, R_5- and R_5-alkyl- where R_5, being unsubstituted or substituted, is as defined above,

it being understood that the compound of formula (I) cannot be N-{2-[(4-acetyl)naphth-1-yl]ethyl}acetamide,

wherein the terms "alkyl" and "alkoxy" denoting inclusively, except where otherwise mentioned, linear or branched groups of 1 to 6 carbon atoms,

the terms "alkenyl" and "alkynyl" denoting inclusively unsaturated, linear or branched groups of 2 to 6 carbon atoms,

the term "cycloalkyl" denoting inclusively a cyclic group of 3 to 8 carbon atoms,

the term "substituted", applied to "alkyl", "alkoxy", "alkenyl", "alkynyl", "cycloalkyl" or "cycloalkylalkyl", means that these groups are substituted with one or more radicals chosen from alkyl, alkoxy and halogen;

the term "substituted" associated with R_3 and with "phenyl", "phenylalkyl" or "diphenylalkyl" means that these groups are substituted with one or more radicals chosen from alkyl, alkoxy, halogen, hydroxyl and trifluoromethyl;

their enantiomers and diastereoisomers,

and their addition salts with a pharmaceutically acceptable acid or base.

5,591,776

PHEYNL OR BENZYL-SUBSTITUTED ROLIPRAM-BASED COMPOUNDS FOR AND METHOD OF INHIBITING PHOSPHODIESTERASE IV

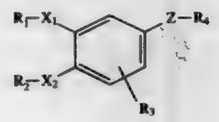
David J. Cavalla, Cambridge, England; Lloyd J. Dolby, Eugene, Oreg., and Mark Chasin, Manalapan, N.J., assignors to Euro-Celtique, S.A., Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 265,641, Jun. 24, 1994. This application Jan. 10, 1995, Ser. No. 370,952

Int. Cl.[6] A61K *31/165; C07C 233/08*

U.S. Cl. 514—622 **15 Claims**

1. A compound of the formula:



wherein:

X_1 and X_2 may be the same or different and each is O or S;

R_1 is selected from the group consisting of cycloalkyl and cycloalkyl-alkyl groups containing from 3 to 10 carbon atoms in the cycloalkyl moiety;

R_2 is R_1 or CH_3;

R_3 is hydrogen, halogen, or a saturated or unsaturated straight-chain or branched C_{1-12} alkyl group, a cycloalkyl or cycloalkyl-alkyl groups containing from 3 to 7 carbon atoms in the cycloalkyl moiety;

Z is a linkage selected from $—CH_2CONH—$ and $—CH_2NHCO—$; and

R_4 is a phenyl or benzyl which may be unsubstituted or substituted with one or more halogen atoms, alkyl groups, hydroxyl groups, cyano groups, carboxyl groups, alkoxy groups, alkoxycarbonyl, amido, carboxamido, substituted or unsubstituted amino groups, cycloalkyl and cycloalkyl-alkyl groups containing from 3 to 10 carbon atoms in the cycloalkyl moiety, aryl or aralkyl groups preferably containing from about 6 to about 10 carbon atoms, or heterocyclic groups containing nitrogen, oxygen or sulfur in the ring; said alkyl, alkoxy, cycloalkyl, cycloalkyl-alkyl, aryl, and aryl-alkyl groups being saturated or unsaturated, unsubstituted or substituted by halogen atoms, hydroxyl groups, cyano groups, carboxyl groups, alkoxy groups, alkoxycarbonyl, carboxamido or substituted or unsubstituted amino groups, or one or more lower alkyl groups having from 1 to 3 carbon atoms;

provided that R_4 cannot be substituted with more than one methoxy group.

5,591,777

USE OF 6,7-SUBSTITUTED-2-AMINOTETRALINES FOR PREPARING PHARMACEUTICAL COMPOSITIONS USEFUL FOR THE TREATMENT OF SEPTIC SHOCK, AND ANTIPYRETIC AND ANTIINFLAMMATORY PHARMACEUTICAL COMPOSITIONS

Piero Foresta, Pomezia, and Vito Ruggiero, Rome, both of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Feb. 27, 1996, Ser. No. 607,452

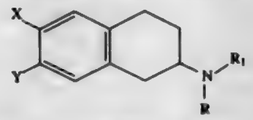
Claims priority, application Italy, Mar. 9, 1995, RM95A0143

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—653 **8 Claims**

1. A therapeutic method for treating septic shock which comprises administering to a patient in need thereof an effective amount of a 6,7-substituted 2-aminotetraline of the formula (I)

(I)



wherein X and Y, equal or different, are selected from the group consisting of methoxy, acetoxy and fluorine and R and R_1, equal or different, are selected from the group consisting of hydrogen, ethyl, propyl, cyclopropylmethyl, 2-phenyl-2-hydroxyethyl, 2-hydroxy-2-(4-methylphenyl)ethyl and 2-hydroxy-3-(4-methoxyphenoxy)propyl.

5,591,778

PROCESS FOR THE PREPARATION OF EXPANDABLE POLYSTYRENE

Dietrich Scherzer, Neustadt; Klaus Hahn, Kirchheim; Anthony Schaefer, Hightstown, and Bernhard Schmied, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Germany

Filed Aug. 14, 1995, Ser. No. 514,643

Int. Cl.[6] C08J *9/18; 9/20*

U.S. Cl. 521—56 **1 Claim**

1. A process for the preparation of bead shaped, expandable polystyrene by the polymerization of styrene containing contaminants in an aqueous suspension in the presence of suspension stabilizers and ordinary styrene soluble polymerization catalysts and from 0.05 to 0.5 weight percent, based on the styrene, of dimeric α-methylstyrene containing contaminants, whereby:

A. 2 to 8 weight percent, based on the styrene, of a C_3 to C_6 hydrocarbon having a boiling point below 70° C. as a blowing agent; and

B. 0.01 to 0.7 weight percent, based on the styrene, of a saturated hydrocarbon having a boiling point between 70° and 170° C. as an auxiliary blowing agent,

are added to the aqueous suspension before, during or after polymerization wherein one first reports the content of saturated hydrocarbons, having a boiling point between 70° and 170° C., contaminating the styrene and dimeric α-methylstyrene, and then enough auxiliary blowing agent B is added before, during or after the polymerization so that the total content of auxiliary blowing agent B in the suspension is from 0.1 to 0.8 weight percent, based on the styrene.

5,591,779

PROCESS FOR MAKING FLEXIBLE FOAMS

Gerhard J. Bleys, Heverlee; Dirk Gerber, Grimbergen, and Vivane G. J. Neyens, Scherpenheuvel, all of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 463,588, Jun. 5, 1995, abandoned, and a continuation-in-part of Ser. No. 478,078, Jun. 7, 1995, abandoned. This application Nov. 20, 1995, Ser. No. 560,858

Claims priority, application European Pat. Off., Nov. 22, 1994, 94203401; May 12, 1995, 95201245

Int. Cl.[6] C08G *8/32; 8/10*

U.S. Cl. 521—109.1 **18 Claims**

1. Process for preparing a flexible foam by reacting a prepolymer having an NCO value of 3–15% by weight, which is the reaction product obtained by reacting an excessive amount of a polyisocyanate with a polyether polyol or a mixture of such polyols, said polyol or mixture having an average nominal hydroxyl functionality of from 2 to 6, an average hydroxyl equivalent weight of from 500 to 5000 and an oxyethylene content of at least 50% by weight, with water, the amount of water being 15–500 parts by weight per 100 parts by weight of prepolymer, at the start of the reaction the temperature of the prepolymer being 10°–50° C. and the temperature of the water being 10°–50° C. higher than the temperature of the prepolymer.

5,591,780

LOW ODOR AMINE CATALYSTS FOR POLYURETHANE FLEXIBLE SLABSTOCK FOAMS BASED ON POLYESTER POLYOLS

Krunoslav Muha, Henstedt-Ulzburg, Germany; Steven P. Hulme, Macclesfield, England, and Mark E. Haraksal, Hurricane, W. Va., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 215,867, Mar. 18, 1994. This application Apr. 17, 1996, Ser. No. 633,325

Int. Cl.[6] C08G *18/20*

U.S. Cl. 521—128 **12 Claims**

1. In a method for preparing a flexible polyurethane slabstock foam which comprises reacting an organic polyisocyanate and a polyester polyol in the presence of a blowing agent, optionally a cell stabilizer, and a catalyst composition, the improvement for providing a flexible open-celled polyurethane slabstock foam which comprises employing a catalyst composition consisting essentially of N-methylimidazole or 1,2-dimethylimidazole, or both.

5,591,781

PROCESS FOR PRODUCING POLYURETHANE FOAM WITH HIGH CURING RATE

Hiroyuki Yoshimura; Hidenki Kisaka, both of Shimonoyo; Yutaka Tamano, Tokuyama, and Shuichi Okuzono, Kudamatsu, all of Japan, assignors to Tosoh Corporation, Shimonoyo, Japan

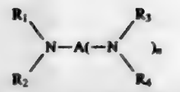
Filed Oct. 24, 1994, Ser. No. 328,064

Claims priority, application Japan, Oct. 27, 1993, 5-268795; Oct. 27, 1993, 5-268796

Int. Cl.[6] C08G *18/18*

U.S. Cl. 521—129 **14 Claims**

1. A process for producing a flexible polyurethane foam by reaction of a polyol and a polyisocyanate in the presence of an amine catalyst, a blowing agent, and a foam stabilizer, the amine catalyst comprising at least one amine compound represented by General Formula (1) below:



(1)

where R_1, R_2, R_3, and R_4 are respectively an alkyl group of 1 to 6 carbons independently; n is an integer of 0 or 1; and A is an alkyl group of 11 to 14 carbons when n is 0, or an alkylene group of 11 to 15 carbons when n is 1,

wherein said blowing agent comprises water in an amount ranging from 2 to 10 parts by weight based on 100 parts by weight of said polyol, and

wherein the polyol has an average functionality ranging from 2 to 5, and an average hydroxyl number ranging from 20 to 100 mgKOH/g.

5,591,782

Patent Not Issued For This Number

5,591,783

ULTRAVIOLET-CURABLE SILICONE COMPOSITION CONTAINING A POLYORGANOSILOXANE TERMINATED WITH A SILANOL GROUP AT BOTH ENDS OR AN ALCOHOL-MODIFIED POLYORGANOSILOXANE

Keiji Kobayashi, Tokyo, Japan, and Roy M. Griswold, New York, N.Y., assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1995, Ser. No. 385,883

Claims priority, application Japan, Feb. 18, 1994, 6-043370

Int. Cl.[6] C08F *2/50;* **C08L** *63/00; 83/06; 83/07*

U.S. Cl. 522—31 **11 Claims**

1. An ultraviolet-curable silicone composition comprising:

(A) 100 parts by weight of a polyorganosiloxane comprising structural units represented by the general formula $R^1_mR^2_nSiO_{(4-m-n)/2}$ wherein R^1's , which may be the same or different, each represents a monovalent hydrocarbon group, R^2 represents hydrogen atom, a divalent hydrocarbon group or a monovalent epoxy-functional organic group, and m and n each represents an integer of from 0 to 3, with the proviso that the sum of m and n is an integer of from 0 to 3, at least two of R^2 are epoxy-functional organic groups;

(B) from 0.1 to 10 parts by weight of (a) a polyorganosiloxane having a viscosity of 1 cP to 30,000 cP at 25° C. represented by the general formula R^3_2SiO wherein R^3's, which may be the same or different, each represents a monovalent hydrocarbon group, which is blocked by $(OH)R^3_2Si_{1/2}$ at the both ends thereof, or (b) an alcohol-modified polyorganosiloxane having a viscosity of from 1 cP to 30,000 cP at 25° C. containing two or more alcoholic OH groups per molecule; and

(C) a catalytically effective amount of an onium salt as a photoinitiator.

5,591,784

CURING OF FIBER-REINFORCED COMPOSITE STRUCTURES

Koichi Muranaka, Sagamihara, Japan, assignor to Three Bond Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1995, Ser. No. 491,274

Claims priority, application Japan, Jun. 17, 1994, 6-168536

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—74 **7 Claims**

1. A process for curing a composite structure comprising:

preparing a composite structure which includes carbon fiber, a curable resin having at least one (meth) acryloyl group in its molecule and a catalyst capable of being activated by heat; and

irradiating said composite structure with visible light having a wavelength of at least 400 nm and/or infrared light.

5,591,785

HIGH MELT STRENGTH, PROPYLENE POLYMER, PROCESS FOR MAKING IT, AND USE THEREOF

B. Joseph Scheve; John W. Mayfield, and Anthony J. DeNicola, Jr., all of New Castle County, Del., assignors to Montell North America Inc., Wilmington, Del.

Division of Ser. No. 299,331, Aug. 31, 1994, which is a continuation of Ser. No. 166,285, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 471,692, Jan. 29, 1990, abandoned, which is a division of Ser. No. 152,619, Feb. 5, 1988, Pat. No. 4,916,198, which is a continuation-in-part of Ser. No. 819,395, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 696,799, Jan. 31, 1985, abandoned. This application Mar. 23, 1995, Ser. No. 409,367

Int. Cl.[6] C08J *3/28*

U.S. Cl. 522—157 **4 Claims**

1. A method of applying a coating to a substrate, which comprises extruding onto said substrate a composition consisting essentially of normally solid, high molecular weight, gel-free, amorphous to predominantly crystalline propylene polymer material, the branching index of which is less than 1, which material has strain hardening elongational viscosity.

5,591,786

SEMI-THERMOPLASTIC MOLDING COMPOSITION HAVING HEAT-STABLE CUSTOM SHAPE MEMORY

Joel D. Oxman; F. Andrew Ubel, III, and Lani S. Kangas, all of St. Paul, Minn., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 388,156, Feb. 13, 1995, which is a continuation of Ser. No. 137,584, Oct. 15, 1993, Pat. No. 5,403,188, which is a continuation of Ser. No. 484,695, Feb. 23, 1990, abandoned. This application May 19, 1995, Ser. No. 444,486

Int. Cl.[6] A61C *9/00*; A61K *6/10*

U.S. Cl. 523—109 **9 Claims**

1. A method for making an impression of dental tissue, comprising the steps of:

a) heating a molding composition to a molten or softened state, said composition comprising a thermoplastic, free-radically polymerizable material, and a free-radical initiator, the composition being solid at 38° C. and having a melting or softening point that comfortably can be withstood by oral tissues,

b) enveloping the tissue with said molten or softened molding composition and in either order,

c) cooling the composition so that it solidifies; and

d) causing or permitting the composition to undergo polymerization,

whereby a semi-thermoplastic dental tissue impression having hot custom memory is obtained.

5,591,787

HARD LEAD FOR A PENCIL

Barbara Schlemmert, Gronsbersdorf, and Gerhard Lugert, Nürnberg, both of Germany, assignors to A.W.-Faber Castell Unternehmensverwaltung GmbH & Co., Stein, Germany

Continuation of Ser. No. 145,858, Nov. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,527

Claims priority, application Germany, Nov. 11, 1992, 9215344 U

Int. Cl.[6] C09D *13/00*; C09K *11/06*

U.S. Cl. 523—164 **17 Claims**

1. A fluorescent color hard lead for color pencils and marking crayons, comprising:

(a) a matrix comprised of at least one material selected from the group consisting of a fatty acid metal salt, a fatty acid ester, and a wax; a binder; and a filler which is aluminum silicate; and

(b) particles which are intimately mixed into the matrix and which are comprised of at least one synthetic polymer and at least one fluoreacent dye with which the at least one synthetic polymer is dyed, the at least one synthetic polymer being selected from the group consisting of homopolymers from one monomer and copolymers from at least two monomers, the monomers being selected from the group consisting of acrylic acids, acrylates, acrylonitriles, and styrene, which monomers have been polymerized in an aqueous solution into which is added the at least one fluoreacent dye to provide a dispersion, which dispersion is added to the matrix directly,

wherein the dyed particles are uniformly distributed throughout the matrix whereby the fluorescent color hard lead is uniformly colored and produces uniformly colored lines in use.

5,591,788

CATIONIC, ADVANCED EPOXY RESIN COMPOSITIONS INCORPORATING GLYCIDYL ETHERS OF OXYALKYLATED AROMATIC OR CYCLOALIPHATIC DIOLS

Kenneth W. Anderson, and Richard A. Hickner, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 575,119, Aug. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 372,065, Jun. 27, 1989, abandoned, which is a division of Ser. No. 128,249, Dec. 3, 1987, Pat. No. 4,863,575. This application Nov. 17, 1992, Ser. No. 977,585

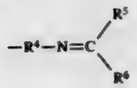
Int. Cl.[6] C08G *59/14*; C08L *63/02*

U.S. Cl. 523—404 **14 Claims**

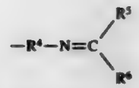
1. A coating resin composition comprising mainly a reaction product obtained by adding a nucleophilic compound to an epoxy resin; said nucleophilic compound being a monobasic heteroaromatic nitrogen compound or a compound represented by the following formula



wherein R^2 and R^3 individually are lower alkyl, hydroxy lower alkyl,

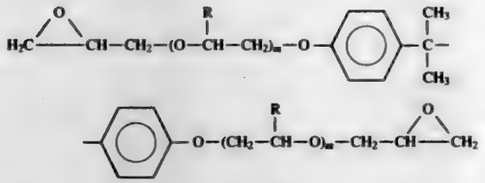


or are combined as one alkylene radical having from 3 to 5 carbon atoms, R^4 is an alkylene group having from 2 to 10 carbon atoms, R^5 and R^6 individually are lower alkyl and R^1 is hydrogen or lower alkyl, aralkyl or aryl, except that when R^2 and R^3 together are an alkylene group then R^1 is hydrogen, lower alkyl or hydroxyalkyl and when either or both of R^2 and R^3 is



then R^1 is hydrogen; said epoxy resin being a reaction product of

(A-1) a diglycidyl ether compound represented by the following formula



wherein R represents hydrogen or an alkyl group having from 1 to 6 carbon atoms, and each m is independently an integer of 1–25;

(A-2) a diglycidyl ether of a dihydric phenol different from component (A-1); and

(B) a dihydric phenol.

5,591,789

POLYESTER DISPERSANTS FOR HIGH THERMAL CONDUCTIVITY PASTE

Sushumna Iruvanti, Wappingers Falls; Keith S. Olsen, Poughkeepsie, and Krishna G. Sachdev, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 477,064

Int. Cl.[6] C08K *3/10;3/22*; C08L *67/00*; H01B *1/20*

U.S. Cl. 523—515 **17 Claims**

1. A method for making a thermally conductive paste comprising:

forming a solution of a polyester dispersant which is a self-condensation reaction product of a hydroxy fatty acid or mixture of hydroxy fatty acids having an Acid No. of about 45–85 in a non-aqueous solvent;

dispersing a high thermal conductivity filler material into the above solution so that a homogenous composition is formed;

removing the solvent; and

blending the homogeneous composition with a dielectric liquid carrier to form a homogeneous paste.

5,591,790

ABSORPTIVE DRESSINGS

Peter M. Lock, 43 Bimini Cove Dr., Ocean Ridge, Fla. 33435

Continuation of Ser. No. 316,941, Oct. 3, 1994, Ser. No. 903,904, Jun. 25, 1992, Pat. No. 5,382,609, Ser. No. 428,630, Apr. 25, 1995, and Ser. No. 904,187, Jun. 25, 1992, Pat. No. 5,451,467. This application Jun. 7, 1995, Ser. No. 488,206

Claims priority, application Great Britain, Jun. 26, 1991, 9113861

Int. Cl.[6] C08L *1/00;1/26*; B05D *1/12*; D04H *1/58*

U.S. Cl. 524—35 **8 Claims**

1. A dressing comprising an absorbent fibrous matrix having on at least one side a layer of porous plastic, said matrix comprising fibers joined by a suitable heat activatable compound therefor, said heat activatable compound being associated with substantially the entire surface of each fiber, and wherein said layer of porous plastic is a thermoplastic and is essentially integral but gas and vapor permeable.

5,591,791

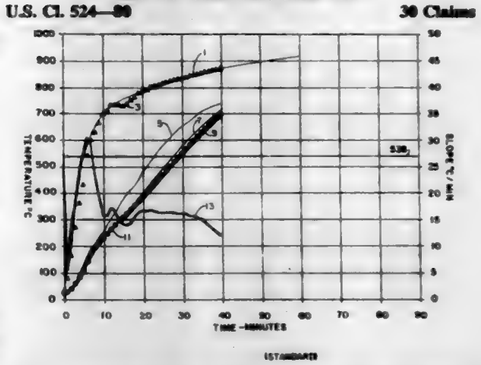
THERMAL PROTECTIVE COMPOSITIONS

Malkit S. Deogun, Chesterfield, Mo., assignor to Nu-Chem, Inc., Fenton, Mo.

Filed Jun. 27, 1995, Ser. No. 494,993

Int. Cl.[6] C08K *3/02*; C09D *5/18*

U.S. Cl. 524—80 **30 Claims**



1. A char-forming thermal protective composition comprising a binder, a source of carbon, a blowing agent which forms a gas when exposed to thermal extremes for expanding the char, and at least 0.5% elemental boron by weight of the binder.

5,591,792

ADHESIVE RESIN COMPOSITION

Masafumi Hattori; Chikako Ikeda; Satoru Sugimoto; Tatsuoki Saito; Hitoshi Yamada, and Etsushi Akashige, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jan. 10, 1995, Ser. No. 370,871

Claims priority, application Japan, Jan. 25, 1994, 6-006689

Int. Cl.[6] C08L *93/04*

U.S. Cl. 524—271 **28 Claims**

1. An adhesive resin composition for a multi-layered resin laminate, consisting essentially of a mixture of an ethylene polymer having a melting point of 70° to 132° C., a density of 0.88 to 0,945 g/cm^3 and a melt flow rate (MFR) of 0.05 to 50 g/10 min., and a modified product which is obtained by graft-modifying said ethylene polymer with an unsaturated carboxylic acid or a derivative thereof grafted thereto in an amount of 0.01 to 10 wt % (component A); a tackifier (component B); and a block copolymer containing at least one polymer block mainly composed of a vinyl aromatic hydrocarbon and at least one polymer block mainly composed of a conjugated diene or a hydrogenated product thereof (component C), wherein the contents of the components A, B and C are 40 to 70 wt %, 5 to 30 wt % and 5 to 30 wt %, respectively, based on the total amount of the components A, B and C.

5,591,793

THIXOTROPIC ALKYD RESINS AND THE USE THEREOF IN COATING COMPOSITIONS

Madhukar Rao, Brecksville; Hyeong-Chan Yoon; Anthony F. Toussaint, both of Cleveland, and Marianne G. DeCaprio, Broadview Heights, all of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 228,543, Apr. 15, 1994, abandoned. This application Dec. 14, 1995, Ser. No. 574,465

Int. Cl.[6] C08L *77/00*

U.S. Cl. 524—310 **25 Claims**

1. A process of preparing a thixotropic resin which comprises heating to a temperature of between about 120° and 150° C. for at least one hour (a) at least one alkyd resin and (b) a polyamide comprising the reaction product of:

(i) a polycarboxylic acid:
(ii) an active hydrogen compound having the formula X_m—R—Y_n, wherein R represents a group containing from 6 to 12 carbon atoms, X and Y are independently selected from primary amino, secondary amino, and hydroxy, and m+n are each at least 1 and the sum of (m+n) is at least 2 with the proviso that at least 90% of the X and Y groups participating in the reaction are selected from primary amino, secondary amino or a mixture thereof; and
(iii) a capping agent comprised of monocarboxylic acid having from 8 to 22 carbon atoms and which is selected from the group consisting of unsaturated monocarboxylic acid, hydroxylated monocarboxylic acid and unsaturated hydroxylated monocarboxylic acid.

5,591,794

RUBBER COMPOSITION FOR TIRE TREAD

Takahiro Fukumoto; Yoko Nakada, both of Kobe, and Yoichi Mizuno, Akashi, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Apr. 13, 1995, Ser. No. 421,686
Claims priority, application Japan, Apr. 19, 1994, 6-080751
Int. Cl.[6] C08K *3/34*
U.S. Cl. 524—447 **19 Claims**

1. A rubber composition for a tire tread comprising 100 parts by weight of a diene rubber containing as a main component thereof at least one rubber selected from the group consisting of natural rubber, polyisoprene and polybutadiene, and 30 to 90 parts by weight of a vulcanized rubber powder, wherein the vulcanized rubber powder is a powder of a rubber resulting from vulcanization of a rubber composition including 100 parts by weight of a diene rubber containing as a main component thereof at least one rubber selected from the group consisting of natural rubber, polyisoprene and polybutadiene and 30 to 100 parts by weight of a clay mainly composed of kaolinite.

5,591,795

POLYPROPYLENE COMPOSITION

Takao Nomura, Toyota; Takeyoshi Nishio, Okazaki; Mikio Hashimoto, and Satoru Moriya, both of Waki-cho, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

PCT No. PCT/JP94/01064, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO95/01398, PCT Pub. Date Jan. 12, 1995
PCT Filed Jun. 30, 1994, Ser. No. 392,814
Claims priority, application Japan, Jun. 30, 1993, 5-161962; Sep. 1, 1993, 5-217501
Int. Cl.[6] C08K *3/00; C08L 53/00*
U.S. Cl. 524—451 **11 Claims**

1. A polypropylene composition comprising: (A) 60–85% by weight of a propylene block copolymer consisting essentially of a crystalline homopolypropylene component and an ethylene/propylene copolymer rubber component which is soluble in 23° C. n-decane, having
(1) a melt flow rate (MFR) at 230° C. under a load of 2.16 kg of 10–60 g/10 min, containing
(2) 3–13 % by weight of the 23° C. n-decane soluble ethylene/propylene copolymer rubber component, said n-decane soluble component having an intrinsic viscosity (η) of 4–12 dl/g and containing the units derived from ethylene in an amount of 30–60 mol %, and having
(3) a melt flow rate (MFR) at 230° C. under a load of 2.16 kg of the crystalline homopolypropylene component of 20–80 g/10 min, and a pentad isotacticity (I_5) of said homopolypropylene component, as determined by ^{13}C-NMR method, being not less than 0.97;
(B) 10–25% by weight of an ethylene/α-olefin random copolymer containing
(1) the units derived from ethylene in an amount of 60–90 mol %, having
(2) an intrinsic viscosity (η) in decalin of 1.5–3.5 dl/g,
(3) a glass transition temperature (Tg) of not higher than −55° C., or a melting point measured as a main peak by DSC method of not higher than 90° C., and
(4) a crystallinity, as measured by X-ray diffractometry, of less than 20%; and
(C) 5–15% by weight of an inorganic filler.

5,591,796

PUMPABLE ANTI-ABRASION INK ADDITIVES AND PRINTING INKS CONTAINING SUCH ADDITIVES

Ted Wisniewski, Edison, and Bruce Tavares, Blairstown, both of N.J., assignors to Rheox, Inc., Hightstown, N.J.

Filed Oct. 2, 1995, Ser. No. 537,646
Int. Cl.[6] C08K *5/01; C08F 114/26; C09D 11/10*
U.S. Cl. 524—484 **23 Claims**

1. A pumpable anti-abrasion additive for ink formulations comprising:
a) about 40 to 70 parts by weight of powdered sintered polytetrafluoroethylene; and
b) about 30 to 60 parts by weight of one or more liquid polyalphaolefins.

5,591,797

TRANSITION METAL-CONTAINING HYDROPHOBIC SILICA

Herbert Barthel, Emmerting, and Frank Achenbach, Simbach am Inn, both of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 21, 1994, Ser. No. 326,983
Claims priority, application Germany, Oct. 25, 1993, 43 36 345.8; Jan. 20, 1994, 44 01 598.4
Int. Cl.[6] C08K *3/34*
U.S. Cl. 524—493 **7 Claims**

1. A white, organosilicon-hydrophobicized hydrophobic silica having a BET specific surface area of 40 to 450 m^2/g, a carbon content of at least 0.5% by weight and a transition metal content of 10 to 10,000 ppm by weight.

5,591,798

HIGH TEMPERATURE STABLE, LOW SOLVENT SWELLING THERMOPLASTIC ELASTOMER COMPOSITIONS

Raman Patel, Akron, Ohio, assignor to Advanced Elastomer Systems, L.P., Akron, Ohio

Continuation of Ser. No. 390,900, Feb. 16, 1995, abandoned, which is a continuation-in-part of Ser. No. 90,367, Jul. 12, 1993, abandoned, which is a continuation of Ser. No. 179,816, Apr. 11, 1988, abandoned. This application May 14, 1996, Ser. No. 645,940
Int. Cl.[6] C08L *77/00*
U.S. Cl. 524—514 **19 Claims**

1. A thermoplastic elastomeric composition having a tension set less than 60 percent, comprising a dynamically vulcanized blend of
a) a non-crystalline, covalently-crosslinked acrylate rubber having a T_g below about 23° C., and
b) from about 20 parts to less than 55 parts of a thermoplastic polyamide resin selected from nylons having a softening point above 100° C., per 100 parts of rubber and polyamide,
wherein no more than 50 percent of said rubber is extractable from the blend and said polyamide is not crosslinked.

5,591,799

AQUEOUS EMULSION MATERIALS CONTAINING COPOLYMERIZED VINYL AMIDE MONOMERS AND HYDROLYSIS PRODUCTS THEREOF

Richard H. Bott, Macungie; Michael E. Ford, Coopersburg, and William E. Lenney, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 3, 1995, Ser. No. 398,025
Int. Cl.[6] C08L *39/00*
U.S. Cl. 524—555 **15 Claims**

1. In a stable aqueous emulsion containing water insoluble, vinyl polymer particles said vinyl polymer particles formed by the emulsion polymerization of at least two ethylenically unsaturated monomers, the improvement wherein the vinyl polymer comprises from 1 to 20% by weight of polymerized N-vinylformamide units, and said polymerized N-vinylformamide units being hydrolyzed in a molar amount of from 8 to 30%.

10. In a process for producing a polymer containing amine functionality, the improvement for producing a stable latex containing said polymer containing amine functionality which comprises:
forming a polymer comprising from 1 to 20% by weight of polymerized units of N-vinylformamide by the emulsion polymerization of a water insoluble monomer system comprising N-vinylformamide;
hydrolyzing the polymer containing polymerized units of N-vinylformamide by contacting the polymer with an acid under conditions for converting from 8 to 30% by weight of the polymerized units of N-vinylformamide to amine groups, thereby forming a stable latex containing said polymer containing amine functionality.

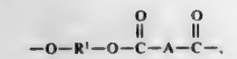
5,591,800

METHOD FOR POLYMERIZING MACROCYCLIC POLY(ALKYLENE DICARBOXYLATE) OLIGOMERS

Tohru Takekoshi, Scotia, and Eric J. Pearce, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

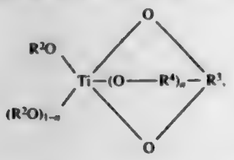
Division of Ser. No. 371,715, Jan. 12, 1995, Pat. No. 5,527,976. This application Nov. 30, 1995, Ser. No. 565,366
Int. Cl.[6] C08K *3/10; C08G 63/85*
U.S. Cl. 524—783 **12 Claims**

1. A method for preparing a polyester which comprises contacting, at a temperature within the range of about 160°–300° C., at least one macrocyclic polyester oligomer comprising structural units of the formula



(I)

wherein R^1 is an alkylene or mono-or polyoxyalkylene radical containing a straight chain of about 2–8 atoms and A is a m- or p-linked monocyclic aromatic or alicyclic radical, with at least one titanium-containing macrocyclic polyester oligomer polymerization catalyst having, at least in part, the formula



(II)

wherein:
R^2 is an alkyl radical, or the two R^2 radicals taken together form a divalent saturated aliphatic hydrocarbon radical;
R^3 is a C_{2-10} divalent or trivalent saturated aliphatic hydrocarbon radical;
R^4 is a methylene or ethylene radical; and
n is 0 or 1.

5,591,801

Patent Not Issued For This Number

5,591,802

THERMOPLASTIC COMPOSITION AND METHOD FOR PRODUCING THERMOPLASTIC COMPOSITION BY MELT BLENDING CARPET

Donald J. David, 11 Indian Pipe La., Amherst, Mass. 10025; Jerauld L. Dickerson, 10165 Noreiga La., Pensacola, Fla. 32514, and Thomas F. Sincock, 29 Simsburg Manor Dr., Weatague, Conn. 06089

Continuation of Ser. No. 400,431, Mar. 3, 1995, abandoned, which is a continuation of Ser. No. 132,332, Oct. 6, 1993, abandoned, which is a division of Ser. No. 37,140, Mar. 25, 1993, Pat. No. 5,294,384. This application Aug. 7, 1995, Ser. No. 512,133
Int. Cl.[6] B29B *17/00;* **C08J** *11/04*
U.S. Cl. 525—66 **14 Claims**

1. A thermoplastic melt blend comprising the polymeric components of a post-consumer carpet sample, said sample including a plurality of nylon tufts, at least one polyolefin backing and styrene-butadiene rubber adhesive, said composition being substantially free of the fiber form of said polymeric components of said sample.

5,591,803

GOLF BALL COVER COMPOSITIONS

Michael J. Sullivan, Chicopee, Mass., and Robert A. Weiss, Storrs, Conn., assignors to Lisco, Inc., Tampa, Fla.

Continuation of Ser. No. 359,620, Dec. 20, 1994, Pat. No. 5,542,677. This application Oct. 31, 1995, Ser. No. 551,254
Int. Cl.[6] C08F *8/00;* **A63B** *37/12*
U.S. Cl. 525—196 **15 Claims**

1. A golf ball having a core and a cover wherein said cover comprises 30 to 90% of a neutralized ethylene/acrylic acid copolymer and 10–70 parts by weight of an ethylene alkyl acrylate copolymer containing up to 30% by weight of the alkyl acrylate.

5,591,804

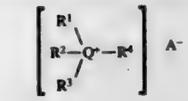
FLUORINATED ONIUM SALTS, CURABLE COMPOSITIONS CONTAINING SAME, AND METHOD OF CURING USING SAME

William D. Coggio, Woodbury, Minn.; Dirk H. C. Arren, Borsbeek, Belgium; Douglas S. Parker, Afton, and Allan T. Worm, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1995, Ser. No. 576,097
Int. Cl.[6] C08F *8/30*
U.S. Cl. 525—276 **31 Claims**

1. A curable composition comprising:
(a) at least one curable polymer comprising vinylidene fluoride units; and

(b) at least one cure accelerator having the formula



where Q is an onium ion; A^- is a counterion; R^1, R^2, R^3, and R^4, independently, comprise (a) a non-fluorinated alkyl, cycloalkyl, allyl, aryl, or aralkyl group; (b) an onium-containing group; or (c) a group having the formula $-(CH_2)_n-Y-R^5$ in which n is at least two; Y is a spacer arm comprising a $-CH_2-$, $-O-$, $-OCH_2-$, $-S-$, $-SO_2-$, or $-Z-SO_2-$ group; Z is an $-R^6-O-$, $-N(R^7)-$, or $-N(H)-$ group; R^6 is a substituted or unsubstituted phenylene group; R^7 is a non-fluorinated alkyl, cycloalkyl, allyl, aryl, or alkaryl group; and R^5 is a fluorinated group, perfluorinated group, or combination thereof,

with the proviso that (i) at least one of R^1, R^2, R^3, and R^4 comprises a group having the formula $-(CH_2)_n-Y-R^5$; (ii) the total number of fluorine atoms in said compound is at least 5; and (iii) when Q is a sulfonium ion, there is no R^4 group.

5,591,805

ANHYDRIDE-FUNCTIONAL POLYMERS COMPRISING ENE REACTION PRODUCTS OF UNSATURATED ANHYDRIDES AND POLYOLEFINS

Mohamad D. Shalati, Homewood; Rodney M. Harris, Chicago; Joyce A. Bibeau, Richton Park, and Richard S. Valpey, III, Matteson, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 176,591, Jan. 3, 1994, Pat. No. 5,492,976. This application Feb. 15, 1996, Ser. No. 602,668

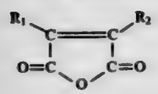
Int. Cl.[6] C08F 8/32

U.S. Cl. 525—285 **45 Claims**

1. A curable composition which comprises:

(a) an anhydride-functional polymer obtained by reacting under ene reaction conditions:

(i) 20 to 70 percent by weight an unsaturated anhydride having the structure:



wherein R_1 and R_2 are each independently hydrogen, alkyl of 1 to about 6 carbons, or alkoxy of 1 to about 6 carbons, or a halogen; and

(ii) 30 to 80 percent by weight of at least one polyolefin having at least two carbon-carbon double bonds in the polyolefin backbone and having an average of at least three carbon atoms in the polyolefin backbone between the carbon-carbon double bonds; and

(b) a compound having an average of at least two functional groups per molecule which are reactive with anhydride groups.

5,591,806

HIGH SOLIDS ETHYLENE ACRYLIC ACID AQUEOUS DISPERSIONS AND METHODS OF PRODUCING SAME

Frank P. Recchia, New Haven, Conn.; Wilson M. Ferrell, and W. Maclin Ferrell, Jr., both of Petersburg, Va., assignors to Dominion Chemical Company, Petersburg, Va.

Division of Ser. No. 94,386, Jul. 21, 1993, Pat. No. 5,430,111, which is a continuation-in-part of Ser. No. 702,095, May 20, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,186

Int. Cl.[6] C08C 19/22

U.S. Cl. 525—369 **6 Claims**

1. A process for the production of a reacted ethylene acrylic acid (EAA) product for use in a dispersion for coating and similar purposes comprising the steps of:

providing a quantity of EAA polymer,

introducing the EAA polymer into an elongated mixing extruder and advancing the same therethrough,

selecting a reactant from the group consisting of ammonia, ammonium hydroxide, sodium hydroxide, and potassium hydroxide,

introducing the reactant into the EAA:

(1) at a point between introduction of the EAA into the extruder and extrusion of the product from the extruder, thereby well mixing the EAA and reactant as the same are advanced through the extruder,

(2) in the range of 0.10 to about 0.25 mole ratio, and,

(3) with said introducing occurring under essentially dry conditions and with water, in an amount minimally sufficient for the selected reactant to swell the EAA polymer to expose reactor sites of the molecule so that the positive ions of the selected reactant can reach the reactor sites of the EAA molecules thereby to react and form the corresponding EAA salts thereat and as a dry product with no additional water added thereto other than that initially present in the said selected reactant,

introducing selected additives into the EAA in the extruder at selected points along the length thereof to obtain desired properties of the reacted EAA product, and,

extruding the reacted product from the extruder.

5,591,807

POLYIMINE/POLYISOCYANATE COATING COMPOSITION CONTAINING POLYMERIC ANHYDRIDE

Rubing Cai, Westmont, and Walter E. Hawrylko, Richton Park, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

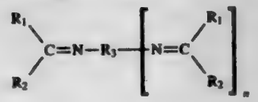
Filed May 23, 1995, Ser. No. 448,243

Int. Cl.[6] C08F 8/32

U.S. Cl. 525—381 **11 Claims**

1. A coating composition having extended pot life and excellent cure comprising:

(i) 1–40% by weight of an imine having the structure



wherein

n is 0 to 30,

R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, aryl, cycloaliphatic, and substituted alkyl, aryl, and cycloaliphatic groups; and R_1 and R_2 may be the same or different; and

R_3 is selected from the group consisting of aliphatic, aromatic, arylaliphatic, and cycloaliphatic groups and which may also contain O, N, S, or Si;

(ii) 20–60% by weight of a polyisocyanate having an average of at least two isocyanate groups per molecule;

(iii) 1–50% by weight of at least one polyaspartic ester; and

(iv) 1–20% by weight of an anhydride functional polymer having an average of at least two cyclic carboxylic acid anhydride groups per molecule and comprising the addition polymerization reaction product of at least one unsaturated monomer having anhydride functionality and at least one other ethylenically unsaturated monomer copolymerizable therewith;

wherein the coating composition is substantially free of hydroxyl groups.

5,591,808

ACETAL-BASED SELF LUBRICATING COMPOSITIONS

Warren E. Jamison, Edmonds, Wash., assignor to E/M Corporation, West Lafayette, Ind.

Filed Oct. 3, 1994, Ser. No. 316,892

Int. Cl.[6] C08L 59/02;71/02

U.S. Cl. 525—403 **28 Claims**

1. A self lubricating plastic composition comprising:

(a) from about 75% by weight to about 95% by weight of a polyoxymethylene polymer; and

(b) from about 5% by weight to about 25% by weight of a mixture of polyglycols comprising:

(i) at least one polyglycol serving as a compatibilizer because of its solubility in the polyoxymethylene polymer; and

(ii) another polyglycol having a coefficient of friction that is less than that of both the polyoxymethylene polymer and the compatibilizer and sufficiently soluble in said compatibilizer to be made miscible in the polyoxymethylene by the compatibilizer.

5,591,809

PROCESS FOR PREPARING HYPERBRANCHED POLYMERS

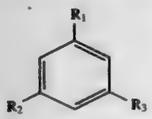
Richard Vicari; Kathleen N. Juneau, and Carl D. Murphy, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 18, 1995, Ser. No. 516,667

Int. Cl.[6] C08G 63/00

U.S. Cl. 525—419 **20 Claims**

1. A process for preparing a highly branched macromolecule polymer comprising the step of reacting (i) a branching monomer, having functional groups thereon, having the formula:



wherein R_1 is independently selected from the group consisting of:

COOR where R is H, alkyl (C_1–C_{20}) or aromatic;

$C(O)—OC_6H_5$;

$O—CH_2CH_2OH$;

$O—C(O)—CH_3$; and

$N—CH_2CH_2OH$;

R_2 and R_3 are each independently selected from the group consisting of:

COOR where R is H, alkyl (C_1–C_{20}) or aromatic;

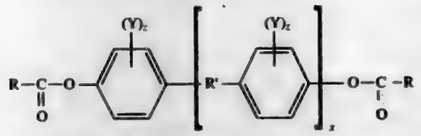
OH;

NH_2; and

$O—C(O)—CH_3$;

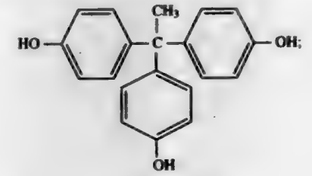
with the proviso that (a) when R_1 is —COOH, R_2 and R_3 must be the same but not equal to R_1, and R_2 and R_3 are either OH or $O—C(O)—CH_3$, and (b) when R_1 is $—C(O)—OC_6H_5$, R_2 and R_3 are equal and are either OH or NH_2; and (c) when R_1 is $O—CH_2CH_2OH$ or $N—CH_2CH_2OH$, R_2 and R_3 are equal, and R_2 and R_3 are $COOR_4$, where R_4 is H or alkyl C_{1-4};

(ii) a core monomer, having functional groups thereon, selected from the group consisting of:

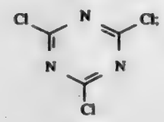


(I)

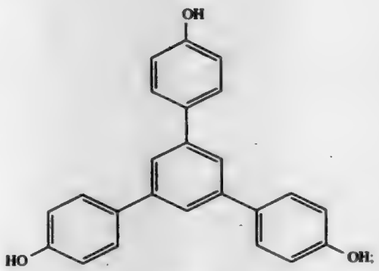
wherein R is independently selected from the group consisting of hydrogen, an alkyl radical having from 1 to 6 carbon atoms, cycloalkyl having from 4 to 7 carbon atoms, and aryl, Y is independently selected from the group coasisting of an alkyl group of 1 to 4 carbon atoms, chlorine and bromine, z independently has a value of 0 to 4, inclusive, R' is independently selected from the group consisting of a divalent saturated aliphatic hydrocarbon radical and halogenated derivatives thereof, cycloalkylene or cycloalkylidene radicals having up to and including 9 carbon atoms and halogenated derivatives thereof, O, S, SO, SO_2, and CO; and x is 0 or 1;



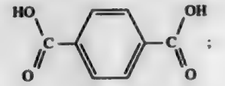
(II)



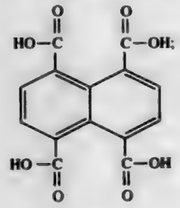
(III)



(IV)



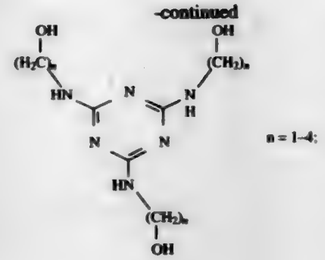
(V)



(VI)

and

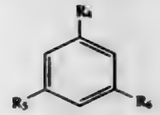
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n = 1–4;

and

(iii) an end-capping monomer having the formula:

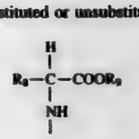


wherein R_4 is selected from the group consisting of COOR wherein R is H, alkyl (C_1–C_{20}) or aromatic; C(O)—OC_6H_5; O—CH_2CH_2OH; O—C(O)—CH_3; and N—CH_2CH_2OH; R_5 and R_6 are each independently selected from the group consisting of:



(A)

where R_7 is a substituted or unsubstituted aryl or alkyl group;



(B)

where R_8 is a substituted or unsubstituted heterocyclic, aryl, or alkyl group and R_9 is H or alkyl;



(C)

where R_8 is a substituted or unsubstituted heterocyclic, aryl, or alkyl group;



(D)

where R_8 is a substituted or unsubstituted heterocyclic, aryl, or alkyl group;



(E)

where R_8 is a substituted or unsubstituted heterocyclic, aryl, or alkyl group; and

(F) chiral or racemic phosphine ligands,

at a sufficient temperature and for a sufficient period of time to produce said highly branched polymer; with the proviso that the branching monomer (i) and the core monomer (ii) are mixed together first and then heated and then the end-capping monomer (iii), which is characterized as a monomer which contains functional groups which will only react with two of the three functional groups of the branching monomer (i), is added to this mixture and the heating continued until said polymer is formed.

5,591,810

CURABLE FURAN RESIN(S) MODIFIED WITH PHENOLIC RESIN(S) FOR USE AS BINDERS FOR CEMENTS AND COATING COMPOSITIONS HAVING IMPROVED THERMAL STABILITY PROCESSES FOR THEIR PREPARATION AND THEIR USE

Wolfgang Hesse, Thannenstein, and Klaus Rauhut, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 171,819, Dec. 21, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 419,820

Claims priority, application Germany, Dec. 23, 1992, 42 43 797.8

Int. Cl.[6] C08F *283/00;* C08G *8/28;* C08L *61/06*

U.S. Cl. 525—480 5 Claims

1. A curable furan resin modified with phenolic resins for cements and coating compositions based on condensation products of furan compounds with phenols and solutions thereof in organic solvents, wherein the curable furan resin modified with phenolic resins comprises condensation products of alkylidenepolyphenols of the novolak type with 0.2 to 0.8 mole of furfuryl alcohol or mixtures of furfuryl alcohol with other reactive furan derivatives per mole equivalent of phenolic hydroxy group, in which the alkylidenepolypheaols in the ortho and/or para positions relative to the phenolic hydroxyl groups are substituted by 2-furylmethyls which condensation products are obtained by reaction of alkylidenepolyphenols with furfuryl alcohol or mixtures thereof with other reactive furan derivatives in the presence of weakly acidic catalysts with elimination of water at reaction temperatures of 140° to 250° C., the acid catalyst being optionally neutralized or removed after reaction is complete, or the furan resins together with excess furfuryl alcohol remaining in the reaction mixture or subsequently admixed furfuryl alcohol or mixtures thereof with other reactive organic solvents, optionally with additional amounts of inert solvents, forming readily curable, low- or high-viscosity resin solutions.

5,591,811

1-IMIDAZOLYLMETHYL-2-NAPHTHOLS AS CATALYSTS FOR CURING EPOXY RESINS

Yefim Brynkhmann, Bronx, N.Y., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Sep. 12, 1995, Ser. No. 527,132

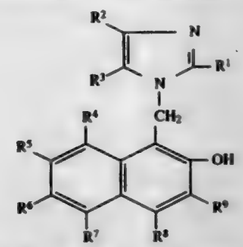
Int. Cl.[6] C08G *59/00;65/08;65/14*

U.S. Cl. 525—504 18 Claims

1. A storage-stable, fast curing epoxy resin composition comprising

A) an epoxy resin containing glycidyl ether groups and having an epoxy equivalent weight of 700 or less; and

B) an amount in the range of from 2–25 parts by weight, per 100 parts of component (A), of a compound of formula (II)

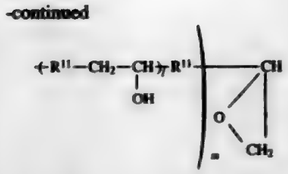


(I)

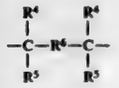
wherein R^1, R^2 and R^3 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, or said cycloalkyl substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, or said cycloalkyl-alkyl substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, or said aryl substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, or said phenylalkyl substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; aromatic or aliphatic acyl group of 3 to 12 carbon atoms; or alkyl or aryl of 3 to 12 carbon atoms containing a cyano group or halogen; and

R^4, R^5, R^6, R^7, R^8 and R^9 are each independently of the other hydrogen; alkyl of 1 to 12 carbon atoms; cycloalkyl of 3 to 12 carbon atoms, or said cycloalkyl substituted by alkyl groups of 1 to 4 carbon atoms; cycloalkyl-alkyl of 4 to 20 carbon atoms, or said cycloalkyl-alkyl substituted by alkyl groups of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms, or said aryl substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; phenylalkyl of 7 to 15 carbon atoms, or said phenylalkyl substituted by 1 to 3 alkyl groups of 1 to 4 carbon atoms; alkenyl of 3 to 12 carbon atoms; alkynyl of 3 to 12 carbon atoms; halogen; alkoxy of 1 to 12 carbon atoms; or hydroxy.

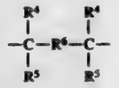
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wherein R^{11} is a divalent organic group, and a plurality of R^{11} may be the same or different; R^1 is a group of the formula:



wherein R^4 is a hydrogen atom or a monovalent organic group; R^5 is a monovalent organic group; R^6 is a phenylene group or a naphthylene group; R^2 is a group of the formula:



wherein R^4 is a hydrogen atom or a monovalent organic group; R^5 is a monovalent organic group; R^6 is a phenylene group or a naphthylene group; and R^3 is a divalent organic group, a plurality of R^1's, R^2's and R^3's may be the same or different, respectively; n is zero or an integer of 1 or more; k is zero or an integer of 1 or more; l is zero or an integer of 1 or more; and m is an integer of 1 or more.

5,591,812

REACTIVE ACCELERATORS FOR AMINE CURED EPOXY RESINS

William E. Starner, Nesquehoning, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 26, 1996, Ser. No. 592,094

Int. Cl.[6] C08G *59/56;59/50*

U.S. Cl. 525—526 20 Claims

1. A curative composition for epoxy resins consisting essentially of (a) 0.02 to 0.99 eq % monomethylamine adduct which is the reaction product of monomethylamine and a polyglycidyl ether reacted in a ratio of >2 moles of monomethylamine per equivalent of epoxide and containing a maximum of 25 eq % tertiary amine and (b) 0.01 to 0.98 eq % amine co-curative for epoxy resins.

5,591,813

AMIDE GROUP-CONTAINING DIISOCYANATES AND AMIDE GROUP-CONTAINING EPOXY RESINS

Kenji Suzuki, Hitachi; Yoshiyuki Mukoyama, Chiba, and Toshihiko Iso, Ibaraki-ken, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

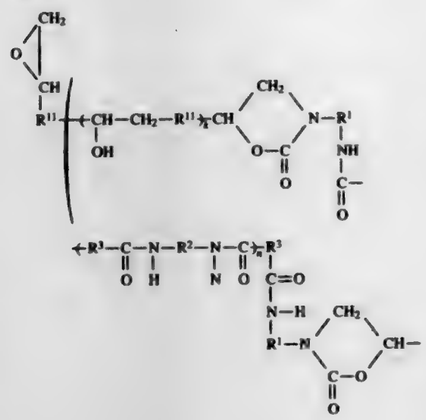
Division of Ser. No. 245,671, May 18, 1994. This application Jun. 6, 1995, Ser. No. 470,630

Claims priority, application Japan, May 21, 1993, 5-119702; Dec. 13, 1993, 5-311662

Int. Cl.[6] C08G *18/28;18/77*

U.S. Cl. 525—528 11 Claims

1. An amide group-containing epoxy resin represented by the formula:



(VI)

5,591,814

CURING AGENT MASTERBATCH FOR EPOXY RESIN AND THEIR PREPARATION

Souichi Murai, Shizuoka-ken, and Hai-Chuan Tsai, Kanagawa-ken, both of Japan, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 22,607, Feb. 18, 1993, Pat. No. 5,400,957. This application Jun. 7, 1995, Ser. No. 472,616

Int. Cl.[6] C08F *283/00;* C08L *63/00*

U.S. Cl. 525—528 3 Claims

1. A method for the preparation of a curing agent masterbatch for epoxy resin which comprises the steps of:

(a) dispersing fine substantially spherical particles of an amine compound lepoxy compound adduct having a diameter of 0.1 μm to 30 μm in a liquid epoxy resin to form a dispersion;

(b) adding 1 to 100 parts by weight of a polyfunctional isocyanate compound based on 100 parts by weight of said particles at a predetermined temperature below the melting point of said particles with agitation; and

(c) continuing the heating and agitation of the resulting mixture at said temperature until substantially all of the isocyanate groups in said polyfunctional isocyanate compound are reacted, said particles being obtained by reacting an amine compound having only one active amino-hydrogen and a polyfunctional epoxy compound at a ratio of the epoxy group in said epoxy compound to the active amino-hydrogen in said amine compound of substantially 1:1 in the presence of a dispersion stabilizer in an organic solvent capable of dissolving both said amine compound and said epoxy compound but incapable of dissolving the adduct formed therefrom at elevated temperatures with agitation, said dispersion stabilizer being a polymeric compound having high affinity to both said organic solvent and said adduct formed.

5,591,815

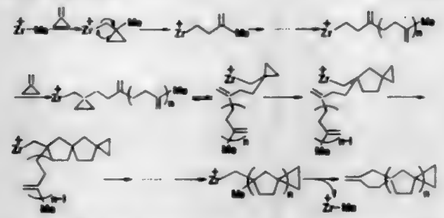
ZIRCONIUM AND HAFNIUM-CATALYZED POLYMERIZATION OF METHYLENECYCLOPROPANE

Tobin J. Marks, Evanston, Ill.; Xinmin Yang, Somerset, N.J., and Li Jia, Evanston, Ill., assignors to Northwestern University, Chicago, Ill.

Division of Ser. No. 399,390, Mar. 6, 1995, Pat. No. 5,488,952, which is a continuation-in-part of Ser. No. 136,217, Oct. 14, 1993, Pat. No. 5,395,906, which is a continuation-in-part of Ser. No. 962,390, Oct. 16, 1992, Pat. No. 5,300,598. This application Nov. 6, 1995, Ser. No. 553,876

Int. Cl.[6] C08F *4/44;4/64*

U.S. Cl. 526—127 **3 Claims**



1. A method for the polymerization of methylenecyclopropanes comprising the steps of adding toluene and methylenecyclopropane or substituted methylenecyclopropanes at a temperature of about −78° C. to a flask containing a catalyst of the formula $L_1L_2MR^+RB(C_6F_5)_3^-$ (R=alkyl or hydride; M=Ti, Zr, Hf) stirring at 20° C. and recovering the polymerized product, where L_1 and L_2 are cyclopentadienyl-containing ligands.

5,591,816

HEAT-RESISTANT MALEIMIDO POLYMERS/BLOCK COPOLYMERS

Sunil K. Varshney, Liege; Philippe Teyssie, Neuville en Condroz, and Roger Fayt, Nessre, all of Belgium, assignors to Atochem, Puteaux, France

Division of Ser. No. 804,674, Dec. 10, 1991, Pat. No. 5,294,674, which is a continuation of Ser. No. 618,637, Nov. 27, 1990, abandoned. This application Dec. 16, 1993, Ser. No. 167,832

Claims priority, application France, Nov. 27, 1989, 89 15581

Int. Cl.[6] C08F *222/40*

U.S. Cl. 526—262 **1 Claim**

1. A homopolymer of N-cyclohexylmaleimide, said homopolymer having a number-average molecular weight ranging from 12,000 to 100,000 and a polydispersity index ranging from 1.1 to 1.5.

5,591,817

MOLDED ARTICLES OF SYNDIOTACTIC POLYPROPYLENE AND METHOD FOR PREPARING SAME

Tadashi Asanuma; Tateyo Sasaki; Mitsuru Ito, all of Takaishi, and Tetsunosuke Shiomura, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 74,274, Jun. 9, 1993, abandoned, which is a continuation of Ser. No. 610,681, Nov. 8, 1990, abandoned. This application Mar. 18, 1994, Ser. No. 210,082

Claims priority, application Japan, Nov. 28, 1989, 1-299498; Dec. 6, 1989, 1-315140; Jan. 23, 1990, 2-11799; Jan. 23, 1990, 2-11800

Int. Cl.[6] C08F *10/06*

U.S. Cl. 526—351 **4 Claims**

1. A molded article of a syndiotactic polypropylene having excellent transparency in which the melting point attributed to the polypropylene having a syndiotactic structure measured at a heating rate of 10° C./minute by differential scanning thermal analysis is represented by a substantially single peak, said molded article being prepared by heating, melting and then hot-molding (a) a homopolymer of propylene, which has a syndiotactic structure such that the syndiotactic pentad fraction is 0.7 or more, (b) a copolymer of propylene and a small amount of another olefin, which has a syndiotactic structure such that, in a ^{13}C-NMR spectrum of the copolymer, a peak intensity at 20.2 ppm occupies 0.5 or more of the total intensity of all the peaks attributed to the methyl groups of propylene units, or (c) a mixture of said homopolymer or said copolymer and less than 50% by weight of the mixture of a polypropylene having a substantially isotactic structure, followed by quenching.

5,591,818

ORGANOSILANE POLYCONDENSATION PRODUCTS

Burkhard Standke, Lörrach; Hartwig Rauleder, Rheinfelden; Claus-Dietrich Seiler, Rheinfelden; Hans-Joachim Kötzsch, Rheinfelden, and Hermann Peters, Siegburg, all of Germany, assignors to Hüls Aktiengesellschaft, Marl, Germany

Filed Mar. 29, 1995, Ser. No. 413,042

Int. Cl.[6] C08G *77/26*

U.S. Cl. 528—38 **31 Claims**

1. An organosilane polycondensation product of the formula

$$[Z—SiO_{(1.5-(a+b+z)/2)}(OH)_a(OR)_bR'_z]_r \quad (I)$$

wherein

R and R' are each independently alkyl of 1 to 8 carbon atoms;

Z is

$$—(CH_2)_nNH_cR_d^1(CH_2)_mNH_eR_f^2 \cdot HX_{(c+e)}; \quad (II)$$

X is an anion of an organic or inorganic acid;

R^1 is $—(CH_2)_pAr^1$ or vinylbenzyl;

R^2 is $—(CH_2)_qAr^2$ or vinylbenzyl;

Ar^1 and Ar^2 are each independently aryl, aralkyl or aralkenyl;

$0<a<3$, $0<b<3$, $(a+b+z)<3$, $z\leq 1$, $r>1$;

n, m, p and q are each independently integers of 1 to 8, inclusive; and

$c\leq 1$, $d\leq 1$, $e\leq 2$, $f\leq 2$, $c+d=1$, $e+f=2$, $1\leq(f+d)\leq 3$.

5,591,819

ALDIMINE OXAZOLIDINES AND POLYISOCYANATES

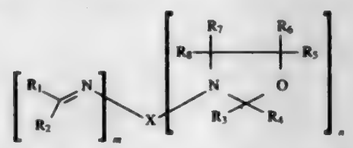
Chih-Yueh Chou, Elk Grove, and Marina D. Hoffman, Cary, both of Ill., assignors to Angus Chemical Company, Buffalo Grove, Ill.

Continuation-in-part of Ser. No. 143,470, Oct. 26, 1993, Pat. No. 5,466,769. This application Oct. 11, 1994, Ser. No. 321,227

Int. Cl.[6] C08G *18/28*

U.S. Cl. 528—73 **15 Claims**

1. A method of improving the pot life of a polyisocyanate composition, comprising admixing with the composition, an effective amount of an aldimine oxazolidine compound having the formula:



wherein: R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are, individually, a hydrogen atom, a methyl or methylol group, an ethyl or ethylol group, a straight chain or branched chain alkyl or alkanol group, a cycloalkyl group, or an aryl group, including any of the above groups substituted by nitro, halogen, thiol and amino functional groups, such that when both R_7 and R_8 are hydrogen atoms, neither R_3 nor R_4 are hydrogen atoms; m and n are integers of one to three, and m+n is between two and four; and X is a covalent bond between the nitrogen atom of the aldimine group and the nitrogen atom of the oxazolidine group or an (m+n)-valent methylene group, ethylene group, straight chain or branched chain alkylene group, cycloalkylene group, or arylene group, including any of the above X groups substituted by nitro, halogen, thiol and amino functional groups.

5,591,820

POLYURETHANE PRESSURE-SENSITIVE ADHESIVES

Agis Kydonieus, Kendall Park; Ladislav Bastar, North Brunswick; Kishore Shah, Bridgewater; Khosrow Jamshidi, Princeton; Tak-lung Chang, Skillman, and Sheng-hung Kuo, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 973,448, Nov. 9, 1992, abandoned. This application May 9, 1995, Ser. No. 437,069

Int. Cl.[6] C08G *18/30*

U.S. Cl. 528—76 **23 Claims**

1. A pressure-sensitive adhesive comprising a polyurethane polymer formed by the reaction of an isocyanate component and a polyol component having a molecular weight between about 1,000 and 10,000, said components being reacted at a molar ratio of isocyanate moieties to hydroxyl moieties of less than one, said polymer being free from any added tackifying and plasticizing agents, said polymer having a glass transition temperature of less than about 0° C., a moisture absorption at equilibrium of at least 20% of its weight, and a peel adhesion to human skin of between about 0.3 and 4 newtons/cm width of the polymer, wherein said isocyanate and said polyol components each have a functionality of at least two and wherein at least one of said components has a functionality that is greater than 2, and further wherein said polyurethane polymer is crosslinked to a crosslink density α of between about 10^{-4} and 10^{-3} wherein α is defined by the equation

$$\alpha = \frac{\sum_{i=1}^{i=n} X_i(F_i - 2)}{(1.05 - r)\,Mw}$$

where

i=1 to n where n is the number of the reactant components;

X_i=the mole fraction of the ith component;

F_i=the functionality of the ith component;

r=the NCO/OH ratio; and

Mw=the molecular weight of the polyol.

5,591,821

OMEGA-CONOTOXIN PEPTIDES

Baldomero M. Olivera; David R. Hillyard; Julita S. Imperial, all of Salt Lake City, Utah, and Virginia D. Monje, Quezon City, Philippines, assignors to The University of Utah, Salt Lake City, Utah

Filed Jul. 16, 1993, Ser. No. 92,215

Int. Cl.[6] C07K *14/00;7/00;* A61K *38/00*

U.S. Cl. 530—324 **20 Claims**

1. A substantially pure ω-conotoxin peptide having the formula Cys-Xaa_1-Gly-Xaa_2-Gly-Ala-Xaa_3-Cys-Arg-Lys-Thr-Xaa_4-Tyr-Xaa_5-Cys-Cys-Ser-Gly-Ser-Cys-Xaa_6-Arg-Gly-Xaa_7-Cys (SEQ ID NO:2), wherein Xaa_1 is Lys or Gln, Xaa_2 is Lys or Arg, Xaa_3 is Pro, Ser or 4 -hydroxyproline, Xaa_4 is Met, Ser or norleucine, Xaa_5 is Asp or Asn, Xaa_6 is Gly-Arg or Asn and Xaa_7 is Lys or Arg.

5,591,822

HYDROPHOBIC ATTACHMENT SITE FOR ADHESION PEPTIDES

Michael D. Pierschbacher, San Diego; Cyrll J. Hosnik, La Jolla, and Lisa B. Dreisbach, Cardiff, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 932,929, Aug. 20, 1992, which is a continuation of Ser. No. 787,318, Oct. 30, 1991, abandoned, which is a continuation of Ser. No. 326,168, Mar. 20, 1989, Pat. No. 5,120,829. This application May 5, 1995, Ser. No. 435,317

Int. Cl.[6] A61K *38/00;38/04;* C07K *5/00;7/00*

U.S. Cl. 530—326 **2 Claims**

1. A peptide having the amino acid sequence X-GRGDSPASSK$(G)_4$SR$(L)_6$R-Amide, wherein X is NH_2, nMe, acetyl or other amino acid.

5,591,823

EXPRESSION OF SPECIFIC IMMUNOGENS USING VIRAL ANTIGENS

Paul P. Hung, Bryn Mawr; Shaw-Guang L. Lee, Villanova, and Narender K. Kalyan, Wayne, all of Pa., assignors to American Home Products Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 805,105, Dec. 11, 1991, abandoned. This application Dec. 17, 1993, Ser. No. 169,813

Int. Cl.[6] C07K *1/00;* C12Q *1/70;* A61K *39/00;39/145*

U.S. Cl. 530—350 **9 Claims**

1. A peptide comprising an amino acid sequence substantially the same as the HA surface protein of an influenza A virus, said surface protein having five immunodominant antigenic sites, wherein an amino acid sequence substantially the same as that of a foreign epitope is inserted into the amino acid sequence for at least one antigenic site.

5,591,824

PORCINE APAMIN BINDING PROTEIN/RECEPTOR

Mohammad R. Ziai, Montvale; Patricia T. Sokol, Bedminster, and Manik Chandra, Paramus, all of N.J., assignors to American Cyanamid Company, Wayne, N.J.

Continuation-in-part of Ser. No. 922,307, Jul. 30, 1992, abandoned, and Ser. No. 923,095, Jul. 30, 1992, Pat. No. 5,401,652. This application Apr. 21, 1994, Ser. No. 229,511

Int. Cl.[6] C07K *14/705*

U.S. Cl. 530—350 **9 Claims**

1. An isolated and purified porcine apamin binding protein having a molecular weight of about 80 kilodaltons, wherein the protein is encoded by a nucleic acid which hybridizes under medium stringency conditions with a nucleic acid encoding the amino acid sequence of SEQ ID NO. 2, and wherein the protein is isolatable from porcine tissue.

5,591,825

INTERLEUKIN 4 SIGNAL TRANSDUCERS

Steven L. McKnight, and Jinzhao Hou, both of South San Francisco, Calif., assignors to Tularik, Inc., So. San Francisco, Calif.

Continuation-in-part of Ser. No. 269,604, Jul. 5, 1994, abandoned. This application Jul. 15, 1994, Ser. No. 276,099

Int. Cl.[6] C12N *15/12;* C07K *14/47*

U.S. Cl. 530—350 **3 Claims**

1. An isolated interleukin-4 signal transducer and activator of transcription (IL-4 STAT) protein wherein said protein:

(a) selectively binds a transcription factor binding site having a sequence selected from the group consisting of SEQ ID NO:03, SEQ ID NO:04, SEQ ID NO:05, SEQ ID NO:06, SEQ ID NO:07, SEQ ID NO:08 and SEQ ID NO:09; and

(b) selectively binds an IL-4 receptor peptide having a sequence defined by SEQ ID NO:10 or SEQ ID NO:11; and

(c) is encoded by a DNA which hybridizes with SEQ ID NO:01 under high stringency conditions.

5,591,826

HUMAN MSH2 PROTEIN

Albert de la Chapelle, Helsingfors, Finland; Bert Vogelstein, and Kenneth W. Kinzler, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 160,295, Dec. 2, 1994, which is a continuation-in-part of Ser. No. 56,546, May 5, 1993, Pat. No. 5,492,808. This application Jun. 1, 1995, Ser. No. 457,176

Int. Cl.[6] C07K *14/435*; A61K *38/16*

U.S. Cl. 530—350 **1 Claim**

1. An isolated and purified protein which has the sequence shown in SEQ ID NO:2.

5,591,827

INTERLEUKIN-6 RECEPTOR ANTAGONISTS

Just P. J. Brakenhoff, Amsterdam, and Lacies A. Aarden, Broek in Waterland, both of Netherlands, assignors to Cetus Oncology Corporation, Emeryville, Calif.

Continuation of Ser. No. 959,942, Oct. 20, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 357,538

Int. Cl.[6] C07K *14/54*; A61K *38/20*

U.S. Cl. 530—351 **20 Claims**

1. An interleukin-6 (IL-6) receptor antagonist comprising a mutated IL-6 polypeptide comprising amino acids 30 through 185 of mature IL-6 proteins characterized by having up to three substitutions or deletions in the region corresponding to amino acid positions 154 through 163 of mature IL-6 protein, said substitutions or deletions providing decreased IL-6 signal transduction activity relative to IL-6 receptor-binding activity.

5,591,828

BISPECIFIC AND OLIGOSPECIFIC MONO-AND OLIGOVALENT RECEPTORS, THE PREPARATION AND USE THEREOF

Klaus Bosslet; Peter Hermentin; Gerhard Seemann, all of Marburg; Ludwig Kuhlmann, Flörsheim am Main, and Axel Steinstrasser, Liederbach, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 147,428, Nov. 5, 1993, abandoned, which is a continuation of Ser. No. 17,439, Feb. 12, 1993, abandoned, which is a continuation of Ser. No. 541,020, Jun. 20, 1990, abandoned. This application Sep. 29, 1994, Ser. No. 317,612

Claims priority, application Germany, Jun. 22, 1989, 39 20 358.1

Int. Cl.[6] C07K *16/46*;*16/28*

U.S. Cl. 530—387.3 **10 Claims**

1. A bispecific or oligospecific mono- or oligovalent receptor produced by gene manipulation comprising:

a) a VH and a CH1 region of a first antibody having an antigen binding specificity;

b) a VH and a CH1 region of a second antibody having an antigen binding specificity, wherein the antigen binding specificity of said first antibody is different from the antigen binding specificity of said second antibody; and

c) a polypeptide spacer that links the CH1 region of said first antibody to the VH region of said second antibody without impeding association with light chains of said antibodies or antigen binding.

5,591,829

ANTIBODIES MODIFIED WITH TOXIC SUBSTANCE

Shuso Matsushita, 22-22, Suizenji 2-chome, Kumamoto-shi, Kumamoto-ken, Japan

Continuation of Ser. No. 288,302, Jul. 26, 1994, abandoned, which is a continuation of Ser. No. 999,678, Dec. 30, 1992, abandoned, which is a continuation of Ser. No. 760,807, Sep. 16, 1991, abandoned, which is a continuation of Ser. No. 477,692, Feb. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 198,957, May 26, 1988, abandoned. This application Mar. 27, 1995, Ser. No. 410,932

Claims priority, application Japan, May 29, 1987, 62-138907; Jun. 10, 1988, 63-142948

Int. Cl.[6] C12N *5/12*; C07K *16/10*

U.S. Cl. 530—388.35 **3 Claims**

1. A cytotoxic antibody conjugate comprising a substance which induces cytotoxicity against HIV-1 infected human cells, said substance being selected from the group consisting of diphtheria toxin, Pseudomonas exotoxin, ricin, abrin, pokeweed anti-viral protein, saponin and gelonin, conjugated with monoclonal antibody 0.5 or a fragment thereof which specifically binds at least one antigen of HIV-1 virus, the conjugation being effected by using a pharmacologically inert bifunctional ligand.

5,591,830

DETECTION OF COMPLEXES WHICH INCLUDE BASEMENT MEMBRANE COMPONENTS AS DIAGNOSTIC OF CANCER AND OTHER DISEASES

Morgun Van Aken, and Stefan L. Paskell, both of Bainbridge Island, Wash., assignors to Bainbridge Sciences, Inc., Redmond, Wash.

Continuation of Ser. No. 178,219, Jan. 6, 1994, Pat. No. 5,512,657, which is a continuation of Ser. No. 96,490, Jul. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 721,756, Jun. 26, 1991, Pat. No. 5,264,370, which is a continuation-in-part of Ser. No. 283,397, Dec. 12, 1988, abandoned. This application Jun. 1, 1995, Ser. No. 456,855

Int. Cl.[6] C07K *16/00*;*16/18*

U.S. Cl. 530—388.85 **11 Claims**

3. The cell line 1B4, designated by ATCC No. 11389.

5,591,831

SOLUBILIZATION AND PURIFICATION OF THE ACTIVE GASTRIN RELEASING PEPTIDE RECEPTOR

Richard I. Feldman; James M. Wu, both of El Cerrito; Elaina Mann; Anne Larocca, both of San Leandro, and James C. Jenson, Moraga, all of Calif., assignors to Berlex Laboratories, Inc.

Division of Ser. No. 879,825, May 7, 1992, abandoned, which is a division of Ser. No. 426,150, Oct. 24, 1989, Pat. No. 5,215,963. This application Jun. 25, 1994, Ser. No. 186,351

Int. Cl.[6] C07K *14/705*

U.S. Cl. 530—395 **14 Claims**

1. A purified naturally occurring gastrin releasing peptide receptor in active form, which has been solubilized from the cell membrane, and wherein said gastrin releasing peptide receptor has the following characteristics:

(1) binds gastrin releasing peptide with an affinity of at least K_D=10 nM;

(2) binds selectively with peptides of the bombesin type;

(3) contains N-linked carbohydrates; and

(4) when deglycosylated has an apparent molecular weight of 36 kilodaltons plus or minus 5 kilodaltons on SDS-PAGE under reducing conditions.

5,591,832

BENZYLATED LIGNOCELLULOSIC SUBSTANCE AND A PRODUCING METHOD THEREOF

Tetsuo Koshijima, Osaka; Nobuo Shiraishi, Kyoto; Tadashi Takahashi, Osaka; Toshiharu Hiraoka, Osaka, and Masami Ueda, Osaka, all of Japan, assignors to Japan Chemical Engineering & Machinery Co., Ltd., Japan

Filed Nov. 21, 1994, Ser. No. 345,404

Claims priority, application Japan, Nov. 19, 1993, 5-290839; Jun. 24, 1994, 6-143260

Int. Cl.[6] C07G *1/00*; C08H *5/00*

U.S. Cl. 530—500 **10 Claims**

1. A benzylated material obtained from a wood raw material having an original amount of lignin-carbohydrate complex (LCC), said benzylated lignocellulose material containing a remaining rate of 46 to less than 97% of said original amount of the lignin-carbohydrate complex (LCC), said benzylated lignocellulose having an absolute amount of at least 1.5% by weight of the lignin-carbohydrate complex (LCC) and having a degree of benzyl substitution per glucose residue of about 1.3 to 1.5 for hardwoods and about 1.6 to 1.8 for softwoods.

5,591,833

COLORANTS AND INTERMEDIATES THEREFOR HAVING BRANCHED POLY(OXYALKYLENE)MOIETIES, AND THEIR MANUFACTURE

John B. Hines; David J. Moody, both of Spartanburg, and Edward W. Kluger, Pauline, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 887,109, May 19, 1992, abandoned, which is a continuation of Ser. No. 546,206, Jun. 28, 1990, abandoned. This application Aug. 10, 1993, Ser. No. 104,276

The portion of the term of this patent subsequent to Apr. 28, 2009, has been disclaimed.

Int. Cl.[6] C09B *69/10*; D06P *5/13*

U.S. Cl. 534—607 **8 Claims**

1. A colorant comprising a compound having the formula $C(Z)_{1-8}$ wherein:

C is a chromogen radical having from 1–8 nucleophilic site residues to which the Z moieties are attached; said Z moieties containing at least about 60 weight percent of poly(oxyalkylene) which is comprised of

(a) at least one glycidol residue segment of 2–6 glycidol residues attached to a nucleophilic site of C, wherein said poly(oxyalkylene) contains a total of from 2–20 glycidol residues, and

(b) wherein said poly(oxyalkylene) further contains three separate poly (oxyalkylene) branches pendant from said glycidol residue segment containing the residues of one or more other epoxide reactants of ethylene oxide (EO), propylene oxide (PO), or butylene oxide (BO), or mixtures thereof, wherein said poly(oxyalkylene) contains a total of from about 10 to about 600 of said EO, PO or BO residues, or mixtures thereof, at least about 75 mole percent of which are EO residues.

5,591,834

REACTIVE DYESTUFFS HAVING REACTIVE FLUORINE-CONTAINING PYRIMIDYL RADICALS

Konrad Bentz, Wetter, and Karl-Josef Herd, Odenthal-Holz, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

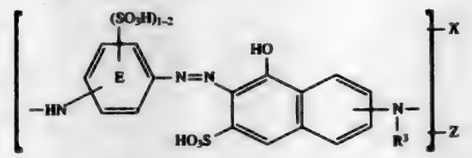
Continuation of Ser. No. 6,868, Jan. 15, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 363,568

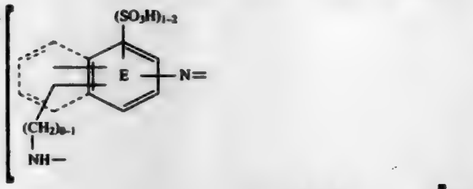
Claims priority, application Germany, Jan. 22, 1992, 42 01 609.6

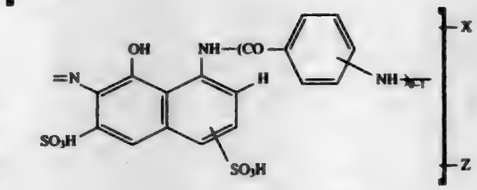
Int. Cl.[6] C09B *62/20*;*62/503*;*62/002*; D06P *1/38*

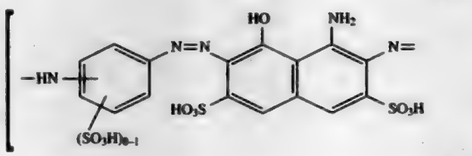
U.S. Cl. 534—618 **5 Claims**

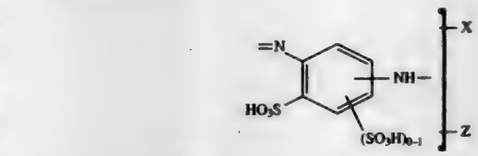
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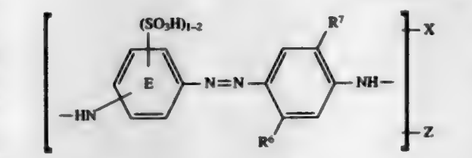


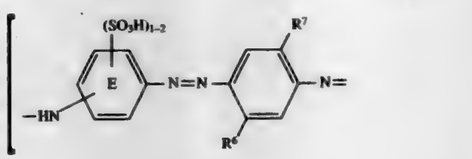




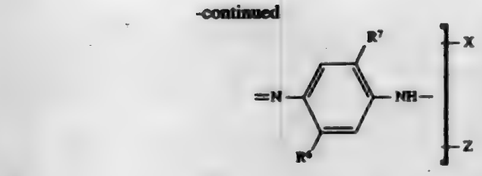


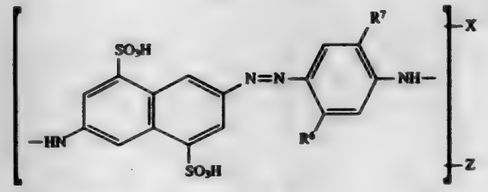


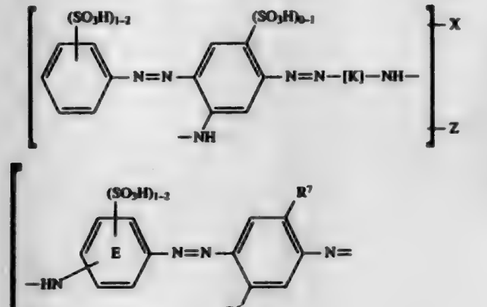


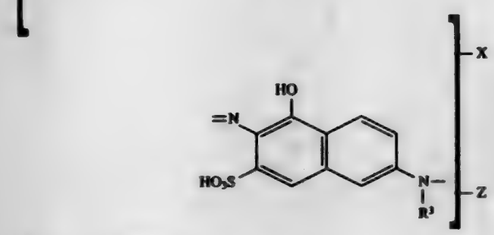


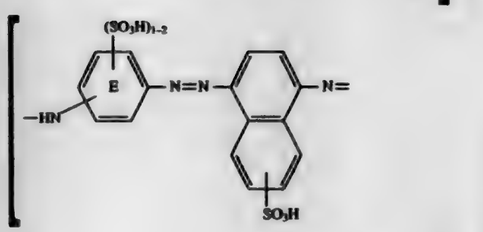
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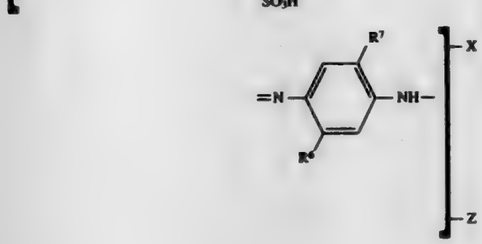




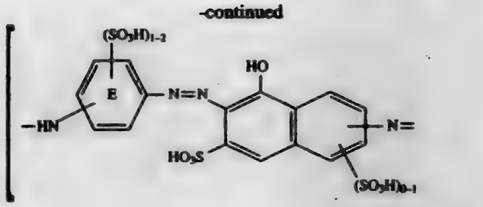


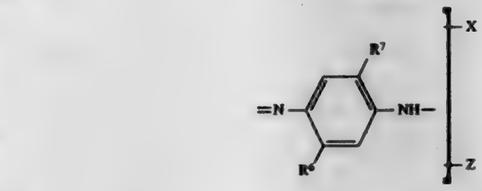


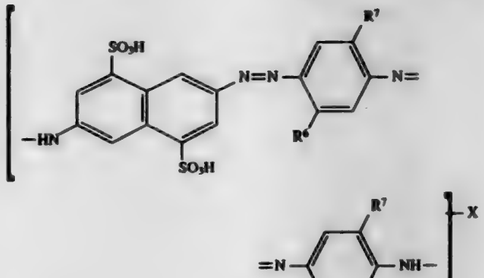


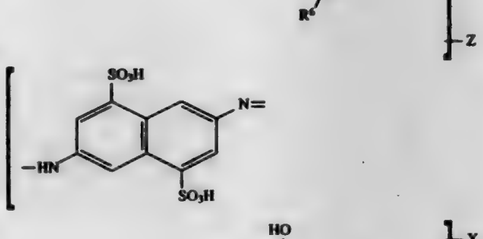


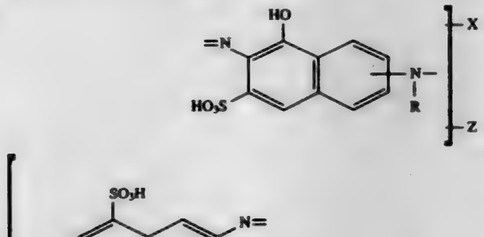
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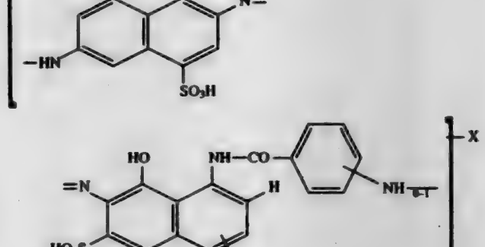




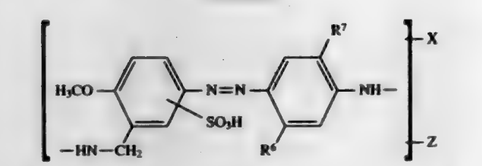


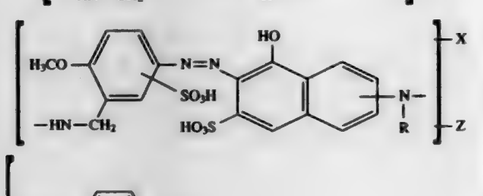


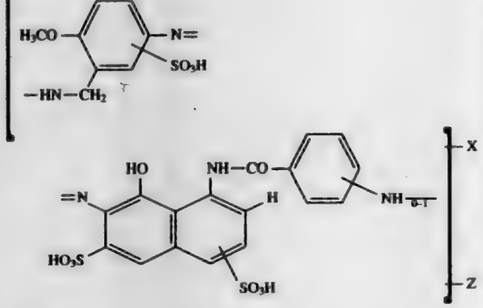


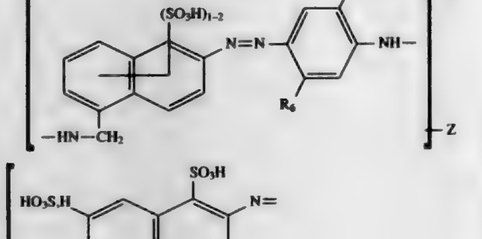


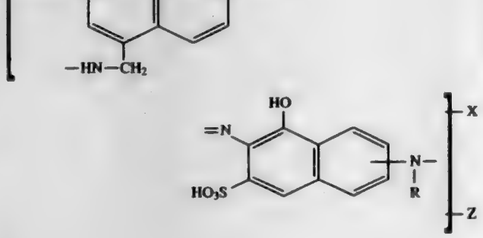
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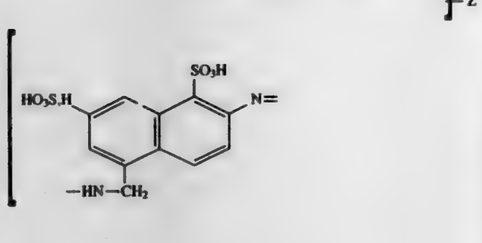




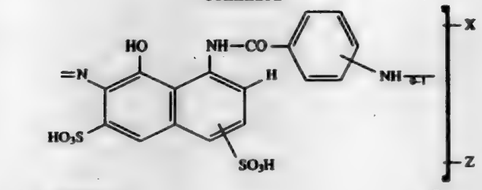


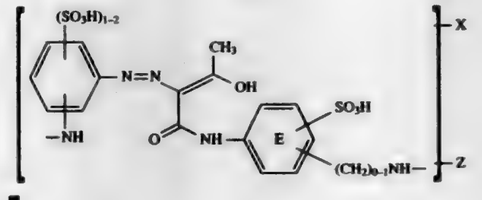


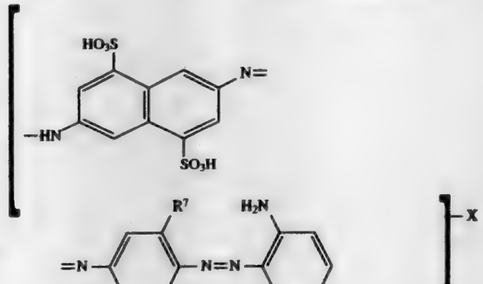


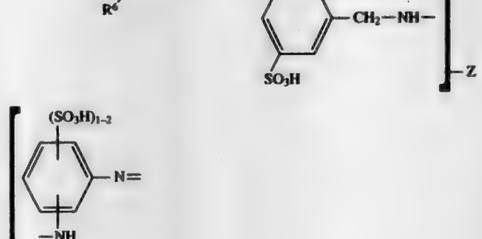


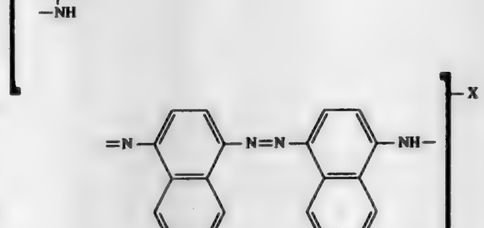
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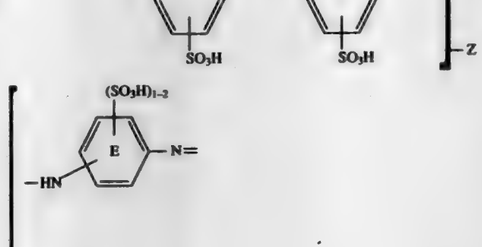




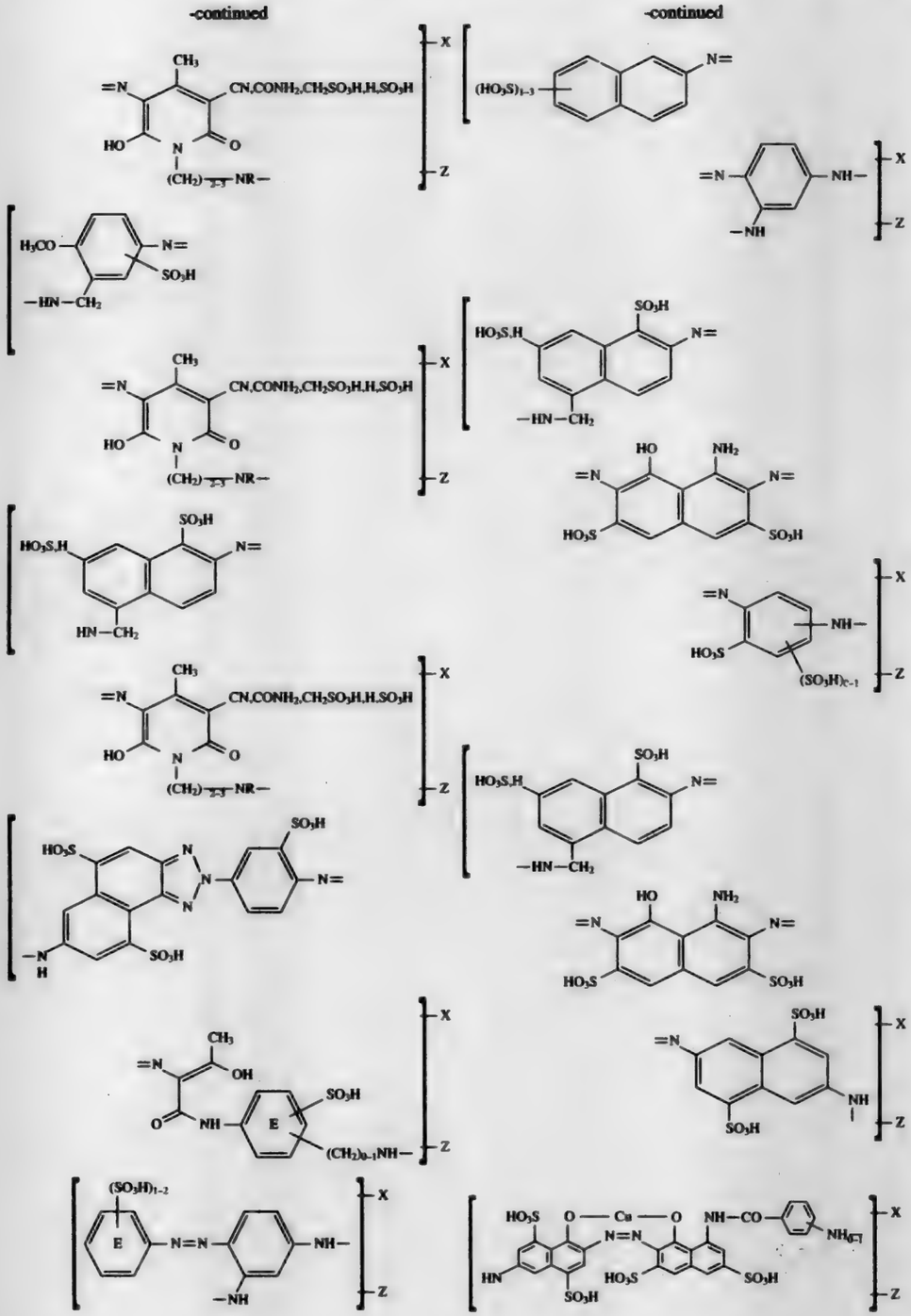






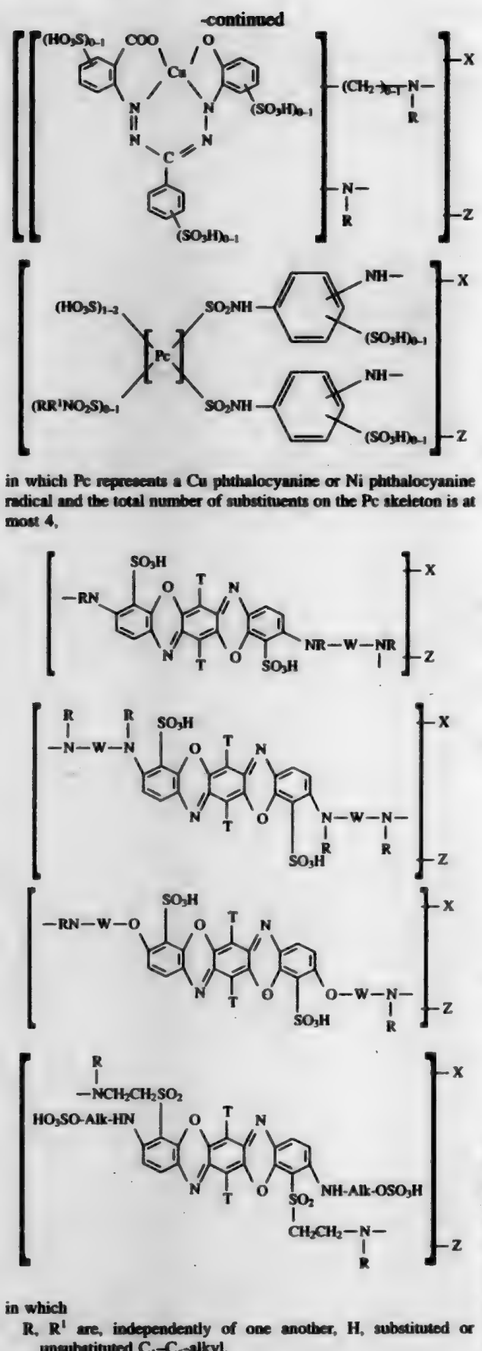


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in which Pc represents a Cu phthalocyanine or Ni phthalocyanine radical and the total number of substituents on the Pc skeleton is at most 4,

in which

R, R^1 are, independently of one another, H, substituted or unsubstituted C_1–C_6-alkyl,

R^3 is H, CH_3 or C_2H_5

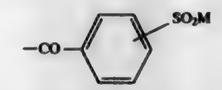
R^6 is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, acylamino, C_1–C_4-alkylcarbonylamino, C_1–C_4-alkylsulphonylamino, aminocarbonylamino, phenylcarbonylamino, Cl or Br,

R^7 is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, OH or SO_3H,

W is an aliphatic bridging member,

K is the radical of a coupling component from the hydroxybenzene, hydroxynaphthalene, aminobenzene, aminonaphthalene, aminohydroxynaphthalene series, a 5-hydroxy-3-methyl (or carboxy)-pyrazolone, a 6-hydroxy-2-pyridone or an acetoacetic arylide radical which is unsubstituted or ring-substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy,

X is



M is $CH{=}CH_2$ or CH_2CH_2V, in which

V is OH or a radical which can be eliminated by alkali,

Z is a fibre-reactive fluorine-containing 4-pyrimidyl radical

T is Cl, Br or $^-OCH_3$

Alk is straight-chain or branched C_1–C_6-alkylene, which may be interrupted by hetero atoms or groupings containing hetero atoms selected from the group consisting of NR, O and S, and

wherein the benzene rings E may be further substituted by CH_3, C_2H_5, CH_3O, C_2H_5O, halogen or CO_2H.

5,591,835

SUBSTITUTED LACTOSE DERIVATIVES

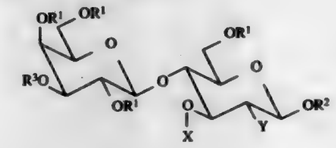
Saeed A. Abbas, Vallejo; Falguni Dasgupta, San Leandro, both of Calif.; Darwin Aas, Galesburg, Mich.; John H. Musser, San Carlos, and Mina A. Nashed, Alameda, both of Calif., assignors to Glycomed Incorporated, Alameda, Calif.

Continuation-in-part of Ser. No. 910,709, Jun. 29, 1992, abandoned. This application Feb. 1, 1994, Ser. No. 189,630

Int. Cl.[6] C07H *3/04;3/06;15/04*

U.S. Cl. 536—4.1 14 Claims

1. A compound of the formula:



wherein each R^1 is independently H or lower alkyl (1–4C);

R^2 is H, a lower alkyl group (1–4C), an additional saccharide residue;

R^3 is a negatively charged moiety selected from the group consisting of $-SO^{1-}{}_3$ and $-PO_3{}^{1-}$;

Y is H, OH or lower alkyl (1–4C); and

X is H, $—CHR^4(CHOR^1)_2CHR^5OR^1$ wherein R^4 and R^5 are each independently H or lower alkyl (1–4C),

6-methyl-3,4,5-trihydroxypyran-2-yl,

6-acetyl-3,4,5,trihydroxypyran-2-yl,

6-propylamido-3,4,5,trihydroxypyran-2-yl,

6-propylamido-2,3,4-trimethoxypyran-2-yl,

6-ethyl-2,3-dihydroxy-4-methoxypyran-2-yl,

6-N-ethylamino-2-hydroxy-3,4-ethoxypyran-2-yl,

3,4,5-tri-n-propyloxypyran-2-yl,

3,4,5-trihydroxypyran-2-yl,

2,3,4-trimethoxyfuran-2-yl,

2,3-dihydroxy-4-methoxyfuran-2-yl,

2-hydroxy-3,4-ethoxyfuran-2-yl,

3,4,5-tri-n-propyloxyfuran-2-yl,

3,4,5-trihydroxyfuran-2-yl,

or 2,3,4-trihydroxybenzoyl, wherein if X is H then R^2 is a higher alkyl group;

and salts thereof.

5,591,836
CHOLESTEROL LOWERING COMPOUNDS
Adam W. Mazur; Stanislaw Pikul, and Bruce P. Daggy, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 771,668, Oct. 4, 1991, abandoned. This application Oct. 7, 1993, Ser. No. 133,822
Int. Cl.[6] C07J *17/00*; A61K *31/705*; C07H *15/24*
U.S. Cl. 536—6.1 **17 Claims**

1. A sterol 5-C-hydroxymethyl glycoside compound wherein the glycoside is selected from the group consisting of 5-C-hydroxymethyl glucose and 5-C-hydroxymethyl galactose and their acylated derivatives and the sterol is selected from the group consisting of diosgenin, tigogenin and cholesterol, wherein the glycoside is attached at the 3-position of the sterol via a glycosidic linkage.

5,591,837
5-O-DESOSAMINYLERYTHRONOLIDE A DERIVATIVE
Toshifumi Asaka; Masato Kashimura; Yoko Minwa; Shigeo Morimoto, and Katsuo Hatsuyama, all of Tokyo, Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan
PCT No. PCT/JP93/00516, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/21199, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 21, 1993, Ser. No. 318,795
Claims priority, application Japan, Apr. 22, 1992, 4-101492
Int. Cl.[6] C07H *17/08*
U.S. Cl. 536—7.4 **1 Claim**

1. 11-Amino3,11-dideoxy-3-oxo-5-O-desosaminyl-6-O-methylerythronolide A 11-N,12-O-cyclic carbamate or a pharmaceutically acceptable acid addition salt thereof.

5,591,838
DETECTION OF CONVERSION TO MUCOIDY IN *PSEUDOMONAS AERUGINOSA* INFECTING CYSTIC FIBROSIS PATIENTS
Vojo Deretic, and Daniel W. Martin, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.
Filed Feb. 12, 1993, Ser. No. 17,114
Int. Cl.[6] C07H *21/04*
U.S. Cl. 536—23.7 **9 Claims**

425 455
AGCGAAGAGCAGGGCGCGCCGCAGGTGATCA

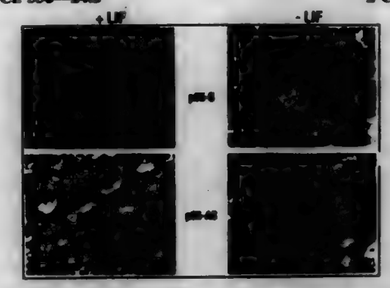
CAGGGGGCCAGGGCGC	OLIGO 568	(*mucA2*)
GAGCAGGG-GCGCC	OLIGO 578	(*mucA22*)
GAGCAGGGCGCGCCG	OLIGO 381	(*mucA+*)

1. A first polynucleotide having the sequence of SEQ ID NO. 10, a second polynucleotide complementary to the first polynucleotide, or a third polynucleotide differing from the first or second polynucleotide by codon degeneracy, wherein the first, second, and third polynucleotides are purified from total genomic Pseudomonas DNA.

5,591,839
POLYNUCLEOTIDES ENCODING α2-3 NEURAMINIDASE
Harvey I. Miller, Pleasant Hill; John C. Klock, Nicasio, and Christopher M. Starr, Sonoma, all of Calif., assignors to Glyko, Inc., Novato, Calif.
Filed Aug. 18, 1994, Ser. No. 294,477
Int. Cl.[6] C07H *21/02;21/04*
U.S. Cl. 536—23.7 **10 Claims**

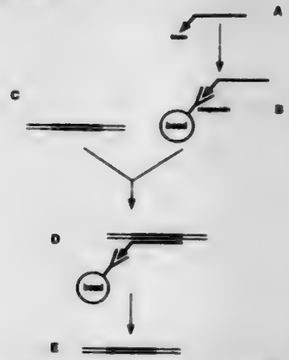
1. An isolated polynucleotide from a Streptococcus species encoding an enzyme possessing α2-3 neuraminidase activity.

5,591,840
ANTISENSE OLIGONUCLEOTIDES DIRECTED AGAINST NUCLEIC ACIDS ENCODING NFKB TRANSCRIPTION FACTOR
Ramaswamy Narayanan, Belleville, and Craig A. Rosen, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation of Ser. No. 950,531, Sep. 23, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 328,592
Int. Cl.[6] C07H *21/04*
U.S. Cl. 536—24.5 **2 Claims**



1. An oligodeoxynucleotide having the nucleotide sequence set forth as SEQ ID NO: 3.

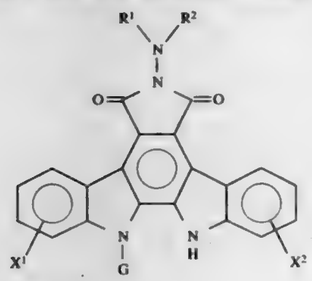
5,591,841
RAPID PURIFICATION OF CIRCULAR DNA BY TRIPLEX-MEDIATED AFFINITY CAPTURE
Huamin Ji, 4817 Sheboygan Ave., and Lloyd M. Smith, 1115 Amherst Dr., both of Madison, Wis. 53705
Continuation of Ser. No. 4,374, Jan. 14, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 317,102
Int. Cl.[6] C07H *21/04*
U.S. Cl. 536—25.4 **10 Claims**



1. A process for quickly and efficiently purifying circular DNA from a bacterial host, consisting essentially of the steps of:
a) creating a cleared cell lysate from a culture of bacterial cells having therewithin a double-stranded, circular target DNA molecule in a mixture with other heterogeneous circular DNA molecules, the target DNA molecule containing a target tract appropriate for triple helix formation, the target tract containing non-identical homopurine bases on one strand;
b) adding to the cleared lysate a triplex capture complex including an immobilizing support and an oligonucleotide probe able to form a triplex with the target tract, the support and the probe being bound together, the probe containing non-identical homopyrimidine bases;
c) incubating the triplex capture complex in the cleared cell lysate on the order of 15 minutes under acidic conditions under conditions such that the triplex capture complex and the double-stranded circular DNA molecule including the target DNA will form a complex, the triplex capture complex and the target DNA being held together by a triplex formed between the probe and the target tract;
d) separating the triplex capture complex-target DNA complex from the cell lysate, any other DNA, and from any other contaminants by separating the immobilizing support from the cleared lysate;
e) disrupting the triplex by raising the pH of the triplex capture-target DNA complex; and
f) the target DNA from the triplex capture complex and recovering the target double-stranded circular target DNA, wherein steps b–f are performed within 30 minutes.

5,591,842
INDOLOPYRROLOCARBAZOLE DERIVATIVES
Katsuhisa Kojiri; Hisao Kondo; Hiroharu Arakawa; Mitsuru Ohkubo, and Hiroyuki Suda, all of Tsukuba, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 166,364, Dec. 14, 1993, Pat. No. 5,437,996, which is a continuation-in-part of Ser. No. 68,097, May 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 981,070, Nov. 24, 1992. This application Jun. 8, 1994, Ser. No. 255,980
Claims priority, application Japan, Nov. 29, 1991, 3-341916; Feb. 18, 1992, 4-69269; Sep. 1, 1992, 4-257306
Int. Cl.[6] C07H *19/00;19/22*; A61K *31/70*
U.S. Cl. 536—27.1 **20 Claims**

1. A compound having antitumor activity represented by the following formula (I) or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2 each, independently, represent



(I)

(a) a hydrogen atom,
(b) C_1–C_6 alkyl group,
(c) C_3–C_6 alkenyl group,
(d) C_6–C_{12} aromatic hydrocarbon group,
(e) C_1–C_6 alkyl group substituted by C_6–C_{12} aromatic hydrocarbon group,
(f) pyrrolyl group,
(g) oxazolyl group,
(h) isoxazolyl group,
(i) thiazolyl group,
(j) imidazolyl group,
(k) pyridyl group,
(l) pyrimidinyl group,
(m) oxazolinyl group,
(n) oxazolidinyl group,
(o) imidazolinyl group,
(p) imidazolidinyl group,
(q) pyrrolidinyl group,
(r) piperazinyl group,
(s) thiazolyl group,
(t) thiazolidinyl group, or
(u) a group of the formula —Y—R^3, wherein
wherein said groups (b) to (t) may be substituted by 1 to 5 substituents selected from the group consisting of a carboxyl group, carbamoyl group, NH_2, SO_3H, cyano group, mono-(C_1–C_6 alkyl) amino group, di-(C_1–C_6 alkyl) amino group, hydroxyl group and halogen atom,
Y represents a carbonyl group, thiocarbonyl group or sulfonyl group, and
R^3 represents
(A) a hydrogen atom,
(B) C_1–C_6 alkyl group,
(C) C_3–C_6 cycloalkyl group,
(D) C_4–C_{10} cycloalkyl alkyl group,
(E) C_6–C_{12} aromatic hydrocarbon group,
(F) C_1–C_6 alkyl group substituted by C_6–C_{12} aromatic hydrocarbon group,
(G) C_1–C_6 alkoxy group,
(H) $NHNH_2$,
(I) NH_2,
(J) amino group substituted by C_6–C_{12} aromatic hydrocarbon group,
(K) carbamoyl group,
(L) pyrrolyl group,
(M) oxazolyl group,
(N) isoxazolyl group,
(O) thiazolyl group,
(P) imidazolyl group,
(Q) pyridyl group,
(R) pyrimidinyl group,
(S) oxazolinyl group,
(T) oxazolidinyl group,
(U) imidazolinyl group,
(V) imidazolidinyl group,
(W) pyrrolidinyl group,
(X) piperazinyl group,
(Y) thiazinyl group, or
(Z) thiazolidinyl group,
wherein said groups (B) to (F) and (L) to (Z) may be substituted by 1 to 4 substituents selected from the group consisting of a halogen atom, unprotected hydroxyl group, hydroxyl group protected by a protective group selected from the group consisting of a C_2–C_6 alkanoyl group, C_2–C_7 alkoxycarbonyl group, benzoyl group, acetal-forming group, benzyl group and benzyl group substituted by C_1–C_6 alkoxy group or nitro group, NH_2, carboxyl group, carbamoyl group, cyano group and C_2–C_7 alkoxycarbonyl group; and the NH_2 and carbamoyl group are unsubtituted or mono- or di-substituted by unsubstituted C_1–C_6 alkyl group(s) or by C_1–C_6 alkyl group(s) substituted by substituent(s) selected from the group consisting of a halogen atom, hydroxyl group, NH_2, carboxyl group, carbamoyl group and C_2–C_7 alkoxycarbonyl group; or
R^1 and R^2 combine to form
(i) a C_1–C_6 alkylidene group, or
(ii) C_1–C_6 alkylidene group substituted by 1 to 4 substituents selected from the group consisting of NH_2, mono-(C_1–C_6 alkyl) amino group, di-(C_1–C_6 alkyl) amino group, hydroxyl group, carboxyl group and SO_3H; or
R^1 and R^2 combine together with the nitrogen atom to which they are bonded to form
(iii) pyrrolidinyl,
(iv) imidazolidinyl,
(v) imidazolinyl,
(vi) piperidino, or
(vii) piperazinyl, wherein
said groups (iii) to (vii) may be substituted on the ring by unsubstituted C_1–C_6 alkyl group(s) or by C_1–C_6 alkyl group(s) substituted by group(s) selected from the group consisting of NH_2, hydroxyl group, carboxyl group and SO_3H;
G represents a pentose group or hexose group, and
X^1 and X^2 each, independently, represent
(I) a hydrogen atom,
(II) halogen atom,
(III) NH_2,
(IV) mono-(C_1–C_6 alkyl) amino group,
(V) di-(C_1–C_6 alkyl) amino group,
(VI) hydroxyl group,
(VII) C_1–C_6 alkoxy group,

(VIII) C_1–C_6 alkoxy group substituted by C_6–C_{12} aromatic hydrocarbon group,
(IX) COOH,
(X) C_2–C_7 alkoxycarbonyl group, or
(XI) C_1–C_6 alkyl.

5,591,843

5-MODIFIED PYRIMIDINES FROM PALLADIUM CATALYZED CARBON-CARBON COUPLING

Bruce Eaton, SW. 460 Jones Rd., Pullman, Whitman Co., Wash. 99163

Division of Ser. No. 76,735, Jun. 14, 1993, Pat. No. 5,428,149. This application Apr. 19, 1995, Ser. No. 423,395

Int. Cl.[6] C07H *1/00;19/00*

U.S. Cl. 536—28.52 **3 Claims**

1. A pyrimidine nucleoside modified at the 5-position of the pyrimidine ring prepared according to a method comprising the steps of:
a) preparing a solution of a palladium catalyst of the formula PdL_3, wherein L is triphenylphosphine (PPh_3);
b) reacting a pyrimidine starting material containing a halogen leaving group attached to the 5-position of said pyrimidine starting material with a tetraalkyl tin compound of the formula $R'SnR''_3$, wherein R' is a C1 to C4 alkyl, and R'' is selected from the group consisting of a C1 to C7 carbonyl, a C1 to C5 carbalkoxy, a C1 to C3 alkenyl, a C1 to C4 alkoxy or phenyl (C_6H_5), in the presence of the PdL_3 catalyst; and
c) isolating and purifying said pyrimidine nucleoside.

5,591,844

ALKYL HYDROXYALKYL CELLULOSE ETHERS CONTAINING SULFOALKYL GROUPS

Uwe Bartz, Oestrich-Winkel; Reinhard Dönges, Bad Soden/Taunus, and Heiner Kiehe, Mainz, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 72,736, Jun. 7, 1993, Pat. No. 5,395,930. This application Nov. 28, 1994, Ser. No. 345,912

Claims priority, application Germany, Jun. 6, 1992, 42 18 738.9

Int. Cl.[6] C08B *11/193;* C04B *24/02;40/00;* C08L *1/28*

U.S. Cl. 536—90 **16 Claims**

1. An alkyl monohydroxyalkyl cellulose ether, which contains a sulfoalkyl group as a further ether substituent and has an average degree of substitution ($DS_{sulfoalkyl}$) below 0.4.

5,591,845

PROCESS FOR THE PRODUCTION OF SURFACTANTS HAVING IMPROVED DETERGENCY

Karl Schmid, Mettmann; Brigitte Giesen, and Andreas Syldath, both of Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/02508, § 371 Date Mar. 22, 1995, § 102(e) Date Mar. 22, 1995, PCT Pub. No. WO94/07901, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 16, 1993, Ser. No. 403,856

Claims priority, application Germany, Sep. 25, 1992, 42 32 165.4

Int. Cl.[6] C07H *15/00;15/04;* C08B *37/00*

U.S. Cl. 536—124 **19 Claims**

1. A process for the production of surface-active compounds having improved detergency comprising hydrolyzing a water-containing paste of an alkyl or alkenyl oligoglycoside of the formula (I):

$$R'O(G)_p \qquad (I)$$

wherein R' is an alkyl or alkenyl radical having from about 4 to about 22 carbon atoms, G is a sugar unit having 5 or 6 carbon atoms and p is a number of 1 to 10 for a period of from about 5 minutes to about 10 days at a temperature of from about 70° to about 180° C. and under pressures of from about 1 to about 50 bar.

5,591,846

NONIONIC RADIOGRAPHIC CONTRAST AGENTS

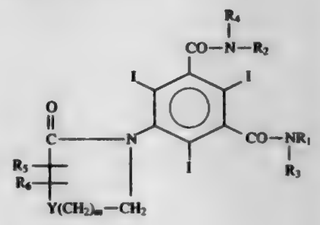
Ramachandran S. Ranganathan, Princeton; Thangavel Arunchalam, Plainsboro; Edmund R. Marinelli, Lawrenceville, and Radhakrishna K. Pilai, Kendall Park, all of N.J., assignors to Bracco International B.V., Amsterdam

Division of Ser. No. 894,691, Jun. 5, 1992, which is a continuation-in-part of Ser. No. 710,884, Jun. 6, 1991, which is a continuation-in-part of Ser. No. 617,716, Nov. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 442,869, Nov. 29, 1989, abandoned. This application Oct. 27, 1993, Ser. No. 143,684

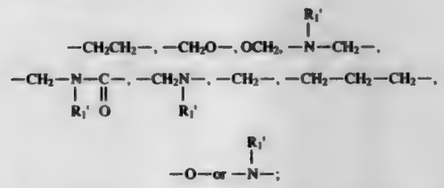
Int. Cl.[6] C07D *205/08*

U.S. Cl. 540—362 **23 Claims**

1. Compounds of the formula



wherein
Y is a single bond,



R_1, R_1' and R_2 are the same or different and are hydrogen, alkyl or hydroxyalkyl;
R_3 and R_4 are the same or different and are hydrogen, alkyl or $—CH_2CH_2OH$;
R_5 is hydrogen, alkyl, $—CH_2CH_2OH$, CH_2OH or OH and R_6 is alkyl, $—CH_2CH_2OH$, CH_2OH, OH or hydrogen and may be the same or different than R_5; and
m in is zero or one,
with the proviso that no methylene or methine carbon atom of the heterocyclic ring is attached to both a nitrogen and an oxygen atom with the additional provisos that when Y is a single bond, m is not zero and the group $—Y(CH_2)_m—$ is not $—CH_2—CH_2—$.

5,591,847

LONG WAVELENGTH ABSORBING PHOTOSENSITIZERS RELATED TO PURPURIN-18, BACTERIOPURPURIN-18 AND RELATED COMPOUNDS WITH IMIDE LINKAGES

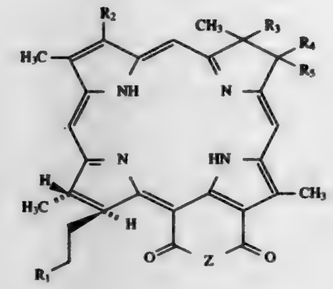
Ravindra K. Pandey, Williamsville; Thomas J. Dougherty, Grand Island, both of N.Y.; Kevin M. Smith, Davis, Calif., and Fun-Yau Shiau, Sugar Land, Tex., assignors to Health Research, Inc., Buffalo, N.Y., and The Regents of the University of California, Oakland, Calif.

Filed May 23, 1994, Ser. No. 247,866

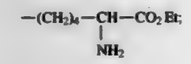
Int. Cl.[6] C07D *487/22*

U.S. Cl. 540—472 **15 Claims**

1. A compound comprising:



where z is =O or $=NR_6$, where R_6 is lower alkyl of from 1 to 8 carbon atoms or



R_1 is



where R_7 is



or $—OR_8$, where R_8 is hydrogen or lower alkyl of 1 to 8 carbon atoms, or R_7 is an amino acid residue connected at a nitrogen atom of such residue; R_2 is lower alkyl or lower alkylene of from 2 to 4 carbon atoms or a formyl or carbonyl containing group of from 1 to 4 carbon atoms; R_3 and R_4 are —H or $—OR_8$ and R_4 may be taken together with R_5 to form =O; and R_5 is ethyl or is taken together with R_4 to form =O; provided that when Z is —O—, the sum of the number of carbon atoms in, R_1 through R_5 is from 12 to 20 and when Z is $=NR_6$, the sum of the number of carbon atoms in R_1 through R_6 is 8 to 20.

5,591,848

SPIROCONJUGATED CHARGE-TRANSFER DYES FOR OPTICAL APPLICATIONS

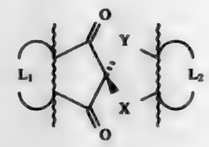
Przemyslaw B. Miasik, Bensburg, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Oct. 7, 1994, Ser. No. 320,890

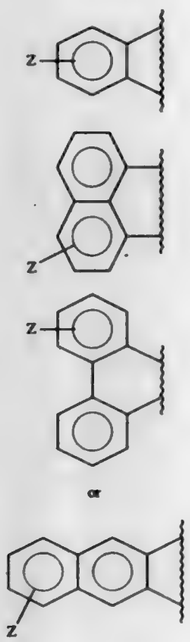
Int. Cl.[6] C07D *277/64;235/12;243/04;239/70*

U.S. Cl. 540—543 **4 Claims**

1. A compound having the formula



wherein X and Y are nitrogen substituted by an alkyl or aryl group R substituent selected from the group consisting of methyl, ethyl, propyl, isobutyl, benzyl and phenyl;
and the linkers L_1, L_2 have the formula



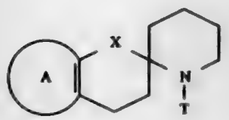
wherein Z is optionally present and is one or more substituents on any available carbon, said one or more Z substituents being selected from the group consisting of halogens, nitro-, amino-, dimethylamino-, trimethylammonium-, hydroxy-, alkoxy-, thiomethyl-, sulfoxy-, sulfonyl- and cyano-.

5,591,849
SPIRO[NAPHTHALENE-2(1H),2'-PIPERIDINE] AND THEIR USE

Kazuyoshi Kato, Kawanishi; Jun Terauchi, and Yasuo Nagai, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 3, 1995, Ser. No. 398,290
Claims priority, application Japan, Mar. 4, 1994, 6-034421
Int. Cl.[6] C07D 221/20;401/06;413/06; A61K 31/445
U.S. Cl. 544—70 10 Claims

1. A compound represented by the formula:



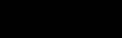
wherein

(a) ring A represents a benzene ring which may be substituted by 1 to 3 substituents independently selected from the group consisting of halogen atoms, a C_{1-6} alkoxy group and a hydroxyl group; and T represents a group represented by the formula:



wherein Alk represents a C_{1-10} alkylene group which may be substituted by an oxo group; Y represents a nitrogen atom or —CH<; and Z represents an oxygen atom, >CH—$(CH_2)_q$—W or >N—$(CH_2)_q$—W wherein q represents an integer from 0 to 4, and W represents a hydrogen atom or a C_{6-14} aryl or 5- or 6-membered heterocyclic group containing 1 to 3 nitrogen, sulfur or oxygen hetero atoms independently selected from the group consisting of 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-furyl, 3-furyl, 1-pyrrolidinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 1-piperazinyl and 2-piperazinyl, said aryl or heterocyclic group being optionally substituted with 1 to 3 substituents independently selected from the group consisting of (i) halogen atoms, (ii) a C_{1-6} alkyl group, (iii) a C_{3-8} cycloalkyl group, (iv) a C_{1-6} alkoxy group, (v) a nitro group, (vi) a cyano group, (vii) a sulfonyl group, (viii) a hydroxyl group, (ix) an amino group, (x) a mono- or di-C_{1-6} alkylamino group, (xi) a carbamoyl group, (xii) a mono- or di-C_{1-6} alkylcarbamoyl group, (xiii) a phenyl group, (xiv) a benzyl group and (xv) a C_{1-6} alkyl-carbonyl group; or

(b) ring A represents a benzene ring substituted by 1 or 2 substituents independently selected from the group represented by the formula:



wherein p represents an integer from 0 to 4; and Q represents a C_{6-14} aryl or 5- or 6-membered heterocyclic group containing 1 to 3 nitrogen, sulfur or oxygen hetero atoms independently selected from the group consisting of 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-furyl, 3-furyl, 1-pyrrolidinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 1-piperazinyl and 2-piperazinyl, which may be substituted by 1 to 3 substituents independently selected from the group consisting of (i) a halogen atom, (ii) a C_{1-6} alkyl group, (iii) a C_{3-8} cycloalkyl group, (iv) a C_{1-6} alkoxy group, (v) a nitro group, (vi) a cyano group, (vii) a sulfonyl group, (viii) a hydroxyl group, (ix) an amino group, (x) a mono- or di-C_{1-6} alkylamino group, (xi) a carbamoyl group, (xii) a mono- or di-C_{1-6} alkylcarbamoyl group, (xiii) a phenyl group, (xiv) a benzyl group and (xv) a C_{1-6} alkyl-carbonyl group; and

T represents a C_{1-6} alkyl, C_{2-10} alkenyl or C_{2-10} alkynyl group; and

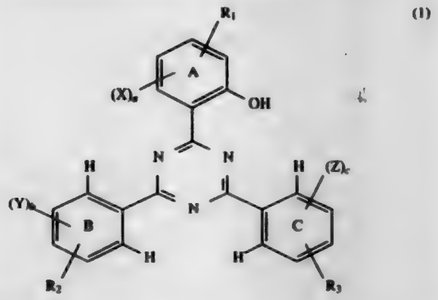
X represents —CH_2—, —CO— or —CH(OH)—, or a pharmaceutically salt thereof.

5,591,850
O-HYDROXYPHENYL-S-TRIAZINES

Jean-Luc Birbaum, Fribourg, Switzerland; Jürgen Kaschig, Freiburg; Dieter Reinehr, Kandern, both of Germany; Manfred Rembold, Pfeffingen, Switzerland; André Schnitter, Hegenheim, France; Helmut Luther, Grenzach-Wyhlen, Germany; Bernd Herzog, Bad Säckingen, Germany, and Dietmar Hilgin, Freiburg, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Nov. 17, 1994, Ser. No. 340,952
Claims priority, application Switzerland, Nov. 23, 1993, 3488/93
Int. Cl.[6] C07D 251/00
U.S. Cl. 544—216 12 Claims

1. A hydroxyphenyl-s-triazine of the formula



(I)

in which

R_1 is hydrogen, hydroxyl, halogen, C_1–C_{15}alkyl, C_1–C_{15}alkoxy or a radical of the formula



(Ia)

R_2 and R_3 are each independently of the other hydrogen or C_1–C_{15}alkoxy;

R_4 is C_1–C_5alkyl or C_1–C_5alkoxy-C_1–C_5alkyl;

Q is an C_1–C_4alkylene radical;

X, Y and Z are independently of one another halogen, hydroxyl, C_1–C_{15}alkyl or C_1–C_{15}alkoxy;

a is an integer from 0 to 3; and

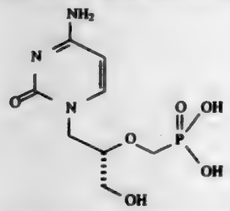
b and c are each independently of the other an integer from 0 to 2; wherein the compound contains at least two C_1–C_{15}alkoxy radicals.

5,591,851
METHOD FOR SYNTHESIS

Petr Alexander, Foster City, Calif., assignor to Gilead Sciences, Inc., Foster City, Calif.

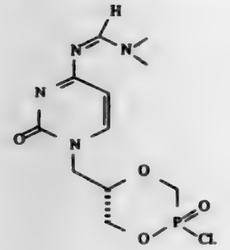
Continuation of Ser. No. 193,341, Feb. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 123,483, Sep. 17, 1993. This application Feb. 5, 1996, Ser. No. 597,005
Int. Cl.[6] C07F 9/6512;9/6503;9/653;9/6539
U.S. Cl. 544—243 7 Claims

1. A method comprising treating the compound of structure (a)



(a)

with Vilsmeier's reagent under conditions suitable to yield a compound of structure (b)



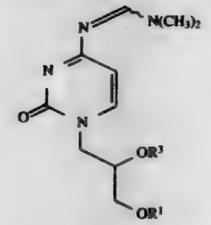
(b)

5,591,852
PROCESS FOR THE PREPARATION OF NUCLEOTIDES

Purushotham Vemishetti; Paul R. Brodfuehrer; Henry G. Howell, and Chester Sapino, Jr., all of Onondaga County, N.Y., assignors to Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic, Czechoslovakia, and Rega Stichting v.z.w., Belgium

Division of Ser. No. 822,271, Jan. 21, 1992, Pat. No. 5,476,938, which is a continuation of Ser. No. 566,200, Aug. 10, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 482,036
Int. Cl.[6] C07D 239/47
U.S. Cl. 544—317 6 Claims

1. A compound having the formula



wherein R^1 is a hydroxy protecting group that protects against alkylation by the methanephosphenate of formula (IV)

$$LCH_2P(O)(OR^2)_2 \quad \text{(IV)}$$

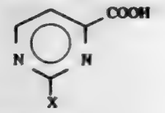
where L is a leaving group and R^3 is hydrogen or —CH_2—P(O)$(OR^2)_2$ wherein R^2 is lower alkyl having from one to five carbon atoms.

5,591,853
PRODUCTS OF A MICROBIOLOGICAL PROCESS FOR THE PRODUCTION OF 2-HALO-PYRIMIDINE-4-CARBOXYLIC ACIDS

Andreas Kiener, Visp; Rainer Glöckler, Visperterminen, and Gerhard Stucky, Brig-Glis, all of Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 158,771, Dec. 1, 1993, abandoned, which is a continuation of Ser. No. 6,489, Jan. 21, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,122
Claims priority, application Switzerland, Jan. 24, 1992, 208/92
Int. Cl.[6] C07D 239/30;239/26;239/34
U.S. Cl. 544—334 4 Claims

1. A 2-halo-pyrimidine-4-carboxylic acid of formula:



I

wherein X is a halogen atom.

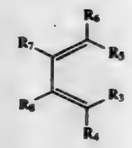
5,591,854
ENANTIOSELECTIVE SYNTHESIS OF SEVEN-MEMBERED CARBOCYCLES AND TROPANES

Huw M. L. Davies, Clemmons, N.C., assignor to Wake Forest University, Winston-Salem, N.C.

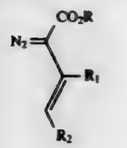
Filed Oct. 14, 1994, Ser. No. 324,106
Int. Cl.[6] C07D 451/02; C07C 69/24; C07F 15/00;7/10
U.S. Cl. 546—14 3 Claims

1. A process of chiral synthesis of optionally substituted cyclohepta-1,5 dienes or optionally substituted 8-aza-bicyclo [3.2.1] octa-2,6 dienes comprising:

reacting a diene of the formula:



with a vinyldiazomethane of the formula:



wherein

R is C_1 to C_4.

R_1 and R_2 are selected from the group consisting of C_1 to C_{20} alkyl, phenyl, vinyl, hydrogen, silyloxy, and

R_4 and R_6 are selected from the group consisting of C_1 to C_{20} alkyl, C_1 to C_{20} alkoxy, acetoxy, and silyloxy, and R_3 and R_5 may be the same or different and are selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_1 to C_{20} alkoxy, silyloxy, and adjoining moieties nitrogen, oxygen, methylene and ethylene and

R_7 and R_8 may be the same or different, and each may be selected from the group consisting of C_1 to C_{20} alkyl, alkoxy, silyloxy and hydrogen, said reaction occurring in a non-polar solvent and in the present of a catalytically effective amount of a chiral di-rhodium(II) tetracarboxylate-catalyst,

wherein

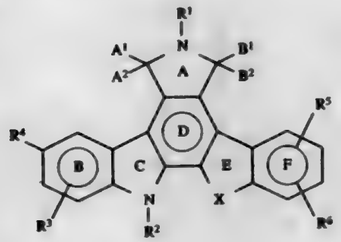
R_9 and R_5 are an adjoining moiety selected from the group consisting of nitrogen, oxygen, methylene, and ethylene, and further providing that the amount of the rhodium chiral catalyst is from 0.0001 equivalents to 0.1 equivalents of the diazomethane.

5,591,855
FUSED PYRROLOCARBAZOLES

Robert L. Hudkins, Chester Springs, Pa., and Ernest Knight, Jr., Wilmington, Del., assignors to Cephalon, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 323,755, Oct. 14, 1994, Pat. No. 5,475,110. This application Apr. 24, 1995, Ser. No. 427,160
Int. Cl.[6] C07D *487/06*
U.S. Cl. 546—256 **16 Claims**

1. A fused pyrrolocarbazole defined by the following general formula:



wherein:

a) R^1 is selected from the group consisting of H, alkyl of 1–4 carbons, aryl, arylalkyl, heteroaryl, heteroarylalkyl, COR^9, where R^9 is selected from the group consisting of alkyl of 1–4 carbons and aryl; $—OR^{10}$ where R^{10} is selected from the group consisting of H and alkyl of 1–4 carbons; $—CONH_2$, $—NR^7R^8$, $—(CH_2)_nNR^7R^8$, where n is an integer of 1–4; and $—O(CH_2)_nNR^7R^8$ wherein either

1) R^7 and R^8 independently are selected from the group consisting of H and alkyl of 1–4 carbons; or

2) R^7 and R^8 are combined together to form a linking group of the general formula $—(CH_2)_2—X^1—(CH_2)_2—$, where X^1 is selected from the group consisting of O, S and CH_2;

b) R^2 is selected from the group consisting of H, $—SO_2R^9$, $—CO_2R^9$, $—COR^9$, alkyl of 1–8 carbons alkenyl of 1–8 carbons, alkynyl of 1–8 carbons, and a monosaccharide of 5–7 carbons wherein each hydroxyl group of the monosaccharide is independently selected from the group consisting of unsubstituted hydroxyl group and a replacement moiety replacing said hydroxyl group, said replacement moiety selected from the group consisting of H, alkyl of 1–4 carbons, alkylcarbouyloxy of 2–5 carbons and alkoxy of 1–4 carbons; wherein either

1) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons, or alkynyl of 1–8 carbons is unsubstituted; or

2) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons, or alkynyl of 1–8 carbons is independently substituted with a moiety selected from the group consisting of phenyl, naphthyl, heteroaryl, F, Cl, Br, I, —CN, $—NO_2$, OH, $—OR^9$, $—O(CH_2)_nNR^7R^8$, $—OCOR^9$, $—OCONHR^9$, O-tetrahydropyranyl, NH_2, $—NR^7R^8$, $—NR^{10}COR^9$; $—NR^{10}CO_2R^9$, $—NR^{10}CONR^7R^8$, $—NHC(=NH)NH_2$, $—NR^{10}SO_2R^9$, $—S(O)_yR^{11}$, where R^{11} is selected from the group consisting of H, alkyl of 1–4 carbons, aryl of 6–10 carbons, and heteroaryl wherein y is 1 or 2; $—SR^{11}$, $—CO_2R^9$, $—CONR^7R^8$, —CHO, COR^9, $—CH_2OR^7$, $—CH=NMR^{11}R^{12}$, $—CH=NOR^{11}$, $—CH=NR^9$, $—CH=NNHCH(N=NH)NH_2$, $—SO_2NR^{12}R^{13}$, $—PO(OR^{11})_2$, and OR^{14}, where R^{14} is the residue of an amino acid after the hydroxyl group of the carboxyl group is removed; and wherein either

i) R^{12} and R^{13} are each independently selected from the group consisting of H, alkyl of 1–4 carbons, aryl of 6–10 carbons, and heteroaryl; or

ii) R^{12} and R^{13} are combined together to form a linking group of the general formula $—(CH_2)_2—X^1—(CH_2)_2$;

c) R^3, R^4, R^5 and R^6, are each independently selected from the group consisting of H, aryl, heteroaryl; F, Cl, Br, I, —CN, CF_3, $—NO_2$, OH, $—OR^9$, $—O(CH_2)_nNR^7R^8$, $—SR^{11}$, $—S(O)yR^{11}$ where y is 1 or 2; $—CO_2R^9$, $—COR^9$, $—CONR^7R^8$, —CHO, $—CH=NOR^{11}$, $—CH=NR^9$, $—CH=NNR^{11}R^{12}$, $—(CH_2)_nSR^9$, where n is an integer of 1–4, $—(CH_2)_nS(O)_yR^9$, $—CH_2SR^{15}$, where R^{15} is alkyl of 1–4 carbons; $—CH_2S(O)_yR^{14}$, $—(CH_2)_nNR^7R^8$, $—(CH_2)_nNHR^{14}$, alkyl of 1–8 carbons; alkenyl of 1–8 carbons; alkynyl of 1–8 carbons, wherein either

1) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons or alkynyl of 1–8 carbons is unsubstituted; or

2) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons or alkynyl of 1–8 carbons is substituted as described in b)2), above;

d) X is selected from the group consisting of

1) an unsubstituted alkylene of 1–3 carbons; or

2) an alkylene of 1–3 carbons substituted by R^2, OR^{10}, $—SR^{10}$, R^{15}, where R^{15} is an alkyl of 1–4 carbons; phenyl, naphthyl, arylalkyl of 7–14 carbons; or

3) $—CH=CH—$, $—CH(OH)CH(OH)—$, $—O—$, $—S—$, $—S(=O)—$, $—S(=O)_2—$, $—C(R^{10})_2—$, $—C(=O)—$, $—C(=NOR^{11})—$, $—C(OR^{11})(R^{11})—$, $—C(=O)CH(R^{15})—$, $—CH(R^{15})C(=O)—$, $—C(=NOR^{11})CH(R^{15})—$, $—CH(R^{15})C(=NOR^{11})—$, $—CH_2Z—$, $—ZCH_2—$, $—CH_2ZCH_2—$, wherein Z is selected from the group consisting of $—C(OR^{11})(R^{11})—$, $—O—$, $—S—$, $—C(=O)—$, $—C(=NOR^{11})—$, and NR^{11};

e) A^1 and A^2 are selected from the group consisting of H, H; H, $—OR^{11}$; H, $—SR^{11}$; H^1, $—N(R^{11})_2$; and a group wherein A^1 and A^2 together form a moiety selected from the group consisting of =O, =S; and $=NR^{11}$, and

f) B^1 and B^2 are selected from the group consisting of H, H; H, $—OR^{11}$; H, $—SR^{11}$; H^1, $—N(R^{11})_2$; and a group wherein B^1 and B^2 together form a moiety selected from the group consisting of =O, =S, and $=NR^{11}$

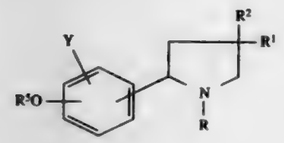
with the proviso that at least one of the pairs A^1, A^2 or B^1, B^2 is =O.

5,591,856
(PYRROLIDINYL) PHENYL CARBAMATES AND RELATED COMPOUNDS

David G. Wettlaufer, Phillipsburg, and Peter A. Nemoto, Raritan, both of N.J., assignors to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

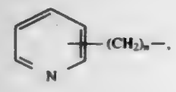
Division of Ser. No. 248,785, May 25, 1994, Pat. No. 5,405,845, which is a division of Ser. No. 208,554, Mar. 10, 1994, Pat. No. 5,338,739. This application Jan. 10, 1995, Ser. No. 370,944
Int. Cl.[6] C07D *401/06;207/04;207/10*
U.S. Cl. 546—278.4 **14 Claims**

1. A compound of the formula

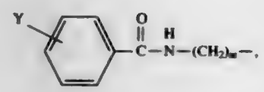


wherein:

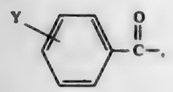
a. R is a group of the formula



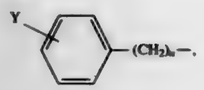
a group of the formula



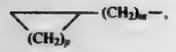
a group of the formula



a group of the formula



a group of the formula



Y is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, or trifluoromethyi, and m is 1 to 5, n is 1 to 5, and p is 1, 2, 3, 4, or 5;

b. R^1 and R^2 are independently hydrogen or loweralkyl;

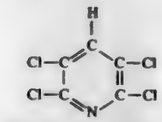
c. R^5 is hydrogen or loweralkyl; or the optical isomers thereof, or pharmaceutically acceptable salts thereof.

5,591,857
PROCESS FOR THE PREPARATION OF 2,3,5,6-TETRACHLOROPYRIDINE

Niels Friis, Bakkmarksbro, and Per Frølich, Harboøre, both of Denmark, assignors to Cheminova Agro A/S, Rønland, Denmark

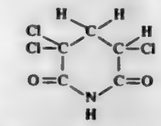
PCT No. PCT/DK93/00392, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO94/14774, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 1, 1993, Ser. No. 290,946
Claims priority, application Denmark, Dec. 22, 1992, 1535/92
Int. Cl.[6] C07D *213/61;213/69*
U.S. Cl. 546—296 **14 Claims**

1. A process for the preparation of 2,3,5,6-tetrachloropyridine of formula I



I

by reacting 3,3,5-trichloroglutarimide of formula II



II

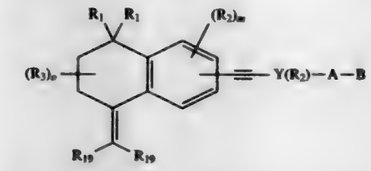
with phosphorus trichloride and chlorine, optionally in the presence of phosphorus oxytrichloride as a solvent, followed by a dehydrochlorination of the reaction mixture and finally conversion of polyphosphorus compounds formed into phosphorus oxytrichloride by supplying chlorine optionally only after supplying further phosphorus trichloride.

5,591,858
ACETYLENES DISUBSTITUTED WITH A 5 SUBSTITUTED TETRAHYDRONAPHTHYL GROUP AND WITH AN ARYL OR HETEROARYL GROUP HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY

Vidyasagar Vuligonda, Irvine; Min Teng, Aliso Viejo; Richard L. Beard, Newport Beach; Alan T. Johnson, Rancho Santa Margarita; Tien T. Duong, Irvine; Yuan Lin, Walnut, and Roshantha A. Chandraratna, Mission Viejo, all of Calif., assignors to Allergan

Division of Ser. No. 366,168, Dec. 29, 1994, Pat. No. 5,514,825. This application Feb. 27, 1996, Ser. No. 607,737
Int. Cl.[6] C07D *213/55;307/46;333/22*
U.S. Cl. 546—322 **19 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or alkyl of 1 to 10 carbons;

R_2 and R_3 are hydrogen, or alkyl of 1 to 6 carbons and the substituted ethynyl group occupies either the 2 or the 3 position of the tetrahydronaphthalene nucleus;

m is an integer having the value of 0–3;

o is an integer having the value 0–4;

Y is heteroaryl selected from a group consisting of pyridyl, thienyl, furyl, pyridazinyl, pyrimidinyl, pyrazinyl, thiazolyl,

oxazolyl, and imidazolyl, said groups being optionally substituted with one or two R_2 groups;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_6$, $CONR_9R_{10}$, $—CH_2OH$, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, $—COR_7$, $CR_7(OR_{12})_2$, CR_7OR_{13} O, or tri-lower alkylsilyl, where R_7 is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons or (trimethylsilyl)alkyl where the alkyl group has 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenol or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons, and

R_{19} is independently hydrogen, alkyl of 1 to 10 carbons, fluoro-substituted alkyl of 1 to 10 carbons, alkenyl of 2 to 10 carbons and having 1 to 3 double bonds, alkynyl having 2 to 10 carbons and 1 to 3 triple bonds, carbocyclic aryl selected from the group consisting of phenyl, C_1–C_{10}-alkylphenyl, naphthyl, C_1–C_{10}-alkylnaphthyl, phenyl-C_1–C_{10}alkyl, naphthyl-C_1–C_{10}alkyl; CN, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, $(CH_2)_pCO_2R_8$ $(CH_2)_pCH_2OH$, $(CH_2)_pCH_2OR_{11}$, $(CH_2)_pCH_2OCOR_{11}$, where p is an integer between 0 to 10, or the two R_{19} groups jointly represent 3 to 6 methylene groups which together with the alkylidene carbon complete a ring.

5,591,859

PROCESS FOR THE PRODUCTION OF 2-CYANOIMINOTHIAZOLIDINE

Franz Thalhammer, Trostberg, Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

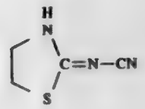
Filed Aug. 1, 1995, Ser. No. 509,740

Claims priority, application Germany, Aug. 4, 1994, 44 27 539.0

Int. Cl.[6] C07D 277/18

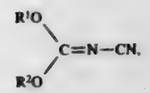
U.S. Cl. 548—198 **21 Claims**

1. A process for the production of 2-cyanoiminothiazolidine of formula



comprising,

a) reacting 2-aminoethanethiol and a dialkyl-N-cyanoimidocarbonate of the general formula



in which the residues R^1 and R^2 are the same or different and represent aliphatic residues with 1 to 4 carbon atoms which together can also form an alkylene bridge, for 30 minutes to 6 hours at a temperature of from −10° to +40° C. in a pH range from 7 to 12 in water and/or an organic solvent and

b) the reaction is completed at a pH value of >8 by increasing the temperature by 30° to 60° C.

5,591,860

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

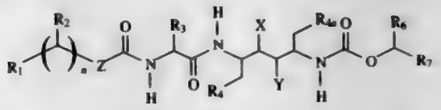
Dale J. Kempf, Libertyville; Daniel W. Norbeck, Crystal Lake; Hing L. Sham, and Chen Zhao, both of Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 158,587, Dec. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 998,114, Dec. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,828, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Apr. 4, 1995, Ser. No. 416,272

Int. Cl.[6] C07D 277/30

U.S. Cl. 548—204 **11 Claims**

1. A compound of the formula:



wherein

R_1 is monosubstituted isoxazolyl or monosubstituted isothiazolyl wherein the substituent is selected from (i) heterocyclic wherein the heterocyclic is selected from aziridinyl, azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, morpholinyl, thiomorpholinyl, thiazolyl, oxazolyl, isoxazolyl, isothiazolyl, pyridinyl, pyrimidinyl, pyridazinyl and pyrazinyl and wherein the heterocyclic is unsubstituted or substituted with a substituent selected from halo, C_1-to-C_6-loweralkyl, hydroxy, C_1-C_6-alkoxy or benzyloxy and C_1-to-C_6-thioalkoxy or benzyl-S— and (ii) (heterocyclic)-C_1-to-C_6-alkyl wherein heterocyclic is defined as above;

n is 1, 2 or 3;

R_2 is hydrogen or C_1-to-C_6-loweralkyl;

R_3 is C_1-to-C_6-loweralkyl;

R_4 and R_{4a} are independently selected from phenyl wherein the phenyl ring is unsubstituted or substituted with a substituent selected from (i) halo, (ii) C_1-to-C_6-loweralkyl, (iii) hydroxy, (iv) C_1-to-C_6-alkoxy or benzyloxy and (v) C_1-to-C_6-thioalkoxy or benzyl-S—;

R_6 is hydrogen or C_1-to-C_6-loweralkyl;

R_7 is thiazolyl or oxazolyl wherein the thiazolyl or oxazolyl ring is unsubstituted or substituted with C_1-to-C_6-loweralkyl;

X is hydrogen and Y is —OH; and

Z is absent, —O—, —S—, $—CH_2—$ or $—N(R_8)—$ wherein R_8 is C_1-to-C_6-loweralkyl, C_3-to C_7-cycloalkyl, —OH or $—NHR_{8a}$ wherein R_{8a} is hydrogen or C_1-to-C_6-loweralkyl; or a pharmaceutically acceptable salt thereof.

5,591,861

OPTICALLY ACTIVE ω-HALO-2-AMINO-ALKANECARBOXYLIC ACID DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND THEIR USE FOR THE PREPARATION OF OPTICALLY ACTIVE PHOSPHORUS-CONTAINING α-AMINO ACIDS

Hans-Joachim Zeiss, Sulzbach/Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

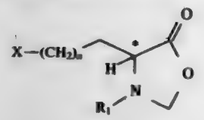
Continuation of Ser. No. 337,322, Nov. 10, 1994, abandoned, which is a continuation of Ser. No. 924,342, Jul. 31, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 466,877

Claims priority, application Germany, Aug. 3, 1991, 41 25 753.7

Int. Cl.[6] C07D 263/18

U.S. Cl. 548—228 **6 Claims**

1. A process for the enantioselective synthesis of novel and known optically active compound of the formula I,



(I)

in which

R^1 is $(C_1$–$C_6)$alkyl which is unsubstituted or is substituted by one or more radicals selected from the group consisting of hydroxyl, $(C_1$–$C_4)$alkoxy, $[(C_1$–$C_4)$alkyl]carbonyl and $[(C_1$–$C_4)$alkoxy]carbonyl; or is a group of the formula R_2—CO— or R_3—SO_2—,

R_2 is $(C_1$–$C_{11})$alkyl, phenyl, naphthyl, fluorenyl, substituted phenyl, substituted naphthyl or substituted fluorenyl, $(C_1$–$C_6)$alkoxy, which is unsubstituted or substituted by one or more radicals selected from the group consisting of phenyl, naphthyl, fluorenyl, substituted phenyl, substituted naphthyl and substituted fluorenyl,

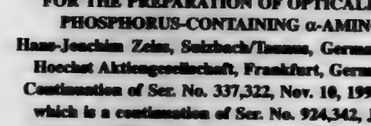
R_3 is $(C_1$–$C_4)$alkyl, phenyl or substituted phenyl,

X is halogen, and

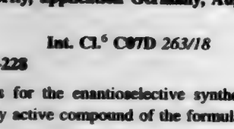
n is zero or one,

which comprises

a) in the case of the compound of the formula I_S mentioned, reacting an optically active diacyl peroxide of the formula II_S in which R_1 and n have the same meaning as in formula I, in a nitrile group-containing solvent in the presence of a copper-containing catalyst with a halogenation agent DX selected from the group consisting of elementary halogen selected from chlorine, bromine and iodine, and phosphorous(V) halides and copper halides, and isolating the compound of the formula I_S from the resulting mixture of the compounds I_S and III_S

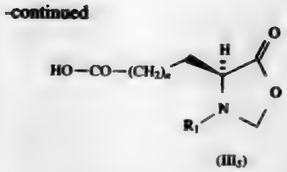


(II_S)



(I_S)

-continued



(III_S)

or

b) in the case of the compound of the formula I_R which corresponds to the formula I_S mentioned under a) but which has the (R) configuration at the asymmetric carbon atom instead of the (S) configuration, or a mixture of the compounds of the formulae I_R and/or I_S, using an optically active diacyl peroxide II_R, which corresponds to the compound of the formula II_S mentioned under a), but which instead of the (S) configuration at the respective asymmetric carbon atom has the (R) configuration, or a corresponding mixture of the diacyl peroxides II_R and II_S, and reacting them as under a) and isolating the compound of the formula I_R or the mixture of the compounds of the formulae I_R and I_S.

5,591,862

TETRAZOLE DERIVATIVES, THEIR PRODUCTION AND USE

Takashi Sohda, Takatsuki; Hitoshi Ikeda, Higashiosaka, and Yu Momose, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

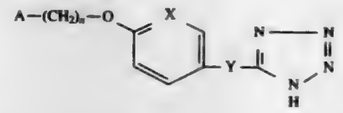
Filed Jun. 8, 1994, Ser. No. 257,856

Claims priority, application Japan, Jun. 11, 1993, 5-140986

Int. Cl.[6] C07D 413/12;403/14;401/14;417/14; A61K 31/425;31/42;31/415;31/44;31/505

U.S. Cl. 548—235 **26 Claims**

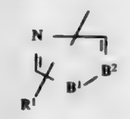
1. A compound of the formula



wherein

n is an integer of 1 to 3,

A is an aromatic 5-membered cyclic residue of the formula



wherein

B^1 is a sulfur atom, oxygen atom, or NR group wherein

R is hydrogen a lower alkyl group having 1 to 3 carbon atoms, benzyl

or phenylethyl,

B^2 is N or C—R^2

wherein

R^2 is hydrogen

or

a lower alkyl group which is unsubstituted or is substituted with hydroxyl group

R^1 is

(1) hydrogen,

(2) a hydrocarbon residue selected from the group consisting of saturated aliphatic hydrocarbon residue having 1 to 8 carbon atoms,

unsaturated aliphatic hydrocarbon residue having 2 to 8 carbon atoms,

saturated alicyclic hydrocarbon residue having 3 to 7 carbon atoms,

unsaturated alicyclic hydrocarbon residue having 5 to 7 carbon atoms,

alicyclic-aliphatic hydrocarbon residue formed by bondage of the above-mentioned saturated or unsaturated alicyclic hydrocarbon residues and aliphatic hydrocarbon residues, and having 4 to 9 carbon atoms,

phenyl alkyl having 7 to 9 carbon atoms, naphthyl alkyl having 11 to 13 carbon atoms, phenyl, and naphthyl

(3) 5- or 6-membered heterocyclic ring selected from the group consisting of thienyl, furyl, pyridyl, thiazolyl, oxazolyl, imidazolyl, pyrimidinyl, pyrazinyl, pyridazinyl, piperidinyl, pyrrolidinyl, morpholinyl and tetrahydrofuryl, the 5- or 6- membered heterocyclic ring being bonded through a carbon atom, or

(4) amino group selected from the group consisting of

a. N-monosubstituted amino group substituted by a lower alkyl having 1 to 4 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, phenyl, naphthyl, pyridyl, thienyl, furyl, oxazolyl, thiazolyl, piperidinyl, pyrrolidinyl, morpholinyl, benzyl, phenethyl, acetyl, propionyl, carbamoyl group, N-monosubstituted carbamoyl group selected from the group consisting of

N-methylcarbamoyl, N-ethylcarbamoyl and N-propylcarbamoyl,

N,N-disubstituted carbamoyl group selected from the group consisting of

N,N-dimethylcarbamoyl, N-methyl-N-ethyl-carbamoyl and N,N-diethylcarbamoyl,

a lower alkoxycarbonyl group having 2 to 5 carbon atoms, hydroxyl group, a lower alkoxy group having 1 to 4 carbon atoms, benzyloxy, phenethyloxy and naphthyloxy,

b. N,N-disubstituted amino group substituted by a substituent selected from substantially the same ones as in the above-mentioned N-monosubstituted amino group and by a substituent selected from the group consisting of alkyl group, cycloalkyl group, aryl group, aralkyl group,

and

c. cyclic amino group selected from the group consisting of 1-azetidinyl, 1-pyrrolidino, piperidino, morpholino, piperazino, piperazino having, at the 4-position, lower alkyl having 1 to 4 carbon atoms, benzyl, phenethyl, naphthylmethyl, phenyl and naphthyl,

when the hydrocarbon residue contains an alicyclic group or when the 5- or 6-membered heterocyclic ring is a saturated one,

each of them may be subetituted by one to three lower alkyl groups having 1 to 3 carbon atoms, when the hydrocarbon residue contains an aromatic hydrocarbon residue or when the 5- or 6- membered heterocyclic group is an unsaturated one,

it may have 1 to 4 substituents selected from the group consisting of halogen, hydroxyl, cyano, nitro, trifluoromethyl,

a lower alkoxy group having 1 to 4 carbon atoms,

a lower alkyl group having 1 to 4 carbon atoms,

a lower alkoxycarbonyl group having 2 to 4 carbon atoms,

a lower alkylthio having 1 to 3 carbon atoms, and

a lower alkyl amino having 1 to 4 carbon atoms,

R^1 and R^2 may be combined with each other to form a condensed ring if R^1 is combined with one of the ring-constituting carbon atoms adjacent to the carbon atom on which R^2 is substituted,

Y is a straight- or branched-chain divalent hydrocarbon residue selected from the group consisting of alkylene and alkenylene, and

X is CH or N,

or a pharmaceutically acceptable salt thereof.

5,591,863

IMIDAZOLIUM HARDENERS FOR HYDROPHILIC COLLOIDS

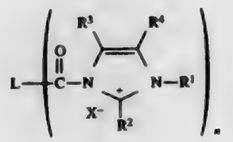
Ludovic Fedor; Timothy D. Weatherill, both of Hendersonville, and Reif T. Weberg, Brevard, all of N.C., assignors to Sterling Diagnostic Imaging, Inc., Glasgow, Del.

Continuation of Ser. No. 266,403, Jun. 27, 1994, Pat. No. 5,470,986. This application Jun. 5, 1995, Ser. No. 463,793

Int. Cl.[6] C07D *233/64;233/61;233/72;* B05D *3/02*

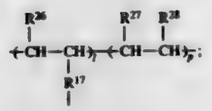
U.S. Cl. 548—312.7 **17 Claims**

1. A hardener for hydrophilic colloid defined by the formula:

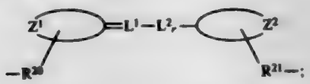


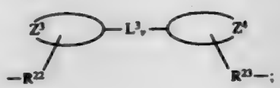
wherein:

L is chosen from a set consisting of alkyl of 1 to 20 carbons with a proviso that L is not $—CH_2CHOH—$ or $—CH_2CHCH_2—$; phenyl; naphthyl; diphenyl; anthracene; phenanthrene; benzyl; $—R^{11}—O—R^{12}—$; $—(R^{13}O)_m—R^{14}—$; $—R^{15}SR^{16}—$;

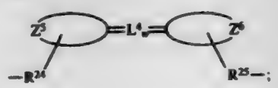








and



R^1 is an alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; or $—C(O)R^5$;

R^2 is hydrogen; alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; $—OR^6$; nitro; carboxyl; mercapto; alkylamino of 1 to 24 carbons; or a halogen;

R^3 and R^4 independently represent hydrogen; alkyl of 1 to 24 carbons; nitro; carboxyl; mercapto; $—OR^7$; or R^3 and R^4 taken together represent a 5- or 6-membered ring containing atoms chosen from a set consisting of C, N, O and S;

R^5 represents an alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; $—OR^8$; —CN; $—NR^9R^{10}$; or a 5- or 6-membered ring containing atoms chosen from a set consisting of C, N, O and S;

R^6 represents hydrogen or alkyl of 1 to 24 carbons;

R^7 represents hydrogen or alkyl of 1 to 24 carbons;

R^8 represents hydrogen; alkyl of 1 to 24 carbons or aryl of 6 to 24 carbons;

R^9 and R^{10} independently represent hydrogen; alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; or R^9 and R^{10} taken together represent a 5- or 6-membered ring containing atoms chosen from a set consisting of C, N, O and S;

R^{11} and R^{12} independently represent alkyl of 2 to 24 carbons or aryl of 6 to 24 carbons;

R^{13} and R^{14} independently represent alkyl of 1 to 10 carbons;

R^{15} and R^{16} independently represent alkyl of 1 to 24 carbons;

R^{17} represents a chemical bond; an alkyl of 1 to 24 carbons; an aryl of 6 to 24 carbons; or $—N(R^{29})_{3-s}(R^{30})_s^+$;

R^{18} is an alkyl of 1 to 24 carbons;

R^{19} is an alkylene of 1 to 24 carbons;

R^{20}, R^{21}, R^{22}, R^{23}, R^{24} and R^{25} independently represent a chemical linkage; an alkyl of 1 to 10 carbons; an aryl of 6 to 24 carbons; an aralkyl of 7–24 carbons; or an alkoxy of 1 to 10 carbons;

R^{26}, R^{27} and R^{28} independently represent hydrogen or alkyl of 1 to 5 carbons;

R^{29} represents hydrogen or an alkyl of 1 to 20 carbons;

R^{30} represents an alkylene of 1 to 20 carbons; arylene of 6 to 24 carbons; or aralkylene of 6 to 24 carbons;

L^1 represents methine or nitrogen;

L^2 and L^3 independently represent methine or dimethine;

L^4 represents dimethine;

Z^1, Z^2, Z^3, Z^4, Z^5 and Z^6 independently represent thiazoline; thiazalidine; benzothiazole; benzoxazole; 3-3-dialkylindolenine; 3,3-dialkylbenz[e]indole; 1,3-indandione; pyrazolone; 2,4,6,-trioxohexahydropyrimidine; 2-thio-4,6,dioxohexahydropyrimidine; 3,5-pyrazolidinedione; 5,7-dioxo-6,7-hyhydro-5-thiazolo[3,2-a]pyrimidine,2-thio-2,4oxazolidinedione; 5,5-dialkyl-1,3-dyclohexanedione; 2-hydroxy-4H-pyrido[1,2-a]pyrimidin-4-one; rhodanine; hydantoin; thiohydantoin; or isoxazolone;

l is an integer of 2 to 400,000;

m is an integer of 1 to 40;

n is an integer of at least 2;

p is an integer of 0 to 400,000;

w is an integer of 0 to 5;

v is an integer of 0 to 5;

q is an integer of 2 to 4;

r is an integer of 0 to 5;

s is an integer of 1 to 3; and

X^- is a counter ion to balance charge.

5,591,864

4-AND 6-CARBAMATES RELATED TO PHYSOSTIGMINE AND INTERMEDIATES FOR THE PREPARATION THEREOF

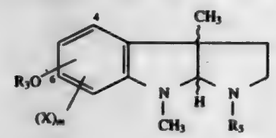
Edward J. Glamkowski, Warren, and Barbara E. Kurys, Elmwood Park, both of N.J., assignors to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Division of Ser. No. 753,547, Sep. 3, 1991, Pat. No. 5,260,452, which is a division of Ser. No. 431,103, Nov. 3, 1989, Pat. No. 5,081,117. This application Apr. 27, 1992, Ser. No. 873,862

Int. Cl.[6] C07D *487/04*

U.S. Cl. 548—429 **12 Claims**

1. A 4- or 6-substituted pyrrolo[2,3-b]indole of the formula



where R_5 is hydrogen or alkyl; R_3 is hydrogen or alkyl; m is 0, 1, or 2; each X is independently hydrogen, halogen, loweralkyl, nitro or amino; or the optical isomers including the 3aS-cis and 3aR-cis optical isomers, the racemic mixture or a pharmaceutically acceptable acid addition salt thereof.

5,591,865

CRYSTAL MODIFICATION OF A DIKETOPYRROLOPYRROLE PIGMENT

Zhimin Hao, Marly; Abul Iqbal, Arconciel, and Fritz Herren, Düdingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jun. 22, 1995, Ser. No. 493,853

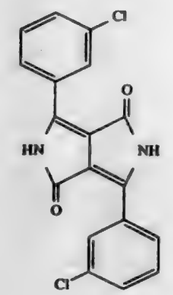
Claims priority, application Switzerland, Jun. 29, 1994, 2074/94

Int. Cl.[6] C07D *487/04*

U.S. Cl. 548—453 **8 Claims**

1. A diketopyrrolopyrrole of the formula

(I)



in its β-modification, whose X-ray diffraction pattern is characterized by the following diffraction lines

Interplanar spacings (d values in Å)	double glancing angle (2 Θ)	relative intensity
13.1801	6.70	100
6.6594	13.29	50
6.3830	13.86	91
5.7056	15.52	40
5.1298	17.27	54
4.5362	19.55	47
4.4159	20.09	36
4.0577	21.89	29
3.3910	26.26	25
3.1307	28.49	22.

5,591,866

(1H-INDOL-1-YL)-2-(AMINO)ACETAMIDE DERIVATIVES AND PREPARATION THEREOF

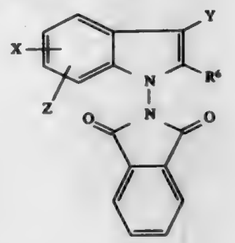
Raymond W. Kosley, Jr.; Denise M. Flanagan, both of Bridgewater; Lawrence L. Martin, Lebanon, and Peter A. Nemoto, Piscataway, all of N.J., assignors to Hoechst Marion Roussel Inc., Bridgewater, N.J.

Division of Ser. No. 218,211, Mar. 25, 1994, which is a division of Ser. No. 863,273, Apr. 3, 1992, Pat. No. 5,319,096. This application Jun. 1, 1995, Ser. No. 457,723

Int. Cl.[6] C07D *403/04*

U.S. Cl. 548—455 **10 Claims**

1. A compound of the formula



wherein

X is hydrogen, chloro, bromo, fluoro, hydroxy, loweralkoxy, aryiloweralkoxy, acyloxy, loweralkylaminocarbonyloxy, diloweralkylaminocarbonyloxy, amino, loweralkylamino, diloweralkylamino, acylamino, loweralkyl or trifluoromethyl;

Y is hydrogen, loweralkyl, chloro or bromo;

Z is hydrogen, loweralkyl, loweralkoxy or halogen; or X and Z taken together can form a methylenedioxy group;

R^6 is hydrogen, chloro, bromo, arylcarbonyl, loweralkylcarbonyl, aryl(hydroxy)loweralkyl or hydroxyloweralkyl; and with the proviso that when X, Z and R^6 are hydrogen Y is not hydrogen or methyl.

5,591,867

SYNTHESIS OF KAINIC ACID

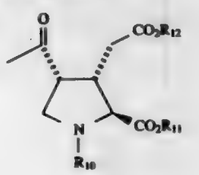
James A. Monn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 231,543, Apr. 22, 1994, Pat. No. 5,486,620, which is a division of Ser. No. 56,687, Apr. 30, 1993, Pat. No. 5,352,799, which is a continuation-in-part of Ser. No. 985,906, Dec. 4, 1992, Pat. No. 5,319,095. This application Oct. 30, 1995, Ser. No. 550,422

Int. Cl.[6] C07D *513/16*

U.S. Cl. 548—532 **21 Claims**

1. A compound of the formula



V

wherein

R_{10} is hydrogen, acyl, alkoxycarbonyl, or arylalkoxycarbonyl;

R_{11} is hydrogen, C_1–C_6 alkyl, aryl, or arylalkyl; and

R_{12} is hydrogen, C_1–C_6 alkyl, aryl, or arylalkyl;

provided that R_{10}, R_{11}, and R_{12} are not all hydrogen.

5,591,868

AROMATIC CARBOXYLIC ACIDS

Ichiro Nasuno; Mitsuru Shibata; Masashi Sakamoto, and Kazuyoshi Kolke, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

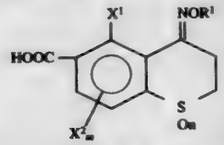
Division of Ser. No. 367,183, Dec. 27, 1994, Pat. No. 5,506,194. This application Oct. 11, 1995, Ser. No. 540,707

Claims priority, application Japan, Jul. 13, 1992, 4-185526

Int. Cl.[6] C07D *335/06*

U.S. Cl. 549—23 **8 Claims**

1. An aromatic carboxylic acid compound of the formula (II).



(II)

(wherein R^1 is a C_1–C_6 alkyl group, each of X^1 and X^2 is independently a C_1–C_4 alkyl group, m is an integer of 0 or 1, and n is an integer of 0, 1 or 2, or a salt thereof.

5,591,869

PROCESS FOR THE PREPARATION OF METHYLENE COMPOUNDS AND THE NOVEL COMPOUND 2-(2,4-DICHLORO-5-FLUOROBENZYL)THIOPHENE

Helmut Fiege, and Ferdinand Hagedorn, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

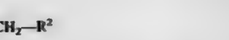
Filed Dec. 6, 1995, Ser. No. 568,050

Claims priority, application Germany, Dec. 16, 1994, 44 44 862.7

Int. Cl.[6] C07D *333/12;307/38*

U.S. Cl. 549—80 **11 Claims**

1. A process for the preparation of a methylene compound of the formula



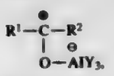
(I)

in which

R^1 represents a C_6–C_{10}-aryl radical which is unsubstituted or substituted by 1 to 4 C_1–C_4-alkyl radicals, 1 to 4 fluorine, chlorine and/or bromine atoms, one C_1–C_8-alkoxy group and/or one acetoxy group, or represents a heteroaryl radical which is unsubstituted or substituted by one C_1–C_4-alkyl radical and/or one fluorine, chlorine or bromine atom and contains 5 to 10 C atoms and one O or S atom and

R^2 represents a C_1–C_{12}-alkyl radical which is unsubstituted or substituted by 1 to 5 fluorine, chlorine and/or bromine atoms, independently of R^1 represents a radical as defined for R^1 and, in the case where R^1=a C_6–C_{10}-aryl radical which is substituted by 1 to 4 fluorine, chlorine and/or bromine atoms, also represents a furyl or thienyl radical,

which comprises reducing an aluminum halide complex of the formula



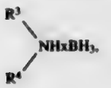
(II)

in which

R^1 and R^2 have the above mentioned meaning, and

Y represents fluorine, chlorine or bromine,

with an amineborane of the formula



(III)

in which

R^3 represents C_1–C_4-alkyl and

R^4 represents hydrogen or C_1–C_4-alkyl and/or

with sodium borohydride and/or with potassium borohydride.

5,591,870

PROCESS FOR PRODUCING A VANADIUM-PHOSPHORUS OXIDE CATALYST PRECURSOR

Masakatsu Hatano, Yokohama; Masayoshi Murayama, Yamato; Kenji Shima, and Masumi Ito, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 187,715, Jan. 28, 1994, Pat. No. 5,496,787. This application Jun. 7, 1995, Ser. No. 480,916

Claims priority, application Japan, Jan. 29, 1993, 5-034348

Int. Cl.[6] B01J *27/198*

U.S. Cl. 549—259 **2 Claims**

1. A method for producing maleic anhydride, which comprises: conducting the oxidization of a hydrocarbon having at least 4 carbon atoms in the vapor phase over a vanadiumphosphorus oxidation catalyst prepared from a catalyst precursor prepared by:

(a) introducing into an organic solvent a vanadium alkoxide as a pentavalent vanadium compound and a phosphorus compound in the presence of a reducing agent capable of reducing the pentavalent vanadium compound to the tetravalent state,

(b) hydrolyzing at least a part of the vanadium alkoxide before or after the introduction of the phosphorus compound, and

(c) heating the vanadium-containing liquid medium obtained in step (b), in the presence of the phosphorus compound to reduce at least a part of vanadium to the tetravalent state.

5,591,871

BISLACTONE COMPOUND AND A PROCESS FOR PRODUCING THE SAME

Naoko Suzuki, Amagasaki; Hirotashi Nakanishi, Osaka, and Kyouko Nagase, Ibaraki, all of Japan, assignors to Sumitomo Chemical Co., Ltd, Osaka, Japan

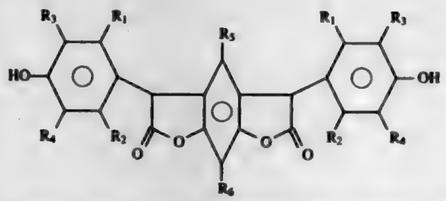
Filed Aug. 28, 1995, Ser. No. 520,096

Claims priority, application Japan, Aug. 29, 1994, 6-203484

Int. Cl.[6] C07D *407/00*

U.S. Cl. 549—299 **5 Claims**

1. A bislactone compound represented by the general formula (I):



(I)

wherein R_1 and R_2 each independently represent a hydrogen atom or an alkyl group having 6 or less carbon atoms, and R_3, R_4, R_5 and R_6 each independently represent a hydrogen atom, a hydroxy group or an alkyl group having 6 or less carbon atoms.

5,591,872

AUTOINDUCER MOLECULE

James P. Pearson; Kendall M. Gray, both of Iowa City, Iowa; Luciano Passador, Rochester, N.Y.; Kenneth D. Tucker, Germantown, Md.; Anatol Eberhard, Brooktondale; Barbara H. Iglewski, Fairport, both of N.Y., and Everett P. Greenberg, Iowa City, Iowa, assignors to The University of Iowa Research Foundation, Iowa City, Iowa

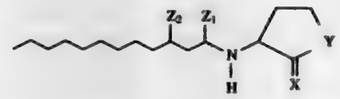
Filed Aug. 9, 1993, Ser. No. 104,487

Int. Cl.[6] C07D *307/33*

U.S. Cl. 549—321 **4 Claims**

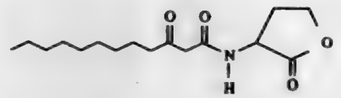
1. N-(3-oxododecanoyl)homoserine lactone.

2. An autoinducer molecule comprising a molecule of the formula:



wherein X is O, S, or NH; Y is O, and Z_1 and Z_2 are independently selected from the group consisting of hydrogen, =O, =S, and =NH; the molecule being able to regulate gene expression.

3. An autoinducer molecule comprising a molecule of the formula:



the molecule being able to regulate gene expression.

5,591,873

FORMED COPPER CATALYST FOR THE SELECTIVE HYDROGENATION OF FURFURAL TO FURFURYL ALCOHOL

Martin Bonkmann, Gelnhausen; Johannes Ohmer, Gruendau, and Thomas Tacke, Friedrichsdorf, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 1, 1995, Ser. No. 381,518

Claims priority, application Germany, Feb. 2, 1994, 44 03 187.4

Int. Cl.[6] C07D *307/44*; B01J *23/72*

U.S. Cl. 549—503 **24 Claims**

1. A formed copper catalyst comprising an intimate mixture of copper and pyrogenic silica, wherein the copper is present as crystallites with an average size as determinable by X-ray diffraction between 5 and 50 nm, the copper content relative to the total weight of the catalyst is between 10 and 70% by weight.

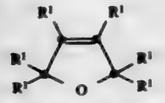
21. A method for preparation of furfuryl alcohol comprising supplying furfural to an evaporation zone, evaporating the furfural to form a vapor thereof, mixing said vapor with hydrogen in the presence of a catalyst comprising an intimate mixture of copper and pyrogenic silica, wherein copper is present as crystallites with an average size as determinable by X-ray diffraction between 5 and 50 nm, the copper content relative to the total weight of the catalyst being 10 to 70% by weight, and recovering the product.

5,591,874
PROCESS FOR THE PREPARATION OF 2,5-DIHYDROFURAN COMPOUNDS

Thomas A. Puckette, and Gerald W. Phillips, both of Longview, Tex., assignors to Eastman Chemical Company, Kingsport, Tenn.

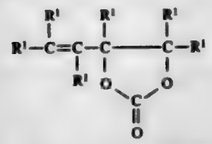
Filed Sep. 29, 1995, Ser. No. 536,595
Int. Cl.[6] C07D 307/28;307/78
U.S. Cl. 549—507 11 Claims

1. Process for the preparation of a 2,5-dihydrofuran compound having the formula:



(I)

which comprises contacting a vinyl ethylene carbonate compound having the formula

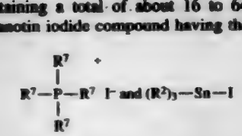


(II)

with a catalyst system comprising an acidic component and a halogen component;

wherein each R^1 is independently selected from hydrogen, alkyl of up to about 8 carbon atoms, a carbocyclic or heterocyclic aryl group of about 5 to 10 carbon atoms or halogen or any two R^1 substituents collectively may represent an alkylene group forming a ring.

11. Process for the preparation of 2,5-dihydrofuran which comprises contacting in the liquid phase at a temperature of about 60° to 150° C. vinyl ethylene carbonate with a catalyst comprising a combination of (i) a quaternary phosphonium iodide compound containing a total of about 16 to 64 carbon atoms and (ii) an organotin iodide compound having the general formulas:



wherein

each R^7 substituent is independently selected from alkyl of up to about 20 carbon atoms, benzyl, phenyl or phenyl substituted with up to 3 substituents selected from lower alkyl, lower alkoxy or halogen; and

each R^2 substituent is independently selected from alkyl of up to about 12 carbon atoms, benzyl, 2-methyl- 2-phenylpropyl, phenyl or phenyl substituted with up to 3 substituents selected from lower alkyl, lower alkoxy or halogen.

5,591,875
EPOXIDATION PROCESS

Te Chang, 839 Shaumont Dr.; David W. Leyshon, 408 Trio La., both of West Chester, Pa. 19382, and Guy L. Crecco, 1514 Ridge Rd., Wilmington, Del. 19809

Continuation of Ser. No. 510,221, Aug. 2, 1995, abandoned. This application Jan. 16, 1996, Ser. No. 587,183
Int. Cl.[6] C07D 301/12;303/04
U.S. Cl. 549—531 22 Claims

1. A method for epoxidizing an olefin comprising reacting said olefin with hydrogen peroxide in a liquid phase in a reaction zone in the presence of a titanium-containing molecular sieve catalyst, a salt comprising an anionic species and a cation selected from the group consisting of ammonium cations, alkali metal cations, and alkaline earth metal cations and an amount of a chelating agent effective to reduce non-selective decomposition of the hydrogen peroxide to molecular oxygen upon aging of the titanium-containing molecular sieve catalyst.

19. A method of epoxidizing a C_2–C_{10} aliphatic olefin comprising reacting said C_2–C_{10} aliphatic olefin with hydrogen peroxide at a temperature of 20° C. to 80° C. in a liquid phase within a reaction zone in the presence of a solvent, a titanium-containing molecular sieve catalyst, and a salt comprising an anionic species selected from the group consisting of halides, phosphates, sulfates, carbonates, carboxylates, hydroxide, alkoxides, and nitrate and a cation selected from ammonium, lithium, sodium, and potassium and a chelating agent having at least two functional groups, said functional groups being the same or different and selected from the group consisting of amino, hydroxy, carboxyl, phosphoryl and combinations thereof with at least two of said functional groups being carboxyl or phosphoryl, wherein the salt is present at a concentration of from 0.08001M to 0.02M in said liquid phase and the polyfunctional chelating agent is present at a concentration of from 1 to 1000 ppm in said liquid phase.

5,591,876

Patent Not Issued For This Number

5,591,877
PROCESS FOR THE RECOVERY OF FLUORINATED CARBOXYLIC ACIDS

Reinhold Obermeier, Mühldorf, and Gunter Stefaniak, Burgkirchen, both of Germany, assignors to Hoechst AG, Frankfurt Am Main, Germany

Division of Ser. No. 251,752, May 31, 1994, Pat. No. 5,442,097. This application May 3, 1995, Ser. No. 433,164
Claims priority, application Germany, Jun. 2, 1993, 43 18 258.5; Jan. 29, 1994, 44 02 694.3
Int. Cl.[6] C07C 53/00;53/21
U.S. Cl. 554—226 14 Claims

1. A process for preparing an ammonium salt of a fluorinated carboxylic acid emulsifier, which comprises hydrolyzing an ester of the fluorinated carboxylic acid in aqueous ammonia.

5,591,878
CATALYZED PROCESS FOR PRODUCING METAL CARBOXYLATES FOR USE AS ANIMAL FEED SUPPLEMENTS

Christopher E. Nelson, Des Moines, and Douglas H. Catron, Ames, both of Iowa, assignors to Kemin Industries, Inc., Des Moines, Iowa

Filed Sep. 19, 1995, Ser. No. 531,193
Int. Cl.[6] C07F 15/06;11/00;13/00
U.S. Cl. 556—49 11 Claims

1. A catalyzed process for preparing a dry, particulate polyvalent metal cation carboxylate having a formula $M(CH_3(CH_2)_xCOO^-)_y$, wherein M is a polyvalent metal cation that is Mn^{+2}, Co^{+2}, or Cr^{+3}, x is zero or 1, and y is an integer equal to the cationic charge of M that comprises the steps of:

(a) admixing (i) a dry particulate polyvalent metal compound that is an oxide, hydroxide or carbonate of Mn^{+2}, Co^{+2} or Cr^{+3}, (ii) an anhydrous carboxylic acid that is acetic or propionic acid and (iii) a catalytic agent, said admixing being at a relative molar ratio of about 1:2–10:0.01–3, respectively, and said admixing being carried out in the absence of added solvent or other diluent to form an exothermic reaction mixture that produces water as a product;

(b) maintaining said reaction mixture at reflux while continually removing said produced water and carboxylic acid for a time period sufficient to remove the water and about 80 percent of the unreacted carboxylic acid to form a composition of the

catalyst and polyvalent metal cation carboxylate product in residual carboxylic acid;

(c) cooling and solidifying said product-containing solution;

(d) grinding said solid and separating said residual carboxylic acid from said product; and

(e) collecting the product.

5,591,879
PROCESS FOR PREPARING CYCLOPENTADIENYL-TYPE LIGANDS

Krisztina Frey; Gabriele von Massow; Helmut G. Alt, all of Bayreuth, Germany, and M. Bruce Welch, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 383,982, Sep. 9, 1994. This application Jun. 23, 1995, Ser. No. 444,985
Int. Cl.[6] C07F 7/08;7/10
U.S. Cl. 556—404 9 Claims

1. A process for preparing a cyclopentadienyl-type ligand comprising:

(1) reacting a halosilane with an alkali metal salt of a cyclopentadienyl-type compound to form a silylcyclopentadienyl-type compound,

wherein said halosilane compound containing a cyclopentadienyl-type group is represented by the formula $X^*Si(R^1)_3$, wherein X^* is a halide and wherein each R^1 is individually an alkyl group containing 1 to 20 carbon atoms or hydrogen,

wherein said cyclopentadienyl-type group is an unsubstituted cyclopentadienyl, substituted cyclopentadienyl, unsubstituted indenyl, substituted indenyl, unsubstituted fluorenyl, or substituted fluoreayl group, wherein the substituents on said cyclopentadienyl-type group are hydrocarbyl groups containing 1 to 12 carbon atoms, alkoxy groups containing 1 to 12 carbon atoms, trialkylsilyl groups where each alkyl group contains 1 to 12 carbon atoms, alkyl halide groups where the alkyl group contains 1 to 12 carbon atoms, or halide;

(2) reacting said silylcyclopentadienyl-type compound with an alkali metal alkyl containing 1 to 8 carbon atoms and methylene chloride, to produce a chloromethylated silylcyclopentadienyl-type compound; and then

(3) reacting said chloromethylated silylcyclopentadienyl-type compound with a nucleophile to produce said cyclopentadienyl-type ligand,

wherein said nucleophile is represented by the formula JA, wherein J is an alkali metal, wherein A is $—YPR_2$, $—YNR_2$, or $—NR_2$, wherein Y is an alkylene group containing 1 to 24 carbon atoms, wherein each R is individually selected from alkyl groups containing 1 to 20 carbon atoms.

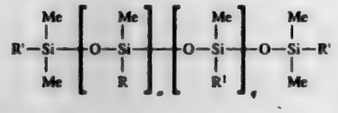
5,591,880
SILICONE ESTER AMINO COMPOUNDS

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Filed May 6, 1996, Ser. No. 642,936
Int. Cl.[6] C07F 7/10
U.S. Cl. 556—413 24 Claims

1. A compound prepared by the esterification reaction of;

(a) a silicone carboxylate conforming to the following structure:



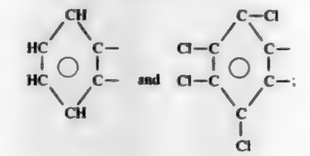
wherein;

Me is methyl;

R and R' are CH_3 or $—(CH_2)_3—O—(EO)_a—(PO)_b—(EO)_c—C(O)—R^*—C(O)—OH$;

with the proviso that both R and R' are not CH_3;

R^* is selected from $—CH_2—CH_2—$; $—CH=CH—$; $—CH_2—C(R^7)—H$;



R^1 is alkyl having from 1 to 20 carbon atoms;

R is selected from lower alkyl $CH_3(CH)_n$ or phenyl;

n is an integer from 0 to 8;

a, b and c are integers independently ranging from 0 to 20;

EO is an ethylene oxide residue $—(CH_2CH_2—O)—$;

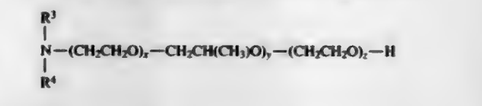
PO is a propylene oxide residue $—(CH_2CH(CH_3)—O)—$;

o is an integer ranging from 1 to 100;

q is an integer ranging from 0 to 500.

and

(c) a tertiary amine conforming to the following structure:



wherein;

R3 and R4 are independently $CH_3—(CH_2)k—$;

k is an integer ranging from 0 to 20;

x, y and z are independently integers ranging from 0 to 20, with the proviso that x+y+z be greater than 1.

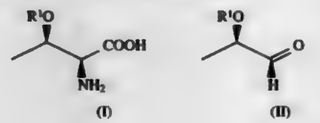
5,591,881
STEREOSELECTIVE PREPARATION OF (E)-ENOLTHIOETHER DERIVATIVES

Young-Ki Sim; Tae-Seop Hwang, both of Kyungki-do; Mi-Jung Lee, Kyungsang-buk-do; Hee-An Kwon, and Tea-Heung Song, both of Kyungki-do, all of Rep. of Korea, assignors to Choongwae Pharmaceutical Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 8, 1995, Ser. No. 512,507
Claims priority, application Rep. of Korea, Aug. 10, 1994, 94-19644
Int. Cl.[6] C07F 7/08
U.S. Cl. 556—427 10 Claims

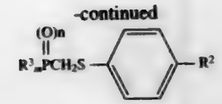
1. A process for stereoselective preparation of (E)-enalthioether derivatives comprising the steps of;

(a) protecting free secondary hydroxy group of L-threonine with trialkylsilyl group; (b) the protected L-threonine derivatives (I) being degraded by ninhydrin to prepare (2R)-2-(trialkylsilyloxy)propanal (II); and (c) carring out the Honor-Wordsworth-Emons (HWE) reaction of the resultant compound (II) with stabilized phosphonate ylide, phosphonium ylide or phosphine oxide ylide which was obtained by treating the organic phosphine compound (III) with strong base to provide (E)-enolthioether derivatives(IV),

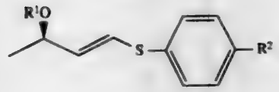


(I) (II)

-continued



(III)



(IV)

in the above formulas, R^1 represents trialkylsilyl group; R^2 represents hydrogen, C_{1-3} lower alkyl, C_{1-3} lower alkoxy or halogen atom;

R^3 represents C_{1-3} lower alkylalkoxy, allylalkoxy or allyl group; and m and n are integers of 2–3 and 0–1, respectively.

5,591,882

PROCESS FOR PREPARING ORGANOPHOSPHATES USEFUL FOR INCREASING THE OCULAR HAEMO- AND BIOCOMPATIBILITY OF SYNTHETIC POLYMERS

Peter W. Straford, and Michael J. Driver, both of Uxbridge, United Kingdom, assignors to Biocompatibles Limited, Uxbridge Middlesex, United Kingdom

Division of Ser. No. 927,293, Sep. 23, 1992, Pat. No. 5,422,402. This application Apr. 18, 1995, Ser. No. 423,983

Claims priority, application United Kingdom, Mar. 5, 1990, 9004881

Int. Cl.[6] C07H *9/09*

U.S. Cl. 558—87 **10 Claims**

1. A process for preparing a compound of formula (IV)



(IV)

in which the groups R may be the same or different and each is a straight or branched C_{1-4} alkyl group, and Y' is $-(CH_2)_p-$ or $-(CH_2)_a-Ar-(CH_2)_b-$, where

p is from 1 to 30; Ar is a para- or meta-disubstituted aryl or heteroaryl group; and a and b are the same or different and each is from 0 to 5 and a+b is from 1 to 10;

which process comprises monoprotecting a diol of formula:

HO-Y'-OH

in which Y' is as hereinbefore defined; coupling the protected diol with 2-chloro-2-oxo-1,3,2- dioxaphospholane in the presence of an inorganic or organic base; reacting the coupled product with an anhydrous tertiary amine of formula NR_3 wherein the groups R are as hereinbefore defined and deprotecting the protected, hydroxy phosphorylcholine derivative thus obtained in a non-aqueous organic solvent to provide a compound of formula (IV).

5,591,883

PROCESS FOR PREPARING CARBONATE COMPOUNDS

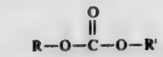
Kuen-Yuan Hwang; Yu Z. Chen; Chio C. Chu, and Hsiao T. Liao, all of Shin-Chu, Taiwan, assignors to Chang Chun Plastics Co. Ltd., Taipei, Taiwan

Filed Oct. 31, 1994, Ser. No. 333,089

Int. Cl.[6] C07C *69/96*

U.S. Cl. 558—270 **12 Claims**

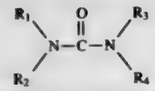
1. A process for preparing carbonates represented by formula



[I]

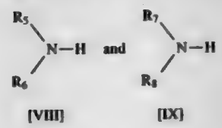
wherein R and R' may be the same or different, and are a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, an optionally substituted C_6–C_{14} aryl group, an alkylaryl group or an arylalkyl group; said process comprising the steps of:

(i) reacting a urea derivative represented by formula



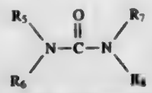
[II]

wherein R_1, R_2, R_3 and R_4 may be the same or different, and are hydrogen, a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, an optionally substituted C_6–C_{14} aryl group, an alkylaryl group or an arylalkyl group; or R_1 and R_2, or R_3 and R_4 are bonded together with a nitrogen atom adjacent thereto to form an optionally substituted nitrogen-containing five- or six- member heterocyclic ring, with compounds represented by formula and for 1 to 4 hours:



[VIII] [IX]

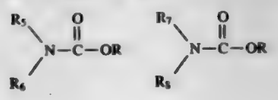
wherein R_5, R_6, R_7 and R_8 may be the same or different, and are hydrogen, a C_1–C_6 alkyl group, a C_1–C_6 alkoxyl group, a C_1–C_6 alkoxy carbonyl group, a substituted or unsubstituted phenyl group; provided that at least one of R_5 and R_6 is a substituted or unsubstituted phenyl group, and at least one of R_7 and R_8 is a substituted or unsubstituted phenyl group, to give compounds represented by formula:



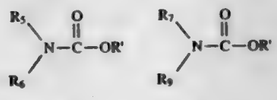
[III]

wherein R_5, R_6, R_7 and R_8 are defined as above;

(2) reacting the resulting compound represented by formula with R—OH and/or R'—OH, wherein R and R' are defined as above, to give compounds represented by formulas to:



[IV] [V]



[VI] [VII]

(3) recovering and then allowing the compounds represented by formulas to either independently versatilely decompose or to carry out replacement compounds and or compounds and between them in the presence of not more than one catalyst to obtain the carbonate compounds represented by formula

wherein reaction steps (1) to (3) are performed at a temperature below about 200° C.

5,591,884

DOPAMINE AGONISTS

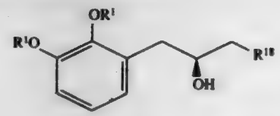
Michael P. DeNinno, Gales Ferry, Conn., and Richard J. Perner, Gurnee, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 442,236, May 30, 1995, which is a continuation-in-part of Ser. No. 998,161, Dec. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 359,448, May 31, 1989, Pat. No. 4,963,568. This application Jun. 5, 1995, Ser. No. 461,330

Int. Cl.[6] C07F *5/04*; C07C *49/105;43/205*

U.S. Cl. 558—286 **1 Claim**

1. A compound having the formula



wherein R^1 is a catechol-protecting group, and R^{18} is substituted C_3–C_9-alkyl.

5,591,885

PROCESS FOR THE PREPARATION OF HALOGENATED α-AMINOKETONE COMPOUNDS

Hans Hilpert, Reinach, Switzerland, assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Aug. 11, 1995, Ser. No. 514,329

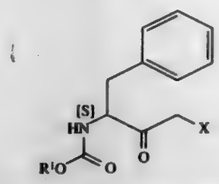
Claims priority, application Switzerland, Sep. 23, 1994, 2904/94; Dec. 9, 1994, 3736/94

Int. Cl.[6] C07C *229/34*

U.S. Cl. 560—29 **1 Claim**

1. A process for the preparation of a halogenated α-aminoketone of formula

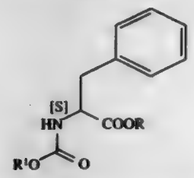
III



wherein X is halogen and R^1 is lower alkyl, benzyl, or phenyl, which process comprises:

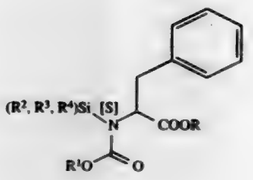
a) reacting a diester of formula

II



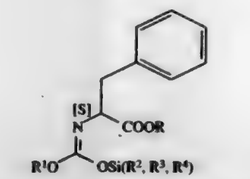
wherein R is lower alkyl and R^1 is as defined above, with a lower-alkyl-lithium and an organochlorosilane of the formula $ClSi(R^2,R^3,R^4)$, wherein R^2, R^3 and R^4 are independently lower alkyl or phenyl, to produce a silyl-protected compound of formulas

VIII



or

IX



wherein R, R^1, R^2, R^3 and R^4 are as defined above;

b) reacting the resulting silyl-protected compound of formulas VIII or IX in the presence of dihalogenated methane and a lower-alkyl-lithium to produce the halogenated α-aminoketone of formula III.

5,591,886

PROCESS FOR THE CRYSTALLIZING L-α-ASPARTYL-L-PHENYLALANINE METHYL ESTER FROM THE SOLUTION

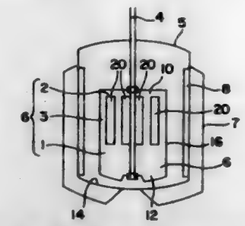
Hiroshi Ichiki; Ryoichi Taneda; Hiroyuki Itoh, and Yoshitsugu Kono, all of Okazaki, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 175,044, Dec. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 788,268, Nov. 5, 1991, abandoned. This application Jun. 16, 1995, Ser. No. 445,346

Claims priority, application Japan, Nov. 5, 1990, 2-297119

Int. Cl.[6] C07C *229/00*

U.S. Cl. 560—41 **9 Claims**



1. A process for crystallizing L-α-aspartyl-L-phenylalanine methyl ester, APM, specifically to form crystals thereof from a solution thereof, the method comprising the steps of:

containing the solution in a vessel having a bottom and a sidewall, the sidewall having vertically extending baffles extending inwardly thereof;

while cooling the solution to a first temperature by cooling the vessel, minimizing deposition of crystals on the bottom and sidewalls of the vessel by stirring the solution with a stirrer on a rod rotating about a vertical axis in a range of about 30 to about 50 RPM to form crystals of APM and to keep the crystals suspended in the solution, the stirrer having vertically extending stirring blades located in closer proximity to the bottom of the vessel than to the baffles to sweep the bottom of the container, with a peripheral speed of the stirring blades of about 0.66 to about 1.1 m/sec, the stirring blades each having a plurality of openings therethrough and vertical side edges and bottom edges, the openings being spaced from the bottom edges of the blades, wherein the solution is agitated by

passing through the openings in the blades as well as by passing between the stationary baffles and the vertical side edges of the blades to create a slurry of liquid and crystals;

while stirring and cooling the solution, maintaining a reduced pressure within the vessel by applying a vacuum thereto as the blades are rotated;

upon the solution substantially filling with crystals, cooling the solution as to form a slurry of liquid and crystals;

filtering the slurry to separate the crystals from the fluid; and

dehydrating the crystals.

5,591,887

PROSTAGLANDINS OF THE F SERIES

Ryuzo Ueno, and Ryuji Ueno, both of Nishinomiya, Japan, assignors to R-Tech Ueno, Ltd., Osaka, Japan

Continuation of Ser. No. 43,177, Apr. 2, 1993, abandoned, which is a division of Ser. No. 945,594, Sep. 16, 1992, Pat. No. 5,221,763, which is a continuation of Ser. No. 607,791, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 189,108, May 2, 1988, abandoned. This application Dec. 22, 1994, Ser. No. 361,712

Claims priority, application Japan, Apr. 30, 1987, 62-107529; Sep. 18, 1987, 62-235890

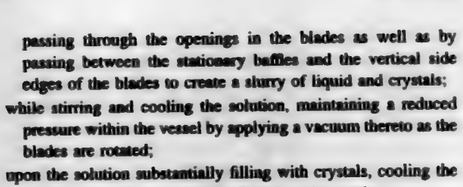
Int. Cl.[6] C07C *405/00*

U.S. Cl. 560—121 **7 Claims**

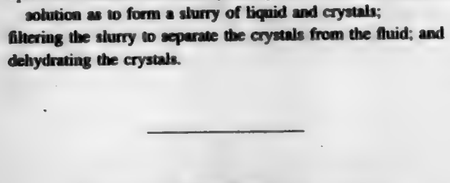
1. A 13,14-dihydro-15-keto-PGF represented by the formula:



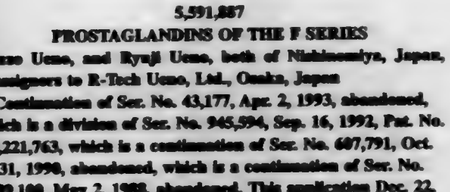
(22)



(23)

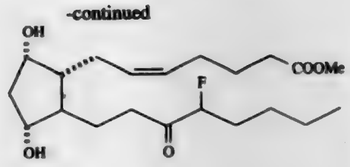


(24)



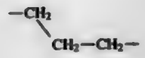
(25)

-continued



(26)

in which a bond between C-2 and C-3 is a single or a double bond, X is a group:



R_1 is a hydrogen atom or a C_{1-4} alkyl, phenyl, benzoyl, hydroxyalkyl, alkoxyalkyl, trialkylsilyl or tetrahydropyranyl group;

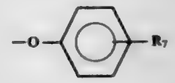
R_2 is a hydrogen atom or a lower alkyl group;

R_3 is hydroxyl;

R_7 is hydroxyl;

R_4 and R_5 are the same or different, and signify a hydrogen atom, a halogen atom, or a lower alkyl group, and at least one of R_4 and R_5 is a halogen atom;

R_6 is a C_{4-9} alkyl group which may be branched or contain a double bond, a C_{1-9} alkyl group containing a C_{1-2} alkoxy substituent or



(wherein R_7 is a hydrogen or halogen atom or a halogenated methyl group); and a physiologically acceptable salt of said 13,14-dihydro-15-keto-PGF.

5,591,888

PROCESS FOR PRODUCING TERT.-BUTYL CHLOROACETATE

Andreas Seidel, Köln; Dieter Peters; Norbert Weferling, both of Hürth-Efferen, and Dimitrios Mouratidis, Frechen, all of Germany, assignors to Hoechst AG, Frankfurt am Main, Germany

Filed Sep. 13, 1995, Ser. No. 527,543

Claims priority, application Germany, Sep. 27, 1994, 44 33 444.9

Int. Cl.[6] C07C *69/63*

U.S. Cl. 560—226 **3 Claims**

1. A process for preparing tert-butyl chloroacetate by addition of chloroacetic acid to isobutene in a closed vessel under pressure, which comprises carrying out the reaction in the absence of catalysts and solvents in a pressurized vessel at a temperature of 80° to 110° C. over a period of 1 to 12 hours, cooling the pressure vessel, withdrawing the cooled product mixture and distilling under reduced pressure without prior neutralization.

5,591,889

METHOD FOR THE SYNTHESIS OF TRISODIUM PHOSPHONOFORMATE HEXAHYDRATE

Edib Jakupovic, Nykvarn, and Jan Stenbede, Södertälje, both of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Continuation of Ser. No. 91,475, Jul. 14, 1993, abandoned, which is a continuation of Ser. No. 773,621, Nov. 12, 1991, abandoned. This application Apr. 18, 1995, Ser. No. 425,344

Int. Cl.[6] C07F *9/22*

U.S. Cl. 562—24 **8 Claims**

1. A method for the preparation of trisodium phosphonoformate hexahydrate, comprising the steps of adding sodium hydroxide to water; heating the aqueous sodium hydroxide solution to 50° C.; adding triethyl phosphonoformate to said solution at 50° C. so as to produce a reaction mixture containing trisodium phosphonoformate and ethanol; heating the reaction mixture to reflux temperature for about 1 hour for removing the ethanol; cooling the reaction mixture to a temperature between about 17° C. and about 30° C.; and filtering off the product, trisodium phosphonoformate hexahydrate.

5,591,890

PROCESS FOR PRODUCING ORTHO-NITRO AROMATIC ACIDS BY OXIDATION OF ORTHO-NITROALKYLAROMATIC COMPOUNDS

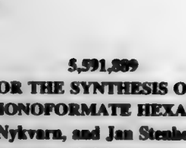
Stephen E. Jacobson, Princeton Junction, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 3, 1995, Ser. No. 552,420

Int. Cl.[6] C07C *51/16*

U.S. Cl. 562—412 **5 Claims**

1. A process for producing an ortho-nitroaromatic acid by the direct oxidation of an ortho-nitroalkyl aromatic compound having the formula



wherein R_1 is an alkyl group of 1–4 carbon atoms but not t-butyl; R_2 and R_3 are H, R_1, CO_2H, SO_3Na, SO_2R_1, F, Cl, Br and NO_2, can be in any other available position in the aromatic ring and can be the same or different comprising the steps of:

A. adding to a pressure vessel said ortho-nitroalkylaromatic compound, oxidation resistant solvent and a salt of a catalytic metal soluble in said solvent;

B. raising the temperature and pressure of the contents to above 90° C. up to 150° C. and between 10.5 bar and 70 bar, respectively, by heating and introducing an oxygen-containing gas;

C. introducing an aliphatic aldehyde or ketone;

D. maintaining the contents in presence of a continuous supply of said oxygen-containing gas and said aliphatic aldehyde or ketone until at least 50% of said ortho-nitroalkylaromatic compound is converted to the corresponding acid;

E. recovering the catalyst by the addition of an alkali metal carbonate to the contents followed by a separation step; and

F. recovering the product ortho-nitroaromatic acid by acidification and separation.

5,591,891

N-[MERCAPTOACYL (AMINO ACID OR PEPTIDE)] COMPOUNDS AND S-LIPOPHIIIC ALIPHATIC CARBONYL DERIVATIVES THEREOF AS ANTIHYPERTENSIVES

Marie-Claude Fournie-Zaluski, Paris, and Bernard-Pierre Roques, Saint Maurice, both of France, assignors to Institut National de la Sante et de la Recherche Medicale (INSERM), Paris, France

Filed Jan. 24, 1994, Ser. No. 185,563

Int. Cl.[6] C07C *321/00*

U.S. Cl. 567—426 **14 Claims**

1. An S-lipophilic aliphatic carbonyl [N-mercaptoacyl(amino acid or peptide)] compound.

5,591,892

ALLOSTERIC MODIFIERS OF HEMOGLOBIN

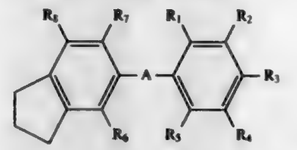
Donald J. Abraham, Midlothian; Gajanan Joshi, Richmond, both of Va.; Ramnarayan Randad, Frederick, Md., and Jayashree Panikker, Richmond, Va., assignors to Center for Innovative Technology, Herndon, Va.

Division of Ser. No. 374,206, Jan. 18, 1995, and a continuation-in-part of Ser. No. 722,382, Jun. 26, 1991, Pat. No. 5,382,680, which is a continuation of Ser. No. 623,346, Dec. 7, 1990, abandoned, said Ser. No. 374,206is a continuation-in-part of Ser. No. 101,501, Jul. 30, 1993, Pat. No. 5,432,191, which is a continuation-in-part of Ser. No. 6,246, Jul. 30, 1993, Pat. No. 5,290,803, which is a continuation-in-part of Ser. No. 702,947, May 20, 1991, Pat. No. 5,122,539, which is a continuation-in-part of Ser. No. 478,848, Feb. 12, 1990, Pat. No. 5,049,695. This application May 30, 1995, Ser. No. 451,658

Int. Cl.[6] C07C *229/40*

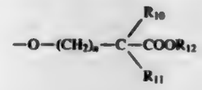
U.S. Cl. 562—455 **1 Claim**

1. A compound having the formula:



wherein A is a chemical bridge which includes two to four chemical moieties bonded together, wherein said chemical moieties in A are selected from the group consisting of CO, O, S, SO_2, NH, NR_9 where R_9 is a C_{1-6} alkyl group, CH_2, CH, and C, with the proviso that, except in the case where A contains two identical CH and C moieties positioned adjacent one another to form an alkene or alkyne, the chemical moieties in A are each different from one another, and

wherein at least one of R_{1-5} is substituted with a compound having the chemical formula:



where n is zero to five, where R_{10} and R_{11} are selected from the group consisting of hydrogen, halogen, C_{1-12} alkyl groups, carboxylic acids and esters, aromatic or heteroatomic groups, and these moieties may be the same or different, or alkyl moieties of part of an aliphatic ring connecting R_{10} and R_{11}, and where R_{12} is a hydrogen, halogen, salt cation, metal, or C_{1-6} alkyl group, and wherein a remainder of said R_{1-5} moieties and said R_{6-8} moieties are selected from the group consisting of hydrogen, halogen, C_{1-6} alkyl groups, C_{1-6} ether or esters, aromatics and heteroaromatics, and alkyl moieties of an aliphatic ring connecting two sites on a phenyl group.

5,591,893

PROCESS FOR THE PREPARATION OF POLYCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Jürgen Kulpe, and Heinz Strutz, both of Frankfurt am Main, Germany, assignors to Hoechst AG, Frankfurt am Main, Germany

Continuation of Ser. No. 875,386, Apr. 29, 1992, abandoned. This application Oct. 27, 1993, Ser. No. 146,429

Claims priority, application Germany, May 2, 1991, 41 14 376.0

Int. Cl.[6] C07C *61/06*

U.S. Cl. 562—504 **20 Claims**

1. A process for the preparation of a polycarboxylic acid having at least three carboxyl groups, consisting of the steps

(A) introducing one or more aliphatic cycloalkenes into water, wherein said aliphatic cycloalkenes have one or more carbon-carbon double bonds, and further wherein said aliphatic cycloalkenes include in their structures substituents having an aromatic group, a halogen-containing group, a nitro group, a carboxyl group, a polycarboxyl group, an alkoxy group, an aryloxy group or a cyano group,

(B) ozonolysis of said aliphatic cycloalkene(s) in water by passing in an ozone-containing carrier gas, and

(C) addition of an aqueous hydrogen peroxide solution, to oxidatively work up the ozonolysis products produced in step (B), which comprises, in step (A), introducing the aliphatic cycloalkene(s) into water having a pH of 7 or less than 7 and, in step (C), adding hydrogen peroxide in water without adding an organic solvent or an acid.

5,591,894

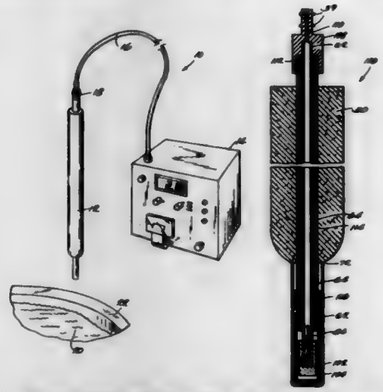
HYDROGEN SAMPLER FOR MOLTEN METAL AND METHOD

Richard A. Falk, Hillsboro Beach, Fla., and Robert W. Nott, Ontario, Canada, assignors to Midwest Instrument Co., Inc., Hartland, Wis.

Continuation-in-part of Ser. No. 500,318, Jul. 10, 1995, abandoned. This application Oct. 16, 1995, Ser. No. 543,396

Int. Cl.[6] G01N *7/00*

U.S. Cl. 73—19.07 **35 Claims**



1. An immersion probe for determination of the concentration of a gas dissolved in molten metal by immersion of said probe in said metal comprising,

a heat resistant probe body in the form of a housing having an elongated configuration, said body being formed of a non-metallic, solid, gas and molten metal impervious material encased in a tube of metal;

said body having a first end adapted to be connected to a gas conduit;

said body having a second end adapted to be immersed in molten metal, said second end being spaced away from, but in fluid flow communication with, said first end and having a gas-permeable, liquid metal-impervious plug, said second end and said plug being sealed by a molten metal-soluble cap.

17. An immersion probe for determination of the concentration of a gas dissolved in molten metal by immersion of said probe in said metal comprising,

a probe body in the form of a hermetically sealed housing having an elongated configuration, said body being formed of a gas and liquid metal impervious material of sufficient resistance to withstand immersion in molten metal;

said body having a first end adapted to be connected to a gas inlet and a gas outlet, said first end being hermetically sealed by a temporary sealing means;

said body having a second end adapted to be immersed in molten metal, said second end being in fluid flow communication with said first end and having a gas-permeable, liquid metal-impervious plug, said second end and said plug being hermetically sealed by a molten metal-soluble cap; and,

an inert, dry carrier gas sealed within said probe body.

5,591,895

DETECTING PARTICLES IN A GAS FLOW

Michael Rigby, Cambridgeshire, Great Britain, assignor to Pollution Control & Measurement (Europe) Ltd., Huntingdon, Great Britain

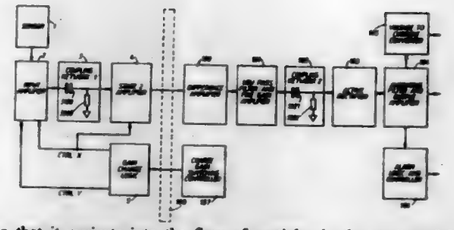
PCT No. PCT/GB92/00816, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/22653, PCT Pub. Date Nov. 11, 1993

PCT Filed May 5, 1992, Ser. No. 325,294

Claims priority, application United Kingdom, Apr. 30, 1992, 9209407

Int. Cl.[6] G01N *25/00*

U.S. Cl. 73—28.01 **8 Claims**



1. A method for detecting particles flowing in a gas flow along a stack and emitted through the stack in which a probe is positioned so that it projects into the flow of particles in the stack and is charged triboelectrically by particles in the flow and the quantities of electrical charges transferred to the probe are evaluated to provide an indication of the particle flow in the gas flow, wherein, in order to reduce the effect of variations in gas flow related variables other than those relating to particle flow, an alternating component in the signal caused by the triboelectrical charging of the probe is monitored, the alternating component of the signal from the probe is filtered to exclude high frequency components of the signal and the magnitude of the residual alternating component is itself used to give an indication of the particle flow through the stack.

5,591,896

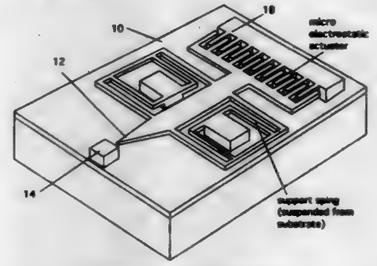
SOLID-STATE GAS SENSORS

Gang Lin, 301 E. Reynolds Dr. 4-C, Ruston, La. 71270

Filed Nov. 2, 1995, Ser. No. 552,219

Int. Cl.[6] G01N *27/62;27/52;* G01T *1/18*

U.S. Cl. 73—31.05 **20 Claims**



A micromachined gas sensor with integrated gap spacing actuator

1. A solid-state gas sensor for detecting a gaseous contaminant, a gaseous compound or a change of composition of a gas in a given atmosphere, comprising:

a) a dielectric surfaced base substrate;

b) a first electrode mounted on said base;

c) a second electrode mounted on said base, said second electrode being disposed near and spaced apart from said first electrode, thereby forming a gap between said first and second electrodes, thereby establishing a baseline electric current response for said sensor in the presence of negligible gaseous contaminants or an unchanging gas composition;

wherein, a difference of electrical potential is impressed on said first and second electrodes to ionize gas molecules within said gap between said first and second electrodes;

wherein each of said first and second electrodes is connected to electrical measurement means for the purpose of signal analysis and signal processing;

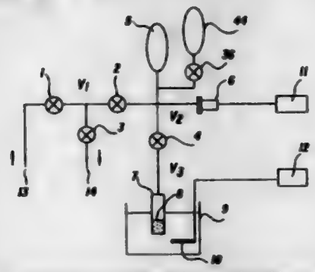
whereby, when a contamination or changes in said gas composition occur in the area surrounding said gap, said electrical measurement means detect the change caused by a corresponding change in ionization characteristics at said gap in form of electric current response, which amplitude and time dependent behavior of said change in electric current response form thereby is indicative of the contamination or the changes in said gas composition.

5,591,897

APPARATUS FOR AND METHOD OF MEASURING GAS ABSORBING CHARACTERISTICS

Hiroshi Nakamura, Neyagawa; Shin Fujitani, Hirakata; Yumiko Nakamura, Moriguchi; Takahiro Yonezaki, Gunma; Koichi Nishimura, Suita; Terubiko Imoto, Kadoma, and Ikuo Yonezu, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 6, 1995, Ser. No. 466,045
Claims priority, application Japan, Jun. 24, 1994, 6-143343
Int. Cl.[6] G01N *15/08*
U.S. Cl. 73—38 7 Claims



1. An apparatus for measuring the gas absorbing and/or desorbing characteristics of a substance having a property to absorb a gas, the apparatus having a sample container for containing the substance, a gas storage connected to the sample container for storing the gas until a predetermined pressure is reached, and a gas supply source for supplying the gas to the gas storage, the apparatus further comprising:

a first valve provided on a line connecting the gas supply source to the gas storage,

a second valve provided on a line between the first valve and the gas storage,

a third valve provided on a gas discharge line connected to the line between the first valve and the second valve,

the first, second and third valves being each a two-position valve having an open position and closed position, the valves defining a region thereby surrounded and serving as a preliminary storage for temporarily holding the gas when the gas is supplied or discharged, and

valve control means for controlling opening and closing of the valves, the first valve and the second valve alternately opened and closed under the control of the valve control means to thereby intermittently supply the gas from the gas storage and pressurize the gas storage of pressure stepwise until the predetermined pressure is reached.

5,591,898

METHOD FOR MEASURING MATERIAL PERMEABILITY CHARACTERISTICS

William N. Mayer, White Bear Lake, Minn., assignor to Modern Controls, Inc., Minneapolis, Minn.

Filed Oct. 12, 1995, Ser. No. 542,318
Int. Cl.[6] G01N *15/08*
U.S. Cl. 73—38 5 Claims

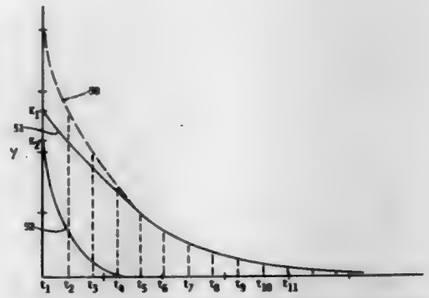
1. A method for measuring the permeability of a gas through a material, comprising the steps of:

a) exposing the material to the gas to be measured;

b) measuring the amount of said gas which is outgassed from said material over successive increments of time; and forming a curve plot which represents the outgassed amount (y) versus time;

c) choosing a uniform time increment (t_i) and subdividing said curve plot into uniform time increments t_i;

d) measuring the value of y at the beginning and end of each time increment t_i and forming the ratio R_1 thereof, and continuing until the nth and (n+1) time increments t_i when two subsequent ratios R_1 are substantially equal;



e) forming an equation $y_1(t)=K_1e^{-at}$ wherein $K_1=y(tn)/R_1^n$ and $-a=\text{Ln } R_1/t_i$;

f) plotting a second curve of the equation $y_1(t)=K_1e^{-at}$ and subtracting said second curve from said formed curve plot to produce a third curve of the equation $y_2(t)=K_2e^{-bt}$;

g) measuring the value of Y_2 at the beginning and end of each uniform time increment t; of said second curve, and forming the ratio R_2 of the value of Y_2 at the beginning and end of a time increment t_i;

h) solving for K_2 by the equation $K_2=y_2(tn)/R_2^n$ and solving for "B" by the equation $b=\text{Ln } R_2/t_i$;

i) calculating the diffusion coefficient "D" by the equation $D=a\ l^2/2.4$ and calculating the solubility coefficient "S" by the equation $S=[K_1/a+K_2/b]/V$ where "l" is one-half the thickness of said material and "V" is the volume of said material; and

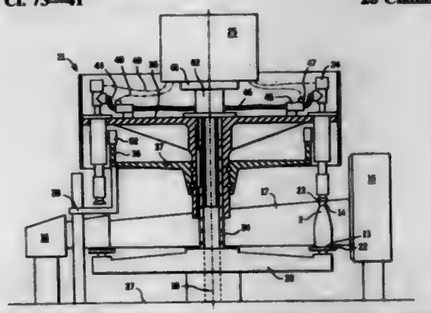
j) calculating the permeability "P" of said material by the equation $P=S\cdot D$.

5,591,899

CONTINUOUSLY OPERATING INSPECTION MACHINE FOR VESSELS

Karl Griesbeck, Regensburg, Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Germany

Continuation of Ser. No. 167,796, Dec. 17, 1993, abandoned. This application Jul. 12, 1995, Ser. No. 501,268
Claims priority, application Germany, May 11, 1992, 42 14 958.4
Int. Cl.[6] G01M *3/32*
U.S. Cl. 73—41 28 Claims



22. A machine for inspecting bottles made of plastics or glass comprising:

a rotationally driven turntable for transporting said bottles in sequence along a circular path between an infeed station where said bottles are deposited on said turntable and a discharge station where said bottles are discharged from said turntable,

devices for pressurizing each bottle positively or negatively and for concurrently inspecting each bottle for a leak as said each bottle is transported along said path, and

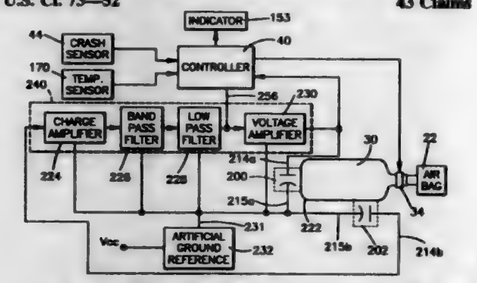
an optoelectronic inspection apparatus arranged stationarily along said circular path and adapted for inspecting said each bottle for the presence of foreign matter and damage concurrently with said each bottle undergoing a test for a leak as said each bottle passes said optoelectronic inspection apparatus.

5,591,900

METHOD AND APPARATUS FOR TESTING FLUID PRESSURE IN A SEALED VESSEL

Allen J. Bronowocki, Laguna Niguel; Steven P. Kuritz, Los Angeles, both of Calif.; Brian K. Blackburn, Rochester, Mich.; Scott B. Gentry, Rosseo, Mich., and Joseph F. Mazur, Washington, Mich., assignors to TRW Vehicle Safety Systems Inc., and TRW Inc., both of Lyndhurst, Ohio

Continuation-in-part of Ser. No. 986,035, Dec. 4, 1992, Pat. No. 5,351,527. This application Sep. 23, 1994, Ser. No. 311,607
Int. Cl.[6] G01M *3/00;* G01F *15/00;* B60R *21/16;21/26*
U.S. Cl. 73—52 43 Claims



1. An apparatus for sensing pressure in a sealed vessel, said apparatus comprising:

a piezoelectric patch transducer assembly operatively secured to said vessel for, when energized, transferring energy to pressurized fluid in said vessel through a localized deformation of the vessel, said transferred energy establishing oscillations of the pressurized fluid in the vessel;

a piezoelectric patch receiver assembly operatively secured to said vessel for providing a received electrical signal having a frequency value functionally related to the natural frequency of the pressurized fluid in said vessel;

receiver circuit means operatively connected to said receiver assembly for providing a fluid resonating signal having a frequency value functionally related to the natural frequency of the oscillating pressurized fluid in the vessel, the frequency value functionally related to the natural frequency being indicative of the fluid pressure in said vessel; and

drive circuit means operatively connected to said receiver circuit means and to said piezoelectric patch transducer assembly for initially driving said piezoelectric patch transducer assembly with a noise signal and subsequently driving said piezoelectric patch transducer assembly with an oscillating energy wave having a frequency equal to said frequency value functionally related to the natural frequency of said pressurized fluid in said vessel.

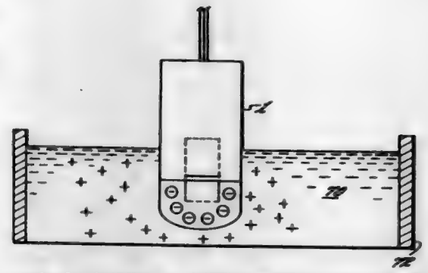
5,591,901

FLUID SENSOR

James R. Heckman, Palm Harbor, Fla., assignor to Ryland Engineering Corporation, Palm Harbor, Fla.

Filed Apr. 13, 1994, Ser. No. 226,958
Int. Cl.[6] G01N *33/18;33/26;37/00*
U.S. Cl. 73—61.43 20 Claims

1. A detecting device for detecting a fluid, comprising:



a probe for detecting an electrical potential between itself and said fluid;

an output circuit in said probe, said output circuit producing an output signal when said electrical potential reaches a predetermined value;

a printed circuit board, said printed circuit board comprising a sensor pad area and a circuit area;

said sensor pad area being responsive to a difference in potential between itself and said fluid;

said sensor pad area sending a signal to said circuit area when said electrical potential reaches said predetermined amount;

a potting material encapsulating said printed circuit board; and

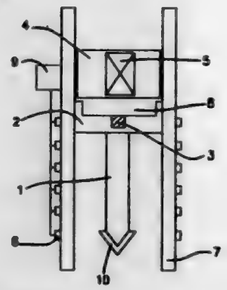
an additive added to said potting material.

5,591,902

DYNAMIC PYROTECHNICAL PENETROMETER

Bernard Castagner, 4, chemin de Bourgogne, F-77450 Coupvray, France

Continuation-in-part of Ser. No. 75,546, Jun. 14, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 411,896
Claims priority, application France, Dec. 12, 1990, 90 15512
Int. Cl.[6] G01N *3/40*
U.S. Cl. 73—84 13 Claims



1. Soil recognition and characterization device comprising:

a recoiling tube;

a probe rod constructed and arranged for movement with respect to the recoiling tube;

a pyrotechnical gas generator,

detection means mounted on said recoiling tube and including several elements, said probe rod including means for penetrating soil by pressure produced by the pyrotechnical gas generator, and said elements including means for detecting the movement of the probe rod as said rod passes levels of the detection means, so as to provide a measurement of the probe rod movement during penetration of soil; and

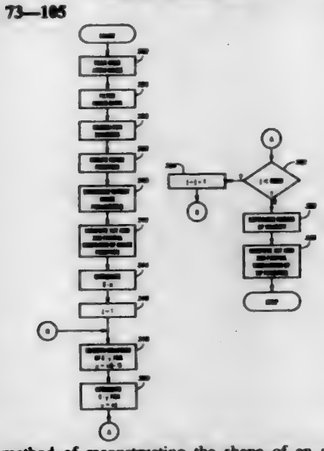
a recoiling mass located in the recoiling tube for balancing the amount of movements transmitted to the probe rod, the recoiling mass rising in and relative to the recoiling tube to absorb the reaction to the force applied by the generator to the probe rod.

5,591,903

RECONSTRUCTING THE SHAPE OF AN ATOMIC FORCE MICROSCOPE PROBE

James P. Vesenka, and Richard K. Miller, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Aug. 11, 1994, Ser. No. 289,190
Int. Cl.[6] G01B 5/28
U.S. Cl. 73—105 **36 Claims**



1. A method of reconstructing the shape of an atomic force microscope probe using an atomic particle of known shape and size, wherein the probe is attached to a cantilever, and wherein the cantilever is deflected by the atomic particle, the method comprising the steps of:

scanning the probe over the atomic particle;

translating the resulting deflections into signals representative of the shape of the atomic particle;

receiving said signals representative of the shape of the atomic particle;

transforming said received signals into data points; and

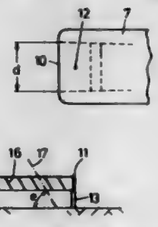
determining the probe shape from said data points by using relationships of the probe shape to the known size and shape of the atomic particle.

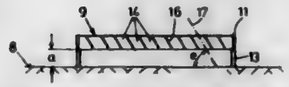
5,591,904

APPARATUS FOR DIMINISHING INTAKE VORTEXES IN JET ENGINES

Horst Schaflhaupt, Egenhofen, and Josef Ballmann, Aachen, both of Germany, assignors to Rheinbold & Mahla AG, München, Germany

Filed Oct. 19, 1994, Ser. No. 325,934
Claims priority, application Germany, Oct. 21, 1993, 43 35 872.1
Int. Cl.[6] B64C 21/08
U.S. Cl. 73—117.4 **18 Claims**





1. A grating structure located on ground (8) in front of, spaced from and below an engine inlet (10) of a jet engine having a turbo-compressor for diminishing intake vortexes in the jet engine, said grating structure comprising a grate (9) having meshes (15) with a width (b) and a height (c) which form approximately vertically extending wind tunnels (14), said grate (9) being disposed substantially horizontal, near and above the ground (8) and below and directly in front of the engine inlet (10) which has a diameter (d),

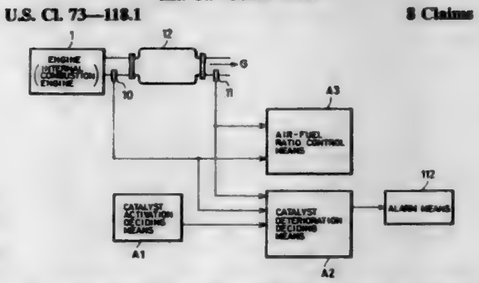
wherein said grating structure diminishes intake vortexes in the jet engine.

5,591,905

DETERIORATION DETECTING APPARATUS FOR CATALYTIC CONVERTER

Shinya Fujimoto, and Hirofumi Ohuchi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 253,166, Jun. 2, 1994, abandoned.
This application Aug. 31, 1995, Ser. No. 524,169
Claims priority, application Japan, Feb. 15, 1994, 6-018717
Int. Cl.[6] G01M 15/00
U.S. Cl. 73—118.1 **8 Claims**



1. A deterioration detecting apparatus for catalytic converter comprising:

catalyst activation deciding means for deciding whether a catalyst is activated in a catalytic converter;

a steady state operation determining means, distinct from said catalyst activation deciding means, for determining a steady state operation of said internal combustion engine;

a catalyst deterioration deciding means for deciding deterioration of said catalyst only when said catalyst activation deciding means decides that said catalyst is activated and when said steady state deciding means decides that said engine is in a steady state operation; and

operating state detecting means for detecting an operating state of said internal combustion engine,

wherein said catalyst activation deciding means decides that said catalyst is activated during a period starting after elapse of a first time count in which an output value from said operating state detecting means is kept in a predetermined range, and ending upon the elapse of a second time count commencing after said output value is out of said predetermined range.

5,591,906

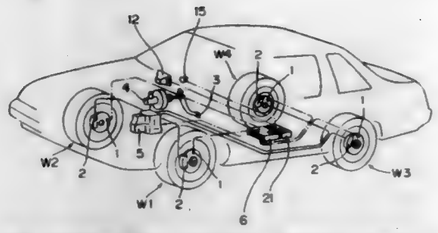
TIRE PRESSURE DROP DETECTING DEVICE AND METHOD

Yasushi Okawa, and Isao Isshiki, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed May 12, 1994, Ser. No. 241,997
Claims priority, application Japan, Sep. 16, 1992, 4-246848; Sep. 16, 1992, 4-246849; Sep. 16, 1992, 4-246850; Sep. 16, 1992, 4-246851; WIPO, Sep. 14, 1993, PCT/JP93/01316
Int. Cl.[6] B60C 23/00
U.S. Cl. 73—146.5 **50 Claims**

1. A tire-pressure drop detecting device for a four-wheel vehicle having four tires, comprising:

rotational angular velocity detecting means for each tire, each rotational angular velocity detecting means including



pulse outputting means respectively provided in relation to a corresponding tire for outputting pulses at a rate proportional to the speed of rotation of the corresponding tire,

counting means connected to the pulse outputting means for counting the pulses applied from the pulse outputting means within a predetermined measuring period,

storing means for storing the time when the last pulse within each of the measuring periods is applied to the counting means,

means for calculating the time elapsed from the time when the last pulse in the preceding measuring period is applied to the time when the last pulse in the present measuring period is applied, which calculated time is stored in the storing means as a reference time of the present measuring period,

means for dividing the number of pulses applied within the present measuring period by said reference time, to calculate a number of pulses per unit time, and

means for calculating the rotational angular velocity of the corresponding tire on the basis of said calculated number of pulses per unit time;

vehicle state judging means for judging whether or not said four-wheel vehicle is in a state previously determined to be unsuitable for detection of a tire pressure reduction;

operating means for

not performing an operation if said vehicle state judging means judges that the four-wheel vehicle is in a state previously determined to be unsuitable for the detection, and

finding, from the rotational angular velocities of the four tires detected by said rotational angular velocity detecting means, the ratio of the sum of the rotational angular velocities of a first pair of tires to the sum of the rotational angular velocities of a second pair of tires, the first pair of tires being spatially arranged on a diagonal line relative to the four tires of the vehicle, if said vehicle state judging means does not judge that the four-wheel vehicle is in a state previously determined to be unsuitable for the detection; and

reduced pressure tire judging means for judging that the pneumatic pressure of a tire is reduced depending on whether the ratio found by said operating means is larger or smaller than a predetermined value.

5,591,907

WEATHERPROOF SENSING APPARATUS WITH ROTATABLE SENSOR

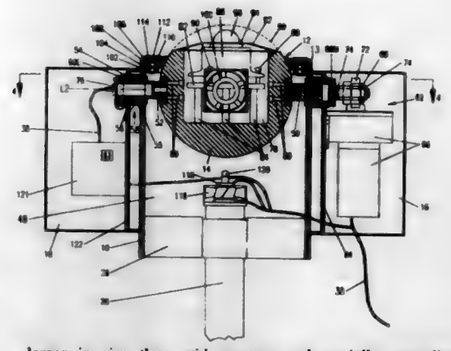
Peter J. Stein, Hollis, N.H.; Armen Bahlavouni, Waltham, Mass.; Michael G. Fitzgerald, Wilmington, Mass., and Douglas W. Andersen, Acton, Mass., assignors to Scientific SOlutions, Inc., Hollis, N.H.

Filed Jul. 13, 1995, Ser. No. 502,219
Int. Cl.[6] G12B 9/00
U.S. Cl. 73—170.16 **20 Claims**

1. A sensing apparatus for use in adverse conditions, said sensing apparatus comprising:

a main enclosure defining an interior cavity protected from an exterior environment and having an aperture provided in a first surface thereof opening to the environment; and

a sensor being supported by a generally spherically shaped housing, said generally spherically shaped housing being



larger in size than said aperture and partially extending through said aperture so that at least said sensor is extendible out through said aperture in said main enclosure for obtaining, when in a use position, sensor measurements;

wherein said generally spherically shaped housing is rotatable relative to said aperture and is supported by said main enclosure for rotation about a rotational axis from the use position, in which said sensor is located outside said main enclosure and positioned to obtain desired sensor measurements, to a retracted position in which said sensor is completely accommodated within said interior cavity of said main enclosure; and

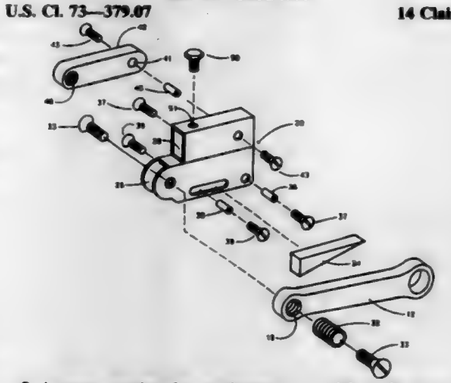
a drive mechanism is coupled to said generally spherically shaped housing for rotating, as desired, said generally spherically shaped housing to the use position and to the retracted position.

5,591,908

TORQUE MONITOR FOR TRAINING BICYCLISTS

Jerry C. Reid, New Market, Ala., assignor to Amtec Corporation, Huntsville, Ala.

Filed Jan. 24, 1994, Ser. No. 184,924
Int. Cl.[6] G01L 5/00
U.S. Cl. 73—379.07 **14 Claims**



5. A torque monitor for attachment to a pedal crank arm of a bicycle, said torque monitor comprising:

a drive link having a pivotal end and a free end;

mounting means for pivotally attaching said pivotal end of said drive link to said pedal crank arm;

limiting means for restricting movement of said free end of said drive link with respect to said pedal crank arm;

and wherein said free end of said drive link includes an aperture for reception of a bicycle pedal, whereby a force applied to said pedal in a direction toward said pedal crank arm will drive the free end of said drive link toward said pedal crank arm and against said limiting means, and a force in a direction

away from said pedal crank arm will drive the free end of said drive link away from said pedal crank arm and against said limiting means.

5,591,909

METHOD AND DEVICE FOR BALANCING AN UNBALANCE ON A MOTOR VEHICLE WHEEL

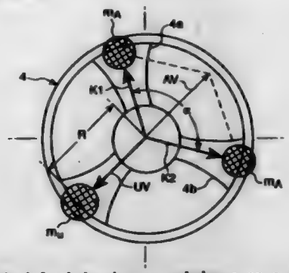
Karl Rothamel, Seeheim-Jugenheim; Kurt Humber, Griesheim, and Ulrich Dies, Reichshof, all of Germany, assignors to Hofmann Werkstatt-Technik GmbH, Germany

Filed May 5, 1995, Ser. No. 435,153

Claims priority, application Germany, May 5, 1994, 44 15 931.5

Int. Cl.[6] G01M 1/38

U.S. Cl. 73—462 6 Claims



1. A method for balancing an unbalance on a motor vehicle wheel including a disk having openings therein defining radially extending, spaced apart supports comprising the steps of:

rotating the wheel and sensing wheel unbalance and determining a balancing mass to correct sensed unbalance and the angular position therefor;

determining angular positions corresponding to the radially extending spaced apart supports and storing such angular positions thereof; and

where the desired angular position for a balancing mass lies outside of the spaced apart supports of the wheel disk, the additional steps of dividing the required balancing mass into balancing masses and determining angular positions for the divided balancing masses that correspond to the location of wheel disk supports so that the divided balancing masses are attached in corresponding angular positions on the wheel disk to balance the vehicle wheel.

5,591,910

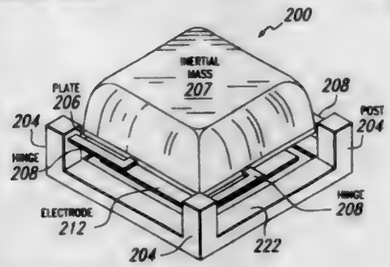
ACCELEROMETER

Tsen-Hwang Lin, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 3, 1994, Ser. No. 253,799

Int. Cl.[6] G01P 15/08

U.S. Cl. 73—514.38 10 Claims



1. An accelerometer, comprising:

(a) a plate suspended over an electrode by a set of hinges, each of said hinges is affixed to a corresponding post extending from a plane including said electrode;

(b) an inertial mass on said plate, said inertial mass characterized as a material plated onto said plate; and

(c) sensing circuitry connected between said hinges and said electrode.

5,591,911

ULTRASOUND SIGNAL PROCESSOR

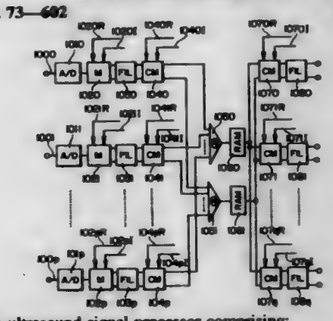
Hiroshi Masuzawa, Hachioji; Ryuuichi Shinomura, Higashimatsuyama, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jul. 3, 1995, Ser. No. 497,883

Claims priority, application Japan, Jul. 5, 1994, 6-153397

Int. Cl.[6] G01N 29/06; 29/10

U.S. Cl. 73—602 10 Claims



1. An ultrasound signal processor comprising:

an electro-acoustic transducer array for receiving ultrasound signals from a testing body to obtain a plurality of received analog signals which are electric signals;

analog-digital converters for sampling at least two of said plurality of received analog signals;

multipliers for performing a multiplication of the outputs of said analog-digital converters and first complex digital reference signals;

first low-pass filters for limiting the signal bands of the outputs of said multipliers;

first complex multipliers for performing a multiplication of second complex digital reference signals and the outputs of said first low-pass filters;

adders for performing an addition of the outputs of said first complex multipliers for real signals and an addition thereof for imaginary signals;

memory devices for storing the outputs of said adders;

second complex multipliers for performing a multiplication of signals read from said memory devices and third complex digital reference signals;

second low-pass filters for limiting the signal bands of the outputs of said second complex multipliers; and

a signal processing circuit for converting signals read from said second low-pass filters into an image signal concerning information of the interior of said testing body.

5,591,912

METHOD AND APPARATUS FOR INSPECTING CONDUITS

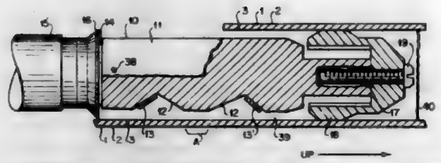
Michael J. Spisak, Venetia, and Roy A. Nance, McMurray, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1995, Ser. No. 402,219

Int. Cl.[6] G01N 29/06

U.S. Cl. 73—623 1 Claim

1. An ultrasonic inspection method of inspecting an area of a conduit to detect a defect or a deposit, which comprises the steps of:



a) positioning a probe inside said conduit, said probe comprising a pair of ultrasonic transceivers positioned on said probe such that said transceivers are on either side of and substantially equidistant from said area;

b) directing a first ultrasonic pulse, from a first transceiver of said pair, at said area of the conduit, from a first direction axially forward of said area; and substantially simultaneously directing a second ultrasonic pulse, from a second transceiver of said pair, at said area of the conduit, from a second direction axially rearward of said area;

c) receiving at said first transceiver reflected sound signals caused by reflection of said first ultrasonic pulse from said area;

d) receiving at said second transceiver reflected sound signals caused by reflection of said second ultrasonic pulse from said area;

e) plotting said reflected sound signals versus time, wherein a defect is distinguished from a deposit and identified by observing overlap of signal patterns produced by both said transceivers, indicating that said reflected sound is received at the same time by both said transceivers.

5,591,913

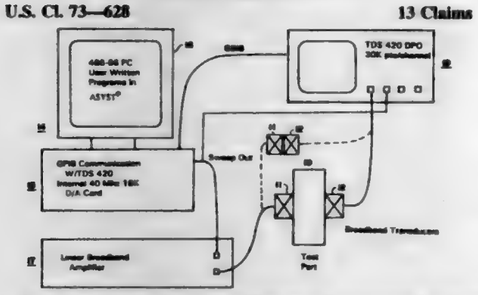
APPARATUS AND METHOD FOR ULTRASONIC SPECTROSCOPY TESTING OF MATERIALS

James R. Tucker, Birmingham, Ala., assignor to Southern Research Institute, Birmingham, Ala.

Filed May 12, 1994, Ser. No. 241,862

Int. Cl.[6] G01N 29/04

U.S. Cl. 73—628 13 Claims



1. An apparatus for performing ultrasonic spectroscopy testing on a test material comprising:

a transmit transducer for coupling a swept frequency acoustical wave to a test material;

a sweep generator for supplying a frequency swept signal to said transmit transducer, said sweep generator comprising:

means for specifying a plurality of amplitude values of a signal which define each cycle of a swept wave for a swept frequency range having a start frequency and end frequency; and,

means for continuously producing said amplitude values defining each cycle of said swept wave at a controlled rate, whereby a series of amplitude values are sequentially produced defining each cycle constituting said swept wave;

a receive transducer coupled to receive an acoustical wave from said material and produce an electrical signal in response thereto; and

a digital processing device for storing said electrical signal representing an amplitude and phase of a spectral response to said swept frequency acoustic wave.

5,591,914

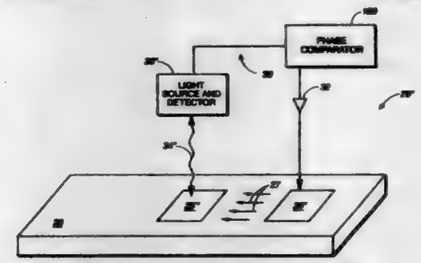
ULTRASONIC POSITION SENSOR

Richard M. White; Stuart Wenzel, and Eric R. Minami, all of Berkeley, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 902,713, Jun. 23, 1992, Pat. No. 5,450,752, which is a continuation-in-part of Ser. No. 399,865, Aug. 29, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 488,162

Int. Cl.[6] H03B 5/30; G01B 11/14

U.S. Cl. 73—643 2 Claims



1. A position sensor for measuring the distance between a first position and a second position of an object, comprising:

a structural member having an acoustical path over which elastic waves may propagate,

transducer means for generating elastic waves in said structural member in response to an input signal,

a light source spaced from said structural member for producing a light beam that can be directed to and reflected from a surface of said structural member wherein the light beam is reflected from said structural member in a manner that depends upon the phase of the elastic waves propagating over said acoustical path,

an optical detector means for detecting said reflected light beam and for producing an output signal in response thereto, and

a phase comparator means for detecting a phase change between said input and output signals to measure the distance between the first position and the second position of the object.

5,591,915

SYSTEM FOR THE CONTINUOUS MEASUREMENT OF THE RESISTANCE OF A TRACK TO TRANSVERSE DISPLACEMENT

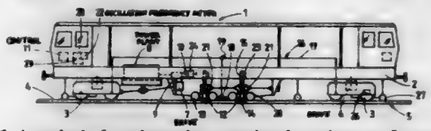
Josef Theurer, Vienna, and Bernhard Lichtberger, Leonding, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H., Vienna, Austria

Filed Jun. 2, 1995, Ser. No. 458,264

Claims priority, application Austria, Jun. 17, 1994, 1283/94

Int. Cl.[6] E01B 35/00; 27/00

U.S. Cl. 73—646 9 Claims



1. A method of continuously measuring the resistance of a track to transverse displacement, which comprises the steps of

(a) continuously advancing a vibrating means along the track while the vibrating means grips the track,

(b) applying hydraulic pressure to the vibrating means to impart oscillations to the track extending transversely to the track in a horizontal plane while keeping other factors influencing the oscillation power constant, and

(c) recording a datum corresponding to the hydraulic pressure as a correlated measurement value of the transverse track displacement resistance (QVW).

5,591,916

FOREIGN OBJECT DETECTOR FOR VEHICLES AND OTHER MACHINERY

Frederick N. Byrne, 63 Grove Road, The Spa, Ballynahinch, Down, BT24 8HQ, United Kingdom

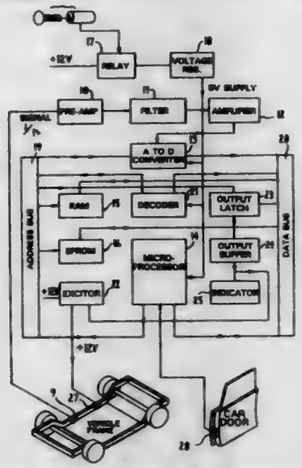
PCT No. PCT/GB93/00277, § 371 Date Oct. 3, 1994, § 102(e) Date Oct. 3, 1994, PCT Pub. No. WO93/16400, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 10, 1993, Ser. No. 284,576

Claims priority, application United Kingdom, Feb. 10, 1992, 9202714

Int. Cl.[6] G01N *29/04*; G08B *21/00*

U.S. Cl. 73—649 **16 Claims**



1. A detector assembly for sensing the placement of a foreign body on an object:

an exciter unit attached to the object for vibrating the object;

an exciter driver attached to said exciter unit for energizing said exciter unit to cause vibrations of the object;

an exciter controller attached to said exciter driver for selectively actuating said exciter driver so as to cause repetitive energizations of said exciter unit;

a detector attached to the object for monitoring the vibrations of the object in response to the repetitive energizations of said excitor unit, said detector configured to produce vibration signals representative of the vibrations of the object;

a detector signal analyzer coupled to said detector for receiving said vibration signals, said detector signal analyzer circuit being configured to: establish normal vibration data for the object based on initial vibration signals received in response to an initial set of object vibrations; compare later-received vibration signals received in response to later object vibrations that occur after the initial set of object vibrations to said normal vibration data; and, if said comparison indicates that said later-received vibration signals vary beyond a first select limit from said normal vibration data, to generate an alarm signal; and

an alarm connected to receive said alarm signal, said alarm being configured to generate a warning message when said alarm signal is generated.

5,591,917

SEMICONDUCTOR PRESSURE SENSOR WITH RATED PRESSURE SPECIFIED FOR DESIRED ERROR OF LINEARITY

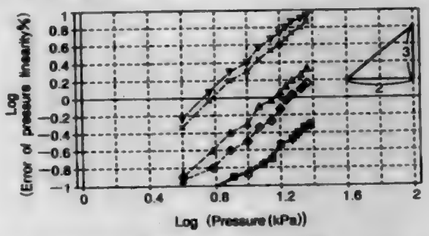
Takanobu Takeuchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1995, Ser. No. 530,734

Claims priority, application Japan, Jun. 7, 1995, 7-140426

Int. Cl.[6] G01L *9/06*

U.S. Cl. 73—727 **12 Claims**



1. A semiconductor pressure sensor comprising:

a silicon plate including a diaphragm and a base surrounding the diaphragm; and

a plurality of piezoresistor elements formed on the diaphragm;

wherein an area S[(m^2)] and a thickness t[(m)] of said diaphragm satisfies a following relation:

$$S/t^2<(\epsilon/P\%K))^{1/2},$$

where P denotes a rated pressure value above which the pressure sensor's response departs from the desired error of linearity ϵ and where K is a constant.

5,591,918

PRESSURE GAUGE FOR SEMI-CONDUCTOR PROCESSING

Walter J. Ferguson, Waterbury, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 16, 1996, Ser. No. 584,949

Int. Cl.[6] G01L *7/04*

U.S. Cl. 73—732 **10 Claims**



1. In a pressure gauge having a tubular socket defining an internal bore for connecting to a pressure site at which pressure of a gas is to be monitored, a Bourdon tube extending between ends including a secured end in flow communication with the bore of said socket and a free displacement end displaceable in correlation to pressure changes being monitored at said site, the improvement comprising:

a shelf-free flow path extending from an inlet through said bore to the displaceable end of said Bourdon tube so as to render said flow path self-drainable.

5,591,919

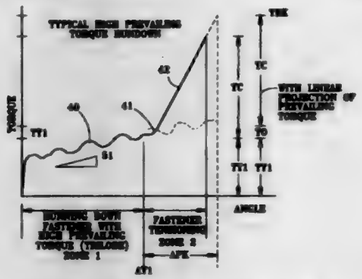
METHOD AND APPARATUS FOR MONITORING AND CONTROLLING TIGHTENING OF PREVAILING TORQUE FASTENERS

Thomas J. Hathaway, Farmington Hills; Frank L. Schmid, Beverly Hills, and Edwin E. Rice, Ann Arbor, all of Mich., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 49,716, Apr. 20, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,217

Int. Cl.[6] F16B *31/02*

U.S. Cl. 73—761 **17 Claims**



1. An apparatus for determining fastener tension in a fastener tightening sequence wherein a fastener is rotated by a power source to achieve a desired clamping load and resultant tension in the fastener comprising:

a means for determining a value of a first point of incipient constant rate of fastener tensioning in a fastener tightening sequence;

a means for dividing said fastener tightening sequence into a plurality of tightening zones differentiated by said first point of incipient constant rate of fastener tensioning;

a means for determining at least one tension related parameter of the fastener associated with fastener tightening in a first free running zone of said plurality of tightening zones occurring prior to said first point of incipient constant rate of fastener tensioning value; and

a means for utilizing said at least one tension related parameter determined in said first zone prior to said first point of incipient constant rate for modifying said fastener tightening sequence continuing in subsequent zones.

5,591,920

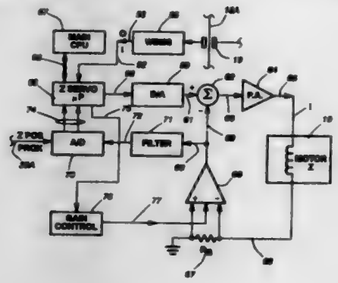
DIAGNOSTIC WIRE BOND PULL TESTER

Susanne F. Price, Berwyn, Pa.; Hiroshi Munakata, Yokohama, Japan; Eli Razon, Maple Glen, Pa.; Gil Perlberg, Elkins Park, Pa., and Igor Fokin, Warminster, Pa., assignors to Kulicke and Soffa Investments, Inc., Wilmington, Del.

Filed Nov. 17, 1995, Ser. No. 560,529

Int. Cl.[6] G01N *3/00*

U.S. Cl. 73—828 **17 Claims**



1. A wire bond tool strength tester for automatic wire bonders, comprising:

an automatic wire bonder of the type having a bonding head assembly for supporting a tool holder for positioning a bonding tool in a Z axis for making fine wire bonds,

a Z-axis encoder coupled to said bonding head assembly for monitoring the Z-axis position of the bonding tool in said bond tool holder,

a Z-axis drive motor for raising said bonding tool in a Z direction above a fine wire bond,

wire clamping means for clamping a fine wire extended above said fine wire bond,

control means for applying predetermined increments of pull force in increasing steps to said fine wire through said wire clamping means,

a continuity circuit coupled to said fine wire for determining the continuity of the fine wire bond at said pull force step,

means for recording the Z position of said bonding tool and the pull force being applied to said fine wire at said predetermined pull force steps, and

means for determining the pull force applied to said fine wire bond when a predetermined condition of stress or strain or continuity has been reached.

5,591,921

DEVICE FOR MEASURING THE BENDING OF A CYLINDER

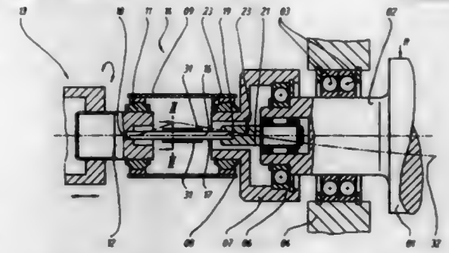
Johannes G. Schaede, Würzburg, Germany, assignor to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Filed Oct. 13, 1995, Ser. No. 542,739

Claims priority, application Germany, Oct. 13, 1994, 44 36 628.0

Int. Cl.[6] G01N *3/20*

U.S. Cl. 73—849 **6 Claims**



1. A device for measuring bending in a cylinder in a rotary printing press comprising:

a rotatable cylinder having cylinder journals and an axis of rotation;

means for rotatably supporting said cylinder journals in a frame of a rotary printing press, said cylinder being shiftable axially along said axis of rotation;

an axially displaceable lateral register adjustment device secured to said frame;

a double jointed coupling connecting said lateral register adjustment device and said cylinder journal; and

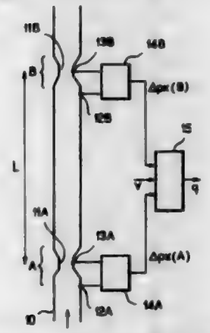
a bending rod extending between said cylinder journal and said lateral register adjustment device, said bending rod having a first end secured in a bending-resistant manner to said lateral register adjustment device and having a second end connected in a bending resistant manner and rotatable with respect to said cylinder journal.

5,591,922

METHOD AND APPARATUS FOR MEASURING MULTIPHASE FLOWS

Gerard Segeral, Gif-sur-Yvette, France; Peter Long, Harlton, Great Britain, and Ian Atkinson, Bailly, France, assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed May 16, 1995, Ser. No. 442,256
Claims priority, application France, May 27, 1994, 94 06453
Int. Cl.[6] G01F *1/74*
U.S. Cl. 73—861.04 **30 Claims**



1. A method of measuring flow rate for a multiphase fluid, such as the effluent of an oilwell, which may contain a mixture of liquid hydrocarbons, gas, and water, comprising the steps of:

changing the flow velocity respectively in a first section and in a second section situated at a distance from each other in the flow direction to produce a first and a second pressure difference;

measuring said first and second pressure differences to obtain a first and a second pressure difference signals; and

determining a time lag corresponding to maximum correlation between said first and second pressure difference signals to derive a third signal indicative of the total volume flow rate q.

5,591,923

ELECTROIC FILTER FOR FLOWMETERS WITH COMPOUND CONTROLS

Hyok S. Lew; Yon S. Lew, and Hyon S. Lew, all of 7890 Oak St., Arvada, Colo. 80005

Continuation of Ser. No. 270,820, Jul. 5, 1994, Pat. No. 5,435,188, which is a continuation-in-part of Ser. No. 113,197, Aug. 30, 1993, Pat. No. 5,351,556, and a continuation-in-part of Ser. No. 848,291, Mar. 9, 1992, Pat. No. 5,309,771, and a continuation-in-part of Ser. No. 164,925, Dec. 10, 1993, Pat. No. 5,419,189. This application Jun. 8, 1995, Ser. No. 488,603
Int. Cl.[6] G01F *1/32*
U.S. Cl. 73—861.22 **20 Claims**

11. An apparatus for generating and conditioning a primary flow signal representing a flow rate of fluid comprising in combination;

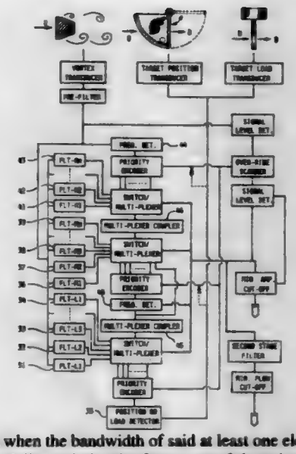
a) an electronic filter assembly including at least one electronic filter having an electronic switch and a bandwidth, wherein said at least one electronic filter selectively transmits an alternating electrical signal with frequencies distributed substantially within the bandwidth of said at least one electronic filter;

b) a principal flow rate measuring device generating a primary flow signal supplied to an input end of the electronic filter assembly;

c) an accessory flow level detecting device generating an auxiliary flow signal;

d) means for generating a command signal from the auxiliary flow signal and sending the command signal to the electronic switch of said at least one electronic filter; wherein the command signal closes the electronic switch when the bandwidth of said at least one electronic filter substantially includes a frequency of the primary flow signal, and opens the electronic switch when the bandwidth of said at least one electronic filter substantially excludes the frequency of the primary flow signal; and

e) means for obtaining a conditioned form of the primary flow signal from an output end of the electronic filter assembly as an alternating electrical signal representing the fluid flow.

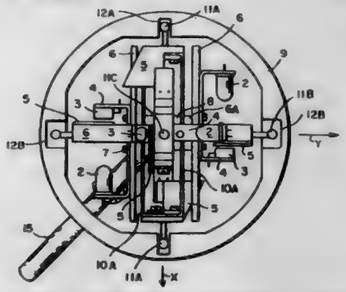


5,591,924

FORCE AND TORQUE CONVERTER

John A. Hilton, Hudson, N.H., assignor to Spacetec IMC Corporation, Lowell, Mass.

Continuation-in-part of Ser. No. 427,931, Oct. 25, 1989, Pat. No. 5,222,400, which is a continuation of Ser. No. 311,113, Feb. 15, 1989, abandoned, which is a continuation of Ser. No. 927,915, Nov. 6, 1986, Pat. No. 4,811,608. This application Apr. 23, 1993, Ser. No. 52,377
Int. Cl.[6] G01L *3/00*
U.S. Cl. 73—862.043 **25 Claims**



1. An apparatus for providing an electronic representation in response to force being applied to said apparatus, the apparatus comprising:

a base;

an actuating member for receiving said applied force;

resilient means for generally supporting the actuating member from the base, and for providing restoring force to said actuating member; and

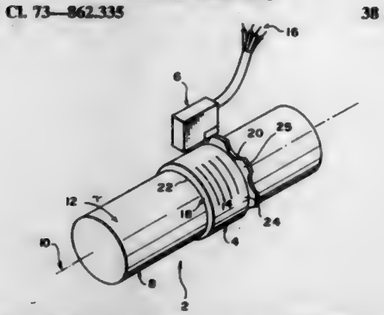
sensing means responsive to movement of the actuating member relative to said base for providing said electronic representation, the electronic representation being representative of the applied force in a direct relationship which is defined by a sensitivity curve relating the electronic representation to the applied force, said sensitivity curve having a derivative in a first region of the curve that is relatively small compared to a derivative in a second region of the curve and further having a derivative in a third region of the curve that is relatively small compared to said derivative in a second region, said first region corresponding to a range of small applied forces, said second region corresponding to a range of intermediate applied forces, and said third region corresponding to high applied forces.

5,591,925

CIRCULARLY MAGNETIZED NON-CONTACT POWER SENSOR AND METHOD FOR MEASURING TORQUE AND POWER USING SAME

Ivan J. Garshelis, 176 S. Mountain Rd., Pittsfield, Mass. 01201

Continuation-in-part of Ser. No. 253,022, Jun. 2, 1994, Pat. No. 5,520,059, which is a continuation-in-part of Ser. No. 736,299, Jul. 29, 1991, Pat. No. 5,351,555. This application Feb. 24, 1995, Ser. No. 394,001
Int. Cl.[6] G01L *3/02*
U.S. Cl. 73—862.335 **38 Claims**



24. A method of sensing the power transmitted by a rotating torqued member extending in an axial direction, comprising the steps of:

(a) providing a magnetoelastically active ferromagnetic magnetostrictive element endowed with an effective uniaxial magnetic anisotropy having the circumferential direction as the easy axis and which is magnetically polarized in a circumferential direction, said element being directly or indirectly attached to or forming part of the surface of said torqued member such that torque applied to the member is proportionally transmitted to said element;

(b) producing a magnetic field as a consequence of the application of torque to said member;

(c) modulating the torque-created magnetic field in a periodic manner, the period being indicative of the speed of member rotation; and

(d) sensing, at a position proximate to said magnetoelastically active element,

the amplitude of the time rate of change of said modulated magnetic field as an indication of the power transmitted by said member.

5,591,926

SILVER BASE ELECTRICAL CONTACT MATERIAL

Hayato Inada, Moriguchi, and Koji Tuji, Nara, both of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Sep. 26, 1995, Ser. No. 534,203
Claims priority, application Japan, Sep. 28, 1994, 6-232950
Int. Cl.[6] C22C *5/06*
U.S. Cl. 75—247 **2 Claims**

1. A silver base electric contact material essentially consisting of:

a) 1.3 to 24.8 wt % nickel,

b) 0.2 to 4.7 wt % nickel oxide,

c) 0.05 to 3 wt % at least one additive selected from the group consisting of vanadium, manganese, chromium, thallium, titanium, cobalt, and tungsten carbide,

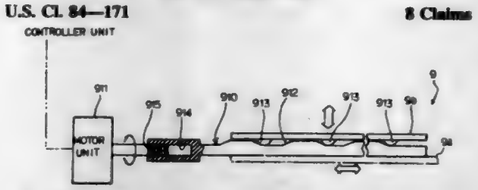
d) the balance silver; and said nickel being in the form of essentially pure nickel particles, said nickel oxide being in the form of essentially pure nickel oxide particles, and said additive being in the form of essentially pure additive particles, all said particles being dispersed in a silver matrix for strengthening said contact martial.

5,591,927

KEYBOARD MUSICAL INSTRUMENT HAVING KEY ACTION MECHANISMS MOVABLE TO AND FROM STRINGS

Kiyoshi Kawamura; Taroh Muramatsu; Masahiro Wada; Nobuo Sugiyama, and Shinya Koseki, all of Shizuoka-ken, Japan, assignors to Yamaha Corporation, Japan

Continuation-in-part of Ser. No. 123,294, Sep. 17, 1993. This application Oct. 22, 1993, Ser. No. 140,617
Int. Cl.[6] G10D *15/00*
U.S. Cl. 84—171 **8 Claims**



1. A keyboard musical instrument having a silent mode and an acoustic sound mode comprising:

a) a keyboard having a plurality of keys assigned respective notes of a scale, said plurality of keys being swingably supported by a rail so as to be movable between a rest position and an end position;

b) a movable key bed mounting said keyboard;

c) a plurality of sets of strings respectively assigned said notes;

d) a plurality of hammer assemblies associated with said plurality of sets of strings, each of said plurality of hammer assemblies including means for allowing said hammer assemblies to rotate around an axis to strike at least one set of said plurality of sets of strings, said plurality of hammer assemblies being attached to said movable key bed such that said plurality of hammer assemblies move with said movable key bed and said axis of each of said plurality of hammer assemblies remains in a fixed position with respect to said movable key bed;

e) a plurality of key action mechanisms associated with said plurality of hammer assemblies and linked with said plurality of keys for driving said plurality of hammer assemblies through predetermined motions, said plurality of key action mechanisms being attached to said movable key bed such that said plurality of key action mechanisms move with said movable key bed and said predetermined motions remain in a fixed position with respect to said movable key bed;

f) a stopper movably supported by a first stationary member of said keyboard musical instrument and associated with said plurality of hammer assemblies;

g) moving means for moving said stopper between a blocking position in which said stopper blocks said plurality of hammer assemblies from striking said plurality of sets of strings while said keyboard musical instrument is in said silent mode and a non-blocking position in which said stopper allows said plurality of hammer assemblies to strike said plurality of sets of strings while said keyboard musical instrument is in said acoustic sound mode; and

h) driving means for moving said movable key bed away from said plurality of sets of strings when said keyboard musical

instrument is placed in said silent mode and moving said movable key bed toward said plurality of sets of strings when said keyboard musical instrument is placed in said acoustic sound mode, said driving means comprising:

a stationary key bed provided under said movable key bed,

projections attached to a lower surface of said movable key bed,

at least one reciprocal cam rod inserted between said movable key bed and said stationary key bed, and having a cam surface held in contact with said projections attached to the lower surface of said movable key bed,

a driver selectively rotating in either of a first direction or a second direction opposite the first direction, and

a transformer coupled between said driver and said reciprocal cam rod, and changing said rotation of said driver into a reciprocal motion of said reciprocal cam rod.

5,591,928

Patent Not Issued For This Number

5,591,929

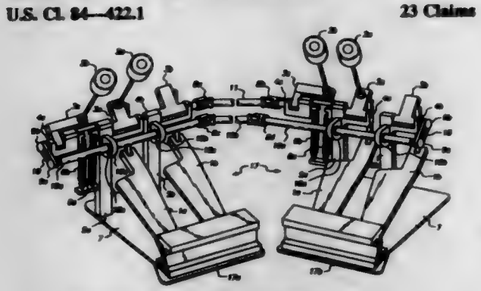
QUAD BASS DRUM PEDAL AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Ronald J. Wellman, 816 Cawood, Lansing, Mich. 48915

Filed May 13, 1994, Ser. No. 242,328

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—422.1 **23 Claims**



1. A quad bass drum pedal, comprising:

a first dual drum pedal including: a first beater, a first foot pedal, and first means operatively connected to said first beater and said first foot pedal for controlling a substantially rotational movement of said first beater; and a second beater and a second foot pedal positioned adjacent said first foot pedal;

a second dual drum pedal including: a third beater, a third foot pedal, and second means connected to said third beater and said third foot pedal for controlling a substantially rotational movement of said third beater; and a fourth beater, a fourth foot pedal and a third means connected to said fourth foot pedal and said second beater for controlling a substantially rotational movement of said second beater;

said first dual drum pedal includes fourth means, connected to said second foot pedal and said fourth beater, for controlling a substantially rotational movement of said fourth beater;

fifth means for remotely coupling said second beater to said third controlling means;

sixth means for remotely coupling said fourth controlling means to said fourth beater; and

said sixth means includes a first drive belt to operatively connect to said fourth controlling means.

5,591,930

ELECTRONIC MUSICAL INSTRUMENT PERFORMING MULTI-TASK PROCESSING

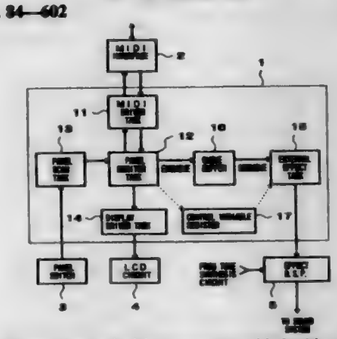
Masahiro Kakishita, and Toshifumi Kunimoto, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Oct. 25, 1994, Ser. No. 329,088

Claims priority, application Japan, Oct. 29, 1993, 5-292420

Int. Cl.[6] G10H *7/00*

U.S. Cl. 84—602 **8 Claims**



1. An electronic musical instrument provided with a multi-task processing function comprising:

buffer memory means for storing messages given to a specific task in order of arrival; and

processing means for performing message processing on the basis of the messages stored in said buffer memory means, in a different order from the order of arrival, wherein said processing means includes determination means for determining contents of plural unprocessed ones of the messages stored in said buffer memory means, so as to invalidate each of the messages which is currently meaningless and to validate each of the messages which is currently meaningful, and means for processing the message validated by said determination means.

5,591,931

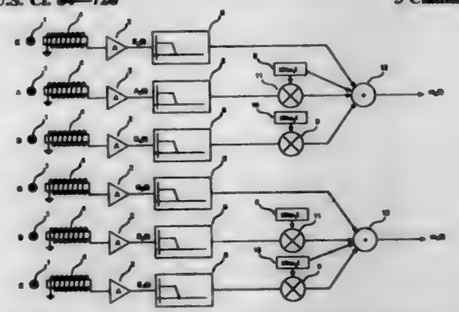
MUSICAL SIGNAL MULTIPLEXING CIRCUIT AND DEMULTIPLEXING SYSTEM

Stephen G. Dame, Everett, Wash., assignor to Virtual DSP Corporation, Everett, Wash.

Filed Jan. 17, 1995, Ser. No. 373,442

Int. Cl.[6] G10H *1/053;1/12;3/18*

U.S. Cl. 84—726 **5 Claims**



1. An audio signal multiplexing device with audio band output comprising:

(a) three audio signal receivers,

(b) three frequency band limiting filters, first through third, one coupled to each receiver,

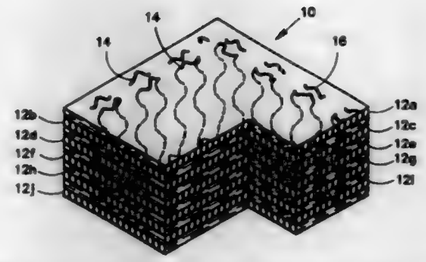
(c) a first carrier generating circuit which generates a first carrier frequency which, when multiplied by the frequencies which pass the filters, contains different enough frequencies from the frequencies which pass the filters to be filter-separable from such frequencies,

(d) a second carrier generating circuit which generates a second carrier frequency which, when multiplied by the frequencies which pass the filters, contains different enough frequencies from the frequencies which pass the filters and from the frequencies of the first carrier frequency when multiplied by the frequencies which pass the filters to be filter-separable from both such sets of frequencies,

(e) a first carrier multiplying circuit coupled to the first carrier generating circuit and to the first filter,

(f) a second carrier multiplying circuit coupled to the second carrier generating circuit and to the second filter, and

(g) an adding circuit, which produces an audio band signal, coupled to the first carrier multiplying circuit, to the second carrier multiplying circuit, to the third filter, to one of the two carrier generating circuits, and to an output.



said layers secured together by a stitching means which comprises slack fiber stitches wherein the average stitch length is at least 110% of the average stitch path.

5,591,932

BREAK ACTION CANNON

Richard W. Staiert, Coon Rapids, and James E. Wildman, Plymouth, both of Minn., assignors to FMC Corp., Chicago, Ill.

Filed May 9, 1994, Ser. No. 239,779

Int. Cl.[6] F41A *3/14;3/76*

U.S. Cl. 89—33.03 **9 Claims**



1. A device for separating a gun barrel, having a muzzle end and a breech end, from a breech block and combuster compartment to simultaneously ram a projectile into said barrel comprising:

a mechanism for removably attaching the barrel to the breech block including:

a barrel locking collar and actuator;

a machined surface of the barrel at said breech end; and

said barrel locking collar threadably mated to said machined surface of the barrel to thereby lock the barrel;

a mechanism for shifting the barrel forward including:

a barrel shift collar; and

an actuator to drive said barrel shift collar;

a mechanism for orienting the barrel including:

cam plates

cradle; and

said cam plates attached to said cradle to fore shift and tip said barrel; and

an obturator face seal disposed between said barrel locking collar and said breach end to positively seal combustion gases therein.

5,591,933

CONSTRUCTIONS HAVING IMPROVED PENETRATION RESISTANCE

Hsin L. Li, Parsippany; Young D. Kwon, Mendham; Kwok W. Lem, Randolph, and Duane C. Prevorsek, Morristown, all of N.J., assignors to AlliedSignal Inc., Morristown, N.J.

Continuation of Ser. No. 75,359, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 891,147, Jun. 1, 1992, abandoned. This application Jun. 20, 1995, Ser. No. 492,587

Int. Cl.[6] F41H *5/04*

U.S. Cl. 89—36.02 **13 Claims**

1. A rigid penetration resistant composite comprising a plurality of fibrous layers comprising a network of fibers in a polymeric matrix selected from the group consisting of thermoplastic polymers, thermosetting resins or a combination thereof, at least two of

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5,591,934

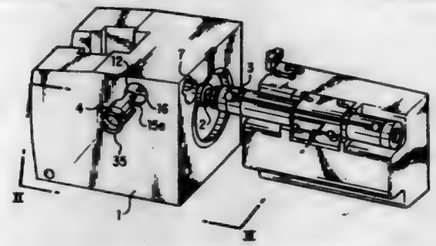
BLOCKING PART INSERTABLE IN A BREECH RING FOR PREVENTING TRANSLATION OF A ROD WITHIN THE BREECH RING

Patrick Balbo; Philippe Grelat, both of Bourges; Guy Maisonenet, Ploay, and Fabienne Manderoux, Sainte Thorette, all of France, assignors to Giat Industries, Versailles, France

Filed May 11, 1995, Ser. No. 439,381

Int. Cl.[6] F41A *25/02*

U.S. Cl. 89—43.01 **21 Claims**



21. A weapon including an assembly, comprising:

a breech ring;

a rod that is mobile in axial translation with respect to the breech ring; and

a removable blocking part arranged to be associated with the breech ring in a first position in which the blocking part forms a positive lock with the rod thereby preventing translation of the rod; and

means for guiding the blocking part with respect to the breech ring between the first position and a second position, the guiding means including a recess enabling the blocking part to be guided between the first and second positions, the recess including a wall having a cavity arranged to allow a stopping organ to be inserted in the cavity to prevent movement of the blocking part from the first position.

5,591,935

SHOCK SENSING DUAL MODE WARHEAD

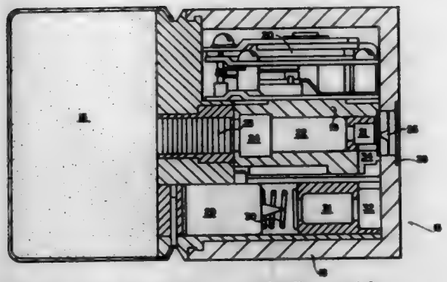
Morley C. Shamblen, La Plata; Martin T. Walchak, Brookville, and Louis Richmond, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 27, 1980, Ser. No. 186,888

Int. Cl.[6] F42B *13/00;* **F42C** *9/14;1/08*

U.S. Cl. 102—500 **7 Claims**

1. A shock sensing dual mode warhead for use against both soft and hard targets and capable of sensing which type of target has been struck comprising:



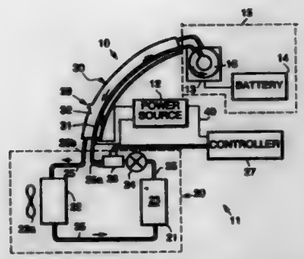
a hollow casing formed of a strong ductile material;
a base closure for closing the rearward end of said casing;
a structurally-stiff explosive charge filling the interior of said casing;
a booster mounted on said base closure and disposed within said explosive charge for detonating said explosive; and
a shock-sensing fuze assembly mounted on said booster for initiating said booster upon impact with a target, said fuze assembly comprising:
a low g inertial firing train responsive to low impact deceleration for initiating said booster upon impact with a soft target, said low g firing train including a time delay element to permit substantial penetration of the target before detonation of said explosive charge; and
a high g firing train responsive to dynamic pressure within said explosive charge caused by high impact deceleration for initiating said booster upon impact with a hard target, the ductility of said casing allowing said casing to mushroom without fragmenting upon impact with a hard target thereby disposing more of said explosive charge closer to the surface of said target prior to detonation of said explosive charge whereby the blast effectiveness is increased.

5,591,936
CLEAN SPACE MOTOR/GAS GENERATOR SOLID PROPELLANTS
Rodney L. Willer, Newark, Del., and David K. McGrath, Elkton, Md., assignors to Thiokol Corporation, Ogden, Utah
Filed Aug. 2, 1990, Ser. No. 561,951
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.4 **23 Claims**

1. A high energy, space motor solid propellant having a theoretical specific impulse, at a chamber pressure of 1000 psi expanding to 14.7 psi, of at least about 230 lb-sec/lb, said propellant comprising an isocyanate cured polyglycidyl nitrate binder and from about 60 to about 85% by weight high energy particulate solids comprising ammonium nitrate oxidizer particulates and wherein the polyglycidyl nitrate is an isocyanate curable polyglycidyl nitrate polymer having a functionality of nearly 2.0 or more and a hydroxyl equivalent weight of from about 1000 to about 1700 and has less than about 2 to 5% by weight cyclic oligomer present in the polyglycidyl nitrate.

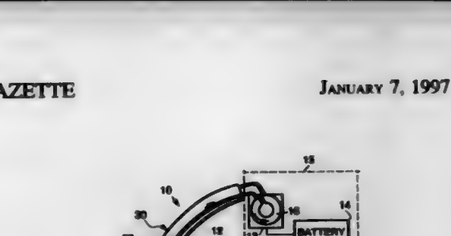
5,591,937
HIGH POWER, HIGH FREQUENCY TRANSMISSION CABLE BREACH DETECTION
George R. Woody, Redondo Beach, and Stephen J. Hulsey, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 2, 1994, Ser. No. 348,664
Int. Cl.[6] H02G *3/03*; H01B *7/34*
U.S. Cl. 174—5 R **1 Claim**

1. An electric vehicle inductive battery charging system that transfers electric power from a power source to batteries of the electric vehicle, said inductive charging system comprising:



a cooling system for storing, cooling, and pumping coolant;
a pressure sensitive switch for determining the pressure in the cooling system and for providing an output signal indicative of a drop in sensed pressure;
a controller coupled to the pressure sensitive switch responsive to the output signal from the switch for shutting down the inductive charging system in the event of such drop in sensed pressure; and
a transmission cable for electrically coupling the power source to the batteries via an inductive charge port on the vehicle, and for coupling coolant between the cooling system and the inductive charge port via a plurality of coolant channels in the cable.

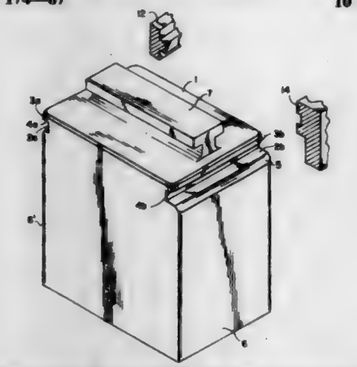
5,591,938
ELECTRICAL MECHANISM SUPPORT MEMBER APPLICABLE TO A TRAY FOR ELECTRICAL CONDUCTORS
Juan M. B. Navazo, Sant Cugat Del Valles, Spain, assignor to Aparellaje Electrico, S.A., Barcelona, Spain
Filed Jun. 13, 1994, Ser. No. 258,713
Claims priority, application Spain, Jun. 14, 1993, 9301308
Int. Cl.[6] H02G *3/08*; H05K *5/00*
U.S. Cl. 174—50 **3 Claims**



1. An electrical mechanism support member applicable to a tray for electrical conductors, said tray having a bottom wall provided with a pair of longitudinal ribs; each having a harpoon-shaped free end, said support member having a base portion adapted to bear against said bottom wall, the support member comprising:
a slot means directed inwardly of the support member from the base portion and defining an internal cavity capable of receiving said ribs, said slot means including a first side wall having passages and a second side wall in which there is an aperture;
a retaining member formed by: a connecting foot portion for attachment to the slot means; a fold-down tab defining at least one end locking finger; and a tooth facing away from said end locking finger; said retaining member being movable between an inactive position, which it normally occupies, and an active position in which said tooth is inserted through said aperture and is capable of retentively engaging one of said free ends;
fingers, each of which: (i) is opposite one of said passages; (ii) is attached to said base portion by a resilient connecting portion; and (iii) has a salient tooth inserted through said one of said passages and which is capable of retentively engaging the other of said free ends; and

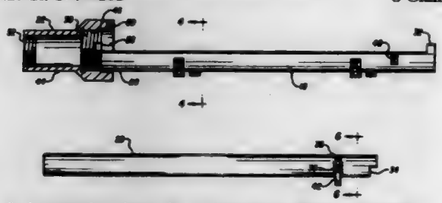
at least one resilient bridge extending on a higher plane above said base portion, facing said at least one end locking finger, and which is capable of receiving said at least one end locking finger when said retaining member is in said active position.

5,591,939
ENCLOSURE HOOD
Wolfgang Hoffmann; André Koerner, both of Lippstadt, and Maik Zimmer, Erwitte, all of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany
Filed Apr. 12, 1994, Ser. No. 229,335
Claims priority, application Germany, Apr. 23, 1993, 43 13 285.5
Int. Cl.[6] H05K *5/03*; H01R *13/447*
U.S. Cl. 174—67 **10 Claims**



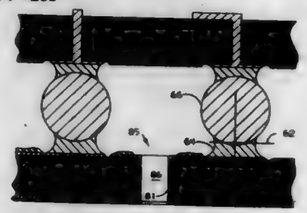
1. Enclosure hood for an electrical, electronic or electromagnetic device, defining a cavity, accessible through an open side thereof and closed at a side thereof opposite the open side by a covering plate, wherein in areas of two end portions at opposite ends of the covering plate the enclosure hood defines grooves which have different shapes.

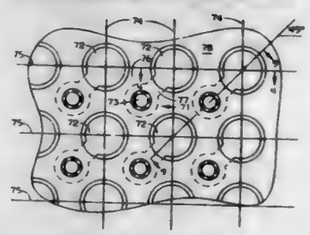
5,591,940
PROTECTIVE SLEEVE
Douglas E. Bacso, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 22, 1994, Ser. No. 299,314
Int. Cl.[6] F16L *57/00*; *21/00*
U.S. Cl. 174—101 **8 Claims**



1. A protective sleeve for an instrument gland comprising:
an elongated, generally semi-cylindrical sleeve body and an elongated generally semi-cylindrical sleeve cover;
said sleeve body having an end tubular portion;
a connector ring having a tubular portion at one end for engagement with the end tubular portion of said sleeve body;
means carried by said connector ring and said end tubular portion of said sleeve body for securing said connector ring and said sleeve body to one another;
one end of said cover being telescopically receivable within said connector ring when said cover is applied to said sleeve body with diametrical opposed longitudinal edges of said cover and said sleeve body engageable with one another to form a generally tubular protective sleeve;
a sealing gasket about the longitudinal edges of said cover and said sleeve body for sealing the cover and sleeve body to one another when secured to one another;
an element carried by said tubular portion of said connector ring for engaging said one end of said cover and biasing said cover into sealing engagement with said sleeve body; and
quick connect and disconnect latches carried by said sleeve and cooperable between said cover and said sleeve body adjacent an opposite end of said sleeve for releasably coupling the cover and sleeve body to one another, whereby removal of said cover and access within said sleeve body are obtained with access only to said adjacent end of said sleeve by disconnecting said latches and substantially axially withdrawing without rotation said one cover end from said connector ring.

5,591,941
SOLDER BALL INTERCONNECTED ASSEMBLY
John Acocella, Hopewell Junction, N.Y.; Donald R. Banks, Pflugerville, Tex.; Joseph A. Benenati, Hopewell Junction; Thomas Caulfield, Croton Fall, both of N.Y.; Karl G. Hoebener, Georgetown, Tex.; David P. Watson, Beaverton, Oreg., and John S. Corbin, Jr., Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 28, 1993, Ser. No. 144,981
Int. Cl.[6] H06K *1/14*
U.S. Cl. 174—266 **28 Claims**





1. An interconnect assembly comprising:
a first and second interconnect substrates;
a planer pattern of multiple, metal contacts on each respective substrate, for interconnection between the substrates, which are mirror images of each other to provide multiple confronting pairs of contacts;
balls of conductive metal for respective pairs of such contacts with a ball diameter about the same as the width of the contacts; and
a volume of a first joining-material for each such pair of contacts connected to the respective contact of the first interconnect substrate and a volume of a second joining-material for each such pair of contacts connected to the respective contact of the second interconnect substrate, with melting temperatures of the joining-materials of both the first and second volumes substantially less than the melting temperature of the metal-balls, with the first and second volumes of each pair of contacts connected to approximately diametrically opposite ends of a respective metal-ball, and with the smallest cross

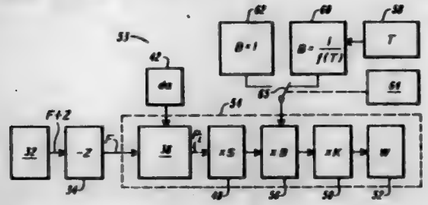
sectional area of each joining-material volume having a minimum diameter at least about ⅔ of the diameter of the metal-ball.

5,591,942

TEMPERATURE-COMPENSATED BELT SCALE

Frank S. Hyer, Duxbury, Mass., assignor to Hyer Industries, Inc., Pembroke, Mass.

Filed Nov. 8, 1993, Ser. No. 148,286
Int. Cl.[6] G01G *11/14*
U.S. Cl. 177—16 **13 Claims**



1. The combination of

a conveyor having a supporting structure, an endless conveyor belt drivingly supported thereon, load cell means, a support carriage bearing on the load cell means, and a plurality of mutually longitudinally spaced idlers supporting the belt and including at least one idler on the carriage and located to transfer load forces on the belt through the carriage to the load cell means,

a transducer responsive to the temperature in the vicinity of the support carriage,

a factor generator connected to the transducer,

a belt travel transducer driven by the belt, and

an integrating computer comprising an integrator responsive to the output of the load cell means and the belt travel transducer, a weight totalizer and at least two multipliers each having a variable output representing a multiplying factor, said computer including connections between said integrator and said multipliers and circuit means to produce an input to said totalizer proportional to the integral of said output of the load means multiplied by both of said multiplier outputs, one of said multipliers being connected to said factor generator.

5,591,943

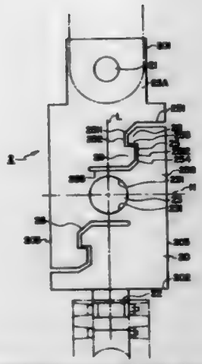
WEIGHT-SENSING MEMBER FOR AN ELECTRICAL SUSPENSION WEIGHER

Liang-Chieh Cheng, No. 4, Lane 404, Chung-Cheng S. Rd., Yung-Kang City, Tainan Hsien, Taiwan

Filed Jun. 10, 1994, Ser. No. 258,576
Int. Cl.[6] B66C *1/40*; G01G *23/02*; G01L *5/00*; *1/04*
U.S. Cl. 177—147 **5 Claims**

1. A weight-sensing member to be used in an electrical suspension weigher, said weight-sensing member made of a material with toughness and elastic deformability characteristics and having a top end with a first means to be suspended on a suspending means, a bottom end with a second means for suspending an article that is to be weighed, and a broadened portion located between and integral with said first and second ends, said broadened portion having a pair of opposed peripheries extending respectively between said first and second end, a through-hole aligned with said first and second means and a pair of slots formed symmetrically on both sides of said through-hole, wherein the improvement comprises:

each of said slots beginning with an open end at a respective one of said opposed peripheries adjacent to a corresponding one of said top and bottom ends and terminating with a closed end



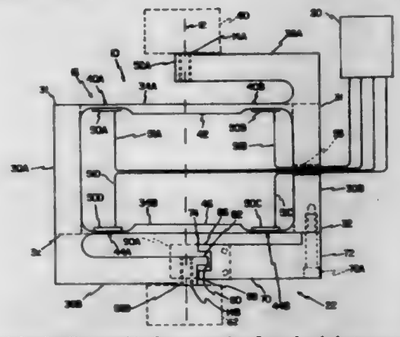
near said through-hole, each of said slots dividing partially said weight-sensing member into two separate parts on both sides of said one of said slot, said two separate parts each comprising a higher part near said top end and a lower part near said bottom end, said lower part having a higher portion with a protrusion extending along said slot into an opening formed in said higher part, said higher part having a lower portion with a protrusion under said opening extending along said slot into another opening formed in said lower part under said protrusion thereof, said higher part capable of bearing said lower part when said lower part is deformed downwardly due to suspension of said article at said second end means of said bottom end while said first means is suspended on said suspending means, thereby causing said protrusion of said lower part to touch said protrusion of said higher part.

5,591,944

OVERLOAD STOP ASSEMBLY FOR A LOAD CELL

Richard A. Meyer, Carver, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jan. 5, 1994, Ser. No. 177,613
Int. Cl.[6] G01G *3/08*; *23/02*
U.S. Cl. 177—229 **13 Claims**



1. A load cell assembly for measuring force loads between a first element and a second element along a test axis, the load cell assembly comprising:

a first support portion having a first end and a second end;

a second support portion parallel to the first support portion and having a first end and a second end;

first flexure means for joining the first ends of the first and second support portions, the first flexure means having two spaced apart flexure regions;

second flexure means for joining the second ends of the first and second support portions, the second flexure means having two spaced apart flexure regions;

measuring means for measuring strain in at least one of the flexure regions and providing a representative output signal;

a first connection arm joined to the first end of the second support portion, the first connection arm having a free end with means for connecting the first element thereto, the free end of the first connection arm being positioned between the flexure regions of the first flexure means;

a second connection arm joined to the second end of the first support portion, the second connection arm having a free end with means for connecting the second element thereto, the free end of the second connection arm being positioned between the flexure regions of the second flexure means; and

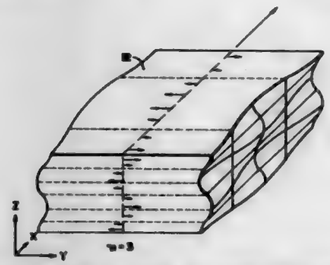
a stop member joined to the end of the second support portion and extending toward the free end of the second connection arm, the stop member selectively contacting the free end of the second connection arm between the flexure regions of the second flexure means.

5,591,945

ACOUSTIC TOUCH POSITION SENSOR USING HIGHER ORDER HORIZONTALLY POLARIZED SHEAR WAVE PROPAGATION

Joel Kent, Fremont, Calif., assignor to Elo TouchSystems, Inc., Oak Ridge, Tenn.

Filed Apr. 19, 1995, Ser. No. 424,216
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—19 **125 Claims**



125. An acoustic device, suitable for coupling to a transducer for imparting a wave having a longitudinal component into the device, the wave having an axis of propagation, said device comprising:

a substrate having a surface, said substrate supporting propagation of waves having a horizontally polarized component and a non-uniform volumetric energy density along an axis normal to said surface; and

an array of acoustically reflective elements, on a surface of said substrate, disposed along the axis of wave propagation, each of said elements being disposed at an angle which reflects a wave having a longitudinal component propagating along the axis of wave propagation as a wave having a horizontally polarized component and a non-uniform volumetric energy density along an axis normal to said surface propagating at an angle of 90° to the axis of wave propagation.

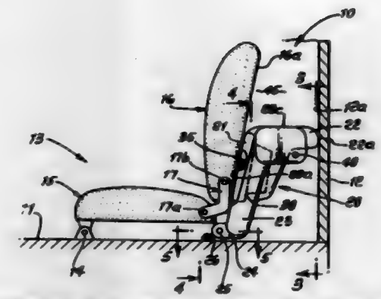
5,591,946

FOLDING ACOUSTIC SPEAKER CONTAINER

William B. Jehle, Los Angeles, and Richard Reus, Anaheim, both of Calif., assignors to RJC Designs, Los Angeles, Calif.

Filed Dec. 4, 1995, Ser. No. 566,543
Int. Cl.[6] H05K *5/00*
U.S. Cl. 181—141 **12 Claims**

1. In a speaker box adapted to fit at the rear of a vehicle seat, the combination comprising:



a) a box body that is horizontally elongated, has front and rear sides, opposite horizontally spaced ends, a top and a bottom,

b) means associated with said body to accommodate body swinging between rearward upright position, and forward stowed position, providing storage spaces in both said positions,

c) and speaker means carried by the body to direct sound effectively within the vehicle in each of said body positions,

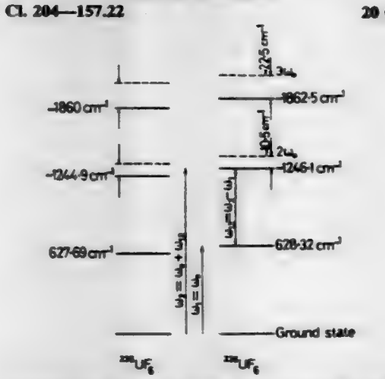
d) said means associated with the body to accommodate body swinging including hinge means attached to a lower portion of the body which projects forwardly and downwardly in body upright position.

5,591,947

METHOD AND APPARATUS FOR LASER ISOTOPE SEPARATION

Doros Andreou, Strovolos, Cyprus, assignor to Synergetic Resources Limited, Douglas, Isle of Man

PCT No. PCT/GB92/00552, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/18844, PCT Pub. Date Sep. 30, 1993
PCT Filed Mar. 26, 1992, Ser. No. 307,718
Int. Cl.[6] B01D *5/00*
U.S. Cl. 204—157.22 **20 Claims**



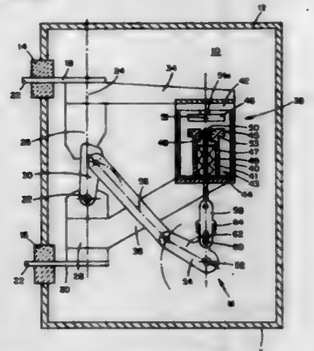
1. A method of preferentially exciting and selectively dissociating, in a molecular gas containing molecules of different isotopes, molecules of a desired isotope, in which the gas is irradiated with a first narrow bandwidth laser beam at a frequency ω_1 equal to the frequency ω_o of the absorption band of the molecules of the desired isotopic species and simultaneously with a second narrow bandwidth laser beam at a frequency ω_2 equal to the frequency $(\omega_o+\omega_{12})$ between the ground state and the second energy excitation level of the molecules of the desired isotopic species, where ω_{12} is the frequency difference between the first and second energy excitation levels.

5,591,948

VACUUM CARTRIDGE, NOTABLY FOR A MEDIUM VOLTAGE ELECTRICAL CICUIT BREAKER OR SWITCH AND A SWITCH INCORPORATING SUCH A CARTRIDGE

Roger Belongeat-Mobleu; Frédéric Barnaz, both of Echirolles, and Hans Schellekens, Meylan, all of France, assignors to Schneider Electric S.A., France

Filed Jun. 6, 1995, Ser. No. 466,735
Claims priority, application France, Jun. 20, 1994, 94 07615
Int. Cl.[6] H01H *33/66;33/04*
U.S. Cl. 218—68 **8 Claims**



8. A circuit breaker or switch, comprising:
a sealed enclosure filled with a high dielectric strength gas;
a vacuum cartridge comprising:
an enclosure of appreciably cylindrical shape having a first and a second end plate;
first and second stationary arcing contacts fixed axially inside said enclosure and fixed to said first and second end-plates respectively;
a movable contact, including a rod, slidably mounted with respect to said second end plate and slidably mounted in said second stationary arcing contact;
means connected to said movable contact for moving said movable contact between a closed position wherein said movable contact contacts said first stationary arcing contact and a separated position wherein said movable contact is separated from said first stationary arcing contact; and
means for producing an axial magnetic field in an arc formation zone between said first and second stationary arcing contacts,
whereby an electrical arc, generated when said movable contact is separated from said first stationary contact, is uniformly distributed by said axial magnetic field during a breaking of an electrical circuit;
a pair of main contacts electrically connected in parallel to said arcing contacts; and
an operating mechanism to open said contacts after the main contacts and to close said contacts before the main contacts.

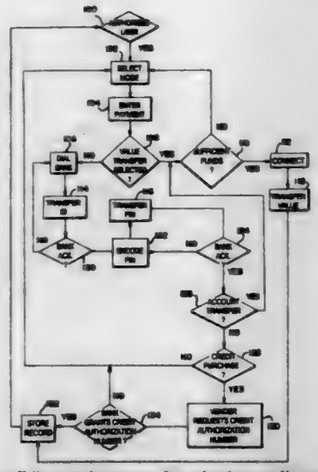
5,591,949

AUTOMATIC PORTABLE ACCOUNT CONTROLLER FOR REMOTELY ARRANGING FOR PAYMENT OF DEBT TO A VENDOR

Robert J. Bernstein, First Options, One Financial Plz. 440 S. LaSalle St., Chicago, IL 60605

Filed Jan. 6, 1995, Ser. No. 369,749
Int. Cl.[6] G06K *5/00*
U.S. Cl. 235—380 **22 Claims**

1. An automatic portable account controller for remotely arranging for payment of debt to a vendor comprising in combination: means for activating the automatic portable account controller upon detection of indicia of identity of an authorized user; means for selecting direct value transfer as a mode of payment to the



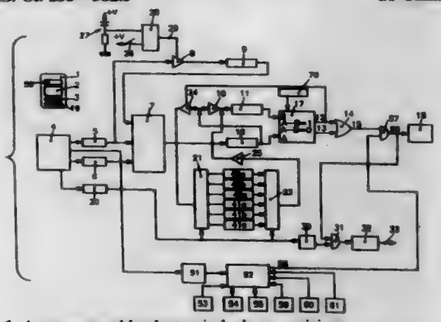
vendor via off-line mode; means for selecting credit purchase as a mode of payment to the vendor via off on-line mode; means for selecting bank account transfer as a mode of payment to the vendor via on-line mode; means for entering a payment amount; means for communicating with the vendor; and means for executing the selected mode of payment to the vendor through the means for communicating.

5,591,950

PROGRAMMABLE ELECTRONIC LOCK

Juan A. Imedio-Ocaña, San Sebastian, Spain, assignor to Talleres de Escoriaza, S.A. (TESA), Irun, Spain

Continuation-in-part of Ser. No. 147,790, Nov. 4, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,346
Claims priority, application Spain, Nov. 4, 1992, 9202223
Int. Cl.[6] G06K *7/01*
U.S. Cl. 235—382.5 **21 Claims**



1. A programmable electronic lock, comprising:
a card, having fields respectively encoded with a card code, a shift code, and a card type code;
a card reader;
means for storing said card code;
means for storing said shift code;
means for storing said card type code;
a system code;
means for storing said system code;
means for receiving said card, system, and shift codes, and calculating a key code therefrom;
means for storing said key code;
a plurality of lock codes for said card type code;
means for storing said plurality of lock codes for said card type code;

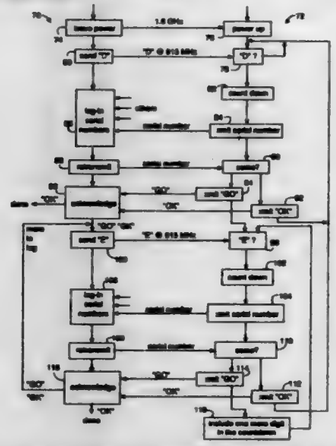
means for receiving said card type code and retrieving a lock code from said plurality of lock codes for said card type code;
means for receiving and comparing said key code and said lock code;
said means for receiving and comparing said key code and said lock code producing an active output signal at a first output when said key code is equal in value to said lock code;
said means for receiving and comparing said key code and said lock code producing an active signal at a second output when said key code value is within a predetermined tolerance value of said lock code value;
means for setting and storing said predetermined tolerance value;
means for opening a lock responsive to either of said active output signals from said means for receiving and comparing said key code and said lock code;
means for automatically updating said lock code, by replacing said lock code with said key code, responsive to said second active output signal from said means for receiving and comparing said key and said lock codes.

5,591,951

SYSTEM AND METHOD FOR SIMULTANEOUSLY COLLECTING SERIAL NUMBER INFORMATION FROM NUMEROUS IDENTITY TAGS

Michael A. Doty, Manteca, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Oct. 12, 1995, Ser. No. 542,214
Int. Cl.[6] G06K *7/00*
U.S. Cl. 235—435 **9 Claims**



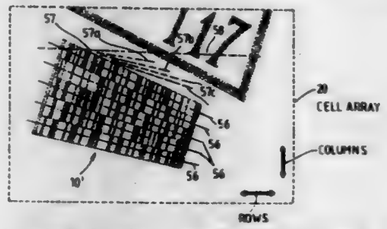
1. A coded-radio-frequency identification system (**10, 60**), comprising:
a reader (**12, 62, 70**) with a first radio frequency (RF) transmitter that provides for the transmission of a first start character and a log of received serial numbers and a first RF receiver that provides for the reception of a plurality of tag unit serial numbers;
a tag unit (**14, 64, 72**) with a second RF receiver (**34, 36, 38, 40, 42, 44, 46, 48**) that provides for the reception of said first start character and a second RF transmitter (**28, 30, 32, 34, 36, 38, 40, 42, 44**) that provides for the transmission of a unique serial number and an acknowledge character and a not-acknowledge character;
timing means (**22, 82, 102**) connected to said second RF receiver and to a memory (**50**) for storing said unique serial number and providing for a time delay proportional to a first part of said unique serial number and connected to the second RF transmitter to send said unique serial number after said time delay;
retransmission means (**12, 62, 88, 108**) for repeating said serial numbers received by said first RF receiver with said first RF transmitter;
matching means (**22, 90, 110**) connected to said second RF receiver to compare said repeated serial numbers with said unique serial number in said memory and connected to transmit with said second RF transmitter said acknowledge character if a match occurred and said not-acknowledge character if a match did not occur;
acknowledgment means (**12, 62, 96, 116**) connected to said first RF receiver to receive said acknowledge characters and said not-acknowledge characters from a plurality of tag units, wherein a simultaneous occurrence of both said acknowledge characters and said not-acknowledge characters combines to form a legitimate composite character;
log-in means (**12, 62, 86, 106**) for storing said repeated serial numbers when said acknowledge character is received; and
collision occurrence means (**12, 22, 62, 98–118**) for using a second portion of said unique serial number to control the timing means.

5,591,952

BAR CODE READER

Mark J. Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Holtsville, N.Y.

Continuation of Ser. No. 240,299, May 9, 1994, Pat. No. 5,396,054, which is a continuation of Ser. No. 41,281, Mar. 30, 1993, abandoned, which is a continuation of Ser. No. 317,533, Mar. 1, 1989, abandoned. This application Jan. 26, 1995, Ser. No. 378,596
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—462 **39 Claims**



1. A method of reading a two-dimensional bar code symbol having a plurality of linearly arranged indicia patterns of encoded information having a reading direction corresponding to said linear direction, said method comprising the steps of:
(a) optically imaging upon a light-detector array a field of view including said symbol to be read;
(b) directly transferring serially only to a serial port of a memory array a binary representation of light impinging on the light-detector array;
(c) scanning said binary representation in the memory array via a parallel port of said memory array to produce electrical data output to processing means;
(d) evaluating said electrical output including finding the presence of bar code symbol information by said processing means to thereby determine orientation of said linearly arranged pattern of bar code data in said bar code symbol; and
(e) thereafter scanning said binary representation in the memory array via said parallel port of said memory array using addressing based on said determined orientation to produce electrical bar code data to said processing means, and decoding said electrical bar code data using said processing means.

5,591,953

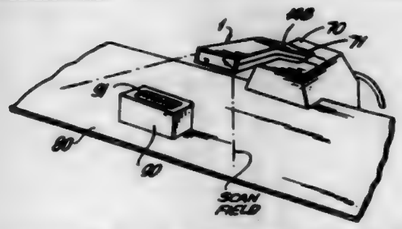
COUNTERTOP BAR CODE SYMBOL READING SYSTEM HAVING AUTOMATIC HAND-SUPPORTABLE BAR CODE SYMBOL READING DEVICE AND STAND FOR SUPPORTING PROJECTED SCAN FIELD THEREOF

George B. Rockstein, Audubon; David M. Wilz, Sr., Sewell; David P. Babunski, Glassboro, and Carl H. Knowles, Moorestown, all of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation of Ser. No. 147,833, Nov. 4, 1993, Pat. No. 5,424,525, which is a continuation of Ser. No. 583,421, Sep. 17, 1990, Pat. No. 5,260,553. This application Jun. 7, 1995, Ser. No. 476,069

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—462 7 Claims



1. An automatic bar code symbol reading system having hand-held and stand-supported modes of automatic operation, comprising:

(A) a hand-supportable bar code symbol reading device including

(1) a hand-supportable housing supportable in the hand of a user, and having a light transmission aperture through which visible light can exit and enter said hand-supportable housing;

(2) object detection means in said hand-supportable housing, for detecting an object bearing a bar code symbol and being located within at least a portion of a scan field definable external to said hand-supportable housing, and automatically generating an activation signal in response to the detection of said object in at least a portion of said scan field;

(3) scan data producing means in said hand-supportable housing, for producing scan data from said detected object located in said scan field, said scan data producing means including

(i) a visible laser beam producing means disposed in said hand-supportable housing for producing and projecting a visible laser beam through said light transmission aperture,

(ii) scanning means for repeatedly scanning said visible laser beam across said scan field and said bar code symbol on said detected object, and

(iii) laser light detecting means for detecting the intensity of laser light reflected off said scanned bar code symbol and passed through said light transmission aperture, and automatically producing scan data indicative of said detected light intensity;

(4) scan data processing means in said hand-supportable housing for processing produced scan data so as to detect and decode said scanned bar code symbol on said detected object, and automatically produce symbol character data representative of said detected and decoded bar code symbol; and

(5) system control circuitry for automatically activating said scan data producing means and said scan data processing means for up to a predetermined time period in response to the generation of said activation signal, and automatically deactivating said scan data producing means and said scan data processing means in response to said scan data processing means failing to detect and decode a scanned bar code symbol within said predetermined time period,

wherein, during said hand-held mode of automatic operation, a bar code symbol on an object can be automatically read only when said object is automatically detected by said object detection means in at least a portion of said scan field while said hand-supportable bar code symbol reading device is supported within the hand of said user; and

(B) scanner support stand including

(1) housing support means for receiving and supporting at least a portion of said hand-supportable housing, and

(2) a base portion mountable relative to a countertop surface so that when said hand-supportable housing is supported within said housing support means during said stand-supported mode of automatic operation, said scan field is projected away from said scanner support stand and said hand-supportable housing, and extends above said countertop surface permitting the automatic reading of bar code symbols on objects passed by said scanner support stand,

wherein, during said scanner-supported mode of automatic operation, a bar code symbol on an object can be automatically read only when said object is automatically detected by said object detection means in at least a portion of said scan field projected away from said scanner support stand and above said countertop surface, while said hand-supportable bar code symbol reading device is supported within said scanner support stand.

5,591,954

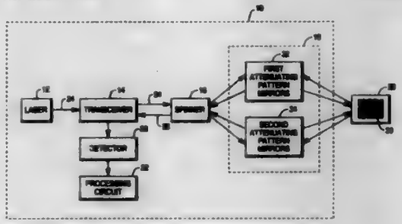
APPARATUS AND METHOD FOR EQUALIZING THE SIGNAL STRENGTHS OF DIFFERENT SCAN LINES

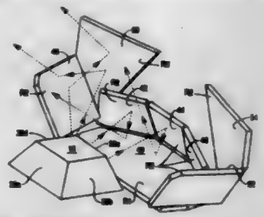
Michael A. Spencer, Lawrenceville, Ga., assignor to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Feb. 23, 1995, Ser. No. 392,596

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—467 13 Claims





1. A bar code scanner comprising:

a plurality of pattern mirrors, including a first pattern mirror which attenuates and reflects a laser beam to produce a scan line for scanning an article, and a second pattern mirror which attenuates and reflects the laser beam at an attenuation different than the attenuation of the first pattern mirror to produce another scan line for scanning the article.

5,591,955

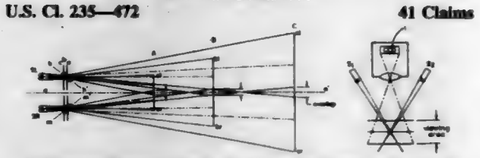
PORTABLE DATA FILE READERS

Vadim Laser, 9876 Zig Zag, Cincinnati, Ohio 45242

Continuation-in-part of Ser. No. 332,560, Oct. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 298,345, Aug. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 241,866, May 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 170,120, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 67,384, May 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 60,404, May 11, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 340,285

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—472 41 Claims



1. A process for receiving an image of an object, comprising:

(a) aiming one or more beams of photons at the object;

(b) capturing an image of the object for preprocessing;

(c) determining whether the object is within focal range;

(d) focusing the image upon two or more photosensitive arrays, wherein the step of focusing involves adjusting two or more lenses such that a partial image of the object is focused on each array, wherein the partial images overlap each other;

(e) indicating whether the object is within focal range;

(f) controlling the exposure of the object;

(g) triggering the capture of the image;

(h) capturing a partial image by each of the arrays;

(i) digitizing said captured partial images; and

(j) processing said captured partial images.

5,591,956

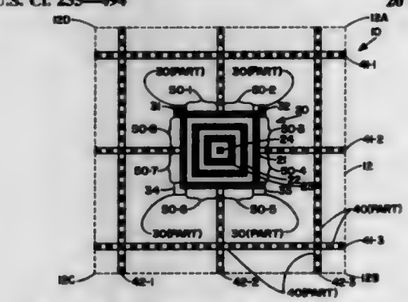
TWO DIMENSIONAL DATA ENCODING STRUCTURE AND SYMBOLOGY FOR USE WITH OPTICAL READERS

Andrew Longacre, Jr., Skaneateles, and Rob Hussey, Liverpool, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed May 15, 1995, Ser. No. 441,446

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—494 20 Claims



1. An optically readable two dimensional bar code symbol, comprising:

a finder structure including a center and a plurality of squares which have centers that approximately coincide with said center and which are disposed in nested relationship to one another, each of said squares having first and second major axes which are substantially perpendicular to one another and which pass approximately through said center;

a symbol descriptor structure encoding data indicating at least the overall symbol size and the length of the message encoded in said bar code symbol, said descriptor structure being located adjacent to said finder structure;

a reference structure comprising at least two linear arrays of reference elements, said linear arrays having respective longitudinal axes that are oriented parallel to at least one of said first and second major axes;

a data structure including a plurality of data blocks, said data blocks being concatenated to form layers that surround said finder structure;

whereby the data blocks of said layers may be read sequentially within each layer and said layers may be read sequentially until all data has been read from said symbol.

5,591,957

APPARATUS FOR READING MESH PATTERN IMAGE DATA HAVING BARS ALONG UPPER AND LOWER SIDES OF MESH PATTERN AND A BOUNDARY LINE BETWEEN HORIZONTALLY ADJACENT DARK AND LIGHT AREA OF MESH PATTERN

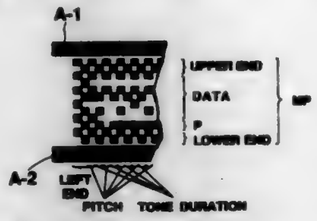
Shigeneri Morikawa, Tokyo, and Takeshi Matsuoka, Kawasaki, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 196,808, Feb. 10, 1994, which is a division of Ser. No. 113,957, Aug. 30, 1993, Pat. No. 5,327,510, which is a continuation of Ser. No. 957,634, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 680,164, Apr. 3, 1991, abandoned, which is a division of Ser. No. 389,287, Aug. 3, 1989, Pat. No. 5,042,079. This application May 26, 1995, Ser. No. 451,526

Claims priority, application Japan, Aug. 12, 1988, 63-200225; Aug. 12, 1988, 63-200226; Aug. 12, 1988, 63-200227

Int. Cl.[6] G06K 19/06

U.S. Cl. 235—494 2 Claims



1. A data reading apparatus comprising:

image sensor means for reading an image formed on a recording medium, the image including a mesh pattern formed of a plurality of boxes arranged in a checkerboard pattern, each box being set to be a dark or light area on said recording medium which represents a block of encoded data encoded in accordance with a predetermined rule, as well as first indicia for indicating a vertical data sampling position of said mesh pattern and second indicia for indicating a horizontal data sampling position of said mesh pattern,

said first indicia comprising a pair of bars formed along upper and lower sides of said mesh pattern and said second indicia comprising a boundary line between horizontally adjacent dark and light areas included in said mesh pattern;

vertical sampling position calculating means for detecting said first indicia from data of the image read by said image sensor means to calculate the vertical data sampling position,

said vertical sampling position calculating means comprising interval measuring means for measuring an interval between said pair of bars and dividing means for substantially equally dividing the interval of said pair of bars measured by said interval measuring means to calculate the vertical data sampling positions;

horizontal sampling position calculating means for detecting said second indicia from data of the image read by said image sensor means and for calculating the horizontal data sampling position of said mesh pattern,

said horizontal sampling position calculating means comprising dark and light area boundary detecting means for detecting said boundary line to determine the horizontal data sampling position;

data sampling means for sampling data of the image at data sampling coordinates defined by the vertical and horizontal data sampling positions calculated by said vertical sampling position calculating means and said horizontal sampling position calculating means; and

said data sampling means reading each area in said sampled data and using said predetermined rule to reproduce said sampled data.

5,591,958

SCANNING EXPOSURE METHOD AND APPARATUS

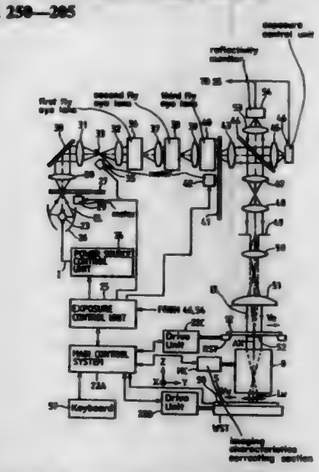
Kenji Nishi, Yokohama, and Shinji Wakamoto, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 260,398, Jun. 14, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 622,920

Claims priority, application Japan, Jun. 14, 1993, 5-141912; Jun. 16, 1993, 5-144633

Int. Cl.[6] G01J *1/20; 1/32*

U.S. Cl. 250—205 **22 Claims**



1. A scanning exposure apparatus comprising:

an illumination system for illuminating a mask with continuous light from a light source;

a first light amount adjusting device which controls power supply to said light source and changes an amount of said continuous light;

a second light amount adjusting device which is disposed in an optical path of said continuous light and whose light reducing ratio with respect to said continuous light is variable;

a projection optical system for projecting an image of a pattern on said mask onto a photosensitive substrate;

a scan system for scanning synchronously said mask and said photosensitive substrate; and

a controller which controls said first and second light amount adjusting devices based on a sensitivity characteristic of said photosensitive substrate, a scan speed of said photosensitive substrate and a width of an exposure area in the scan direction of said photosensitive substrate conjugate with an illumination area on the mask with respect to said projection optical system, thereby adjusting the amount of said continuous light.

5,591,959

RADIATION DETECTION DEVICE HAVING ABUTTING DETECTION ELEMENTS AND PROCESS FOR THE PRODUCTION OF SAID DEVICE

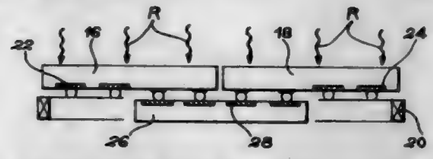
Jean-Charles Cigna, Villard de Lans; Claudine Petitprez, Lancey; François Marion, Saint Egreve, and Michel Ravetto, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 27, 1994, Ser. No. 331,369

Claims priority, application France, Nov. 17, 1993, 93 13721

Int. Cl.[6] H01L *27/00*

U.S. Cl. 250—208.1 **6 Claims**



1. Radiation detection device incorporating at least two detection elements (16, 18, 56) each having edges and faces, each element being made from a material transparent to the radiation and having, on one face, a plurality of photodetectors (22, 24, 64) able to detect the radiation, sets of two detection elements abutting along corresponding edges so that the faces of the abutting elements are substantially coplanar, said device being characterized in that the device also comprises, for any set of two abutting elements, a complementary detection element (26, 62) having, on one face, a plurality of photodetectors (28, 66) able to detect the radiation, in that said complementary element is placed astride the two abutting elements, the photodetectors of said complementary element being positioned facing said faces of the two abutting elements, and in that said two abutting elements have no photodetector facing the photodetectors of the complementary element.

5,591,960

PHOTOELECTRIC CONVERTER WITH SIGNAL PROCESSING

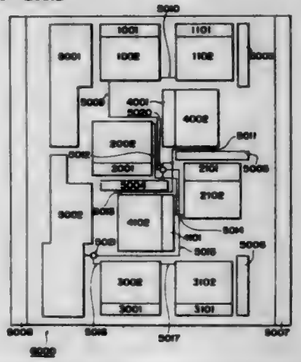
Tatsuo Furukawa, and Toshiki Nakayama, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 280,585, Jul. 26, 1994, abandoned, which is a continuation of Ser. No. 90,625, Jul. 12, 1993, abandoned, which is a continuation of Ser. No. 874,209, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 661,291, Feb. 27, 1991, abandoned. This application Feb. 22, 1995, Ser. No. 392,619

Claims priority, application Japan, Feb. 28, 1990, 2-48076

Int. Cl.[6] G03B *13/36*

U.S. Cl. 250—208.1 **10 Claims**



1. A photoelectric converter provided on a common semiconductor substrate, comprising:

(a) a plurality of arrays, each array comprising a respective plurality of plural photoreceiving elements arranged for detecting incident light, wherein said plurality of arrays comprises first, second, third and fourth groups of arrays, each group comprising at least two arrays, wherein said arrays of said first group are arranged substantially perpendicular to said arrays of said second group so as to cross said arrays of said second group, said arrays of said first and second groups being sandwiched between said arrays of said third group and said fourth group, and said arrays of said third and fourth groups being arranged substantially parallel to said arrays of said second group;

(b) a plurality of reading means arranged correspondingly adjacent to each array of said photoreceiving elements, each said reading means for reading an output signal from said corresponding array; and

(c) level detecting means arranged correspondingly to each of said arrays of photoreceiving elements for detecting a maximum signal level and a minimum signal level from said corresponding array, said level detecting means being arranged at least between said arrays of photoreceiving elements and said reading means.

5,591,961

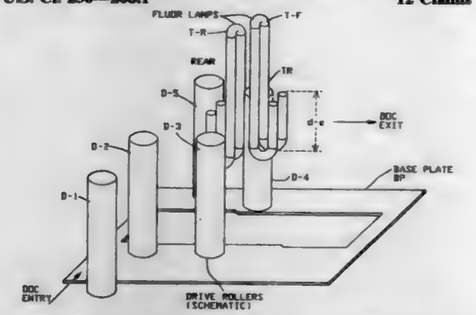
ILLUMINATION WITH BENT FLUORESCENT TUBES

Johan P. Bakker, West Bloomfield; Clive E. Catchpole, Birmingham; David B. Tratar, Dearborn, and John D. Vala, Plymouth, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 304,328, Sep. 12, 1994, Pat. No. 5,471,048, which is a division of Ser. No. 89,818, Jul. 12, 1993, Pat. No. 5,371,356, which is a division of Ser. No. 872,956, Apr. 27, 1992, Pat. No. 5,272,331. This application Nov. 24, 1995, Ser. No. 562,480

Int. Cl.[6] G01N *9/04*; H04N *1/21*

U.S. Cl. 250—208.1 **12 Claims**



1. A method, for illuminating objects at a prescribed site in an instrument closure using one or more fluorescent tube means which is outsized for said closure; this method comprising: bending each said tube means at least once to fit it better within said closure; said tube means having a radius R, and taking care that none of the resulting bend radii exceed radius R so as not to adversely affect the fluorescent discharge.

5,591,962

SYNCHRONOUS SIGNAL DETECTION APPARATUS WITH A PHOTOCONDUCTIVE PHOTODETECTOR

Musubu Koishi; Akira Takeshima, and Mitsunori Nishizawa, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

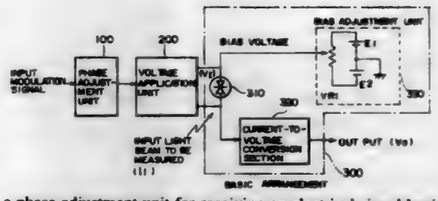
Filed Jul. 6, 1995, Ser. No. 498,984

Claims priority, application Japan, Jul. 6, 1994, 6-154903

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—214.1 **8 Claims**

1. A synchronous signal detection apparatus for measuring a frequency component of a signal to be measured, comprising;



a phase adjustment unit for receiving an electrical signal having a predetermined frequency, and changing a phase of an output signal in accordance with an external designation;

a voltage application unit for receiving the electrical signal output from said phase adjustment unit, and outputting a first voltage signal at a low output impedance;

a photoconductive photodetector, having a voltage application terminal to which the voltage signal output from said voltage application unit is input, for receiving the signal to be measured; and

a current-to-voltage conversion unit for converting a current signal flowing through said photoconductive photodetector into a voltage signal, and extracting a substantially DC component to be output as a second voltage signal,

wherein an intensity of a component of the predetermined frequency included in the signal to be measured is detected.

5,591,963

PHOTOELECTRIC CONVERSION DEVICE WITH DUAL INSULATING LAYER

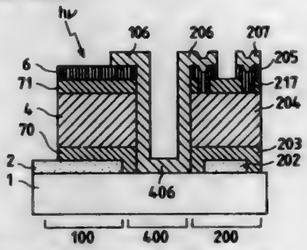
Shinichi Takeda, Atsugi; Hidemasa Mizutani, Sagamihara; Noriyuki Kaifu, Hachioji, and Isao Kobayashi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1995, Ser. No. 512,698

Claims priority, application Japan, Aug. 22, 1994, 6-196646; Aug. 22, 1994, 6-196647

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—214.1 **16 Claims**



1. A photoelectric conversion device comprising:

a photoelectric conversion unit having, in lamination, a first electrode layer, a first insulating layer for blocking carriers of first conduction type and carriers of second conduction type different from said first conduction type from passing therethrough, a photoelectric conversion semiconductor layer, a second insulating layer for blocking carriers of said first conduction type and carriers of said second conduction type from passing therethrough, and a second electrode layer;

a power source unit for supplying, in a refresh mode, a potential between said first electrode layer and said second electrode layer, or making the same potential at said first electrode layer and said second electrode layer, to promote recombination of carriers of said first conduction type and carriers of said second conduction type within said photoelectric conversion semiconductor layer, or in a photoelectric conversion mode, supplying a potential between said first electrode layer and said second electrode layer to lead carriers of said first and second conduction types produced by the light incident upon said photoelectric conversion semiconductor layer to an interface between said second insulating layer and said photoelec-

tric conversion semiconductor layer, and an interface between said first insulating layer and said photoelectric conversion semiconductor layer, respectively; and

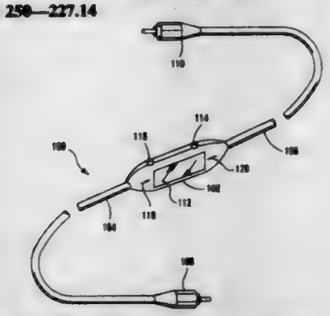
a detecting unit for detecting carriers of said second conduction type led to the interface between said first insulating layer and said photoelectric conversion semiconductor layer, or carriers of said first conduction type led to the interface between said second insulating layer and said photoelectric conversion semiconductor layer.

5,591,964

OPTICAL POWER METER USING LOW-POWER MEASUREMENT CIRCUIT

Craig D. Poole, 8 Wenrock Dr., Ocean, N.J. 07712

Filed May 11, 1995, Ser. No. 438,843
Int. Cl.[6] G02B *6/26*
U.S. Cl. 250—227.14 **23 Claims**



1. An apparatus for the in-line measuring of optical power being carried by an optical fiber comprising:

a housing;

a power source contained within said housing;

an optical tap contained within said housing and in optical communication with said optical fiber such that optical power traversing said optical fiber is tapped off by said optical tap;

an optical detector contained within said housing and in optical communication with said optical tap such that optical energy tapped off by said optical tap is subsequently detected by said optical detector, said optical detector producing a first current in response to the detected optical power;

a measuring circuit contained within said housing, said measuring circuit having a current/voltage converter in electrical communication with said optical detector, said current/voltage converter producing a first voltage that is related to the detected optical power; and

a control circuit contained within said housing and electrically connected to said measuring circuit, said control circuit comprising:

i) a timing circuit for producing a periodic voltage signal; and

ii) an electrically controlled switch connected to the power source for switching electrical power produced by said power source to said measuring circuit in response to said periodic voltage signal.

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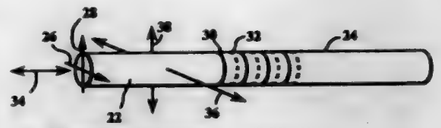
MULTIPARAMETER SENSOR SYSTEM USING A MULTIPLE GRATING FIBER OPTIC BIREFRINGENT FIBER

Eric Udd, 2555 NE. 205th Ave., Troutdale, Oreg. 97060

Filed May 8, 1995, Ser. No. 438,025
Int. Cl.[6] H01J *5/16*
U.S. Cl. 250—227.18 **20 Claims**

1. A fiber grating sensor to sense at least one environmental effect, said sensor including:

a birefringent optical fiber for subjection to environmental effects having:



X, Y, and Z optical axes;

a first internal grating pattern comprised of:

areas having different indices of refraction whose instantaneous positions relative to each other are affectable by environmental effects on each of said optical axes of said birefringent optical fiber to vary the spectral reflectance and transmittance of said first internal grating pattern along each of said optical axes; and

a second internal grating pattern in substantially the same location as said first internal grating pattern comprised of:

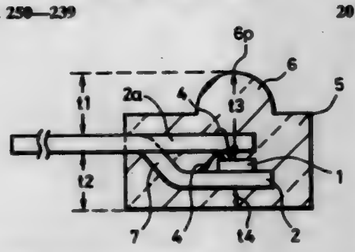
areas having different indices of refraction whose instantaneous positions relative to each other are affectable by environmental effects on each of said optical axes of said birefringent fiber to vary the spectral reflectance and transmittance of said second internal grating pattern along each of said optical axes.

5,591,966

PHOTOSENSOR PACKAGE WITH DEFINED LOCATIONS FOR LENS SUPPORTING LEAD

Yoshio Harada; Hiroyuki Takanatsu, both of Kanagawa; Toshiyasu Shimada, and Takanori Yamashita, both of Tokyo, all of Japan, assignors to Sony Corp., and NEC Corp., both of Japan

Filed Jun. 5, 1995, Ser. No. 463,858
Claims priority, application Japan, Jun. 10, 1994, 6-152583
Int. Cl.[6] H04B *10/00*
U.S. Cl. 250—239 **20 Claims**



1. An optical device comprising:

an optical element;

an optical element supporting lead for supporting said optical element; and

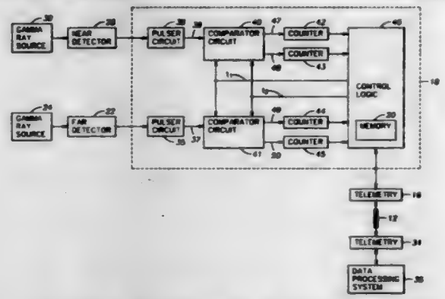
a package having a lens disposed on a surface of the package at its position opposing said optical element, light traveling to or from said optical element passing said lens, said optical element being sealed by said package together with other leads, a height t4 from a rear surface of said optical element support lead at its portion supporting said optical element to the rear surface of said package being set smaller than a height t3 from the front surface of said optical element to a top of the lens, and outer ends of said leads including said optical element supporting lead being projected from one side surface of said package, wherein a height t2 from the rear surface of said package to the rear surfaces of said leads including said optical element supporting lead and a height t1 from the top of said lens to the front surfaces of said leads become substantially equal to each other as seen from the side surface of said package from which said optical element supporting lead is projected.

5,591,967

METHOD AND APPARATUS FOR DETERMINING NEUTRON DETECTOR OPERABILITY USING GAMMA RAY SOURCES

Gordon L. Moake, Houston, Tex., assignor to Halliburton Company, Houston, Tex.

Filed Oct. 11, 1994, Ser. No. 320,859
Int. Cl.[6] G01V *5/10*; G01T *3/00*
U.S. Cl. 250—252.1 **27 Claims**



1. A method of determining the operations of a plurality of neutron detectors in a neutron well logging tool, each said neutron detector generating an output pulse in response to the detection of a gamma ray or a neutron, comprising the steps of:

(a) establishing first and second voltage thresholds;

(b) exposing each said detector to a source of gamma rays;

(c) comparing said detector pulses to said first and second threshold levels thereby to obtain event signals representative of detected gamma rays or neutrons for each said detector, in which (i) detector pulses greater in amplitude than said second threshold represent detected neutrons, and (ii) detector pulses greater in amplitude than said first threshold but less than said second threshold represent detected gamma rays;

(d) determining the event signal rate of detected gamma rays for each said detector; and

(e) comparing the determined rate of detected gamma rays for each said detector to an expected value to determine if each said neutron detector is operational.

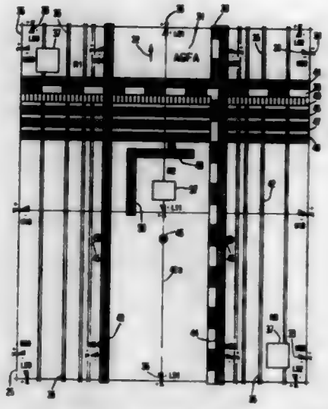
5,591,968

PHOTOSTIMULABLE IMAGING PLATE AND METHOD OF TESTING A DIGITAL DEVICE FOR SCANNING SUCH PLATE

Luc Grillet, Munich, Germany, assignor to Agfa-Gevaert AG, Munich, Germany

Filed Jul. 21, 1995, Ser. No. 505,790
Claims priority, application Germany, Sep. 19, 1994, 44 33 344.7
Int. Cl.[6] G01N *23/04*
U.S. Cl. 250—252.1 **12 Claims**

1. In a method of testing a digital device for scanning a photostimulable imaging plate with respect to various system parameters of the scanning device, said scanning device being operable to scan the imaging plate with a beam of scanning radiation, the improvement wherein the digital scanning device scans a photostimulable imaging plate having a permanent and non-erasable test pattern



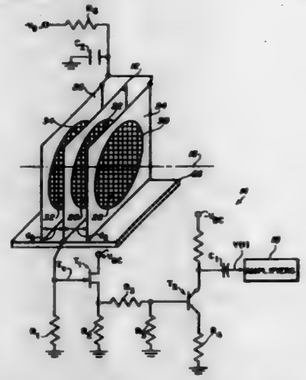
applied thereto which is substantially transparent to X-rays but substantially opaque to the scanning radiation.

5,591,969

INDUCTIVE DETECTOR FOR TIME-OF-FLIGHT MASS SPECTROMETERS

Melvin Park, Bremen, Germany, and John H. Callahan, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1995, Ser. No. 420,536
Int. Cl.[6] H01J *37/244*
U.S. Cl. 250—287 **16 Claims**



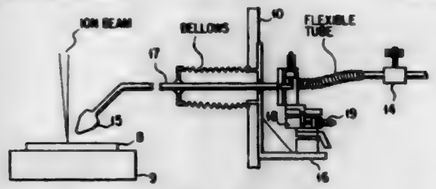
1. A mass spectrometer for measuring the spectra of pluses of charged particles moving along a predetermined flight path, said mass spectrometer comprising:

a sensing electrode formed of an electrical conductive material and located relative to said flight path so that said charged particles induces a charge signal on the surface of said electrode when passing by said sensing electrode:

a converter circuit having means for receiving said charge signal and developing an output signal representative thereof;

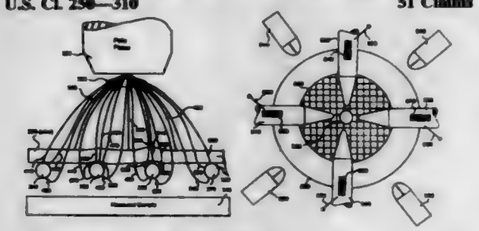
wherein said sensing electrode comprises a first member having a central opening with its center approximately located in said flight path and covered by a screen.

5,591,970
CHARGED BEAM APPARATUS
Haruki Komano; Akira Matsuura; Hiroko Nakamura; all of Yokohama, and Kazuyoshi Sugihara, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 13, 1995, Ser. No. 527,583
Claims priority, application Japan, Sep. 17, 1994, 6-248437; Jul. 25, 1995, 7-189069
Int. Cl.[6] H01J 37/30
U.S. Cl. 250—309 11 Claims



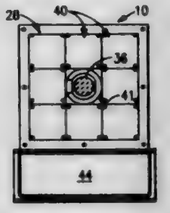
1. A charged beam apparatus, comprising:
a sample table on which a sample is placed;
a column for irradiating a charged beam on a surface of the sample;
a gas supply mechanism having a gas supply opening for injecting a gas to an irradiated position of the charged beam; and
a driving mechanism for moving said gas supply opening parallel to said surface of the sample in order to position said gas supply opening, and moving said gas supply opening perpendicularly to said surface of the sample in order to set a distance from said gas supply opening to a processing position.

5,591,971
SHIELDING DEVICE FOR IMPROVING MEASUREMENT ACCURACY AND SPEED IN SCANNING ELECTRON MICROSCOPY
Arie Shahar; Nira Schwartz, and Richard W. Woods, all of 2800-187 Plaza Del Amo, Torrance, Calif. 90503
Filed Sep. 18, 1995, Ser. No. 529,675
Int. Cl.[6] H01J 37/256;37/28; G01N 23/225
U.S. Cl. 250—310 51 Claims



1. A scanning system comprising:
(a) means for producing a scanning electron beam and scanning a measured sample of a substance with said beam along a scanning range,
(b) focusing means having a depth of focus and a focal plane remote from said focusing means at a focal length distant from said focusing means,
(c) said focusing means being arranged to produce a focused electron beam and focus said electron beam onto a focusing spot on said focal plane such that said focal plane coincides with a surface of said sample within an accuracy range equal to said depth of focus throughout said scanning range of said scanning electron beam,
(d) sensor means for detecting an emission selected from the group consisting of X-rays emitted from said sample, electrons emitted from said sample, and electrons reflected from said sample,
(e) said sensor means being arranged to provide a sensor output in response to said detecting,
(f) said sensor means being positioned in structural symmetry relative to said scanning electron beam for reducing astigmatic distortion of said scanning electron beam,
(g) shielding device means mounted above said sample for screening a field selected from the group consisting of magnetic fields from said sample, electromagnetic fields from said sample, and electric fields from said sample, such that said focusing spot and said focal length are independent of any composition or geometry of said sample,
(h) said shielding device means having a first opening for allowing passage of said scanning electron beam through said shielding device means throughout said scanning range without disturbance,
(i) said shielding device means having a plurality of additional openings for allowing emissions from said sample to strike said sensor means, such that emissions propagating from said sample at multiple orientations will include emissions which travel along trajectories passing through said shielding device, and will also include emissions that pass above said shielding device means and are unscreened, and
(j) analyzing means for analyzing the output of said sensor means.

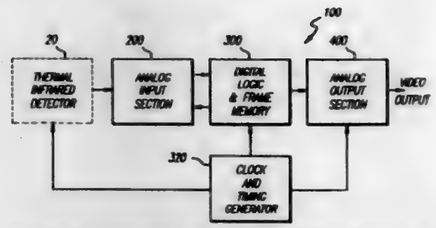
5,591,972
APPARATUS FOR READING OPTICAL INFORMATION
J. Donald Noble, La Fayette, and Michael M. Muehlemann, Liverpool, both of N.Y., assignors to Illumination Technologies, Inc., East Syracuse, N.Y.
Filed Aug. 3, 1995, Ser. No. 509,758
Int. Cl.[6] H04N 1/04
U.S. Cl. 250—330 13 Claims



1. Apparatus for reading optical information contained on a distant object, said apparatus comprising:
a camera for receiving radiation from said object and for producing an electrical signal representative of said optical information, said camera having an imaging lens disposed on an optical axis extending through said apparatus;
an illumination source for projecting a beam of illuminating radiation along said axis and onto said object, said source being generally coaxial with said lens and including one or more two-dimensional arrays of LED's arranged about said optical axis, said LED's emitting invisible infrared radiation with a wavelength above 700 nm; and
a power supply for said illumination source, said power supply including a means for strobing said LED's at a predetermined frequency.

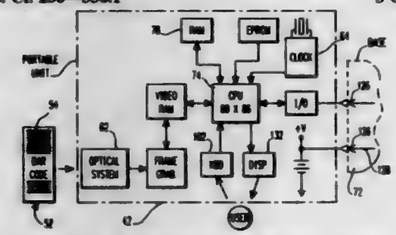
5,591,973
SIGNAL PROCESSOR FOR INFRARED CAMERA
David M. Masarik, Laguna Beach; Robert S. Hayes, Lawndale; Frank N. Cheung, Agoura, and Robert W. Klatt, Rancho Palos Verdes, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.
Filed Apr. 12, 1994, Ser. No. 226,796
Int. Cl.[6] G01J 5/00
U.S. Cl. 250—332 8 Claims

1. A signal processor for use with an array of detectors, each detector having an amplifier associated therewith and each amplifier providing gain, the processor comprising:



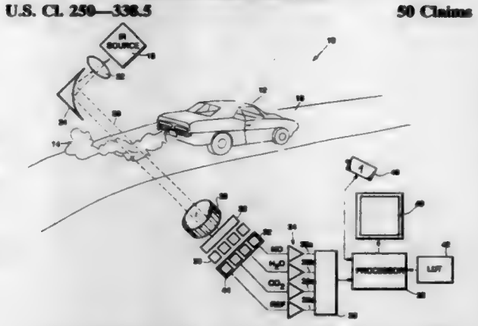
means for compensating for a DC offset of each detector of the array;
means for correcting variations in the sensitivity of each detector amplifier, the second means providing a digital video signal;
a D/A converter for converting the digital video signal to an analog video signal;
means for scaling an input to the D/A converter; and
means for adding blanking signals and sync pulses to the analog video signal.

5,591,974
AUTOMATED COLLECTION AND PROCESSING OF ENVIRONMENTAL SAMPLES
Gary L. Troyer; Susan G. McNeece; Darryl D. Brayton, all of Richland, and Amardip K. Panesar, Kennewick, all of Wash., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sep. 30, 1992, Ser. No. 954,511
Int. Cl.[6] G01T 7/04
U.S. Cl. 250—336.1 3 Claims



1. A method for automatic monitoring of an environmental parameter at a plurality of collection sites, comprising the steps of:
deploying sample collectors at each of the collection sites, and uniquely distinguishing at least a subset of the sample collectors from other sample collectors by associating with the sample collectors an automatically readable means representing an identity code;
exposing the sample collectors at the collection sites to capture samples representing an effect of the environmental parameter at the collection sites;
collecting the samples, and automatically reading the identity codes upon at least one of said collecting and said deploying, using a portable data entry unit having means for reading the identity code and means for determining a time of said reading, and storing the time of the reading, indexed to the identity code;
communicating a plurality of said identity codes and times from the portable data entry unit to a base processing unit, and storing said identity codes and said times in a data memory coupled to the base processing unit;
testing the samples for assessing exposure of individual said samples to the environmental parameter, and storing in the data memory a numerical assessment of said exposure, indexed to the respective collection site;
generating at least one report of said exposure for each of the plurality of sample collectors; and
uniquely distinguishing the collection sites by a site code fixed thereto, and wherein the identity code and the site code are optically read by an image grabber coupled to the portable data entry unit, the site code being read at least once during deployment of the sample collector and collection of the sample, for associating the sample with a particular site.

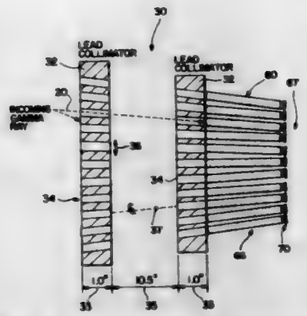
5,591,975
OPTICAL SENSING APPARATUS FOR REMOTELY MEASURING EXHAUST GAS COMPOSITION OF MOVING MOTOR VEHICLES
Michael D. Jack, Goleta, Calif.; Robert D. Stephens, Sterling Heights, Mich.; Christopher B. Tacelli, Goleta, Calif.; David R. Nelson, Santa Barbara, Calif.; Geoffrey A. Walter; Jose A. Santana, both of Goleta, Calif., and Lane H. Rubin, Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Continuation-in-part of Ser. No. 119,788, Sep. 10, 1993, abandoned, and Ser. No. 239,151, May 5, 1994, Pat. No. 5,418,366.
This application Oct. 5, 1994, Ser. No. 318,566
Int. Cl.[6] G01N 21/25;21/35
U.S. Cl. 250—338.5 50 Claims



1. A sensing apparatus for sensing a composition of an exhaust plume of a motor vehicle, comprising:
a light source for radiating light including a plurality of predetermined wavelengths through said plume;
a chopper positioned between said source and said plume for alternating blocking and passing said light;
a photosensor for simultaneously sensing alternating blocked or passed radiation levels at said predetermined wavelengths for said light passing through said plume; and
a computer for computing transmittances of said predetermined wavelengths from respective differences between said blocked and passed radiation levels, and computing said composition as a predetermined function of said transmittances.

5,591,976
GAMMA CAMERA SYSTEM FOR IMAGING CONTAMINATION
John W. Berthold, Salem; J. Jeffrey Kidwell; Douglas A. Norton, both of Alliance, and Stuart E. Reed, Homeworth, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 26, 1994, Ser. No. 312,250
Int. Cl.[6] G01T 1/169
U.S. Cl. 250—363.1 16 Claims

1. A system for detecting and imaging gamma radiation emitted by a contaminated area located a distance ranging from approximately 5 to approximately 25 feet away from the system, comprising:
two collimators spaced a distance apart from each other, the collimators having a plurality of holes therethrough having a diameter ranging from approximately 0.2 to approximately 0.8 inches, the holes of one collimator being aligned with the holes of the other collimator for forming a plurality of hole



alignments, the hole alignments for passing a gamma ray through the collimators;

scintillator means, for each hole alignment, for scintillating in the presence of gamma rays and means for converting a scintillation at each scintillator means into an informational signal indicative thereof for identifying the position of the gamma rays passed through the hole alignments in the collimators; and

visual imaging means for producing a visual image of the location and the size of the contaminated area using said informational signal.

5,591,977

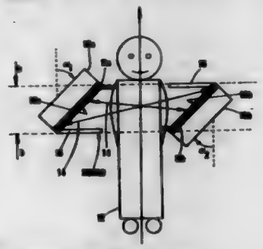
VARIABLE AXIAL APERTURE POSITRON EMISSION TOMOGRAPHY SCANNER

Michael V. Green, Kensington; Jurgen Seidel, Bethesda, and William R. Gandler, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 235,310, Apr. 29, 1994, abandoned. This application Dec. 15, 1994, Ser. No. 357,574

Int. Cl.[6] G01T *1/166*

U.S. Cl. 250—363.03 **19 Claims**



1. An imaging device which comprises:

means defining an imaging target space;

at least two scintillation cameras which are positioned on opposite sides of said imaging target space so as to define one or more matched pairs of sciatillation cameras, each of said at least two scintillation cameras including a scintillation crystal;

means for tilting the scintillation cameras of the one or more matched pairs of scintillation cameras and their respective scintillation crystals, so as to maximize coincidence detection sensitivity by adjusting an axial field of view to match an axial extent of a target located in said imaging target space; and

means for processing signals generated by said at least two scintillation cameras;

wherein each of said one or more matched pairs of cameras is configured to detect paired gamma rays, emitted simultaneously and in opposite directions from a point of annihilation of a positron in a target within said target space, to thereby define endpoints of a coincidence line passing through said target and connecting said pair of cameras; and

wherein each of said one or more matched pairs of cameras is adapted to generate electrical signals, responsive to substantially simultaneous absorption of each of said paired gamma rays by a respective one of said pair of cameras, indicative of said paired gamma rays emanating from a single positron annihilation in said target.

5,591,978

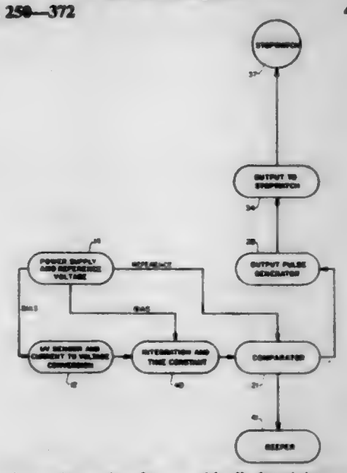
ALL WAVELENGTH ULTRAVIOLET INTENSITY MONITOR

Alvin Kovalsky, 29226 Ocean Ridge Dr., Rancho Palos Verdes, Calif. 90275, and Max D. Miller, Carson, Calif., assignors to Alvin Kovalsky, Rancho Palos Verdes, Calif.

Filed Jul. 27, 1994, Ser. No. 281,446

Int. Cl.[6] G01J *5/00*

U.S. Cl. 250—372 **4 Claims**



1. An electronic monitor for use with all ultraviolet wavelengths comprising:

(a) a first stage sensitive to all ultraviolet wavelengths providing a current proportional to the amount of ultraviolet exposure,

(b) a second stage coupled to said first stage operating as an integrator to establish a fixed constant in joules,

(c) a fourth stage coupled to the outputs of said first and said second stages constituting a comparator,

(d) a fifth stage coupled to said fourth stage constituting an oscillator supplying an activating signal to cause an audible tone indicating the end of cycle,

(e) a sixth stage which incorporates a modified stop watch to indicate the time elapsed from start of measurement to end of measurement, and

(f) a third stage operably coupled to said first, second, fourth, fifth and sixth stages providing power thereto and incorporating a voltage divider and supplying reference voltages.

5,591,979

DEVICE AND METHOD FOR SECURING AN ELECTRET IN A RADON GAS DETECTOR

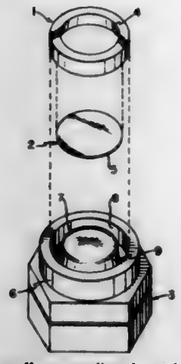
Robert W. Ramsey, Woodsboro, Md., assignor to Radon Testing Corporation of America, Irvington, N.Y.

Continuation-in-part of Ser. No. 26,851, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 10,579, Jul. 12, 1993, abandoned. This application Sep. 23, 1994, Ser. No. 311,546

Int. Cl.[6] G01T *1/14*

U.S. Cl. 250—383 **12 Claims**

1. An assembly for mounting a flexible sheet on a raised pedestal with a top and bottom comprising:



an annular shaped wall surrounding the pedestal so as to form an annular groove about the pedestal; and

a ring with a beveled interior surface so that the interior surface has a minor diameter at one side of the ring and a major diameter at the other side, the minor diameter being smaller than the diameter of the pedestal at its top, said ring being flexible so that it is capable of rotating about its axis, said ring being force fit over the sheet on the pedestal so as to stretch the sheet to remove wrinkles and being rotated to wedge in the groove.

5,591,980

BI-AXIAL-TILTING SPECIMEN FINE MOTION DEVICE AND METHOD OF CORRECTING IMAGE SHIFTING

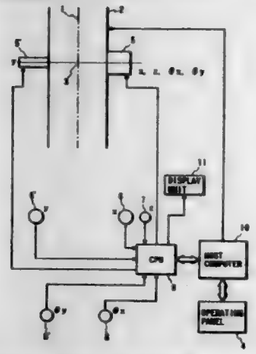
Mitsuo Ogasawara, Hitachinaka; Hiroyuki Kobayashi, Mito, and Morioki Kubonoe, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Science Systems, Ltd., Hitachinaka, both of Japan

Filed Jun. 20, 1995, Ser. No. 492,878

Claims priority, application Japan, Jun. 29, 1994, 6-148109

Int. Cl.[6] H01J *37/20*

U.S. Cl. 250—442.11 **10 Claims**



1. A eucentric side entry bi-axial-tilting specimen fine motion device comprising:

a specimen holder movable forward and backward in a direction nearly perpendicular to an optical axis and universally pivotable and rotatable around a point of support positioned on the center axis of the specimen holder,

a specimen table rotatable provided on said specimen holder,

a specimen position and tilt angle controller, and

a calculator;

where, in a coordinate system in which an axis intersecting the center axis of said specimen holder at a right angle on said specimen holder is the x-axis, an axis connecting an observed point positioned on said optical axis and said point of support and intersecting said optical axis at a right angle is the y-axis, an axis perpendicular to said x-axis and said y-axis is the z-axis, a tilt angle of said x-axis to the plane perpendicular to said optical axis is θ_x, a tilt angle to the center axis of said specimen holder in said specimen table being rotatable around said x-axis is Θy, a coordinate of said observed point having the intersecting point of the center axis of said specimen holder and said x-axis as the point of origin is (x, y, z);

a shifting of an observed image is automatically corrected by calculating correction values of image shifting Δy and Δz using said calculator based on the following equations and by shifting the observed point to a coordinates $(x, y-\Delta y, z-\Delta z)$ using said specimen position and tilt angle controller when said tilt angle θ_y is varied from θ_{y1} to θ_{y2}

$$\Delta y = y(1-\cos\theta_{y2}/\cos\theta_{y1})$$

$$\Delta z = y(\sin\theta_{y2}-\sin\theta_{y1})/\cos\theta_{y1}/\cos\theta_{y1}.$$

5,591,981

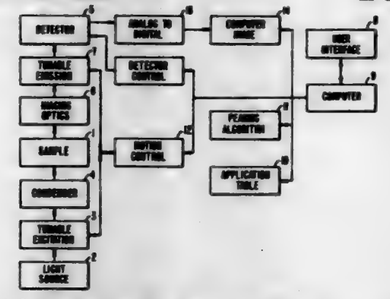
TUNABLE EXCITATION AND/OR TUNABLE EMISSION FLUORESCENCE IMAGING

David M. Heffelfinger, San Pablo, and Franklin R. Witney, Novato, both of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Mar. 16, 1995, Ser. No. 405,468

Int. Cl.[6] G01N *21/64*

U.S. Cl. 250—458.1 **25 Claims**



1. A fluorescence imaging system, comprising:

an interface allowing a user to specify a set of application parameters, said set of user specified application parameters selected from the group consisting of a dye type, a fluorochrome type, a stain type, a sample support, and a separation matrix;

a look-up table designating a set of imaging system operating parameters based on said set of application parameters, said set of imaging system operating parameters selected from the group consisting of a first primary wavelength, a second primary wavelength, a first band and a first bandwidth associated with said first primary wavelength, and a second band and a second bandwidth associated with said second primary wavelength;

an excitation source emitting radiation over a first range of wavelengths;

a first wavelength selector for selecting said first primary wavelength from said first range of wavelengths in a continuously tunable manner;

a focussing system for focussing radiation of said first primary wavelength on a sample, said radiation inducing said sample to fluoresce at at least one wavelength within a second range of wavelengths;

a second wavelength selector for selecting said second primary wavelength from said second range of wavelengths in a continuously tunable manner;

a detector capable of detecting fluorescence over said second range of wavelengths, said detector generating an output signal dependent upon the intensity of said fluorescence; and

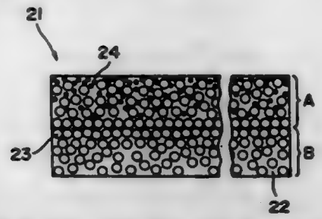
a display device for displaying an image of said sample, wherein said display device is responsive to said output signal.

5,591,982

RADIATION IMAGE STORAGE PANEL AND RADIATION IMAGE RECORDING AND REPRODUCING METHOD

Katsuhiro Kohda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1995, Ser. No. 412,565
Claims priority, application Japan, Apr. 15, 1994, 6-101997
Int. Cl.[6] G03B *42/00*
U.S. Cl. 250—484.4 **3 Claims**



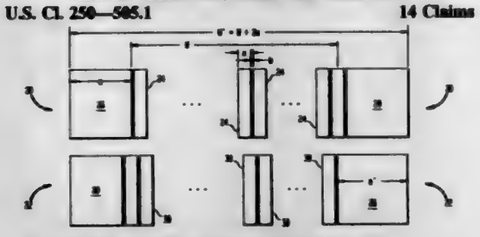
1. A radiation image storage panel having a stimulable phosphor layer which comprises a binder and stimulable phosphor particles dispersed therein and is so colored as to absorb a portion of stimulating rays, wherein the coloring and a weight ratio of phosphor particles to binder vary in the phosphor layer in its depth direction under the conditions that a ratio of weight of phosphor particles to binder in a portion up to ⅓ of the depth of the layer from one surface of the layer is lower than the ratio of weight of phosphor particles to binder in the phosphor layer, and the portion is colored more deeply than other portion of the phosphor layer.

5,591,983

MULTIPLE LAYER MULTILEAF COLLIMATOR

Jonathan Y. Yao, Pleasant Hill, Calif., assignor to Siemens Medical Systems, Inc., New Jersey, Calif.

Filed Jun. 30, 1995, Ser. No. 491,322
Int. Cl.[6] G21K *1/04*; G02B *5/00*; H01J *1/52*
U.S. Cl. 250—505.1 **14 Claims**



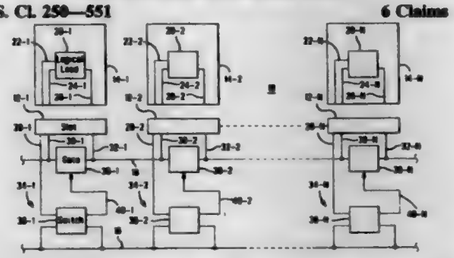
1. A radiation emitting apparatus, comprising:
a source of radiation for providing a substantially unshaped radiation beam in a given beam direction, and
a collimator for shaping said radiation beam, said collimator comprising, first and second layers of a plurality of elongated radiation blocking leaves, frame means for supporting said leaves, and moving means for moving said leaves, said leaves of each layer being arranged adjacent one another so as to form two opposed rows of adjacently positioned leaves and being movable by said moving means in a longitudinal direction (Y) which is generally traverse to the beam direction so as to define a radiation beam shaping field between the opposed ends of the leaves, and said layers being arranged one above another in the beam direction and offset in a lateral direction (X) generally transverse to the beam direction and orthogonal to the longitudinal direction (Y) so that spaces between adjacent leaves of said first and second layers are positioned over and under, respectively, leaves of said second and said first layers, respectively;
wherein each row of said collimator leaves comprises a plurality of adjacently positioned relatively narrow width leaves bounded on at least one end with a relatively wider width end leaf which is also movable in the longitudinal direction.

5,591,984

CURRENT SENSING DAISY-CHAIN BYPASS ARRANGEMENT

Kevin D. Drucker, Lafayette Hill, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 15, 1995, Ser. No. 490,968
Int. Cl.[6] G02B *27/00*; G01R *27/00*
U.S. Cl. 250—551 **6 Claims**



1. In an electronic system having a backplane defining a plurality of slots each for demountably holding a respective one of a plurality of plug-in modules, said backplane including a first conductive trace extending to all of said slots for supplying power to all of said slots and a second conductive trace for carrying a daisy-chained signal to all of said slots, a respective arrangement associated with each of said slots for selectively bypassing said daisy-chained signal past said each slot when no module is present in said each slot, the arrangement comprising:
controllable signal transmission means coupled to said second trace for selectively providing a conductive path bypassing said each slot; and
current sensing means coupled to said first trace extending to said each slot and responsive to current flow through said first trace to said each slot for controlling said signal transmission means:
a) to close said conductive path in the absence of said current flow; and
b) to open said conductive path in the presence of said current flow.

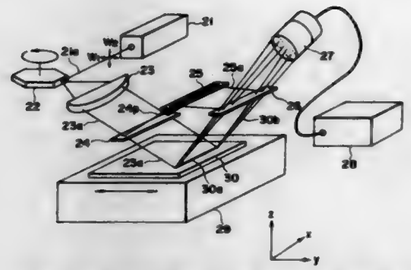
5,591,985

SURFACE STATE INSPECTING SYSTEM INCLUDING A SCANNING OPTICAL SYSTEM FOR SCANNING A SURFACE TO BE INSPECTED WITH A FIRST LIGHT AND FOR SIMULTANEOUSLY SCANNING A DIFFRACTION GRATING WITH A SECOND LIGHT

Toshihiko Tsuji, and Michio Kohno, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 374,884
Claims priority, application Japan, Jan. 21, 1994, 6-005298
Int. Cl.[6] G01N *21/88;21/89*
U.S. Cl. 250—559.45 **8 Claims**

1. A surface state inspecting system, comprising:
a scanning optical system for scanning a surface to be inspected, with first light and simultaneously for scanning a diffraction



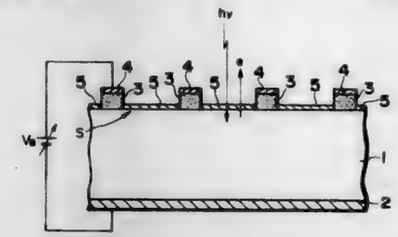
grating with second light, wherein the first light and the second light have mutually different wavelengths and mutually different polarization directions;
a light receiving optical system for receiving scattered light produced sidewardly from the surface and diffraction light produced sidewardly from the diffraction grating, and for superposing the received lights one upon another; and
photoelectric converting means for converting light from said light receiving optical system into an electric signal;
wherein said scanning optical system and said light receiving optical system provide an optical system which is telecentric with respect to the surface to be inspected.

5,591,986

PHOTOEMITTER ELECTRON TUBE AND PHOTODETECTOR

Minoru Niigaki; Toru Hirohata; Tuneo Ihara, and Masami Yamada, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamastu, Japan

Filed Sep. 2, 1994, Ser. No. 299,664
Claims priority, application Japan, Sep. 2, 1993, 5-218609; Sep. 10, 1993, 5-226237
Int. Cl.[6] H01L *27/14;29/49*; H01J *31/00*
U.S. Cl. 257—10 **31 Claims**



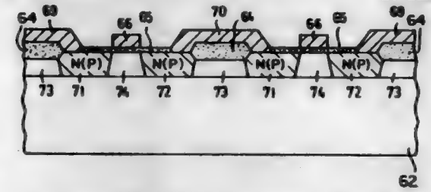
1. A photoemission device comprising:
a photon absorbing layer having either one of a p-type semiconductor, a semi-insulating semiconductor, and a hetero structure and absorbing incident photons to excite photoelectrons;
a Schottky electrode layered on one surface of said photon absorbing layer;
a lead electrode layered through an insulator layer on said Schottky electrode; and
contacts formed on respective, appropriate portions of said Schottky electrode and said photon absorbing layer in order to apply a predetermined polarity bias voltage between said photon absorbing layer and said Schottky electrode and a predetermined polarity bias voltage between said Schottky electrode and said lead electrode;
wherein the photoelectrons excited by incident photons entering said photon absorbing layer are made to be emitted by an electric field produced by said predetermined polarity bias voltages.

5,591,987

SEMICONDUCTOR MIS FIELD EFFECT TRANSISTOR WITH SEMI-AMORPHOUS SEMICONDUCTOR MATERIAL

Shunpei Yamazaki, Tokyo, and Yujiro Nagata, Ichikawa, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 487,904, Mar. 5, 1990, abandoned, which is a division of Ser. No. 98,705, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 775,767, Sep. 13, 1985, abandoned, which is a division of Ser. No. 278,418, Jun. 29, 1981, Pat. No. 4,581,620, which is a continuation-in-part of Ser. No. 237,609, Feb. 24, 1981, Pat. No. 4,409,134. This application Aug. 14, 1992, Ser. No. 928,181
Claims priority, application Japan, Jun. 30, 1980, 55-88974
Int. Cl.[6] H01L *29/786*
U.S. Cl. 257—57 **20 Claims**



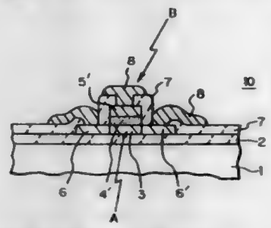
1. A MIS field effect transistor comprising source and drain regions with a channel region formed therebetween, wherein said channel region is made of a semiconductor which is a mixture of crystalline and amorphous structures and which is doped with dangling bond neutralizer comprising hydrogen or a halogen at less than 5 mol % and where said semiconductor has lattice strain.

5,591,988

SOLID STATE IMAGING DEVICE WITH LOW TRAP DENSITY

Michio Arai, Tokyo; Takashi Inushima, Kanagawa; Mitsufumi Codama, Kanagawa; Kazushi Sugiura, Kanagawa; Ichiro Takayama, Kanagawa; Isamu Kobori, Kanagawa; Yukio Yamauchi, Kanagawa, and Naoya Sakamoto, Kanagawa, all of Japan, assignors to TDK Corporation, Tokyo, and Semiconductor Energy Lab. Co. Ltd., Kanagawa, both of Japan

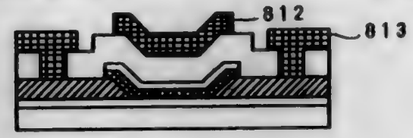
Division of Ser. No. 343,492, Nov. 22, 1994. This application Jun. 7, 1995, Ser. No. 477,104
Claims priority, application Japan, Mar. 23, 1993, 5-63789; Nov. 19, 1993, 5-314135
Int. Cl.[6] H01L *29/04;31/036;31/0376;31/20*
U.S. Cl. 257—59 **11 Claims**



1. A solid state image sensor comprising;
a substrate having insulation surface,
an active layer of non-single crystal silicon layer provided on said insulation surface, having at least a source region and a drain region,
a gate electrode layer provided on light receiving region between said source region and said drain region on said active layer through a gate insulation layer,
a source electrode layer and a drain electrode layer each provided on said source region and said drain region, respectively,

trap density of said active layer being less than $5\times10^{11}/cm^2$,
said gate electrode layer being provided a predetermined bias potential, and
electrical output of current between said source electrode layer and said drain electrode layer being provided depending upon input light which illuminates said light receiving region on said active layer.

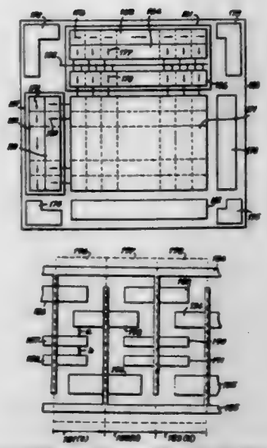
5,591,989
SEMICONDUCTOR DEVICE HAVING FIRST AND SECOND GATE INSULATING FILMS
Mitsutoshi Miyasaka, and Thomas W. Little, both of Sawa, Japan, assignors to Seiko Epson Corporation, Nagano-ken, Japan
Division of Ser. No. 792,436, Nov. 15, 1991, Pat. No. 5,372,958. This application Aug. 17, 1994, Ser. No. 291,764
Claims priority, application Japan, Nov. 16, 1990, 2-310477; Apr. 9, 1991, 3-76486; Sep. 13, 1991, 3-235098
Int. Cl.[6] H01L *29/76;31/036;31/112*
U.S. Cl. 257—66 **11 Claims**



1. A MIS thin film semiconductor device comprising:
a glass substrate;
a protective underlayer film formed on the glass substrate;
a silicon film formed on the protective underlayer film; and
a gate insulating film which includes a first silicon oxide layer and a second silicon oxide layer, the first silicon oxide layer and the second silicon oxide layer not including impurities;
wherein the first silicon oxide layer is in contact with the silicon film and the second silicon oxide layer is in contact with the first silicon oxide layer, and a refractive index of the first silicon oxide layer is 1.42 at a wavelength of 632.8 nm and a refractive index of the second silicon oxide layer is less than the refractive index of the first silicon oxide layer.

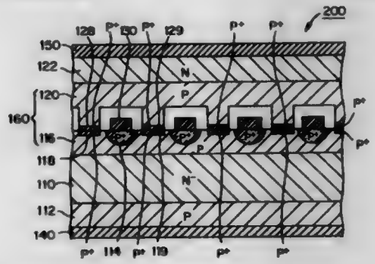
5,591,990
ACTIVE MATRIX ASSEMBLY
Toshiyuki Minawa, and Hiroyuki Oshima, both of Nagano-ken, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 402,376, Mar. 13, 1995, which is a continuation of Ser. No. 142,892, Oct. 25, 1993, abandoned, which is a continuation of Ser. No. 924,695, Jul. 31, 1992, abandoned, which is a division of Ser. No. 351,758, May 15, 1989, Pat. No. 5,250,931. This application Jun. 5, 1995, Ser. No. 461,409
Claims priority, application Japan, May 17, 1988, 63-119919
Int. Cl.[6] H01L *27/13;29/786*
U.S. Cl. 257—72 **30 Claims**

1. An active matrix assembly for an electro-optical device comprising:
a picture element matrix including a plurality of picture elements, each of the plurality of picure elements including a thin film transistor and a transparent picture element electrode, each of the plurality of picture elements having a picture element pitch; and
a driving circuit coupled to the picture element matrix, the driving circuit comprising a plurality of unit cells, each of the plurality of unit cells having an unit cell pitch, a value of the unit cell pitch being one of equal to and twice a value of the picture element pitch, the unit cells comprising a plurality of power source lines and a plurality of thin film transistor regions having longitudinal axes, the thin film transistor



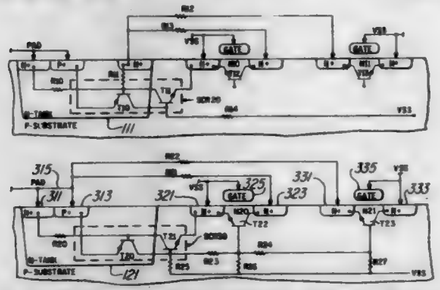
regions comprising P-type and N-type regions, the thin film transistor regions being connected to the plurality of power source lines, wherein distances between adjacent thin film transistor regions along a direction perpendicular to the axes of the thin film transistor regions are approximately equal.

5,591,991
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME
Yoshio Terasawa, Katsuta, Japan, assignor to NGK Insulators, Ltd., Japan
PCT No. PCT/JP94/01241, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO95/04375, PCT Pub. Date Feb. 9, 1995
PCT Filed Jul. 28, 1994, Ser. No. 407,023
Claims priority, application Japan, Jul. 28, 1993, 5-186450
Int. Cl.[6] H01L *29/74;31/111*
U.S. Cl. 257—137 **13 Claims**



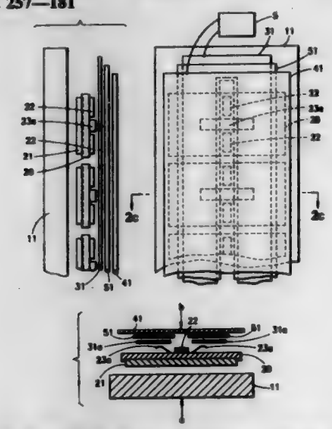
1. A semiconductor device comprising:
a semiconductor substrate;
an anode electrode provided on a surface of said semiconductor substrate;
a cathode electrode provided on the opposite surface of said semiconductor substrate; and
a gate formed within said semiconductor substrate for controlling a current flowing between said anode electrode and said cathode electrode;
wherein said gate comprises (i) at least two gate regions of semiconductor material doped with at least one impurity and (ii) a portion of an electrically conductive gate electrode formed on each said gate region.

5,591,992
ELECTROSTATIC DISCHARGE PROTECTION IN INTEGRATED CIRCUITS, SYSTEMS AND METHODS
Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 178,722, Jan. 10, 1994, which is a division of Ser. No. 948,074, Sep. 21, 1992, Pat. No. 5,290,724, which is a continuation of Ser. No. 677,928, Mar. 28, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 474,217
Int. Cl.[6] H01L *29/74*
U.S. Cl. 257—173 **6 Claims**



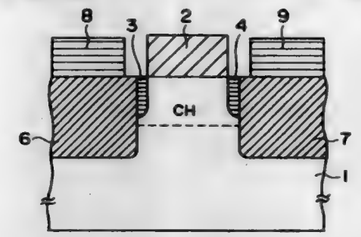
1. An electrostatic discharge protection circuit for use in an integrated circuit having bond pads and internal circuitry on a substrate for operation of the integrated circuit, the electrostatic discharge protection circuit comprising:
a latchable circuit fabricated on said substrate and connected to a first said bond pad; and
field effect transistors having connections to a second said bond pad, the field effect transistors located in proximity to said latchable circuit so that upon occurrence of an electrostatic discharge event the field effect transistors inject current into the substrate to latch said latchable circuit and thereby protect said integrated circuit.

5,591,993
STRUCTURE FOR CONNECTING FLAT TYPE SEMICONDUCTOR SWITCHES IN PARALLEL
Toshihiro Nomura, Tokyo; Masaaki Hisamoto, Mie, and Iwao Kurata, Tokyo, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Mar. 23, 1995, Ser. No. 410,136
Claims priority, application Japan, Mar. 24, 1994, 6-052397
Int. Cl.[6] H01L *23/48;29/417*
U.S. Cl. 257—181 **12 Claims**



1. A connection structure for connecting a plurality of semiconductor switches in parallel, comprising:
a plurality of first electrodes on a first surface of each of said semiconductor switches;
a plurality of second electrodes protruding from a second surface of each of said semiconductor switches;
a plurality of elastic third electrodes on said second surface and insulated from said second electrodes;
each of said elastic third electrodes including a first elastic wing and a second elastic wing&
a first conductor;
a second conductor;
first and second third conductors;
an insulating film interposed between said second conductor and said third conductors;
means for pressing said first conductor and said second conductor toward each other, such that pressed contact of said first conductor with said first electrodes, said second conductor with said second electrodes, and said first and second third conductors with each of said first and second elastic wings, respectively, is established; and
connecting means, made of a same material as said third conductors, for connecting said third conductors to each other at ends thereof.

5,591,994
COMPOUND SEMICONDUCTOR FIELD EFFECT TRANSISTOR HAVING A CONTROLLED DIFFUSION PROFILE OF IMPURITY ELEMENTS
Naoki Hara; Shigeru Kuroda, and Masashi Shima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Jul. 25, 1995, Ser. No. 507,638
Claims priority, application Japan, Aug. 18, 1994, 6-193925
Int. Cl.[6] H01L *31/0328;31/0336;29/80*
U.S. Cl. 257—192 **13 Claims**



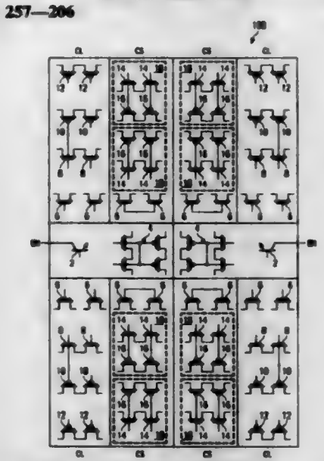
1. A field effect transistor, comprising:
a substrate of a single crystal compound semiconductor material;
a source region formed in said substrate, said source region containing a dopant element;
a drain region formed in said substrate with a separation from said source region, said drain region containing said dopant element;
a channel region defined in said substrate between said source region and said drain region, said channel region having a first end adjacent to said source region and a second, opposite end adjacent to said drain region, said channel region transporting carriers therethrough;
a gate electrode provide on said substrate so as to cover said channel region;
a pair of diffusion suppressing regions provided in said substrate respectively at said first and second ends of said channel region with a mutual separation from each other, each of said diffusion suppressing regions containing an electrically inert element and suppressing a diffusion of said dopant element therethrough.

5,591,995

BASE CELL FOR BICMOS AND CMOS GATE ARRAYS

Ching-Hao Shaw, Plano, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed May 10, 1994, Ser. No. 240,411
Int. Cl.[6] H01L *27/10*
U.S. Cl. 257—206 **26 Claims**



1. A base cell for a gate array, comprising:

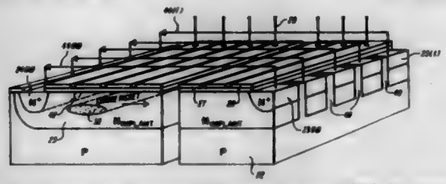
a. a plurality of CMOS sites arranged in at least one row, wherein said plurality of CMOS site comprises at least two small CMOS sites having transistors of a first gate width and at least two large CMOS sites having transistors of a second gate width in each of said at least one row, said second gate width being greater than said first gate width, and wherein said at least one row comprises at least two rows and the physical layout of the CMOS sites in a first of said rows is inverted from the physical layout of the CMOS sites in a second of said rows.

5,591,996

RECIRCULATING CHARGE TRANSFER MAGNETIC FIELD SENSOR

Geoffrey T. Haigh, Boxford, and Scott C. Munroe, Carlisle, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Mar. 24, 1995, Ser. No. 409,809
Int. Cl.[6] H01L *27/148;29/768*
U.S. Cl. 257—238 **38 Claims**



1. A device for producing an output voltage which is proportional to an applied magnetic field, said device comprising:

a charge injection region;

a charge exit region;

a charge transfer region;

means for propagating at least one isolated charge packet across said charge transfer region in a predetermined direction from said charge injection region to said charge exit region, said charge packet being subject to said applied magnetic field which is perpendicular to said charge transfer region so as to induce a resultant potential that is orthogonal to both said applied magnetic field and said predetermined direction, said resultant potential effecting a lateral redistribution of charge carriers in said packet;

means for recirculating said packet from said output region back to said input region in order to accommodate a continuation of said redistribution of charge carriers; and

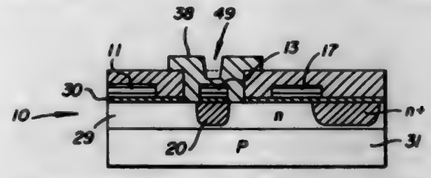
means for sensing said resultant potential as said output voltage.

5,591,997

LOW CAPACITANCE FLOATING DIFFUSION STRUCTURE FOR A SOLID STATE IMAGE SENSOR

Robert M. Guidash, Rush; Herbert J. Erhardt, and Eric G. Stevens, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,691
Int. Cl.[6] H01L *31/062;31/12*
U.S. Cl. 257—290 **19 Claims**



1. A solid state photo sensor having an output amplifier with a gate electrode provided on a substrate of a first conductivity type comprising:

a floating diffusion of a second conductivity type opposite the first conductivity type;

a contact region patterned such that an opening is formed that overlaps both the floating diffusion region and at least a portion of an outside edge of the gate electrode; and

means for creating an electrical connection between the floating diffusion and the gate electrode within the contact region.

5,591,998

SEMICONDUCTOR MEMORY DEVICE

Shinichiro Kimura; Naotaka Hashimoto, both of Hachioji; Yoshio Sakai, Tsukui-gun; Tokuo Kure, Nishitama-gun; Yoshifumi Kawamoto, Tsukui-gun; Toru Kaga, Urawa, and Eiji Takeda, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

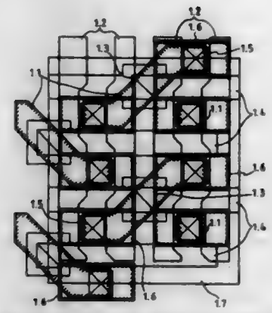
Continuation of Ser. No. 324,352, Oct. 17, 1994, which is a continuation of Ser. No. 72,482, Jun. 3, 1993, Pat. No. 5,374,576, which is a continuation of Ser. No. 805,383, Dec. 10, 1991, abandoned, which is a division of Ser. No. 475,148, Feb. 5, 1990, Pat. No. 5,140,389, which is a continuation-in-part of Ser. No. 287,881, Dec. 21, 1988, Pat. No. 4,970,564. This application May 17, 1995, Ser. No. 443,106
Claims priority, application Japan, Jan. 8, 1988, 63-1213; Feb. 28, 1989, 1-045400; Feb. 28, 1989, 1-045401
Int. Cl.[6] H01L *27/108*
U.S. Cl. 257—306 **22 Claims**

1. A semiconductor memory device having first and second word lines formed by a first level wiring layer over a surface of semiconductor substrate, a bit line formed by a second level wiring layer over said first-level wiring layer and first and second dynamic memory cells whose storage electrodes of capacitors are formed by a third level wiring layer over said second level wiring layer,

wherein said first dynamic memory cell has a first MOS transistor whose gate is coupled to said first word line;

wherein said second dynamic memory cell has a second MOS transistor whose gate is coupled to said second word line;

wherein said storage electrode of said capacitor of said first dynamic memory cell is coupled to a source or a drain of said first MOS transistor through a first capacitor contact hole;



wherein said storage electrode of said capacitor of said second dynamic memory cell is coupled to a source or a drain of said second MOS transistor through a second capacitor contact hole;

wherein said bit line is coupled to drains or sources of said first and second transistors through a bit line contact hole between said first word line and said second word line;

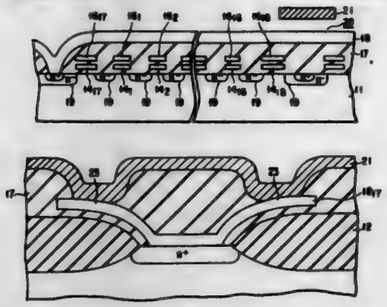
wherein said first and second word lines and said bit line are between said first capacitor contact hole and second capacitor contact hole.

5,591,999

ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY DEVICE WITH AN IMPROVED MEMORY CELL PATTERN LAYOUT

Masaki Momodomi; Junichi Miyamoto, and Toshiharu Watanabe, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 8, 1994, Ser. No. 257,188
Claims priority, application Japan, Jun. 8, 1993, 5-137739
Int. Cl.[6] H01L *29/788*
U.S. Cl. 257—315 **18 Claims**



1. A semiconductor memory device comprising:

a plurality of electrically rewritable memory cells connected in series to form NAND cells, each of said memory cells including a drain and a source;

one or more source lines coupled to the sources of said memory cells through a contact hole; and

bit lines arranged so as to avoid the contact hole, wherein said one or more source lines are arranged above said bit lines;

wherein said bit lines are formed of a first conductive layer and said one or more source lines are formed of a second conductive layer;

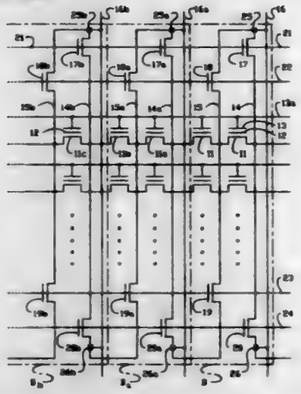
one or more isolated pattern portions to which said sources are connected and in which said bit lines of the first conductive layer are not formed, wherein said one or more isolated pattern portions are connected to said one or more source lines.

5,592,000

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE PROGRAMMABLE AND ERASABLE AT LOW VOLTAGE

Katsunori Onishi, and Fuchia Shone, both of Hsinchu, Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Jan. 25, 1995, Ser. No. 356,879
Int. Cl.[6] H01L *29/788;27/10;* **G11C** *11/34*
U.S. Cl. 357—315 **3 Claims**



1. A non-volatile semiconductor memory device comprising buried diffusion layers arranged in parallel on a semiconductor substrate, the buried diffusion layers used as source diffusion layers or drain diffusion layers and used as bit lines or source lines, word lines formed of polycrystalline silicon arranged in a direction perpendicular to said buried diffusion layers, a first insulating film formed in contact with said semiconductor substrate, floating gates on the first insulating film under which the semiconductor substrate includes channels, and a second insulation film between said floating gates and said word lines, such that memory cell transistors are arranged in a matrix form on said semiconductor substrate with adjacent pairs of said memory cell transistors on a single word line sharing a buried diffusion layer; the non-volatile semiconductor memory device characterized by:

a plurality of metal lines including one metal line arranged in parallel with said buried diffusion layers for every two buried diffusion layers to construct unit blocks;

a unit block including

first and second block transistors, having respective sources and drains, the metal line of said unit block connected to the drains of the first and second block transistors, the sources of the first and second block transistors connected to proximal ends of first and second buried diffusion layers in said unit block;

third and fourth block transistors, having respective sources and a drains, the drains of third and fourth block transistors connected to respective distal ends of said first and second buried diffusion layers in said unit block, the source of said third block transistor connected to said metal line of said unit block;

the source of said third block transistor of said unit block connected to the source of a fourth block transistor of a first adjacent unit block on one side of said unit block,

the source of said fourth block transistor of said unit block connected to the source of a third block transistor of a second adjacent unit block on another side of said unit block and to a metal line of the second adjacent unit block;

such that said buried diffusion layers of the unit blocks are connected in a bellows configuration via said first to fourth block transistors.

5,592,001

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

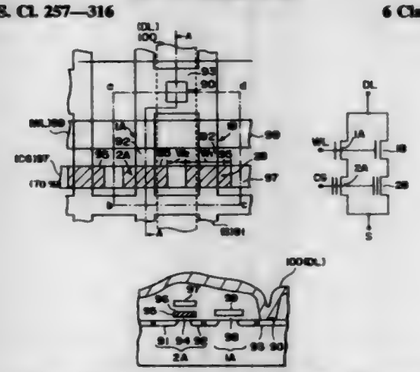
Masayuki Asano, Tokyo-To, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 247,481, May 23, 1994, abandoned, which is a continuation of Ser. No. 718,407, Jun. 24, 1991, abandoned. This application Apr. 5, 1996, Ser. No. 626,148

Claims priority, application Japan, Jun. 22, 1990, 2-164678

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **6 Claims**



1. A non-volatile semiconductor memory device, comprising:

a plurality of non-volatile memory cells arranged in a matrix to form a cell array, said memory cells comprising transistors having floating gates;

a plurality of data lines for transmitting data to the memory cells of respective columns of said cell array and receiving data therefrom;

a plurality of word lines for selecting the memory cells of respective rows of said cell array to connect selected memory cells to corresponding data lines;

a column decoder for selecting said data lines;

a row decoder for selecting said word lines;

a pair of memory cells of said plurality of memory cells selected by a corresponding one of said word lines and said data lines, said pair of memory cells comprising a plurality of transistors and connected to said corresponding one of said data lines by a common contact portion to constitute a one bit data memory unit for storing one bit data; said plurality of transistors of said pair of memory cells included in said one bit data memory unit being arranged in a parallel relationship with respect to each other; and

a plurality of select transistors reapectively provided for said plurality of transistors and which are turned ON and OFF by said corresponding one of said word lines and which are provided between said common contact portion and drains of said plurality of transistors of said pair of memory cells, said plurality of transistors of said pair of memory cells and said corresponding select transistors being arranged in a series relationship with respect to said corresponding data line, said plurality of select transistors being arranged in a parallel relationship with respect to each other, and gates of said each of said plurality of select transistors being commonly connected to said corresponding word line, drains of each of said plurality of select transistors being commonly connected to said common contact portion, and sources of each of said plurality of select transistors being respectively connected to drains of said corresponding transistors of said pair of memory cells,

wherein said each of said memory cells comprises a drain side diffused layer and a source side diffused layer formed in a manner that a channel region is positioned therebetween on a surface of a semiconductor substrate, a floating gate comprises a first polycrystalline silicon layer and a control gate comprises a second polycrystalline silicon layer formed close to said source side diffused layer and above said channel region,

and wherein said select transistors each have a select gate which comprises a third polycrystalline silicon layer at a position close to said drain side diffused layer and above said channel region.

5,592,002

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING REDUCED CURRENT CONSUMPTION

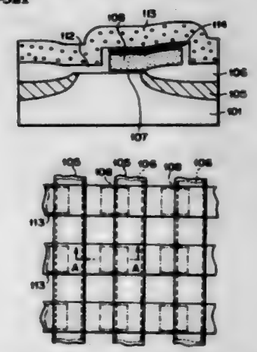
Kohji Kanamori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,858

Claims priority, application Japan, Sep. 29, 1994, 6-259094

Int. Cl.[6] H01L *29/68*

U.S. Cl. 257—321 **13 Claims**



1. A non-volatile semiconductor memory device comprising:

a semiconductor substrate of a first conduction type;

a source region and a drain region of a second conduction type formed in said semiconductor substrate and separated by first and second channel regions, said first channel being adjacent to said drain region and said second channel region being adjacent to said source region;

a first insulating film formed over said first channel region;

a floating gate formed over said first insulating film;

a second insulating film formed over said floating gate;

a control gate formed over said second insulating film;

a third insulating film formed over said second channel region;

a split gate, electrically connected to said control gate, formed over said third insulating film;

wherein relative thickness of said insulating films is ordered so that the thickness of said first insulating film is the smallest, the thickness of said third insulating film is the largest, and the thickness of said second insulating film is greater than the thickness of said first insulating film and less than the thickness of said third insulating film; and

wherein said non-volatile semiconductor memory performs a data writing operation such that electrons are drawn out from said floating gate to said drain region by a Fowler-Nordheim tunnelling action.

5,592,003

NONVOLATILE SEMICONDUCTOR MEMORY AND METHOD OF REWRITING DATA THERETO

Yasuo Sato, and Kikuzo Sawada, both of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

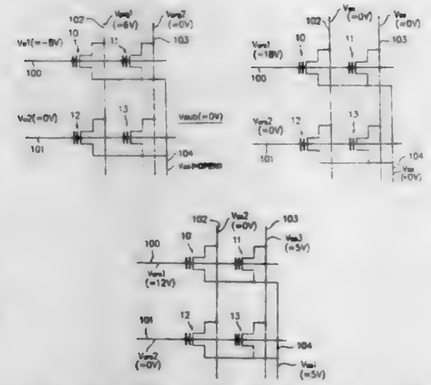
Continuation of Ser. No. 173,080, Dec. 27, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,160

Claims priority, application Japan, Dec. 28, 1992, 4-360028; Dec. 28, 1992, 4-360029

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—322 **1 Claim**

1. A method of writing and erasing data in a nonvolatile semiconductor memory device having a plurality of memory cells arranged in a matrix,



said plurality of memory cells being formed in a first well of a first conductivity type, said first well being formed in a second well of a second conductivity type which is formed in a semiconductor substrate of said first conductivity type, wherein each of said memory cells further includes a source which comprises (a) a first high impurity concentrated diffusion layer of said first conductivity type being formed in said first well, and (b) a second high impurity concentrated diffusion layer of said second conductivity type being formed in said first high impurity concentrated diffusion layer, said first high impurity concentrated diffusion layer having impurities of said first conductivity type with a higher concentration than said semiconductor substrate and said second high impurity concentrated diffusion layer having impurities of said second conductivity type with a higher concentration than said second well, a drain which comprises a third high inpurity concentrated diffusion layer of said second conductivity type being formed in said first well, said third high impurity concentrated diffusion layer having impurities of said second conductivity type with a higher concentration than said second well a channel region between said source and drain, an electric, charge holding layer disposed above said channel region, a control gate disposed above said channel region, said method comprising the steps of:

selecting a first memory cell from said plurality of memory cells;

applying a first voltage lower than a ground potential to a control gate of said first memory cell;

applying a second voltage higher than the ground potential to a drain of said first memory cell;

opening a source of said first memory cell to let it float;

maintaining said first and second voltages until a potential of said first memory cell reaches a write level due to extraction of negative electric charges from an electric charge holding layer of said first memory cell by utilizing a tunnel phenomenon derived from a difference between said first and second voltages;

selecting at least one second memory cell from said plurality of memory cells having a control gate electrically communicating with said control gate of said first memory cell;

applying a third voltage to a drain of said at least one second memory cell, said third voltage being lower than said second voltage and not sufficient to derive the tunnel phenomenon from a difference of said third voltage and said first voltage;

selecting at least one third memory cell from said plurality of memory cells having a drain electrically communicating with said drain of said first memory cell;

applying a fourth voltage to a control gate of said at least one third memory cell, said fourth voltage being higher than said first voltage and not sufficient to derive the tunnel phenomenon from a difference of said fourth voltage and said second voltage,

thereby information is written in said first memory cell,

selecting a fourth memory cell from said plurality of memory cells;

applying a fifth voltage to a control gate of said fourth memory cell and the ground potential to a source and drain of said fourth memory cell so that a tunnel current flows due to a potential difference between an electric charge holding layer of said fourth memory cell and a channel region of said fourth memory cell, whereby electrons are injected to said electric charge holding layer of said fourth memory cell from said channel region of said fourth memory cell to have a potential of said fourth memory cell above an erasure level,

thereby information written in said fourth memory cell is erased;

selecting a fifth memory cell from said plurality of memory cells; and

applying a sixth voltage to a control gate of said fifth memory cell and a seventh voltage higher than the ground potential to a source of said fifth memory cell, whereby hot electrons are injected to an electric charge holding layer of said fifth memory cell from a channel region of said fifth memory cell to have a potential of said fifth memory cell above the erasure level,

thereby information written in said fifth memory cell is erased.

5,592,004

SILICON NITRIDE FILM HAVING A SHORT ABSORPTION WAVELENGTH AND SURROUNDING CRYSTAL-LIKE GRAIN BOUNDARIES

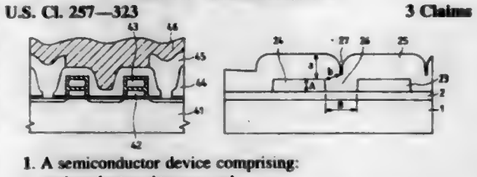
Muneo Tamura; Takeshi Yamauchi; Katuhide Niwa; Takeshi Fukazawa; Akira Kuroyanagi, and Tooru Yamaoka, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 28, 1995, Ser. No. 534,976

Claims priority, application Japan, Sep. 30, 1994, 6-261595; Sep. 6, 1995, 7-255635

Int. Cl.[6] H01L *29/06;29/78*

U.S. Cl. 257—323 **3 Claims**



1. A semiconductor device comprising:

a semiconductor element; and

a silicon nitride film covering the semiconductor element and being made of $Si_XN_YH_Z$, where X, Y, and Z denote atomic fractions of Si, N, and H respectively, the silicon nitride film relating to an optical absorption edge wavelength shorter than 254 nm, wherein a mean area of regions surrounded by crystal-like grain boundaries at a surface of the silicon nitride film is equal to 4.5×10^4 nm^2 or more.

5,592,005

PUNCH-THROUGH FIELD EFFECT TRANSISTOR

Brian H. Floyd, Sunnyvale; Fwu-Iuan Hshieh, Saratoga, and Mike F. Chang, Cupertino, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Filed Mar. 31, 1995, Ser. No. 415,009

Int. Cl.[6] H01L *29/78*

U.S. Cl. 257—331 **20 Claims**

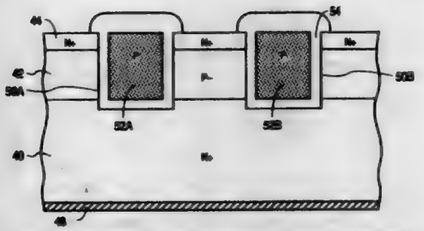
1. A semiconductor device, comprising:

a drain region of a first conductivity type and uniform doping concentration;

a body region of a second opposite conductivity type formed overlying and in direct contact with the drain region;

a source region of the first conductivity type formed overlying the body region; and

a conductive gate electrode extending into at least the source region and the body region, wherein the gate electrode is



polycrystalline silicon doped to the second conductivity type; wherein the device has three external independent electrodes to respectively the source region, the gate electrode, and the drain region.

5,592,006

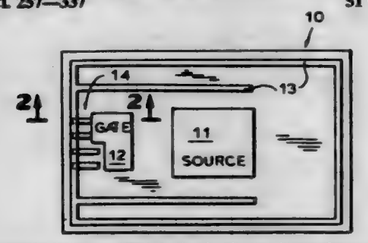
GATE RESISTOR FOR IGBT

Perry Merrill, El Segundo, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 242,436, May 13, 1994, abandoned. This application Sep. 19, 1995, Ser. No. 530,014

Int. Cl.[6] H01L *29/76;29/74;29/94;29/00*

U.S. Cl. 257—337 **51 Claims**



1. A MOS gate controlled device having an integral gate resistor with a predetermined resistance; said device comprising a silicon die having a predetermined power device junction pattern therein; said junction pattern including a channel region and a polysilicon gate electrode for controlling said channel region to control the turn on and/or off of said device; an insulating layer formed on one surface of said die; a metal layer formed atop said insulating layer and having an elongated metallic gate finger structure which is connected to said polysilicon gate electrode and having a metallic gate pad adapted to be contacted by an external gate lead; a plurality of thin sheets of resistive material defining a plurality of spaced resistors, at least a selected two of said spaced resistors each having one end connected to a portion of said gate finger through a respective first opening in said insulating layer and an opposite end connected to said gate pad through a respective second opening in said insulating layer, whereby the electrical connection from said gate pad to said polysilicon gate electrode includes the resistance of said at least selected two of said spaced resistors and whereby the predetermined resistance of said integral gate resistor is determined by the number of openings in said insulating layer connecting said spaced resistors in parallel with one another and to said gate finger and said gate pad.

5,592,007

MEMBRANE DIELECTRIC ISOLATION TRANSISTOR FABRICATION

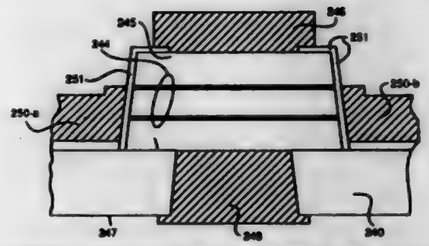
Glenn J. Leedy, 1061 E. Mountain Dr., Montecito, Calif. 93108

Continuation of Ser. No. 315,905, Sep. 30, 1994, which is a division of Ser. No. 865,412, Apr. 8, 1992, Pat. No. 5,354,695. This application Jun. 7, 1995, Ser. No. 484,829

Int. Cl.[6] H01L *23/48;27/00*

U.S. Cl. 257—347 **7 Claims**

1. A field effect transistor comprising:



a dielectric membrane having a surface tensile stress of 2 to 100 times less than the fracture strength of the dielectric and having a principal surface;

a semiconductor film formed on the principal surface of the membrane, the semiconductor film including at least three doped layers;

a contact to a first of the three doped layers formed through the membrane;

a contact to a second of the doped layers formed on a principal surface of the semiconductor film:

an insulating layer formed over an edge of the semiconductor film; and

a gate electrode formed overlying the insulating layer.

5,592,008

SEMICONDUCTOR DEVICE AND METHOD FOR FORMING THE SAME

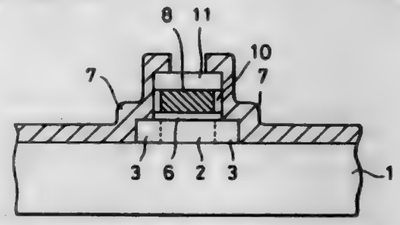
Shunpei Yamazaki, Tokyo, and Toshiji Hamatani, Kanagawa, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Division of Ser. No. 111,748, Aug. 25, 1993, Pat. No. 5,459,090, which is a continuation of Ser. No. 877,421, May 1, 1992, abandoned. This application Jul. 19, 1995, Ser. No. 504,226

Claims priority, application Japan, May 16, 1991, 3-174269

Int. Cl.[6] H01L *27/01*

U.S. Cl. 257—347 **7 Claims**



1. A complementary thin film transistor pair comprising:

a p-channel thin film transistor and an n-channel thin film transistor formed on an insulating surface of a substrate, (a) said p-channel thin film transistor comprising a first semiconductor layer formed on said surface and having source, drain and channel regions therein; a first gate insulating layer formed on said first semiconductor layer; and a first gate electrode formed on said gate insulating layer, (b) said n-channel thin film transistor comprising a second semiconductor layer formed on said surface and having source, drain and channel regions therein; a second gate insulating layer formed on said second semiconductor layer; and a second gate electrode formed on said second gate insulating layer,

wherein at least side surfaces of said gate electrodes are formed with an anodic oxide layer of said gate electrodes, and said source and drain regions are offset from the corresponding gate electrode in each of said transistors.

5,592,009

SEMICONDUCTOR DEVICE HAVING A FLOATING NODE THAT CAN MAINTAIN A PREDETERMINED POTENTIAL FOR LONG TIME, A SEMICONDUCTOR MEMORY DEVICE HAVING HIGH DATA MAINTENANCE PERFORMANCE, AND A METHOD OF MANUFACTURING THEREOF

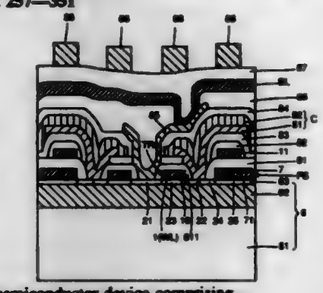
Hideto Hidaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,875

Claims priority, application Japan, Sep. 1, 1994, 6-208698; Feb. 6, 1995, 7-017899

Int. Cl.[6] H01L *27/01;29/06;21/265*

U.S. Cl. 257—351 **30 Claims**



1. A semiconductor device comprising

a semiconductor substrate,

a first region of a first type conductivity formed within said semiconductor substrate,

a second region of a second type conductivity formed within said semiconductor substrate, and adjacent to said first region,

a third region of the first type conductivity formed within said semiconductor substrate, and adjacent to said second region,

a fourth region of the second type conductivity formed within said semiconductor substrate, and adjacent to said first region, and

a node electrically floating, and formed on said first and second regions in common.

5,592,010

SEMICONDUCTOR DEVICE

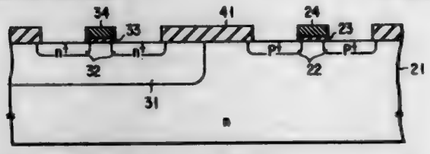
Masakazu Kakumu, Kawasaki, Japan; Kazutaka Nogami, Palo Alto, Calif., and Yuki Satoh, Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 71,305, Jun. 2, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,359

Claims priority, application Japan, Jun. 2, 1992, 4-141505

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—368 **17 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type having at least one MOSFET circuit which includes at least one p-channel MOSFET and at least one n-channel MOSFET, said MOSFET circuit having a plurality of operation modes, said MOSFET circuit being coupled to a signal line which provides a signal to said MOSFET circuit for switchably selecting a one of said plurality of MOSFET circuit operation modes in which said MOSFET circuit will operate; and

bias generating means for supplying a bias voltage to said semiconductor substrate of said first conductivity type and varying said bias voltage in accordance with said selected one of said plurality of operation modes of said MOSFET circuit.

5,592,011

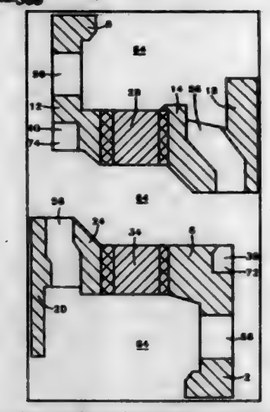
SINGLE LAYER THIN FILM TRANSISTOR STATIC RANDOM ACCESS MEMORY CELL

Ming-Tzong Yang, Hsin Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Division of Ser. No. 288,686, Dec. 14, 1994, Pat. No. 5,451,534. This application Jun. 23, 1995, Ser. No. 494,633

Int. Cl.[6] H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—368 **1 Claim**



1. A six transistor static random access memory cell formed on a monocrystalline semiconductor substrate with an overlaying gate oxide layer and a single surface polysilicon layer, each cell comprising:

first and second latch transistors (T3, T4), each latch transistor having a control electrode, and first and second current electrodes;

first and second transfer transistors (T1, T2), each transfer transistor having a control electrode, and first and second current electrodes;

first and second load transistors (T5, T6), each load transistor having a control electrode and first and second current electrodes;

said 1st and 2nd current electrodes (14, 18, 20, 24) each of said latch transistors (T3, T4) being impurity regions in the substrate and the said control electrode being in said polysilicon layer;

said 1st and 2nd current electrodes of the transfer transistors (T1, T2) being impurity regions (2, 6, 8, 12) in the substrate and the control electrode of said transfer transistor being in said polysilicon layer,

said 1st and second current electrode of said load transistor being formed in said polysilicon layer and said control electrode being an impurity region in the substrate,

a first current node comprised of first buried impurity region,

a second current node comprised of second buried impurity region,

a first buried conductive impurity strip comprised of said first current node (38), said first electrode of said first latch transistor, said control electrode (34) of second load transistor, first electrode (26) of said first transfer transistor;

a first polysilicon strip comprised of said first current electrode (26) of said first load transistor, the control electrode (16) of the second latch transistor and the first node (38);

a connection between said first current node (38) and said first current electrode (24) of first transfer transistor (T1) comprised of a first buried impurity strip;

a connection between said first current node (38) and said first current electrode (24) of first latch transistor (T3) comprised of second buried impurity strip (24, 34, 6, 38);

a connection between said first current node (38) and said control electrode (16) of second latch transistor (T4) comprised of first polysilicon strip which includes said control electrode of second latch transistor (T4);

a connection between said first, current node (38) and said control electrode (34) of second load transistor (T6) comprised of second buried impurity strip;

a connection between said first current node and said first current electrode (26) of first load transistor (T5) comprised of said a first polysilicon strip which includes said control electrode (16) of second latch transistor (T4);

a second buried conductive impurity strip comprised of said first electrode (14) of said second latch transistor(T4), said control electrode (28) of first load transistor (T5), and said first electrode (12) of second transfer transistor;

a second polysilicon strip comprised of said first current electrode (36) of said second load transistor (T6), the control electrode (22) of the first latch transistor (T3), and said second node (40);

a connection between said second current node (40) and said first current electrode (12) of second transfer transistor(T2) comprised of said second buried impurity strip;

a connection between said second current node (40) and said first current electrode (14) of second latch transistor (T4) comprised of second buried impurity strip;

a connection between said second current node and said control electrode (22) of first latch transistor (T3) comprised of said second polysilicon strip which includes said control electrode (22) of said first latch transistor (T3);

a connection between said second current node (40) and said control electrode (28) of first load transistor (T5) comprised of second buried impurity strip; and

a connection between said second current node (40) and said first current electrode (36) of second load transistor (T6) comprised of comprised of said second polysilicon strip which includes said control electrode (22) of first latch transistor (T3).

5,592,012

MULTIVALUED SEMICONDUCTOR READ ONLY STORAGE DEVICE AND METHOD OF DRIVING THE DEVICE AND METHOD OF MANUFACTURING THE DEVICE

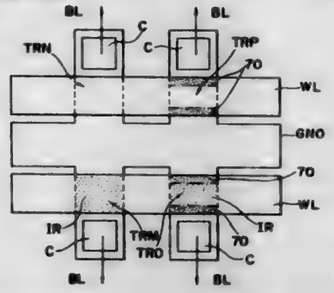
Yasushi Kubota, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 222,812, Apr. 5, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 558,977

Claims priority, application Japan, Apr. 6, 1993, 5-079907; Jun. 30, 1993, 5-162045

Int. Cl.[6] H01L *29/76;29/94*

U.S. Cl. 257—391 **12 Claims**



1. A multivalued read only data storage device, wherein memory cells arrayed in matrix form at intersections of word lines and bit lines each comprise a metal oxide semiconductor (MOS) transistor which has a combination of one of a plurality of predetermined channel impurity profiles and one of a plurality of predetermined effective channel lengths, each combination corresponding to a different one of said multivalued data, wherein the channel impurity profile and the effective channel length of each MOS transistor is independent of each other MOS transistor and wherein the combinations of the channel impurity profile and the effective channel length respectively represent one of at least four different data values.

5,592,013

SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING THE SAME

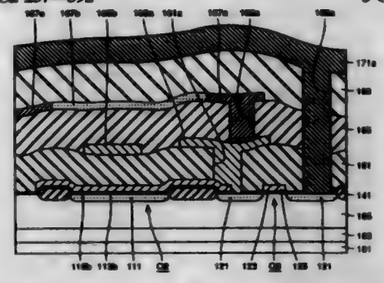
Hiroki Honda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 467,649

Claims priority, application Japan, Oct. 12, 1994, 6-246167

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—392 **5 Claims**



1. A semiconductor memory device having a memory cell area including static-type memory cells, and a peripheral circuit area, said device comprising:

a semiconductor substrate of a first conductivity type having a major surface;

a first impurity region of a second conductivity type formed within said memory cell area at the major surface of said semiconductor substrate;

a second impurity region of the first conductivity type which is formed within said first impurity region at the major surface of said semiconductor substrate and includes impurity of the first conductivity type at a first concentration at a position near the major surface of said semiconductor substrate;

first MIS transistors each having a pair of source/drain regions formed by being spaced out from each other by a prescribed distance within said second impurity region at the major surface of said semiconductor substrate, and a gate electrode layer formed on the area between said source/drain regions by being interposed with a gate insulating layer;

a third impurity region of the first conductivity type which is formed within said peripheral circuit area at the major surface of said semiconductor substrate and includes impurity of the first conductivity type at a second concentration which is lower than said first concentration at a position near the major surface of said semiconductor substrate; and

a second MIS transistor having a pair of source/drain regions formed by being spaced out from each other by a prescribed distance within said third impurity region at the major surface of said semiconductor substrate, and a gate electrode layer formed on the area between said source/drain regions by being interposed with a gate insulating layer,

said second and third impurity regions being connected electrically.

5,592,014

HIGH BREAKDOWN VOLTAGE SEMICONDUCTOR DEVICE

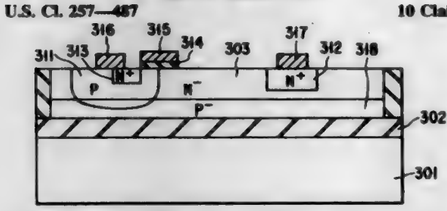
Hideyuki Funaki, Tokyo; Akio Nakagawa, Hiratsuka; Norio Yasuhara, Yokohama; Tomoko Matsudai, Tokyo; Yoshihiro Yamaguchi, Urawa, and Ichiro Omura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 85,056, Jul. 2, 1993, Pat. No. 5,438,220, which is a continuation-in-part of Ser. No. 829,214, Jan. 31, 1992, Pat. No. 5,343,067, which is a continuation-in-part of Ser. No. 642,565, Jan. 18, 1991, Pat. No. 5,241,210, which is a continuation-in-part of Ser. No. 236,746, Aug. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 161,102, Feb. 26, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 484,864

Claims priority, application Japan, Feb. 26, 1987, 62-043564; Jul. 29, 1987, 62-189420; Jul. 4, 1988, 63-166403; Jan. 31, 1991, 3-031720; Mar. 28, 1991, 3-090068; Apr. 16, 1991, 3-109605; Sep. 20, 1991, 3-268970; Jul. 2, 1992, 4-175777; Mar. 11, 1993, 5-050534; May 22, 1995, 7-122635

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—487 **10 Claims**



1. A high breakdown voltage semiconductor apparatus comprising:

a substrate having an insulating layer formed thereon;

a high resistance semiconductor layer of a first conductivity type formed on said insulating layer;

a base region of a second conductivity type formed selectively in a surface region of said high resistance semiconductor layer;

a source region of the first conductivity type formed in said base region;

a drain region formed in said high resistance semiconductor layer;

a gate electrode formed on a region between said source region and said drain region, with a gate insulating film interposed between said gate electrode and said region between said source region and said drain region;

a source electrode provided in contact with said base region and said source region; and

a drain electrode provided in contact with said drain region,

wherein a high resistance semiconductor region of the second conductivity type is provided between said insulating layer and said high resistance semiconductor layer of the first conductivity type, and said base region reaches said high resistance semiconductor region of the second conductivity type.

5,592,015

DIELECTRIC ISOLATED TYPE SEMICONDUCTOR DEVICE PROVIDED WITH BIPOLAR ELEMENT

Makio Iida, Ichinomiya; Tadashi Shibata, Toyokawa; Takayuki Sugisaka, Okazaki; Shoji Miura, Nukata-gun, and Toshio Sakakibara, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 207,738, Mar. 9, 1994, abandoned. This application Oct. 26, 1995, Ser. No. 547,740

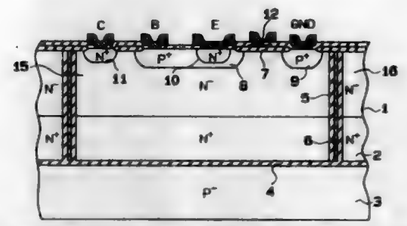
Claims priority, application Japan, Mar. 10, 1993, 5-049657

Int. Cl.[6] H01L *29/00;23/58*

U.S. Cl. 257—524 **21 Claims**

1. A main bipolar transistor comprising:

a silicon substrate;



an island disposed on said silicon substrate with an insulation film disposed therebetween, said island having a high concentration silicon layer of a first conductivity type and a low concentration silicon layer of the first conductivity type which is disposed on the high concentration silicon layer;

an insulation film formed on an outer peripheral portion of said island;

a base region of a second conductivity type formed in a surface of said low concentration silicon layer of said island as a base region of said bipolar transistor;

an emitter region of the first conductivity type formed within said base region as an emitter region of said bipolar transistor;

a collector region of the first conductivity type formed in the surface of said low concentration silicon layer of said island as a collector region of said bipolar transistor;

a diffusion region of the second conductivity type for extracting excessive carriers formed at the surface of said low concentration silicon layer of said island, a constant electric potential being applied to said diffusion region;

an emitter electrode formed on said emitter region as an emitter electrode of said bipolar transistor;

a base electrode formed on said base region as a base electrode of said bipolar transistor;

a collector electrode formed on said collector region as a collector electrode of said bipolar transistor; and

an extracting electrode formed on said diffusion region;

wherein said emitter region, said base region and said collector region collectively form said oipolar transistor;

said base region, said collector region and said diffusion region collectively form a parasitic transistor removing excessive charge carriers from said low concentration silicon layer of the first conductivity type to said extracting electrode when said bipolar transistor is in a saturation mode;

said diffusion region is a collector of said parasitic transistor; and

said diffusion region has a reference potential applied thereto so that when said bipolar transistor is on, said parasitic transistor is also on.

5,592,016

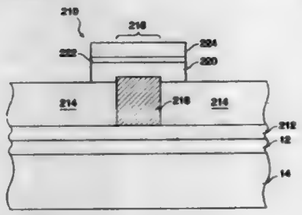
ANTIFUSE WITH IMPROVED ANTIFUSE MATERIAL

Ying Go, Palo Alto; John L. McCollum, Saratoga, and Abdelshafy A. Eltoukhy, San Jose, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed Apr. 14, 1995, Ser. No. 423,518

Int. Cl.[6] H01L *29/04;27/10;29/00*

U.S. Cl. 257—530 **15 Claims**



1. An antifuse comprising:

a first conductive electrode;

an antifuse layer disposed over said first conductive electrode, said antifuse layer comprising a solid hydrocarbon material stable at temperatures below about 600° C., having a defect density less than about 100 defects/cm^2, a breakdown field less than about 10 megavolts/cm, a dielectric constant lower than about 4.0, a resistivity of greater than about 10^6 ohm-cm; and

a second conductive electrode disposed over said antifuse layer.

5,592,017

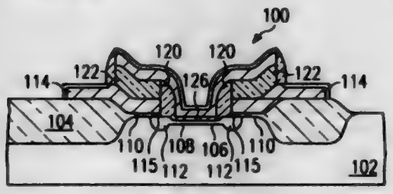
SELF-ALIGNED DOUBLE POLY BJT USING SIGE SPACERS AS EXTRINSIC BASE CONTACTS

F. Scott Johnson, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 409,558, Mar. 23, 1995. This application Jun. 7, 1995, Ser. No. 473,415

Int. Cl.^{6} H01L *29/73;29/737*

U.S. Cl. 257—554 **4 Claims**



1. A bipolar transistor comprising:

a collector region:

an intrinsic base region within said collector region;

a base link-up region within said collector region and self-aligned to said intrinsic base region;

a conductive spacer located above and in contact with said base link-up region, said conductive spacer comprising a material that may be selectively etched with respect to silicon;

a base electrode separated from said collector region by an insulator layer, said base electrode connected to said intrinsic base region through said conductive spacer and said base link-up region wherein said conductive spacer is located laterally adjacent said base electrode; and

an emitter region within said intrinsic base region.

5,592,018

MEMBRANE DIELECTRIC ISOLATION IC FABRICATION

Glenn J. Leedy, 1061 E. Mountain Dr., Montecito, Calif. 93108

Continuation of Ser. No. 315,905, Sep. 30, 1994, which is a division of Ser. No. 865,412, Apr. 8, 1992, Pat. No. 5,354,695. This application Jun. 7, 1995, Ser. No. 475,796

Int. Cl.^{6} H01L *29/84;29/96*

U.S. Cl. 257—619 **13 Claims**



1. A dielectrically isolated integrated circuit formed by a method comprising the steps of:

providing a substrate having a principal surface;

forming an etch barrier layer in the substrate parallel to the principal surface;

forming the integrated circuit on the principal surface wherein the integrated circuit includes at least one transistor;

depositing a low stress insulating membrane over the integrated circuit; and

etching away to the etch barrier layer a portion of the substrate from a backside of the substrate opposite the integrated circuit;

wherein the insulating membrane and remaining substrate containing the integrated circuit have a combined thickness less than about 50 μm.

5,592,019

SEMICONDUCTOR DEVICE AND MODULE

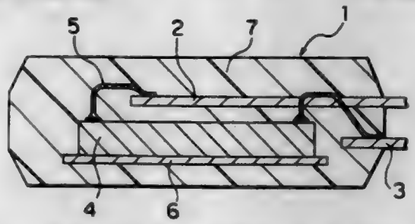
Tetsuya Ueda; Kiyomitsu Ono; Kou Shimomura, and Hideyuki Ichiyama, all of Kikuchi-gun, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,196

Claims priority, application Japan, Apr. 19, 1994, 6-080616

Int. Cl.^{6} H01L *23/495*

U.S. Cl. 257—666 **12 Claims**



1. A semiconductor device including first and second lead frames having respective inner leads and outer leads, a semiconductor chip having electrodes on a functional face and electrically connected to respective inner leads of the first and second lead frames, a resin encapsulating the semiconductor chip and the inner leads, the outer leads projecting outwardly from a Side of the resin, wherein the inner leads of the first lead frame extend along and are spaced from the functional face of the semiconductor chip and are electrically connected to electrodes on the semiconductor chip remote from the side of the resin where the outer leads extend outwardly, inner leads of the second lead frame are electrically connected to electrodes on the semiconductor chip located proximate the side of the resin where the outer leads extend outwardly, the outer leads of the first and second lead frames are substantially parallel to each other and are disposed in different, respective planes and, in a geometric projection of the outer leads of the first lead frame on the plane containing the outer leads of the second lead frame, the outer leads of the first lead frame overlap portions of the outer leads of the second lead frame.

5,592,020

SEMICONDUCTOR DEVICE WITH SMALLER PACKAGE HAVING LEADS WITH ALTERNATING OFFSET PROJECTIONS

Mitsuhiro Nakao, Yokohama; Toshimitsu Ishikawa, Kawaguchi, and Kazunori Hayashi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 219,717, Mar. 29, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 462,564

Claims priority, application Japan, Apr. 16, 1993, 5-090032

Int. Cl.^{6} H01L *23/48;23/495*

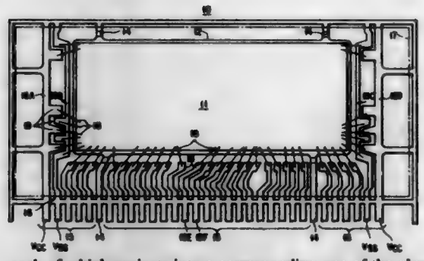
U.S. Cl. 257—666 **54 Claims**

1. A semiconductor device comprising:

a semiconductor chip having a plurality of sides and including at least first, second, third and fourth pads serving as outer electrodes;

a first lead member having a portion extending substantially parallel to one of said plurality of sides, said first lead member having a plurality of projections and recesses;

a second lead member located adjacent to said first lead member and farther from the outer electrodes than the first lead member, said second lead member having a plurality of projections



each of which projects into a corresponding one of the plurality of recesses of said first lead member and having a plurality of recesses, wherein each of the projections of said first lead member projects into a corresponding one of the plurality of recesses of said second lead member;

a first connection member for electrically connecting said first lead member to said first pad, said first connection member being connected to one of said projections of said first lead member;

a second connection member for electrically connecting said second lead member to said second pad, said second connection member traversing the first lead member and being connected to one of said projections of said second lead member;

a third connection member for electrically connecting said first lead member to said third pad, said third connection member being connected to another projection of said first lead member; and

a fourth connection member for electrically connecting said second lead member to said fourth pad, said fourth connection member traversing the first lead member and being connected to another projection of said second lead member.

5,592,021

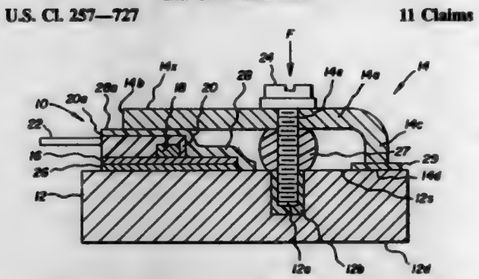
CLAMP FOR SECURING A POWER DEVICE TO A HEATSINK

Stephan J. Meschter, Endicott; Ricky L. Icenogle, Lisle; Glenn Trojnar, and William A. Peterson, both of Vestal, all of N.Y., assignors to Martin Marietta Corporation, King of Prussia, Pa.

Filed Apr. 26, 1995, Ser. No. 428,997

Int. Cl.^{6} H01L *23/34*

U.S. Cl. 257—727 **11 Claims**



1. A clamp for securing a power-dissipating device to a heatsink, comprising:

a unitary member having a first section adapted to bear against a selected first device of a plurality of devices, and a second section adapted to bear against a selected second device of said plurality of devices; and

fastening means adapted to exert a force on said member at a location between said first device and said second device, to cause said first section and said second section each to respectively urge said first device and second device firmly against said heatsink.

5,592,022

FABRICATING A SEMICONDUCTOR WITH AN INSULATIVE COATING

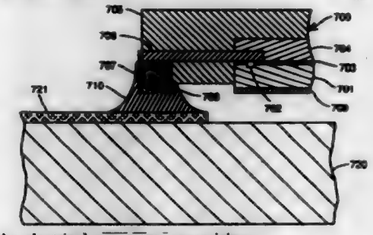
John G. Richards; Hector Flores, both of San Jose, and Wendell B. Sander, Los Gatos, all of Calif., assignors to Chip-Scale, Inc., San Jose, Calif.

Continuation of Ser. No. 45,584, Apr. 9, 1993, abandoned, which is a division of Ser. No. 898,832, May 27, 1992, Pat. No. 5,403,729. This application Jul. 5, 1994, Ser. No. 270,939

The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—735 **29 Claims**



1. An electrical apparatus, comprising:

(A) a first discrete region of semiconductor material having a bottom,

(B) a second discrete region of semiconductor material that includes an integrated circuit covered with a first insulating layer;

(C) a metallic interconnecting structure that electrically couples the first discrete region of semiconductor material to the integrated circuit of the second discrete region over the first insulating layer;

(D) a second insulating layer comprising an epoxy layer, wherein the metallic interconnecting structure is directly and physically sandwiched by the second insulating layer, wherein the first and second discrete regions are physically separated from each other by the second insulating layer;

(E) a first metal layer applied to the bottom of the first discrete region, wherein the first metal layer is physically separated from the second discrete region and does not contact the second discrete region.

5,592,023

SEMICONDUCTOR DEVICE

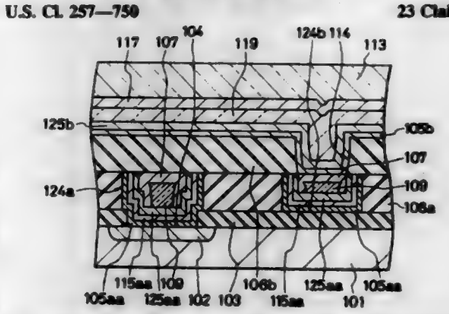
Noriaki Oda, Tokyo, Japan, assignor to NEC Corporation, Minato-ku, Japan

Division of Ser. No. 65,629, May 21, 1993, Pat. No. 5,479,053. This application Jun. 26, 1995, Ser. No. 494,538

Claims priority, application Japan, May 22, 1992, 4-138349

Int. Cl.^{6} H01L *23/48*

U.S. Cl. 257—750 **23 Claims**



1. A semiconductor device comprising a silicon substrate having a diffusion layer therein, a silicon dioxide insulator film over a surface of said substrate and said diffusion layer, a contact hole

formed in the insulator film at a position corresponding to the diffusion layer, a first interlayer insulator film formed on the insulator film, said first interlayer insulator film having a first opening formed therein, a first wiring formed in said first opening, the first wiring being formed by an insulator core and a surrounding conductor formed by a cladding made of four electroconductive films;

wherein an electric resistance of said wiring remains substantially constant due to a skin effect at an operating frequency of 80 GHz or higher.

5,592,024

SEMICONDUCTOR DEVICE HAVING A WIRING LAYER WITH A BARRIER LAYER

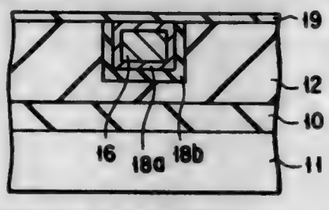
Hiroko Aoyama, Kawasaki; Kyoichi Segure, Yokohama; Hiromi Niiyama, Yokohama; Hitoshi Tamura, Yokohama; Hisataka Hayashi, Yokohama; Tomonori Aoyama; Goka Minamihobe, both of Kawasaki, and Tadashi Ijima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 28, 1994, Ser. No. 330,998

Claims priority, application Japan, Oct. 29, 1993, 5-272784; Mar. 15, 1994, 6-070156; Sep. 19, 1994, 6-249984

Int. Cl.[6] H01L *23/535;29/41;29/43*

U.S. Cl. 257—751 **5 Claims**



1. A semiconductor device comprising:

a semiconductor substrate in which a semiconductor element is formed,

an interlayer insulating film formed on said semiconductor substrate;

an insulating barrier layer, formed on said interlayer insulating film and having a thickness of 1 to 100 nm, for preventing diffusion of a metal contained in a wiring layer;

a conductive barrier layer, formed on said insulating barrier layer, for preventing diffusion of said metal; and

a wiring layer containing said metal on said conductive barrier layer,

said conductive barrier layer extending to cover a side surface of said wiring layer, and said insulating barrier layer extending to cover that portion of said conductive barrier layer which covers the side surface of said wiring layer.

5,592,025

PAD ARRAY SEMICONDUCTOR DEVICE

Minh-Hien N. Clark, and James W. Sloan, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

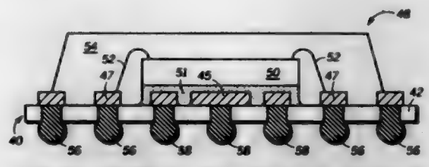
Continuation-in-part of Ser. No. 227,120, Jul. 19, 1994, Pat. No. 5,510,691, which is a continuation of Ser. No. 925,145, Aug. 6, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 349,272

Int. Cl.[6] H01L *23/48;23/04;23/52*

U.S. Cl. 257—774 **13 Claims**

1. A pad array semiconductor device comprising:

a substrate having a die mounting region on a first surface, a second surface, and a plurality of through-holes, only the first surface having a pattern of conductive metal traces which includes a plurality of solder pads overlying the plurality of through-holes, wherein the plurality of solder pads is larger in diameter than the plurality of through-holes;



a semiconductor die mounted on and directly affixed to the first surface of the substrate in the die mounting region with an electrically insulative adhesive;

a plurality of wire bonds electrically connecting the semiconductor die to the pattern of conductive metal traces;

a package body formed by an encapsulating material covering the semiconductor die and the plurality of wire bonds; and

a plurality of solder balls directly attached to the plurality of solder pads through the plurality of through-holes.

5,592,026

INTEGRATED STRUCTURE PAD ASSEMBLY FOR LEAD BONDING

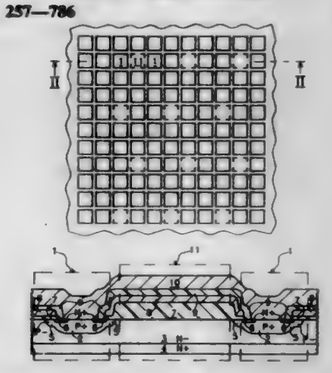
Ferruccio Frisina, S. Agata Li Battiati, and Marcantonio Mangiagli, Acireale, both of Italy, assignors to Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno, Catania, Italy

Filed Dec. 21, 1994, Ser. No. 361,801

Claims priority, application European Pat. Off., Dec. 24, 1993, 93830524

Int. Cl.[6] H01L *29/41;29/78*

U.S. Cl. 257—786 **29 Claims**



1. An integrated pad assembly disposed substantially within an active element of a semiconductor device, for bonding to an electrode of the active element of the semiconductor device, comprising a semiconductor substrate having a first sub-portion containing the active element of the semiconductor device, said first sub-portion being located in an upper portion of the substrate, and a second sub-portion wherein no active element of the semiconductor device is present, each of said first sub-portion and said second sub-portion being completely covered by a continuous metallization layer, and at least one layer of a dielectric material being partially disposed between a top surface of said second sub-portion and said metallization layer so that said continuous metallization layer disposed above the second sub-portion is connected to at least a portion of said electrode of said active element of said first sub-portion.

5,592,027

COMPACTING FLAMMABLE AND/OR EXPLOSIVE METAL WASTE

Patrick Jacq, Montigny le Bretonneux; Jean C. Masse, Jouy en Josas, and Isabelle Moriaes, Clamart, all of France, assignors to Compagnie Générale Des Matiéres Nucléaires, Velizy-Villacoublay, France

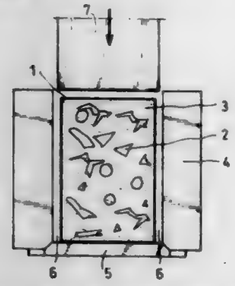
PCT No. PCT/FR94/00045, § 371 Date Jun. 28, 1995, § 102(e) Date Jun. 28, 1995, PCT Pub. No. WO94/15775, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 14, 1994, Ser. No. 481,297

Claims priority, application France, Jan. 14, 1993, 93 00279

Int. Cl.[6] G21C *21/00*

U.S. Cl. 264—0.5 **11 Claims**



1. A method of compacting, without danger of ignition and/or explosion, waste liable to ignite and/or explode when compacted, said method comprising:

loading a container with said waste;

injecting an inert gas into said container so that said container is saturated in said inert gas; and

compacting the container, which has been loaded with the waste and injected with the inert gas, thereby causing the container to develop cracks and the inert gas to be released from the container through the cracks.

5,592,028

WIND FARM GENERATION SCHEME UTILIZING ELECTROLYSIS TO CREATE GASEOUS FUEL FOR A CONSTANT OUTPUT GENERATOR

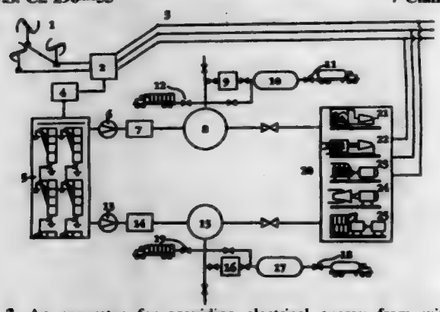
Declan N. Pritchard, Saudi Aramco, Box 8647, Dhahran 31311, Saudi Arabia

Continuation of Ser. No. 991,336, Dec. 16, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 313,769

Claims priority, application United Kingdom, Jan. 31, 1992, 9202053; Jun. 19, 1992, 9212977

Int. Cl.[6] F03D *9/02;* **F02C** *6/00*

U.S. Cl. 290—55 **7 Claims**



2. An apparatus for providing electrical energy from wind energy comprising:

a wind farm arranged to generate electrical power;

a switch means, including control means, operably connected to electrical power output from said wind farm;

a plurality of electrolysis cells operably connected to said switch means, each electrolysis cell being adapted to convert water into hydrogen and oxygen by electrolysis;

wherein said electrolysis cells are arranged into a plurality of modules, said modules being connected in parallel, each module comprising a series combination of said electrolysis cells;

means for measuring the voltage of said electrical power; means for monitoring the current density within said cells;

means for storing the hydrogen produced by said electrolysis; and

means to generate electricity from said stored hydrogen;

wherein said switch means is operable to apply said electrical power output across a particular number of said electrolysis cells and a particular number of said electrolysis modules;

said number of electrolysis cells being determined by said voltage, and said number of electrolysis modules being determined by said current density;

whereby the voltage across each of said electrolysis cells and the current density within each electrolysis cell is such that the cells operate with optimum efficiency.

5,592,029

POWER TAKEOFF CONTROL

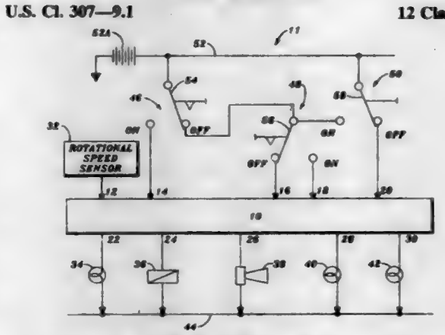
Jürgen Hollstein, and Gerd Redemann, both of Mannheim, Germany, assignors to Deere & Company, Moline, Ill.

Filed Jul. 10, 1995, Ser. No. 500,034

Claims priority, application Germany, Aug. 11, 1994, 44 28 368.7

Int. Cl.[6] B60K *26/00*

U.S. Cl. 307—9.1 **12 Claims**



1. A system for engaging and disengaging a PTO on a work vehicle, the work vehicle having

an operator's station,

a main switch positioned at the operator's station and switchable between OFF and ON positions,

a momentary push-button switch positioned remotely of the operator's station and switchable between OFF and ON positions, and

a voltage source coupled to the main and remote switches, the system comprising:

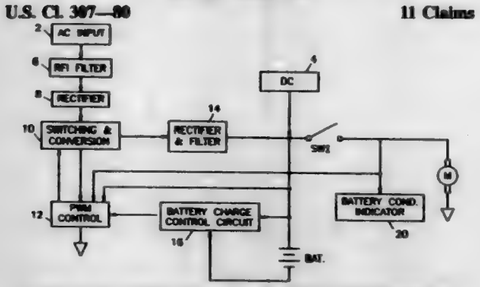
a selector switch positioned at the operator's station and coupled to the main and remote switches, the selector switch being switchable between OFF and ON positions to select, respectively, standard and remote modes of PTO operation that allow, respectively, the main and remote switches to engage and disengage the PTO; and

a control device coupled to the PTO and the switches to interpret combinations of the positions of the switches for engagement and disengagement of the PTO, and preventing activation of the remote mode of PTO operation when the PTO is engaged.

5,592,830
POWER SUPPLY FOR ENERGIZING DC LOAD FROM AC OR DC SOURCE

Carmeli Adahan, Netivel Am 11, Ramot Gimmel, 97552 Jerusalem, Israel

Filed Aug. 19, 1993, Ser. No. 109,020
Int. Cl.[6] H02B 1/24
U.S. Cl. 307—80 11 Claims



1. A power supply for energizing an electrical DC motor, comprising:

an AC socket for receiving a plug to be connected to an AC source;

rectifier means for rectifying the AC when the AC source is connected to the AC socket, and for supplying DC voltage to the DC motor, said rectifier means including a first rectifier circuit for rectifying the AC of the AC source, a switching circuit for converting the rectified output from the first rectifier circuit to AC of a frequency higher than the AC source, a transformer receiving the AC from said switching circuit, and a second rectifier circuit for rectifying the output of said transformer;

a battery compartment for receiving a rechargeable battery;

a charging circuit for charging a rechargeable battery, when received within said compartment, with rectified AC from said rectifier means; a manual switch connected to the rectifier means, the DC motor, and the battery, wherein said manual switch may be manually opened or closed;

and a control circuit effective:

(a) when the manual switch is closed and the AC socket is not connected to an AC source, to connect the battery to the motor;

(b) when the manual switch is closed and the AC socket is connected to an AC source, to connect the AC source to the motor and to disconnect the battery from the motor and from said charging circuit; and

(c) when the manual switch is open and the AC socket is connected to an AC source, to connect the battery to said charging circuit;

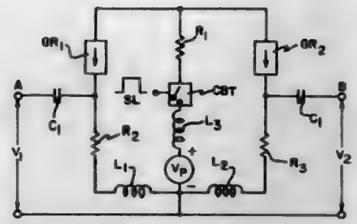
said control circuit including a controller which controls the duty cycle of said switching circuit to regulate the output thereof in accordance with the output of said second rectifier circuit, a comparator circuit which senses the voltage applied to the load device from the AC source, and a transistor circuit controlled by said comparator circuit to disconnect the battery from the DC motor when the comparator senses the presence of a DC voltage applied to the DC motor from the AC source.

5,592,831
FAST BIDIRECTIONAL ANALOG SWITCHING SYSTEM FOR HF PULSES OF HIGH INSTANTANEOUS POWER

Antonio Ramos Fernandez, and Pedro T. Sanz Sanchez, both of Madrid, Spain, assignors to Consejo Superior Investigaciones Cientificas, Madrid, Spain

Filed Sep. 28, 1994, Ser. No. 383,049
Claims priority, application Spain, Jan. 28, 1993, 9300154
Int. Cl.[6] H01P 1/10
U.S. Cl. 307—112 6 Claims

1. A fast bidirectional analog switching system for high frequency pulses of high instantaneous power, comprising:



an input node, an output node and a common node;

a main channel between said input and output nodes having ON and OFF states for switching high voltage pulses in both directions, said channel including a pair of rectifiers connected so as to be conductive in opposite directions;

a common branch extending between a point in said main channel and said common node, thereby defining a first secondary circuit between said input node and said common node and a second secondary circuit between said output node and said common node, each of said secondary circuits sharing a rectifier with said main channel;

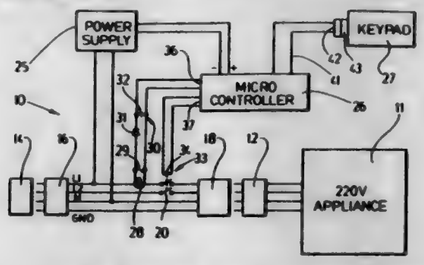
said common branch including, in series circuit, a voltage source of value V_p, a current switch, and impedance means for presenting a high impedance to pulses of either polarity with a peak voltage greater than V_p when the main channel is OFF; and

coupling means in said secondary circuits for providing efficient coupling in both the ON and OFF states of the main channel to high voltage pulse generators connected to said input node and to receivers connected to said output to said output node which exhibit impedance that is one of low and inclusive of an inductive component.

5,592,832
SECURITY POWER INTERRUPT

Daniel J. Keizer, 38 First Avenue, Schumacher, Ontario, Canada; Steven A. Lax, 193 Crestwood Road, Toronto, Ontario, Canada, and Robert K. Mayiwyk, Toronto, Canada, assignors to Daniel J. Keizer, Schumacher, and Steven A. Lax, Toronto, both of Canada

Continuation-in-part of Ser. No. 173,046, Dec. 27, 1993, Pat. No. 5,486,725. This application Nov. 15, 1995, Ser. No. 559,457
Int. Cl.[6] H01H 71/24
U.S. Cl. 307—116 9 Claims



1. A device for interrupting power to an electrical appliance, comprising

means for connecting the device to an electrical power supply,

means for supplying electrical power to the appliance,

means for switching the device between a mode in which power is supplied to the appliance and a mode in which power to the appliance is substantially interrupted,

manually operable enabling means detachably coupled to the device for activating the means for switching the device,

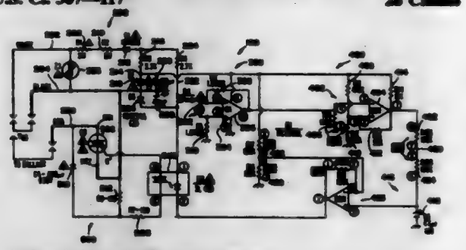
means for monitoring the enabling means to determine when the enabling means has been detached from the device, and

means for interrupting power to the appliance responsive to detachment of the enabling means.

5,592,833
PHOTOCELL SWITCHING CIRCUIT

John H. Gold, Binghamton, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 16, 1993, Ser. No. 167,865
Int. Cl.[6] G02B 27/00; H01H 35/00
U.S. Cl. 307—117 28 Claims



1. A switching circuit comprising:

means for detecting light to produce a light detection signal;

means for producing a control signal in response to said light detection signal, wherein said control signal producing means includes hysteresis for generating said control signal by using a first threshold to produce said control signal and a second threshold to discontinue said control signal;

means responsive to said control signal for gating energy from a power supply providing means to a load;

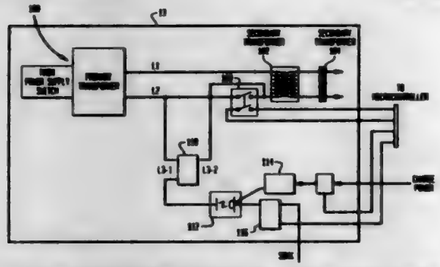
means for supplying power to components of said switching circuit, said power supplying means including a first power supply portion for supplying drive power to said energy gating means and a second power supply portion for supplying power to said control signal producing means; and

means for enclosing said energy gating means and said light detection means in a single unit enclosure.

5,592,834
POWER SHUT DOWN DELAY CIRCUIT FOR A POSTAGE METER MAILING MACHINE HAVING AN INK JET PRINTER SYSTEM

Benita J. Felmus, Westport; Edilberto I. Salazar, Brookfield, and Richard P. Schoonmaker, Wilton, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 29, 1995, Ser. No. 581,718
Int. Cl.[6] H01H 35/00
U.S. Cl. 307—130 5 Claims



1. An improved mailing machine for a postage meter mailing system, said postage meter mailing system having a meter vault including a controller, said controller of said meter vault having a communication port for receiving and transmitting data messages and for storing funds accounting data

a digital printer including a controller for controlling printing of said digital printer, said controller of said printer having a communication port for receiving and transmitting data messages,

a mailing machine including a controller for controlling operations of said mailing machine and having a communication port for receiving and transmitting data messages, a cleaning station, a printer transport for transporting said digital printer to and from said cleaning station,

a printer interface means for providing a communication path between said mailing machine, meter vault and said printer, wherein said improved mailing machine comprising:

sensor means for sensing the presents of said printer at said cleaning station and generating an output to said mailing machine controller in response,

a power supply having a main transformer and a plurality of secondary transformer in parallel electrical communication over first and second electrical lines,

a switch means having a first input and output stage and a second input and output stage, said first input and output stage interposed between said first electrical line between said main transformer and one of said second transformers,

said second input and output stage being in electronic communication with said mailing machine controller such that when said switch means is open a first voltage level is received by said mailing machine controller and when said switch means is closed a second voltage level is received by said mailing machine controller,

by-pass means having a first mode for providing an electrical by-pass alone said first electrical line around said first input and output stage of said switch when said switch means is open, and a second mode for preventing electrical by-pass alone said first electrical line when said switch means is closed,

means for placing said by-pass means in said second mode in response to initial opening of said switch means until said printer is positioned in said cleaning station and then causing said switch means to close.

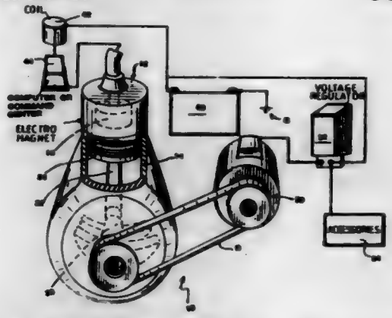
5,592,835

Patent Not Issued For This Number

5,592,836
ENGINE CONSTRUCTION

Raul M. Pino, 153 7th St., Bethpage, N.Y. 11714

Filed Jul. 18, 1994, Ser. No. 276,476
Int. Cl.[6] H02K 33/16
U.S. Cl. 310—24 1 Claim



1. An improved engine comprising:

at least one cylinder, said cylinder having walls and a cylinder head comprising an electromagnet forming a part of and completely closing off the top of said cylinder;

a piston disposed within said cylinder walls comprising a solid cylindrical permanent magnet, said magnet mounted for reciprocation within said cylinder, and a rod extending from said permanent magnet connected to drive a crankshaft;

power means for supplying electrical power to said electromagnet;

power control means for selectively switching the polarity of said electromagnet to alternatively attract and repel said permanent magnet causing said permanent magnet to reciprocate within said cylinder, so as to provide a positive force on said piston during both directions of movement, said rod rotating said crankshaft; and

belt means driven by said crankshaft to deliver power output of said engine.

5,592,837

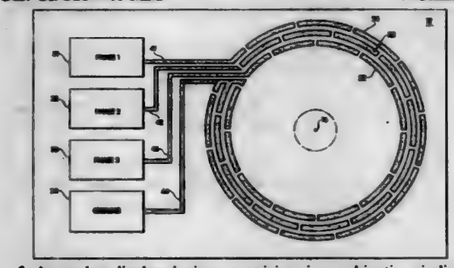
ANALOG DISPLAY DEVICE WITH MICRO-MOTOR DRIVE MEANS

Edward N. Sickafus, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 43,956, Apr. 5, 1993, Pat. No. 5,412,265. This application Sep. 20, 1993, Ser. No. 122,968

Int. Cl.[6] H02K *1/06;3/00;* G01D *7/02*

U.S. Cl. 310—40 MM **9 Claims**



1. An analog-display device comprising, in combination, indicator means for visibly displaying a position, comprising a moveable display member, and a planar micro-motor for driving the display member, the micro-motor comprising:

a substrate;

stator means for receiving electrical current to generate an electromagnetic field, comprising a plurality of electrically conductive bifilar micro-coils supported by the substrate and arrayed radially in a first plane; and

rotor means having a rotor body for rotation in response to electromagnetic fields generated by the micro-coils of the stator means, comprising a plurality of magnetic members arrayed in a second plane substantially parallel to the first plane;

wherein the display member of the indicator means is mounted for movement by rotation of the rotor body.

5,592,838

UNIT PROVIDING VENTILATION AND AN ELECTRICAL CONNECTOR INTENDED FOR AN ENVIRONMENTALLY SEALED MOTOR, AND AN ENVIRONMENTALLY SEALED MOTOR USING SUCH A UNIT

Arsène Gaspar, Mornagia, and Jean-Michel Pigeau, Bretigny sur Orge, both of France, assignors to Valeo Systemes d'Essuyage, Montigny-le-Bretonneux, France

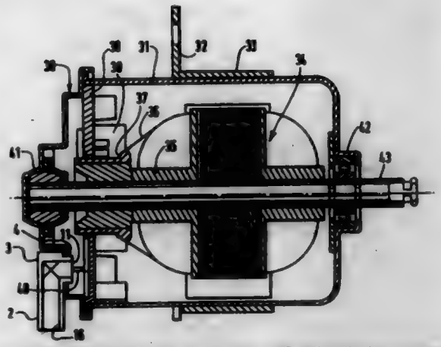
Filed Jun. 27, 1994, Ser. No. 266,002

Claims priority, application France, Jun. 30, 1993, 93 07984

Int. Cl.[6] H02K *11/00;5/10;5/22*

U.S. Cl. 310—71 **7 Claims**

1. A unit providing ventilation and an electric connector, intended for an environmentally sealed electric machine that has a



cover, comprising a plate having passages for electrical connecting pins to an electric circuit disposed inside said environmentally sealed machine, said plate being disposed on a cover of the machine, and incorporating an air passage aperture having baffle-forming means, in which the unit has at least two holes having different diameters formed therein, which holes open into and communicate with one another to form a baffle-forming means for ventilation, said two holes each having generally circular sections in which one of said holes is formed within the other of said holes and is in diametrical alignment therewith to enable the centers of said holes to be offset from each other.

5,592,839

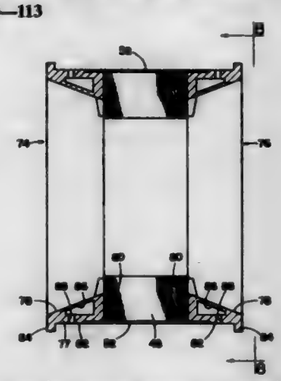
AC AND DC MOTOR-GENERATOR SET HAVING STATORS WITH ANNULAR END PLATE WATER COOLING CHANNELS

Richard F. Guardiani, Ohio Township, Allegheny County, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 23, 1990, Ser. No. 556,248

Int. Cl.[6] H02K *47/04;1/00;9/28*

U.S. Cl. 310—113 **17 Claims**



1. A stator core for a motor-generator set, comprising:

(a) means for supporting a plurality of windings along middle portions thereof, said supporting means having a pair of opposite lateral side surfaces;

(b) a pair of annular end plates disposed respectively at said opposite side surfaces of said supporting means; and

(c) means for connecting with said supporting means and said end plates to retain them in an assembled unit;

(d) each of said end plates having an annular body with an outer surface, an annular cooling water-carrying channel defined and enclosed in said body and extending continuously around the entire annular extent thereof, and at least one orifice extending through said body between said channel and said outer surface of said body.

5,592,840

ACOUSTIC WAVE RESONATOR FILTER

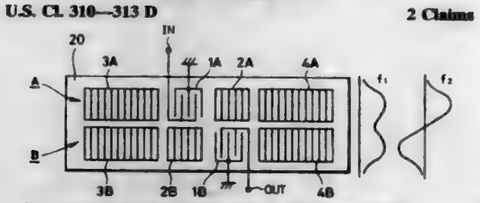
Yasushi Yamamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 110,997, Aug. 24, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,764

Claims priority, application Japan, Aug. 24, 1992, 4-223698

Int. Cl.[6] H03H *9/64*

U.S. Cl. 310—313 D **2 Claims**



1. A surface acoustic wave resonator filter comprising:

a substrate having a piezoelectric surface;

an input terminal and an output terminal;

a first longitudinal mode coupling type resonator disposed on said piezoelectric surface of said substrate and connected to said input terminal;

a second longitudinal mode coupling type resonator disposed on said piezoelectric surface of said substrate and connected to said output terminal;

wherein said first longitudinal mode coupling type resonator comprises:

a first interdigital electrode connected to said input terminal for converting an electrical input signal into travelling acoustic surface waves in a longitudinal direction of propagation;

a first dummy electrode, comprising electrically shorted interdigital electrodes, arranged mutually adjacent to said first interdigital electrode in said longitudinal direction of propagation;

a first reflector arranged on an outer side of said first interdigital electrode; and

a second reflector arranged on an outer side of said first dummy electrode;

said first longitudinal mode coupling type resonator being arranged to generate two longitudinal mode resonations;

and wherein said second longitudinal mode coupling type resonator comprises:

a second dummy electrode, comprising electrically shorted interdigital electrodes;

a second interdigital electrode connected to said output terminal for converting said travelling acoustic surface waves into an electrical output signal, said second interdigital electrode being arranged mutually adjacent to said second dummy electrode in said longitudinal direction of propagation;

a third reflector arranged on an outer side of said second dummy electrode; and

a fourth reflector arranged on an outer side of said second interdigital electrode;

said second longitudinal mode coupling type resonator being arranged to generate two longitudinal mode resonations;

and wherein said first longitudinal mode coupling type resonator and said second longitudinal mode coupling type resonator being acoustically coupled and arranged mutually adjacent in a transverse direction perpendicular to said direction of propagation.

5,592,841

ULTRASONIC MOTOR AND ELECTRONIC APPARATUS EQUIPPED WITH ULTRASONIC MOTOR

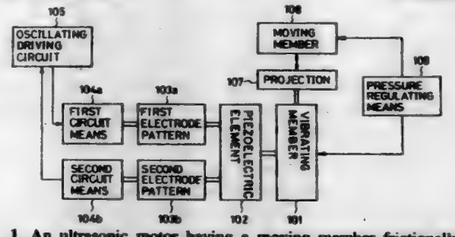
Masao Kasuga; Kenji Suzuki; Makoto Suzuki, and Mineko Suzuki, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan

Filed Oct. 18, 1994, Ser. No. 324,736

Claims priority, application Japan, Oct. 21, 1993, 5-263928; Sep. 6, 1994, 6-213011

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—316 **20 Claims**



1. An ultrasonic motor having a moving member frictionally driven by a vibrating wave generated by a piezoelectric element using elastic movement of the piezoelectric element, the ultrasonic motor comprising:

a piezoelectric element having first and second surfaces;

a plurality of electrode patterns disposed on the first surface of the piezoelectric element at nearly equal intervals in a multiple of four, wherein each pair of two neighboring electrode patterns corresponds to a region of the piezoelectric element having an alternately reversed direction of polarization;

first and second circuit means for short-circuiting every other one of the electrode patterns to form two electrode pattern groups;

a vibrating member disposed on the second surface of and electrically connected to the piezoelectric element;

a plurality of projections disposed on the surface of the vibrating member near every other one of the boundaries of the electrode patterns;

oscillation driving circuit means for detecting oscillation data from one of the electrode patterns short-circuited by the first circuit means, performing phase adjustment and amplification of the vibrating wave generated by the piezoelectric element, and inputting a driving signal to one of the electrode patterns short-circuited by the second circuit means;

a moving member movably disposed on the vibrating member; and

a pressure-regulating member for urging the moving member into pressure contact with the vibrating member.

5,592,842

PIEZOELECTRIC/ELECTROSTRICTIVE ACTUATOR

Yukihisa Takeuchi, and Masato Komazawa, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 860,127, Mar. 31, 1992, abandoned, which is a continuation of Ser. No. 551,176, Jul. 11, 1990, abandoned. This application Sep. 20, 1993, Ser. No. 123,196

Claims priority, application Japan, Jul. 11, 1989, 1-178747; Jan. 20, 1990, 2-11173

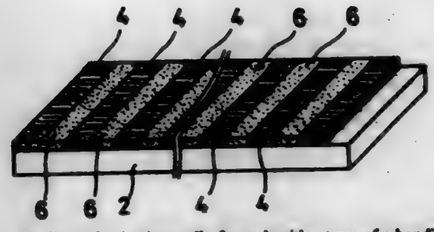
Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—328 **6 Claims**

1. A piezoelectric/electrostrictive actuator consisting essentially of:

a ceramic substrate having a major component consisting essentially of aluminum oxide, magnesium oxide, zirconium oxide, aluminum nitride, or silicon nitride, and having a thickness of not greater than 30 μm and a bending strength of at least 1500 kgf/cm^2;

a plurality of electrodes comprising a metal, an alloy, an intermetallic compound, or an electrically conductive ceramic in



the form of strips integrally formed, without use of a bonding adhesive, on at least a portion of at least one surface of the substrate by one of a thick-film forming technique and a thin-film forming technique, such that said strips are spaced from each other in a direction parallel to said at least one surface; and

a piezoelectric/electrostrictive portion comprising a piezoelectric/electrostrictive ceramic material which is integrally formed without use of a bonding adhesive, by a thick-film forming technique, between the adjacent strips of the electrodes in said direction, and in contact with said adjacent strips, said piezoelectric/electrostrictive portion producing a flexural displacement or force due to at least a longitudinal mode of converse piezoelectric effect or electrostrictive effect upon application of a voltage between said adjacent strips of the electrodes, said piezoelectric/electrostrictive ceramic material having a major component which consists essentially of at least one material selected from the group consisting of: lead zirconium titanate, lead magnesium niobate, lead nickel niobate, lead manganese niobate, lead antimony stannate, lead titanate, barium titanate, lead niobate, barium niobate and a mixture thereof.

5,592,043

CATHODE INCLUDING A SOLID BODY

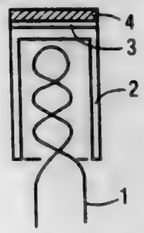
Georg Gürtner, Aachen, and Hans Lydtin, Stolberg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 375,283, Jan. 18, 1995, abandoned, which is a continuation of Ser. No. 25,691, Mar. 3, 1993, abandoned. This application Apr. 3, 1996, Ser. No. 625,689

Claims priority, application Germany, Mar. 7, 1992, 42 07 220.4

Int. Cl.[6] H01J 1/14

U.S. Cl. 313—346 DC **23 Claims**



1. A cathode comprising a solid body which solid body comprises metallic constituents selected from the group consisting of W, Ni, Re, and Pt and oxidic constituents selected from the group consisting of BaO, CaO, Al_2O_3, Sc_2O_3, SrO, ThO_2 and La_2O_3, characterized in that the structure of said metallic and oxidic constituents and the volume percent Vm of the metallic constituents relative to the overall volume of the solid body are chosen to be such that the resistivity of the solid body ρ has a value of $\rho_0 \cdot 10^{-4} > \rho > \rho_\infty \cdot 10^{-2}$, wherein ρ_0 and ρ_∞ are the resistivities, defined at 20° C., of the pure oxidic constituents and the pure metallic constituents, respectively, each of said constituents being a particle or grain.

5,592,044

COLOR CATHODE RAY TUBE AND METHOD OF MANUFACTURING SHADOW MASK

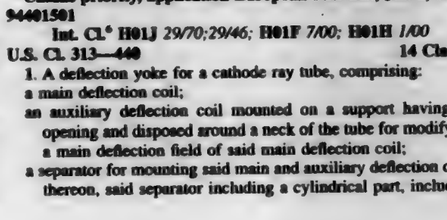
Yasuhiro Ohtake; Seiji Sago; Mitsuaki Yamazaki, all of Fukuyama, and Sachiko Murmamoto, Tatebayashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 26, 1995, Ser. No. 451,814

Claims priority, application Japan, May 27, 1994, 6-113232

Int. Cl.[6] H01J 29/07

U.S. Cl. 313—403 **5 Claims**



1. A color cathode ray tube comprising:

a face panel having a phosphor screen formed on an inner surface thereof;

an electron gun arranged to oppose the phosphor screen, for emitting electron beams toward the phosphor screen; and

a shadow mask arranged between the electron gun and the face panel to oppose the phosphor screen and having a large number of electron beam apertures which are formed almost all over the shadow mask and through which the electron beams pass;

the shadow mask including a first surface opposed to the electron gun, a second surface opposed to the phosphor screen, and a mask center aligned with a tube axis of the cathode ray tube,

each of the electron beam apertures having a small opening open to the first surface of the shadow mask and a large opening open to the second surface of the shadow mask and communicating with the small opening, the large opening having a center axis and a diameter larger than that of the small opening, and

wherein a wall surface of the shadow mask which defines the large opening of each of the electron beam apertures located at a peripheral portion of the shadow mask includes a bulged portion which is located on the opposite side of the mask center with respect to the center axis of the large opening and which is bulged outward in the radial direction.

5,592,045

AUXILIARY COIL FASTENER IN A DEFLECTION YOKE

Alain Dessot, St. Saveur; Christophe Mathey, and Alain Vougny, both of Dijon, all of France, assignors to Thomson Tubes & Displays, S.A., France

Filed Jun. 5, 1995, Ser. No. 461,896

Claims priority, application European Pat. Off., Jul. 1, 1994, 94401501

Int. Cl.[6] H01J 29/70;29/46; H01F 7/00; H01H 1/00

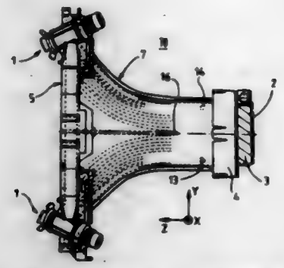
U.S. Cl. 313—440 **14 Claims**

1. A deflection yoke for a cathode ray tube, comprising:

a main deflection coil;

an auxiliary deflection coil mounted on a support having an opening and disposed around a neck of the tube for modifying a main deflection field of said main deflection coil;

a separator for mounting said main and auxiliary deflection coils thereon, said separator including a cylindrical part, including



at least a stud that projects from a wall of said separator and said cylindrical part being provided with a positioning arrangement that cooperates with said opening for positioning said auxiliary coil against a wall of said separator.

5,592,046

ELECTRONIC GUN FOR COLOR CATHODE-RAY TUBE

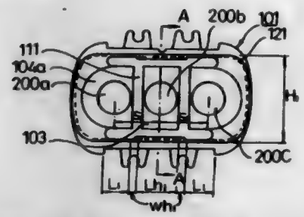
Won H. Kim, Kyungsangbuk-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 28, 1993, Ser. No. 127,528

Claims priority, application Rep. of Korea, Sep. 30, 1992, 17927/1992; Oct. 29, 1992, 20079/1992; Aug. 2, 1993, 14947/1993

Int. Cl.[6] H01J 29/50;29/46

U.S. Cl. 313—447 **11 Claims**



3. An electron gun for a color cathode-ray tube having axial, horizontal and vertical directions, said directions being substantially perpendicular to one another, comprising:

means for generating a plurality of electron beams, said beams representing respective color components for forming a color image; and

a pair of electrodes spaced axially, said pair of electrodes being substantially symmetrical in the axial direction about a horizontal line located midway between the electrodes, and each electrode being substantially symmetrical in said horizontal direction, said pair of electrodes providing passages for said plurality of electron beams, each of said electrodes further including an envelope having a rim adjacent a common opening, said rim surrounding said plurality of electron beams and defining said common opening; and

a control electrode plate, located within an envelope, having upper and lower beam members connected by a pair of spaced apart column members so as to form a center opening having top and bottom sides and left and right sides, respectively, and so as to form two outer openings, one on each opposite side in the horizontal direction from said center opening, said column members each having a bend near an end thereof where attached to said upper and lower beam members such that a middle portion of the center opening formed by said column members is located at a first axial position which is different from axial positions of the top and bottom sides of the center opening.

5,592,047

FLAT GLOW DISCHARGE LAMP

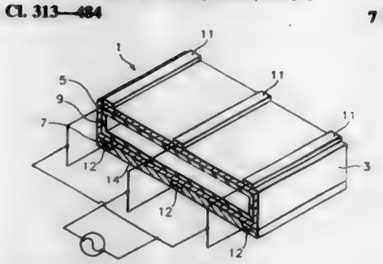
Duk-il Park, Seoul, and Sang-mook Kim, Kyunggi-do, both of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Jan. 30, 1995, Ser. No. 380,964

Claims priority, application Rep. of Korea, Oct. 25, 1994, 94-27880 U

Int. Cl.[6] H01J 65/04;61/92

U.S. Cl. 313—484 **7 Claims**



1. A flat lighting device comprising:

a discharge tube having opposing first and second flat faces and two side faces disposed between said first and second flat faces, the first and second faces each comprising a larger surface area than the surface area of each of the side faces, said discharge tube being filled with rare gases or gaseous mercury; and

a plurality of elongated parallel electrodes disposed on the first flat face of the discharge tube, and another plurality of elongated parallel electrodes disposed on the second flat face of the discharge tube, wherein electric discharge occurs between adjacent said electrodes throughout the length of the electrodes when electricity is applied to the electrodes.

5,592,048

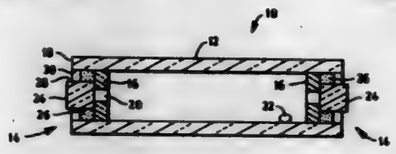
ARC TUBE ELECTRODELESS HIGH PRESSURE SODIUM LAMP

George C. Wei, Weston; Walter P. Lapatovich, Marlborough, both of Mass., and Paul H. Ingalls, Penacook, N.H., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Aug. 18, 1995, Ser. No. 516,885

Int. Cl.[6] H01J 17/20;61/12;1/62;63/04

U.S. Cl. 313—570 **6 Claims**



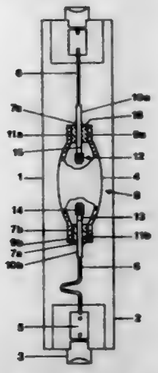
1. An electrodeless arc tube for a high pressure sodium discharge lamp comprising: a substantially tubular, translucent body formed from a material comprising sintered polycrystalline alumina, said body having an inside diameter and an outside diameter and a given length; a fill comprising sodium and xenon within said body; and at least one end-seal for said body, said end-seal comprising a first alumina disc sealed within said inside diameter by compression, said first disc being spaced inwardly from an end of said body and having a substantially centrally located aperture therein; and a second alumina disc sealing said aperture, said second disc being bonded to said first disc and to the inner wall of said body by a sealing frit.

5,592,049

HIGH PRESSURE DISCHARGE LAMP INCLUDING DIRECTLY SINTERED FEEDTHROUGH

Juergen Heider, Munich; Stefan Juengst, Zorneding, both of Germany; Koichiro Maekawa, Ichinomiya, and Osamu Asano, Hashima, both of Japan, assignors to Patent-Treuhand-Gesellschaft fuer Elektrische Gluehlampen mbH, Munich, Germany, and NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 146,969, Nov. 3, 1993, abandoned.
This application Nov. 6, 1995, Ser. No. 553,827
Claims priority, application European Pat. Off., Feb. 5, 1993, 93101831
Int. Cl.[6] H01J 17/18;61/36
U.S. Cl. 313—625 21 Claims



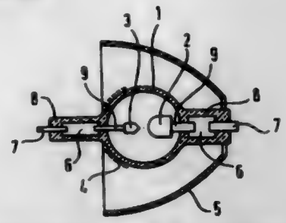
1. In a high-pressure discharge lamp, an alumina ceramic discharge vessel (8) formed with two tubular ends (9),
an ionizable fill including a halogen containing component in the discharge vessel;
two electrode systems (12) in the discharge vessel;
a ceramic member, shaped in form of a plug (11) defining an outer surface facing away from the interior of the discharge vessel, said plug being formed with an opening closing off each tubular end;
a metallic current feedthrough of circular cross-section which is connected to a respective electrode system gas-tightly disposed in the opening of each plug,
wherein
at least at a first end the feedthrough (10*a*) is pin-like,
is of a metal which has a thermal expansion coefficient which is smaller than the thermal expansion coefficient of the ceramic vessel (8);
has a diameter smaller than 550 μm; and
is of the metals of the group consisting of molybdenum, tungsten, rhenium, an alloy of molybdenum, an alloy of tungsten, and an alloy of rhenium;
at least one of (11*a*) the ceramic plugs consists of a composite material whose thermal expansion coefficient lies between the thermal expansion coefficients of the vessel ceramic and of the feedthrough metal;
wherein said feedthrough (10*a*) and the respective plug (11*a*) comprise
a direct sinter connection between the outside of the feedthrough and the inside of the opening in the plug, and hence forming a tight connection devoid of sealing material between the outside of the feedthrough and the opening of the plug,
whereby, the respective plug (11*a*) having undergone shrinking during sintering, presses against and tightly engages the feedthrough (10*a*); and
wherein a ceramic sealing material (7*a*) is provided, covering only at least a portion of the outer surface area surrounding the feedthrough (10*a*) at the outer surface (18) of the respective plug the surface of the feed through adjacent said outer surface of the respective plug, said ceramic sealing material (7*a*) additionally sealing the feedthrough (10*a*) with respect to the plug.

5,592,050

METAL HALIDE LAMP

Tadatoshi Higashi, Tokyo, and Tomoyoshi Arimoto, Tatsuno, both of Japan, assignors to Ushiodenki Kabushiki Kaisha, Japan

Filed Apr. 20, 1995, Ser. No. 425,102
Claims priority, application Japan, Apr. 20, 1994, 6-104490
Int. Cl.[6] H01J 17/20;61/12
U.S. Cl. 313—637 1 Claim



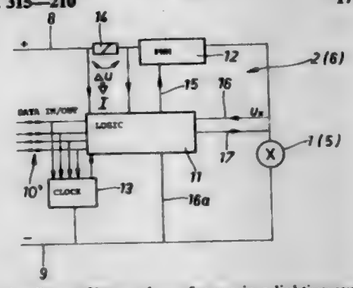
1. Metal halide lamp of the short arc type having an emission tube with a high load output on a tube wall thereof of more than 35 W/cm^2,
wherein an inert starting gas, mercury, rare earth halides, cesium halide, and from 0.8 micromole/cm^3 of tube internal volume to 8.0 micromoles/cm^3 of tube internal volume of indium halide are encapsulated within the emission tube; wherein an arc axis between electrodes of the emission tube is essentially horizontal; wherein said electrodes are connected to a source of direct current; and wherein iodine and bromine are contained in the halogen of said halides, and wherein a ratio of iodine atoms to total halogen atoms is at least equal to 50%.

5,592,051

INTELLIGENT LAMP OR INTELLIGENT CONTACT TERMINAL FOR A LAMP

Heikki Korkala, Juurikantie 22, Oulunsalo, Finland

Continuation of Ser. No. 244,059, Jul. 11, 1994, abandoned.
This application Aug. 24, 1995, Ser. No. 524,119
Claims priority, application Finland, Nov. 13, 1991, 915346
Int. Cl.[6] H05B 37/02
U.S. Cl. 315—210 17 Claims



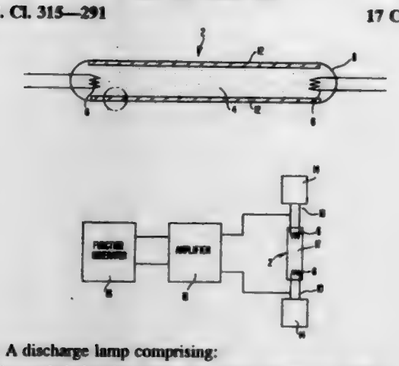
1. An intelligent filament lamp for use in a lighting system of a vehicle, comprising:
a plurality of individually controlled lamps linked in a common power-supply circuit, each of said lamps having their own associated electronic control elements;
a single common code conductor which is connected to each of said electronic control elements;
an operation control device for transmitting a desired operation control signal over said single common code conductor to the electronic control elements associated with each lamp, said elements selectively reacting or failing to react to various control signals;
wherein each lamp and electronic control element pair provides a single replaceable component which is fitted with means for identifying a predetermined message included in the control signal and with means for switching on the lamp upon identification of said predetermined message;
wherein said means for identifying comprises a logic circuit and a synchronizing clock;
wherein said means for switching comprises the logic circuit and a pulse-width modulator.

5,592,052

VARIABLE COLOR TEMPERATURE FLUORESCENT LAMP

Jakob Maya, Brookline, and Jagannathan Ravi, Bedford, both of Mass., assignors to Matsushita Electric Works R&D Laboratory, Woburn, Mass.

Filed Jun. 13, 1995, Ser. No. 490,078
Int. Cl.[6] G05F 1/00
U.S. Cl. 315—291 17 Claims



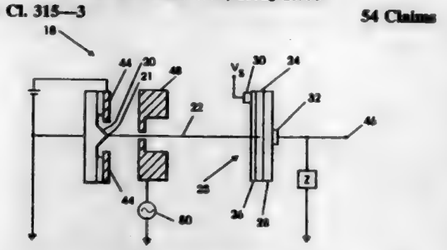
1. A discharge lamp comprising:
(a) a sealed chamber with at least one transparent wall,
(b) a mixture of rare gas and mercury contained within the chamber,
(c) a multi-phosphor coating on said wall comprising
(i) a first phosphor covering a first portion of the chamber wall,
a second phosphor covering a second portion of the chamber wall, said first and second phosphors having different visible emission spectra,
(d) means defining two electrodes extending into the chamber through said walls with external electrical contacts,
(e) means for driving an electrical signal from one contact through the chamber to the second contact, where said electrical signal causes the mercury to emit radiation, and where the phosphors absorb said radiation and emit visible light in response thereto,
(f) means for controlling the electrical signal such that the phosphors are preferentially excited such that the phosphors emit said different spectra of visible light responsive to said means for controlling, and wherein
(g) said means for controlling comprise means for selectively establishing at least two distinct wavelength levels or bands of exciting radiation of the mercury corresponding to separate excitation frequencies of phosphors to cause them to emit said different spectra of light, the different spectra comprising altered combinations of intensities of spectral lines compared to each other.

5,592,053

DIAMOND TARGET ELECTRON BEAM DEVICE

Bradley A. Fox, Cary; Jeffrey T. Glass, Apex; David L. Driefus, Cary, and Luka Lojk, Chapel Hill, all of N.C., assignors to Kobe Steel USA, Inc., Research Triangle Park, N.C.

Filed Dec. 6, 1994, Ser. No. 349,794
Int. Cl.[6] H03F 3/54; H01J 25/00
U.S. Cl. 315—3 54 Claims



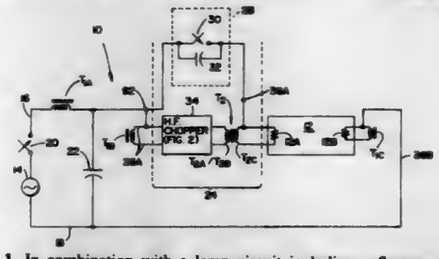
1. An electron beam device comprising:
electron beam generating means for generating an electron beam;
a diamond layer positioned downstream from the electron beam and oriented so that the electron beam irradiates a first face thereof so that said diamond layer defines an electron beam target, said diamond layer having a conductance responsive to the electron beam, and said diamond layer comprising a first degeneratively doped surface portion on the first face;
an electrically conductive layer on a portion of said first degeneratively doped surface portion of said diamond layer defining a first electrical contact therewith; and
a second electrical contact on said diamond layer;
wherein said first degeneratively doped surface portion of said diamond layer is positioned in the path of the electron beam, and said electrically conductive layer defines an exposed portion of said first degeneratively doped surface portion in the path of the electron beam.

5,592,054

FLUORESCENT LAMP BALLAST WITH SELECTABLE POWER LEVELS

Louis R. Nerone, Brecksville; Edward E. Hammer, Mayfield Village, and Mario Sanchez, Cleveland, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

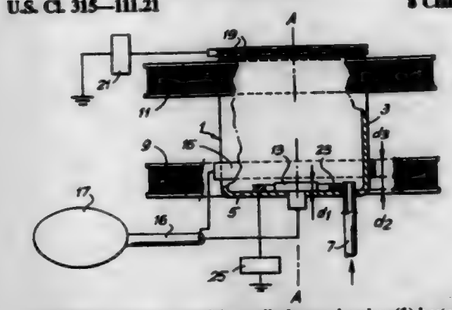
Filed Sep. 6, 1995, Ser. No. 523,858
Int. Cl.[6] H05B 39/00
U.S. Cl. 315—105 18 Claims



1. In combination with a lamp circuit including a fluorescent lamp having first and second cathodes with resistive-heating filaments each spaced at a respective end of a lamp tube; first and second power leads for respectively connecting said cathodes to an a.c. power source whose power can be selectively enabled and interrupted by a main power switch; and a ballast inductor being in serial circuit with one of said power leads and including a plurality of filament-heating windings for supplying power to said cathodes; a power-level selection circuit interposed between a first cathode and a filament-heating winding, comprising:

(a) a power-receiving circuit coupled to said filament-heating winding to receive power therefrom;
(b) a filament-supply circuit for continuously supplying available power to said first cathode; and
(c) a selectable-impedance circuit serially coupled between said first power lead and said first cathode and being responsive to a predetermined duration of interruption of power from said a.c. source to said power leads for selecting a different impedance of said selectable-impedance circuit, thereby selecting a different power level of said lamp.

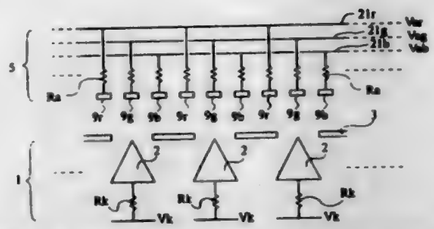
5,592,055
RADIO-FREQUENCY PLASMA SOURCE
Marco Capacci, Sigau, and Giovanni E. Neci, Bagno a Ripoli, both of Italy, assignors to Proel Tecnologie S.p.A., Florence, Italy
Filed Oct. 17, 1995, Ser. No. 544,018
Claims priority, application Italy, Oct. 21, 1994, FI94A0194
Int. Cl.[6] H01J 7/24
U.S. Cl. 315—111.21 **8 Claims**



1. A plasma source comprising a discharge chamber (1) bounded by a base wall (5) and by a lateral wall (3), a system (7) for the admission of gas into said discharge chamber, a system of electrodes (13, 15) which are associated with said discharge chamber (1) and which are connected to a radio-frequency generator (17), and which apply an oscillating electric field within the discharge chamber and means (9, 11) for generating a static magnetic field in said discharge chamber,
characterized in that:
coaxially with said discharge chamber (1) there are disposed a first and a second electrode (15; 13; 13X), at least one of which has an annular extent and is disposed in an intermediate position along the axial extent of the diacharge chamber, said two electrodes (15; 13; 13X) being connected to two poles of the radio-frequency generator;
and in that the means (9, 11) for generating the static magnetic field generate a magnetic field (B_0) approximately parallel to the axis (A—A) of the discharge chamber, with an average intensity in the discharge chamber for which the corresponding electron cyclotron frequency f_c satisfies the condition f<fc<7f where f is the frequeacy of the electric field.

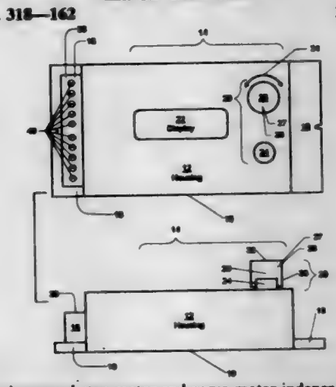
5,592,056
ELECTRICAL PROTECTION OF AN ANODE OF A FLAT DISPLAY SCREEN
Jean-Francois Peyre, Rousset, and Francis Courreges, Trets, both of France, assignors to Pixtech S.A., Rousset, France
Filed Sep. 27, 1995, Ser. No. 534,707
Claims priority, application France, Sep. 28, 1994, 94 11806
Int. Cl.[6] G09G 3/10
U.S. Cl. 315—169.1 **10 Claims**

1. An anode for a flat display screen, of the type including at least one set (*r, g, b*) of phosphor strips (7) disposed over corresponding conductive strips (9) and at least one interconnection conductor (21) for said phosphor strips, wherein said conductive strips (9) of said set are interconnected through resistors (22)



disposed in series between the conductive strips and the associated interconnection conductor.

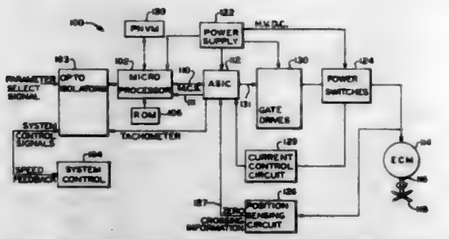
5,592,057
STEP MOTOR AND SERVO MOTOR INDEXER
Jeffrey A. Kordik, Watsonville, Calif., assignor to Applied Motion Products, Inc., Watsonville, Calif.
Filed Jun. 23, 1995, Ser. No. 494,165
Int. Cl.[6] H02P 8/00
U.S. Cl. 318—162 **21 Claims**



1. An improved step motor and servo motor indexer of the type having a control unit and a user interface, which includes a display and a data entry means for selectably programming said control unit, wherein the improvement comprises said data entry means comprising:
a. a rotary device, which produces a first signal component that is transmitted to said control unit, for user input to said control unit of data which will be presented on said display for later confirmation; and
b. a toggle device, which produces a second signal component representing a bi-modal state change, which is transmitted to said control unit, for confirming that said indexer is to use data currently presented on said display.

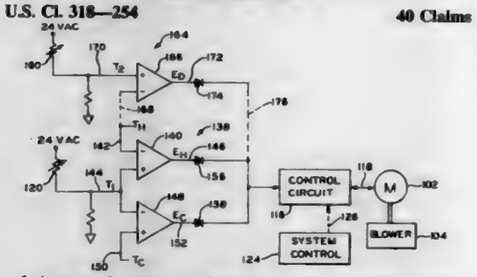
5,592,058
CONTROL SYSTEM AND METHODS FOR A MULTIPARAMETER ELECTRONICALLY COMMUTATED MOTOR
William R. Archer; Roger C. Becerra; Brian L. Beifus; Mark A. Brattoli, all of Fort Wayne, and Rajendra K. Shah, Indianapolis, all of Ind., assignors to General Electric Company, Fort Wayne, Ind.
Filed May 27, 1992, Ser. No. 889,708
Int. Cl.[6] H52P 7/00
U.S. Cl. 318—254 **74 Claims**

1. A system for driving a component of a heating ventilating, and/or air conditioning (HVAC) system in response to a system control signal provided by a central means, said system comprising:



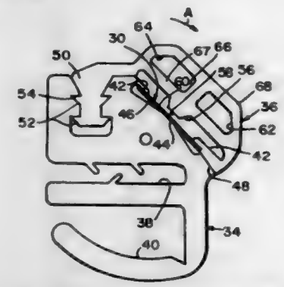
a motor having a stationary assembly and a rotatable assembly in magnetic coupling relation to the stationary assembly, said rotatable assembly in driving relation to the component, said motor driving the component in response to a control signal;
a programmable memory for storing parameters representative of the system;
means for receiving a parameter select signal for selecting at least one parameter stored in the memory;
means, including a microprocessor responsive to the selected parameter and to the system control signal, for generating control signals to control motor speed or torque as a function of the selected parameter and the system control signal; and
an instruction memory for storing instructions controlling the operation of the microprocessor.

5,592,059
SYSTEM AND METHODS FOR DRIVING A BLOWER WITH A MOTOR
William R. Archer, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.
Continuation-in-part of Ser. No. 889,708, May 27, 1992. This application Dec. 1, 1994, Ser. No. 348,514
Int. Cl.[6] H02P 7/00
U.S. Cl. 318—254 **40 Claims**



1. A system for driving a blower of a heating, ventilating, and/or air conditioning (HVAC) system, said blower discharging heated or cooled air through a discharge air path to a space thereby to condition air in the space by changing its temperature, said system comprising:
a temperature sensor positioned in the discharge air path, said temperature sensor generating a temperature signal representative of the temperature of the air discharged to the space by the blower;
a motor having first and second operating modes driving the blower at a speed or torque defined by a motor control signal thereby to control air flow rate of the HVAC system said motor operating at a minimum speed or torque in the first operating mode and operating at a variable speed or torque greater than or equal to the minimum speed or torque in the second operating mode; and
a control circuit generating the motor control signal in response to the temperature signal to cause the motor to operate in the first operating mode until the temperature of the discharged air as represented by the temperature signal reaches a reference temperature, said control circuit thereafter generating the motor control signal to cause the motor to operate in the second operating mode, said variable motor speed or torque of the second operating mode being a function of the difference between the temperature of the discharged air and the reference temperature, said motor maintaining the air flow rate of the HVAC system substantially constant in the first operating mode and increasing the air flow rate of the HVAC system as the temperature difference increases in the second operating mode.

5,592,060
SYSTEM FOR SENSING AN OBSTRUCTION BETWEEN A MOVABLE PANEL AND A STATIONARY PANEL FRAME
Lloyd G. Racine, Shelby Township, and Edward J. Bratkowski, Harrison Township, both of Mich., assignors to Webasto Sunroofs Inc., Rochester Hills, Mich.
Filed Jul. 10, 1995, Ser. No. 500,364
Int. Cl.[6] E05F 15/10; H01H 3/16
U.S. Cl. 318—469 **23 Claims**



1. A system for detecting an obstruction disposed between a movable closure member and a stationary frame, the frame being mounted with respect to an opening, the closure member being of a size to close the opening and is mounted on the frame for movement between an opened position wherein at least a portion of the opening is exposed and a closed position, the system comprising:
a drive assembly operatively associated with the closure member so as to move the closure member between said opened and closed positions;
control structure for controlling operation of the drive assembly; and
sensor structure comprising:
mounting structure including an elongated base and an elongated flexible member coupled to said base, said base being constructed and arranged to be coupled to one of said closure member and said frame; and at least one switch assembly mounted between said base and said flexible member, said switch assembly comprising:
first and second elongate elements, each said element comprising a flexible substrate and conductive particles applied to a surface of said substrate, said conductive particles defining an electrical contact surface, each of said first and second elements including a surface opposing a respective electrical contact surface, each said electrical contact surface having first and second ends with said second ends being coupled together through a resistor member and said first ends being connectable to an electrical supply of the control structure;
an elongated spacer having a plurality of longitudinally spaced openings therein, said spacer being disposed between said first and second elements such that said openings extend generally transverse with respect to said electrical contact surfaces, portions of said spacer between said openings contacting the respective electrical contact surfaces of said first and second elements in such a manner that said electrical contact surfaces do not engage each other through the openings when said

switch assembly is in an unstressed condition, an extent of said openings in a longitudinal direction of said spacer defining an active area of said switch assembly,

said flexible member of said mounting structure covering said switch assembly and including at least one actuating portion disposed adjacent said opposing surface of said second element and extending longitudinally of said flexible member so as to be cooperable with said active area of said switch assembly, said opposing surface of said first element disposed adjacent said base,

said flexible member being constructed and arranged to deform when a force is exerted on a peripheral surface thereof causing a force component to be directed towards said switch assembly, due to contact with an obstruction, and to transmit the force component to said actuating portion regardless of input direction of the force which causes the force component,

said actuating portion being constructed and arranged so that when a force component of a predetermined magnitude is transmitted thereto, said actuating portion causes the electrical contact surfaces of said first and second elements to engage each other through certain openings of said spacer thereby actuating said switch assembly and changing a resistance value thereof from a nominal resistance value, said control structure being constructed and arranged to detect said resistance value change and to control the drive assembly to prevent further closing movement of the closure member upon the obstruction.

5,592,861

Patent Not Issued For This Number

5,592,862

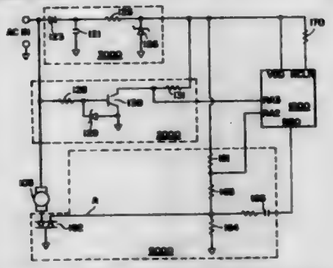
CONTROLLER FOR AC INDUCTION MOTORS

Daniel G. Bach, 11809 Warpaint Dr., Phoenix, Ariz. 85044

Filed Mar. 8, 1994, Ser. No. 207,588

Int. Cl.[6] H02P *7/00*

U.S. Cl. 318—805 **11 Claims**



1. A controller for an AC induction motor coupled to an AC power source, said controller comprising:

a circuit for providing a voltage signal in phase with voltage applied to said motor from said AC power source:

a triac coupled between said motor and said AC power source, said triac having a gate and being switchable from a non-conductive state to a conductive state in response to a control signal applied to said gate, said triac remaining in said conductive state until current flowing through said triac becomes zero; and

a microcontroller coupled to said circuit and to said gate, and responsive to said voltage signal and the voltage at said gate of said triac during at least the time that said motor is to be operated after an initial start period for determining a time during each AC cycle that said triac is rendered conductive to couple said AC power source to said motor and to generate said control signal in accordance with said time.

5,592,863

VOLTAGE GENERATOR CIRCUIT

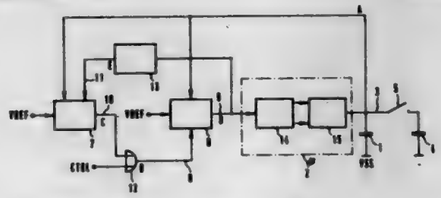
Dominique Savignac, Ismaning; Dieter Gleis, Grosskarolinenfeld, and Manfred Menke, München, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 25, 1994, Ser. No. 279,918

Claims priority, application Germany, Jul. 23, 1993, 43 24 853.5

Int. Cl.[6] G11C *5/10*

U.S. Cl. 320—1 **8 Claims**



1. A voltage generator circuit, comprising:

a) a storage capacitor with a terminal for pickup of an output voltage;

b) a voltage generator device to be turned on and off, said voltage generator device having an output being connected to the terminal of said storage capacitor;

c) a first comparator device to be turned on and off, said first comparator device comparing the output voltage with a first threshold voltage and generating a signal for turning said voltage generator device on and off;

d) a second comparator device for comparing the output voltage with a second threshold voltage and generating an output signal of said second comparator device with which said first comparator device is turned on and off;

wherein said first comparator device has a shorter signal delay time than said second comparator device; the first threshold voltage is higher than the second threshold voltage; and

including an edge detector receiving the output signal of said first comparator device and generating a pulse resetting said second comparator device upon a signal edge turning off said voltage generator device.

5,592,864

BATTERY CHARGING APPARATUS, POWER SUPPLY, AND ATTACHMENT FOR CONNECTING DIFFERENT TYPES OF BATTERY PACKS TO A BATTERY CHARGER

Hideyo Morita, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 22, 1993, Ser. No. 155,197

Claims priority, application Japan, Nov. 26, 1992, 4-081824 U; Feb. 4, 1993, 5-017483

Int. Cl.[6] H01M *10/46*

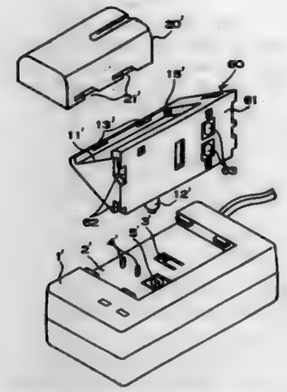
U.S. Cl. 320—2 **18 Claims**

1. An attachment for mating a battery pack which houses battery cells charged by a constant voltage charging, with a battery charger, comprising:

charging terminals for a constant current output and adapter terminals at constant voltage output;

a battery mount for freely mounting or removing the battery pack;

connecting terminals for electrical connection with said adapter terminals; and



charging contacts for electrical connection with battery terminals of the battery pack mounted in said battery mount and with electrical connection to said connecting terminals.

5,592,865

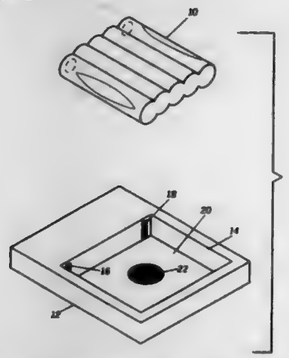
BATTERY CHARGER HAVING BATTERY TEMPERATURE MEASUREMENT PROBE

John W. Oglesbee, Athens; William C. Bohne, Lawrenceville, and Robert W. McGinnis, Grayson, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 6, 1995, Ser. No. 554,221

Int. Cl.[6] H02J *7/00*

U.S. Cl. 320—2 **15 Claims**



1. A battery charger for charging a battery pack, said battery pack generating a temperature and a temperature change when recharged, said charger comprising:

a housing having a battery receiving surface, said battery receiving surface having an opening formed therethrough;

a charging circuit for recharging said battery pack; and

a probe disposed in said opening and thermally isolated from said housing for thermally coupling with said battery pack, and having a temperature sensing element disposed therein for transmitting an electrical signal indicative of said temperature and temperature change to said charging circuit, and further having a top surface and a bottom surface, said top surface having a surface area and pockets formed in said top surface for enhancing said surface area.

5,592,866

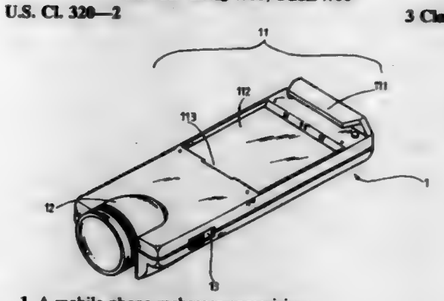
MOBILE PHONE RECHARGER

Eagle Fan, No. 30, Lu-Chang, Chu-Pei City, Hsin-Chu Hsien, Taiwan

Filed Nov. 20, 1995, Ser. No. 559,845

Int. Cl.[6] H02J *7/00*; F21L *7/00*

U.S. Cl. 320—2 **3 Claims**



1. A mobile phone recharger comprising:

a battery seat on top surface;

a light source, controlled by a switch formed on one side of said recharger through connectors, which is pivotally connected to the front end of said recharger;

clipping means having an adjustable supporting frame pivotally connected to the sides;

a frame formed at the back of the clipping member of said clipping means for receiving a plate whose shape is in correspondence with that of the frame;

an arc-recess formed within a concave located at one end of said frame, and at an axial direction of the arc-recess, an axial groove for connecting with said supporting frame;

a securing groove formed on the periphery of said arc recess for securing the position of the supporting frame.

5,592,867

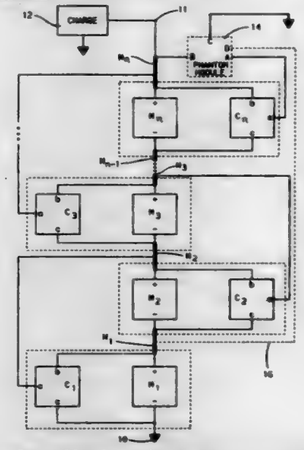
DISTRIBUTED MULTI-MODULE BATTERY EQUALIZATION

David A. Peter, Anderson, and John L. Ayres, Cicero, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 178,170, Jan. 6, 1994, abandoned. This application Jan. 23, 1995, Ser. No. 376,631

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—15 **7 Claims**



2. In a rechargeable electrochemical battery system having a battery pack comprising a series arrangement of electrochemical

modules including end modules at opposite ends of the series arrangement, each of said modules having a positive and a negative terminal and a respective module voltage thereacross, said battery pack having an aggregate pack voltage terminal comprising the positive terminal of the one of the end modules with its respective negative terminal connected to an adjacent module and an aggregate pack ground terminal comprising the negative terminal of the other of the end modules with its positive terminal connected to an adjacent module, each module further having a corresponding pack node voltage across its respective positive terminal and the aggregate pack ground terminal, a module charge equalization apparatus comprising:

a charging source coupled across the aggregate pack voltage terminal and aggregate pack ground terminal; and,

a plurality of switched mode power converter means, each converter means coupled to a respective pair of said modules which are adjacent one another such that all pairs of adjacent modules have associated therewith one of the plurality of converter means, each of said converter means being responsive to the module voltages of the respective pair of adjacent modules coupled thereto to unidirectionally pump charge from the positive terminal of a first one of said respective pair of adjacent modules to the positive terminal of a second one of said respective pair of adjacent modules only when the module voltage of the first one of said pair of adjacent modules exceeds the module voltage of the second one of said pair of adjacent modules, the respective first and second ones of all pairs of adjacent modules having the same relative positions within the series arrangement.

5,592,068

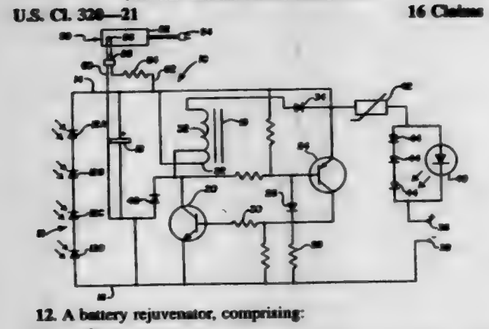
LEAD ACID BATTERY REJUVENATOR

William E. Gregory, 700 Koustre Ct., Irving, Tex. 75061, and Chester C. Allen, Jr., Richardson, Tex., assignors to William E. Gregory, Irving, Tex.

Continuation of Ser. No. 92,515, Jul. 16, 1993, Pat. No. 5,491,399, which is a continuation-in-part of Ser. No. 68,159, May 28, 1993, abandoned. This application Nov. 16, 1995, Ser. No. 558,678

Int. Cl.[6] H01M *10/46*; H02J *7/10*

U.S. Cl. 320—21 16 Claims



12. A battery rejuvenator, comprising:

a capacitor;

a transformer having a primary coil and having a secondary coil;

a first switch functioning when turned on to connect the capacitor in parallel with the primary coil of the transformer, and when turned off to disconnect the capacitor from the primary coil of the transformer;

a second switch connected to sense a voltage stored in the capacitor and in response thereto turn the first switch on and off thereby generating a pulse train signal at the secondary coil of the transformer; and

means for connecting the generated pulse train signal at the secondary coil to a pair of terminals for a battery to remove or inhibit the growth of sulfate deposits.

5,592,069

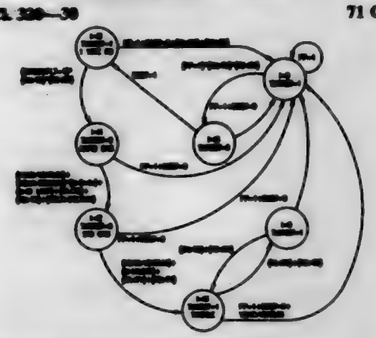
BATTERY CHARGER

Donald R. Dias, Carrollton, and Robert D. Lee, Denton, both of Tex., assignors to Dallas Semiconductor Corporation

Filed Oct. 7, 1992, Ser. No. 957,571

Int. Cl.[6] H01M *10/44*; *10/46*

U.S. Cl. 320—30 71 Claims



1. A battery charging system, comprising

a battery charger;

a battery pack including:

at least one rechargeable battery cell and a memory having stored therein charge instructions;

said charge instructions comprising information instructing said battery charger of procedures for charging the at least one battery cell.

5,592,070

BATTERY CHARGER HAVING A TEMPERATURE SENSOR AND A RECHARGEABLE BATTERY CHARGING METHOD

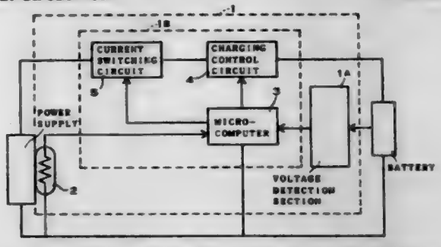
Takayuki Miao, Mihara-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 23, 1995, Ser. No. 377,094

Claims priority, application Japan, Jan. 28, 1994, 6-008449

Int. Cl.[6] H02J *7/04*; H01M *10/44*

U.S. Cl. 320—35 23 Claims



1. A battery charger having a temperature sensor comprising:

(a) a power supply circuit with heat producing elements;

(b) a control means connected between the power supply circuit and a rechargeable battery to control rechargeable battery charging; and the control means comprising:

(1) a voltage detection section to determine battery voltage;

(2) a temperature sensor to determine the temperature of heat producing elements in the power supply circuit; and

(3) a control circuit to operate on the voltage detected by the voltage detection section and control rechargeable battery charging, to stop charging when the rechargeable battery reaches full charge, to operate on the signal input From the temperature sensor to determine the temperature of heat producing elements in the power supply circuit, to reduce rechargeable battery charging current when the detected temperature becomes greater than or equal to a specified temperature, and to suspend detection of full rechargeable battery charge when the charging current is reduced.

9. A rechargeable battery charging method comprising:

(a) detecting battery voltage with a voltage detection section;

(b) detecting the temperature of heat producing elements in a power supply circuit with a temperature sensor; and

(c) with a control circuit, operating on the detected battery voltage to stop charging when a rechargeable battery reaches full charge, operating on the signal detected from the temperature sensor to reduce rechargeable battery charging current when the temperature detected by the temperature sensor becomes greater than or equal to a specified temperature, and suspending rechargeable battery full charge detection when the charging current is reduced.

5,592,071

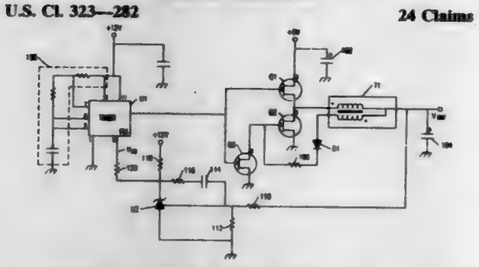
METHOD AND APPARATUS FOR SELF-REGENERATION SYNCHRONOUS REGULATOR

Alan E. Brown, Georgetown, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jan. 11, 1995, Ser. No. 371,322

Int. Cl.[6] G05F *1/56*

U.S. Cl. 323—282 24 Claims



1. A synchronous regulator circuit, comprising:

a transformer having first and second magnetically coupled inductors, said first inductor for transferring power to an output of the synchronous regulator circuit;

means for providing a DC source voltage;

a first switch having a current path coupled to said first inductor and said DC source voltage providing means, said power switch having a control terminal;

a second switch having a current path coupled to said first inductor and a control terminal coupled to said second inductor; and

a timing circuit coupled to said first and second switches for turning on said first switch and turning off said second switch during a power phase and for turning off said first switch during a flux reversal phase of each cycle, wherein flux reversal of said second inductor turns on said second switch during said flux reversal phase of each cycle.

5,592,072

HIGH PERFORMANCE DUAL SECTION VOLTAGE REGULATOR

Alan E. Brown, Georgetown, Tex., assignor to Dell USA, L.P., Austin, Tex.

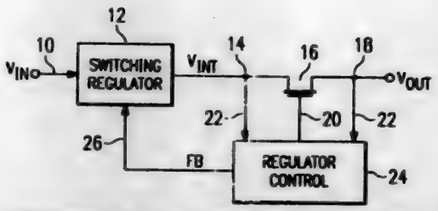
Filed Jan. 24, 1995, Ser. No. 377,575

Int. Cl.[6] G05F *1/40*

U.S. Cl. 323—268 12 Claims

1. A regulator for receiving an input voltage and outputting a regulated output voltage, comprising:

a switching regulator having a first input and a first output for receiving on the first input the input voltage and providing on the first output a regulated intermediate voltage in accordance with a switching regulator operation, said first output connected to an intermediate node;



a linear regulator having a second input and a second output with a pass element connected therebetween for receiving on said second input said regulated intermediate voltage associated with said intermediate node and for providing to an output node on said second output the regulated output voltage at a predetermined output voltage level by varying the impedance of said pass element in accordance with a linear voltage regulation operation; and

a regulator control for regulating at least said switching regulator to vary the regulated intermediate voltage to a level that is a predetermined intermediate voltage above said predetermined output voltage level to maintain a predetermined differential voltage across said pass element to minimize power dissipation in said pass element, said regulator control comprising:

an intermediate voltage sensor for sensing said regulated intermediate voltage;

a switching regulator control for utilizing said sensed regulated intermediate voltage to control said switching regulator operation to regulate said regulated intermediate voltage to said predetermined intermediate voltage level;

a differential voltage sensor comprising an operational amplifier (op amp) having a first op amp input electrically connected to said intermediate node, a second op amp input electrically connected to said output node, and an op amp output, wherein said op amp is configured for sensing via said first and second op amp inputs the differential voltage across said pass element between said intermediate node and said output node and for generating onto said op amp output an op amp signal indicative of the differential voltage sensed between said intermediate node and said output node; and

an offset control for modifying said predetermined intermediate voltage when said sensed differential voltage indicated by said op amp signal deviates from said predetermined differential voltage such that said sensed differential voltage is maintained substantially constant and the operation of said switching regulator control is dependent upon said sensed differential voltage.

5,592,073

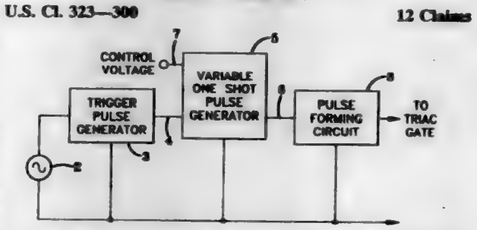
TRIAC CONTROL CIRCUIT

Robert W. Redlich, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed May 31, 1995, Ser. No. 454,635

Int. Cl.[6] G05F *5/00*

U.S. Cl. 323—300 12 Claims



1. A triac control circuit for generation of triac firing pulses spaced in time by one-half the period of an AC line signal, the time

interval between zero crossing of the AC line signal and the next firing pulse being controllable by a control signal magnitude, the circuit comprising:

(a) a trigger pulse generator circuit having an input connected to the AC line and generating a pulse at a generator output at each zero crossover of the AC line signal;

(b) a variable, one shot, pulse generator circuit having a trigger input connected to the output of the trigger pulse generator circuit and generating a pulse at a one shot output which is initiated by a pulse from the trigger pulse generator circuit and terminates following a time interval which is controlled by the magnitude of a control signal applied to a control input; and

(c) a pulse forming circuit including a high pass filter and diode and connected to the one shot pulse generator circuit output for forming a triac firing pulse at the termination of the one shot pulse generator circuit output pulse.

5,592,074

BATTERY POWER SUPPLY SYSTEM

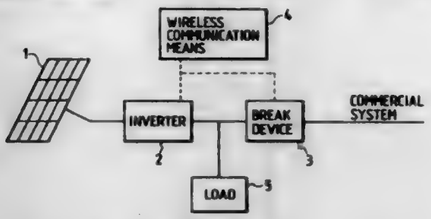
Nobuyoshi Takehara, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1993, Ser. No. 74,463

Claims priority, application Japan, Jun. 26, 1992, 4-169682

Int. Cl.[6] H02J *3/46*

U.S. Cl. 363—131 **13 Claims**



1. A power supply system comprising:

a first power supply connected in a system line;

a DC-AC inverter for converting a DC output of said first power supply to an AC output so as to supply the converted AC output to a load;

a second power supply for supplying an AC power to the load connected in the system line; and

a break device for electrically disconnecting the first power supply from the system line in response to information derived from a wireless communication means.

5,592,075

CIRCUIT CONFIGURATION FOR SUPPLYING ELECTRICAL CONSUMERS WITH A CONSTANT VOLTAGE

Joern Heining, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

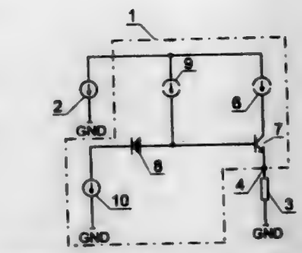
Filed Sep. 21, 1994, Ser. No. 309,953

Claims priority, application European Pat. Off., Sep. 21, 1993, 93115240

Int. Cl.[6] G05F *3/16*

U.S. Cl. 323—313 **5 Claims**

1. A circuit configuration for supplying electrical consumers, including sensors in a motor vehicle, with a constant voltage from a voltage source, comprising at least a first series circuit having a first current source, and a first transistor connected as an emitter follower, a second series circuit composed of a second current source, a diode, and a reference voltage source, said second series



circuit connected in parallel with the voltage source, and wherein the base of the transistor is connected with the anode of the diode.

5,592,076

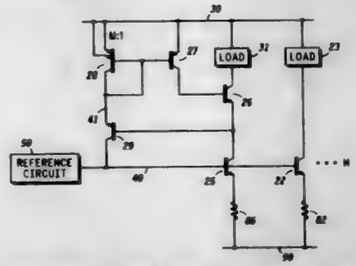
BASE CURRENT SUPPLY CIRCUIT FOR MULTIPLE CURRENT SOURCES

William E. Main, Mesa, and Jeffrey Durec, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1995, Ser. No. 497,966

Int. Cl.[6] G05F *3/16*

U.S. Cl. 323—315 **16 Claims**



1. A compensation circuit for supplying base currents to a plurality of current sources, comprising:

a current divider having a first output of said current divider coupled to a control input of the plurality of current sources, a second output of said current divider coupled to one output of the plurality of current sources, where a first current flowing into a first input of said current divider is substantially equal to current flowing out of said first output of said current divider, and a second current flowing into a second input of said current divider is substantially equal to current flowing out of said second output of said current divider;

a first transistor having a collector coupled to said first input of said current divider, an emitter coupled to a first power supply conductor, and a base coupled to said second input of said current divider;

a second transistor having a base coupled to said base of said first transistor, an emitter coupled to said first power supply conductor; and

a third transistor having a base coupled to a collector of said second transistor, a collector coupled to said first power supply conductor, and an emitter coupled to said one output of the plurality of current sources.

5,592,077

CIRCUITS, SYSTEMS AND METHODS FOR TESTING ASIC AND RAM MEMORY DEVICES

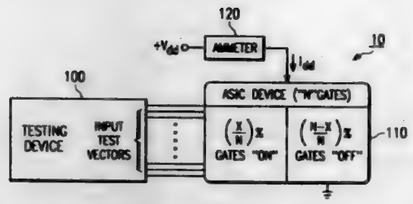
Michael E. Runas, McKinney, and Kirit B. Patel, Dallas, both of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Feb. 13, 1995, Ser. No. 387,218

Int. Cl.[6] G01R *1/00*; H04B *17/00*

U.S. Cl. 324—158.1 **18 Claims**

1. A method for evaluating the performance of an unproven microcircuit, the method comprising the steps of:



determining a signature map of power supply current values for a known good microcircuit, wherein the signature map comprises a power supply current value measured for a fixed power supply voltage applied to a power supply input of the known good microcircuit and wherein the power supply current value corresponds to a unique test input stimuli pattern applied to data inputs of the known good microcircuit;

storing the signature map in an electronic memory;

applying a voltage equal to the fixed power supply voltage to a power supply input of the unproven microcircuit;

applying to data inputs of the unproven microcircuit the unique test input stimuli pattern;

measuring the power supply current of the unproven microcircuit;

comparing the measured power supply current of the unproven microcircuit with the power supply current value stored in the signature map corresponding to the unique test input stimuli pattern; and

faulting the unproven microcircuit if the measured power supply current of the unproven microcircuit differs from the power supply current value stored in the signature map by more than a predetermined amount.

5,592,078

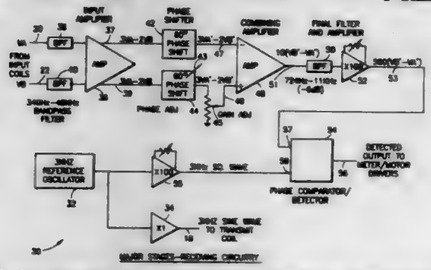
METHOD AND APPARATUS FOR MOVING ALONG A BOUNDARY BETWEEN ELECTROMAGNETICALLY DIFFERENT MATERIALS

David W. Giragosian, Ridgefield; James R. Norris, Jr., Georgetown, and Howard A. Sholl, Storrs, all of Conn., assignors to Dapco Industries, Inc., Ridgefield, Conn.

Filed Nov. 29, 1994, Ser. No. 346,026

Int. Cl.[6] G01B *7/14*; G01N *29/04*; G05B *19/33*; B23K *9/12*

U.S. Cl. 324—207.18 **3 Claims**



1. An apparatus for moving along a boundary between a first material having different electromagnetic properties than an adjacent second material, the apparatus comprising:

a sensor, the sensor further comprising a transmitting coil, and first and second receiving coils positioned adjacent to the transmitting coil;

a detection circuit, the detection circuit further comprising:

a driving subcircuit for driving the transmitting coil with a low frequency input signal;

a signal processing subcircuit for receiving signals from the first and second receiving coils and for processing and combining the signals received by the first and second receiving coils so as to generate a single bipolar signal whose phase polarity is proportional to the position of the sensor relative to the boundary between the first material and the second material being detected;

a comparison subcircuit for comparing the single bipolar signal to a reference signal representative of the input signal to the transmitting coil and for generating a control signal in proportion to a result of the comparison of the reference signal to the single bipolar signal;

a position encoder for providing a signal representing the position of the apparatus; and

a process controller responsive to the control signal for moving the apparatus along the boundary between the first material and the second material, the process controller further comprising means, responsive to the position encoder, for moving the apparatus to a known position where the boundary was detected when the apparatus does not detect the boundary.

5,592,079

MICROELECTRONIC POSITION SENSOR FOR VOLUME CONTROL

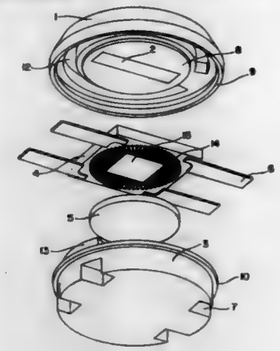
Peter U. Scheel, Byleddet, Denmark, assignor to Microtonic A/S, Roskilde, Denmark

PCT No. PCT/DK92/00264, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/05965, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 3, 1992, Ser. No. 392,804

Int. Cl.[6] G01B *7/30*; H01H *19/00*; H04R *25/00*; H01L *43/00*

U.S. Cl. 324—207.25 **4 Claims**



1. A microelectronic position sensor for determining changes in an adjustable parameter of an apparatus, said position sensor comprising:

a stationary base portion including magnetic field sensitive elements and an adjustment means rotatably mounted within said adjustment means and including a permanent magnet;

said adjustment means being electrically coupled to the apparatus by means of a plurality of electrically conductive terminals embedded in said adjustment means;

said adjustment means comprising an integrated circuit on which said magnetic field sensitive elements are mounted for providing an electrical signal depending on the position of the permanent magnet and the rotor;

said adjustment means and said stationary base portion comprise housing parts having interengaging flanges and forming together a self-contained unit encompassing the electric and and magnetic components of the position sensor and in which the adjustment means is rotatably mounted on the stationary base member;

a soft-iron member is mounted in the stationary base member to form an iron return path the magnetic system comprising the permanent magnet and the magnetic field sensitive elements; and

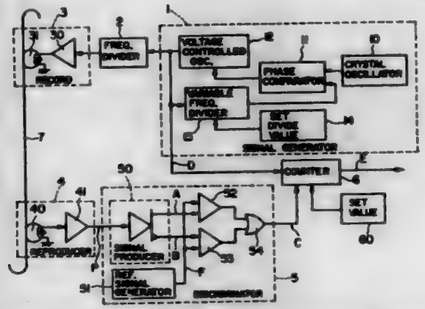
the electrically conductive contact between the terminals and the integrated circuit is effected by bonding to the integrated circuit, each terminal being separately secured to the integrated circuit.

5,592,080

RECORD MEDIUM CHECKING DEVICE INCLUDING A CIRCUIT FOR RECORDING A SIGNAL ON A RECORD MEDIUM FROM DETECTED CLOCK PULSES AND FOR SELECTIVE FREQUENCY SETTING

Tohru Matsuno, Chofu, Japan, assignor to Otari Inc., Chofu, Japan

Filed Dec. 30, 1993, Ser. No. 175,639
Claims priority, application Japan, Jan. 29, 1993, 5-049831
Int. Cl.[6] G01R *33/12*; G11B *27/36*
U.S. Cl. 324—212 **3 Claims**



1. A record medium checking device for detecting an absence of a reproduced signal on the record medium comprising:

detecting clock pulse generating means for generating detecting clock pulses, said detecting clock pulse generating means including frequency setting means for selectively setting the frequency of the detecting clock pulses;

recording means for recording a signal on the record medium from the detecting clock pulses generated by said detecting clock pulse generating means, the frequency of said recorded signal being n times the number of detecting clock pulses generated where n>0;

reproducing means for reproducing the signal recorded on the record medium;

discriminating means for producing a discriminating signal output from a comparison of the reproduced signal with a reference signal;

counting means for counting said detecting clock pulses receiving said discriminating signal input from said discriminating means and producing an output check signal at a set value if not reset by said discriminating signal;.

whereby an absence of said reproduced signal from said record medium is detected and indicated by said check signal.

5,592,081

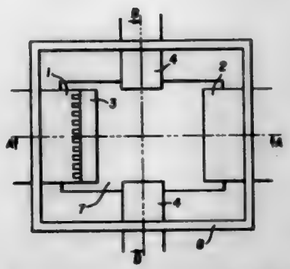
MAGNETIC SENSOR

Kazuo Matsuzaki, Nagano, Japan, assignor to Fuji Electric Co., Ltd., Japan

Filed Apr. 6, 1995, Ser. No. 418,105
Claims priority, application Japan, Apr. 6, 1994, 6-067510
Int. Cl.[6] H01L *27/22*;*43/06*; G01R *33/06*
U.S. Cl. 324—251 **18 Claims**

1. A magnetic sensor comprising:

an insulated substrate including a rectangular recess;



a positive electrode located on an upper surface of the insulated substrate that surrounds the rectangular recess, wherein an end of the positive electrode projects over the rectangular recess from a first side of said rectangular recess;

a negative electrode located on the upper surface of the insulated substrate, wherein an end of the negative electrode projects over the rectangular recess from a second side of the rectangular recess that is opposite to said first side, and wherein the end of the negative electrode includes at least one electron emitting tip;

first and second Hall electrodes respectively located on the upper surface of the insulated substrate at third and fourth sides of the rectangular recess;

a gate electrode provided on a bottom surface of the rectangular recess and facing the negative electrode; and

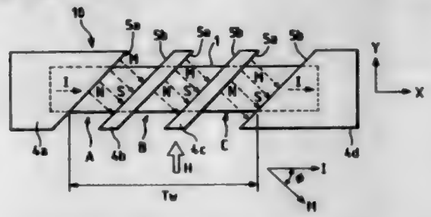
containment means for containing the negative electrode, positive electrode, first and second Hall electrodes, and gate electrode in a vacuum.

5,592,082

MAGNETIC SENSOR WITH PERMANENT MAGNET BIAS LAYERS

Toshihiro Kuriyama, Niigata-ken, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1995, Ser. No. 525,874
Claims priority, application Japan, Sep. 29, 1994, 6-259379
Int. Cl.[6] G11B *5/39*; G01R *33/09*
U.S. Cl. 324—252 **9 Claims**



1. A magnetic sensor comprising:

a magnetoresistive effect layer to which an electric current is supplied; and

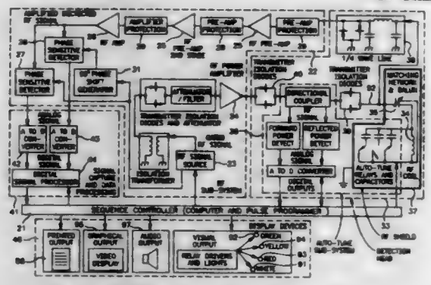
a plurality of spaced-apart permanent magnet layers formed on said magnetoresistive layer such that a gap is formed between each adjacent pair of permanent magnet layers, said permanent magnetic layers being adapted to impart a bias magnetic field to said magnetoresistive layer, wherein said permanent magnet layers have slanted edges that are slanted with respect to a direction of said electric current and to a direction of an external magnetic field, with slanted edges of different polarities being opposed to each other across each gap.

5,592,083

SYSTEM AND METHOD FOR CONTRABAND DETECTION USING NUCLEAR QUADRUPOLE RESONANCE INCLUDING A SHEET COIL AND RF SHIELDING VIA WAVEGUIDE BELOW CUTOFF

Erik E. Magnuson, Escondido; Charles R. Moeller, Cardiff; Julian D. Shaw, Guerneville, and Alan G. Sheldon, San Diego, all of Calif., assignors to Quantum Magnetics, Inc., San Diego, Calif.

Filed Mar. 8, 1995, Ser. No. 400,679
Int. Cl.[6] G01V *3/08*;*3/10*
U.S. Cl. 324—300 **19 Claims**



1. A system for detecting a target substance within a class of explosives and narcotics containing quadrupolar nuclei in a specimen employing the phenomenon of nuclear quadrupole resonance (NQR), said system comprising:

a sequence controller having means for providing timing and programming pulses to said system;

a radio frequency (RF) subsystem comprising a variable frequency RF source to provide pulsed RF excitation at a frequency generally corresponding to predetermined characteristic nuclear quadrupolar resonant frequency of the specimen, wherein nuclear quadrupolar resonant frequency is the frequency of nuclear precession due to quadrupolar interaction with molecular electric field gradients;

a detection head subsystem comprising:

a single turn distributed RF coil sheet shaped and configured to define a cavity of predetermined volume therein and to receive the specimen within the cavity defined by said RF coil, said cavity having a first end and a second end, the RF signal from said RF source being transmitted within said cavity and being uniformly applied to the specimen within said RF coil cavity and generating a uniform field within said cavity, said RF coil also functioning as the pickup coil for the NQR signals from the specimen and providing an NQR output signal;

apparatus for tuning said RF coil to about the desired characteristic nuclear quadrupolar resonant frequency for the specimen under test; and

an electrically conductive RF shield surrounding and spaced from and electrically isolated from said RF coil, said RF shield being shaped and configured to provide electromagnetic interference and radio frequency interference (EMI/RFI) shielding from external noise and to prevent RF and magnetic flux from escaping from said RF coil cavity and RF shield combination, said RF shield configuration being longer than said RF coil, thereby extending beyond both said first end and said second end of said coil, said RF shield being an electrically integral part of said RF coil to improve the Q and the efficiency of said RF coil and contributing to the uniformity of flux field applied to the specimen within said RF coil, said RF coil and RF shield together forming a scanner;

a signal capture and data processing subsystem having a digital signal processor and comprising:

means for receiving the NQR output signal from said RF coil;

memory means storing characteristics of NQR signals from at least one target substance in the class explosives and narcotic compounds;

means for processing the NQR output signal from said RF coil; and

means for comparing characteristics of the processed NQR output signal with the characteristics in memory and emitting a final output signal; and

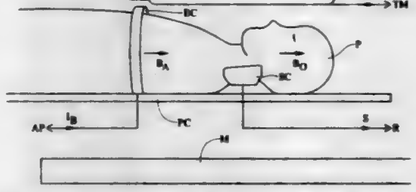
a display device receiving the final output signal from said signal capture and data processing subsystem and, in response thereto, said display device selectively indicating the presence of the target substance, the absence of the target substance, and an intermediate result when conditions of the received signal from the specimen indicate that further testing is necessary.

5,592,084

METHOD FOR IMAGING OF MOVEMENT OF MATERIAL

Raimo E. Sepponen, Helsinki, Finland, assignor to Picker Nordstar Inc., Helsinki, Finland

Filed Nov. 30, 1993, Ser. No. 158,990
Claims priority, application Finland, Dec. 1, 1992, 925465
Int. Cl.[6] G01V *3/00*;*3/14*; A61B *5/0265*;*5/055*
U.S. Cl. 324—306 **9 Claims**



5. A magnetic resonance imaging method for the examination of material moving from a first area of an object under examination to an area of the object to be examined, the object containing stationary material, said method comprising the steps of:

applying a main magnetic field B_o along an axis of the object under examination;

applying an auxiliary magnetic field B_a along the main magnetic field axis and over the first area, said auxiliary magnetic field being strongest over the first area, the strength of the auxiliary magnetic field varying non-linearly along the main magnetic field axis toward the area of the object to be examined;

applying a first radio frequency pulse for at least a portion of the time said auxiliary magnetic field B_a is applied, said radio frequency pulse at substantially the Larmor frequency corresponding to the strength of the magnetic field at the area to be examined, the length of said pulse corresponding in time for the material to move from the first area to at the area to be examined, the combination of the application of said non-linear auxiliary magnetic field and said first radio frequency pulse resulting in an adiabatic half passage sweep of the moving material and saturation of the stationary material in the area to be examined; and

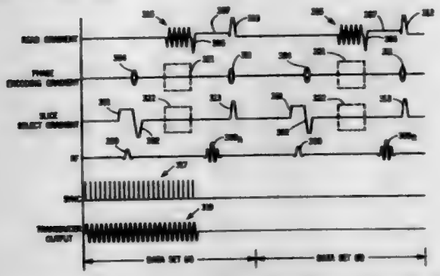
obtaining an image of the area of the object to be examined using an imaging sequence.

5,592,085

MR IMAGING OF SYNCHRONOUS SPIN MOTION AND STRAIN WAVES

Richard L. Ehman, Rochester, Minn., assignor to Mayo Foundation For Medical Education And Research, Rochester, Minn.

Filed Oct. 19, 1994, Ser. No. 325,834
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—309 **41 Claims**



1. A method for producing an image indicative of a mechanical characteristic of tissues, the steps comprising:

a) applying a polarizing magnetic field to the tissues;

b) irradiating the tissues with an RF excitation field that produces transverse magnetization in spins in said tissues;

c) applying a magnetic field gradient to the spins which alternates in polarity;

d) applying a stress to the tissues which varies in magnitude in synchronism with the alternation in the magnetic field gradient polarity;

e) acquiring an NMR signal produced by the transversely magnetized spins;

f) repeating steps a) through e) to acquire a set of said NMR signals from which a first image may be reconstructed;

g) repeating steps a) through f) to acquire NMR signals from which a second image may be constructed;

h) producing a third image indicative of the difference in phase between the NMR signals acquired for said first and second images; and

i) producing from said third image a fourth image which indicates a mechanical property of the tissues.

5,592,086

AUTOMATED COMPUTERIZED MAGNETIC RESONANCE DETECTOR AND ANALYZER

Ronald J. Weinstock, and Sigrid Lipsett, both of 2083 Lindengrove St., Westlake Village, Ventura County, Calif. 91361

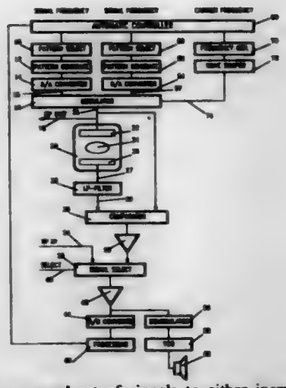
Continuation-in-part of Ser. No. 229,605, Apr. 19, 1994, which is a continuation-in-part of Ser. No. 945,529, Sep. 16, 1992, Pat. No. 5,317,265. This application Oct. 19, 1994, Ser. No. 326,459
Int. Cl.[6] G01R *33/28*
U.S. Cl. 324—318 **1 Claim**

1. A method for analyzing and altering the natural resonance signature of a substance, the method comprising the steps of:

modulating a magnetic field having a strength of about 0.5 to 7 gauss with a first set of pattern signals wherein the first set of pattern signals is comprised of a partial spectrum of test pattern signals;

subjecting a substance to the modulated magnetic field;

measuring the resultant resonance peaks, wherein each peak represents either an in-phase or an out-of-phase resonance;



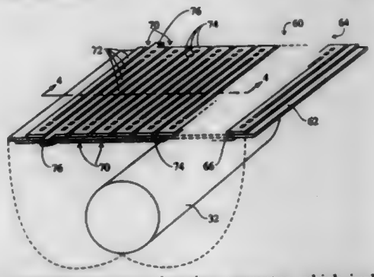
applying a second set of signals to either increase, decrease, flatten or nullify each at least one out-of-phase resonance peak.

5,592,087

LOW EDDY CURRENT RADIO FREQUENCY SHIELD FOR MAGNETIC RESONANCE IMAGING

Mark A. Richard, Cleveland Heights; Xueming Zou, Chesterland, and Michael A. Morich, Mentor, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Jan. 27, 1995, Ser. No. 379,979
Int. Cl.[6] G01H *3/00;3/14*
U.S. Cl. 324—318 **17 Claims**



1. A magnetic resonance imaging apparatus which includes a toroidal magnet assembly for generating a temporally constant magnetic field through an examination region in a bore thereof, a cylindrical gradient coil assembly mounted in the bore for causing magnetic field gradients within the examination region, a cylindrical radio frequency coil assembly disposed within the cylindrical gradient coil assembly for transmitting radio frequency pulses into the examination region, and a radio frequency shield disposed between the cylindrical gradient coil assembly and the cylindrical radio frequency coil assembly, the radio frequency shield including:

a dielectric layer;

a plurality of first metal strips mounted on one surface of the dielectric layer extending substantially parallel to a longitudinal axis of the bore, the first metal strips being separated by gaps;

a plurality of second metal strips disposed on an opposite face of the dielectric layer and extending substantially parallel to the longitudinal axis of the bore, the second metal strips being separated by gaps, the first and second metal strips being offset from each other such that the gaps between the first metal strips are substantially centered over the second metal strips;

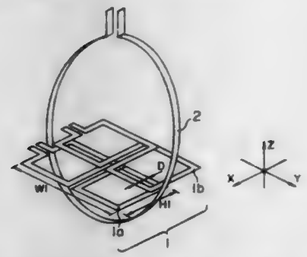
a plurality of low impedance direct current bridges connecting adjacent first metal strips and adjacent second metal strips, the bridges connecting adjacent pairs of metal strips being staggered such that the first metal strips and the staggered bridges form a meandering low impedance direct current path and the second metal strips and the staggered bridges form another meandering low impedance direct current path such that any low frequency and direct currents are constrained to flow along the meandering low impedance paths.

5,592,088

MULTIPLE-COIL ADOPTING A QUADRATURE DETECTION METHOD APPLIED THERETO AND A SIGNAL PROCESSING CIRCUIT EMPLOYING THE SAME IN AN MRI APPARATUS IN A VERTICAL MAGNETIC SYSTEM

Yoshikuni Matsunaga, Hachioji; Tetsuhiko Takahashi, Soka, and Etsuji Yamamoto, Akishima, all of Japan, assignors to Hitachi, Ltd., and Hitachi Medical Corporation, both of Tokyo, Japan

Continuation of Ser. No. 981,399, Nov. 25, 1992, Pat. No. 5,457,386. This application Apr. 26, 1995, Ser. No. 427,868
Claims priority, application Japan, Nov. 26, 1991, 3-310585
Int. Cl.[6] G01R *33/48*
U.S. Cl. 324—318 **7 Claims**



1. An RF probe for an MRI apparatus in a vertical magnetic field system, comprising:

(a) an RF array coil comprising a plurality of first unit coils which are arranged in a direction perpendicular to a direction of a static magnetic field, for forming an RF magnetic field in a direction perpendicular to the direction of the static magnetic field, each of said first unit coils forming the RF magnetic field independently of one another, and said RF array coil being arranged so that a mutual coupling between the adjacent first unit coils becomes a minimum; and

(b) an RF coil which forms an RF magnetic field in a direction perpendicular to both a direction of the RF magnetic field formed by said RF array coil and said direction of said static magnetic field, said RF coil being arranged in a space surrounding a subject to be inspected.

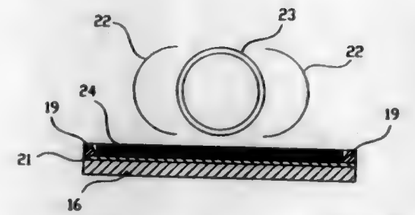
5,592,089

EDDY CURRENT CONTROL IN NMR IMAGING SYSTEM

Gordon T. Danby, Wading River; John W. Jackson, Shoreham; Charles E. Bruki, Fort Salonga, all of N.Y.; Krishna M. Gudinetta, Hammond, La., and Joseph F. Rimkunas, Massapequa, N.Y., assignors to Fonar Corporation, Melville, N.Y.

Division of Ser. No. 5,296, Jan. 19, 1993, Pat. No. 5,495,171. This application Jun. 1, 1995, Ser. No. 457,014
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—318 **32 Claims**

1. A primary field magnet assembly for use in medical NMR imaging systems, comprising:



a) a ferromagnetic structure which provides a return path for magnetic flux,

b) means for generating said magnetic flux, said means magnetically coupled to said ferromagnetic structure to establish magnetic flux flowing through said ferromagnetic structure,

c) two opposed ferromagnetic poles spaced apart from one another and forming a gap therebetween for receiving a portion of human anatomy therein, said ferromagnetic poles being magnetically coupled to said ferromagnetic structure to develop a magnetic field between said poles, and

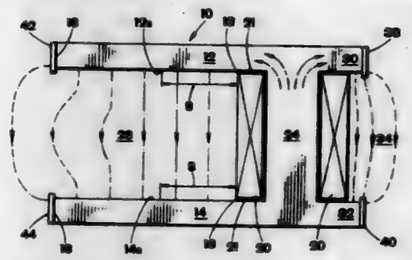
d) a layer of eddy current suppressing material having an initial permeability greater than approximately 1000, and a resistivity less than 1000 micro ohm-cm, said material providing means to reduce eddy currents in said ferromagnetic poles, and said material placed proximate to a surface of each said pole which faces said gap.

5,592,090

COMPACT, OPEN GEOMETRY U-SHAPED MAGNET FOR MAGNETIC RESONANCE IMAGING

Sergio Pissanetzky, The Woodlands, Tex., assignor to Houston Advanced Research Center, The Woodlands, Tex.

Filed Dec. 12, 1994, Ser. No. 354,282
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—319 **16 Claims**



1. A compact, open geometry magnet for performing magnetic resonance imaging, said compact, open geometry magnet comprising:

a substantially U-shaped structure defining an imaging region, said substantially U-shaped structure including:

a pair of parallel iron slabs forming the arms of said U-shaped structure, said pair of parallel iron slabs having inner faces;

an iron flux return passing between said pair of parallel iron slabs and forming the connecting leg of said U-shaped structure;

a coil surrounding said iron flux return so that the surface of said coil is substantially contiguous with the inner faces of said pair of parallel iron slabs; and

adjustable means for drawing flux flow away from said substantially U-shaped structure located on the opposite side of said iron flux return from said parallel iron slabs.

5,592,091

METHOD FOR SHIMMING A MAGNETIC FIELD IN AN EXAMINATION SPACE OF A NUCLEAR MAGNETIC RESONANCE APPARATUS INCLUDING USE OF FUZZY LOGIC

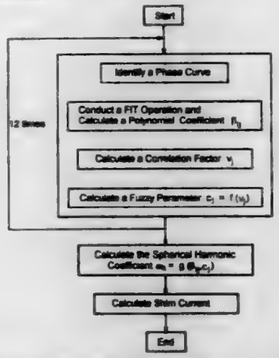
Atsutaka Manabe, Roettenbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 27, 1994, Ser. No. 313,386

Claims priority, application Germany, Sep. 30, 1993, 43 33 440.7

Int. Cl.[6] G01V *3/00;* **G01R** *33/20*

U.S. Cl. 324—320 **21 Claims**



1. A method for shimming a basic magnetic field in an examination space of a nuclear magnetic resonance apparatus, said basic magnetic field being mathematically representable in the form of spherical, harmonic functions whereby shim coils are arranged in the nuclear magnetic resonance apparatus which are fashioned such that each shim coil essentially influences one coefficient of these functions, said method comprising the steps of:

(a) exciting nuclear spins in said examination space, collecting nuclear magnetic resonance signals and thereby obtaining a data set for calculating coefficients of said spherical, harmonic functions, said nuclear magnetic resonance signals having an amplitude in the time domain and said data set having a plausibility associated therewith which increases with said amplitude;

(b) repeating step (a) a plurality of times to obtain a plurality of data sets from said nuclear magnetic resonance signals;

(c) setting a weighting for each data set representing said plausibility of each data set with a higher weighting representing a higher plausibility;

(d) calculating coefficients of a spherical harmonic function from said data sets including incorporating said weighting into said calculation of said coefficients so that data sets with a higher weighting provide a greater contribution to said coefficients; and

(e) generating a current dependent on said coefficients and supplying said current to a shim coil for correcting said inhomogeneities.

5,592,092

PIPE PROXIMITY WARNING DEVICE FOR ACCIDENTAL DAMAGE PREVENTION MOUNTED ON THE BUCKET OF A BACKHOE

Mark V. Mechler, Austin, Tex., assignor to Gas Research Institute, Chicago, Ill.

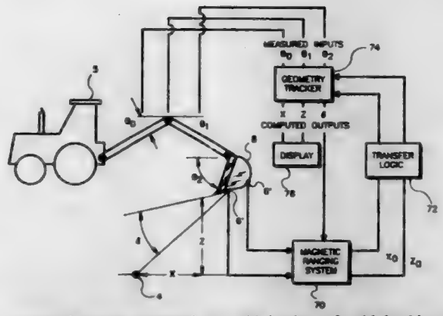
Filed Oct. 28, 1994, Ser. No. 331,229

Int. Cl.[6] G01V *3/08;* **G01R** *19/02*

U.S. Cl. 324—326 **25 Claims**

1. A locating system for use with a backhoe operating in the vicinity of a wire generating a magnetic field for locating the wire and for preventing the wire from becoming damaged, comprising:

a first sensor mounted on a bucket of said backhoe for detecting said magnetic field and for producing a first sensor output signal;



a second sensor mounted on said bucket of said backhoe a predetermined distance from said first sensor for detecting said magnetic field and for producing a second sensor output signal;

processing means for locating said wire by receiving said first sensor output signal and said second sensor output signal and determining the distance from said backhoe to said wire, wherein said processing means receives a signal representing an angle of said bucket and determines said distance to said wire based upon the following equation:

$$z=\gamma\sigma^2+\beta\sigma+\alpha$$

where σ is the ratio of said first sensor output signal to said second sensor output signal and α, β, and γ are constants unique for the bucket angle; and

means for indicating said distance and direction from said backhoe to said wire.

5,592,093

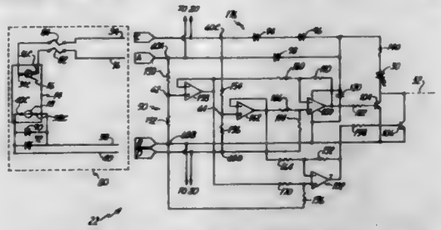
ELECTRONIC BATTERY TESTING DEVICE LOOSE TERMINAL CONNECTION DETECTION VIA A COMPARISON CIRCUIT

August G. Klingbiel, Willowbrook, Ill., assignor to Midtronics, Inc., Burr Ridge, Ill.

Filed May 5, 1995, Ser. No. 436,017

Int. Cl.[6] G01N *27/27;* **G08B** *29/04*

U.S. Cl. 324—426 **11 Claims**



1. A device for accessing condition of a battery, comprising:

a first connector for coupling to a first terminal of the battery;

a second connector for coupling to the first terminal of the battery;

a third connector for coupling to a second terminal of the battery;

a fourth connector for coupling to the second terminal of the battery;

electrical circuitry coupled to the first, second, third and fourth connectors for measuring a parameter of the battery and providing a measurement output;

a bridge circuit having first and second inputs connected to the first and second connectors and third and fourth inputs connected to the third and fourth connectors; and

output circuitry connected to a first and a second output of the bridge circuit providing an output in response to a voltage difference detected between the first output and the second output.

5,592,094

BATTEREY DISCHARGE CHARACTERISTICS CALCULATION METHOD AND REMAINING BATTERY CAPACITY MEASURING DEVICE

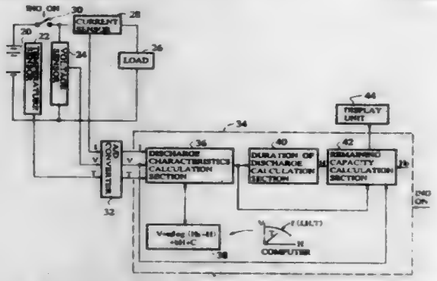
Hiroshi Ichikawa, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Nov. 24, 1995, Ser. No. 562,608

Claims priority, application Japan, Nov. 25, 1994, 6-291131

Int. Cl.[6] G01N *27/416*

U.S. Cl. 324—427 **7 Claims**



1. A battery discharge characteristics calculation method achieved by using a sensing unit formed of a voltage sensor for use in detecting the terminal voltage of the battery connected to a load, a current sensor for use in detecting a current flowing through the load, and a temperature sensor for use in detecting the temperature of the battery to determine approximated discharge characteristics of the battery based on the detected voltage, current and temperature, comprising the steps of:

reading signals supplied from the sensing unit, the signals being indicative of the voltage, current, and temperature of the battery to be varied depending upon the variation of the load; and

approximating the discharge characteristics in accordance with the variation of the load at a curved surface function formed on voltage, temperature, and duration of discharge axes, and substituting the detected current and temperature for the corresponding coefficients of the curved surface function to determine the approximated discharge characteristics at that given temperature on the voltage-duration of discharge axes.

5,592,095

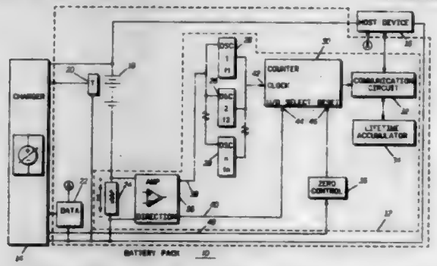
CHARGE MEASUREMENT CIRCUIT FOR A BATTERY IN WHICH OSCILLATORS ARE USED TO INDICATE MODE OF OPERATION

Vernon Meadows, Lilburn, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1995, Ser. No. 520,362

Int. Cl.[6] G01R *27/26*

U.S. Cl. 324—436 **12 Claims**



1. A charge measurement circuit for a battery pack having at least one battery cell, comprising:

means for converting current through said at least one battery cell to a voltage level;

a plurality of oscillators connected to said means for converting, each of said oscillators providing a dock signal comprised of regular pulses at a different preselected frequency corresponding to an operating mode of a host device in response to said voltage level being within a corresponding exclusive range;

means for generating a count of said pulses connected to said at least one oscillator, said means for generating a count being reset to an initial state in response to said at least one battery cell being recharged; and

means for communicating said count to a host device.

5,592,096

ELECTRICAL MOBILITY SELECTOR OF CHARGED PARTICLES

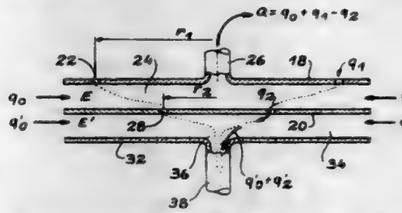
Michel Pourprix, Montlhéry, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 11, 1995, Ser. No. 438,708

Claims priority, application France, May 24, 1994, 94 06273

Int. Cl.[6] G01N *27/60*

U.S. Cl. 324—452 **4 Claims**



1. Electrical mobility selector of aerosol particles contained in an atmosphere, comprising a first and a second spaced, parallel, coaxial conductive disks defining a first space therebetween, an electrical field E being established between the disks by raising the disks to different potentials, the first space between the two disks communicating with the atmosphere to be examined through an annular slot of radius r_1 made in the first disk, a central intake being provided in the first disk for bringing about a circulation in said space, as from the periphery of the disks, of a stable, centripetal, laminar filtered air flow, the second disk being provided with an annular opening of mean radius $r_2(r_2<r_1)$, said selector also comprising:

a third disk facing the second disk and defining a second Space therebetween,

means for injecting, into the second space between the second and third disks, a radial, laminar, filtered air flow from the periphery of said second and third disks, and

a central pipe fixed to the third disk by which the particles are discharged to the outside of the selector.

5,592,097

LOAD OPEN STATE DETECTION USING H-BRIDGE DRIVING CIRCUIT

Toshifumi Shimizu; Yumiko Iwanami, and Kazuhiro Mori, all of Kanagawa, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 110,368, Aug. 23, 1993, Pat. No. 5,457,391. This application May 15, 1995, Ser. No. 441,199

Claims priority, application Japan, Sep. 3, 1992, 4-235774; Sep. 29, 1992, 4-259185

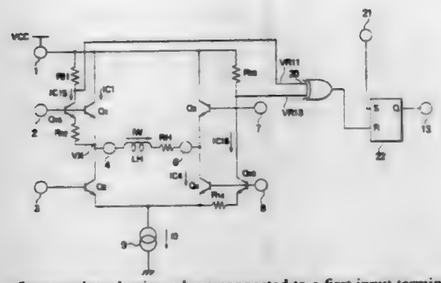
Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—546 **10 Claims**

1. A load open state detection circuit, comprising:

a load driving circuit of H-bridge type for receiving load driving signals and supplying to a load an alterative current, said load driving circuit including:

X and Y terminals between which the load is connected,



a first transistor having a base connected to a first input terminal to which a first load drive signal is supplied, and a collector connected to a terminal to which a predetermined voltage is supplied;

a second transistor having a base connected to a second input terminal to which a second load drive signal is supplied, and a collector connected to an emitter of the first transistor and the X terminal,

a third transistor having a base connected to a third input terminal to which a third drive signal is supplied, and a collector connected to the terminal to which said predetermined voltage is supplied, and

a fourth transistor having a base connected to a fourth input terminal to which a fourth drive signal is supplied, a collector connected to an emitter of the third transistor and the Y terminal, and an emitter connected to the emitter of the second transistor;

a fifth transistor having a base connected to the base of the first transistor, a collector connected to a first resistor which is connected to the collector of the first transistor, and an emitter connected to a second resistor which is connected to the emitter of the first transistor;

a sixth transistor having a base connected to the base of the fourth transistor, a collector connected to a third resistor which is connected to the collector of the first transistor and an emitter connected to a fourth resistor which is connected to the emitter of the fourth transistor; and

a logic gate circuit for receiving voltages of the collectors of the fifth and sixth transistors for executing a logic operation on said received voltages so as to determine whether the load is in a normal state in which load current flows therethrough or in an open state in which no load current flows therethrough.

5,592,098

CHANNEL FORMING FUEL PERMITTIVITY SENSOR WITH AUTOMATIC TEMPERATURE COMPENSATION

Hiroyoshi Suzuki; Akira Otada, and Takahiro Moronaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 279,550, Jul. 25, 1994, which is a continuation of Ser. No. 935,210, Aug. 26, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 487,515

Claims priority, application Japan, Aug. 28, 1991, 3-216825; Aug. 28, 1991, 3-216840; Sep. 12, 1991, 3-232863

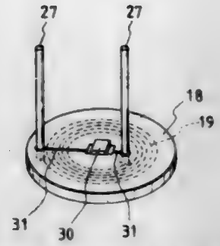
Int. Cl.[6] G01N *27/22*; G01R *27/26*

U.S. Cl. 324—663 **10 Claims**

1. An apparatus for detecting a permittivity of fuel, said apparatus comprising:

single-layer winding coil means provided with a thin insulating layer having high-permittivity, said thin insulating layer being in contact with the fuel;

metal electrode means, disposed concentrically with said single-layer winding coil means and separated from said single-layer winding coil means by a predetermined distance, said metal electrode means defining a fuel channel with said thin insulating layer of said single-layer winding coil means; and



means for detecting the permittivity of the fuel flowing through said fuel channel based on an electrostatic capacity between said single-layer winding coil means and said metal electrode means;

wherein said single-layer winding coil means is formed in a tubular shape, and said metal electrode means is formed in a columnar shape.

5,592,099

IC TESTER JOINED WITH ION BEAM TESTER AND THE DETECTION METHOD OF THE FAILURE PART OF IC

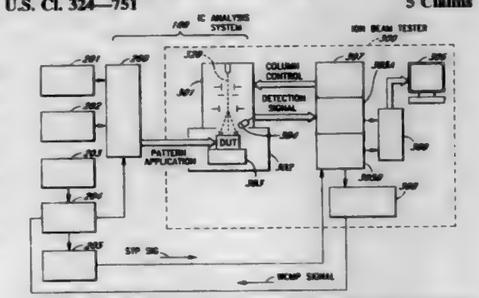
Masayuki Kuribara, Gyoda; Akira Goishi, Kazo, and Koshi Ueda, Tokyo, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Apr. 7, 1995, Ser. No. 418,498

Claims priority, application Japan, Apr. 8, 1994, 6-095678

Int. Cl.[6] G01R *31/28*

U.S. Cl. 324—751 **5 Claims**



1. An IC analysis system for analyzing a defective part of an IC device under test, comprising:

a test pattern generator sequentially applying test pattern signals to an IC device under test;

an ion beam tester which sweeps and irradiates an ion beam on the surface of said IC device under test, said ion beam tester acquiring a potential distribution of said IC device under test by measuring amounts of second electrons emitted from the irradiation points on said surface of said ion beam and displaying a potential contrast image based on said potential distribution;

stop pattern setting means for setting at least two repeat test patterns to be repeated by said test pattern generator;

pattern hold means for instructing said test pattern generator to stop incrementing a sequence of said test pattern and to repeat generating one of said repeat test patterns defined by said stop pattern setting means when said test pattern signal generated by said test pattern generator reaches said one of said repeat test patterns;

means for generating a stop signal indicating said stop in said incrementing said test pattern signal;

at least two image data acquisition means for acquiring said potential contrast images corresponding to said repeat test patterns repeated by said test pattern generator in response to said step signal;

computation means for processing said image data acquired by said two image data acquisition means to obtain differences between said image data; and

a monitor which illustrates said differences between said image data obtained by said computation means in a form of said potential contrast image.

5,592,100

METHOD FOR DETECTING AN IC DEFECT USING CHARGED PARTICLE BEAM

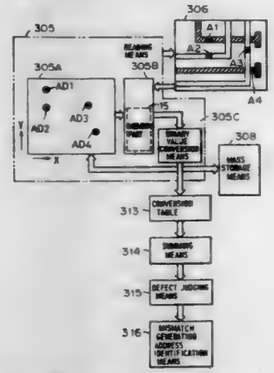
Soichi Shida; Hiroshi Kawamoto, both of Saitama, and Hironobu Nijima, Gunma, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

Division of Ser. No. 503,003, Jul. 17, 1995. This application Apr. 30, 1996, Ser. No. 640,439

Claims priority, application Japan, Jul. 18, 1994, 6-165149

Int. Cl.[6] G01R *31/28*

U.S. Cl. 324—751 **1 Claim**



1. A method for detecting an IC defect using a charged particle beam comprising:

a first step for applying test patterns sequentially to an IC under test, stopping the test pattern update at a stop test pattern address, irradiating a charged particle beam to a specified area of said IC under test, and detecting a secondary electron emission to acquire a potential contrast image data for all test patterns through a predetermined test pattern address by stepping back the test pattern address sequentially;

a second step for applying the test patterns sequentially to a second IC, stopping the test pattern update at the stop test pattern address, irradiating a charged particle beam to said specified area of said second IC, and detecting a secondary electron emission to acquire a potential contrast image data for all the test patterns through said predetermined test pattern address by stepping back the test pattern address sequentially;

a third step for acquiring a potential data of a specified portion in said specified area from each of said potential contrast image data for each of said stop test pattern addresses for said IC under test;

a fourth step for acquiring a potential data of said specified portion in said specified area from each of said potential contrast image data for each of said stop test pattern addresses for said second IC;

a fifth step for converting each of said potential data acquired in said third step into a binary value;

a sixth step for converting each of said potential data acquired in said fourth step into a binary value;

a seventh step for acquiring a series of numeric values by sequentially referencing a conversion table with each of the binary value potential data acquired in said fifth step, said conversion table being constructed such that a numeric value is given for each of logical values H and L for each of reference numbers, said numeric value being selected so that sum of the numeric values referenced in response to the logical value H or L in a series of binary values is different if said series of binary values is different;

an eighth step for acquiring a series of the numeric values by sequentially referencing said conversion table with each of the binary value potential data acquired in said sixth step;

a ninth step for summing each of the numeric values in the series of the numeric values acquired in said seventh step;

a tenth step for summing each of the numeric values acquired in said eighth step; and

an eleventh step for comparing each of the summed values sequentially acquired in said ninth step with each of the summed values sequentially acquired in said tenth step.

5,592,101

ELECTRO-OPTIC APPARATUS FOR MEASURING AN ELECTRIC FIELD OF A SAMPLE

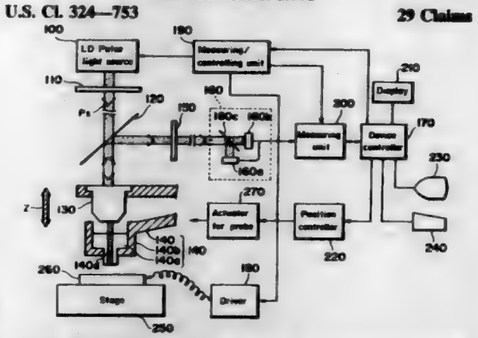
Hironori Takahashi; Shinichiro Asahina, and Isuke Hirano, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jul. 22, 1993, Ser. No. 94,974

Claims priority, application Japan, Jul. 24, 1992, 4-198791

Int. Cl.[6] G01R *29/12*

U.S. Cl. 324—753 **29 Claims**



1. An electro-optic probe apparatus for measuring an electric field of a sample, comprising:

a freely reciprocating electro-optic member comprised of an electro-optic material;

a guide mechanism for supporting said freely reciprocating electro-optic member to be freely reciprocally movable within a predetermined stroke range, said free reciprocal movement occuring only in directions normal to said sample; and

driving means for reciprocating said guide mechanism in said direction of said sample.

5,592,102

MEANS AND APPARATUS TO MINIMIZE THE EFFECTS OF SILICON PROCESSING DEFECTS IN PROGRAMMABLE LOGIC DEVICES

Christopher F. Lane, Campbell; Srinivas T. Reddy, Santa Clara, and Bonnie I. Wang, Cupertino, all of Calif., assignors to Altera Corporation, San Jose, Calif.

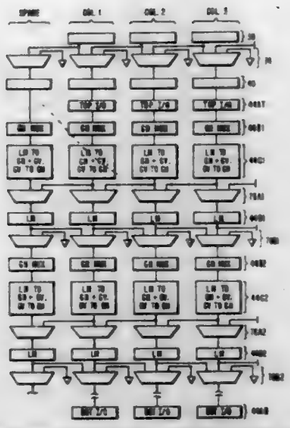
Filed Oct. 19, 1995, Ser. No. 545,437

Int. Cl.[6] H01L *25/00*

U.S. Cl. 326—10 **16 Claims**

1. Programmable logic array integrated circuit device apparatus comprising:

a plurality of regular columns of programmable programming data memory cells disposed substantially side by side on said device, the cells in each of said columns being connected to one another in a series such that programming data applied at any point in said series flows from that point down the series in a direction from a top of said column toward a bottom of said column, adjacent cells in the series in each of said



columns being grouped into a plurality of first groups and a plurality of second groups which are interspersed with said first groups in said series;

a spare column of programmable programming data memory cells disposed substantially side by side with one of said regular columns which is at an end of said plurality of said regular columns, the cells in said spare column being connected to one another in a series such that programming data applied at any point in said series flows from that point down the series in a direction from a top of said spare column toward a bottom of said spare column, adjacent cells in the series in said spare column being grouped into a plurality of second groups, each of which is associated with a respective one of the second groups in each of said regular columns;

first switching circuitry disposed in the series in each of said columns in advance of each of said second groups in said column for selectively connecting (1) any cell in said column which is immediately above said first switching circuitry to any cell in said column which is immediately below said first switching circuitry or (2) any cell in a first column adjacent to said column in a direction away from said spare column, which cell is immediately above the first switching circuitry in said first adjacent column, to any cell in said column which is immediately below said first switching circuitry; and

second switching circuitry disposed in the series in each of said columns below each of said second groups in said column for selectively connecting (1) any cell in said column which is immediately above said second switching circuitry to any cell in said column which is immediately below said second switching circuitry or (2) any cell in a second column adjacent to said column in a direction toward said spare column, which cell is immediately above the second switching circuitry in said second adjacent column, to any cell in said column which is immediately below said second switching circuitry.

5,592,103

SYSTEM FOR FAST SWITCHING OF TIME CRITICAL INPUT SIGNALS

Ivan E. Sutherland, Santa Monica, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 140,654, Oct. 21, 1993, and a continuation-in-part of Ser. No. 140,655, Oct. 21, 1993. This application Jul. 3, 1995, Ser. No. 499,407

Int. Cl.[6] H03K *19/01*

U.S. Cl. 326—17 **20 Claims**

1. A circuit comprising:

a signal output node;

a first logic column including first logic, a first inverter, and a first logic column output node coupled to the signal output node, the first logic column connected to receive first logic column input signals and in response supply a first logic column output signal to the first logic column output node, some of the first logic column input signals being supplied to the first logic, and at least one first logic column input signal being supplied to the first inverter;

a second logic column including second logic, a second inverter, and a second logic column output node coupled to the signal output node, the second logic column connected to receive second logic column input signals and in response supply a second logic column output signal to the second logic column output node, some of the second logic column input signals being supplied to the second logic, and at least one second logic column input signal being supplied to the second inverter; and

wherein the at least one first logic column input signal comprises a selected input signal and the at least one second logic column input signal comprises a signal complementary to the selected input signal.

5,592,104

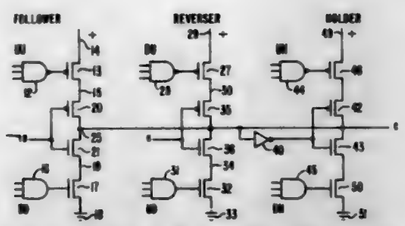
OUTPUT BUFFER HAVING TRANSMISSION GATE AND ISOLATED SUPPLY TERMINALS

Randall Bach, Stillwater, Minn., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 13, 1995, Ser. No. 571,724

Int. Cl.[6] H03K *17/16*

U.S. Cl. 326—27 **6 Claims**



1. A CMOS tri-state output buffer comprising:

first and second relatively positive supply terminals which are isolated from one another;

first and second relatively negative supply terminals which are isolated from one another;

a data input terminal;

a data output terminal;

a predriver stage having a first pull-up transistor and a first pull-down transistor which are coupled between the first relatively positive and negative supply terminals, the first pull-up and pull-down transistors having control terminals coupled to the data input terminal and having first and second outputs, respectively;

an output stage having a second pull-up transistor and a second pull-down transistor which are coupled between the second relatively positive and negative supply terminals, the second pull-up and pull-down transistors having control terminals coupled to the first and second outputs, respectively, and having third and fourth output terminals coupled to the data output terminal;

an enable input terminal;

an enable control circuit coupled to the enable input and having complementary output terminals; and

a CMOS transmission gate coupled between the control terminals of the second pull-up and pull-down transistors and having complementary control terminals coupled to respective ones of the complementary output terminals.

5,592,105

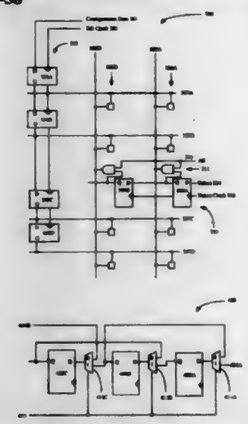
CONFIGURATION LOGIC TO ELIMINATE SIGNAL CONTENTION DURING RECONFIGURATION

Edmond Y. Cheung, San Jose, and Charles R. Erickson, Fremont, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Jan. 20, 1995, Ser. No. 375,763

Int. Cl.[6] H03K *19/173*; G11C *19/28;19/00*

U.S. Cl. 326—38 **7 Claims**



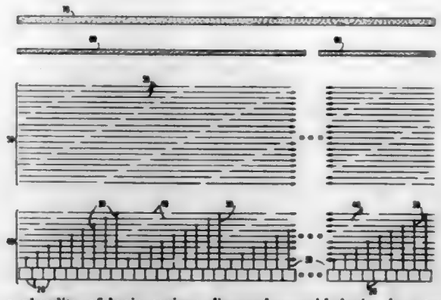
1. A structure for reversing a signal propagation direction to prevent signal contention during memory initialization comprising:

a plurality of synchronous storage elements;

a plurality of access enable circuits, wherein each output terminal of one of said plurality of synchronous storage elements is coupled to an input terminal of one of said plurality of access enable circuits;

a plurality of memory cells, wherein each output terminal of one of said plurality of access enable circuits is coupled to a predetermined set of said plurality of memory cells; and

a plurality of two-input multiplexers, wherein a control signal in a first logic state provided to said multiplexers provides a first signal propagation direction through said storage elements and the control signal in a second logic state provided to said multiplexers provides a second signal propagation direction through said storage elements.



a plurality of logic regions disposed on said device in a two-dimensional array of intersecting rows and columns of such logic regions, each logic region being programmable to produce an associated logic region output signal which is any of a plurality of logical functions of a plurality of logic region input signals associated with and applied to said logic region via input terminals of said logic regions;

a plurality of local feedback channels adjacent each said row;

a plurality of local feedback conductors axially aligned in said plurality of local feedback channels, each of said plurality of local feedback conductors being associated with a respective one of said logic regions and receiving the output signal of only the associated logic region, each of said local feedback conductors spanning a substantially unique group of logic regions adjacent to said associated logic region, each said group of logic regions including a plural number of said logic regions;

a first plurality of programmable logic connectors for selectively connecting each of said local feedback conductors to at least one of said input terminals of each of the logic regions spanned by said local feedback conductor;

a plurality of row conductors associated with and extending along each of said rows;

a plurality of column conductors associated with and extending along each of said columns;

a plurality of intermediary conductors, each of which is selectively connectable to any of an associated subplurality of said row conductors and each of which spans an associated subplurality of adjacent ones of said logic regions, each logic region being included in a multiplicity of said subpluralities of logic regions, at least some of said subpluralities of logic regions in each multiplicity including at least some different ones of said logic regions than others of said subpluralities in said multiplicity include;

a second plurality of programmable logic connectors for selectively connecting each of said intermediary conductors to at least one of said input terminals of each of the logic regions spanned by said intermediary conductors;

a third plurality of programmable logic connectors for selectively connecting the output signal of each logic region to some row and column conductors adjacent to said logic region; and

a fourth plurality of programmable logic connectors for selectively interconnecting said row and column conductors.

5,592,106

PROGRAMMABLE LOGIC ARRAY INTEGRATED CIRCUITS WITH INTERCONNECTION CONDUCTORS OF OVERLAPPING EXTENT

William Leong, San Francisco; Cameron McClintock, Mountain View, and Richard G. Cliff, Milpitas, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed May 17, 1995, Ser. No. 442,796

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—41 **24 Claims**

1. A programmable logic array integrated circuit device comprising:

5,592,107

CONFIGURABLE NAND/NOR ELEMENT

Mark W. McDermott, and John E. Turner, both of Austin, Tex., assignors to Cyrix Corporation, Richardson, Tex.

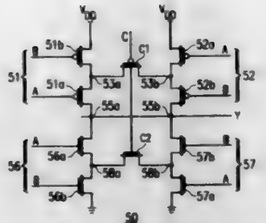
Filed Jun. 30, 1995, Ser. No. 497,491

Int. Cl.[6] H03K *19/0948*

U.S. Cl. 326—49 **4 Claims**

1. A configurable NAND/NOR logic element receiving A and B inputs and providing a Y output, comprising:

(a) a first transistor stack including a B-input p-transistor in series with an A-input p-transistor, defining a first internal node; and



(b) a second transistor stack including an A-input p-transistor in series with a B-input p-transistor, defining a second internal node;

(c) a third transistor stack including an A-input n-transistor in series with a B-input n-transistor, defining a third internal node; and

(d) a fourth transistor stack including a B-input n-transistor in series with an A-input n-transistor, defining a fourth internal node;

(e) the first transistor stack and the third transistor stack being coupled in series to define a first output node, and the second transistor stack and the fourth transistor stack being coupled in series to define a second output node, the first and second output nodes being coupled to provide the Y output;

(f) a configuration p-transistor coupled between the first and second internal nodes; and

(g) a configuration n-transistor coupled between the third and fourth internal nodes;

(h) the configuration p- and n-transistors being gated by a C input, such that

(i) if the C input is deasserted, the configuration p-transistor shorts the first and second internal nodes, and configuring the NAND/NOR logic element as a NAND gate with a corresponding Y output; or

(j) if the C input is asserted, the configuration n-transistor shorts the third and fourth internal nodes, and configuring the NAND/NOR logic element as a NOR gate with a corresponding Y output.

5,592,108

INTERFACE CIRCUIT ADAPTED FOR CONNECTION TO FOLLOWING CIRCUIT USING METAL-SEMICONDUCTOR TYPE TRANSISTOR

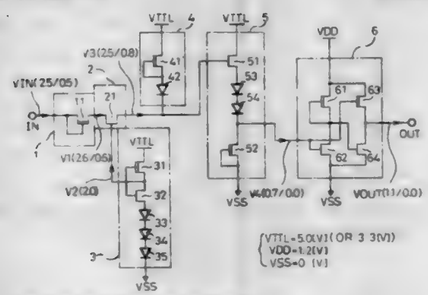
Kazuhisa Tsukahara, Yamanashi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 25, 1995, Ser. No. 506,638

Claims priority, application Japan, Jan. 20, 1995, 7-007500

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—69 **14 Claims**



1. An interface circuit comprising:

an input current limiting circuit for limiting a current of an input signal fed from a preceding circuit, thereby outputting the current-limited signal to a following circuit which is constituted using an MES type transistor;

a level shifting circuit supplied with a first higher power supply voltage and a lower power supply voltage, for converting a level of said current-limited signal into a logic level of said following circuit which is supplied with a second higher power supply voltage; and

a level judging circuit connected between said input current limiting circuit and said level shifting circuit, for judging a logic threshold level of said input signal based on a predetermined level reference voltage.

5,592,109

PHASE COMPARATOR AND PLL CIRCUIT

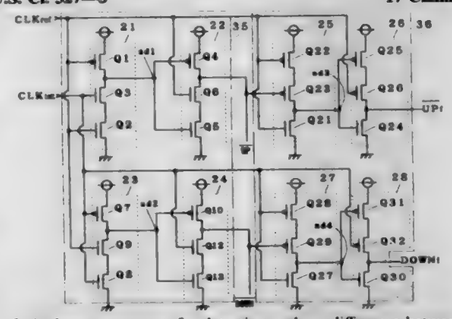
Hiromi Notani, and Harufusa Kondoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 403,948

Claims priority, application Japan, Apr. 1, 1994, 6-065190

Int. Cl.[6] H03K *5/22*

U.S. Cl. 327—3 **17 Claims**



1. A phase comparator for detecting a phase difference between a first clock in which a first signal level and a second signal level alternately appear and a second clock in which a third signal level and a fourth signal level alternately appear by comparing timing of changing from said first signal level to said second signal level and timing of changing from said third signal level to said fourth signal level and outputting a first output signal when a phase of said first clock is leading a phase of said second clock and outputting a second output signal when said first clock is lagging behind said second clock, characterized by:

going into a first state in which said first and second output signals are not outputted when the phase of said first clock and the phase of said second clock agree;

in said first state, holding said first state when said second clock changes from said third signal level to said fourth signal level when said first clock is at said second signal level;

in said first state, holding said first state when said first clock changes from said first signal level to said second signal level when said second clock is at said fourth signal level;

in said first state, changing to a second state in which only said first output signal is outputted when said first clock changes from said first signal level to said second signal level when said second clock is at said third signal level;

in said second state, holding said second state when said first clock changes from said first signal level to said second signal level when said second clock is at said third signal level;

in said second state, changing to said first state when said second clock changes from said third signal level to said fourth signal level when said first clock is at said second signal level;

in said first state, changing to a third state in which said second output signal only is outputted when said second clock changes from said third signal level to said fourth signal level when said first clock is at said first signal level;

in said third state, holding said third state when said second clock changes from said third signal level to said fourth signal level when said first clock is at said first signal level;

in said third state, changing to said first state when said first clock changes from said first signal level to said second signal level when said second clock is at said fourth signal level; and

making no state transition among said first, second and third states when said first clock changes from said second signal level to said first signal level and when said second clock changes from said fourth signal level to said third signal level.

5,592,110

PHASE COMPARISON CIRCUIT FOR MAINTAINING A STABLE PHASE LOCKED LOOP CIRCUIT IN THE ABSENCE OF THE PULSE OF AN INPUT SIGNAL

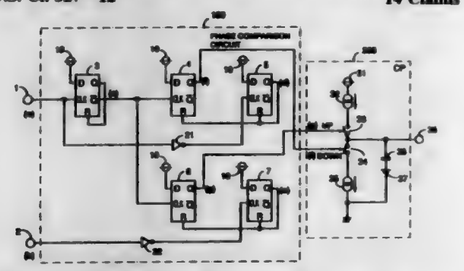
Kenji Noguchi, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1995, Ser. No. 428,343

Claims priority, application Japan, Nov. 11, 1994, 6-277670

Int. Cl.[6] H03D *13/00;* **H03K** *5/26;* **H03L** *7/06*

U.S. Cl. 327—12 **14 Claims**



1. A phase comparison circuit comprising:

a first circuit for generating a first pulse at each rising edge of an input signal;

a second circuit for generating a second pulse at each falling edge of the input signal;

a third circuit for generating a third pulse at each falling edge of a reference signal;

a fourth circuit, connected to said first and second circuits, for receiving said first and second pulses and generating a first output signal; and

a fifth circuit, connected to said first and third circuits, for receiving said first and third pulses and generating a second output signal.

5,592,111

CLOCK SPEED LIMITER FOR AN INTEGRATED CIRCUIT

Keng L. Wong, Portland; Alexander Waizman, Beaverton, both of Oreg., and Bart R. McDaniel, Phoenix, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 14, 1994, Ser. No. 355,859

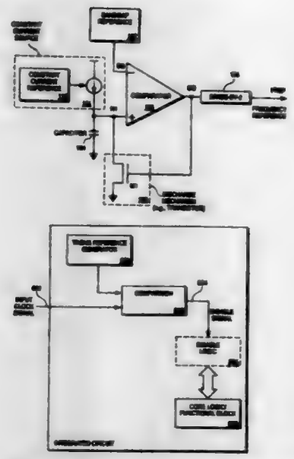
Int. Cl.[6] G01R *23/02;* **H03D** *3/00*

U.S. Cl. 327—45 **37 Claims**

1. An apparatus for disabling the operation of an integrated circuit operating under control of an input clock signal, said apparatus comprising:

a timing reference generator generating a timing reference having a frequency that is substantially constant with temperature, wherein the timing reference generator generates the timing reference using a bandgap voltage reference and a constant current reference; and

a comparison circuit coupled to receive the timing reference and the input clock signal comparing a predetermined frequency to the input clock signal during a predetermined logic state of the timing reference and providing a disable signal for disabling the integrated circuit when the frequency of the input clock signal exceeds the predetermined frequency.



5,592,112

MOTOR CURRENT DETECTION CIRCUIT

Yasushi Nishibe, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

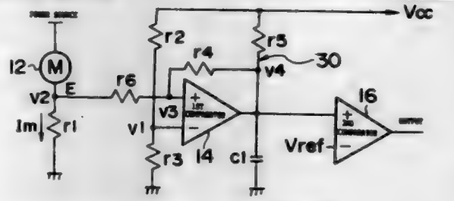
Continuation of Ser. No. 195,287, Feb. 14, 1994, abandoned.

This application Feb. 14, 1996, Ser. No. 601,537

Claims priority, application Japan, Feb. 18, 1993, 5-29347

Int. Cl.[6] H03K *5/153;3/037*

U.S. Cl. 327—87 **4 Claims**



1. A motor current detection circuit comprising:

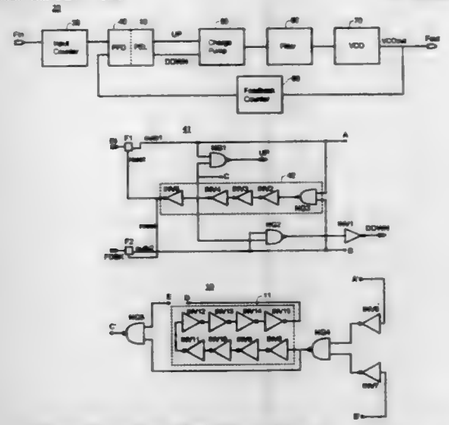
a current detector for detecting an overloaded state of a motor by separately receiving a first signal having a value representative of current flowing through said motor and a second signal having a predetermined reference value, said current detector comparing said first signal with said second signal; and

a hysteresis generating circuit for generating and applying, in said current detector, a hysteresis characteristic to said first signal, said hysteresis characteristic corresponding to an integrated value with respect to time of an increment amount by which said value representative of the current flowing through said motor exceeds said predetermined reference value, said current detector outputting a third signal representative of the overloaded state of the motor when the value representative of the current flowing through the motor exceeds the predetermined reference value.

5,592,113
GRADUAL FREQUENCY CHANGING CIRCUIT

Duane G. Quiet, and E. Wayne Porter, both of Portland, Me., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Mar. 28, 1995, Ser. No. 412,270
Int. Cl.[6] H03L 7/06
U.S. Cl. 327—158 **20 Claims**

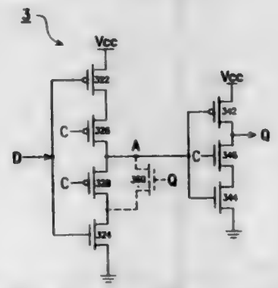


1. A phase-locked loop device comprising:
a. a phase-frequency detector for receiving a reference signal and a VCO signal to be compared to said reference signal;
b. a charge pump coupled to said phase-frequency detector, for converting a digital UP signal or a digital DOWN signal from said phase-frequency detector into a current;
c. a loop filter coupled to said charge pump, for receiving a charge related to said current from said charge pump; and
d. a voltage-controlled oscillator coupled to said loop filter and to said phase-frequency detector, wherein a voltage at an output of said loop filter controls a frequency of said VCO signal transmitted by said voltage-controlled oscillator to said phase-frequency detector,
wherein said phase-frequency detector includes means for regulating a phase difference associated with said digital UP signal or said digital DOWN signal transmitted by said phase-frequency detector.

5,592,114
TRUE TYPE SINGLE-PHASE SHIFT CIRCUIT

Chung-Yu Wu, Hsinchu, and Shu-Yuan Chin, Tao-Yuan, both of Taiwan, assignors to National Science Counsil, Taipei, Taiwan

Filed Jul. 14, 1994, Ser. No. 275,172
Int. Cl.[6] H03K 3/353
U.S. Cl. 327—208 **3 Claims**

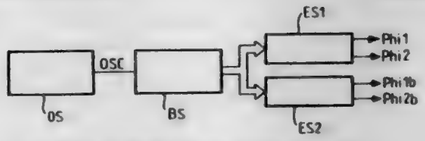


1. A true type single-phase shift circuit utilizing a first electric potential, a second electric potential that is lower than said first electric potential, and a clock pulse as a triggering signal for storing and outputing a data signal; comprising:
a first PMOS transistor having a source terminal coupled to said first electric potential source, a drain terminal, and a gate terminal coupled to said data signal;
a first NMOS transistor having a source terminal coupled to said second electric potential, a drain terminal and a gate terminal coupled to said data signal;
two first-type MOS transistors serially coupled between said drain terminal of said first PMOS transistor and said drain of said first NMOS transistor wherein each of said two first-type MOS transistors has a gate terminal coupled to said clock pulse signal;
a second PMOS transistor having a source terminal coupled to said first electric potential, a drain terminal, and agate terminal connected between said two first-type MOS transistors;
a second NMOS transistor having a source terminal coupled to said second electric potential source, a drain terminal, and a gate terminal coupled between said two first-type MOS transistors;
a second-type MOS transistor serially coupled between said drain terminal of said second PMOS transistor and said drain terminal of said second NMOS transistor having a gate terminal coupled to said clock pulse signal, and a drain terminal used as an output terminal,
wherein one of said first-type MOS transistors is coupled in parallel with a feedback second-type transistor having a gate terminal coupled to said output terminal.

5,592,115
VOLTAGE BOOSTER CIRCUIT OF THE CHARGE-PUMP TYPE WITH A BOOTSTRAPPED OSCILLATOR

Christian G. Kassapian, Marseille, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Division of Ser. No. 128,871, Sep. 29, 1993. This application Jun. 6, 1995, Ser. No. 467,297
Claims priority, application France, Oct. 1, 1992, 92 11751
Int. Cl.[6] H03K 3/00
U.S. Cl. 327—239 **20 Claims**

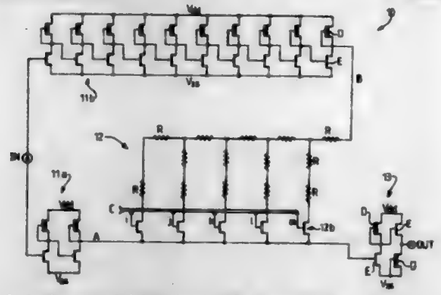


1. A transistor switching control circuit comprising:
a ring oscillator having an output that provides an oscillator signal at an oscillator frequency;
a phase splitter stage coupled to the ring oscillator, having an input that receives the oscillator signal and an output that provides a plurality of non-overlapping phase-split signals substantially at the oscillator frequency;
a non-bootstrapped output stage coupled to the phase splitter stage, having an input that receives the plurality of non-overlapping phase-split signals, and an output that provides a plurality of non-bootstrapped non-overlapping output signals that switch between a zero voltage and a supply voltage substantially at the oscillator frequency; and
a bootstrapped output stage coupled to the phase splitter stage, having an input that receives the plurality of non-overlapping phase-split signals, and an output that provides a plurality of bootstrapped non-overlapping output signals that switch between the zero voltage and a voltage of greater magnitude than the supply voltage substantially synchronously with the plurality of non-bootstrapped non-overlapping output signals.

5,592,116
ADJUSTABLE DELAY CIRCUIT

Mohamed Bedouani, Viroflay, France, assignor to Bull S.A., Louveciennes, France

Filed Apr. 5, 1995, Ser. No. 417,258
Claims priority, application France, Apr. 13, 1994, 94 04331
Int. Cl.[6] H03K 5/13; 17/28
U.S. Cl. 327—276 **13 Claims**

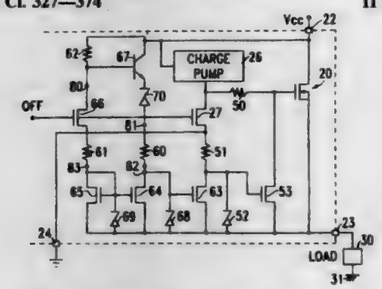


1. An integrated delay circuit (**10**), comprising:
two amplifiers (**11***a*, **11***b*) having a common input for receiving an input signal (IN) and respective first and second output terminals for providing corresponding output signals (A,B) differently delayed with respect to said input signal, and
a resistive-ladder network (**12**) having first and second terminals respectively connected to said first and second output terminals of said two amplifiers, output means (**13**) for providing an output signal (OUT) having a controllable delay with respect to said input signal (IN), a plurality of resistive stages of the type R-2R coupled between said first and second terminals and a plurality of switches controlled by a digital control signal (C) for selecting between said resistive stages in order to linearly vary said controllable delay of said output signal of said resistive-ladder network with respect to said input signal (IN).

5,592,117
INTEGRATED MOSGATED POWER SEMICONDUCTOR DEVICE WITH HIGH NEGATIVE CLAMP VOLTAGE AND FAIL SAFE OPERATION

Bruno C. Nadd, Puyvert, France, assignor to International Rectifier Corporation, El Segundo, Calif.

Filed Apr. 11, 1995, Ser. No. 420,194
Int. Cl.[6] H03K 17/04
U.S. Cl. 327—374 **11 Claims**

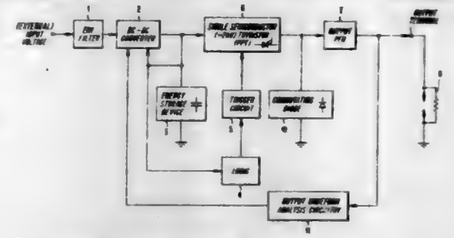


1. A high side switch circuit comprising:
a voltage source (V_{CC}) terminal;
a logic ground terminal;
an output voltage terminal connectable to one side of a load, the load being connectable at its other side to a load ground terminal;
a MOSgated semiconductor power device having first and second power electrodes and a control electrode, said first power electrode coupled to said output voltage terminal and said second power electrode coupled to said V_{CC} terminal;
an input circuit which produces signals for turning said power device off or on;
a main control MOSFET connected between said first power electrode and said control electrode of said power device for turning off said power device when said main control MOSFET turns on;
a signal level translator circuit for maintaining a substantially constant control voltage until commutation of said MOSgated semiconductor power device is desired; and
an inverter circuit, said inverter circuit coupled to said input circuit and said signal level translator circuit, said signal level translator circuit being coupled to said main control MOSFET to turn off said main control MOSFET in response to an input turn-on signal, the threshold conduction voltage of said main control MOSFET being lower than the threshold conduction voltage of said MOSgated semiconductor power device.

5,592,118
IGNITION EXCITER CIRCUIT WITH THYRISTORS HAVING HIGH DI/DT AND HIGH VOLTAGE BLOCKAGE

Theodore S. Wilmot, Greenville, S.C.; John C. Driscoll, Raleigh, N.C., and Steve J. Kempinski, Easley, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 9, 1994, Ser. No. 207,717
Int. Cl.[6] H03K 17/72; F02B 3/08
U.S. Cl. 327—440 **16 Claims**



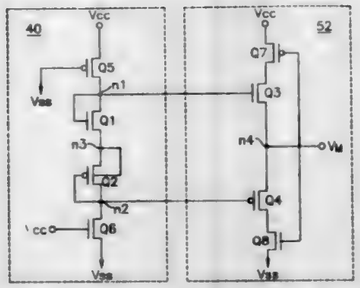
1. An exciter circuit comprising:
a node for receiving an input voltage;
a voltage conversion device for stepping up the input voltage to at least 2 kV;
an energy storage device for storing the stepped-up input voltage of at least 2 kV; and
a semiconductor switching device for outputting the stored, stepped-up input voltage to a pulse-forming network, said semiconductor switching device having a di/dt characteristic of at least 200 amperes per microsecond and operating to block said stepped-up input voltage of at least 2 kV.

5,592,119
HALF POWER SUPPLY VOLTAGE GENERATING CIRCUIT FOR A SEMICONDUCTOR DEVICE

Seung-Moon Yoo, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 7, 1994, Ser. No. 224,019
Claims priority, application Rep. of Korea, Apr. 16, 1993, 1993-6412
Int. Cl.[6] G05F 1/10
U.S. Cl. 327—530 **9 Claims**

1. A half power supply voltage generating circuit receiving first and second power supply voltages and comprising:
a bias circuit receiving said first and second power supply voltages and generating first and second reference voltages in response to said first and second power supply voltages; and
a driver circuit receiving said first and second power supply voltages and said first and second reference voltages, and



generating a half power supply voltage at a half power supply voltage node, said driver circuit comprising:

a first MOS transistor of first conductivity type having a first source connected to said first power supply voltage, a first gate connected to said half power supply voltage node, and a first drain;

a second MOS transistor of second conductivity type having a second source connected to said half power supply voltage node, a second gate connected to said first reference voltage, and a second drain connected to said first drain;

a third MOS transistor of first conductivity type having a third source connected to said half power supply voltage node, a third gate connected to said second reference voltage, and a third drain; and

a fourth MOS transistor of second conductivity type having a fourth source connected to said second power supply voltage, a fourth gate connected to said half power supply voltage node, and a fourth drain connected to said third drain.

5,592,120

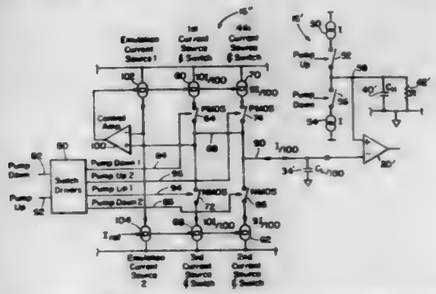
CHARGE PUMP SYSTEM

Wyn Palmer, N. Andover, and Fernando Viana, Cambridge, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Continuation of Ser. No. 302,351, Sep. 7, 1994, abandoned. This application Aug. 11, 1995, Ser. No. 514,389

Int. Cl.[6] G05F *1/10*

U.S. Cl. 327—536 **6 Claims**



1. A charge pump system for charging an integrated capacitor comprising:

pump down means, responsive to a pump down signal for supplying a pump down current to the integrated capacitor including:

a first current source, said first current source providing a first current, and a second current source, said second current source providing a second current which is a fraction of said first current; and

switching means for connecting both said first current source and said second current source to said integrated capacitor such that the difference between said first and second currents is supplied to said integrated capacitor; and

pump up means, responsive to a pump up signal, for supplying a pump up current to said integrated capacitor including:

a third current source, said third current source providing a third current, and a fourth current source to fourth current source providing a fourth current which is a fraction of said third current: and

a second switching means for connecting said third current source and said fourth current source, said said integrated capacitor such that the difference between said third and fourth currents flow from said integrated capacitor.

5,592,121

INTERNAL POWER-SUPPLY VOLTAGE SUPPLIER OF SEMICONDUCTOR INTEGRATED CIRCUIT

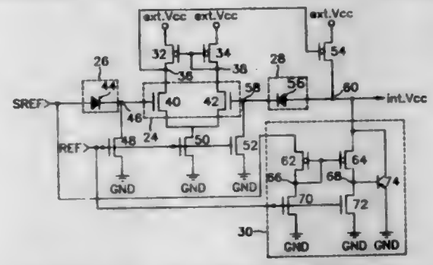
Chul-Min Jung, Seoul, and Hee-Choul Park, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 358,929

Claims priority, application Rep. of Korea, Dec. 18, 1993, 1993-28363

Int. Cl.[6] G05F *1/46*

U.S. Cl. 327—541 **17 Claims**



1. An internal power-supply voltage supplier comprising:

a driver having an external input terminal coupled to an external power supply, a control input terminal and an output terminal, said driver providing to said output terminal an internal power-supply voltage having a desired internal voltage level;

an offset generator having an output connected to said control input terminal of said driver, said offset generator receiving a reference voltage and said internal power-supply voltage and outputting to said offset generator output an offset corresponding to a difference in voltage levels between said reference voltage and said internal power-supply voltage, said offset generator using two differentially connected transistors having different channel widths to ensure that said offset is produced when said difference is minimal; and

a power-up controller which receives said reference voltage and said internal power-supply voltage and reduces the voltage level of said internal power-supply voltage when said internal power-supply voltage exceeds said reference voltage by a predetermined voltage level.

5,592,122

RADIO-FREQUENCY POWER AMPLIFIER WITH INPUT IMPEDANCE MATCHING CIRCUIT BASED ON HARMONIC WAVE

Maeda Masahiro, Neyagawa; Osamu Ishikawa, Kyoto, and Hiroyasu Takehara, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 8, 1995, Ser. No. 436,142

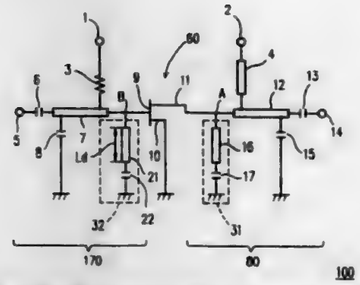
Claims priority, application Japan, May 19, 1994, 6-105430

Int. Cl.[6] H03F *3/60;3/191*

U.S. Cl. 330—286 **13 Claims**

1. A radio-frequency power amplifier comprising:

a power transistor;



an input impedance matching circuit connected to an input of the power transistor; and

an output impedance matching circuit connected to an output of the power transistor,

wherein the input impedance matching circuit includes an input impedance control circuit for setting an input impedance for a harmonic wave with respect to a fundamental wave frequency within a predetermined non-zero impedance range, the input impedance control circuit being connected to the input of the power transistor.

5,592,123

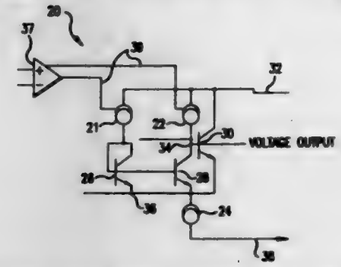
FREQUENCY STABILITY BOOTSTRAPPED CURRENT MIRROR

Stephen F. Ulbrich, Anaheim Hills, Calif., assignor to Linfinity Microelectronics, Inc., Garden Grove, Calif.

Filed Mar. 7, 1995, Ser. No. 399,738

Int. Cl.[6] H03F *3/04*

U.S. Cl. 330—288 **15 Claims**



1. A floating current mirror cell having only a first pole the floating current mirror cell comprising:

a capacitive load;

a floating node;

a current source;

a current mirror coupled to a reference current and the floating node and responsive to the current source, the current mirror having a first transistor having a control node, a pair of ports through which current flow is controlled by the control node the transistor being coupled to provide a current proportional to the reference current at a first of the ports;

a second transistor having a control node, and a pair of ports through which current flow is controlled by the control node, a first of the ports of the second transistor being coupled to the floating node and the control node of the second transistor being coupled to the first port of the first transistor;

wherein one of the control node of the second transistor and the first port of the first transistor being the output of the cell such that the capacitive load coupled to the output of the cell affects the frequency and the magnitude of the first pole.

5,592,124

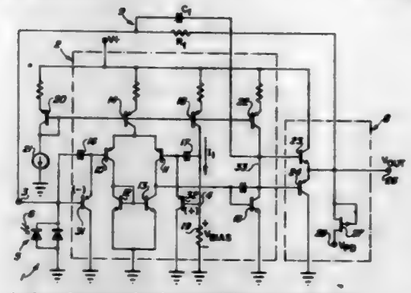
INTEGRATED PHOTODIODE/TRANSIMPEDANCE AMPLIFIER

Edward Mullins; Rodney T. Burt; Walter B. Meinel, and R. Mark Stitt, II, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jan. 26, 1995, Ser. No. 494,413

Int. Cl.[6] H03F *3/08*

U.S. Cl. 330—308 **18 Claims**



1. A photodetector circuit comprising in combination:

(a) a transimpedance amplifier including a differential stage having first and second emitter-coupled transistors, and having an inverting input, a non-inverting input, and an output;

(b) an output amplifier circuit having an output on which an output voltage is produced and also having an input connected to the output of the transimpedance amplifier;

(c) an input circuit in the transimpedance amplifier including

i. a first input transistor having an emitter coupled to a base of the first emitter-coupled transistor, a collector coupled to a first reference voltage conductor and a base coupled to the inverting input, and a second input transistor having an emitter coupled to a base of the second emitter-coupled transistor, a collector coupled to the first reference voltage conductor, and a base coupled to the non-inverting input, and

ii. a first bypass capacitor coupled between the emitter and the base of the first input transistor;

(d) a feedback network coupled to the inverting input and the output of the output amplifier circuit; and

(e) a photodiode having a first electrode coupled to the inverting input and a second electrode coupled to the first reference voltage conductor.

5,592,125

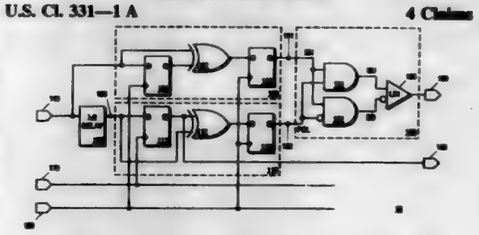
MODIFIED BANG-BANG PHASE DETECTOR WITH TERNARY OUTPUT

Bertrand J. Williams, Campbell, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.

Continuation of Ser. No. 329,277, Oct. 26, 1994, Pat. No. 5,455,540. This application Aug. 18, 1995, Ser. No. 516,917

Int. Cl.[6] H03L *7/085*

U.S. Cl. 331—1 A **4 Claims**



1. A method for controlling a clock generator comprising:

generating a clock signal;

receiving a data signal from an external circuit;

generating a first polarity signal when a transition edge of said clock signal occurs after a transition edge of said data signal;

generating a second polarity signal when said transition edge of said clock signal occurs before said transition edge of said data signal; and

generating a presence signal when said data signal remains in a same signal state for at least two transition edges of a same type of said clock signal.

5,592,126

MULTIPHASE OUTPUT OSCILLATOR

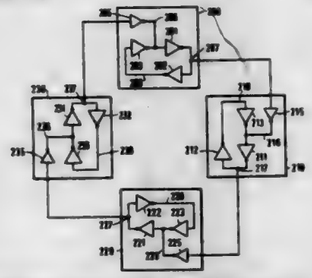
Arnoldus J. J. Boudewijns, Eindhoven, and Johannes P. M. Van Lammeren, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 107,500, Aug. 17, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,608

Claims priority, application European Pat. Off., Aug. 20, 1992, 92202546

Int. Cl.[6] H03B *5/00;27/00*

U.S. Cl. 331—45 **32 Claims**



1. A multiphase output oscillator which comprises:

a plurality of oscillator circuits coupled together to form a loop of serially coupled oscillator circuits,

means for coupling each particular oscillator circuit in the loop to its respective serial predecessor oscillator circuit in the loop, the coupling means simultaneously providing each particular oscillator circuit with adjustment of frequency and/or phase of an oscillating signal of that particular oscillator circuit, dependent upon a respective difference between the phase of the oscillation signal in that particular oscillator circuit and a phase of the oscillation signal in its respective serial predecessor oscillator circuit, so as to maintain, in operation, said respective phase difference.

5,592,127

VOLTAGE-CONTROLLED OSCILLATOR WITH REDUCED PHASE DIFFERENCE

Masayuki Mizuno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 520,988

Claims priority, application Japan, Aug. 30, 1994, 6-204079

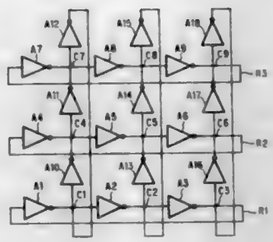
Int. Cl.[6] H03B *5/24*

U.S. Cl. 331—57 **4 Claims**

1. A voltage-controlled oscillator, comprising:

oscillators of number M, where M is an integer, each of which includes amplifier elements of odd number N, where N is an integer, which function as inverting amplifiers and are connected in the form of a ring, and which include an input terminal, an output terminal and a delay-time control terminal, wherein delay time is externally controlled through said delay-time control terminal,

wherein said oscillators form a network by repeating one or more times a procedure that two output terminals are optionally selected from said amplifier elements of total number



M×N, said two output terminals not being input and output terminals of one of said amplifier elements and not being output terminals belonging to one of said oscillators, then said two output terminals are connected to input and output terminals of another of said amplifier elements, wherein none of said two output terminals have both in-phase and anti-phase paths through between them, on condition that all signal paths laid between said two output terminals do not pass more than one time through said same output terminal.

5,592,128

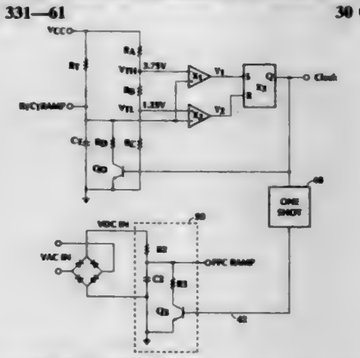
OSCILLATOR FOR GENERATING A VARYING AMPLITUDE FEED FORWARD PFC MODULATION RAMP

Jeffrey H. Hwang, Saratoga, Calif., assignor to Micro Linear Corporation, San Jose, Calif.

Filed Mar. 30, 1995, Ser. No. 413,232

Int. Cl.[6] G05F *1/613;* **H02M** *3/335;* **H03K** *4/50*

U.S. Cl. 331—61 **30 Claims**



17. An oscillator, comprising:

a. means for generating a clock output signal having a frequency, a corresponding period, a first output state and a second output state wherein at a beginning of the period the clock output signal is at the first output state and at an end of the period the clock output signal is at the second output state;

b. means for generating a varying amplitude ramp output signal having an increasing state and a decreasing state wherein the ramp output signal is coupled for controlling a switch of a power factor correction circuit; and

c. means for synchronizing coupled to the means for generating a clock output signal and to the means for generating a varying amplitude ramp output signal for synchronizing the clock output signal with the varying amplitude ramp output signal so that the varying amplitude ramp output signal is generated with the frequency and the corresponding period.

5,592,129

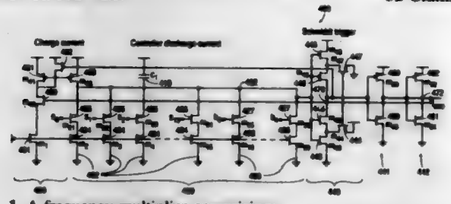
HIGH RESOLUTION, LARGE MULTIPLICATION FACTOR DIGITALLY-CONTROLLED FREQUENCY MULTIPLIER

Rafael Fried, Caesarea, and Eyal Rozin, Ramat-Gan, both of Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 22, 1995, Ser. No. 494,575

Int. Cl.[6] H03B *5/24;* **H03L** *7/18*

U.S. Cl. 331—111 **32 Claims**



1. A frequency multiplier comprising:

a current-controlled oscillator generating a substantially constant charge current and a controlled discharge current and having a plurality of input lines connected to receive a digital current select signal controlling the controlled discharge current, and the current-controlled oscillator having an output terminal connected to carry a timing signal at a current-controlled oscillator frequency f_{CCO} set in accordance with the current select signal, the current-controlled oscillator generating a controlled bias current for biasing a discharge current source and a charge current source, the controlled discharge current and the controlled bias current being controlled in parallel to substantially eliminate inaccuracies in a characteristic frequency-current curve of the current-controlled oscillator; and

a control circuit having a first timing input terminal coupled to the current-controlled oscillator output terminal to receive the current-controlled oscillator frequency f_{CCO}, output lines coupled to the current-controlled oscillator digital current select input lines, a second timing input terminal connected to receive a timing signal at a reference frequency f_{REF}, and a plurality of input lines connected to receive a programmable frequency multiplication factor.

5,592,130

PIEZOELECTRIC OSCILLATOR INCLUDING A PIEZOELECTRIC RESONATOR WITH OUTER LEAD

Tatsuo Ikeda; Hiroyuki Ogino, and Kazushige Ichinose, all of Sawa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 352,049, Dec. 5, 1994, Pat. No. 5,504,460, which is a continuation of Ser. No. 114,858, Sep. 2, 1993, Pat. No. 5,392,006, which is a division of Ser. No. 782,771, Oct. 17, 1991, Pat. No. 5,265,316, which is a continuation of Ser. No. 563,879, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 265,865, Oct. 6, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 477,734

Claims priority, application Japan, Feb. 27, 1987, 62-28640; Sep. 8, 1987, 62-224425; Nov. 20, 1987, 62-293560; Nov. 20, 1987, 62-293562

Int. Cl.[6] H03B *5/36;* **H01L** *41/053*

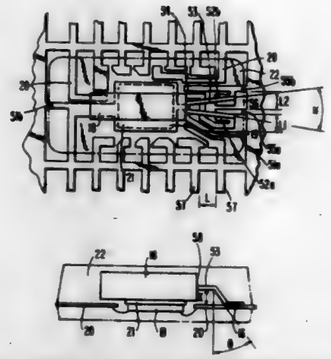
U.S. Cl. 331—158 **10 Claims**

1. A resin mold type piezoelectric oscillator comprising:

a piezoelectric resonator including a piezoelectric vibrator and at least one outer lead;

a semiconductor integrated circuit formed in one chip for electrically oscillating said piezoelectric resonator; and

a lead frame formed substantially in a plane and having at least one connection pad, the semiconductor integrated circuit and the piezoelectric resonator being mounted on and electrically connected to the lead frame, the at least one outer lead of the piezoelectric resonator being electrically connected to at least



one connection pad of the lead frame, and the at least one outer lead of the piezoelectric resonator being bent at least twice in a plane which is substantially perpendicular to the plane of the lead frame and which also intersects the connection pad to which the outer lead is connected.

9. A resin mold type piezoelectric oscillator comprising:

a piezoelectric resonator including a piezoelectric vibrator and at least one outer lead;

a semiconductor integrated circuit formed in one chip for electrically oscillating said piezoelectric resonator; and

a lead frame formed substantially in a plane, the lead frame having at least one suspension pin lead, a tab portion supported by the suspension pin leads, support leads, and connection pads supported by the support leads, the semiconductor integrated circuit and the piezoelectric resonator being mounted on and electrically connected to the lead frame, the semiconductor integrated circuit being mounted on the tab portion of the lead frame, and the at least one suspension pin lead and the support leads of the connection pads being arranged along a side of the resin mold type piezoelectric oscillator such that the at least one suspension pin lead and the support leads may be cut at the same time.

5,592,131

SYSTEM AND METHOD FOR MODULATING A CARRIER FREQUENCY

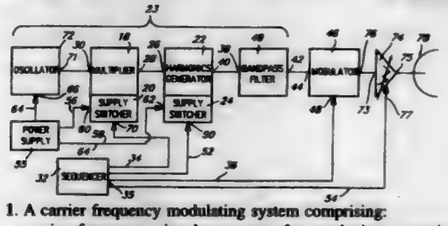
Louis Labreche, Montreal, and Jean-Pierre Lepage, Beaconsfield, both of Canada, assignors to Canadian Space Agency, Saint-Hubert, Canada

Filed Mar. 30, 1994, Ser. No. 220,215

Claims priority, application Canada, Jun. 17, 1993, 2098624

Int. Cl.[6] H03L *5/00;* **G01S** *13/00*

U.S. Cl. 332—103 **42 Claims**



1. A carrier frequency modulating system comprising:

a carrier frequency signal generator for producing a carrier frequency signal at a carrier frequency at an output thereof;

a sequencer for producing a modulation signal at an output thereof, said modulation signal comprising a plurality of modulation signal portions separated by at least one null modulation signal portion having a corresponding null time length;

a modulator for producing a modulated carrier frequency signal at an output thereof, said modulator having a first input

connected to the output of said carrier frequency signal generator for receiving said carrier frequency signal, and having a second input for receiving said modulation signal;

a power supply means for supplying electrical power to said carrier frequency signal generator; antenna means having an input connected to the output of said modulator to transmit said modulated carrier frequency signal wherein:

(a) said sequencer is connected to said carrier frequency generator for controlling the activation thereof during the modulation signal portions of the modulation signal to provide the carrier frequency signal to the modulator first input during such portions, and to interrupt delivery of said carrier frequency signal to the modulator during said corresponding null time length; and

b) said carrier frequency signal generator comprises:

(i) an oscillator for producing a first signal at a first frequency at an output thereof;

(ii) a harmonic generator having an input connected to the output of said oscillator to produce a second signal comprising a plurality of harmonic frequencies at an output thereof, said harmonic frequencies being higher than said first frequency;

(iv) a bandpass filter means having an input connected to the output of said harmonic generator to select a substantially narrow frequency band centered at a single harmonic frequency from said harmonic frequency signal at said carrier frequency at an output thereof;

said sequencer being connected to said oscillator and said harmonic generator for controlling the activation thereof.

5,592,132

FREQUENCY MODULATOR COMPRISING AN ADJUSTING CIRCUIT

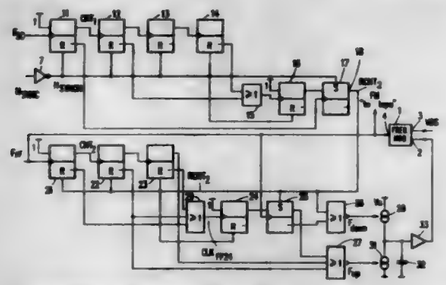
Holger Ernst, and Holger Moll, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1995, Ser. No. 433,666

Claims priority, application Germany, May 6, 1994, 44 15 989.7

Int. Cl.[6] H03C *3/00;3/08;* **G11B** *20/06*

U.S. Cl. 332—117 **13 Claims**



1. A frequency modulator comprising:

a frequency modulator which frequency modulates an applied luminance signal of a color video signal that contains synchronization pulses, while the chrominance signal of the color video signal is modulated on a carrier provided with a reference frequency, an adjusting circuit which includes a capacitor which is charged or discharged, respectively, in dependence on the period duration of the modulator output signal and in dependence on the period length of the reference frequency of the chrominance carrier, and the steepness of the voltage/frequency characteristic curve of the frequency modulator is set dependent upon the capacitor charge condition, the ratio between the capacitor charging and discharging operations is selected such that the charge on the capacitor is maintained constant on average if the modulator frequency is equal to a predefined nominal frequency and increases or decreases if the modulator frequency drops below or exceeds the nominal frequency, respectively, during the synchronization pulses.

5,592,133

BUILD-OUT NETWORK FOR A BUILT-IN TYPE BALANCED LINE DRIVER CIRCUIT

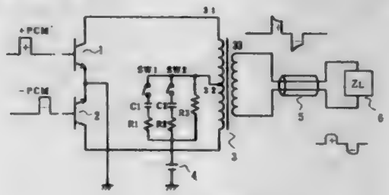
Isamu Kawana, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 16, 1994, Ser. No. 213,634

Claims priority, application Japan, Apr. 30, 1993, 5-128489; Jan. 6, 1994, 6-011377; Jan. 6, 1994, 6-011378

Int. Cl.[6] H03H *7/42*

U.S. Cl. 333—25 **22 Claims**



	SW1	SW2
0~250 feet	OFF	OFF
250~ feet	ON	OFF
500~750 feet	ON	ON

1. A driver circuit with a build-out network which drives a balanced line having a frequency characteristic, the driver circuit comprising:

a series circuit of first and second switch circuits connected in series and supplied with unipolar pulse signals, the first and second switch circuits being alternatively conductive with the unipolar pulse signals, and the series circuit having two terminals;

a unipolar/bipolar converting transformer including a primary winding having an intermediate tap and a secondary winding connected to the balanced line, the primary winding having two terminals connected to the two terminals of the series circuit of the first and second switch circuits, and the secondary winding outputting converted bipolar pulse signals; and

an impedance circuit inserted between the intermediate tap and a connecting point of the series circuit of first and second switch circuits, having a frequency characteristic reverse to the frequency characteristic of the balanced line.

5,592,134

EMI FILTER WITH A CERAMIC MATERIAL HAVING A CHEMICAL REACTION INHIBITING COMPONENT

Yasuyuki Ogata; Yoshimasa Hayashi, and Yasushi Kojima, all of Saitama-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 8, 1995, Ser. No. 384,536

Claims priority, application Japan, Feb. 9, 1994, 6-015319; Feb. 23, 1994, 6-025357; Mar. 8, 1994, 6-036804; Mar. 25, 1994, 6-055408

Int. Cl.[6] H03H *7/01;* **G04B** *35/48*

U.S. Cl. 333—185 **12 Claims**

6. A three-terminal capacitor-shaped EMI filter comprising a sintered mixture of a dielectric material, a magnetic material, and a third component capable of inhibiting any chemical reaction between the dielectric material and the magnetic material, and reducing the temperature required to sinter the mixture, the component being present in a chemical reaction preventing and sintering temperature reducing-effective amount.



5,592,135

SURFACE ACOUSTIC WAVE FILTER WITH DIFFERENT FILTER PORTIONS SATISFYING COMPLEX CONJUGATE RELATIONSHIP OF IMPEDANCES

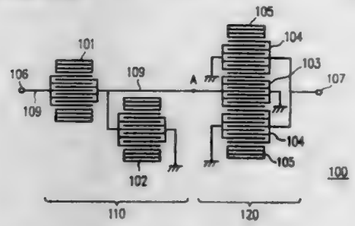
Yutaka Taguchi, Ibaraki; Kazuo Eda, Nara; Keiji Onishi, Settsu, and Shun-ichi Seki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 17, 1995, Ser. No. 373,033

Claims priority, application Japan, Jan. 20, 1994, 6-004471

Int. Cl.[6] H03H *9/64*

U.S. Cl. 333—193 **5 Claims**



1. A surface acoustic wave filter comprising:

a piezoelectric substrate;

an input terminal for receiving an input signal;

an output terminal for providing an output signal; and

a first surface acoustic wave filter portion and a second surface acoustic wave filter portion each serially connected to a signal line connecting the input terminal and the output terminal,

wherein the first surface acoustic wave filter portion includes at least one parallel surface acoustic wave resonator connected between a ground and the signal line, and at least one series surface acoustic wave resonator connected to the signal line in series,

the second surface acoustic wave filter portion includes an input interdigital transducer for receiving a signal, two output interdigital transducers connected with each other and disposed as sandwiching the input interdigital transducer therebetween for providing an output, and two reflectors disposed as sandwiching the input interdigital transducer and the two output interdigital transducers therebetween, and

impedances on respective sides of the first and second surface acoustic wave filter portions viewed from a connecting point therebetween substantially have a complex conjugate relationship with each other with respect to frequencies in a pass band of the surface acoustic wave filter.

5,592,136

ELECTROMAGNET APPARATUS AND APPARATUS FOR ADJUSTING EXPOSURE OF CAMERA USING THE SAME

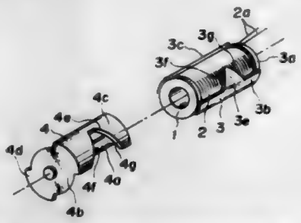
Moriya Katagiri, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,094

Claims priority, application Japan, Jun. 17, 1993, 5-146468; Jun. 18, 1993, 5-147878

Int. Cl.[6] H01F *7/08;7/14*

U.S. Cl. 335—272 **11 Claims**



8. A drive force generating apparatus comprising:

a cylindrical-shaped solenoid;

a rotor having a rotary portion comprising a magnetic member covering a portion of an outer surface of said solenoid, said rotary portion being inhibited from moving in an axial direction of said solenoid and being rotatable about a central axis of said cylindrical solenoid; and

a stator having a fixed portion made of a magnetic member covering a portion of said outer surface of said solenoid, wherein said rotary portion is located at a predetermined position on said outer surface of said solenoid spaced apart from said fixed portion when no electric current flows through said solenoid and said rotary portion is rotated about said central axis to approach said fixed portion by attractive forces acting only in a rotation direction acted around said central axis of said solenoid when an electric current flows through said solenoid.

5,592,137

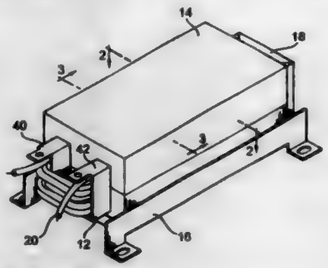
HIGH EFFICIENCY, HIGH FREQUENCY TRANSFORMER

Alexander Levran, Los Angeles; Joseph M. Nowosielski, Laguna Hills; Giao M. Ton-That, Mission Viejo, and Ramamoorthy Rajagopalan, Irvine, all of Calif., assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 935,041, Aug. 25, 1992, Pat. No. 5,414,609. This application Sep. 25, 1992, Ser. No. 951,208

Int. Cl.[6] H01F *27/28*

U.S. Cl. 336—195 **23 Claims**



1. A transformer comprise:

a rectangular shaped integral coil assembly including

a first coil winding consisting of one or more turns of an insulated electrical conductor and

a second coil winding consisting of one or more turns of a hollow electrically conductive material selectively surrounding and enclosing the majority of said first coil winding;

said first coil winding further comprises one or more windings of an electrical conductor placed in a predetermined orientation within said hollow portion of said second coil winding;

a high magnetic permeability material selectively surrounding a lengthwise portion of said integral coil assembly; and

wherein a portion of said integral coil assembly not surrounded by said high magnetic permeability material is perpendicular to said lengthwise portion of said integral coil assembly to minimize electromagnetic interference and to reduce heat rise within said transformer.

5,592,138

INDUCTIVE DEVICE WITH CLAMPING BRACKET

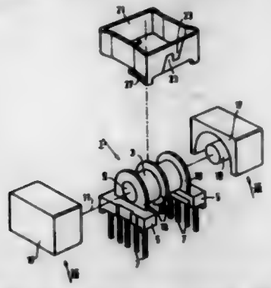
Johannes H. Tubben, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1994, Ser. No. 186,732

Claims priority, application European Pat. Off., Feb. 5, 1993, 93200315

Int. Cl.[6] H01F *27/26;27/30*

U.S. Cl. 336—210 **4 Claims**



1. An inductive device, comprising a winding support (1) which is made of an electrically insulating material and which comprises a coil former (3), provided with a through-opening (9), and a core of a soft magnetic material which consists of two parts (15) and which comprises a limb (19) projecting through the opening of the coil former and a yoke (17) at least partly enclosing the winding support, said two core parts being attached to one another by means of a clamping bracket (21) which is made of a resilient material and which is shaped as a closed ring, characterized in that the clamping bracket (21) consists of one piece of a resilient material which is formed as a strip having barb-shaped free ends (23) and being bent so as to form a ring, the facing free ends engaging one another so that the ring is closed.

5,592,139

AIR-CONVECTION-COOLED DRY WELL FOR HIGH-VOLTAGE CURRENT-LIMITING FUSE FOR USE IN LIQUID GAS INSULATED SWITCHGEAR

Frank C. Trayer, and John P. Trayer, both of 898 Pennsylvania Ave., San Francisco, Calif. 94107

Filed May 30, 1995, Ser. No. 453,250

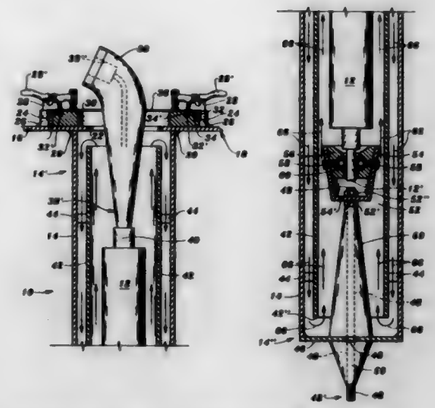
Int. Cl.[6] H01H *85/02*

U.S. Cl. 337—202 **7 Claims**

1. A dry well for a high-voltage current-limiting fuse, comprising:

a thermally conductive outer wall having a first open end and a second open end;

first closure means for said first open end, having an aperture passing therethrough which is of sufficient size to pass said fuse;



second closure means for said second open end;

cover means for covering said aperture;

fastening means for fastening said cover means in air-tight closing relation to said aperture;

first bushing means air-tightly mounted in said cover means and including a first bushing conductor passing through said cover means and insulated therefrom;

second bushing means air-tightly mounted in said second closure means and including a second bushing conductor passing therethrough and insulated therefrom;

first and second fuse mounting means affixed respectively to the adjacent ends of said first and second bushing conductors; and

chimney means located within and spaced from said outer wall and first and second closure means and spaced from and surrounding said fuse when it is mounted in said fuse mounting means.

5,592,140

VARISTOR FORMED OF BISMUTH AND ANTIMONY AND METHOD OF MANUFACTURING SAME

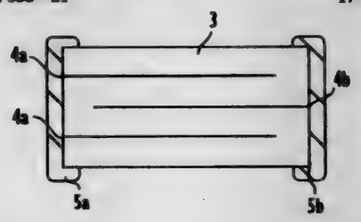
Hideaki Tokunaga, Shiiyonawate; Yasuo Wakahata, Katano, and Naoki Mutoh, Chitose, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 29, 1994, Ser. No. 313,598

Claims priority, application Japan, Sep. 29, 1993, 5-242428

Int. Cl.[6] H01C *7/10*

U.S. Cl. 338—21 **17 Claims**



1. A varistor comprised of a sintered varistor element and a pair of electrodes provided on both sides of said varistor element containing zinc-oxide as a main constituent and at least bismuth and antimony as accessory constituents;

wherein the content of bismuth in the form of Bi_2O_3 is in a range from about 0.1 to 4.0 mol % and the content of antimony in the form of $Sb2O_3$ constitutes a mol-ratio of Sb_2O_3/Bi_2O_3 less than or equal to about 0.1 mol %, providing that the total amount of said main and said accessory constituents is 100 mol %.

5,592,141

MINIATURE POTENTIOMETER

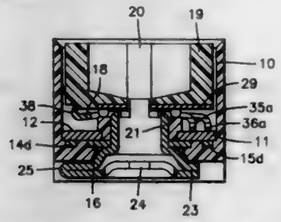
Jesus C. Castellano Aldave, Fontellas, Spain, assignor to Navarra de Componentes Electronicos, S.A., Tudela, Spain

Filed Apr. 14, 1994, Ser. No. 227,525

Claims priority, application Spain, Apr. 14, 1993, 9300760

Int. Cl.[6] H01C *10/32*

U.S. Cl. 338—162 **6 Claims**



1. A miniature potentiometer including an insulating vessel-shaped casing made of thermoplastic resin molded on a first sub-assembly comprising an electrically insulating support which supports an electro-resistive track having an incomplete annular shape with two extensions of electrically conductive material linked to a pair of connection terminals extending outwardly from said casing, and a collector plate having at least one connection terminal extending therefrom; said potentiometer further comprising a second sub-assembly housed in said casing and defined by a wiper integral with a wiper-holder having notches to facilitate rotation of said second sub-assembly, said first and second sub-assemblies being attached to one another by a tubular shaft of electrically conductive material which thereby establishes electrical contact between said wiper and said collector plate, characterized in that said wiper comprises a first part defined by an annular plate to which said wiper-holder is securely molded and a second part extending in one direction from said annular plate, said second part having a distal edge and an arcuate groove provided proximate said distal edge, said arcuate groove forming two resilient arms having centrally located protuberances for frictionally engaging said resistive track, said second part being folded 180 degrees against the bottom of said wiper-holder thus defining a blunt fold length, said second part further comprising a slight, medially located cross fold in opposite sense to said fold length and at a distance thereof, which causes said second part to partially separate from said bottom of the wiper-holder and creates a gap at the fold length between said second part and said annular plate, said cross fold also causing said distal edge to diverge away from the bottom, said protuberances of said second part being supported on said resistive track.

5,592,142

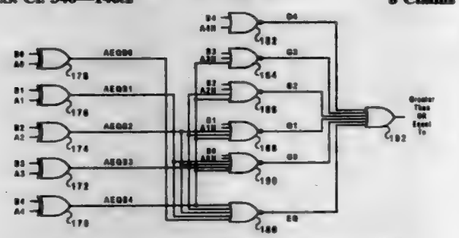
HIGH SPEED GREATER THAN OR EQUAL TO COMPARE CIRCUIT

R. Dean Adams, Essex Junction; Donald A. Evans, Williston, and Roy C. Flaker, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1995, Ser. No. 529,255

Int. Cl.[6] G06F *7/02*

U.S. Cl. 340—146.2 **8 Claims**



1. A greater than or equal to compare circuit comprising:

an equal to compare circuit including M number of exclusive-OR gates input into a NOR gate, each exclusive-OR gate N of the M number of exclusive-OR gates, wherein 1<N<M, receiving as inputs a Nth bit of a first digital number having M bits and a corresponding Nth bit of a second digital number having M bits, and outputting a Nth not-equal signal indicating when the Nth bit of the first digital number is not equal to the corresponding Nth bit of the second digital number, wherein the output signal of the NOR gate indicates that the first digital number is equal to the second digital number;

a greater than compare circuit including M number of NOR gates, each NOR gate N of the M NOR gates receiving as inputs the complement of the Nth bit of the first digital number, a corresponding Nth bit of the second digital number, and each not-equal signal output from each exclusive-OR gate P, wherein N<P<M, and outputting a greater than signal indicating when the first digital number is greater than the second digital number; and

an output OR gate receiving the NOR gate output signal from the equal to compare circuit and every greater than signal from the greater than compare circuit as inputs, and outputting a greater than or equal to signal indicating the first digital number is greater than or equal to the second digital number.

5,592,143

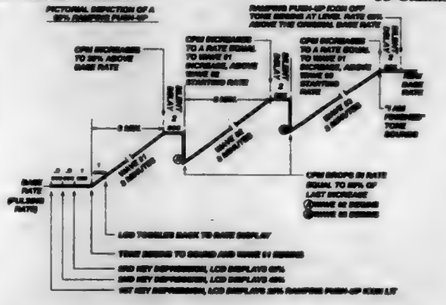
PULSED-TONE TIMING EXERCISE METHOD

Julie B. Romney, 2970 Devonshire Cir., Salt Lake City, Utah 84108, and William R. Bushman, 859 E. 1050 South, Spanish Fork, Utah 84660

Filed Jul. 25, 1994, Ser. No. 279,440

Int. Cl.[6] G08B *1/00;* **G09B** *17/04*

U.S. Cl. 340—309.15 **18 Claims**



1. A pulsed-tone pacing method comprising the steps of:

(a) activating pulsed audible guide tones at an initial pulsing rate; and

(b) repeatably (i) increasing the pulsing rate over a time span to a successively higher pulsing rate and (ii) abruptly dropping the pulsing rate to a lower rate between the higher pulsing rate and the initial pulsing rate, until a final pacing rate is reached.

5,592,144

MOOD LAMP

James W. Greene, 332 Bleecker St., New York, N.Y. 10014

Filed Sep. 9, 1994, Ser. No. 303,669

Int. Cl.[6] G08B *5/00*

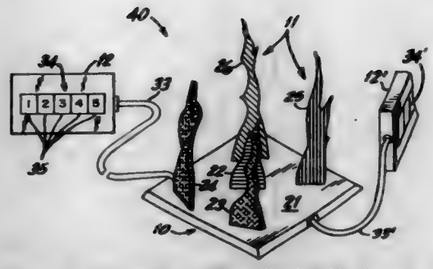
U.S. Cl. 340—332 **3 Claims**

1. A lamp device for non-verbally communicating moods and sexual feelings between two persons, said lamp device comprising:

a base member;

a first elongated illuminatable element projecting from said base member, formed to define a length;

a second elongated illuminatable element projecting from said base member, formed to define a length greater than the length of said first illuminatable element;



at least one elongated intermediate illuminatable element, projecting from said base member, formed to define a length between the length of said first illuminatable element and the length of said second illuminatable element;

a plurality of illuminatable first electric bulbs, each having a different color, one said first electric bulb being disposed within each of said illuminatable elements;

a plurality of illuminatable second electric bulbs, all having a single color, one said second electric bulb being disposed within each of said illuminatable elements; and

two separate control means for selectively illuminating the electric bulbs, each said control means being disposed remotely from said base member and connected to the electric bulbs, and each said control means having a plurality of selective settings including a lowest setting, at least one intermediate setting, and a highest setting, each said intermediate setting corresponding to one said intermediate illuminatable element, where the selection of said lowest setting on each said control means illuminates said first electric bulb within said first illuminatable element, the selection of one said intermediate setting on each said control means illuminates said first electric bulb within said corresponding intermediate illuminatable element, and the selection of said highest setting on each said control means illuminates said second electric bulbs within all said illuminatable elements, whereby the illumination of each said illuminatable element non-verbally communicates a mood and sexual feeling.

5,592,145

ELECTROMAGNETIC SIGNAL HORN

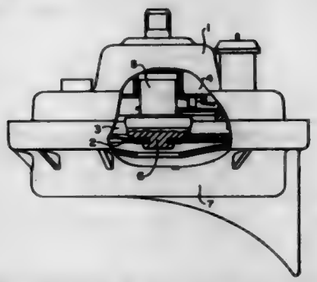
Ulrich Kellner, Geesteruh; Stefan Gepfert, Lippstadt; Franz-Josef Schlueter, Erwitte, and Harald Dietz, Lippstadt, all of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany

Filed Apr. 19, 1994, Ser. No. 229,776

Claims priority, application Germany, Apr. 30, 1993, 43 14 242.7

Int. Cl.[6] G08B *3/00*

U.S. Cl. 340—391.1 **9 Claims**



1. An electromagnetic signal horn having a housing, a membrane whose peripheral edge is attached to the housing and which with the housing defines a chamber, an electromagnetic motor arranged in the chamber, a magnetic core, arranged in the chamber with an attaching pin thereof extending through a central opening of the membrane, with a coupling channel to couple the chamber with outside atmosphere being partially defined by a radial recess in the central opening of the membrane, wherein the central opening is a polygon-shaped hole with a spacing between opposite side edges thereof being approximately the same or only slightly larger than a diameter of the attaching pin.

5,592,146

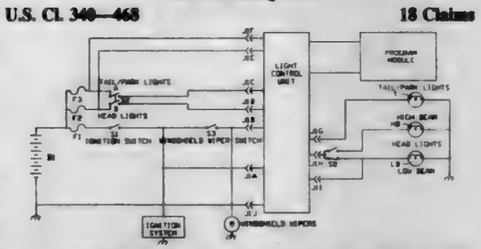
PROGRAMMABLE VEHICLE LIGHT CONTROLLER

Joseph Kover, Jr., 463 W. Creekside La., Kaysville, Utah 84037

Filed Nov. 6, 1995, Ser. No. 553,856

Int. Cl.[6] B60Q *1/76*

U.S. Cl. 340—468 **18 Claims**



1. A vehicle lighting system, for use in automobiles or trucks or other vehicles intended to be driven by a driver, where the vehicle has an electrical system incorporating an electric starter and a battery, comprising:

a tail lamp;

a tail lamp relay having a control input, connected such that an electrical current flows through the battery, the tail lamp, and the tail lamp relay when the control input is in a first state, and current does not flow through the tail lamp when the control input is in a second state;

tail lamp switching means;

battery low voltage sensing means;

taillamp programming means;

means for sensing that the vehicle is in operation;

control means configured such that the control input of the tail lamp relay is in the first state whenever the vehicle is in operation and the tail lamp switching means is in a first state, or following the vehicle ceasing operation, the taillamp programming means is in a first state, and the battery low voltage sensing means senses a high battery voltage, but where the control input of the tail lamp relay is placed in the second state whenever the vehicle is not in operation and either the taillamp programming means is in a second state or the battery low voltage sensing means senses a low battery voltage.

5,592,147

FALSE ALARM RESISTANT FIRE DETECTOR WITH IMPROVED PERFORMANCE

Jacob Y. Wong, 4589 Camino Molinero, Santa Barbara, Calif. 93110

Filed Jun. 14, 1993, Ser. No. 77,488

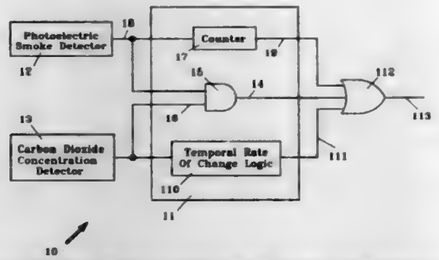
Int. Cl.[6] G08B *19/00*

U.S. Cl. 340—522 **4 Claims**

1. A fire detector having a low rate of generating false alarms, said fire detector comprising:

a CO_2 fire detector module;

a smoke detector module adapted to measure a second property that is indicative of the presence of a fire;



an AND gate, having an output, having an input connected to an output of the CO_2 fire detector module and having an input connected to an output of the second fire detector module;

a clock, connected to said smoke detector, for measuring a duration of each interval in which the smoke detector measures a smoke level exceeding a preselected threshold level; and

temporal rate of change logic having an input connected to the output of the CO_2 fire detector module and having an output indicating a temporal rate of change of carbon dioxide concentration.

5,592,148

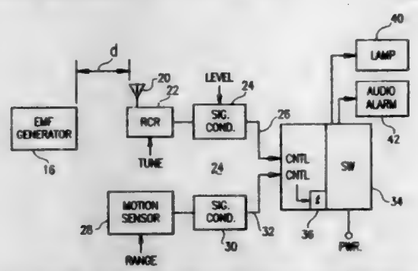
SAFE-DISTANCE WARNING SYSTEM FOR EMF GENERATORS

Nicholas S. Morales, 3126 W. 70th St., Hialeah, Fla. 33016

Continuation-in-part of Ser. No. 489,836, Jun. 13, 1995. This application Apr. 5, 1996, Ser. No. 628,886

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—540 **7 Claims**



1. A warning system for devices generating electromagnetic field (EMF) radiation such as televisions, cathode ray tubes, computer monitors, and microwave ovens comprising:

an antenna tuned to an EMF frequency generated by said EMF radiating device;

means for converting an output of said antenna into a first control signal in the presence of said EMF radiation from said EMF radiating device;

a motion sensor mounted adjacent said EMF radiating device, said motion sensor generating a second control signal when said motion sensor detects a moving object within a detection range about said motion sensor;

a switch electrically coupled to said means for converting and said motion sensor and receiving said first and second control signals, said switch generating activation signals dependent upon said first and second control signals;

a visual warning alarm electrically coupled to said switch, said visual warning alarm being activated by said activation signals from said switch; and,

an audio warning alarm electrically coupled to said switch, said audio warning alarm being activated by said activation signals from said switch.

5,592,149

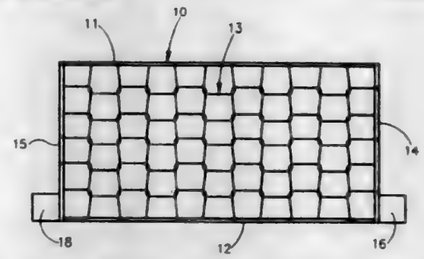
SECURITY FENCE

Uri Alizi, 21 Hertzel St., Herzlia Pituach, Israel

Continuation-in-part of Ser. No. 330,613, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 915,666, Jul. 21, 1992, abandoned. This application Jul. 26, 1995, Ser. No. 507,138

Int. Cl.[6] G08B *13/00*

U.S. Cl. 340—550 **2 Claims**



1. A security fence which comprises at least one section of fence, wherein said at least one section of fence consists essentially of a single weft-knitted interlooped optical wire and a frame, said frame having two upright posts, an upper tension wire spanning the distance between said upright posts, and a lower tension wire spanning the distance between said upright posts, said upright posts and tension wires being arranged so as to define a parallelogram, said single weft-knitted interlooped optical wire being connected to said frame by being looped around said posts and said tension wires, said single weft-knitted interlooped optical wire being under tension in both the vertical and horizontal directions so as to maintain the geometrical configuration without any auxiliary means, one end of said single weft-knitted interlooped optical wire being connected to a light transmitter, and the other end of said single weft-knitted interlooped optical wire being connected to a light receiver, which light receiver is connected to an alarm so that an abrupt change in the intensity of light passing through the single weft-knitted interlooped optical wire actuates said alarm.

5,592,150

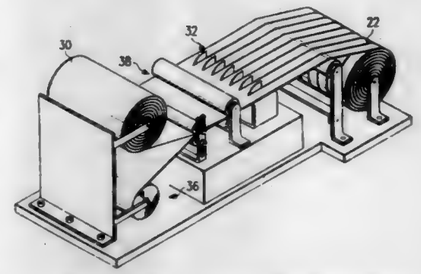
AIR COIL AND METHOD OF MAKING THE SAME

Loek J. D'Hont, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1994, Ser. No. 330,038

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—572 **14 Claims**



1. A method of making an air coil comprising the steps of:

providing a sheet of conductive material;

disposing an insulating material adjacent said sheet of conductive material;

cutting said sheets of conductive material and insulating material into a plurality of strips; and

winding each strip into an air coil such that each air coil comprises a plurality of windings wherein said insulating

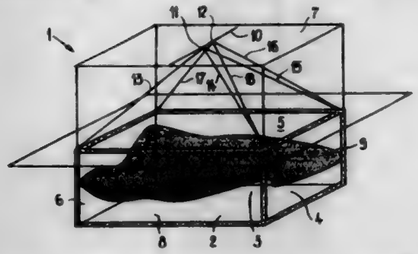
material electrically insulates each of said windings from adjacent ones of said windings.

5,592,151

FIRE MONITORING SYSTEM

Vladimir Rolih, Winterthur, Switzerland, assignor to Von Roll Umwelttechnik AG, Zurich, Switzerland

Filed Mar. 17, 1995, Ser. No. 406,074
Claims priority, application Switzerland, Mar. 17, 1994, 797/94
Int. Cl.[6] G08B 17/00
U.S. Cl. 340—584 18 Claims



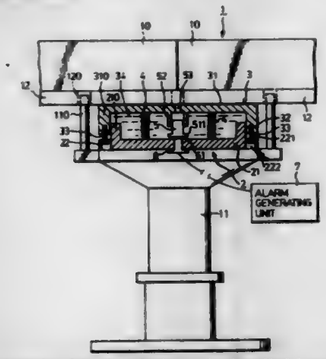
1. A fire monitoring system for a waste bunker, comprising:
a pair of infrared detector means arranged at a distance from each other and both being arranged on a same axis of rotation for detecting spots in the bunker which exceed a predetermined temperature;
a controllable drive means connected to the axis of rotation;
an angle transmitter means connected to the axis of rotation for transmitting data of angles of orientation of the pair of infrared cameras;
a processing means for digitizing the thermal images determined by the pair of infrared detector means and for calculating spatial coordinates of the spots in the waste bunker which exceed the predetermined temperature based on the digitized thermal images determined by the pair of infrared detector means and the data supplied by the angle transmitter means.

5,592,152

INTRUDER DETECTING DEVICE TO BE INSTALLED IN AN INTEGRATED RAISED FLOORING SYSTEM

Chien-Teh Huang, Fan-Po-Lin No. 47-1, San-Chi Hsiang, Taipei Hsien, Taiwan

Filed Sep. 25, 1995, Ser. No. 533,004
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—666 13 Claims



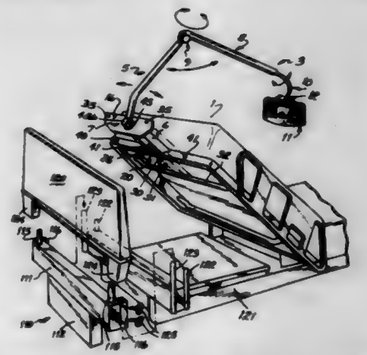
1. An intruder detecting device to be installed in an integrated raised flooring system, the flooring system including a floor panel assembly and a plurality of pedestals which support the floor panel assembly on a base floor, said intruder detecting device comprising:
a housing including a lower housing part and an upper housing part disposed coaxially and connected slidably and sealingly to said lower housing part so as to confine a sealed chamber therewith, said lower housing part being adapted to be disposed on one of the pedestals, said upper housing part being adapted to support the floor panel assembly thereon, said upper housing part being formed with an air hole and a hollow piston guide which opens downwardly and which is aligned axially with said air hole, said sealed chamber containing hydraulic fluid therein;
at least one restoring member disposed in said sealed chamber to bias said upper housing part away from said lower housing part;
a switch unit mounted on said lower housing part and having a resilient switch contact which extends into said sealed chamber and which is aligned with said piston guide; and
a piston extending slidably and sealingly into said piston guide, said piston abutting normally against said switch contact to deactivate said switch unit;
whereby, an increase in load applied on the floor panel assembly causes the floor panel assembly to apply downward pressure on said upper housing part of said housing, thereby resulting in movement of said upper housing part toward said lower housing part to cause said hydraulic fluid in said sealed chamber to move said piston further into said piston guide and away from said switch contact to activate said switch unit.

5,592,153

HOSPITAL BED COMMUNICATION AND CONTROL DEVICE

Jeffrey R. Welling, Batesville, and Michael E. Poehner, West Harrison, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Continuation of Ser. No. 984,208, Nov. 30, 1993, abandoned.
This application Mar. 23, 1995, Ser. No. 409,940
Int. Cl.[6] H04Q 1/00
U.S. Cl. 340—825.19 9 Claims



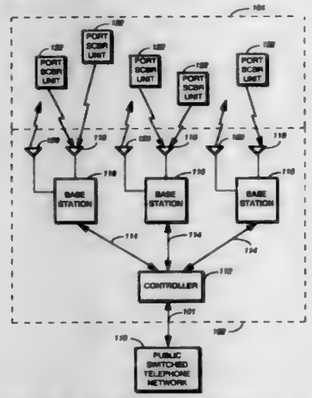
1. A communication and control device for use on a hospital bed having sides, foot and head end portions, comprising a communication and control module responsive to an on-bed patient's input to perform at least one of the following functions:
calling a nurse,
turning on a light in the room,
turning on a light to read by,
turning on a TV,
placing and receiving telephone calls,
adjusting the height of the hospital bed,
adjusting the configuration of the hospital bed, and
adjusting a mattress atop the bed comprising:
a communication and control module having a patient command request receiving portion to accept a request from a patient atop the bed to control at least one of the above functions and an output control portion for transmitting a control signal to control at least one of the above functions,
a securing means for attachment directly on a frame member of the hospital bed at the head end of the bed below the head portion of the bed,
a communication and control member support means, having a first end cantilevered from the securing means which support member extends between the communication and control member and the securing mechanism and atop the hospital bed for variably positioning the communications and control member, in a cantilevered position from the frame of a hospital bed, to be located atop a patient resting on said bed and in close proximity to the head of the patient lying atop of the bed.

5,592,154

METHOD AND APPARATUS FOR PRIORITIZING COMMUNICATIONS IN A TWO-WAY COMMUNICATION SYSTEM

Jyh-Han Lin, Ft. Worth, Tex., and Zhonghe Wang, Lake Worth, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1995, Ser. No. 463,114
Int. Cl.[6] G08B 5/22; H04M 11/00; H04Q 7/00
U.S. Cl. 340—825.5 16 Claims



1. A method for prioritizing communications in a two-way communication system serving a plurality of portable subscriber units in a coverage area, the method comprising in a fixed portion of the two-way communication system the steps of:
requesting location information from a subset of the plurality of portable subscriber units in response to having a need to communicate therewith;
receiving the location information from the subset of the plurality of portable subscriber units, the location information including a plurality of mobility index values determined by the subset of the plurality of portable subscriber units for indicating mobility of each portable subscriber unit; and
prioritizing the communications based upon the plurality of mobility index values.

5,592,155

REMOTE CONTROL INFRARED RECEIVER WITH LIGHT DETECTOR AND PRE-AMPLIFIER

Daniel Ehrensaasn, Rudolfstetten, Switzerland, assignor to T.L.E.E. Industrial Laser and Electronic Engineering, Switzerland

Filed Feb. 1, 1994, Ser. No. 189,663
Claims priority, application Switzerland, Feb. 3, 1993, 316/93
Int. Cl.[6] H04Q 7/06
U.S. Cl. 340—825.72 10 Claims

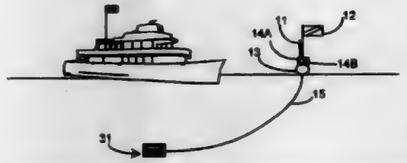
1. A remote control receiver, comprising:
an integrated receiver circuit, wherein said receiver circuit is designed for processing received signals and comprises an input designed for a direct connection to at least one predefined light detector operating in a detector operating range;
an input circuit, wherein an output signal of said input circuit is coupled to said input of said receiver circuit; and
a replacement load applied to said input of said receiver circuit, instead of said at least one predefined light detector, said replacement load having substantial the same electric impedance as said at least one predefined light detector within said detector operating range.

5,592,156

UNDERWATER ALPHA-NUMERIC COMMUNICATION SYSTEM

Robert James, 2805 SW. 22nd Ave. #104, Delray Beach, Fla. 33445

Filed Oct. 5, 1995, Ser. No. 539,618
Int. Cl.[6] H04B 11/00
U.S. Cl. 340—850 19 Claims



1. A communication system for the transmission and reception of keyed in digital messages between an underwater diver and an above-water vessel comprising:
(a) an above-water hand held transceiver unit comprising an attached antenna means for transmitting radio frequency modulated digital messages through the air and also providing means for reception of airborne radio frequency modulated digital messages, means for viewing said received messages and for viewing said keyed in messages prior to transmission, means for entering in messages for transmission and control of unit functions, a housing means for protection of electronic components,
(b) an underwater hand held transceiver unit comprising an attached antenna means for transmitting radio frequency modulated digital messages through the air and also providing means for the reception of airborne radio frequency modulated digital messages, means for viewing said received messages and for viewing said keyed in messages prior to transmission, means for entering in messages for transmission and control of unit functions, a housing means for protection of electronic components, whereby no attachments directly to underwater diver or diver's equipment are necessary,
(c) a molded sturdy plastic handle providing a location of predetermined size whereby said underwater hand held transceiver unit may be mounted while providing a second location of predetermined size whereby an underwater diver may grasp said plastic handle.

5,592,157

RELATIVE VISIBILITY MEASURING PROCESS AND DEVICE

Juergen Metz, Wettenberg, and Joachim Tiedeke, Achberg/Esseratsweiler, both of Germany, assignors to Leica AG, Heerbrugg, Switzerland

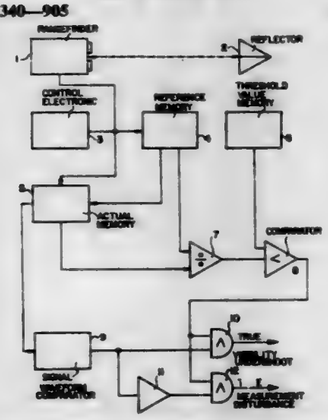
PCT No. PCT/EP93/02689, § 371 Date Apr. 5, 1995, § 102(e) Date Apr. 5, 1995, PCT Pub. No. WO94/08254, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 1, 1993, Ser. No. 411,695

Claims priority, application Germany, Oct. 5, 1992, 42 33 379.2

Int. Cl.[6] G08G *1/09*

U.S. Cl. 340—905 **14 Claims**



1. A relative visibility measuring process, comprising the steps of:

a) measuring and storing a reference propagation time of a measurement pulse over a reference distance between a pulse propagation time rangefinder and a reflector under ideal conditions,

b) measuring and storing a reference amplitude of the measurement pulse, which is reflected by the reflector, under the ideal conditions,

c) measuring and storing characteristics of an actual signal which correspond to a time response of a received signal of the pulse propagation time rangefinder under actual conditions,

d) determining an actual amplitude which is equal to an amplitude of a time element of the actual signal having a propagation time equal to the reference propagation time,

e) determining a ratio of the actual amplitude to the reference amplitude and comparing the ratio with a threshold value which is dependent on a visibility to be determined,

f) comparing a signal waveform of the actual signal with standard waveforms for various states, which influence visibility, of a measurement path between the pulse propagation time rangefinder and the reflector, and

g) logically linking the comparison results in order to produce a switching and/or warning signal for a case of a visibility undershoot or a measurement disturbance.

5,592,158

INITIALIZATION BEACON FOR INITIALIZING A STATIONARY VEHICLE

Didier Riffaud, Choisy le Roi, France, assignor to GEC Alsthom Transport SA, Paris, France

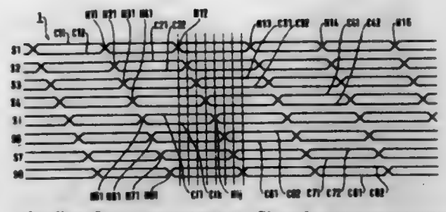
Filed Nov. 17, 1994, Ser. No. 343,927

Claims priority, application France, Nov. 23, 1993, 93 13989

Int. Cl.[6] G08G *1/01*

U.S. Cl. 340—941 **9 Claims**

1. An initialization beacon for initializing a stationary vehicle, the beacon comprising:



a plurality of cross-over structures Si, each cross-over structure being constituted by a first electrical cable Ci1 and a second electrical cable Ci2, which cables are mutually parallel over most of their length, the first electrical cable Ci1 crossing over the second electrical cable Ci2 so as to form a succession of magnetic nodes Nij, wherein the magnetic nodes Nij of any given cross-over structure are distributed, in compliance with a space period, along said given cross-over structure; and

means for successively powering pairs Pma of said cross-over structures Si at a clock frequency FH and at a data frequency FD.

5,592,159

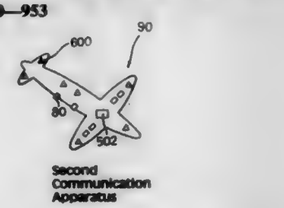
CONTROL SYSTEM FOR A FLIGHT VEHICLE

Yeong-shyeong Tsai; Wang-jr Li, both of No. 141, Fu Hsing Rd., Lu Chou Hsiang, Taipei Hsien; Hong-ming Tsai, No. 2-1, Lane 395, Kuokuang Rd., Taichung; Bo-yu Tsai, No. 2-1, Lane 395, Kuokuang Rd., Taichung, and Liu-ang Tsai, No. 2-1, Lane 395, Kuokuang Rd., Taichung, all of Taiwan

Filed Jun. 30, 1995, Ser. No. 496,935

Int. Cl.[6] G08G *5/00*

U.S. Cl. 340—953 **4 Claims**



1. A control system for a flight vehicle (**90**) when landing and comprising:

at least one guiding device (**40**) mounted on the ground for guiding said flight vehicle (**90**) and comprising:

a long range guiding water jet generator (**410**) including a plurality of nozzles (**414**) each projecting a jet of water upwardly in a radiating manner and an illumination apparatus (**412**) projecting a plurality of beams of light upwardly in a radiating manner each in concert with the jet of water projected from each of said nozzles (**414**) of said long range guiding water jet generator (**410**) so as to guide said flight vehicle (**90**) along a predetermined direction when said flight vehicle (**90**) is located at a predetermined distance relative to said guiding device (**40**);

at least one support water jet generator (**30**) including a nozzle (**301**) injecting a jet of pressurized water upwardly for supporting said flight vehicle (**90**) when landing; and

a supply device (**10**) for supplying water to said nozzles (**414**) of said long range guiding water jet generator (**410**) and said nozzle (**301**) of said support water jet generator (**30**) respectively.

5,592,160

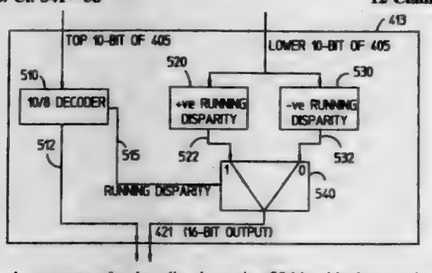
METHOD AND APPARATUS FOR TRANSMISSION CODE DECODING AND ENCODING

Dwayne Bennett, Scarborough; Clifford Yeung, Richmond Hill, and Wayne Wu, Rexdale, all of Canada, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1995, Ser. No. 548,504

Int. Cl.[6] H03M *7/14*

U.S. Cl. 341—58 **12 Claims**



1. An apparatus for decoding incoming 20 bit wide data received from an optical interface into 16-bit wide data comprising:

a first 10-bit 10/8 bit decoder for translating the first 10-bits of the 20 bit data into 8-bits.

a positive second 10-bit 10/8 bit decoder for translating of the second 10-bits of the 20 bit data into 8-bits,

a negative second 10-bit 10/8 bit decoder for translating the second 10-bits of the 20 bit data into 8-bits, wherein, the running disparity into the first 10-bit decoder is based on the last 20 bit data decoded, and the running disparity out is employed for selecting the first or second 10-bit decoder output.

a multiplexer for selecting between the encodings of the positive and the negative second 10-bit disparity decoder based on the output of the running disparity of the first 10-bit decoded output, wherein the output of the first 10-bit 10/8 bit decoder and the multiplexer output are concatenated to form the 16-bit decoded output.

5,592,161

METHOD AND APPARATUS FOR PROCESSING DATA SIGNALS IN HIGH QUALITY WITHOUT DETERIORATION OF SIGNAL-NOISE RATIO

Toshiharu Kuwaoka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 16, 1993, Ser. No. 167,249

Claims priority, application Japan, Dec. 16, 1992, 4-354521

Int. Cl.[6] H03M *7/00*

U.S. Cl. 341—95 **6 Claims**

1. A data signal processing method for converting M bits of code information into N bits of code information, comprising:

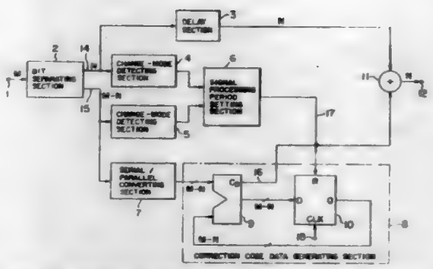
a step of separating the M bits of code information into a first group of upper N bits of code information and a second group of lower (M-N) bits of code information;

a step of detecting a first change condition of the first group of upper N bits of code information on a time base;

a step of detecting a second change condition of the second group of lower (M-N) bits of code information on a time base;

a step of obtaining sequential sample values from the second group of lower (M-N) bits of code information;

a step of setting a signal processing period according to the first change condition and the second change condition;



a step of adding the sequential sampling values to obtain an added value in each signal processing period;

a step of generating compensation code information at each time when the added value reaches a quantized value of $2^{(M-N)}$; and

a step of adding the compensation code information with the code information of the first group.

5,592,162

INTERVAL WIDTH UPDATE PROCESS IN THE ARITHMETIC CODING METHOD

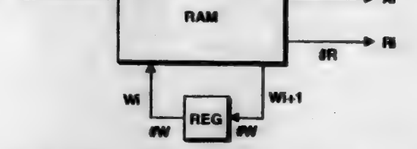
Harry W. Printz, New York, N.Y., and Peter R. Stubley, Outremont, Canada, assignors to Digital Equipment International, Ltd., Fribourg, Switzerland

Filed Mar. 23, 1994, Ser. No. 216,741

Claims priority, application France, Mar. 29, 1993, 93 03590

Int. Cl.[6] H03M *7/00*

U.S. Cl. 341—107 **3 Claims**



1. Interval width update process in arithmetic coding, characterized in that

a set of values $\mathcal{A}=\{A[0], A[1], \ldots, A[r-1]\}$, is selected and the interval width is maintained as an index Wi in said set,

a table lookup simultaneously updates the interval width and supplies the augend and shift by performing the following operation:

$$(Wi+1,\ Xi,\ Ri)=f^{*}(Si,\ Wi)$$

in which the function f^{*} is implemented by a table lookup, in which p(Si) and P(Si) are determined from Si, A[Wi] is determined from Wi, p(Si)·A[Wi] and Ri=P(Si)·A[Wi] are computed, the shift Xi necessary for representing $p(Si)\cdot A[Wi]\cdot 2^{Xi}$ in $\mathcal{R}$ is determined. Wi+1 is determined in such a way that A[Wi+1] is the best representative of $p(Si)\cdot A[Wi]\cdot 2^{Xi}$, followed by return to Wi+1, Xi and Ri.

wherein

A is interval width

Xi is a shift

Ri is augend of P(Si)·Ai

p(Si) is symbol occurrence probability

P(Si) is cumulative symbol probability

R is range of admissible values of Ai

Si=symbol to be coded in stage i.

5,592,163

CODING SYSTEM

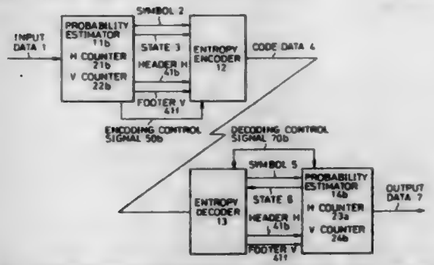
Tomohiro Kimura; Shigenori Kino; Masayuki Yoshida, and Fumitaka Ono, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1994, Ser. No. 284,086

Claims priority, application Japan, Aug. 6, 1993, 5-196406; Jun. 22, 1994, 6-140311

Int. Cl.[6] H03M 7/00

U.S. Cl. 341—107 **35 Claims**



1. A coding system comprising: an encoder for encoding information source symbols, and a decoder for decoding information source symbols, wherein a total number of the information source symbols for encoding and decoding is not known before coding begins,

wherein the encoder includes:

encoder information source unit memory means for storing a given number of information source symbols as an information source unit;

encoder information source unit count means for counting a number of information source units of the encoding information source symbols referring to the information source unit stored by the information source unit memory means; and

notify means for transmitting the number of information source units counted by the information source unit count means to the decoder after encoding has started, and

wherein the decoder includes:

decoder information source unit memory means for storing the information source unit;

decoder information source unit count means for counting the number of information source units stored in the decoder information source unit memory means; and

decode terminate means receiving said number of information source units from said notify means, for comparing the number of information source units counted by the decoder information source unit count means and the number of information source units notified by the notify means, and for terminating the decoding according to a result of the comparison.

5,592,164

CIRCUIT ARRANGEMENT FOR SIGNAL PROCESSING

Stefan Hilbert, Zenthen, and Bernd Kirchner, Berlin, both of Germany, assignors to Deutsche Forschungsanstalt für Luft- und Raumfahrt, e.V., Köln, Germany

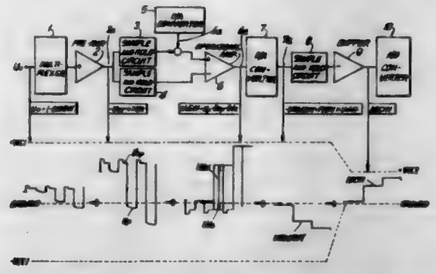
Filed Jun. 24, 1994, Ser. No. 265,434

Claims priority, application Germany, Jun. 24, 1993, 43 21 621.8

Int. Cl.[6] H03M 1/00

U.S. Cl. 341—120 **14 Claims**

1. A circuit arrangement for signal processing of discrete or continuous signals of at least one CCD component, comprising: a multiplexer which receives the signals for processing and has an output; a pre-amplifier having an input connected to the output of the multiplexer, and further having an output; two sample and hold circuits each having an input connected to the output of the pre-amplifier, each of the sample and hold circuits further having



an output; an operational amplifier having a non-inverting input connected to the output of a first of the sample and hold circuits and an inverting input connected to the output of a second of the sample and hold circuits, the operational amplifier further having an output; a digital-analog converter having an output connected to the non-inverting input of the operational amplifier and putting out a correction signal to the operational amplifier a multiplying digital-analog converter having a reference input connected to the output of the operational amplifier, the multiplying digital-analog converter further having an output; a third sample and hold circuit having an input connected to the output of the multiplying digital-analog converter, the third sample and hold circuit further having an output; a buffer having an input connected to the output of the third sample and hold circuit, the buffer further having an output; and an analog-digital converter having an input connected to the output of the buffer.

5,592,165

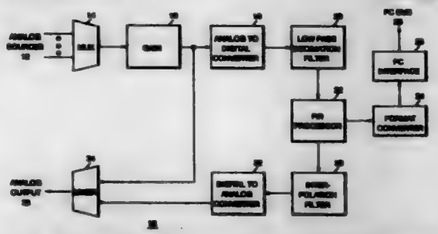
METHOD AND APPARATUS FOR AN OVERSAMPLED DIGITAL TO ANALOG CONVERTOR

Harry S. Jackson, and Michael A. Margulas, both of Austin, Tex., assignors to Sigmatel, Inc., Austin, and Dallas Semiconductor Corporation, Dallas, both of Tex.

Filed Aug. 15, 1995, Ser. No. 515,309

Int. Cl.[6] H03M 3/02

U.S. Cl. 341—143 **20 Claims**



1. An oversampled digital to analog converter (DAC) comprising:

memory having at least N-bit locations, the memory receives and stores a digital bit stream;

primary current sources, each of the primary current sources having substantially equal current sourcing capabilities and each of the primary current sources being operably coupled, at one end, to a different one of the N-bit locations and operably coupled, at another end, to a summing node;

secondary current sources, each of the secondary current sources having substantially equal current sourcing capabilities, each of the secondary current sources are operably coupled, at one end, to a corresponding one of the N-bit locations and operably coupled, at another end, to a resistive network; and

amplifier having a first input coupled to a reference and a second input coupled to the summing node and the resistive network, an output of the amplifier provides a filtered analog representation of the digital bit stream.

5,592,166

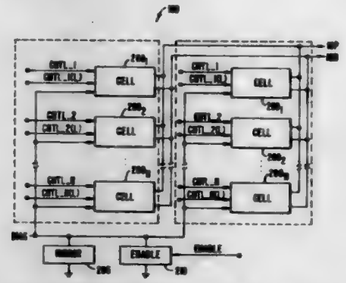
HIGH SPEED CMOS D/A CONVERTER FOR WAVE SYNTHESIS IN NETWORK

John M. Wincn, Cupertino, Calif., assignor to Advanced Micro Devices Inc., Sunnyvale, Calif.

Filed Jun. 2, 1995, Ser. No. 458,969

Int. Cl.[6] H03M 1/66

U.S. Cl. 341—144 **4 Claims**



1. A least significant cell for an integrated digital to analog converter for driving an incremental current at each of a first and a second output node, comprising:

a first and second matching MOS transistor, each having a first terminal node, a second terminal node and a gate terminal node, said gate terminal nodes receiving a bias current for controlling an operating current between said first terminal node and second terminal node and wherein said first terminal node of said first MOS transistor is coupled to the first output node and said first terminal node of said second MOS transistor is coupled to the second output node;

a first current source having a first current terminal coupled to said second terminal node of said first MOS transistor and a second current terminal coupled to a voltage reference level, said first current source responsive to a first control signal for switching a first operating current through said first MOS transistor on when said first control signal has a first value and switching said first operating current through said first MOS transistor off when said first control signal has a second value; and

a second current source having a first current terminal coupled to said second terminal node of said second MOS transistor and a second current terminal coupled to said voltage reference level, said second current source responsive to a second control signal for switching a second operating current through said second MOS transistor on when said second control signal has a first value and switching said second operating current through said second MOS transistor off when said second control signal has a second value.

5,592,167

ANALOG-DIGITAL CONVERTER USING CURRENT CONTROLLED VOLTAGE REFERENCE

John M. Caruso, Fremont; Quoi V. Huynh, San Jose, and Roger A. Levinson, San Francisco, all of Calif., assignors to Exar Corporation, San Jose, Calif.

Filed Oct. 19, 1994, Ser. No. 325,716

Int. Cl.[6] H03M 1/36

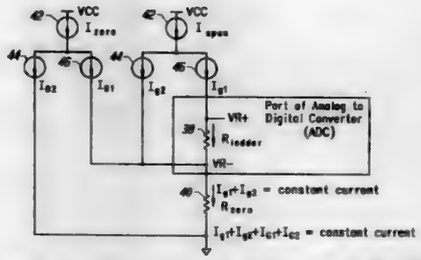
U.S. Cl. 341—159 **21 Claims**

1. An analog to digital converter (ADC) for receiving and converting an analog signal to a digital output comprising

a code converter,

a resistor ladder connected between a zero reference voltage and a maximum span voltage for use in comparing an analog voltage and driving said code converter,

a first current driver means for selectively steering part of a first current through said resistor ladder and establishing said span voltage,



a zero reference resistor serially connected with said resistor ladder, and

a second current driver means for selectively steering a part of a second current through said zero reference resistor for establishing a zero reference voltage for said span voltage.

5,592,168

HIGH SPEED DUAL-SLOPE ANALOG-TO-DIGITAL CONVERTER

Tsuoe-Hsiang Liao, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Apr. 29, 1994, Ser. No. 235,783

Int. Cl.[6] H03M 1/50

U.S. Cl. 341—167 **3 Claims**



1. A dual-slope analog-to-digital converter including a buffer, an integrator and a comparator, the operation phases of said converter comprising:

a signal integrator phase during which said buffer, said integrator and said comparator are connected as an integrating circuit that is fed with an analog input signal for integrating said input signal to an integrated voltage at the output of said integrator;

a signal de-integration phase during which said integrating circuits is fed with a reference voltage of opposite polarity to said analog input signal for discharging said integrated voltage toward an initial voltage;

a unified zero-reset phase during which said buffer, said integrator and said comparator are connected as a unified zero-reset circuit that is fed with a common calibrating voltage to correct for offset and residue voltages of said integrating circuit and to quickly reset the output of said integrator to said initial voltage at the end of said de-integration phase,

said unified zero-reset circuit comprising:

said buffer,

said integrator, having an amplifier, an integrating capacitor, an integrating resistor, and a reset capacitor which is connected between the inverting input terminal and the junction of said integrating capacitor and said integrating resistor,

the input of said integrator connected to the output of said buffer,

said comparator, having a non-inverting input terminal connected to the output of said integrator, an inverting input terminal connected to the inverting input terminal of said amplifier in said integrator, and an output terminal coupled to the input of said buffer;

said common calibrating voltage applied to the non-inverting input terminal of said amplifier in said integrator.

5,592,169

TRANSMITTER FOR VEHICLE REMOTE CONTROL SYSTEM

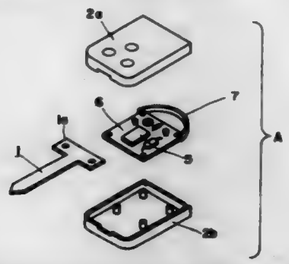
Yasunori Nakamura, Yamanashi-ken, and Shunji Kato, Saitama-ken, both of Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 360,353

Claims priority, application Japan, Dec. 24, 1993, 5-348187; Dec. 29, 1993, 5-352275

Int. Cl.[6] G08C *19/12*

U.S. Cl. 341—173 **15 Claims**



1. A remote control transmitter used for a switching of a state of a door lock device between a locked state and an unlocked state and so on comprising:
- a portable-size case;
- at least one operating button provided on an outer surface of the case;
- a rechargeable secondary battery provided within the case;
- a solar battery provided on the outer surface of the case and rechargeably connected to the secondary battery; and
- a generator for generating a coded signal,
- wherein when the operating button is pushed, electric current is fed from the secondary battery to the generator; and
- wherein one of terminals of the operating button is connected to a positive terminal of the secondary battery and the other of the terminals of the operating button is connected to a positive terminal of the generator.

5,592,170

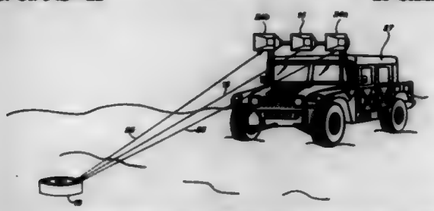
RADAR SYSTEM AND METHOD FOR DETECTING AND DISCRIMINATING TARGETS FROM A SAFE DISTANCE

Robert H. Price, Santa Fe; Herbert T. Davis, III, Corrales, and Scott A. Dunn, Albuquerque, all of N.M., assignors to Jaycor, San Diego, Calif.

Continuation-in-part of Ser. No. 421,692, Apr. 11, 1995, abandoned. This application Jun. 6, 1995, Ser. No. 466,938

Int. Cl.[6] G01S *13/24;7/41*

U.S. Cl. 342—22 **28 Claims**



1. A method of detecting the presence of a buried object within a target area from a probing location that is a prescribed stand-off distance away from the target area, the method comprising the steps of:
- (a) irradiating the target area with a plurality of incident pulses of microwave power from the probing location, the incident pulses having a prescribed waveform signature;
- (b) receiving a plurality of return pulses of microwave power reflected from the target area at two spaced-apart locations, the two spaced-apart locations having a prescribed orientation relative to the probing location; and
- (c) processing the return pulses received at the two spaced-apart locations in step (b) to determine the presence and location of the object.

5,592,171

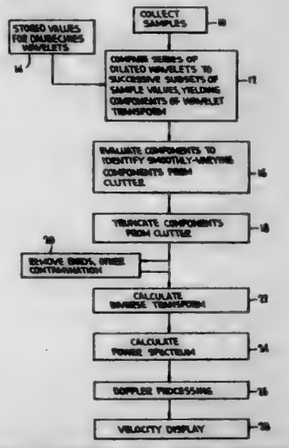
WIND PROFILING RADAR

James R. Jordan, Boulder, Colo., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Aug. 17, 1995, Ser. No. 516,219

Int. Cl.[6] G01S *13/95*

U.S. Cl. 342—26 **6 Claims**



1. A method of measuring wind velocity, including the step of reducing the amplitude of clutter components in a series of samples representing a radar return signal with respect to the return from meteorological reflectors, comprising the steps of:
- computing wavelet transforms of the series of samples employing selected wavelet functions, in order to calculate a set of components;
- identifying relatively large components from said set of components as due to smoothly-varying radar return signals from nonmeteorological reflectors;
- truncating the amplitude of the identified components;
- computing the inverse transform with respect to the remaining components, yielding a series of processed samples having had the return from said nonmeteorological reflectors effectively removed;
- calculating the power spectrum of the series of processed samples; and
- analyzing the power spectrum to determine the velocity of meteorological reflectors contributing to the return signal.

5,592,172

METHOD OF, AND SYSTEM FOR, DESCRIBING A GEOGRAPHICAL AREA TO A COMMUNICATIONS NETWORK

Alister J. Bailey, Cambridge, England, and Ruud H. M. Hendrikxen, Beek en Donk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

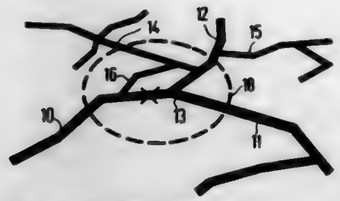
Filed Apr. 12, 1994, Ser. No. 226,617

Claims priority, application United Kingdom, May 14, 1993, 9309916

Int. Cl.[6] G01S *1/00*

U.S. Cl. 342—350 **24 Claims**

1. A method of describing a geographical area to a communications network, comprising determining the shape of the geographical area and determining the location of at least one point lying symmetrically in the geographical area or lying on the perimeter of the geographical area, encoding the location of the at least one point as an angle of latitude and an angle of longitude and encoding the shape of the geographical area as a series of bits, and transmitting the description of the geographical area as a single code word or a plurality of concatenated code words.



5,592,173

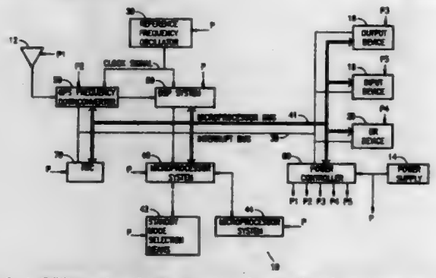
GPS RECEIVER HAVING A LOW POWER STANDBY MODE

Chung Y. Lau, Sunnyvale; Dominic G. Farmer, Milpitas; Kreg A. Martin, and Eric B. Rodal, both of Cupertino, all of Calif., assignors to Trimble Navigation, Ltd, Sunnyvale, Calif.

Filed Jul. 18, 1994, Ser. No. 276,886

Int. Cl.[6] G01S *5/02;* **G06F** *1/00;* **H04B** *1/16*

U.S. Cl. 342—357 **31 Claims**



1. A GPS receiver having a normal operational mode to process GPS satellite signals and provide GPS location information and having a low power standby mode, the GPS receiver including:
- a GPS frequency downconverter to downconvert the frequency of said GPS satellite signals and to provide a GPS intermediate frequency (IF) signal;
- clock signal means for providing a system clock signal;
- a digital signal processing (DSP) system, coupled to the GPS frequency downconverter and the clock signal means, to operate with the system clock signal to provide correlation information corresponding to said GPS IF signal in said normal mode and to receive a control signal to enable said system clock signal for said normal mode or to inhibit said system clock signal for said standby mode;
- a microprocessor system, coupled to the DSP system, to process said correlation information to provide said GPS location information;
- standby mode selection means, coupled to the microprocessor system, for calculating a standby time duration for said standby mode; and
- the microprocessor system includes means for providing said control signal according to the standby mode selection means to cause said standby mode or said normal mode.

5,592,174

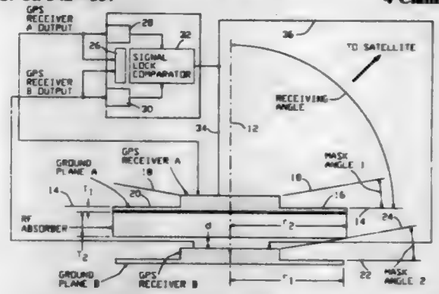
GPS MULTI-PATH SIGNAL RECEPTION

George F. Nelson, Coon Rapids, Minn., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Jan. 26, 1995, Ser. No. 378,436

Int. Cl.[6] G01S *5/02;* **H01Q** *1/52;25/00*

U.S. Cl. 342—357 **4 Claims**



1. A Global Positioning System (GPS) for receiving satellite positioning signals comprising,
- a first signal-locking receiver for locking-in on said satellite positioning systems,
- a first ground plane located adjacent to said first receiver, the periphery of which extends beyond the periphery of said first receiver, and
- RF absorber positioned adjacent said first ground plane and having a periphery substantially coextensive with the periphery of said first ground plane,
- a second signal-locking receiver located so that an RF absorber is positioned intermediate said first ground plane and said second receiver, and a second ground plane located adjacent said second receiver such that said second receiver is positioned intermediate said second ground plane and said RF absorber, said first and second receivers constructed to have a direct receiving angle for receiving direct positioning signals from said satellites and a multi-path receiving angle for receiving positioning signals that are reflected off of objects and, thereby, indirectly received by said first and second receivers through said multi-path receiving angles, wherein said second receiver is spaced from said RF absorber such that said RF absorber blocks direct positioning and multiple reflections between ground plane signals while providing a multi-path receiving angle for said multi-path receiving signals, and said first receiver will lock in on said direct signals when it exceeds a lock-in threshold, and said second receiver will lock in on said multi-path signal when said direct signal is less than said lock-in threshold.

5,592,175

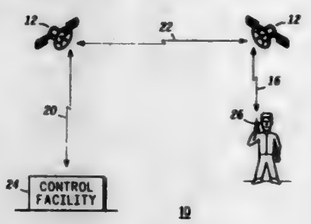
LOCATION DETERMINATION METHOD AND APPARATUS FOR A COMMUNICATION UNIT

Daniel R. Tayloe, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 25, 1995, Ser. No. 519,869

Int. Cl.[6] G01S *5/02*

U.S. Cl. 342—357 **19 Claims**



8. A method for locating a communication unit in a communication system comprising the communication unit, a satellite which projects multiple communication cells toward the communication unit and which moves relative to the communication unit, and a location determination unit, the method comprising the steps of:

a) receiving, by the communication unit, a message to contact the location determination unit when the communication unit is located within one of multiple optimal communication cells;

b) waiting until the communication unit is located within one of the multiple optimal communication cells; and

c) when the communication unit is located within one of the multiple optimal communication cells, contacting the location determination unit.

5,592,176

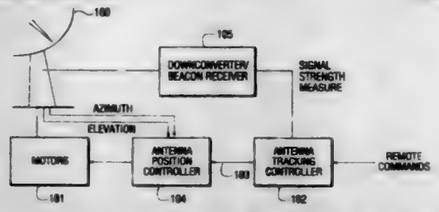
TRACKING SYSTEM FOR TRACKING A MOVING SIGNAL SOURCE

Edward H. Vickers, Auburn, and Phillip C. Lewis, Duluth, both of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Mar. 30, 1995, Ser. No. 411,423

Int. Cl.[6] H01Q 3/00

U.S. Cl. 342—359 **4 Claims**



1. An antenna tracking controller for generating signals used to position an antenna for tracking a moving signal source, said antenna tracking controller comprising:

a first Kalman filter for estimating parameters of a first model of the motion of said moving signal source; and

a second Kalman filter for estimating parameters of a second model of the motion of said moving signal source,

wherein said second Kalman filter uses the parameters estimated by said first Kalman filter as initial values.

5,592,177

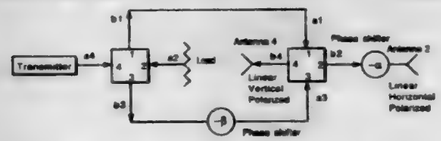
POLARIZATION-ROTATION MODULATED, SPREAD POLARIZATION-ROTATION, WIDE-BANDWIDTH RADIO-WAVE COMMUNICATIONS SYSTEM

Terence W. Barrett, Vienna, Va., assignor to Autometric, Incorporated, Alexandria, Va.

Filed Jun. 11, 1993, Ser. No. 75,271

Int. Cl.[6] H01Q 21/06;21/24; H04B 7/10

U.S. Cl. 342—361 **7 Claims**



1. A radio wave communication system comprising:

a source of RF signals,

a dual feed pair of cross polarized antennas having a common axis and being at orthogonal angles to each other relative to said common axis, and

means for coupling said source of RF signals to said pair of cross-polarized antennas including phase modulation means connected between at least one of said pair of cross-polarized antennas and said source for modulating the polarization of RF signals launched by said pair of cross-polarized antennas with an information signal.

5,592,178

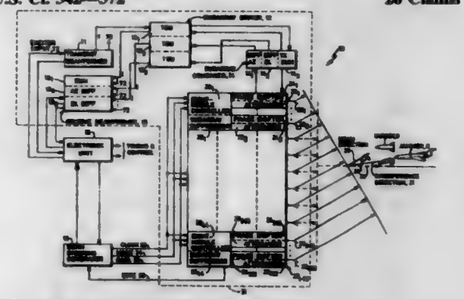
WIDEBAND INTERFERENCE SUPPRESSOR IN A PHASED ARRAY RADAR

Kaichiang Chang, Northborough; Fernando Beltran, Framingham, and Fritz Steudel, Sudbury, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 1, 1994, Ser. No. 252,502

Int. Cl.[6] H01Q 3/22

U.S. Cl. 342—372 **20 Claims**



1. A phased array antenna comprising:

a plurality of time-steering subarrays;

each of said subarrays comprises a plurality of interference suppressor means;

said interference suppressor means comprises means for generating a set of identical notch control commands for each of said time-steering subarrays;

subarray driver means coupled to each of said time-steering subarrays for combining outputs of said interference suppressor means to produce an identical notch for each of said subarrays in the direction of interference; and

beamforming means coupled to said subarray driver means for combining outputs of said time-steering subarrays to produce a wideband notch of said antenna in the direction of interference.

5,592,179

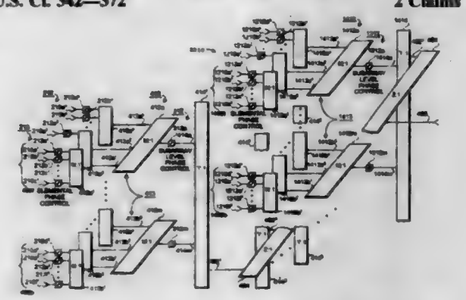
FREQUENCY-HOPPING ARRAY ANTENNA SYSTEM

John A. Windyka, Liverpool, N.Y., assignor to Martin Marietta Corp., Nashua, N.H.

Filed Aug. 2, 1995, Ser. No. 510,731

Int. Cl.[6] H01Q 3/22;3/24;3/26

U.S. Cl. 342—372 **2 Claims**



1. An array antenna for use with a frequency-hopping signal, said array antenna comprising:

an array of antenna elements, each for transducing electromagnetic signals between space and a corresponding RF port;

phase-shifting means coupled to the RF port of each of said antenna elements of said array of antenna elements, for phase-shifting said signals under the control of beam direction control signals;

beam direction control signal generating means coupled to said phase-shifting means, for controlling said phase shift of each of said phase-shifting means in a manner selected for forming at least one beam in a selected direction;

one of a source and sink of frequency-hopping RF signals for one of generating or receiving said frequency-hopping signals, respectively, and for generating frequency-indicative control signals representative of the instantaneous frequency of said frequency-hopping signals;

coupling means coupled to said phase-shifting means and to said one of said source and sink, for coupling said frequency-hopping signals between said phase-shifting means and said one of said source and sink, whereby a corresponding one of a transmit and receive beam is generated by said array, but changes in frequency of said frequency-hopping RF signals cause deviations of said beam from said selected direction; said coupling means further comprising (a) grouping means coupled to predetermined groups of said phase-shifting means, for grouping said phase-shifting means and their associated antenna elements into plural subgroups, each including a subgroup feed port and (b) additional phase shifting means coupled to each of said subgroup feed ports, for controllably shifting the phase of said RF signals applied to said antenna elements of each of said subgroups; and

antenna beam correction control means coupled to said additional phase-shifting means and to said one of said source and sink, for generating beam direction correction signals in response to said frequency-indicative control signals, for generating a group phase shift of said RF signals which tends to offset said deviations of said beam from said desired direction.

5,592,180

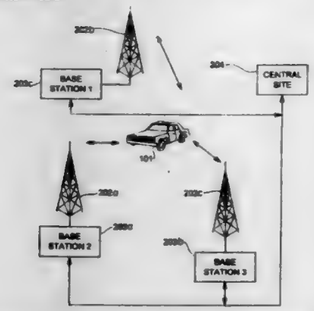
DIRECTION FINDING AND MOBILE LOCATION SYSTEM FOR TRUNKED MOBILE RADIO SYSTEMS

Hanoch Yokev, Ramat-Gan; Haim Harel, Herzelia; Yehouda Meiman, Rishon Letzian, and Shimon Peleg, Hod Hasharon, all of Israel, assignors to Nexus1994 Limited, London, Great Britain

Continuation-in-part of Ser. No. 158,441, Nov. 24, 1993, Pat. No. 5,430,759, which is a continuation-in-part of Ser. No. 961,776, Oct. 15, 1992, Pat. No. 5,335,246, which is a continuation-in-part of Ser. No. 932,610, Aug. 20, 1992. This application Oct. 26, 1994, Ser. No. 329,549

Int. Cl.[6] G01S 3/02

U.S. Cl. 342—450 **7 Claims**



7. A method of locating a trunked mobile transmitter, comprising the steps of:

a.) receiving at a first base station a trunked radio frequency signal on a plurality of irregularly spaced antennas;

b.) removing the modulation information to produce a demodulated radio frequency carrier signal;

c.) calculating the observed angle of arrival of the demodulated radio frequency carrier signal by comparing the phase difference of the demodulated radio frequency carrier signal between pairs of the plurality of irregularly spaced antennas;

d.) determining the most probable angle of arrival of the demodulated radio frequency carrier signal by comparing the observed angle of arrival to ambiguity lines in an n-dimensional space where the number of antennas is n+1;

e.) repeating steps a.–d. for each of a plurality of base stations to produce a plurality of most probable angles of arrivals;

f.) calculating an histogram of the plurality of most probable angles of arrivals and selecting the strongest most probable values; and

g.) applying a spatial filter to the strongest most probable values from each base station and selecting the location based on the closest grouping of the strongest most probable values.

5,592,181

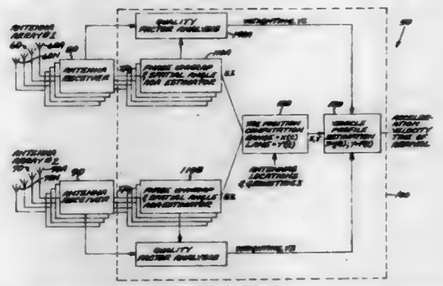
VEHICLE POSITION TRACKING TECHNIQUE

Khiem V. Cai, Brea, and Roger J. O'Connor, Dove Canyon, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 18, 1995, Ser. No. 443,519

Int. Cl.[6] G01S 3/02

U.S. Cl. 342—457 **30 Claims**



1. A method for tracking a moving transmitter which transmits RF signals, comprising the following steps:

positioning first and second antenna arrays is a spaced arrangement relative to an area in which the transmitter is moving, each antenna array comprising a plurality of antenna elements arranged in spaced relationship, the elements comprising a plurality of baseline pairs of elements, wherein the element-to-element spacing d of elements in the baseline pairs are different for each baseline pair;

receiving RF signals from the transmitter using the first and second antenna arrays and converting baseline signals from each baseline pair of elements into digital data;

processing the digital data to provide phase data indicative of the electrical phases of signals received at the different baseline pairs of the first and second antenna arrays;

converting the phase data into spatial angle data indicative of angle of arrival of RF signals incident on the baseline pairs of the first and second antenna arrays;

processing the spatial angle data with antenna configuration data indicative of the location and geometry of the first and second antenna arrays to provide transmitter position data specifying an estimated position of the transmitter; and

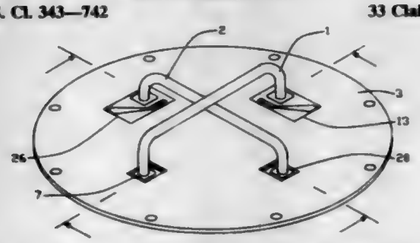
determining sample quality weighting factors and weighting the transmitter position data with said factors to compensate for multipath distorted samples.

5,592,182

EFFICIENT, DUAL-POLARIZATION, THREE-DIMENSIONALLY OMNI-DIRECTIONAL CROSSED-LOOP ANTENNA WITH A PLANAR BASE ELEMENT

Nian J. Yao, Mountain View, and Vikram Verma, Palo Alto, both of Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 10, 1995, Ser. No. 500,415
Int. Cl.[6] H01Q *11/12*
U.S. Cl. 343—742 **33 Claims**



1. An electrically small loop antenna for connection to an electrical circuit for operation at a radiation frequency, said antenna comprising,

a radiation device conducting a resonant current for radiation at the radiation frequency,

said radiation device including,

a conductive planar base element extending in a base plane for conducting said resonant current for radiation at the radiation frequency,

a conductive first loop extending from a first-loop first end to a first-loop second end for conducting a first component of said resonant current for radiation at the radiation frequency,

a conductive second loop extending from a second-loop first end to a second-loop second end for conducting a second component of said resonant current for radiation at the radiation frequency,

said first-loop first end for connection to said base element at a first-loop first location and said first-loop second end for connection to said base element at a first-loop second location spaced from said first-loop first location to enable said first component of said resonant current to conduct through the conductive planar base element and the conductive first loop,

said second-loop first end for connection to said base element at a second-loop first location and said second-loop second end for connection to said base element at a second-loop second location spaced from said second-loop first location to enable said second component of said resonant current to conduct through the conductive planar base element and the conductive second loop,

a first matching network for matching the impedance of the conductive planar base element and the first loop to the impedance of the electrical circuit, said first matching network connecting the first-loop second end of the conductive first loop to the base element at the first-loop second location to form a first resonant circuit loop having a high Q, said first resonant circuit loop including said conductive planar base element and said conductive first loop whereby said first component of the resonant current is conducted through the base element and through the conductive first loop,

a second matching network for matching the impedance of the conductive planar base element and the second loop to the impedance of the electrical circuit, said second matching network connecting the second-loop second end of the conductive second loop to the base element at the second-loop second location to form a second resonant circuit loop having a high Q, said second resonant circuit loop including said conductive planar base element and said conductive second loop whereby said second component of the resonant current is conducted through the base element and through the conductive second loop,

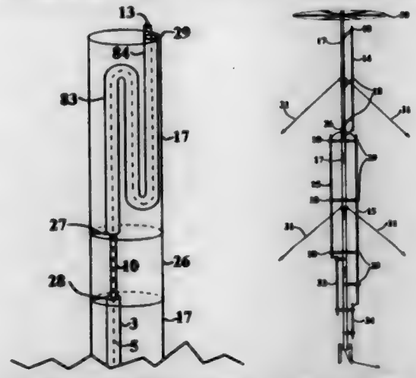
first and second connector means, each having first and second conductors for connecting to the electrical circuit, one of said conductors for each of said first and second connector means connected directly to said base element and the other of said conductors connected respectively one of said matching networks whereby electrical current is conducted between the electrical circuit and the radiation device.

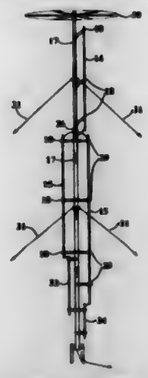
5,592,183

GAP RAIDATED ANTENNA

George Henf, 174 Chaloupe Terr., Sebastian, Fla. 32958

Continuation-in-part of Ser. No. 852,751, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 593,284, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 280,743, Dec. 6, 1988, abandoned. This application Nov. 12, 1993, Ser. No. 151,353
Int. Cl.[6] H01Q *9/38*
U.S. Cl. 343—749 **5 Claims**





1. An HF/VHF/UHF frequency RF antenna for transmitting and receiving RF signals of at least two or more discrete, predetermined frequencies, each at a high signal resonance without a trap or coil for matching or loading comprising:

a first, rigid linear electrically conductive metal tube, sized in length 16 feet and 0.06 wave length at the lowest fundamental frequency and having a proximal end and distal end;

a second, rigid linear electrically conductive tube, sized in length 15.5 feet and 0.059 wave length at said lowest frequency, having a proximal end and a distal end;

a rigid electrical insulator, physically connected to said first conductive tube at its proximal end and to said second conductive tube at its distal end, such that said first conductive tube and said second conductive tube are collinear along a longitudinal axis and are each joined to said rigid electrical insulator which separates said first conductive tube from said second conductive tube, said first and second conductive tubes and said first insulator forming a rigid linear support;

a coaxial cable 65 feet in physical length and 95.5 feet electrically in length created by a coaxial cable velocity factor of 0.68, having a first linear segment mounted inside said first conductive tube and a second linear segment mounted in said second conductive tube;

at least two conductive radials, each having a distal end and a proximal end connected conductively to said second conductive tube and sized in length 25 feet and 0.096 wave length at said lowest frequency;

said coaxial cable having said first linear segment 49 feet physically in length and 72 feet electrically created by a coaxial cable velocity factor of 0.68 mounted in said first tube and said second linear segment 15 feet physically and 22 feet electrically created by a velocity factor of 0.68 mounted in said second conductive tube, said coaxial cable having a center conductor extending from a first proximal end to a second distal end and an electrical coaxially insulator coaxially surrounding said center conductor throughout and a peripheral conductor coupled peripherally around said insulator coaxially surrounding said center conductor, said coaxial cable peripheral conductor having first and second conductive segments non-conductively separated forming an insulated gap;

first and second electrical connecting means connecting said peripheral first and second conductive segments of said coaxial cable respectively to said first conductive tube and said second conductive tube at the insulated gap, said insulated gap being positioned within the rigid linear support between said first conductive tube and second conductive tube;

a first linear conductive tuning rod electrically connected to said first tube in close proximity to the insulated gap and parallel to said first and second conductive tubes, said tuning rod 12.75 feet nominally in length and 0.05 wave length in length at the fundamental frequency and having a substantial portion of said tuning rod being spaced adjacent said second conductive tube, said first linear conductive tuning rod spaced 7 inches and 0.003 wave length from said second conductive tube, said first linear conductive tuning rod having a diameter nominally ¼ to ⅛ the diameter of the second conductive tube; and

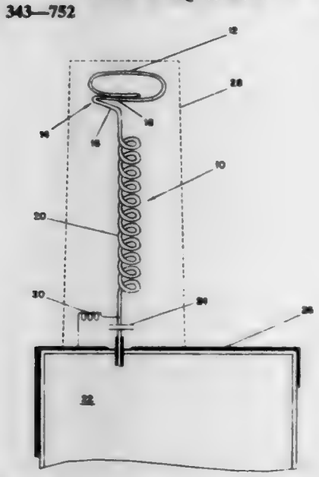
means connected to said coaxial cable peripheral conductor and said coaxial cable center conductor, attachable to an RF transmitter and receiver whereby said antenna can transmit and receive at least two HF or UHF or VHF frequencies at or near resonance wherein the antenna resistance is matched to the characteristic impedance of the coaxial cable and wherein minimal earth loss is introduced to the antenna.

5,592,184

MINIATURE ANTENNA

Erland Cassel, and Jan Cassel, both of Djursholm, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 203,733, Feb. 28, 1994, abandoned, and Ser. No. 929,447, Aug. 14, 1992, abandoned. This application May 23, 1995, Ser. No. 447,344
Claims priority, application Sweden, Aug. 16, 1991, 9102379
Int. Cl.[6] H01Q *1/36;9/40*
U.S. Cl. 343—752 **11 Claims**



1. A linearly polarized miniature antenna, comprising:

a substantially helical base portion wound around a longitudinal axis and having a length of less than a quarter of a wavelength suitable for cellular communications;

a substantially circular top loop arranged perpendicular to said axis and having a larger diameter than said helical base portion; and

a substantially U-shaped load connecting said helical base portion to said circular top loop for creating a rectangular current distribution in said antenna, said U-shaped load comprising:

a first elongated leg substantially perpendicular to said axis,

a second elongated leg substantially perpendicular to said axis, and

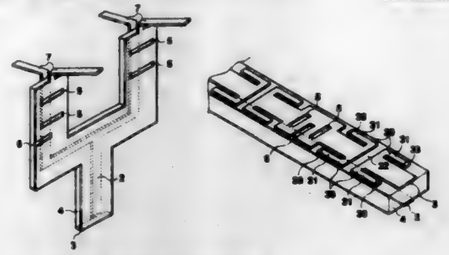
a bend of approximately 180 degrees connecting said first leg to said second leg so that said legs are substantially parallel to each other.

5,592,185

ANTENNA APPARATUS AND ANTENNA SYSTEM

Yasuhiro Itabashi; Kazuhito Miyashita; Yoshiyuki Chatani; Takayoshi Furuno; Hiroaki Miyashita; Toshio Masujima; Makoto Matsunaga; Takashi Katagi; Hiroyuki Aoki, and Tetsuo Haruyama, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 219,011, Mar. 28, 1994, abandoned. This application Sep. 25, 1995, Ser. No. 533,382
Claims priority, application Japan, Mar. 30, 1993, 5-072100; Dec. 15, 1993, 5-315361
Int. Cl.[6] H01Q *13/20*
U.S. Cl. 343—794 **35 Claims**



1. An antenna apparatus comprising:

(a) a dielectric substrate having a first surface and a second surface;

(b) an earth conductor mounted on the first surface of said dielectric substrate;

(c) a conductor mounted on the second surface of said dielectric substrate, the conductor, the earth conductor and the dielectric substrate forming a microstrip transmission line, having a length greater than a width, for transmitting an electromagnetic wave along the length of the microstrip transmission line;

(d) an antenna element formed integrally with said microstrip transmission line; and

(e) a delayed wave opening situated in said earth conductor, the delayed wave opening having a width and a length, the width of the delayed wave opening being substantially less than a wavelength of the electromagnetic wave, wherein the delayed wave opening alters a phase of the electromagnetic wave so as to steer a beam direction of the antenna, the length of the delayed wave opening being greater than the width of the delayed wave opening and perpendicular to the length of the transmission line.

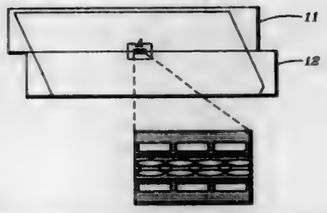
5,592,186

SECTIONAL FILTER ASSEMBLY

William J. Hoofe, IV, Costa Mesa, and John E. Schroeder, Huntington Beach, both of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Mar. 2, 1995, Ser. No. 397,338
Int. Cl.[6] H01Q *15/24*
U.S. Cl. 343—909 **10 Claims**

1. A frequency selective device that appears electrically to be one surface without degrading radar system performance and aircraft low-observability characteristics said device comprising:



two or more frequency selective surfaces that are individually fabricated to meet dimensional tolerances for FSS element size, shape, and spacing; and

means for joining said surfaces together edge-to-edge, whereby said surfaces provide respective sections of said device;

wherein said joining means comprises a seam overlapping abutting edges of two of said frequency selective surfaces, said seam comprising a perforated electrically conductive foil.

5,592,187

PLASMA DISPLAY CONTROL SYSTEM

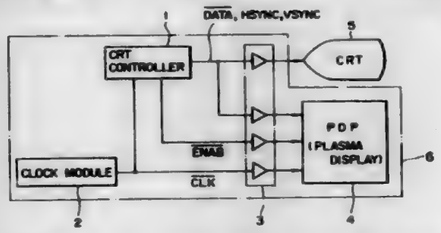
Hiroki Zenda, Hamura-machi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 88,332, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 789,537, Nov. 8, 1991, Pat. No. 5,396,258, which is a continuation of Ser. No. 355,615, May 23, 1989, abandoned. This application Oct. 19, 1994, Ser. No. 326,808

Claims priority, application Japan, May 28, 1988, 63-130923

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—3 **13 Claims**



1. A display system provided with a flat panel display unit and adapted for connection with a cathode ray tube (CRT) display unit and for concurrently displaying a common image on both the flat panel display unit and the CRT, comprising:

a CRT controller for producing vertical and horizontal sync signals for controlling a display timing of the CRT display unit;

the flat panel display unit comprising:

display period setting means for setting a display period corresponding to a back porch period following the vertical sync signal; and

means for sending image data, in synchronism with the vertical and horizontal sync signals, to the flat panel display unit during the display period, thereby to display image data at a position of the flat panel display unit determined by the display period in synchronism with the vertical and horizontal sync signals while concurrently displaying the image data on the CRT display unit.

5,592,188

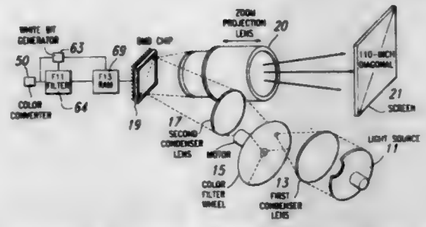
METHOD AND SYSTEM FOR ACCENTUATING INTENSE WHITE DISPLAY AREAS IN SEQUENTIAL DMD VIDEO SYSTEMS

Donald B. Doherty, Richardson, Tex., and Robert J. Gove, Los Gatos, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1995, Ser. No. 368,448

Int. Cl.[6] H04N *9/12*; G02F *1/00*

U.S. Cl. 345—84 **17 Claims**



1. A method for accentuating intense white display areas in a sequential DMD video system comprising the steps of:

generating a special signal that indicates a boost white intensity; and

during the presence of said special signal, enabling a DMD mirror to be in the on position during times when a source of light for the DMD mirror traverses a color boundary of a color wheel.

5,592,189

APPARATUS FOR USE IN OFFICES ETC.

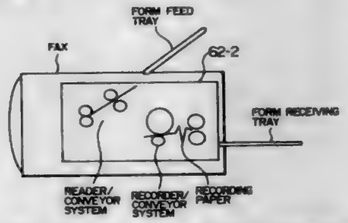
Soshiro Kuzunuki; Yasuro Hori, both of Katsuta; Shuichi Okabe, Yokohama, and Fumitaka Ito, Chiba-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 942,199, Sep. 9, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 469,789

Claims priority, application Japan, Sep. 9, 1991, 3-227843

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—87 **9 Claims**



1. An office equipment apparatus having an arrangement facilitating, in response to a change in an operational state of said apparatus, observation of internal mechanisms of said apparatus without mechanically opening a housing of said apparatus, said apparatus comprising:

a planar liquid crystal shutter disposed at at least a portion of a surface of said housing of said apparatus, said shutter being set to a transparent state or a non-transparent state depending on an input signal supplied thereto; and

a control means for applying to said shutter a control signal controlling said transparent or non-transparent state of said shutter;

wherein said shutter is disposed at a position on said surface of said housing so that, when said shutter is set to a transparent state, said internal mechanisms of said apparatus within said housing thereof are externally observable through said shutter, and

said control means applies to said shutter, at an occurrence of an abnormality related to said internal mechanisms, a control signal for setting said shutter to said transparent state so that said internal mechanisms can be observed.

5,592,190

LIQUID CRYSTAL DISPLAY APPARATUS AND DRIVE METHOD

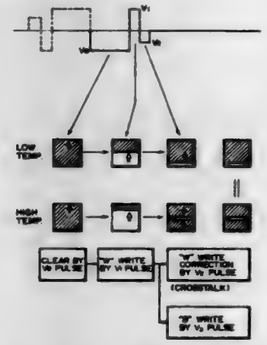
Shinjiro Okada, Isehara; Shuzo Kaneko, Yokohama; Yutaka Inaba, Kawaguchi; Katsuhiko Shinjo, Isehara; Hirokatsu Miyata, Yokohama, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,818

Claims priority, application Japan, Apr. 28, 1993, 5-123233; May 21, 1993, 5-141268

Int. Cl.[6] G02F *1/133*

U.S. Cl. 345—89 **5 Claims**



2. A driving method for a liquid crystal device of a type comprising a pair of oppositely disposed electrode plates having thereon a group of scanning lines and a group of data lines, respectively, and a chiral smectic liquid crystal disposed between the pair of electrode plates so as to form a pixel at each intersection of the scanning lines and data lines, said driving method comprising the steps of:

in a selection period for an N-th selected scanning line, to a first pixel at an intersection of the N-th selected scanning line and a prescribed data line, applying a first reset pulse for resetting the first pixel to its brightest or darkest state, then a first writing pulse and then a first correction pulse; and

in a selection period for an N+1-th selected scanning line, to a second pixel at an intersection of the N+1-th selected scanning line and the prescribed data line, applying a second reset pulse for resetting the second pixel to its darkest or brightest state, then a second writing pulse and then a second correction pulse, wherein:

(a) the first writing pulse is set corresponding to gradation data to be displayed at the first pixel on the N-th selected scanning line,

(b) the first correction pulse is set corresponding to gradation data to be displayed at the second pixel on the N+1-th selected scanning line,

(c) the second writing pulse is set corresponding to gradation data to be displayed at the second pixel on the N+1-th selected scanning line,

(d) the second correction pulse is set corresponding to gradation data to be displayed at a third pixel at an intersection of an N+2-th selected scanning line and the prescribed data line, and

(e) the selection periods for the N-th and N+1-th selected scanning lines do not overlap each other.

5,592,191

DISPLAY APPARATUS

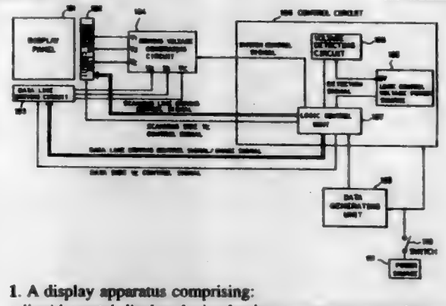
Akira Tsuboyama, Sagamihara; Katsuhiro Miyamoto, Hiratsuka; Atsushi Mizutome, Fujisawa; Hideo Kanno, Machida; Hiroshi Inoue, Yokohama, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 603,375, Oct. 26, 1990, abandoned. This application Apr. 29, 1993, Ser. No. 53,304

Claims priority, application Japan, Oct. 27, 1989, 1-280318; Apr. 17, 1990, 2-100768

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—97 **12 Claims**



1. A display apparatus comprising:

a liquid crystal display device having a memory property comprising a plurality of picture elements, each picture element including a liquid crystal material disposed between a respective pair of electrodes;

detecting means for detecting whether a predetermined power level is being applied to said display apparatus;

erasing means for applying a non-zero erasing signal to said liquid crystal device for erasing display contents of said picture elements; and

setting means for setting all of the pairs of electrodes corresponding to the picture elements to a substantially same electric potential,

wherein said setting means sets all the pairs of electrodes to the substantially same electric potential before said erasing means applies the erasing signal, in accordance with a detection of said detecting means.

5,592,192

METHOD OF DRIVING OPTICAL MODULATION DEVICE

Junichiro Kanbe; Kazuharu Katagiri, both of Yokohama, and Syuzo Kaneko, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 139,162, Dec. 21, 1987, Pat. No. 5,448,383, which is a continuation of Ser. No. 7,408, Jan. 27, 1987, abandoned, which is a continuation of Ser. No. 598,800, Apr. 10, 1984, Pat. No. 4,655,561. This application May 19, 1995, Ser. No. 444,746

Claims priority, application Japan, Apr. 19, 1983, 58-68659; Apr. 19, 1983, 58-68660; Jul. 30, 1983, 58-138707; Jul. 30, 1983, 58-138710; Aug. 4, 1983, 58-142954

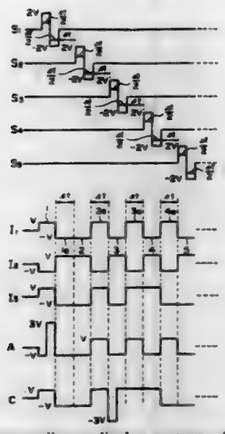
Int. Cl.[6] G09G *3/18*

U.S. Cl. 345—97 **11 Claims**

1. A liquid crystal apparatus, comprising: a liquid crystal device having a group of scanning electrodes arranged in a matrix with and spaced apart from a group of signal electrodes with a liquid crystal showing different stable states in accordance with different applied voltages and having a memory function disposed therebetween;

first drive means for selecting and sequentially driving the scanning electrodes by applying a scanning selection signal thereto;

second drive means for driving the signal electrodes by applying voltages comprising a writing voltage and a first non-writing



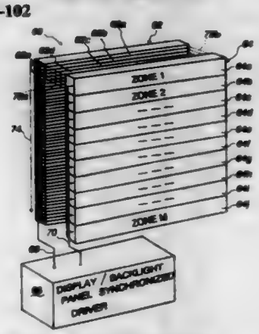
voltage corresponding to display contents of the display apparatus in synchronism with the application of the scanning selection signal; and

control means coupled to the first and second drive means, for controlling the first drive means so as to apply reset voltages to the respective pixels of the liquid crystal layer, whereby orientation of the liquid crystal's molecules is made uniform before the selection of the scanning electrode, wherein an amplitude of a writing voltage applied to an intersection of the selected scanning electrode and a selected signal electrode is two or more times that of a first non-writing voltage applied to an intersection of a nonselected scanning electrode and the selected signal electrode, said writing voltage and said first non-writing voltage being respectively determined with respect to a reference voltage determined as a difference between a voltage applied to a signal electrode receiving no data signal and a voltage applied to a non-selected scanning electrode.

5,592,193
BACKLIGHTING ARRANGEMENT FOR LCD DISPLAY PANEL

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taipei, Taiwan

Continuation of Ser. No. 289,297, Mar. 10, 1994, abandoned. This application Sep. 18, 1995, Ser. No. 529,345
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—102 **12 Claims**



1. A video display apparatus comprising:

a passive, generally planar color liquid crystal display panel having a plurality of linear, spaced, parallel arrays of video image elements, wherein said arrays of video image elements are vertically scanned in a sequential manner from a first edge of said display panel to a second, opposed edge of said display panel in providing a plurality of spaced, parallel portions of a video image in a sequential manner on said display panel, and wherein a complete scan of said video image elements defines a picture field;

a partitioned planar light panel disposed generally parallel to and spaced from an aft surface of said display panel and including a plurality of linear, elongated arrays of light sources aligned generally parallel to said arrays of video image elements for directing a white light beam on one or more adjacent arrays of video image elements at a given time; and

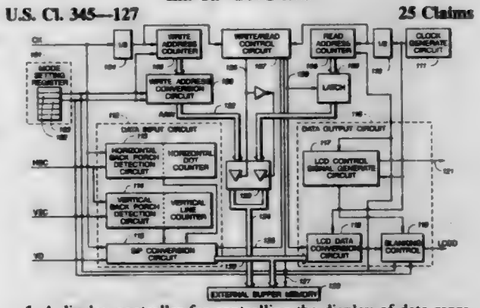
synchronizing drive means coupled to said display panel and to said light panel for actuating each of said light sources in a sequential manner synchronously with the vertical scanning of said arrays of video image elements for displacing said white light beam over said display panel in a scanning manner for illuminating only that portion of said display panel providing a portion of a video image at a given time, wherein all of said light sources are sequentially scanned within a picture field;

wherein said arrays of video image elements are greater in number than said arrays of light sources, and wherein each array of light sources directs a white light beam onto a plurality of adjacent, spaced arrays of video image elements, and wherein said arrays of video image elements are scanned in a continuous manner at a first constant scan rate and said arrays of light sources are scanned in a continuous manner at a second constant scan rate, and wherein said first scan rate is greater than said second scan rate, and wherein reduced light energy is used by directing a white light beam from a single array of light sources at a given time onto a plurality of video image elements in said display panel.

5,592,194
DISPLAY CONTROLLER

Fumitaka Nishikawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 289,963, Aug. 12, 1994, which is a continuation of Ser. No. 147,102, Nov. 3, 1993, abandoned, which is a continuation of Ser. No. 449,932, Mar. 11, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 461,613
Claims priority, application Japan, Apr. 27, 1988, 63-104831; Mar. 27, 1989, 1-74226
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—127 **25 Claims**



1. A display controller for controlling the display of data represented as H_d horizontal dots and V_d vertical dots and having a predetermined number of dots defining a predetermined resolution on a display unit, comprising:

first setting means for storing a predetermined maximum usable first display size for the display unit corresponding to a maximum number of horizontal and vertical display dots that can be physically displayed thereon;

second setting means for storing a second display size to be used for displaying data as a desired number of horizontal and vertical dots, said second size being less than the .predetermined maximum;

a buffer memory for storing image data to be displayed of said display unit;

a display counter having a count value that indicates display positions on said display unit;

control means responsive to said first and second setting means and said buffer memory, for generating blanking data and for selectively outputting to said display unit one of

(1) all of said display data in said buffer memory through application of address and read and write signals so as to display data covering said second display size in a desired display area of the display unit as defined by a relationship between the specified number of horizontal and vertical dots for said first and second display sizes relative to each other, said display data being displayed with the predetermined number of dots at the predetermined resolution,

(2) the blanking data in accordance with the count value for displaying of said blanking data in a display portion outside of the desired display area,

wherein said control means reads said display data from addresses in said buffer memory and comprises a read address counter configured to select addresses from which display data is read by said control means, and

wherein said display counter comprises a line counter configured for counting and indicating a number of lines on said display and setting a maximum number of lines to be counted from said first display size for said display unit,

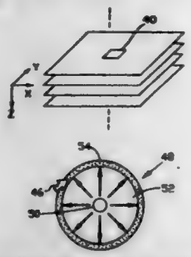
wherein said control means comprises blanking control means comprising means for generating a display enable signal during a period of time in which lines starting from a display start line of said desired display area and extending to a desired display end line are counted and indicated by the contents of said line counter; and

gate means for outputting said display data read from said buffer memory addresses designated by said read address counter, which sets a maximum count value based on said first display size to said display unit during the period said display enable signal is generated.

5,592,195
INFORMATION DISPLAYING DEVICE

Shinji Misono; Jung-Kook Hong, both of Tokyo, and Kazuo Iwano, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,979
Int. Cl.[6] G09G *1/06*
U.S. Cl. 345—146 **10 Claims**



1. An information displaying device comprising:

storing means for storing n-dimensional information, n being an integer greater than or equal to three;

display means for displaying an icon which is provided with a central region and a peripheral region surrounding said central region, and for displaying information, among the n-dimensional information stored in said storing means, corresponding to a given displayed region within a two-dimensional cross-section formed in two predetermined dimensions, and for displaying a cursor;

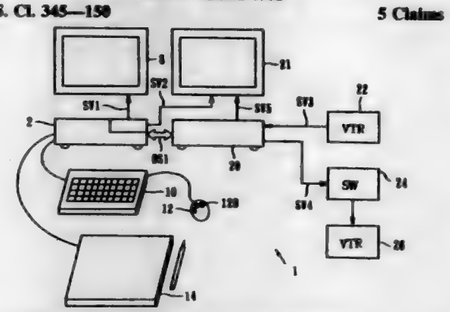
selecting means for positioning said cursor at a desired area of said icon and for selecting said desired area; and

control means for controlling said display means so that said displayed region changes within said two-dimensional cross-section in a direction determined by said central region of said icon and said selected area at a speed corresponding to a distance between said central region and said selected area when an area included in said peripheral region of said icon is selected by said selecting means, and for controlling said display means so that said displayed region changes in a direction of a third dimension other than said two predetermined dimensions and is positioned within another two-dimensional cross-section formed in said two predetermined dimensions when said central region of said icon is selected by said selecting means.

5,592,196
PICTURE DATA PROCESSING APPARATUS

Akira Nakamatsu, and Tomio Suzuki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 9,317, Jan. 26, 1993, abandoned. This application May 2, 1995, Ser. No. 432,686
Claims priority, application Japan, Jan. 29, 1992, 4-040156
Int. Cl.[6] G09G *5/02*
U.S. Cl. 345—150 **5 Claims**



1. A picture data processing apparatus comprising:

a frame memory for outputting color picture data and alpha data of a plurality of bits representing transparency of said color picture data;

picture data conversion means for converting said color picture data into predetermined conversion picture data, said picture data conversion means including a plurality of independently accessible look-up tables for a respective plurality of independent components of said color picture data, said tables each containing a plurality of pages of instructions for converting said color picture data into said predetermined conversion picture data and outputting said predetermined conversion picture data on the basis of a page corresponding to a page selection signal fed thereto; and

page switching means for outputting said page selection signal fed to said picture data conversion means on the basis of said alpha data;

said apparatus being capable of operation in an alternative mode wherein a predetermined number of most significant bits of said alpha data are employed to form a cursor.

5,592,197
DISPLAY-INTEGRATED TYPE TABLET DEVICE

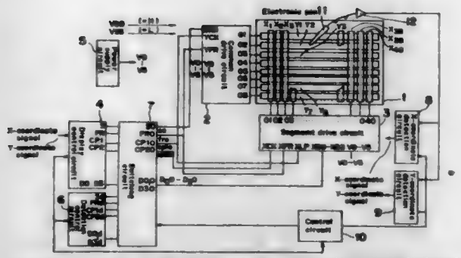
Takao Tagawa, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 849,733, Mar. 11, 1992, Pat. No. 5,357,266. This application Jul. 14, 1994, Ser. No. 275,116
Claims priority, application Japan, Mar. 12, 1991, 3-046751; Mar. 18, 1991, 3-052393; Apr. 9, 1991, 3-075415; Feb. 4, 1992, 4-019064
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—173 **6 Claims**

1. A display-integrated type tablet device comprising:

a display panel having a plurality of first electrodes arrayed in parallel to one another and a plurality of second electrodes arrayed in parallel to one another in a direction other than the direction in which the first electrodes are arrayed;

an electronic pen having at its tip an electrode electrostatically coupled with the first electrodes and the second electrodes of the display panel;



a display control circuit for producing a display control signal and display data for displaying an image to the plurality of first electrodes and the plurality of second electrodes of the display panel;

a detection control circuit for producing a detection-scanning control signal for scanning the first electrodes and the second electrodes to detect coordinates of the tip of the electronic pen on the display panel;

a switching circuit for switchedly selecting a side of the display control circuit for a display period to produce the display control signal and display data from the display control circuit and for switchedly selecting a side of the detection control circuit for a coordinate detection period to produce the detection-scanning control signal from the detection control circuit, under control of a control circuit;

a second-electrode drive circuit for generating a second-electrode drive signal during the display period to select among the second electrodes in turn according to the display control signal;

a first-electrode drive circuit for generating a first-electrode drive signal during the display period to display pixels relative to the second electrodes selected by the second-electrode drive signal according to the display control signal and display data and for generating a first electrode scan signal during the coordinate detection period to feed a scan voltage to the first electrodes in turn according to the detection-scanning control signal from the switching circuit; and

a coordinate detection circuit for receiving an input of induced voltage developed to the electrode of the electronic pen according to the first-electrode scan signal fed from the first-electrode drive circuit to the first electrodes, and then detecting coordinates of the tip of the electronic pen by a predetermined procedure on the basis of the induced voltage derived from the electronic pen to produce an x-coordinate signal, wherein the second-electrode drive circuit generates during the display period the second-electrode drive signal in which a coordinate detection signal including a predetermined non-direct current voltage component is superimposed onto a scan pulse, and

the coordinate detection circuit has an extraction means for separating the coordinate detection signal out of the induced voltage fed from the electronic pen, and based on the extracted coordinate detection signal, detects a y-coordinate of the tip of the electronic pen.

5,592,198

TERMINAL FOR MAN-MACHINE DIALOGUE WITH A COMPUTER SYSTEM USING PLURAL VIEWING ELEMENTS

P. Fagard, Montigny Le Bretonneux, and Isabelle Jahier, Paris, both of France, assignors to Sextant Avionique, Meudon La Foret, France

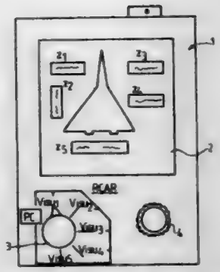
Continuation of Ser. No. 194,525, Feb. 10, 1994, abandoned. This application Mar. 3, 1995, Ser. No. 400,197

Claims priority, application France, Mar. 12, 1993, 93 02981

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **15 Claims**

1. A terminal enabling dialogue between an operator and a computer system having a processing unit and several viewing elements displaying respective images, said terminal comprising:



a means for selecting a viewing element from said viewing elements,

a touch-sensitive screen having a display screen covered by a transparent touch-sensitive surface limited to said terminal and separated from said viewing elements and an image displayed thereon,

said display screen of the terminal displaying an image representative of the image displayed on a selected viewing element, irrespective of format, resolution or content thereof,

the image displayed on said display screen of the terminal defining on said touch-sensitive surface, touch-sensitive command areas corresponding to display areas of the image displayed on said selected viewing element,

said operator being able to transmit a command to the system through manual action on a corresponding touch-sensitive command area of said touch-sensitive command areas a modification of the image displayed on the selected viewing element by a means for enabling transmission to said system of information corresponding to the area designated by said operator, and

a means enabling said modification to be made on the image displayed on said display screen of the terminal.

5,592,199

ASSEMBLY STRUCTURE OF A FLAT TYPE DEVICE INCLUDING A PANEL HAVING ELECTRODE TERMINALS DISPOSED ON A PERIPHERAL PORTION THEREOF AND METHOD FOR ASSEMBLING THE SAME

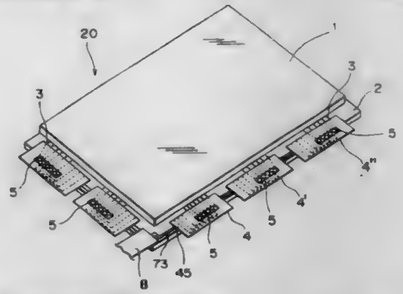
Hisao Kawaguchi; Shinichi Sugimoto, both of Nara, and Yasunobu Tagusa, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1994, Ser. No. 186,455

Claims priority, application Japan, Jan. 27, 1993, 5-011728; Feb. 8, 1993, 5-020295; Aug. 6, 1993, 5-196416

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—206 **5 Claims**



1. A panel assembly comprising:

a flat panel having a plurality of electrode terminals disposed along a peripheral portion of one surface;

an integrated circuit mounted on a flexible wiring board and electrically connected to said electrode terminals for driving the panel;

an insulating layer having a first and second surface, with said electrode terminals located on said first surface;

a circuit wiring extending along the peripheral portion for transferring an external signal to the panel, located on said second surface below said first surface so as to be insulated from said electrode terminals;

junction terminals spaced from each other in conducting contact with said circuit wiring, said junction terminals penetrating said insulating layer and having portions located on said first surface; and

said flexible wiring board including on one side input and output terminals leading to the integrated circuit;

wherein the one side of the flexible wiring board is overlaid on the peripheral portion of the panel so that the junction terminals and electrode terminals of the panel are electrically connected to the input and output terminals of the flexible wiring board, respectively.

5,592,200

INK JET APPARATUS CAPABLE OF PRACTICING AN IMPROVED RECOVERY OPERATION

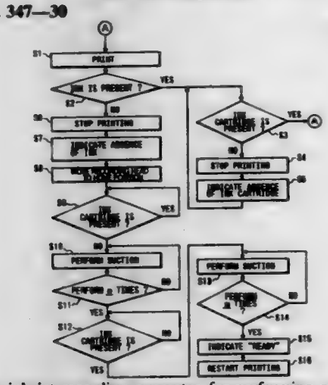
Mineo Kaneko, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1992, Ser. No. 955,018

Claims priority, application Japan, Oct. 3, 1991, 3-256542

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—30 **16 Claims**



1. An ink jet recording apparatus for performing recording by ejecting ink, said apparatus comprising:

a mounting section for accepting an exchangeable ink cartridge;

a head portion for forming desired images on a recording medium using ink introduced to said head portion from said ink cartridge through an ink passage on said mounting section, when said ink cartridge is in place on said mounting section; and

a suction recovery device for performing a suction recovery operation for said head portion to introduce air into said ink passage from said mounting section when said ink cartridge is not installed in said apparatus.

5,592,201

MANUAL PRIMING PUMP FOR INKJET PRINTING MECHANISMS

Swee K. Lim, Singapore, Singapore, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 28, 1994, Ser. No. 235,066

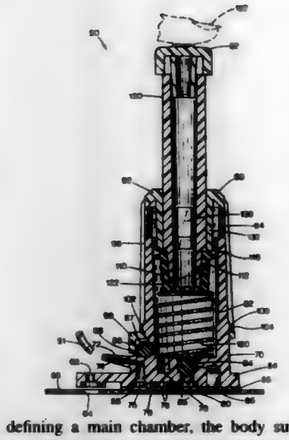
Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—30 **19 Claims**

1. A priming apparatus for priming an inkjet cartridge pen having a printhead, comprising:

a frame;

mounted to the frame, a pen support configured to support the pen;



a body defining a main chamber, the body supported by the frame to define an ink entrapment chamber therebetween, with the body also defining a series of baffles in the entrapment chamber;

an activation device slidably coupled to the body to draw a vacuum on the printhead when the priming apparatus is placed in fluid communication therewith to purge a mixture of ink and gaseous compounds accumulated in the printhead;

a first valve responsive to the activation device to selectively place the entrapment chamber in fluid communication with the main chamber; and

wherein the body defines the entrapment chamber in a configuration to receive said accumulated mixture upon operation of the activation device, with the baffles arranged to impede the flow of ink through the entrapment chamber and to allow the gaseous compounds to vent to atmosphere through the main chamber, and with each baffle having a surface to collect the ink thereon to extract ink from the purged mixture.

5,592,202

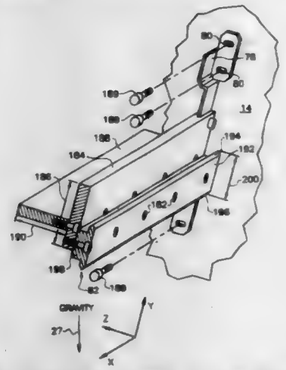
INK JET PRINT HEAD RAIL ASSEMBLY

Paul R. Erickson, Prior Lake, Minn., assignor to Laser Master Corporation, Eden Prairie, Minn.

Filed Nov. 10, 1994, Ser. No. 337,080

Int. Cl.[6] G01D *15/16*

U.S. Cl. 347—37 **17 Claims**



1. An ink jet printer for printing on a large format printing medium, the ink jet printer comprising:

a support housing;

a printing medium transport system which advances the printing medium in a y-direction, the printing medium transport system being carried by the support housing;

a rail structure having two ends with a rail running in an x-direction perpendicular to the y-direction and across the printing medium, the rail structure being supported at both ends by the support housing and disposed at an evenly spaced distance from the printing medium and removeably mounted at a first of said both ends so that said rail structure may be pivoted and tilted from its supported position while a second of said both ends is unsupported by the support housing;

a carriage supported entirely by the rail and moveable in the x-direction in excess of 17 inches and wherein the carriage is removeably coupled to the rail structure;

a carriage drive system to move the carriage in the x-direction and removeably coupled to the carriage; and

a print head assembly supported by the carriage adjacent the printing medium, wherein the print head assembly further comprises at least two discrete print head members each electrically coupled to an individual drive circuit.

5,592,203

INK JET PRINT HEAD

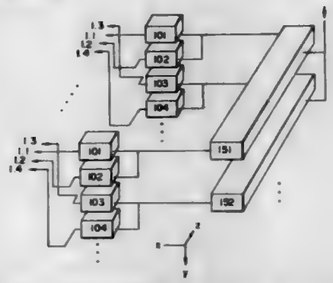
Wolfgang Thiel, and Stephan Günther, both of Berlin, Germany, assignors to Francotyp-Postalia GmbH, Birkenwerder, Germany

Filed Aug. 2, 1993, Ser. No. 101,449

Claims priority, application Germany, Jul. 31, 1992, 42 25 799.9

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—40 **11 Claims**



1. An ink jet print head of the edge-shooter type, comprising:

a first chamber-carrying member having a flat surface, at least one second chamber-carrying member having a flat surface, and at least one center member disposed between the flat surface of said first chamber-carrying member and said second chamber-carrying member; said first chamber-carrying member and said second chamber-carrying member each having a plurality of ink chambers formed in said flat surface thereof for receiving ink, said center member and said first chamber-carrying member forming a plurality of nozzles each communicating with a respective one of said ink chambers in said first chamber-carrying member and said second chamber-carrying member, and disposed in a face edge of the print head;

means for supplying ink to said ink cheers and means for ejecting ink from said ink chambers through said nozzles;

said nozzles forming a single nozzle row having k nozzle groups and extending in a first direction, said ink chambers defining k chamber groups each associated with a respective one of said k nozzle groups where $k \geq 2$;

said ink chambers formed in said first chamber-carrying member being a first chamber group and said ink chambers formed in said second chamber-carrying member being a second chamber group;

said nozzles extending and ejecting ink droplets in a second direction being substantially orthogonal to said first direction, said k chamber groups being disposed in a third direction relative to one another, said third direction being substantially orthogonal to said first and second direction, and further including additional second chamber-carrying members and at least one further center member disposed between respective ones of said additional second chamber-carrying members, all said chamber-carrying members and said center members together forming an ink jet print head module with only said first chamber-carrying member having said nozzles formed therein.

5,592,204

HOT MELT IMPULSE INK JET INK WITH DISPERSED SOLID PIGMENT IN A HOT MELT VEHICLE

An-Chang R. Lin, New Town, and Theodore M. Cooke, Danbury, both of Conn., assignors to DataProducts Corporation, Simi Valley, Calif.

Continuation of Ser. No. 520,960, May 4, 1990, abandoned, which is a continuation of Ser. No. 146,211, Jan. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 93,151, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 6,727, Jan. 23, 1987, abandoned, which is a continuation of Ser. No. 938,334, Dec. 4, 1986, abandoned, which is a continuation of Ser. No. 668,095, Nov. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 610,627, May 16, 1984, abandoned, which is a continuation of Ser. No. 394,153, Jul. 1, 1982, abandoned, which is a continuation of Ser. No. 565,124, Dec. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 507,918, Jun. 27, 1983, Pat. No. 4,484,948, which is a continuation of Ser. No. 331,604, Dec. 17, 1981, Pat. No. 4,390,369, which is a continuation of Ser. No. 644,542, Aug. 27, 1984, Pat. No. 4,659,383. This application Dec. 12, 1991, Ser. No. 809,105

Int. Cl.[6] B41J *2/17*

U.S. Cl. 347—88 **14 Claims**

1. A process for applying a thermoplastic composition to a substrate with a non-contact ink jet printing apparatus, the process comprising the steps of:

providing a relative movement between the substrate and the non-contact ink jet printing apparatus;

operating the non-contact ink jet printing apparatus to apply the composition to the moving substrate as a series of discrete droplets, the composition being applied at a temperature in excess of 100° C., the composition comprising a wax-based vehicle and being characterized as being thermally stable at the temperature of application and having a maximum viscosity of 35 centipoise at the temperature of application;

providing a reservoir as part of the non-contact ink jet printing apparatus;

holding the composition in the reservoir at a temperature so that the composition is maintained in the molten state;

feeding the composition from the reservoir to a series of nozzles for discharging the composition onto the substrate as a series of droplets; and

controlling the discharge of the composition from the nozzles by providing transducer means between the reservoir and the nozzles.

5,592,205

COLOR PRINT HEAD

Yukihiko Shimizu, and Hiroshi Watanabe, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Continuation of Ser. No. 953,818, Sep. 30, 1992, abandoned. This application Feb. 3, 1994, Ser. No. 191,280

Claims priority, application Japan, Sep. 30, 1991, 3-276234

Int. Cl.[6] G01D *15/14*; **H01J** *1/46*

U.S. Cl. 347—115 **1 Claim**

1. A color print head comprising:

a light permeable substrate;



a first plurality of strip-like anode conductors corresponding to a red color and arranged in parallel on the substrate, each of said strip-like conductors having through holes, wherein adjacent through holes on adjacent ones of said strip-like anode conductors are offset with respect to each other in a main scanning direction by one through hole;

a second plurality of strip-like anode conductors corresponding to a green color and arranged in parallel on the substrate, each of said strip-like conductors having through holes, wherein adjacent through holes on adjacent ones of said strip-like anode conductors are offset with respect to each other in a main scanning direction by one through hole;

a third plurality of strip-like anode conductors corresponding to a blue color and arranged in parallel on the substrate, each of said strip-like conductors having through holes, wherein adjacent through holes on adjacent ones of said strip-like anode conductors are offset with respect to each other in a main scanning direction by one through hole;

phosphorous material formed in each of the through holes, each formation of the phosphorous material in the through holes being of an identical material;

a plurality of cathode electrodes for emitting electrons to be received by said phosphorous material;

control electrodes formed between said cathode electrodes and said anode electrodes in a sub-scanning direction oblique to the direction of the main scanning direction and each of said control electrodes having slits, each of said slits being arranged above said through holes;

a red filter arranged above the first plurality of strip-like anodes;

a green filter arranged above the second plurality of strip-like anodes;

a blue filter arranged above the third plurality of strip-like anodes; and

wherein, the control electrodes are selectively charged to cause respective phosphorous material in the through holes to emit light which passes through a corresponding red, green or blue filter to produce a red, green, or blue beam of light.

5,592,206

WRITE HEAD FOR FLUORESCENT PRINTER

Hiroshi Watanabe; Masao Miyagishima, and Toshiaitsu Fuyuki, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

PCT No. PCT/JP92/01168, § 371 Date Sep. 27, 1993, § 102(e) Date Sep. 27, 1993, PCT Pub. No. WO93/04867, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 11, 1992, Ser. No. 50,238

Claims priority, application Japan, Sep. 11, 1991, 3-258732

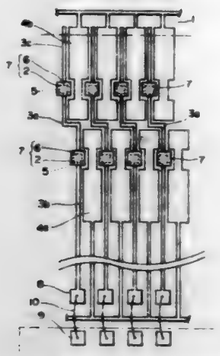
Int. Cl.[6] B41J *2/435*; **H04N** *1/23*

U.S. Cl. 347—122 **3 Claims**

1. A write head for a fluorescent printer comprising:

arrays of dot-like anodes including anode conductors and phosphor layers arranged on a substrate spaced from each other at a predetermined interval in a main scanning direction;

said anode arrays being juxtaposed in two rows extending in a sub-scanning direction, wherein each of said anode conductors of one of said rows corresponds to one of said anode conductors of another of said rows;



anodes of each of said arrays which correspond to each other being connected by one of a plurality of wiring conductors, resulting in a zigzag arrangement; and

said corresponding anodes being arranged offset from each other;

a plurality of control electrodes for each of said anode arrays arranged on said substrate;

wherein said anode conductors, wiring conductors, and control electrodes are all coplaner and are each made of a thin metal film; and

said control electrodes are formed of two electrically separate groups of electrodes, each of said groups extended to an intermediate portion of said arrays and surrounded by each of said anode conductors and wiring conductors of one of said anode arrays.

5,592,207

OPTICAL RECORDING APPARATUS

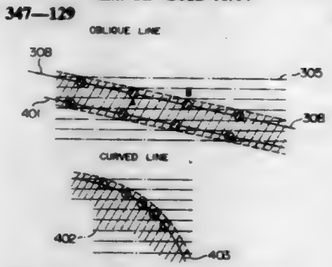
Shinya Kobayashi, Mito; Akira Arimoto, Hitachi; Hiroo Fujisaki, Hadano, and Susumu Saito, Mito, all of Japan, assignors to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Sep. 16, 1992, Ser. No. 945,799

Claims priority, application Japan, Sep. 20, 1991, 3-241870

Int. Cl.[6] G01D *15/14*

U.S. Cl. 347—129 **22 Claims**



1. An optical recording apparatus comprising:

a light source generating a laser beam;

control means for controlling scanning of said laser beam of an image to be recorded in a primary scanning direction and a subsidiary scanning direction;

recording means for recording input image information using said laser beam;

wherein said control means includes:

means for deriving an amount of displacement of a scanning line of said laser beam in said subsidiary scanning direction with respect to each pixel depending upon said image information; and

means for displacing said laser beam in accordance with said derived amount of displacement.

5,592,208

PRINTING METHOD AND A PRINTING APPARATUS FOR CARRYING OUT THE SAME

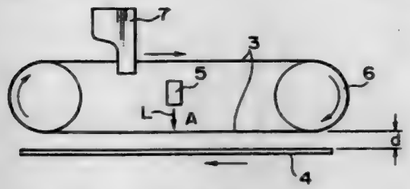
Kenji Shinozaki; Hideki Hirano; Koichi Kawasumi; Nobutoshi Arai, all of Kanagawa; Hideni Tomita, Tokyo; Shuji Sato, Kanagawa; Masanori Ogata, Saitama, and Hiroyuki Shiota, Chiba, all of Japan, assignees to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1994, Ser. No. 188,841

Claims priority, application Japan, Jan. 29, 1993, 5-034891; Apr. 23, 1993, 5-120924; Jul. 16, 1993, 5-199084

Int. Cl.[6] B41J *2/325;2/435*

U.S. Cl. 347—171 **7 Claims**



7. A printing method comprising the steps of:

providing a continuous printing medium including a substrate having a surface and a sublimable dye layer disposed on said surface;

providing a printing station having an associated print head capable of generating heat;

providing a recording medium at the printing station in spaced adjacent relation to said print head;

passing said printing medium through said printing station adjacent said print head so that said dye layer faces said recording medium and is spaced from the recording medium by a distance of from about 1 to about 100 μm;

using the printing medium to selectively heat dye in said dye layer to thereby transfer dye from the printing medium to the recording medium;

moving the printing medium so that a previously heated portion of the printing medium is outside of the printing station; and

thereafter, replenishing dye to said dye layer by passing a previously heated portion through a dye supply unit, contacting the dye layer of the previously heated portion with powdered dye and heating the printing medium opposite the dye layer to fuse the powdered dye to the previously heated dye layer, thereby replenishing the dye layer for continuous use.

5,592,209

DEVICE AND METHOD FOR DOT-MATRIX THERMAL RECORDING

Takanori Hasegawa, and Koichi Okuzawa, both of Tokyo-to, Japan, assignors to Riso Kagaku Corporation, Tokyo-to, Japan

Continuation-in-part of Ser. No. 218,706, Mar. 28, 1994. This application Mar. 8, 1995, Ser. No. 400,967

Claims priority, application Japan, Feb. 21, 1991, 3-027517

Int. Cl.[6] B41J *2/335*

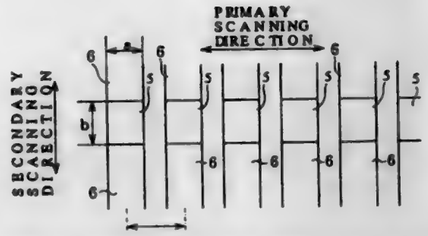
U.S. Cl. 347—206 **23 Claims**

1. A thermal recording device for forming an image with a dot matrix, comprising:

a thermal recording material;

a thermal head, including a plurality of heat emitting elements arranged in a single row at a first itch along a primary scanning direction;

thermal head applying means for applying said thermal head onto a surface of said thermal recording material in said primary scanning direction;



thermal recording material moving means for moving said thermal recording material relative to said thermal head in a secondary scanning direction perpendicular to said primary scanning direction; and

heating means for selectively heating said heat emitting elements in synchronism with a movement of said thermal recording material at second pitch in said secondary scanning direction; wherein,

a ratio of a first length of each of said heat emitting elements of said thermal head in said primary scanning direction to said first pitch is 30 to 70%, and a ratio of a second length of each of said heat emitting elements of said thermal head in said secondary scanning direction to said second pitch to 60 to 95%, and wherein,

a dot matrix pitch of an image formed on said thermal recording material is determined in said primary scanning direction by said first pitch of said heat emitting elements and in said secondary. direction by a heat emitting timing of said heat emitting elements relative to a movement of said thermal recording material in said secondary scanning direction.

5,592,210

METHOD AND APPARATUS FOR DRIVING EDGE EMISSION TYPE LINE HEAD

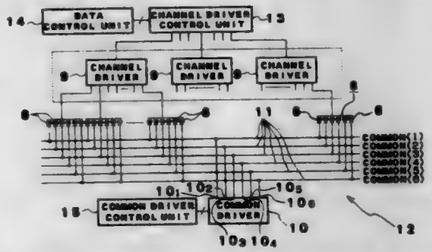
Kei Hara, and Shigeru Morino, both of Shizuoka, Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan

Filed Oct. 27, 1993, Ser. No. 141,637

Claims priority, application Japan, Oct. 27, 1992, 4-288410

Int. Cl.[6] B41J *2/447;2/47*

U.S. Cl. 347—237 **12 Claims**



1. An apparatus for driving an edge emission type line head having a plurality of edge emission electroluminescent EL elements grouped in blocks, each group of said edge emission type EL elements having a channel electrode connected to a channel driver and having a common electrode connected through a matrix circuit to common terminals of a common driver, said channel driver outputting voltages while said common driver outputs alternately a positive and a negative high voltage during operation of said line head, said apparatus comprising:

common pulse setting means for setting a plurality of pairs of a positive and a negative high voltage pulse as a respective plurality of units of voltage output from any one of said common terminals; and

common pulse stopping means responsive to an interruption of the operation of the edge emission line head while said edge emission line head is being driven for causing any one of said common terminals to output a single unit of voltage output

and then stopping the output of said common driver, whereby after said line head interruption only one of said units of voltage output is supplied to said common driver.

5,592,211

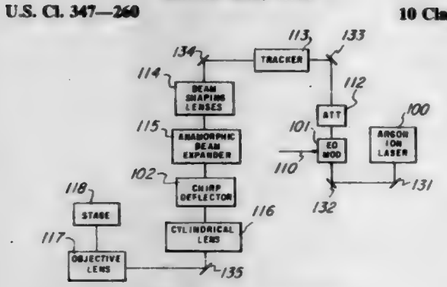
LASER PATTERN/INSPECTOR WITH A LINEARLY RAMPED CHIRP DEFLECTOR

Vernon R. Porter, Plano; William G. Manns, Dallas; Anthony B. Wood, Dallas; Jerry D. Merryman, Dallas; Don J. Weeks, South Lake; S. Charles Baber, Richardson, and Thomas C. Penn, both of Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 796,912, Nov. 22, 1991, abandoned, which is a continuation of Ser. No. 484,471, Feb. 23, 1990, abandoned, which is a continuation of Ser. No. 173,774, Mar. 25, 1988, abandoned. This application Feb. 28, 1995, Ser. No. 396,358

Int. Cl.[6] B41J *15/16*

U.S. Cl. 347—260 **10 Claims**



1. A laser pattern writing system, comprising:

a laser for producing a laser beam;

a modulator for modulating the laser beam;

a linearly ramped chirp deflector, having an aperture, for deflecting the modulated laser beam, in one direction only, causing the laser beam to sweep through an angle subtended by a strip of photosensitive target to be written to by the laser and to raster scan the photosensitive target; and

an acousto-optical tracker between said modulator and said ramped chirp deflector to direct the laser beam toward the chirp deflector, and for tracking the modulated laser beam and sweeping the beam through the angle subtended by the aperture of the chirp deflector.

5,592,212

METHODS AND SYSTEMS FOR NON-PROGRAM APPLICATIONS FOR SUBSCRIBER TELEVISION

Doron Handelman, Givataim, Israel, assignor to News Datacom Ltd., England

Continuation of Ser. No. 80,344, Jun. 21, 1994, Pat. No. 5,539,450. This application Jun. 7, 1995, Ser. No. 478,054

Claims priority, application Israel, Apr. 16, 1993, 105432

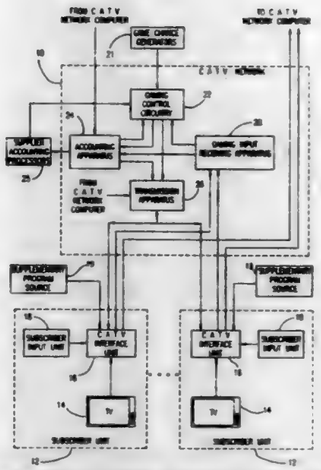
Int. Cl.[6] H04N *7/10*

U.S. Cl. 348—12 **49 Claims**

1. A subscriber unit in a pay television gaming system comprising:

a receiver for receiving separate accounting identification codes for pay television and for gaming associated with separate accounting data for pay television and for gaming from a pay television network transmitter;

a processor, coupled to said receiver, for matching a subscriber selection identified by an identification code to one of the separate accounting identification codes for pay television and for gaming, and to a portion of the separate accounting data associated with said one of the separate accounting identification codes for pay television and for gaming, and for performing monetary calculations on said portion of the separate



accounting data to generate processed accounting data associated with said subscriber selection; and

a transmitter for transmitting the processed accounting data associated with said subscriber selection and said one of the separate accounting identification codes for pay television and for gaming associated thereto.

5,592,213

RECEIVING UNIT FOR TWO-WAY BROADCASTING INCLUDING AUTOMATIC DISPLAY OF OPERATING STATE OF A TRANSMITTING SYSTEM

Hitoshi Yoshinobu, Kanagawa, and Junya Saito, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 393,978

Claims priority, application Japan, Mar. 1, 1994, 6-055300

Int. Cl.[6] H04N *7/16*

U.S. Cl. 348—13 **9 Claims**

		FUNCTIONS OF BUTTONS 34w1~34wb
TWO-WAY BUTTON	NON-RESPONSIVE MODE	CHANNEL SELECTION CONTROL FUNCTION FOR SELECTING THE CHANNEL PRESET IN EACH BUTTON
	RESPONSIVE MODE	FUNCTION AS THE 10-KEY

1. A receiving unit for two-way broadcasting comprising:

reception means for receiving a two-way broadcast program;

transmission means being selectable between an operative and responsive state or a nonoperative and nonresponsive state in response to a user initiated control signal for transmitting information of a reply to a multiple-choice question in a received two-way broadcast program to a specific destination;

control signal input means for receiving user initiated commands and for feeding the user initiated control signal to the transmission means;

video display means for selectively displaying the two-way broadcast program or a video program;

means for displaying the state of said transmission means on said video display means; and

discrimination means for discriminating whether said transmission means is in the nonoperative and nonresponsive state or the operative and responsive state, wherein

when said transmission means is decided to be in the responsive state by said discrimination means, the state of said transmission means being responsive is displayed on said video display means.

5,592,214

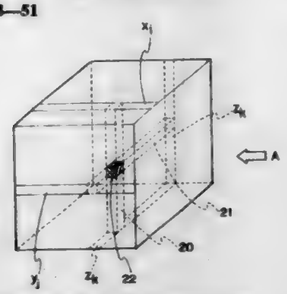
Patent Not Issued For This Number

5,592,215

STEREOSCOPIC PICTURE SYSTEM AND STEREOSCOPIC DISPLAY PANEL THEREFOR

Kaeko Kuga, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Division of Ser. No. 179,943, Jan. 11, 1994, abandoned. This application May 26, 1995, Ser. No. 451,435
Claims priority, application Japan, Feb. 3, 1993, 5-16493; Feb. 3, 1993, 5-16494; Feb. 3, 1993, 5-16496
Int. Cl.[6] H04N *13/04*
U.S. Cl. 348—51 2 Claims



1. A stereoscopic picture system comprising:
at least two cameras for identifying an image of a subject as electrical signals;
a control circuit for converting the electrical signals identified by the cameras into control signals corresponding to x coordinate, y coordinate and z coordinate of a three-dimensional space coordinate system;
a stereoscopic display panel having three-dimensionally arranged pixels for displaying a stereoscopic picture; and
a driver circuit for driving the stereoscopic display panel on the basis of the control signals corresponding to x coordinate, y coordinate and z coordinate which are fed from the control circuit, wherein said stereoscopic display panel is three-dimensionally formed by superposing a plurality of flat display panels, said three-dimensionally formed stereoscopic display panel including
a liquid crystal block having a rectangular parallelepiped shape or a cubic shape; and
stripe-like shaped electrode films provided on two opposite faces and on another two opposite faces, each stripe-like shaped electrode film intersect the one on the opposite face, and each two opposite faces intersect the other two opposite faces.

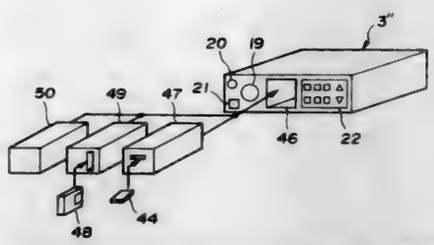
5,592,216

ENDOSCOPIC APPARATUS CAPABLE OF STORING IMAGE INFORMATION FOR A PLURALITY OF FRAMES

Masao Uehara, Hachioji; Katsuyuki Saito, Kokubunji; Akinobu Uchikubo, Ome; Takehiro Nakagawa, Hachioji; Masahiko Sasaki, Hachioji, and Shinji Yamashita, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 106,692, Aug. 16, 1993, abandoned, which is a continuation of Ser. No. 788,678, Nov. 6, 1991, abandoned. This application Aug. 22, 1994, Ser. No. 294,207
Claims priority, application Japan, Nov. 9, 1990, 2-305516
Int. Cl.[6] A61B *1/04*; H04N *7/18*
U.S. Cl. 348—74 19 Claims

1. An endoscopic apparatus, comprising:
image pickup means for picking up an optical image obtained by an imaging optical system in an endoscope;
illumination means including a light source for supplying illumination light to said endoscope; and
control means for controlling an image pickup signal output from said image pickup means, said control means including an analog-to-digital converter for converting said image pickup signal into digital image information,
wherein said control means further including memory means for digitally storing said digital image information for a plurality of images consisting of continuous multiple frames of said digital image information recorded in a predetermined time interval; and
wherein said memory means includes a plurality of detachable memory-type adaptor devices, each said memory-type adaptor device being insertable into a single common receptacle in said control means, said memory-type adaptor devices being adapted to house memory devices having different formats, respectively.

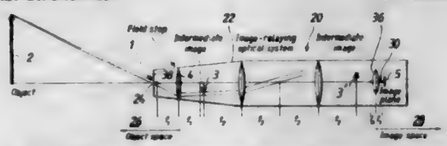


5,592,217

ASSEMBLY FOR COMBUSTION CHAMBER MONITORING CAMERA

Juhani Hirvonen, Helsinki; Pekka Kobola, Espoo; Kari Ikonen, Vantaa, and Matti Takala, Virkkala, all of Finland, assignors to Imatran Voima Oy, Helsinki, Finland

Filed Feb. 18, 1993, Ser. No. 19,634
Claims priority, application Finland, Feb. 25, 1992, 920826
Int. Cl.[6] H04N *7/18*; *5/225*
U.S. Cl. 348—83 12 Claims



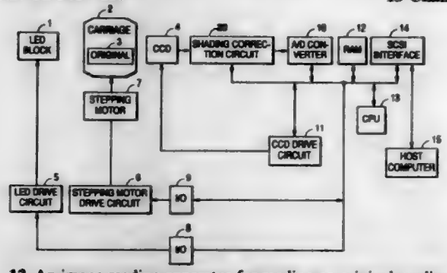
1. An assembly for a combustion chamber monitoring camera, said assembly comprising:
an image-forming optical system having an object space in a combustion chamber and having an image plane coincident with a photosensitive element of the camera, and having a focal point on the object space side situated outside the optical system;
a structure enclosing the optical system;
a solid baffle plate on the object space side of the optical system having a hole therein, the hole is concentrical with a center axis of the optical system and is situated at the focal point of the optical system on the object space side; and
a channel in said structure enclosing the optical system for feeding purging air, the channel being formed between the optical system and the enclosing structure and feeding air via said hole into the combustion chamber.

5,592,218

IMAGE READING APPARATUS HAVING IMPROVED SHADING CORRECTION AND QUANTITY OF LIGHT RATIO MEASUREMENT

Toru Ochiai, Matsudo; Hidehisa Tsuchihashi, and Soichi Ueta, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 201,123, Feb. 24, 1994, abandoned. This application May 25, 1995, Ser. No. 450,575
Claims priority, application Japan, Feb. 24, 1993, 5-033804
Int. Cl.[6] H04N *5/253*
U.S. Cl. 348—110 13 Claims



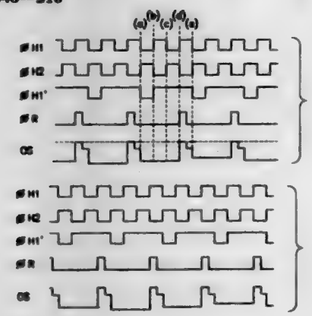
12. An image reading apparatus for reading an original medium, comprising:
a light emission unit emitting colors of light;
a photoelectric conversion unit receiving the light emitted by said light emission unit and producing image signals corresponding to the received light, the light emitted from said light emission unit travelling along a light transmission path from said light emission unit to said photoelectric conversion unit;
a positioning unit for positioning an original medium in the light transmission path; and
a shading correction mechanism determining respective shading correction coefficients of each color of light emitted by the light emission unit immediately before an original medium is positioned in the light transmission path by said positioning unit.

5,592,219

METHOD OF READING OUT SIGNALS FOR A SOLID-STATE IMAGING DEVICE

Tadashi Nakagawa, Naberi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 103,734, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 832,852, Feb. 7, 1992, abandoned. This application May 11, 1995, Ser. No. 439,445
Claims priority, application Japan, Feb. 8, 1991, 3-017491
Int. Cl.[6] H04N *5/225*; *5/335*
U.S. Cl. 348—216 15 Claims



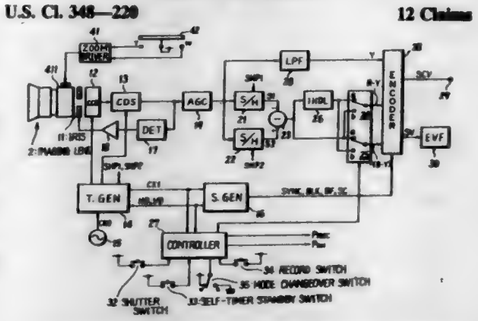
1. A method of reading out signals for a solid-state imaging device comprising
photoelectric conversion means,
a plurality of vertical transfer sections, and
a horizontal transfer section,
said photoelectric conversion means having a plurality of pixels arranged in an array of rows and columns, each of said pixels converting light to signal charges, said plurality of vertical transfer sections receiving said signal charges and transferring said signal charges to an output of said device through said horizontal transfer section, the method comprising the step of
synchronizing timing of a reset clock signal, for resetting said charges, wherein the resetting is performed only one time during at least two clock cycles of each of a plurality of horizontal CCD clock signals for horizontally transferring said signal charges to said output so that substantially all signal charges generated in at least two horizontally adjacent ones of said pixels, are combined in an end portion of said horizontal transfer section and are output at said output in a combined form.

5,592,220

CAMERA APPARATUS HAVING A SELF-TIMER FUNCTION

Satoshi Ishii, Kita-adachi-gun, and Haruo Saitoh, Kuki, both of Japan, assignors to AIWA Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 308,866, Sep. 2, 1994, abandoned, which is a continuation of Ser. No. 932,872, Aug. 20, 1992, abandoned. This application Feb. 14, 1995, Ser. No. 390,802
Claims priority, application Japan, Aug. 30, 1991, 3-219748; Sep. 26, 1991, 3-247786; Mar. 24, 1992, 4-66357; Mar. 24, 1992, 4-66358; May 26, 1992, 4-133994; Jun. 30, 1992, 4-173445
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—220 12 Claims



1. A camera apparatus having a self-timer function, comprising:
a video camera unit operable for capturing a dynamic image and providing a video signal;
a still camera operable for capturing still images upon receiving a shutter pulse, the still camera being operable during operation of the video camera unit;
frequency divider means for frequency dividing a vertical synchronizing component of said video signal; and
timer means for providing a shutter pulse for actuating a shutter of said still camera, said shutter pulse having a timing duration corresponding to an output signal of the frequency divider means.

5,592,221

PHOTOGRAPHIC CAMERA WITH ROTATABLE FILTER ASSEMBLY HAVING INTERCHANGEABLE FILTER DISKS AND CHARGE-COUPLED SURFACE SENSOR

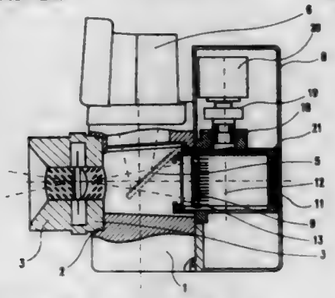
Bodo Mielke, Fümmelse, Germany, assignor to Rollei Fototechnic GmbH, Braunschweig, Germany

Filed Jun. 16, 1995, Ser. No. 491,218

Claims priority, application Germany, Jul. 5, 1994, 44 23 425.2

Int. Cl.[6] H04N 9/083

U.S. Cl. 348—270 20 Claims



1. A photographic camera, comprising:
a camera body having first and second sides;
a lens positioned on said first side of said camera body;
a back part selectively connectable to said second side of said camera body, said back part having a back part window positioned in a rear image field opening of said camera body;
a filter system positioned within said back part having a filter disk carrier rotatable around a central rotational axis, on said filter disk carrier a plurality of filter disks are disposed, staggered circumferentially and rotationally symmetrically with respect to said central rotational axis; each filter disk being disposed in a plane parallel to said central rotational axis; and
a charge-coupled device surface sensor mounted in said back part at a position where said charge-coupled device surface sensor is aligned with said lens, said rear image field opening and said back part window and is surrounded by said filter disk carrier whereby rotating said filter disk carrier causes individual filter disks to emerge in succession in front of said charge-coupled device surface sensor.

5,592,222

SENSOR CHIP AND PHOTO-ELECTRIC CONVERSION APPARATUS USING THE SAME

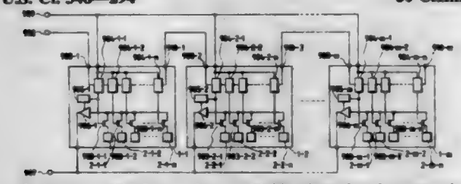
Kenichi Nakamura, Isehara, and Yoshio Keide, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 150,246, Nov. 9, 1993, abandoned, which is a continuation of Ser. No. 994,446, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 856,847, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 476,767, Feb. 8, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 465,189

Claims priority, application Japan, Feb. 10, 1989, 1-30015; Feb. 10, 1989, 1-30016; Feb. 10, 1989, 1-30018

Int. Cl.[6] H04N 3/14;5/335

U.S. Cl. 348—294 60 Claims



1. A sensor chip for use in a multichip photoelectric conversion apparatus having a plurality of sensor chips disposed in an array, said chip comprising:
a plurality of light-receiving elements;
an output signal line common to the plurality of light receiving elements for outputting a signal from the plurality of light-receiving elements of the sensor chip to outside of the sensor chip;
an amplifier coupled to said plurality of light receiving elements;
a first switch provided between said output signal line and an output of said amplifier, for electrically switching said output signal line, said first switch being provided at a final stage of the chip; and
a control circuit outputting a signal for closing said first switch for a first duration for outputting the signal from the light-receiving elements to the outside of the sensor chip, and for opening said first switch for a second duration other than the first duration, said control circuit comprising a shift register for outputting the signal from the light-receiving elements continuously and selectively.

5,592,223

CHARGE-COUPLED DEVICE HAVING ON-CHIP LENS

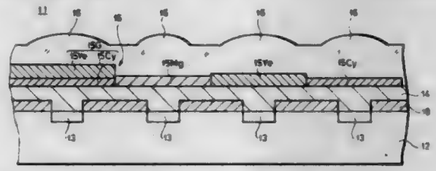
Yoji Takamura, and Hiroki Endo, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 149,945, Nov. 10, 1993, abandoned. This application May 12, 1995, Ser. No. 440,213

Claims priority, application Japan, Nov. 11, 1992, 4-301204

Int. Cl.[6] H04N 3/14;5/335;5/225;9/083

U.S. Cl. 348—309 19 Claims



1. A solid-state imaging device, comprising:
a plurality of light sensitive portions formed on a semiconductor substrate;
a plurality of color filter layers formed above said respective light sensitive portions; and
a plurality of lenses formed above said respective color filter layers, wherein diameters of said lenses in light receiving area are made different from one another in accordance with thicknesses of said color filter layers.

5,592,224

DEVICE FOR ROTATING LIQUID CRYSTAL DISPLAY COUPLED TO CAMCORDER

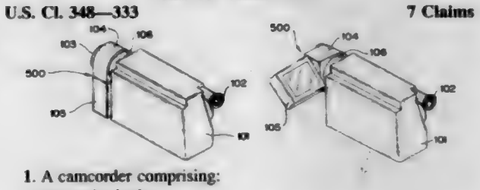
Kwan Bo Shim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Apr. 12, 1995, Ser. No. 420,559

Claims priority, application Rep. of Korea, Apr. 14, 1994, 7824/1994

Int. Cl.[6] H04N 5/225

U.S. Cl. 348—333 7 Claims



1. A camcorder comprising:
a camcorder body;
a lens barrel longitudinally extending through an upper portion of an interior of the camcorder body, the lens barrel having a plurality of lenses;
an outer lens mounted to one end of the lens barrel;
a cylindrical slip ring fitted around an outer surface of the lens barrel;
a rotating body fitted around the end portion of the lens barrel surrounded by the slip ring between the outer lens and the camcorder body such that it can rotate about the lens barrel;
a rectangular liquid crystal display coupled to the rotating body, the liquid crystal display having the same width and thickness as those of the rotating body; and
liquid crystal display rotating means for rotating the liquid crystal display with respect to the rotating body.

5,592,225

DEVICE AND METHOD FOR CONTROLLING CODING

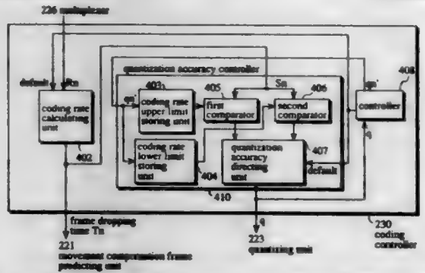
Akio Kurobe, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1994, Ser. No. 314,334

Claims priority, application Japan, Sep. 30, 1993, 5-244564; May 18, 1994, 6-104007

Int. Cl.[6] H04N 7/32

U.S. Cl. 348—405 16 Claims



1. A coding device for coding moving pictures to be transmitted by a transmission path of a preset transmission speed by setting a pair of a quantization accuracy and a coding rate appropriately, the quantization accuracy by which coding distortion to space domain is measured and the coding rate being a function of the quantization accuracy by which coding distortion to time domain due to frame dropping is measured so that an optimal balance of the coding distortion in a display picture to the time and space domains in visual terms is achieved, said coding device comprising:
a coding means for coding a moving picture signal according to input order;
a quantization accuracy holding means for holding a quantization accuracy with which a latest frame is coded;
a coding rate calculating means for calculating a coding rate for the latest frame which was coded;
an optimal coding rate upper limit storing means for storing a preset upper limit value on an optimal coding rate which corresponds to a preset quantization accuracy;
an optimal coding rate lower limit storing means for storing a preset lower limit value on an optimal coding rate which corresponds to a preset quantization accuracy;
a first comparing means for comparing a coding rate for the latest frame calculated by the coding rate calculating means with the upper limit value on an optimal coding rate which corresponds to the quantization accuracy held by the quantization accuracy holding means;
a second comparing means for comparing a coding rate for the latest frame calculated by the coding rate calculating means with the lower limit value on an optimal coding rate which corresponds to the quantization accuracy held by the quantization accuracy holding means;
a quantization accuracy storing means for storing a plurality of quantization accuracies which are set beforehand;
a quantization accuracy selecting means for selecting a quantization accuracy which is more accurate than the quantization accuracy with which the latest frame is coded when the coding rate for the latest frame is greater than the upper limit value on an optimal coding rate, for selecting a quantization accuracy which is less accurate than the quantization accuracy with which the latest frame is coded when the coding rate for the latest frame is smaller than the lower limit value on an optimal coding rate from the plurality of quantization accuracies stored in the quantization accuracy storing means, and for selecting the quantization accuracy with which the latest frame is coded when the coding rate for the latest frame is in a range between the lower limit value and the upper limit value, the range including both the lower limit value and the upper limit value; and
a coding control means for controlling the coding means to operate the next coding with the quantization accuracy selected by the quantization accuracy selecting means.

5,592,226

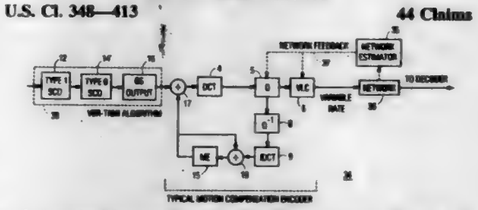
METHOD AND APPARATUS FOR VIDEO DATA COMPRESSION USING TEMPORALLY ADAPTIVE MOTION INTERPOLATION

Jungwoo Lee, Princeton, and Bradley W. Dickinson, Lawrenceville, both of N.J., assignors to BTG USA Inc., Gulph Mills, Pa.

Filed Jan. 26, 1994, Ser. No. 187,595

Int. Cl.[6] H04N 7/30;7/32

U.S. Cl. 348—413 44 Claims



1. A method for compressing video data comprising the steps of:
determining the degree of global motion between frames of video data, where global motion is the motion between frames as a whole;
assigning reference frames based upon the global motion;
adjusting the temporal spacing between reference frames relative to the degree of global motion measured between frames relative to temporal masking in human vision, thereby determining the group of pictures (GOP) structure;
establishing different threshold magnitudes or levels of motion between frames as representing different scene change types;
assigning different bit rates to individual frames based upon said pre-established threshold levels of motion between frames;
said threshold establishing step including the steps of designating a Type 1 scene change between a pair of successive frames as occurring whenever the measured motion therebetween exceeds a value defining a T_1 threshold representing a substantial scene or picture change; and
designating and defining pursuant to the value of measured motion defining a Type 1 scene change, the first occurring or prior frame of the pair as a P2 frame, and the second occurring or past frame as an I2 frame, each being of predetermined bit rates via said assigning step.

5,592,227

METHOD AND APPARATUS FOR COMPRESSING A DIGITAL SIGNAL USING VECTOR QUANTIZATION

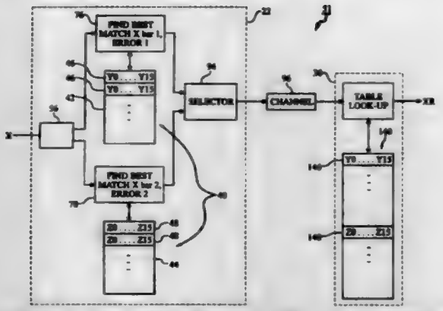
Yushu Feng, Elk Grove Village, Ill., assignor to VCOM, Inc., Stamford, Conn.

Filed Sep. 15, 1994, Ser. No. 306,713

Int. Cl.[6] H04N 7/28

U.S. Cl. 348—414 19 Claims

1. A method for compressing a digital signal to produce a compressed signal stream, comprising the steps of:



providing a first table of vectors having a first degree of intraframe signal correlation and a second table of vectors having a second degree of intraframe signal correlation, referred to as a class-1 table and a class-2 table respectively;

dividing said digital signal into a series of segments, each segment comprising a plurality of digital signal values;

determining a first vector Xbar1 for a selected segment having said first degree of intraframe signal correlation for the signal values in said selected segment;

determining a second vector Xbar2 for said selected segment having said second degree of intraframe signal correlation for the signal values in said selected segment;

finding an entry in said class-1 table that is a best match for said vector Xbar1, referred to as a class-1 best match entry;

finding an entry in said class-2 table that is a best match for said vector Xbar2, referred to as a class-2 best match entry;

inserting into said compressed signal stream an identifying code, said identifying code representing a selected one of said class-1 best match entry or said class-2 best match entry.

5,592,228

VIDEO ENCODER USING GLOBAL MOTION ESTIMATION AND POLYGONAL PATCH MOTION ESTIMATION

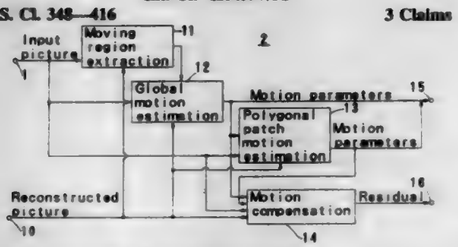
Kenshi Dachiku; Shogo Yamaguchi; Kazuo Ozeki; Katsumi Takahashi; Mitsunori Omokawa, and Takaaki Kuratate, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 2, 1994, Ser. No. 205,028

Claims priority, application Japan, Mar. 4, 1993, 5-043655; Aug. 23, 1993, 5-207359; Sep. 28, 1993, 5-240940; Dec. 27, 1993, 5-332856

Int. Cl.[6] H04N 7/32

U.S. Cl. 348—416 **3 Claims**



1. A video encoding apparatus comprising:

a moving region analyzing means for extracting a moving region from an input video signal, analyzing its motion and outputting a residual signal relative to a reconstructed two-dimensional picture and motion parameters;

a residual coding means for encoding said residual signal from said moving region analyzing means to form encoded residual data;

a reconstruction means for creating the reconstructed picture using said motion parameters from said moving region analyzing means and said encoded residual data from said residual coding means; and

a variable length coding means for performing a variable length coding of said motion parameters from said moving region analyzing means and said encoded residual data from said residual coding means;

wherein said moving region analyzing means comprises:

a global motion estimating means for estimating global motion parameters of the moving region;

a polygonal patch motion estimating means for estimating polygonal patch motion parameters for local motions within the moving region by applying polygonal patches to the moving region using the global motion parameters estimated by said global motion estimating means; and

a motion compensating means for performing a motion compensation of the reconstructed picture using the global motion parameters estimated by said global motion estimating means and the polygonal patch motion parameters estimated by said polygonal patch motion estimating means.

5,592,229

VIDEO SIGNAL INTERFRAME PREDICTIVE CODING APPARATUS USING MOTION DETECTION

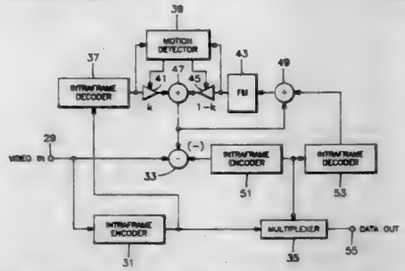
Kenji Sugiyama, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 969,770, Oct. 30, 1992, abandoned. This application May 30, 1995, Ser. No. 453,345

Claims priority, application Japan, Oct. 31, 1991, 3-313609

Int. Cl.[6] H04N 7/32

U.S. Cl. 348—416 **8 Claims**



7. An apparatus for coding a video signal, comprising:

first coding means for coding a video signal of a present frame/field to be coded to obtain a coded video signal;

first decoding means for decoding the coded video signal to obtain a decoded video signal;

first addition means for adding the decoded video signal of the present frame/field and a local video signal reproduced least one frame/field prior to the present frame/field to temporal addition video signal;

subtraction means for subtracting the temporal addition video signal from the video signal of the present frame/field coded to obtain a predictive error signal;

second coding means for coding the predictive error signal to obtain a coded predictive error signal;

second decoding means for decoding the coded predictive error signal to obtain a decoded predictive error signal;

second addition means for adding the decoding predictive error signal and the temporal addition video signal to obtain reproduced local video signal of the present frame/field; and

adjusting means for adjusting the addition conducted by the first means according to a conformance of the decoded video signal present frame/field with the local video signal reproduced at one frame/field prior to the present frame/field.

5,592,230

HIGH DEFINITION TELEVISION RECEIVER

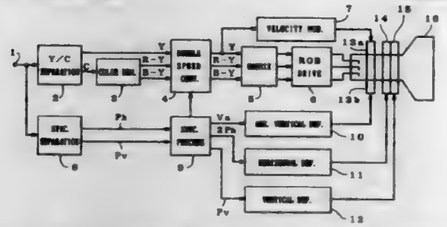
Akio Yoshino, Noda, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa-ken, Japan

Filed Nov. 21, 1995, Ser. No. 561,383

Claims priority, application Japan, Nov. 22, 1994, 6-312594

Int. Cl.[6] H04N 7/01

U.S. Cl. 348—448 **2 Claims**



1. A HDTV receiver for displaying an image of a current standard color television signal and an image of an HDTV signal having a horizontal deflection frequency about twice that of the current standard color television signal on a screen of a cathode ray tube having a pair of velocity modulation coils mounted on a bobbin arranged in a vertical deflecting direction of an electron beam of said cathode ray tube, comprising:

a horizontal deflection circuit for horizontally deflecting said electron beam at a frequency substantially twice a horizontal sync signal separated from the current standard color television signal during a reproduction of the current standard color television signal;

a double speed conversion circuit for time-compressing an input current standard color television signal to ½ during the reproduction of the current standard color television signal and supplying a signal of two scanning lines having a same content as that of a signal of one line prior to the time-compression to said cathode ray tube; and

an auxiliary vertical deflection circuit for driving a pair of auxiliary vertical deflection coils at a line frequency of said current standard color television signal for controlling a vertical deflection of said electron beam such that said two scanning lines having the same content are superposed on each other to appear as one scanning line during the reproduction of the current standard color television signal, said pair of auxiliary vertical deflection coils being laid out in substantially a horizontal direction of said electron beam in a space of said bobbin.

5,592,231

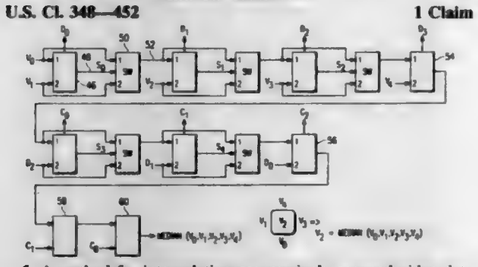
MOTION ADAPTIVE SCAN-RATE CONVERSION USING DIRECTIONAL EDGE INTERPOLATION

Todd Clatanoff; Vishal Markandey, both of Dallas; Robert J. Gove, and Kazuhiro Ohara, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 227,816, Apr. 14, 1994, Pat. No. 5,519,451. This application Jun. 7, 1995, Ser. No. 477,743

Int. Cl.[6] H04N 7/01

U.S. Cl. 348—452 **1 Claim**



1. A method for interpolating progressively scanned video data from interlaced video data fields comprising the steps of:

receiving said interlaced video data fields at a processor;

applying a fast median filtering method to said video data fields, comprising the steps of:

a. performing a series of extreme comparisons between pairs of data values, for a set of data samples:

b. updating a current most extreme value of said set of data as each one of said series of comparisons is performed;

c. comparing each data value of said set with the current extreme value, then storing the one closest to the opposite extreme from said current extreme value;

d. repeating said updating and said comparing steps until three said extreme values remain; and

e. finding a final most extreme value of said remaining values, wherein said final most extreme value is a median value;

further filtering said video field data using said median value both spatially and temporally, thereby producing an interpolated output; and

sending said interpolated output to a display device for display as progressively scanned video data.

5,592,232

Patent Not Issued For This Number

5,592,233

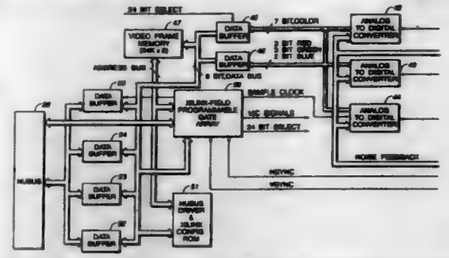
APPARATUS AND METHOD FOR VIDEO PIXEL DATA TRANSFER

Mark C. Koz, 731 Stanford Ave., Palo Alto, Calif. 94306

Division of Ser. No. 292,831, Aug. 19, 1994, Pat. No. 5,502,503, which is a division of Ser. No. 121,718, Sep. 14, 1993, Pat. No. 5,341,175, which is a division of Ser. No. 683,593, Apr. 9, 1991, Pat. No. 5,249,164, which is a continuation-in-part of Ser. No. 545,352, Jun. 27, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 484,298

Int. Cl.[6] H04N 9/00

U.S. Cl. 348—552 **48 Claims**



25. A video data transfer apparatus for assembling and rapidly transferring digital data words defining pixels of a video image to a bus of a cooperating computer which includes a display screen upon which the computer may display the video image received from said video data transfer apparatus; said video data transfer apparatus comprising:

a video memory which receives the digital data words of the video image and which stores the received digital data words;

a video data transfer controller which transmits a signal that informs the computer when digital data words of the video image are present in said video memory, and which subsequently receives from the computer a command to transfer, to the bus of the computer, digital data words of the video image; and

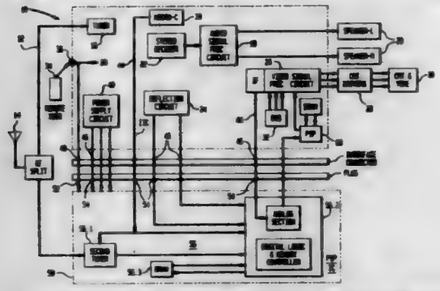
word buffers that operate in response to load signals received from the video data transfer controller for respectively receiving from said video memory and temporarily storing digital data words of the video image, and then the word buffers, in response to a transfer signal received from the video data transfer controller, transfer, to the bus of the computer, the digital data words of the video image, which is present in the word buffers.

5,592,234

INTERFACE SYSTEM FOR A TELEVISION RECEIVER

Timothy J. Gardner; Spyros Bournias, and Larry Johnson, all of Knoxville, Tenn., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,837
Int. Cl.[6] H04N 5/44
U.S. Cl. 348—553 6 Claims



1. An interface system for a television receiver, said television receiver comprising a tuner for receiving and selectively tuning to a television signal, a deflection circuit coupled to said tuner for generating deflection signals from synchronization signals contained in said television signal, an audio signal processing circuit coupled to said tuner for processing an audio signal contained in said television signal, a video signal processing circuit coupled to said tuner for processing a video signal contained in said television signal, a display coupled to said deflection circuit and said video signal processing circuit for displaying said video signal in dependence on said deflection signals, and a power supply circuit for supplying operating power to each of the above components, characterized in that said interface system comprises:

standard bus means having M leads separately connected to said audio signal processing circuit, said deflection circuit, said video signal processing circuit and said power supply circuit, where M is an integer greater than one;

connector means having M contacts connected, respectively, to said M leads in said standard bus means; and

circuit board means accessible by a user of said television receiver, said circuit board means having plug means connectable to said connector means, said plug means having N contacts corresponding, respectively, to at least some of the M contacts in said connector means, where N is an integer less than or equal to M, and circuit means connected to said N contacts in said plug means, said circuit means, when connected through said plug means, said connector means and said standard bus means to at least one of the audio signal processing circuit, the video signal processing circuit, the deflection circuit and the power supply circuit in the television receiver, modifies the operation of said at least one of the audio signal processing circuit, the video signal processing circuit, the deflection circuit and the power supply circuit in the television receiver, whereby additional features are provided for the user.

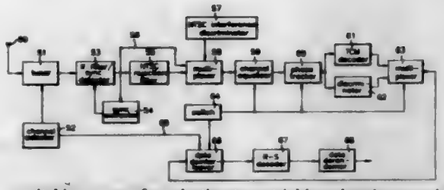
5,592,235

TERRESTRIAL/CABLE BROADCASTING SIGNAL RECEIVER FOR HDTV

Heebok Park, and Jong-Seok Park, both of Kyungki-do, Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

Filed Apr. 11, 1995, Ser. No. 420,199
Claims priority, application Rep. of Korea, Apr. 12, 1994, 7624/1994
Int. Cl.[6] H04N 5/46
U.S. Cl. 348—555 8 Claims

1. A terrestrial/cable broadcasting receiver for an HDTV for receiving both terrestrial and cable channel broadcastings of an HDTV comprising:



a switching means for selecting terrestrial broadcasting or cable broadcasting;

a channel equalizer for increasing the number of filter taps when said switching means selects terrestrial broadcasting and decreasing the number of filter taps when said switching means selects cable broadcasting;

a phase tracker for calculating a phase and error signal inputted from said channel equalizer with 8 VSB symbol level when said switching means selects terrestrial broadcasting and calculating a phase and error signal inputted from said channel equalizer with 16 VSB symbol level when said switching means selects cable broadcasting;

a TCM decoder for symbol-detecting and error-correcting a baseband signal of the terrestrial broadcasting for HDTV;

a discriminating means for symbol-detecting a baseband signal of the HDTV cable broadcasting; and

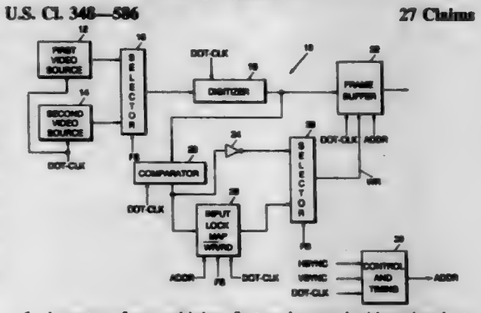
a multiplexer for selecting and outputting one of the signals output from said TCM decoder and said discriminating means according to said switching means.

5,592,236

METHOD AND APPARATUS FOR OVERLAYING TWO VIDEO SIGNALS USING AN INPUT-LOCK

Fred Rosenbaum, Austin, Tex., and Paul S. Yosim, Superior, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1995, Ser. No. 457,560
Int. Cl.[6] H04N 9/74
U.S. Cl. 348—586 27 Claims



1. A system for combining first and second video signals to produce a composite video signal for display comprising:

first video generator means for providing said first video signal for each of a first plurality of pixels,

second video generator means for providing said second video signal for each of a second plurality of pixels,

means for comparing each pixel of said first video signal with a preselected color and generating a logic signal for each one of said first plurality of pixels indicating whether each pixel matches said preselected color,

map means coupled to said comparing means for storing each of said logic signals when a field data is in a first state and for providing said logic signals on an output line thereof when said field data is in a second state,

means coupled to said comparing means and said map means for selectively providing (1) a complement of said logic signals from said comparing means to a frame buffer when said field data is in said first state and (2) said logic signals from said output line of said map means to said frame buffer when said field data is in said second state, and

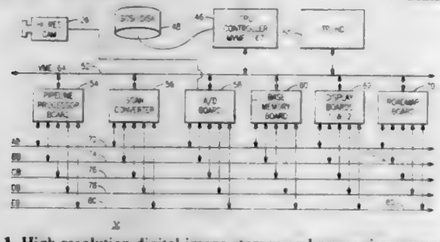
said frame buffer selectively coupled to said first or second video signal, said frame buffer being operative to store said composite video signal which is comprised of (1) a plurality of selected pixels from said first video signal which have corresponding logic signals that indicate they do not match the preselected color and (2) a plurality of selected pixels from said second video signal which have corresponding logic signals that indicate they correspond to pixel locations of the first video signal which matched the preselected color.

5,592,237

HIGH RESOLUTION IMAGE PROCESSOR WITH MULTIPLE BUS ARCHITECTURE

William C. Greenway, Tully; David Breithaupt, Dewitt; Donald W. Schoppe, Bridgeport; Norman M. Lutz, Liverpool; Andrew W. Beardslee, Baldwinsville; Minh N. Nguyen, Liverpool, and Timothy L. Stevener, Cicero, all of N.Y., assignors to InfiMed, Inc., Liverpool, N.Y.

Filed Nov. 4, 1994, Ser. No. 334,577
Int. Cl.[6] H04N 5/907;7/00
U.S. Cl. 348—716 9 Claims



1. High resolution digital image storage and processing arrangement for capturing, storing, enhancing and displaying a series of video images produced by a high resolution video imager that delivers image signals having a density of 2048 lines per frame and for furnishing said video image signals to a high resolution image display device, comprising:

a) A/D circuit means for converting said video image signals to a digital image signal as a sequence of digital bytes at a density of 2048 pixels per line of said video image signal;

b) display circuit means for providing said video image signal to said image display device including onboard memory means for temporarily storing at least one frame of said digital image signal, and buffering means for providing said video image signal to said display device at a frame rate independent of the frame rate of the digital image signal supplied to said display circuit means;

c) image processor circuit means including video memory means for storing at least one frame of said digital image signal and image enhancement means for creating an enhanced video image based on the digital image signal stored in said video memory means;

d) memory interface circuit means for writing frames of said digital image signal onto a bulk data storage medium and for reading frames of the digital image signal from said storage medium;

e) system controller means for generating control signals to control flow of said digital image signal between the A/D circuit means, said display circuit means, said image processor circuit means and said memory interface circuit means;

f) a user interface device permitting a user to select an operational mode, and means generating a control signal based on the operational mode selected;

g) a digital control bus coupled to said A/D circuit means, said display circuit means, said image processor circuit means, said memory interface circuit means, said system controller means and said user interface device for carrying control signals between said system controller means and said A/D circuit means, said display circuit means, said image processor circuit means, and said memory interface circuit means; and

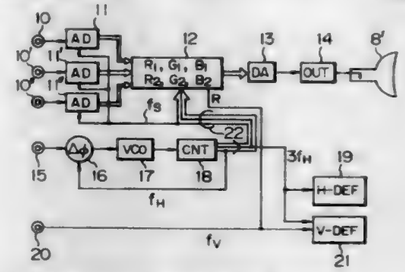
h) a plurality of parallel independently addressable data buses each of which is coupled to a respective data bus interface on each of said A/D circuit means, said display circuit means, said image processor circuit means, and said memory interface circuit means.

5,592,238

FIELD-SEQUENTIAL PROJECTION DISPLAY

Masanori Ogino, Yokohama; Tetsuo Asano, Mobara, and Yasuhiko Uehara, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1995, Ser. No. 453,415
Claims priority, application Japan, Oct. 27, 1994, 6-263437
Int. Cl.[6] H04N 5/14;9/31;9/14
U.S. Cl. 348—744 9 Claims



1. A single-tube type projection display comprising:

a screen;

three projection lenses;

a parallel-to-serial scan-conversion means; and

a vertically-arranged three-primary-color phosphor CRT, wherein said CRT has phosphor layers for three primary colors formed on upper, middle and lower portions of a faceplate thereof, the middle portion of the faceplate corresponding to a green phosphor having a longest after-glow duration among the three primary colors, wherein images of the three primary colors are projected field-sequentially on said phosphor layers with one electron, a green color image being displayed prior to images of other of the three primary colors, and wherein by overlapping said images of the three primary colors on said screen by said three projection lenses, a color picture can be formed on said screen.

5,592,239

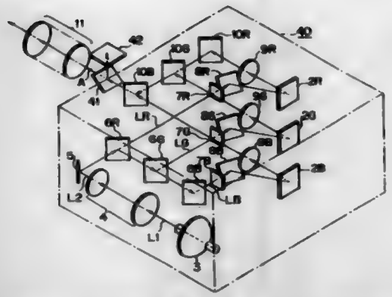
PROJECTOR DEVICE

Nobuyuki Hara, and Shigekatsu Tagami, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan, and Texas Instruments Corporation, Dallas, Tex.

Filed Jul. 13, 1994, Ser. No. 274,476
Claims priority, application Japan, Jul. 14, 1993, 5-197032
Int. Cl.[6] H04N 5/74
U.S. Cl. 348—771 4 Claims

1. A projector device for displaying desired images on an image displaying surface, by projecting illuminating light on at least two mirror deflection type light modulators each having a plurality of microscopic mirror elements arranged in accordance with image data pixels, said at least two mirror deflection type light modulators being modulated by said image data of at least two colors respectively, and effective reflection lights from said at least two mirror deflection type light modulators which correspond to said respective image data being synthesized, said projector device comprising;

relay lens means for focusing said effective reflection lights of said at least two mirror deflection type light modulators into



images at a focusing position in front of a projection lens having an aperture, the focused images being smaller than said aperture;

mirror means disposed in front of said focusing position for partly reflecting and turning said effective reflection light images;

two-dimensional position detecting means for detecting vertical and horizontal positions of the effective reflection light images turned by said mirror means;

adjusting means for finely displacing said at least two mirror deflection type light modulators in the vertical and horizontal directions; and

control means for controlling said adjusting means in accordance with detected output from said two-dimensional position detecting means, so as to finely displace said at least two mirror deflection type light modulators thereby controlling the positions of said effective reflection light images of said at least two mirror deflection type light modulators.

5,592,240

DIGITAL CONVERGENCE APPARATUS

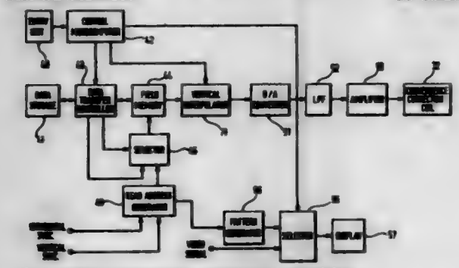
Tsutomu Sakamoto; Masanori Fujiwara; Yoshiji Tsuzuki, and Hiroyuki Mihara, all of Saitama-ken, Japan, assignors to Kabushiki Kaisha Rodaba, Kawasaki, Japan

Filed Jun. 22, 1995, Ser. No. 493,749

Claims priority, application Japan, Jun. 22, 1994, 6-140504

Int. Cl.[6] H04N *3/22;9/28*

U.S. Cl. 348—807 **16 Claims**



1. A digital convergence apparatus, comprising:

a first memory storing convergence correction data for plural correction executing points aligned in a horizontal or vertical direction on a screen;

a first static convergence compensation data memory storing a first static convergence compensation data for correcting the entire screen in the same direction;

a second static convergence compensation data memory for storing a second static convergence compensation data which is different from the first static convergence compensation data by an amount based on a distance between scanning lines;

selecting means for producing a selected output by selecting an output from the first or the second static convergence compensation data memory in response to an odd field period or an even field period;

adding means for generating an added output by adding output from the first memory and the selected output;

vertical interpolation means for generating interpolated output by interpolating the added output in the vertical direction; and

a convergence correction coil correcting convergence based on the interpolated output.

5,592,241

ATTACHABLE PROTECTIVE SCREEN FOR IMAGE DISPLAY DEVICE AND INSTALLATION METHOD THEREFOR

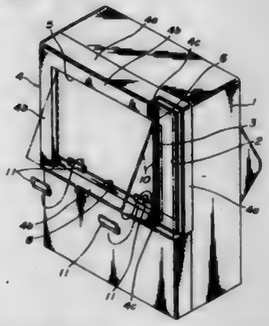
Tetsuya Kita, Kanagawa, and Makoto Koizumi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 419,944

Claims priority, application Japan, Apr. 18, 1994, 6-078256; Sep. 8, 1994, 6-214149

Int. Cl.[6] H04N *5/65*

U.S. Cl. 348—823 **8 Claims**



1. A method of installing a protector screen on an image display device, comprising the steps of:

installing a display screen in a wall portion of a housing;

attaching a screen frame to said housing so as to overlap peripheral edges of said display screen to define a frame opening bordering said display screen;

providing a base support portion on said image display device at a location corresponding to a lower edge of said screen frame so as to define a concave support groove along said lower edge of said screen frame;

upwardly inserting a protector screen, having a width dimension substantially equal to a width dimension of said frame opening and a vertical dimension greater than a vertical dimension of said frame opening into a clearance defined in an upper side of said screen frame, until a lower side of said protector screen is positioned above said base support portion; and

fitting said lower side of said protector screen into said concave support groove.

5,592,242

EYEGLASS CONNECTION DEVICE

Yuzuru Ooie, Higashi-Osaka, Japan, assignor to O.G.K. Hanbai Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/00849, § 371 Date Jun. 19, 1995, § 102(e) Date Jun. 19, 1995, PCT Pub. No. WO95/12139, PCT Pub. Date May 4, 1995

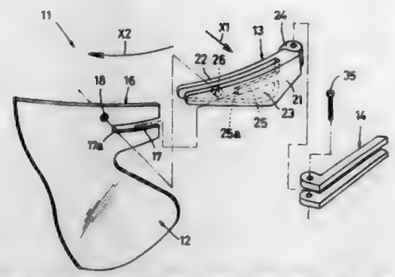
PCT Filed May 27, 1994, Ser. No. 454,312

Claims priority, application Japan, Oct. 29, 1993, 5-294838

Int. Cl.[6] G02C *7/10;1/08;1/04;1/02*

U.S. Cl. 351—44 **20 Claims**

1. Sunglasses comprising a lens of single-lens type made of a plastic resin, a pair of frames removably mounted on opposite



upper side edges of said lens, and a pair of temples pivotally supported by said pair of respective frames, wherein:

said lens has an engagement long nick having an open outer end at each of said upper side edges of the lens and extending substantially horizontally and inwardly from the upper side edge, and an engagement hole independent of said engagement long nick;

said pair of frames are each provided with a pair of holding pieces which hold therebetween one of the upper side edges of the lens and between which are provided a projection removably engaging said engagement hole, and an elongated protrusion removably inserted into said engagement long nick; and

said engagement long nick serves to guide said elongated protrusion substantially horizontally when the elongated protrusion is inserted into the engagement long nick.

5,592,243

SPECTACLE FRAME HAVING GEAR COUPLING

Richard Chao, No. 43-4, Yi-Hsin Tsuen, Shui San Hsiang, Chin Yi Hsien, Taiwan

Filed Nov. 9, 1995, Ser. No. 555,003

Int. Cl.[6] G02C *5/22;5/00*

U.S. Cl. 351—153 **2 Claims**



1. A spectacle frame comprising:

a frame body for supporting lenses therein, said frame body including two side portions each having an extension extended therefrom, said extensions each including a first and a second gears rotatably secured therein, said first gears being-engaged with said second gears respectively, said extensions each including a free end having a curved notch formed therein, said second gears being rotatably engaged in said free ends of said extensions, and

a pair of legs each including a first end secured to said second gears as to allow said legs to be rotated in concert with said second gears, said first ends of said legs each including a projection means extended therefrom for engaging with said curved notches and for limiting a rotational movement of said second gears and said legs.

5,592,244

HOLDING DEVICE FOR EYEGLASSES

Edwin D. Vyhmeister, 4085 NE. 160th St., Seattle, Wash. 98155

Filed Jan. 24, 1996, Ser. No. 590,544

Int. Cl.[6] G02C *1/00;* A47F *5/00*

U.S. Cl. 351—158 **23 Claims**



1. A holding device for eyeglasses, the eyeglasses having arms, nasal pads, and a bridge, comprising:

a first flange having a first upper portion;

a flexible retaining flange having a second upper portion, said second upper portion having a curved shape that extends toward said first flange, said first and second upper portions being spaced apart from each other, said second upper portion being movable relative to said first upper portion; and

a nasaloid support member between said first flange and said retaining flange, said nasaloid support member having first and second end portions and an intermediate portion between said first and second end portions, said nasaloid support member having side surfaces oriented to support the nasal pads when the eyeglasses are removably held in a retained position by said holding device, a portion of said second upper portion being above said intermediate portion of said nasaloid support member.

5,592,245

APPARATUS FOR ENHANCING VISUAL PERCEPTION OF SELECTED OBJECTS IN RECREATIONAL AND SPORTING ACTIVITIES

J. Paul Moore, 5500 W. 129th St., Overland Park, Kans. 66209, and David V. Kerns, Jr., 6626 Brookmont Ter., Nashville, Tenn. 37205

Filed Aug. 10, 1994, Ser. No. 288,449

Int. Cl.[6] G02C *7/10;* G02B *5/22*

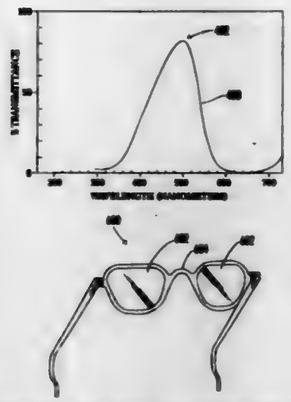
U.S. Cl. 351—163 **4 Claims**

1. A viewing apparatus for enhancing visualization of a predetermined target object against a background of other objects comprising:

a. lens means for transmitting a high percentage of light to each eye of a user over a spectrum of wavelengths within a visible light spectrum, to define a filter spectrum;

b. the lens means including optical filter means for attenuating light at wavelengths outside the filter spectrum such that the filter spectrum is broader than a target spectrum and narrower than the visible spectrum, and whereby the filter spectrum has upper and lower edges defined by wavelengths where light in the visible spectrum outside the upper and lower edges is substantially attenuated as compared to a center portion of the filter spectrum, the optical filter means having a color tint visible to the user;

c. the target spectrum comprising a spectrum of wavelengths of light which emanate from the target object to define a true color of the object, the target spectrum corresponding to a relatively narrow portion of the visible light spectrum of wavelengths, and wherein the target spectrum is further



defined by at least one target wavelength which corresponds to a point within the target spectrum of peak light intensity, with light intensity within the target spectrum both above and below the target wavelength being of decreased intensity compared to the target wavelength;

d. the optical filter means further attenuating light such that the target wavelength is within the filter spectrum and proximate either the upper or lower edge of the filter spectrum whereby the target object is perceived by the user as having its substantially true color and background objects are perceived as having a contrasting color which is substantially the same as the color tint of the optical filter means; and

e. support means for positioning the lens means between the user and the target object such that visual perception of the target object is enhanced concurrently in each eye of the user.

5,592,246

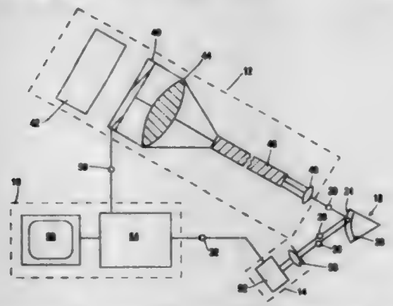
DEVICE AND METHOD FOR MAPPING OBJECTS

William P. Kuhn, Tucson, Ariz., and Phillip C. Baker, Orinda, Calif., assignors to KeraVision, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 200,241, Feb. 24, 1994, Pat. No. 5,475,452. This application May 12, 1995, Ser. No. 440,512

Int. Cl.[6] A61B *3/10;3/00*

U.S. Cl. 351—212 **8 Claims**



1. A system for mapping the surface of a transparent object, the system comprising:

a light source generating a first pattern of light and dark areas, the light source being positioned to project the pattern onto an anterior surface of the transparent object;

a light detector positioned to receive reflections of the pattern from the anterior surface and from a posterior surface of the transparent object; and

mapping means for determining the three-dimensional shape of the anterior and posterior surfaces of the object from the received reflections wherein said light source generates a detectable frequency of electromagnetic radiation.

5,592,247

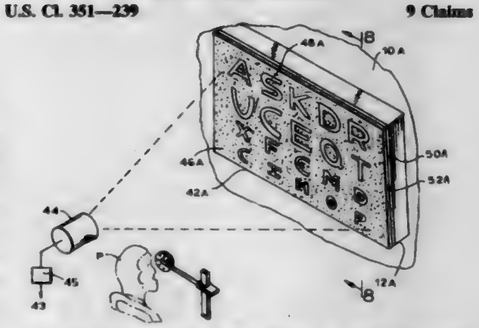
APPARATUS AND METHOD TO MEASURE VISUAL FUNCTION UNDER SIMULATED NIGHTTIME CONDITIONS

Stephen L. Trokel, 190 E. 72nd St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 237,634, May 4, 1994, Pat. No. 5,471,262. This application Jun. 22, 1995, Ser. No. 493,679

Int. Cl.[6] A61B *3/02;3/00*

U.S. Cl. 351—239 **9 Claims**



1. An apparatus for testing visual function of a person following refractive surgical procedures where the corneal optics have been modified, under simulated nighttime conditions when the pupil is large by projecting light onto a test field, comprising:

a test field having recognizable indicia of variable irradiance which appear on a light absorbing, completely black background having substantially zero-irradiance to maximize pupillary size during the test, said test field comprising at least one layer of reflective material and at least one layer of material having a completely black light absorbing surface, wherein said layer of reflective material includes a polycarbonate resin with prismatic faces and has an extremely high coefficient of reflectivity, said layer of light absorbing material defining said indicia for viewing by the person being tested;

whereby said indicia of variable irradiance provide a bright resolution target for the person being tested while said black background of substantially zero irradiance maintains extremely low ambient illumination when the test is administered in a darkened room.

5,592,248

COMPUTERIZED METHOD FOR FITTING EYEGLASSES

Ross A. Norton, and Leon L. Norton, both of 1620 Euclid Ave., Bristol, Va. 24201

Filed Nov. 16, 1995, Ser. No. 559,364

Int. Cl.[6] A61B *3/00;3/04;3/10;* **G02C** *13/00*

U.S. Cl. 351—246 **5 Claims**

1. The method for custom manufacturing or fitting eyeglasses comprising the steps of:

(a) providing digital camera means and taking a series of digital electronic images of selected portions of a subjects head;

(b) digitally transmitting said images to primary computer means electronically associated therewith, said images comprising frame and lens fitting information with respect to the size and shape of the subjects head;



(c) providing visual image display means functionally associated with said computer means for receiving therefrom and visually displaying said images;

(d) providing a display of selected ones of said images on said display means; and

(e) providing eyeglass frame means and lens which are structurally and dimensionally configured in accordance with said fitting information.

5,592,249

DATA IMPRINTING DEVICE FOR A CAMERA

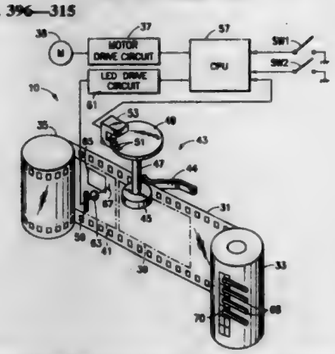
Toshiyuki Nakamura; Isao Soshi; Hidenori Miyamoto, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 119,712, Sep. 10, 1993, Pat. No. 5,519,463. This application Apr. 18, 1995, Ser. No. 423,319

Claims priority, application Japan, Sep. 10, 1992, 4-241895

Int. Cl.[6] G03B *17/24*

U.S. Cl. 396—315 **1 Claim**



1. A data imprinting device for a camera comprising:

a plurality of light emitting elements including at least first and second groups, at least one of said at least first and second groups having at least two light emitting elements therein;

a control circuit;

said control circuit including a first sub-circuit which produces at least a first control signal and a second control signal;

a first device, responsive to said first control signal, which controls said first group of said plurality of light emitting elements;

a second device, responsive to said second control signal, which controls said second group of said plurality of light emitting elements, independently of said first group of said plurality of light emitting elements; and

said control circuit including a second sub-circuit which controls said first control signal at a time non-overlapping with a timing of controlling of said second control signal, whereby reduced peak power demands are provided.

5,592,250

DRIVING MECHANISM FOR A PHOTOGRAHING OPTICAL SYSTEM

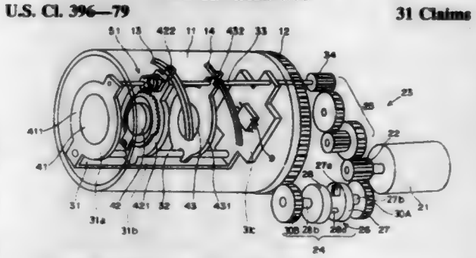
Hitoshi Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1995, Ser. No. 491,764

Claims priority, application Japan, Jun. 21, 1994, 6-160780

Int. Cl.[6] G03B *1/18*

U.S. Cl. 396—79 **31 Claims**



1. A photographing device, comprising:

a driving mechanism provided in a photographing optical system;

a driving source located outside said photographing optical system;

a rotational shaft located parallel with an optical axis of said photographing optical system, said rotational shaft being located in said photographing optical system, and connecting said driving source and said driving mechanism; and

an electro-magnetic clutch mechanism located around said optical axis of said photographing optical system, said electromagnetic clutch mechanism arranged to connect/disconnect said driving mechanism and said driving source.

5,592,251

METHOD AND APPARATUS FOR PREVENTING IMAGE DEFLECTION IN AN OPTICAL SYSTEM

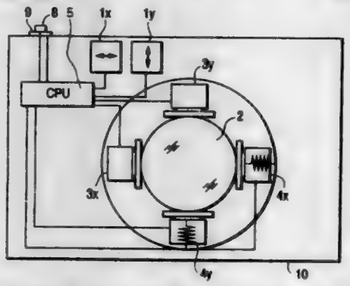
Tadao Kai, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 8, 1994, Ser. No. 257,034

Claims priority, application Japan, Jun. 8, 1993, 5-163918

Int. Cl.[6] G03B *17/00*

U.S. Cl. 396—55 **25 Claims**



15. A device for preventing image deflection in an optical system, comprising:

a correction optical system;

a movement detecting device detecting movement of the optical system;

a correction unit receiving an output from the movement detecting device and driving the correction optical system to correct for the movement of the optical system;

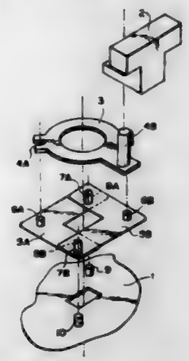
a direction detection unit detecting a direction of driving of the correction optical system with respect to a center point of a drive range of the correction optical system; and

an exposure control unit to inhibit an exposure when the direction detection unit detects the direction of driving the correction optical system is away from the center point.

5,592,252
FIELD FRAME FOR FINDER

Kiyotaka Kobayashi; Toshihiko Izaki; Hiroshi Sohma, and Yukitaka Takeshita, all of Saitama-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 114,094, Aug. 31, 1993. This application Sep. 18, 1995, Ser. No. 529,790
Claims priority, application Japan, Sep. 1, 1992, 4-233868
Int. Cl.[6] G03B 13/10
U.S. Cl. 396—380 8 Claims



1. A field frame comprising:

a reference field frame with its center arranged in line with an optical axis;

two L-shaped field switch means which are movably arranged opposite to each other with respect to the optical axis; and

a driving means for displacing said L-shaped field switch means relatively to each other so that the combination of said L-shaped field switch means can produce a rectangular space by the inner-angles of said L-shaped field switch means, whereupon a part of the visual field of said reference field frame is laterally or longitudinally concealed by the presence of said rectangular space, whereby an aspect ratio of said field frame can be changed;

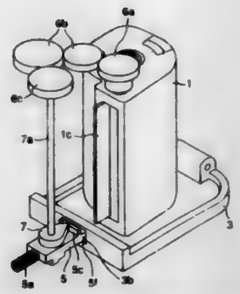
said reference field frame defining a rectangular opening whose edges are so disposed that, in a first position of said L-shaped field switch means, said edges of said reference field frame define two vertical edges of said visual field and said L-shaped field switch means define two horizontal edges of said visual field; in a second position of said L-shaped field switch means, said edges of said reference field frame define two horizontal edges of said visual field and said L-shaped field switch means define two vertical edges of said visual field; and in a third position of said L-shaped field switch means, said edges of said reference field frame define two vertical and horizontal edges of said visual field.

5,592,253
LOCK DEVICE OF CARTRIDGE CHAMBER DOOR OF CAMERA

Tomoki Nishimura, Kawasaki, and Noboru Akami, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Aug. 16, 1995, Ser. No. 515,568
Claims priority, application Japan, Sep. 16, 1994, 6-221613
Int. Cl.[6] G03B 17/26
U.S. Cl. 396—538 5 Claims

1. A lock device of a camera having a camera body using a film cartridge having a light-shielding door shiftable between a light-shielding condition for shielding light to a photographic film in said film cartridge and a non-light-shielding condition for enabling said photographic film to be withdrawn from said film cartridge, said lock device comprising:



a cartridge chamber having an opening portion through which said film cartridge is loaded in said cartridge chamber;

a cartridge chamber door being disposed in a shielding position for shielding said opening portion of said cartridge chamber when said light-shielding door of said film cartridge is at least in the non-light-shielding condition;

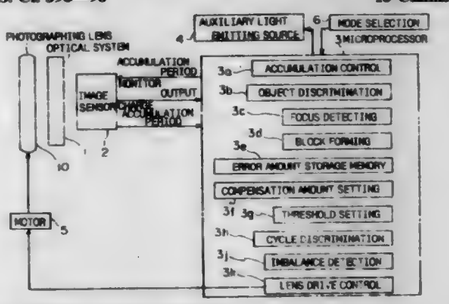
a holding member, slidably supported by said camera body and having a projection, shiftable between a prohibited position for prohibiting movement of said cartridge chamber door from said shielding position and an allowed position for allowing movement of said cartridge chamber door from said shielding position; and

a limiting member contactable with said projection for limiting movement of said holding member from said prohibited position to said allowed position.

5,592,254
AUTOFOCUS CAMERA

Shigeyuki Uchiyama, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 235,147, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 113,892, Aug. 31, 1993, abandoned. This application Sep. 19, 1995, Ser. No. 529,989
Claims priority, application Japan, Sep. 3, 1992, 4-235963
Int. Cl.[6] G03B 13/36
U.S. Cl. 396—96 15 Claims



1. Autofocus camera comprising:

an image sensor including a plurality of photoelectric elements to accumulate an electric charge generated during a set accumulation time and to output a signal corresponding to said accumulated electric charge;

an optical system which directs the light having passed through a photographing lens to said image sensor;

an operation means for calculating an operation result representing a focus condition of said photographing lens on the basis of said output signal of said image sensor and judging whether or not said operation result is reliable;

a lens drive control means for driving said photographing lens on the basis of said operation result when said operation result has been judged to be reliable and performing scanning operation in which the photographing lens is driven in a specified direction to find out a location where a reliable operation result can be obtained when said result has been judged not reliable; and

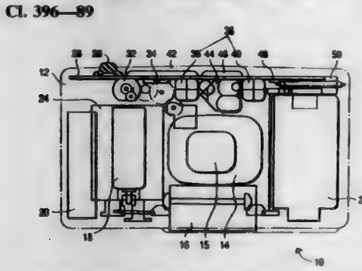
an accumulation control means, in a first setup mode, setting the accumulation time of said image sensor on the basis of the previously set accumulation time and the output signal of said image sensor obtained during said previously set accumulation time and, in the second setup mode, setting the accumulation time of said image sensor according to the output of the monitor sensor arranged in the vicinity of said plurality of photoelectric elements and detecting the intensity of the light incidental to said image sensor;

wherein said lens drive control means does not perform said scanning operation in the condition where said accumulation control means selects said second setup mode and the output signal of said image sensor does not satisfy predetermined conditions, even if said operation result has been judged not reliable.

5,592,255
COMPACT CAMERA HAVING COMPONENTS INCLUDING INHIBITING CIRCUIT MOUNTED ON ONE MOUNTING BOARD

Hiroshi Wakabayashi, Yokohama, and Hidenori Miyamoto, Urayasu, both of Japan, assignors to Nikon Corporation, Japan

Division of Ser. No. 295,069, Aug. 26, 1994, abandoned, which is a continuation of Ser. No. 116,972, Sep. 7, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,434
Claims priority, application Japan, Sep. 4, 1992, 4-260638; Sep. 4, 1992, 4-260639
Int. Cl.[6] G03B 7/08;13/36;17/00
U.S. Cl. 396—89 3 Claims



1. A compact camera including a plurality of components, comprising:

one mounting board having an upper surface and a lower surface and disposed inside said compact camera, near a top portion of said compact camera;

a control circuit, mounted on said upper surface of said one mounting board, to control an operation of said plurality of components;

a land portion disposed underneath at least one input device and mounted on said upper surface of said one mounting board;

an IC element mounted on said lower surface of said one mounting board;

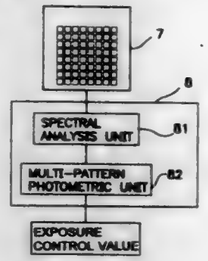
a low power device disposed near said at least one input device and mounted on said lower surface of said one mounting board; and

an inhibiting circuit mounted on said upper surface of said one mounting device, to inhibit an operation of said low power device when said at least one input device receives an operation input signal.

5,592,256
PHOTOMETRY DEVICE FOR A CAMERA

Masaru Muramatsu, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 246,424, May 20, 1994, abandoned. This application May 29, 1996, Ser. No. 654,998
Claims priority, application Japan, Jun. 8, 1993, 5-163919
Int. Cl.[6] G03B 7/08
U.S. Cl. 396—225 20 Claims



1. A photometric device for use in a camera, the photometric device comprising:

segmented brightness measuring means for segmenting a photographic scene of the camera into multiple areas and for outputting corresponding multiple photometric values;

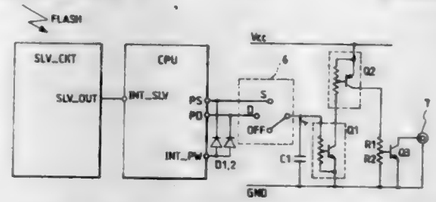
spectral analysis means for performing spectral analysis of the spatial frequency of a photographic subject using the corresponding multiple photometric values output by said segmented brightness measuring means; and

photometric computation means for performing photometric computations based on the spectral pattern of the photographic subject output by said spectral analysis means to produce exposure control values.

5,592,257
ELECTRONIC FLASH DEVICE WITH SLAVE EMISSION FUNCTION

Hiroshi Sakamoto, Kawasaki; Hideki Matsui, Fujisawa, and Nobuyoshi Hagiuda, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 7, 1995, Ser. No. 499,376
Claims priority, application Japan, Aug. 24, 1994, 6-199864; Aug. 24, 1994, 6-199866
Int. Cl.[6] G03B 7/26
U.S. Cl. 396—171 10 Claims



1. An electronic flash device having a slave emission function and a standby mode, comprising:

a setting member to set the slave emission function; and

power supply control means for controlling a power supply of said electronic flash device to be turned on when the slave emission function is set by said setting member and the electronic flash device is in the standby mode.

5,592,258

FILM TRANSPORTING APPARATUS AND FILM PROCESSING SYSTEM USING THE SAME

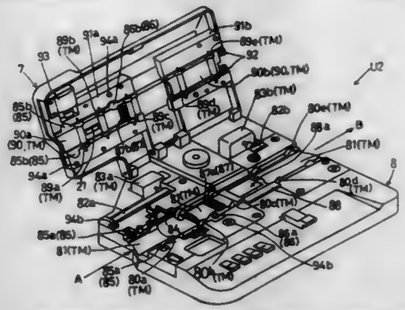
Keiji Hashizume, Kainan; Junichi Owaki, Wakayama; Yasuhito Tauchi, Wakayama, and Kohji Seki, Wakayama, all of Japan, assignors to Noritsu Koki Co., Ltd., Wakayama-ken, Japan

Filed Nov. 21, 1994, Ser. No. 342,833

Claims priority, application Japan, Nov. 22, 1993, 5-292064; Nov. 22, 1993, 5-292065; Nov. 22, 1993, 5-292066; Sep. 13, 1994, 6-219031; Sep. 13, 1994, 6-219032; Sep. 13, 1994, 6-219033

Int. Cl.[6] G03B *27/52*

U.S. Cl. 355—41 **24 Claims**



1. A film transporting apparatus for a film processing system, comprising:

a pair of frame members pivotably connected to each other to be opened and closed;

transport means provided to each of the frame members and operable to transport a film along a predetermined film transport passage when said frame members are closed;

an optical sensor for detecting film information including a light emitting portion provided in one of the frame members and a light receiving portion provided in the other frame member;

positioning engaging portions provided respectively to the frame members and coming into engagement with each other in association with a pivotal movement of the frame members to a closed state; and

a movable frame member movably provided to one of said frame members, said movable frame member supporting said positioning engaging portions and said light emitting portion of said light receiving portion, said movable frame member allowing relative movement between said positioning engaging portions provided respectively to said pair of frame members.

5,592,259

PHOTOMASK, AN EXPOSURE METHOD AND A PROJECTION EXPOSURE APPARATUS

Seiteru Amai, Ebina, and Masaya Komatsu, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

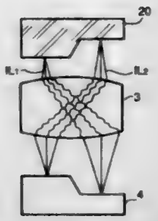
Continuation of Ser. No. 395,188, Feb. 27, 1995, abandoned, which is a continuation of Ser. No. 110,207, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 924,642, Aug. 4, 1992, abandoned. This application Dec. 18, 1995, Ser. No. 573,760

Claims priority, application Japan, Aug. 9, 1991, 3-200580; Oct. 14, 1991, 3-292063

Int. Cl.[6] G03B *27/52*

U.S. Cl. 355—53 **22 Claims**

12. In a projection exposure apparatus for exposing a pattern formed on an original substrate onto a predetermined exposure area that includes a stepped surface of a sensitive substrate, said apparatus having a projection optical system for projecting and forming an image of the pattern on the sensitive substrate and a stage for supporting the sensitive substrate, an exposure method comprising:



providing an image surface correcting member that shifts a portion of an image forming surface of the projection optical system along an optical axis of the projection optical system such that the image forming surface assumes a stepped configuration corresponding to a stepped configuration of said stepped surface;

supporting the sensitive substrate such that the stepped surface of said exposure area is substantially coincident with the image forming surface of said projection optical system; and

exposing the exposure area with the pattern formed on the original substrate through the projection optical system.

5,592,260

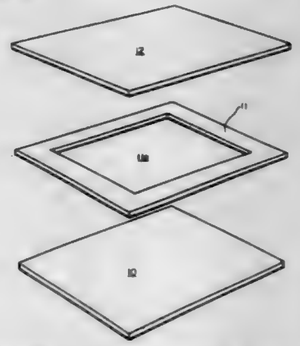
PHOTOGRAPHIC CROPPING DEVICE AND METHOD

Brett R. Thompson, 2477 S. Lake St., Salt Lake City, Utah 84106

Filed Aug. 18, 1995, Ser. No. 516,796

Int. Cl.[6] G03B *27/58*

U.S. Cl. 355—74 **17 Claims**



1. A device made up of separate pieces for use with a photographic enlarger for cropping photographic prints during printing of an image on photographic paper, comprising a base sheet upon which can be disposed a sheet of photographic paper having substantially the same shape and outside peripheral edge dimensions as said base sheet and having a developing face that will be uppermost when the reverse side of said sheet of photographic paper is placed against said base sheet; and a template sheet adapted to be placed upon said developing face of said sheet of photographic paper as placed on said base sheet, said base sheet and said template sheet having substantially the same shape and outside peripheral edge dimensions and having thickness and stiffness sufficient to enable proper alignment entirely by feel of the outside peripheral edges thereof in an unlighted darkroom with respect to the assembled base sheet, template sheet as conformingly placed on said base sheet, and said sheet of photographic paper as applied to said base sheet and said template sheet, said template sheet having an interior opening for passing an image projected from a photographic enlarger onto said sheet of photographic paper in an exposure area between said base sheet and the exterior edge of said template sheet while said template sheet protects peripheral margins of said photographic paper from exposure to light projected from said enlarger.

5,592,261

IMAGE FORMING APPARATUS HAVING A STEPPING MOTOR FOR ROTATING A PHOTOSENSITIVE DRUM

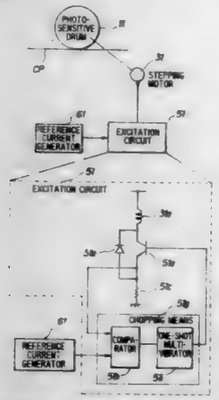
Satoshi Yoshino, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 23, 1995, Ser. No. 447,713

Claims priority, application Japan, Jul. 5, 1994, 6-153887

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—167 **2 Claims**



1. An image forming apparatus for developing an elastrostatic latent image formed on a photosensitive drum by a toner while rotating said photosensitive drum, transferring said toner image to a paper, and fixing said toner image on said paper, said image forming apparatus comprising:

a stepping motor, having a coil and phases for exciting the coil, for rotating the photosensitive drum; and

an excitation circuit for gradually increasing an exciting current of the coil in each phase of said stepping motor to a predetermined value and thereafter gradually decreasing said excited current, said excitation circuit including

switching elements, having ON and OFF states, each of the switching elements respectively provided for one of the phases of the coil;

a detecting portion for detecting the exciting current of the coil when said switching element is in the ON state;

a reference current generating portion for generating a reference current gradually increasing to a predetermined value and thereafter gradually decreasing in accordance with a reference current waveform in each phase;

chopping means for turning OFF one of said switching elements corresponding to the phase having a detected current value reaching the reference current; and

a diode which causes a flyback current to flow on the coil while the one of the switching elements is in the OFF state.

5,592,262

IMAGE FORMING APPARATUS WITH INK JET AND ELECTROPHOTOGRAPHIC RECORDING UNITS

Kiyoharu Tanaka, Tokyo; Takashi Uchida, Yokohama; Akira Hiramatsu, Yokohama; Haruhiko Takahashi, Yokohama, and Atsushi Munakata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

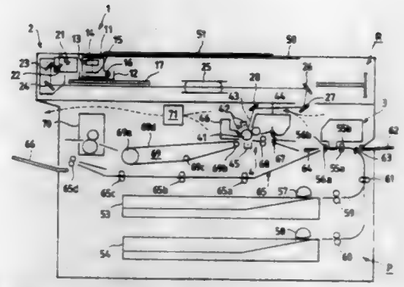
Division of Ser. No. 110,196, Aug. 23, 1993, Pat. No. 5,321,467, which is a continuation of Ser. No. 877,757, May 4, 1992, abandoned. This application Mar. 11, 1994, Ser. No. 208,685

Claims priority, application Japan, May 7, 1991, 3-130247; Apr. 23, 1992, 4-104790

Int. Cl.[6] G03G *15/00*; **B41J** *2/01*

U.S. Cl. 399—1 **32 Claims**

1. An image forming apparatus for forming an image on a recording medium, said apparatus comprising:



first image forming means for forming an image on a recording medium;

second image forming means for forming an image on the recording medium by an image forming system different from that of said first image forming means;

receiving means for receiving the recording medium after the image is recorded;

a first recording medium conveyance path for conveying the recording medium to said receiving means after passing by said first and second image forming means; and

a second recording medium conveyance path for conveying the recording medium to said receiving means after passing by said first image forming means.

5,592,263

CHARGING DEVICE

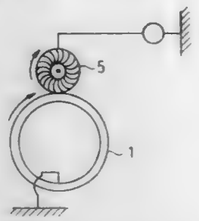
Katsumi Adachi, Nara-ken; Shiro Narikawa, Kashihara; Takashi Hayakawa, Soraku-gun; Yukihito Nishio, Gojyo; Hirofumi Yanagizawa; Takumi Sakamoto, both of Shiga-ken, and Atsushi Okada, Kusatu, all of Japan, assignors to Gunze Limited, Ayabe, and Sharp Kabushi Kaisha, Osaka, both of Japan

Filed Jun. 13, 1994, Ser. No. 258,969

Claims priority, application Japan, Jun. 17, 1993, 5-146316

Int. Cl.[6] G03G *15/02*

U.S. Cl. 399—176 **5 Claims**



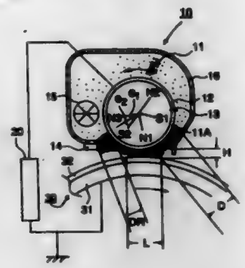
1. A charging device for use in an image forming apparatus which charges an object to be charged by contacting a conductive charging member with the surface of the object and then applying a voltage across the charging member and the object

wherein at least a contact portion of the charging member comprises a conductive material containing one of polyolefin type resins, fluorine type resins and aromatic type resins and having a hygroscopic degree of 0.2% or less.

5,592,264
MAGNETIC BRUSH TYPE CHARGING DEVICE

Kunio Shigeta; Sachie Hosogoezawa, and Masahiro Onoders, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Feb. 17, 1995, Ser. No. 390,631
Claims priority, application Japan, Feb. 23, 1994, 6-025479; Apr. 15, 1994, 6-077476
Int. Cl.[6] G03G 15/02
U.S. Cl. 399—175 2 Claims



1. An apparatus for charging an image surface of an image carrying member which is rotated in a predetermined direction, comprising:

a rotatable cylinder arranged to face the image carrying member so as to form a minimum gap section at which a gap distance between the cylinder and the image carrying member becomes minimum, wherein a minimum gap distance at the minimum gap section is H (cm) and the cylinder is rotated in the same direction as that of the image carrying member at the minimum gap section;

a magnet member having plural magnetic poles being fixed in the cylinder;

a magnetic brush formed by magnetic particles on a surface of the cylinder, wherein the magnetic particles have a volume average particle diameter d (μm) and an apparent density ρ (g/cm^3) and a roughness of the surface of the cylinder is 1/10 to 1/3 of the volume average particle diameter d;

a regulator facing the cylinder wherein a distance D_R of a regulating gap between the regulator and the cylinder satisfies the following relation in terms of the minimum gap distance H: $H<D_R<1.4H$, the regulator regulating an amount of the magnetic particles on the cylinder when the magnetic brush passes the regulating gap;

the cylinder conveying the magnetic brush toward the minimum gap section so that the magnetic brush is compressed between the cylinder and the image carrying member and the compressed magnetic brush forms a nip region of 0.2 mm to 10 mm in length, wherein an amount M (g/cm^2) of the magnetic particles existing in the nip region satisfies a following relation: $\rho \leq M/H \leq 1.6\rho$, whereby the magnetic particles are packed in the nip region and the packed magnetic particles contact the image carrying member over all of the nip region;

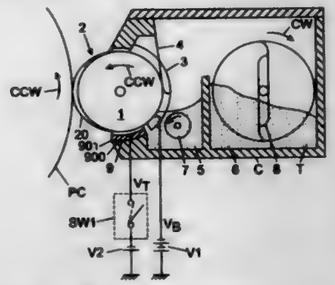
the plural magnet poles of the magnet member being arranged such that one of the plural magnet poles is located in the nip region and downstream of the minimum gap section in terms of the rotating direction of the cylinder; and

a bias device for applying a bias voltage to the magnetic brush so that the image carrying member is charged through the packed magnetic particles in the nip region, the bias voltage comprising a DC voltage component and an AC voltage component.

5,592,265
IMAGE FORMING APPARATUS WITH RESIDUAL TONER REMOVAL

Tamotsu Sakuraba, and Shinichi Takemoto, both of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Aug. 2, 1995, Ser. No. 510,309
Claims priority, application Japan, Aug. 3, 1994, 6-182065
Int. Cl.[6] G03G 15/08
U.S. Cl. 399—285 20 Claims



1. An image forming apparatus comprising:

an electrostatic latent image carrier;

an image forming means for forming an electrostatic latent image on said electrostatic latent image carrier;

a developing device including a toner carrying member opposed to said electrostatic latent image carrier and having a movable surface on which a toner is held;

a charge erasing member being in contact with said surface of said toner carrying member;

a developing bias power unit which applies a developing bias voltage to said toner carrying member;

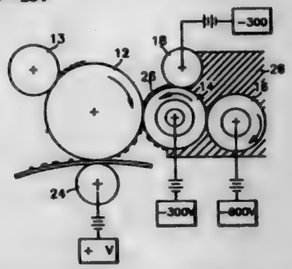
a charge erasing bias power unit which applies a charge erasing bias voltage to said charge erasing member; and

a control circuit for controlling the charge erasing bias voltage in response to a state of said image forming means.

5,592,266
ELECTROPHOTOGRAPHIC PROCESS CARTRIDGE

Dong-Hoon Park, Kyungki-do, and Dong-Ho Lee, Suwon, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 8, 1995, Ser. No. 525,161
Claims priority, application Rep. of Korea, Sep. 8, 1994, 22610/1994
Int. Cl.[6] G03G 15/06
U.S. Cl. 399—284 15 Claims



1. An electrophotographic process cartridge, comprising:

a photosensitive drum;

charging means for uniformly distributing a layer of electrical charge on an outer surface of said photosensitive drum;

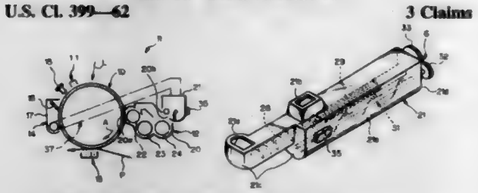
a developing roller for transferring particles of polymeric toner each having a substantially spherical shape onto said outer surface of said photosensitive drum; and

control means for engaging an outer surface of said developing roller to enable formation of two layers or less of said particles of said polymeric toner on said outer surface of said developing roller, said particles of said polymeric toner being transferred from said outer surface of said developing roller to said outer surface of said photosensitive drum and being transferred from said outer surface of said photosensitive drum back to said outer surface of said developing roller in dependence upon a voltage applied to said developing roller.

5,592,267
IMAGE FORMING APPARATUS USING FRESH TONER AND USED TONER

Naomi Misago, and Kazuhisa Sudo, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 374,901
Claims priority, application Japan, Jun. 19, 1994, 6-018984; Nov. 8, 1994, 6-298831
Int. Cl.[6] G03G 15/08;21/00
U.S. Cl. 399—62 3 Claims



1. An image forming apparatus comprising:

a photoconductive element for electrostatically forming a latent image thereon;

a developing unit for developing the latent image by toner, said toner consisting essentially of fresh toner and used toner, and said developing unit provided with a used toner inlet for receiving said used toner;

a cleaning unit for removing said toner remaining on said photoconductive element after image transfer and thereby collecting the used toner;

conveying means for conveying the used toner from said cleaning unit to said used toner inlet of said developing unit where the used toner is constantly fed through the used toner inlet; and

a toner end sensor for determining that an amount of toner existing in said developing unit is less than a predetermined amount and causing fresh toner to be replenished into said developing unit based on the amount determined,

said toner end sensor disposed in said developing unit adjoiningly positioned to underlie said used toner inlet such that the toner end sensor senses a combined amount of used toner fed to the developing unit through the used toner inlet and fresh toner in said developing unit before causing fresh toner to be replenished in the developing unit.

5,592,268
MECHANISM TO PREVENT TONER LEAKAGE FROM AN IMAGE FORMING UNIT

Mitsuyoshi Uehara, Nagoya; Hideo Yoshihara, Toki; Tsutomu Suzuki, Nagoya; Fumio Morita, Nagoya, and Hiroshi Igarashi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 22, 1995, Ser. No. 494,558
Claims priority, application Japan, Jul. 22, 1994, 6-170633; Jul. 22, 1994, 6-170634
Int. Cl.[6] G03G 15/09
U.S. Cl. 399—276 18 Claims

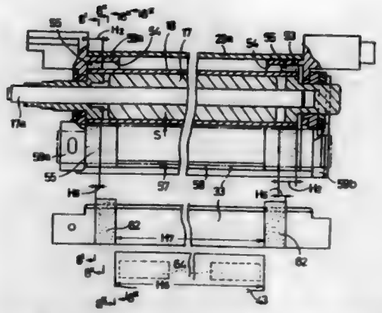
1. An image forming unit, comprising:

a photoconductive drum;

a cylindrical developing sleeve internally provided with a magnet roller and supported for rotation in an open chamber formed in a developing device case, the magnet roller being disposed such that regions subject to the magnetism of opposite ends of the magnet roller are inside opposite ends of the developing sleeve;

substantially semicircular recesses formed in opposite side walls of the developing device case, the substantially semicircular recesses limiting opposite ends of the open chamber; and

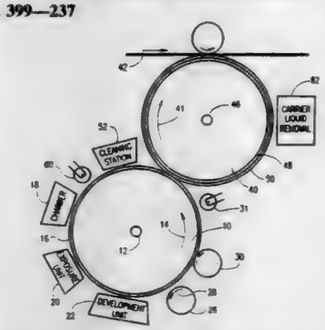
side sealing members extended along surfaces of the recesses in sliding contact with the opposite ends of the developing sleeve, respectively, the side sealing members being disposed outside the regions subject to the influence of the magnetism of the opposite ends of the magnet roller or inside regions where the influence of the magnetism of the opposite ends of the magnet roller is insignificant and further comprising a gap between an inner side of each of said side sealing members and a corresponding outer end of a developer.



5,592,269
IMAGING SYSTEM HAVING AN INTERMEDIATE TRANSFER MEMBER

Hani Younes, Ara; Ilan Kander, Ranana; Dorron Levy, Tel Aviv; Yossi Cohen, Rehovot, and Haim Belinkov, Rishon Le Zion, all of Israel, assignors to Indigo N.V., Rotterdam, Netherlands

Filed Sep. 29, 1993, Ser. No. 128,149
Claims priority, application Israel, Mar. 26, 1993, 105185; Apr. 1, 1993, 105269
Int. Cl.[6] G03G 15/10;15/11;15/16
U.S. Cl. 399—237 27 Claims



1. An intermediate transfer member apparatus for an imaging machine comprising:

a release surface suitable for receiving liquid toner images comprising toner particles and a hydrocarbon carrier liquid from a first surface and for transferring them to a second surface, wherein the release surface comprises an oxime cured silicone material.

5,592,270

DEVELOPING DEVICE IN AN ELECTROPHOTOGRAPHIC APPARATUS CAPABLE OF CONTROLLING A DISCHARGE OF DETERIORATED DEVELOPER AND METHOD OF DISCHARGING DETERIORATED DEVELOPER

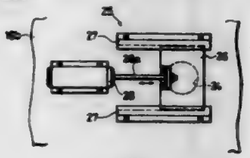
Yasuhiro Takai, Sakurai; Hideaki Hagihara, Nara; Hirokazu Tanaka, Osaka; Atsushi Ueda, Nara; Hideo Yamasa, Ikoma, and Fumio Shimazu, Chiba, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

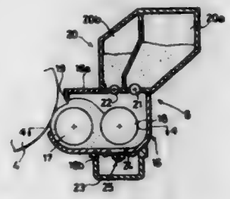
Filed Jul. 16, 1993, Ser. No. 93,075

Claims priority, application Japan, Jul. 21, 1992, 4-194056; Feb. 16, 1993, 5-026796; Feb. 25, 1993, 5-036456; Feb. 25, 1993, 5-036460; May 13, 1993, 5-111604; May 24, 1993, 5-121698

Int. Cl.[6] G03G *15/06*

U.S. Cl. 399—260 **42 Claims**





1. A developing device comprising:

a developer container comprising side walls and a bottom wall for storing developer having toner and carrier;

a discharge opening formed in said developer container for discharging the developer from said developer container;

a developing roller, mounted rotatably in said developer container, for supplying to a photoreceptor the developer so as to develop an electrostatic latent image formed on a photoreceptor surface into a toner image;

an agitating member, mounted rotatably in said developer container, for agitating the developer to charge said toner by friction;

developer supply means for supplying developer;

shutter means for opening and closing said discharge opening so as to control a discharge of deteriorated developer from said developer container, and

supply and discharge control means for controlling said developer supply means to add unused carrier to developer according to a degree of deterioration of carrier in the developer, and controlling said shutter means to discharge the deteriorated developer.

5,592,271

DONOR ROLLS WITH CAPACITIVELY CUSHIONED COMMUTATION

Delmer G. Parker, Rochester, and Gerald M. Fletcher, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

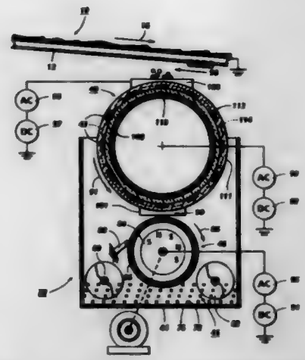
Filed Jan. 11, 1996, Ser. No. 585,070

Int. Cl.[6] G03G *15/06*

U.S. Cl. 399—285 **34 Claims**

1. A donor roll for transporting marking particles to an electrostatic latent recorded on a surface, said donor roll adaptable for use with an electric to assist in transporting the marking particles, said donor roll comprising:

a rotatably mounted body, a portion thereof being electrically conductive;



a dielectric layer mounted on a portion of the electrically conductive portion of said body;

a first electrode member, mounted on said body, adjacent said dielectric layer, and spaced from the electrically conductive portion of said body; and

a second electrode member mounted on said body, adjacent said dielectric layer spaced from the electrically conductive portion of said body and spaced from said first electrode member, said dielectric layer electrically interconnecting said first electrode to said second electrode, said dielectric layer being made of a material having electrical properties thereof, the electrical properties of said being selected so that when the electric field is applied to said first electrode member a substantial portion of the field will be transferred to said second electrode member.

5,592,272

Patent Not Issued For This Number

5,592,273

PHOTOCONDUCTIVE DRUM AND TRANSFER APPARATUS FOR AN IMAGE FORMING APPARATUS

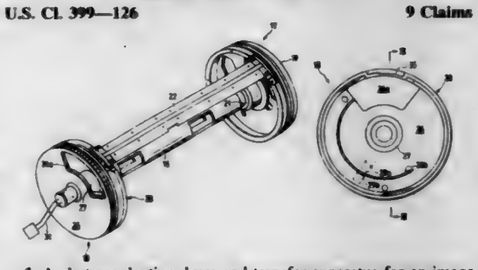
Keiji Yamamoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1995, Ser. No. 515,619

Claims priority, application Japan, Aug. 18, 1994, 6-194419

Int. Cl.[6] G03G *15/00;15/14*

U.S. Cl. 399—126 **9 Claims**



1. A photoconductive drum and transfer apparatus for an image forming apparatus comprising:

a photoconductive drum having a photoconductive-drum-sided gear and a photoconductive-drum-sided positioning cylindrical surface at an outer peripheral portion thereof;

a transfer apparatus including a transfer drum and a transfer drum supporting shaft for rotatably supporting said transfer drum, said transfer drum comprising a pair of drums each having a transfer-sided positioning cylindrical surface at an outer peripheral portion thereof, drum coupling member for integrally coupling said pair of drums with each other at a predetermined separated distance, and a transfer-sided gear positioned at an outer periphery of at least one of said pair of drums; and

a position adjusting apparatus for positioning said transfer drum close to, or apart from said photoconductive drum by moving said transfer drum supporting shaft;

wherein, both transfer-sided gear and transfer-sided positioning cylindrical surface are formed of an amorphous thermoplastic resin and when said transfer drum is positioned close to said photoconductive drum, said transfer-sided gear is meshed with said photoconductive-drum-sided gear, and said transfer-sided positioning cylindrical surface is abutted to said photoconductive-drum-sided positioning cylindrical surface.

5,592,274

ELECTROPHOTOGRAPHIC APPARATUS AND PROCESS FOR SIMULTANEOUSLY TRANSFERRING AND FIXING TONER IMAGE ONTO TRANSFER PAPER

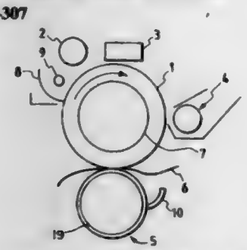
Taketoshi Higashi; Shigeru Yagi; Yuzuru Fukuda; Masato Ono; Masao Watanabe, and Tsuyoshi Ohta, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 12,159

Claims priority, application Japan, Jan. 31, 1992, 4-040695; Jul. 21, 1992, 4-214797

Int. Cl.[6] G03G *15/14;15/20*

U.S. Cl. 399—307 **18 Claims**



14. An electrophotographic process using an electrophotographic apparatus including a photoreceptor, a heater, and a transferring part equipped with a cleaning mechanism, the photoreceptor comprising a metallic cylindrical support having thereon, an inhibiting layer, a photoconductive layer on the inhibiting layer, an electron trapping layer provided on the photoconductive layer, a photosensitive layer made of amorphous silicon on the electron trapping layer, and a surface protecting layer on the photosensitive layer, said process comprising the steps of:

uniformly heating the photosensitive layer and the surface protecting layer of the photoreceptor to a constant temperature with said heater;

placing a transfer paper over a toner image formed by electrophotography on the photoreceptor;

pressing the transfer paper and photoreceptor with a pressure of 100 kg weight/cm^2 or more using the transferring part such that the transfer paper is pressed between the cylinder supported photoreceptor and the transferring part to simultaneously transfer and fix the toner image onto the transfer paper; and

cleaning the transferring part using the cleaning mechanism.

5,592,275

IMAGE FIXING DEVICE WITH OIL APPLICATION ROLLER FOR IMAGE FORMING APPARATUS

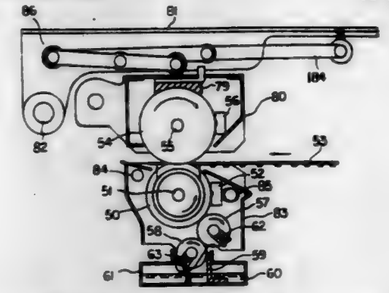
Katsuhiro Echigo, Asaka, and Shigeo Kurotaka, Sagamihara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 476,884

Claims priority, application Japan, Jul. 12, 1994, 6-160405

Int. Cl.[6] G03G *15/20*

U.S. Cl. 399—325 **31 Claims**



1. A fixing device for fixing a toner image on recording paper comprising:

a fixing roller including a heater;

a pressure roller held in press contact with said fixing roller;

an oil application roller contacting said fixing roller for applying oil to said fixing roller;

an oil supply roller contacting said oil application roller for applying said oil to said oil application roller;

an oil application felt contacting said oil supply roller for applying said oil to said oil supply roller; and

a driver drivingly connected to said oil application roller so as to rotate said oil application roller such that said oil application roller moves in the same direction as said fixing roller at a contact portion between said fixing roller and said oil application roller, and such that a surface velocity of said oil application roller is lower than a surface velocity of said fixing roller.

5,592,276

IMAGE FIXING DEVICE WITH HEATER RESPONSIVE TO THERMAL STRESS

Yasumasa Ohtsuka; Shunji Nakamura; Kouichi Okuda, all of Yokohama; Yohji Tomoyuki, Ichikawa; Akira Hayakawa, and Daizo Fukuzawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 977,025, Nov. 16, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,608

Claims priority, application Japan, Nov. 14, 1991, 3-298987; Oct. 21, 1992, 4-283051

Int. Cl.[6] G03G *15/20*; H01H *85/00*

U.S. Cl. 339—335 **30 Claims**

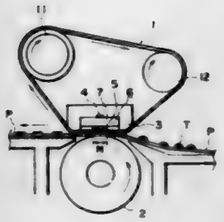
1. A heater comprising:

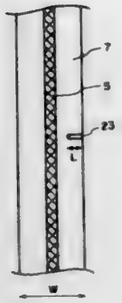
a base plate having a length and a width;

a resistor, having a length extending in a direction of the length of said base plate, for generating heat when electric energy is supplied thereto; and

a recess, formed in said base plate in a range of the length of said resistor and extending through only a portion of the width of the base plate in a direction substantially perpendicular to a direction of current flow through the resistor,

wherein said base plate is biased to break at said recess, and said resistor is biased to break and separate at said recess along a





line generally perpendicular to the direction of current flow through said resistor.

5,592,277

IMAGE FIXING APPARATUS AND IMAGE FORMING APPARATUS

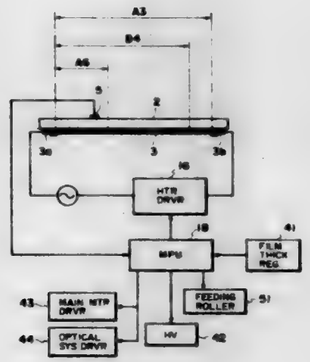
Kensaku Kusaka, Kawasaki; Hidekazu Maruta, Yokohama, and Koji Masuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,231

Claims priority, application Japan, Feb. 21, 1994, 6-022611

Int. Cl.[6] G03G *15/20*

U.S. Cl. 399—328 **22 Claims**



1. An image forming apparatus comprising:

image forming means for forming an unfixed image on a recording material

a heater;

a film movable with the recording material carrying the unfixed image, wherein said heater heats the unfixed image through said film;

a control means for controlling a fixing condition in accordance with a thickness of said film.

5,592,278

CONTINUOUS FORM PRINTER WITH PAPER GUIDE MECHANISM

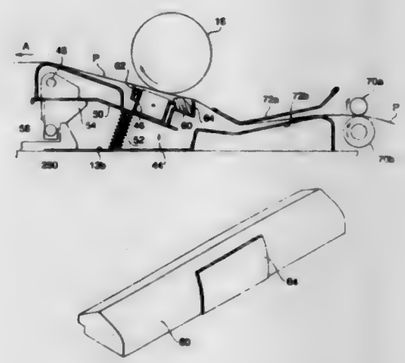
Tsutamu Sato; Masakazu Hirano; Tsukasa Yanashima; Hiroyuki Yamaguchi, and Yoshio Monma, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,336

Claims priority, application Japan, Nov. 13, 1993, 5-307250

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—384 **13 Claims**



11. A printer using continuous form paper, said printer comprising:

means for feeding the paper along a paper path of said printer;

means for forming an image on the paper;

a guide member, provided upstream of said means for forming along said paper path, for guiding the paper to contact said means for forming; and

a center urging member, provided to a center portion of said guide member across a width of the paper, for pushing a center portion of the paper towards said means for forming;

wherein said center urging member comprises a resilient flap.

5,592,279

Patent Not Issued For This Number

5,592,280

SHEET BINDING APPARATUS CAPABLE OF PERFORMING TWO KINDS OF BINDING PROCESSES

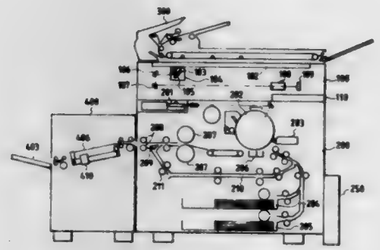
Daisuke Ishizuka, Yokohama; Akiyoshi Kimura, Kawasaki; Yoshiyuki Suzuki, Yokohama; Tadashi Suzuki, Tokyo; Shinichi Nakamura, Kawasaki; Yoshihiko Suzuki, Tokyo; Minoru Nada, Kawasaki; Satoru Kutsuwada, Yokohama; Kenji Kobayashi, Tokyo; Satoshi Kaneko; Syokyo Koh, both of Kawasaki; Norifumi Miyake, Tokyo, and Hirohiko Tashiro, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

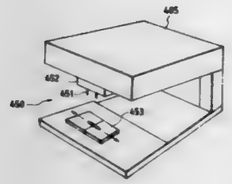
Filed Jul. 21, 1995, Ser. No. 505,145

Claims priority, application Japan, Jul. 25, 1994, 6-172199

Int. Cl.[6] C03G *15/00*

U.S. Cl. 399—410 **18 Claims**





1. A sheet binding apparatus associated with an image forming apparatus for forming an image onto a sheet in either one of first and second modes, comprising:

storage means for storing sheets ejected from said image forming apparatus; and

binding processing means for executing a binding process to the plurality of sheets stored in said storage means,

wherein said binding processing means includes first binding processing means for performing a binding process by a first binding method and second binding processing means for performing a binding process by a second binding method which can more easily release a binding than said first binding method, and

in the case where said first mode is executed in said image forming apparatus, the binding process is executed by said first binding processing means, and in the case where said second mode is executed, the binding process is executed by said second binding processing means.

5,592,281

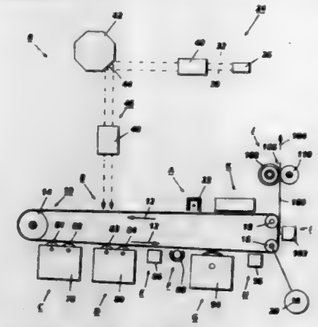
DEVELOPMENT SCHEME FOR THREE COLOR HIGHLIGHT COLOR TRILEVEL XEROGRAPHY

Delmer G. Parker, Rochester, N.Y., and Gregory J. Kovacs, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1994, Ser. No. 345,045

Int. Cl.[6] G03G *15/01*

U.S. Cl. 399—156 **22 Claims**



1. A method of creating toner images on a charge retentive surface, said method including the steps of:

uniformly charging said charge retentive surface;

simultaneously forming a trilevel image comprising a CAD and a DAD image and a background area intermediate thereof;

forming another DAD image simultaneously with the formation of said CAD and DAD images wherein said another image is electrostatically indistinguishable from said background area whereby development thereof is precluded when said CAD and DAD images are developed;

developing said CAD and DAD images forming said trilevel image;

uniformly recharging said charge retentive surface;

rendering said another DAD image electrostatically distinguishable from said background area; and

developing said another DAD image.

5,592,282

SUPPRESSION OF STIMULATED SCATTERING IN OPTICAL TIME DOMAIN REFLECTOMETRY

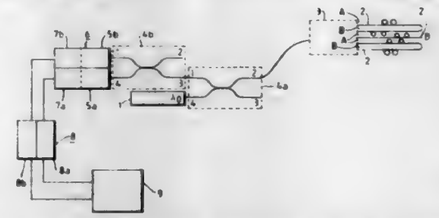
Arthur H. Hartog, Southampton, United Kingdom, assignor to York Limited, Hampshire, United Kingdom

Filed Jul. 21, 1994, Ser. No. 278,173

Claims priority, application United Kingdom, Jul. 22, 1993, 9315231

Int. Cl.[6] G01N *21/65;* **G01J** *5/06*

U.S. Cl. 356—44 **28 Claims**



1. An optical time domain reflectometry method of sensing respective values of a physical parameter at different locations along an optical fibre, deployed through a region of interest, in which method optical radiation at a first wavelength (λ_0) is launched into the fibre and back-scattered optical radiation in at least one preselected spectral band is used to produce output signals dependent upon the values being sensed, wherein none of

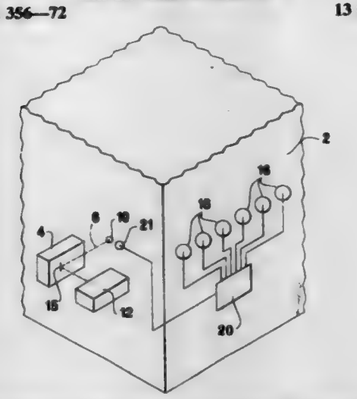
the spectral bands used to produce said output signals lies about a second wavelength (λ_{+1}) which is equal to the wavelength on which a first order Stokes spectral band, which results from inelastic scattering in the fibre of optical radiation at said first wavelength (λ_0), is centred, and wherein said first wavelength (λ_0) and/or said optical fibre are chosen and/or arranged such that relative growth in the intensity in the fibre of optical radiation at said second wavelength (λ_{+1}) is arranged to be inhibited, thereby to suppress conversion in the fibre through stimulated scattering of optical radiation at said first wavelength (λ_0) to optical radiation at said second wavelength (λ_{+1}).

5,592,283

TESTING OF CONCRETE BY LASER ABLATION

Dann J. Flesher, Benton City; David L. Becker, Kennewick; William L. Beem, Kennewick; Tommy C. Berry, Kennewick, and N. Scott Cannon, Kennewick, all of Wash., assignors to Westinghouse Hanford Company, Richland, Wash.

Filed Apr. 3, 1995, Ser. No. 415,842
Int. Cl.[6] G01N *3/00;21/63*
U.S. Cl. 356—72 **13 Claims**



1. A method of testing concrete in a structure in situ, comprising:
directing a succession of pulses of laser radiation at a point on the structure so that each pulse effects removal of a quantity of concrete and transfers energy to the concrete;
detecting a characteristic of energy which has been transferred to the concrete;
determining, separately from said detecting step, the total quantity of concrete removed by the succession of pulses; and
calculating a property of the concrete on the basis of the detected energy characteristic and the determined total quantity of concrete removed.

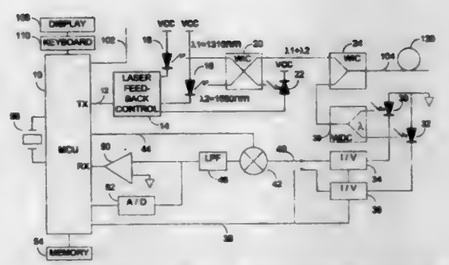
5,592,284

SINGLE CONNECTION AUTOMATED BI-DIRECTIONAL FIBEROPTIC ATTENUATION MEASUREMENT SYSTEM

Michel Bédard, Québec, Canada, assignor to Nortech Fibronic Inc., Quebec, Canada

Filed Apr. 21, 1995, Ser. No. 426,926
Int. Cl.[6] G01N *21/27;21/59*
U.S. Cl. 356—73.1 **7 Claims**

1. A method of measuring attenuation of an optical fiber, wherein said optical fiber is connected in between a first transceiver and a second transceiver, said method comprising the steps of:
at said first transceiver:
a) transmitting to said second transceiver, through said optical fiber, a first optical signal having a first wavelength, at a first pre-defined transmitted power level,
at said second transceiver:



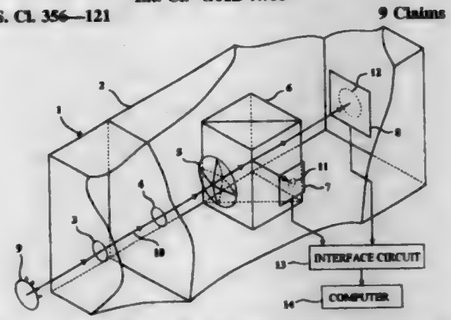
b) during step a), measuring said first wavelength of said first optical signal received,
c) during step a), measuring a first received power level from said first optical signal wherein said first optical signal received is compensated with a wavelength sensitivity information of said second transceiver related to said measured wavelength of said first optical signal,
d) transmitting to said first transceiver, through said optical fiber, a second optical signal having a second wavelength at a second pre-defined transmitted power level,
e) modulating, on said second optical signal, information identifying said second pre-defined transmitted power level and said measured first received power level,
at said first transceiver:
f) during step d), measuring said second wavelength of said second optical signal received,
g) during step d), measuring a second received power level from said second optical signal, wherein said second optical signal received is compensated with a wavelength sensitivity information of said first transceiver related to said measured wavelength of said second optical signal,
h) during step e), demodulating said information identifying said second pre-defined transmitted power level and said first measured received power level,
i) calculating first transceiver to second transceiver attenuation of said optical fiber using value of said first pre-defined transmitted power level and said demodulated information identifying said first received power level,
j) calculating second transceiver to first transceiver attenuation of said optical fiber using said demodulated information identifying said second pre-defined transmitted power level and said measured second power level.

5,592,285

OPTICAL SOURCE POSITION AND DIRECTION SENSOR

Marvin L. Pund, 14529 Amstell Ct., Chesterfield, Mo. 63017

Filed Dec. 12, 1995, Ser. No. 571,084
Int. Cl.[6] G01B *11/00*
U.S. Cl. 356—121 **9 Claims**



1. A sensor for determining the lateral position and direction of the power centroid of an optical radiation ray bundle comprising:
means for defining said optical radiation ray bundle, including a first aperture and a second aperture substantially separated from said first aperture;

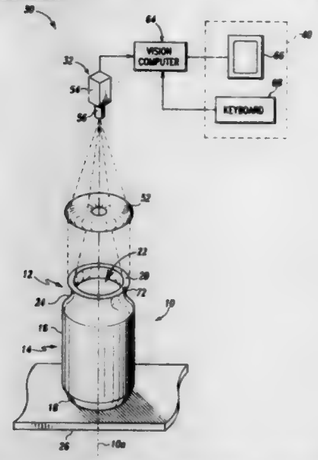
means for performing a first power centroid measurement of said optical radiation ray bundle at a first aperture object and for performing a second power centroid measurement of said optical radiation ray bundle at a second aperture object;
means for computing, from said first power centroid measurement and said second power centroid measurement, the direction and lateral position of the power centroid of said optical radiation ray bundle in any object plane.

5,592,286

CONTAINER FLANGE INSPECTION SYSTEM USING AN ANNULAR LENS

Richard L. Fedor, Mantua, Ohio, assignor to Alltrista Corporation, Muncie, Ind.

Filed Mar. 8, 1995, Ser. No. 400,359
Int. Cl.[6] G01N *21/00;* **H04N** *7/18;9/47*
U.S. Cl. 356—240 **27 Claims**



1. An inspection apparatus for inspecting a circular container, the apparatus comprising:
means for producing an enlarged image of an upper surface of the container, and
means for capturing and processing the enlarged image,
wherein the producing means includes an annular lens with a annular convex portion which increases in thickness from its inner periphery positioned between the container and the capturing and processing means.

5,592,287

Patent Not Issued For This Number

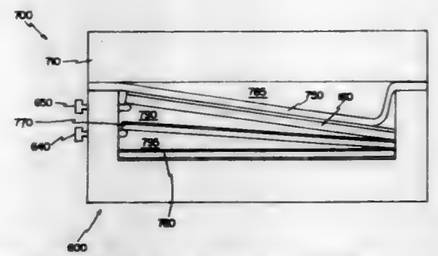
5,592,288

METHOD AND APPARATUS FOR PRE-ASSEMBLING OPTICAL COMPONENTS FOR USE WITH LIQUID CRYSTAL DISPLAYS

James D. Sampica, Cedar Rapids; Melvin L. Campbell, Marion; Donald L. Benn, Cedar Rapids, and Brian K. Smith, Marion, all of Iowa, assignors to Rockwell International Corp., Seal Beach, Calif.

Filed Apr. 28, 1995, Ser. No. 430,966
Int. Cl.[6] G02F *1/1335*
U.S. Cl. 356—62 **11 Claims**

1. A method of securing a first rigid optical component having a substantially planar surface to a second rigid optical component



having a substantially planar surface to create an optical component assembly for use with a liquid crystal display, the method comprising:
placing the first rigid optical component into a cavity;
placing the second rigid optical component into the cavity such that the substantially planar surface of the first rigid optical component and the substantially planar surface of the second rigid optical component face one another, the substantially planar surface of at least one of the first and second rigid optical components including an adhesive material attached thereto such that the adhesive material is positioned between the substantially planar surfaces of the first and second rigid optical components, wherein the second rigid optical component is supported by a first support device such that a first end of the second rigid optical component is prevented from contacting a corresponding first end of the first rigid optical component, a first chamber being formed between the substantially planar surface of the second rigid optical component and the substantially planar surface of the first rigid optical component;
evacuating air from the first chamber;
removing the support of the first support device so that the first end of the second rigid optical component comes into contact with the first end of the first rigid optical component such that the substantially planar surface of the first rigid optical component and the substantially planar surface of the second rigid optical component are positioned parallel to one another with the adhesive material sandwiched therebetween; and
applying a force to at least one of the first and second rigid optical components, the force being directed such that the substantially planar surface of one of the first and second rigid optical components is urged toward the substantially planar surface of the other of the first and second rigid optical components.

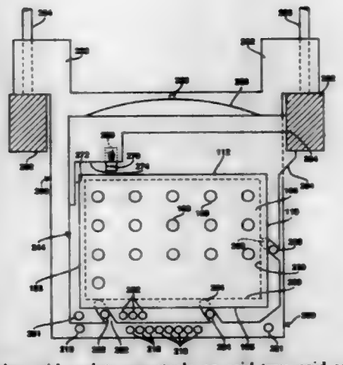
5,592,289

SELF-ALIGNING MECHANISM FOR POSITIONING ANALYTE RECEPTACLES

Michael C. Norris, Los Gatos, Calif., assignor to Molecular Dynamics, Sunnyvale, Calif.

Filed Jan. 9, 1995, Ser. No. 370,486
Int. Cl.[6] G01N *21/01*
U.S. Cl. 356—244 **20 Claims**

1. A mechanism for positioning an analyte receptacle with respect to a measuring instrument, said mechanism comprising:
a carriage retractably supported in a structure, said carriage includes at least three guide members and at least one stop member, rigidly attached to said carriage; and
a tray movably coupled to said carriage, said tray comprises at least three slots capable of engaging said at least three guide members, at least one biasing device comprising a spring and being preloaded against said at least one stop member, a protuberance for contacting said structure, and a pair of contact surfaces capable of pushing said analyte receptacle against said at least three guide members, and wherein said tray is demountably coupled to said carriage, and wherein said protuberance contacts said structure when said carriage is protracted from said structure, thereby displacing said tray along said at least three guide members to provide an area for



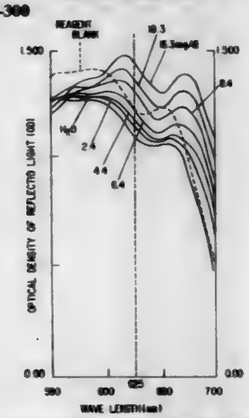
placing said analyte receptacle on said tray, said area being defined by said at least three guide members and said pair of contact surfaces.

5,592,290

METHOD FOR CORRECTING INSTRUMENTAL ERROR OF SPECTROSCOPE OF OPTICAL ANALYZER

Fuminori Arai; Yoshikazu Amano, and Kiyoshi Yamada, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 14, 1994, Ser. No. 358,486
Claims priority, application Japan, Nov. 12, 1993, 5-307332
Int. Cl.[6] G01J *3/00*
U.S. Cl. 356—300 **6 Claims**



1. A method for correcting an optical density measurement having an instrumental error, the optical density measurement to be corrected being of a sample using a first optical analyzer having an unknown instrumental error, said sample being prepared from a dry analysis element containing a first dye having an absorption spectrum and having been contacted with a sample solution containing an analyte, the method comprising the steps of:

selecting a standard color plate of a second dye selected from the group consisting of:

a reference dye which is the same as said first dye; and

a dye which has an absorption spectrum similar to the absorption spectrum of said first dye;

measuring and recording a standard optical density of said standard color plate using a second optical analyzer having a known instrumental error;

measuring and recording the optical density of said standard color plate using said first optical analyzer to be tested;

measuring and recording the optical density of said sample using said first optical analyzer to obtain said,optical density measurement to be corrected;

calculating a corrected optical density of said prepared sample using the equation:

$$OD_C=(OD_{ST}/OD_M)\times OD_S;$$

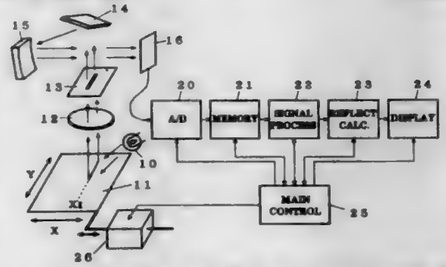
where OD_C represents said corrected optical density, OD_{ST} represents said optical density of said standard color plate as measured by said second optical analyzer, OD_M represents the optical density of said standard color plate as measured by said first optical analyzer, and OD_S represents the optical density of said sample as measured by said first optical analyzer.

5,592,291

SPECTROPHOTOMETER

Atsuhiro Iida, Nagaokakyo, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed May 21, 1996, Ser. No. 651,859
Claims priority, application Japan, May 23, 1995, 7-149577
Int. Cl.[6] G01J *3/36*
U.S. Cl. 356—326 **4 Claims**



1. A spectrophotometer for carrying out a spectral analysis of a two-dimensional target area of a sample, comprising:

moving means for moving the sample in a first direction;

a slit having a length in a second direction which is perpendicular to the first direction;

a dispersing element for dispersing light from each point of the slit in a third direction which is perpendicular to the second direction;

a photo-detector consisting of a plurality of photocells arrayed two-dimensionally in the second direction and in the third direction;

sampling means for receiving a signal from the photo-detector, for generating digital data of each point of a three-dimensional space corresponding to the first, the second and the third directions, and for saving the digital data to a memory while the sample is moved; and

arithmetic operating means for reading out data from the memory and for correcting data of a target point in the three-dimensional space using data of a plurality of points in a proximity of the target point in a two-dimensional space of the first and the second directions.

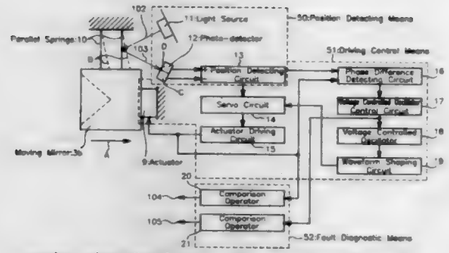
5,592,292

INTERFERENCE SPECTROMETER WITH A MOVING MIRROR

Tomoaki Nanko; Takeo Tanaami, and Kenta Mikuriya, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Dec. 12, 1994, Ser. No. 353,679
Claims priority, application Japan, Jan. 19, 1994, 6-004116
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—356 **7 Claims**

1. An interference spectrometer which causes an interference by dividing an output light from a light source into two optical paths and by changing a length of each optical path, said spectrometer comprising:



a moving mirror for changing said optical path lengths;

a pair of parallel leaf springs for supporting said moving mirror;

position detecting means for detecting a position of said moving mirror, said position detecting means comprising means for transmitting a signal to one of said pair of parallel leaf springs and means for detecting another signal reflected by said one of said pair of parallel leaf springs; and

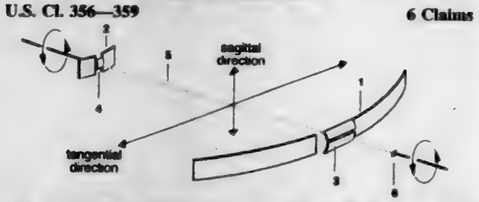
driving control means for controlling position of said moving mirror by driving said moving mirror at a natural frequency of a spring system comprising said moving mirror and said pair of parallel leaf springs, and based on an output of said position detecting means.

5,592,293

SCANNING TOMOGRAPHICAL IMAGING TELESCOPE

Moishe Garfinkle, P. O. Box 15855, Philadelphia, Pa. 19103

Continuation-in-part of Ser. No. 8, Jan. 4, 1993, abandoned.
This application Oct. 24, 1994, Ser. No. 328,109
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—359 **6 Claims**



1. An imaging instrument comprising reflecting means and a focal plane sharing a common optical axis, said reflecting means and focal plane essentially orthogonal to, and in synchronous rotation about, said optical axis,

said reflecting means comprising a plurality of tangential plano-cylindrical reflectors and a plurality of sagittal plano-cylindrical reflectors, said tangential reflectors essentially orthogonal to said sagittal reflectors and to said common optical axis,

whereupon said tangential reflectors intercept the incident flux from an object and focus said flux on the focal plane solely in the tangential plane and said sagittal reflectors intercept the incident flux from said object and focus said flux on said focal plane solely in the sagittal plane,

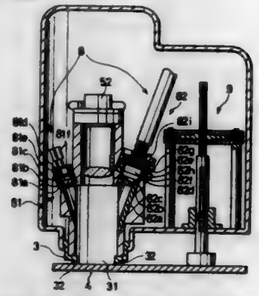
thereby providing a sequence of exposures upon rotation of said instrument about said optical axis, each said exposures with high resolution in the tangential plane and wavefront continuity at the focal plane in both the tangential and the sagittal planes using only simple-curvature reflectors, with all of the information contained in said sequence of exposures available to generate an image as it would appear at the focal plane of a circular aperture of equal tangential aperture extent wherein said tangential plano-cylindrical reflectors comprise a parabolic plano-concave primary reflector and a hyperbolic plano-convex secondary reflector and said sagittal plano-cylindrical reflectors comprise a parabolic plano-concave primary reflector and a hyperbolic plano-convex secondary reflector, said tangential and said sagittal reflectors so disposed so as to provide a tangential and a sagittal Cassegrainian optical arrangement, said tangential Cassegrainian arrangement essentially orthogonal to said sagittal Cassegrainian arrangement, thereby providing an extended focal length amenable to astronomical observations.

5,592,294

COLOR MEASURING APPARATUS WITH POSITION ADJUSTMENT

Mitsunobu Ota, Shinshiro; Wataru Yamaguchi, and Isamu Nakajima, both of Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Mar. 24, 1995, Ser. No. 410,081
Claims priority, application Japan, Mar. 30, 1994, 6-60949
Int. Cl.[6] G01J *3/50*
U.S. Cl. 356—402 **7 Claims**



1. An apparatus for measuring color of an object, the apparatus comprising:

a primary light projector which projects light to an object;

a primary photosensor which senses light which has been projected by the light projector and reflected from the object;

a calculator which calculates a color value of the object based on an output of the primary photosensor;

an angle detector which detects respective angles of the primary light projector and the primary photosensor with respect to the object;

an adjustment mechanism which adjusts the respective angles of the primary light projector and the primary photosensor; and

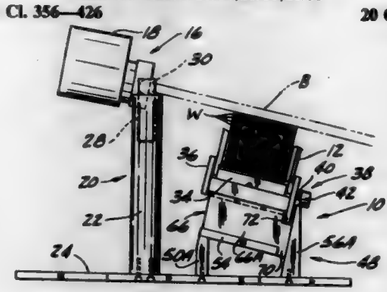
a controller which controls the adjustment mechanism based on a detection result of the angle detector so that the primary light projector and the primary photosensor come into their respective desired angles.

5,592,295

APPARATUS AND METHOD FOR SEMICONDUCTOR WAFER EDGE INSPECTION

Leslie G. Stanton, Simpsonville, and Kenneth Krause, Clemson University, both of S.C., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed May 8, 1995, Ser. No. 436,840
Int. Cl.[6] G01N *21/84;21/00;21/55*
U.S. Cl. 356—426 **20 Claims**



1. Apparatus for inspecting a plurality of semiconductor wafers at substantially the same time, said apparatus comprising

a holder for holding a plurality of wafers of substantially identical diameter in spaced apart parallel relation, each wafer having a center and a generally circular outer edge, said holder being adapted to hold the wafers with their centers substantially on a common axis,

a light source for projecting a well-defined columnar beam of light along a central longitudinal axis generally parallel to said common axis of the wafers and generally tangential to the edges of the wafers in the holder, and

a device for rotating the wafers while the beam is projected on the edges of the wafers to detect any imperfections in the edges of the wafers.

5,592,296

EXHAUST GAS PARTICLE SENSOR

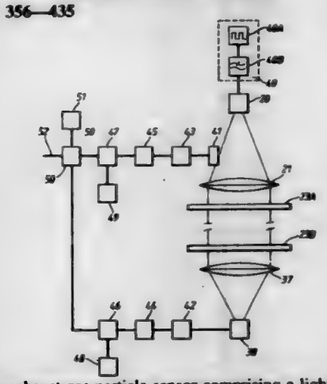
John A. Pye, Essex, United Kingdom, assignor to GEC-Marconi Limited, Middlesex, United Kingdom

Continuation of Ser. No. 963,488, Oct. 20, 1992, abandoned. This application Dec. 14, 1995, Ser. No. 574,558

Claims priority, application United Kingdom, Oct. 22, 1991, 9122361

Int. Cl.[6] G01N *21/15;21/59*

U.S. Cl. 356—435 **9 Claims**



1. An exhaust gas particle sensor comprising a light source and light sensor means in which the opacity of gas is measured by passing a light beam emitted by the light source through the gas and said particle sensor includes means for varying the intensity of the light beam emitted by the said light source in a near square wave waveform, said means for varying being coupled to said light source and comprising means for generating a pure square wave waveform and means for modifying said square wave waveform to produce said near square wave waveform as an output, said output being coupled to said light source.

5,592,297

METHOD AND APPARATUS FOR ENCODING AND DECODING DIGITAL IMAGE DATA

Etienne L. M. E. Van Dornelaer, El Sintjansteen, Netherlands, assignor to Oce-Nederland B.V., Netherlands

Continuation of Ser. No. 101,295, Aug. 3, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,512

Claims priority, application Netherlands, Aug. 6, 1992, 9201415

Int. Cl.[6] H04N *1/41*

U.S. Cl. 358—261.1 **27 Claims**

1. A method of encoding digital image data, each datum representing a pixel, wherein a series of pixels to be encoded is set according to a vertical transition in which inter-block-corresponding pixel values differ, rather than according to a horizontal transition in which intra-block-adjacent pixel values differ, the method comprising the steps of:

providing a reference block of image data;

selecting a current block of image data, the current block including at least one series of pixels;

determining a length of a series of pixels in the current block that is identical to corresponding pixels in the reference block, the length of the series being set according to a vertical transition; and

encoding at least a portion of the series as a function of the number of horizontal transitions in the series.

5,592,298

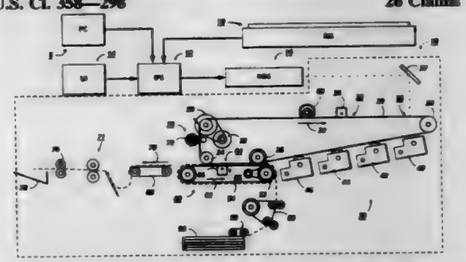
APPARATUS AND METHOD FOR DETECTING DIGITIZED IMAGE AREA COVERAGE BY COUNTING PIXELS

Angelo T. Caruso, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1994, Ser. No. 253,796

Int. Cl.[6] H04N *1/387;1/40;* **G01D** *15/14*

U.S. Cl. 358—298 **26 Claims**



1. An apparatus for estimating pixel coverage in a digitized image comprising:

a controller for sampling pixels in a byte stream according to a varied spacing mode so as to avoid image pattern errors; and

a processor, in communication with said controller, for summing the pixels in said sampled bytes, whereby said processor provides an estimate of a total number of pixels turned on in the digitized image.

5,592,299

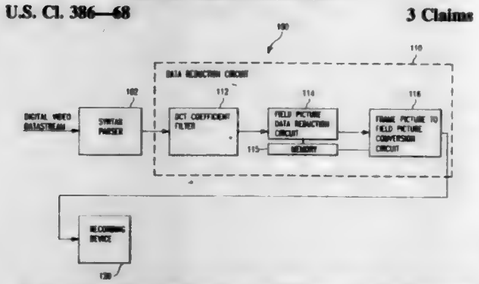
METHOD AND APPARATUS FOR REDUCING THE AMOUNT OF DATA REQUIRED TO REPRESENT A VIDEO FRAME

Jill M. Boyce, Manalapan; Frank A. Lane, Medford Lakes, both of N.J., and Larry Pearlstein, Newton, Pa., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Sep. 26, 1994, Ser. No. 311,811

Int. Cl.[6] H04N *5/76;9/79;5/78*

U.S. Cl. 386—68 **3 Claims**



1. A method of reducing the amount of data required to represent a video image, comprising the steps of:

receiving a compressed HDTV digital video data stream including a pair of field pictures, each field picture including a first field picture and a second field picture represented by digital data;

replacing one of the field pictures, in the pair of field pictures, with a third field picture represented by less digital data then the field picture being replaced, the third field picture being a transparent field;

generating header information associated with the pair of field pictures, the header information being a digital storage media control byte including a control bit set to prevent a receiver from displaying the third field picture; and

recording the first and third field pictures on a tape in a tape segment from which data can be read during fast forward operation of a digital video tape recorder.

5,592,300

METHOD AND APPARATUS FOR USING PROGRAMMING SIGNALS FOR AUTOMATIC TIME SETTINGS

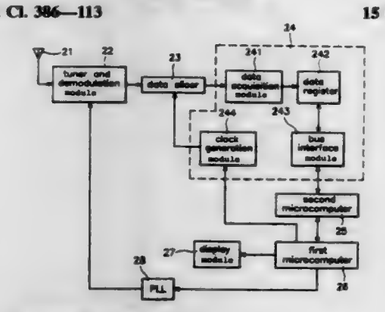
Chung H. Huh, Kyungki-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 365,924

Claims priority, application Rep. of Korea, Dec. 30, 1993, 31524/1993; Feb. 3, 1994, 2043/1994

Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—113 **15 Claims**



1. An apparatus comprising:

a clock for keeping the current time;

a receiver for receiving a signal containing television video data and time data;

means for setting the clock with the time data;

a phase locked loop for applying a synchronization signal to the receiver; and

means for changing a frequency of the synchronization signal in response to an error detection in the time data.

5,592,301

VIDEO CAMERA APPARATUS

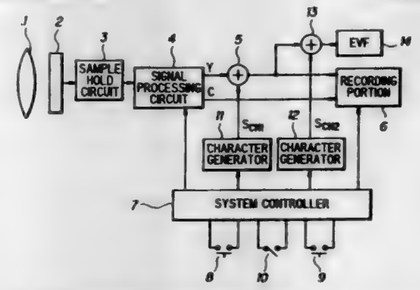
Mitsuhiro Shimada, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 152,332, Nov. 12, 1993, abandoned. This application Apr. 9, 1995, Ser. No. 420,455

Claims priority, application Japan, Nov. 12, 1992, 4-302282

Int. Cl.[6] H04N *5/225*

U.S. Cl. 386—117 **8 Claims**



1. A video camera apparatus comprising:

a lens for focusing light reflected from a scene being recorded and transmitting said light through said lens;

an image pickup device for producing an output signal indicative of said light;

a camera signal processing circuit for changing said output signal of said image pickup device to a video signal;

a video signal recording portion for recording said video signal of said camera signal processing circuit, said video signal recording portion enabling recording for at least one recording metered time period, wherein the length of said recording method time period is dependent upon a recording method utilized to record said video signal on a recording medium;

a display member for displaying a state of said video signal recording portion;

a counter for counting an operating time on said video signal recording portion;

a system controller for controlling said video signal recording portion and said display member, wherein said counter is reset when a recording of said video signal starts and counts an elapsed time for recording said video signal and wherein said display member displays an indicator which indicates said elapsed time; and

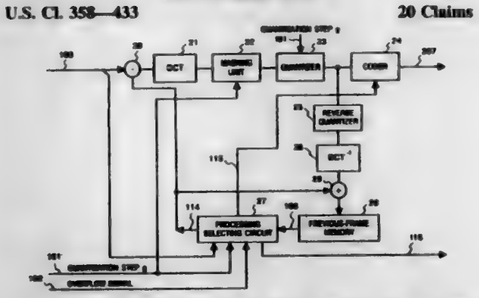
time setting means for setting a desired shot time for recording said scene selected from a range of shot times and for automatically stopping said recording when said elapsed time exceeds said shot time, wherein said desired shot time is the minimum amount of time desired for recording said scene and each of said shot times is shorter in length than said recording method time period to provide a range of available shot times which may be selected and set within said recording method time period.

5,592,302

CODING METHOD FOR CODING PIXEL BLOCKS AND APPARATUS THEREFOR

Yasuji Hirabayashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1993, Ser. No. 34,701
Claims priority, application Japan, Mar. 23, 1992, 4-064555
Int. Cl.[6] H04N *1/415*
U.S. Cl. 358—433 **20 Claims**



1. A coding method for coding image data in units of pixel blocks having a prescribed size, each of the pixel blocks constituting a picture, comprising the steps of:

a calculation step of performing a calculation by using image data in a pixel block of a picture of interest and image data in a block of another picture, and generating difference values therebetween;

an orthogonal transformation step of orthogonally transforming the difference values and generating a DC component and AC components;

a masking step of masking a part of an AC component area containing AC components generated by said orthogonal transformation step, said part being determined based on the amount of coded image data; and

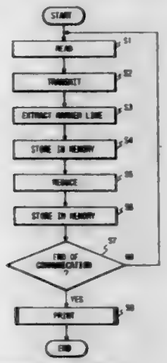
a quantizing step of quantizing the AC components processed by said masking step.

5,592,303

IMAGE COMMUNICATION APPARATUS AND METHOD WHICH EXTRACTS AND RECORDS IMAGES ON THE TRANSMISSION SIDE

Shoichi Yamaguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 200,503, Feb. 23, 1994, abandoned.
This application Dec. 18, 1995, Ser. No. 573,749
Claims priority, application Japan, Feb. 24, 1993, 5-059566; Feb. 17, 1994, 6-043232
Int. Cl.[6] H04N *1/387*
U.S. Cl. 358—435 **36 Claims**



1. A facsimile apparatus comprising:

reading means for reading an original having a plurality of pages to provide a respective plurality of image pages;

transmitting means for transmitting the plurality of image pages in a single communication to a facsimile apparatus on a reception side;

extracting means for extracting a partial image from each of the image pages, each partial image existing in an area shown by a mark image corresponding to a mark written by a marker pen on the respective page of the original;

storing means for storing the partial images extracted by said extracting means; and

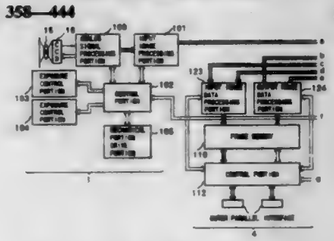
recording means for recording the partial images stored in the storing means on a recording paper.

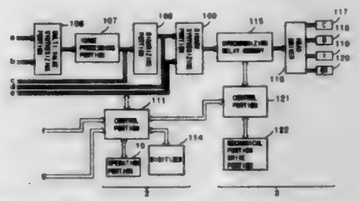
5,592,304

IMAGE PROCESSING SYSTEM IN WHICH OVERLAPPING IMAGE DATA IS DELETED FROM A FRAME MEMORY

Yutaka Udagawa, Machida; Toshihiko Otsubo, Yokohama, and Masahiro Nishio, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 777,636, Oct. 16, 1991, abandoned.
This application Jun. 22, 1994, Ser. No. 264,256
Claims priority, application Japan, Oct. 17, 1990, 2-276520
Int. Cl.[6] H04N *1/21;1/387*
U.S. Cl. 358—444 **23 Claims**





1. An image processing apparatus comprising:

generating means for generating serial-scanned image data representing a whole image, said image data having an overlap portion in a subscanning direction and having a predetermined width;

image processing means for performing image processing on a pixel of interest in said image data by using image data for pixels adjacent to the pixel of interest, said image data for pixels adjacent to the pixel of interest comprising image data from said overlap portion in a case where the pixel of interest is adjacent to said overlap portion; and

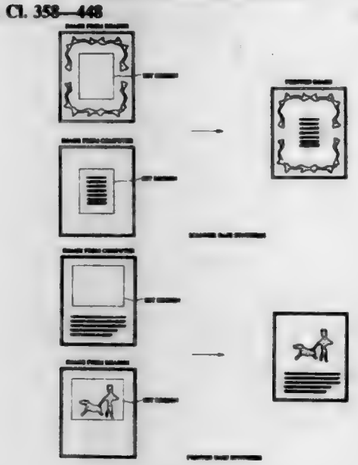
writing means for writing said image data processed by said image processing means into a memory so that said overlap portion is deleted and the whole image is stored in said memory.

5,592,305

IMAGE FORMING APPARATUS FOR SYNTHESIZING PLURAL IMAGES

Masahiro Iwadate, Yokohama; Yoshihiko Suzuki, Tokyo; Hideto Kohtani, Yokohama; Satoru Kutsuwada; Shokyo Koh, both of Kawasaki, and Ken Kuroda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1994, Ser. No. 276,787
Claims priority, application Japan, Jul. 23, 1993, 5-202602
Int. Cl.[6] H04N *1/387;1/393*
U.S. Cl. 358—448 **16 Claims**



1. An image forming apparatus comprising:

first input means for inputting image information from a computer;

second input means for inputting original document image information;

third input means for inputting region information indicating a region in which images are synthesized;

selection means for selecting one of a first mode in which said image information from said first input means is formed outside the region and the original document image information from said second input means is formed inside the region, and a second mode in which said image information from said first input means is formed inside the region and the original document image information from said second input means is formed outside the region;

synthesizing means for synthesizing the image information from said first input means and the original document image information from said second input means in accordance with the mode selected by said selection means and the region information supplied from said third input means;

image forming means for forming an image on a selected sheet in accordance with image information supplied from said synthesizing means; and

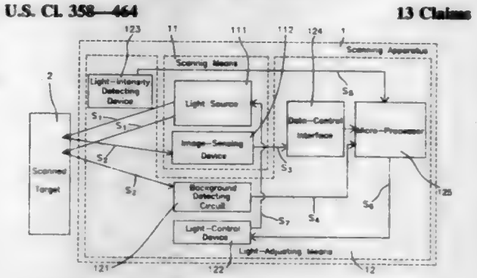
control means that inhibits an image forming operation of said image forming means when a size of an image represented by the image information supplied from said first input means and a size of the selected sheet do not coincide with each other in the first mode, and that permits said image forming means to start the image forming operation independent of a relationship between the image size of the image information supplied from said first input means and the size of the selected sheet in the second mode.

5,592,306

SCANNING APPARATUS INCLUDING A LIGHT ADJUSTING DEVICE

Andy Cheng, Hsin-Chu, Taiwan, assignor to Must Systems Inc., Hsin-Chu, Taiwan

Filed Sep. 15, 1995, Ser. No. 528,790
Int. Cl.[6] H04N *1/40*
U.S. Cl. 358—464 **13 Claims**



1. A scanning apparatus, comprising:

scanning means for emitting a light to a scanned target and receiving a reflected light from said scanned target for scanning said scanned target; and

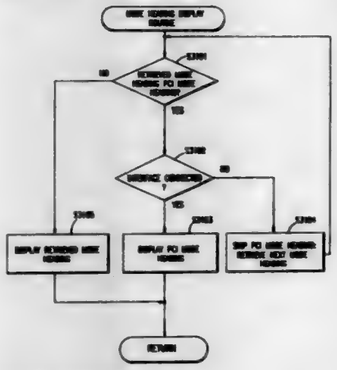
light-adjusting means electrically connected to said scanning means for adjusting said emitted light in accordance with said reflected light, said light adjusting means comprising a background detecting circuit for receiving said reflected light and generating a data signal related to background data of said scanned target, and a light-intensity detecting device installed near the emitted light for detecting an intensity of the emitted light and generating a light-intensity signal in accordance with said intensity of the emitted light.

5,592,307

FACSIMILE MACHINE WITH ERRONEOUS MODE SETTING PREVENTION FUNCTION

Suzuyo Mural, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 21, 1995, Ser. No. 505,395
Claims priority, application Japan, Jul. 28, 1994, 6-176473
Int. Cl.[6] H04N *1/32*
U.S. Cl. 358—468 **8 Claims**



1. A facsimile machine comprising:

a computer connection portion connectable to a computer;

setting means for setting modes of the facsimile machine;

display for displaying modes set via the setting means;

reception capability judgement means for judging whether the computer can receive facsimile data; and

display disable means for preventing the display from displaying modes relating to the computer connectable to the computer connection portion when the reception capability judgement means judges that the computer can not receive facsimile data.

5,592,308

OPTICAL IMAGE SCANNER

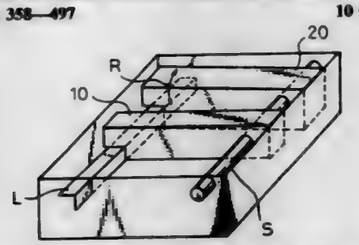
Tatsuo Fujiwara, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 24, 1994, Ser. No. 265,029

Claims priority, application Japan, Sep. 17, 1993, 5-231559

Int. Cl.[6] H04N *1/00;1/04;* **G03G** *15/28;* **H01J** *3/14*

U.S. Cl. 358—497 **10 Claims**



1. An image scanner which optically reads out image information such as figures and characters on a document surface using an optical system mounted on at least one carrier movable with respect to the image scanner body, said image scanner characterized in that: one side of said carrier is movably engaged with a fixed guide shaft extending in the moving direction of said carrier; and the other side of said carrier is guided by a bearing which rolls on a fixed guide rail disposed in parallel with said guide shaft, wherein said carrier is capable of being adjusted in the rolling direction with respect to said guide shaft when a position of said bearing with respect to said carrier is adjusted.

5,592,309

MULTIPLE LENS SEPARATION SCANNER

Michael Nagler, Tel Aviv; Haim Melman, Kfar Saba; Moshe Yanai, Alfei Menashe; Amir Kleinstern, Kiron, and Eliyahu Shalev, Kfar Saba, all of Israel, assignors to Scitex Corporation Ltd., Herzliya, Israel

Continuation of Ser. No. 652,545, Feb. 8, 1991, which is a continuation-in-part of Ser. No. 670,950, Mar. 18, 1991, Pat. No. 5,325,217, which is a continuation of Ser. No. 44,428, Apr. 30, 1987, abandoned. This application Aug. 19, 1994, Ser. No. 293,087

Claims priority, application Israel, May 2, 1986, 78675; Feb. 13, 1990, 93368

Int. Cl.[6] H04N *1/04;1/46;* **G02B** *7/02*

U.S. Cl. 358—500 **10 Claims**



1. A color separation scanner comprising:

a support arranged for mounting thereon a two-dimensional image to be scanned; and

color separation sensing means arranged for sensing said two-dimensional image to provide electrical signals representing color separations of said two-dimensional image, said color separation sensing means comprising:

a scanning head located a fixed distance from said two-dimensional image; at least first and second objective lens assemblies; and

means for selectively arranging each of said at least first and second objective lens assemblies in a respective fixed location along the optical path between said image and said scanning head, thereby providing at least corresponding first and second optical magnifications of said image onto said color separation sensing means,

wherein said scanning head comprises a plurality of generally parallel CCD arrays, and each one of said plurality of said CCD arrays is associated with dichroic filter means and said CCD arrays are disposed in different focal planes.

5,592,310

IMAGE PROCESSING METHOD AND APPARATUS

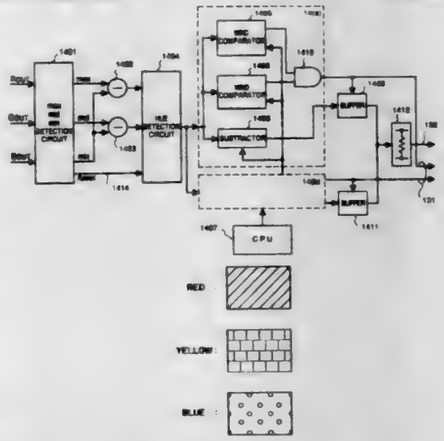
Takashi Sugiura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 888,586, May 26, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 345,327

Claims priority, application Japan, May 29, 1991, 3-124338

Int. Cl.[6] H04N *1/46*

U.S. Cl. 358—501 **22 Claims**



1. An image processing apparatus comprising:

input means for inputting a color image;

color discrimination means for discriminating a color of the color image input by said input means;

pattern generation means for generating a pattern image in accordance with the color discriminated by said color discrimination means;

difference detecting means for detecting a color difference between the color discriminated by said color discrimination means and a predetermined color; and

control means for controlling a density of the pattern image generated by said pattern generation means in accordance with the color difference detected by said difference detecting means.

5,592,311

APPARATUS FOR FORMING COLOR IMAGES HAVING REDUCED EDGE EXAGGERATION WITH HIGH RATE UNDERCOLOR REMOVAL

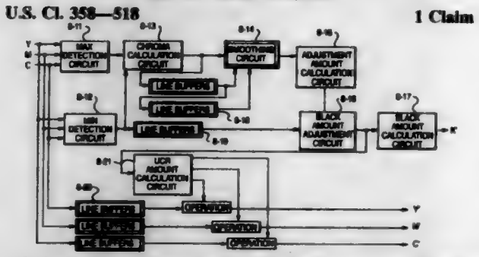
Yoshiharu Hibi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 310,742, Sep. 22, 1994, abandoned. This application Apr. 4, 1996, Ser. No. 627,395

Claims priority, application Japan, Oct. 6, 1993, 5-250424

Int. Cl.[6] H04N *1/56;1/60*

U.S. Cl. 358—518 **1 Claim**



1. A color image forming apparatus for forming a color image having a plurality of pixels with use of respective color signals for coloring materials of yellow, magenta, cyan and black for each pixel processed in forming the image, said apparatus comprising:

black amount detection means for detecting a black amount in each processed pixel to produce a color adjustment signal for each processed pixel according to the black amount detected therefor;

operation means for performing an operation on each color adjustment signal according to a detected black amount for at least one pixel adjacent to the processed pixel; and

adjustment means for adjusting a coefficient for a filtering process applied to the color adjustment signal for each processed pixel based on a result of the adjacent pixel color adjustment signal operation to suppress exaggeration of color signals for at least one of yellow, magenta and cyan coloring materials to be applied to image portions having substantial black content.

5,592,312

METHOD FOR TRANSFORMING COLOR SIGNALS

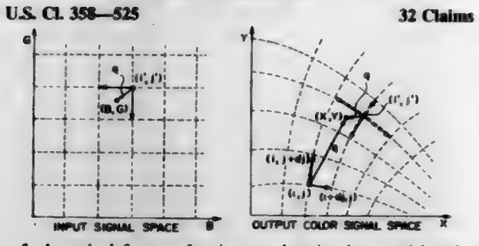
Takafumi Noguchi, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Apr. 17, 1995, Ser. No. 422,915

Claims priority, application Japan, Apr. 18, 1994, 6-078584

Int. Cl.[6] H04N *1/46*

U.S. Cl. 358—525 **32 Claims**



1. A method for transforming a color signal, comprising the steps of:

(a) creating a look-up table storing a plurality of three-dimensional input signal components and a plurality of corresponding three-dimensional output color signal components, each of which is obtained with one of the three-dimensional input signal components;

(b) transforming a target output color signal component into a three-dimensional input signal component of said plurality of three-dimensional input signal components by referring to the look-up table; and

(c) interpolating the three-dimensional input signal component corresponding to the target output color signal component, which is not stored in the look-up table, with an interpolating process from a plurality of the three-dimensional input signal components corresponding to a plurality of the three-dimensional output color signal components, which are stored in the look-up table and which are close to the target output color signal component, said linear interpolating process including,

(c1) designating the plurality of the three-dimensional input signal components stored in the look-up table as lattice points in a three-dimensional input signal space, and designating the plurality of the three-dimensional output color signal components stored in the look-up table as lattice points in a three-dimensional output color signal space,

(c2) setting a certain appropriate origin and three linearly independent vectors in said three-dimensional output color signal space,

(c3) originating said three linearly independent vectors from said origin, a local coordinate system being thereby constituted in said three-dimensional output color signal space,

(c4) transforming a difference between the target output color signal component and said origin into local coordinates in said local coordinate system in said three-dimensional output color signal space,

(c5) updating said origin and said three linearly independent vectors by utilizing said local coordinates in said three-dimensional output color signal space,

(c6) repeating steps (c3)-(c5), a plurality of times, thereby determining a new local coordinate system and new coordinates in said three-dimensional output color signal space, and

(c7) taking a point, which is in a local coordinate system in said three-dimensional input signal space, the local coordinate system corresponding to said new local coordinate system in said three-dimensional output color signal space, and which is represented by said new coordinates, as a resultant three-dimensional input signal component, which corresponds to the target output color signal component.

5,592,313

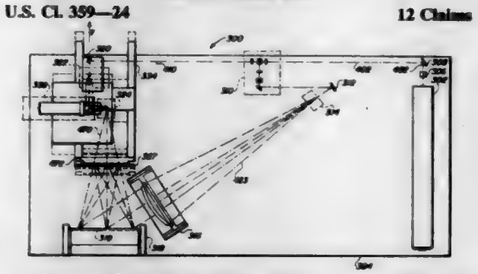
METHODS AND APPARATUS FOR MAKING HOLOGRAMS

Stephen J. Hart, San Clemente, Calif., assignor to Voxel, Laguna Hills, Calif.

Continuation of Ser. No. 982,316, Nov. 27, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,568

Int. Cl.[6] G03H *1/26*

U.S. Cl. 359—24 **12 Claims**



1. A method for making a composite hologram, comprising the steps of:

pre-processing data comprising two-dimensional images;

providing a thin, substantially planar, photo-sensitive substrate having a first surface;

providing a reference beam at a first angle with respect to said first surface and an object beam at a second angle with respect to said first surface;

consecutively illuminating a plurality of two-dimensional images by said object beam while maintaining said object beam at said second angle with respect to said first surface, wherein said plurality of images comprises at least twenty images;

consecutively exposing said substrate to said two-dimensional images and said reference beam to superimpose a plurality of holograms corresponding to said two-dimensional images onto said substrate, while maintaining said object beam at said second angle with respect to said first surface; and

photo-processing said substrate to develop said plurality of holograms.

5,592,314

TUNABLE WAVELENGTH FILTER FORMED BY 2 LCDS IN SERIES HAVING OPPOSITE TWIST ANGLES OF N*π/2 AND A DIELECTRIC MIRROR LAYER ON EACH SUBSTRATE

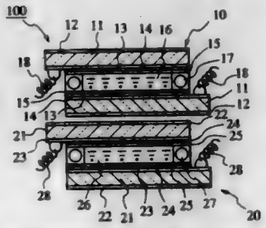
Yasuyuki Ogasawara, and Yoshihiko Watanabe, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 1, 1994, Ser. No. 353,205

Claims priority, application Japan, Dec. 2, 1993, 5-303042; Jun. 13, 1994, 6-130516

Int. Cl.[6] G02F 1/1335;1/1347;1/13; G01B 9/02

U.S. Cl. 349—18 **6 Claims**



1. A tunable wavelength filter of liquid crystal étalon type, said filter comprising:

a first liquid crystal layer including two first glass substrates arranged oppositely from each other, each of said first glass substrates having an opposed surface on which a transparent electrode, a dielectric mirror and an alignment layer are coated in order, said first liquid crystal layer further including a liquid crystal interposed between said opposing alignment layers of said first glass substrates, molecule alignment of said liquid crystal being twisted by nπ/2 radian to one twisting direction where n is a positive uneven number; and

a second liquid crystal layer including two second glass substrates arranged oppositely from each other, each of said second glass substrates having an opposed surface on which a transparent electrode, a dielectric mirror and an alignment layer are coated in order, said second liquid crystal layer further including another liquid crystal interposed between said opposing alignment layers of said second glass substrates, molecule alignment of said liquid crystal being twisted by −nπ/2 radian to said twisting direction where n is a positive uneven number;

wherein said first and second liquid crystal layers are laid to overlap each other so that an axis of liquid crystal molecules on the emission side of said first liquid crystal layer is perpendicular to an axis of liquid crystal molecules on the incidence side of said second liquid crystal layer.

5,592,315

LIQUID CRYSTAL DEVICE AND LIQUID CRYSTAL APPARATUS

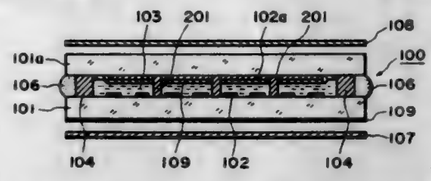
Kazuharu Katagiri, Tama; Kazuo Yoshinaga, Machida; Shinjiro Okada, Isehara, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 420,312, Apr. 10, 1995, which is a division of Ser. No. 191,929, Feb. 4, 1994, which is a division of Ser. No. 34,827, Mar. 18, 1993, Pat. No. 5,311,343, which is a continuation-in-part of Ser. No. 863,781, Apr. 6, 1992, Pat. No. 5,301,049, which is a continuation-in-part of Ser. No. 251,028, Sep. 26, 1988, Pat. No. 5,120,466, which is a continuation of Ser. No. 750,295, Jul. 1, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 476,038

Claims priority, application Japan, Jul. 13, 1984, 59-146211; Jul. 14, 1984, 59-146498; Sep. 12, 1984, 59-190789; Sep. 12, 1984, 59-190790; Sep. 14, 1984, 59-192920

Int. Cl.[6] G02F 1/13;1/1343

U.S. Cl. 349—126 **24 Claims**



1. A liquid crystal device, comprising: a pair of substrates, and a chiral smectic liquid crystal disposed between the pair of substrates; only one of said pair of substrates having been subjected to a uniaxial aligning treatment; said chiral smectic liquid crystal comprising at least one liquid crystal compound having a temperature range where it assumes smectic phase, and an optically active substance.

5,592,316

METHOD OF MAKING AN ELECTRO-OPTIC DISPLAY DEVICE WITH POROUS SUB-LAYER

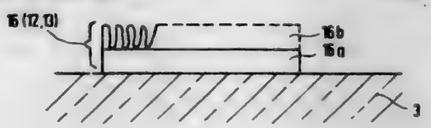
Teunis J. Vink, and Willem Walrave, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1993, Ser. No. 116,381

Claims priority, application European Pat. Off., Sep. 8, 1992, 92202711

Int. Cl.[6] G02F 1/1333;1/1335;1/13

U.S. Cl. 349—187 **14 Claims**



1. A method of providing a supporting plate with a metal pattern which is light-reflective at the side facing the supporting plate and light-absorbing at the other side, the metal pattern having a porous upper layer, the method comprising depositing the metal by sputtering, increasing the sputtering pressure during deposition to provide the porous upper layer, and etching the porous upper layer after sputtering.

8. A method of providing a supporting plate with a metal pattern which is light-reflecting at the side facing the supporting plate and light-absorbing at the other side, the metal pattern having a porous upper layer, the method comprising depositing the metal by sputtering, increasing the sputtering pressure during deposition to provide the porous upper layer, and oxidizing the porous upper layer after sputtering.

5,592,317

CHROMIUM BLANKS FOR FORMING BLACK MATRIX-SCREEN AND COLOR FILTER FOR LIQUID CRYSTAL DISPLAY

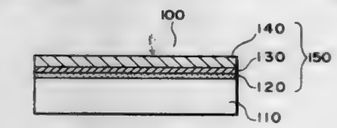
Junji Fujikawa; Yukio Iimura; Masahiro Takahashi; Takashi Nishimoto; Hiroyuki Matsui, and Masanobu Fujita, all of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

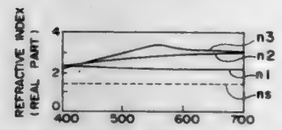
Filed Dec. 21, 1995, Ser. No. 576,138

Claims priority, application Japan, Dec. 22, 1994, 6-335383

Int. Cl.[6] G02F 1/1335; G03F 1/00

U.S. Cl. 349—110 **12 Claims**





1. A blank for forming a black matrix-screen, comprising:

a transparent substrate; and

a laminated film formed by sequentially forming a first antireflection film, a second antireflection film and a screening film in that order on one major surface of the transparent substrate;

said transparent substrate and the first antireflection film, the second antireflection film and the screening film meeting in the substantially entire visible wavelength range an inequality:

$$n_s<n_1n_2<n_3$$

where n_s is the refractive index of the transparent substrate, n_1 is the real part of the complex index of refraction of the first antireflection film, no is the real part of the complex index of refraction of the second antireflection film, and n_3 is the real part of the complex index of refraction of the screening film.

5,592,318

LIQUID CRYSTAL DISPLAY APPARATUS HAVING AN INORGANIC FILLER BETWEEN PIXEL ELECTRODES AND A METHOD FOR PRODUCING THE SAME

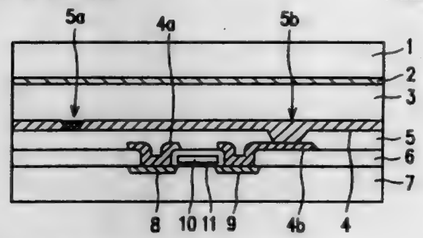
Kenji Majima, Matsubara, and Yoshitaka Yamamoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jun. 7, 1994, Ser. No. 255,709

Claims priority, application Japan, Jun. 7, 1993, 5-136228

Int. Cl.[6] G02F 1/1333;1/1343

U.S. Cl. 349—122 **7 Claims**



1. A liquid crystal display apparatus including:

a first substrate having a silicon layer on the surface thereof;

a transparent second substrate placed so as to face the silicon layer; and

a liquid crystal layer sandwiched between the first substrate and the second substrate,

wherein the first substrate includes a plurality of switching elements formed in the silicon layer, a protective layer formed on the surface of the first substrate so as to cover the switching elements, a plurality of reflective pixel electrodes with gaps therebetween formed in a matrix on the protective layer, and a filler for filling the gaps, and

wherein a surface of the filler and surfaces of the reflective pixel electrodes are polished to form mirror finished surfaces, and the surface of the filler is formed so as to be at the same level as that of the surfaces of the reflective pixel electrodes, and wherein the filler is an inorganic material.

5,592,319

ALL-OPTICAL SIGNAL PROCESSING APPARATUS OF NON-LINEAR FIBER LOOP MIRROR TYPE

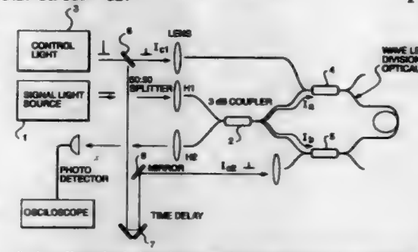
Hak-Kyu Lee; Kyong-Hon Kim; Seo-Yeon Park, and El-Hang Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-Shi, Rep. of Korea

Filed Dec. 20, 1994, Ser. No. 360,140

Claims priority, application Rep. of Korea, Apr. 13, 1994, 94-7777

Int. Cl.[6] H04J 14/02

U.S. Cl. 359—127 **1 Claim**



1. An all-optical signal processing apparatus of a non-linear fiber loop mirror type including a three dB optical fiber coupler for dividing a light signal inputted from a light signal source into two light signals in a proportion of 50:50, a first wave length division optical fiber coupler for receiving an adjusting light signal produced by an adjusting light source via a sagnac interferometer having an optical fiber loop, and a second wave length division optical fiber coupler for receiving the adjusting light signal from the sagnac interferometer, said apparatus further comprising:

a light divider for dividing said adjusting light signal received from the adjusting light source into two adjusting light signals I_{c1} and I_{c2} in a proportion of 50:50; and

a delay line for delaying one of said two adjusting light signals for a predetermined time so as to set a time difference between one of said two adjusting light signals and another light signal; said delay line comprises a delay device for time delaying said one adjusting light signal received from the light divider and a mirror for outputting said one adjusting light signal after being time delayed by the delay device to the second wave length division optical fiber coupler.

5,592,320

SATELLITE COMMUNICATIONS SYSTEM

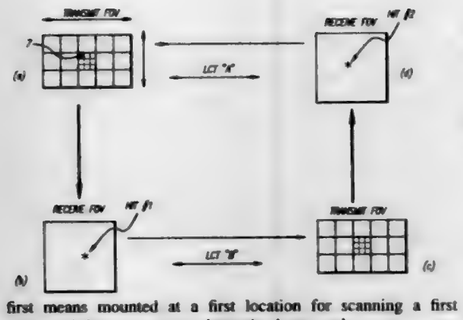
Alan B. Wissinger, Wilton, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 15, 1994, Ser. No. 260,152

Int. Cl.[6] H04B 10/00

U.S. Cl. 359—159 **19 Claims**

1. In an optical communication system, an improved system for acquiring and tracking an optical beam, the improved system comprising:



first means mounted at a first location for scanning a first transmit beam over a predetermined area and

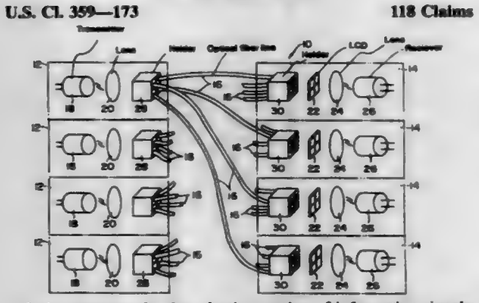
second means mounted at a second location for detecting the first transmit beam and providing a first signal in response thereto indicative of the scan position of the first transmit beam at a time that the first transmit beam is detected by the second means, said first signal further providing an indication of the time at which the first transmit beam was detected by the second means, and said second means further including means for modulating a second transmit beam with the first signal.

5,592,321

APPARATUS FOR SELECTIVE ROUTING OF INFORMATION SIGNALS

David Elberbaum, Tokyo, Japan, assignor to Elbex Video, Ltd., Tokyo, Japan

Filed Apr. 13, 1995, Ser. No. 421,615
Int. Cl.[6] H04B *10/12*
U.S. Cl. 359—173 **118 Claims**



1. An apparatus for the selective routing of information signals, comprising:

a plurality of transmitting means, each having a transmitter for transmitting an information signal by converting said information signal into a light signal;

a plurality of fiber optic lines for carrying said light signal from said transmitting means, each fiber optic line respectively corresponding to one of said transmitting means; and

at least one receiving means for selectively receiving said light signal carried by said fiber optic lines;

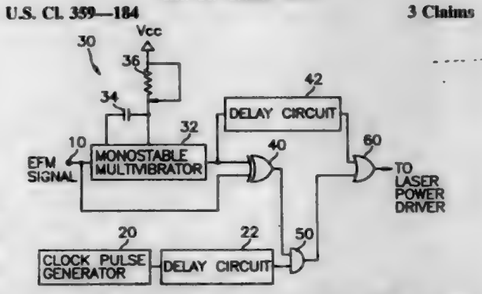
wherein said receiving means includes a liquid crystal panel having a plurality of light passing areas the optical transmission properties of said plurality of light passing areas being individually controlled, receiving light from said fiber optic lines, each light passing area respectively corresponding to one of said fiber optic lines, a receiver for generating an electrical signal from the light passing through said liquid crystal panel, add a selection means for individually controlling said light passing areas for selecting any of said light passing areas to be switched on so as to selectively connect, by said fiber optic lines, said transmitting means and said receiving means in any arbitrary combination with each other.

5,592,322

LASER BEAM MODULATION APPARATUS

Jung-Gyu Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 5, 1995, Ser. No. 524,012
Int. Cl.[6] H04B *10/04*
U.S. Cl. 359—184 **3 Claims**



1. A laser beam modulation apparatus for controlling a laser beam, wherein the laser beam is controlled by on-time and off-time intervals of a data modulated signal to be recorded on a rewritable optical disk, wherein the apparatus comprises:

means for generating a pulse modulation prohibition window signal having a first window pulse width of a fixed time period in synchronization with each of positive-directional transitions of the data modulated signal, wherein the pulse modulation prohibition window signal prohibits the pulse modulation of the data modulated signal during the first window width of the fixed time period;

means for logically combining the pulse modulation prohibition window signal and the data modulated signal during the on-time interval using an exclusive addition to produce a pulse modulation permission window signal having a second window pulse width, wherein the pulse modulation permission window signal allows the modulation of the data modulated signal during the second window pulse width;

means for generating a clock pulse having a predetermined period;

means for performing a logical multiplication on the clock pulse and the pulse modulation permission window signal to produce a pulse modulated signal; and

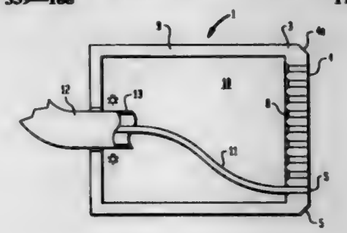
means for performing a logical addition of the pulse modulated signal and the pulse modulation prohibition window signal to produce a laser beam control signal.

5,592,323

APPARATUS FOR TRANSMITTING DATA

Klaus Wolter, and Dieter Henke, both of Friedrich-Wilhelm-Str. 32, 40625 Duesseldorf, Germany

PCT No. PCT/EP93/03089, § 371 Date Jun. 20, 1995, § 102(e) Date Jun. 20, 1995, PCT Pub. No. WO94/10594, PCT Pub. Date May 11, 1994
PCT Filed Oct. 28, 1993, Ser. No. 428,168
Claims priority, application Germany, Oct. 30, 1992, 42 36 704.2
Int. Cl.[6] H04B *10/04;10/12;10/00*
U.S. Cl. 359—188 **17 Claims**



1. An apparatus for transmitting multi-bit data words by means of optical waveguides comprising:

a data transmission line having optical waveguides,

a first coupling element connected to said data transmission line, said first coupling element receiving said optical waveguides to form a first group of optical waveguides,

a second coupling element which can be detachably coupled with said first coupling element, said second coupling element having opto-transmitters, light-sensitive sensors, and a second group of optical waveguides,

wherein said first and second coupling elements are each provided with feed-through openings which are mutually flush in the coupled condition, and in which the end surfaces of said first group of optical waveguides are associated with the end surfaces of said opto-transmitters, said light-sensitive sensors, and said second group of optical waveguides,

wherein said first and second coupling elements are each provided with feed-through openings corresponding to at least the number of bits of said multi-bit data words when transmitted in parallel, and wherein said optical waveguides of said data transmission line are arranged as an optical waveguide bundle within a common oversheath,

wherein said light-sensitive sensors are arranged in a partial number of said feed-through openings of said second coupling element, said light-sensitive sensors being connected to a circuit which comprises a complementary pair of transistors with compensating temperature characteristics, said transistors functioning as an emitter follower and a voltage amplifier, respectively,

wherein said opto-transmitters are arranged in a further partial number of said feed-through openings of said second coupling element, and

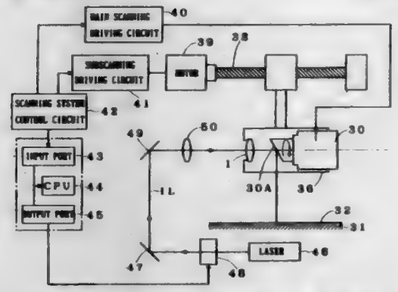
wherein said second group of optical waveguide sensors are arranged in a further partial number of said feed-through openings of said second coupling element.

5,592,324

CYLINDRICAL INNER SURFACE SCANNER AND IMAGING CONTROL METHOD IN CYLINDRICAL INNER SURFACE SCANNER

Yukihiko Inagaki, Kamikyo-ku, and Hideki Matsuura, Minami-ku, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 22, 1994, Ser. No. 310,716
Claims priority, application Japan, Sep. 22, 1993, 5-259036
Int. Cl.[6] G02B *26/08*
U.S. Cl. 359—210 **9 Claims**



1. A cylindrical inner surface scanner for scanning a plate material being mounted on an inner surface of a cylindrical surface drum having a hollow shape provided with a cylindrical inner surface in a main scanning direction with a light beam being incident upon said cylindrical inner surface drum by a deflector mounted on a scanning head movable in a subscanning direction being parallel to a central axis of said cylindrical inner surface drum for exposing said plate material, thereby producing a printing plate, said cylindrical inner surface scanner comprising:

means (a) for inputting a command signal indicating thickness of said plate material being actually mounted on said inner surface; and

means (b) being arranged on an optical path of said light beam being incident upon said deflector and movable in said subscanning direction integrally with said deflector, for imaging said incident light beam on an exposure surface of said plate material on the basis of said command signal;

said means (b) comprising means (b-1) to receive said command signal for generating a control signal providing a driving quantity that is required for positioning an image of said light beam on said exposure surface of said plate material, and

means (b-2) arranged on said scanning head and comprising:

a lens (b-2-1) for focusing said light beam on said exposure surface of said plate material,

a holder (b-2-2) for holding said lens, and

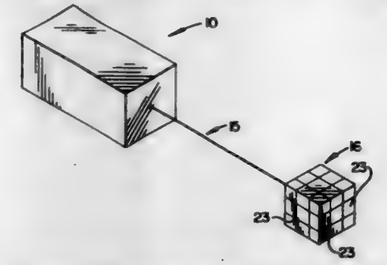
driving means (b-2-3) which upon receiving said control signal, generates a driving force in the subscanning direction to be applied to said holder and thereby images said light beam on said exposure surface of said plate material.

5,592,325

METHOD AND APPARATUS FOR LASER BEAM MANAGEMENT WITH FREQUENCY CONVERTING COMPOUNDS

Timothy J. Dodge, Pineville; Thomas E. Iradi, Matthews, and Divya C. Patel, Pineville, all of N.C., assignors to Litton Systems, Inc., Charlotte, N.C.

Filed Jul. 29, 1994, Ser. No. 282,899
Int. Cl.[6] G02F *1/35*
U.S. Cl. 359—326 **34 Claims**



1. A beam dump for dissipating the beam and associated energy from laser electromagnetic radiation, said beam dump comprising a solid polygon formed of a polycrystalline nonlinear frequency converting harmonic generation compound.

5,592,326

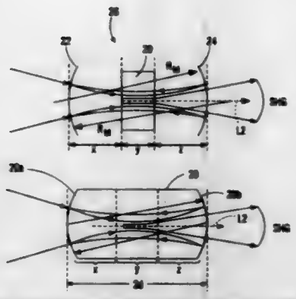
DEVICE AND METHOD FOR WAVELENGTH CONVERSION

Yoichi Taira, Tokyo-to, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1995, Ser. No. 489,189
Claims priority, application Japan, Oct. 28, 1994, 6-3054885
Int. Cl.[6] G02F *1/39*
U.S. Cl. 359—326 **2 Claims**

1. A wavelength conversion device for conversion of light from a light radiation source that radiates light of a fundamental wavelength, comprising:

a nonlinear optical material having an index of refraction n2, a first flat outer face located so as to be irradiated by incident light from the source, and a second flat outer face parallel to said first flat outer face and spaced therefrom a distance y, the nonlinear optical material outputting both the incident light of a fundamental wavelength and light of at least one converted wavelength differing from the fundamental wavelength through said second outer flat face;



a light reflection-transmission mirror having a radius of curvature R greater than the curvature of the wavefront of the light from the source and spaced from said second outer face of said nonlinear optical material by a distance z for reflecting light of the fundamental wavelength from said nonlinear optical material so that the reflected beam diverges and the cross-sectional beam shape of said reflected fundamental wavelength light differs from that of the incident light, and for transmitting light of the converted wavelength; and

a light reflection mirror located between said first outer face of said nonlinear optical material and the light radiation source and spaced from said first outer face by a distance x, the light reflection mirror having a radius of curvature R, for reflecting back the light reflected by said reflection-transmission mirror so that said reflected back light

converges along an optical path generally coincident with the optical path of said incident light of the fundamental wavelength, the space between the mirrors and the nonlinear optical material being occupied by a medium having an index of refraction n1 and the radius of curvature R of the mirrors being generally equal to x+y(n1/n2)+z, whereby the converging beam reflected back by said light reflection mirror has a cross-sectional beam shape generally equal to that of the incident light of the fundamental wavelength from the source.

5,592,327

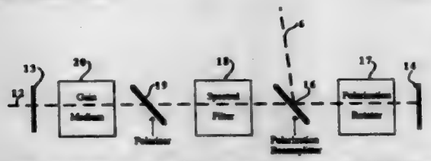
REGENERATIVE AMPLIFIER INCORPORATING A SPECTRAL FILTER WITHIN THE RESONANT CAVITY

Edward F. Gabl, Saline; David R. Walker, and Yang Pang, both of Ann Arbor, all of Mich., assignors to Clark-MXR, Inc., Dexter, Mich.

Continuation-in-part of Ser. No. 358,023, Dec. 16, 1994, abandoned. This application Dec. 29, 1995, Ser. No. 581,045

Int. Cl.[6] H01S *3/00;3/08*

U.S. Cl. 359—348 **19 Claims**



1. An amplifier for amplifying seed pulses, the seed pulses having energy in a band of wavelengths and characterized by a center wavelength comprising:

a resonant cavity:

a gain medium in said resonant cavity characterized by a gain bandwidth that at least partially overlaps the band of wavelengths of the seed pulses; and

a spectral filter within the resonant cavity for passing a band of wavelengths that at least partially overlaps the gain bandwidth and the band of wavelengths of the seed pulse and selected to introduce losses as a function of wavelength into the cavity that filter out excess bandwidth and thereby prevent damage due to self-focusing.

5,592,328

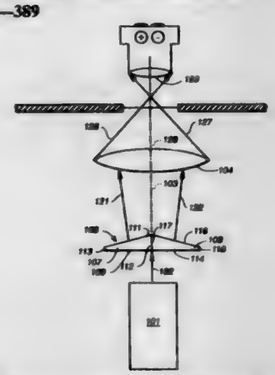
ILLUMINATION SYSTEM AND METHOD FOR A HIGH DEFINITION LIGHT MICROSCOPE

Gary Greenberg, Los Angeles, Calif., assignor to Edge Scientific Instrument Company LLC, Santa Monica, Calif.

Continuation-in-part of Ser. No. 688,170, Apr. 19, 1991, Pat. No. 5,345,333. This application Jul. 24, 1992, Ser. No. 919,769

Int. Cl.[6] G02B *21/06;21/00*

U.S. Cl. 359—389 **29 Claims**



1. In an illumination system for a transmitted light microscope having a light source for providing a light beam, a condenser lens means with an optical axis, and an objective lens means with an optical axis, the combination comprising:

a light beam divider means optically disposed between the light source and the condenser lens means, said light beam divider means operable to divide a single light beam into a plurality of independent light beams having paths which are non-coincident with the optical axis of the condenser lens means, and which pass through both the condenser lens means and the objective lens means, wherein the paths of the beams between the condenser lens means and the objective lens means are oblique to the optical axis of the objective lens means.

5,592,329

CATADIOPTRIC OPTICAL SYSTEM

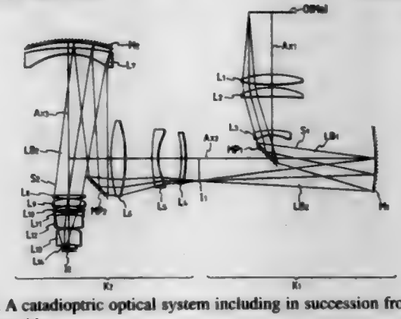
Toshiro Ishiyama, Tokyo, and Yutaka Suenaga, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 28, 1994, Ser. No. 187,484

Claims priority, application Japan, Feb. 3, 1993, 5-016275; Feb. 12, 1993, 5-023974

Int. Cl.[6] G02B *17/00;5/30;5/10;3/00*

U.S. Cl. 359—399 **12 Claims**



1. A catadioptric optical system including in succession from an object side:

a first partial optical system having positive refractive power and for forming a primary image of an object;

a second partial optical system having positive refractive power and for forming a secondary image by light from said primary image;

a first aperture stop disposed in an optical path of said first partial optical system; and

a second aperture stop disposed in an optical path of said second partial optical system;

wherein a beam of light incident on said aperture steps, respectively, is partially intercepted thereby, and wherein each of said aperture stops is constructed to intercept only a marginal portion of a cross-section of the incident beam that extends over less than an entire periphery of said cross-section, the marginal portion partially intercepted by the first aperture stop and the marginal portion partially intercepted by the second aperture stop corresponding to different partial marginal portions of a light beam propagated through said first and second partial optical systems, each of said first and second aperture stops being part of a plurality of aperture stops which, together, intercept a marginal area that extends over substantially the entire periphery of a cross section of said propagated light beam.

5,592,330

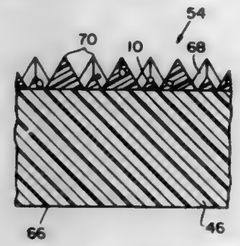
RETROREFLECTIVE PRISM ARRAYS WITH FORMED AIR SPHERES THEREIN

Gus Bernard, West Hartford, Conn., assignor to Reflexite Corporation, Avon, Conn.

Filed May 19, 1995, Ser. No. 444,551

Int. Cl.[6] G02B *5/124*

U.S. Cl. 359—529 **16 Claims**



1. Retroreflective sheeting comprising an array of retroreflective prisms formed on a base body with air spheres encapsulated in the prisms.

5,592,331

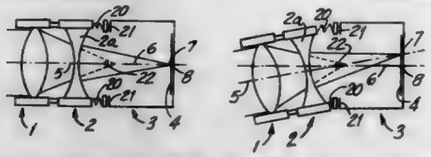
OPTICAL ADAPTER FOR CONTROLLING THE ANGLE OF THE PLANE OF FOCUS

John Eastcott, 151 Eagle's Nest Rd., Hurley, N.Y. 12443

Filed Jan. 18, 1995, Ser. No. 374,248

Int. Cl.[6] G02B *27/64*

U.S. Cl. 359—554 **28 Claims**



1. An adapter for altering the angle of the plane of focus of an optical system, the optical system including (a) an optical instrument having an opening through which an image forming beam can pass, an image plane adapted to receive an image thereon and an optical axis, and (b) an interchangeable lens having an optical axis;

the adapter being sandwiched between, and removably connected to, the optical instrument and the interchangeable lens; the adapter having

(i) an adapter body;

(ii) a secondary lens mounted within the adapter body,

(iii) a front face coupling means on the adapter body to removably mount the interchangeable lens thereto,

(iv) a back face coupling means on the adapter body to removably mount the adapter to the optical instrument, and

(v) tilt means to tilt the optical axis of the interchangeable lens at a variable, including non-perpendicular, angle to the image plane of the optical instrument.

5,592,332

RENTICULAR LENS, SURFACE LIGHT SOURCE, AND LIQUID CRYSTAL DISPLAY APPARATUS

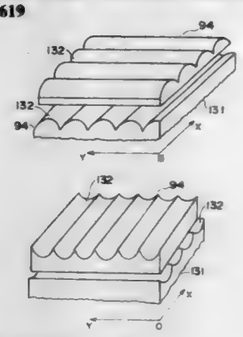
Toshikazu Nishio; Yoshiyuki Yamashita; Hiroyuki Amemiya; Michiko Takeuchi, and Nobu Masubuchi, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Dec. 27, 1993, Ser. No. 173,118

Claims priority, application Japan, Dec. 25, 1992, 4-358319; Apr. 16, 1993, 5-112397; Jun. 16, 1993, 5-168376

Int. Cl.[6] G02B *27/10;17/00;* G03B *21/60*

U.S. Cl. 359—619 **62 Claims**



1. A lenticular lens, comprising:

a light transmitting substrate having one a first surface and a second surface opposite to said first surface; and

a plurality of lens elements elongated on the first surface of said light transmitting substrate, having concave shaped cross sections, and defined in such a way that ridges thereof are aligned in parallel,

wherein

$30° \leqq \theta_{10}$

$\leqq 100°$ and $R \leqq 20\%$, where θ_{10}

is a diffusing angle range with respect to normal of the first surface in the case that when light is entered from the second surface or first surface and transmitted from the first surface or second surface, the intensity of the light transmitted is equal to or more than 10% of the intensity of the light transmitted in a peak direction of a main lobe; and R is the ratio of side lobes to main lobe.

5,592,333

DEVICE FOR OPTICALLY ROTATING LIGHT BEAMS IN A BEAM ARRAY

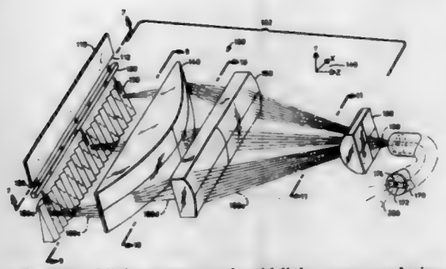
John R. Lewis, Acton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 283,225, Jul. 29, 1994, abandoned. This application Jul. 11, 1996, Ser. No. 678,150

Int. Cl.[6] G02B *27/10;27/30;6/02*

U.S. Cl. 359—628 **32 Claims**

1. An optical apparatus for optically rotating light beams in a beam array, said apparatus comprising:



a plurality of light sources, each said light source producing a light beam having divergence defined both in a first azimuthal direction orthogonal to the direction of propagation and in a second azimuthal direction orthogonal both to the direction of propagation and to the first azimuthal direction, said light beams oriented such that their respective first azimuthal directions are substantially parallel to one another; and

a substrate having a grooved surface, said grooved surface comprising a plurality of adjacent grooves having at least a one-to-one correspondence with the light beams to be rotated, each said groove being formed of first and second reflecting surfaces which intersect along a common vertex edge and form a dihedral angle (Φ) between them, each said groove vertex edge being oriented at an aspect angle (ψ) with respect to the direction of propagation of the corresponding light beam so that said first reflecting surface is positioned to intercept the corresponding light beam and to direct it as an inverted beam to said second reflecting surface along a first path of travel, that is folded with respect to the direction of propagation, while said second reflecting surface operates to intercept the inverted beam reflected off said first reflecting surface and to direct it as a rotated beam along a second path of travel, folded with respect to said first path of travel, said rotated beams acquiring an orientation such that their respective second azimuthal directions are substantially parallel to one another.

5,592,334

ZOOM LENS SYSTEM

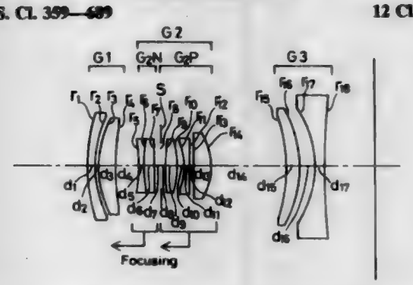
Minoru Oshikiri, Akigawa, and Toshihide Nozawa, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,658

Claims priority, application Japan, Mar. 26, 1993, 5-068006

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—689 **12 Claims**



1. A zoom lens system comprising, in order from an object side, a 1-st lens unit of positive power, a 2-nd lens unit of positive power, and a 3-rd lens unit of negative power, wherein zooming from a wide end toward a tele end is effected by increasing the spacing between the 1-st and 2-nd lens units while reducing the spacing between the 2-nd and 3-rd lens units, and the 2-nd lens unit of positive power is composed, in order from the object side, of a sub-lens unit of negative power, and a sub-lens unit of positive power, and wherein when focusing is to be effected on an object at a short distance at, at least, the wide end, the sub-lens units of the 2-nd lens unit are simultaneously moved toward the object side in parallel to an optical axis with the spacing between the sub-lens units gradually enlarged, and the following conditions (1) and (2) are satisfied:

$$-(1+4\phi_1/\phi_2)<\phi_{2N}/\phi_2+\phi_{2P}/\phi_2 \quad (1)$$

$$0.8<\phi/\phi_w<2.0 \quad (2)$$

where

ϕ_1: the power of the 1-st lens unit;

ϕ_2: the power of the 2-nd lens unit;

ϕ_3: the power of the 3-rd lens unit;

ϕ_{2N}: the power of the negative sub-lens unit in the 2-nd lens unit;

ϕ_{2P}: the power of the positive sub-lens unit in the 2-nd lens unit; and

ϕ_w: the reciprocal of the focal length of the entire system at the wide end.

5,592,335

REDUCED DIAMETER CAMERA LENS BARREL WITH LENS SHIFT DEVICE AND IMPROVED FOCUS LENS DRIVE LINKAGE

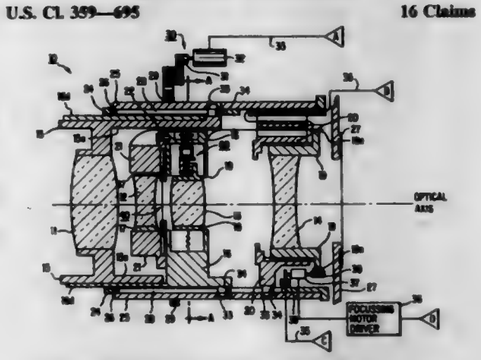
Junichi Omi, Kawasaki; Hidenori Miyamoto, Urayasu, and Minoru Katou, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,283

Claims priority, application Japan, Mar. 23, 1993, 5-088009; May 15, 1993, 5-136739

Int. Cl.[6] G02B *15/14;7/02;9/00*

U.S. Cl. 359—695 **16 Claims**



1. A camera lens barrel for a camera, comprising:

a plurality of lens groups;

a diaphragm positioned between a first lens group and a first additional lens group of the plurality of lens groups, the first lens group positioned on a first side of the diaphragm and the first additional lens group positioned on a second side of the diaphragm;

diaphragm drive means for driving the diaphragm and positioned on the first side of the diaphragm; and

lens shift drive means for shifting at least the first additional lens group in a direction perpendicular to an optical axis of the camera lens barrel and positioned on the second side of the diaphragm.

5,592,336

REFLECTOR SUPPORTING MECHANISM

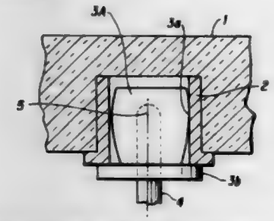
Hideo Saito, and Noboru Itoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1995, Ser. No. 504,137

Claims priority, application Japan, Dec. 20, 1994, 6-316681

Int. Cl.[6] G02B *7/18*

U.S. Cl. 359—871 **10 Claims**



1. A reflector supporting mechanism comprising:

a sleeve fitted in a hole provided on a rear surface of a reflector;

a cylindrical socket remountably inserted into said sleeve, said cylindrical socket having a flange formed thereon for contacting said sleeve to provide a supporting force for said reflector in an axial direction of said socket;

a universal joint provided in said socket; and

a supporting lever rotatably coupled to said universal joint,

wherein one of an internal side surface part of said sleeve and an external side surface part of said socket opposing to said internal side surface part is formed as a convex profile with a curve along the axial direction as a crest line and the other of these side surface parts is formed as a curved profile with a straight line along the axial direction as a crest line, whereby the internal side surface part of said sleeve and the external side surface of said socket come in only point contact to provide a supporting force for said reflector in a lateral direction of said socket.

5,592,337

MIRROR FASTNER FOR OPTICAL SCANNING DEVICE

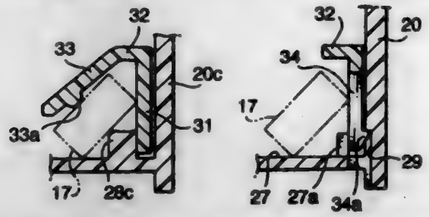
Yoshihiro Hama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1995, Ser. No. 547,191

Claims priority, application Japan, Oct. 27, 1994, 6-287386

Int. Cl.[6] G02B *7/182;26/08*

U.S. Cl. 359—872 **13 Claims**



1. A mirror securing apparatus for an optical scanning device, said mirror securing apparatus comprising:

an oblong mirror having a front mirror side for reflecting a scanning light beam and a back side, said oblong mirror extending in a main scanning direction of said optical scanning device;

a mirror mount formed in the optical scanning device and having a rear surface formed therein;

a plurality of protrusions formed on said mirror mount, each of said protrusions having a first side for contacting said back side of said oblong mirror and a second side opposite said first side, said second side facing said rear surface of said mirror mount and having a clearance therebetween; and

a fastener for holding said oblong mirror in said mirror mount, said fastener comprising:

a rear wall arranged between said back side of said oblong mirror and said rear surface of said mirror mount, said rear wall having substantially the same length in said main scanning direction as said oblong mirror;

at least two resilient arm portions extending from said rear wall, for holding said oblong mirror at least toward opposite ends in said main scanning direction of said oblong mirror; and

at least one resilient engaging portion for engaging said rear surface, said at least one resilient engaging portion being inserted in said clearance between said second side of said protrusions and said rear surface of said mirror mount.

5,592,338

GRAZING INCIDENCE CO-AXIAL AND CONFOCAL

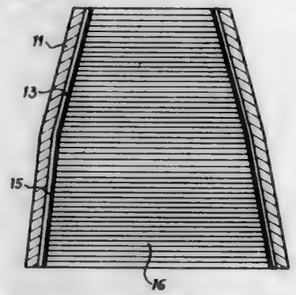
Oberto Citterio, Merate, Italy, assignor to Osservatorio Astronomico di Brera, Milan, Italy

Filed Mar. 2, 1995, Ser. No. 397,768

Claims priority, application Italy, Mar. 4, 1994, MI94A0403

Int. Cl.[6] G02B *5/08*

U.S. Cl. 359—883 **11 Claims**



1. Grazing incidence co-axial and confocal mirror, having a parabola/hyperbola double cone truncated cone structure, with polynomial sections or other geometric configurations, said mirror comprising an internal reflecting surface (15), constituted by a gold layer, an epoxy resin layer (14) on which said gold layer is supported, and a mechanical structural supporting element or carrier (11), to which the resin layer (14) is anchored, wherein said carrier (11) is a ceramic material having a specific weight less than 8.8 kg $m^{-3}10^3$, a coefficient of thermal expansion less than 14 $K^{-1}10^{-6}$1 a thermal conductivity greater than 90 W $m^{-1}K^{-1}$, a modulus of elasticity greater than 150 G Pa, a thermal distortion parameter greater than 0.6 W m^{-1} and a specific stiffness greater than 17 MN $kg^{-1}10$.

5,592,339

INFORMATION SIGNAL RECORDING APPARATUS HAVING AN AUDIO EDITING FUNCTION

Norio Kimura, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

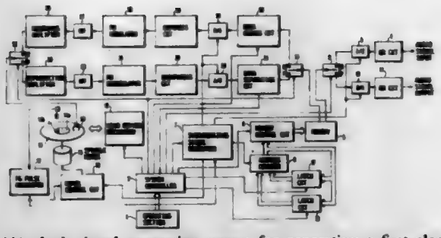
Continuation of Ser. No. 272,905, Jul. 8, 1994, abandoned, which is a continuation of Ser. No. 182,377, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 879,713, May 6, 1992, abandoned, which is a continuation of Ser. No. 432,057, Nov. 6, 1989, abandoned. This application Dec. 21, 1994, Ser. No. 361,851

Claims priority, application Japan, Nov. 11, 1988, 63-285142

Int. Cl.[6] G11B *27/02;5/00;5/09*

U.S. Cl. 360—13 **8 Claims**

1. An information signal recording apparatus for recording information signals on a recording medium, comprising:



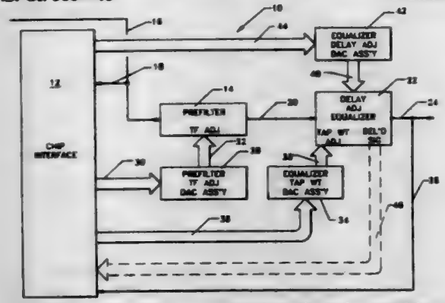
(A) clock signal generating means for generating a first clock signal having a first frequency and a second clock signal having a second frequency higher than said first frequency;
(B) analog/digital converting means arranged to input a predetermined quantity of the information signals, to convert the inputted predetermined quantity of the information signals into digital information signals in synchronism with said first clock signal generated by said clock signal generating means and to output the digital information signals;
(C) memory means for storing temporarily the digital information signals to change a data rate of the digital information signals outputted from said analog/digital converting means;
(D) instruction means for instructing to delete an arbitrarily-selected portion among the digital information signals stored in said memory means;
(E) memory control means arranged to store the digital information signals outputted from said analog/digital converting means in said memory means in synchronism with said first clock signal generated by said clock signal generating means, to designate exclusively addresses in said memory means wherein the digital information signals stored in said memory means corresponding to said arbitrarily-selected portion of the digital information signals instructed by said instruction means are stored, among the addresses in said memory means where the digital information signals are stored, and to read out the digital information signals stored in the designated addresses of said memory means in synchronism with said second clock signal generated by said clock signal generating means; and
(F) recording means for recording the digital information signals read out from said memory means onto a recording medium different from said memory means.

5,592,340

COMMUNICATION CHANNEL WITH ADAPTIVE ANALOG TRANSVERSAL EQUALIZER

Vadim B. Mikushin; Vladimir Kovner, both of Oklahoma City, and Srinivasan Surendran, Norman, all of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Sep. 21, 1994, Ser. No. 309,912
Int. Cl.[6] G11B *5/09;5/035*
U.S. Cl. 360—46 **6 Claims**



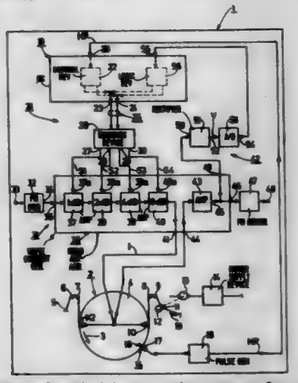
1. A filter system for a communications channel, comprising:
prefilter adaptive parameter signal means for providing a prefilter adaptive parameter signal;
an adaptive, analog prefilter characterized in that the response of the prefilter varies continuously in relation to the excitation of the prefilter in accordance with a transfer function determined by the prefilter adaptive parameter signal;
filter section adaptive parameter signal means for providing a filter section adaptive parameter signal; and
an analog, adaptive transversal equalizer connected to the prefilter to receive the response of the prefilter, wherein the transversal equalizer is comprised of:
a delay circuit comprising a plurality of serially connected analog filter sections, wherein each filter section is characterized as an adaptive filter section in that the response of the filter section varies continuously independently of the sampling rate in relation to the excitation of the filter section in accordance with the filter section adaptive parameter signal;
a plurality of analog multipliers connected to selected tap locations of the delay circuit, whereby the responses of the multipliers are signals having amplitudes that are multiples of the amplitudes of signals at said tap locations determined in relation to tap weight signals received by the multipliers; and
analog summing means connected to the multipliers for adding the responses of the multipliers.

5,592,341

METHOD OF OPTIMIZING A WRITE CURRENT FOR AT LEAST ONE ROTATABLE MAGNETIC HEAD AND ARRANGEMENT FOR CARRYING OUT SUCH A METHOD

Gabor Hadl, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,358
Claims priority, application Austria, Feb. 3, 1994, 207/94
Int. Cl.[6] G11B *5/09*
U.S. Cl. 360—46 **20 Claims**



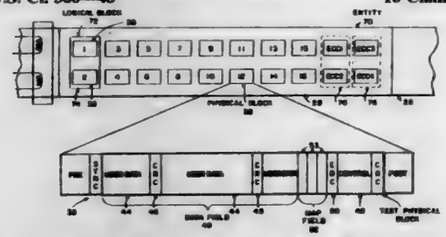
1. A method of optimizing a write current for at least one rotatable magnetic head for scanning a magnetic tape along a plurality of tracks which are inclined relative to the longitudinal direction of the magnetic tape in a respective plurality of consecutive scanning periods, each track corresponding to a single scanning period, said method comprising the steps:
applying a write current to the magnetic head as a test signal with a given number of graded amplitude values within a given time interval and this test signal being recorded on the magnetic tape by the magnetic head;
scanning the recorded test signal from the magnetic tape;
determining the level values of the scanned and reproduced test signal, which correspond to the graded amplitude values of the write current recorded as the test signal; and
determining an optimum amplitude value of the write current from the level values thus determined, characterized in that in said step of applying a write current, the total given number of graded amplitude values of the write current applied to the magnetic head as the test signal is applied to the magnetic head within a single one of said respective plurality of consecutive scanning periods of this magnetic head.

5,592,342

METHOD FOR PACKING VARIABLE SIZE USER DATA RECORDS INTO FIXED SIZE BLOCKS ON A STORAGE MEDIUM

Dana Hall, Bellingham, Mass., and Haim Bitner, Raanana, Israel, assignors to Quantum Corporation, Milpitas, Calif.

Filed May 23, 1994, Ser. No. 247,378
Int. Cl.[6] G11B *20/12;5/09;* G11C *8/00*
U.S. Cl. 360—48 **16 Claims**



1. A method for packing user data records into physical blocks of predetermined storage capacity defined on a storage medium comprising:
receiving user data record of variable lengths;
building a map field of record packing information for each one of the physical blocks;
formatting the user data record and map field of record packing information into the physical blocks, the step of formatting comprising the steps of:
creating a plurality of variable length data pages from the user data record;
building a map entry of record packing information within the map field for each of the plurality of data pages; and
storing each one of the plurality of data pages and the map entry for each one of the plurality of data pages within the physical block, the step of storing each one of the plurality of data pages and the map entry comprising the step of:
arranging the data pages in consecutive order within the physical block and arranging the map entries in reverse order within the physical block;
grouping a fixed number of said physical blocks in groups to define logical blocks,
grouping a fixed number of said logical blocks in groups to define entities on the storage medium; and
storing said entities on the storage medium.

5,592,343

METHOD OF REPRODUCING DIGITAL VIDEO SIGNALS HAVING TRICK PLAY DATA

Goo-man Park, Seoul; Sei-hyun Baik, and Taek-soo Han, both of Kyungki-do, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 289,364, Aug. 11, 1994. This application May 8, 1995, Ser. No. 436,668
Claims priority, application Rep. of Korea, Jun. 30, 1994, 94-15674
Int. Cl.[6] G11B *5/09*
U.S. Cl. 360—48 **11 Claims**

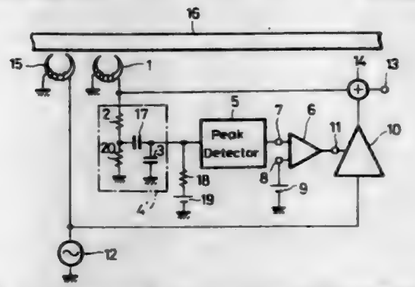
1. A digital video tape reproducing method comprising the steps of:
dividing data reproduced from a tape into normal play sync blocks, first trick play sync blocks, second trick play sync blocks, and third trick play sync blocks, said first trick play sync blocks corresponding to trick play data for high speeds and first and second low speeds, said second trick play sync blocks corresponding to trick play data for said first and second low speeds, and said third trick play sync blocks corresponding to trick play data for said first low speed;
at said high speeds,
error-correcting said first trick play sync blocks using first error correction sync blocks thereof, and
outputting high-speed trick play reproduced data;
at said second low speed,
error-correcting said first speed trick play sync blocks using said first error correction sync blocks thereof to produce corrected first trick play data sync blocks,
error-correcting said second trick play sync blocks using second error correction sync blocks thereof to produce corrected second trick play data sync blocks,
summing said corrected first trick play data sync blocks and said corrected second trick play data sync blocks, and
outputting second low-speed trick play reproduced data; and,
at said first low speed,
error-correcting said first speed trick play sync blocks using said first error correction sync blocks thereof to produce said corrected first trick play data,
summing said second trick play data sync blocks and said third trick play data sync blocks,
error-correcting said summed second and third trick play data sync blocks using said second error correction sync blocks and third error correction sync blocks thereof to produce corrected third trick play data sync blocks,
summing said corrected third trick play data sync blocks and said corrected first trick play data sync blocks, and
outputting first low-speed trick play reproduced data.

5,592,344

AC BIAS CONTROL CIRCUIT FOR MAGNETIC RECORDING HEAD

Tatsuya Tsuruoka, Kanagawa, Japan, assignor to Sony Corp., Japan

Continuation of Ser. No. 317,565, Oct. 4, 1994, abandoned. This application Dec. 7, 1995, Ser. No. 568,799
Claims priority, application Japan, Oct. 6, 1993, 5-250693
Int. Cl.[6] G11B *5/03;5/02*
U.S. Cl. 360—66 **11 Claims**



1. An AC bias control circuit for a magnetic recording head comprising:
an input terminal supplied with an input signal to be recorded;

an oscillator for generating an AC bias signal;
an amplifier for amplifying said AC bias signal with a gain corresponding to a control signal;
an adder for adding an output of said amplifier to said input signal;
a magnetic recording head supplied with an output of said adder;
a band pass filter formed by a low pass filter and a high-pass filter and having an input in circuit with said magnetic recording head, said band pass filter being constituted by a first combination of a first resistor and a first capacitor connected in series between an input and an output of said band pass filter;
a peak detector supplied with an output of said band-pass filter; and
a differential amplifier, supplied with an output of said peak detector and a predetermined voltage from a reference voltage source, for outputting said control signal
wherein said first combination includes said first resistor and a second resistor connected in series to form a resistive impedance path between said magnetic recording head and ground; and
wherein said first resistor has a higher resistance value than said second resistor.

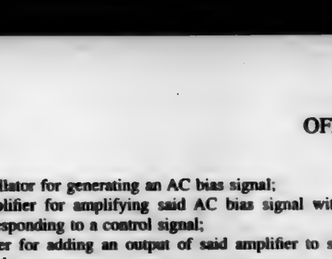
5,592,345

FEEDFORWARD CIRCUIT AND METHOD FOR CONTROLLING THE SPEED OF A SPINDLE MOTOR IN A DISK DRIVE

Francesco Carobolante, Portola Valley, Calif., and Sandro Cerato, Merate, Italy, assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Nov. 30, 1994, Ser. No. 347,277
Int. Cl.[6] G11B *15/46;21/02*
U.S. Cl. 360—73.03 **20 Claims**

(PRIOR ART)



1. A method for precompensating the speed control loop of a disk drive, the method comprising the steps of:
positioning a head of the disk drive using a head position circuit having a head control signal;
controlling a speed of a spindle motor in the disk drive using a speed control loop circuit having a speed control signal; and
feeding forward said head control signal to the speed control loop signal such that a constant rotational velocity is maintained.

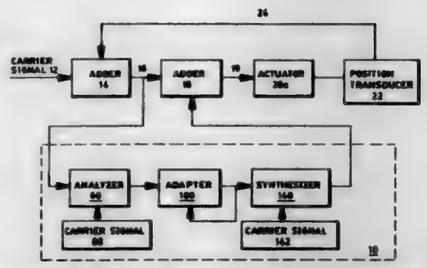
5,592,346

CONTROL SYSTEM UTILIZING AN ADAPTIVE PREDICTOR TO COMPENSATE FOR HARMONIC DISTORTION

Paul F. Sullivan, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 31, 1994, Ser. No. 221,189
Int. Cl.[6] G11B *5/596*; G01R *23/165*
U.S. Cl. 360—77.04 **17 Claims**

9. An adaptive predictor for use in a control system, forming part of a mechanical system that operates on a periodic basis, for compensating for harmonic distortion due to harmonics related to the periodic basis within an error signal, said adaptive predictor comprising
analysis means for analyzing said error signal from position error data encompassing at least one cycle of each of the harmonics and for providing a coefficients signal representative of said harmonic distortion;
adaptive means in electrical communication with said analysis means for combining the coefficients signal with a coefficients signal of a previous period of operation of the mechanical system thereby producing an adaptive error signal which is adaptable to variations in the operation of the mechanical system, said adaptive means also having variable gain control for adaptively controlling adjustments of the coefficients signal such that a time constant for damping of the harmonics is adjusted as determined by an amount of time since initialization of the adaptive means; and
synthesis means for receiving said adaptive error signal and for combining the adaptive error signal with a carrier signal related to the periodic basis to produce a predictor utilized for compensation of harmonic distortion in the control system.

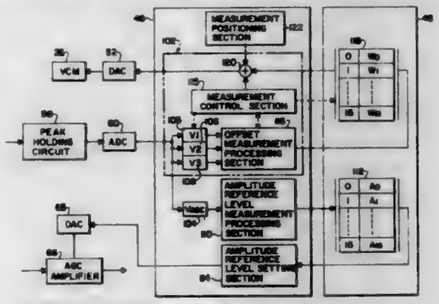


5,592,347

APPARATUS FOR MEASURING OFFSET OF HEAD FROM SERVO PATTERN OF DATA SURFACE AND DISK MEDIUM HAVING RECORDED SERVO PATTERN FOR MEASUREMENT OF OFFSET

Kazunori Mori, and Tatsuro Sasamoto, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 30, 1994, Ser. No. 347,516
Claims priority, application Japan, Mar. 15, 1994, 6-043486
Int. Cl.[6] G11B *5/596;5/09*
U.S. Cl. 360—77.04 **17 Claims**



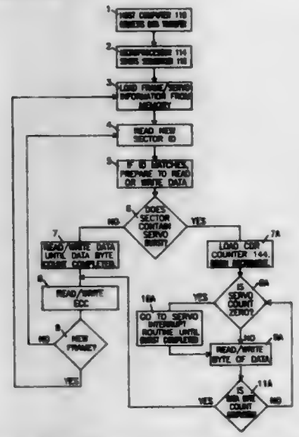
1. A disk apparatus comprising:
a disk medium in which one of a plurality of disk surfaces is set to a servo surface on which servo information has been recorded every cylinder, the remaining disk surfaces are set to data surfaces, and as servo information for offset detection, first servo information is recorded so as to be offset to an inner side and second servo information is subsequently recorded so as to be offset to an outer side at specific cylinder positions of each of said data surfaces;
a head actuator which has a servo head to read the servo information of said servo surface and a plurality of data heads to read and write the information from/to said data surfaces and which can integrally move each head in such a direction as to traverse tracks;
a measurement positioning section for positioning each of said heads to the specific cylinder position for offset detection of each of said data surfaces when an offset is measured; and
an offset measuring section for judging whether the offset lies within a specified range or not from read signals of said servo information recorded in said specific cylinder for offset detection, for measuring an offset amount (Wn) of each of said data heads on the basis of said read signals in the case where it is judged that said offset lies within the specified range, for moving said data head by a predetermined amount in such a direction as to eliminate the offset of said data head, in the case where it is judged that the offset exceeds said specified range for again measuring an offset, and for setting a total value of said predetermined amount and the offset amount which was again measured to an offset measurement value.

5,592,348

METHOD AND STRUCTURE FOR LOCATING AND SKIPPING OVER SERVO BURSTS ON A MAGNETIC DISK

Clifford E. Strang, Jr., San Jose, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

Continuation of Ser. No. 704,568, May 17, 1991, abandoned. This application Oct. 28, 1993, Ser. No. 145,037
Int. Cl.[6] G11B *5/596*
U.S. Cl. 360—77.08 **7 Claims**



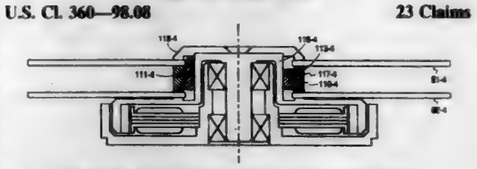
1. A method of handling servo bursts written on a magnetic disk comprising the steps of:
loading a servo burst counter with a value which identifies the number of bytes which must be counted before reaching the location of a servo burst written within a sector on a track of a magnetic disk when said sector is to be read from or written to, wherein said value varies based on the location of a servo burst within a sector to be read from or written to, and wherein said value loaded into said servo burst counter is obtained from information within a sector on said magnetic disk;
generating a servo burst interrupt signal during a read or write operation in response to an indication from said servo burst counter that a servo burst is about to occur; and
skipping over said servo burst in response to said servo burst interrupt signal.

5,592,349

MICROMINIATURE DISK DRIVE WITH CLAMP HAVING FINGERS FOR RADIALLY POSITIONING A PAIR OF DISKS AND A SPINDLE MOTOR PROVIDING A REDUCED DISK DRIVE HEIGHT

James H. Morehouse, Jamestown; Robert A. Alt, Longmont; James A. Dunckley; David M. Furay, both of Boulder; Bruce D. Emo, Niwot, and Steven B. Volk, Boulder, all of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

Division of Ser. No. 766,480, Sep. 25, 1991, Pat. No. 5,379,171. This application Dec. 7, 1993, Ser. No. 286,192
Int. Cl.[6] G11B *17/08*
U.S. Cl. 360—98.08 **23 Claims**



1. A disk drive information storage device comprising:
a housing having a footprint that includes a first dimension of about 35 mm;
a pair of substantially rigid disks, each of said disks having an inside edge;
a hub supported in said housing, said hub being adapted to receive said disks;
a clamp for mounting said disks on said hub, said clamp comprising:
an annular element having a central axis;
a first set of fingers extending from said annular element in a first direction substantially parallel to said central axis, each finger in said first set of fingers being for imposing a radial force on an inside edge of a first disk; and
a second set of fingers extending from said annular element in a second direction substantially parallel to said central axis and opposite to said first direction, each finger in said second set of fingers being for imposing a radial force on an inside edge of a second disk.

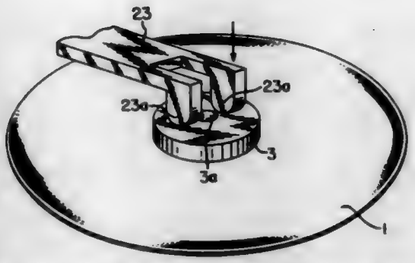
5,592,350

DISC MOUNTING APPARATUS HAVING A PRESSING MEANS FOR PRESSING ON THE CENTER CORE OF A DISC

Tsukasa Uehara, Tokyo, and Masaya Maeda, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 108,948, Aug. 18, 1993, abandoned, which is a continuation of Ser. No. 995,559, Dec. 22, 1992, abandoned, which is a continuation of Ser. No. 863,381, Apr. 3, 1992, abandoned, which is a continuation of Ser. No. 741,326, Aug. 7, 1991, abandoned, which is a division of Ser. No. 700,065, May 1, 1991, Pat. No. 5,084,796, which is a continuation of Ser. No. 545,110, Jun. 26, 1990, abandoned, which is a continuation of Ser. No. 296,295, Jan. 10, 1989, abandoned, which is a continuation of Ser. No. 220,911, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 106,979, Oct. 2, 1987, abandoned, which is a continuation of Ser. No. 884,878, Jul. 8, 1986, abandoned, which is a continuation of Ser. No. 591,383, Mar. 20, 1984, abandoned. This application Apr. 22, 1994, Ser. No. 231,852
Claims priority, application Japan, Mar. 25, 1983, 58-50037; May 11, 1983, 58-82353
Int. Cl.[6] G11B *17/022*
U.S. Cl. 360—99.12 **11 Claims**

1. A disc mounting apparatus using a disc having a central portion provided with an engaging hole thereon, said apparatus comprising:
(A) a spindle engageable with said engaging hole of said central portion of said disc, said spindle having a disc mounting portion for receiving thereon said central portion, said spindle rotating said disc;



(B) presser means for pressing said central portion of said disc against said mounting portion of said spindle;

(C) disc loading means movably supported between a first position for receiving and holding said disc and a second position for positioning said disc at a recording and/or reproducing position, said disc loading means loading said disc at said recording and/or reproducing position by moving from said first position to said second position in a predetermined direction;

(C') disc ejecting means for ejecting said disc by moving said disc loading means from said second position to said first position; and

(D) control means for controlling said presser means according to said disc loading means so as to operate said presser means to press said central portion of said disc against said disc mounting portion of said spindle and subsequently release a pressing operation of said presser means for pressing said central portion of said disc according to the moving of said disc loading means in said predetermined direction from said first position to said second position and controlling said disc ejecting means so as not to operate said presser means when said disc loading means is moved in a reverse direction from said second position to said first position by said disc ejecting means.

5,592,351

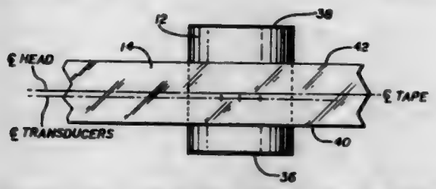
LOW PROFILE ENCLOSURE AND MECHANISM FOR A SINGLE CHANNEL HEAD 8MM TAPE DRIVE

David M. Carter, Simi Valley, Calif., assignor to Tecmar Technologies, Inc., Longmont, Colo.

Continuation of Ser. No. 60,251, May 12, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 376,122

Int. Cl.[6] G11B *5/55*

U.S. Cl. 360—106 **11 Claims**



1. A tape drive assembly that can read and write information onto a magnetic recording tape, said recording tape having a selected width defined by a first tape edge and a second tape edge and a plurality of data tracks recorded between and substantially parallel to the edges of the tape, comprising:

an enclosure;

a tape head having a width defined by a first edge, a second edge and a centerline located equal distance from the first and second edges wherein the width of said tape head is at least twice the width of the recording tape, said tape head further having a transducer for reading and a transducer for writing data from one of said plurality of data tracks, said transducers having a common centerline offset from the centerline of the tape head; and

positioning means for positioning said transducers from the first tape edge to a predetermined distance from the second tape edge, where the predetermined distance substantially equals the offset of the transducer centerline from the tape head centerline so that said transducers can read and write data from each of said plurality of data tracks.

5,592,352

SYSTEM FOR RECORDING/REPRODUCING SIGNALS ON/FROM A MAGNETIC TAPE IN A CASSETTE

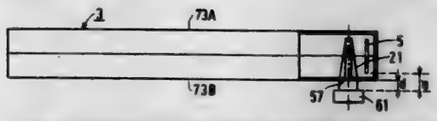
Norbert C. Vollmann, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 927,783, Aug. 10, 1992, which is a continuation of Ser. No. 545,307, Jun. 26, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 464,909

Claims priority, application Netherlands, Jun. 26, 1989, 8901605

Int. Cl.[6] G11B *23/02*

U.S. Cl. 360—132 **8 Claims**



1. The combination of a magnetic tape cassette with a magnetic tape cassette apparatus, said combination comprising:

a magnetic tape cassette apparatus having means for receiving a magnetic tape cassette, a magnetic head, and a locating pin with a conical portion extending from a free end and terminating at a shoulder of said locating pin, said conical portion having an outer surface and longitudinally extending recesses extending along a portion of said outer surface such that, in cross-section transverse to its length dimension, said outer surface of said conical portion of said locating pin has the shape of a four-pointed star, said recesses having respective ends adjacent said shoulder; and

a magnetic tape cassette including a housing having a wall with a locating aperture extending through the wall and having a shape complementary to the shape of said conical portion of said locating pin for receiving said locating pin of said tape cassette apparatus, said aperture having a central region and four aperture appendages extending from said central region, each aperture appendage being defined by respective opposing pairs of inwardly directed projections of said wall directed inwardly towards said central region, said aperture appendages being aligned with each other in pairs with each pair being orthogonal to the other pair, at least one of said pairs defining a maximum diameter of said aperture and said central region being substantially smaller than said maximum diameter, said locating aperture has an outer periphery with the shape of a four-pointed star with said aperture appendages defining the points of said star, said inwardly directed projections and said appendages being sized such that with said locating pin fully received in said locating aperture said inwardly directed projections engage the ends of said recesses adjacent said shoulder of said shank portion.

5,592,353

POWER SUPPLY SYSTEM

Toru Shinohara, and Tatsuhiko Kosugi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

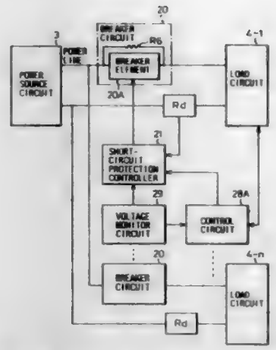
Filed Nov. 22, 1994, Ser. No. 343,229

Claims priority, application Japan, Apr. 18, 1994, 6-078312

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—63 **20 Claims**

1. A power supply system for supplying power from a power source circuit to a load circuit through a respective power line, comprising:



a breaker element provided for said power line, which is turned ON and OFF in response to external control signals, to connect and disconnect said power source circuit to and from said load circuit;

overcurrent detection means provided for said power line for detecting an overcurrent in said load circuit;

a short-circuit protection controller provided for said power line, which turns OFF said breaker element to disconnect said power line from said load circuit if a signal from said overcurrent detection means indicates that there is an overcurrent in said load circuit;

a control circuit connected to said power line of said load circuit, for controlling said load circuit; and

current limit means connected in parallel with said breaker element, for passing a small current while said breaker element if OFF, said control circuit being sufficiently driven with the small current.

5,592,354

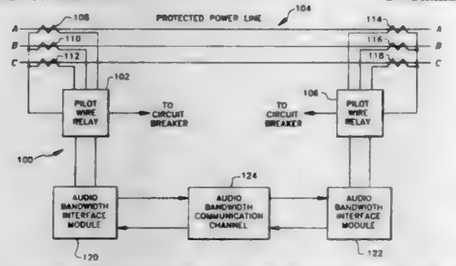
AUDIO BANDWIDTH INTERFACE APPARATUS FOR PILOT WIRE RELAYS

Albert Nocentino, Jr., 9140 Verree Rd., Philadelphia, Pa. 19115

Continuation-in-part of Ser. No. 26,117, Mar. 3, 1993, Pat. No. 5,426,554, which is a continuation of Ser. No. 671,497, Mar. 19, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 347,288

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—69 **19 Claims**



1. An audio bandwidth interface apparatus for use with a protective relay for an electrical power distribution system, said apparatus comprising:

(a) means for receiving an output signal from said protective relay, which output signal is representative of line current conditions at a predetermined location in said electrical power distribution system;

(b) means for converting said protective relay output signal into a first square wave signal;

(c) means for generating at least a first local signal having at least a first frequency within the audio band;

(d) means for generating a local audio bandwidth output signal for transmission to at least one remote audio bandwidth interface apparatus over an audio band communication channel, said local audio bandwidth output signal comprising said first local signal modulated by said first square wave;

(e) means for receiving, from said audio band communication channel, a remote signal comprising the local audio bandwidth output signal generated by at least one remote audio bandwidth interface apparatus;

(f) means for converting said remote signal into a second square wave signal;

(g) means for imparting a predetermined delay to said first square wave signal; and

(h) means for comparing the phase of said delayed first square wave signal with the phase of said second square wave signal and generating a trip output signal when said phase comparison exceeds predetermined limits.

5,592,355

MOTOR CONTROL CIRCUIT

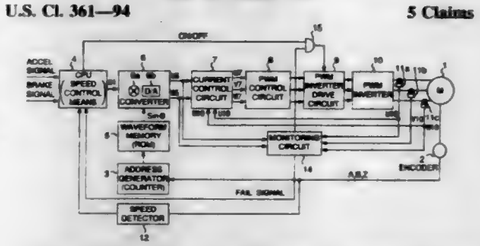
Yasufumi Ikkai, Kobe, and Satoshi Tamaki, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Oct. 5, 1995, Ser. No. 539,635

Claims priority, application Japan, Oct. 6, 1994, 6-242734

Int. Cl.[6] H02H *7/00*

U.S. Cl. 361—94 **5 Claims**



1. A control circuit for supplying current to a motor comprising:

a current supply means for supplying current to said motor;

a current detection means for detecting the current supplied by said current supply means;

a monitoring means for outputting a fail signal to disable said current supply means when the detected current exceeds a predetermined threshold value, and for terminating the fail signal to re-enable said current supply means when the detected current drops below a predetermined value;

a fail signal counter for counting only the time during which the fail signal is output; and

a control means for disabling said current supply means when the cumulative time counted by said fail signal counter exceeds a first predetermined time limit.

5,592,356

DUAL COIL ACTUATOR WITH TIMING CIRCUIT

Kendall Ryl, Arlington Heights; George A. Hollins, Palos Park, and Gregory L. Pence, Lisle, all of Ill., assignors to Synchro-Start Products, Inc., Niles, Ill.

Filed Sep. 27, 1994, Ser. No. 312,773

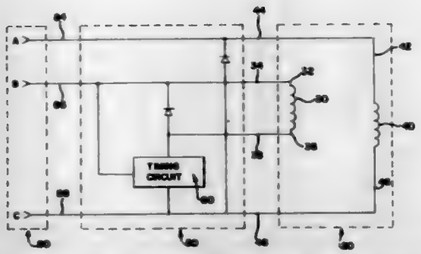
Int. Cl.[6] H01H *47/04*

U.S. Cl. 361—154 **35 Claims**

11. A solenoid actuator for connection to an OEM wire harness plug having a first electrical contact providing a low current supply, a second electrical contact providing a high current supply and a third electrical contact providing a ground, the solenoid actuator comprising:

a pull coil and a hold coil, the pull coil having first side and second side pull coil conductors and the hold coil having first side and second side hold coil conductors;

a first direct electrical connection from the second electrical contact to the first side pull coil conductor, a second direct electrical connection from the first electrical contact to the



first side hold coil conductor and a third electrical connection from the third electrical contact to the second side hold coil conductor;

control means for switching the second side pull coil conductor from the third electrical connection to an open circuit configuration after a predetermined period of time.

5,592,357

ELECTROSTATIC CHARGING APPARATUS AND METHOD

Mark S. Rader, Knoxville; Igor Alexeff, Oak Ridge; Peter P. Tsai, and Larry C. Wadsworth, both of Knoxville, all of Tenn., assignors to The University of Tennessee Research Corp., Knoxville, Tenn.

Continuation-in-part of Ser. No. 958,958, Oct. 9, 1992, Pat. No. 5,401,446. This application Sep. 10, 1993, Ser. No. 119,358

Int. Cl.[6] H05F *3/00*

U.S. Cl. 361—225 **32 Claims**



1. An electrode for producing an ionized discharge, comprising a hollow tube for receiving a non electron absorbing gas therein, a plurality of apertures extending through the hollow tube for delivering the gas received in the hollow tube to surface portions of the hollow tube, and means for receiving a biasing voltage for producing an electrostatic discharge in the presence of a thin, non electron absorbing layer of the gas.

5,592,358

ELECTROSTATIC CHUCK FOR MAGNETIC FLUX PROCESSING

Shamouil Shamouilian, San Jose; John F. Cameron, Los Altos; Chandra Deshpandey, Fremont, and Yuh-Jia Su, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 18, 1994, Ser. No. 276,841

Int. Cl.[6] H02N *13/00*

U.S. Cl. 361—234 **28 Claims**

1. An electrostatic chuck for holding a substrate in a process chamber during processing of the substrate in a magnetic flux, the electrostatic chuck comprising:

(a) a base;

(b) an insulator on the base, the insulator having a top surface for supporting the substrate thereon;

(c) at least one non-ferromagnetic electrode in the insulator, the electrode capable of electrostatically holding the substrate; and

(d) a ferromagnetic shunt in the insulator, the shunt capable of reducing the magnetic flux above the shunt to allow uniform processing of the substrate.

5,592,359

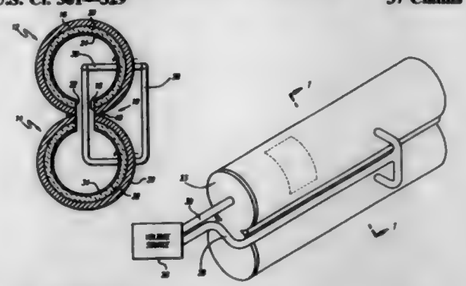
TRANSDUCER

Harry W. Kompanek, Santa Barbara, Calif., assignor to Undersea Transducer Technology, Inc., Ventura, Calif.

Filed Jul. 13, 1994, Ser. No. 275,941

Int. Cl.[6] H01G *4/38;* G01M *7/00*

U.S. Cl. 361—329 **37 Claims**



1. In combination,

a first unit having a first outer shell made from an electrically conductive material and a member disposed within the first outer shell and made from a dielectric material, there being an electrically conductive material on the inner surface of the first member, the first outer shell and the member being open at one end,

a second unit having a second outer shell made from an electrically conductive material and a member disposed with the second outer shell and made from a dielectric material, there being an electrically conductive material on the inner surface of the first member, the second outer shell and the member being open at one end, and

means for bracing the first and second units at the open ends of the first and second outer shells.

5,592,360

COMPACT MOTOR CONTROL UNIT

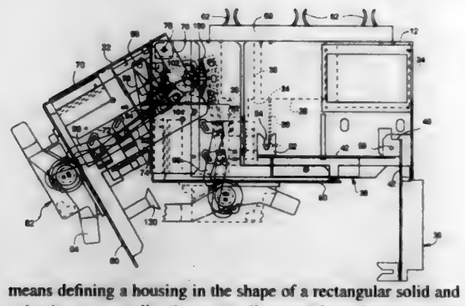
Jayne G. Beck, St. Charles; Mark E. Bortner, Batavia; Larry W. Eads, Aurora; Felix M. Galvan, Jr., St. Charles; Daniel R. Mead, Aurora, all of Ill.; David J. Packard, Fishers, Ind.; George C. Pipis, Geneva, Ill.; Stephanie C. Robinson, Sussex, Wis., and Richard A. Brink, St. Charles, Ill., assignors to Furnas Electric Company, Batavia, Ill.

Filed Jun. 9, 1995, Ser. No. 489,108

Int. Cl.[6] H02B *1/26*

U.S. Cl. 361—626 **10 Claims**

1. A motor control unit for installation in a motor control center comprising:



means defining a housing in the shape of a rectangular solid and having a top wall, a bottom wall spaced from the top wall, a rear wall and a front;

a plurality of motor control instrumentalities within said housing and mounted to at least one of said walls in close proximity to said rear wall;

a side wall located at one side of said top, bottom and rear walls;

means mounting said side wall for pivotal movement about an axis generally parallel to and in proximity to said rear wall;

a disconnect switch carried by said side wall to be disposed in said housing in one position of movement of said side wall relative thereto;

a partial front wall for said housing and carried by said side wall;

an actuator for said disconnect switch mounted on said partial front wall; and

a linkage at least partially mounted on said side wall and interconnecting said actuator and said switch;

whereby said side wall may be pivoted away from said one position to increase access to the interior of said housing and said motor control instrumentalities mounted therein.

5,592,361

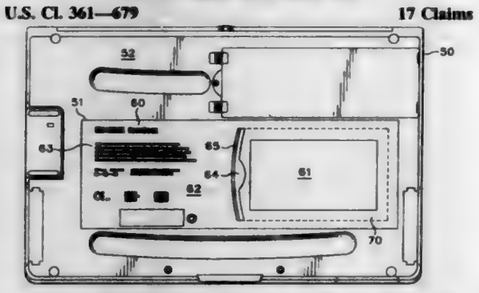
ELECTRONIC DEVICE WITH IDENTIFICATION CARD RECEPTACLE

Mark A. Smith, Corvallis; John Sterner, Albany, and Robert P. Bliven, Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 13, 1995, Ser. No. 422,023

Int. Cl.[6] H05K *5/03;* G09F *3/00*

U.S. Cl. 361—679 **17 Claims**



17. An electronic device having a first surface comprising a recessed portion and a non-recessed portion, said electronic device comprising:

an appliqué affixed to said recessed portion of first surface, wherein said appliqué is substantially flush with said non-recessed portion of said first surface of said electronic device, said appliqué further comprising:

a transparent portion;

an inwardly sloped, arc shaped slot substantially adjacent to said transparent portion;

a non-transparent portion further comprising device indicia;

a tray for holding an identification card, said tray insertable through said slot into a receptacle located between said first surface and said appliqué, underneath said transparent portion of said appliqué, said tray further comprising:

a removable spacer portion that, when removed, allows said tray to accommodate a larger identification card than when said removable spacer portion is not removed; and

a nail catch to allow said tray to be easily removed from said receptacle.

5,592,362

ELECTRONIC SYSTEM HAVING PORTABLE ELECTRONIC APPARATUS AND EXTERNAL EXPANSION UNIT FOR EXPANDING FUNCTION OF ELECTRONIC APPARATUS

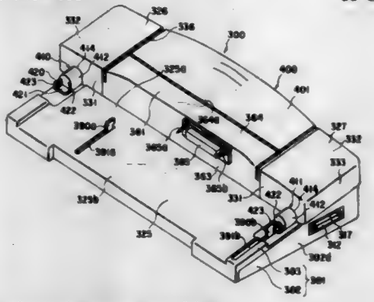
Keizo Ohgami; Kazuyuki Matsuda; Takaichi Kobayashi; Kazuya Shibasaki; Hiroshi Nakamura; Shigeru Sekine; Hironori Ito; Kenichi Ishikawa; Tadamichi Shimohira, all of Tokyo, and Moriya Gibo, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 17, 1994, Ser. No. 291,906

Claims priority, application Japan, Oct. 29, 1993, 5-292488; Feb. 18, 1994, 6-020981

Int. Cl.[6] H05K *7/10;* G06F *1/16*

U.S. Cl. 361—686 **33 Claims**



1. An electronic system comprising:

an electronic apparatus body having a bottom surface and a rear surface continuous with the bottom surface, and having a first connector arranged on the rear surface;

an external expansion unit having a first surface opposing the bottom surface of said electronic apparatus body, and a second surface opposing the rear surface of said electronic apparatus body, said electronic apparatus body being detachably coupled to said external expansion unit, said external expansion unit having a second connector on the second surface, and said second connector being detachably connected to said first connector;

engaging means arranged on the first surface of said external expansion unit, said engaging means being movable between a first position where said engaging means is separated from the bottom surface of said electronic apparatus body and a second position where said engaging means is engaged with the bottom surface of said electronic apparatus body to pull said electronic apparatus body toward the second surface; and

an operation mechanism for selectively moving said engaging means to the first and second positions, said operation mechanism connecting said first connector to said second connector upon moving said engaging means to the second position.

5,592,363

ELECTRONIC APPARATUS

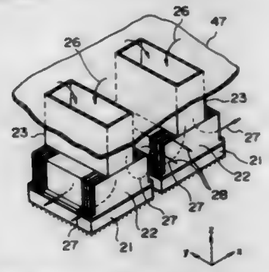
Takayuki Atarashi; Toshio Hatada, both of Tsuchiura; Takahiro Daikoku, Isehara; Nobuo Kawasaki; Toshiki Iino, both of Ibaraki-ken; Tsunetsu Tsukaguchi, Hiratsuka; Kenichi Kasai, Hadano; Fumiyuki Kobayashi, Sagamihara, and Yoshito Hayashi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1993, Ser. No. 128,227

Claims priority, application Japan, Sep. 30, 1992, 4-261086; Sep. 30, 1992, 4-261118

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—689 **10 Claims**



1. An electronic apparatus, comprising:

a plurality of heat-generating semiconductor devices mounted on a board;

a plurality of heat sinks attached to corresponding heat-generating semiconductor devices in a heat conducting relationship thereto, said heat sinks being arranged to determine a direction of flow and discharge of a cooling medium therethrough; and

a discharge chamber for passage of confluence flow of said cooling medium composed of fractions of heated cooling medium emitted from said heat sinks;

wherein said heat sinks are disposed such that the direction of flow and discharge of said cooling medium through said heat sinks are substantially the same, each of said heat sinks being respectively supplied with said fractions of the cooling medium through a nozzle provided on an end surface of the respective heat sinks opposite to a heat-generating semiconductor device associated with each of the heat sinks and wherein a flow space for the heated cooling medium to be discharged is formed between adjacent nozzles so as to extend in a direction substantially orthogonal to said direction of flow and discharge of said cooling medium in the respective heat sinks, along the end surface of the respective heat sinks opposite to said board.

5,592,364

HIGH DENSITY INTEGRATED CIRCUIT MODULE WITH COMPLEX ELECTRICAL INTERCONNECT RAILS

Jerry M. Roane, Austin, Tex., assignor to Staktek Corporation, Austin, Tex.

Filed Jan. 24, 1995, Ser. No. 377,578

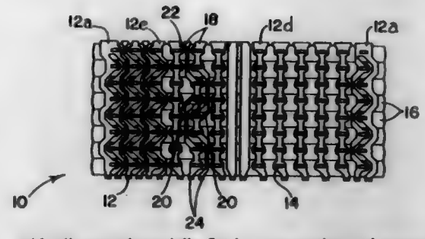
Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—735 **9 Claims**

1. A high density integrated circuit module, comprising:

a plurality of stacked level-one integrated circuit devices, each said level-one device comprising an integrated circuit die encapsulated in a casing, said level-one device including leads extending through said casing; and

a rail assembly, comprising a plurality of rails which electrically and thermally interconnect with only selected leads from selected stacked level-one devices, wherein one or more of said rails are substantially flat in cross-section and are meandering in a non-linear connection path among selected not immediately adjacent leads from selected level-one devices.



5,592,365

PANEL ASSEMBLY STRUCTURE AND PANEL ASSEMBLING METHOD CAPABLE OF ACHIEVING A HIGHLY RELIABLE CONNECTION OF ELECTRODE TERMINALS EVEN WHEN THE ELECTRODE TERMINALS HAVE A FINE PITCH

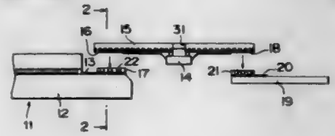
Takayuki Sugimoto, Shiki-gun; Yasunobu Tagusa, Ikoma, and Hisao Kawaguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

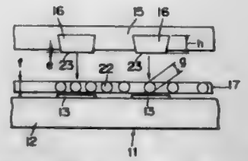
Filed Dec. 20, 1994, Ser. No. 360,018

Claims priority, application Japan, Dec. 21, 1993, 5-322792; Aug. 25, 1994, 6-200543

Int. Cl.[6] H05K *1/11;1/14;* **H01R** *23/68;23/72*

U.S. Cl. 361—789 **26 Claims**





1. A panel assembly structure in which a first electrode terminal formed in a peripheral portion of one surface of a substrate of a panel is connected via an anisotropic conductive film with a second electrode terminal which is formed on a flexible printed circuit board mounted with a drive use integrated circuit for driving the panel and connected with the drive use integrated circuit, wherein

a height of the second electrode terminal on the flexible printed circuit board from a surface of the flexible printed circuit board is set at a value of not greater than 10×10^{-3} mm, and

a film thickness of the anisotropic conductive film is set at a value approximately equal to an outer diameter of each conductive particle existing in the anisotropic conductive film.

5,592,366

FRONT LOADING COMPUTER/BUS EXTENDER

Jacob Goldman, 18242 W. McDurmott St., Irvine, Calif. 92714, and Moshe Zarmi, New York, N.Y.

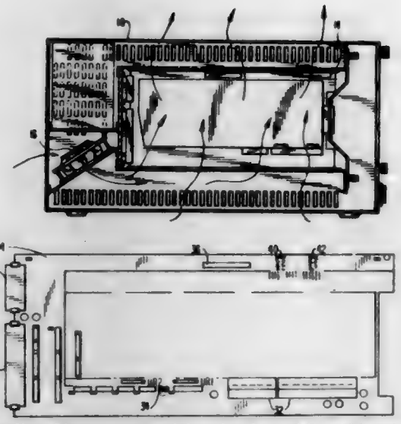
Filed Sep. 29, 1994, Ser. No. 314,857

Int. Cl.[6] H05K *7/14*

U.S. Cl. 361—796 **6 Claims**

1. A front loading computer/bus extender comprising:

a housing having a front, the front having an opening in a first loading plane;



a plurality of instrument receiving slots located in said housing, each of said slots being engageable to a PC instrument card inserted through said front opening;

a carrier card for engaging said PC instrument card to said instrument receiving slot, first and second power supplies,

said first power supply being electrically coupled to a first set of said plurality of instrument receiving slots, and

a second power supply being electrically coupled to a second set of said plurality of instrument receiving slots,

whereby a first set of said PC instrument cards are maintaining electrical and mechanical separation and isolation from a second set of said PC instrument cards.

5,592,367

APPARATUS FOR NON-CONTACTING FEEDING OF HIGH FREQUENCY POWER

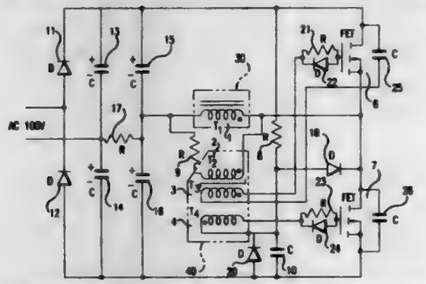
Katsunori Sugimori, Tokyo, and Hiroshi Sakamoto, Kumamoto, both of Japan, assignors to Nippon Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1994, Ser. No. 319,368

Claims priority, application Japan, Jun. 6, 1994, 6-147053

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—17 **9 Claims**



1. An apparatus for wireless feeding of a high frequency power, the apparatus comprising:

a voltage doubler full-wave rectifier circuit including a bridge circuit having:

a series circuit of two diodes (**11**) and (**12**), a first series circuit of two capacitors (**13**) and (**14**) and a second series circuit of two capacitors (**15**) and (**16**) all connected in parallel with one another, and

a resistor (**17**) connecting a first series junction of said first series circuit of two capacitors with a second series junction of said second series circuit of two capacitors;

a main transformer having a primary winding (**1**);

a saturable transformer having a primary winding (**2**) connected in series to a resistor, the series connection of the primary winding (**2**) and the resistor being connected in parallel with the primary winding (**1**) of the main transformer, and the saturable transformer further having first and second secondary windings (**3**) and (**4**);

a Royer oscillation circuit having first and second FETs (**6**) and (**7**) having respective first and second gate circuits, respectively, connected to first and second ends of the first and second secondary windings (**3**) and (**4**), respectively, of the saturable transformer through first and second parallel circuits composed of a resistor and a diode, a second end of said first secondary winding (**3**) being connected to a source terminal of the first FET (**6**), the source terminal of the first FET (**6**) further being connected to a drain terminal of the second FET (**7**) while a drain terminal of the first FET (**6**) and a source terminal of the second FET (**7**) are respectively connected to positive and negative output terminals of the voltage doubler full-wave rectifier circuit, said first and second FETs (**6**) and (**7**) respectively having first and second channel capacitors (**25**) and (**26**) connected in parallel with channels of said first and second FETs (**6**) and (**7**);

a starting gate bias stabilization circuit having a series circuit composed of a resistor (**8**) and a capacitor (**10**) connected across the positive and negative output terminals of the voltage doubler full-wave rectifier circuit, a diode (**18**) connecting a junction of the resistor (**8**) and the capacitor (**10**) to the junction of the source terminal of the first FET (**6**) and the drain terminal of the second FET (**7**), a diode (**20**) connected in parallel with the capacitor (**10**), and a second end of said second secondary winding (**4**) being connected to the junction of said resistor (**8**) and the capacitor (**10**); and

the main transformer having the primary winding (**1**) connected at a first end to the second series junction of said second series circuit of two capacitors of the voltage doubler full-wave rectifier circuit and at a second end to the junction of the source terminal of the first FET (**6**) and the drain terminal of the second FET (**7**), the primary winding (**1**) of the main transformer having a high frequency power signal driven therethrough by the Royer oscillation circuit and coupled to the primary winding (**2**) of the saturable transformer to provide feedback for the Royer oscillation circuit.

5,592,368

STATIC FREQUENCY CONVERTER WHICH COMPENSATES FOR FLUCTUATIONS IN A VOLTAGE SOURCE WHILE CONTROLLING THE WAVEFORM APPLIED TO A CHARGE WHILE CONTROLLING THE WAVEFORM APPLIED TO A CHARGE

Francis Bidaud, Duclair; Sylvain Benoit, Artas; Jacques Plisson, Barentin; Gérard Rilly, Unterkirnach; Gérard Morizot, Villingen, and Harald Roth, Munchweiler, all of France, assignors to L'Unite Hermetique, La Verpilliere, France

Filed Dec. 28, 1993, Ser. No. 174,418

Claims priority, application France, Dec. 30, 1992, 92 15911

Int. Cl.[6] H02J *3/00;* **H02M** *5/40*

U.S. Cl. 363—34 **2 Claims**

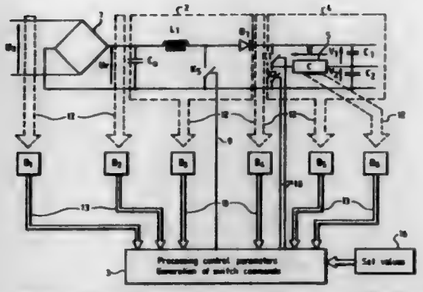
1. A static frequency converter comprising an active filter coupled to terminals of a DC/AC converter powering a load comprising:

a rectifier having a plurality of terminals;

a condenser performing high frequency filter at the terminals of the rectifier;

the active filter including a series inductance connected to the rectifier and to a parallel switch controlled by a control parameter processing and command generation element, a series diode connected to a terminal of the switch and to an input of the DC/AC converter;

said DC/AC converter comprising at least one bridge arm including two switches and at least one condenser, all the



switches of said frequency converter being controlled by said control parameter processing and command generation element;

wherein said rectifier, said condenser at the terminals of the rectifier, said series inductance, said series diode, all said switches of said frequency converter and said at least one condenser have values so that:

$$1-\frac{\hat{Ur}}{E} \geq -\frac{fo}{\hat{Ur}^2}$$

and:

$$t_{on} \leq \frac{1-\frac{\hat{Ur}}{E}}{fo}$$

where UR^ is the peak voltage of a voltage source supplying said static frequency converter, E is the voltage output by the active filter, P is the power output at the load, L1 is the value of said series inductance, of is the upper limit of audible frequencies and t_{on} is the closing time of the active filter parallel switch.

5,592,369

DEVICE IN A D.C. CIRCUIT FOR TRANSFER OF A CURRENT FROM ONE CURRENT PATH TO ANOTHER AND FOR CONTROL OF THE VOLTAGE IN THE CIRCUIT

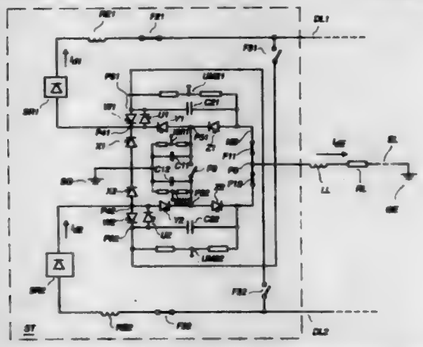
Per-Erik Björklund, Bjurås, Sweden, assignor to Asea Brown Boveri AB, Västerås, Sweden

Filed Sep. 9, 1994, Ser. No. 303,758

Claims priority, application Sweden, Sep. 10, 1993, 9303073

Int. Cl.[6] H03K *17/72*

U.S. Cl. 363—51 **24 Claims**



1. A device in a system for power transmission by means of high voltage direct current, comprising:

a first current path and a second current path, said first and second current paths being interconnected at a branch point;

a first semiconductor connection connected into said first current path only and which is controllable between conducting and non-conducting states and vice versa;

a second semiconductor connection having a diode function and which is connected into said second current path only;

a capacitor branch comprising a capacitor and connected between a first connection point on said first current path and a second connection point on said second current path;

said first connection point and said branch point being located on opposite sides of said first semiconductor connection;

said second connection point and said branch point being located on opposite sides of said second semiconductor connection; and

control members for controlling, in dependence on the voltage across the capacitor, said first semiconductor connection between a non-conducting and a conducting state.

5,592,370

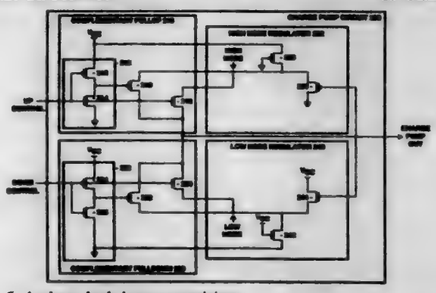
REGULATED COMPLEMENTARY CHARGE PUMP CIRCUIT

Alan C. Rogers, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Sep. 19, 1994, Ser. No. 308,748

Int. Cl.[6] H02M *3/18;7/00*

U.S. Cl. 363—60 **15 Claims**



6. A phase lock loop comprising:

a phase/frequency detector coupled to receive two frequency signals for generating an up control signal and a down control signal representing a phase difference between said two frequency signals;

a charge pump circuit coupled to receive said up control signal and said down control signal and for generating charge at a charge pump output in accordance with said up control signal and said down control signal, said charge pump circuit comprising:

a first switch pass gate coupled to a high node and said charge pump output for coupling said high node to said charge pump output;

a second switch pass gate coupled to a low node and said charge pump output for coupling said low node to said charge pump output;

a high node regulator coupled to a source voltage for said charge pump circuit and said first switch pass gate and coupled to receive said charge pump output, for generating a high node voltage at said high node, said high node voltage being regulated a predetermined margin above said charge pump output;

a low node regulator coupled to ground and said second switch pass gate and coupled to receive said charge pump output, for generating a low node voltage at said low node, said low node voltage being a predetermined margin below said charge pump output;

a loop capacitor coupled to said charge pump output for storing said charge; and

a voltage controlled oscillator coupled to said loop capacitor for generating an output frequency locked to a first of said two frequency signals.

5,592,371

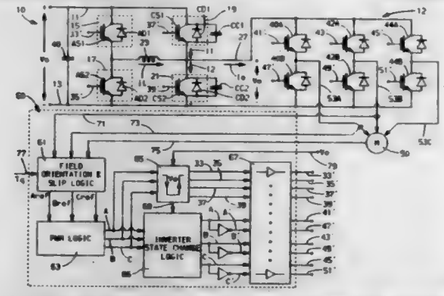
DC LINK INVERTER

Kaushik Rajashekara, Carmel, and Alexander Kurnia, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1995, Ser. No. 443,214

Int. Cl.[6] H02M *7/44*

U.S. Cl. 363—98 **22 Claims**



1. A DC link having a DC input and a DC output, the DC input coupled to a DC source and the DC output having substantially a first voltage during power delivery intervals and substantially a second voltage during power interrupt intervals, the DC link comprising:

the DC input comprising a positive DC rail at the first voltage and a negative DC rail at the second voltage;

the DC output comprising a quasi-resonant rail and the negative DC rail;

a first controlled switch connected between the positive DC rail and the quasi-resonant rail;

a second controlled switch connected between the negative DC rail and the quasi-resonant rail;

first and second diodes, the first diode coupled in anti-parallel across the first controlled switch and the second diode coupled in anti-parallel across the second controlled switch;

first and second capacitors, the first capacitor coupled across the first controlled switch and the second capacitor coupled across the second controlled switch;

a third diode having an anode and a cathode, said anode coupled to the negative DC rail;

an inductor coupled between the cathode of the third diode and the quasi-resonant rail;

a third controlled switch coupled between the cathode of the third diode and the positive DC rail; and

a DC link control for executing power interrupt intervals intermediate power delivery intervals by sequentially commanding off the first controlled switch to release the quasi-resonant rail from the first voltage to thereby swing the quasi-resonant rail to the second voltage, commanding on the second controlled switch while the second diode is forward biased, commanding on the third controlled switch to catalyze a swing of the quasi-resonant rail to the first voltage, commanding off the second controlled switch to release the quasi-resonant rail from the second voltage to thereby swing the quasi-resonant rail to the first voltage, commanding on the first controlled switch while the first diode is forward biased.

5,592,372

SEALED HOUSING EVAPORATIVE DETERMINATION TESTING APPARATUS AND METHOD

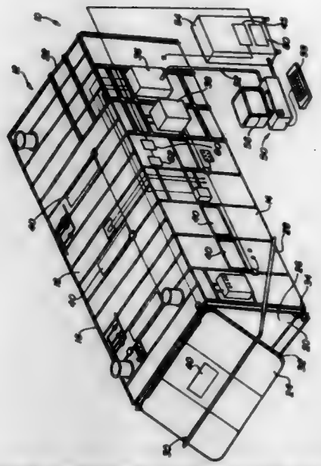
Hassan A. Artail, Dearborn, and Dennis M. Blumke, Washington Township, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Feb. 3, 1995, Ser. No. 383,144

Int. Cl.[6] G05B *21/02;* **G01M** *15/00*

U.S. Cl. 364—178 **16 Claims**

1. An apparatus operable for testing motor vehicle evaporative emissions comprising:



a substantially air-tight testing structure operable for enclosing a subject motor vehicle, the testing structure containing a quantity of ambient air;

environmental control means for controlling temperature of the ambient air within the testing structure;

sampling means for withdrawing a portion of the ambient air from within the testing structure;

means for testing the sampled portion of the ambient air;

means for evacuating a portion of the ambient air contained within the testing structure and for filling a portion of air into the testing structure such that the pressure of the ambient air within the structure remains substantially constant;

means for testing the evacuated or filled air; and

means for determining the amount of evaporated emissions.

5,592,373

METHOD AND APPARATUS FOR CONFIGURING AN AUTOMATION SYSTEM

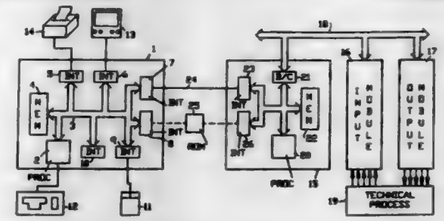
Herbert Barthel, Herzogenaurach; Horst Daar, Erlangen, and Hartmut Schuetz, Heroldsbach, all of Germany, assignors to Siemens Aktiengesellschaft, München, Germany

Filed Oct. 24, 1994, Ser. No. 327,834

Claims priority, application European Pat. Off., Nov. 18, 1993, 93118599.5

Int. Cl.[6] G05B *19/05;19/02*

U.S. Cl. 364—184 **16 Claims**



8. An apparatus for configuring an automation system, comprising:

a user interface enabling a user to specify a peripheral channel of the automation system and a required fault behavior for handling a fault in said peripheral channel;

a memory unit storing a plurality of possible configurations of said peripheral channel and a fault behavior associated with each configuration;

a processor coupled to said user interface and said memory unit said processor adapted to select a suitable configuration from said memory unit by comparing said required fault behavior to said fault behaviors stored in said memory unit, said processor further adapted to configure said user-specified peripheral channel according to said suitable configuration; and

an output unit for communicating said suitable configuration to the automation system.

5,592,374

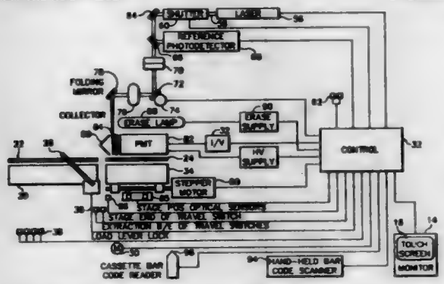
PATIENT IDENTIFICATION AND X-RAY EXAM DATA COLLECTION BAR CODE SYSTEM

Peter C. Fellegara, Fairport; Robert W. Appe, Rochester; Mervet E. Heartberg, Webster, and Richard E. Oulecki, Hemlock, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 2, 1993, Ser. No. 86,967

Int. Cl.[6] G06F *159/00*

U.S. Cl. 395—203 **3 Claims**



1. A patient identification and x-ray exam data collection bar code system, comprising:

a patient bar code located with a patient for identifying a patient;

a storage phosphor for storing an x-ray image of a patient, said storage phosphor having a storage phosphor bar code for identifying the storage phosphor;

x-ray exam bar code chart locatable with an x-ray source for identifying x-ray examination characteristics of said x-ray image stored in said storage phosphor, wherein said exam bar code chart includes fields of exam bar codes identifying a plurality of unique body parts of a patient and a plurality of x-ray exposure conditions;

hand-held bar code scanner having a user input, a memory, a digital controller, and a display, for scanning the patient bar code, the storage phosphor bar code and a bar code from at least one of said fields of bar codes on said exam bar code chart;

a required fields control card having bar codes representing required bar code fields required to be scanned into the bar code scanner by a bar code scanner user before the scanner allows a record to be completed, wherein said required bar code fields includes a patient bar code, a storage phosphor bar code, and an exam bar code from said x-ray exam bar code chart; and

a default values control card having bar codes representing default values bar code scanner commands and bar codes representing default values for exam characteristics which need not be scanned at the time of an x-ray exam.

5,592,375

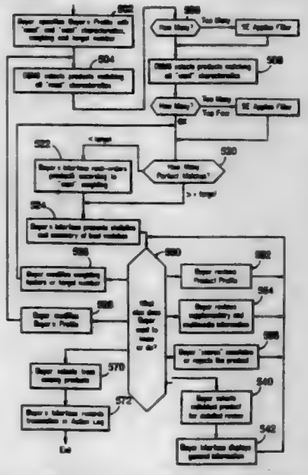
COMPUTER-ASSISTED SYSTEM FOR INTERACTIVELY BROKERING GOODS OR SERVICES BETWEEN BUYERS AND SELLERS

Bardwell C. Salmon, Weston; John D. Borgman, Acton, and Thomas O. Holtey, Newton, all of Mass., assignors to Eagleview, Inc., Weston, Mass.

Filed Mar. 11, 1994, Ser. No. 212,349

Int. Cl.[6] G06F *17/60; 19/00*

U.S. Cl. 395—207 **11 Claims**



1. A computer-implemented system for assisting an employer's hiring decision from among a pool of candidates, the system comprising:

a computer,

a database stored on said computer containing information, including multimedia information, descriptive of respective ones of said candidates, descriptive information for one of said candidates comprising a plurality of profile vectors, each comprising multiple independently-represented database entries of said database, the entries of each said profile vector being associated with the other entries in said profile vector but independent of entries of other said profile vectors for the same candidate;

a seller interface executed on a computer for enabling said candidates to interactively enter said descriptive information, including said multimedia information and said profile vectors, into said database; and

a buyer interface executed on a computer for:

enabling said employer interactively to specify a description of a desired prospective employee, including specifying desired combinations of the associated entries of said profile vectors,

matching said desired employee description against candidate descriptive information stored in said database, the matching using approximate-comparison logic to select, from among said descriptive information, those at least approximately matching said desired employee description, the approximate-comparison logic including "want", "must", and weighted logic requirements;

displaying to said employer a list of summary descriptions of said selected descriptive information, the summary descriptions of said list being rank-ordered according to the closeness of the match to said desired employee profile wherein some entries of said profile do not match said candidate entered descriptive information, and

making perceptible said multimedia information in response to an interactive selection request from among said rank-ordered list by said employer.

5,592,376

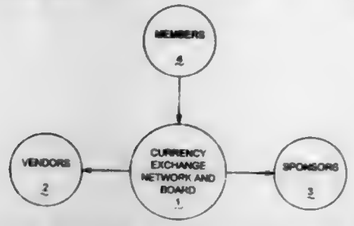
CURRENCY AND BARTER EXCHANGE DEBIT CARD AND SYSTEM

Joel Hodroff, Minneapolis, Minn., assignor to Commonweal Incorporated, St. Louis Park, Minn.

Filed Jun. 17, 1994, Ser. No. 261,459

Int. Cl.[6] G06F *157/00*

U.S. Cl. 395—214 **8 Claims**



1. A record management system for use in accounting for sales by a Vendor of a quantum of goods or services in return for a payment in a dual-currency combination of cash and service credits, said system comprising:

a) input means for receiving data indicative of the cash and service credit balances credited those respective accounts of each participant Member and on each Member's Cash Discount Category (CDC);

b) register means connected for receiving data from said input means and for storing that data for each Member and each account; and

c) control means for implementing and accounting for a sale of a particular quantum of goods and services to be sold through the dual-currency system, said control means carrying out the operations for each transaction of:

1. obtaining information indicative of the TRANSACTION PRICE for the selected quantity of the goods or services;

2. calculating the minimum cash percentage of the CASH BASE price required for the selected quantity of the goods or services;

3. accessing cumulative records of cash discounts made available to Members over a specified time interval and cumulative records of all service credits earned by all Members in the same selected time interval to enable the calculation of a current ratio of goods and services to service credits and storing that current ratio in the register means;

4. accessing CDC and current ratio information in the register means and calculating the amounts of cash and service credits required to be paid by a participant to complete the transaction. with the minimum cash portion equaling the CASH BASE; and

5. debiting the Member's dollar and service credit accounts in the register means by an amount equal to the dollars and service credits necessary to complete the transaction and crediting designated accounts with those dollars and service credits in accordance with a distribution plan implemented by the control means.

5,592,377

CHECK CASHING SYSTEM

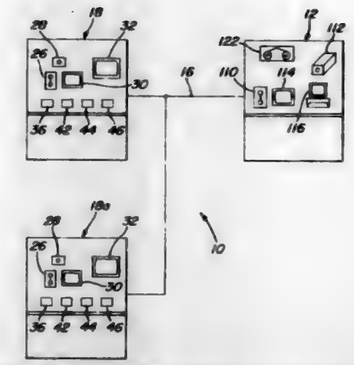
Edward B. Lipkin, 230 S. Broad St., Philadelphia, Pa. 19102

Continuation of Ser. No. 174,515, Dec. 18, 1993, abandoned. This application Mar. 9, 1995, Ser. No. 401,748

Int. Cl.[6] G06F *19/00*

U.S. Cl. 395—242 **10 Claims**

1. An automated check cashing system for use by a customer bearing a check, said system comprising an unmanned customer station, a operator station, and means for enabling two-way communication between said customer station and said operator station, said customer station being arranged to have the customer bring the check to the customer station and including means for dispensing cash, means for transmitting the image of a customer to said operator station, means for enabling voice communication between said customer station and said operator station to enable the customer to provide verbal personal information to the operator station upon a request by the operator, means for transmitting to said operator station an image of both sides of a check that is to be cashed and a visual image of other identification documents of the customer to the operator station, and means for storing the check, said means for dispensing cash being operative in response to a signal from said operator station, said operator station being remote from the customer station and being manned with an operator, said operator station including a database means containing customer identification information and check identification information, said customer identification information comprising images of customers, signatures of customers and personal information about customers, said check identification information comprising indicia appearing on checks, means at said operator station for displaying the image of the customer, means at said operator station for displaying both sides of the check and for displaying the visual image of said other identification documents, and means at said operator station for enabling the operator to recall from the database means information stored therein for use with information provided from the customer station in order to enable the operator to determine if the check is to be cashed, and means for providing said signal to energize said cash dispenser at said customer station to dispense an amount of cash authorized by the operator at said operator station.



5,592,378

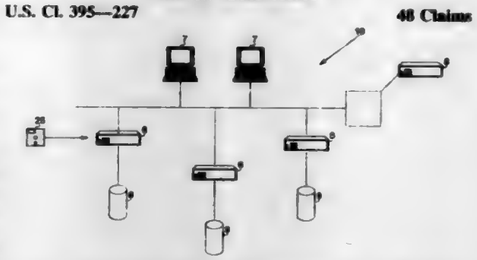
COMPUTERIZED ORDER ENTRY SYSTEM AND METHOD

Paul S. Cameron, Minneapolis; John C. Nash, Shoreview; Robert C. Bloomer, Little Canada; Robert E. Wollan, Minneapolis; Kelly M. Kreutter, Minnetonka; Melinda A. Ahler Olmstead, Shoreview; Dale H. Renner, Edina; Ryan D. Bourne, Eden Prairie; Keith M. Carnish, Minneapolis, and Dean R. Jones, St. Louis Park, all of Minn., assignors to Andersen Consulting LLP, Chicago, Ill.

Filed Aug. 19, 1994, Ser. No. 293,470

Int. Cl.[6] G06F *153/00*

U.S. Cl. 395—227 **48 Claims**



1. A computerized system for the placement of an order for an item by a user, the system including at least one data entry device having a display, the computerized system comprising:

(a) storage means for storing offer information relating to a plurality of available multi-attributed offers;

(b) user-driven offer search means for locating a particular multi-attributed offer from the plurality of available offers, the user-driven offer search means comprising:

(i) sequence-independent input means for allowing category search criteria to be entered in any sequence desired by the user; and

(ii) offer selection means for designating one or more search categories in response to the category search criteria, and for allowing selection of the particular multi-attributed offer from the available offers that are common to the designated one or more search categories;

(c) attribute selection means for identifying one or more offer attributes and a set of attribute choices for each of the one or more offer attributes upon selection of the particular multi-attributed offer, and for allowing sequence-independent selection of an attribute choice from each set of attribute choices; and

(d) stock-keeping-unit designation means for automatically designating a stock-keeping-unit identifier for the item corresponding to the particular multi-attributed offer selected via the offer selection means and having the attribute choices selected via the attribute selection means,

whereby the item is identified through sequence-independent navigation of multiple search categories and offer attributes.

5,592,379

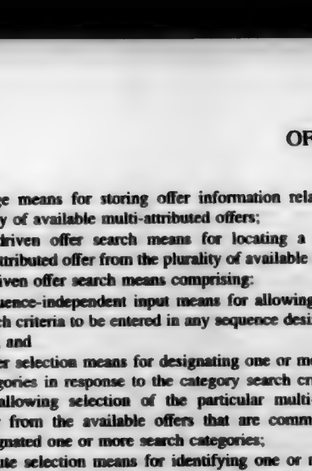
METHOD AND APPARATUS FOR POOLING AND DISTRIBUTING BOND DIVIDENDS

Dale B. Fiufrock, 221 Park Ave.; A. René Dervaes, Jr., 246 Esplanade Way, both of Palm Beach, Fla. 33480, and Robert S. Dervaes, 11 Edgehill Ct., Bel Air, Md. 21014

Continuation of Ser. No. 867,415, Apr. 13, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 319,253

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—239 **5 Claims**



1. A microprocessor based computer system including computer readable program code stored in a computer readable memory for administering a program to provide a base income to senior citizens, the income of which increases to living participants with full return of investment, which determines payments required for participation in the program and distribution thereof, said system comprising:

a base microprocessor computer system having a memory means, and a modem means for communicating with remote computer terminals;

at least one remote computer terminal having an input means and a modem means for communicating with said base microprocessor computer system;

a predetermined group size of living participants for participation in a group program;

a minimum amount of payment per said living participant required for participation in the program, said minimum payment based on an interest producing security with a fixed maturity date to produce participation payment data;

said at least one remote computer terminal input means and modem means for entering said participation payment data and security purchases in the microprocessor based computer system memory means;

said computer readable program code including means for causing said computer system to periodically process said participation payment data to determine the total number of living participants relative to the number of securities purchased and interest producible therefrom to produce total participation data;

output means responsive to said total participation data for providing portfolio management data output reports so that interest is paid out to the living participants;

means for distribution of security proceeds upon maturity to participants or participant's heirs;

output means for generating a management report including said portfolio management data and said participation data.

5,592,380

Patent Not Issued For This Number

5,592,381

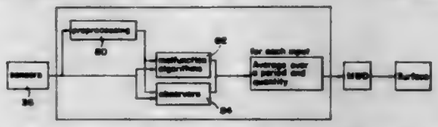
DEVICE FOR PROCESSING AND INTERPRETING DRILLING DATA, PLACED AT THE BOTTOM OF A WELL AND METHOD IMPLEMENTING THIS DEVICE

Henry Henneuse, Billere, and Elyes Draoui, Pau, both of France, assignors to Elf Aquitaine Production, Paris, France

Continuation of Ser. No. 50,447, Jun. 25, 1993, abandoned. This application Oct. 16, 1995, Ser. No. 543,696

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—422 **12 Claims**



1. In a device for processing and interpreting drilling data, including a drill string and, mounted at a lower end of the drill string, a drilling tool, a measuring unit, and means for transmitting data from a bottom of a drilling well to a surface, the improvement wherein said means for transmitting data from the bottom to the surface comprises means for interpreting the measurements acquired by the measuring unit and means for sending to the surface abridged messages based on the interpreted measurements.

5,592,382

DIRECTIONAL STEERING AND NAVIGATION INDICATOR

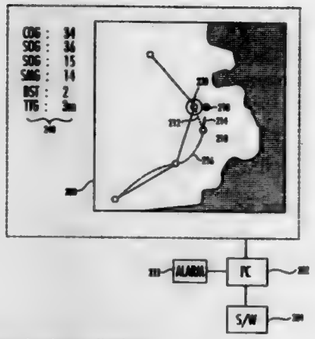
Jaime B. Colley, Laguna Niguel, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Mar. 10, 1995, Ser. No. 402,434

Int. Cl.[6] G06G *7/78*; G08G *1/123*

U.S. Cl. 364—449.1 **17 Claims**

1. A system for indicating directional information to a user having a current position traveling on a current course toward a desired destination, comprising:



a computer having a display;

a navigation system coupled to the computer for providing position and course data;

means for determining a point of closest approach (PCA) to the desired destination in accordance with the desired destination, the user's current position, and current course, the desired destination having an associated waypoint representing the desired destination on the display;

means for indicating integrated steering information to the user including:

means for informing the user whether the current course will direct the user to the waypoint, and

means for correcting the current course of the user to enable the user to reach the waypoint by directing the PCA to coincide with the waypoint; and

means for displaying the corrected current course to the user, wherein the user's current position and course, the PCA, the desired destination, and the integrated steering information are simultaneously and integrally displayed on the computer display.

5,592,383

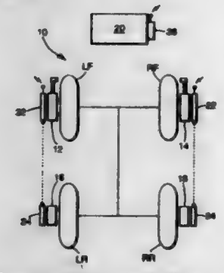
WHEEL ALIGNER CORDLESS COMMUNICATIONS UNIT

Steven W. Rogers, Conway, and David R. Coburn, Maumelle, both of Ark., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 7, 1994, Ser. No. 301,455

Int. Cl.[6] G01B *7/315*

U.S. Cl. 364—424.034 **6 Claims**



1. A method for upgrading a wheel aligner comprising at least two wheel-mountable alignment heads for generating wheel orientation data, a console including processor means for processing the data and a cable for transmitting the data from each head to the console; which comprises:

removing the cable;

providing cordless transceiver means for each head and the console;

electrically connecting the cordless transceiver means to the heads and the console to provide for communication between the heads and the console without the cable.

5,592,384

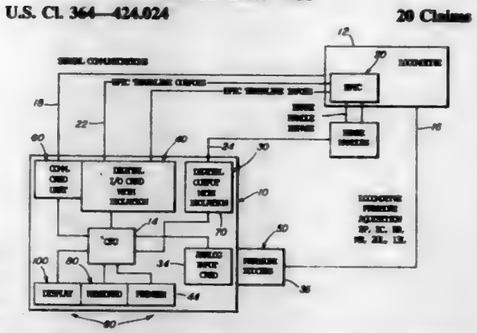
RAILWAY BRAKE SYSTEM TESTER

Daniel J. Wolf, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Mar. 14, 1995, Ser. No. 403,385

Int. Cl.[6] B60T *17/22*

U.S. Cl. 364—424.024 **20 Claims**



1. A railway vehicle brake system test apparatus for performing at least one predetermined test procedure on an electronically controlled railway vehicle brake system disposed on a railway vehicle without requiring removal of such electronically controlled railway vehicle brake system from such railway vehicle, said railway vehicle brake system test apparatus comprising:

(a) a mounting means for mounting a number of predetermined components of said railway vehicle brake system test apparatus thereon;

(b) a microprocessor unit disposed on said mounting means and connected for both receiving and communicating certain preselected information required for performing said at least one predetermined test procedure;

(c) a means disposed on said mounting means and connected for receiving at least one preselected output from such electronically controlled railway vehicle brake system and connected to communicate such at least one preselected output to said microprocessor unit and connected to receive at least one preselected input from said microprocessor unit and connected to communicate said at least one preselected input to such electronically controlled railway vehicle brake system; and

(d) a means disposed on said mounting means and connected for communicating at least one predetermined pressure acquisition signal to said microprocessor unit.

5,592,385

VEHICLE CRUISE CONTROL SYSTEM WITH VOICE COMMAND

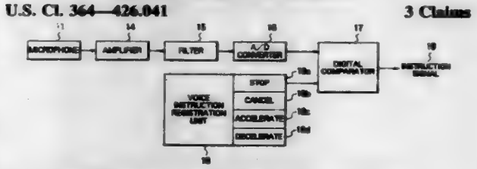
Kazuyori Katayama, and Yasuo Naito, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 305,898, Sep. 14, 1994, abandoned. This application Nov. 8, 1995, Ser. No. 555,311

Claims priority, application Japan, Sep. 20, 1993, 5-233593

Int. Cl.[6] B60K *31/00*; G10L *5/06*

U.S. Cl. 364—426.041 **3 Claims**



1. A vehicle running speed control system, comprising:

a) means for setting a target speed of a vehicle;

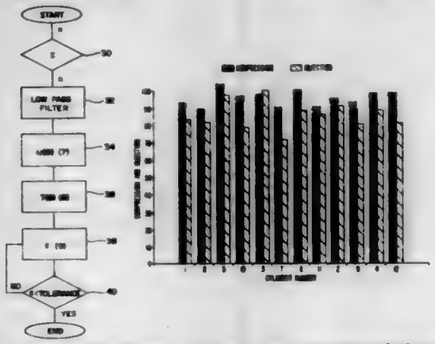
b) means for detecting a running speed of said vehicle as an actual running speed;
c) voice command input means for receiving a verbal target speed command from the driver;
d) target speed instructing means including:
1) memory means for storing in advance a plurality of driver's voice commands, each corresponding to a numerical target speed,
2) means for matching and identifying the verbal target speed command as one of the stored numerical target speeds, and
3) means responsive to an identification of the stored numerical target speed for changing the setting means to a new target speed corresponding to the identified numerical target speed, and
e) means for controlling an opening of a throttle valve depending on a deviation of the actual running speed from the new target speed to implement a smooth transition from the actual running speed to the new target speed without any disruptive and potentially dangerous overshooting or undershooting.

5,592,386

METHOD AND APPARATUS FOR THE DETECTION OF RECIPROCATING MACHINE FAULTS AND FAILURES

Philippe Gaultier, Ste-Geneviève, Canada, assignor to Noranda Inc., Toronto, Canada

Continuation of Ser. No. 124,068, Sep. 21, 1993, abandoned. This application Jul. 7, 1995, Ser. No. 499,649
Claims priority, application Canada, Oct. 23, 1992, 2081080
Int. Cl.[6] G06F *19/00*; G06G *7/70*
U.S. Cl. 364—431.01 **20 Claims**



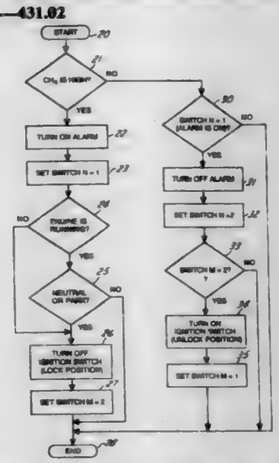
1. A method for detection of reciprocating machine faults and failures, comprising the steps of:
a) acquiring data representing velocity variation waveforms of a reciprocating machine having a plurality of cylinders;
b) transforming said acquired data using a computer to produce torque waveforms corresponding to the acquired velocity variation waveforms;
c) using a model-based optimization algorithm to obtain:
(i) a coefficient corresponding to the compression cycle for each cylinder, and
(ii) a coefficient corresponding to the expansion cycle for each cylinder, wherein the coefficient corresponding to the expansion cycle is derived independently from the coefficient corresponding to the compression cycle;
d) presenting the compression coefficient, the expansion coefficient, and the transformed torque waveforms to a user to distinguish between compression faults and expansion faults for each cylinder; and
e) determining a reciprocating machine imbalance by detecting at least one of the compression fault and the expansion fault.

5,592,387

METHOD OF OPERATING A NATURAL GAS VEHICLE AS A FUNCTION OF AMBIENT METHANE CONCENTRATION

Mordecai Shelef, Bloomfield Village, and Eleftherios M. Logothetis, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 29, 1994, Ser. No. 267,737
Int. Cl.[6] G06F *19/00*; F02B *43/00*
U.S. Cl. 364—431.02 **1 Claim**



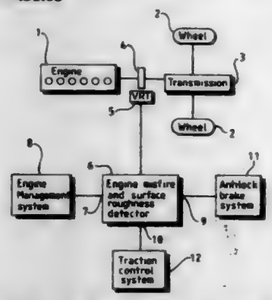
1. A method of operating a compressed natural gas (CNG) vehicle using a computer as a function of a concentration of methane in an atmosphere surrounding the vehicle includes the computer implemented steps:
establishing a predetermined level of methane concentration;
operating the CNG vehicle as a function of that predetermined level by turning off a vehicle ignition of the CNG vehicle when the predetermined level of methane is sensed in the surrounding atmosphere, said establishing and operating steps including the steps of:
determining if the level of methane is higher than the predetermined level using a sensor selectively responsive to methane;
if yes, turning on an alarm and setting a switch N equal to 1;
determining if the engine is running;
if yes, determining if a vehicle transmission is either in the neutral or park condition;
if no, ending the process;
if yes, turning off the ignition switch;
if the engine is not running, turning off the ignition switch;
logic flow then goes to setting a switch M equal to 2 and then ending the logic flow;
if the original methane level was not high, logic flow goes to a decision block to determine if the switch N is equal to 1, indicating the alarm is on;
if no, exiting the logic flow;
if yes, then turning off the alarm, setting the switch N equal to 2;
deciding if a switch M is equal to 2;
if switch M is not 2, exiting the logic flow; and
if yes, turning on the ignition switch to the unlock position and setting the switch M equal to 1.

5,592,388

METHOD OF AND APPARATUS FOR ANALYZING INTERNAL COMBUSTION ENGINE SPEED DATA

Benjamin J. Bradshaw; Michael Holmes, both of West Midlands, and Russell W. Jones, Stratford-on-Avon, all of Great Britain, assignors to Lucas Industries Public Limited Company, West Midlands, England

Filed Jan. 24, 1992, Ser. No. 825,048
Claims priority, application United Kingdom, Feb. 1, 1991, 9102232
Int. Cl.[6] G01M *15/00*; G06F *17/00*
U.S. Cl. 364—431.08 **19 Claims**



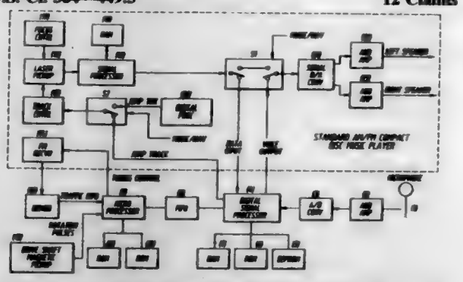
1. A method of signalling an engine misfire by processing internal combustion engine speed data, said method comprising the steps of:
measuring variations in speed of said internal combustion engine,
analyzing a distribution of said variations in speed measured in said measuring step to determine a degree of asymmetry of said distribution, and
signalling an engine misfire if said degree of asymmetry exceeds a predetermined degree.

5,592,389

NAVIGATION SYSTEM UTILIZING AUDIO CD PLAYER FOR DATA STORAGE

Charles La Rue, La Canada, and Robert W. Diller, Pasadena, both of Calif., assignors to ANS, LLP, Van Nuys, Calif.

Continuation-in-part of Ser. No. 299,486, Sep. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 110,503, Aug. 20, 1993, which is a continuation of Ser. No. 675,632, Mar. 27, 1991, Pat. No. 5,274,560, which is a continuation-in-part of Ser. No. 621,577, Dec. 3, 1990, abandoned. This application Mar. 6, 1995, Ser. No. 399,931
Int. Cl.[6] G06F *17/30*
U.S. Cl. 364—449.5 **12 Claims**



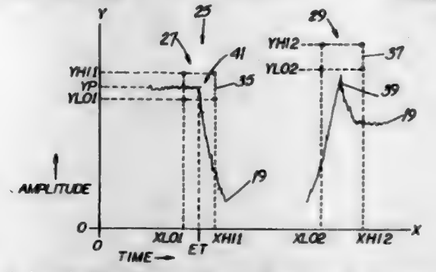
1. In a navigation system which includes data storage means for storing a database containing map data and navigation information, means for storing software for controlling the system and effecting route selection in cooperation with the database, and a navigator processor connected to the means for storing software for operating the navigation system under control of the software, the improvement wherein said data storage means comprise:
a) an audio CD player having a read head and means for positioning said read head in response to positioning signals from said navigator processor; and
b) a CD storing the database in an audio format, said CD being playable by said player.

5,592,390

TIME BASED METHOD FOR ANALYZING A WAVEFORM

Peter A. Liken, West Olive; Mark C. Jacobs, Holland, and Monte E. Van Nortwick, Hudsonville, all of Mich., assignors to Venturedyne, Ltd., Milwaukee, Wis.

Continuation of Ser. No. 216,409, Mar. 23, 1994, Pat. No. 5,485,078. This application Sep. 29, 1995, Ser. No. 536,443
Int. Cl.[6] G08B *21/00*
U.S. Cl. 364—487 **6 Claims**



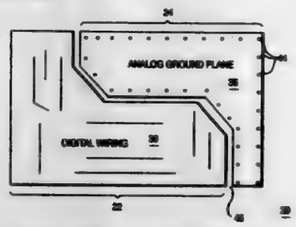
1. A method for stress-screening a circuit board by analyzing a circuit board waveform having waveform points which are spaced in time, the method including the steps of:
placing the circuit board in a test chamber;
displaying the circuit board waveform on a graph;
establishing a first graphic boundary circumscribing a first point on the waveform;
establishing a second graphic boundary circumscribing a second point on the waveform; and
generating an error signal if one of the points moves outside its graphic boundary.

5,592,391

FARADAY CAGE FOR A PRINTED CIRCUIT CARD

Jorge E. Muyshondt, Austin; Gary A. Parker, Round Rock, and Bruce J. Wilkie, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 26,888, Mar. 5, 1993, Pat. No. 5,475,606. This application Jun. 7, 1995, Ser. No. 485,704
Int. Cl.[6] H05K *3/00*
U.S. Cl. 364—489 **8 Claims**



4. A method of operating a printed circuit board having a plural number of conductor layers separated by a plural number of insulator layers, comprising the steps of:
in a first section of the board, grounding a Faraday cage disposed entirely within the printed circuit board including a first and a second ground plane disposed in a first and second

conductor layer respectively, the ground planes being electrically interconnected at selected peripheral regions by a plurality of vias;

transmitting electrical signals from a first type of active device through a plurality of signal paths in a third conductor layer disposed between the first and second ground planes and substantially surrounded by the Faraday cage, the electrical signals from the first type of active device sensitive to emissions created by signals from a second type of a second active device; and

transmitting electrical signals from a second type of active device through a second, separately grounded section of the board;

wherein the electrical signals from the first type of active device are protected by the Faraday cage from the emissions created by the second type of electrical device.

5,592,392

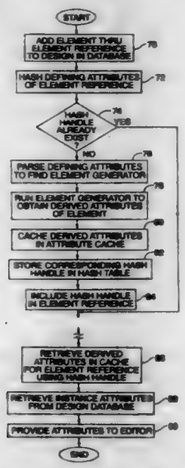
INTEGRATED CIRCUIT DESIGN APPARATUS WITH EXTENSIBLE CIRCUIT ELEMENTS

Thomas G. Matheson, Brookside; Joseph F. Cicchiello, Phillipsburg, and Glenn Wikle, South Orange, all of N.J., assignors to Mentor Graphics Corporation, Wilsonville, Oreg.

Filed Nov. 22, 1994, Ser. No. 343,756

Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—490 **11 Claims**



1. A method of rapidly providing access to extensible elements in a layout, the method comprising the following steps:

in connection with an element reference, hashing defining attributes of an extensible element to produce a corresponding identifier;

storing each element reference to a selected element along with its identifier;

if the identifier of an extensible element does not yet exist for the layout, applying the defining attributes of the element to an extensible element generator and caching derived element attributes that result in an attribute cache, the derived attributes associated with the defining attributes' identifier;

if the identifier of an extensible element already exists for the layout, not applying the defining attributes to the extensible element generator; and

providing access to the extensible element by using its defining attributes' identifier to retrieve the derived attributes from the attribute cache.

5,592,393

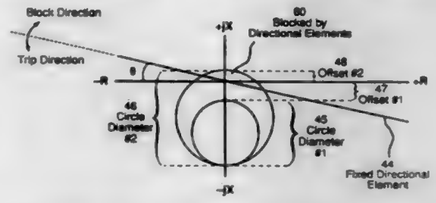
METHOD AND SYSTEM FOR PROVIDING PROTECTIVE RELAY FUNCTIONS

Murty V. V. S. Yalla, Seminole, Fla., assignor to Beckwith Electric Co., Largo, Fla.

Division of Ser. No. 87,083, Jul. 7, 1993, abandoned. This application Mar. 16, 1995, Ser. No. 404,929

Int. Cl.[6] H02H *3/00*

U.S. Cl. 364—492 **3 Claims**



1. A method of providing a loss of field protection of a synchronous generator connected in an alternating current and voltage electrical power system, said method consisting of the steps of,

a) charting the characteristics of an impedance relay having a defined positive sequence impedance on a rectangular coordinate graph (having an abscissa, an ordinate, an origin and four quadrants) to obtain two circles which are offset from the origin for identifying the operate to trip portion of said impedance relay,

b) positioning said circles to include said origin within a circle to coordinate the impedance values depicted by said circles to the minimum excitation limits and capabilities of the generator;

c) providing a directional trip limiting element extending on said graph from the fourth quadrant, through the origin, through the second quadrant, and through at least one of said circles to effectively prevent tripping of said relay in the first quadrant and limited portions of the second and fourth quadrants;

d) comparing said relay characteristics with the sensed impedance of said generator to determine whether the positive sequence impedance of said generator is within the operate to trip portion of said circles; and

e) setting a generator trip time delay to effect tripping when said generator impedance is within said operate to trip portion,

whereby mis-operation during frequency excursions, power swings and fault conditions are prevented.

5,592,394

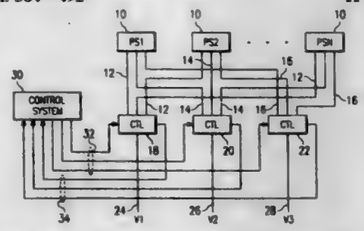
FET CURRENT SENSOR FOR ACTIVE BALANCING OR REGULATING CIRCUITS

Nathan Wiscombe, Cedar Park, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.

Continuation-in-part of Ser. No. 381,044, Jan. 31, 1995. This application Aug. 31, 1995, Ser. No. 522,038

Int. Cl.[6] H02J *1/00*

U.S. Cl. 364—492 **11 Claims**



1. An apparatus for regulating a flow of current in a power supply device, comprising: a transistor disposed in a current path of said power supply device on an output thereof and having its source/drain path connected between the output of the power supply device and an external load, a series impedance of said transistor controlled by a received control signal and said transistor having a known impedance relationship to a voltage level of said control signal;

a voltage detector for detecting a voltage across said transistor;

a control processor for receiving said control signal and determining an impedance value of said transistor from said voltage level of said received control signal in conjunction with said known impedance relationship and calculating a current through said transistor from said detected voltage across said transistor and said determined impedance value of said transistor; and

a control system for controlling said power supply device utilizing said calculated current through said transistor through generation of said control signal.

5,592,395

METHOD AND APPARATUS FOR DETERMINING AND EXTENDING A CHANGE INTERVAL FOR AN OPERATING FLUID OF A UNIT

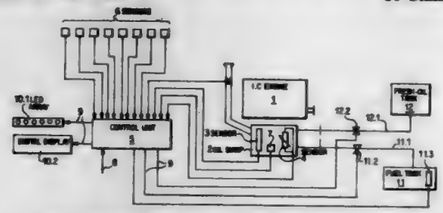
Fritz Braun, Kernen; Ursula Felger, Schorndorf; Otto Jung, Stuttgart, and Jakob Wojtacki, Wendlingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Mar. 1, 1994, Ser. No. 203,253

Claims priority, application Germany, Mar. 1, 1993, 43 06 270.9

Int. Cl.[6] F01M *11/04*; G01M *17/00*; G07C *5/00*

U.S. Cl. 364—509 **10 Claims**



1. A method for determining and extending a change interval for an operating fluid of a unit, comprising the steps of evaluating at least one operating variable representing a qualitative condition of the operating fluid, and continuously calculating therefrom the change interval, wherein the continuously calculated change interval is related to a specified unit service interval and, if the change interval expires before the service interval, a regeneration signal for removal of a quantity of the spent operating fluid and the replacement of said quantity with a fresh operating fluid is produced as a function of the difference therebetween.

5,592,396

MONITORING AND CONTROL OF FLUID DRIVEN TOOLS

Angelo L. Tambini, Manor Kilbride, Ireland, and John Linehan, Horsham, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 927,853, Aug. 10, 1992, abandoned. This application Dec. 4, 1992, Ser. No. 986,027

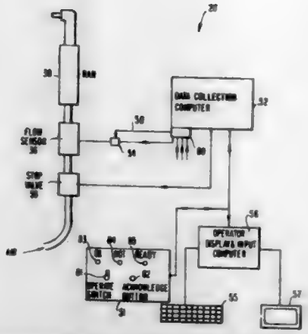
Int. Cl.[6] G01L *1/02*

U.S. Cl. 364—510 **56 Claims**

1. A system for monitoring a fluid driven tool for driving threaded fasteners comprising:

means for measuring fluid flow rate into the tool during operation of the tool wherein said means for measuring said fluid flow rate includes a venturi;

means for converting said measured fluid flow rate into an electrical signal representative of the magnitude of said fluid flow rate, wherein said means for converting said measured fluid flow rate into an electrical signal further includes a transducer arranged so as to detect the differential pressure caused by flow through said venturi;



means for electrically computationally processing said signal to transform said signal into another signal representing at least one parameter corresponding to a condition of said tool to be monitored which is a function of said fluid flow rate wherein said means for electrically processing said signal includes a suitably programmed microprocessor which is configured to identify a portion of the signal representative of fluid flow rate corresponding to the initial fluid flow rate during rundown of the fastener, prior to reaching a snug point; and

means for displaying said parameter.

5,592,397

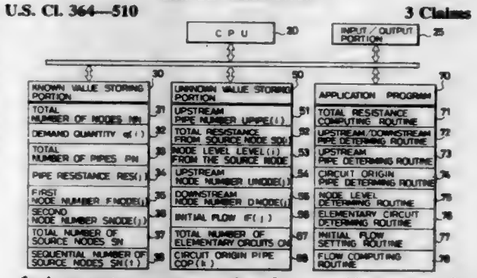
COMPUTER PROGRAM PRODUCT FOR DETERMINING ELEMENTARY CIRCUITS AND INITIAL VALUES OF FLOW IN A PIPE NETWORK

Sakura Shinoaki, Fujisawa, and Junichi Enomoto, Funabashi, both of Japan, assignors to Tokyo Gas Co., Ltd., Tokyo, Japan

Division of Ser. No. 59,291, May 11, 1993, Pat. No. 5,414,641. This application Mar. 6, 1995, Ser. No. 399,366

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—510 **3 Claims**



1. A computer program product for use with a system for analyzing flows in a pipe network including one or more source nodes and a plurality of demanding nodes, said one or more source nodes and said plurality of demanding nodes being interconnected with pipes, and each of said pipes having a known resistance, said computer program product comprising:

(a) first computer readable program code means for causing a computer to determine a resistance of a passage from each of said one or more source nodes to each one of said plurality of demanding nodes by summing the resistance of each of said pipes constituting the passage;

(b) second computer readable program code means for causing said computer to determine for each of said plurality of demanding nodes, a source and a total resistance on the basis of the resistance of the passage, said total resistance being determined as the minimum resistance of the passages from the demanding node to the source nodes, and said source node being determined as a source node joined to the demanding node through the passage providing the total resistance;

(c) third computer readable program code means for causing said computer to determine for each of said pipes, an

upstream node and a downstream node on the basis of the total resistances, said upstream node having less total resistance than said downstream node;

(d) fourth computer readable program code means for causing said computer to designate a pipe joining one of said upstream nodes to one of said downstream nodes as an upstream pipe of that downstream node;

(e) fifth computer readable program code means for causing said computer to select a pipe, which is never designated as an upstream pipe, as a circuit origin pipe;

(f) sixth computer readable program code means for causing said computer to determine for each of said one or more source nodes and said plurality of demanding nodes, a node level on the basis of said upstream nodes and said downstream nodes by ignoring the circuit origin pipes of said pipeline network, said node level indicating the number of nodes included in the passage from the source node;

(g) seventh computer readable program code means for causing said computer to determine elementary circuits, by tracing upstream nodes along a first route starting from a first node of one of said circuit origin pipes and along a second route starting from a second node of the circuit origin pipe in accordance with the node level of the upstream node of each pipe, until the first and second routes reach a same source node or different source nodes, or a same demanding node, each of said elementary circuits being used as an element for determining a flow of each of said pipes; and

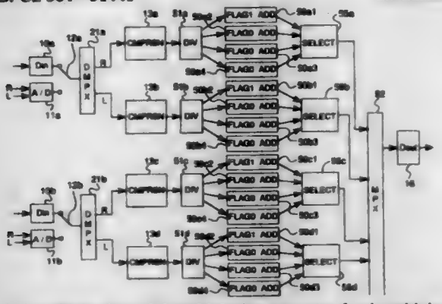
(h) a storing medium usable by said computer and storing said first to seventh computer readable program code means.

5,592,398

MULTIPLE CHANNEL MULTIPLEXING APPARATUS

Ikuo Terauchi, Nara; Keiichi Terashibi, Hirakata; Mitsuhiro Kazahaya, Katano, and Katsuyuki Taguchi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 9, 1994, Ser. No. 257,656
Claims priority, application Japan, May 16, 1994, 6-101086
Int. Cl.° H04L *29/06*
U.S. Cl. 364—514 A **18 Claims**



1. A multiple channel demultiplexing apparatus for demultiplexing a multiplexed bit stream data to a plurality of channels of audio data, said multiplexed bit stream data being assembled in a predetermined format comprising a preamble area, audio data area and sub-data area, said audio data area carrying a plurality of data blocks of different channels, each data block being added with a channel data identifying a particular channel to which said data block is associated, said apparatus comprising:

channel data detection means for detecting the channel data added to each data block;

display means for displaying the channel data detected by said channel data detection means;

demultiplexing means for demultiplexing the received multiplexed bit stream to said plurality of data blocks and sending the data blocks to different channels based on the detected channel data; and

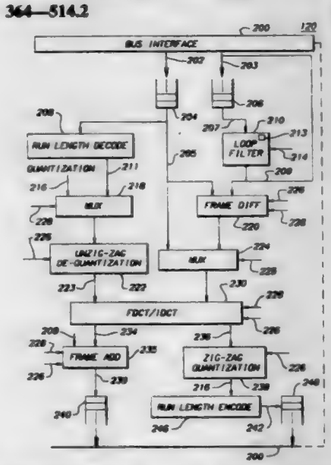
data expansion means, provided for each of said different channels, for data expanding the demultiplexed data block to obtain audio data.

5,592,399

PIPELINED VIDEO ENCODER ARCHITECTURE

Michael Keith, Beaverton, Oreg.; Tuan Bui, Phoenix, Ariz.; Kevin Harney, Brooklyn, N.Y., and Michael Kelly, Phoenix, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 26, 1993, Ser. No. 68,136
Int. Cl.° G06F *17/00*
U.S. Cl. 364—514.2 **23 Claims**



1. A video accelerator for a video processing system, wherein the video accelerator is adapted to perform hardwired decode functions to decode encoded video signals to accelerate video decode processing of the video processing system, comprising:

a run-length decoder, a dequantizer coupled to the run-length decoder, and an inverse transformer coupled to the dequantizer, wherein the video accelerator comprises a pipelined architecture such that;

the run-length decoder transforms a first set of signals into run-length decoded signals;

the dequantizer transforms a second set of signals into dequantized signals simultaneously with the transformation of the first set of signals by the run-length decoder;

the inverse transformer transforms a third set of signals into inverse transformed signals simultaneously with the transformation of the first set of signals by the run-length decoder and the transformation of the second set of signals by the dequantizer;

the run-length decoder transmits the run-length decoded signals directly to the dequantizer for dequantizing; and

the dequantizer transmits the dequantized signals directly to the inverse transformer for inverse transforming.

5,592,400

CARD ISSUE SYSTEM

Hiroshi Sasou, and Atsushi Yamazaki, both of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Japan

Filed Aug. 22, 1994, Ser. No. 294,134
Claims priority, application Japan, Aug. 27, 1993, 5-234343
Int. Cl.° G06F *17/00*
U.S. Cl. 364—514 R **6 Claims**

1. A card issue system comprising:

a data terminal for receiving card issue information including a card issue command;

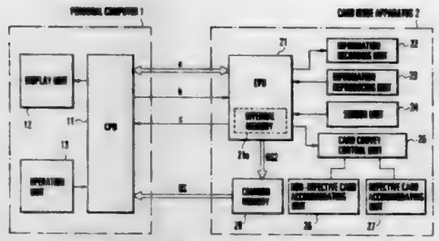
a card issue apparatus for performing a card issue process on the basis of the card issue information from said data terminal;

a common memory, arranged in said card issue apparatus, for storing card issue process result information;

interface means for performing data interface between said data terminal and said card issue apparatus, the card issue information from said data terminal being transmitted to said card issue apparatus through said interface means; and

a data bus for connecting said common memory and said data terminal, the card issue process result information stored in said common memory being transmitted to said data memory through said data bus, wherein,

said card issue apparatus is comprises detection means for detecting that said common memory is used by said data terminal, storage control means for storing the card issue result information in said common memory on the basis of a detection output from said detection means, and use permission means for permitting said data terminal to use said common memory upon completion of a storing operation performed by said storage control means, and said data terminal comprises read means for reading out the card issue result information from said common memory in accordance with a use permission command from said use permission means, and informing means for informing said card issue apparatus that said common memory is in use during a reading operation performed by said read means and informing said card issue apparatus that said common memory is not in use upon completion of the reading operation performed by said read means.



nent and a deficient component of said signal values, wherein said signal values are different;

each one of said sensors mounted on sensor supports for positioning in functional relationship to said entity for measuring the movement of said entity; and

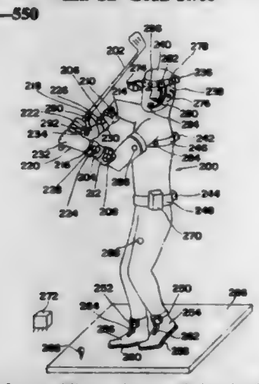
a data processor for receiving said first and second signal values for said entity, upon receipt of each second signal value selecting said second proficient component from said second signal value and improving said first signal value with said second proficient component.

5,592,401

ACCURATE, RAPID, RELIABLE POSITION SENSING USING MULTIPLE SENSING TECHNOLOGIES

James F. Kramer, Menlo Park, Calif., assignor to Virtual Technologies, Inc., Palo Alto, Calif.

Filed Feb. 28, 1995, Ser. No. 395,430
Int. Cl.° G01B *21/00*
U.S. Cl. 364—550 **31 Claims**



1. A device for providing an improved signal value in relation to a change in position of a movable entity along a path, said device comprising at least two sensors, wherein each one of a pair of said sensors has a deficiency not shared by the other sensor and a proficiency not shared by the other sensor, said deficiencies and proficiencies relating to position and time, said device comprising:

first and second position sensors providing first and second signal values, respectively, for said position, where each of said first and second signal values have a proficient component and a deficient component of said signal values, wherein said signal values are different;

each one of said sensors mounted on sensor supports for positioning in functional relationship to said entity for measuring the movement of said entity; and

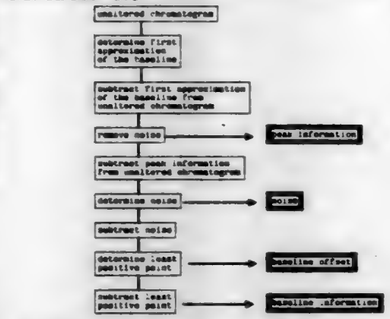
a data processor for receiving said first and second signal values for said entity, upon receipt of each second signal value selecting said second proficient component from said second signal value and improving said first signal value with said second proficient component.

5,592,402

METHOD FOR INTERPRETING COMPLEX DATA AND DETECTING ABNORMAL INSTRUMENTOR PROCESS BEHAVIOR

Kenneth R. Beebe; Glen H. Hughes; Harry D. Ruhl, and Richard C. Wintertou, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 200,804, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 869,607, Apr. 16, 1992, abandoned. This application Apr. 26, 1995, Ser. No. 430,093
Int. Cl.° G06G *7/48;7/58;* **G01N** *31/00*
U.S. Cl. 364—578 **26 Claims**



1. A method of using a computing device to conduct an analysis of a sample, comprising:

(a) performing an analytical technique on the sample, said analytical technique being selected from the group consisting of chromatography and spectrometry so that a set of multivariate data which corresponds to the sample is produced;

(b) obtaining a series of representative multivariate data sets, wherein the representative multivariate data sets are obtained from the same type of analysis as was performed to produce the set of multivariate data in step (a);

(c) creating a model of the series of multivariate data sets obtained in step (b);

(d) creating individual residuals describing the portion of the multivariate data set obtained for each member of the calibration set which is not described by the model created in step (c);

(e) creating an average residual by averaging the individual residuals created in step (d);

(f) determining the distance between the individual residual for each member of the calibration set and the average residual;

(g) creating a residual describing the portion of the multivariate data set produced in step (a) which is not described by the model created in step (c);

(h) determining the distance between a residual obtained in step (g) and the average residual created in step (e);

(i) labeling as an outlier any set of multivariate data whose distance obtained in step (h) is statistically different from the set of distances determined in step (f); and

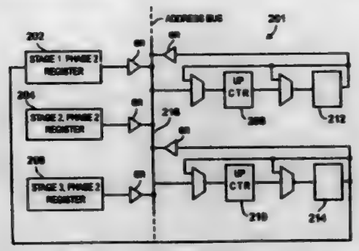
(j) checking for changes in feedstock, chemical processes and/or instruments used to make or evaluate the sample whenever one or more sets of multivariate data has been labelled as an outlier.

5,592,403

DIGITAL-TO-ANALOG CONVERTER INCLUDING INTEGRAL DIGITAL AUDIO FILTER

David S. Trager; Akhtar Ali; Frederick J. Highton, and Kun Lin, all of Tucson, Ariz., assignors to Monolith Technologies Corporation, Tucson, Ariz.

Filed Mar. 11, 1993, Ser. No. 29,870
Int. Cl.[6] G06F *17/10*
U.S. Cl. 364—724.01 1 Claim



1. A digital signal processor (DSP) circuit for recursively retrieving and processing pairs of data points in a symmetric digital filter, comprising:

first means for selecting an initial address within a sequentially addressed memory array and for storing indicia of said initial address in an address storage register;

second means for applying a data point corresponding to said initial address to an adder circuit;

third means for applying indicia of said initial address to an up counter and to a down counter;

fourth means for decrementing said down counter to produce a first down counter address;

fifth means for applying a data point corresponding to said first down counter address to said adder circuit for summation with said data point corresponding to said initial address;

sixth means for writing indicia of said first down counter address over said indicia of said initial address in said address storage register;

seventh means for incrementing said up counter to generate a subsequent up counter address, and decrementing said down counter to generate a subsequent down counter address; and

eighth means for applying the respective data points corresponding to said subsequent up counter address and said subsequent down counter address to said adder circuit;

wherein said seventh and eighth means are configured to sequentially increment said up counter, decrement said down counter, and apply a pair of data points corresponding to said up counter and said down counter outputs, respectively, to said adder circuit.

5,592,404

VERSATILE ERROR CORRECTION SYSTEM

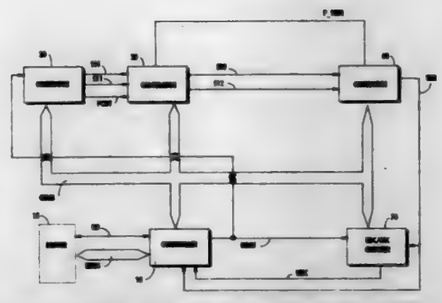
Christopher P. Zook, Longmont, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 147,758, Nov. 4, 1993. This application Sep. 16, 1994, Ser. No. 307,259
Int. Cl.[6] G06F *7/00;15/00;* H03M *13/00*
U.S. Cl. 364—746.1 73 Claims

1. Error correction apparatus for use with a buffer obtaining data in the form of codewords and any pointers generated with respect to such data, the pointers from the buffer being one bit buffer-obtained pointers, the error correction apparatus comprising:

a generator which generates syndromes for the codewords and which uses any one bit buffer-obtained pointer for the codeword to generate a multi-bit buffer-obtained pointer;

a calculation unit which uses the syndromes generated by the generator for a codeword to generate an error pattern for the codeword;



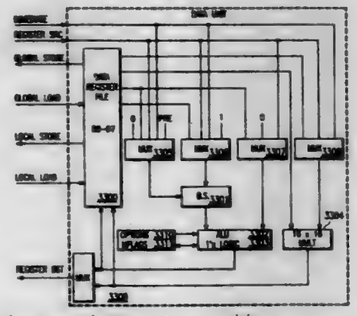
a correction unit which uses the error pattern generated by the calculation unit to correct the codeword for which the error pattern was generated.

5,592,405

MULTIPLE OPERATIONS EMPLOYING DIVIDED ARITHMETIC LOGIC UNIT AND MULTIPLE FLAGS REGISTER

Robert J. Gove, Plano; Karl M. Gutting, Missouri City, both of Tex.; Keith Balmer, and Nicholas K. Ing-Simmons, both of Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 263,504, Jun. 21, 1994, Pat. No. 5,471,592, which is a continuation of Ser. No. 135,754, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 933,865, Aug. 21, 1992, abandoned, which is a continuation of Ser. No. 435,591, Nov. 17, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 484,579
Int. Cl.[6] G06F *7/38;7/00;7/50*
U.S. Cl. 364—749 39 Claims



1. A data processing apparatus comprising:

an options register storing an indication of a number of sections selected from a plurality of possible number of sections;

an arithmetic logic unit connected to said options register having a first N-bit data input for a first N-bit digital input and a second N-bit data input for a second N-bit digital input, said arithmetic logic unit being divisible into said plurality of possible number of sections and divided into a plurality of sections equal in number to said indication of said number of sections stored in said options register, each section generating at a corresponding output a digital resultant signal representing a combination of respective subsets of said first and second multibit digital inputs of said inputs, and said arithmetic logic unit including a status detector generating a plurality of single bit status signals equal in number to said indication of said number of sections stored in said options register, each single bit status signal indicative of said digital resultant signal of a corresponding section of said arithmetic logic unit; and

a multiple flags register connected to said options register and said status detector having a number of bit storage locations greater than a greatest possible number of sections of said arithmetic logic unit, said multiple flags register connected to said status detector of said arithmetic logic unit for storing in predetermined locations within said multiple flags register said plurality of single bit status signals equal in number to said indication of said number of sections stored in said options register.

5,592,406

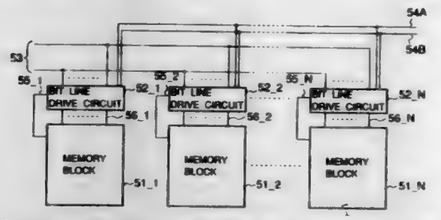
Patent Not Issued For This Number

5,592,407

ASSOCIATIVE MEMORY

Masahiro Konishi; Hiroshi Sasama, and Masato Yoneda, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Feb. 23, 1995, Ser. No. 393,072
Claims priority, application Japan, Feb. 25, 1994, 6-028130
Int. Cl.[6] G11C *15/00*
U.S. Cl. 365—49 9 Claims



1. An associative memory for storing a large amount of storage data and retrieving, when a retrieval data is inputted, the storage data corresponding to said retrieval data inputted, comprising:

a large number of memory words being divided into a plurality of memory blocks so as to respectively include at least one memory word group consisting of a plurality of memory words storing each storage data;

flag registers for storing match flags, each flag register corresponding to at least one of said large number of memory words, each match flag indicating, when storage data stored in the at least one of said large number of memory words and corresponding to said inputted retrieval data is detected on the occasion of retrieval, that said storage data corresponding to said inputted retrieval data is stored in the at least one of said large number of memory words corresponding to the each flag register; and

bit line drive circuits for driving bit lines of a memory block for current retrieval, depending on condition of said match flags stored in said flag registers in a preceding retrieval operation.

5,592,408

IDENTIFICATION CARD AND ACCESS CONTROL DEVICE

Yucel K. Keskin, Cupertino, and Asil T. Gokcebay, San Francisco, both of Calif., assignors to Security People, Inc., San Francisco, Calif.

Filed Jan. 3, 1994, Ser. No. 177,118
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—52 21 Claims

1. An electronic identification device, comprising:



an electronic header piece as a first component, the header piece including a housing containing a memory means with stored electronic memory and connection terminals for interfacing with an electronic port of a reader device,

encoded data programmed into the memory of the electronic header, and

an identification card as a second component non-integral with said first component, the card including information relating to a and identifying an intended holder of the device, and

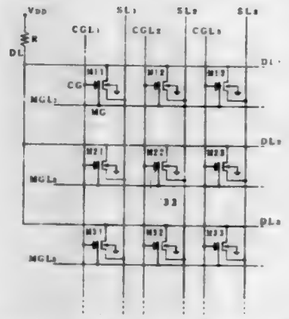
attachment means for securing the identification card to the header piece via an edge of the indentification card.

5,592,409

NONVOLATILE MEMORY

Kiyoshi Nishimura; Hideki Hayashi; Jun Muramoto; Takaaki Fuchikami, and Hiromi Uenoyama, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Japan

Filed Jan. 18, 1995, Ser. No. 374,216
Claims priority, application Japan, Jan. 18, 1994, 6-003796; Jan. 18, 1994, 6-003797; Apr. 20, 1994, 6-081481; Dec. 22, 1994, 6-319922
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 24 Claims



1. Nonvolatile memory formed by nonvolatile memory devices connected in a matrix of columns and lines:

wherein each of said nonvolatile memory devices comprises,

a source region and a drain region,

a channel region formed between the source and the drain regions,

a memory gate formed on the channel region and insulated from the channel region,

a ferroelectric layer formed on the memory gate, and

a control gate formed on the ferroelectric layer, and

wherein said nonvolatile memory comprises,

a first drain line which connects the drain regions of the nonvolatile memory devices in the same line of the matrix;

a unified second drain line which connects at least some of the first drain lines of the matrix,

a memory gate line which connects the memory gates of the nonvolatile memory devices in the same line of the matrix,

a source line which connects the source regions of the nonvolatile memory devices in the same column of the matrix, and

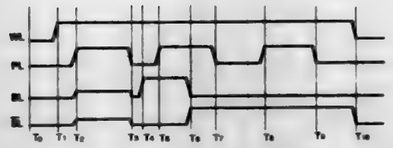
a control gate line which connects the control gates of the nonvolatile memory devices in the same column of the matrix.

5,592,410
CIRCUIT AND METHOD FOR REDUCING A COMPENSATION OF A FERROELECTRIC CAPACITOR BY MULTIPLE PULSING OF THE PLATE LINE FOLLOWING A WRITE OPERATION

Donald J. Verhaeghe, and Steven D. Traynor, both of Colorado Springs, Colo., assignors to Ramtron International Corporation, Colorado Springs, Colo.

Filed Apr. 10, 1995, Ser. No. 420,293
Int. Cl.[6] G11C 11/22
U.S. Cl. 365—145 9 Claims





1. A process for writing data to a ferroelectric memory cell comprising at least one ferroelectric capacitor having a predetermined stored dipole state maintained therein and a series connected transistor selectively coupled between a plate line and a bit line in response to a word line coupled to a control terminal of said transistor, said process comprising the steps of:

firstly applying a potential to said word line to enable said transistor;

secondly applying a first potential to said plate line to place an opposite stored dipole state in said capacitor;

thirdly removing said first potential from said plate line;

fourthly applying a potential to said bit line to return said opposite stored dipole state to said predetermined stored dipole state in said capacitor;

fifthly reapplying said first potential to said plate line;

sixthly removing said potential from said bit line to again place said opposite stored dipole state in said capacitor;

seventhly removing said first potential from said plate line;

eighthly again reapplying said first potential to said plate line;

ninthly again removing said first potential from said plate line; and

tenthly returning said bit line and said word line to an initial condition thereof.

5,592,411
NON-VOLATILE REGISTER AND METHOD FOR ACCESSING DATA THEREIN

Jy-Der D. Tai, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1995, Ser. No. 552,156
Int. Cl.[6] G11C 11/22
U.S. Cl. 365—145 20 Claims

1. A non-volatile register, comprising:

a first capacitor with polarization retention having a first electrode and a second electrode, wherein the first electrode is coupled for receiving an extraction signal and the second electrode is coupled for transmitting a data signal;

a second capacitor with polarization retention having a first electrode and a second electrode, wherein the first electrode is coupled to the second electrode of the first capacitor and the second electrode is coupled for receiving a restoration signal;

a third capacitor with polarization retention having a first electrode and a second electrode, wherein the first electrode is coupled to the first electrode of the first capacitor and the second electrode is coupled for transmitting a complementary data signal;

a fourth capacitor with polarization retention having a first electrode and a second electrode, wherein the first electrode is coupled the second electrode of the third capacitor and the second electrode is coupled to the second electrode of the second capacitor;

a voltage detector having a first voltage electrode, a second voltage electrode, a first control electrode, and a second control electrode, wherein the first voltage electrode is coupled to the second electrode of the first capacitor and the second voltage electrode is coupled to the second electrode of the third capacitor;

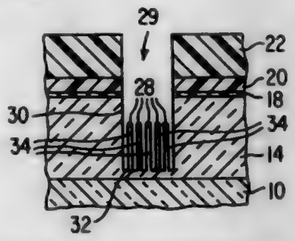
a first switch having a control electrode, a first current conducting electrode, and a second current conducting electrode, wherein the control electrode is coupled for receiving a first activation signal, the first current conducting electrode is coupled for receiving a first voltage level, and the second current conducting electrode is coupled to the first control electrode of the voltage detector; and

a second switch having a control electrode, a first current conducting electrode, and a second current conducting electrode, wherein the control electrode is coupled for receiving a second activation signal, the first current conducting electrode is coupled for receiving a second voltage level, and the second current conducting electrode is coupled to the second control electrode of the voltage detector.

5,592,412
ENHANCED DEEP TRENCH STORAGE NODE CAPACITANCE FOR DRAM

Richard Kleinhenz; Karl P. Muller; Klaus Rolthner, all of Wappingers Falls, and Masakatsu Tuschiaki, Fishkill, all of N.Y., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany; International Business Machines Corporation, Armonk, N.Y., and Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Oct. 5, 1995, Ser. No. 539,475
Int. Cl.[6] G11C 11/24; H01L 21/70;27/108;29/00
U.S. Cl. 365—149 20 Claims



1. A method for making a capacitance storage trench for a dynamic random access memory cell, comprising the steps of:

providing a substrate of semiconductive material having a surface;

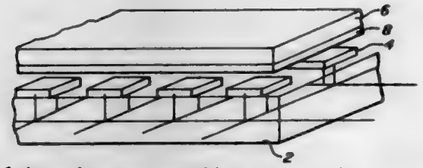
forming a plurality of micromasks within a selected region of said substrate spaced from said surface; and

applying an etchant to a selected area of said surface of said substrate which overlies said micromasks to form a trench in said substrate, said trench including at least one sidewall that extends into said substrate beyond said micromasks and terminates in a bottom wall, and a plurality of rods which extend between said bottom wall of said trench and said micromasks.

5,592,413
MICROSTRUCTURE ARRAY AND ACTIVATION SYSTEM THEREFOR

Richard Spitzer, 1214 Oxford St., Berkeley, Calif. 94709

Continuation of Ser. No. 45,563, Apr. 9, 1993, Pat. No. 5,491,338, which is a division of Ser. No. 649,522, Feb. 1, 1991, Pat. No. 5,237,529. This application Apr. 13, 1995, Ser. No. 422,336
The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.
Int. Cl.[6] G11C 13/00;7/00
U.S. Cl. 365—151 21 Claims



1. A transducer array comprising:

a) on a common substrate, an array of individual submillimeter transducers, said array of transducers being stationary relative to a material adjacent to said array of transducers during activation of said array;

b) means for selecting a desired portion of said array of transducers for activation; and

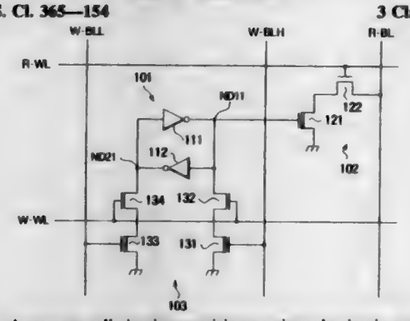
c) addressing means for activating the transducers in said desired portion of said array of transducers at selected times;

wherein said transducer array is operable to read information from said material adjacent said array without altering said information.

5,592,414
MEMORY CELL CIRCUIT INDEPENDENTLY CONTROLLED IN WRITING AND READING

Mitsuo Soneda, and Akihiko Hashiguchi, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Oct. 25, 1995, Ser. No. 547,784
Claims priority, application Japan, Oct. 28, 1994, 6-265890
Int. Cl.[6] G11C 11/34
U.S. Cl. 365—154 3 Claims



1. A memory cell circuit comprising a write only circuit, at least one read only circuit, and a latch circuit having an output node, in which said read only circuit comprises a first insulator gate field-effect transistor for driving and a second insulator gate field-effect transistor for selecting,

said first and second transistors being connected in series between a bit line for reading and a reference voltage source,

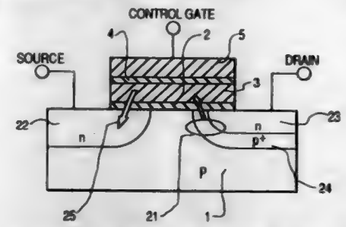
a gate electrode of said first insulator gate field-effect transistor being connected to said output node of said latch circuit, and a gate electrode of said second insulator gate field-effect transistor being connected to an address select line for reading, and

said first insulator gate field-effect transistor comprising an enhancement type transistor with a threshold voltage set lower than the threshold voltage of said second insulator gate field-effect transistor.

5,592,415
NON-VOLATILE SEMICONDUCTOR MEMORY

Masataka Kato, Musashino; Tetsuo Adachi, Hachioji; Toshihiro Tanaka, Akigawa; Toshio Sasaki, Nishitama-gun; Hitoshi Kume, Musashino, and Katsutaka Kimura, Akishima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 85,156, Jul. 2, 1993, abandoned. This application Dec. 10, 1993, Ser. No. 164,780
Claims priority, application Japan, Jul. 6, 1992, 4-177973
Int. Cl.[6] G11C 13/00
U.S. Cl. 365—185.01 8 Claims



1. A non-volatile semiconductor memory having an electric programmable/erasable function, comprising a plurality of memory arrays each including a plurality of memory cells disposed in a matrix having rows and columns,

wherein each of said memory cells is a one-transistor type memory cell essentially consisting of one MOSFET including a source region and a drain region disposed in a semiconductor substrate in a mutually spaced-apart relationship, a gate insulating film having a substantially uniform thickness from the surface of said source region to the surface of said drain region, a floating gate electrode formed on said gate insulating film, and a control gate formed over said floating gate electrode through an intermediate insulating film;

wherein said drain regions of said MOSFETs of a plurality of said memory cells on the same column are connected to one sub-data line in each of said memory arrays, and said sub-data line in each of said memory arrays on the same column is connected to one main data line through a drain side switch MOSFET;

wherein said source regions of said MOSFETs of each of said memory cells on the same column in each of said memory arrays are connected to one sub-source line, and said sub-source line of each of said memory arrays on the same column is connected to one common source line through a source side switch MOSFET;

wherein said control gates of said MOSFETs of each of said memory cells on the same row in each of said memory arrays are connected to one word line;

wherein, when an electric programming operation is carried out to remove charges retained at the floating gate of the MOSFET of one of said memory cells, a first voltage is applied to the drain region of the MOSFET of the memory cell to be subjected to said electric programming operation, said first voltage having a polarity to apply a reverse bias to a junction

between said drain region and said substrate, a second voltage having a polarity different from that of said first voltage with respect to said semiconductor substrate is applied to said control gate of the MOSFET of said memory cell, and said source side switch MOSFETs are brought into a turn-off state; and

wherein, when an electric erasing operation is carried out to inject charges into the floating gate of the MOSFET of one of said memory cells, a third voltage having the same polarity as that of said first voltage with respect to said semiconductor substrate is applied to said control gate of each of the MOSFETs of memory cells to be subjected to said electric erasing operation, and the other electrodes of said MOSFETs of said memory cells to be subjected to said erasing operation and the electrodes of the MOSFETs of other memory cells are all kept at the same voltage as that of said semiconductor substrate.

5,592,416

ELECTRONIC STORAGE CIRCUIT

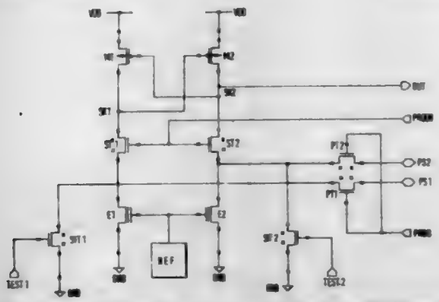
Rainer Bonitz, Bruckmühl, and Peter Birkenseher, München, both of Germany, assignors to SGS-Thomson Microelectronics GmbH, Grasbrunn, Germany

Filed Dec. 15, 1994, Ser. No. 358,000

Claims priority, application Germany, Dec. 15, 1993, 43 42 821.5

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.01 **28 Claims**



2. An electronic storage circuit for storing information having a parallel connection inserted between two poles of a supply voltage source and comprising a first series connection with a first EPROM transistor, a first MOS transistor and a first circuit node therebetween, and a second series connection with a second EPROM transistor, a second MOS transistor and a second circuit node, the gate of each of the two MOS transistors being connected with the circuit node of the other series connection, and the circuit node of one of the two series connections providing an output signal of the storage circuit,

wherein

the two EPROM transistors are connected with a programming means capable of selecting only the first or the second EPROM transistor to be placed in a programmed state and to leave the other EPROM transistor in an unprogrammed state depending on the information to be stored; the programming means includes:

a first and a second programming transistor respectively connecting the first and second EPROM transistors to a programming signal means that applies a programming signal only to the selected one of the two EPROM transistors and no programming signal to the other during a programming operation, and

a programming control signal means that renders the two programming transistors conductive during a programming operation;

a cutoff transistor is inserted in each of the two series connections between the circuit nodes and a connection point between EPROM transistor and programming transistor, said cutoff transistor being switchable by means of the programming control signal means to an off-state and otherwise to an on-state during a programming operation;

at least one simulation transistor is connected in parallel or in series with each of the two EPROM transistors, each simulation transistor being switchable alternately to an on- or off-state by means of a corresponding test signal for test simulation purposes;

the control gates of the two EPROM transistors are connected jointly with a reference voltage source that includes:

a voltage divider inserted between the two poles of the supply voltage source and having a first switching transistor inserted between one of the two poles and a partial voltage tap point, and a series connection inserted between the partial voltage tap point and the other of the two poles and comprising a first circuit element with a constant voltage drop and a second circuit element with a constant voltage drop in the form of a third EPROM transistor wired as a diode, the voltage divider being dimensioned in such a way that a voltage present at the partial voltage tap point suffices to switch the unprogrammed EPROM transistor to the on-state but not the programmed EPROM transistor,

a first controllable switch inserted between the partial voltage tap point and the output of the reference voltage source for gating, in the on-state, the partial voltage level present at the partial voltage tap point to the output,

a programming reference voltage source with a programming reference voltage high enough for programming an EPROM transistor,

and a second controllable switch inserted between the programming reference voltage source and the output of the reference voltage source for gating, in the on-state, the programming reference voltage to the output,

the controllable switches and being controlled by the programming control signal means in such a way that only the second controllable switch and otherwise only the first controllable switch is rendered conductive during a programming operation,

and the three EPROM transistors being part of one and the same integrated monolithic circuit and produced by the same method steps.

5,592,417

NON-VOLATILE PROGRAMMABLE BISTABLE MULTIVIBRATOR, PROGRAMMABLE BY THE SOURCE, FOR MEMORY REDUNDANCY CIRCUIT

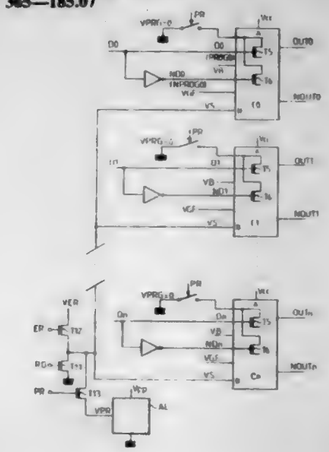
Jean-Michel Mirabel, Gardanne, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Filed Jan. 30, 1995, Ser. No. 380,738

Claims priority, application France, Jan. 31, 1994, 94 01035

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—185.07 **30 Claims**



1. An electrically programmable non-volatile memory, comprising:

a bistable cell having two floating-gate transistors, each of the floating-gate transistors having a source, a drain, and a control gate; and

means for applying, in a programming mode, a first fixed programming voltage to the source of each of the floating-gate transistors, a second fixed programming voltage to the control gate of each of the floating-gate transistors, and a zero voltage to the drain of one of the two floating-gate transistors and a high impedance to the drain of the other of the two floating-gate transistors depending on the state of programming desired for the cell, the zero voltage being the voltage applied to the sources of the floating-gate transistors in a reading mode.

5,592,418

NON-VOLATILE ANALOG MEMORY CELL WITH DOUBLE POLYSILICON LEVEL

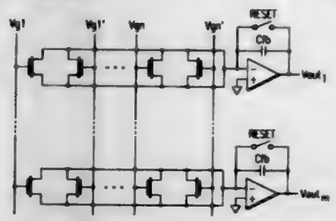
Marco Sabatini, Brescia, Italy, and Alan Kramer, Berkley, Calif., assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Jan. 3, 1995, Ser. No. 367,068

Claims priority, application European Pat. Off., Dec. 31, 1993, 93830538

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—185.18 **22 Claims**



17. An integrated circuit analog memory, comprising:

a memory cell, comprising

source and drain diffusions of a first type, and a channel region separating said source diffusion from said drain diffusion;

a first conductive thin film gate layer, overlying and capacitively coupled to and insulated from said channel region; and

a second conductive thin film gate layer, overlying and capacitively coupled to and insulated from said first conductive thin film gate layer and said channel region; and

a first metal conductor, insulated from said first and second conductive thin film gate layer and said channel region, which makes ohmic contact to said source region;

a second metal conductor, insulated from said first and second conductive thin film gate layer and said channel region, which makes ohmic contact to said drain region;

wherein each said gate layer has a width over said channel which is greater than the width thereof near said source and drain regions;

sensing circuitry, connected to sense, and to provide a voltage output corresponding to, the charge stored in said memory cell, without applying current between source and drain thereof;

wherein said channel includes a widened portion, beneath said floating gate, which is wider than portions of said channel nearer said source and drain regions.

5,592,419

FLASH MEMORY WITH IMPROVED ERASABILITY AND ITS CIRCUITRY

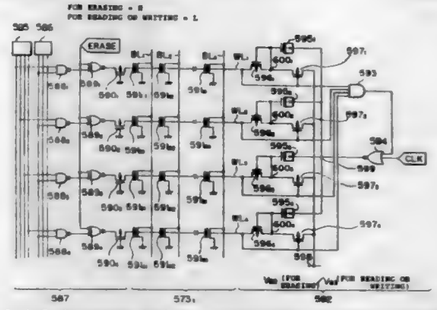
Takao Akaogi; Hiromi Kawashima; Tetsuji Takeguchi; Ryoji Hagiwara; Yasushi Kasa; Kiyoshi Itano, all of Kawasaki; Yasuhige Ogawa, Kasugai, and Shouichi Kawamura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 98,406, Aug. 6, 1993, abandoned. This application May 15, 1995, Ser. No. 441,598

Claims priority, application Japan, Dec. 9, 1991, 3-324701; Dec. 27, 1991, 3-346571; Jan. 14, 1992, 4-4678; Mar. 19, 1992, 4-64143; Jun. 5, 1992, 4-145300; Jun. 15, 1992, 4-154958; Sep. 25, 1992, 4-256594; Nov. 10, 1992, 4-299987

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—185.18 **1 Claim**



1. A flash memory including a cell matrix, in which rewritable nonvolatile memory cells are arranged at intersections between a plurality of word lines and a plurality of bit lines, and row decoders for applying specified voltage selectively to said word lines during writing or reading, said flash memory comprising:

switch circuits that are located between said cell matrix and said row decoder in association with said word lines, and that enter a cutoff state when said word lines are set to negative voltage and enter a conducting state on any other occasion;

negative-voltage bias circuits whose negative-voltage output terminals are connected to said word lines, and that apply the voltage output of a negative power supply to said word lines in response to a clock pulse; and

clock pulse control circuits for extending control so that when it is detected during erasing that said word lines are selected, said clock pulse will be supplied to said negative-voltage bias circuit, wherein said word lines are divided into a plurality of groups; and said clock pulse control circuits extend control so that when any word lines in a group are selected, said clock pulse will be supplied to each of said negative-voltage bias circuits connected to the selected word lines in the group.

5,592,420

PROGRAMMABLE POWER GENERATION CIRCUIT FOR FLASH EEPROM MEMORY SYSTEMS

Raul-Adrian Cernea, Cupertino; Douglas J. Lee, San Jose; Mehrdad Mofidi, Fremont, and Sanjay Mehrotra, Milpitas, all of Calif., assignors to SanDisk Corporation, Sunnyvale, Calif.

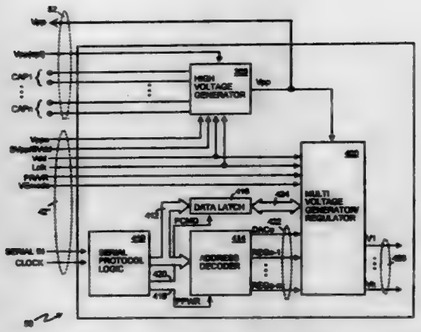
Division of Ser. No. 325,774, Oct. 17, 1994, Pat. No. 5,508,971. This application Jun. 7, 1995, Ser. No. 482,939

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.18 **13 Claims**

1. In a flash EEPROM chip having a plurality of flash EEPROM cells, a programmable voltage generator circuit comprising:

means for generating, in response to an enable signal, a high voltage and a high current from a low voltage source connected to said high voltage and high current generating means;



a plurality of registers respectively storing information indicative of a plurality of voltages suitable for programming, reading and erasing selected ones of said plurality of flash EEPROM cells; and

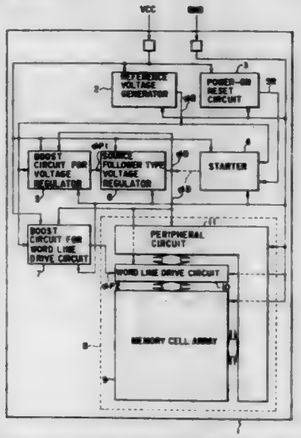
a plurality of digital-to-analog converters connected to said high voltage and high current generating means, wherein individual ones of said plurality of digital-to-analog converters are coupled to at least one of said plurality of registers to provide an analog output voltage proportional to the information stored in said at least one register.

5,592,421

SEMICONDUCTOR INTEGRATED CIRCUIT FOR GENERATING AN INTERNAL POWER SOURCE VOLTAGE WITH REDUCED POTENTIAL CHANGES

Tetsuya Kaneko, Kawasaki, and Takashi Ohsawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1995, Ser. No. 393,077
Claims priority, application Japan, Feb. 25, 1994, 6-028313
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—189.09 **28 Claims**



8. A semiconductor integrated circuit device comprising:

an integrated circuit section;

first converting means for converting a first potential which causes changes in potential levels into a second potential which has a substantially constant potential range in which potential changes are reduced by regulating the first potential to a predetermined potential level;

generating means driven by the second potential as a power source, for generating a third potential which is higher than the second potential and is used as an operating power source for at least a part of a first circuit block in the integrated circuit section; and

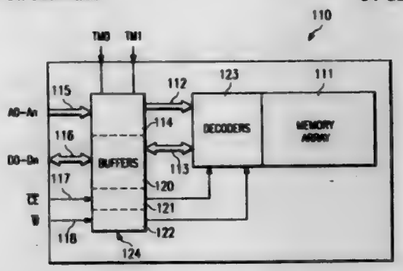
second converting means using the third potential, for generating a fourth potential which is lower than the third potential and is used as an operating power source for at least a part of a second circuit block in the integrated circuit section.

5,592,422

REDUCED PIN COUNT STRESS TEST CIRCUIT FOR INTEGRATED MEMORY DEVICES AND METHOD THEREFOR

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 7, 1995, Ser. No. 476,658
Int. Cl.[6] G11C *29/00*
U.S. Cl. 365—201 **34 Claims**



1. A signal buffer in an integrated memory circuit, said integrated memory circuit having a normal operation mode and at least two special test operation modes, comprising:

an input signal line for receiving an input signal;

a first and a second test mode control input for receiving a mode select code;

a first output signal line;

a circuit for generating an output signal on the first output signal line corresponding to the input signal responsive to the first and second test mode control inputs receiving a mode select code indicating normal operation of the integrated circuit, and for generating an output signal on the first output signal line to a predetermined logic state responsive to said first and second test mode control inputs receiving a mode select code indicating one of the at least two special test operation modes.

5,592,423

SEMICONDUCTOR INTEGRATED CIRCUIT ENABLING EXTERNAL MONITOR AND CONTROL OF VOLTAGE GENERATED IN INTERNAL POWER SUPPLY CIRCUIT

Kenji Tokami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 485,918
Claims priority, application Japan, Oct. 4, 1994, 6-240126
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—221 **10 Claims**

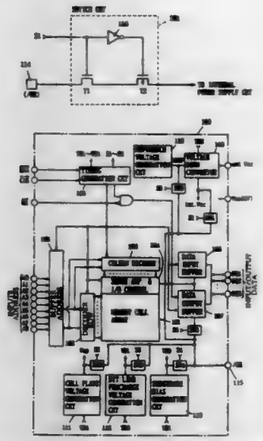
1. A semiconductor integrated circuit device operating with an externally applied power supply voltage, comprising:

internal voltage generating means for converting said external power supply voltage to a predetermined internal power supply voltage;

an external terminal employed for an input/output of a signal to/from said semiconductor integrated circuit device;

means for generating a signal for designating a test mode; and

switch means including a p channel MOS transistor and an n channel MOS transistor connected in series, provided between an output of said internal voltage generating means and said



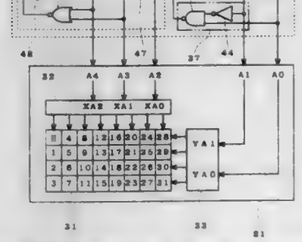
external terminal and simultaneously opening and closing in response to said test mode designating signal.

5,592,424

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Hideshi Maeno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 521,585
Claims priority, application Japan, Feb. 27, 1995, 7-038474
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 **12 Claims**



1. A semiconductor integrated circuit device comprising:

a memory circuit which comprises a plurality of memory cells, an X decoder for designating an X address of said memory cells and a Y decoder for designating a Y address of said memory cells; and

an address generating circuit for generating addresses of both said X decoder and said Y decoder, wherein

said address generating circuit comprises:

a first circuit generating full cyclic sequence for generating all values of an address of one of said X decoder and said Y decoder while sequentially, periodically and systematically changing the values of said address;

a second circuit generating full cyclic sequence for generating all values of an address of the other one of said X decoder and said Y decoder while sequentially, periodically and systematically changing the values of said address; and

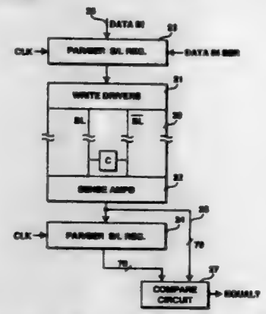
a specific state detection circuit for detecting a specific address state in said first circuit generating full cyclic sequence and for rendering said second circuit generating full cyclic sequence inoperable when said first circuit generating full cyclic sequence is in a state other than said specific address state.

5,592,425

METHOD AND APPARATUS FOR TESTING A MEMORY WHERE DATA IS PASSED THROUGH THE MEMORY FOR COMPARISON WITH DATA READ FROM THE MEMORY

Alex Neduva, Migdal HA'Emek, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 20, 1995, Ser. No. 576,705
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 **9 Claims**



1. A method for testing a memory in an integrated circuit comprising the steps of:

reading a first bit pattern from the memory;

passing a second bit pattern through the memory without storing the second bit pattern in the memory; and,

comparing the first and second bit patterns.

5,592,426

EXTENDED SEGMENTED PRECHARGE ARCHITECTURE

Derwin L. Jaffice, Reston, Va.; Christopher M. Durham, and Michael K. Ciraula, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 142,991, Oct. 29, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,441
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—203 **4 Claims**

1. A memory array having row address inputs connected to a row address decoder and column address inputs connected to a column address decoder, said memory array including word lines organized into rows and a plurality of bit line pairs organized into columns, each bit line pair being associated with a column, said memory array comprising:

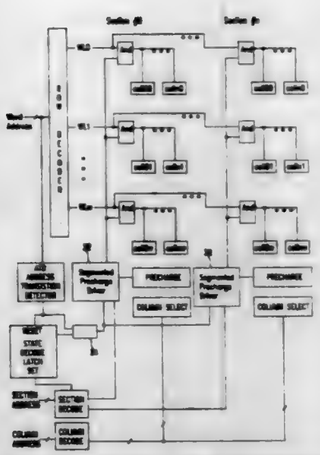
a plurality of segments, each segment containing a portion of said plurality of bit line pairs;

a precharge circuit coupled to each of said plurality of segments for precharging and equalizing a potential on each bit line in a bit line pair of a given segment;

an address transition detection circuit having an input coupled to said row address inputs, said address transition detection circuit detecting a row address transition and outputting an address transition signal when said row address transition is detected;

a segment address decoder for decoding an address of a selected segment;

logic circuitry having a first input coupled to an output of said address transition detection circuit for receiving said address transition signal and a second input coupled to an output of



said segment address decoder, said logic circuitry determining whether precharging of said selected segment is necessary; and

a controller for each precharge circuit having a first input coupled to an output of said logic circuitry, a second input coupled to said segment address decoder and an output coupled to said precharge circuit, said controller activating said precharge circuit only if said logic circuitry determines that said address transition signal was received and said selected segment was immediately previously selected.

5,592,427

SEMICONDUCTOR MEMORY HAVING A SENSE AMPLIFIER WITH LOAD TRANSISTORS HAVING DIFFERENT LOAD CHARACTERISTICS

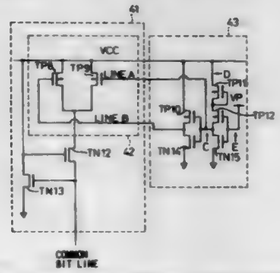
Sinsuke Kunakura; Hirokazu Yamazaki; Hisayoshi Watanabe, and Yasushi Kasa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 365,847, Dec. 29, 1994, Pat. No. 5,469,394, which is a division of Ser. No. 192,821, Feb. 7, 1994, Pat. No. 5,402,388. This application Jun. 6, 1995, Ser. No. 463,636

Claims priority, application Japan, Mar. 17, 1993, 5-057135

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—205 **1 Claim**



1. A semiconductor memory having a sense amplifier comprising:

a load resistance section including a plurality of load transistors having different load characteristics which are selectable for connection; and

a load transistor select signal generating circuit for generating a select signal for selecting one of the plurality of load transistors for connection in accordance with a supply voltage supplied to said load resistance section.

5,592,428

DYNAMIC MEMORY

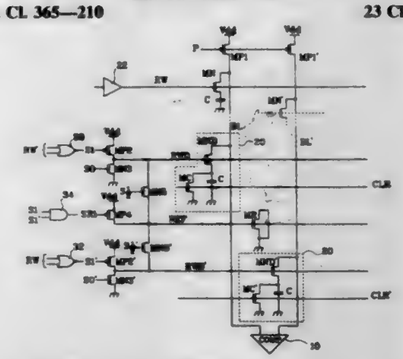
Michel Harrand, Saint Egreve, and Michel Runtz, Grenoble, both of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis Poullly, France

Filed May 10, 1994, Ser. No. 240,144

Claims priority, application France, May 24, 1993, 93 06533

Int. Cl.[6] G11C *7/02*

U.S. Cl. 365—210 **23 Claims**



1. A dynamic memory comprising:

a plurality of cells, each cell including a capacitor connected by a column to a bit line and by a row to a selection line, the plurality of cells grouped into a plurality of pairs, each pair having an even column containing a cell of a respective even row, and an odd column containing a cell of a respective odd row;

an even row and odd row containing reference cells, the cells of the other rows being memory cells;

means for precharging each bit line at a predetermined state before reading;

means for selecting, when reading, the odd row of each reference cell simultaneously with one of the even rows of the memory cells; and

a comparator associated with each pair of columns, receiving the two bit lines of the pair of columns;

wherein the capacitor of each reference cell has a capacitance value and the capacitor of each memory cell has a capacitance value substantially equal to the capacitance value of the capacitor of each reference cell; and wherein means are provided for, prior to reading a memory cell of an even row, connecting a selection line of the odd row of reference cells to a capacitance element that is precharged at the state opposite to the state of the selection line of the odd row of reference cells, the selection line of the odd row of reference cells and the capacitance element each having a substantially equal capacitance.

5,592,429

COMPACT SEMICONDUCTOR MEMORY DEVICE CAPABLE OF PREVENTING INCOMPLETE WRITING AND ERASING

Masayoshi Hirata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 30, 1995, Ser. No. 550,158

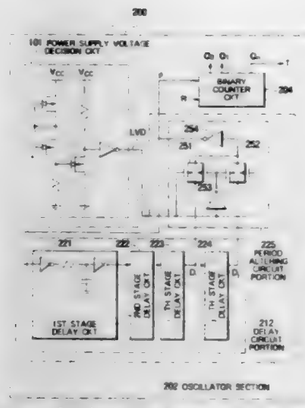
Claims priority, application Japan, Oct. 28, 1994, 6-265563

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—226 **4 Claims**

4. A writing/erasing time interval determining circuit which is for use in a semiconductor memory device and which produces a pulse signal of a pulse width for deciding a predetermined writing/erasing time interval, comprising:

a power supply voltage decision circuit which senses a power supply voltage to detect whether or not the power supply voltage is higher than a predetermined level and which produces an output detected signal; and



altering means for altering said pulse width in response to said output detected signal.

5,592,430

SEMICONDUCTOR DEVICE EQUIPPED WITH SIMPLE STABLE SWITCHING CIRCUIT FOR SELECTIVELY SUPPLYING DIFFERENT POWER VOLTAGES

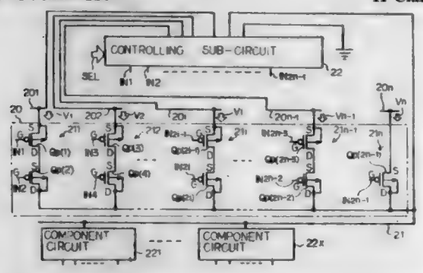
Tetsuya Ohtsuki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 31, 1995, Ser. No. 550,658

Claims priority, application Japan, Nov. 4, 1994, 6-271085

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—226 **11 Claims**



1. A supply voltage switching circuit incorporated in a semiconductor integrated circuit device, comprising:

a plurality of first series sub-circuits coupled to a power distribution line and a plurality of power supply lines different in power voltage thereon, each of said plurality of first series sub-circuits including a first p-channel enhancement type transistor having a first source node coupled to associated one of said plurality of power supply lines, a first gate electrode and a first drain node and a second p-channel enhancement type transistor having a second source node coupled to said first drain node, a second gate electrode and a second drain node coupled to said power distribution line; and

a controlling sub-circuit coupled to said plurality of first series sub-circuits, and responsive to a selecting signal indicative of one of said plurality of power supply lines so as to produce

a first control signal of a first certain potential level lower than the power voltage on associated one of said plurality of power supply lines by at least a first threshold level of said first p-channel enhancement type transistor coupled to said one of said plurality of power supply lines,

a second control signal of a second certain potential level lower than a potential level on said power distribution line by at least a second threshold of said second p-channel enhancement type transistor associated with said one of said plurality of power supply lines,

a third control signal of a third certain potential level equal to the power voltage on each of the other or others of said plurality of power supply lines, and

a fourth control signal of a fourth certain potential level equal to the potential level on said power distribution line,

said first control signal being supplied to said first gate electrode of said first p-channel enhancement type transistor coupled to said one of said plurality of power supply lines so that said first p-channel enhancement type transistor of said one of said plurality of power supply lines turns on,

said second control signal being supplied to said second gate electrode of said second p-channel enhancement type transistor associated with said one of said plurality of power supply lines so that said second p-channel enhancement type transistor of said one of said plurality of power supply lines turns on,

said third control signal being supplied to said first gate electrode of each first p-channel enhancement type transistor coupled to each of said plurality of power supply lines except for said one of said plurality of power lines so that each first p-channel enhancement transistor is turned off,

said fourth control signal being supplied to said second gate electrode of each second p-channel enhancement type transistor associated with said each of said plurality of power supply lines except for said one of said plurality of power lines so that each said second p-channel enhancement type transistor is turned off.

5,592,431

Patent Not Issued For This Number

5,592,432

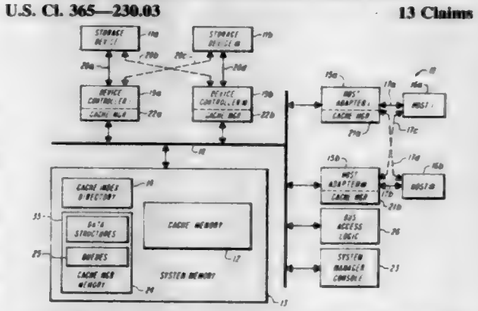
CACHE MANAGEMENT SYSTEM USING TIME STAMPING FOR REPLACEMENT QUEUE

Natan Vishlitzky, 4 Alton Ct., Unit #1, Brookline, Mass. 02132, and Yuval Ofek, 9 DiCarlo Rd., Hopkinton, Mass. 01748

Filed Sep. 5, 1995, Ser. No. 523,304

Int. Cl.[6] G11C *8/00;15/00;29/00*; G06F *12/00*

U.S. Cl. 365—230.03 **13 Claims**



1. In a data storage system having a system memory responsive to a plurality of hosts, host computers a method for placing data elements in the system memory comprising the steps of:

establishing a replacement queue containing cache memory slots storing data elements,

time stamping each data element placed in the cache memory slot at the tail of the replacement queue,

comparing the elapsed time of a data element to be updated to a predetermined threshold,

if the elapsed time of the data element to be updated is less than a predetermined threshold, maintaining the data element in the same location in the replacement queue; and

if the elapsed time of the data element to be updated is greater than the predetermined threshold, inserting the data element at the tail of the replacement queue.

5,592,433

SEMICONDUCTOR MEMORY DEVICE HAVING A CAPABILITY FOR CONTROLLED ACTIVATION OF SENSE AMPLIFIERS

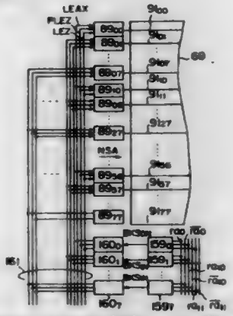
Hiroyoshi Tomita; Makoto Yanagisawa, and Yukinori Kodama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 578,389, Dec. 28, 1995, which is a continuation of Ser. No. 314,885, Sep. 29, 1994, which is a division of Ser. No. 193,535, Feb. 8, 1994, Pat. No. 5,384,726. This application May 7, 1996, Ser. No. 643,834

Claims priority, application Japan, Mar. 18, 1993, 5-059109; Mar. 18, 1993, 5-059110

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—230.06 **6 Claims**



1. A semiconductor memory device, comprising:
a memory cell array including a plurality of memory cells and sense amplifiers;
a plurality of drive each of said drive circuits being supplied with a control signal for activating the sense amplifiers in response thereto;
a plurality of gate circuits, each provided in correspondence to one of said plurality of drive circuits, each of said gate circuits being supplied with said control signal for controlling a passage of said control signal to a corresponding drive circuit;
a control circuit connected to each of said plurality of gate circuits via a common control line, said control circuit producing said control signal and supplying said control signal commonly to said plurality drive of circuits substantially simultaneously via said control line, and
a selection circuit connected to said plurality of gate circuits via respective selection lines, the selection circuit selecting one of said gate circuits as a selected gate circuit in response to a selection signal transmitted along a correspoonding selection line, such that said selected gate circuit passes said control signal to the corresponding drive circuit.

5,592,434

SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE

Hitoshi Iwamoto; Yasuhiro Konishi; Katsumi Dosaka, and Yasunobu Murai, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

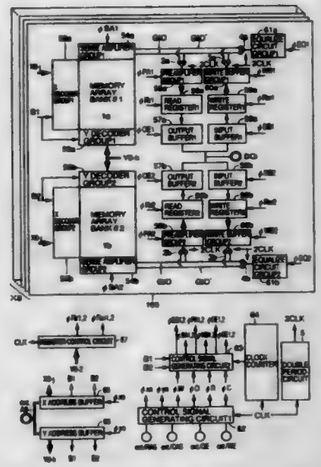
Filed Oct. 25, 1995, Ser. No. 548,285

Claims priority, application Japan, Dec. 15, 1994, 6-311842; Jan. 30, 1995, 7-013048

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—233 **19 Claims**

1. A synchronous semiconductor memory device strobing an external signal including a control signal, an address signal, and a data signal in response to an external clock signal, comprising:



a memory array including a plurality of memory cells arranged in rows and columns;
first and second signal input/output line pairs for inputting/outputting the data signal to and from said memory array;
a frequency division circuit frequency-dividing said external clock signal and outputting an internal clock signal having a period a plurality of times that of the external clock signal;
a selection circuit continuously selecting any memory cell of said memory array according to said address signal;
a switching circuit responsive to said internal clock signal outputted from said frequency division circuit for connecting each of the memory cells selected by said selection circuit to one ends of said first and second signal input/output line pairs alternately on a clock cycle basis; and
a data input/output circuit responsive to said internal clock signal outputted from said frequency division circuit for receiving and transmitting the data signal to and from the other ends of said first and second signal input/output terminal pairs alternately on a clock cycle basis.

5,592,435

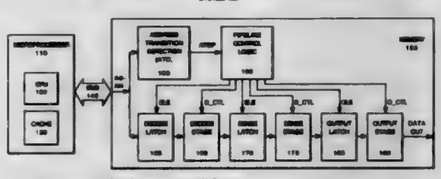
PIPELINED READ ARCHITECTURE FOR MEMORY

Duane R. Mills; Sachidanandan Sambandan, and Phillip M. L. Kwong, all of Folsom, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 254,028, Jun. 3, 1994, abandoned. This application Dec. 20, 1995, Ser. No. 575,339

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233.5 **6 Claims**



1. A memory device comprising:
a memory array;
an address transition detection circuit providing an ATD signal in response to an address transition from a previous address identifying previously requested data to a new address identifying newly requested data;
a read pipeline comprising:
a decode latch for latching the new address in response to a DLE signal;

a decode stage, the decode stage receiving the previous address from the decode latch in response to the DLE signal, wherein the decode stage decodes the previous address in response to a first D_CTL signal;
a sense latch, wherein an output of the decode stage is latched in the sensing latch in response to an SLE signal;
a sense stage, wherein the sense stage retrieves a previously requested data from a portion of the memory array identified by output of the decode stage latched in the sense latch in response to an S_CTL signal;
an output latch, wherein the previously requested data is latched into the output latch from the sense stage in response to an OLE signal;
an output stage, wherein the previously requested data is provided by the output stage in response to an O_CTL signal;
a pipeline control logic (PCL) circuit for providing the DLE, first D_CTL, SLE, S_CTL, OLE, and O_CTL signals responsive to the ATD signal, wherein the PCL circuit provides a second D_CTL signal to decode the new address, wherein the second D_CTL signal is delayed such that the decode stage finishes decoding the new address at substantially the same time the sense stage finishes retrieving the previously requested data.

5,592,436

DATA TRANSFER SYSTEM

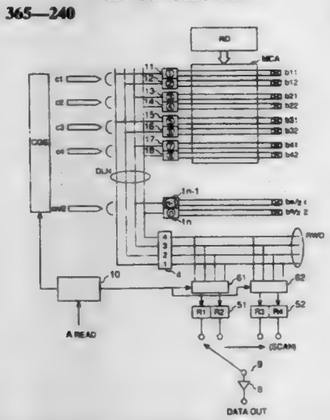
Haruki Toda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 345,682, Nov. 21, 1994, Pat. No. 5,508,970, which is a division of Ser. No. 111,046, Aug. 24, 1993, Pat. No. 5,392,254. This application Feb. 27, 1995, Ser. No. 397,038

Claims priority, application Japan, Aug. 28, 1992, 4-230583

Int. Cl.[6] G11C *8/04*

U.S. Cl. 365—240 **24 Claims**



1. A data transfer system, comprising:
a plurality of data input/output gates arranged by k-unit group by k-unit group in a predetermined sequence;
gate selector circuit each arranged for k-unit group of said gates, for selecting said gates in unit of k-unit group;
a plurality of data transfer paths for transferring data via said gates selected by said gate selector circuit;
a first register group composed of a-units of data registers for transferring data simultaneously to and from said data transfer paths, the a-unit data registers being serial-accessed in a constant sequence; and
a scrambler circuit for designating any required data input/output gates and for further selectively connecting said data transfer paths connected to said designated data input/output gates with said data registers so that said data transfer paths connected to said designated input/output gates can be connected to the serial-accessible registers in a predetermined sequence, when the number of the data transfer paths is (L×k) under the following conditions:

if a (mod k) ≡ 0, 1, $L = [a/k] + 1$

if other than the above, $L = [a/k] + 2$

where L denotes a maximum number of said gate selecting means selectable simultaneously.

5,592,437

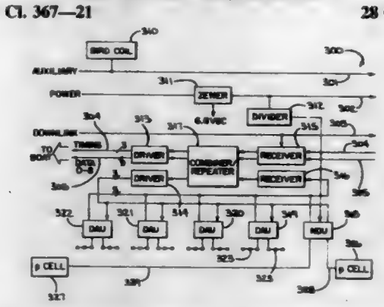
DATA COLLECTION AND RELAY CIRCUIT FOR TOWED HYDROPHONE ARRAY

Bruce Elliott, Plano, Tex., assignor to Whitehall Corporation, Dallas, Tex.

Filed Sep. 23, 1993, Ser. No. 126,064

Int. Cl.[6] G01V *1/22*; H03G *3/20*

U.S. Cl. 367—21 **28 Claims**



1. A programmable data collection and relay circuit for a towed hydrophone array, comprising:
a plurality of sensor inputs, each of said sensor inputs adapted to be coupled to a sensor capable of sensing a physical characteristic selected from the group consisting of temperature, depth, voltage, fluid invasion and tension, within said towed hydrophone array;
means for polling at least a portion of said plurality of sensor inputs to determine values of said inputs;
means for storing programmed data concerning which of said plurality of inputs is to be polled; and
means for serially placing said input values in condition for insertion into a data stream transmitted along said towed hydrophone array.

5,592,438

METHOD AND APPARATUS FOR COMMUNICATING DATA IN A WELLBORE AND FOR DETECTING THE INFLUX OF GAS

Louis H. Rorden, Los Altos; Ashok Patel, San Jose, both of Calif.; James V. Leggett, III; Frank L. Gibbons, both of Houston, Tex., and Steven C. Owens, Katy, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 715,364, Jun. 14, 1991, Pat. No. 5,283,768. This application Aug. 18, 1993, Ser. No. 108,958

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.[6] G01V *1/40*

U.S. Cl. 367—83 **88 Claims**

1. An acoustic communication apparatus for use in a wellbore having a plurality of concentrically nested tubular strings disposed therein, with at least one fluid column defined therein selected as a communication channel, comprising:
a transducer in force-transferring communication with said communication channel;



a housing for securing said transducer in a selected location within said wellbore, said housing affecting an acoustic admittance of said communication channel; and

at least one impedance matching member, dimensioned in (1), cross-sectional area and (2) length with respect to at least one of (1) said communication channel, (2) said housing, and (3) at least one probable acoustic communication frequency to minimize reflection of acoustic energy at said housing.

5,592,439

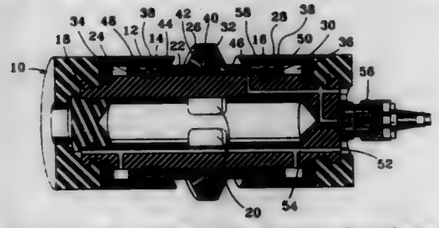
SELF-CENTERING DUAL SHUTTLE AIR GUN

E. R. Harrison, Plano, and Philip J. Jenkins, deceased, late of Pearland, both of Tex., assignors to I/O Exploration Products (U.S.A.), Inc., Stafford, Tex.

Filed Feb. 24, 1995, Ser. No. 393,721

Int. Cl.[6] H04R *23/00*

U.S. Cl. 367—144 **6 Claims**



1. An air gun for releasing compressed air into the environment, comprising:

a housing defining a chamber for storing the compressed air and further defining a port for permitting the release of the compressed air from the chamber into the environment;

a first valve, having a first tapered surface, movable relative to the housing for selectively closing a portion of the port;

a second valve, having a second tapered surface, movable relative to the housing for cooperating with the first valve to close the port in an initial charged position to permit the placement of compressed air into the housing chamber;

an actuator for moving the first valve and the second valve to open the port to permit the release of the compressed air into the environment;

a first seal between the housing and the first tapered surface, the first seals, the housing, and the first tapered surface defining a first charging chamber;

a second seal between the housing and the second tapered surfaces, the second seal, the housing, and the first tapered surface defining a second charging chamber;

wherein the first and second charging chambers are operable for being charged with compressed air for urging the first and second valves into the initial charged position; and

wherein the surface area of the first and the second tapered surfaces in contact with the compressed air increases as the first and second valves move from the initial charged position so that the first and second valves are biased to return to the initial charged position.

5,592,440

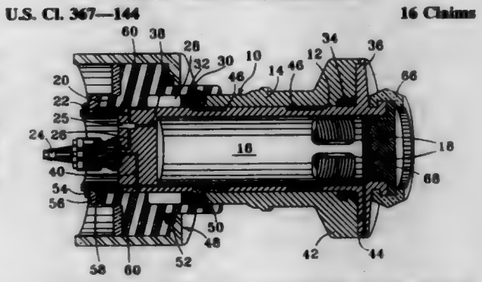
COMPACT SLEEVE AIR GUN

E. R. Harrison, Plano, Tex., assignor to I/O Exploration Products (U.S.A.), Inc., Houston, Tex.

Filed Mar. 31, 1995, Ser. No. 414,583

Int. Cl.[6] G01V *1/02*; H04R *23/00*

U.S. Cl. 367—144 **16 Claims**



1. An air gun for releasing compressed air into the environment, comprising:

a housing defining a chamber for storing the compressed air and further defining a port for permitting the release of the compressed air from the chamber into the environment;

a valve movable relative to the housing for selectively closing a portion of the port;

an actuator for selectively moving the valve to open the port and to permit the release of the compressed air into the environment;

an end cap for closing the housing chamber; and

a retainer for detachably engaging the end cap to the housing, wherein the retainer is selected from the group consisting of a split ring, a removable pin, a clip, a hook, a detent spring, and a disconnect.

5,592,441

HIGH-GAIN DIRECTIONAL TRANSDUCER ARRAY

Philip M. Kuhn, Severna Park, Md., assignor to Martin Marietta Corporation, Syracuse, N.Y.

Filed Oct. 6, 1995, Ser. No. 542,477

Int. Cl.[6] G01S *15/00*

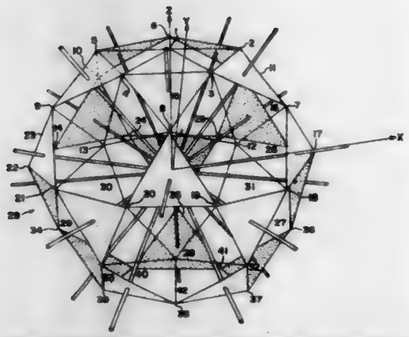
U.S. Cl. 367—153 **2 Claims**

1. A transducer array comprising:

forty-two acoustic transducers for use in a fluid medium, each of said transducers having maximum lateral dimensions of less than one acoustic wavelength in said medium;

arraying means for arraying said acoustic transducers at the vertices of a regular geodesic two-frequency icosahedron, said arraying means further comprising:

one of drive and receiving means coupled to said transducers, for generating transducer drive signals therefor, and for receiving transduced signals therefrom, respectively; and



delay control means coupled to said acoustic transducers and with said one of said drive and receiving means, for controlling an acoustic beam formed by said array.

5,592,442

WATCH HAVING A SENSOR

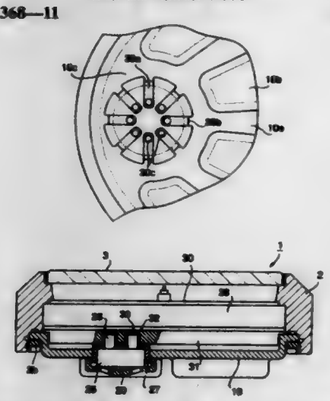
Junichi Nishikawa; Tomomi Murakami, and Nobuyuki Uehara, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Japan

Filed Apr. 14, 1995, Ser. No. 422,595

Claims priority, application Japan, Apr. 14, 1994, 6-075961; May 20, 1994, 6-106898; May 31, 1994, 6-118606; Apr. 11, 1995, 7-085164

Int. Cl.[6] G04B *47/06*

U.S. Cl. 368—11 **2 Claims**



1. A wrist watch having a watch case and a back, comprising:

a sensor housing pipe provided in a recess formed on an underside of the back;

a sensor housed in the sensor housing pipe;

securing means for securing the sensor in the sensor housing pipe;

the back having a plurality of grooves formed on the underside thereof and communicating the recess on the back with outside of the watch;

an outermost member mounted on said back and having an underside, an engaging surface formed on the underside of the outermost member and being flush with the underside of the back to engage with a wrist of a wearer;

the outermost member having an opening at a position inward of the engaging surface, opening to an outside of watch, and communicating with said groove; and

a fluid passage provided within the outermost member and communicating the sensor with the opening to sense an environmental condition of the watch,

said outermost member being a sensor lid secured to the sensor housing pipe.

5,592,443

STRUCTURE OF A WATCH AND ASSEMBLING METHOD THEREOF

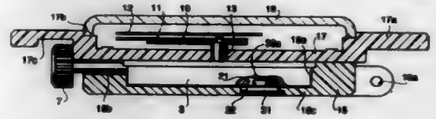
Masahiro Kasaya; Yasuo Kitajima, and Takayuki Hasumi, all of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

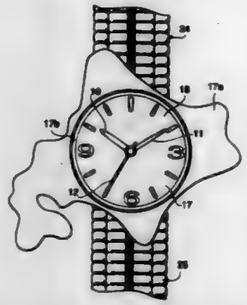
Filed Nov. 29, 1994, Ser. No. 350,079

Claims priority, application Japan, Nov. 30, 1993, 5-064002 U; Dec. 22, 1993, 5-325280; Jun. 21, 1994, 6-138742

Int. Cl.[6] G04C *3/00*

U.S. Cl. 368—281 **14 Claims**





1. A structure of a watch comprising a watch case having a pair of band connecting portions and a crown, a module mounted in the watch case, a dial secured to the watch case, hands disposed above the dial and operatively connected to the module, and a shield for shielding the dial;

the structure further comprising an extending portion extending outwardly and horizontally from the dial and projected from peripheries of the watch case and the shield;

the dial being secured to the watch case and the shield being secured to the dial;

said band connecting portions being concealed by the extending portion of the dial and said crown being at least partially concealed by said extending portion of the dial and said crown being at least partially concealed by said extending portion of the dail.

5,592,444

METHOD OF WRITING DATA SIMULTANEOUSLY ON A PLURALITY OF TRACKS OF AN OPTICAL DISK, AND APPARATUS THEREFOR

Amir Alon, Yahud; Shlomo Shapira, and Itzhak Katz, both of Petach Tikva, all of Israel, assignors to Zen Research N.V., Netherlands Antilles

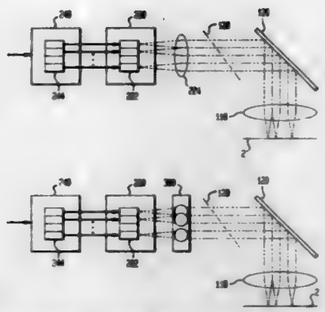
Filed Jun. 6, 1994, Ser. No. 254,187

Claims priority, application Israel, Jun. 14, 1993, 106009

Int. Cl.[6] G11B *11/00; 7/00*

U.S. Cl. 369—13 **12 Claims**

1. A method of writing data simultaneously on a plurality of tracks of an optical disk, comprising providing an array of light sources, each of said light sources being independently modulated, providing means to determine the position of each said light source with respect to the center of a given track, and varying the intensity of each said light source so that their interference generates a plurality of writing light beams, each of said writing light beams being positioned so that it illuminates the center position of a single track, each of said writing light beams being generated by a plurality of adjacent said light sources, each of said light beams having the desired intensity and position on the written track, and



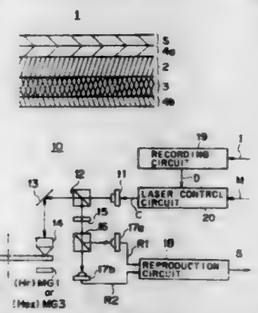
wherein two adjacent writing light beams do not substantially interfere with one another.

5,592,445

EXCHANGE COUPLING OPTICAL RECORDING MEDIUM AND RECORDING/REPRODUCING DEVICE THEREFOR

Nobuaki Onagi, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan

Filed Oct. 12, 1994, Ser. No. 321,547
Claims priority, application Japan, Oct. 13, 1993, 5-255393
Int. Cl.[6] G11B *11/00*
U.S. Cl. 369—13 **11 Claims**



1. A device for recording information on a magneto-optical recording medium, said recording medium comprising:

a mask layer having a first compensation temperature higher than a predetermined reproduction temperature and lower than a predetermined first recording temperature, a first Curie temperature lower than a predetermined second recording temperature and a first coercive force, and for storing information assigned to magnetizing directions; and

an information recording layer having a second compensation temperature higher than the reproduction temperature and lower than the first compensation temperature, a second Curie temperature lower than the second recording temperature and a second coercive force, and for storing information assigned to magnetizing directions, said device comprising:

a light irradiating means for irradiating recording light on a recording position of the recording medium;

a first magnetic field applying means for applying first magnetic field having a first magnetizing direction;

a second magnetic field applying means for applying second magnetic field having a second magnetizing direction opposite to the first magnetizing direction;

a first control means for controlling power of the recording light so that temperature of the recording position becomes substantially equal to the first recording temperature; and

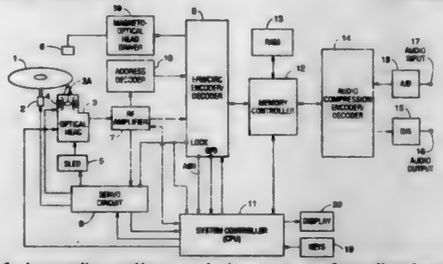
a second control means for controlling power of the recording light beam so that temperature of the recording position becomes substantially equal to the second recording temperature.

5,592,446

DUAL MODE RECORDING AND REPRODUCING APPARATUS HAVING TWO RECORDING REGIONS USING DIFFERING REPRODUCTION PRINCIPLES

Hiroshi Saitoh, Saitama, and Hideki Takahashi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 8, 1994, Ser. No. 255,467
Claims priority, application Japan, Jun. 14, 1993, 5-165953; Jun. 14, 1993, 5-165954
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—44.27 **12 Claims**



1. A recording and/or reproducing apparatus for a disc-shaped recording medium, with information signals being recorded in first and second recording regions of the disc-shaped recording medium using recording methods which involve differing reproduction principles comprising:

head means for recording or reproducing information signals on or from the disc-shaped recording medium and moving between the first and second recording regions of the disc-shaped recording medium;

rotational driving means for rotationally driving the disc-shaped recording medium according to an output signal from said head means;

servo control means for generating a servo signal according to an error signal generated based on the output signal from said head means and for controlling said head means and said rotational driving means; and

control means for controlling said servo control means in a first reproduction mode that corresponds to data recordation/reproduction in the first region and a second reproduction mode that corresponds to data recordation/reproduction in the second region of the disc-shaped recording medium such that when said servo control means is in one of the first and second modes and said output signal becomes, for a predetermined amount of time, either incompatible with the data recordation/reproduction or non-existent in said one mode, said control means switches said servo control means from said one mode to the other of said first and second modes.

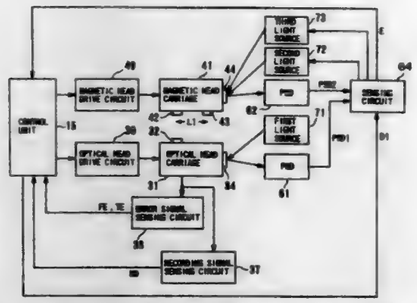
5,592,447

CONTROL DEVICE FOR HEAD UNIT HAVING OPTICAL HEAD AND MULTIPLE MAGNETIC HEADS

Suguru Takishima, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 383,379, Feb. 3, 1995, Pat. No. 5,513,159, which is a division of Ser. No. 43,823, Apr. 7, 1993, Pat. No. 5,408,455. This application Oct. 6, 1995, Ser. No. 539,763
Claims priority, application Japan, Apr. 8, 1992, 4-086831
Int. Cl.[6] G11B *7/095*
U.S. Cl. 369—44.27 **3 Claims**

1. A device for controlling head units provided in a magneto-optical recording device, comprising:



an optical head unit for radiating a laser beam onto a magneto-optical disc, said optical head unit moving relative to said magneto-optical disc;

a magnetic head unit synchronously movable with said optical head unit, and having a first magnetic head and a second magnetic head arranged along a radial direction with respect to said magneto-optical disc;

radiating means for radiating a luminous flux to said optical head unit and said magnetic head unit, said luminous flux being reflected by said optical head unit and said magnetic head unit; and

control means for controlling said optical head unit and said magnetic head unit based on said luminous flux reflected from said optical head unit and said magnetic head unit, whereby one of said first and second magnetic heads is moved while maintaining a predetermined positional relationship with respect to said optical head unit;

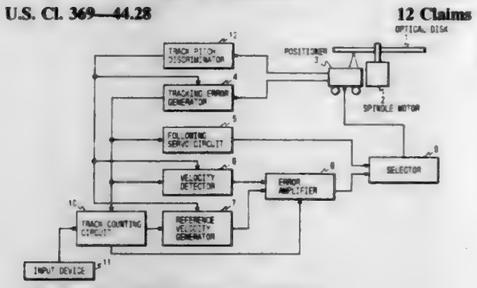
wherein said radiating means comprises a first light source, a second light source and a third light source, said first light source radiating luminous flux onto said optical head unit, said second light source radiating luminous flux onto said magnetic head unit to sense a position of said first magnetic head by said control means, and said third light source radiating luminous flux onto said magnetic head unit to sense a position of said second magnetic head by said control means.

5,592,448

ACCESS CONTROL APPARATUS FOR OPTICAL DISK ACCORDING CHANGE OF TRACK PITCH

Motoyuki Suzuki, and Yoshio Suzuki, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 49,808, Apr. 20, 1993, abandoned. This application Jun. 15, 1995, Ser. No. 495,810
Claims priority, application Japan, May 8, 1992, 4-116315
Int. Cl.[6] G11B *7/085*
U.S. Cl. 369—44.28 **12 Claims**



1. An access control apparatus comprising:

a tracking control loop which comprises,

an optical head for recording and regenerating information by forming a light spot on an information track provided on an optical disk,

a positioner to move said optical head in a radial direction of the optical disk and position set said optical head on a desired information track,

a position sensing means for making a tracking error signal indicating a relative position between an information track and the light spot in reference to an output signal from said optical head,

an amplifying means for amplifying the tracking error signal from said position sensing means,

a tracking control means for returning an output of said position sensing means back to said positioner in such a manner that said optical head pursues a desired track in response to the output of said amplifying means; and

a track pitch discriminator to determine a track pitch of the information track, wherein

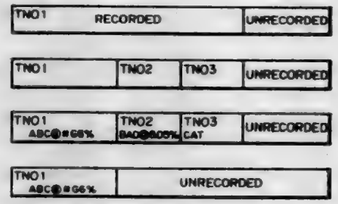
an amplitude of said amplifying means is changed in such a manner that an amplitude A1 of said amplifying means at a track pitch P1 and an amplitude A2 of said amplifying means at a track pitch P2 becomes A1/P1=A2/P2 in response to an output of said track pitch discriminator.

5,592,449

DISC APPARATUS USING CHARACTER-BASED CONTROL CODES IN A TABLE OF CONTENTS

Soju Goto, Hino; Takashi Kawasaki, Tokyo; Satoshi Hiranuma, Urawa; Nobumasa Suzuki, Hachioji, and Izumi Shibata, Tokyo, all of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

Continuation of Ser. No. 142,135, Oct. 28, 1993, abandoned. This application Nov. 14, 1995, Ser. No. 557,900
Claims priority, application Japan, Oct. 29, 1992, 4-291415
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—47 **16 Claims**



1. A disc recording/reproducing apparatus for recording/reproducing information in/from a disc having a TOC area capable of recording a character in correspondence with a track number appended to the recorded information at a desired position in the disc, characterized in that it further comprises:

means for entering a string of characters which includes at least two first and second specific characters as control codes and ordinary characters to store the string of characters in said TOC area, and

means for sequentially reading the string of the characters stored in said TOC area and forming a control signal identified by ordinary character or characters interposed between said first and second specific characters in the string, the control signal being used to control said disc recording/reproducing apparatus or control another device connected to said disc recording/reproducing apparatus.

5,592,450

METHOD FOR REPRODUCING COMPRESSED INFORMATION DATA FROM A DISK USING A SPATIAL FREQUENCY LESS THAN THE TRACK PITCH

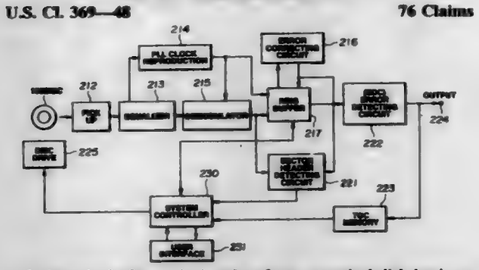
Jun Yonemitsu, Kanagawa; Ryuichi Iwamura; Shunji Yoshimura, both of Tokyo, and Makoto Kawamura, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 405,890, Mar. 17, 1995. This application Jun. 7, 1995, Ser. No. 478,489

Claims priority, application Japan, Mar. 19, 1994, 6-074445

Int. Cl.[6] G11B *5/09*; H04N *5/76*

U.S. Cl. 369—48 **76 Claims**



1. A method of reproducing data from an optical disk having a diameter less than 140 mm, a thickness of 1.2 mm±0.1 mm and a recording area divided into a lead-in area, a program area and a lead-out area, and wherein said data is recorded as embossed pits representing modulated, error-correction encoded user information including MPEG-compressed video data and compressed audio data in sectors in user tracks in said program area, representing modulated, error-correction encoded table of contents (TOC) information in sectors in at least one TOC track in said lead-in area with said TOC information including addresses of respective start sectors of said user tracks, and representing application table of contents (ATOC) information in sectors in at least one track in said program area related to said MPEG-compressed video and compressed audio data; the tracks having a track pitch in the range of 0.646 μm to 1.05 μm; said method comprising the steps of rotating said disk to obtain a constant linear velocity; projecting a pickup light beam through a lens for optically reading the data recorded on the rotating disk, said pickup light beam having a spatial frequency l=λ/2NA, where the spatial frequency l is less than the track pitch, λ is the wavelength of the pickup light beam and NA is the numerical aperture of the lens; demodulating the data read from said disk; error correcting the demodulated data; separating the error corrected data into TOC information, ATOC information and user information; using said TOC information to access and read selected user tracks in response to access instructions from a user; and using said ATOC information to reproduce selected video and audio data from said disk.

5,592,451

TEST-WRITING CONTROLLING METHOD FOR OPTICAL DISK RECORDING DEVICE

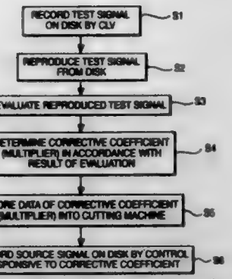
Juichi Shikunami, Kanagawa-ken, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 15, 1995, Ser. No. 490,884

Claims priority, application Japan, Jun. 22, 1994, 6-200042

Int. Cl.[6] G11B *3/90;27/36*

U.S. Cl. 369—54 **10 Claims**



1. A method comprising the steps of:

recording a test signal on a first recording disk according to a constant linear velocity technique;

reproducing the test signal from the first recording disk;

evaluating the reproduced test signal as a function of a recording position on said test signal on the first recording disk;

recording an information signal on a second recording disk having first and second areas, said first area having an inferior degree of deterioration in quality than the second area;

decreasing a recording density during recording of the information signal on the first area below a recording density during recording of the information signal on the second area as a function of a recording position on the second recording disk based on the evaluation of said test signal.

5,592,452

OPTICAL DISK WITH LOGICAL TRACKS FORMED THEREON AND OPTICAL DISK DRIVE DEVICE

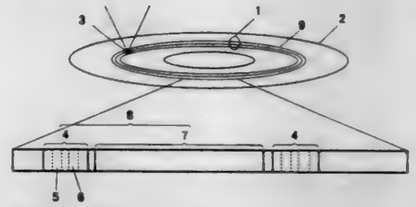
Kyosuke Yoshimoto, Nagaokakyo; M. C. Rao, Kurashiki; Hiroyuki Ohata, Nagaokakyo; Kazuhiko Nakane, Nagaokakyo; Teruo Furukawa, Nagaokakyo; Jiuichi Kondo, and Masafumi Ototake, both of Amagasaki, all of Japan, assignors to Mitsuishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1993, Ser. No. 128,193

Claims priority, application Japan, Oct. 5, 1992, 4-265893; Oct. 12, 1992, 4-272673; Dec. 4, 1992, 4-325319; Sep. 24, 1993, 5-238354

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **29 Claims**



1. An optical disk, comprising:

a recording region;

a plurality of physical tracks formed in said recording region, each physical track corresponding to a single revolution of said optical disk;

said recording region being divided into a plurality of annular zones centered at a center of said optical disk, an annular recording density of said optical disk being higher in zones further from said center of said optical disk such that a linear recording density of said optical disk is substantially constant throughout said recording region;

an integer number of sectors formed in each of said physical tracks, each sector including a header field with a track address field;

one or more of said sectors being formed into one of a plurality of logical tracks by setting a track address in said track address field of each sector to indicate membership in one of said logical tracks, said logical tracks being divided into revolution groups such that a number of said revolution groups equals a number of said zones, thus, each revolution group corresponds to one of said zones, and an end point of at least one revolution group is not coinciding with an end point of a corresponding one of said zones.

5,592,453

Patent Not Issued For This Number

5,592,454

DATA REPRODUCING APPARATUS WHICH REPLACES VENDOR UNIQUE IDENTIFICATION DATA IN RESPONSE TO A REFERENCE ERROR CORRECTION RATE WHICH IS LOWER THAN THAT USED FOR REPLACEMENT OF OTHER DATA

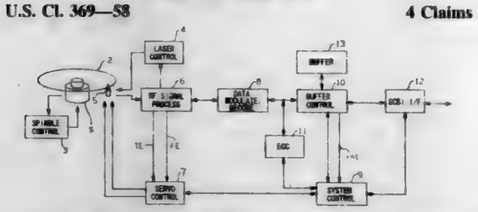
Minoru Tobita, Tokyo, and Takeshi Funahashi, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 290,233, Aug. 15, 1994. This application Oct. 6, 1995, Ser. No. 540,313

Claims priority, application Japan, Aug. 17, 1993, 5-225246; Aug. 31, 1993, 5-238940

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **4 Claims**



1. A disc driving apparatus for driving a disc recording medium on which a plurality of sets of user data and a plurality of unique data, each of which is related to each set of the user data, are recorded, said disc driving apparatus comprising:

reproducing means for reproducing said unique data and said user data recorded on said disc recording medium;

error correction means for correcting errors in the data reproduced by said reproducing means and detecting an error rate of the data reproduced by said reproducing means;

data replacement means for recording the unique data which is error-corrected by said error correction means in a replacement area of the disc recording medium when the error rate of the unique data is higher than a first reference error rate and for recording the user data which is error-corrected by said error correction means in the replacement area of the disc recording medium when the error rate of the user data is higher than a second reference error rate which second reference error rate is different from the first reference error rate.

5,592,455

SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to DiscoVision Associates, Irvine, Calif.

Division of Ser. No. 180,312, Jan. 12, 1994, Pat. No. 5,373,490, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application May 18, 1994, Ser. No. 245,558

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—59 **6 Claims**

1. A method of reading digital information from an optical disc comprising the steps of:

reading a succession of alternating marks and spaces recorded on the optical disc and generating a corresponding succession of playback signals indicative thereof;

recognizing each of the marks and spaces when they have a length no less than a minimum length and no greater than a maximum length, the maximum length being greater than double the minimum length;

recognizing length differences between a first length of any mark or space and a second length of any other mark or space which are less than said minimum length; and

converting the succession of recognized marks and spaces into a succession of binary bits indicative of the digital information represented by the recognized marks and spaces in accordance with the recognized length difference, by decoding each portion of the succession of playback signals using only a first decoding operation to decode each portion of the succession of playback signals into a portion of the succession of binary bits and no operation, subsequent to the first decoding operation, which processes the portion of the succession of binary bits, each decoded portion being a final code indicative of each corresponding portion of the succession of playback signals.

5,592,456

INFORMATION REPRODUCING APPARATUS AND METHOD

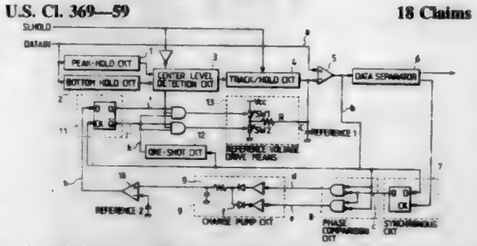
Akira Miyashita, Tokorozawa, and Takaaki Ashinuma, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,114

Claims priority, application Japan, Dec. 10, 1993, 5-310599

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—59 **18 Claims**



1. An information reproducing apparatus having first comparing means for comparing a reproduction signal from an information recording medium and a first reference signal, thereby performing a binarization, clock signal generating means for generating a clock signal from the signal binarized by said first comparing means, and synchronous means for synchronizing said binary signal by said clock signal, comprising:

phase comparing means for comparing a phase of said binary signal and a phase of said synchronous means;

a charge/discharge circuit which is driven by an output of said phase comparing means; and

second comparing means for comparing an output of said charge/discharge circuit and a second reference signal,

wherein said first reference signal is controlled by an output of said second comparing means synchronously with said binary signal or the output of said synchronous means.

5,592,457

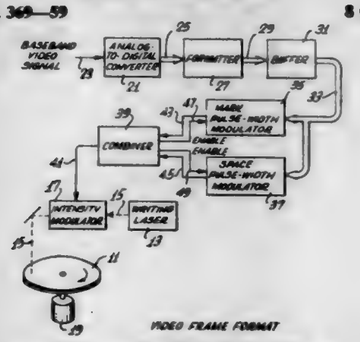
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to Discovision Associates, Irvine, Calif.

Continuation of Ser. No. 105,935, Aug. 13, 1993, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application Jun. 7, 1995, Ser. No. 473,736

Int. Cl.[6] H04N 5/76;5/78

U.S. Cl. 369—59 **8 Claims**



1. A method for recording digital information on a record medium, comprising the steps of:

receiving an input signal to be recorded;

sampling and formatting the input signal to produce successive samples indicative of the input signal;

receiving a first series of samples, and producing an output pulse of a logical "1" level, having a discretely variable time duration corresponding to each successive sample of the first series;

receiving a second series of samples, and producing an output pulse of a logical "0" level, having a discretely variable time duration corresponding to each successive sample of the second series;

assembling streams of pulses of opposite polarities, so that each two immediately adjacent pulses in a stream include one pulse of said logical "0" level immediately adjacent to another pulse of said logical "1" level by combining alternate ones of said logical "1" level and logical "0" level pulses;

using said streams of pulses to modulate an output of a writing source to write on the record medium; and

recording supermarks between writing said streams of pulses, said supermarks comprising a synchronization pattern distinguishable from said written streams of pulses.

5,592,458

OPTICAL INFORMATION CONTROL DEVICE AND SYNCHRONIZING METHOD THEREOF

Hideki Kobunaya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

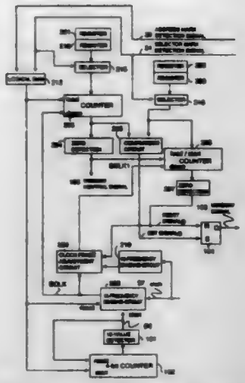
Division of Ser. No. 275,105, Jul. 14, 1994. This application Feb. 2, 1996, Ser. No. 597,576

Claims priority, application Japan, Jul. 14, 1993, 5-195620

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—59 **2 Claims**

1. An optical information control device comprising:



a mark detection means for detecting a mark recorded at even intervals in a track on an optical disk and generating a mark detection signal;

a reference clock generation means for generating a reference clock by frequency dividing a pit clock and stopping generation of said reference clock when having received said mark detection signal;

a synchronous clock generation means for generating a synchronous clock to a phase of said reference clock;

a first counting means for counting said reference clock;

a first detection means for detecting the event that the counted number of said first counting means has reached a preset number and outputting a set signal;

a second counting means for counting said pit clocks for a preset number when having received said mark detection signal;

a second detection means for detecting the event that the counted number of said second counting means has reached a preset number and resuming said reference clock generation means that has been stopping generation of said reference clock;

a third counting means for counting said synchronous clock when the counted number of said first counting means has reached a preset number;

a third detection means for detecting the event that the counted number of said third counting means has reached a preset number and outputting a reset signal; and

a window signal generation means for activating a signal by input of said set signal, inactivating said signal by input of said reset signal, and then generating a window signal to make said mark detection signal enabled.

5,592,459

OPTICAL HEAD DEVICE HAVING ELECTRO-MAGNETICALLY ROTATABLE AND STRAIGHT MOVABLE MEMBERS

Akihiro Kasahara, Chiba-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1994, Ser. No. 364,288

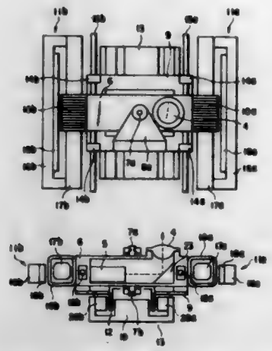
Claims priority, application Japan, Dec. 27, 1993, 5-332738

Int. Cl.[6] G11B 7/09

U.S. Cl. 369—112 **35 Claims**

1. An optical head device for use in recording/reproducing data to/from an optical data recording medium, comprising:

a first movable member having an optical unit for emitting a light beam and an objective lens for perpendicularly sending the light beam emitted from said optical unit to said optical data recording medium, an interior of said first movable member formed to be hollow to ensure a course of said light beam;



a second movable member being capable of moving straight along a pair of guide rails provided in a direction perpendicular to an optical axis of said objective lens;

a support member supporting said first movable member on said second movable member at a central axis of said first movable member parallel to the optical axis of said objective lens such that said first movable member can be rotated about said central axis; and

tracking drive means for generating electro-magnetic force at least at two points on said first movable member in predetermined directions to obtain a rotational movement of said first movable member or a straight movement of said second movable member.

5,592,460

LOW PROFILE OPTICAL PICKUP UNIT FOR RECORDING/REPRODUCING DEVICE

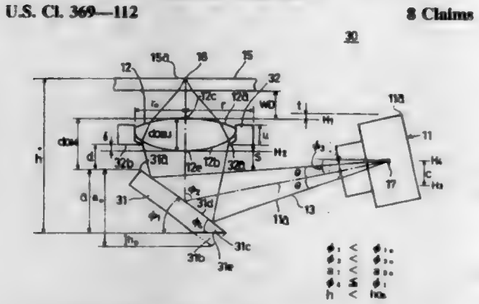
Hiroyuki Shindo, Chofu, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Jul. 17, 1995, Ser. No. 502,885

Claims priority, application Japan, Jul. 21, 1994, 6-169741

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—112 **8 Claims**



1. An optical pickup unit comprising:

a light emitting unit for emitting a light beam in a direction downwardly oblique from a horizontal direction;

a single stand-up mirror for reflecting said light beam so as to deflect said light beam upwardly, a stand-up angle of said stand-up mirror being not more than 45°;

an objective lens for converging a deflected light beam onto an information recording medium;

a lens holder for holding said objective lens; and

an aperture stop provided in said lens holder for limiting a light beam which is then incident on said objective lens, said aperture stop being located at a level higher than a projecting end of a bottom convex surface of said objective lens.

5,592,461

METHODS OF RECORDING AND REPRODUCING INFORMATION USING AN OPTICAL RECORDING MEDIUM

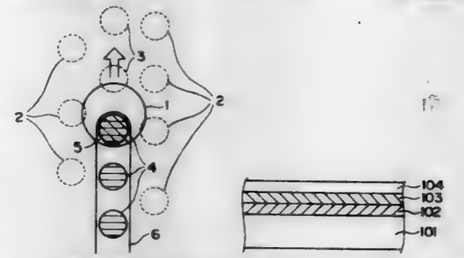
Tsuyoshi Tsujioka, Osaka, and Masahiro Irie, 1-29-4-404, Kasugakouen, Kasuga-city, Fukuoka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, and Masahiro Irie, Fukuoka, both of Japan

Filed Dec. 15, 1994, Ser. No. 356,589

Claims priority, application Japan, Dec. 16, 1993, 5-316744

Int. Cl.[6] G11B 7/24

U.S. Cl. 369—126 **8 Claims**



7. A method of recording information in a recording layer of an optical recording medium comprising:

a recording layer, and

a masking layer containing a photochromic dye which absorbs radiation in a wavelength of a reproducing beam and thereby causes a photon mode reaction of said photochromic dye so that the transmittance of said masking layer, relative to the passage of said reproducing beam therethrough, is increased, said photochromic dye also absorbing radiation in a wavelength different from a wavelength of a recording beam and thereby causing a photon mode reaction so that the transmittance of said masking layer, relative to the passage of said recording beam therethrough, is increased,

said method comprising the steps of:

previously irradiating said masking layer with a beam of said wavelength different from said wavelength of said recording beam for improving said transmittance of said masking layer relative to the passage of said recording beam; and

then irradiating with said recording beam and transmitting the same through said masking layer of said improved transmittance into said recording layer.

5,592,462

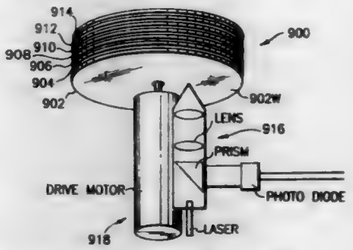
THREE-DIMENSIONAL OPTICAL DATA STORAGE AND RETRIEVAL

Donald T. Beldock, and James G. Beldock, both of 99 Biltmore Ave., Suite 260, Rye, N.Y. 10580

Filed Dec. 30, 1994, Ser. No. 367,059

Int. Cl.[6] G11B 25/00

U.S. Cl. 369—273 **36 Claims**



35. An optical data storage medium comprising:

at least two optical data storage surfaces upon which data is stored in concentric circular tracks, at least one of said data storage surfaces having a laser transparent window which transects at least some of said circular tracks, wherein

said at least two data storage surfaces are independently rotatable about a common axis.

5,592,463

APPARATUS FOR AND METHOD FOR DETERMINING OPTIMUM POWER FOR RECORDING INFORMATION ON RECORDABLE OPTICAL DISC

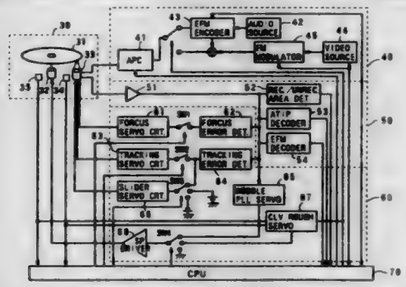
Eiji Muramatsu; Akiyoshi Inoue; Shoji Taniguchi; Hiroyuki Takahashi, all of Tokorozawa; Shigenori Murakami, and Toshihiko Takishita, both of Koufu, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 299,046

Claims priority, application Japan, Sep. 3, 1993, 5-220323

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—275.2 **6 Claims**



1. An apparatus for recording information on a recordable optical disc by applying a light beam on the surface thereof, said disc comprising a first recording area on which information is recorded and reproduced while the disc is rotated at a first linear velocity; and a second recording area on which information is recorded and reproduced while the disc is rotated at a second linear velocity, the first recording area comprising a test recording area, and

said apparatus comprising recording power determining means for determining first optimum recording power for recording information on the first area by a test recording utilizing the test recording area, and for determining second optimum recording power for recording information on the second area by multiplying a first optimum recording power by the predetermined constant, wherein the constant is calculated on the basis of a ratio of the first linear velocity and the second linear velocity.

5,592,464

OPTICAL DISK AND OPTICAL DISK APPARATUS

Toshihiro Sugaya, Ibaraki-ken, and Yoshinori Honguh, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

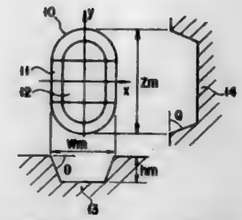
Continuation of Ser. No. 304,849, Sep. 13, 1994, Pat. No. 5,459,712. This application Jun. 7, 1995, Ser. No. 475,494

Claims priority, application Japan, Jan. 19, 1994, 6-004230; Mar. 29, 1994, 6-082934

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—275.4 **25 Claims**

1. An optical disk comprising:



a substrate having information recorded thereon with a specific track pitch, said information being recorded as a plurality of pit trains, each of said pit trains including a plurality of pits;

a reflecting layer formed on said substrate;

wherein said information is reproduced by projecting a light beam via an objective lens onto said optical disk; and

wherein when the wavelength of said light beam is λ μm and the specific track pitch is in the range of (0.72 to 0.8)×(λ/NA)1.14 μm, and each of said pits has a substantially trapezoidal cross section having an upper width in the range of (0.3 to 0.5)×(λ/NA)/1.14 μm, a lower width in the range of (0.2 to 0.32)×(λ/NA)/1.14 μm, and a depth in a range of (1/4.2×λ/n) to (1/5.2×λ/n), where n is a refractive index of said substrate and NA is a numerical aperture of said objective lens.

5,592,465

DISC RECORDING METHOD

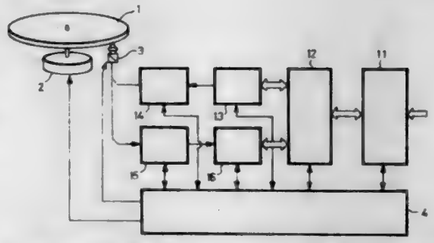
Tamotsu Yamagami, Kanagawa; Tetsu Watanabe, Tokyo, and Yoichiro Sako, Chiba, all of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 969,144, Feb. 10, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 348,751

Claims priority, application Japan, Jun. 17, 1991, 3-144836; Aug. 20, 1991, 3-208158

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—275.3 **6 Claims**



1. A disc recording method in which a disc on which servo control data is recorded in advance, in alignment with a radial direction from the innermost periphery to the outermost periphery, wherein the disc is divided into a plurality of zones in the radial direction, comprising the steps of:

recording digital data having different clock rates on every zone, wherein the number of segments segmented by adjacent servo control data within one track is the same within and among all zones, a number of bytes of data recorded within a segment is different for each zone and a plurality of segments constitute one data sector on said disc; and

recording reference data on an entire data recording area of at least one segment segmented by servo control data, the reference data being detectable for control of reproduction of the recorded digital data, wherein said reference data is a reference signal utilized to control a phase of data clock upon reproduction of the recording digital data.

5,592,466

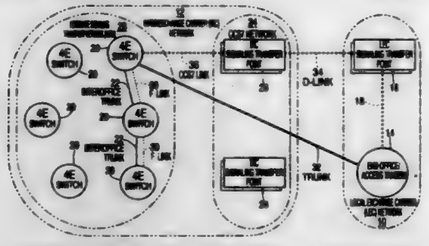
NETWORK INTERCONNECT BACKUP

Frank A. Bucnny, Freehold Township, Monmouth County; Mark S. Mui, Middletown, both of N.J., and Doug W. Varney, Naperville, Ill., assignors to AT&T, Holmdel, N.J.

Filed Nov. 3, 1994, Ser. No. 333,668

Int. Cl.[6] H04J *1/16*

U.S. Cl. 370—217 **24 Claims**



1. A backup signaling network for backing up network interconnect signaling between a first network and a second network, comprising:

said first network including:

a first circuit-switched network having a first network switch; and

a first signaling network, supporting said first circuit-switched network, having a first signal transfer point;

said second network including:

a second circuit-switched network having a plurality of second network switches; and

a second signaling network, supporting said second circuit-switched network, having a second signal transfer point;

wherein said second network switches are at least partially interconnected by F-links used for an alternate signaling network to said second signaling network;

wherein at least one of said second network switches is a gateway switch connected to said second signal transfer point by a communication link, and other of said second network switches are capable of functioning as helper switches with respect to a victim switch that is isolated to signaling from said second signal transfer point via said second signaling network;

where signaling information from said first network switch destined for said victim switch is routed along a path including said first signal transfer point via said first signaling network, said second signal transfer point, said gateway switch via said communication link, at least one helper switch via said second signaling network, and said victim switch via at least one of said F-links.

5,592,467

NETWORK NODE CROSS-CONNECTION DEVICE USING SELECTABLE MEMORIES FOR NEW CONNECTION IN THE EVENT OF FAILURE

Yayoi Takeuchi, and Yuuki Yoshifuji, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 876,358, Apr. 30, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 350,725

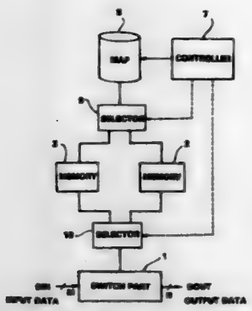
Claims priority, application Japan, Apr. 30, 1991, 3-128758; Jun. 12, 1991, 3-166244

Int. Cl.[6] H04J *1/16*

U.S. Cl. 370—225 **5 Claims**

1. A cross-connection device installed in a node of a transmission network, comprising:

map means for pre-storing a first set of connection information indicating to which of a plurality of output transmission paths,



a plurality of input transmission paths should each be connected, and for pre-storing at least a second set of alternative connection information indicating alternatives for connecting the plurality of output transmission paths to the plurality of input transmission paths;

first memory means;

second memory means;

first selector means, arranged between said map means and said first and second memory means, for selecting either said first or second memory means for writing said first set of connection information stored in said map means into said first memory means and for writing said at least second set of alternative connection information into said second memory means;

switch means for connecting each of said input transmission paths to any of said output transmission paths on the basis of the connection information of either said first or second memory means; and

second selector means, arranged between said switch means and said first and second memory means, for selecting either said first memory means or said second memory means and connecting the selected first or second memory means to said switch means.

5,592,468

WIRELESS LOCAL AREA NETWORK SYSTEM WITH IMPROVED TRANSFER EFFICIENCY AND DATA TRANSFER METHOD FOR SAME

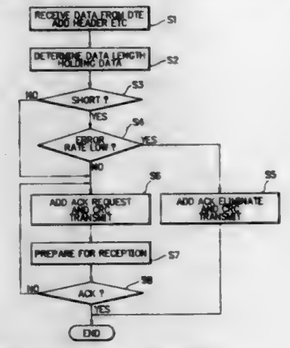
Tsuyoshi Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 501,958

Claims priority, application Japan, Jul. 13, 1994, 6-160893

Int. Cl.[6] H04Q *1/30*; H04L *12/28*

U.S. Cl. 370—252 **82 Claims**



1. A wireless LAN system, comprising:

a first station and a second station having an established association with each other so that a formatted first frame is transmittable from said first station to said second station, said first frame including as basic fields thereof a first header field, a data field with a variable-length data sequence, and a first frame check field with a calculated value for a check of an entire length of said first frame, and a formatted second frame is transmittable from said second station to said first station:

said first station comprising:

a calculation means for calculating a total length of said basic fields of said first frame, as a basic length of said first frame;

a first control means for depending on said basic length of said first frame to make either of an affirmative decision for and a negative decision against sending a first message for requesting an acknowledgment of a reception of said entire length of said first frame by said second station;

a formatter means for formatting said data sequence into said first frame;

said formatter means being responsive to said affirmative decision to combine said basic fields of said first frame and a first message field containing said first message, to thereby constitute said first frame; and

a first transmission means for transmitting said first frame.

5,592,469

RADIO SYSTEM

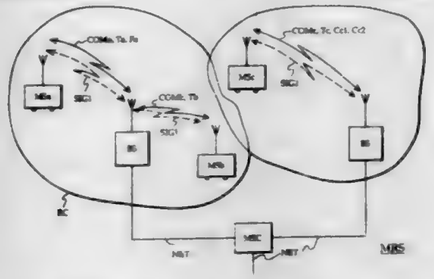
Laszlo Szabo, Korntal, Germany, assignor to Alcatel SEL A.G., Stuttgart, Germany

Filed Aug. 9, 1994, Ser. No. 287,848

Claims priority, application Germany, Aug. 28, 1993, 43 29 010.8

Int. Cl.[6] H04J *4/00; 13/00*

U.S. Cl. 370—342 **27 Claims**



1. Radio system (MRS) with at least one base station (BS) and remote radio stations (MSa, MSb, MSc) containing transmitting (MOD, UP) and receiving means (DWN, DEM) for the transmission of useful data via radio interfaces (COMa, COMb, COMc), whose respective transmission capacity is changed continuously by the base station on the basis of requests signaled by the remote radio stations (MSa, MSb, MSc), and based on a monitoring of existing radio transmissions in the field range (RC) of the base station (BS), wherein the base station (BS) determines variable parameters of the radio interfaces (COMa, COMb, COMc) for changing the respective transmission capacity, which variable parameters specify the modulation and the demodulation for the transmitting means (MOD, UP) or for the receiving means (DWN, DEM), respectively.

5,592,470

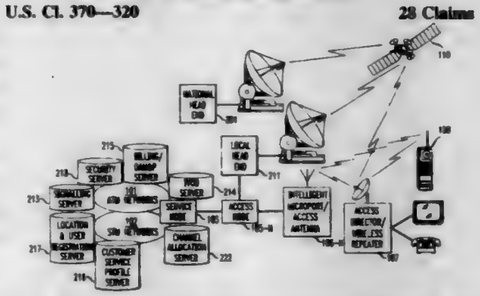
BROADBAND WIRELESS SYSTEM AND NETWORK ARCHITECTURE PROVIDING BROADBAND/ NARROWBAND SERVICE WITH OPTIMAL STATIC AND DYNAMIC BANDWIDTH/CHANNEL ALLOCATION

Ashok N. Rudrapatna, Basking Ridge; Gopal K. Jaisingh, Montville; Robert R. Miller, II, Morris Township, Morris County; Jesse E. Russell, Piscataway, and Robert E. Schroeder, Morris Township, Morris County, all of N.J., assignors to AT&T, Holmdel, N.J.

Filed Dec. 21, 1994, Ser. No. 361,355

Int. Cl.[6] H04J *3/26;* **H04L** *5/22*

U.S. Cl. 370—320 **28 Claims**



13. A communication network for providing broadband and narrowband services with a wireless connection between the network and end users, comprising:

an asynchronous transport mode network and a synchronous transport mode network;

a service node connected to the asynchronous transport mode network and the synchronous transport mode network and an access node which is in turn connected to a microport including an antenna for radiating radio signals to a receiving antenna of an end user;

a channel allocation server, connected to the service node, for estimating blocking probabilities across service chases and for identifying channels to be moved from one service class to another to accommodate service demands;

communication circuitry for communicating and for providing communication network routing control;

wherein the communication network apportions communication channels and conduits to specific communication services;

and wherein the service node measures channel occupancy of the channels controlled by the communication system and assigns network trunks to operate as access trunks;

the access node combining and splitting channels to conform with the mapping of services onto channels;

the microport having radiant apparatus to transmit and receive signals over air media and associating wired channels of the networks to a RF channel; and

the access port connecting received wireless signals to wired and wireless equipment of the end user and transmitting wireless signals from the end user to the microport.

5,592,471

MOBILE RADIO RECEIVERS USING TIME DIVERSITY TO AVOID SERVICE OUTAGES IN MULTICHANNEL BROADCAST TRANSMISSION SYSTEMS

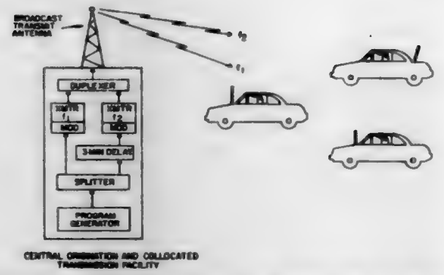
Robert D. Briskman, North Bethesda, Md., assignor to CD Radio Inc., Washington, D.C.

Continuation-in-part of Ser. No. 426,713, Apr. 20, 1995, abandoned. This application May 4, 1995, Ser. No. 434,228

Int. Cl.[6] H04J *13/02;* **H04B** *1/69*

U.S. Cl. 455—52.3 **44 Claims**

1. A method for substantially eliminating service outages from various causes, including physical blockage, multipath fading and electronic interference, by the transmission of at least two radio broadcast signals having frequencies in the range of about 300



MHZ to about 3,000 MHZ, and having substantially the same content to a plurality of mobile receivers for said signals comprising:

broadcasting a first radio broadcast signal to said plurality of mobile receivers;

after a time delay of sufficient length to substantially eliminate said service outages, said delay being at least about 0.5 seconds, following the broadcast of said first radio broadcast signal, broadcasting a second radio broadcast signal containing substantially the same program content as said first radio broadcast signal to said plurality of mobile receivers;

storing, in each of said mobile receivers, said first radio broadcast signal for a time period substantially the same as the time of said time delay; and

outputting from each of said plurality of mobile receivers, the program contents of said first and said second radio broadcast signals by combining said first and said second radio broadcast signals for output or by selecting for output, in correct time-ordered progression, portions of said first radio broadcast signal and portions of said second radio broadcast signal.

5,592,472

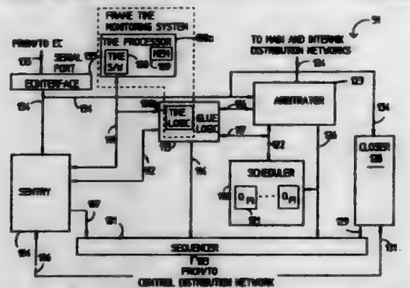
HIGH PERFORMANCE PATH ALLOCATION SYSTEM AND METHOD FOR A FIBER OPTIC SWITCH FOR A FIBER OPTIC NETWORK

Robert Grant; Bent Steevhase; Robin Purohit, all of Toronto; Gregory T. Sullivan, Brampton, and David Book, Thornhill, all of Canada, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1994, Ser. No. 330,169

Int. Cl.[6] H04J *14/08;* **H04L** *12/56*

U.S. Cl. 370—351 **10 Claims**



1. A path allocation system for high performance data transfer through a fiber optic switch which selectively interconnects fiber optic channels in a fiber optic network, comprising:

a plurality of bidirectional ports corresponding respectively with said channels;

a memory means associated with said ports, said memory means for temporarily storing an incoming new data frame from a source port;

a distribution network configured to interconnect said ports;

a sentry in communication with said memory means, said sentry configured to determine when said new data frame has been received by said memory means;

a scheduler which maintains a destination queue corresponding with each of said ports, said scheduler configured to receive path data pertaining to said new data frame from said sentry after said sentry determines receipt of said new data frame, said path data including a source port indicator, a memory address identifying a location of said frame in said memory means, and a destination port indicator mapped by said sentry, and said scheduler configured to place said path data within the destination queue corresponding with said destination port and to retrieve said path data from said destination queue based upon an order defined by said queue; and

an arbitrator configured to control said distribution network and in communication with said scheduler and said ports, said arbitrator configured to determine, after said arbitrator receives a frame transfer request from said scheduler, when said destination port is busy servicing another frame transfer request and when said destination port is available for accommodating said frame transfer request, and said arbitrator configured to allow communication of said new data frame to said destination port via said distribution network when said destination port is available and to disallow said frame transfer request when said destination port is busy.

5,592,473

PRIVATE BRANCH EXCHANGE SYSTEM AND METHODS FOR OPERATING SAME

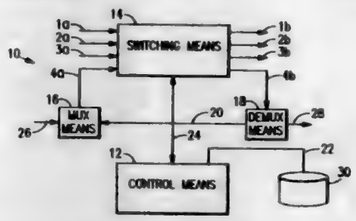
William T. Maters, and Amy K. Leach, both of Newton, N.H., assignors to Newton Communications, Inc., Newton, N.H.

PCT No. PCT/US93/09609, § 371 Date Apr. 7, 1995, § 102(e) Date Apr. 7, 1995, PCT Pub. No. WO94/09603, PCT Pub. Date Apr. 28, 1994

Continuation-in-part of Ser. No. 958,310, Oct. 8, 1992, Pat. No. 5,313,459. This PCT application Oct. 7, 1993, Ser. No. 416,739

Int. Cl.[6] H04Q *11/04*

U.S. Cl. 370—264 **53 Claims**



1. A private branch exchange system (**10,10'**) having a plurality of input and output ports, each of said ports having a plurality of digitally encoded time division multiplexed signals in a plurality of time slots, said system (**10,10'**) comprising:

a. control means (**12**) for controlling operation of said system (**10,10'**) and also being programmed to generate supervisory data;

b. switch means (**14**) for interconnecting any of said plurality of time slots of said ports (**1***a,b*, . . . **4***a,b*), said switch means (**14**) being connected to said control means (**12**) so as to be able to receive both control data and supervisory data therefrom, said switch means (**14**) also being for transmitting supervisory data received to at least one port (**1***a,b*, . . . **4***a,b*) selected by said control means (**12**); and

c. means (38) for connecting at least one selected time slot of said input ports to an outside public communications network having a plurality of remote locations accessible by said public communications network, said connecting means (38) being capable of accessing said remote locations through said public communications network.

5,592,474

SYSTEM FOR PROCESSING SYNCHRONIZATION SIGNALS WITH PHASE SYNCHRONIZATION IN A MOBILE COMMUNICATION NETWORK

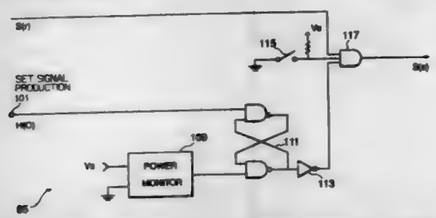
Hirouso Tanaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 995,721, Dec. 23, 1992, Pat. No. 5,426,633. This application May 19, 1995, Ser. No. 445,002

Claims priority, application Japan, Sep. 2, 1991, 3-246557; Jun. 2, 1992, 4-141214; Jun. 2, 1992, 4-141223; Jun. 9, 1992, 4-149041

Int. Cl.[6] H04J 3/06

U.S. Cl. 370—350 2 Claims



1. An output switch for use in a highest hierarchy switching center as one of a synchronization trunk device and a relay trunk device, each comprising a synchronization signal generate and relay circuit operable by electric power of a source voltage to produce an output signal and a highest hierarchy indication signal indicative of the fact that said output switch is used in said highest hierarchy switching center, said output switch comprising:

a set signal producing means for stopping production of a set signal when supplied with said highest hierarchy indication signal:

a power monitor for monitoring said source voltage to produce a reset signal when said source voltage decreases below a predetermined voltage;

flip-flop means set by said set signal and reset by said reset signal to produce a first control signal while said flip-flop means is set;

control switch means manually switched for normally producing a second control signal unless manually switched; and

gating means responsive to said first and said second control signals for gating said output synchronization signal as a switched synchronization signal.

5,592,475

DISTRIBUTED DIGITAL LOOP SYSTEM WITH TRUNK UNIT INTERFACE

Alexandru S. Gliga, San Jose, and Stephen H. Diaz, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 7, 1993, Ser. No. 163,258

Int. Cl.[6] H04Q 11/04

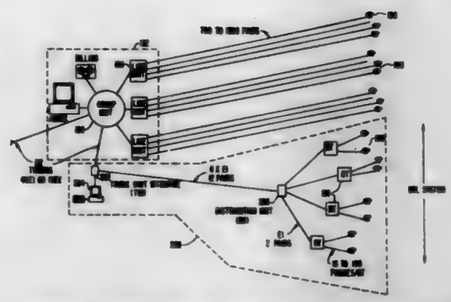
U.S. Cl. 370—359 35 Claims

1. A distributed digital loop (DDL) telephone system providing telephone services for a plurality of subscribers comprising:

a trunk unit interface, centrally located and coupled to a central office switch via a first digital transmission medium;

said trunk unit interface comprising:

a processor;



a time slot interchange unit for connecting any internal DDL time slot to any central office switch time slot;

at least one tone receiver;

a tone generator; and

a control bus coupling said processor to said time slot interchange unit, said at least one tone receiver, and said tone generator;

at least one distribution unit, located close to said plurality of subscribers and coupled to said trunk unit interface via a second digital transmission medium; and

at least one remote terminal, located close to said plurality of subscribers and coupled to said at least one distribution unit via a third digital transmission medium, said at least one remote terminal for supporting a plurality of subscriber equipment.

5,592,476

ASYNCHRONOUS TRANSFER MODE SWITCH WITH MULTICASTING ABILITY

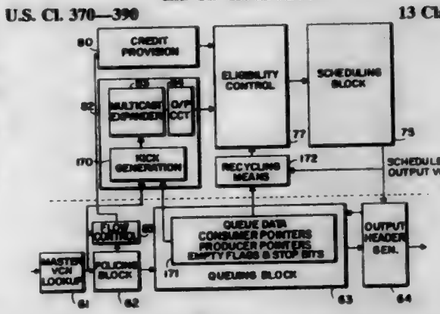
Costas Calamvokis, Bishopston, and David Banks, Redland, both of England, assignors to Hewlett-Packard Limited, Palo Alto, Calif.

Filed Apr. 14, 1995, Ser. No. 422,156

Claims priority, application European Pat. Off., Apr. 28, 1994, 94303117

Int. Cl.[6] H04L 12/56

U.S. Cl. 370—390 13 Claims



1. Apparatus for receiving at least one input stream of packets each having a packet body and multicasting this stream as a plurality of output streams of packets by copying across the packet bodies of the packets of the input stream into packets of the output streams, the input and output streams being identified in the apparatus by input and output identifiers respectively, said apparatus comprising:

input means for receiving packets and providing for each packet received, the input identifier for the input stream to which the packet belongs,

storage means for storing both the packet bodies of the packets received by the input means and queue data serving to identify in first-in-first-out order, the packet bodies to be output on each output stream, said storage means including queue-control means for maintaining said queue data on the basis of the input identifier associated with each new packet body being stored and of the output identifier of the output stream on which a stored packet body is output,

send-control means comprising scheduling means and injection means for injecting output identifiers into said scheduling means, the scheduling means effecting output scheduling of said output streams on the basis of said output identifiers and indicating the next scheduled output stream by outputting the corresponding output identifier, thereby removing it from said scheduling means, and

output means for receiving from said send-control means the output identifier of the next scheduled output stream, for retrieving from the storage means using said output identifer the packet body next to be output for the scheduled output stream, and for outputting the retrieved packet body on the scheduled output stream;

said injection means being responsive to at least some of the input identifiers provided by said input means to inject associated output identifiers into said scheduling means.

5,592,477

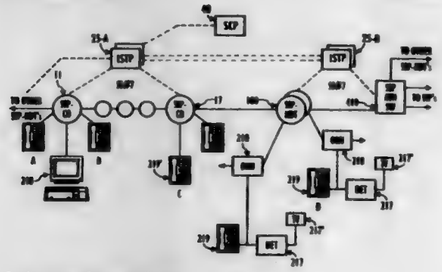
VIDEO AND TELCO NETWORK CONTROL FUNCTIONALITY

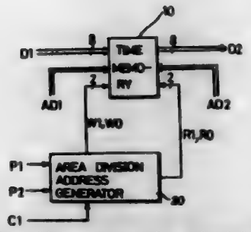
Robert D. Farris, Sterling, and Dale L. Bartholomew, Vienna, both of Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 302,472, Sep. 12, 1994, Pat. No. 5,541,917, and Ser. No. 524,306, Sep. 6, 1995. This application Oct. 5, 1995, Ser. No. 539,646

Int. Cl.[6] H04J 3/12; H04M 3/42;7/00

U.S. Cl. 370—396 34 Claims


SCP
ISTP
ISTP
STP
STP
ST



an area division address generator for maintaining a time difference between memory write time and memory read time by at least one frame period; and

a time memory for storing multiplexed data from a multiplexer and for writing the stored multiplexed data in accordance with the time difference being larger than one frame period so as to produce an identical frame delay;

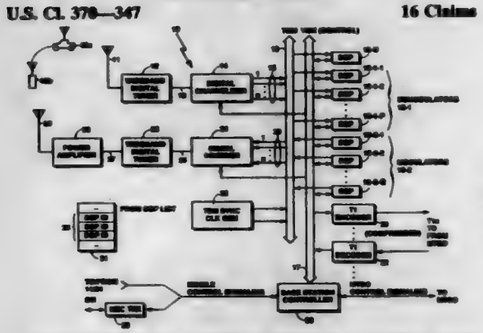
wherein said area division address generator includes a 2-bit counter for counting reference pulses and for generating successive addresses sequentially, a first flip-flop for receiving a random read frame pulse signal and for delaying the successive addresses from said 2-bit counter for at least one frame, and a second flip-flop for receiving a switching clock, for clocking the successive addresses from said 2-bit counter with the delayed successive addresses from the first flip-flop, and for generating write addresses and delayed read addresses with the time difference being larger than one frame period.

5,592,480

WIDEBAND WIRELESS BASESTATION MAKING USE OF TIME DIVISION MULTIPLE-ACCESS BUS HAVING SELECTABLE NUMBER OF TIME SLOTS AND FRAME SYNCHRONIZATION TO SUPPORT DIFFERENT MODULATION STANDARDS

Ronald R. Carney, 916 Flower St., NW., Palm Bay, Fla. 32907; Thomas R. Schmautz, 1934 Glen Meadow Cir., Melbourne, Fla. 32935, and Terry L. Williams, 204 Ash Ave., Melbourne Beach, Fla. 32951

Filed Mar. 13, 1995, Ser. No. 402,585
Int. Cl.[6] H04B *7/212*
U.S. Cl. 370—347 **16 Claims**



1. A basestation for processing signals in a multiple mobile subscriber unit wireless communication system comprising:

an antenna for receiving signals from a plurality of the mobile units as a composite radio frequency, RF, signal;

wideband digital tuner means, connected to the antenna, for down-converting a selected bandwidth of the RF signal to an intermediate frequency, IF, signal and for performing an analog to digital conversion on the IF signal, to provide a wideband digital tuner output signal;

digital channelization means, being connected to receive the wideband tuner output signal, and providing multiple digital channel signal outputs, each digital channel signal output having a predetermined channel bandwidth, and each digital channel signal corresponding to one of the signals received from one of the mobile units;

a plurality of digital signal processing means, for providing digitally processed channel signal outputs;

time division multiplex switching means, disposed between the multiple digital channel signal outputs and the plurality of digital signal processing means, the switching means for interconnecting any one of the multiple digital channel signal outputs to any one of the plurality of digital signal processing means; and

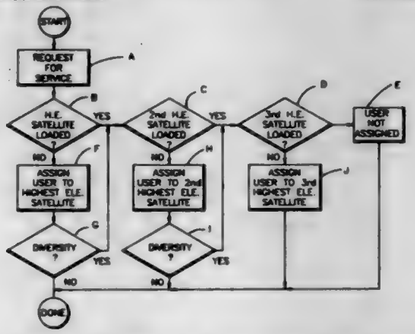
synchronization timing means, connected to control the time division multiplex means, to provide, at a frame rate which depends upon the predetermined bandwidth of the channel signals, a plurality of time slots, the number of time slots depending upon the number of digital channel signals.

5,592,481

MULTIPLE SATELLITE REPEATER CAPACITY LOADING WITH MULTIPLE SPREAD SPECTRUM GATEWAY ANTENNAS

Robert A. Wiedeman, Los Altos; Paul A. Monte, San Jose; Stephen S. Carter, San Diego, and William Ames, Poway, all of Calif., assignors to Globalstar L.P., San Jose, and Qualcomm Incorporated, San Diego, both of Calif.

Filed Jun. 6, 1995, Ser. No. 465,972
Int. Cl.[6] H04B *7/185*
U.S. Cl. 370—316 **25 Claims**



1. A method for allocating communications traffic amongst a plurality of satellites of a constellation of low earth orbit satellites, each of the plurality of satellites being oriented, at any given time when in view of a ground station and a user terminal, at a particular elevation angle, comprising the steps of:

providing each of the plurality of satellites with a receiver for receiving communication links from the ground station, a transmitter for transmitting communication links to user terminals, a receiver for receiving communication links from user terminals, and a transmitter for transmitting communication links to the ground station;

in response to a request for service, determining if a highest elevation angle satellite can be assigned a new communications link;

if yes, assigning a new communication link to the highest elevation angle satellite;

if no, determining if a lower elevation angle satellite can be assigned a new communications link; and

if yes, assigning a new communication link to a lower elevation angle satellite; wherein

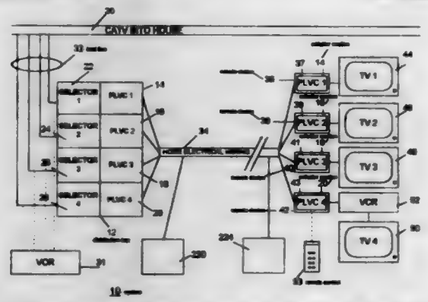
the steps of determining each include a step of determining if the satellite will be in view of both the user terminal and the ground station for a predetermined period of time and, if not, the satellite is not accepted for being assigned the new communication link.

5,592,482

VIDEO DISTRIBUTION SYSTEM USING IN-WALL WIRING

Charles Abraham, 804 Cheswold Ct., Wayne, Pa. 19087

Continuation-in-part of Ser. No. 180,421, Jan. 11, 1994, which is a continuation of Ser. No. 822,326, Jan. 17, 1992, abandoned, which is a continuation of Ser. No. 515,578, Apr. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,208, Oct. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 344,907, Apr. 28, 1989, abandoned. This application Sep. 12, 1994, Ser. No. 304,495
Int. Cl.[6] H04J *3/02*
U.S. Cl. 348—8 **25 Claims**



1. A video distribution system for selectively distributing video signals originating from at least one video signal source having a plurality of independent video signals comprising:

a) a display monitor;

b) AC electrical wiring;

c) a remote device connected to said display monitor and to said AC electrical wiring comprising:

1) a first video signal selector device for generating a selection signal corresponding to one of said plurality of independent video signals,

2) a first transmitter/receiver tuned to a first frequency band for:

i) matching the characteristic impedance of said AC electrical wiring,

ii) transmitting said selection signal over said AC electrical line, and

iii) receiving said one of said plurality of independent video signals;

d) a distribution device connected to said AC electrical wiring and to said at least one video signal source comprising:

1) a second transmitter/receiver tuned to said first frequency band for:

i) matching the characteristic impedance of said AC electrical wiring,

ii) receiving said selection signal, and

iii) transmitting said one of said plurality of independent video signals corresponding to said selection signal over said AC electrical line to said; remote device

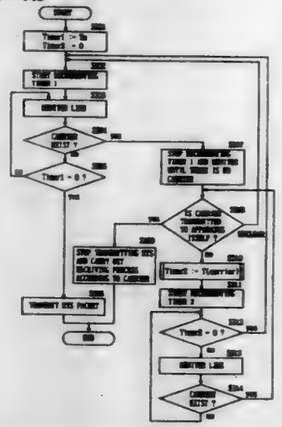
2) a second video signal selector for tuning said one of said plurality of independent video signals from said video signal source for transmission to said display monitor.

5,592,483

DATA COMMUNICATION APPARATUS ACHIEVING EFFICIENT USE OF THE MEDIA

Kaoru Hieda, Kitakatsuragi-gun; Masahiko Tsukamoto, and Akira Imai, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 6, 1995, Ser. No. 466,358
Claims priority, application Japan, Jul. 21, 1994, 6-169743
Int. Cl.[6] H04L *12/413*
U.S. Cl. 370—445 **13 Claims**



1. A data communication apparatus which carries out data communication between a plurality of apparatuses which share same media, comprising:

transmitted packet generating means for generating a packet to be transmitted to said media;

transmitting means for transmitting said generated packet to said media;

packet receiving means for receiving a received packet from said media;

packet reproducing means for reproducing said received packet;

means for detecting a detected time when said transmitting means desires data transmission;

first time setting means for setting a first prescribed time period from said detected time when said transmitting means desires data transmission;

first determining means for determining whether data communication is being carried out between said plurality of apparatuses or not and contents thereof within said first prescribed time period by means of said packet receiving means and said packet reproducing means;

second time setting means for setting a second time period according to a type of a determined packet determined by said first determining means, when said first determining means determines that data communication is being carried out between other apparatuses; and

controlling means for controlling said transmitting means to transmit a prescribed packet according to said determined packet after lapse of said first prescribed time period and said second time period.

5,592,484

TELECOMMUNICATION NETWORK HAVING A NUMBER OF STATIONS WHICH ARE CONNECTED TO A TOKEN RING NETWORK, AND STATION FOR SUCH A NETWORK

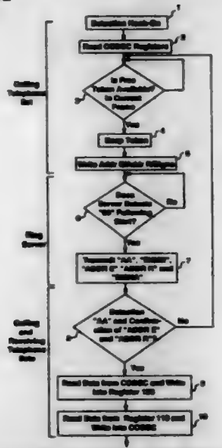
Andre Albano, La Colle Sur Loup; Rene Chuniaud, Cagnes Sur Mer; Jacques Fleschi, Saint Laurent du Var; Patrick Michel, La Gaude, and Jean-Francois Le Pennec, Nice, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1995, Ser. No. 455,826

Claims priority, application European Pat. Off., Jul. 28, 1994, 94480068

Int. Cl.[6] H04J *3/12;* **H04L** *12/433*

U.S. Cl. 370—452 **4 Claims**



1. A telecommunication network including a plurality of telephone stations connected to a ring server station (**8**) via a token ring over which communication between the stations is conducted in a periodic time division multiplex frame which includes;

a first field (START) for identifying the start of the frame,

a second field (TOKEN) which can have one of three different values, the first (FF) a free token, the second, (**00**) a busy token and the third (AA) for identifying communication from the ring server station (**8**),

a third field (SNUM) identifying a slot number in the multiplex frame,

a fourth field (ADDR_E) the address of an emitting station,

a fifth field (ADDR_R) the address of a receiving station,

a sixth field (SIGNA) representative of a signalling message to be transmitted to the server station (**8**), and

a number (n) of TDM slots used for communicating data, said telecommunication network characterized in that each said station includes:

a receiver (**10**) for receiving the TDM frame, for generating a first control signal (STADEC) and a second control signal (STODC) which represent the beginning and end ,respectively of the TDM frame;

a counter (**70**) controlled by said first control signal (STADEC) and clocked by clock signals for generating a third control signal (SYNC); means (**20**) connected to said receiver (**10**) for receiving TDM frames coming from the token ring and for generating a clock signal and a data flow (DIN) extracted from the TDM frames;

a coder decoder circuit (**80**) connected to a telephone set for providing A/D and D/A conversion of voice signals;

a serializer circuit (**131**) having an input bus connected to the output of a register (**120**) controlled by a processor (**200**);

a selector circuit (**40**) having a first input receiving said data flow extracted from said TDM frame and a second input which is connected to the output of said serializer; said selector having an output lead which is connected to said transmitting means (**60**) and which receives one among the two signals existing at its input in accordance with the state of a fourth control signal (SUBST1);

a token substitution circuit (**35**) under control of the processor (**200**) for detecting the presence of said first value (FF) in said token field and for replacing it with said second value (**00**) to inform the ring server station (**8**) that the token is requested and includes;

a first RS latch (**190**) which has an S input lead receiving said first control signal (STADEC) and an R input lead receiving said third control signal (SYNC); said first RS latch having an output lead which is connected to a first input lead of a first AND gate (**240**), said first AND gate (**240**) having a second input receiving said data flow (DIN) and a third input receiving a control signal (REQ) generated by said processor (**200**) when it wishes to request a token;

a second RS latch which has an S input lead connected to the output of said first AND gate (**240**) and an R input lead connected to the output of a first OR gate (**250**); said first OR gate (**250**) having a first input receiving the inverted data flow (DIN) and a second input lead which receives said third control signal (SYNC); and,

a second OR gate (**270**) which has a first input receiving the output of said second RS latch and a second input which is connected to receive a control signal (output of gate **300**) coming from said processor (**200**), said second OR gate (**270**) generating said fourth control signal (SUBST1).

5,592,485

CONNECTION SYSTEM BETWEEN A MASTER AND SLAVE PROCESSING UNITS

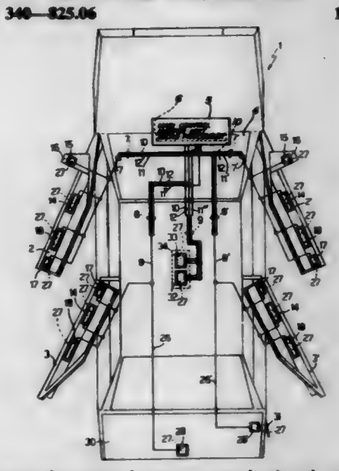
Franco Consiglieri, Piacenza; Arturo Wolfgruber, Milan, and Sandro Storti, Sesto San Giovanni, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Italy

Continuation of Ser. No. 519,287, May 4, 1990. This application Apr. 29, 1992, Ser. No. 876,127

Claims priority, application Italy, May 4, 1989, 67328/89

Int. Cl.[6] G05B *19/00;* **B60R** *16/02*

U.S. Cl. 340—825.06 **12 Claims**



1. A connection system between a central unit and a plurality of peripheral units, comprising:

a plurality of communication channels, each communication channel connecting a predetermined group of peripheral units to said central unit;

a microprocessor disposed in said central unit for controlling the exchange of communication between said central unit and each of said predetermined groups of peripheral units on each of said communication channels connected to said predetermined group;

a plurality of first switches disposed in said central unit, each of said first switches being connected to a respective one of said plurality of communication channels, each first switch being responsive to said microprocessor for enabling transmissions on its respective communication channel; and

a plurality of second switches disposed in said central unit, each second switch having a first terminal connected to a respective one of said plurality of communication channels and a second terminal connected to each of said plurality of first switches, said second switches enabling communication between its respective communication channel and each of said plurality of first switches.

5,592,486

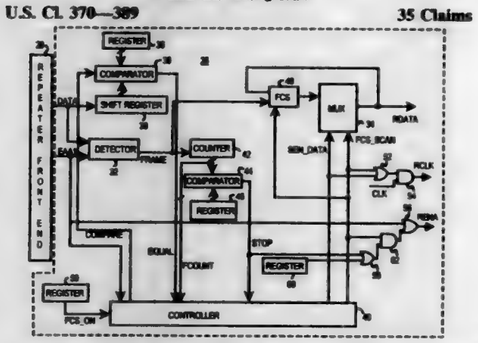
SYSTEM AND METHOD FOR EFFICIENTLY MONITORING INFORMATION IN A NETWORK HAVING A PLURALITY OF REPEATERS

William Lo, Santa Clara, and Ian S. Crayford, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 17, 1995, Ser. No. 406,081

Int. Cl.[6] H04J *3/24*

U.S. Cl. 370—389 **35 Claims**



1. A method for providing an efficient transfer of information from a data packet being transmitted on a network, the method comprising the steps of:

(a) receiving a data packet on a repeater in the network, the data packet including a destination address;

(b) determining whether the destination address matches an associated stored management unit address; and

(c) compressing the data packet transmitted from the repeater to a management unit when the destination address does not match the stored address.

5,592,487

COMMUNICATION PROTOCOL FOR TRANSFERRING INFORMATION ACROSS A SERIAL COMMUNICATION LINK

Kevin M. Knecht, Chippewa Falls, and Eric C. Fromm, Eau Claire, both of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Division of Ser. No. 250,375, May 27, 1994, Pat. No. 5,420,583, which is a division of Ser. No. 788,496, Nov. 6, 1991, Pat. No. 5,390,041. This application Mar. 20, 1995, Ser. No. 407,898

Int. Cl.[6] H04J *3/24*

U.S. Cl. 370—473 **3 Claims**



1. A method of communicating information, comprising the steps of:

(a) providing a plurality of signals including data packets, control packets, checksum packets, and sync symbols to establish a communications protocol;

(b) transmitting one of said control packets after one of said sync symbols is transmitted;

(c) transmitting one of said sync symbols or data packets or checksum packets after one of said control packets is transmitted;

(d) transmitting one of said sync symbols after one of said checksum packets is transmitted; and

(e) transmitting one of said sync symbols or another of said data packets after one of said data packets is transmitted.

5,592,488

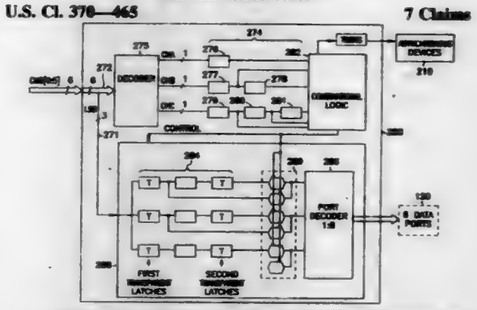
METHOD AND APPARATUS FOR PIPELINED MULTIPLEXING EMPLOYING ANALOG DELAYS FOR A MULTIPORT INTERFACE

Mark Thomsen, and Huy T. Vo, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 7, 1995, Ser. No. 477,148

Int. Cl.[6] G06F *15/80*

U.S. Cl. 370—465 **7 Claims**



1. A synchronous multiport interface for pipelined multiplexing of a plurality of port instructions issued in a digital communications system having a multiport architecture, comprising:

an instruction decoder for decoding the plurality of port instructions;

an instruction pipeline, connected to the instruction decoder, for sequentially storing a plurality of issued port instructions; and

an instruction multiplexer, connected to the instruction pipeline, for coordinating simultaneous execution of the plurality of issued port instructions in the instruction pipeline;

wherein the instruction pipeline has storage for single cycle, double cycle, and triple cycle port instructions issued by the digital communications system.

5,592,489

DATA COMBINATION CIRCUIT DEVICE AND DATA COMBINATION METHOD

Masayuki Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 889,971, May 29, 1992, abandoned. This application Sep. 27, 1994, Ser. No. 312,658

Claims priority, application Japan, May 31, 1991, 3-129873

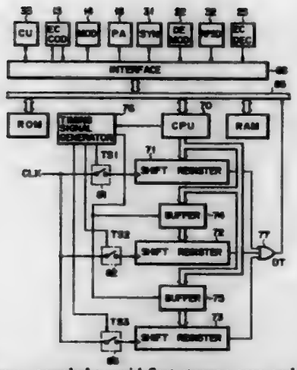
Int. Cl.[6] H04Q *7/04;* **H04B** *7/26*

U.S. Cl. 370—458 **23 Claims**

1. A data combination apparatus for use in a digital communications system, wherein data is transmitted in a predetermined format in time slots between a transmitting station and a receiving station, said apparatus comprising:

a first storage area for storing first data, the first data being variable from time slot to time slot;

a second storage area for storing second data including color code data, the second data being uniform from time slot to time slot;



timing means, coupled to said first storage area and said second storage area, for generating a plurality of timing signals and selectively supplying the timing signals to said first storage area and said second storage area to serially output the first data and the second data from said first storage area and said second storage area respectively, at predetermined timing intervals in accordance with the predetermined data format;

a data combining circuit, coupled to said first storage area and said second storage area, for serially combining data strings of the first data and the second data and outputting the serially combined data strings;

first switching means, for switching the timing signals from said timing means, a first timing signal being used for outputting the first data stored in said first data storage area to said data combining circuit; and

second switching means, for switching the timing signals from said timing means, a second timing signal being used for outputting the second data stored in said second storage area to said data combining circuit,

wherein for a data transmission, said data combining circuit combines the first data and the second data according to the switching of said first and second switching means and outputs first serially combined data strings during a first time period and second serially combined data strings during a second time period.

5,592,490

SPECTRALLY EFFICIENT HIGH CAPACITY WIRELESS COMMUNICATION SYSTEMS

Craig H. Barratt, Redwood City, Calif.; David M. Parish, Amherst, N.Y., and Richard H. Roy, III, Mountain View, Calif., assignors to ArrayComm, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 806,695, Dec. 12, 1991, Pat. No. 5,515,378, and Ser. No. 234,747, Apr. 28, 1994. This application Jan. 20, 1995, Ser. No. 375,848

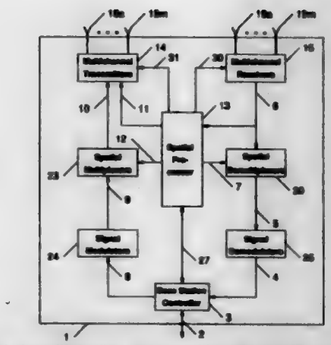
Int. Cl.[6] H04Q *7/00*

U.S. Cl. 370—310 **35 Claims**

1. A wireless system for calculating uplink signals transmitted from a plurality of remote terminals using a common uplink channel, said system including at least one base station, said system comprising:

receiving means at said at least one base station including a plurality of antenna elements and receivers for producing measurements of combinations of said uplink signals from said plurality of remote terminals using said common uplink channel,

receive spatial processing means for determining and storing receive spatial signatures for said plurality of remote terminals using said measurements, and



spatial demultiplexing means using said receive spatial signatures and said measurements to calculate said uplink signals.

5,592,491

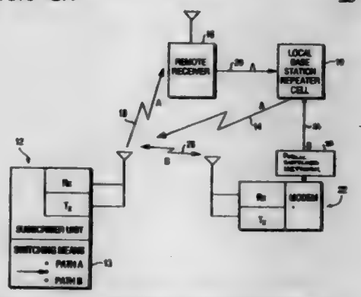
WIRELESS MODEM

Gilbert M. Dinkins, Herndon, Va., assignor to EON Corporation, Reston, Va.

Continuation-in-part of Ser. No. 966,414, Oct. 26, 1992, Pat. No. 5,388,101. This application Dec. 2, 1994, Ser. No. 348,618

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—277 **23 Claims**



1. A two-way communication network comprising:

a network hub switching center;

subscriber units dispersed at various locations within a predetermined geographic area, said subscriber units including switching means for selecting a communication path within said network,

local base station repeater cell communicating with identified individual subscriber units within a local base station geographic area associated with said local base station repeater cell, said local base station repeater cell further comprising,

base station data processing and communication unit for transmitting to a set of said subscriber units contained within said local base station geographic area associated with said local base station repeater cell and receiving from a subset of said set of local subscriber units multiplexed synchronously related digital data messages of variable lengths for point-to-point communication between said local base station repeater cell and said subset of said local subscriber units,

reception for receiving and processing data messages from said set of local subscriber units comprising a local remote receiver disposed within one of a plurality of cell subdivision sites partitioned from said local base station geographic area associated with said local base station repeater cell, said plurality of cell subdivision sites dispersed over said local base station geographic area, said local remote receiver being adapted to receive low power digital messages transmitted from said local subscriber units within range of said local remote receiver,

said set of local subscriber units including low power mobile units located within said local base station geographic area, each of said local subscriber units adapted to communicate with said local base station repeater cell by way of digital data signals of variable lengths synchronously related to a base station broadcast signal and timed for multiplexed message transmission, and

a modem communicatively coupled to said local subscriber units and said local base station repeater cell for transferring said multiplexed synchronously related digital data messages of variable lengths between said set of local subscriber units and said local base station repeater cell if said local subscriber units are unable to directly communicate with said local base station repeater cell.

5,592,492

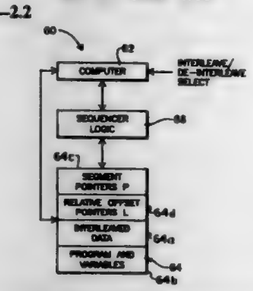
CONVOLUTIONAL INTERLEAVING/DE-INTERLEAVING METHOD AND APPARATUS FOR DATA TRANSMISSION

Nadav Ben-Efraim, Sunnyvale, and Peter T. Liu, Alameda, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed May 13, 1994, Ser. No. 242,199

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—2.2 **26 Claims**



14. An apparatus for selectively interleaving and de-interleaving symbols, comprising:

a memory including a plurality of segments having locations for storing said symbols;

a sequencer for sequentially reading stored symbols out of current locations in said segments, and sequentially writing current symbols into said current locations in said segments respectively; and

a computer for redesignating next locations in said segments as said current locations respectively, and controlling the sequencer to repeat said reading and writing;

in which the memory comprises B segments that have different numbers of locations C_K respectively in accordance with the relation $C_K=K\times\lceil N/B\rceil$, where K is a segment number from K_0 to $K_{(B-1)}$, C_K is said number of locations in segment K, N is a predetermined block length of said symbols and B is a predetermined interleaving depth.

5,592,493

SERIAL SCAN CHAIN ARCHITECTURE FOR A DATA PROCESSING SYSTEM AND METHOD OF OPERATION

Alfred L. Crouch; Matthew D. Pressly, both of Austin, Tex.; Joseph C. Circello, Phoenix, and Richard Duerden, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

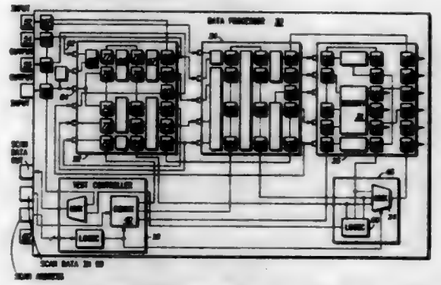
Filed Sep. 13, 1994, Ser. No. 304,968

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—22.3 **28 Claims**

1. A data processor having a scan chain architecture, the scan chain architecture comprising:

a plurality of scan chains wherein each scan chain in the plurality of scan chains has a plurality of serially connected storage



elements, each scan chain having a first storage element which has a scan input and a last storage element which has a scan output;

a multiplexer having a plurality of inputs wherein each input in the plurality of inputs is coupled to one scan output from the plurality of scan chains, the multiplexer having a multiplexer output wherein the multiplexer output is selectively coupled to one of the inputs in the plurality of inputs via the multiplexer;

a demultiplexer having a plurality of outputs wherein each output in the plurality of outputs is coupled to one scan input from the plurality of scan chains, the demultiplexer having a demultiplexer input wherein the demultiplexer input is selectively coupled to one output in the plurality of outputs via the demultiplexer; and

an output scan chain having an input coupled to the output of the multiplexer and an output coupled to an output terminal of the data processor, the multiplexer serially coupling the output scan chain to a selected one of the plurality of scan chains to form a total scan chain comprising the selected one of the plurality of scan chains and the output scan chain.

5,592,494

CURRENT REDUCTION CIRCUIT FOR TESTING PURPOSE

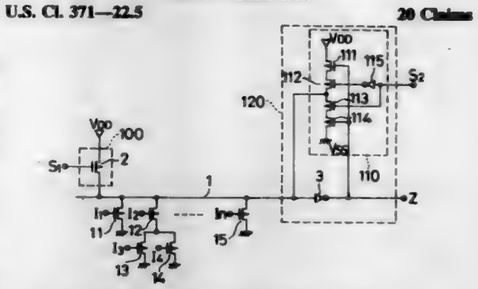
Yasuyuki Nozuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 17, 1993, Ser. No. 77,648

Claims priority, application Japan, Jun. 17, 1992, 4-158103; Feb. 24, 1993, 5-034972

Int. Cl.[6] G11C *5/12*

U.S. Cl. 371—22.5 **20 Claims**



1. A semiconductor integrated circuit comprising:

a first circuit having a first output line to which a first logic level corresponding to an arbitrary first input signal is supplied; and

a first standby means for maintaining the first circuit at a first standby state, wherein a first power supply potential is prevented from supplying current to said semiconductor integrated circuit on receipt of first information by which the first standby state is set, and said first logic level corresponding to said arbitrary first input signal is maintained on the first output line of the first circuit at a power supply potential level corresponding to said first logic level.

5,592,495

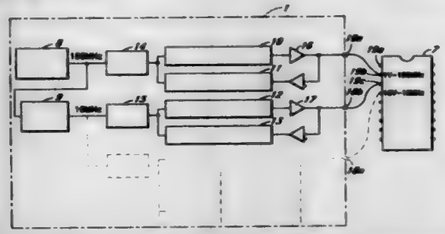
Patent Not Issued For This Number

5,592,496

SEMICONDUCTOR TEST EQUIPMENT

Masao Shimizu, and Kenji Yoshida, both of Gyoda, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,048
Claims priority, application Japan, Apr. 4, 1994, 6-087406
Int. Cl.[6] G01R 31/28; G06F 11/00
U.S. Cl. 371—27 4 Claims



1. A semiconductor test equipment for testing a semiconductor device, comprising:

a main clock generator circuit which generates a main clock signal having the highest frequency for the semiconductor testing equipment;

a first pattern generator which receives said main clock signal from the said main clock generator for generating a first test pattern signal having a frequency corresponding to said main clock signal;

a clock divider which divides said main clock signal by a predetermined rate to generate a lower frequency clock signal;

a second pattern generator which receives said lower frequency clock signal from said clock divider for generating a second test pattern having a frequency corresponding to said lower frequency clock signal, said second pattern generator being inoperable at a rate of said main clock signal;

a first wave formatter which receives said first pattern signal from said first pattern generator and forms a predetermined wave shape to be provided to said device under test; and

a second wave formatter which receives said second pattern signal from said second pattern generator and forms a predetermined wave shape to be provided to said device under test, said second wave formatter being inoperable at said rate of said main clock signal.

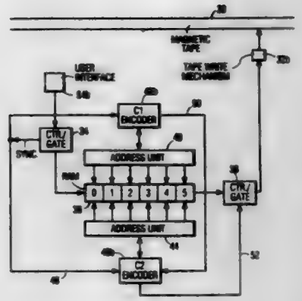
5,592,497

MULTITRACK RECORD CARRIER HAVING DIGITAL DATA REVERSIBLY STORED THEREON AS ERROR PROTECTED PRODUCT CODEWORDS

Gerardus C. P. Lokhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 197,870, Feb. 15, 1994, Pat. No. 5,467,360, which is a continuation of Ser. No. 814,944, Dec. 30, 1991, abandoned, which is a continuation of Ser. No. 491,371, Mar. 9, 1990, abandoned. This application Apr. 10, 1995, Ser. No. 419,483
Claims priority, application European Pat. Off., Jan. 18, 1990, 90200128
Int. Cl.[6] G06F 11/00
U.S. Cl. 371—37.4 8 Claims

1. A magnetic tape record carrier having a plurality of substantially parallel coextensive recording tracks constituting a succession of tape frames in the tape direction, each tape frame including a predetermined number of successive tape segments each of which includes a segment of all of the tracks, each tape segment having a corresponding segment of a frame of data recorded thereon; each data segment including first codewords (C1) and second codewords (C2) of respective error correcting codes which together constitute a product block code, each codeword including data symbols and parity symbols in accordance with the relevant error correcting code, the symbols of any particular C1 codeword all being on a single track in a single tape segment and the symbols of any particular C2 codeword being distributed among a plurality of tracks in a plurality of the segments of a tape frame; the number of symbols in a C2 codeword being an integral multiple of the number of tracks and being distributed thereon so that the geometric spacing between adjoining symbols of said C2 codeword is substantially uniform and has non-zero components both along and across said tracks.

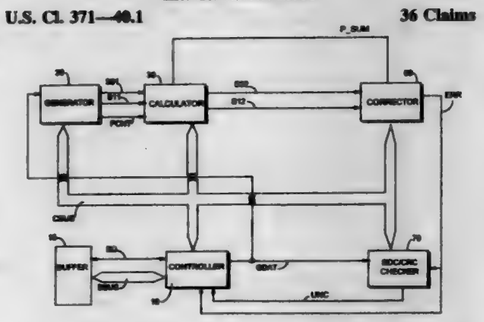


5,592,498

CRC/EDC CHECKER SYSTEM

Christopher P. Zook, Longmont, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 16, 1994, Ser. No. 306,917
Int. Cl.[6] G11C 29/00
U.S. Cl. 371—40.1 36 Claims



1. A system for checking bytes of information stored in block form in a buffer, the system comprising:

a correction unit which outputs error patterns for use in correcting specified bytes of the block during a correction access of the buffer;

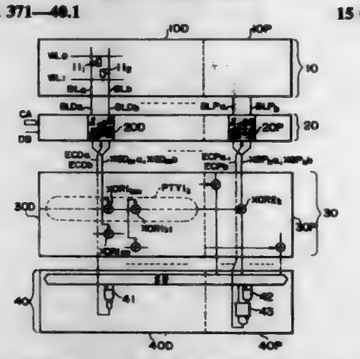
a CRC/EDC checker which operates upon the bytes of the block during the correction access of the buffer and uses CRC/EDC information to confirm that the block is corrected.

5,592,499

SEMICONDUCTOR MEMORY DEVICE

Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 979,939, Nov. 23, 1992, abandoned.
This application Jun. 21, 1995, Ser. No. 493,295
Claims priority, application Japan, Nov. 26, 1991, 3-310318
Int. Cl.[6] G11C 29/00
U.S. Cl. 371—40.1 15 Claims



1. A semiconductor memory device with built-in error correcting code circuitry, comprising:

a memory cell array for storing a plurality of information bits and a plurality of parity bits, said memory cell array comprising a plurality of memory cells for storing said information bits or said parity bits;

a register circuit, operatively coupled to said memory cell array, for temporarily holding said plurality of information bits and said plurality of parity bits, said register circuit including a plurality of information bit register circuits for temporarily holding said plurality of information bits and a plurality of parity bit register circuits for temporarily holding said plurality of parity bits;

an exclusive-OR (XOR) circuit, operatively coupled to said register circuit, for detecting an error of logical values of a plurality of information bits and a plurality of parity bits temporarily held in said register circuit in accordance with a predetermined verifying matrix, said XOR circuit including a plurality of XORs each having a first input line pair for receiving information in a first direction, a second input line pair for receiving information in a second direction perpendicular to said first direction, and an output line pair outputting XOR logical values in said second direction,

said XOR circuit including an information bit XOR circuit and a parity bit XOR circuit,

wherein the information bit XOR circuit has n rows of XOR line circuits extending in a third direction each of which includes:

a first XOR having a first input line pair coupled for receiving one of the information bits in a fourth direction perpendicular to the third direction, a second input line pair comprised of metal, the second input line pair coupled for receiving a predetermined signal from the third direction, and an output line pair comprised of metal, and

second to m-th XORs, each having a first input line pair coupled for receiving one of the information bits in the fourth direction, a second input line pair comprised of metal, the second input line pair coupled to the output line pair of the preceding XOR for receiving an output signal of the preceding XOR in the third direction, and an output line pair comprised of metal,

where n and m are integers greater than 1,

wherein the parity bit XOR circuit includes a plurality of XORs, each of which has a first input line pair coupled to one of the output line pairs of the m-th XORs for receiving an output signal of the m-th XORs in the third direction, a second input line pair comprised of metal, the second input line pair coupled for receiving the parity bit from the fourth direction, and an output line pair comprised of metal for outputting the error information bit in the fourth direction; and

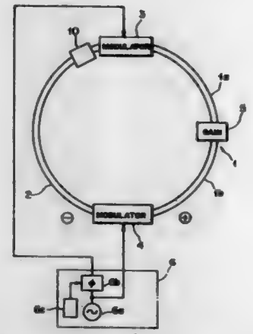
a decode circuit for correcting a bit error of a plurality of information bits and a plurality of parity bits temporarily held in said register circuit in accordance with the error information bit.

5,592,500

LASER DEVICE

Masataka Shirasaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 3, 1995, Ser. No. 538,798
Claims priority, application Japan, Feb. 9, 1995, 7-022075
Int. Cl.[6] H01S 3/10
U.S. Cl. 372—26 9 Claims



1. A laser device comprising:

a laser resonator formed of a positive dispersion region, a negative dispersion region, said first and second dispersion regions having the same dispersion amount, a first mode synchronous light modulator, a second mode synchronous light modulator, and a light gain medium;

a light propagation path formed by arranging in the light propagating order said first mode synchronous light modulator, said positive dispersion region, said second mode synchronous light modulator, and said negative dispersion region; said light gain medium being arranged in any place in said light propagation path; and

control means for varying a mutual phase in modulation between said first mode synchronous light modulator and said second mode synchronous light modulator.

5,592,501

LOW-STRAIN LASER STRUCTURES WITH GROUP III NITRIDE ACTIVE LAYERS

John A. Edmond; Gary E. Bulman, both of Cary, and Hua-Shuang Kong, Raleigh, all of N.C., assignors to Cree Research, Inc., Durham, N.C.

Filed Sep. 20, 1994, Ser. No. 309,247
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—45 35 Claims

1. A separate-confinement heterostructure laser comprising:

an indium gallium nitride active layer;

upper and lower waveguide layers on said active layer formed from the group consisting of AlGaN, InGaN, and AlInGaN; and



upper and lower cladding layers on said respective upper and lower waveguide layers and formed of AlGaN.

5,592,502

SEMICONDUCTOR LASER ELEMENT AND METHOD FOR ADJUSTING SELF-INDUCED OSCILLATION INTENSITY OF THE SAME

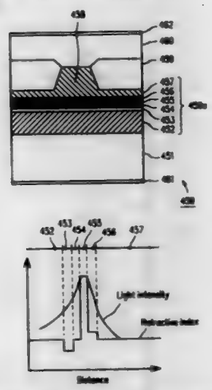
Mitsuhiro Matsumoto, Kashihara, and Ken Ohbayashi, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1994, Ser. No. 327,452

Claims priority, application Japan, Oct. 22, 1993, 5-265121; Sep. 14, 1994, 6-220677

Int. Cl.[6] H01S *3/18*

U.S. Cl. 372—45 **42 Claims**



1. A semiconductor laser element comprising:

a semiconductor laminated structure for emitting a laser light, including an active layer interposed between a first cladding layer of a first-conductivity type and a second cladding layer of a second-conductivity type, the first cladding layer and the second cladding layer having lower refractive indices than that of the active layer; and

a current light confining means including a current light confining layer having an opening, formed on a surface of the second cladding layer on a side opposite to the active layer, for confining a laser driving current and the laser light in a region of the active layer corresponding to the opening,

wherein the refractive index of the first cladding layer is larger than that of the second cladding layer in the semiconductor laminated structure, and the semiconductor laminated structure includes at least one semiconductor layer of the second-conductivity type having a higher refractive index than that of the second cladding layer, disposed between the second cladding layer and the active layer; and

wherein a difference in equivalent refractive indices in a thickness direction between inside and outside the opening is set to be within a range of 1×10^{-3} to 4×10^{-3}, and a rate of light confined in the active layer in the thickness direction outside the opening is set to be within a range of 0.12 to 0.3.

5,592,503

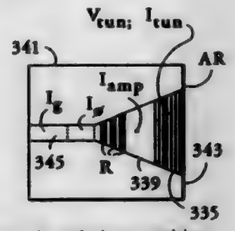
SEMICONDUCTOR LASER WITH INTEGRAL SPATIAL MODE FILTER

David F. Welch, Palo Alto; David G. Mehuys, Menlo Park, and Donald R. Scifres, San Jose, all of Calif., assignors to SDL, Inc., San Jose, Calif.

Division of Ser. No. 1,735, Jan. 7, 1993, Pat. No. 5,392,308. This application Jun. 21, 1994, Ser. No. 263,190

Int. Cl.[6] H01S *3/19*

U.S. Cl. 372—50 **56 Claims**



1. A semiconductor laser device comprising

a lightwave gain region including a broad portion with a lateral dimension along its length greater than a lateral dimension along other portions of said gain region that permits lightwaves to propagate with a diverging phase front therein,

electrical excitation means for pumping said gain region,

means for providing optical feedback to said gain region, said feedback means defining a laser cavity, said gain region included within said laser cavity, said feedback means providing optical feedback of a portion of said diverging lightwaves propagating in said broad portion of said gain region, a single transverse mode filter also included within said laser cavity, said gain region including means associated with said feedback means for tuning an optical feedback wavelength of said lightwaves propagating in said laser cavity,

a lightwave phase adjustment region in a path of said lightwaves in said laser cavity, with means for electrically tuning said phase adjustment region, separately from but in coordination with said means for tuning said optical feedback wavelength, to maintain single longitudinal mode operation of said laser cavity over an extended wavelength tuning range, and

means for coupling lightwaves out of said gain region.

5,592,504

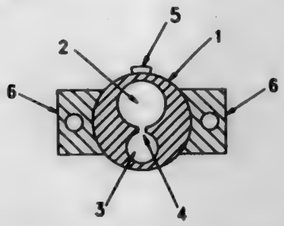
TRANSVERSELY EXCITED NON WAVEGUIDE RF GAS LASER CONFIGURATION

Harold A. Cameron, 1539 Baker St., Ste. B, Costa Mesa, Calif. 92626

Filed Oct. 10, 1995, Ser. No. 541,888

Int. Cl.[6] H01S *3/03*

U.S. Cl. 372—61 **13 Claims**



1. A high energy gas laser comprising, in combination:

an elongated body made from a homogeneous dielectric material having an external surface and two ends;

first and second elongated chambers formed in and extending entirely along said elongated body, parallel to each other, between said two ends; each of said first and second elongated chambers having open ends;

a narrow slot formed between said first and second elongated chambers in said elongated body, fluidly connecting the same along their entire length to thereby relieve any gas pressure buildup during laser modulation and to interrupt an internal wall surface and prevent high order mode reflection;

a laser gas filling said first and second elongated chambers;

a plurality of electrodes secured to said external surface of said elongated body;

laser optics sealed to the open ends of the first elongated chamber and end caps sealed to the open ends of the second elongated chamber; and

an external RF power source connected to said plurality of electrodes to produce a laser gas discharge in the first elongated chamber, with the second elongated chamber being a gas reservoir.

5,592,505

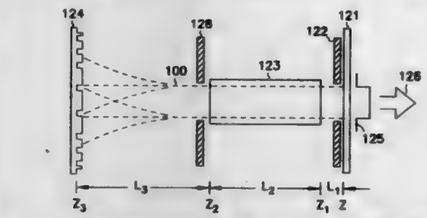
PHASE CONJUGATING DIFRACTIVE ELEMENTS AND METHOD

James R. Leger, Plymouth, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 239,028, May 6, 1994, Pat. No. 5,454,004. This application May 4, 1995, Ser. No. 434,788

Int. Cl.[6] H01S *3/08*

U.S. Cl. 372—99 **18 Claims**



1. A mirror comprising a diffractive surface, the diffractive surface configured to reconstruct, at a first chosen surface passing through a point z, wherein the point z is at a distance from the mirror, a phase conjugate of an arbitrary areal profile a of substantially coherent electromagnetic radiation, the diffractive surface having a reflectance which is substantially the rate b*/b, wherein b* is a complex phase conjugate of a profile b, and wherein the profile b substantially represents the profile a propagated from the chosen surface to the diffractive surface.

5,592,506

MSK SPREAD-SPECTRUM RECEIVER WHICH ALLOWS CDMA OPERATIONS

Jimmy K. Omura, Capertino; Paul T. Yang, Sunnyvale, both of Calif.; Gurgen H. Khachatrian, Yerevan, Argentina; Karen M. Nikogossian, Yerevan, Argentina; Karen S. Hovakimian, Yerevan, Argentina, and Armen L. Vartapetian, Yerevan, Argentina, assignors to Cylink Corporation, Sunnyvale, Calif.

Filed Oct. 17, 1994, Ser. No. 324,478

Int. Cl.[6] H04B *15/00*; H04K *1/00*; H04L *27/30*

U.S. Cl. 375—207 **19 Claims**

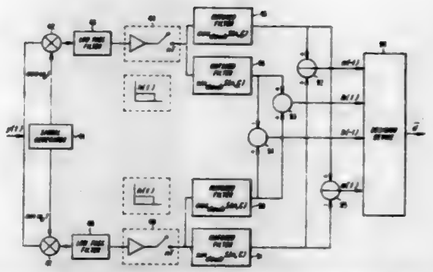
1. A method for demodulating a received-spread-spectrum signal using a minimum-shift-keyed (MSK) receiver, comprising the steps of:

generating an in-phase-component signal from the received-spread-spectrum signal;

generating a quadrature-phase-component signal from the received-spread-spectrum signal;

processing the in-phase-component signal using $\sin_{d_{code}}S(n,C)$ to generate a first processed signal;

processing the quadrature-phase-component signal using $\sin_{d_{code}}S(n,C)$ to generate a second processed signal;



processing the in-phase-component signal using $\cos_{d_{code}}S(n,C)$ to generate a third processed signal;

processing the quadrature-phase-component signal using $\cos_{d_{code}}S(n,C)$ to generate a fourth processed signal;

combining the first processed signal with the fourth processed signal to generate a first combined signal;

combining an inverse of the first processed signal with the fourth processed signal to generate a second combined signal;

combining the second processed signal with the third processed signal to generate a third combined signal;

combining an inverse of the second processed signal with the third processed signal to generate a fourth combined signal; and

deciding from the first combined signal, the second combined signal, the third combined signal and the fourth combined signal, an estimate of data of the received-spread-spectrum signal.

5,592,587

INTERMEDIATE RELAY STATION OF A DIGITAL MICROWAVE COMMUNICATION SYSTEM USING SERVICE CHANNEL FOR MONITORING AND CONTROLLING SPACE AND/OR TIME DIVERSITY, HETERODYNE RELAY, PHASE CONTROL, FREQUENCY CONTROL, WITH PHASE SHIFT KEYING MODULATION

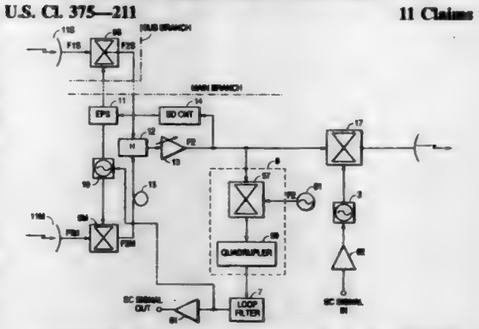
Kenzo Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 86,827, Jul. 7, 1993, abandoned. This application Sep. 18, 1995, Ser. No. 529,416

Claims priority, application Japan, Jul. 7, 1992, 4-178725

Int. Cl.[6] H04B *3/36*; *7/17*; *17/02*; *27/00*

U.S. Cl. 375—211 **11 Claims**



9. An intermediate relay station of a microwave communication system, comprising:

a pair of first receiving mixer means for frequency-converting first and second received microwave signals received by two antennas apart from each other into first and second intermediate frequency received signals;

phase shifter means for shifting the phase of said first intermediate frequency received signal so that a phase difference between carriers of said first and second intermediate frequency received signals, the phase difference arising from the difference of propagation paths of the microwave carriers, is compensated;

adding means for adding the first intermediate frequency received signal whose phase has been shifted and the second intermediate frequency received signal whose phase has not been shifted, in order to generate a third intermediate frequency received signal;

second receiving mixer means for frequency-converting said third intermediate frequency received signal from said adding means into a fourth intermediate frequency received signal;

fixed-frequency oscillating means for generating a first intermediate frequency reference signal having a fixed-frequency equal to a frequency of a carrier of said fourth intermediate frequency received signal;

phase difference detecting means for inputting said intermediate frequency reference signal and said fourth intermediate frequency received signal, and for generating a control signal corresponding only to a frequency deviation in said fourth intermediate frequency received signal, the frequency deviation arising from a frequency modulation with a service channel signal;

a VCO device, responsive to said control signal, generating a receiving-side local oscillation signal whose frequency varies so that the fourth intermediate frequency received signal is frequency-locked to said first intermediate frequency reference signal from said fixed-frequency oscillating means; and

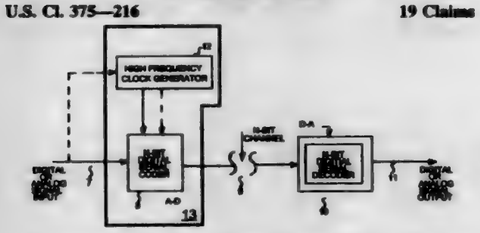
transmitting mixer means for converting the fourth intermediate frequency received signal, having a reduced frequency modulation component, into a transmitting microwave.

5,592,508

ANALOG SIGNAL CODING AND TRANSMISSION APPARATUS AND METHOD CAPABLE OF OPERATION WITH MULTIPLE TYPES OF ANALOG AND DIGITAL SIGNALS

J. Carl Cooper, 15288 Via Pinto, Monte Sereno, Calif. 95030

Filed Sep. 22, 1994, Ser. No. 310,689
Int. Cl.[6] H04L *25/00*
U.S. Cl. 375—216 **19 Claims**



1. A system for coupling an input electronic or optical signal, which may be in analog or digital form, from one point to another, including in combination:

a) a clock generator providing a clock signal;

b) an analog to digital convertor responsive to said input signal and said clock signal to digitize said input signal thereby providing a serial digital data stream equivalent of said input signal;

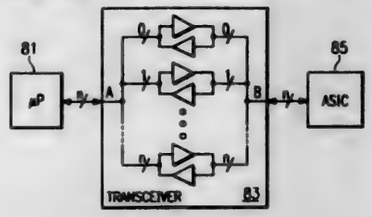
circuitry in a) or b) above for determining if said input signal is an analog or digital signal and causing b) to alter its operation accordingly.

5,592,509

TRANSCEIVER CIRCUIT WITH TRANSITION DETECTION

Mark T. McClear, and Christopher Wellheuser, both of Plano, Tex., assignors to Texas Instruments, Dallas, Tex.

Division of Ser. No. 228,867, Apr. 15, 1994, Pat. No. 5,469,473. This application Jun. 7, 1995, Ser. No. 485,520
Int. Cl.[6] H04B *1/38;* **H03K** *5/1534*
U.S. Cl. 375—219 **1 Claim**



1. An integrated circuit, comprising:

a first bidirectional data port;

a second bidirectional data port; and

a plurality of transceivers coupled to said first and second bidirectional data ports, each of said transceivers comprising:

a first bus holder circuit coupled to said first bidirectional data port;

a second bus holder circuit coupled to said second bidirectional data port;

a first tri-state output driver coupled to said second bidirectional data port;

a second tri-state output driver coupled to said first bidirectional data port;

a first input transition detector coupled to said first bus holder circuit comprising a rising edge detector circuit and a falling edge detector circuit and outputting a first edge detection signal when either a rising or falling edge is detected;

a second input transition detector coupled to said second bus holder circuit comprising a rising edge detector circuit and a falling edge detector circuit and outputting a second edge detection signal when either a rising or falling edge is detected;

collision arbitration circuitry coupled to said first and second input transition detectors and having outputs for enabling said first and second tri-state output drivers to transmit data on said second and first bidirectional data ports, respectively, responsive to said first and second edge detection signals, respectively.

5,592,510

COMMON MODE EARLY VOLTAGE COMPENSATION SUBCIRCUIT FOR CURRENT DRIVER

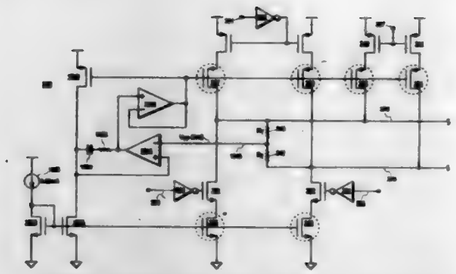
Roger W. Van Brunt, San Francisco, and Florin A. Oprescu, Sunnyvale, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 29, 1994, Ser. No. 219,664
Int. Cl.[6] H04B *1/38;* **H04L** *5/16*
U.S. Cl. 375—220 **35 Claims**

1. A driver circuit comprising:

driving circuitry driving differential signals over a twisted pair cable and driving common mode current signals containing information over said twisted pair cable, said driving circuitry comprising driving transistors and having a bias voltage, said driving transistors coupled to said twisted pair cable; and

a subcircuit coupled to said driving circuitry and modifying an effective common mode early voltage characteristic of said driving transistors in response to variations in said bias voltage from a reference voltage level, said subcircuit effectively



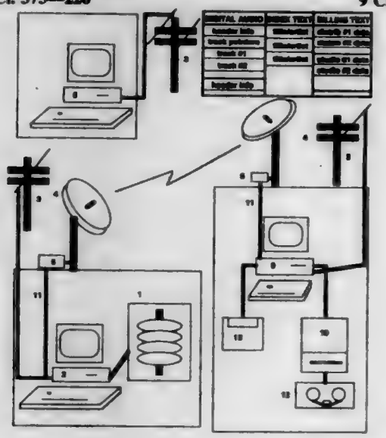
reducing common mode current flow over said twisted pair cable in response to variations of said bias voltage from said reference voltage level.

5,592,511

DIGITAL CUSTOMIZED AUDIO PRODUCTS WITH USER CREATED DATA AND ASSOCIATED DISTRIBUTION AND PRODUCTION SYSTEM

Neil C. Schoen, and Wendy A. Schoen, both of 9817 Freestate Pl., Gaithersburg, Md. 20879

Continuation of Ser. No. 240,454, May 10, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,295
Int. Cl.[6] H04B *1/38;* **H04L** *5/16*
U.S. Cl. 375—220 **9 Claims**



1. Systems for creation of user-created, customized audio products at record stores and distribution sites from digital databases remotely located at a plurality of recording company sites, consisting of:

means for creating addressable digital databases of audio information;

means for retrieving selected data/audio files from said databases;

means for transmitting said data/audio files to customers at record stores and distribution sites and interactively including customer-created data;

means for producing at faster than playback speed, at said record stores and distribution sites, customized playback media products, including optical compact discs (CDs) and digital audio tapes (DATs), containing compilations of said data/audio files, wherein said data/audio files consist of a plurality of previously recorded and customer-provided audio information and associated text/graphics material, at the level of individual songs and portions of voice data, text material, and still photographs, which are then assembled into a customized compilation to become said CD and DAT customized playback media products; and

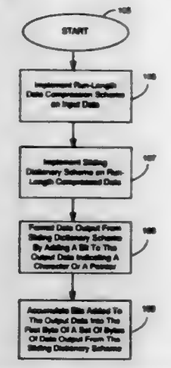
means for collecting billing data and distributing invoices for royalties and other associated fees to owners and operators of the data/audio files and the transmitting and distribution systems.

5,592,512

ADAPTIVE DISPLAY REFRESH AND DATA COMPRESSION IN A RADIO FREQUENCY ENVIRONMENT

Gary N. Spiess, Lisbon, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 265,712, Jun. 24, 1994, abandoned. This application Jul. 1, 1994, Ser. No. 270,239
Int. Cl.[6] H04B *1/66*
U.S. Cl. 375—240 **1 Claim**



1. A method of compressing data comprising:

(a) first implementing a run length compression scheme to output repeated characters in a stream of input data as flags followed by a count of the number of repetitions;

(b) second implementing a sliding dictionary scheme to output a character itself if it is occurring for the first time in the stream of input data, and to output a pointer to a previously compressed character if the character has already occurred in the stream of input data;

(c) formatting the output of step (b) by adding an additional bit to each character or pointer to indicate whether it represents a character or a pointer; and

(d) accumulating the additional bits into a first byte of a set of data bytes to indicate whether each byte in the set is a character or a pointer,

such that data communication speed is improved without an increase in memory storage used.

5,592,513

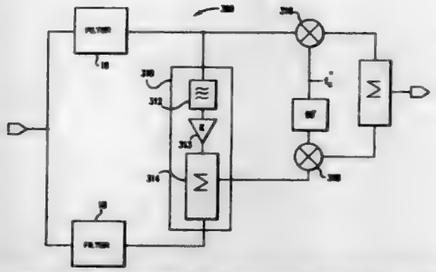
SYNCHRONOUS MODULATOR AND METHODS FOR SYNCHRONOUS MODULATION

Leo Montreuil, Atlanta, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Division of Ser. No. 223,223, Apr. 5, 1994. This application Jun. 7, 1995, Ser. No. 473,949
Int. Cl.[6] H03C *1/04;* **H04L** *27/36*
U.S. Cl. 375—296 **12 Claims**

9. A modulator for shaping a spectrum of a modulated signal produced by modulating an information signal on a carrier signal, the modulator comprising:

first and second input filters, each filter coupled to the information signal, the first input filter having a first filter output, the second filter having a second filter output;



combiner circuitry having first and second combiner inputs and a combiner output, the first combiner input being coupled to the first filter output, the second combiner input being coupled to the second filter output;

first and second mixer circuits, each mixer circuit having first and second mixer inputs and a mixer output, the first mixer input of the first mixer circuit being coupled to the first filter output, the combiner output being coupled to the first mixer input of the second mixer circuit;

a phase transformer having a transformer input coupled to the second mixer input of the first mixer circuit and having a transformer output coupled to the second mixer input of the second mixer circuit;

a carrier signal input terminal connected to the transformer input; and

summation circuitry input and a summation circuitry output, a second summation circuitry input and a summation circuitry output, the first summation circuitry input being coupled to the mixer output of the first mixer circuit, the second summation circuitry input being coupled to the mixer output of the second mixer circuit, the summation circuitry output providing the modulated signal.

17. A binary digital signal processing system for performing signal reconstruction at the receiving end of a communications system, said system comprising:

a binary digital signal processor;

a memory containing, stored in predetermined memory locations, a first reconstructed discrete signal and N discrete channel tap components of a discrete channel estimate of the communications system, N being a positive integer; and

a signal bus coupling said binary digital signal processor to said memory unit;

said binary digital signal processor being configured so as to reconstruct a second discrete signal from the first reconstructed discrete signal and one of the N discrete channel tap components.

5,592,515

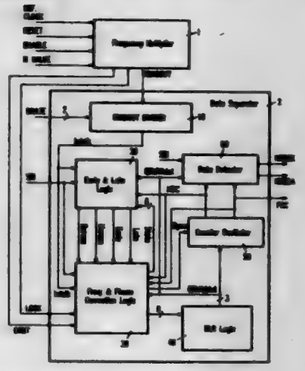
FULLY DIGITAL DATA SEPARATOR AND FREQUENCY MULTIPLIER

Rami Sebun, Holon; Alon Shacham, Tel-Aviv; Avner Efendovich, Jerusalem, and Varda Karpati, Netanya, all of Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 221,618, Apr. 1, 1994, Pat. No. 5,553,100. This application Apr. 20, 1995, Ser. No. 425,633

Int. Cl.[6] H04L *27/06;7/02;7/00*

U.S. Cl. 375—340 **3 Claims**



1. A digital data separator comprising:

an early and late logic unit, said early and late logic unit comprising:

a phase shift accumulator (PSA) register having an input, said PSA register being actuated so as to change a binary value stored in said PSA register when a data input signal is phase-shifted with respect to a clock signal output, and

a limit detector connected to said PSA register, said limit detector detecting when the binary value stored in said PSA register reaches a predetermined limit;

a bit length register (BLR) logic unit, said BLR logic unit comprising a counter register, said counter register counting at a fast clock rate which is a preselected multiple of a data rate of said data input signal, an output from said limit detector causing a binary value to be loaded into said counter register; and

a counter oscillator, said counter oscillator receiving a detect signal when said counter register reaches a selected binary value and delivering said clock signal output.

5,592,514

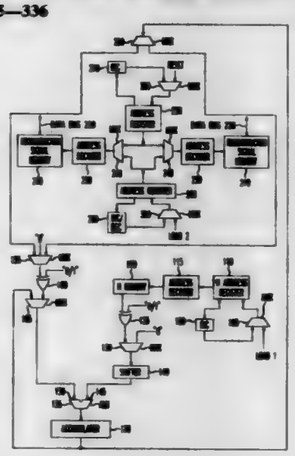
METHOD OF PERFORMING SIGNAL RECONSTRUCTION AT THE RECEIVING END OF A COMMUNICATIONS SYSTEM, SUCH AS FOR GSM

Mohammad S. Mobin, Whitehall, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 8, 1995, Ser. No. 401,059

Int. Cl.[6] H03D *3/00;* **H04L** *27/14;27/06*

U.S. Cl. 375—336 **20 Claims**



5,592,516

METHOD AND CIRCUITS FOR COMBINING BASEBAND SIGNALS AND RECOVERY OF CLOCK TIMING

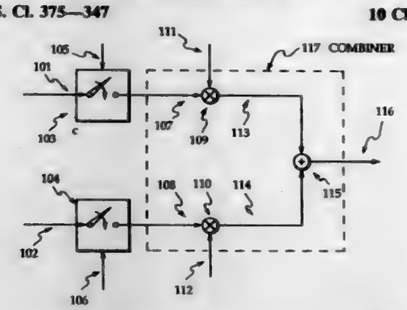
Franco Guglielmi, Milan; Carlo Luschi, Maria Hoè , and Arnaldo Spalvieri, Milan, all of Italy, assignors to Alcatel Italia S.P.A., Milan, Italy

Filed Jul. 1, 1994, Ser. No. 270,140

Claims priority, application Italy, Jul. 2, 1993, MI93A1428

Int. Cl.[6] H04L *1/02;7/00*

U.S. Cl. 375—347 **10 Claims**



1. A method of combining at least two baseband complex signals into a combined signal having a combined signal phase, comprising the steps of:

multiplying at least one of said at least two baseband complex signals by a feedback multiplying coefficient, for providing at least one multiplied baseband complex signal;

summing said at least one multiplied baseband complex signal with another of said at least two baseband signals, for providing the combined signal; and

determining said feedback multiplying coefficient by operating on said combined signal independently of the combined signal phase.

5,592,517

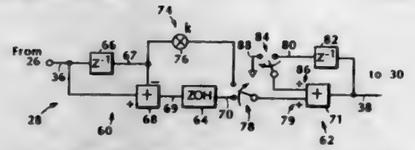
CASCADED COMB INTEGRATOR INTERPOLATING FILTERS

James C. Camp, Sudbury, and James P. Mulvey, Woburn, both of Mass., assignors to Tellabs Wireless, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 220,728, Mar. 31, 1994, abandoned. This application Aug. 28, 1995, Ser. No. 519,877

Int. Cl.[6] G06F *15/31*

U.S. Cl. 375—350 **30 Claims**



1. A digital interpolator, comprising

a filter processing digital data at a first data rate to produce filtered data and differentiated data,

means connected to an output of the filter, said means increasing the data rate of the differentiated data,

an integrator connected to said means, the integrator receiving the differentiated data at a second data rate higher than the first data rate, and

a feedforward path between said filter and said integrator, said feedforward path providing said filtered data to said integrator, said filtered data representing an output of said integrator in the absence of error.

5,592,518

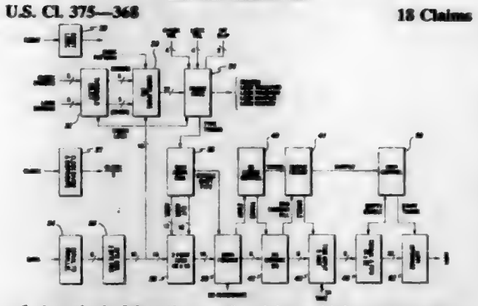
PARALLEL FRAME SYNCHRONIZER FOR DETECTING FORWARD-ORDERED/REVERSE-ORDERED, INVERTED/NON-INVERTED DATA

Richard M. Davis, Littleton; Thad J. Genrich, Aurora, and Mark W. Hall, Franktown, all of Colo., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Mar. 28, 1994, Ser. No. 219,695

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—368 **18 Claims**



1. A method of detecting synchronizing to high speed serial true and inverted data capture by detecting a predetermined frame synchronization pattern within a received digital signal characterized by a serial bit stream, wherein a predetermined number of consecutive bits in the serial bit stream is converted to a parallel data word as the digital signal is received, the method comprising:

substantially simultaneously comparing each parallel data word with a plurality of predetermined parallel bit patterns, each bit pattern of the plurality of predetermined parallel bit patterns corresponding to a different representation of the frame synchronization pattern; so as to characterize the digital signal being received and to determine a position of the frame synchronization pattern within the parallel data word, the digital signal being characterized as being one of the members of the group consisting of true forward, true reverse, inverted forward, and inverted reverse, wherein true forward is indicative of a forward-ordered, non-inverted bit sequences, true reverse is indicative of a reverse-ordered, non-inverted bit sequence, inverted forward is indicative of a forward-ordered, inverted bit sequence and inverted reverse is indicative of a reverse-ordered, inverted bit sequence;

generating a correlation signal for each substantially simultaneous comparison to indicate a degree of correlation between each of the plurality of predetermined parallel bit patterns and at least a portion of the parallel data word; and

selecting one of the correlation signals which has a degree of correlation greater than a predetermined minimum degree of correlation so as to detect the predetermined frame synchronization pattern.

5,592,519

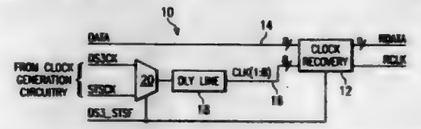
DUAL FREQUENCY CLOCK RECOVERY USING COMMON MULTITAP LINE

Charles M. Honaker, Jr., Garland, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Jun. 22, 1994, Ser. No. 263,818

Int. Cl.[6] H04L *25/36*

U.S. Cl. 375—373 **17 Claims**



1. Clock recovery circuitry for generating a recovered clock signal from a data stream having one of a multiple of frequencies comprising:

reference clock circuitry for generating a plurality of reference clock signals and outputting one of said plurality of reference clock signals responsive to a control signal indicating the frequency of said data stream;

delay line circuitry for generating a plurality of phase shifted clock signals responsive to said reference clock;

circuitry for selecting a set of said plurality of phase shifted clocks responsive to said control signal;

circuitry for comparing the selected set of phased clocks to the data stream to determine which phased clock detects a predetermined logic level first;

circuitry for detecting metastable anomalies by counting the consecutive number of times the predetermined logic level is detected first by one of said phased clock; and

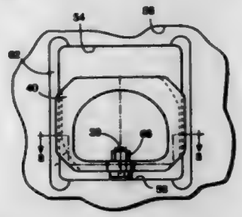
circuitry for dynamically reproducing one of said set of phase shifted clocks as the recovered clock responsive to said circuitry for comparing.

5,592,520

LATCH HANDLE FOR A CONTROL ROAD IN A NUCLEAR REACTOR

Kevin L. Ledford, and Jeffrey A. Wilson, both of Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 30, 1995, Ser. No. 520,880
Int. Cl.[6] G21C *7/10*
U.S. Cl. 376—233 **19 Claims**



1. A control rod for a nuclear reactor comprising:

a control rod body having a plurality of blades projecting generally at right angles to one another, said body having a window defined by a plurality of generally linearly extending sides;

a latch handle for connection to said control rod body and location in said window, said latch handle having a plurality of linearly extending sides, at least a pair of sides of one of said window and said latch handle having retaining slots and at least a pair of sides of another of said window and said latch handle having flanges for engaging in said slots;

the sides of said latch handle and said window being configured so that said latch handle, in a first rotational orientation relative to said window, is receivable within the peripheral confines of said window and, upon rotation thereof into a second rotational orientation relative to said window, engages the periphery of said window with slots and flanges of said pairs of sides of said window and said latch handle engaging one another, respectively, to retain said latch handle in said window;

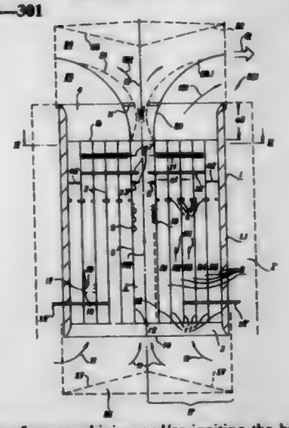
said pairs of sides engaging one another in said second orientation of said latch handle relative to said window to enable sliding movement of said latch handle in at least one linear direction relative to said window.

5,592,521

PROCESS AND DEVICE FOR RECOMBINING AND/OR IGNITING HYDROGEN CONTAINED IN AN H_2-AIR-STEAM MIXTURE, PREFERABLY FOR NUCLEAR POWER STATIONS

Axel Hill, Stockstadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 189,304, Jan. 28, 1994, Pat. No. 5,492,686. This application Jun. 7, 1995, Ser. No. 484,520
Claims priority, application Germany, Jul. 29, 1991, 41 25 085.0
Int. Cl.[6] G21C *9/06*
U.S. Cl. 376—301 **25 Claims**



1. A device for recombining and/or igniting the hydrogen contained in an H_2-air-steam mixture, comprising:

a) at least one first channel for a first partial flow of the H_2-air-steam mixture, said at least one first channel including a channel wall having a wall surface with a catalytic coating for recombining hydrogen and oxygen flowing past;

b) at least one second channel, in addition to said first channel for a second partial flow of the H_2-air-steam mixture in parallel with the first partial flow, said at least one second channel including a channel wall having at least one ignition element to be heated to an ignition temperature for igniting ignitable H_2-air-steam mixtures flowing past; and

c) means for coupling heat produced in recombination processes in said first channel into said second channel;

wherein said first channel has flow spaces in which said at least one ignition element is disposed, at least one of said first and second channel walls is metallically contacted, and said at least one ignition element has a point extending through said channel wall of said second channel into a channel cross section of said second channel.

5,592,522

CONTROL ROD FOR A NUCLEAR REACTOR

James E. Holden, Wilmington, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1995, Ser. No. 489,130
Int. Cl.[6] G21C *7/10*
U.S. Cl. 376—333 **12 Claims**

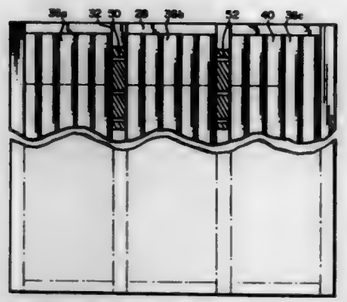
1. A control rod for a nuclear reactor, comprising:

a cruciform control rod body having four elongated, substantially vertically extending wings arranged generally 90° relative to one another, each wing including a plurality of elongated, generally vertically extending discrete structural members spaced from one another and discrete horizontally extending structural members adjacent opposite ends of said vertically extending members defining a plurality of vertically extending, side-by-side compartments;

a sheath disposed along opposite sides of said vertically and horizontally extending members, said structural members being welded to one another and said sheaths being welded to said structural members whereby said members and said sheath seal said compartments externally of said wing;

neutron-absorbing material disposed in each said sealed compartment; and

a passage through a vertically extending member in part defining adjacent compartments enabling passage of gas under pressure generated by reaction of at least certain of the neutron-absorbing material with neutrons from one of said adjacent compartments through said passage into another of said adjacent compartments.

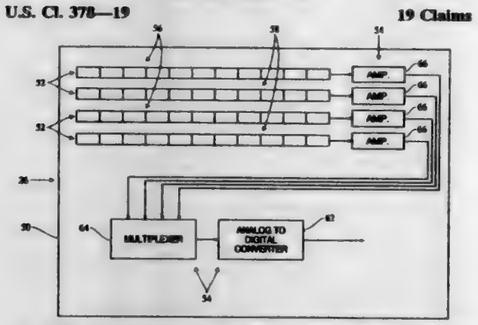


5,592,523

TWO DIMENSIONAL DETECTOR ARRAY FOR CT SCANNERS

Heang K. Tuy, Chesterland; Dale J. Bendula, Painesville, and Walter W. Lindstrom, Shaker Heights, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Dec. 6, 1994, Ser. No. 350,412
Int. Cl.[6] H05G *1/60*
U.S. Cl. 378—19 **19 Claims**



1. In a computerized tomographic scanner having an x-ray radiation source for selectively emitting penetrating x-ray radiation which traverses an examination area, an image reconstruction means for reconstructing images representative of the examination area using digital signals, a plurality of radiation detector arrays positioned opposite the radiation source each detector array having (i) a plurality of scintillation crystals arranged in an n×m array, each of said scintillation crystals converting x-ray radiation into visible light, (ii) a substrate, and (iii) a plurality of photodetectors connected to the substrate, arranged in an n×m array, and optically coupled with the scintillation crystal array, each photodetector converting visible light into electrical charge, THE IMPROVEMENT COMPRISING:

a plurality of charge storage devices formed on the substrate for accumulating and storing charge, each photodetector being selectively connected to a respective charge storage device for altering the analog charge stored thereby in accordance with the charge generated in response to received light;

a plurality of amplifiers formed on the substrate and connected with the charge storage devices for selectively amplifying the stored analog charges; and

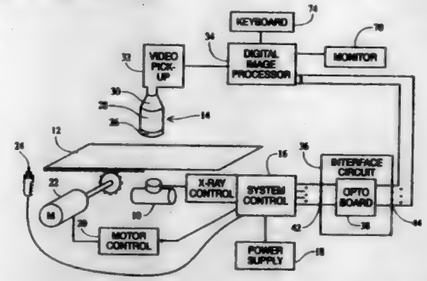
an analog to digital converter formed on the substrate and connected with the amplifiers for converting the amplified analog charges into digital values.

5,592,524

UNIVERSAL ELECTRICAL INTERFACE FOR DIGITAL SPOTFILM PRODUCT

Frank H. Roper, Richmond Heights, and Joseph J. Ferencic, Solon, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Sep. 25, 1995, Ser. No. 533,454
Int. Cl.[6] H05G *1/58*
U.S. Cl. 378—98.2 **10 Claims**



1. In a diagnostic imaging system which generates a plurality of first control signals for controlling an x-ray source and a formerly connected first imaging device, the improvement comprising:

a substitute second imaging device mounted in place of the former first imaging device for generating images from x-rays that have passed from the x-ray source through a subject;

an interface circuit including a plurality of dual function devices, each of the plurality of dual function devices having an input selectively connected to one of the plurality of data channels for intercepting the plurality of first control signals and each of the plurality of dual function devices having an output selectively connected to the second imaging device, the plurality of dual function devices (i) generating a plurality of second control signals based on the plurality of first control signals intercepted for operating the second imaging device, and (ii) electrically isolating the second imaging device and the diagnostic imaging system from each other.

5,592,525

METHOD FOR MAKING A ROTATING ANODE WITH AN INTEGRAL SHAFT

Gregory Reznikov, Akron; Peter Eloff, Cleveland Hts., both of Ohio, and Thomas Tiearney, Waukesha, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 30, 1994, Ser. No. 347,534
Int. Cl.[6] H01J *35/10*
U.S. Cl. 378—121 **3 Claims**

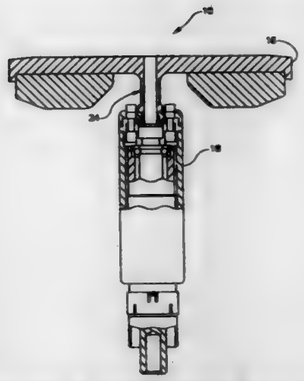
1. An X-ray tube comprising:

an anode assembly;

a cathode which emits electrons;

an anode target which radiates x-ray in response to bombardment by the electrons;

an anode stem;



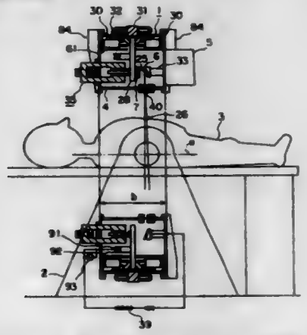
attachment means for integrally attaching the anode target to the anode stem to form an integral anode target and stem assembly.

5,592,526

ROTARY CATHODE X-RAY TUBE EQUIPMENT

Akihiro Daikoku; Shigekazu Sakabe; Masao Inoue, and Akinori Yamasaki, all of Hyogo, Japan, assignors to Shimadzu Corporation, Kyoto, and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of Japan

Division of Ser. No. 434,171, May 3, 1995, Pat. No. 5,481,585, which is a continuation of Ser. No. 79,913, Jun. 23, 1993, abandoned. This application Sep. 21, 1995, Ser. No. 531,872
Claims priority, application Japan, Sep. 18, 1992, 4-249255
Int. Cl.[6] H01J *35/04*
U.S. Cl. 378—132 **3 Claims**



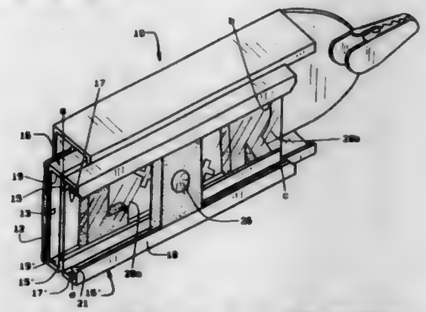
1. Rotary cathode X-ray tube equipment comprising:
a ring-shaped hollow vacuum vessel;
a ring-shaped anode target fixed within said vacuum vessel;
a ring-shaped rotary member rotatably disposed in an opposed relation to said anode target within said vacuum vessel;
at least one cathode portion attached to said rotary member on the side opposed to said anode target;
an X-ray radiation window for passing the X-ray generated at the anode target therethrough, said X-ray radiation window being mounted to said inner ring of said vacuum vessel;
a rotary driving mechanism including a linear induction motor having a rotor provided at a periphery of said ring-shaped rotary member; and
a stator provided on a side of the rotary member opposed to said rotor at the peripbery of said vacuum vessel.

5,592,527

IDENTIFICATION MARKER FOR X-RAY FILM WITH CARRYING CASE

Michael A. Ray, 3657 Rutger, St. Louis, Mo. 63110

Continuation-in-part of Ser. No. 438,539, May 10, 1995, abandoned, which is a continuation of Ser. No. 327,143, Oct. 21, 1994, abandoned, which is a continuation of Ser. No. 6,239, Jan. 19, 1993, abandoned. This application Jul. 19, 1995, Ser. No. 504,092
Int. Cl.[6] H05G *1/28*
U.S. Cl. 378—165 **31 Claims**



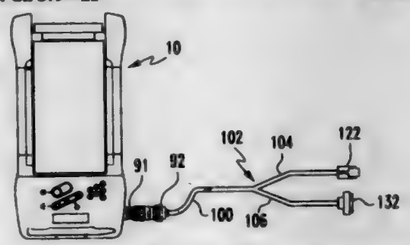
1. A self-contained film marker for x-ray films comprising
(a) a field defined by an elongated base which is transparent to an x-ray energy source used to expose an x-ray film sensitive to the x-ray energy source,
(b) a pair of juxtaposed channels positioned on the field,
(c) a pair of laterally spaced marking symbols positioned in one of the channels on the field, the symbols being opaque to the x-ray energy source used to expose the x-ray film,
(d) an x-ray energy opaque cover positioned in the second channel and movable therealong, the cover being of a size to allow shielding of one of the marker symbols, and
(e) a putty permanently bonded to the marker and attached to the x-ray film cassette during exposure to the x-ray radiation and detachable therefrom without leaving significant residue.

5,592,528

BATTERY CHARGING AND SIGNALLING INTERCONNECT ARRANGEMENT FOR CRAFTSPERSON'S PORTABLE SIGNAL PROCESSING AND COMMUNICATIONS UNIT

John R. Nelson, Leawood, Kans.; Gregory J. Pettit, Camarillo, Calif.; Tim G. Godfrey, Overland Park, Kans., and Wayne K. Wong, Camarillo, Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed Nov. 14, 1994, Ser. No. 339,906
Int. Cl.[6] H04M *1/24*; H04B *17/00*; H01H *31/04*;*31/02*
U.S. Cl. 379—21 **39 Claims**



1. A method of providing an electrical interface for a craftsperson's signal processing and communications craft unit through

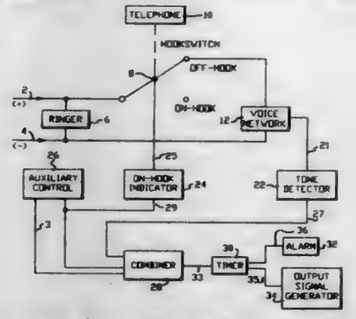
which a craftsperson, who may be dispatched to a service site that is remotely located with respect to a telephone facility serving a subscriber line, may conduct telephone and digital communication signalling with a test system of said telephone facility and with a test head that is connectable to said subscriber line, said craft unit having telephone signalling leads and communication signalling leads, said method comprising the steps of:
(a) mounting to said craft unit a multi-conductor sealed connector that is configured to prevent the entry of contaminants thereinto and into said craft unit; and
(b) interconnecting respective ones of either or both of said telephone signalling leads and said communication signalling leads to respective conductors of said multi-conductor sealed connector.

5,592,529

TELEPHONE INADVERTENT OFF-HOOK CONDITION DETECTOR

Ralph Linsker, Millwood, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1994, Ser. No. 314,999
Int. Cl.[6] H04M *1/24*;*3/22*;*3/00*;*1/00*
U.S. Cl. 379—32 **19 Claims**



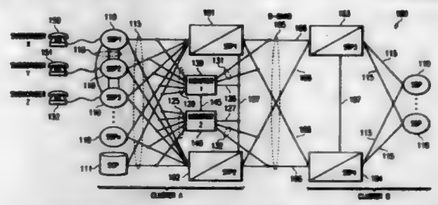
1. An apparatus for use with a telephone connected to a telephone system, said telephone of said telephone system having means for a user to generate a user generated reset signal, comprising:
said telephone having a hook status selected from a group consisting of on-hook and off-hook,
a detector, having means for coupling to said telephone, for detecting said user generated reset signal;
an indicator of said hook status having means for coupling to said telephone, for producing a hook signal;
a timer, having means for coupling to said telephone, said timer producing a timer signal if and only if said telephone is continuously off-hook for greater than an off-hook time and said user generated reset signal is not detected by said detector within a reset time;
an output signal generator coupled to said timer for producing an output signal;
an auxiliary control for providing said user generated reset signal;
an alarm coupled to said timer;
if said telephone is continuously off hook for greater than said off-hook time and said reset signal is not received within said reset time said telephone is determined to be inadvertently off-hook;
a re-hook means to place said telephone in an on-hook status;
an alert means coupled to said timer for generating an alert signal and wherein if said timer produces said timer signal, said alert means generates an alert signal;
combining means coupled to said detector, said indicator and said timer.

5,592,530

TELEPHONE SWITCH DUAL MONITORS

Pierce E. Breckman, Garland; John I. Ayers, and Gary S. Ruwaldt, both of Plano, all of Tex., assignors to Inet, Inc., Plano, Tex.

Filed Jan. 25, 1995, Ser. No. 377,978
Int. Cl.[6] H04M *1/24*; H04J *1/16*;*1/00*
U.S. Cl. 379—34 **23 Claims**



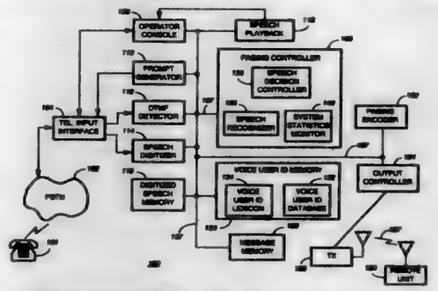
1. A monitoring system for use in a telephone system having at least one pair of switches operating in mated relationship to one another such that call control information pertaining to a communication link carrying voice and data signals between a calling party and a called party will always pass through one or both of said pair of switches, wherein said pair of switches are geographically separated from each other and said pair of switches are separate from a communication network over which said communication link is established, said monitoring system comprising:
a pair of processors each associated with a particular one of said pair of switches, each said processor operable for receiving and temporarily storing therein selected call control information as said call control information passes through said associated switch, said stored calling information identifiable for a particular calling party and for a particular call transaction, wherein each said processor compriaes means for storing all selected call control information for a particular call transaction in a unified list sorted by time of occurrence of said call control information; and
means for combining said unified lists for all stored selected call control information for a particular call transaction in one or the other of said processors.

5,592,531

SELECTIVE CALL COMMUNICATION SYSTEM HAVING ADAPTIVE VOICE DATA ENTRY

Yan M. Cheng, Lake Worth, and Lu Chang, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,288
Int. Cl.[6] H04Q *7/06*;*7/08*
U.S. Cl. 379—57 **7 Claims**



1. A selective call communication system comprising:
a database memory for storing a database associating a speech Voice User ID to a subscriber ID for one or more subscribers of the selective call communication system;

a lexicon memory for storing a lexicon including at least one speech Voice User ID that is associated with a subscriber ID for the one or more subscribers of the selective call communication system;

a monitor, coupled to the database memory and to the lexicon memory, for monitoring user system statistics for the selective call communication system and accumulating the user system statistics in the database, the monitor further defining the lexicon in the lexicon memory for including in the lexicon the at least one speech Voice User ID based on the accumulated user system statistics to determine a subset of the more active subscribers, rank ordering the one or more subscriber IDs according to the user system statistics, and grouping a set of the rank ordered one or more subscriber IDs to include at least one speech Voice User ID in the lexicon for voice data entry;

an input for receiving a voice data;

a controller, coupled to the input and to the lexicon memory,

for comparing the voice data to the at least one speech Voice User ID in the lexicon for determining a match between the voice data and one of the at least one speech Voice User ID of the lexicon,

for selecting a subscriber ID associated with a matching speech Voice User ID for the selective call communication system, and

for sending a selective call message to one or more recipient remote units corresponding to the selected subscriber ID; and

a system console coupled to the controller and in response to the controller determining that no match is found between the voice data and the at least one speech Voice User ID of the defined lexicon, the controller routing a call handling operation to the system console.

5,592,532

WIRELESS TELEPHONE SYSTEM WITH MESSAGE STORAGE FOR PLURAL TELEPHONES

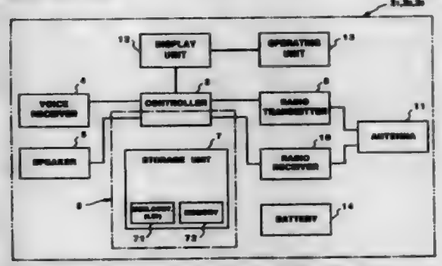
Shigeru Koinuma, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 866,193, Apr. 9, 1992, abandoned. This application Aug. 26, 1994, Ser. No. 296,972

Claims priority, application Japan, Apr. 12, 1991, 3-108437; Feb. 21, 1992, 4-035024

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—58 **44 Claims**



1. A wireless telephone system having a plurality of phones and a base unit which is connected to a telephone line and which communicates with said plurality of phones,

said base unit comprising first storage means for storing an outgoing message to be transmitted to the telephone line in response to an incoming call, reception means for receiving a selection signal sent from a calling party to select one of said plurality of phones, and transmission means for transmitting an incoming message from said telephone line to one of said plurality of phones selected by the selection signal so as to store the incoming message in the selected phone, and

each of said plurality of phones comprising second reception means for receiving the incoming message transmitted by said transmission means, second storage means for storing the incoming message received by said second reception means, and control means for controlling said second storage means to store the incoming message received by said second reception means.

5,592,533

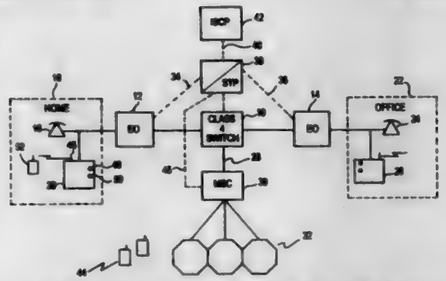
PERSONAL COMMUNICATION SERVICE REGISTRATION SYSTEM AND METHOD

James F. McHenry, Doylestown, Pa., and Robert D. Farris, Sterling, Va., assignors to Bell Atlantic Mobile Systems, Inc., Bedminster, N.J.

Continuation-in-part of Ser. No. 363,840, Dec. 23, 1994. This application Dec. 23, 1994, Ser. No. 363,835

Int. Cl.[6] H04Q *7/24*

U.S. Cl. 379—58 **26 Claims**



1. A registration system for routing a call to a subscriber to a personal telephone number service in an integrated wired and wireless communications network, comprising:

a central office switching system connected to communication lines connected to subscriber premise terminals including at least one service switching point for selectively providing switched communications between the communication lines;

a mobile switching center connected to the central office switching system arranged for selectively providing wireless communications between said central office switching system and wireless mobile communications units by using control data conveyed to at least one service switching point through a service transfer point;

a network controller arranged for selectively providing control data to effect land line communications, and arranged separately from the central office switching system and the mobile switching center, said network controller being connected to both said mobile switching center and at least one service switching point through at least one service transfer point arranged to convey control data to effect communications, said network controller storing preprogrammed call processing data associated with subscribers who are associated with the communication lines connected to consumer premise terminals connected to the central office switching system and said mobile switching center and who are also associated with a mobile communication unit, said network controller having additional storage capacity;

a first adjunct registration device which is portable associated with each of said subscribers, which registration device includes a low power transceiver programmed to respond to receipt of a predetermined wireless signal and transmit an identifying signal;

a second adjunct registration device associated with a consumer premise terminal located at a site where multiple persons gather, said second adjunct registration device including a low power transceiver programmed to periodically transmit a predetermined wireless signal associated with at least one of said first adjunct registration devices to cause said first registration device transceiver to respond and transmit its identity signal, said second adjunct registration device responsive to receiving said response causing the conveyance of a signal to at least one of said service switching points, whereby said service switching point originates a signal to said network controller to cause storage of registration of the subscriber identified by said identification signal.

5,592,534

RADIO COMMUNICATION SYSTEM HAVING A BASE UNIT CONTROL FOR ESTABLISHING WIRE-LINE CONNECTIONS FOR CALLS FROM MOBILE UNITS AND FOR DISPLAYING ANY WAIT STATUS FOR SUCH CALLS

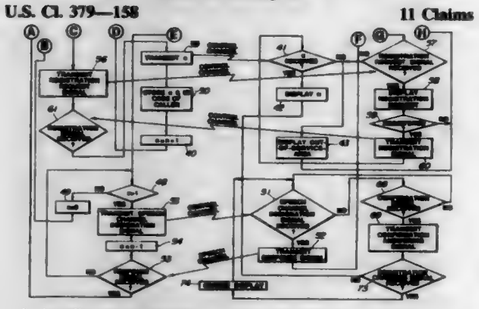
Koichi Ito, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 150,256, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 480,137, Feb. 14, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,757

Claims priority, application Japan, Feb. 17, 1989, 1-37787

Int. Cl.[6] H04Q *7/38*

U.S. Cl. 379—158 **11 Claims**



1. A radio communication system comprising:

a plurality of mobile units that are movable to any place, the mobile units having respective identification data; and

a base unit fixedly installed at a predetermined installation place, having a predetermined radio communication service area in the vicinity of the installation place and being connectable to a public telephone network through at least one public telephone line, the base unit being connectable through a radio channel to any one of the plurality of mobile units,

wherein the mobile units are connected via a radio channel to the base unit by issuing a calling request to the base unit within the radio communication service area of the base unit so as to communicate with the public telephone network through the public telephone line,

wherein the base unit comprises:

calling request receiving means for receiving a calling request when the calling request is issued from one of the mobile units within the radio communication service area of the base unit; and

connection control means for receiving a calling request when the calling request is issued from one of the mobile units within the radio communication service area of the base unit, the connection control means including registering means for, when said at least one public telephone line is idle, connecting said one mobile unit, which issued the calling request, to the public telephone network through the idle public telephone line, and for, when said at least one public telephone line is busy, registering identification data of said one mobile unit, which issued the calling request, as a mobile unit in a calling request wait state in the registering means and for transmitting wait data indicative of the wait state of calling request by said one mobile unit, and

wherein each of the mobile units comprises:

calling request transmitting means for transmitting a calling request to the base unit using a calling operation;

registration changing means for transmitting a registration confirming signal to mobile units registered in the registering means and, when a response signal to the registration confirming signal is not issued from one of the registered mobile units, erasing the registration of the one registered mobile unit which does not issue the response signal;

means for transmitting a changed registration signal indicative of a new registration content as changed by the registration changing means;

display means for displaying the wait state of calling requests upon receipt of the wait data from the base unit; and

display control means for displaying the changed registration content on the display in response to the reception of the changed registration signal,

wherein the connection control means responds to the registering means to establish a connection from a waiting mobile unit through the one public telephone line connected to the base unit, when the one public telephone line becomes idle upon disconnection of the one mobile unit through the base unit, and

wherein the wait data comprises numerical data, and the registration changing means subtracts one from the numerical data when erasing the registration of the one registered mobile unit, the changed registration signal transmitting means transmits the numerical data subtracted by one.

5,592,535

MOBILE-RADIO NETWORK WITH DEBIT ACCOUNTS

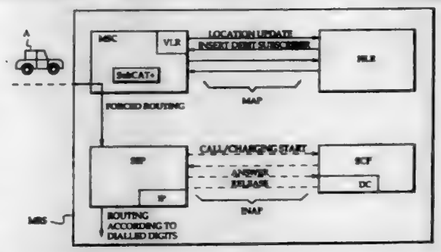
Bernhard Kletz, Stuttgart, Germany, assignor to Alcatel Sel Aktiengesellschaft, Stuttgart, Germany

Continuation of Ser. No. 228,568, Apr. 15, 1994, abandoned. This application Apr. 2, 1996, Ser. No. 630,727

Claims priority, application Germany, Apr. 16, 1993, 43 12 362.7

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 379—58 **13 Claims**



6. A method of establishing a connection and charging incoming calls in a mobile-radio network comprising a mobile switching center and network elements of an intelligent network, the network elements including a service switching point which is connected to or incorporated in the mobile switching center and a service control point which is connected to the service switching point, the method comprising the following steps:

storing in the service control point, for at least one respective mobile-radio subscriber, a debit account having a credit balance indicative of an amount of credit;

receiving incoming calls from mobile-radio subscribers at the mobile switching center;

selecting incoming calls that have a predetermined subscriber profile, the predetermined subscriber profile indicating that an incoming call is from a respective mobile-radio subscriber having a debit account;

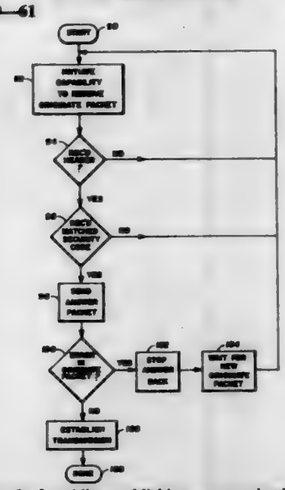
forwarding the selected calls to the service switching point;
accessing the debit account of the respective mobile-radio subscriber for each selected incoming call;
comparing the credit balance in the debit account of the respective mobile-radio subscriber to a predetermined minimum balance;
establishing a connection for a selected incoming call if the debit account of the respective mobile-radio subscriber shows a credit balance greater than the predetermined minimum balance;
once a connection is established, charging for the selected incoming call by consecutively deducting a predetermined unit fee from the debit account of the respective mobile radio subscriber; and
releasing the connection for the selected incoming call if the debit account of the respective mobile radio subscriber shows no credit balance.

5,592,536

APPARATUS AND METHOD FOR FAST INITIATION OF CONNECTION IN CORDLESS TELEPHONES

Walter E. Parkerson, Fayetteville, Ark., and Roger D. Forrester, Garland, Tex., assignors to TE Electronics, Inc., Fort Worth, Tex.

Continuation of Ser. No. 964,779, Oct. 22, 1992, abandoned. This application Oct. 12, 1995, Ser. No. 541,231
Int. Cl.[6] H04Q *7/32;7/30*
U.S. Cl. 379—61 **21 Claims**



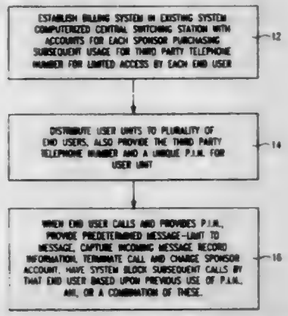
1. A method of rapidly establishing communication between a base station in a radio telephone system and on associated mobile unit comprising the steps of:
storing a communication originate packet comprised of a number of initial bits and a number of other bits in the base station;
storing a communication answer packet responsive to the originate packet in the mobile unit;
transmitting the originate packet to the mobile unit from the base station;
detecting the originate packet in the mobile unit;
transmitting the answer packet from the mobile unit to the base station upon receipt of the initial ones of the bits of the originate packet and without regard to receipt of the remaining other ones of the bits; and
establishing communications between the base station and the mobile unit in response to receipt by the base station of the answer packet.

5,592,537

METHOD OF PROVIDING MESSAGE SERVICE FOR LIMITED ACCESS TELECOMMUNICATIONS

Arthur J. Moen, 6 Goosetown Rd., Clinton, N.J. 08809-2603

Filed May 20, 1994, Ser. No. 247,037
Int. Cl.[6] H04M *15/00;1/56*
U.S. Cl. 379—67 **28 Claims**



1. A method of operating a telecommunication system for providing a message service to a plurality of end users, which comprises:
(a) in a telecommunication system having telecommunication lines with a telecommunication switching network and a computerized central switching station, establishing a billing system for sponsors and forming an account for each sponsor purchasing subsequent usage relating to one or more third party telephone numbers, said usage being based on a predetermined bulk rate for consumption of user telecommunication time over a preset time period;
(b) distributing a user unit to each user of a subset of said end users for providing to each of said end users for said subset said one third party telephone number and at least one personal identification number, said at least one personal identification number being unique to each said user unit;
(c) in said billing system, programming said computerized central switching station to permit a call of a preset message limit to be made by each of said end users of said subset to said one third party telephone number only upon receipt of said unique personal identification number; and,
(d) in response to one of said end users of said subset calling said one third party telephone number, providing a predetermined message to said one of said end users of said subset in accordance with said preset message limit, automatically terminating the call of said one of said end users of said subset, and charging an appropriate amount to said account of said sponsor.

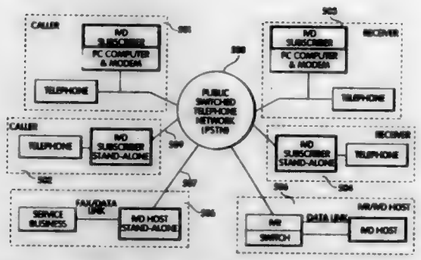
5,592,538

TELECOMMUNICATION DEVICE AND METHOD FOR INTERACTIVE VOICE AND DATA

Richard P. Kozlowsky, Boston, Mass.; Michael P. Santullo, Palo Alto, Calif., and Michael R. Kosowsky, Hancock, Me., assignors to Momentum, Inc., Boston, Mass.

Filed Mar. 10, 1993, Ser. No. 28,959
Int. Cl.[6] H04M *11/00;1/00*
U.S. Cl. 379—93 **39 Claims**

3. An interactive voice and data response IVD host system for communicating with a plurality of callers over a public switched telephone network (PSTN), the plurality of callers including at least one IVD subscriber system, the IVD host system alternately effecting voice communication and data communication with the at least one IVD subscriber system, the IVD host system comprising:
means for establishing a communication channel with a caller over the PSTN;
data communication means for establishing a full-duplex bidirectional data link over the communication channel, and for transferring data messages to and receiving data messages from the caller over the data link;
voice communication means for communicating voice messages with the caller over the .communication channel;
recognition means for recognizing whether the caller is the at least one IVD subscriber system;
means, coupled to the recognition means, for enabling the data communication means to transfer data messages to the caller when the caller is the at least one IVD subscriber system; and
means, coupled to the recognition means, for selecting an introductory message to be transferred to the caller so that the introductory message is a data message when the caller is the at least one IVD subscriber system and is a voice message when the caller is not the at least one IVD subscriber system.

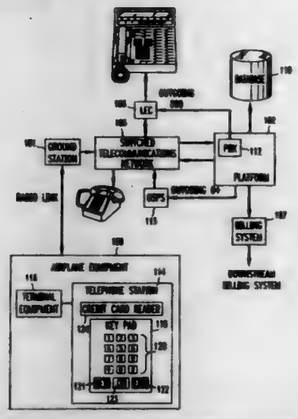


5,592,539

SYSTEM FOR COMPLETING AIR-TO-GROUND TELEPHONE CALLS

Brenda B. Amarant, South Orange; Erik N. Breden, Holmdel; Thomas A. Dunn, Edison; Michael W. Funk, Mountainside; Stephen M. Kocan, Fairfield, all of N.J.; Ilane L. Mathews, Pataskala, Ohio; Karl O'Connell, Bridgewater, and Mark C. Pollman, Old Bridge, both of N.J., assignors to AT&T, Holmdel, N.J.

Filed Dec. 30, 1993, Ser. No. 176,006
Int. Cl.[6] H04M *15/00;17/00*
U.S. Cl. 379—112 **6 Claims**



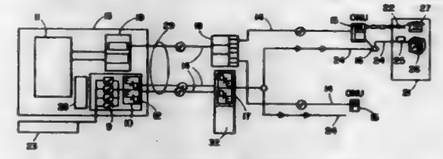
1. A system for completing air-to-ground telephone calls from a caller on an aircraft to a called party on the ground, said system comprising:
a special purpose platform disposed in the land-based telecommunications network,
means for routing all calls made from said aircraft to said platform, and
means in said platform for interacting with the caller, said platform including
(a) means for collecting billing information,
(b) means for validating said billing information in real time; and
(c) means responsive to said validation means, for completing the call as either a traditional 1+ long distance call, or as a 0+ operator assisted call.

5,592,540

METHOD AND APPARATUS FOR SELECTIVELY DELIVERING TELEPHONY SIGNALS ON A HYBRID COAXIAL CABLE NETWORK

Gregory J. Beveridge, Thornton, Colo., assignor to U S WEST Advanced Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 69,233, May 28, 1993, abandoned. This application Oct. 6, 1995, Ser. No. 540,365
Int. Cl.[6] H04N *7/10;7/14;* **H04M** *13/00;* **H04H** *1/00*
U.S. Cl. 379—184 **4 Claims**



1. A device for transmission of telephony signals in a downstream frequency range and an upstream frequency range on a bus based coaxial cable network including at least a first signal path and a second signal path to and from a subscriber location comprising:
an interdiction device connected to said coaxial cable network, said interdiction device including:
a jamming oscillator connected to said coaxial cable network;
an amplifier connected to said coaxial cable network;
a forward coupler connected to said coaxial cable network; and
a modulator/demodulator connected to said coaxial cable network;
whereby said interdiction device jams telephony signals in said downstream frequency range on said second signal path said amplifier and said forward coupler isolate telephony signals in said upstream frequency range on said first and second signal paths and said modulator/demodulator demodulates selected baseband telephony signals in the downstream frequency range on said first signal path and modulates baseband telephony signals in the upstream frequency range on said first signal path such that said baseband telephony signals to and from said subscriber location may not be monitored at another subscriber location on said bus based coaxial cable network.

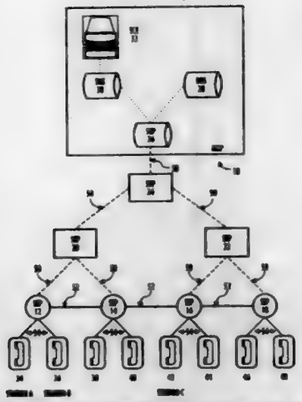
5,592,541

APPARATUS AND METHOD FOR FORWARDING INCOMING CALLS

Harold C. Fleischer, III; Michael W. Beeckman, and S. James Merlin, all of St. Louis, Mo., assignors to Southwestern Bell Technology Resources, Inc., St. Louis, Mo.

Filed May 31, 1995, Ser. No. 455,024
Int. Cl.[6] H04M *3/54;3/42*
U.S. Cl. 379—211 **33 Claims**

1. An intelligent call forwarding system for use in a communications network, said network comprising a plurality of communication lines extending between dispersed network locations, each of said locations being identified by a communication line number, and a plurality of service switching points for selectively interconnecting said communication lines in order to establish a communication connection between at least two of said locations, said communication connection being established in response to a service request by a caller located at one of said locations, said intelligent call forwarding system comprising:



a service control point comprising a routing list for storing a plurality of subscriber communication line numbers and at least one alternate routing option associated with each of said subscriber communication line numbers, and a group record for storing group numbers, each of said group numbers identifying predetermined groups of one or more subscriber communication line numbers and service logic associated with each of said group numbers, said service logic identifying said at least one alternate routing option for each of said groups; and

a signaling communications system for establishing two-way communication of data messages between said plurality of service switching points and said service control point, said signaling communications system comprising means for transmitting a query message from one of said plurality of service switching points to said service control point in response to said service request from said caller to establish communication with a subscriber, said query message including a communication line number of said caller and a dialed subscriber communication line number; and

said service control point further comprising means for accessing one of said group numbers and said associated service logic from said group record based on said dialed subscriber communication line number, means for retrieving said at least one alternate routing option from said routing list based on said one group number associated with said dialed subscriber communication line number and said service logic accessed by said accessing means, and means for instructing one of said service switching points, through said signaling communications system, to route the service request in accordance with said at least one alternate routing option retrieved by said retrieving means.

5,592,542

CALL DISTRIBUTION CONTROL METHOD AND CALL DISTRIBUTION CONTROL SYSTEM

Yosuke Honda; Motoharu Uzumi, and Syuich Tanaka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 114,684, Aug. 31, 1993, abandoned. This application Mar. 5, 1996, Ser. No. 610,848

Claims priority, application Japan, Feb. 2, 1993, 5-015297

Int. Cl.[6] H04M *3/00*; H04Q *3/64*

U.S. Cl. 379—265 **11 Claims**

1. A call distribution control method for terminating an incoming call from a trunk or another extension at a pilot extension in a private branch exchange and routing the incoming call from the pilot extension to an idle agent in an agent group, comprising the steps of:

assigning a predetermined priority level to each agent in a respective one of a plurality of agent groups wherein an incoming call is to be routed to an idle agent having the highest priority level;

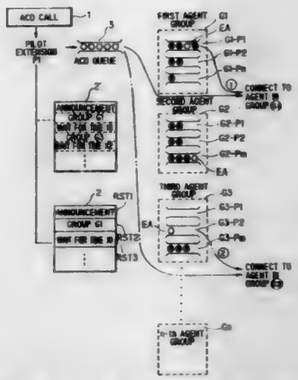
creating queues of the idle agents for each priority level in each agent group and storing said queues of the idle agents in a memory;

providing a routing table, in correspondence with the pilot extension, for designating an agent group to which an incoming call is to be routed;

designating an agent group based upon said routing table when an incoming call is terminated at the pilot extension;

searching for an idle agent having the highest priority level in said agent group that is the routing destination by reference to said queues of the idle agents for each priority level; and

routing the incoming call to the searched idle agent.



5,592,543

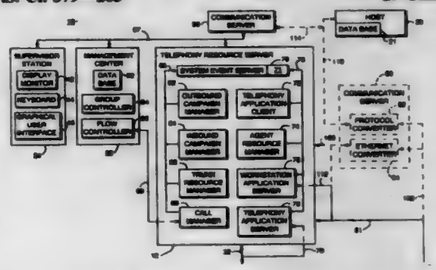
METHOD AND SYSTEM FOR ALLOCATING AGENT RESOURCES TO A TELEPHONE CALL CAMPAIGN

B. Scott Smith, Londonderry, and Gerry L. Pearson, Nashua, both of N.H., assignors to Davox Corporation, Westford, Mass.

Continuation of Ser. No. 252,121, Jun. 1, 1994, abandoned. This application Mar. 21, 1996, Ser. No. 619,164

Int. Cl.[6] H04M *3/00*

U.S. Cl. 379—265 **29 Claims**



1. A method for allocating an agent resource to an outbound telephone call campaign in a telephony system, for servicing a plurality of call records, said telephony system including an agent resource manager for allocating said agent resource to said outbound telephone call campaign, said method comprising the steps of:

providing a plurality of agent resources to be managed by said telephony system, each agent resource of said plurality of agent resources characterized by at least one agent attribute;

providing at least one outbound telephone call campaign to said telephony system, said outbound telephone call campaign including a plurality of call records, each of said plurality of call records including a telephone number to be dialed by said telephony system;

providing at least one system script to said at least one outbound telephone call campaign, for processing said at least one outbound telephone call campaign;

providing at least one agent resource request with said at least one system script, for requesting from said agent resource manager said at least one agent resource according to said at least one agent attribute;

said step of providing said at least one agent resource request further including the step of providing at least one agent parameter corresponding to said at least one agent attribute of said at least one agent resource to be requested; and

providing at least one agent resource including said at least one agent attribute to said at least one outbound telephone call campaign by said agent resource manager in response to said agent resource manager receiving said agent resource request including at least one agent parameter corresponding to said at least one agent attribute of said at least one agent resource.

5,592,544

DTMF SIGNAL JUDGING APPARATUS

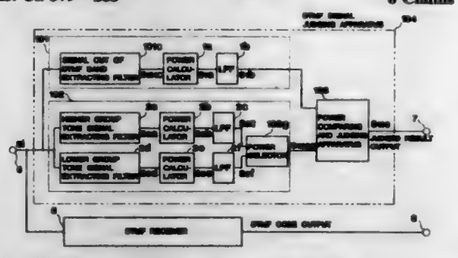
Yasumoto Murata, Nara-ken; Michio Ikeuchi; Shuichi Yoshikawa, both of Nara, and Masahiko Watanabe, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 384,613, Feb. 3, 1995, which is a continuation of Ser. No. 978,742, Nov. 19, 1992, abandoned. This application May 25, 1995, Ser. No. 451,049

Claims priority, application Japan, Nov. 19, 1991, 3-303402; Dec. 27, 1991, 3-347312; Jan. 27, 1992, 4-12275; Feb. 10, 1992, 4-24106

Int. Cl.[6] H04M *1/515*

U.S. Cl. 379—283 **6 Claims**



1. A DTMF signal judging apparatus comprising:

first means for calculating power of a signal in a certain frequency band of an input signal, the input signal having a frequency band which includes frequencies inside a DTMF detection frequency band and outside the DTMF detection frequency band;

second means for extracting a signal having a frequency in the DTMF detection frequency band from the input signal, and for calculating power of the extracted signal, the second means including,

a first filter for extracting a tone signal of a higher frequency group from the input signal;

a second calculator for calculating the power of the signal output from the first filter;

a second low-pass filter for passing a lower frequency signal of the signal output from the second calculator;

a second filter for extracting a tone signal of a lower frequency group from the input signal;

a third calculator for calculating the power of the signal output from the second filter;

a third low-pass filter for passing a lower frequency signal of the signal output from the third calculator;

a power adder for performing an operation for the signals output from the second and third low-pass filters; and

third means for performing an operation for the signals output from the first and second means, for comparing the operation result with a predetermined threshold value, and for outputting the compared result.

5,592,545

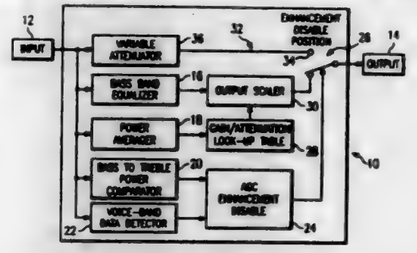
VOICE ENHANCEMENT SYSTEM AND METHOD

Helena S. Ho, San Jose, Calif.; Michael K. Pratt, Plano, Tex.; Pong C. Lim, Los Altos, and Thomas T. Oshidari, San Jose, both of Calif., assignors to DSC Communications Corporation, Plano, Tex.

Continuation of Ser. No. 161,120, Dec. 2, 1993, Pat. No. 5,471,527. This application Jun. 7, 1995, Ser. No. 484,677

Int. Cl.[6] H04M *7/00*

U.S. Cl. 379—347 **40 Claims**



1. A method for providing voice enhancement in a telecommunications network, comprising the steps of:

determining the average power of an input voice-band signal;

determining a scaling factor in response to the average power of the input voice-band signal;

equalizing the input voice-band signal by attenuating a predetermined portion of the input voice signal;

scaling the equalized input voice-band signal with the scaling factor;

coupling the scaled voice-band signal to an output; and

wherein said determining a scaling factor step further comprises the step of limiting the amount of change between consecutive scaling factors.

5,592,546

MEMORY DIALING CONTROL SYSTEM HAVING IMPROVED TELEPHONE NUMBER RETRIEVAL FUNCTION BY USING HISTORY INFORMATION

Kouichi Takahashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 210,234, Mar. 17, 1994, abandoned. This application Jan. 31, 1996, Ser. No. 594,384

Claims priority, application Japan, Sep. 20, 1993, 5-233106

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—355 **1 Claim**

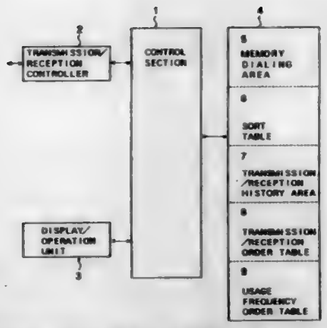
1. A memory dialing system comprising:

a first memory including a memory dialing area for registering a plurality of telephone numbers;

a second memory for storing history information indicating how used telephone numbers among said plurality of telephone numbers have been used in both call transmitting and call receiving;

displaying means for displaying said history information read out from said second memory so that an operator may retrieve a telephone number from among said plurality of telephone numbers by using said history information displayed thereby; and

control means interconnected between said first and second memory and said displaying means for controlling writing data into and reading data out from said memory dialing area,



controlling writing and storing history information into said second memory on each transmission/reception occasion and controlling a displaying of said registered telephone numbers on said displaying means so that said telephone number retrieved by the operator may be dialed by the operator, wherein:

said first memory is also controlled by said control means to register therein names and identification numbers respectively relevant to said plurality of telephone numbers so that said plurality of telephone numbers may be respectively retrieved by specifying the corresponding respective names:

said second memory comprises:

a sort table for storing said identification numbers in a predetermined order according to the first letters in the spellings of said names;

a history telephone-number table for storing said used telephone numbers in the order in which said used telephone numbers have been used;

a history identification-number table for storing used identification numbers among said registered identification numbers respectively relevant to said used telephone numbers in the order in which said used telephone numbers have been used; and

a frequency table for storing used identification numbers in an order according to the frequencies with which said used telephone numbers have been used.

5,592,547

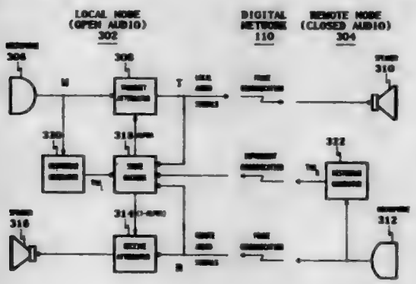
PROCESSING AUDIO SIGNALS USING A DISCRETE STATE MACHINE

Carol Wu, Beaverton, and Soo P. Ng, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 342,270, Nov. 16, 1994, which is a continuation-in-part of Ser. No. 340,172, Nov. 15, 1994, which is a continuation-in-part of Ser. No. 157,694, Nov. 24, 1993, Pat. No. 5,586,954. This application Dec. 20, 1994, Ser. No. 359,477

Int. Cl.[6] H04M *9/10*

U.S. Cl. 379—390 **24 Claims**



13. A computer-implemented process for processing audio signals, comprising the steps of:

(a) generating a level of transmit attenuation and a level of receive attenuation using a discrete state machine of a controller, wherein the discrete state machine comprises a no talking state, a single talk (local) state, a single talk (remote) state, and at least one double talk state;

(b) attenuating, with a transmit attenuator at the level of transmit attenuation, local audio signals generated with a local microphone for transmission to a remote node; and

(c) attenuating, with a receive attenuator at the level of receive attenuation, remote audio signals received from the remote node for playback at a local speaker.

5,592,548

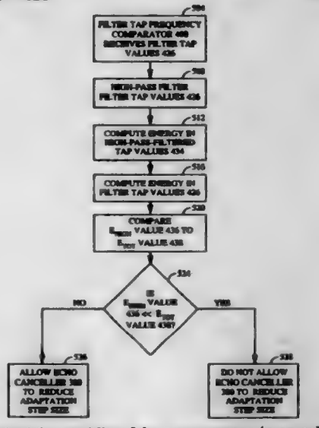
SYSTEM AND METHOD FOR AVOIDING FALSE CONVERGENCE IN THE PRESENCE OF TONES IN A TIME-DOMAIN ECHO CANCELLATION PROCESS

Gilbert C. Sih, San Diego, Calif., assignor to QUALCOMM Incorporated, San Diego, Calif.

Filed May 31, 1995, Ser. No. 455,801

Int. Cl.[6] H04B *3/23*; H04M *9/08*

U.S. Cl. 379—410 **22 Claims**



22. A method for avoiding false convergence in an echo canceller having an adaptive filter with an adaptation step size controlled to allow a set of filter tap values to converge to estimate a response of a channel over an operation frequency range, comprising the steps of:

determining a spectral content of said set of filter tap values; and

controlling said adaptation step size of said adaptive filter in response to said spectral content of said set of filter tap values.

5,592,549

METHOD AND APPARATUS FOR RETRIEVING SELECTED INFORMATION FROM A SECURE INFORMATION SOURCE

Robert Nagel, and Thomas H. Lipscomb, both of New York, N.Y., assignors to Infosafe Systems, Inc., New York, N.Y.

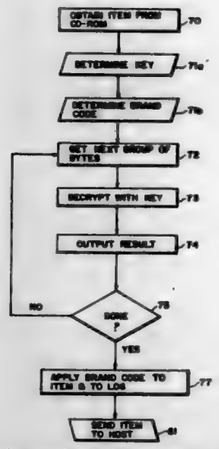
Filed Jun. 15, 1995, Ser. No. 491,531

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—4 **20 Claims**

1. In apparatus for retrieving information from a secure electronic information source, wherein at least some of said information is in encrypted form and are decrypted for use; and wherein said apparatus comprises:

(a) a control device for selecting information to be retrieved from said information source;



(b) an information retrieval device, coupled to said control device, for retrieving said selected information from said information source;

(c) a decryption device, coupled to said control device, for decrypting at least portions of said selected information retrieved from said information source; and

(d) a data logging device, coupled to said control device, for maintaining a data log of said selected information as it is retrieved from said information source and decrypted;

the improvement comprising the method steps of automatically electronically:

(1) adding a unique brand code to at least some of said selected and decrypted information; and

(2) adding said brand code to said data log in association with the identity of said selected and decrypted information;

whereby at least some of said selected and decrypted information includes a brand code.

5,592,550

VIDEO CASSETTES AND OTHER PRE-RECORDED MEDIA CARTRIDGES

Raymond L. Davis, and Michael J. Swift, both of West Midlands, United Kingdom, assignors to Shapecourt Limited, Birmingham, United Kingdom

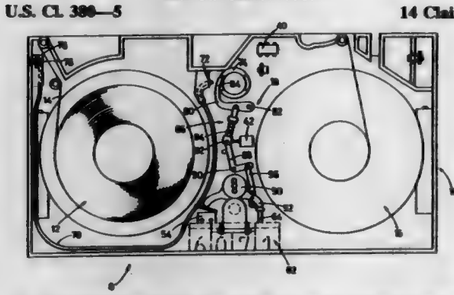
PCT No. PCT/GB93/01163, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO93/26010, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 1, 1993, Ser. No. 347,337

Claims priority, application United Kingdom, Jun. 5, 1992, 9211984

Int. Cl.[6] H04N *7/167*

U.S. Cl. 380—5 **14 Claims**



1. A cartridge assembly comprising a tamper-resistant housing containing a medium which has been pre-recorded in use, interfacing means whereby the cartridge will interact with compatible operating equipment for operations including replay of a recording carried by the medium, a timer operable to define a pre-set user period during which said operations of the assembly by use of said equipment can take place, and inhibiting means automatically activated outside said period at least at the end thereof to restrict said operations, characterised in that the inhibiting means includes transmitter means for radiating an electromagnetic inhibiting signal externally of the housing without affecting the pre-recorded medium itself, said signal interacting with an operating system of the compatible equipment in use.

5,592,551

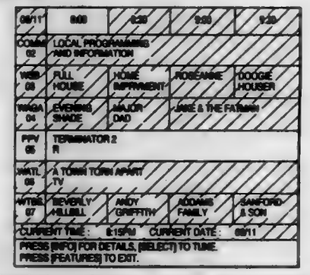
METHOD AND APPARATUS FOR PROVIDING INTERACTIVE ELECTRONIC PROGRAMMING GUIDE

David B. Lett, Duluth; William M. Raley, Jr., Lawrenceville, both of Ga., and Michael T. Hayashi, Aurora, Colo., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 983,910, Dec. 2, 1992, Pat. No. 5,367,571, Ser. No. 983,909, Dec. 11, 1992, abandoned, and Ser. No. 984,838, Dec. 1, 1992, Pat. No. 5,357,276. This application Apr. 19, 1994, Ser. No. 230,144

Int. Cl.[6] H04N *7/00;7/10;7/167*

U.S. Cl. 380—20 **48 Claims**



1. A subscription television system for supplying television signals to a plurality of subscribers, said subscription television system comprising:

an electronic programming guide listing a plurality of television programs by date, time and channel in a grid format, said plurality of television programs including at least one of a pay-per-view and a near-video-on-demand television program and another television program, said grid format having slots for identifying said television programs;

a first and a second transmitting means, said first transmitting means for transmitting the television signals comprising said plurality of television programs to said subscribers on a plurality of television channels, said first transmitting means also transmitting to said subscribers said electronic programming guide;

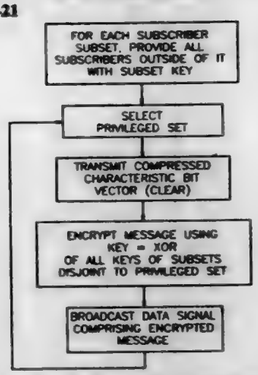
a subscriber terminal for receiving the television signals and providing the television signals to a user of said subscription television system, said subscriber terminal including:

means for displaying said electronic programming guide in said grid format and for providing a cursor to highlight said slots for identifying said television programs said cursor being activated by a remote control;

a first and a second selecting means, said first selecting means for directly selecting said television programs from said displayed programming guide by highlighting said television program slot, said first selecting means including means for directly purchasing after said user highlights said television slot said at least one of said pay-per-view or said near video-on-demand television program from said electronic programming guide by activating said highlighted television slot via said remote control; and

tuning means connected to said display means to tune to said highlighted television program.

5,592,552
BROADCAST ENCRYPTION
Amos Fiat, Tel Aviv, Israel, assignor to Algorithmic Research Ltd., Givat Shmuel, Israel
Filed Sep. 24, 1994, Ser. No. 295,207
Claims priority, application Israel, Aug. 25, 1993, 106796
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—21 20 Claims



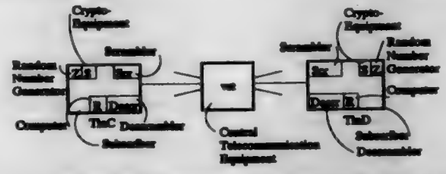
1. A selective broadcasting method operative to transmit a plurality of message data signals to a corresponding plurality of subscriber subsets within a set of subscribers, the method comprising:
receiving an indication of a privileged set comprising an individual subset; and
transmitting a message data signal from which a key can be extracted by members of the privileged set and cannot be extracted by any set of members outside the privileged set whose number of members is less than a predetermined resiliency,
wherein the length of the message data signal is less than the sum of lengths of the message data signals required if an individual message data signal is transmitted to each subscriber in the privileged set.

5,592,553
AUTHENTICATION SYSTEM USING ONE-TIME PASSWORDS
Richard H. Guski, Red Hook; Raymond C. Larson, Rhinebeck, both of N.Y.; Stephen M. Matyas, Jr.; Donald B. Johnson, both of Manassas, Va., and Don Coppersmith, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 99,784, Jul. 30, 1993, abandoned.
This application Feb. 8, 1996, Ser. No. 597,376
Int. Cl.[6] H04L 9/32
U.S. Cl. 380—23 31 Claims



1. In an authentication system, a method of generating a time-dependent password for presentation to an authenticator, comprising the steps of:
generating an authentication parameter as a function of time-dependent information using a predetermined first transformation having an inverse transformation, said time-dependent information being recoverable from said authentication parameter using said inverse transformation;
generating a time-dependent password comprising a character string from said authentication parameter using a predetermined second transformation having an inverse transformation, said authentication parameter being recoverable from said password using said inverse transformation; and
presenting said password to said authenticator.

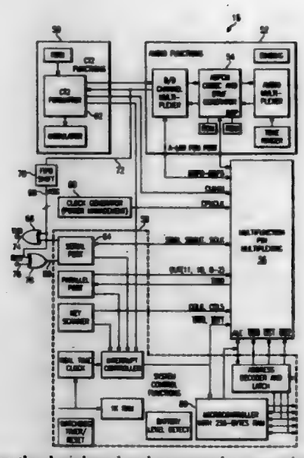
5,592,554
METHOD FOR DATA SECURITY IN A DIGITAL TELECOMMUNICATION SYSTEM
Karl-Heinz Moehrmann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed May 2, 1994, Ser. No. 235,985
Claims priority, application European Pat. Off., Jun. 30, 1993, 93110457
Int. Cl.[6] H04L 9/12;9/30
U.S. Cl. 380—48 9 Claims



1. A method for data security of signal transmission in a digital communication system having a plurality of subscriber equipment, comprising: calculating, during ongoing signal transmission, a public key from a secret key prescribed in a first subscriber equipment; communicating, during ongoing signal transmission, said public key from the first subscriber equipment to a second subscriber equipment participating in a connection with the first subscriber equipment, at said second subscriber equipment using the public key for encoding information for matching said first subscriber equipment to transmission modalities that are, during ongoing signal transmission repeatedly modified and that are provided in said second subscriber equipment for said first subscriber equipment.

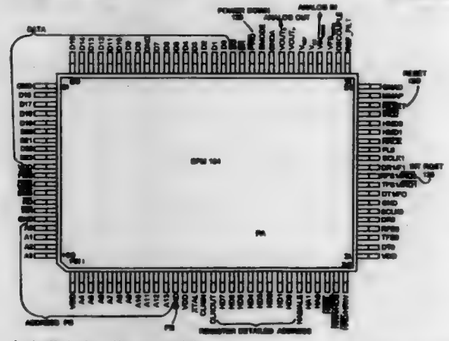
5,592,555
WIRELESS COMMUNICATIONS PRIVACY METHOD AND SYSTEM
Brett B. Stewart, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Apr. 12, 1994, Ser. No. 226,717
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—49 60 Claims

1. A method for privately communicating over a wireless communications network, comprising the steps of:
processing the communication signals in a first signal processing circuit within a first communications controller circuit at a first location to produce processed communication signals;
enciphering the processed communication signals in the first signal processing circuit at said first location to produce enciphered and processed communication signals;
transmitting the enciphered and processed communication signals between a first location and a second location using the first communications controller circuit at said first location;
receiving the enciphered and processed communication signals at the second location using a second communications controller circuit;
deciphering the enciphered and processed communication signals in a second signal processing circuit within the second communications controller circuit at said second location; and



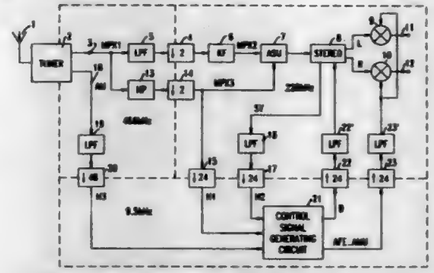
processing the deciphered and processed communication signals in the second signal processing circuit to produce communications signals at the second location.

5,592,556
DIGITAL RADIO WITH VOCODING ENCRYPTING CODEC
Daniel I. Schwed, Lynchburg, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.
Filed Aug. 9, 1994, Ser. No. 287,812
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—49 11 Claims



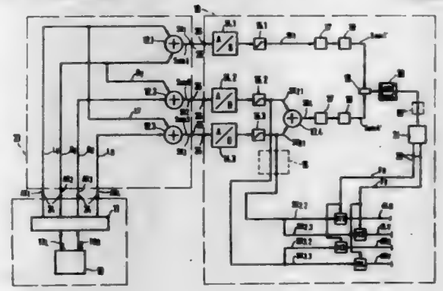
4. A digital radio comprising:
at least one audio destination requiring an output analog signal;
RF transceiving circuitry for transmitting RF signals over the air and for receiving RF signals transmitted over the air;
a control microprocessor connected to control said RF transceiving circuitry; and
a memory limited mixed signal speech processing chip coupled to said control microprocessor and to said input and output analog signals, said speech processing chip including an analog signal processor and a digital signal processor, said speech processing chip for:
(a) converting said input analog signal to a digital signal,
(b) compressing said digital signal,
(c) encrypting said digital signal; and
(d) synchronizing said steps (a)–(c) to process a stream of speech information in real time.

5,592,557
RADIO RECEIVER WITH DIGITAL SIGNAL PROCESSING
Djahanyar Chahabodi; Matthias Herrmann; Lothar Vogt, all of Hildesheim, and Juergen Kaemer, Dickholzen, all of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany
PCT No. PCT/DE94/00326, § 371 Date Feb. 16, 1995, § 102(e) Date Feb. 16, 1995, PCT Pub. No. WO94/22232, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 22, 1994, Ser. No. 343,414
Claims priority, application Germany, Mar. 24, 1993, 43 09 518.6
Int. Cl.[6] H04H 5/00
U.S. Cl. 381—10 12 Claims



1. A radio receiver with digital signal processing, comprising:
a tuner for receiving a stereo multiplex signal;
first processing means for processing the received stereo multiplex signal and signals derived therefrom in digital form at a first sampling rate;
sampling rate decreasing means for decreasing the sampling rate of the processed signals derived from the received stereo multiplex signal to a second sampling rate, thereby generating subsidiary signals;
second processing means for processing at least part of the subsidiary signals at the second sampling rate;
sampling rate increasing means for increasing the sampling rate of the processed subsidiary signals to the first sampling rate; and
control means for controlling the stereo multiplex signal and the signals derived therefrom with the processed subsidiary signals at the first sampling rate.

5,592,558
SOUND REPRODUCTION DEVICE
Friedbert Stahlfelner, Leibling, Germany, and Harri Valio, Tampere, Finland, assignors to Nokia Technology GmbH, Germany
Filed Sep. 15, 1995, Ser. No. 528,728
Claims priority, application Germany, Sep. 30, 1994, 44 35 224.7
Int. Cl.[6] H04R 5/00; H03G 3/00
U.S. Cl. 381—18 7 Claims



1. Sound reproduction device,

with an audio signal source (10) comprising two separate audio signal channels (TK_L, TK_R) for the stereophonic transmission of sound events,

with an adjustable fader control (11) to which the two audio signals (TK_L, TK_R) are routed, and in which the audio output signals (L, R) existing in the two audio signal channels (TK_L, TK_R) are divided into two audio signals (L_H, R_H or L_V, R_V) in two channels, and are routed to the output channels (AK_1 to AK_4), and

with a device (13) for the digital processing of audio signals, which follows the fader control (11) and has at least two audio-signal-suitable analog-to-digital (A/D) converters (14) available, each followed by a signal channel (SK), wherein

a first adder (12.1) is provided and connected to two output channels (AK_1, AK_2 or AK_3, AK_4), which conduct audio signals (L_H, R_H or L_V, R_V) intended for equal front or rear listening areas for providing a first summed signal (Sum 1) in a first signal channel (SK_1),

wherein a second and third adder (12.2, 12.3) is provided and each of these adders (12.2, 12.3) is connected to two respective output channels (AK_1, AK_3 or AK_2, AK_4), which conduct audio signals (L_H, R_H or L_V, R_V) intended for different front and rear listening areas, but which originate from equal audio signal channels (TK_L or TK_R) for providing second and third composite signals in respective second and third signal channels (SK_2, SK_3),

wherein each of the second and third composite signals (Sum 2 to Sum 3) from the respective second and third adder (12.2, 12.3) is routed to one of the audio- signal-suitable A/D converters (14.2, 14.3),

wherein each of the second and third signal channels (SK_2, SK_3) is divided into at least three parallel signal channels ($SK_{2.1-3}$ or $SK_{3.1-3}$),

wherein one multiplier of the four multipliers (M1–4) each is assigned to at least two of the respective three parallel signal channels ($SK_{2.2}$, $SK_{2.3}$, $SK_{3.2}$, $SK_{3.3}$),

wherein a fourth adder (12.4) is provided, to which the composite signals (Sum 2, Sum 3) formed in the adders (12.2/3) are routed, for providing a fourth summed signal (Sum 4) in a fourth signal channel (SK_4),

wherein the channels connected to the respective adders (12.1–3) include at least one averaging device (17) for determining an average level value,

wherein the respective averaging devices (17) for determining an average level value are followed by a smoothing device (18) in the channel,

wherein the first and fourth signal channels (SK_1, SK_4) are routed to a divider (20), which forms a quotient signal (Q) from the summed signals (Sum 1, Sum 4),

wherein a calculator (21) is provided, to which the quotient (Q) is supplied through a signal channel (SK_5) and in which two factors (F_V, F_H) are determined by means of the respective quotient and corresponding front and rear factor signals are provided,

wherein the front and rear factor signals are provided to separate pairs of the four multipliers (M1/3, M2/4) that are also responsive to signal channels ($SK_{2.2/3}$, $SK_{3.2/3}$), and

wherein at least one other not necessarily audio-signal-suitable A/D converter (14.1) is provided in the first channel between the first adder (12.1) and the multipliers (M1–4).

5,592,559

SPEAKER DRIVING CIRCUIT

Ryutaro Takahashi, and Toru Hayase, both of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

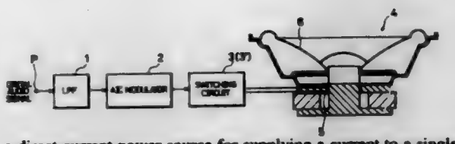
Filed Jul. 28, 1992, Ser. No. 920,888

Claims priority, application Japan, Aug. 2, 1991, 3-193982; Aug. 7, 1991, 3-197709; Jun. 12, 1992, 4-153630

Int. Cl.[6] H04R 3/00

U.S. Cl. 381—111 **8 Claims**

1. A speaker driving circuit, comprising:



a direct-current power source for supplying a current to a single voice coil speaker;

a delta sigma modulator for converting a multi-bit digital audio signal into a one-bit pulse density modulated signal having binary "0" or "1" information at a predetermined sampling frequency, said delta sigma modulator having a higher order feedback circuit.; and

an on-off switch directly responsive to said delta sigma modulator for switching at said predetermined sampling frequency the supply of the current from the power source to said single voice coil between on and off by directly controlling an output of said direct-current power source in accordance with the binary information from said delta sigma modulator, said coil being connected directly to said switch and said speaker functioning as an acoustic low-pass filter.

5,592,560

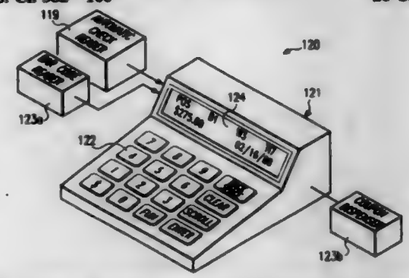
METHOD AND SYSTEM FOR BUILDING A DATABASE AND PERFORMING MARKETING BASED UPON PRIOR SHOPPING HISTORY

David W. Deaton, and Rodney G. Gabriel, both of Abilene, Tex., assignors to Credit Verification Corporation, Abilene, Tex.

Continuation of Ser. No. 177,690, Jan. 4, 1994, Pat. No. 5,388,165, which is a continuation of Ser. No. 16,991, Feb. 10, 1993, Pat. No. 5,327,508, which is a continuation of Ser. No. 886,385, May 19, 1992, Pat. No. 5,201,010, which is a continuation-in-part of Ser. No. 826,255, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 345,475, May 1, 1989, abandoned. This application Sep. 8, 1994, Ser. No. 303,631

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—100 **26 Claims**



1. A system for performing targeted marketing on customers in a retail establishment comprising:

a terminal for entering selected indicia from identification presented by customers at a point-of-sale in order to generate a unique identification code for each customer;

a reader for detecting the machine readable product code on products purchased by said customers;

a processor responsive to said terminal and said reader for creating a centralized database of a plurality of the store's customers' data relating to product codes of products previously purchased by said customers during previous customer visits in association with said customers' unique identification codes, including information regarding specific products previously infrequently purchased;

said processor generating a signal upon entry of unique identification codes of customers whose transactions meet predetermined infrequent product purchasing history criteria; and

circuitry responsive to said processor and said database for dispensing a sales promotion at the point-of-sale during a customer's checkout to said customers who meet said predetermined infrequent product purchasing history criteria, wherein said sales promotion is for a product previously infrequently purchased and is redeemable at a future visit such that said customers are incented to return to the retail establishment to purchase said previously infrequently purchased product in a future transaction.

5,592,561

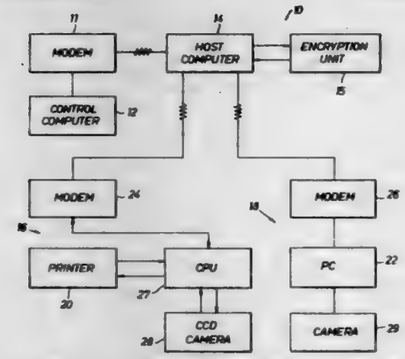
ANTI-COUNTERFEITING SYSTEM

Lewis J. Moore, 6225 Padget Parrish Ct., Charlotte, N.C. 28270

Continuation-in-part of Ser. No. 227,662, Apr. 14, 1994, abandoned. This application Apr. 11, 1995, Ser. No. 420,034

Int. Cl.[6] G06K 9/00; G09C 3/08

U.S. Cl. 382—103 **17 Claims**



1. A method of controlling the authentication and tracking of goods and locating counterfeit goods, the method comprising the steps of:

a) providing a control central processing unit to control and enable a host central processing unit by providing an allotment of prints to label an allotted number of goods to the host central processing unit;

b) enabling the host central processing unit to direct a printer central processing unit to print encoded symbols onto a line of goods;

c) scanning goods with at least one field reader to capture symbols imprinted thereon;

d) transferring the captured symbols to the host central processing unit;

e) comparing within the host central processing unit the captured symbols with a data base of encoded symbols; and

f) transmitting to the at least one field reader an indication of the result of the comparison.

5,592,562

INSPECTION SYSTEM FOR CROSS-SECTIONAL IMAGING

Stephen M. Rooks, Willowdale, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1994, Ser. No. 300,677

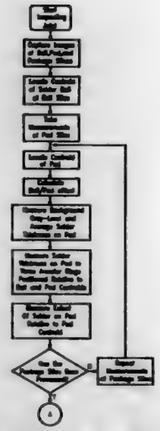
Claims priority, application Canada, Jan. 19, 1994, 2113752

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—150 **22 Claims**

1. A method of inspecting a solder joint of a ball-grid array comprising the steps of:

using cross-sectional images of said joint generated in planes intersecting said joint at ball, pad and package slices;



locating the centroid of the solder ball of said joint in said cross-sectional image taken at said ball slice; and

performing the steps of

a) measuring said joint at said pad slice;

locating the centroid of said pad;

determining the ball pad offset;

measuring image background gray level and average solder thickness in the region of said pad;

measuring solder thickness on said pad in a plurality of annular rings positioned relative to said ball and pad centroids;

measuring the extent of solder on said pad relative to the centroid of said pad;

b) measuring said joint at said package slice;

locating the centroid of said joint at said package slice;

determining the ball joint offset at said package slice;

measuring image background gray level and average solder thickness at said joint on said package;

measuring solder thickness on said package in a plurality of annular rings positioned relative to said ball and package centroids;

measuring the extent of solder at said package relative to the centroid of the joint at said package slice; and

c) comparing selected measurements to predetermined threshold valuations to identify a defective or acceptable joint.

5,592,563

IMAGING OF 3-DIMENSIONAL OBJECTS

Dov Zahavi, 12 Eilat Street, Haifa, Israel

Continuation of Ser. No. 17,858, Feb. 16, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,750

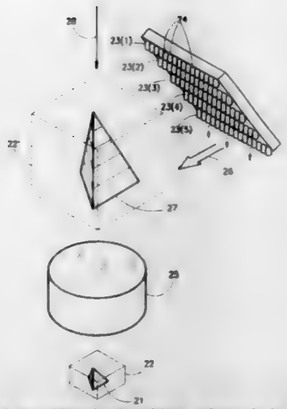
Int. Cl.[6] G06K 9/40

U.S. Cl. 382—154 **7 Claims**

1. A method for acquiring an image of a non-planar object which is in an object volume, and for processing the image to form a high resolution image, comprising:

forming an image of the object using an optical lens system having an optical axis pointing downwardly toward the object volume, said image being formed in an image volume above the optical lens system and focusing the non-planar object in the image volume;

providing a matrix above the optical lens system, the matrix comprising a plurality of spaced parallel linear arrays of photosensitive elements which each face downwardly parallel to the optical axis and toward the object, each array extending perpendicularly to the optical axis, the arrays being spaced from each other vertically in a direction parallel to the optical axis, and horizontally in a scan direction which is perpendicular to the optical axis and perpendicular to the extending direction of the arrays, so that the matrix is fitted and an entire



height of the object in the object volume is in focus in the image volume for at least one of the photosensitive elements in at least one of the arrays, each photosensitive element producing a subimage;

scanning the non-planar object by moving the optical lens system and matrix together in the scan direction and over the non-planar object while maintaining a constant height of each array as the arrays move through the image volume so that, during each instant of the scanning, the object is in focus for different ones of the photosensitive elements at specific heights above the object and in the image volume for forming an altitude contour of the object comprising a plurality of the subimages of the photosensitive elements during a period when each subimage was in focus; and

evaluating the subimages and integrating the subimages which were in focus during the scanning step to form a high resolution image of the non-planar object.

5,592,565

HAND-WRITTEN CHARACTER RECOGNITION APPARATUS WITH A PERSONAL DICTIONARY PREPARATION FUNCTION

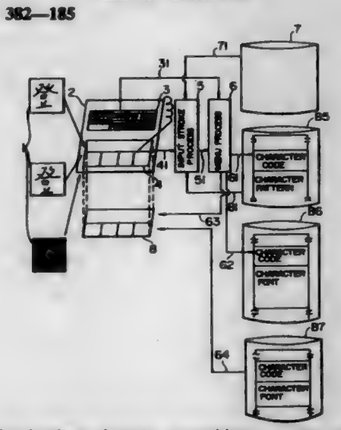
Hiroshi Shojima, Hitachi; Soshiro Kuzunuki, Katsuta; Yasushi Fukunaga, Hitachi; Toshihiko Matsuda, Owariasahi; Toshio Takekoshi, Ischara; Masaki Miura, Hitachi; Junko Mori, Hitachi, and Toshimi Mifune, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 969,720, Oct. 30, 1992, abandoned, which is a continuation of Ser. No. 219,265, Jul. 15, 1988, Pat. No. 5,191,622. This application Jul. 11, 1994, Ser. No. 267,847

Claims priority, application Japan, Jul. 17, 1987, 62-176981; Jul. 17, 1987, 62-176982; Aug. 12, 1987, 62-199815; Mar. 18, 1988, 63-63337

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—185 **1 Claim**



1. A hand-written character recognition apparatus with a personal dictionary preparation function, comprising:

input means for time serially inputting hand-written character data;

character recognition means for comparing the input hand-written character data from said input means to standard character patterns registered in a standard dictionary to recognize a similar character pattern;

a personal dictionary registering personal character patterns and corresponding character codes of these characters in pairs;

display means for selecting and displaying a display font corresponding to the recognized character pattern;

means, responsive to a character to be registered being inputted by hand-writing, for causing said character recognition means to compare inputted first hand-written character data of a personal character pattern to be registered to the standard character patterns registered in said standard dictionary to recognize a similar character pattern, and for selecting a code of the recognized standard character pattern as a character code of the character to be registered;

means for registering inputted second hand-written character data of a personal character pattern in said personal dictionary in corresponding relation to said selected code; and

means for calculating a similarity between said inputted second hand-written character data and personal character patterns registered in said personal dictionary, for calculating a stability index indicating a degree of stability of recognition of said inputted second hand-written character data and for transmitting said stability index to said display means, said inputted second hand-written character data being different from said inputted first hand-written character data.

5,592,564

PATTERN RECOGNITION METHOD USING FUZZY NEURON

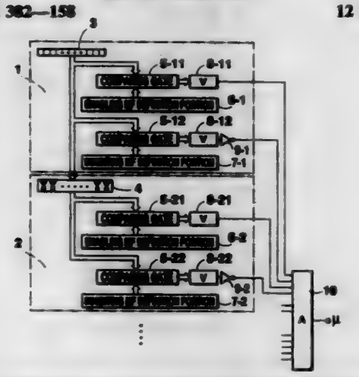
Fumiaki Shigeoka, and Masanari Oh, both of Fukuoka, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 160,274, Dec. 2, 1993, Pat. No. 5,434,930. This application Apr. 27, 1995, Ser. No. 429,634

Claims priority, application Japan, Jan. 29, 1993, 5-14185

Int. Cl.[6] G06K 9/62

U.S. Cl. 382—158 **12 Claims**



1. An alphanumeric character recognition method comprising:

a first step for representing a reference character having fuzziness and comprising a plurality of features by using a plurality of categories, each category representing at least one feature of the reference character;

a second step for inputting an input pattern;

a third step for producing an inverted input pattern by logically inverting said input pattern;

a fourth step for comparing said input pattern with any one of said plurality of categories to make a judgment whether said input pattern includes at least one of the plurality of features of said reference character;

a fifth step for comparing said inverted input pattern with any other one of the plurality of categories to make a judgment whether said input pattern is provided with at least another one of features of said reference character; and

a sixth step for evaluating the judgments in the fourth and fifth steps, and, if the evaluation indicates that said input pattern sufficiently matches said reference character, recognizing that the input pattern corresponds to the reference character.

5,592,566

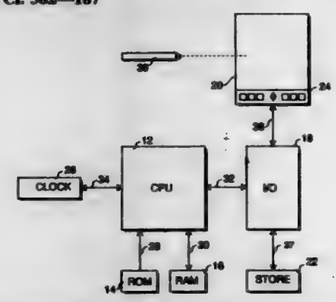
METHOD AND APPARATUS FOR COMPUTERIZED RECOGNITION

Giulio Pagallo, Cupertino; Ernest H. Beernink, San Carlos; Michael C. Tchao, Palo Alto, and Stephen P. Cappa, San Carlos, all of Calif., assignors to Apple Computer, Incorporated, Cupertino, Calif.

Continuation of Ser. No. 1,123, Jan. 5, 1993, which is a continuation-in-part of Ser. No. 889,216, May 27, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 456,554

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—187 **24 Claims**



1. A recognition system for a pen-based computer system having a stylus, a processing means capable of running an application program, and a display suitable for displaying an output directed by said application program, the recognition system comprising:

tablet means for inputting strokes from a stylus;

low level recognizer means responsive to said strokes inputted through said tablet means and operative to perform low level recognition on said strokes, including the recognition of a plurality of gestures, the low level recognizer means being capable of running on said processing means;

high level recognizer means independent of the low level recognizer means and responsive to stroke objects that are not recognized by said low level recognizer and operative to perform high level recognition on strokes that are not recognized by said low level recognizer, the high level recognizer means being capable of running on said processing means; and

a recognition interface permitting independent communication between said low level recognizer means and an application program, and permitting independent communication between said high level recognizer and said application program to permit the application program to utilize recognized information to direct the output to said display;

whereby processing efficiency is increased by permitting the low level recognizer to recognize certain stroke objects and not requiring stroke objects recognized by the low level recognizer to be handled by the high level recognizer and thereby avoiding at least some preprocessing that is required by the high level recognizer.

5,592,567

METHOD FOR DETECTING AND SEPARATING THE SHADOW OF MOVING OBJECTS IN A SEQUENCE OF DIGITAL IMAGES

Michael Kilger, Ergoldsbach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

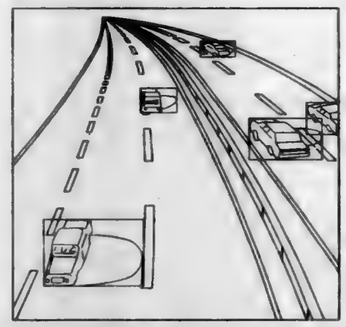
PCT No. PCT/DE93/01043, § 371 Date May 10, 1995, § 102(e) Date May 10, 1995, PCT Pub. No. WO94/11852, PCT Pub. Date May 26, 1994

PCT Filed Nov. 2, 1993, Ser. No. 416,838

Claims priority, application Germany, Nov. 10, 1992, 42 37 906.7

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—199 **6 Claims**



1. A method for detecting and separating shadow of moving objects in a sequence of digital images, comprising the steps of:

a) determining a sequence of background images from the sequence of digital images, said sequence of background images containing only the non-moving image background of the sequence of images but not the moving objects;

b) determining, for extracting object edges, in each case an edge gray-value image for each image of the sequence of digital images and for each respective corresponding background image of the sequence of background images;

c) determining, by means of vertical or horizontal projection of said edge gray-value images, corresponding vertical or horizontal edge histograms in each case for the edge gray-value images;

d) eliminating edges which do not belong to moving objects or shadows, in that edge histograms of a background image are subtracted from corresponding edge histograms of an image, at a common instant in time, of the sequence of digital images, thereby forming differential edge histograms;

e) subjecting the differential edge histograms to a threshold value discrimination, to eliminate those edges which do not correspond to actual moving objects but which do correspond to a shadow of a moving object.

5,592,568

WORD SPOTTING IN BITMAP IMAGES USING CONTEXT-SENSITIVE CHARACTER MODELS WITHOUT BASELINES

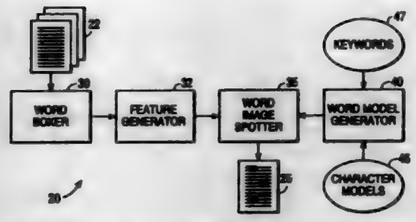
Lynn D. Wilcox, Portola Valley, and Francine R. Chen, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 991,911, Dec. 17, 1992, abandoned. This application Feb. 13, 1995, Ser. No. 387,958

Int. Cl.[6] G06K 9/68

U.S. Cl. 382—218 **18 Claims**

1. For use in a processor-based method of determining whether a keyword is present in a bitmap input image wherein the input image is subjected to an operation that determines bounding boxes for portions of the input image that potentially contain text and an operation that generates a sequence of features for each such portion of the input image, the text being considered to extend



horizontally, a method for modeling the appearance of keywords in the input image, the method comprising the steps of:

providing a set of previously-trained single-character hidden Markov models (HMMs);

concatenating those single-character HMMs that correspond to the characters in the keyword so as to define a keyword HMM; and

constructing an HMM network that includes the keyword HMM;

said providing step being characterized in that:

each character has a shape that is characterized at each of a plurality of horizontal locations along the character by at least one parameter representing a vertical slice of the character at the horizontal location,

each character has a number of distinct portions, the number being greater than 1 for at least some characters,

each distinct portion spans a respective contiguous subset of the plurality of horizontal locations,

a given single-character HMM for a given character is characterized by a number of states, each state of which corresponds to a respective one of the number of distinct portions of the given character,

each state is characterized by a statistical distribution of the at least one parameter for the corresponding distinct portion of the given character,

each single-character HMM has a number of possible contexts depending on whether the character has an ascender or descender,

for a given single-character HMM, a given state for a first context differs from the given state for a second context in a manner that reflects differences in at least one of (a) the size of the given character, and (b) the vertical position of the given character, such differences being between a situation when the given character is registered to a bounding box of a portion of the input image in the first context and a situation when the given character is registered to the bounding box of a portion of the input image in the second context, and

the single-character HMMs that are concatenated to form the keyword HMM have the same context.

5,592,569

METHOD FOR ENCODING AND DECODING IMAGES

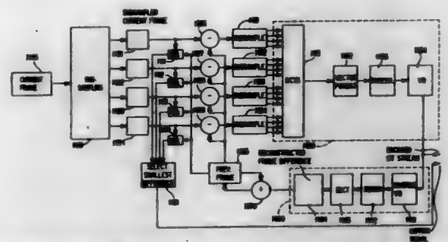
Weiping Li, Bethlehem, Pa., assignor to Competitive Technologies, Inc., Westport, Conn.

Continuation of Ser. No. 60,130, May 10, 1993, Pat. No. 5,436,985. This application May 11, 1995, Ser. No. 439,566

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—253 **8 Claims**

7. For use in a system for encoding and then decoding video signals, a method for decoding the video signals which were encoded by subsampling video signals to obtain, for each image represented by the video signals, a plural number of subsampled frames of spatially offset image-representative signals; transforming each of said subsampled frames to obtain a corresponding number of frames of transform coefficient-representative signals; forming vector-representative signals from corresponding coefficient-representative signals of the respective frames of coefficient-representative signals; and vector quantizing the vector-representative signals to obtain encoded signals; the decoding method comprising the steps of:



inverse vector quantizing the encoded signals, and demultiplexing the result thereof to obtain demultiplexed signals;

inverse transforming the demultiplexed signals to obtain image domain signals representative of subsampled spatially offset frames; and

combining the image domain signals to recover a decoded video image.

5,592,570

IMAGE PROCESSING METHOD

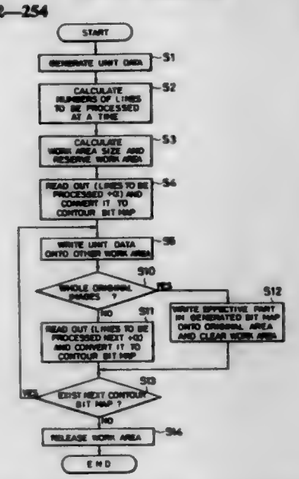
Hiroo Koyama, Kaisei-machi, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 136,987, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 875,218, Apr. 28, 1992, abandoned, which is a continuation of Ser. No. 671,314, Mar. 19, 1991, abandoned. This application Nov. 28, 1994, Ser. No. 348,956

Claims priority, application Japan, Mar. 23, 1990, 2-73943; Apr. 5, 1990, 2-91161

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—254 **12 Claims**



1. An image processing method for use in an image processing apparatus for thickening or shadowing an image, said method comprising the steps of: generating and storing in a memory unit data for one of thickening and shadowing, said unit data being representative of characteristics of a thickening or shadowing process; generating a contour image by copying a reverse image of said image in a first memory location to a second memory location, shifting said reverse image to the left or right by one bit pixel to produce a first image, performing a first logical sum (OR) between said first image and said reverse image to produce a second image, shifting said second image to the right or left by two bit pixels to produce a third image, performing a second logical sum (OR) between said second and third images to produce a fourth image, preforming a third logical sum (OR) between said fourth image shifted upward and downward by one bit pixel and said fourth image to produce a fifth image, performing a logical exclusive-OR between said fifth image and the image in the first memory location to produce a sixth image, reversing said sixth image to produce said contour image and copying, said contour image into the first memory location; applying said unit data to selected positions on said image corresponding to each contour picture element of said contour image in order to thicken or shadow said image; and outputting said thickened or shadowed image.

5,592,571

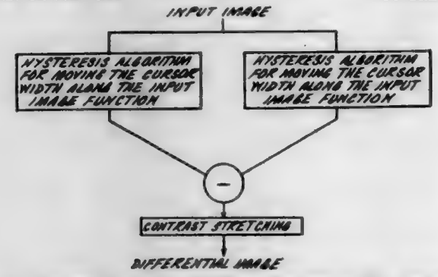
DIGITAL PIXEL-ACCURATE INTENSITY PROCESSING METHOD FOR IMAGE INFORMATION ENHANCEMENT

Klaus-Ruediger Peters, New Haven, Conn., assignor to The University of Connecticut, Storrs, Conn.

Filed Mar. 8, 1994, Ser. No. 207,489

Int. Cl.[6] G06T *5/50*

U.S. Cl. 382—261 **50 Claims**



1. A method of enhancing the detail information in a digitized image data array comprising a matrix of pixels including the steps of:

(a) generating first and second image data arrays;

(b) two dimensional hysteresis processing each pixel in said first image data array to produce a hysteresis processed image, said hysteresis processed image having spacial correlation maintained with said first image data array; and

(c) subtracting one of said first and second arrays from the other to define a differential image having a selected intensity range.

5,592,572

AUTOMATED PORTRAIT/LANDSCAPE MODE DETECTION ON A BINARY IMAGE

Daniel X. D. Le, Burke, Va., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Nov. 5, 1993, Ser. No. 147,798

Int. Cl.[6] G06K *9/36;9/46*

U.S. Cl. 382—289 **10 Claims**

1. A method for determining an orientation of a binary image, wherein the binary image is generated from a scan of a document, the method comprising the steps of:

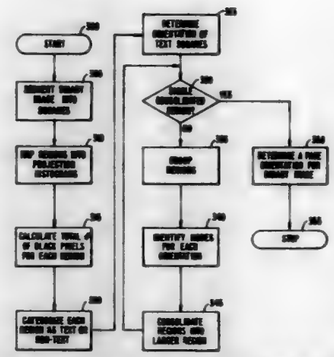
a) scanning the document to generate the binary image;

b) segmenting the binary image into a first plurality of regions, wherein bounds of regions in the first plurality of regions are independent of content of the binary images;

c) determining, for regions in the first plurality of regions, which of such regions are textual regions;

d) determining an orientation of at least each textual region of said first plurality of regions; and

e) grouping regions of said first plurality of regions into regions of a second plurality of regions;



f) determining, for regions in the second plurality of regions, which of such regions are textual regions;

g) determining an orientation of at least each textual region of the second plurality of regions; and

h) determining an orientation of the binary image from the orientations determined for the second plurality of regions.

5,592,573

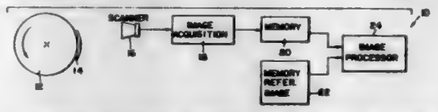
METHOD AND APPARATUS FOR DETERMINING MIS-REGISTRATION

Christoph Eisenbarth, El Granada; Ira Finkelstein, San Jose; Dennis McGhie, Portola Valley, and Edward Panofsky, Woodside, all of Calif., assignors to De La Rue Giori S.A., Lausanne, Switzerland

Continuation of Ser. No. 926,770, Aug. 6, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 320,570

Int. Cl.[6] G06K *9/32;9/68*

U.S. Cl. 382—294 **7 Claims**



1. An image processing apparatus for assuring valid registration of images comprising:

image acquisition means for acquiring data corresponding to an image, said image acquisition means including means for picking at least two local regions of a sample image, said local regions being spatially linked by a predetermined amount, each local region being represented as a two dimensional array of pixels;

storage means for storing at least two local regions of a reference image corresponding to said local regions of said sample image;

compiling means for compiling information from all of said local regions of said sample image and said reference image, said compiling means including summing means for summing data representative of a pixel from one sample array with data representative of a pixel from another sample array; and

analyzing means for anaylzing the compiled information to determined if said image is shifted from a nominal position, to thereby determine mis-registration of said sample image;

means for storing said summed array;

means for shifting said sample arrays; and

means for comparing a new summed array obtained from said shifted sample arrays to the stored summed array.

5,592,574

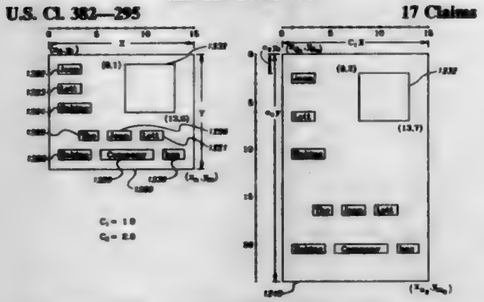
METHOD AND APPARATUS FOR EXPANSION OF WHITE SPACE IN DOCUMENT IMAGES ON A DIGITAL SCANNING DEVICE

Jeff K. Chilton; John F. Cullen, both of Mt. View, Calif., and Koichi Ejiri, Chiba-ken, Japan, assignors to Ricoh Company Ltd., Japan

Continuation of Ser. No. 28,676, Mar. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 864,432, Apr. 6, 1992, Pat. No. 5,335,290. This application Jan. 12, 1995, Ser. No. 371,678

Int. Cl.[6] G06K *9/32*

U.S. Cl. 382—295 **17 Claims**



1. A method for expanding whitespace in a document image having dimensions X, Y, comprising the steps of:

obtaining a digital representation of said document image;

identifying a set of rectangles that bound image data within the digital representation of said document image, said data including text and non text data, each of said rectangles having an original size; and

mapping said set of rectangles to an area C_1X by C_2Y, wherein C_1 and C_2 are not both equal to one; and

preserving said original size of each of said rectangles;

wherein an output document image having changed whitespace between said image data in said X and Y directions, and unaltered image data size is created, said output document image distorted from said original document image by said value C_1 along said X direction and by said value C_2 along said Y direction.

5,592,575

APPARATUS FOR RECORDING IMAGE SIGNAL CONTROLLABLE IN TWO MODES OF OPERATION

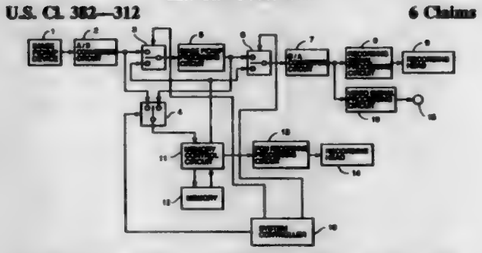
Saburo Nakazato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1993, Ser. No. 72,968

Claims priority, application Japan, Jun. 30, 1992, 4-196295

Int. Cl.[6] G06K *9/60*

U.S. Cl. 382—312 **6 Claims**



1. An image signal processor for processing an image signal corresponding to an object image, comprising:

an image pickup device having a plurality of sensor sites, each of which corresponds to one of a plurality of kind of color components different from one another, said plurality of sensor sites generating a plurality of pixel signals, each of which corresponds to one of the plurality of kinds of color components, by photoelectrically converting the object image;

pixel signal processing means for forming a brightness signal and a color signal by using the plurality of pixel signals generated by the plurality of sensor sites, and outputting the brightness signal and the color signal;

memory means for storing one of either (a) the plurality of pixel signals generated by the plurality of sensor sites without the intermediary of said pixel signal processing means or (b) the brightness signal and the color signal output from said pixel signal processing means;

supply means for supplying one of either (a) the plurality of pixel signals generated by the plurality of sensor sites directly or (b) the signals stored in said memory means to said pixel signal processing means;

selective output means for inputting one of either (a) the plurality of pixel signals generated by the plurality of sensor sites without the intermediary of said pixel signal processing means or (b) the brightness signal and the color signal output from said pixel signal processing means, and supplying to said memory means one of either the plurality of pixel signals or (b) the brightness signal and the color signal input by said selective output means;

output means for outputting to a signal utilization device the brightness signal and the color signal output from said pixel signal processing means; and

control means having a moving image outputting mode and a still image outputting mode, and controlling said supply means and said selective output means so that said supply means supplies the plurality of pixel signals generated by the plurality of sensor sites directly to said pixel signal processing means and said selective output means inputs the plurality of pixel signals generated by the plurality of sensor sites without the intermediary of said pixel signal processing means and supplies the input plurality of pixel signals to said memory means in the moving image outputting mode, while said supply means supplies the signals stored in said memory means to said pixel signal processing means and said selective output means inputs the brightness signal and the color signal output from said pixel signal processing means and supplies the input brightness signal and the input color signal to said memory means in the still image mode.

5,592,576

SCANNING APPARATUS HAVING A DOUBLE SIDE SCANNER AND METHOD FOR CONTROLLING THE SCANNER

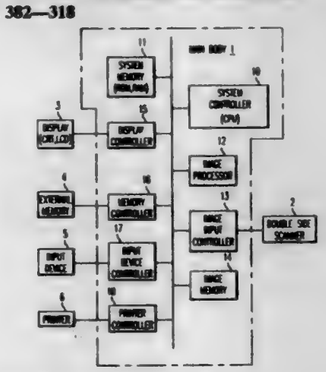
Masahiro Hayashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,267

Claims priority, application Japan, Dec. 20, 1993, 5-319351

Int. Cl.[6] G06K *9/00*; **G03B** *27/32*

U.S. Cl. 382—318 **23 Claims**



1. A scanning apparatus comprising:

a first scanner for scanning a first side of a sheet;

a second scanner, connected to the first scanner, for scanning a second side of said sheet;

an input device for inputting scanning parameters for said first side of said sheet;

a determining means, connected to the input device, for determining scanning parameters for said second side of said sheet using said scanning parameters for said first side of said sheet; and

a controller, connected to said first scanner and said second scanner, for controlling said first scanner and said second scanner using said scanning parameters for said first side of said sheet and said scanning parameters for said second side of said sheet,

wherein said scanning parameters for said first side of said sheet include at least one parameter selected from the group consisting of a monochrome binary specification, a half-tone specification, a scanning resolution, a compression specification, a length of said sheet, and a density specification.

5,592,577

OPTICAL TRANSMISSION LINE ENABLING DEFINITION OF A FAULT POINT AND A METHOD FOR DEFINING THE FAULT POINT

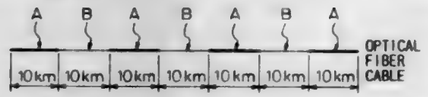
Toshiyuki Tanoue, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 18, 1995, Ser. No. 516,753

Claims priority, application Japan, Oct. 21, 1994, 6-256612

Int. Cl.[6] G02B *6/00*; **G01N** *21/00*

U.S. Cl. 385—12 **18 Claims**



1. A method for defining a fault point in an optical transmission line, comprising the steps of:

providing an optical transmission line including a plurality of optical fiber units connected in series in the longitudinal direction, each optical fiber unit being of a predetermined length and having fiber parameters different from adjacent fiber units;

inputting pulsed light to one end of said optical transmission line;

detecting change of an intensity of reflected light, said change being caused by change in the power of back-scattered light based on the difference in the fiber parameters;

obtaining a curve of a relationship between the change in the intensity and distance scales of said optical transmission line, and representing the relationship on the curve;

detecting discontinuous points in the intensity on the curve, said discontinuous points resulting from connections between adjacent fiber units; and

using each of said discontinuous points as a distance marker to measure a distance from the end of said optical transmission line to a fault point occurring on said transmission line.

9. An optical transmission line, having a length L between ends, for enabling definition of a fault point located between said ends, comprising:

a plurality of optical fiber units including fibers, said fiber units being connected in series in the longitudinal direction between said ends; and

each of said optical fiber units having a respective predetermined length less than L and fiber parameters different from adjacent fiber units,

connections between adjacent fiber units producing discontinuous points of intensity on an ODTR trace, said discontinuous points being suitable as markers of known distances on said trace.

5,592,578

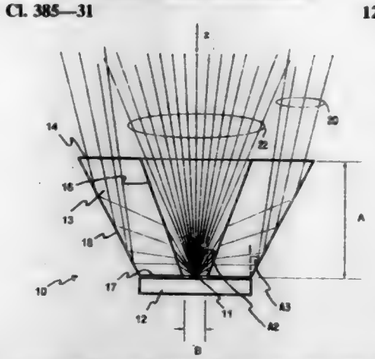
PERIPHERAL OPTICAL ELEMENT FOR REDIRECTING LIGHT FROM AN LED

Richard A. Ruh, Monte Sereno, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 1, 1995, Ser. No. 548,309

Int. Cl.[6] G02B *6/00;6/26;6/42*

U.S. Cl. 385—31 **12 Claims**



1. A peripheral optical element for redirecting dispersed light into a predetermined viewing angle relative to an optical axis, the peripheral optical element comprising:

a pair of coplanar base surfaces each having an inside and an outside edge, perpendicular to the optical axis, offset from the optical axis;

a pair of refracting surfaces, each refracting surface adjacent to the inside edge of each base surface and at a first acute angle to the optical axis;

a pair of reflecting surfaces, each reflecting surface adjacent to the outside edge of each base surface, and at a second acute angle to the optical axis wherein the second acute angle is greater than the first acute angle; and

a pair of exiting surfaces adjacent to the reflecting and refracting surfaces.

5,592,579

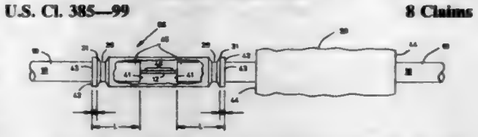
FIBER OPTIC CABLE SPLICE AND METHOD FOR PRODUCING SAME

Steven J. Cowen, San Diego, and James H. Dombrowski, Carlsbad, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 448,000, May 23, 1995, abandoned. This application Jun. 5, 1996, Ser. No. 658,769

Int. Cl.[6] G02B *6/255*

U.S. Cl. 385—99 **8 Claims**



1. A method for splicing fiber optic cable, comprising the steps of:

positioning a malleable metal tube having first and second chamfered inside rims around a first resinous outer sheath of a first fiber optic cable having a first optical fiber;

fusing said first optical fiber to a second optical fiber of a second fiber optic cable having a second resinous outer sheath to form a fused region;

crimping said malleable metal tube to said first and second resinous outer sheaths; and

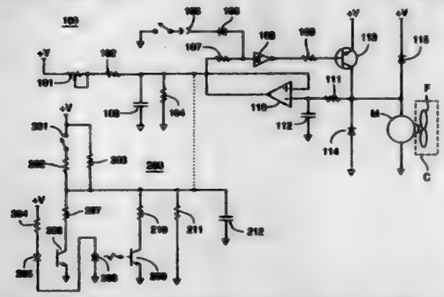
bending said malleable metal tube into an arc.

5,592,580

SYSTEM FOR CONTROLLING ENERGY OUTPUT OF COMBUSTION-POWERED, FASTENER-DRIVING TOOL

James E. Doherty, Barrington; Stanley C. Vesnikas, Wheeling, and Ernest J. Wendling, Algonquin, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Nov. 10, 1994, Ser. No. 337,289
Int. Cl.[6] B02P 5/00
U.S. Cl. 388—815 20 Claims



1. In combination, a combustion-powered, fastener-driving tool exhibiting an energy output, and a system for controlling said energy output of said tool, comprising:

a combustion chamber defined within said combustion-powered, fastener-driving tool;

fan means disposed within said combustion chamber of said tool for producing turbulence within said combustion chamber of said tool when said fan means is driven;

motor means for driving said fan means when a driving voltage is applied across said motor means;

battery means for providing said driving voltage to said motor means; and

circuit means, for controlling said energy output of said tool by controlling the speed of said fan means, comprising first means for providing a setpoint voltage, and second means, including a comparator, for sampling a voltage proportional to said speed of said fan means, comparing said sampled voltage to said setpoint voltage, and selectively applying said driving voltage across said motor means if said sampled voltage is less than said setpoint voltage and terminating said driving voltage to said motor means if said sampled voltage is not less than said setpoint voltage.

5,592,581

HEAT TREATMENT APPARATUS

Wataru Okase, Sagamihara, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Tokyo-To, and Tokyo Electron Tohoku Kabushiki, Iwate-Ken, both of Japan

Filed Jul. 18, 1994, Ser. No. 276,848
Claims priority, application Japan, Jul. 19, 1993, 5-198807; Dec. 28, 1993, 5-351399
Int. Cl.[6] H01L 21/02; F27D 11/02
U.S. Cl. 392—418 22 Claims

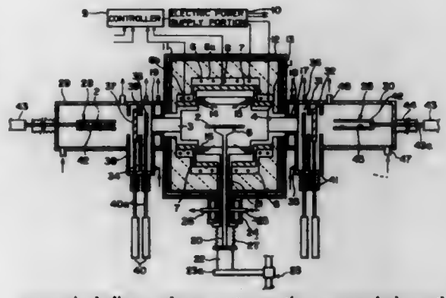
1. A heat treatment apparatus comprising:

a treatment chamber for heat-treating a workpiece arranged therein;

means for transferring the workpiece into said treatment chamber, and transferring the heat-treated workpiece from said treatment chamber to the outside thereof;

means for holding the workpiece transferred into said chamber;

a first heat generating source arranged above the workpiece and said heat treatment apparatus having a heat equalizing member provided between the workpiece and the first heat generating source, so as to heat the workpiece held in said chamber to the predetermined temperature, said first heat generating



source including a planar center portion arranged above the workpiece, a planar peripheral portion arranged radially externally and above the workpiece, and a step portion formed between the center and peripheral portions, and said peripheral portion is arranged in parallel with the center portion; and

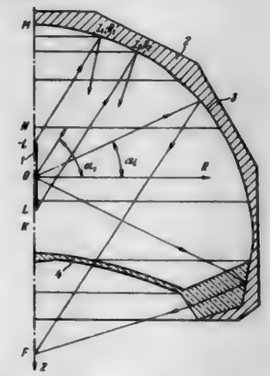
means for controlling the temperature of said first heat generating source so that the center and peripheral portions are independently controlled to respective predetermined temperatures by said controlling means.

5,592,582

BEAM MACHINING DEVICE WITH HEATING LAMP AND SEGMENTED REFLECTOR SURFACE

Mikhail I. Oparin; Mikhail T. Borisov, and Georgy M. Alexeev, all of Moscow, Russian Federation, assignors to Nauchno-Proizvodstvennya Firma "Adonia", and Nauchno-Proizvodstvennya Firma "MGM", both of Vidnoe, Russian Federation

PCT No. PCT/RU93/00158, § 371 Date Feb. 16, 1995, § 102(e) Date Feb. 16, 1995, PCT Pub. No. WO94/24586, PCT Pub. Date Oct. 27, 1994
PCT Filed Jul. 6, 1993, Ser. No. 351,299
Claims priority, application Russian Federation, Mar. 30, 1993, 93016356
Int. Cl.[6] G02B 5/10; F21V 7/09
U.S. Cl. 392—421 2 Claims



1. A beam machining device comprising an extended radiation source and a concentrating reflector with a reflecting surface in the form of a surface of revolution whose generatrix in made up of several successively-joined segments characterized in that the shape of the reflector generating surface for any segment except the one adjoining the apex as well as boundaries between the joined segments are defined by a system of equations:

$$\begin{cases} \dfrac{dR}{dZ} = tg\,\dfrac{1}{2}\left(-\alpha_i + \operatorname{arctg}\dfrac{F-z}{R}\right), \\ \alpha_i = \operatorname{arctg}\dfrac{z_i + L}{R_i}, \\ \dfrac{z_{i+1} - L}{R_{i+1}} = tg\,\alpha_i, \end{cases}$$

where R, z—radial and axial coordinates of the surface profile of reflector's i-th segment in the cylindrical system of coordinates with its center in the middle of the linear radiation source 2L long; R_i, z_i—coordinates of the joining points of adjacent segments of reflector profile designated by numbers i–1 and i (i=1, 2, 3, . . .); F—axial coordinate of the radiation focusing point; the initial segment of the reflector profile from its apex to the point of the profile R_1, z_1 is made in the form of a segment of the curve of 2nd order with a curvature radius ρ satisfying the condition:

$$L-M<\rho<-2\,(L+M),$$

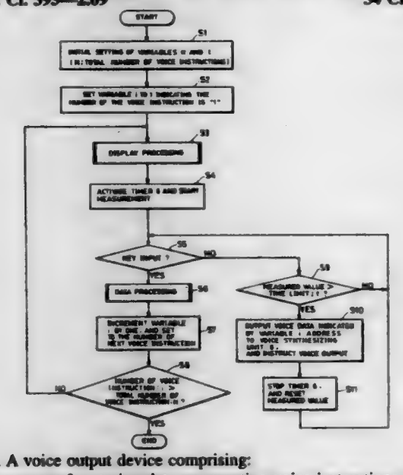
where M—axial coordinate of reflector apex.

5,592,583

VOICE OUTPUT DEVICE FOR OUTPUTTING VOCAL INSTRUCTIONS WHEN THE WAITING TIME FOR A KEY INPUT OPERATION EXCEEDS A SET TIME LIMIT

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 815,884, Jan. 7, 1992, abandoned, which is a continuation of Ser. No. 350,445, May 11, 1989, abandoned. This application Jul. 9, 1993, Ser. No. 88,110
Claims priority, application Japan, May 12, 1988, 63-113563
Int. Cl.[6] G01L 1/06; G06F 15/00; G10L 5/02;9/00
U.S. Cl. 395—2.09 34 Claims



1. A voice output device comprising:

a memory for storing data representing voice instructions relating to a sequ .nce of key input operations;

means for storing data representing a plurality of time limits associated with the voice instructions;

means for setting a plurality of time limits associated with the voice instructions and for storing data representing the set time limits in said storing means;

a timer for measuring a waiting time for a next key input operation of the sequence of key input operations;

detection means for detecting whether the waiting time measured by said timer surpasses a stored time limit associated with a particular voice instruction; and

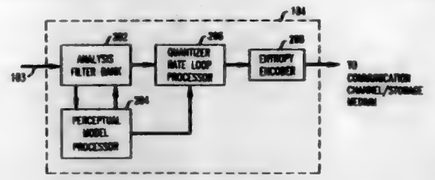
voice output means for outputting the particular voice instruction relating to the next key input operation in response to a detection by said detection means that the waiting time for the next key input operation surpasses the time limit associated with the particular voice instruction.

5,592,584

METHOD AND APPARATUS FOR TWO-COMPONENT SIGNAL COMPRESSION

Anibal J. Ferreira, Penafiel, Portugal, and James D. Johnston, Warren, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 844,819, Mar. 2, 1992, abandoned.
This application Nov. 4, 1994, Ser. No. 334,889
Int. Cl.[6] G10L 9/00;3/02
U.S. Cl. 395—2.12 6 Claims



1. A method of processing an audio signal comprising the steps of:

digitizing said audio signal to form blocks of samples thereof,

processing the samples of each of said blocks to form a first Fourier transform representation thereof,

generating in response to said first Fourier transform representation of each said blocks both a) a signal representing a second Fourier transform representation of said first Fourier transform representation, and b) a set of perceptual thresholds, there being a one-to-one correspondence between at least individual elements of said perceptual thresholds and at least individual elements of said second Fourier transform representation, said second Fourier transform being generated in serial response to the formation of said first Fourier transform, and

quantizing each of said individual elements of said second Fourier transform representation using a quantization step size that is a function of the corresponding perceptual thresholds.

5,592,585

METHOD FOR ELECTRONICALLY GENERATING A SPOKEN MESSAGE

Bert Van Coile, Sint-Michiels; Stefaan Willems, Sint-Andries, and Steven Leys, Drongen, all of Belgium, assignors to Lernout & Hauspie Speech Products N.C., Belgium

Filed Jan. 26, 1995, Ser. No. 379,330
Int. Cl.[6] G10L 3/02;9/00
U.S. Cl. 395—2.15 29 Claims

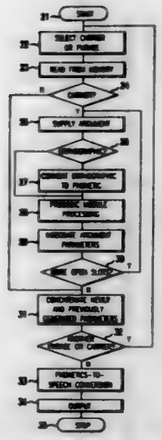
1. An improved method for generating a spoken message of the type formed by (i) first recording speech and (ii) then utilizing the recording so as to obtain at least one carrier, each carrier having at least one fixed part and at least one open slot, and then (iii) inserting an argument into each open slot, wherein the improvement comprises:

a) applying a prosody transplantation technique to the recording in order to obtain a sequence of phonetico-prosodic parameters for each carrier;

b) identifying in each sequence sections of phonetico-prosodic parameters corresponding to the argument of each open slot;

c) substituting each of the sections by open slot data comprising at least position information indicating the position of each open slot;

d) assigning to each thus obtained sequence an identifier; and



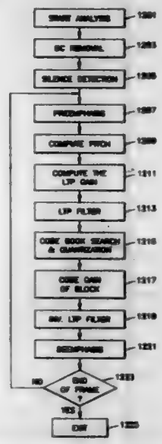
e) storing the thus obtained sequences with their identifiers in memory.

5,592,586

VOICE COMPRESSION SYSTEM AND METHOD

Sidhartha Maitra; Ashish Thanawala, and Steve Young, all of Saratoga, Calif., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.

Division of Ser. No. 2,467, Jan. 8, 1993, Pat. No. 5,452,289. This application Aug. 11, 1994, Ser. No. 289,297
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.29 **2 Claims**



1. A system for performing voice compression, comprising:

voice interface means including a voice input device for receiving analog voice signals from a user;

conversion means for converting the analog voice signals into discrete samples of digital voice data and collecting the discrete samples into segments;

means for dividing the segments into subsegments and for producing therefrom a current voice subsegment;

pitch prediction means for determining the long term predicted gain of the current voice subsegment by comparing the current voice subsegment to reconstructed voice samples to produce a pitch predictor gain and a lag component;

pitch filter means for pitch filtering the current voice subsegment based on the pitch predictor gain and the lag component and for producing therefrom long term residual samples;

means for determining the peak amplitude of the long term residual samples;

means for scaling the long term residual samples based on the peak amplitude to produce normalized long term residual samples;

means including a code book stored in a memory for comparing the normalized long term residual samples to stored distinct normalized long term residual samples stored in the memory and for locating a single memory address of a closest match between the normalized long term residual samples and the stored distinct normalized long term residual samples;

means for producing normalized reconstructed long term residual samples from the stored distinct normalized long term residual samples at the single memory address of the closest match;

means for producing a reconstructed long term residual samples from the normalized reconstructed long term residually samples;

means for inverse pitch filtering the reconstructed long term residual samples based upon the pitch predictor gain and the lag component and for producing therefrom the reconstructed voice samples; and

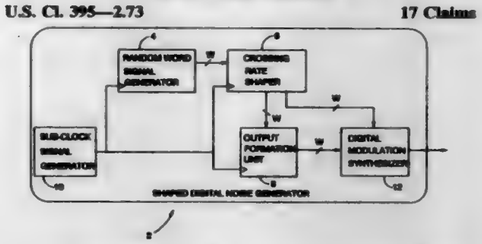
output means for providing the distinct memory address, the pitch predictor gain, the lag component and the peak amplitude for each voice subsegment.

5,592,587

SHAPED DIGITAL NOISE SIGNAL GENERATOR AND METHOD

Noah Kunoff, Old Bethpage; William Van Deusen, East Northport, and Craig Consiglio, Mannorville, all of N.Y., assignors to AIL Systems, Inc., Subsidiary of Eaton Corp., Deer Park, N.Y.

Filed Mar. 30, 1994, Ser. No. 221,745
Int. Cl.[6] G10L 5/02;9/00
U.S. Cl. 395—2.73 **17 Claims**



1. A method for generating a shaped non-random sequence of N-bit digital word signals, where N is a non-zero integer and each digital word signal represents at least one of 2^N possible values, comprising the steps of:

generating an unshaped pseudo random sequence of N-bit digital word signals with a random word signal generator; and

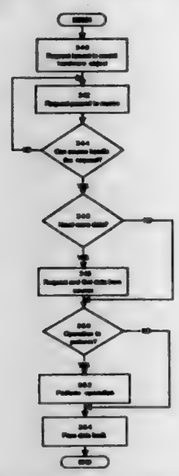
shaping the pseudo random sequence of N-bit digital word signals with a shaping circuit to provide said shaped non-random sequence of digital word signals, said shaped sequence being capable of producing a digital noise signal characterized by a substantially uniform frequency crossing rate distribution as compared to a digital noise signal generated by said unshaped pseudo random sequence.

5,592,588

METHOD AND APPARATUS FOR OBJECT-ORIENTED DIGITAL AUDIO SIGNAL PROCESSING USING A CHAIN OF SOUND OBJECTS

James D. Reekes, San Jose, and Kipley J. Olson, Redwood City, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 10, 1994, Ser. No. 241,242
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.87 **4 Claims**



1. A method for processing one or more streams of audio signals in a computer having a processor coupled to a storage medium and having an object-oriented dynamic binding mechanism resident is the storage medium so that the processor can access and execute the binding mechanism, said method comprising the steps:

receiving a request to become ready to play sound from a software application;

in response to the request to become ready to play sound,

generating a chain of sound objects for processing at least one stream of audio signals, a sound object being specialized for a particular task, the chain of sound objects having a sound source object linked to a source of audio signals, a sound hardware object linked to a sound hardware, and a series of processing objects, the series having a first end coupled to the sound source object for receiving audio signals therefrom and a second end coupled to the sound hardware object for receiving requests therefrom and sending audio signals thereto, and

passing the request along the chain from the sound hardware object to the sound source object, each sound object accessing and storing information in the request which is pertinent to its particular task;

receiving at a sound hardware object a request other than a request to become ready to play sound; and

in response to the request,

passing the request along a chain in a direction toward a source sound object of the chain until a sound object is found which is capable of handling requests of a type such as the request or until each sound object in the chain is examined, whichever occurs first,

if a sound object is found to handle the request, then

handling the request, requesting and getting from a source of the found sound object more audio signals if needed to handle the request and

passing the response to the request along the chain toward the sound hardware object, each sound object operating on the data, if appropriate, and

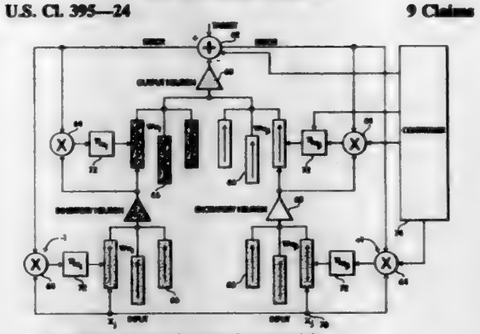
if a sound object is not found, then passing along the chain to the sound hardware object, an indication that the request can not be handled.

5,592,589

TREE-LIKE PERCEPTRON AND A METHOD FOR PARALLEL DISTRIBUTED TRAINING OF SUCH PERCEPTRONS

Chi-Sang Poon, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 8, 1993, Ser. No. 88,884
Claims priority, application United Kingdom, Jul. 8, 1992, 9214514
Int. Cl.[6] G06E 1/00;3/00
U.S. Cl. 395—24 **9 Claims**



1. An electrical neural network, comprising:

an input layer comprising at least one neuron circuit having at least one input and at least one output;

a hidden layer comprising a plurality of neuron circuits, each neuron circuit being one of inhibitory and excitatory and having at least one input and an output;

an output layer comprising at least two neuron circuits having at least one input and an output;

a plurality of first synapses, each first synapse connecting the output of a neuron circuit in the input layer to the input of at least one neuron circuit in the hidden layer and having a connection weight;

a plurality of second synapses, each second synapse connecting the output of a neuron circuit in the hidden layer to an input of at most one neuron circuit in the output layer and having a connection weight with a magnitude and a polarity;

each neuron in the hidden layer being connected to only one corresponding neuron circuit in the output layer; and

wherein each neuron circuit in the hidden layer receives a reinforcement signal from the corresponding neuron circuit in the output layer to update the connection weight of a synapse connected between the output of a neuron circuit in the input layer and the input of the neuron circuit in the hidden layer, wherein the reinforcement signal is independent of the magnitude of the connection weight of any synapse connected between the output of the neuron circuit in the hidden layer and the input of any neuron circuit connected posterior to the neuron circuit in the hidden layer.

5,592,590

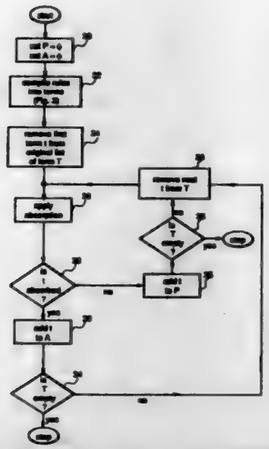
METHOD FOR EFFICIENTLY DETECTING COVERED RULES IN A KNOWLEDGE BASE

Christopher H. Jolly, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1994, Ser. No. 272,972
Int. Cl.[6] G06F 17/00
U.S. Cl. 395—75 **15 Claims**

1. A method for verifying a plurality of prioritized rules stored in a knowledge base for consistency, each prioritized rule having at least one option and a corresponding range for satisfying the option, the method comprising the steps of:

compiling each of the plurality of prioritized rules into a prioritized term, each prioritized term having at least one variable corresponding to each option and range in a rule;



arranging the prioritized terms into a hierarchical listing with high priority terms being placed before low priority terms;

for each prioritized term in the hierarchical listing, removing a highest priority term remaining in the hierarchical listing;

determining if the removed prioritized term is covered by any combination of prioritized terms in a sum of previously removed prioritized terms, the rules corresponding to the covered prioritized terms being covered; and

adding each removed prioritized term to the sum of previously removed prioritized terms.

5,592,591

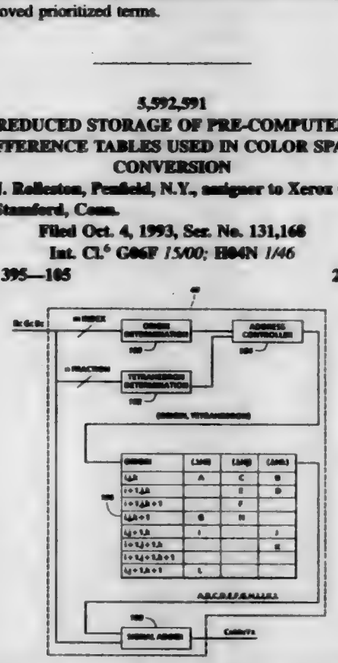
REDUCED STORAGE OF PRE-COMPUTED DIFFERENCE TABLES USED IN COLOR SPACE CONVERSION

Robert J. Rolleston, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1993, Ser. No. 131,168

Int. Cl.[6] G06F *15/00*; H04N *1/46*

U.S. Cl. 395—105 **20 Claims**



12. A printing system having a color print input, receiving input signals thereat describing a color print to be made in terms of a first color space, and a color space transform device for converting the first color space signals to a second color space whereby suitable printer driver signals are provided to drive a printer to reproduce the color print, the color space transform device including a device memory storing a set of empirically derived output colors at addresses corresponding to selected input colors distributed through the first color space, and an interpolation processor receiving an input color which does not correspond to a stored output color, and provide an interpolated output color, an arrangement improving the efficiency of the interpolation processor comprising:

a. a difference memory, having stored therein electromagnetic difference signals representing said distances between each output color signal in the second color space and a plurality of adjacent neighbors in color space, the difference signals stored at a like plurality of addresses in said difference memory associated with corresponding input colors;

b. control means, controlling the storage of said digital difference signals, and directing from the calculating means to the difference memory at addresses associated with a known color only such digital difference digital distance signals as have not been previously stored for a neighboring known color;

c. said control means controlling the retrieval of said difference signals for interpolation processing from addresses associated with the known color and neighboring known colors, as required to provide the correct distance signals for interpolation processing.

5,592,592

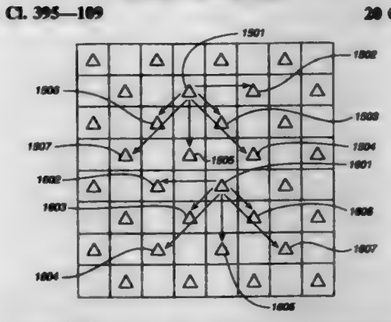
METHOD AND APPARATUS FOR MINIMIZING ARTIFACTS IN IMAGES PRODUCED BY ERROR DIFFUSION HALFTONING UTILIZING INK REDUCTION PROCESSING

Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 269,708, Jul. 1, 1994. This application Oct. 11, 1994, Ser. No. 320,537

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—109 **20 Claims**



1. A method of converting a continuous-tone image, represented as an array of electronically encoded nxm pixels comprising n rows of m pixels each specifying a gray-scale value, into a binary raster suitable for electronic printing, n and m being positive integers, the method comprising the steps of:

A. identifying a series of pixels corresponding to a linear segment of the image, the identified pixels comprising one of

(1) odd ones of the m pixels on corresponding odd ones of the n rows of pixels and even ones of the m pixels on corresponding even ones of the n rows of pixels; and

(2) even ones of the m pixels on corresponding odd ones of the n rows of pixels and odd ones of the m pixels on corresponding even ones of the n rows of pixels;

B. processing the identified pixels, in a sequence corresponding to movement along the segment in a predetermined direction, to convert the pixels into binary raster values; and

C. repeating the identification and processing steps until the image has been fully processed.

5,592,593

PRINTING IN DATA PROCESSING SYSTEMS

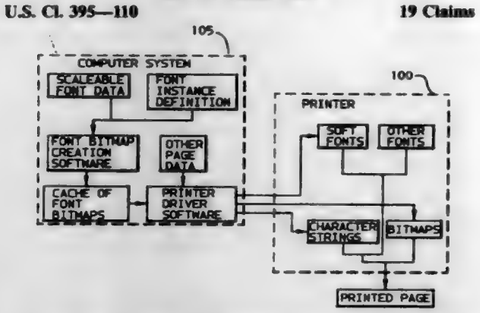
Robin C. Speed, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 875,877, Apr. 30, 1992, abandoned. This application Mar. 24, 1994, Ser. No. 217,227

Claims priority, application European Pat. Off., Apr. 30, 1991, 91303919

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—110 **19 Claims**



1. A method of printing a document stored in a data processing system, comprising the steps of:

selecting a document to be printed on a printer linked to the data processing system;

selecting a system font for use in printing at least part of the document;

automatically generating character definition data representing the system font for the part of the document after selecting the document and the printer;

automatically converting the generated character definition data to a format acceptable to the printer as soft font definition data;

automatically transmitting the soft font definition data to the printer; and

automatically transmitting character identification data to the printer for printing the part of the document using the soft font definition data.

5,592,594

METHOD AND APPARATUS FOR ALLOCATING CACHE MEMORY SPACE FOR FONT DATA

James B. Cahoon, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1994, Ser. No. 233,183

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—115 **10 Claims**

4. A method for controlling allocation of cache memory space in a printer, said cache memory space employed for storage of print data, said method comprising the steps of:

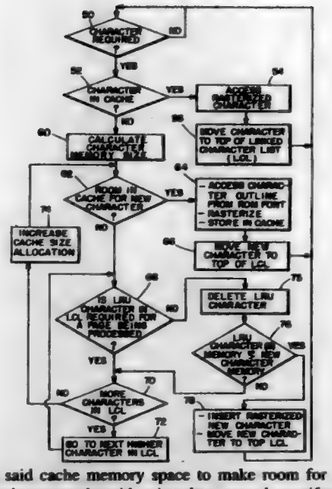
(a) maintaining a list of print data records recently employed by said printer in a print action, said list arranged so as to enable determination of a ranking of usage among listed print data records;

(b) for each print data record stored in said cache memory space, providing an indication if said print data is required to be used at least once for a page being processed by said printer;

(c) responding to a requirement for a next print data record by determining said next print data record is stored in said cache memory space and, if not, and if sufficient cache memory space is available, storing said next print data record in said cache memory space; or

(d) responding to a requirement for a next print data record by determining if said next print data record is stored in said cache memory space and if not, and if insufficient cache memory space is available to store said next print data record, removing at least a print data record determined from said list of print data records as manifesting a lowest ranking of usage, from said cache memory space to make room for said next print data record, said print data record manifesting said lowest ranking of usage being removed only if it is not indicated as being required for use at least once for a page currently being processed by said printer; and

e) in conjunction with steps (c) or (d), revising said list of print data records to reflect insertion of said next print data record.



5,592,595

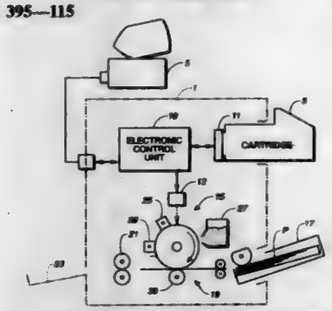
INTELLIGENT CARTRIDGE FOR ATTACHMENT TO A PRINTER TO PERFORM IMAGE PROCESSING TASKS IN A COMBINATION IMAGE PROCESSING SYSTEM AND METHOD OF IMAGE PROCESSING

Kenichi Wakabayashi; Kaoru Hatakoshi; Kiyotaka Nishimura; Tsuyoshi Morikawa; Tadashi Shiozaki; Akira Nakajima; Hajime Nishizawa, and Chitoshi Takayama, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Division of Ser. No. 816,455, Dec. 30, 1991. This application Jan. 12, 1995, Ser. No. 372,488

Int. Cl.[6] G06K *7/00*

U.S. Cl. 395—115 **8 Claims**



1. A printer having a CPU driven print control unit to develop a two dimensional bit image based on print data received from an external source and printout an image based upon the developed bit image,

an intelligent cartridge for attachment to said printer and for electrical connection to address and data buses in said control unit via a cartridge/control unit connector, said cartridge including print data input means for receiving said print data via said connector to said printer buses, and further including image development means having a CPU for developing a bit image based on said print data, and data transfer means for transfer of said developed image data to said printer,

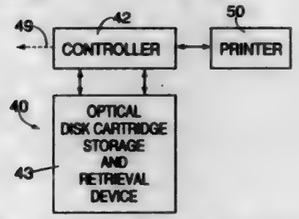
said printer including an interval timer for providing a sequence of timed interval signals and providing said timed interval signals to said cartridge CPU for timing of operations for said print data input means and said image development means, response means in said cartridge CPU for sending an acknowledge signal to said printer in response to said timed interval signals from said printer interval timer, and detection means in said printer for determining the lack of response from said cartridge CPU to said timed interval signals indicative of a malfunction.

5,592,596

SYSTEM AND METHOD FOR THE AUTOMATIC PRINTING OF STORAGE MEDIA LABELS

James Balsom, Poway, Calif., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics Inc., Park Ridge, N.J.

Filed Jun. 8, 1995, Ser. No. 488,712
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—117 **24 Claims**



1. A method of automatically printing a label for any of a plurality of disk cartridges residing in a disk cartridge storage and retrieval device, wherein each of a first number of said plurality of disk cartridges is associated with a media ID, the method comprising the steps of:

determining through a controller of said disk cartridge storage and retrieval device, whether a label flag is associated with a selected one of said first number of disk cartridges; and,

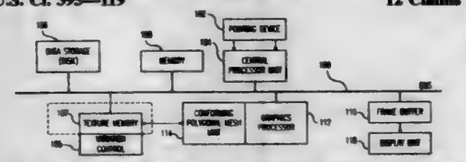
printing a label through a printer connected to said disk cartridge storage and retrieval device when said controller means determines that said selected one of said first number of said disk cartridges is not associated with a label flag, said label comprising said media ID associated with said selected disk cartridge.

5,592,597

REAL-TIME IMAGE GENERATION SYSTEM FOR SIMULATING PHYSICAL PAINT, DRAWING MEDIA, AND FEATURE MODELING WITH 3-D GRAPHICS

Kenneth W. Kim, Salt Lake City, Utah, assignor to Parametric Technology Corporation, Waltham, Mass.

Filed Feb. 14, 1994, Ser. No. 195,112
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—119 **12 Claims**



1. A system for simulating painting on an electronic display having means for displaying a three-dimensional surface, comprising:

means for simulating a drawing tool on said electronic display;

a drawing primitive associated with said simulated drawing tool and including a polygonal mesh having a plurality of adjacent three-dimensional mesh primitives and associated x-, y-, and z- dimensions, wherein as said simulated drawing tool moves along a trajectory on said electronic display said drawing primitive is drawn on said electronic display at a series of overlapping locations and said polygonal mesh x- and y-dimensions are fixed and said z-dimension automatically varies to conform to said three-dimensional surface; and

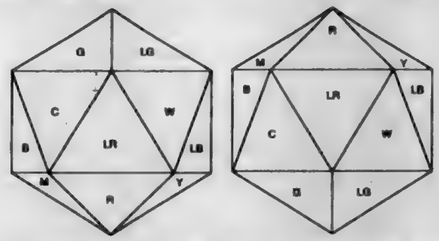
a texture map including means for defining one or more visual components of said drawing primitive.

5,592,598

METHOD OF COLOR CODING ORIENTATION INFORMATION

Boris Yamrom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 18, 1994, Ser. No. 324,996
Int. Cl.[6] G06T *15/50;15/60;11/40*
U.S. Cl. 395—123 **5 Claims**



1. A method of color coding points on a surface having associated orientation vectors comprising the steps of:

a) employing an input device to select a number N defining how many solid angle ranges will be employed;

b) employing the polyhedron creation device to receive the number N from the input device and define a polyhedron having 2N facets, an equator and top and bottom poles;

c) utilizing an input device to interact with an operator to select N colors;

d) employing the polyhedron creation device to assign the N colors to the facets such that opposite facets have the same color, and a total aggregate of color differences between adjacent facets is minimized;

e) selecting a surface point;

f) utilizing an intersection device to determine which facet will be intersected by the orientation vector associated with the selected surface point when the polyhedron is deemed to be centered over the selected surface point;

g) color coding the selected surface point with the intersection device with the color assigned to the intersected facet; and

h) repeating steps "f"–"g" for remaining points on said surface to result in a color coded surface.

5,592,599

VIDEO SPECIAL EFFECTS SYSTEM WITH GRAPHICAL OPERATOR INTERFACE

Dennis A. Lindholm, Oakland, Calif., assignor to Ampex Corporation, Redwood City, Calif.

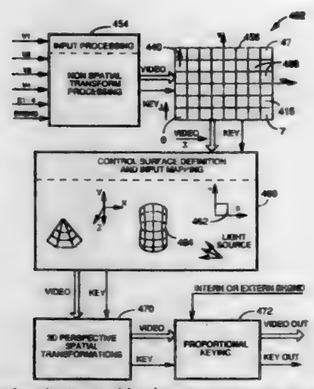
Filed Dec. 18, 1991, Ser. No. 810,758
Int. Cl.[6] G06T *15/10*
U.S. Cl. 395—127 **67 Claims**

1. A method of transforming an input video image comprising the steps of:

defining a control surface by sweeping an operator selected sweep curve through an operator selected sweep trajectory;

selectively positioning and rotating the control surface relative to a view plane;

defining a position and orientation of a control video image on the control surface; and



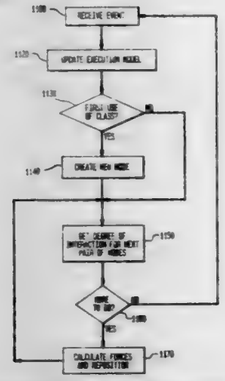
transforming the input video image to generate an output video image corresponding to a projection of the control video image onto the view plane.

5,592,600

ANIMATED DISPLAY SHOWING EXECUTION OF OBJECT-ORIENTED PROGRAMS

Wim De Pauw, Scarborough; Vincent J. Cina, Chestnut Ridge, both of N.Y.; Andrew R. Helm, Montreal, Canada; Douglas N. Kimelman, Danbury, Conn., and John M. Vlissides, Mohegan Lake, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1994, Ser. No. 312,849
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—140 **21 Claims**



1. A computer with a graphical interface comprising:

a. one or more nodes displayed on the graphical interface, each node representing a class of an object-oriented program that has been active during execution, and each node having a placement on the graphical interface;

b. an event collector executed by the computer with the object-oriented program, the event collector collecting one or more events produced by the executing object-oriented program, the events being data structures that have execution information about the execution of the object-oriented program; and

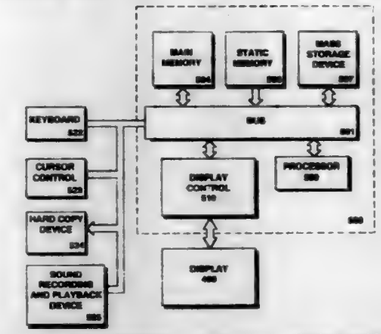
c. a visualizer that receives the execution information from the event collector, the visualizer moving one or more of the nodes on the graphical interface to a new placement of the node, the new placement of the node being determined by a degree of interaction, determined from the execution information, between the class that the node represents and all other classes.

5,592,601

METHOD AND APPARATUS FOR INCREMENTAL ACCELERATION OF THE RENDERING PROCESS UTILIZING MULTIPLE SCANLINE RENDERING DEVICES

Michael W. Kelley, San Mateo, and Shou-Chern Yen, Sunnyvale, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 232,831, Apr. 22, 1994. This application Sep. 30, 1994, Ser. No. 316,233
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—143 **12 Claims**



1. A system for displaying objects on a display, said system comprising:

a first memory for storing a first set of the objects, each object having at least one next pointer, which when set to an object list value, points to a next object in a linked list of at least a portion of a group of objects active on the display;

a second memory for storing a second set of the objects, said second memory having a faster access time than said first memory, said second set part of the group of objects active on the display;

at least one scan line rendering device, said scan line rendering device generating graphic data of the group of objects active on a scan line, said graphic data utilized to display the objects, said scan line rendering device further copying objects from the first memory to the second memory as objects become active and removing objects from the second memory when an object is no longer active, said scan line rendering device further maintaining a list of a portion of the group of active objects in the first memory when the second memory is full by providing a pointer to the first object in the first set of objects that is on the active list but not stored in the second memory and updating the next pointer of the object to an object list value that points to a next object on the active list not stored in the second memory to provide a linked list of objects in the first memory on the active object list.

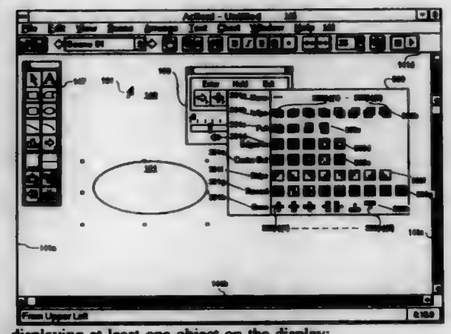
5,592,602

USER INTERFACE AND METHOD FOR CONTROLLING AND DISPLAYING MULTIMEDIA MOTION, VISUAL, AND SOUND EFFECTS OF AN OBJECT ON A DISPLAY

Michael V. Edmunds; Kenneth E. MacKenzie; Joseph Dunn; A. Gordon Smith, all of San Francisco, Calif., and J. Paul Kase, Bar Harbor, Me., assignors to Macromedia, Inc., San Francisco, Calif.

Filed May 17, 1994, Ser. No. 243,964
Int. Cl.[6] G06T *13/00*
U.S. Cl. 395—174 **31 Claims**

9. In a computer based multimedia authoring environment, including an electronic pointing device, a display, and a memory for storing at least one multimedia object, the authoring environment for creating a multimedia art work including the multimedia object, a computer implemented method for applying a multimedia effect to an object comprising the steps of:



displaying at least one object on the display;

receiving a selection of the object with the electronic pointing device;

displaying a plurality of motion direction icons, each motion direction icon representing a motion effect with a direction;

receiving a selection of one of the motion direction icons with the electronic pointing device;

storing the motion effect with a direction represented by the selected motion direction icon in association with the object in the memory;

displaying a motion direction setting icon indicating the stored motion effect for the object;

displaying a plurality of visual effect icons, each visual effect icon representing a visual effect altering the appearance of the object;

receiving a selection of one of the visual effect icons with the electronic pointing device;

storing the selected visual effect with the object in the memory;

displayiny a visual effect setting icon indicating the stored visual effect for the object; and

concurrently moving the object on the display in the direction represented by the selected motion direction icon and displaying the object with stored visual effect.

5,592,603

METHOD OF AND APPARATUS FOR CUSTOMIZING USER INTERFACE

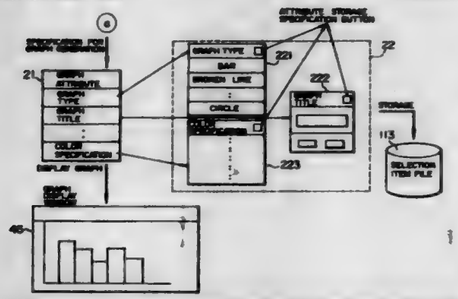
Yoshihiro Arato, Tokyo, and Chiaki Ishimura, Chigasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 207,272

Claims priority, application Japan, Mar. 16, 1993, 5-056137

Int. Cl.[6] G06F 3/14

U.S. Cl. 395—334 **8 Claims**



1. A user interface customizing method in an information processing system in which processing is executed in association with a selection and setting operation repeatedly conducted by a user for a plurality of items displayed in a screen image, comprising the steps of:

storing for each selection and setting operation items selected and set in a process in which the user completely accomplishes the selection and setting operation for the plural items displayed in the screen image; and

displaying, in a same selection and setting operation to be executed later for the same items thus selected and set, a screen image instead including selected and set items stored in the storing step.

5,592,604

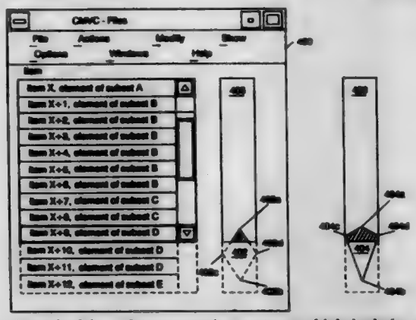
METHOD AND SYSTEM FOR INDICATING BOUNDARIES OF CONNECTED DATA SUBSETS

Scott M. Marmunk, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1994, Ser. No. 298,704

Int. Cl.[6] G06F 3/14

U.S. Cl. 395—340 **18 Claims**



1. A method in a data processing system, which includes data having a plurality of data subsets, said method comprising:

displaying a display window, wherein said data is displayed within said display window;

selecting a data subset within said plurality of data subsets comprising said data; and

displaying a marker in association with said display window in response to selection of a member of said data subset, said marker having two terminuses, an upper terminus and a lower terminus, wherein a location of said upper terminus indicates an upper boundary of said data subset and a location of said lower terminus indicates a lower boundary of said data subset and wherein an absence of one of said two terminuses intuitively indicates, to a user, a presence of additional undisplayed data within said data subset.

5,592,605

MENU PICTURE DISPLAY METHOD AND APPARATUS FOR A DATA PROCESSOR

Hajime Asuma, Chigasaki; Tsukasa Hasegawa, Hiratsuka; Akira Naito; Yasuhiko Kasai, both of Fujisawa; Tomoko Tsuchiya, Tokyo; Shinichi Yoshida, Yokohama, and Yasumasa Matsuda, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

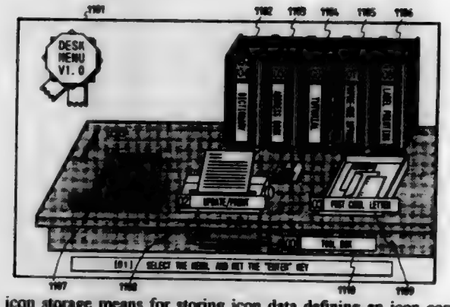
Filed Aug. 2, 1994, Ser. No. 285,836

Claims priority, application Japan, Aug. 5, 1993, 5-194469; Jan. 19, 1994, 6-004118

Int. Cl.[6] G06F 3/14

U.S. Cl. 395—348 **28 Claims**

1. An icon menu display apparatus having icon selecting means for a user to select an icon from a plurality of icons displayed as an icon menu, comprising:



icon storage means for storing icon data defining an icon constituted at least by a plurality of portions of picture data and function name data, said icon being selectable by said icon selecting means;

background image storage means for storing a background image representing a perspective view of a room having a desk against which said icon menu is displayed;

background image display means for displaying said background image on an entire screen;

display position storage means for storing display position data representing a plurality of positions in said background image at which corresponding icons are placed according to function names thereof; and

icon display means for displaying said icons on said background image at positions based on said display position data.

5,592,606

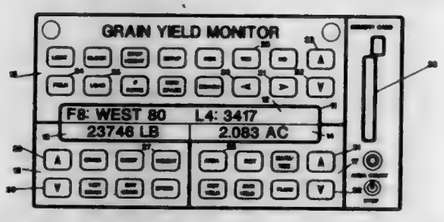
METHOD AND APPARATUS FOR STORAGE AND DISPLAY OF HIERARCHALLY ORGANIZED DATA

Allen Myers, P.O. Box 2348, Ames, Iowa 50010

Filed Jul. 30, 1993, Ser. No. 100,569

Int. Cl.[6] G06F 3/14

U.S. Cl. 395—356 **14 Claims**



1. Apparatus for collecting and displaying data from a monitor of an agricultural machine, comprising:

means for collecting said data from a specific geographic territory;

data memory means for storing said data in an organized format including at least two hierarchal levels;

a display which is divided into at least two display area;

a digital processing unit interconnected with said display;

a keypad for providing instructions to said digital processing unit to select the data shown on said display areas; and

wherein said keypad has groups of keys associated with each of said display areas, for control of said associated display areas.

5,592,687

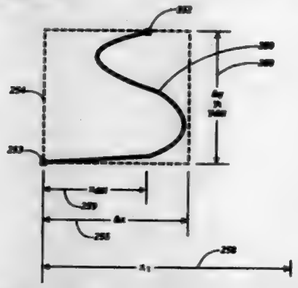
INTERACTIVE METHOD AND SYSTEM FOR PRODUCING ADDRESS-CORRELATED INFORMATION USING USER-SPECIFIED ADDRESS ZONES

Karou A. Weber, San Francisco; Alex D. Poon, Mountain View, and Thomas P. Moran, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1993, Ser. No. 138,545

Int. Cl.[6] G06F 3/14

U.S. Cl. 395—358 **28 Claims**



1. A method of operating a system to capture user-produced event data in a data structure in a manner enabling later retrieval of the user-produced event data; the system including input circuitry connected to a user input device for producing signals indicating actions of a system user; output circuitry connected to a display having a display area for presenting images; a processor connected for receiving the signals from the input circuitry, and connected for providing images to the output circuitry for presentation in the display area of the display; and memory for storing data; the data stored in the memory including instruction data indicating instructions the processor executes; the processor being further connected for accessing the data stored in the memory; the method comprising:

operating the processor to receive a first signal from the user input device indicating a request from the system user to obtain a user-requested address value from an address source connected for providing address data to the processor of the system; the address source indicating data measuring an event;

operating the processor to respond to the request from the system user by accessing the address source and obtaining an address data item for use as the user-requested address value;

presenting a first image in the display area; the first image including an address zone display feature positioned at an address marking location in the display area so that the address zone display feature is perceived by the system user as marking a spatial region in the display area; and

producing an address zone data structure in the memory of the system and storing the address data item and the address marking location therein such that the address zone data structure is accessible by the processor using either the address marking location indicating the spatial region marked in the display area or the address data item indicating the user-requested address value;

operating the processor to receive a second signal from the user input device indicating user-produced event data indicating information entered by the system user in a spatial region in the display area; and

operating the processor to respond to the second signal from the system user by

storing the user-produced event data in the address zone data structure represented by the spatial region in which the user-produced event data was entered such that all of the user-produced event data entered by the system user within the spatial region marked in the display area is accessible by the processor in the address zone data structure using the user-requested address value indicated by the address data item obtained when the spatial region was first produced; and

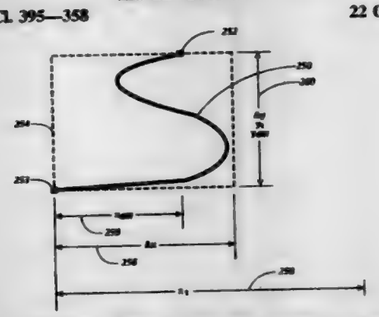
presenting a second image in the spatial region of the display area; the second image including display features representing the user-produced event data entered by the user.

5,592,608

INTERACTIVELY PRODUCING INDICES INTO IMAGE AND GESTURE-BASED DATA USING UNRECOGNIZED GRAPHICAL OBJECTS

Karon A. Weber, San Francisco; Alex D. Poon, Mountain View, and Thomas P. Moran, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1993, Ser. No. 138,548
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—358 **22 Claims**



1. A method for operating a machine, the machine including input circuitry connected to a user input device for producing signals indicating actions of a machine user; output circuitry connected to a display having a display area for presenting images; memory for storing data, the data stored in the memory including instructional data indicating instructions the processor executes; and a processor connected for receiving the signal from the input circuitry connected for providing images to the output circuitry, and connected for accessing the data stored in the memory; the method comprising:

operating the processor to receive a first signal from the user input device indicating a first selection action by the machine user selecting a first image segment displayed in the display area; the first image segment representing a portion of a first data structure stored in the memory; the first selection action including a signal designating the portion of the first data structure represented by the first image segment as a key object, hereafter referred to as key object data;

operating the processor to respond to the first signal by:

producing a key object data structure and storing therein said key object data; assigning to said key object data a unique key object identifier; and storing said unique key object identifier in said key object data structure with said key object data; said unique key object identifier being accessible to the processor using the key object data;

operating the processor to receive a second signal from the user input device indicating a second selection action by the machine user selecting a target image segment displayed in the display area; the target image segment representing a portion of a target data structure; the second selection action including a signal designating the portion of the target data structure as target object data and associating said key object data with the target object data represented by the target image segment; and

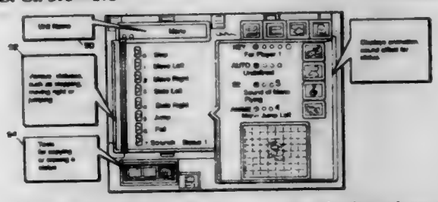
operating the processor to respond to the second selection action by modifying at least one of the key object data structure and the target data structure such that the target object data is accessible to the processor using the unique key object identifier; the target image segment being perceived by the machine user as being associated with the first image segment selected by the user as key object data; the target image segment being retrievable by the machine user using the first image segment selected as the key object data.

5,592,609

VIDEO GAME/VIDEOGRAPHICS PROGRAM FABRICATING SYSTEM AND METHOD WITH UNIT BASED PROGRAM PROCESSING

Toshiaki Suzuki; Satoshi Yamato; Nobuhito Koganezawa, and Yuichi Ozaki, all of Kyoto-fu, Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan

Filed Oct. 31, 1994, Ser. No. 332,551
Int. Cl.[6] G06T *1/00*
U.S. Cl. 395—173 **43 Claims**



1. A method of editing a video game program having at least one moving object character for use by users in creating a new video game using a computing system having a display screen, and an input device comprising the steps of:

initiating the execution of said video game program;

stopping said video game by a user via said input device at a current display frame;

identifying with the input device a moving object character in the current display frame, said identified moving object character being associated with a unique identifier;

accessing a data structure, associated with said unique identifier and said moving object character, storing data indicative of diverse game play related characteristics for said moving object character;

storing data indicative of at least one program for processing data relating to said moving object;

generating at least one display screen in the current display frame displaying a set of editing tools for permitting a user to modify diverse game play related characteristics for said moving object via said input device by selecting one of said set of editing tools;

receiving input from a user via said input device; and

resuming said video game incorporating any change made by the user via said input device.

5,592,610

METHOD AND APPARATUS FOR ENHANCING THE FAULT-TOLERANCE OF A NETWORK

Suresh S. Chittor, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 21, 1994, Ser. No. 363,353
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.02 **24 Claims**

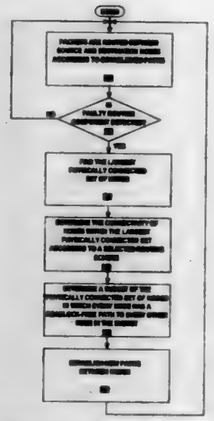
1. A method for finding a set of available computing nodes in a network upon detection of a faulty network component, the method comprising the steps of:

(a) determining a set of nodes in the network which are physically coupled together;

(b) for a first node of the set of nodes determining a connectivity value which indicates a number of nodes of the set of nodes to which the first node has a deadlock-free path;

(c) repeating the determining step (b) for each node of the set of nodes;

(d) determining a subset of the set of nodes such that each node in the subset can transfer data to and from each other node in the subset, wherein the determining of the subset is based on the connectivity value for each node of the set of nodes; and



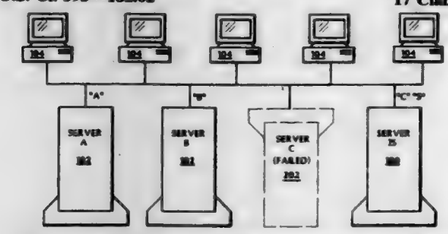
(e) using the subset of the set of nodes as the set of available computing nodes.

5,592,611

STAND-IN COMPUTER SERVER

Christopher W. Midgely, Framingham; John W. Webb, Sutton, and John L. Acott, Westborough, all of Mass., assignors to Network Integrity, Inc., Marlborough, Mass.

Filed Mar. 14, 1995, Ser. No. 403,307
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.02 **17 Claims**



1. In a network of computers, the computers comprising one or more server nodes and client nodes requesting services from the server nodes, messages sent between nodes each having a destination address and a message content, a method for providing the services of a protected one of said server nodes to the client nodes, comprising the steps:

when said protected server node becomes unavailable to said client nodes, a connection server connected to another node on the network publishing as its name the name of the unavailable server node, in addition to publishing a name by which the connection server is regularly known;

a client node requesting services from a service server by continuing to request services by the name of the unavailable server node in the same manner as requests were made prior to the protected server node becoming unavailable.

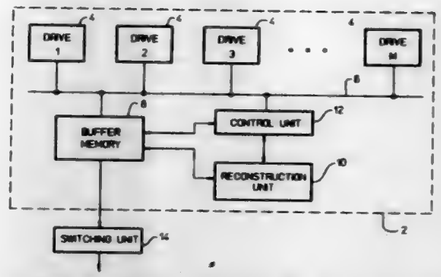
5,592,612

METHOD AND APPARATUS FOR SUPPLYING DATA STREAMS

Yitzhak Birk, c/o Thaler 35 Castenada, San Francisco, Calif. 94116 •

Filed Apr. 28, 1995, Ser. No. 431,189
Int. Cl.[6] G01R *31/28*; G06F *11/00*
U.S. Cl. 395—182.04 **22 Claims**

1. A server system for storing and supplying data, said system comprising:



a plurality of disk drives, each of said disk drives storing data;

a buffer memory, operatively connected to said disk drives, for temporarily storing a portion of the data from said disk drives which is soon to be supplied;

a reconstruction unit, operatively connected to said buffer memory, for reconstructing a portion of the data from at least one of said disk drives using a portion of the data from a plurality of the remaining disk drives so that at least one of said disk drives can be bypassed;

queues associated with said disk drives;

a control unit for controlling said server system, said control unit examines said queues to obtain queue information and then decides based on the queue information whether to bypass any of said disk drives; and

an output unit for outputting the data from either or both of said buffer memory and said reconstruction unit.

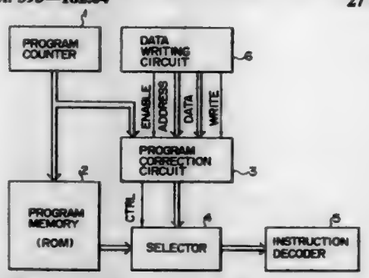
5,592,613

MICROCOMPUTER HAVING A PROGRAM CORRECTION FUNCTION

Azuma Miyazawa, Mitaka, and Toshiaki Ishimaru, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 271,180, Jul. 7, 1994, abandoned, which is a continuation of Ser. No. 40,562, Mar. 31, 1993, Pat. No. 5,357,627, which is a continuation of Ser. No. 496,807, Mar. 21, 1990, abandoned. This application Oct. 18, 1995, Ser. No. 544,694

Claims priority, application Japan, Mar. 28, 1989, 1-076047; May 25, 1989, 1-131861; Dec. 18, 1989, 1-325876
Int. Cl.[6] G01R *31/28*; G06F *11/00*
U.S. Cl. 395—182.04 **27 Claims**



7. A microcomputer system comprising:

a one-chip microcomputer for controlling the microcomputer system based on a stored program; and

programmable nonvolatile memory means, arranged as a different chip from said one-chip microcomputer and being externally connected to said one-chip microcomputer, said programmable nonvolatile memory means having a first storage area for storing an address data denoting an address where a program data to be corrected is stored and a correction program data, and a second storage area for storing adjustment data for adjusting said microcomputer system;

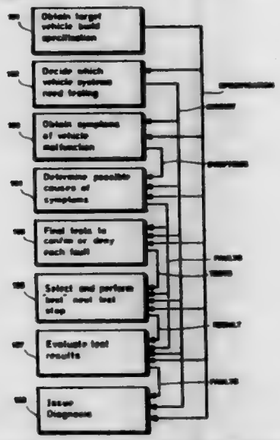
said one-chip microcomputer comprising:
program memory means for storing a program data;
program counter means for addressing said program memory means;
instruction decoder means for decoding the program data read out from said program memory means addressed by said program counter means;
serial communication means for serially communicating said one-chip microcomputer with said externally connected nonvolatile memory means to receive the address data and the correction program data from the first storage area of said nonvolatile memory means substantially at one time upon power-on of said one-chip microcomputer;
volatile memory means for storing the address data and the correction program data received from said external nonvolatile memory means via said serial communication means;
comparison means for comparing the output from said program counter means with the address data stored in said volatile memory means, and outputting a coincidence signal when a coincidence is detected therebetween; and
means for executing an interruption processing in response to the coincidence signal to execute the correction program data stored in said nonvolatile memory means,
wherein at least one of the address data and correction program data stored in said programmable nonvolatile memory means is loaded and stored in said volatile memory means via the serial communication means when power of the one-chip microcomputer is turned on.

5,592,614

FAULT IDENTIFICATION SYSTEM

Michael Peters, Manchester, England, assignor to Genrad Limited, London, England

Filed Sep. 4, 1991, Ser. No. 754,899
Claims priority, application United Kingdom, Sep. 8, 1990, 9019718
Int. Cl.[6] G06F *11/22*
U.S. Cl. 395—183.02 **11 Claims**



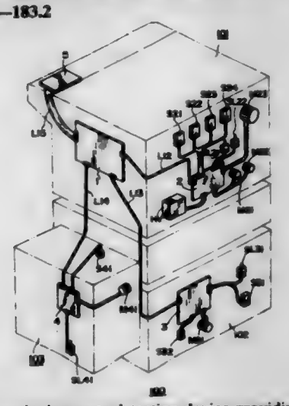
1. A system for identifying faults in an electrical circuit intended to provide a plurality of outputs, each output being in response to at least one predetermined set of circuit conditions, the system comprising
a) means storing data describing individual components of an electrical circuit and interconnections at circuit nodes between said components that together define the topology of the electrical circuit,
b) means for inputting data to the system ideatifying a fault symptom indicating that, for one predetermined set of said circuit conditions, an intended output is not received or measured,
c) means for accessing stored data describing the electrical characteristic of selected components of said circuits a fault in any one of which said selected components could be a cause of the said fault symptom,
d) means for directly calculating, from the accessed data describing electrical characteristics of said selected components, expected electrical parameter values at predetermined measurement points in a non-defective sub-circuit defined by said selected components and said interconnections therebetween given the said predetermined set of circuit conditions,
e) means for selecting measurement points in said sub-circuit at which points said electrical parameter values are to be measured,
(f) means for selectively inputting measurement data indicating the electrical parameter values measured at said selected measurement points,
g) means for providing a comparison of said input measurement data with said calculated expected electrical parameter values, and
h) means for identifying at least one most likely faulty component from the comparison of said input measurement data with said calculated expected electrical parameter values.

5,592,615

MALFUNCTIONING PARTS DETECTING DEVICE AND A METHOD OF DETECTING MALFUNCTIONING PARTS

Nobuhiro Michiura, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Dec. 1, 1994, Ser. No. 352,809
Claims priority, application Japan, Dec. 6, 1993, 5-305127
Int. Cl.[6] G01R *31/28*; G06F *11/00*
U.S. Cl. 395—183.2 **7 Claims**



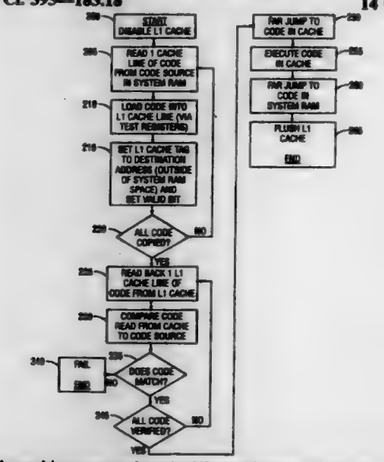
5. A malfunctioning parts detection device providing:
a control section;
sub-control sections connected to said control section through communication lines and executing desired operations by means of mutual intercommunication with said control section through said communication lines;
first reply means actuated by a first predetermined signal output from said control section and provided between said communication lines and said control section for retransmitting the first predetermined signal to said control section;
second reply means actuated by a second predetermined signal output from said control section and provided between said communication lines and each of said sub-control sections for retransmitting the second predetermined signal to said control section; and
detecting means which detects anomalous operation of one of the sub-control sections when the second predetermined signal is transmitted to said second reply section and is not retransmitted back to said control means, and detects anomalous operation of the control section when the first predetermined signal is transmitted to said first reply section and is retransmitted back to said control means.

5,592,616

METHOD FOR PERFORMING EFFICIENT MEMORY TESTING ON LARGE MEMORY ARRAYS USING TEST CODE EXECUTED FROM CACHE MEMORY

Richard W. Finch, Austin, and Stephen R. Cooper, Cedar Park, both of Tex., assignors to Dell USA, LP, Austin, Tex.

Filed Jun. 7, 1995, Ser. No. 481,634
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—183.18 **14 Claims**



1. A machine-executed method for performing efficient memory testing on large RAM arrays in a computer system, said computer system including a CPU having at least one cache buffer, and said large RAM arrays having a definable address space, wherein executable memory test code is stored in ROM, flash memory, or said RAM arrays of said computer system, said method comprising:
(a) copying said memory test code into said processor cache buffer;
(b) initializing said processor cache buffer to assure that said memory test code resides in an address space separate from said address space for said large RAM arrays;
(c) disabling said processor cache buffer to prevent corruption of said memory test code in said processor cache buffer; and
(d) executing said memory test code from said processor cache buffer to test the entire RAM arrays in a single, contiguous block.

5,592,617

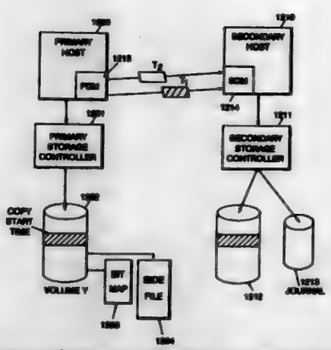
Patent Not Issued For This Number

5,592,618

REMOTE COPY SECONDARY DATA COPY VALIDATION-AUDIT FUNCTION

William F. Micka, Tucson, Ariz.; Claus W. Mikkelsen, San Jose, Calif.; Robert W. Shomler, Morgan Hill, Calif., and May N. Wone, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1994, Ser. No. 317,632
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—185.07 **22 Claims**



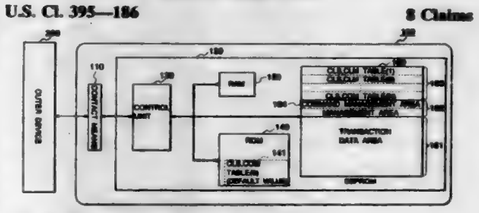
1. A method for validating whether shadowed data is a true copy of primary data updates, wherein the primary data updates are generated by one or more applications running in a primary processor at a primary site, the primary data updates received by a primary storage subsystem, each primary data update identified by a unique device and subsystem address, the primary storage subsystem causing I/O write operations to write each primary data update therein, and wherein a secondary site, whether local to or remote from the primary site, shadows the primary data updates in sequence consistent order such that data at the secondary site is available for disaster recovery purposes, the method comprising steps of:
(a) operating the primary and secondary sites in a full duplex mode such that the primary data updates are continuously shadowed at the secondary site;
(b) initiating a validation session in the primary and secondary sites, including identifying those primary data updates to be validated as properly shadowed at the secondary site;
(c) determining device and subsystem addresses for the identified primary data updates;
(d) specifying a copy start time for grouping a portion of the identified primary data updates to be validated, the copy start time being a logically equivalent time at the primary and secondary sites for the grouped portion of the identified primary data updates and the corresponding shadowed data at the secondary site;
(e) creating first check codes at the primary site for the grouped portion of primary data updates, and creating second check codes at the secondary site for the corresponding shadowed data; and
(f) comparing the first and second check codes for determining whether the shadowed data is a true copy of the corresponding primary data updates.

5,592,619

HIGH-SECURITY IC CARD

Yoshihiro Shona, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,213
Claims priority, application Japan, Jul. 28, 1993, 5-205691
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—186 **8 Claims**



1. An IC card apparatus comprising:

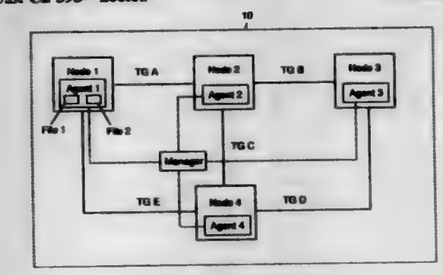
a card base;
at least one integrated circuit disposed on said card base; and
communication means disposed on said card base and coupled to said at least one integrated circuit, for transferring signals between said at least one integrated circuit and an external device;
wherein said at least one integrated circuit includes:
a first memory having a command table area for storing command tables, said first memory being a reloadable memory;
a second memory for storing a non-reloadable command table, said second memory being a read-only memory;
wherein the command table of the first memory and the command table of the second memory store command class designations which designate the class of each of the commands, and store command code designations which designate the operation corresponding to each of the commands; and
selecting means, operatively coupled to said first memory and said second memory, for selecting either said non-reloadable command table stored in said second memory or a command table stored in said command table area of said first memory.

5,592,620

SYSTEM AND METHOD FOR CONTROLLING, MONITORING AND RETRIEVING ACCOUNTING DATA

David D.-H. Chen, Cary, and Leo Temoshenko, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1993, Ser. No. 105,543
Int. Cl.[6] G06F *13/00;17/30*
U.S. Cl. 395—200.01 **14 Claims**



TG = Transmission Group

1. For use in a Manager of a network comprising at least one Agent, said Agent having means for collecting accounting data related to network activity, said accounting data comprising a plurality of data objects, a method of controlling, monitoring, and retrieving said data objects comprising the steps of:
requesting said Agent, using Simple Network Management Protocol (SNMP) commands, to being collecting data objects and storing said data objects in one or more accounting files;
maintaining a record at said Agent containing data indicating whether each accounting file is COMPLETE or ACTIVE;
determining from said Agent, using SNMP commands, whether any of said accounting files are complete, said determining step comprising the steps of said Manager periodically issuing, using SNMP commands, a message to said Agent requesting an indication of the status of said accounting file and of said Agent responding with said indication; and
requesting, using File Transfer Protocol (FTP) commands, from said Agent, if there are any completed accounting files, to transfer said completed accounting files to said Manager.

5,592,621

SYSTEM FOR INSERTING FIRST TRANSMISSION TOKEN INTO DATA STREAM APPENDED TO SECOND TRANSMISSION TOKEN TO FACILITATE FULL DUPLEX COMMUNICATION BETWEEN CENTRAL CONTROLLER AND OTHER CONTROLLERS

Daniel Rabinovich, Plainville, and Henry Steinberg, Westboro, both of Mass., assignors to EMC Corporation, Hopkington, Mass.

Filed Aug. 3, 1994, Ser. No. 285,345
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.02 **31 Claims**



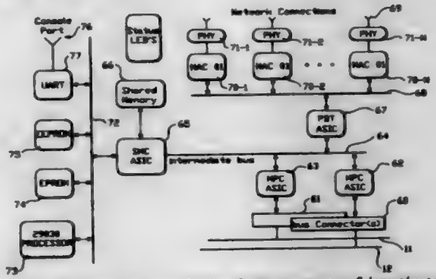
1. A method of providing a network communication protocol, for controlling communications between a central controller and a plurality of other controllers, said method comprising the steps of:
passing a first data transmission token (T2), under control of said central controller, from the central controller to at least a first other controller, from said at least a first other controller back to the central controller, and then from said central controller to and from each remaining other of said plurality of controllers, whereby any of said plurality of other controllers is allowed to return data to the central controller only appended to said first data transmission token (T2); and
broadcasting a second data transmission token (T1) addressed to one of said plurality of other controllers from said central controller to all of said plurality of other controllers, said second data transmission token (T1) further including a data stream, appended to said second data transmission token (T1), said second data transmission token (T1) and said appended data stream to be transmitted from said central controller to said addressed controller; and
inserting said first data transmission token (T2) into said data stream appended to said second token (T1), to allow said first data transmission token (T2) to be passed more regularly between said central controller and said plurality of other controllers, to facilitate full duplex communication.

5,592,622

NETWORK INTERMEDIATE SYSTEM WITH MESSAGE PASSING ARCHITECTURE

Mark S. Isfeld; Bruce W. Mitchell, both of San Jose; Michael J. Seaman, Mountain View; Tracy D. Mallory, and Nagaraj Arunkumar, both of San Jose, all of Calif., assignors to 3Com Corporation, Santa Clara, Calif.

Filed May 10, 1995, Ser. No. 438,897
Int. Cl.[6] G06F *13/00;15/163*
U.S. Cl. 395—200.02 **47 Claims**



1. An apparatus for transferring large amounts of input/output data among a plurality of processors having respective local memories, comprising:
a bus interconnecting the plurality of processors;

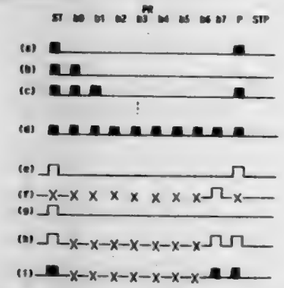
a plurality of bus interface devices, coupled to the bus and to corresponding processors in the plurality of processors, a first bus interface device in the plurality of bus interface devices which originates a transfer without first obtaining permission to transfer to a destination device including
a command list storing a list of commands which characterize transfers of data from local memory across the bus,
a bus data buffer which buffers data subject of a command being executed between local memory and the bus,
and a second bus interface device in the plurality of bus interface devices which receives a transfer including
a free buffer list storing pointers to free buffers in local memory into which data may be loaded from the bus,
a receive list storing pointers to buffers in local memory loaded with data from the bus, and
an inbound data buffer which buffers data subject of a transfer addressed to the second bus interface between the bus and free buffers in local memory.

5,592,623

SYSTEM FOR A DISTRIBUTED WIRELESS STAR NETWORK WITH TERMINAL DEVICES AND A CONCENTRATOR INCLUDING START BITS AND ORING LOGIC FOR RESOLVING TRANSMISSION CONTENTION

Akio Kurobe, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 26, 1993, Ser. No. 54,164
Claims priority, application Japan, Apr. 28, 1992, 4-109963
Int. Cl.[6] G06F *13/00;15/16*
U.S. Cl. 395—200.06 **21 Claims**



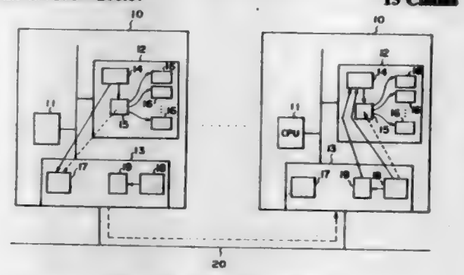
1. A decentralized data-processing star network with a contention system, comprising a plurality of terminal devices and a concentrator to interconnect the terminal devices via a wireless transmission medium, any of the terminal devices being able to start to transmit a packet immediately after a pause disposed to prohibit all transmissions, the pause occurring every time a packet has been transmitted,
wherein the concentrator comprises:
start bit generation means for generating a start bit in accordance with the timing that the terminal devices should transmit their start bits; and
relay means for ORing the start bit generated by the start bit generation means with the start bits of packets which have been modulated as predetermined with a first frequency and received from the plurality of terminal devices, converting the received packets into packets modulated as predetermined with a second frequency, and transmitting the converted packets out to the plurality of terminal devices;
wherein each of the terminal devices is assigned a unique code for contention control and comprises monitor means for ORing bits of the code to be transmitted, and monitoring the accordance between bits of the OR and corresponding bits of the code to be transmitted in order to suspend the transmission if they do not accord.

5,592,624

DATA COMMUNICATION FOR CONTROLLING MESSAGE TRANSMISSION AND RECEPTION AMONG PROCESSING MODULES USING INFORMATION STORED IN DESCRIPTOR TO FORM A LOOSELY COUPLED MULTIPROCESSING SYSTEM

Hajime Takahashi; Hirohide Sugahara, and Akira Kabemoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP91/01306, § 371 Date May 28, 1992, § 102(e) Date May 28, 1992, PCT Pub. No. WO92/06430, PCT Pub. Date Apr. 16, 1992
PCT Filed Sep. 27, 1991, Ser. No. 859,318
Claims priority, application Japan, Sep. 28, 1990, 2-259391
Int. Cl.[6] G06F *13/00;13/14*
U.S. Cl. 395—200.07 **15 Claims**



1. A data communication system comprising:
a system bus; and
a plurality of processing modules connected to each other via said system bus, said processing modules each including:
a central processing unit;
a memory unit, accessible by said central processing unit, including:
a data processing part for causing the central processing unit to perform a predetermined function dependant on the content of a message;
a buffer forming a storage region and in which a transmitting message is decomposed and stored; and
a descriptor storage location for managing at least one descriptor which contains address and data length information of the storage region for a message in the form of a chain; and
a connection unit, forming an interface between said memory unit and said system bus, including:
a logical transmitting port with associated physical transmitting port for controlling message transmission to other processing modules by successively reading a message from the buffer based on the information stored in the descriptor and transmitting the message as a continuous message; and
a logical receiving port with associated physical receiving port for controlling message reception from other processing modules by receiving and successively storing the message transmitted thereto having that processing module as a destination based on the information stored in the descriptor;

an access control unit for interfacing with said central processing unit and said memory unit in said processing module;

a memory access control unit for accessing the memory unit;

a transmission control unit for processing an interface of a transmission process with the system bus;

a reception control unit for processing an interface of a reception process with said system bus;

a main sequence control unit for controlling said connection unit; and

a memory coupled to said main sequence control unit to provide a work area for said main sequence control unit.

5,592,625

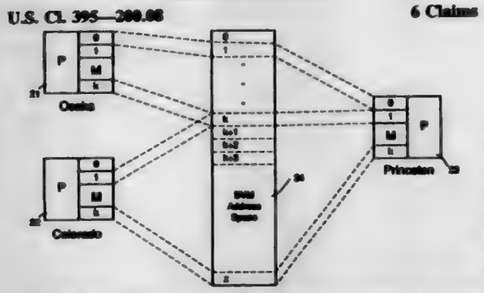
APPARATUS FOR PROVIDING SHARED VIRTUAL MEMORY AMONG INTERCONNECTED COMPUTER NODES WITH MINIMAL PROCESSOR INVOLVEMENT

Jonathan Sandberg, New York, N.Y., assignor to Panasonic Technologies, Inc., Secaucus, N.J.

Continuation of Ser. No. 286,794, Aug. 4, 1994, Pat. No. 5,522,045, which is a continuation of Ser. No. 859,887, Mar. 27, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,390

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.08 **6 Claims**



1. Apparatus at a first node to update a first memory location, each said first node having at least one first processor, first operating system and first memory location with first virtual memory location address, said first node connected in a network to a plurality of second nodes, each said second node having at least one second processor, second operating system and second memory location having a second virtual memory location address, wherein said first memory location and said plurality of second memory locations contain shared memory values, each said first node having at least one page table containing virtual addresses and physical addresses of said first memory locations at said first node and of said second memory locations at said plurality of second nodes, comprising:

(a) link hardware means at said first node for receiving a packet from said network containing an update value and said first virtual memory location address;

(b) means for accessing said at least one page table to translate said first virtual memory location address to a physical memory address corresponding to said first memory location; and

(c) means for updating, with said physical memory address, said first memory location with said update value;

whereby said receiving means and said updating means operate atomically independent of the operation of said first operating system.

5,592,626

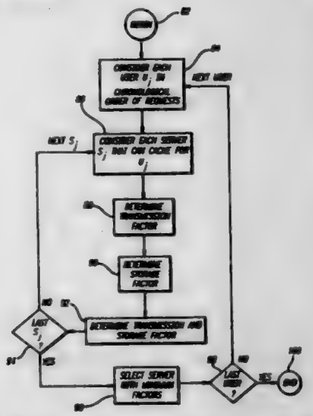
SYSTEM AND METHOD FOR SELECTING CACHE SERVER BASED ON TRANSMISSION AND STORAGE FACTORS FOR EFFICIENT DELIVERY OF MULTIMEDIA INFORMATION IN A HIERARCHICAL NETWORK OF SERVERS

Christos Papadimitriou, La Jolla, and P. Venkat Rangan, San Diego, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 192,654, Feb. 7, 1994. This application May 19, 1994, Ser. No. 246,246

Int. Cl.[6] G06F *13/00*; H04N *7/173*; H04H *1/02*

U.S. Cl. 395—200.09 **13 Claims**



1. In a multimedia delivery network system including a hierarchical plurality of program servers variously in various communication paths between a root node server and at least one first and one second user, a method for delivering a multimedia program having a primary time of transmission to the first and to the second users at respective user-selected first and second times, wherein the first time is simultaneous with or subsequent to the primary time of transmission and the second time is subsequent to the first time, and wherein the method comprises the steps of:

(a) for each of the hierarchical plurality of servers, determining a first transmission factor associated with transmitting if possible the program from the server to the first user;

(b) for each of the hierarchical plurality of servers, determining a first storage factor associated with storing the program at the server from the primary time of transmission to the first time;

(c) designating as a first server of the hierarchical plurality of servers the server having the lowest combined first transmission factor and first storage factor for receiving directly, or indirectly via other ones of the plurality of servers, the multimedia program from the root note server at the time of transmission, for storing the program until the first time, and for transmitting, directly or indirectly via other ones of the plurality of servers, the multimedia program to the first user at the first time;

(d) receiving directly, or indirectly via other ones of the plurality of servers, the multimedia program at the designated first server from the root note server at the time of transmission, storing the program at the designated first server until the first time, and transmitting, directly or indirectly via other ones of the plurality of servers, the multimedia program from the designated first server to the first user at the first time;

(e) for each of the hierarchical plurality of servers, determining a second transmission factor associated with transmitting if possible the program from the server to the second user;

(f) for each of the hierarchical plurality of servers, determining a second storage factor associated with storing the program at the server from the first time to the second time; and

(g) designating as a second server of the hierarchical of servers the server having the lowest combined second transmission factor and second storage factor for receiving, indirectly from the root note server via the first server, the multimedia program from the first server at the first time, for storing the program until the second time, and for transmitting, directly or indirectly via other ones of the plurality of servers, the multimedia program to the second user at the second time;

(h) receiving, indirectly from the root note server via the first server, the multimedia program at the designated second server from the designated first server at the first time, storing the program at the designated second server until the second time, and transmitting, directly or indirectly via other ones of the plurality of servers, the multimedia program from the designated second server to the second user at the second time.

5,592,627

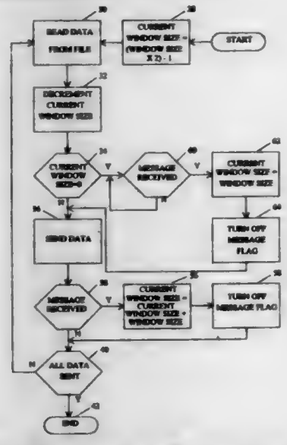
PIPELINED, SLIDING-WINDOW, FLOW CONTROL FOR END-TO-END COMMUNICATION SESSIONS

Denis Burt, Medway, Mass.; Patrick Pagano, and Dwayne Waite, both of Pittsburgh, Pa., assignors to Emprise Technologies, L.P., Wilmington, Del.

Filed Oct. 11, 1994, Ser. No. 321,176

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.13 **4 Claims**



3. A method of improving the efficiency of transferring data between a transmitting unit and a receiving unit in an application layer of an SNA network operating an LU6.2 communications session, comprising the steps of:

the transmitting unit and receiving unit agreeing upon a window size;

the transmitting unit:

setting a current window size equal to two times the window size minus one;

accepting data for transmission;

decrementing the current window size;

determining if the current window size equals zero and, if so, waiting to receive a message from the receiving unit and, upon receipt of said message, setting the current window size equal to the window size;

sending the data over the network;

setting the current window size equal to the current window size plus the window size if said message was received before the current window size reaches zero; and

returning to the accepting data step if all data has not been sent;

the receiving unit:

setting a current window size equal to the window size;

receiving a frame of data from the network;

decrementing the current window size;

sending the message to the transmitting unit and resetting the current window size equal to the window size if the current window size equals zero;

transferring the data; and

returning to the receiving data step until all data is received.

5,592,628

DATA COMMUNICATION SYSTEM WHICH GUARANTEES AT A TRANSMISSION STATION THE ARRIVAL OF TRANSMITTED DATA TO A RECEIVING STATION AND METHOD THEREOF

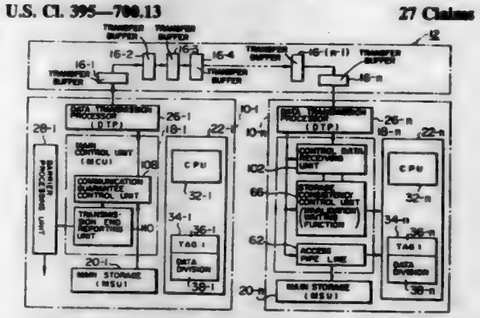
Haruhiko Ueno; Shigeru Nagasawa; Masayuki Ikeda; Naoki Shinjo; Ken-ichi Ishizaka; Teruo Utsumi; Masumi Dewa, and Kazushige Kobayakawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 109,519, Aug. 20, 1993, abandoned. This application Feb. 1, 1996, Ser. No. 595,585

Claims priority, application Japan, Nov. 27, 1992, 4-318212

Int. Cl.[6] G06F *15/163*

U.S. Cl. 395—700.13 **27 Claims**



1. A data communication system having a transmission station which serially transmits processed data in a first given order to a receiving station, said data communication system guaranteeing, to the transmission station, an arrival of the processed data at the receiving station, said data communication system comprising:

data communication network means for connecting a communication path between the transmission and receiving stations through at least one communication buffer; and

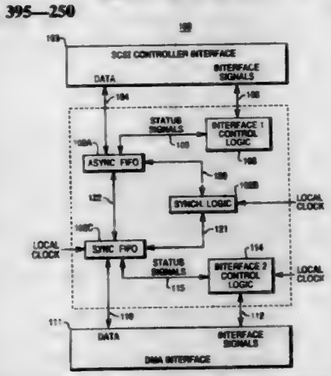
communication guarantee means, provided in said transmission station, for serially transmitting dummy data, having a length at least as long as a data length of all of said communication buffers existing in the established communication path formed by said data communication network means, in a second given order through all of said communication buffers existing in the established communication path to the receiving station subsequently to the processed data that is serially transmitted from the transmission station through all of said communication buffers existing in the established communication path, wherein the processed data, which has been transmitted prior to the dummy data, is forced in a run from said data communication network means at a time point when the transmission of the dummy data to said data communication network means is completed, thereby guaranteeing, to the transmission station, the arrival of the processed data at the receiving station.

5,592,629

APPARATUS AND METHOD FOR MATCHING DATA RATES TO TRANSFER DATA BETWEEN TWO ASYNCHRONOUS DEVICES

William H. Gamble, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed Dec. 28, 1992, Ser. No. 997,426
Int. Cl.[6] G06F *13/42*
U.S. Cl. 395—250 19 Claims



1. A circuit for matching data rates to transfer data between two asynchronous devices, comprising:

an asynchronous FIFO that has a first bi-directional data port, a second bi-directional data port, and a bi-directional control port;

a synchronous FIFO, that has a first bi-directional data port, a second bi-directional data port, and a bi-directional control port, said first bi-directional data port of said synchronous FIFO connected to said second bi-directional data port of said asynchronous FIFO; and

a synchronizer, that has a first bi-directional control port and a second bi-directional control port, said first bi-directional control port of said synchronizer connected to said bi-directional control port of said asynchronous FIFO and said second bi-directional control port connected to said bi-directional control port of said synchronous FIFO;

wherein asynchronous data signals from one of said asynchronous devices are transferred between said first bi-directional data port of said asynchronous FIFO and said second bi-directional data port of said synchronous FIFO to the other of the asynchronous devices after a delay.

5,592,630

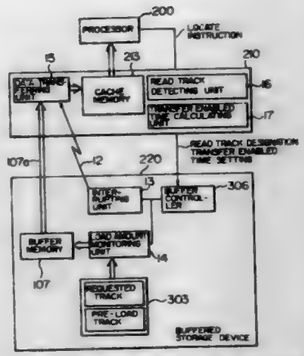
DATA TRANSFER APPARATUS AND METHOD FOR DATA PROCESSING SYSTEM

Kenji Yamagami, Kanagawa-ken; Akira Yamamoto, and Takao Satoh, both of Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1993, Ser. No. 37,022
Claims priority, application Japan, Apr. 3, 1992, 4-081894
Int. Cl.[6] G06F *13/00;13/14*
U.S. Cl. 395—250 14 Claims

1. A data transfer system for buffered storage devices in which information recorded in a recording medium is read via a buffer memory and a cache in response to a request from a processor, comprising:

a controller including said cache and a transfer information judging unit, said cache being connected to said processor for storing information, and said transfer information judging unit being responsive to a read instruction issued by said processor for reading information in said recording medium, and determining a first transfer enabled time for storing the information of a first track of said recording medium in said cache and a second transfer enabled time for storing the information of a second track of said recording medium in said cache; and



a storage device connected to said controller, said storage device including at least said recording medium having said first and second tracks corresponding to a request track for recording information requested from said processor and a pre-load track close to said request track, respectively, a buffer memory for temporarily storing the information read from said request track and pre-load track of said recording medium at every track, and a buffer controller receiving at least the information of said request track and said first and second transfer enabled times from said controller, for outputting an instruction to transfer at least the information of said request track and said pre-load track from said buffer memory to said cache at said first and second transfer enabled times,

wherein between said recording medium and said buffer memory and between said buffer memory and said cache a ratio of a speed for transferring the information from said recording medium to said buffer memory and a speed for transferring the information from said buffer memory to said cache is 1:n ($1 \leqq n$), and said buffer controller provides instructions such that the information of said request track is transferred from said buffer memory to said cache at said first transfer enabled time which occurs when at least $(1-1/n)$ of all of the information of said request track in said buffer memory has been transferred from said recording medium to said buffer memory and provides instructions such that the information of said pre-load track is transferred from said buffer memory to said cache at said second transfer enabled time which occurs when at least $(1-1/n)$ of all of the information of said pre-load track has been transferred from said recording medium to said buffer memory and,

wherein the read instruction which causes information of the request track and the pre-load track to be stored by the buffer memory, is a single read instruction.

5,592,631

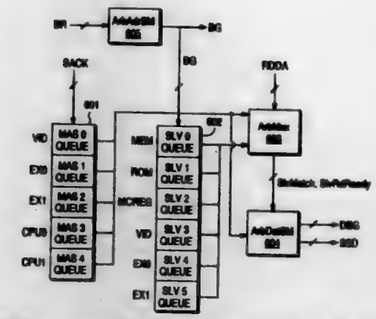
BUS TRANSACTION REORDERING USING SIDE-BAND INFORMATION SIGNALS

James D. Kelly, Aptos, and R. Stephen Polzin, Morgan Hill, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 2, 1995, Ser. No. 432,620
Int. Cl.[6] G06F *13/366*
U.S. Cl. 395—293 16 Claims

1. A method of increasing bus utilization in a computer system having a system bus including an address bus and a data bus and having, operatively connected to said system bus, a plurality of master devices and a plurality of slave devices, said method comprising the steps of:

providing a first plurality of signals including, for each master device an address arbitration signal;



providing a second plurality of signals including, for each slave device, a data arbitration signal, and a read-ready signal indicating that a respective slave device has data to present on the system bus;

providing a third plurality of signals including, for each slave device, an address termination signal;

forming an address arbitration vector composed of address arbitration signals for said master devices, an address termination vector composed of address termination signals for said slave devices, and a read-ready vector composed of read-ready signals for said slave devices;

sampling said address arbitration vector and said address termination vector;

using a queue structure having a front and a rear, queuing address arbitration and address termination vectors; and

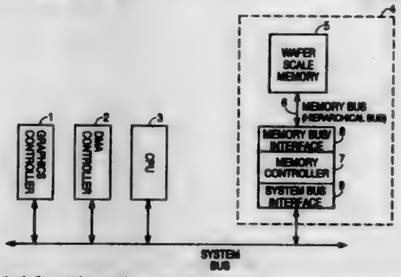
issuing a data arbitration signal to one of said slave devices based on address arbitration and address termination vectors at the head of the queue structure and based on said read-ready vector.

5,592,632

DEFECT TOLERANT INTEGRATED CIRCUIT SUBSYSTEM FOR COMMUNICATION BETWEEN A MODULE AND A BUS CONTROLLER IN A WAFER-SCALE INTEGRATED CIRCUIT SYSTEM

Wing Y. Leung, Cupertino, and Fu-Chieh Hsu, Saratoga, both of Calif., assignors to Monolithic System Technology, Inc., San Jose, Calif.

Division of Ser. No. 307,496, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 927,564, Aug. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 865,410, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 787,984, Nov. 5, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 469,887
Int. Cl.[6] G06F *11/20;13/00*
U.S. Cl. 395—306 15 Claims



1. A defect-tolerant integrated circuit subsystem comprising:

a plurality of modules comprising functional modules and one or more defective modules;

a hierarchical bus having a plurality of bus segments connecting to said modules;

a plurality of tri-stateable transceivers connected to the hierarchical bus for controlling signal transfer directions on said hierarchical bus and for preventing signal transfer on said hierarchical bus;

at least one bus master for controlling operation of said hierarchical bus, said at least one bus master being coupled to said plurality of tri-stateable transceivers; and

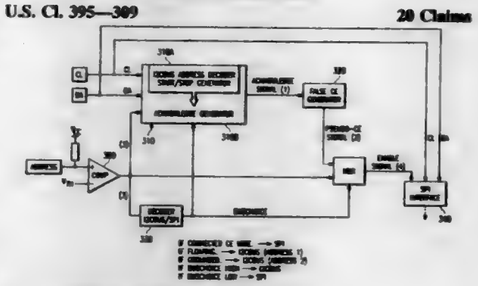
a plurality of programmable switches connected to the hierarchical bus for isolating said defective modules and defective bus segments of said hierarchical bus from a remainder of said subsystem.

5,592,633

INTEGRATED CIRCUIT INTERFACE TO CONTROL BUS WITH EITHER OF TWO DIFFERENT PROTOCOL STANDARDS

Marco Casis, Varese, and Giorgio Pedrazzini, Pavia, both of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Apr. 6, 1994, Ser. No. 223,949
Claims priority, application European Pat. Off., Apr. 6, 1993, 93830146
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—309 20 Claims



1. An integrated circuit, comprising:

first, second, and third external connections;

internal circuitry having data and clock inputs operatively connected to receive respective signals from said first and second external connections, and also having an enable input;

an edge detector which is operatively connected to detect transitions on said third connection, and to provide an output accordingly;

an enable signal generation circuit, connected to said first and second external connections and to said output of said edge detector, to produce an enable signal in dependence on data and clock signals received in accordance with a predetermined serial protocol, and in dependence on the state of said output of said edge detector;

a multiplexer, connected to said output of said edge detector, said enable signal generation circuit and said third external connector to provide an output, to said enable input of said internal circuitry,

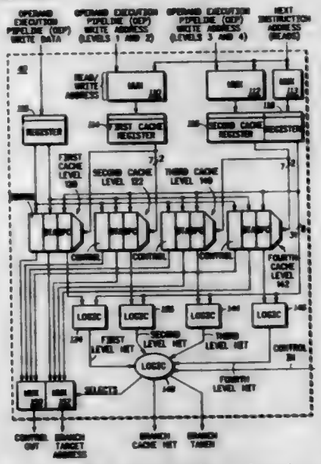
wherein when said output of said edge detector is in a first state, said multiplexer supplies said enable signal as output, and when said output of said edge detector is in a second state, said multiplexer supplies a signal received externally at said third connection.

5,592,634

ZERO-CYCLE MULTI-STATE BRANCH CACHE PREDICTION DATA PROCESSING SYSTEM AND METHOD THEREOF

Joseph C. Circello, and David J. Schimke, both of Phoenix, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 16, 1994, Ser. No. 242,766
Int. Cl.[6] G06F 9/30;9/38
U.S. Cl. 395—586 46 Claims



1. A data processing system having a branch cache which performs parallel writes to enable branch instruction folding, the data processing system comprising:

an execution unit;

the branch cache being coupled to the execution unit and having a plurality of storage locations, each storage location having a plurality of history bits to indicate whether a branch is likely to be taken or not likely to be taken, the branch cache being N-way set associative wherein N is a finite positive integer greater than one, the branch cache having at least two registers comprising a first address register and a second address register, the first address register being used to store a first plurality of address bits and the second address register being used to store a second plurality of address bits, the first plurality of address bits being different from the second plurality of address bits during at least one branch cache write operation so that two different locations in the branch cache are written in parallel to the branch cache.

5,592,635

TECHNIQUE FOR ACCELERATING INSTRUCTION DECODING OF INSTRUCTION SETS WITH VARIABLE LENGTH OPCODES IN A PIPELINE MICROPROCESSOR

Stephen H. Chan, Sunnyvale, Calif., assignor to Zilog, Inc., Campbell, Calif.

Continuation of Ser. No. 858,178, Mar. 25, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 276,060
Int. Cl.[6] G06F 9/30
U.S. Cl. 395—386 31 Claims

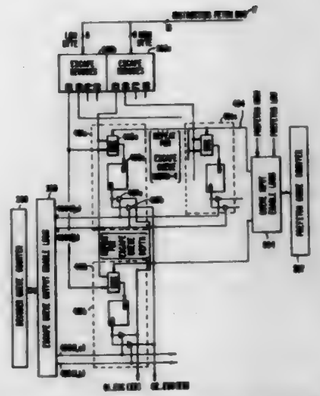
1. A central processing unit (CPU), comprising:

fetching means for fetching CPU instructions,

decoding means for decoding CPU instructions fetched by said fetching means,

executing means for executing CPU instructions decoded by said decoding means, and

examining means for examining, concurrently with the fetching of a CPU instruction by said fetching means, a first subset of bits in the CPU instruction, including means for generating at least one signal based upon said first subset of bits to accelerate decoding of the CPU instruction by the decoding means, wherein said examining means further comprises means responsive to said at least one signal for selecting a second subset of bits in said CPU instruction to be decoded by said decoding means.

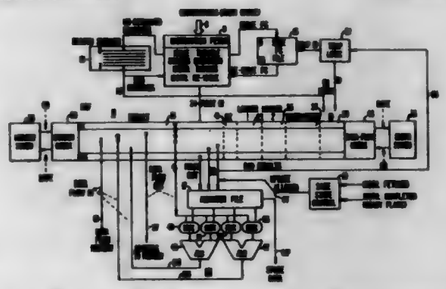


5,592,636

PROCESSOR ARCHITECTURE SUPPORTING MULTIPLE SPECULATIVE BRANCHES AND TRAP HANDLING

Valeri Popescu, San Diego; Merle A. Schultz, Escondido; Gary A. Gibson, Carlsbad; John E. Spracklen, and Bruce D. Lightner, both of San Diego, all of Calif., assignors to Hyundai Electronics America, San Jose, Calif.

Division of Ser. No. 622,893, Dec. 5, 1990, Pat. No. 5,487,156, which is a continuation-in-part of Ser. No. 451,403, Dec. 15, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 468,785
Int. Cl.[6] G06F 9/32;9/38
U.S. Cl. 395—586 16 Claims



1. A data processing system that performs operations responsive to a program including a plurality of instructions, the instructions including at least a first and second test instruction and at least a first and second branch instruction that determine an intended sequence of execution of the instructions within the program responsive to results of the first and second test instructions respectively, the system comprising:

an operation unit that executes the instructions by performing operations responsive to the instructions;

a branch prediction unit that speculates a first intended sequence of execution of the instructions responsive to the first branch instruction and speculates a second intended sequence of execution of the instructions responsive to the second branch instruction, the first and second intended sequences affecting sequence of execution of instructions by the operation unit;

an instruction shelving unit;

a fetching unit that continuously fetches instructions from an instruction memory responsive to said first and second intended sequences and that stores operations to be performed responsive to said instruction in said instruction shelving unit;

an evaluation unit that determines, responsive to execution of the first test instruction by the operation unit, whether the branch prediction unit has speculated the first intended sequence correctly, wherein the branch prediction unit speculates the second intended sequence prior to execution of the first test instruction;

a repair unit that, upon a determination by the evaluation unit that the branch unit has speculated either the first intended sequence or the second intended sequence incorrectly, nullifies the effects of instructions of the incorrectly speculated intended sequence;

a temporary result storage unit that stores results of the operations performed responsive to the instructions, the results including the presence or absence of a trapping condition for a potentially-trapping operation, and wherein the repair unit nullifies an instruction by reversing any update of results to the result storage unit affected by the nullified instruction and preventing any further update of results to the result storage unit by any future performance of operations responsive to the nullified instruction;

a register unit; and

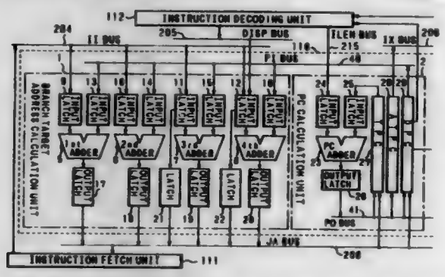
a retirement and flushing unit that retires instructions if the operations performed responsive to the instructions are not potentially trapping or their results are absent a trapping condition by updating the register unit with the results, and that flushes the performed operation and all following operations from the instruction shelving unit if the performed operation's result indicates the presence of a trapping condition by preventing the performance of these operations from updating the register unit, and that forces the fetching unit to re-fetch the instruction immediately following the instruction corresponding to the operation whose result indicates the presence of a trapping condition, the retiring and flushing unit disposing each instruction in the order of appearance in the sequence.

5,592,637

DATA PROCESSOR PROCESSING A JUMP INSTRUCTION

Masahito Matsuo, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 10,085, Jan. 27, 1993, Pat. No. 5,485,587. This application Sep. 29, 1995, Ser. No. 537,080
Claims priority, application Japan, Feb. 7, 1992, 4-22695
Int. Cl.[6] G06F 9/38;9/32
U.S. Cl. 395—584 1 Claim



1. A data processor for processing a jump instruction which jumps to an address specified by the instruction, and detecting exception when the jump target address does not satisfy the specified boundary condition, comprising:

a memory for storing instructions;

an instruction fetch unit for fetching the instructions from said memory;

an instruction decoding unit for decoding the instructions fetched by said instruction fetch unit;

an instruction execution unit for executing the instructions on the basis of the instruction decoding result by the instruction decoding unit; and

pre-jump means including a jump target address generating unit having means for generating the jump target address relating to processing the jump instruction, and transferring means for transferring said jump target address to said instruction fetch unit, judging means for judging the boundary condition of the jump target address, and means for, at processing the jump instruction, instructing to fetch an instruction of said jump target by transferring said jump target address generated in said jump target address generating unit to said instruction fetch unit via said transferring means;

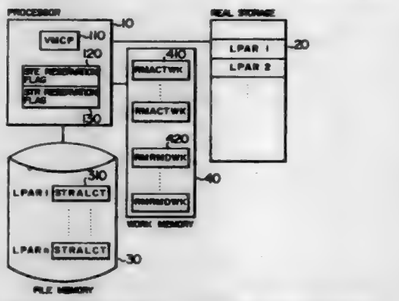
wherein at processing the unconditional jump instruction, said pre-jump means generates the jump target address in said jump target address generating unit, and transfers said jump target address to said instruction fetch unit via said transferring means, and said instruction fetch unit fetches an instruction of said jump target, when exception is detected by said judging means said unconditional jump instruction is processed in said instruction execution unit, and when the exception is not detected by said judging means said unconditional jump instruction is not processed in said instruction execution unit.

5,592,638

STORAGE REGION ASSIGNMENT METHOD IN A LOGICALLY PARTITIONED ENVIRONMENT

Osamu Onodera, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1993, Ser. No. 90,953
Claims priority, application Japan, Jul. 14, 1992, 4-186648
Int. Cl.[6] G06F 12/08
U.S. Cl. 395—406 12 Claims



12. In a data processor having a storage and a processor, a method of assigning a plurality of regions of said storage to a plurality of virtual machines according to a plurality of activating or non-activating storage region assignment requests, comprising the steps of:

(a) preparing, on the basis of said plurality of storage assignment requests each indicative of assignment of at least a storage extent of a storage origin, a reservation storage extent, and the storage extent in the storage regions, a parameter table holding therein the storage origins and the storage extents;

(b) generating, on the basis of said parameter table, a storage assignment table holding therein said storage origin and said storage extent;

(c) setting, on the basis of the storage activating assignment request, an activation flag in said storage assignment table;

(d) setting, on the basis of the designation of the storage origin and the nonactivating storage region assignment request, said activation flag in said storage assignment table to generate a plurality of assignment work tables each having an activation storage origin and an activation storage extent which are the same as said storage origin and said storage extent;

(e) arranging said plurality of assignment work tables in an ascending order of said storage origins;

(f) generating, on the basis of data of said plurality of assignment work tables, a plurality of remainder work tables each containing a remainder storage origin and a remainder storage extent indicative of a non-assignment region, in said storage origin ascending order;

(g) rearranging said plurality of remainder work tables in an ascending order of said remainder storage extents in said plurality of remainder work tables;

(h) determining, in said remainder storage extent ascending order, whether or not a request storage size contained in the storage assignment request does not exceed said remainder storage extents of said plurality of remainder work tables; and

(i) when it is determined that said request storage size does not exceed said remainder storage extents of said plurality of remainder work tables, copying said remainder storage origin and said remainder storage extent in said storage origin and said storage extent of said storage assignment table, respectively.

5,592,639

DEVICE AND METHOD FOR WRITING IN A STORAGE DEVICE OF THE QUEUE TYPE

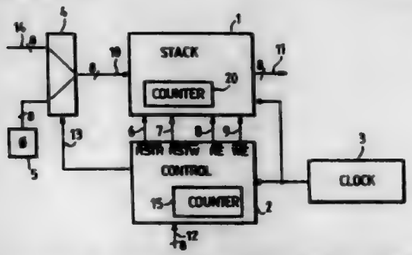
Jean-Claude Guillon, Gerstheim, France, assignor to Laboratoire Europeen de Recherches Electroniques Avancees Societe en nom Collectif, Courbevoie, France

Continuation of Ser. No. 613,630, Nov. 28, 1990, abandoned. This application Jan. 3, 1994, Ser. No. 176,675

Claims priority, application France, Apr. 4, 1989, 89 04405

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—428 **9 Claims**



1. A method for writing data into a given address of a first-in, first-out (FIFO) memory storage device under control of a control device, wherein the FIFO memory storage device comprises a FIFO counter, which can be reset and incremented by the control device, but wherein the FIFO counter cannot be read from the control device and the FIFO counter cannot be written by the control device, said method comprising the steps of:

specifying a given multi-bit memory address to which pertinent data is to be written by applying the given multi-bit memory address on a multi-bit address bus of the control device;

synchronizing a multi-bit address counter in the control device with the FIFO counter so that the multi-bit address counter and the FIFO counter are both reset to zero after the given multi-bit memory address is applied to the multi-bit address bus;

repetitively writing non-pertinent data into said FIFO memory storage device until the given multi-bit memory address is stored in the FIFO counter, wherein said multi-bit address counter and said FIFO counter are incremented each time a write operation is performed to said FIFO memory;

writing pertinent data into said FIFO memory storage device when the given multi-bit memory address is stored in the FIFO counter.

5,592,640

DATA PROCESSING APPARATUS CAPABLE OF READING DATA FROM DIFFERENT-FORMAT CD-ROMS ACCORDING TO DIFFERENT PROCESSING METHODS OF THE DATA

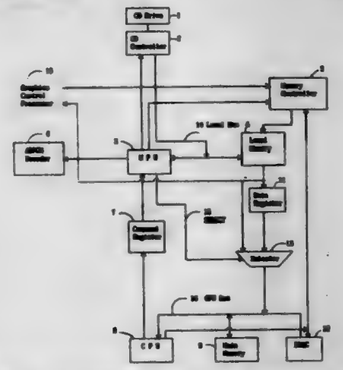
Hiroshi Minoura, and Shoji Yamaguchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 817,876, Jan. 6, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 347,195

Claims priority, application Japan, Jan. 18, 1991, 3-018278

Int. Cl.[6] G06F *13/12*

U.S. Cl. 395—428 **18 Claims**



1. A data processing apparatus for processing data of a CD-ROM which stores the data of one of plural, different formats, said data processing apparatus comprising:

a central processing unit issuing read commands based upon one of commands from a user and an application program;

a CD-ROM drive which reads the data from the CD-ROM;

command means for addressing the data in the CD-ROM, commanding the CD-ROM drive to read the data and specifying one of the plural and different formats and one of methods of processing the data read from the CD-ROM, based upon the read commands from the central processing unit;

memory means for storing the data read from the CD-ROM, wherein said memory means comprises an address space having a plurality of memory locations, each memory location being assigned an address which is addressable by said central processing unit so that a program instruction from said central processing unit directly accesses said memory means;

a main memory receiving and storing the data stored in said memory means in response to a memory control command from said command means;

a plurality of control means corresponding to the plural, respective and different formats of the data and methods of processing the data that are specified by said command means, each control means controlling the CD-ROM drive to read the data with the corresponding format addressed by said command means, for processing the data with the corresponding formats read in accordance with the corresponding formats and processing methods and for storing the data processed using the corresponding formats into said memory means; and

selection means for selecting one of said plurality of control means.

5,592,641

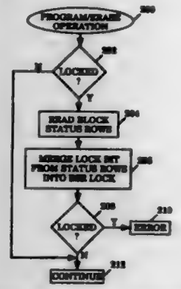
METHOD AND DEVICE FOR SELECTIVELY LOCKING WRITE ACCESS TO BLOCKS IN A MEMORY ARRAY USING WRITE PROTECT INPUTS AND BLOCK ENABLED STATUS

Mickey L. Fandrich, Placerville; Salim B. Fedel, Folsom; Thomas C. Price, Fair Oaks; Richard J. Durante, Citrus Heights; Geoffrey A. Gould, El Dorado Hills; Timothy W. Goodell, Elk Grove, and Scott M. Doyle, Citrus Heights, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 30, 1993, Ser. No. 85,546

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—430 **35 Claims**



34. A method for detecting whether a block in a memory array is write protected, the method comprising the steps of:

testing a flag to determine if the flag indicates that the block is write protected, the flag indicating that the block is write protected if a block enabled bit in a block Status register indicates the block is write protected and a write protect input is enabled;

if the flag indicates that the block is write protected, then

reading a block status from the memory array;

updating the block enabled bit in the block status register from the block status;

testing the flag to determine if the block is write protected; and

signaling an error if the block is write protected.

5,592,642

FERROELECTRIC STORAGE DEVICE EMULATING A ROTATING DISK DRIVE UNIT IN A COMPUTER SYSTEM AND HAVING AN OPTICAL AND PARALLEL DATA INTERFACE

Michael E. Thomas, San Jose, Calif., assignor to Framdrive, Greenbrae, Calif.

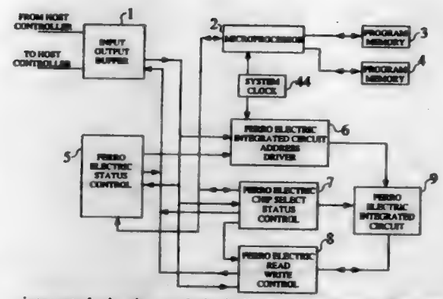
Continuation-in-part of Ser. No. 895,328, Jun. 8, 1992, Pat. No. 5,359,726, which is a continuation-in-part of Ser. No. 374,822, Jul. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,160, Dec. 22, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 326,657

Int. Cl.[6] G06F *3/00;13/00;* G11C *11/22*

U.S. Cl. 395—431 **15 Claims**

1. A solid-state, non-volatile random access memory (RAM) pack for emulating a rotating disk drive peripheral device in a host data processing system in response to control signals from the host data processing system, the control signals including stepping and stepping direction signals representing movement from a present location to a desired location; the non-volatile random access memory pack using the control signals to address a selected block of solid state memory within the memory pack using a given controller specification including the stepping and stepping direction signals and an indexing control signal, said memory pack comprising:

a removable solid-state non-volatile random access memory means for storing data, said random access memory means comprising a plurality of ferroelectric random access memory integrated circuits, each including a ferroelectric film layer underneath a silicon substrate;



optical parallel data interface means for coupling the random access memory means to said host data processing system, the optical data interface means including:

controller means for receiving control signals used for a disk drive peripheral device;

means for generating from the control signals an address for addressing a section of said random access memory means, said section including a plurality of data storage locations; and

means for sequentially addressing said data storage locations within the selected section when reading data from the random access memory to the disk drive controller and when writing data to the random access memory means from the disk drive controller; and from the host data processing system, including means for providing status signals including an index signal to the host data processing system.

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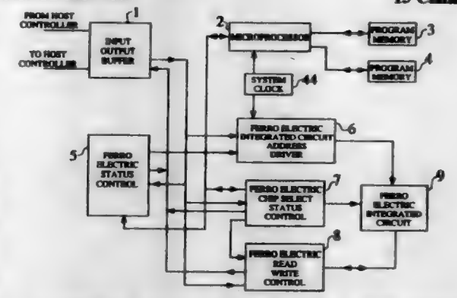
FERROELECTRIC STORAGE DEVICE EMULATING A ROTATING DISK DRIVE UNIT IN ACOMPUTER SYSTEM AND HAVING A PARALLEL DATA INTERFACE

Michael E. Thomas, San Jose, Calif., assignor to Framdrive, Greenbrae, Calif.

Continuation-in-part of Ser. No. 895,328, Jun. 8, 1992, Pat. No. 5,359,726, which is a continuation-in-part of Ser. No. 374,822, Jul. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,160, Dec. 22, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 326,659

Int. Cl.[6] G06F *3/00;13/00;* G11C *11/22*

U.S. Cl. 395—431 **15 Claims**



1. A solid-state, non-volatile random access memory (RAM) pack for emulating a rotating disk drive peripheral device in a host data processing system in response to control signals from the host data processing system, the control signals including stepping and stepping direction signals representing movement from a present location to a desired location; the non-volatile random access memory pack using the control signals to address a selected block of solid state memory within the memory pack using a given

controller specification including the stepping and stepping direction signals and an indexing control signal, said memory pack comprising:

a removable solid-state non-volatile random access memory means for storing data, said random access memory means comprising a plurality of ferroelectric random access memory integrated circuits, each including a ferroelectric film layer underneath a silicon substrate;

parallel data interface means for coupling the random access memory means to said host data processing system, the parallel data interface means including:

controller means for receiving control signals used for a disk drive peripheral device;

means for generating from the control signals an address for addressing a section of said random access memory means, said section including a plurality of data storage locations; and

means for sequentially addressing said data storage locations within the selected section when reading data from the random access memory to the disk drive controller and when writing data to the random access memory means from the disk drive controller; and in parallel from the host data processing system, including means for providing status signals including an index signal to the host data processing system.

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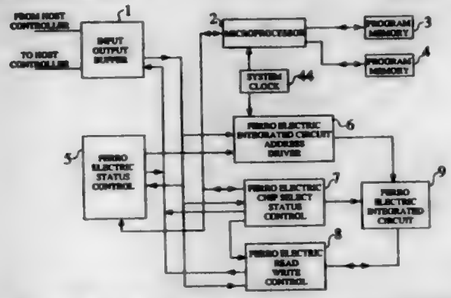
FERROELECTRIC STORAGE DEVICE EMULATING A ROTATING DISK DRIVE UNIT IN A COMPUTER SYSTEM AND HAVING AN OPTICAL DATA INTERFACE

Michael E. Thomas, San Jose, Calif., assignor to Framdrive, Greenbrae, Calif.

Continuation-in-part of Ser. No. 895,328, Jun. 8, 1992, Pat. No. 5,359,726, which is a continuation-in-part of Ser. No. 374,822, Jul. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,160, Dec. 22, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 326,660

Int. Cl.[6] G06F *3/00;13/00;* G11C *11/22*

U.S. Cl. 395—431 **15 Claims**



1. A solid-state, non-volatile random access memory (RAM) pack for emulating a rotating disk drive peripheral device in a host data processing system in response to control signals from the host data processing system, the control signals including stepping and stepping direction signals representing movement from a present location to a desired location; the non-volatile random access memory pack using the control signals to address a selected block of solid state memory within the memory pack using a given controller specification including the stepping and stepping direction signals and an indexing control signal, said memory pack comprising:

a removable solid-state non-volatile random access memory means for storing data, said random access memory means comprising a plurality of ferroelectric random access memory integrated circuits, each including a ferroelectric film layer underneath a silicon substrate;

optical data interface means for coupling the random access memory means to said host data processing system, the optical data interface means including:

controller means for receiving control signals used for a disk drive peripheral device;

means for generating from the control signals an address for addressing a section of said random access memory means, said section including a plurality of data storage locations; and

means for sequentially addressing said data storage locations within the selected section when reading data from the random access memory to the disk drive controller and when writing data to the random access memory means from the disk drive controller; and from the host data processing system, including means for providing status signals including an index signal to the host data processing system.

5,592,645

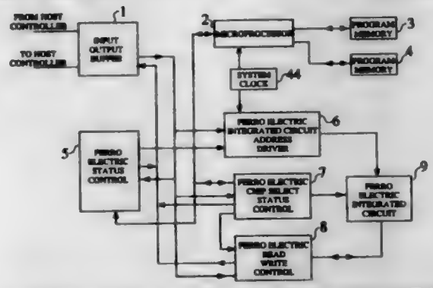
FERROELECTRIC STORAGE DEVICE EMULATING A ROTATING DISK DRIVE UNIT IN A COMPUTER SYSTEM AND HAVING A FREQUENCY MODULATED (FM) DATA INTERFACE

Michael E. Thomas, San Jose, Calif., assignor to Framdrive, Greenbrae, Calif.

Continuation-in-part of Ser. No. 895,328, Jun. 8, 1992, Pat. No. 5,359,726, which is a continuation-in-part of Ser. No. 374,822, Jul. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,160, Dec. 22, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 326,661

Int. Cl.[6] G06F *3/00;13/00;* G11C *11/22*

U.S. Cl. 395—431 **15 Claims**



1. A solid—state, non-volatile random access memory (RAM) pack for emulating a rotating disk drive peripheral device in a host data processing system in response to control signals from the host data processing system, the control signals including stepping and stepping direction signals representing movement from a present location to a desired location; the non-volatile random access memory pack using the control signals to address a selected block of solid state memory within the memory pack using a given controller specification including the stepping and stepping direction signals and an indexing control signal, said memory pack comprising:

a removable solid—state non-volatile random access memory means for storing data, said random access memory means comprising a plurality of ferroelectric random access memory integrated circuits, each including a ferroelectric film layer underneath a silicon substrate;

modulated radio frequency data interface means for coupling the random access memory means to said host data processing system, the frequency modulated data interface means including:

controller means for receiving control signals used for a disk drive peripheral device;

means for generating from the control signals an address for addressing a section of said random access memory means, said section including a plurality of data storage locations; and

means for sequentially addressing said data storage locations within the selected section when reading data from the random access memory to the disk drive controller and when writing data to the random access memory means from the disk drive controller; and from the host data processing system, including means for providing status signals including an index signal to the host data processing system.

5,592,646

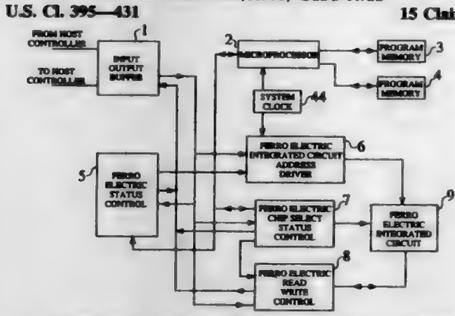
FERROELECTRIC STORAGE DEVICE EMULATING A ROTATING DISK DRIVE UNIT IN A COMPUTER SYSTEM AND HAVING A PARALLEL AND MULTIPLEXED OPTICAL DATA INTERFACE

Michael E. Thomas, San Jose, Calif., assignor to Framdrive, Greenbrae, Calif.

Continuation-in-part of Ser. No. 895,328, Jun. 8, 1992, Pat. No. 5,359,726, which is a continuation-in-part of Ser. No. 374,822, Jul. 3, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,160, Dec. 22, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 326,662

Int. Cl.[6] G06F *3/00;13/00;* G11C *11/22*

U.S. Cl. 395—431 **15 Claims**



1. A solid-state, non-volatile random access memory (RAM) pack for emulating a rotating disk drive peripheral device in a host data processing system in response to control signals from the host data processing system, the control signals including stepping and stepping direction signals representing movement from a present location to a desired location; the non-volatile random access memory pack using the control signals to address a selected block of solid state memory within the memory pack using a given controller specification including the stepping and stepping direction signals and an indexing control signal, said memory pack comprising:

a removable solid-state non-volatile random access memory means for storing data, said random access memory means comprising a plurality of ferroelectric random access memory integrated circuits, each including a ferroelectric film layer underneath a silicon substrate;

multiplexed optical parallel data interface means for coupling the random access memory means to said host data processing system, the multiplexed optical parallel data interface means including:

controller means for receiving control signals used for a disk drive peripheral device;

means for generating from the control signals an address for addressing a section of said random access memory means, said section including a plurality of data storage locations; and

means for sequentially addressing said data storage locations within the selected section when reading data from the random access memory to the disk drive controller and when writing data to the random access memory means from the disk drive controller; and from the host data processing system, including means for providing status signals including an index signal to the host data processing system.

5,592,647

PTC PANEL HEATER WITH SMALL RUSH CURRENT CHARACTERISTIC AND HIGHLY HEAT INSULATING REGION CORRESPONDING TO HEATER LOCATION TO PREVENT LOCAL OVERHEATING

Masahiro Yamauchi; Takashi Kaimoto; Mitsuhiko Furukawa; Katsutoshi Rikihisa; Hironori Yoshida, and Kenji Watanabe, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., and Kyushu Electric Power Co., Inc., both of Fukuoka, Japan

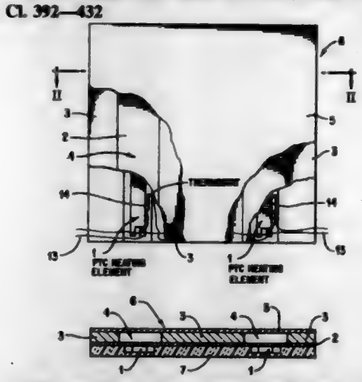
PCT No. PCT/JP92/01069, § 371 Date Apr. 8, 1993, § 102(e) Date Apr. 8, 1993, PCT Pub. No. WO93/04498, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 25, 1991, Ser. No. 39,114

Claims priority, application Japan, Aug. 26, 1991, 3-213969; Nov. 20, 1991, 3-305098

Int. Cl.[6] H01C *7/02;* H05B *3/14;3/20;* F24D *13/02*

U.S. Cl. 392—432 **6 Claims**



1. A PTC heater device comprising a PTC element including $BaTiO_3$ as a principal component thereof and Nb_2O_5 as an additive thereof, the amount of Nb in said PTC element is limited to less than 0.03% by weight, thereby suppressing a rush current.

5,592,648

METHOD FOR DEVELOPING PHYSICAL DISK DRIVE SPECIFIC COMMANDS FROM LOGICAL DISK ACCESS COMMANDS FOR USE IN A DISK ARRAY

Stephen M. Schultz, Houston; David S. Schmenk, The Woodlands; E. David Neufeld, Tomball; David L. Grant, Houston, and David L. Flower, Tomball, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

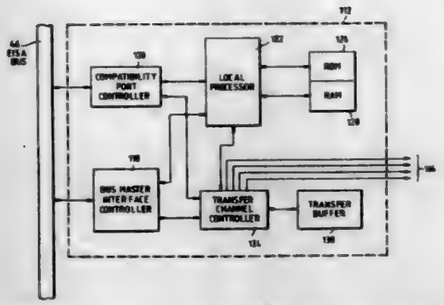
Division of Ser. No. 145,829, Oct. 28, 1993, Pat. No. 5,448,716, which is a continuation of Ser. No. 431,748, Nov. 3, 1989, abandoned. This application Dec. 7, 1993, Ser. No. 163,011

Int. Cl.[6] G06F *7/22*

U.S. Cl. 395—441 **11 Claims**

1. For use with a computer system having an intelligent mass storage disk array subsystem, the disk array subsystem including a plurality of disks and a microprocessor based disk array controller, a method for controlling disk access operations within the disk array comprising:

determining a disk array configuration and a selectable data distribution scheme for the particular computer system and disk array configuration, said data distribution scheme including a logical address to physical address mapping scheme and a fault tolerance mode;



the computer system generating a logical disk access request and sending said logical disk access request to the disk array controller;

the disk array controller receiving said logical disk access request;

the disk array controller creating at least one disk drive specific access command from said logical disk access request;

the disk array controller developing said disk drive specific access command by calculating physical drive parameters including disk drive cylinder, head and sector information to be used to access at least one disk drive within the disk array in response to said logical disk access request, the calculation of said physical drive parameters based on said disk array configuration and said data distribution scheme, the disk array controller loading said physical drive parameters into said disk drive specific access command after completing the calculation; and

the disk array controller queuing said disk drive specific access command for execution by the disk array controller.

5,592,649

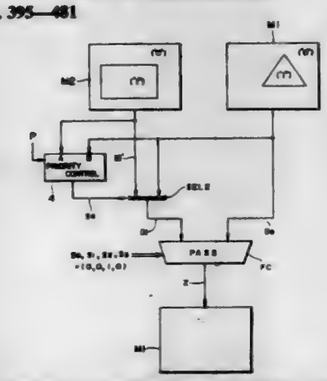
RAM CONTROL METHOD AND APPARATUS FOR PRESETTING RAM ACCESS MODES

Koichi Kimura, Yokohama; Toshihiko Ogura, Ebina; Hiroaki Aotsu, Yokohama; Mitsuru Ikegami, Kanagawa-ken, and Tadashi Kuwabara, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 942,217, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 349,403, May 8, 1989, Pat. No. 5,175,838, which is a continuation of Ser. No. 240,380, Aug. 29, 1988, Pat. No. 4,868,781, which is a continuation of Ser. No. 779,676, Sep. 24, 1985, abandoned. This application Jul. 26, 1994, Ser. No. 279,843

Int. Cl.[6] G06F *9/00;9/302*

U.S. Cl. 395—481 **8 Claims**



1. A method of accessing dynamic random access memory elements, formed on one chip as an integrated circuit device with an access control circuit, by an external device via a data bus, said data bus transfers data between said external device and said dynamic random access memory elements,

said one chip integrated circuit device having:

a first external terminal for inputting data from external of said one chip integrated circuit device into said dynamic random access memory elements and for outputting said data from said dynamic random access memory elements to said external of said one chip integrated circuit device, and

second external terminals for inputting access mode designation signals from said external of said one chip integrated circuit device,

said method comprising the steps of:

presetting said access control circuit to preset access mode data prior to commencement of either one of a read bus cycle and a write bus cycle of said dynamic random access memory elements by said external device, said preset access mode data corresponds to one access mode selected from a plurality of access modes in accordance with said access mode designation signals received from said external device via said second external terminals and via lines other than said data bus, said preset access mode data specifies a condition of a write operation of said dynamic random access memory elements in accordance with said access mode designation signals; and then

accessing said dynamic random access memory elements by said external device in accordance with said preset access mode data preset in said access control circuit.

5,592,650

COMPUTER APPARATUS AND METHOD FOR REPLACING PROGRAMS BETWEEN MEMORIES BY EMPLOYING PROTECTION MECHANISM WITH WRITE ENABLE GENERATION SCHEME

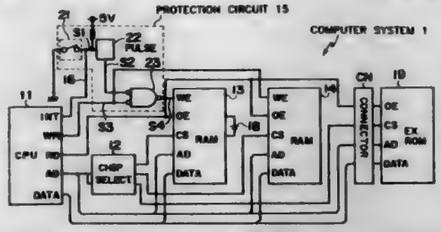
Toru Okatani, Kobe; Yoichi Kawabuchi; Syuzi Maruta, both of Toyokawa, and Keiichi Nomura, Amagasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 2, 1993, Ser. No. 86,159

Claims priority, application Japan, Jul. 7, 1992, 4-179872

Int. Cl.[6] G06F *12/16*

U.S. Cl. 395—490 **13 Claims**



3. In a computer system having a CPU and a program memory in which first programs to be executed by the CPU are stored, a program replacement device comprising:

a memory element in which data can be written and read, said memory element being employed as said program memory and having a write enable terminal;

a protection circuit interposed between the write enable terminal of said program memory and a write signal output terminal of said CPU, said protection circuit including an instruction section for instructing program replacement with respect to said program memory; a pulse generating circuit for generating a pulse signal having a given time interval in response to an instruction from said instruction section; and a gate circuit for making, only when the pulse signal is generated, a write signal outputted from said write signal output terminal of said CPU valid with respect to the write enable terminal of said program memory; and

an interruption generating circuit for generating in said CPU an interruption required to write second programs in said program memory in response to the instruction from said instruction section for replacing said first programs stored in said program memory by said second programs.

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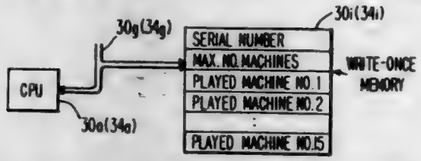
METHOD AND SYSTEM FOR LIMITING MULTI-USER PLAY OF VIDEO GAME CARTRIDGES

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230

Continuation of Ser. No. 75,823, Jun. 11, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 370,348

Int. Cl.[6] G06F *7/04;* G11B *15/04;19/04;* H04L *9/00*

U.S. Cl. 395—490 **1 Claim**



1. A method for limiting the number of different machines on which a compatible software medium may be played, said software medium and each of said machines transferring information therebetween, comprising the steps of associating with each machine one of a number of different machine identification codes, providing for storage in said software medium of up to at least ten machine identification codes associated with machines on which said software medium has been played, said number of different machine identification codes being substantially larger than the number of machine identification codes for which storage is provided in said software medium, storing in said software medium the identification code of any machine on which said software medium is played if said identification code is not already stored in said software medium and there is storage available in said software medium for at least one more machine identification code, and aborting play of said software medium by a machine if the identification code of the machine is not stored in the software medium and there is no more storage available for identification codes in said software medium.

5,592,652

SINGLE-CHIP MICROCOMPUTER SYSTEM HAVING ADDRESS SPACE ALLOCATION HARDWARE FOR DIFFERENT MODES

Katsunobu Hongo, and Tatsuya Oki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1995, Ser. No. 435,565

Claims priority, application Japan, May 6, 1994, 6-094448

Int. Cl.[6] G06F *12/00*

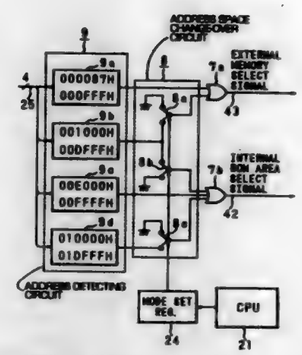
U.S. Cl. 395—497.01 **8 Claims**

1. A microcomputer system, comprising:

a single-chip microcomputer, in which a CPU, executing a program, and internal resources, including an internal ROM being accessed through execution of said program by said CPU, are configured on one chip, said internal ROM having an address space including an interrupt vector area for storing addresses of programs for interrupt processing and areas whereto addresses of said internal ROM are allocated; and

external resources connected with said single-chip microcomputer and being accessed through execution of the program by said CPU;

wherein said system can operate in either a first mode under which said CPU can access only said internal resources and said internal ROM is allocated to a first area in said address space, or a second mode under which said CPU can access both of said internal resources and said external resources and said internal ROM is allocated to a second area in said address space, said second area excluding said interrupt area,



further comprising:

address decoding means for decoding an address outputted from said CPU and accessing said address space in one of said first and second modes,

address space changing-over means for making said address decoding means access said first area of said internal ROM when a first value indicating said first mode is set as an address space changing-over bit, and for making said address decoding means access said second area of said internal ROM when a second value indicating said second mode is set as said address space changing-over bit.

5,592,653

INTERFACE CONVERSION DEVICE

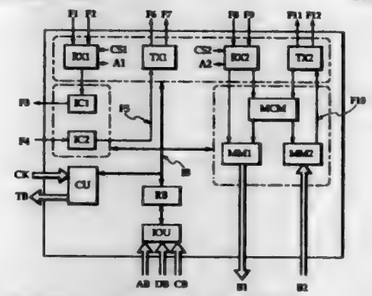
Juan A. Guedan, and Ana Ma del Mar M. Martin, both of Madrid, Spain, assignors to Alcatel, N.V., Amsterdam, Netherlands

Filed Apr. 20, 1994, Ser. No. 230,097

Claims priority, application Spain, Apr. 30, 1993, 9300926

Int. Cl.[6] H04J *3/06;3/07*

U.S. Cl. 395—500 **10 Claims**



1. An interface conversion device, comprising:

a first line received (RX1), responsive to a first input serial data stream (F1) and a second input serial data stream (F2), identical to each other, each having information bits, a parity bit and bits without information in each of a plurality of channels thereof, for providing a single serial data stream corresponding to one of the first and second input serial data streams that is selected by a first control signal (CS1) to which the first line receiver is also responsive;

a first interface converter (IC1), responsive to the single serial data stream, for providing a third serial data stream (F3) that contains only the information bits of the single serial data stream, transmitted at one half of an input bit rate of the single serial data stream, the bits without information and the parity bit of each channel being suppressed;

a second interface converter (IC2), responsive to a fourth serial data stream (F4) having information bits in a plurality of channels transmitted at said one half of the input bit rate, for providing a fifth serial data stream (F5) to which it adds, after each channel of the fourth serial data stream, a byte without information, in this way doubling the bit rate of the fourth serial data stream (F4), and

a first line transmitter (TX1), responsive to the fifth serial data stream (F5), for providing a parity bit for each channel and placing it in a last channel position, for providing a sixth serial data stream (F6) and a seventh serial data stream (F7), identical to each other at an output bit rate equal to said input bit rate,

wherein said first input serial data stream (F1) and said second input serial data stream (F2) together with said sixth serial data stream (F6) and said seventh serial data stream (F7) comprise a first redundant, bidirectional, proprietary interface bus for use within proprietary equipment and wherein said third serial data stream (F3) together with said fourth serial data stream (F4) comprise a nonredundant, bidirectional, first standard interface bus for use outside said proprietary equipment;

a second line receiver (RX2), responsive to an eighth input serial data stream (F8) and a ninth input serial data stream (F9), identical to each other, for providing a second single serial data stream corresponding to one of the eighth and ninth input serial data streams that is selected by a second control signal (CS2) to which the second line receiver is also responsive;

a first memory module (MM1), responsive to a memory write signal and to the second signal serial data stream, for temporarily storing four consecutive data frames for providing, in response to a memory read signal, a first bus (B1) containing eight streams that constitute bursts held in a standard interface, the write and read signals provided by a memory control module (MCM) of the interface conversion device;

a second memory module (MM2), responsive to a second bus (B2) having various standard interface streams in which are stored, in response to address signals provided by the memory control module (MCM), the various standard interface streams having data equivalent to four consecutive frames such that, in response to read signals provided by the memory module, a tenth (F10) serial data stream is provided; and

a second line transmitter (TX2) responsive to the tenth serial data stream (F10) for inserting four cyclic redundancy check bits in channels 15 and 31 for providing an eleventh serial data stream (F11) and a twelfth serial data stream (F12) which are identical,

wherein said eighth input serial data stream (F8) and said ninth input serial data stream (F9) together with said tenth serial data stream (F10) and said twelfth serial data stream (F12) comprise a second redundant, bidirectional, proprietary interface bus for use within said proprietary equipment and wherein said first bus (B1) together with said second bus (B2) comprise a nonredundant, bidirectional, second standard interface bus for use outside said proprietary equipment.

5,592,654

APPARATUS AND METHOD FOR CONVERTING A JOB CONFORMING TO A FIRST PROTOCOL INTO A JOB CONFORMING TO A SECOND PROTOCOL

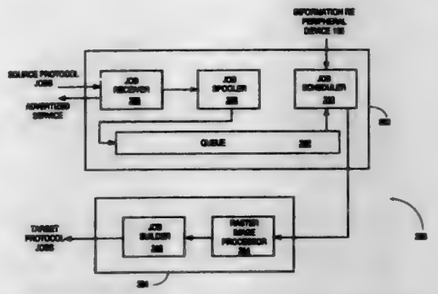
Vladan Djakovic, San Jose, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jun. 3, 1994, Ser. No. 253,457

Int. Cl.[6] G06F *13/10*

U.S. Cl. 395—500 **15 Claims**

14. An apparatus for submitting a first job, the first job conforming to a first graphical image description language and defining a task to be performed by a graphical display device, to the graphical display device which accepts jobs conforming to a second graphical image description language, the apparatus comprising a new



job generator for building from the first job a second job, the second job conforming to the second graphical image description language and defining the task, wherein the new job generator does not reside within the graphical display device and the new job generator comprises:

a raster image processor for reducing a graphical description contained in the first job into a bit-mapped image; and

a job builder, operatively coupled to the raster image processor, for building from the bit-mapped image the second job by inserting graphical commands of the second graphical image description language before and after the bit-mapped image.

5,592,655

LOGIC SIMULATION METHOD

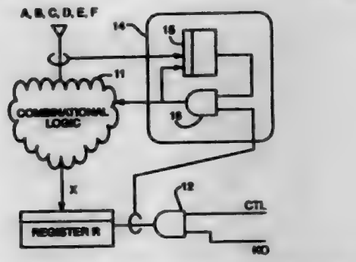
Yoshio Takamine; Kei Suzuki, both of Kokubunji, and Toshihiko Sugita, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 742,411, Aug. 8, 1991, abandoned. This application Nov. 18, 1994, Ser. No. 341,115

Claims priority, application Japan, Aug. 10, 1990, 2-210342

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **14 Claims**



1. A logic simulation system, for simulating a logic circuit which has a plurality of combinational logic circuits and a plurality of registers, comprising:

means for sensing a change in an input value sent to one of said combinational logic circuits;

means for storing an indicator, which was prepared for each combinational logic circuit, when said input value has changed;

means for generating a demand in response to input values received by another combinational logic circuit, and providing said demand to said one of the combinational logic circuits;

means for sensing a demand, and controlling execution of the simulation when said demand has been sensed and said indicator has been stored.

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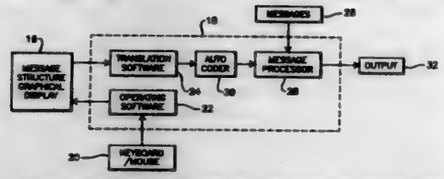
METHOD AND APPARATUS FOR PROCESSING MESSAGES HAVING ARBITRARY MESSAGE STRUCTURES WITHA MESSAGE PROCESSOR THAT IS CONDITIONED WITH A GRAPHICAL USER-DEFINED MESSAGE STRUCTURE

Jeanene D. Canzone, Pomona, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 114,260, Aug. 30, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,909

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—680 **16 Claims**



1. A method of enabling a message processor to process messages having a user-determined message structure, said message processor having a known message processing language and a coder which is pre-programmed to input a predetermined message processing function into the message processor to process said messages, comprising:

displaying a set of message structure descriptors on a graphical display,

defining said user-determined message structure on said graphical display in terms of said message structure descriptors,

translating the message structure thus defined into a language that is recognizable by said coder, and

generating message processing software for said message processor with said coder in response to said translated message structure to enable said message processor to perform said predetermined function upon messages having said user-defined message structure.

5,592,657

CONSOLE SIMULATOR, MULTI-CONSOLE MANAGEMENT SYSTEM, AND CONSOLE MANAGEMENT DISTRIBUTION SYSTEM

R. Brent Johnson, 10816 E. Newton St., Tulsa, Okla. 74116, and Darrell B. Burson, P.O. Box 580068, Tulsa, Okla. 74158

Continuation of Ser. No. 47,754, Apr. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 877,886, May 1, 1992, abandoned. This application Jan. 3, 1995, Ser. No. 367,950

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **5 Claims**

1. A computer-implemented system for simulating functions of a mainframe computer comprising:

a first central processing unit;

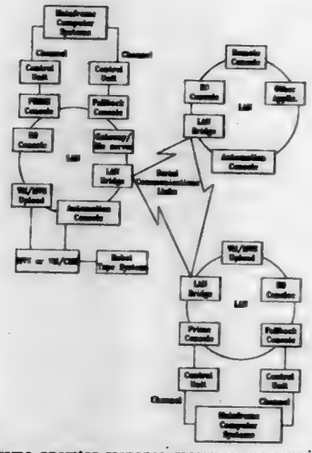
a memory, in communication with said first central processing unit, for storing a response message database of mainframe operator messages from a mainframe operating system and data representing the status of said simulated mainframe computer monitor console;

a second central processing unit in communication with said first central processing unit;

interface means for inputting operator input messages into said second central processing unit;

simulator engine means, stored in said memory and executed by said first central processing unit, for selecting from said mainframe operator response message database response messages in response to said operator input messages, for selecting response messages that are unsolicited with respect to operator input messages, for selecting response messages from a random events list and for updating data representing the status of said simulated computer monitor console; and

a display connected to said second central processing unit for displaying said operator input messages and said selected



mainframe operator response messages communicated from said first central processing unit.

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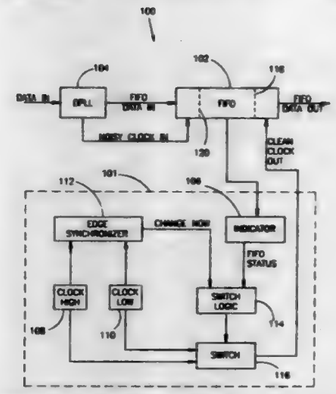
APPARATUS AND METHOD FOR COMPUTER NETWORK CLOCK RECOVERY AND JITTER ATTENUATION

Avishay Noam, Ramat Hasharon, Israel, assignor to Novacom Technologies Ltd., Israel

Filed Sep. 29, 1994, Ser. No. 315,179

Int. Cl.[6] G06F *1/10*

U.S. Cl. 395—558 **12 Claims**



1. A unit for controlling a data output rate from a First-In, First-Out (FIFO) buffer which outputs data in accordance with either a first output clock or a second output clock, said FIFO buffer receives data within a range of input rates, the unit comprising:

an indicator for indicating a level of fullness of said FIFO buffer;

first and second clocks which operate at first and second predetermined frequencies, respectively;

an edge synchronizer for indicating whether a first pulse of said first clock and a second pulse of said second clock are phase aligned; and

a switch, which receives an indication from said indicator, said indication being said level of fullness of said FIFO buffer, and from said edge synchronizer, which switches between said first and second clocks if said first and second pulses are

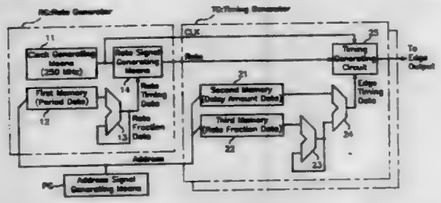
phase aligned and maintaining said first clock if said first and second pulses are not phase aligned.

5,592,659

TIMING SIGNAL GENERATOR

Akira Toyama, and Tatsuyuki Agata, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Oct. 30, 1995, Ser. No. 549,948
Claims priority, application Japan, Nov. 24, 1994, 6-289416
Int. Cl.[6] G06F *1/04*
U.S. Cl. 395—558 **5 Claims**



1. A timing signal generator comprising:
a rate generator means for generating a reference clock and rate signal; and
a timing generator means for receiving said reference clock and said rate signal from said rate signal generator means, and for generating an edge signal having a user defined delay period; wherein
said rate generator means comprises:
clock generating means for generating said reference clock having a fixed period;
first memory means for storing periodic data;
first adder means for adding said periodic data obtained from said first memory means to fractional data of rate timing data from a previous cycle; and
rate signal generating means for receiving said reference clock and said rate timing data, and for generating a rate signal having a predetermined resolution which corresponds to said periodic data; and wherein
said timing generator means comprises:
second memory means for storing data of said delay period;
third memory means for storing fractional data of data corresponding to said periodic data stored in said first memory means;
second adder means for adding said fractional data obtained from said third memory means to fractional data of a previous cycle;
third adder means for adding said data of said delay period obtained from said second memory means to data from said second adder means to produce edge timing data; and
timing pulse generating means for receiving said reference clock and said rate signal, and for generating a delay pulse which is initialized by said rate signal and which corresponds to said edge timing data.

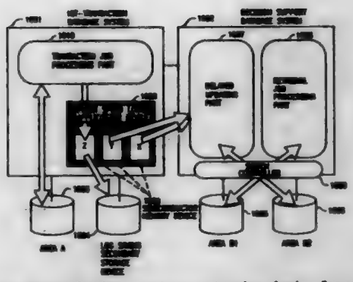
5,592,660

DATABASE MANAGEMENT SYSTEM TO ALTERNATELY PERFORM RETRIEVAL PROCESS AND UPDATING PROCESS

Haruo Yokota, Tatsunokuchimachi; Yasuo Noguchi, Kawasaki; Naoki Akabeshi, Kawasaki; Katsumi Hayashi, Kawasaki, and Seigo Hirotsu, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 13, 1992, Ser. No. 912,525
Claims priority, application Japan, Mar. 4, 1991, 4-046893; Jul. 12, 1991, 3-172756
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—608 **14 Claims**

1. A database system including a transaction database system processing device for executing a transaction database process and



a decision support database system processing device for executing a decision support process, comprising:
transaction database storage means, provided with said transaction database system processing device, for retaining a transaction database created and updated by the transaction database process;
a first and second database storage means, each provided with said decision support database system processing device, each for retaining a first and a second decision database, respectively, for use in said decision support process;
delayed updating means, provided with said decision support database system processing device, for alternately supplying, during consecutive time intervals starting at a first time interval, continuing through a second time interval and a third time interval and ending at a fourth time interval, each said time interval being a predetermined time interval, logs created at said first time interval and said second time interval to said first database storage means at said third time interval, and logs created at said second time interval and said third time interval to said second database storage means at said fourth time interval; and
retrieving means, provided with said decision support database system processing device, for alternately executing a retrieving process, in synchronism with said predetermined time intervals, for said second decision database stored in said second database storage means when said delayed updating means supplies said logs to said first database storage means and for said first decision database stored in said first database storage means when said delayed updating means supplies said logs to said second database storage means.

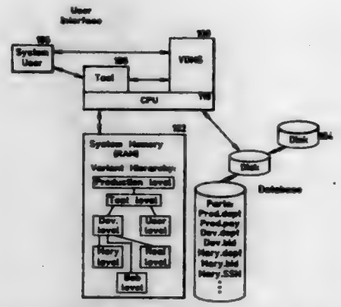
5,592,661

DETECTION OF INDEPENDENT CHANGES VIA CHANGE IDENTIFIERS IN A VERSIONED DATABASE MANAGEMENT SYSTEM

Neal R. Eisenberg, San Jose; Robert L. Huddleston, Sunnyvale, both of Calif.; Gary R. Karasiuk, Keswick, Canada; Tony K. Lee, San Jose, Calif.; Mary C. Lehner, San Jose, Calif.; Brian T. Tran, San Jose, Calif., and Charles S. Tribolet, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 16, 1992, Ser. No. 914,902
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **13 Claims**

1. A computer-implemented method for evaluating consistency of variants of a part that are candidates for promotion in hierarchical versioned data management system to determine candidacy status of the variants comprising the steps of:
for each variant of a part, providing a last_change identifier field for identifying a most recent change to the variant;
when a variant of a part is created, setting its last_change identifier field to a value currently unused for the part;
when a variant of a part is update, setting its last_change identifier field to a value currently unused for the part;
for each variant of a part, providing a drawdown_from identifier field for storing the last_change identifier value of the variant from which it was drawn down;



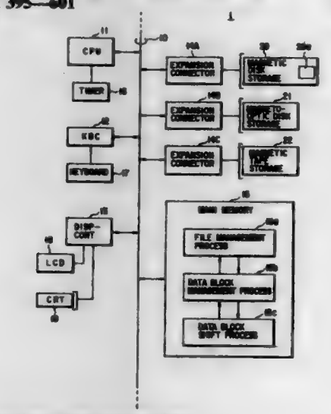
when a variant of a part is drawn down, setting its drawdown_ from identifier field to the value of the last_change identifier field of the variant from which it was drawn down;
receiving a request to promote a candidate variant of a part, said candidate variant having a hierarchically superior parent variant;
responsive to the request to promote, comparing the drawdown_ from identifier value for the candidate variant to the last_ change identifier value for the parent variant;
responsive to the compared drawdown_from identifier value equaling the compared last_change identifier value, maintaining the candidacy of the candidate variant;
responsive to the compared drawdown_from identifier value not equaling the compared last_change identifier value, rejecting the request to promote; and
when a variant of a part is promoted, leaving its last_change identifier field unaltered.

5,592,662

FILE MANAGEMENT SYSTEM AND METHOD FOR MANAGING ACCESS AND STORAGE OF DATA WITHIN MULTIPLE EXTERNAL MEMORY DEVICES

Takaaki Sawada, Sagamihara; Masahiko Yoshimura, and Seiji Yoshida, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1993, Ser. No. 128,219
Claims priority, application Japan, Sep. 30, 1992, 4-262118
Int. Cl.[6] G06F *7/00; 13/00*
U.S. Cl. 395—601 **23 Claims**



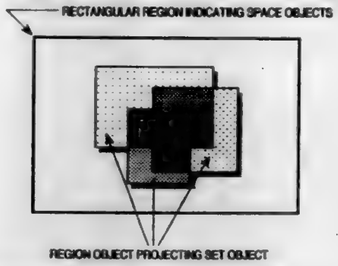
1. A computer system comprising:
at least two types of external memory devices, said external memory devices storing data blocks;
management means for assigning a unique data block identifier to the data blocks within said plural external memory devices, and for managing the data blocks;
memory means for storing the data block identifiers corresponding to the data blocks which constitute a file;
access means for acquiring, in response to a file access request, the data block identifier corresponding to the file access request by referring to the memory means, and for acquiring contents of the data block indicated by the data block identifier using the management means; and
shift means for shifting, in response to a request for a data block shift between the plural external memory devices, contents of a data block from a source external memory device to a destination external memory device using the management means, and for changing a data block identifier in the memory means corresponding to the data block of the source external memory device to the data block identifier corresponding to the data block of the destination external memory device.

5,592,663

GRAPHING METHOD AND APPARATUS FOR DATA BASE RETRIEVAL

Nobuhiko Nagamori, 5-5-13, Kusugidaidanchi, 1404, Kawashima-cho, Hodogaya-ku, Yokohama-shi, Kanagawa 240, Japan

Filed Dec. 17, 1993, Ser. No. 168,219
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—605 **20 Claims**



11. A database retrieval apparatus comprising:
a) a means for selecting a space object database;
b) a means for creating a plurality of set objects for retrieval of data from said space object database;
c) a means for displaying a visual representation of said plurality of set objects, wherein said display gives overlapping areas of said visual representation when data in said set objects is the same;
d) a means for selecting one or more area of said display; and
e) a means for extracting data from said space object which is within said one or more areas selected.

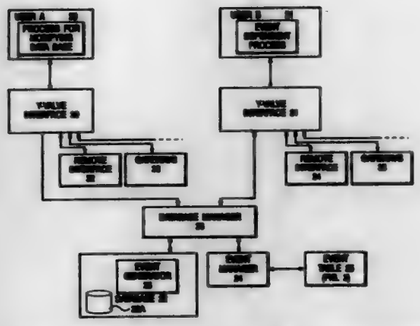
5,592,664

DATABASE SERVER SYSTEM WITH METHODS FOR ALERTING CLIENTS OF OCCURRENCE OF DATABASE SERVER EVENTS OF INTEREST TO THE CLIENTS

James A. Starkey, Manchester, Mass., assignor to Borland International Inc., Scotts Valley, Calif.

Continuation of Ser. No. 737,382, Jul. 29, 1991. This application Sep. 7, 1994, Ser. No. 276,739
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **25 Claims**

1. A multi-user computer system comprising:
a database server providing access to a database of information including at least one database field, said database server including a database manager for controlling said access to said database;
a first computer operating a process which requests modification of information stored in the database;
at least one second computer operating a process which is dependent on occurrence of a selected modification of infor-



mation stored in the database such that a selected database field in the database attains a preselected value;

means for requesting that said database server notify said at least one said second computer upon occurrence of said selected modification of information; and

event alerting means, residing on the database server and operably coupled to the database manager, said event alerting means detecting modification of information stored in the database and notifying said at least one second computer upon occurrence of said selected modification of information.

5,592,665

METHOD AND APPARATUS FOR FAST ACCESSING OF DATA ITEMS FROM A SORTED LIST FOR USE WITH SUCH METHOD AND/OR APPARATUS

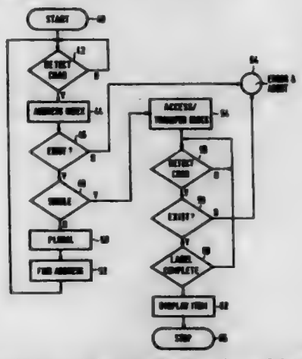
Paul D. M. E. Lahaije, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1994, Ser. No. 315,156

Claims priority, application European Pat. Off., Oct. 4, 1993, 93202816

Int. Cl.[6] G06F *12/08;17/30*

U.S. Cl. 395—604 **16 Claims**



1. A method for accessing a particular subset of data items from among a multiplicity of data items of a data base contained in a relatively slow background memory, each data item comprising a string of label elements, and said data base comprising a sequence of blocks together containing said data items and furthermore comprising an index containing a second multiplicity of treewise organized index items each comprising an initial part of a label header of an associated subset of data items, one or more pointers and an indication of whether all data items associated to that initial part are contained in only a single said block or in a plurality of said blocks, said method comprising the steps of:

storing said index in a relatively fast foreground memory;

with respect to said index detecting of a particular such initial part being called;

then upon finding with respect to the latter initial part said subset being contained in only a single block, reading the pointer contained in said index item as primary pointer to an associated single block and storing that block in said foreground memory while enabling extending said initial part to a full header for identifying said associated subset, and accessing such subset in the single block through its eventually completed label;

but upon finding with respect to the latter initial part said being contained in a plurality of blocks reading any pointer contained in said index item as secondary pointer to a further index item of said tree having the current initial part extended by a next successor label element while enabling selective extending of the current initial part by such next successor label element.

5,592,666

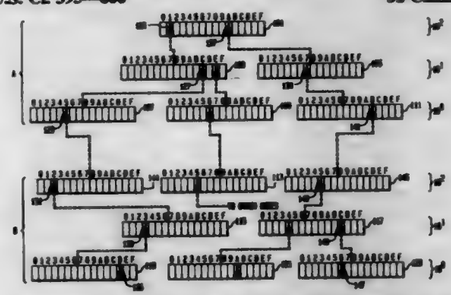
METHOD AND SYSTEM FOR STORING AND RETRIEVING DATA FROM A MULTIDIMENSIONAL ARRAY USING DATABASE POINTERS

Manuel Perez, Berkeley Heights, N.J., assignor to Singer Corporation, Warren, N.J.

Filed Oct. 31, 1994, Ser. No. 331,914

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—600 **32 Claims**



1. A computer-implemented method for storing within a database of a computer a series of database-pointers for values of a multidimensional array, said database-pointers corresponding to elements for said values with respect to dimensions of said array, at least one of said elements having no corresponding dabatase pointer, said method comprising the steps of:

(a) establishing a storage node within said database, said storage node being associated with one of said dimensions, said one dimension having N elements;

(b) allocating a storage location within said storage node;

(c) storing one of said database-pointers within said storage location;

(d) causing said one database-pointer to point to a second storage node within said database, said second storage node being associated with a second one of said dimensions, said second dimension having M elements;

(e) establishing a sub-storage area within said database, said sub-storage area being associated with said storage node and having N sub-storage locations, each of said N sub-storage locations corresponding to one of said N elements;

(f) storing a first indicium within a first sub-storage location of said sub-storage area, said first sub-storage location corresponding to a first element of said one dimension and said first indicium identifying said one database-pointer as corresponding to said first element; and

(g) storing a second indicium within a second substorage location of said substorage area, said second substorage location corresponding to a second element of said one dimension and said second indicium indicating that no database-pointer corresponds to said second element.

5,592,667

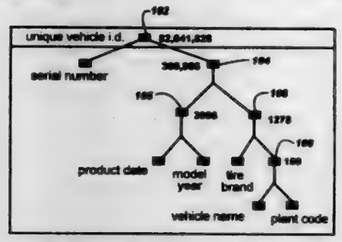
METHOD OF STORING COMPRESSED DATA FOR ACCELERATED INTERROGATION

Joseph M. Bugajski, Ypsilanti, Mich., assignor to Triada, Ltd., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 287,382, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 978,360, Nov. 18, 1992, Pat. No. 5,293,164, which is a continuation of Ser. No. 706,949, May 29, 1991, Pat. No. 5,245,337. This application Nov. 10, 1994, Ser. No. 336,942

Int. Cl.[6] G06F *7/00;12/00*

U.S. Cl. 395—613 **16 Claims**



1. A method of storing, in compressed form, a plurality of simultaneously occurring parallel data bodies, each comprised of sequentially ordered signals and with implied associations among the signals in the parallel data bodies, comprising the steps of:

creating a dictionary of unique signals for each of the simultaneously occurring parallel data bodies to be compressed and stored, the dictionary in each case consisting of a numerical index value associated with each unique field entry;

forming an n-ary tree having terminal and non-terminal nodes, including a single, highest non-terminal node representative of all lower derivative nodes, the terminal nodes of the tree corresponding to the dictionaries created for each of the simultaneously occurring parallel data bodies to be compressed and stored, each non-terminal node of the tree being represented by an associative memory assigning a numerical index value to each unique combination of the index values of the two nodes from which that non-terminal node is derived;

ordering the elements of the n-ary nodes by frequency and, thence, canonically within each associative memory;

canonically ordering one or more of the "n" sets of derivative index values within each associative memory;

storing a signal indicative of the counts of the number of times a signal or group of signals occurred in the data body;

reducing the canonically ordered set of index values to binary form, alternating from one binary value to the other as a change occurs in the ordering; and

storing data representative of the associative memories having been ordered and reduced.

5,592,668

METHOD AND APPARATUS FOR SPECIFYING A QUERY TO AN INFORMATION SYSTEM USING NATURAL LANGUAGE-LIKE CONSTRUCTS

James A. Harding, Issaquah, and Jonathan I. McCormack, Renton, both of Wash., assignors to Asymetrix Corporation, Bellevue, Wash.

Division of Ser. No. 112,852, Aug. 25, 1993, Pat. No. 5,495,604. This application Jun. 6, 1995, Ser. No. 488,384

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—602 **12 Claims**

1. Apparatus including a general purpose programmable digital computer, said computer having central processing means, bus means, display means, data entry means, memory means, data storage means, and graphical user interface for describing in a natural language a query to a database, said apparatus further comprising:

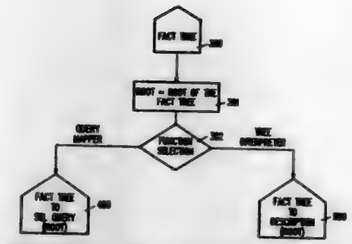


diagram means for producing a diagram on said display means;

cursor control means for moving a cursor over said diagram;

repository means further comprising relational database means implemented on said computer;

fact tree formation means for forming a fact tree based on said query; and

fact tree description means for describing said fact tree in said natural language, said fact tree description means including

(a) first variable assignment means for assigning variables based on said fact tree, said variables comprising root, parent, child and node, wherein said root is the root of said fact tree, said parent is the parent of said root, said child is the child of the root and said node is the number of the child,

(b) parent test means for testing if a value of said parent is null,

(c) root text creation means, responsive to a determination by said parent test means that said value of said parent is null, for creating text for said root,

(d) node text creation means, responsive to a determination by said parent test means that a value of said parent is not null, for creating text for said node,

(e) print means for printing, on said display means, said text created by said root text creation means and said node text creation means,

(f) counter means for counting an iteration as an iteration value,

(g) node test means for determining if said iteration value is equal to a value of said node, and

(h) recursive means for recursively invoking said fact tree description means using depth-first search means.

5,592,669

FILE STRUCTURE FOR A NON-VOLATILE BLOCK-ERASABLE SEMICONDUCTOR FLASH MEMORY

Kurt B. Robinson, Newcastle; Dale K. Elbert, and Markus A. Levy, both of Citrus Heights, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 395,916, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 636,238, Dec. 31, 1990, abandoned. This application Dec. 1, 1995, Ser. No. 565,929

Int. Cl.[6] G06F *17/30*

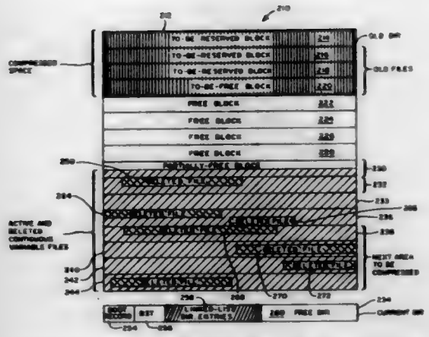
U.S. Cl. 395—622 **16 Claims**

1. A processor-controlled method of file management for a nonvolatile semiconductor memory with a plurality of physical erase blocks, wherein bits of the memory cannot be overwritten from a first logical state to a second logical state without a prior erasure, wherein erasure is by physical erase block and not on an individual byte basis, the method comprising the steps of:

(1) allocating a first portion of the memory in a first physical erase block for storing an active file and a deleted file;

(2) allocating a second portion of the memory in a second physical erase block for storing a copy of the active file;

(3) storing in an allocated third portion of the memory information as to whether a portion of the memory has been allocated



to store the active and deleted files or allocated to store the copy of the active file;

(4) reclaiming memory space by storing in the second portion of the memory the copy of the active file and by erasing the first physical erase block including the first portion of the memory in order to permit reuse of the first portion of the memory for storage;

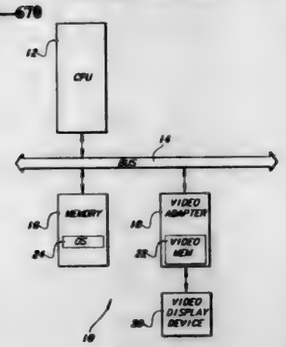
(5) storing data in the first and second portions of the memory in a inked-list variable file structure.

5,592,670

AVOIDANCE OF DEADLOCKS IN A DEMAND PAGED VIDEO ADAPTER

Richard A. Pletcher, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Nov. 2, 1992, Ser. No. 970,118
Int. Cl.[6] G06F 9/00
U.S. Cl. 395—670 **31 Claims**



1. In a data processing system including a processor and a memory having a plurality of pages and a plurality of page frames, each page and page frame for holding a page of information wherein the processor executes an instruction requiring a piece of information from a first page of the memory and a second page of the memory in order to complete the instruction, the location of the first page of the memory being different from the second page of the memory, and during the execution of the instruction the processor has access to only one page frame in the memory, a method comprising the steps of:

a) storing the page of information from the first page of the memory in the page frame;

b) determining whether the page of information stored in the page frame has been accessed; and

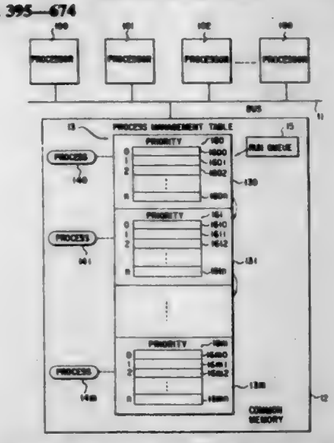
c) where the page of information stored in the page frame has yet to be accessed, detecting that a deadlock is imminent.

5,592,671

RESOURCE MANAGEMENT SYSTEM AND METHOD

Hideaki Hirayama, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 204,507, Mar. 2, 1994, abandoned. This application Jan. 5, 1996, Ser. No. 583,484
Claims priority, application Japan, Mar. 2, 1993, 5-041470
Int. Cl.[6] G06F 15/16
U.S. Cl. 395—674 **12 Claims**



5. A method for causing a plurality of processors to process a plurality of executable resources, the method comprising the steps of:

storing for each of the executable resources priority levels for each of the processors;

permitting each of the processors to select a resource based on the priority levels;

permitting each of the processors to process the selected resource; and

when one of the processors processes the selected resource, raising a priority level of the selected resource for that processor, leaving priority levels of not selected resources unchanged.

5,592,672

SYSTEM FOR LOAD BALANCING BETWEEN MESSAGE PROCESSORS BY ROUTING ALL QUEUED MESSAGES TO A PARTICULAR PROCESSOR SELECTED BY A DETERMINISTIC RULE

Kalwant S. Grewal, Long Valley; Jagdish A. Patel, Piscataway, and Tzyh-Jong Wang, Edison, all of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Continuation of Ser. No. 146,249, Nov. 2, 1993, abandoned. This application Jan. 18, 1996, Ser. No. 588,279
Int. Cl.[6] G06F 15/16
U.S. Cl. 395—200.15 **13 Claims**

1. A service controller comprising:

a plurality of front end communication processors each connected to a signalling link in each of two linksets;

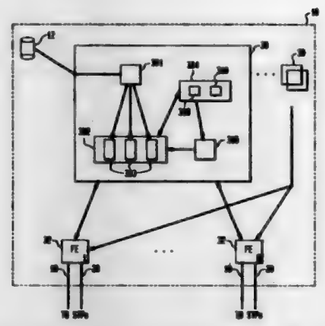
at least two independent control processors each connected to each of said front end processors with each said control processor comprising:

a memory for queuing outgoing messages addressed to a signalling link;

counter means for keeping track of the number of messages in queue;

timer means for keeping track of the time messages are in queue; and

message distribution means for using a deterministic rule for routing the messages in said memory to a one of said front end communication processors to control the load on the



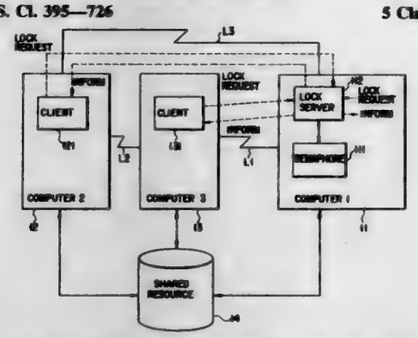
front and processors as identified by said rule when one of said counter means or said timer means reaches its predetermined threshold value.

5,592,673

LOOSELY COUPLED COMPOUND COMPUTER SYSTEM USING LOCK AND SEMAPHORE MECHANISM FOR PERFORMING EXCLUSIVE CONTROL OF SHARED RESOURCE WHICH IS ACCESSED THROUGH A DISTINCT BUS

Hiroaki Kurabayashi, and Shin-ichiro Mochizuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 842,520, Feb. 27, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 458,825
Claims priority, application Japan, Feb. 27, 1991, 3-032968
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—726 **5 Claims**



1. A loosely-coupled compound computer system constituted by connecting a plurality of computers through a network, said plurality of computers using a shared resource under exclusive control, each of the plurality of computers being connected to said shared resource through a distinct bus and wherein a specific computer of said plurality of computers comprises:

semaphore means for indicating a busy state of said shared resource according to a value of a semaphore variable which is increased/decreased in response to P and V operation instructions; and

means, coupling to said semaphore means, for issuing the P and V operation instructions added with computer identification data and task identification data indicating which task of which computer issued a use request or use end information of the shared resource through the network in response to a shared resource use request from another computer or the specific computer, and determining whether or not enabling information of the use request should be issued through the network to a source computer of the use request according to the value of the semaphore variable, and

each remaining computer of said plurality of computers comprises:

means for transmitting the shared-resource-use request to the issuing means in the specific computer through the network;

means for receiving the enabling information representing permission of the use request to access the shared resource from the issuing means in the specific computer through the network and then accessing the shared resource through the distinct bus;

means for waiting to use said shared resource until the enabling information from said semaphore means is received through the network; and

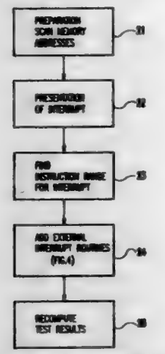
means for issuing, to the issuing means in the specific computer through the network, the use end information upon completion of the access to said shared resource, whereby the semaphore means releases the busy state of the shared resource.

5,592,674

AUTOMATIC VERIFICATION OF EXTERNAL INTERRUPTS

Alon Gluska, Kiriat Yam; Laurent Fournier, Givat Elah; Raanan Gewirtzman, Haifa, and Reuven Nisser, Kiriyat Byalik, all of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1994, Ser. No. 359,810
Int. Cl.[6] G06F 9/455;9/46
U.S. Cl. 395—742 **9 Claims**



1. In a dynamic process for generating biased pseudo-random test patterns for the functional verification of hardware designs using reference models, a method for adding to a test pattern the automatic verification of external interrupts in pipelined and superscalar processors under a very wide range of instruction sequences, wherein at the time each said interrupt is presented said processor will have fetched a first plurality of instructions, an unknown number of which may be executed prior to servicing said interrupt, the sequence and timing of said execution being unknown to said reference model, each said interrupt being one of a plurality of types, said microprocessor upon servicing said interrupt branching to a specific address according to said type, comprising the steps of:

identifying a second plurality of external interrupts to be verified;

scanning memory addresses for those addresses already used by a test and allocating unused memory spaces for a third plurality of memory blocks and two memory addresses for pointers;

presenting an interrupt of said second plurality of interrupts at any desired location in a test sequence of instructions, said location being determined by a design simulator controller;

finding an instruction range within said test sequence of instructions in which each said presented interrupt could be serviced, said instruction range corresponding to said first plurality of instructions;

adding external interrupt routines to the test for each said type of said second plurality of interrupts, said routines being executed each time an external interrupt of said type is serviced by said processor;

servicing said second plurality of external interrupts during an execution of said test sequence of instructions; and

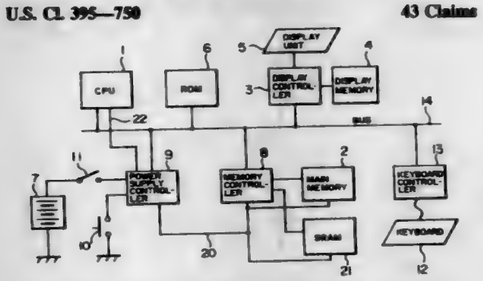
recomputing said test sequence using said reference model of said processor, thereby producing test results which can be compared to results of said execution of said test sequence.

5,592,675

COMPUTER CONTROLLED METHOD AND SYSTEM CAPABLE OF PRESERVING INFORMATION REPRESENTING PLURAL WORK STATES AND RECOVERING THE WORK STATES

Hiromichi Itoh; Keiichi Nakane, both of Yokohama; Naomichi Nonaka, Kawasaki, and Yoshinori Watanabe, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1993, Ser. No. 1,248
Claims priority, application Japan, Jan. 8, 1992, 4-001262
Int. Cl.[6] G06F *11/32*
U.S. Cl. 395—750 **43 Claims**



1. An information processing apparatus having a storage unit, a display unit and a processing unit for executing processing in accordance with programs stored in said storage unit, said apparatus comprising:

plural sets of intermediate work state preservation areas provided in said storage unit, each set of intermediate work state preservation areas being adapted to store therein respective first and second intermediate work state information representing at least an intermediate work state of said processing unit and an intermediate work state of said display unit at plural optional times during operation of said processing unit and said display unit respectively, said information including said first and second intermediate work state representing respective intermediate work states of said information processing apparatus;

means for storing information representing an intermediate work state of said information processing apparatus at an optional time into an optional one of said plural sets of intermediate work state preservation areas; and

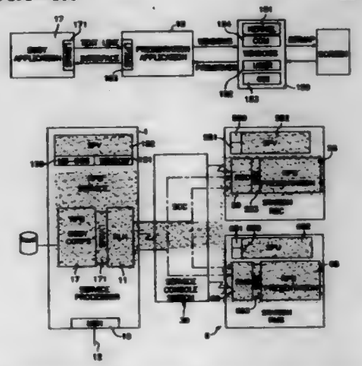
means for reading information stored in said optional one of said plural sets of said intermediate work state preservation areas and recovering an intermediate work state of said information processing apparatus represented by the read information.

5,592,676

SYSTEM ARCHITECTURE FOR ENABLING REMOTE CONSOLE CONTROL OF AN APPLICATION AND METHOD OF USING SAID ARCHITECTURE

Jean-Francois Bounafoux, Lamorlaye, France, assignor to Bull, S.A., Paris, France

Division of Ser. No. 661,848, Feb. 27, 1991, Pat. No. 5,396,629. This application Jan. 28, 1994, Ser. No. 169,399
Claims priority, application France, Feb. 28, 1990, 90.02517
Int. Cl.[6] G06F *9/40*
U.S. Cl. 395—800 **12 Claims**



1. An architecture for enabling remote console control of an application, said architecture comprising:

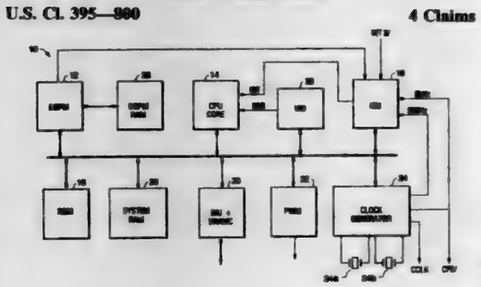
at least a first service processor connected via a network and a maintenance unit having channels connected to a central system, said first service processor being connected via a service console switch to a maintenance service console and to a remote service console, wherein each service processor and each said console further includes: operating system programs, a supervisor program, and at least a first service program, said service program comprising two independent applications, a first application being a body program comprising a program algorithm of said service program, said body program being independent of an interface, and a second application being a presentation program of said service program, said presentation program including said interface with a user-enabling, window-type display having a menu bar, each said body and presentation program including a message communication module linked to the body and presentation program to provide remote console control from any console of said body program via said presentation program, said programs being independent programs called via the message communication module, and said processors and consoles enabling remote console control of an application via said network using said programs.

5,592,677

INTEGRATED DATA PROCESSING SYSTEM INCLUDING CPU CORE AND PARALLEL, INDEPENDENTLY OPERATING DSP MODULE

Amos Intrater, Natanya, Israel; Andy Birenbaum, Lyons, France; Gideon Intrater, Tel-Aviv, Israel; Iddo Carmon, Kfar Saba, Israel; Ilan Shimony, Ramat-Gan, Israel; Itsel Fraenkel, Petah Tikva, Israel; Lev Epstein, Holon, Israel; Lior Katzri, Ramat-Aviv, Israel; Omri Viner, Hod Hasharon, Israel; · Raya Levitan, Givataim, Israel; Ronny Cohen, Ramat-Hasharon, Israel; Sidi Yomtov, Nex-Ziona, Israel; Yehezkel Tzadik, Hedera, Israel; Zvi Greenfeld, Kfar Saba, Israel; Israel Greiss, Raanana, Israel; Oved Oz; Yachin Afek, both of Cfar Saba, Israel; Meir Tsadik, Hod Hasharon, Israel; Moshe Doron, Givataim, Israel, and Alberto Sandbank, Natanya, Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 806,082, Dec. 6, 1991, abandoned. This application May 19, 1994, Ser. No. 246,554
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—800 **4 Claims**



1. A data processing system unitarily formed on an integrated circuit, comprising:

a shared internal bus for transferring instructions and data;

a general purpose (GP) central processing unit (CPU) connected to the shared internal bus and including means for executing GP instructions to process data;

a digital signal processor (DSP) module connected to the shared internal bus and including instruction executing means for processing an externally-provided digital signal received by the DSP module by executing DSP command-list code instructions;

a system memory that is connected to the shared internal bus and that holds GP instructions to be executed by, and data to be processed by, the GP CPU; and

a DSP module memory that is connected to the DSP module, but is not connected to the shared internal bus, and that holds command-list code instructions to be executed by, and operand data to be processed by, the DSP module, wherein the instruction executing means fetches all the command-list code instructions and all the operand data directly from the DSP module memory

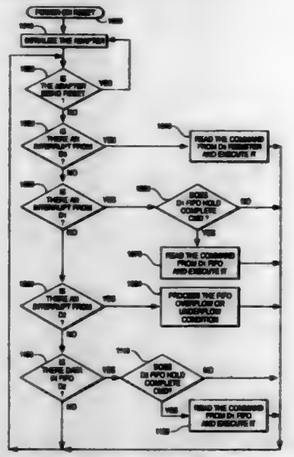
whereby the DSP module executes command-list code instructions independent of and in parallel with execution of GP instructions by the GP CPU.

5,592,678

DISPLAY ADAPTER SUPPORTING PRIORITY BASED FUNCTIONS

John A. Cook; Gregory A. Flurry; Larry W. Henson, and Bruce R. Wood, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 734,428, Jul. 23, 1991, abandoned. This application Nov. 9, 1994, Ser. No. 336,716
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—800 **14 Claims**



1. In a multitasking data processing apparatus including a common means for executing processes and including a display adapter for executing functions supporting a display, said display adapter comprising:

a) a first port means for receiving, from said common means for executing processes, requests to execute selected functions having a first execution priority;

b) a second port means for concurrently receiving, from said common means for executing processes, requests to execute selected functions having a second execution priority lower than said first execution priority;

c) a third port means for concurrently receiving, from said common means for executing processes, requests to execute selected functions having a third execution priority lower than said second execution priority;

d) a first and second port buffer means for storing said first and second port requests; and

e) processing means, coupled to said first and second port means, for executing said selected functions in response to said concurrently received requests from said common means for executing processes according to said execution priority based on which port means received said concurrently received requests, said processing means further including means for selecting said selected functions for execution according to said execution priority.

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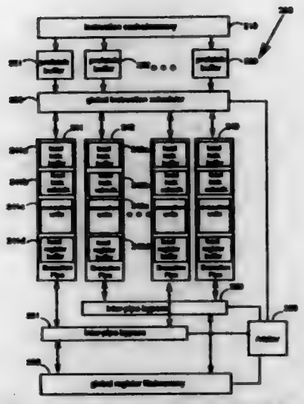
APPARATUS AND METHOD FOR DISTRIBUTED CONTROL IN A PROCESSOR ARCHITECTURE

Robert Yung, Fremont, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Nov. 14, 1994, Ser. No. 339,518
Int. Cl.[6] G06F *15/82*
U.S. Cl. 395—800 **9 Claims**

1. A distributed data flow (DDF) processor comprising:

a global instruction scheduler for distributing a plurality of instructions into sub-groups of instructions; and



a first and a second execution pipe coupled to said global instruction scheduler, each said execution pipe includes;

a local instruction buffer for receiving a corresponding one of said sub-groups of instructions;

at least one execution unit coupled to said local instruction buffer for executing said corresponding one sub-group of instructions;

a local register buffer coupled to said at least one execution unit for storing local register operand values generated by said at least one execution unit; and

a local instruction scheduler for scheduling said corresponding one sub-group of instructions, said local instruction scheduler providing said local register operand values to said at least one execution unit when said local register operand values are useful as source operand values by said at least one execution unit;

an inter-pipe bypass coupled to said first and said second execution pipe for transferring said local register operand values between said first and said second execution pipe;

an arbiter coupled to said inter-pipe bypass for garnering one of said local register operand values from said first execution pipe to said second execution pipe when said one local register operand value of said first execution pipe is useful as a source operand value for said second execution pipe; and

a global register file coupled to said arbiter for storing global register operand values, said arbiter garnering one of said global register operand values from said global register file to said first execution pipe when said one global register operand value is useful as a source operand value for said first execution pipe, wherein said global register file is coupled to said inter-pipe bypass and said one global register operand value is garnered from said global register file to said first execution pipe via said inter-pipe bypass.

5,592,680

ABNORMAL PACKET PROCESSING SYSTEM

Teruo Utsumi; Shigeru Nagaswa; Masayuki Ikeda; Naoki Shinjo; Masami Dewa; Haruhiko Ueno; Kazuhige Kobayakawa, and Kenichi Ishizuka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 163,784, Aug. 10, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,085

Claims priority, application Japan, Dec. 18, 1992, 4-338793

Int. Cl.[6] G06F 11/00

U.S. Cl. 395—800 **3 Claims**

1. An abnormal packet processing system in a data processing system comprising:

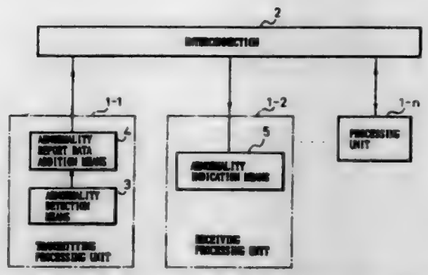
a network;

a receiving processor for receiving data in data packets from said network said receiving processor comprises abnormality indication means for analyzing abnormality report data of each received data packet and for indicating whether a malfunction exists in each respective received data packet; and

a transmitting processor for transmitting data in data packets, through said network, said transmitting processor comprising:

first means for detecting malfunctions which occur during transmission of each data packet from said transmitting processor; and

second means, coupled to said first means, for adding to each data packet, during transmission and in response to said first means, abnormality report data containing an indication that at least one of said malfunctions has occurred and a classification of each of the malfunctions which has occurred.



5,592,681

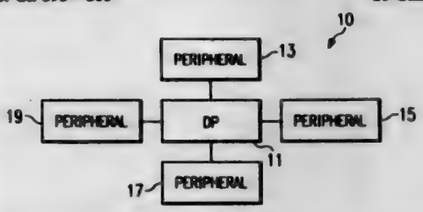
DATA PROCESSING WITH IMPROVED REGISTER BIT STRUCTURE

Jim D. Childers, Missouri City, Tex., and Paul J. Huckkamp, Minneapolis, Minn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 259,728, Jun. 14, 1994, abandoned. This application Oct. 16, 1995, Ser. No. 543,349

Int. Cl.[6] G06F 13/00

U.S. Cl. 395—800 **10 Claims**



1. A data processing system, comprising:

data processing circuitry for performing data processing operations on data provided thereto;

a peripheral device connected to said data processing circuitry for communication with said data processing circuitry;

said data processing circuitry including a register for holding data therein, said register including a register bit structure having a data input and a data output, said register bit structure also including a latch having an input connected to said data input and having an output, said register bit structure including a terminal connected to said latch output, and said register bit structure also including a multiplexer having an output connected to said data output, said multiplexer having a plurality of inputs, one of said multiplexer inputs connected to said latch output, and another of said multiplexer inputs connected to said terminal; and

wherein said multiplexer has a control input and connects said data output to said terminal when said control input indicates that said data processing circuitry is operating in a functional mode, and wherein said multiplexer connects said data output to said latch output when said control input indicates that said data processing circuitry is operating in an emulation mode or a test mode.

5,592,682

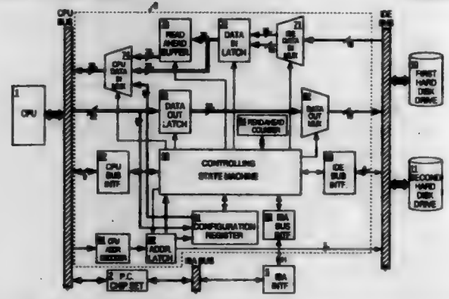
INTERFACE CIRCUIT FOR TRANSFERRING DATA BETWEEN HOST DEVICE AND MASS STORAGE DEVICE IN RESPONSE TO DESIGNATED ADDRESS IN HOST MEMORY SPACE ASSIGNED AS DATA PORT

Edward J. Chejlava, Jr., San Bruno; Leslie E. Cline, Sunnyvale, and Kenneth C. Curt, Saratoga, all of Calif., assignors to Cirrus Logic, Inc., Calif.

Continuation-in-part of Ser. No. 964,598, Oct. 20, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 329,557

Int. Cl.[6] G06F 15/02

U.S. Cl. 395—823 **7 Claims**



1. An interface circuit which transfers data from a host device to a mass storage device, said host device coupled to a computer bus, said host device having an IO space and a memory space, said interface circuit being coupled to said computer bus, said interface circuit comprising:

an address decoder having a first input lead coupled to said computer bus, and having a second input lead, a first output lead and a second output lead, said address decoder comprising circuitry responsive to receipt of a designated address in said memory space to produce at said first output lead a memory transfer control signal, said designated address being assigned as a data port for transferring data between said host device and said interface circuit;

a configuration register having an input lead and having an output lead coupled to said second input lead of said address decoder, said configuration register having stored therein said designated address, said configuration register outputting said designated address to said address decoder through said second input lead of said address decoder, said input lead of said configuration register being coupled to said second output lead of said address decoder;

a controlling state machine having an input lead coupled to the first output lead of said address decoder;

a computer bus interface circuit coupled to said controlling state machine and to said computer bus; and

a host data receiving circuit coupled to said computer bus for receiving data from said computer bus, wherein in response to receipt of said designated address said controlling state machine provides signals to said computer bus interface circuit whereby said computer bus interface circuit enables memory instruction transfer of data from said host device to said mass storage device via said host data receiving circuit and said computer bus.

5,592,683

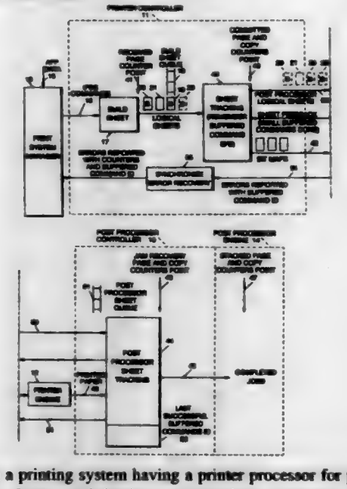
SYSTEM FOR SELECTIVELY PROCESSING NESTED PRINT COMMANDS AND BUFFERED POST-PRINT COMMANDS THEREAFTER AND RESENDING SELECTED PORTION OF DATA STREAM UPON ERROR DETECTION

Wellin Chen; James W. Marlin, both of Longmont; Ronald D. Parrish, Niwot; Frankie S. Shook, and David E. Stone, both of Longmont, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 18, 1994, Ser. No. 210,782

Int. Cl.[6] G06F 7/14; 11/08

U.S. Cl. 395—872 **6 Claims**



1. In a printing system having a printer processor for producing printed sheets, and having a post-printer processor for post-processing said printed sheets, a method for controlling said printer processor and said post-printer processor, comprising the steps of:

nesting printer commands and post-printer commands in a print data stream to said printer processor in said printing system,

said printer commands bounding a group of pages in said print data stream,

said group of pages containing one or more page data blocks, and

said post-printer commands defining one or more operations to be performed on said printed sheets that are printed from said page data blocks,

processing in said printer processor said page data blocks and printing said group of pages on said printed sheets in accordance with said printer commands in said print data stream,

synchronously buffering said post-printer commands in said printer processor as said printer processor processes said page data blocks, thereby creating buffered post-printer commands corresponding to said printed sheets,

merging said printed sheets from said printer processor with said buffered post-printer commands for said post-printer processor and passing said printed sheets and said buffered post-printer commands to said post-printer processor,

processing said printed sheets by said post-printer processor responsive to said buffered post-printer commands to perform post-printer processing of said printed sheets in accordance with said buffered post-printer commands,

maintaining a memory in said post-printer processor of a last successfully executed buffered post-printer command, and

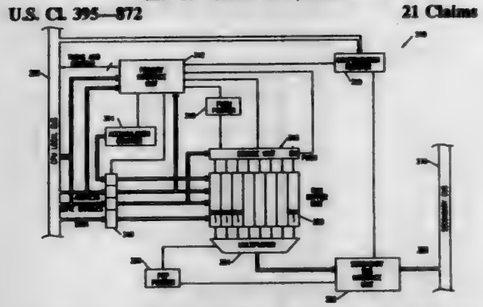
upon an error being detected in said printing system, resending said print data stream to said printing system in accordance with said last successfully executed printer command and buffered post-printer command.

5,592,684

STORE QUEUE INCLUDING A BYTE ORDER TRACKING MECHANISM FOR MAINTAINING DATA COHERENCY

Darius D. Gaskins, Austin, and Terry J. Parks, Round Rock, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Jul. 22, 1994, Ser. No. 279,758
Int. Cl.[6] G06F 13/14;13/38
U.S. Cl. 395—872 21 Claims



1. A store queue for temporarily storing data to be transferred from a primary bus to a secondary bus, said store queue comprising:

a storage unit including a plurality of word storage cells, wherein one of said word storage cells receives a first group of data in response to a first partial write cycle on said primary bus;

a primary bus interface unit coupled to said storage unit and said primary bus, wherein said primary bus interface unit determines whether a subsequent partial write cycle on said primary bus corresponds to a word address of said first partial write cycle, and wherein said primary bus interface unit causes a merging of a second byte of data associated with said subsequent partial write cycle into said one of said word storage cells if said subsequent partial write cycle corresponds to said word address of said first partial write cycle;

a byte order tracking circuit coupled to said storage unit and for tracking the order in which said first byte is written with respect to said second byte; and

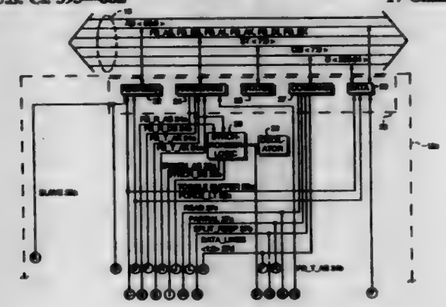
a secondary bus interface unit coupled to said storage unit and for transferring said first and second bytes of data from said one of said word storage cells of said storage unit during separate partial write cycles on said secondary bus.

5,592,685

SYNCHRONOUS/ASYNCHRONOUS PARTITIONING OF AN ASYNCHRONOUS BUS INTERFACE

Chester W. Pawlowski, North Chelmsford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 7, 1992, Ser. No. 957,977
Int. Cl.[6] G06F 13/14;13/20
U.S. Cl. 395—882 17 Claims



1. A data transfer device, comprising;

means for controlling data transfer between an asynchronous bus and said data transfer device including

a synchronous logic network to provide a transaction connection between said asynchronous bus and said data transfer device during an initial phase of said transaction;

an asynchronous logic network provide data transfer between said asynchronous bus and said data transfer device during a subsequent phase of said transaction;

a data buffer coupled to said asynchronous bus interfacing means and to said controlling means, to store data to be sent to said asynchronous bus and to store data received from said asynchronous bus;

said synchronous logic network further comprising means for determining that said data buffer stores data to be transferred during said transaction and for passing transaction control to said asynchronous logic network, during transfer of data to said asynchronous bus;

means for determining that said data buffer is available to store data received during said transaction and for passing transaction control to said asynchronous logic network, during receiving data from said asynchronous bus;

said asynchronous logic network further comprising means for transferring the data stored in said data buffer for said transaction and for returning transaction control to said synchronous logic network, during transfer of data to said asynchronous bus; and

means for storing data received from said asynchronous bus in said data buffer for said transaction and for returning transaction control to said synchronous logic network, during receiving data from said asynchronous bus;

means, coupled to said controlling means, for interfacing said data transfer device to said asynchronous bus.

5,592,686

POROUS METAL STRUCTURES AND PROCESSES FOR THEIR PRODUCTION

Christine E. Third, 8707 25 A Avenue, Edmonton, Alberta, Canada; Stephen F. J. Corbin, 8921 79 Avenue, Edmonton, Alberta, Canada, and Prasad S. Apte, 34 Langholme Drive, St. Alberta, Alberta, Canada

Filed Jul. 25, 1995, Ser. No. 506,492
Int. Cl.[6] B22F 7/02
U.S. Cl. 419—2 23 Claims

1. A process for the preparation of a porous metal component having controlled microporosity which comprises, the sequential steps of:

preparing a colloidal suspension comprising at least one metal powder having a particle size less than 300 microns, in admixture with a binder system, a plasticizer, a solvent and a pyrolysable, particulate pore-forming agent;

casting said colloidal suspension into a thin sheet;

air drying said sheet to thereby form a tape having preselected pliability properties;

layering a predetermined number of tape layers, and compacting said layers at pressures ranging from between about 5 to 60 MPa at temperatures in the range of between about 25° to 800° C. for a time effective to laminate said layers of tape and form a green body;

heating said green body at a controlled rate, at temperatures effective to remove the pyrolysable additives and form a brown body; and

sintering said brown body at temperatures in the range of between about 700° to 1400° C. to thereby form a porous metal structure.

DESIGNS

JANUARY 7, 1997

377,107

FRINGED BELT

Preston M. Baldwin, Box 404 Gadstontown Rd., Powell, Tenn. 37849, and Barry Snell, 172 Sexton Ln., Clinton, Tenn. 37716

Filed Jan. 5, 1994, Ser. No. 17,105
Term of patent 14 years
U.S. Cl. D2—627

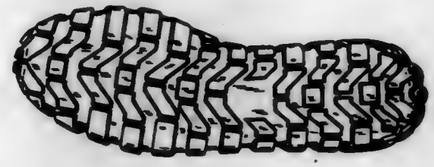


377,109

SHOE SOLE

Natale Manfredi, Vigevano, Italy, assignor to FILA SPORT S.p.A., Vercelli, Italy

Filed Aug. 3, 1995, Ser. No. 42,180
Claims priority, application Hague Agreement, Feb. 9, 1995, DM/032 072
Term of patent 14 years
U.S. Cl. D2—957



377,108

BILL GUARD FOR A CAP

Ronald N. Schulz, 6564 E. Michigan Ave., Lot 51, Saline, Mich. 48176

Filed Nov. 8, 1994, Ser. No. 30,798
Term of patent 14 years
U.S. Cl. D2—893

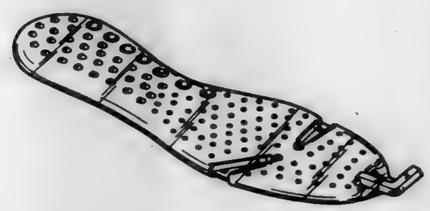


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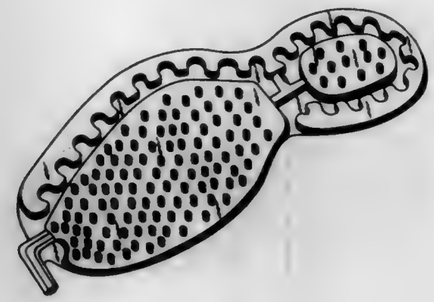
BLADDER FOR A SHOE SOLE

Joel L. Pauke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

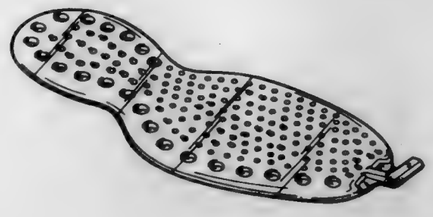
Filed Jun. 6, 1996, Ser. No. 55,477
Term of patent 14 years
U.S. Cl. D2—961



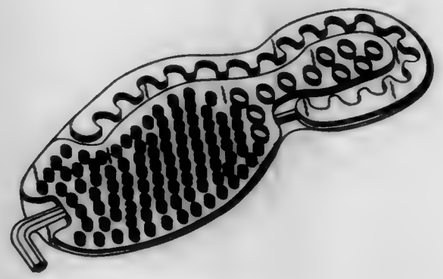
377,111
BLADDER FOR A SHOE SOLE
Joel L. Pauke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,479
Term of patent 14 years
U.S. Cl. D2—961



377,113
BLADDER FOR A SHOE SOLE
Joel L. Pauke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,533
Term of patent 14 years
U.S. Cl. D2—961



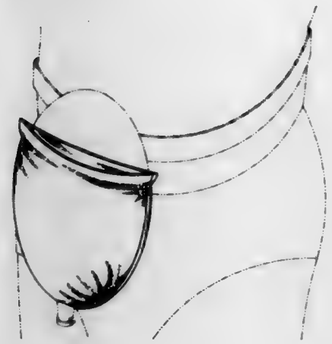
377,112
BLADDER FOR A SHOE SOLE
Joel L. Pauke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Jun. 6, 1996, Ser. No. 55,527
Term of patent 14 years
U.S. Cl. D2—961



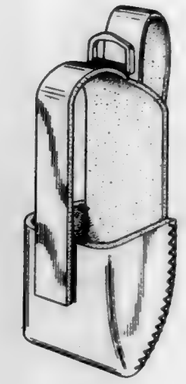
377,114
SHOE EYELETS
Kevin J. Crowley, Brentwood, N.H., and Joseph F. Davis, Brooklyn, N.Y., assignors to Fila U.S.A., Inc., Hunt Valley, Md.
Filed Nov. 22, 1995, Ser. No. 46,956
Term of patent 14 years
U.S. Cl. D2—978



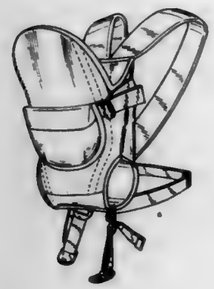
377,115
BAG COVER FOR A BODILY FLUID DRAINAGE POUCH
L. Ann Ferlend, and Ruth D. Adams, both of 338 Forest Lake Dr., Seabrook, Tex. 77586
Filed Jan. 29, 1996, Ser. No. 49,748
Term of patent 14 years
U.S. Cl. D3—203



377,117
CELLULAR PHONE HOLSTER
Norman Klassen, Carvel, Canada, assignor to Jaynor Contracting Ltd., Carvel, Canada
Filed Feb. 20, 1996, Ser. No. 50,468
Claims priority, application Canada, Sep. 13, 1995, 1995-2023
Term of patent 14 years
U.S. Cl. D3—218



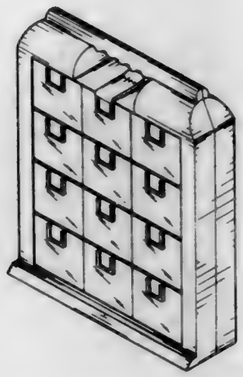
377,116
BABY CARRIER
Toshihide Shimura, and Hiroaki Matsuda, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Continuation of Ser. No. 21,386, Apr. 15, 1994, abandoned.
This application Nov. 2, 1995, Ser. No. 47,054
Claims priority, application Japan, Oct. 15, 1994, 5-31128
Term of patent 14 years
U.S. Cl. D3—214



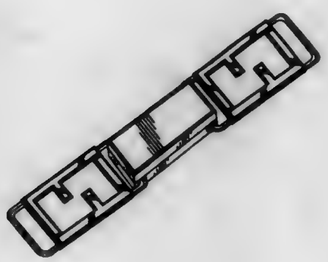
377,118
BELT-ATTACHED FLASHLIGHT HOLDER
Richard J. Carbone, Southbury, and Craig A. Dubois, Trumbull, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Jul. 24, 1995, Ser. No. 41,734
Term of patent 14 years
U.S. Cl. D3—228



377,119
TOOL BOX
Hsin-Te Huang, Fl. 1 No. 2 Alley 32 Lane 300 Ching-Haan Rd. Sec 2, Taichung, Taiwan
Filed Apr. 25, 1995, Ser. No. 37,975
Term of patent 14 years
U.S. Cl. D3—315



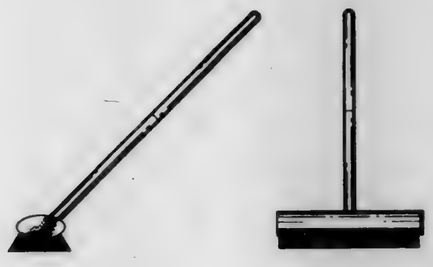
377,120
CLASP FOR PURSES AND HANDBAGS
Paola Fendi, Rome, Italy, assignor to Fendi Paolea & S.lle S.n.c., Rome, Italy
Filed Feb. 8, 1995, Ser. No. 34,608
Claims priority, application WIPO, Aug. 11, 1994, DM/030.395
Term of patent 14 years
U.S. Cl. D3—318



377,121
TOOTHBRUSH
Chin-Fu Lee, 58, Ma Yuan West St., Taichung, Taiwan
Filed Jan. 31, 1996, Ser. No. 49,776
Term of patent 14 years
U.S. Cl. D4—111



377,122
BROOM
Benjamin F. Lofton, 3207 Ridgeway Dr., Albany, Ga. 31707
Filed Jun. 8, 1995, Ser. No. 40,012
Term of patent 14 years
U.S. Cl. D4—132



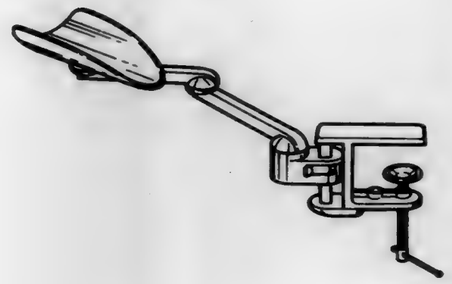
377,123
CAP HOLDER
Thomas Hutcheus, 715 E. 60th St., Indianapolis, Ind. 46220
Filed Sep. 28, 1995, Ser. No. 44,666
Term of patent 14 years
U.S. Cl. D6—323



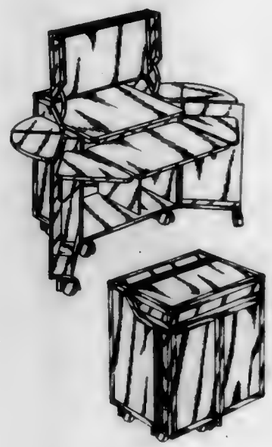
377,124
COMBINED BOWLING BALL RACK AND TABLE
Michael F. Stirling, and Michael J. Katje, both of Spring Lake, Mich., assignors to Brunswick Bowling & Billiards Corporation, Muskegon, Mich.
Filed Jan. 5, 1995, Ser. No. 33,090
Term of patent 14 years
U.S. Cl. D6—397



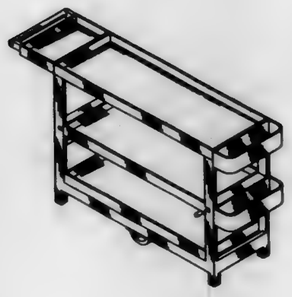
377,125
ELBOW REST
Stefan Adamsson, Vänersborg, Sweden, assignor to Sun-Flex AB, Sweden
Filed Oct. 20, 1995, Ser. No. 45,700
Claims priority, application Sweden, Aug. 14, 1995, 95-1536
Term of patent 14 years
U.S. Cl. D6—418



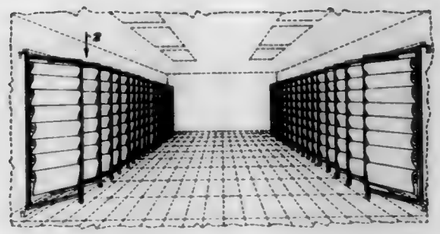
377,126
FOLDABLE MOBILE
Keith E. Foco, Holland, and Renna L. Jacobs, Saugatuck, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Feb. 7, 1996, Ser. No. 50,042
Term of patent 14 years
U.S. Cl. D6—425



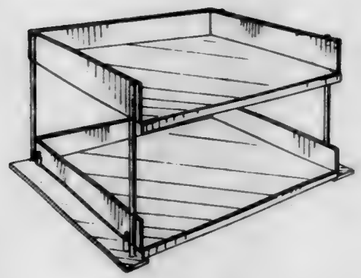
377,127
COMBINED PLANT TROLLEY AND POTTING BENCH
Christopher J. Barrington, 33 Glebelands Johnston, Haverfordwest, Dyfed, S.W. Wales, United Kingdom
Filed Nov. 29, 1993, Ser. No. 15,765
Term of patent 14 years
U.S. Cl. D6—477



377,129
COMBINATION DISPLAY RACK AND ROLLED GOODS
Gary W. Loflin, 722-2A Salem St., Thomasville, N.C. 27360
Filed Feb. 23, 1995, Ser. No. 35,248
Term of patent 14 years
U.S. Cl. D6—520



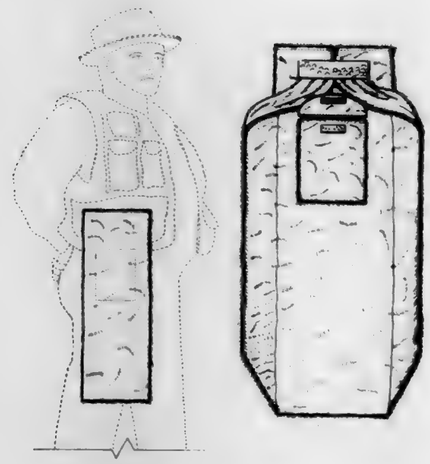
377,128
SHELVING UNIT
William E. Baker, 5513 Jordan Dr., Loveland, Colo. 80537
Filed Oct. 3, 1995, Ser. No. 44,902
Term of patent 14 years
U.S. Cl. D6—479



377,130
KNEE CUSHION
Harold H. Dutton, Jr., 128 Gansevoort Rd., Ft. Edward, N.Y. 12828
Filed Sep. 7, 1995, Ser. No. 43,598
Term of patent 14 years
U.S. Cl. D6—601



377,131
SPORTSMAN'S TOWEL DEVICE
Robert E. Davis, P.O. Box 1, Belsano, Pa. 15922
Filed Feb. 6, 1995, Ser. No. 34,433
Term of patent 14 years
U.S. Cl. D6—608



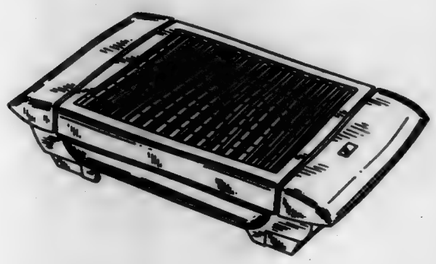
377,132
COFFEEMAKER
Carsten Jørgensen, Triengen, Switzerland, assignor to PI-Design AG, Triengen, Switzerland
Filed Jan. 27, 1995, Ser. No. 34,133
Term of patent 14 years
U.S. Cl. D7—318



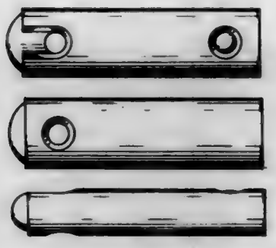
377,133
TOASTER
Franz A. Stützer, Offenbach am Main, and Bernd Figur, Schaafheim/Schlierbach, both of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Germany
Filed Jan. 29, 1996, Ser. No. 49,677
Claims priority, application Germany, Jul. 28, 1995, M 95 05 960.1
Term of patent 14 years
U.S. Cl. D7—330



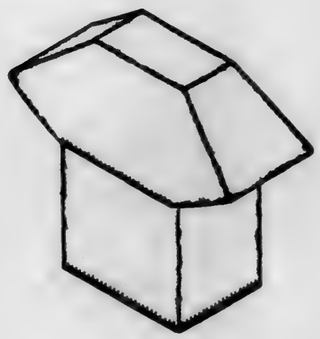
377,134
CULINARY GRILL
Vincent Des Touche, Vieugy, France, assignor to Tefal S.A., Rumilly, France
Filed Aug. 2, 1995, Ser. No. 42,132
Claims priority, application France, Feb. 3, 1995, 950 662
Term of patent 14 years
U.S. Cl. D7—362



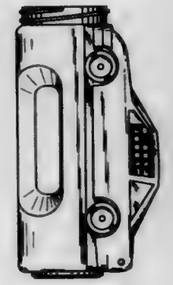
377,135
GADGET HANDLE
Bruce Ancona; Jane Ancona, both of 21 E. 22nd St., #6K, New York, N.Y. 10010, and Mary J. DeGuzman, 101 W. 74th St., #3E, New York, N.Y. 10021
Filed Sep. 7, 1995, Ser. No. 43,614
Term of patent 14 years
U.S. Cl. D7—401.2



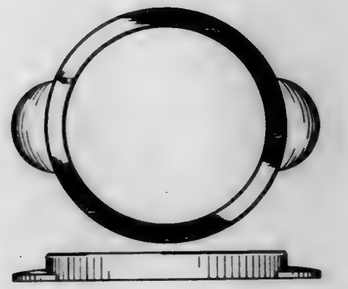
377,136
TWO PART BBQ COVER
Roberta Knuth, 12708 NW. 13th St., Sunrise, Fla. 33323
Filed Jul. 11, 1995, Ser. No. 41,305
Term of patent 14 years
U.S. Cl. D7—402



377,137
DRINK CONTAINER IN THE SHAPE OF AN AUTOMOBILE
Dwayne S. Hurst, Lutz, Fla., assignor to Palomino Sports, Inc., Odessa, Fla.
Filed Jan. 22, 1996, Ser. No. 49,387
Term of patent 14 years
U.S. Cl. D7—515



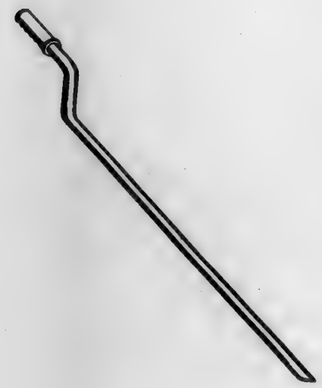
377,138
BURGER MOLD
David R. Angelo, 1199 Million Dollar Hwy., Kersey, Pa. 15846
Filed Nov. 17, 1995, Ser. No. 46,519
Term of patent 14 years
U.S. Cl. D7—672



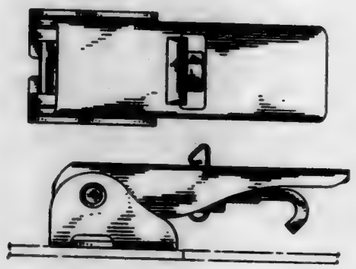
377,139
MATERIAL PICK UP FINGER
Mark W. Bruns, P.O. Box 33, Gibbon, Minn. 55335
Filed Aug. 10, 1995, Ser. No. 42,452
Term of patent 14 years
U.S. Cl. D8—14



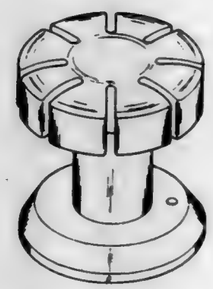
377,140
SHINGLE REMOVAL TOOL
Leland R. Bair, 906 18th Ave.,SW., Cedar Rapids, Iowa 52404
Filed Sep. 12, 1995, Ser. No. 43,847
Term of patent 14 years
U.S. Cl. D8—89



377,141
DRAW LATCH
James J. Ford, Niskayuna, N.Y.; Lynn B. Ziemer, Ridley Park, and Edward A. McCormack, Media, both of Pa., assignors to Southco, Inc., Concordville, Pa.
Division of Ser. No. 27,634, Aug. 25, 1994, Pat. No. Des. 367,218, which is a continuation-in-part of Ser. No. 19,345, Feb. 28, 1994, abandoned. This application Aug. 25, 1995, Ser. No. 43,106
Term of patent 14 years
U.S. Cl. D8—331



377,142
MOORING
Ju-Hsun Yang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Jul. 24, 1995, Ser. No. 41,791
Term of patent 14 years
U.S. Cl. D8—356



377,143

JOINING SPACER

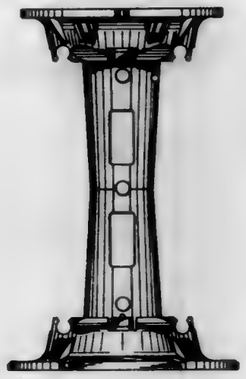
Wolfgang Schmabel, Mögglingen, Germany, assignor to KUNZ GmbH & Co., Gschwend, Germany

Filed Nov. 28, 1995, Ser. No. 47,177

Claims priority, application Germany, Jun. 28, 1995, M9505341.7

Term of patent 14 years

U.S. Cl. D8—382



377,144

PACKING BOX

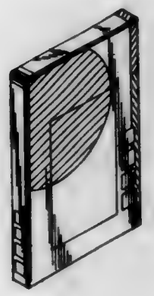
Shuzo Sawa, Nara-ken, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1996, Ser. No. 49,662

Claims priority, application Japan, Jul. 27, 1995, 7-22264

Term of patent 14 years

U.S. Cl. D9—432



377,145

POURING DEVICE

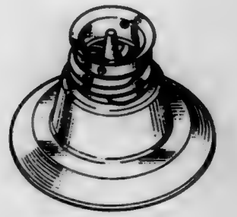
Pierre Huser, Aurora, Canada, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Apr. 17, 1995, Ser. No. 37,546

Claims priority, application Sweden, Nov. 2, 1994, 94-2228

Term of patent 14 years

U.S. Cl. D9—447



377,146

LID LEASH

Janice L. Schmidiger, P.O. Box 13, Sheep Ranch, Calif. 95250

Filed Jun. 7, 1995, Ser. No. 39,949

Term of patent 14 years

U.S. Cl. D9—499



377,147

COMBINED BOTTLE AND CLOSURE

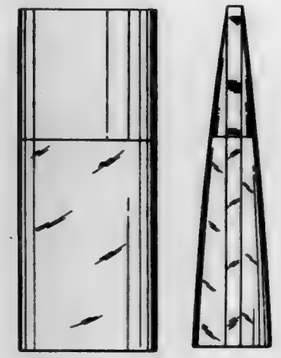
Fabien Baron, New York, N.Y., assignor to Beaute Prestige Internationsl, Paris, France

Filed Sep. 12, 1994, Ser. No. 28,262

Claims priority, application WIPO, Mar. 17, 1994, DMA002454

Term of patent 14 years

U.S. Cl. D9—529



377,148

CLOCK

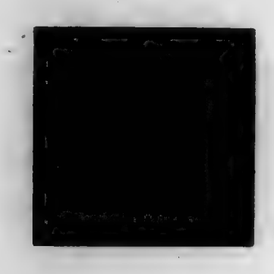
Giampiero Bodino, Milan, Italy, assignor to Baume & Mercier S.A., Geneva, Switzerland

Filed Oct. 25, 1995, Ser. No. 45,650

Claims priority, application Hague Agreement, Apr. 28, 1995, DMA/002.922

Term of patent 14 years

U.S. Cl. D10—18



377,149

WATCHCASE

Yukiko Hayashi, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

Filed May 26, 1995, Ser. No. 39,370

Term of patent 14 years

U.S. Cl. D10—30



377,150

COMBINED WATCH AND BRACELET

Paul Hartzband, Chappaqua, N.Y., assignor to HartCase Corp., Rockville Center, N.Y.

Filed Feb. 12, 1996, Ser. No. 50,214

Term of patent 14 years

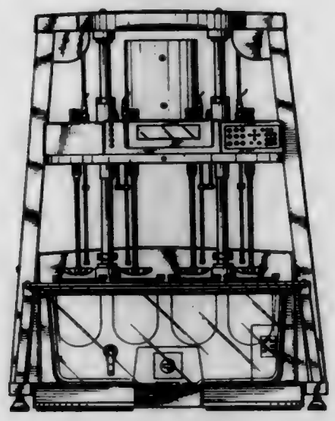
U.S. Cl. D10—32



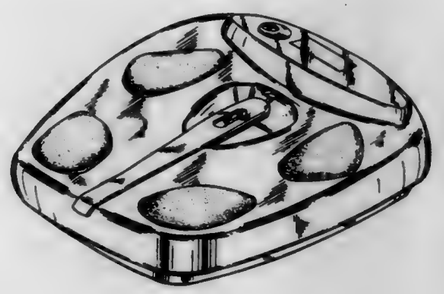
377,151
WRIST WATCH
Takashi Takeichi, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1995, Ser. No. 46,014
Term of patent 14 years
U.S. Cl. D10—39



377,152
DISSOLUTION TEST APPARATUS
Royal A. Hanson, Chatsworth; Bruce E. Rondow, Castaic; Guillermo E. Meneses, Chatsworth; Sean M. Montgomery, Santa Barbara, and Robeon L. Splane, Jr., Granada Hills, all of Calif., assignors to Hanson Research Corporation, Chatsworth, Calif.
Filed Feb. 26, 1996, Ser. No. 50,754
Term of patent 14 years
U.S. Cl. D10—81



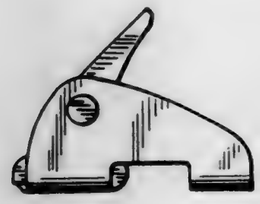
377,153
WEIGHING APPARATUS FOR BABIES
Louis Andrieu, Sales, France, assignor to Tefal S.A., Rumilly, France
Division of Ser. No. 38,466, May 2, 1995. This application May 23, 1996, Ser. No. 54,850
Claims priority, application France, Nov. 2, 1994, 94 6006
Term of patent 14 years
U.S. Cl. D10—92



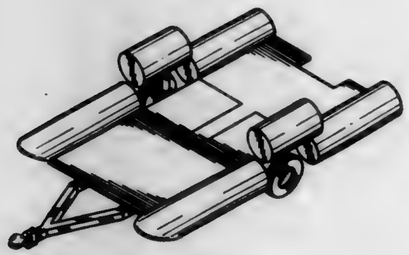
377,154
WATCH BRACELET
Freddy Rumo, La Chaux-de-Fonds, Switzerland, assignor to Montres DuRoy, and F. Rumo, both of La Chaux-de-Fonds, Switzerland
Filed Sep. 29, 1995, Ser. No. 44,695
Claims priority, application Switzerland, Mar. 30, 1995, DM/033132
Term of patent 14 years
U.S. Cl. D11—3



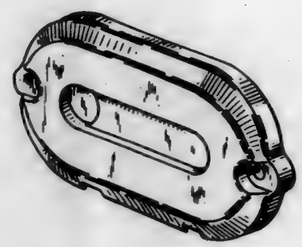
377,155
BUCKLE FOR CARGO STRAPS
Kazuhide Takimoto, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1994, Ser. No. 24,986
Claims priority, application Japan, Jul. 21, 1992, 4-21835
Term of patent 14 years
U.S. Cl. D11—216



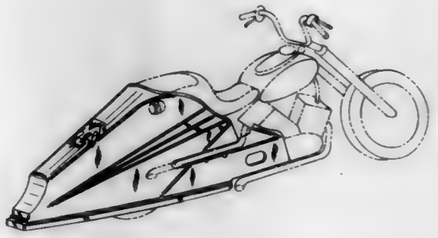
377,156
TRAILERLESS PONTOON BOAT
Randy Muir, 601 St. Cloud, Rapid City, S. Dak. 57701
Filed Nov. 23, 1994, Ser. No. 31,575
Term of patent 14 years
U.S. Cl. D12—101



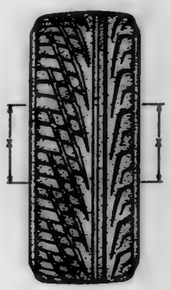
377,157
MOTORCYCLE TRANSMISSION END COVER
William G. Davidson, Delafield, and Louis Netz, Grafton, both of Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.
Filed Aug. 2, 1995, Ser. No. 42,155
Term of patent 14 years
U.S. Cl. D12—126



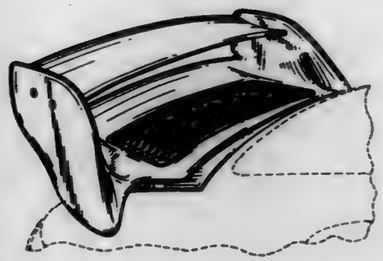
377,158
COVER FOR REAR OF MOTORCYCLE
Joel A. Grimaldi, 6 Auburndale Dr., Pittsford, N.Y. 14534
Filed Aug. 11, 1995, Ser. No. 42,476
Term of patent 14 years
U.S. Cl. D12—126



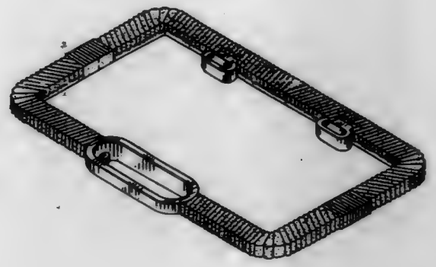
377,159
AUTOMOBILE TIRE
Kenichi Shirai; Toshihiko Suzuki, both of Hiratsuka; Izumi Kuramochi, and Hiroshi Tokizaki, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1995, Ser. No. 35,281
Term of patent 14 years
U.S. Cl. D12—147



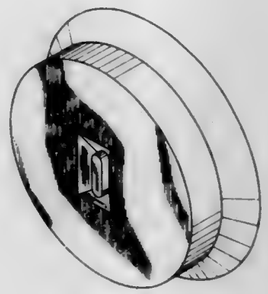
377,160
SPOILER FOR A MOTOR VEHICLE
Stephen Murkett, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed May 11, 1995, Ser. No. 38,766
Claims priority, application Germany, Nov. 11, 1994, 94 08 797.0
Term of patent 14 years
U.S. Cl. D12—181



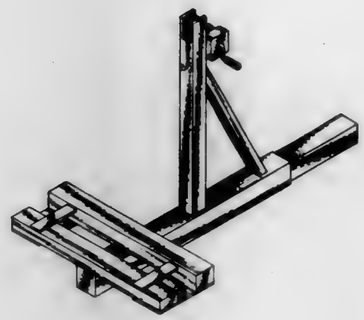
377,161
NUMBER PLATE MOUNTING FRAME
Shun-Tian Shuen, San Chung, Taiwan, assignor to Jauchy Enterprise Co., Ltd., Taipei, Taiwan
Filed Apr. 6, 1995, Ser. No. 37,287
Term of patent 14 years
U.S. Cl. D12—193



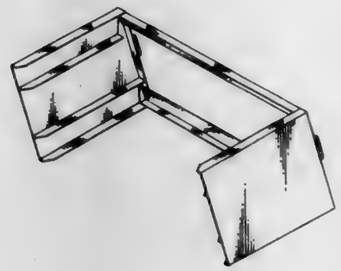
377,162
CUSTOM WHEEL SHIELD FOR USE IN CLEANING TIRES
Rex A. Maynard, 7711 Rosemead Blvd., Apt. #54, Pico Rivera, Calif. 90660
Filed Jan. 29, 1996, Ser. No. 49,534
Term of patent 14 years
U.S. Cl. D12—213



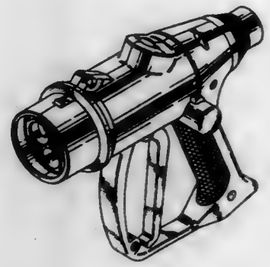
377,163
STORAGE RACK FOR VEHICLE DOLLY
Denis M. Davis, 3004 S. Lake Rd., Scottsburg, Ind. 47170
Filed Dec. 14, 1994, Ser. No. 32,223
Term of patent 14 years
U.S. Cl. D12—408



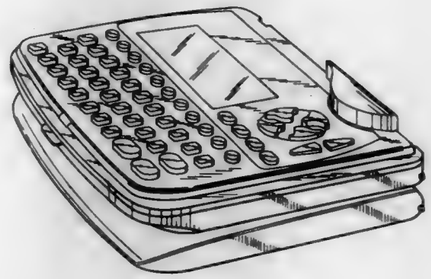
377,164
DOUBLE UTILITY DRAWER SHELF
Joseph R. McPeek, 508 Manor Cir., Columbiana, Ohio 44408, and John J. LaBuda, 1462 Vienna Rd., Niles, Ohio 44446
Filed May 4, 1995, Ser. No. 38,354
Term of patent 14 years
U.S. Cl. D12—426



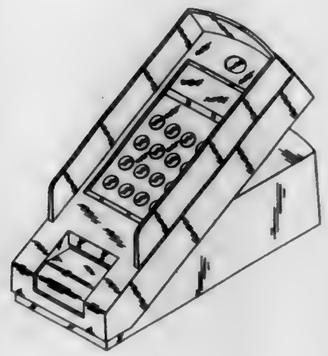
377,165
CONNECTOR FOR AN ELECTRIC SUPPLIER FOR ELECTRIC CAR
Nobuaki Yoshioka, and Hirotaka Fukushima, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Japan
Division of Ser. No. 30,229, Oct. 24, 1994, Pat. No. Des. 370,461. This application May 2, 1996, Ser. No. 53,965
Term of patent 14 years
U.S. Cl. D13—146



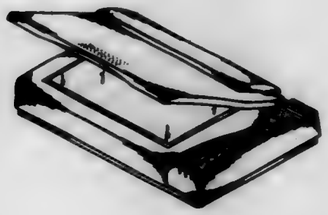
377,166
ELECTRONIC ORGANIZER HOUSING
Jeffrey M. Jones, Highland Park, Ill., and Kenny L. K. Keung, Hong Kong, Hong Kong, assignors to Tiger Electronics, Inc., Vernon Hills, Ill.
Continuation-in-part of Ser. No. 33,677, Jan. 18, 1995, abandoned. This application Dec. 11, 1995, Ser. No. 47,698
Term of patent 14 years
U.S. Cl. D14—100



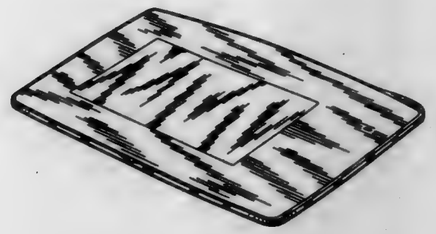
377,167
CARD READER DEVICE
Robert H. High, Sr., and David G. Lyka, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 30, 1995, Ser. No. 40,958
Term of patent 14 years
U.S. Cl. D14—105



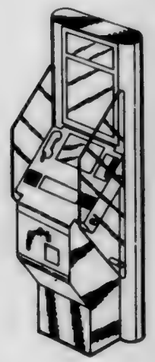
377,168
VISUAL IMAGE SCANNER
Tony Chen, and Thomas Chang, both of Hsinchu, Taiwan, assignors to Umax Data Systems Inc., Hsinchu, Taiwan
Filed Sep. 14, 1995, Ser. No. 43,947
Term of patent 14 years
U.S. Cl. D14—107



377,169
TABLET
Hiromi Chida, Chiba, Japan, assignor to Seiko Instruments Inc., Japan
Filed May 26, 1995, Ser. No. 39,368
Term of patent 14 years
U.S. Cl. D14—114



377,170
PUBLIC INTERACTIVE KIOSK
Donald Wilson, Toronto, Canada, assignor to King Products Inc., Mississauga, Canada
Filed Apr. 24, 1995, Ser. No. 37,919
Term of patent 14 years
U.S. Cl. D14—130



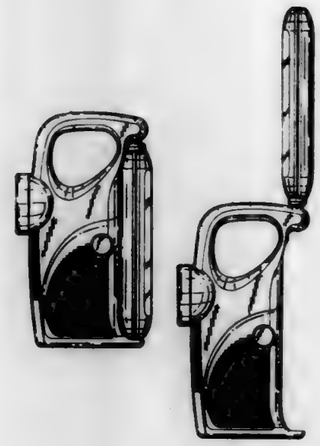
377,171
PORTABLE RADIO TELEPHONE
Takato Yokouchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 4, 1996, Ser. No. 51,087
Claims priority, application Japan, Nov. 9, 1995, 7-33799
Term of patent 14 years
U.S. Cl. D14—138



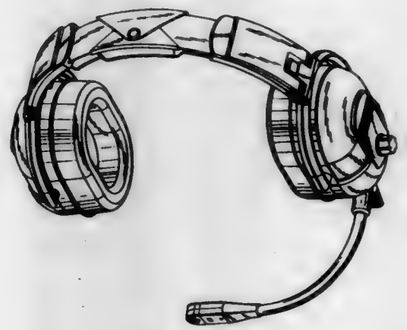
377,172
TELEPHONE SET
Josh Zeltman, Brooklyn, N.Y., assignor to Lenoxx Electronics Corp., Brooklyn, N.Y.
Filed Apr. 24, 1996, Ser. No. 53,497
Term of patent 14 years
U.S. Cl. D14—150



377,173
COMBINED RADIO WITH FLOURESCENT LANTERN, SPOTLIGHT AND BLINKING LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Oct. 17, 1995, Ser. No. 46,797
Claims priority, application United Kingdom, Apr. 20, 1995, 2-046874
Term of patent 14 years
U.S. Cl. D14—168



377,174
AIRCRAFT HEADSET
Lars Runquist, St. Paul, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.
Filed May 25, 1995, Ser. No. 39,235
Term of patent 14 years
U.S. Cl. D14—206



377,175

FLOOR STANDING LOUDSPEAKER

Edward L. Boyd, Montvale, N.J., assignor to Sony Corp. of America, Park Ridge, N.J.

Filed Jun. 13, 1995, Ser. No. 40,222

Term of patent 14 years

U.S. Cl. D14—214



377,176

SPEAKER BOX

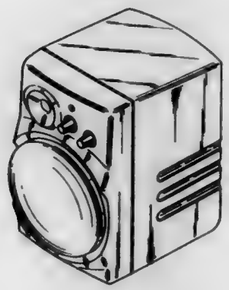
Masafumi Ito; Minoru Sube, and Hiroyuki Watanabe, all of Musashino, Japan, assignors to Tenc Corporation, Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 52,936

Claims priority, application Japan, Oct. 30, 1995, 7-32690

Term of patent 14 years

U.S. Cl. D14—215



377,177

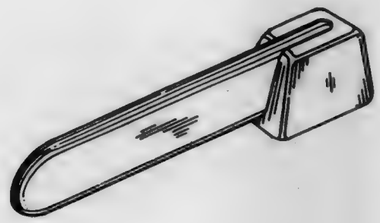
FOLDING TELEPHONE ANTENNA SYSTEM

Martin Heine, Troy, and Dixxian Liu, Dayton, both of Ohio, assignors to Valor Enterprises, Inc., Piqua, Ohio

Filed Jan. 25, 1996, Ser. No. 49,430

Term of patent 14 years

U.S. Cl. D14—230



377,178

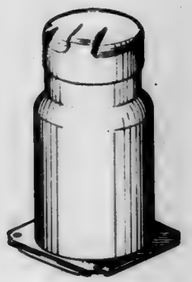
REFRIGERATION COMPRESSOR SHELL

Peter A. Kotlarek, Onalaska; Larry R. Arentz, Mindoro, and Dyck A. Shepherd, Stoddard, all of Wis., assignors to American Standard Inc., Piscataway, N.J.

Filed Aug. 3, 1995, Ser. No. 42,199

Term of patent 14 years

U.S. Cl. D15—9



377,179

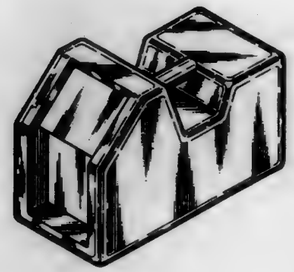
REFRIGERANT RECOVERY MACHINE

Greg S. Sundheim, Littleton; Brett W. Reuck, Aurora; Michael J. Ralph, Denver, and John M. Sundheim, Boulder, all of Colo., assignors to Promax Amprobe Division of Core Industries, Inc., Denver, Colo.

Filed Jan. 16, 1996, Ser. No. 48,991

Term of patent 14 years

U.S. Cl. D15—79



377,180

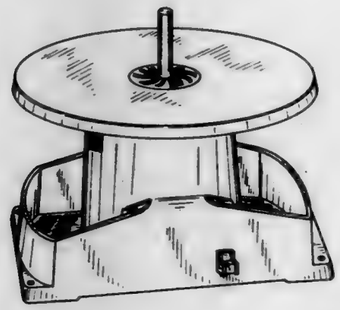
SPINDLE SANDING MACHINE

Ronald E. Young, Cheswick, and Louis C. Brickner, Jr., Pittsburgh, both of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Mar. 7, 1996, Ser. No. 50,841

Term of patent 14 years

U.S. Cl. D15—125



377,181

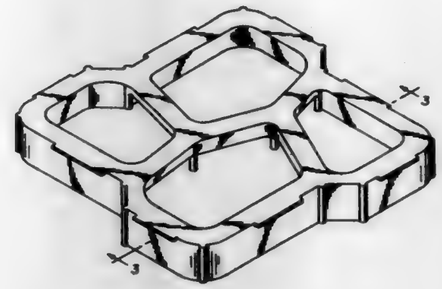
MOLD FOR FORMING CONCRETE COBBLESTONES

Jack T. Hupp, P.O. Box 1206, Richmond, Tex. 77469

Filed Mar. 14, 1996, Ser. No. 51,595

Term of patent 14 years

U.S. Cl. D15—136



377,182

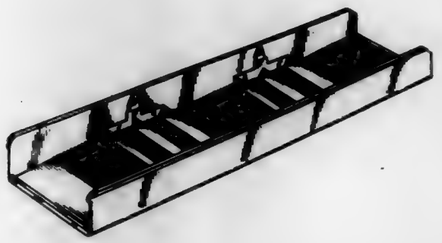
GOLD SEPARATOR SLUICE

Joseph A. Simpson, c/o Tee Dee Co., 2800 W. 5th St., Unit 4, Santa Ana, Calif. 92703-1824

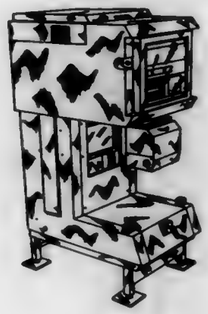
Filed Oct. 26, 1995, Ser. No. 45,672

Term of patent 14 years

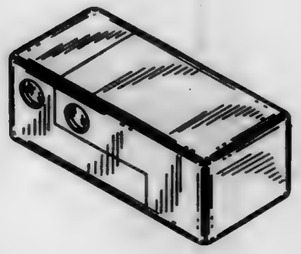
U.S. Cl. D15—147



377,183
CONTAINER INSPECTION MACHINE
Monti D. Emery, Elmira, N.Y., assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.
Filed Sep. 9, 1994, Ser. No. 28,202
Term of patent 14 years
U.S. Cl. D15—199



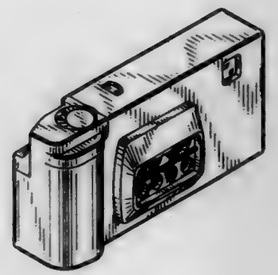
377,184
BINOCULARS
Ben Wells, Waltham, Mass., and Arthur Becker, New York, N.Y., assignors to BNOX, Inc., New York, N.Y.
Filed Sep. 28, 1994, Ser. No. 28,717
Term of patent 14 years
U.S. Cl. D16—133



377,185
BINOCULARS
Akira Nojima, Fuusa, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Oct. 12, 1994, Ser. No. 29,633
Term of patent 14 years
U.S. Cl. D16—133



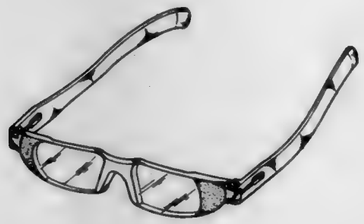
377,186
CAMERA FOR TAKING CONSECUTIVE EXPOSURES
Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 26, 1996, Ser. No. 50,760
Claims priority, application Japan, Aug. 28, 1995, 7-25028
Term of patent 14 years
U.S. Cl. D16—208



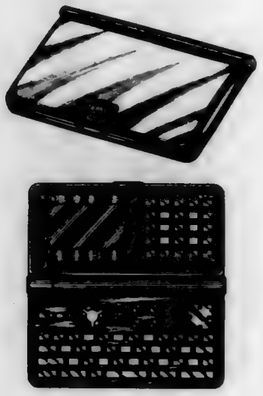
377,187
CAMERA
Nobuo Hashimoto, Kawasaki, and Shoko Ryuen, Ichikawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Feb. 5, 1996, Ser. No. 49,966
Term of patent 14 years
U.S. Cl. D16—209



377,188
SPECTACLES
Wu Mei Wu Cheng, No. 20-1, Lane 54, An Ho Road, Sec. 2, Tainan, Taiwan
Filed Nov. 22, 1995, Ser. No. 46,983
Term of patent 14 years
U.S. Cl. D16—321



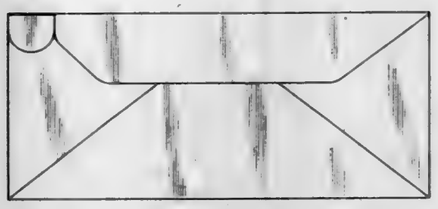
377,189
ELECTRONIC CALCULATOR HAVING THE FUNCTIONS OF TELEPHONE BOOK, ADDRESS BOOK, CALENDAR, SCHEDULE BOOK AND MEMO BOOK
Yoshihiro Komuta, Sagamihara, and Yuiti Kurabuti, Kasukabe, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1995, Ser. No. 48,432
Term of patent 14 years
U.S. Cl. D18—2



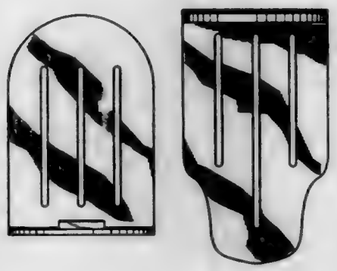
377,190
ELECTRONIC CALCULATOR
Makoto Matsuda, Yokohama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 22, 1996, Ser. No. 53,426
Term of patent 14 years
U.S. Cl. D18—7



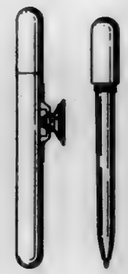
377,191
ENVELOPE
Larry R. Thompson, 405 W. 8th, Ritzville, Wash. 99169
Filed Dec. 4, 1995, Ser. No. 47,444
Term of patent 14 years
U.S. Cl. D19—3



377,192
PORTABLE BOOKEND
Ming He, 4350 West 2nd Avenue, Vancouver, BC, Canada
Filed Jul. 3, 1995, Ser. No. 41,054
Term of patent 14 years
U.S. Cl. D19—34.1



377,193
WRITING INSTRUMENT AND HOLDER
Shun Takemura, Torrance, Calif., assignor to Itoya of America, Ltd., Torrance, Calif.
Filed Apr. 23, 1996, Ser. No. 53,490
Term of patent 14 years
U.S. Cl. D19—36



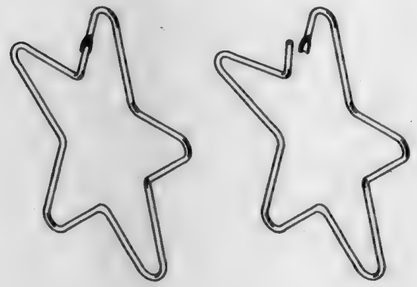
377,194
PEN
Brian Q. Young, P.O. Box 862469 Terminal Annex, Los Angeles, Calif. 90086-2469
Filed Jul. 11, 1994, Ser. No. 25,752
Term of patent 14 years
U.S. Cl. D19—48



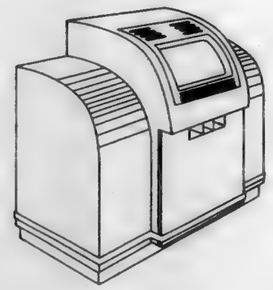
377,195
WRITING INSTRUMENT
Osamu Takahashi, Kawagoe, Japan, assignor to Kotobuckl & Co., Ltd., Kyoto, Japan
Filed Mar. 5, 1996, Ser. No. 51,093
Term of patent 14 years
U.S. Cl. D19—51



377,196
STAR CLIP
James M. Sheppard, Jr., Mooresville, N.C., assignor to Devant Ltd., Monroe, N.C.
Filed Nov. 3, 1995, Ser. No. 45,973
Term of patent 14 years
U.S. Cl. D19—65



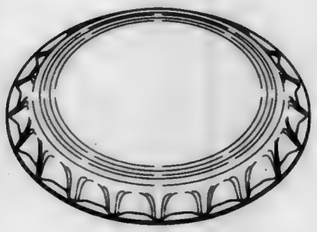
377,197
ADVERTISING DISPLAY KIOSK
V. Grainger McKoy, Sr., 490 Hwy. 261 North, Sumter, S.C. 29154
Filed May 31, 1995, Ser. No. 39,581
Term of patent 14 years
U.S. Cl. D20—10



377,198
CONTROLLER FOR VIDEO GAME MACHINE
Akitoshi Oikawa; Atsushi Ichijou; Kunikazuru Uemura, and Hiroshi Ohta, all of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan
Filed Mar. 11, 1996, Ser. No. 51,433
Claims priority, application Japan, Sep. 13, 1995, 7-27018
Term of patent 14 years
U.S. Cl. D21—48



377,199
FLYING DISC
Paul Verrny, Minervaplein 4 III, 1077 TN Amsterdam, Netherlands
Filed Feb. 28, 1996, Ser. No. 50,479
Term of patent 14 years
U.S. Cl. D21—86



377,201
BOXING BAG
Derrick A. Howard, 1407 8th St., Glenarden, Md. 20706
Filed Feb. 20, 1996, Ser. No. 50,444
Term of patent 14 years
U.S. Cl. D21—191



377,200
KITE
Peter J. Cale, P.O. Box 278, Katoomba 2780, Australia
Filed Aug. 1, 1995, Ser. No. 42,118
Claims priority, application Australia, Apr. 12, 1995, 1129/95
Term of patent 14 years
U.S. Cl. D21—88



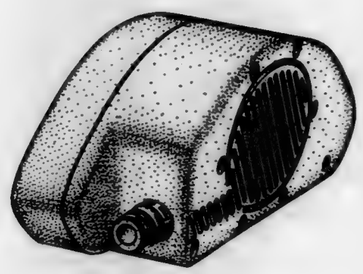
377,202
ROD
Wilma M. Rohan, 496 Old Surrey Rd., Hinsdale, Ill. 60521
Filed Apr. 1, 1996, Ser. No. 52,617
Term of patent 14 years
U.S. Cl. D21—191



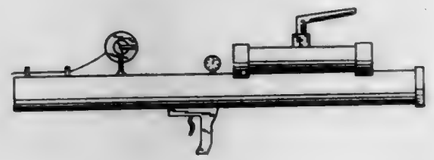
377,203
CLIMB AND SLIDE STRUCTURE
Michael S. Jaeb, Hiram, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jul. 3, 1995, Ser. No. 41,029
Term of patent 14 years
U.S. Cl. D21—244



377,205
END HOUSING FOR AN OSCILLATING IRRIGATOR
Gianfranco Roman, Fiaiano, Italy, assignor to Claber S.p.A., Fiume Veneto, Italy
Filed Jun. 22, 1995, Ser. No. 40,623
Claims priority, application Italy, Jan. 3, 1995, MI95/00008
Term of patent 14 years
U.S. Cl. D23—216



377,204
PRESSURE AIR POWERED CASTING GUN FOR FISH LINE AND SINKER
Elias Athanasiadis, 150-12 Grand Central Pky., Jamaica, N.Y. 11432
Filed Feb. 27, 1995, Ser. No. 35,415
Term of patent 14 years
U.S. Cl. D22—134



377,206
URINAL
Minoru Tani, Kitakyushu, Japan, assignor to Toto Ltd., Fukuoka-Ken, Japan
Filed Feb. 28, 1996, Ser. No. 50,845
Term of patent 14 years
U.S. Cl. D23—302



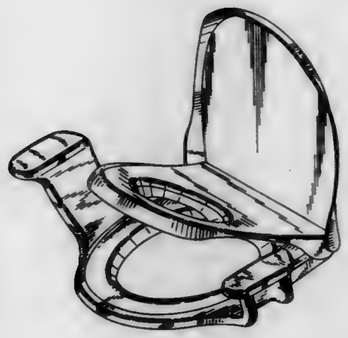
377,207
URINAL
Minoru Tani, and Hisayoshi Sakai, both of Fukuoka-Ken, Japan, assignors to Toto Ltd., Fukuoka-Ken, Japan
Filed Feb. 28, 1996, Ser. No. 50,846
Term of patent 14 years
U.S. Cl. D23—302



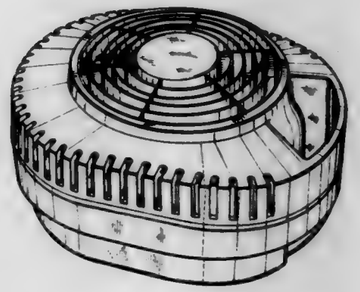
377,209
WATER CLOSET TANK
Minoru Tani; Hisayoshi Sakai, and Seijiro Kawamura, all of Kitakyushu, Japan, assignors to Toto Ltd., Fukuoka-Ken, Japan
Filed Sep. 28, 1995, Ser. No. 44,656
Term of patent 14 years
U.S. Cl. D23—313



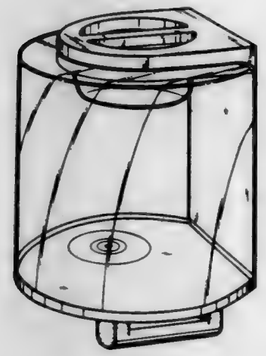
377,208
TOILET SEAT ASSEMBLY
Antti Kivelä, Jämsä, Finland, assignor to Nobi Oy, Jämsä, Finland
Filed Sep. 14, 1995, Ser. No. 43,903
Claims priority, application Finland, Mar. 17, 1995, 203/95
Term of patent 14 years
U.S. Cl. D23—311



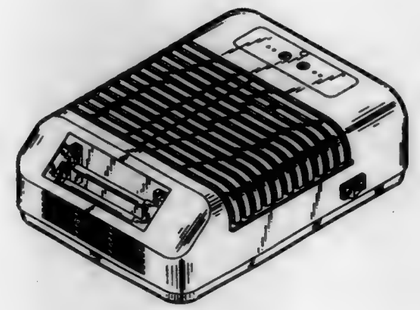
377,210
EVAPORATIVE HUMIDIFIER
Marc S. Harrison, Portsmouth, R.I.; Wyley G. Kitzmiller, and James G. Montagnino, both of El Paso, Tex., assignors to Kaz, Incorporated, New York, N.Y.
Filed Aug. 16, 1995, Ser. No. 42,647
Term of patent 14 years
U.S. Cl. D23—356



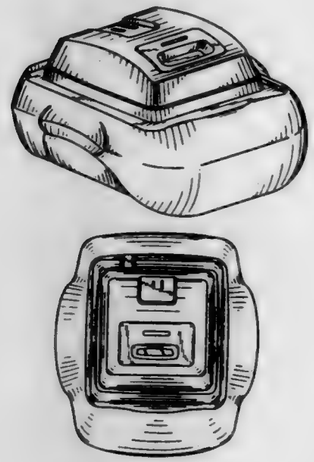
377,211
HUMIDIFIER TANK
Rodney Jane, Westboro, Mass.; Jui-Shang Wang, Taipei, Taiwan; Stanley Greszus, Homewood, and Gregory Holderfield, Palatine, both of Ill., assignors to Duracraft Corp., Southborough, Mass.
Filed Sep. 19, 1995, Ser. No. 44,158
Term of patent 14 years
U.S. Cl. D23—358



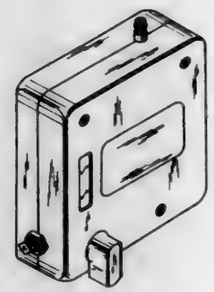
377,213
AIR CLEANER
Hung-Hsin Wang, Taipei Hsien, Taiwan, assignor to Yih Chang Enterprise Co., Ltd., Taipei Hsien, Taiwan
Filed Oct. 24, 1995, Ser. No. 46,695
Term of patent 14 years
U.S. Cl. D23—364



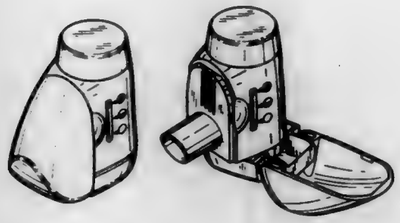
377,212
VAPORIZER
Devin L. Moore, Decatur, Ga., assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.
Filed Oct. 31, 1995, Ser. No. 45,851
Term of patent 14 years
U.S. Cl. D23—360



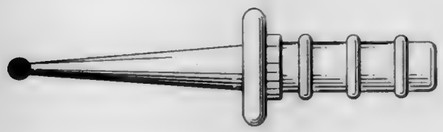
377,214
PORTABLE AIR FILTER
Larry E. Seeley, 7925 Evies Way, Port Richey, Fla. 34668
Filed Oct. 27, 1995, Ser. No. 45,733
Term of patent 14 years
U.S. Cl. D23—365



377,215
INHALER
Paul K. Rand, Ware, Great Britain, assignor to Glaxo Group Limited, London, England
Filed Oct. 11, 1995, Ser. No. 45,153
Claims priority, application United Kingdom, Apr. 13, 1995, 2046732
Term of patent 14 years
U.S. Cl. D24—110



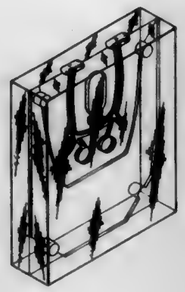
377,216
FLUID APPLICATOR SHORT HANDLED KNOB BRUSH
Phillip Mark, 6417 Marlberry Dr., Orlando, Fla. 32819
Filed Jan. 31, 1996, Ser. No. 49,882
Term of patent 14 years
U.S. Cl. D24—152



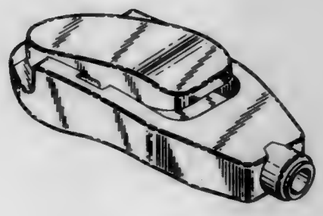
377,217
JAWBONE SUPPORT PLATE
Axel Kirsch, Talstrasse 23, D70794 Filderstadt, and Walter Dürr, Panoramastrasse 5, D75196 Remchingen, both of Germany, assignors to Axel Kirsch, Filderstadt, and Walter Dürr, Remchingen, both of Germany
Filed Sep. 2, 1994, Ser. No. 27,947
Claims priority, application Germany, Mar. 4, 1994, M 94 01 890.1
Term of patent 14 years
U.S. Cl. D24—155



377,218
ENDO-BLOCK
Brett I. Cohen, Nanuet, and Barry L. Musikant, New York, both of N.Y., assignors to Essential Dental Systems, Inc., South Hackensack, N.J.
Filed Oct. 25, 1995, Ser. No. 45,631
Term of patent 14 years
U.S. Cl. D24—176



377,219
CONNECTOR FOR A BIOMEDICAL ELECTRODE
Jerome E. Strand, Hudson, Wis., and Perry S. Dotterman, Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation-in-part of Ser. No. 2,534, Dec. 15, 1992, abandoned. This application Jun. 7, 1994, Ser. No. 24,864
Term of patent 14 years
U.S. Cl. D24—187

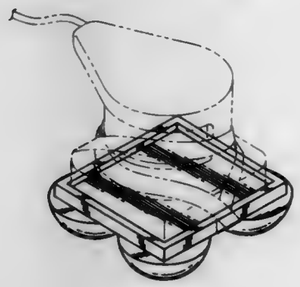


377,220
ANKLE BANDAGE INSERT
Thomas Eriksson, Tyreso, Sweden, assignor to Rehband Anatomiska AB, Sollentuna, Sweden
Filed Aug. 21, 1995, Ser. No. 42,877
Claims priority, application Sweden, Feb. 22, 1995, 95-0373
Term of patent 14 years
U.S. Cl. D24—192

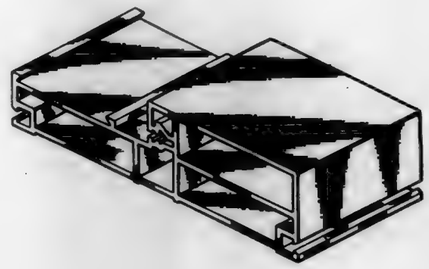
377,221
AIRLESS BABY BOTTLE PLUNGER
Raymond Beiseo, 3001 Cagle St., National City, Calif. 91950
Filed Sep. 6, 1994, Ser. No. 28,079
Term of patent 14 years
U.S. Cl. D24—194



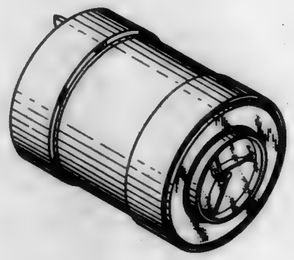
377,222
MASSAGER HEAD
Tom C. Pemberton, P.O. Box 916, Friday Harbor, Wash. 98250
Filed Jan. 29, 1996, Ser. No. 49,675
Term of patent 14 years
U.S. Cl. D24—215



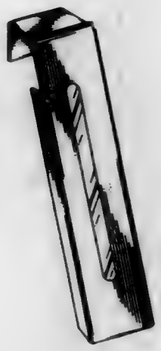
377,223
SIDE LIGHT FRAME
Pablo Marci, Brampton, Canada, assignor to Yorkview Plastics Limited, Concord, Canada
Filed Nov. 9, 1995, Ser. No. 46,194
Term of patent 14 years
U.S. Cl. D25—124



377,224
FOCUSED XENON LAMP
Roy D. Roberts, Newark, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.
Filed Oct. 5, 1995, Ser. No. 45,016
Term of patent 14 years
U.S. Cl. D26—24



377,225
LIGHT FIXTURE FOR A MOTORCYCLE
Yerchanik Bedrosian, 9618 Tajunga Canyon Blvd., Tajunga, Calif. 91042; Ara Bedrosian, and Shant Bedrosian, both of 12670 Pierce St., Pacoima, Calif. 91331
Filed Feb. 12, 1996, Ser. No. 50,161
Term of patent 14 years
U.S. Cl. D26—28

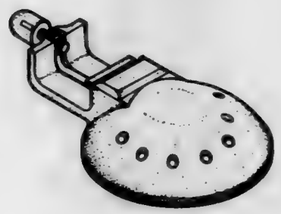


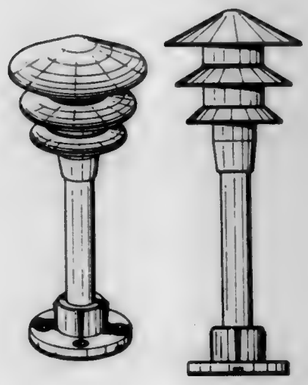
377,227
ADJUSTABLE DENTAL LAMP
Carl G. Nordstrom, Lake Oswego, and Stephen N. Weller, Tualatin, both of Oreg., assignors to A-Dec, Inc., Newberg, Oreg.
Filed Sep. 27, 1995, Ser. No. 44,883
Term of patent 14 years
U.S. Cl. D26—65



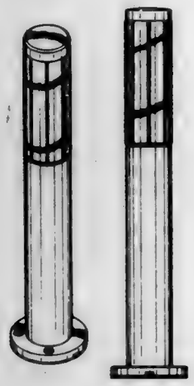
377,228
EXTERIOR LIGHT
Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Ltd., Hong Kong
Filed Oct. 18, 1995, Ser. No. 45,407
Claims priority, application United Kingdom, Apr. 26, 1995, 2046991
Term of patent 14 years
U.S. Cl. D26—68

377,226
CLAMP-ON LIGHTING FIXTURE
Wei-Hong Shen, 6F, No. 416, Jen-Ai Rd., Sec. 4, Taipei, Taiwan
Filed Jan. 11, 1996, Ser. No. 48,666
Term of patent 14 years
U.S. Cl. D26—60

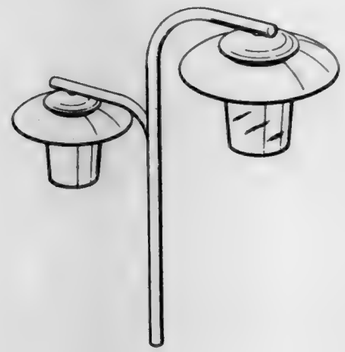




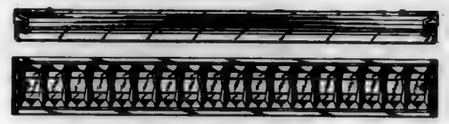
377,229
OUTDOOR POST LAMP
Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Ltd., Hong Kong
Filed Oct. 19, 1995, Ser. No. 46,640
Claims priority, application United Kingdom, Apr. 26, 1995, 2046993
Term of patent 14 years
U.S. Cl. D26—68



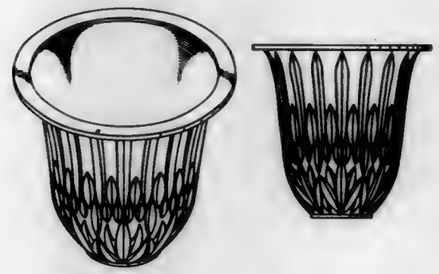
377,230
GARDEN LIGHT
Lester Parris, Weston, Canada, assignor to 167,520 Canada Inc., Weston, Canada
Filed Oct. 4, 1994, Ser. No. 29,388
Term of patent 14 years
U.S. Cl. D26—69



377,231
LUMINAIRE
Paul G. Degelmann, Americus, Ga., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 19, 1996, Ser. No. 51,890
Term of patent 14 years
U.S. Cl. D26—77



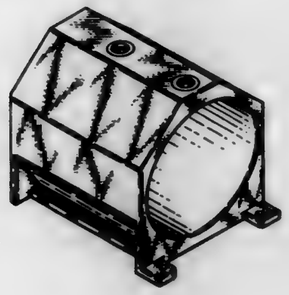
377,232
LAMP SHADE
Keen Hsu, Taichung, Taiwan, assignor to Bright Yin Huey Co., Ltd., Taichung, Taiwan
Filed Apr. 30, 1996, Ser. No. 53,804
Term of patent 14 years
U.S. Cl. D26—133



377,233
LAMP SHADE
Keen Hsu, Taichung, Taiwan, assignor to Bright Yin Huey Co., Ltd., Taichung, Taiwan
Filed Dec. 18, 1995, Ser. No. 48,036
Term of patent 14 years
U.S. Cl. D26—134



377,234
LAMP HOLDER
Roy D. Roberts, Newark, and John Kim, San Jose, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.
Filed Apr. 13, 1995, Ser. No. 37,452
Term of patent 14 years
U.S. Cl. D26—138



377,235
GAS LIGHTER
Isao Inoue, Tokyo, and Minoru Kanno, Shizuoka-ken, both of Japan, assignors to Tokai Corporation, Kanagawa-ken, Japan
Filed May 10, 1995, Ser. No. 38,791
The portion of the term of this patent subsequent to Nov. 19, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D27—141



377,236
HAIR COMB
Rafael T. Nevarez, 4781 Del Rio Rd., Sacramento, Calif. 95822
Filed Dec. 29, 1995, Ser. No. 48,495
Term of patent 14 years
U.S. Cl. D28—21



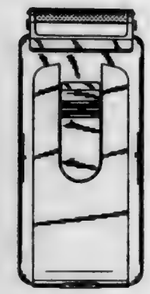
377,237
TOP REAR SURFACE OF RAZOR HEAD
Frank E. Brown, Maidenhead, and Brian Oldroyd, Reading, both of England, assignors to The Gillette Company, Boston, Mass.
Filed Sep. 30, 1993, Ser. No. 13,723
Term of patent 14 years
U.S. Cl. D28—47



377,238
RAZOR HANDLE
David Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Nov. 8, 1993, Ser. No. 15,901
Term of patent 14 years
U.S. Cl. D28—48



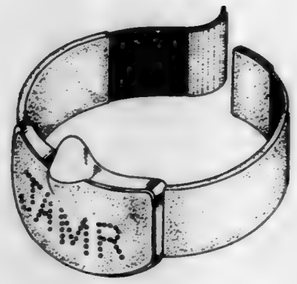
377,239
ELECTRIC SHAVER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Products Company, Nagano, Japan
Filed May 24, 1995, Ser. No. 39,469
Claims priority, application Japan, Dec. 19, 1994, 6-38822
Term of patent 14 years
U.S. Cl. D28—51



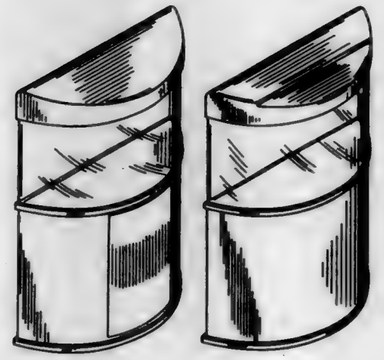
377,240
NAIL CLIPPER
Dal La Magna, Sea Cliff, N.Y., assignor to Tweezerman Corporation, Glen Cove, N.Y.
Filed May 16, 1995, Ser. No. 39,278
Term of patent 14 years
U.S. Cl. D28—60



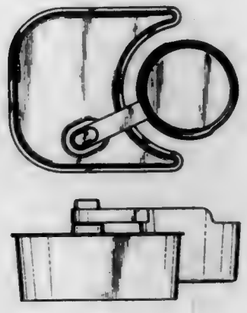
377,241
FACE SHIELD FOR WINTER OUTDOOR ACTIVITIES
Philip A. Kenner, 423 Arboretum Way, Burlington, Mass. 01803
Filed Sep. 12, 1995, Ser. No. 43,772
Term of patent 14 years
U.S. Cl. D29—108



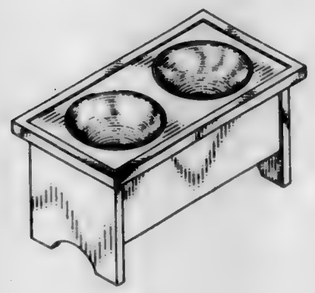
377,242
COMBINED AQUARIUM COVER AND STAND
Scott A. Kelley, 10811 Richmond #2, Houston, Tex. 77042
Filed Jul. 29, 1994, Ser. No. 26,518
Term of patent 14 years
U.S. Cl. D30—101



377,243
ANIMAL FEEDER
Ramon A. Fivenah, 5938 Woodway Pl. Ct., Houston, Tex. 77057
Filed Jun. 2, 1995, Ser. No. 39,696
Term of patent 14 years
U.S. Cl. D30—130



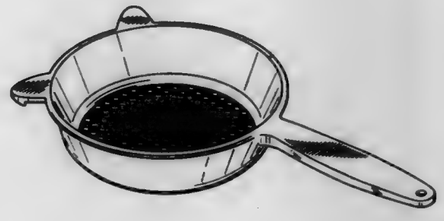
377,244
PET DINING TABLE
Allen F. Steininger, 7602 - 125th Street, Surrey, British Columbia, Canada
Filed Dec. 28, 1995, Ser. No. 48,409
Term of patent 14 years
U.S. Cl. D30—133



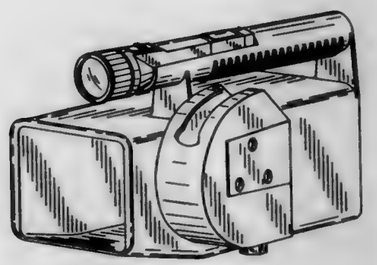
377,245
PET COLLAR
Phylane L. Normann, and Eileen J. Condon, both of Algonquin, Ill., assignors to Baxter & Charming, Ltd., Carpentersville, Ill.
Filed Aug. 23, 1994, Ser. No. 27,515
Term of patent 14 years
U.S. Cl. D30—152



377,246
CAT LITTER STRAINER
James C. Clenney, 1231 Temple Dr., Pacheco, Calif. 94553
Filed Dec. 1, 1995, Ser. No. 47,334
Term of patent 14 years
U.S. Cl. D30—162



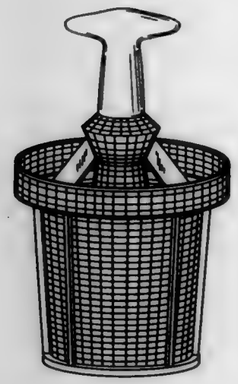
377,247
COMBINED ANIMAL WASTE COLLECTOR AND FLASHLIGHT
Larry L. Albert, P.O. Box 2045, Anna Maria, Fla. 34216
Filed Dec. 22, 1995, Ser. No. 48,229
Term of patent 14 years
U.S. Cl. D30—162



377,248
ATTACHMENT FOR A BLOWING MACHINE
Hiroko Kishi, Tokyo, Japan, assignor to Japanic Corporation, Ashikaga, Japan
Filed Aug. 25, 1995, Ser. No. 43,081
Term of patent 14 years
U.S. Cl. D32—32



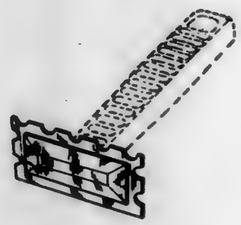
377,249
SWIMMING POOL SKIMMER BASKET
Ken Granshaw, Unit 18, 42 Lombard Street, Glebe NSW 2037, Australia
Filed Jan. 23, 1995, Ser. No. 33,850
Term of patent 14 years
U.S. Cl. D32—35



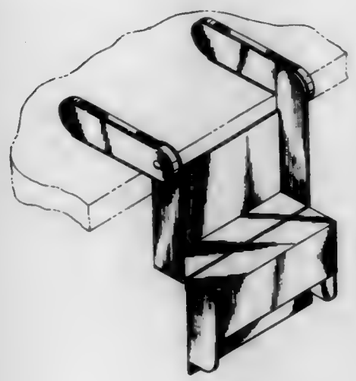
377,250
LOTTERY TICKET SCRAPER
Louis M. Bafile, Jr., P.O. Box 298, Nescopeck, Pa. 18635, and Antonio D. Rado, III, R.R. 3, Box 3074, Berwick, Pa. 18603
Filed Sep. 11, 1995, Ser. No. 43,844
Term of patent 14 years
U.S. Cl. D32—46



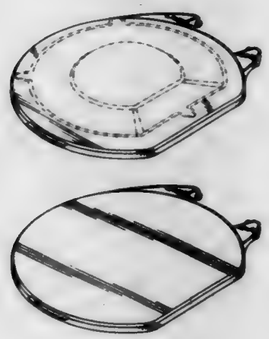
377,251
BARBECUE GRILLE SCRAPER HEAD
Andrew E. Mitchell, 9 Killbride Avenue, Torrens Park, South Australia, Australia
Filed Sep. 26, 1994, Ser. No. 28,919
Claims priority, application Australia, Mar. 24, 1994, 985/94
Term of patent 14 years
U.S. Cl. D32—49



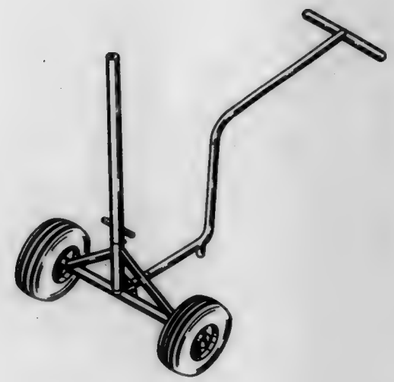
377,252
COUNTERTOP WASTE DISPOSAL UNIT
Richard Laurenzi, 278 Sterling Pl., Brooklyn, N.Y. 11238
Filed Feb. 7, 1996, Ser. No. 50,027
Term of patent 14 years
U.S. Cl. D34—1



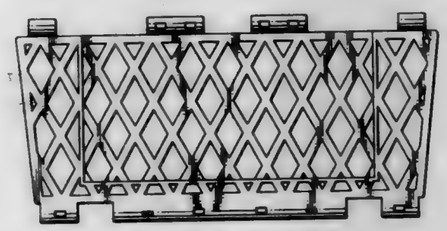
377,253
REFUSE CONTAINER LID
Donald C. Presnell, Stephens City, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Aug. 25, 1995, Ser. No. 43,112
Term of patent 14 years
U.S. Cl. D34—11



377,254
MOTORCYCLE TIRE/WHEEL CARRIER
Daren L. Cavalliere, HCR 33 44 Valley Rd., East Sullivan, N.H. 03445
Filed Nov. 27, 1995, Ser. No. 47,136
Term of patent 14 years
U.S. Cl. D34—24



377,255
CHILD SEAT FOR SHOPPING CART
Houston Rehrig, 4606 Foxhall Crescent, Washington, D.C. 20007
Filed Oct. 12, 1995, Ser. No. 45,284
Term of patent 14 years
U.S. Cl. D34—27



377,256
MAIL BOX FOR USE IN SNOW
James M. Parrish, Jr., 607 Mountain Blvd., Mountain Top, Pa. 18707-9601
Filed Feb. 24, 1995, Ser. No. 35,332
Term of patent 14 years
U.S. Cl. D99—32



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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7th DAY OF JANUARY, 1997

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Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,591,440, Cl. 424-227.100.
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Abe, Kimihiro; and Onoda, Katsuhiko, to Yazaki Corporation. Press-connecting terminal. 5,591,044, Cl. 439-397.000.

Abraham, Charles. Video distribution system using in-wall wiring. 5,592,482, Cl. 348-8.000.

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Abramczyk, Robert J. Dispenser. 5,590,813, Cl. 221-197.000.

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Ackley, Rhonda L.: *See*—
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Acocella, John; Banks, Donald R.; Benenati, Joseph A.; Caulfield, Thomas; Hoebener, Karl G.; Watson, David P.; and Corbin, John S., Jr., to International Business Machines Corporation. Solder ball interconnected assembly. 5,591,941, Cl. 174-266.000.

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Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukihito; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okada, Atsushi, to Gunze Limited; and Sharp Kabushi Kaisha. Charging device. 5,592,263, Cl. 399-176.000.

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Adams, Lee: *See*—
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Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; and Wilson, Joseph H., to Ecomed, Inc. Medical waste collection and treatment system. 5,590,840, Cl. 241-99.000.

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Akazaki, Shusuke: *See*—
Nishimura, Yoichi; Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shusuke, 5,590,638, Cl. 125-687.000.

Akihama, Shigeyuki: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Aksys, Ltd.: *See*—
Kenley, Rodney S.; Treu, Dennis M.; Peter, Frederick H., Jr.; Feldstein, Thomas M.; Pawlak, Kenneth E.; Adolf, Wayne F.; and Roettger, Linda, 5,591,344, Cl. 210-636.000.

Aktiebolaget Astra: *See*—
Jakupovic, Edib; and Stenhede, Jan, 5,591,889, Cl. 562-24.000.

Akzo Nobel Ashpalt Applications, Inc.: *See*—
Kilheffer, Kenneth E.; Stegemoeller, Calvin L.; and Hays, Lesley T., 5,590,976, Cl. 404-72.000.

Akzo Nobel N.V.: *See*—
Plomma, Jan J. H., 5,591,706, Cl. 510-372.000.

Alakoski, Markku; Ilmarinen, Antti; Tissari, Martti; and Uunaaa, Kyösti, to Valmet Corporation. Multi-story dryer section in a paper machine. 5,590,476, Cl. 34-117.000.

Alanco Environmental Resources Corp.: *See*—
Jones, James T.; Kersey, Larry M.; and Steinke, Richard A., 5,591,412, Cl. 422-171.000.

Alazet, Jean, to Famulus. Apparatus for cleaning by spreading cleaning liquid and by suction of the used liquid. 5,590,439, Cl. 15-320.000.

Alba-Waldensian, Inc.: *See*—
Osborne, Harold G., 5,590,548, Cl. 66-177.000.

Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, to International Business Machines Corporation. Telecommunication network having a number of stations which are connected to a token ring network, and station for such a network. 5,592,484, Cl. 370-452.000.

Albemarle Corporation: *See*—
Ramachandran, Venkataraman, 5,591,311, Cl. 203-36.000.

Albert Einstein College of Medicine of Yeshiva University: *See*—
Karmen, Arthur, 5,591,644, Cl. 436-53.000.

Alberto, Pietro. Device for feeding into and withdrawing fabrics from an autoclave for continuous decatizing. 5,590,549, Cl. 68-5.00E.

Alberts, Jack B.; and McNeely, Michael D., to Keystone International Holdings Corporation. Dual pilot manifold assembly for a safety relief valve. 5,590,684, Cl. 137-489.000.

Albrecht, Harry A.; and Van Alstine, Daniel W., to General Railway Signal Corporation. Trailing device for a railroad switch layout. 5,590,857, Cl. 246-318.000.

Albus, Udo: *See*—
Lang, Hans-Jochen; Weichert, Andreas; Kleemann, Heinz-Werner; Englert, Heinrich; Scholz, Wolfgang; and Albus, Udo, 5,591,754, Cl. 514-331.000.

Alcatel Italia S.P.A.: *See*—
Guglielmi, Franco; Lunchi, Carlo; and Spalvieri, Arnaldo, 5,592,516, Cl. 375-347.000.

Alcatel, N.V.: *See*—
Guedan, Juan A.; and Martin, Ana Ma del Mar M., 5,592,653, Cl. 395-500.000.
Weiss, Manfred, 5,592,478, Cl. 370-260.000.

Alcatel Network Systems, Inc.: *See*—
Honaker, Charles M., Jr., 5,592,519, Cl. 375-373.000.

Alcatel SEL A.G.: *See*—
Szabo, Laszlo, 5,592,469, Cl. 370-342.000.

Alcatel Sel Aktiengesellschaft: *See*—
Klotz, Bernhard, 5,592,535, Cl. 379-58.000.

Alcon Laboratories, Inc.: *See*—
Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,591,397, Cl. 422-37.000.

Aldovini, Anna: *See*—
O'Donnell, Michael A.; Duda, Rosemary B.; DeWolf, William C.; Aldovini, Anna; and Young, Richard A., 5,591,632, Cl. 435-252.300.

Alesi, Daniel E.: *See*—
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; and Toso, Kenneth E., 5,591,178, Cl. 606-143.000.

Alexander, Petr, to Gilead Sciences, Inc. Method for synthesis. 5,591,851, Cl. 544-243.000.

Alexeev, Georgy M.: *See*—
Oparin, Mikhail I.; Borisov, Mikhail T.; and Alexeev, Georgy M., 5,592,582, Cl. 392-421.000.

Alexeff, Igor: *See*—

Rader, Mark S.; Alexeff, Igor; Tsai, Peter P.; and Wadsworth, Larry C., 5,592,357, Cl. 361-225.000.

Algorithmic Research Ltd.: *See*—
Fiat, Amos, 5,592,552, Cl. 380-21.000.

Ali, Akhtar: *See*—
Trager, David S.; Ali, Akhtar; Higbee, Frederick J.; and Lin, Kun, 5,592,403, Cl. 364-724.010.

Ali, Ricardo M.: *See*—
Baeck, Ivo; Fernandez, Horacio H.; Llano, Horacio; and Ali, Ricardo M., 5,591,271, Cl. 134-8.000.

Alizi, Uri. Security fence. 5,592,149, Cl. 340-550.000.

Alkemade, Stanley J.: *See*—
Morales, Alvaro; and Alkemade, Stanley J., 5,591,724, Cl. 514-54.000.

Allegheny Ludlum Corporation: *See*—
Price, Leroy R.; and Benford, James G., 5,590,559, Cl. 72-366.200.

Allen, Chester C., Jr.: *See*—
Gregory, William E.; and Allen, Chester C., Jr., 5,592,068, Cl. 320-21.000.

Allen, Janice B.: *See*—
Furcht, Leo T.; McCarthy, James B.; Wahl, Sharon M.; and Allen, Janice B., 5,591,719, Cl. 514-13.000.

Allen, John T.: *See*—
Peck, Richard O.; Pagcas, Gary M.; Williams, Colin B.; Allen, John T.; Wickersham, Bernard G.; Bisgrove, Leonard C.; and Sellers, Bruce D., 5,590,602, Cl. 104-88.010.

Allen, Michael: *See*—
Seaton, Jay J.; Allen, Michael; Landis, Donald; Lee, Patrick; Linzy, David; and Luca, Susan B., 5,591,299, Cl. 156-626.100.

Allen, Patrick J.: *See*—
Hasse, Margaret H.; and Allen, Patrick J., 5,591,151, Cl. 604-385.100.

Allergan: *See*—
Vuligonda, Vidyasagar; Teng, Min; Beard, Richard L.; Johnson, Alan T.; Duong, Tien T.; Lin, Yuan; and Chandraratna, Roshantha A., 5,591,858, Cl. 546-322.000.

AlliedSignal Inc.: *See*—
Li, Hsin L.; Kwon, Young D.; Lem, Kwok W.; and Prevorack, Dusan C., 5,591,933, Cl. 89-36.020.
Olson, Robert W., 5,590,852, Cl. 244-118.500.

Allison, John L.: *See*—
Dai, Charles M.; and Allison, John L., 5,591,057, Cl. 440-42.000.

Allred, Donald E. Braid tip. 5,590,670, Cl. 132-273.000.

Alltrista Corporation: *See*—
Fedor, Richard L., 5,592,286, Cl. 356-240.000.

Almasy, Lawrence; Shuler, James F.; Vandepas, Robert J.; and Carlson, William L., to WCM Industries, Inc. Wall water hydrant having backflow and back siphonage preventor. 5,590,679, Cl. 137-218.000.

Almlöf, Göran; and Lillieblök, Folke, to BAL AB. Combined combustion and exhaust gas cleansing plant. 5,590,519, Cl. 60-39.330.

Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, to Zen Research N.V. Method of writing data simultaneously on a plurality of tracks of an optical disk, and apparatus therefor. 5,592,444, Cl. 369-13.000.

Alpha Fry Limited: *See*—
Shores, A. Andrew, 5,591,379, Cl. 252-194.000.

Alpha Therapeutic Corporation: *See*—
Whalen, John J.; Chlebowski, Michael E.; Heldebrant, Charles M.; and Matveld, H. Edward, 5,591,573, Cl. 435-5.000.

Alps Electric Co., Ltd.: *See*—
Kuriyama, Toshihiro, 5,592,082, Cl. 324-252.000.

Alt, Helmut G.: *See*—
Frey, Krisztina; von Massow, Gabriele; Alt, Helmut G.; and Welch, M. Bruce, 5,591,879, Cl. 556-404.000.

Alt, Robert A.: *See*—
Morehouse, James H.; Alt, Robert A.; Dunckley, James A.; Furay, David M.; Enno, Bruce D.; and Volk, Steven B., 5,592,349, Cl. 360-98.080.

Altera Corporation: *See*—
Lane, Christopher F.; Reddy, Srinivas T.; and Wang, Bonnie I., 5,592,102, Cl. 326-10.000.
Leong, William; McClintock, Cameron; and Cliff, Richard G., 5,592,106, Cl. 326-41.000.

Altman, Ralph F.; Wyst, S. Ronald; Smolensky, Leo A.; and Easom, Bruce H., to Electric Power Research Institute, Inc. Electrostatically enhanced separator (EES). 5,591,253, Cl. 96-61.000.

Altnäs, Martin: *See*—
Fredriksson, Mattias; and Altnäs, Martin, 5,590,997, Cl. 414-541.000.

Aluminum Company of America: *See*—
Russell, Vincent T., 5,590,992, Cl. 411-431.000.

Alvarez, Francisco J.: *See*—
Gupta, Pramod K.; Alvarez, Francisco J.; and Semla, Susan J., 5,591,451, Cl. 424-464.000.

ALZA Corporation: *See*—
Kuczynski, Anthony L.; Ayer, Atul D.; and Woog, Patrick S.-L., 5,591,454, Cl. 424-486.000.
Phipps, Joseph B., 5,591,124, Cl. 604-20.000.

Amano, Yoshikazu: *See*—
Arai, Fuminori; Amano, Yoshikazu; and Yamada, Kiyoshi, 5,592,290, Cl. 356-300.000.

Amarasi, Brenda B.; Breden, Erik N.; Dunn, Thomas A.; Funk, Michael W.; Kocan, Stephen M.; Mathews, Ilase L.; O'Connell, Kari; and Pollman, Mark C., to AT&T. System for completing air-to-ground telephone calls. 5,592,539, Cl. 379-112.000.

Ambrico, Kathleen A.: *See*—
Ambrico, Sal J.; and Ambrico, Kathleen A., 5,591,055, Cl. 440-6.000.

Ambrico, Sal J.; and Ambrico, Kathleen A. Clutch controlled adjustable steering device. 5,591,055, Cl. 440-6.000.

Ambrose, Jay H.: *See*—
Hsu, Ike C.; and Ambrose, Jay H., 5,590,538, Cl. 62-51.200.

Ameen, Joseph G.; Korleski, Joseph E.; Mortimer, William P., Jr.; and Yokimcus, Victor P., to W. L. Gore & Associates, Inc. Thermally conductive adhesive interface. 5,591,034, Cl. 439-91.000.

Amemiya, Hiroyuki: *See*—
Nishio, Toshikazu; Yamashita, Yoshiyuki; Amemiya, Hiroyuki; Takeuchi, Michiko; and Masubuchi, Nobu, 5,592,332, Cl. 359-619.000.

Ament, Weston H. Fly reel with adjustable brake assembly. 5,590,847, Cl. 242-317.000.

American Cord & Webbing Company, Inc.: *See*—
Krauss, Mark J., 5,590,444, Cl. 24-625.000.

American Cyanamid Company: *See*—
Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., 5,591,693, Cl. 504-130.000.
Lai, Margaret H. K.; Kirach, Donald R.; and Bard, Martin, 5,591,576, Cl. 435-6.000.
Lovell, James B., 5,591,765, Cl. 514-406.000.
Newton, Trevor W., 5,591,695, Cl. 504-263.000.
Patel, Bomi P.; Van Tuyl Cotter, Henry; and Lavanish, Jerome M., 5,591,726, Cl. 514-64.000.
Pfrengle, Waldemar F. A., 5,591,741, Cl. 514-231.500.
Thorner, Michael O.; Gaylinn, Bruce D.; Zysk, John R.; Lynch, Kevin R.; and Harrison, Jeffrey K., 5,591,641, Cl. 435-69.100.
Zisi, Mohammad R.; Sokol, Patricia T.; and Chandra, Manik, 5,591,824, Cl. 530-350.000.

American Home Products Corporation: *See*—
Hung, Paul P.; Lee, Shaw-Guang L.; and Kalyan, Narender K., 5,591,823, Cl. 530-350.000.

American National Can Company: *See*—
Forrest, Randall; Turner, Timothy; and Thurman, Don, 5,590,807, Cl. 220-608.000.
Weiss, Mark E.; Bauer, Thomas J.; and Johnson, Richard E., 5,590,777, Cl. 206-439.000.

American Research Corporation of Virginia: *See*—
Groger, Howard P.; Lo, Peter; Weiss, Martin; and Zory, Peter, 5,591,407, Cl. 422-82.050.

American Safety Razor Company: *See*—
Prochaska, Frank H., 5,590,468, Cl. 30-41.000.

American Sterilizer Company: *See*—
Chiffon, Mark E.; Klobusnik, Kenneth J.; and Ruffo, Anthony B., 5,591,396, Cl. 422-26.000.

Amerman, Thomas R. Underground heat exchange system. 5,590,715, Cl. 166-290.000.

Amersham International PLC: *See*—
Hampson, Ian N.; Pope, Lynne; and Butler, John, 5,591,575, Cl. 435-6.000.

Ames, William: *See*—
Wiedeman, Robert A.; Mouse, Paul A.; Carter, Stephen S.; and Ames, William, 5,592,481, Cl. 370-316.000.

Amesbury Group, Inc.: *See*—
Martin, Jeffrey S.; and Hoffman, Michael K., 5,590,496, Cl. 52-213.000.

Ametek, Inc.: *See*—
Dwyer, Mark K., 5,591,017, Cl. 417-366.000.

Ammermann, Eberhard: *See*—
Eicken, Karl; Müller, Bernd; Sauter, Hubert; Lorenz, Gisela; Ammermann, Eberhard; Schelberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Amoco Corporation: *See*—
Bhattacharyya, Alakananda; Chang, Wen-Dong; Kleeflach, Mark S.; and Udovich, Carl A., 5,591,238, Cl. 48-198.700.
Bhattacharyya, Alakananda; Foral, Michael J.; and Reagan, William J., 5,591,418, Cl. 423-239.100.

Amos, Dennis R.; and Chen, Jianqiang, to Westinghouse Electric Corporation. Optimized welding technique for NiMoV rotors for high temperature applications. 5,591,363, Cl. 219-137.0PS.

Ampex Corporation: *See*—
Lindholm, Dennis A., 5,592,599, Cl. 395-127.000.

Amplatz, Curtis: *See*—
Porter, Christopher H.; Van Tassel, Robert; Amplatz, Curtis; and Kasinkas, Michael, 5,591,199, Cl. 606-198.000.

AMS Medinvent S.A.: *See*—
Bachmann, Michel; and Nissels, Robert, 5,591,172, Cl. 606-108.000.

Amtec Corporation: *See*—
Reid, Jerry C., 5,591,908, Cl. 73-379.070.

Analog Devices, Inc.: *See*—
Haigh, Geoffrey T.; and Munroe, Scott C., 5,591,996, Cl. 257-238.000.
Palmer, Wyn; and Viana, Fernando, 5,592,120, Cl. 327-536.000.

Anani, Anaba A.: *See*—
Louie, Edmond; Reichert, Veronica R.; Anani, Anaba A.; and Zhang, Jinshan, 5,591,540, Cl. 429-163.000.

Anders, Alfred K.: *See*—
Joos, Felipe M.; and Anders, Alfred K., 5,590,560, Cl. 73-64.480.

Andersen Consulting LLP: *See*—
Cameron, Paul S.; Nash, John C.; Bloomer, Robert C.; Wollan, Robert E.; Kreutter, Kelly M.; Ahler Olmstead, Melinda A.; Renner, Dale H.; Bourne, Ryan D.; Carnish, Keith M.; and Jones, Dean R., 5,592,378, Cl. 395-227.000.

Andersen, Douglas W.: *See*—
Stein, Peter J.; Bablevouni, Armen; Fitzgerald, Michael G.; and Andersen, Douglas W., 5,591,907, Cl. 73-170.160.

Anderson, Brian W.; and Pugh, David A. Floor-mountable retractable roller device. 5,590,920, Cl. 292-219.000.

Anderson, Dirk M.; and Giri, Judith G., to Immunex Corporation. Monoclonal antibodies that bind interleukin-15 receptors. 5,591,630, Cl. 435-240.270.

Anderson, Gary J.: *See*—
Wallis, Frank S.; Caillat, Jean-Luc; Simpson, Francis M.; Anderson, Gary J.; Rode, Donald W.; and Beck, Norman G., 5,591,014, Cl. 417-310.000.

Anderson, Kenneth W.; and Hickner, Richard A., to Dow Chemical Company, The. Cationic, advanced epoxy resin compositions incorporating glycidyl ethers of oxyalkylated aromatic or cycloaliphatic diols. 5,591,788, Cl. 523-404.000.

Anderson, Kevin P.; and Draper, Kenneth G., to Isis Pharmaceuticals, Inc. Oligonucleotides for modulating the effects of cytomegalovirus infections. 5,591,720, Cl. 514-44.000.

Anderson, Mark A.: *See*—
Jaco, Pamela J.; Anderson, Mark A.; Simanson, Michael G.; and Montgomery, Terry G., 5,591,316, Cl. 428-253.000.

Anderson, Michael C.; Heap, Anthony J.; and Grose, Horst-Dieter, to Linpac Plastics International Limited. Method of manufacturing composite sheet materials. 5,591,496, Cl. 428-36.500.

Anderson, Scott C.: *See*—
Orth, Geoffrey A.; Anderson, Scott C.; and Brown, Peter S., 5,591,197, Cl. 606-198.000.

Anderson, Jan, to Lear Seating Corporation. Folding headrest. 5,590,933, Cl. 297-408.000.

Andis Company: *See*—
Andis, Matthew L., 5,590,475, Cl. 34-97.000.

Andis, Matthew L., to Andis Company. Hand held appliance and holder assembly. 5,590,475, Cl. 34-97.000.

Ando, Sadanaga; Kurasawa, Taizo; and Ozasa, Akio, to Nissei Kabushiki Kaisha. Method for manufacturing biodegradable molded articles. 5,591,491, Cl. 427-544.000.

Andreou, Doros, to Synergetic Resources Limited. Method and apparatus for laser isotope separation. 5,591,947, Cl. 204-157.220.

Andrus, Bryan D.; Sikes, Martin; Robertson, Christopher D. G.; Armes, Roderick; Slemko, Mark J.; Maduza, Andrew G.; and Nieto, Augustine, to Life Fitness. Physical exercise video system. 5,591,104, Cl. 482-7.000.

Aneja, Arun P., to Du Pont de Nemours, E. I., and Company. Polyester tow. 5,591,523, Cl. 428-357.000.

Angelon Corporation: *See*—
Kroll, Mark W., 5,591,209, Cl. 607-5.000.
Kroll, Mark W.; and Adams, Theodore P., 5,591,210, Cl. 607-5.000.

Angell, Edwin C. Method of improving soil irrigation with an improved solution grade calcium sulfate dihydrate. 5,590,983, Cl. 405-263.000.

Angermüller, Jürgen: *See*—
Scheck, Georg; Brandt, Carsten; Fischer, Markus; Angermüller, Jürgen; Rampel, Hans; and Dreher, Udo, 5,590,562, Cl. 74-89.140.

Angus Chemical Company: *See*—
Chou, Chih-Yueh; and Hoffman, Marina D., 5,591,819, Cl. 528-73.000.

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Bland, Bobby J.; Richardson, Kurt E.; and Ferrer, Jose E., 5,591,467, Cl. 426-2.000.

ANS, LLP: *See*—
La Rue, Charles; and Diller, Robert W., 5,592,389, Cl. 364-449.500.

Antisoma Limited: *See*—
Courtenay-Luck, Nigel S., 5,591,593, Cl. 435-7.230.

Aozzi, Satore; and Komatsu, Masaya, to Nikon Corporation. Photomask, an exposure method and a projection exposure apparatus. 5,592,259, Cl. 355-53.000.

Aoki, Hiroyuki: *See*—
Itabashi, Yasuhiro; Miyashita, Kazuhito; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroshi; Masujima, Toshio; Matsunaga, Makoto; Katagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.

Aono, Akira: *See*—
Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tanaka, Hisayoshi; Shiina, Takanori; and Kaburagi, Haruko, 5,591,406, Cl. 422-80.000.

Aoshima, Shinichiro: *See*—
Takahashi, Hirosori; Aoshima, Shinichiro; and Hirano, Isuke, 5,592,101, Cl. 324-753.000.

Aotsu, Hiroshi: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroshi; Ikegami, Mitsuru; and Kuwabara, Tadashi, 5,592,649, Cl. 395-481.000.

Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tamura, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamihaba, Gaku; and Iijima, Tadashi, to Kabushiki Kaisha Toshiba. Semiconductor device having a wiring layer with a barrier layer. 5,592,024, Cl. 257-751.000.

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Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tamura, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamihaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.

Aparellaje Electrico, S.A.: *See*—
Navarro, Juan M. B., 5,591,938, Cl. 174-50.000.

Appalachian Stove & Fabricators, Inc.: *See*—
Evenson, Barry; and Rice, James S., 5,591,024, Cl. 431-125.000.

Apple Computer, Inc.: *See*—
Kelley, Michael W.; and Yen, Shou-Chern, 5,592,601, Cl. 395-143.000.
Kelly, James D.; and Poirin, R. Stephen, 5,592,631, Cl. 395-293.000.
Pagallo, Giulia; Beernink, Ernest H.; Tchao, Michael C.; and Capps, Stephen P., 5,592,566, Cl. 382-187.000.
Rookes, James D.; and Olson, Kipley J., 5,592,588, Cl. 395-2.870.
Van Brunt, Roger W.; and Opreseu, Florin A., 5,592,510, Cl. 375-220.000.

Applied Materials, Inc.: *See*—
Sato, Tatsuya; Tabuta, Atsushi; and Kobayashi, Naoaki, 5,591,494, Cl. 427-579.000.
Shamouilian, Shamouil; Cameron, John F.; Deshpandey, Chandra; and Su, Yeh-Jia, 5,592,358, Cl. 361-234.000.

Applied Medical Resources Corporation: *See*—
Edelstein, Robert A., 5,591,179, Cl. 606-144.000.
Johnson, Gary M., 5,591,182, Cl. 606-151.000.

Applied Motion Products, Inc.: *See*—
Kordik, Jeffrey A., 5,592,057, Cl. 318-162.000.

Apps, Robert W.: *See*—
Fellegara, Peter C.; Apps, Robert W.; Heartberg, Mervet E.; and Osiecki, Richard E., 5,592,374, Cl. 395-203.000.

AptarGroup S.A.: *See*—
Rosenthal, Karl-Heinz; and Kitzing, Tom, 5,590,835, Cl. 239-333.000.

Apte, Prasad S.: *See*—
Third, Christine E.; Corbin, Stephen F. J.; and Apte, Prasad S., 5,592,686, Cl. 419-2.000.

Aquastrada International Corporation: *See*—
Gere, Gary M.; Holder, Russell L., Jr.; Masseti, Louis J.; and Ramsey, Ray, Jr., 5,590,617, Cl. 114-270.000.

Arai, Fumimori; Amano, Yoshikazu; and Yamada, Kiyoshi, to Fuji Photo Film Co., Ltd. Method for correcting instrumental error of spectroscope of optical analyzer. 5,592,290, Cl. 356-300.000.

Arai, Michio; Imashima, Takashi; Codama, Mitsufumi; Sugiura, Kazushi; Takayama, Ichiro; Kobori, Isamu; Yamauchi, Yukio; and Sakamoto, Naoya, to TDK Corporation; and Semiconductor Energy Lab. Co. Ltd. Solid state imaging device with low trap density. 5,591,988, Cl. 257-59.000.

Arai, Takahiro: *See*—
Seenaga, Tatsuo; Nakagawa, Hiroshi; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinsuke; Kobayashi, Miklio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanzawa, Masao; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Arai, Takashi; and Furusawa, Akira, to Canon Kabushiki Kaisha. Method for cooling injection molding molds. 5,591,385, Cl. 264-40.600.

Arai, Takeo; and Fukawa, Junichi, to Konica Corporation. Method for processing black-and-white silver halide photographic light-sensitive material. 5,591,561, Cl. 430-264.000.

Arakawa, Hiroharu: *See*—
Kojiri, Katsuhisa; Kondo, Hisao; Arakawa, Hiroharu; Ohkubo, Mitsuru; and Sada, Hiroyuki, 5,591,842, Cl. 536-27.100.

Arakawa, Masaaki, to Nitto Denko Corporation. Structure of releasing part. 5,591,498, Cl. 428-40.100.

Arakawa, Masaaki; Hori, Katsumi; and Makihara, Yoshiaki, to Nitto Denko Corporation. Z-shape pressure-sensitive adhesive tapes, and fastening system and sanitary absorptive articles using the tapes. 5,591,521, Cl. 428-352.000.

Araki, Shinji: *See*—
Tajima, Makoto; Araki, Shinji; and Beppu, Kei, 5,590,709, Cl. 165-167.000.

Arami, Junichi; Ishikawa, Kenji; Deguchi, Youichi; Yagi, Hironori; Kawada, Nobuo; and Yanagisawa, Isao, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Vacuum processing apparatus. 5,591,269, Cl. 118-723.00R.

Arato, Yoshihiro; and Ishimura, Chiaki, to Hitachi, Ltd. Method of and apparatus for customizing user interface. 5,592,603, Cl. 395-334.000.

ARB Corporation Limited: *See*—
Jones, Peter R.; and McDonald, Norman F., 5,591,098, Cl. 475-231.000.

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Reid, Robert A.; Ackley, Rhonda L.; and Hemperly, John J., 5,591,583, Cl. 435-6.000.
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King, Roger M., 5,590,799, Cl. 215-216.000.

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Loison, Gérard; Lemoine, Yves; Labat, Nathalie; and Balland, Alain, 5,591,640, Cl. 435-320.100.

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Bosslet, Klaus; Hermentin, Peter; Seemann, Gerhard; Kuhlmann, Ludwig; and Steinsträsser, Axel, 5,591,828, Cl. 530-387.300.

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Melnik, Bodo C.; and Plewig, Gerd, 5,591,446, Cl. 424-439.000.

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Smart, Michael; and McCay, Steven, 5,590,873, Cl. 271-303.000.

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Bell Atlantic Mobile Systems, Inc.: *See*—
McHenry, James F.; and Farris, Robert D., 5,592,533, Cl. 379-58.000.

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Farris, Robert D.; and Bartholomew, Dale L., 5,592,477, Cl. 370-396.000.
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Grewal, Kalwant S.; Patel, Jagdish A.; and Wang, Tzyh-Jong, 5,592,672, Cl. 395-200.150.
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Belmond, Jean-Marc, to Rockwell Light Vehicle Systems. Motor vehicle electric parking brake. 5,590,744, Cl. 188-265.000.
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Bengmark, Stig; Ahrne, Siv; Molin, Göran; and Jeppsson, Bengt, to Probi AB. Intestine colonizing lactobacilli. 5,591,428, Cl. 424-93.450.
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Benkert, Thomas: *See*—
Mann, Peter; and Benkert, Thomas, 5,590,514, Cl. 57-104.000.
Benn, Donald L.: *See*—
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Bennett, Dwayne; Young, Clifford; and Wu, Wayne, to Hewlett-Packard Company. Method and apparatus for transmission code decoding and encoding. 5,592,160, Cl. 341-58.000.
Benoist, Louis. Device and method for positioning and holding bone fragments in place. 5,591,169, Cl. 606-69.000.
Benoit, Sylvain: *See*—
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Benson, Steven: *See*—
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Beppu, Kei: *See*—
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Berkers, Antonius J. H.; Smits, Johannes F. G.; and Van De Ven, Antonius A. P., to Vanderlande Industries Nederland B.V. Conveying rail system for a trolly. 5,590,995, Cl. 414-357.000.
Berkowitz, Ami, to University of California, The Regents of the. Giant magnetoresistance single film alloys. 5,591,532, Cl. 428-611.000.
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Feldman, Richard I.; Wu, James M.; Mann, Elaine; Larocca, Anne; and Jenson, James C., 5,591,831, Cl. 530-395.000.
Bernard, Alain: *See*—
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Bernard, Gus, to Reflexite Corporation. Retroreflective prism arrays with formed air spheres therein. 5,592,330, Cl. 359-529.000.
Bernardi, Luigi: *See*—
Quadri, Luisa; Bernardi, Luigi; Bianchi, Giuseppe; Ferrari, Patrizia; Melloni, Piero; and Valentino, Loredana, 5,591,734, Cl. 514-172.000.
Bernhardt, Andrew; and Morrison, Matthew M., to Smith & Nephew Richards, Inc. Multi angle bone bolt. 5,591,166, Cl. 606-61.000.
Berns, Antonius J. M.: *See*—
Krimpenfort, Paulus J. A.; and Berns, Antonius J. M., 5,591,669, Cl. 800-2.000.
Bernstein, Robert J. Automatic portable account controller for remotely arranging for payment of debt to a vendor. 5,591,949, Cl. 235-380.000.
Berry, Tommy C.: *See*—
Fleaher, Dana J.; Becker, David L.; Beem, William L.; Berry, Tommy C.; and Cannon, N. Scott, 5,592,283, Cl. 356-72.000.
Berthiaume, William A., to C. R. Bard, Inc. Telescoping balloon catheter and method of use. 5,591,194, Cl. 606-192.000.
Berthold, John W.; Kidwell, J. Jeffrey; Norton, Douglas A.; and Reed, Stuart E., to Babcock & Wilcox Company, The. Gamma camera system for imaging contamination. 5,591,976, Cl. 250-363.100.
Bertossi, Roberto. Anti-fire system for vehicles. 5,590,718, Cl. 169-62.000.
Bertram, George T.; Corrigan, John J., III; Lacombe, Patrick S.; and Knaak, Michael R., to Sealed Air Corporation. Hand held dispenser for foamable compositions and dispensing system. 5,590,816, Cl. 222-135.000.
Bertrand Faure Equipements S.A.: *See*—
Hamelin, Bruno, 5,590,929, Cl. 297-216.120.
Bertrand, Jacques C.: *See*—
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Bertschi, Peter; and Gysi, Peter, to Elpatronic AG. Retaining element on a carousel conveyor with several outlets for selective retention of conveyed containers. 5,590,753, Cl. 198-441.000.
Best Lock Corporation: *See*—
Kester, Steven A.; Gilbertson, Scott A.; and McIntire, John W., 5,590,555, Cl. 70-224.000.
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O'Donnell, Michael A.; Duda, Rosemary B.; DeWolf, William C.; Aldovini, Anna; and Young, Richard A., 5,591,632, Cl. 435-252.300.
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Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., to American Cyanamid Company. Turfgrass management compositions. 5,591,693, Cl. 504-130.000.
Bhatia, Rajkumar P.: *See*—
Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,591,397, Cl. 422-37.000.
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BHP Steel (JLA) Pty Ltd.: *See*—
Fukaze, Hisahiko, 5,590,701, Cl. 164-415.000.
Bianchi, Giuseppe: *See*—
Quadri, Luisa; Bernardi, Luigi; Bianchi, Giuseppe; Ferrari, Patrizia; Melloni, Piero; and Valentino, Loredana, 5,591,734, Cl. 514-172.000.
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Bibeau, Joyce A.: *See*—
Shalati, Mohamad D.; Harris, Rodney M.; Bibeau, Joyce A.; and Valpey, Richard S., III, 5,591,805, Cl. 525-285.000.
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, to L'Unite Hermetique. Static frequency converter which compensates for fluctuations in a voltage source while controlling the waveform applied to a charge while controlling the waveform applied to a charge. 5,592,368, Cl. 363-34.000.
Bierck, Barnes R. Low permeability waste containment construction and composition containing granular activated carbon and method of making. 5,591,118, Cl. 588-259.000.
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Morris, Bruce E.; and Avery, Fred L., 5,590,913, Cl. 285-18.000.
Billert, Brian J.: *See*—
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Gschweitl, Karlheinz, 5,590,791, Cl. 209-577.000.
Bio-Lab, Inc.: *See*—
Jones, Ronald L.; Caughman, Henry D.; Shelor, Susan M.; and Lines, Ellwood L., Jr., 5,591,692, Cl. 504-124.000.
Bio-Rad Laboratories, Inc.: *See*—
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Olson, Phillip T.; Millis, James R.; and Reimer, Michael H., 5,591,438, Cl. 424-195.100.
Biocompatibles Limited: *See*—
Straford, Peter W.; and Driver, Michael J., 5,591,882, Cl. 558-87.000.
Bioniche Inc.: *See*—
Morales, Alvaro; and Alikemade, Stanley J., 5,591,724, Cl. 514-54.000.
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Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, to Ciba-Geigy Corporation. o-Hydroxyphenyl-s-triazines. 5,591,850, Cl. 544-216.000.
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Birk, Yitzhak. Method and apparatus for supplying data streams. 5,592,612, Cl. 395-182.040.
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Bitner, Haim: *See*—
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Bivens, Jack L. Diesel engine, modification, and method. 5,590,625, Cl. 123-65.00R.
Bizea, Yoshio: *See*—
Yoshizawa, Yoshihito; Bizea, Yoshio; Suwabe, Shigekazu; Yamauchi, Kiyotaka; and Nishiyama, Toshikazu, 5,591,276, Cl. 148-304.000.
Björklund, Per-Erik, to Asea Brown Boveri AB. Device in a d.c. circuit for transfer of a current from one current path to another and for control of the voltage in the circuit. 5,592,369, Cl. 363-51.000.
Bjørn, Soren E.; Norris, Kjeld; Diness, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., to Novo Nordisk A/S. Process for preparing aprotinin and aprotinin analogs in yeast cells. 5,591,603, Cl. 435-69.200.
Black & Decker Inc.: *See*—
Garuglieri, Andrea, 5,590,991, Cl. 411-354.000.
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Black Clawson Company, The: *See*—
Seifert, Peter; Chupka, David E.; and Bliss, Terry L., 5,591,336, Cl. 210-386.000.
Black, Larry J.; and Cullinan, George J., to Eli Lilly and Company. Combination treatment for osteoporosis. 5,591,753, Cl. 514-324.000.
Blackburn, Brian K.: *See*—
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Blackmore, Richard D. Method of forming advanced cured resin composite parts. 5,591,291, Cl. 156-173.000.
Blanchard, Richard A., to SGS-Thomson Microelectronics, Inc. Process for manufacturing a vertical switched-emitter structure with improved lateral isolation. 5,591,655, Cl. 437-31.000.
Blanche, Francis; and Thibaut, Denis, to Rhone-Poulenc Rorer, S.A. Process for the enzymatic preparation of macrolactone. 5,591,614, Cl. 435-120.000.
Bland, Bobby J.; Richardson, Kurt E.; and Ferrer, Jose E., to Anitox Corporation. Contamination-resistant animal feedstuffs. 5,591,467, Cl. 426-2.000.
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Bleys, Gerhard J.; Gerber, Dirk; and Neyens, Vivane G. J., to Imperial Chemical Industries PLC. Process for making flexible foams. 5,591,779, Cl. 521-109.100.
Blickhan, Franz. Drilling column with sledgehammer drilling head. 5,590,725, Cl. 175-100.000.
Blischke, Frank: *See*—
Schnaibel, Eberhard; Schneider, Erich; and Blischke, Frank, 5,590,521, Cl. 60-274.000.
Bliss, Terry L.: *See*—
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Bliven, Robert P.: *See*—
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Cheil Foods & Chemicals, Inc.: *See*—
Bang, Won Y.; Yeon, Kyu J.; Baik, Yeong O.; Kim, Young H.; Park, Kwan H.; Lee, Ki H., and Kim, Jin W., 5,591,766, Cl. 514-412.000.

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Friis, Niels; and Fruhich, Per, 5,591,857, Cl. 546-296.000.

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Chen, Jianqiang: *See*—
Amos, Dennis R.; and Chen, Jianqiang, 5,591,363, Cl. 219-137.0PS.

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Wagner, Thomas E.; Chen, Xiaozhuo; and Li, Yunsheng, 5,591,601, Cl. 435-69.100.

Chen, Yaw-Hwang, to Hewlett-Packard Co. Method of making a bipolar stripe transistor structure. 5,591,651, Cl. 437-33.000.

Chen, Yu Z.: *See*—
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Rojko, Jennifer L.; Hartke, James R.; and Cheney, Carolyn M., 5,591,717, Cl. 514-12.000.

Cheng, Andy, to Mast Systems Inc. Scanning apparatus including a light adjusting device. 5,592,306, Cl. 358-464.000.

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Cheng, Paul, to Taiwan Hodaka Industrial Co., Ltd. Adjustable buffer device for a bicycle. 5,590,869, Cl. 267-132.000.

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Cheng, You-Jen; and Cheng, Tzu-Ling, 5,590,952, Cl. 362-255.000.

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Masarik, David M.; Hayes, Robert S.; Cheung, Frank N.; and Klatt, Robert W., 5,591,973, Cl. 250-332.000.

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Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., 5,591,322, Cl. 208-120.000.
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Strupczewski, Joseph T.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,591,745, Cl. 514-254.000.

Chiba, Shou: *See*—
Usui, Kaoru; and Chiba, Shou, 5,591,268, Cl. 118-723.00E.

Chiba, Tomohiro: *See*—
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Rhoades, George D., 5,590,535, Cl. 62-50.200.

Chiffon, Mark E.; Klobusnik, Kenneth J.; and Ruffo, Anthony B., to American Sterilizer Company. Self cleaning drain system and modular plumbing system for a sterilizing apparatus. 5,591,396, Cl. 422-26.000.

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Chin, Albert K., to Origin Medsystems, Inc. Dissection apparatus. 5,591,183, Cl. 606-159.000.

Chin, Chen-Woo; and McEvoy, Christopher N., to Sanelsh Pty Ltd. Wood preservative applicator. 5,591,263, Cl. 118-200.000.

Chin, Shu-Yuan: *See*—
Wu, Chung-Yu; and Chin, Shu-Yuan, 5,592,114, Cl. 327-208.000.

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ChipScale, Inc.: *See*—
Richards, John G.; Flores, Hector; and Sander, Wendell B., 5,592,022, Cl. 257-735.000.

Chiron Corporation: *See*—
Chang, Che-An; Urdea, Michael S.; and Horn, Thomas, 5,591,584, Cl. 435-6.000.

Chiron Viagene, Inc.: *See*—
Barber, Jack R.; Jolly, Douglas J.; Respess, James G.; and Chang, Stephen M. W., 5,591,624, Cl. 435-240.200.

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Clark, Raymond C.; Grisel, Hilton L.; and Reimann, Kent D., 5,591,174, Cl. 606-130.000.

Chittor, Suresh S., to Intel Corporation. Method and apparatus for enhancing the fault-tolerance of a network. 5,592,610, Cl. 395-182.020.

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Whalen, John J.; Chlebowski, Michael E.; Heldebrant, Charles M.; and Marveld, H. Edward, 5,591,573, Cl. 435-5.000.

Cho, Kwan Shik, to LG Electronics Inc. Burner for stirling engines. 5,590,526, Cl. 60-517.000.

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Choi, Yong K.; and Song, Young J., to LG Semicon Co., Ltd. Phase shift mask and method for forming phase shift mask. 5,591,550, Cl. 430-5.000.

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Sim, Young-Ki; Hwang, Tae-Seop; Lee, Mi-Jung; Kwon, Hee-An; and Song, Tea-Heung, 5,591,881, Cl. 556-427.000.

Chou, Chih-Yueh; and Hoffman, Marina D., to Angus Chemical Company. Aldimine oxazolidines and polyisocyanates. 5,591,819, Cl. 528-73.000.

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Granados, Edward N.; Heiman, Daniel F.; Chow, Herbert S.; and Thaler, Maria L., 5,591,598, Cl. 435-29.000.

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McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Croe, James W., 5,591,148, Cl. 604-378.000.

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Bjarn, Soren E.; Norris, Kjeld; Dineus, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.

Christiansen, Lance J.: *See*—
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Small, Lyle D.; and Highberger, Gerald, 5,591,255, Cl. 106-21.00A.

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Wilson, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., 5,591,390, Cl. 264-456.000.

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Chunghwa Picture Tubes, Ltd.: *See*—
Chen, Hsing-Yao, 5,592,193, Cl. 345-102.000.

Chuniaud, Rene: *See*—
Albano, Andre; Chuniaud, Rene; Fieschi, Jacques; Michel, Patrick; and Le Pennec, Jean-Francois, 5,592,484, Cl. 370-452.000.

Chupka, David E.: *See*—
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Church & Dwight Co., Inc.: *See*—
Spears, William E., Jr., 5,591,064, Cl. 451-2.000.

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Massey, Richard J.; Powell, Michael J.; Dressick, Walter J.; Leland, Jonathan K.; Hino, Janet K.; Poonian, Mohinder S.; and Ciana, Leopoldo D., 5,591,581, Cl. 435-6.000.

Ciarmaia, Charles F., to Too Sweet, Ltd. Electromechanical cake decorating apparatus. 5,591,261, Cl. 118-13.000.

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Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.
Blyakhman, Yefim, 5,591,811, Cl. 525-504.000.
Hino, Zhimin; Iqbal, Abul; and Herren, Fritz, 5,591,865, Cl. 548-453.000.

Ciccarelli, Roger N.; Bertrand, Jacques C.; Pickering, Thomas R.; and Bayley, Denise R., to Xerox Corporation. Toner combination and method and apparatus for use. 5,591,552, Cl. 430-45.000.

Cicchiello, Joseph F.: *See*—
Matheson, Thomas G.; Cicchiello, Joseph F.; and Wilde, Glenn, 5,592,392, Cl. 364-490.000.

Cigna, Jean-Charles; Petitpez, Claudine; Marion, François; and Ravetto, Michel, to Commissariat a l'Energie Atomique. Radiation detection device having shunting detection elements and process for the production of said device. 5,591,959, Cl. 250-208.100.

Cimini, Catherine M.: *See*—
Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kukio, Anthony, Jr.; Mawbin, James A.; Marcelino, Edsardo; and Simone, Albert, 5,591,403, Cl. 422-73.000.

Cina, Vincent J.: *See*—
De Pauw, Wim; Cina, Vincent J.; Helm, Andrew R.; Kimelman, Douglas N.; and Vlissides, John M., 5,592,600, Cl. 395-140.000.

Cirasle, Michael K.: *See*—
Jallice, Darwin L.; Durham, Christopher M.; and Cirasle, Michael K., 5,592,426, Cl. 365-203.000.

Cirsollo, Joseph C.; and Schimke, David J., to Motorola Inc. Zero-cycle multi-state branch cache prediction data processing system and method thereof. 5,592,634, Cl. 395-586.000.

Cirsollo, Joseph C.: *See*—
Crouch, Alfred L.; Pressly, Matthew D.; Circello, Joseph C.; and Duerden, Richard, 5,592,493, Cl. 371-22.300.

Cirjak, Larry M.: *See*—
Blum, Patricia R.; Cirjak, Larry M.; Pepera, Marc A.; and Paparizos, Christos, 5,591,688, Cl. 502-330.000.

Cirrus Logic, Inc.: *See*—
Chejlava, Edward J., Jr.; Cline, Leslie E.; and Curt, Kenneth C., 5,592,682, Cl. 395-823.000.
Runas, Michael E.; and Patel, Kirit B., 5,592,077, Cl. 324-158.100.
Zook, Christopher P., 5,592,404, Cl. 364-746.100.
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Citizen Watch Co., Ltd.: *See*—
Kasaya, Masahiro; Kitajima, Yasuo; and Hasumi, Takayuki, 5,592,443, Cl. 368-281.000.
Nishikawa, Junichi; Murakami, Tomomi; and Uehara, Nobuyuki, 5,592,442, Cl. 368-11.000.

Citterio, Oberto, to Osservatorio Astronomico di Brera. Grazing incidence co-axial and confocal. 5,592,338, Cl. 359-883.000.

Clark Equipment Company: *See*—
Jacobson, Scott B., 5,590,731, Cl. 180-53.400.

Clark, Minh-Hien N.; and Sloan, James W., to Motorola, Inc. Pad array semiconductor device. 5,592,025, Cl. 257-774.000.

Clark-MXR, Inc.: *See*—
Gabl, Edward F.; Walker, David R.; and Pang, Yang, 5,592,327, Cl. 359-348.000.

Clark, Raymond C.; Grisel, Hilton L.; and Reimann, Kent D., to Chiron Vision Corporation. Microkeratome and method and apparatus for calibrating a microkeratome. 5,591,174, Cl. 606-130.000.

Clark, Thomas R.: *See*—
Brooks, Harold L.; Clark, Thomas R.; Kim, Kun H.; and Overbey, James W., 5,590,917, Cl. 292-21.000.

Clatanoff, Todd; Mankandey, Vishal; Gove, Robert J.; and Ohara, Kazuhiro, to Texas Instruments Incorporated. Motion adaptive scan-rate conversion using directional edge interpolation. 5,592,231, Cl. 348-452.000.

Clear, Sandra H.: *See*—
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., 5,591,152, Cl. 604-385.200.

Clearwater, Inc.: *See*—
Thomas, Todd R., 5,591,701, Cl. 507-240.000.

Clegg, William J.; and Kendall, Kevin, to Tioxide Specialties Limited. Process for producing layered ceramic product. 5,591,287, Cl. 156-89.000.

Clemco Products, Inc.: *See*—
London, Wallace, 5,590,765, Cl. 206-289.000.

Clement, John: *See*—
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Cliff, Richard G.: *See*—
Leong, William; McClintock, Cameron; and Cliff, Richard G., 5,592,106, Cl. 326-41.000.

Cline, Leslie E.: *See*—
Chejlava, Edward J., Jr.; Cline, Leslie E.; and Curt, Kenneth C., 5,592,682, Cl. 395-823.000.

Clinton, Peter M.; Cloud, Nathan; and Rohrbacher, Frank, to Du Pont de Nemours, E. I., and Company. One tank paint makeup process using a recirculation loop with liquid injection. 5,590,960, Cl. 366-134.000.

Clobes, Armin L.: *See*—
Schroeder, John A.; Clobes, Armin L.; and Hood, Arthur L., 5,591,395, Cl. 422-4.000.

Clorox Company, The: *See*—
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Cloud, Nathan: *See*—
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COBE Laboratories, Inc.: *See*—
Brugger, James M., 5,591,251, Cl. 95-242.000.
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Coburn, David R.: *See*—
Rogers, Steven W.; and Coburn, David R., 5,592,383, Cl. 364-424.034.

Cochran, Phillip: *See*—
Darling, Donald T.; Francis, Trent G.; Williams, Brad L.; Dewar, Harold L.; Delazer, David B.; Gold, Daniel B.; Postel, Jerry; Wright, Paul L.; Sands, Peter J.; and Cochran, Phillip, 5,591,462, Cl. 425-173.000.

Codama, Mitsufumi: *See*—
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Codina, George; Krull, Donald R.; and Vachon, J. Thomas, to Caterpillar Inc. Spark ignition system of an internal combustion engine. 5,590,629, Cl. 123-310.000.

Coggio, William D.; Arvea, Dirk H. C.; Parker, Douglas S.; and Worm, Allan T., to Minnesota Mining and Manufacturing Company. Fluorinated onium salts, curable compositions containing same, and method of curing using same. 5,591,804, Cl. 525-276.000.

Cognetti, Carlo: *See*—
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Cohen, Neil. Lockable container. 5,590,801, Cl. 220-315.000.

Cohen, Ronny: *See*—

Intrater, Amos; Birenbaum, Asdy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Inael; Epstein, Lev; Katzri, Lior; Viner, Omri; Levinan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Or, Ovod; Afek, Yachin; Tzadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.
Cohen, Yossi: *See*—
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Col-Ven S.A.: *See*—
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Colebrand Limited: *See*—
Tasch, Klaus N., 5,591,265, Cl. 118-404.000.
Coleman, John D.: *See*—
Bressler, Peter W.; and Coleman, John D., 5,590,495, Cl. 52-173.300.
Coleman, R. Glen, to Linvatec Corporation. Driving system for inserting threaded suture anchors. 5,591,207, Cl. 606-232.000.
Colin Corporation: *See*—
Ohmori, Kenji; Narimatsu, Kiyoyuki; and Kobayashi, Ikuo, 5,590,661, Cl. 128-672.000.
Colley, Jaime B., to Rockwell International Corporation. Directional steering and navigation indicator. 5,592,382, Cl. 364-449.100.
Colton, Mark W.: *See*—
Green, Vincent D.; and Colton, Mark W., 5,590,806, Cl. 220-562.000.
Colussi, Rafael A.; and Venica, Nestor J., to Col-Ven S.A. Liquid trap for compressed air. 5,591,243, Cl. 55-321.000.
Comcot S.A.I.C.: *See*—
Busch, Ivo; Fernandez, Horacio H.; Llano, Horacio; and Ali, Ricardo M., 5,591,271, Cl. 134-8.000.
Commissariat a l'Energie Atomique: *See*—
Cigna, Jean-Charles; Petitprez, Claudine; Marion, François; and Ravetto, Michel, 5,591,959, Cl. 250-208.100.
Pourprix, Michel, 5,592,096, Cl. 324-452.000.
Commonwealth Incorporated: *See*—
Hodroff, Joel, 5,592,376, Cl. 395-214.000.
Compagnie Générale Des Matières Nucléaires: *See*—
Jacq, Patrick; Masse, Jean C.; and Morlacs, Isabelle, 5,592,027, Cl. 264-0.500.
Compaq Computer Corporation: *See*—
Schultz, Stephen M.; Schmenk, David S.; Neufeld, E. David; Grant, David L.; and Flower, David L., 5,592,648, Cl. 395-441.000.
Compositive Technologies, Inc.: *See*—
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Compliant Solutions, LC: *See*—
Hilton, Lance; and Beal, Vicki S., 5,590,768, Cl. 206-308.100.
Condrey, Tommy H. Method and apparatus for delivering cotton modules and cotton therefrom into a cotton gin. 5,590,839, Cl. 241-27.000.
Cone, Alan C.; Loh, Ralph A.; and Tenenbaum, Stuart A., to World, Inc. Method and apparatus for applying pressure to a body limb for treating edema. 5,591,200, Cl. 606-201.000.
Conger, Kenneth D.: *See*—
Becker, Michael L.; Beer, Klaus; and Conger, Kenneth D., 5,591,288, Cl. 156-130.700.
Connally, Leslie O.: *See*—
Davignon, John J.; Jermain, Don J.; and Connally, Leslie O., 5,591,353, Cl. 216-18.000.
Connecteurs Cinch, Societe Anonyme: *See*—
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Consiglieri, Franco; Wolfsgruber, Arturo; and Storti, Sandro, to SGS-Thomson Microelectronics S.r.l. Connection system between a master and slave processing units. 5,592,485, Cl. 340-825.060.
Consiglio, Craig: *See*—
Kunoff, Noah; Van Deusen, William; and Consiglio, Craig, 5,592,587, Cl. 395-2.730.
Consorzio Per La Ricerca Sulla Microelectronica Nel Mezzogiorno: *See*—
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Containment Separations, Inc.: *See*—
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Costco International, Inc.: *See*—
Foster, Donald D., 5,590,834, Cl. 239-333.000.
Continental Aktiengesellschaft: *See*—
Mahling, Rolf, 5,591,283, Cl. 152-501.000.
Mahling, Rolf, 5,591,513, Cl. 428-143.000.
Conzelmann, Fritz, to Sipra Patententwicklungs-U.Beteiligungsgesellschaft mbH. Yarn feeder device utilizing position sensors to maintain yarn wrap. 5,590,547, Cl. 66-132.00R.
Cook, John A.; Pharry, Gregory A.; Henson, Larry W.; and Wood, Bruce R., to International Business Machines Corporation. Display adapter supporting priority based functions. 5,592,678, Cl. 395-800.000.
Cooke, Theodore M.: *See*—
Liu, An-Chang R.; and Cooke, Theodore M., 5,592,204, Cl. 347-88.000.
Cooley, Craig H.; Tibbitts, Gordon A.; and Hansen, Wayne R., to Baker Hughes Incorporated. Superhard cutting structures for earth boring with enhanced stiffness and heat transfer capabilities. 5,590,729, Cl. 175-432.000.
Coon, John S.; Balasubramanian, Manoharamy; Emanuele, R. Martin; and Shah, Himanshu, to Rush Presbyterian-St. Luke's Medical Center. Methods and compositions for reducing multidrug resistance. 5,591,715, Cl. 514-10.000.
Cooper Industries, Inc.: *See*—
Gold, John H., 5,592,033, Cl. 307-117.000.
Wilmot, Theodore S.; Driscoll, John C.; and Kempinski, Steve J., 5,592,118, Cl. 327-440.000.
Cooper, J. Carl. Analog signal coding and transmission apparatus and method capable of operation with multiple types of analog and digital signals. 5,592,508, Cl. 375-216.000.
Cooper, John T.: *See*—
Cree, James W.; Brown, Bruce; David, Jennifer; Plumley, Julian A.; Marshall, Robert E. L., III; and Cooper, John T., 5,591,149, Cl. 604-378.000.
Cooper, Stephen R.: *See*—
Finch, Richard W.; and Cooper, Stephen R., 5,592,616, Cl. 395-183.180.
Copeland Corporation: *See*—
Wallis, Frank S.; Caillat, Jean-Luc; Simpson, Francis M.; Anderson, Gary J.; Rode, Donald W.; and Beck, Norman G., 5,591,014, Cl. 417-310.000.
Coppersmith, Don: *See*—
Gushi, Richard H.; Larson, Raymond C.; Matyas, Stephen M., Jr.; Johnson, Donald B.; and Coppersmith, Don, 5,592,553, Cl. 380-23.000.
Corbia, John S., Jr.: *See*—
Accocella, John; Banks, Donald R.; Benenati, Joseph A.; Caulfield, Thomas; Hoebener, Karl G.; Watson, David P.; and Corbia, John S., Jr., 5,591,941, Cl. 174-266.000.
Corbin, Stephen F. J.: *See*—
Thiel, Christine E.; Corbin, Stephen F. J.; and Apte, Prasad S., 5,592,686, Cl. 419-2.000.
Cordis Corporation: *See*—
Narayanan, Pallassana V.; and Stanley, Kimberly D., 5,591,140, Cl. 604-269.000.
Van Erp, Wilhelmus P. M. M., 5,591,142, Cl. 604-282.000.
Corduan, Horst; and Rohde, Wilhelm, to Linde Aktiengesellschaft. Process and apparatus for recovery of pure argon. 5,590,544, Cl. 62-656.000.
Corneal Contouring Development L.L.C.: *See*—
Kilmer, Lauren G.; Nordquist, Robert E.; Nadalsky, Michael; and Gibson, David R., 5,591,185, Cl. 606-166.000.
Cornell Pump Manufacturing Corporation: *See*—
Ray, Robert B.; Qandil, Mark M.; and Olin, Gary L., 5,591,001, Cl. 415-111.000.
Corning Incorporated: *See*—
Stempin, John L.; and Wetzell, Dale R., 5,591,683, Cl. 501-32.000.
Corpex Technologies, Inc.: *See*—
D'Muhala, Thomas F., 5,591,270, Cl. 134-3.000.
Corrigan, John J., III: *See*—
Bertram, George T.; Corrigan, John J., III; Lacombe, Patrick S.; and Knaak, Michael R., 5,590,816, Cl. 222-135.000.
Cortez, David L.: *See*—
McDonnell, Christopher; Cortez, David L.; Whitfield, Kenneth H.; and Scott, Ian M., 5,591,184, Cl. 606-167.000.
Costner Industries Nevada, Inc.: *See*—
Meilkrantz, David H.; Macaluso, Lawrence L.; Sams, H. William, III; Schardin, Charles H., Jr.; and Federici, Alfred G., 5,591,340, Cl. 210-512.300.
Cota, Jose G. Consolidated music instrument case with amplifier and speakers. 5,590,771, Cl. 206-314.000.
Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; and Sohr, John, to Hypertherm, Inc. Plasma arc cutting process and apparatus using an oxygen-rich gas shield. 5,591,357, Cl. 219-121.390.
Coulie, Pierre: *See*—
Townsend, Alan; Bastin, Judy; Boon-Falleur, Thierry; van der Bruggen, Pierre; Coulie, Pierre; and Gajewski, Thomas, 5,591,430, Cl. 424-93.710.
Counts, Mary E.: *See*—
Fleischhauer, Grier S.; Hayes, Patrick H.; Morgan, Constance H.; Hajaligol, Mohammad R.; Watkins, Michael L.; Nichols, Walter A.; Sharpe, David E.; and Counts, Mary E., 5,591,368, Cl. 219-535.000.
Couret, Francoise: *See*—
Patoiseau, Jean-Francois; Couret, Francoise; Faure, Christian; Dupont-Passelaigue, Elisabeth; and Kook, Wouter, 5,591,743, Cl. 514-242.000.
Courreges, Francis: *See*—
Peyre, Jean-Francois; and Courreges, Francis, 5,592,056, Cl. 315-169.100.
Courtaulds Fibres (Holdings) Limited: *See*—
Sellars, Alan; White, Patrick A.; and Robinson, Philip L, 5,591,388, Cl. 264-168.000.
Courtenay-Luck, Nigel S., to Antisoma Limited. Minimum recognition unit of a PEM mucin tandem repeat specific monoclonal antibody and detection method using same. 5,591,593, Cl. 435-7.230.
Courty, Philippe: *See*—
Marcilly, Christian; Leporq, Serge; and Courty, Philippe, 5,591,323, Cl. 208-207.000.
Couture-Dorschner, Laurie; Hirt, Dede A.; Stoeger, William G.; and Dilnik, Rebecca L., to Kimberly-Clark Corporation. Absorbent article having an oppositely biased attachment flap. 5,591,147, Cl. 604-369.000.
Cowen, Steven J.; and Dombrowski, James H., to United States of America, Navy. Fiber optic cable splice and method for producing same. 5,592,579, Cl. 385-99.000.
Cowie, William D.: *See*—
Mannava, Seetharamaiah; McDaniel, Albert E.; Cowie, William D.; Halila, Herbert; Rhoda, James E.; and Gutknecht, James E., 5,591,009, Cl. 416-241.00R.
Cox, James E.: *See*—
Shoup, Michael J.; Cox, James E.; Fordenbacher, Paul J.; and Boldeaow, Gregory A., 5,591,129, Cl. 604-96.000.
Cragg, Gordon M.: *See*—
Boyd, Michael R.; Cardellina, John H., II; Gustafson, Kirk R.; McMahon, James B.; Fuller, Richard W.; Cragg, Gordon M.; Kashman, Yoel; and Soejarto, Doel, 5,591,770, Cl. 514-453.000.
Crane, Marsha: *See*—
Crum, Donald; and Crane, Marsha, 5,590,804, Cl. 220-483.000.
Craner, James. Device and method for treatment of hand involved habits. 5,590,421, Cl. 2-161.700.
Crank, Douglas: *See*—
Fisher, Daniel J.; Agrawal, Raj K.; Crank, Douglas; and Carter, John W., 5,591,528, Cl. 428-411.100.
Crawford, David R.: *See*—
Pinckney, Clarence D.; Gerasimov, Vladimir M.; Barkan, Mark G.; and Crawford, David R., 5,590,553, Cl. 68-212.000.
Cray Research, Inc.: *See*—
Knecht, Kevin M.; and Fromm, Eric C., 5,592,487, Cl. 370-473.000.
Crayford, Ian S.: *See*—
Lo, William; and Crayford, Ian S., 5,592,486, Cl. 370-389.000.
Credit Verification Corporation: *See*—
Deaton, David W.; and Gabriel, Rodney G., 5,592,560, Cl. 382-100.000.
Cree, James W.; Brown, Bruce; David, Jennifer; Plumley, Julian A.; Marshall, Robert E. L., III; and Cooper, John T., to Procter & Gamble Company, The. Absorbent article having meltblown components. 5,591,149, Cl. 604-378.000.
Cree, James W.: *See*—
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.
Cree Research, Inc.: *See*—
Edmond, John A.; Bulman, Gary E.; and Kong, Hua-Shuang, 5,592,501, Cl. 372-45.000.
Crews, Mitchell S.; Kuhn, Wayne H.; and Bryll, M. Scott, to Stone Container Corporation. Shipping platform apparatus. 5,590,606, Cl. 108-51.300.
Crocco, Guy L.: *See*—
Chang, Te; Leyshon, David W.; and Crocco, Guy L., 5,591,875, Cl. 549-531.000.
Crouch, Alfred L.; Pressly, Matthew D.; Ciccello, Joseph C.; and Duerden, Richard, to Motorola Inc. Serial scan chain architecture for a data processing system and method of operation. 5,592,493, Cl. 371-22.300.
Crum, Donald; and Crane, Marsha. Device for draining and storing items in the vicinity of a sink. 5,590,804, Cl. 220-483.000.
Cucchiara, Francine A.: *See*—
Cucchiara, Lewis P.; Cucchiara, Francine A.; and Delgudico, Thomas C., 5,590,492, Cl. 52-15.000.
Cucchiara, Lewis P.; Cucchiara, Francine A.; and Delgudico, Thomas C. Roof drainage system. 5,590,492, Cl. 52-15.000.
Cuevas, Jess A., to TRW Inc. Air bag inflator. 5,590,905, Cl. 280-737.000.
Culbert, Brent A.: *See*—
Ruf, Arthur; Culbert, Brent A.; and Trenka, Eszter, 5,590,479, Cl. 34-589.000.
Cullen, John F.: *See*—
Chilton, Jeff K.; Cullen, John F.; and Ejiri, Koichi, 5,592,574, Cl. 382-295.000.
Culler, Michael D.: *See*—
Goldstein, Gideon; and Culler, Michael D., 5,591,588, Cl. 435-7.100.
Cullinan, George J.: *See*—
Black, Larry J.; and Cullinan, George J., 5,591,753, Cl. 514-324.000.
Cumming, David X.: *See*—
Brinson, Alan D.; Cumming, David X.; and York, David W., 5,591,705, Cl. 510-276.000.
Cummins, Donald L., deceased (by Marian G. Cummins, executor), to Cummins Eagle, Inc. Dough cut-off method and apparatus. 5,591,472, Cl. 425-503.000.
Cummins Eagle, Inc.: *See*—
Cummins, Donald L., deceased, 5,591,472, Cl. 425-503.000.
Cummins Engine Company, Inc.: *See*—
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter L.; Kleine, Richard E.; and Webber, Larry R., 5,591,102, Cl. 477-107.000.
Cummins, Marian G., executor: *See*—
Cummins, Donald L., deceased, 5,591,472, Cl. 425-503.000.
Cummins, Thomas J.: *See*—
Bergmeyer, Lynn; and Cummins, Thomas J., 5,591,580, Cl. 435-6.000.
Cunha, Francisco J.; and Walker, Alan, to General Electric Co. Closed or open air cooling circuits for nozzle segments with wheelspace purge. 5,591,002, Cl. 415-115.000.
Cunningham, John. Earthquake-resistant architectural system. 5,590,506, Cl. 52-741.300.
Cunningham, Patrick M., to Branson Ultrasonics Corporation. Mounting means and method for vibration member. 5,590,866, Cl. 248-638.000.
Curry, Robert J.: *See*—
Monk, Ronald W.; VanCleve, David P.; and Curry, Robert J., 5,591,031, Cl. 434-14.000.
Curt, Kenneth C.: *See*—
Chejlava, Edward J., Jr.; Cline, Leslie E.; and Curt, Kenneth C., 5,592,682, Cl. 395-823.000.
Cylink Corporation: *See*—
Omura, Jimmy K.; Yang, Paul T.; Khachatrian, Gurgen H.; Nikogossian, Karen M.; Hovakimian, Karen S.; and Vartapetian, Armen L., 5,592,506, Cl. 375-207.000.
Cymbal, William D.: *See*—
Palfenier, Samuel R.; Keipert, Frank R.; Beauch, Howard D.; Olgren, Leland N.; and Cymbal, William D., 5,590,565, Cl. 74-493.000.
Cypress Semiconductor Corporation: *See*—
Williams, Bertrand J., 5,592,125, Cl. 331-1.00A.
Cyrix Corporation: *See*—
McDermott, Mark W.; and Turner, John E., 5,592,107, Cl. 326-49.000.
Czanderna, Alvin W.: *See*—
King, David E.; Herdt, Gregory C.; and Czanderna, Alvin W., 5,591,690, Cl. 502-401.000.
Czura, Peter: *See*—
Dornier, Peter D.; Wahhoud, Adnan; Czura, Peter; and Scorl, Hans-Dieter, 5,590,692, Cl. 139-1.00R.
Daar, Horst: *See*—
Barthel, Herbert; Daar, Horst; and Schuetz, Hartmut, 5,592,373, Cl. 364-184.000.
Dabrowski, Henry P.; Salpekar, Anil; and Lever, O. William, Jr., to Bausch & Lomb Incorporated. Ophthalmic solution for artificial tears. 5,591,426, Cl. 424-78.040.
Dachiku, Kenshi; Yamaguchi, Shogo; Ozeki, Kazuo; Takahashi, Katsumi; Omokawa, Mitsusori; and Kuratate, Takaaki, to Kabushiki Kaisha Toshiba. Video encoder using global motion estimation and polygonal patch motion estimation. 5,592,228, Cl. 348-416.000.
Dade MicroScan Inc.: *See*—
Jones, Donald, 5,591,402, Cl. 422-65.000.
Jones, Donald, 5,591,642. Cl. 436-43.000.
Daewoo Electronics Co., Ltd.: *See*—
Kim, Jung-Gyu, 5,592,322, Cl. 359-184.000.
Daggy, Bruce P.: *See*—
Mazur, Adam W.; Pikul, Stanislaw; and Daggy, Bruce P., 5,591,836, Cl. 536-6.100.
Dai, Charles M.; and Allison, John L., to United States of America, Navy. Hull supported steering and reversing gear for large waterjets. 5,591,057, Cl. 440-42.000.
Dai Nippon Printing Co., Ltd.: *See*—
Fujikawa, Junji; Iimura, Yukio; Takahashi, Masahiro; Nishimoto, Takashi; Matsui, Hiroyuki; and Fujita, Masanobu, 5,592,317, Cl. 349-110.000.
Nishio, Toshikazu; Yamashita, Yoshiyuki; Amemiya, Hiroyuki; Takeuchi, Michiko; and Masubuchi, Nobu, 5,592,332, Cl. 359-619.000.
Daijavad, Shahrokh: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Brawn, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viebbeck, Alfred, 5,591,285, Cl. 156-62.200.
Daikin Industries, Ltd.: *See*—
Kawafune, Kazunori; Sahara, Masaaki; and Hiraki, Masahiro, 5,591,013, Cl. 417-271.000.
Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, to Shimadzu Corporation; and Mitsubishi Denki Kabushiki Kaishi. Rotary cathode x-ray tube equipment. 5,592,526, Cl. 378-132.000.
Daikoku, Takahiro: *See*—
Atarashi, Takayuki; Hatada, Toshio; Daikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kasai, Kenichi; Kobayashi, Fumiyuki; and Hayashi, Yoshito, 5,592,363, Cl. 361-689.000.
Daimler-Benz Aktiengesellschaft: *See*—
Bodensohn, Alexander; and Henkel, Heinz, 5,591,665, Cl. 437-61.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Inagaki, Yukihiko; and Matsuura, Hideki, 5,592,324, Cl. 359-210.000.
Dalebout, William T.; Watterson, Scott R.; and Furner, Paul, to ICON Health & Fitness, Inc. Exercise step bench with adjustable legs. 5,591,105, Cl. 482-52.000.
Dalebout, William T.; Measom, S. Ty; and Watterson, Scott R., to ICON Health & Fitness, Inc. Adjustable incline system for exercise equipment. 5,591,106, Cl. 482-54.000.
Dallas Semiconductor Corporation: *See*—
Dias, Donald R.; and Lee, Robert D., 5,592,069, Cl. 320-30.000.
Jackson, Harry S.; and Margules, Michael A., 5,592,165, Cl. 341-143.000.
Dalrymple, William H.: *See*—
Saunders, William T., deceased; and Dalrymple, William H., 5,590,558, Cl. 72-347.000.
Dame, Stephen G., to Virtual DSP Corporation. Musical signal multiplexing circuit and demultiplexing system. 5,591,931, Cl. 84-726.000.
D'Amore, Jean-Francois: *See*—

Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-Francois; and Deneuvillers, Guy, 5,591,167, Cl. 606-61.000.

Danby, Gordon T.; Jackson, John W.; Bridi, Charles E.; Gudimetla, Krishna M.; and Rimbaugh, Joseph F., to Fonar Corporation. Eddy current control in NMR imaging system. 5,592,089, Cl. 324-318.000.

Daniel, William H., to Purdue Research Foundation. Planted surface moisture control system. 5,590,980, Cl. 405-37.000.

Daniels, Mark E., to Avantage Group, Inc., The. Header bag dispensing combination. 5,590,784, Cl. 206-554.000.

Dantlgraber, Jörg, to Mannesmann Rexroth GmbH. Constructional unit consisting of a hydraulic machine (hydraulic pump or hydraulic motor) and a support. 5,591,015, Cl. 417-312.000.

Dapco Industries, Inc.: *See*—
Giragosian, David W.; Norris, James R., Jr.; and Sholl, Howard A., 5,592,078, Cl. 324-207.180.

Dare, Karen; Riswick, Martin; Ruykovitz, Gary F.; and Paul, Charles W., to National Starch and Chemical Investment Holding Corporation. Disposable absorbent product. 5,591,154, Cl. 604-387.000.

Daringer, Ronald G.; and Wilcox, Stephen D., to Maryland Wire Belts, Inc. Woven-wire belt with vertically-oriented lateral edges and conveyance methods and apparatus. 5,590,755, Cl. 198-778.000.

Darling, Donald T.; Francis, Trent G.; Williams, Brad L.; Dewar, Harold L.; Delater, David B.; Gold, Daniel B.; Pentel, Jerry; Wright, Paul L.; Sands, Peter J.; and Cochran, Phillip, to Prasco Technology, Inc. Bottle inspection along molder transport path. 5,591,462, Cl. 425-173.000.

Darnell, Lawrence; and Salter, James, to COBE Laboratories, Inc. Centrifugally assisted centrifuge bowl mount. 5,591,113, Cl. 494-12.000.

Darnell, Lloyd W.: *See*—
Arnold, Richard W.; and Darnell, Lloyd W., 5,591,649, Cl. 437-8.000.

Dasgupta, Falguni: *See*—
Abbas, Saeed A.; Dasgupta, Falguni; Aas, Darwin; Musser, John H.; and Naabed, Mina A., 5,591,835, Cl. 536-4.100.

Dassanayake, N. L.: *See*—
Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., 5,591,397, Cl. 422-37.000.

Dassel, Mark W.; Master, Donald C.; Rennie, Donald H.; McBrayer, Roy N., Jr.; Deaton, James E.; and Thompson, Fred W., to RPC Waste Management Services, Inc. Reactor for supercritical water oxidation of waste. 5,591,415, Cl. 422-241.000.

DataProducts Corporation: *See*—
Lin, An-Chang R.; and Cooke, Theodore M., 5,592,204, Cl. 347-88.000.

Datascope Investment Corp.: *See*—
Jansen, Ernst; Rutgers, Gunter; and Sager, Lawrence, 5,591,204, Cl. 606-213.000.

Dang-Hoppecke Gesellschaft fuer Batteriesysteme mbH: *See*—
Imhof, Orwin; Kistrup, Holger; and Kitzhoefer, Wilhelm, 5,591,053, Cl. 439-874.000.

Daugherty, David W., Jr.: *See*—
Duffy, James L.; Daugherty, David W., Jr.; Kanjo, Wajik; and George, Rudi E., 5,590,797, Cl. 213-33.000.

David, Donald J.; Dickerson, Jerauld L.; and Sincock, Thomas F. Thermoplastic composition and method for producing thermoplastic composition by melt blending carpet. 5,591,802, Cl. 525-66.000.

David, Jennifer: *See*—
Cree, James W.; Brown, Bruce; David, Jennifer; Phanley, Julian A.; Marshall, Robert E. L., III; and Cooper, John T., 5,591,149, Cl. 604-378.000.

Davidson, Donald R., to H-Tech, Inc. Fluid filter with pleated septum. 5,591,329, Cl. 210-193.000.

Davidson Textron Inc.: *See*—
Pilcos, Scott M.; and Gallant, Christopher, 5,591,078, Cl. 454-124.000.
Gajewski, Gerard H., 5,590,453, Cl. 29-407.050.
Souders, Steven L.; and Frost, Colin, 5,591,289, Cl. 156-148.000.

Davie, Robert M.: *See*—
Iorio, Ralph A.; Davie, Robert M.; McDaniel, James D.; Mitchell, Frank L.; and Nie, Tho, 5,590,691, Cl. 138-146.000.

Davies, Huw M. L., to Wake Forest University. Enantioselective synthesis of seven-membered carbocycles and tropanes. 5,591,854, Cl. 546-14.000.

Davies, Michael B.; Hearne, David J.; Rand, Paul K.; and Walker, Richard I., to Glaxo Group Limited. Inhalation device. 5,590,645, Cl. 128-203.150.

Davignon, John J.; Jernasia, Don J.; and Connelly, Leslie O., to Texas Instruments Incorporated. Reduction of surface copper thickness on surface mount printed wire boards with copper plated through holes by the chemical planarization method. 5,591,353, Cl. 216-18.000.

Davis, Cecil J.: *See*—
Paranjpe, Ajit P.; Davis, Cecil J.; and Matthews, Robert T., 5,591,493, Cl. 427-569.000.

Davis, Herbert T., III: *See*—
Price, Robert H.; Davis, Herbert T., III; and Dunn, Scott A., 5,592,170, Cl. 342-22.000.

Davis, Raymond L.; and Swift, Michael J., to Shapecourt Limited. Video cassettes and other pre-recorded media cartridges. 5,592,550, Cl. 380-5.000.

Davis, Richard M.; Gourich, Thad J.; and Hall, Mark W., to Hughes Electronics. Parallel frame synchronizer for detecting forward-ordered/reverse-ordered, inverted/non-inverted data. 5,592,518, Cl. 375-368.000.

Davox Corporation: *See*—
Smith, B. Scott; and Pearson, Garry L., 5,592,543, Cl. 379-265.000.

Day, Kathleen C.: *See*—
Schuteen, Charles S.; Day, Kathleen C.; and Finn, Rory F., 5,591,431, Cl. 424-94.640.

DBS Manufacturing, Inc.: *See*—
Young, Richard N.; and Irwin, Thomas J., II, 5,591,635, Cl. 435-286.100.

De La Rue Giori S.A.: *See*—
Eisenberth, Christoph; Finkelstein, Ira; McGhie, Dennis; and Pasofsky, Edward, 5,592,573, Cl. 382-294.000.
Wyssmann, Hans, 5,590,507, Cl. 53-399.000.

De Andrea, Renato, to Bull HN Information Systems Italia S.P.A. Computer frame of riveted modular construction. 5,590,938, Cl. 312-257.100.

Deering, Michael P., Sr.; Baten, Robert A.; Cedillo, Greg L.; and Vicknair, Bruce A., to Steward & Stevenson Services, Inc. Automatic cementing system for precisely obtaining a desired cement density. 5,590,958, Cl. 366-20.000.

Deaton, David W.; and Gabriel, Rodney G., to Credit Verification Corporation. Method and system for building a database and performing marketing based upon prior shopping history. 5,592,560, Cl. 382-100.000.

Deaton, James E.: *See*—
Dassel, Mark W.; Master, Donald C.; Rennie, Donald H.; McBrayer, Roy N., Jr.; Deaton, James E.; and Thompson, Fred W., 5,591,415, Cl. 422-241.000.

DeBakker, Peter M.: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Schereb, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

DeCamp, William H.: *See*—
Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., 5,591,361, Cl. 219-121.820.

DeCapite, Marianne G.: *See*—
Rao, Madhukar; Youn, Hyeong-Chas; Toussaint, Anthony F.; and DeCapite, Marianne G., 5,591,793, Cl. 524-310.000.

Decker, Richard H.: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,591,440, Cl. 424-227.100.

Dedola, Salvatore J.: *See*—
Trombley, Frederick W., III; and Dedola, Salvatore J., 5,591,143, Cl. 604-283.000.

Deere & Company: *See*—
Hollstein, Jürgen; and Redemann, Gerd, 5,592,029, Cl. 307-9.100.

DeFreitas, Dennis M., to Simmonds Precision Engine Systems, Inc. Ignition methods and apparatus for combustors. 5,590,517, Cl. 60-39.060.

Degen, Peter J.; and Lee, Joseph Y., to Pall Corporation. Electrolytically conductive battery separator polymeric film. 5,591,539, Cl. 429-144.000.

Degremont: *See*—
Delporte, Claude; and Jacquart, Jean-Claude, 5,591,342, Cl. 210-603.000.

Deguchi, Yoshichi: *See*—
Azumi, Junichi; Ishikawa, Kouji; Deguchi, Yoshichi; Yagi, Hiromori; Kawada, Nobuo; and Yanagisawa, Isao, 5,591,269, Cl. 118-723.00R.

Degussa Aktiengesellschaft: *See*—
Bankmann, Martin; Ohmer, Johannes; and Tacke, Thomas, 5,591,873, Cl. 549-503.000.
Makryaleas, Kyriakos; Druz, Karlheinz; and Bommarius, Andreas, 5,591,613, Cl. 435-114.000.
Storeck, Arnold, 5,591,307, Cl. 162-181.600.

de Jong, Willem G. L.: *See*—
Weterings, Wilhelmine M. M.; Nieuwenhuis, Franciscus J. M.; and de Jong, Willem G. L., 5,590,427, Cl. 4-611.000.

Dekel, Eliad, to State of Israel, Ministry of Defence, Armament Development Authority. System and method for monitoring progress of winding a fiber. 5,590,846, Cl. 242-158.00R.

Dekel, Moshe. Laparoscopic tissue retrieval device and method. 5,591,187, Cl. 606-180.000.

Dekzar, John L.; and Patil, Sanjay L., to Minnesota Mining and Manufacturing Company. Method for producing an ionic sensor. 5,591,400, Cl. 422-57.000.

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Marra, Robert A.; Hudoba, Kurt J.; and Willis, John W., 5,590,567, Cl. 74-502.400.

Delgadico, Thomas C.: *See*—
Cacchiara, Lewis P.; Cacchiara, Francine A.; and Delgadico, Thomas C., 5,590,492, Cl. 52-15.000.

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Wisecombe, Nathan, 5,592,394, Cl. 364-492.000.

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Brown, Alan E., 5,592,071, Cl. 323-282.000.

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Gaskins, Darius D.; and Parks, Terry J., 5,592,684, Cl. 395-872.000.

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Finch, Richard W.; and Cooper, Stephen R., 5,592,616, Cl. 395-183.180.

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Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-Francois; and Deneuvillers, Guy, 5,591,167, Cl. 606-61.000.

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Kelman, David C.; and Trentacosta, Joseph D., 5,591,233, Cl. 623-16.000.

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Desaulty, Michel A. A.; Sandelis, Denis J. M.; and Schroer, Pierre M. V. E., to Societe National D'Etdue et de Construction de Moteurs D'Aviation S.N.E.C.M.A. Perforated wall for a gas turbine engine. 5,590,531, Cl. 60-752.000.

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Horn, Joseph B.; and De Scheerder, Ivan, 5,591,230, Cl. 623-1.000.

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Shamouilian, Shamouil; Cameron, John F.; Deshpandey, Chandra; and Su, Yuh-Jia, 5,592,358, Cl. 361-234.000.

Detable, Pascal, to Etablissements Caillau. Pair of jaw fittings for mounting on pliers for clamping a collar. 5,590,573, Cl. 81-9.300.

de Toledo, Fernando A.: *See*—
Spievack, Alan R.; and de Toledo, Fernando A., 5,591,170, Cl. 606-82.000.

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Imhof, Orwin; Kistrup, Holger; and Kitzhoefer, Wilhelm, 5,591,053, Cl. 439-874.000.

Deutsche Carbone AG: *See*—
Ulrich, Heinz P., 5,590,708, Cl. 165-165.000.

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Hilbert, Stefan; and Kirchner, Bernd, 5,592,164, Cl. 341-120.000.

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Fuchs, Patrick; Little, Melvyn; Breitling, Frank; and Dübel, Stefan, 5,591,604, Cl. 435-69.700.

Dewa, Masami: *See*—
Ueno, Haruhiko; Nagasawa, Shigeru; Ikeda, Masayuki; Shinjo, Naoki; Ishizaka, Ken-ichi; Utsumi, Teruo; Dewa, Masami; and Kobayakawa, Kazushige, 5,592,628, Cl. 395-700.130.
Utsumi, Teruo; Nagasawa, Shigeru; Ikeda, Masayuki; Shinjo, Naoki; Dewa, Masami; Ueno, Haruhiko; Kobayakawa, Kazushige; and Ishizaka, Kenichi, 5,592,680, Cl. 395-800.000.

DeWald, Ronald L.: *See*—
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Agrawal, Sudhir; Diasio, Robert B.; and Zhang, Ruiwen, 5,591,721, Cl. 514-44.000.

Diaz, Stephen H.: *See*—
Gliga, Alexandru S.; and Diaz, Stephen H., 5,592,475, Cl. 370-359.000.

DiCarlo, Paul: *See*—
LeMaire, Norman J., III; DiFrancesco, Francis J.; DiCarlo, Paul; Naugler, Peter D.; and Sikora, George J., 5,590,570, Cl. 74-579.00R.

Dickerson, Jerauld L.: *See*—
David, Donald J.; Dickerson, Jerauld L.; and Sincock, Thomas F., 5,591,802, Cl. 525-66.000.

Dickinson, Bradley W.: *See*—
Lee, Jungwoo; and Dickinson, Bradley W., 5,592,226, Cl. 348-413.000.

Dickinson, Robert J.: *See*—
Hamilton, Robin; Ryan, Patrick J.; Kelly, Derek; and Dickinson, Robert J., 5,590,659, Cl. 128-661.010.

Diehl, Karl H.; Eggensperger, Heinz; Goroncy-Bermes, Peter; Ohmsmann, Peter; and Toefke, Susanne, to Reckitt & Colman Inc. Skin antiseptic and hand disinfectant. 5,591,442, Cl. 424-401.000.

Dietz, Erwin: *See*—
Urban, Manfred; and Dietz, Erwin, 5,591,258, Cl. 106-497.000.

Dietz, Harald: *See*—
Kellner, Ulrich; Gepfert, Stefan; Schlueter, Franz-Josef; and Dietz, Harald, 5,592,145, Cl. 340-391.100.

Diez, Ulrich: *See*—
Rothamel, Karl; Humber, Kurt; and Diez, Ulrich, 5,591,909, Cl. 73-462.000.

Different Dimensions Inc.: *See*—
Zuckerman, Andrew M., 5,590,822, Cl. 223-85.000.

DiFrancesco, Francis J.: *See*—
LeMaire, Norman J., III; DiFrancesco, Francis J.; DiCarlo, Paul; Naugler, Peter D.; and Sikora, George J., 5,590,570, Cl. 74-579.00R.

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Pawlowski, Chester W., 5,592,685, Cl. 395-882.000.

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Printz, Harry W.; and Stubley, Peter R., 5,592,162, Cl. 341-107.000.

Diller, Robert W.: *See*—
La Rue, Charles; and Diller, Robert W., 5,592,389, Cl. 364-449.500.

Dilnik, Rebecca L.: *See*—
Couture-Dorschner, Laurie; Hirt, Dede A.; Stoeger, William G.; and Dilnik, Rebecca L., 5,591,147, Cl. 604-369.000.

Diness, Viggo: *See*—
Bjørn, Soren E.; Norris, Kjeld; Diness, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.

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Dinkins, Gilbert M., to EON Corporation. Wireless modem. 5,592,491, Cl. 370-277.000.

DiscoVision Associates: *See*—
Bailey, Jack H., 5,592,455, Cl. 369-59.000.
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DiStefano, Thomas H.; Smith, John W.; Karavakis, Konstantine N.; Kovac, Zlata; and Fjelstad, Joseph, to Tessera, Inc. Method of making multilayer circuit. 5,590,460, Cl. 29-830.000.

Djakovic, Vladan, to Integrated Device Technology, Inc. Apparatus and method for converting a job conforming to a first protocol into a job conforming to a second protocol. 5,592,654, Cl. 395-500.000.

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Lieberman, Fred S., 5,591,504, Cl. 428-68.000.

Djuric, Stevan W.; Haack, Richard A.; and Miyashiro, Julie M., to G. D. Searle & Co. LTB4 synthesis inhibitors. 5,591,756, Cl. 514-350.000.

D'Muhala, Thomas F., to Corpex Technologies, Inc. Lead oxide removal method. 5,591,270, Cl. 134-3.000.

Doak, Nancy B.: *See*—
Olsen, Robb E.; Bittar, Sandra R.; Hines, Letha M.; Vinnage, William R., Jr.; May, Melisse N.; Osborn, Thomas W., III; and Doak, Nancy B., 5,591,150, Cl. 604-385.100.

Dober Chemical Corp.: *See*—
Prendergast, Frank T., 5,590,686, Cl. 137-597.000.

Dodge, Timothy J.; Iradi, Thomas E.; and Patel, Divya C., to Litton Systems, Inc. Method and apparatus for laser beam management with frequency converting compounds. 5,592,325, Cl. 359-326.000.

Dohan, Yves; Rouhier, Maurice; and Heulot, Jacques-Henry, to Framatome Connectors International. Floating connector with temporary locking facility and space application thereof. 5,591,040, Cl. 439-248.000.

Doherty, Donald B.; and Gove, Robert J., to Texas Instruments Incorporated. Method and system for accessuzing inserse white display areas in sequential DMD video systems. 5,592,188, Cl. 345-84.000.

Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoux, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., to Merck & Co., Inc. Substituted azetidinones as anti-inflammatory and antidegenerative agents. 5,591,737, Cl. 514-210.000.

Doherty, James E.; Veoukas, Stanley C.; and Woodling, Ernest J., to Illinois Tool Works Inc. System for controlling energy output of combustion-powered, fastener-driving tool. 5,592,580, Cl. 388-815.000.

Dohnishi, Kiyoyuki, to Murata Manufacturing Co., Ltd. High voltage connector. 5,591,049, Cl. 439-595.000.

Döhring, Klaus: *See*—
Bethmann, Michael; and Döhring, Klaus, 5,590,888, Cl. 277-235.008.

Doi, Etsuro; Aioh, Kiyoshi; Mochizuki, Shoichi; and Koiso, Masakazu, to Kel Corporation. Circuit board connector. 5,591,036, Cl. 439-79.000.

Dolan, John W.: *See*—
Abrams, Brad P.; Minor, Raymond B.; McGregor, Gordon L.; and Dolan, John W., 5,591,526, Cl. 428-401.000.

Dolby, Lloyd J.: *See*—
Cavalia, David J.; Dolby, Lloyd J.; and Chasin, Mark, 5,591,776, Cl. 514-622.000.

Dollinger Corporation: *See*—
Preette, Dean M.; and Larson, Stephen E., 5,591,338, Cl. 210-493.100.

Dolomite S.p.A.: *See*—
Vaccari, Franco, 5,590,481, Cl. 36-118.800.

Dombrowski, James H.: *See*—
Cowen, Steven J.; and Dombrowski, James H., 5,592,579, Cl. 385-99.000.

Dominion Chemical Company: *See*—
Recchia, Frank P.; Ferrell, Wilson M.; and Ferrell, W. Maclin, Jr., 5,591,806, Cl. 525-369.000.

Dönges, Reinhard: *See*—
Bartz, Uwe; Dönges, Reinhard; and Klehr, Heiner, 5,591,844, Cl. 536-90.000.

Donnelly Corporation: *See*—
Fisher, Daniel J.; Agrawal, Raj K.; Crank, Douglas; and Carter, John W., 5,591,528, Cl. 428-411.100.

Don-Yehiya, Yehuda, to State of Israel Rafael-Armament Development Authority. Quick connector. 5,590,973, Cl. 403-325.000.

Dorinski, Dale W.: *See*—
Suppelsa, Anthony B.; and Dorinski, Dale W., 5,591,364, Cl. 219-201.000.

Dorn, Conrad P.: *See*—
Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoux, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.

Dornier, Peter D.; Wahlstedt, Adnan; Czura, Peter; and Scorl, Hans-Dieter, to Lindauer Dornier Gesellschaft mbH. Method for avoiding fabric faults during transitional loom operating conditions. 5,590,692, Cl. 139-1.008.

Doron, Moshe: *See*—
Intrater, Amos; Binyahaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itzak; Epstein, Lev; Katzri, Lior; Viner, Ouri; Levitan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.

Douka, Katsumi: *See*—
Iwamoto, Hisashi; Konishi, Yasuhiro; Douka, Katsumi; and Murai, Yasumitsu, 5,592,434, Cl. 365-233.000.

Doucet, Alain; Mathey, Christophe; and Vougny, Alain, to Thomson Tubes & Displays, S.A. Auxiliary coil fastener in a deflection yoke. 5,592,045, Cl. 313-440.000.

Doty, Michael A., to University of California, The Regents of the. System and method for simultaneously collecting serial number information from numerous identity tags. 5,591,951, Cl. 235-435.000.

Dougherty, Thomas J.: *See*—
Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Shieu, Fuu-Yau, 5,591,847, Cl. 540-472.000.

Dow Chemical Company, The: *See*—
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Beebe, Kenneth R.; Hughes, Glen H.; Ruhl, Harry D.; and Winterton, Richard C., 5,592,402, Cl. 364-578.000.
Pews, R. Garth; Morgan, Tod A.; and Kar, Kishore K., 5,591,503, Cl. 428-65.400.
Walton, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., 5,591,390, Cl. 264-456.000.

Down Mining Co., Ltd.: *See*—
Hirano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,591,535, Cl. 428-694.0RE.

DowElanco: *See*—
Turner, Jan R.; Huber, Mary L. B.; Broughton, Mary C.; Mynderse, Jon S.; and Martin, James W., 5,591,606, Cl. 435-76.000.

Downing, Dennis D. Lawn edger apparatus. 5,590,720, Cl. 172-18.000.

Doyle, Scott M.: *See*—
Fandrich, Mickey L.; Fedel, Salim B.; Price, Thomas C.; Durante, Richard J.; Gould, Geoffrey A.; Goodell, Timothy W.; and Doyle, Scott M., 5,592,641, Cl. 395-430.000.

Dr. Karl Thomae GmbH: *See*—
Hasel, Norbert; Narr, Berthold, deceased; Ries, Uwe; van Meel, Jacobus C. A.; Wienen, Wolfgang; and Entzeroth, Michael, 5,591,762, Cl. 514-381.000.

Dragner, Louis R.; and Farewell, John P., to Sequa Chemicals, Inc. Process for surface sizing paper or paperboard. 5,591,489, Cl. 427-364.000.

Drake, Charles A.: *See*—
Wu, An-hsiang; Drake, Charles A.; and Melton, Ralph J., 5,591,689, Cl. 502-334.000.

Draoui, Elyes: *See*—
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Draper, Kenneth G.: *See*—
Anderson, Kevin P.; and Draper, Kenneth G., 5,591,720, Cl. 514-44.000.

Drauz, Karlheinz: *See*—
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Dreher, Udo: *See*—
Scheck, Georg; Brandt, Carsten; Fischer, Markus; Angermüller, Jürgen; Rampel, Hans; and Dreher, Udo, 5,590,562, Cl. 74-89.140.

Dreisbach, Lisa B.: *See*—
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Dresser Industries, Inc.: *See*—
Ferguson, Walter J., 5,591,918, Cl. 73-732.000.

Dressick, Walter J.: *See*—
Massey, Richard J.; Powell, Michael J.; Dressick, Walter J.; Leland, Jonathan K.; Hino, Janel K.; Poonian, Mohinder S.; and Cuna, Leopoldo D., 5,591,581, Cl. 435-6.000.

Dretzka, Andrew P., to Harnischfeger Corporation. Bearing retainer assembly. 5,590,968, Cl. 384-563.000.

Dreux, Jacques: *See*—
Nallet, Jean-Pierre; Dreux, Jacques; Berdeaux, Alain; Richard, Vincent; Mantoman, Piero; and Bohn, Helmut, 5,591,758, Cl. 514-365.000.

Drew Chemical Corporation: *See*—
Mansfield, William D., 5,590,716, Cl. 166-302.000.

Drexel Oil Field Services, Inc.: *See*—
Van Winkle, D. Wayne, 5,590,867, Cl. 251-1.300.

Driefus, David L.: *See*—
Fox, Bradley A.; Glass, Jeffrey T.; Driefus, David L.; and Lojk, Luka, 5,592,053, Cl. 315-3.000.

Driscoll, John C.: *See*—
Wilmot, Theodore S.; Driscoll, John C.; and Kempinski, Steve J., 5,592,118, Cl. 327-440.000.

Driver, Michael J.: *See*—
Stratford, Peter W.; and Driver, Michael J., 5,591,882, Cl. 558-87.000.

Drucker, Kevin D., to Whitaker Corporation, The. Current sensing daisy-chain bypass arrangement. 5,591,984, Cl. 250-551.000.

Drug Delivery Systems Inc.: *See*—
Sibalis, Dan; and Rosen, Sanford, 5,591,123, Cl. 604-20.000.

DSC Communications Corporation: *See*—
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,592,545, Cl. 379-347.000.

Du Pont de Nemours, E. I., and Company: *See*—
Aneja, Arun P., 5,591,523, Cl. 428-357.000.
Clinton, Peter M.; Cloud, Nathan; and Rohrbacher, Frank, 5,590,960, Cl. 366-134.000.
Fahmy, Mohamed A. H., deceased; Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., 5,591,764, Cl. 514-403.000.
Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., 5,591,729, Cl. 514-85.000.
Hodge, Richard M., 5,591,699, Cl. 507-213.000.
Jacobson, Stephen E., 5,591,890, Cl. 562-412.000.

Döbel, Stefan: *See*—
Fuchs, Patrick; Little, Melvyn; Breitling, Frank; and Döbel, Stefan, 5,591,604, Cl. 435-69.700.

Dubois, Marie-Françoise: *See*—
Tiollais, Pierre; Chany, Charles; Dubois, Marie-Françoise; Pourcel, Christine; and Louise, Anne, 5,591,638, Cl. 435-320.100.

Ducheyne, Paul; Radin, Shulamith; and Santos, Erick M., to University of Pennsylvania, The Trustees of the. Incorporation of biologically active molecules into bioactive glasses. 5,591,453, Cl. 424-484.000.

Duda, Rosemary B.: *See*—
O'Donnell, Michael A.; Duda, Rosemary B.; DeWolf, William C.; Aldovini, Anna; and Young, Richard A., 5,591,632, Cl. 435-252.300.

Duerden, Richard: *See*—
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Duffy, James L.; Daugherty, David W., Jr.; Kaajo, Wajih; and George, Rudi E., to Westinghouse Air Brake Company. Friction clutch mechanism for high capacity draft gear assembly and method of reconditioning draft gear with such friction clutch mechanism. 5,590,797, Cl. 213-33.000.

Dumas, Marc: *See*—
Boste, Frédéric; Meyheck, Alain; and Dumas, Marc, 5,591,437, Cl. 424-195.100.

Dumont, Philippe; and Goffin, Robert, to Lhoist Recherche et Developpement S.A. Agglomerated product with paper fibers. 5,591,247, Cl. 75-329.000.

Dunckley, James A.: *See*—
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Dungan, Thomas E. Frequency modulator. 5,591,219, Cl. 607-88.000.

Dunlop France SA: *See*—
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Dunn, Joseph: *See*—
Edmunds, Michael V.; MacKenzie, Kenneth E.; Dunn, Joseph; Smith, A. Gordon; and Kase, J. Paul, 5,592,602, Cl. 395-174.000.

Dunn, Scott A.: *See*—
Price, Robert H.; Davis, Herbert T., III; and Dunn, Scott A., 5,592,170, Cl. 342-22.000.

Dunn, Thomas A.: *See*—
Amarant, Brenda B.; Breden, Erik N.; Dunn, Thomas A.; Funk, Michael W.; Kocan, Stephen M.; Mathews, Ilene L.; O'Connell, Kari; and Pollman, Mark C., 5,592,539, Cl. 379-112.000.

Duong, Lan Q., to CFM International Inc. Adaptor for installing flue liners to direct vent fireplace inserts. 5,590,641, Cl. 126-85.008.

Duong, Tien T.: *See*—
Valigonda, Vidyasagar; Teng, Min; Beard, Richard L.; Johnson, Alan T.; Duong, Tien T.; Lin, Yuan; and Chandrasena, Roshantha A., 5,591,858, Cl. 546-322.000.

Dupont-Passelaigue, Elizabeth: *See*—
Patoiseau, Jean-Francois; Couret, Francoise; Faure, Christian; Dupont-Passelaigue, Elizabeth; and Koek, Wouter, 5,591,743, Cl. 514-242.000.

Duran, John A.; Vargas, Javier; and Ricks, Merle K., to Avibank Mfg., Inc.; and Morton International, Inc. Air bag mounting system. 5,590,900, Cl. 280-728.200.

Durante, Richard J.: *See*—
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Durec, Jeffrey: *See*—
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Jallice, Derwin L.; Durham, Christopher M.; and Ciraula, Michael K., 5,592,426, Cl. 365-203.000.

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Dutchik, Robert A., to Baxter International Inc. Double-sterile package for medical apparatus and method of making. 5,590,778, Cl. 206-439.000.

Duvoisin, Robert M.: *See*—
Heinemann, Stephen F.; Patrick, James W.; Boulter, James R.; Deneris, Evan S.; Connolly, John G.; Duvoisin, Robert M.; Heinemann, Eden D.; Wada, Keiji; Ballivet, Marc C.; and Goldman, Daniel J., 5,591,590, Cl. 435-7.100.

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Kydonieus, Agis; Baxter, Ladislav; Shah, Kishore; Jamshidi, Khosrow; Chang, Tak-lung; and Kuo, Sheng-hung, 5,591,820, Cl. 528-76.000.

E/M Corporation: *See*—
Jamison, Warren E., 5,591,808, Cl. 525-403.000.

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Mitchell, Donald J., 5,590,802, Cl. 220-321.000.

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Salmon, Bardwell C.; Borgman, John D.; and Holtey, Thomas O., 5,592,375, Cl. 395-207.000.

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Yachera, Robert S., 5,590,671, Cl. 134-95.100.

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Joos, Felipe M.; and Anders, Alfred K., 5,590,560, Cl. 73-64.480.
Kapp, Daniel L.; and Yoemathan, Janet, 5,591,569, Cl. 430-549.000.
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Adams, Mathew J.; Lancaster, Kenneth R.; Menzel, David B.; Rapp, Jeffrey C.; and Wilson, Joseph H., 5,590,840, Cl. 241-99.000.

ECP-Enichem Polymeres France S.A.: *See*—
Audureau, Joël; Mehalla, Hacene; and Pellerin, Thierry, 5,591,410, Cl. 422-131.000.

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Greenberg, Gary, 5,592,328, Cl. 359-389.000.

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Diehl, Karl H.; Eggensperger, Heinz; Gorneey-Bernes, Peter; Ottenstein, Peter; and Toefke, Susanne, 5,591,442, Cl. 424-401.000.

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Kubota, Yasushi; Konishi, Yoshiaki; and Eguchi, Masaaki, 5,591,016, Cl. 417-365.000.

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Ejiri, Koichi: *See*—
Chikon, Jeff K.; Cullen, John F.; and Ejiri, Koichi, 5,592,574, Cl. 382-295.000.

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Feldman, Steven; and Jenkins, David C., 5,590,463, Cl. 29-844.000.

Elcon Products International: *See*—
Matthews, Russell H., 5,591,039, Cl. 439-181.000.

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Pyke, Stephen C., 5,591,321, Cl. 205-787.000.
Trou, John L.; and Garey, John F., 5,590,706, Cl. 165-11.100.

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Altman, Ralph F.; Wyatt, S. Ronald; Smolensky, Leo A.; and Eason, Bruce H., 5,591,253, Cl. 96-61.000.

Electroline Corp.: *See*—
Erbrick, Robert S.; and Erbrick, Joseph E., 5,590,470, Cl. 30-250.000.

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Lee, Hak-Kyu; Kim, Kyong-Hon; Park, Seo-Yeon; and Lee, El-Hang, 5,592,319, Cl. 359-127.000.

Elf Aquitaine Production: *See*—
Heaucouse, Henry; and Draoui, Elyes, 5,592,381, Cl. 364-422.000.

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Black, Larry J.; and Cullinan, George J., 5,591,753, Cl. 514-324.000.
Mons, James A., 5,591,867, Cl. 548-532.000.
Nagarajan, Ramakrishnan; and Schabel, Amelia A., 5,591,714, Cl. 514-9.000.

Elkanick, Mark: *See*—
Cannon, James J.; and Elkanick, Mark, 5,590,850, Cl. 244-3.150.

Elliott, Bruce, to Whitehall Corporation. Data collection and relay circuit for towed hydrophone array. 5,592,437, Cl. 367-21.000.

Elliott, Gregory: *See*—
Prescott, Jack R.; Elliott, Gregory; Hopkins, Mark A.; Rudewicz, Paul T.; and Thomas, Thom, 5,590,809, Cl. 221-1.000.

Ellis, Bradley D.: *See*—
Bornhorst, James M.; Ellis, Bradley D.; and Hutton, Richard W., 5,590,955, Cl. 362-324.000.

Ellis, Robert P.; Nill, Robert E.; and Niedzwiecki, Leon P., to TRW Vehicle Safety Systems Inc. Dual resistance switch for buckle confirmation. 5,590,904, Cl. 280-735.000.

Elo TouchSystems, Inc.: *See*—
Kent, Joel, 5,591,945, Cl. 178-19.000.

Eloff, Peter: *See*—
Reznikov, Gregory; Eloff, Peter; and Tierney, Thomas, 5,592,525, Cl. 378-121.000.

Elpatronic AG: *See*—
Bertschi, Peter; and Gysi, Peter, 5,590,753, Cl. 198-441.000.

Eltoukhy, Abdelshafy A.: *See*—
Go, Ying; McCollum, John L.; and Eltoukhy, Abdelshafy A., 5,592,016, Cl. 257-530.000.

Ema, Taiji; and Ikoda, Toshimi, to Fujitsu Limited. Process of producing a semiconductor device in which a height difference between a memory cell area and a peripheral area is eliminated. 5,591,659, Cl. 437-52.000.

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Coon, John S.; Balasubramanian, Manoharamy; Emanuele, R. Martin; and Shah, Himanshu, 5,591,715, Cl. 514-10.000.

EMC Corporation: *See*—
Rabinovich, Daniel; and Steinberg, Henry, 5,592,621, Cl. 395-200.020.

Emerson Electric Co.: *See*—
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Emo, Bruce D.: *See*—
Morehouse, James H.; Alt, Robert A.; Dunckley, James A.; Furay, David M.; Emo, Bruce D.; and Volk, Steven B., 5,592,349, Cl. 360-98.080.

Emond, Jean P.; and Saville, Robert G., to Caterpillar Inc. Engine cooling systems. 5,590,624, Cl. 123-41.490.

Emprise Technologies, L.P.: *See*—
Burt, Denis; Pagano, Patrick; and Waite, Dwayne, 5,592,627, Cl. 395-200.130.

EMS-INVENTA AG: *See*—
Torre, Hans D.; and Hewel, Manfred, 5,591,495, Cl. 428-35.700.

Endo, Hiroki: *See*—
Takamura, Yoji; and Endo, Hiroki, 5,592,223, Cl. 348-309.000.

Endo, Kouji: *See*—
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Endo, Tsukimi: *See*—
Nakayama, Masatoshi; Nakano, Masahiro; and Endo, Tsukimi, 5,590,969, Cl. 400-120.010.

Endo, Yoichi, to Sakase Textile Co., Ltd.; and Endo, Yoichi. Protector. 5,590,826, Cl. 224-264.000.

Endovascular Systems, Inc.: *See*—
Marin, Michael L.; and Marin, Ralph, 5,591,196, Cl. 606-198.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Fritzsche, Hellmut, 5,591,501, Cl. 428-64.100.

Engel, Wolfgang: *See*—
Wrobel, Günter; Engel, Wolfgang; and Engelberger, Raimund, 5,591,008, Cl. 416-144.000.

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Englert, Heinrich: *See*—
Lang, Hans-Jochen; Weichert, Andreas; Kleemann, Heinz-Werner; Englert, Heinrich; Scholz, Wolfgang; and Albus, Udo, 5,591,754, Cl. 514-331.000.

Enomoto, Junichi: *See*—
Shinoaki, Sakura; and Enomoto, Junichi, 5,592,397, Cl. 364-510.000.

Entact Corporation: *See*—
Pierce, Sherry A., 5,591,116, Cl. 588-256.000.

Entzeroth, Michael: *See*—
Hauel, Norbert; Narr, Berthold, deceased; Ries, Uwe; van Moel, Jacobus C. A.; Wienen, Wolfgang; and Entzeroth, Michael, 5,591,762, Cl 514-381.000.

Environamics Corporation: *See*—
Rockwood, Robert E., 5,591,020, Cl. 417-423.130.

EON Corporation: *See*—
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Eppenbach, Lawrence C. Tent and tent pole system. 5,590,674, Cl. 135-114.000.

Eppendorf-Netheler-Hinz GmbH: *See*—
Belgardt, Herbert; Schürbrock, Klaus; and Meyer, Rolf-Günter, 5,591,408, Cl. 422-100.000.

Epstein, Lev: *See*—
Intrater, Amos; Birenbaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itael; Epstein, Lev; Katzri, Lior; Viner, Omri; Levitan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.

Epstein, Michael J.: *See*—
Joshi, Narendra D.; Epstein, Michael J.; and Ewbank, Michael E., 5,590,529, Cl. 60-737.000.

Erbrick, Joseph E.: *See*—
Erbrick, Robert S.; and Erbrick, Joseph E., 5,590,470, Cl. 30-250.000.

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Erhardt, Herbert J.: *See*—
Guidash, Robert M.; Erhardt, Herbert J.; and Stevens, Eric G., 5,591,997, Cl. 257-290.000.

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Cheung, Edmond Y.; and Erickson, Charles R., 5,592,105, Cl. 326-38.000.

Erickson, Donald J.: *See*—
Testerman, Roy L.; and Erickson, Donald J., 5,591,216, Cl. 607-42.000.

Erickson, Paul R., to Laser Master Corporation. Ink jet print head rail assembly. 5,592,202, Cl. 347-37.000.

Ericsson GE Mobile Communications Inc.: *See*—
Schwed, Daniel L., 5,592,556, Cl. 380-49.000.

Eriksen, Gunnar; and Olsen, Sissel W., to Kvaerner Eureka A.S. Method of heating a jacketed working surface of rotating roller and a rotary roller. 5,590,704, Cl. 165-90.000.

Ernst, Holger; and Moll, Holger, to U.S. Philips Corporation. Frequency modulator comprising an adjusting circuit. 5,592,132, Cl. 332-117.000.

Ersler, Donald J.: *See*—
Lunde, Mark H., 5,590,823, Cl. 223-94.000.

Esrock, Bernard S. Method for making disposable tubular device. 5,591,389, Cl. 264-171.120.

Esteves, Robert; and Fruchard, Michel, to W. R. Grace & Co-Conn. Process and machine for conditioning any products in containers such as barquettes. 5,590,509, Cl. 53-432.000.

Etablissements Caillau: *See*—
Dotable, Pascal, 5,590,573, Cl. 81-9.300.

Etablissements Recoules et Fils (S.A.): *See*—
Bouzounie, Lucien, 5,590,987, Cl. 408-230.000.

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Privitera, Salvatore; Schwemberger, Richard F.; and Kolata, Ron, 5,591,192, Cl. 606-185.000.

Ethyl Corporation: *See*—
Bell, Donald R., 5,591,237, Cl. 44-325.000.

Etoh, Yoshihiko: *See*—
Yamazaki, Hiroshi; Oshiba, Takeo; and Etoh, Yoshihiko, 5,591,558, Cl. 430-120.000.

Etzel, James E.; and Kurek, Joseph, to Heritage Environmental Services, Inc. Water treatment process. 5,591,346, Cl. 210-668.000.

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Cavalla, David J.; Dolby, Lloyd J.; and Chasin, Mark, 5,591,776, Cl. 514-622.000.
Miller, Ronald B.; Leslie, Stewart T.; Malkowska, Sandra T. A.; Smith, Kevin J.; Wimmer, Walter; Winkler, Horst; Hahn, Udo; and Fraser, Derek A., 5,591,452, Cl. 424-468.000.

Evans, Donald A.: *See*—
Adams, R. Dean; Evans, Donald A.; and Flaker, Roy C., 5,592,142, Cl. 340-146.200.

Everatt, Allan E.: *See*—
Miller, Alistair I.; Stuart, Andrew T. B.; and Everatt, Allan E., 5,591,319, Cl. 205-627.000.

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Ewbank, Michael E.: *See*—
Joshi, Narendra D.; Epstein, Michael J.; and Ewbank, Michael E., 5,590,529, Cl. 60-737.000.

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Hiramoto, Koji, 5,590,895, Cl. 280-278.000.

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Audett, Jay D.; and McElrath, Kenneth O., 5,591,551, Cl. 430-18.000.

Exxon Research and Engineering Company: *See*—
Terry, Patrick H.; Sherowski, Gregory S.; and Holmes, Philip, 5,591,411, Cl. 422-139.000.

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Martinitz, Hans-Peter, 5,590,678, Cl. 137-205.000.

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Vross, Anthony R.; and Fagan, George V., 5,591,244, Cl. 55-356.000.

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Fahmy, Mohamed A. H., deceased (by Salwa Fahmy, executor); Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., to Du Pont de Nemours, E. I., and Company. N-acylated pyrazolines. 5,591,764, Cl. 514-403.000.

Fahmy, Salwa, executor: *See*—
Fahmy, Mohamed A. H., deceased; Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., 5,591,764, Cl. 514-403.000.

Fahy, Gregory M., to Organ, Inc.; and Life Resuscitation Technologies, Inc. Anastomosis cuff manipulator tool. 5,591,203, Cl. 606-207.000.

Faigle, Ernst M.; Semcheson, John H.; and Thompson, Richard J., to TRW Vehicle Safety Systems Inc. Vehicle occupant restraint inflator. 5,590,906, Cl. 280-741.000.

Falco, Desiderio: *See*—
Millan, Jose; Falco, Desiderio; and Soberino, Emilio R., 5,590,962, Cl. 366-248.000.

Falcone, Daniella T.: *See*—
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., 5,591,152, Cl. 604-385.200.

Falk, Richard A.; and Nott, Robert W., to Midwest Instrument Co., Inc. Hydrogen sampler for molten metal and method. 5,591,894, Cl. 73-19.070.

Famulus: *See*—
Alazet, Jean, 5,590,439, Cl. 15-320.000.

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Fanjat, Norbert: *See*—
Tsukamoto, Toshiyuki; Fanjat, Norbert; and Friedt, Jean, 5,591,273, Cl. 134-21.000.

Fanuc Ltd: *See*—
Obara, Haruki; Kita, Yuki; and Ito, Masaya, 5,590,964, Cl. 374-141.000.

Farewell, John P.: *See*—
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Farmer, Dominic G.: *See*—
Lau, Chung Y.; Farmer, Dominic G.; Martin, Kreg A.; and Rodal, Eric B., 5,592,173, Cl. 342-357.000.

Farmer, Ian; and St. Denis, Gregory A., to Gates Corporation, The. Tensioner with adjustable stop for power transmission belt. 5,591,094, Cl. 474-117.000.

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Huang, Lan; and Farrington, Stephen A., 5,591,259, Cl. 106-696.000.

Farris, Robert D.; and Bartholomew, Dale L., to Bell Atlantic Network Services, Inc. Video and TELCO network control functionality. 5,592,477, Cl. 370-396.000.

Farris, Robert D.: *See*—
McHenry, James P.; and Farris, Robert D., 5,592,533, Cl. 379-58.000.

Faulkner, David J.: *See*—
Chipman, Stewart; and Faulkner, David J., 5,591,740, Cl. 514-215.000.

Fauve, Christian: *See*—
Patoiseau, Jean-Francois; Couret, Francoise; Fauve, Christian; Dupont-Passelaigue, Elisabeth; and Koek, Wouter, 5,591,743, Cl. 514-242.000.

Fauteux, Denis G.; Massucco, Arthur A.; Wilkins, Ronnie D.; and Shi, Jie, to Arthur D. Little, Inc. Current collector device. 5,591,544, Cl. 429-209.000.

Favre, Michel: *See*—
Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,591,574, Cl. 435-5.000.

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Danby, Gordon T.; Jackson, John W.; Bruhl, Charles E.; Gudimetla, Krishna M.; and Rinkleman, Joseph F., 5,592,089, Cl. 324-318.000.

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Mack, Hans-Dieter, 5,590,985, Cl. 408-56.000.

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Gunert, Ronald M.; Mickelson, Steve; and Schaeffer, J. Kenyon, 5,590,977, Cl. 404-101.000.

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Davidson, Donald R., 5,591,329, Cl. 210-193.000.

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Finge, Helmut; and Hagedorn, Ferdinand, 5,591,869, Cl. 549-80.000.

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Takai, Yasuhiro; Hagihara, Hideaki; Tanaka, Hirokazu; Ueda, Atsushi; Yamane, Hideo; and Shimazu, Fumio, 5,592,270, Cl. 399-260.000.

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Sakamoto, Hiroshi; Matsui, Hideki; and Hagiuda, Nobuyoshi, 5,592,257, Cl. 396-171.000.

Hagiwara, Ryoji: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Inuo, Kiyoshi; Ogawa, Yasushige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.

Hagmann, William K.: *See*—
Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoss, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.

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Toyoda, Shigeru; Yagi, Shuichi; Itagaki, Masaaki; Ike, Nobukatsu; and Ohshima, Kenji, 5,590,689, Cl. 138-97.000.

Hale, Jeffrey J.: *See*—
Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoss, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.

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Halila, Herbert: *See*—
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Hall, Allen L.: *See*—
Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,591,615, Cl. 435-172.100.

Hall, Dana; and Bitner, Haim, to Quantum Corporation. Method for packing variable size user data records into fixed size blocks on a storage medium. 5,592,342, Cl. 360-48.000.

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Davis, Richard M.; Genrich, Thad J.; and Hall, Mark W., 5,592,518, Cl. 375-368.000.

Hall, Roger E. Safety base with anchor, methods of using and making, and associated tool. 5,590,874, Cl. 473-501.000.

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Harris, Phillip C.; Powell, Ronald J.; and Heath, Stanley J., 5,591,700, Cl. 507-204.000.
Monke, Gordon L., 5,591,967, Cl. 250-252.100.
Walker, Jerry L.; Carrera, Victor M.; and Carter, Donald R., 5,590,723, Cl. 175-4.600.
Walker, Michael L., 5,591,381, Cl. 252-389.540.

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Hama, Yoshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mirror fastner for optical scanning device. 5,592,337, Cl. 359-872.000.

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Koishi, Musubu; Takeshima, Akira; and Nishizawa, Mitsunori, 5,591,962, Cl. 250-214.100.
Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,591,986, Cl. 257-10.000.
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, 5,592,101, Cl. 324-753.000.

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Yamazaki, Shunpei; and Hamatani, Toshiji, 5,592,008, Cl. 257-347.000.

Hamelin, Bruno, to Bertrand Faure Equipements S.A. Locking system for a device adjustable by translational motion, such as a headrest. 5,590,929, Cl. 297-216.120.

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Hammer, Edward E.: *See*—
Nerone, Louis R.; Hammer, Edward E.; and Sanchez, Maria, 5,592,054, Cl. 315-105.000.

Hammons, John L.: *See*—
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.

Hansprecht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Walter, Helmut; Gerber, Matthias; and Kardorff, Uwe, to BASF Aktiengesellschaft. Herbicidal sulfonylureas. 5,591,694, Cl. 504-214.000.

Hanspeon, Ian N.; Pope, Lynne; and Butler, John, to Amersham International PLC. Subtraction hybridization employing aziridinylbenoquinone cross-linking agents. 5,591,575, Cl. 435-6.000.

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Keller, Karl; Hanrraths, Konrad; Afflerbach, Erhard; and Klein, Dieter, 5,590,557, Cl. 72-238.000.

Han, Taek-soo: *See*—
Park, Goo-man; Baik, Sei-hyun; and Han, Taek-soo, 5,592,343, Cl. 360-48.000.

Handelman, Doron, to News Datacom Ltd. Methods and systems for non-program applications for subscriber television. 5,592,212, Cl. 348-12.000.

Hankins, William G., to Chemithon Corporation, The. Flue gas conditioning method for intermittently energized precipitation. 5,591,249, Cl. 95-6.000.

Hansen, Wayne R.: *See*—
Cooley, Craig H.; Tibbitts, Gordon A.; and Hansen, Wayne R., 5,590,729, Cl. 175-432.000.

Hanson, Douglas A.; and Stacy, Timothy D., to Vari-Lite, Inc. Dimmer blade. 5,590,954, Cl. 362-321.000.

Hao, Zhimin; Iqbal, Absl; and Herren, Fritz, to Ciba-Geigy Corporation. Crystal modification of a diketopyrrolopyrrole pigment. 5,591,865, Cl. 548-453.000.

Hara, Kei; and Morino, Shigeru, to Kabushiki Kaisha TEC. Method and apparatus for driving edge emission type line head. 5,592,210, Cl. 347-237.000.

Hara, Koji: *See*—
Sakamoto, Takeshi; Hara, Koji; and Harada, Akira, 5,591,542, Cl. 429-192.000.

Hara, Masaki: *See*—
Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; Gosain, Dharam Pal; and Usui, Setsuo, 5,591,653, Cl. 437-40.000.

Hara, Naoki; Kuroda, Shigeru; and Shima, Masashi, to Fujitsu Limited. Compound semiconductor field effect transistor having a controlled diffusion profile of impurity elements. 5,591,994, Cl. 257-192.000.

Hara, Nobuyuki; and Tagami, Shigekatsu, to Sony Corporation; and Texas Instruments Corporation. Projector device. 5,592,239, Cl. 348-771.000.

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Midorikawa, Shingo; Harada, Masaaki; and Kondoh, Takamori, 5,591,279, Cl. 152-209.00R.

Harada, Yoshio; Takamatsu, Hiroyuki; Shimada, Toshiyasu; and Yamashita, Takanori, to Sony Corp.; and NEC Corp. Photosensor package with defined locations for lens supporting lead. 5,591,966, Cl. 250-239.000.

Harakal, Mark E.: *See*—
Muha, Krunoslav; Hulme, Steven P.; and Harakal, Mark E., 5,591,780, Cl. 521-128.000.

Harding, James A.; and McCormack, Jonathan I., to Asymetrix Corporation. Method and apparatus for specifying a query to an information system using natural language-like constructs. 5,592,668, Cl. 395-602.000.

Harel, Haim: *See*—
Yokev, Hanoch; Harel, Haim; Meiman, Yehouda; and Peleg, Shimon, 5,592,180, Cl. 342-450.000.

Harmand, Brice. Method for boring overhead cam engine cylinder heads. 5,590,466, Cl. 29-888.011.

Harmon, Stuart: *See*—
Hennings, David R.; Vassiliadis, Arthur V.; Goode, Richard L.; Sand, Bruce J.; and Harmon, Stuart, 5,591,157, Cl. 606-3.000.

Harney, Kevin: *See*—
Keith, Michael; Bui, Tuan; Harney, Kevin; and Kelly, Michael, 5,592,399, Cl. 364-514.200.

Harnischfeger Corporation: *See*—
Dretzka, Andrew P., 5,590,968, Cl. 384-563.000.

Harrand, Michel; and Rantz, Michel, to SGS-Thomson Microelectronics S.A. Dynamic memory. 5,592,428, Cl. 365-210.000.

Harrelson, Glenn R., to Riverwood International Corporation. Basket-style carrier with retainer tabs. 5,590,762, Cl. 206-162.000.

Harriman, Ron E.: *See*—
Mostaner, Pedro P.; Monegal, Manuel R.; Harriman, Ron E.; and Lasserre, P., 5,590,815, Cl. 222-82.000.

Harris Corporation: *See*—
Nelson, John R.; Pettit, Gregory J.; Godfrey, Tim G.; and Wong, Wayne K., 5,592,528, Cl. 379-21.000.

Harris, Michael: *See*—
Jacob, Eberhard; and Harris, Michael, 5,591,414, Cl. 422-180.000.

Harris, Phillip C.; Powell, Ronald J.; and Heath, Stanley J., to Halliburton Company. Fracturing fluid with encapsulated breaker. 5,591,700, Cl. 507-204.000.

Harris, Rodney M.: *See*—
Shalati, Mohamad D.; Harris, Rodney M.; Bibesu, Joyce A.; and Valpey, Richard S., III, 5,591,805, Cl. 525-285.000.

Harrison, Charles R.; Laban, George P.; and Stevenson, Thomas M., to Du Pont de Nemours, E. I., and Company. Arthropodicidal tetrahydropyridazines. 5,591,729, Cl. 514-85.000.

Harrison, Charles R.: *See*—
Fahmy, Mohamed A. H., deceased; Harrison, Charles R.; Laban, George P.; and Stevenson, Thomas M., 5,591,764, Cl. 514-403.000.

Harrison, E. R.; Jenkins, Philip J., deceased (by Victoria G. Jenkins, executrix), to I/O Exploration Products (U.S.A.), Inc. Self-centering dual thuttle air gun. 5,592,439, Cl. 367-144.000.

Harrison, E. R., to I/O Exploration Products (U.S.A.), Inc. Compact sleeve air gun. 5,592,440, Cl. 367-144.000.

Harrison, Jeffrey K.: *See*—
Thorner, Michael O.; Gaylinn, Bruce D.; Zyak, John R.; Lynch, Kevin R.; and Harrison, Jeffrey K., 5,591,641, Cl. 435-69.100.

Harrison, Robert G., to PMI International Corporation. Appliance for making bread and for cooking bagels. 5,590,583, Cl. 99-327.000.

Hart, Stephen J., to Voxel. Methods and apparatus for making holograms. 5,592,313, Cl. 359-24.000.

Hartitz, Joachim E., to B. F. Goodrich Company, The. Chlorinated polyvinyl chloride rigid pipe and method of forming such pipe. 5,591,497, Cl. 428-36.920.

Hartka, James R.: *See*—
Rojko, Jennifer L.; Hartka, James R.; and Cheney, Carolyn M., 5,591,717, Cl. 514-12.000.

Hartog, Arthur H., to York Limited. Suppression of stimulated scattering in optical time domain reflectometry. 5,592,282, Cl. 356-44.000.

Haruyama, Tetsuo: *See*—
Inabashi, Yasuhiro; Miyashita, Kazuhiko; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroshi; Masujima, Toshio; Matsunaga, Makoto; Kasagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.

Hasbro, Inc.: *See*—
Sejnowski, Joseph P., 5,590,876, Cl. 473-417.000.

Hasegawa, Koji; Kakuta, Hideo; and Mizutani, Junya, to Research Development Corporation of Japan. Physiologically active substances of plant, process for the preparation thereof, and utilities thereof. 5,591,697, Cl. 504-292.000.

Hasegawa, Takanori; and Okuzawa, Koichi, to Riso Kagaku Corporation. Device and method for dot-matrix thermal recording. 5,592,209, Cl. 347-206.000.

Hasegawa, Tsukasa: *See*—
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Hasegawa, Yukinobu: *See*—
Shimomura, Hiroyoshi; Hasegawa, Yukinobu; Serizawa, Hiroshi; and Maruyama, Masatoshi, 5,591,556, Cl. 430-109.000.

Hasegawa, Yusuke: *See*—
Nishimura, Yoichi; Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shunsuke, 5,590,638, Cl. 125-687.000.

Hashiguchi, Akihiko: *See*—
Sonoda, Mitsuo; and Hashiguchi, Akihiko, 5,592,414, Cl. 365-154.000.

Hashimoto, Mikio: *See*—
Nomura, Takao; Nishio, Takeyoshi; Hashimoto, Mikio; and Moriya, Satoru, 5,591,795, Cl. 524-451.000.

Hashimoto, Naotaka: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.

Hashimura, Keiji; Owaki, Junichi; Tauchi, Yasuhito; and Seki, Kohji, to Noritsu Koki Co., Ltd. Film transporting apparatus and film processing system using the same. 5,592,258, Cl. 355-41.000.

Hasken, Gary M.; and Lee, Simeon T., to Regent Lighting Corporation. Directable decorative lantern with motion sensor. 5,590,953, Cl. 362-276.000.

Haase, Margaret H., to Procter & Gamble Company, The. Sanitary napkin with perfume-bearing microcapsule adhesive. 5,591,146, Cl. 604-359.000.

Haase, Margaret H.; and Allen, Patrick J., to Procter & Gamble Company, The. Garment-like disposable absorbent article having a bloused outer cover. 5,591,151, Cl. 604-385.100.

Hasumi, Takayuki: *See*—
Kasuya, Masahiro; Kitajima, Yasuo; and Hasumi, Takayuki, 5,592,443, Cl. 368-281.000.

Hatada, Toshio: *See*—
Azuzuki, Takayuki; Hatada, Toshio; Daikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kasai, Kenichi; Kobayashi, Fumiyuki; and Hayashi, Yoshito, 5,592,363, Cl. 361-689.000.

Hatakeyama, Akira: *See*—
Osawa, Yoshihisa; Tsunoda, Eizo; Hosogaya, Ryuji; Hatakeyama, Akira; Tanaka, Hideki; and Tobinawa, Seiichi, 5,591,266, Cl. 118-410.000.

Hatakeyama, Yasunori; and Ueda, Kenichi, to Murata Kikai Kabushiki Kaisha. Bunch winding processing apparatus. 5,590,844, Cl. 242-18.05EW.

Hatakoshi, Kaoru: *See*—
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyoshi; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.

Hatano, Masahiro; Murayama, Masayoshi; Shima, Kenji; and Ito, Masumi, to Mitsubishi Chemical Corporation. Process for producing a vanadium-phosphorus oxide catalyst precursor. 5,591,870, Cl. 549-259.000.

Hatayama, Kazuo: *See*—
Asaka, Toshifumi; Kashimura, Masao; Minowa, Yoko; Morimoto, Shigeo; and Hatayama, Kazuo, 5,591,837, Cl. 536-7.400.

Hatayama, Toshio; Sasaki, Mie; Kojima, Takeshi; and Sakai, Kouichi, to Tosoh Limited. Automobile parts and engine canister. 5,591,351, Cl. 210-767.000.

Hathaway, Thomas J.; Schmid, Frank L.; and Rice, Edwin E., to Ingersoll-Rand Company. Method and apparatus for monitoring and controlling tightening of prevailing torque fasteners. 5,591,919, Cl. 73-761.000.

Hattori, Masafumi: Ikeda, Chikako; Sugimoto, Satoru; Saito, Tatsuoki; Yamada, Hiroshi; and Akashige, Ryuichi, to Mitsubishi Chemical Corporation. Adhesive resin composition. 5,591,792, Cl. 524-271.000.

Hattori, Ryuichi; and Tanaka, Hisashi, to House Foods Corporation. Method for growing fruit body of *Flammlina lupatica*. 5,590,489, Cl. 47-1.100.

Hattori, Toshihiko: *See*—
Hirami, Mitsuo; Masuda, Shouji; Hattori, Toshihiko; Kashiyama, Kenji; and Sasaki, Jumon, 5,590,626, Cl. 123-90.150.

Hauel, Norbert; Narr, Berthold, deceased (by Elisabeth Narr, legal representative); Ries, Uwe; van Meel, Jacobus C. A.; Wiesen, Wolfgang; and Entenroth, Michael, to Dr. Karl Thomae GmbH. Benzimidazoles useful as angiotensin-II antagonists. 5,591,762, Cl. 514-381.000.

Hauni Maschinenbau AG: *See*—
Chehab, Firdaousia; Fiethau, Stefan; and Arnold, Peter-Franz, 5,590,449, Cl. 28-240.000.

Hausslein, Robert W.: *See*—
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Hawkins, J. Riley; and Hawkins, Nicole E., to Georgia Tech Research Corporation. Fire alarm extension apparatus and method. 5,590,759, Cl. 200-331.000.

Hawkins, Nicole E.: *See*—
Hawkins, J. Riley; and Hawkins, Nicole E., 5,590,759, Cl. 200-331.000.

Hawryluk, Walter E.: *See*—
Cai, Rubing; and Hawryluk, Walter E., 5,591,807, Cl. 525-381.000.

Hayabuchi, Masahiro: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kadotani, Masanori; and Kasuya, Satoru, 5,591,099, Cl. 475-318.000.

Hayakawa, Akira: *See*—
Ohtsuka, Yasumasa; Nakamura, Shouji; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; and Futuzawa, Daizo, 5,592,276, Cl. 339-335.000.

Hayakawa, Takashi: *See*—
Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukitsio; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okuda, Atsushi, 5,592,263, Cl. 399-176.000.

Hayase, Toru: *See*—
Takahashi, Ryutaro; and Hayase, Toru, 5,592,559, Cl. 381-111.000.

Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, to Ono Pharmaceutical Co., Ltd. Antibodies for mevalonic acid and methods for immunological determination of mevalonic acid by using them. 5,591,648, Cl. 436-518.000.

Hayashi, Akira; Tanaka, Kunihiko; and Wakasuki, Gorozi, to Honda Giken Kogyo Kabushiki Kaisha. Continuously variable transmission vehicle. 5,591,100, Cl. 477-44.000.

Hayashi, Hideki: *See*—
Nishimura, Kiyoshi; Hayashi, Hideki; Muramoto, Jun; Fuchikami, Takaaki; and Uenoyama, Hiromi, 5,592,409, Cl. 365-145.000.

Hayashi, Hisataka: *See*—
Aoyama, Hisako; Sagara, Kyoichi; Niiyama, Hiromi; Tamura, Hiroshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamibaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.

Hayashi, Katsumi: *See*—
Yokota, Haruo; Noguchi, Yasuo; Akaboshi, Naoki; Hayashi, Katsumi; and Hirowa, Seigo, 5,592,660, Cl. 395-608.000.

Hayashi, Kazunori: *See*—
Nakao, Mitsuhiro; Ishikawa, Toshimitsu; and Hayashi, Kazunori, 5,592,020, Cl. 257-666.000.

Hayashi, Masahiro, to Ricoh Company, Ltd. Scanning apparatus having a double side scanner and method for controlling the scanner. 5,592,576, Cl. 382-318.000.

Hayashi, Michael T.: *See*—
Lett, David B.; Raley, William M., Jr.; and Hayashi, Michael T., 5,592,551, Cl. 380-20.000.

Hayashi, Yoshimasa: *See*—
Ogata, Yasuyuki; Hayashi, Yoshimasa; and Kojima, Yasuaki, 5,592,134, Cl. 333-185.000.

Hayashi, Yoshito: *See*—
Azuzuki, Takayuki; Hatada, Toshio; Daikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kasai, Kenichi; Kobayashi, Fumiyuki; and Hayashi, Yoshito, 5,592,363, Cl. 361-689.000.

Hayashida, Minoru: *See*—
Fujiki, Setsuo; Nakayama, Shozo; Ogawa, Haruo; Numakawa, Makoto; Hayashida, Minoru; Inoue, Suzuo; and Higashida, Yasuhiro, 5,591,028, Cl. 433-129.000.

Hayashitani, Mamo: *See*—
Tokunaga, Takahiro; Kajihara, Junko; Hirayama, Mamo; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Mamo; Kajihara, Yoshihiro; and Inoura, Tatsuya, 5,591,478, Cl. 426-658.000.

Hayes, Patrick H.: *See*—
Fleischhauer, Grier S.; Hayes, Patrick H.; Morgan, Constance H.; Hajahigol, Mohammad R.; Watkins, Michael L.; Nichols, Walter A.; Sharpe, David E.; and Counts, Mary E., 5,591,368, Cl. 219-535.000.

Hayes, Robert S.: *See*—
Maserik, David M.; Hayes, Robert S.; Choung, Frank N.; and Klatt, Robert W., 5,591,973, Cl. 250-332.000.

Hayes Wheels International, Inc.: *See*—
Jansen, Daniel F.; Heck, Thomas E.; and Turner, Charles A., 5,591,386, Cl. 264-46.900.

Haynesworth, Stephen E.: *See*—
Garson, Stanton L.; Caplan, Arnold I.; and Haynesworth, Stephen E., 5,591,625, Cl. 435-240.200.

Hays, Lesley T.: *See*—
Killkeffer, Kenneth E.; Stegemoeller, Calvin L.; and Hays, Lesley T., 5,590,976, Cl. 404-72.000.

He, Pei-feng; Yamamoto, Toshihiro; and Yamamoto, Miwako, to Inoac Corporation. Conductive polyurethane foam and its manufacture. 5,591,482, Cl. 427-244.000.

HE Holdings, Inc.: *See*—
Bendik, Joseph J.; Malloy, Gerard T.; and Finnile, Ronald M., 5,591,678, Cl. 437-208.000.

Head, Allan J. Apparatus for framing fabric in embroidery hoops. 5,590,613, Cl. 112-103.000.

Health Research, Inc.: *See*—

Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Shiau, Pen-Yau, 5,591,847, Cl. 540-472.000.

Heap, Anthony J.: *See*—
Anderson, Michael C.; Heap, Anthony J.; and Grone, Horst-Ditmar, 5,591,496, Cl. 428-36.500.

Heard, Robert A. H.; and Waite, Terry, to Signfix Limited. Mounting devices. 5,590,504, Cl. 52-730.100.

Hearne, David J.: *See*—
Davies, Michael B.; Hearne, David J.; Rand, Paul K.; and Walker, Richard L., 5,590,645, Cl. 128-203.150.

Heartberg, Mervet E.: *See*—
Fellegara, Peter C.; Appa, Robert W.; Heartberg, Mervet E.; and Osiecki, Richard E., 5,592,374, Cl. 395-203.000.

Heartstream, Inc.: *See*—
Morgan, Carlton B., 5,591,213, Cl. 607-5.000.

Heath, Stanley J.: *See*—
Harris, Phillip C.; Powell, Ronald J.; and Heath, Stanley J., 5,591,700, Cl. 507-204.000.

Hebert, Paul W.; and Floyd, Ted. Hammer having a gripping surface with recesses. 5,590,868, Cl. 254-26.00R.

Heck, Thomas E.: *See*—
Jansen, Daniel F.; Heck, Thomas E.; and Turner, Charles A., 5,591,386, Cl. 264-46.900.

Heckler & Koch GmbH: *See*—
Brandl, Rudolf, 5,590,485, Cl. 42-102.000.

Heckman, James R., to Ryland Engineering Corporation. Fluid sensor. 5,591,901, Cl. 73-61.430.

Heckman, Tom B.: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

Hector, Valerie. Jewelry beads including main beads made up of small beads. 5,590,546, Cl. 63-2.000.

Hedrick, James L., Jr.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,591,285, Cl. 156-62.200.

Hedrick, Jeffrey C.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,591,285, Cl. 156-62.200.

Heffelfinger, David M.; and Witney, Franklin R., to Bio-Rad Laboratories, Inc. Tunable excitation and/or tunable emission fluorescence imaging. 5,591,981, Cl. 250-458.100.

Heibel, Helmut, to Lucas Industries public limited company. Electronically controlled vehicle braking system and method for operating same. 5,590,937, Cl. 303-125.000.

Heidelberger Druckmaschinen AG: *See*—
Hess, Andreas, 5,590,970, Cl. 400-708.000.

Heider, Juergen; Juengst, Stefan; Maekawa, Koichiro; and Asano, Osamu, to Patent-Treuhand-Gesellschaft fuer Elektrische Gluehlampen mbH; and NGK Insulators, Ltd. High pressure discharge lamp including directly sintered feedthrough. 5,592,049, Cl. 313-625.000.

Heiman, Daniel F.: *See*—
Granados, Edward N.; Heiman, Daniel F.; Chow, Herbert S.; and Thaler, Maria L., 5,591,598, Cl. 435-29.000.

Heinemann, Eden D.: *See*—
Heinemann, Stephen F.; Patrick, James W.; Boulter, James R.; Deneris, Evan S.; Connolly, John G.; Duvoisin, Robert M.; Heinemann, Eden D.; Wada, Keiji; Ballivet, Marc C.; and Goldman, Daniel J., 5,591,590, Cl. 435-7.100.

Heinemann, Stephen F.; Patrick, James W.; Boulter, James R.; Deneris, Evan S.; Connolly, John G.; Duvoisin, Robert M.; Heinemann, Eden D.; Wada, Keiji; Ballivet, Marc C.; and Goldman, Daniel J., to Salk Institute for Biological Studies, The. Neuronal nicotinic acetylcholine receptor assay. 5,591,590, Cl. 435-7.100.

Heinicke, Ralph M., to Biotechnology Resources, Inc. Synergistic insecticide composition. 5,591,443, Cl. 424-405.000.

Heming, Joern, to Siemens Aktiengesellschaft. Circuit configuration for supplying electrical consumers with a constant voltage. 5,592,075, Cl. 323-313.000.

Heinzelman, Bert D.: *See*—
Phillips, Matthew L.; Heinzelman, Bert D.; Mulhauser, Paul J.; Schiff, David R.; Brooks, Christopher; and Remiszewski, Stanley H., 5,590,696, Cl. 141-47.000.

Heisner, Douglas L.: *See*—
Ingwersen, Peter; Kurek, Lawrence M.; and Heisner, Douglas L., 5,590,576, Cl. 83-147.000.

Heki, Katsuhiko: *See*—
Takiguchi, Hideki; Kashiwagi, Hiroshi; Tsuji, Nobuaki; Socman, Hó; and Heki, Katsuhiko, 5,591,570, Cl. 430-567.000.

Heldebrant, Charles M.: *See*—
Whalen, John J.; Chlebowski, Michael E.; Heldebrant, Charles M.; and Matveld, H. Edward, 5,591,573, Cl. 435-5.000.

Helia KG Hueck & Co.: *See*—
Hoffmann, Wolfgang; Koerner, André; and Zimmer, Maik, 5,591,939, Cl. 174-67.000.

Kellner, Ullrich; Geipfert, Stefan; Schlueter, Franz-Josef; and Dietz, Harald, 5,592,145, Cl. 340-391.100.

Helm, Andrew R.: *See*—
De Pauw, Wim; Cina, Vincent J.; Helm, Andrew R.; Kinselman, Douglas N.; and Vlissides, John M., 5,592,600, Cl. 395-140.000.

Hemani, Gregory W.; Sessler, Jonathan L.; and Mody, Tarak D., to Pharmacyclics, Inc.; and Board of Regents, The University of Texas System. Texaphyrin complexes having improved functionalization. 5,591,422, Cl. 424-9.362.

Hemperly, John J.: *See*—
Bronson, Dianne D.; and Hemperly, John J., 5,591,432, Cl. 424-130.100.
Reid, Robert A.; Ackley, Rhonda L.; and Hemperly, John J., 5,591,583, Cl. 435-6.000.

Henderson, Donna J. Combined headband and hair-retainer. 5,590,422, Cl. 2-171.000.

Henderson, Lance S.; and Parks, Randall C., to Stone Manufacturing & Supply Co., Inc. Method and apparatus for livestock castration. 5,591,176, Cl. 606-137.000.

Hendricksen, Ruud H. M.: *See*—
Bailey, Alisser J.; and Hendricksen, Ruud H. M., 5,592,172, Cl. 342-350.000.

Henf, George. Gap radiated antenna. 5,592,183, Cl. 343-749.000.

Henke, Dieter: *See*—
Wolter, Klaus; and Henke, Dieter, 5,592,323, Cl. 359-188.000.

Henkel Corporation: *See*—
Miyafuji, Kazunomo; Tanaka, Shigeo; and Morita, Ryoji, 5,591,275, Cl. 148-246.000.
Murphy, Donald P., 5,591,702, Cl. 510-202.000.
Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,591,615, Cl. 435-172.100.

Henkel, Heinz: *See*—
Bodeaosha, Alexander; and Henkel, Heinz, 5,591,665, Cl. 437-61.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Kiewert, Eva; Jeschke, Peter; Middelhauve, Birgit; and Carrer, Giuseppe, 5,591,376, Cl. 510-437.000.
Nickel, Dieter; and Hofmann, Rainer, 5,591,377, Cl. 510-383.000.
Rachue, Wilfried; Fues, Johann F.; Pastberg, Herbert; and Pantz, Kathleen, 5,591,707, Cl. 510-451.000.
Schmid, Karl; Giesen, Brigitte; and Sylduth, Andreas, 5,591,845, Cl. 536-124.000.

Henn, Andreas, to Heidelberger Druckmaschinen AG. Contact-free double-sheet control device for a printer. 5,590,970, Cl. 400-708.000.

Hennessee, Henry; and Dracoi, Elyes, to Elf Aquitaine Production. Device for processing and interpreting drilling data, placed at the bottom of a well and method implementing this device. 5,592,381, Cl. 364-422.000.

Hennings, David R.; Vassiliadis, Arthur V.; Goode, Richard L.; Sand, Bruce J.; and Harmon, Stuart. Method and apparatus for tympanic membrane shrinkage. 5,591,157, Cl. 606-3.000.

Henry Valve Company: *See*—
Gugala, Zbigniew H.; and Scapes, John N., 5,590,680, Cl. 137-312.000.

Henson, Larry W.: *See*—
Cook, John A.; Flurry, Gregory A.; Henson, Larry W.; and Wood, Bruce R., 5,592,678, Cl. 395-800.000.

Herd, Karl-Josef: *See*—
Bootz, Konrad; and Herd, Karl-Josef, 5,591,834, Cl. 534-618.000.

Herdt, Gregory C.: *See*—
King, David E.; Herdt, Gregory C.; and Czaderna, Alvin W., 5,591,690, Cl. 502-401.000.

Heritage Environmental Services, Inc.: *See*—
Etzel, James E.; and Kurek, Joseph, 5,591,346, Cl. 210-668.000.

Herman, Richard J. Multiple configuration produce stand. 5,590,796, Cl. 211-149.000.

Hermentin, Peter: *See*—
Bossler, Klaus; Hermentin, Peter; Seemann, Gerhard; Kuhlmann, Ludwig; and Steinstraesser, Axel, 5,591,828, Cl. 530-387.300.

Herren, Fritz: *See*—
Hao, Zhimin; Iqbal, Abul; and Herren, Fritz, 5,591,865, Cl. 548-453.000.

Herrick, Robert M.: *See*—
Bhalla, Prithvi R.; Herrick, Robert M.; and Gates, Donald W., 5,591,693, Cl. 504-130.000.

Herrmann, Matthias: *See*—
Chahabadi, Djahanyar; Herrmann, Matthias; Vogt, Lothar; and Kaesser, Juergen, 5,592,557, Cl. 381-10.000.

Herron, Donn M.: *See*—
Agrawal, Rakesh; Herron, Donn M.; and White, Thomas R., 5,590,543, Cl. 62-643.000.

Hersh, Lawrence T.; and Booth, John W., to Johnson & Johnson Medical, Inc. Detection of oscillometric blood pressure complexes using correlation. 5,590,662, Cl. 128-681.000.

Hershkovitz, David, to Vargus Ltd. Tool for working materials on workpieces, particularly for manual deburring. 5,590,990, Cl. 409-303.000.

Herzog, Bernd: *See*—
Birbaum, Jean-Luc; Kaschig, Jürgen; Reiseler, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.

Hess, H. Frederick, III: *See*—
Hess, H. Frederick, Jr.; and Hess, H. Frederick, III, 5,591,316, Cl. 204-482.000.

Hess, H. Frederick, Jr.; and Hess, H. Frederick, III, to UFS Corporation. Electrocoat painting method using guarded tubular membrane electrode cells. 5,591,316, Cl. 204-482.000.

Hesse, Wolfgang; and Raubut, Klaus, to Hoechst Aktiengesselschaft. Curable furan resin(s) modified with phenolic resin(s) for use as binders for cements and casting compositions having improved thermal stability processes for their preparation and their use. 5,591,810, Cl. 525-480.000.
Hettinger, Catherine A. Spinning toy. 5,591,062, Cl. 446-46.000.
Heulot, Jacques-Henry: *See*—
Dohan, Yves; Roshier, Maurice; and Heulot, Jacques-Henry, 5,591,040, Cl. 439-248.000.
Hewel, Manfred: *See*—
Torre, Hans D.; and Hewel, Manfred, 5,591,495, Cl. 428-35.700.
Hewlett-Packard Company: *See*—
Bennett, Dwayne; Yeung, Clifford; and Wu, Wayne, 5,592,160, Cl. 341-58.000.
Cahoon, James B., 5,592,594, Cl. 395-115.000.
Chen, Yaw-Hwang, 5,591,651, Cl. 437-33.000.
Grant, Robert; Stoevhase, Beat; Purohit, Robin; Sullivan, Gregory T.; and Book, David, 5,592,472, Cl. 370-351.000.
Lim, Swee K., 5,592,201, Cl. 347-30.000.
Rub, Richard A., 5,592,578, Cl. 385-31.000.
Smith, Mark A.; Sterner, John; and Bliven, Robert P., 5,592,361, Cl. 361-679.000.
Hewlett-Packard Limited: *See*—
Calamvokis, Costas; and Banks, David, 5,592,476, Cl. 370-390.000.
Hibi, Yoshihara, to Fuji Xerox Co., Ltd. Apparatus for forming color images having reduced edge exaggeration with high rate undercolor removal. 5,592,311, Cl. 358-518.000.
Hickner, Richard A.: *See*—
Anderson, Kenneth W.; and Hickner, Richard A., 5,591,788, Cl. 523-404.000.
Hicks, Daniel J., to Carlton Wilbert Vaults, Inc. Double depth crypt. 5,590,446, Cl. 27-1.000.
Hidaka, Hidemasa: *See*—
Tokunaga, Takahisa; Kajihara, Junko; Hirayama, Masao; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Masao; Kajibata, Yoshihiro; and Imura, Tatsuya, 5,591,478, Cl. 426-658.000.
Hidaka, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having a floating node that can maintain a predetermined potential for long time, a semiconductor memory device having high data maintenance performance, and a method of manufacturing thereof. 5,592,009, Cl. 257-351.000.
Hidenhima, Takahiro, to Fuji Photo Film Co., Ltd. Printed material reader and search method therefor. 5,590,941, Cl. 353-26.00A.
Hieda, Kaoru; Tsukamoto, Masahiko; and Imai, Akira, to Sharp Kabushiki Kaisha. Data communication apparatus achieving efficient use of the media. 5,592,483, Cl. 370-445.000.
Hiei, Yotoh; and Komori, Toshihito, to Japan Tobacco, Inc. Method for transforming monocotyledons. 5,591,616, Cl. 435-172.300.
Higa, Teruo. Microbiological method for disposing of organic waste materials. 5,591,634, Cl. 435-262.000.
Higashi, Hidehiro, to Catalysts & Chemicals Industries Co., Ltd. Process for hydrotreating heavy oil and hydrotreating apparatus. 5,591,325, Cl. 208-251.00H.
Higashi, Tadatoshi; and Arimoto, Tomoyoshi, to Ushiodenki Kabushiki Kaisha. Metal halide lamp. 5,592,050, Cl. 313-637.000.
Higashi, Takeyoshi; Yagi, Shigeru; Fukuda, Yuzuru; Ono, Masato; Watanabe, Masao; and Ohta, Tsuyoshi, to Fuji Xerox Co., Ltd. Electrophotographic apparatus and process for simultaneously transferring and fixing toner image onto transfer paper. 5,592,274, Cl. 399-307.000.
Higashida, Yasuhiro: *See*—
Fujiki, Setsuo; Nakayama, Shozo; Ogawa, Haruo; Numakawa, Makoto; Hayashida, Minoru; Inoue, Suezo; and Higashida, Yasuhiro, 5,591,028, Cl. 433-129.000.
High, DeWayne A.; and Timmerman, Timm J. Adjustable extension stepladder. 5,590,739, Cl. 182-169.000.
Highberger, Gerald: *See*—
Small, Lyle D.; and Highberger, Gerald, 5,591,255, Cl. 106-21.00A.
Highton, Frederick J.: *See*—
Trager, David S.; Ali, Akhtar; Highton, Frederick J.; and Lin, Kua, 5,592,403, Cl. 364-724.010.
Hilbert, Stefan; and Kirchner, Bernd, to Deutsche Forschungsanstalt für Luft-und Raumfahrt, e.V. Circuit arrangement for signal processing. 5,592,164, Cl. 341-120.000.
Hildebrand, Eduard. Portable object illumination device. 5,590,950, Cl. 362-109.000.
Hill, Axel, to Siemens Aktiengesellschaft. Process and device for recombining and/or igniting hydrogen contained in an H_2-air-steam mixture, preferably for nuclear power stations. 5,592,521, Cl. 376-301.000.
Hill, David. Crayon organizer. 5,590,811, Cl. 221-89.000.
Hill-Rom Company, Inc.: *See*—
Welling, Jeffrey R.; and Poehner, Michael E., 5,592,153, Cl. 340-825.190.
Hillyard, Carmel J.: *See*—
Kemp, Bruce E.; Hillyard, Carmel J.; Rylatt, Dennis B.; and Bundesen, Peter G., 5,591,572, Cl. 435-5.000.
Hillyard, David R.: *See*—
Olivera, Baldomero M.; Hillyard, David R.; Imperial, Julita S.; and Monje, Virginia D., 5,591,821, Cl. 530-324.000.
Hilpert, Hans, to Hoffman-La Roche Inc. Process for the preparation of halogenated α-aminoketone compounds. 5,591,885, Cl. 560-29.000.
Hilton, John A., to Spacetec IMC Corporation. Force and torque converter. 5,591,924, Cl. 73-862.043.
Hilton, Lance; and Beal, Vicki S., to Compliant Solutions, LC. Storage case for disk-shaped media having a bi-stable ejection mechanism utilizing compliant device technology. 5,590,768, Cl. 206-308.100.
Himmelsbach, Frank; Austel, Volkhard; Pieper, Helmut; Eisert, Wolfgang; Mueller, Thomas; Weisenberger, Johannes; Linz, Gaenter; and Krueger, Gerd, to Karl Thomae GmbH. Cyclic imino derivatives and pharmaceutical compositions containing them. 5,591,769, Cl. 514-423.000.
Hinchliffe, Peter W. J., to United States Surgical Corporation. Surgical suturing apparatus. 5,591,180, Cl. 606-144.000.
Hines, John B.; Moody, David J.; and Kluger, Edward W., to Milliken Research Corporation. Colorants and intermediates therefor having branched poly(oxyalkylene)moieties, and their manufacture. 5,591,833, Cl. 534-607.000.
Hines, Letha M.: *See*—
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.
Olsen, Robb E.; Bittar, Saadra R.; Hines, Letha M.; Vinnage, William R., Jr.; May, Melisse N.; Osborn, Thomas W., III; and Doak, Nancy B., 5,591,150, Cl. 604-385.100.
Hino, Junel K.: *See*—
Massey, Richard J.; Powell, Michael J.; Dressick, Walter J.; Leland, Jonathan K.; Hino, Junel K.; Poonian, Mohindar S.; and Cima, Leopoldo D., 5,591,581, Cl. 435-6.000.
Hirabayashi, Yasuji, to Canon Kabushiki Kaisha. Coding method for coding pixel blocks and apparatus therefor. 5,592,302, Cl. 358-433.000.
Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tanaka, Hisayoshi; Shiino, Takanori; and Kaburagi, Haruko, to Shimadzu Corporation; and Honda Giken Kogyo Kabushiki Kaisha. Automatic exhaust gas analyzer for an internal combustion engine. 5,591,406, Cl. 422-80.000.
Hirai, Yutaka; Matsuyama, Jinsho; and Shirai, Shigeru, to Canon Kabushiki Kaisha. Process for forming and etching a film to effect specific crystal growth from activated species. 5,591,492, Cl. 427-563.000.
Hiraki, Masahito: *See*—
Kawafune, Kazunori; Suhara, Masaaki; and Hiraki, Masahito, 5,591,013, Cl. 417-271.000.
Hiramatsu, Akira: *See*—
Tanaka, Kiyoharu; Uchida, Takashi; Hiramatsu, Akira; Takahashi, Haruhiko; and Munakata, Atsushi, 5,592,262, Cl. 399-1.000.
Hiramatsu, Makoto: *See*—
Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, 5,591,648, Cl. 436-518.000.
Hiramoto, Koji, to Exedy Corporation. Collapsible bicycle frame. 5,590,895, Cl. 280-278.000.
Hirano, Hideki: *See*—
Shiozaki, Kenji; Hirano, Hideki; Kawasumi, Koichi; Asai, Nobutoshi; Tomita, Hidemi; Sato, Shuji; Ogata, Masanori; and Shiota, Hiroyuki, 5,592,208, Cl. 347-171.000.
Hirano, Isuke: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, 5,592,101, Cl. 324-753.000.
Hirano, Masakazu: *See*—
Sato, Tsutamu; Hirano, Masakazu; Yanashima, Tsukasa; Yamaguchi, Hiroyuki; and Moema, Yoshio, 5,592,278, Cl. 399-384.000.
Hirasuma, Satoshi: *See*—
Goto, Soju; Kawasaki, Takashi; Hirasuma, Satoshi; Suzuki, Nobumasa; and Shibata, Izumi, 5,592,449, Cl. 369-47.000.
Hiraoka, Toshiharu: *See*—
Koshijima, Tetsuo; Shiraishi, Nobuo; Takahashi, Tadashi; Hiraoka, Toshiharu; and Ueda, Masami, 5,591,832, Cl. 530-500.000.
Hirata, Koji: *See*—
Yoshida, Takahiko; Hirata, Koji; Osawa, Atsuo; Wada, Kiyoshi; and Yoshikawa, Hiroki, 5,590,943, Cl. 353-74.000.
Hirata, Masayoshi, to NEC Corporation. Compact semiconductor memory device capable of preventing incomplete writing and erasing. 5,592,429, Cl. 365-226.000.
Hirayama, Hideaki, to Kabushiki Kaisha Toshiba. Resource management system and method. 5,592,671, Cl. 395-674.000.
Hirayama, Masao: *See*—
Tokunaga, Takahisa; Kajihara, Junko; Hirayama, Masao; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Masao; Kajibata, Yoshihiro; and Imura, Tatsuya, 5,591,478, Cl. 426-658.000.
Hirohata, Toru: *See*—
Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,591,986, Cl. 257-10.000.
Hirose, Mifune; Suzuki, Eiichi; Sekaki, Mamoru; and Katayama, Masato, to Canon Kabushiki Kaisha. Recording paper, ink-jet recording process and recording system making use of the recording paper. 5,591,514, Cl. 428-211.000.
Hiroshima, Yasunori: *See*—
Kato, Taku; Hiroshima, Yasunori; Adachi, Akinao; Nakano, Akira; and Shimomura, Kiyoshi, 5,590,455, Cl. 29-564.100.
Hirosue, Seigo: *See*—
Yokota, Haruo; Noguchi, Yasuo; Akaboshi, Naoki; Hayashi, Katsumi; and Hirosue, Seigo, 5,592,660, Cl. 395-608.000.
Hirotsuru, Hideki: *See*—
Mitomo, Mamoru; Hirotsuru, Hideki; and Kim, Youngwook, 5,591,685, Cl. 501-88.000.

Hirschek, Herwig; and Schüller, Manfred, to Autefa Maschinenfabrik GmbH Augsburg. Device for producing a nonwoven fabric made of fiber material. 5,590,442, Cl. 19-163.000.
Hirt, Dede A.: *See*—
Couture-Dorschner, Laurie; Hirt, Dede A.; Stoeger, William G.; and Dilnik, Rebecca L., 5,591,147, Cl. 604-369.000.
Hirvonen, Juhani; Kohola, Pekka; Ikonen, Kari; and Takala, Matti, to Imatran Voima Oy. Assembly for combustion chamber monitoring camera. 5,592,217, Cl. 348-83.000.
Hisamoto, Masaaki: *See*—
Nomura, Toshihiro; Hisamoto, Masaaki; and Kurata, Iwao, 5,591,993, Cl. 257-181.000.
Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, to Dowa Mining Co., Ltd. Ferromagnetic metal powder. 5,591,535, Cl. 428-694.0RE.
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Hitachi Chemical Company, Ltd.: *See*—
Suzuki, Kenji; Mukoyama, Yoshiyuki; and Ito, Toshihiko, 5,591,813, Cl. 525-528.000.
Hitachi Koki Co., Ltd.: *See*—
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Asama, Hajime; Hasegawa, Tsukasa; Naito, Akira; Kasai, Yasuhiko; Tsuchiya, Tomoko; Yoshida, Shinichi; and Matsuda, Yasumasa, 5,592,605, Cl. 395-348.000.
Atarashi, Takayuki; Hatada, Toshio; Daikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kasai, Kenichi; Kobayashi, Fumiyuki; and Hayashi, Yoshio, 5,592,363, Cl. 361-689.000.
Itoh, Hiromichi; Nakane, Keiichi; Nonaka, Naomichi; and Watanabe, Yoshinori, 5,592,675, Cl. 395-750.000.
Kato, Masataka; Adachi, Tetsuo; Tanaka, Toshihiro; Sasaki, Toshio; Kume, Hitoshi; and Kimura, Katsutaka, 5,592,415, Cl. 365-185.010.
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; and Kuwabara, Tadashi, 5,592,649, Cl. 395-481.000.
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Tore; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.
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Matsunaga, Yoshikuni; Takahashi, Tetsuhiko; and Yamamoto, Etsuji, 5,592,088, Cl. 324-318.000.
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Ogino, Masanori; Asano, Tetsuo; and Uehara, Yasuhiko, 5,592,238, Cl. 348-744.000.
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Shojima, Hiroshi; Kuzunaki, Soshiro; Fukunaga, Yasushi; Matsuda, Toshihiko; Takekoshi, Toshio; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 5,592,565, Cl. 382-185.000.
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Takamine, Yoshio; Suzuki, Kei; and Sagita, Toshihiko, 5,592,655, Cl. 395-500.000.
Yanagami, Kenji; Yamamoto, Akira; and Satoh, Takao, 5,592,630, Cl. 395-250.000.
Yoshida, Takahiko; Hirata, Koji; Osawa, Atsuo; Wada, Kiyoshi; and Yoshikawa, Hiroki, 5,590,943, Cl. 353-74.000.
Hitachi Maxell, Ltd.: *See*—
Kaneno, Kimihiko; Yuasa, Takuma; and Fujimoto, Hideki, 5,591,512, Cl. 428-141.000.
Hitachi Medical Corporation: *See*—
Masuzawa, Hiroshi; Shimomura, Ryuuichi; and Katakura, Kageyoshi, 5,591,911, Cl. 73-602.000.
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Ogasawara, Mitsuo; Kobayashi, Hiroyuki; and Kubonoe, Morioki, 5,591,980, Cl. 250-442.110.
Hitomi, Mitsuo; Masuda, Shuji; Hattori, Toshihiko; Kashiyama, Kenji; and Sasaki, Jumon, to Mazda Motor Corporation. Reciprocating engine of a spark ignition type. 5,590,626, Cl. 123-90.150.
Hival Ltd.: *See*—
Nagura, Toru, 5,591,546, Cl. 429-218.000.
Ho, Helena S.; Prat, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., to DSC Communications Corporation. Voice enhancement system and method. 5,592,545, Cl. 379-347.000.
Ho, I-Hui. Endlessly clockwise/counterclockwise idly rotatable burglarproof door lock. 5,590,554, Cl. 70-221.000.
Ho, Ping-Sen. Racket string bracing apparatus. 5,590,877, Cl. 473-556.000.
Hobin, Michael P.; Johnston, Milo; Johnson, Mark; and Clement, John, to Sorbent Products Co., Inc. Modular shoreline oil spill barrier assembly. 5,591,333, Cl. 210-242.400.
Hodge, Richard M., to Du Pont de Nemours, E. I., and Company. Particle transport fluids thickened with acetylate free xanthan heteropolysaccharide biopolymer plus guar gum. 5,591,699, Cl. 507-213.000.
Hodges, Joe, to Micron Technology, Inc. UV light sensitive die-pac for securing semiconductor dies during transport. 5,590,787, Cl. 206-724.000.
Hodgson, Rodney T.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molia, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,591,285, Cl. 156-62.200.
Hodroff, Joel, to Commonweal Incorporated. Currency and barter exchange debit card and system. 5,592,376, Cl. 395-214.000.
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Hoechst AG: *See*—
Kulpe, Jürgen; and Strutz, Heinz, 5,591,893, Cl. 562-504.000.
Obermeier, Reinhold; and Stefaniak, Gunter, 5,591,877, Cl. 554-226.000.
Seidel, Andreas; Peters, Dieter; Weferling, Norbert; and Mouratidis, Dimitrios, 5,591,888, Cl. 560-226.000.
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Lang, Hans-Jochen; Weichert, Andreas; Kleemann, Heinz-Werner; Englert, Heinrich; Scholz, Wolfgang; and Albus, Udo, 5,591,754, Cl. 514-331.000.
Lorenz, Georg M.; Fester, Walter; Schuster, Ulrich; Leicht, Erhard; and Schäfer, Ralph, 5,591,509, Cl. 428-107.000.
Urban, Manfred; and Dietz, Erwin, 5,591,258, Cl. 106-497.000.
Weide, Joachim; Jung, Rüdiger; and Metz, Hans J., 5,591,257, Cl. 106-496.000.
Zeiss, Hans-Joachim, 5,591,861, Cl. 548-228.000.
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Hesse, Wolfgang; and Raubut, Klaus, 5,591,810, Cl. 525-480.000.
Hoechst Celanese Corporation: *See*—
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Hoechst Japan Limited: *See*—
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Hoechst Marion Roussel, Inc.: *See*—
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Kosley, Raymond W., Jr.; Flanagan, Denise M.; Martin, Lawrence L.; and Nemoto, Peter A., 5,591,866, Cl. 548-455.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Strupczewski, Joseph T.; Glazkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,591,745, Cl. 514-254.000.
Wentlandt, David G.; and Nemoto, Peter A., 5,591,856, Cl. 546-278.400.
Hoekstra, Merl F.: *See*—
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Hoey, Michael; and Gehlbach, Peter, to University of Minnesota, Regents of the. Smooth muscle chemical pacemaker. 5,591,445, Cl. 424-426.000.
Hoffman, Charles, Jr.: *See*—
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Hoffman, Marina D.: *See*—
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Hoffman, Michael K.: *See*—
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Narayanan, Ramaswamy; and Rosen, Craig A., 5,591,840, Cl. 536-24.500.
Hoffmann, Wolfgang; Koerner, André; and Zimmer, Maik, to Hella KG Hueck & Co. Enclosure hood. 5,591,939, Cl. 174-67.000.
Hofmann, Rainer: *See*—
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Hofmann Werkstatt-Technik GmbH: *See*—
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Hofrichter, Brian D.; Gardlik, John M.; Sawin, Philip A.; Luebbe, John P.; and Bradbury, Barton J., to Procter & Gamble Company, The. Antiperspirant gel stick compositions. 5,591,424, Cl. 424-66.000.
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Holder, Russell L., Jr.: *See*—
Gere, Gary M.; Holder, Russell L., Jr.; Musetti, Louis J.; and Ramsey, Ray, Jr., 5,590,617, Cl. 114-270.000.
Holdermann, Konstantin; Mikuszr, Adolf; and Schmidt, Hans-Josef, to Siemens Solar GmbH. Solar cell with combined metallization and process for producing the same. 5,591,565, Cl. 430-314.000.
Hollandse Signaalapparaten B.V.: *See*—
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Hollins, George A.: *See*—
Ryl, Kendall; Hollins, George A.; and Pence, Gregory L., 5,592,356, Cl. 361-154.000.
Hollister Incorporated: *See*—
Jensen, Ole R., 5,591,447, Cl. 424-443.000.
Hollstein, Jürgen; and Redemann, Gerd, to Deere & Company. Power takeoff control. 5,592,029, Cl. 307-9.100.
Holmes, Michael: *See*—
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Holmes, Philip: *See*—
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Holtermann, Dennis L.: *See*—
Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., 5,591,322, Cl. 208-120.000.
Holtey, Thomas O.: *See*—
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Holmes, Eli J.; and McCormack, Edward A., to Southco, Inc. Swell latch assembly. 5,590,921, Cl. 292-257.000.
Honaker, Charles M., Jr., to Alcatel Network Systems, Inc. Dual frequency clock recovery using common multitap line. 5,592,519, Cl. 375-373.000.
Honda Gikeu Kogyo Kabushiki Kaisha: *See*—
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Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tanaka, Hisayoshi; Shiina, Takanori; and Kaburagi, Haruko, 5,591,406, Cl. 422-80.000.
Ikeda, Susumu; Isobe, Toshimi; Inoue, Atsuo; Fujita, Toshihiko; Tajiri, Akihiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,590,540, Cl. 62-180.000.
Miyashita, Kohichi; Demachi, Atsushi; Sato, Kenji; Noguchi, Minoru; and Ohi, Naohiko, 5,591,545, Cl. 429-218.000.
Motodate, Shoji, 5,590,637, Cl. 123-634.000.
Naito, Shiro; Yamamoto, Tomohiko; and Yamamoto, Tomomori, 5,590,694, Cl. 140-93.200.
Nishimura, Yoichi; Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shusuke, 5,590,638, Cl. 125-687.000.
Ohashi, Tatsuyuki; and Mochizuki, Tetsuya, 5,591,103, Cl. 477-131.000.
Saida, Yoshitaka, 5,591,079, Cl. 454-155.000.
Saitou, Yuuji; Mouko, Minoru; Yoshida, Suguru; and Sugawara, Kohki, 5,591,359, Cl. 219-121.640.
Sugino, Mitsutaka; and Shimizu, Yasuo, 5,590,732, Cl. 180-444.000.
Honda, Hiroki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and method of fabricating the same. 5,592,013, Cl. 257-392.000.
Honda, Yosuke; Urumi, Motoharu; and Tanaka, Syuich, to Fujitsu Limited. Call distribution control method and call distribution control system. 5,592,542, Cl. 379-265.000.
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Hong, Seog J., to LG Electronics Inc. Washing machine equipped with bubble producing apparatus and bubble producing control method thereof. 5,590,551, Cl. 68-183.000.
Hongo, Katsumobu; and Oki, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Single-chip microcomputer system having address space allocation hardware for different modes. 5,592,652, Cl. 395-497.010.
Honguh, Yoshinori: *See*—
Segaya, Toshihiro; and Honguh, Yoshinori, 5,592,464, Cl. 369-275.400.
Honjo, Hironnao: *See*—
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Hood, Arthur L.: *See*—
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Hoofe, William J., IV; and Schroeder, John E., to Northrop Grumman Corporation. Sectional filter assembly. 5,592,186, Cl. 343-909.000.
Hoover, Allen L.; and Lyons, Pamela A. One-handed knife. 5,590,469, Cl. 30-136.000.
Hopkins, Mark A.: *See*—
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Horgan, Anthony M.: *See*—
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Horn, Joseph B.; and De Scheerder, Ivan, to Global Therapeutics, Inc. Radially expandable stent. 5,591,230, Cl. 623-1.000.
Horn, Thomas: *See*—
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Hornstedt, Earl. Fastening assembly. 5,590,975, Cl. 403-407.100.
Hoshino, Akinori: *See*—
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Hosogaya, Ryuji: *See*—
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Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., to Motorola, Inc. Sealing arrangement for a laser enclosure. 5,591,361, Cl. 219-121.820.
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Ueda, Hiroshi; Fukui, Tsuguhi; Imata, Kazuyoshi; Kimura, Hirofumi; Yasuda, Shoji; Hotani, Shin; Inoue, Kimio; Minato, Ryota; Tanaka, Yoshimitsu; and Takahashi, Katsunori, 5,590,959, Cl. 366-84.000.
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Houde, Ajay Y.: *See*—
Stern, S. Alexander; Kawakami, Hiroyoshi; Houde, Ajay Y.; and Zhou, Guangbin, 5,591,250, Cl. 95-51.000.
Housand, James E.; and Fehr, Dana J., to Aircraft Braking Systems Corporation, Inc. Pre-load device for reducing aircraft brake vibration. 5,590,743, Cl. 188-71.400.
House Foods Corporation: *See*—
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Hovakimian, Karen S.: *See*—
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Hovden, Hallgeir. Hunting trap device. 5,590,487, Cl. 43-81.000.
Howard, Thomas E. Portable shelf for notebook computers. 5,590,607, Cl. 108-98.000.
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Venishetti, Purushotham; Brodfuehrer, Paul R.; Howell, Henry G.; and Sapino, Chester, Jr., 5,591,852, Cl. 544-317.000.
Hoyland Fox Limited: *See*—
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Hsieh, Fwu-luan: *See*—
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Hsia, Jen-Chang. Compositions and methods utilizing nitroxides to avoid oxygen toxicity, particularly in stabilized, polymerized, conjugated, or encapsulated hemoglobin used as a red cell substitute. 5,591,710, Cl. 514-6.000.
Hsia, Shaw-Tzeng: *See*—
Lee, Ching-Ying; Hsia, Shaw-Tzeng; and Yen, Haw, 5,591,672, Cl. 437-190.000.
Hsu, Ching-Hsiang; and Liang, Mong-Song, to Taiwan Semiconductor Manufacturing Company Ltd. Method of making a body contacted SOI MOSFET. 5,591,650, Cl. 437-21.000.
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Hsu, Ike C.; and Ambrose, Jay H., to Lockheed Missiles and Space Company, Inc. Stacked multistage Joule-Thomson cryostat. 5,590,538, Cl. 62-51.200.
Hsu, Jemin C., to Rohm and Haas Company. Synergistic microbicidal combinations containing 4,5-dichloro-2-octyl-3-isothiazolone and certain commercial biocides. 5,591,760, Cl. 514-372.000.
Hu, Stephen. Baby's carriage for teaching children to walk. 5,590,892, Cl. 280-87.051.
Huang, Chien-Teh. Intruder detecting device to be installed in an integrated raised flooring system. 5,592,152, Cl. 340-666.000.
Huang, Lan; and Parrington, Stephen A., to Sandoz Ltd. Rapid setting cementitious compositions and method. 5,591,259, Cl. 106-696.000.
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Hubbell Incorporated: *See*—
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Huber, Mary L. B.: *See*—
Turner, Jan R.; Huber, Mary L. B.; Broughton, Mary C.; Mynderse, Jon S.; and Martin, James W., 5,591,606, Cl. 435-76.000.
Hucknall, Richard. Security device. 5,590,922, Cl. 292-300.000.
Huddleston, Robert L.: *See*—
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Hudkins, Robert L.; and Knight, Ernest, Jr., to Cephalon, Inc. Fused pyrrolocarbazoles. 5,591,855, Cl. 546-256.000.
Hudoba, Kurt J.: *See*—
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Hudson, Derek; Johnson, Charles R.; and Giebel, Lutz, to Arris Pharmaceutical. Method and apparatus for peptide synthesis and screening. 5,591,646, Cl. 436-518.000.
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Huete, David A., to Shell Oil Company. Tendon cluster array. 5,590,982, Cl. 405-223.100.
Huffines, Robert W., to Gehr - Huff Technologies, Inc. Swing trainer. 5,591,089, Cl. 473-215.000.
Hughes Aircraft Company: *See*—
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Canzone, Jeanene D., 5,592,656, Cl. 395-680.000.
Wissinger, Alan B., 5,592,320, Cl. 359-159.000.
Woody, George R.; and Hulsey, Stephen J., 5,591,937, Cl. 174-5.00R.
Hughes Electronics: *See*—
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Hughes, Ernest W.: *See*—
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Hughes, Glen H.: *See*—
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Hughes, Henry G.; Lue, Ping-Chang; and Robinson, Frederick J., to Motorola, Inc. Method of making a semiconductor device having a low permittivity dielectric. 5,591,676, Cl. 437-195.000.
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Cannon, James J.; and Elkanick, Mark, 5,590,850, Cl. 244-3.150.
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Price, Robert H.; Davis, Herbert T., III; and Dana, Scott A., 5,592,170, Cl. 342-22.000.

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Harrison, E. R.; Jenkins, Philip J., deceased, 5,592,439, Cl. 367-144.000.

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Harrison, E. R.; Jenkins, Philip J., deceased, 5,592,439, Cl. 367-144.000.

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Schmidt, Harald; and Jenko, Edward J., 5,591,366, Cl. 219-494.000.

Jensen, Christopher; and Carter, Robert L., to Thrustmaster, Inc. Side-mounted throttle and weapons controller for computer video games and flight simulation. 5,591,082, Cl. 463-38.000.

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Jensen, Ole R., to Hollister Incorporated. Wound dressing having a contoured adhesive layer. 5,591,447, Cl. 424-443.000.

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Bengmark, Stig; Ahrné, Siv; Molin, Göran; and Jeppsson, Bengt, 5,591,428, Cl. 424-93.450.

Jermain, Don J.: *See*—
Davignon, John J.; Jermain, Don J.; and Connally, Leslie O., 5,591,353, Cl. 216-18.000.

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Kiewert, Eva; Jeschke, Peter; Middelhauve, Birgit; and Carrer, Giuseppe, 5,591,376, Cl. 510-437.000.

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Ikeda, Masahiro, 5,590,578, Cl. 91-376.00R.

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de la Chapelle, Albert; Vogelstein, Bert; and Kinzler, Kenneth W., 5,591,826, Cl. 530-350.000.

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Bergmeyer, Lynn; and Cummins, Thomas J., 5,591,580, Cl. 435-6.000.

Johnson & Johnson Consumer Products, Inc.: *See*—
Chen, Albert C.; Hrinko, Peter, Jr.; Yost, Kevin G.; and Kent, John R., 5,590,438, Cl. 15-167.100.
Prospero, Richard M.; Lunde, Erik; Swanson, Harry; and Adams, Lee, 5,590,814, Cl. 221-266.000.

Johnson & Johnson Medical, Inc.: *See*—
Hersh, Lawrence T.; and Booth, John W., 5,590,662, Cl. 128-681.000.

Johnson, Charles R.: *See*—
Hudson, Derek; Johnson, Charles R.; and Giebel, Lutz, 5,591,646, Cl. 436-518.000.

Johnson, Clarence W., to Barber Industries, Ltd. High-low indicator. 5,590,685, Cl. 137-552.000.

Johnson, Donald B.: *See*—
Gaski, Richard H.; Larson, Raymond C.; Matyas, Stephen M., Jr.; Johnson, Donald B.; and Coppersmith, Don, 5,592,553, Cl. 380-23.000.

Johnson, F. Scott, to Texas Instruments Incorporated. Self-aligned double poly BJT using nige spacers as extrinsic base contacts. 5,592,017, Cl. 257-554.000.

Johnson, Gary M., to Applied Medical Resources Corporation. Atraumatic surgical clamping instrument. 5,591,182, Cl. 606-151.000.

Johnson, Larry: *See*—
Gardner, Timothy J.; Bournias, Spyros; and Johnson, Larry, 5,592,234, Cl. 348-553.000.

Johnson, Mark: *See*—
Hobin, Michael P.; Johnston, Milo; Johnson, Mark; and Clement, John, 5,591,333, Cl. 210-242.400.

Johnson, R. Brent; and Burson, Darrell B. Console simulator, multi-console management system, and console management distribution system. 5,592,657, Cl. 395-500.000.

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Weiss, Mark E.; Bauer, Thomas J.; and Johnson, Richard E., 5,590,777, Cl. 206-439.000.

Johnson, Robin D.: *See*—
Fisher, Francis E.; Johnson, Robin D.; Gove, David G.; and Wade, Michael D., 5,590,712, Cl. 165-185.000.

Johnson, Wade M.: *See*—
Trerotola, Scott O.; and Johnson, Wade M., 5,591,226, Cl. 623-1.000.

Johnston, James D.: *See*—
Ferreira, Anibal J.; and Johnston, James D., 5,592,584, Cl. 395-2.120.

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Jolly, Christopher H., to General Electric Company. Method for efficiently detecting covered rules in a knowledge base. 5,592,590, Cl. 395-75.000.

Jolly, Douglas J.: *See*—
Barber, Jack R.; Jolly, Douglas J.; Respess, James G.; and Chang, Stephen M. W., 5,591,624, Cl. 435-240.200.

Jones, Dean R.: *See*—
Cameron, Paul S.; Nash, John C.; Bloomer, Robert C.; Wollan, Robert E.; Kreutzer, Kelly M.; Ahler Olmstead, Melinda A.; Renner, Dale H.; Bourne, Ryan D.; Carnish, Keith M.; and Jones, Dean R., 5,592,378, Cl. 395-227.000.

Jones, Donald, to Dade MicroScan Inc. Fluid dispensing apparatus. 5,591,402, Cl. 422-65.000.

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Jones, James T.; Kersey, Larry M.; and Steiske, Richard A., to Alasco Environmental Resources Corp. Electrostatic gun for injection of an electrostatically charged sorbent into a polluted gas stream. 5,591,412, Cl. 422-171.000.

Jones, Lawrence E.; Wert, Michael D.; Rivera, José B.; and Schlosser, Ted M., to Bulk Chemicals, Inc. Method and composition for treating metal surfaces. 5,591,801, Cl. 525-56.000.

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Boyce, Ricky C.; Jones, Mona C.; Parker, Wilbur A.; and Feste, Edward J., 5,591,477, Cl. 426-633.000.

Jones, Neil: *See*—
Williams, David A.; and Jones, Neil, 5,590,898, Cl. 280-707.000.

Jones, Peter R.; and McDonald, Norman F., to ARB Corporation Limited. Locking differential. 5,591,098, Cl. 475-231.000.

Jones, Ronald L.; Caughman, Henry D.; Shelor, Susan M.; and Lines, Ellwood L., Jr., to Bio-Lab, Inc. Compositions and methods for controlling the growth of microbials in aqueous media. 5,591,692, Cl. 504-124.000.

Jones, Russell W.: *See*—
Bradshaw, Benjamin J.; Holmes, Michael; and Jones, Russell W., 5,592,388, Cl. 364-431.080.

Jones, Samuel S. Absorbant cloth with agitating feature. 5,591,507. Cl. 428-88.000.

Jones, Timothy: *See*—
Barnes, John S.; Jones, Timothy; Thompson, Graham L.; and Breugelmans, Adrianus C. M., 5,591,371, Cl. 222-607.000.

Joos, Felipe M.; and Anders, Alfred K., to Eastman Kodak Company. Apparatus for measuring viscosity or thickness, surface tension and surface dilational elasticity. 5,590,560, Cl. 73-64.480.

Jordan Holding Company: *See*—
Gibson, David L., 5,591,254, Cl. 96-113.000.

Jordan, James R., to United States of America, Commerce. Wind profiling radar. 5,592,171, Cl. 342-26.000.

Joshi, Gajanan: *See*—
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JP Laboratories, Inc.: *See*—
Patel, Gordhanbhai N.; and Patel, Subhash H., 5,591,354, Cl. 216-83.000.

Juang, Bor-Chang. Drill jig for locating holes to be drilled in a workpiece. 5,590,986, Cl. 408-115.00R.

Judet, Thierry; and Saillant, Gérard, to Tornier S.A. Device for stabilizing fractures of the upper end of the femur. 5,591,168, Cl. 606-65.000.

Juengst, Stefan: *See*—
Heider, Juergen; Juengst, Stefan; Maekawa, Koichiro; and Asano, Osamu, 5,592,049, Cl. 313-625.000.

Juneau, Kathleen N.: *See*—
Vicari, Richard; Juneau, Kathleen N.; and Murphy, Carl D., 5,591,809, Cl. 525-419.000.

Jung, Chul-Min; and Park, Hee-Choul, to Samsung Electronics Co., Ltd. Internal power-supply voltage supplier of semiconductor integrated circuit. 5,592,121, Cl. 327-541.000.

Jung, Jung S.; and Kim, Bae H., to Hyundai Electronics Industries Co., Ltd. Time switching device having identical frame delay and a method thereof in a full-electronic exchange. 5,592,479, Cl. 370-378.000.

Jung, Otto: *See*—
Braun, Fritz; Felger, Ursula; Jung, Otto; and Wojtacki, Jakob, 5,592,395, Cl. 364-509.000.

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Weide, Joachim; Jung, Rüdiger; and Metz, Hans J., 5,591,257, Cl. 106-496.000.

Jung, Ruey-feng. Generator for bicycle and a light system using the same. 5,590,946, Cl. 362-72.000.

Juster, Stephen G.; Rietzer, Gregory M.; and Thomas, Paul E., to Tredegar Industries, Inc. Layered fabric material having angled capillaries. 5,591,510, Cl. 428-132.000.

Juto, Jan-Erik. Device for positioning a person's head in a coordinate system. 5,591,175, Cl. 606-130.000.

K & M Engineering & Consulting Corp.: *See*—
Raimondi, Pietro; Achenson, Willard P.; and Overbey, William K., Jr., 5,591,115, Cl. 588-249.000.

Kabemoto, Akira: *See*—
Takahashi, Hajime; Sugahara, Hirohide; and Kabemoto, Akira, 5,592,624, Cl. 395-200.070.

Kaburagi, Haruko: *See*—
Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tanaka, Hisayoshi; Shiina, Takanori; and Kaburagi, Haruko, 5,591,406, Cl. 422-80.000.

Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, 5,590,878, Cl. 273-121.00B.

Kabushiki Kaisha Daikin Seisakusho: *See*—
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Kabushiki Kaisha FRC: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
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Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,612, Cl. 435-100.000.

Kabushiki Kaisha Kenwood: *See*—
Goto, Soje; Kawasaki, Takashi; Hirasuna, Satoshi; Suzuki, Noburnasa; and Shibata, Izumi, 5,592,449, Cl. 369-47.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
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Ueda, Hiroshi; Fukui, Tsugushi; Imuta, Kazuyoshi; Kimura, Hirofumi; Yasuda, Shoji; Hotani, Shin; Inoue, Kimio; Minato, Ryota; Tanaka, Yoshimitsu; and Takahashi, Katsunori, 5,590,959, Cl. 366-84.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Sakuragi, Shunichi; and Tsurumaki, Naoya, 5,591,356, Cl. 219-121.500.

Kabushiki Kaisha Mijke Tekkosho: *See*—
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Kabushiki Kaisha Roshiba: *See*—
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Kabushiki Kaisha TEC: *See*—
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Katsuumi, Kazushige; Miyazawa, Toshio; and Tsukamoto, Toshihiro, 5,590,451, Cl. 29-25.350.

Kabushiki Kaisha Tishiba: *See*—
Sawada, Takaaki; Yoshimura, Masahiko; and Yoshida, Seiji, 5,592,662, Cl. 395-601.000.

Kabushiki Kaishu Tokai-Rika-Denki-Seisakusho: *See*—
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Kabushiki Kaisha Toshiba: *See*—
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Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tamura, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamihaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.
Asano, Masamichi, 5,592,001, Cl. 257-316.000.
Dachiku, Kenshi; Yamaguchi, Shogo; Ozeki, Kazuo; Takahashi, Katsumi; Omokawa, Mitsunori; and Kuratate, Takaaki, 5,592,228, Cl. 348-416.000.
Funaki, Hideyuki; Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; and Omura, Ichiro, 5,592,014, Cl. 257-487.000.
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Kaneko, Tetsuya; and Ohsawa, Takashi, 5,592,421, Cl. 365-189.090.
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Kleinhenz, Richard; Muller, Karl P.; Roithner, Klaus; and Tuschiaki, Masakatsu, 5,592,412, Cl. 365-149.000.
Komano, Haruki; Matsuura, Akira; Nakamura, Hiroko; and Sugihara, Kazuyoshi, 5,591,970, Cl. 250-309.000.
Kurabayashi, Hiroaki; and Mochizuki, Shin-ichiro, 5,592,673, Cl. 395-726.000.
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Ohgami, Keizo; Matsuda, Kazuyuki; Kobayashi, Takaichi; Shibasaki, Kazuya; Nakamura, Hiroshi; Sekine, Shigeru; Ito, Hironori; Ishikawa, Kenichi; Shimohira, Tadamichi; and Gibo, Moriya, 5,592,362, Cl. 361-686.000.
Ohtake, Yasuhisa; Sago, Seiji; Yamazaki, Mitsuaki; and Muramatsu, Sachiko, 5,592,044, Cl. 313-403.000.
Okano, Haruo; Noguchi, Sadahisa; and Sekine, Makoto, 5,591,486, Cl. 427-255.200.
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Kabushiki Kaisya Ohara: *See*—
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Kabushikikaisha Barudan: *See*—
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Kachich, Albert J., to Indresco Inc. Air tool with exhaust diverting valve. 5,591,070, Cl. 451-295.000.

Kadomatsu, Hideyuki: *See*—
Takemoto, Takatoshi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, 5,590,878, Cl. 273-121.00B.

Kadotani, Masanori: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kadotani, Masanori; and Kasuya, Satoru, 5,591,099, Cl. 475-318.000.

Kaempen, Charles E., to Kaempen, Charles R. Composite double-wall underground tank structure and method for making same. 5,590,803, Cl. 220-461.000.

Kaempen, Charles R.: *See*—
Kaempen, Charles E., 5,590,803, Cl. 220-461.000.

Kaesser, Juergen: *See*—
Chahabadi, Djahanyar; Herrmann, Matthias; Vogt, Lothar; and Kaesser, Juergen, 5,592,557, Cl. 381-10.000.

Kaga, Toru: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.

Kai, Ikuyo: *See*—
Komatsu, Nobuo; Kai, Ikuyo; Konishi, Nami; Iwasawa, Naozumi; and Furusawa, Satoru, 5,591,562, Cl. 430-280.100.

Kai, Tadao, to Nikon Corporation. Method and apparatus for preventing image deflection in an optical system. 5,592,251, Cl. 396-55.000.

Kaifu, Noriyuki: *See*—
Takeda, Shinichi; Mizutani, Hidemasa; Kaifu, Noriyuki; and Kobayashi, Isao, 5,591,963, Cl. 250-214.100.

Kaimoto, Takashi: *See*—
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Kais, Alfred: *See*—
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Kajibata, Yoshihiro: *See*—
Tokunaga, Takahisa; Kajihara, Junko; Hirayama, Masao; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Masao; Kajibata, Yoshihiro; and Imura, Tatsuya, 5,591,478, Cl. 426-658.000.

Kajihara, Junko: *See*—
Tokunaga, Takahisa; Kajihara, Junko; Hirayama, Masao; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Masao; Kajibata, Yoshihiro; and Imura, Tatsuya, 5,591,478, Cl. 426-658.000.

Kajima Corporation: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

KAK Enterprises: *See*—
Kollias, Michael; Addington, Steve; and Kanak, Bud, 5,590,640, Cl. 126-25.00R.

Kakishita, Masahiro; and Kunimoto, Toshifumi, to Yamaha Corporation. Electronic musical instrument performing multi-task processing. 5,591,930, Cl. 84-602.000.

Kaku, Yoshio: *See*—
Kimura, Tomio; Kaku, Yoshio; Ikuta, Takashi; Fujiwara, Hiroshi; Ueno, Hitoshi; and Okasari, Eiji, 5,591,752, Cl. 514-314.000.

Kakumu, Masakazu; Nogami, Kazutaka; and Satoh, Yuki, to Kabushiki Kaisha Toshiba. Semiconductor device. 5,592,010, Cl. 257-368.000.

Kakuta, Hideo: *See*—
Hasegawa, Koji; Kakuta, Hideo; and Mizutani, Junya, 5,591,697, Cl. 504-292.000.

Kalyan, Narender K.: *See*—
Hung, Paul P.; Lee, Shaw-Guang L.; and Kalyan, Narender K., 5,591,823, Cl. 530-350.000.

Kambalov, Sergei. Device and method for securing doors against forced break-ins. 5,590,918, Cl. 292-60.000.

Kamibayashi, Hiroyuki: *See*—
Sakai, Hirokazu; Shimizu, Takayuki; Asano, Ryuzo; Miyahara, Naotoshi; Furukawa, Kiyoshi; Nagai, Masaaki; Honjo, Hiromasa; and Kamibayashi, Hiroyuki, 5,591,522, Cl. 428-353.000.

Kamide, Yukihiro: *See*—
Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiro; and Yanagida, Toshiharu, 5,591,302, Cl. 156-661.110.

Kampa, Guido: *See*—
Guentert, Josef; Hummel, Karsten; Kampa, Guido; Paetz, Axel; and Kolar, Karel, 5,591,021, Cl. 417-494.000.

Kanai, Kazuyuki, to Toa Medical Electronics Company, Ltd. Method of diagnosing cerebral infarction. 5,590,665, Cl. 128-898.000.

Kanak, Bud: *See*—
Kollias, Michael; Addington, Steve; and Kanak, Bud, 5,590,640, Cl. 126-25.00R.

Kanamori, Kohji, to NEC Corporation. Non-volatile semiconductor memory device having reduced current consumption. 5,592,092, Cl. 257-321.000.

Kanbe, Junichiro; Katagiri, Kazuharu; and Kaneko, Syuzo, to Canon Kabushiki Kaisha. Method of driving optical modulation device. 5,592,192, Cl. 345-97.000.

Kanbe, Junichiro: *See*—
Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, 5,592,315, Cl. 349-126.000.

Kander, Ilan: *See*—
Younes, Hani; Kander, Ilan; Levy, Dorron; Cohen, Yossi; and Belinkov, Haim, 5,592,269, Cl. 399-237.000.

Kandil, Magdy A., to Sundstrand Corporation. Method of preventing cavitation in an axial piston pump during an aiding load and system and valve employing the same. 5,590,525, Cl. 60-460.000.

Kaneko, Hideo; Tokunaga, Katsushi; and Tawara, Yoshio, to Shin-Etsu Chemical Co., Ltd. Magnetic recording medium. 5,591,502, Cl. 428-65.300.

Kaneko, Mineo, to Canon Kabushiki Kaisha. Ink jet apparatus capable of practicing an improved recovery operation. 5,592,200, Cl. 347-30.000.

Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, to Canon Kabushiki Kaisha. Copying apparatus capable of changing original feed order. 5,592,279, Cl. 399-85.000.

Kaneko, Satoshi: *See*—

Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Noda, Minoru; Katawada, Satore; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.

Kaneko, Shuzo: *See*—
Okada, Shinjiro; Kaneko, Shuzo; Inaba, Yutaka; Shinjo, Katsuhiko; Miyata, Hirokazu; and Katakura, Kazunori, 5,592,190, Cl. 345-89.000.

Kaneko, Syuzo: *See*—
Kanbe, Junichiro; Katagiri, Kazuharu; and Kaneko, Syuzo, 5,592,192, Cl. 345-97.000.

Kaneko, Tetsuya; and Ohsawa, Takashi, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit for generating an internal power source voltage with reduced potential changes. 5,592,421, Cl. 365-189.090.

Kanno, Kimihiko; Yuasa, Takuma; and Fujimoto, Hideki, to Hitachi Maxell, Ltd. Magnetic recording medium having a magnetic layer comprising iron powder and an underlayer comprising non magnetic powders having specified particle size ratios. 5,591,512, Cl. 428-141.000.

Kangas, Lani S.: *See*—
Ozman, Joel D.; Ubel, F. Andrew, III; and Kangas, Lani S., 5,591,786, Cl. 523-109.000.

Kanjo, Wajih: *See*—
Duffy, James L.; Daugherty, David W., Jr.; Kanjo, Wajih; and George, Rudi E., 5,590,797, Cl. 213-33.000.

Kanno, Hideo: *See*—
Tsuboyama, Akira; Miyamoto, Katsuhiro; Mizutome, Atsushi; Kanno, Hideo; Inoue, Hiroshi; and Katakura, Kazunori, 5,592,191, Cl. 345-97.000.

Kansas State University Research Foundation: *See*—
Jenkins, Mark C.; Peyer, Ronald; Tilley, Michael; and Upton, Steven L., 5,591,434, Cl. 424-191.100.

Kanto Yakin Kogyo K.K.: *See*—
Takahashi, Sunuan, 5,591,274, Cl. 148-206.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Azuma, Toshiro; Kojima, Masaaki; Nakayoshi, Masao; Okanishi, Toshiaki; and Inanaga, Masashi, 5,590,737, Cl. 180-308.000.

Kapaan, Hendrikus J., to SKF Industrial Trading & Development Company B.V. Bearing unit for a vehicle wheel. 5,590,967, Cl. 384-448.000.

Kapp, Daniel L.; and Youngblun, Janet, to Eastman Kodak Company. Photographic element containing an azopyrazolone masking coupler exhibiting improved keeping. 5,591,569, Cl. 430-549.000.

Kar, Kishore K.: *See*—
Pewe, R. Garth; Morgan, Ted A.; and Kar, Kishore K., 5,591,503, Cl. 428-65.400.

Kazanwa, Taizo: *See*—
Ando, Sadamasa; Kazanwa, Taizo; and Ozasa, Akio, 5,591,491, Cl. 427-544.000.

Karasick, Gary R.: *See*—
Eisenberg, Neal R.; Huddleston, Robert L.; Karasick, Gary R.; Lee, Tony K.; Lehner, Mary C.; Tran, Brian T.; and Tribolet, Charles S., 5,592,661, Cl. 395-600.000.

Karavakis, Konstantine N.: *See*—
DiStefano, Thomas H.; Smith, John W.; Karavakis, Konstantine N.; Kovac, Zlata; and Fjelstad, Joseph, 5,590,460, Cl. 29-830.000.

Kardorff, Uwe: *See*—
Hauspreht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Walter, Helmut; Gerber, Matthias; and Kardorff, Uwe, 5,591,694, Cl. 504-214.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Lenzen, Josef; and Wisniewski, Herbert, 5,590,448, Cl. 28-191.000.

Karl Thomae GmbH: *See*—
Himmelsbach, Frank; Austel, Volkhard; Pieper, Helmut; Eisert, Wolfgang; Mueller, Thomas; Weisenberger, Johannes; Linz, Guenter; and Krueger, Gerd, 5,591,769, Cl. 514-423.000.

Karmen, Arthur, to Albert Einstein College of Medicine of Yeshiva University. Sensitive on line assay of chromatographic effluent. 5,591,644, Cl. 436-53.000.

Karpati, Varda: *See*—
Sahar, Rami; Shachaam, Alon; Efendovich, Avner; and Karpati, Varda, 5,592,515, Cl. 375-340.000.

Kärrberg, Anders: *See*—
Ljunghohm, Bengt; Nilsson, Nils; Wendeberg, Staffan; Kärrberg, Anders; and Schill, Mikael, 5,590,733, Cl. 180-89.140.

Kasa, Yasushi: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Itano, Kiyoshi; Ogawa, Yasushige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.
Kunakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,592,427, Cl. 365-205.000.

Kasahara, Akihiro, to Kabushiki Kaisha Toshiba. Optical head device having electro-magnetically rotatable and straight movable members. 5,592,459, Cl. 369-112.000.

Kassi, Kosichi: *See*—
Azurashi, Takayuki; Hatada, Toshio; Doikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kassi, Kenichi; Kobayashi, Puniyuki; and Hayashi, Yoshito, 5,592,363, Cl. 361-689.000.

Kassi, Yasuhiko: *See*—
Aonuma, Hajime; Hasegawa, Tsukasa; Naito, Akira; Kassi, Yasuhiko; Tachiya, Tomoko; Yoshida, Shinichi; and Matsuda, Yasumasa, 5,592,605, Cl. 395-348.000.

Kasuya, Masahiro; Kitajima, Yasuo; and Hasumi, Takayuki, to Citizen Watch Co., Ltd. Structure of a watch and assembling method thereof. 5,592,443, Cl. 368-281.000.

Kaschig, Jürgen: *See*—
Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Höglin, Dietmar, 5,591,850, Cl. 544-216.000.

Kase, J. Paul: *See*—
Edmonds, Michael V.; MacKenzie, Kenneth E.; Dunn, Joseph; Smith, A. Gordon; and Kase, J. Paul, 5,592,602, Cl. 395-174.000.

Kashimura, Masato: *See*—
Asaka, Toshifumi; Kashimura, Masato; Misawa, Yoko; Morimoto, Shigeo; and Hatayama, Katsuo, 5,591,837, Cl. 536-7.400.

Kashiwagi, Hiroshi: *See*—
Takiguchi, Hideki; Kashiwagi, Hiroshi; Tsuji, Nobuaki; Socman, Hó; and Hehi, Katsuhito, 5,591,570, Cl. 430-567.000.

Kashiyama, Kenji: *See*—
Hitomi, Mitsuo; Masuda, Shunji; Hanori, Toshihiko; Kashiyama, Kenji; and Suzuki, Junzou, 5,590,626, Cl. 123-90.150.

Kashman, Yoel: *See*—
Boyd, Michael R.; Cardellina, John H., II; Gustafson, Kirk R.; McMahon, James B.; Fuller, Richard W.; Cragg, Gordon M.; Kashman, Yoel; and Soejarto, Doel, 5,591,770, Cl. 514-453.000.

Kasinkas, Michael: *See*—
Porter, Christopher H.; Van Tassel, Robert; Amplatz, Curtis; and Kasinkas, Michael, 5,591,199, Cl. 606-198.000.

Kasinoff, Harvey A.: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

Kassapian, Christian G., to SGS-Thomson Microelectronics S.A. Voltage booster circuit of the charge-pump type with a bootstrapped oscillator. 5,592,115, Cl. 327-239.000.

Kast, Howard B. Toy motion simulator and hydraulic control valve for use therein. 5,591,086, Cl. 472-130.000.

Kasuga, Masao; Suzuki, Kenji; Suzuki, Makoto; and Suzuki, Mineko, to Seiko Instruments Inc. Ultrasonic motor and electronic apparatus equipped with ultrasonic motor. 5,592,041, Cl. 310-316.000.

Kasuya, Satoru: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kadotani, Masanori; and Kasuya, Satoru, 5,591,099, Cl. 475-318.000.

Katagi, Takashi: *See*—
Inabushi, Yasuhiro; Miyashita, Kazuhiro; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroshi; Masujima, Toshio; Matsunaga, Makoto; Katagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.

Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Liquid crystal device and liquid crystal apparatus. 5,592,315, Cl. 349-126.000.

Katagiri, Kazuharu: *See*—
Kanbe, Junichiro; Katagiri, Kazuharu; and Kaneko, Syuzo, 5,592,192, Cl. 345-97.000.

Katagiri, Moriya, to Olympus Optical Co., Ltd. Electromagnet apparatus and apparatus for adjusting exposure of camera using the same. 5,592,136, Cl. 335-272.000.

Katakura, Kageyoshi: *See*—
Masuzawa, Hiroshi; Shimomura, Ryuuichi; and Katakura, Kageyoshi, 5,591,911, Cl. 73-602.000.

Katakura, Kazunori: *See*—
Okada, Shinjiro; Kaneko, Shuzo; Inaba, Yutaka; Shinjo, Katsuhiko; Miyata, Hirokazu; and Katakura, Kazunori, 5,592,190, Cl. 345-89.000.
Tsuboyama, Akira; Miyamoto, Katsuhiro; Mizutome, Atsushi; Kanno, Hideo; Inoue, Hiroshi; and Katakura, Kazunori, 5,592,191, Cl. 345-97.000.

Katayama Chemical, Inc.: *See*—
Ito, Yosuke; Sano, Yoichi; Tsuji, Katsuji; and Katayama, Sakae, 5,591,759, Cl. 514-372.000.

Katayama, Kazuyori; and Naito, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Vehicle cruise control system with voice command. 5,592,385, Cl. 364-426.041.

Katayama, Masato: *See*—
Hirose, Mifune; Suzuki, Eiichi; Sakaki, Mamoru; and Katayama, Masato, 5,591,514, Cl. 428-211.000.

Katayama, Sakae: *See*—
Ito, Yosuke; Sano, Yoichi; Tsuji, Katsuji; and Katayama, Sakae, 5,591,759, Cl. 514-372.000.

Kato, Hideto: *See*—
Kato, Ryochi; Kato, Umeko; Kato, Tomohiko; Kato, Hideto; and Ichizuka, Teruko, 5,590,855, Cl. 246-202.000.

Kato, Kazeyoshi; Terauchi, Jun; and Nagai, Yasuo, to Takeda Chemical Industries, Ltd. Spiro[naphthalene-2(1H),2'-piperidine] and their use. 5,591,849, Cl. 544-70.000.

Kato, Masaaka; Adachi, Tetsuo; Tanaka, Toshihiro; Sasaki, Toshio; Kume, Hitoshi; and Kimura, Katsutaka, to Hitachi, Ltd. Non-volatile semiconductor memory. 5,592,415, Cl. 365-185.010.

Kato, Ryochi; Kato, Umeko; Kato, Tomohiko; Kato, Hideto; and Ichizuka, Teruko. Train detection device for railroad models and train crossing control apparatus utilizing the train detection device. 5,590,855, Cl. 246-202.000.

Kato, Senji; Endo, Kouji; Sone, Shigeru; Goto, Atsushi; and Ohkawa, Nobuhisa, to Toyota Jidosha Kabushiki Kaisha. Apparatus for computing the amount of intake air in internal combustion engine. 5,590,632, Cl. 123-480.000.

Kato, Shunji: *See*—
Nakamura, Yasunori; and Kato, Shunji, 5,592,169, Cl. 341-173.000.

Kato, Soichiro: *See*—
Yabe, Toshikazu; Kato, Soichiro; and Maminatsu, Ken, 5,590,965, Cl. 384-15.000.

Kato, Taku; Hiroshima, Yasunori; Adachi, Akinao; Nakano, Akira; and Shimomura, Kiyoshi, to Pioneer Electronic Corporation. Apparatus for manufacturing a printed circuit board. 5,590,455, Cl. 29-564.100.

Kato, Tomohiko: *See*—
Kato, Ryochi; Kato, Umeko; Kato, Tomohiko; Kato, Hideto; and Ichizuka, Teruko, 5,590,855, Cl. 246-202.000.

Kato, Umeko: *See*—
Kato, Ryochi; Kato, Umeko; Kato, Tomohiko; Kato, Hideto; and Ichizuka, Teruko, 5,590,855, Cl. 246-202.000.

Katoh, Hideo; Nakamura, Kenji; and Satomura, Shinji, to Wako Pure Chemical Industries, Ltd. Process for separating and measuring glycoprotein. 5,591,589, Cl. 435-7.100.

Katou, Minoru: *See*—
Omi, Junichi; Miyamoto, Hidenori; and Katou, Minoru, 5,592,335, Cl. 359-695.000.

Katsuta, Yutaka: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masao; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Katsuumi, Kazuhige; Miyazawa, Toshio; and Tsukamoto, Toshihiro, to Kabushiki Kaisha TEC; and Toshiba-Emi Limited. Manufacturing method for ink jet printer head. 5,590,451, Cl. 29-25.350.

Katz, Itzhak: *See*—
Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, 5,592,444, Cl. 369-13.000.

Katzri, Lior: *See*—
Intrater, Amos; Birenbaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itael; Epstein, Lev; Katzri, Lior; Viner, Omri; Levitan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenafeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.

Kauffman, Dean, Jr. Golf training device. 5,591,090, Cl. 473-271.000.

Kaufman, John G. Dispenser with flow control. 5,590,817, Cl. 222-185.100.

Kaun, James M., to Kimberly-Clark Corporation. Method for making soft tissue using cationic silicones. 5,591,306, Cl. 162-127.000.

Kawabuchi, Yoichi: *See*—
Okatani, Toru; Kawabuchi, Yoichi; Maruta, Syuzi; and Nomura, Keiichi, 5,592,650, Cl. 395-490.000.

Kawachi, Shinji; Sato, Yoshifumi; and Nishimura, Yasuhiro, to Nippon Electric Glass Co., Ltd. Glass bubbles for use as fillers in printed circuit board. 5,591,684, Cl. 501-33.000.

Kawada, Nobuo: *See*—
Arami, Junichi; Ishikawa, Kenji; Deguchi, Youichi; Yagi, Hironori; Kawada, Nobuo; and Yanagisawa, Isao, 5,591,269, Cl. 118-723.00R.

Kawade, Hisaaki: *See*—
Ikeda, Sotomitsu; Yamanobe, Masato; Kawade, Hisaaki; Ohnishi, Toshikazu; and Iwasaki, Tatsuya, 5,591,061, Cl. 445-3.000.

Kawafuse, Kazunori; Suhara, Masaaki; and Hiraki, Masahito, to Daikin Industries, Ltd. Fluid pressure generating device. 5,591,013, Cl. 417-271.000.

Kawaguchi, Hisao; Sugimoto, Shinichi; and Tagusa, Yasunobu, to Sharp Kabushiki Kaisha. Assembly structure of a flat type device including a panel having electrode terminals disposed on a peripheral portion thereof and method for assembling the same. 5,592,199, Cl. 345-206.000.

Kawaguchi, Hisao: *See*—
Sugimoto, Takayuki; Tagusa, Yasunobu; and Kawaguchi, Hisao, 5,592,365, Cl. 361-789.000.

Kawakami, Hiroyoshi: *See*—
Stern, S. Alexander; Kawakami, Hiroyoshi; Houde, Ajay Y.; and Zhou, Guangbin, 5,591,250, Cl. 95-51.000.

Kawakami, Koji: *See*—
Miyao, Tetsuya; Iwamoto, Shozo; Matsushima, Kozo; Kawakami, Koji; and Inoue, Masaki, 5,590,812, Cl. 221-112.000.

Kawakami, Kuzuhisa: *See*—
Mochizuki, Seiji; Kawakami, Kuzuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, 5,590,510, Cl. 53-434.000.

Kawamoto, Hiroshi: *See*—
Shida, Soichi; Kawamoto, Hiroshi; and Niijima, Hironobu, 5,592,100, Cl. 324-751.000.

Kawamoto, Yoshifumi: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.

Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, to Yamaha Corporation. Keyboard musical instrument having key action mechanisms movable to and from strings. 5,591,927, Cl. 84-171.000.

Kawamura, Makoto: *See*—
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, 5,592,450, Cl. 369-48.000.

Kawamura, Shouichi: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Itano, Kiyoshi; Ogawa, Yasushige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.

Kawamura, Tetsuya: *See*—
Maegawa, Shigeki; Kawamura, Tetsuya; Furuta, Mamoru; and Miyata, Yutaka, 5,591,668, Cl. 437-174.000.

Kawana, Izanna, to Fujitsu Limited. Build-out network for a built-in type balanced line driver circuit. 5,592,133, Cl. 333-25.000.

Kawanishi, Yoshitaka, to NBC Corporation. Information recording medium. 5,591,500, Cl. 428-641.000.

Kawano, Minoru: *See*—
Okabe, Hirohiko; Sekiguchi, Masaaki; Yukizane, Shigemi; Matsumoto, Toshitaka; and Kawano, Minoru, 5,590,871, Cl. 270-58.270.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tokunaga, Takahisa; Kajihara, Junko; Hirayama, Masao; Hidaka, Hidemasa; Itoh, Hayami; Hayashitani, Masao; Kajibata, Yoshihiro; and Imura, Tatsuya, 5,591,478, Cl. 426-658.000.

Kawasaki, Nobuo: *See*—
Azurashi, Takayuki; Hatada, Toshio; Doikoku, Takahiro; Kawasaki, Nobuo; Iino, Toshiki; Tsukaguchi, Tamotsu; Kassi, Kenichi; Kobayashi, Puniyuki; and Hayashi, Yoshito, 5,592,363, Cl. 361-689.000.

Kawasaki, Shigeru: *See*—
Kimura, Kazumi; Mitsutake, Hideaki; and Kawasaki, Shigeru, 5,590,942, Cl. 353-34.000.

Kawasaki Steel Corporation: *See*—
Konishi, Masahiro; Sasama, Hiroshi; and Yoneda, Masato, 5,592,407, Cl. 365-49.000.

Kawasaki, Takashi: *See*—
Goto, Soju; Kawasaki, Takashi; Hiranuma, Satoshi; Suzuki, Nobumasa; and Shibata, Izumi, 5,592,449, Cl. 369-47.000.

Kawashima, Hiromi: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Itano, Kiyoshi; Ogawa, Yasushige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.

Kawasumi, Koichi: *See*—
Shinozaki, Kenji; Hirano, Hideki; Kawasumi, Koichi; Asai, Nobutoshi; Tomita, Hidemi; Sato, Shuji; Ogata, Masanori; and Shiota, Hiroyuki, 5,592,208, Cl. 347-171.000.

Kayyem, Jon F.: *See*—
Meade, Thomas J.; Kayyem, Jon F.; and Fraser, Scott E., 5,591,578, Cl. 435-6.000.

Kazahaya, Mitsuhiro: *See*—
Terauchi, Ikuo; Terasiahi, Keiichi; Kazahaya, Mitsuhiro; and Taguchi, Katsuyuki, 5,592,398, Cl. 364-514.00A.

Kazmark, Eugene A., Jr., to Remin Laboratories, Inc. Cart and luggage handle assembly with rotatable release member. 5,590,891, Cl. 280-37.000.

Keimel, John G., to Medtronic, Inc. Hybrid battery for implantable pulse generator. 5,591,212, Cl. 607-5.000.

Keipert, Frank R.: *See*—
Palfenier, Samuel R.; Keipert, Frank R.; Beauch, Howard D.; Olgren, Leland N.; and Cymbal, William D., 5,590,565, Cl. 74-493.000.

Keith, Michael; Bui, Tuan; Harney, Kevin; and Kelly, Michael, to Intel Corporation. Pipelined video encoder architecture. 5,592,399, Cl. 364-514.200.

Keizer, Daniel J.; Lax, Steven A.; and Muylwyk, Robert K., to Keizer, Daniel J.; and Lax, Steven A. Security power interrupt. 5,592,032, Cl. 307-116.000.

Kel Corporation: *See*—
Doi, Etsuro; Aoh, Kiyoshi; Mochizuki, Shoichi; and Koiso, Masakazu, 5,591,036, Cl. 439-79.000.

Keller, James J. Horizontal sheet transfer multiple color offset rotary printing press with horizontal slide access. 5,590,598, Cl. 101-479.000.

Keller, Karl; Hamraths, Konrad; Afflerbach, Erhard; and Klein, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Roll stand. 5,590,557, Cl. 72-238.000.

Keller, Robert A., to Shakespeare. Polymeric cable. 5,591,525, Cl. 428-374.000.

Kelley, Michael W.; and Yen, Shou-Chern, to Apple Computer, Inc. Method and apparatus for incremental acceleration of the rendering process utilizing multiple scanline rendering devices. 5,592,601, Cl. 395-143.000.

Kelley, Scott A.: *See*—
Phillion, Jack A.; and Kelley, Scott A., 5,590,903, Cl. 280-728.300.

Kellner, Ullrich; Gepfert, Stefan; Schlueter, Franz-Josef; and Dietz, Harald, to Hella KG Hueck & Co. Electromagnetic signal horn. 5,592,145, Cl. 340-391.100.

Kelly, Derek: *See*—
Hamilton, Robin; Ryan, Patrick J.; Kelly, Derek; and Dickinson, Robert J., 5,590,659, Cl. 128-661.010.

Kelly, James D.; and Polzin, R. Stephen, to Apple Computer, Inc. Bus transaction reordering using side-band information signals. 5,592,631, Cl. 395-293.000.

Kelly, Michael: *See*—
Keith, Michael; Bui, Tuan; Harney, Kevin; and Kelly, Michael, 5,592,399, Cl. 364-514.200.

Kelman, David C.; and Trentacosta, Joseph D., to Depuy Dupont Orthopaedics. Metal/composite hybrid orthopedic implants. 5,591,233, Cl. 623-16.000.

Kemicraft Overseas Limited: *See*—
Miller, Jorge; and Kling, Miguel, 5,591,506, Cl. 423-81.000.

Kemin Industries, Inc.: *See*—

Nelson, Christopher E.; and Catron, Douglas H., 5,591,878, Cl. 556-49.000.

Kemp, Bruce E.; Hillyard, Carmel J.; Rylatt, Dennis B.; and Bundesen, Peter G., to St. Vincents Institute of Medical Research Limited; and Agen Limited. Detection of mammalian immunodeficiency viruses. 5,591,572, Cl. 435-5.000.

Kemp, John D.: *See*—
Hall, Timothy C.; Kemp, John D.; Slightom, Jerry L.; and Sutton, Dennis W., 5,591,605, Cl. 435-70.100.

Kemper, Timothy G.; Monroe, Allan L.; and Riner, Tony L., to French Oil Mill Machinery Co., The. Stationary screen extractor. 5,591,416, Cl. 422-268.000.

Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, to Abbott Laboratories. Retroviral protease inhibiting compounds. 5,591,860, Cl. 548-204.000.

Kempin, Ronald. Masonary cutting tool and method. 5,590,639, Cl. 125-41.000.

Kempinski, Steve J.: *See*—
Wilmot, Theodore S.; Driscoll, John C.; and Kempinski, Steve J., 5,592,118, Cl. 327-440.000.

Kendall, Kevin: *See*—
Clegg, William J.; and Kendall, Kevin, 5,591,287, Cl. 156-89.000.

Kenley, Rodney S.; Tree, Dennis M.; Peter, Frederick H., Jr.; Feldstein, Thomas M.; Pawlak, Kenneth E.; Adolf, Wayne F.; and Roettger, Linda, to Akzo, Ltd. Hot water disinfection of dialysis machines, including the extracorporeal circuit thereof. 5,591,344, Cl. 210-636.000.

Kennedy, Paul E.; Rajewski, Roger A.; and Baldoni, John M., to U.S. Bioscience, Inc. Crystalline zanifostine compositions. 5,591,731, Cl. 514-114.000.

Kenney, Cory. Cord holding attachment for electrical receptacle. 5,591,043, Cl. 439-373.000.

Kent, Joel, to Elo TouchSystems, Inc. Acoustic touch position sensor using higher order horizontally polarized shear wave propagation. 5,591,945, Cl. 178-19.000.

Kent, John R.: *See*—
Chen, Albert C.; Hrinko, Peter, Jr.; Yost, Kevin O.; and Kent, John R., 5,590,438, Cl. 15-167.100.

KenVision, Inc.: *See*—
Kuhn, William P.; and Baker, Phillip C., 5,592,246, Cl. 351-212.000.

Korkut, Awdhoot V.: *See*—
Friedmann, Semyon D.; Korkut, Awdhoot V.; Hughes, Ernest W.; Breezy, Rasto; Lau, John Wing-Keung; and Block, Jacob, 5,591,691, Cl. 502-439.000.

Kerns, David V., Jr.: *See*—
Moore, J. Paul; and Kerns, David V., Jr., 5,592,245, Cl. 351-163.000.

Kersey, Larry M.: *See*—
Jones, James T.; Kersey, Larry M.; and Steinke, Richard A., 5,591,412, Cl. 422-171.000.

Kerska, Donald H.: *See*—
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Iwadate, Masahiro; Suzuki, Yoshihiko; Kohtani, Hideto; Kutsuwada, Satoru; Koh, Shokyo; and Kuroda, Ken, 5,592,305, Cl. 358-448.000.

Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohito, 5,592,279, Cl. 399-85.000.

Koh, Syokyo: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohito, 5,592,280, Cl. 399-410.000.

Kohda, Katsuhiro, to Fuji Photo Film Co., Ltd. Radiation image storage panel and radiation image recording and reproducing method. 5,591,982, Cl. 250-484.400.

Kohno, Michio: *See*—
Tsuji, Toshihiko; and Kohno, Michio, 5,591,985, Cl. 250-559.450.

Kohola, Pekka: *See*—
Hirvonen, Juhani; Kohola, Pekka; Ikonen, Kari; and Takala, Matti, 5,592,217, Cl. 348-83.000.

Kohtani, Hideto: *See*—
Iwadate, Masahiro; Suzuki, Yoshihiko; Kohtani, Hideto; Kutsuwada, Satoru; Koh, Shokyo; and Kuroda, Ken, 5,592,305, Cl. 358-448.000.

Koide, Yoshio: *See*—
Nakamura, Kenichi; and Koide, Yoshio, 5,592,222, Cl. 348-294.000.

Koike, Kazuyoshi: *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,591,868, Cl. 549-23.000.

Kois, Adam: *See*—
Chan, Ming F.; Raja, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vinakadi N., 5,591,761, Cl. 514-380.000.

Koishi, Masuhs; Takeshima, Akira; and Nishizawa, Mitsunori, to Hamamatsu Photonics K.K. Synchronous signal detection apparatus with a photoconductive photodetector. 5,591,962, Cl. 250-214.100.

Koiso, Masakazu: *See*—
Doi, Etsuro; Atoh, Kiyoshi; Mochizuki, Shoichi; and Koiso, Masakazu, 5,591,036, Cl. 439-79.000.

Koizumi, Makoto: *See*—
Kita, Tetsuya; and Koizumi, Makoto, 5,592,241, Cl. 348-823.000.

Koizumi, Shigeru, to Canon Kabushiki Kaisha. Wireless telephone system with message storage for plural telephones. 5,592,532, Cl. 379-58.000.

Kojima, Masaaki: *See*—
Azuma, Toshiro; Kojima, Masaaki; Nakayachi, Masao; Okanishi, Toshiaki; and Inanaga, Masashi, 5,590,737, Cl. 180-308.000.

Kojima, Takeshi: *See*—
Hatayama, Toshio; Sasaki, Mie; Kojima, Takeshi; and Sakai, Kouichi, 5,591,351, Cl. 210-767.000.

Kojima, Yasushi: *See*—
Ogata, Yasuyuki; Hayashi, Yoshimasa; and Kojima, Yasushi, 5,592,134, Cl. 333-185.000.

Kojiri, Katsuhisa; Kondo, Hisao; Arakawa, Hiroharu; Ohkubo, Mitsuru; and Suda, Hiroyuki, to Banyu Pharmaceutical Co., Ltd. Indolopyrrolocarbazole derivatives. 5,591,842, Cl. 536-27.100.

Kolar, Karel: *See*—
Guentert, Josef; Hummel, Karsten; Kaeppa, Guido; Paetz, Axel; and Kolar, Karel, 5,591,021, Cl. 417-494.000.

Kolata, Ron: *See*—
Privitera, Salvatore; Schwemberger, Richard F.; and Kolata, Ron, 5,591,192, Cl. 606-185.000.

Kollias, Michael; Addington, Steve; and Kanak, Bud, to KAK Enterprises. Protective guard for outdoor grill. 5,590,640, Cl. 126-25.00R.

Komano, Haruki; Matsuura, Akira; Nakamura, Hiroko; and Sugihara, Kazuyoshi, to Kabushiki Kaisha Toshiba. Charged beam apparatus. 5,591,970, Cl. 250-309.000.

Komori, Toshihiko: *See*—
Hiei, Yotoh; and Komori, Toshihiko, 5,591,616, Cl. 435-172.300.

Komatsu, Eiji: *See*—
Fujikawa, Kazuhide; and Komatsu, Eiji, 5,591,660, Cl. 437-53.000.

Komatsu, Hideki; and Nishio, Shoji, to Konica Corporation. Method of processing photographic light-sensitive material. 5,591,567, Cl. 430-399.000.

Komatsu, Masaya: *See*—
Aazai, Satoru; and Komatsu, Masaya, 5,592,259, Cl. 355-53.000.

Komatsu, Nobuo; Kai, Ikuyo; Konishi, Nami; Iwasawa, Naozumi; and Furusawa, Satoru, to Sony Corporation. Water and acid developable photoresist composition exhibiting improved adhesion. 5,591,562, Cl. 430-280.100.

Komatsu, Takashi; Uehara, Hiroomi; and Shinkai, Syuji, to Nisshin Flour Milling Co., Ltd. Forming apparatus for a powdery sample. 5,591,461, Cl. 425-169.000.

Komazawa, Masato: *See*—

Takuchi, Yukihisa; and Komazawa, Masato, 5,592,042, Cl. 310-328.000.

Kompanek, Harry W., to Undersea Transducer Technology, Inc. Transducer. 5,592,359, Cl. 361-329.000.

Kondo, Hisao: *See*—
Kojiri, Katsuhisa; Kondo, Hisao; Arakawa, Hiroharu; Ohkubo, Mitsuru; and Suda, Hiroyuki, 5,591,842, Cl. 536-27.100.

Kondo, Jinichi: *See*—
Yoshimoto, Kyosuke; Rao, M. C.; Obata, Hiroyuki; Nakase, Kazuhiko; Furukawa, Teruo; Kondo, Jinichi; and Ototake, Masafumi, 5,592,452, Cl. 369-58.000.

Kondo, Mituo: *See*—
Machida, Mitunori; and Kondo, Mituo, 5,591,120, Cl. 600-140.000.

Kondoh, Harufusa: *See*—
Notani, Hiromi; and Kondoh, Harufusa, 5,592,109, Cl. 327-3.000.

Kondoh, Takanori: *See*—
Midorikawa, Shingo; Harada, Masaaki; and Kondoh, Takanori, 5,591,279, Cl. 152-209.00R.

Kong, Hua-Shuang: *See*—
Edmond, John A.; Bulman, Gary E.; and Kong, Hua-Shuang, 5,592,501, Cl. 372-45.000.

Konica Corporation: *See*—
Arai, Takeo; and Fukawa, Junichi, 5,591,561, Cl. 430-264.000.
Komatsu, Hideki; and Nishio, Shoji, 5,591,567, Cl. 430-399.000.
Okabe, Hirohiko; Sekiguchi, Masaaki; Yukizane, Shigemi; Matsumoto, Toshitaka; and Kawano, Minoru, 5,590,871, Cl. 270-58.270.
Osawa, Yoshihisa; Tsunoda, Eizo; Hosogaya, Ryuji; Hatakeyama, Akira; Tanaka, Hideki; and Tobisawa, Seiichi, 5,591,266, Cl. 118-410.000.
Shigeta, Kunio; Hosogoezawa, Sachie; and Onodera, Masahiro, 5,592,264, Cl. 399-175.000.
Takiguchi, Hideki; Kashiwagi, Hiroshi; Tsuji, Nobuaki; Socman, Hó; and Heki, Katsuhiko, 5,591,570, Cl. 430-567.000.
Yamazaki, Hiroshi; Oshiba, Takeo; and Etoh, Yoshihiko, 5,591,558, Cl. 430-120.000.

König, Axel: *See*—
Froeschke, Reinhard; and König, Axel, 5,591,458, Cl. 425-6.000.

Konishi, Masahiro; Sasama, Hiroshi; and Yoneda, Masato, to Kawasaki Steel Corporation. Associative memory. 5,592,407, Cl. 365-49.000.

Konishi, Nami: *See*—
Komatsu, Nobuo; Kai, Ikuyo; Konishi, Nami; Iwasawa, Naozumi; and Furusawa, Satoru, 5,591,562, Cl. 430-280.100.

Konishi, Yasuhiro: *See*—
Iwamoto, Hisashi; Konishi, Yasuhiro; Dosaka, Katsumi; and Murai, Yasumitsu, 5,592,434, Cl. 365-233.000.

Konishi, Yoshiaki: *See*—
Kubota, Yasushi; Konishi, Yoshiaki; and Eguchi, Masaaki, 5,591,016, Cl. 417-365.000.

Kono, Yoshitsugu: *See*—
Ichiki, Hiroshi; Taneda, Ryoichi; Itoh, Hiroyuki; and Kono, Yoshitsugu, 5,591,886, Cl. 560-41.000.

Konoya, Hisashi: *See*—
Okada, Hajime; Kobayashi, Masaaki; Fujitani, Mitsuhiro; and Konoya, Hisashi, 5,591,054, Cl. 439-884.000.

Kopp, Clinton V.: *See*—
Barboza, Steven D.; Hoffman, Charles, Jr.; Kopp, Clinton V.; Schmitt, Robert J.; and Shucosky, Anthony C., 5,591,335, Cl. 210-323.200.

Kordik, Jeffrey A., to Applied Motion Products, Inc. Step motor and servo motor indexer. 5,592,057, Cl. 318-162.000.

Koretsky, Diana R.: *See*—
Fehervari, Agota F.; Foley, James A.; Kim, Gia Y.; Koretsky, Diana R.; Taylor, Lloyd D.; and Waterman, Kenneth C., 5,591,560, Cl. 430-203.000.

Korhonen, Ville; Pirinen, Timo; and Ramstedt, Jorma, to Valmet Corporation. Mounting arrangement for calendar rolls in a calender. 5,590,593, Cl. 100-93.0RP.

Korkala, Heikki. Intelligent lamp or intelligent contact terminal for a lamp. 5,592,051, Cl. 315-210.000.

Korleski, Joseph E.: *See*—
Ameen, Joseph G.; Korleski, Joseph E.; Mortimer, William P., Jr.; and Yokimcus, Victor P., 5,591,034, Cl. 439-91.000.

Kortenjann, Ludger: *See*—
Wagner, Gerhard; Kortenjann, Ludger; and Bertsche, Bernd, 5,591,096, Cl. 475-119.000.

Koseki, Shinya: *See*—
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,591,927, Cl. 84-171.000.

Koshijima, Tetsuo; Shiraishi, Nobuo; Takahashi, Tadashi; Hiraoka, Toshiharu; and Ueda, Masami, to Japan Chemical Engineering & Machinery Co., Ltd. Benzylated lignocellulosic substance and a producing method thereof. 5,591,832, Cl. 530-500.000.

Kosley, Raymond W., Jr.; Flanagan, Denise M.; Martin, Lawrence L.; and Nemoto, Peter A., to Hoechst Marion Roussel Inc. (1H-indol-1-yl)-2-(amino)acetamide derivatives and preparation thereof. 5,591,866, Cl. 548-455.000.

Kosowsky, Michael R.: *See*—
Kosowsky, Richard P.; Santullo, Michael P.; and Kosowsky, Michael R., 5,592,538, Cl. 379-93.000.

Kosowsky, Richard P.; Santullo, Michael P.; and Kosowsky, Michael R., to Momentum, Inc. Telecommunication device and method for interactive voice and data. 5,592,538, Cl. 379-93.000.

Kostigian, John V., to Galt Display Rack Company Limited. Floor covering storage rack with cleaning device. 5,590,435, Cl. 15-40.000.

Kosuge, Katsumi: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sagishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Kosugi, Tatsuhiko: *See*—
Shinohara, Toru; and Kosugi, Tatsuhiko, 5,592,353, Cl. 361-63.000.

Kotoh, Satoru: *See*—
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoso, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,590,672, Cl. 134-201.000.

Kötzsch, Hans-Joachim: *See*—
Standke, Burkhard; Rauleder, Hartwig; Seiler, Claus-Dietrich; Kötzsch, Hans-Joachim; and Peeters, Hermann, 5,591,818, Cl. 528-38.000.

Kovac, Zlata: *See*—
DiStefano, Thomas H.; Smith, John W.; Karavakis, Konstantine N.; Kovac, Zlata; and Fjelstad, Joseph, 5,590,460, Cl. 29-830.000.

Kovacs, Gregory J.: *See*—
Parker, Delmer G.; and Kovacs, Gregory J., 5,592,281, Cl. 399-156.000.

Kovalsky, Alvin; and Miller, Max D., to Kovalsky, Alvin. All wavelength ultraviolet intensity monitor. 5,591,978, Cl. 250-372.000.

Kover, Joseph, Jr. Programmable vehicle light controller. 5,592,146, Cl. 340-468.000.

Kovner, Vladimir: *See*—
Minuhin, Vadim B.; Kovner, Vladimir; and Surendran, Srinivasan, 5,592,340, Cl. 360-46.000.

Kowa Co., Ltd.: *See*—
Saino, Yushi; Iwasaki, Akio; and Suda, Makoto, 5,591,633, Cl. 435-252.300.

Koyama, Hiroo, to Fuji Photo Film Co., Ltd. Image processing method. 5,592,570, Cl. 382-254.000.

Koyama, Masayoshi; Takahashi, Mikiko; and Yanagawa, Masayoshi, to Hoechst Japan Limited. L-lysyl-glycyl-L-histidine and therapeutic agent for wound healing containing the same. 5,591,711, Cl. 514-6.000.

Koz, Mark C. Apparatus and method for video pixel data transfer. 5,592,233, Cl. 348-552.000.

Kramer, Alan: *See*—
Sabatini, Marco; and Kramer, Alan, 5,592,418, Cl. 365-185.180.

Kramer, James F., to Virtual Technologies, Inc. Accurate, rapid, reliable position sensing using multiple sensing technologies. 5,592,401, Cl. 364-550.000.

Krause, Kenneth: *See*—
Stanton, Leslie G.; and Krause, Kenneth, 5,592,295, Cl. 356-426.000.

Krauss, Mark J., to American Cord & Webbing Company, Inc. Side release buckle with improved distribution of stress under loads. 5,590,444, Cl. 24-625.000.

Krebs, Art T.: *See*—
Stockley, Henry W., III; and Krebs, Art T., 5,591,468, Cl. 426-106.000.

Kremsdorf, Dina: *See*—
Orth, Gerard; Favre, Michel; Kremsdorf, Dina; and Pehau-Arnaudet, Gérard, 5,591,574, Cl. 435-5.000.

Kreutter, Kelly M.: *See*—
Cameron, Paul S.; Nash, John C.; Bloomer, Robert C.; Wollan, Robert E.; Kreutter, Kelly M.; Ahler Olmstead, Melinda A.; Renner, Dale H.; Bourne, Ryan D.; Carnish, Keith M.; and Jones, Dean R., 5,592,378, Cl. 395-227.000.

KRh Thermal Systems: *See*—
Prescott, Jack R.; Elliott, Gregory; Hopkins, Mark A.; Rudewicz, Paul T.; and Thomas, Thom, 5,590,809, Cl. 221-1.000.

Krichever, Mark J.; and Metlitsky, Boris, to Symbol Technologies. Bar code reader. 5,591,952, Cl. 235-462.000.

Krimpenfort, Paulus J. A.; and Berns, Antonius J. M., to GenPharm International, Inc. Transgenic mice depleted in a mature lymphocytic cell-type. 5,591,669, Cl. 800-2.000.

Kroeschell, Peter: *See*—
Kniep, Rüdiger; Klein, Hans; and Kroeschell, Peter, 5,591,374, Cl. 252-70.000.

Kroll, Mark W., to Angeion Corporation. Implantable defibrillator system for generating an active biphasic waveform. 5,591,209, Cl. 607-5.000.

Kroll, Mark W.; and Adams, Theodore P., to Angeion Corporation. Implantable defibrillation system and method for producing only short pulse waveforms. 5,591,210, Cl. 607-5.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Griesbeck, Karl, 5,591,899, Cl. 73-41.000.

Krueger, Gerd: *See*—
Himmelsbach, Frank; Austel, Volkhard; Pieper, Helmut; Eisert, Wolfgang; Mueller, Thomas; Weisenberger, Johannes; Linz, Gaenter; and Krueger, Gerd, 5,591,769, Cl. 514-423.000.

Krull, Donald R.: *See*—
Codina, George; Krull, Donald R.; and Vachon, J. Thomas, 5,590,629, Cl. 123-310.000.

Krup, William R. Carburetor and metering device therefor. 5,591,383, Cl. 261-34.100.

Krupa, Calvin S.: *See*—
Knoss, Robert; and Krupa, Calvin S., 5,590,805, Cl. 220-508.000.

Kubota, Michio: *See*—
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,611, Cl. 435-100.000.
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,612, Cl. 435-100.000.

Kubota, Yasushi; Konishi, Yoshiki; and Eguchi, Masaaki, to Nikkiso Co., Ltd. Multistage canned motor pump having a thrust balancing disk. 5,591,016, Cl. 417-365.000.

Kubota, Yasushi, to Sharp Kabushiki Kaisha. Multivalued semiconductor read only storage device and method of driving the device and method of manufacturing the device. 5,592,012, Cl. 257-391.000.

Kubonoe, Morioki: *See*—
Ogasawara, Minoo; Kobayashi, Hiroyuki; and Kubonoe, Morioki, 5,591,980, Cl. 250-442.110.

Kaczynski, Anthony L.; Ayer, Atul D.; and Wong, Patrick S.-L., to ALZA Corporation. Method for lowering blood glucose. 5,591,454, Cl. 424-486.000.

Kuga, Kunio, to Rohm Co., Ltd. Stereoscopic picture system and stereoscopic display panel therefor. 5,592,215, Cl. 348-51.000.

Kuhlmann, Ludwig: *See*—
Bonalet, Klaus; Hermanns, Peter; Seemann, Gerhard; Kuhlmann, Ludwig; and Steinsträsser, Axel, 5,591,828, Cl. 530-387.300.

Kuhn, Philip M., to Martin Marietta Corporation. High-gain directional transducer array. 5,592,441, Cl. 367-153.000.

Kuhn, Wayne H.: *See*—
Crews, Mitchell S.; Kuhn, Wayne H.; and Bryll, M. Scott, 5,590,606, Cl. 108-51.300.

Kuhn, William P.; and Baker, Phillip C., to KenVision, Inc. Device and method for mapping objects. 5,592,246, Cl. 351-212.000.

Kuklo, Anthony, Jr.: *See*—
Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; Marcolino, Edoardo; and Simone, Albert, 5,591,403, Cl. 422-73.000.

Kulicke and Soffa Investments, Inc.: *See*—
Price, Suzanne F.; Munekata, Hiroshi; Razon, Eli; Perlberg, Gil; and Pobin, Igor, 5,591,920, Cl. 73-828.000.

Kulpa, Jürgen; and Stratz, Heinz, to Hoechst AG. Process for the preparation of polycarboxylic acids and derivatives thereof. 5,591,893, Cl. 562-504.000.

Kumahara, Shinobu; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, to Fujitsu Limited. Semiconductor memory having a sense amplifier with load transistors having different load characteristics. 5,592,427, Cl. 365-205.000.

Kume, Hitoshi: *See*—
Kato, Masataka; Adachi, Tetsuo; Tanaka, Toshihiro; Suzuki, Toshio; Kume, Hitoshi; and Kimura, Katsutaka, 5,592,415, Cl. 365-185.010.

Kunimoto, Toshifumi: *See*—
Kakishita, Masahiro; and Kunimoto, Toshifumi, 5,591,930, Cl. 84-602.000.

Kunoff, Noah; Van Deusen, William; and Consiglio, Craig, to AIL Systems, Inc., Subsidiary of Eaton Corp. Shaped digital noise signal generator and method. 5,592,587, Cl. 395-2.730.

Kuo, Chi L. Smoke processor. 5,591,242, Cl. 55-318.000.

Kuo, Sheng-hung: *See*—
Kydonieus, Agis; Bastez, Ladislav; Shah, Kishore; Jamshidi, Khosrow; Chang, Tsk-hung; and Kuo, Sheng-hung, 5,591,820, Cl. 528-76.000.

Kurahoyashi, Hiroshi; and Mochizuki, Shin-ichiro, to Kabushiki Kaisha Toshiba. Loosely coupled compound computer system using lock and semaphore mechanism for performing exclusive control of shared resource which is accessed through a distinct bus. 5,592,673, Cl. 395-726.000.

Kurata, Iwao: *See*—
Nomura, Toshihiro; Hisamoto, Masaaki; and Kurata, Iwao, 5,591,993, Cl. 257-181.000.

Kurotate, Takaaki: *See*—
Dachiku, Kenshi; Yamaguchi, Shogo; Ozeki, Kazuo; Takahashi, Katsumi; Onozawa, Mitsunori; and Kurotate, Takaaki, 5,592,228, Cl. 348-416.000.

Kuno, Tohzo: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tohzo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.

Kurek, Joseph: *See*—
Bland, James E.; and Kurek, Joseph, 5,591,346, Cl. 210-668.000.

Kurek, Lawrence M.: *See*—
Ingwerson, Peter; Kurek, Lawrence M.; and Heimer, Douglas L., 5,590,576, Cl. 83-147.000.

Kurihara, Masayuki; Goishi, Akira; and Ueda, Koshi, to Advantest Corporation. IC tester joined with ion beam tester and the detection method of the failure part of IC. 5,592,099, Cl. 324-751.000.

Kurihara, Masaru; and Igarashi, Masanori, to Fuji Jukogyo Kabushiki Kaisha. Idling speed control system and the method thereof. 5,590,630, Cl. 123-339.170.

Kuritz, Steven P.: *See*—
Brzozowski, Allen J.; Kuritz, Steven P.; Blackburn, Brian K.; Gentry, Scott B.; and Mazur, Joseph F., 5,591,900, Cl. 73-52.000.

Kuriyama, Takashi: *See*—
Ishida, Seiji; and Kuriyama, Takashi, 5,590,711, Cl. 165-179.000.

Kuriyama, Toshihiro, to Alps Electric Co., Ltd. Magnetic sensor with permanent magnet bias layers. 5,592,082, Cl. 324-252.000.

Kurnia, Alexander: *See*—
Rajasekhara, Kaushik; and Kurnia, Alexander, 5,592,371, Cl. 363-98.000.

Kurobe, Akio, to Matsushita Electric Industrial Co., Ltd. Device and method for controlling coding. 5,592,225, Cl. 348-405.000.

Kurobe, Akio, to Matsushita Electric Industrial Co., Ltd. System for a distributed wireless star network with terminal devices and a concentrator including start bits and ORing logic for resolving transmission contention. 5,592,623, Cl. 395-200.060.

Kuroda, Ken: *See*—
Iwadate, Masahiro; Suzuki, Yoshihiko; Kobani, Hideto; Katsuwada, Satoru; Koh, Shokyo; and Kuroda, Ken, 5,592,305, Cl. 358-448.000.

Kuroda, Masato, to Yamatake-Honeywell Co., Ltd. Electropneumatic positioner. 5,590,677, Cl. 137-85.000.

Kuroda, Masayoshi: *See*—
Ominami, Taiichi; Sakata, Toshio; Kuroda, Masayoshi; Tamura, Tomonobu; Nakase, Masami; and Nakatsuka, Kazuhiko, 5,590,872, Cl. 271-176.000.

Kuroda, Shigeru: *See*—
Hara, Naoki; Kuroda, Shigeru; and Shima, Masashi, 5,591,994, Cl. 257-192.000.

Kurome, Hirokazu: *See*—
Sumiya, Takashi; Tanaka, Iwao; Shibatsuji, Kunio; Kurome, Hirokazu; Sugiura, Seiya; and Ono, Wataru, 5,591,518, Cl. 428-318.400.

Kurotaka, Shigeo: *See*—
Ichigo, Katsuhiro; and Kurotaka, Shigeo, 5,592,275, Cl. 399-325.000.

Kuroyanagi, Akira: *See*—
Tamura, Masao; Yamauchi, Takeshi; Niwa, Katshide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Toora, 5,592,004, Cl. 257-323.000.

Kurys, Barbara E.: *See*—
Glamkowski, Edward J.; and Kurys, Barbara E., 5,591,864, Cl. 548-429.000.

Kusaka, Kensaku; Murata, Hidekazu; and Masuda, Koji, to Canon Kabushiki Kaisha. Image fixing apparatus and image forming apparatus. 5,592,277, Cl. 399-328.000.

Kuslich, Stephen D. Spinal fixation device. 5,591,235, Cl. 623-17.000.

Kutsuwada, Satoru: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Iwadate, Masahiro; Suzuki, Yoshihiko; Kobani, Hideto; Kutsuwada, Satoru; Koh, Shokyo; and Kuroda, Ken, 5,592,305, Cl. 358-448.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.

Kuwabara, Tadashi: *See*—
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Lindenbaum, Ella, 5,591,709, Cl. 514-4.000.

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Borgeson, Robert A.; Russ, Robert M.; Lincoln, Larry A.; Webster, Thomas L.; Merry, Nir; and Bassett, William W., 5,590,642, Cl. 126-116.00A.

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Dornier, Peter D.; Wahhoud, Adnan; Czura, Peter; and Scorl, Hans-Dieter, 5,590,692, Cl. 139-1.00R.

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Cartier, Guy, 5,590,735, Cl. 180-210.000.
Cordsen, Horst; and Rohde, Wilhelm, 5,590,544, Cl. 62-656.000.

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Tuy, Heang K.; Beadula, Dale J.; and Lindstrom, Walter W., 5,592,523, Cl. 378-19.000.

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Tambini, Angelo L.; and Linehan, John, 5,592,396, Cl. 364-510.000.

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Jones, Ronald L.; Caughman, Henry D.; Shelor, Susan M.; and Lines, Ellwood L., Jr., 5,591,692, Cl. 504-124.000.

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Ulbrich, Stephen F., 5,592,123, Cl. 330-288.000.

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Negus, Charles C.; and Linhares, Stephen J., 5,591,161, Cl. 606-17.000.

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Anderson, Michael C.; Heap, Anthony J.; and Grose, Horst-Dittmar, 5,591,496, Cl. 428-36.500.

Linsker, Ralph, to International Business Machines Corporation. Telephone inadvertent off-hook condition detector. 5,592,529, Cl. 379-32.000.

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Coleman, R. Glen, 5,591,207, Cl. 606-232.000.

Linz, Guenter: *See*—
Himmelsbach, Frank; Austel, Volkhard; Pieper, Helmut; Eisert, Wolfgang; Mueller, Thomas; Weisenberger, Johannes; Linz, Guenter; and Krueger, Gerd, 5,591,769, Cl. 514-423.000.

Linzy, David: *See*—
Seaton, Jay J.; Allen, Michael; Landis, Donald; Lee, Patrick; Linzy, David; and Luca, Susan B., 5,591,299, Cl. 156-626.100.

Lipkin, Edward B. Check cashing system. 5,592,377, Cl. 395-242.000.

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Lane, Ronald H.; Qureshi, Asaf A.; and Salser, Winston A., 5,591,772, Cl. 514-458.000.

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Nagel, Robert; and Lipscomb, Thomas H., 5,592,549, Cl. 380-4.000.

Lipsett, Sigrid: *See*—
Weinstock, Ronald J.; and Lipsett, Sigrid, 5,592,086, Cl. 324-318.000.

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Sullivan, Michael J.; and Weiss, Robert A., 5,591,803, Cl. 525-196.000.

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Smith, Rory J. M.; Little, Gillian R.; and Shelley, Nicholas S., 5,591,144, Cl. 604-327.000.

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Barwick, Billie J., Jr.; and Little, James H., 5,591,127, Cl. 604-66.000.

Little, Melvyn: *See*—
Fuchs, Patrick; Little, Melvyn; Breitling, Frank; and Döbel, Stefan, 5,591,604, Cl. 435-69.700.

Little, Thomas W.: *See*—
Miyasaka, Mitsutoshi; and Little, Thomas W., 5,591,989, Cl. 257-66.000.

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Dodge, Timothy J.; Iradi, Thomas E.; and Patel, Divya C., 5,592,325, Cl. 359-326.000.

Litwin, Allen: *See*—
Michael, J. Gabriel; and Litwin, Allen, 5,591,433, Cl. 424-184.100.

Liu, Chin-Fu. Renewable wear-proof elbow with a detachable buffer chamber. 5,590,916, Cl. 285-127.000.

Liu, Peter T.: *See*—
Ben-Efraim, Nadav; and Liu, Peter T., 5,592,492, Cl. 371-2.200.

Ljungdahl, Lars G.: *See*—
Xin-Liang, Li; and Ljungdahl, Lars G., 5,591,619, Cl. 435-201.000.

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Baeck, Ivo; Fernandez, Horacio H.; Llano, Horacio; and Ali, Ricardo M., 5,591,271, Cl. 134-8.000.

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Groger, Howard P.; Lo, Peter; Weiss, Martin; and Zory, Peter, 5,591,407, Cl. 422-82.050.

Lo, William; and Crayford, Ian S., to Advanced Micro Devices, Inc. System and method for efficiently monitoring information in a network having a plurality of repeaters. 5,592,486, Cl. 370-389.000.

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Lock, Peter M. Absorptive dressings. 5,591,790, Cl. 524-35.000.

Lockheed Martin Corporation: *See*—
Nelson, George F., 5,592,174, Cl. 342-357.000.

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Hsu, Ike C.; and Ambrose, Jay H., 5,590,538, Cl. 62-51.200.

Lorwe, Richard T. Flywheel tire inflation device. 5,591,281, Cl. 152-418.000.

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Shelef, Mordecai; and Logothetis, Eleftherios M., 5,592,387, Cl. 364-431.020.

Loh, Ralph A.: *See*—
Cone, Alan C.; Loh, Ralph A.; and Tenenbaum, Stuart A., 5,591,200, Cl. 606-201.000.

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Fox, Bradley A.; Glass, Jeffrey T.; Driefus, David L.; and Lojk, Luka, 5,592,053, Cl. 315-3.000.

Lokhoff, Gerardus C. P., to U.S. Philips Corporation. Multitrack record carrier having digital data reversibly stored thereon as error protected product codewords. 5,592,497, Cl. 371-37.400.

London, Wallace, to Clemco Products, Inc. Hanger support for garment bag comprising a latching device with a front plate. 5,590,765, Cl. 206-289.000.

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Segeral, Gerard; Long, Peter; and Atkinson, Ian, 5,591,922, Cl. 73-861.040.

Longacre, Andrew, Jr.; and Hussey, Rob, to Welch Allyn, Inc. Two dimensional data encoding structure and symbology for use with optical readers. 5,591,956, Cl. 235-494.000.

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Kiener, Andreas; Glöckler, Rainer; and Stucky, Gerhard, 5,591,853, Cl. 544-334.000.

Lopez, Angel F.: *See*—
Vadas, Matthew A.; Lopez, Angel F.; and Shannon, Mary F., 5,591,427, Cl. 424-85.200.

Lord, Paul J. Ratcheting pipe hanger assembly. 5,590,859, Cl. 248-62.000.

L'Oreal: *See*—
Bollens, Eric; and Mahieu, Claude, 5,591,449, Cl. 424-450.000.

Lorenz, Georg M.; Pester, Walter; Schuster, Ulrich; Leicht, Erhard; and Schäfer, Ralph, to Hoechst Aktiengesellschaft. Ski containing sheetlike plates or tapes made of a fiber reinforced material. 5,591,509, Cl. 428-107.000.

Lorenz, Gisela: *See*—
Eichen, Karl; Möller, Bernd; Sauter, Hubert; Lorenz, Gisela; Ammermann, Eberhard; Schelberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Lorenz, James M.: *See*—
Plattner, David K.; Lorenz, James M.; Brennan, Michael J., Jr.; and Carrick, Brent H., 5,590,914, Cl. 285-23.000.

Lotsof, Howard S., to NDA International, Inc. Method of treating chemical dependency using β-carboline alkaloids, derivatives and salts thereof. 5,591,738, Cl. 514-214.000.

Lotz, James A.; and Kizer, David V. Antifreeze compositions and uses. 5,591,375, Cl. 252-70.000.

Louie, Edmond; Reichert, Veronica R.; Anani, Anahs A.; and Zhang, Jinshan, to Motorola, Inc. Packaging for an electrochemical device and device using same. 5,591,540, Cl. 429-163.000.

Louise, Anne: *See*—
Thollais, Pierre; Chany, Charles; Dubois, Marie-Françoise; Pourcel, Christine; and Louise, Anne, 5,591,638, Cl. 435-320.100.

Lovell, James B., to American Cyanamid Company. Insecticidal and synergistic miticidal compositions. 5,591,765, Cl. 514-406.000.

Lowery, Sterling W. Blade feeder conveyor system. 5,590,754, Cl. 198-514.000.

LSI Logic Corporation: *See*—
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Ben-Efraim, Nadav; and Liu, Peter T., 5,592,492, Cl. 371-2.200.
Rostoker, Michael D.; Pasch, Nicholas F.; and Zelayeta, Joe, 5,591,564, Cl. 430-311.000.

LTC Americas Inc.: *See*—
McPhee, William S.; and Mudd, Stephen B., Jr., 5,591,067, Cl. 451-88.000.

Lu, Richard, to Telectronics Pacing Systems, Inc. Pacemaker with automatic blanking period function. 5,591,214, Cl. 607-9.000.

Lu, Shih-Lai, to Minnesota Mining and Manufacturing Company. Optical security articles and methods for making same. 5,591,527, Cl. 428-411.100.

Luca, Susan B.: *See*—
Seaton, Jay J.; Allen, Michael; Landis, Donald; Lee, Patrick; Linzy, David; and Luca, Susan B., 5,591,299, Cl. 156-626.100.

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Bradshaw, Benjamin J.; Holmes, Michael; and Jones, Russell W., 5,592,388, Cl. 364-431.080.
Heibel, Helmut, 5,590,937, Cl. 303-125.000.

Lucent Technologies Inc.: *See*—
Armington, Richard S.; and L'Esperance, Leroy D., 5,590,456, Cl. 29-721.000.
Ferreira, Anibal J.; and Johnston, James D., 5,592,584, Cl. 395-2.120.
Jin, Sunghar; and McCormack, Mark T., 5,591,037, Cl. 439-91.000.
Lee, Kuo-Hua; and Yu, Chen-Hua D., 5,591,674, Cl. 437-193.000.
Mobin, Mohammad S., 5,592,514, Cl. 375-336.000.

Ludwig Institute for Cancer Research: *See*—
Townsend, Alan; Bastin, Judy; Boon-Falleur, Thierry; van der Bruggen, Pierre; Coulie, Pierre; and Gajewski, Thomas, 5,591,430, Cl. 424-93.710.

Ludy, Andrew W. Lever tool handle. 5,590,575, Cl. 81-177.500.

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Hughes, Henry G.; Lue, Ping-Chang; and Robinson, Frederick J., 5,591,676, Cl. 437-195.000.

Luebbe, John P.: *See*—
Hofrichter, Brian D.; Gardlik, John M.; Sawin, Philip A.; Luebbe, John P.; and Bradbury, Barton J., 5,591,424, Cl. 424-66.000.

Lugert, Gerhard: *See*—
Schleusner, Barbara; and Lugert, Gerhard, 5,591,787, Cl. 523-164.000.

Lund, VanMetre, to Autran Corp. Transportation system including elevated guideway. 5,590,603, Cl. 104-88.040.

Lund, VanMetre, to Autran Corp. Transportation system with high speed vehicles and automatic control. 5,590,604, Cl. 104-88.040.

Lunde, Erik: *See*—
Prospero, Richard M.; Lunde, Erik; Swanson, Harry; and Adams, Lee, 5,590,814, Cl. 221-266.000.

Lunde, Mark H., to Ersler, Donald J. Collapsible garment hanger suitable for rapid one-handed engagement with garment. 5,590,823, Cl. 223-94.000.

Lundquist, Ingemar H.: *See*—
Edwards, Stuart D.; Sharkey, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James A., Jr., 5,591,125, Cl. 604-22.000.

L'Unite Hermetique: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,592,368, Cl. 363-34.000.

Luo, Lifeng: *See*—
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Luossavaara-Kiirunavaara AB: *See*—
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Luschi, Carlo: *See*—
Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, 5,592,516, Cl. 375-347.000.

Lush, Craig L. Reusable paint ball grenade, reloadable with standard .68 caliber paint balls. 5,590,886, Cl. 473-577.000.

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Ramachandran, Natarajan; Lewis, Kim R.; and Lute, Richard C., Jr., 5,590,609, Cl. 109-59.000.

Luther, Helmut: *See*—
Birbaum, Jean-Luc; Kuschig, Jürgen; Reinelt, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.

Lutz, Norman M.: *See*—
Greenway, William C.; Breithaupt, David; Schoppe, Donald W.; Lutz, Norman M.; Beardslee, Andrew W.; Nguyen, Minh N.; and Stevener, Timothy L., 5,592,237, Cl. 348-716.000.

Lydin, Hans: *See*—
Gärtner, Georg; and Lydin, Hans, 5,592,043, Cl. 313-346.0DC.

Lynch, Kevin R.: *See*—
Thorner, Michael O.; Gaylinn, Bruce D.; Zyuk, John R.; Lynch, Kevin R.; and Harrison, Jeffrey K., 5,591,641, Cl. 435-69.100.

Lynn, Daniel R.; Minshall, Billy W.; Woss, Allen R.; and Fisher, David P., to Baxter International Inc. Apparatus for filtering leukocytes from blood cells. 5,591,337, Cl. 210-489.000.

Lynx Therapeutics, Inc.: *See*—
Gryaznov, Sergei M.; Schultz, Ronald G.; and Chen, Jer-kang, 5,591,607, Cl. 435-91.100.

Lyons, Pamela A.: *See*—
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M N Engineering Kabushiki Kaisya: *See*—
Matsunaga, Masahiro; and Hamada, Hakuo, 5,590,424, Cl. 4-243.100.

Macaluso, Lawrence L.: *See*—
Meikrantz, David H.; Macaluso, Lawrence L.; Sama, H. William, III; Schardin, Charles H., Jr.; and Federici, Alfred G., 5,591,340, Cl. 210-512.300.

MacAulay, Calum; Palcic, Branko; Lam, Stephen; and Jaggi, Bruno, to Xillix Technologies Corp. Apparatus and method for imaging diseased tissue using integrated autofluorescence. 5,590,660, Cl. 128-664.000.

Maccoss, Malcolm: *See*—
Doherty, James B.; Dorn, Conrad P.; Darrette, Philippe L.; Finke, Paul E.; Maccoss, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.

MacGregor, Cline J., to Goodyear Tire & Rubber Company, The. Method and apparatus for vehicle trim panel having hidden air bag door. 5,590,901, Cl. 280-728.300.

Machida, Minamori; and Kondo, Mitsuo, to Fuji Photo Optical Co., Ltd. Joint construction for angle section of endoscopic insertion rod. 5,591,120, Cl. 600-140.000.

Mack, Hans-Dieter, to Gunter Horst Rohm. Drill with pneumatically self-clearing chuck. 5,590,985, Cl. 408-56.000.

MacKenzie, Kenneth E.: *See*—

Edmunds, Michael V.; MacKenzie, Kenneth E.; Dunn, Joseph; Smith, A. Gordon; and Kane, J. Paul, 5,592,602, Cl. 395-174.000.

Macromedia, Inc.: *See*—
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Macronix International Co., Ltd.: *See*—
Onishi, Katsunori; and Shone, Fuchia, 5,592,000, Cl. 357-315.000.

Macy, Joyce. Hair braiding method and device. 5,590,668, Cl. 132-200.000.

Maduza, Andrew G.: *See*—
Andrus, Bryan D.; Sikes, Martin; Robertson, Christopher D. G.; Armes, Roderick; Slomko, Mark J.; Maduza, Andrew G.; and Nieto, Augustine, 5,591,104, Cl. 482-7.000.

Maeda, Masaya: *See*—
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Maegawa, Shigeki; Kawamura, Tetsuya; Furuta, Mamoru; and Miyata, Yutaka, to Matsushita Electric Industrial Co., Ltd. Laser annealing method for a semiconductor thin film. 5,591,668, Cl. 437-174.000.

Maekawa, Koichiro: *See*—
Heider, Juergen; Juengst, Stefan; Maekawa, Koichiro; and Asano, Osamu, 5,592,049, Cl. 313-625.000.

Maeno, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 5,592,424, Cl. 365-201.000.

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Wagner, Ronald D.; and Klima, William L., 5,590,749, Cl. 191-12.400.

Magnuson, Erik E.; Moeller, Charles R.; Shaw, Julian D.; and Sheldon, Alan G., to Quantum Magnetics, Inc. System and method for contraband detection using nuclear quadrupole resonance including a sheet coil and RF shielding via waveguide below cutoff. 5,592,083, Cl. 324-300.000.

Mahawili, Imad. Fluid replacement apparatus for use with a portable heating and cooling system. 5,591,220, Cl. 607-104.000.

Mahieu, Claude: *See*—
Bollens, Eric; and Mahieu, Claude, 5,591,449, Cl. 424-450.000.

Mahling, Rolf, to Continental Aktiengesellschaft. Pneumatic tire for bicycles with tire padding strips. 5,591,283, Cl. 152-501.000.

Mahling, Rolf, to Continental Aktiengesellschaft. Rubber article comprising basic amino-group containing, aromatic anti-oxidants and having a non-black areal member. 5,591,513, Cl. 428-143.000.

Maho, Sandor: *See*—
Tuba, Zoltan; Vizi, E. Szilveszter; Foldes, Francis F.; and Maho, Sandor, 5,591,735, Cl. 514-172.000.

Mai, Shi-Chong. Descending device for emergent escape from a building. 5,590,740, Cl. 182-236.000.

Maiman, Thomas: *See*—
Messano, Joseph; and Maiman, Thomas, 5,590,956, Cl. 362-410.000.

Main, William E.; and Durec, Jeffrey, to Motorola, Inc. Base current supply circuit for multiple current sources. 5,592,076, Cl. 323-315.000.

Maingaud, Daniel: *See*—
Gratton, Michel; Tauvron, Fabrice; Billet, Rene; Arhab, Rabah; Ginaldi, Michel; and Maingaud, Daniel, 5,590,750, Cl. 192-3.290.

Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, to Multi-Tech Systems, Inc. Voice compression system and method. 5,592,586, Cl. 395-2.290.

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Maki, Hidetaka: *See*—
Nishimura, Yoichi; Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shusuke, 5,590,638, Cl. 125-687.000.

Makihara, Yoshiaki: *See*—
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Malassenet, Guy: *See*—
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Nye, Richard V., 5,590,647, Cl. 128-207.140.

Mallory, Tracy D.: *See*—
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Whalen, John J.; Chlebowski, Michael E.; Heldebrant, Charles M.; and Matveld, H. Edward, 5,591,573, Cl. 435-5.000.

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Mayo Foundation For Medical Education And Research: *See*—
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Mills, Dunne R.; Sambandan, Sachidanandan; and Kwong, Phillip M. L., to Intel Corporation. Pipelined read architecture for memory. 5,592,435, Cl. 365-233.500.

Mills, Sander G.: *See*—
Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoss, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.

Milltronics Ltd.: *See*—
Van Zyl, Ian D., 5,591,010, Cl. 417-12.000.

Mimms, Larry T.: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,591,440, Cl. 424-227.100.

Mimura, Tadashi: *See*—
Tamura, Shinichi; Terasaki, Seishi; Mimura, Tadashi; Kobayashi, Teruaki; and Tei, Youichi, 5,591,555, Cl. 430-78.000.

Minami, Eric R.: *See*—
White, Richard M.; Wenzel, Stuart; and Minami, Eric R., 5,591,914, Cl. 73-643.000.

Minamikaba, Gaku: *See*—
Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tawara, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamikaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.

Minato, Ryota: *See*—
Ueda, Hiroshi; Fukui, Tsugushi; Imuta, Kazuyoshi; Kimura, Hirofumi; Yasuda, Shoji; Hotani, Shin; Inoue, Kimio; Minato, Ryota; Tanaka, Yoshimitsu; and Takahashi, Katsumori, 5,590,959, Cl. 366-84.000.

Minnesota Mining and Manufacturing Company: *See*—
Coggio, William D.; Arrea, Dirk H. C.; Parker, Douglas S.; and Worm, Allan T., 5,591,804, Cl. 525-276.000.
Dektar, John L.; and Patil, Sanjay L., 5,591,400, Cl. 422-57.000.
Larson, Eric G.; Sanders, Rufus C., Jr.; Niccum, Brent D.; Pawlikowski, Walter W.; and Edblom, Elizabeth C., 5,591,239, Cl. 51-294.000.
Lu, Shih-Lai, 5,591,527, Cl. 428-411.100.
Ozman, Joel D.; Ubel, F. Andrew, III; and Kangas, Lani S., 5,591,786, Cl. 523-109.000.
Warner, Robert W.; Fitzer, Robert C.; Redmond, David B.; and Tabar, Ronald J., 5,591,530, Cl. 428-480.000.

Mino, Norihisa: *See*—
Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,591,487, Cl. 427-299.000.

Miso, Takayuki, to Sanyo Electric Co., Ltd. Battery charger having a temperature sensor and a rechargeable battery charging method. 5,592,070, Cl. 320-35.000.

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Okatani, Toru; Kawabuchi, Yoichi; Maruta, Syuzi; and Nomura, Ketichi, 5,592,650, Cl. 395-490.000.

Minolta Co., Ltd.: *See*—
Mishima, Nobuhiro, 5,592,615, Cl. 395-183.200.
Oominami, Taiichi; Sakata, Toshio; Kuroda, Masayoshi; Tamura, Tomonobu; Nakane, Masami; and Nakatsuka, Kazuhiko, 5,590,872, Cl. 271-176.000.
Ota, Mitsunobu; Yamaguchi, Wataru; and Nakajima, Isamu, 5,592,294, Cl. 356-402.000.
Sakuraba, Tamotsu; and Takemoto, Shinichi, 5,592,265, Cl. 399-285.000.

Minor, Raymond B.: *See*—
Abrams, Brad F.; Minor, Raymond B.; McGregor, Gordon L.; and Dolan, John W., 5,591,526, Cl. 428-401.000.

Minoura, Hiroshi; and Yamaguchi, Shoji, to Fujitsu Limited. Data processing apparatus capable of reading data from different-format CD-ROMS according to different processing methods of the data. 5,592,640, Cl. 395-428.000.

Minshall, Billy W.: *See*—
Lynn, Daniel R.; Minshall, Billy W.; Wons, Allen R.; and Fisher, David P., 5,591,337, Cl. 210-489.000.

Minuhin, Vadim B.; Kovner, Vladimir; and Surendran, Srinivasan, to Seagate Technology, Inc. Communication channel with adaptive analog transversal equalizer. 5,592,340, Cl. 360-46.000.

Mirabel, Jean-Michel, to SGS-Thomson Microelectronics S.A. Non-volatile programmable bistable multivibrator, programmable by the source, for memory redundancy circuit. 5,592,417, Cl. 365-185.070.

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Bennett, C. Frank; and Mirabelli, Christopher K., 5,591,623, Cl. 435-240.200.

Mirsadeghi, Seid: *See*—
Bolger, Michael B.; Gee, Kelvin W.; Lan, Nancy C.; Purdy, Robert H.; Mirsadeghi, Seid; Tahir, Syed Hasan; and Belelli, Delia, 5,591,733, Cl. 514-172.000.

Misago, Naomi; and Sudo, Kazuhisa, to Ricoh Company, Ltd. Image forming apparatus using fresh toner and used toner. 5,592,267, Cl. 399-62.000.

Misawa, Toshiyuki; and Oshima, Hiroyuki, to Seiko Epson Corporation. Active matrix assembly. 5,591,990, Cl. 257-72.000.

Misawa, Yoko: *See*—
Asaka, Toshifumi; Kashimura, Masato; Misawa, Yoko; Morimoto, Shigeo; and Hatayama, Katsuo, 5,591,837, Cl. 536-7.400.

Mishima, Nobuhiro, to Minolta Co., Ltd. Malfunctioning parts detecting device and a method of detecting malfunctioning parts. 5,592,615, Cl. 395-183.200.

Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., to Xerox Corporation. Multilayered photoreceptor with adhesive and intermediate layers. 5,591,554, Cl. 430-59.000.

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Yoneda, Tetsuya; Mitate, Takehito; Nishimura, Naoto; and Yamada, Kazuo, 5,591,547, Cl. 429-218.000.

Mitchell, Andrew; Lardear, Joseph L.; and Schonbach, Dave I., to Tremont Medical. Personal health care system. 5,590,648, Cl. 128-630.000.

Mitchell, Bruce W.: *See*—
Isfeld, Mark S.; Mitchell, Bruce W.; Seaman, Michael J.; Mallory, Tracy D.; and Arunkumar, Nagaraj, 5,592,622, Cl. 395-200.020.

Mitchell, Danny J.: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

Mitchell, Donald J., to Eagle Manufacturing Company. Salvage drum with protected clamping. 5,590,802, Cl. 220-321.000.

Mitchell, Frank L.: *See*—
Iorio, Ralph A.; Davie, Robert M.; McDaniel, James D.; Mitchell, Frank L.; and Nie, Tao, 5,590,691, Cl. 138-146.000.

Mitsuno, Mamoru; Hirotsuru, Hideki; and Kim, Youngwook, to National Institute for Research in Inorganic Materials. Superplastic silicon carbide sintered body. 5,591,685, Cl. 501-88.000.

Mitsubishi Cable Industries, Ltd.: *See*—
Sakai, Hirokazu; Shimizu, Takayuki; Asano, Ryuzo; Miyahara, Naotoshi; Furukawa, Kiyoshi; Nagai, Masaaki; Honjo, Hironasa; and Kamibayashi, Hiroyuki, 5,591,522, Cl. 428-353.000.

Mitsubishi Chemical Corporation: *See*—
Hatano, Masakatsu; Murayama, Masayoshi; Shima, Kenji; and Ito, Masumi, 5,591,870, Cl. 549-259.000.
Hattori, Masafumi; Ikeda, Chikako; Sugimoto, Satoru; Saito, Tatsuoki; Yamada, Hitoshi; and Akashige, Etsushi, 5,591,792, Cl. 524-271.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujimoto, Shinya; and Ohuchi, Hirofumi, 5,591,905, Cl. 73-118.100.
Hidaka, Hideto, 5,592,009, Cl. 257-351.000.
Honda, Hiroki, 5,592,013, Cl. 257-392.000.
Hongo, Katsunobu; and Oki, Tatsuya, 5,592,652, Cl. 395-497.010.
Ikeda, Akira; Nakatsugawa, Naoki; Yoshimura, Yumiko; Tanimura, Yasuhiro; and Ezaki, Kenji, 5,591,349, Cl. 210-760.000.
Itabashi, Yasuhiro; Miyashita, Kazuhito; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroaki; Masujima, Toshio; Matsunaga, Makoto; Katagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.
Iwamoto, Hisashi; Konishi, Yasuhiro; Douka, Katsumi; and Murai, Yasumitsu, 5,592,434, Cl. 365-233.000.
Katayama, Kazuyori; and Naito, Yasuo, 5,592,385, Cl. 364-426.041.
Kimura, Tomohiro; Kino, Shigenori; Yoshida, Masayuki; and Ono, Fumitaka, 5,592,163, Cl. 341-107.000.
Kishimura, Shinji, 5,591,654, Cl. 437-26.000.
Maeno, Hideshi, 5,592,424, Cl. 365-201.000.
Matsuo, Masahito, 5,592,637, Cl. 395-584.000.
Noguchi, Kenji, 5,592,110, Cl. 327-12.000.
Notani, Hiromi; and Kondoh, Harufusa, 5,592,109, Cl. 327-3.000.
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kosoh, Satoru, 5,590,672, Cl. 134-201.000.
Saito, Hideo; and Itoh, Noboru, 5,592,336, Cl. 359-871.000.
Suzuki, Hiroyoshi; Okada, Akira; and Morounga, Takahiro, 5,592,098, Cl. 324-663.000.
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Tokatsi, Kenji, 5,592,423, Cl. 365-221.000.
Ueda, Tetsuya; Ono, Kisamitsu; Shimomura, Kou; and Ichiyama, Hideyuki, 5,592,019, Cl. 257-666.000.

Mitsubishi Denki Kabushiki Kaishi: *See*—
Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,592,526, Cl. 378-132.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tsuji, Takeshi, 5,590,571, Cl. 74-606.00R.

Mitsubishi Materials Corporation: *See*—
Ogata, Yasuyuki; Hayashi, Yoshimasa; and Kojima, Yasushi, 5,592,134, Cl. 333-185.000.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Nakamura, Yasunori; and Kato, Shunji, 5,592,169, Cl. 341-173.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Nomura, Takao; Nishio, Takeyoshi; Hashimoto, Mikio; and Moriya, Satoru, 5,591,795, Cl. 524-451.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Asanuma, Tadashi; Sasaki, Taeyo; Ito, Mitsuru; and Shiounura, Tetsusosuke, 5,591,817, Cl. 526-351.000.
Ichiki, Hiroshi; Taneda, Ryoichi; Itoh, Hiroyuki; and Kono, Yoshitsugu, 5,591,886, Cl. 560-41.000.

Mitsuishi Denki Kabushiki Kaisha: *See*—
Yoshimoto, Kyosuke; Rao, M. C.; Ohata, Hiroyuki; Nakane, Kazuhiko; Furukawa, Teruo; Kondo, Jinichi; and Ototake, Masafumi, 5,592,452, Cl. 369-58.000.

Mitsutake, Hideaki: *See*—
Kimura, Kazumi; Mitsutake, Hideaki; and Kawasaki, Shigeru, 5,590,942, Cl. 353-34.000.

Miura, Masaki: *See*—
Shojima, Hiroshi; Kuzunaki, Soshiro; Fukunaga, Yasushi; Matsuda, Toshihiko; Takekoshi, Toshio; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 5,592,565, Cl. 382-185.000.

Miura, Shoji: *See*—
Iida, Makio; Shibata, Tadashi; Sugisaka, Takayuki; Miura, Shoji; and Sakakibara, Toshio, 5,592,015, Cl. 257-524.000.

Miwa, Kiyoshi: *See*—
Tsuchiya, Makoto; Moriya, Mika; and Miwa, Kiyoshi, 5,591,577, Cl. 435-6.000.

Miyachi Technos Corporation: *See*—
Ishikawa, Sakae, 5,591,355, Cl. 219-110.000.

Miyafuji, Kazunobu; Tanaka, Shigeo; and Morita, Ryoji, to Henkel Corporation. Composition and process for surface treating metal prior to cold working. 5,591,275, Cl. 148-246.000.

Miyagishima, Masao: *See*—
Watanabe, Hiroshi; Miyagishima, Masao; and Fuyuki, Toshimitsu, 5,592,206, Cl. 347-122.000.

Miyahara, Naotoshi: *See*—
Sakai, Hirokazu; Shimizu, Takayuki; Asano, Ryuzo; Miyahara, Naotoshi; Furukawa, Kiyoshi; Nagai, Masaaki; Honjo, Hironasa; and Kamibayashi, Hiroyuki, 5,591,522, Cl. 428-353.000.

Miyake, Kazutoshi: *See*—
Asai, Tomohito; Ieono, Toru; and Miyake, Kazutoshi, 5,591,093, Cl. 474-94.000.

Miyake, Norifumi: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Sbokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.

Miyake, Toshio: *See*—
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,611, Cl. 435-100.000.
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,612, Cl. 435-100.000.

Miyamoto, Hidenori: *See*—
Nakamura, Toshiyuki; Soshi, Isao; Miyamoto, Hidenori; and Wakabayashi, Hiroshi, 5,592,249, Cl. 396-315.000.
Omi, Junichi; Miyamoto, Hidenori; and Katou, Minoru, 5,592,335, Cl. 359-695.000.
Sago, Hiroyoshi; Kobari, Hideya; Ueda, Koji; Miyamoto, Hidenori; and Takatsuki, Ryuzo, 5,591,262, Cl. 118-52.000.
Wakabayashi, Hiroshi; and Miyamoto, Hidenori, 5,592,255, Cl. 396-89.000.

Miyamoto, Hisashi: *See*—
Ueda, Hiraki; Miyamoto, Hisashi; Yamashita, Hiroshi; and Tone, Hitoshi, 5,591,744, Cl. 514-252.000.

Miyamoto, Junichi: *See*—
Momodomi, Masaki; Miyamoto, Junichi; and Watanabe, Toshiharu, 5,591,999, Cl. 257-315.000.

Miyamoto, Katsuhiro: *See*—
Tsuboyama, Akira; Miyamoto, Katsuhiro; Mizutome, Atsushi; Kanno, Hideo; Inoue, Hiroshi; and Katakura, Kazunori, 5,592,191, Cl. 345-97.000.

Miyamoto, Shigeyuki, to NBC Corporation. Apparatus for arranging cells in culture medium. 5,591,627, Cl. 435-240.230.

Miyao, Tetsuya; Iwamoto, Shozo; Matsushima, Kozo; Kawakami, Koji; and Inoue, Masaki, to Fuji Electric Co., Ltd. Product-delivery device for automatic vending machines. 5,590,812, Cl. 221-112.000.

Miyasaka, Mitsutoshi; and Little, Thomas W., to Seiko Epson Corporation. Semiconductor device having first and second gate insulating films. 5,591,989, Cl. 257-66.000.

Miyashiro, Julie M.: *See*—
Djuric, Stevan W.; Haack, Richard A.; and Miyashiro, Julie M., 5,591,756, Cl. 514-350.000.

Miyashita, Akira; and Ashizawa, Takaaki, to Canon Kabushiki Kaisha. Information reproducing apparatus and method. 5,592,456, Cl. 369-59.000.

Miyashita, Hiroaki: *See*—
Itabashi, Yasuhiro; Miyashita, Kazuhito; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroaki; Masujima, Toshio; Matsunaga, Makoto; Katagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.

Miyashita, Kazuhito: *See*—
Itabashi, Yasuhiro; Miyashita, Kazuhito; Chatani, Yoshiyuki; Furuno, Takayoshi; Miyashita, Hiroaki; Masujima, Toshio; Matsunaga, Makoto; Katagi, Takashi; Aoki, Hiroyuki; and Haruyama, Tetsuo, 5,592,185, Cl. 343-794.000.

Miyashita, Kohichi; Demachi, Atsushi; Sato, Kenji; Noguchi, Minoru; and Oki, Naohiko, to Honda Giken Kogyo Kabushiki Kaisha. Carbon material and method for producing same. 5,591,545, Cl. 429-218.000.

Miyata, Hirokatsu: *See*—
Okada, Shinjiro; Kaneko, Shuzo; Inaba, Yutaka; Shinjo, Kazuhiko; Miyata, Hirokatsu; and Katakura, Kazunori, 5,592,190, Cl. 345-89.000.

Miyata, Kaori: *See*—
Igarashi, Masaaki; Senba, Hiroyuki; and Miyata, Kaori, 5,591,391, Cl. 420-38.000.

Miyata, Yutaka: *See*—
Maegawa, Shigeki; Kawamura, Tetsuya; Furuta, Mamoru; and Miyata, Yutaka, 5,591,668, Cl. 437-174.000.

Miyazawa, Azuma; and Ishimaru, Toshiaki, to Olympus Optical Co., Ltd. Microcomputer having a program correction function. 5,592,613, Cl. 395-182.040.

Miyazawa, Toshio: *See*—
Katsuumi, Kazushige; Miyazawa, Toshio; and Tsukamoto, Toshihiro, 5,590,451, Cl. 29-25.350.

Mizuno, Masayuki, to NEC Corporation. Voltage-controlled oscillator with reduced phase difference. 5,592,127, Cl. 331-57.000.

Mizuno, Sadao; Hoshino, Akinori; Muraoka, Akira; and Takahashi, Hiroyuki, to Aisin Seiki Kabushiki Kaisha; and Nachi-Fujikoshi Corp. Method of dressing honing wheels. 5,591,065, Cl. 451-47.000.

Mizuno, Yoichi: *See*—
Fukumoto, Takahiro; Nakada, Yoko; and Mizuno, Yoichi, 5,591,794, Cl. 524-447.000.

Mizuta, Shuichi: *See*—
Obuchi, Masanobu; and Mizuta, Shuichi, 5,590,459, Cl. 29-809.000.

Mizutani, Hidemasa: *See*—
Takeda, Shinichi; Mizutani, Hidemasa; Kaifu, Noriyuki; and Kobayashi, Isao, 5,591,963, Cl. 250-214.100.

Mizutani, Junya: *See*—
Hasegawa, Koji; Kakuta, Hideo; and Mizutani, Junya, 5,591,697, Cl. 504-292.000.

Mizutome, Atsushi: *See*—
Tsuboyama, Akira; Miyamoto, Katsuhiro; Mizutome, Atsushi; Kanno, Hideo; Inoue, Hiroshi; and Katakura, Kazunori, 5,592,191, Cl. 345-97.000.

Moake, Gordon L., to Halliburton Company. Method and apparatus for determining neutron detector operability using gamma ray sources. 5,591,967, Cl. 250-252.100.

Mobil Oil Corporation: *See*—
Buchanan, John S.; Mathias, Mark F.; Sodomin, Joseph F., III; and Teitman, Gerald J., 5,591,417, Cl. 423-210.000.
Migliorini, Robert A.; and Mount, Eldridge M., III, 5,591,320, Cl. 428-347.000.
Shih, Stuart S., 5,591,326, Cl. 208-251.000.

Mobin, Mohammad S., to Lucent Technologies Inc. Method of performing signal reconstruction at the receiving end of a communications system, such as for GSM. 5,592,514, Cl. 375-336.000.

Mochizuki, Seiji; Kawakami, Kuzuhisa; Nakamura, Masahiro; Otsuhima, Keiichi; and Yoshida, Masanori, to Seiko Epson Corporation. Ink-jet recording apparatus and ink tank cartridge thereof. 5,590,510, Cl. 53-434.000.

Mochizuki, Shin-ichiro: *See*—
Kurabayashi, Hiroaki; and Mochizuki, Shin-ichiro, 5,592,673, Cl. 395-726.000.

Mochizuki, Shoichi: *See*—
Doi, Etsuro; Atoh, Kiyoshi; Mochizuki, Shoichi; and Koiso, Masakazu, 5,591,036, Cl. 439-79.000.

Mochizuki, Tetsuya: *See*—
Ohashi, Tatsuyuki; and Mochizuki, Tetsuya, 5,591,103, Cl. 477-131.000.

Modern Controls, Inc.: *See*—
Mayer, William N., 5,591,898, Cl. 73-38.000.

Modern Technologies Corp.: *See*—
Abrams, Fredric L.; and Freund, Robert F., 5,591,384, Cl. 264-40.500.

Mody, Tarak D.: *See*—
Hemmi, Gregory W.; Sessler, Jonathan L.; and Mody, Tarak D., 5,591,422, Cl. 424-9.362.

Moehrmann, Karl-Heinz, to Siemens Aktiengesellschaft. Method for data security in a digital telecommunication system. 5,592,554, Cl. 380-48.000.

Moeller, Charles R.: *See*—
Magnuson, Erik E.; Moeller, Charles R.; Shaw, Julian D.; and Sheldon, Alan G., 5,592,083, Cl. 324-300.000.

Moen, Arthur J. Method of providing message service for limited access telecommunications. 5,592,537, Cl. 379-67.000.

Moffre, Mark C.; and LaPointe, Alyssa B. Urinal cover. 5,590,426, Cl. 4-301.000.

Mofidi, Mehrdad: *See*—
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay. 5,592,420, Cl. 365-185.180.

Mogensen, Mogens: *See*—
Bagger, Carsten; Kindl, Bruno; and Mogensen, Mogens. 5,591,537, Cl. 429-33.000.

Mohme, Heinrich, to TSK Prüfsysteme GmbH. Locking system for securing a cable terminal in a plug case. 5,590,458, Cl. 29-748.000.

Mohr, Judy M.; Baker, Richard W.; and Nakaji, Lisa A., to Pharmetrix Corporation. Liquid reservoir transdermal patch for the administration of ketorolac. 5,591,767, Cl. 514-413.000.

Mokros, James A. Roofing cant strip. 5,590,498, Cl. 52-287.100.

Mold-Masters Limited: *See*—
Babin, Denis L., 5,591,465, Cl. 425-549.000.

Molecular Dynamics: *See*—
Norris, Michael C., 5,592,289, Cl. 356-244.000.

Molex Incorporated: *See*—
Cecil, Paul D., Jr.; and Marceau, Scott P., 5,591,041, Cl. 439-352.000.
Ingwersen, Peter; Kurek, Lawrence M.; and Heisner, Douglas L., 5,590,576, Cl. 83-147.000.
Sasaoka, Satoshi, 5,591,050, Cl. 439-607.000.

Molin, Göran: *See*—
Bengmark, Stig; Ahrad, Siv; Molin, Göran; and Jeppsson, Bengt, 5,591,428, Cl. 424-93.450.

Molis, Steven E.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Brasen, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,591,285, Cl. 156-62.200.

Moll, Holger: *See*—
Ernst, Holger; and Moll, Holger, 5,592,132, Cl. 332-117.000.

Moller, Kurt H.: *See*—
Freeman, Gary M.; Carter, Richard D.; Broome, Thad T.; and Moller, Kurt H., 5,591,256, Cl. 106-483.000.

Mombo-Caristan, Jean C., to Twentyfirst Century Corporation, The. Method of butt welding. 5,591,360, Cl. 219-121.640.

Momentum, Inc.: *See*—
Kosowsky, Richard P.; Santullo, Michael P.; and Kosowsky, Michael R., 5,592,538, Cl. 379-93.000.

Momodomi, Masaki; Miyamoto, Junichi; and Watanabe, Toshiharu, to Kabushiki Kaisha Toshiba. Electrically erasable programmable read only memory device with an improved memory cell pattern layout. 5,591,999, Cl. 257-315.000.

Momose, Yu: *See*—
Sohda, Takashi; Ikeda, Hitoshi; and Momose, Yu, 5,591,862, Cl. 548-235.000.

Monegal, Manuel R.: *See*—
Montaner, Pedro P.; Monegal, Manuel R.; Harriman, Ron E.; and Lasserre, P., 5,590,815, Cl. 222-82.000.

Monje, Virginia D.: *See*—
Olivera, Baldomero M.; Hillyard, David R.; Imperial, Julita S.; and Monje, Virginia D., 5,591,821, Cl. 530-324.000.

Monk, Ronald W.; VanCleve, David P.; and Curry, Robert J., to Hughes Electronics. Missile simulator apparatus. 5,591,031, Cl. 434-14.000.

Monma, Yoshio: *See*—
Sato, Tsutomu; Hirano, Masakazu; Yanashima, Tsukasa; Yamaguchi, Hiroyuki; and Monma, Yoshio, 5,592,278, Cl. 399-384.000.

Monn, James A., to Eli Lilly and Company. Synthesis of kainic acid. 5,591,867, Cl. 548-532.000.

Monolith Technologies Corporation: *See*—
Trager, David S.; Ali, Akhtar; Highton, Frederick J.; and Lin, Kun, 5,592,403, Cl. 364-724.010.

Monolithic System Technology, Inc.: *See*—
Leung, Wing Y.; and Hsu, Fu-Chieh, 5,592,632, Cl. 395-306.000.

Monque, Reinaldo; Garcia, Wolfgang; Galiasso, Roberto; and Perez, Jose A., to Intevep, S.A. Hydroprocessing scheme for production of premium isomerized light gasoline. 5,591,324, Cl. 208-216.00R.

Monroe, Allan L.: *See*—
Kemper, Timothy G.; Monroe, Allan L.; and Ritter, Tony L., 5,591,416, Cl. 422-268.000.

Montaner, Pedro P.; Monegal, Manuel R.; Harriman, Ron E.; and Lasserre, P., to Monturas S.A. Miniature pump sprayer. 5,590,815, Cl. 222-82.000.

Monte, Paul A.: *See*—
Wiedeman, Robert A.; Monte, Paul A.; Carter, Stephen S.; and Ames, William, 5,592,481, Cl. 370-316.000.

Monteil North America Inc.: *See*—
Scheve, B. Joseph; Mayfield, John W.; and DeNicola, Anthony J., Jr., 5,591,785, Cl. 522-157.000.

Montgomery, John A.; and Secrist, John A., III, to Southern Research Institute. 2'-deoxy-4'-thioribonucleosides and their antiviral activity. 5,591,722, Cl. 514-45.000.

Montgomery, Terry G.: *See*—
Jaco, Pamela J.; Anderson, Mark A.; Simmons, Michael G.; and Montgomery, Terry G., 5,591,516, Cl. 428-253.000.

Montreuil, Leo, to Scientific-Atlanta, Inc. Synchronous modulator and methods for synchronous modulation. 5,592,513, Cl. 375-296.000.

Monturas S.A.: *See*—
Montaner, Pedro P.; Monegal, Manuel R.; Harriman, Ron E.; and Lasserre, P., 5,590,815, Cl. 222-82.000.

Moody, David J.: *See*—
Hines, John B.; Moody, David J.; and Kluger, Edward W., 5,591,833, Cl. 534-607.000.

Mooney, Aurelius A., deceased; Mooney, by Virginia R., personal representative; Schmitter, Edward P.; and Baker, Richard. Universal mount for rifle. 5,590,484, Cl. 42-100.000.

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Moore, Austin W.: *See*—
Moore, Dan T., III; Moore, Austin W.; and Wheeler, Maurice E., 5,590,524, Cl. 60-323.000.

Moore, Carter. Christmas tree transport and storage satchel. 5,590,775, Cl. 206-423.000.

Moore, Dan T., III; Moore, Austin W.; and Wheeler, Maurice E., to Soundwich, Inc. Damped heat shield. 5,590,524, Cl. 60-323.000.

Moore, J. Paul; and Kerns, David V., Jr. Apparatus for enhancing visual perception of selected objects in recreational and sporting activities. 5,592,245, Cl. 351-163.000.

Moore, Larry, to Tac Star Industries, Inc. Externally mountable laser sight for weapons and other applications. 5,590,486, Cl. 42-103.000.

Moore, Lewis J. Anti-counterfeiting system. 5,592,561, Cl. 382-103.000.

Moore, Megan R.: *See*—
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.

Moore, Richard G. Circular or generally circular prestressed concrete tank and method of constructing same. 5,590,497, Cl. 52-223.300.

Moormann, Alan E.: *See*—
Becker, Daniel P.; Flynn, Daniel L.; Moormann, Alan E.; Nosal, Roger; and Villamil, Clara I., 5,591,749, Cl. 514-300.000.

Morales, Alvaro; and Alkemade, Stanley J., to Bioniche Inc. Method for treating the urinary bladder and associated structures using hyaluronic acid. 5,591,724, Cl. 514-54.000.

Morales, Nicholas S. Safe-distance warning system for EMF generators. 5,592,148, Cl. 340-540.000.

Moran, Thomas P.: *See*—
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,607, Cl. 395-358.000.
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,608, Cl. 395-358.000.

Morehouse, James H.; Alt, Robert A.; Dunckley, James A.; Furay, David M.; Emo, Bruce D.; and Volk, Steven B., to Integral Peripherals, Inc. Microminiature disk drive with clasp having fingers for radially positioning a pair of disks and a spindle motor providing a reduced disk drive height. 5,592,349, Cl. 360-98.080.

Moreno, Ricardo P., to Metagal Industria E Comercio Ltda. Courtesy light fixture of rearview mirror. 5,590,948, Cl. 362-83.100.

Morgan, Carlton B., to Heartstream, Inc. Defibrillator system condition indicator. 5,591,213, Cl. 607-5.000.

Morgan, Constance H.: *See*—
Fleischhauer, Grier S.; Hayes, Patrick H.; Morgan, Constance H.; Hajaligol, Mohammad R.; Watkins, Michael L.; Nichols, Walter A.; Sharpe, David E.; and Counts, Mary E., 5,591,368, Cl. 219-535.000.

Morgan Construction Company: *See*—
Shore, Terence M.; and Woodrow, Harold E., 5,590,848, Cl. 242-361.000.

Morgan, Steven V.; Vanderstraeten, Johan; Vanderstraeten, Erwin; and Gobin, Guy. Apparatus for affixing a rotating cylindrical magnetron target to a spindle. 5,591,314, Cl. 204-298.220.

Morgan, Ted A.: *See*—
Pews, R. Garth; Morgan, Ted A.; and Kar, Kishore K., 5,591,503, Cl. 428-65.400.

Mori, Junko: *See*—
Shojima, Hiroshi; Kuzunuki, Soshiro; Fukunaga, Yasushi; Matsuda, Toshihiko; Takekoshi, Toshio; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 5,592,565, Cl. 382-185.000.

Mori, Kazuhiro: *See*—
Shimizu, Toshifumi; Iwanami, Yumiko; and Mori, Kazuhiro, 5,592,097, Cl. 324-546.000.

Mori, Kazunori; and Sasamoto, Tatsuro, to Fujitsu Limited. Apparatus for measuring offset of head from servo pattern of data surface and disk medium having recorded servo pattern for measurement of offset. 5,592,347, Cl. 360-77.040.

Morich, Michael A.: *See*—
Richard, Mark A.; Zou, Xueming; and Morich, Michael A., 5,592,087, Cl. 324-318.000.

Morikawa, Shigenori; and Matsuoka, Takeshi, to Casio Computer Co., Ltd. Apparatus for reading mesh pattern image data having bars along upper and lower sides of mesh pattern and a boundary line between horizontally adjacent dark and light area of mesh pattern. 5,591,957, Cl. 235-494.000.

Morikawa, Tsuyoshi: *See*—
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.

Morimoto, Shigeo: *See*—
Asaka, Toshifumi; Kashimura, Masato; Misawa, Yoko; Morimoto, Shigeo; and Hatayama, Katsuo, 5,591,837, Cl. 536-7.400.

Morino, Shigeru: *See*—
Hara, Kei; and Morino, Shigeru, 5,592,210, Cl. 347-237.000.

Morishita, Isuya, to Funai Electric Co., Ltd. Bread maker. 5,590,585, Cl. 99-327.000.

Morita, Fumio: *See*—
Uehara, Mitsuyoshi; Yoshihara, Hideo; Suzuki, Tsutomu; Morita, Fumio; and Igarashi, Hiroshi, 5,592,268, Cl. 399-276.000.

Morita, Hideyo, to Sanyo Electric Co., Ltd. Battery charging apparatus, power supply, and attachment for connecting different types of battery packs to a battery charger. 5,592,064, Cl. 320-2.000.

Morita, Ryoji: *See*—
Miyafuji, Kazutomo; Tanaka, Shigeo; and Morita, Ryoji, 5,591,275, Cl. 148-246.000.

Moriya, Mika: *See*—
Tsuchiya, Makoto; Moriya, Mika; and Miwa, Kiyoshi, 5,591,577, Cl. 435-6.000.

Moriya, Satoru: *See*—
Nomura, Takao; Nishio, Takeyoshi; Hashimoto, Mikio; and Moriya, Satoru, 5,591,795, Cl. 524-451.000.

Morizot, Gérard: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,592,368, Cl. 363-34.000.

Morlaes, Isabelle: *See*—
Jacq, Patrick; Masse, Jean C.; and Morlaes, Isabelle, 5,592,027, Cl. 264-0.500.

Moronaga, Takahiro: *See*—
Suzuki, Hiroyoshi; Okada, Akira; and Moronaga, Takahiro, 5,592,098, Cl. 324-663.000.

Morris, Bruce E.; and Avery, Fred L., to Big Inch Marine Systems. Pipeline connector for connecting a branch pipe to a carrier pipe. 5,590,913, Cl. 285-18.000.

Morris, John M.; and Thompson, Andrew F., to GT Development Corporation. Vehicle pneumatic seat rollover safety vent valve. 5,590,736, Cl. 180-282.000.

Morrison, Matthew M.: *See*—
Bernhardt, Andrew; and Morrison, Matthew M., 5,591,166, Cl. 606-61.000.

Morrison, Robert, to Milliken Packaging Corporation. Automatic cutter adjustment. 5,590,511, Cl. 53-552.000.

Mortimer, William P., Jr.: *See*—
Azuma, Joseph G.; Korleski, Joseph E.; Mortimer, William P., Jr.; and Yokimcus, Victor P., 5,591,034, Cl. 439-91.000.

Morton International, Inc.: *See*—
Duran, John A.; Vargas, Javier; and Ricks, Merle K., 5,590,900, Cl. 280-728.200.

Motodane, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Ignition coil device. 5,590,637, Cl. 123-634.000.

Motoman, Inc.: *See*—
Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., 5,591,361, Cl. 219-121.820.

Motorola: *See*—
Shiralagi, Kumar; Tsai, Raymond K.; and Goronkin, Herbert, 5,591,666, Cl. 437-103.000.

Motorola Energy Systems, Inc.: *See*—
Li, Changming; Liau, Ke K.; and Wu, Han, 5,591,318, Cl. 205-210.000.

Motorola, Inc.: *See*—
Cheng, Yan M.; and Chang, Lu, 5,592,531, Cl. 379-57.000.
Circello, Joseph C.; and Schimke, David J., 5,592,634, Cl. 395-586.000.
Clark, Minh-Hien N.; and Sloan, James W., 5,592,025, Cl. 257-774.000.
Crouch, Alfred L.; Pressly, Matthew D.; Circello, Joseph C.; and Duerden, Richard, 5,592,493, Cl. 371-22.300.
Hughes, Henry G.; Lue, Ping-Chang; and Robinson, Frederick J., 5,591,676, Cl. 437-195.000.
Liu, Jyh-Han; and Wang, Zhonghe, 5,592,154, Cl. 340-825.500.
Louie, Edmond; Reichert, Veronica R.; Anani, Anaba A.; and Zhang, Jinshan, 5,591,540, Cl. 429-163.000.
Main, William E.; and Durec, Jeffrey, 5,592,076, Cl. 323-315.000.
Mao, Zhenhua, 5,591,548, Cl. 429-218.000.
Meadows, Vernon, 5,592,095, Cl. 324-436.000.
Ogleshee, John W.; Bohne, William C.; and McGinnis, Robert W., 5,592,065, Cl. 320-2.000.
Suppelsa, Anthony B.; and Dorinski, Dale W., 5,591,364, Cl. 219-201.000.
Tai, Jy-Der D., 5,592,411, Cl. 365-145.000.
Tayloe, Daniel R., 5,592,175, Cl. 342-357.000.
Weisman, Douglas H.; Swirbel, Thomas J.; and Arledge, John K., 5,591,480, Cl. 216-13.000.

Moufarrège, Richard. Method and device for closing wounds. 5,591,206, Cl. 606-215.000.

Mouko, Minoru: *See*—
Saitou, Yuuji; Mouko, Minoru; Yoshida, Suguru; and Sugawara, Kohki, 5,591,359, Cl. 219-121.640.

Mount, Eldridge M., III: *See*—
Migliorini, Robert A.; and Mount, Eldridge M., III, 5,591,520, Cl. 428-347.000.

Mourtidis, Dimitrios: *See*—
Seidel, Andreas; Peters, Dieter; Weferling, Norbert; and Mourtidis, Dimitrios, 5,591,888, Cl. 560-226.000.

MTS Systems Corporation: *See*—
Meyer, Richard A., 5,591,944, Cl. 177-229.000.

Mudd, Stephen B., Jr.: *See*—
McPhee, William S.; and Mudd, Stephen B., Jr., 5,591,067, Cl. 451-88.000.

Muehlemann, Michael M.: *See*—
Noble, J. Donald; and Muehlemann, Michael M., 5,591,972, Cl. 250-330.000.

Mueller, Thomas: *See*—
Himmelsbach, Frank; Austel, Volkhard; Pieper, Helmut; Eisert, Wolfgang; Mueller, Thomas; Weisenberger, Johannes; Linz, Guenter; and Krueger, Gerd, 5,591,769, Cl. 514-423.000.

Muha, Krunoslav; Hubac, Steven P.; and Haraksal, Mark E., to Air Products and Chemicals, Inc. Low odor amine catalysts for polyurethane flexible slabstock foams based on polyester polyols. 5,591,780, Cl. 521-128.000.

Mühlhauser, Ernst. Delivery syringe for dental compound. 5,591,027, Cl. 433-90.000.

Mui, Mark S.: *See*—
Buczay, Frank A.; Mui, Mark S.; and Varney, Doug W., 5,592,466, Cl. 370-217.000.

Mukoyama, Yoshiyuki: *See*—
Suzuki, Kenji; Mukoyama, Yoshiyuki; and Ito, Toshihiko, 5,591,813, Cl. 525-528.000.

Mulhauser, Paul J.: *See*—
Phillips, Matthew L.; Heinzelman, Bert D.; Mulhauser, Paul J.; Schiff, David R.; Brooks, Christopher; and Remiszewski, Stanley H., 5,590,696, Cl. 141-47.000.

Müller, Bernd: *See*—
Eicken, Karl; Müller, Bernd; Sauter, Hubert; Lovesz, Gisela; Ammermann, Eberhard; Scheiberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Muller, Joachim; and Braun, Rolf, to MAN Roland Druckmaschinen AG. Method for regulating ink distribution in a printing machine. 5,590,599, Cl. 101-483.000.

Muller, Karl P.: *See*—
Kleinhenz, Richard; Muller, Karl P.; Roidner, Klaus; and Tuschiaki, Masakatsu, 5,592,412, Cl. 365-149.000.

Mullins, Edward; Burt, Rodney T.; Meisel, Walter B.; and Seitz, R. Mark, II, to Burr-Brown Corporation. Integrated photodiode/transimpedance amplifier. 5,592,124, Cl. 330-308.000.

Multi-Tech Systems, Inc.: *See*—
Maitra, Siddhartha; Thanawala, Ashish; and Young, Steve, 5,592,586, Cl. 395-2.290.

Mulvey, James P.: *See*—
Camp, James C.; and Mulvey, James P., 5,592,517, Cl. 375-350.000.

Mulvihill, Ralph. Flexible router height-adjustment mechanism. 5,590,989, Cl. 409-182.000.

Munakata, Atsushi: *See*—
Tanaka, Kiyotsune; Uchida, Takashi; Hiramatsu, Akira; Takahashi, Haruhiko; and Munakata, Atsushi, 5,592,262, Cl. 399-1.000.

Munakata, Hiroshi: *See*—
Price, Suzanne F.; Munakata, Hiroshi; Raxon, Eli; Perlberg, Gil; and Fokis, Igor, 5,591,920, Cl. 73-828.000.

Munroe, Scott C.: *See*—
Haigh, Geoffrey T.; and Munroe, Scott C., 5,591,996, Cl. 257-238.000.

Münzer, Adolf: *See*—
Holdermann, Konstantin; Münzer, Adolf; and Schmidt, Hans-Josef, 5,591,565, Cl. 430-314.000.

Murai, Mikio: *See*—
Takahashi, Kiyoshi; Murai, Mikio; Odagiri, Masaru; and Ueda, Hideyuki, 5,591,481, Cl. 427-131.000.

Murai, Suzuyo, to Brother Kogyo Kabushiki Kaisha. Facsimile machine with erroneous mode setting prevention function. 5,592,307, Cl. 358-468.000.

Murai, Yasunitsu: *See*—
Iwamoto, Hisashi; Konishi, Yasuhiro; Douska, Katsumi; and Murai, Yasunitsu, 5,592,434, Cl. 365-233.000.

Murakami, Shigenori: *See*—
Muramatsu, Eiji; Inoue, Akiyoshi; Taniguchi, Shoji; Takahashi, Hiroyuki; Murakami, Shigenori; and Takishita, Toshihiko, 5,592,463, Cl. 369-275.200.

Murakami, Tomomi: *See*—
Nishikawa, Junichi; Murakami, Tomomi; and Uehara, Nobuyuki, 5,592,442, Cl. 368-11.000.

Muramatsu, Eiji; Inoue, Akiyoshi; Taniguchi, Shoji; Takahashi, Hiroyuki; Murakami, Shigenori; and Takishita, Toshihiko, to Pioneer Electronic Corporation. Apparatus for and method for determining optimum power for recording information on recordable optical disc. 5,592,463, Cl. 369-275.200.

Muramatsu, Masaru, to Nikon Corporation. Photometry device for a camera. 5,592,256, Cl. 396-225.000.

Muramatsu, Sachiko: *See*—
Ohtake, Yasuhisa; Sago, Seiji; Yamazaki, Mitsuaki; and Muramatsu, Sachiko, 5,592,044, Cl. 313-403.000.

Muramatsu, Taroh: *See*—
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sagiyama, Nobuo; and Koseki, Shinya, 5,591,927, Cl. 84-171.000.

Muramoto, Jun: *See*—
Nishimura, Kiyoshi; Hayashi, Hideki; Muramoto, Jun; Pachikami, Takashi; and Uenoyama, Hiromi, 5,592,409, Cl. 365-145.000.

Muranaka, Koichi, to Three Bond Co., Ltd. Curing of fiber-reinforced composite structures. 5,591,784, Cl. 522-74.000.

Muraoka, Akira: *See*—
Mizuno, Sadao; Hoshino, Akinori; Muraoka, Akira; and Takahashi, Hiroyuki, 5,591,065, Cl. 451-47.000.

Murata, Kenji: *See*—
Hirano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,591,535, Cl. 428-694.0RE.

Murata Kikai Kabushiki Kaisha: *See*—
Hatakeyama, Yasunori; and Ueda, Kenichi, 5,590,844, Cl. 242-18.0EW.
Nakagawa, Takashi; and Todo, Yuji, 5,590,845, Cl. 242-35.60E.

Murata Manufacturing Co., Ltd.: *See*—
Dohnishi, Kiyoyuki, 5,591,049, Cl. 439-595.000.

Murata, Yamamoto; Ikeuchi, Michio; Yoshikawa, Shuichi; and Watanabe, Masahiko, to Sharp Kabushiki Kaisha. DTMF signal judging apparatus. 5,592,544, Cl. 379-283.000.

Murata, Yoshihiro; and Shibata, Masanori, to Kabushikikaisha Barudan. Sewing machine. 5,590,614, Cl. 112-237.000.

Murayama, Masayoshi: *See*—
Hatano, Masakazu; Murayama, Masayoshi; Shima, Kenji; and Ito, Masami, 5,591,870, Cl. 549-259.000.

Murdock, Douglas C. Backpack with convertible frame. 5,590,825, Cl. 224-156.000.

Muroi, Souichi; and Tsai, Hsi-Chuan, to W. R. Grace & Co.-Conn. Curing agent masterbatch for epoxy resin and their preparation. 5,591,814, Cl. 525-528.000.

Murphey, James D. Method and apparatus for making snow cones. 5,590,999, Cl. 414-795.600.

Murphy, Anthony: *See*—
Greenblatt, Saul E.; and Murphy, Anthony, 5,591,215, Cl. 607-14.000.

Murphy, Carl D.: *See*—
Vicari, Richard; Juneau, Kathleen N.; and Murphy, Carl D., 5,591,809, Cl. 525-419.000.

Murphy, Donald P., to Henkel Corporation. Stripping compositions with mixtures or organic solvents and uses thereof. 5,591,702, Cl. 510-202.000.

Murphy, Frank C. Emergency safety mask. 5,590,646, Cl. 128-206.190.

Musetti, Louis J.: *See*—
Gere, Gary M.; Holder, Russell L., Jr.; Musetti, Louis J.; and Ramsey, Ray, Jr., 5,590,617, Cl. 114-270.000.

Musschoot, Albert, to General Kinematics Corporation. Vibratory tumbling apparatus with reduced force transmission. 5,591,074, Cl. 451-328.000.

Musser, John H.: *See*—
Abbas, Saeed A.; Dasgupta, Falguni; Asa, Darwin; Musser, John H.; and Nashed, Mina A., 5,591,835, Cl. 536-4.100.

Must Systems Inc.: *See*—
Cheng, Andy, 5,592,306, Cl. 358-464.000.

Musters, Wouter; Stam, Hein; Suykerbuyk, Maria E.; Visser, Jacob; and Verbekel, Johannes M., to Unilever Patent Holdings, B.V. Methods of detecting and isolating a ripening form of a polypeptide having rhamnogalacturonase activity. 5,591,620, Cl. 435-201.000.

Mutoh, Naoki: *See*—
Tokunaga, Hideaki; Wakahata, Yasuo; and Mutoh, Naoki, 5,592,140, Cl. 338-21.000.

Muylwyk, Robert K.: *See*—
Keizer, Daniel J.; Lax, Steven A.; and Muylwyk, Robert K., 5,592,032, Cl. 307-116.000.

Muyshondt, Jorge E.; Parker, Gary A.; and Wilkie, Bruce J., to International Business Machines Corporation. Faraday cage for a printed circuit card. 5,592,391, Cl. 364-489.000.

Mycogen Plant Science, Inc.: *See*—
Hall, Timothy C.; Kemp, John D.; Slightom, Jerry L.; and Sutton, Dennis W., 5,591,605, Cl. 435-70.100.

Myers, Allen. Method and apparatus for storage and display of hierarchally organized data. 5,592,606, Cl. 395-356.000.

Mynderse, Jon S.: *See*—
Turner, Jan R.; Huber, Mary L. B.; Broughton, Mary C.; Mynderse, Jon S.; and Martin, James W., 5,591,606, Cl. 435-76.000.

Myrvik, Quentin N.: *See*—
Gristina, Anthony G.; and Myrvik, Quentin N., 5,591,441, Cl. 424-401.000.

N T Monarch Hardware: *See*—
Brooks, Harold L.; Clark, Thomas R.; Kim, Kun H.; and Overbey, James W., 5,590,917, Cl. 292-21.000.

Nachi-Fujikoshi Corp.: *See*—
Mizuno, Sadao; Hoshino, Akinori; Muraoka, Akira; and Takahashi, Hiroyuki, 5,591,065, Cl. 451-47.000.

Nada, Minoru: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.

Nadalsky, Michael: *See*—
Kilmer, Lauren G.; Nordquist, Robert E.; Nadalsky, Michael; and Gibson, David R., 5,591,185, Cl. 606-166.000.

Nadd, Bruno C., to International Rectifier Corporation. Integrated MOSgated power semiconductor device with high negative clamp voltage and fail safe operation. 5,592,117, Cl. 327-374.000.

Nagahara, Kouhei: *See*—
Ishikawa, Fumio; Nagahara, Kouhei; and Matsumoto, Mie, 5,591,596, Cl. 435-7.320.

Nagai, Masaaki: *See*—
Sakai, Hirokazu; Shimizu, Takayuki; Asano, Ryuzo; Miyahara, Naotoshi; Furukawa, Kiyoshi; Nagai, Masaaki; Honjo, Hiromasa; and Kamibayashi, Hiroyuki, 5,591,522, Cl. 428-353.000.

Nagai, Shigekazu, to SMC Corporation. Loading positioning apparatus. 5,590,580, Cl. 92-33.000.

Nagai, Yasuo: *See*—
Kano, Kaneyoshi; Terauchi, Jun; and Nagai, Yasuo, 5,591,849, Cl. 544-70.000.

Nagakura, Yasuhiko: *See*—
Shin, Shoichi; Tsunada, Masafumi; Nagakura, Yasuhiko; and Oithi, Toshio, 5,591,071, Cl. 451-276.000.

Nagamori, Nobuhiko. Graphing method and apparatus for data base retrieval. 5,592,663, Cl. 395-605.000.

Nagano, Yoshihisa: *See*—
Nasu, Toru; Inoue, Atsuo; Nagano, Yoshihisa; Matsuda, Akihiro; and Arita, Koji, 5,591,663, Cl. 437-60.000.

Nagarajan, Ramakrishnan; and Schabel, Amelia A., to Eli Lilly and Company. Derivatives of A82846. 5,591,714, Cl. 514-9.000.

Nagasawa, Shigeru: *See*—
Ueno, Haruhiko; Nagasawa, Shigeru; Ikeda, Masayuki; Shinjo, Naoki; Ishizaka, Ken-ichi; Utsumi, Teruo; Dewa, Masami; and Kobayakawa, Kazushige, 5,592,628, Cl. 395-700.130.
Utsumi, Teruo; Nagasawa, Shigeru; Ikeda, Masayuki; Shinjo, Naoki; Dewa, Masami; Ueno, Haruhiko; Kobayakawa, Kazushige; and Ishizaka, Kenichi, 5,592,680, Cl. 395-800.000.

Nagase, Kyouko: *See*—
Suzuki, Naoko; Nakanishi, Hirotoshi; and Nagase, Kyouko, 5,591,871, Cl. 549-299.000.

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Sakamoto, Hiroshi; Matsui, Hideki; and Hagiuda, Nobuyoshi, 5,592,257, Cl. 396-171.000.
Uchiyama, Shigeyuki, 5,592,254, Cl. 396-96.000.
Wakabayashi, Hiroshi; and Miyamoto, Hidenori, 5,592,255, Cl. 396-89.000.

Nill, Robert E.: *See*—
Ellis, Robert P.; Nill, Robert E.; and Niedzwiecki, Leon P., 5,590,904, Cl. 280-735.000.

Nilsson, Nils: *See*—
Ljungholm, Bengt; Nilsson, Nils; Wendeberg, Staffan; Kärrberg, Anders; and Schill, Mikael, 5,590,733, Cl. 180-89.140.

Niman, Henry L., to Scripps Research Institute, The. Polypeptide-induced monoclonal receptors to protein ligands. 5,591,587, Cl. 435-7.100.

Nimpoeno, Roy, to Scoeche Industries, Inc. Compact disc organizer on sun visor. 5,590,827, Cl. 224-312.000.

Niuchi, Ryuji, to Yazaki Corporation. Terminal insertion guiding apparatus. 5,590,457, Cl. 29-721.000.

Nintendo Co., Ltd.: *See*—
Suzuki, Toshiaki; Yamato, Satoshi; Koganezawa, Nobuhito; and Ozaki, Yuichi, 5,592,609, Cl. 395-173.000.

Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Shimomura, Hiroyoshi; Hasegawa, Yukinobu; Serizawa, Hiroshi; and Maruyama, Masanoshi, 5,591,556, Cl. 430-109.000.

Nippon Electric Glass Co., Ltd.: *See*—
Kawachi, Shinji; Sato, Yoshifumi; and Nishimura, Yasuhiro, 5,591,684, Cl. 501-33.000.

Nippon Electric Industry Co., Ltd.: *See*—
Sugimori, Katsunori; and Sakamoto, Hiroshi, 5,592,367, Cl. 363-17.000.

Nippon Oil Co., Ltd.: *See*—
Kitaoka, Motomitsu; Tsubokura, Akira; and Kiyota, Takashi, 5,591,343, Cl. 210-634.000.

Nippon Steel Corporation: *See*—
Sato, Yasuo; and Sawada, Kikuzo, 5,592,003, Cl. 257-322.000.
Usami, Akira; Inoue, Takashi; and Tanabe, Kouji, 5,591,392, Cl. 420-41.000.

Nippon Tungsten Co., Ltd.: *See*—
Yamauchi, Masahiro; Kaimoto, Takashi; Furukawa, Mitsuhiko; Rikihisa, Katsutoshi; Yoshida, Hironori; and Watanabe, Kenji, 5,592,647, Cl. 392-432.000.

Nippondenso Co., Ltd.: *See*—
Iida, Makio; Shibata, Tadashi; Sugisaka, Takayuki; Miura, Shoji; and Sakakibara, Toshio, 5,592,015, Cl. 257-524.000.
Nakane, Naoki; Sakakibara, Kazuo; Ozaki, Tadashi; and Obtaka, Koji, 5,590,899, Cl. 280-728.200.
Tamura, Museo; Yamauchi, Takeshi; Niwa, Katuhide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Tooru, 5,592,004, Cl. 257-323.000.

Niro Holding A/S: *See*—
Rasmussen, Carsten O., 5,590,961, Cl. 366-165.100.

Nishi, Kenji; and Wakamoto, Shinji, to Nikon Corporation. Scanning exposure method and apparatus. 5,591,958, Cl. 250-205.000.

Nishibe, Yasushi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Motor current detection circuit. 5,592,112, Cl. 327-87.000.

Nishikawa, Fumitaka, to Seiko Epson Corporation. Display controller. 5,592,194, Cl. 345-127.000.

Nishikawa, Junichi; Murakami, Tomomi; and Uehara, Nobuyuki, to Citizen Watch Co., Ltd. Watch having a sensor. 5,592,442, Cl. 368-11.000.

Nishikawa, Masaharu; Rollag, Keith W.; Sageser, David M.; and Yamada, Jiro, to Procter & Gamble Company, The. Disposable training pant having improved stretchable side panels. 5,591,155, Cl. 604-393.000.

Nishimoto, Akira: *See*—
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohito; and Kotob, Satoru, 5,590,672, Cl. 134-201.000.

Nishimoto, Takashi: *See*—
Fujikawa, Junji; Iimura, Yukio; Takahashi, Masahiro; Nishimoto, Takashi; Matsui, Hiroyuki; and Fujita, Masanobu, 5,592,317, Cl. 349-110.000.

Nishimura, Kiyoshi; Hayashi, Hideki; Muramoto, Jun; Fuchikami, Takaaki; and Uenoyama, Hiromi, to Rohm Co., Ltd. Nonvolatile memory. 5,592,409, Cl. 365-145.000.

Nishimura, Kiyotaka: *See*—
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.

Nishimura, Koichi: *See*—
Nakamura, Hiroshi; Fujitani, Shin; Nakamura, Yumiko; Yonesaki, Takahiro; Nishimura, Koichi; Imoto, Teruhiko; and Yoneza, Ikuo, 5,591,897, Cl. 73-38.000.

Nishimura, Naoto: *See*—
Yoneda, Tetsuya; Mitate, Takehiro; Nishimura, Naoto; and Yamada, Kazuo, 5,591,547, Cl. 429-218.000.

Nishimura, Tomoki; and Akami, Noboru, to Nikon Corporation. Lock device of cartridge chamber door of camera. 5,592,253, Cl. 396-538.000.

Nishimura, Yasuhiro: *See*—
Kawachi, Shinji; Sato, Yoshifumi; and Nishimura, Yasuhiro, 5,591,684, Cl. 501-33.000.

Nishimura, Yoichi; Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shusuke, to Honda Giken Kogyo Kabushiki Kaisha. Fuel metering control system for internal combustion engine. 5,590,638, Cl. 125-687.000.

Nishio, Masahiro: *See*—
Udagawa, Yutaka; Otsubo, Toshihiko; and Nishio, Masahiro, 5,592,304, Cl. 358-444.000.

Nishio, Shoji: *See*—
Komatsu, Hideki; and Nishio, Shoji, 5,591,567, Cl. 430-399.000.

Nishio, Takeyoshi: *See*—
Nomura, Takao; Nishio, Takeyoshi; Hashimoto, Mikio; and Moriya, Satore, 5,591,795, Cl. 524-451.000.

Nishio, Toshikazu; Yamashita, Yoshiyuki; Amemiya, Hiroyuki; Takeuchi, Michiko; and Masubuchi, Nobu, to Dai Nippon Printing Co., Ltd. Reticular lens, surface light source, and liquid crystal display apparatus. 5,592,332, Cl. 359-619.000.

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Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukihito; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okada, Atsushi, 5,592,263, Cl. 399-176.000.

Nishiyama, Toshikazu: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Suwabe, Shigekazu; Yamauchi, Kiyotaka; and Nishiyama, Toshikazu, 5,591,276, Cl. 148-304.000.

Nishizawa, Hajime: *See*—
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.

Nishizawa, Mitsunori: *See*—
Koishi, Musubu; Takeshima, Akira; and Nishizawa, Mitsunori, 5,591,962, Cl. 250-214.100.

Nissei Kabushiki Kaisha: *See*—
Ando, Sadamasa; Karasawa, Taizo; and Ozasa, Akio, 5,591,491, Cl. 427-544.000.

Nissels, Robert: *See*—
Bachmann, Michel; and Nissels, Robert, 5,591,172, Cl. 606-108.000.

Nisser, Reuven: *See*—
Gluska, Alon; Fournier, Laurent; Gewirtzman, Raanan; and Nisser, Reuven, 5,592,674, Cl. 395-742.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Komatsu, Takashi; Uehara, Hiroomi; and Shinkai, Syuji, 5,591,461, Cl. 425-169.000.

Nitto Denko Corporation: *See*—
Arakawa, Masaaki, 5,591,498, Cl. 428-40.100.
Arakawa, Masaaki; Hori, Katsumi; and Maichara, Yoshiaki, 5,591,521, Cl. 428-352.000.

Niwa, Katuhide: *See*—
Tamura, Museo; Yamauchi, Takeshi; Niwa, Katuhide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Tooru, 5,592,004, Cl. 257-323.000.

Niwano, Shichiro; and Idomoto, Norihumi, to Niwano, Shichiro. Production method of puffed food and puffed food dough. 5,591,471, Cl. 426-440.000.

No Limit Designs, Inc.: *See*—
Robinson, William G.; and Thorpe, James C., 5,590,893, Cl. 280-250.100.

Noah, Craig M.: *See*—
Siegele, Stephen H.; Noah, Craig M.; and Gregg, John N., 5,590,695, Cl. 141-21.000.

Noam, Avishay, to Novacom Technologies Ltd. Apparatus and method for computer network clock recovery and jitter attenuation. 5,592,658, Cl. 395-558.000.

Nobbs, Malcolm S.: *See*—
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,591,746, Cl. 514-255.000.

Noble, J. Donald; and Muehlemann, Michael M., to Illumination Technologies, Inc. Apparatus for reading optical information. 5,591,972, Cl. 250-330.000.

Nocentino, Albert, Jr. Audio bandwidth interface apparatus for pilot wire relays. 5,592,354, Cl. 361-69.000.

Noci, Giovanni E.: *See*—
Capacci, Marco; and Noci, Giovanni E., 5,592,055, Cl. 315-111.210.

Noda, Shinichi: *See*—
Takehira, Yasushi; and Noda, Shinichi, 5,590,752, Cl. 192-208.000.

Nogami, Kazutaka: *See*—
Kakumu, Masakazu; Nogami, Kazutaka; and Satoh, Yuki, 5,592,010, Cl. 257-368.000.

Noguchi, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Phase comparison circuit for maintaining a stable phase locked loop circuit in the absence of the pulse of an input signal. 5,592,110, Cl. 327-12.000.

Noguchi, Minoru: *See*—
Miyashita, Kohichi; Demachi, Atsushi; Sato, Kenji; Noguchi, Minoru; and Oki, Naohiko, 5,591,545, Cl. 429-218.000.

Noguchi, Sadahisa: *See*—
Okano, Haruo; Nogachi, Sadahisa; and Sekine, Makoto, 5,591,486, Cl. 427-255.200.

Noguchi, Takafumi, to Fuji Photo Film Co., Ltd. Method for transforming color signals. 5,592,312, Cl. 358-525.000.

Noguchi, Yasuo: *See*—
Yokota, Haruo; Noguchi, Yasuo; Akaboshi, Naoki; Hayashi, Katsumi; and Hirosue, Seigo, 5,592,660, Cl. 395-608.000.

Nokia Technology GmbH: *See*—
Stuhlfelner, Friedbert; and Valio, Harri, 5,592,558, Cl. 381-18.000.

Nomura, Keiichi: *See*—
Okatani, Toru; Kawabuchi, Yoichi; Maruta, Syuzi; and Nomura, Keiichi, 5,592,650, Cl. 395-490.000.

Nomura, Takao; Nishio, Takeyoshi; Hashimoto, Mikio; and Moriya, Satoru, to Mitsui Petrochemical Industries, Ltd.; and Toyota Jidosha Kabushiki Kaisha. Polypropylene composition. 5,591,795, Cl. 524-451.000.

Nomura, Toshihiro; Hisamoto, Masaaki; and Kurata, Iwao, to Fuji Electric Co., Ltd. Structure for connecting flat type semiconductor swiches in parallel. 5,591,993, Cl. 257-181.000.

Nonaka, Naomichi: *See*—
Itoh, Hiromichi; Nakane, Keiichi; Nonaka, Naomichi; and Watanabe, Yoshinori, 5,592,675, Cl. 395-750.000.

Noraad Corporation: *See*—
Spiess, Gary N., 5,592,512, Cl. 375-240.000.

Noranda Inc.: *See*—
Gaultier, Philippe, 5,592,386, Cl. 364-431.010.

Norbeck, Daniel W.: *See*—
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,591,860, Cl. 548-204.000.

Nordischer Maschinenbau Rud. Baader GmbH & CO KG: *See*—
Evers, Reinhard; Götz, Klaus-Werner; Reeps, Karl-Dieter; Schwarz, Olaf; and Torkler, Conrad, 5,591,076, Cl. 452-157.000.

Nordquist, Robert E.: *See*—
Kilmer, Lauren G.; Nordquist, Robert E.; Nadalsky, Michael; and Gibson, David R., 5,591,185, Cl. 606-166.000.

Noritsu Koki Co., Ltd.: *See*—

Hashizume, Keiji; Owaki, Junichi; Tauchi, Yasuhito; and Seki, Kohji, 5,592,258, Cl. 355-41.000.

Normandin, Sharon E.: *See*—
Mishra, Sachidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.

Norris, Fanny: *See*—
Bjørn, Soren E.; Norris, Kjeld; Dineas, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.

Norris, James R., Jr.: *See*—
Giragosian, David W.; Norris, James R., Jr.; and Sholl, Howard A., 5,592,078, Cl. 324-207.180.

Norris, J. Bernice. Garment strap retainer. 5,590,545, Cl. 63-2.000.

Norris, Kjeld: *See*—
Bjørn, Soren E.; Norris, Kjeld; Dineas, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.

Norris, Michael C., to Molecular Dynamics. Self-aligning mechanism for positioning analyte receptacles. 5,592,289, Cl. 356-244.000.

Nørskov-Lauritsen, Leif: *See*—
Bjørn, Soren E.; Norris, Kjeld; Dineas, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.

Nortech Fibronic Inc.: *See*—
Bédard, Michel, 5,592,284, Cl. 356-73.100.

Northrop Grumman Corporation: *See*—
Hoofe, William J., IV; and Schroeder, John E., 5,592,186, Cl. 343-909.000.
Wu, Jiing-Liang, 5,590,536, Cl. 62-51.100.

Northwestern University: *See*—
Marks, Tobin J.; Yang, Xinmin; and Jia, Li, 5,591,815, Cl. 526-127.000.

Norton, Douglas A.: *See*—
Berthold, John W.; Kidwell, J. Jeffrey; Norton, Douglas A.; and Reed, Stuart E., 5,591,976, Cl. 250-363.100.

Norton, Ian T., to Van den Bergh Foods Co., Division of Conopco, Inc. Water-in-oil dispersion. 5,591,725, Cl. 514-58.000.

Norton, Leon L.: *See*—
Norton, Ross A.; and Norton, Leon L., 5,592,248, Cl. 351-246.000.

Norton, Ross A.; and Norton, Leon L. Computerized method for fitting eyeglasses. 5,592,248, Cl. 351-246.000.

Nosal, Roger: *See*—
Becker, Daniel P.; Flynn, Daniel L.; Moormann, Alan E.; Nosal, Roger; and Villamil, Clara L., 5,591,749, Cl. 514-300.000.

Notani, Hiromi; and Koadoh, Harufusa, to Mitsubishi Denki Kabushiki Kaisha. Phase comparator and PLL circuit. 5,592,109, Cl. 327-3.000.

Nott, Robert W.: *See*—
Falk, Richard A.; and Nott, Robert W., 5,591,894, Cl. 73-19.070.

Novacom Technologies Ltd.: *See*—
Noam, Avishay, 5,592,658, Cl. 395-558.000.

Novo Nordisk A/S: *See*—
Bjørn, Soren E.; Norris, Kjeld; Dineas, Viggo; Nørskov-Lauritsen, Leif; Christensen, Niels D.; Bregengaard, Claus; Norris, Fanny; and Petersen, Lars C., 5,591,603, Cl. 435-69.200.
Sauerberg, Per; and Olesen, Preben H., 5,591,755, Cl. 514-342.000.

Nowosielski, Joseph M.: *See*—
Levraa, Alexander; Nowosielski, Joseph M.; Ton-That, Giao M.; and Rajagopalan, Ramamoorthy, 5,592,137, Cl. 336-195.000.

Nozaki, Masahiro, to Toyoda Gosei Co., Ltd. Structure for attachment of weather strip. 5,590,926, Cl. 296-206.000.

Nozawa, Toshihide: *See*—
Oshikiri, Minoru; and Nozawa, Toshihide, 5,592,334, Cl. 359-689.000.

Nozuyama, Yasuyuki, to Kabushiki Kaisha Toshiba. Current reduction circuit for testing purpose. 5,592,494, Cl. 371-22.500.

NSK Ltd.: *See*—
Yabe, Toshikazu; Kato, Soichiro; and Mamimatsu, Ken, 5,590,965, Cl. 384-15.000.

Nu-Chem, Inc.: *See*—
Deogon, Malkit S., 5,591,791, Cl. 524-80.000.

Nuding, Erich: *See*—
Beneaowski, Sebastian; Höhne, Hubertus; Kais, Alfred; and Nuding, Erich, 5,590,833, Cl. 238-171.000.

Numakawa, Makoto: *See*—
Fujiki, Setsuo; Nakayama, Shozo; Ogawa, Haruo; Numakawa, Makoto; Hayashida, Minoru; Inoue, Suezo; and Higashida, Yasuhiro, 5,591,028, Cl. 433-129.000.

Nunez, George: *See*—
Slater, Charles R.; Smith, Kevin W.; Palmer, Matthew A.; Mazzeo, Anthony L.; and Nunez, George, 5,591,202, Cl. 606-205.000.

Nurse, Harry L., *Jr.* Filter device including a housing with removable sidewalls having a filtering capacity. 5,591,331, Cl. 210-232.000.

Nye, Richard V., to Mallinckrodt Medical, Inc. Method of providing anesthesia with a specialized tracheal tube. 5,590,647, Cl. 128-207.140.

O.G.K. Hanbai Co., Ltd.: *See*—
Ooie, Yuzuru, 5,592,242, Cl. 351-44.000.

Obara, Haruki; Kita, Yuki; and Ito, Masaya, to Fanuc Ltd. Wire temperature measuring method for a wire electric discharge machine. 5,590,964, Cl. 374-141.000.

Obermeier, Reinhold; and Stefaniak, Gunter, to Hoechst AG. Process for the recovery of fluorinated carboxylic acids. 5,591,877, Cl. 554-226.000.

Obijeski, Todd J.: *See*—
Walton, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., 5,591,390, Cl. 264-456.000.

Oce-Nederland B.V.: *See*—
Van Dorsselaer, Etienne L. M. E., 5,592,297, Cl. 358-261.100.

Oceanit Laboratories, Inc.: *See*—
Sullivan, Patrick K.; Vithanage, Dayananda; and Bucher, Warren E., 5,590,979, Cl. 405-36.000.

Ochiai, Toru; Tsuchihashi, Hidehisa; and Ueta, Soichi, to Nikon Corporation. Image reading apparatus having improved shading correction and quantity of light ratio measurement. 5,592,218, Cl. 348-110.000.

O'Connell, Kari: *See*—
Amerant, Brenda B.; Bredea, Erik N.; Dunn, Thomas A.; Funk, Michael W.; Kocan, Stephen M.; Mathews, Ilane L.; O'Connell, Kari; and Pollman, Mark C., 5,592,539, Cl. 379-112.000.

O'Connell, Kevin R. Stretcher frame clamp. 5,590,431, Cl. 5-658.000.

O'Connell, Richard, to Wheaton Holding, Inc. Container-closure assembly. 5,590,798, Cl. 215-48.000.

O'Connor, Roger J.: *See*—
Cai, Khieu V.; and O'Connor, Roger J., 5,592,181, Cl. 342-457.000.

Oda, Noriaki, to NEC Corporation. Semiconductor device. 5,592,023, Cl. 257-750.000.

Odagiri, Masaru: *See*—
Takahashi, Kiyoshi; Murai, Mikio; Odagiri, Masaru; and Ueda, Hideyuki, 5,591,481, Cl. 427-131.000.

Odell, Peter G., to Xerox Corporation. Supercritical toner processes. 5,591,559, Cl. 430-137.000.

Odom, Harold A., Jr. Tree stand fastener. 5,590,865, Cl. 248-524.000.

O'Donnell, Michael A.; Duda, Rosemary B.; DeWolf, William C.; Aldovini, Anna; and Young, Richard A., to Beth Israel Hospital; and Whitehead Institute For Biomedical Research. Recombinant BCG. 5,591,632, Cl. 435-252.300.

O'Dorisio, M. Sue: *See*—
O'Dorisio, Thomas M.; O'Dorisio, M. Sue; Martin, Edward W., Jr.; and Woltering, Eugene A., 5,590,656, Cl. 128-654.000.

O'Dorisio, Thomas M.; O'Dorisio, M. Sue; Martin, Edward W., Jr.; and Woltering, Eugene A., to Ohio State University Research Foundation, The. Application of peptide/cell receptor kinetics utilizing radiolabeled somatostatin cogeners in the in situ, in vivo detection and differentiation of neoplastic tissue. 5,590,656, Cl. 128-654.000.

O'Dowd, Brian F. Nucleic acid encoding opioid receptor. 5,591,602, Cl. 435-69.100.

Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., to Henkel Corporation. Mutant of *Geotrichum candidum* which produces novel enzyme system to selectively hydrolyze triglycerides. 5,591,615, Cl. 435-172.100.

Oetjen, David C.: *See*—
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.

Ofek, Yuval: *See*—
Vishlitzky, Natan; and Ofek, Yuval, 5,592,432, Cl. 365-230.030.

Ogasawara, Mitsuo; Kobayashi, Hiroyuki; and Kubozoe, Morioki, to Hitachi, Ltd.; and Hitachi Science Systems, Ltd. Bi-axial-tilting specimen fine motion device and method of correcting image shifting. 5,591,980, Cl. 250-442.110.

Ogasawara, Yasuyuki; and Watanabe, Yoshihiko, to Yazaki Corporation. Tunable wavelength filter formed by 2 lcds in series having opposite twist angles of n*π/2 and a dielectric mirror layer on each substrate. 5,592,314, Cl. 349-18.000.

Ogata, Masaaori: *See*—
Shinozaki, Kenji; Hirano, Hideki; Kawasumi, Koichi; Asai, Nobutoshi; Tomita, Hidemi; Sato, Shuji; Ogata, Masanori; and Shiota, Hiroyuki, 5,592,208, Cl. 347-171.000.

Ogata, Yasuyuki; Hayashi, Yoshimasa; and Kojima, Yasushi, to Mitsubishi Materials Corporation. EMI filter with a ceramic material having a chemical reaction inhibiting component. 5,592,134, Cl. 333-185.000.

Ogawa, Haruo: *See*—
Fujiki, Setsuo; Nakayama, Shozo; Ogawa, Haruo; Numakawa, Makoto; Hayashida, Minoru; Inoue, Suezo; and Higashida, Yasuhiro, 5,591,028, Cl. 433-129.000.

Ogawa, Kazufumi: *See*—
Obtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,591,487, Cl. 427-299.000.

Ogawa, Tohru, to Sony Corporation. Method of forming a resist pattern by using a silicon carbide anti-reflective layer. 5,591,566, Cl. 430-325.000.

Ogawa, Yasuaki: *See*—
Igari, Yasutaka; Yamada, Minoru; and Ogawa, Yasuaki, 5,591,713, Cl. 514-8.000.

Ogawa, Yasushige: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Itano, Kiyoshi; Ogawa, Yasushige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.

Ogino, Masaaori; Asano, Tetsuo; and Uehara, Yasuhiko, to Hitachi, Ltd. Field-sequential projection display. 5,592,238, Cl. 348-744.000.

Ogiso, Hiroyuki: *See*—
Ikeda, Tatsuo; Ogiso, Hiroyuki; and Ichinose, Kazushige, 5,592,130, Cl. 331-158.000.

Ogisu, Yasuhiko: *See*—

Senda, Masanobu; Ogisu, Yasuhiko; and Funahashi, Toshikazu, 5,590,887, Cl. 277-205.000.

Oglesbee, John W.; Boisse, William C.; and McGinnis, Robert W., to Motorola, Inc. Battery charger having battery temperature measurement probe. 5,592,065, Cl. 320-2.000.

Ogura, Toshihiko: *See*—
Kimura, Koichi; Ogura, Toshihiko; Aotsu, Hiroaki; Ikegami, Mitsuru; and Kuwabara, Tadashi, 5,592,649, Cl. 395-481.000.

Oh, Masanari: *See*—
Shigeoka, Fumiaki; and Oh, Masanari, 5,592,564, Cl. 382-158.000.

Ohara, Kazuhiro: *See*—
Cistanoff, Todd; Markandey, Vishal; Gove, Robert J.; and Ohara, Kazuhiro, 5,592,231, Cl. 348-452.000.

Ohashi, Tatsuyuki; and Mochizuki, Tetsuya, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic control circuit for hydraulically operated vehicular transmission. 5,591,103, Cl. 477-131.000.

Ohata, Hiroyuki: *See*—
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Ohgami, Keizo; Matsuda, Kazuyuki; Kobayashi, Takaichi; Shibasaki, Kazuya; Nakamura, Hiroshi; Sekine, Shigeru; Ito, Hironori; Ishikawa, Kenichi; Shimohira, Tadamichi; and Gibo, Moriya, to Kabushiki Kaisha Toshiba. Electronic system having portable electronic apparatus and external expansion unit for expanding function of electronic apparatus. 5,592,362, Cl. 361-686.000.

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Ohkawa, Nobuhisa: *See*—
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Ohkubo, Mitsuru: *See*—
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Ohmer, Johannes: *See*—
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Ohmi, Tadahiro; and Umeda, Masaru. Reduced pressure device. 5,591,267, Cl. 118-715.000.

Ohmori, Kenji; Narimatsu, Kiyoyuki; and Kobayashi, Ikuo, to Colin Corporation. Blood pressure measuring apparatus. 5,590,661, Cl. 128-672.000.

Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor cleaning apparatus and wafer cassette. 5,590,672, Cl. 134-201.000.

Ohnishi, Toshikazu: *See*—
Ikeda, Setomitsu; Yamanobe, Masato; Kawade, Hisaaki; Ohnishi, Toshikazu; and Iwasaki, Tatsuya, 5,591,061, Cl. 445-3.000.

Ohsawa, Takashi: *See*—
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Ohshima, Keiichi: *See*—
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Ohshima, Kenji: *See*—
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Ohta, Tsuyoshi: *See*—
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Ohtaka, Koji: *See*—
Nakane, Naoki; Sakakibara, Kazuo; Ozaki, Tadashi; and Ohtaka, Koji, 5,590,899, Cl. 280-728.200.

Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Information recording medium and methods of manufacturing and using the same. 5,591,487, Cl. 427-299.000.

Ohtake, Yasuhisa; Sago, Seiji; Yamazaki, Mitsuaki; and Muramatsu, Sachiko, to Kabushiki Kaisha Toshiba. Color cathode ray tube and method of manufacturing shadow mask. 5,592,044, Cl. 313-403.000.

Ohtsuka, Yasumasa; Nakamura, Shunji; Okuda, Kouichi; Tomoyuki, Yohji; Hayakawa, Akira; and Fukuzawa, Daizo, to Canon Kabushiki Kaisha. Image fixing device with heater responsive to thermal stress. 5,592,276, Cl. 339-335.000.

Ohtsuki, Tetsuya, to NEC Corporation. Semiconductor device equipped with simple stable switching circuit for selectively supplying different power voltages. 5,592,430, Cl. 365-226.000.

Ohuchi, Hirofumi: *See*—
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Ohuchi, Masatoshi; and Mizuta, Shuichi, to Opt Engineering Co., Ltd. Device for successively inserting rivets and the like into a long continuous rivet-holding belt. 5,590,459, Cl. 29-809.000.

Oikawa, Rei: *See*—
Sasaki, Kenichi; Oikawa, Rei; Chiba, Tomohiro; and Iwai, Jun, 5,590,710, Cl. 165-173.000.

Oishi, Toshio: *See*—
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Oka, Hideto: *See*—
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Okabe, Hirohiko; Sekiguchi, Masaaki; Yukizane, Shigemi; Matsumoto, Toshitaka; and Kawano, Minoru, to Konica Corporation. Recording sheet finishing apparatus. 5,590,871, Cl. 270-58.270.

Okabe, Shuichi: *See*—
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Okada, Akira: *See*—
Suzaki, Hiroyoshi; Okada, Akira; and Moromaga, Takahiro, 5,592,098, Cl. 324-663.000.

Okada, Atsushi: *See*—
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Okada, Hajime; Kobayashi, Masaaki; Fujitani, Mitsuhiro; and Kosoya, Hitashi, to Sumitomo Wiring Systems, Ltd. Male terminal fitting and method of producing the same. 5,591,054, Cl. 439-884.000.

Okada, Shinjiro; Kaneko, Shuzo; Inaba, Yutaka; Shinjo, Katsuhiko; Miyata, Hirokatsu; and Katakura, Kazunori, to Canon Kabushiki Kaisha. Liquid crystal display apparatus and drive method. 5,592,190, Cl. 345-89.000.

Okada, Shinjiro: *See*—
Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, 5,592,315, Cl. 349-126.000.

Okamoto, Kazuya: *See*—
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Okano, Haruo; Noguchi, Sadahisa; and Sekine, Makoto, to Kabushiki Kaisha Toshiba. Method for forming a film on a substrate by activating a reactive gas. 5,591,486, Cl. 427-255.200.

Okase, Wataru, to Tokyo Electron Kabushiki Kaisha; and Tokyo Electron Tohoku Kabushiki. Heat treatment apparatus. 5,592,581, Cl. 392-418.000.

Okatani, Toru; Kawabuchi, Yoichi; Maruta, Syuzi; and Nomura, Keiichi, to Minolta Camera Kabushiki Kaisha. Computer apparatus and method for replacing programs between memories by employing protection mechanism with write enable generation scheme. 5,592,650, Cl. 395-490.000.

Okawa, Yasushi; and Iashiki, Isao, to Sumitomo Electric Industries, Ltd. Tire pressure drop detecting device and method. 5,591,906, Cl. 73-146.500.

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Olivera, Baldomero M.; Hillyard, David R.; Imperial, Julita S.; and Monje, Virginia D., to University of Utah, The. Omega-conotoxin peptides. 5,591,821, Cl. 530-324.000.

Olivieri, Lawrence J., to Fisher Dynamics Corporation. Anti-chuck seat recliner. 5,590,932, Cl. 297-367.000.

Olivo, Paul D.; and Schlesinger, Sondra, to Washington University. Indicator cell line for detecting RNA viruses and method therefor. 5,591,579, Cl. 435-6.000.

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Orth, Geoffrey A.; Anderson, Scott C.; and Brown, Peter S., to Advanced Cardiovascular Systems, Inc. Expandable stent forming projecting barbs and method for deploying. 5,591,197, Cl. 606-198.000.

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Osborne, Keith J., to Intelpro, Inc. Double-containment underground piping system. 5,590,981, Cl. 405-154.000.

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Owen, Ashley J.; Carlisle, Michael L.; and Parkin, Christopher S., to Rolls-Royce plc. Fuel and air mixing parts for a turbine combustion chamber. 5,590,530, Cl. 60-748.000.

Owen, David B. Coin display holder. 5,590,761, Cl. 206-0.820.

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Pinarbasi, Mustafa, to International Business Machines Corporation. Thin film magnetic transducer having a stable soft film for reducing asymmetry variations. 5,591,533, Cl. 428-611.000.

Pinckney, Clarence D.; Gerasimov, Vladimir M.; Barkan, Mark G.; and Crawford, David R., to Gaston County Dyeing Machine Company. Carrier for supporting textile material packages in a wet treatment machine and package retaining cap for same. 5,590,553, Cl. 68-212.000.

Pino, Raul M. Engine construction. 5,592,036, Cl. 310-24.000.

Piock, Walter; Wirth, Martin; and Fraidl, Günter K., to AVL Gesellschaft Für Verbrennungskraftmaschinen und Messtechnik m.b.hl. Prof.Dr.Dr.h.c. hans List. Device for introducing fuel into the combustion chamber of an internal combustion engine. 5,590,635, Cl. 123-532.000.

Pioneer Electronic Corporation: *See*—
Kato, Taku; Hiroshima, Yasunori; Adachi, Akinao; Nakano, Akira; and Shimomura, Kiyoshi, 5,590,455, Cl. 29-564.100.
Muramatsu, Eiji; Inoue, Akiyoshi; Taniguchi, Shoji; Takahashi, Hiroyuki; Murakami, Shigenori; and Takishita, Toshihiko, 5,592,463, Cl. 369-275.200.
Onagi, Nobuaki, 5,592,445, Cl. 369-13.000.

Piontek, David P., to ASC Incorporated. Reconfigurable space frame cabinet. 5,590,939, Cl. 312-263.000.

Pipis, George C.: *See*—
Beck, Jayne G.; Bortner, Mark E.; Eads, Larry W.; Galvan, Felix M., Jr.; Mead, Daniel R.; Packard, David J.; Pipis, George C.; Robinson, Stephanie C.; and Brink, Richard A., 5,592,360, Cl. 361-626.000.

Pirinen, Timo: *See*—
Korhonen, Ville; Pirinen, Timo; and Ramstedt, Jorma, 5,590,593, Cl. 100-93.0RP.

Pisano, Albert P.: *See*—
Lin, Liwei; and Pisano, Albert P., 5,591,139, Cl. 604-264.000.

Pischel, Dieter A. Process and arrangement for manufacturing a prefabricated, insulating wall element. 5,590,499, Cl. 52-309.900.

Pissanetzky, Sergio, to Houston Advanced Research Center. Compact, open geometry U-shaped magnet for magnetic resonance imaging. 5,592,090, Cl. 324-319.000.

Pitkänen, Harri; and Simula, Markku, to Neles-Jamesbury Oy. Device provided with a gas flow channel to reduce noise caused by throttling a gas flow. 5,590,688, Cl. 138-39.000.

Pitney Bowes Inc.: *See*—
Felmus, Benita J.; Salazar, Edilberto I.; and Schoonmaker, Richard P., 5,592,034, Cl. 307-130.000.

Pitts, M. Michael, Jr. Electrostatic device for water treatment. 5,591,317, Cl. 204-667.000.

Pixtech S.A.: *See*—
Peyre, Jean-Francois; and Courreges, Francis, 5,592,056, Cl. 315-169.100.

Pla, Frederic G., to General Electric Company. Active noise control using an array of plate radiators and acoustic resonators. 5,590,849, Cl. 244-1.00N.

Plastino, Mario A. Auto mold machine for hats. 5,590,820, Cl. 223-12.000.

Platner, David K.; Lorenz, James M.; Brennan, Michael J., Jr.; and Carrick, Brent H., to Perfection Corporation. Field assembled gas riser. 5,590,914, Cl. 285-23.000.

PLC Medical Systems, Inc.: *See*—
Negus, Charles C.; and Linhares, Stephen J., 5,591,161, Cl. 606-17.000.

Pletcher, Richard A., to Microsoft Corporation. Avoidance of deadlocks in a demand paged video adapter. 5,592,670, Cl. 395-670.000.

Plewig, Gerd: *See*—
Melnik, Bodo C.; and Plewig, Gerd, 5,591,446, Cl. 424-439.000.

Plexus, Inc.: *See*—
Barreras, Francisco J., 5,591,217, Cl. 607-61.000.

Plisson, Jacques: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,592,368, Cl. 363-34.000.

Plotkin, Stanley A.; Ricciardi, Robert P.; and Gonczol, Ewa, to Wistar Institute of Anatomy and Biology, The. Recombinant cytomegalovirus vaccine. 5,591,439, Cl. 424-199.100.

Ploumen, Jan J. H., to Akzo Nobel N.V. Aqueous peroxide compositions with improved safety profile. 5,591,706, Cl. 510-372.000.

Plumley, Julian A.: *See*—
Cree, James W.; Brown, Bruce; David, Jennifer; Plumley, Julian A.; Marshall, Robert E. L., III; and Cooper, John T., 5,591,149, Cl. 604-378.000.

PMI International Corporation: *See*—
Harrison, Robert G., 5,590,583, Cl. 99-327.000.

Poehner, Michael E.: *See*—
Welling, Jeffrey R.; and Poehner, Michael E., 5,592,153, Cl. 340-825.190.

Polsa, Romeo; and Braun, Siegmar, to Rieter Ingolstadt Spinnereimaschinenbau AG. Device for the laying of yarn on a cross-wound bobbin. 5,591,524, Cl. 428-367.000.

Poissant, Sylvain: *See*—
Bourassa, Alain; Poissant, Sylvain; Legris, Alain; and Lacroix, Claude, 5,590,858, Cl. 248-27.100.

Polaroid Corporation: *See*—
Lewis, John R., 5,592,333, Cl. 359-628.000.
Sullivan, Paul F., 5,592,346, Cl. 360-77.040.

Polka, Alan R.: *See*—
Walter, Scott A.; Polka, Alan R.; and Szalankiewicz, James J., 5,590,757, Cl. 198-812.000.

Pollman, Mark C.: *See*—
Amarant, Brenda B.; Breden, Erik N.; Dunn, Thomas A.; Funk, Michael W.; Kocan, Stephen M.; Mathews, Ilane L.; O'Connell, Kari; and Pollman, Mark C., 5,592,539, Cl. 379-112.000.

Pollution Control & Measurement (Europe) Ltd.: *See*—
Rigby, Michael, 5,591,895, Cl. 73-28.010.

Polster, Louis S., to Oliver Products Company. Cooker/rethermalizer. 5,590,587, Cl. 99-403.000.

Polzin, R. Stephen: *See*—
Kelly, James D.; and Polzin, R. Stephen, 5,592,631, Cl. 395-293.000.

Poncelet, Olivier J. C.; and Garenaux, Jean-Jacques E., to Eastman Kodak Company. Process for manufacturing layers of diamond doped with boron. 5,591,484, Cl. 427-249.000.

Pomroy, Yves, to Institut de Recherche Biologique. Brain phospholipid composition and method of making for an infant formula. 5,591,479, Cl. 426-662.000.

Poole, Craig D. Optical power meter using low-power measurement circuit. 5,591,964, Cl. 250-227.140.

Poon, Alex D.: *See*—
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,607, Cl. 395-358.000.
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,608, Cl. 395-358.000.

Poon, Chi-Sang, to Massachusetts Institute of Technology. Tree-like perceptron and a method for parallel distributed training of such perceptrons. 5,592,589, Cl. 395-24.000.

Poonian, Mohindar S.: *See*—
Massey, Richard J.; Powell, Michael J.; Dressick, Walter J.; Leland, Jonathan K.; Hino, Janel K.; Poonian, Mohindar S.; and Ciana, Leopoldo D., 5,591,581, Cl. 435-6.000.

Pope, Lynne: *See*—
Hampson, Ian N.; Pope, Lynne; and Butler, John, 5,591,575, Cl. 435-6.000.

Popescu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., to Hyundai Electronics America. Processor architecture supporting multiple speculative branches and trap handling. 5,592,636, Cl. 395-586.000.

Porter, Christopher H.; Van Tassel, Robert; Amplatz, Curtis; and Kasinkas, Michael. Curable fiber composite stent and delivery system. 5,591,199, Cl. 606-198.000.

Porter, E. Wayne: *See*—
Quiet, Duane G.; and Porter, E. Wayne, 5,592,113, Cl. 327-158.000.

Porter, Vernon R.; Mauss, William G.; Wood, Anthony B.; Merryman, Jerry D.; Weeks, Don J.; Baber, S. Charles; and Penn, Thomas C., to Texas Instruments Incorporated. Laser pattern/inspector with a linearly ramped chirp deflector. 5,592,211, Cl. 347-260.000.

Post, Richard L.: *See*—
Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.

Poulin, Bernard; and Margerie, Michel, to GKN Glaenzer Spicer. Transmission joint body portion having an envelope with interior peripheral surface portions extending opposite to and contoured substantially the same as opposite rear surfaces of bearing tracks. 5,591,084, Cl. 464-111.000.

Pourcel, Christine: *See*—
Tiollais, Pierre; Chany, Charles; Dubois, Marie-Françoise; Pourcel, Christine; and Louise, Anne, 5,591,638, Cl. 435-320.100.

Pourprix, Michel, to Commissariat a l'Energie Atomique. Electrical mobility selector of charged particles. 5,592,096, Cl. 324-452.000.

Powell, Michael J.: *See*—
Massey, Richard J.; Powell, Michael J.; Dressick, Walter J.; Leland, Jonathan K.; Hino, Janel K.; Poonian, Mohindar S.; and Ciana, Leopoldo D., 5,591,581, Cl. 435-6.000.

Powell, Richard L.; and Jacobsen, W. Joe, to Powell, Richard L. Laser weapon simulator apparatus with firing detection system. 5,591,032, Cl. 434-22.000.

Powell, Ronald J.: *See*—
Harris, Phillip C.; Powell, Ronald J.; and Heath, Stanley J., 5,591,700, Cl. 507-204.000.

Pozzobon, Alessandro. Braking device particularly for skates. 5,590,889, Cl. 280-11.200.

Prater, Derek A.: *See*—
Miller, Ronald B.; Leslie, Stewart T.; Malkowska, Sandra T. A.; Smith, Kevin J.; Wimmer, Walter; Winkler, Horst; Hahn, Udo; and Prater, Derek A., 5,591,452, Cl. 424-468.000.

Pratt, Michael K.: *See*—
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,592,545, Cl. 379-347.000.

Precision Instrument Design: *See*—
Grass, George M., 5,591,636, Cl. 435-287.100.

Prelude UK Limited: *See*—
Wright, John R.; and Balkwill, David, 5,590,436, Cl. 15-105.000.

Premark FEG Corporation: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

Prendergast, Frank T., to Dober Chemical Corp. Liquid delivery systems. 5,590,686, Cl. 137-597.000.

Prescott, Jack R.; Elliott, Gregory; Hopkins, Mark A.; Rudewicz, Paul T.; and Thomas, Thom, to KRh Thermal Systems. Method of controlling inventory carousel in vending machine. 5,590,809, Cl. 221-1.000.

President and Fellows of Harvard College: *See*—
Halperin, Jose; and Brugnara, Carlo, 5,591,763, Cl. 514-399.000.

Pressaco, Pierre: *See*—
Mery, Jean Claude; and Pressaco, Pierre, 5,590,747, Cl. 188-326.000.

Pressco Technology, Inc.: *See*—
Darling, Donald T.; Francis, Trent G.; Williams, Brad L.; Dewar, Harold L.; Delater, David B.; Gold, Daniel B.; Pentel, Jerry; Wright, Paul L.; Sands, Peter J.; and Cochran, Phillip, 5,591,462, Cl. 425-173.000.

Pressly, Matthew D.: *See*—
Crouch, Alfred L.; Pressly, Matthew D.; Circello, Joseph C.; and Duerden, Richard, 5,592,493, Cl. 371-22.300.

Prevorsek, Dusan C.: *See*—
Li, Hsin L.; Kwon, Young D.; Lem, Kwok W.; and Prevorsek, Dusan C., 5,591,933, Cl. 89-36.020.

Price, Leroy R.; and Benford, James G., to Allegheny Ludlum Corporation. Method and apparatus for domain refining electrical steels by local mechanical deformation with multiple scribing rolls. 5,590,559, Cl. 72-366.200.

Price, Robert H.; Davis, Herbert T., III; and Dunn, Scott A., to Jaycor. Radar system and method for detecting and discriminating targets from a safe distance. 5,592,170, Cl. 342-22.000.

Price, Susanne F.; Munakata, Hiroshi; Razon, Eli; Perlberg, Gil; and Fokin, Igor, to Kulicke and Soffa Investments, Inc. Diagnostic wire bond pull tester. 5,591,920, Cl. 73-828.000.

Price, Thomas C.: *See*—
Fandrich, Mickey L.; Pedel, Salim B.; Price, Thomas C.; Durante, Richard J.; Gould, Geoffrey A.; Goodell, Timothy W.; and Doyle, Scott M., 5,592,641, Cl. 395-430.000.

Prince, Martin R. Method and apparatus for magnetic resonance imaging of arteries using a magnetic resonance contrast agent. 5,590,654, Cl. 128-653.400.

Printz, Harry W.; and Stubley, Peter R., to Digital Equipment International, Ltd. Interval width update process in the arithmetic coding method. 5,592,162, Cl. 341-107.000.

Pritchard, Declan N. Wind farm generation scheme utilizing electrolysis to create gaseous fuel for a constant output generator. 5,592,028, Cl. 290-55.000.

Privitera, Salvatore; Schwemberger, Richard F.; and Kolata, Ron, to Ethicon Endo-Surgery, Inc. Surgical penetration instrument including an imaging element. 5,591,192, Cl. 606-185.000.

Pro-Line Corporation: *See*—
Dhaliwal, Tehsel, 5,591,425, Cl. 424-70.400.

Probi AB: *See*—
Bengmark, Stig; Ahrné, Siv; Molin, Göran; and Jeppsen, Bengt, 5,591,428, Cl. 424-93.450.

Prochaska, Frank H., to American Safety Razor Company. Movable blade shaving cartridge with conditioning bar. 5,590,468, Cl. 30-41.000.

Procter & Gamble Company, The: *See*—
Ahr, Nicholas A., 5,591,297, Cl. 156-521.000.
Branson, Alan D.; Cumming, David X.; and York, David W., 5,591,705, Cl. 510-276.000.
Buell, Kenneth B.; Clear, Sandra H.; and Falcone, Daniella T., 5,591,152, Cl. 604-385.200.
Cree, James W.; Brown, Bruce; David, Jennifer; Plumley, Julian A.; Marshall, Robert E. L., III; and Cooper, John T., 5,591,149, Cl. 604-378.000.
Hasse, Margaret H., 5,591,146, Cl. 604-359.000.

Hasse, Margaret H.; and Allen, Patrick J., 5,591,151, Cl. 604-385.100.
Hofrichter, Brian D.; Gardlik, John M.; Sawin, Philip A.; Luebbe, John P.; and Bradbury, Barton J., 5,591,424, Cl. 424-66.000.
Mazur, Adam W.; Pikul, Stanislaw; and Daggy, Bruce P., 5,591,836, Cl. 536-6.100.
McFall, Ronald R.; Hines, Letha M.; Oetjen, David C.; Hammons, John L.; Chow, Shirley L.; Lampson, Patricia L.; Moore, Megan R.; and Cree, James W., 5,591,148, Cl. 604-378.000.
Nishikawa, Masaharu; Rollag, Keith W.; Sageser, David M.; and Yamada, Jiro, 5,591,155, Cl. 604-393.000.
Olsen, Robb E.; Bittar, Sandra R.; Hines, Letha M.; Vinnage, William R., Jr.; May, Melisse N.; Osborn, Thomas W., III; and Doak, Nancy B., 5,591,150, Cl. 604-385.100.
Roetker, Timothy C., 5,591,236, Cl. 8-137.000.
Sadlowski, Eugene S., 5,591,703, Cl. 510-220.000.

Proel Tecnologie S.p.A.: *See*—
Capacci, Marco; and Noci, Giovanni E., 5,592,055, Cl. 315-111.210.

Progressive Tool & Industries Co.: *See*—
Quagline, James R., 5,591,358, Cl. 219-121.630.

Prom, Randy R.: *See*—
Data, Oprea; and Prom, Randy R., 5,590,561, Cl. 73-162.000.

Prospero, Richard M.; Lunde, Erik; Swanson, Harry; and Adams, Lee, to Johnson & Johnson Consumer Products, Inc. Method and apparatus for loading bobbin cores. 5,590,814, Cl. 221-266.000.

Protos, Paul T., to General Motors Corporation. Scroll compressor with integral anti rotation means. 5,591,022, Cl. 418-55.300.

Pruette, Dean M.; and Larson, Stephen E., to Dollinger Corporation. Fluid filter. 5,591,338, Cl. 210-493.100.

Prusti, Som C. Composition for a dietary supplement for the treatment of hemorrhoids. 5,591,436, Cl. 424-195.100.

Puckett, Steven W.: *See*—
Pepe, Paul J.; and Puckett, Steven W., 5,591,045, Cl. 439-460.000.

Puckette, Thomas A.; and Phillips, Gerald W., to Eastman Chemical Company. Process for the preparation of 2,5-dihydrofuran compounds. 5,591,874, Cl. 549-507.000.

Pund, Marvin L. Optical source position and direction sensor. 5,592,285, Cl. 356-121.000.

Purdue Research Foundation: *See*—
Daniel, William H., 5,590,980, Cl. 405-37.000.

Purdy, Robert H.: *See*—
Bolger, Michael B.; Gee, Kelvin W.; Lan, Nancy C.; Purdy, Robert H.; Mirsadeghi, Seid; Tahir, Syed Hasan; and Belelli, Delia, 5,591,733, Cl. 514-172.000.

Purohit, Robin: *See*—
Grant, Robert; Stoevhase, Bent; Purohit, Robin; Sullivan, Gregory T.; and Book, David, 5,592,472, Cl. 370-351.000.

Push, David A.: *See*—
Aadersen, Brian W.; and Push, David A., 5,590,920, Cl. 292-219.000.

Pye, John A., to GEC-Marconi Limited. Exhaust gas particle sensor. 5,592,296, Cl. 356-435.000.

Pyke, Stephen C., to Electric Power Research Institute. Detection of fluids with metal-insulator-semiconductor sensors. 5,591,321, Cl. 205-787.000.

Qandil, Mark M.: *See*—
Ray, Robert B.; Qandil, Mark M.; and Olin, Gary L., 5,591,001, Cl. 415-111.000.

Quadri, Luisa; Bernardi, Luigi; Bianchi, Giuseppe; Ferrari, Patrizia; Melloni, Piero; and Valentino, Loredana, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. 17-(3-furyl)-5β, 14β-androstane derivatives active on the cardiovascular system, processes for their preparation and pharmaceutical compositions containing same. 5,591,734, Cl. 514-172.000.

Quagline, James R., to Progressive Tool & Industries Co. Apparatus for clamping and laser welding. 5,591,358, Cl. 219-121.630.

QUALCOMM Incorporated: *See*—
Sih, Gilbert C., 5,592,548, Cl. 379-410.000.
Wiedeman, Robert A.; Monte, Paul A.; Carter, Stephen S.; and Ames, William, 5,592,481, Cl. 370-316.000.

Quantum Corporation: *See*—
Hall, Dana; and Bitner, Haim, 5,592,342, Cl. 360-48.000.
Turgeon, Carol R., 5,591,073, Cl. 451-314.000.

Quantum Magnetics, Inc.: *See*—
Magnuson, Erik E.; Moeller, Charles R.; Shaw, Julian D.; and Sheldon, Alan G., 5,592,083, Cl. 324-300.000.

Quass, Jeffrey D.: *See*—
Bria, Michael P.; and Quass, Jeffrey D., 5,590,480, Cl. 34-629.000.

Quate, Calvin F., to Xerox Corporation. Acoustic deposition of material layers. 5,591,490, Cl. 427-457.000.

Quiet, Duane G.; and Porter, E. Wayne, to National Semiconductor Corp. Gradual frequency changing circuit. 5,592,113, Cl. 327-158.000.

Quinn, Deborah A.: *See*—
Quinn, Edwin A.; and Quinn, Mary L., 5,590,924, Cl. 294-19.200.

Quinn, Edwin A.; and Quinn, Mary L., to Quinn, Deborah A. Golf ball retrieval rake. 5,590,924, Cl. 294-19.200.

Quinn, Mary L.: *See*—
Quinn, Edwin A.; and Quinn, Mary L., 5,590,924, Cl. 294-19.200.

Quinn, Patrick A.; and Severson, Frederick E. Complex switch turn-out arrangements using proximity selection. 5,590,856, Cl. 246-219.000.

Quintos Instrument Company: *See*—
Fowler, Bradford C., 5,591,205, Cl. 606-213.000.

Qureshi, Asaf A.: *See*—
Lane, Ronald H.; Qureshi, Asaf A.; and Salaer, Winston A., 5,591,772, Cl. 514-458.000.

R. A. Hanson Company, Inc.: *See*—
Peterson, Randy S.; Steele, Thomas W.; and Walker, Robert D., 5,590,482, Cl. 37-403.000.

R-Tech Ueno, Ltd.: *See*—
Ueno, Ryuzo; and Ueno, Ryuji, 5,591,887, Cl. 560-121.000.

Raba, Charles E.; and Gabriele, Joseph A., to SmithKline Beecham Corporation. Mulitsegmented nozzle for dispensing viscous materials. 5,590,818, Cl. 222-575.000.

Rabinovich, Daniel; and Steinberg, Henry, to EMC Corporation. System for inserting first transmission token into data stream appended to second transmission token to facilitate full duplex communication between central controller and other controllers. 5,592,621, Cl. 395-200.020.

Racine, Lloyd G.; and Bratkowski, Edward J., to Webasto Sunroofs Inc. System for sensing an obstruction between a movable panel and a stationary panel frame. 5,592,060, Cl. 318-469.000.

Rackman, Michael I. Method and system for limiting multi-user play of video game cartridges. 5,592,651, Cl. 395-490.000.

Rader, Mark S.; Alexeff, Igor; Tsai, Peter P.; and Wadsworth, Larry C., to University of Tennessee Research Corp., The. Electrostatic charging apparatus and method. 5,592,357, Cl. 361-225.000.

Radin, Shulamith: *See*—
Ducheyne, Paul; Radin, Shulamith; and Santos, Erick M., 5,591,453, Cl. 424-484.000.

Radon Testing Corporation of America: *See*—
Ramsey, Robert W., 5,591,979, Cl. 250-383.000.

Raehse, Wilfried; Fues, Johann F.; Pattberg, Herbert; and Paatz, Kathleen, to Henkel Kommanditgesellschaft auf Aktien. Process for producing free-flowing granules with superheated steam. 5,591,707, Cl. 510-451.000.

Rager, Sylvain: *See*—
Fourrey, Francois; and Rager, Sylvain, 5,590,931, Cl. 297-366.000.

Rahimi, Houching; and Vossoughi, Hamid. Surgical method for rejuvenating body members or for reshaping body members or for rejuvenating and reshaping body members by bone grafting. 5,591,232, Cl. 623-16.000.

Raimondi, Pietro; Acheson, Willard P.; and Overbey, William K., Jr., to K & M Engineering & Consulting Corp.; and BDM Federal, Inc. Barrier for blocking movement of contaminants within an aggregate particulate substrate. 5,591,115, Cl. 588-249.000.

Rainwater, Julius H., to Mead Corporation, The. Barrel-type refrigerator and drain pan. 5,590,541, Cl. 62-255.000.

Rajagopalan, Ramamoorthy: *See*—
Levran, Alexander; Nowosielski, Joseph M.; Ton-That, Giao M.; and Rajagopalan, Ramamoorthy, 5,592,137, Cl. 336-195.000.

Rajashekara, Kaushik; and Kurnia, Alexander, to General Motors Corporation. DC link inverter. 5,592,371, Cl. 363-98.000.

Rajewski, Roger A.: *See*—
Kennedy, Paul E.; Rajewski, Roger A.; and Baldoni, John M., 5,591,731, Cl. 514-114.000.

Raju, Bore G.: *See*—
Chan, Ming F.; Raju, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vitukudi N., 5,591,761, Cl. 514-380.000.

Raley, William M., Jr.: *See*—
Lett, David B.; Raley, William M., Jr.; and Hayashi, Michael T., 5,592,551, Cl. 380-20.000.

Ramachandran, Natarajan; Lewis, Kim R.; and Lote, Richard C., Jr., to InterBold. Envelope dispenser door mechanism for automated teller machine. 5,590,609, Cl. 109-59.00R.

Ramachandran, Venkataraman, to Albemarle Corporation. Process for purifying a 2,6-dialkylphenol. 5,591,311, Cl. 203-36.000.

Ramos Fernandez, Antonio; and Saez Sanchez, Pedro T., to Consejo Superior Investigaciones Cientificas. Fast bidirectional analog switching system for HF pulses of high instantaneous power. 5,592,031, Cl. 307-112.000.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See*—
Peled, Emanuel; Menachem, Chen; and Gorenshtein, Aharon, 5,591,543, Cl. 429-192.000.

Rampel, Hans: *See*—
Scheck, Georg; Brandt, Carsten; Fischer, Markus; Angermüller, Jürgen; Rampel, Hans; and Dreher, Udo, 5,590,562, Cl. 74-89.140.

Ramsey, John L. Protective packaging for valuable articles. 5,590,779, Cl. 206-459.100.

Ramsey, Ray, Jr.: *See*—
Gere, Gary M.; Holder, Russell L., Jr.; Musetti, Louis J.; and Ramsey, Ray, Jr., 5,590,617, Cl. 114-270.000.

Ramsey, Robert W., to Radon Testing Corporation of America. Device and method for securing an electret in a radon gas detector. 5,591,979, Cl. 250-383.000.

Ramstedt, Jorma: *See*—
Korhonen, Ville; Pirinen, Timo; and Ramstedt, Jorma, 5,590,593, Cl. 100-93.0RP.

Ramtron International Corporation: *See*—
Verhaeghe, Donald J.; and Traynor, Steven D., 5,592,410, Cl. 365-145.000.

Rand, Paul K.: *See*—
Davies, Michael B.; Hearne, David J.; Rand, Paul K.; and Walker, Richard I., 5,590,645, Cl. 128-203.150.

Randad, Ramnarayan: *See*—
Abraham, Donald J.; Joshi, Gajanan; Randad, Ramnarayan; and Panikker, Jayashree, 5,591,892, Cl. 562-455.000.

Rangan, P. Venkat: *See*—

Papadimitriou, Christos; and Rangan, P. Venkat, 5,592,626, Cl. 395-200.090.
Ranganathan, Ramachandran S.; Arunchalam, Thangavel; Marinelli, Edmund R.; and Pillai, Radhakrishna K., to Bracco International B.V. Nonionic radiographic contrast agents. 5,591,846, Cl. 540-362.000.
Rao, Madhukar; Youn, Hyeong-Chan; Toussaint, Anthony F.; and DeCapite, Marianne G., to Sherwin-Williams Company, The. Thixotropic alkyd resins and the use thereof in coating compositions. 5,591,793, Cl. 524-310.000.
Rao, M. C.: *See*—
Yoshimoto, Kyosuke; Rao, M. C.; Ohata, Hiroyuki; Nakane, Kazuhiko; Furukawa, Teruo; Kondo, Jinichi; and Ototake, Masafumi, 5,592,452, Cl. 369-58.000.
Rapp, Jeffrey C.: *See*—
Adams, Mathew J.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; and Wilson, Joseph H., 5,590,840, Cl. 241-99.000.
Rapphahn, Daniel A. Fold-away high chair. 5,590,927, Cl. 297-143.000.
Rasmussen, Carsten O., to Niro Holding A/S. Method for injecting a first fluid into a second fluid and an apparatus for carrying out the method. 5,590,961, Cl. 366-165.100.
Rauhut, Klaus: *See*—
Hesse, Wolfgang; and Rauhut, Klaus, 5,591,810, Cl. 525-480.000.
Rauleder, Hartwig: *See*—
Standke, Burkhard; Rauleder, Hartwig; Seiler, Claus-Dietrich; Kötzsch, Hans-Joachim; and Peeters, Hermann, 5,591,818, Cl. 528-38.000.
Raven, Inc.: *See*—
Genova, James J., 5,590,650, Cl. 128-630.000.
Ravetto, Michel: *See*—
Cigna, Jean-Charles; Petitprez, Claudine; Marion, François; and Ravetto, Michel, 5,591,959, Cl. 250-208.100.
Ravi, Jagannathan: *See*—
Maya, Jakob; and Ravi, Jagannathan, 5,592,052, Cl. 315-291.000.
Ray, Michael A. Identification marker for x-ray film with carrying case. 5,592,527, Cl. 378-165.000.
Ray, Robert B.; Qandil, Mark M.; and Olin, Gary L., to Cornell Pump Manufacturing Corporation. Aeration system. 5,591,001, Cl. 415-111.000.
Raychem Corporation: *See*—
Gliga, Alexandru S.; and Diaz, Stephen H., 5,592,475, Cl. 370-359.000.
Raykovitz, Gary F.: *See*—
Dare, Karen; Riswick, Martin; Raykovitz, Gary F.; and Paul, Charles W., 5,591,154, Cl. 604-387.000.
Rayovac Corporation: *See*—
Otman, John E., 5,591,541, Cl. 429-171.000.
Raytheon Company: *See*—
Chang, Kaichiang; Beltran, Fernando; and Steudel, Fritz, 5,592,178, Cl. 342-372.000.
Razon, Eli: *See*—
Price, Susanne F.; Munakata, Hiroshi; Razon, Eli; Perlberg, Gil; and Fokin, Igor, 5,591,920, Cl. 73-828.000.
Reagan, William J.: *See*—
Bhattacharyya, Alaksananda; Foral, Michael J.; and Reagan, William J., 5,591,418, Cl. 423-239.100.
Reber, James K. Method and apparatus for folding and pressing bindings and ruffles. 5,590,821, Cl. 223-34.000.
Recalde, Carlos E., to Saipem Offshore Limited. Pipelay method and devices. 5,590,915, Cl. 285-119.000.
Recchia, Frank P.; Ferrell, Wilson M.; and Ferrell, W. Maclin, Jr., to Dominion Chemical Company. High solids ethylene acrylic acid aqueous dispersions and methods of producing same. 5,591,806, Cl. 525-369.000.
Reckitt & Colman Inc.: *See*—
Diehl, Karl H.; Eggensperger, Heinz; Goroncy-Bermes, Peter; Ottmanns, Peter; and Toefke, Susanne, 5,591,442, Cl. 424-401.000.
Richter, Alan F., 5,591,708, Cl. 510-463.000.
Reddy, Srinivas T.: *See*—
Lane, Christopher F.; Reddy, Srinivas T.; and Wang, Bonnie L., 5,592,102, Cl. 326-10.000.
Redemann, Gerd: *See*—
Hollstein, Jürgen; and Redemann, Gerd, 5,592,029, Cl. 307-9.100.
Redlich, Robert W., to Sunpower, Inc. Triac control circuit. 5,592,073, Cl. 323-300.000.
Redmond, David B.: *See*—
Warner, Robert W.; Fitzer, Robert C.; Redmond, David B.; and Taber, Ronald J., 5,591,530, Cl. 428-480.000.
Redpoint Thermalloy, Ltd.: *See*—
Fisher, Francis E.; Johnson, Robin D.; Gove, David G.; and Wade, Michael D., 5,590,712, Cl. 165-185.000.
Reebok International Ltd.: *See*—
Phillips, Matthew L.; Heinzelman, Bert D.; Mulhauser, Paul J.; Schiff, David R.; Brooks, Christopher; and Remiszewski, Stanley H., 5,590,696, Cl. 141-47.000.
Reed, Stuart E.: *See*—
Berthold, John W.; Kidwell, J. Jeffrey; Norton, Douglas A.; and Reed, Stuart E., 5,591,976, Cl. 250-363.100.
Reekes, James D.; and Olson, Kipley J., to Apple Computer, Inc. Method and apparatus for object-oriented digital audio signal processing using a chain of sound objects. 5,592,588, Cl. 395-2.870.
Reeps, Karl-Dieter: *See*—
Evers, Reinhard; Götz, Klaus-Werner; Reeps, Karl-Dieter; Schwarz, Olaf; and Torkler, Conrad, 5,591,076, Cl. 452-157.000.
Reese, James A.: *See*—
Kettler, John P.; and Reese, James A., 5,590,830, Cl. 236-49.300.
Reflexite Corporation: *See*—
Bernard, Gus, 5,592,330, Cl. 359-529.000.
Rega Stichting v.z.w.: *See*—
Vemishetti, Purushotham; Brodfuehrer, Paul R.; Howell, Henry G.; and Sapino, Chester, Jr., 5,591,852, Cl. 544-317.000.
Regent Lighting Corporation: *See*—
Haslam, Gary M.; and Loe, Simeon T., 5,590,953, Cl. 362-276.000.
Reichert, Veronica R.: *See*—
Louie, Edmond; Reichert, Veronica R.; Anani, Anaba A.; and Zhang, Jinshan, 5,591,540, Cl. 429-163.000.
Reid, Jerry C., to Amtec Corporation. Torque monitor for training bicyclists. 5,591,908, Cl. 73-379.070.
Reid, Robert A.; Ackley, Rhonda L.; and Hemperly, John J., to Becton, Dickinson and Company. Human restrictin and nucleic acid sequences. 5,591,583, Cl. 435-6.000.
Reid, Roger P.; and Christiansen, Lance J., to Omnipure Filter Co. Filter assembly with automatic shut-off and quick-connect filter cartridge. 5,591,332, Cl. 210-235.000.
Reimann, Kent D.: *See*—
Clark, Raymond C.; Grisel, Hilton L.; and Reimann, Kent D., 5,591,174, Cl. 606-130.000.
Reimer, Michael H.: *See*—
Olson, Phillip T.; Millis, James R.; and Reimer, Michael H., 5,591,438, Cl. 424-195.100.
Reinehr, Dieter: *See*—
Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.
Rekoske, Michael J.: *See*—
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Rembold, Manfred: *See*—
Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.
Remin Laboratories, Inc.: *See*—
Kazmark, Eugene A., Jr., 5,590,891, Cl. 280-37.000.
Remiszewski, Stanley H.: *See*—
Phillips, Matthew L.; Heinzelman, Bert D.; Mulhauser, Paul J.; Schiff, David R.; Brooks, Christopher; and Remiszewski, Stanley H., 5,590,696, Cl. 141-47.000.
Remond, Georges: *See*—
de Nanteuil, Guillaume; Remond, Georges; and Verbeuren, Tony, 5,591,728, Cl. 514-80.000.
Renard, Pierre: *See*—
Depreux, Patrick; Ait Mansour, Hamid; Lesieur, Daniel; Lefoulon, François; Renard, Pierre; Adam, Gérard; and Delagrange, Philippe, 5,591,775, Cl. 514-580.000.
Renner, Dale H.: *See*—
Cameron, Paul S.; Nash, John C.; Bloomer, Robert C.; Wollan, Robert E.; Kreutner, Kelly M.; Ahler Olmstead, Melinda A.; Renner, Dale H.; Bourne, Ryan D.; Carnish, Keith M.; and Jones, Dean R., 5,592,378, Cl. 395-227.000.
Rennie, Donald H.: *See*—
Dassel, Mark W.; Matter, Donald C.; Rennie, Donald H.; McBrayer, Roy N., Jr.; Deaton, James E.; and Thompson, Fred W., 5,591,415, Cl. 422-241.000.
Reasel, John D.; and Weitzenhof, David A., to Bridgestone/Firestone, Inc. Vibration damping device using ER fluids having multiple electrodes. 5,590,745, Cl. 188-267.000.
Renzo, Cerboni, to Carle & Montanari S.p.A. Molding plant for conveying molds for chocolate or similar products. 5,591,464, Cl. 425-453.000.
Replicon, Inc.: *See*—
Auerbach, Jeffrey I., 5,591,609, Cl. 435-91.200.
Research and Development Institute, Inc., The: *See*—
Vaccarello-Dunkel, Florence; Weaver, David K.; and Weaver, Theodore W., III, 5,591,435, Cl. 424-195.100.
Research Development Corporation of Japan: *See*—
Hasegawa, Koji; Kakuta, Hideo; and Mizutani, Junya, 5,591,697, Cl. 504-292.000.
Research Laboratories of Australia Pty Ltd.: *See*—
Lawson, Terence M.; and Nicholls, Stephen L., 5,591,557, Cl. 430-115.000.
Respess, James G.: *See*—
Barber, Jack R.; Jolly, Douglas J.; Respess, James G.; and Chang, Stephen M. W., 5,591,624, Cl. 435-240.200.
Restaurant Technology, Inc.: *See*—
Ulfig, Kimberly A.; and Venetucci, Patricia A., 5,590,586, Cl. 99-339.000.
Reus, Richard: *See*—
Jehle, William B.; and Reus, Richard, 5,591,946, Cl. 181-141.000.
Reuter, David F., to General Motors Corporation. Hydraulic ABS modulator. 5,590,936, Cl. 303-116.100.
Reynard, Michael. Fiber optic sleeve for surgical instruments. 5,591,160, Cl. 606-15.000.
Reznikov, Gregory; Eloff, Peter; and Tiearney, Thomas, to General Electric Company. Method for making a rotating anode with an integral shaft. 5,592,525, Cl. 378-121.000.
Rheinhold & Mahla AG: *See*—
Schafhaupt, Horst; and Ballmann, Josef, 5,591,904, Cl. 73-117.400.
Rheox, Inc.: *See*—
Wisniewski, Ted; and Tavares, Bruce, 5,591,796, Cl. 524-484.000.

Rhoades, George D., to Chicago Bridge & Iron Technical Services Company. Process and apparatus for conditioning cryogenic fuel to establish a selected equilibrium pressure. 5,590,535, Cl. 62-50.200.
Rhoda, James E.: *See*—
Manasva, Seetharamaiah; McDaniel, Albert E.; Cowie, William D.; Halila, Herbert; Rhoda, James E.; and Gutknecht, James E., 5,591,009, Cl. 416-241.00R.
Rhone-Poulenc Rorer, S.A.: *See*—
Blanche, Francis; and Thibaut, Denis, 5,591,614, Cl. 435-120.000.
Ricciardi, Robert P.: *See*—
Plotkin, Stanley A.; Ricciardi, Robert P.; and Gonczol, Ewa, 5,591,439, Cl. 424-199.100.
Rice, Edwin E.: *See*—
Hathaway, Thomas J.; Schmid, Frank L.; and Rice, Edwin E., 5,591,919, Cl. 73-761.000.
Rice, James S.: *See*—
Eavenson, Barry; and Rice, James S., 5,591,024, Cl. 431-125.000.
Richard, Mark A.; Zou, Xueming; and Morich, Michael A., to Picker International, Inc. Low eddy current radio frequency shield for magnetic resonance imaging. 5,592,087, Cl. 324-318.000.
Richard, Michael B. Sliding tie rack cabinet for dressers. 5,590,940, Cl. 312-287.000.
Richard, Vincent: *See*—
Nallet, Jean-Pierre; Dreux, Jacques; Berdeaux, Alain; Richard, Vincent; Martorana, Piero; and Bohn, Helmut, 5,591,758, Cl. 514-365.000.
Richards, David C.; Williams, Maurice S.; and Ward, Brian, to Melrose Products Limited. Apparatus for using packs of flexible tubing in packaging. 5,590,512, Cl. 53-567.000.
Richards, John G.; Flores, Hector; and Sander, Wendell B., to ChipScale, Inc. Fabricating a semiconductor with an insulative coating. 5,592,022, Cl. 257-735.000.
Richardson, Kendrick E. Method and apparatus for producing parts by layered subtractive machine tool techniques. 5,590,454, Cl. 29-527.400.
Richardson, Kurt E.: *See*—
Bland, Bobby J.; Richardson, Kurt E.; and Ferrer, Jose E., 5,591,467, Cl. 426-2.000.
Richmond, Louis: *See*—
Shamblen, Morley C.; Walchak, Martin T.; and Richmond, Louis, 5,591,935, Cl. 102-500.000.
Richter, Alan F., to Reckitt & Colman Inc. Pine oil hard surface cleaning compositions. 5,591,708, Cl. 510-463.000.
Richter, Wayne E.: *See*—
Walter, Peter A.; and Richter, Wayne E., 5,591,290, Cl. 156-152.000.
Ricks, Merle K.: *See*—
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Ricoh Company Ltd.: *See*—
Chilton, Jeff K.; Cullen, John F.; and Ejiri, Koichi, 5,592,574, Cl. 382-295.000.
Echigo, Katsuhiro; and Kurotaka, Shigeo, 5,592,275, Cl. 399-325.000.
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Misago, Naomi; and Sudo, Kazuhisa, 5,592,267, Cl. 399-62.000.
Rieker, Gregory M.: *See*—
Junker, Stephen G.; Rieker, Gregory M.; and Thomas, Paul E., 5,591,510, Cl. 428-132.000.
Ries, Uwe: *See*—
Hauel, Norbert; Narr, Berthold, deceased; Ries, Uwe; van Meel, Jacobus C. A.; Wienen, Wolfgang; and Entzeroth, Michael, 5,591,762, Cl. 514-381.000.
Rieter Ingolstadt Spinnereimaschinenbau AG: *See*—
Greis, Dietmar; and Mayer, Walter, 5,590,843, Cl. 242-18.0EW.
Pohn, Romeo; and Braun, Siegmar, 5,591,524, Cl. 428-367.000.
Riffaud, Didier, to GEC Alsthom Transport SA. Initialization beacon for initializing a stationary vehicle. 5,592,158, Cl. 340-941.000.
Rigby, Michael, to Pollution Control & Measurement (Europe) Ltd. Detecting particles in a gas flow. 5,591,895, Cl. 73-28.010.
Rikihisa, Katsutoshi: *See*—
Yamauchi, Masahiro; Kaimoto, Takashi; Furukawa, Mitsuhiko; Rikihisa, Katsutoshi; Yoshida, Hironori; and Watanabe, Kenji, 5,592,647, Cl. 392-432.000.
Rilly, Gérard: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,592,368, Cl. 363-34.000.
Rimkunas, Joseph F.: *See*—
Danby, Gordon T.; Jackson, John W.; Brukl, Charles E.; Gudimetta, Krishna M.; and Rimkunas, Joseph F., 5,592,089, Cl. 324-318.000.
Riso Kagaku Corporation: *See*—
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Riswick, Martin: *See*—
Dare, Karen; Riswick, Martin; Raykovitz, Gary F.; and Paul, Charles W., 5,591,154, Cl. 604-387.000.
Ritter, Tony L.: *See*—
Kemper, Timothy G.; Monroe, Allan L.; and Ritter, Tony L., 5,591,416, Cl. 422-268.000.
Rivera, José B.: *See*—
Jones, Lawrence E.; Wert, Michael D.; Rivera, José B.; and Schlosser, Ted M., 5,591,801, Cl. 525-56.000.
Riverwood International Corporation: *See*—
Harrelson, Glenn R., 5,590,762, Cl. 206-162.000.
RJC Designs: *See*—
Jehle, William B.; and Reus, Richard, 5,591,946, Cl. 181-141.000.
Rosne, Jerry M., to Staktek Corporation. High density integrated circuit module with complex electrical interconnect rails. 5,592,364, Cl. 361-735.000.
Robert Bosch GmbH: *See*—
Guentert, Josef; Hummel, Karsten; Kampa, Guido; Paetz, Axel; and Kolar, Karel, 5,591,021, Cl. 417-494.000.
Schnaibel, Eberhard; Schneider, Erich; and Bliechke, Frank, 5,590,521, Cl. 60-274.000.
Roberts, Holly H. Surgical needle discard container. 5,590,774, Cl. 206-366.000.
Robertson, Christopher D. G.: *See*—
Andrus, Bryan D.; Sikes, Martin; Robertson, Christopher D. G.; Armes, Roderick; Slemko, Mark J.; Maduza, Andrew G.; and Nieto, Augustine, 5,591,104, Cl. 482-7.000.
Robinett, Gordon. Golf wet towel container. 5,590,773, Cl. 206-315.100.
Robinson, Charles C.: *See*—
Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.
Robinson, Frederick J.: *See*—
Hughes, Henry G.; Lue, Ping-Chang; and Robinson, Frederick J., 5,591,676, Cl. 437-195.000.
Robinson, Kurt B.; Elbert, Dale K.; and Levy, Markus A., to Intel Corporation. File structure for a non-volatile block-erasable semiconductor flash memory. 5,592,669, Cl. 395-622.000.
Robinson, Philip L: *See*—
Sellars, Alan; White, Patrick A.; and Robinson, Philip L, 5,591,388, Cl. 264-168.000.
Robinson, Stephanie C.: *See*—
Beck, Jayne G.; Bortner, Mark E.; Eads, Larry W.; Galvan, Felix M., Jr.; Mead, Daniel R.; Packard, David J.; Pipis, George C.; Robinson, Stephanie C.; and Brink, Richard A., 5,592,360, Cl. 361-626.000.
Robinson, Webster. Self-cleaning filter screen for venturi suck back passage. 5,591,339, Cl. 210-499.000.
Robinson, William G.; and Thorpe, James C., to No Limit Designs, Inc. Wheelchair frame assembly. 5,590,893, Cl. 280-250.100.
Rockstein, George B.; Wilz, David M., Sr.; Bubnoski, David P.; and Knowles, Carl H., to Metrologic Instruments, Inc. Countertop bar code symbol reading system having automatic hand-supportable bar code symbol reading device and stand for supporting projected scan field thereof. 5,591,953, Cl. 235-462.000.
Rockwell International Corporation: *See*—
Balow, Frank A., 5,590,597, Cl. 101-216.000.
Colley, Jaime B., 5,592,382, Cl. 364-449.100.
Sampica, James D.; Campbell, Melvin L.; Benn, Donald L.; and Smith, Brian K., 5,592,288, Cl. 356-62.000.
Rockwell Light Vehicle Systems: *See*—
Belmond, Jean-Marc, 5,590,744, Cl. 188-265.000.
Rockwood, Robert E., to Environamics Corporation. Pump oil mister. 5,591,020, Cl. 417-423.130.
Rodal, Eric B.: *See*—
Lau, Chung Y.; Farmer, Dominic G.; Martin, Kreg A.; and Rodal, Eric B., 5,592,173, Cl. 342-357.000.
Rode, Donald W.: *See*—
Wallis, Frank S.; Caillat, Jean-Luc; Simpson, Francis M.; Anderson, Gary J.; Rode, Donald W.; and Beck, Norman G., 5,591,014, Cl. 417-310.000.
Rodgers, Robert E., Jr. Mobile exercise apparatus. 5,591,107, Cl. 482-57.000.
Rodriguez, Moses; and Miller, David J., to Mayo Foundation for Medical Education & Research. Monoclonal antibodies which promote central nervous system remyelination. 5,591,629, Cl. 435-240.270.
Roetker, Timothy C., to Procter & Gamble Company, The. Polyacrylate emulsified water/solvent fabric cleaning compositions and methods of using same. 5,591,236, Cl. 8-137.000.
Roettger, Linda: *See*—
Kenley, Rodney S.; Treu, Dennis M.; Peter, Frederick H., Jr.; Feldstein, Thomas M.; Pawlak, Kenneth E.; Adolf, Wayne F.; and Roettger, Linda, 5,591,344, Cl. 210-636.000.
Rogers, Alan C., to Sun Microsystems, Inc. Regulated complementary charge pump circuit. 5,592,370, Cl. 363-60.000.
Rogers, Steven W.; and Coburn, David R., to FMC Corporation. Wheel aligner cordless communications unit. 5,592,383, Cl. 364-424.034.
Rohde, Wilhelm: *See*—
Corduan, Horst; and Rohde, Wilhelm, 5,590,544, Cl. 62-656.000.
Rohm and Haas Company: *See*—
Hsu, Jemin C., 5,591,760, Cl. 514-372.000.
Rohm Co., Ltd.: *See*—
Kuga, Kaeko, 5,592,215, Cl. 348-51.000.
Nishimura, Kiyoshi; Hayashi, Hideki; Muramoto, Jun; Fuchikami, Takaaki; and Uenoyama, Hiromi, 5,592,409, Cl. 365-145.000.
Shigeoka, Fumiaki; and Oh, Masanari, 5,592,564, Cl. 382-158.000.
Rohrbacher, Frank: *See*—
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Roig, Richard: *See*—
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Roithner, Klaus: *See*—

Kleinhenz, Richard; Muller, Karl P.; Roithner, Klaus; and Tuschiaki, Masakatsu, 5,592,412, Cl. 365-149.000.
Rojko, Jennifer L.; Hartke, James R.; and Cheney, Carolyn M. Branched apogenic peptide for inducing apoptosis. 5,591,717, Cl. 514-12.000.
Rolander, Ulf, to Sandvik AB. Method for obtaining well defined edge radii on cutting tool inserts by electropolishing technique. 5,591,320, Cl. 205-664.000.
Rolih, Vladimir, to Von Roll Umwelttechnik AG. Fire monitoring system. 5,592,151, Cl. 340-584.000.
Rollag, Keith W.: *See*—
Nishikawa, Masaharu; Rollag, Keith W.; Sageser, David M.; and Yamada, Jiro, 5,591,155, Cl. 604-393.000.
Rollei Fototechnic GmbH: *See*—
Mielke, Bodo, 5,592,221, Cl. 348-270.000.
Rolleston, Robert J., to Xerox Corporation. Reduced storage of pre-computed difference tables used in color space conversion. 5,592,591, Cl. 395-105.000.
Rolls-Royce plc: *See*—
Owen, Ashley J.; Carlisle, Michael L.; and Parkin, Christopher S., 5,590,530, Cl. 60-748.000.
Romanauskas, William A., to Sorvall Products, L.P. Swinging bucket centrifuge rotor. 5,591,114, Cl. 494-20.000.
Romaney, Julie B.; and Bushman, William B. Pulsed-tone timing exercise method. 5,592,143, Cl. 340-309.150.
Rooks, Stephen M., to International Business Machines Corporation. Inspection system for cross-sectional imaging. 5,592,562, Cl. 382-150.000.
Roper, Frank H.; and Ferencie, Joseph J., to Picker International, Inc. Universal electrical interface for digital spotfilm product. 5,592,524, Cl. 378-98.200.
Roques, Bernard-Pierre: *See*—
Fournie-Zaluski, Marie-Claude; and Roques, Bernard-Pierre, 5,591,891, Cl. 567-426.000.
Rordea, Louis H.; Patel, Ashok; Leggett, James V., III; Gibbons, Frank L.; and Owens, Steven C., to Baker Hughes Incorporated. Method and apparatus for communicating data in a wellbore and for detecting the influx of gas. 5,592,438, Cl. 367-83.000.
Rose, Anne-Melissa: *See*—
Toole, Robert D.; and Rose, Anne-Melissa, 5,590,623, Cl. 119-165.000.
Rosen, Craig A.: *See*—
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Rosen, Robert: *See*—
Stein, Juergen; and Rosen, Robert, 5,590,841, Cl. 241-171.000.
Rosen, Sanford: *See*—
Sibalis, Dan; and Rosen, Sanford, 5,591,123, Cl. 604-20.000.
Rosenbaum, Fred; and Yosim, Paul S., to International Business Machines Corporation. Method and apparatus for overlaying two video signals using an input-lock. 5,592,236, Cl. 348-586.000.
Rosenkoetter, Terry O., to Med-Plastics, Intl., Inc. Heat and moisture exchanger for breathing. 5,590,644, Cl. 128-201.130.
Rosenstein, Robert W., to Becton, Dickinson & Co. Solid phase chromatographic immunoassay. 5,591,645, Cl. 436-514.000.
Rosenthal, Karl-Heinz; and Kitzing, Tom, to AptarGroup S.A. Atomization attachment for a liquid container. 5,590,835, Cl. 239-333.000.
Rosiek, Thomas A.: *See*—
Bagchi, Pranab; Edwards, James L.; Gibson, Danuta; Rosiek, Thomas A.; Thomas, Brian; and Flow, Vincent J., III, 5,591,568, Cl. 430-449.000.
Rosso, Francesco; Rosso, Giuseppe A.; and Carenini, Ettore, to Forcelledo, Jack L. Roller skate. 5,590,890, Cl. 280-11.220.
Rosso, Giuseppe A.: *See*—
Rosso, Francesco; Rosso, Giuseppe A.; and Carenini, Ettore, 5,590,890, Cl. 280-11.220.
Rostoker, Michael D.; Paach, Nicholas F.; and Zelayeta, Joe, to LSI Logic Corporation. Gamma ray techniques applicable to semiconductor lithography. 5,591,564, Cl. 430-311.000.
Roter, Amir, to Adelbar Importing and Marketing Ltd. Air pressurized person supporting device with ventilation. 5,590,428, Cl. 5-726.000.
Roth, Harald: *See*—
Bidaud, Francis; Benoit, Sylvain; Plisson, Jacques; Rilly, Gérard; Morizot, Gérard; and Roth, Harald, 5,592,368, Cl. 363-34.000.
Rothansel, Karl; Humber, Kurt; and Diez, Ulrich, to Hofmann Werkstatt-Technik GmbH. Method and device for balancing an unbalance on a motor vehicle wheel. 5,591,909, Cl. 73-462.000.
Rothers, David E.: *See*—
Baugh, John L.; Owens, Steven C.; Rothers, David E.; and Holcombe, Michael W., 5,590,713, Cl. 166-53.000.
Rouhier, Maurice: *See*—
Dohan, Yves; Rouhier, Maurice; and Heulot, Jacques-Henry, 5,591,040, Cl. 439-248.000.
Rowe, Jerry D. Gambrel support structure for animal carcass. 5,591,077, Cl. 452-189.000.
Rowland Institute for Science: *See*—
Scarpetti, Julius J., 5,591,508, Cl. 428-105.000.
Roy, Richard H., III: *See*—
Barratt, Craig H.; Parish, David M.; and Roy, Richard H., III, 5,592,490, Cl. 370-310.000.
Rozin, Eyal: *See*—
Fried, Rafael; and Rozin, Eyal, 5,592,129, Cl. 331-111.000.
RPC Waste Management Services, Inc.: *See*—
Dassel, Mark W.; Matter, Donald C.; Rennie, Donald H.; McBrayer, Roy N., Jr.; Deaton, James E.; and Thompson, Fred W., 5,591,415, Cl. 422-241.000.
Rubin, Lane H.: *See*—
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.
Rudewicz, Paul T.: *See*—
Prescott, Jack R.; Elliott, Gregory; Hopkins, Mark A.; Rudewicz, Paul T.; and Thomas, Thom, 5,590,809, Cl. 221-1.000.
Rudrapatna, Ashok N.; Jaisingh, Gopal K.; Miller, Robert R., II; Russell, Jesse E.; and Schroeder, Robert E., to AT&T. Broadband wireless system and network architecture providing broadband/narrowband service with optimal static and dynamic bandwidth/channel allocation. 5,592,470, Cl. 370-320.000.
Ruf, Arthur; Culbert, Brent A.; and Trenka, Eszter, to Bühler AG. Method for continuously crystallizing and polymerizing synthetic material and a device for it. 5,590,479, Cl. 34-589.000.
Ruf, Gunther; and Burbach, Hans-Jorg, to J.M. Voith GmbH. Device for cutting a paper web in a press end of a paper machine. 5,590,577, Cl. 83-371.000.
Ruffo, Anthony B.: *See*—
Chiffon, Mark E.; Klobusnik, Kenneth J.; and Ruffo, Anthony B., 5,591,396, Cl. 422-26.000.
Ruggiero, Vito: *See*—
Foresta, Piero; and Ruggiero, Vito, 5,591,777, Cl. 514-653.000.
Rugowski, James S.; Rekoske, Michael J.; Lin, Philip S.; Gropp, Ronald F.; and Arnold, Paul A. B. L. M., to Kimberly-Clark Corporation. Papermaking machine for making uncreped throughdried tissue sheets. 5,591,309, Cl. 162-283.000.
Ruh, Richard A., to Hewlett-Packard Company. Peripheral optical element for redirecting light from an LED. 5,592,578, Cl. 385-31.000.
Ruhl, Harry D.: *See*—
Beebe, Kenneth R.; Hughes, Glen H.; Ruhl, Harry D.; and Winterton, Richard C., 5,592,402, Cl. 364-578.000.
Runas, Michael E.; and Patel, Kirit B., to Cirrus Logic, Inc. Circuits, systems and methods for testing ASIC and RAM memory devices. 5,592,077, Cl. 324-158.100.
Runtz, Michel: *See*—
Harraud, Michel; and Runtz, Michel, 5,592,428, Cl. 365-210.000.
Ruoslahti, Erkki I.; Tarone, Guido; Giancotti, Filippo G.; and Vogel, Bruce E., to La Jolla Cancer Research Foundation. Method for detection of fibronectin receptor ligands. 5,591,592, Cl. 435-7.210.
Rusconi, Maurizio, to Black & Decker Inc. Plunge type router. 5,590,988, Cl. 409-182.000.
Rusek, Stanley J., Jr.; Fisher, Albert B.; and Strauss, Carl R., to Owens-Corning Fiberglas Technology, Inc. Fibrous insulation product having inorganic binders. 5,591,505, Cl. 428-69.000.
Rush Presbyterian-St. Luke's Medical Center: *See*—
Coon, John S.; Balasubramanian, Mannarsamy; Emanuele, R. Martin; and Shah, Himanshu, 5,591,715, Cl. 514-10.000.
Ruskin, Rodney: *See*—
Miller, David B.; Langa, John M.; and Ruskin, Rodney, 5,591,293, Cl. 156-244.130.
Russ, Robert M.: *See*—
Borgeson, Robert A.; Russ, Robert M.; Lincoln, Larry A.; Webster, Thomas L.; Merry, Nir; and Bassett, William W., 5,590,642, Cl. 126-116.00A.
Russell, Jesse E.: *See*—
Rudrapatna, Ashok N.; Jaisingh, Gopal K.; Miller, Robert R., II; Russell, Jesse E.; and Schroeder, Robert E., 5,592,470, Cl. 370-320.000.
Russell, Vincent T., to Aluminum Company of America. Cover for a bolt and nut. 5,590,992, Cl. 411-431.000.
Russian-American Technology Alliance, Inc.: *See*—
Verdgikovsky, Alexander V., deceased, 5,590,724, Cl. 175-57.000.
Ruttgers, Gunter: *See*—
Jaazza, Ernst; Ruttgers, Gunter; and Saper, Lawrence, 5,591,204, Cl. 606-213.000.
Ruwaldt, Gary S.: *See*—
Brockman, Pierce E.; Ayers, John L.; and Ruwaldt, Gary S., 5,592,530, Cl. 379-34.000.
Ryan, Patrick J.: *See*—
Hamilton, Robin; Ryan, Patrick J.; Kelly, Derek; and Dickinson, Robert J., 5,590,659, Cl. 128-661.010.
Rygiel, Ronald; and Szatkowski, Antoni, to Chrysler Corporation. Fluid inletting and support structure for a variable valve assembly. 5,590,627, Cl. 123-90.160.
Ryl, Kendall; Hollins, George A.; and Pence, Gregory L., to Synchro-Start Products, Inc. Dual coil actuator with timing circuit. 5,592,356, Cl. 361-154.000.
Ryland Engineering Corporation: *See*—
Heckman, James R., 5,591,901, Cl. 73-61.430.
Rylatt, Dennis B.: *See*—
Kemp, Bruce E.; Hillyard, Carmel J.; Rylatt, Dennis B.; and Bundesen, Peter G., 5,591,572, Cl. 435-5.000.
S & S Slides, Inc.: *See*—
Walter, Scott A.; Polka, Alan R.; and Szalankiewicz, James J., 5,590,757, Cl. 198-812.000.
S. C. Johnson & Son, Inc.: *See*—
Schroeder, John A.; Clobes, Armin L.; and Hood, Arthur L., 5,591,395, Cl. 422-4.000.

Saban, Rami; Shacham, Alon; Efendovich, Avner; and Karpati, Varda, to National Semiconductor Corporation. Fully digital data separator and frequency multiplier. 5,592,515, Cl. 375-340.000.
Sabatini, Marco; and Kramer, Alan, to SGS-Thomson Microelectronics, S.r.l. Non-volatile analog memory cell with double polysilicon level. 5,592,418, Cl. 365-185.180.
Sachdev, Krishna G.: *See*—
Iruvanti, Sushumna; Olsen, Keith S.; and Sachdev, Krishna G., 5,591,789, Cl. 523-515.000.
Sachse, Hans-Ernst. Catheter with wall perforations. 5,591,145, Cl. 604-349.000.
Sack, Robert L.: *See*—
Lewy, Alfred J.; and Sack, Robert L., 5,591,768, Cl. 514-415.000.
Sadlowski, Eugene S., to Procter & Gamble Company, The. Liquid or granular automatic diswashing detergent compositions containing builder, enzyme and low molecular weight, modified polyacrylate copolymers. 5,591,703, Cl. 510-220.000.
Safe Flight Instrument Corporation: *See*—
Greene, Leonard M., 5,590,853, Cl. 244-184.000.
Sageser, David M.: *See*—
Nishikawa, Masaharu; Rollag, Keith W.; Sageser, David M.; and Yamada, Jiro, 5,591,155, Cl. 604-393.000.
Sago, Hiroyoshi; Kobari, Hideya; Ueda, Koji; Miyamoto, Hidenori; and Takatsuki, Ryuzo, to Tazmo Co., Ltd.; and Tokyo Ohka Kogyo Co., Ltd. Rotary chemical treater having stationary cleaning fluid nozzle. 5,591,262, Cl. 118-52.000.
Sago, Seiji: *See*—
Ohtake, Yasuhisa; Sago, Seiji; Yamazaki, Mitsuaki; and Muramatsu, Sachiko, 5,592,044, Cl. 313-403.000.
Sahoo, Soumya P.: *See*—
Doherty, James B.; Dorn, Conrad P.; Durette, Philippe L.; Finke, Paul E.; Maccoss, Malcolm; Mills, Sander G.; Shah, Shrenik K.; Sahoo, Soumya P.; Hale, Jeffrey J.; Lanza, Thomas J.; and Hagmann, William K., 5,591,737, Cl. 514-210.000.
Saida, Yoshitaka, to Honda Giken Kogyo Kabushiki Kaisha. Ventilation louver assembly, and methods of constructing and utilizing same. 5,591,079, Cl. 454-155.000.
Saillant, Gérard: *See*—
Judet, Thierry; and Saillant, Gérard, 5,591,168, Cl. 606-65.000.
Saino, Yushi; Iwasaki, Akio; and Suda, Makoto, to Kowa Co., Ltd. Nucleic acids encoding human placental coagulation inhibitor (PCI). 5,591,633, Cl. 435-252.300.
Saito, Hideo; and Itoh, Noboru, to Mitsubishi Denki Kabushiki Kaisha. Reflector supporting mechanism. 5,592,336, Cl. 359-871.000.
Saito, Junya: *See*—
Yoshinobu, Hitoshi; and Saito, Junya, 5,592,213, Cl. 348-13.000.
Saito, Katsuyuki: *See*—
Uehara, Masao; Saito, Katsuyuki; Uchikubo, Akinobu; Nakagawa, Takehiro; Sasaki, Masahiko; and Yamashita, Shinji, 5,592,216, Cl. 348-74.000.
Saito, Kazuhisa: *See*—
Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,591,535, Cl. 428-694.0RE.
Saito, Susumu: *See*—
Kobayashi, Shinya; Arimoto, Akira; Fujisaki, Hiroo; and Saito, Susumu, 5,592,207, Cl. 347-129.000.
Saito, Tatsuoki: *See*—
Hattori, Masafumi; Ikeda, Chikako; Sugimoto, Satoru; Saito, Tatsuoki; Yamada, Hitoshi; and Akashige, Etsushi, 5,591,792, Cl. 524-271.000.
Saitoh, Haruo: *See*—
Ishii, Satoshi; and Saitoh, Haruo, 5,592,220, Cl. 348-220.000.
Saitoh, Hiroshi; and Takahashi, Hideki, to Sony Corporation. Dual mode recording and reproducing apparatus having two recording regions using differing reproduction principles. 5,592,446, Cl. 369-44.270.
Saitou, Yuuji; Mouko, Minoru; Yoshida, Suguru; and Sugawara, Kohki, to Honda Gikeu Kogyo Kabushiki Kaisha. High-density energy beam welding process and welded structure. 5,591,359, Cl. 219-121.640.
Sakabe, Shigekazu: *See*—
Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,592,526, Cl. 378-132.000.
Sakai, Hirokazu; Shimizu, Takayuki; Asano, Ryuzo; Miyahara, Naotoshi; Furukawa, Kiyoshi; Nagai, Masaaki; Honjo, Hiromasa; and Kamibayashi, Hiroyuki, to Tokai Rubber Industries, Ltd.; and Mitsubishi Cable Industries, Ltd. Insulating tape or sheet. 5,591,522, Cl. 428-353.000.
Sakai, Kouichi: *See*—
Hatayama, Toshio; Sasaki, Mie; Kojima, Takeshi; and Sakai, Kouichi, 5,591,351, Cl. 210-767.000.
Sakai, Manabu: *See*—
Takeuchi, Yoshiharu; Yasu, Toshiharu; Sakai, Manabu; Tsubokawa, Masahiro; Oka, Hideto; and Aiba, Osamu, 5,591,018, Cl. 417-366.000.
Sakai, Yoshio: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.
Sakaki, Mamoru; Fujita, Miyuki; and Ishii, Yasuyuki, to Canon Kabushiki Kaisha. Recording sheet manufacturing and storing method, recording sheet obtained by the method, and ink jet recording method using the recording sheet. 5,591,294, Cl. 156-250.000.
Sakaki, Mamoru: *See*—
Hirose, Mifune; Suzuki, Eiichi; Sakaki, Mamoru; and Katayama, Masato, 5,591,514, Cl. 428-211.000.
Sakakibara, Kazuo: *See*—
Nakane, Naoki; Sakakibara, Kazuo; Ozaki, Tadashi; and Ohtaka, Koji, 5,590,899, Cl. 280-728.200.
Sakakibara, Toshio: *See*—
Iida, Makio; Shibata, Tadashi; Sugisaka, Takayuki; Miura, Shoji; and Sakakibara, Toshio, 5,592,015, Cl. 257-524.000.
Sakakiyama, Ryuzo; Shirakawa, Kimunaga; and Tezuka, Kazunari, to Fuji Jukogyo Kabushiki Kaisha. Failure detecting system and method for automatic transmission. 5,591,101, Cl. 477-99.000.
Sakamoto, Hiroshi; Matsui, Hideki; and Hagiuda, Nobuyoshi, to Nikon Corporation. Electronic flash device with slave emission function. 5,592,257, Cl. 396-171.000.
Sakamoto, Hiroshi: *See*—
Sugimori, Katsunori; and Sakamoto, Hiroshi, 5,592,367, Cl. 363-17.000.
Sakamoto, Masashi: *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,591,868, Cl. 549-23.000.
Sakamoto, Naoya: *See*—
Arai, Michio; Inushima, Takashi; Codama, Mitsufumi; Sugiura, Kazushi; Takayama, Ichiro; Kobori, Isamu; Yamauchi, Yukio; and Sakamoto, Naoya, 5,591,988, Cl. 257-59.000.
Sakamoto, Takeshi; Hara, Koji; and Harada, Akira, to Sumitomo Electric Industries, Ltd. Battery diaphragm and battery with such a diaphragm. 5,591,542, Cl. 429-192.000.
Sakamoto, Takumi: *See*—
Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukihito; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okada, Atsushi, 5,592,263, Cl. 399-176.000.
Sakamoto, Tsutomu; Fujiwara, Masanori; Tsuzuki, Yoshiji; and Mihara, Hisayuki, to Kabushiki Kaisha Roshiba. Digital convergence apparatus. 5,592,240, Cl. 348-807.000.
Sakase Textile Co., Ltd.: *See*—
Endo, Yoichi, 5,590,826, Cl. 224-264.000.
Sakata, Toshio: *See*—
Oominami, Taiichi; Sakata, Toshio; Kuroda, Masayoshi; Tamura, Tomonobu; Nakane, Masami; and Nakatsuka, Kazuhiko, 5,590,872, Cl. 271-176.000.
Sako, Yoichiro: *See*—
Yamagami, Tamotsu; Watanabe, Tetsu; and Sako, Yoichiro, 5,592,465, Cl. 369-275.300.
Sakuma, Choji: *See*—
Ikeda, Susumu; Isobe, Toshimi; Inoue, Atsuo; Fujita, Toshihiko; Tajiri, Akihiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,590,540, Cl. 62-180.000.
Sakuraba, Tamotsu; and Takemoto, Shinichi, to Minolta Co., Ltd. Image forming apparatus with residual toner removal. 5,592,265, Cl. 399-285.000.
Sakuragi, Shunichi; and Tsurumaki, Naoya, to Kabushiki Kaisha Komatsu Seisakusho. Plasma torch having cylindrical velocity reduction space between electrode end and nozzle orifice. 5,591,356, Cl. 219-121.500.
Sakurai, Atsushi, to Canon Kabushiki Kaisha. Voice output device for outputting vocal instructions when the waiting time for a key input operation exceeds a set time limit. 5,592,583, Cl. 395-2.090.
Salazar, Edilberto I.: *See*—
Felmus, Benita J.; Salazar, Edilberto I.; and Schoonmaker, Richard P., 5,592,034, Cl. 307-130.000.
Salinas, Lee G. Pool table. 5,591,087, Cl. 473-3.000.
Salk Institute for Biological Studies, The: *See*—
Heinemann, Stephen F.; Patrick, James W.; Boulter, James R.; Deneris, Evan S.; Connolly, John G.; Duvoisin, Robert M.; Heinemann, Eden D.; Wada, Keiji; Ballivet, Marc C.; and Goldman, Daniel J., 5,591,590, Cl. 435-7.100.
Salmon, Bardwell C.; Borgman, John D.; and Holtey, Thomas O., to Eagleview, Inc. Computer-assisted system for interactively brokering goods or services between buyers and sellers. 5,592,375, Cl. 395-207.000.
Salonen, Tauno T., to Tamglass Engineering Oy. Method and apparatus for developing and edge stress in a windshield in a windshield bending furnace. 5,591,245, Cl. 65-107.000.
Salpekar, Anil: *See*—
Dabrowski, Henry P.; Salpekar, Anil; and Lever, O. William, Jr., 5,591,426, Cl. 424-78.040.
Salser, Winston A.: *See*—
Lane, Ronald H.; Qureshi, Asaf A.; and Salser, Winston A., 5,591,772, Cl. 514-458.000.
Salter, James: *See*—
Darnell, Lawrence; and Salter, James, 5,591,113, Cl. 494-12.000.
Salter, Kenneth D.; Armstrong, Daniel A.; and Fredrick, Ted W., to Walt Disney Company, The. Conveying device with self steering powered caster. 5,590,605, Cl. 104-139.000.
Sambandan, Sachidanandan: *See*—
Mills, Duane R.; Sambandan, Sachidanandan; and Kwong, Phillip M. L., 5,592,435, Cl. 365-233.500.
Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; Gosain, Dharam Pal; and Usui, Setsuo, to Sony Corporation. Method of manufacturing Si-Ge thin film transistor. 5,591,653, Cl. 437-40.000.
Sampica, James D.; Campbell, Melvin L.; Bean, Donald L.; and Smith, Brian K., to Rockwell International Corp. Method and apparatus for preassembling optical components for use with liquid crystal displays. 5,592,288, Cl. 356-62.000.

Sams, H. William, III: *See—*
Meikrantz, David H.; Macaluso, Lawrence L.; Sams, H. William, III; Schardin, Charles H., Jr.; and Federici, Alfred G., 5,591,340, Cl. 210-512.300.

Samsung Display Devices Co., Ltd.: *See—*
Park, Duk-il; and Kim, Sang-mook, 5,592,047, Cl. 313-484.000.

Samsung Electronics Co., Ltd.: *See—*
Jung, Chul-Min; and Park, Hee-Choul, 5,592,121, Cl. 327-541.000.
Kim, Jae-woo; Kim, Joon; and Kim, Jin-hong, 5,591,675, Cl. 437-195.000.
Kim, Young-Min, 5,590,552, Cl. 68-207.000.
Kim, Young-sun; and Park, Young-wook, 5,591,671, Cl. 437-190.000.
Park, Dong-Hoon; and Lee, Dong-Ho, 5,592,266, Cl. 399-284.000.
Park, Goo-man; Baik, Sei-hyun; and Han, Taek-soo, 5,592,343, Cl. 360-48.000.
Park, Won-mo; Shin, Jung-hyun; and Park, Young-hun, 5,591,670, Cl. 437-187.000.
Yoo, Seung-Moon, 5,592,119, Cl. 327-530.000.

Samsung Heavy Industries Co., Ltd.: *See—*
Kim, Joon Y., 5,590,483, Cl. 37-468.000.

Samsung Heavy Industry Co., Ltd.: *See—*
Chung, Hae-Gycon, 5,590,730, Cl. 180-6.300.

Sanbonmatsu, Yutaka. Waste burning boiler. 5,590,610, Cl. 110-234.000.

Sanchez, Maria: *See—*
Nerone, Louis R.; Hammer, Edward E.; and Sanchez, Maria, 5,592,054, Cl. 315-105.000.

Sand, Bruce J.: *See—*
Hennings, David R.; Vassiliadis, Arthur V.; Goode, Richard L.; Sand, Bruce J.; and Harmon, Stuart, 5,591,157, Cl. 606-3.000.

Sandbank, Alberto: *See—*
Intrater, Amos; Biresbaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itzel; Epstein, Lev; Katzri, Lior; Viner, Omri; Levitan, Raya; Cohen, Roswy; Yountov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.

Sandberg, Jonathan, to Panasonic Technologies, Inc. Apparatus for providing shared virtual memory among interconnected computer nodes with minimal processor involvement. 5,592,625, Cl. 395-200.080.

Sandelis, Denis J. M.: *See—*
Deaudry, Michel A. A.; Sandelis, Denis J. M.; and Schroer, Pierre M. V. E., 5,590,531, Cl. 60-752.000.

Sanden Corporation: *See—*
Ikeda, Susumu; Inobe, Toshimi; Inoue, Atsuo; Fujita, Toshihiko; Tajiri, Akihiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,590,540, Cl. 62-180.000.
Sasaki, Kenichi; Oikawa, Rei; Chiba, Tomohiro; and Iwai, Jun, 5,590,710, Cl. 165-173.000.

Sander, Wendell B.: *See—*
Richards, John G.; Flores, Hector; and Sander, Wendell B., 5,592,022, Cl. 257-735.000.

Sanders, Nicholas A.: *See—*
Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; and Sohr, John, 5,591,357, Cl. 219-121.390.

Sanders, Rufus C., Jr.: *See—*
Larson, Eric G.; Sanders, Rufus C., Jr.; Niccum, Brent D.; Pawlikowski, Walter W.; and Edblom, Elizabeth C., 5,591,239, Cl. 51-294.000.

SanDisk Corporation: *See—*
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,592,420, Cl. 365-185.180.

Sandoz Ltd.: *See—*
Huang, Lan; and Farrington, Stephen A., 5,591,259, Cl. 106-696.000.

Sands, Peter J.: *See—*
Darling, Donald T.; Francis, Trent G.; Williams, Brad L.; Dewar, Harold L.; Delater, David B.; Gold, Daniel B.; Peatel, Jerry; Wright, Paul L.; Sands, Peter J.; and Cochran, Phillip, 5,591,462, Cl. 425-173.000.

Sandvik AB: *See—*
Rolander, Ulf, 5,591,320, Cl. 205-664.000.

Sanesh Pty Ltd: *See—*
Chin, Choo-Woo; and McEvoy, Christopher N., 5,591,263, Cl. 118-200.000.

Sano, Kazushi: *See—*
Hisano, Seiichi; Saito, Kazuhisa; Aizawa, Satoshi; Sano, Kazushi; Matsumoto, Kazuyuki; and Murata, Kenji, 5,591,535, Cl. 428-694.0RE.

Sano, Naoki: *See—*
Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; Gosain, Dharam Pal; and Usui, Setsuo, 5,591,653, Cl. 437-40.000.

Sano, Yoichi: *See—*
Ito, Yosuke; Sano, Yoichi; Tsuji, Katsuji; and Katayama, Sakae, 5,591,759, Cl. 514-372.000.

Santa Barbara Research Center: *See—*
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.

Santana, Jose A.: *See—*
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.

Santilli, Donald S.: *See—*
Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., 5,591,322, Cl. 208-120.000.

Santo, Kouichi, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing connection terminals of flexible wiring pattern substrates. 5,590,465, Cl. 29-884.000.

Santos, Erick M.: *See—*
Ducheyne, Paul; Radin, Shulamith; and Santos, Erick M., 5,591,453, Cl. 424-484.000.

Santrade Ltd.: *See—*
Froeschke, Reinhard; and König, Axel, 5,591,458, Cl. 425-6.000.

Santullo, Michael P.: *See—*
Kosowsky, Richard P.; Santullo, Michael P.; and Kosowsky, Michael R., 5,592,538, Cl. 379-93.000.

Sanyo Electric Co., Ltd.: *See—*
Miao, Takayuki, 5,592,070, Cl. 320-35.000.
Morita, Hideyo, 5,592,064, Cl. 320-2.000.
Nakamura, Hiroshi; Fujitani, Shin; Nakamura, Yumiko; Yonesaki, Takahiro; Nishimura, Koichi; Imoto, Terubiko; and Yonezu, Ikuo, 5,591,897, Cl. 73-38.000.
Tsujioka, Tsuyoshi; and Irie, Masahiro, 5,592,461, Cl. 369-126.000.

Sanz Sanchez, Pedro T.: *See—*
Ramos Fernandez, Antonio; and Sanz Sanchez, Pedro T., 5,592,031, Cl. 307-112.000.

Saper, Lawrence: *See—*
Janzea, Ernst; Ruttgers, Gunter; and Saper, Lawrence, 5,591,204, Cl. 606-213.000.

Sapino, Chester, Jr.: *See—*
Vemishetti, Purushotham; Brodfuehrer, Paul R.; Howell, Henry G.; and Sapino, Chester, Jr., 5,591,852, Cl. 544-317.000.

Sasai, Hiroshi: *See—*
Okamori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Nachiko; and Kotoh, Sasoru, 5,590,672, Cl. 134-201.000.

Sasaki, Etsuro: *See—*
Takemoto, Takatoshi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, 5,590,878, Cl. 273-121.00B.

Sasaki, Junsou: *See—*
Hitomi, Mitsuo; Masuda, Shunji; Hattori, Toshihiko; Kashiyama, Kenji; and Sasaki, Junsou, 5,590,626, Cl. 123-90.150.

Sasaki, Kenichi; Oikawa, Rei; Chiba, Tomohiro; and Iwai, Jun, to Sanden Corporation. Heat exchanger. 5,590,710, Cl. 165-173.000.

Sasaki, Masahiko: *See—*
Uehara, Masao; Saito, Katsuyuki; Uchikubo, Akinobu; Nakagawa, Takehiro; Sasaki, Masahiko; and Yamashita, Shinji, 5,592,216, Cl. 348-74.000.

Sasaki, Mie: *See—*
Hatayama, Toshio; Sasaki, Mie; Kojima, Takeshi; and Sakai, Kouichi, 5,591,351, Cl. 210-767.000.

Sasaki, Mitsuo. Support. 5,590,863, Cl. 248-354.300.

Sasaki, Tateyo: *See—*
Asazuma, Tadashi; Sasaki, Tateyo; Ito, Mitsuru; and Shiomura, Tetsunosuke, 5,591,817, Cl. 526-351.000.

Sasaki, Toshio: *See—*
Kato, Masataka; Adachi, Tetsuo; Tanaka, Toshihiro; Sasaki, Toshio; Kume, Hitoshi; and Kimura, Katsutaka, 5,592,415, Cl. 365-185.010.

Sasama, Hiroshi: *See—*
Konishi, Masahiro; Sasama, Hiroshi; and Yoneda, Masao, 5,592,407, Cl. 365-49.000.

Sasamoto, Tatsuro: *See—*
Mori, Kazunori; and Sasamoto, Tatsuro, 5,592,347, Cl. 360-77.040.

Sasou, Hiroshi; and Yamazaki, Atsushi, to Tamura Electric Works, Ltd. Card issue system. 5,592,400, Cl. 364-514.00R.

Sato, Akihiro: *See—*
Sasawa, Takashi; Ioaki, Keiji; Tamai, Hideo; Shimizu, Yoshihiko; Shiraki, Kaneto; and Sato, Akihiro, 5,591,222, Cl. 623-1.000.

Sato, Junichi: *See—*
Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiro; and Yanagida, Toshihara, 5,591,302, Cl. 156-661.110.

Sato, Kenji: *See—*
Miyashita, Kohichi; Demachi, Atsushi; Sato, Kenji; Noguchi, Minoru; and Oki, Naohiko, 5,591,545, Cl. 429-218.000.

Sato, Shuji: *See—*
Shinozaki, Kenji; Hirano, Hideki; Kawasumi, Koichi; Asai, Nobutoshi; Tomita, Hidemi; Sato, Shuji; Ogata, Masanori; and Shiota, Hiroyuki, 5,592,208, Cl. 347-171.000.

Sato, Tatsuya; Tabata, Atsushi; and Kobayashi, Naoaki, to Applied Materials, Inc. Deposition of silicon nitrides by plasma-enhanced chemical vapor deposition. 5,591,494, Cl. 427-579.000.

Sato, Tsutomu; Hirano, Masakazu; Yanashima, Tsukasa; Yamaguchi, Hiroyuki; and Monma, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Continuous form printer with paper guide mechanism. 5,592,278, Cl. 399-384.000.

Sato, Tsuyoshi, to NEC Corporation. Wireless local area network system with improved transfer efficiency and data transfer method for same. 5,592,468, Cl. 370-252.000.

Sato, Yasuo; and Sawada, Kikuzo, to Nippon Steel Corporation. Nonvolatile semiconductor memory and method of rewriting data thereto. 5,592,003, Cl. 257-322.000.

Sato, Yoshifumi: *See—*
Kawachi, Shinji; Sato, Yoshifumi; and Nishimura, Yasuhiro, 5,591,684, Cl. 501-33.000.

Satoh, Takao: *See—*
Yamagami, Kenji; Yamamoto, Akira; and Satoh, Takao, 5,592,630, Cl. 395-250.000.

Satoh, Yuki: *See—*
Kakumu, Masakazu; Nogami, Kazutaka; and Satoh, Yuki, 5,592,010, Cl. 257-368.000.

Satomura, Shinji: *See—*
Katoh, Hideo; Nakamura, Kenji; and Satomura, Shinji, 5,591,589, Cl. 435-7.100.

Sauerberg, Per; and Olesen, Preben H., to Novo Nordisk A/S. Pyridinyl thiadiazolyl compounds for treating glaucoma. 5,591,755, Cl. 514-342.000.

Saunders, Andrew G., to AT&T Global Information Solutions Company. Apparatus including a vacuum pump for assessing the condition of a bank note by measuring airflow drawn through the bank note. 5,590,790, Cl. 209-534.000.

Saunders, Cleo, executrix: *See—*
Saunders, William T., deceased; and Dalrymple, William H., 5,590,558, Cl. 72-347.000.

Saunders, Cleo M., executrix: *See—*
Saunders, William T., deceased, 5,590,993, Cl. 413-12.000.

Saunders, William T., deceased (by Cleo Saunders, executrix); and Dalrymple, William H., to Weirton Steel Corporation. Draw-processing of can bodies for sanitary can packs. 5,590,558, Cl. 72-347.000.

Saunders, William T., deceased (by Cleo M. Saunders, executrix), to Weirton Steel Corporation. Easy-access sheet metal container structures. 5,590,993, Cl. 413-12.000.

Saur, Reinhold: *See—*
Eicken, Karl; Müller, Bernd; Sauter, Hubert; Lorenz, Gisela; Ammermann, Eberhard; Schelberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Sauter, Hubert: *See—*
Eicken, Karl; Müller, Bernd; Sauter, Hubert; Lorenz, Gisela; Ammermann, Eberhard; Schelberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Savignac, Dominique; Gleis, Dieter; and Menke, Manfred, to Siemens Aktiengesellschaft. Voltage generator circuit. 5,592,063, Cl. 320-1.000.

Saville, Robert G.: *See—*
Emond, Jean P.; and Saville, Robert G., 5,590,624, Cl. 123-41.490.

Savkar, Sudhir D.; and Sundell, Robert E., to General Electric Company. Washer auger with flexible ratchet drive. 5,590,550, Cl. 68-133.000.

Sawada, Kikuzo: *See—*
Sato, Yasuo; and Sawada, Kikuzo, 5,592,003, Cl. 257-322.000.

Sawada, Shigeki, to Matsushita Electronics Corporation, Ltd. Semiconductor integrated circuit device with self-aligned superhigh speed bipolar transistor. 5,591,656, Cl. 437-31.000.

Sawada, Takaaki; Yoshimura, Masahiko; and Yoshida, Seiji, to Kabushiki Kaisha Tishiba. File management system and method for managing access and storage of data within multiple external memory devices. 5,592,662, Cl. 395-601.000.

Sawgrass Systems, Inc.: *See—*
Hale, Nathan; and Xu, Ming, 5,590,600, Cl. 101-488.000.

Sawin, Philip A.: *See—*
Hofrichter, Brian D.; Gardlik, John M.; Sawin, Philip A.; Luebbe, John P.; and Bradbury, Barton J., 5,591,424, Cl. 424-66.000.

Sayles, Philip W. One-step test device. 5,591,401, Cl. 422-58.000.

Scapes, John N.: *See—*
Gugala, Zbigniew H.; and Scapes, John N., 5,590,680, Cl. 137-312.000.

Scarpetti, Julius J., to Rowland Institute for Science. Coating methods and compositions for production of digitized stereoscopic polarizing images. 5,591,508, Cl. 428-105.000.

Schabel, Amelia A.: *See—*
Nagarajan, Ramakrishnan; and Schabel, Amelia A., 5,591,714, Cl. 514-9.000.

Schaede, Johannes G., to Koenig & Bauer-Albert Aktiengesellschaft. Device for measuring the bending of a cylinder. 5,591,921, Cl. 73-849.000.

Schaefer, Anthony: *See—*
Scherzer, Dietrich; Hahn, Klaus; Schaefer, Anthony; and Schmied, Bernhard, 5,591,778, Cl. 521-56.000.

Schaefer, Carl W. D.: *See—*
Schaefer, Richard L.; Schaefer, Carl W. D.; Williamson, James M.; and Miller, Norman L., 5,590,681, Cl. 137-375.000.

Schaefer, Richard L.; Schaefer, Carl W. D.; Williamson, James M.; and Miller, Norman L., to Frank W. Schaefer, Inc. Valve assembly. 5,590,681, Cl. 137-375.000.

Schaeffer, J. Kenyon: *See—*
Guntert, Ronald M.; Mickelson, Steve; and Schaeffer, J. Kenyon, 5,590,977, Cl. 404-101.000.

Schaeppi, Thomas J. Reusable ribbed beverage container for use with vehicle beverage holders. 5,590,808, Cl. 220-737.000.

Schäfer, Claus; and Midekke, Hermann-Josef, to Atotech Deutschland GmbH. Process for treating plastic surfaces and swelling solution. 5,591,488, Cl. 427-307.000.

Schäfer, Ralph: *See—*
Lorenz, Georg M.; Fester, Walter; Schuster, Ulrich; Leicht, Erhard; and Schäfer, Ralph, 5,591,509, Cl. 428-107.000.

Schäffler, Manfred: *See—*
Hirschek, Herwig; and Schäffler, Manfred, 5,590,442, Cl. 19-163.000.

Schafhaupt, Horst; and Ballmann, Josef, to Rheinhold & Mahla AG. Apparatus for diminishing intake vortexes in jet engines. 5,591,904, Cl. 73-117.400.

Schardin, Charles H., Jr.: *See—*
Meikrantz, David H.; Macaluso, Lawrence L.; Sams, H. William, III; Schardin, Charles H., Jr.; and Federici, Alfred G., 5,591,340, Cl. 210-512.300.

Schasteen, Charles S.; Day, Kathleen C.; and Finn, Rory F., to G.D. Searle & Co. Enhancement of clot lysis. 5,591,431, Cl. 424-94.640.

Scheck, Georg; Brandt, Carsten; Fischer, Markus; Angermüller, Jürgen; Rampel, Hans; and Dreher, Udo, to Brose Fahrzeugteile GmbH & Co. KG. Manual passive quick adjustment device. 5,590,562, Cl. 74-89.140.

Scheel, Peter U., to Microtonic A/S. Microelectronic position sensor for volume control. 5,592,079, Cl. 324-207.250.

Schelberger, Klaus: *See—*
Eicken, Karl; Müller, Bernd; Sauter, Hubert; Lorenz, Gisela; Ammermann, Eberhard; Schelberger, Klaus; and Saur, Reinhold, 5,591,747, Cl. 514-275.000.

Schelleken, Hans: *See—*
Bolongeat-Mobleu, Roger; Burnaz, Frédéric; and Schelleken, Hans, 5,591,948, Cl. 218-68.000.

Schembri, Carol T., to Abaxis, Inc. Simplified inlet channels. 5,591,643, Cl. 436-45.000.

Schenk, Raymond L., to Venture Enterprises, Incorporated. Segmental casting drum for continuous casting machine. 5,590,702, Cl. 164-429.000.

Scherch, Richard P.: *See—*
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasnoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.

Schertler, Roman, to Balzers Aktiengesellschaft. Chamber, at least for the transport of workpieces, a chamber combination, a vacuum treatment facility as well as a transport method. 5,590,994, Cl. 414-217.000.

Scherzer, Dietrich; Hahn, Klaus; Schaefer, Anthony; and Schmied, Bernhard, to BASF Aktiengesellschaft. Process for the preparation of expandable polystyrene. 5,591,778, Cl. 521-56.000.

Scheve, B. Joseph; Mayfield, John W.; and DeNicola, Anthony J., Jr., to Montell North America Inc. High melt strength, propylene polymer, process for making it, and use thereof. 5,591,785, Cl. 522-157.000.

Schifano, Michael, to Schifano, Michael. Schifano obstetric scissors. 5,591,173, Cl. 606-120.000.

Schiff, David R.: *See—*
Phillips, Matthew L.; Heinzelman, Bert D.; Mulhauser, Paul J.; Schiff, David R.; Brooks, Christopher; and Remiszewski, Stanley H., 5,590,696, Cl. 141-47.000.

Schill, Mikael: *See—*
Ljungholm, Bengt; Nilsson, Nils; Wendeberg, Staffan; Kärrberg, Anders; and Schill, Mikael, 5,590,733, Cl. 180-89.140.

Schiller, Peter J., to VTC Inc. Single crystal silicon dry-etch endpoint based on dopant-dependent and thermally-assisted etch rates. 5,591,300, Cl. 156-626.100.

Schimke, David J.: *See—*
Circello, Joseph C.; and Schimke, David J., 5,592,634, Cl. 395-586.000.

Schlennert, Barbara; and Lugert, Gerhard, to A.W.-Faber Castell Unternehmensverwaltung GmbH & Co. Hard lead for a pencil. 5,591,787, Cl. 523-164.000.

Schlesinger, Sondra: *See—*
Olivo, Paul D.; and Schlesinger, Sondra, 5,591,579, Cl. 435-6.000.

Schlitzer, Ronald L.; Dassanayake, N. L.; and Bhatia, Rajkumar P., to Alcon Laboratories, Inc. Double redox system for disinfecting contact lenses. 5,591,397, Cl. 422-37.000.

Schloetzer, George, to Wheelabrator Corporation, The. Method of making a blast wheel. 5,590,467, Cl. 29-889.210.

Schlosser, Ted M.: *See—*
Jones, Lawrence E.; Wert, Michael D.; Rivera, José B.; and Schlosser, Ted M., 5,591,801, Cl. 525-56.000.

Schlueter, Franz-Josef: *See—*
Kellner, Ullrich; Gepfert, Stefan; Schlueter, Franz-Josef; and Dietz, Harald, 5,592,145, Cl. 340-391.100.

Schlumberger Technology Corporation: *See—*
Segeral, Gerard; Long, Peter; and Atkinson, Ian, 5,591,922, Cl. 73-861.040.

Schmenk, David S.: *See—*
Schultz, Stephen M.; Schmenk, David S.; Neufeld, E. David; Grant, David L.; and Flower, David L., 5,592,648, Cl. 395-441.000.

Schmid, Frank L.: *See—*
Hathaway, Thomas J.; Schmid, Frank L.; and Rice, Edwin E., 5,591,919, Cl. 73-761.000.

Schmid, Karl; Giesen, Brigitte; and Syldath, Andreas, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of surfactants having improved detergency. 5,591,845, Cl. 536-124.000.

Schmidt, Hans-Josef: *See—*
Holdermann, Konstantin; Münzer, Adolf; and Schmidt, Hans-Josef, 5,591,565, Cl. 430-314.000.

Schmidt, Harald; and Jenko, Edward J., to Husky Injection Molding Systems Ltd. Injection molding heater including circuit breaking means. 5,591,366, Cl. 219-494.000.

Schmied, Bernhard: *See—*
Scherzer, Dietrich; Hahn, Klaus; Schaefer, Anthony; and Schmied, Bernhard, 5,591,778, Cl. 521-56.000.

Schmitt, Robert J.: *See—*
Barboza, Steven D.; Hoffman, Charles, Jr.; Kopp, Clinton V.; Schmitt, Robert J.; and Shucosky, Anthony C., 5,591,335, Cl. 210-323.200.

Schmitter, André: *See—*

Birbaum, Jean-Luc; Kaschig, Jürgen; Reinehr, Dieter; Rembold, Manfred; Schmitter, André; Luther, Helmut; Herzog, Bernd; and Hüglin, Dietmar, 5,591,850, Cl. 544-216.000.

Schmitter, Edward P.: *See*—
Mooney, Aurelius A., deceased; Mooney, by Virginia R., personal representative; Schmitter, Edward P.; and Baker, Richard, 5,590,484, Cl. 42-100.000.

Schmutz, Thomas R.: *See*—
Carney, Ronald R.; Schmutz, Thomas R.; and Williams, Terry L., 5,592,480, Cl. 370-347.000.

Schnaibel, Eberhard; Schneider, Erich; and Blischke, Frank, to Robert Bosch GmbH. Method and device for forming a simulated signal of the temperature of the exhaust gas, exhaust gas sensor or catalytic converter. 5,590,521, Cl. 60-274.000.

Schneider Electric S.A.: *See*—
Bolongeat-Mobleu, Roger; Burnaz, Frédéric; and Schelleken, Hans, 5,591,948, Cl. 218-68.000.

Schneider, Erich: *See*—
Schnaibel, Eberhard; Schneider, Erich; and Blischke, Frank, 5,590,521, Cl. 60-274.000.

Schneider (USA) Inc.: *See*—
Trerotola, Scott O.; and Johnson, Wade M., 5,591,226, Cl. 623-1.000.

Schoen, Neil C.; and Schoen, Wendy A. Digital customized audio products with user created data and associated distribution and production system. 5,592,511, Cl. 375-220.000.

Schoen, Wendy A.: *See*—
Schoen, Neil C.; and Schoen, Wendy A., 5,592,511, Cl. 375-220.000.

Scholz, Wolfgang: *See*—
Lang, Hans-Jochen; Weichert, Andreas; Kleemann, Heinz-Werner; Englert, Heinrich; Scholz, Wolfgang; and Albus, Udo, 5,591,754, Cl. 514-331.000.

Schonbach, Dave I.: *See*—
Mitchell, Andrew; Lardear, Joseph L.; and Schonbach, Dave I., 5,590,648, Cl. 128-630.000.

Schoonmaker, Richard P.: *See*—
Feimus, Benita J.; Salazar, Edilberto I.; and Schoonmaker, Richard P., 5,592,034, Cl. 307-130.000.

Schoppe, Donald W.: *See*—
Greenway, William C.; Breithaupt, David; Schoppe, Donald W.; Lutz, Norman M.; Beardslee, Andrew W.; Nguyen, Minh N.; and Stevener, Timothy L., 5,592,237, Cl. 348-716.000.

Schriever, Frederick G.; and Mertz, Richard C., Jr. Exhaust accessory for boats. 5,591,058, Cl. 440-89.000.

Schroeder, Jeffery P.: *See*—
Feldhausen, Joseph E.; and Schroeder, Jeffery P., 5,591,362, Cl. 219-133.000.

Schroeder, John A.; Clobes, Armin L.; and Hood, Arthur L., to S. C. Johnson & Son, Inc. Method of disinfecting air. 5,591,395, Cl. 422-4.000.

Schroeder, John E.: *See*—
Hoofe, William J., IV; and Schroeder, John E., 5,592,186, Cl. 343-909.000.

Schroeder, Robert E.: *See*—
Rudrapatna, Ashok N.; Jaisingh, Gopal K.; Miller, Robert R., II; Russell, Jesse E.; and Schroeder, Robert E., 5,592,470, Cl. 370-320.000.

Schroer, Pierre M. V. E.: *See*—
Desaulty, Michel A. A.; Sandelis, Denis J. M.; and Schroer, Pierre M. V. E., 5,590,531, Cl. 60-752.000.

Schuetz, Hartmut: *See*—
Barthel, Herbert; Daar, Horst; and Schuetz, Hartmut, 5,592,373, Cl. 364-184.000.

Schuhlen, Kevin; and DeNucci, Matthew J. Golf club lock. 5,590,772, Cl. 206-315.300.

Schuler Manufacturing & Equipment Co., Inc.: *See*—
Schuler, Reggie L., 5,590,963, Cl. 366-302.000.

Schuler, Reggie L., to Schuler Manufacturing & Equipment Co., Inc. Vertical feed mixer with hay claws. 5,590,963, Cl. 366-302.000.

Schultz, Merle A.: *See*—
Popescu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., 5,592,636, Cl. 395-586.000.

Schultz, Ronald G.: *See*—
Gryazanov, Sergei M.; Schultz, Ronald G.; and Chen, Jer-kang, 5,591,607, Cl. 435-91.100.

Schultz, Stephen M.; Schmeak, David S.; Neufeld, E. David; Grant, David L.; and Plower, David L., to Compaq Computer Corporation. Method for developing physical disk drive specific commands from logical disk access commands for use in a disk array. 5,592,648, Cl. 395-441.000.

Schärbrock, Klaus: *See*—
Belgardt, Herbert; Schärbrock, Klaus; and Meyer, Rolf-Günter, 5,591,408, Cl. 422-100.000.

Schuster, Ulrich: *See*—
Lorenz, Georg M.; Fester, Walter; Schuster, Ulrich; Leicht, Erhard; and Schäfer, Ralph, 5,591,509, Cl. 428-107.000.

Schwartz, David A.: *See*—
Badger, Alison M.; Bridger, Gary J.; and Schwartz, David A., 5,591,748, Cl. 514-278.000.

Schwartz, Nira: *See*—
Shahar, Arie; Schwartz, Nira; and Woods, Richard W., 5,591,971, Cl. 250-310.000.

Schwartz, Robert S.; and Wolff, Rodney G., to Medtronic, Inc. Bioelastomeric stent. 5,591,224, Cl. 623-1.000.

Schwartz, Robert S.: *See*—
Dinh, Thomas Q.; Tuch, Ronald J.; and Schwartz, Robert S., 5,591,227, Cl. 623-1.000.

Schwartz, Tibor. Jewelry chain. 5,590,516, Cl. 59-80.000.

Schwarz, Olaf: *See*—
Evers, Reinhard; Götz, Klaus-Werner; Reepa, Karl-Dieter; Schwarz, Olaf; and Tortzler, Conrad, 5,591,076, Cl. 452-157.000.

Schwarzkopf, Eugen, to Hotset Heizpatronen U. Zubehor GmbH. Electrical heater assembly for cylindrical body. 5,591,367, Cl. 219-535.000.

Schwed, Daniel L, to Ericsson GE Mobile Communications Inc. Digital radio with vocoding encrypting codec. 5,592,556, Cl. 380-49.000.

Schwemberger, Richard F.: *See*—
Privitera, Salvatore; Schwemberger, Richard F.; and Kolata, Ron, 5,591,192, Cl. 606-185.000.

Scientific-Atlanta, Inc.: *See*—
Lett, David B.; Raley, William M., Jr.; and Hayashi, Michael T., 5,592,551, Cl. 380-20.000.
Montreuil, Leo, 5,592,513, Cl. 375-296.000.
Vickers, Edward H.; and Lewis, Philip C., 5,592,176, Cl. 342-359.000.

Scientific Drilling International: *See*—
Van Steenwyk, Donald H.; Teys, Raymond W.; and Baker, Robert M., 5,590,714, Cl. 166-242.100.

Scientific SOlutions, Inc.: *See*—
Stein, Peter J.; Bahlavouni, Armen; Fitzgerald, Michael G.; and Andersen, Douglas W., 5,591,907, Cl. 73-170.160.

Scifres, Donald R.: *See*—
Welch, David F.; Mehuys, David G.; and Scifres, Donald R., 5,592,503, Cl. 372-50.000.

SciMed Life Systems, Inc.: *See*—
Shoup, Michael J.; Cox, James E.; Fordenbacher, Paul J.; and Boldenow, Gregory A., 5,591,129, Cl. 604-96.000.

Scitex Corporation Ltd.: *See*—
Nagler, Michael; Melman, Haim; Yanai, Moshe; Kleinstern, Amir; and Shalev, Eliayahu, 5,592,309, Cl. 358-500.000.

Scorl, Hans-Dieter: *See*—
Dornier, Peter D.; Wahhoud, Adnan; Czura, Peter; and Scorl, Hans-Dieter, 5,590,692, Cl. 139-1.00R.

Scosche Industries, Inc.: *See*—
Nimpoeno, Roy, 5,590,827, Cl. 224-312.000.

Scott, Ian M.: *See*—
McDonnell, Christopher; Cortez, David L.; Whitfield, Kenneth H.; and Scott, Ian M., 5,591,184, Cl. 606-167.000.

Scripps Research Institute, The: *See*—
Nimsn, Henry L., 5,591,587, Cl. 435-7.100.

SCW, Inc.: *See*—
Wagner, John R.; and Smith, J. E. Howard, 5,590,667, Cl. 131-291.000.

SDL, Inc.: *See*—
Welch, David F.; Mehuys, David G.; and Scifres, Donald R., 5,592,503, Cl. 372-50.000.

Seabrook Enterprises, Inc.: *See*—
Boyce, Ricky C.; Jones, Mona C.; Parker, Wilbur A.; and Festa, Edward J., 5,591,477, Cl. 426-633.000.

Seagate Technology, Inc.: *See*—
Minuhin, Vadim B.; Kovner, Vladimir; and Surendran, Srinivasan, 5,592,340, Cl. 360-46.000.

Sealed Air Corporation: *See*—
Bertram, George T.; Corrigan, John J., III; Lacombe, Patrick S.; and Knaak, Michael R., 5,590,816, Cl. 222-135.000.

Seaman, Michael J.: *See*—
Isfeld, Mark S.; Mitchell, Bruce W.; Seaman, Michael J.; Mallory, Tracy D.; and Arunkumar, Nagaraj, 5,592,622, Cl. 395-200.020.

Seaton, Jay J.; Allen, Michael; Landis, Donald; Lee, Patrick; Linzy, David; and Luca, Susan B., to Advanced Micro Devices, Inc. System for providing integrated monitoring, control and diagnostics functions for semiconductor spray process tools. 5,591,299, Cl. 156-626.100.

Secrist, John A., III: *See*—
Montgomery, John A.; and Secrist, John A., III, 5,591,722, Cl. 514-45.000.

Sectish, Michael G. Funeral procession motorcade safety flag assembly. 5,590,621, Cl. 116-173.000.

Security People, Inc.: *See*—
Kestkin, Yucel K.; and Gokcebay, Asil T., 5,592,408, Cl. 365-52.000.

Seemann, Gerhard: *See*—
Bosslet, Klaus; Hermentin, Peter; Seemann, Gerhard; Kuhlmann, Ludwig; and Steinsträsser, Axel, 5,591,828, Cl. 530-387.300.

Segeral, Gerard; Long, Peter; and Atkinson, Ian, to Schlumberger Technology Corporation. Method and apparatus for measuring multiphase flows. 5,591,922, Cl. 73-861.040.

Segev, David. Nucleic acid detection and amplification by chemical linkage of oligonucleotides. 5,591,585, Cl. 435-6.000.

Seidel, Andreas; Peters, Dieter; Weferling, Norbert; and Mouratidis, Dimitrios, to Hoechst AG. Process for producing tert.-butyl chloroacetate. 5,591,888, Cl. 560-226.000.

Seidel, Jurgen: *See*—
Green, Michael V.; Seidel, Jurgen; and Gandler, William R., 5,591,977, Cl. 250-363.030.

Seifert, Peter; Chupka, David E.; and Bliss, Terry L., to Black Clawson Company, The. Apparatus for dewatering and or washing papermaking stock. 5,591,336, Cl. 210-386.000.

Seiko Epson Corporation: *See*—
Ikeda, Tatsuo; Ogiso, Hiroyuki; and Ichinose, Kazushige, 5,592,130, Cl. 331-158.000.

Misawa, Toshiyuki; and Oshima, Hiroyuki, 5,591,990, Cl. 257-72.000.
Miyasaka, Mitsutoshi; and Little, Thomas W., 5,591,989, Cl. 257-66.000.
Mochizuki, Seiji; Kawakami, Kuzuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, 5,590,510, Cl. 53-434.000.
Nishikawa, Fumitaka, 5,592,194, Cl. 345-127.000.
Shu, Joseph S., 5,592,592, Cl. 395-109.000.
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.

Seiko Instruments Inc.: *See*—
Kasuga, Masao; Suzuki, Kenji; Suzuki, Makoto; and Suzuki, Minako, 5,592,041, Cl. 310-316.000.

Seiler, Claus-Dietrich: *See*—
Standke, Burkhard; Rauleder, Hartwig; Seiler, Claus-Dietrich; Kötzsch, Hans-Joachim; and Peeters, Hermann, 5,591,818, Cl. 528-38.000.

Seitzinger, Richard L., to Seitzinger, Richard L. Furniture finish color spot repair kit and method of making the same. 5,590,785, Cl. 206-575.000.

Sejnowski, Joseph P., to Hasbro, Inc. Ball tossing device. 5,590,876, Cl. 473-417.000.

Seki, Kohji: *See*—
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Spronken, John R., 5,590,503, Cl. 52-677.000.

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Bonitz, Rainer; and Birkensetzer, Peter, 5,592,416, Cl. 365-185.010.

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Harrand, Michel; and Runtz, Michel, 5,592,428, Cl. 365-210.000.
Kassapian, Christian G., 5,592,115, Cl. 327-239.080.
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Casis, Marco; and Pedrazzini, Giorgio, 5,592,633, Cl. 395-309.000.
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Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukihito; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okada, Atsushi, 5,592,263, Cl. 399-176.000.

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Hieda, Kaoru; Tsukamoto, Masahiko; and Imai, Akira, 5,592,483, Cl. 370-445.000.
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Majima, Kenji; and Yamamoto, Yoshitaka, 5,592,318, Cl. 349-122.000.
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Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,591,868, Cl. 549-23.000.

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Kaneko, Hideo; Tokunaga, Katsushi; and Tawara, Yoshio, 5,591,502, Cl. 428-65.300.

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Hirai, Yutaka; Matsuyama, Jinsho; and Shirai, Shigeru, 5,591,492, Cl. 427-563.000.

Shiraishi, Nobuo: *See*—
Koshijima, Tetsuo; Shiraishi, Nobuo; Takahashi, Tadashi; Hiraoka, Toshiharu; and Ueda, Masami, 5,591,832, Cl. 530-500.000.

Shirakawa, Kiminaga: *See*—
Sakakiyama, Ryuzo; Shirakawa, Kiminaga; and Tezuka, Kazunari, 5,591,101, Cl. 477-99.000.

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Susawa, Takashi; Ioaki, Keiji; Tamai, Hideo; Shimizu, Yoshihiko; Shiraki, Kaneto; and Sato, Akihiro, 5,591,222, Cl. 623-1.000.

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Shirasaki, Masataka, to Fujitsu Limited. Laser device. 5,592,500, Cl. 372-26.000.

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Shona, Yoshihiro, to Oki Electric Industry Co., Ltd. High-security IC card. 5,592,619, Cl. 395-186.000.

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Onishi, Katsunori; and Shone, Fuchia, 5,592,000, Cl. 357-315.000.

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Shore, Terence M.; and Woodrow, Harold E., to Morgan Construction Company. High speed laying head. 5,590,848, Cl. 242-361.000.

Shores, A. Andrew, to Alpha Fry Limited. Moisture getting composition for hermetic microelectronic devices. 5,591,379, Cl. 252-194.000.

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Toyoda, Tetsuro, 5,591,413, Cl. 422-180.000.

Shu, Han C. Protective needle cover. 5,591,134, Cl. 604-192.000.

Shu, Joseph S., to Seiko Epson Corporation. Method and apparatus for minimizing artifacts in images produced by error diffusion halftoning utilizing ink reduction processing. 5,592,592, Cl. 395-109.000.

Shucosky, Anthony C.: *See*—
Barboza, Steven D.; Hoffman, Charles, Jr.; Kopp, Clinton V.; Schmitt, Robert J.; and Shucosky, Anthony C., 5,591,335, Cl. 210-323.200.

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Shy, James M.: *See*—
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Sibalis, Dan; and Rosen, Sanford, to Drug Delivery Systems Inc. Programmable control mounting system for transdermal drug applicator. 5,591,123, Cl. 604-20.000.

Sickafus, Edward N., to Ford Motor Company. Analog display device with micro-motor drive means. 5,592,037, Cl. 310-40.0MM.

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Siegele, Stephen H.; Noah, Craig M.; and Gregg, John N., to Advanced Delivery & Chemical Systems, Inc. Manifold systems for high purity chemical delivery systems. 5,590,695, Cl. 141-21.000.

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Barthel, Herbert; Daur, Horst; and Schuetz, Hartmut, 5,592,373, Cl. 364-184.000.
Fischer, Peter, 5,591,000, Cl. 415-55.500.
Grewal, Virinder S., 5,591,301, Cl. 156-643.100.
Heining, Joern, 5,592,075, Cl. 323-313.000.
Hill, Axel, 5,592,521, Cl. 376-301.000.
Kilger, Michael, 5,592,567, Cl. 382-199.000.
Kleinheinz, Richard; Muller, Karl P.; Roithner, Klaus; and Tuschiaki, Masakatsu, 5,592,412, Cl. 365-149.000.
Manabe, Atsutaka, 5,592,091, Cl. 324-320.000.
Moehrmann, Karl-Heinz, 5,592,554, Cl. 380-48.000.
Savignac, Dominique; Gleis, Dieter; and Menke, Manfred, 5,592,063, Cl. 320-1.000.

Siemens Medical Systems, Inc.: *See*—
Yao, Jonathan Y., 5,591,983, Cl. 250-505.100.

Siemens Solar GmbH: *See*—
Holdermann, Konstantin; Münzer, Adolf; and Schmidt, Hans-Josef, 5,591,565, Cl. 430-314.000.

Sigma, Incorporated: *See*—
Suzuki, Hirokazu, 5,591,081, Cl. 463-13.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Foresta, Piero; and Ruggiero, Vito, 5,591,777, Cl. 514-653.000.
Quadri, Luisa; Bernardi, Luigi; Bianchi, Giuseppe; Ferrari, Patrizia; Melloni, Piero; and Valentino, Loredana, 5,591,734, Cl. 514-172.000.

Sigmatel, Inc.: *See*—
Jackson, Harry S.; and Margules, Michael A., 5,592,165, Cl. 341-143.000.

Signfix Limited: *See*—
Heard, Robert A. H.; and Waite, Terry, 5,590,504, Cl. 52-730.100.

Signorino, Charles A., to Warner-Jenkinson Company, Inc. Wet powder film-forming compositions. 5,591,455, Cl. 424-490.000.

Sih, Gilbert C., to QUALCOMM Incorporated. System and method for avoiding false convergence in the presence of tones in a time-domain echo cancellation process. 5,592,548, Cl. 379-410.000.

Sikes, Martin: *See*—
Andrus, Bryan D.; Sikes, Martin; Robertson, Christopher D. G.; Armes, Roderick; Slemko, Mark J.; Maduza, Andrew G.; and Nieto, Augustine, 5,591,104, Cl. 482-7.000.

Sikora, George J.: *See*—
LeMaire, Norman J., III; DiFrancesco, Francis J.; DiCarlo, Paul; Naugler, Peter D.; and Sikora, George J., 5,590,570, Cl. 74-579.00R.

Siliconix incorporated: *See*—
Floyd, Brian H.; Hshieh, Fwu-Iuan; and Chang, Mike F., 5,592,005, Cl. 257-331.000.

Siltech Inc.: *See*—
O'Lenick, Anthony J., Jr., 5,591,880, Cl. 556-413.000.

Sim, Young-Ki; Hwang, Tae-Seop; Lee, Mi-Jung; Kwon, Hee-An; and Song, Tea-Heung, to Choongwae Pharmaceutical Co., Ltd. Stereoselective preparation of (E)-enolthioether derivatives. 5,591,881, Cl. 556-427.000.

Simmonds Precision Engine Systems, Inc.: *See—*
DeFreitas, Dennis M., 5,590,517, Cl. 60-39.060.

Simmons, Michael G.: *See—*
Jaco, Pamela J.; Anderson, Mark A.; Simmons, Michael G.; and Montgomery, Terry G., 5,591,516, Cl. 428-253.000.

Simms, Norman, to Industrial Devices, Inc. Illuminated line of light using point light source. 5,590,945, Cl. 362-31.000.

Simon Roofing and Sheet Metal Corp.: *See—*
Vross, Anthony R.; and Fagan, George V., 5,591,244, Cl. 55-356.000.

Simone, Albert: *See—*
Gavin, Michael; Cimini, Catherine M.; Huang, Ming; Kuklo, Anthony, Jr.; Mawhirt, James A.; Marcelino, Eduardo; and Simone, Albert, 5,591,403, Cl. 422-73.000.

Simpson, Francis M.: *See—*
Wallis, Frank S.; Caillat, Jean-Luc; Simpson, Francis M.; Anderson, Gary J.; Rode, Donald W.; and Beck, Norman G., 5,591,014, Cl. 417-310.000.

Simula, Markku: *See—*
Pitkänen, Harri; and Simula, Markku, 5,590,688, Cl. 138-39.000.

Sincock, Thomas F.: *See—*
David, Donald J.; Dickerson, Jerauld L.; and Sincock, Thomas F., 5,591,802, Cl. 525-66.000.

Singh, Yogendra: *See—*
Leppla, Stephen H.; Klimpel, Kurt R.; Arora, Naveen; Singh, Yogendra; and Nicholls, Peter J., 5,591,631, Cl. 435-252.300.

Sinper Corporation: *See—*
Perez, Manuel, 5,592,666, Cl. 395-600.000.

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Conzelmann, Fritz, 5,590,547, Cl. 66-132.00R.

Sithole, Deborah I. Gastrostomy tube. 5,591,128, Cl. 604-96.000.

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Kapaan, Hendrikus J., 5,590,967, Cl. 384-448.000.

SKW Trostberg Aktiengesellschaft: *See—*
Thalhammer, Franz, 5,591,859, Cl. 548-198.000.

Slanker, Daniel W.: *See—*
Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., 5,591,361, Cl. 219-121.820.

Slater, Charles R.; Smith, Kevin W.; Palmer, Matthew A.; Mazzeo, Anthony I.; and Nunez, George, to Symbiosis Corporation. Endoscopic instruments having low friction sheath. 5,591,202, Cl. 606-205.000.

Slemko, Mark J.: *See—*
Andrus, Bryan D.; Sikes, Martin; Robertson, Christopher D. G.; Armes, Roderick; Slemko, Mark J.; Maduza, Andrew G.; and Nieto, Augustine, 5,591,104, Cl. 482-7.000.

Slighton, Jerry L.: *See—*
Hall, Timothy C.; Kemp, John D.; Slighton, Jerry L.; and Sutton, Dennis W., 5,591,605, Cl. 435-70.100.

Sloan, James W.: *See—*
Clark, Minh-Hien N.; and Sloan, James W., 5,592,025, Cl. 257-774.000.

Small, Lyle D.; and Highberger, Gerald, to Chromatic Technologies, Inc. Thermochromic ink formulations, nail lacquer and methods of use. 5,591,255, Cl. 106-21.00A.

Smalley, Richard E., to William Marsh Rice University. Process for making fullerene fibers. 5,591,312, Cl. 204-157.410.

Smart, Michael; and McCay, Steven, to Bell & Howell Phillipsburg Company. Document set accumulator having shaft-mounted multi-grooved pulleys for tool-less adjustment of lateral belt positioning. 5,590,873, Cl. 271-303.000.

SMC Corporation: *See—*
Nagai, Shigekazu, 5,590,580, Cl. 92-33.000.

Smedley, William H.: *See—*
Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,590,782, Cl. 206-528.000.

Smith, A. Gordon: *See—*
Edmunds, Michael V.; MacKenzie, Kenneth E.; Dunn, Joseph; Smith, A. Gordon; and Kase, J. Paul, 5,592,602, Cl. 395-174.000.

Smith & Nephew Richards, Inc.: *See—*
Bernhardt, Andrew; and Morrison, Matthew M., 5,591,166, Cl. 606-61.000.

Smith, Brian K.: *See—*
Sampica, James D.; Campbell, Melvin L.; Benn, Donald L.; and Smith, Brian K., 5,592,288, Cl. 356-62.000.

Smith, B. Scott; and Pearson, Gerry L., to Davox Corporation. Method and system for allocating agent resources to a telephone call campaign. 5,592,543, Cl. 379-265.000.

Smith, Casey P. Liquid fertilizer injection system. 5,590,611, Cl. 111-127.000.

Smith, J. E. Howard: *See—*
Wagner, John R.; and Smith, J. E. Howard, 5,590,667, Cl. 131-291.000.

Smith, John W.: *See—*
DiStefano, Thomas H.; Smith, John W.; Karavakis, Konstantine N.; Kovac, Zlata; and Fjelstad, Joseph, 5,590,460, Cl. 29-830.000.

Smith, Kevin J.: *See—*
Miller, Ronald B.; Leslie, Stewart T.; Malkowska, Sandra T. A.; Smith, Kevin J.; Wimmer, Walter; Winkler, Horst; Hahn, Udo; and Prater, Derek A., 5,591,452, Cl. 424-468.000.

Smith, Kevin M.: *See—*
Pandey, Ravindra K.; Dougherty, Thomas J.; Smith, Kevin M.; and Shiau, Fuu-Yau, 5,591,847, Cl. 540-472.000.

Smith, Kevin W.: *See—*
Slater, Charles R.; Smith, Kevin W.; Palmer, Matthew A.; Mazzeo, Anthony I.; and Nunez, George, 5,591,202, Cl. 606-205.000.

Smith, Lloyd M.: *See—*
Ji, Husmin; and Smith, Lloyd M., 5,591,841, Cl. 536-25.400.

Smith, Lowell S.: *See—*
Venkataramani, Venkat S.; and Smith, Lowell S., 5,591,372, Cl. 252-62.90R.

Smith, Mark A.; Sterner, John; and Bliven, Robert P., to Hewlett-Packard Company. Electronic device with identification card receptacle. 5,592,361, Cl. 361-679.000.

Smith, Rory J. M.; Little, Gillian R.; and Shelley, Nicholas S., to Welland Medical Limited. Drainage bag. 5,591,144, Cl. 604-327.000.

Smith, William L.: *See—*
Deline, James E.; Arbogast, James W.; Foland, Lafayette D.; and Smith, William L., 5,591,378, Cl. 252-186.380.

SmithKline Beecham Corporation: *See—*
Badger, Alison M.; Bridger, Gary J.; and Schwartz, David A., 5,591,748, Cl. 514-278.000.
Raba, Charles E.; and Gabriele, Joseph A., 5,590,818, Cl. 222-575.000.

Smits, Johannes F. G.: *See—*
Berkers, Antonius J. H.; Smits, Johannes F. G.; and Van De Ven, Antonius A. P., 5,590,995, Cl. 414-357.000.

Smolensky, Leo A.: *See—*
Altman, Ralph F.; Wysk, S. Ronald; Smolensky, Leo A.; and Easom, Bruce H., 5,591,253, Cl. 96-61.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Keller, Karl; Hamraths, Konrad; Afflerbach, Erhard; and Klein, Dieter, 5,590,557, Cl. 72-238.000.

Snelling, Christopher, to Xerox Corporation. Filtered photoreceptor. 5,591,553, Cl. 430-46.000.

Snyder, Donald R.: *See—*
Franson, Nancy M.; and Snyder, Donald R., 5,591,456, Cl. 424-494.000.

Snyder, James G., to Owens Corning Fiberglas Technology, Inc. Apparatus for reinforcing a fiber producing spinner. 5,591,459, Cl. 425-8.000.

Snyder, Robert: *See—*
Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,591,369, Cl. 219-633.000.
Matsen, Marc R.; Gregg, Paul S.; Martinson, Howard; and Snyder, Robert, 5,591,370, Cl. 219-645.000.

Soberino, Emilio R.: *See—*
Millan, Jose; Falco, Desiderio; and Soberino, Emilio R., 5,590,962, Cl. 366-248.000.

Sobr, John: *See—*
Couch, Richard W., Jr.; Sanders, Nicholas A.; Luo, Lifeng; and Sobr, John, 5,591,357, Cl. 219-121.390.

Societe Anonyme dite: Aerospatiale Societe Nationale Industrielle: *See—*
Chevalier, Alain; and Bouchez, Marc, 5,590,705, Cl. 165-9.000.

Societe National D'Etdue et de Construction de Moteurs D'Aviation S.N.E.C.M.A.: *See—*
Desaulty, Michel A. A.; Sandelis, Denis J. M.; and Schroer, Pierre M. V. E., 5,590,531, Cl. 60-752.000.

Socman, Hö: *See—*
Takiguchi, Hideki; Kashiwagi, Hiroshi; Tsuji, Nobuaki; Socman, Hö; and Heki, Katsuhiko, 5,591,570, Cl. 430-567.000.

Sodomin, Joseph F., III: *See—*
Buchanan, John S.; Mathias, Mark F.; Sodomin, Joseph F., III; and Teitman, Gerald J., 5,591,417, Cl. 423-210.000.

Soejarto, Doel: *See—*
Boyd, Michael R.; Cardellina, John H., II; Gustafson, Kirk R.; McMahon, James B.; Fuller, Richard W.; Cragg, Gordon M.; Kashman, Yoel; and Soejarto, Doel, 5,591,770, Cl. 514-453.000.

Sofamor, S.N.C.: *See—*
Jackson, Roger P., 5,591,165, Cl. 606-61.000.
Laurain, Jean-Marie; DeWald, Ronald L.; D'Amore, Jean-Francois; and Deseuvillers, Guy, 5,591,167, Cl. 606-61.000.

Sohda, Takashi; Ikeda, Hitoshi; and Momose, Yu, to Takeda Chemical Industries, Ltd. Tetrazole derivatives, their production and use. 5,591,862, Cl. 548-235.000.

Sohma, Hiroshi: *See—*
Kobayashi, Kiyotaka; Izaki, Toshihiko; Sohma, Hiroshi; and Takeshita, Yukitaka, 5,592,252, Cl. 396-380.000.

Sokol, Patricia T.: *See—*
Ziai, Mohammad R.; Sokol, Patricia T.; and Chandra, Manik, 5,591,824, Cl. 530-350.000.

Solar Turbines Incorporated: *See—*
Boyd, Gary L.; and Shaffer, James E., 5,591,003, Cl. 415-209.200.

Solomon, Larry R.: *See—*
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,591,440, Cl. 424-227.100.

Sone, Shigeru: *See—*
Kato, Senji; Endo, Kouji; Sone, Shigeru; Goto, Atsushi; and Ohkawa, Nobuhisa, 5,590,632, Cl. 123-480.000.

Soneda, Mitsuo; and Hashiguchi, Akihiko, to Sony Corporation. Memory cell circuit independently controlled in writing and reading. 5,592,414, Cl. 365-154.000.

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Song, Tea-Heung: *See—*
Sim, Young-Ki; Hwang, Tae-Seop; Lee, Mi-Jung; Kwon, Hee-An; and Song, Tea-Heung, 5,591,881, Cl. 556-427.000.

Song, Young J.: *See—*
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Sony Corporation: *See—*
Balsom, James, 5,592,596, Cl. 395-117.000.
Fujikawa, Kazuhide; and Komatsu, Eiji, 5,591,660, Cl. 437-53.000.
Hara, Nobuyuki; and Tagami, Shigekatsu, 5,592,239, Cl. 348-771.000.
Harada, Yoshio; Takamatsu, Hiroyuki; Shimada, Toshiyasu; and Yamashita, Takanori, 5,591,966, Cl. 250-239.000.
Kita, Tetsuya; and Koizumi, Makoto, 5,592,241, Cl. 348-823.000.
Komatsu, Nobuo; Kai, Ikuyo; Konishi, Nami; Iwasawa, Naozumi; and Furusawa, Satoru, 5,591,562, Cl. 430-280.100.
Nakamatsu, Akira; and Suzuki, Tomio, 5,592,196, Cl. 345-150.000.
Ogawa, Tohru, 5,591,566, Cl. 430-325.000.
Saitoh, Hiroshi; and Takahashi, Hideki, 5,592,446, Cl. 369-44.270.
Sameshima, Toshiyuki; Hara, Masaki; Sano, Naoki; Gosain, Dharam Pal; and Usui, Setsuo, 5,591,653, Cl. 437-40.000.
Shimada, Mitsuhiro, 5,592,301, Cl. 386-117.000.
Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiro; and Yanagida, Toshiharu, 5,591,302, Cl. 156-661.110.
Shinozaki, Kenji; Hirano, Hideki; Kawasumi, Koichi; Asai, Nobutoshi; Tomita, Hidemi; Sato, Shuji; Ogata, Masanori; and Shiota, Hiroyuki, 5,592,208, Cl. 347-171.000.
Soneda, Mitsuo; and Hashiguchi, Akihiko, 5,592,414, Cl. 365-154.000.
Sugimoto, Emi; Yoshio, Akira; and Ito, Yoshinori, 5,591,264, Cl. 118-320.000.
Takamura, Yoji; and Endo, Hiroki, 5,592,223, Cl. 348-309.000.
Tobita, Minoru; and Funahashi, Takeshi, 5,592,454, Cl. 369-58.000.
Tsuruoka, Tatsuya, 5,592,344, Cl. 360-66.000.
Yamagami, Tamotsu; Watanabe, Tetsu; and Sako, Yoichiro, 5,592,465, Cl. 369-275.300.
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, 5,592,450, Cl. 369-48.000.
Yoshinobu, Hitoshi; and Saito, Junya, 5,592,213, Cl. 348-13.000.

Sony Electronics Inc.: *See—*
Balsom, James, 5,592,596, Cl. 395-117.000.

Sorbent Products Co., Inc.: *See—*
Hobin, Michael P.; Johnston, Milo; Johnson, Mark; and Clement, John, 5,591,333, Cl. 210-242.400.

Sorevco, Inc.: *See—*
Vigeant, Andre F.; and Bernard, Alain, 5,591,534, Cl. 428-612.000.

Sorvall Products, L.P.: *See—*
Rosnanauskas, William A., 5,591,114, Cl. 494-20.000.

Soshi, Isao: *See—*
Nakamura, Toshiyuki; Soshi, Isao; Miyamoto, Hidenori; and Wakabayashi, Hiroshi, 5,592,249, Cl. 396-315.000.

Souders, Steven L.; and Frost, Colin, to Davidson Textron Inc. Method of making a fibrous headliner by compression molding. 5,591,289, Cl. 156-148.000.

Soundwich, Inc.: *See—*
Moore, Dan T., III; Moore, Austin W.; and Wheeler, Maurice E., 5,590,524, Cl. 60-323.000.

Southco, Inc.: *See—*
Holtman, Eli J.; and McCormack, Edward A., 5,590,921, Cl. 292-257.000.

Southern Research Institute: *See—*
Montgomery, John A.; and Secrist, John A., III, 5,591,722, Cl. 514-45.000.
Tucker, James R., 5,591,913, Cl. 73-628.000.

Southpac Trust International, Inc.: *See—*
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,590,508, Cl. 53-399.000.

Southwestern Bell Technology Resources, Inc.: *See—*
Fleischer, Harold C., III; Boeckman, Michael W.; and Merin, S. James, 5,592,541, Cl. 379-211.000.

SP Water Sports, Inc.: *See—*
Lehman, Peter, 5,591,059, Cl. 441-68.000.

Spacetec IMC Corporation: *See—*
Hilton, John A., 5,591,924, Cl. 73-862.043.

Spalvieri, Arnaldo: *See—*
Guglielmi, Franco; Luschi, Carlo; and Spalvieri, Arnaldo, 5,592,516, Cl. 375-347.000.

Sparks, Alison: *See—*
Bronstein, Irena; Edwards, Brooks; Martin, Christopher; Sparks, Alison; and Voyta, John C., 5,591,591, Cl. 435-7.400.

Spears, William E., Jr., to Church & Dwight Co., Inc. Blasting apparatus and method for blast cleaning a solid surface. 5,591,064, Cl. 451-2.000.

Speed, Robin C., to International Business Machines Corporation. Printing in data processing systems. 5,592,593, Cl. 395-110.000.

Spencer, Jeffrey C., to General Motors Corporation. Lift-off door hinge. 5,590,441, Cl. 16-264.000.

Spencer, Michael A., to AT&T Global Information Solutions Company. Apparatus and method for equalizing the signal strengths of different scan lines. 5,591,954, Cl. 235-467.000.

Spiess, Gary N., to Norand Corporation. Adaptive display refresh and data compression in a radio frequency environment. 5,592,512, Cl. 375-240.000.

Spievack, Alan R.; and de Toledo, Fernando A., to Genesis Orthopedics. Intramedullary bone cutting saw. 5,591,170, Cl. 606-82.000.

Spisak, Michael J.; and Nance, Roy A., to United States of America, Energy. Method and apparatus for inspecting conduits. 5,591,912, Cl. 73-623.000.

Spitzer, Richard. Microstructure array and activation system therefor. 5,592,413, Cl. 365-151.000.

Spracklen, John E.: *See—*
Popeacu, Valeri; Schultz, Merle A.; Gibson, Gary A.; Spracklen, John E.; and Lightner, Bruce D., 5,592,636, Cl. 395-586.000.

Springett, Brian E.: *See—*
Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.

Springs Industries, Inc.: *See—*
Jaco, Pamela J.; Anderson, Mark A.; Simmons, Michael G.; and Montgomery, Terry G., 5,591,516, Cl. 428-253.000.

Spronken, John R., to Semper Sealing Systems Inc. Non-composite panel. 5,590,503, Cl. 52-677.000.

Square D Company: *See—*
Levran, Alexander; Nowosielski, Joseph M.; Ton-That, Giao M.; and Rajagopalan, Ramamoorthy, 5,592,137, Cl. 336-195.000.

St. Vincents Institute of Medical Research Limited: *See—*
Kemp, Bruce E.; Hillyard, Carmel J.; Rylatt, Dennis B.; and Bundesen, Peter G., 5,591,572, Cl. 435-5.000.

Stacy, Timothy D.: *See—*
Hanson, Douglas A.; and Stacy, Timothy D., 5,590,954, Cl. 362-321.000.

Staiert, Richard W.; and Wildman, James E., to FMC Corp. Break action cannon. 5,591,932, Cl. 89-33.030.

Staktek Corporation: *See—*
Roane, Jerry M., 5,592,364, Cl. 361-735.000.

Stall, Eugen; and Busch, Winfried, to GKN Automotive AG. Triopd constant velocity universal joint incorporating a retention system for the roller assemblies. 5,591,085, Cl. 464-111.000.

Stam, Hein: *See—*
Musters, Wouter; Stam, Hein; Suykerbuyk, Maria E.; Visser, Jacob; and Verbakel, Johannes M., 5,591,620, Cl. 435-201.000.

Standard Oil Company, The: *See—*
Blum, Patricia R.; Cirjak, Larry M.; Peppera, Marc A.; and Paparizos, Christos, 5,591,688, Cl. 502-330.000.
Mazanec, Terry J.; Cable, Thomas L.; Frye, John G., Jr.; and Kliewer, Wayne R., 5,591,315, Cl. 205-462.000.

Standke, Burkhard; Rauleder, Hartwig; Seiler, Claus-Dietrich; Kötzsch, Hans-Joachim; and Peeters, Hermann, to Hüls Aktiengesellschaft. Organosilane polycondensation products. 5,591,818, Cl. 528-38.000.

Stanley, Kimberly D.: *See—*
Narayanan, Pallassana V.; and Stanley, Kimberly D., 5,591,140, Cl. 604-269.000.

Stanton, Leslie G.; and Krause, Kenneth, to MEMC Electronic Materials, Inc. Apparatus and method for semiconductor wafer edge inspection. 5,592,295, Cl. 356-426.000.

Starkey, James A., to Borland International Inc. Database server system with methods for alerting clients of occurrence of database server events of interest to the clients. 5,592,664, Cl. 395-600.000.

Starner, William E., to Air Products and Chemicals, Inc. Reactive accelerators for amine cured epoxy resins. 5,591,812, Cl. 525-526.000.

Starr, Christopher M.: *See—*
Miller, Harvey I.; Klock, John C.; and Starr, Christopher M., 5,591,839, Cl. 536-23.700.

State of Israel, Ministry of Defence, Armament Development Authority: *See—*
Dekel, Ehud, 5,590,846, Cl. 242-158.00R.

State of Israel Rafael-Armament Development Authority: *See—*
Don-Yehiya, Yehuda, 5,590,973, Cl. 403-325.000.

Stauber, Hans-Ulrich, to Ferag AG. Apparatus for the wire-stapling of printed products. 5,590,828, Cl. 227-81.000.

St. Denis, Gregory A.: *See—*
Farmer, Ian; and St. Denis, Gregory A., 5,591,094, Cl. 474-117.000.

Steele, Thomas W.: *See—*
Peterson, Randy S.; Steele, Thomas W.; and Walker, Robert D., 5,590,482, Cl. 37-403.000.

Stefaniak, Gunter: *See—*
Obermeier, Reinhold; and Stefaniak, Gunter, 5,591,877, Cl. 554-226.000.

Steffens, Walter L.: *See—*
Wilkins, John J.; and Steffens, Walter L., 5,590,758, Cl. 198-890.100.

Stegemoeller, Calvin L.: *See—*
Kilheffer, Kenneth E.; Stegemoeller, Calvin L.; and Hays, Lesley T., 5,590,976, Cl. 404-72.000.

Stein, Juergen; and Rosen, Robert. Agitator ball mill. 5,590,841, Cl. 241-171.000.

Stein, Peter J.; Bahlavouni, Armen; Fitzgerald, Michael G.; and Andersen, Douglas W., to Scientific SOlutions, Inc. Weatherproof sensing apparatus with rotatable sensor. 5,591,907, Cl. 73-170.160.

Steinberg, Henry: *See—*
Rabinovich, Daniel; and Steinberg, Henry, 5,592,621, Cl. 395-200.020.

Steinke, Richard A.: *See—*
Jones, James T.; Kerney, Larry M.; and Steinke, Richard A., 5,591,412, Cl. 422-171.000.

Steinsträsser, Axel: *See—*

Bosslet, Klaus; Hermentin, Peter; Seemann, Gerhard; Kuhlmann, Ludwig; and Steinsträsser, Axel, 5,591,828, Cl. 530-387.300.

Sampsin, John L.; and Wexell, Dale R., to Corning Incorporated. Phase-separated, non-crystalline opal glasses. 5,591,683, Cl. 501-32.000.

Sena Offshore Limited: *See*—
Recalde, Carlos E., 5,590,915, Cl. 285-119.000.

Stenhede, Jan: *See*—
Jakupovic, Edib; and Stenhede, Jan, 5,591,889, Cl. 562-24.000.

Stephens, Robert D.: *See*—
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.

Sterling Diagnostic Imaging, Inc.: *See*—
Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., 5,591,863, Cl. 548-312.700.

Stern, S. Alexander; Kawakami, Hiroyoshi; Houde, Ajay Y.; and Zhou, Guanghua, to Gas Research Institute. Material and process for separating carbon dioxide from methane. 5,591,250, Cl. 95-51.000.

Sterner, John: *See*—
Smith, Mark A.; Sterner, John; and Bliven, Robert P., 5,592,361, Cl. 361-679.000.

Steudel, Fritz: *See*—
Chang, Kaichiang; Beltran, Fernando; and Steudel, Fritz, 5,592,178, Cl. 342-372.000.

Stevener, Timothy L.: *See*—
Greenway, William C.; Breithaupt, David; Schoppe, Donald W.; Lutz, Norman M.; Beardslee, Andrew W.; Nguyen, Minh N.; and Stevener, Timothy L., 5,592,237, Cl. 348-716.000.

Stevens, Brian, to Merit Medical Systems, Inc. Hemostasis valve with locking seal. 5,591,137, Cl. 604-256.000.

Stevens, Eric G.: *See*—
Gaidzak, Robert M.; Erhardt, Herbert J.; and Stevens, Eric G., 5,591,997, Cl. 257-290.000.

Stevens, Scott A., to Wallace Computer Services, Inc. Personalized envelope assembly for printed publication and method. 5,590,912, Cl. 283-56.000.

Stevenson, Thomas M.: *See*—
Fahmy, Mohamed A. H., deceased; Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., 5,591,764, Cl. 514-403.000.
Harrison, Charles R.; Lahm, George P.; and Stevenson, Thomas M., 5,591,729, Cl. 514-85.000.

Steward & Stevenson Services, Inc.: *See*—
Dearing, Michael P., Sr.; Bates, Robert A.; Cedillo, Greg L.; and Vicknair, Bruce A., 5,590,958, Cl. 366-20.000.

Stewart, Brett B., to Advanced Micro Devices, Inc. Wireless communications privacy method and system. 5,592,555, Cl. 380-49.000.

Stichting Energieonderzoek Centrum Nederland: *See*—
Engelen, Charles W. R.; and Van Loeuwen, Willem F., 5,591,345, Cl. 210-640.000.

Stik-Tak, Ltd.: *See*—
Goldberg, Ziv, 5,590,884, Cl. 473-514.000.

Stitt, R. Mark, II: *See*—
Mullins, Edward; Burt, Rodney T.; Meusel, Walter B.; and Stitt, R. Mark, II, 5,592,124, Cl. 330-308.000.

Stockley, Henry W., III; and Krebs, Art T., to W. R. Grace & Co.-Conn. Method of shrinking film to apply lidstock and package made therefrom. 5,591,468, Cl. 426-106.000.

Stoddart, John; and Cataldo, George, to Styro-Stop, Inc. Insulation barrier and a method of making an insulation barrier. 5,590,501, Cl. 52-408.000.

Stoeger, William G.: *See*—
Couture-Dorschner, Laurie; Hirt, Dede A.; Stoeger, William G.; and Dilnik, Rebecca L., 5,591,147, Cl. 604-369.000.

Stoevhase, Bent: *See*—
Grant, Robert; Stoevhase, Bent; Purohit, Robin; Sullivan, Gregory T.; and Book, David, 5,592,472, Cl. 370-351.000.

Stokes, William T. Projectable timer. 5,590,944, Cl. 353-122.000.

Stoller, Marshall L.; and Wolf, James S., Jr., to University of California, The Regents of the. Inhibition of urinary calculi growth. 5,591,730, Cl. 514-108.000.

Stone Container Corporation: *See*—
Crews, Mitchell S.; Kuhn, Wayne H.; and Bryll, M. Scott, 5,590,606, Cl. 108-51.300.

Stone, Corbett W.; Zlock, Stephen W.; and Nicholas, David A., to United States Surgical Corporation. Surgical suturing apparatus with loading mechanism. 5,591,181, Cl. 606-144.000.

Stone, David E.: *See*—
Chen, Weilin; Martin, James W.; Parrish, Ronald D.; Shook, Frankie S.; and Stone, David E., 5,592,683, Cl. 395-872.000.

Stone Manufacturing & Supply Co., Inc.: *See*—
Henderson, Lance S.; and Parks, Randall C., 5,591,176, Cl. 606-137.000.

Stonemetz, Gary L.: *See*—
Burkholder, Shawn W.; and Stonemetz, Gary L., 5,591,035, Cl. 439-79.000.

Storeck, Arnold, to Degussa Aktiengesellschaft. Paper containing a filler. 5,591,307, Cl. 162-181.600.

Storms, Wayne W. Spring motor assembly. 5,590,741, Cl. 185-10.000.

Storti, Sandro: *See*—
Consiglieri, Franco; Wolfsgruber, Arturo; and Storti, Sandro, 5,592,485, Cl. 340-825.060.

Straeter, Joseph G.: *See*—
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,590,508, Cl. 53-399.000.

Straeter, William F.: *See*—
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,590,508, Cl. 53-399.000.

Straford, Peter W.; and Driver, Michael J., to Biocompatibles Limited. Process for preparing organophosphates useful for increasing the ocular haemo- and biocompatibility of synthetic polymers. 5,591,882, Cl. 558-87.000.

Strang, Clifford E., Jr., to Adaptec, Inc. Method and structure for locating and skipping over servo bursts on a magnetic disk. 5,592,348, Cl. 360-77.080.

StrathAyr Pty. Limited: *See*—
Casimaty, Gabriel; Brouwer, Gerardus J.; and Fraser, Ian, 5,590,488, Cl. 47-1.010.

Strauss, Carl R.: *See*—
Rusek, Stanley J., Jr.; Fisher, Albert B.; and Strauss, Carl R., 5,591,505, Cl. 428-69.000.

Strickberger, S. Adam: *See*—
Cain, Charles A.; Ebbini, Emad S.; and Strickberger, S. Adam, 5,590,657, Cl. 128-660.030.

Stricker, Urban; and Siebert, Martin. Process and devices for sorting thermoplastic components from a mixed stream. 5,590,789, Cl. 209-11.000.

Strnad, George. Quick-release retaining collar assembly for a barbell. 5,591,109, Cl. 482-107.000.

Strub, Jürg; and Gasser, Ruedy, to Maxs AG. Assembly kit for a filter coffee maker. 5,590,581, Cl. 99-302.00R.

Strupczewski, Joseph T.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., to Hoechst-Roussel Pharmaceuticals, Inc. (4-heteroaryl)-1-[(2,3-dihydro-1H-isoindol-2-yl)alkyl] piperidines and related compounds and their therapeutic utility. 5,591,745, Cl. 514-254.000.

Strutz, Heinz: *See*—
Kulpe, Jürgen; and Strutz, Heinz, 5,591,893, Cl. 562-504.000.

Stuart, Andrew T. B.: *See*—
Miller, Alistair I.; Stuart, Andrew T. B.; and Everatt, Allan E., 5,591,319, Cl. 205-627.000.

Stubley, Peter R.: *See*—
Printz, Harry W.; and Stubley, Peter R., 5,592,162, Cl. 341-107.000.

Stucky, Gerhard: *See*—
Kiener, Andreas; Glöckler, Rainer; and Stucky, Gerhard, 5,591,853, Cl. 544-334.000.

Stuhlfelner, Friedbert; and Valio, Harri, to Nokia Technology GmbH. Sound reproduction device. 5,592,558, Cl. 381-18.000.

Styro-Stop, Inc.: *See*—
Stoddart, John; and Cataldo, George, 5,590,501, Cl. 52-408.000.

Su, Yuh-Jia: *See*—
Shamouilian, Shamouil; Cameron, John F.; Deshpandey, Chandra; and Su, Yuh-Jia, 5,592,358, Cl. 361-234.000.

Subramanian, Sundaresa V.: *See*—
Lee, Ching-Pang; Subramanian, Sundaresa V.; and Durgin, George A., 5,591,007, Cl. 416-97.00R.

Suda, Hiroyuki: *See*—
Kojiri, Katsuhisa; Kondo, Hisao; Arakawa, Hiroharu; Ohkubo, Mitsuru; and Suda, Hiroyuki, 5,591,842, Cl. 536-27.100.

Suda, Makoto: *See*—
Saino, Yushi; Iwasaki, Akio; and Suda, Makoto, 5,591,633, Cl. 435-252.300.

Sudo, Kazuhisa: *See*—
Misago, Naomi; and Sudo, Kazuhisa, 5,592,267, Cl. 399-62.000.

Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Miktio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, to Kajima Corporation; and Kabushiki Kaisha FRC. Method of making window frame for concrete wall panel. 5,591,286, Cl. 156-71.000.

Suenaga, Yutaka: *See*—
Ishiyama, Toshiro; and Suenaga, Yutaka, 5,592,329, Cl. 359-399.000.

Sueoka, Satoshi, to Molex Incorporated. Shielded electrical connector. 5,591,050, Cl. 439-607.000.

Sugahara, Hirohide: *See*—
Takahashi, Hajime; Sugahara, Hirohide; and Kabemoto, Akira, 5,592,624, Cl. 395-200.070.

Sugawara, Kohki: *See*—
Saitou, Yuuji; Mouko, Minoru; Yoshida, Suguru; and Sugawara, Kohki, 5,591,359, Cl. 219-121.640.

Sugaya, Toshihiro; and Honguh, Yoshinori, to Kabushiki Kaisha Toshiba. Optical disk and optical disk apparatus. 5,592,464, Cl. 369-275.400.

Sugihara, Kazuyoshi: *See*—
Komano, Haruki; Matsuura, Akira; Nakamura, Hiroko; and Sugihara, Kazuyoshi, 5,591,970, Cl. 250-309.000.

Sugimori, Katsunori; and Sakamoto, Hiroshi, to Nippon Electric Industry Co., Ltd. Apparatus for non-contacting feeding of high frequency power. 5,592,367, Cl. 363-17.000.

Sugimoto, Emi; Yoshio, Akira; and Ito, Yoshinori, to Sony Corporation. Spin coating device. 5,591,264, Cl. 118-320.000.

Sugimoto, Satoru: *See*—
Hattori, Masafumi; Ikeda, Chikako; Sugimoto, Satoru; Saito, Tatsuoki; Yamada, Hitoshi; and Akashige, Btsushi, 5,591,792, Cl. 524-271.000.

Sugimoto, Shinichi: *See*—
Kawaguchi, Hisao; Sugimoto, Shinichi; and Tagusa, Yasunobu, 5,592,199, Cl. 345-206.000.

Sugimoto, Takayuki; Tagusa, Yasunobu; and Kawaguchi, Hisao, to Sharp Kabushiki Kaisha. Panel assembly structure and panel assembling method capable of achieving a highly reliable connection of electrode terminals even when the electrode terminals have a fine pitch. 5,592,365, Cl. 361-789.000.

Sugimoto, Toshiyuki: *See*—
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,611, Cl. 435-100.000.
Maruta, Kazuhiko; Kubota, Michio; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,591,612, Cl. 435-100.000.

Sugino, Mitsutaka; and Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electrically assisted power steering system for motor vehicles. 5,590,732, Cl. 180-444.000.

Sugisaka, Takayuki: *See*—
Iida, Makio; Shibata, Tadashi; Sugisaka, Takayuki; Miura, Shoji; and Sakakibara, Toshio, 5,592,015, Cl. 257-524.000.

Sugishita, Shunichi: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Miktio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.

Sugita, Toshihiko: *See*—
Takamine, Yoshio; Suzuki, Kei; and Sugita, Toshihiko, 5,592,655, Cl. 395-500.000.

Sugiura, Kazushi: *See*—
Arai, Michio; Inushima, Takashi; Codama, Mitsufumi; Sugiura, Kazushi; Takayama, Ichiro; Kobori, Isamu; Yamauchi, Yukio; and Sakamoto, Naoya, 5,591,988, Cl. 257-59.000.

Sugiura, Seiya: *See*—
Sumiya, Takashi; Tanaka, Iwao; Shibatsuji, Kunio; Kurome, Hirokazu; Sugiura, Seiya; and Ooe, Wataru, 5,591,518, Cl. 428-318.400.

Sugiura, Takashi, to Canon Kabushiki Kaisha. Image processing method and apparatus. 5,592,310, Cl. 358-501.000.

Sugiyama, Kenji, to Victor Company of Japan, Ltd. Video signal interframe predictive coding apparatus using motion detection. 5,592,229, Cl. 348-416.000.

Sugiyama, Nobuo: *See*—
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,591,927, Cl. 84-171.000.

Suguro, Kyoichi: *See*—
Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tamura, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamihaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.

Suhara, Masaaki: *See*—
Kawafune, Kazunori; Suhara, Masaaki; and Hiraki, Masahito, 5,591,013, Cl. 417-271.000.

Sullivan, Donald P.: *See*—
Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.

Sullivan, Gregory T.: *See*—
Grant, Robert; Stoevhase, Bent; Purohit, Robin; Sullivan, Gregory T.; and Book, David, 5,592,472, Cl. 370-351.000.

Sullivan, James J. Syringe stroke controller with elastically enabled single axis slide adjustment and finger-molded pistol grip. 5,591,135, Cl. 604-211.000.

Sullivan, Michael J.; and Weiss, Robert A., to Lisco, Inc. Golf ball cover compositions. 5,591,803, Cl. 525-196.000.

Sullivan, Patrick K.; Vithanage, Dayananda; and Bucher, Warren E., to Oceanit Laboratories, Inc. Flexible pipe diffuser and method of using the same. 5,590,979, Cl. 405-36.000.

Sullivan, Paul F., to Polaroid Corporation. Control system utilizing an adaptive predictor to compensate for harmonic distortion. 5,592,346, Cl. 360-77.040.

Sumitomo Chemical Co., Ltd: *See*—
Suzuki, Naoko; Nakanishi, Hirotoshi; and Nagase, Kyouko, 5,591,871, Cl. 549-299.000.

Sumitomo Electric Industries, Ltd.: *See*—
Okawa, Yasushi; and Isshiki, Isao, 5,591,906, Cl. 73-146.500.
Sakamoto, Takeshi; Hara, Koji; and Harada, Akira, 5,591,542, Cl. 429-192.000.
Takata, Kensaku; Takano, Satoshi; Inoue, Nori; Itoh, Mitsuru; Okumura, Hitoshi; and Suzuki, Masaji, 5,591,042, Cl. 439-354.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Asami, Hiroshi; and Suzuki, Mitsuru, 5,590,533, Cl. 62-6.000.

Sumitomo Metal Industries, Ltd.: *See*—
Igarashi, Masaaki; Senba, Hiroyuki; and Miyata, Kaori, 5,591,391, Cl. 420-38.000.

Sumitomo Osaka Cement Co., Ltd.: *See*—
Takamiya, Naoki; Nakao, Makoto; Yazawa, Akira; and Wakabayashi, Atumi, 5,591,517, Cl. 428-304.400.

Sumitomo Rubber Industries, Ltd.: *See*—
Asano, Kazuo, 5,591,280, Cl. 152-209.00R.
Fukumoto, Takahiro; Nakada, Yoko; and Mizuno, Yoichi, 5,591,794, Cl. 524-447.000.

Sumitomo Wiring Systems, Ltd.: *See*—
Okada, Hajime; Kobayashi, Masaaki; Fujitani, Mitsuhiro; and Konoya, Hisashi, 5,591,054, Cl. 439-884.000.
Takata, Kensaku; Takano, Satoshi; Inoue, Nori; Itoh, Mitsuru; Okumura, Hitoshi; and Suzuki, Masaji, 5,591,042, Cl. 439-354.000.

Sumiya, Takashi; Tanaka, Iwao; Shibatsuji, Kunio; Kurome, Hirokazu; Sugiura, Seiya; and Ooe, Wataru, to Toray Industries, Inc. Polyester film for use of a laminate with a metal plate. 5,591,518, Cl. 428-318.400.

Sun Microsystems, Inc.: *See*—
Rogers, Alan C., 5,592,370, Cl. 363-60.000.
Sutherland, Ivan E., 5,592,103, Cl. 326-17.000.
Yang, Robert, 5,592,679, Cl. 395-800.000.

Sundell, Robert E.: *See*—
Savkar, Sudhir D.; and Sundell, Robert E., 5,590,550, Cl. 68-133.000.

Sundstrand Corporation: *See*—
Kandil, Magdy A., 5,590,525, Cl. 60-460.000.

Sunpower, Inc.: *See*—
Redlich, Robert W., 5,592,073, Cl. 323-300.000.

Suppelsa, Anthony B.; and Dorinski, Dale W., to Motorola, Inc. Housing with integral opening feature. 5,591,364, Cl. 219-201.000.

Surendran, Srinivasan: *See*—
Minuhin, Vadim B.; Kovner, Vladimir; and Surendran, Srinivasan, 5,592,340, Cl. 360-46.000.

Susawa, Takashi; Ioaki, Keiji; Tamai, Hideo; Shimizu, Yoshihiko; Shiraki, Kaneto; and Sato, Akihiro. Method of manufacturing a device to dilate ducts in vivo. 5,591,222, Cl. 623-1.000.

Sutherland, Ivan E., to Sun Microsystems, Inc. System for fast switching of time critical input signals. 5,592,103, Cl. 326-17.000.

Sutton, Dennis W.: *See*—
Hall, Timothy C.; Kemp, John D.; Slightom, Jerry L.; and Sutton, Dennis W., 5,591,605, Cl. 435-70.100.

Suwabe, Shigekazu: *See*—
Yoshizawa, Yoshihiro; Bizen, Yoshio; Suwabe, Shigekazu; Yamauchi, Kiyotaka; and Nishiyama, Toshikazu, 5,591,276, Cl. 148-304.000.

Suykerbuyk, Maria E.: *See*—
Musters, Wouter; Stam, Hein; Suykerbuyk, Maria E.; Visser, Jacob; and Verbakel, Johannes M., 5,591,620, Cl. 435-201.000.

Suzuki, Eiichi: *See*—
Hirose, Mifune; Suzuki, Eiichi; Sakaki, Mamoru; and Katayama, Masato, 5,591,514, Cl. 428-211.000.

Suzuki, Hirokazu, to Sigma, Incorporated. Card game amusement device. 5,591,081, Cl. 463-13.000.

Suzuki, Hiroyoshi; Okada, Akira; and Moronaga, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Channel forming fuel permittivity sensor with automatic temperature compensation. 5,592,098, Cl. 324-663.000.

Suzuki, Kei: *See*—
Takamine, Yoshio; Suzuki, Kei; and Sugita, Toshihiko, 5,592,655, Cl. 395-500.000.

Suzuki, Kenji; Mukoyama, Yoshiyuki; and Ito, Toshihiko, to Hitachi Chemical Company, Ltd. Amide group-costaining diisocyanates and amide group-containing epoxy resins. 5,591,813, Cl. 525-528.000.

Suzuki, Kenji: *See*—
Kasuga, Masao; Suzuki, Kenji; Suzuki, Makoto; and Suzuki, Minako, 5,592,041, Cl. 310-316.000.

Suzuki, Makoto: *See*—
Kasuga, Masao; Suzuki, Kenji; Suzuki, Makoto; and Suzuki, Minako, 5,592,041, Cl. 310-316.000.

Suzuki, Masaji: *See*—
Takata, Kensaku; Takano, Satoshi; Inoue, Nori; Itoh, Mitsuru; Okumura, Hitoshi; and Suzuki, Masaji, 5,591,042, Cl. 439-354.000.

Suzuki, Minako: *See*—
Kasuga, Masao; Suzuki, Kenji; Suzuki, Makoto; and Suzuki, Minako, 5,592,041, Cl. 310-316.000.

Suzuki, Mitsuru: *See*—
Asami, Hiroshi; and Suzuki, Mitsuru, 5,590,533, Cl. 62-6.000.

Suzuki, Motoyuki; and Suzuki, Yoshio, to Hitachi, Ltd. Access control apparatus for optical disk according change of track pitch. 5,592,448, Cl. 369-44.280.

Suzuki, Naoko; Nakanishi, Hirotoshi; and Nagase, Kyouko, to Sumitomo Chemical Co., Ltd. Bislactone compound and a process for producing the same. 5,591,871, Cl. 549-299.000.

Suzuki, Nobumasa: *See*—
Goto, Soju; Kawasaki, Takashi; Hiramma, Satoshi; Suzuki, Nobumasa; and Shibata, Izumi, 5,592,449, Cl. 369-47.000.

Suzuki, Tadashi: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.

Suzuki, Takuji: *See*—
Aida, Satoshi; Shibata, Mariko; Fujimoto, Katsuhiko; Ishibashi, Yoshiharu; Suzuki, Takuji; Ishihara, Yasutoshi; and Okamoto, Kazuya, 5,590,653, Cl. 128-653.200.

Suzuki, Tomio: *See*—
Nakamatsu, Akira; and Suzuki, Tomio, 5,592,196, Cl. 345-150.000.

Suzuki, Toshiaki; Yamato, Satoshi; Koganezawa, Nobuhiro; and Ozaki, Yuichi, to Nintendo Co., Ltd. Video game/videographics program fabricating system and method with unit based program processing. 5,592,609, Cl. 395-173.000.

Suzuki, Toshiharu; Ozaki, Tatsuhiko; and Matsueda, Hirokazu, to Takemoto Yushi Kabushiki Kaisha. Photocurable resins for stereolithography and compositions containing same. 5,591,563, Cl. 430-284.100.
Suzuki, Tsutomu: *See*—
Uehara, Mitsuyoshi; Yoshihara, Hideo; Suzuki, Tsutomu; Morita, Fumio; and Igarashi, Hiroshi, 5,592,268, Cl. 399-276.000.
Suzuki, Yoshihiko: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Iwadate, Masahiro; Suzuki, Yoshihiko; Kohtani, Hideto; Kutsuwada, Satoru; Koh, Shokyo; and Kuroda, Ken, 5,592,305, Cl. 358-448.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.
Suzuki, Yoshio: *See*—
Suzuki, Motoyuki; and Suzuki, Yoshio, 5,592,448, Cl. 369-44.280.
Suzuki, Yoshiyuki: *See*—
Ishizuka, Daisuke; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Kaneko, Satoshi; Koh, Syokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,280, Cl. 399-410.000.
Kaneko, Satoshi; Kimura, Akiyoshi; Suzuki, Yoshiyuki; Suzuki, Tadashi; Nakamura, Shinichi; Suzuki, Yoshihiko; Nada, Minoru; Kutsuwada, Satoru; Kobayashi, Kenji; Koh, Shokyo; Miyake, Norifumi; and Tashiro, Hirohiko, 5,592,279, Cl. 399-85.000.
Svanberg, Johanna: *See*—
Oulie, Pina; Backlund, Ake; and Svanberg, Johanna, 5,591,303, Cl. 162-19.000.
Swanson, Harry: *See*—
Prospero, Richard M.; Lunde, Erik; Swanson, Harry; and Adams, Lee, 5,590,814, Cl. 221-266.000.
Swedish Mercoring HB: *See*—
Fredriksson, Mattias; and Alnäs, Martin, 5,590,997, Cl. 414-541.000.
Swift, Michael J.: *See*—
Davis, Raymond L.; and Swift, Michael J., 5,592,550, Cl. 380-5.000.
Swift, Thomas R. J.: *See*—
Klein, Lawrence J.; and Swift, Thomas R. J., 5,591,046, Cl. 439-467.000.
Swirbel, Thomas J.: *See*—
Weisman, Douglas H.; Swirbel, Thomas J.; and Arledge, John K., 5,591,480, Cl. 216-13.000.
Syldath, Andreas: *See*—
Schmid, Karl; Giesen, Brigitte; and Syldath, Andreas, 5,591,845, Cl. 536-124.000.
Symbios Logic Inc.: *See*—
Gamble, William H., 5,592,629, Cl. 395-250.000.
Symbiosis Corporation: *See*—
Slater, Charles R.; Smith, Kevin W.; Palmer, Matthew A.; Mazzeo, Anthony L.; and Nunez, George, 5,591,202, Cl. 606-205.000.
Symbol Technologies: *See*—
Krichever, Mark J.; and Metlitsky, Boris, 5,591,952, Cl. 235-462.000.
Synchro-Start Products, Inc.: *See*—
Ryl, Kendall; Hollins, George A.; and Peace, Gregory L., 5,592,356, Cl. 361-154.000.
Synergetic Resources Limited: *See*—
Andreou, Doros, 5,591,947, Cl. 204-157.220.
Szabo, Laszlo, to Alcatel SEL A.G. Radio system. 5,592,469, Cl. 370-342.000.
Szalankiewicz, James J.: *See*—
Walter, Scott A.; Polka, Alan R.; and Szalankiewicz, James J., 5,590,757, Cl. 198-812.000.
Szatkowski, Antoni: *See*—
Rygiel, Ronald; and Szatkowski, Antoni, 5,590,627, Cl. 123-90.160.
Szczyrbowski, Joachim: *See*—
Braatz, Christoph; Szczyrbowski, Joachim; and Zmelty, Anton, 5,591,529, Cl. 428-457.000.
T.L.E.E. Industrial Laser and Electronic Engineering: *See*—
Ehrenmann, Daniel, 5,592,155, Cl. 340-825.720.
T/F Purifiner, Inc.: *See*—
Lefebvre, Byron, 5,591,330, Cl. 210-203.000.
Tabar, Ronald J.: *See*—
Warner, Robert W.; Fitzer, Robert C.; Redmond, David B.; and Tabar, Ronald J., 5,591,530, Cl. 428-480.000.
Tabata, Atsushi: *See*—
Sato, Tatsuya; Tabata, Atsushi; and Kobayashi, Naoaki, 5,591,494, Cl. 427-579.000.
Tabco Technologies, Inc.: *See*—
Barber, Thomas A., Jr.; Kisterskaya, Lioudmila D.; and Kistersky, Leonid L., 5,591,313, Cl. 204-192.120.
Tabusa, Fujio: *See*—
Fujioka, Takafumi; Teramoto, Shuji; Tanaka, Michinori; Shimizu, Hiroshi; Tabusa, Fujio; and Tominaga, Michiaki, 5,591,751, Cl. 514-312.000.
Tac Star Industries, Inc.: *See*—
Moore, Larry, 5,590,486, Cl. 42-103.000.
Tacelli, Christopher B.: *See*—
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.
Tacke, Thomas: *See*—
Bankmann, Martin; Ohmer, Johannes; and Tacke, Thomas, 5,591,873, Cl. 549-503.000.
Tagami, Shigekatsu: *See*—
Hara, Nobuyuki; and Tagami, Shigekatsu, 5,592,239, Cl. 348-771.000.
Tagawa, Takao, to Sharp Kabushiki Kaisha. Display-integrated type tablet device. 5,592,197, Cl. 345-173.000.
Taguchi, Katsuyuki: *See*—
Terauchi, Ikuo; Teranishi, Keiichi; Kazahaya, Mitsuhiro; and Taguchi, Katsuyuki, 5,592,398, Cl. 364-514.00A.
Taguchi, Yutaka; Eda, Kazuo; Onishi, Keiji; and Seki, Shun-ichi, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave filter with different filter portions satisfying complex conjugate relationship of impedances. 5,592,135, Cl. 333-193.000.
Tagusa, Yasunobu: *See*—
Kawaguchi, Hisao; Sugimoto, Shinichi; and Tagusa, Yasunobu, 5,592,199, Cl. 345-206.000.
Sugimoto, Takayuki; Tagusa, Yasunobu; and Kawaguchi, Hisao, 5,592,365, Cl. 361-789.000.
Taheri, Syde; and Leonhardt, Howard J. Apparatus and method for engrafting a blood vessel. 5,591,195, Cl. 606-194.000.
Taheri, Syde A. Transcavitary myocardial perfusion apparatus. 5,591,159, Cl. 606-15.000.
Tahir, Syed Hasan: *See*—
Bolger, Michael B.; Gee, Kelvin W.; Lan, Nancy C.; Purdy, Robert H.; Mirsadeghi, Seid; Tahir, Syed Hasan; and Belelli, Delia, 5,591,733, Cl. 514-172.000.
Tai, Jy-Der D., to Motorola, Inc. Non-volatile register and method for accessing data therein. 5,592,411, Cl. 365-145.000.
Taillon, Michel: *See*—
Gilbert, Sylvain; and Taillon, Michel, 5,590,699, Cl. 144-34.100.
Taira, Yoichi, to International Business Machines Corporation. Device and method for wavelength conversion. 5,592,326, Cl. 359-326.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Asaka, Toshifumi; Kashimura, Masao; Misawa, Yoko; Morimoto, Shigeo; and Hatayama, Katsuo, 5,591,837, Cl. 536-7.400.
Taiwan Hodaka Industrial Co., Ltd.: *See*—
Cheng, Paul, 5,590,869, Cl. 267-132.000.
Taiwan Semiconductor Manufacturing Company Ltd.: *See*—
Chao, Ying-Chen; Shen, Chih-Heng; and Yau, Yi-Dong, 5,591,673, Cl. 437-192.000.
Hsu, Ching-Hsiang; and Liang, Mong-Song, 5,591,650, Cl. 437-21.000.
Wang, Chen-Jong; and Lee, Jin-Yuan, 5,591,664, Cl. 437-60.000.
Tajima, Makoto; Araki, Shinji; and Beppu, Kei, to Calsonic Corporation. Housingless type oil cooler and method for producing the same. 5,590,709, Cl. 165-167.000.
Tajiri, Akihiro: *See*—
Ikeda, Susumu; Isobe, Toshimi; Inoue, Atsuo; Fujita, Toshihiko; Tajiri, Akihiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,590,540, Cl. 62-180.000.
Takahashi, Hajime; Sagahara, Hirohide; and Kabemoto, Akira, to Fujitsu Limited. Data communication for controlling message transmission and reception among processing modules using information stored in descriptor to form a loosely coupled multiprocessing system. 5,592,624, Cl. 395-200.070.
Takahashi, Haruhiko: *See*—
Tanaka, Kiyoharu; Uchida, Takashi; Hiramatsu, Akira; Takahashi, Haruhiko; and Munakata, Atsushi, 5,592,262, Cl. 399-1.000.
Takahashi, Hideki: *See*—
Saitoh, Hiroshi; and Takahashi, Hideki, 5,592,446, Cl. 369-44.270.
Takahashi, Hironori; Aoshima, Shinichiro; and Hirano, Isuke, to Hamamatsu Photonics K.K. Electro-optic apparatus for measuring an electric field of a sample. 5,592,101, Cl. 324-753.000.
Takahashi, Hiroyuki: *See*—
Mizuno, Sadao; Hoshino, Akinori; Muraoka, Akira; and Takahashi, Hiroyuki, 5,591,065, Cl. 451-47.000.
Muramatsu, Eiji; Inoue, Akiyoshi; Taniguchi, Shoji; Takahashi, Hiroyuki; Murakami, Shigenori; and Takishita, Toshihiko, 5,592,463, Cl. 369-275.200.
Takahashi, Katsumi: *See*—
Dachiku, Kenshi; Yamaguchi, Shogo; Ozeki, Kazuo; Takahashi, Katsumi; Omokawa, Mitsunori; and Kuratate, Takaaki, 5,592,228, Cl. 348-416.000.
Takahashi, Katsunori: *See*—
Ueda, Hiroshi; Fukui, Tsugushi; Imata, Kazuyoshi; Kimura, Hirofumi; Yasuda, Shoji; Hotsui, Shin; Inoue, Kimio; Minato, Ryota; Tanaka, Yoshimitsu; and Takahashi, Katsunori, 5,590,959, Cl. 366-84.000.
Takahashi, Kiyoshi; Murai, Mikio; Odagiri, Masaru; and Ueda, Hideyuki, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing a magnetic recording medium including forming a graft polymer lubricant layer by irradiating monomers with radicals or atomic gas. 5,591,481, Cl. 427-131.000.
Takahashi, Kouichi, to Fujitsu Limited. Memory dialing control system having improved telephone number retrieval function by using history information. 5,592,546, Cl. 379-355.000.
Takahashi, Masahiro: *See*—

Fujikawa, Junji; Iimura, Yukio; Takahashi, Masahiro; Nishimoto, Takashi; Matsui, Hiroyuki; and Fujita, Masanobu, 5,592,317, Cl. 349-110.000.
Takahashi, Mikiko: *See*—
Koyama, Masayoshi; Takahashi, Mikiko; and Yanagawa, Masayoshi, 5,591,711, Cl. 514-6.000.
Takahashi, Ryutaro; and Hayase, Toru, to Sharp Kabushiki Kaisha. Speaker driving circuit. 5,592,559, Cl. 381-111.000.
Takahashi, Susumu, to Kanto Yakin Kogyo K.K. Heat treatment method for metals. 5,591,274, Cl. 148-206.000.
Takahashi, Tadashi: *See*—
Koshijima, Tetsuo; Shiraishi, Nobuo; Takahashi, Tadashi; Hiraoka, Toshiharu; and Ueda, Masami, 5,591,832, Cl. 530-500.000.
Takahashi, Tetsuhiko: *See*—
Matsunaga, Yoshikuni; Takahashi, Tetsuhiko; and Yamamoto, Etsuji, 5,592,088, Cl. 324-318.000.
Takai, Yasuhiro; Hagihara, Hideaki; Tanaka, Hirokazu; Ueda, Atsushi; Yamasa, Hideo; and Shimazu, Fumio, to Sharp Kabushiki Kaisha. Developing device in an electrophotographic apparatus capable of controlling a discharge of deteriorated developer and method of discharging deteriorated developer. 5,592,270, Cl. 399-260.000.
Takala, Matti: *See*—
Hirvonen, Juhani; Kohola, Pekka; Ikonen, Kari; and Takala, Matti, 5,592,217, Cl. 348-83.000.
Takamatsu, Hiroyuki: *See*—
Harada, Yoshio; Takamatsu, Hiroyuki; Shimada, Toshiyasu; and Yamashita, Takanori, 5,591,966, Cl. 250-239.000.
Takamine, Yoshio; Suzuki, Kei; and Sugita, Toshihiko, to Hitachi, Ltd. Logic simulation method. 5,592,655, Cl. 395-500.000.
Takamiya, Naoki; Nakao, Makoto; Yazawa, Akira; and Wakabayashi, Atumi, to Sumitomo Osaka Cement Co., Ltd. Antireflection film. 5,591,517, Cl. 428-304.400.
Takamura, Yoji; and Endo, Hiroki, to Sony Corporation. Charge-coupled device having on-chip lens. 5,592,223, Cl. 348-309.000.
Takano, Satoshi: *See*—
Takata, Kensaku; Takano, Satoshi; Inoue, Nori; Itoh, Mitsuru; Okumura, Hitoshi; and Suzuki, Masaji, 5,591,042, Cl. 439-354.000.
Takara, Muneaki. Layered body having rotating adjacent layers with magnetic poles on facing surfaces. 5,590,568, Cl. 74-572.000.
Takata, Kensaku; Takano, Satoshi; Inoue, Nori; Itoh, Mitsuru; Okumura, Hitoshi; and Suzuki, Masaji, to Sumitomo Electric Industries, Ltd.; and Sumitomo Wiring Systems, Ltd. Connector assembly. 5,591,042, Cl. 439-354.000.
Takatsuki, Ryuzo: *See*—
Sago, Hiroyoshi; Kobari, Hideya; Ueda, Koji; Miyamoto, Hidenori; and Takatsuki, Ryuzo, 5,591,262, Cl. 118-52.000.
Takayama, Chitoshi: *See*—
Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takayama, Chitoshi, 5,592,595, Cl. 395-115.000.
Takayama, Ichiro: *See*—
Arai, Michio; Inushima, Takashi; Codama, Mitsufumi; Sugiura, Kazushi; Takayama, Ichiro; Kobori, Isamu; Yamauchi, Yukio; and Sakamoto, Naoya, 5,591,988, Cl. 257-59.000.
Takeda Chemical Industries, Ltd.: *See*—
Igari, Yasutaka; Yamada, Minoru; and Ogawa, Yasuaki, 5,591,713, Cl. 514-8.000.
Kato, Kaneyoshi; Terauchi, Jun; and Nagai, Yasuo, 5,591,849, Cl. 544-70.000.
Sohda, Takashi; Ikeda, Hitoshi; and Momose, Yu, 5,591,862, Cl. 548-235.000.
Takeda, Eiji: *See*—
Kimura, Shinichiro; Hashimoto, Naotaka; Sakai, Yoshio; Kure, Tokuo; Kawamoto, Yoshifumi; Kaga, Toru; and Takeda, Eiji, 5,591,998, Cl. 257-306.000.
Takeda, Shinichi; Mizutani, Hidemasa; Kaifu, Noriyuki; and Kobayashi, Isao, to Canon Kabushiki Kaisha. Photoelectric conversion device with dual insulating layer. 5,591,963, Cl. 250-214.100.
Takeguchi, Tetsuji: *See*—
Akaogi, Takao; Kawashima, Hiromi; Takeguchi, Tetsuji; Hagiwara, Ryoji; Kasa, Yasushi; Itano, Kiyoshi; Ogawa, Yasuhige; and Kawamura, Shouichi, 5,592,419, Cl. 365-185.180.
Takehara, Hiroyasu: *See*—
Masahiro, Maeda; Ishikawa, Osamu; and Takehara, Hiroyasu, 5,592,122, Cl. 330-286.000.
Takehara, Nobuyoshi, to Canon Kabushiki Kaisha. Battery power supply system. 5,592,074, Cl. 363-131.000.
Takehira, Yasushi; and Noda, Shinichi, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc assembly. 5,590,752, Cl. 192-208.000.
Takekoshi, Tohru; and Pearce, Eric J., to General Electric Company. Method for polymerizing macrocyclic poly(alkylene dicarboxylate) oligomers. 5,591,800, Cl. 524-783.000.
Takekoshi, Toshio: *See*—
Shojima, Hiroshi; Kuzunuki, Soshiro; Fukunaga, Yasushi; Matsuda, Toshihiko; Takekoshi, Toshio; Miura, Masaki; Mori, Junko; and Mifune, Toshimi, 5,592,565, Cl. 382-185.000.
Takemoto, Shinichi: *See*—
Sakuraba, Tamotsu; and Takemoto, Shinichi, 5,592,265, Cl. 399-285.000.
Takemoto, Takatoshi; Kadomatsu, Hideyuki; and Sasaki, Etsuro, to Kabushiki Kaisha Ace Denken. Gaming machine island having a bill transporter adjustable to match the bill slots of gaming machines of different dimensions. 5,590,878, Cl. 273-121.00B.
Takemoto Yushi Kabushiki Kaisha: *See*—
Suzuki, Toshiharu; Ozaki, Tatsuhiko; and Matsueda, Hirokazu, 5,591,563, Cl. 430-284.100.
Takenaka, Toichi: *See*—
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masahuru; and Takenaka, Toichi, 5,591,757, Cl. 514-356.000.
Takeshima, Akira: *See*—
Koishi, Musubu; Takeshima, Akira; and Nishizawa, Mitsunori, 5,591,962, Cl. 250-214.100.
Takeshita, Yukitaka: *See*—
Kobayashi, Kiyotaka; Izaki, Toshihiko; Sohma, Hiroshi; and Takeshita, Yukitaka, 5,592,252, Cl. 396-380.000.
Takeuchi, Hideo; and Senda, Kazuo, to Inax Corporation. Method of demolding a green body and finishing same. 5,591,387, Cl. 264-86.000.
Takeuchi, Michiko: *See*—
Nishio, Toshikazu; Yamashita, Yoshiyuki; Amemiya, Hiroyuki; Takeuchi, Michiko; and Masubuchi, Nobu, 5,592,332, Cl. 359-619.000.
Takeuchi, Takanobu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor pressure sensor with rated pressure specified for desired error of linearity. 5,591,917, Cl. 73-727.000.
Takeuchi, Yayoi; and Yoshifuji, Yuuki, to NEC Corporation. Network node cross-connection device using selectable memories for new connection in the event of failure. 5,592,467, Cl. 370-225.000.
Takeuchi, Yoshiharu; Yasu, Toshiharu; Sakai, Manabu; Tsubokawa, Masahiro; Oka, Hideto; and Aiba, Osamu, to Matsushita Electric Industrial Co., Ltd. Hermetic scroll compressor having a pumped fluid motor cooling means and an oil collection pas. 5,591,018, Cl. 417-366.000.
Takiguchi, Hideki; Kashiwagi, Hiroshi; Tsuji, Nobuaki; Socasan, Ho; and Heki, Katsuhiko, to Konica Corporation. Light-sensitive silver halide photographic emulsion, silver halide photographic light sensitive material and method for processing silver halide photographic light-sensitive material. 5,591,570, Cl. 430-567.000.
Takishima, Suguru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Control device for head unit having optical head and multiple magnetic heads. 5,592,447, Cl. 369-44.270.
Takishita, Toshihiko: *See*—
Muramatsu, Eiji; Inoue, Akiyoshi; Taniguchi, Shoji; Takahashi, Hiroyuki; Murakami, Shigenori; and Takishita, Toshihiko, 5,592,463, Cl. 369-275.200.
Takuchi, Yukihisa; and Komazawa, Masato, to NGK Insulators, Ltd. Piezoelectric/electrostrictive actuator. 5,592,042, Cl. 310-328.000.
TAL Apparel Ltd.: *See*—
Wong, John, 5,590,615, Cl. 112-441.000.
Talleres de Escoriaza, S.A. (TESA): *See*—
Imedio-Ocana, Juan A., 5,591,950, Cl. 235-382.500.
Tamai, Hideo: *See*—
Susawa, Takashi; Ioaki, Keiji; Tamai, Hideo; Shimizu, Yoshihiko; Shiraki, Kaneto; and Sato, Akihiro, 5,591,222, Cl. 623-1.000.
Tamaki, Satoshi: *See*—
Ikkai, Yasufumi; and Tamaki, Satoshi, 5,592,355, Cl. 361-94.000.
Tamano, Yutaka: *See*—
Yoshimura, Hiroyuki; Kitaka, Hideaki; Tamano, Yutaka; and Okuzono, Shuichi, 5,591,781, Cl. 521-129.000.
Tambini, Angelo L.; and Linehan, John, to Ingersoll-Rand Company. Monitoring and control of-fluid driven tools. 5,592,396, Cl. 364-510.000.
Tamglass Engineering Oy: *See*—
Salonen, Tauno T., 5,591,245, Cl. 65-107.000.
Tamura Electric Works, Ltd.: *See*—
Sasou, Hiroshi; and Yamazaki, Atsushi, 5,592,400, Cl. 364-514.00R.
Tamura, Hitoshi: *See*—
Aoyama, Hisako; Suguro, Kyoichi; Niiyama, Hiromi; Tamura, Hitoshi; Hayashi, Hisataka; Aoyama, Tomonori; Minamihaba, Gaku; and Iijima, Tadashi, 5,592,024, Cl. 257-751.000.
Tamura, Muneo; Yamauchi, Takeshi; Niwa, Katuhide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Tooru, to Nippondenso Co., Ltd. Silicon nitride film having a short absorption wavelength and surrounding crystal-like grain boundaries. 5,592,004, Cl. 257-323.000.
Tamura, Shinichi; Terasaki, Seishi; Mimura, Tadashi; Kobayashi, Teruaki; and Tei, Youichi, to Fuji Electric Co., Ltd. Electrophotographic photoconductor including a metal-free phthalocyanine. 5,591,555, Cl. 430-78.000.
Tamura, Tomonobu: *See*—
Oominami, Taiichi; Sakata, Toshio; Kuroda, Masayoshi; Tamura, Tomonobu; Nakane, Masami; and Nakatsuka, Kazuhiko, 5,590,872, Cl. 271-176.000.
Tanaami, Masato: *See*—
Suenaga, Tatsuo; Nakagawa, Hiroaki; Terauchi, Shin; Kikuchi, Takeo; Aiba, Shinnosuke; Kobayashi, Mikio; Katsuta, Yutaka; Ago, Kenji; Kosuge, Katsumi; Matsubara, Yasuyuki; Tanaami, Masato; Sugishita, Shunichi; Ikeda, Hideki; Furuya, Toshio; Akihama, Shigeyuki; and Arai, Takahiro, 5,591,286, Cl. 156-71.000.
Tanaami, Takeo: *See*—
Nanko, Tomoaki; Tanaami, Takeo; and Mikuriya, Kenta, 5,592,292, Cl. 356-356.000.
Tanabe, Kouji: *See*—
Usami, Akira; Inoue, Takashi; and Tanabe, Kouji, 5,591,392, Cl. 420-41.000.
Tanaka, Hideki: *See*—

Osawa, Yoshihisa; Tsunoda, Eizo; Hosogaya, Ryuji; Hatakeyama, Akira; Tanaka, Hideki; and Tobisawa, Seiichi, 5,591,266, Cl. 118-410.000.

Tanaka, Hirokazu: *See*—
Takai, Yasuhiro; Hagihara, Hideaki; Tanaka, Hirokazu; Ueda, Atsushi; Yamasa, Hideo; and Shimazu, Fumio, 5,592,270, Cl. 399-260.000.

Tanaka, Hironao, to NEC Corporation. System for processing synchronization signals with phase synchronization in a mobile communication network. 5,592,474, Cl. 370-350.000.

Tanaka, Hiroshi: *See*—
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,590,672, Cl. 134-201.000.

Tanaka, Hisashi: *See*—
Hattori, Ryuichi; and Tanaka, Hisashi, 5,590,489, Cl. 47-1.100.

Tanaka, Hisayoshi: *See*—
Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tasaka, Hisayoshi; Shiina, Takanori; and Kaburagi, Haruko, 5,591,406, Cl. 422-80.000.

Tanaka, Iwao: *See*—
Sumiya, Takashi; Tanaka, Iwao; Shibatsuji, Kunio; Kurone, Hirokazu; Sugiura, Seiya; and Ooe, Wataru, 5,591,518, Cl. 428-318.400.

Tanaka, Kiyoharu; Uchida, Takashi; Hiramatsu, Akira; Takahashi, Haruhiko; and Munakata, Atsushi, to Canon Kabushiki Kaisha. Image forming apparatus with ink jet and electrophotographic recording units. 5,592,262, Cl. 399-1.000.

Tanaka, Kunihiko: *See*—
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University of Illinois, The Board of Trustees of the: *See*—
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Cain, Charles A.; Ebbini, Emad S.; and Strickberger, S. Adam, 5,590,657, Cl. 128-660.030.

University of Minnesota, Regents of the: *See*—
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Townsend, Alan; Bastin, Judy; Boon-Falleur, Thierry; van der Bruggen, Pierre; Coulie, Pierre; and Gajewski, Thomas, 5,591,430, Cl. 424-93.710.

University of Pennsylvania, The Trustees of the: *See*—
Ducheyne, Paul; Radin, Shulamith; and Santos, Erick M., 5,591,453, Cl. 424-484.000.

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Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,591,615, Cl. 435-172.100.

Vesture Corporation: *See*—
Owens, Byron C., 5,591,221, Cl. 607-114.000.

Viana, Fernando: *See*—
Palmer, Wyn; and Viana, Fernando, 5,592,120, Cl. 327-536.000.

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Vicknair, Bruce A.: *See*—
Dearing, Michael P., Sr.; Baten, Robert A.; Cedillo, Greg L.; and Vicknair, Bruce A., 5,590,958, Cl. 366-20.000.

Victor Company of Japan, Ltd.: *See*—
Kuwaoka, Toshiharu, 5,592,161, Cl. 341-95.000.
Shikunami, Juichi, 5,592,451, Cl. 369-54.000.
Sugiyama, Kenji, 5,592,229, Cl. 348-416.000.
Yoshino, Akio, 5,592,230, Cl. 348-448.000.

Vidamed, Inc.: *See*—
Edwards, Stuart D.; Shartzy, Hugh R.; Lundquist, Ingemar H.; Lax, Ronald G.; and Baker, James A., Jr., 5,591,125, Cl. 604-22.000.

Viehbeck, Alfred: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Brarea, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,591,285, Cl. 156-62.200.

Vigeant, Andre F.; and Bernard, Alain, to Sorevco, Inc. Enhanced protective metallic coating weights for steel sheet. 5,591,534, Cl. 428-612.000.

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Viner, Omri: *See*—
Intrater, Amos; Birenbaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itael; Epstein, Lev; Katzri, Lior; Viner, Omri; Levitan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.

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McMillin, Kenneth L., 5,590,437, Cl. 15-143.100.

Vink, Tennis J.; and Walrave, Willem, to U.S. Philips Corporation. Method of making an electro-optic display device with porous sub-layer. 5,592,316, Cl. 349-187.000.

Vinnage, William R., Jr.: *See*—
Olsen, Robb E.; Bittar, Sandra R.; Hines, Letha M.; Vinnage, William R., Jr.; May, Melisse N.; Osborn, Thomas W., III; and Doak, Nancy B., 5,591,150, Cl. 604-385.100.

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Dame, Stephen G., 5,591,931, Cl. 84-726.000.

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Kramer, James F., 5,592,401, Cl. 364-550.000.

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Musters, Wouter; Stam, Hein; Suykerbuyk, Maria E.; Visser, Jacob; and Verbakel, Johannes M., 5,591,620, Cl. 435-201.000.

Vits Zahnfabrik H. Rauter GmbH & Co. KG: *See*—
Thiel, Norbert; and Weber, Susanne, 5,591,030, Cl. 433-212.100.

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Caro, Richard G.; and Sher, Mark H., 5,590,649, Cl. 128-630.000.

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Sullivan, Patrick K.; Vithanage, Dayananda; and Bucher, Warren E., 5,590,979, Cl. 405-36.000.

Vizi, E. Szilveszter: *See*—
Tuba, Zoltan; Vizi, E. Szilveszter; Foldes, Francis F.; and Maho, Sandor, 5,591,735, Cl. 514-172.000.

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De Pauw, Wim; Cina, Vincent J.; Helm, Andrew R.; Kimelman, Douglas N.; and Vlissides, John M., 5,592,600, Cl. 395-140.000.

Vo, Huy T.: *See*—
Thomann, Mark; and Vo, Huy T., 5,592,488, Cl. 370-465.000.

Vogel, Bruce E.: *See*—
Ruoslahti, Erkki I.; Tarone, Guido; Giancotti, Filippo G.; and Vogel, Bruce E., 5,591,592, Cl. 435-7.210.

Vogel, Herman, to Perkin-Elmer Corporation, The. Dry gas curtain for cryogenic surface. 5,590,537, Cl. 62-51.100.

Vogelstein, Bert: *See*—
de la Chapelle, Albert; Vogelstein, Bert; and Kinzler, Kenneth W., 5,591,826, Cl. 530-350.000.

Vogt, Lothar: *See*—
Chalabadi, Djahanyar; Herrmann, Matthias; Vogt, Lothar; and Kassner, Juergen, 5,592,557, Cl. 381-10.000.

Vogt, Robert E.: *See*—
Goodman, Steven L.; and Vogt, Robert E., 5,591,298, Cl. 156-580.100.

Voicalescu, Daust, to Winner International Royalty Corporation. Mechanical door stop. 5,590,928, Cl. 292-338.000.

Volk, Steven B.: *See*—
Morehouse, James H.; Alt, Robert A.; Dunckley, James A.; Furay, David M.; Emo, Bruce D.; and Volk, Steven B., 5,592,349, Cl. 360-98.080.

Vollmann, Norbert C., to U.S. Philips Corporation. System for recording/reproducing signals on/from a magnetic tape in a cassette. 5,592,352, Cl. 360-132.000.

Von Kreisler Selting Werner: *See*—
Tolan, Jeffrey; and Foody, Brian, 5,591,304, Cl. 162-60.000.

Von Roll Umweltechnik AG: *See*—
Rolih, Vladimir, 5,592,151, Cl. 340-584.000.

Vondracek, Hans, to Fried. Krupp AG Hoesch-Krupp. Arrangement for ball shot peening helical compression springs. 5,591,066, Cl. 451-80.000.

von Garrel, Thomas: *See*—
Knaepler, Harald; and von Garrel, Thomas, 5,591,398, Cl. 422-38.000.

VonHoene, Donald C.: *See*—
Mishra, Saachidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limburg, William W.; Normandin, Sharon E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.

von Massow, Gabriele: *See*—
Frey, Krisztina; von Massow, Gabriele; Alt, Helmut G.; and Welch, M. Bruce, 5,591,879, Cl. 556-404.000.

Vossoughi, Hamid: *See*—
Rahimi, Houching; and Vossoughi, Hamid, 5,591,232, Cl. 623-16.000.

Vougny, Alain: *See*—
Donsot, Alain; Mathey, Christophe; and Vougny, Alain, 5,592,045, Cl. 313-440.000.

Voxel: *See*—
Hart, Stephen J., 5,592,313, Cl. 359-24.000.

Voyta, John C.: *See*—
Bronstein, Irena; Edwards, Brooks; Martin, Christopher; Sparks, Alison; and Voyta, John C., 5,591,591, Cl. 435-7.400.

Vross, Anthony R.; and Fagan, George V., to Simon Roofing and Sheet Metal Corp.; and Aercology Incorporated. System for removal of noxious fumes. 5,591,244, Cl. 55-356.000.

VTC Inc.: *See*—
Schiller, Peter J., 5,591,300, Cl. 156-626.100.

Vuligonda, Vidyasagar; Teng, Min; Beard, Richard L.; Johnson, Alan T.; Duong, Tien T.; Lin, Yuan; and Chandraratna, Roshantha A., to Allergan. Acetylenes disubstituted with a 5 substituted tetrahydronaphthyl group and with an aryl or heteroaryl group having retinoid-like biological activity. 5,591,858, Cl. 546-322.000.

Vyhmeister, Edwin D. Holding device for eyeglasses. 5,592,244, Cl. 351-158.000.

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Abrams, Brad F.; Minor, Raymond B.; McGregor, Gordon L.; and Dolan, John W., 5,591,526, Cl. 428-401.000.

W. L. Gore & Associates, Inc.: *See*—
Ameen, Joseph G.; Korleski, Joseph E.; Mortimer, William P., Jr.; and Yokimcus, Victor P., 5,591,034, Cl. 439-91.000.

W. R. Grace & Co-Conn.: *See*—
Esteves, Robert; and Fruchard, Michel, 5,590,509, Cl. 53-432.000.

W. R. Grace & Co.-Conn.: *See*—
Bria, Michael P.; and Quass, Jeffrey D., 5,590,480, Cl. 34-629.000.
Friedman, Semyon D.; Kerkar, Awdhoot V.; Hughes, Ernest W.; Brezny, Rasto; Lau, John Wing-Keung; and Block, Jacob, 5,591,691, Cl. 502-439.000.
Muroi, Souichi; and Tsai, Hsi-Chuan, 5,591,814, Cl. 525-528.000.
Stockley, Henry W., III; and Krebs, Art T., 5,591,468, Cl. 426-106.000.

Wacker-Chemie GmbH: *See*—
Barthel, Herbert; and Achenbach, Frank, 5,591,797, Cl. 524-493.000.

Wada, Keiji: *See*—
Heinemann, Stephen F.; Patrick, James W.; Boulter, James R.; Deneris, Evan S.; Connolly, John G.; Duvoisin, Robert M.; Heinemann, Eden D.; Wada, Keiji; Ballivet, Marc C.; and Goldman, Daniel J., 5,591,590, Cl. 435-7.100.

Wada, Kiyoshi: *See*—
Yoshida, Takahiko; Hirata, Koji; Osawa, Atsuo; Wada, Kiyoshi; and Yoshikawa, Hiroki, 5,590,943, Cl. 353-74.000.

Wada, Masahiro: *See*—
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,591,927, Cl. 84-171.000.

Wade, Michael D.: *See*—
Fisher, Francis E.; Johnson, Robin D.; Gove, David G.; and Wade, Michael D., 5,590,712, Cl. 165-185.000.

Wadsworth, Larry C.: *See*—
Rader, Mark S.; Alexeff, Igor; Tsai, Peter P.; and Wadsworth, Larry C., 5,592,357, Cl. 361-225.000.

Wagner, Dennis J. Stopper for opening in gas conduit wall. 5,590,676, Cl. 137-15.000.

Wagner, Gerhard; Koreajann, Ludger; and Bertsche, Bernd, to Mercedes-Benz AG. Emergency running driving arrangement for a change-speed gearbox automatic selector appliance. 5,591,096, Cl. 475-119.000.

Wagner, John R.; and Smith, J. E. Howard, to SCW, Inc. Tobacco expansion method. 5,590,667, Cl. 131-291.000.

Wagner, Ronald D.; and Klima, William L., to Magic Electrical Products L.L.C. Electrical cord retraction device. 5,590,749, Cl. 191-12.400.

Wagner, Thomas E.; Chen, Xiaozhao; and Li, Yunsheng, to Ohio University Edison Animal Biotechnology Institute. DNA polymerase gene expression system utilizing an RNA polymerase co-delivered with the gene expression vector system. 5,591,601, Cl. 435-69.100.

Wahhoud, Adnan: *See*—
Dornier, Peter D.; Wahhoud, Adnan; Czura, Peter; and Scorl, Hans-Dieter, 5,590,692, Cl. 139-1.00R.

Wahl, Sharon M.: *See*—
Furcht, Leo T.; McCarthy, James B.; Wahl, Sharon M.; and Allen, Janice B., 5,591,719, Cl. 514-13.000.

Wais-Med Lmt, a subsidiary company of Teic Technion Enterpreneurial Incubator Ltd.: *See*—
Waisman, Marc, 5,591,188, Cl. 606-182.000.

Waisman, Marc, to Wais-Med Lmt, a subsidiary company of Teic Technion Enterpreneurial Incubator Ltd. Surgical instrument for inspect insertion of an intraosseous trocar-needle. 5,591,188, Cl. 606-182.000.

Waite, Dwayne: *See*—
Burt, Denis; Pagano, Patrick; and Waite, Dwayne, 5,592,627, Cl. 395-200.130.

Waite, Terry: *See*—
Heard, Robert A. H.; and Waite, Terry, 5,590,504, Cl. 52-730.100.

Waizman, Alexander: *See*—
Wong, Keng L.; Waizman, Alexander; and McDaniel, Bart R., 5,592,111, Cl. 327-45.000.

Wakabayashi, Atumi: *See*—
Takamiya, Naoki; Nakao, Makoto; Yazawa, Akira; and Wakabayashi, Atumi, 5,591,517, Cl. 428-304.400.

Wakabayashi, Hiroshi; and Miyamoto, Hidenori, to Nikon Corporation. Compact camera having components including inhibiting circuit mounted on one mounting board. 5,592,255, Cl. 396-89.000.

Wakabayashi, Hiroshi: *See*—
Nakamura, Toshiyuki; Soshi, Isao; Miyamoto, Hidenori; and Wakabayashi, Hiroshi, 5,592,249, Cl. 396-315.000.

Wakabayashi, Kenichi; Hatakoshi, Kaoru; Nishimura, Kiyotaka; Morikawa, Tsuyoshi; Shiozaki, Tadashi; Nakajima, Akira; Nishizawa, Hajime; and Takiyama, Chitoshi, to Seiko Epson Corporation. Intelligent cartridge for attachment to a printer to perform image processing tasks in a combination image processing system and method of image processing. 5,592,595, Cl. 395-115.000.

Wakahata, Yasuo: *See*—
Tokunaga, Hideaki; Wakahata, Yasuo; and Mutoh, Naoki, 5,592,140, Cl. 338-21.000.

Wakamoto, Shinji: *See*—
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Wakatsuki, Goroei: *See*—
Hayashi, Akira; Tanaka, Kunihiko; and Wakatsuki, Goroei, 5,591,100, Cl. 477-44.000.

Wake Forest University: *See*—
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Wako Pure Chemical Industries, Ltd.: *See*—
Katoh, Hideo; Nakamura, Kenji; and Satomura, Shinji, 5,591,589, Cl. 435-7.100.

Walbro Corporation: *See*—
Tuckey, Charles H., 5,590,631, Cl. 123-447.000.

Walchak, Martin T.: *See*—
Shambleu, Morley C.; Walchak, Martin T.; and Richmond, Louis, 5,591,935, Cl. 102-500.000.

Walker, Alan: *See*—
Cunha, Francisco J.; and Walker, Alan, 5,591,002, Cl. 415-115.000.

Walker, David R.: *See*—
Gabl, Edward F.; Walker, David R.; and Pang, Yang, 5,592,327, Cl. 359-348.000.

Walker, Jerry L.; Carrera, Victor M.; and Carter, Donald R., to Halliburton Company. Perforating charge carrier assembly. 5,590,723, Cl. 175-4.600.

Walker, Michael L., to Halliburton Company. Corrosion inhibiting compositions and methods. 5,591,381, Cl. 252-389.540.

Walker, Richard I.: *See*—
Davies, Michael B.; Hearne, David J.; Rand, Paul K.; and Walker, Richard I., 5,590,645, Cl. 128-203.150.

Walker, Robert D.: *See*—
Peterson, Randy S.; Steele, Thomas W.; and Walker, Robert D., 5,590,482, Cl. 37-403.000.

Wallace Computer Services, Inc.: *See*—
Stevens, Scott A., 5,590,912, Cl. 283-56.000.
Walter, Peter A.; and Richter, Wayne E., 5,591,290, Cl. 156-152.000.

Wallace, Lesley: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,591,440, Cl. 424-227.100.

Wallis, Frank S.; Caillat, Jean-Luc; Simpson, Francis M.; Anderson, Gary J.; Rode, Donald W.; and Beck, Norman G., to Copeland Corporation. Scroll machine with reverse rotation protection. 5,591,014, Cl. 417-310.000.

Walrave, Willem: *See*—
Vink, Tennis J.; and Walrave, Willem, 5,592,316, Cl. 349-187.000.

Walser, Mackenzie, to Johns Hopkins University, The. Method of retarding the progression of chronic renal failure. 5,591,736, Cl. 514-178.000.

Walt Disney Company, The: *See*—
Salter, Kenneth D.; Armstrong, Daniel A.; and Fredrick, Ted W., 5,590,605, Cl. 104-139.000.

Walter, Geoffrey A.: *See*—
Jack, Michael D.; Stephens, Robert D.; Tacelli, Christopher B.; Nelson, David R.; Walter, Geoffrey A.; Santana, Jose A.; and Rubin, Lane H., 5,591,975, Cl. 250-338.500.

Walter, Helmut: *See*—
Hamprecht, Gerhard; Mayer, Horst; Westphalen, Karl-Otto; Walter, Helmut; Gerber, Matthias; and Kardorff, Uwe, 5,591,694, Cl. 504-214.000.

Walter, Peter A.; and Richter, Wayne E., to Wallace Computer Services, Inc. Method of making a laminate having variable adhesive properties. 5,591,290, Cl. 156-152.000.

Walter, Scott A.; Polka, Alan R.; and Szalankiewicz, James J., to S & S Slides, Inc. Extensible continuous haulage system. 5,590,757, Cl. 198-812.000.

Walters, Jeremy P. A. Flotation equipment. 5,591,327, Cl. 209-169.000.

Walton, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., to Dow Chemical Company, The. Method of manufacturing packaging and wrapping film. 5,591,390, Cl. 264-456.000.

Walz, Alfred. Neutrophil activating factors. 5,591,718, Cl. 514-12.000.

Wang, Bonnie I.: *See*—
Lane, Christopher F.; Reddy, Srinivas T.; and Wang, Bonnie I., 5,592,102, Cl. 326-10.000.

Wang, Chen-Jong; and Lee, Jin-Yuan, to Taiwan Semiconductor Manufacturing Company Ltd. Method of increasing the capacitance area in DRAM stacked capacitors using a simplified process. 5,591,664, Cl. 437-60.000.

Wang, Kuang-Pin. Bow saw. 5,590,473, Cl. 30-512.000.

Wang, Leao; and Wu, Peter, to Greenmaster Industrial Corp. Sit-up exercise apparatus. 5,591,111, Cl. 482-140.000.

Wang, Paul S. Dual canteen and interior cooler. 5,590,542, Cl. 62-457.300.

Wang, Tzyh-Jong: *See*—
Grewal, Kalwant S.; Patel, Jagdish A.; and Wang, Tzyh-Jong, 5,592,672, Cl. 395-200.150.

Wang, Zhonghe: *See*—
Lin, Jyh-Han; and Wang, Zhonghe, 5,592,154, Cl. 340-825.500.

Wanstrath, Daniel M.: *See*—
Wanstrath, Kerry A.; and Wanstrath, Daniel M., 5,591,460, Cl. 425-12.000.

Wanstrath, Kerry A.; and Wanstrath, Daniel M. Apparatus for automated windshield repair. 5,591,460, Cl. 425-12.000.

Ward, Brian: *See*—
Richards, David C.; Williams, Maurice S.; and Ward, Brian, 5,590,512, Cl. 53-567.000.

Ward, John F., to Canplas Industries Ltd. Exhaust vent cover. 5,591,080, Cl. 454-359.000.

Ward, Robert W.; and Gay, David E., to General Motors Corporation. Composite iron material. 5,591,373, Cl. 252-62.540.

Warner-Jenkinson Company, Inc.: *See*—
Signorino, Charles A., 5,591,455, Cl. 424-490.000.

Warner, Robert W.; Fitzer, Robert C.; Redmond, David B.; and Tabar, Ronald J., to Minnesota Mining and Manufacturing Company. Flexible optically uniform sign face substrate. 5,591,530, Cl. 428-480.000.

Warshawsky, Alan M.; and Flynn, Gary A., to Merrell Pharmaceuticals Inc. 2-substituted indane-2-carboxyalkyl derivatives useful as inhibitors of enkephalinase and ACE. 5,591,739, Cl. 514-214.000.

Washington University: *See*—
Olivo, Paul D.; and Schlesinger, Sondra, 5,591,579, Cl. 435-6.000.

Watanabe, Hiroshi; Miyagishima, Masao; and Fuyuki, Toshimitsu, to Futaba Denshi Kogyo K.K. Write head for fluorescent printer. 5,592,206, Cl. 347-122.000.

Watanabe, Hiroshi: *See*—
Shimizu, Yukihiko; and Watanabe, Hiroshi, 5,592,205, Cl. 347-115.000.

Watanabe, Hisayoshi: *See*—
Kumakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,592,427, Cl. 365-205.000.

Watanabe, Kenji: *See*—
Yamauchi, Masahiro; Kaimoto, Takashi; Furukawa, Mitsuhiko; Rikihisa, Katsutoshi; Yoshida, Hironori; and Watanabe, Kenji, 5,592,647, Cl. 392-432.000.

Watanabe, Masahiko: *See*—
Murata, Yasumoto; Ikeuchi, Michio; Yoshikawa, Shuichi; and Watanabe, Masahiko, 5,592,544, Cl. 379-283.000.

Watanabe, Masao: *See*—
Higashi, Taketoshi; Yagi, Shigeru; Fukuda, Yuzuru; Ono, Masao; Watanabe, Masao; and Ohta, Tsuyoshi, 5,592,274, Cl. 399-307.000.

Watanabe, Tamio, to Yazaki Corporation. Connector with a double locking mechanism. 5,591,052, Cl. 439-752.000.

Watanabe, Tetsu: *See*—
Yamagami, Tamotsu; Watanabe, Tetsu; and Seko, Yoichiro, 5,592,465, Cl. 369-275.300.

Watanabe, Toshiharu: *See*—
Momodomi, Masaki; Miyamoto, Junichi; and Watanabe, Toshiharu, 5,591,999, Cl. 257-315.000.

Watanabe, Yoshihiko: *See*—
Ogasawara, Yasuyuki; and Watanabe, Yoshihiko, 5,592,314, Cl. 349-18.000.

Watanabe, Yoshinori: *See*—
Itoh, Hirounichi; Nakane, Keiichi; Nonaka, Naomichi; and Watanabe, Yoshinori, 5,592,675, Cl. 395-750.000.

Waterman, Kenneth C.: *See*—
Febervari, Agota F.; Foley, James A.; Kim, Gia Y.; Koretsky, Diana R.; Taylor, Lloyd D.; and Waterman, Kenneth C., 5,591,560, Cl. 430-203.000.

Watkins, Carl J. Providing aromas. 5,591,409, Cl. 422-110.000.

Watkins, Michael L.: *See*—
Fleischhauer, Grier S.; Hayes, Patrick H.; Morgan, Constance H.; Hajaligol, Mohammad R.; Watkins, Michael L.; Nichols, Walter A.; Sharpe, David B.; and Counts, Mary E., 5,591,368, Cl. 219-535.000.

Watson, David P.: *See*—
Acocella, John; Banks, Donald R.; Benenati, Joseph A.; Caulfield, Thomas; Hoebener, Karl G.; Watson, David P.; and Corbin, John S., Jr., 5,591,941, Cl. 174-266.000.

Watterson, Scott R.: *See*—
Dalebout, William T.; Watterson, Scott R.; and Furner, Paul, 5,591,105, Cl. 482-52.000.
Dalebout, William T.; Measom, S. Ty; and Watterson, Scott R., 5,591,106, Cl. 482-54.000.

Wayne State University: *See*—
Winter, Charles H.; Lewkebandara, T. Suren; and Jayaratne, Kumudini C., 5,591,483, Cl. 427-248.100.

WCM Industries, Inc.: *See*—
Almasy, Lawrence; Shuler, James F.; Vandepas, Robert J.; and Carlson, William L., 5,590,679, Cl. 137-218.000.

Weatherill, Timothy D.: *See*—
Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., 5,591,863, Cl. 548-312.700.

Weaver, David K.: *See*—
Vaccarello-Dunkel, Florence; Weaver, David K.; and Weaver, Theodore W., III, 5,591,435, Cl. 424-195.100.

Weaver, Theodore W., III: *See*—
Vaccarello-Dunkel, Florence; Weaver, David K.; and Weaver, Theodore W., III, 5,591,435, Cl. 424-195.100.

Webasto Sunroofs Inc.: *See*—
Racine, Lloyd G.; and Bratkowski, Edward J., 5,592,060, Cl. 318-469.000.

Webb, John W.: *See*—
Midgely, Christopher W.; Webb, John W.; and Acott, John L., 5,592,611, Cl. 395-182.020.

Webber, Larry R.: *See*—
White, Gregory R.; Gatewood, Bryan S.; Wilson, Mark L.; Griffen, Peter L.; Kleine, Richard E.; and Webber, Larry R., 5,591,102, Cl. 477-107.000.

Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., to Xerox Corporation. Interactive method and system for producing address-correlated information using user-specified address zones. 5,592,607, Cl. 395-358.000.

Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., to Xerox Corporation. Interactively producing indices into image and gesture-based data using unrecognized graphical objects. 5,592,608, Cl. 395-358.000.

Weber, Mark F., to Eaton Corporation. Hydrostatic pump and bearing-clocking mechanism therefor. 5,590,579, Cl. 92-12.200.

Weber, Michael J.; and Grant, Stuart D., to Goodyear Tire & Rubber Company, The. Tire and vehicle system utilizing asymmetric support member molded to inboard sidewall. 5,591,282, Cl. 152-456.000.

Weber, Reinhart; and Sheppard, Robert E. Method and apparatus for producing nickel shell molds. 5,591,485, Cl. 427-250.000.

Weber, Susanne: *See*—
Thiel, Norbert; and Weber, Susanne, 5,591,030, Cl. 433-212.100.

Weberg, Rolf T.: *See*—
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Odell, Peter G., 5,591,559, Cl. 430-137.000.
Parker, Delmer G.; and Fletcher, Gerald M., 5,592,271, Cl. 399-285.000.
Parker, Delmer G.; and Kovacs, Gregory J., 5,592,281, Cl. 399-156.000.
Quate, Calvin F., 5,591,490, Cl. 427-457.000.
Rolleston, Robert J., 5,592,591, Cl. 395-105.000.
Snelling, Christopher, 5,591,553, Cl. 430-46.000.
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,607, Cl. 395-358.000.
Weber, Karon A.; Poon, Alex D.; and Moran, Thomas P., 5,592,608, Cl. 395-358.000.
Wilcox, Lynn D.; and Chen, Francine R., 5,592,568, Cl. 382-218.000.
Xie, Mark: *See*—
Tweed, Brian A.; DeBakker, Peter M.; Osborne, Michael W.; Scherch, Richard P.; Kasinoff, Harvey A.; Heckman, Tom B.; Mitchell, Danny J.; and Xie, Mark, 5,591,072, Cl. 451-293.000.
Xilinx, Inc.: *See*—
Cheung, Edmond Y.; and Erickson, Charles R., 5,592,105, Cl. 326-38.000.
Xillix Technologies Corp.: *See*—
MacAulay, Calum; Palcic, Branko; Lam, Stephen; and Jaggi, Bruno, 5,590,660, Cl. 128-664.000.
Xiu-Liang, Li; and Ljungdahl, Lars G., to University of Georgia Research Foundation, Inc. Aureobasidium pullulans xylanase, gene and signal sequence. 5,591,619, Cl. 435-201.000.
Xu, Ming: *See*—
Hale, Nathan; and Xu, Ming, 5,590,600, Cl. 101-488.000.
Yaakov, Greenvurcel. Cutlery which does not soil and a method for its production. 5,590,472, Cl. 30-323.000.
Yabe, Toshikazu; Kato, Soichiro; and Mamimatsu, Ken, to NSK Ltd. Linear guide apparatus lubricated with lubricant-containing polymer. 5,590,965, Cl. 384-15.000.
Yachera, Robert S., to East Penn Manufacturing Co., Inc. Mobile battery cleaning system. 5,590,671, Cl. 134-95.100.
Yagi, Hironori: *See*—
Arami, Junichi; Ishikawa, Kenji; Deguchi, Youichi; Yagi, Hironori; Kawada, Nobuo; and Yanagisawa, Isao, 5,591,269, Cl. 118-723.00R.
Yagi, Shigeru: *See*—
Higashi, Taketoshi; Yagi, Shigeru; Fukuda, Yuzuru; Ono, Masato; Watanabe, Masao; and Oota, Tsuyoshi, 5,592,274, Cl. 399-307.000.
Yagi, Shuichi: *See*—
Toyoda, Shigeru; Yagi, Shuichi; Itagaki, Masaaki; Ike, Nobukatsu; and Ohshima, Kenji, 5,590,689, Cl. 138-97.000.

Yalamoori, Venkatachalapathi: *See*—
Chan, Ming F.; Raju, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vitukudi N., 5,591,761, Cl. 514-380.000.
Yalla, Murty V. V. S., to Beckwith Electric Co. Method and system for providing protective relay functions. 5,592,393, Cl. 364-492.000.
Yamada, Hitoshi: *See*—
Hattori, Masafumi; Ikeda, Chikako; Sugimoto, Satoru; Saito, Tatsuoki; Yamada, Hitoshi; and Akashige, Etsushi, 5,591,792, Cl. 524-271.000.
Yamada, Jiro: *See*—
Nishikawa, Masaharu; Rollag, Keith W.; Sageser, David M.; and Yamada, Jiro, 5,591,155, Cl. 604-393.000.
Yamada, Kazuo: *See*—
Yoneda, Tetsuya; Mitate, Takehito; Nishimura, Naoto; and Yamada, Kazuo, 5,591,547, Cl. 429-218.000.
Yamada, Kiyoshi: *See*—
Arai, Fuminori; Amano, Yoshikazu; and Yamada, Kiyoshi, 5,592,290, Cl. 356-300.000.
Yamada, Masami: *See*—
Niigaki, Minoru; Hirohata, Toru; Ihara, Tuneo; and Yamada, Masami, 5,591,986, Cl. 257-10.000.
Yamada, Minoru: *See*—
Igari, Yasutaka; Yamada, Minoru; and Ogawa, Yasuaki, 5,591,713, Cl. 514-8.000.
Yamada, Shoji; and Fujiura, Yoshitsugu, to Whitaker Corporation, The. Card edge connectors. 5,591,047, Cl. 439-541.500.
Yamada, Toshiyuki: *See*—
Kita, Hideki; Tseng, Wenjea J.; and Yamada, Toshiyuki, 5,591,687, Cl. 501-97.000.
Yamagami, Kenji; Yamamoto, Akira; and Satoh, Takao, to Hitachi, Ltd. Data transfer apparatus and method for data processing system. 5,592,630, Cl. 395-250.000.
Yamagami, Tamotsu; Watanabe, Tetsu; and Sako, Yoichiro, to Sony Corporation. Disc recording method. 5,592,465, Cl. 369-275.300.
Yamaguchi, Hiroyuki: *See*—
Sato, Tsutomu; Hirano, Masakazu; Yanashima, Tsukasa; Yamaguchi, Hiroyuki; and Moroma, Yoshio, 5,592,278, Cl. 399-384.000.
Yamaguchi, Shogo: *See*—
Dachiku, Kenshi; Yamaguchi, Shogo; Ozeki, Kazuo; Takahashi, Katsumi; Omokawa, Mitsunori; and Kuratate, Takaaki, 5,592,228, Cl. 348-416.000.
Yamaguchi, Shoichi, to Canon Kabushiki Kaisha. Image communication apparatus and method which extracts and records images on the transmission side. 5,592,303, Cl. 358-435.000.
Yamaguchi, Shoji: *See*—
Minoura, Hiroshi; and Yamaguchi, Shoji, 5,592,640, Cl. 395-428.000.
Yamaguchi, Wataru: *See*—
Ota, Mitsunobu; Yamaguchi, Wataru; and Nakajima, Isamu, 5,592,294, Cl. 356-402.000.
Yamaguchi, Yoshihiro: *See*—
Funaki, Hideyuki; Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; and Omura, Ichiro, 5,592,014, Cl. 257-487.000.
Yamaha Corporation: *See*—
Kakishita, Masahiro; and Kunimoto, Toshifumi, 5,591,930, Cl. 84-602.000.
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,591,927, Cl. 84-171.000.
Yamamoto, Akira: *See*—
Yamagami, Kenji; Yamamoto, Akira; and Satoh, Takao, 5,592,630, Cl. 395-250.000.
Yamamoto, Etsuji: *See*—
Matsunaga, Yoshikuni; Takahashi, Tetsuhiko; and Yamamoto, Etsuji, 5,592,088, Cl. 324-318.000.
Yamamoto, Keiji, to Fuji Xerox Co., Ltd. Photoconductive drum and transfer apparatus for an image forming apparatus. 5,592,273, Cl. 399-126.000.
Yamamoto, Miwako: *See*—
He, Fei-feng; Yamamoto, Toshihiro; and Yamamoto, Miwako, 5,591,482, Cl. 427-244.000.
Yamamoto, Tomohiko: *See*—
Naito, Shiro; Yamamoto, Tomohiko; and Yamamoto, Tomonori, 5,590,694, Cl. 140-93.200.
Yamamoto, Tomonori: *See*—
Naito, Shiro; Yamamoto, Tomohiko; and Yamamoto, Tomonori, 5,590,694, Cl. 140-93.200.
Yamamoto, Toshihiro: *See*—
He, Fei-feng; Yamamoto, Toshihiro; and Yamamoto, Miwako, 5,591,482, Cl. 427-244.000.
Yamamoto, Yasushi, to NEC Corporation. Acoustic wave resonator filter. 5,592,040, Cl. 310-313.00D.
Yamamoto, Yoshitaka: *See*—
Majima, Kenji; and Yamamoto, Yoshitaka, 5,592,318, Cl. 349-122.000.
Yamane, Fujio: *See*—
Nakamura, Hideki; Yamasaki, Keiji; Yamane, Fujio; Yoshida, Toshiki; Iizuka, Tadashi; and Ishiyama, Akihiko, 5,591,023, Cl. 418-179.000.
Yamanobe, Masato: *See*—
Ikeda, Sotomitsu; Yamanobe, Masato; Kawade, Hisaaki; Ohnishi, Toshikazu; and Iwasaki, Tatsuya, 5,591,061, Cl. 445-3.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Fujikura, Takashi; Ito, Noriki; Matsumoto, Yuzo; Asano, Masaharu; and Takenaka, Toichi, 5,591,757, Cl. 514-356.000.
Yamaoka, Tooru: *See*—
Tamura, Museo; Yamauchi, Takeshi; Niwa, Katuhide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Tooru, 5,592,004, Cl. 257-323.000.
Yamasa, Hideo: *See*—
Takai, Yasuhiro; Hagihara, Hideaki; Tanaka, Hirokazu; Ueda, Atsushi; Yamasa, Hideo; and Shimazu, Fumio, 5,592,270, Cl. 399-260.000.
Yamasaki, Akinori: *See*—
Daikoku, Akihiro; Sakabe, Shigekazu; Inoue, Masao; and Yamasaki, Akinori, 5,592,526, Cl. 378-132.000.
Yamasaki, Keiji: *See*—
Nakamura, Hideki; Yamasaki, Keiji; Yamane, Fujio; Yoshida, Toshiki; Iizuka, Tadashi; and Ishiyama, Akihiko, 5,591,023, Cl. 418-179.000.
Yamashita, Hiroshi: *See*—
Ueda, Hiraki; Miyamoto, Hisashi; Yamashita, Hiroshi; and Tone, Hitoshi, 5,591,744, Cl. 514-252.000.
Yamashita, Shinji: *See*—
Uehara, Masao; Saito, Katsuyuki; Uchikubo, Akinobu; Nakagawa, Takehiro; Sasaki, Masahiko; and Yamashita, Shinji, 5,592,216, Cl. 348-74.000.
Yamashita, Takanori: *See*—
Harada, Yoshio; Takamatsu, Hiroyuki; Shimada, Toshiyasu; and Yamashita, Takanori, 5,591,966, Cl. 250-239.000.
Yamashita, Tetsuhiro, to Mazda Motor Corporation. Vehicle slip control system. 5,590,636, Cl. 123-564.000.
Yamashita, Yoshiyuki: *See*—
Nishio, Toshikazu; Yamashita, Yoshiyuki; Amemiya, Hiroyuki; Takeuchi, Michiko; and Masubuchi, Nobu, 5,592,332, Cl. 359-619.000.
Yamashita, Yuji: *See*—
Hirai, Kenji; Aono, Akira; Tsuneda, Shinya; Matsumoto, Hirokazu; Yamashita, Yuji; Tanaka, Hisayoshi; Shiina, Takanori; and Kaburagi, Haruko, 5,591,406, Cl. 422-80.000.
Yamatake-Honeywell Co., Ltd.: *See*—
Kuroda, Masao, 5,590,677, Cl. 137-85.000.
Yamao, Satoshi: *See*—
Suzuki, Toshiaki; Yamato, Satoshi; Koganezawa, Nobuhito; and Ozaki, Yuichi, 5,592,609, Cl. 395-173.000.
Yamauchi, Kiyotaka: *See*—
Yoshizawa, Yoshihito; Bizen, Yoshio; Suwabe, Shigekazu; Yamauchi, Kiyotaka; and Nishiyama, Toshikazu, 5,591,276, Cl. 148-304.000.
Yamauchi, Masahiro; Kainoto, Takashi; Furukawa, Mitsuhiko; Rikihisa, Katsutoshi; Yoshida, Hironori; and Watanabe, Kenji, to Nippon Tungsten Co., Ltd.; and Kyushu Electric Power Co., Inc. PTC panel heater with small rush current characteristic and highly heat insulating region corresponding to heater location to prevent local overheating. 5,592,647, Cl. 392-432.000.
Yamauchi, Takeshi: *See*—
Tamura, Museo; Yamauchi, Takeshi; Niwa, Katuhide; Fukazawa, Takeshi; Kuroyanagi, Akira; and Yamaoka, Tooru, 5,592,004, Cl. 257-323.000.
Yamauchi, Yukio: *See*—
Arai, Michio; Inushima, Takashi; Codama, Mitsufumi; Sugiura, Kazashi; Takayama, Ichiro; Kobori, Isamu; Yamauchi, Yukio; and Sakamoto, Naoya, 5,591,988, Cl. 257-59.000.
Yamazaki, Atsushi: *See*—
Sasou, Hiroshi; and Yamazaki, Atsushi, 5,592,400, Cl. 364-514.00R.
Yamazaki, Hirokazu: *See*—
Kunakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,592,427, Cl. 365-205.000.
Yamazaki, Hiroshi; Oshiba, Takeo; and Etoh, Yoshihiko, to Konica Corporation. Image forming method. 5,591,558, Cl. 430-120.000.
Yamazaki, Mitsuaki: *See*—
Obtake, Yasuhisa; Sago, Seiji; Yamazaki, Mitsuaki; and Muramatsu, Sachiko, 5,592,044, Cl. 313-403.000.
Yamazaki, Shunpei; and Nagata, Yujiro, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor MIS field effect transistor with semi-amorphous semiconductor material. 5,591,987, Cl. 257-57.000.
Yamazaki, Shunpei; and Hamatani, Toshiji, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device and method for forming the same. 5,592,008, Cl. 257-347.000.
Yanrom, Boris, to General Electric Company. Method of color coding orientation information. 5,592,598, Cl. 395-123.000.
Yan, Yi-Dong: *See*—
Chao, Ying-Chen; Shen, Chih-Heng; and Yan, Yi-Dong, 5,591,673, Cl. 437-192.000.
Yanagawa, Masayoshi: *See*—
Koyama, Masayoshi; Takahashi, Mikiko; and Yanagawa, Masayoshi, 5,591,711, Cl. 514-6.000.
Yanagida, Toshiharu: *See*—
Shinohara, Keiji; Sato, Junichi; Kamide, Yukihiro; and Yanagida, Toshiharu, 5,591,302, Cl. 156-661.110.
Yanagisawa, Isao: *See*—
Arami, Junichi; Ishikawa, Kenji; Deguchi, Youichi; Yagi, Hironori; Kawada, Nobuo; and Yanagisawa, Isao, 5,591,269, Cl. 118-723.00R.
Yanagisawa, Makoto: *See*—
Tomita, Hiroyoshi; Yanagisawa, Makoto; and Kodama, Yukinori, 5,592,433, Cl. 365-230.060.
Yanagizawa, Hirofumi: *See*—
Adachi, Katsumi; Narikawa, Shiro; Hayakawa, Takashi; Nishio, Yukihito; Yanagizawa, Hirofumi; Sakamoto, Takumi; and Okada, Atsushi, 5,592,263, Cl. 399-176.000.
Yanai, Moshe: *See*—

Nagler, Michael; Melman, Haim; Yanai, Moshe; Kleinstern, Amir; and Shalev, Elinyahu, 5,592,309, Cl. 358-500.000.
Yanashima, Tsukasa: *See*—
Sato, Tsutomu; Hirano, Masakazu; Yanashima, Tsukasa; Yamaguchi, Hiroyuki; and Moroma, Yoshio, 5,592,278, Cl. 399-384.000.
Yang, Ming-Tzong, to United Microelectronics Corporation. Self aligning fabrication method for sub-resolution phase shift mask. 5,591,549, Cl. 430-5.000.
Yang, Ming-Tzong, to United Microelectronics Corporation. Single layer thin film transistor static random access memory cell. 5,592,011, Cl. 257-368.000.
Yang, Paul T.: *See*—
Onsrud, Jimmy K.; Yang, Paul T.; Khachaturian, Gurgen H.; Nikogossian, Karen M.; Hovakimian, Karen S.; and Vartapetian, Armen L., 5,592,506, Cl. 375-207.000.
Yang, Tian-Show. Assembling connector structure. 5,590,974, Cl. 403-327.000.
Yang, Xiaomin: *See*—
Marks, Tobin J.; Yang, Xiaomin; and Jia, Li, 5,591,815, Cl. 526-127.000.
Yao, Jonathan Y., to Siemens Medical Systems, Inc. Multiple layer multileaf collimator. 5,591,983, Cl. 250-505.100.
Yao, Nian J.; and Verma, Vikram, to Texas Instruments Incorporated. Efficient, dual-polarization, three-dimensionally omni-directional crossed-loop antenna with a planar base element. 5,592,182, Cl. 343-742.000.
Yasu, Toshiharu: *See*—
Takeuchi, Yoshiharu; Yasu, Toshiharu; Sakai, Masabu; Tsubokawa, Masahiro; Oka, Hideto; and Aiba, Osamu, 5,591,018, Cl. 417-366.000.
Yasuda, Shoji: *See*—
Ueda, Hiroshi; Fukui, Tsugushi; Imura, Kazuyoshi; Kimura, Hirofumi; Yasuda, Shoji; Hotani, Shin; Inoue, Kimio; Minato, Ryota; Tanaka, Yoshimitsu; and Takahashi, Katsunori, 5,590,959, Cl. 366-84.000.
Yasuhara, Norio: *See*—
Funaki, Hideyuki; Nakagawa, Akio; Yasuhara, Norio; Matsudai, Tomoko; Yamaguchi, Yoshihiro; and Omura, Ichiro, 5,592,014, Cl. 257-487.000.
Yasui, Ken K., to McDonnell Douglas Corporation. Superplastically formed structure having a perforated skin. 5,591,511, Cl. 428-138.000.
Yazaki Corporation: *See*—
Abe, Kimihiro; and Onoda, Katsuhiko, 5,591,044, Cl. 439-397.000.
Ichikawa, Hiroshi, 5,592,094, Cl. 324-427.000.
Ninchi, Ryuji, 5,590,457, Cl. 29-721.000.
Ogasawara, Yasuyuki; and Watanabe, Yoshihiko, 5,592,314, Cl. 349-18.000.
Watanabe, Tamio, 5,591,052, Cl. 439-752.000.
Yazawa, Akira: *See*—
Takamiya, Naoki; Nakao, Makoto; Yazawa, Akira; and Wakabayashi, Atsuni, 5,591,517, Cl. 428-304.400.
Yeh, Sheng-Fu. CD bank. 5,590,770, Cl. 206-308.100.
Yen, Haw: *See*—
Lee, Ching-Ying; Hsia, Shaw-Tzeng; and Yen, Haw, 5,591,672, Cl. 437-190.000.
Yen, Shou-Chern: *See*—
Kelley, Michael W.; and Yen, Shou-Chern, 5,592,601, Cl. 395-143.000.
Yeon, Kyu J.: *See*—
Bang, Won Y.; Yeon, Kyu J.; Baik, Yeong O.; Kim, Young H.; Park, Kwan H.; Lee, Ki H.; and Kim, Jin W., 5,591,766, Cl. 514-412.000.
Yeung, Clifford: *See*—
Bennett, Dwayne; Yeung, Clifford; and Wu, Wayne, 5,592,160, Cl. 341-58.000.
Yewer, Edward H., Jr. Convertible support belt. 5,591,122, Cl. 602-19.000.
Yokev, Hanoch; Harel, Haim; Meiman, Yehouda; and Peleg, Shimon, to Nexus1994 Limited. Direction finding and mobile location system for trunked mobile radio systems. 5,592,180, Cl. 342-450.000.
Yokimcus, Victor P.: *See*—
Ameen, Joseph G.; Korleski, Joseph E.; Mortimer, William P., Jr.; and Yokimcus, Victor P., 5,591,034, Cl. 439-91.000.
Yokogawa Electric Corporation: *See*—
Nanko, Tomoaki; Tanaami, Takeo; and Mikuriya, Kenta, 5,592,292, Cl. 356-356.000.
Toyama, Akira; and Agata, Tatsuyuki, 5,592,659, Cl. 395-558.000.
Yokohama Rubber Co., Ltd., The: *See*—
Midorikawa, Shingo; Harada, Masaaki; and Kondoh, Takanori, 5,591,279, Cl. 152-209.00R.
Yokota, Haruo; Noguchi, Yasuo; Akaboshi, Naoki; Hayashi, Katsumi; and Hirosue, Seigo, to Fujitsu Limited. Database management system to alternately perform retrieval process and updating process. 5,592,660, Cl. 395-608.000.
Yomtov, Sidi: *See*—
Intrater, Amos; Birenbaum, Andy; Intrater, Gideon; Carmon, Iddo; Shimony, Ilan; Fraenkel, Itael; Epstein, Lev; Katzri, Lior; Viner, Omri; Levitan, Raya; Cohen, Ronny; Yomtov, Sidi; Tzadik, Yehezkel; Greenfeld, Zvi; Greiss, Israel; Oz, Oved; Afek, Yachin; Tsadik, Meir; Doron, Moshe; and Sandbank, Alberto, 5,592,677, Cl. 395-800.000.
Yoneda, Masato: *See*—
Konishi, Masahiro; Sasama, Hiroshi; and Yoneda, Masato, 5,592,407, Cl. 365-49.000.
Yoneda, Tetsuya; Mitate, Takehito; Nishimura, Naoto; and Yamada, Kazuo, to Sharp Kabushiki Kaisha. Method of manufacturing a negative electrode for lithium secondary battery. 5,591,547, Cl. 429-218.000.
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, to Sony Corporation. Method for reproducing compressed information data from a disk using a spatial frequency less than the track pitch. 5,592,450, Cl. 369-48.000.
Yonezaki, Takahiro: *See*—
Nakamura, Hiroshi; Fujitani, Shin; Nakamura, Yumiko; Yonezaki, Takahiro; Nishimura, Koichi; Imoto, Teruhiko; and Yonezu, Ikuo; 5,591,897, Cl. 73-38.000.
Yonezu, Ikuo: *See*—
Nakamura, Hiroshi; Fujitani, Shin; Nakamura, Yumiko; Yonezaki, Takahiro; Nishimura, Koichi; Imoto, Teruhiko; and Yonezu, Ikuo, 5,591,897, Cl. 73-38.000.
Yoo, Seung-Moon, to Samsung Electronics Co., Ltd. Half power supply voltage generating circuit for a semiconductor device. 5,592,119, Cl. 327-530.000.
Yoon, InBae. Safety penetrating instrument with safety member moving during penetration and triggered safety member protrusion. 5,591,189, Cl. 606-185.000.
Yoon, InBae. Safety trocar penetrating instrument. 5,591,190, Cl. 606-185.000.
Yoon, InBae. Retractable safety penetrating instrument for portal sleeve introduction. 5,591,193, Cl. 606-185.000.
Yore, Thomas S.; and Wright, Jeffrey M. Lockable lock box mounting assembly and method. 5,590,608, Cl. 109-50.000.
York, David W.: *See*—
Brinson, Alan D.; Cumming, David X.; and York, David W., 5,591,705, Cl. 510-276.000.
York International Corporation: *See*—
Kettler, John P.; and Reese, James A., 5,590,830, Cl. 236-49.300.
York Limited: *See*—
Hartog, Arthur H., 5,592,282, Cl. 356-44.000.
Yoshida, Hironaori: *See*—
Yamauchi, Masahiro; Kaimoto, Takashi; Furukawa, Mitsuhiko; Rikihisa, Katsutoshi; Yoshida, Hironori; and Watanabe, Kenji, 5,592,647, Cl. 392-432.080.
Yoshida, Kenji: *See*—
Shimizu, Masao; and Yoshida, Kenji, 5,592,496, Cl. 371-27.000.
Yoshida, Masanori: *See*—
Mochizuki, Seiji; Kawakami, Kuzuhisa; Nakamura, Masahiro; Ohshima, Keiichi; and Yoshida, Masanori, 5,590,510, Cl. 53-434.000.
Yoshida, Masayuki: *See*—
Kimura, Tomohiro; Kiso, Shigenori; Yoshida, Masayuki; and Ono, Fumitaka, 5,592,163, Cl. 341-107.000.
Yoshida, Seiji: *See*—
Sawada, Takaaki; Yoshimura, Masahiko; and Yoshida, Seiji, 5,592,662, Cl. 395-601.000.
Yoshida, Shinichi: *See*—
Asuma, Hajime; Hasegawa, Tsukasa; Naito, Akira; Kasai, Yasuhiko; Tsuchiya, Tomoko; Yoshida, Shinichi; and Matsuda, Yasumasa, 5,592,605, Cl. 395-348.000.
Yoshida, Suguru: *See*—
Saitou, Yuuji; Mouko, Minoru; Yoshida, Suguru; and Sugawara, Kobki, 5,591,359, Cl. 219-121.640.
Yoshida, Takahiko; Hirata, Koji; Osawa, Atsuo; Wada, Kiyoshi; and Yoshikawa, Hiroki, to Hitachi, Ltd. Rear projection type image display apparatus and transmission type screen used therein. 5,590,943, Cl. 353-74.000.
Yoshida, Toshiki: *See*—
Nakamura, Hideki; Yamasaki, Keiji; Yamane, Fujio; Yoshida, Toshiki; Iizuka, Tadashi; and Ishiyama, Akihiko, 5,591,023, Cl. 418-179.000.
Yoshifuji, Yuuki: *See*—
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Yoshihara, Hideo: *See*—
Uehara, Mitsuyoshi; Yoshihara, Hideo; Suzuki, Tsutomu; Morita, Fumio; and Igarashi, Hiroshi, 5,592,268, Cl. 399-276.000.
Yoshikawa, Hiroki: *See*—
Yoshida, Takahiko; Hirata, Koji; Osawa, Atsuo; Wada, Kiyoshi; and Yoshikawa, Hiroki, 5,590,943, Cl. 353-74.000.
Yoshikawa, Shuichi: *See*—
Murata, Yasumoto; Ikeuchi, Michio; Yoshikawa, Shuichi; and Watanabe, Masahiko, 5,592,544, Cl. 379-283.000.
Yoshimoto, Kyosuke; Rao, M. C.; Ohata, Hiroyuki; Nakase, Kazuhiko; Furukawa, Teruo; Kondo, Jinichi; and Ozutake, Masafumi, to Mitsuishi Denki Kabushiki Kaisha. Optical disk with logical tracks formed thereon and optical disk drive device. 5,592,452, Cl. 369-58.000.
Yoshimura, Hiroyuki; Kisaka, Hideaki; Tamano, Yutaka; and Okuzono, Shuichi, to Tosoh Corporation. Process for producing polyurethane foam with high curing rate. 5,591,781, Cl. 521-129.000.
Yoshimura, Masahiko: *See*—
Sawada, Takaaki; Yoshimura, Masahiko; and Yoshida, Seiji, 5,592,662, Cl. 395-601.000.
Yoshimura, Shunji: *See*—
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, 5,592,450, Cl. 369-48.000.
Yoshimura, Yumiko: *See*—
Ikeda, Akira; Nakatsugawa, Naoki; Yoshimura, Yumiko; Tanimura, Yasuhiro; and Ezaki, Kenji, 5,591,349, Cl. 210-760.000.
Yoshinaga, Kazuo: *See*—
Katagiri, Kazuharu; Yoshinaga, Kazuo; Okada, Shinjiro; and Kanbe, Junichiro, 5,592,315, Cl. 349-126.000.

Yoshino, Akio, to Victor Company of Japan, Ltd. High definition television receiver. 5,592,230, Cl. 348-448.000.
Yoshino, Satoshi, to Fujitsu Limited. Image forming apparatus having a stepping motor for rotating a photosensitive drum. 5,592,261, Cl. 399-167.000.
Yoshinobu, Hitoshi; and Saito, Junya, to Sony Corporation. Receiving unit for two-way broadcasting including automatic display of operating state of a transmitting system. 5,592,213, Cl. 348-13.000.
Yoshio, Akira: *See*—
Sugimoto, Emi; Yoshio, Akira; and Ito, Yoshinori, 5,591,264, Cl. 118-320.000.
Yoshizawa, Yoshihito; Bizen, Yoshio; Suwabe, Shigekazu; Yamauchi, Kiyotaka; and Nishiyama, Toshikazu, to Hitachi Metals, Ltd. Magnetic alloy with ultrafine crystal grains and method of producing same. 5,591,276, Cl. 148-304.000.
Yosim, Paul S.: *See*—
Rosenbaum, Fred; and Yosim, Paul S., 5,592,236, Cl. 348-586.000.
Yost, Kevin G.: *See*—
Chen, Albert C.; Hrinko, Peter, Jr.; Yost, Kevin G.; and Kent, John R., 5,590,438, Cl. 15-167.100.
Youn, Hyeong-Chan: *See*—
Rao, Madhukar; Youn, Hyeong-Chan; Toussaint, Anthony F.; and DeCapite, Marianne G., 5,591,793, Cl. 524-310.000.
Younathan, Janet: *See*—
Kapp, Daniel L.; and Younathan, Janet, 5,591,569, Cl. 430-549.000.
Younes, Hani; Kander, Ilan; Levy, Dorron; Cohen, Yossi; and Belinkov, Haim, to Indigo N.V. Imaging system having an intermediate transfer member. 5,592,269, Cl. 399-237.000.
Young, Gary. Baseball bat. 5,590,875, Cl. 473-457.000.
Young, John A.: *See*—
Cairo, John A., Jr.; and Young, John A., 5,591,347, Cl. 210-703.000.
Young, Richard A.: *See*—
O'Donnell, Michael A.; Duda, Rosemary B.; DeWolf, William C.; Aldovini, Anna; and Young, Richard A., 5,591,632, Cl. 435-252.300.
Young, Richard N.; and Irwin, Thomas J., II, to DBS Manufacturing, Inc. Methods and apparatuses for rapid composting with closed air loop circulation for positive control. 5,591,635, Cl. 435-286.100.
Young, Steve: *See*—
Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,592,586, Cl. 395-2.290.
Yu, Chen-Hua D.: *See*—
Lee, Kuo-Hua; and Yu, Chen-Hua D., 5,591,674, Cl. 437-193.000.
Yu, Robert C. U.: *See*—
Mishra, Satchidanand; Yu, Robert C. U.; Carmichael, Kathleen M.; Grabowski, Edward F.; Horgan, Anthony M.; Limbury, William W.; Normandin, Shawn E.; Pai, Damodar M.; Post, Richard L.; Robinson, Charles C.; Springett, Brian E.; Sullivan, Donald P.; and VonHoene, Donald C., 5,591,554, Cl. 430-59.000.
Yu, Ruey J.; and Van Scott, Eugene J. Method of treating wrinkles using malic acid. 5,591,774, Cl. 514-574.000.
Yuasa, Takuma: *See*—
Kaneno, Kimihiko; Yuasa, Takuma; and Fujimoto, Hideki, 5,591,512, Cl. 428-141.000.
Yukizane, Shigemi: *See*—
Okabe, Hirohiko; Sekiguchi, Masaaki; Yukizane, Shigemi; Matsumoto, Toshitaka; and Kawano, Minoru, 5,590,871, Cl. 270-58.270.
Yung, Robert, to Sun Microsystems, Inc. Apparatus and method for distributed control in a processor architecture. 5,592,679, Cl. 395-800.000.
Yuri, Nobuyuki: *See*—
Ikeda, Susumu; Isobe, Toshimi; Inoue, Atsuo; Fujita, Toshihiko; Tajiri, Akihiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,590,540, Cl. 62-180.000.
Zachary, Gordon B. Sorting module installation. 5,590,794, Cl. 209-702.000.
Zagaroli, James, Jr., to Knight Industries, Inc. Gravity conveyor with return. 5,590,756, Cl. 198-795.000.
Zahavi, Dov. Imaging of 3-dimensional objects. 5,592,563, Cl. 382-154.000.
Zambrano, Raffaele, to Consorizio Per La Ricerca Sulla Microelectronica Nel Mezzogiorno. Method of manufacturing a power integrated circuit (PIC) structure. 5,591,662, Cl. 437-57.000.
Zammit, Edward, to Zammit, Edward. Implement for seperating the liquid medium from the solid contents of canned foodstuffs. 5,590,590, Cl. 99-495.000.
Zarmi, Moshe: *See*—
Goldman, Jacob; and Zarmi, Moshe, 5,592,366, Cl. 361-796.000.
Zaug, Arthur J.: *See*—
Cech, Thomas R.; Zaug, Arthur J.; and Been, Michael D., 5,591,610, Cl. 435-91.310.
ZBB Technologies, Inc.: *See*—
Eidler, Phillip A.; and Lee, Peter J., 5,591,538, Cl. 429-122.000.
Zehr, Melvin A. Conveyor with extending shroud. 5,590,842, Cl. 241-186.350.
Zeiss, Hans-Joachim, to Hoechst Aktiengesellschaft. Optically active ω-halo-2-amino-alkanecarboxylic acid derivatives, process for the preparation thereof and their use for the preparation of optically active phosphorus-containing α-amino acids. 5,591,861, Cl. 548-228.000.
Zelayeta, Joe: *See*—
Rossoker, Michael D.; Psuch, Nicholas F.; and Zelayeta, Joe, 5,591,564, Cl. 430-311.000.
Zelno, Heinz. Method and an apparatus for the disposal of material containing infective microorganisms. 5,591,117, Cl. 588-258.000.
Zen Research N.V.: *See*—
Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, 5,592,444, Cl. 369-13.000.
Zenda, Hiroki, to Kabushiki Kaisha Toshiba. Plasma display control system. 5,592,187, Cl. 345-3.000.
Zenoni, Pietro: *See*—
Pedrini, Giovanni; and Zenoni, Pietro, 5,590,693, Cl. 139-452.000.
Zest Anchors, Inc.: *See*—
Zuest, Max, 5,591,029, Cl. 433-173.000.
Zettler, Karl-Heinz, to Westfalia Separator Aktiengesellschaft. Process and system for regulating the fat content of milk and cream. 5,591,469, Cl. 426-231.000.
Zhang, Jinshan: *See*—
Louie, Edmond; Reichert, Veronica R.; Asani, Anaba A.; and Zhang, Jinshan, 5,591,540, Cl. 429-163.000.
Zhang, Ruiwen: *See*—
Agrawal, Sudhir; Diasio, Robert B.; and Zhang, Ruiwen, 5,591,721, Cl. 514-44.000.
Zhao, Chen: *See*—
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,591,860, Cl. 548-204.000.
Zhao, Jianai: *See*—
McDevitt, John T.; Zhou, Ji-Ping; and Zhao, Jianai, 5,591,696, Cl. 505-234.000.
Zhou, Guangbin: *See*—
Stera, S. Alexander; Kawakami, Hiroyoshi; Houde, Ajay Y.; and Zhou, Guangbin, 5,591,250, Cl. 95-51.000.
Zhou, Ji-Ping: *See*—
McDevitt, John T.; Zhou, Ji-Ping; and Zhao, Jianai, 5,591,696, Cl. 505-234.000.
Ziai, Mohammad R.; Sokol, Patricia T.; and Chandra, Manik, to American Cyanamid Company. Porcine apamin binding protein/receptor. 5,591,824, Cl. 530-350.000.
Ziemer, James N.: *See*—
Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., 5,591,322, Cl. 208-120.000.
Zilog, Inc.: *See*—
Chan, Stephen H., 5,592,635, Cl. 395-386.000.
Zimmer, Inc.: *See*—
Nazre, Aniruddha A.; and Fish, Elson B., 5,591,164, Cl. 606-59.000.
Zimmer, Maik: *See*—
Hoffmann, Wolfgang; Koerner, André; and Zimmer, Maik, 5,591,939, Cl. 174-67.000.
Zinser Textilmaschinen GmbH: *See*—
Mann, Peter; and Beukert, Thomas, 5,590,514, Cl. 57-104.000.
Ziu, Christopher G., to Ziu, Christopher G. Centering support for double-containment pipe assembly. 5,590,690, Cl. 138-113.000.
Zlock, Stephen W.: *See*—
Stone, Corbett W.; Zlock, Stephen W.; and Nicholas, David A., 5,591,181, Cl. 606-144.000.
Zmelty, Anton: *See*—
Braatz, Christoph; Szczyrbowski, Joachim; and Zmelty, Anton, 5,591,529, Cl. 428-457.000.
Zones, Stacey I.; Holtermann, Dennis L.; Innes, Robert A.; Pecoraro, Theresa A.; Santilli, Donald S.; and Ziemer, James N., to Chevron U.S.A. Inc. Dewaxing process using zeolite SSZ-25. 5,591,322, Cl. 208-120.000.
Zones, Stacey I., to Chevron U.S.A. Inc. Zeolite SSZ-41. 5,591,421, Cl. 423-706.000.
Zook, Christopher P., to Cirrus Logic, Inc. Versatile error correction system. 5,592,404, Cl. 364-746.100.
Zook, Christopher P., to Cirrus Logic, Inc. CRC/EDC checker system. 5,592,498, Cl. 371-40.100.
Zory, Peter: *See*—
Groger, Howard P.; Lo, Peter; Weiss, Martin; and Zory, Peter, 5,591,407, Cl. 422-82.050.
Zou, Xueming: *See*—
Richard, Mark A.; Zou, Xueming; and Morich, Michael A., 5,592,087, Cl. 324-318.000.
Zuckerman, Andrew M., to Different Dimensions Inc. Garment hanger information tab. 5,590,822, Cl. 223-85.000.
Zuest, Max, to Zest Anchors, Inc. Dental implant system. 5,591,029, Cl. 433-173.000.
Zysk, John R.: *See*—
Thorner, Michael O.; Gaylinn, Bruce D.; Zysk, John R.; Lynch, Kevin R.; and Harrison, Jeffrey K., 5,591,641, Cl. 435-69.100.
3Com Corporation: *See*—
Isfeld, Mark S.; Mitchell, Bruce W.; Seaman, Michael J.; Mallory, Tracy D.; and Arunkumar, Nagaraj, 5,592,622, Cl. 395-200.020.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7th DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cathey, David A.; Tuttle, Mark E.; and Lowrey, Tyler A., to Micron Technology, Inc. Method of increasing capacitance by surface roughening in semiconductor wafer processing. Re. 35,420, Cl. 437-228.000.
Kilty, Cormac G.; and O'Byrne, Seamus, to Kilty, Cormac G.; and O'Byrne, Seamus. Measurement of an enzyme marker as an aid to diagnosis of liver transplant rejection. Re. 35,419, Cl. 435-7.400.
Lenchig G., Sergio: *See*—
Ruiz, Luis A.; and Lenchig G., Sergio, Re. 35,421, Cl. 606-166.000.
Lowrey, Tyler A.: *See*—
Cathey, David A.; Tuttle, Mark E.; and Lowrey, Tyler A., Re. 35,420, Cl. 437-228.000.
Martignago, Dino. Securing device, particularly for footwear. Re. 35,418, Cl. 24-68.0SK.
Micron Technology, Inc.: *See*—
Cathey, David A.; Tuttle, Mark E.; and Lowrey, Tyler A., Re. 35,420, Cl. 437-228.000.
O'Byrne, Seamus: *See*—
Kilty, Cormac G.; and O'Byrne, Seamus, Re. 35,419, Cl. 435-7.400.
Ruiz, Luis A.; and Lenchig G., Sergio. Automatic corneal shaper. Re. 35,421, Cl. 606-166.000.
Tuttle, Mark E.: *See*—
Cathey, David A.; Tuttle, Mark E.; and Lowrey, Tyler A., Re. 35,420, Cl. 437-228.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Egami, Shunichiro; and Kawai, Makoto, to Nippon Telegraph & Telephone Corporation. Power amplifying apparatus. B1 4,618,831, Cl. 330-124.00R.
Empi, Inc.: *See*—
Maurer, Donald D.; and Kipnis, Alexander, B1 5,314,465, Cl. 607-138.000.
Gas Research Institute: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., B1 4,858,704, Cl. 175-61.000.
Herben, William C.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., B1 4,858,704, Cl. 175-61.000.
Kawai, Makoto: *See*—
Egami, Shunichiro; and Kawai, Makoto, B1 4,618,831, Cl. 330-124.00R.
Kipnis, Alexander: *See*—
Maurer, Donald D.; and Kipnis, Alexander, B1 5,314,465, Cl. 607-138.000.
Longfibre Company: *See*—
Nordstrom, Duane M., B1 1,033,128, Cl. 220-465.000.
Martin, Keith F., to Netlon Limited. Drainage material and drainage core for a drainage system. B1 4,815,892, Cl. 405-45.000.
Maurer, Donald D.; and Kipnis, Alexander, to Empi, Inc. Incontinence electrode apparatus and method. B1 5,314,465, Cl. 607-138.000.
Maurer, William C.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., B1 4,858,704, Cl. 175-61.000.
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., to Gas Research Institute. Guided earth boring tool. B1 4,858,704, Cl. 175-61.000.
Netlon Limited: *See*—
Martin, Keith F., B1 4,815,892, Cl. 405-45.000.
Nippon Telegraph & Telephone Corporation: *See*—
Egami, Shunichiro; and Kawai, Makoto, B1 4,618,831, Cl. 330-124.00R.
Nordstrom, Duane M., to Longfibre Company. Paperboard container for liquids including means to prevent fitment rotation. B1 1,033,128, Cl. 220-465.000.
Pittard, Gerard T.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., B1 4,858,704, Cl. 175-61.000.
Wasson, Michael R.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., B1 4,858,704, Cl. 175-61.000.

LIST OF DESIGN PATENTEES

A-Dec, Inc.: *See*—
Nordstrom, Carl G.; and Weiler, Stephen N., 377,227, Cl. D26-65.000.
Adams, Ruth D.: *See*—
Ferland, L. Ann; and Adams, Ruth D., 377,115, Cl. D3-203.000.
Adamson, Stefan, to Sun-Flex AB. Elbow rest. 377,125, Cl. D6-418.000.
Albert, Larry L. Combined animal waste collector and flashlight. 377,247, Cl. D30-162.000.
American Standard Inc.: *See*—
Kotlarek, Peter A.; Arentz, Larry R.; and Shepherd, Dyck A., 377,178, Cl. D15-9.000.
Ancona, Bruce; Ancona, Jane; and DeGuzman, Mary J. Gadget handle. 377,135, Cl. D7-401.200.
Ancona, Jane: *See*—
Ancona, Bruce; Ancona, Jane; and DeGuzman, Mary J., 377,135, Cl. D7-401.200.
Andrieu, Louis, to Tefal S.A. Weighing apparatus for babies. 377,153, Cl. D10-92.000.
Angelo, David R. Burger mold. 377,138, Cl. D7-672.000.
Arentz, Larry R.: *See*—
Kotlarek, Peter A.; Arentz, Larry R.; and Shepherd, Dyck A., 377,178, Cl. D15-9.000.
Athanasiadis, Elias. Pressure air powered casting gun for fish line and sinker. 377,204, Cl. D22-134.000.
Bafile, Louis M., Jr.; and Rado, Antonio D., III. Lottery ticket scraper. 377,250, Cl. D32-46.000.
Bair, Leland R. Shingle removal tool. 377,140, Cl. D8-89.000.
Baker, William E. Shelving unit. 377,128, Cl. D6-479.000.
Baldwin, Preston M.; and Snell, Barry. Fringed belt. 377,107, Cl. D2-627.000.
Baron, Fabien, to Beaute Prestige International. Combined bottle and closure. 377,147, Cl. D9-529.000.
Barrington, Christopher J. Combined plant trolley and potting bench. 377,127, Cl. D6-477.000.
Baume & Mercier S.A.: *See*—
Bodino, Giuspiero, 377,148, Cl. D10-18.000.
Baxter & Charming, Ltd.: *See*—
Norman, Phylane L.; and Condon, Eileen J., 377,245, Cl. D30-152.000.
Beaute Prestige International: *See*—
Baron, Fabien, 377,147, Cl. D9-529.000.
Becker, Arthur: *See*—
Wells, Ben; and Becker, Arthur, 377,184, Cl. D16-133.000.
Bedrosian, Ara: *See*—
Bedrosian, Yerchanik; Bedrosian, Ara; and Bedrosian, Shant, 377,225, Cl. D26-28.000.
Bedrosian, Shant: *See*—
Bedrosian, Yerchanik; Bedrosian, Ara; and Bedrosian, Shant, 377,225, Cl. D26-28.000.
Bedrosian, Yerchanik; Bedrosian, Ara; and Bedrosian, Shant. Light fixture for a motorcycle. 377,225, Cl. D26-28.000.
Beinsco, Raymond. Airless baby bottle plunger. 377,221, Cl. D24-194.000.

Black & Decker Inc.: *See*—
Carbone, Richard J.; and Dubois, Craig A., 377,118, Cl. D3-228.000.
BNOX, Inc.: *See*—
Wells, Ben; and Becker, Arthur, 377,184, Cl. D16-133.000.
Bodino, Giampiero, to Baume & Mercier S.A. Clock. 377,148, Cl. D10-18.000.
Boyd, Edward L., to Sony Corp. of America. Floor standing loudspeaker. 377,175, Cl. D14-214.000.
Brickner, Louis C., Jr.: *See*—
Young, Ronald E.; and Brickner, Louis C., Jr., 377,180, Cl. D15-125.000.
Bright Yin Huey Co., Ltd.: *See*—
Hsu, Keen, 377,232, Cl. D26-133.000.
Hsu, Keen, 377,233, Cl. D26-134.000.
Brown, Frank E.; and Oldroyd, Brian, to Gillette Company, The. Top rear surface of razor head. 377,237, Cl. D28-47.000.
Bruns, Mark W. Material pick up finger. 377,139, Cl. D8-14.000.
Brunswick Bowling & Billiards Corporation: *See*—
Stirling, Michael F.; and Katje, Michael J., 377,124, Cl. D6-397.000.
Byrne, David, to Warner-Lambert Company. Razor handle. 377,238, Cl. D28-48.000.
Cale, Peter J. Kite. 377,200, Cl. D21-88.000.
Carbone, Richard J.; and Dubois, Craig A., to Black & Decker Inc. Belt-attached flashlight holder. 377,118, Cl. D3-228.000.
Casio Computer Co., Ltd.: *See*—
Komuta, Yoshihiro; and Kurabuti, Yuiti, 377,189, Cl. D18-2.000.
Matsuda, Makoto, 377,190, Cl. D18-7.000.
Takeichi, Takashi, 377,151, Cl. D10-39.000.
Cavalliere, Daren L. Motorcycle tire/wheel carrier. 377,254, Cl. D34-24.000.
Chang, Thomas: *See*—
Chen, Tony; and Chang, Thomas, 377,168, Cl. D14-107.000.
Chen, Tony; and Chang, Thomas, to Umax Data Systems Inc. Visual image scanner. 377,168, Cl. D14-107.000.
Cheng, Su Mei W. Spectacles. 377,188, Cl. D16-321.000.
Chida, Hiromi, to Seiko Instruments Inc. Tablet. 377,169, Cl. D14-114.000.
Claber S.p.A.: *See*—
Roman, Gianfranco, 377,205, Cl. D23-216.000.
Clenney, James C. Cat litter strainer. 377,246, Cl. D30-162.000.
Cohen, Brett I.; and Musikant, Barry L., to Essential Dental Systems, Inc. Endo-block. 377,218, Cl. D24-176.000.
Combi Corporation: *See*—
Shimura, Toshihide; and Matsuda, Hiroaki, 377,116, Cl. D3-214.000.
Condon, Eileen J.: *See*—
Norman, Phylane L.; and Condon, Eileen J., 377,245, Cl. D30-152.000.
Cooper Industries, Inc.: *See*—
Degelmann, Paul G., 377,231, Cl. D26-77.000.
Crowley, Kevin J.; and Davis, Joseph F., to Fila U.S.A., Inc. Shoe eyelets. 377,114, Cl. D2-978.000.
Davidson, William G.; and Netz, Louis, to Harley-Davidson Motor Company. Motorcycle transmission end cover. 377,157, Cl. D12-126.000.
Davis, Denis M. Storage rack for vehicle dolly. 377,163, Cl. D12-408.000.
Davis, Joseph F.: *See*—
Crowley, Kevin J.; and Davis, Joseph F., 377,114, Cl. D2-978.000.
Davis, Robert E. Sportsman's towel device. 377,131, Cl. D6-608.000.
Degelmann, Paul G., to Cooper Industries, Inc. Luminaire. 377,231, Cl. D26-77.000.
DeGuzman, Mary J.: *See*—
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Delta International Machinery Corp.: *See*—
Young, Ronald E.; and Brickner, Louis C., Jr., 377,180, Cl. D15-125.000.
Des Touche, Vincent, to Tefal S.A. Culinary grill. 377,134, Cl. D7-362.000.
Devant Ltd.: *See*—
Sheppard, James M., Jr., 377,196, Cl. D19-65.000.
Dorrer, Robert. Knee cushion. 377,130, Cl. D6-601.000.
Dotterman, Perry S.: *See*—
Strand, Jerome E.; and Dotterman, Perry S., 377,219, Cl. D24-187.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Markett, Stephen, 377,160, Cl. D12-181.000.
Dubois, Craig A.: *See*—
Carbone, Richard J.; and Dubois, Craig A., 377,118, Cl. D3-228.000.
Duracraft Corp.: *See*—
Jane, Rodney; Wang, Jui-Shang; Greaves, Stanley; and Holderfield, Gregory, 377,211, Cl. D23-358.000.
Dürr, Walter: *See*—
Kirsch, Axel; and Dürr, Walter, 377,217, Cl. D24-155.000.
Emery, Monti D., to Emhart Glass Machinery Investments Inc. Container inspection machine. 377,183, Cl. D15-199.000.
Emhart Glass Machinery Investments Inc.: *See*—
Emery, Monti D., 377,183, Cl. D15-199.000.
Eriksson, Thomas, to Rehband Anatomiska AB. Ankle bandage insert. 377,220, Cl. D24-192.000.
Essential Dental Systems, Inc.: *See*—
Cohen, Brett I.; and Musikant, Barry L., 377,218, Cl. D24-176.000.
Fendi, Paola, to Fendi Paolos & S.lle S.a.s. Clasp for purses and handbags. 377,120, Cl. D3-318.000.
Fendi Paolos & S.lle S.a.s.: *See*—
Fendi, Paola, 377,120, Cl. D3-318.000.
Fericad, L. Aan; and Adams, Ruth D. Bag cover for a bodily fluid drainage pouch. 377,115, Cl. D3-203.000.
Figur, Bernd: *See*—
Stitzer, Franz A.; and Figur, Bernd, 377,133, Cl. D7-330.000.
Fila Sport S.p.A.: *See*—
Manfredi, Natale, 377,109, Cl. D2-957.000.
Fila U.S.A., Inc.: *See*—
Crowley, Kevin J.; and Davis, Joseph F., 377,114, Cl. D2-978.000.
Fiveash, Ramon A. Animal feeder. 377,243, Cl. D30-130.000.
Foco, Keith E.; and Jacobs, Ronna L., to Haworth, Inc. Foldable mobile. 377,126, Cl. D6-425.000.
Ford, James J.; Ziemer, Lynn B.; and McCormack, Edward A., to Southco, Inc. Draw latch. 377,141, Cl. D8-331.000.
Fuji Photo Film Co., Ltd.: *See*—
Fukuda, Hiroshi, 377,186, Cl. D16-208.000.
Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Camera for taking consecutive exposures. 377,186, Cl. D16-208.000.
Fukushima, Hirotaka: *See*—
Yoshioka, Nobuaki; and Fukushima, Hirotaka, 377,165, Cl. D13-146.000.
Gillette Company, The: *See*—
Brown, Frank E.; and Oldroyd, Brian, 377,237, Cl. D28-47.000.
Glaxo Group Limited: *See*—
Rand, Paul K., 377,215, Cl. D24-110.000.
Grantham, Ken. Swimming pool skimmer basket. 377,249, Cl. D32-35.000.
Greaves, Stanley: *See*—
Jane, Rodney; Wang, Jui-Shang; Greaves, Stanley; and Holderfield, Gregory, 377,211, Cl. D23-358.000.
Grimaldi, Joel A. Cover for rear of motorcycle. 377,158, Cl. D12-126.000.
Hanson Research Corporation: *See*—
Hanson, Royal A.; Renslow, Bruce E.; Meneses, Guillermo E.; Montgomery, Sean M.; and Splane, Robson L., Jr., 377,152, Cl. D10-81.000.
Hanson, Royal A.; Renslow, Bruce E.; Meneses, Guillermo E.; Montgomery, Sean M.; and Splane, Robson L., Jr., to Hanson Research Corporation. Dissolution test apparatus. 377,152, Cl. D10-81.000.
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Young, Ronald E.; and Brickner, Louis C., Jr., to Delta International Machinery Corp. Spindle sanding machine. 377,180, Cl. D15-125.000.
Yuen, John S., to John Manufacturing Limited. Combined radio with floures-cent lantern, spotlight and blinking light. 377,173, Cl. D14-168.000.
Zeitman, Josh, to Lenoxx Electronics Corp. Telephone set. 377,172, Cl. D14-150.000.
Ziemer, Lynn B.: *See*—
Ford, James J.; Ziemer, Lynn B.; and McCormack, Edward A., 377,141, Cl. D8-331.000.
167,520 Canada Inc.: *See*—
Parris, Lester, 377,230, Cl. D26-69.000.

LIST OF PLANT PATENTEES

Apps, Darrel A., to Centerton Nursery, Inc. Daylily named 'Rosy Returns'. 9,779, Cl. Plt.-87.400.

Bennett, Cecilia L. D., deceased (by Susan M. O'Brien, Executrix): *See*—
O'Brien, Susan M.; Bennett, Cecilia L. D., deceased, 9,776, Cl. Plt.-10.100.

Centerton Nursery, Inc.: *See*—
Apps, Darrel A., 9,779, Cl. Plt.-87.400.

Conard-Pyle Company, The: *See*—
Meilland, Alain A., 9,777, Cl. Plt.-22.000.

Gardner, Leith M.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,778, Cl. Plt.-43.100.

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O'Brien, Susan M., Executrix: *See*—
O'Brien, Susan M.; Bennett, Cecilia L. D., deceased, 9,776, Cl. Plt.-10.100.

Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Peach tree 'Star-Fire'. 9,778, Cl. Plt.-43.100.

Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,778, Cl. Plt.-43.100.

Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 9,778, Cl. Plt.-43.100.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM
STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
7th DAY OF JANUARY, 1997

Broz, Alfred; and Green, William H., to United States of America, Army. Method of and apparatus for image processing using a variable focal spot size. H1,627, Cl. 378-98.120.

Dandridge, Anthony: *See*—
Kersey, Alan D.; and Dandridge, Anthony, H1,626, Cl. 370-479.000.

Dreier, Kimberly A.: *See*—
Roe, Donald C.; and Dreier, Kimberly A., H1,630, Cl. 604-385.200.

Ekanayake, Athula; and Pultinas, Edmund P., Jr. Tea extract and process. H1,628, Cl. 426-597.000.

Frankel, Michael Y., to United States of America, America. Distortion-compensated fiber-optic multi-tap proportional true time delay. H1,625, Cl. 342-375.000.

Garcia, John M.: *See*—
Reed, William S.; and Garcia, John M., H1,623, Cl. 219-524.000.

Green, William H.: *See*—
Broz, Alfred; and Green, William H., H1,627, Cl. 378-98.120.

Hendricks, Eric W.: *See*—
Ogden, T. Roger; and Hendricks, Eric W., H1,624, Cl. 261-123.000

Hercules Incorporated: *See*—
Riehle, Richard J.; and Staib, Ronald R., H1,629, Cl. 525-426.000.

Kersey, Alan D.; and Dandridge, Anthony. Fiber optic network system with low crosstalk using code-division multiplexing. H1,626, Cl. 370-479.000.

Ogden, T. Roger; and Hendricks, Eric W., to United States of America, Navy. Stabilizer for submerged gaseous jets in liquids. H1,624, Cl. 261-123.000.

Procter & Gamble Company, The: *See*—
Roe, Donald C.; and Dreier, Kimberly A., H1,630, Cl. 604-385.200.

Pultinas, Edmund P., Jr.: *See*—
Ekanayake, Athula; and Pultinas, Edmund P., Jr., H1,628, Cl. 426-597.000.

Reed, William S.; and Garcia, John M. Frozen bag of liquid thawer utilizing heat at ambient temperature. H1,623, Cl. 219-524.000.

Riehle, Richard J.; and Staib, Ronald R., to Hercules Incorporated. Poly(aminoamideureylene) resin, its synthesis, and its use in paper and paperboard manufacture. H1,629, Cl. 525-426.000.

Roe, Donald C.; and Dreier, Kimberly A., to Procter & Gamble Company, The. Diaper having plural upstanding leg cuffs. H1,630, Cl. 604-385.200.

Staib, Ronald R.: *See*—
Riehle, Richard J.; and Staib, Ronald R., H1,629, Cl. 525-426.000.

United States of America
America: *See*—
Frankel, Michael Y., H1,625, Cl. 342-375.000.
Army: *See*—
Broz, Alfred; and Green, William H., H1,627, Cl. 378-98.120.
Navy: *See*—
Ogden, T. Roger; and Hendricks, Eric W., H1,624, Cl. 261-123.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 7, 1997

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2
69 5,590,420
161.7 5,590,421
171 5,590,422

CLASS 4
213 5,590,423
243.1 5,590,424
246.1 5,590,425
301 5,590,426
611 5,590,427

CLASS 5
600 5,590,429
655.5 5,590,430
658 5,590,431
726 5,590,428

CLASS 7
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CLASS 8
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CLASS 14
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CLASS 15
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40 5,590,435
105 5,590,436
143.1 5,590,437
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809 5,590,459
830 5,590,460
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844 5,590,463
884 5,590,465
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889.21 5,590,467

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512 5,590,473

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235 5,590,477
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408 5,590,501
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51.2 5,590,538
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180 5,590,540
255 5,590,541
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366.2 5,590,559

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861.22 5,591,923
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43.01 5,591,934

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403 5,590,587
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450.7 5,590,589
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544 5,590,591

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698 5,590,665

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597 5,590,686
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61 B1 4,858,704
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444 5,590,732

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192.12 5,591,313
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482 5,591,316
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462 5,591,315
627 5,591,319
664 5,591,320
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CLASS 206
0.82 5,590,761
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162 5,590,762
271 5,590,763
278 5,590,764
289 5,590,765
296 5,590,766
308.1 5,590,767
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5,590,770
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315.3 5,590,772
366 5,590,774
423 5,590,775
427 5,590,776
439 5,590,777
5,590,778
459.1 5,590,779
520 5,590,780
521 5,590,781
528 5,590,782
542 5,590,783
554 5,590,784
575 5,590,785
587 5,590,786
724 5,590,787
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603 5,591,342
634 5,591,343
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640 5,591,345
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760 5,591,349
764 5,591,350
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112 5,590,812
197 5,590,813
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135 5,590,816
185.1 5,590,817
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156 5,590,825
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312 5,590,827

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81 5,590,828

CLASS 228
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435 5,591,951
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5,591,375
186.38 5,591,378
194 5,591,379
313.1 5,591,380
389.54 5,591,381
511 5,591,382

CLASS 254
26 R 5,590,868

CLASS 257
10 5,591,986
57 5,591,987
59 5,591,988
66 5,591,989
72 5,591,990
137 5,591,991
173 5,591,992
181 5,591,993
192 5,591,994
206 5,591,995
238 5,591,996
290 5,591,997
306 5,591,998
315 5,591,999
316 5,592,001
321 5,592,002
322 5,592,003
323 5,592,004
331 5,592,005
337 5,592,006
347 5,592,007
5,592,008
351 5,592,009
368 5,592,010
5,592,011
391 5,592,012
392 5,592,013
487 5,592,014
524 5,592,015
530 5,592,016
554 5,592,017
619 5,592,018
666 5,592,019
5,592,020
727 5,592,021
735 5,592,022
750 5,592,023
751 5,592,024
774 5,592,025
786 5,592,026

CLASS 261
34.1 5,591,383

CLASS 264
0.5 5,592,027
40.5 5,591,384
40.6 5,591,385
46.9 5,591,386
86 5,591,387
168 5,591,388
171.12 5,591,389
456 5,591,390

CLASS 267
132 5,590,869

CLASS 269
21 5,590,870

CLASS 270
58.27 5,590,871

CLASS 271
176 5,590,872
303 5,590,873

CLASS 273
121 B 5,590,878
144 R 5,590,879
150 5,590,880
249 5,590,883
348.5 5,590,885

CLASS 277
205 5,590,887
235 B 5,590,888

CLASS 280
11.2 5,590,889
11.22 5,590,890
37 5,590,891
87.051 5,590,892
250.1 5,590,893
260 5,590,894
278 5,590,895
642 5,590,896
655 5,590,897
707 5,590,898
728.2 5,590,899
5,590,900
728.3 5,590,901
5,590,902
5,590,903
735 5,590,904
737 5,590,905
741 5,590,906
801.1 5,590,907
809 5,590,908

CLASS 281
20 5,590,909
45 5,590,910

CLASS 283
36 5,590,911
56 5,590,912

CLASS 285
18 5,590,913
23 5,590,914
119 5,590,915
127 5,590,916

CLASS 290
55 5,592,028

CLASS 292
21 5,590,917
60 5,590,918
137 5,590,919
219 5,590,920
257 5,590,921
300 5,590,922
338 5,590,928

CLASS 294
19.1 5,590,923
19.2 5,590,924

CLASS 296
24.1 5,590,925
206 5,590,926

CLASS 297
143 5,590,927
216.12 5,590,929
313 5,590,930
366 5,590,931
367 5,590,932
408 5,590,933
411.38 5,590,934

CLASS 301
37.1 5,590,935

CLASS 303
116.1 5,590,936
125 5,590,937

CLASS 307
9.1 5,592,029
80 5,592,030
112 5,592,031
116 5,592,032
117 5,592,033
130 5,592,034

CLASS 310
24 5,592,036
40 MM 5,592,037
71 5,592,038
113 5,592,039
313 D 5,592,040
316 5,592,041
328 5,592,042

CLASS 312
257.1 5,590,938
263 5,590,939
287 5,590,940

CLASS 313
346 DC 5,592,043
403 5,592,044
440 5,592,045
447 5,592,046
484 5,592,047
570 5,592,048
625 5,592,049
637 5,592,050

CLASS 315
3 5,592,053
105 5,592,054
111.21 5,592,055
169 1 5,592,056
210 5,592,051
291 5,592,052

CLASS 318
162 5,592,057
254 5,592,058
5,592,059
469 5,592,060
805 5,592,062

CLASS 320
1 5,592,063
2 5,592,064
5,592,065
5,592,066
15 5,592,067
21 5,592,068
30 5,592,069
35 5,592,070

CLASS 323
268 5,592,072
282 5,592,071
300 5,592,073
313 5,592,075
315 5,592,076

CLASS 324
158.1 5,592,077
207.18 5,592,078
207.25 5,592,079
212 5,592,080
251 5,592,081
252 5,592,082
300 5,592,083
306 5,592,084
309 5,592,085
318 5,592,086
5,592,087
5,592,088
5,592,089
319 5,592,090
320 5,592,091
326 5,592,092
426 5,592,093
427 5,592,094
436 5,592,095
452 5,592,096
546 5,592,097
663 5,592,098
751 5,592,099
5,592,100
753 5,592,101

CLASS 326
10 5,592,102
17 5,592,103
27 5,592,104
38 5,592,105
41 5,592,106
49 5,592,107
69 5,592,108

CLASS 327
3 5,592,109
12 5,592,110
45 5,592,111
87 5,592,112
158 5,592,113
208 5,592,114
239 5,592,115
276 5,592,116
374 5,592,117
440 5,592,118
530 5,592,119
536 5,592,120
541 5,592,121

CLASS 330
124 R B1 4,618,831
286 5,592,122
288 5,592,123
308 5,592,124

CLASS 331
1 A 5,592,125
45 5,592,126
57 5,592,127
61 5,592,128
111 5,592,129
158 5,592,130

CLASS 332
103 5,592,131
117 5,592,132

CLASS 333
25 5,592,133
185 5,592,134
193 5,592,135

CLASS 335
272 5,592,136

CLASS 336
195 5,592,137
210 5,592,138

CLASS 337
202 5,592,139

CLASS 338
21 5,592,140
162 5,592,141

CLASS 339
335 5,592,276

CLASS 340
146.2 5,592,142
309.15 5,592,143
332 5,592,144
391.1 5,592,145
468 5,592,146
522 5,592,147
540 5,592,148
550 5,592,149
572 5,592,150
584 5,592,151
666 5,592,152
825.06 5,592,485
825.19 5,592,153
825.5 5,592,154
825.72 5,592,155
850 5,592,156
905 5,592,157
941 5,592,158
953 5,592,159

CLASS 341
58 5,592,160
95 5,592,161
107 5,592,162
5,592,163
120 5,592,164
143 5,592,165
144 5,592,166
159 5,592,167
167 5,592,168
173 5,592,169

CLASS 342
22 5,592,170
26 5,592,171
350 5,592,172
357 5,592,173
5,592,174
5,592,175
359 5,592,176
361 5,592,177
372 5,592,178
5,592,179
450 5,592,180
457 5,592,181

CLASS 343
742 5,592,182
749 5,592,183
752 5,592,184
794 5,592,185
909 5,592,186

CLASS 345
3 5,592,187
84 5,592,188
87 5,592,189
89 5,592,190
97 5,592,191
5,592,192
102 5,592,193
127 5,592,194
146 5,592,195
150 5,592,196
173 5,592,197
5,592,198
206 5,592,199

CLASS 347
30 5,592,200
5,592,201
37 5,592,202
40 5,592,203
88 5,592,204
115 5,592,205
122 5,592,206
129 5,592,207
171 5,592,208
206 5,592,209
237 5,592,210
260 5,592,211

CLASS 348
8 5,592,482
12 5,592,212
13 5,592,213
51 5,592,215
74 5,592,216
83 5,592,217
110 5,592,218
216 5,592,219
220 5,592,220
270 5,592,221
294 5,592,222
309 5,592,223
333 5,592,224
405 5,592,225
413 5,592,226
414 5,592,227
416 5,592,228
73.03 5,592,229
77.04 5,592,230
452 5,592,231
552 5,592,233
553 5,592,234
555 5,592,235
586 5,592,236
716 5,592,237
744 5,592,238
771 5,592,239
807 5,592,240
823 5,592,241

CLASS 349
18 5,592,314
110 5,592,317
122 5,592,318
126 5,592,315
187 5,592,316

CLASS 351
44 5,592,242
153 5,592,243
158 5,592,244
163 5,592,245
212 5,592,246
239 5,592,247
246 5,592,248

CLASS 353
26 A 5,590,941
34 5,590,942
74 5,590,943
122 5,590,944

CLASS 355
41 5,592,258
53 5,592,259
74 5,592,260

CLASS 356
44 5,592,282
62 5,592,288
72 5,592,283
73.1 5,592,284
121 5,592,285
240 5,592,286
244 5,592,289
300 5,592,290
326 5,592,291
356 5,592,292
359 5,592,293
402 5,592,294
426 5,592,295
435 5,592,296

CLASS 357
315 5,592,000

CLASS 358
261.1 5,592,297
298 5,592,298
433 5,592,302
435 5,592,303
444 5,592,304
448 5,592,305
464 5,592,306
468 5,592,307
497 5,592,308
500 5,592,309
501 5,592,310
518 5,592,311
525 5,592,312

CLASS 359
24 5,592,313
127 5,592,319
159 5,592,320
173 5,592,321
184 5,592,322
188 5,592,323
210 5,592,324
326 5,592,325
5,592,326
348 5,592,327
389 5,592,328
399 5,592,329
529 5,592,330
554 5,592,331
619 5,592,332
628 5,592,333
689 5,592,334
695 5,592,335
871 5,592,336
872 5,592,337
883 5,592,338

CLASS 360
13 5,592,339
46 5,592,340
5,592,341
48 5,592,342
5,592,343
66 5,592,344
73.03 5,592,345
77.04 5,592,346
5,592,347
77.08 5,592,348
98.08 5,592,349
99.12 5,592,350
106 5,592,351
132 5,592,352

CLASS 361
63 5,592,353
69 5,592,354
94 5,592,355
154 5,592,356
225 5,592,357
234 5,592,358
329 5,592,359
626 5,592,360
679 5,592,361
686 5,592,362
689 5,592,363
735 5,592,364
789 5,592,365
796 5,592,366

CLASS 362
31 5,590,945
72 5,590,946
5,590,947
83.1 5,590,948
86 5,590,949
109 5,590,950
205 5,590,951
255 5,590,952
276 5,590,953
321 5,590,954
324 5,590,955
410 5,590,956
419 5,590,957

CLASS 363
17 5,592,367
34 5,592,368
51 5,592,369
60 5,592,370
98 5,592,371
131 5,592,074

CLASS 364
178 5,592,372
184 5,592,373
422 5,592,381
424.024 5,592,384
424.034 5,592,383
426.041 5,592,385
431.01 5,592,386
431.02 5,592,387
431.08 5,592,388
449.1 5,592,382
449.5 5,592,389
487 5,592,390
489 5,592,391
490 5,592,392
492 5,592,393
5,592,394
509 5,592,395
510 5,592,396
5,592,397
514 A 5,592,398
514 R 5,592,400
514.2 5,592,399
550 5,592,401
578 5,592,402
724.01 5,592,403
746.1 5,592,404
749 5,592,405

CLASS 365
49 5,592,407
52 5,592,408
145 5,592,409
5,592,410
5,592,411
149 5,592,412
151 5,592,413
154 5,592,414
185.01 5,592,415
5,592,416
185.07 5,592,417
185.18 5,592,418
5,592,419
5,592,420
189.09 5,592,421
201 5,592,422
5,592,424
5,592,425
203 5,592,426
205 5,592,427
210 5,592,428
221 5,592,423
226 5,592,429
5,592,430
230.03 5,592,432
230.06 5,592,433
233 5,592,434
233.5 5,592,435
240 5,592,436

CLASS 366
20 5,590,958
84 5,590,959
134 5,590,960
165.1 5,590,961
248 5,590,962
302 5,590,963

CLASS 367
21 5,592,437
83 5,592,438
144 5,592,439
5,592,440
153 5,592,441

CLASS 368
11 5,592,442
281 5,592,443

CLASS 369
13 5,592,444
5,592,445
44.27 5,592,446
5,592,447
44.28 5,592,448
47 5,592,449
48 5,592,450
54 5,592,451
58 5,592,452
5,592,454
59 5,592,455
5,592,456
5,592,457
5,592,458
112 5,592,459
5,592,460
126 5,592,461
273 5,592,462
275.2 5,592,463
275.3 5,592,465
275.4 5,592,464

CLASS 370
217 5,592,466
225 5,592,467
252 5,592,468
260 5,592,478
264 5,592,473
277 5,592,491
310 5,592,490
316 5,592,481
320 5,592,470
342 5,592,469
347 5,592,480
350 5,592,474
351 5,592,472
359 5,592,475
378 5,592,479
389 5,592,486
390 5,592,476
396 5,592,477
445 5,592,483
452 5,592,484
458 5,592,489
465 5,592,488
473 5,592,487

CLASS 371
2.2 5,592,492
22.3 5,592,493
22.5 5,592,494
27 5,592,496
37.4 5,592,497
40.1 5,592,498
5,592,499

CLASS 372
26 5,592,500
45 5,592,501
5,592,502
50 5,592,503
61 5,592,504
99 5,592,505

CLASS 374
141 5,590,964

CLASS 375
207 5,592,506
211 5,592,507
216 5,592,508
219 5,592,509
220 5,592,510
5,592,511
240 5,592,512
296 5,592,513
336 5,592,514
340 5,592,515
347 5,592,516
350 5,592,517
368 5,592,518
373 5,592,519

CLASS 376
233 5,592,520
301 5,592,521
333 5,592,522

CLASS 378
19 5,592,523
98.2 5,592,524
121 5,592,525
132 5,592,526
165 5,592,527

CLASS 379
21 5,592,528
32 5,592,529
34 5,592,530
57 5,592,531
58 5,592,532
5,592,533
5,592,535
61 5,592,536
67 5,592,537
93 5,592,538
112 5,592,539
158 5,592,534
184 5,592,540
211 5,592,541
265 5,592,542
5,592,543
5,592,544
347 5,592,545
355 5,592,546
390 5,592,547
410 5,592,548

CLASS 380
4 5,592,549
5 5,592,550
20 5,592,551
21 5,592,552
23 5,592,553
48 5,592,554
49 5,592,555
5,592,556

CLASS 381
10 5,592,557
18 5,592,558
111 5,592,559

CLASS 382
100 5,592,560
103 5,592,561
150 5,592,562
154 5,592,563
158 5,592,564
185 5,592,565
187 5,592,566
199 5,592,567
218 5,592,568
253 5,592,569
254 5,592,570
261 5,592,571
289 5,592,572
294 5,592,573
295 5,592,574
312 5,592,575
318 5,592,576

CLASS 384
15 5,590,965
16 5,590,966
448 5,590,967
563 5,590,968

CLASS 385
12 5,592,577
31 5,592,578
99 5,592,579

CLASS 386
68 5,592,299
113 5,592,300
117 5,592,301

CLASS 388
815 5,592,580

CLASS 392
418 5,592,581
421 5,592,582
432 5,592,647

CLASS 395
2.09 5,592,583
2.12 5,592,584
2.15 5,592,585
2.29 5,592,586
2.73 5,592,587
2.87 5,592,588
24 5,592,589
75 5,592,590
105 5,592,591
109 5,592,592
110 5,592,593
115 5,592,594
5,592,595
117 5,592,596
119 5,592,597
123 5,592,598
127 5,592,599

140 5,592,600
143 5,592,601
173 5,592,609
174 5,592,602
182.02 5,592,610
5,592,611
182.04 5,592,612
5,592,613
183.02 5,592,614
183.18 5,592,616
183.2 5,592,615
185.07 5,592,618
186 5,592,619
200.01 5,592,620
200.02 5,592,621
5,592,622
200.06 5,592,623
200.07 5,592,624
200.08 5,592,625
200.09 5,592,626
200.13 5,592,627
200.15 5,592,672
203 5,592,374
207 5,592,375
214 5,592,376
227 5,592,378
239 5,592,379
242 5,592,377
250 5,592,629
5,592,630
293 5,592,631
306 5,592,632
309 5,592,633
334 5,592,603
340 5,592,604
348 5,592,605
356 5,592,606
358 5,592,607
5,592,608
386 5,592,635
406 5,592,638
428 5,592,639
5,592,640
430 5,592,641
431 5,592,642
5,592,643
5,592,644
5,592,645
5,592,646
441 5,592,648
481 5,592,649
490 5,592,650
5,592,651
497.01 5,592,652
500 5,592,653
5,592,654
5,592,655
5,592,657
558 5,592,658
5,592,659
584 5,592,637
586 5,592,634
5,592,636
600 5,592,661
5,592,664
5,592,666
601 5,592,662
602 5,592,668
604 5,592,665
605 5,592,663
608 5,592,660
613 5,592,667
622 5,592,669
670 5,592,670
674 5,592,671
680 5,592,656
700.13 5,592,628
726 5,592,673
742 5,592,674
750 5,592,675
800 5,592,676
5,592,677
5,592,678
5,592,679
5,592,680
5,592,681
823 5,592,682
872 5,592,683
5,592,684
882 5,592,685

CLASS 396

55 5,592,251
79 5,592,250
89 5,592,255
96 5,592,254
171 5,592,257
225 5,592,256
315 5,592,249
380 5,592,252
538 5,592,253

CLASS 399

1 5,592,262
62 5,592,267
85 5,592,279
126 5,592,273
156 5,592,281
167 5,592,261
175 5,592,264
176 5,592,263
237 5,592,269
260 5,592,270
276 5,592,268
284 5,592,266
285 5,592,265
5,592,271
307 5,592,274
325 5,592,275
328 5,592,277
384 5,592,278
410 5,592,280

CLASS 400

120.01 5,590,969
708 5,590,970

CLASS 401

202 5,590,971

CLASS 402

79 5,590,972

CLASS 403

325 5,590,973
327 5,590,974
407.1 5,590,975

CLASS 404

72 5,590,976
101 5,590,977

CLASS 405

3 5,590,978
36 5,590,979
37 5,590,980
45 B1 4,815,892
154 5,590,981
223.1 5,590,982
263 5,590,983

CLASS 406

32 5,590,984

CLASS 408

56 5,590,985
115 R 5,590,986
230 5,590,987

CLASS 409

182 5,590,988
5,590,989
303 5,590,990

CLASS 411

354 5,590,991
431 5,590,992

CLASS 413

12 5,590,993

CLASS 414

217 5,590,994
357 5,590,995
416 5,590,996
541 5,590,997
607 5,590,998
795.6 5,590,999

CLASS 415

55.5 5,591,000
111 5,591,001
115 5,591,002
209.2 5,591,003

CLASS 416

42 5,591,004
62 5,591,005
5,591,006
97 R 5,591,007
144 5,591,008
241 R 5,591,009

CLASS 417

12 5,591,010
199.1 5,591,011
238 5,591,012
271 5,591,013
310 5,591,014
312 5,591,015
365 5,591,016
366 5,591,017
5,591,018
422 5,591,019
423.13 5,591,020
494 5,591,021

CLASS 418

55.3 5,591,022
179 5,591,023

CLASS 419

2 5,592,686

CLASS 420

38 5,591,391
41 5,591,392
422 5,591,394

CLASS 422

4 5,591,395
26 5,591,396
37 5,591,397
38 5,591,398
44 5,591,399
48 5,591,404
57 5,591,400
58 5,591,401
65 5,591,402
73 5,591,403
89 5,591,406
92.05 5,591,407
100 5,591,408
110 5,591,409
131 5,591,410
139 5,591,411
171 5,591,412
180 5,591,413
5,591,414
241 5,591,415
268 5,591,416

CLASS 423

81 5,591,506
210 5,591,417
239.1 5,591,418
576.6 5,591,419
700 5,591,420
706 5,591,421

CLASS 424

9.302 5,591,422
59 5,591,423
66 5,591,424
70.4 5,591,425
78.04 5,591,426
85.2 5,591,427
93.45 5,591,428
93.51 5,591,429
93.71 5,591,430
94.64 5,591,431
130.1 5,591,432
184.1 5,591,433
191.1 5,591,434
195.1 5,591,435
5,591,436
5,591,437
5,591,438
199.1 5,591,439
227.1 5,591,440
401 5,591,441
5,591,442
405 5,591,443
426 5,591,444
5,591,445
439 5,591,446
443 5,591,447
450 5,591,448
5,591,449
451 5,591,450
464 5,591,451
468 5,591,452
484 5,591,453
486 5,591,454
490 5,591,455
494 5,591,456
613 5,591,457

CLASS 425

6 5,591,458
8 5,591,459
12 5,591,460
169 5,591,461
173 5,591,462
359 5,591,463
453 5,591,464
503 5,591,472
549 5,591,465
577 5,591,466

CLASS 426

2 5,591,467
106 5,591,468
231 5,591,469
391 5,591,470
440 5,591,471
573 5,591,473
580 5,591,474
627 5,591,475
631 5,591,476
633 5,591,477
658 5,591,478
662 5,591,479

CLASS 427

131 5,591,481
244 5,591,482
248.1 5,591,483
249 5,591,484
250 5,591,485
255.2 5,591,486
5,591,487
299 5,591,488
307 5,591,489
364 5,591,490
457 5,591,491
544 5,591,492
563 5,591,493
569 5,591,494

CLASS 428

35.7 5,591,495
36.5 5,591,496
36.92 5,591,497
40.1 5,591,498
64.1 5,591,501
65.3 5,591,502
65.4 5,591,503
68 5,591,504
69 5,591,505
88 5,591,507
105 5,591,508
107 5,591,509
132 5,591,510
138 5,591,511
141 5,591,512
143 5,591,513
211 5,591,514
212 5,591,515
253 5,591,516
304.4 5,591,517
318.4 5,591,518
344 5,591,519
347 5,591,520
352 5,591,521
353 5,591,522
357 5,591,523
367 5,591,524
374 5,591,525
401 5,591,526
411.1 5,591,527
5,591,528
5,591,529
5,591,530
5,591,531
5,591,532
5,591,533
612 5,591,534
641 5,591,500
694 RE 5,591,535

CLASS 429

33 5,591,537
122 5,591,538
144 5,591,539
163 5,591,540
171 5,591,541
192 5,591,542
5,591,543
209 5,591,544
218 5,591,545
5,591,546
5,591,547
5,591,548

CLASS 430

5 5,591,549
5,591,550
18 5,591,551
45 5,591,552
46 5,591,553
59 5,591,554
78 5,591,555
109 5,591,556
115 5,591,557
120 5,591,558
137 5,591,559
203 5,591,560
264 5,591,561
280.1 5,591,562
284.1 5,591,563
311 5,591,564
314 5,591,565
325 5,591,566
399 5,591,567
449 5,591,568
549 5,591,569
567 5,591,570

CLASS 431

125 5,591,024
329 5,591,025

CLASS 432

239 5,591,026

CLASS 433

90 5,591,027
129 5,591,028
173 5,591,029
212.1 5,591,030

CLASS 434

14 5,591,031
22 5,591,032
178 5,591,033

CLASS 435

5 5,591,572
5,591,573
5,591,574
6 5,591,575
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7.1 5,591,587
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7.21 5,591,592
7.23 5,591,593
5,591,595
7.32 5,591,596
7.4 Re.35,419
5,591,591
29 5,591,598
32 5,591,599
69.1 5,591,600
5,591,601
5,591,602
5,591,641
69.2 5,591,603
69.7 5,591,604
70.1 5,591,605
76 5,591,606
91.1 5,591,607
91.2 5,591,609
91.31 5,591,610
100 5,591,611
5,591,612
114 5,591,613
120 5,591,614
172.1 5,591,615
172.3 5,591,616
194 5,591,618
201 5,591,619
5,591,620
240.2 5,591,623
5,591,624
5,591,625
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240.23 5,591,627
240.26 5,591,628
240.27 5,591,629
5,591,630
252.3 5,591,631
5,591,632
5,591,633
262 5,591,634
286.1 5,591,635
287.1 5,591,636
290.2 5,591,637
320.1 5,591,638
5,591,639
5,591,640

CLASS 436

43 5,591,642
45 5,591,643
53 5,591,644
514 5,591,645
518 5,591,646
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CLASS 437

8 5,591,649
21 5,591,650
26 5,591,654
31 5,591,655
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33 5,591,651
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36 5,591,661
57 5,591,662
60 5,591,663
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61 5,591,665
103 5,591,666
164 5,591,667
174 5,591,668
187 5,591,670
190 5,591,671
5,591,672
192 5,591,673
193 5,591,674
195 5,591,675
5,591,676
5,591,677
208 5,591,678
228 Re.35,420
5,591,679
238 5,591,680
240 5,591,681

CLASS 439

79 5,591,035
5,591,036
91 5,591,034
5,591,037
133 5,591,038
181 5,591,039
248 5,591,040
352 5,591,041
354 5,591,042
373 5,591,043
397 5,591,044
460 5,591,045
467 5,591,046
541.5 5,591,047
567 5,591,048
595 5,591,049
607 5,591,050
752 5,591,051
5,591,052
874 5,591,053
884 5,591,054

CLASS 440

6 5,591,055
12 5,591,056
42 5,591,057
89 5,591,058

CLASS 441

68 5,591,059
75 5,591,060

CLASS 445

3 5,591,061

CLASS 446

46 5,591,062

CLASS 449

4 5,591,063

CLASS 451

2 5,591,064
47 5,591,065
80 5,591,066
88 5,591,067
104 5,591,068
241 5,591,069
276 5,591,071
293 5,591,072
295 5,591,070
314 5,591,073
328 5,591,074
451 5,591,075

CLASS 452

157 5,591,076
189 5,591,077

CLASS 454

124 5,591,078
155 5,591,079
359 5,591,080

CLASS 455

52.3 5,592,471

CLASS 463

13 5,591,081
38 5,591,082

CLASS 464

83 5,591,083
111 5,591,084
5,591,085

CLASS 472

130 5,591,086

CLASS 473

3 5,591,087
131 5,591,088
215 5,591,089
218 5,590,882
271 5,591,090
289 5,591,091
324 5,590,881
330 5,591,092
417 5,590,876
457 5,590,875
501 5,590,874
514 5,590,884
556 5,590,877
577 5,590,886

CLASS 474

94 5,591,093
117 5,591,094
231 5,591,095

CLASS 475

119 5,591,096
207 5,591,097
231 5,591,098
318 5,591,099

CLASS 477

44 5,591,100
99 5,591,101
107 5,591,102
131 5,591,103

CLASS 482

7 5,591,104
52 5,591,105
54 5,591,106
57 5,591,107
95 5,591,108
107 5,591 109
111 5,591,110
140 5,591,111

CLASS 493

213 5,591,112

CLASS 494

12 5,591,113
20 5,591,114

CLASS 501

4 5,591,682
32 5,591,683
33 5,591,684
88 5,591,685
96 5,591,686
97 5,591,687

CLASS 502

330 5,591,688
334 5,591,689
401 5,591,690
439 5,591,691

CLASS 504

124 5,591,692
130 5,591,693
214 5,591,694
263 5,591,695
292 5,591,697
234 5,591,696
450 5,591,698

CLASS 507

204 5,591,700
213 5,591,699
240 5,591,701

CLASS 510

202 5,591,702
220 5,591,703
276 5,591,705
372 5,591,706
383 5,591,377
437 5,591,376
451 5,591,707
463 5,591,708

CLASS 514

4 5,591,709
6 5,591,710
5,591,711
8 5,591,713
9 5,591,714
10 5,591,715
12 5,591,716
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13 5,591,719
44 5,591,720
5,591,721
45 5,591,722
54 5,591,724
58 5,591,725
64 5,591,726
68 5,591,727
80 5,591,728
85 5,591,729
108 5,591,730
114 5,591,731
170 5,591,732
172 5,591,733
5,591,734
5,591,735
178 5,591,736
210 5,591,737
214 5,591,738
5,591,739
215 5,591,740
231.5 5,591,741
234.5 5,591,742
242 5,591,743
252 5,591,744
254 5,591,745
255 5,591,746
275 5,591,747
278 5,591,748
300 5,591,749
312 5,591,751
314 5,591,752
324 5,591,753
331 5,591,754
342 5,591,755
350 5,591,756
356 5,591,757
365 5,591,758
372 5,591,759
5,591,760
380 5,591,761
381 5,591,762
399 5,591,763
403 5,591,764
406 5,591,765
412 5,591,766
413 5,591,767
415 5,591,768
423 5,591,769
453 5,591,770
456 5,591,771
458 5,591,772
532 5,591,773
574 5,591,774
580 5,591,775
622 5,591,776
653 5,591,777

CLASS 521

56 5,591,778
109.1 5,591,779
128 5,591,780
129 5,591,781

CLASS 522

31 5,591,783
74 5,591,784
157 5,591,785

CLASS 523

109 5,591,786
164 5,591,787
404 5,591,788
515 5,591,789

CLASS 524

35 5,591,790
80 5,591,791
271 5,591,792
310 5,591,793
447 5,591,794
451 5,591,795
484 5,591,796
493 5,591,797
514 5,591,798
555 5,591,799
783 5,591,800

CLASS 525

56 5,591,801
66 5,591,802
196 5,591,803
276 5,591,804
285 5,591,805
369 5,591,806
381 5,591,807
403 5,591,808
419 5,591,809
480 5,591,810
504 5,591,811
526 5,591,812
528 5,591,813
5,591,814

CLASS 526

127 5,591,815
262 5,591,816
351 5,591,817

CLASS 528

38 5,591,818
73 5,591,819
76 5,591,820

CLASS 530

324 5,591,821
326 5,591,822
350 5,591,823
5,591,824
5,591,825
351 5,591,827
387.3 5,591,828
388.35 5,591,829
388.85 5,591,830
395 5,591,831
500 5,591,832

CLASS 534

607 5,591,833
618 5,591,834

CLASS 536

4.1 5,591,835
6.1 5,591,836
7.4 5,591,837
23.7 5,591,838
5,591,839
24.5 5,591,840
25.4 5,591,841
27.1 5,591,842
28.52 5,591,843
90 5,591,844
124 5,591,845

CLASS 540

362 5,591,846
472 5,591,847
543 5,591,848

CLASS 544

70 5,591,849
216 5,591,850
243 5,591,851
317 5,591,852
334 5,591,853

CLASS 546

14 5,591,854
256 5,591,855
278.4 5,591,856
296 5,591,857
322 5,591,858

CLASS 548

198 5,591,859
204 5,591,860
228 5,591,861
235 5,591,862
312.7 5,591,863
429 5,591,864
453 5,591,865
455 5,591,866
532 5,591,867

CLASS 549

23 5,591,868
80 5,591,869
259 5,591,870
299 5,591,871
321 5,591,872
503 5,591,873
507 5,591,874
531 5,591,875

CLASS 554

226 5,591,877

CLASS 556

49 5,591,878
404 5,591,879
413 5,591,880
427 5,591,881

CLASS 558

87 5,591,882
270 5,591,883
286 5,591,884

CLASS 560

29 5,591,885
41 5,591,886
121 5,591,887
226 5,591,888

CLASS 562

24 5,591,889
412 5,591,890
455 5,591,892
504 5,591,893

CLASS 567

426 5,591,891

CLASS 588

249 5,591,115
256 5,591,116
258 5,591,117
259 5,591,118

CLASS 600

112 5,591,119
140 5,591,120

CLASS 602

5 5,591,121
19 5,591,122

CLASS 604

20 5,591,123
5,591,124
22 5,591,125
66 5,591,127
96 5,591,128
5,591,129
100 5,591,130
110 5,591,131
158 5,591,132
192 5,591,133
5,591,134
211 5,591,135
5,591,136
256 5,591,137
263 5,591,138
264 5,591,139
269 5,591,140
280 5,591,141
282 5,591,142
283 5,591,143
327 5,591,144
349 5,591,145
359 5,591,146
369 5,591,147
378 5,591,148
5,591,149
385.1 5,591,150
5,591,151
385.2 5,591,152
387 5,591,153
5,591,154
393 5,591,155

CLASS 606

1 5,591,156
3 5,591,157
15 5,591,159
5,591,160
17 5,591,161
25 5,591,162
29 5,591,163
59 5,591,164
61 5,591,165
5,591,166
65 5,591,167
69 5,591,168
82 5,591,169
94 5,591,170
108 5,591,171
120 5,591,172
130 5,591,173
5,591,174
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137 5,591,176
139 5,591,177
143 5,591,178
144 5,591,179
5,591,180
5,591,181
151 5,591,182
159 5,591,183
166 Re.35,421
5,591,185
167 5,591,184
170 5,591,186
180 5,591,187
182 5,591,188
185 5,591,189
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5,591,191
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192 5,591,194
194 5,591,195
198 5,591,196
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201 5,591,200
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205 5,591,202
207 5,591,203
213 5,591,204
5,591,205
215 5,591,206
232 5,591,207
241 5,591,208

CLASS 607

5 5,591,209
5,591,210
5,591,211
5,591,212
5,591,213
9 5,591,214
14 5,591,215
42 5,591,216
61 5,591,217
63 5,591,218
88 5,591,219
104 5,591,220
114 5,591,221
138 B1 5,314,465

CLASS 623

1 5,591,222
5,591,223
5,591,224
5,591,225
5,591,226
5,591,227
5,591,228
5,591,229
5,591,230
5,591,232
5,591,233
5,591,234
5,591,235

CLASS 800

2 5,591,669

CLASSIFICATION OF DESIGNS

D2— 627 377,107
893 377,108
957 377,109
961 377,110
377,111
377,112
377,113
978 377,114
D3— 203 377,115
214 377,116
218 377,117
228 377,118
315 377,119
318 377,120
D4— 111 377,121
132 377,122
D6— 323 377,123
397 377,124
418 377,125
425 377,126
477 377,127
479 377,128
520 377,129
601 377,130
608 377,131
D7— 318 377,132
330 377,133
362 377,134
401.2 377,135
402 377,136
515 377,137
672 377,138
D8— 14 377,139
89 377,140
D9— 331 377,141
356 377,142
382 377,143
432 377,144
447 377,145
499 377,146
529 377,147
D10— 18 377,148
30 377,149
32 377,150
39 377,151
81 377,152
92 377,153
D11— 3 377,154
216 377,155
D12— 101 377,156
126 377,157
377,158
147 377,159
181 377,160
193 377,161
213 377,162
408 377,163
426 377,164
D13— 146 377,165
D14— 100 377,166
105 377,167
D16— 133 377,184
377,185
208 377,186
209 377,187
D22— 134 377,204
D23— 216 377,205
302 377,206
377,207
311 377,208
D15— 9 377,178
79 377,179
125 377,180
D20— 10 377,197
D21— 48 377,198
86 377,199
88 377,200
191 377,201
377,202
244 377,203
377,204
377,205
377,206
377,207
377,208
D18— 2 377,189
7 377,190
D19— 3 377,191
34.1 377,192
36 377,193
48 377,194
51 377,195
65 377,196
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	313	377,209		176	377,218		65	377,227	D28—	21	377,236		152	377,245		24	377,254
	356	377,210		187	377,219		68	377,228		47	377,237		162	377,246		27	377,255
	358	377,211		192	377,220			377,229		48	377,238			377,247	D99—	32	377,256
	360	377,212		194	377,221		69	377,230		51	377,239	D32—	32	377,248			
	364	377,213		215	377,222		77	377,231		60	377,240		35	377,249			
	365	377,214	D25—	124	377,223		133	377,232	D29—	108	377,241		46	377,250			
D24—	110	377,215	D26—	24	377,224		134	377,233	D30—	101	377,242		49	377,251			
	152	377,216		28	377,225		138	377,234		130	377,243	D34—	1	377,252			
	155	377,217		60	377,226	D27—	141	377,235		133	377,244		11	377,253			

CLASSIFICATION OF PLANTS

P.—	10.1	9,776	22	9,777	43.1	9,778	87.4	9,779			

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261—	123	H1624	370—	479	H1626	426—	597	H1628	604—	385.2	H1630

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,590,423		5,590,675		5,591,211		5,591,858		5,592,370		5,592,644
	5,590,825		5,590,695		5,591,277		5,591,900		5,592,382		5,592,645
	5,591,722		5,590,706		5,591,281		5,591,914		5,592,389		5,592,646
	5,591,908		5,590,714		5,591,293		5,591,937		5,592,401		5,592,654
	5,591,913		5,590,749		5,591,314		5,591,945		5,592,408		5,592,656
02 :	5,590,674		5,590,778		5,591,322		5,591,946		5,592,413		5,592,661
04 :	5,590,486		5,590,782		5,591,378		5,591,951		5,592,418		5,592,669
	5,590,598		5,590,784		5,591,379		5,591,971		5,592,420		5,592,679
	5,590,771		5,590,803		5,591,400		5,591,973		5,592,435		5,592,682
	5,590,852		5,590,809		5,591,402		5,591,975		5,592,438	08 :	5,590,602
	5,590,905		5,590,815		5,591,404		5,591,978		5,592,455		5,590,607
	5,590,999		5,590,819		5,591,421		5,591,981		5,592,457		5,590,679
	5,591,031		5,590,823		5,591,422		5,591,983		5,592,475		5,590,777
	5,591,317		5,590,827		5,591,454		5,592,005		5,592,481		5,591,069
	5,591,666		5,590,837		5,591,490		5,592,006		5,592,486		5,591,119
	5,591,676		5,590,847		5,591,511		5,592,007		5,592,490		5,591,214
	5,591,772		5,590,850		5,591,532		5,592,010		5,592,492		5,591,215
	5,592,062		5,590,854		5,591,533		5,592,016		5,592,503		5,591,230
	5,592,076		5,590,868		5,591,564		5,592,018		5,592,504		5,591,251
	5,592,124		5,590,880		5,591,573		5,592,022		5,592,506		5,591,399
	5,592,175		5,590,882		5,591,578		5,592,057		5,592,508		5,591,460
	5,592,246		5,590,893		5,591,584		5,592,083		5,592,510		5,591,610
	5,592,403		5,590,900		5,591,586		5,592,086		5,592,545		5,591,651
	5,592,411		5,590,909		5,591,590		5,592,102		5,592,548		5,591,690
	5,592,618		5,590,915		5,591,592		5,592,103		5,592,566		5,591,923
	5,592,634		5,590,923		5,591,600		5,592,105		5,592,568		5,592,171
05 :	5,590,477		5,590,944		5,591,607		5,592,106		5,592,573		5,592,349
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January 14, 1997 Volume 1194 Number 2

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20.	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 11, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,276,922 through 5,278,997
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 09, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,891,845 through 4,893,354
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 07, 1986 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,562,596 through 4,563,775
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED November 6, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,283	06/682,859	11/11/86
(4,481,188)	(06/409,996)	(11/06/84)
Re. 32,457	06/811,152	07/07/87
(4,481,616)	(06/307,021)	(11/06/84)
Re. 33,469	06/927,218	12/04/90
(4,481,487)	(06/293,040)	(11/06/84)
Re. 33,580	07/419,600	04/30/91
(4,781,933)	(07/095,027)	(11/01/88)
Re. 33,893	07/570,003	04/21/92
(4,781,323)	(06/882,377)	(11/01/88)
4,480,340	06/235,585	11/06/84
4,480,343	06/481,915	11/06/84
4,480,346	06/428,031	11/06/84
4,480,347	06/428,159	11/06/84
4,480,351	06/445,936	11/06/84
4,480,354	06/494,639	11/06/84
4,480,360	06/452,437	11/06/84
4,480,361	06/446,211	11/06/84
4,480,366	06/450,752	11/06/84
4,480,369	06/350,991	11/06/84
4,480,378	06/402,282	11/06/84
4,480,379	06/489,515	11/06/84
4,480,381	06/468,508	11/06/84
4,480,386	06/396,277	11/06/84
4,480,390	06/419,675	11/06/84
4,480,391	06/446,630	11/06/84
4,480,406	06/407,257	11/06/84
4,480,407	06/407,497	11/06/84
4,480,409	06/414,611	11/06/84
4,480,414	06/422,677	11/06/84
4,480,420	06/580,134	11/06/84
4,480,428	06/528,643	11/06/84
4,480,432	06/444,926	11/06/84
4,480,433	06/469,877	11/06/84
4,480,440	06/370,407	11/06/84
4,480,446	06/271,447	11/06/84
4,480,452	06/476,995	11/06/84
4,480,457	06/428,261	11/06/84
4,480,459	06/439,063	11/06/84
4,480,461	06/478,432	11/06/84
4,480,473	06/498,633	11/06/84
4,480,475	06/461,883	11/06/84
4,480,491	06/250,145	11/06/84
4,480,492	06/329,809	11/06/84
4,480,494	06/450,723	11/06/84
4,480,495	06/418,208	11/06/84
4,480,497	06/332,718	11/06/84
4,480,499	06/262,786	11/06/84
4,480,501	06/395,800	11/06/84
4,480,515	06/496,388	11/06/84
4,480,518	06/389,982	11/06/84
4,480,519	06/429,364	11/06/84
4,480,523	06/319,029	11/06/84
4,480,525	06/343,060	11/06/84
4,480,530	06/392,543	11/06/84
4,480,533	06/518,706	11/06/84
4,480,538	06/557,067	11/06/84
4,480,542	06/565,144	11/06/84
4,480,545	06/502,062	11/06/84

Patent Number	Serial Number	Issue Date
4,480,548	06/493,735	11/06/84
4,480,549	06/454,554	11/06/84
4,480,556	06/339,406	11/06/84
4,480,557	06/523,375	11/06/84
4,480,559	06/456,479	11/06/84
4,480,560	06/560,015	11/06/84
4,480,561	06/485,252	11/06/84
4,480,565	06/318,703	11/06/84
4,480,566	06/525,929	11/06/84
4,480,570	06/432,821	11/06/84
4,480,584	06/558,623	11/06/84
4,480,594	06/581,847	11/06/84
4,480,595	06/549,080	11/06/84
4,480,599	06/416,959	11/06/84
4,480,608	06/359,279	11/06/84
4,480,627	06/396,300	11/06/84
4,480,642	06/385,894	11/06/84
4,480,649	06/391,301	11/06/84
4,480,650	06/353,963	11/06/84
4,480,655	06/310,875	11/06/84
4,480,667	06/448,782	11/06/84
4,480,669	06/463,566	11/06/84
4,480,672	06/512,842	11/06/84
4,480,673	06/498,458	11/06/84
4,480,674	06/404,468	11/06/84
4,480,686	06/457,115	11/06/84
4,480,693	06/565,158	11/06/84
4,480,697	06/469,054	11/06/84
4,480,700	06/365,510	11/06/84
4,480,703	06/321,937	11/06/84
4,480,704	06/399,414	11/06/84
4,480,711	06/426,249	11/06/84
4,480,714	06/386,321	11/06/84
4,480,730	06/398,315	11/06/84
4,480,734	06/395,927	11/06/84
4,480,756	06/469,259	11/06/84
4,480,768	06/423,623	11/06/84
4,480,774	06/462,606	11/06/84
4,480,777	06/388,297	11/06/84
4,480,779	06/417,163	11/06/84
4,480,785	06/385,387	11/06/84
4,480,790	06/453,815	11/06/84
4,480,794	06/450,733	11/06/84
4,480,797	06/409,991	11/06/84
4,480,803	06/401,862	11/06/84
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4,480,812	06/531,629	11/06/84
4,480,818	06/414,151	11/06/84
4,480,821	06/452,314	11/06/84
4,480,824	06/358,080	11/06/84
4,480,827	06/481,036	11/06/84
4,480,832	06/428,572	11/06/84
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4,480,919	06/399,844	11/06/84
4,480,923	06/532,165	11/06/84
4,480,925	06/523,648	11/06/84
4,480,927	06/383,139	11/06/84
4,480,932	06/422,936	11/06/84
4,480,939	06/453,773	11/06/84
4,480,946	06/312,250	11/06/84
4,480,949	06/383,374	11/06/84
4,480,956	06/461,117	11/06/84
4,480,965	06/432,576	11/06/84
4,480,969	06/517,181	11/06/84
4,480,974	06/478,957	11/06/84
4,480,977	06/474,474	11/06/84
4,480,981	06/470,147	11/06/84
4,480,988	06/378,977	11/06/84
4,480,995	06/534,967	11/06/84
4,480,998	06/419,298	11/06/84
4,480,999	06/549,176	11/06/84
4,481,001	06/498,292	11/06/84
4,481,008	06/309,796	11/06/84
4,481,012	06/514,544	11/06/84
4,481,014	06/350,337	11/06/84
4,481,016	06/325,661	11/06/84
4,481,027	06/451,796	11/06/84
4,481,030	06/500,102	11/06/84
4,481,036	06/473,469	11/06/84
4,481,044	06/591,903	11/06/84
4,481,045	06/474,190	11/06/84
4,481,061	06/490,013	11/06/84
4,481,067	06/408,640	11/06/84
4,481,068	06/563,331	11/06/84
4,481,078	06/377,269	11/06/84
4,481,079	06/423,468	11/06/84
4,481,081	06/537,723	11/06/84
4,481,086	06/444,816	11/06/84
4,481,093	06/537,695	11/06/84
4,481,096	06/565,056	11/06/84
4,481,101	06/411,141	11/06/84
4,481,102	06/526,866	11/06/84
4,481,107	06/597,310	11/06/84
4,481,109	06/278,686	11/06/84
4,481,112	06/517,880	11/06/84
4,481,113	06/376,724	11/06/84
4,481,115	06/465,380	11/06/84
4,481,123	06/371,031	11/06/84
4,481,127	06/520,663	11/06/84
4,481,131	06/347,997	11/06/84
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4,481,141	06/484,806	11/06/84
4,481,144	06/576,668	11/06/84
4,481,148	06/244,525	11/06/84
4,481,171	06/279,087	11/06/84
4,481,175	06/544,361	11/06/84
4,481,192	06/522,534	11/06/84
4,481,195	06/311,031	11/06/84
4,481,197	06/389,561	11/06/84
4,481,198	06/579,620	11/06/84
4,481,202	06/453,059	11/06/84
4,481,214	06/496,174	11/06/84
4,481,215	06/483,726	11/06/84
4,481,216	06/540,571	11/06/84
4,481,219	06/395,928	11/06/84
4,481,223	06/541,498	11/06/84
4,481,232	06/498,999	11/06/84
4,481,240	06/444,986	11/06/84
4,481,255	06/376,344	11/06/84
4,481,257	06/505,567	11/06/84
4,481,258	06/433,324	11/06/84
4,481,261	06/445,687	11/06/84
4,481,264	06/323,433	11/06/84
4,481,268	06/499,754	11/06/84
4,481,275	06/459,247	11/06/84
4,481,278	06/437,617	11/06/84
4,481,283	06/479,426	11/06/84
4,481,287	06/590,810	11/06/84
4,481,289	06/359,296	11/06/84
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5,160,424	07/612,932	11/03/92
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5,161,226	07/698,077	11/03/92
5,161,234	07/634,627	11/03/92
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Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,825,941, Re. S.N. 08/752,155, November 18, 1996, Cl. 165/110, CONDENSER FOR USE IN A CAR COOLING SYSTEM, Ryoichi Hoshino, et. al., Owner of Record: *Showa Aluminum Corp., Osaka, Japan*, Attorney or Agent: Vasilios D. Dossas, Ex. Gp.: 3406

5,488,586, Re. S.N. 08/744,448, November 7, 1996, Cl. 29/893.100, METHOD AND APPARATUS FOR AUTOMATICALLY ASSEMBLING SIDE GEARS, PINIONS AND PINION SHAFT WITHIN DIFFERENTIAL CASE, Masaba Ichiki, et. al., Owner of Record: *Toyota Jidosha Kabushiki Kaisha, Aichi-Ken, Japan*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 3206

5,453,758, Re. S.N. 08/736,288, October 24, 1996, Cl. 345/158, INPUT APPARATUS, Kazuhiro Sato, Owner of Record: *Sony Corporation, Tokyo, Japan*, Attorney or Agent: Ronald P. Kananen, Ex. Gp.: 2609

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,445,558, Reexam. No. 90/004,479, Dec. 10, 1996, 141/329, FLEXIBLE WALLED CONTAINER HAVING MEMBRANE FITMENT FOR USE WITH ASEPTIC FILLING APARATUS, John C. Davis, et. al., Owner of Record: *Schoelle Corp., Irvine, Calif.*, Attorney or Agent: McCaleb, Lucas & Brugman, Chicago, Ill., Ex. Gp.: 3105, Requester: Liqui-Box Corp., c/o Marshall A. Lerner & Bradford E. Mattes, Arant, Kleinberg, Lerner & Rum, Los Angeles, Calif.

4,565,714, Reexam. No. 90/004,480, Dec. 10, 1996, Cl. 427/515, LOW SURFACE ENERGY MATERIAL, Robert J. Kosbar, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Lorraine R. Sherman, St. Paul, Minn., Ex. Gp.: 1112, Requester: Shin-Etsu Chemical Co. Ltd., c/o Birch Stewart Kolasch & Birch, Falls Church, Va.

4,596,446, Reexam. No. 90/004,473, Oct. 29, 1996, Cl. 359/055, LIQUID CRYSTAL DEVICES WITH PARTICULAR CHOLESTERIC PITCH-CELL THICKNESS RATIO, Colin M. Waters, et. al., Owner of Record: *Sec. of State For Her Defence In Her Maj. Govt. The UK of Gt. Britain and Northern Ireland, Whitehall, London, England*, Attorney or Agent: Arthur R. Crawford, Nixon & Vanderhye, Arlington, Va., Ex. Gp.: 2515, Requester: Richard L. Treanor, Oblon, Spivak, McClelland Maier & Neustadt, Arlington, Va.

5,079,262, Reexam. No. 90/004,475, Dec. 4, 1996, Cl. 514/561, METHOD OF DETECTION AND TREATMENT OF MALIGNANT AND NON-MALIGNANT LESIONS UTILIZING 5-AMINOLEVULINIC ACID , James C. Kennedy, et. al., Owner of Record: *Queen's University At Kingston, Kingston, Canada*, Attorney or Agent: Melvin Blecher, Foley & Lardner, Washington, D.C., Ex. Gp.: 1205, Requester: Owner

5,211,938, Reexam. No. 90/004,476, Dec. 4, 1996, Cl. 424/9.6, METHOD OF DETECTION OF MALIGNANT AND NON-MALIGNANT LESIONS BY PHOTOCHEMOTHERAPY OF PROTOPORPHYRIN IX PRECURSORS, James C. Kennedy, et. al., Owner of Record: *Queen's University At Kingston, Kingston, Canada*, Attorney or Agent: Melvin Blecher, Foley & Lardner, Washington, D.C., Ex. Gp.: 1211, Requester: Owner

5,339,987, Reexam. No. 90/004,477, Dec. 5, 1996, Cl. 222/079, CONTROLLED FLOW, BURSTING WATER GUN RELEASE MECHANISM, Bruce M. D'Andrade, Owner of Record: *Inventor*, Attorney or Agent: Inventor, Ex. Gp.: 3104, Requester: Alan B. Amron, Syosset, N.Y.

5,492,547, Reexam. No. 90/004,474, Nov. 8, 1996, Cl. 047/058, PROCESS FOR PREDICTING THE PHENOTYPIC TRAIT OF YIELD IN MAIZE, Richard Johnson, Owner of Record: *DeKalb Genetics Corp., DeKalb, Ill.*, Attorney or Agent: David L. Parker, Arnold White & Durkee, Houston, Tex., Ex. Gp.: 3501, Requester: Foley & Lardner, Stephen A. Bent, Washington, D.C.

5,487,718, Reexam. No. 90/004,478, Dec. 6, 1996, Cl. 428/41.5, TRANSPARENT PAPER LABEL SHEETS, Ghanshyam H. Popat, et. al., Owner of Record: *Avery Dennison Corp., Pasadena, Calif.*, Attorney or Agent: Poms Smith Lande & Rose, Scott R. Hansen, Los Angeles, Calif., Ex. Gp.: 1315, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 17, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
107,583	71/087,108	12/14/1915
107,628	71/078,639	12/14/1915
107,629	71/078,640	12/14/1915
107,630	71/078,641	12/14/1915
329,815	71/366,260	12/12/1935
330,586	71/368,152	12/10/1935
330,608	71/366,558	12/10/1935
330,609	71/366,508	12/10/1935
330,653	71/368,433	12/10/1935
330,689	71/344,643	12/10/1935
330,690	71/366,151	12/10/1935
617,322	71/681,480	12/13/1955
617,332	71/680,496	12/13/1955
617,343	71/680,632	12/13/1955
617,347	71/685,059	12/13/1955
617,356	71/671,210	12/13/1955
617,357	71/674,608	12/13/1955
617,360	71/678,382	12/13/1955
617,365	71/680,994	12/13/1955
617,366	71/681,282	12/13/1955
617,377	71/685,289	12/13/1955
617,379	71/686,368	12/13/1955
617,383	71/651,957	12/13/1955
617,386	71/670,322	12/13/1955
617,389	71/681,235	12/13/1955
617,418	71/656,272	12/13/1955
617,423	71/672,585	12/13/1955
617,434	71/682,067	12/13/1955
617,440	71/671,956	12/13/1955
617,445	71/679,091	12/13/1955
617,448	71/678,946	12/13/1955
617,450	71/668,524	12/13/1955
617,456	71/641,821	12/13/1955
617,459	71/671,209	12/13/1955
617,464	71/681,675	12/13/1955
617,466	71/666,021	12/13/1955
617,468	71/674,539	12/13/1955
617,470	71/662,764	12/13/1955
617,478	71/661,688	12/13/1955
617,505	71/664,816	12/13/1955
617,518	71/671,194	12/13/1955
617,528	71/676,839	12/13/1955
617,536	71/680,370	12/13/1955
617,546	71/681,577	12/13/1955
617,551	71/668,915	12/13/1955
617,554	71/676,747	12/13/1955
617,560	71/666,860	12/13/1955
617,562	71/676,991	12/13/1955
617,568	71/652,197	12/13/1955
617,571	71/663,255	12/13/1955
617,574	71/666,090	12/13/1955

Reg. Number	Serial Number	Reg. Date
617,576	71/672,079	12/13/1955
617,579	71/676,509	12/13/1955
617,580	71/677,129	12/13/1955
617,583	71/677,734	12/13/1955
617,585	71/666,978	12/13/1955
617,598	71/657,438	12/13/1955
617,600	71/667,295	12/13/1955
617,603	71/672,673	12/13/1955
617,609	71/665,757	12/13/1955
617,610	71/668,344	12/13/1955
617,614	71/679,670	12/13/1955
617,628	71/677,207	12/13/1955
617,630	71/671,180	12/13/1955
993,584	72/453,729	09/24/1974
1,012,025	73/034,093	06/03/1975
1,018,133	73/033,686	08/12/1975
1,026,484	73/026,090	12/09/1975
1,026,487	73/038,629	12/09/1975
1,026,490	73/016,396	12/09/1975
1,026,491	73/043,837	12/09/1975
1,026,492	73/005,240	12/09/1975
1,026,498	73/025,054	12/09/1975
1,026,501	73/031,334	12/09/1975
1,026,503	73/038,854	12/09/1975
1,026,507	73/042,995	12/09/1975
1,026,508	73/044,256	12/09/1975
1,026,513	73/029,098	12/09/1975
1,026,520	73/042,300	12/09/1975
1,026,521	73/047,772	12/09/1975
1,026,524	73/049,678	12/09/1975
1,026,527	73/050,837	12/09/1975
1,026,528	73/017,767	12/09/1975
1,026,529	73/017,807	12/09/1975
1,026,531	73/023,186	12/09/1975
1,026,532	73/024,972	12/09/1975
1,026,533	73/029,448	12/09/1975
1,026,534	73/029,518	12/09/1975
1,026,540	73/047,817	12/09/1975
1,026,541	73/000,398	12/09/1975
1,026,542	73/006,280	12/09/1975
1,026,546	73/018,526	12/09/1975
1,026,549	73/019,134	12/09/1975
1,026,551	73/019,971	12/09/1975
1,026,552	73/020,369	12/09/1975
1,026,553	73/020,891	12/09/1975
1,026,556	73/023,889	12/09/1975
1,026,557	73/025,669	12/09/1975
1,026,558	73/029,450	12/09/1975
1,026,561	73/032,523	12/09/1975
1,026,562	73/032,583	12/09/1975
1,026,563	73/032,584	12/09/1975
1,026,567	73/034,820	12/09/1975
1,026,568	73/035,252	12/09/1975
1,026,569	73/036,344	12/09/1975
1,026,576	73/040,766	12/09/1975
1,026,581	73/047,131	12/09/1975
1,026,582	73/047,237	12/09/1975
1,026,586	73/026,422	12/09/1975
1,026,588	73/047,154	12/09/1975
1,026,589	73/047,488	12/09/1975
1,026,591	73/047,691	12/09/1975
1,026,593	73/048,104	12/09/1975
1,026,595	73/010,590	12/09/1975
1,026,596	73/011,365	12/09/1975
1,026,602	73/015,311	12/09/1975
1,026,603	73/017,493	12/09/1975
1,026,605	73/019,345	12/09/1975
1,026,609	73/022,837	12/09/1975
1,026,610	73/023,288	12/09/1975
1,026,612	73/023,974	12/09/1975
1,026,616	73/028,965	12/09/1975
1,026,617	73/028,985	12/09/1975
1,026,618	73/029,508	12/09/1975
1,026,625	73/036,669	12/09/1975
1,026,626	73/037,131	12/09/1975
1,026,629	73/038,105	12/09/1975
1,026,632	73/038,898	12/09/1975
1,026,633	73/039,297	12/09/1975
1,026,634	73/039,492	12/09/1975
1,026,635	73/039,614	12/09/1975
1,026,639	73/043,198	12/09/1975
1,026,640	73/043,813	12/09/1975
1,026,643	73/047,112	12/09/1975
1,026,644	73/047,240	12/09/1975
1,026,648	73/049,751	12/09/1975
1,026,663	73/027,974	12/09/1975
1,026,672	73/044,844	12/09/1975
1,026,673	73/049,349	12/09/1975
1,026,674	73/010,806	12/09/1975
1,026,675	73/016,249	12/09/1975
1,026,677	73/024,116	12/09/1975
1,026,678	73/024,864	12/09/1975
1,026,679	73/033,949	12/09/1975
1,026,682	73/044,217	12/09/1975
1,026,683	73/046,491	12/09/1975
1,026,684	73/046,540	12/09/1975
1,026,685	73/046,541	12/09/1975
1,026,686	73/049,711	12/09/1975
1,026,687	73/001,460	12/09/1975
1,026,688	73/016,542	12/09/1975
1,026,689	73/020,343	12/09/1975
1,026,690	73/034,392	12/09/1975
1,026,693	73/051,850	12/09/1975
1,026,697	73/018,881	12/09/1975
1,026,702	73/038,638	12/09/1975
1,026,705	73/005,094	12/09/1975
1,026,707	73/008,884	12/09/1975
1,026,708	73/011,544	12/09/1975
1,026,712	73/015,969	12/09/1975
1,026,713	73/017,771	12/09/1975
1,026,714	73/017,772	12/09/1975
1,026,722	73/028,943	12/09/1975
1,026,729	73/032,820	12/09/1975
1,026,732	73/036,054	12/09/1975
1,026,741	73/050,255	12/09/1975
1,026,751	73/029,482	12/09/1975
1,026,752	73/040,961	12/09/1975
1,026,756	73/041,091	12/09/1975
1,026,762	73/006,061	12/09/1975
1,026,766	73/022,292	12/09/1975
1,026,769	73/024,499	12/09/1975
1,026,773	73/029,398	12/09/1975
1,026,784	73/015,137	12/09/1975
1,026,788	73/025,969	12/09/1975
1,026,793	73/030,172	12/09/1975
1,026,795	73/020,180	12/09/1975
1,026,796	73/025,154	12/09/1975
1,026,797	73/028,432	12/09/1975
1,026,798	73/031,320	12/09/1975
1,026,800	73/033,587	12/09/1975
1,026,801	73/036,395	12/09/1975
1,026,802	73/039,381	12/09/1975
1,026,803	73/043,341	12/09/1975
1,026,804	73/043,364	12/09/1975
1,026,808	73/007,480	12/09/1975
1,026,809	73/007,698	12/09/1975
1,026,810	73/008,608	12/09/1975
1,026,815	73/029,600	12/09/1975
1,026,819	73/033,059	12/09/1975
1,026,822	73/034,727	12/09/1975
1,026,823	73/036,336	12/09/1975
1,026,830	73/038,956	12/09/1975
1,026,831	73/038,957	12/09/1975
1,026,835	73/043,832	12/09/1975
1,026,838	73/044,065	12/09/1975
1,026,844	73/012,647	12/09/1975
1,026,845	73/015,962	12/09/1975
1,026,846	73/037,226	12/09/1975
1,026,849	73/008,853	12/09/1975
1,026,850	73/016,928	12/09/1975
1,026,858	73/019,152	12/09/1975
1,026,859	73/019,854	12/09/1975
1,026,861	73/020,703	12/09/1975
1,026,864	73/026,557	12/09/1975
1,026,867	73/028,323	12/09/1975
1,026,869	73/028,512	12/09/1975

Reg. Number	Serial Number	Reg. Date
1,026,872	73/033,074	12/09/1975
1,026,876	73/044,061	12/09/1975
1,026,878	73/045,325	12/09/1975
1,026,880	73/048,074	12/09/1975
1,026,885	73/011,948	12/09/1975
1,026,886	73/013,437	12/09/1975
1,026,888	73/020,439	12/09/1975
1,026,890	73/026,270	12/09/1975
1,026,892	73/029,826	12/09/1975
1,026,898	73/042,958	12/09/1975
1,026,901	73/047,862	12/09/1975
1,026,907	73/020,561	12/09/1975
1,026,909	73/022,878	12/09/1975
1,026,911	73/042,959	12/09/1975
1,026,918	73/037,518	12/09/1975
1,026,923	73/022,466	12/09/1975
1,026,925	73/026,859	12/09/1975
1,026,928	73/038,194	12/09/1975
1,026,929	73/000,900	12/09/1975
1,026,933	73/024,765	12/09/1975
1,026,934	73/024,766	12/09/1975
1,026,935	73/024,805	12/09/1975
1,026,937	73/028,254	12/09/1975
1,026,943	73/052,163	12/09/1975
1,026,947	73/028,274	12/09/1975
1,026,950	73/005,737	12/09/1975
1,026,956	73/023,766	12/09/1975
1,026,957	73/035,297	12/09/1975
1,026,961	73/041,185	12/09/1975
1,026,962	73/048,062	12/09/1975
1,026,964	73/051,952	12/09/1975
1,026,967	73/036,387	12/09/1975
1,026,972	73/046,656	12/09/1975
1,026,977	73/025,363	12/09/1975
1,026,980	73/043,281	12/09/1975
1,026,981	73/047,055	12/09/1975
1,026,985	73/027,123	12/09/1975
1,026,986	73/027,901	12/09/1975
1,026,987	73/033,135	12/09/1975
1,026,989	73/038,610	12/09/1975
1,026,990	73/040,601	12/09/1975
1,026,993	73/007,966	12/09/1975
1,026,994	73/007,969	12/09/1975
1,026,995	73/011,878	12/09/1975
1,027,014	72/446,439	12/09/1975
1,027,016	72/446,960	12/09/1975
1,027,023	72/461,598	12/09/1975
1,027,029	72/462,900	12/09/1975
1,027,031	72/457,619	12/09/1975
1,027,035	72/434,401	12/09/1975
1,027,036	72/459,313	12/09/1975
1,027,049	72/453,831	12/09/1975
1,027,050	72/463,340	12/09/1975
1,027,058	72/429,124	12/09/1975
1,027,062	72/372,033	12/09/1975
1,027,063	72/461,941	12/09/1975
1,027,064	72/451,585	12/09/1975
1,027,073	73/014,391	12/09/1975

Status of Certification Services

On November 28, 1995, the Office published an Official Gazette Notice entitled "Temporary Suspension of At Cost Services for Orders for Certified Copies" (1180 OG 121) to advise practitioners and the public of delays in filling orders for certified copies of PTO documents. This is an update of actual days to mail for orders filled during the month of November 1996:

Certified Product	Goal	Actual Calendar Days to Mail
Patent Application-As-Filed, Expedited	7	4
Patent Application-As-Filed, Regular	17	13
Patent Related File Wrapper	25	34
Patent Copy	10	8
Patent Assignments	17	8
Trademark Application-As-Filed, Expedited	7	8
Trademark Application-As-Filed, Regular	17	13
Trademark Related File Wrapper	25	35
Trademark Assignments	17	5
Trademark Registration, Expedited	3*	6*
Trademark Registration, Regular	10*	11*

*Business Days

Due to backlogs and varying availability of media, customers will not be advised when orders are not delivered within the published goal periods. However, customers will be advised if any unexpected delay in their order has been identified. Customers should use the above actual days to mail for each product as a guide as to when they can expect their orders.

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessibility. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

December 16, 1996 WESLEY H. GEWEHR
Administrator for Information Dissemination

Patents Available For License or Sale

4,280,330 VEHICLE HEATING AND COOLING SYSTEM

Contact: Verdell Harris
455 Carlton Ave.
Brooklyn, N.Y. 11238

5,231,571 PERSONAL FINANCIAL SYSTEM COMPUTER METHOD

Contact: Michael S. Bigel
Bell, Seltzer, Park & Gibson
Post Ofc. Drawer 34009
Charlotte, N.C. 28231
(voice): (919) 420-2200
(fax): (919) 881-3175

5,335,813 DOUBLE-VESSEL CAN

Contact: Hao Qi
151 Byng Ave.
Scarborough, Ont.
M1L 3P3 Canada
(voice): (416) 698-0996

5,420,108 A METHOD OF CONTROLLING DIABETES MELLITUS

Contact: Isaac H. Shobet
70-34 Kissena Blvd.
Flushing, N.Y. 11367

5,425,707 METHOD FOR NON-SURGICAL

TREATMENT OF CARPAL TUNNEL SYNDROME

Contact: Robert F. Zielinski
Wolf, Block, Schorr and Solis-Cohen
Twelfth Floor Packard Building
S.E. Corner 15th and Chestnut St.
Philadelphia, Pa. 19102-2678
(voice): (215) 977-2000
(fax): (215) 977-2334
(fax): (215) 977-2346

5,501,037 HYDROPONICS PROCESS AND DEVICE

Contact: Bruce E. Lilling
Lilling & Lilling
11 Martine Ave.
White Plains, N.Y. 10606
(voice): (914) 684-0600
(fax): (914) 684-0304

5,533,526 METHOD AND APPARATUS FOR NON-SURGICAL TREATMENT OF CARPAL TUNNEL SYNDROME

Contact: Robert F. Zielinski
Wolf, Block, Schorr and Solis-Cohen
Twelfth Floor Packard Building
S.E. Corner 15th and Chestnut St.
Philadelphia, Pa. 19102-2678
(voice): (215) 977-2000
(fax): (215) 977-2334
(fax): (215) 977-2346

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

4U2C Lifestyles, Inc., St. Petersburg, Fla., Reg. No. 1,691,665, for the mark "4U2C", Canc. No. 25,387.

Datacom, Inc., Horsham, Pa., Reg. No. 1,680,297, for the mark "EVOLUTION", Canc. No. 25,339.

Feeling Fine Programs, Inc., Los Angeles, Calif., Reg. No. 1,660,562, for the mark "VIDEO HOUSECALL", Canc. No. 25,532.

Kono, Alexander DBA Merchant Banking Center, Atlanta, Ga., Reg. No. 1,701,172 for the mark "A.C.E.S.", Canc. No. 25,599.

JEAN BROWN
Technical Support Manager
Trademark Trial and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Errata

"All reference to Patent No. 5,576,307 to Dikis Roufa, et. al., of Missouri for METHODS AND COMPOSITIONS FOR INHIBITING OF CELL INVASION AND FIBROSIS USING DEXTRAN SULFATE appearing in the *Official Gazette* of November 19, 1996 should be deleted since no patent was granted."

Certificates of Correction For Week of January 14, 1996

D. 374,984	5,486,623	5,535,496	5,557,440
D. 375,416	5,489,533	5,536,501	5,557,698
4,296,027	5,493,026	5,536,597	5,557,712
4,690,985	5,495,155	5,537,058	5,557,923
4,892,851	5,497,701	5,537,910	5,558,766
5,131,251	5,501,175	5,538,283	5,558,815
5,134,221	5,501,416	5,538,320	5,558,959
5,192,707	5,502,533	5,540,808	5,559,046
5,254,680	5,502,970	5,540,929	5,559,218
5,263,252	5,504,107	5,541,305	5,559,948
5,268,934	5,504,171	5,541,864	5,560,411
5,308,956	5,504,455	5,541,954	5,560,457
5,309,616	5,505,763	5,543,076	5,560,480
5,323,389	5,509,763	5,543,206	5,560,813
5,339,330	5,510,004	5,543,414	5,561,140
5,346,694	5,510,104	5,543,473	5,561,558
5,349,134	5,511,069	5,543,855	5,561,835
5,356,252	5,512,405	5,544,337	5,561,851
5,373,508	5,515,323	5,544,696	5,561,893
5,379,610	5,515,376	5,545,450	5,561,943
5,380,160	5,515,913	5,545,577	5,562,175
5,388,445	5,515,956	5,545,855	5,562,345
5,393,984	5,516,636	5,545,901	5,562,372
5,411,654	5,517,639	5,546,102	5,562,885
5,423,068	5,518,378	5,546,280	5,563,484
5,424,039	5,519,379	5,546,375	5,563,667
5,424,666	5,519,704	5,546,504	5,563,753
5,426,479	5,520,951	5,546,554	5,563,804
5,429,353	5,522,294	5,547,233	5,563,818
5,431,820	5,524,893	5,547,295	5,564,018
5,436,550	5,524,922	5,548,162	5,564,040
5,440,369	5,524,933	5,548,246	5,564,304
5,440,631	5,525,351	5,548,428	5,564,589
5,442,586	5,525,379	5,548,538	5,564,791
5,446,245	5,526,062	5,549,740	5,565,659
5,446,683	5,526,531	5,550,039	5,566,159
5,446,856	5,527,900	5,550,651	5,566,948
5,448,712	5,527,946	5,551,398	5,567,037
5,449,313	5,527,991	5,552,149	5,567,707
5,452,034	5,528,579	5,552,298	5,567,801
5,453,540	5,529,542	5,552,646	5,568,479
5,454,287	5,529,887	5,554,200	5,568,910
5,455,279	5,530,882	5,554,359	5,568,945
5,455,924	5,532,039	5,554,380	5,570,602
5,460,861	5,532,110	5,554,622	5,570,728
5,465,866	5,532,677	5,554,642	5,570,826
5,472,959	5,532,801	5,555,018	5,570,956
5,474,030	5,533,589	5,555,181	5,572,959
5,478,941	5,533,973	5,555,543	5,573,340
5,479,401	5,534,178	5,555,619	5,573,388
5,480,249	5,534,891	5,556,345	5,573,469
5,481,914	5,534,921	5,556,861	5,573,675
5,483,689	5,535,343	5,556,921	

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
November 18-22, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-19	EX	74/468,255	Fishbones Sand Lake Road, Inc.	2(d)	Refusal Affirmed		"FISHBONES" [restaurant services]	"FISHBONE'S" and "FISHBONE'S RHYTHM KITCHEN CAFE" [restaurant services]	No
11-19	EX	74/471,002	TBAC Investments, Inc.	2(d)	Refusal Affirmed		"AMERICAN ANGLER" [neckwear]	"ANGLER" [gloves made of fabric and leather]	No
11-19	EX	74/456,723	Albert Goldberg and Jean-Pierre Benaym	requirement to provide an English translation of applicant's mark	Refusal Reversed		"FAÇONNABLE" [stationery articles, pens, pencils, note paper, appointment books and notebooks]		No
11-19	EX	74/474,107	Composite Products, Inc.	2(d)	Refusal Reversed		"COMPOSITE PRODUCTS" (and design) [building materials, namely, wood and fiber flooring planks, strips and tiles, wood and fiber roofing tiles and panels, and wood and fiber siding]	"COMPOSITE TECHNOLOGY, INC." [glass fiber structures- namely, roof decking, structural beams, roofing panels, siding panels, ridge vents and flashing; ventilating louvers]	No
11-19	EX	74/531,950	Wamaco Inc.	2(e)(1)	Refusal Affirmed		"EASY FITTING" [bras, panties, slips, camisoles and tap pants]		No
11-19	EX	74/076,974	Rockline, Inc.	2(d)	Refusal Affirmed (on the basis of both cited registrations)		"COTTON TAILS" [baby wipes]	"COTTON TAILS" [packages of absorbent cotton; dispensers filled with cotton-tipped swabs or applicators; etc.] and "COTTONTAILS" [disposable diapers]	No

(1) EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (S) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-19	EX	74/451,823	Paint Mate, Inc.	2(e)(1)	Refusal Affirmed		"THE RECYCLER" [plastic containers sold empty for recycling solvents]		No
11-19	EX	74/497,846	Tibbals Flooring Co.	2(d)	Refusal Affirmed		"BEAUMONT" [wood flooring]	"BEAUMONT PLACE" [wood doors]	No
11-20	EX	74/525,335	McGladrey & Pullen	2(d)	Refusal Reversed		"RENAISSANCE" [consulting services for assisting businesses in organizational renewal]	"RENAISSANCE MEETING CENTER" [organizing and conducting business conferences for others]	No
11-20	EX	74/281,163	Pretesting Co., Inc.	genericness/Section 2(f) distinctiveness; acceptability of applicant's drawing	Refusal Affirmed (on both grounds)		"THE PRETESTING COMPANY" [advertising research services, namely, exposing selected consumers to advertising materials, evaluating their reactions, and reporting such evaluation to the prospective advertiser]		No
11-20	EX	74/265,217	Terra Int'l., Inc.	2(d); acceptability of applicant's amended drawing [material alteration]	Refusal Affirmed [on both grounds]		"ACTIVATE PLUS" [spreader/activator for use in connection with agricultural pesticides]	"ACTIVATE" [surfactant for use with herbicides, insecticides, and fungicides]	No
11-21	EX	74/384,333	A. J. Mfg., Inc.	2(d)	Refusal Affirmed		"AJ FREEDOM STORM DOOR" (and design) [insulated steel storm doors for residential and commercial building usage]	"FREEDOM" [garage doors for residential, commercial and industrial installations]	No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-21	EX	74/524,135	Magicarpet Products, Inc.	2(e)(1)	Refusal Affirmed		"POOCH PADS" [reusable and washable housebreaking and incontinence floor mats for domestic animals, particularly dogs and puppies]		No
11-21	EX	74/463,486	Easthill Group, Inc.	2(e)(1)/Section 2(f) distinctiveness	Refusal Affirmed		"CHASSIS BLACK" [paint and protective coatings, especially for specific parts of automobiles]		No
11-22	EX	74/373,937	Roto Frank AG	2(d); whether identification of goods must be amended to conform to goods recited in foreign registration asserted under Sec. 44	Refusal Affirmed (only on "identification of goods" ground)		"ROTO ALPINE" [windows, particularly for mounting on inclined surfaces, such as roof windows and conservatory windows]	"ROTOMATIC" and "ROTOMATIC" (and design) [automatic balanced doors]; "ROTO-SWING" and "ROTOSWING" (and design) [balanced doors]	No
11-22	EX	74/504,380	Silicon Systems, Inc.	2(e)(1)	Refusal Affirmed		"SILENT SPIN" [integrated circuits]		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Assistant Commissioner for Trademarks
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Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Please address mail as follows:

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Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks
Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(304) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 592-7000
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/02/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	08/09/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/17/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/15/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	01/30/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	01/30/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	06/08/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	03/01/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/10/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	05/15/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/17/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/13/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Director	308-1113	07/17/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	06/29/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/29/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/21/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	09/18/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of December 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/22/96	10/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/13/96	07/08/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/05/96	11/12/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/03/96	08/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/03/96	06/19/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/11/96	08/23/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/27/96	10/09/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/26/96	07/24/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/96	08/15/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	10/04/96	—0—
Renewals (All Classes)	10/11/96	—0—
Section 12(c) Publications (All Classes)	06/10/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

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REEXAMINATIONS

JANUARY 14, 1997

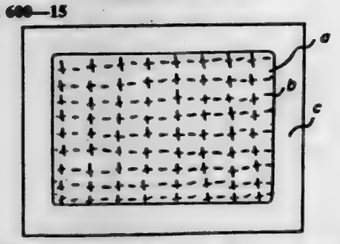
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,489,711 (3100th)

MAGNETIC PLASTER

Arne W. Latzke, Wolfhalden, Switzerland, assignor to Magnesystems, Inc., Los Angeles, Calif.

Reexamination Request Nos. 90/003,497, Jul. 5, 1994 and 90/003,591, Oct. 7, 1994 and 90/003,617, Oct. 27, 1994.
Reexamination Certificate for Patent 4,489,711, issued Dec. 25, 1984, Ser. No. 353,856, Mar. 1, 1982.
Claims priority, application Germany, Oct. 2, 1981, 31 39 280; Dec. 3, 1981, 31 47 852
Int. Cl.[6] A61N *1/40*
U.S. Cl. 600—15



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claimes **1–15** is confirmed.

1. A flexible, permanently magnetized plastic sheet compatible with the skin having a flux density of about 50 to 2000 Gauss, a thickness of form 0.2 to 5 mm, and which sheet has alternating positive and negative parallel magnetized strips and the positive and negative poles of the strips are at distances between each other of from about 4 to 10 mm, said sheet being self adhesive to the skin or attachable to the skin by a self adhesive plaster compatible with the skin.

B1 4,754,840 (3101st)

LEVELING ASSEMBLY FOR WORK PLATFORMS ON ARTICULATING BOOMS

Wayne P. MacDonald, McConnellsburg, and Jeffery J. Ritz, Warfordsburg, both of Pa., assignors to JLG Industries, Inc., McConnellsburg, Pa.

Reexamination Request No. 90/004,062, Dec. 22, 1995.
Reexamination Certificate for Patent 4,754,840, issued Jul. 5, 1988, Ser. No. 105,724, Oct. 7, 1987.
Int. Cl.[6] B66F *11/00*
U.S. Cl. 182—2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **11–16** is confirmed.

Claims **1** and **7** are determined to be patentable as amended.

Claims **2–6** and **8–10**, dependent on an amended claim, are determined to be patentable.

1. An apparatus for maintaining the orientation of a platform or other elevatable member relative to a fixed support while the member is raised or lowered relative to the fixed support, the member being mounted on a boom which is pivotally connected to the fixed support and has a fly end, comprising:

pivot plate means defining a triangle having first, second and third mounting locations, each mounting location being disposed relatively adjacent a respective corner of said triangle;

a first mounting means for coaxially pivotally mounting said pivot plate means, the fly end of the boom and said member at said first mounting location;

pivot means pivotally connected at one end to said second mounting location by a second mounting means and at another end to the fixed support, said pivot means *and said boom fly end forming a parallelogram linkage and* being adapted to pivot said second mounting means relative to said first mounting means;

means for adjusting the orientation of said member, comprising a third mounting means for pivotally connecting said adjusting means to said pivot plate means at said third mounting location, said adjusting means being further provided with pin means for pivotally connecting said adjusting means to said member at a location spaced from said third mounting location, whereby said adjusting means interconnects said pivot plate means and the member so that the member pivots about said first mounting location in correspondence with the pivoting of said second mounting means about said first mounting location, said adjusting means being adapted to vary the spacing of said pin means and said third mounting location; and

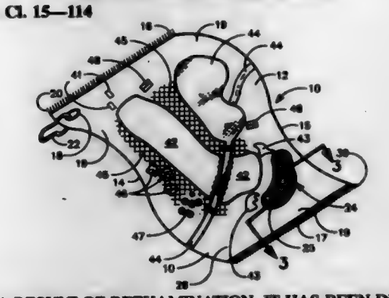
means for pivoting the boom about the fixed support, whereby said pivot means pivots said second mounting means about said first mounting means, and said adjusting means acts to correspondingly pivot the member to maintain its orientation as said second mounting means pivots about said first mounting means.

B1 4,912,800 (3102nd)

CLEANING DEVICE FOR GOLFERS AND CONSTRUCTION METHOD THEREFOR

Barry Zeltner, Littleton, Colo., assignor to Recreative Technologies Corporation

Reexamination Request No. 90/002,613, Jan. 6, 1992.
Reexamination Certificate for Patent 4,912,800, issued Apr. 3, 1990, Ser. No. 232,306, Aug. 15, 1988.
Int. Cl.[6] A44B *21/00*; A47K *10/02*
U.S. Cl. 15—114



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–20 is confirmed.

1. A cleaning device which is adapted to be secured to a golf bag for use by a golfer to clean his/her golfing implements and equipment, such as golf clubs, golf shoes, golf balls and the like, comprising:

a towel body constructed of a water absorbent material in the form of a panel having a front surface, a rear surface, a peripheral edge extending there-around and a peripheral margin adjacent the peripheral edge;

a brush member secured to said towel body on the front surface thereof, said brush member including a plurality of stiff, resilient and elongated bristles projecting generally perpendicularly outwardly from said front surface; and

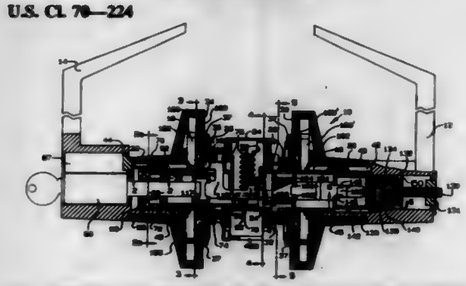
mounting means for releasably mounting said towel body while in use at a point of attachment of said golf bag, said mounting means located in spaced apart relation to said brush member to suspend said brush member in spaced relation from the point of attachment so that said brush member can be easily and effectively maneuvered and employed by the golfer to clean his/her golfing implements and equipment without detaching said towel body from said golf bag.

B1 4,920,773 (3103rd)

DOOR LOCK HAVING DISENGAGED OUTER LEVER HANDLE WHEN IN THE LOCKED CONDITION AND MEANS TO BIAS THE HANDLE TOWARD HORIZONTAL POSITION

Walter E. Surko, Jr., Southington, Conn., assignor to Yale Security Inc., Monroe, N.C.

Reexamination Request No. 90/003,688, Jan. 17, 1995.
Reexamination Certificate for Patent 4,920,773, issued May 1, 1990, Ser. No. 153,215, Feb. 8, 1988.
Int. Cl.[6] E05B *13/10*
U.S. Cl. 70—224



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **10** is cancelled.

Claims **1**, **3–5**, **7**, **8** and **11–13** are determined to be patentable as amended.

Claims **2**, **6**, **9**, **14**, dependent on an amended claim, are determined to be patentable.

New claims **15–58** are added and determined to be patentable.

1. A dock lock comprising:

an inner handle,

an outer handle in the form of a lever normally disposed horizontally and having a rose,

a latch housing between the handles [and] , *the latch housing* containing a latch retractor,

[and] first spring means biasing the *latch* retractor outwardly toward latched disposition,

an inner *tubular spindle* and an outer tubular spindle receiving the respective handles and both terminating respectively inside the lock in arcuate pull-back scoops, the two scoops being aligned end-to-end and disposed against the side of the *latch* retractor opposite the first spring means and each being adapted when turned to move the *latch retractor inwardly,*

the inside handle being keyed to the inner spindle,

the outer spindle being notch out at its outer end, the notch comprising a longitudinal slot and an adjoining partial circumferential space,

the outer spindle having thereinside a central boss having a radial finger and second spring means urging the boss inward toward the latch housing,

the outside handle having a shank with a longitudinal interior keyway,

the boss and finger normally disposed by the second spring means with the finger extending through the longitudinal slot and into the keyway to key the outer handle and the outer tubular spindle into unitary rotation with each other, and

push-piece means terminating in an actuator central of the inner [knob] *handle* and extending through the outer and inner tubular spindles and adapted on depressing to engage and push the boss to move the radial finger into the circumferential space so that the outer handle is free to turn unkeyed from the outer spindle,

releasable catch means for holding the push-piece means in the depressed condition, and

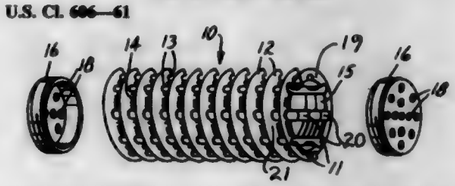
third spring means disposed in the rose of the outer handle for biasing the outer handle toward its normal position.

B1 4,961,740 (3104th)

V-THREAD FUSION CAGE AND METHOD OF FUSING A BONE JOINT

Charles D. Ray, Deephaven, and Eugene A. Dickhudt, New Brighton, both of Minn., assignors to Surgical Dynamics, Incorporated, Alameda, Calif.

Reexamination Request No. 90/003,433, May 13, 1994.
Reexamination Certificate for Patent 4,961,740, issued Oct. 9, 1990, Ser. No. 259,831, Oct. 17, 1988.
Int. Cl.[6] A63F *2/44;2/28*
U.S. Cl. 606—61



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **4**, **6**, **23** and **27–34** are determined to be patentable as amended.

Claims **2**, **3**, **5**, **7–22** and **24–26**, dependent on an amended claim, are determined to be patentable.

New claims **35–164** are added and determined to be patentable.

1. A fusion cage adapted for promoting fusion with [one or more] bone structures when bone-growth-[inducting]*inducing* substance is packed in to the fsion cage, comprising:

a cage body defining an internal cavity adapted to be packed with the bone-growth-inducing substance, which cage body [defining] *defines* an outer surface;

means defined on the outer surface of the cage body for mating the fusion cage to the bone structure, which means prevents the fusion cage from backing out from the bone structure;

means for providing immediate contact between the [one or more bone] structures and the bone-growth-inducing substance packed into the fusion cage wen the fusion cage is mated to the [one or more] bone structures so that the [one or more bone] structures cross over the outer surface into the internal cavity an into [the] contact with the bone-growth-inducing substance packed in the fusion cage.

B1 5,003,640 (3105th)

ADVERTISING CAP NAMEPLATE

Anthony Pizzacar, 160 Greenway West, New Hyde Park, N.Y. 11040

Reexamination Request No. 90/003,609, Oct. 19, 1994.
Reexamination Certificate for Patent 5,003,640, issued Apr. 2, 1991, Ser. No. 417,204, Oct. 4, 1989.
Int. Cl.[6] A42B *1/24*
U.S. Cl. 2—209.13



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are determined to be patentable as amended.

Claims **3–8** dependent on an amended claim, are determined to be patentable.

1. An advertising cap for a user, comprising:

(a) a conventional cap having a back[,] *with an opening therethrough*, and a headband;

(b) a pair of straps disposed at said back of said conventional cap for adjustment of the size of said headband of said conventional cap, said pair of straps having tops *and defining a lower boundary of said opening through the back of said conventional cap above said pair of straps*;

(c) means for substantially concealing said pair of straps after said headband of said conventional cap is adjusted, said means for substantially concealing said pair of straps being mounted directly over said pair of straps which are now concealed[;], *said means for substantially concealing having a shape that is less than the area of said opening in the back of said conventional cap, thereby leaving said opening substantially uncovered;*

(d) means for removably mounting said concealing means so that said concealing means may be changed depending upon the preference of the user; and

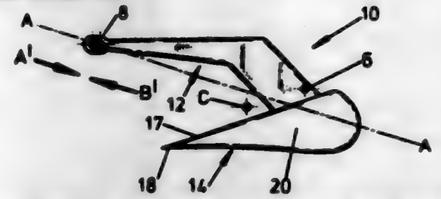
(e) means for advertising being disposed directly onto said concealing means.

B1 5,138,967 (3106th)

MARINE ANCHOR

Philip F. McCarron; James W. Stewart, and Gordon M. Lyall, all of Glasgow, Scotland, assignors to Simpson-Lawrence Ltd., Glasgow, Scotland

Reexamination Request No. 90/004,045, Dec. 12, 1995.
Reexamination Certificate for Patent 5,138,967, issued Aug. 18, 1992, Ser. No. 582,939, Apr. 3, 1989.
PCT No. PCT/GB89/00339, § 371 Date Nov. 1, 1990, § 102(e) Date Nov. 1, 1990, PCT Pub. No. WO89/09722, PCT Pub. Date Oct. 19, 1989
Claims priority, application United Kingdom, Apr. 9, 1988, 8808373
Int. Cl.[6] B63B *21/32*
U.S. Cl. 114—301



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2–8** and **10–15** is confirmed.

Claim **1** is determined to be patentable as amended.

Claim **9**, dependent on an amended claim, is determined to be patentable.

New claims **16–30** are added and determined to be patentable.

1. An anchor of the type *cast from a vessel and* buried in the seabed by a pull in a longitudinal direction, comprising a substantially rigid shank, and rigidly connected thereto, a fluke in the form of a double bladed plough-share with a pointed forward end and a central ridge and substantially symmetrical about a longitudinal median plane, each blade of the fluke having a generally inwardly dished outer surface extending to either side of the central ridge, formed between said outer surfaces, and being generally parallel to said central ridge at the forward end portion of the fluke and diverging in the direction towards a rear end portion of the fluke at which said fluke is connected to the shank so that said fluke blade surface extends substantially obliquely with respect to said central ridge at said rear portion at least in an outer side portion laterally spaced from the central ridge so that the fluke presents a substantial surface area facing generally in the direction of pull on the anchor in use thereof when said anchor has penetrated the mooring bed and oriented itself with respect to the direction of pull, said shank and fluke being arranged to define a buoyant center of gravity disposed between the shank and the fluke forwardly of the connection between the shank and the fluke.

B1 5,163,115 (3107th)

CABLES SUCH AS OPTICAL FIBER CABLES INCLUDING SUPERABSORBENT POLYMERIC MATERIALS WHICH ARE TEMPERATURE AND SALT TOLERANT

Jim J. Shaw, Dunwoody, Ga., assignor to American Telphone and Telegraph Company, New York, N.Y.

Reexamination Request No. 90/004,012, Nov. 13, 1995.
Reexamination Certificate for Patent 5,163,115, issued Nov. 10, 1992, Ser. No. 785,601, Oct. 30, 1991.
Int. Cl.[6] G02B *6/44*
U.S. Cl. 385—100

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



Claims 1, 11 and 24 are determined to be patentable as amended.

Claims 2–10, 12–23 and 25–36, dependent on an amended claim, are determined to be patentable.

1. A cable, which includes:
a core comprising at least one communication transmitting medium; and
a sheath system in which is disposed said core, said sheath system including at least one waterblocking member which comprises a superabsorbent polymer which is temperature and salt tolerant and which includes (1) [an] *a monovalent* ionic constituent which is characterized in that its solubility product is substantially higher than that of carboxylate and in that it has a slower reaction rate for forming an anhydride than does carboxylate, and (2) a counter ion *wherein the concentrations of the ionic group and the counter ion are substantially equal.*

B1 5,439,068 (3100th)

MODULAR ROTARY DRILL BIT

Alan D. Hollestelle, Grand Prairie, and Wesley P. Dietz, DeSoto, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

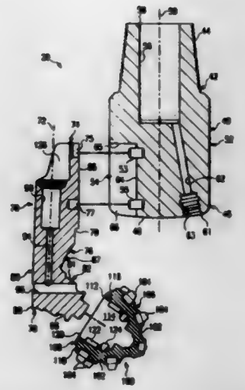
Reexamination Request No. 90/004,218, Apr. 8, 1996.

Reexamination Certificate for Patent 5,439,068, issued Aug. 8, 1995, Ser. No. 287,446, Aug. 8, 1994.

Int. Cl.[6] E21B *10/08; 10/24*

U.S. Cl. 175—356

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims 2, 4–9 and 12–23 is confirmed.

Claims 1, 3, 10 and 11 are cancelled.

12. A support arm and cutter cone assembly for a rotary cone drill bit having a bit body comprising:
said support arm having a longitudinal axis extending therethrough and an upper end, an inside surface, an exterior surface with a shirttail surface formed as a part thereof and a bottom edge with said inside surface and said shirttail surface contiguous at said bottom edge;
said support arm having a first side and a second side extending from said inside surface;
the dimensions of said upper end and the adjacent portions of said inside surface and said first side and said second side selected to allow securing a portion of said support arm within a pocket formed in said bit body;
a spindle attached to said inside surface near said bottom edge and angled downwardly and inwardly with respect to said support arm;
said cutter cone assembly having an opening and a chamber extending therefrom for mounting said cutter cone assembly on said spindle; and
means provided on said inside surface of said support arm for alignment and positioning of said support arm within said pocket during fabrication of said drill bit.

REISSUES

JANUARY 14, 1997

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,422

APPARATUS AND METHOD FOR CONTROLLING A WINDSHIELD WIPING SYSTEM

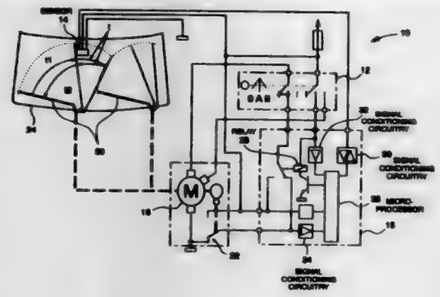
Juergen Levers, Bochum, Germany, assignor to Leopold Kostal GmbH & Co. KG, Ludenscheid, Germany

Original No. 5,336,980, dated Aug. 9, 1994, Ser. No. 989,052, Dec. 10, 1992. Application for reissue Nov. 27, 1995, Ser. No. 562,851

Claims priority, application Germany, Dec. 14, 1991, 41 41 348.2

Int. Cl.[6] H02P *1/04*

U.S. Cl. 318—444 **16 Claims**



1. An apparatus for controlling a vehicular windshield wiping system including a motor and at least one windshield wiper, the apparatus including a sensor mounted to the windshield for monitoring a portion of the windshield wiped by the wiper during each wipe cycle, the sensor generating a signal having a value which varies as a coating collects on the monitored portion, the wiping system being activated when the sensor value crosses a switch-on threshold such that the at least one wiper leaves a resting position and wipes the windshield, passing over the monitored portion of the windshield at least once during each wipe cycle, the apparatus further comprising:
detecting means for determining when the at least one wiper passes over the monitored portion of the windshield for the last time during a first wipe cycle; and
means for controlling the windshield wiping system based on the sensor value generated only after determining when the wiper passes over the monitored portion of the windshield for the last time during the first wipe cycle.

Re. 35,423

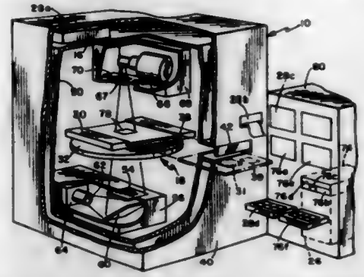
METHOD AND APPARATUS FOR PERFORMING AUTOMATED CIRCUIT BOARD SOLDER QUALITY INSPECTIONS

John Adams, Escondido; Juan Amoroso, Jr., San Diego; Paul Axford, La Jolla; Phil Bowles, Encinitas; Mike Juba, Del Mar; Van Nguyen, San Diego; Charles Preskitt, La Jolla; Ed Ross, Escondido; Doug Thompson, and Paul Turner, both of San Diego, all of Calif., assignors to ThermoSpectra Corporation, Franklin, Mass.

Original No. 4,809,308, dated Feb. 28, 1989, Ser. No. 831,997, Feb. 20, 1986. Application for reissue Jan. 14, 1994, Ser. No. 182,841

Int. Cl.[6] G06F *15/46*

U.S. Cl. 378—58 **57 Claims**



40. An apparatus for measuring structural characteristics of selected portions of a circuit board having components disposed upon and electrically connected thereto at solder joints, comprising:
x-ray means for providing a beam of x-rays;
multi-axis positioning means for receiving and for selectively positioning a circuit board, said circuit board having components coupled thereto at solder joints, within said beam of x-rays;
imaging means for detecting x-rays from said beam of x-rays transmitted through said circuit board and providing an electronic image thereof;
processing means for converting said electronic image into a gray scale coded image;
means for optically identifying the circuit board;
means for automatically retrieving an inspection list corresponding to the circuit board; and
computational means for storing a library of measurement algorithms and predetermined measurement parameters corresponding thereto, for receiving said gray scale coded image, for analyzing said gray scale coded image by selecting measurement algorithms from said library of measurement algorithms with the selected measurement algorithms corresponding to certain structural characteristics of said circuit board, performing predetermined computational analysis on said gray scale coded image based upon each selected measurement algorithm, and providing a resultant analysis value corresponding to each computational analysis, for comparing each resultant analysis value with each corresponding predetermined measurement parameter, and for providing an output corresponding to the variation of each resultant analysis value from each corresponding predetermined measurement parameter.

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PLANT PATENTS

GRANTED JANUARY 14, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,780

MINIATURE ROSE PLANT NAMED 'SOMETHING FOR JUDY'

Cecilia L. D. Bennett, deceased, Chula Vista, and by Susan M. O'Brien, administratrix, 489 Minot Ave., late of Chula Vista, both of Calif. 91910

Filed Jan. 2, 1996, Ser. No. 582,198
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of miniature rose plant, named 'Something For Judy', hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described; characterized by its hybrid tea form blooms, ranging from near Orient Pink to near Shell Pink with darker pink blush on the outermost petals of near Azalea Pink to near Scarlet, which are abundant on the bush and usually borne one to a stem but occasionally in sprays of 3to 5 or more.

9,781

POLEMONIUM PLANT NAMED BRISE D'ANJOU

Maurice Proteau, and Rene Proteau, both of Les Quatre Rues, Saturnin-sur-Loire, 49320 Brissac-Quince, France

Filed Jun. 28, 1995, Ser. No. 495,974
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—68.1 1 Claim

1. A new and distinct variet of Polemonium plant named Brise d'Anjou, substantially as illustrated and described.

9,782

DIEFFENBACHIA PLANT NAMED 'TROPIC BREEZE'

Edwin J. Frazer, Kenmore, Australia, assignor to Twyford International Inc., Santa Paula, Calif.

Filed Apr. 17, 1995, Ser. No. 422,899
Int. Cl.[6] A01H 5/00
U.S. Cl. Plt.—88.2 1 Claim

1. A new and distinct cultivar of Dieffenbachia plant named Tropic Breeze, as illustrated and described.

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PATENTS

GRANTED January 14, 1997

ERRATA

For CLASS	See PATENT NO.
473–429	5,593,154
473–463	5,593,155
040–584	5,593,156
473–606	5,593,157
473–520	5,593,158
463–047	5,593,159
414–729	5,593,293
441–125	5,593,337
474–177	5,593,366
474–177	5,593,614
526–238	5,594,126
399–281	5,594,198
315–290	5,594,308
396–429	5,594,514
396–315	5,594,515
396–418	5,594,516
396–087	5,594,517
396–133	5,594,518
396–449	5,594,519
396–463	5,594,520
396–453	5,594,521
396–517	5,594,522
396–287	5,594,524
355–029	5,594,525
355–067	5,594,526
355–075	5,594,527
355–084	5,594,528
399–008	5,594,529
399–111	5,594,530
399–154	5,594,531
399–100	5,594,532
399–061	5,594,533
399–285	5,594,534
399–262	5,594,535
399–297	5,594,536
399–318	5,594,537

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ERRATA–CONTINUED

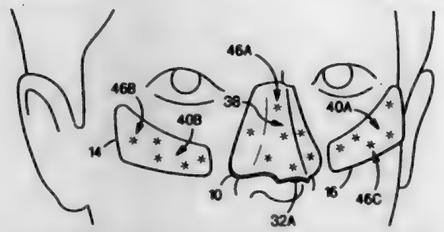
For CLASS	See PATENT NO.
399–310	5,594,538
399–316	5,594,539
399–326	5,594,540
399–358	5,594,541
399–402	5,594,542
386–040	5,594,550
386–092	5,594,551
386–131	5,594,552
386–088	5,594,553
349–059	5,594,561
349–059	5,594,561
349–012	5,594,562
349–074	5,594,563
349–143	5,594,564
349–019	5,594,565
359–062	5,594,566
349–028	5,594,567
349–120	5,594,568
349–122	5,594,569
349–129	5,594,570
349–155	5,594,572
349–013	5,594,573
349–058	5,594,574
349–171	5,594,575
349–005	5,594,591
386–080	5,594,596
341–120	5,594,612
395–202	5,594,637
395–203	5,594,638
395–794	5,594,640
395–601	5,594,641
395–797	5,594,642
379–059	5,594,740

PATENTS

GRANTED JANUARY 14, 1997

GENERAL AND MECHANICAL

5,592,687
FACIAL INSULATOR
Alan L. Lajoueness, 11 Ellerton St., Chicopee, Mass. 01020
Filed Sep. 28, 1995, Ser. No. 535,647
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—9 **14 Claims**



5. An improved facial insulator set for restricting heat loss from exposed skin surfaces, comprising a nose bridge facial insulator, a left upper cheek bone facial insulator, and a right upper cheek bone facial insulator for restricting heat loss from a user's nose bridge and left and right upper cheekbones, wherein the nose bridge, left upper cheek bone and right upper cheek bone facial insulators each comprise:

a. a support pad having a design surface for displaying a design, and having an opposed adhesive surface, the adhesive surface having an edge strip defined along a perimeter edge of the pad and an insulating area defined by the edge strip as a circumference of the insulating area;

b. a pressure sensitive adhesive layer covering the edge strip;

c. an insulating material affixed to the insulating area;

d. at least two vent break means positioned at generally opposed locations on the edge strip for permitting a current of air to pass over the edge strip; and,

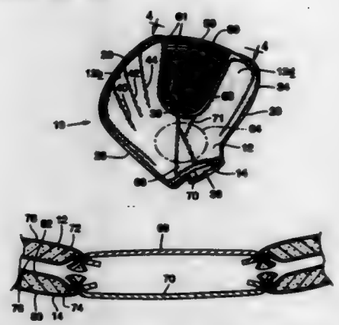
e. a release layer affixed to and covering the edge strip and insulating material so that upon removal of the release layer from the edge strip and insulating material the pressure sensitive adhesive layer secures the support pad to the exposed skin surface and one vent break means permits the current of air to move into the insulating material and the at least one other vent break means permits the current of air to move through and out of the insulating material.

5,592,688
REVERSIBLE CATCHING MITT
Ron LaRonge, San Jose; Thomas H. Grimm, Menlo Park; Diana L. Wooldridge, San Carlos, and Scott H. Stillinger, Monte Sereno, all of Calif., assignors to OddzOn Products, Inc., Campbell, Calif.
Filed Sep. 9, 1994, Ser. No. 303,496
Int. Cl.[6] A41D *13/08*
U.S. Cl. 2—19 **3 Claims**

1. A catching mitt usable either for the left or the right hand where the hand has fingers in an approximately parallel array and an outwardly projecting thumb, the mitt comprising:

a first side expanse facing in one direction and an opposite side expanse facing in the opposite direction,

the two side expanses having substantially matching outlines and each side expanse including a thumb cover portion extending inwardly at one lateral extremity of the mitt and a finger cover portion extending inwardly from an opposite lateral extremity of the mitt, the finger cover portions of the two expanses seating the fingers of the hand with the fingers in an approximately parallel array and the thumb cover portions of the two side expanses seating the thumb with the thumb extending out at a relatively sharp angle from the array of fingers,

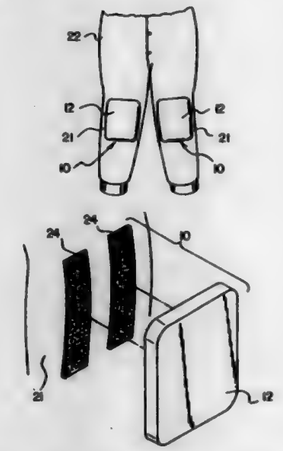


each side expanse of the mitt including a layer of foamed elastomer material which extends over the thumb cover portion and the finger cover portion of the side expanse and which protects the front of the hand with the side expanse facing forwardly on the hand,

each side expanse of the mitt further having a space located between the thumb cover portion and the finger Cover portion accommodating independent movement of these portions, the space in one side expanse lying opposite the space of the other side expanse and said spaces collectively outlining a web region in the mitt, and

which further includes a web in the mitt bridging this web region which draws the thumb and finger cover portion together to shape a cup-shaved concave deformable pocket which faces in one direction outwardly with the mitt usable for the left hand and which is deformable so that the concavity of the pocket may face in the opposite direction with the mitt used for the right hand.

5,592,689
SOUND-EMITTING KNEE APPARATUS
Jacqueline R. Matthews, 5355 Santa Rosa Ave., Sparks, Nev. 89436
Filed Aug. 18, 1995, Ser. No. 516,957
Int. Cl.[6] A41D *13/06*
U.S. Cl. 2—23 **3 Claims**



1. A sound-emitting knee pad apparatus **10**, comprising:

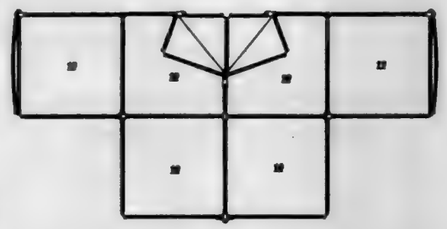
a garment 22 which includes a knee-juxtaposed region 21 and an outside surface,
a first connector assembly 24 attached to said outside surface of said knee-juxtaposed region 21 of said garment 22,
a pad assembly 12 which emits a sound when located between a knee 14 of a person 15 and a floor surface 16 when the person 15 is crawling on the floor surface 16, wherein said pad assembly 12 includes an air chamber assembly which includes a plurality of resilient exterior walls 32 which define an interior air chamber 34, and a whistle assembly 36 supported by one of said resilient exterior walls 32, wherein said whistle assembly 36 provides an air communication path between said interior air chamber 34 and air outside said interior air chamber 34, and
a second connector assembly 26 attached to an outside surface 28 of said pad assembly 12 for connecting said pad assembly 12 to said first connector assembly 24.

5,592,690
ELASTIC LAMINATED SHEET FOR ARTICLES OF CLOTHING
Pal-Chuan Wu, Cincinnati, Ohio, assignor to Clopay Plastic Products Company, Inc., Cincinnati, Ohio
Continuation-in-part of Ser. No. 104,791, Aug. 11, 1993, Pat. No. 5,422,172. This application Nov. 30, 1994, Ser. No. 346,884
Int. Cl.[6] D03D *17/00*
U.S. Cl. 2—67 **9 Claims**



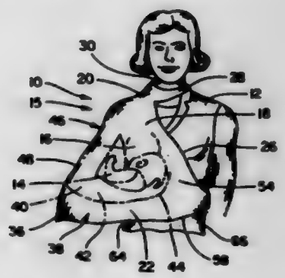
1. An article of clothing selected from the group consisting of a shirt, a pant, a skirt, a dress, an undergarment and a sock, the article of clothing including an elastic laminated sheet proximate a joint of a wearer, said sheet comprising an elastomeric film and a nonwoven fibrous web laminated to substantially a surface of said film to form said laminated sheet, said laminated sheet having a multitude of fibers extending outwardly from said laminated surface, said fibers being formed by incrementally stretching of the laminated sheet along lines substantially uniformly across the laminated sheet and throughout its depth, said laminated sheet being stretchable and recoverable in response to movements of the joint of the wearer to provide a more comfortable and durable article of clothing, said laminated sheet having a permanent set after being stretched to 50% of its original shape of no more than about 10%.

5,592,691
MODULAR PANEL FOR FABRICATING CLOTHING AND ACCESSORIES
Glen Ronald, Edmonton, Canada, assignor to Vancouver, Canada
Filed Aug. 19, 1994, Ser. No. 292,802
Claims priority, application Canada, Aug. 20, 1993, 2104496
Int. Cl.[6] A41D *01/06;* A41H *03/00*
U.S. Cl. 2—69 **3 Claims**



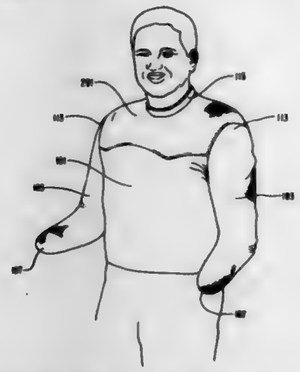
1. A garment, comprising:
a plurality of modular panels, each modular panel including a flexible planar sheet form regular polygonal shaded body with at least three peripheral edges and reusable fastening means along each of the at least three peripheral edges, whereby the peripheral edges of the body are mated with another regular polygonal shaped body.

5,592,692
BREASTFEEDING GARMENT
Monica R. Larson, 2 S. 781 Winchester Cir. South, #3, Warrenville, Ill. 60555
Filed Dec. 1, 1995, Ser. No. 566,184
Int. Cl.[6] A41D *1/20*
U.S. Cl. 2—104 **15 Claims**



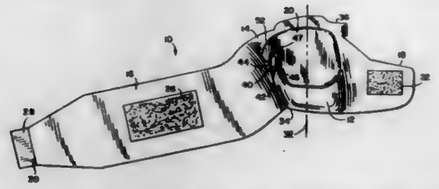
1. A breastfeeding garment for use by a woman while breastfeeding a child which conceals both the woman's breast and the child, the garment comprising:
(a) a body portion having a top section and a bottom section, the body portion extending downwardly over one of the woman's breasts;
(b) the body portion having a pouch section extending substantially from the top section to the bottom section, the pouch section being structurally sized for envelopment of either arm of a wearer, the pouch section having an inner cavity for receiving an elbow of the wearer, the pouch section being defined by first and second bounded edges being in converging relationship, the pouch section having a first outer surface and a surface, the pouch section being positionable in a first position with the pouch section enveloping a right arm of the wearer with the first outer surface facing generally forwardly and the second outer surface facing generally rearwardly, the pouch section being swingable to a second position with the pouch section enveloping a left arm of the wearer with the first outer surface facing generally rearwardly and the second outer surface facing generally forwardly;
(c) strap means connected to the top section of the body portion for extending around a neck of a wearer allowing the body portion to be swingable about the neck from the first position to the second position; and
(d) a pair waist straps, with a waist strap extending from a respective left and right section of the body portion for extending around a waist of the wearer and in detachable engagement with one another.

5,592,693
AMPUTEE STUMP PROTECTOR CLOTHING
Darwin A. Jensen, and Gwen R. Jensen, both of 135 S. 100 East, Centerfield, Utah 84622
Filed Dec. 4, 1995, Ser. No. 566,917
Int. Cl.[6] A41D *1/04;27/10*
U.S. Cl. 2—115 **23 Claims**



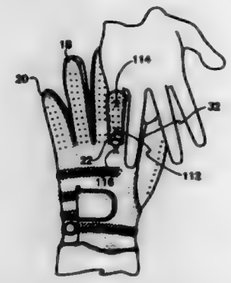
14. A shirt for protecting an amputee having at least one amputated arm having a stump against friction caused by a prosthesis and its associated harness, the shirt comprising:
a substantially tubular body having a shoulder region;
a yoke overlaying the shoulder region such that the yoke and shoulder region form a plurality of layers for slidably cushioning the amputee's shoulders against harness friction; and
at least one sleeve including:
a proximal end connected to the body of the shirt and having an opening in the shoulder region for receiving the at least one amputated arm therethrough; and
a closed distal end that extends integrally from the sleeve for snug placement over the stump of the at least one amputated arm such that the closed distal end of the sleeve is permanently closed and tapered such that it closely encapsulates the stump and such that when the shirt is worn under a prosthesis the closed distal end of the shirt protects the stump against prosthesis friction.

5,592,694
WRAP TYPE HAND GLOVE
Edward H. Yewer, Jr., 6259 N. Hwy. 83, Hartland, Wis. 53029
Continuation of Ser. No. 122,858, Sep. 16, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 427,943
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—161.1 **2 Claims**



1. A sports glove of the type made from a flexible web material and having a palm panel for covering the palm of a human hand, a back panel fixed to said palm panel for covering a portion of the back of a human hand, and a wrist wrap panel extending from a side of said back panel opposite from said palm panel, the improvement wherein:
said palm panel covers said palm from one side to the other and from wrist to fingers;
a tab is secured to said palm panel along a side of said palm panel opposite from said back panel, said tab being foldable over the back of a human hand to underlie a portion of said back panel;
a first fastening patch is secured to an outer surface of said tab;
a second fastening patch is secured to an inner surface of said back panel to engage said first fastening patch in releasable facing contact;
a third fastening patch is secured to an outer surface of said wrist wrap panel;
a fourth fastening patch is secured to said wrist wrap panel adjacent to a free end thereof, said third and fourth patches being engagable in releasable facing contact when said wrist wrap panel is wrapped around a user's wrist;
a closed thumb hole is defined between said palm panel and said back panel; and
said flexible web material is elastic.

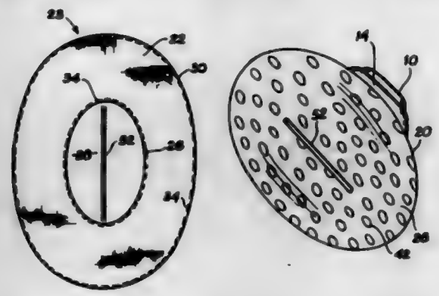
5,592,695
GOLF GLOVE
Mortimer P. Roche, 8516 Blounts La., Fulton, Md. 20759
Continuation-in-part of Ser. No. 530,928, Sep. 29, 1995. This application May 10, 1996, Ser. No. 644,852
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—161.2 **1 Claim**



1. A golfer's glove for assisting in maintaining effective positioning of the hands and grasp of the shaft of a club when swinging the club, said glove comprising:
a main portion surrounding the central portion of a user's hand;
a thumb pocket and four finger pockets including an index finger pocket and a middle finger pocket, joined to and projecting from said main portion, said thumb pocket maintained abutting said main portion and said index finger pocket by permanent attachment means comprising a continuous seam joining said thumb pocket to said main portion of said golfer's glove and extending at least to a user's inserted index finger first knuckle; and
a sleeve for receiving a finger of the hand opposite that wearing said golfer's glove, said sleeve having an open proximal end and an open distal end, said sleeve arranged parallel to said four finger pockets and attached between said index finger pocket and middle finger pocket, said sleeve dimensioned and configured to enclose two finger joints of a user's inserted opposite hand finger, said sleeve having two seams running the full length of opposite sides of said sleeve, one of said two seams attaching said sleeve to an upper surface of said index finger pocket and the other of said two seams attaching said sleeve to an upper surface of said middle finger pocket, said sleeve extending from below outermost finger joints of the inserted user index and middle fingers to the inserted user knuckles at said index finger pocket and said middle finger pocket, wherein
said golfer's glove allows the user to maintain an effective grasp of the shaft of the club by preventing the gloved thumb from wrapping around the shaft and by preventing separation of the

user's hands by virtue of the restraint of a finger of the user's opposite hand within said sleeve and further encouraging the user's hands to stay in constant orientation with respect to one another.

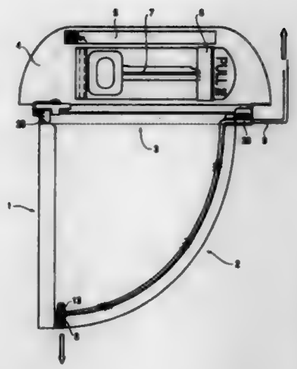
5,592,696
ORNAMENTAL HAT-BRIM SLIP COVER AND METHOD OF MANUFACTURE
Doreen A. Oliver, 1758 Maisa Pl., Show Low, Ariz. 85901
Continuation-in-part of Ser. No. 272,568, Jul. 11, 1994, abandoned. This application Dec. 26, 1995, Ser. No. 578,838
Int. Cl.[6] A42B *1/02*
U.S. Cl. 2—175.3 11 Claims



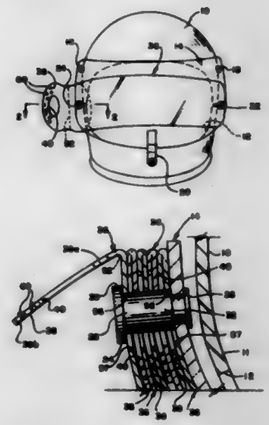
1. A slip cover for a hat having a substantially tubular crown with a predetermined inner perimeter and having a substantially-annular brim with a predetermined brim width and with outer and inner brim edges of predetermined sizes and shapes, comprising:
(a) a substantially-annular top member of flexible material having an outer edge approximately equal in size and shape to the brim outer edge and having a width approximately equal to the brim width, said top member having an open inner portion capable of receiving said substantially tubular crown;
(b) a substantially-circular bottom member of flexible and stretchable material having an outer edge approximately equal in size and shape to the brim outer edge and having a linear slit cut in said bottom member within a boundary corresponding to said inner perimeter of the crown, wherein said bottom member is entirely disposed on a plane parallel to said top member, thereby providing an inner stretchable opening within said inner perimeter of the crown; and
(c) means for attaching said outer edges of the substantially-annular top member and the substantially-circular bottom member.

5,592,697
WATERPROOF POCKET
Russell Young, Ka On Building, 14th Floor, Apt B2, 65 Catchick Street, Kennedy Town, Hong Kong
Filed Apr. 18, 1995, Ser. No. 423,894
Int. Cl.[6] A41D *27/20*
U.S. Cl. 2—247 14 Claims

1. A waterproof garment pocket comprising: overlying first and second sheets of a waterproof material sealed together to define a pocket having an opening for receiving an object to be stored in the pocket; a waterproof closure means secured to said pocket for opening and closing said opening; first air extraction means comprising a one-way valve positioned in said pocket and communicating the interior of said pocket with the exterior thereof for allowing discharge of air from said pocket by application of external pressure to said pocket after said pocket has been closed by said closure means; and second air extraction means comprising a pump for extracting remaining air from said pocket, said pump being operatively connected to said pocket and adapted to be formed on said garment.

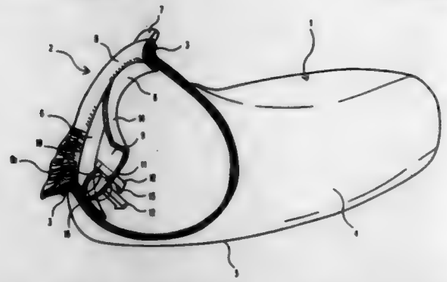


5,592,698
TEAR-OFF LENS FOR TRANSPARENT EYE AND FACE SHIELD
Marlen M. Woods, 112 Grass Rd., Mesquite, Tex. 75149
Filed Jun. 30, 1995, Ser. No. 497,486
Int. Cl.[6] A42B *3/00*; A61F *9/02*
U.S. Cl. 2—424 9 Claims



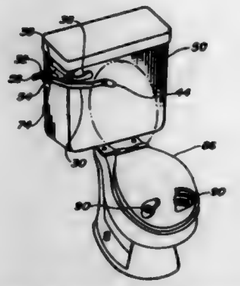
8. A transparent lens adapted to be supported on a helmet for quick removal from said helmet, said transparent lens comprising:
an elongated flexible sheet having opposed surfaces and a tab formed at one end of said sheet, said tab including a finger grasping hole formed therein and a plurality of projections disposed between said hole and a distal edge of said tab for increasing the surface roughness of said tab to assist in grasping said tab to quickly tear said lens away from said helmet, said projections being formed by displacing the material of said tab away from at least one of said opposed surfaces of said tab, said projections being arranged at plural spaced apart locations between said hole and said distal edge of said tab to assist in grasping said tab by a person wearing said helmet to tear said lens away from said helmet.

5,592,699
DEVICE FOR A URINAL USED BY BEDRIDDEN PATIENTS
Niels Jensen, Ravnshovvej 5, Gentofte, Denmark
Filed Jan. 31, 1995, Ser. No. 381,077
Int. Cl.[6] A47K *11/12*
U.S. Cl. 4—144.3 6 Claims



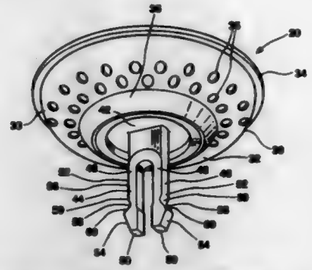
1. A single, replaceable mouth piece attachment for a urinal having a mouth and facilitating use of the urinal by bedridden patients of either sex and comprising a round part provided to fit into sealing contact with the mouth of the urinal, the round part having a border area of soft, flexible material facing the patient, means forming a liquid barrier extending substantially across the round part and separating the mouth piece into two separate areas for receiving urine, one area being closed off by a floor area having a valve only permitting flow of liquid into the urinal, when the mouth piece is attached to the urinal, the thickness of the border area decreasing in a direction away from the urinal and the outer border of at least a portion of the border area being corrugated.

5,592,700
AUTOMATIC TOILET LID CLOSER
Bryan V. Genesse, Granada Hills, Calif., assignor to Genova-tive Concepts International LLC, Granada Hills, Calif.
Filed Mar. 26, 1996, Ser. No. 620,667
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—246.1 17 Claims



1. An automatic toilet lid closer for a toilet having a flush handle on a water tank and a hinged toilet lid, said closer comprising:
(a) a closer arm consisting of a sloped edge angular arm having a first end and a second end with the first end containing a pivot means;
(b) an adjustable mounting pedestal adapted to be fastened with an attaching means to the toilet water tank;
(c) a pivot pin attaching the pivot means to the pedestal permitting the arm to swing outwardly when said flush handle is rotated to flush said toilet, said handle, when rotated, contacting the sloped edge of said arm thereby pivoting the arm into contact with the toilet lid sufficiently to make the lid fall into a closed horizontal position; and,
(d) cushion means, adapted for connection to said lid, to break the fall of the lid to the toilet.

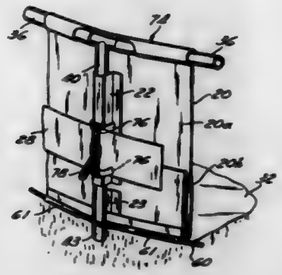
5,592,701
SINK STOPPER
Ronald A. Smith, 35 Cranston Drive, Caledon East Ontario, Canada
Filed Mar. 7, 1996, Ser. No. 612,186
Int. Cl.[6] A47K *1/14*
U.S. Cl. 4—295 7 Claims



1. A sink stopper for use with an insert assembly in a sink, said insert assembly having a grate with a plurality of drainage apertures and a central guiding aperture therein, said sink stopper comprising:
a perforated strainer basket having a substantially planar bottom portion;
a sealing member disposed on said strainer basket and shaped and dimensioned to engage said insert assembly in substantially water-tight sealed relation;
a handle extending upwardly from said strainer basket for manually manipulating said sink stopper; and
a generally centrally disposed locating stem depending downwardly from said bottom portion of said strainer basket, and being shaped and dimensioned for insertion into said central guiding aperture;
wherein said generally centrally disposed locating stem comprises a base portion located adjacent said bottom portion of said strainer basket, two substantially parallel and coplanar spaced-apart co-operating legs extending downwardly from said base portion, each of said legs having a top end, a bottom end, and a peripheral surface for contacting said grate of said insert assembly at the circumferenace of said central guiding aperture;
wherein said legs are substantially rigid yet resiliently deformable within the same plane towards each other when said legs are subjected to inwardly directed lateral pinching reaction forces from said grate, at a time when said locating stem is pushed downwardly through said central guiding aperture in said grate;
wherein each said peripheral surface comprises an outwardly and upwardly sloped guide surface disposed at a bottom end portion thereof, an outwardly and downwardly sloped grate-contacting surface disposed at a top end portion thereof, and a grate-receiving notch disposed between said guide surface and said grate-contacting surface, wherein said grate-receiving notch includes an upwardly facing catch surface shaped and dimensioned to catch on said grate in interfering relation therewith;
wherein the maximum width of said locating stem at a bottom end of said sloped grate-contacting surface is adapted to be greater than the diameter of said central guiding aperture in said grate; and
wherein said sink stopper is movable between a seated flow precluding position whereat said locating stem engages said grate at said outwardly and downwardly sloped grate-contacting surface so as to thereby bias said sink stopper downwardly, and a raised straining position whereat said

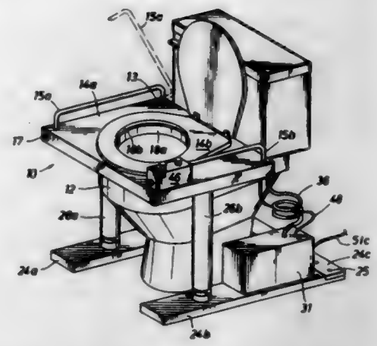
locating stem engages said grate at said grate-receiving notch, so as to thereby support said sink stopper and so as to resist upward movement therefrom of said sink stopper.

5,592,702
VARIABLE SIZE ABOVE-GROUND SWIMMING POOL
Hendrik C. Gilleboard, Jr., 1015 Calle Amanecer, San Clemente, Calif. 92673
Filed Apr. 28, 1995, Ser. No. 433,256
Int. Cl.[6] E04H *4/00*; A47K *3/06*
U.S. Cl. 4—506 **4 Claims**



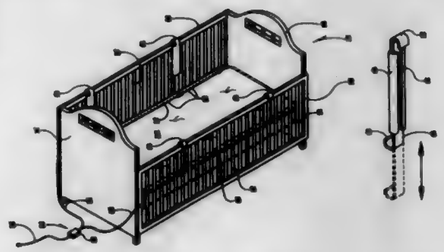
1. A variable size, portable above-the-ground swimming pool, comprising:
a frame portion including:
a plurality of wall members having top and bottom ends; and
a plurality of rim members attached to and extending between the top ends of the wall members;
a flexible liner portion including:
an upper rim defining a plurality of horizontally oriented rim sleeves sized to slidably receive respective ones of the rim members;
a sidewall extending downwardly from the upper rim and defining an inner, water contacting surface and an outer surface, said sidewall being of a first height and selectively collapsible to a second height which is less than the first height;
a plurality of vertically oriented wall sleeves disposed on the outer surface of the sidewall and sized to slidably receive respective ones of the wall members;
a plurality of inner loop members disposed on the inner surface of the sidewall in vertically oriented pairs, the inner loop members of each pair being separated from each other by a first distance, with the collapse of the sidewall to the second height reducing the distance separating the inner loop members of each pair to a second distance which is less than the first distance, said sidewall being maintained in the collapsed configuration by the connection of the inner loop members of each pair to each other; and
a floor attached to said sidewall.

5,592,703
POWERED TOILET SEAT LIFT
David L. Jones, Houston, and George L. Dreamer, Jr., Sugar Land, both of Tex., assignors to Mobility Plus, Inc., Houston, Tex.
Filed Mar. 11, 1996, Ser. No. 613,467
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—667 **3 Claims**



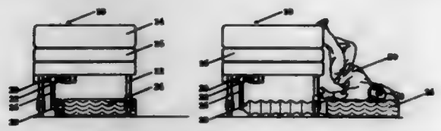
1. An apparatus for moving a toilet seat between a lowered position above a toilet bowl and a raised position above the toilet bowl to assist a physically disabled person in using a toilet, comprising:
a toilet seat comprising a hollow platform defining a central opening therethrough for communication with said toilet bowl and having an enclosed interior passageway;
a baseplate adapted to be positioned about a base portion of the toilet bowl;
a pair of fluid power cylinders for supporting the toilet seat for vertical movement between the lowered position and the raised position from which the person can easily move between a standing position and a position at least partially supported by said toilet seat, each of said cylinders having a piston rod extending downwardly therefrom and connected to said baseplate;
means for providing pressurized fluid to said cylinders through the enclosed interior passageway in said toilet seat;
means for exhausting preasurized fluid from said cylinders; and
control means carried by said toilet seat and communicating through the enclosed interior passageway with said pressurized fluid providing means and said pressurized fluid exhausting means for delivering pressurized fluid to said cylinders to raise said toilet seat from the lowered position to the raised position and exhausting pressurized fluid from said cylinders to lower said toilet seat from the raised position to the lowered position whereby the person is assisted up from and down to a seated position immediately above the toilet bowl.

5,592,704
CRIB VENTILATING SYSTEM
Steven M. Breese, 4132 8th St., Des Moines, Iowa 50313
Filed Aug. 11, 1995, Ser. No. 514,494
Int. Cl.[6] A47C *21/04*; A47D *15/00*
U.S. Cl. 5—423 **7 Claims**

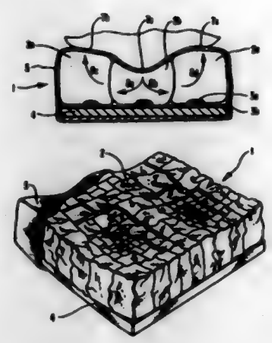


1. A device for generating controlled air flows at mattress level in a crib having a frame with opposing side rails and a mattress having a top surface, the device comprising:
an air blower;
an elongated conduit connected to the blower and positioned horizontally adjacent the top surface of the mattress, the conduit having a plurality of longitudinally spaced perforations therein so as to provide a plurality of air flows directed substantially horizontally across the top surface of the mattress;
the conduit being attached to one of the side rails of the frame;
a mounting bracket for attaching the conduit to the side rail;
the mounting bracket including telescoping first and second end portions such that the second end portion of the mounting bracket is vertically adjustable with respect to the side rail; and
the first end portion being adapted to removably mount to the side rail and the second end portion being adapted to hold the conduit.

5,592,705
IMPACT CUSHIONING DEVICE TO PREVENT FALL RELATED INJURIES
Raymond O. West, Box 1137, Bellair, Wash. 98528
Filed Feb. 27, 1995, Ser. No. 394,447
Int. Cl.[6] A47C *21/08*
U.S. Cl. 5—424 **9 Claims**



1. An impact cushioning device for protecting a bed occupant from fall-related injuries comprising the combination of:
a bed housing a frame portion and a horizontal mattress portion;
at least one sensing means disposed in or on said mattress portion, said sensing means being operable to generate a signal when the weight of said occupant is removed therefrom;
an impact cushioning device stowed in relationship to said frame portion;
a bellows attached to said impact cushioning device;
inflating means for inflating said bellows, said inflating means being responsive to said signal generated by said sensing means; and
a switch for selectively activating and deactivating said sensing means; said impact cushioning device being stowed by said frame portion in a manner wherein said impact cushioning device will displace outwardly from said bed so as to create a barrier between said bed occupant and the floor when said occupant falls from the mattress portion.



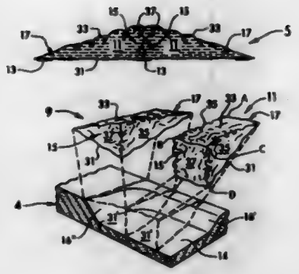
wherein the volumetric capacity of each bladder is in the range of 105% to 1000% of the space allotted to the bladder on the base;
wherein each bladder forms a supporting hammock across its top surface when a supported object rests on it;
wherein said cushioning device is capable of generally equalizing supporting hammock forces across the contact area of a supported object by conforming itself to the shape of the supported area including accommodating uneven surfaces such as protuberances and crevices;
wherein said cushioning device is adapted to contact and support an area of a human body and wherein supporting pressure exerted by said cushion on the contact surface of the body is less than that which would cause tissue damage and lead to decubitus ulcers;
wherein each bladder is sealed in order to prevent fluid communication between any two bladders, so that when required to support a cushioned object, said bladders interact with each other in a manner such that a bladder beneath a protuberance of the cushioned object is depressed and in turn exerts a generally lateral force on adjacent bladders, forcing the adjacent bladders upward to fill crevices of the cushioned object, thereby providing uniform support across the contact surface of the cushioned object;
wherein said bladders are filled with a flowable filler that includes microspheres and a quantity of lubricant sufficient to lubricate the exterior surfaces of said microspheres but insufficient to disperse the microspheres in the lubricant; and
wherein said bladders are arranged in an array, said array having a width of N bladders and a length of M bladders, where both M and N are greater than 2.

5,592,706
CUSHIONING DEVICE FORMED FROM SEPARATE RESHAPABLE CELLS
Tony M. Pearce, Alpine, Utah, assignor to TekSource, LC, Draper, Utah; Nike, Inc., and Nike International, Ltd., both of Beaverton, Oreg.
Filed Nov. 9, 1993, Ser. No. 149,224
Int. Cl.[6] A47C *27/10*; A61G *7/057*
U.S. Cl. 5—654 **4 Claims**

1. A cushioning device comprising:
(a) a base,
(b) a plurality of individual bladders comprising an elastomeric material, said bladders being attachable to and detachable from said base,
(c) a filler within each of said bladders, and
(d) a cover;
wherein the quantity of filler within each bladder is in the range of 10% to 95% of the unstretched volumetric capacity of the bladder;
wherein said filler is a fluid which flows under slight pressure, shears easily and has low shape memory;

5,592,707
SEATING SYSTEM WITH PRESSURE RELIEVING PAD
John C. Diamond, III, Westminster, and Barry VanEveren, Loveland, both of Colo., assignors to Jay Medical Ltd., Boulder, Colo.
Continuation of Ser. No. 316,732, Oct. 3, 1994, Pat. No. 5,490,299, which is a continuation-in-part of Ser. No. 217,366, Mar. 24, 1994, Pat. No. 5,524,971, which is a division of Ser. No. 945,733, Sep. 16, 1992, Pat. No. 5,352,023. This application Feb. 12, 1996, Ser. No. 601,428
Int. Cl.[6] A47C *27/18*; *7/02*
U.S. Cl. 5—654 **14 Claims**

1. A fluid pad for use in a seating system primarily intended for use to relieve pressure and to reduce development of decubitus ulcers, said fluid pad comprising;
a pouch substantially filled with fluid having a viscosity of at least one, said pouch being substantially wedge-shaped in cross section with said wedge shape tapering down in vertical thickness from a thicker first end portion to a thinner second end portion, said wedge-shaped pouch being adapted for positioning in a shaped tray having a seating well defined by



an upper surface which is inclined over a portion thereof with the thicker first end portion of said wedge-shaped pouch overlying at least a lowermost part of the upper surface of the seating well and with the thinner second end portion of said wedge-shaped pouch overlying at least a part of the inclined upper surface of the seating well.

5,592,708

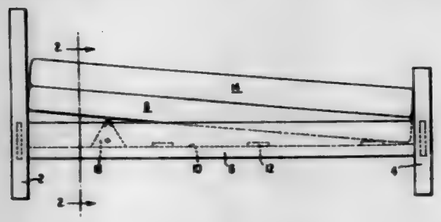
Patent Not Issued For This Number

5,592,709

APPARATUS FOR ADJUSTING THE ATTITUDE OF A MATTRESS

John A. Watkins, deceased, late of Clarksville, and Margaret C. Watkins, administrator, P.O. Box 1426 Virginia Ave., Clarksville, Va. 23927

Filed Aug. 25, 1995, Ser. No. 519,611
Int. Cl.[6] A47C *31/00*
U.S. Cl. 5—660 **4 Claims**



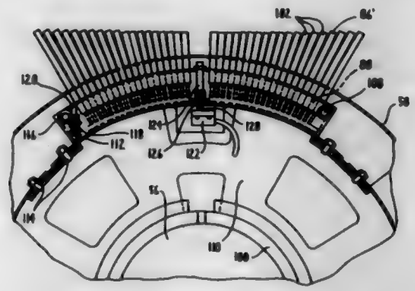
1. In combination, mattress means for supporting a resting person, a bed frame supporting said mattress means, and a device for adjusting an angular relationship between said mattress means and said frame, wherein said bed frame includes a ledge for supporting said mattress means and said device comprises first and second spaced frame-engaging elements engaging respective said ledges and being adapted to freely move there along, and a narrow bar extending between said frame-engaging elements and engaging a bottom surface of said mattress means at a single narrow location extending across said bottom surface, whereby said angular relationship may be adjusted by moving said device along said ledge.

5,592,710

BRUSH HEAD FOR CLEANING SURFACES

Martin Wanner, Stuttgart; Dieter Maier, Pfinzhausen, and Gerhard Birk, Stuttgart, all of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Germany

PCT No. PCT/EP93/02467, § 371 Date May 22, 1995, § 102(e) Date May 22, 1995, PCT Pub. No. WO94/07389, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 13, 1993, Ser. No. 411,747
Claims priority, application Germany, Oct. 2, 1992, 42 33 161.7
Int. Cl.[6] B60S *3/00*
U.S. Cl. 15—53.2 **22 Claims**



1. In a brush head having a brush roller and a drive means for rotatably driving said brush roller in a predefined direction of rotation, said brush roller having a bristle crown formed of centrifugally supported, flexurally soft bristles adapted to contact against a work surface, said brush roller further having at least one contact sensor which is disposed within the bristle crown, and is displaceable relative to the said brush roller and, said brush roller further includes rigidly elastic sensing members, the improvement wherein said contact sensor includes a sensing bristle carrier and support means for supporting said sensing bristle carrier for rotation with said brush roller and for radial movement with respect to said brush roller, wherein said sensing bristle carrier is fitted with said sensing members configured as a tuft of rigidly elastic sensing bristles, and wherein a switching member is provided and is actuatable by a radial motion of said sensing bristle carrier for triggering an emergency cut-out of said drive means.

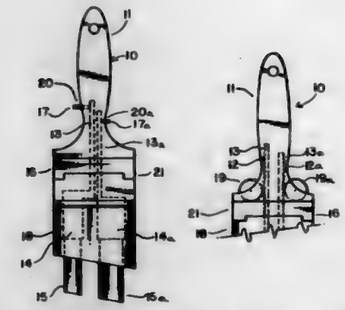
5,592,711

PAINT BRUSH APPARATUS HAVING MULTIPLE PAINTING WIDTHS

Christopher L. Maier, P.O. Box 898, Manchester Center, Vt. 05255, and Kevin R. Bust, P.O. Box 141, Manchester, Vt. 05254

Filed Aug. 11, 1995, Ser. No. 514,428
Int. Cl.[6] A46B *15/00*
U.S. Cl. 15—106 **2 Claims**

1. A paint brush apparatus having multiple painting widths, for use by individuals in order to make the job of painting much more efficient, comprising:
a handle assembly;
said handle assembly comprising a unit of rigid construction;
said handle assembly having apertures positioned lengthwise in said handle assembly;
said handle assembly further having moveable drive shafts positioned within said apertures for permitting the operator to extend said moveable drive shafts forward from said handle assembly and also permitting the operator to retract said moveable drive shafts into said apertures in said handle assembly;
said handle assembly further having a control mechanism for giving the operator control over said moveable drive shafts;



said control mechanism comprising thumbwheel units that are meshed with grooves in each of said moveable drive shafts in order to control the movement of said moveable drive shafts;
said thumbwheel units having connection means for maintaining said thumbwheel units in position;
said handle having slot means for permitting said control mechanism to be connected to said moveable shafts;
a bristle assembly positioned at one end of said handle assembly;
said bristle assembly comprising a base unit;
said base unit having attaching means for the bristles of said bristle assembly;
said bristle assembly having apertures located therein;
brush insert pieces to be positioned within said bristle assembly apertures;
said bristle assembly apertures comprising slotted areas within said base unit of said bristle assembly;
said slotted areas comprising a width dependent upon the width of each of said brush insert pieces;
said brush insert pieces comprising a formed base unit of rigid construction;
said brush insert pieces having attaching means for the positioned of bristles on said brush insert pieces;
said brush insert pieces further having adhesive connection means of single piece construction for attaching said each of said brush insert pieces to said moveable drive shafts independently for allowing said brush insert pieces to extend outwardly from said bristle assembly when the operator desires to have a different width painting unit and also will retract into said bristle assembly in order to form a single uniform painting unit;
one of said brush insert pieces comprising a unit connected to one of said moveable drive shafts in a straight line direct plane; and
the other of said brush insert pieces further comprising a unit connected to the other of said moveable drive shafts with at least one ninety degree angle offset.

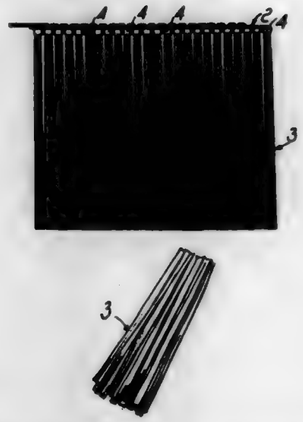
5,592,712

BRISTLE ROLLER FOR AUTOMATIC MOTOR VEHICLE WASHING SYSTEMS

Edoardo Favagrossa, Via Lepanto, 51, 26040 Roncadello Di Casalmaggiore, (Cremona), Italy

Continuation of Ser. No. 225,549, Apr. 11, 1994, abandoned. This application Mar. 21, 1996, Ser. No. 620,704
Claims priority, application Italy, Feb. 11, 1994, MI94A0256
Int. Cl.[6] A46B *9/00*; B60S *3/04*
U.S. Cl. 15—179 **3 Claims**

1. A bristle roller for motor vehicle automatic washing systems, comprising a cylindrical body rotatively supported for rotating about a substantially horizontal axis, said cylindrical body supporting a plurality of rod-like elements, each said rod-like element having a plurality of adjoining seats, each said seat having a respective plurality of elongated strip-like elements made of a plastic material selected from the group consisting of polypropylene, polythene and copolymers thereof, each said strip-like element being formed by folding the plastic material so as to define a longitudinal outer body of flat configuration with inwardly folded longitudinal edge flat portions.

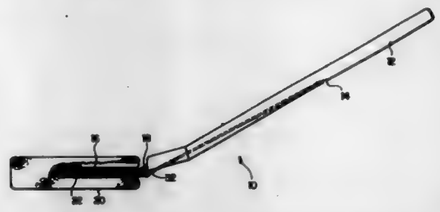


5,592,713

TOILET MOP

James M. Rouse, Atlanta, Ga., assignor to Americo, Acworth, Ga.

Filed Mar. 18, 1996, Ser. No. 617,116
Int. Cl.[6] A47K *11/10*
U.S. Cl. 15—210.1 **4 Claims**



1. A toilet mop comprising an elongated handle having a flat portion at one end thereof and connector means located intermediate opposite ends of the handle, a scrub pad comprised of compressed fibrous material having a slot extending therein from one edge of the pad, a flat insert having a plurality of projections along opposite side edges thereof disposed in said pad with said projections engaging said fibers to prevent withdrawal of said insert and elastic means detachably connected between said insert and said connector means on said handle for holding said flat portion of said handle in superimposed engagement with said insert within said slot in said pad whereby upon detachment of said elastic means from said connector means, said flat portion of said handle can be easily withdrawn from said slot, thereby permitting disposal of said pad.

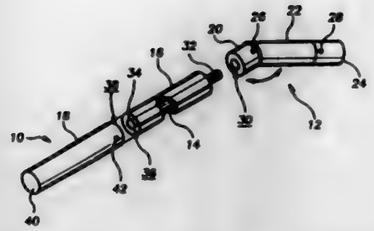
5,592,714

LOTION APPLICATOR

David N. Bernard, P.O. Box 2148, Paco, Fla. 32571

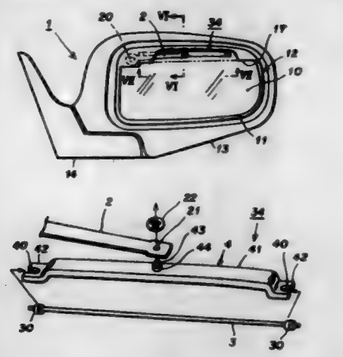
Filed Jan. 11, 1996, Ser. No. 584,257
Int. Cl.[6] B05C *17/02*
U.S. Cl. 15—230.11 **20 Claims**

1. A lotion applicator comprising:



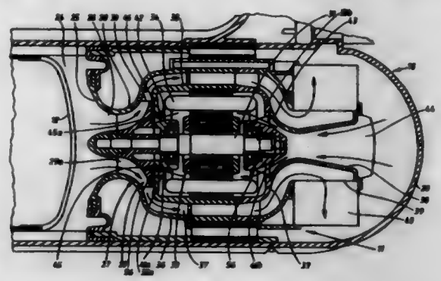
an angled handle having a first end section, a middle section and a second end section;
an elongated stem having a neck end and a retainer end, said retainer end being connected to said first end section of said angled handle;
an applicating member rotatably mounted on said elongated stem between said neck end and said retainer end; and
a tubular member having a first open end and a second closed end, said first open end being connectable to said first end section for storing said applicating member therein and connectable to said second end section for extending said handle.

5,592,715
WIPER BLADE FOR AUTOMOTIVE OUTSIDE MIRROR WIPER AND AUTOMOTIVE OUTSIDE MIRROR WIPER USING SAME
Norio Yoshida, and Masayuki Yokota, both of Ichiura, Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan
Filed Nov. 18, 1994, Ser. No. 344,715
Claims priority, application Japan, Nov. 19, 1993, 5-290596; Apr. 26, 1994, 6-088681; Apr. 26, 1994, 6-088682
Int. Cl.[6] B60S *1/56;1/38*
U.S. Cl. 15—250.003 **15 Claims**



1. A wiper assembly adapted for use on an automotive outside mirror, said outside mirror having a mirror unit including a mirror body, a reflecting surface, a mirror holder, and a mirror housing in which the mirror unit is installed, the wiper assembly comprising:
a drive unit provided inside the mirror housing,
a wiper arm connected to the drive unit, and
a wiper blade reciprocally movable on the reflecting surface of the mirror body by the wiper arm driven by the drive unit, said wiper blade comprising
a blade lever adapted to be disposed substantially parallel with the reflecting surface, and coupled to the wiper arm, said blade lever having a thickness and two opposite sides, said blade lever comprising an elongated rigid body having string fixtures at both ends, said string fixtures extending substantially parallel to said rigid body, each fixture defining a planar surface;
a wiping string having first and second end portions and being held extended along one side of said blade lever, said end portions being coupled to said string fixtures and said wiping string contacting said planar surfaces; and wherein said wiping string is adapted to engage the reflecting surface to wipe away raindrops therefrom.

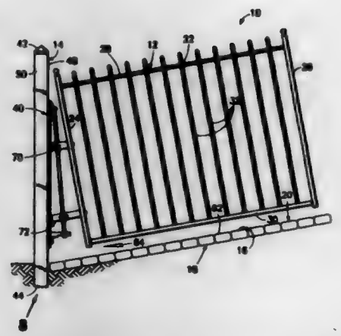
5,592,716
DEVICE FOR A VACUUM CLEANER AND A METHOD FOR COOLING A MOTOR
Lars G. Morén, Huddinge; Christer C. I. Wim, Lidingö, and Magnus C. W. Lindmark, Stockholm, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Oct. 24, 1994, Ser. No. 327,916
Claims priority, application Sweden, Nov. 2, 1993, 9303598; Nov. 2, 1993, 9303599
Int. Cl.[6] A47L *9/28*
U.S. Cl. 15—412 **15 Claims**



1. A vacuum cleaner having a suction nozzle (14), a dust bag (12), means connecting the suction nozzle to the dust bag, and a turbo-fan unit (27) including an impeller (29) driven by an electric motor and placed after the dust bag as seen in a direction of air flow, said impeller (29) being driven by the motor at a speed above 50,000 rpm and creating a primary air stream which exits the turbo-fan unit via an outlet (30), wherein the vacuum cleaner comprises means for creating a secondary air stream which at least partially cools the electric motor (32), said secondary air stream flowing into the electric motor via an inlet (43) which is separate from the primary air stream, at least a portion of the secondary air stream being directed into the primary air stream to form a combined air stream, said combined air stream flowing generally opposite the direction of said secondary air stream.

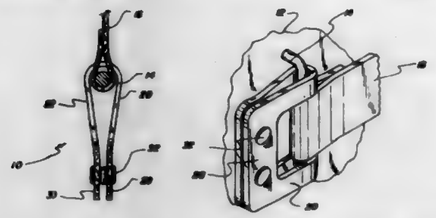
5,592,717
GATE HINGE
Pietro Longo, 6 Justin Ct., Saddle River, N.J. 07458
Filed Nov. 30, 1994, Ser. No. 346,872
Int. Cl.[6] E05D *13/10;7/06*
U.S. Cl. 16—367 **10 Claims**

1. A gate hinge for hinging a gate to a post, the post having an upper end, an opposite lower end, a front face, a rear face opposite the front face, an outer side face and a laterally opposite inner side face, the post projecting in a vertically upward direction from a surface having a first surface portion extending laterally of the post in an inward direction normal to the direction of the post and a second surface portion inclined rearwardly of the post upwardly at an angle of inclination, the gate hinge comprising:
a first hinge providing a first hinge axis at a first location for placement adjacent the upper end of the post;
a second hinge providing a second hinge axis at a second location vertically below the first location for placement adjacent the lower end of the post, with the second location placed rearwardly and outwardly relative to the first location;



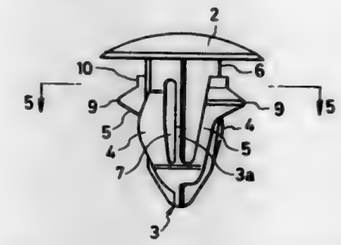
a first bracket for mounting the gate to the first hinge for swinging movement about the first hinge axis; and
a second bracket for mounting the gate to the second hinge for swinging movement about the second hinge axis;
the first and second brackets mounting the gate for swinging movement about the first and second hinge axes between a closed position and an open position, the first and second brackets having bracket arms for locating the gate relative to the respective first and second hinge axes such that the gate, when in the closed position, extends laterally inwardly, relative to the post, generally parallel to the first surface portion and vertically in a first plane extending laterally generally parallel to the post and, when in the open position, extends upwardly and rearwardly at essentially said angle of inclination to extend generally parallel to the second surface portion while located vertically in a second plane extending rearwardly generally parallel to the post.

5,592,718
BELT BUCKLE ALIGNMENT DEVICE
Donald C. Mohr, 353 G Lexington Ct., Pewaukee, Wis. 53072
Filed Jan. 5, 1995, Ser. No. 369,156
Int. Cl.[6] A44B *11/22*
U.S. Cl. 24—265 BC **4 Claims**



1. An alignment device for use with a belt buckle having a U-shaped mount of a first transverse dimension and having opposed upper and lower portions, and for use with a belt of a second transverse dimension substantially less than the first transverse dimension of the U-shaped mount, the alignment device being couplable to the U-shaped mount to substantially center the belt on the U-shaped mount, the alignment device comprising:
(a) a foldable web including a pair of upper spacing webs of a third transverse dimension and a pair of lower spacing webs of a fourth transverse dimension which are extendable between the belt and the respectively opposed upper and lower portions of the U-shaped mount, the sum of the second transverse dimension, the third transverse dimension and the fourth transverse dimension being substantially equal to the first transverse dimension;
(b) securing web portions interposed between the lower spacing webs and the upper spacing webs, and
(c) a plurality of securing snaps coupled to the securing web portions for joining the securing web portions together about the U-shaped mount, the securing snaps positioned transverse to the upper spacing webs and the lower spacing webs,
to substantially center the belt relative to the U-shaped mount of the belt buckle.

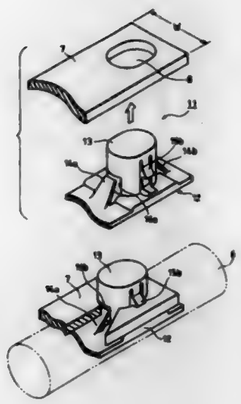
5,592,719
FASTENING CLIP
Shinsuke Eto, Kariya; Yoshiaka Abe, Chiryu, and Yuichi Shirase, Toyota, all of Japan, assignors to Nifco Inc., Yokohama, Japan
Filed Feb. 27, 1995, Ser. No. 394,808
Claims priority, application Japan, Mar. 10, 1994, 6-076266
Int. Cl.[6] F16B *19/00*
U.S. Cl. 24—453 **6 Claims**



1. A clip comprising a head portion, a leg portion extending from an underside of the head portion, reducible-diameter protruding engaging portions provided midway along the length of the leg portion on a peripheral surface thereof, engaging members provided on a part of the peripheral surface of the leg portion and spaced from said engaging portions, said engaging members becoming wider upon extending from an end part of the leg portion toward the underside of the head portion and having at a free end thereof additional peak-shaded engaging portions positioned between the protruding engaging portions and the underside of the head portion.

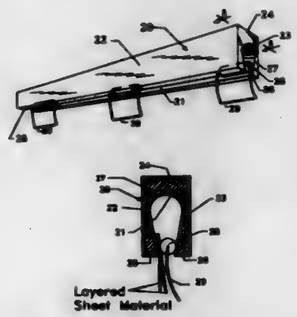
5,592,720
MOUNTING CLIP
Hidetoshi Sasakawa, Hokkaido, and Keiji Ushiyama, Shizuoka, both of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 6, 1995, Ser. No. 568,417
Claims priority, application Japan, Dec. 6, 1994, 6-302327
Int. Cl.[6] A44B *17/00*; F16B *29/00*
U.S. Cl. 24—453 **7 Claims**

1. A clip for mounting to a mounting plate, the clip comprising:
a base plate;
a clip main body disposed on the base plate, the clip main body to be inserted into a mounting hole of the mounting plate;
a pair of retaining protuberances being mounted on a circumferential wall surface of the clip main body, the retaining protuberances being flexible; and
a pair of flexible blades disposed on the base plate the flexible blades being inwardly sloped toward the clip main body from the base plate, wherein a line connecting the pair of flexible blades orthogonally intersects a line connecting the pair of



retaining protuberances, and wherein the clip main body is disposed at the intersection.

5,592,721
HOLDER TO SECURE SHEET MATERIAL
Hal M. Zeller, 824 Lodo Ln., Cincinnati, Ohio 45245
Filed Jul. 11, 1995, Ser. No. 500,605
Int. Cl.[6] A41F *1/00*; A44B *21/00*
U.S. Cl. 24—460 16 Claims



1. A holder for holding a flexible sheet material in a generally vertical manner on a wall, said holder comprising:

(a) an elongated substantially horizontally oriensed housing for mounting on the wall, said housing having an open sided passageway extending the length of the elongated housing, further wherein the passageway has inwardly sloping walls to form a narrowed opening sufficiently wide to receive an edge of the flexible sheet material; and

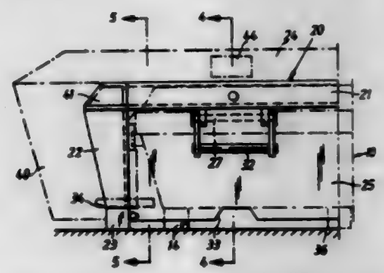
(b) a wedging means positioned in an interior of the passageway of the elongated housing to frictionally hold the sheet material against one of the walls of the passageway, said wedging means dimensioned to freely fit into the interior of the passageway but unable to pass through the narrowed opening of the passageway and further having a handle connected to said wedging means so as to extends through the narrowed opening of the passageway alongside the flexible sheet material when the wedging means is positioned in the passagway, said handle for grasping so as to cause vertical movement of the wedging means within the passageway.

5,592,722
CLOSURE DEVICE, PARTICULARLY FOR SPORTS SHOES
Giancarlo Fascare, Treviso, and Mirco Battistella, Spresiano, both of Italy, assignors to Nordica S.p.A., Trevignano, Italy
Filed Sep. 1, 1994, Ser. No. 299,390
Claims priority, application Italy, Sep. 10, 1993, TV93A0081
Int. Cl.[6] A43C *11/14*
U.S. Cl. 24—68 SK 20 Claims



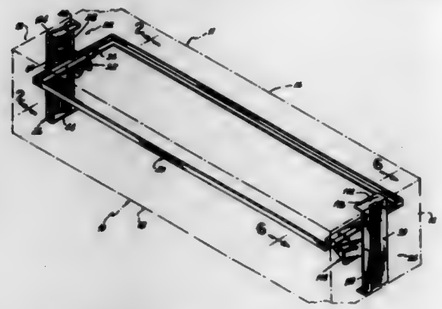
1. Closure device for releasably mutually securing a first portion and a second portion of a sports shoe, wherein the closure device comprises grip elements which are associable with the first portion and which selectively and detachably interact, by means of an auxiliary lever, with at least one engagement element which is associable with the second portion, and wherein each of said grip elements comprises a base which is associable with the first portion, multiple mutually parallel first seats being provided transversely on said base, and wherein a first tab protrudes at each one of said first seats towards a facing surface of said first portion, and wherein said engagement element is constituted by a pawl which has a first tooth directed towards said first portion when said first tooth selectively and detachably interacts with a respective first seat.

5,592,723
BURIAL COFFIN ARRANGEMENT
Carl B. Leijonhufvud, Upsala, and Jan-Ake Hallén, Partille, both of Sweden, assignors to Carl Leijonhufvud, Upsala, Sweden
PCT No. PCT/SE93/00643, § 371 Date Jan. 26, 1995, § 102(e) Date Jan. 26, 1995, PCT Pub. No. WO94/03139, PCT Pub. Date Feb. 17, 1994
PCT Filed Jul. 28, 1993, Ser. No. 374,717
Claims priority, application Sweden, Jul. 30, 1992, 9202262
Int. Cl.[6] A61G *17/00*
U.S. Cl. 27—2 14 Claims



1. A burial coffin arrangement comprising an open-bottom outer ceremonial casket and an inner casket to be received in the ceremonial casket, the inner casket having a downwardly wedge-shape and inwardly inclined lower part, means to enable the caskets to be separated from one another by vertical relative movement therebetween, the ceremonial casket including mutually opposing side-walls which are pivotally mounted at the tops thereof to an upper part of the ceremonial casket by hinge means, so that when the bottom parts of said side-walls are moved apart, said caskets are able to move relative to one another in a vertical direction, and when the bottom parts of said side-walls are moved towards one another, the side-walls form a wedge-shaped outer-wall configuration which is adapted to the lower part of the inner casket.

5,592,724
MECHANISM FOR LIFTING AND TILTING THE BED OF A CASKET
John E. Linville, Osgood, Ind., and Olan L. Long, Columbus, Ohio, assignors to Batesville Casket Company, Inc., Batesville, Ind.
Filed Feb. 14, 1994, Ser. No. 195,867
Int. Cl.[6] A61G *17/00*
U.S. Cl. 27—12 29 Claims



1. A casket comprising:

a shell having two end walls and two side walls;

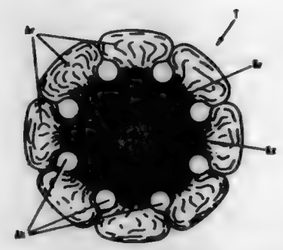
a bed frame; and

a lift mechanism mounted to each said end wall of said shell for raising and lowering said bed frame, each said lift mechanism having an elongated integral C-shaped bracket, a threaded drive screw supported in said C-shaped bracket, a seat threadably engaging said drive screw for supporting said bed frame, and fasteners integrally associated with said C-shaped bracket for securing said lift mechanism to said shell.

5,592,725
TAMPON, AS WELL AS A METHOD AND A DEVICE FOR MANUFACTURING IT
Alfred Brinker, Gevelsberg, Germany, assignor to Karl Ruggli AG, Fislbach, Switzerland
PCT No. PCT/EP94/02454, § 371 Date May 26, 1995, § 102(e) Date May 26, 1995, PCT Pub. No. WO95/03766, PCT Pub. Date Feb. 9, 1995
PCT Filed Jul. 26, 1994, Ser. No. 411,756
Claims priority, application Germany, Jul. 28, 1993, 43 25 220.6
Int. Cl.[6] A61F *13/20*; A61B *17/52*
U.S. Cl. 28—118 3 Claims

1. A method of manufacturing a tampon, said method comprising the steps of:

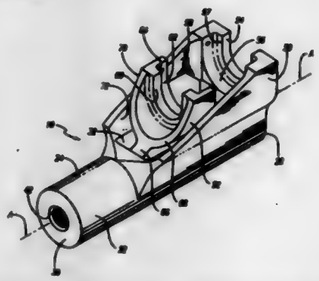
rolling up a strip of fiber fleece material to form a cylindrical blank having a cylindrical mantle with mantle sections uniformly distributed over the circumference of the cylindrical blank;



applying pressing forces onto the mantle sections, wherein the pressing forces are directed tangentially relative to a circular cylinder surrounding a central axis of the blank at a selected distance, and thereby forming a preformed blank having a core and longitudinal ribs extending in the longitudinal direction of the preformed blank and distributed adjacent to one another so as to surround the core, wherein the fiber fleece material of the core is compressed more strongly than the fiber fleece material of the longitudinal ribs; and

subjecting the longitudinal ribs to radial pressure forces for finish-shaping the preformed blank to form the tampon, wherein the core of the tampon has a circular cross-section comprising an annular outer area and a circular central area surrounded by the annular outer area, wherein the fiber fleece material of the circular central area is compressed less than the fiber fleece material of the annular outer area.

5,592,726
AXIAL SWAGE TOOL HAVING A STABILIZING PIN
Srinivas B. Suresh, Irvine, Calif., assignor to The Deutsch Company, Santa Monica, Calif.
Filed Jan. 6, 1995, Ser. No. 369,794
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—237 14 Claims



1. A swaging tool for swaging a fitting to a tube, the swaging tool comprising:

a tubular housing having a first end, a second end, an interior, an interior surface, a first end portion that is open at the first end, a second end portion at the second end defining a closed cylinder having a port for receiving pressurized fluid, and a middle portion between the first and second end portions;

a first jaw unit on the first end portion of the housing;

a ram movable in opposite axial directions in the cylinder of the second end portion of the housing, the ram having an interior surface defining a bore;

a piston movable in opposite axial directions in the middle portion of the housing and into engagement with the ram, the piston having an interior surface;

a second jaw unit on the piston, which moves toward the first jaw unit upon movement of the piston in a first axial direction within the housing;

a stabilizing pin slidably received through the piston and into the bore of the ram, the stabilizing pin having a first end portion

located between the first end of the housing and the piston and an elongated portion having an exterior surface engaging the interior surfaces of the ram and the piston; and

the ram and the first end portion of the stabilizing pin each having bearing means for reacting moments generated by the second jaw unit during swaging directly into the housing.

5,592,727

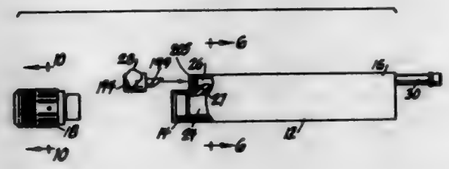
METHOD OF MAKING ARTHROSCOPIC SHAVER WITH ROTATABLE COLLET AND SLIDE ASPIRATION CONTROL VALVE

Michael P. Glowa; Phillip J. Berman, both of St. Petersburg, and Dale Slenker, Palm Harbor, all of Fla., assignors to Linvatec Corporation, Largo, Fla.

Division of Ser. No. 383,910, Sep. 9, 1994, Pat. No. 5,492,527. This application Oct. 12, 1995, Ser. No. 542,204

Int. Cl.[6] B23P *11/00*

U.S. Cl. 29—434 **2 Claims**



1. A method of manufacturing an elongated surgical handpiece having a body with a proximal end, a distal end, a longitudinally aligned first bore extending between said proximal end and said distal end for containing a motor for driving a surgical instrument, a longitudinally aligned second bore, parallel to said first bore, for providing an aspiration conduit for aspirating material from said distal end to said proximal end, said method comprising the steps of:

providing an extrudable material;

extruding said extrudable material to produce said body with said first and second bores extending therethrough;

forming an oblique aspiration channel extending from said second bore distally to said first bore;

providing a longitudinally movable aspiration control valve comprising an elongated pin sized to be axially received in the distal end of said second bore and sufficiently elongated to selectively occlude said oblique aspiration channel, a slide body adapted to slidably retain said pin within said second bore and a handle means for enabling a user to longitudinally move said slide body;

sealing the distal end of said second bore with said aspiration control valve.

5,592,728

SLIDE ASSEMBLY FOR MACHINE TOOLS AND METHOD OF MAKING SAME

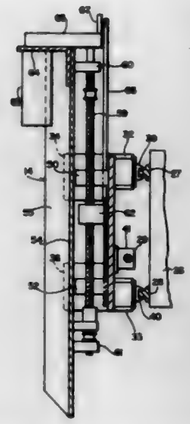
Kenneth J. Sumjura, Santa Claus, Ind., assignor to Thermwood Corporation, Dale, Ind.

Division of Ser. No. 390,754, Feb. 17, 1995. This application Apr. 1, 1996, Ser. No. 625,987

Int. Cl.[6] B21D *53/10*; B23P *11/00*; F16C *33/10*

U.S. Cl. 29—434 **6 Claims**

1. A method of forming a sliding assembly for a machine tool consisting of a first member having at least one guide slot disposed parallel to a given line of travel and a second member disposed in a predetermined spatial relation relative to said first member and displaceable relative to said first member along said line of travel, having a side edge portion protruding into and displaceable along said guide slot, comprising:



inserting detachable means between said members to space said members and thereby position said protruding side edge portions spaced from and disposed between side wall portions of said guide slot;

positioning said second member relative to said first member whereby said protruding side edge portion is received within and spaced from a bottom wall portion of said guideslot;

applying detachable means for fastening said members together with said protruding side edge portion disposed in said guide slot, spaced from said side and bottom wall surfaces thereof;

injecting a structural polymer in a prehardened fluid state in the space between said protruding side edge portion of said second member and said side and bottom wall portions of said guide slot in said first member;

allowing said structural polymer to harden and adhere to one of said members to form a guideway on one of said members; and

removing said spacing and fastening means to permit displacement of said members relative to each other along said line of travel.

5,592,729

METHOD OF ASSEMBLING AN INFLATABLE CUSHION WITH A REACTION HOUSING IN AN INFLATABLE RESTRAINT SYSTEM

David J. Dyer, Kaysville, and Larry D. Rose, Layton, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Aug. 12, 1994, Ser. No. 289,864

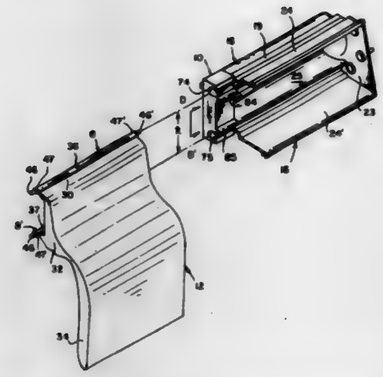
Int. Cl.[6] B23Q *3/00*; B21D *39/00*

U.S. Cl. 29—464 **24 Claims**

16. A method for securing an inflatable cushion insert within a channel portion of a cushion retainer member to form a cushion retainer insert which can facilitate the coupling of an inflatable cushion with a reaction housing in an inflatable restraint system, comprising the steps of:

a) providing a die comprising (i) at least one cavity extending through the die to receive said channel portion of said cushion retainer member, and (ii) an elongate slot communicating with the interior of the cavity and disposed along the length thereof to permit a remainder of said cushion retainer member to extend through said slot, and to permit axial introduction and passage of an inflatable cushion insert through the cavity;

b) placing the inflatable cushion insert into the channel portion of the cushion retainer member to form said cushion retainer insert; and



c) moving the cushion retainer insert through the cavity of the die thereby obtaining a uniform securement of the channel portion about the cushion insert.

5,592,730

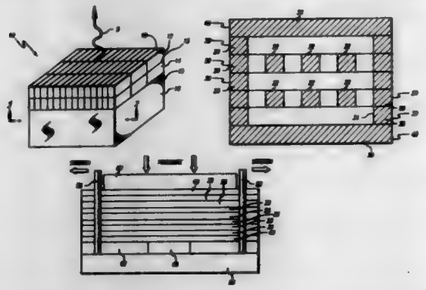
METHOD FOR FABRICATING A Z-AXIS CONDUCTIVE BACKING LAYER FOR ACOUSTIC TRANSDUCERS USING ETCHED LEADFRAMES

Michael Greenstein, Los Altos, and Henry Yoshida, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 29, 1994, Ser. No. 283,136

Int. Cl.[6] H04R *31/00;17/00*; H01L *41/22*

U.S. Cl. 29—594 **15 Claims**



1. A method for fabricating a backing layer for use in an acoustic transducer, said method comprising the steps of:

providing a plurality of spacer leadframes each having an outer frame member and a space defined within said outer frame member;

providing a plurality of trace leadframes each having an outer frame member and at least one conductor extending across said leadframes terminating at said outer frame members of trace leadframes at opposite ends thereof;

stacking said plurality of trace leadframes alternatingly with said spacer leadframes such that respective conductors of adjacent ones of said trace leadframes are disposed with a space defined between said respective conductors of adjacent ones of said trace leadframes;

pouring an electrically insulating acoustic backing material onto said stacked plurality of trace leadframes to completely fill said spaces defined between said respective conductors; and

removing said frame members and excess acoustic backing material from said stacked and poured plurality of trace leadframes, thereby forming the backing layer.

5,592,731

METHOD OF CONSTRUCTING A STATOR

Hao Huang, Aurora; Michael S. DeBruzzi, Golden, and Thomas A. Rice, Elizabeth, all of Colo., assignors to Unique Mobility, Inc., Golden, Colo.

Division of Ser. No. 937,311, Sep. 1, 1992, Pat. No. 5,382,859. This application Oct. 21, 1994, Ser. No. 327,410

Int. Cl.[6] H02K *15/02*

U.S. Cl. 29—596 **18 Claims**



1. A method for creating a stator for an electro-mechanical transducer from a plurality of segments, said segments having an axially elongated body having a radial outer portion and a radial inner tooth portion and at least one half of a tooth, said radial outer portion being circumferentially wider than said radial inner tooth portion so that when a plurality of said segments are positioned in an annular configuration an axially extending radial side portion of each segment will contact an axially extending radial side portion of the adjacent segment on each side to form a return path, said return path having a plurality of teeth projecting radially inwardly therefrom, said method comprising:

aligning said plurality of segments linearly whereby a single row of teeth is created;

winding said linearly aligned teeth to create an armature winding;

circumferentially positioning the segments to create a circumferential structure, said teeth of said circumferentially positioned segments pointing radially inwardly; and

fitting an annulus about the outer diameter of the circumferentially positioned segments in an interference fit to maintain the segments circumferentially.

5,592,732

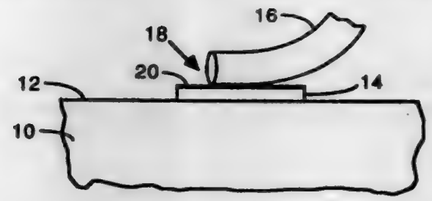
METHOD OF MAKING SUPER CONDUCTING BONDS FOR THIN FILM DEVICES

Arthur C. Leutholz, and Ronald T. Wakai, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 26, 1994, Ser. No. 334,161

Int. Cl.[6] H01L *39/24*

U.S. Cl. 29—599 **14 Claims**



1. A method for making a connection between first and second members, steps of which method comprise:

applying a layer of a first material to a surface of the first member, wherein the first material is selected from a group consisting of indium and an indium alloy;

mechanically working the surface of the first member to break up any oxide coating that is on the first member underneath the layer of the first material; and

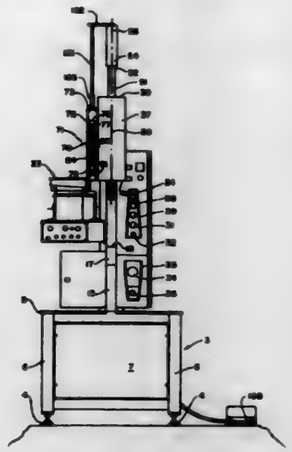
alloying a second material with the layer of the first material applied to the surface of the first member, wherein the second material is selected from a group consisting of tin and a tin alloy, to form an alloy of indium-tin that bonds the second member to the first member.

5,592,733

HIGH PRODUCTION HARDWARE INSERTION PRESS INCORPORATING OPERATOR AND TOOL PROTECTION SYSTEMS AND APPARATUS

Robert C. Wareham, Midland, Mich., assignor to Haeger, Inc., Oakdale, Calif.

Filed Nov. 16, 1994, Ser. No. 340,748
Int. Cl.[6] B21J *15/28*; B23Q *11/00*
U.S. Cl. 29—708 14 Claims



1. A hardware insertion press for assembling fastening devices or punching holes in sheetmetal hardware devices and incorporating operator and/or tool protection safety systems, comprising:

a. a base unit;

b. a main frame mounted on said base unit and including a lower tool-support anvil member and a hydraulic ram/upper tool assembly support member;

c. a pressure-exerting ram assembly mounted on said hydraulic ram/upper tool assembly support member and including a hydraulic cylinder and a double-acting ram operatively associated and selectively movable through a predetermined excursion along its longitudinal axis, said lower tool-support anvil member underlying said ram assembly;

d. an upper tool holder slidably mounted on said ram in electrically conductive interrelation therewith and adapted to removably support a selected upper tool thereon;

e. a lower tool holder assembly mounted on said anvil member and adapted to removably support a selected lower tool thereon in cooperative relation to said upper tool;

f. first control means for normally selectively advancing said ram to bring said upper and lower tools together into a predetermined pressure exerting relationship upon a workpiece interposed there between while automatically stopping advance of the ram if the operator's hand intervenes between the upper and lower tools;

g. said first control means including a normally closed safety switch operatively interposed between said ram and said upper tool holder and operable to normally open a circuit to stop the advance of the ram when a non-conductive element, such as the operator's hand, is encountered with sufficient force to slidably displace said upper tool holder to open said normally closed switch; and

h. second control means operatively associated with said ram and responsive to axial displacement thereof to define the limits of a press "window" only within the limits of which "window" will a selected operating pressure normally be applied to a workpiece interposed between said upper and lower tools;

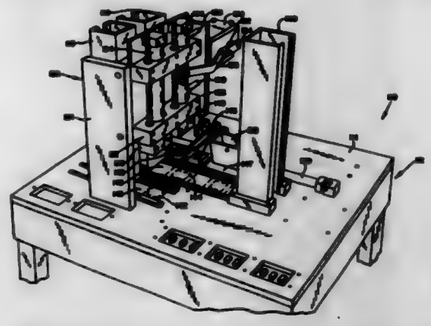
wherein said hydraulic ram is symmetrical about a longitudinal axis perpendicular to said upper and lower tool support members and includes an exteriorly threaded upper end portion that projects above said upper tool-support member, and said second control means operatively associated with said ram includes a lower stop tube rotatably mounted on said upper tool-support member and coaxially arranged about a portion of the ram projecting above the tool-support member, said lower stop tube having an abutment thereon adjacent one end thereof and an elongated guide slot on its outer periphery, an upper outer tube coaxially arranged about said exteriorly threaded upper end portion of the ram and including a threaded stop nut threadably engaging said exteriorly threaded ram portion and a guide pin slidably engaging the guide slot in said lower stop tube, a cantilever beam mounted on the upper end surface of the ram and extending laterally therefrom generally perpendicular to the longitudinal axis of the ram to provide a free end laterally spaced from the ram, and a tool protection assembly mounted on the upper tool-support member and including an actuator shaft mounted by its upper end on said cantilever beam and depending in general parallelism with said ram to a lower end, a microswitch selectively vertically adjustably supported on said upper tool support member in operative association with said lower end of said actuator shaft, and means on the lower end of said actuator shaft adapted to actuate said microswitch when said ram and said actuator shaft move axially during a press operation whereby at least the upper limit of said press "window" is determined by the position of said microswitch in relation to said ram and actuator shaft.

5,592,734

METHOD AND APPARATUS FOR FRAMING A FILM MOUNTED INTEGRATED CIRCUIT

Jon C. Houghton, Auburn, Wash., and Chester H. Petry, Jr., Tigard, Oreg., assignors to Byers Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 671,681, Mar. 5, 1991, Pat. No. 5,251,372, which is a continuation-in-part of Ser. No. 228,365, Aug. 3, 1988, Pat. No. 4,949,159. This application Oct. 12, 1993, Ser. No. 136,086
The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—827 16 Claims



1. An apparatus for framing a tape-assisted bonding (TAB) segment in a TAB carrier of the type having first and second carrier members which are engagable with one another for framing the TAB segment therebetween, said apparatus comprising:

a loading station for supporting a first TAB carrier member; means for supporting a TAB segment on one side of said loading station; means for supporting a second TAB carrier member on another side of said loading station;

means for transferring a TAB segment from said TAB segment supporting means to said loading station;

means operatively associated with said TAB segment transferring means for transferring a second TAB carrier member from said second TAB carrier member supporting means to said loading station; and

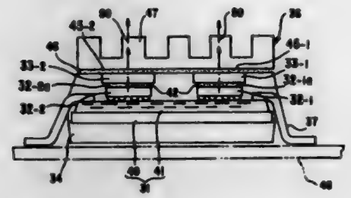
means for engaging the first and second carrier members with one another in said loading station thereby framing such a TAB segment therebetween.

5,592,735

METHOD OF MAKING A MULTI-CHIP MODULE HAVING AN IMPROVED HEAT DISSIPATION EFFICIENCY

Takashi Ozawa, and Haruo Serimachi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 520,297, Aug. 28, 1995, abandoned, which is a division of Ser. No. 281,672, Jul. 28, 1994, Pat. No. 5,471,366. This application Apr. 26, 1996, Ser. No. 638,090
Claims priority, application Japan, Aug. 19, 1993, 5-205444
Int. Cl.[6] H05K *3/30*
U.S. Cl. 29—841 3 Claims



1. A method for fabricating a multi-chip module, comprising the steps of:

mounting a plurality of semiconductor chips on a semiconductor substrate that carries thereon an interconnection pattern;

bonding a plurality of thermally conductive blocks on an upper major surface of said semiconductor chips;

forming a resin package body by covering said plurality of semiconductor chips on said substrate and said thermally conductive blocks on said semiconductor chips, by a molten resin;

polishing an upper major surface of said resin package body to form a substantially flat upper major surface for said resin package body, such that said thermally conductive blocks are exposed at said substantially flat upper major surface, with respective upper major surfaces forming a substantially flush surface with said flat upper major surface of said resin package body; and

mounting a heat sink such that said heat sink establishes an intimate contact with respective exposed upper major surfaces of said thermally conductive blocks.

5,592,736

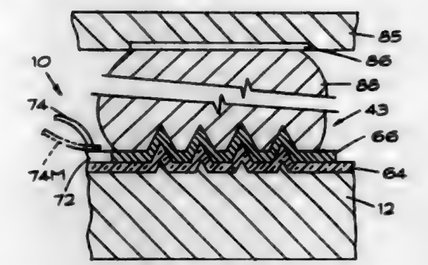
FABRICATING AN INTERCONNECT FOR TESTING UNPACKAGED SEMICONDUCTOR DICE HAVING RAISED BOND PADS

Salman Akram, Boise; Warren M. Farnworth, Nampa, and Alan G. Wood, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 335,267, Nov. 7, 1994, Pat. No. 5,483,741, which is a continuation-in-part of Ser. No. 206,747, Mar. 4, 1994, Pat. No. 5,523,697, which is a division of Ser. No. 116,394, Sep. 3, 1993, Pat. No. 5,326,428. This application Jan. 5, 1995, Ser. No. 369,067
Int. Cl.[6] H05K *3/00*
U.S. Cl. 29—842 38 Claims

1. A method for fabricating an interconnect suitable for establishing a temporary electrical connection with a semiconductor die having a raised contact location, said method comprising:

providing a substrate;



forming a contact member on the substrate including a sharpened projection, said sharpened projection comprising an elongated blade configured to penetrate into the raised contact location to a limited penetration depth;

forming an insulating layer on the substrate and sharpened projection;

forming a conductive layer on the sharpened projection; and

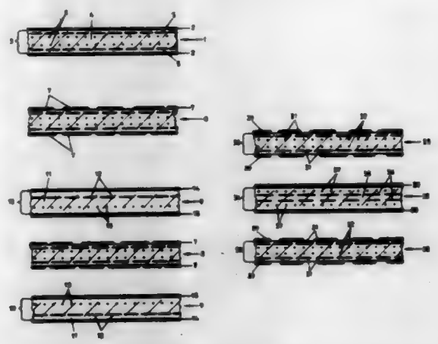
forming a conductive trace on the substrate in electrical communication with the conductive layer.

5,592,737

METHOD OF MANUFACTURING A MULTILAYER PRINTED WIRE BOARD

Erik Middelman, Arnhem, and Pieter H. Zaaring, Nijmegen, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/EP92/01133, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO92/22192, PCT Pub. Date Dec. 10, 1992
PCT Filed May 19, 1992, Ser. No. 157,877
Claims priority, application Netherlands, Jun. 4, 1991, 9100958
Int. Cl.[6] H05K *3/24*; *3/32*; *3/46*; *3/36*
U.S. Cl. 29—848 22 Claims



1. A method of manufacturing a multilayer printed wire board comprising lamination bonding at least one hard base substrate (8) having conductive traces (7) on both sides thereof and having voids between said conductive traces and at least one intermediate substrate (9) comprising a hard core layer (10) comprising a flowable adhesive layer (15) on at least a side thereof facing the conductive traces (7) of the base substrate (8), the lamination being conducted under a pressure sufficiently high thereby bringing the core layer (10) of the intermediate substrate (9) at least substantially into contact with the conductive traces (7) of the base substrate (8) with the adhesive (15) filling the voids between the traces (7), and wherein the base substrate (8) and the intermediate substrate (9) comprising a fiber-reinforced matrix material, the

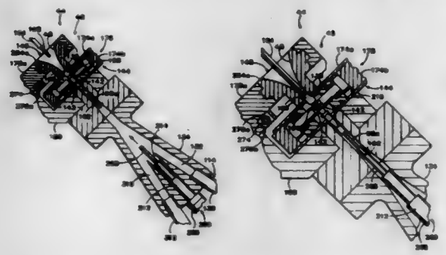
reinforcement being in the form of a crosswise arrangement of layers of unidirectionally oriented fibers.

5,592,738

SYSTEM FOR QUICKLY TERMINATING WIRES AND PREVENTING FAULTY CRIMPS

William L. Reieragaard, Portland; Andrew W. Knebel, Jr., Fairview; Curtis A. Davis, Portland; John M. Reieragaard, Portland, and Lloyd E. Pelton, Portland, all of Oreg., assignors to Gaard Automation Inc., Portland, Oreg.

Division of Ser. No. 161,135, Dec. 2, 1993, Pat. No. 5,511,307.
This application Jan. 25, 1996, Ser. No. 591,736
Int. Cl.[6] B23P *19/00*; H01R *43/055*
U.S. Cl. 29—863 10 Claims



1. A method for attaching an electrical contact to the conductive end of a wire comprising:

(a) providing a crimping mechanism having at least a pair of opposing jaws and being adjustable between an open position in which an electrical contact will pass between said jaws and a closed position in which said electrical contact is crimped while positioned between said jaws;

(b) positioning an electrical contact between said jaws;

(c) partially closing said crimping mechanism so that said jaws firmly grip said contact without crimping it;

(d) thereafter, positioning the conductive end of a wire along said contact; and

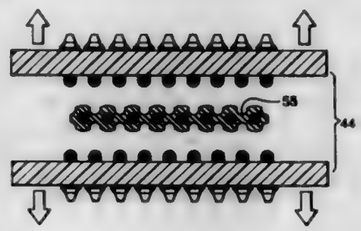
(e) thereafter, fully closing said crimping mechanism in order to crimp said contact for attachment to said conductive end.

5,592,739

BONDING DISCRETE WIRES TO FORM UNITARY RIBBON CABLE

Jess B. Ferrill, Madison, and Kevin H. Snead, Greensboro, both of N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 31, 1994, Ser. No. 334,172
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—872 8 Claims



1. A method of aligning and bonding a plurality of discrete insulation jacketed conductors to facilitate handling and insertion of said conductors into an electrical connector housing to be electrically terminated therein, said method comprising the steps of:

(a) selecting plural discrete insulation jacketed conductors arranged in at least two different planes,

(b) arranging and aligning the ends of said plural conductors in side-by-side fashion in a common plane, and

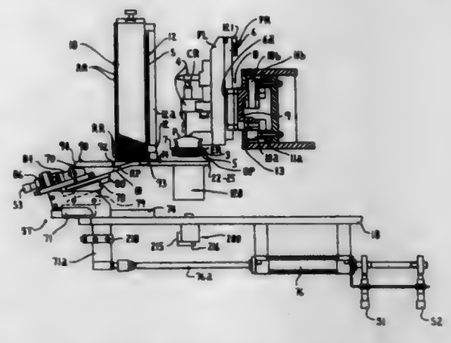
(c) bonding the insulation jackets of adjacent said ends through the application of heat to form a unitary ribbon type cable, wherein said heat is derived from heating elements, the number of said conductors is "n", and the number of said heating elements is at least "n+1".

5,592,740

PISTON RING METHOD

Deryll L. Liechty, Berne, and James L. Geels, Decatur, both of Ind., assignors to Micro Precision Operations, Inc., Berne, Ind.

Division of Ser. No. 138,475, Oct. 15, 1993, Pat. No. 5,404,629.
This application Jan. 19, 1995, Ser. No. 374,912
Int. Cl.[6] B23Q *7/10*
U.S. Cl. 29—888.044 5 Claims



1. A method of positioning a ring in a circumferential piston groove, comprising:

disposing a plurality of radially movable ring nest members about a common axis to collectively form a circular opening concentric about said common axis and a ring-receiving recess concentric about said opening, said recess having a radial dimension for receiving and locating a radially unexpanded ring concentric with said common axis,

positioning an unexpanded ring in the recess to locate said ring concentric with said common axis,

disposing a plurality of ring expanding fingers in said opening about said common axis and within the ring residing in said ring-receiving recess, said ring expanding fingers being disposed in axially opposing relation to the recess and an inner periphery of the ring residing in said recess,

moving the ring expanding fingers radially outward to engage the inner periphery of the ring to expand said ring and move said ring nest members radially outward so as to collectively enlarge said opening for receiving the piston and said recess to maintain the expanded ring concentric with said common axis, and

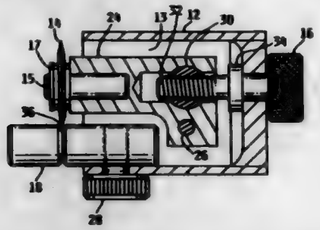
positioning the piston in the enlarged opening in a manner that the ring expanding fingers are moved axially out of opposing relation to the enlarged recess in response to said piston movement and said piston groove is moved to a ring receiving position opposing the enlarged recess so as to allow the expanded ring to enter said piston groove therefrom.

5,592,741

TUBE CUTTER

John J. Vasser, 1210 Rushmore Dr., Colorado Springs, Colo. 80910-2823

Filed Jul. 25, 1995, Ser. No. 506,801
Int. Cl.[6] B23D *21/08*
U.S. Cl. 30—101 10 Claims



1. A tube cutter adapted for severing a tubing end section from a length of tubing, comprising:

a) a housing having an interior cavity between a pair of spaced-apart walls and having a cylindrical post sized for insertion into said tubing end section;

b) a beam pivotally mounted in said cavity, said beam having a first end between said pair of spaced-apart walls and having a second end projecting outside said cavity;

c) a cutter wheel rotatably mounted about an axis of rotation on said second end; and

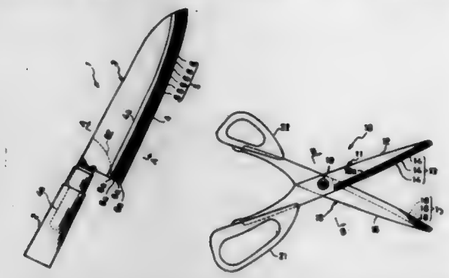
d) means for pivoting said beam, so that said cutter wheel cuts through said tubing end section; said means for pivoting comprising a hole drilled at least partially through said beam, a rotatable yoke mounted in said beam along an axis normal to and passing through said hole said yoke having a threaded opening in alignment with said hole, and a threaded shank threadably engaged in said threaded opening, said threaded shank having an end projecting outside said housing, and a knob affixed to said end projecting outside.

5,592,742

CUTTING EDGE ARRANGEMENT

Toshio Okamura, 12, Yasui-cho 4-chome, Nishinomiya-shi Hyogo-ken, Japan

Filed Mar. 13, 1995, Ser. No. 402,508
Int. Cl.[6] B26B *5/00*
U.S. Cl. 30—254 17 Claims



1. A cutting device having a cutting edge arrangement, comprising:

a base plate,

multiple cutting plates attached to said base plate, and

a single exposed operative cutting edge, each said cutting plate having opposing flat surfaces and a cutting edge, said cutting plates being removably joined together in series between said base plate and an outermost cutting plate having an outermost cutting edge, said outermost cutting edge comprising said single exposed operative cutting edge, said cutting plates being removably joined together in series along facing said flat surfaces with each successive said cutting edge aligned parallel to and extending slightly beyond the cutting edge of a previous cutting plate in a direction generally perpendicular to the cutting edges,

wherein after said outermost cutting edge becomes dull, said outermost cutting plate is removed in order to expose a successive outermost cutting plate with a sharp said outermost cutting edge.

15. A cutting device having a cutting edge arrangement, comprising:

a first base plate,

a second base plate,

a first set of multiple cutting plates attached to said first base plate to form a first cutting element, and

a second set of multiple cutting plates attached to said second base plate to form a second cutting element, the first cutting element being rotatably connected to the second cutting element proximate a central region by a pin member extending through a hole in said first and said cutting elements, each said cutting plate having opposing flat surfaces and a cutting edge, each said set of cutting plates being removably joined together in series between the corresponding said base plate and a respective outermost cutting plate having an outermost cutting edge, said cutting plates being removably joined together in series along facing said flat surfaces with each successive said cutting edge aligned parallel to and extending slightly beyond the cutting edge of a previous cutting plate in a direction generally perpendicular to the cutting edges,

wherein after said outermost cutting edge becomes dull, said outermost cutting plate is removed in order to expose a successive outermost cutting plate with a sharp said outermost cutting edge,

and wherein said first and said second cutting elements are arranged such that the outermost cutting edge of the first cutting element faces the outermost cutting edge of the second cutting element, and such that the outermost cutting edge of the first cutting element passes the outermost cutting edge of the second cutting element with substantially zero clearance when the cutting elements are rotated about said pin member.

5,592,743

SHOCK ABSORBER FOR SCISSOR ACTION TOOL

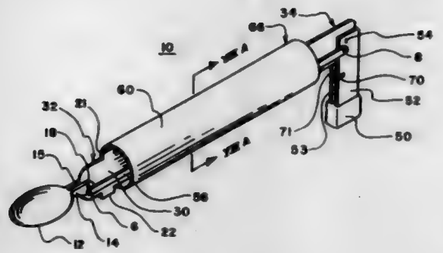
Ernest D. Labarre, Wauwatosa, and Jerrold N. Austin, Baraboo, both of Wis., assignors to Fiskars Inc., Madison, Wis.

Filed Mar. 9, 1994, Ser. No. 208,127
Int. Cl.[6] B26B *13/16*
U.S. Cl. 30—271 16 Claims



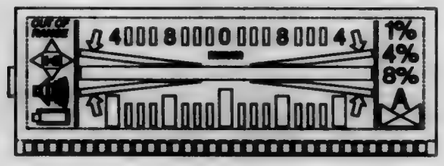
1. A bumper for absorbing the impact created by complete closure of a pair of cooperatively-engaging elongated members united for scissor action about a joint, the bumper having a longitudinal axis and comprising a shank configured to be removably secured to one of the members, the shank merging into a resilient head coming into abutting relationship with the other of the members when the members assume a closed position, the head being formed as an annular structure having spaced inner and outer surfaces, the shank comprising a pair of spaced legs projecting from the head by a predetermined distance in a direction substantially parallel to the axis, the legs having respective inner and outer faces, the inner faces being configured to engage a first of the elongated members.

5,592,744
EATING UTENSIL
Alex H. Weinstein, 4403 W. Grace St., Richmond, Va. 23230
Filed Nov. 29, 1995, Ser. No. 563,956
Int. Cl.[6] A47J 43/28
U.S. Cl. 30—324 16 Claims



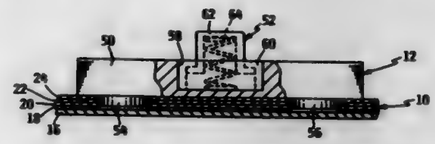
1. A self leveling eating utensil comprising:
an elongate main body having a longitudinal axis, a proximal end, and a distal end;
a handle, having a proximal end and a distal end, which substantially surrounds said main body and is movable with respect to said main body;
a working portion connected to the proximal end of said main body and free to rotate with respect to said main body;
a weighted portion connected to the distal end of said main body and free to rotate with respect to said main body; and
a mechanical link member disposed parallel to the longitudinal axis of said main body, connected to said working portion and said weighted portion;
whereby said working portion is held relatively level regardless of the angular orientation of said handle.

5,592,745
ELECTRONIC LEVEL DISPLAYING INCLINATION WITH REGARD TO INSTRUMENT LENGTH
Charles E. Heger, Saratoga, and Gary R. Schaltbeck, Los Gatos, both of Calif., assignors to Zircon Corporation, Campbell, Calif.
PCT No. PCT/US93/07434, § 371 Date Feb. 13, 1995, § 102(e) Date Feb. 13, 1995, PCT Pub. No. WO94/04888, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 11, 1993, Ser. No. 381,977
Int. Cl.[6] G01C 9/06;9/18
U.S. Cl. 33—366 9 Claims



1. An inclination sensing device having a particular length and comprising:
a sensor for determining an inclination of the device relative to a null position; and
a display for displaying the inclination as a measurement expressed in a fraction of a linear unit inclination per the particular length of the device.

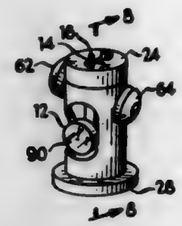
5,592,746
IMAGE REGISTRATION BOARD AND COMPRESSIBLE SPACER ASSEMBLY
Gretchen Ternus, Shoreview, Minn., assignor to Ternus-Burton Company, Saint Paul, Minn.
Continuation-in-part of Ser. No. 780,739, Oct. 18, 1991, Pat. No. 5,485,679. This application Jul. 20, 1992, Ser. No. 917,456
Int. Cl.[6] G01D 21/00
U.S. Cl. 33—623 28 Claims



1. An image board and compressible spacer assembly for use in maintaining the registration of one or more negatives, a flats, or plates during layout, stripping, transfer, or in a platemaker, said negative said flat, or said plate having at least one registration hole associated therewith, said image board and compressible spacer assembly comprising:
an image board having at least one base layer, at least one intermediate layer connected to and disposed above said at least one base layer, and a bed layer connected to and disposed above said at least one intermediate layer, said bed layer having a top surface defining an image layout area, said image board further defining a border region adjacent said image layout area and a ruler disposed proximate to said border region, said image board defining a plurality of indexing holes spaced apart generally equidistantly at predetermined positions along said ruler proximate to said border region; and
a compressible spacer having a body, a post, and a spring member, said body defining a well extending partially through said body such that said body defines a platform from which said spring member biases said post upwardly to an extended position, said post being mounted for reciprocal movement relative to said body between said extended position and a retracted position, said body including at least one bottom pin depending from said body for selectively and removably mounting said compressible spacer within at least one of said plurality of indexing holes, at least a portion of said post initially extending above said top surface of said bed layer when said compressible spacer is mounted on said image board such that the one or more negatives, flats, or plates are disposed on said image layout area with the registration hole receiving said portion of said post therethrough when said post is in said extended position, said post being movable to said retracted position in response to pressure being exerted downwardly on said post.

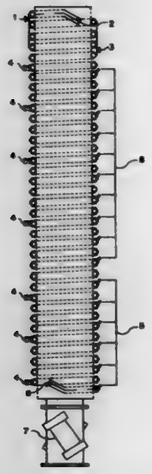
5,592,747
PORTABLE PRECISION INDICATOR GAGE
Dennis B. Kessler, 1084 Florida La., Elk Grove Village, Ill. 60007
Filed Jan. 6, 1995, Ser. No. 369,697
Int. Cl.[6] G01B 5/12
U.S. Cl. 33—783 17 Claims

1. A portable precision indicator gage for measuring a distance between two contact points, and adapted to receive an indicator device for indicating a dimension of an object corresponding to the distance between two contact points having a movable indicator pin defining one of the contact points, comprising;
a tubular housing including a radial surface having a port for facilitating viewing of an indicator device and a proximal end portion and spaced axially therefrom a distal end portion;
an end cap connected to the proximal end portion having an end port adapted to receive a movable indicator pin therethrough, including an anchor pin extending outwardly therefrom, the



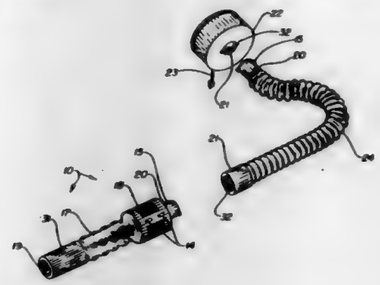
movable indicator pin and the anchor pin defining a first and a second contact point, respectively; and
an adjustment mechanism for adjusting the distance between the contact points, substantially pivotably connected to the housing, the adjustment mechanism includes at least one clamping device operably connected to a knob for allowing the pivot pin to be adjusted, substantially axially defined as in a direction substantially perpendicular to the end cap, substantially radially defined as in a direction substantially parallel to the end cap, substantially both axially and radially, or substantially held stationary with respect to the anchor pin.

5,592,748
HEAT TREATMENT OF SOLID CATALYST OR ADSORBENT PARTICLES IN THE PRESENCE OF FLUID IN A VIBRATING HELICAL COIL
Martin Mitzkat; Pierre Dufresne, both of Valence, and François Ackermann, La Voulte Sur Rhone, all of France, assignors to Eurecat, France
Division of Ser. No. 201,504, Feb. 24, 1994, Pat. No. 5,508,243. This application Jun. 5, 1995, Ser. No. 460,863
Claims priority, application France, Feb. 26, 1993, 93 02366
Int. Cl.[6] F26B 19/00
U.S. Cl. 34—61 12 Claims



12. Apparatus for the treatment of solid particles, said apparatus comprising:
at least on substantially tubular metal coil having at least two turns helically wound around a vertical axis and a central shaft,
at least one lateral pipe for the introduction of said particles and at least one lateral pipe for drawing off said particles,
at least one low voltage current tapping point permitting direct generation of heat in the mass of the coil at at least one turn of the coil by the Joule effect to a temperature between 20° and 1000° C.,
at least one assembly of two pipes having a lateral pipe for the introduction of at least one fluid and a lateral pipe for drawing off at least said fluid in such a way that said fluid flows in at least one turn of the coil,
means for imparting vibrations to the shaft and coil, such that the particles are advanced through the coil.

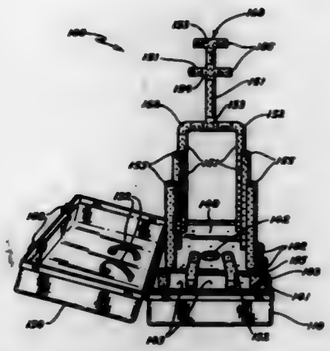
5,592,749
HANDS-FREE HAIR DRYER
Karen Trimmer, 212 Walnut St., Little Rock, Ark. 72205
Filed Jul. 11, 1995, Ser. No. 500,776
Int. Cl.[6] F26B 19/00
U.S. Cl. 34—97 14 Claims



1. A hair dryer, comprising
an electrical hair dryer head comprising a housing forming an air intake and an air exhaust, with said housing enclosing a motor, a fan, a heating element, a means for controlling said motor, and a means for controlling said heating element, said housing also having a male connector, and a means for conducting electricity through said male connector of said hair dryer head to said means for controlling said heating element and said means for controlling said motor,
a base with a female connector and a means of conducting electricity through said female connector of said base to a male connector; and
a flexible arm, said arm being bendable into a user selectable shape and being adapted to support said hair dryer head in a desired position, said arm having a male connector that may be detachably secured to said female connector of said base, a female connector that may be detachably secured to said male connector of said hair dryer head, and means for conducting electricity through said male connector of said arm to said female connector of said arm.

5,592,750
PORTABLE CLOTHING AND EQUIPMENT DRIER
Gerard Eichten, 3101 Selkirk Dr., Burnsville, Minn. 55337
Filed Sep. 11, 1995, Ser. No. 526,377
Int. Cl.[6] F26B 25/00
U.S. Cl. 34—104 9 Claims

1. A portable drier for use in drying articles of clothing, said portable drier comprising:
a) a container having an outer wall, a storage section, and an equipment section, a base plate, an electric circuit, and a control, said storage section and said equipment section being disposed within said container, said base plate having a plurality of conduit openings, said base plate further being disposed within said container so as to separate said equipment section from said storage section;



b) a blower disposed within said equipment section, said blower having a blower inlet and a blower outlet, said base plate further disposed to enable the flow of forced air from said blower outlet to said conduit openings;

c) a plurality of conduit members each having a plurality of air outlet openings, the plurality of conduit members initially being disposed within the storage section of the container and further capable of being assembled into at least one rack and mounted in position relative to the conduit openings of the base plate such that the plurality of conduit members direct the forced air from the blower to the plurality of air outlet openings such that the forced air is expelled within the articles of clothing disposed on the at least one rack; and

d) an air inlet extending through the container and communicating with the equipment section and the blower inlet,

whereby air is drawn through the air inlet into the blower disposed within the equipment section, and is forced by the blower through the conduit openings of the base plate and through the conduit members, and is expelled through the air outlet openings within the articles of closing to thereby dry the articles of clothing.

5,592,751

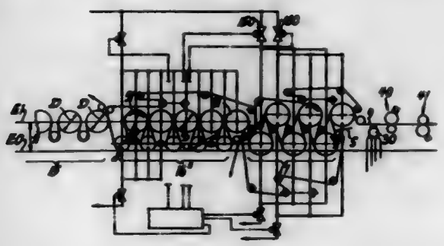
DRYER SECTION HAVING COMBINATION OF SINGLE AND DOUBLE TIER DRYER GROUPS

Adolf Goggemos, Heidenheim, and Markus Oechs Le, Bartholomae, both of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Germany

Continuation-in-part of Ser. No. 344,736, Nov. 23, 1994. This application May 12, 1995, Ser. No. 440,087

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—117 **15 Claims**



14. A drying section for the drying of a paper web in a paper making machine, comprising:

a plurality of heatable drying cylinders for contacting the paper web in each of a plurality of successively located drying groups;

at least in an initial region of the drying section, the drying groups being configured as single-felt drying groups, in which a respective single endless felt and the paper web travel together alternately over the heatable cylinders and over vacuum guide rolls so that one side of the paper web contacts the heatable cylinders;

at least one two-felt drying group located downstream of the single felt drying groups, the at least one two-felt drying group including upper cylinders and lower cylinders;

at least one control device for controlling a supply of thermal energy to each of the upper and lower cylinders of the at least one two-felt drying group; and

a contactless drying device provided and located past the drying section for removing or reducing curl developed in the paper web in the drying section.

5,592,752

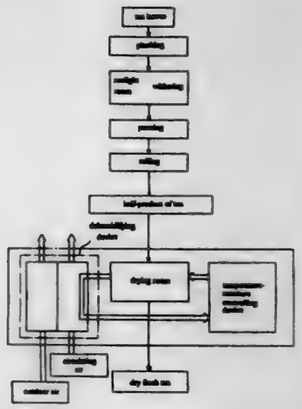
PROCESS AND AN APPARATUS FOR PRODUCING TEAS

Ya-ming Fu; Jyi-Ching Perng; Chen-Une Hwang, and Liang-Jyi Fang, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Division of Ser. No. 60,146, May 13, 1993, Pat. No. 5,433,019. This application Jun. 7, 1995, Ser. No. 481,117

Int. Cl.[6] A23F *3/16*

U.S. Cl. 34—388 **10 Claims**



1. A process for producing a flavor-rich tea from tea leaves, said process comprising the steps of:

(a) plucking the tea leaves;

(b) withering the tea leaves;

(c) rolling the tea leaves; and

(d) drying the tea leaves in a drying apparatus in a circulating air at a drying temperature in the range of from about 30° C. to less than about 80° C. while maintaining a relative humidity of the circulating air in the range about 1% to 30%, said drying apparatus comprising a dehumidifying device for dehumidifying air, a temperature-moisture controlling device, and a drying room;

(e) wherein said tea is capable of being subsequently stored at room temperature and substantially retains flavor-producing volatile constituents.

5,592,753

METHOD AND APPARATUS FOR SEPARATING VOLATILE COMPONENTS FROM A BASE MATERIAL

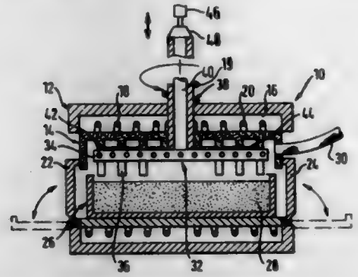
Claus Gronholz, Norderstedt, Germany, assignor to Umwelt-Technics-Nord GmbH, Norderstedt, Germany

Filed May 25, 1994, Ser. No. 248,815

Claims priority, application Germany, May 25, 1993, 43 17 291.1

Int. Cl.[6] F26B *3/347;23/08*

U.S. Cl. 34—410 **17 Claims**



1. A method for separating volatile components from a base material characterized by the following method steps:

a) heating said base material in a gas-tight space within an induction vessel and agitating said base material with a heated agitator means;

b) generating a vacuum within said gas-tight space;

c) sweeping said base material with an inert gas; and

d) evacuating volatilized components from said base material.

7. An apparatus for separating volatile components from a particulate base material by induction heating, said apparatus comprising:

a gas-tight reactor including at least one access opening for receiving an induction heating vessel, said gas-tight reactor operatively connected to an induction coil adapted and arranged for heating particulate base material in said vessel,

an agitator disposed within said gas-tight reactor, said agitator including:

agitator portions adapted to be immersed into the particulate base material,

channels for conducting a heating fluid through the agitator,

outlet openings in said agitator portions effective for discharging inert gas into the particulate base material,

agitating operational means operatively connected to said agitator for providing agitation of the particulate base material; and

said reactor also provided with evacuating outlets for evacuating volatile components from within said reactor.

5,592,754

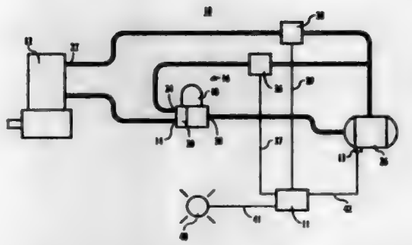
ELECTRONIC CONTROL OF COMPRESSOR UNLOADER AND AIR DRYER PURGE

Robert D. Krieder, Sullivan, and Cheryl L. Greenly, Elyria, both of Ohio, assignors to AlliedSignal Truck Brake Systems Co., Elyria, Ohio

Filed Jun. 7, 1996, Ser. No. 660,521

Int. Cl.[6] F04B *41/02;39/06*

U.S. Cl. 34—527 **6 Claims**



5. An air compressor system having a compressor, which is loaded and unloaded in response to a pneumatic signal, for supplying compressed air to a reservoir through an air dryer, which includes a purge means responsive to a pneumatic signal for purging the air dryer to atmosphere and which also includes a desiccant bed, the improvement comprising:

a compressor control solenoid valve disposed in a pneumatic connection between the compressor and the reservoir to provide the pneumatic signal to load or unload the compressor;

an air dryer purge solenoid valve disposed in a pneumatic connection between the air dryer and the reservoir to provide a pneumatic signal to said purge means;

a pressure transducer mounted to sense the pressure in the reservoir and provide an output electrical signal indicative of the pressure in the reservoir;

controller means for receiving the output electrical signal from said pressure transducer and for providing a first electrical output to said compressor control solenoid valve to unload the compressor when a first pressure is reached and to load the compressor when the reservoir pressure falls below a second pressure and a second electrical output to said air dryer purge solenoid valve to cause purging of the air dryer when the air compressor is unloaded and pressure in the reservoir is above the second pressure.

5,592,755

SHOE SOLE AND PROCESS FOR PRODUCING THEREOF

Johann Ehrlich, Kremsmünster, Austria, assignor to Kastinger Stapa-Schuhfabrik Hans Huemer Gesellschaft m.b.H., Lambach, Austria

PCT No. PCT/AT91/00140, § 371 Date Aug. 17, 1993, § 102(e) Date Aug. 17, 1993, PCT Pub. No. WO92/11779, PCT Pub. Date Jul. 23, 1992

PCT Filed Dec. 23, 1991, Ser. No. 78,262

Claims priority, application Austria, Dec. 28, 1990, A2645/90

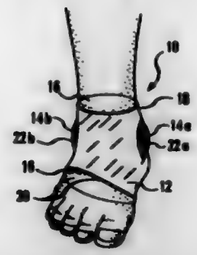
Int. Cl.[6] A43B *13/08;1/06*

U.S. Cl. 36—33 **18 Claims**



1. A shoe sole comprising an upper sole part comprising wood, said upper sole part having an upper side which forms a support for a sole of a foot and further having an underside, said shoe sole further comprising a running sole of elastic and flexible material arranged underneath said upper sole part, said upper sole part having a ball region which is divided into a plurality of strips running crosswise to a longitudinal direction of said shoe sole, said strips being joined together by flexible intermediate pieces, said shoe sole further comprising a reinforcing layer which is rigidly joined to the under side of said upper sole part in the ball region thereof.

5,592,756
ANKLE SUPPORTING SYSTEM FOR ATHLETIC FOOTWEAR INCLUDING MATING ARTICULATION SURFACES
John W. Decker, 30 Somerdale St., Spotswood, N.J. 08884
Filed Jul. 3, 1995, Ser. No. 497,862
Int. Cl.[6] A43B 7/20;5/04;5/16
U.S. Cl. 36—89 7 Claims



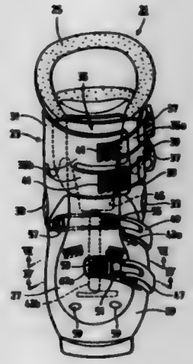
1. An article of footwear for providing support to an ankle joint of a wearer, the ankle joint having a lateral and a medial side, comprising:
an interior assembly including a flexible body portion manipulable to receive at least a portion of a wearer's foot;
a first disk member coupled to said flexible body portion and projecting from an exterior surface portion thereof, said first disk member being positionable over one of the lateral or medial side of the ankle joint and defining a substantially convex exterior surface portion;
an exterior assembly defining an interior cavity dimensioned and arranged to receive said flexible body portion while said interior member is worn on the foot of the wearer, said exterior assembly including a sole and an upper; and
a second disk member coupled to said exterior assembly and disposed within said interior cavity, said second disk member having a substantially concave interior surface portion dimensioned and arranged to receive said convex exterior surface portion in substantially complementary engagement, whereby axial loads are directed toward a wearer's ankle joint and distributed over an area defined by said first and second disk members, wherein said interior assembly is movable, while worn on the foot of the wearer, from a position external to the interior cavity into a second position within said cavity in which the first and second disk members are aligned.

5,592,757
SHOE WITH WALKING SOLE
Carmen U. Jacklosky, 18815 SW. Honeywood Ct., Aloha, Oreg. 97006
Continuation of Ser. No. 205,595, Mar. 2, 1994, abandoned.
This application Mar. 21, 1995, Ser. No. 409,886
Int. Cl.[6] A43B 13/00;5/00;13/14
U.S. Cl. 36—114 11 Claims



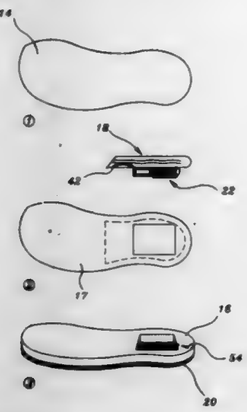
1. A shoe including an upper adapted for inclusion of a wearer's foot, and an elongate nondetachable sole which combines with the upper to provide support for the wearer's foot, the sole including a midsole intermediate an insole and an outsole, said midsole comprising:
a wedge-shaped rear portion which extends from beneath the wearer's heel to beneath the ball of the wearer's foot, said rear portion including a flat load-bearing surface which increases in thickness continuously from beneath the wearer's heel to beneath the ball of the wearer's foot to provide for forwardly-inclined planting of the wearer's foot; and
an arcuate forward portion which extends continuously arcuately forwardly from beneath the ball of the wearer's foot to a forward terminus, said arcuate forward portion arcing continuously forwardly from beneath the ball of the wearer's foot to the forward terminus to accommodate forward rollover of the wearer's foot.

5,592,758
SKI BOOT WITH OVERLAPPING INSTEP PORTIONS
Shinichi Iwama; Seiki Ota, and Keiji Tsugami, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Dec. 27, 1993, Ser. No. 172,897
Claims priority, application Japan, Dec. 28, 1992, 4-348881
Int. Cl.[6] A43B 5/04
U.S. Cl. 36—117.1 13 Claims



1. A ski boot comprising:
a shell main body having a trunk portion defining a foot insertion opening, separated and overlapping portions separated from and adapted to be overlapped with each other and located at an instep area of said main body, and a slit located between each of said separated and overlapping portions and said foot insertion opening;
a cover laid from a toe portion of said main body to said foot insertion opening for covering said slit and said separated and overlapping portions; and
a plurality of fastening members pivotally mounted to fasten said trunk portion and said separated and overlapping portions, wherein:
at least one fastening member for fastening said separated and overlapping portions is pivotally mounted directly to said shell main body, and pivots between a first loosened position and a second fastened position;
wherein said first part has a mounting shaft fixedly received by a through-hole formed in one of said separated and overlapping portions, a distal, axial end of said mounting shaft is located between said first and second portions.

5,592,759
VIBRATING FOOTWEAR
Donald R. Cox, Chesterfield, Mo., assignor to Co-Jo Sports, Inc., Ellisville, Mo.
Filed Jan. 26, 1995, Ser. No. 378,560
Int. Cl.[6] A61F 5/14
U.S. Cl. 36—141 11 Claims



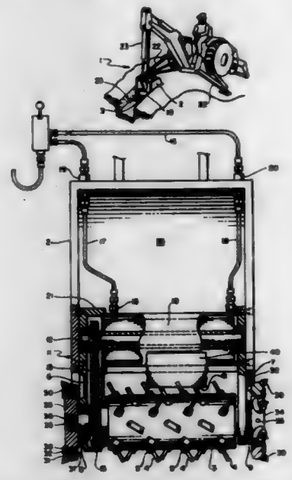
1. A shoe comprising;
a shoe upper;
a sole having a sole cavity opening within the sole;
a removable member intermediate the sole and sole cavity and a wearer's foot;
a motor assembly inserted at least partially into the cavity and releasably mounted within the sole cavity and having a generally flat surface to both support the removable member and transfer vibration from the motor assembly to the wearer's foot and the shoe through the removable member;
a battery operated vibrating means included with the motor assembly and located within the cavity; and
an actuator switch.

5,592,760
LABOR-SAVING MATERIALS DISPENSER
Darryl A. Kobout, P.O. Box 524, Waite Park, Minn. 56387
Filed Jul. 25, 1995, Ser. No. 506,709
Int. Cl.[6] E02F 5/22
U.S. Cl. 37—403 8 Claims



1. A materials dispenser, comprising:
a materials receptacle having a rear wall, a first side and an opposing second side, said first side having a dispensing aperture and said second side having an axle mounting aperture;
a generally rectangular vertical mounting plate disposed in said materials receptacle, said mounting plate having an auger aperture and a motor aperture;
a motor means;
a drive axle extending from, and rotated by, said motor means, said drive axle extending through said motor aperture in said vertical mounting plate;
a drive gear mounted on said drive axle;
an auger having a first end and a second end, said first end of said auger disposed proximate said dispensing aperture, said second end of said auger extending through said auger aperture;
a tubular guidance flange including a semicircular extension mounted within said receptacle at said dispensing aperture said extension supporting said first end of said auger;
a drive chain;
an auger gear mounted on said second end of said auger, said drive chain engaging said drive gear and said auger gear; and
a first bearing unit supporting said auger at said auger aperture and a second bearing unit supporting said auger at said axle mounting aperture.

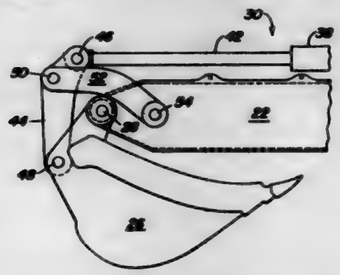
5,592,761
BACKHOE SCARIFYING APPARATUS
Arthur A. Ward, 17232 Anne Freda St., Canyon Country, Calif. 91351
Filed Aug. 7, 1995, Ser. No. 511,925
Int. Cl.[6] E02F 3/96
U.S. Cl. 37—403 5 Claims



1. In a backhoe tractor for dislodging of and collection of soil during a trench excavation procedure, including a hydraulic power system and a hydraulically actuated boom assembly mounted on said backhoe tractor, the improvement which comprises the combination:
a bucket pivotally connected to said boom assembly having a terminating edge between opposite sides leading into a storage cavity for gathering and receiving hard ground;
an elongated cylindrical roller rotatably carried on said bucket opposite sides parallel to and facing said terminating edge of said bucket in fixed spaced relationship and having a plurality of outwardly and radially projecting elements arranged in staggered rows and columns from said roller in close proximity to said terminating edge;
each of said elements is characterized as being replaceable and deployed about the circumference of said roller;
motor means carried on said bucket for driving said roller and including means of connection to said hydraulic power system of the backhoe tractor;
said rotatable roller disposed with respect to said bucket storage cavity for reception and collection of dislodged soil;

said elements outwardly projecting at an angle with respect to said roller;
said roller having end portions outwardly projecting from opposite ends of said roller;
said end portions having splines;
end pieces having splined bores matable with said splined end portions to retain said roller on said bucket;
a plurality of teeth means carried on each end piece;
smooth shank and bore means matably supporting said teeth means on said end pieces; and
a lock ring releasably retaining each of said teeth means on said end piece.

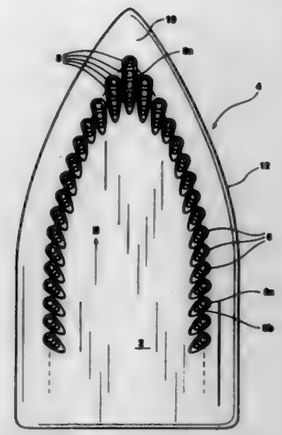
5,592,762
EXCAVATOR BUCKET LINKAGE
Scott S. Hendron, and Michael E. Kennedy, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Aug. 16, 1995, Ser. No. 515,851
Int. Cl.[6] E02F 3/32
U.S. Cl. 37—443 **6 Claims**



1. A bucket linkage for manipulating an excavator bucket that is pivotally attached to an excavator dipperstick, the bucket linkage comprising:
a hydraulic cylinder having a cylinder end that is pivotally coupled to said excavator dipperstick and having an opposite rod end;
a ternary link having a first pivot connection being pivotally coupled to the rod end of the hydraulic cylinder, a second pivot connection being pivotally coupled to said excavator bucket, and a third pivot connection located between the first and second pivot connections, the first and second pivot connections of the ternary link define a plane and the third pivot connection lies above the plane away from said excavator dipperstick; and
a follower link having a first pivot connection pivotally coupling the follower link to the excavator dipperstick and a second pivot connection pivotally coupling the follower link to the third pivot connection of the ternary link.

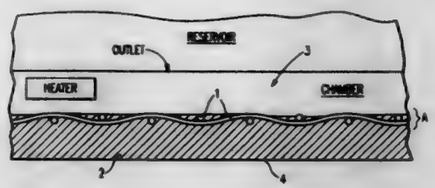
5,592,763
STEAM DISCHARGE AND STEAM DISTRIBUTION MEANS
Andreu Halmewald, Droieich, Germany; Augustin Auria, Esplugues de Llobregat, Spain; Miguel Jiminez, Molins de Rei, Spain; Miguel Vazquez, Barcelona, Spain; Francesc Carreras, Sant Just Desvern, Spain, and Juan C. Cervando, Barcelona, Spain, assignors to Braun Aktiengesellschaft, Kronberg, Germany
Filed Apr. 6, 1995, Ser. No. 418,177
Claims priority, application Germany, Apr. 6, 1994, 44 22 087.1; Apr. 6, 1994, 44 11 790.6
Int. Cl.[6] D06F 75/20
U.S. Cl. 38—77.9 **6 Claims**

1. A soleplate of a steam iron, the soleplate including:
a pressing surface;



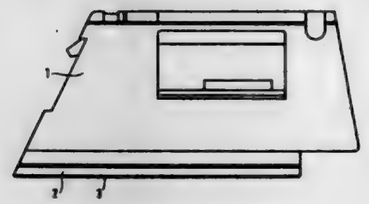
a plurality of beads formed in the pressing surface; and
a plurality of steam outlet openings located in the soleplate, wherein at least two of the steam outlet openings are located in one of the beads, a first one of the at least two steam outlet openings having a different size than a second one of the at least two steam outlet openings.

5,592,764
EVAPORATION CHAMBER WITH ANTI-CALEFACTION LAYER
Henry Bouiud, La Plaine, and Jean-Louis Brandellini, Saint-Etienne, both of France, assignors to SEB S.A., Aviouges, France
PCT No. PCT/FR94/00877, § 371 Date Apr. 27, 1995, § 102(e) Date Apr. 27, 1995, PCT Pub. No. WO95/02787, PCT Pub. Date Jan. 26, 1995
PCT Filed Jul. 13, 1994, Ser. No. 397,858
Claims priority, application France, Jul. 16, 1993, 93 08988
Int. Cl.[6] D06F 75/18
U.S. Cl. 38—77.83 **16 Claims**



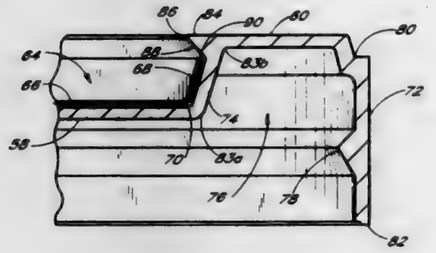
1. A steam generating device including an evaporation chamber for evaporating a liquid which is delivered from a reservoir while the chamber is being heated, which chamber includes a base comprising: a body of thermally conductive material having an upper surface against which the liquid to be evaporated is directed. said body having a surface layer extending from the upper surface; and hydrophilic fibers distributed across the upper surface and at least partially and locally embedded in said surface layer.

5,592,765
IRON HAVING AN ANTI-FRICTION LAYER
Emmanuel W. J. L. Oomen, Eindhoven, and Hans De Bourr, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 23, 1994, Ser. No. 294,287
Claims priority, application Belgium, Aug. 23, 1994, 09300858
Int. Cl.[6] D06F 75/38
U.S. Cl. 38—93 **13 Claims**



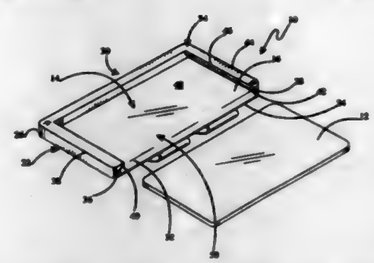
1. An iron comprising a metal soleplate which is provided with an anti-friction layer, wherein in the anti-friction layer comprises an inorganic polymer.

5,592,766
CONTAINER LID/CLOSURE WITH PRINTED CLOSURE INSERT
Leonard T. Mygatt, 12791 Panorama Pl., Santa Ana, Calif. 92705
Filed Jun. 7, 1995, Ser. No. 484,957
Int. Cl.[6] G09F 3/20
U.S. Cl. 40—307 **31 Claims**



30. A closure for a container, comprising:
a planar top wall forming an uppermost surface on said closure and having an inner and outer periphery;
an outer skirt depending downwardly from the outer periphery of said top wall, said skirt adapted to removably engage a container rim;
a central recess having a floor spaced below said top wall;
a product label insert captured within said recess, said insert having a main body defined by a periphery sized to fit within said recess;
a recess side wall connected at an upper end to the inner periphery of said top wall and at a lower end to said floor, said side wall having a portion angled downwardly and radially outwardly from said top wall to an outermost periphery.

5,592,767
HOLDER FOR IDENTIFICATION CARDS
Dieter Trenka, 13700 Bellevue Dr., Minnetonka, Minn. 55345
Filed Dec. 5, 1994, Ser. No. 349,545
Int. Cl.[6] G09F 3/20
U.S. Cl. 40—649 **19 Claims**



16. A holder for retaining and displaying a card, comprising:
a) a panel having a front portion, a back portion, and a perimeter wall interconnecting said front portion with said back portion;
b) a frame having first and second ends forming an open top, said frame being integral with said perimeter wall, said frame extends perpendicularly outward from the front portion of said panel and terminates in a lip extending perpendicularly inward, wherein said frame and said panel cooperate to:
(i) form said holder having an open front, thereby permitting viewing of the card.
(ii) form the open top which permits insertion and removal of the card, and
(iii) define a card retaining slot wherein a card is retainable within the frame between the front portion of said panel and said lip;
c) a first holder attachment means comprising a first flexible clip integral and extending from said back portion of said panel, said flexible clip having first and second slots extending therethrough; and
d) a second holder attachment means secured through said first and second slots of said first clip.

5,592,768
PHOTOGRAPH DISPLAY DEVICE
Richard J. Testa, 352 Lansing Rd., Honeoye Falls, N.Y. 14472
Filed Dec. 6, 1994, Ser. No. 349,907
Int. Cl.[6] G09F 1/00
U.S. Cl. 40—786 **29 Claims**



1. A photograph display device comprising:
a piece of a first material having a top surface and a bottom surface;
at least two substantially parallel creases separating the piece of first material into at least three panels, a third panel of the at least three panels folding over a second panel of the at least three panels and a first panel of the at least three panels folding over the third panel;

a die cut in the first panel adapted to display a photograph selectively held between the first and third panels; and

a first arcuate crease on the second panel, the first arcuate crease delineating a selectively foldable curved portion of the third panel which, when folded substantially perpendicular to the third panel and toward the first panel, bears against the first panel and forces the first and second panels to assume opposite curvatures.

5,592,769

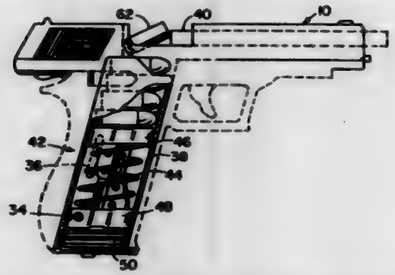
AUTOMATIC CARTRIDGE MONITORING AND INDICATOR SYSTEM FOR A FIREARM

Michael J. Villani, 11 Cranmer Rd., Hyannis, Mass. 02601

Filed Jun. 27, 1994, Ser. No. 266,943

Int. Cl.[6] F41A 9/62

U.S. Cl. 42—1.02 **75 Claims**



1. An automatic cartridge monitoring and indicator system for a firearm having a cartridge chamber comprising:

a magazine for storing a plurality of cartridges;

a follower mechanism in said magazine for feeding said cartridges from said magazine into the firearm; said follower mechanism includes a follower element, an intermediate element spaced from said follower element, a first spring device between said elements and a second spring device engaged with the side of said intermediate element opposite said first spring device; said first spring device opens before said second spring device and remains open while said second spring device opens;

an actuator moveable with said follower mechanism;

monitoring means disposed along the path of said follower mechanism and operable by said actuator for monitoring the level of said follower mechanism and the level of cartridges in said magazine and in said chamber; and

an indicator device, responsive to said monitoring means, for providing a representation of the level of cartridges in the magazine and in said chamber.

5,592,770

SHOTGUN MOUNTED LAUNCHING DEVICE AND LAUNCHING PROJECTILE

John Gudgel, 840 N. Oswego, Tulsa, Okla. 74115

Filed Jun. 19, 1996, Ser. No. 666,756

Int. Cl.[6] F41C 27/06

U.S. Cl. 42—105 **5 Claims**



1. A launching device for a shotgun for use in training retrieving dogs wherein the shotgun is provided with a barrel and wherein the device comprises an adapter shaft having a longitudinal bore extending therethrough, said adapter shaft having a first end adapted to be received in the barrel of the shotgun and a second end opposite from said first end and upon which is mounted a disc-shaped shield plate, a cylindrical male launching tube mounted on a side of said shield plate opposite from said adapter shall and having an external diameter larger than that of said adapter shaft, said male launching tube having a longitudinal bore therethrough, the longitudinal bore of said male launching tube being of larger diameter than the longitudinal bore of said adapter shaft and communicating with the longitudinal bore of said adapter shaft through said shield plate, a projectile adapted to fit over said male launching tube, whereby, when a blank is fired in said shotgun, the projectile will be launched away from the male launching tube so that a retriever can associate the firing of the blank with the launching of the projectile.

5,592,771

TUBULAR FISHING ROD AND ITS METHOD OF MANUFACTURE

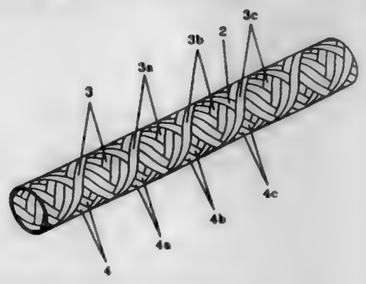
Young-Mook Kim, Pusan, Rep. of Korea, assignor to Wonder Co., Ltd., Pusan, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 365,943

Claims priority, application Rep. of Korea, Jan. 12, 1994, 1994-539

Int. Cl.[6] A01K 87/00

U.S. Cl. 43—18.1 **4 Claims**



1. A tubular fishing rod comprising:

a first plurality of multiple helical windings of a tow or yarn, in one direction and at a right-hand pitch;

a second plurality of multiple helical windings of a tow or yarn wound in the reverse direction and at a left-hand pitch, said second plurality of multiple helical windings being intertwined with said first plurality of multiple helical windings thereby defining a crosswise tubular weave construction which is both strong and flexible, all of the weaving being one of the right-hand and left-hand pitches and the right-hand and left-hand pitches being a generally uniform, constant pitch except for at ends of the fishing rod, the first and second multiple helical windings being free of internal structures such that the fishing rod is hollow and is made only from the plurality of windings.

5,592,772

FISHING ROD AND ITS METHOD OF MANUFACTURE

Young-Mook Kim, Pusan, Rep. of Korea, assignor to Wonder Co., Ltd., Pusan, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,042

Claims priority, application Rep. of Korea, Apr. 23, 1994, 1994-8746

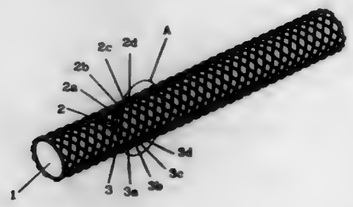
Int. Cl.[6] A01K 87/00

U.S. Cl. 43—18.1 **6 Claims**

1. A fishing rod comprising:

a tubular rod having two ends;

a first plurality of weavings of tow or yarn helically and longitudinally wound around said tubular rod in a first direction; and



a second plurality of weavings of tow or yarn helically and longitudinally wound around said tubular rod in a second direction, the first direction being opposite to the second direction,

said first and second plurality of weavings being woven together such that they cross each other in the longitudinal direction in an over-under relationship to define a crosswise tubular weave construction which is both strong and flexible, the first and second plurality of weavings crossing one another at locations distributed around a circumference of the tubular rod,

each weaving of the first plurality of weavings crosses the weavings of said second plurality of weavings, two at a time in said over-under relationship and each weaving of said second plurality of weavings crosses the weaving of said first plurality of weavings two at a time in said over-under relationship,

the first plurality of weavings being wound at a first pitch and the plurality of second weavings being wound at a second pitch, the first pitch being one of a right-hand and left-hand pitch and the second pitch being the other of a right-hand and left-hand pitch, and weavings being made around the rod at only the first and second pitches except for the ends of the rods.

5,592,773

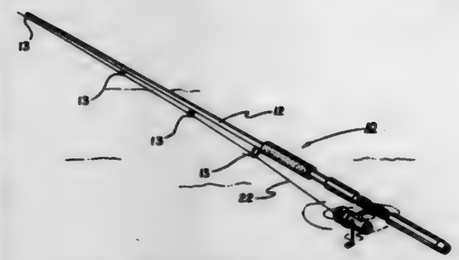
FISHING ROD FLOTATION DEVICE

Mickey J. Perry, Box 806, McCamey, Tex. 79752

Filed Oct. 6, 1995, Ser. No. 540,048

Int. Cl.[6] H01K 87/00

U.S. Cl. 43—25 **5 Claims**



1. A new and improved fishing flotation device comprising a float member selectively and removably attachable to said fishing rod along an axial length thereof, said float member being resiliently deformable during attachment to said fishing rod and being frictionally retained in engagement with said fishing rod after said attachment thereto, said float member being of a cylindrical design and having a hollow core extending therethrough along an axial length thereof, said fishing rod being retained within said hollow core when attached to said float member, said float member including a slit along said axial length thereof, said slit extending completely through a side wall of said float member and being operable to receive said fishing rod therethrough when said float member is engaged to said rod, said slit defining a plane which is angularly displaced to a radial plane extending through and being aligned with an axial center line of said hollow core, said slit being angulated so as to provide a firmer and more secure grip of said float member with said fishing rod when said fishing rod is retained within said hollow core.

5,592,774

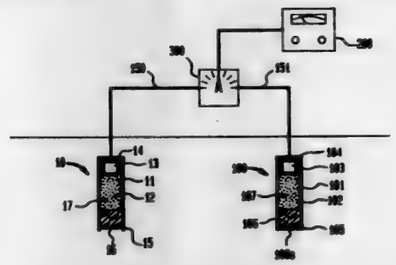
TERMITE ACTIVITY REMOTE MONITORING AND INFORMATION SYSTEM

Stanley D. Galyon, Maynardville, Tenn., assignor to Nieus Corp., Knoxville, Tenn.

Filed Feb. 10, 1994, Ser. No. 195,856

Int. Cl.[6] A01M 1/20

U.S. Cl. 43—124 **19 Claims**



1. A system for use in the determination and/or control of termite infestation comprising: at least one sensing station including a generally impermeable housing, said housing defining a first hollow inner chamber, a first sensor capable of sensing evidence of termites and ambient environmental factors disposed within said first chamber, a means for allowing termites and ambient environmental factors access into said first chamber, and a bait disposed within said first chamber; and a detector operably linked to said first sensor wherein said first sensor is a moisture sensor, methane gas sensor, or pH sensor.

5,592,775

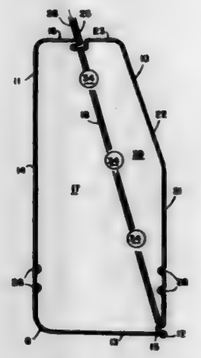
PACKAGE FOR SPROUTS

Diana Dew, 17671-133rd Way N., Jupiter, Fla. 33478

Filed Jan. 22, 1996, Ser. No. 589,524

Int. Cl.[6] A01G 31/00

U.S. Cl. 47—61 **12 Claims**

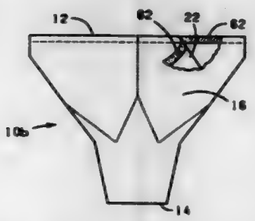


1. A system for containing sprouts comprising a one piece transparent container comprising:

1) a rear portion comprising:

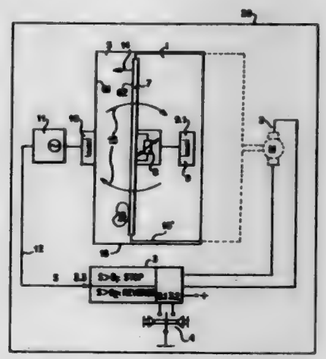
a) a horizontal bottom panel forming a base for resting the container on a support surface;
b) a vertical back panel joined to the bottom panel and extending upward therefrom;
c) a horizontal top panel joined to the back panel and extending forward therefrom;
d) first and second side panels joining the bottom, back and top panels at three edges thereof and having an unjoined fourth edge extending diagonally from the top panel to the bottom panel; and
e) a rectangular perimeter;
2) a front portion comprising:
a) a horizontal top wall;
b) a vertical front wall of a lesser height than the back panel;
c) a sloping wall connecting the top wall to the front wall;
d) first and second side walls joining the top, sloping and front walls at three margins thereof and having an unjoined fourth margin extending diagonally from the top wall to the front wall; and
e) a rectangular perimeter;
3) a hinge means for hingedly joining the front portion to the rear portion;
4) the perimeters of the front and rear portions provided with sealing means for coacting and sealingly locking the portions together when the perimeters are forced together; and
5) at least one ventilating passage formed in at least one of the unjoined fourth edges of the side panels and the unjoined fourth margins of the side walls, the at least one ventilating passage positioned above the lower portion of the container so that the lower portion of the container, when closed, will be impervious to liquid.

5,592,776
SEALABLE FLORAL SLEEVE HAVING A DETACHABLE PORTION
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.
Continuation of Ser. No. 237,878, May 3, 1994, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, Pat. No. 5,572,851, and Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482. This application Jun. 5, 1995, Ser. No. 463,645
Int. Cl.[6] A01G *9/02*
U.S. Cl. 47—72 **47 Claims**



1. A tubular sleeve comprising:
a base portion having a lower end, an upper end, an outer surface and a retaining space for enclosing a pot means having an outer peripheral surface, and defined as that portion of the tubular sleeve which is substantially adjacent to and surrounds the outer peripheral surface of the pot means;
a skirt portion extending beyond the upper end of the base portion and having an upper peripheral edge and shaped and dimensioned to extend a distance from the base without substantially encompassing a floral grouping disposed within the pot means;
a sleeve portion having an upper end and a lower end, the lower end connected to the skirt portion and detachable therefrom and extending a distance therefrom, and sized to substantially surround and encompass the floral grouping prior to detachment of the sleeve portion; and
sealing means for sealing the sleeve portion near the upper end thereof.

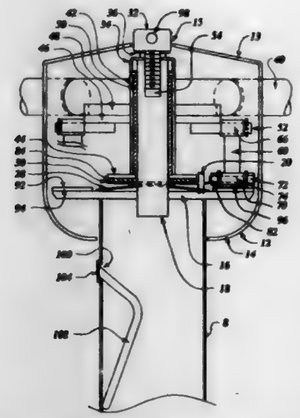
5,592,777
APPARATUS FOR INTERRUPTING OPERATION OF A MOTOR DRIVEN MOVABLE MEMBER UPON CONTACTING AN OBSTACLE
Volker Petri, Aidlingen; Reinhold Mickeler, Altdorf, and Michael Meyer, Sindelfingen, all of Germany, assignors to Mercedes-Benz AG, Germany
Filed Sep. 26, 1995, Ser. No. 534,156
Claims priority, application Germany, Sep. 26, 1994, 44 34 334.5
Int. Cl.[6] E05F *15/02*
U.S. Cl. 49—28 **12 Claims**



1. Apparatus adopted to interrupt closing operation of a movable closing member driven by an electric motor in a motor vehicle, upon detection of an obstacle which obstructs such closing operation, said apparatus comprising:
a pressure-sensitive sensor strip which is arranged on a closing edge of said movable closing member, and which emits a signal when pressure is applied;
an electronic control device for controlling said electric motor which drives the closing member, said electronic control device having a control input driven by a sensor signal derived from the signal from the sensor strip, for halting or reversing operation of said motor;
a base station arranged on a stationary part of said vehicle, which generates an alternating electromagnetic field; and
a responsive circuit arranged on said closing member and connected to receive said signal from said sensor strip, said responsive circuit being coupled by said electromagnetic field generated by said base station, and being driven by said signal from said sensor strip to modify said electromagnetic field as a function thereof;
wherein said base station evaluates changes in the alternating electromagnetic field, and generates said sensor signal in response thereto.

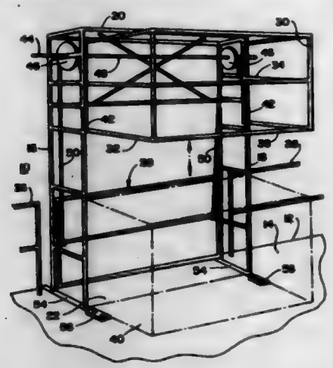
5,592,778
SAFETY TURNSTILE
John D. McGuire, Brampton, Canada, assignor to Brascon Architectural Products Inc.
Filed Nov. 17, 1994, Ser. No. 344,808
Int. Cl.[6] E05D *15/02*
U.S. Cl. 49—42 **15 Claims**

1. A turnstile comprising:
a stator assembly;



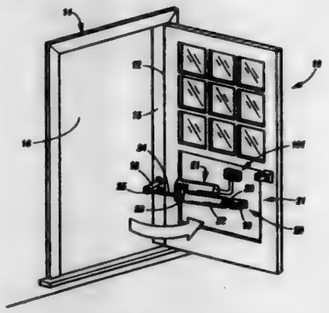
a rotor assembly coaxially mounted for rotation about said stator assembly;
said stator assembly including one of: (a) a bearing surface or (b) at least one drag shoe assembly;
said rotor assembly including the other of: (a) at least one drag shoe assembly or (b) a bearing surface;
displaceable means adapted to be moved from a first position in which said drag shoe assembly is disengaged from said bearing surface to a second position wherein said drag shoe assembly rests against and angularly engages said bearing surface
whereby in said second position pivotal motion of said rotor assembly in a first direction of rotation with respect to said stator assembly is accompanied by sliding engagement of said at least one drag shoe assembly with said bearing surface and pivotal motion of said rotor assembly in a second, opposite, direction of rotation with respect to said stator assembly is accompanied by jamming of said drag shoe assembly with said bearing surface.

5,592,779
EXPANDED AREA SAFETY GATE
James M. Conway, 9 Woodcrest Rd., Manchester, Mass. 01944
Continuation-in-part of Ser. No. 342,598, Nov. 21, 1994. This application Jul. 31, 1995, Ser. No. 509,346
Int. Cl.[6] E06B *3/32*
U.S. Cl. 49—73.1 **11 Claims**



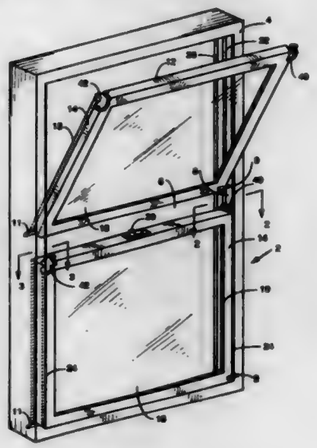
1. A safety gate assembly for providing a defined safe work and shipping area at the edge of a raised or mezzanine floor, comprising:
a frame assembly having a pair of spaced apart side rails secured together at their uppermost ends by an overhead horizontally disposed transverse frame arrangement, said frame assembly defining a generally rectangularly shaped box-like enclosure;
a front gate assembly vertically moveable on and with respect to said frame assembly which is comprised of said side rails;
a rear gate assembly, vertically movable on and with respect to said frame assembly, said rear gate assembly defining a three-sided further box-like space having a generally rectangularly shaped footprint for defining a protected further work and shipping area within said gate assembly, and a balancing means arranged between said gates and said frame assembly, to permit each of said gates to be movable in opposite directions, simultaneously with respect to one another.

5,592,780
DOOR POSITION CONTROLLING APPARATUS
Peter Checkovich, 8 Locust St., Burlington, Mass. 01803
Filed Jun. 7, 1995, Ser. No. 479,151
Int. Cl.[6] E05F *1/10;3/00*
U.S. Cl. 49—386 **20 Claims**



1. An apparatus for controlling the position of a door relative to a door frame, the door having a piston closing assembly attached thereto, the piston closing assembly including a cylinder, a connecting rod connected at a frame end to the door frame and at a door end to the door, the connecting rod slidably extending from an end of the cylinder such that the connecting rod may slide into the end of the cylinder to allow the door to be closed and out from the end of the cylinder to allow the door to be opened, and a latch plate carried around the connecting rod such that in a non-tilted position the connecting rod travels generally smoothly though the latch plate and by tilting the latch plate to a blocking position, the connecting rod is prevented from sliding into the cylinder and the door is prevented from closing, said controlling apparatus comprising:
means for tilting the latch plate to the blocking position to prevent further movement of the connecting rod into the cylinder and the door thereby to close, said tilting means including an electromagnet positioned in proximity to a surface of the latch plate such that when such electromagnet is activated the latch plate is tilted to the blocking position, said tilting means mounted adjacent to the piston closing assembly by a mounting container;
an actuator communicating with said tilting means to activate said electromagnet and cause the latch plate to tilt to the blocking position;
means for flexing the latch plate to the not-tilted position, said flexing means connected to the latch plate and sized and shaped and having a composition such that the latch plate is maintained in the non-tilted position without activation of the tilting means; and
a backing plate connected to said flexing means and to said mounting container such that the latch plate surface is confinably positioned proximate to said tilting means so that the latch plate is tiltable upon activation of said electromagnet.

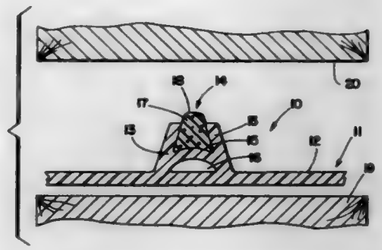
5,592,781
ROTATING TILT LATCH
Gerald D. Mauro, 135 Springhouse La., Pittsburgh, Pa. 15238
Filed May 19, 1995, Ser. No. 444,906
Int. Cl.[6] E05B 65/08; E05C 17/00;19/00
U.S. Cl. 49—394 12 Claims



1. A window, comprising:
a frame having a sash opening therein and at least one sash engaging surface;
at least one sash having at least one pane member and at least one frame engaging surface and being slidably mounted in said sash opening of said frame so that said frame engaging surface engages said sash engaging surface;
at least one sash stop mounted in said frame and being movable between an extended position and a retracted position, said sash stop structured to maintain said sash in position in said sash opening of said frame when said sash stop is in the extended position, said sash stop including resilient means between said frame and said sash stop for urging said sash stop into the extended position; and
at least one latch rotatably mounted on said sash positioned adjacent to said sash stop and being rotatable between a closed position in which said latch does not engage said sash stop and an open position in which said latch engages and depresses said sash stop, whereby said sash may be at least partially removed from said frame.

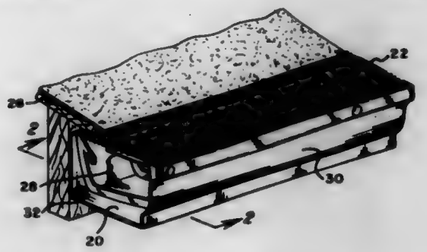
5,592,782
POLYMERIC SEALING/SPRING STRIP AND EXTRUSION METHOD OF PRODUCING SAME
Michael K. Scott, Hilliard, Ohio, assignor to Crane Plastics Company Limited Partnership, Columbus, Ohio
Continuation of Ser. No. 313,419, Sep. 27, 1994, abandoned, which is a division of Ser. No. 7,187, Jan. 21, 1993, Pat. No. 5,375,376. This application Jul. 26, 1995, Ser. No. 507,547
Int. Cl.[6] E06B 7/16
U.S. Cl. 49—489.1 2 Claims

1. A sealing/spring strip, said sealing/spring strip comprising: a longitudinally extending polymer and silicone rubber composite strip, said strip having a cross-section, said cross-section comprising:
(i) a polymeric base portion having first and second sides providing respective first and second surfaces, and having a longitudinally extending well formed in said first side; and
(ii) a cured silicone rubber bead disposed in said well and extending from said well so as to form a resilient surface of silicone rubber extending from said first surface; and



(iii) a longitudinal sealing member disposed in said well and enclosing a space therein whereby a portion of said well is rendered unavailable for filling by said silicone rubber.

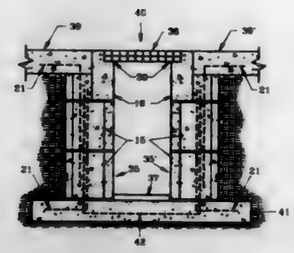
5,592,783
GUTTER GUARD
Lawrence P. Jones, 318 Westminster Ave., Cherry Hill, N.J. 08002
Filed Jun. 7, 1995, Ser. No. 488,335
Int. Cl.[6] E04D 13/00
U.S. Cl. 52—12 6 Claims



1. In combination with a gutter having a front wall, a rear wall, a bottom wall and a predetermined axial length; a gutter guard for preventing the clogging of said gutter comprising:
a coil spring spiral member having a top, a bottom, first and second ends, and including a plurality of turns, each of said turns being substantially equal in size and being aligned with one another, said spiral member being adapted for movement between a contracted condition and an expanded condition, and
a mesh screen attached to the top of said spiral member along the length thereof, said mesh screen being substantially planar when said spiral member is in its expanded condition.

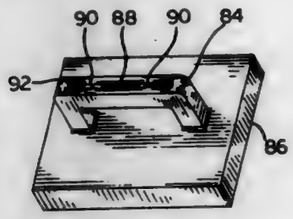
5,592,784
TRENCH STRUCTURE
Kirk N. Nivens, Seabrook, S.C., assignor to Forma Block, Inc., Beaufort, S.C.
Continuation-in-part of Ser. No. 147,293, Nov. 5, 1993, abandoned. This application Oct. 27, 1994, Ser. No. 329,833
Int. Cl.[6] E02D 29/14
U.S. Cl. 52—20 17 Claims

13. A trench structure for a drain or chase comprising: a first and a second cap block, said first and second cap block each of uniform concrete composition, said first and said second cap block each comprising: a face section, said face section having rear, front, top, bottom, and first and second side surfaces, said face section defining a notch along the front top edge; a support section, said support section defining a vertical channel, said vertical channel extending the entire height of said support section, said support section



having rear, front, top, bottom, and first and second side surfaces, the longitudinal length of said support section less than the longitudinal length of said face section, said front surface of said support section joined to said rear surface of said face section, said first side surface of said support section flush with said first side surface of said face section; a horizontal extension, said horizontal extension longitudinally extending from said first side surface of said support section and having a depth less than the depth of said support section, said bottom surface of said support section flush with said bottom surface of said face section, said support section having a height less than said face section wherein said first side surface of said face section, said first side surface of said support section and said horizontal extension for complementary reception of second side surfaces of an adjacent cap block, said first cap block front surface oppositely positioned to said front face of said second cap block and spaced therefrom to form a channel therebetween, a drain cover, said cover positioned between said first and said second cap blocks and resting within said notches thereof.

5,592,785
HANDLE FOR SUBTERRANEAN CONCRETE COVERS
Norman W. Gavin, 2545 Ridge Rd., North Haven, Conn. 06473
Filed Feb. 17, 1995, Ser. No. 392,357
Int. Cl.[6] F02D 29/14
U.S. Cl. 52—20 5 Claims

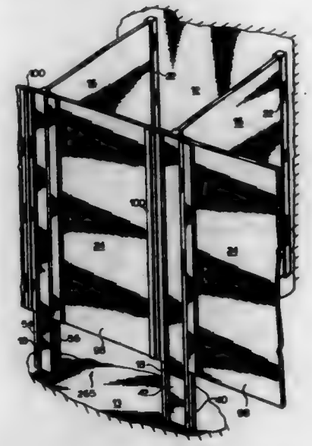


1. An assembly comprising in combination: a concrete cover for a subterranean construction, a plastic handle comprising a first end and a second end, said first end being cast in said concrete cover, and said second end being external of said cover, a first piece of rebar mounted on said second end, and a second piece of rebar held by said first end in said cover.

5,592,786
WALL PROTECTOR
Christian P. Kamm, Fairview Park, Ohio, assignor to Wilkinson Company, Stow, Ohio
Filed Jun. 1, 1995, Ser. No. 456,696
Int. Cl.[6] E04F 11/18
U.S. Cl. 52—28 33 Claims

1. A wall protector comprising:
a bumper having first and second spaced ends, a front wall having a channel therein between said first end and said second end, and rear a wall providing an opening between said first end and said second end;
light means disposed in said channel: for providing illumination:
first mounting means for clampingly interengaging with said rear wall:
a bracket for mounting on a wall; and
attachment means for attaching said first mounting means to said bracket.

5,592,787
MODULAR PARTITION SYSTEM
Heiner Ophardt, 3931 Vineyard Cres., Vineland, Ontario, Canada
Filed Jun. 8, 1995, Ser. No. 488,607
Claims priority, application Canada, May 25, 1995, 2150174
Int. Cl.[6] A47F 10/00
U.S. Cl. 52—34 22 Claims



3. A modular partition construction comprising;
first and second vertical post means, said first post means spaced from said second post means and defining a door opening for a first cubicle therebetween,
door means pivotally disposed in said door opening, the door means including a door panel and hinge means for hingely coupling said door panel to one of said first and second post means,

planar divider panel means having a forward vertical edge portion and a rearward vertical edge portion for defining a first side of said first cubicle, and

a plurality of elongate support channel members each being elongated along a longitudinal axis and in cross-section through said axis having a generally rectangular C-shape with parallel spaced front and rear sides, said rear side defining an opening therethrough extending the length on said channel member parallel to said axis, said opening having a dimension sized to receive therein one edge portion of said divider panel means,

said first post means comprising first pilaster means and a first one of said channel members, said first pilaster means having a forward and rearward facing vertical surfaces, and slot means for engaging said first channel member extending vertically along said rearward surface, the slot means and front side of the channel member configured to permit the front side of the channel member to be slid into the slot means so that the first channel member and first pilaster means are fixed to each other for relative longitudinal sliding,

wherein in assembly, said first channel member is coupled to said first pilaster member with said front side disposed in said slot means,

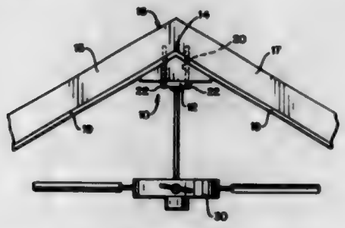
the first vertical edge portion of said divider panel means is secured in said first channel member opening, and the second vertical edge portion of the panel means is secured in the opening of a second one of said channel members which is spaced from said first channel member.

5,592,788

CATHEDRAL CEILING FIXTURE MOUNTING SYSTEM

James M. Corridon, 4929 Tibbitt Ln., Burke, Va. 22015

Filed May 13, 1994, Ser. No. 242,231
Int. Cl.[6] E04F 19/00
U.S. Cl. 52—39 10 Claims



1. Apparatus for providing a flush surface for a ceiling fixture at the ridge of a cathedral ceiling, comprising:

a base mount member having a planar lower surface and two planar upper surfaces which angle upwardly and meet at an apex to form a first pitch angle;

a pitch mount member having two planar lower surfaces which meet at an apex and two planar upper surfaces which meet at an apex to form a second pitch angle wherein said second pitch angle is steeper than said first pitch angle; and

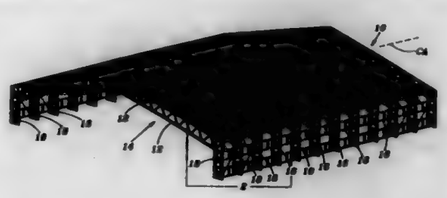
means for mounting said pitch mount member on said base mount member in a stacked configuration such that said planar lower surfaces of said pitch mount member abut the planar upper surfaces of said base mount member along the entire length thereof in substantially flush relation.

5,592,789

MODULAR SUPPORTING STRUCTURE

William D. Liddell, Sr., Boston, Mass., and Raymond W. Hawes, Peterborough, N.H., assignors to American Containment Systems, Inc., Boston, Mass.

Filed Jun. 13, 1995, Ser. No. 490,060
Int. Cl.[6] E04B 1/19
U.S. Cl. 52—63 16 Claims



1. A supporting structure comprising:

(a) a plurality of elongated base structural members each having first and second ends defining the length thereof and each base structural member being defined in part by a hollow tubular portion extending coextensively therewith, the hollow tubular portion of each base structural member having a given width defined by opposed transverse sides;

(b) a plurality of bracing members each having first and second ends which define the length thereof;

(c) attachment means formed on said first and second ends of said bracing members for engaging with a surface on one of said plurality of elongated base structural members to effect a connection therebetween;

(d) each of said plurality of elongated base structural members having a keyhole slot formed in the transverse sides thereof, each of said keyhole slots being sized and shaped to receive and hold the attachment means of one of said first and second ends of said bracing members; and

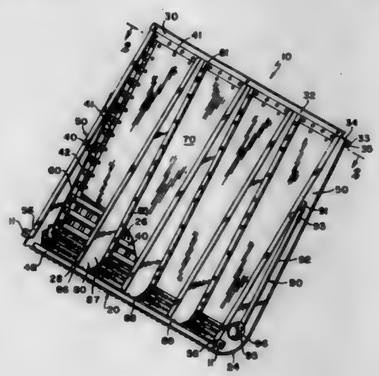
(e) each of said plurality of elongate base members including a locking bolt securement means integrally formed as part of said hollow portion thereof and extending coextensively with the length of each base structural member and exclusively of engagement with said attachment means for receiving and locking a locking bolt to be secured within said securement means at infinite positions therealong.

5,592,790

REINFORCED AWNING

Antonio Requejo, 13280 NW. 43 Ave., Opalocka, Fla. 33054

Filed Feb. 3, 1995, Ser. No. 383,406
Int. Cl.[6] E04B 1/34
U.S. Cl. 52—77 5 Claims



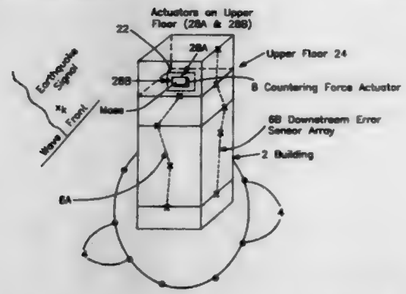
1. In an aluminium awning mounted above a building opening to be protected and said aluminium awning being of the type that includes a plurality of partially superimposed elongated slats, having first and second ends, and said slats forming a cover assembly defining rear, front and lateral sides, the slats bring mounted on a plurality of spaced apart and parallel purlin members, hinge means with first and second leaf members and said first leaf member being mounted to said first ends of said slats which are aligned and define said rear side, and the other leaf member adapted to be mounted above said opening, and said awning further including two side stiffener members, having an upper and a lower flange each, and said lateral sides of said cover assembly being mounted to upper flanges, the improvement comprising a sheet member mounted on said purlin members at a spaced apart and parallel relationship with respect to said elongated slats.

5,592,791

ACTIVE CONTROLLER FOR THE ATTENUATION OF MECHANICAL VIBRATIONS

Camille M. D'Annunzio, Gaithersburg, Md., and Charles E. Chassaing, Raleigh, N.C., assignors to Radix Sytems, Inc., Rockville, Md.

Filed May 24, 1995, Ser. No. 450,678
Int. Cl.[6] E04B 1/98
U.S. Cl. 52—167.2 24 Claims



1. An active vibration control system for attenuating an input vibration field within a building structure resulting from externally applied, seismic or other environmentally induced, disturbances acting upon the building structure, the control system comprising:

a plurality of input sensors positionable about a building structure for sensing incoming disturbances in advance of the disturbances reaching the building structure and for converting such sensed disturbances to a reference signal;

orthogonal component separation means for receiving the reference signal and converting the reference signal into orthogonal reference signal components;

a plurality of output sensors positionable on a building structure for sensing building structure vibrations and for converting such sensed vibrations to orthogonal output signals;

vibration actuator means for imparting a cancellation vibration field to a building structure so as to counteract said input vibration field and to reduce building structure vibrations, said vibration actuator means including orthogonally oriented actuators responsive to orthogonal actuator driving signals;

plural orthogonal feed forward controller means for receiving said orthogonal reference signal components and said orthogonal output signals and for providing orthogonal actuator driving signals to said vibration actuator means, said plural orthogonal feed forward controller means comprising a plurality of feed forward controllers corresponding in number to the number of orthogonal reference signal components, each controller comprising:

first controller input means for receiving one of said orthogonal reference signal components;

second controller input means for receiving a corresponding orthogonal output signal;

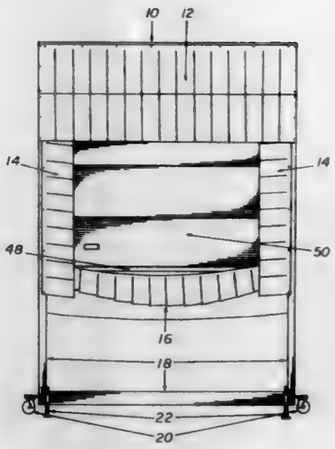
digital signal processing means for response to said orthogonal reference signal component and said orthogonal output signal and for providing an orthogonal actuator driving signal to said vibration actuator means so as to drive said orthogonally oriented actuators to impart a cancellation vibration field to the building structure to counteract said input vibration field.

5,592,792

SELF SEALING POTATO TRUCK LOADING DOCK

Craig F. Meehan, 211 Third Ave. SE., New Rockford, N. Dak. 58365, and Lyle G. Forde, 220 Seventh Ave. North, Carrington, N. Dak. 58421

Filed Jun. 21, 1995, Ser. No. 493,097
Int. Cl.[6] E04B 1/34
U.S. Cl. 52—173.2 9 Claims



1. A portable self sealing loading dock for use with a potato truck having rear doors, a center mounted conveyor and a pair of sides which slope inward towards said center mounted conveyor, said loading dock comprising:

a rectangular frame having a lower section defining a floor, an upper section defining a ceiling and a right and left section defining side walls;

a stand for said rectangular frame said stand being fixably attached to said rectangular frame and further extending below the floor portion of said frame;

a top double layered sealing canvas having an inside and outside layer with cut slats, said canvas being fixably attached to the front ceiling portion of said rectangular frame;

a right double layered sealing canvases having an inside and outside layer with cut slats, said right double layered sealing canvas being fixably attached at one edge to the front portion of said right side wall of said rectangular frame;

a left double layered sealing canvases having an inside and outside layer with cut slats, said left double layered sealing canvas being fixably attached at one edge to the front portion of said left side wall of said rectangular frame;

a lower double layered sealing canvas having an inside and outside layer with cut slats, said lower double layered sealing canvas being fixably attached along said lower double layered sealing canvas's bottom edge to the floor of said rectangular frame; and

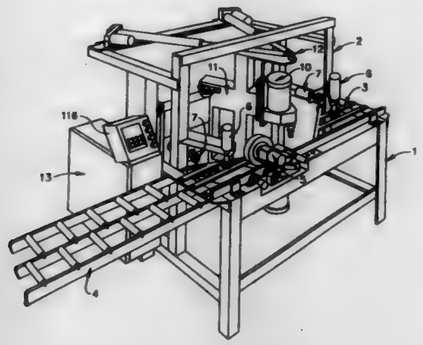
a means of adjustably and elastically attaching and holding in tension the top edge of said lower double layered sealing canvas to the side walls of said rectangular frame.

5,592,793

ROUTER MACHINE

Harold E. Damratowski, Alda, and Richard J. Merrick, Grand Island, both of Nebr., assignors to Merrick Machine Co., Alda, Nebr.

Filed Jun. 7, 1995, Ser. No. 480,682
Int. Cl.[6] E04F *11/00*; B27C *5/00*; B27B *1/00*
U.S. Cl. 52—182 **20 Claims**



1. A router machine for making repetitive router cuts at predetermined positions on at least one workpiece, said router machine comprising a free standing main frame having an open work horizontal platform for supporting said at least one workpiece, said horizontal platform having a longitudinal front edge, clamping mechanisms for clamping said at least one workpiece at said predetermined positions, a workpiece feed mechanism for advancing said at least one workpiece to each of said predetermine positions, a router assembly having at least one router with a vertically oriented bit, a movable support assembly for said router assembly, said at least one router being shiftable vertically on said support assembly between an extended cutting position and a retracted non-cutting position, a pair of linear actuator assemblies each having a first end pivotally attached to said frame and a second end pivotally engaged with an upstanding pivot pin affixed to said router support assembly to shift said at least one router through said repetitive router cuts, said pivot pin being coaxial with said bit of said at least one router, a programmable electronic control system having output signals controlling said workpiece clamp mechanisms, said workpiece feed mechanism, said at least one router, said vertical router position between said extended cutting position and said retracted non-cutting position, and said linear actuator assemblies.

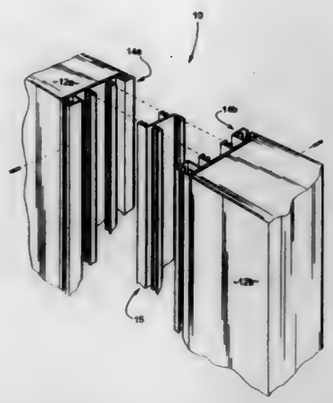
5,592,794

INTERLOCKING OFFICE PANEL DEVICE

Apisit Tundsun, 10002/2 Soi Saenanikom 1, Pholyothin Rd, Bangkok, 10900 THX

Filed Jul. 26, 1995, Ser. No. 507,588
Int. Cl.[6] E04B *2/28*
U.S. Cl. 52—220.7 **8 Claims**

1. A room subdividing device comprising:
a panel for use as a partial wall to subdivide room space, said panel having two vertical ends connected by sidewalls,
a base plate for attachment to said panel end, said plate having a flange extending generally orthogonally therefrom, said flange presenting an arm extending therefrom and generally parallel to said base plate,
a shoe comprising a center spine having a first and second face, said spine having a plurality of flanges extending orthogonally from either face of said spine, said shoe flanges presenting an arm extending therefrom, said arm of said shoe flanges being



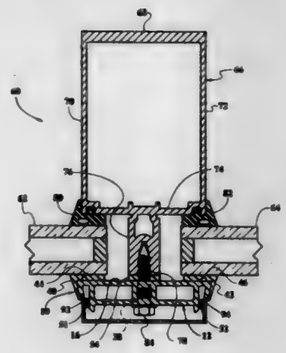
engageable with said arm of said base plate flanges for capture of said panel-attached base plate with said shoe, said base plate flange and said shoe flange being sufficiently long so as to space said base plate from said shoe spine to provide a void for insertion of a cable therethrough, and
a means for securing said shoe to said base plate upon engagement of said shoe flange with said base plate flange, such that said shoe flange of said first spine face is secured to a first panel base plate and said shoe flange of said second spine face is secured to a second panel base plate to interconnect said first panel with said second panel.

5,592,795

COEXTRUDED POLYMER PRESSURE PLATE

David M. Rinehart, Lawrenceville; Wayne E. Whitmyer, Lilburn, and Gregory B. McKenna, Cumming, all of Ga., assignors to Kawneer Company, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 174,834, Dec. 29, 1993, abandoned. This application Aug. 17, 1995, Ser. No. 516,123
Int. Cl.[6] E04H *1/00*
U.S. Cl. 52—235 **20 Claims**



1. A glazed panel wall construction comprising:
a frame member;
a glazing panel disposed adjacent said frame member;
a pressure plate mounted to said frame member; and

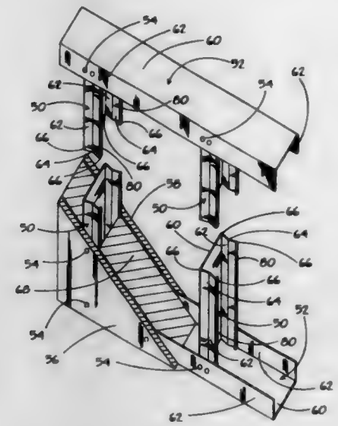
a gasket element bonded to said pressure plate and confronting an exterior marginal portion of said glazing panel.

5,592,796

THERMALLY-IMPROVED METALLIC FRAMING ASSEMBLY

LeRoy A. Landers, 2322 Spruce St. Apt. 2F, Philadelphia, Pa. 19103

Filed Dec. 9, 1994, Ser. No. 353,090
Int. Cl.[6] E04B *2/60*; E04C *3/32*
U.S. Cl. 52—241 **9 Claims**



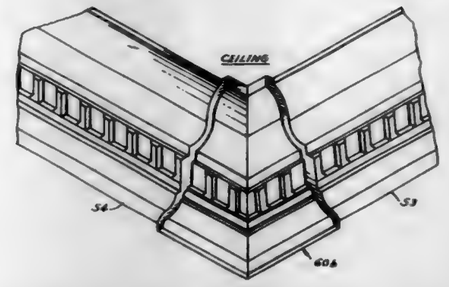
1. A thermally improved framing assembly, comprising:
a planar wall component;
a bottom metallic runner having a substantially flat face and at least one substantially flat flange extending transversely from said flat face;
a metallic channel disposed transverse to said bottom metallic runner, said metallic channel comprising an elongated web and at least one elongated flange extending transversely from said web, said at least one elongated flange comprising first and second continuous ridges along the length of said at least one elongated flange which contact an inner edge of said at least one substantially flat flange of said bottom metallic runner and confront and support said planar wall component along first and second lines of contact transverse to said substantially flat face of said bottom metallic runner, and said at least one elongated flange further comprising an offset portion laterally spaced from said planar wall component, said offset portion extending between said first and second ridges approximately the entire width of said at least one elongated flange along the length of said metallic channel; and
fastening means for connecting said planar wall component against said first and second ridges of said at least one elongated flange of said metallic channel, said fastening means extending through said planar wall component and said at least one elongated flange to rigidly connect said planar wall component to said at least one elongated flange so as to form a closed air pocket between said planar wall component and said offset portion of said at least one elongated flange which is bounded on either side by said first and second lines of contact formed between said first and second ridges and said planar wall component and which is bounded on one end by said bottom metallic runner.

5,592,797

DECORATIVE MOLDING STRIP SYSTEM

Richard Logan, Kingsville, Canada; Charles E. Schiedegger, Metamora, Mich.; Michael C. Clark, Columbiaville, Mich., and Daniel G. Meyer, Rochester Hills, Mich., assignors to Mid-America Building Products Corporation, Plymouth, Mich.

Continuation-in-part of Ser. No. 143,253, Oct. 26, 1993, Pat. No. 5,457,923, which is a continuation-in-part of Ser. No. 916,399, Jul. 20, 1992, abandoned, and Ser. No. 158,163, Nov. 24, 1993, Pat. No. 5,398,469, which is a continuation-in-part of Ser. No. 143,253, Oct. 26, 1993, and Ser. No. 262,918, Jun. 20, 1994, abandoned. This application Sep. 22, 1994, Ser. No. 310,432
Int. Cl.[6] F04F *19/04*
U.S. Cl. 52—288.1 **9 Claims**



1. A decorative molding system removably installed at a juncture of a ceiling and a vertical wall, said molding system comprising:
a plurality of thin molding strips of flexible plastic having a length and an upper free edge, a lower free edge, a front surface and a back surface, said upper free edge being adapted to lie against one of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto, said lower free edge being adapted to lie against the other of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto,
a plurality of flexible plastic clips,
each said flexible plastic clip having a first end and a second free end,
said flexible plastic clips being attached at spaced points along the length of the back surface of each molding strip such that the first end of each said clip is attached on the back surface of said molding strip at a point of attachment intermediate the upper free edge and lower free edge of said molding strip and said second free end of each said clip extends at an angle from said point of attachment,
said second free end of each said clip being capable of flexing relative to said point of attachment to said molding, each said molding strip being sufficiently flexible about its length as well as its width to provide conforming engagement of its upper free edge and its lower free edge with the ceiling and vertical wall to provide conforming engagement with the ceiling and vertical wall,
a plurality of wall tracks of thin flexible plastic having a back surface, a front surface, an upper edge and a forward leading edge providing a gap between the leading edge and the front surface,
means for mounting the upper edge of each track on one of said ceiling and said vertical wall adjacent the juncture of said ceiling and said vertical wall such that said forward leading edge is spaced from the other of said ceiling and said vertical wall,
said forward leading edge of said track being capable of flexing relative to said upper edge of said track,
interengaging means on said second free end of said clip and said forward leading edge of said track such that when the thin molding strip with the flexible plastic clips attached thereto is mounted on said track by movement of each said

second free end if each said clip into the gap between the leading edge of said track and the front surface, the second free end of each said clip is moved into the gap and said forward leading edge of said track are interengaged, such that each said thin molding strip is restrained against ready removal and such that when said molding strip is mounted on said wall track, the upper edge of said molding strip is angled outwardly from said track, such that said clip is positioned between said lower forward free edge of said wall track and its associated wall,

at least one pair of said plastic molding strips having free ends with their longitudinal axis forming an angle at a corner of a room,

a plastic corner member provided between said adjacent plastic molding strips and forming a corner,

said plastic corner member comprising a one piece plastic body having side walls intersecting at substantially the same angle as the angle formed by the axis of adjacent plastic molding strips,

each said side wall having substantially the same undulating cross sectional configuration as the first surfaces of said adjacent plastic molding strips,

each said wall having an upper free edge, a lower free edge and a vertical free edge, an outer surface and an inner surface,

a flexible plastic clip means attached to each said side wall,

each said clip means having said first end and a second free end, said first end being attached to the inner surfaces of its respective side wall intermediate the upper free edge of said wall and the lower free edge of said wall and said second free end of said clip extending at an acute angle to said wall of said corner member from said point of attachment,

said free end of each said clip on said wall having interengaging means engaging said interengaging means on said forwarding leading edge of said track and holding said corner member in contact with said adjacent molding strips.

5,592,798

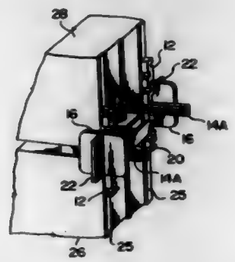
SPACER FOR GLASS BLOCKS

Jed C. Friesen, Suite 205, 98 Tenth Street, New Westminster, British Columbia, V3M 6L8, and Bohumir Cervenka, Vancouver, both of Canada, assignors to Jed C. Friesen, British Columbia, Canada

Filed Apr. 26, 1995, Ser. No. 427,842

Int. Cl.[6] E04G *21/16*

U.S. Cl. 52—308 **11 Claims**



1. A spacer for use in forming a wall of glass blocks, comprising:

(a) a pair of parallel elongated first arms;

(b) a pair of parallel elongated second arms, each of said second arms being perpendicular to a corresponding one of said first arms so as to form a pair of spaced apart crossed arms positioned to rest on edge surfaces of a glass block bounding the exterior wall forming surfaces thereof;

(c) an elongated connecting bar interconnecting said crossed arms;

(d) a pair of plates positioned parallel to each of said crossed arms and spaced apart a distance so as to be able to lie on either side of said glass blocks;

(e) a frangible coupling affixing each of said plates to a corresponding one of said crossed arms having a plurality of holes at its junction with said one crossed arm so as to weaken the joint and permit breaking at the joint without splintering; and

(f) an elongated vane element extending out from and across said plates and passing through a notional line through a center of each of said frangible couplings so that a user may grip and twist said vane element so as to impart a torque about said notional line which shears an associated frangible coupling at its joint with an associated one of said crossed arms without imparting any translational force to said spacer.

5,592,799

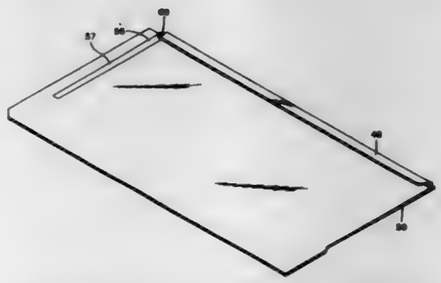
ROOF SHINGLE TAB COVER SYSTEM

Richard F. Reinke, 4th & Bryson, Deshler, Nebr. 68340

Filed Feb. 8, 1995, Ser. No. 385,438

Int. Cl.[6] E04D *1/06*

U.S. Cl. 52—529 **13 Claims**



1. In combination, a roofing cover assembly including vertically overlapped horizontal courses of slightly horizontally spaced apart roofing tabs of a predetermined plan shape and size each including free lower corner portions spaced along a corresponding course and interconnected by a lower edge and opposite side edges extending upwardly from said corner portions and wherein the tabs of each course of tabs are horizontally offset, in the direction in which the course extends, relative to an adjacent course of tabs, a cover system for said cover assembly including a plurality of thin cover panels each of generally said predetermined plan shape and slightly larger in size than said tabs, said cover panels each including lower corners interconnected by a lower edge, side margins extending upwardly from said lower corners and upper edges extending between upper portions of said side margins, one of said side margins including a down turned flange extending therealong, the other side margin including a downwardly offset trough extending therealong spaced at least slightly inwardly of an outer edge of said other side margin, said cover panels each overlying a corresponding tab with said downturned flange thereof disposed immediately outward of the corresponding tab edge and said trough thereof disposed immediately outwardly of the other side edge of said corresponding tab, said upper edge of each cover panel being inserted beneath the lower edges of the adjacent tabs of the next upper course of tabs, said troughs depending beneath said cover panels and being received in spaces between horizontally adjacent tabs and terminating upwardly below said upper edges, said downturned flange being downwardly received in said troughs, said lower corner portions having roofing fasteners secured downward therethrough and also downwardly through longitudinally spaced portions of the central area of the upper edges of the underlying cover panels and anchor structure anchoring said lower edge of each cover panel to the lower edge of the corresponding roofing tab.

5,592,800

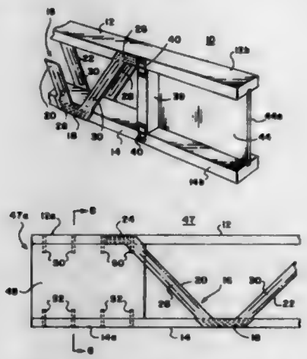
TRUSS WITH ADJUSTABLE ENDS AND METAL WEB CONNECTORS

Kenneth G. Koo, Richmond Hill, and Bill M. Tully, L'Acadie, both of Canada, assignors to Truswal Systems Corporation, Arlington, Tex.

Filed Jan. 20, 1995, Ser. No. 375,928

Int. Cl.[6] E04C *3/30*

U.S. Cl. 52—692 **8 Claims**



1. A truss adapted for load bearing, comprising:

first and second generally parallel wooden chord members;

a plurality of V-shaped metal webs interconnecting said first and second chord members, each web having an apex portion and two elongated diverging legs with enlarged end portions, each web further including a plurality of teeth projecting from the apex portion and the enlarged end portions thereof, whereby the corresponding web is connected to said first and second chord members, the interconnection of said webs with said first and second chord members defining a primary section of said truss;

said first and second chord members having respective first and second extension portions extending in the same direction beyond said webs, said truss further including a wooden connector member and non-metallic attachment means for attaching said connector member to said first and second chord members along substantially the entire length of said first and second extension portions, but not along said primary section) to define an end section of said truss adjacent said primary section, said end section being adapted to be trimmed for lengthwise adjustment of said truss;

said first extension portion having a plurality of spaced apart first holes and said second extension portion having a plurality of spaced apart second holes, said connector member having a plurality of spaced apart third holes in alignment with respective first holes and a plurality of spaced apart fourth holes in alignment with respective second holes, said truss further including a plurality of first wooden pins extending through said first and third holes and attaching said connector member to said first extension portion and a plurality of second wooden pins extending through said second and fourth holes and attaching said connector member to said second extension portion.

5,592,801

MOBILE STAIR SYSTEM FOR PETS AND ANIMALS, METHOD OF MAKING SAID MOBILE STAIR SYSTEM

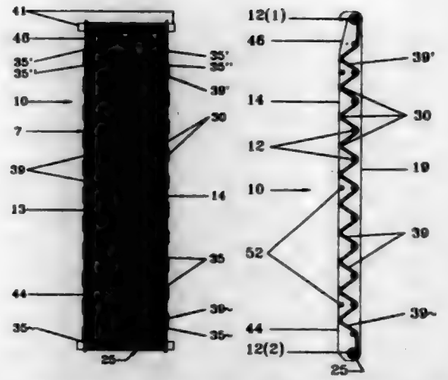
Karen B. Balzer, Houston, Tex., assignor to Vector Equipment-Houston, Inc., Houston, Tex.

Filed Mar. 1, 1995, Ser. No. 396,544

Int. Cl.[6] E04B *1/00*

U.S. Cl. 52—741.2 **17 Claims**

11. A method of making a mobile stair system, said method comprising:



a. using rigid or semi-rigid material to form elements of the mobile stair system, said elements comprising a number of crossbars, comprising a first crossbar, a last crossbar, a highest crossbar and a lowest crossbar, a left side support and a right side support each having a number of holes comprising a first hole, a following hole and a last hole;

b. placing the number of crossbars horizontally between the left side support and the right side support, with the left side support and the right side support being vertical to the number of crossbars and having leveled top portions and leveled bottom portions, and connecting the number of crossbars to the left side support and to the right side support to form a main frame for the mobile stair system;

c. spreading a covering over the number of crossbars of the main frame and gluing each end of the covering to the highest crossbar and to the lowest crossbar of the number of crossbars; and

d. connecting the covering to the main frame by using a cord and by passing the cord, through a number of holes in the left side support and in the right side support, through the number of crossbars and over the covering;

such that the covering, when connected to the main frame, serves as a number of stairs, comprising a first stair and a last stair, for the mobile stair system.

5,592,802

TRANSVERSE ZIPPER SYSTEM

Art Malin, Northbrook; Donald Van Erden, Wildwood, and Michael McMahon, Palatine, all of Ill., assignors to Illinois Tool Works, Inc., Glenview, Ill.

Division of Ser. No. 393,864, Feb. 24, 1995. This application May 13, 1996, Ser. No. 647,580

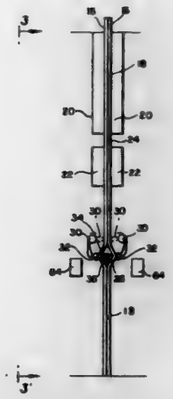
Int. Cl.[6] B65B *61/20*

U.S. Cl. 53—133.4 **8 Claims**

1. An apparatus for the manufacture of plastic bags on a form, fill and seal machine which includes a longitudinally extending filling tube and a forming collar for guiding a plastic sheet material having lateral edges into the form of a tube having a longitudinally fin formed by said lateral edges about said filling tube, said apparatus comprising:

a first pair of longitudinal fin sealing bars and a second pair of longitudinal fin sealing bars, said first and second pairs of longitudinally fin sealing bars being longitudinally separated from one another by a transverse gap, so that, when said tube is sequentially advanced in increments equal to a longitudinal dimension of a package, a transverse fin seal gap will remain when the first and second sealing bars seal said fin;

means for opening said transverse fin seal gap, said means being at a first position downstream from said gap between said first and second pairs of fin sealing bars a distance equal to a whole number multiple of said longitudinal dimension of a package; and



means for inserting a preselected length of zipper into said transverse gap of said tube, said means for inserting being at said first position with said means for opening said transverse fin seal gap.

5,592,803

FLORAL GROUPING WRAPPER AND METHODS

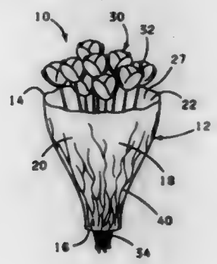
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.

Division of Ser. No. 171,489, Dec. 21, 1993, Pat. No. 5,497,881, and a continuation-in-part of Ser. No. 95,331, Jul. 21, 1993, Pat. No. 5,428,939, which is a continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,803, Ser. No. 923,117, Jul. 30, 1992, Pat. No. 5,307,605, and Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482, which is a continuation-in-part of Ser. No. 926,898, Aug. 5, 1992, said Ser. No. 963,882is a continuation-in-part of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 923,117is a continuation-in-part of Ser. No. 883,318, Dec. 4, 1991, Pat. No. 5,344,016, said Ser. No. 171,489is a continuation-in-part of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 31, 1995, Ser. No. 455,807

The portion of the term of this patent subsequent to Mar. 25, 2014, has been disclaimed.

Int. Cl.[6] B65B *11/00;13/00*

U.S. Cl. 53—397 **8 Claims**



1. A method for wrapping a floral grouping, comprising the steps of:

disposing the floral grouping in a flexible sleeve having a first end, a second end, an outer surface, an inner surface defining a floral grouping retaining space, and a bonding material on at least one of the outer and inner surfaces such that the sleeve is disposed about at least a portion of the floral grouping and such that the floral grouping is disposed in the retaining space of the sleeve; and

crimping the sleeve about a stem portion of the floral grouping along the bonding material of the sleeve such that portions of the sleeve overlap adjacent portions of the sleeve and the overlapping portions bondingly connect so as to secure the crimped portion of the sleeve in a crimped condition about the floral grouping wherein at least a portion of the stem portion is disposed within the crimped portion of the sleeve.

5,592,804

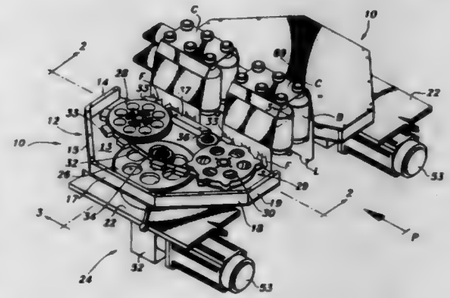
METHOD AND APPARATUS FOR POSITIONING CARTON FLAPS

Urs Reuteler, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Oct. 30, 1995, Ser. No. 549,988

Int. Cl.[6] B65B *21/00;21/24;27/04*

U.S. Cl. 53—398 **24 Claims**



1. A method of folding the flaps of a packaging carton blank about a group of bottles having an exterior surface, the carton blank and the group of bottles being conveyed through a packaging machine along a path of travel, the carton blank having at least one prescored flap area formed in a side wall of the carton blank with respect to each bottle within the group of bottles, said method comprising the steps of:

(a) positioning a carton flap folding assembly along the path of travel so that the carton blank passes in spaced relationship to said folding assembly as the carton blank is conveyed along the path of travel, said folding assembly including engagement means for engaging the carton blank;

(b) inserting said engagement means into the carton blank through the prescored flap area and moving the flaps of the prescored flap area inwardly toward one of the bottles within the group of bottles;

(c) moving the side wall of the carton blank toward the group of bottles;

(d) guiding the flaps of the prescored flap area into tangential engagement with the exterior surface of the bottle with said engagement means;

(e) opening the flaps of the prescored flap area by moving the flaps tangentially across the exterior surface of the bottle; and

(f) withdrawing said engagement means from the carton blank.

5,592,805

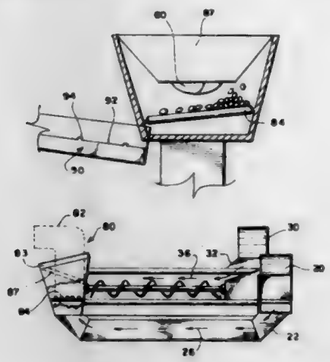
NUT HARVESTER

W. Jack Croft, 2707 N. Church St., Wichita Falls, Tex. 76308

Continuation-in-part of Ser. No. 159,516, Dec. 1, 1993, Pat. No. 5,465,562. This application Oct. 12, 1995, Ser. No. 542,160

Int. Cl.[6] A01D *61/00*

U.S. Cl. 56—16.4 R **12 Claims**



1. A nut harvesting apparatus for harvesting nuts and separating the nuts from debris accompanying the nuts, where the debris is variable in size including larger than nut size, nut size, and smaller than nut size, said nut harvesting apparatus comprising:

a housing for providing a channeling means for the harvested nuts and the accompanying debris;

sweeping means for gleaning and casting the nuts and the accompanying debris from a supporting surface through the channelling means;

a first separating means and a second separator means, said first separator means for separating the larger than nut size debris from the nuts, the nut size debris and the smaller than nut size debris, and collecting the nuts, the nut size debris and the smaller than nut size debris, said first separating means also delivering the collected nuts, the nut size debris and smaller than nut size debris to said second separator means wherein said first separator means expels the larger than nut size debris from said nut harvesting apparatus;

an exit means;

said second separator means for directing the nuts, the nut size debris and the smaller than nut size debris to said exit means, said second separator means including a screw-shaped auger rotatably supported in a trough having a longitudinal axis, and a duct having a longitudinal axis parallel to said longitudinal axis of said trough, a first air stream within said trough in a direction parallel to said longitudinal axis of said trough, a second air stream within said duct in a direction parallel to said longitudinal axis of said duct;

a vertical chimney having a proximal end and a distal end, said proximal end communicating with said exit means and said duct, said proximal end of said chimney directing said second air stream upward through said chimney, said proximal end of said chimney communicating with a conveyer means for catching and conveying away the nuts as the nuts are separated from the nut size and smaller than nut size debris, and said distal end of said chimney being open to allow discharge of nut size and smaller than nut size debris; whereby

said first and second air streams merge and propel the nut size and smaller than nut size debris upward through said chimney while the nuts fall and are guided to the conveyer means, thus separating the nuts from the nut size and smaller than nut size debris.

5,592,806

NON-WRAPPED NON-SLEEVING COMPACT CORD

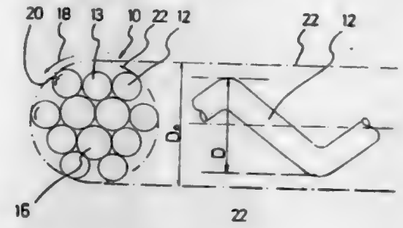
Joost Berghmans, Stevoort; Johan De Waegenaere, Zwevegem; Pierre Klingeleers, Maasmechelen, and Frans Van Giel, Wevelgem, all of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Continuation of Ser. No. 233,506, Apr. 26, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 603,385

Claims priority, application European Pat. Off., Jun. 2, 1993, 93201572

Int. Cl.[6] D02G *3/36*

U.S. Cl. 57—212 **21 Claims**



1. A steel cord comprising:

a center structure of one to five center filaments; and

an outer layer of outer layer filaments surrounding said center structure;

wherein all the center filaments and all the outer layer filaments have the same twist direction and have the same twist pitch;

wherein the steel cord is free of a wrapping filament; that being, the steel cord consists essentially of filaments that have the same twist direction and the same twist pitch; and

wherein the outer layer filaments have a preforming ratio which is smaller than one hundred percent so that the outer layer filaments exert a force which is directed radially inward, and which is of such a magnitude that sleeving of the steel cord is prevented.

5,592,807

BEARING ARRANGEMENT FOR AN OPEN-END SPINNING ROTOR

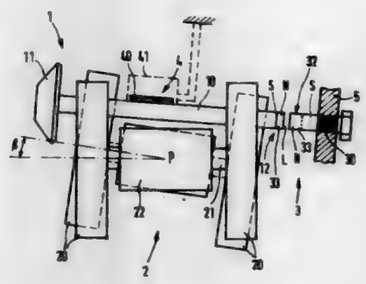
Josef Breitenhuber, Buxheim; Erich Bock, Wettstetten; Gallus Lindner, Haunstetten, and Manfred Knabel, Ingolstadt, all of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed May 16, 1995, Ser. No. 442,014

Claims priority, application Germany, Jul. 6, 1994, 44 23 605.0

Int. Cl.[6] D01H *4/00*

U.S. Cl. 57—406 **15 Claims**



1. An open end spinning device, comprising:

a spinning rotor having a rotor pot with a fiber collection groove defined therein and a rotor shaft having a diameter between 5.5 mm and 9 mm;

pairs of rotatable supporting rings supported on axles and defining a nip therebetween, said rotor shaft rotatably supported in said nip, said rings having a diameter between 62 mm to 82 mm, and said axles crossed with respect to each other at an angle of generally between 0 degrees 15 minutes and 0 degrees 45 minutes, thereby imparting an axial thrust to said spinning rotor in a direction opposite said rotor portion of the rotor shaft as said spinning rotor is rotatably driven in said nip;

a non-contacting axial bearing opposite an end of said rotor shaft for absorbing said axial thrust without contacting said rotor shaft, said axial thrust imparted to said spinning rotor between 1N and 7N on said rotor shaft; and

a driving device contacting said rotor shaft for rotatably driving said rotor, said driving device having a contact pressure with said rotor shaft from a value of 8N to 39N.

5,592,808

OPENER DEVICE FOR A SPINNING STATION OF AN OPEN-END SPINNING MACHINE

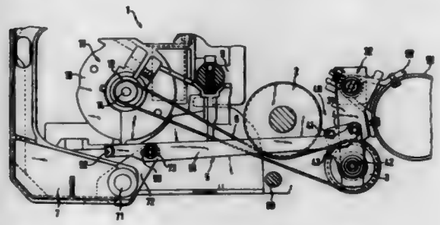
Armin Brunner, Lärchenstrasse, and Erich Bock, Rosenstrasse, both of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed May 25, 1995, Ser. No. 451,047

Claims priority, application Germany, Aug. 4, 1994, 44 27 584.6

Int. Cl.[6] D01H *4/00; 13/14*

U.S. Cl. 57—408 **16 Claims**



1. An opener device for use in an open-end spinning machine, comprising:

an opener roller rotatably driven by a driven drive disc through a drive belt;

a tension roller, said drive belt disposed about said tension roller; and

a braking device for braking said opener roller; said braking device further comprising

a movable actuating element and a braking member operably associated with said actuating element so that a movement of said actuating element moves said braking member;

said actuating element and braking member movable between a first position wherein said braking member is at a distance from said drive belt and a second position wherein said braking member is in contact with said drive belt forcing said drive belt away from said drive disk.

5,592,809

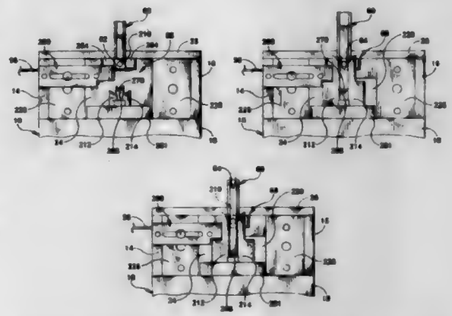
LINK FORMING AND JOINING APPARATUS

Anthony Marcotrigiano, Rumford, and James T. Pepper, Coventry, both of R.I., assignors to Crafford Precision Products Co., Riverside, R.I.

Filed Feb. 14, 1995, Ser. No. 389,134

Int. Cl.[6] B21L *1/02*

U.S. Cl. 59—25 **5 Claims**



1. Apparatus for forming a wire link and joining the wire link as formed to a preformed jewelry article comprising:

a guide assembly including a vertically extending passage therein, said passage having a lower end for receiving a U-shaped wire element therein with an open end of said U-shaped wire element facing upwardly, said passage further having an upper end defining a forming station, said passage defining a working plane;

a lower forming tool mounted for sliding movement in said passage for engaging said U-shaped wire element in said passage and lifting said U-shaped wire element from said lower end of said passage to said forming station at said upper end;

a head assembly located above said guide assembly, said head assembly including a forming head die mounted for vertical movement within said working plane for engaging said U-shaped wire element during a forming operation, said forming head die cooperating with said lower forming tool to form said U-shaped wire element into a completed link during said forming operation;

means for feeding wire stock to a cutting and bending station located within said working plane at the lower end of said passage, said feeding means including means for adjusting the length of a wire section severed from said wire stock, said means for feeding said wire stock comprising a feed block assembly and a feed clamp assembly mounted on said feed block assembly, said feed block assembly comprising a body portion, and a horizontally extending guide bar mounted to said body portion, said feed clamp assembly being slidably mounted on said guide bar for movement between first and second positions, said feed clamp assembly receiving a length of wire stock therethrough and including means for selectively clamping said wire stock, said feed block assembly further comprising a pivotably mounted lever having a first end pivotably mounted to said feed clamp assembly and a second end coupled to an actuator arm of said link forming apparatus, said actuator arm being movable for actuating said feed clamp assembly between said first and second positions, said lever including a plurality of apertures therein, said feed block assembly further comprising a pivot block slidably mounted in said body portion, said pivot block having a pivot pin extending therefrom, said pivot pin defining a pivot axis of said lever,

said pivot pin being selectively extended through one of said apertures in said lever to adjust the vertical position of said pivot axis, said pivot block being slidably adjustable within said body portion by means of a threaded rod extending vertically through said pivot block for finite adjustment of said vertical position of said pivot axis;

means at said cutting and bending station for severing a wire section from said wire stock;

means at said cutting and bending station for bending said wire section into a U-shaped wire element within said working plane; and

means for operating said feeding means, said severing means, said bending means, said lower forming tool and said forming head die in timed relation to sequentially severing a single wire section, bending said wire section into a U-shaped wire element and forming said U-shaped wire element into a closed link.

5,592,810

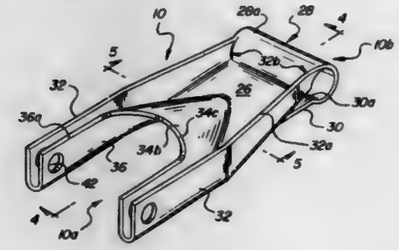
CLEVIS LINK

Mark Zmyslowski, Grosse Pointe Shores, and Erik W. Larson, Birmingham, both of Mich., assignors to Radar Industries, Inc., Roseville, Mich.

Continuation of Ser. No. 507,004, Jul. 25, 1995, Pat. No. 5,533,328. This application May 3, 1996, Ser. No. 642,485

Int. Cl.[6] B21L *11/00*; F16G *15/00*

U.S. Cl. 59—78 **12 Claims**



1. A clevis link formed of a single piece of sheet metal and including:

a curl structure at a rearward end of the link formed as a rear end portion of the sheet metal piece curled around an axis generally transverse to a longitudinal axis of the link to form a transversely extending cylindrical bearing surface defining a rearward pivot axis extending generally transversely to the longitudinal axis of the link;

a bifurcated structure rigid with the curl structure and including two transversely spaced forwardly extending sections defining an opening at a forward end of the link;

a main body structure extending transversely between and rigidly interconnecting the spaced forwardly extending sections forwardly of the curl structure and blending with the spaced forwardly extending sections; and

aligned apertures in the two sections defining a forward pivot axis extending generally transversely to the longitudinal axis of the link.

5,592,811

METHOD AND APPARATUS FOR THE DESTRUCTION OF VOLATILE ORGANIC COMPOUNDS

Paul R. Dodge, Mesa; Robert S. McCarty, Phoenix, both of Ariz.; Doug Rogers, Visalia, and Gail Rogers, San Gabriel, both of Calif., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Oct. 3, 1995, Ser. No. 538,692

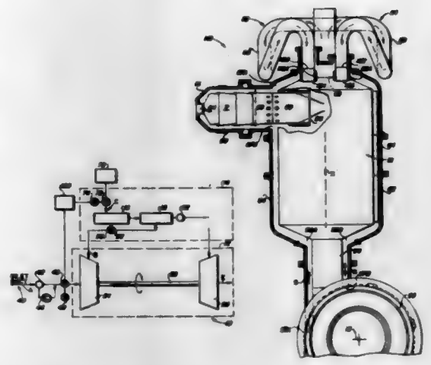
Int. Cl.[6] F02C *6/18*; F02G *3/00*

U.S. Cl. 60—39.02 **17 Claims**

1. A system for the destruction of volatile organic compounds (VOCs) comprising:

a combustor;

a reaction chamber connected to said combustor; and,



an engine connected to said reaction chamber;

wherein said system is configured to receive a primary fuel and a secondary fuel, said secondary fuel comprising VOC laden air, and wherein said primary fuel is combusted in said combustor and said secondary fuel is combusted in said combustor and said reaction chamber.

5,592,812

METAL COMPLEXES FOR USE AS GAS GENERANTS

Jerald C. Hinshaw, Farr West; Daniel W. Doll, North Ogden; Reed J. Blau, Richmond, and Gary K. Lund, Ogden, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Continuation of Ser. No. 184,456, Jan. 19, 1994, abandoned. This application Feb. 9, 1996, Ser. No. 599,634

Int. Cl.[6] C06D *5/00*

U.S. Cl. 60—205 **22 Claims**

1. A method for inflating an inflatable air bag which comprises the steps of:

generating substantially non-toxic gas consisting essentially of nitrogen gas and water vapor by combusting an at least essentially azide-free composition adapted for generating gas for use in inflating an air bag which comprises a metal ammine complex having a metal cation of a transition metal or an alkaline earth metal, sufficient oxidizing anion to balance the charge of the complex, and a neutral ligand comprising ammonia; and

inflating said air bag using said gas.

5,592,813

HUSH KIT FOR JET ENGINE

Lee F. Webb, Russells Point, Ohio, assignor to Avaero, Safety Harbor, Fla.

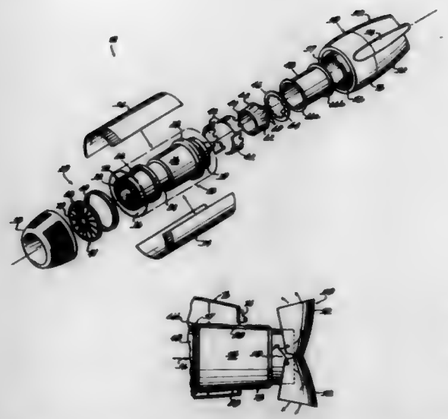
Filed Jul. 6, 1995, Ser. No. 499,112

Int. Cl.[6] F02K *3/02*

U.S. Cl. 60—226.2 **15 Claims**

1. A noise reduction assembly for a jet engine having a core engine generating axial exhaust gas flow through a downstream end thereof, an inlet having a plurality of fixed guide vanes at an upstream end of the core engine, an outer casing defining an annular bypass duct surrounding the core engine, a fan positioned downstream from the inlet for generating axial fan air flow through the bypass duct, a thrust reverser for selectively converting axial flow of exhaust gas and fan air into reverse thrust, and a tail pipe disposed to axially receive and discharge the exhaust gas and fan air, the noise reduction assembly comprising:

an annular ring positioned between the inlet and the fan of the core engine, said annular ring providing an increased axial spacing between the guide vanes and the fan to thereby reduce noise generated by the jet engine;



a mixer assembly having a plurality of cold ducts being radially inwardly directed and a plurality of hot ducts being radially outwardly directed, said cold ducts diverting the fan air from the bypass duct inwardly toward an axial centerline of the jet engine and said hot ducts diverting the exhaust gas from the core engine outwardly away from said axial centerline; and

an acoustic barrel within the thrust reverser, said acoustic barrel having a sandwich configuration with an outer imperforate skin, an inner perforate skin having a plurality of holes therein and a multi-cellular core positioned between said inner and outer skins, the exhaust gas from the core engine and the fan air from the bypass duct being mixed in said mixer assembly and passing through said acoustic barrel prior to being discharged through the tail pipe to thereby reduce noise generated by the jet engine.

5,592,814

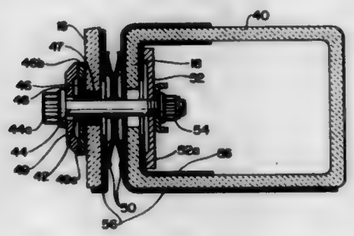
ATTACHING BRITTLE COMPOSITE STRUCTURES IN GAS TURBINE ENGINES FOR RESILIENTLY ACCOMMODATING THERMAL EXPANSION

Mark E. Paisnis, Jupiter; Carlos G. Figueroa, Wellington; Daniel C. Friedberg, Juno Beach; Gary D. Jones, Jensen Beach, and Gunther Eichhorn, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1994, Ser. No. 360,937

Int. Cl.[6] F02C *7/20*

U.S. Cl. 60—271 **3 Claims**



3. An exhaust liner for a gas turbine engine, characterized by:

a ceramic sheet in an exhaust section of said gas turbine engine;

a ceramic tile comprising at least four walls each parallel to a common axis to define an interior with the tile;

an aperture in the ceramic sheet;

an opposed aperture in one of said walls of said ceramic tile, said apertures sharing a common axis;

a fastener extending through said apertures to attach the ceramic liner to the sheet;

means for resiliently allowing movement of the fastener radially and axially in the aperture in the sheet with respect to said common axis, said means constructed of metal; and

means for resiliently accommodating movement between the sheet and the ceramic liner along said axis of the apertures, said means constructed of metal.

5,592,815

PROCESS FOR MONITORING THE CONVERSION RATE OF AN EXHAUST CATALYST

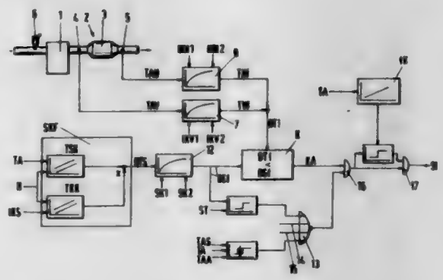
Hanno Jelden, Lehre; Winfried Schultalbers, Meinersen, and Thomas Bizenberger, Braunschweig, all of Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Sep. 13, 1995, Ser. No. 527,786

Claims priority, application Germany, Nov. 11, 1994, 44 40 276.7

Int. Cl.[6] F01N *3/00*

U.S. Cl. 60—274 **9 Claims**



1. A process for monitoring the conversion rate of an exhaust catalyst in an exhaust line of an internal combustion engine which includes at least two points at which exhaust temperature values are determined during operation of the engine comprising:

determining first and second exhaust gas temperature values upstream and downstream respectively of at least a portion of the exhaust catalyst in the direction of exhaust gas flow;

filtering at least one of the first and second temperature values to eliminate short term fluctuations;

determining an actual temperature difference value from difference between the filtered temperature value and the other of the first and second temperature values;

generating a desired temperature difference value from a desired value characteristic map memory based upon the speed of the internal combustion engine, the exhaust gas temperature in the exhaust line and the fuel injection rate of the internal combustion engine;

filtering the desired temperature value to eliminate short term variations;

comparing the actual temperature difference value and the filtered desired temperature difference value;

generating a current time window value from a time characteristic map as a function of the exhaust-gas temperature; and

triggering a monitoring signal when the comparison results in a filtered desired temperature difference value which is greater than the actual temperature difference value for a time at least as great as the value of the current time window value.

5,592,816

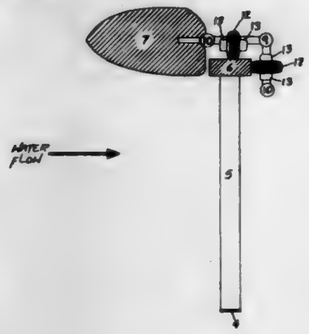
HYDROELECTRIC POWERPLANT

Herbert L. Williams, Rte. 1 Box 454, E. Palatka, Fla. 32131

Filed Feb. 3, 1995, Ser. No. 397,858

Int. Cl.[6] F16D *31/02;* **B63H** *1/34;* **B64C** *11/24*

U.S. Cl. 60—398 **7 Claims**



SECTION B

1. A hydroelectric turbine which:

has no central shaft;

transfers rotational energy from it's outer rim to synthetic rubber tires;

has an open area through it's center larger than the area occupied by it's blades;

has no bearings, bushings or friction load handling devices but depends on an external means to hold it in position.

5,592,817

FORKLIFT CONTROLLER

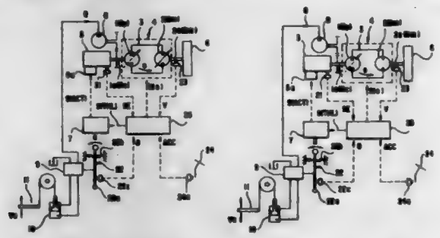
Ryuhei Nishimura; Hiroaki Murakami, and Shinya Yamamura, all of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Continuation of Ser. No. 234,104, Apr. 26, 1994, abandoned. This application Feb. 14, 1996, Ser. No. 601,540

Claims priority, application Japan, Apr. 27, 1993, 5-100764; Apr. 28, 1993, 5-102827

Int. Cl.[6] B60K *23/00;* **F16D** *31/02*

U.S. Cl. 60—431 **13 Claims**



1. A forklift controller for controlling a loading speed and a vehicle speed of the forklift, comprising:

a hydrodynamic transmission for changing the speed ratio infinitely while intervening between an engine and a wheel;

a loading operational means for loading operation at a loading speed corresponding to a number of revolutions of said engine, said engine being driven by engine power;

a loading speed detecting means for detecting said loading speed;

a loading speed setting means for setting a target value of said loading speed;

a vehicle speed detecting means for detecting a vehicle speed of said forklift;

a vehicle speed setting means for setting a target value of said vehicle speed;

a throttle opening controlling means, receiving said target value of said loading speed from said load speed setting means and receiving said loading speed from said load speed detecting means, for controlling the throttle opening of said engine so that said loading speed detected by said loading speed detecting means is maintained at said target value set by said loading speed setting means; and

a speed ratio controlling means for controlling a speed ratio of said hydrodynamic transmission so that said vehicle speed, detected by said vehicle speed detecting means, is maintained at said target value set by said vehicle speed setting means.

5,592,818

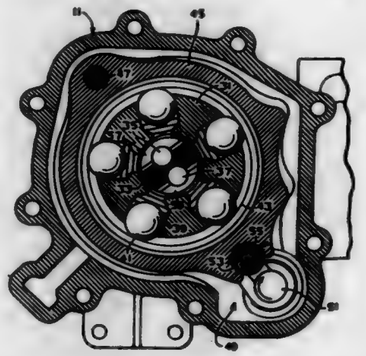
REVERSIBLE HYDROSTATIC TRANSMISSION WITH DUMP VALVE

Arthur F. Haag, Green Isle, and William A. Byrd, Minneapolis, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 26, 1994, Ser. No. 280,426

Int. Cl.[6] F16D *39/00*

U.S. Cl. 60—487 **18 Claims**



1. A hydrostatic transmission comprising a housing assembly, a variable displacement radial piston pump and a fluid pressure operated motor disposed in said housing assembly; said radial piston pump including displacement varying means operable to vary the displacement of said pump, including reversible control means operable to move said displacement varying means in first and second opposite directions, in response to movement of said control means in first and second opposite directions from a neutral position; said motor defining a fluid inlet and a fluid outlet, and said housing assembly defining high and low pressure passages in fluid communication with said fluid inlet and said fluid outlet, respectively; said pump comprises a rotor assembly rotatably mounted on a journal member disposed within a journal bore defined by said housing assembly, said journal bore providing open fluid communication with both of said high and low pressure passages; said journal member defining high and low pressure pump slots in fluid communication with contracting and expanding chambers, respectively, of said pump, said journal member further defining high and low pressure housing slots in fluid communication with said high and low pressure passages, respectively, and said journal member defining a high pressure axial bore interconnecting said high pressure pump and housing slots, and a low pressure axial bore interconnecting said low pressure pump and housing slots; characterized by: said journal member is an element selected from a group consisting of:

(a) a first journal member in which said axial bores are oriented generally perpendicular to said pump slots, and said housing

slots are oriented generally perpendicular to said axial bores, whereby said hydrostatic transmission operates in a forward direction in response to movement of said control means in said first direction from said neutral position; and,

(b) a second journal member in which said axial bores are oriented at an acute angle relative to said pump slots and said housing slots are oriented at an acute angle relative to said axial bores whereby said hydrostatic transmission operates in said forward direction in response to movement of said control means in said second direction from said neutral position.

5,592,819

PRE-MIXING INJECTION SYSTEM FOR A TURBOJET ENGINE

Denis R. H. Ansart, Bois le Roi; Patrice A. Commaret, Maincy; Etienne S. R. David, Bois le Roi; Michel A. A. Desaulty, Vert Saint Denis; Bruno M. M. Quinquenneau, Massy, and Denis Sandelis, Nangis, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A., Paris CEdex, France

Filed Mar. 8, 1995, Ser. No. 400,574

Claims priority, application France, Mar. 10, 1994, 94 02750

Int. Cl.[6] F23R *3/34*

U.S. Cl. 60—737 **11 Claims**



1. A pre-mixing injection system to feed a fuel/air mixture to a combustion chamber of a turbojet engine the combustion chamber having a front end, the premixing injection system, comprising:

a) a pre-mixing tube in front of the front end of the combustion chamber comprising:

i) a convergent premixing zone having an inlet and an outlet, the premixing zone converging in a direction from the inlet towards the outlet;

ii) an intermediate zone having an inlet in communication with the outlet of the premixing zone and an outlet in communication with the front end of the combustion chamber, the intermediate zone diverging in a direction from the inlet towards the outlet, the diverging intermediate zone being defined by an inner wall and an outer wall spaced from the inner wall so as to define therebetween a generally frusto-conical chamber, and having a plurality of cooling holes therein to allow cooling air to pass through the outer wall into cooling contact with the inner wall, the frusto-conical chamber having a downstream evacuation passage to allow cooling air to pass from the frusto-conical chamber; and,

iii) a plurality of elongated slots in the inner wall to introduce cooling air from the frusto-conical chamber into the intermediate zone wherein the intermediate zone has a central longitudinal axis and wherein the elongated slots are substantially parallel to each other and extend obliquely to the central longitudinal axis;

b) a fuel injector to inject fuel into the inlet of the pre-mixing zone; and

c) means to introduce air into the inlet of the pre-mixing zone so as to disperse the fuel into droplets.

5,592,820

GAS TURBINE DIFFUSER

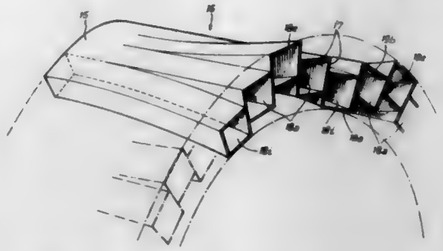
Jean-Paul D. Alary, Saint Maur Des Fosses; Michel Desaulty, Vert Saint Denis; Denis J. M. Sandelis, Nangis, and Pierre Schroer, Bruney, all of France, assignors to Societe National D'Etdue et de Construction de Moteurs D'Aviation S.N.E.C.M.A, Paris Cedex, France

Filed Oct. 25, 1994, Ser. No. 328,820

Claims priority, application France, Oct. 27, 1993, 93 12799

Int. Cl.[6] F02K *1/48*

U.S. Cl. 60—751 **13 Claims**



1. A diffuser for a turbojet engine having an oxidizer compressor located upstream of a generally annular combustion chamber assembly with inner and outer casings extending about a longitudinal axis, inner and outer walls spaced from the inner and outer casings bounding the combustion chamber, an upstream end wall connecting the inner and outer walls, a baffle extending between the inner and outer walls and spaced from the upstream end wall, the baffle defining a plurality of openings, and a plurality of fuel injectors extending through the baffle and the upstream end wall, the diffuser located between the compressor and the combustion chamber assembly and comprising:

a) a plurality of diffuser inlets bounded by inner and outer diffuser walls extending about the longitudinal axis and a plurality of partitions extending substantially radially with respect to the longitudinal axis and interconnecting the inner and outer diffuser walls such that the diffuser inlets are arranged in a substantially circular array and are located so as to receive oxidizer from the compressor; and,

b) a plurality of sets of diffuser outlets, each set comprising a plurality of diffuser outlets arranged in a substantially circular array about the longitudinal axis wherein the radius of each set of diffuser outlets is different from the radius of the other sets of diffuser outlets such that the entirety of diffuser outlets comprises a non-circular array about the longitudinal axis whereby the diffusion outlets are displaced in a circumferential direction around the longitudinal axis such that no two diffuser outlets lie on a common radial line extending from the longitudinal axis.

5,592,821

GAS TURBINE ENGINE HAVING AN INTEGRAL GUIDE VANE AND SEPARATOR DIFFUSER

Jean-Paul D. Alary, Saint Maur des Fosses; Gérard Y. G. Barbier, Morangis; Corine G. Delahaye, Mormant; Jacques G. W. R. Havard, Moissy Cramayel; Paul Mackovic, Villiers S/Marne; Bruno R. H. Masse, Vaux le Penil; Didier Merville, Breuillet; Francois J.-P. Mirville, Hericy; Serge R. Y. Muccioli, Boulogne; Denis J. M. Sandelis, Nangis, and Ralph M. Stelter, Lesigny, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs F'Aviation S.N.E.C.M.A., Paris, France

Continuation of Ser. No. 255,922, Jun. 7, 1994, abandoned.

This application Sep. 6, 1995, Ser. No. 523,908

Claims priority, application France, Jun. 10, 1993, 93 06956

Int. Cl.[6] F02C *1/00*

U.S. Cl. 60—751 **10 Claims**

1. An integral guide vane and separator-diffuser for a gas turbine engine having a central axis, at least two radially spaced annular rows of fuel injection heads disposed around the central axis and an oxidizer compressor located upstream of the at least two annular rows of fuel injection heads, the compressor having at least one rotor, the separator-diffuser comprising:

a) wall means defining a generally annular oxidizer flow diffuser passage around the central axis having an oxidizer inlet located downstream of the at least one rotor so as to enable oxidizer to pass from the at least one rotor into the oxidizer flow diffuser passage;

b) at least one generally annular separator member located in the oxidizer flow diffuser passage downstream of the oxidizer inlet so as to divide the oxidizer flow diffuser passage into at least two separate oxidizer flow paths each having a separate oxidizer outlet to direct oxidizer toward the at least two rows of fuel injection heads, the separator member having an upstream leading edge portion;

c) a plurality of circumferentially spaced apart, generally axially extending primary guide vane arms connecting the separator member to the wall means, the primary guide vane arms having integral leading edge portions extending upstream beyond the upstream leading edge portion of the at least one separator member so as to form the sole stationary guide vanes adjacent to at least one said rotor so as to guide the oxidizer flow from the compressor, each primary guide vane arm having an axial length measured along the central axis greater than an axial length of the at least one annular separator member;

d) a first trailing edge defined by the separator member; and,

e) second trailing edges defined by the primary guide vane arms and located such that the second trailing edges are adjacent to the first trailing edge.

5,592,822

FLUID DEFLECTION SKIRT APPARATUS

David M. Stubbs, Mountain View, Calif., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Dec. 20, 1995, Ser. No. 579,997

Int. Cl.[6] F25B *19/02*

U.S. Cl. 62—51.2 **20 Claims**

1. Apparatus for deflecting flow comprising:

(A) a nozzle having:

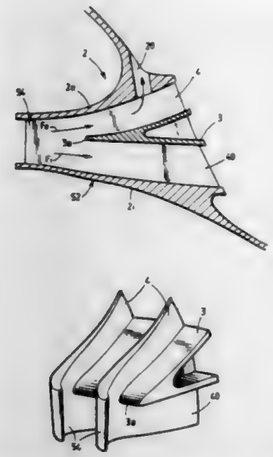
(i) an upper end,

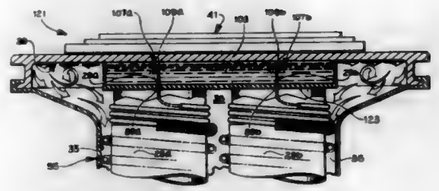
(ii) an orifice at the nozzle upper end from which a fluid emanates, and

(iii) an external diameter,

(B) a fluid impinged surface facing the nozzle orifice, and

(C) a skirt comprising:





(i) a remote portion having:

(a) an interior surface surrounding the nozzle,

(b) an exterior surface opposite the interior surface,

(c) an outer edge, and

(d) an opening slightly larger than the nozzle external diameter through which the nozzle extends closer to the fluid impinged surface than the remote portion interior surface, and

(ii) a close portion extending from the outer edge of the remote portion towards the fluid impinged surface and extending closer to the fluid impinged surface than the nozzle orifice so that a small gap is formed between the close portion and the fluid impinged surface so as to cause the fluid to flow along the fluid impinged surface, the close portion having:

(a) an interior surface facing towards the nozzle, and

(b) an opposite facing exterior surface, the close portion and the fluid impinged surface spaced apart by a small gap, the gap directing the flow of the fluid along the fluid impinged surface.

5,592,823

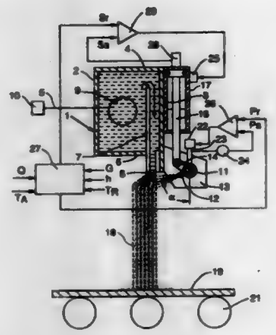
VARIABLE SOFT COOLING HEADER

Vladimir B. Ginzburg, Pittsburgh, Pa., assignor to Danieli United, and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.

Filed Mar. 12, 1996, Ser. No. 614,394

Int. Cl.[6] F25D *17/02*

U.S. Cl. 62—64 **8 Claims**



1. A method of soft cooling of a moving heated metal strip, comprising forming a waterwall descending vertically in the direction of the metal strip and extending across a width of the strip perpendicularly to a line of travel of the strip, impacting the waterwall with an air stream to convert the water wall to a descending curtain of water-air mist, and directing the curtain of air-water mist onto an upper surface of the heated metal strip to effect soft cooling thereof.

5,592,824

DRIVING CONTROL DEVICE FOR AIR CONDITIONER

Masaharu Segabe, and Hisashi Sumida, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP94/00734, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/25803, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 27, 1994, Ser. No. 360,846

Claims priority, application Japan, Apr. 28, 1993, 5-102136

Int. Cl.[6] F24F *11/02*

U.S. Cl. 62—127 **12 Claims**



1. A driving control device for an air conditioner in which an integral controller (5B) is connected to a plurality of air conditioning units (3, 3, . . .) so that control signals are transmitted and received between each of the air conditioning units (3, 3, . . .) and the integral controller (5B), said driving control device comprising:

setting range specifying means (52) provided in the integral controller (5B) for specifying a range of address settings within which an address can be set to each of the air conditioning units (3, 3, . . .) managed by the integral controller (5B);

signal transmitting means (53) provided in the integral controller (5B) for outputting a signal showing the range of address settings to each of the air conditioning units (3, 3, . . .) based on the range of address settings which has been specified by the setting range specifying means (52); and

setting allowing means (32) provided in each of the air conditioning units (3, 3, . . .) for outputting a signal allowing an address setting when receiving the signal showing the range of address settings which has been outputted from the signal transmitting means (53) of the integral controller (5B).

5,592,825

ABSORPTION REFRIGERATION MACHINE

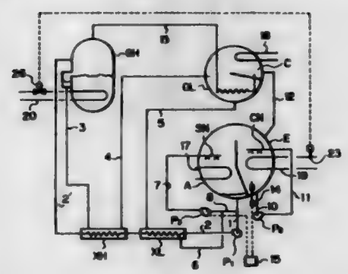
Naoyuki Inoue, Kanagawa-ken, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 520,468

Claims priority, application Japan, Aug. 30, 1994, 6-227439; Sep. 13, 1994, 6-243401; Sep. 16, 1994, 6-246723

Int. Cl.[6] F25B *15/00*

U.S. Cl. 62—141 **14 Claims**



1. An absorption refrigerating machine wherein a refrigerant gas separated from a solution at a generator is cooled and becomes a liquid refrigerant, said liquid refrigerant then evaporates at an evaporator (E) so that a cooling load (19) in said evaporator is cooled, and a concentrated solution generated in said generator is directed through a heat exchanger to a solution spray nozzle in an absorber (A), characterized in that

said absorption refrigerating machine comprises:

a concentrated solution spray pump disposed between said heat exchanger and said spray nozzle,

a concentrated solution controller (15) operatively connected to said concentrated solution spray pump for controlling a supply of the concentrated solution to said absorber (A),

said controller (15) being operative to control said pump to increase said supply of concentrated solution to said absorber (A) when a refrigerant liquid level in said evaporator is higher than a given value, and to decrease said supply of concentrated solution to said absorber (A) when the refrigerant liquid level in said evaporator is less than said given value, and

means for determining a level of refrigerant liquid level in said evaporator operatively connected to said controller.

5,592,826

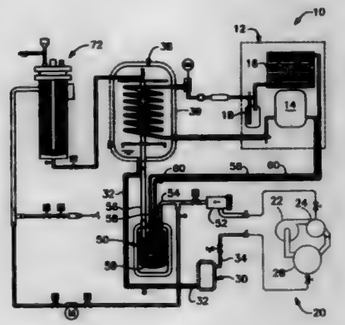
AIR CONDITIONING SYSTEMS WITH PURGE

Chris Sagar, 540 Carillon Pkwy., Apt. 2041, St. Petersburg, Fla. 33716, and Mike Britt, 23706 Texwheeler Ave., Christmas, Fla. 32709

Filed Dec. 26, 1995, Ser. No. 578,367

Int. Cl.[6] F25B *43/04*

U.S. Cl. 62—195 **21 Claims**



1. An air conditioning system having refrigerant circulating therethrough, comprising:

a primary compressor and a primary condenser;

a purge vessel for separating noncondensibles and condensibles from said refrigerant;

a refrigerant preheater disposed in fluid communication between an outlet of said primary compressor and an inlet of said purge vessel, said refrigerant preheater providing a thermal load enabling operation of said purge vessel in said system;

a chiller including a compressor, a condenser, and an evaporator;

a refrigerant regeneration recycling means for separating contaminants from said refrigerant;

said refrigerant regeneration recycling means having an inlet in fluid communication with an outlet of said purge vessel and having an outlet in selective fluid communication with a vent to atmosphere and an inlet of said preheater; and

a static flow controller having an inlet in fluid communication with condensed refrigerant collected in a bottom of said purge vessel and having an outlet in fluid communication with said chiller evaporator;

said static flow controller being at least partially filled with condensed refrigerant to provide a liquid seal between said chiller evaporator and condenser, said condensed refrigerant evaporating within said static flow controller at a rate that is proportional to the rate of input thereinto of condensed refrigerant from said purge vessel.

5,592,827

TEMPERATURE CONTROLLING METHOD OF REFRIGERATOR USING MICROPROCESSOR

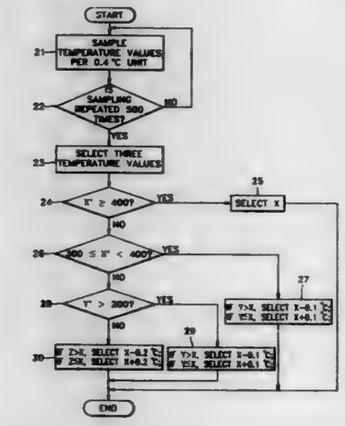
Seong-wook Jeong, Suwon; Jae-in Kim, Seoul, and Yun-seog Kang, Suwon, all of Rep. of Korea, assignors to Samsung Electronics Co. Ltd., Kyungki-do, Rep. of Korea

Filed Nov. 29, 1995, Ser. No. 563,927

Claims priority, application Rep. of Korea, Nov. 30, 1994, 94-32114

Int. Cl.[6] G01K *7/00*; G05D *15/00*

U.S. Cl. 62—229 **5 Claims**



1. A temperature controlling method of a refrigerator by using a microprocessor comprises the steps of:

sampling digitized temperature values counted by an analog-to-digital converter according to a predetermined temperature range by a predetermined frequency by using the microprocessor;

when the number (X') of a temperature value (X) counted with the most frequency is not less than a desired frequency, selecting the temperature value with the most frequency as a controlling temperature;

when the number (X') of the temperature value (X) counted with the most frequency is less than said desired frequency, selecting a value obtained by adding/subtracting a predetermined temperature value which is less than said predetermined temperature range to/from said temperature value (X) with the most frequency as the controlling temperature; and

selecting a temperature value obtained by applying said steps to at least two temperature values (Y) (Z) counted with the second most frequency and the third most frequency as the controlling temperature.

5,592,828

CARCASS PROCESSING METHOD

Leland Tollet, Springdale; Gary H. Anders, Lowell, and Hilton L. Bell, Jr., Berryville, all of Ark., assignors to Tyson Holding Company, Wilmington, Del.

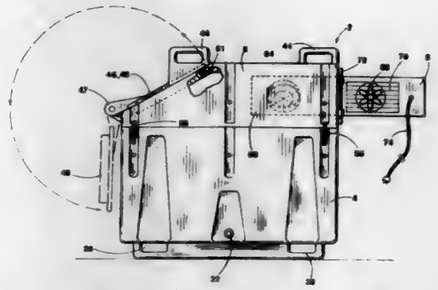
Division of Ser. No. 188,964, Jan. 27, 1994, abandoned. This application May 23, 1995, Ser. No. 449,900

Int. Cl.[6] A47F *3/04*

U.S. Cl. 62—249 **18 Claims**

17. A method of processing the carcasses of nonslaughtered animals which die during the course of a grow-out operation, said grow-out operating being conducted at a grow-out operation site, said method comprising the steps of:

(a) collecting and freezing said carcasses in a freezing apparatus located at said grow-out operation site and then



(b) transporting said carcasses to a processing facility.

5,592,829

REFRIGERATOR PROVIDED WITH A CONDENSER HAVING AN IMPROVED COOLING EFFICIENCY

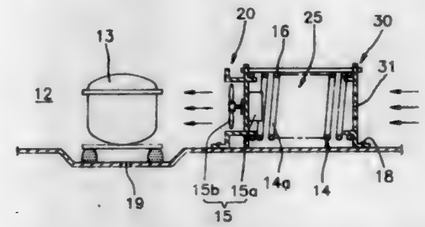
Byung-Sun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 18, 1995, Ser. No. 424,744

Claims priority, application Rep. of Korea, Apr. 21, 1994, 94-8429

Int. Cl.[6] F25D *17/06*

U.S. Cl. 62—428 **1 Claim**



1. In an improved refrigerator of the type including a compressor, a fan motor for directing the flow of a coolant air and a casing which supports the fan motor, wherein said improvement comprises:

a condenser having a generally coil-shaped configuration along the flow direction of the coolant air;

a counterpart casing disposed in an opposite side of said casing about the condenser for slightly depressing the condenser against the casing, the counterpart casing having an intake hole and a plurality of intake slots through which the coolant air flows into; and

a support bracket mounted above the condenser for connecting the casing with the counterpart casing.

5,592,830

REFRIGERANT CONDENSER WITH INTEGRAL RECEIVER

Norimasa Baba, Nagoya, and Michiyasu Yamamoto, Chiryu, both of Japan, assignors to NipponDenso Co., Ltd., Kariya, Japan

Filed Jul. 21, 1995, Ser. No. 505,637

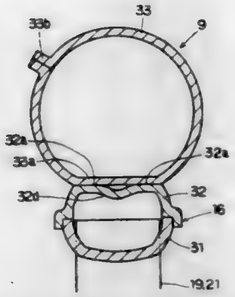
Claims priority, application Japan, Jul. 22, 1994, 6-170870

Int. Cl.[6] F25B *39/04*

U.S. Cl. 62—509 **11 Claims**

1. A refrigerant condenser with an integral receiver, comprising:

a core having a condenser portion to condense refrigerant flowing horizontally;



a header extending vertically at one end portion of said core, and connected to a downstream-side portion of said condenser portion, said header having a communication chamber therein communicating with one end of said condenser portion;

a receiver disposed to one side of said communicating chamber and having a vapor-liquid separation chamber for separating vapor-liquid of refrigerant;

a refrigerant introducing means for introducing refrigerant in said communicating chamber into said vapor-liquid separation chamber; and

a refrigerant discharging means for discharging refrigerant located below said introducing means and in said vapor-liquid separation chamber to an outside of said separation chamber; wherein:

said header and said receiver are formed from first and second tubular bodies which extend vertically;

at least one of said first and second tubular bodies has a first flat portion and a curved portion on an outer-wall surface thereof, and the other has at least a second flat portion to join with said first flat portion;

said first flat portion has a rib depressed toward an inner side thereof.

5,592,831

PROCESS FOR RECOVERING A PURE CARBON MONOXIDE FRACTION

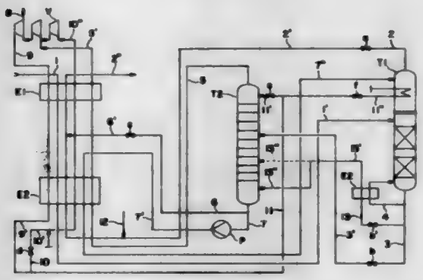
Heinz Bauer, Ebenhausen, and Rainer Fabian, Geretsried, both of Germany, assignors to Linde Aktiengesellschaft, Germany

Filed Sep. 8, 1995, Ser. No. 524,676

Claims priority, application Germany, Sep. 16, 1994, 44 33 114.2

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—625 **4 Claims**



1. In a process for recovering a pure CO fraction from a charge containing at least hydrogen, carbon monoxide and methane, comprising cooling and partially condensing the charge, scrubbing the resultant charge with supercooled liquid methane scrubbing agent to remove carbon monoxide from the charge and provide a liquid containing methane, carbon monoxide and hydrogen, stripping hydrogen from said liquid so as to obtain an enriched CO/CH_4 fraction, and subjecting said enriched CO/CH_4 fraction to rectification to separate out a pure CO fraction and an enriched CH_4 fraction, the improvement which comprises employing as the supercooled liquid methane scrubbing agent, a liquid methane scrubbing agent containing at least 2 to 15 mol % carbon monoxide.

5,592,832

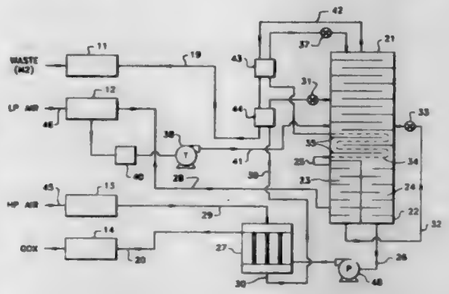
PROCESS AND APPARATUS FOR THE PRODUCTION OF MODERATE PURITY OXYGEN

Donn M. Herron, Fogelsville; Rakesh Agrawal, Emmaus, and Jianguo Xu, Fogelsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 3, 1995, Ser. No. 538,541

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—646 **20 Claims**



1. A cryogenic process for production of an oxygen product from air, wherein the air is compressed, purified to remove contaminants which freeze out at cryogenic temperatures and cooled to near its dew point, wherein the cooled, purified, compressed air is fed to a separator, wherein separator vapor is rectified into a nitrogen-enriched rectifier overhead and a crude liquid oxygen bottoms; wherein an oxygen-enriched liquid is stripped to produce a nitrogen-enriched stripper overhead and the oxygen product, characterized in that a multiple passage plate-fin heat exchanger having at least two sets of passages is used to effectuate the rectifying and stripping functions, wherein one set of passages comprises a continuous-contact rectification dephlegmator which rectifies the separator vapor and produces the enriched-nitrogen rectifier overhead and the crude liquid oxygen bottoms; wherein a second set of passages comprises a continuous-contact stripping dephlegmator which strips the oxygen-enriched liquid to produce the nitrogen-enriched stripper overhead and the oxygen product; wherein reflux of the rectification device and boilup for the stripping device is provided, at least in part, by indirect heat exchange between and along said two sets of passages, thereby producing a thermal link between the rectification dephlegmator and the stripping dephlegmator.

5,592,833

PROCESS AND APPARATUS FOR THE RECOVERY OF PURE ARGON

Anton Moll, Raisting, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

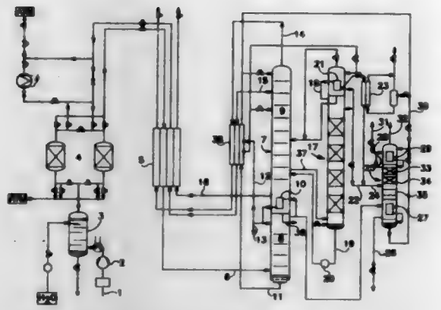
Filed Feb. 23, 1995, Ser. No. 393,388

Claims priority, application Germany, Feb. 24, 1994, 44 06 051.3; Oct. 10, 1994, 44 36 160.2

Int. Cl.[6] F25J *3/04*

U.S. Cl. 62—648 **21 Claims**

1. A process for recovering argon comprising:



separating air in at least one air separation column to provide a product oxygen stream and a product nitrogen stream,

withdrawing an argon-containing oxygen stream from said air separation column and introducing said argon-containing oxygen stream into a crude argon column,

withdrawing a crude argon fraction from said crude argon column and introducing said crude argon fraction at an intermediate point into a pure argon column,

cooling the head of said pure argon column by indirect heat exchange, and

withdrawing from an upper region of said pure argon column a residual nitrogen-containing fraction and withdrawing from a lower region of said pure argon column a pure argon fraction,

wherein mass transfer in said pure argon column is brought about, at least in part, by a packing contained therein.

5,592,834

PROCESS AND INSTALLATION FOR THE SEPARATION OF AIR

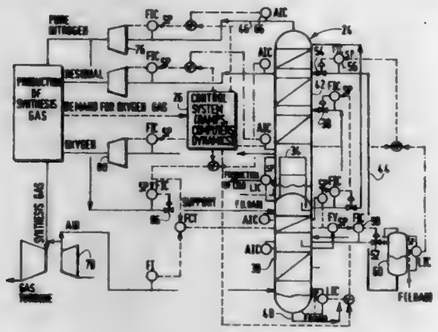
Bernard Darredeau, Sartrouville; Jean-Yves Lehman, Maisons-Alfort, and Jean-Marc Peyron, Creteil, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris Cedex, France

Division of Ser. No. 230,521, Apr. 20, 1994, Pat. No. 5,437,160. This application Jul. 31, 1995, Ser. No. 509,137

Claims priority, application France, Apr. 29, 1993, 93 05062; Sep. 28, 1993, 93 11509

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—656 **3 Claims**



1. A method for controlling a cryogenic rectification plant for the separation of air, the plant having a higher pressure column and a lower pressure column, the method comprising passing air into said higher pressure column, passing liquid from the sump of the higher pressure column to the lower pressure column, maintaining the liquid in the sump of the higher pressure column at a predetermined level by means of a sump level controller having a set point set at a predetermined level; and controlling said sump level solely in dependence on the flow rate of air to the column.

5,592,835

NECKLACE WITH MEANS FOR ADDING GEM STONES THERETO

Andria R. Herr, 310 S. Pressview Ave., Longwood, Fla. 32750

Filed Sep. 25, 1995, Ser. No. 533,117

Int. Cl.[6] A44C *5/02*

U.S. Cl. 63—4 **3 Claims**



1. A necklace having means for installing gemstones therein after purchase of the necklace by a consumer comprising:

a) a pendant element composed of a central semi-globular metallic bead and first and second semi-globular metallic beads rigidly attached to said central bead, such that imaginary lines through the centers of each of said first and second attached beads, and through a center of said central bead form essentially a right angle therebetween having said central bead at the apex thereof;

b) a plurality of said semi-globular beads having linking means for movably linking said beads together to form a pair of strings thereof, one of said strings attached to said first attached bead, and a second of said strings attached to said second attached bead, said strings including means for coupling said pair of strings to form said necklace;

c) whereby said pendant element serves as a weight to maintain said necklace centered when being worn; and

d) each of said beads of said pendant and said beads of said strings includes a central partial cylindrical bore from a rear surface thereof formed therein, thereby providing a region thereabove each of said beads for subsequent forming of a gemstone setting in a front face thereof, said setting for mounting of a gemstone.

5,592,836

CIRCULARLY KNIT BRASSIERE HAVING KNIT-IN-LIFT AND SUPPORT PANELS, AND A BLANK AND METHOD FOR MAKING SAME

Thomas F. Schuster, Hickory, and Harold G. Osborne, Boomer, both of N.C., assignors to Alba-Waldensian, Inc., Valdese, N.C.

Continuation-in-part of Ser. No. 237,114, May 3, 1994, Pat. No. 5,479,791, and a continuation-in-part of Ser. No. 382,864, Feb. 3, 1995. This application Jun. 7, 1995, Ser. No. 479,180

Int. Cl.[6] A41B *9/06*; A41C *1/00*

U.S. Cl. 66—176 **28 Claims**

1. A method of making a circular knit blank comprising:

knitting a series of courses defining a cylindrical, tubular fabric portion in the form of a turned welt;



knitting to said turned welt a series of courses defining a tubular fabric upper torso portion, said upper torso portion including at least first and second discrete integrally knit generally walewise extending support panels having a greater resistance to coursewise stretch than the remainder of the upper torso portion to provide support for a wearer's breasts, said support panels being separated by first and second differentially shaped breast cups; and

knitting to said upper torso portion a series of courses defining a shoulder portion including plural elongated areas in which the courses are simple knit with the areas being divided by elongate panel areas, and then completing the blank by

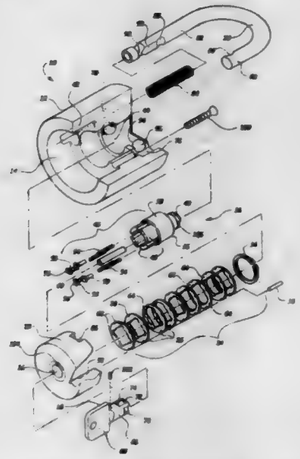
knitting several courses forming a non-raveling edge.

5,592,837

PICK RESISTANT LOCK

Darryl G. McBride, Mocksville, N.C., assignor to Universal Lock, Mocksville, N.C.

Filed Sep. 11, 1995, Ser. No. 526,569
Int. Cl.[6] E05B *67/22*
U.S. Cl. 70—38 A **11 Claims**



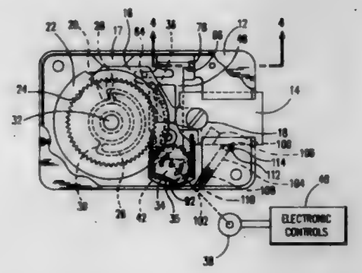
1. A lock comprising a housing defining an interior chamber having a chamber axis and a keyway opening through said housing axially into said chamber, said housing having stationary cam means disposed annularly adjacent said chamber for defining a plurality of generally parallel raceways each having a predetermined limited extent anularly with respect to said chamber and each in a separate predetermined planar disposition axially relative to said chamber, a tumbler assembly disposed within said chamber for selective rotational movement therein about the chamber axis, said tumbler assembly having a plurality of bearing elements supported for movement axially relative to said raceways, a key insertable into said keyway and having a plurality of shoulders at selective spacings from one another to engage and move said plurality of bearing elements axially into respective operative dispositions within corresponding ones of said raceways enabling annular movement of said bearing elements along the raceways in at least two parallel planes without movement of the cam means wherein said tumbler assembly may be rotated by said key between a looked disposition and an unlocked disposition, and a locking member mounted to said housing for movement between a retained position engaged by said tumbler assembly when in its said locked disposition and a released position disengaged by said tumbler assembly when in its said unlocked disposition.

5,592,838

ANTI-ATTACK INTERLOCKS FOR A COMBINATION LOCK MECHANISM

Thomas R. Clark; Gerald L. Dawson, and Paul T. Scherer, all of Lexington, Ky., assignors to Mas-Hamilton Group, Lexington, Ky.

Filed Feb. 20, 1992, Ser. No. 839,174
Int. Cl.[6] E05B *49/02*
U.S. Cl. 70—303 A **15 Claims**



1. An interlock comprising:

a bolt having two positions, one of said positions being an extended position and another of said positions being a withdrawn position;

a linkage connected to said bolt for transmitting force to said bolt to move said bolt from one of said positions to said other of said positions, said linkage having two positions relative to said bolt, one of said positions being a position ineffective to receive said force and said other of said positions being a position effective to receive said force;

bolt moving means for providing said linkage said force to move said bolt;

an interposer for displacing said linkage from said ineffective position to said effective position, said linkage disengageable from said interposer only upon movement of said linkage and said bolt to said withdrawn position;

means for manually inputting a force to said lock;

a rotary member rotationally driven by said means for manually inputting a force to transmit said input force to said interposer;

electromagnetic means for selectively connecting said means for manually inputting a force to said rotary member;

a displaceable blocking member for preventing said interposer from displacing said linkage, said displaceable blocking member directly blockingly engageable with said interposer to block said interposer from movement and displaceable by said rotary member to a position out of engagement with said interposer;

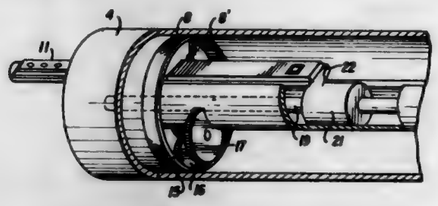
said blocking member further comprises displacing means for moving said blocking member out of engagement with said interposer.

5,592,839

ASSEMBLY FOR RETAINING OF KEYS OF SIMILAR OBJECTS

Noam Hasan, Alia St. 27/5, Afula, Israel

Filed Mar. 22, 1994, Ser. No. 215,713
Claims priority, application Israel, Mar. 24, 1993, 105149
Int. Cl.[6] A44B *15/00*
U.S. Cl. 70—456 R **14 Claims**



1. A key assembly comprising:

a generally tubular housing, having a longitudinal axis;

key retaining means mounted within said housing and rotatable about said longitudinal axis, said key retaining means defining a plurality of grooves into which a plurality of keys may be mounted and slidable parallel to said longitudinal axis;

key advancing and retracting means mounted within said tubular housing for advancing said keys parallel to said longitudinal axis and through an opening defined in one end of said housing;

wherein said key advancing and retracting means comprises an axle rotatably mounted within said housing, and said axle carries a retracting member, pivotally mounted on said axle and formed as a hook, adapted to grab a selected key and to advance it along a receiving groove of said key retaining means in response to rotary motion of said axle;

guiding means for directing said retracting member when it advances said selected key toward a use position and for disengaging it from the key after it is returned to the stored position; and

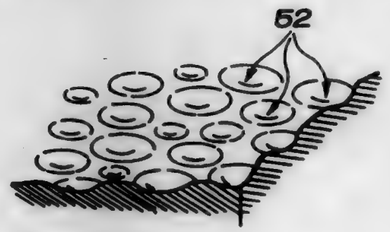
disconnecting means for separating said retracting member from the key when the key is moved out of the exit opening into the use position.

5,592,840

METHOD OF PREVENTING ABRASION AT SLIDING PORTION OF METAL-PRODUCT

Yoshio Miyasaka, Kasugai, Japan, assignor to Fuji Kihan Co., Ltd., Aichi, Japan

Filed Mar. 22, 1995, Ser. No. 408,293
Int. Cl.[6] C21D *7/06;8/00*
U.S. Cl. 72—53 **26 Claims**



1. A method for preventing abrasion of a metal-product, made of ferrous metal having an A_3 transformation temperature or made of nonferrous metal having a recrystallization temperature, said metal-product having a portion which is to be subjected to sliding action, said portion having a surface, said method comprising:

subjecting said portion of said metal-product to shot peening thereby resulting in

an increase in temperature at the surface of said portion of said metal-product to a temperature at least as high as (a) A_3, the transformation temperature of the metal of said metal product in the case that said metal-product is made of a ferrous metal, or (b) the recrystallization temperature of said metal of said metal product in the case that said metal-product is made of a nonferrous metal, and

formation of a plurality of concave sumps on said surface of said portion, each sump having a circular arc-shaped cross section,

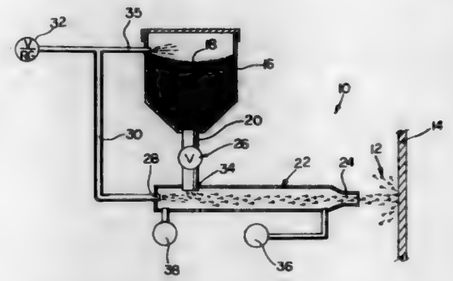
said shot-peening comprising projecting shots under pressure at a velocity of at least 50 m/sec whereby said shots impact against said surface of said portion, said shots having a hardness at least as high as that of said metal-product, a substantially spherical shape, and a size of 20 to 200μ.

5,592,841

SHOT PEENING METHOD

Jack M. Champaigne, 1919 Inwood Rd., South Bend, Ind. 46614

Continuation-in-part of Ser. No. 274,806, Jul. 14, 1994, Pat. No. 5,460,025. This application Aug. 1, 1995, Ser. No. 509,827
Int. Cl.[6] B24C *1/00*
U.S. Cl. 72—53 **12 Claims**



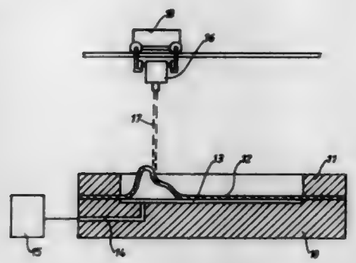
1. Shot peening method comprising the steps of providing a transport hose with a nozzle attached at an end thereof; conveying shot into said nozzle other than through said transport hose at a predetermined mass flow rate, supplying gas under pressure to said hose through an inlet opening for accelerating said shot in said nozzle, discharging said shot from said nozzle directed at a workpiece being treated, determining from a look-up table the pressure levels in said hose at a first measuring point at said nozzle and at a second measuring point upstream from said first measuring point required to establish a desired shot velocity at said predetermined shot mass flow rate, controlling the pressure of said gas supplied to said hose to establish said pressure levels at said first and second measuring points representing said desired shot velocity of shot being conveyed through said hose, monitoring the pressure levels at said first and second measuring poiats during treatment of the workpiece, and discontinuing treatment of said workpiece when a change of either of said pressure levels indicates a velocity of the particles being transported through said hose that is other than the desired velocity.

5,592,842

METHOD AND DEVICE FOR SHAPING DETAILS BY MEANS OF SUPERPLASTIC FORMING

Olli J. Nyrhilä, Åbo, Finland, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Aug. 28, 1995, Ser. No. 519,707
Claims priority, application Sweden, Sep. 21, 1994, 9403164
Int. Cl.[6] B21D *26/02*
U.S. Cl. 72—60 **7 Claims**



1. A method for forming details in a foil or plate material by means of superplastic forming, comprising the steps of:

guiding a laser beam over a selected portion of the material to thereby heat the selected portion to a temperature suitable for superplastic deformation; and,

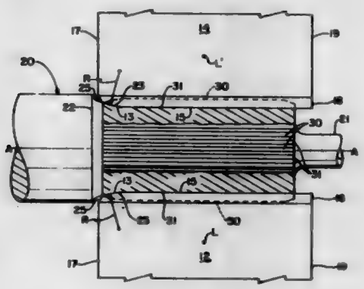
simultaneously exposing the material to a fluid pressure to thereby slowly deform the selected portion into a predetermined shape.

5,592,843

SPLINE RACK

Wei-Jiung Tsung, Fort Wayne, and James Fisher, Huntertown, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 10, 1995, Ser. No. 386,922
Int. Cl.[6] B21H *5/00*
U.S. Cl. 72—88 **6 Claims**



1. A spline rack for use on a spline rack cutter capable of moving said spline rack on a path in the direction of its longitudinal axis, said spline rack comprising:

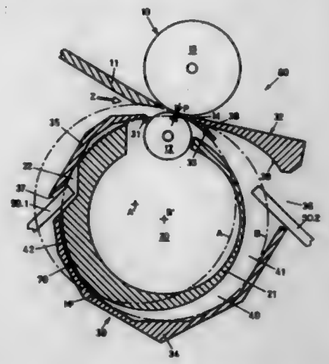
at least one tooth having a top land surface extending generally transverse relative to said path of movement and between an inner tooth edge region and an outer tooth edge region, and wherein said inner tooth edge region includes a chamfer joining said inner tooth edge region with said curved portion of said top land surface, said curved portion providing an upwardly curved bottom land portion toward a workpiece inner tooth edge in a workpiece having a shoulder adjacent said workpiece inner tooth edge.

5,592,844

PROCESS AND APPARATUS FOR ROUNDING SHEET-METAL BLANKS

Michael Baumgartner, Rekingen, Switzerland, assignor to Elpatronic AG, Zug, Switzerland

Filed Jun. 29, 1995, Ser. No. 496,532
Claims priority, application Switzerland, Aug. 10, 1994, 2473/94; Oct. 31, 1994, 3242/94
Int. Cl.[6] B21B *39/02*; B21D *5/14*; *9/10*
U.S. Cl. 72—133 **21 Claims**



1. Process for rounding, in a rounding apparatus, blanks which are fed to the apparatus in succession one immediately after another, comprising the steps of:

plastically deforming each blank in a rounding mechanism,

moving each plastically deformed blank into a natural rounding position, and

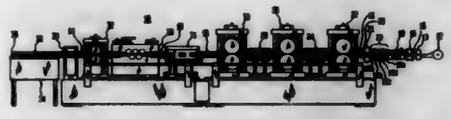
immediately after the rounding of each deformed blank is completed, shifting at least a rear end portion of the deformed blank into a transfer position which is different from the rounding position so that the rounding position is vacated by the shifted, deformed blank for occupation by at least a leading portion of the next incoming blank which is already in the process of being rounded before the shifted, deformed blank is ejected from the rounding apparatus.

5,592,845

PROCESS FOR PRODUCING BAR FLATS

Duane Gerenser, New Hope; Reinhard F. Kuffel, Washington Crossing, both of Pa., and Donald Jorgensen, Hamilton Square, N.J., assignors to Pennington Metals, Inc., Trenton, N.J.

Continuation of Ser. No. 73,751, Jun. 8, 1993, abandoned.
This application May 25, 1995, Ser. No. 450,888
Int. Cl.[6] B21B *1/28*; *15/00*
U.S. Cl. 72—161 **4 Claims**



1. A method of producing improved cold finished bar flats from a strip of a sheet, said strip including a top surface, bottom surface and edge surfaces on either side of said strip, comprising the steps of:

shaving said edge surfaces of said strip, said strip having a thickness of between 0.125 and 0.50 inches;

first cold finishing for finishing said top and bottom surfaces of said strip with a plurality of pairs of cold finishing rollers;

edge conditioning said edges of said strip with at least one pair of edge conditioning rollers, said at least one pair of edge conditioning rollers is positioned between said plurality of pairs of cold finishing rollers, said cold finishing rollers and said edge conditioning rollers reduce the thickness and width of said strip by ±0.020 inches and hold minimum tolerances of between 0 to −0.002 inches to form said cold finished bar flats having a smooth finish on top, bottom and edge surfaces of said bar flats; and

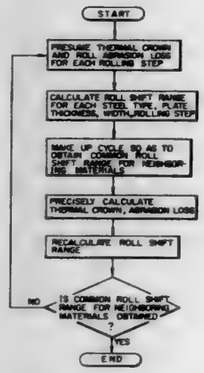
second cold finishing for finishing said top and bottom surfaces of said strip after said edge conditioning step.

5,592,846

ENDLESS HOT ROLLING METHOD

Yuichiro Watanabe; Kunio Isobe; Ikuo Yarita, and Hideyuki Nikaido, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 4, 1993, Ser. No. 101,860
Claims priority, application Japan, Aug. 7, 1992, 4-211710; Aug. 7, 1992, 4-211711
Int. Cl.[6] B21B *1/26*
U.S. Cl. 72—206 **3 Claims**



1. An endless hot rolling method using a hot strip mill substantially composed of a roughing mill and a finishing mill having roll bending means and roll shifting means to continuously roll different rolling materials which have been sequentially joined, said endless hot rolling method comprising the steps of:

calculating a roll shift range in an axial direction for each rolling material so as to provide a desired crown for the rolling material;

determining a rolling sequence so as to obtain a common roll shift range for each pair of neighboring rolling materials;

connecting a preceding rolling material at a tail end thereof to a head end of a succeeding rolling material, between the roughing mill and the finishing mill, said connection forming a joint portion of the different rolling materials to be continuously rolled wherein a transition occurs between different steel types and sizes at said joint portion;

shifting in an axial direction a roll position during the continuous rolling and during the transition from the preceding material to the succeeding material so that a roll shift position corresponding to a position at the connection of said preceding material and said succeeding material is within a common roll shift range for said preceding material and said succeeding material; and

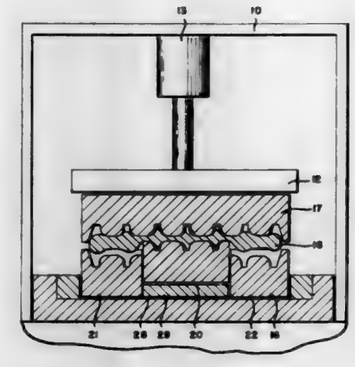
rolling while changing a roll bending load on each of said roll bending means in accordance with a roll shift pattern so as to achieve the desired crown of each rolling material, thereby suppressing deviation from a target crown at the joint portion where sheet bars of differing steel types are joined for continuous endless rolling.

5,592,847

STEPPED SEGMENTED, CLOSED-DIE FORGING

John M. Sarkisian, Northboro; John R. Paltsch, and Joseph J. Zecco, Jr., both of Shrewsbury, all of Mass., assignors to Wyman-Gordon Company, N. Grafton, Mass.

Continuation of Ser. No. 169,380, Dec. 17, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 467,159
Int. Cl.[6] B21J *13/02*
U.S. Cl. 72—356 **17 Claims**



1. A method for enhancing the performance, on a workpiece having a first portion and a second portion, of a forging press in which the shape and thickness of the workpiece are significantly altered and in which grain flow and flow lines are formed, that is, patterns revealable by macroetching in the workpiece resulting from elongation of non-homogeneous constituents and the grain structure of the workpiece in the direction of working during forming, the press having a first die bed and a second die bed, comprising the steps of:

(a) installing, in the press, a closed die set having a first impression die mounted on the first die bed, and a second impression die mounted on the second die bed, one of said die beds being actuated by a single ram, said first die being divided into at least two segments, a first segment and a second segment,

(b) providing a first advancement means comprising a first solid spacer block between said first die bed and said first segment and employing the first advancement means to advance the first segment ahead of the second segment,

(c) placing the workpiece between the dies,

(d) carrying out a first closed die forging operation on the workpiece, so that the first segment is a primary forging agent and acts on said first portion, the thickness of said first spacer block being such that the second segment provides the minimum force required to prevent bending of the workpiece,

(e) opening said press and removing said first solid spacer block,

(f) providing a second advancement means comprising a second solid spacer block between said first die bed and said second segment and employing the second advancement means to advance the second segment ahead of the first segment, and

(g) conducting a second closed die forging operation on the workpiece, so that the second segment is a primary forging agent and acts on said second portion, the thickness of said second spacer block being such that the first segment provides the minimum force required to prevent bending of the workpiece.

5,592,848

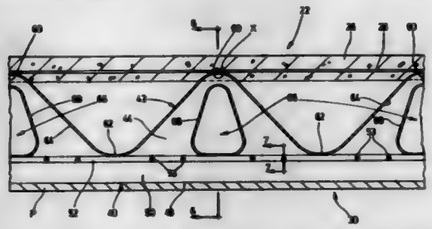
METHOD OF SIMULTANEOUSLY FORMING A PAIR OF SHEET METAL STRUCTURAL MEMBERS

Ernest R. Bodnar, 2 Daurese Crescent, Don Mills, Ontario, Canada

Continuation-in-part of Ser. No. 285,738, Aug. 4, 1994, which is a continuation-in-part of Ser. No. 974,508, Nov. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 710,524, Jun. 3, 1991, Pat. No. 5,207,045. This application May 10, 1995, Ser. No. 435,426

Int. Cl.[6] B21D *31/00*

U.S. Cl. 72—379.2 **4 Claims**



1. A method of forming a pair of sheet metal structural members simultaneously from a single elongated strip of sheet metal defining parallel side edges and comprising the steps of;

severing said strip sheet metal along a pre-determined zig-zag separation path, thereby dividing said strip into two strip portions on opposite sides of said zig-zag separation path, each having generally zig-zag edges said zig-zag edges being in generally inter-fitting relation;

forming edge flange formations along said zig-zag edges of each of said strip portions at an angle thereto, and,

forming linear edge formations along said parallel side edges of said strip portions.

5,592,849

YARN UNEVENESS INFORMATION ANALYZING APPARATUS

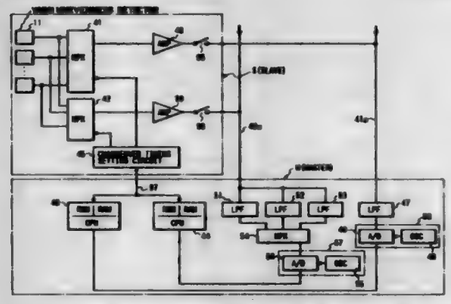
Kazuhiko Nakade, Kyoto; Shujiro Suzuki, Mukou, and Masakatsu Hasegawa, Uji, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 132,910, Oct. 7, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 559,178

Claims priority, application Japan, Oct. 16, 1992, 4-304940

Int. Cl.[6] G01N *27/00;33/36;* **G06F** *19/00*

U.S. Cl. 73—160 **6 Claims**



1. A yarn unevenness information analyzing apparatus which receives signals from a plurality of yarn unevenness detectors, the apparatus comprising:

calculation means receiving the signals from the plurality of yarn unevenness ydetectors, for analyzing yarn unevenness, said calculation means including a central processing unit portion; and

a first changeover means receiving the signals from said plurality of yarn unevenness detectors for sequentially connecting signals from each of said plurality of yarn unevenness detectors in a first predetermined time period to successively output the signals to said calculation means, and a second changeover means indepeadently receiving the signals from said plurality of yarn unevenness detectors for sequentially connecting signals from each of said plurality of yarn unevenness detectors in a second predetermined time period which is different from said first predetermined time period to successively output the signals to said calculation means, wherein said first changeover means and said second changeover means are operated independently from each other so that both of a periodical yarn unevenness in said first predetermined time period and a yarn unevenness in said second predetermined time period can be simultaneously analyzed.

5,592,850

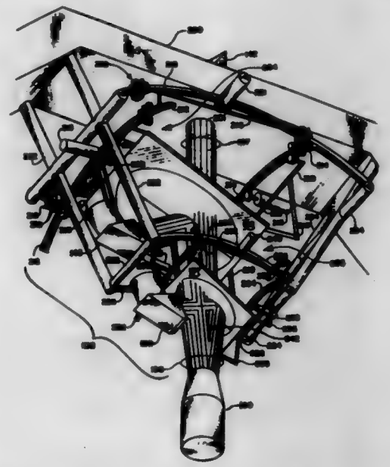
MISSILE GUIDANCE SEEKER AND SEEKER MISSILE COUNTERMEASURES SYSTEM TESTING APPARTATUS WITH CO-LOCATION AND INDEPENDENT MOTION OF TARGET SOURCES

Herman K. Rowan, Baker, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 27, 1994, Ser. No. 266,413

Int. Cl.[6] G01L *5/14*

U.S. Cl. 73—167 **7 Claims**



1. Missile heat seeker and heat seeking missile countermeasures testing apparatus comprising the combination of:

a hot target image simulating source of radiant energy movably disposed within the viewing field of a test missile guidance system;

a hot countermeasures image simulating source of radiant energy disposed in movable image relationship with said hot target image simulating source of radiant energy and within the viewing field of said test missile guidance system;

first externally controllable image determining means connected with said hot target image simulating source of radiant energy for positioning, moving, and additionally controlling the hot target image in response to a first testing algorithm;

second externally controllable image determining means connected with said hot countermeasures image simulating source of radiant energy for positioning, moving, and additionally controlling the hot countermeasures image in response to a second testing algorithm;

responsive means connected with said test missile guidance system for physically positioning and moving said test missile guidance system relative to said hot target image and said hot countermeasures image in response to signals from said test missile guidance system generated in response to said hot target image and said hot countermeasures image; and

means for evaluating the response of said test missile guidance system to changes in input data provided to either of said first and second testing algorithms.

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SEMI-AUTOMATIC MECHANICAL TRANSMISSION WITH FORCED AUTOMATIC SHIFTING

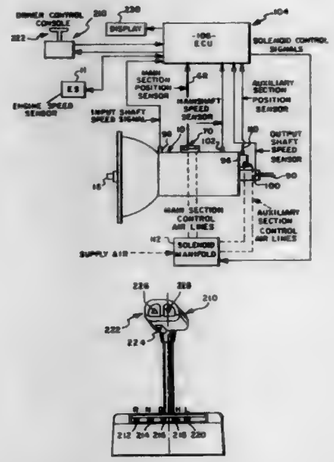
Ian R. J. Bates, W. Yorkshire; Michael Daly, London, and Paul M. Fowler, Lymm, all of England, assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 1, 1995, Ser. No. 551,603

Claims priority, application United Kingdom, Nov. 11, 1994, 9422850

Int. Cl.[6] F16H *61/00*

U.S. Cl. 74—336 R **10 Claims**



1. A method of controlling a vehicular automated mechanical change-gear transmission system comprising a fuel throttle-controlled engine (E), a multi-speed change-gear mechanical transmission (**10**), a manually operated shift selection device (**226/228, 301**), sensing means for sensing vehicle operating conditions a central processing unit (**106**) for receiving inputs indicative of vehicle operating conditions and for processing same according to predetermined logic rules to issue command output signals to non-manually controlled operators including a transmission operator (**112**), said transmission system operable in a hold mode of operation wherein said transmission is retained engaged in a currently engaged ratio (GR_C) until a shift from said currently engaged ratio to a target gear ratio (GR_T) is manually initiated by use of said selection device, said method comprising:

when operating in said hold mode of operation, sensing for existence of a predetermined override condition,

upon sensing the existence of said override condition, determining a desirable gear ratio (GR_D) as a function of sensed operating conditions overriding said hold mode of operation and causing an automatic initiation of a shift from said currently engaged ratio to said desirable gear ratio.

5,592,852

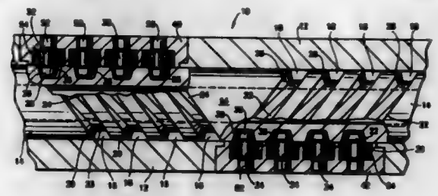
MECHANICAL OSCILLATOR

John D. Parsons, Bethel, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Nov. 3, 1994, Ser. No. 333,735

Int. Cl.[6] F16C *19/54;* **F16H** *25/12*

U.S. Cl. 74—57 **12 Claims**



1. A mechanical oscillator comprising, in combination:

a) a shaft having a pair of oppositely-oriented, spaced-apart endless grooves in its periphery,

b) a nut body carried by and slidable along said shaft on the respective peripheral portions thereof which have the said oppositely-oriented endless grooves,

c) a pair of roller pins carried by said nut body, said pins being oppositely oriented in said body and having nose portions respectively extending into and engaging oppositely-faced walls of the said endless grooves and having tail portions disposed in the peripheral portions of the nut body, and

d) anti-friction bearings carried by the nut body, said bearings carrying the said roller pins.

5,592,853

POWER-SHIFTABLE, MULTIPLE GEAR REVERSING GEAR BOX

Wolfgang Rebholz, and Fritz Leber, both of Friedrichshafen, Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

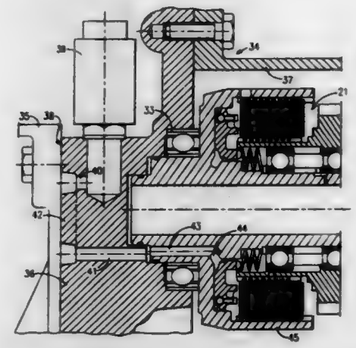
PCT No. PCT/EP93/03539, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO94/15116, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 15, 1993, Ser. No. 433,380

Claims priority, application Germany, Dec. 18, 1992, 42 42 942.0

Int. Cl.[6] F16H *3/093;61/00*

U.S. Cl. 74—325 **5 Claims**



1. In a power-shiftable multiple gear reversing transmission (**1**), having a multi-part housing (**34**), an input shaft (**11**) and countershafts (**17** to **20**) with fixed gears (**12** to **14**, **30**, **31**) to form a changing set (**15**) and an output gear set (**32**), a hydraulically actuatable clutch (**21** to **24**) situated upon each countershaft, an idler gear (**25** to **28**) associated with each clutch and being selec-

tively non-rotatably connectable with the corresponding countershaft and oil for actuation of the clutches being supplied by valves (39), ducts (42) and housing bores (40, 41), wherein the improvement comprises:

a multipart housing having a first housing part (35) removably secured to a second housing part (36) to define a partition (38);

a valve (39) secured to the second housing part (36);

a clutch carrier (45) rotatably mounted in the second housing part (36);

at least first and second housing bores (40, 41) provided in the second housing part (36), the first bore (40) extending from the partition (38) to the valve (39), and the second bore (41) extending from the partition (38) to an annular cavity defined by the second housing part (36) and the clutch carrier (45);

a duct (42) provided in the second housing part (36) adjacent the partition (38) and being extended between the two housing bores (40, 41);

a carrier bore (43) provided in the clutch carrier (45) and extending from the annular cavity defined by the second housing part (36) and the clutch carrier (45) to an annular space (44) of a clutch; and

the valve (39), housing bores (40, 41), duct (42) and carrier bore (43) communicating such that an oil is containable therein for clutch actuation.

5,592,854

MOTOR VEHICLE GEARBOX

Sverker Alfredsson, Västra Frölunda, Sweden, assignor to AB Volvo, Gothenburg, Sweden

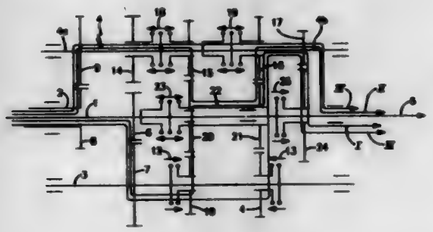
PCT No. PCT/SE93/00761, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/07055, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 20, 1993, Ser. No. 483,830

Claims priority, application Sweden, Sep. 21, 1992, 9202722

Int. Cl.[6] F16H *3/08*

U.S. Cl. 74—331 **7 Claims**



1. In a motor vehicle gearbox, comprising two intermediate shafts for transmission of an input torque to an output shaft, whereby a first gear wheel, rotatably mounted on each intermediate shaft and lockable by means of coupling means on respective shaft, is in engagement with a common gear wheel rotatably mounted with respect to the output shaft and lockable for rotation together with the output shaft, said gear wheel being arranged to transmit torque from one intermediate shaft to the other in the disengaged position; the improvement comprising at least one second gear wheel (11, 16) on each intermediate shaft (3, 4) engagement with at least a second common gear wheel (21) which is drivably coupled to a first common gear wheel (20) in order to allow torque transmission from said first gear wheel (10) on said first-mentioned intermediate shaft (3) to said second gear wheel (16) on the second intermediate shaft (4) via both the common gear wheels (20,21), the second intermediate shaft (4) being divided into two parts (4a, 4b) rotatable relative to each other, said parts being engageable with each other by means of coupling means (19) for rotation as a unit.

5,592,855

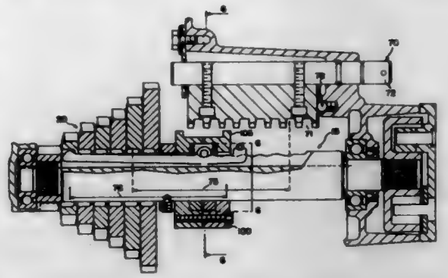
TRANSMISSION SHIFT KEY

Mike Weirich, Medina, and Kurt E. Vogt, Crestline, both of Ohio, assignors to MTD Products Inc., Cleveland, Ohio

Division of Ser. No. 260,763, Jun. 16, 1994. This application Jan. 16, 1996, Ser. No. 587,420

Int. Cl.[6] F16H *3/08*

U.S. Cl. 74—371 **13 Claims**



1. An improved shift key mechanism for a transmission having a rotating shaft with at least one gear freely journalled thereon, the shaft having at least one longitudinal slot in its circumferential outer surface, a shift key being in the slot slideable therein for selectively connecting an individual gear to the shaft and the shift key being longitudinally movable in the slot by a shift collar, the improvement of a pivot, said pivot being connected to the shift key, said pivot engaging the outer circumferential surface of the shaft to support the shift key above the bottom of the slot,

at least one tab, said tab being on the shift collar,

a shift lock, said shift lock having at least one slot, said shift lock being movably connected to the transmission, and means to selectably engage said slot of said shift lock with said tab on the shift collar so as to cooperate to maintain the transmission in an operator-set position.

5,592,856

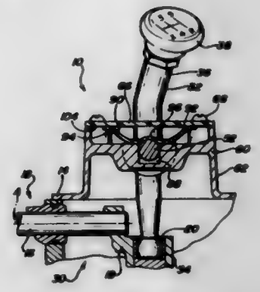
SELF-CENTERING SHIFTER ASSEMBLY

George A. Parsons, Grosse Pointe, Mich., assignor to New Venture Gear, Inc., Troy, Mich.

Filed Feb. 15, 1995, Ser. No. 389,015

Int. Cl.[6] F16C *11/06*; F16H *59/04*; G05G *9/00*

U.S. Cl. 74—473 P **20 Claims**



1. A shifter assembly of the type operably coupled to a gearshift mechanism associated with a multi-speed manual transmission for permitting a vehicle operator to selectively shift the transmission between a plurality of ratio gear positions thereof, the shifter assembly comprising:

a shift mechanism including an elongated shift lever, said elongated shift lever having a first end coupled to the gearshift mechanism and a second end under the control of a vehicle operator for causing movement of the gearshift mechanism among the plurality of ratio gear positions in response to selective pivotal movement of said shift lever and said shift mechanism including a rocking shaft having first and second ends;

mounting means for operatively mounting said shift mechanism with respect to a housing of the transmission; and

first and second single leaf flat springs biasing said shift mechanism into a neutral position, said first single leaf flat spring biasing said first end of said rocking shaft and said second single leaf flat spring biasing said second end of said rocking shaft such that said first and second single leaf flat springs are on opposing sides of said shift lever and said first and second single leaf flat springs including an arcuate segment associated with said first and second end such that said first and second ends are matingly received in said arcuate segments.

5,592,857

VARIABLE CAMSHAFT PHASER

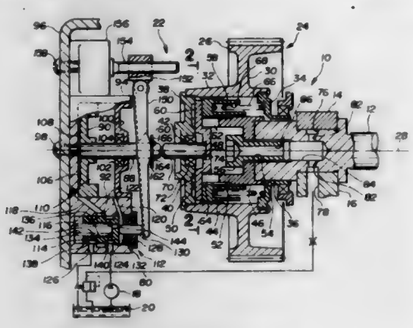
Seinosuke Hara, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Feb. 16, 1995, Ser. No. 389,312

Claims priority, application Japan, Feb. 16, 1994, 6-019083

Int. Cl.[6] F16H *53/00*

U.S. Cl. 74—568 R **18 Claims**



1. A variable camshaft phaser comprising:

coaxial drive and driven members;

coupling means including a slide disposed between said drive and driven members for permitting relative rotational movement between said drive and driven members in response to axial movement of said slide such that the magnitude of relative rotational movement between said drive and driven members is determined by the magnitude of axial movement of said slide;

an electro-hydraulic actuator including a body formed with a cylindrical bore disposed outside of said drive and driven members, a piston slidably received in said cylindrical bore and defining in said cylindrical bore a pressure chamber, and a piston rod fixed to said piston, said cylindrical bore and defining in said cylindrical bore a pressure chamber, and a piston rod fixed to said piston, said piston being movable between two limit positions thereof;

a push rod supported by said driver member and having one end abutting on said piston rod and an opposite end;

a cross bar having one and opposite end portions abutting on said slide and a center portion receiving said opposite end of said push rod;

a slide spring acting on said slide in such a direction as to provide motion connection between said piston rod, said push rod, said cross bar, and said slide,

wherein said electro-hydraulic actuator includes valve means for regulating supply of fluid to and discharge thereof from said pressure chamber, a worm gearing including a worm and a worm gear, a motor coupled with said worm for turning said worm, and a lever pivotally supported by said worm gear, said lever being so operatively connected to said position feedback of said piston rod to said valve means.

5,592,858

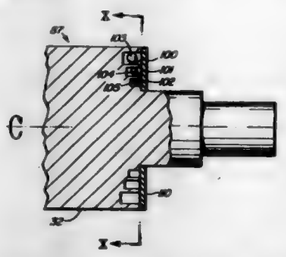
WEIGHT COMPENSATING METHOD AND APPARATUS

Gary R. Taylor, Calgary, Canada, assignor to ETI Technologies Inc., St. Peter Port, Channel Islands

Division of Ser. No. 175,320, Dec. 29, 1993, abandoned, which is a continuation of Ser. No. 887,340, May 21, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,820

Int. Cl.[6] F16F *15/22*

U.S. Cl. 74—573 R **17 Claims**



1. A counterbalancing apparatus comprising a shaft having an outer diameter, at least two grooves formed in said shaft, said grooves being coaxial with the axis of said shaft and formed one inside the other, the outside one of said grooves being inside the outer diameter of said shaft, freely movable weights positioned in each of said grooves and means to retain said weights in said grooves.

5,592,859

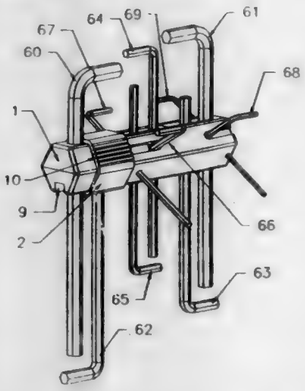
TOOL HANDLE FOR HOLDING MULTIPLE TOOLS OF DIFFERENT SIZES DURING USE

Kenneth R. Johnson, 288 B W. Sunnyoaks Ave., Campbell, Calif. 95008; Robert L. Johnson, 1057 November Dr., Cupertino, Calif. 95014, and Ronald L. Johnson, 3553 Bournemouth Ct., San Jose, Calif. 95136

Filed Jul. 29, 1994, Ser. No. 282,828

Int. Cl.[6] B25G *1/08*

U.S. Cl. 81—177.4 **23 Claims**



1. A generally cylindrical tool handle having two ends and a generally cylindrical surface, the handle for accepting and holding a plurality of tool drivers each of a differing size, wherein each of the plurality of tool drivers includes an elongated rod having a bend through a predetermined angle and including a proximal end for engaging a tool, and a mounting end between the bend and a distal end, wherein the tool handle includes a plurality of holding slots formed into the cylindrical surface, each holding slot for accepting the mounting end of a corresponding tool driver so that

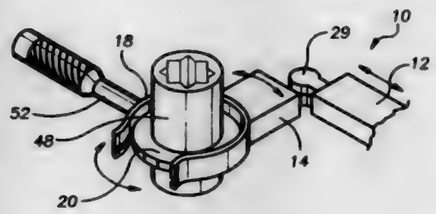
the proximal end of the tool driver extends away from the cylindrical surface, further comprising a plurality of apertures each formed through a bottom of one of the holding slots and penetrating the tool handle wherein a tool driver is mounted to the tool handle by passing the proximal end through an appropriate one of the apertures before engaging the mounting end in the holding slot, and a slidable lock configured to slide along the cylindrical surface for holding the mounting end in the slot.

5,592,860

RATCHET SOCKET BRAKE AND STARTER TOOL

David A. Woodsum, 2623 Gladiolus St., New Orleans, La. 70122

Filed Dec. 15, 1995, Ser. No. 573,117
Int. Cl.[6] B25B *13/58*
U.S. Cl. 81—180.1 20 Claims



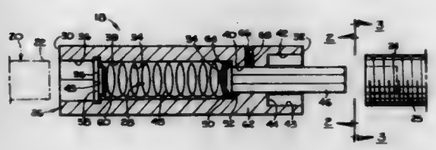
1. A ratchet socket brake and starting tool comprising:
a handle section;
a pivot arm pivotally connected at one end to said handle section with a pivot mechanism;
a pivot-arm slide-lock that is slidable over said pivot mechanism to lock said pivot arm in a fixed position with respect to said handle section;
a horseshoe-shaped friction member having a disk receiving channel formed in an inner surface thereof; and
a socket-post disk having a socket-post keyway formed through a center thereof, said socket-post disk being rotatably entrapped within said disk receiving channel in a manner such that a frictional force is developed between said socket-post disk and said friction member, said frictional force being of sufficient magnitude to cause a socket post of a ratchet mechanism disposed through said socket-post keyway to cause said ratchet mechanism to ratchet.

5,592,861

SOCKET WRENCH SET

Thomas C. Barmore, 4N 127 Verrill, Addison, Ill. 60101

Filed Jun. 4, 1993, Ser. No. 71,057
The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.
Int. Cl.[6] B25B *23/00*
U.S. Cl. 81—438 12 Claims



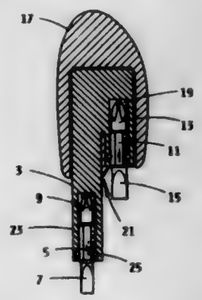
1. A socket wrench unit for use with fasteners having heads of the kind having a first surface, and a second surface, and for those having only a said first surface, those surfaces being of regular polygonal shape, for engagement by sockets for turning the fastener about a longitudinal axis, comprising,
a socket having a front end and a rear end and a longitudinal hole therethrough,
the hole including a rear recess at the rear end for receiving a driving tool element,
the hole also including a front recess at the front end with a polygonal internal surface,
the hole also including a segment rearwardly of and smaller than the front recess, and having a polygonal internal surface,
a key having an external polygonal surface complementary to the internal surface of the smaller segment of the hole, ad slidable therein to a full forward position in which it extends forwardly through the front recess to the exterior, and to a full retracted position in which its front end is at least as far rearwardly as the rear end of the front recess,
said front recess, smaller hole, throughout their lengths in axial direction, and the key throughout its axial length from its front end rearwardly an extent of its range of movement between its forward and retracted positions, all being of uniform dimension, and said front recess being open and unencumbered except for the key, and
yieldable spring means in the hole compressed between the key and a stop element of the socket adjacent the rear end of the hole, and biasing the key toward its full forward position.

5,592,862

COMPACT, HIGH TORQUE, MULTI-DRIVE SCREWDRIVER

Richard J. Macor, Greenwich Township, Warren County, N.J., assignor to Proprietary Technologies, Inc.

Continuation-in-part of Ser. No. 39,726, Jun. 5, 1995. This application Sep. 5, 1995, Ser. No. 523,355
Int. Cl.[6] B25B *23/00*
U.S. Cl. 81—439 10 Claims



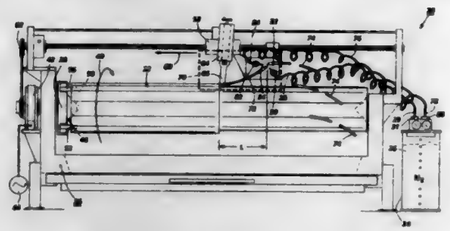
1. A screwdriver having multiple driving heads comprising:
(a) Two double-ended driving bits, each having dimensions of length greater than width and a driving head at either end capable of controlling fastener rotation; and,
(b) a handle having dimensions of length greater than width, and width greater than thickness; and a cavity to store one of said two double-ended driving bits therein, with the length of said driving bit substantially parallel the length of said handle, and off-center relative to said handle width; and,
(c) a screwdriver shank extending from said handle beside said handle cavity and off-center relative to said handle width; and, said screwdriver shank having means to house and secure rotation of one of said two double-ended driving bits.

5,592,863

CRYOGENIC MACHINING OF SOFT/DUCTILE MATERIALS

Timothy R. Jaskowiak, Webster; Daniel R. Gilmore, III, Victor, and Thomas L. DiGravio, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 25, 1995, Ser. No. 533,580
Int. Cl.[6] B23B *25/02*
U.S. Cl. 82—1.11 20 Claims



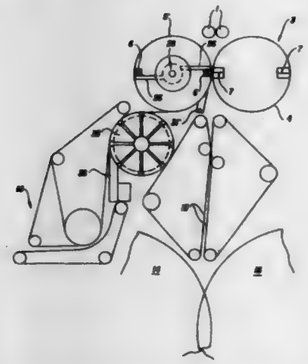
1. A method for producing discontinuous chips during the machining of a workpiece by a cutting tool, comprising:
engaging the cutting tool with the workpiece to produce a continuous chip; and
directing a stream of cryogen toward the continuous chip at a position spaced from the cutting tool and away from the workpiece, so as to rapidly cool the continuous chip and fracture the continuous chip into the discontinuous chips and so as to avoid damage to the workpiece caused by rapid cooling thereof by the stream of cryogen.

5,592,864

DEVICE FOR EXTRACTING SAMPLES FROM A FOLDER

Richard E. Breton, Rochester, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Division of Ser. No. 333,601, Nov. 2, 1994, Pat. No. 5,427,005, which is a continuation of Ser. No. 68,249, May 27, 1993, abandoned, which is a division of Ser. No. 823,673, Jan. 21, 1992, Pat. No. 5,249,493. This application May 26, 1995, Ser. No. 450,868
Int. Cl.[6] B26D *1/40;* B65H *35/08*
U.S. Cl. 83—154 5 Claims



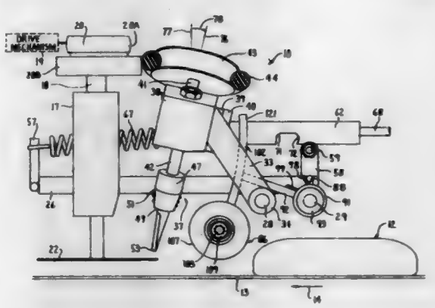
1. Device for extracting samples from a folder, comprising a cutting cylinder pair including a blade cylinder and a grooved cylinder, said blade cylinder having at least one cutting blade mounted on the periphery thereof, said grooved cylinder having at least one groove bar, a respective remotely controlled holding device for signatures assigned to said groove bar, conveyor tapes for conveying signatures emerging from a nip between said blade cylinder and said grooved cylinder of said cutting cylinder pair to a signature delivery and to a conveyor unit assigned to said cutting cylinder pair, a transport cylinder disposed in vicinity of said cutting cylinder pair and adapted to receive a selectively extracted signature emerging from the nip between said blade cylinder and said grooved cylinder, wherein said holding device comprises means defining a plurality of openings formed in the outer cylindrical surface of said grooved cylinder, said openings being connectible with a vacuum source for holding a respective signature against said grooved cylinder by suction.

5,592,865

SEPARATING ROLLERS FOR A SLICING MECHANISM OF A ROLL SLICING MACHINE

Dale S. Lecrone, Jackson, Mich., assignor to LeMatic, Inc., Jackson, Mich.

Filed Jan. 3, 1995, Ser. No. 368,220
Int. Cl.[6] B26D *3/08*
U.S. Cl. 83—872 11 Claims



1. A roll slicing apparatus, comprising: conveyor means for supporting and effecting movement in a first direction of a roll cluster which includes a pair of rolls separably joined at a joint and spaced in a second direction substantially perpendicular to said first direction, each roll having a top and bottom; roll slicing means for simultaneously slicing the rolls of the pair between said top and bottom the roll slicing means, including a rotatably supported shaft extending in a third direction substantially perpendicular to said first and second directions and having at an end nearest said conveyor means a disk knife extending approximately parallel to said first and second directions; drive means for effecting rotation of said shaft; roll breaking means positioned in a fourth direction from said shaft in feeding alignment with said shaft for breaking apart said pair of rolls along a joint therebetween and above a slice made by said knife to provide clearance for passage of said shaft between said rolls, said fourth direction being opposite said first direction; and spreading means positioned in said fourth direction from said roll breaking means in feeding alignment with the spreading means for urging the rolls of the pair away from each other in directions parallel to said second direction prior to engagement of said roll breaking means with the rolls, and said spreading means being supported for movement toward and away from said conveyor means in directions approximately parallel to said shaft, and said spreading means includes a means for yieldably urging said spreading means toward said conveyor means.

5,592,866

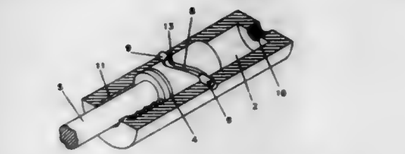
ROTARY PISTON DRIVING MECHANISM

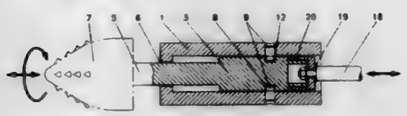
Arieh Sher, 35 Spinoza Street, Rehovot 76452, Israel

Continuation of Ser. No. 180,949, Aug. 3, 1993, which is a continuation-in-part of Ser. No. 83,760, Jun. 30, 1993, Pat. No. 5,350,390, which is a continuation of Ser. No. 857,556, Mar. 25, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 473,880

Int. Cl.[6] F01B *3/00*

U.S. Cl. 92—31 15 Claims







1. Apparatus for converting longitudinal reciprocating motion of a piston in a housing to combined longitudinal reciprocation and rotation of the piston in only one rotational direction about its longitudinal axis, said apparatus comprising:

an endless wave-shaped guide groove defined in one of said piston and said housing and comprising a series of groove sections of generally alternating directions;

motion conversion means responsive to linear motion of said piston in said housing for causing said piston to also rotate relative to said housing about said axis, said motion conversion means comprising at least one guide member secured in the other of said piston and said housing and projecting substantially radially and into said guide groove;

directing means responsive to continuously repeated linear reciprocation of said piston for directing said guide member in a forward direction into successive groove sections while preventing reverse directional movement of the guide member into a groove section that has been immediately previously traversed; and

a working head secured to said piston for rotational and reciprocating movement with said piston.

5,592,867

BEVERAGE DISPENSING SYSTEM

John J. Walsh, Wiltshire, and Leigh D. Carter, Middlesex, both of Great Britain, assignors to Guinness Brewing Worldwide Limited, London, Great Britain

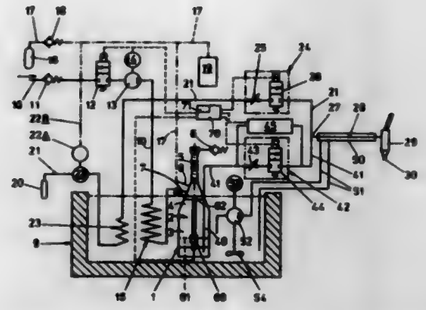
Filed Mar. 17, 1995, Ser. No. 405,834

Claims priority, application United Kingdom, Mar. 29, 1994, 9406172

Int. Cl.[6] A23L *2/26*

U.S. Cl. 99—323.2 21 Claims

1. A beverage dispensing system comprising a carbonation bowl chamber into which carbon dioxide (CO2) under pressure is introduced to provide a CO2 atmosphere and into which atmosphere and bowl chamber liquid for the beverage is introduced intermittently for carbonation of the liquid to a CO2 absorption content



less than a predetermined CO2 absorption content for said liquid, carbonated liquid thereby provided in the bowl chamber forming a reservoir from which the carbonated liquid is drawn on demand for dispensing carbonated beverage and further forming a headspace containing CO2 under pressure from which headspace the reservoir of carbonated liquid absorbs further CO2, and wherein control means is provided for controlling the absorption, by the liquid in the reservoir, of CO2 from said headspace during dormant periods of the system when carbonated liquid is not drawn from the bowl chamber to maintain, during said dormant periods, the carbonated liquid in the reservoir with a CO2 absorption content less than said predetermined absorption content.

5,592,868

APPARATUS FOR COOKING FOOD MATERIALS

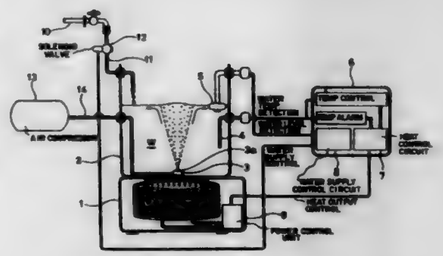
Yasuhiro Asai, 1-8, Ibukino, Midori-ku, Yokohama-shi, Kanagawa-ken, and Masayuki Akasaka, 5-20, Shimomeguro 3, Meguro-ku, Tokyo, both of Japan

Division of Ser. No. 111,930, Aug. 26, 1993, Pat. No. 5,436,016. This application May 11, 1995, Ser. No. 438,958

Claims priority, application Japan, Aug. 28, 1992, 4-230276

Int. Cl.[6] A47J *27/62*

U.S. Cl. 99—348 6 Claims



1. A cooking apparatus comprising:

a cooking container for receiving to-be-heated materials therein;

a bubble generator having air holes for sending air into and generating bubbles in the to-be-heated materials received in said cooking container;

an air pipe operationally connected to said bubble generator and disposed on an inner wall surface of said cooking container;

wherein said air holes are arranged in said cooking container, at positions facilitating fluidization and stirring of said to-be-heated materials; and

a temperature regulating means for varying a temperature of said to-be-heated materials operationally connected to said cooking container and a generation quantity regulating means for making the generation quantity of bubbles variable, operationally connected to said bubble generator means.

5,592,869

OPEN THROAT BLANCHER WITH SUPPORT BRACES

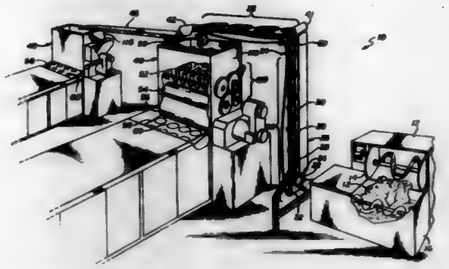
David R. Zittel, Columbus, Wis., assignor to Lyco Manufacturing Inc., Columbus, Wis.

Filed May 17, 1996, Ser. No. 649,300

Int. Cl.[6] A23L *3/00;* A23N *12/00;* A47J *37/12;* F25D *25/02*

U.S. Cl. 99—348 23 Claims





1. A blancher for blanching food product comprising:

(a) a tank having an inlet end and an outlet end;

(b) an inlet end plate positioned within the tank adjacent the inlet end and having an inlet opening;

(c) a discharge end plate positioned within the tank adjacent the outlet end and having an outlet opening;

(d) a support core received within the tank having one end adjacent the outlet end plate and its other end adjacent the inlet end plate and terminating downstream of the inlet opening such that there is a gap between the end of the core and the inlet plate to allow food product to enter through the inlet opening;

(e) an auger carried by the support core;

(f) at least two braces connecting the core to the inlet end plate with each brace having a portion extending radially outwardly from the core and another portion extending axially to the inlet plate for providing an unobstructed space adjacent the inlet opening for the entry of food product into the blancher.

5,592,870

MASA HANDLING APPARATUS AND METHOD FOR HANDLING MASA

Victor R. Sanchez, Fontana; Alberto Ceja, Pico Rivera, and Rigoberto Anguiano, Baldwin Park, all of Calif., assignors to Machine Masters, Inc., Pomona, Calif.

Filed Feb. 7, 1994, Ser. No. 192,458

Int. Cl.[6] A21C *15/00;* A47J *37/00*

U.S. Cl. 99—353 31 Claims

1. A masa handling system for use in a food processing system for masa, or other similar dough, the food processing system being of the type having a masa producing device, producing a generally continuous stream of masa, to a pair of opposed, aligned, counter rotating sheeter rollers, said masa handling system comprising:

a masa separator having

a pair of aligned, opposed endless belt separator conveyors having their facing surfaces spaced apart and generally parallel to define a masa chamber therebetween having input and output ends;

a nozzle connected to the masa producing device for feeding masa into the input end of said masa chamber to be gripped by said facing surfaces and transported therebetween;

the facing surfaces of said separator conveyors moving in the same direction away from said nozzle to cause the masa to be separated into masa logs;

a masa hopper feed system having

at least two masa hoppers;

at least two endless belt feed conveyors having upper surfaces moving in the same direction and arranged in relative upstream and downstream positions relative to each other;

said upstream feed conveyor extending from said output end of said masa chamber defined by said opposed, aligned separator conveyors of said masa separator, to receive the masa logs, to a point generally above one of said masa hoppers;

said downstream feed conveyor extending from a position spaced from said upstream conveyor to a point generally above another of said masa hoppers;

a movable diverter gate positioned between said feed conveyors for selective movement between

a first position whereby masa logs are guided from said upstream feed conveyor to said downstream feed conveyor, and

a second position whereby the masa logs are guided into said one masa hopper;

a sensor associated with said one masa hopper sensing the level of masa therein and causing a signal which changes its state when the level of masa in said one hopper is below a predetermined level;

a mechanism connected to said diverter gate responsive to said signal to move said diverter gate from said first to said second position when the level of masa in said one masa hopper is sensed to be below the predetermined level and to return said diverter gate to said first position when the level of masa in said one masa hopper is sensed to be above the predetermined level;

said masa hoppers being self feeding, each said masa hopper having

an opening positioned to receive masa from the associated one of said feed conveyors;

a gravity feeder having side walls and a bottom wall cooperating to define a space for the placement of the masa to be fed to the sheeter rollers;

one or more rotating shafts mounted within said gravity feeder, each shaft having projections for removing gas bubbles from the masa and forcing the masa toward the sheeter rollers;

said bottom wall of said gravity feeder extending from the side walls and defining a slot for the masa to pass through towards the sheeter rollers.

5,592,871

PORTABLE STOVE TOP GRILL

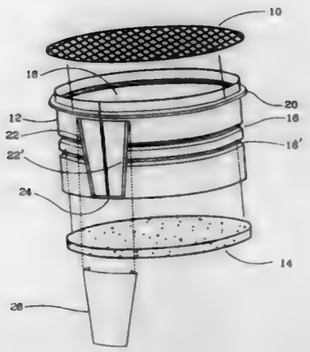
Albin C. Bartlett, 1496 Shirona La., Oak Harbor, Wash. 98277

Filed Mar. 13, 1995, Ser. No. 403,218

Int. Cl.[6] A21B *1/52;* A48J *37/07*

U.S. Cl. 99—400 14 Claims

1. A stove top grill apparatus for barbecue cooking food on concentrated heat sources comprising: a base portion comprising at

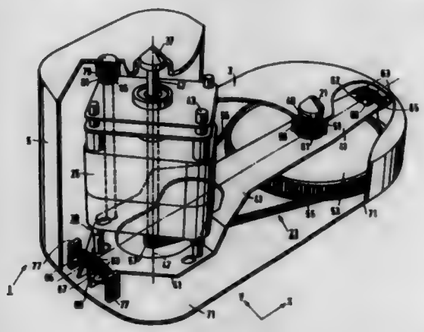


least one side wall, grill supporting means, and stone supporting means, said base portion surrounding an open ended central cavity; a grill portion for holding food supported by said base portion; and a stone portion supported by said base portion within said cavity substantially parallel to and in spaced relation to said grill portion; wherein said grill portion does not channel drippings from food cooked thereon out of said apparatus but is configured to allow said drippings to fall onto said stone portion; wherein said base portion comprises a connecting seam and means to close said connecting seam.

5,592,872
KITCHEN MACHINE WITH ELASTIC FRAME SUSPENSION

Klaas Kooyker; Adam Weits, both of Hoogeveen, and Frans Van Der Vlugt, Drachten, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 16,353, Feb. 11, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,546
Claims priority, application European Pat. Off., Feb. 18, 1992, 92200457
Int. Cl.[6] A47J *43/046*
U.S. Cl. 99—510 **10 Claims**

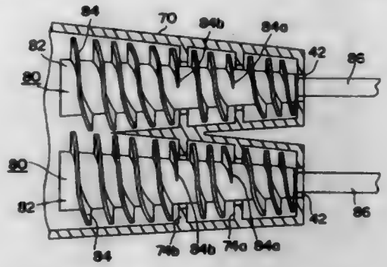


1. A kitchen machine having improved damping of noise transmitted to the housing during operation which comprises a housing; a frame fastened to the housing via at least one elastic element; an electric motor arranged in the housing and fastened to said frame; and a rotatable tool which is drivable by the electric motor; the elastic element comprising an elastically deformable suspension element having a mechanical stiffness and supported by a support member of the housing; a contact face having a surface area being present between the suspension element and the support member, said mechanical stiffness of the suspension element depending on the surface area of the contact face, wherein said surface area of the contact face and the mechanical stiffness of the suspension element depending on the said surface area increase with an increase in the mechanical load acting on the frame.

5,592,873
JUICE EXTRACTOR

Mun-Hyon Lee, Arcadia, Calif., assignor to Angel Life Co., Ltd., Los Angeles, Calif.

Filed Dec. 1, 1995, Ser. No. 565,668
Int. Cl.[6] A23N *1/00;1/02;* A23L *1/212;2/06*
U.S. Cl. 99—510 **13 Claims**

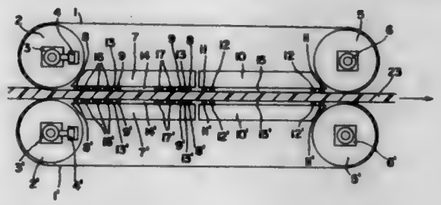


1. A juice extractor comprising a grinding chamber which is provided therein with a pair of helical gears for grinding material and a compression chamber which communicates at one end thereof with one end of said grinding chamber and is provided therein with a spiral screw which is provided on an outer circumference thereof with a spiral ridge, wherein said compression chamber is provided with an annular rib on an inner surface thereof and said spiral screw is provided with a cut-out in said spiral ridge so that said cut-out of said spiral ridge engages with said annular rib of said compression chamber.

5,592,874
DOUBLE BELT PRESS WITH HYDROSTATIC BELT SUPPORT

Wilfried Blaubut, Linz, Austria, assignor to PCD Polymere Gesellschaft m.b.H., Schwechet-Mannsworth, Austria

Filed Sep. 14, 1994, Ser. No. 305,610
Claims priority, application Austria, Sep. 14, 1993, A 1850/93
Int. Cl.[6] B30B *5/06*
U.S. Cl. 100—93 RP **5 Claims**



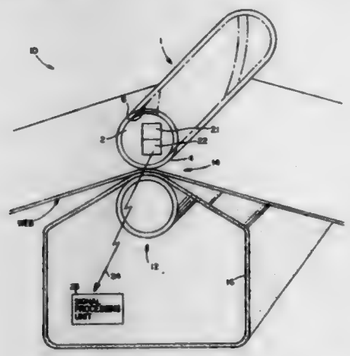
1. A double belt press comprising:
a rigid press frame;
a first pair of drums rotatively mounted in said frame;
an upper endless pressing belt positioned on said first pair of drums and having an inner surface and an outer pressing surface;
a second pair of drums rotatively mounted in said frame;
a lower endless pressing belt positioned on said second pair of drums and having an inner surface and an outer pressing surface;

a first upper pressure plate fixed in said frame between said first pair of drums;
a first lower pressure plate fixed in said frame between said second pair of drums and opposing said first upper pressure plate;
a first annular sliding-surface seal mounted on each of said first upper and lower pressure plates, said annular seals defining upper and lower pressure chambers;
a plurality of belt support strips mounted on each of said pressure plates and being circumscribed by said first annular seal, said support strips having an inner surface opposing said inner surface of said belt and extending across the width of said belt,
each said strip including longitudinal side projections operatively engaging said inner surface of said respective belt, an inner surface extending between said side projections, and a fluid pressure supply duct extending through said support strip between said longitudinal side projections, wherein each support strip defines a support pressure chamber which is delimited by said inner surface of said respective belt, said longitudinal side projections, and said inner surface of said support strip; and
a second annular sliding-surface seal mounted on each of said pressure plates and spaced from said first annular sliding-surface seal, respectively, said first and second annular seals defining an annular space therebetween, wherein at least one of said plurality of support strips are located in said annular space on an entrance side of said annular space relative to the direction of travel of said belts.

5,592,875
ROLL HAVING MEANS FOR DETERMINING PRESSURE DISTRIBUTION

Charles Moschel, Stephens City, Va., assignor to Stowe Woodward Licensco, Inc., Wilmington, Del.

Filed Sep. 16, 1994, Ser. No. 308,080
Int. Cl.[6] B30B *3/04;* G01L *5/00*
U.S. Cl. 100—99 **4 Claims**

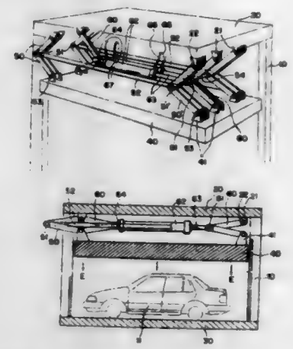


1. A system for sensing pressure in a press nip comprising:
first roll configured with a second roll in a press nip, said first roll and said second roll adapted to rotatingly press matter therebetween, said first roll comprising at least one sensor for sensing pressure exhibited on said first roll and for providing a pressure signal representative thereof;
a trigger signal generator for providing a trigger signal, said trigger signal representing the occurrence of a revolution of said first roll;
a processing unit for processing said pressure signal and said trigger signal; and
a peripheral device comprising an audible device for providing an indication of pressure distribution, coupled to said processing unit, wherein said audible device, signals non-uniform pressure distributions thus evidencing an operating malfunction.

5,592,876
PRESSING APPARATUS FOR CRUSHING USED CARS

Jung N. Son, Daegu, Rep. of Korea, assignor to Kum Sung Press Machine Co., Ltd., Daegu, Rep. of Korea

Filed Apr. 6, 1995, Ser. No. 418,023
Int. Cl.[6] B30B *1/16;9/32*
U.S. Cl. 100—272 **23 Claims**

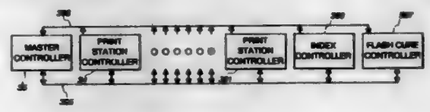


1. A pressing apparatus for compressing large articles into small articles which comprises:
an upper plate and a lower base plate;
a pressing plate disposed between said upper plate and said lower base plate, said pressing plate being suspended from said upper plate by a plurality of foldable link members which are pivotally connected to the upper plate and to the pressing plate at opposite sides thereof;
piston-cylinder means connecting at least some of the foldable link members disposed at opposite sides of said upper plate and pressing plate; and
means for operating said piston-cylinder means, whereby the back and forth movement of said piston-cylinder means causes said foldable link members to fold on themselves to a closed position or extend to an open position whereby the pressing plate is raised and lowered relative to said upper plate and said lower base plate;
wherein the foldable link members comprise central link members and lateral link members, said piston-cylinder means connecting said central link members, and wherein said pressing apparatus further includes horizontal bar members connecting said lateral link members.

5,592,877
SCREEN PRINTING APPARATUS WITH DATA STORAGE

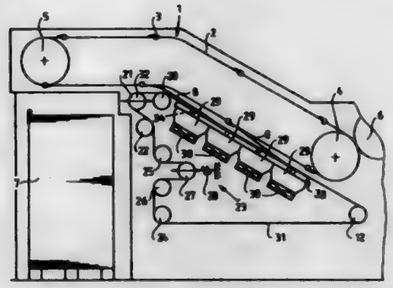
Alexander Szyszko, Bloomingdale; Rick L. Fuqua, St. Charles; Thomas B. Lyden, Schaumburg; Mariusz Smialek, Elk Grove Village, and Marek Dudek, Hoffman Estates, all of Ill., assignors to Elexon Ltd., Elk Grove Village, Ill.

Filed Oct. 25, 1995, Ser. No. 548,072
Int. Cl.[6] B41M *1/12*
U.S. Cl. 101—129 **4 Claims**



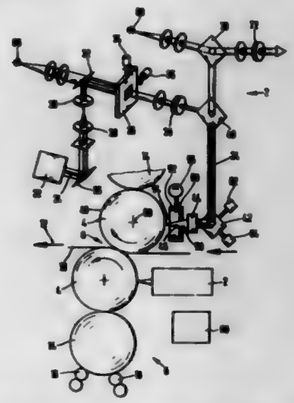
1. A method of screen printing comprising the steps of:
screen printing with a plurality of colors at different printing stations in a predetermined sequence and storing these color sequence parameters for later use;
using at least one curing station between a pair of respective printing stations and storing curing parameters with respect thereto;
operating squeegees at the respective printing stations for the different color inks at known travel speeds and at known stroke lengths in absolute units of measurement, and storing these travel speed and stroke length parameters in absolute units of measurement;
providing off-contact distances and peel rates at respective printing stations in absolute known units of measurement and storing these off-contact and peel rate parameters in absolute units of measurement; and
using these previously-stored color sequence parameters, curing parameters, travel speed and stroke length parameters; off-contact distance and peel-rate parameters at a later time to duplicate the previous screen printing operation.

5,592,878
CHAIN CONVEYOR OF A SHEET-FED PRINTING MACHINE
Bruno Elmer, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg
Continuation of Ser. No. 157,723, Nov. 24, 1993, abandoned. This application Jul. 26, 1995, Ser. No. 507,865
Claims priority, application Germany, Nov. 25, 1992, 42 39 561.5
Int. Cl.[6] B41F *5/02*
U.S. Cl. 101—231 **12 Claims**



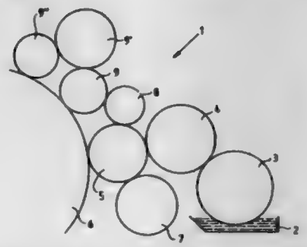
1. Chain conveyor of a sheet-fed printing machine for first-form and perfector printing, in which sheets are guided in a sheet conveying direction, comprising guided revolving gripper chains, having a respective lower strand and a respective upper strand, at least a part of said lower strand being disposed in a sheet-conveying region, a sheet-guiding device disposed in said sheet-conveying region below said lower strand for guiding in a sheet-conveying direction a sheet having a downwardly directed printed side, said sheet-guiding device being formed with a plurality of deflecting rollers and a flexible material guided about said deflecting rollers, a portion of said flexible material between two deflecting rollers parallel to said lower strand of said gripper chains defining a guide surface continuously movable in said sheet-conveying direction at a sheet conveying velocity means for continuously driving said guide surface, and one of said deflecting rollers being displaceable for varying the length of said continuously movable guide surface in said sheet conveying direction.

5,592,879
METHOD AND APPARATUS FOR THE CONTACT-FREE REMOVAL OF DIRT FROM THE CYLINDERS OF PRINTING MACHINES
Franz Walzmann, Gesertshausen, Germany, assignor to Baldwin-Gegenheimer GmbH, Germany
Filed Dec. 10, 1993, Ser. No. 164,318
Claims priority, application Germany, Dec. 10, 1992, 42 41 575.6
Int. Cl.[6] B41F *35/00*
U.S. Cl. 101—416.1 **22 Claims**



1. A method for contact-free removal of dirt, ink, color residues, fibers and dust contained on a rotating surface of a cylinder, drum or roller in a printing machine while the cylinder, drum or roller is rotating, the rotating surface having a surface structure, the method comprising the steps of:
directing a laser beam onto the rotating surface of the cylinder, drum or roller; and
controlling or adjusting the wavelength, energy density, beam cross section, relative speed, pulse repetition rate and pulse duration of the laser beam applied onto the rotating surface so that the laser beam directed onto the rotating surface removes the dirt from the rotating surface without changing the surface structure of the rotating surface.

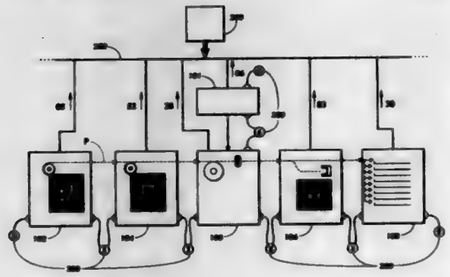
5,592,880
METHOD OF SUPPLYING OR FEEDING DAMPENING SOLUTION
Anton Rodi, Leimen, Germany, assignor to Heidelberger Druckmaschinen, Heidelberger, Germany
Continuation-in-part of Ser. No. 175,946, Dec. 30, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 407,167
Int. Cl.[6] B41F *7/24;7/26*
U.S. Cl. 101—450.1 **7 Claims**



1. A method of supplying dampening solution to a printing form of an offset printing press, which comprises:

selecting a mean value of a quantity of dampening solution to be supplied to the printing form, the mean value being selected on the basis of an adjustable minimum value and an adjustable maximum value;
determining the maximum value above the mean value and the minimum value below the mean value;
supplying a quantity of dampening solution, and selectively fluctuating the quantity about the mean value alternatingly between the minimum value and the maximum value independently of possible fluctuations due to deviations in a control of a dampening solution supply.

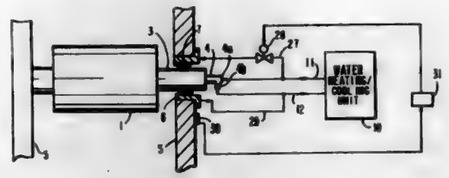
5,592,881
SYSTEM FOR IDENTIFYING MODULES IN A MODULAR PRINTING APPARATUS
Douglas T. Rabjohns, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 28, 1995, Ser. No. 520,222
Int. Cl.[6] B41F *1/28*
U.S. Cl. 101—483 **8 Claims**



1. In a printing system wherein sheets are caused to move among a plurality of operatively interassociated modules, the modules collectively capable of performing a coordinated printing process, a method of controlling the plurality of modules, comprising the steps of:
assigning a unique connection code to each connection between a pair of modules where a physical interaction between modules in the coordinated printing process can occur;
deriving an identification code for a module by combining connection codes for a plurality of connections associated with the module;
causing the module to send a derived identification code thereof to a controller; and
operating the module by the controller addressing the module by the identification code.

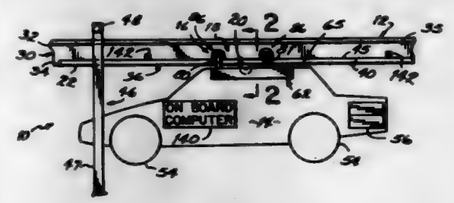
5,592,882
PRINTING PRESS BEARING AND METHOD OF CONTROLLING TEMPERATURE OF BEARINGS OF A PRINTING PRESS
Hideaki Toyoda, Sekiyadomachi, Japan, assignor to Komori Corporation, Tokyo, Japan
Continuation of Ser. No. 386,219, Feb. 9, 1995, abandoned, which is a continuation of Ser. No. 61,594, May 13, 1993, abandoned. This application Dec. 12, 1995, Ser. No. 570,818
Claims priority, application Japan, Jun. 4, 1992, 4-037775 U
Int. Cl.[6] B41F *23/04*
U.S. Cl. 101—487 **3 Claims**

1. A printing press comprising:
a cylinder having a cylinder axle,
a bearing for supporting said cylinder axle,
a bearing housing for supporting said bearing,
a frame for supporting said bearing housing,



a first heating means for heating up a surface of said cylinder to a first temperature after starting said printing press and before starting any printing operation by supplying heating medium to an inner side of said surface of said cylinder through said cylinder axle,
a second heating means for heating up at least one of said bearing housing and said frame to a second temperature after starting said printing press and before starting any printing operation by supplying heating medium to at least one of said bearing housing and said frame, and
a heating/cooling unit for supplying heating medium to said inner side of said surface of said cylinder and at least one of said bearing housing and said frame and for supplying cooling medium to said inner side of said surface of said cylinder and not supplying cooling medium to said bearing housing and said frame while a printing plate is exchanged,
wherein said second temperature is a stable temperature reached by said bearing housing and said frame during a printing operation, as measured in the absence of heat supplied to at least one of said bearing housing and said frame, said second temperature being dependent on said first temperature and the ambient temperature in the location of said printing press, said second temperature being determined such that overloads applied to said bearing are prevented and the warm up period required after starting said printing press and before starting any printing operation is reduced from the warm up period required in the absence of said second heating means.

5,592,883
MONORAIL TRANSPORTATION SYSTEM AND VEHICLE FOR TRAVELING THEREON
F. Jay Andreas, III, 3524 Holly Ave., Cincinnati, Ohio 45208
Filed May 16, 1994, Ser. No. 243,257
Int. Cl.[6] B61B *3/00*
U.S. Cl. 104—88.03 **66 Claims**



1. A transportation system comprising:
an elongated, overhead monorail having an upper surface and a lower surface, and a pair of laterally adjacent, U-shaped channels formed therein, the upper surface of the monorail including at least an inside surface of each of the channels;
a vehicle adapted to selectively travel on one of a road surface and the monorail;
a coupler removably supporting the vehicle from the upper surface of the monorail for travel therealong having a bracket pivotally connected to the top of the vehicle and being pivotable between a reased position within the top of the vehicle and an extended position, and a pair of guide wheels spaced to be movably received in the U-shaped channels, the wheels being rotatably connected to the bracket; and

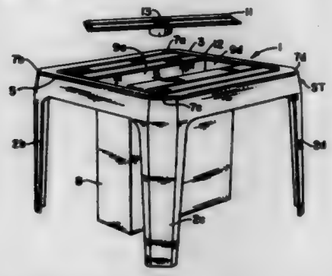
a drive wheel connected to the top of the vehicle engaging the lower surface of the monorail when the vehicle is supported therebeneath for propelling the vehicle along the monorail.

5,592,884

MOLDED TABLE WITH STORAGE COMPARTMENT

Irving Glick, Englewood Cliffs, N.J., and Peter Miale, Brooklyn, N.Y., assignors to Imp Designs, Inc., Brooklyn, N.Y.

Filed Jul. 14, 1995, Ser. No. 502,496
Int. Cl.[6] A47B *85/00*
U.S. Cl. 108—25 **23 Claims**



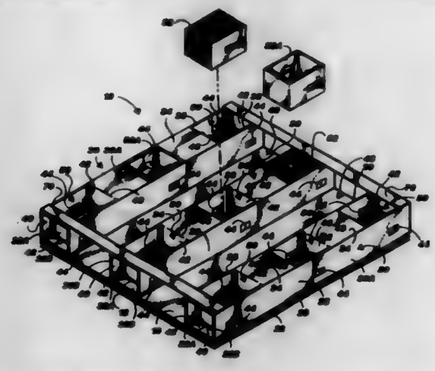
1. A table comprising:
table top means with, an upper surface, a lower surface, and an opening therethrough disposed medially in the upper surface;
spaced leg means connected to said table top means on opposite sides of said medially disposed opening having a length for supporting said table top means at a predetermined height; and
container means affixed to the lower surface of said table top means about said opening having a length generally equal to the length of said spaced leg means for coacting with said leg means in supporting said table top means.

5,592,885

COLLAPSIBLE PALLET

Robson T. Young, Jr., Kirkland, and Roger L. Thomas, Cedarville, both of Ill., assignors to National Pallet LLC, Kirkland, Ill.

Continuation-in-part of Ser. No. 307,313, Sep. 16, 1994, Pat. No. 5,517,926. This application Feb. 10, 1995, Ser. No. 386,889
Int. Cl.[6] B65D *19/00*
U.S. Cl. 108—51.3 **31 Claims**



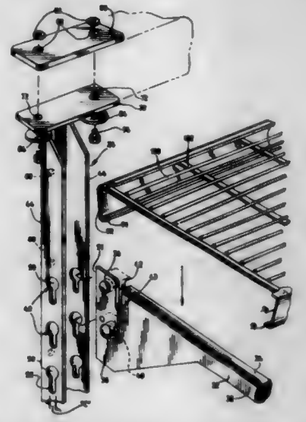
1. A collapsible pallet comprising:
a. a pallet base including opposing upper and lower surfaces;
b. a support member having a generally rectangular shape defined by opposing first and second ends and opposing first and second sides, the support member including:
(1) contiguous foldably attached walls defining an upper wall, an opposing lower wall, and first and second opposing side walls, wherein the upper wall and the lower wall are foldably connected to the first and second side walls to form an internal channel having two opposing ends; and
(2) at least one foldable support flap integrally connected to the lower wall and adapted to fold inwardly into the internal channel and thereby define a support compartment within the internal channel which opens onto the lower wall, the support flap having an edge which includes at least one locking tongue thereon;
wherein the upper wall is attached to the lower surface of the pallet base, and further wherein the upper wall includes at least one receiving slot therein, each receiving slot being sized to releasibly receive one locking tongue therein when the support flap is folded into the internal channel.

5,592,886

ADJUSTABLE WALL-MOUNTED SYSTEM FOR SHELVES

Theodore G. Williams, Clarendon Hills; John P. Chap, Lemont; Mike Gadberry, Chicago, all of Ill., and William M. Covert, Flower Mount, Tex., assignors to Amco Corporation, Chicago, Ill.

Filed Jan. 31, 1994, Ser. No. 189,150
Int. Cl.[6] A47B *9/00*
U.S. Cl. 108—108 **10 Claims**



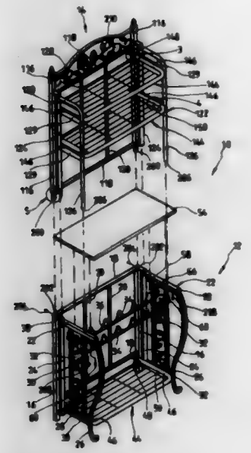
1. A shelf system for mounting on a wall comprising:
a) at least one shelf;
b) at least one pair of standards adapted to be mounted on said wall, wherein said standards each comprise a U-shaped member with a backwall portion adapted to be mounted to said wall and two arms extending outwardly from said backwall;
c) a plurality of keyhole slots spaced along each of said arms;
d) at least one pair of brackets adapted to be removably secured to said pair of standards to receive and support said shelf, each of said brackets having a front end and a back end, with a downwardly extending slot formed near the back end of the bracket, said back end of said brackets abutting against said backwall portion of said standards when said brackets are secured to said standards; and
e) said shelf having first means for fitting over and engaging the front end of said bracket and second means for fitting into and engaging said downwardly extending slot formed near the back of said bracket, said first and second means including lower hook portions for engaging said bracket.

5,592,887

ARTICLE ORGANIZING SHELF FRAME

Shih-Chin Teng, No. 58, Sec. 1, Shenlin Road, Taya Hsiang, Taichung Hsien, Taiwan

Filed Nov. 7, 1995, Ser. No. 554,497
Int. Cl.[6] A47B *3/00*
U.S. Cl. 108—134 **17 Claims**



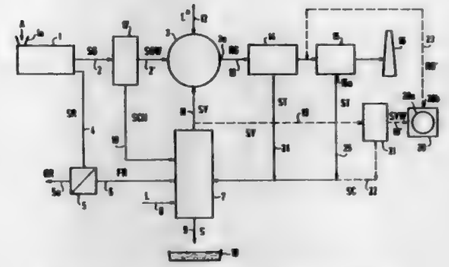
1. An article organizing shelf frame structure comprising:
a lower unit comprising:
two first rear legs extending vertically and spaced from each other with a first rear frame connected therebetween,
a first side frame pivoted to each of the first rear legs to be substantially parallel with and spaced from each other, each of the first side frames having a first front leg dimensioned to cooperate with the rear legs for supporting the lower unit on a surface,
at least one first article support member having two side members respectively pivoted to the first rear legs to be rotatable relative to the first rear legs between an expanded position where the first article support member is substantially horizontal and a stowed position where the first article support member is substantially overlapping the rear frame, and
retaining means for retaining the first article support member at the expanded position; and
an upper unit detachably mounted on the lower unit and comprising:
two second rear legs extending vertically and spaced from each other with a second rear frame connected therebetween, each of the second rear legs corresponding to one of the first rear legs and having a reduced lower section receivable within a hole formed on the respective first rear leg to releasably connect the upper unit to the lower unit,
a second side frame pivoted to each of the second rear legs to be substantially parallel with and spaced from each other, each of the second side frames having a second front leg dimensioned to be supported on the one of the first side frames of the lower unit,
at least one second article support member having two side members respectively pivoted to the second rear legs to be rotatable relative to the second rear legs between an expanded position where the second article support member is substantially horizontal and a stowed position where the second article support member is substantially overlapping the rear frame, and
retaining means for retaining the second article support member at the expanded position.

5,592,888

PROCESS AND APPARATUS FOR DISPOSING OF WASTE

Heinz-Jürgen Berwein, Höchstadt, and Gerd Baumgärtel, Röttenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 18, 1995, Ser. No. 529,587
Claims priority, application Germany, Mar. 17, 1993, 43 08 551.2
Int. Cl.[6] F23G *5/12*
U.S. Cl. 110—229 **15 Claims**



9. An apparatus for disposing of waste, comprising:
a waste feed device;
a carbonization drum disposed downstream of said waste feed device;
a carbonization gas outlet line and a carbonization residue outlet line discharging from said carbonization drum;
a combustion chamber being connected to said carbonization gas outlet line and having a flue gas outlet;
a separation device being connected to said carbonization residue outlet line and having a coarse fraction outlet line and a fine fraction outlet line;
a gasifier being connected to said fine fraction outlet line and having a slag outlet line and a synthesis gas outlet line; and
a combustion chamber being directly connected to said synthesis gas outlet line.

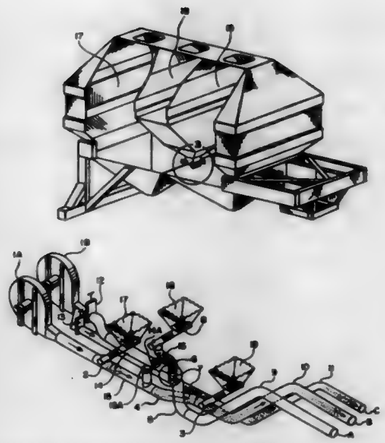
5,592,889

MULTI COMPARTMENT AIR SEEDER

Gerard F. J. Bourgault, St. Brieux, Canada, assignor to Bourgault Industries Ltd., St. Brieux, Canada

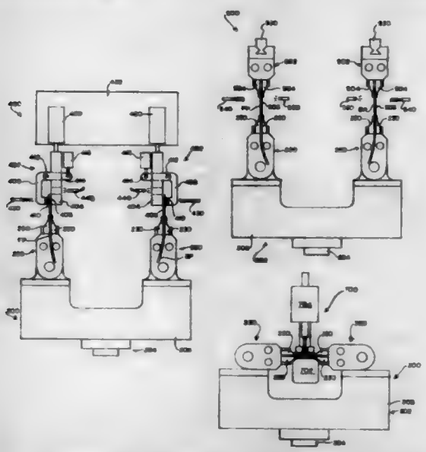
Filed Jun. 2, 1995, Ser. No. 459,773
Int. Cl.[6] A01C *15/04*; B65G *11/00*
U.S. Cl. 111—174 **7 Claims**

1. An air seeder comprising:
a rear hopper bin;
a central hopper bin;
a front hopper bin;
at least one blower fan; and
a plurality of conveyance ducts;
each of said hopper bins including a particle metering and dispensing device connected to a lowermost discharge port on each of said hopper bins;
said hopper bins further including an upper filler port;
said hopper bins being adapted to hold at least one of seed, fertilizer or granular herbicide and being supported by a wheeled cart;
said central hopper bin including a front and rear closeable port opening adjacent the bottom of said central hopper bin;
said front and rear closeable port openings being located substantially higher than said lowermost discharge ports on said front and rear hopper bin, such that in operation, said front port opening is adapted to permit contents of said central hopper bin to enter said front hopper bin when a front port opening door is removed, and said rear port opening is



adapted to permit the contents of said central hopper bin to enter said rear hopper bin when a rear port opening door is removed.

5,592,890
CROTCH-FORMING APPARATUS
Donald E. Burt, Danvers, and Henry R. Cofek, Groton, both of Mass., assignors to Design Technology Corporation, Billerica, Mass.
Filed Sep. 19, 1994, Ser. No. 308,667
Int. Cl.[6] D05B *21/00*
U.S. Cl. 112—470.07 **11 Claims**



1. An apparatus for forming the crotch in a garment having a front panel and a back panel which are joined at respective ends thereof to form the crotch, said apparatus comprising:

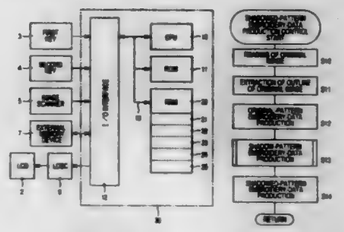
(a) a holding fixture including a pair of grippers for holding the front panel and back panel adjacent to the ends to be joined;

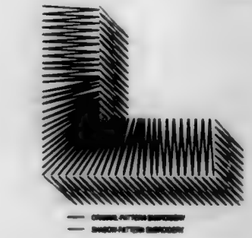
(b) an end positioner for positioning the ends of the front and back panel in their respective grippers;

(c) a side edge aligning apparatus for aligning side edges of the front and back panels with respect to one another, said edge aligning apparatus including first and second pairs of clamping means movably mounted adjacent the grippers for engaging respective fabric panels adjacent respective edges of the fabric panels while the fabric panels are held in said grippers, at least one of each of said first and second pairs of clamping means being movable laterally with respect to the fabric panels; and

(d) a sewing apparatus for sewing the ends of the front and back panel together.

5,592,891
EMBROIDERY DATA PROCESSING APPARATUS AND PROCESS OF PRODUCING AN EMBROIDERY PRODUCT
Yukiyoshi Muto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan
Filed Apr. 17, 1996, Ser. No. 633,480
Claims priority, application Japan, Apr. 28, 1995, 7-105159
Int. Cl.[6] D05C *9/06;* **D05B** *21/00*
U.S. Cl. 112—475.19 **30 Claims**



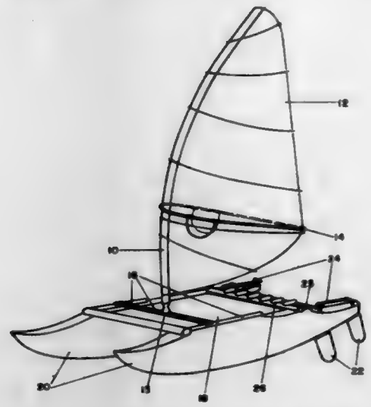


21. A process of producing an embroidery product by forming an embroidery pattern on a work sheet, the process comprising the steps of:

producing, based on original-outline data representing at least one original outline of an original embroidery pattern, and data indicative of a reference vector specifying a reference direction and a reference length, shadowed-pattern embroidery data needed to control a sewing machine to form stitches of a shadowed embroidery pattern including the original embroidery pattern and at least one shadow embroidery pattern which is contiguous with the original embroidery pattern and whose outline is defined by at least one of a plurality of segments of said original outline and at least one of two straight width-defining segments which extend in said reference direction from opposite two ends of said one segment, respectively, and each of which has said reference length defining a width of the shadow embroidery pattern in said reference direction; and

operating a computer of the sewing machine to control, according to the produced shadowed-pattern embroidery data, a stitch-forming device of the sewing machine to form the stitches of the shadowed embroidery pattern on the work sheet and thereby produce the embroidery product.

5,592,892
MULTIHULL WINDSURFER
Brian Kerckhoff, 2110 Farms Rd., Tallahassee, Fla. 32311
Filed Oct. 13, 1995, Ser. No. 543,058
Int. Cl.[6] B63B *35/00*
U.S. Cl. 114—39.2 **2 Claims**



1. A wind powered sailing vessel operable by a standing sailor, comprising:

a plurality of hulls, said hulls being elongated, upwardly curved and substantially triangular in transverse cross-section, each said hull thereby forming a keel; platform means for providing deck space, whereby said hulls are joined and held substantially parallel to each other;

mast mount means, comprising a fore and slidably adjustable mast track assembly attached to said vessel, for carrying a mast;

mast means for carrying sail means and boom means, said mast means being pivotally mounted onto said mast track assembly, thereby being fully articulating and fore and aft translocatable on said vessel;

sail means, releasably attached to said mast mesas, for providing wind power;

boom means for directionally controlling said sail means, releasably attached to said sail mares and to said mast means, said boom means being manually engageable;

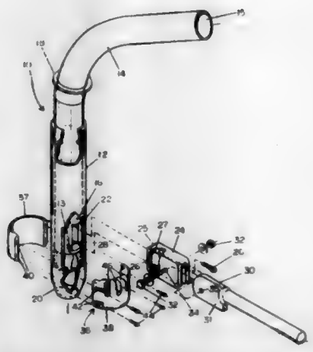
a plurality of rudders, comprising a fore rudder and an aft rudder, rotatably mounted under said hulls, for providing steering ability to said vessel said fore rudder being detachably mounted;

a steering assembly engageably mounted on said hulls and pivotally connected to said plurality of rudders, comprising a tiller linkage rod and steering centering means releasably resiliently connecting said tiller linkage rod to a stationary part of said vessel for returning said steering assembly to a centered position, thereby causing said plurality of rudders to return to an amidships position;

a plurality of foot-operable tiller paddles, mounted on said tiller linkage rod, for transmitting directional control to said rudder means, thereby allowing the sailor to direct the course of said vessel.

5,592,893
SPORT FISHING OUTRIGGER DEVICE
Robert T. Jordan, III, Jupiter, and Russell G. Mortensen, Palm Beach Gardens, both of Fla., assignors to E-Tec Marine Products, Inc., Riviera Beach, Fla.
Filed Feb. 14, 1996, Ser. No. 605,328
Int. Cl.[6] B63B *35/14*
U.S. Cl. 114—255 **19 Claims**

1. A sport fishing outrigger assembly which facilitates precise indexing and nonslip positive locking without metal-on-metal contact of the position adjustment locking mechanism parts, said outrigger assembly comprising:



an indexing pipe with an upper and lower end, said pipe having a vertically elongated aperture window in its lower end;

an inner assembly having:

(i) a cylindrical central pivot core with a flanged upper end and a flanged lower end and a centrally disposed cavity formed in said core's side,

(ii) a plastic pivot bearing which is attached to said flanged lower end of said pivot core, and

(iii) an extension tube which is weldably attached to said flanged upper end of said pivot core, said tube receiving a plastic bushing which slips over its top,

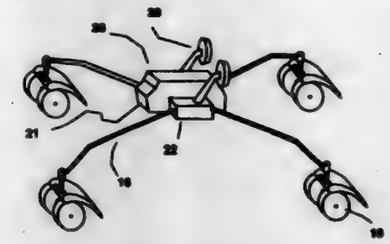
whereby said inner assembly is inserted into said indexing pipe for rotational engagement so that said extension tube extends out the top of said indexing pipe, with said plastic bushing being fitted between said tube and said pipe at the top, and said plastic bearing being fitted between said core and said pipe at the bottom, said plastic parts thereby preventing metal-on-metal contact of said rotating parts;

a mounting bracket which is receivably mounted in said side cavity of said pivot core when said cavity is aligned for accessibility through said indexing pipe aperture window;

a handle locking engagement assembly with a handle and locking bar integrally attached thereto, wherein said assembly is pivotally mounted in said mounting bracket;

a indexing collar with a plurality of castellated aperture slots for receivably engaging said pivoting locking bar.

5,592,894
SPIDERCRAFT
Herrick J. Johnson, R.R. 5 Box 2392, Brunswick, Me. 04011
Filed Nov. 29, 1994, Ser. No. 346,493
Int. Cl.[6] B63B *35/00*
U.S. Cl. 114—270 **14 Claims**

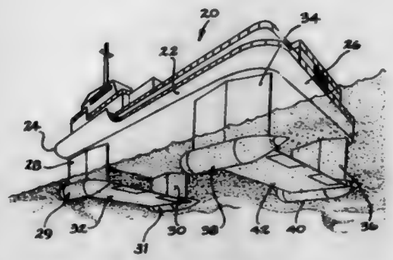


1. A high speed waterborne vessels comprising,

(a) a cabin to accommodate crew, passengers and cargo, with a means to attach at least one suspension system and at least one propulsion system,

(b) said suspension system adapted to absorb shocks imparted to the suspension system; each said suspension system including means for attachment to said cabin and to at least one wave rider pod;
(c) said at least one wave rider pod having means to attach at least one flotation tire and at least one ground effect wing segment; said at least one waverider pod also having means for attachment to said suspension system; and
(d) a propulsion system attached to said cabin, said suspension system, or said wave rider pod.

5,592,895
SMALL WATERPLANE AREA HIGH SPEED SHIP
Terrence W. Schmidt, Santa Clara, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 899,525, Jun. 16, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 200,110
Int. Cl.[6] B63B *1/24*
U.S. Cl. 114—274 **39 Claims**

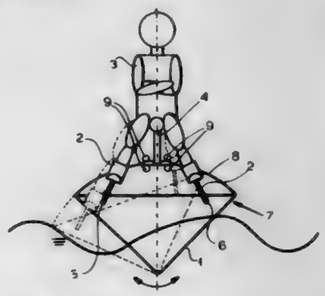


1. A small waterplane area high speed ship comprising a hull structure having a bow portion and a stem portion and being normally supported above the surface of the water when in operation, a forward set of dual struts depending from the bow portion of the hull structure, said dual struts subtended by a first transverse displacement foil extending laterally between and connected to each of said dual struts, said first transverse displacement foil being attached to said forward set of dual struts at a fixed, non-rotatable longitudinal inclination, a second set of aft dual struts depending from the stern portion of the hull structure, said second set of dual struts being subtended by a second transverse displacement foil exteading laterally between and connected to each of said struts, said second transverse displacement foil being attached to said second set of aft dual struts at a fixed, non-rotatable longitudinal inclination; said transverse displacement foils providing the major buoyancy for the ship during operation to maintain said hull above the surface of the water during operation, said forward and aft struts and said foils being spaced longitudinally a predetermined distance selected such that the transverse waves created by the forward struts and transverse displacement foil and the aft struts and transverse displacement foil are 180° out of phase at the critical hump speed, the hull speed region at which a large increase in wave resistance occurs as a main or primary hump on a wave drag curve so as to result in a requirement for a maximum increase in propulsion power.

5,592,896
ASSEMBLEABLE ANCHOR LANDSCAPING DEVICE
Francis J. Cassidy, Three Leisure Retail Center, Long Neck, Del. 19966
Filed Sep. 18, 1995, Ser. No. 529,652
Int. Cl.[6] B63B *21/24*.
U.S. Cl. 114—303 **3 Claims**

1. A decorative kedge anchor for landscape use comprising a shank having an upper end portion, a lower end portion and a hollow cavity, a hollow crown having a detachably connected first arm and a detachably connected second arm each arm having a fluke and extending in opposite directions, a removable stock connected to the shank and extending outwardly therefrom, the stock including two portions each removably connected to the shank and extending outwardly therefrom in opposite directions, and a ring, wherein the ring is formed with a threaded portion, the shank upper end portion is formed with a threaded portion which corresponds to the ring threaded portion, and threadedly engages the ring threaded portion whereby the ring is detachably mounted to the upper end portion of the shank, the shank is formed with side apertures which releasably engage the removable stock portions, the shank lower end portion detachably engages the crown, and the shank comprises multiple shank portions along its length which detachably engage one another.

5,592,897
WATERCRAFT
Hans-Harald Kattwinkel, Burgweg 66, D-58553 Halver, Germany, and Marcus Kattwinkel, Vömmelbach 89, D-58553 Halver, Germany
PCT No. PCT/DE94/00060, § 371 Date Oct. 18, 1995, § 102(e) Date Oct. 18, 1995, PCT Pub. No. WO94/26586, PCT Pub. Date Nov. 24, 1994
PCT Filed Jan. 21, 1994, Ser. No. 545,595
Claims priority, application Germany, May 18, 1993, 43 16 538.9
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—363 **8 Claims**



1. A watercraft comprising:
an elongated buoyancy hull having an upper side opposite a keel side and a vertical longitudinal median plane;

an upwardly bowed arcuate guide rail on said upper side extending transversely to said plane and transversely of a longitudinal dimension of said hull;
a passenger stand displaceable along said guide rail transversely to said plane and to said longitudinal dimension to enable a passenger on said passenger stand to remain generally upright upon rolling of the buoyancy hull in response to waves; and
means braced on at least one support area of said hull and enabling shifting of said passenger stand along said guide rail.

5,592,898
LANE MARKER
John G. Korpi, Livonia, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 10, 1995, Ser. No. 387,003
Int. Cl.[6] E01F *9/016;9/019*
U.S. Cl. 116—209 **9 Claims**

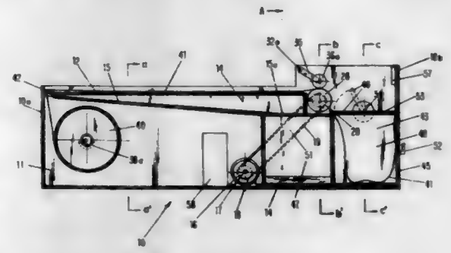


8. A geographic area marker, comprising:
a base having an obverse surface and a reverse surface opposed to the obverse surface, the base defining an aperture;
an illuminator in a lowered position at the base;
destructible means engaging the base for releasably retaining the illuminator in the lowered position, the destructible means comprising a frangible element;
a cantilever embedded in the frangible element and extending from the frangible element along the illuminator, the cantilever being stronger than the frangible element;
a spring having one end secured to the base and a coiled section compressed against the obverse surface, the coiled section disposed in a generally planer array of coils about the aperture;
a second section of the spring integral with the coiled section and connected to the illuminator, the second section biasing the illuminator to rotate up from the lowered position;
a keeper section of the spring having an S-shaped free end connected to the illuminator and bearing on the coiled section, whereby the coiled section is retained against the base;
means for releasably latching the keeper to the base
wherein the aperture forms part of the latching means, and the latching means further comprises the S-shaped end portion of the keeper section passed through the aperture and fixed relative to the illuminator, and the latching means still further comprises a terminus of the S-shaped end portion opposed to a part of the reverse surface of the base.

5,592,899
METHOD AND DEVICE FOR FEEDING DOGS
Edward E. English, 7801 Fall Creek Rd., Indianapolis, Ind. 46256-3254
Filed Jun. 12, 1995, Ser. No. 489,351
Int. Cl.[6] A01K *5/01*
U.S. Cl. 119—61 **7 Claims**

1. A dog feeding method comprising the steps of:
providing an open-topped container;
coating a portion of the container with a material that smells like a food that the dog naturally eats;
placing in the container a dry food; and
presenting the container with said food therein to the dog.

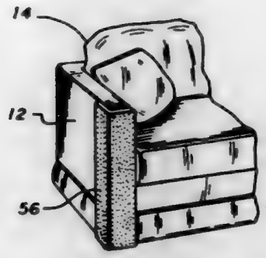
5,592,900
AUTOMATED PORTABLE PET TOILET
Kihachiro Kakuta, 4-chome 74-Banchi, Apt. 711, Sueyoshi-cho Naka-Ku, Yokohama-shi Kanagawa-ken, Japan
Continuation-in-part of Ser. No. 175,615, Dec. 30, 1993, Pat. No. 5,363,807, which is a continuation of Ser. No. 840,075, Feb. 20, 1992, Pat. No. 5,279,258. This application Oct. 19, 1994, Ser. No. 325,791
Int. Cl.[6] A01K *1/01*
U.S. Cl. 119—164 **34 Claims**



1. Automated pet toilet apparatus comprising:
a platform;
a first circuit for detecting the presence of a pet upon said platform;
a second circuit for determining whether said pet has deposited solid excreta upon said apparatus;
a third circuit for determining whether said pet has deposited liquid waste upon said apparatus; and
a waste receiving member for conveying said solid excreta to a receptacle.

5,592,901
CAT SCRATCHING DEVICE FOR PROTECTING FURNITURE
Joan Birmingham, P.O. Box 3577, San Bernardino, Calif. 92413
Continuation-in-part of Ser. No. 48,830, Apr. 15, 1993, abandoned. This application May 26, 1995, Ser. No. 451,556
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—706 **20 Claims**

1. A scratching device for protecting a piece of furniture from being scratched by a pet, comprising:
a substantially rigid protective frame for covering at least a portion of the piece of furniture when placed in close proximity thereto, wherein said protective frame includes a surface into which a pet may sink its claws; and
an outwardly extending member connected to said protective frame for holding said protective frame in a substantially upright fashion and in close proximity to the piece of furni-



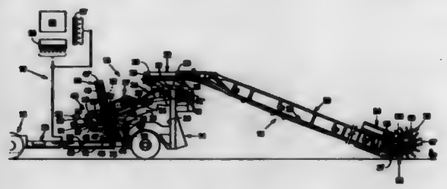
ture, said outwardly extending member extending at an angle less than 90 degrees relative to said protective frame, wherein said member maintains the protective frame in a substantially upright position and the angulation of said member and said protective frame creates a biasing force which maintains said protective frame abutted against the piece of furniture when said member is placed between the floor and the piece of furniture.

5,592,902

METHOD AND APPARATUS FOR COOPING CHICKENS

Herbert D. Horton, Louisville, Miss., assignor to The Taylor Group, Inc., Louisville, Miss.

Filed Nov. 21, 1994, Ser. No. 342,493
Int. Cl.[6] A01K 29/00
U.S. Cl. 119—846 **27 Claims**



1. Apparatus for cooping chickens by translocating the chickens from within a chicken growing area into each compartment of a multi-tiered coop, comprising:

a main frame having a forward end, a central part, and a trailing end; an elongated boom having a pivoted end opposed to a gathering end, a first conveyor means supported along the length of said boom; journal means attaching said pivoted end to said main frame forward end such that said gathering end can be moved in a vertical and a horizontal plane; and, means for removably supporting a multi-tiered coop adjacent said main frame trailing end;

a chicken gathering apparatus supported from said boom gathering end for gathering any chickens that come in contact therewith onto said first conveyor means; said first conveyor means being adapted to move chickens from said gathering end to a discharge end located at said pivoted end thereof;

an intermediate conveyor system having a chicken receiving end opposed to a chicken discharge end, means positioning the receiving end of the conveyor system respective to the discharge end of said first conveyor means for receiving chickens from the discharge end of said first conveyor;

a transfer divider means for receiving chickens discharged from the discharge end of the intermediate conveyor system and dividing the chickens to move along one of a plurality of parallel paths;

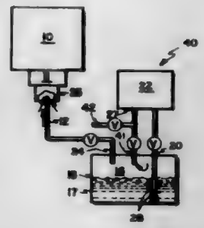
elevator means including carriage means to which said transfer divider means is mounted for positioning said transfer divider means respective to the tiers of a coop and to the parallel paths by which chickens discharged from the transfer divider means are sequentially transferred into the tiers of the coop.

5,592,903

VAPOR CATALYST SYSTEM FOR COMBUSTION

Fred A. Wentworth, Jr., Stratham, N.H., assignor to Ionic Fuel Technology, Inc., Wilmington, Del.

Division of Ser. No. 719,343, Aug. 31, 1976, Pat. No. 5,558,513, which is a continuation-in-part of Ser. No. 515,527, Oct. 17, 1974, Pat. No. 4,016,837, which is a continuation-in-part of Ser. No. 430,252, Jan. 2, 1974, Pat. No. 3,862,819. This application May 25, 1995, Ser. No. 451,018
Int. Cl.[6] F23J 7/00
U.S. Cl. 123—25 A **11 Claims**



1. A vapor catalyst system for fossil fuel combustion apparatus, and comprising:

(a) a closed container of liquid constituted at least partially of water;

(b) an air pump having a pressure side and a suction side;

(c) a first connection from the pressure side of said pump to below the liquid surface in said container;

(d) a second connection from the suction side of said pump directly to said container at a location above the liquid surface in said container to produce continuously circulating air flow between said pump and said container passing through said liquid;

(e) a third connection to the suction side of said pump from ambient air,

(f) means to exhaust at least some recirculating air to said combustion apparatus while replacing said recirculating air with ambient air, said recirculating air exhausting means including a direct connection from the intake of said combustion apparatus to said container at a point above the liquid surface; and,

(g) means for maintaining the flow of recirculating air above the liquid surface at a higher flow rate as compared to the air exhausted to said combustion apparatus.

5,592,904

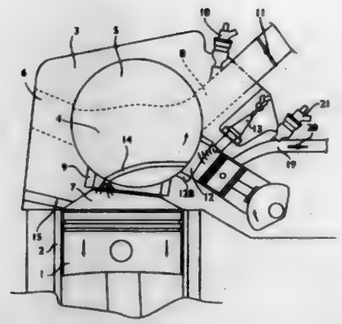
METHOD AND DEVICES FOR CONTROLLING THE COMBUSTION OF A FOUR STROKE ENGINE

Guy Negre, Forum Aurelia, Route du val, Brignoles, France

PCT No. PCT/FR94/00503, § 371 Date Jan. 26, 1995, § 102(e) Date Jan. 26, 1995, PCT Pub. No. WO94/25743, PCT Pub. Date Nov. 10, 1994
PCT Filed May 2, 1994, Ser. No. 360,678
Claims priority, application France, May 3, 1993, 93 05542
Int. Cl.[6] F02B 19/06; F01L 7/02
U.S. Cl. 123—52.3 **28 Claims**

1. A device for controlling combustion of a four-stroke rotary timing engine, the engine including at least one cylinder and cylinder liner, a primary piston mounted for reciprocation within said cylinder, a primary induction circuit that includes an induction conduit, an exhaust conduit, a primary combustion chamber in which a fuel-air mixture is compressed by the primary piston, the fuel-air mixture being ignited in the primary combustion chamber, and a gasket ring for sealing the primary combustion chamber, said device having a low load mode of operation and a full load mode of operation, said device comprising:

a rotary distributor mounted for rotation on and with respect to the assembly of said cylinder, cylinder liner, piston, primary combustion chamber, and gasket ring;



said rotary distributor having a lateral transfer port for successively connecting said exhaust conduit with said primary combustion chamber and said primary combustion chamber with said induction conduit, said induction conduit, exhaust conduit, and transfer port lying substantially within a common plane;

a secondary combustion chamber, smaller than said primary combustion chamber and lying in a plane different from said common plane, a gasket ring for sealing said secondary combustion chamber with respect to said rotary distributor;

a secondary induction circuit for supplying an independent fuel-air mixture to said secondary combustion chamber, said secondary induction circuit being separate from said primary induction circuit, said secondary induction circuit comprising a secondary induction conduit, fuel injector, and gas throttle;

a secondary piston mounted for compressing said independent fuel-air mixture within said secondary combustion chamber;

means for igniting said independent fuel-air mixture following induction of said fuel-air mixture and compression thereof within said secondary combustion chamber;

said rotary distributor having a linkage channel, separate from said transfer port, for communicating said primary combustion chamber with said secondary combustion chamber for ensuring expansion of an ignited fuel-air mixture from said secondary combustion chamber to said primary combustion chamber to push said primary piston and thus ensure a power stroke of the engine;

means for supplying said primary combustion chamber with only air in said low load mode of operation, said ignited fuel-air mixture in said secondary combustion chamber expanding through said linkage channel to said primary combustion chamber to push said primary piston and thus ensure a power stroke of the engine.

means for supplying said primary combustion chamber with a fuel-air mixture in said full load mode of operation, said ignited fuel-air mixture in said secondary combustion chamber issuing a flame jet from said secondary combustion chamber through said linkage channel to said primary combustion chamber for igniting said fuel-air mixture in said primary combustion chamber, whereby expansion of gases of combustion from said secondary combustion chamber and said primary combustion chamber expand and push said primary piston and thus ensure a power stroke of the engine.

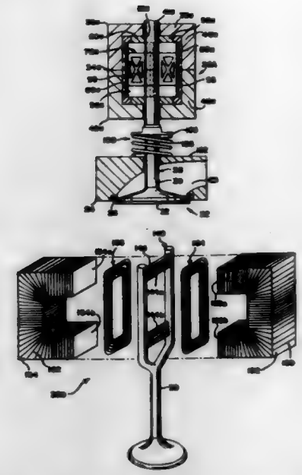
5,592,905

ELECTROMECHANICAL VARIABLE VALVE ACTUATOR

Joseph Born, Lincolnwood, Ill., assignor to Machine Research Corporation of Chicago, Evanston, Ill.

Continuation of Ser. No. 356,053, Dec. 14, 1994, Pat. No. 5,515,818, which is a continuation of Ser. No. 176,835, Dec. 15, 1993, abandoned. This application May 10, 1996, Ser. No. 644,527
Int. Cl.[6] F01L 9/04
U.S. Cl. 123—90.11 **3 Claims**

2. In a gas exchange intake or exhaust valve assembly for controlling the flow of gases into and/or out of a cylinder in an internal combustion engine, said gas exchange valve assembly



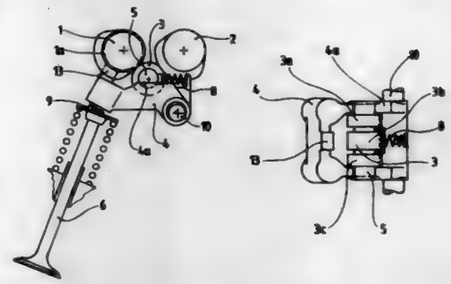
including an opening to the cylinder and a valve closure member for opening and closing the opening, the valve closure member having a head coacting with the opening and a stem extending from the head, the improvement being in a valve actuator for driving the valve closure member, said actuator comprising an armature connected to said valve stem having windings extending substantially perpendicular to said stem, means generating a magnetic field across said windings, and means supplying current to said windings to coact with said magnetic field to drive the valve closure member to open and close said valve closure member depending on the direction of the current in said windings.

5,592,906

METHOD AND DEVICE FOR VARIABLE VALVE CONTROL OF AN INTERNAL COMBUSTION ENGINE

Peter Kreuter; Joachim Reinicke-Murmann, and Peter Henser, all of Aachen, Germany, assignors to Meta Motoren- und Energie-Technik GmbH, Herzogenrath, Germany

PCT No. PCT/DE94/00786, § 371 Date Mar. 3, 1995, § 102(e) Date Mar. 3, 1995, PCT Pub. No. WO95/02116, PCT Pub. Date Jan. 19, 1995
PCT Filed Jul. 6, 1994, Ser. No. 392,983
Claims priority, application Germany, Jul. 6, 1993, 43 22 480.6
Int. Cl.[6] F01L 1/18; 13/00
U.S. Cl. 123—90.16 **34 Claims**



2. An apparatus for the variable control of a valve of an internal combustion engine, comprising:

two camshafts that normally rotate at the same speed, said camshafts being provided with respective cams, wherein said cam of one of said camshafts that operates as an opening

camshaft is provided with a base circle portion that merges via an opening portion with a lobe, and wherein said cam of the other of said camshafts that operates as a closing camshaft is provided with a lobe that merges via a closing portion with a base circle portion;

follower means for sensing contours of said cams of said camshafts in the manner of an adder;

an actuating means for transmitting movement of said follower means to said valve for actuating said valve;

means for varying a phase relationship between said camshafts to vary at least one of a lift and an opening duration of said valve;

spring means for holding said follower means, after closure of said valve, in contact with said cam of only one of said camshafts; and

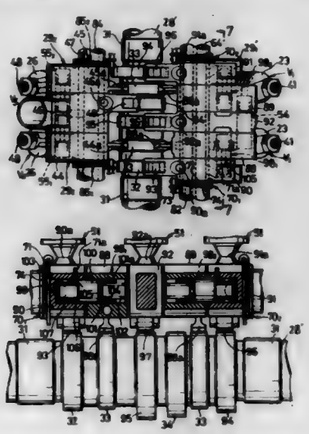
means for holding said actuating means, when said valve is in a closed state, substantially in contact with said valve.

5,592,907

VALVE OPERATING SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Tetsuya Hasebe, and Kazuhide Kumagai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 475,790
Claims priority, application Japan, Aug. 25, 1994, 6-200386
Int. Cl.[6] F01L *13/00*; F02D *13/06*
U.S. Cl. 123—90.16 **12 Claims**



7. A valve operating system for a cylinder of a multi-cylinder internal combustion engine comprising:

first and second intake valves in the cylinder;

a cam shaft having at least one portion of no valve a substantially circular cam with a small cam lobe of short radial height and circumferential length, and at least one operating cam having a valve-opening cam lobe;

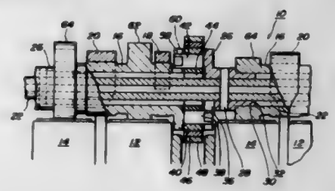
means for selectively operating said intake valves in one of three modes, namely, (1) maintaining said first and second intake valves closed for stopping operation of the cylinder, (2) operating said first intake valve by said substantially circular cam and operating said second intake valve by said operating cam, and (3) operating said first and second intake valves by said at least one operating cam.

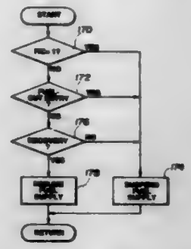
5,592,908

ENGINE CYLINDER VALVE CONTROL SYSTEM

Seinosuke Hara, and Akira Hidaka, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Utsugi, Japan

Filed Sep. 28, 1994, Ser. No. 313,868
Claims priority, application Japan, Sep. 28, 1993, 5-240834
Int. Cl.[6] F01L *13/00*
U.S. Cl. 123—90.17 **22 Claims**





18. A method of controlling an internal combustion engine with a cylinder valve control device, the cylinder valve control device including a driving shaft driven by the engine to drive an intermediate member which in turn drives a cam arranged to open an engine cylinder valve, and a driver which is operative in response to a command to vary an amount of an offset between an axis about which the intermediate member is rotatable and a shaft axis of the driving shaft, the intermediate member being supported in a support for rotation about the axis thereof in an eccentric condition to accelerate and decelerate the cam with respect to rotation of the driving shaft during engine operation, the intermediate member being in a concentric condition to provide a synchronous motion of the cam with rotation of the driving shaft during engine operation, the method comprising the steps of:

providing an output distinguishing an operation of the intermediate member in said eccentric condition from an operation of the intermediate member in said concentric condition;

suspending, responsive to said output, fuel supply to the internal combustion engine upon the engine speed exceeding a first predetermined engine speed when said output represents the operation of the intermediate member in said eccentric condition; and

increasing, responsive to said output, fuel supply to the internal combustion engine upon the engine speed dropping below a second predetermined engine speed that is lower than said first predetermined engine speed and an amount of load imposed on the internal combustion engine being less than a predetermined engine load value when said output represents the operation of said intermediate member in said concentric condition.

21. A method of controlling an internal combustion engine with a cylinder valve control device, the cylinder valve control device including a driving shaft driven by the engine to drive an intermediate member which in turn drives a cam arranged to open an engine cylinder valve, and a driver which is operative in response to a command to vary an amount of an offset between an axis about which the intermediate member is rotatable and a shaft axis of the driving shaft, the intermediate member being supported in a support for rotation about the axis thereof in an eccentric condition to accelerate and decelerate the cam with respect to rotation of the driving shaft during engine operation, the intermediate member being in a concentric condition to provide a synchronous motion of the cam with rotation of the driving shaft during engine operation, the method comprising the steps of:

providing an output distinguishing an operation of the intermediate member in said eccentric condition from an operation of the intermediate member in said concentric condition; and

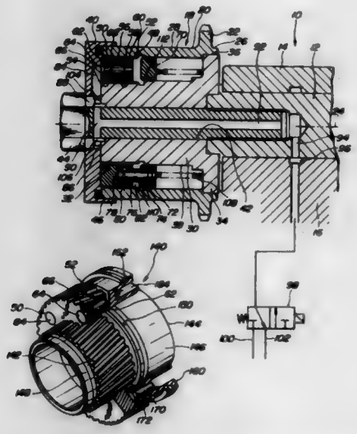
suspending, responsive to said output, fuel supply to the internal combustion engine upon the engine speed exceeding a predetermined engine speed when said output represents the operation of the intermediate member in said eccentric condition.

5,592,909

CAMSHAFT PHASE CHANGING DEVICE

Seiji Tsuruta, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Mar. 17, 1995, Ser. No. 406,302
Claims priority, application Japan, Mar. 18, 1994, 6-048789
Int. Cl.[6] F01L *1/34*
U.S. Cl. 123—90.17 **11 Claims**



1. A variable camshaft phase changing device for an internal combustion engine having a camshaft and rotatable about a camshaft axis, comprising:

co-axial drive and driven members, said driven member being securable to the camshaft for rotation therewith about an axis;

a pair of axially-spaced annular gears disposed and engaged between said drive and driven members, said pair of axially-spaced annular gears having inner and outer splines;

means for biasing said annular gears one toward the other for lash take-up;

force means for axially moving said annular gears in one direction to vary the phase relationship between said drive and driven members, said force means including an annular piston, a chamber on one side of said annular piston and oil supplied under pressure to said chamber, said annular piston being axially movable in said one direction in response to said oil under pressure supplied to said chamber, said annular piston having a plurality of pins passing through one of said annular gears toward the other of said annular gears;

return spring means biasing said annular piston in a return direction opposite to said one direction to keep said pins in driving contact with the other of said annular gears to move said other of said annular gears in said return direction as said annular piston moves in said return direction,

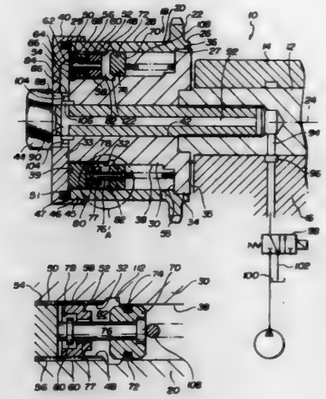
said pins having portions arranged to come into driving relation with said one of said annular gears for transmitting motion of said plurality of pins to said one of said annular gears to move said one of said annular gears in said one direction as said annular piston moves in said one direction.

5,592,910

CAMSHAFT PHASE CHANGING DEVICE

Seiji Suga; Hiroaki Imai, and Katsuhiko Uchida, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Aug. 25, 1995, Ser. No. 519,517
Claims priority, application Japan, Aug. 30, 1994, 6-204703
Int. Cl.[6] F01L *1/344*
U.S. Cl. 123—90.17 **15 Claims**



1. A variable camshaft phaser for an internal combustion engine having a camshaft, comprising:

co-axial drive and driven members, said driven member being secured to the camshaft for rotation therewith about an axis;

a pair of axially-spaced annular gears disposed and engaged between said drive and driven members, said pair of axially-spaced annular gears having inner and outer splines;

means for biasing said annular gears one toward the other for lash take-up;

force means for axially moving said annular gears in one direction to vary the phase relationship between said drive and driven members, said force means including an annular piston, a chamber on one side of said annular piston and oil supplied under pressure to said chamber, said annular piston being axially movable in said one direction in response to said oil supplied under pressure to said chamber, said annular piston having a plurality of pins that passes through a plurality of openings, respectively, in one of said annular gears toward the other of said annular gears;

return spring means biasing said annular piston in a return direction opposite to said one direction to keep said plurality of pins in driving contact with the other of said annular gears to move said other of said annular gears in said return direction as said annular piston moves in said return direction,

said plurality of pins having portions arranged to come into driving relation with said one of said annular gears for transmitting motion of said plurality of pins to said one of said annular gears to move said one of said annular gears in said one direction as said annular piston moves in said one direction,

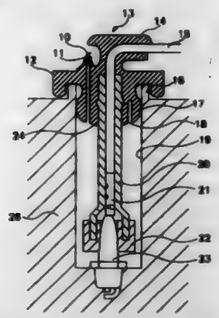
each of said plurality of openings of said one of said annular gears being dimensioned to provide a clearance around the corresponding one of said plurality of pins to keep said one of said annular gears out of contact with an outer surface of the corresponding pin.

5,592,911

WATER-TIGHT CAP WITH VENT

Toshihiko Komatsu, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed Aug. 22, 1995, Ser. No. 518,077
Claims priority, application Japan, Oct. 24, 1994, 6-257933
Int. Cl.[6] H01T *13/06*
U.S. Cl. 123—143 C **13 Claims**



1. A plug cap for intermittently sealing a bore, said cap having an opening and comprising

at least one vent having an aperture to permit evacuation of a gas from said bore, a flap adjacent said aperture, and a fixing element connecting said flap to said plug cap,

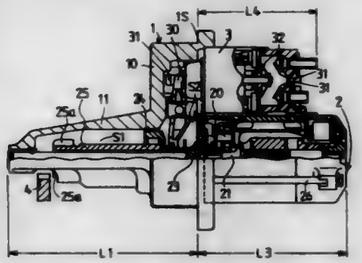
said fixing element having an open position, wherein a portion of said flap is out of contact with said opening, and a closed position, wherein said flap contacts said opening and prevents entry of liquid therein, said flap being in said open position if no external force toward said opening is exerted thereon, said flap being in said closed position if a force toward said opening is exerted on said flap, said fixing element constituting a fulcrum about which said flap pivots between said open position and said closed position.

5,592,912

STARTER HAVING IMPROVED HEAT RADIATION

Nobuhiko Uryu, and Nobuyuki Hayashi, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 16, 1995, Ser. No. 405,153
Claims priority, application Japan, May 27, 1994, 6-115281
Int. Cl.[6] F02N *11/00*
U.S. Cl. 123—179.25 **8 Claims**



1. A starter for an internal combustion engine, the engine having a ring gear enclosed in a clutch housing, said starter comprising:

a starter housing having a large diameter base portion with an installation surface and a small diameter pinion enclosure portion and being constructed and arranged to be mounted to said clutch housing at said installation surface, said small diameter portion and a part of said starter housing large diameter base portion being insertable axially into said clutch housing and a remaining part of said starter housing large diameter portion being extendable from said clutch housing at a position outside thereof, said small diameter portion of said starter housing having an end surface;

a pinion supported rotatably and axially slidably in said starter housing so as to engage said ring gear of said engine; and

a starter motor fitted to said remaining part of said starter housing large diameter portion for driving said pinion, said starter motor having an end surface,

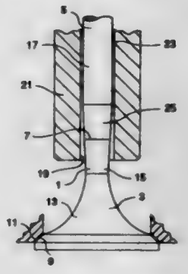
wherein an axial length from the end surface of said small diameter portion of said starter housing to said installation surface of said starter housing is longer than an axial length from the end surface of said motor to said installation surface so that when said starter is mounted to said clutch housing, heat generated by said starter motor is radiated to air in the clutch housing via said starter housing.

5,592,913

EXHAUST VALVE WITH A TAPERED STEM PORTION

William F. Matthews, Lafayette, Ind., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 29, 1996, Ser. No. 625,501
Int. Cl.[6] F01L *3/02*
U.S. Cl. 123—188.3 **5 Claims**



1. An exhaust valve for an internal combustion engine having a generally cylindrical stem portion adapted to fit in a bore of a valve guide and formed of one alloy and a head portion having a generally frustoconical seat portion, the head portion being formed of another alloy, which will withstand high exhaust temperatures, the stem and head portions being welded together, the exhaust valve being characterized in that a portion of the stem and a portion of the head adjacent the weld form a taper, which extends longitudinally on each side of the weld and decreases in diameter from the stem end of the taper to the head end of the taper and the weld area between the head portion and the stem portion is always disposed within the bore of the valve guide when the valve is disposed in the engine, whereby thermal growth of the head portion due to differential thermal expansion will not interfere with the valve guide bore as the valve opens and closes during the operation of the engine.

5,592,914

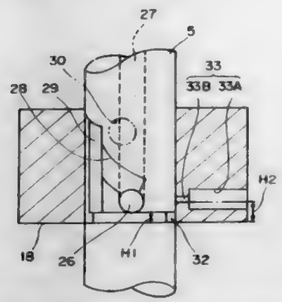
Patent Not Issued For This Number

5,592,915

PILOT INJECTION CONTROLLER IN FUEL INJECTION SYSTEM AND METHOD OF CONTROLLING PILOT INJECTION QUANTITY

Hiroshi Ishiwata; Takashi Ohishi, and Nobuhiro Kitahara, all of Saitama Prefecture, Japan, assignors to Zexel Corporation, Japan

Filed Sep. 29, 1995, Ser. No. 536,988
Claims priority, application Japan, Sep. 30, 1994, 6-259694
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—300 **17 Claims**



1. A pilot injection controller in a fuel injection system including a cam rotated by an engine,

a plunger barrel with a fuel compression chamber,

a plunger reciprocated inside the plunger barrel by the cam for sucking fuel into the fuel compression chamber from a fuel reservoir through a fuel suction and discharge hole and delivering the fuel under pressure and

a control sleeve fitted over the plunger to be slidable thereon in an axial direction of the plunger,

the plunger executing a pilot injection delivery stroke of fixed magnitude to pilot-inject fuel prior to main injection of fuel

the pilot injection controller comprising

means for adjusting prestroke by changing a positional relationship in the axial direction between the control sleeve and the plunger, and

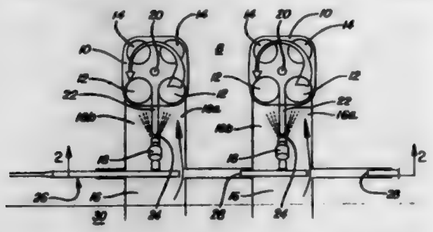
means for enabling the prestroke adjustment by the prestroke adjustment means to cause a portion of the cam in a lower delivery velocity region to be used with increasing rotational speed of the cam.

5,592,916

INTERNAL COMBUSTION ENGINE HAVING INTAKE PORT THROTTLES INCORPORATING CHARGE MOTION CONTROL

William F. Stockhausen, and Robert A. Stein, both of Northville, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 3, 1995, Ser. No. 552,447
Int. Cl.[6] F02B *31/00;* **F02D** *9/14*
U.S. Cl. 123—308 **5 Claims**



1. A multicylinder internal combustion engine comprising:

a plurality of cylinders, with each cylinder having at least one intake valve and one exhaust valve;

a plurality of intake ports located within a cylinder head, with at least one port for supplying charge to each cylinder;

a fuel injector mounted within each intake port;

a dividing wall extending upstream axially, from the position at which each intake port joins a cylinder, through a volume of the intake port which is not greater than approximately 70% of the displacement volume of the cylinder; and

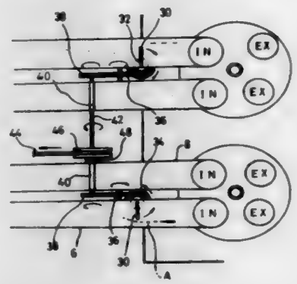
a port throttle for controlling the magnitude and direction of airflow through each of said intake ports, with said port throttle comprising a single sliding plate extending through the intake ports normally to the longitudinal axes of said intake ports and having a plurality of windows which may be selectively indexed with said intake ports such that charge air admitted into said cylinders may be directed to the primary section of the port during low load, high swirl operation, whereas air may be directed equally to both sections of the port during high load, low swirl operation.

5,592,917

INTAKE AIR CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yoonsuk Kim, Kyungki, Rep. of Korea, assignor to Hyundai Motor Company, Rep. of Korea

Filed Dec. 27, 1995, Ser. No. 579,397
Claims priority, application Rep. of Korea, Dec. 28, 1994, 94-37994
Int. Cl.[6] F02B *31/00;* **F02D** *9/08*
U.S. Cl. 123—308 **6 Claims**



1. In an internal combustion engine having a surge tank for temporarily storing intake air taken in through a throttle valve coupled to an accelerator pedal, and low speed and high speed intake tubes for supplying the intake air from the surge tank to a combustion chamber, an intake air control device comprising:

a swirl producing valve provided in the low speed intake tube for partially closing an intake port of the combustion chamber so as to impart swirling motion to air flowing into the combustion chamber when operating the engine at a low speed including idling;

an intake control valve provided in the high speed intake tube for completely blocking passage of air through the high speed intake tube when operating the engine at said low speed; and

valve control means for simultaneously controlling the swirl producing valve and the intake control valve by moving the accelerator pedal so as to close the swirl producing valve and the intake control value at said low speed or to open the swirl producing valve and the intake control valve at medium and high speeds of the engine, wherein when the swirl producing valve partially closes the intake port, a narrow opening forms between an edge of the swirl producing valve and a wall of the low speed intake tube for imparting the swirling motion to the intake air supplied from the surge tank to the combustion chamber.

5,592,918

INTAKE AIR VOLUME CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

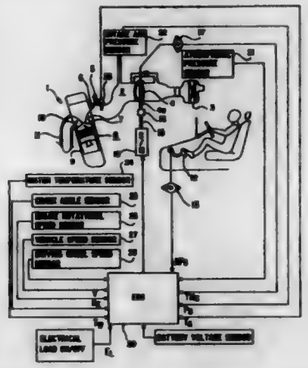
Norio Suzuki, and Yousuke Tachibana, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1995, Ser. No. 508,030

Claims priority, application Japan, Aug. 10, 1994, 6-208206

Int. Cl.[6] F02D 41/16

U.S. Cl. 123—339.18 **3 Claims**



1. An intake air volume control device for an internal combustion engine in which there is provided a throttle opening degree control means for driving a throttle valve arranged in an air intake system of the internal combustion engine and adjusting an intake air volume, comprising:

sensor means for detecting operational states of the internal combustion engine;

a target intake air volume calculating means for calculating a target intake air volume in response to operational states of the internal combustion engine; and

a target throttle opening degree setting means for setting a target throttle opening degree in response to said target intake air volume calculated by said target intake air volume calculating means,

wherein said target throttle opening degree setting means calculates a throttle opening degree in response to an accelerator pedal angle and calculates an idle throttle opening degree in response to outputs from said sensor means of the internal combustion engine,

said throttle valve being driven and controlled by said throttle opening degree control means in response to said target throttle opening degree.

5,592,919

ELECTRONIC CONTROL SYSTEM FOR AN ENGINE AND THE METHOD THEREOF

Koji Morikawa, Tokyo-to, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

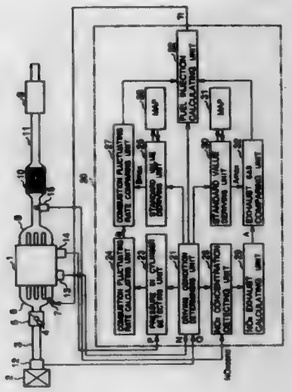
Filed Dec. 8, 1994, Ser. No. 355,190

Claims priority, application Japan, Dec. 17, 1993, 5-317685; Jan. 25, 1994, 6-6577

Int. Cl.[6] F02D 41/14

U.S. Cl. 123—435 **4 Claims**

1. An electronic control system for an engine having, an intake manifold connected to said engine for inducting an air and fuel mixture, an airflow meter mounted on said intake manifold via a throttle valve for measuring an amount of air inducted thereof and for generating an air amount signal, an exhaust manifold connected to said engine for exhausting burnt gases, a nitrogen oxide concentration sensor inserted in said exhaust manifold for detecting a nitrogen oxide amount in said burnt gases and for producing a



nitrogen oxide signal, a crank angle sensor mounted on said engine for sensing an engine speed and for generating an engine speed signal, a pressure sensor mounted on said engine for detecting a combustion pressure in a cylinder and for outputting a pressure signal and a fuel injector, the system comprising:

driving condition determining means, responsive to said engine speed and pressure signals, for determining an operating condition of said engine and for generating an operating condition signal;

combustion fluctuating rate calculating means, responsive to said pressure and operating condition signals, for calculating an actual combustion fluctuating rate and for generating a fluctuating rate signal;

combustion fluctuating rate comparing means, responsive to said operating condition and said fluctuating rate signals, for deriving an optimum air-fuel ratio by comparing said fluctuating rate signal with a standard value stored in a map and for producing a first control signal;

nitrogen oxide exhaust calculating means, responsive to said nitrogen oxide signal and said operating condition signal, for calculating an actual nitrogen oxide gas amount in said burnt gases and for generating a nitrogen oxide signal;

exhaust gas comparing means, responsive to said operating condition signal and said nitrogen oxide signal, for judging said optimum air-fuel ratio by comparing said actual nitrogen oxide gas amount with a desired value stored in a memory and for producing a second control signal; and

fuel injection calculating means, responsive to said first and second control signals, for deciding an optimum fuel injection amount corresponding to each driving condition to thereby enable the correct amount of fuel to be injected by said fuel injector so as to accurately control said engine without fluctuation.

5,592,920

DISTRIBUTOR-TYPE FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Wolfgang Fehlmann, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/01267, § 371 Date Jun. 29, 1995, § 102(e) Date Jun. 29, 1995, PCT Pub. No. WO95/13469, PCT Pub. Date May 18, 1995

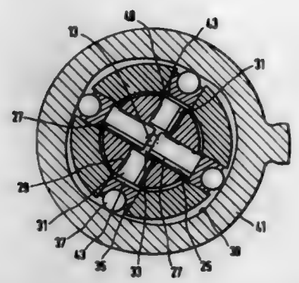
PCT Filed Oct. 28, 1994, Ser. No. 464,896

Claims priority, application Germany, Nov. 10, 1993, 43 38 344.0

Int. Cl.[6] F02M 41/00

U.S. Cl. 123—450 **3 Claims**

1. A distributor-type fuel injection pump for internal combustion engines comprising a housing, a cam drive, said cam drive is driven in rotation by a drive shaft (9) and during the rotary motion



of said drive shaft a reciprocating motion is imparted to a pump plunger in a cylinder bore arranged radially relative to the drive shaft by means of a roller tappet (35) which runs along a cam track (39), in a rotor part (1), at least two intersecting cylinder bores being provided in the rotor part in a plane radial relative to the drive shaft, in each of said cylinder bores two mutually opposite pump plungers are arranged which delimit a common pump working space (33) alternately connectable to a low-pressure space (23) and an injection line (19) and which are moved radially inwards during the delivery stroke and the axial length of said pump plungers is designed such that, during the delivery stroke movement, a first, longer pump-plunger pair (27) guided in a first cylinder bore (25) in each case includes one end that enters a second intersecting cylinder bore (29) which guides a shorter second pump-plunger pair (31) and the shorter pump plungers (31), guided in said cylinder bore (29) do not intersect the first cylinder bore (25) in their maximum delivery-stroke position, wherein the pump plungers (31) of the second, shorter pump-plunger pair each have a stop (45) at an end that protects out of the second cylinder bore (29), the said stop limiting said second pump plungers to a maximum depth of penetration into the cylinder bore (29) in the direction of the pump working space (33), and the shorter pump plungers (31) each come to rest by use of their stop on an axial end wall (49) of the cylinder bore (29) which guides and stops said shorter pump plungers before a pump working-space end enters the region of the cylinder bore (25).

5,592,921

METHOD AND DEVICE FOR ACTUATING AN ELECTROMAGNETIC LOAD

Gerhard Rehbichler, St. Johann, Austria, assignor to Robert Bosch GmbH, Stuttgart, Germany

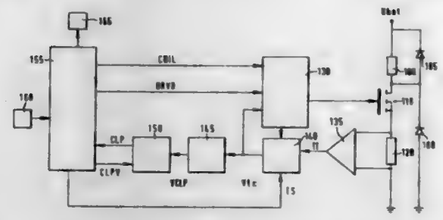
PCT No. PCT/DE94/01416, § 371 Date Aug. 8, 1995, § 102(e) Date Aug. 8, 1995, PCT Pub. No. WO95/16118, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 29, 1994, Ser. No. 500,994

Claims priority, application Germany, Dec. 8, 1993, 43 41 797.3

Int. Cl.[6] F02M 51/00

U.S. Cl. 123—490 **11 Claims**



3. A method for actuating an electromagnetic load to influence the metering of fuel in a diesel internal combustion engine, wherein the electromagnetic load is connected in series with a means for switching, the method comprising the steps of:

generating an actuation signal;

providing the actuation signal to the means for switching to cause a current to flow through the electromagnetic load in response to the actuation signal provided to the means for switching;

evaluating a characterizing parameter of the actuation signal; and

determining a switching time of the electromagnetic load as a function of the evaluation of the characterizing parameter.

5,592,922

VENTING APPARATUS FOR A FUEL SYSTEM OF AN INTERNAL COMBUSTION ENGINE

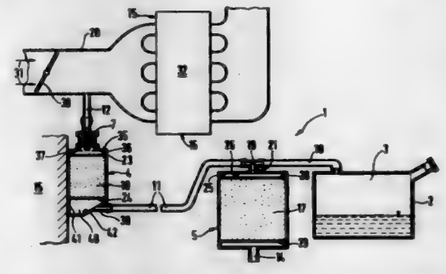
Helmut Denz, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 15, 1995, Ser. No. 404,696

Claims priority, application Germany, Mar. 16, 1994, 44 08 869.8

Int. Cl.[6] F02M 33/02

U.S. Cl. 123—520 **11 Claims**



1. A venting apparatus for a fuel system of an internal combustion engine comprising a fuel tank, in which fuel vapors evolved in the fuel tank are introduced into an intake pipe of the internal combustion engine via a regeneration valve connected to said intake pipe, said regeneration valve assumes an open position or a closed position, and to take up the fuel vapors, a first adsorption filter is connected to said regeneration valve and by a connecting conduit (11) to a second adsorption filter, said second adsorption filter is connected to the atmosphere only by a ventilation conduit and is accommodated in a region of the fuel tank (2), the first adsorption filter (4) is accommodated in a region of the internal combustion engine, and the fuel vapors from the fuel tank (2) pass into and flow through the second adsorption filter (5) in a closed position of the regeneration valve (7) and pass into and flow through the first adsorption filter (4) in the open position of the regeneration valve (7) and only the first adsorption filter (4) is connected to the intake pipe.

5,592,923

DIAGNOSIS APPARATUS AND METHOD IN AN APPARATUS FOR TREATING FUEL VAPOR OF AN ENGINE

Kenichi Machida, Atsugi, Japan, assignor to Unisia Jecs Corporation, Kanagawa-ken, Japan

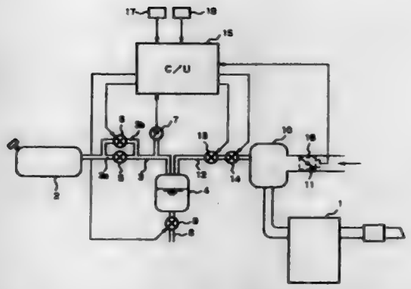
Filed Aug. 10, 1995, Ser. No. 513,284

Claims priority, application Japan, Aug. 11, 1994, 6-189213

Int. Cl.[6] F02M 33/02

U.S. Cl. 123—520 **18 Claims**

1. A diagnosis apparatus in an apparatus for treating fuel vapor of an engine in which the fuel vapor in a fuel tank is adsorbed and trapped by an adsorbing means via a fuel vapor passage, and the fuel vapor adsorbed and trapped by the adsorbing means is sup-



plied, via a purge passage, to an intake system of the engine together with the fresh air introduced through an air introduction passage utilizing an intake negative pressure of the engine, including a check valve provided in the fuel vapor passage, a check valve by-pass valve provided in a by-pass passage which by-passes the check valve, a drain cut valve provided in the air introduction passage, a purge cut valve which is opened and closed in an ON/OFF manner and a purge control valve of which degree is adjusted, interposed in series in the purge passage, and a pressure detecting means provided to detect pressure in the fuel vapor passage between the combination of the purge cut valve and the purge control valve and the combination of the check valve and the check valve by-pass valve, said apparatus comprising:

a valve defect diagnosis means for carrying out diagnosis for each of said check valve by-pass valve, said drain cut valve, said purge cut valve and said purge control valve based upon the comparison of reference pressure conditions depending on combinations of open and closed states of said check valve by-pass valve, said drain cut valve, said purge cut valve and said purge control valve with pressures detected by said pressure detecting means.

5,592,924

INTERNAL COMBUSTION ENGINE ADAPTED TO OPERATE SELECTIVELY WITH INJECTION OF GASOLINE OR LPG

Filippo Andiolo; Gianpiero Borello; Massimo Ferrera; Pietro Gianotti, and Riccardo Gozzelino, all of Turin, Italy, assignors to Centro Ricerche Fiat Societa' Consortile Per Azioni, Turin, Italy

Filed Feb. 5, 1996, Ser. No. 596,478

Claims priority, application Italy, Feb. 3, 1995, TO95A0064; May 24, 1995, TO95A0405

Int. Cl.[6] F02M *21/02*

U.S. Cl. 123—525 **10 Claims**

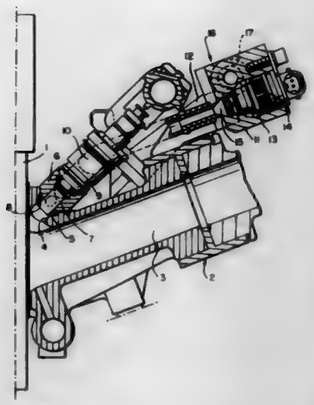
1. Internal combustion engine, provided with a gasoline feed system, including many gasoline injection devices which are respectively associated with the cylinders of the engine, and an LPG feed system, including many LPG injection devices respectively associated with the cylinders of the engine, said engine being adapted to operate selectively with gasoline or LPG injection, characterized by the combination of the following features:

the engine includes, for each cylinder, an adaptor member provided both with a seat for a gasoline injector, and with a seat for an LPG injector, said adaptor member having an inner cavity communicated to said seats and opening into an outlet hole, said outlet hole being formed through a portion of said adaptor member which is to be fitted within a seat of the engine originally provided for receiving the gasoline injection device, said engine further comprising a distributing conduit or rail for feeding LPG to all the LPG injection devices,

the LPG feed system comprises:

the plurality of said LPG injectors respectively associated with the various cylinders of the engine,

said distributing conduit or rail for feeding LPG to the injectors, separate from the gasoline feed rail,



an LPG reservoir,

means for feeding LPG from the reservoir to the feed rail while keeping the LPG in a liquid state, said means including a pump which takes LPG from the reservoir and feeds it to the rail,

a re-flow conduit for returning the quantity of LPG fed in excess to the injectors into the reservoir,

a pressure adjuster, interposed in the reflow conduit for throttling this conduit so that said pump provides an increase from the pressure of LPG within the reservoir up to the pressure at which LPG is fed to the injectors,

means associated with said pressure adjuster, able to detect the pressure of LPG within the reservoir, which is a function of the temperature, and to vary as a consequence the degree of throttling of the adjuster so as to keep said pressure increase at a substantially constant level,

sensor means of the LPG feed pressure to the injectors, and

electronic control means which receives output signals from said sensor means of the injector feed pressure and controls as a consequence the time during which the injectors remain open.

5,592,925

EXHAUST GAS RECIRCULATION DEVICE FOR INTERNAL COMBUSTION ENGINE

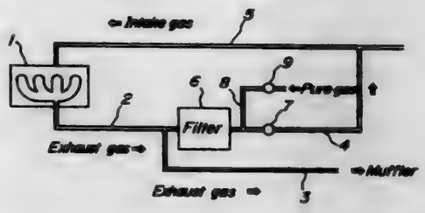
Minoru Machida; Toshio Yamada; Yukihito Ichikawa, and Yoshiyuki Kasai, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 6, 1995, Ser. No. 524,253

Claims priority, application Japan, Sep. 14, 1994, 6-220057

Int. Cl.[6] F02M *25/07*; F01N *3/02*

U.S. Cl. 123—568 **14 Claims**



1. An exhaust gas recirculation device for an internal combustion engine comprising a filter for trapping particulates in a recirculation gas, which is arranged in a recirculation gas route, and a device for generating a reverse air flow in which a pure gas flow for said reverse air flow passing through said filter in a reverse direction with respect to a recirculation gas flowing direction in said filter is generated, wherein a filter regeneration is performed in such a manner that the trapped particulates are discharged out of said filter by said reverse air flow and the trapped particulates are not returned to said internal combustion engine.

5,592,926

METHOD OF DETECTING MISFIRE OF ENGINE IGNITION SYSTEM AND DEVICE FOR CARRYING OUT THE SAME

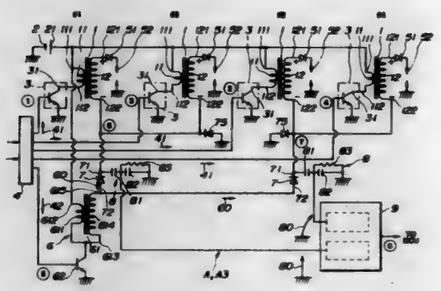
Shigeru Miyata; Noriaki Kondo, and Hiroshi Inagaki, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 15, 1994, Ser. No. 356,737

Claims priority, application Japan, Dec. 17, 1993, 5-317210; Aug. 31, 1994, 6-205834; Oct. 7, 1994, 6-243585

Int. Cl.[6] F02P *17/00*

U.S. Cl. 123—630 **12 Claims**



2. A misfire detecting device for a single-ended distributorless ignition system having ignition coils of the same number as cylinders of an engine and each having a primary winding and a secondary winding independent from the primary winding, primary current supplying means for supplying battery current to the primary winding of the ignition coils intermittently and in turn, and spark plugs provided for respective cylinders of the engine and each connected at a center electrode side to one end of the secondary winding and grounded at an outer electrode side to a cylinder side, the misfire detecting device comprising:

pulse generating means for generating a high tension pulse having a voltage level lower than that required for spark discharge after completion of spark discharge of one of the spark plugs and before application of an ignition high voltage to another of the spark plugs which is to discharge next;

reverse current preventing diodes of half the number of the ignition coils and each connected at a cathode to a junction between the other ends of each secondary windings of two of the ignition coils which cause ignition at a phase differeace of 360° with respect to an engine crank angle end at an anode to an output end of said pulse generating means;

voltage dividing means of half the number of the ignition coils for dividing a voltage at a cathode side of each of said diodes to obtain a divided voltage thereat; and

detecting means for detecting a misfire of the ignition system on the basis of an attenuation characteristic of said divided voltage after application of said high tension pulse.

5,592,927

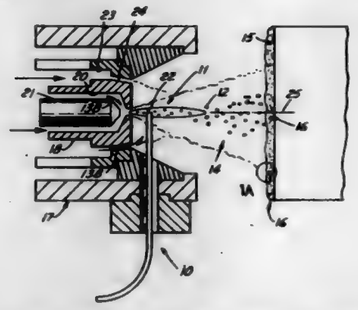
METHOD OF DEPOSITING AND USING A COMPOSITE COATING ON LIGHT METAL SUBSTRATES

Matthew J. Zaluzec, Canton; Robert C. McCune, Jr., Southfield; Obadele O. Popoola, Grand Blanc; James R. Baughman, Plymouth, and John E. Brevick, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 6, 1995, Ser. No. 540,147

Int. Cl.[6] F02B *77/02*

U.S. Cl. 123—668 **10 Claims**



1. A method of depositing an Fe_xO comprising coating onto a light metal substrate by use of wire-arc thermal spraying that propels atomized droplets by use of atomizing gases, comprising:

(a) preparing at least one surface of said light metal substrate to present an exposed essentially non oxidized substrate surface; and

(b) thermally spraying melted droplets of a low carbon (0.04–2% by wt.) steel feedstock wire onto said prepared surface by use of propellant gases at a gas flow rate of 30–120 SCFM to deposit a composite coating, the gases being controlled as to content to regulate the exposure of said droplets to oxygen so that wustite of the formula Fe_xO (Wustite) is the only iron oxide formed during spraying, x being 0.5–1.5, said coating containing said wustite in amount of 5–30% by volume with the balance being iron based of a composition essentially that of the starting feedstock.

5,592,928

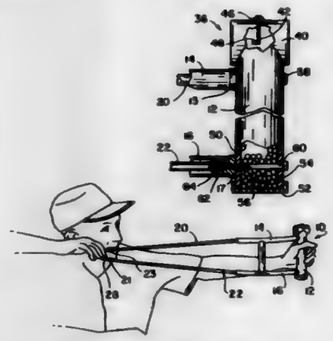
ARCHERY PRACTICE DEVICE

William P. Frazier, 3980 Sheep Ranch Rd., Rhinelander, Wis. 54501

Filed Mar. 12, 1996, Ser. No. 614,268

Int. Cl.[6] F41B *5/00*

U.S. Cl. 124—1 **8 Claims**



1. An archery practice device comprising:

a handgrip member;

a pair of parallel rigid guide members attached to the handgrip member and extending perpendicularly from a longitudinal length of the handgrip member;

a pair of elastic cords each attached at one end to the handgrip member through the pair of guide members; and

a bowstring attached to a second end of each of the pair of elastic cords.

8. A method of practicing archery comprising the steps of:

retracting a bowstring attached to a pair of elastic cords threaded through a pair of rigid guide members that are attached to a handgrip;

retaining the handgrip with a force opposite of that necessary in the step of retracting;

aligning a sight with a target;

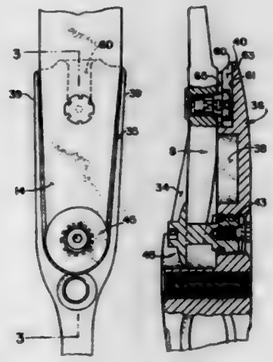
maintaining the sight and steadying the handgrip and bowstring; and releasing the bowstring while concentrating on maintaining the proper sight alignment.

5,592,929

RECURVE BOW ALIGNMENT

Earl H. Hoyt, Jr., 11510 Natural Bridge Rd., St. Louis, Mo. 63044

Filed Mar. 3, 1995, Ser. No. 398,148
Int. Cl.[6] F41B *5/00*
U.S. Cl. 124—23.1 **9 Claims**



1. In a recurve bow having a handle and upper and lower limbs, said handle having upper and lower limb-receiving pockets and, in each, a pull-weight adjusting spool fixed against lateral movement with respect to said pocket and located at an inner end of said pocket, each of said limbs having at a butt end thereof slot means for closely receiving said pull-weight adjusting spool, the improvement comprising means for pivoting said limb around said spool and for holding said limb in a desired angular position with respect to said spool.

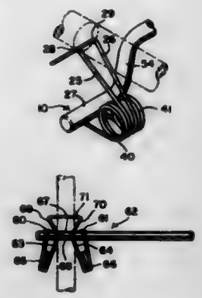
9. The method of aligning limbs of a recurve bow having a handle, said handle having upper and lower limb receiving pockets and, in each pocket, a pull-weight adjusting spool located at an inner end of said pocket and having a centerline, said limbs having at butt ends thereof slot means for closely receiving said spool, said method comprising aligning the centerlines of said spools with a bench mark, pivoting a limb about one of said spools until an outer end of said limb is aligned with the centerlines of said spools and said bench mark, and maintaining said limb in said aligned condition.

5,592,930

ARROW REST

Kent S. Roberts, and Brent J. Roberts, both of American Fork, Utah, assignors to Inventive Technology, American Fork, Utah

Filed Feb. 24, 1995, Ser. No. 396,187
Int. Cl.[6] F41B *5/22*
U.S. Cl. 124—44.5 **7 Claims**



1. An archery arrow rest comprising:

a rest base;

means for securing the rest base to an archery bow;

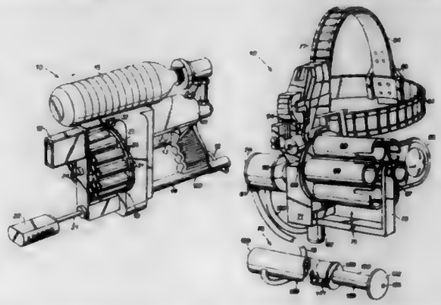
a pair of spaced arrow support fingers extending from the base to support an arrow shaft thereon and therebetween, said fingers each having an arrow contact area and being spaced apart at their respective arrow contact areas less than the diameter of the arrow, said fingers being configured to resiliently move vertically and horizontally to an extent to follow up and down and side-to-side movement of an arrow supported by the rest during shooting of the arrow and being formed of resilient, but normally shape-retaining wire secured to the rest base, the wire forming each finger being wound in spring configuration adjacent the rest base, with the fingers extending therefrom to provide resilience to the fingers, and the fingers being joined together so that they move together.

5,592,931

COMPRESSED AIR GUN WITH MAGAZINE INDEXER

Lonnie G. Johnson, Smyrna, Ga., and John Applewhite, Atlanta, both of Ga., assignors to Johnson Research & Development Co, Inc., Smyrna, Ga.

Continuation-in-part of Ser. No. 441,229, May 15, 1995. This application Jun. 26, 1995, Ser. No. 494,407
Int. Cl.[6] F41B *11/00*
U.S. Cl. 124—69 **16 Claims**



1. A compressed air toy gun for firing projectiles comprising:

launch tube means for holding, aiming and launching projectiles;

head harness means for supporting said launch tube means adjacent the head of a person;

hand pump means for manually compressing air; and

flexible conduit means for conveying compressed air from said hand pump means to said launch tube means as said hand pump means is manipulated by the person and oriented substantially independently of and without effecting the aim of the launch tube means.

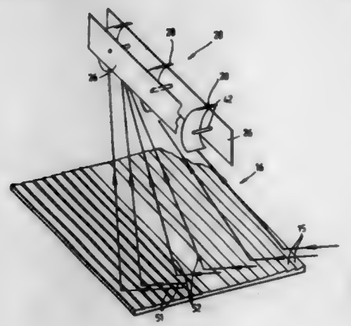
7. A compressed air toy gun comprising, a magazine in which a plurality of projectiles may be loaded; pump means for compressing air; pneumatic indexing means for sequentially positioning projectiles in said magazine for firing; triggering means for sequentially triggering the release of compressed air to said magazine for firing the projectiles; and means for conveying compressed air from said pump means to said pneumatic indexing means and to said magazine in both sequentially positioning and firing the projectiles, said pneumatic indexing means includes a manifold in fluid communication with said pump means, a piston positioned within said manifold for reciprocal movement between a first position and a second position, biasing means for biasing said piston toward said first position, and wherein said conduit means includes a conduit for conveying pressurized air from said pump means to said manifold for use in pneumatically biasing said piston toward said second position, and coupling means for coupling said piston to said magazine.

5,592,932

RADIANT ENERGY COLLECTING APPARATUS

Allan J. Yeomans, 60 Sunrise Boulevard, Surfers Paradise, Gold Coast City, QLD 4217, Australia

Filed Sep. 8, 1994, Ser. No. 302,276
Int. Cl.[6] F24J *2/02*
U.S. Cl. 126—686 **24 Claims**



1. A radiant energy collecting apparatus comprising:

a primary substantially parabolic concentrating assembly having a principal axis and a substantially linear focus;

a secondary concentrating assembly arranged adjacent said linear focus to receive energy from said primary concentrating assembly, said secondary concentrating assembly including:

a pair of substantially parallel spaced apart planar reflectors fixed relative to said primary concentrating assembly so as to face each other on opposite sides of said principal axis, said reflectors having substantially linear edges proximate to the primary concentrating assembly in substantial alignment with said linear focus; and

substantially parabolic secondary concentrators arranged between said planar reflectors, said secondary concentrators having focus lines and being mounted for rotational movement about their said focus lines relative to said planar reflectors.

5,592,933

HYGROSCOPIC CARTRIDGE PARTICULARLY FOR FILTERS FOR MEDICAL USE

Giuseppe Zucchi, San Possidonio, Italy, assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

PCT No. PCT/EP93/01899, § 371 Date Mar. 23, 1995, § 102(e) Date Mar. 23, 1995, PCT Pub. No. WO94/02192, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 19, 1993, Ser. No. 374,557
Claims priority, application Italy, Jul. 22, 1992, MI92A1777
Int. Cl.[6] A61M *16/00*; A62B *9/00*
U.S. Cl. 128—201.13 **3 Claims**



1. Hygroscopic cartridge particularly for filters for medical use, comprising a band-like element which is wound to form a flat bobbin, characterized in that said band-like element comprises a first layer, having corrugations which extend in a transverse direction with respect to the longitudinal extension of said band-like element and made of a heat-conducting plastically deformable material, and a second layer impregnated with hygroscopic salts, said corrugations defining channels for an aeriform flow in a transverse direction with respect to the plane of lay of the flat bobbin, wherein said corrugations are constituted by mutually parallel undulations, said undulations being inclined with respect to the longitudinal axis of said bobbin.

5,592,934

ANAESTHETIC VAPORIZER

David J. Thwaites, Addingham, England, assignor to The BOC Group plc, Windlesham, England

Continuation of Ser. No. 737,858, Jul. 30, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 264,112
Claims priority, application United Kingdom, Aug. 2, 1990, 9016970; Apr. 26, 1991, 9109022
Int. Cl.[6] A61M *15/00*
U.S. Cl. 128—203.12 **10 Claims**

1. An anaesthetic vaporizer which comprises:

(a) an inlet for carder gas;

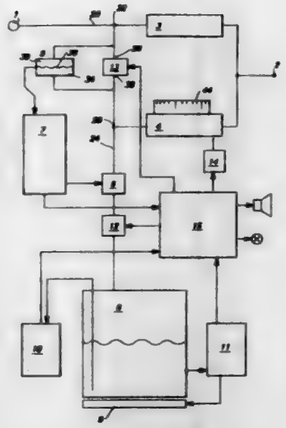
(b) an outlet for the carrier gas and an anaesthetic agent for delivery to a patient;

(c) a passage which extends between said inlet and said outlet;

(d) a vaporizing chamber for an anaesthetic agent;

(e) a passageway which extends from the vaporizing chamber to said outlet;

(f) a pressure transducer which generates an electrical signal corresponding to the differences in pressure between the carder gas in said passage and the agent in said passageway;



(g) means for generating an electrical control signal corresponding to the pressure difference measured by said pressure transducer; and

(h) an electrically operated control valve located in said passageway for controlling the rate of flow of the agent through said passageway, said valve being controlled by the electrical signal from said control signal generating means; and

(i) further including means for automatically ensuring the isolation of the vaporizing chamber and resetting of the manually adjustable restrictor during an alarm condition.

5,592,935

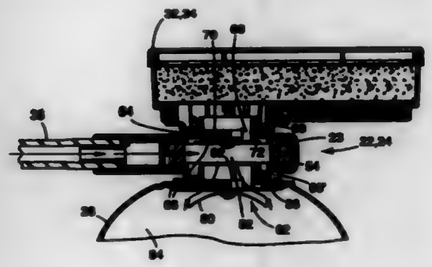
POSITIVE/NEGATIVE AIR PRESSURE ADAPTOR FOR USE WITH RESPIRATORS

Gerald V. Elstran, Woonsocket, S. Dak.; Robert J. Mattila, Mahtomedi, and Jerome D. Phillips, Wyoming, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 3, 1995, Ser. No. 434,377

Int. Cl.[6] A62B *7/10*

U.S. Cl. 128—205.29 **26 Claims**



1. A positive/negative air pressure adaptor for fluidically coupling a positive pressure air source to a respirator having a filter cartridge, the positive/negative air pressure adaptor comprising an adaptor housing having a port region for fluidically coupling a filter cartridge to a respirator, an inlet port for connecting a positive pressure air source to the port region, and a first check valve that restricts the flow of air from the port region to a filter cartridge in response to positive air pressure from a positive pressure air source.

5,592,936

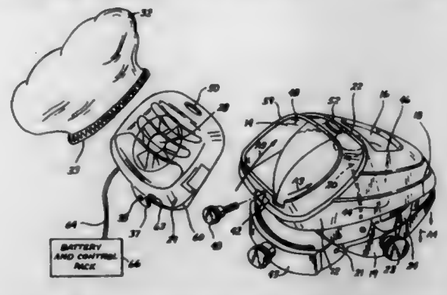
SURGICAL HELMET

Ron Thomas, Jr., Alta Loma; Roger G. Ignon, Palos Verdes Estates, and William Cohen, Long Beach, all of Calif., assignors to Stackhouse, Inc., Palm Springs, Calif.

Filed Aug. 28, 1995, Ser. No. 519,721

Int. Cl.[6] A62B *7/10*

U.S. Cl. 128—206.12 **20 Claims**



1. An air filtration system to be worn on a user's head, comprising:

(a) a unitary helmet member for generally covering an upper portion of the user's head, the unitary helmet member including

(1) a middle aperture for positioning over a top middle portion of the user's head, the middle aperture connecting an outside surface of the unitary helmet member to an inside surface of the unitary helmet member,

(2) a rear aperture for positioning over a top rear portion of the user's head, the rear aperture connecting the outside surface of the unitary helmet member to an interior surface of the unitary helmet member, and

(3) a front aperture for positioning over a front portion of the user's head, the front aperture connecting the interior surface of the unitary helmet member to both the inside surface and the outside surface of the unitary helmet member;

(b) an air filter extending across the rear aperture;

(c) a forehead strap including

(1) a left end connected at a left connecting point for positioning near a left side of the user's head, and

(2) a right end connected at a right connecting point for positioning near a right side of the user's head, the left end and the right end together spanning from the left connecting point to the right connecting point to extend across a forehead of the user;.

(d) air routing means, for routing air between the rear aperture and the front aperture, the air routing means routing air around the middle aperture and being defined by interior surfaces connecting the front aperture and the rear aperture; and

(e) air circulating means, positioned in the rear aperture of the unitary helmet member, for circulating air between an outside of the air filtering system and the air routing means, the air circulating means circulating air through the air filter in the rear aperture, through the air routing means, through the front aperture, and over the user's face, to thereby filter air and circulate air over the user's face.

5,592,937

RESPIRATOR MASK WITH STIFFENING ELEMENTS

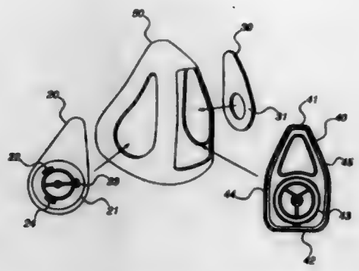
Paul X. Freund, Mars, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 7, 1995, Ser. No. 485,172

Int. Cl.[6] A62B *18/08;9/04*

U.S. Cl. 128—206.16 **20 Claims**

1. In a respiratory mask having a facepiece with filter cartridges attached thereto, the improvement wherein the facepiece comprises



a flexible material and a plurality of stiffening elements which are stiffer than the flexible material and are connected together by the flexible material, each of the stiffening elements having at least one substantially straight edge with adjacent straight edges of adjacent stiffening elements being substantially parallel to provide a hinge-like connection by the flexible material.

5,592,938

MASK APPARATUS

Eugene N. Scarberry, Trafford, and Patrick M. Handke, Monroeville, both of Pa., assignors to Respironics Inc., Murrysville, Pa.

Continuation of Ser. No. 69,739, Jun. 1, 1993, Pat. No. 5,343,878, which is a division of Ser. No. 895,225, Jun. 8, 1992, Pat. No. 5,222,478. This application Aug. 9, 1994, Ser. No. 288,005

Int. Cl.[6] A62B *18/08*

U.S. Cl. 128—206.24 **10 Claims**



1. A mask apparatus for enclosing a selected area of a patient's face adjacent at least the patient's nose or mouth comprising:

a body member formed to enclose a space and to confront a selected area of a patient's face to enclose said space adjacent thereto;

a flexible means carried by said body member and extending thereon to lie adjacent a peripheral extent of the selected area of a patient's face;

peripheral seal means associated with said flexible means and operable to engage the patient's face in sealing engagement therewith to at least partially enclose said space;

said flexible means being deformable upon engagement of said seal means with the patient's face in a manner to conform said seal means closely to the portions of the patient's face in contact therewith;

said flexible means including a flexible wall forming chamber means and a plurality of interengagable elements confined within said chamber means; vacuum drawing means which is cooperable with said chamber means and is selectively operable to draw a partial vacuum therein such that relatively greater pressure acting on external surfaces of said flexible wall moves said interengagable elements into mechanical interengagement to thereby maintain said seal means in closely conforming relation with the patient's face; and

adhesive means which is effective to maintain said mutual interengagement of said interengagable elements upon release of the partial vacuum within said chamber means.

5,592,939

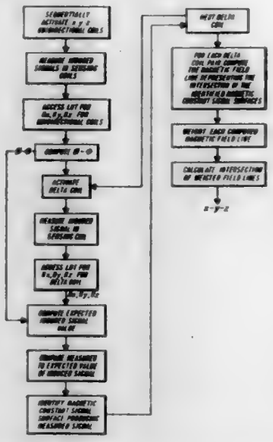
METHOD AND SYSTEM FOR NAVIGATING A CATHETER PROBE

Michael A. Martinelli, 58 Wedgemere Ave., Winchester, Mass. 01890

Filed Jun. 14, 1995, Ser. No. 490,342

Int. Cl.[6] A61B *5/05*

U.S. Cl. 128—653.1 **22 Claims**



1. A method of determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising the steps of:

inducing within said sensing coil a set of orientation signal values each representative of an orientation of said sensing coil and independent of a position of said sensing coil;

determining the orientation of said sensing coil using said induced orientation signal values;

inducing within said sensing coil a set of positional signal values each representative of the position of said sensing coil; and

determining the position of said sensing coil using said positional signal values and said determined orientation.

5,592,940

PROCESS FOR MAKING DOSES FORMULATION OF CONTRAST MEDIA FROM CONCENTRATE

Michael Kampfe, and Bernhard Better, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Germany

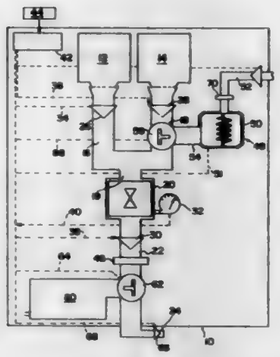
Continuation of Ser. No. 779,492, Oct. 24, 1991, Pat. No. 5,450,847, which is a continuation-in-part of Ser. No. 688,922, Apr. 22, 1991, abandoned. This application Sep. 19, 1995, Ser. No. 529,972

Claims priority, application Germany, Jun. 29, 1991, 41 21 568.0

Int. Cl.[6] A61B *5/05;8/00*

U.S. Cl. 128—654 **38 Claims**

1. A process for the production of a diagnostic contrast medium comprising at least one contrast agent and an aqueous solution, said process comprising:



delivering, under sterile conditions, a predetermined amount of at least a first contrast medium concentrate containing 340–450 mg of I/ml of X-ray contrast agent, 0.5–4 mol of NMR contrast agent/liter, or an ultrasound contrast agent, from at least a first container by a first pipe to a mixing chamber;

delivering a predetermined amount of diluent from a second container by a second pipe to the mixing chamber, wherein said predetermined amounts are mixed to form a physiologically compatible preparation; and

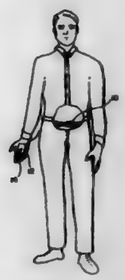
delivering the resultant mixture to a discharge station.

5,592,941

APPARATUS AND METHOD FOR NON-INVASIVELY DETECTING URINARY TRACT INFECTION USING ULTRASOUND

Gerald J. McMorrow, Kirkland, Wash., assignor to Diagnostic Ultrasound Corporation, Redmond, Wash.

Filed Oct. 20, 1995, Ser. No. 546,068
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—660.07 **14 Claims**



1. An apparatus for detecting urinary tract infection, comprising:

ultrasound means for transmitting an ultrasound signal into a portion of the bladder;

means for receiving a return signal from the bladder;

means for gating the received signal so that only backscatter values from urine in a sample volume in the bladder remain; and

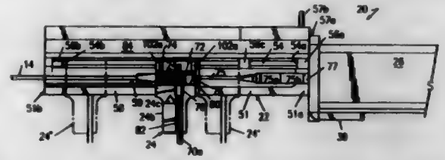
means for comparing said sample volume backscatter values against a pre-established threshold value, wherein a backscatter value above the threshold is indicative of the presence of elements in the urine which in turn indicate a urinary tract infection.

5,592,942

AUTOMATED LONGITUDINAL POSITION TRANSLATOR FOR ULTRASONIC IMAGING PROBES, AND METHODS OF USING SAME

William E. Webler, Costa Mesa, and Mark S. Buhr, Newport Beach, both of Calif., assignors to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 285,969, Aug. 4, 1994, Pat. No. 5,485,846, which is a continuation of Ser. No. 906,311, Jun. 30, 1992, Pat. No. 5,361,768. This application Dec. 12, 1995, Ser. No. 573,507
Int. Cl.[6] A61B *8/00;8/12*
U.S. Cl. 128—660.09 **22 Claims**



1. An automated longitudinal position translator for ultrasonic imaging probes having a housing and a distally located ultrasound transducer subassembly, said position translator comprising:

a probe drive module which rotates the ultrasound transducer subassembly of the imaging probe;

a motor-driven linear translation module to affect motor-driven longitudinal translation of said probe drive module to longitudinally shift said ultrasound transducer subassembly between spaced-apart positions relative to said probe housing; and

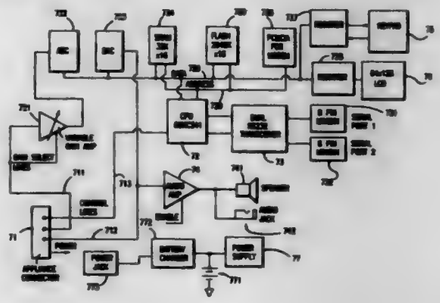
means for coupling said probe drive module to said translation module to allow for switching between an automatically-operable condition wherein said probe drive module is coupled to said motor-driven translation module to affect said motor-driven longitudinal translation thereof relative to the probe housing, and a manually-operable condition wherein said probe drive module is capable of being longitudinally shifted manually relative to the probe housing.

5,592,943

APPARATUS AND METHOD FOR ACOUSTIC ANALYSIS OF BONE USING OPTIMIZED FUNCTIONS OF SPECTRAL AND TEMPORAL SIGNAL COMPONENTS

Joe P. Bubler, Portland; David Butt, Beaverton; Jeffrey H. Goll, Lake Oswego; Harold R. McCarter, Portland; Stuart H. Rowan, Banks; Neldon C. Wagner, Aloha, and Hartwell H. Whitney, Portland, all of Oreg., assignors to Osteo Sciences Corporation, Beaverton, Oreg.

Continuation of Ser. No. 43,870, Apr. 7, 1993, Pat. No. 5,396,891. This application Mar. 13, 1995, Ser. No. 404,813
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—661.03 **17 Claims**



1. An apparatus for externally measuring in a vertebrate subject the extent of osteoporosis of a bone disposed within a body part, the apparatus comprising:

(a) first and second transducers;

(b) a mounting arrangement for mounting the transducers in spaced relationship with respect to the bone;

(c) a signal generator, in communication with the first transducer, for causing the first transducer to produce acoustic pulses, having energy distributed over a frequency range, that are propagated into the subject and received by the second transducer along a first path that includes the bone;

(d) a signal processor, in communication with the second transducer, for providing a measure that is indicative of at least one of transient spectral and transient temporal characteristics of a portion, up to the whole amount thereof, of a signal received by the second transducer, the measure being selected for its ability to minimize differences among successive measurements taken of the same individual and to maximize differences in measurements taken of different individuals, so that the measurement relates to the extent of osteoporosis of the bone.

5,592,944

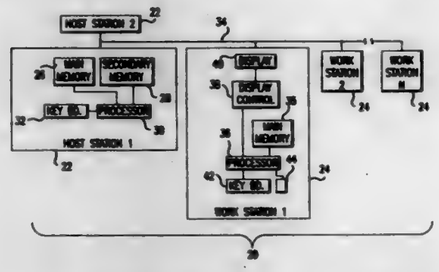
Patent Not Issued For This Number

5,592,945

REAL-TIME EVENT CHARTING IN AN ELECTRONIC FLOWSHEET

Steven P. Fiedler, Leominster, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1996, Ser. No. 608,347
Int. Cl.[6] A61B *5/0402*
U.S. Cl. 128—710 **14 Claims**



1. A method for facilitating entry of patient information in a medical information system, the medical information system including a computer with an input unit, a display and a database containing a data record, the method comprising the steps of:

displaying at least a portion of said data record in the form of an electronic data sheet having plural data elements each representative of patient care information associated with a time and date;

receiving a first input from the input unit, said first input including event information representative of a selected event;

receiving a second input from the input unit, said second input including a data value representative of a data value to be associated with the selected event;

in response to one of said first and second inputs, determining current time information to be associated with the data value;

in response to said second input, causing said current time information, data value, and selected event to be associated to provide an associated data value; and

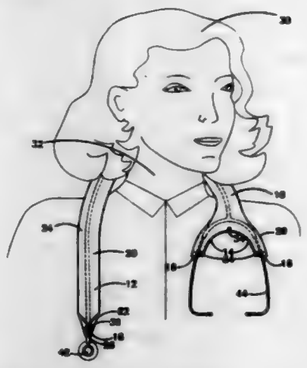
entering said associated data value as said data element in said data record.

5,592,946

STETHOSCOPE COVER

Colleen D. Eddy, 303 Linden St., Manchester, Mass. 03104

Filed Mar. 31, 1995, Ser. No. 414,309
Int. Cl.[6] A61B *7/02*
U.S. Cl. 128—715 **8 Claims**



1. A cover for a stethoscope comprising:

a Y-shaped top panel member, said top panel member having upper inside edges, outside edges, and a bottom edge, and being substantially flat and flexible;

a Y-shaped bottom panel member, said bottom panel member having upper inside edges, outside edges, and a bottom edge, and being substantially flat and flexible;

said top panel member and said bottom panel member being joined at said outer edges; and

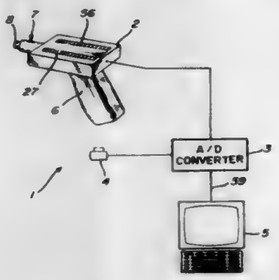
upper closure members on said upper inside edges, said upper closure members releasably attaching said top panel member and said bottom panel member at said upper inside edges.

5,592,947

ALGOMETER WITH PRESSURE INTENSIFICATION RATE ADJUSTING AND CONTROL CAPABILITIES

Gilles Lavigne, and Léo Teubekuna, both of Québec, assignors to Universite de Montreal, Montreal, Canada

Filed May 9, 1995, Ser. No. 437,700
Int. Cl.[6] A61B *3/00*
U.S. Cl. 128—744 **13 Claims**



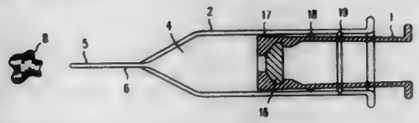
1. A pressure algometer comprising:

a pressure applying member for applying to a point of a patient's body a pressure increasing in intensity;

a pressure sensor for sensing the intensity of the pressure applied to said point of the patient's body and for producing a pressure intensity representative signal having an amplitude which increases with the intensity of the pressure applied;

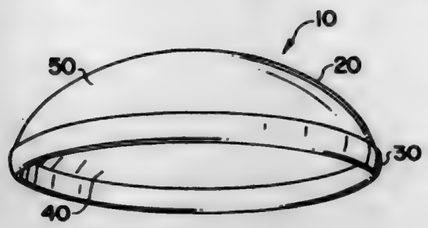
first and second elongate and laterally adjacent display units for producing first and second visual signals to be displaced along the first and second elongate display units, respectively;
a first display unit driving circuit for displacing the first visual signal in a given direction along the first display unit at a predetermined speed;
a second display unit driving circuit responsive to the pressure intensity representative signal increasing in amplitude for displacing the second visual signal in said given direction along the second display unit;
wherein, in operation, the pressure applied to said point of the patient's body is intensified at a rate adjusted to follow, with the second visual signal, the first visual signal displacing in said given direction along the first display unit whereby the rate of intensification of the pressure is controlled by the speed of displacement of the first visual signal along the first elongate display unit.

5,592,948
SELF CONTAINED VIAL FOR DRAWING, STORING, SEALING AND IDENTIFYING A FLUID SAMPLE
Ronald A. Gatten, 2794 Calle Allegre, Pleasanton, Calif. 94566
Continuation of Ser. No. 188,290, Jan. 28, 1994, abandoned.
This application Jul. 19, 1995, Ser. No. 504,344
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—763 **6 Claims**



1. A method of storing and extracting a fluid in a chamber having two ends and having a tubular portion at a first end defining a port at one end of the tubular portion, the method comprising:
drawing the fluid into said chamber by extending a piston disposed in said chamber;
closing said tubular portion;
providing a septum in said chamber;
penetrating the septum with a hollow needle from a second end of said chamber opposite the first end of said chamber; and
extracting the fluid from said chamber through said needle.

5,592,949
DEVICE FOR ACIDIC BUFFERING AND METHOD FOR INACTIVATION OF PATHOGENS
Thomas R. Moench, 703 Stags Head Rd., Baltimore, Md. 21286-1446, and Richard A. Cone, 225 W. Lafayette Ave., Baltimore, Md. 21217
Filed Jun. 29, 1994, Ser. No. 266,777
Int. Cl.[6] A61F *6/06*
U.S. Cl. 128—837 **14 Claims**



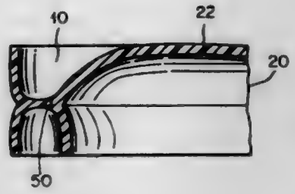
1. A device for controlling pH by acidic buffering, comprising:
a) a flexible circular rim and
b) a flexible, impervious dome having a concave surface, a convex surface and a margin,
wherein said dome is continuously attached at said margin to said circular rim,
wherein said device contains between 0.1 and 10 grams of an acidic absorbent buffer and wherein said acidic absorbent buffer has a buffering capacity to maintain a pH less than or equal to 5 after an addition of between 0.014 g to 1.4 g of sodium hydroxide in said device, and
wherein said acidic absorbent buffer is comprised of at least one polymer comprised of monomers selected from the group consisting of monounsaturated monocarboxylated monomers and monounsaturated dicarboxylated monomers.

5,592,950
LATEX PROPHYLACTICS
Alberto Kopelowicz, Calle 103, No. 1161/65, 1650 San Martin, Buenos Aires, Argentina
Filed Feb. 22, 1996, Ser. No. 604,225
Claims priority, application Argentina, Feb. 24, 1995, 331145
Int. Cl.[6] A61F *6/02*
U.S. Cl. 128—842 **2 Claims**



1. An improved latex prophylactic of a tubular body having an open distal end and a closed proximal end, comprising said prophylactic body having incorporated to the structure therein a fabric having a cross-section elastomeric warp and an inelastic longitudinal weft extending longitudinally in relation with an axis of said prophylactic.

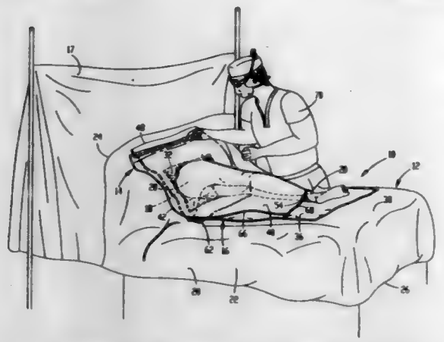
5,592,951
ORAL APPLIANCE
Vincent Castagnaro, 533 Hawkins Rd., Selden, N.Y. 11784, and Gerald J. Schnal, 191 Connetquot Ave., East Islip, N.Y. 11730-1416
Filed Sep. 12, 1995, Ser. No. 527,277
Int. Cl.[6] A61F *5/56*; A61C *5/14*
U.S. Cl. 128—848 **18 Claims**



1. An oral appliance comprising:
an upper channel, adapted to receive upper teeth or gums, comprising a substantially arcuate upper sidewall and a base;

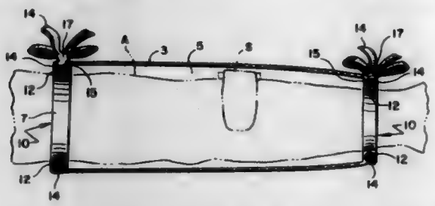
a roof wall connected to said upper channel, said roof wall comprising an upper surface adapted to generally conform to the roof of a user's mouth and a lower surface for engagement with a user's tongue;
means for maintaining a lower jaw in a forward position, said mantaining means extending downwardly from said upper channel; and
at least one air passage extending through said base.

5,592,952
INFECTION CONTROL SURGICAL DRAPE AND METHOD OF MAKING SURGICAL INCISION
William W. Bohn, 6720 Willow Ln., Mission Hills, Kans. 66208
Filed Aug. 18, 1995, Ser. No. 516,797
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—849 **25 Claims**



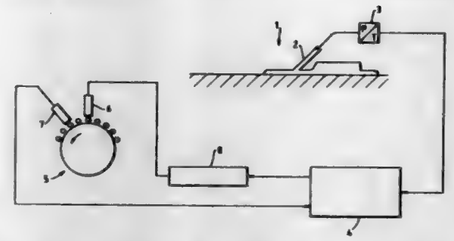
1. A surgical drape for isolating a surgical site comprising, in combination:
a first sheet defining therein an opening adapted for receiving therethrough a body part;
a second sheet formed of transparent synthetic resin film and presenting a first side, a second side, a proximate margin, a remote margin, and a pair of opposite edges;
means connecting said proximate margin of said second sheet to said first sheet adjacent said opening in an orientation enabling said second sheet to be extended in covering relationship to said opening; and
an adhesive coating on said first side of said second sheet for securing said second sheet to the body part during surgery.

5,592,953
TUBULAR SLEEVE WITH ELASTICIZED SEALING MEANS
Wenda K. Deiss, 1517 S. 7th St., La Crosse, Wis. 54601
Filed Apr. 2, 1996, Ser. No. 627,682
Int. Cl.[6] A61F *5/37*
U.S. Cl. 128—882 **20 Claims**



1. A protective sleeve useful for placement over a bodily appendage to protect a medicinal site from external contamination, said sleeve comprising an elongated water-resistant sleeve member for protectively covering the site, a plurality of laterally disposed elastic sections for sealing the sleeve member against the appendage and protecting the medicinal site from the external contamination, with each of said elastic sections including a resilient layer circumscribing an internally disposed chamber opening for slipping the sleeve member over the appendage and an elastic drawing means circumferentially disposed about the resilient layer so that the elastic drawing means, when elastically drawn to a contractive position, applies a contractive force against the layer so as to conformingly seal the sleeve member against the appendage.

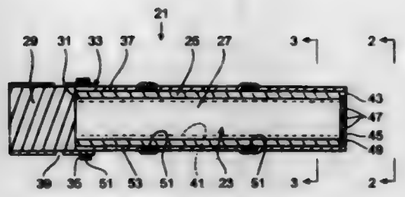
5,592,954
MEASURING CIGARETTE PRESSURE DROP
Paul D. Case, and William J. Stone, both of Southampton, United Kingdom, assignors to British-American Tobacco Company Limited, Middlesex, England
Continuation of Ser. No. 967,516, Oct. 28, 1992, abandoned.
This application Mar. 3, 1995, Ser. No. 400,276
Claims priority, application United Kingdom, Nov. 16, 1991, 9124411
Int. Cl.[6] A24C *5/14*
U.S. Cl. 131—84.1 **23 Claims**



1. A method of determining the unbound cigarette pressure drop of finished ventilated cigarettes before their completion which comprises measuring the pressure drop across a rod of tobacco fibers as the rod is formed on a cigarette making machine, by passing a gas stream across the rod of tobacco fibers and detecting the pressure drop as an electrical signal using pressure sensitive means, the pressure drop being measured as the rod is compacted in a format finger of said cigarette making machine at a point along the rod in the format finger where the preasure drop measured across the rod correlates with a bound tobacco rod pressure drop measurement along the rod when the rod of tobacco fibers is in a finished wrapped condition; the electrical signal being indicative of a particular preasure drop measurement and calculating using calculation means an unbound cigarette pressure drop for a finished ventilated filter-tipped cigarette made from said rod, the calculation means utilizing the bound tobacco rod preasure drop obtained by correlation with the measured pressure drop across the rod in an algorithm held by the calculation means, which algorithm is determined by the specific filter element design of the completed cigarette.

5,592,955
CIGARETTE WITH INSULATING SHELL AND METHOD FOR MAKING SAME
Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Feb. 7, 1994, Ser. No. 192,737
Int. Cl.[6] A24F *1/28*; A24D *1/02*
U.S. Cl. 131—175 **18 Claims**

1. A device, for use in smoking a rod of smokable material, comprising:
an air permeable shell adapted to conceal and retain the rod of smokable material before, during, and after smoking; the shell



being reusable to conceal and retain a subsequent rod of smokable material after a preceding rod of smokable material has been smoked, the shell having a permeability of greater than 5 Coresta units;

an air permeable cap attachable to at least one end of the shell;

an air permeable wrapper around the shell; and

wherein the wrapper material is paper.

5,592,956

COMPOSITION AND METHOD FOR INHIBITING THE DESIRE FOR TOBACCO

Wei Ju, New York; Morris J. Westfried, Brooklyn, and Frank J. Robilotto, New York, all of N.Y., assignors to Herbs for Health, Inc., New York, N.Y.

Filed Jul. 3, 1995, Ser. No. 497,808

Int. Cl.[6] A24F 47/00

U.S. Cl. 131—270 **7 Claims**

1. A method of decreasing desire for chewing or smoking tobacco comprising topical application of a composition containing, by weight

10% to 45% oil of cloves

2% to 5% oil of wintergreen

22% to 35% monosodiumglutamate

5% to 30% extract of evodia fruit

3% to 25% extract of Sichuan Lovage Rhizome

said composition being applied to at least one acupuncture point selected from the group consisting of Feishu Point, Jingqu Point, Taiyuan Point, Shenmen Point, Kidney Point, and Lung Point.

5,592,957

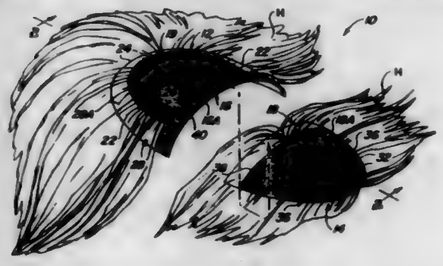
HAIRPIECE WITH DETACHABLE PORTIONS HAVING CONTINUOUS FASTENING SEGMENTS

Carmine M. Gaserro, 9343 Sunpoint Dr., and Richard Indiveri, 9748 El Clair Ranch Rd., both of Boynton Beach, Fla. 33437

Filed Aug. 28, 1995, Ser. No. 520,137

Int. Cl.[6] A41G 3/00; 5/00

U.S. Cl. 132—53 **18 Claims**



1. A hairpiece, comprising:

(a) an outer rear base portion for connecting multiple strands of hair thereto, said outer rear base portion having a top surface for the multiple strands of hair to extend thereover and a bottom surface for applying to a top rear region of a wearer's head, said outer rear base portion also having a rear end, a pair of opposite sides converging rearwardly toward one another and merging with said rear end, and a front end spaced forwardly of said rear end and extending between said opposite sides;

(b) an inner U-shaped band disposed between said outer rear base portion and the wearer's head and having opposite upper and lower surfaces, said inner U-shaped band being fixedly attached at said upper surface thereof to said bottom surface of said rear base portion along said rear end and said opposite sides thereof;

(c) an adhesive substance applied on said lower surface of said inner U-shaped band for releasably attaching said band to the wearer's head;

(d) a front base portion for connecting multiple strands of hair thereto, said front base portion having a top surface for the multiple strands of hair to extend thereover, a pair of opposite sides, and a rear end extending therebetween and coextensive with said front end of said rear base portion; and

(e) means for releasably connecting said rear end of said front base portion to said front end of said rear base portion continuously between said pairs of opposite sides of said front and rear base portions with one of said rear end of said front base portion and said front end of said rear base portion overlapping the other thereof so as to relieve a wearer of the necessity to achieve precise alignment and registry of said front base portion with said rear base portion in order to connect said front base portion with said rear base portion.

5,592,958

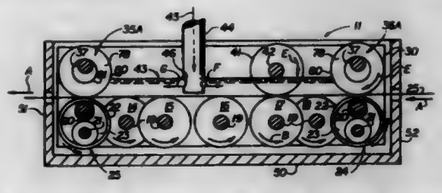
FLOOD CONVEYER

Kenneth D. Gardner, Apache Junction, Ariz., assignor to Coates, Asi, Inc., Phoenix, Ariz.

Filed Feb. 1, 1995, Ser. No. 382,077

Int. Cl.[6] B08B 3/04

U.S. Cl. 134—122 R **5 Claims**



1. Apparatus for processing a circuit board substrate by passing the substrate through a reservoir, said apparatus including

(a) upper input roller means;

(b) lower input roller means positioned below said upper input roller means;

(c) upper output roller means spaced apart from said upper input roller means and said lower input roller means;

(d) lower output roller means positioned below said upper output roller means and spaced apart from said upper input roller means and said lower input roller means;

(e) a liquid reservoir intermediate and extending above said lower input roller means and said lower output roller means, said substrate passing intermediate said upper and lower input roller means to enter said reservoir and passing intermediate said upper and lower output roller means to exit said reservoir;

(f) intermediate roller means adjacent said lower input roller means and including a plurality of spaced apart disks for contacting and supporting said substrate passing through said liquid reservoir from said lower input roller means to said lower output roller means;

said lower input roller means including

(g) a plurality of spaced apart cylindrical members for contacting said substrate passing intermediate said upper and lower input roller means, each of said cylindrical members having an outer cylindrical surface having an equivalent diameter, a portion of said outer surface of each of said cylindrical members being coincident with a common contact line perpendicular to the direction of travel of the substrate between said upper input roller means and said lower input roller means, said cylindrical members contacting said substrate along said contact line; and,

(h) a plurality of cylindrical rollers (31) each spaced apart from said contact line and mounted intermediate a pair of said cylindrical members such that at least a portion of one of said disks extends intermediate said pair of cylindrical members to facilitate the travel of said substrate from said cylindrical members onto said disk, each of said cylindrical rollers having an outer cylindrical surface having an equivalent diameter less than said diameter of said cylindrical members.

5,592,959

PIPET WASHING APPARATUS

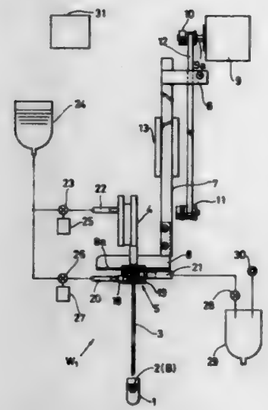
Takaaki Nagai, Kobe, Japan, assignor to TOA Medical Electronics Co., Ltd., Hyogo-ken, Japan

Filed Dec. 20, 1994, Ser. No. 359,994

Claims priority, application Japan, Dec. 20, 1993, 5-320152; Nov. 24, 1994, 6-289790

Int. Cl.[6] B08B 9/00

U.S. Cl. 134—169 R **19 Claims**



1. A pipet washing apparatus comprising;

a pipet-outer-wall washing member including a through-hole, in which a pipet with a bottom end serving as a sampling inlet is loosely insertable, a supply path for supplying washing solution to said through-hole, and a discharge path for discharging waste liquid from said through-hole;

pipet-interior washing device, connectable to said pipet, for supplying washing solution to the interior of said pipet;

a washing solution storage chamber, connected to said supply path of said pipet-outer-wall washing member and said pipet-interior washing device;

suction device connected to said discharge path of said pipet-outer-wall washing member, for sucking up waste liquid;

a waste liquid storage chamber, connected to said discharge path of said pipet-outer-wall washing member, for storing the waste liquid sucked-up by said suction device; and

drive device for causing at least one of said washing member and said pipet to move, to thereby vary the relative position of said washing member and said pipet,

said through-hole including a relatively narrow diameter portion of substantially constant diameter defining an entrance opening of relatively small clearance for insertion of said pipet, and a relatively wide diameter portion, formed below said relatively narrow diameter portion, defining an exit opening having clearance for said pipet that is relatively wider than that of said entrance opening, and wherein

said supply path is directly connected to said relatively wide diameter portion and said discharge path is directly connected to said relatively narrow diameter portion such that an inner wall of the interior of the pipet is washed by supplying washing solution from the supply path, and such that waste liquid is discharged from the sampling inlet of the pipet when the sampling inlet of the pipet is positioned above the discharge path and inside the relatively narrow diameter portion of the through-hole of the washing member.

5,592,960

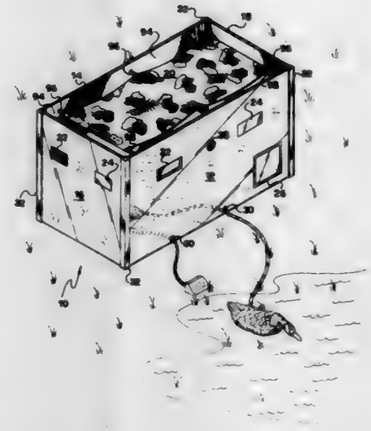
HUNTING BLIND

Christopher R. Williams, 5525 Mesca Pass Ct., Colorado Springs, Colo. 80917

Filed Nov. 1, 1995, Ser. No. 551,312

Int. Cl.[6] E04B 1/348; A01M 31/00

U.S. Cl. 135—87 **16 Claims**



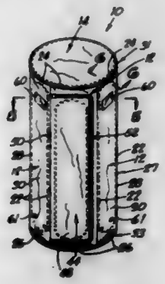
1. A portable hunting blind, comprising:

a front panel, an opposite rear panel, and a first and an opposite second side panel, with each said panel being of rigid, substantially inflexible construction and having a flat mirrored reflective and substantially optically correct outwardly facing surface adapted to reflect accurately the surrounding environment and thereby substantially conceal the appearance of said blind when assembled to define an interior, and further each having a first and an opposite second lateral edge, and;

camouflaged top cover means adapted to cover said interior at least substantially when said hunting blind is assembled and to blend substantially with the surrounding environment when viewed from above, said top cover means including a thin, flexible sheet of material having a camouflage pattern thereon, and a plurality of substantially parallel lateral poles extending across said interior of said blind and providing support for said sheet of material, whereby;

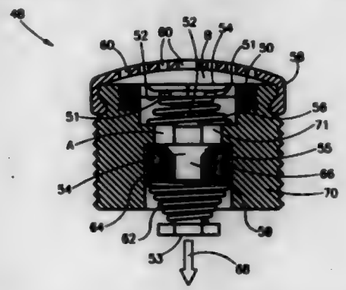
each said panel and said top cover means are transported to a desired hunting site, and said hunting blind is assembled and used to provide concealment for at least one hunter therein by means of said reflectively mirrored surface of each said panel and said camouflaged top cover means.

5,592,961
PORTABLE BOOTH
Anna H. K. Chin, 820 Champion Cir., Walnut, Calif. 91789
Filed Jan. 5, 1996, Ser. No. 583,517
Int. Cl.[6] E04H *15/40*
U.S. Cl. 135—125 18 Claims



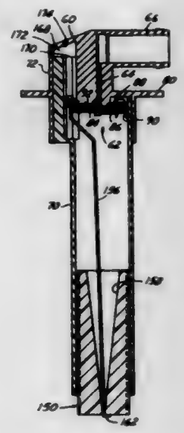
1. A portable booth comprising:
(a) a plurality of elongate, substantially vertical side panels, each side panel having a pair of opposed, substantially parallel side edges, an upper end edge and a lower end edge, the side panels being attached side edge to side edge to form an enclosure having an upper end and a lower end, wherein the upper end edge and the lower end edge of at least one of the side panels can be twisted in opposite rotational directions to form a compact assembly unit comprising at least two substantially parallel assembly moieties;
(b) a first stiffener comprising a continuous band of spring steel, the first stiffener being sized and dimensioned to fit horizontally and snugly within the upper end of the enclosure; and
(c) a second stiffener comprising a continuous band of spring material, the second stiffener being sized and dimensioned to fit horizontally and snugly within the lower end of the enclosure;
wherein the plurality of side panels can be stacked to form a continuous multi-layer assembly having first and second ends and a longitudinal axis, and the first and second ends of the multiple-layer assembly can be twisted in opposite directions around the longitudinal axis to form a compact assembly unit comprising at least two substantially parallel assembly moieties.

5,592,962
COMPRESSED GAS RELEASE SYSTEM
Gideon Hoobermans, Haifa, Israel, assignor to G.O.T. Guide-On Technologies Ltd., Nesher, Israel
Filed Sep. 5, 1995, Ser. No. 523,480
Int. Cl.[6] F16K *17/36*
U.S. Cl. 137—68.22 36 Claims



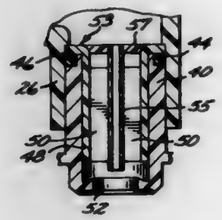
1. A compressed gas release system operating under a combination of a predetermined threshold external pressure and a defined chemical environment, comprising:
(a) a housing defining a space;
(b) a material contained in part of said space, said material being a solid in a first chemical environment and dissolving in a second chemical environment;
(c) a biasing member activated when pressed against said material when said material is solid, said biasing member being relaxed when said material dissolves;
(d) a firing pin including a gas releasing end, said firing pin being fired when said biasing member is relaxed;
(e) a source of compressed gas, said source of compressed gas releasing a gas when said firing pin is fired;
(f) a diaphragm having an internal side and an external side, said diaphragm being mounted onto said housing, said internal side of said diaphragm facing said space of said housing, thereby sealing said first chemical environment in said space;
(g) a diaphragm puncturing device mounted in said space of said housing;
(h) a pressure responding means in said space of said housing, said pressure responding means keeping said internal side of said diaphragm away from said diaphragm puncturing device when the external pressure is below the threshold and, said diaphragm being punctured by said diaphragm puncturing device when the external pressure is above the threshold;
said housing, said space, said biasing member, said material, said pressure responding means, said firing pin, said gas releasing end, said diaphragm and said diaphragm puncturing device being arranged so that when said diaphragm is punctured by said diaphragm puncturing device, said space is exposed to said second chemical environment, said material dissolves, said biasing member is relaxed, said firing pin is fired along with said gas releasing end and, as a result, said gas is released from said source of compressed gas.

5,592,963
CONTROL VALVE AND SYSTEM FOR FUEL VAPOR RECOVERY
George H. Bucci, South Windsor, and Mark R. Johanson, Cheshire, both of Conn., assignors to Walbro Corporation, Cass City, Mich.
Filed Oct. 4, 1995, Ser. No. 539,197
Int. Cl.[6] F16K *3/18*
U.S. Cl. 137—202 24 Claims



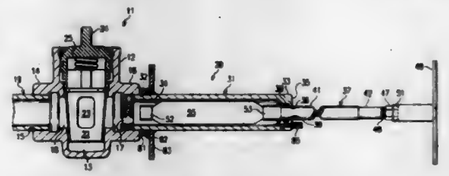
1. A vapor control apparatus for a vehicle fuel tank for containing volatile hydrocarbon liquid fuel which comprises: a housing constructed to be received in a vehicle fuel tank adjacent the top of the tank, an outlet passage carried by the housing for communicating with the exterior of the tank for supplying fuel vapor from the interior of the tank to a vapor receiving canister, a valve seat carried by the housing immediately adjacent the top of the tank, and having a continuous perimeter bounding a valve opening communicating with the outlet passage for supplying to the outlet passage fuel vapor from the interior of the tank, a carrier plate pivotally carried by the housing and movable to a closed position underlying the valve seat and to an open position spaced from the closed position, a flexible closure of an elastomeric material received on the carrier plate and in the closed position bearing on the seat to prevent the flow of fuel vapor from the tank through the valve opening into the outlet conduit and in the open position disengaged from the seat to permit the flow of fuel vapor from the tank through the valve opening and outlet, a stripper plate pivotally carried by the housing and when the closure element is in the closed position having at least portions of the stripper plate closely adjacent the seat and overlying adjacent portions of the closure extending outwardly of the seat, a spring yieldably biasing the carrier plate and closure toward the closed position thereof, and a float operably connected with the stripper plate and responsive to the level of liquid fuel in the tank to move the closure and the carrier plate to the open position thereof when the level of fuel in the tank is below a first predetermined level and to permit the closure and carrier plate to move to the closed position when the fuel in the tank is at a second level above the first level.

5,592,964
AIR GAP ANTI-SIPHON SYSTEM
Paul L. Traylor, 16591 Milliken Ave., Irvine, Calif. 92714
Filed Aug. 11, 1994, Ser. No. 289,137
Int. Cl.[6] E03C *1/12*
U.S. Cl. 137—216 15 Claims



15. In an air gap anti-siphon system comprising an air gap body which includes a waste water flow passage having an air gap opening to atmosphere, the improvement comprising:
stream modifying means located upstream other air gap body for shaping waste water flow into the air gap body into a well defined stream for passage past the air gap opening without splattering of water out of the air gap opening, the stream modifying means including an upper end for receiving waste water, a lower end having a discharge nozzle, and an inner wall mounting a plurality of vertically oriented, radially towardly extending and circumferentially spaced apart fins having outer and inner edges, the outer edges being attached to the inner wall and thereby defining a plurality of vertically oriented laminar flow passageways between the fins which form a first flow path for relatively high rates of waste water flow, the inner edges terminating centrally In spaced apart relation to define a vertically extending central passageway adapted to receive a tube for forming a second flow path for relatively low rates of waste water flow.

5,592,965
VALVE STOP CHANGER
Kenneth E. Rakieski, Gifford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Aug. 11, 1994, Ser. No. 289,016
Int. Cl.[6] F16L *55/12*; F16K *43/00*
U.S. Cl. 137—315 19 Claims



9. A changer tool for removal of a fluid valve from a fluid pressurized container, the fluid valve having a valve body forming a fluid inlet opening and a fluid outlet opening which are at least generally aligned with each other, the fluid pressurized container being connected to the valve body at a first one of the fluid inlet opening and the fluid outlet opening, said changer tool comprising:
a tubular housing having first and second end portions and a first bore extending axially therethrough, said first end portion of said housing being adapted for connection to the valve body at a second one of the fluid inlet opening and the fluid outlet opening;
a tubular member positioned within and coaxial with said first bore for slidable movement of the tubular member along the axis of said first bore, said tubular member having a first end and a second end and a second bore extending axially therethrough;
a shaft positioned within and coaxial with the second bore for axial movement of the shaft with respect to the tubular member, said shaft having a first end and a second end;
a first retention member on said first end of said shaft;
a second retention member on said first end of said tubular member, said second retention member being spaced a distance from said first retention member;
wherein said first reteation member has inner and outer annular chambers formed therein coaxially with said shaft and extending radially outwardly from said shaft, said outer annular chamber being positioned between and extending axially from said inner annular chamber to an end of said first retention member facing toward said second end of said shaft, said inner annular chamber having radial dimensions (measured from the longitudinal axis of said shaft) which are greater than the corresponding radial dimensions of the immediately adjacent portion of the outer annular chamber so as to form a first annular shoulder at the junction of the inner and outer annular chambers of the first retention member;
wherein said second retention member has inner and outer annular chambers formed therein coaxially with said shaft and extending radially outwardly from said shaft, the outer annular chamber of said second retention member being positioned between and extending axially from the inner annular chamber of said second retention member to an end of said second retention member facing toward said first end of said shaft, the inner annular chamber of said second retention member having radial dimensions (measured from the longitudinal axis of said shaft) which are greater than the corresponding radial dimensions of an immediately adjacent portion of the outer annular chamber of the second retention member so as to form a second annular shoulder at the junction of the inner and outer annular chambers of the second retention member; and
an elastomeric tubular plug member positioned about said shaft between said first retention member and said second retention member, said elastomeric plug member having a first end portion in contact with and secured to said first retention member, a second end portion in contact with and secured to said second retention member, and an intermediate portion

connecting said first end portion of said elastomeric plug member to said second end portion of said elastomeric plug member;

wherein said first end portion of said elastomeric plug member extends axially through the outer annular chamber of the first retention member into the inner annular chamber of the first retention member and has a first radially outwardly extending retention element positioned in the inner annular chamber of the first retention member with a maximum actual radial dimension (measured from the longitudinal axis of said shaft) of said first retention element being greater than a minimum actual radial dimension (measured from the longitudinal axis of said shaft) of the first annular shoulder such that the first end portion of said elastomeric plug member is secured to said first retention member; and

wherein said second end portion of said elastomeric plug member extends axially through the outer annular chamber of the second retention member into the inner annular chamber of the second retention member and has a second radially outwardly extending retention element positioned in the inner annular chamber of the second retention member with the maximum actual radial dimension (measured from the longitudinal axis of said shaft) of said second retention element being greater than a minimum actual radial dimension (measured from the longitudinal axis of said shaft) of the second annular shoulder such that the second end portion of said elastomeric plug member is secured to said second retention member;

whereby when said elastomeric plug member is inserted through said fluid inlet opening and said fluid outlet opening into said fluid pressurized container, axial movement of the shaft with respect to the tubular member in a first direction decreases the distance between said first and second retention members so as to axially compress said elastomeric Plug member and thereby cause a radial expansion of said elastomeric plug member to thereby plug said fluid pressurized container, and then axial movement of the shaft with respect to the tubular member in a second direction, opposite said first direction, increases the distance between said first and second retention members so that the thus axially compressed elastomeric plug member can be placed under tension to eliminate the axial compression of said thus axially compressed elastomeric plug member and thus cause an axial expansion and radial contraction of said elastomeric plug member to thereby unplug said fluid pressurized container.

5,592,966
BACK-FLOW PREVENTER
Alan J. Gates, 9735 Chillicothe Rd., Unit No. 41, Kirtland, Ohio 44094, assignor to Alan J. Gates, Laurinburg, N.C.
Filed Mar. 10, 1995, Ser. No. 401,954
Int. Cl.[6] F16K *21/02;15/14*
U.S. Cl. 137—513.5 **8 Claims**

1. A back-flow preventer, comprising:

a generally annular body portion having axially spaced upstream and downstream ends;

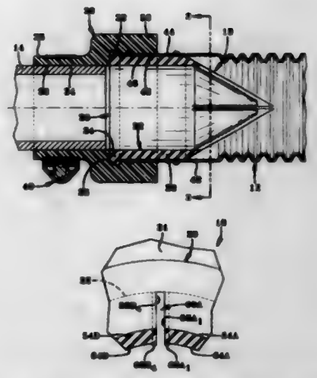
a substantially cylindrical passageway extending through said body portion;

a plurality of circumferentially adjacent cuspids connected to said downstream end of said body portion for selectively opening and closing said passageway;

said cuspids are conically disposed;

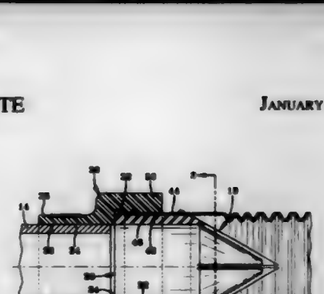
said cuspids have lateral edges that converge to an apex;

each said cuspid being marginated by a rib extending into said passageway; and,



said ribs are disposed to increase the bending strength of said cuspids and enhance boundary layer separation of fluid flowing therethrough.

5,592,967
CONTROL VALVE WITH VARIABLE PRIORITY FUNCTION
Hyung J. Cho, Changwon, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 30, 1995, Ser. No. 497,187
Claims priority, application Rep. of Korea, Sep. 30, 1994, 94-25149
Int. Cl.[6] F16K *15/00*
U.S. Cl. 137—522 **6 Claims**

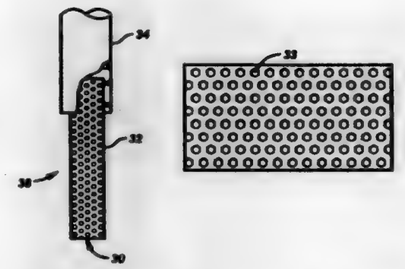


1. In a hydraulic device including at least two actuators both adapted to be operated by a single pump, one of the actuators having a priority over the other actuator, a control valve for the one actuator comprising:

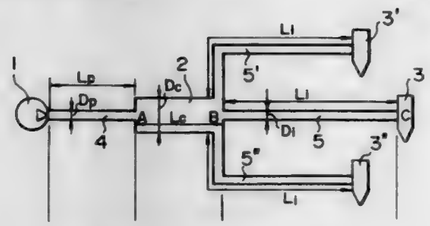
a load hold check valve adapted to assign a variable priority function to the one actuator over the other actuator,

the load hold check valve including a valve body provided with a pair of ports respectively communicating with the actuators and a parallel fluid passage communicating with the pump, the parallel fluid passage also communicating with a selected one of the actuator ports at an opened state thereof, a poppet disposed in the valve body and adapted to fully open the parallel fluid passage when it moves a full stroke thereof and partially open the parallel fluid passage when it moves a limited stroke thereof wherein the poppet is provided at a lower portion thereof with a smaller diameter portion and at a middle portion thereof with a larger diameter portion so that it opens the parallel fluid passage by a diameter difference between the smaller diameter portion and the larger diameter portion when it moves the limited stroke and thereby performs an orifice function, while fully opening the parallel fluid passage when it moves the full stroke and thereby releasing the orifice function, and a pressure setting spring adapted to always urge the poppet toward an initial position for closing the parallel fluid passage,

the load hold check valve further including a first pilot line adapted to supply a first pilot oil to a spring chamber equipped in the load hold check valve to receive the pressure setting spring, the first pilot oil having a predetermined pressure so that the poppet moves the limited stroke when the supply of the first pilot oil is carried out, while moving the full stroke when the supply of the first pilot oil is not carried out.



5,592,968
PRESSURE SUPPLY DEVICE
Tatsushi Nakashima, Nishio; Tsutomu Furuhashi, Kariya; Hiroyuki Kano, Nagoya; Kazuo Yamamoto, Kariya, and Hiroshi Inoue, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Oct. 4, 1994, Ser. No. 317,364
Claims priority, application Japan, Oct. 6, 1993, 5-250545
Int. Cl.[6] F02M *55/02*
U.S. Cl. 137—561 A **6 Claims**



1. A pressure supply apparatus, comprising:

a tubular common rail that accumulates pressure to be distributed;

a pressure supply source to supply pressure to said common rail;

a plurality of pressure branching paths that connect independently one end of said common rail to an external pressure sink, and have a diameter smaller than that of said common rail; and

wherein the following equations (1) and (2) are satisfied:

$$(2n+0.5)Lp \leqq Lc \leqq (2n+1.5)Lp \quad (1)$$

$$(2n+1.5)Lp \leqq Li \leqq (2n+2.5)Lp, \text{ where } (n=0 \text{ or a natural number}) \quad (2)$$

with Lp representing the length of pressure supply side paths, Lc representing the length of pressure propagation path in said common rail, and Li representing the length of said pressure branching paths, each pressure supply side path beginning from at a point where path diameter changes from a pump side and each pressure branching path ending at a second point where path diameter changes,

whereby pressure fluctuations generated at said pressure sink with said pressure supply source acting an exciting source is suppressed.

5,592,969
TURBULENCE ARRESTER
Russell L. Reichert, 372 Stokes Rd., Bellville, Tex. 77418
Filed Mar. 10, 1995, Ser. No. 401,944
Int. Cl.[6] F16K *51/00*
U.S. Cl. 137—592 **11 Claims**

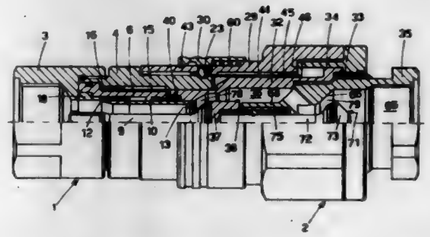
1. A turbulence arrester for a storage tank drop tube comprising:

a body having an open end for connection to the drop tube;

a closed end; and

a wall therebetween, said wall having a plurality of baffleless apertures permitting liquid flow therethrough, said apertures sized and spaced so that turbulence liquid flow through said apertures is confined to a region approximately two drop tube diameters from the wall.

5,592,970
QUICK-COUPLING FITTING FOR PIPES PROVIDED WITH A SAFETY VALVE
Giovanni Stucchi, Treviglio, and Gianmarco Gatti, Pegnano, both of Italy, assignors to Stucchi s.r.l., Italy
Filed Jun. 5, 1995, Ser. No. 463,857
Claims priority, application Italy, Jun. 8, 1994, MI94A01190
Int. Cl.[6] F16L *37/28*
U.S. Cl. 137—614.03 **8 Claims**



1. Quick-coupling fitting for pipes, comprising a female element and a male element that can be coupled together, which elements are formed by fixed parts and axially sliding parts that when at rest are urged in closed positions in which the axially sliding parts close passage ports for the fluid in the female and male elements and when the two elements are coupled together said axially sliding parts are displaced by engagement with corresponding parts of the other element in open positions in which they cause said passage ports to open and communicate with each other, said axially sliding parts of the female element comprising a bush that is axially sliding and elastically urged toward the closed position and said fixed parts of the male elements comprising a fixed internal casing provided with a seal that can be covered by said bush of the female elements on the occasion of said coupling action, wherein said male element comprises valve means arranged in a supply conduit for the passage port of the male element to close said supply conduit in initial stages of said coupling actions and to open said supply conduit in final stages of said coupling action, and said seal is housed in a seat located in the proximity of one end of said internal casing facing said bush, so that said seal is covered by said bush in the initial stages of said coupling action and before said valve means opens said supply conduit.

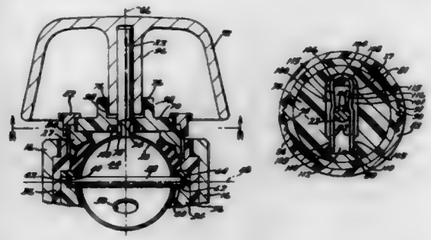
6. Fitting according to claim 1, characterized in that said valve means are constituted by a mushroom valve comprising a head and two stems, said valve being capable of being engaged by an axially sliding piston apt for opening said passage port in said final stages of the coupling action.

5,592,971

SINGLE HANDLE MIXING VALVE WITH FLOW CONTROL DEVICE FOR PREVENTING HAMMER KNOCK

Alfons Knapp, Biberach/Riss, Germany, assignor to Masco Corporation, Taylor, Mich.

Filed Aug. 4, 1995, Ser. No. 500,853
Claims priority, application Italy, Feb. 26, 1993, TO93A0140
Int. Cl.[6] F16K *11/065*
U.S. Cl. 137—625.41 21 Claims



1. In a faucet mixing valve having a housing with a valve chamber, first and second supply inlet ports and a supply outlet port in communication with said valve chamber, a movable mixing valve element operably mounted in said valve chamber and a control stem extending from said valve element through an opening in said housing to control liquid passing through said ports in both flow rate and temperature mix, said control stem movable in one direction to control the flow of liquid through said supply outlet port and in a second direction to control the ratio of flow through said first and second supply inlet ports, said control stem being operably movable upon the exertion of a first predetermined operating force thereupon; the improvement characterized by;

a wall section mounted in proximity to a section of said movable valve element;

one of said section of said movable valve element and said wall section housing a resiliently biased projection that is normally disengaged from the other of said valve section and wall section and being laterally engageable with the other of said valve section and wall section when the valve element is moved to a preset flow position such that the control stem is operably movable upon the exertion of a second predetermined operating force at said preset position that is greater than said first predetermined operating force;

said projection being resiliently biased in a direction substantially perpendicular to the motion of said valve section at the location of the projection engagement with the moving valve section to allow said valve section to move beyond said preset position.

5,592,972

ELECTROPROPORTIONAL SOLENOID VALVE UNIT

Bernd Niethammer, Nürtingen, Germany, assignor to Hydraulik-Ring Antriebs- und Steuerungstechnik GmbH, Nurtingen, Germany

Filed Feb. 10, 1995, Ser. No. 386,372
Claims priority, application Germany, Feb. 10, 1994, 94 02 206.2
Int. Cl.[6] F15B *13/044*
U.S. Cl. 137—625.65 6 Claims

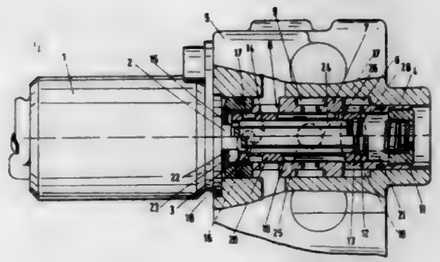
1. An electroproportional solenoid valve unit comprising:

a valve housing with hydraulic connectors for a hydraulic medium;

a piston with a hollow interior, said piston positioned in said valve housing so as to be slidable;

a pressure spring positioned at a first end of said piston;

a solenoid connected to said valve housing and cooperating with a second end of said piston for moving said piston counter to the force of said spring;



a first hydraulic chamber located at said first end of said piston and a second hydraulic chamber located at said second end of said piston;

said piston having a first annular channel adjacent to said first hydraulic chamber and a second annular channel adjacent to said second hydraulic chamber, said first and second annular channels connectable to said hydraulic connectors;

said second hydraulic chamber facing said solenoid being separated from said hollow interior of said piston and from said second annular channel so that the hydraulic medium in said piston cannot enter said second hydraulic chamber; and

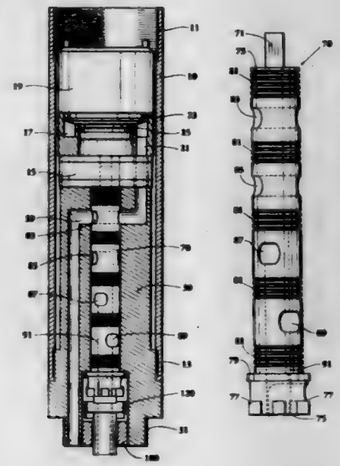
said second annular channel connected to said hollow interior of said piston with at least one opening.

5,592,973

PRESSURE CAPTURE VALVE

Kenneth E. Pope, Box 217, Rte. 3, Wagoner, Okla. 74467

Filed Jun. 19, 1995, Ser. No. 491,400
Int. Cl.[6] F16K *31/00*; F15B *11/08*
U.S. Cl. 137—625.21 21 Claims



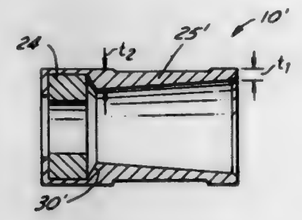
1. A valve comprising means having a first set of passages therethrough for simultaneously connecting an inlet of a first chamber hydraulically to a source of fluid under pressure and an outlet of a second chamber hydraulically to a venting tank and a second set of passages therethrough for simultaneously connecting an inlet of the second chamber hydraulically to the source of fluid under pressure and an outlet of the first chamber hydraulically to the venting tank and means for sequentially repositioning said passage means to alternately cyclically connect and interrupt hydraulic communication through said first and second sets of passages, said first and second sets of passages being so configured in relationship to said inlets and outlets that flow through one said set is completely terminated only after flow in the other said set is initiated.

5,592,974

FLUID FLOW RESTRICTOR

David D. Grohs, Canton; Fred G. Schroeder, Grosse Ile, both of Mich., and Pamela K. Bianco, Richmond, Ind., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1995, Ser. No. 498,382
Int. Cl.[6] F15D *1/02*; F16L *21/00*
U.S. Cl. 138—44 3 Claims



1. A restrictor for limiting the volume of a fluid flowing through an automotive hose into a heat exchanging device in an automotive heating system, the restrictor being secured in the hose by an adjustable clamp, comprising:

a generally cylindrical, hollow body disposed in the hose and having a fluid inlet end and a fluid exit end;

said body including an annular wall of predetermined thickness which tapers from a lesser thickness at the fluid inlet end to a greater thickness at an interior shoulder disposed a predetermined distance from the fluid exit end so as to define a tapering fluid passage of decreasing diameter, wherein the interior shoulder is disposed toward said inlet end at a predetermined angle between 25 and 35 degrees relative to an axis perpendicular to a fluid flow axis through said restrictor, said wall having an exterior surface and an interior surface, the exterior surface of the body including a stepped region of reduced cross-sectional area, said stepped region including a pair of spaced-apart exterior shoulders defining a generally annular space therebetween, said space being configured to engage said hose when said clamp is secured therearound;

a flow limiting washer disposed in said body, wherein the diameter of said washer is greater than the diameter of the annular wall at the interior shoulder of said body, such that said washer abuts said interior shoulder when said fluid flows from said exit end toward said inlet end of said body; and

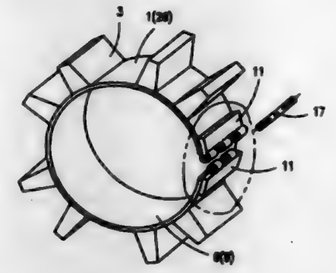
a valve seat defined at the exit end of the body, the valve seat being configured to receive said flow limiting washer therein, whereby the fluid pressure exiting the exit end of the restrictor is less than the fluid pressure entering the inlet end of the restrictor.

5,592,975

GLIDE TUBE RING FOR TUBE-IN-TUBE SYSTEMS

Friedbert Wissmann, Bergstrasse 4, 56130 Bad Ems; Paul Kientz, Wadern, and Bernd Skerra, Mössingen, all of Germany, assignors to SAAR-Gummiwerk GmbH, and Friedbert Wissmann, both of Germany

Filed Dec. 19, 1994, Ser. No. 358,330
Claims priority, application Germany, Dec. 21, 1993, 43 43 762.1
Int. Cl.[6] F16L *9/18*
U.S. Cl. 138—112 12 Claims



1. A glide tube ring for a tube-in-tube system in which the glide tube ring guides a conduit tube within a larger protecting tube, the glide tube ring comprising:

an elastic, flexible, stretchable and recoverable strip-like rubber-elastic glide ring body;

first and second closures, mounted on opposite ends of the strip-like body, engageable with each other to join the ends of the strip-like body to each other with the strip-like body fitting closely around the conduit tube;

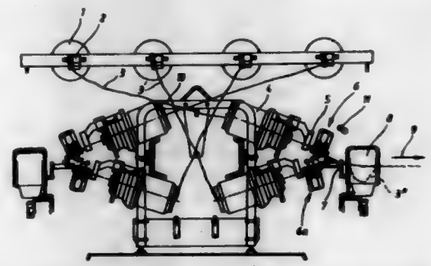
and a plurality of spaced parallel plastic guides, each formed of a plastic selected from the group consisting of fiber-filled polyethylene, polyamide and polyester plastics, and each projecting radially outwardly of the back of the glide ring body into engagement with the protecting tube, the guides having a low coefficient of friction.

5,592,976

THREAD BREAKING DEVICE FOR A POWER LOOM

Rudolf Zwiener, Arbon, Switzerland, assignor to Saurer Stickssysteme AG, Arbon, Switzerland

Filed Dec. 4, 1995, Ser. No. 567,079
Int. Cl.[6] B65H *59/26*; D03D *47/34*
U.S. Cl. 139—194 8 Claims



1. A weft yarn brake for a power loom, said brake comprising:

a first set of hoops including at least two hoops spaced apart and essentially parallel to each other;

a second set of hoops including at least two hoops spaced apart and essentially parallel to each other;

a mechanism including a drive device to swivel at least one of said first and second set of hoops about a rotational axis so that a relative swivelling motion is generated between said first and second set of hoops, wherein a weft yarn that is looped around said first and second set of hoops in a running direction through said yarn brake is braked by said relative swivelling motion of said first and second set of hoops; and

at least one traversing hoop disposed in said running direction of the weft yarn, said traversing hoop further comprising a run-up surface transverse to said running direction of the weft yarn, said run-up surface inclined relative to the running direction of the weft yarn wherein the weft yarn is shifted up and down said inclined run-up surface as said first and second sets of hoops are swivelled relative to each other.

5,592,977

MULTI-LAYERED WOVEN BELT WITH ROPE SHAPED PORTION

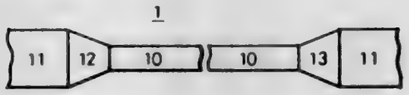
Koichi Kikuchi, Shimada, and Masao Watanabe, Shizuoka, both of Japan, assignors to Kikuchi Web Tech Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/01632, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO94/13872, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 15, 1992, Ser. No. 284,640

Int. Cl.[6] D03D *1/00;11/00;35/00*

U.S. Cl. 139—387 R **8 Claims**



1. A thick belt comprising at least four layers of weave structure including two outer layers and at least two remaining inner layers,

said two outer layers being woven into a hollow tube by a common weft and said at least two remaining inner layers being woven by a second weft,

the belt having a width and a weave structure providing a rope cross-sectionally shaped portion in a central area thereof,

said central area having a cross-sectional shape corresponding to a cross-sectional shape of a rope,

a cross-sectional thickness of said central area being greater than one quarter of the belt width.

5,592,978

SYSTEM FOR CONTROLLING A CHAIN LINK FENCE WEAVING MACHINE

Jose G. Garcia, La Puente, and LD Malatka, Huntington Beach, both of Calif., assignors to BMCI, Inc., South El Monte, Calif.

Filed Mar. 29, 1995, Ser. No. 412,457

Int. Cl.[6] B21F *27/04*

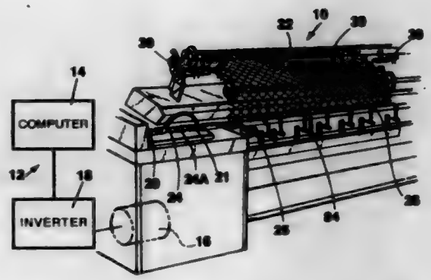
U.S. Cl. 140—92.94 **20 Claims**

1. A chain link fence weaving system comprising:

an electronic motor coupled to a main spindle shaft and an attached weaving blade of a chain link fence weaving machine for driving said main spindle shaft and attached weaving blade;

an electronic control means for controlling said electronic motor, said control means coupled to said electronic motor and to said chain link fence weaving machine for controlling a fabrication rate of chain link fence being woven, said electronic control means controlling the height and length of said chain link fence;

means for continuously feeding two strands of wire from two coils of wire onto said weaving blade, so as to form two intercoiled needles at a time; and



trough means located adjacent to said weaving blade and coupled to said chain link fence weaving machine, said trough means receiving said two intercoiled needles from said weaving blade for weaving said chain link fence, said trough means comprising an elongated trough having first and second portions with a retaining means therebetween, said trough means having a configuration which prevents said two intercoiled needles being woven in said trough from extending into said retaining means, said trough means further including means for frictionally retaining a first picket of the formed chain link fence in said retaining means while said two intercoiled needles are woven to said first picket for further fabricating said chain link fence.

5,592,979

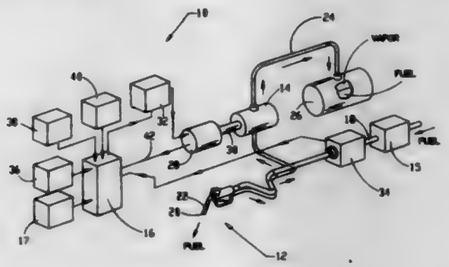
VAPOR RECOVERY SYSTEM FOR A FUEL DELIVERY SYSTEM

Edward A. Payne, Greensboro, and Hal C. Hartsell, Jr., Kernersville, both of N.C., assignors to Gilbarco Inc., Greensboro, N.C.

Division of Ser. No. 294,108, Aug. 22, 1994, Pat. No. 5,542,458. This application Dec. 21, 1995, Ser. No. 576,256

Int. Cl.[6] B67D *5/08*

U.S. Cl. 141—59 **6 Claims**



1. A vapor recovery fuel dispenser comprising

a liquid fuel line extending from a liquid fuel source to a liquid fuel outlet and including a meter that generates a pulse stream at a rate corresponding to a rate of flow of fuel through said line,

a vapor recovery line extending from said liquid fuel outlet to a vapor reservoir,

a vapor impeller in said vapor recovery line to impel vapor to move from said liquid fuel outlet to said vapor reservoir, and

a control for said impeller connected to receive said pulse stream, said control including a pulse source that generates pulses at a rate faster than an expected pulse rate from said meter and a counter to count the number of pulses from said pulse source during an interval between pulses from said meter, said control deriving a control signal for said impeller from the counted number of pulses.

5,592,980

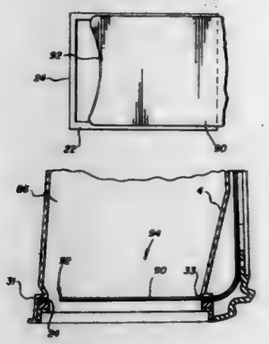
TONER CONTAINER

Philip A. Stern, Spencerport; Terry R. Elich, Pittsford, and Thomas S. Wicks, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1995, Ser. No. 410,461

Int. Cl.[6] B65B *1/04;3/00*

U.S. Cl. 141—364 **5 Claims**



1. A container for supplying toner to a receiving apparatus, said container comprising:

a containing portion having means defining an opening through which toner can pass,

a cover movable through a path between a position covering the opening and a position uncovering the opening, the cover having a leading edge in movement to its covering position,

guide means for guiding the cover through said path, said guide means including a transverse portion extending across the path that engages both sides of the cover at its leading edge when the cover is in its covering position, said portion including a seal for sealing the leading edge of the cover when the cover is in its covering position,

characterized in that the leading edge of the cover is concave in shape to facilitate moving the leading edge of the cover into said transverse portion of the guide means as the cover moves fully to its covering position.

5,592,981

PORTABLE WORK BENCH HAVING SLIDING CONNECTIONS FOR RELEASABLY AND ADJUSTABLY ATTACHING ACCESSORIES THERETO

Thomas E. Derecktor, Fall River, Mass., assignor to TracRac, Inc., Fall River, Mass.

Filed Nov. 3, 1995, Ser. No. 552,601

Int. Cl.[6] B25H *1/00*

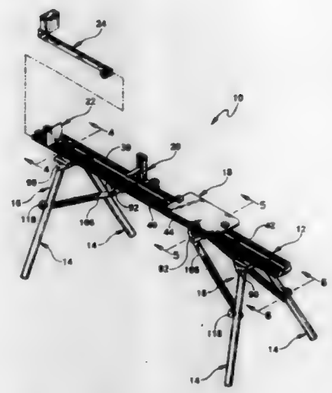
U.S. Cl. 144—286.1 **17 Claims**

1. A portable work bench comprising:

a track having a structural body, and at least one rail member attached to the structural body and extendable along the length of the body;

support means for supporting the track in an elevated position above a surface; and

a sliding lock assembly releasably attachable to the rail member, said sliding lock assembly comprising a sliding lock member slidably mounted on the rail member of the track and movable along the length of the rail member, and means for locking the sliding lock member at a desired position along the length of the rail member, said sliding lock member having means for mounting an accessory thereon.



5,592,982

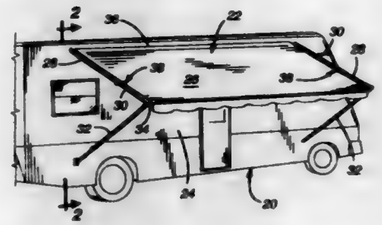
STABILIZING CLAMP FOR CANOPY OF A RETRACTABLE AWNING

Brent W. Murray, Longmont, and Thomas G. Faludy, Westminster, both of Colo., assignors to Carefree/Scott Fetzer Company, Broomfield, Colo.

Filed Mar. 8, 1996, Ser. No. 613,228

Int. Cl.[6] E04F *10/06*

U.S. Cl. 160—67 **10 Claims**



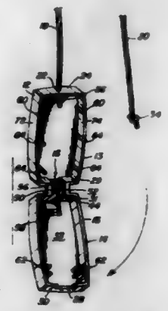
1. A clamp for stabilizing the canopy of a retractable awning wherein the retractable awning is mounted on a support surface so as to be moveable between extended and retracted positions, said awning including a canopy having an inner edge operatively connected to said support surface, an outer edge positionable away from said support surface when the awning is extended and a pair of side edges, a pair of rafter arms each having a first end operatively secured to the Supporting surface and an opposite end moveable away from the supporting surface operatively supporting said outer edge of the canopy such that the rafter arms extend in closely adjacent relationship to said side edges of the canopy when the awning is extended, said clamp being mounted upon at least one of said rafter arms and comprising in combination, a base pivotally connected to said rafter arm and movable between a use position and a non-use position, said base including a clip adapted to releasably grip a side edge of said canopy in said use position to substantially immobilize said side edge relative to said rafter arm at the location where said side edge is gripped by said clip.

5,592,983

PULL CORD SAFETY DEVICE

Eugene Sartini, Fall River, Mass., and Dennis L. McMichael, West Kingston, R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.

Filed Feb. 9, 1995, Ser. No. 389,278
Int. Cl.[6] E06B *9/38*
U.S. Cl. 160—178.1 **20 Claims**



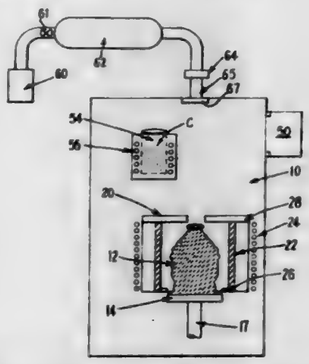
1. A device for connection to ends of plurality of pull cords of a type used with window or door coverings, the device comprising:
a first member having a first rim;
a second member having a second rim;
a hinge coupled to both the first and second members for allowing the first and second members to pivot relative to one another about the hinge from a closed position in which the first and second rims touch to an open position wherein the first and second rims are spaced from one another;
means for fixedly connecting a first pull cord to the first member; and
second means for connecting a second pull cord to the device when the device is in the closed position and for releasing the second pull cord from the device upon application of a force to the device between the first and second pull cords.

5,592,984

INVESTMENT CASTING WITH IMPROVED FILLING

Dean L. Schmiedeknecht, Whitehall; Mark J. Strazzheim, North Muskegon; Dennis J. Thompson, Whitehall, all of Mich., and Brad L. Rauguth, Whiteland, Ind., assignors to Howmet Corporation, Greenwich, Conn.

Filed Feb. 23, 1995, Ser. No. 394,086
Int. Cl.[6] B22D *27/15;27/09;27/00*
U.S. Cl. 164—62 **15 Claims**



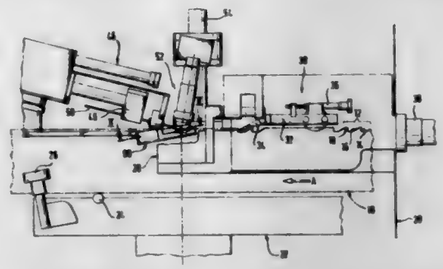
1. A method of casting a melt, comprising introducing the melt into a mold cavity of a mold residing in a furnace in a casting chamber under an initial relative vacuum and then applying gaseous pressure to the melt introduced in the mold cavity while the mold resides in said furnace and prior to withdrawal of said mold from said furnaces, said gaseous pressure being applied rapidly enough after casting said melt in said mold to reduce localized void regions present in the cast melt as a result of surface tension effects between the melt and a mold component.

5,592,985

METHOD OF AND AN APPARATUS FOR APPLYING HARD MATERIAL TO CUTTING TOOL TEETH, ESPECIALLY THE TEETH OF SAW BLADES

Bruno Hessinger, Laupheim-Obersulmetingen, and Werner Reichenzer, Warthausen, both of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Biberach/Riss., Germany

PCT No. PCT/EP94/01284, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO94/25203, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 25, 1994, Ser. No. 351,390
Claims priority, application Germany, May 4, 1993, 43 14 707.0
Int. Cl.[6] B22D *19/08;27/09*
U.S. Cl. 164—98 **3 Claims**



1. A method of applying hard material to cutting tool teeth (**12**), including the teeth of saw blades (**10**), comprising the steps of defining a mold cavity (**40**) around a tooth (**12**):
introducing molten material (**56**) into said mold cavity, wherein due to its surface tension, the molten material forms a spherical segment (**58**);
cooling and subsequently reheating the molten material until it has reached a state which is at least approximately liquid; and then
flattening the spherical segment (**58**) under pressure applied progressively in a direction towards the tip (**18**) of the tooth.

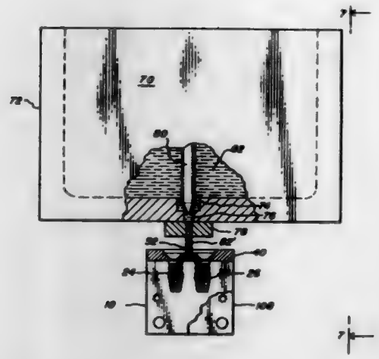
5,592,986

BULLET MOLDING APPARATUS

Armande P. Auger, 3546 Morgan Ave. South, Minneapolis, Minn. 55412, and Roger L. Barnes, 1210 Alexander Rd., Colorado Springs, Colo. 80909

Filed Oct. 17, 1995, Ser. No. 543,899
Int. Cl.[6] B22C *9/22*; B22D *25/02;31/00*
U.S. Cl. 164—335 **8 Claims**

1. Bullet molding apparatus for casting bullets from molten metal comprising:
a) first and second mold blocks, each of said blocks having (i) inner faces with a pair of matching mold half cavities formed therein, and (ii) an upper planar surface, said blocks being adapted to be held in assembled relationship with said half cavities in abutting register, and said half cavities each opening to said upper surface so as to define, when said blocks are held in assembled relationship, the tops of a pair of full cavities,



b) a sprue cutter plate having upper and lower planar surfaces pivotally mounted on said upper surface of one of said blocks so that said lower planar surface of said cutter plate abuts said upper surface of said one of said blocks, and being detachably engageable with said upper planar surface of the other of said blocks when said block inner faces are in abutting register, said sprue plate being further characterized by having (i) a pair of orifice holes in said lower planar surface spaced so as to be aligned with said tops of said cavities when said block inner faces are in abutting register, as aforesaid, and said sprue plate is in engaged condition, (ii) a pair of spaced apart countersinks recessed into said upper planar surface and in respective connecting register with said pair of orifice holes, and (iii) a flat trough in said upper planar surface connecting said pair of countersinks said flat trough having a midpoint;
c) a container of molten metal fixedly positioned adjacent and above said upper surface of said sprue cutter plate and having orifice means in the bottom thereof positioned vertically above said midpoint of said trough and means for controlling the flow of molten metal through said orifice means to provide a preselected stream of molten metal for a preselected length of time to initially impinge said midpoint of said trough and laterally to both of said countersinks and thence downwardly through said pair of sprue cutter orifice holes into said pair of full cavities.

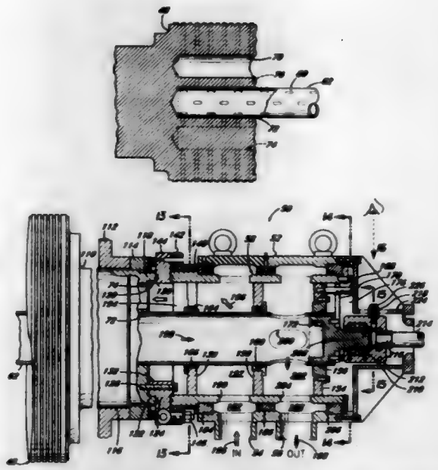
5,592,987

SYSTEM FOR A CROWN CONTROL ROLL CASTING MACHINE

Christopher A. Romanowski, Lake Arrowheard, Calif., and Bruno Amatein, Turin, Italy, assignors to FATA Hunter, Inc., Riverside, Calif.

Continuation of Ser. No. 95,761, Jul. 20, 1993, which is a continuation-in-part of Ser. No. 670,497, Jun. 6, 1991, Pat. No. 5,228,497, which is a continuation of Ser. No. 379,884, Jul. 14, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 478,460
Int. Cl.[6] B22D *11/06;11/124*
U.S. Cl. 164—428 **30 Claims**

1. An apparatus for roll casting molten metal comprising:
a frame;
first and second work rolls rotatably mounted parallel and adjacent to each other in said frame, each roll including a shell mounted on a central core, said core being of solid construction over a majority of the cross-sectional area defined by the interior of said shell in order to withstand large compressive forces exerted on the exterior of the roll;
a fluid cooling system within at least one of said rolls defined by at least two differential axial roll cooling subsystems spaced apart along the axial length of said roll, said cooling subsystems comprising:
a cooling channel circumferentially disposed about said core;



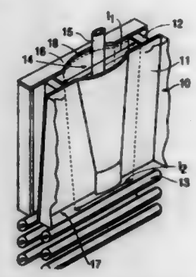
a cooling fluid inlet passage in fluid communication with said channel;
a cooling fluid outlet passage in fluid communication with said channel; and
a metering member adapted to vary the flow of cooling fluid through said outlet passage and control the low rate of cooling fluid through said cooling subsystem with respect to other cooling subsystems such that the crown of the roll may be controlled by metering cooling fluid differentially to the cooling subsystems along the roll, more cooling fluid in a particular cooling subsystem resulting in more cooling and a smaller roll diameter at that axial location from thermal contraction of the core, and less cooling fluid resulting in less cooling and a larger roll diameter from thermal expansion of the core.

5,592,988

METHOD FOR THE CONTINUOUS CASTING OF PERITECTIC STEELS

Umberto Meroni; Domenico W. Ruzza, both of Udine, and Andrea Carboni, Milan, all of Italy, assignors to Danieli & C. Officine Meccaniche SpA., Buttrio, Italy

Filed May 30, 1995, Ser. No. 453,767
Claims priority, application Italy, May 30, 1994, UD94A0090
Int. Cl.[6] B22D *11/00;11/04*
U.S. Cl. 164—478 **17 Claims**



1. Method for the continuous casting of peritectic steels having a carbon content between 0.09 and 0.16% to produce thin slabs, comprising continuously casting the peritectic steel through a mold having a taper at least in its first segment between 2.0% and 6.0% per meter while oscillating the mold, the frequency of oscillation

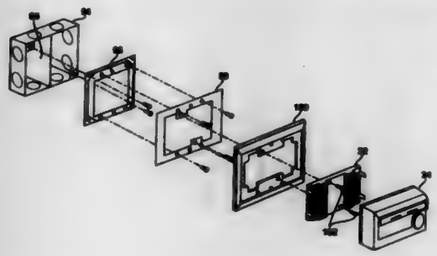
of the mold being between 300 and 500 oscillations per minute with a travel upwards and downwards between ±2.5 mm. and 4 mm., with a total travel of 5 mm. to 8 mm., primary and secondary cooling being restricted.

5,592,989

ELECTRONIC THERMOSTAT HAVING HIGH AND LOW VOLTAGE CONTROL CAPABILITY

Michael Lynn, Green Oaks, Ill.; Alan Morris, Matthews, N.C.; Richard A. Perry, and June R. Carper, both of Charlotte, N.C., assignors to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Apr. 28, 1994, Ser. No. 233,917
Int. Cl.[6] F25B *29/00*
U.S. Cl. 165—259 16 Claims



1. A thermostat for controlling heating and cooling equipment of the type which includes a fan and at least one end device consisting of at least one heating and cooling fluid control valve, at least one electric heating apparatus and at least one air damper, said thermostat comprising:

a base portion adapted to be mounted to a mounting surface;

a cover portion adapted to be attached to said base portion;

switch means for controlling the operation of the thermostat, said switch means being associated with said cover portion and being accessible for operation;

temperature setting means associated with said cover portion for setting a nominal temperature set point;

processing means being connected to one of said base and cover portions for receiving operating status signals and temperature indicating signals and for selectively generating output signals for controlling the heating and cooling equipment;

a first means for sensing the temperature of the air of a space in which the thermostat is to control;

a plurality of first connection means for connecting high voltage circuits associated with selected end devices;

a plurality of second connection means for connecting low voltage circuits associated with selected end devices;

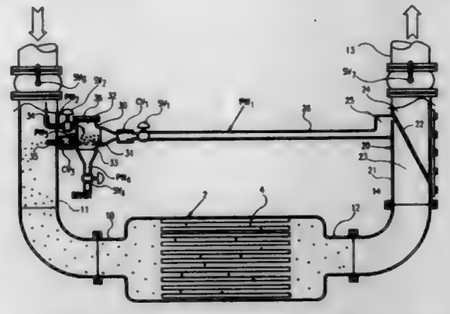
said first connection means and said second connection means being separated from one another, said base portion being adapted to be attached to a conventional electrical box having a partition separating approximately one half of the interior from the other side thereof, each side being adapted to receive one of high voltage circuits and low voltage circuits, said partition separating said high voltage circuits from said low voltage circuits.

5,592,990

CLEANING SYSTEM FOR CLEANING FLUID-CONDUCTING TUBING

Chaim Ben-Dosa, Herzliya, Israel, assignor to Ball-Tech Energy Ltd., Rosh Ha'Ayin, Israel

Filed Jul. 20, 1995, Ser. No. 504,742
Claims priority, application Israel, Jul. 25, 1994, 110445
Int. Cl.[6] F28G *1/12*
U.S. Cl. 165—95 18 Claims



1. A cleaning system for cleaning tubing used for conducting a fluid therethrough, which system includes balls circulated with the fluid through the tubing from its upstream side to its downstream side, separator means for separating the balls from the fluid at the downstream side of the tubing, and recirculating means for recirculating the balls back to the upstream side of the tubing; said recirculating means comprising:

a ball collector housing having an interior containing an apertured partition permitting the fluid, but not the balls, to pass therethrough, and dividing the interior of the housing into an upper compartment and a lower compartment;

a first passageway connecting one side of said upper compartment to the downstream side of said tubing;

a second passageway connecting a first point on an opposite side of said upper compartment to a first point in the upstream side of said tubing;

a third passageway connecting a second point on said opposite side of the upper compartment to a second point in the upstream side of said tubing to receive a pressure slightly lower than that at said first point in the upstream side of said tubing but higher than that at said downstream side of the tubing;

a fourth passageway connecting said lower compartment to a source of lower pressure than that at said downstream side of the tubing as well as at said first and second points in the upstream side of the tubing;

valves in said first, second, third and fourth passageways controlling the fluid flow therethrough;

and a cover covering said upper compartment and removable therefrom to permit adding balls to said upper compartment or removing balls therefrom.

5,592,991

METHOD AND APPARATUS OF INSTALLING A WHIPSTOCK

Jeffrey J. Lembcke, Houston, and Henry J. Jordan, Jr., Conroe, both of Tex., assignors to Baker Hughes Inc., Houston, Tex.

Filed May 31, 1995, Ser. No. 455,177
Int. Cl.[6] E21B *29/00*
U.S. Cl. 166—298 19 Claims

1. A method of milling a window downhole, comprising:

providing a packer without the setting components;

assembling a hydraulically actuated selectively removable setting tool to said packer;

assembling a whipstock to said packer or setting tool;



assembling a milling apparatus to the whipstock;

lowering the assembly of the milling apparatus, whipstock, setting tool, and packer into a well;

setting the packer with said setting tool;

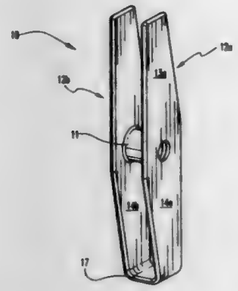
milling a window with the milling apparatus.

5,592,992

LAWN EDGER BLADE ASSEMBLY

Timothy J. Thompson, 9921 Ridge Dr., Indianapolis, Ind. 46256

Filed Jun. 7, 1995, Ser. No. 482,863
Int. Cl.[6] A01B *45/04*
U.S. Cl. 172—15 10 Claims



1. A blade assembly for a lawn edging machine, said blade assembly comprising:

(a) hub member;

(b) a first radial blade member comprising at least two blade arms extending radially from said hub member; and

(c) a second radial blade member comprising at least two blade arms extending radially from said hub member;

wherein said first and second blade members are positioned in a spaced apart relation so that a space is defined between said first and second blade members when said blade members rotate around said hub; and

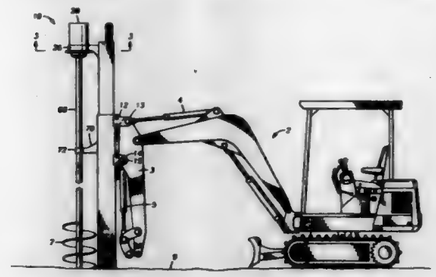
(d) a lateral blade member that bridges said first and second blade members without eliminating the space that is defined between said first and second blade members when said first and second blade members rotate around said hub.

5,592,993

DIRECTIONAL AUGER ATTACHMENT

Robert O. Parish, II, Cleveland, and Cleve C. Reber, Pasadena, both of Tex., assignors to TTI Trenchless Technologies, Inc., Conroe, Tex.

Filed Apr. 28, 1995, Ser. No. 431,106
Int. Cl.[6] E21B *3/02;7/02*
U.S. Cl. 175—162 2 Claims



1. An auger attachment which is mounted on the stick of a backhoe which comprises;

a square-channel outside body having a slot in its front face;

bracket means extending from said outside body for attaching said outside body to said stick of a backhoe:

a telescoping, square-channel inner body having a slot in its front face which is aligned with the slot in the front face of said outside body: said inner body moving within said outside body, said inner body having means to provide a travel channel and a piston chamber;

a travel block extending through both of said slots and moving within said travel channel:

a stabilizer disposed below said travel block, said stabilizer extending through both of said slots in said inner and outside body and moving within said travel channel;

a piston in said piston chamber; said piston having piston rod;

hydraulic fittings for actuating said piston;

on an end of said piston rod, means for carrying two spaced-apart chain sprockets:

two chains within said piston chamber, each connected at one end to said travel block, extended over one of said sprockets, and connected at its other end to a lower end of said outside body;

a centrifugal motor mounted on said travel block, said motor capable of turning an auger; and

hydraulic fittings for actuating said motor and rotating said auger in both directions and for actuating said piston to raise and lower said travel block.

5,592,994

PROPULSION SEAL FOR WIRE LINE CORE DRILLING APPARATUS

Irvin J. Laporte, and Amos J. Watkins, both of North Bay, Canada, assignors to JKS Boyles International Inc., North Bay, Canada

Filed Sep. 18, 1995, Ser. No. 529,747
Claims priority, application Canada, Dec. 15, 1994, 2138201
Int. Cl.[6] E21B *25/00*
U.S. Cl. 175—247 6 Claims

1. Wire line core drilling apparatus including an elongated assembly which is hydraulically propelled along the interior of a drill string to a desired location adjacent the bit end of the drill string under the influence of a moving pressurized liquid within the drill string, characterized in that said elongated assembly is provided with an annular cup seal having a flexible annular lip thereon which expands radially outwardly under the influence of liquid pressure thereon to substantially prevent by-pass of the pressurized liquid between the elongated assembly and the interior wall of the



drill string and which annular lip is capable of expanding and contracting as said assembly moves along the drill string interior to accommodate reasonable fluctuations in drill string interior diameter which may be encountered.

5,592,995

EARTH-BORING BIT HAVING SHEAR-CUTTING HEEL ELEMENTS

Danny E. Scott; Rudolf C. O. Pessier; Matthew R. Isbell, all of Houston, Tex.; Nigel Meany, Banchory, Scotland, and Alain Besson, St. Remy les Chevreuse, France, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jun. 6, 1995, Ser. No. 468,692
Int. Cl.[6] E21B *10/16;10/52*
U.S. Cl. 175—374 **21 Claims**



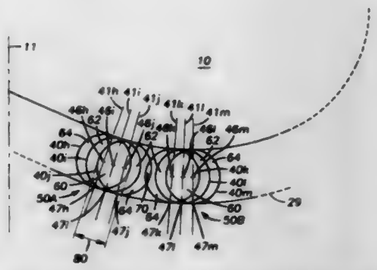
1. An earth-boring bit comprising:
a bit body;
at least one cantilevered bearing shaft depending inwardly and downwardly from the bit body;
a cutter mounted for rotation on the bearing shaft, the cutter including a plurality of cutting elements arranged in generally circumferential rows on the cutter, the generally circumferential rows including a heel row of cutting elements;
at least one of the cutting elements in the heel row having an outer surface at least partially formed of super-hard material and defining a cutting edge for shearing engagement with the sidewall of the borehole as the cutter rolls and slides over the bottom of the borehole during drilling operation.

5,592,996

DRILL BIT HAVING IMPROVED CUTTING STRUCTURE WITH VARYING DIAMOND DENSITY

Carl W. Keith, Spring, and Graham Mensa-Wilmot, Houston, both of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Oct. 3, 1994, Ser. No. 317,227
Int. Cl.[6] E21B *10/58*
U.S. Cl. 175—431 **48 Claims**



1. A drill bit for drilling through formation material when said bit is rotated about its axis, said bit comprising:
a bit body;
a bit face on said body;
at least one set of cutter elements mounted on said bit face, said cutter element set comprising a plurality of cutter elements mounted at differing radial positions relative to the bit axis and having cutting faces with cutting profiles for engaging and cutting formation material, said cutting profiles of said cutter elements in said set defining a set cutting profile of said set;
at least one adjacent cutter element mounted on said bit face at a radial position that differs from the radial positions of said cutter elements of said set and having a cutting profile that partially overlaps, in rotated profile, with said set cutting profile forming a border region of overlap;
wherein, in rotated profile, each cutter element in said set has a cutting profile that partially overlaps the cutting profile of each of the other cutter elements in said same set so as to form a region of maximum diamond density, said region of maximum diamond density being the common area of intersection of said cutting profiles of said cutter elements of said set; and
wherein the centerlines of the cutting profiles of said cutter elements in said set all intersect said region of maximum diamond density; and
wherein, in rotated profile, said set cutting profile does not fall entirely within the cutting profile of any other cutter element on said bit and wherein said common area of intersection does not overlap with any border region.

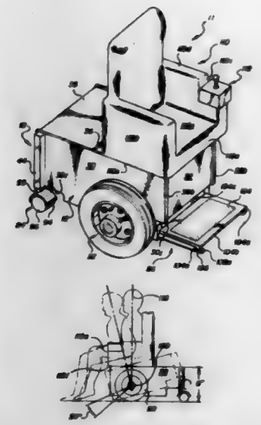
5,592,997

PEDIATRIC WHEELCHAIR

Richard D. Ball, 509 Leeward Ct., Traverse City, Mich. 49684

Continuation of Ser. No. 110,731, Aug. 23, 1993, abandoned. This application Feb. 14, 1995, Ser. No. 388,909
Int. Cl.[6] B60K *1/02*
U.S. Cl. 180—65.1 **5 Claims**

1. A pediatric wheelchair comprising:
a powered base having opposed side faces, opposed front and rear faces, and opposed top and bottom faces, said top face defining a seat support surface, and said front, rear, side and bottom faces defining an interior compartment;
a pair of drive wheels each having a common diameter, said wheels being mounted for rotation with respect to said base proximate said from face thereof, said wheels having an axis of rotation located inboard of and parallel to said front face and spaced from a top face of said seating surface by a distance no greater than said drive wheel common diameter;
a seat mounted on said seat support surface proximate said front face of said base, and including front, rear and opposed side edges, a vertical back rest disposed parallel to said front face, and a horizontal seating surface, said seat being mounted on said base such that, when an occupant is seated on said seating surface with his back resting against the back rest, said wheelchair and occupant have a composite center of gravity generally vertically aligned with said occupant's trunk and located proximate said drive wheels so as to bias said base into said first, upright position;
an actuator unit disposed in said interior compartment tier actuating said drive wheels; and
a control unit mounted on the wheelchair and accessible to the child for controlling movement of the wheelchair
whereby slight forward shifting of said occupant with respect to said seat shifts the composite center of gravity of the wheelchair and the occupant to a point forward of said drive wheel axis, thereby pivoting said base into a second, forwardly tilted position,
wherein said base defines a forward lower corner positioned forwardly of the axis of rotation of the drive wheels and radially outwardly of an outer periphery of the drive wheels, and the base is free to rotate forwardly and downwardly about the axis of rotation of the front drive wheels to said forwardly tilted position in which the forward lower corner of the frame base engages a floor supporting said wheelchair.



5,592,998

DEVICE CAPABLE OF SUCTION-ADHERING TO A SURFACE AND MOVING THEREALONG

Fukashi Urakami, Yokohama, Japan, assignor to Urakami Research and Development, Kanagawa, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

PCT No. PCT/JP94/00701, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO94/25328, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 27, 1994, Ser. No. 356,228
Claims priority, application Japan, May 4, 1993, 5-138847
Int. Cl.[6] B60B *39/00;* B62D *57/024*
U.S. Cl. 180—164 **8 Claims**

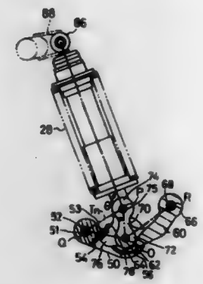
1. A device capable of suction-adhering to a surface and moving therealong, comprising:
a pressure receiver,
a partitioning means mounted on the pressure receiver and defining a pressure reduction space in cooperation with the pressure receiver and the surface, wherein the partitioning means includes a lip portion which extends along the surface, and wherein the lip portion is displaceable by a relatively small force toward and away from the surface, and
a pressure reducing means for discharging a fluid from the pressure reduction space to decrease a pressure inside the pressure reduction space,
wherein the lip portion has a first part and a second part,
the first part of the lip portion having a plurality of contacting means disposed at intervals thereon, and a plurality of gaps located between the contacting means and in communication with the pressure reduction space,
the second part of the lip portion providing an outer peripheral edge portion thereof,
whereby, when the device is suction-adhered to the surface, the outer peripheral edge portion of the lip portion and the contacting means are brought into contact with the surface, and the outer peripheral edge portion maintains the pressure reduction space and the gaps fluid-tight.

5,592,999

ACTUATED SHOCK ABSORBER LINK MECHANISM WITH VARIABLE LINK RATIO AND LINK FORM

Masaaki Matsuura; Toichiro Hikichi; Mitsuru Saito, and Takuya Tagami, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 474,485
Claims priority, application Japan, Sep. 13, 1994, 6-244590
Int. Cl.[6] B62K *25/26*
U.S. Cl. 180—227 **26 Claims**

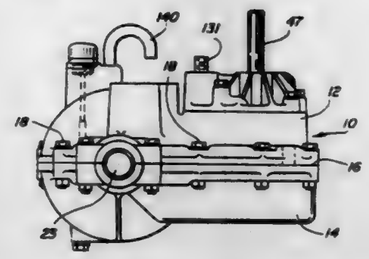


25. A suspension apparatus, comprising:
a shock absorber link mechanism having a variable link ratio for linking a shock absorber to a swing arm, and
an actuator for actuating said shock absorber link mechanism to vary the link ratio.

5,593,000
HYDROSTATIC TRANSAXLE

Alan W. Johnson, Ames, Iowa, assignor to Sauer Inc., Ames, Iowa

Continuation of Ser. No. 182,769, Jan. 14, 1994, which is a continuation of Ser. No. 706,279, May 28, 1991, Pat. No. 5,505,279, which is a continuation of Ser. No. 482,656, Feb. 21, 1990, abandoned, which is a continuation of Ser. No. 319,164, Mar. 3, 1989, Pat. No. 4,903,545. This application Jun. 5, 1996, Ser. No. 658,747
Int. Cl.[6] B60K 7/00
U.S. Cl. 180—385 1 Claim



1. A hydrostatic transaxle having a housing with an interior cavity, an axle assembly in said housing including a differential assembly, the improvement comprising,

a hydrostatic transmission mounted within said cavity and including a generally L-shaped member completely housed within said cavity and having first and second hydrostatic unit mounting surfaces thereon disposed at right angles to each other,

at least a pair of fluid ports in each of said mounting surfaces,

and internal passageways in said L-shaped member connecting at least one of said fluid ports on one of said mounting surfaces with at least one of said fluid ports on the other of said mounting surfaces,

said L-shaped member comprising first and second legs integrally joined and extending at right angles to each other,

said first leg having first and second opposite surfaces with said first mounting surface being located on said first surface,

said second leg having a first surface extending at right angles away from the first surface of said first leg, and a second surface opposite to the first surface of said second leg with the other of said mounting surfaces being on said second surface of said second leg,

said L-shaped member having means for accommodating the mounting thereof within the interior cavity of said housing,

and means for operatively connecting said hydrostatic transmission to said differential assembly,

a hydrostatic pump having an axis of rotation mounted on one of said mounting surfaces, and

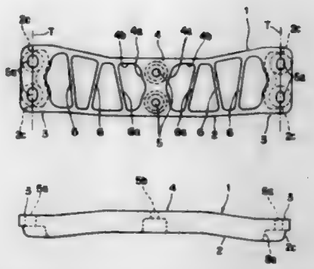
an input shaft extending through said housing and drivably connected to said hydrostatic pump, said input shaft being positioned on the axis of rotation of said hydrostatic pump.

5,593,001
MOUNT SUPPORTING MEMBER AND MANUFACTURING METHOD THEREFOR

Masamitsu Takano, Shizuoka-ken, and Takahide Maejima, Shizuoka-ken, both of Japan, assignors to Yamakawa Industrial Co., Ltd., Fuji, Japan

Continuation of Ser. No. 204,683, Mar. 1, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 635,208
Claims priority, application Japan, Jun. 11, 1993, 5-165094
Int. Cl.[6] B62D 21/00
U.S. Cl. 180—312 11 Claims

1. A mount supporting member for a mount of a vehicular power unit, said member being formed by cutting an extruded good by a predetermined thickness, said member comprising:



a beam defining outer contours of the mount supporting member;

frame side attaching seat portions which, placed at the left and the right ends of the beam, have respectively a bolt attaching hole with a central axis aligned in a direction substantially parallel to a predetermined direction;

a mount attaching seat portion placed at a center of the beam, said mount attaching seat portion including a bolt attaching hole with a central axis aligned in the direction substantially parallel to the predetermined direction; and

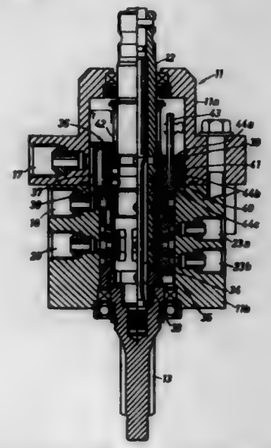
a plurality of ribs respectively extending transversely between a front portion and a rear portion of the beam so as to form through-holes with axes which are generally parallel to the predetermined direction,

wherein the front and rear portions of the beam on either side of the mount attaching seat portion are inclined with respect to a plane orthogonal to the predetermined direction, such that heat is radiated from the vehicular power unit in a direction which is substantially aligned with the axes of the through-holes.

5,593,002
POWER STEERING SYSTEM EQUIPPED WITH MEANS FOR VARYING AN ASSIST TORQUE THEREOF

Yuichi Okada, and Toshihiko Aoyama, both of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1994, Ser. No. 304,282
Claims priority, application Japan, Oct. 26, 1993, 5-288830
Int. Cl.[6] B62D 5/083;6/00
U.S. Cl. 180—421 12 Claims



1. A hydraulic power steering system, comprising:

a housing;

an input shaft rotatably supported by said housing and adapted to be connected to a steering wheel for receiving a steering input;

a pinion rotatably supported by said housing and meshing with a steering rack for actuating steerable road wheels;

a torsion bar connected between said input shaft and said pinion in a torque transmitting relationship;

a power cylinder for actuating said steering rack;

a rotary valve unit adapted to be actuated according to a relative angular displacement between said input shaft and said pinion, said rotary valve unit comprising an annular outer valve element fixedly secured to said pinion coaxially with said torsion bar, and an annular inner valve element adjustably and coaxially received in said outer valve element, the relative angular displacement between said inner and outer valve elements determining the allocation of hydraulic pressure from an oil pump to two pressure chambers of said power cylinder;

said input shaft, said inner valve element, and said outer valve element being angularly displaceable relative to each other for a given twisting angle of the torsion bar;

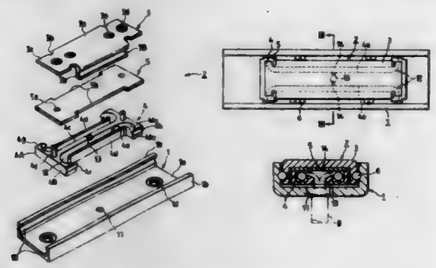
a conversion mechanism engaged to said input shaft, said inner valve element and said outer valve element for determining relative angular displacements thereof for said given twisting angle of said torsion bar; and

varying means for varying said relative angular displacements of said input shaft, said inner valve element and said outer valve element for said given twisting angle of said torsion bar.

5,593,003
LUBRICATING MECHANISM FOR A LINEAR GUIDE APPARATUS

Yasushi Abe, and Teishiro Tamura, both of Gunma, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jan. 23, 1996, Ser. No. 590,447
Claims priority, application Japan, Jan. 24, 1995, 7-008749
Int. Cl.[6] F16C 1/24
U.S. Cl. 184—5.1 6 Claims



1. A linear guide apparatus comprising:

an axially extending guide rail including a U-shaped cross section, a first loaded ball rolling groove formed in an inner lateral side of the guide rail, and a lubricant feed hole in a bottom of the guide rail;

a slider fitted loosely inside the guide rail and including a second loaded ball rolling groove formed in an outer lateral side of the slider, the second loaded ball rolling groove being confronted with the first loaded ball rolling groove, and including a circulator with an unloaded ball circulating passage which extends axially,

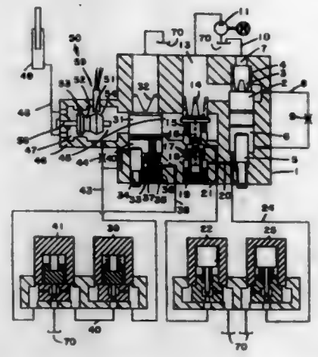
the circulator including a lubricant injection port communicating with the unloaded ball circulating passage, the lubricant injection port connecting the lubricant feed hole at a predetermined position of the slider relative to the guide rail; and

a plurality of balls rolling along the first and second loaded ball rolling grooves via the unloaded ball circulating passage to support the slider moving axially relative to the guide rail.

5,593,004
SERVO CONTROL FOR HYDRAULIC ELEVATOR

Roy W. Blain, Böllinger Höfe, 74078 Heilbronn, Germany

Filed Mar. 28, 1995, Ser. No. 412,247
Int. Cl.[6] G05D 11/00
U.S. Cl. 187—275 6 Claims



1. In a flow sensing channel device of a hydraulic elevator control valve comprising:

a valve housing with a channel,

a flow ring having a center and taper on both sides of its center, fixed in the housing,

a flow responsive metal spool having an axis and a diameter, one end of its diameter being in the shape of a disc, movable along its axis within the flow ring, the disc being spring centered relative to the center of the ring under no flow conditions,

a space between the disc and the flow ring through which fluid may pass, wherein said space opens proportionally in size to the rate of the fluid flowing through, whereby flow through the channel in either direction causes the disc to be displaced,

a conical diametrical form being located along the disc's axis at a distance and opposite end from the disc shaped portion, wherein both parts, the disc and the conical diametrical form, are integral parts of the metal sensing spool, such that when flow takes place, the metal spool and its conical diametrical form moves proportionally to the flow thereto, the conical diametrical form having a peak,

a frequency inductive distance sensor spool means and a sensing point located on its bottom, both protruding through the wall of the valve housing into the channel at right angles to the axis of movement of the metal sensing spool, whereby, said peak of the conical diametrical form under conditions of no flow is centered opposite the sensing point,

a computer means for receiving and assessing signals from the inductive analogue distance sensor spool means, and proportionally revising an electrical output,

a magnetic coil means for receiving the electrical output from the computer means,

a proportional type pilot solenoid valve means for receiving the commands from the magnetic coil means, and steplessly controlling a pilot oil flow through a pilot chamber and thus controlling a pilot pressure,

a bypass valve means and bypass spring so connected that the increase or decrease in oil flow from the pilot chamber causes the bypass valve to close down or open up the bypass spring, thereby affecting the oil flow to a cylinder means for controlling the speed of an elevator,

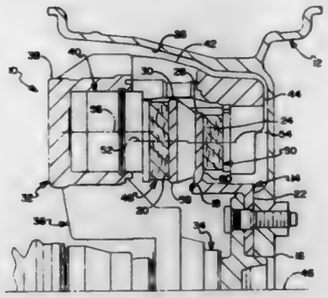
a storage tank means for recycling oil and for receiving a portion of the oil flow from the bypass valve.

5,593,005

CALIPER-TYPE DISC BRAKE WITH STEPPED ROTOR

Bernhard Kuhnann, Rochester Hills; Joerg Scheibel, Auburn Hills, both of Mich.; Larry Mauerrat, Frankfurt, Germany; Daniel Keck, Westland, and Werner Gottschalk, Auburn Hills, both of Mich., assignors to ITT Automotive, Inc., Auburn Hills, Mich.

Filed Jun. 7, 1995, Ser. No. 486,457
Int. Cl.[6] F16D *55/22;65/12*
U.S. Cl. 188—72.4 **5 Claims**



1. A disc brake for applying a net braking torque to a wheel of a motor vehicle, said wheel being rotatable about a first axis, said disc brake comprising:

a rotor mounted to said wheel, said rotor having a first side and a second side, wherein the first side defines a first annular friction surface and the second side defines a second annular frictional surface, and wherein the outer peripheral edge of the second friction surface is radially inward of the outer peripheral edge of the first friction surface; and

a caliper straddling said rotor, said caliper supporting a first brake pad in opposition with a portion of the first friction surface on said rotor and a second brake pad in opposition with a portion of the second friction surface on said rotor, said caliper having a means, operative along a second axis substantially parallel with said first axis, for urging said first and second brake pads into engagement with the first and second friction surfaces of said rotor, respectively,

wherein the radially-outermost edge of said second brake pad is radially inward of the radially-outermost edge of said first brake pad, and

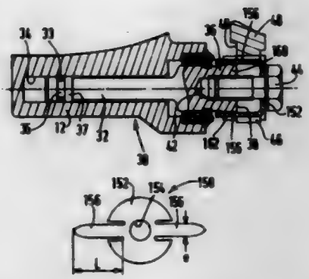
wherein the effective radii of said first brake pad and said second brake pad when urged into engagement with the first and second friction surfaces of said rotor, respectively, are each less than the radial offset of said second axis from said first axis.

5,593,006

SLIDING CALIPER DISK-BRAKE

Gerard Le Delt, Courtry, and Jean Louis Gerard, Bagnolet, both of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

PCT No. PCT/FR94/00535, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO94/28329, PCT Pub. Date Dec. 8, 1994
PCT Filed May 6, 1994, Ser. No. 244,167
Claims priority, application France, May 25, 1993, 93 06182
Int. Cl.[6] F16D *55/227*
U.S. Cl. 188—73.45 **10 Claims**



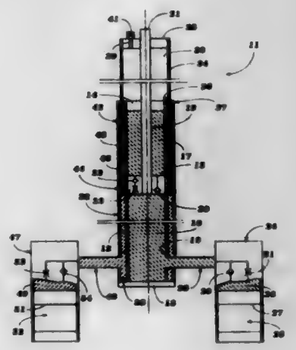
1. A disk-brake having a caliper which slides on a stationary support formed by means of at least one axial guide pin slidingly received in a first bore located in said stationary support, said caliper including actuating means capable of stressing at least one friction pad which is anchored on and slidable with respect to said stationary support toward a rotating disk, locking means for preventing rotation of said caliper about said axial guide pin attached to said stationary support, said locking means consisting of an axial spindle including a shank having a first part of which slides in a second bore formed in said stationary support and a foot, said foot forming a planar stop surface perpendicular to a central axis of said axial spindle, said foot engaging a planar part of the caliper, said foot of the axial spindle interacting with a blocking member by passing with clearance through a mounting opening made in said caliper to allow axial centering of said axial spindle during assembly of said disc brake, characterized in that a holding member is located adjacent said mounting opening to immobilize and prevent rotation of said axial spindle while said disc brake is being assembled, said holding member having a central part with an opening which receives said blocking member, said holding member having tabs which pass through said mounting opening, said tabs of said holding member interact with axial grooves formed on said foot of said axial spindle, said axial spindle being immobilized with respect to radial translation by said second bore, and said first part of said axial spindle sliding with reduced clearance in said second bore and said guide pin sliding with the same clearance in the first bore.

5,593,007

SHOCK ABSORBER WITH THIRD FLUID CHAMBER

Pekka Siltanen, Upplands Vasby, Sweden, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 1, 1993, Ser. No. 160,614
Claims priority, application Japan, Dec. 2, 1992, 4-345151
Int. Cl.[6] F16F *9/46*
U.S. Cl. 188—269 **13 Claims**



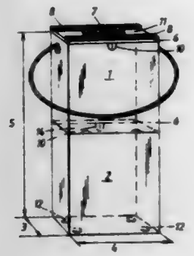
1. A tubular shock absorber comprised of an inner cylinder defining a bore closed at opposite ends and in which a first piston is supported for reciprocation, said first piston dividing said cylinder bore into first and second fluid chambers, a piston rod affixed to said first piston and extending through said first fluid chamber for connection to a first element, means for connecting said inner cylinder to a second element, said first and said second elements being relatively moveable for causing movement of said first piston within said cylinder bore, an outer cylinder fixed telescopically to said inner cylinder and defining an annular chamber there around, a second piston, said second piston having an annular configuration received in said outer cylinder and extending circumferentially therearound to define at least a third fluid chamber of annular configuration, means coupling with said first piston to said second piston for movement with said first piston for at least a portion of the stroke of said first piston, such movement of said second piston displacing fluid from said third fluid chamber upon movement of said piston rod in a first direction for compression of fluid in said second fluid chamber by said first piston, a reservoir chamber for receiving fluid displaced from said third fluid chamber, first damping valve means in said first piston for restricting the flow from said first fluid chamber to said second fluid chamber for damping the movement of said first and second elements in one direction, and second damping valve means for restricting the flow of fluid from said third fluid chamber to said reservoir chamber for damping the movement of said first and said second elements in a direction opposite to the one direction.

5,593,008

DUAL PURPOSE CASE

Thorsten Magnusson, Terrängvägen 2, Lidingö , Sweden

PCT No. PCT/SE92/00865, § 371 Date Jun. 13, 1995, § 102(e) Date Jun. 13, 1995, PCT Pub. No. WO94/13169, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 14, 1992, Ser. No. 454,247
Int. Cl.[6] A45C *3/02;9/00;13/00*
U.S. Cl. 190—8 **2 Claims**



1. A case which can be used for transport as well as a temporary seat, said case comprising

a longest side of a base of the case being more than twice as long as a shortest side of the base,

a height of the case being 1.5–2.5 times greater than the longest side of the base,

the case being divided into a lower box and an upper box separated by a floor/ceiling,

said upper being dimensioned to contain standing binders,

a lid of the upper box having spaced upholstered strips for sitting and a handle located between the upholstered strips so as to not affect the sitting function,

walls of the case having a solid structure to counteract pressure generated when the case is used for a sitting function, and

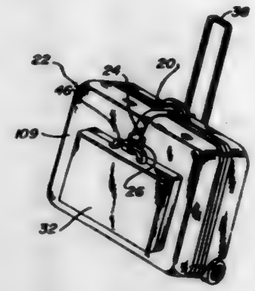
the lid of the upper box having a brim.

5,593,009

RETRACTABLE AUXILIARY LUGGAGE ATTACHMENT MECHANISM AND METHOD

William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.

Continuation of Ser. No. 182,406, Jan. 18, 1994, abandoned. This application Nov. 21, 1995, Ser. No. 562,230
Int. Cl.[6] A45C *5/14;13/30;13/38*
U.S. Cl. 190—102 **16 Claims**



7. An attachment mechanism connected to a main luggage case having a top surface and at least one adjoining exterior surface, said attachment mechanism adapted to support an auxiliary luggage case against the exterior surface to allow the auxiliary luggage case to be conveyed together with the main luggage case, said attachment mechanism comprising:

a flexible elongated strap having opposite sides separated by a thickness and an inner end fixed to the top surface of the main luggage case;

a hook member movably positioned upon the strap and adapted to receive a handle of the auxiliary luggage case, said hook member comprising:

a first portion comprising a first contact surface;

a second portion comprising a second contact surface;

means pivotably connecting the first and second portions to permit the contact surfaces to be pivoted toward each other to selectively fold the first and second portions together prior to retracting the hook member within the pocket, and to permit the contact surfaces to be pivoted away from each other to selectively unfold the first and second portions prior to the hook member receiving the handle of the auxiliary luggage case; and

a slot between the first and second portions, defined at least in part by the means pivotably connecting the first and second portions;

a housing on the top surface of the main luggage case and defining a pocket dimensioned to at least partially contain the strap and the hook member, said strap and hook member being selectively extendable and retractable between an extended position outside the pocket and a retracted position within the pocket, the housing positioned on the main luggage case to locate said strap in the extended position to suspend the auxiliary luggage case from the hook member below the top surface and against the exterior surface of the main luggage case;

a cover member attached to the housing; and

means for selectively closing the cover member over the pocket to maintain the retracted strap and hook member within the pocket and for selectively opening the cover member to allow the strap and hook member to be extended outside the pocket;

wherein the contact surfaces are separated by a distance less than the thickness of the strap when the first and second portions are unfolded, whereby the strap passes through the slot to allow the hook member to move along the strap when the first and second portions are selectively folded together, and the contact surfaces substantially pinch the strap from opposite sides of the strap to secure the hook member to the

strap only when the first and second portions are unfolded to fix the hook member at a predetermined position along the strap.

5,593,010

PROCESS AND DEVICE FOR SUPPLYING ENERGY TO WORKSTATIONS CIRCULATING ON A CHAIN

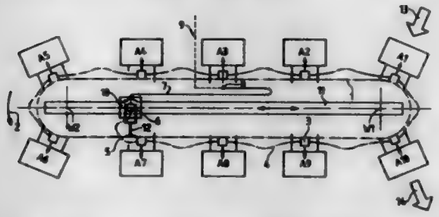
Bernd Willing, Bonn, and Frank Göbel, Köln, both of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Dec. 5, 1995, Ser. No. 567,656

Claims priority, application Germany, Dec. 13, 1994, 44 44 280.7

Int. Cl.[6] H02G *11/00*

U.S. Cl. 191—12 R **2 Claims**



2. An apparatus for carrying out a repeated sequence of operations comprising:

i) a plurality of workstations circulating in the shape of an elongated oval, said workstations being capable of performing said repeated sequence of operations,

ii) a supply line connected to all the workstations and circulating together with the workstations, wherein transmissions pass through said supply line to said workstations,

iii) a rotary linkage arranged within the oval,

iv) a connecting line connected to the rotary linkage and to the supply line, wherein said transmissions pass through said connecting line to said supply line,

v) a runway arranged in a longitudinal direction of, and within, the oval,

vi) a truck capable of travelling on the runway and having the rotary linkage secured thereon,

vii) a trailing cable connected to said rotary linkage, wherein said transmissions pass through said trailing cable to said rotary linkage, and

viii) a transmission means for supplying said transmissions to said trailing cable.

5,593,011

SHIFT LOCK UNIT

Shoichi Harada, Aichi-ken, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-ken, Japan

Filed May 30, 1995, Ser. No. 453,906

Claims priority, application Japan, May 31, 1994, 6-118538

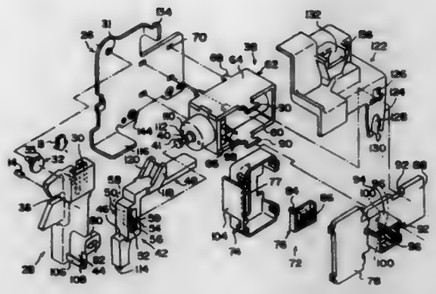
Int. Cl.[6] B60K *41/26;20/02*

U.S. Cl. 192—4 A **14 Claims**

1. A shift lock unit comprising:

a shift lock plate moving due to movement of a grooved pin in an axial direction of a shift lever and engaging with the grooved pin, the movement of the grooved pin in the axial direction of the shift lever being required in order to shift from a P position to another position when shifting in an automatic transmission in which an engagement position of the grooved pin and a detent plate is changed by shift lever operation;

a stopper moving in a direction intersecting a direction of movement of said shift lock plate, such that said stopper freely engages with and separates from said shift lock plate,



and in an engaged state of said stopper and said shift lock plate, movement of said shift lock plate due to movement of the grooved pin in the axial direction of the shift lever is not possible and movement of the grooved pin in the axial direction of the shift lever is prevented, and in a separated state of said stopper and said shift lock plate, movement of said shift lock plate is due to movement of the grooved pin in the axial direction of the shift lever is possible and movement of the grooved pin in the axial direction of the shift lever is permitted;

stopper driving means for driving said stopper;

a detecting switch engaging with said shift lock plate and detecting whether the shift lever is in the P position on the basis of a position of movement of said shift lock plate;

power input connector pins formed at power input terminals of said stopper driving means; and

signal output connector pins formed at signal output terminals of said detecting switch, and said detecting switch and said shift lock plate engage, and said signal output connector pins are positioned in a row with said power input connector pins, and said signal output connector pins together with said power input connector pins are fit with a single female-type connector at wiring between said stopper driving means as well as said detecting switch, and a shift lock controller which controls said stopper driving means to prevent shifting of the P position to another position when a brake pedal is not depressed.

5,593,012

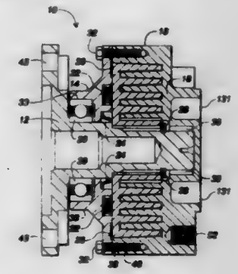
LIMITED FIXED TORQUE SLIP COUPLING

Richard E. Aho, Fort Lauderdale, Fla., assignor to MileMarker, Inc., Pompano Beach, Fla.

Continuation-in-part of Ser. No. 5,562, Jan. 19, 1993, Pat. No. 5,363,948. This application Aug. 2, 1994, Ser. No. 285,023

Int. Cl.[6] F16D *35/00;43/20*

U.S. Cl. 192—56.1 **7 Claims**



1. A limited fixed torque slip coupling for transferring torque from a first rotatable member to a second rotatable member to provide rotation of the first and second rotatable members without substantial relative movement of the members when the torque

exerted upon the coupling does not exceed a predetermined break-away torque, said coupling comprising:

a first rotatable body for mounting on and rotating with the first rotatable member;

a second rotatable body for mounting on and rotating with the second rotatable member;

a plurality of substantially cylindrical substantially concentric first fins extending outwardly from said first rotatable body in an axial direction and defining a plurality of substantially cylindrical substantially concentric cavities;

a plurality of substantially cylindrical substantially concentric second fins extending outwardly from said second rotatable body in an axial direction, each of said second fins being disposed within one of said cavities;

a viscous medium disposed within said cavities for contacting said first and second fins, said viscous medium comprising a viscous fluid having a viscosity sufficiently great so that the first rotatable member and the second rotatable member rotate substantially in unison when the torque exerted upon the coupling is below the break-away torque;

support means associated with said first and second rotatable bodies for maintaining said second fins within said cavities; and

seal means associated with said first and second rotatable bodies and defining a sealed reservoir around said first and second fins for containing said viscous fluid,

first sensing means for sensing the rotational rate of the first rotatable body,

second sensing means for sensing the rotational rate of the second rotatable body,

comparator means for comparing the rotational rate of the first rotatable body sensed by the first sensing means to the rotational rate of the second rotatable body sensed by the second sensing means and for producing a signal corresponding to the difference between the rotational rate of the first rotatable body sensed by the first sensing means as compared to the rotational rate of the second rotatable body sensed by the second sensing means, and

indicator means responsive to one or more signals produced by the comparator means for indicating difference between the rotational rate of the first rotatable body sensed by the first sensing means as compared to the rotational rate of the second rotatable body sensed by the second sensing means.

5,593,013

FLUID COUPLING FOR AN ENGINE

Tsunekazu Yamanochi, Nishikasugai-gun, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1994, Ser. No. 317,656

Claims priority, application Japan, Oct. 1, 1993, 5-247130

Int. Cl.[6] F16D *31/00*

U.S. Cl. 192—58.682 **7 Claims**

1. A fluid coupling for an engine comprising:

a shaft;

a housing rotatably supported on the shaft;

a cover fixed to the housing;

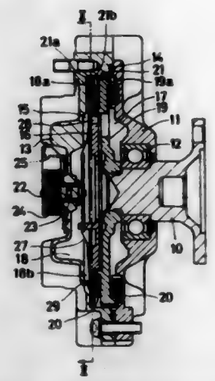
a separation plate which separates a chamber defined by the housing and the cover into a store chamber and an operation chamber;

wherein the store chamber is formed with at least a first store chamber and a second store chamber which are mutually arranged in a circumferential direction of the fluid coupling;

a first opening disposed on the separation plate connecting the first store chamber and the operation chamber;

a second opening disposed on the separation plate connecting the second store chamber and the operation chamber;

valve means for opening and closing the first opening and the second opening; and



a rotor disposed in the operation chamber and fixed on the shaft.

5,593,014

CLUTCH MODULE WITH A PERIPHERALLY THICKENED PRESSURE PLATE

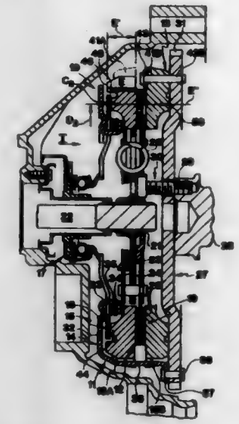
Paolo Viola, Paris, and Michelle Sevennec, St. Germme, both of France, assignors to Valeo, Paris, France

Filed May 24, 1995, Ser. No. 446,599

Claims priority, application France, Sep. 24, 1993, 93 11386

Int. Cl.[6] F16D *13/18*

U.S. Cl. 192—70.18 **6 Claims**



1. A clutch module of the kind comprising a mechanism (11), a clutch friction wheel (12) and a flywheel (13), the mechanism (11) itself comprising a cover plate (14), a diaphragm (15) which bears on the cover plate (14) which has a side wall (36), and a pressure plate (16A) on which the diaphragm (15) engages, while the flywheel (13) comprises a reaction plate (16B) which is substantially comparable in shape to the pressure plate (16A), together with a support plate (27) on which the cover plate (14) is fixed, characterised in that the pressure plate (16A) and the reaction plate (16B) are thicker at their outer periphery than at its inner periphery, and in that the pressure plate (16A) and the reaction plate (16B) have from place to place, in slots (40) formed locally in at least the side wall (36) of the cover plate (14), radial peripheral lugs (41A, 41B) to which circumferentially elongated tongues (43) are attached by fastening means (42A, 42B), with the peripheral edge (47) of the pressure plate (16A) extending over a circumference (C4), the diameter (D4) of which is greater than the diameter (D1)

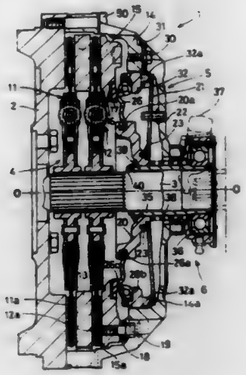
of the circumference (C1) on which the fastening means (42A, 42B) for the tongues (43) are located.

5,593,015

PULL-TYPE CLUTCH PRESSURE PLATE ACTUATING MECHANISM PROVIDING REDUCED-FORCE DISENGAGEMENT

Toshiya Kosumi, Osaka, and Masaaki Asada, Ibaraki, both of Japan, assignors to Exedy Corporation, Osaka, Japan

Filed Aug. 18, 1995, Ser. No. 516,717
Claims priority, application Japan, Aug. 24, 1994, 6-199436
Int. Cl.[6] F16D *13/48;23/14*
U.S. Cl. 192—70.27 **9 Claims**



1. A clutch cover assembly in a pull-type clutch mechanism comprising:
- a clutch cover fixed to a flywheel for rotation therewith;
- at least one pressure plate disposed between said clutch cover and said flywheel;
- a release mechanism having a retaining collar and at least partially disposed on said clutch cover;
- a first spring supported on said clutch cover biasing said retaining collar toward said pressure plate and said flywheel;
- a second spring disposed between said pressure plate and said retaining collar; and
- a plurality of lever mechanisms between said pressure plate and said retaining collar, said lever mechanisms configured for movement in response to axial movement of said retaining collar, said second spring configured for compression in response to movement of said plurality of lever mechanisms such that biasing of said second spring opposes biasing of said first spring, said lever mechanisms providing mechanical advantage in engagement and disengagement of the clutch assembly in accordance with a predetermined lever ratio.

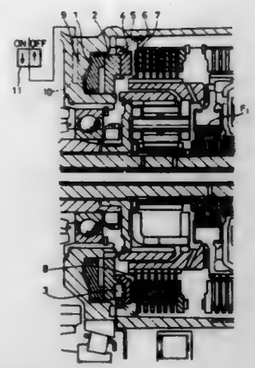
5,593,016

CLUTCH DEVICE FOR AN AUTOMATIC TRANSMISSION

Kiyohito Murata, Susono, and Yoshio Shindo, Numazu, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 6, 1995, Ser. No. 417,765
Claims priority, application Japan, Apr. 7, 1994, 6-069632
Int. Cl.[6] F16D *25/063*
U.S. Cl. 192—85 AA **20 Claims**

1. A clutch device comprising:
- a pair of members spaced on a common axis and relatively rotating around said common axis;



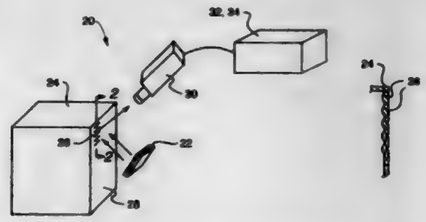
- a variable length coupling means disposed on said common axis between said relatively rotating members having a pair of cam members; and
- a piston means selectively pushing said variable length coupling means toward one of said relatively rotating members, said piston means causing frictional engagement between one end of said variable length coupling means and one of said relatively rotating members so that said cam members relatively rotate and cooperatingly generate a cam force in an axial direction which elongates said variable length coupling means and couples said relatively rotating members;
- wherein said piston means pushes said variable length coupling means even when the direction of said relative rotation of said relatively rotating members is reversed; and
- wherein said cam members have stoppers to limit an axial overall length of said variable length coupling means when said variable length coupling means are fully elongated by said cam force generated by said cam members so as to maintain a clearance between said piston means and said variable length coupling means on that occasion and to receive said cam force caused by oil under pressure supplied to said piston means.

5,593,017

METHOD AND APPARATUS FOR IDENTIFYING INFORMATION CONTAINED IN SURFACE DEVIATIONS

Ken R. Powell, Centreville, and Rusty Driscoll, Leesburg, both of Va., assignors to Environmental Products Corporation, Fairfax, Va.

Filed Mar. 18, 1994, Ser. No. 214,498
Int. Cl.[6] G07F *7/06*
U.S. Cl. 194—212 **23 Claims**



1. A method for identifying information stored in a surface of a container, comprising the steps of:
- introducing the container having predetermined surface deviations to a reading area, the predetermined surface deviations including a plurality of arcs;
- illuminating the container;

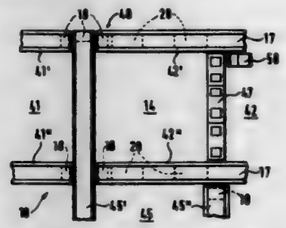
- measuring reflection characteristics of the surface of the container;
- identifying surface deviations by the reflection characteristics of the surface;
- comparing surface deviations to at least one known pattern of surface deviations; and
- determining whether the surface of the container contains identifying information.

5,593,018

APPARATUS FOR SHIFTING WORK CARRIERS

Gerhard Gozdowski, Bietigheim-Bissingen; Werner Arleth, Esslingen, and Peter Ulmer, Urbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 6, 1995, Ser. No. 468,828
Claims priority, application Germany, Aug. 25, 1994, 44 30 159.6
Int. Cl.[6] B65G *37/00*
U.S. Cl. 198—370.1 **7 Claims**



1. An apparatus for shifting work carriers from a feeding conveying path to a further conveying path, said apparatus comprising: a lifting device arranged in a transfer zone for the work carrier and with which the work carrier can be transferred from a feeding conveying path onto a further conveying path, with at least one said conveying path having at least one transport belt having a tight side which serves as a support for the work carrier, and with said lifting device acting on at least one of the transport belts such that, when the lifting device is actuated, the tight side of the transport belt can be lifted and lowered from a first plane into a second plane; and wherein said lifting device has a basic body at least one piston/cylinder unit having a cylinder and a piston, and a pressure piece on which the piston acts, with the pressure piece being able to act on the tight side of the transport belt from the side opposite the bearing surface of the work carrier such that the tight side of the transport belt can be lifted and lowered.

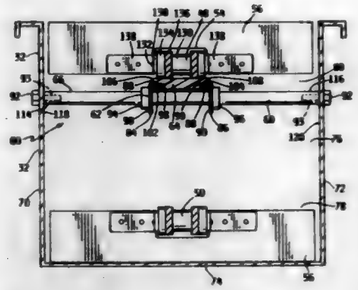
5,593,019

CHAIN RETURN SUPPORT

William A. Schlagel, 300 NW. 97th La., Coon Rapids, Minn. 55433

Filed Jan. 5, 1995, Ser. No. 368,956
Int. Cl.[6] B65G *19/30*
U.S. Cl. 198—721 **20 Claims**

1. A grain conveyor apparatus comprising:
- a) an elongate conveyor trough comprised of two opposing side walls, a bottom wall, a first end, and a second end, the side walls and bottom wall defining an open interior, the open interior having an upper region and a lower region;
- b) a drive sprocket and a tail sprocket, the drive sprocket mounted at the first end of the conveyor trough and the tail sprocket moulded at the second end;
- c) a conveyer chain engaged with the tail sprocket and drive sprocket extending lengthwise in the open interior of the conveyor trough, the chain having a lower conveying section and an upper return section, the chain comprised of a plurality of paddles extending laterally in the open interior for moving the grain;



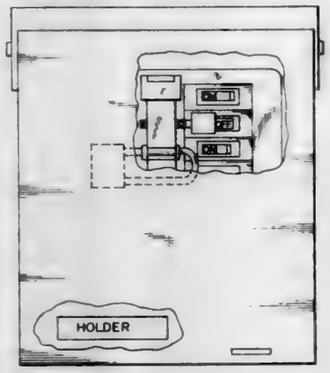
- d) a chain return comprised of
  - i) a track comprised of a pair of inwardly facing horizontal edge portions, the track extending lengthwise in the upper region of the open interior of the trough; and
  - ii) a slide having a prone H-shaped cross-section, the slide comprising two upright sides and a smooth and flat top surface for supporting the return section, the top surface extending continuously between the two upright sides, each of the two sides having an inwardly extending groove sized for receiving one of the edge portions, the edge portions engaged within said grooves whereby the slide and the return section on said slide are supported by the track, the slide engaged with the edge portions; and
- e) a plurality of cross support members bridging the opposing side walls and supporting the track.

5,593,020

APPARATUS FOR LOCKING A CIRCUIT BREAKER, AND METHODS FOR FORMING AND USING SAME

Richard L. Alexander, 2106 Longhorn St., Houston, Tex. 77080

Filed Mar. 7, 1995, Ser. No. 405,590
Int. Cl.[6] H01H *9/28*
U.S. Cl. 200—43.14 **29 Claims**



1. A circuit breaker safety device comprising:
- an elongated base member having a first end and a second end and adapted to be mounted adjacent a column of circuit breakers, said elongated base member having a plurality of parallel spaced transverse grooves; and
- a cover assembly having a first end and a second end hingedly attached by the first end to the elongated base member and having a plurality of transversely extending protrusions, said cover assembly being movable from an open position to a closed position, each protrusion being aligned to be received by a groove of said elongated base member when the cover assembly is in the closed position.

5,593,021

ELECTRIC SWITCH WITH DETECTOR PROBE

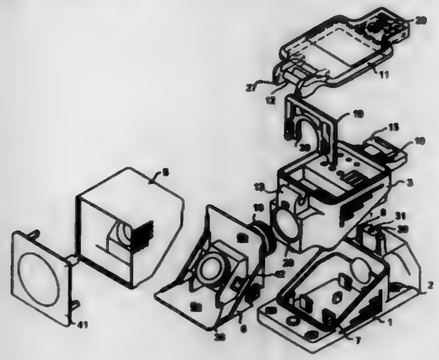
Alfred Ciwierakiki, Cologne, and Rolf Wecke, Porta Westfalica, both of Germany, assignors to Bernstein Senso-Plus GmbH, Bückeburg, and Paintonic Merten GmbH & Co. AG, Wiehl Bomig, both of Germany

Filed Apr. 17, 1995, Ser. No. 423,532

Claims priority, application Germany, Apr. 15, 1994, 44 12 923.8

Int. Cl.[6] H01H *9/02*

U.S. Cl. 200—343 **12 Claims**



1. An electrical switch housing; comprising

a bottom portion and a top portion;

snap-in locking means for detachably connecting said top portion with said bottom portion;

a detector probe with a sensor;

a mounting for accommodating said detector probe with a sensor;

fastening means for rotatably securing said mounting in said top portion; and

a cover snapped onto said top and movable between an open position for allowing access to said top portion and a closed position. said cover having means thereon for securing said locking means in a locking position and for securing said fastening means in place when said cover is in said closed position.

5,593,022

PUSH-AND-TURN LATCHING CONTROL BUTTON, IN PARTICULAR FOR OPERATING AN ELECTRICAL COMPONENT

Maurice Schaeffer, and Alain Chouhroun, both of Strasbourg, France, assignors to B A C O Constructions Electriques Anct. Baumgarten, Strasbourg, France

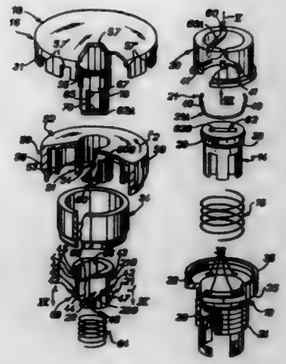
Filed Feb. 3, 1995, Ser. No. 383,230

Claims priority, application France, Feb. 14, 1994, 94 01616

Int. Cl.[6] H01H *3/20*

U.S. Cl. 200—308 **16 Claims**

1. Control button comprising a guide body adapted to be mounted on a support of any kind, a piston adapted to operate an underlying component of any kind and mobile in said guide body against return spring means, a control member mobile axially relative to said guide body between an "out" inoperative position and an "in" operative position and including a head for operation by a user and a spindle for operating said piston, and a retaining ring around said spindle of said control member, fixed axially relative to said guide body and prevented from rotating relative thereto, with, subordinate to said retaining ring, hooking means adapted to hold said control member releasably in its "in" position in respect to action applied thereto and cam means adapted to return said control member to an original angular position when released after being turned in its "in" position to disengage said hooking means, said control member being associated with a position indicator mobile between a retracted position when said control member is in its "out" position and a deployed position when said control member is in its "in" position and at least a portion of the control member being concealed in its retracted position and being revealed in its deployed position, said position indicator being rotatable about said spindle of said control member and including a hub disposed around and rotating on said spindle of said control member and keyed axially thereto, and a flange disposed under said head of said control member, said head of said control member having at least one localized opening in a path of movement of said flange.



5,593,023

ROTATIVELY-OPERATED ELECTRONIC COMPONENT WITH PUSH SWITCH

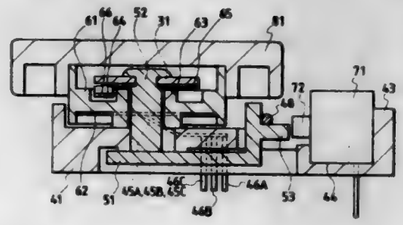
Keiji Kaizaki, Osaka; Tamotsu Yamamoto, Ashiya; Shigeru Yokoji, Osaka; Hiroto Inoue, Kyoto, and Hiroshi Matsui, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 9, 1996, Ser. No. 598,809

Claims priority, application Japan, Jun. 22, 1995, 7-155914

Int. Cl.[6] H01H *19/20*

U.S. Cl. 200—570 **6 Claims**



1. A rotatively-operated electronic component with a push switch, comprising:

a rotatable operation knob;

a rotary contact plate connected to the operation knob for motion about a first axis together with the operation knob;

an attachment base plate;

resilient contact arms provided on the attachment base plate and contacting the rotary contact plate, the resilient contact arms and the contact plate cooperating to generate at least one electric signal in response to rotation of the operation knob;

a drive member connected to the attachment base plate and rotatably supporting the rotary contact plate, the drive member being swingable relative to the attachment base plate about a second axis;

means for allowing the drive member to swing relative to the attachment base plate about said second axis by application of a force to the operation knob;

a push switch portion supported on the attachment base plate; and

means for actuating the push switch portion in response to swing of the drive member relative to the attachment base plate by the application of the force to the operation knob.

5,593,024

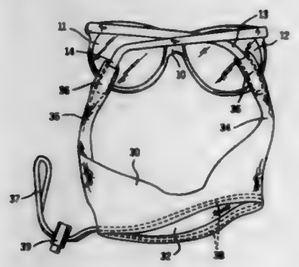
EYEGLASS RETAINER AND PROTECTIVE COVER

Douglas A. Seiler, San Rafael, Calif., assignor to Shaun Brannon, San Francisco, Calif.

Continuation of Ser. No. 375,500, Jan. 19, 1995, abandoned. This application Apr. 16, 1996, Ser. No. 632,761

Int. Cl.[6] A45C *11/04*; G02C *3/00*

U.S. Cl. 206—5 **14 Claims**



1. A device for retaining and covering eyeglasses of the type having a frame for mounting lenses and a pair of stems coupled to the frame for holding the eyeglasses on the head of a user, the device comprising:

means for selectively covering the eyeglasses, including the frame and stems, wherein the covering means is fabricated from fabric and includes front and rear panels joined along an edge to form a pouch, the panels of the pouch being separate along a portion of the edge to form an aperture through which the eyeglasses may be inserted into the pouch and removed therefrom;

means for selectively positively closing the aperture along the edge and for preventing eyeglasses from escaping the covering means; and

means for coupling the covering means to the eyeglasses, whereby the eyeglasses may be selectively covered and uncovered while coupled to the coupling means.

5,593,025

FOLDABLE JEWELRY CARD

Jeffrey A. Feibelman, East Greenwich, R.I., assignor to Display Technologies, Inc., Johnston, R.I.

Filed Dec. 15, 1995, Ser. No. 573,396

Int. Cl.[6] A45C *11/04*

U.S. Cl. 206—6.1 **8 Claims**

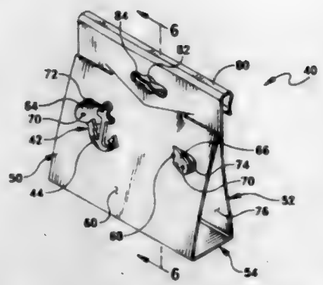
8. A foldable jewelry card for securing thereto at least one article of jewelry comprising:

a front panel having a lower edge, an upper edge, a forwardly facing surface and a rearwardly facing surface, said front panel further having means for securing at least one article of jewelry in a position in front of the forwardly facing surface, and a tab portion formed along the upper edge;

an intermediate panel hingedly connected to the front panel along the lower edge of the front panel; and

a rear panel having a lower edge hingedly connected to the intermediate panel, an upper edge, a forwardly facing surface, a rearwardly facing surface, and means for supporting said card on a hanger, said rear panel further having a slit formed therein, said slit extending in a widthwise dimension generally parallel to the widthwise dimension of the card,

wherein said tab portion is received within the slit of the rear panel in such a manner that the tab portion extends from the forwardly facing surface of the rear panel to the rearwardly facing surface thereof.



5,593,026

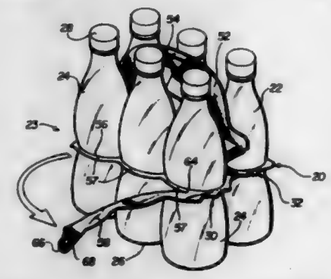
RING CONTAINER MULTIPACK WITH PERFORATED TEAR STRIP FOR CONTAINER REMOVAL

James A. Bronkow, Buffalo Grove, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 21, 1995, Ser. No. 391,137

Int. Cl.[6] B65D *71/50*

U.S. Cl. 206—150 **10 Claims**



1. A planar sheet material carrier for carrying a plurality of containers comprising: a container engaging portion comprising a row of a plurality of continuous annular bands defining a plurality of spaced apart apertures through said bands for holding containers therein, each of said bands having an inner margin portion, an outer margin portion and opposite side margin portions between said inner and outer margin portions, said outer margin portions of adjacent bands in said row being joined together and said side margin portions of adjacent bands in said row being joined together; each of said outer margin portions of said bands having a first portion, a second portion and separating means between said first and second portions for selectively separating the second portion of the outer margin portions from the first portions of the outer margin portions, said first portions of the outer margin portions being continuous after predetermined ones of said second portions have been separated from said first portions of said outer margin portions for retaining containers in said respective annular bands when containers are assembled with the carrier.

8. A package comprising: a carrier and a plurality of containers having side walls, said carrier comprising side by side container engaging portions, each container engaging portion comprising a plurality of bands defining spaced apart apertures through said bands, said bands engaging the side walls of the containers to hold the containers therein, each of said bands having an inner margin

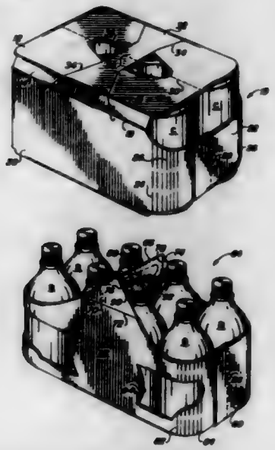
portion, an outer margin portion and side margin portions between said inner and outer margin portions, said inner margin portions of adjacent bands of each container engaging portion being joined together and to adjacent inner bands of the other of said container engaging portions, and said side margin portions of adjacent bands being joined together; said outer margin portions of said bands on each of said container engaging portions having a first portion, a second portion and a perforation line between said first and second portions for selectively separating predetermined ones of said second portions of said outer margin portions from the first portions of the outer margin portions, said first portions of the outer margin portion forming a narrow, continuous web along the carrier after said predetermined ones of said second portions have been separated from said first portions of said outer margin portions to maintain said containers in said package, said narrow, continuous web being selectively rupturable through leveraging said containers against adjacent containers.

5,593,027

CARRIER WITH PREFORMED END PANELS

Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Oct. 10, 1995, Ser. No. 541,355
Int. Cl.[6] B65D *71/36*
U.S. Cl. 206—170 **14 Claims**



1. An article carrier, comprising:
a pair of spaced substantially parallel side panels;
a pair of spaced end panels connected to the side panels;
a bottom panel connected to the side panels; and
a handle connected to and extending between the side panels;
the handle and each of the end panels including a fold line lying in a common plane which is substantially parallel to and spaced an equidistant amount from the side panels, whereby the carrier can be formed from a collapsed state in which the handle and the end panels are folded about said fold lines.

10. A collapsed article carrier, comprising:
a pair of side panels in overlying face-to-face relationship, each side panel having an upper edge and a lower edge;
a pair of end panels, each end panel being connected to adjacent ends of the side panels and being divided into substantially equal halves by a fold line, the end panels being folded about said fold line so that each end panel half overlies and is in face-to-face relationship with the other associated end panel half;
a bottom panel flap connected to the lower edge of at least one of the side panels;
a handle having opposite ends, each end being connected to the upper edge of one of the side panels;
the handle being divided into substantially equal halves by a fold line extending at substantially right angles to the fold lines of the end panels, the handle being folded about said handle fold line so that each half of the handle overlies and is in face-to-face relationship with the other handle half; and
means for allowing the handle to be readily gripped when a carrier formed from the collapsed carrier is lifted by the handle.

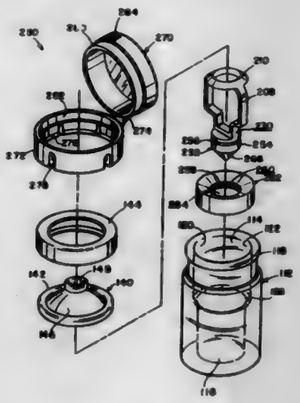
13. A blank for forming an article carrier, comprising:
a centrally located handle having opposite end portions;
a side panel section connected by fold line to each handle end portion;
a bottom panel flap connected to at least one of the side panel sections by a fold line extending substantially parallel to the fold line connecting the side panel to the handle;
an end panel flap connected to opposite ends of each side panel section;
the handle being divided into substantially equal halves by a fold line extending substantially parallel to the fold lines connecting the handle to the side panel sections;
a glue flap connected by a fold line to two of the end panel flaps, the glue flap fold lines extending at substantially right angles to the handle fold line, each glue flap being on opposite sides of the handle; and
means for allowing the handle of a carrier formed from the blank to be readily gripped when the carrier is lifted by the handle.

5,593,028

MULTI-PHARMACEUTICAL STORAGE, MIXING AND DISPENSING VIAL

Terry M. Haber, Lake Forest; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Continuation-in-part of Ser. No. 97,300, Jul. 26, 1993, abandoned, and a continuation-in-part of Ser. No. 89,900, Jul. 9, 1993, abandoned, and a continuation-in-part of Ser. No. 87,152, Jul. 2, 1993, Pat. No. 5,335,773. This application Aug. 17, 1993, Ser. No. 108,458
Int. Cl.[6] B65D *25/08*
U.S. Cl. 206—221 **35 Claims**



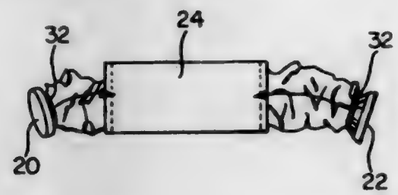
1. A pharmaceutical storage, mixing and dispensing vial, for storing first and second pharmaceutical components, mixing the pharmaceutical components and then providing access to the mixed pharmaceutical by a needle cannula, at least one of the first and second pharmaceutical components being a liquid component, the vial comprising:
a container having an inner wall and an open end;
a needle-pierceable access member having an outer region secured to the open end of the container so to create a sealed interior defined by the inner wall and the access member, said access member being deflectable inwardly into said interior from a first position to a second position;
a barrier within said interior defining said interior into first and second interior regions housing the first and second pharmaceutical components;
the barrier including an elastomeric seal ring positioned at a fixed location against the inner wall and having an internal surface defining a central opening and a plug removably positioned within the central opening for movement between sealed and unsealed positions; and
a mechanical element, physically coupling the access member and the plug, configured so that movement of the access member from the first position to the second position moves the plug from the sealed position to the unsealed position thereby fluid coupling the first and second interior regions, the mechanical element including first and second spaced-apart arms and a ring from which the arms extend, the ring positioned opposite the access member.

5,593,029

SHIRT PACKED IN A CAN-LIKE ARRANGEMENT FOR PRESENTATION

Walter Both, Süderweg 9, 24997 Wanderup, Germany

Filed May 14, 1996, Ser. No. 645,948
Int. Cl.[6] B65D *85/18*
U.S. Cl. 206—278 **7 Claims**



1. A shirt in a can-shaped presentation arrangement, comprising:
a tube-shaped stabilizing element (**10**) having an outer side and two open ends (**12**, **14**).
two lid-shaped end elements (**20**, **22**) fixed on said open ends of said tube-shaped stabilizing element (**10**), and
fixing devices (**32**) for fixing areas of said shirt around said lid-shaped end elements (**20**, **22**).
a middle area of said shirt being rolled onto said outer side of said tube-shaped stabilizing element (**10**), and
additional areas of said shirt extending beyond said open ends of said tube-shaped stabilizing element (**10**) and being positioned within said tube-shaped stabilizing element (**10**).

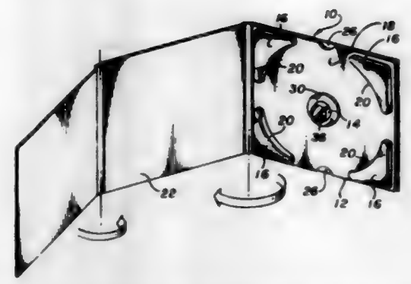
5,593,030

COMPACT DISC HOLDER

Richard B. Tell, 3216 Selby Ave., Los Angeles, Calif. 90034

Filed May 19, 1995, Ser. No. 444,444
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **20 Claims**

1. A disk holder for holding a disk having a mounting hole, comprising:
a substantially planar panel and a hub projecting outwardly from the panel, both the panel and the hub being comprised of paper material, wherein the hub comprises a substantially annular sidewall that projects outwardly from the panel and curves radially inward terminating in a raised top wall, the sidewall and the top wall together defining a cavity under the hub, whereby the hub is adapted to elastically deform radially inward and releasably hold the disk when the hub is received through the mounting hole.



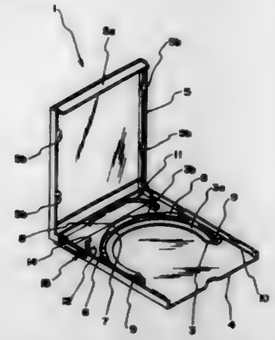
10. A disk holder for holding a compact disk having a mounting hole, wherein the disk holder is constructed entirely from paper material, the disk holder comprising:
a substantially planar panel and a hub projecting outwardly from the panel, wherein the hub comprises an elastically deformable annular sidewall that extends radially about an axis transverse to the planar panel and curves radially inward terminating in a raised top wall, with a slot extending diametrically across the hub, the sidewall and the top wall defining a cavity under the hub such that, in cooperation with the slot, the hub is adapted to exhibit elastic properties and deform radially inward to pass through the disk mounting hole and releasably hold the disk.

12. A disk holder for holding a compact disk having a mounting hole, wherein the disk holder is constructed entirely from paper material, the disk holder comprising:
a substantially planar panel and a hub projecting outwardly from the panel, wherein the hub comprises an elastically deformable annular sidewall that tapers radially inward, the sidewall having a bottom end connected to the panel and a top end extending outwardly from the panel, wherein the top end of the sidewall has an opening and the bottom end of the sidewall is substantially closed by a bottom wall, the sidewall defining a space within the hub such that the sidewall is adapted to exhibit elastic properties and to elastically deform radially inward to pass through disk mounting hole and to releasably hold the disk.

14. A disk holder for holding a compact disk having a mounting hole, wherein the disk holder is constructed entirely from paper material, the disk holder comprising:
a substantially planar panel and a hub projecting outwardly from the panel, wherein the hub comprises an elastically deformable continuous annular sidewall having a bottom end connected to the panel and a top end extending outwardly from the panel, wherein the hub has an opening at the top end that has a diameter smaller than an opening at the bottom end, the sidewall defining a space within the hub such that the sidewall is adapted to exhibit elastic properties and deform radially inward to pass through the mounting hole and to releasably hold the disk.

16. A disk holder for holding a compact disk having a mounting hole, wherein the disk holder is constructed entirely from paper material, the disk holder comprising:
a substantially planar panel and a hub projecting outwardly from the panel, wherein the hub comprises an elastically deformable sidewall having a bottom end connected to the panel and a top end exteading outwardly from the panel, and a plurality of notches in the sidewall at the top end of the sidewall, the sidewall defining a space within the hub such that the sidewall is adapted to exhibit elastic properties and deform radially inward to pass through the disk mounting hole and to releasable hold the disk.

5,593,031
DISC ACCOMMODATION DEVICE INCLUDING MOVABLE DISC HOLDER
Hiromichi Uchida, Tokyo, Japan, assignor to Toyo Chemical Co., Ltd., Tokyo, Japan
Filed Jun. 21, 1995, Ser. No. 493,308
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 5 Claims



1. A disc accommodation device capable of storing therein a disc and capable selectively of two-handed manual manipulation to enable manual insertion therein and removal therefrom of the disc and one-handed manual manipulation to insert the disc therein and to remove the disc therefrom directly into a disc player, said device comprising:
a flat box-shaped casing having an interior;
a disc holder located in said interior of said casing, said disc holder having therein a recess and a shoulder outwardly of said recess and configured to enable the disc to be accommodated within said recess and supported therein solely by a peripheral edge portion of the disc resting on said shoulder;
said casing including a base part having first and second opposite ends and a lid having first and second opposite ends, said disc holder being accommodated in said base part with said recess and said shoulder being directed toward said lid;
said first end of said lid being hinged to said first end of said base part such that said lid is pivotable with respect to said base part between a closed position, whereat said second end of said lid is adjacent said second end of said base part, and an open position, whereat said second end of said lid is swung away and spaced from said second end of said base part, said first ends of said base part and said lid defining a closed first end of said casing, and said second ends of said base part and said lid defining therebetween, when said lid is in said closed position, an opening in a second end of said casing;
said disc holder being mounted in said base part for rectilinear movement relative thereto in opposite directions toward and away from said closed first end of said casing between an inserted position, whereat said disc holder is located entirely within said interior of said casing, and a projected position, whereat said disc holder is partially extended through said opening in said second end of said casing;
a spring member operable between said closed first end of said casing and said disc holder to urge said disc holder toward said projected position;
a lock operable to lock said disc holder in said inserted position against the spring force of said spring member, said lock comprising a raised portion extending inwardly from an inner surface of said base part and a lock portion on said disc holder at a position to abut said raised portion upon said spring force urging said disc holder to move from said inserted position;
a lock release operable to release said lock to enable said spring force to move said disc holder from said inserted position to said projected position, said lock release comprising a push member located at a side of said base part and movable inwardly thereof to move said lock portion out of abutment with said raised portion;
stoppers on an end of said disc holder directed toward said opening adjacent opposite sides of said recess and operable to prevent unintended displacement of the disc in said recess in a direction toward said opening; and
a retainer on said disc holder at an end of said recess spaced from said opening and operable to prevent unintended displacement of the disc in said recess in a direction toward said lid;
whereby two-handed manual manipulation of said device enables said lid to be pivoted relative to said base part from said closed position to said open position, whereat the disc can be manually inserted into or removed from said recess; and
whereby, when said lid is in said closed position, one-handed manual manipulation enables said push member to be moved inwardly to move said lock portion out of abutment with said raised portion such that said spring force of said spring member moves said disc holder to said extended position.

5,593,032
DISC RETAINER DEVICE
Leland Staley, 212 Liberty St., Rock Springs, Wyo. 82901
Filed Mar. 23, 1995, Ser. No. 409,357
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—309 13 Claims

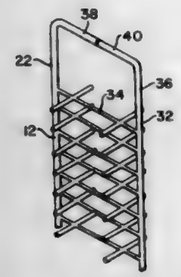


1. A disc retainer device comprising:
a leaf having opposing surfaces defining a thickness of selected dimension therebetween;
a non-linear channel formed through said thickness of said leaf and having a length extending between a first end and a second end and configured to retainingly receive a substantially flat edge of a disc, said channel having a first lip and a second lip;
a void formed through said thickness of said leaf along said length of said channel and between said first end and said second end;
an opening defined between said first end and said second end of said channel sized to receive a disc;
opposing contact ledges formed in said first lip of said channel and spaced a distance from said first end and said second end of said channel, said opposing contact ledges being spaced apart from each other a distance sufficient to receive a disc therebetween and configured to position a disc thereagainst in non-parallel orientation to said channel; and
at least one edge engaging means positioned within said channel for securely engaging said flat edge within said channel.

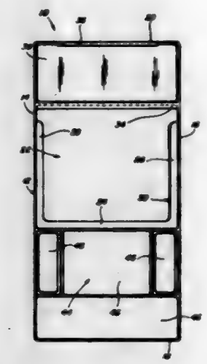
6. A retainer device for holding round, flat discs therein in secure engagement comprising:
a flat plate having a periphery and opposing sides defining a thickness therebetween;
at least one U-shaped channel formed through said flat plate parallel to said opposing sides and sized to receive a flat disc, said at least one channel having a first lip and a second lip, said first lip having a first end and a second end spaced a distance from said periphery of said flat plate and said second lip having a first end and a second end positioned at said periphery of said plate;

a void formed through said thickness of said flat plate positioned about said channel;
two opposing and aligned ledges formed by said first end and said second end of said first lip; and
at least one engagement means positioned in said at least one channel for engaging an edge positioned in said at least one channel.

5,593,033
CLIP OF ATTACHMENTS
Steven Kunreuther, 285 Central Park West, New York, N.Y. 10024
Division of Ser. No. 261,925, Jun. 17, 1994, Pat. No. 5,417,325, which is a division of Ser. No. 194,996, Feb. 14, 1994, Pat. No. 5,405,070, which is a division of Ser. No. 10,836, Jan. 29, 1993, Pat. No. 5,339,954. This application Feb. 3, 1995, Ser. No. 383,183
Int. Cl.[6] A44B *9/00*; B65D *85/24*; G09F *3/12*
U.S. Cl. 206—346 8 Claims



1. In combination, a clip of attachments and an apparatus for dispensing said attachments, one at a time, through spaced hollow needles mounted on a housing, said housing having a surface and a channel for receiving said clip extending through said housing and opening at said surface, said clip comprising a first attachment and a last attachment and first and second connecting bars each comprising a main section extending between said first and last attachments, said attachments being mounted in spaced relation between said main sections of said connecting bars, each of said attachments comprising a first "T" bar end adapted to be dispensed through one of said needles and a second "T" bar end adapted to be dispensed through the other of said needles, said first and second "T" bar ends being connected by a filament, said clip being received within and advanced along said channel to bring each attachment, in turn in alignment with said needles, said housing surface being spaced from said needles, each of said connecting bars comprising a part extending outwardly beyond said main section at a first end thereof a distance greater than the distance along said channel between said needles and said surface of the housing, such that said extending parts are accessible from the exterior of said housing when said last attachment is aligned with said needles.

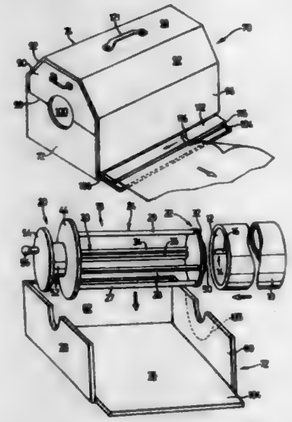


a card having a length and a height; and
a display compartment for displaying the card, the display compartment comprising a pair of side walls, an end wall, a bottom wall portion, and a top clip portion formed integrally with the end wall, the top clip portion adapted to receive and hold the card, and the top clip portion extending along substantially the entire end wall.

5,593,034
PRE-RECORDED MEDIA PACKAGE AND DISPLAY
Neal R. Zeld, 11869 Featherwood Dr., St. Louis, Mo. 63146
Continuation of Ser. No. 159,767, Nov. 30, 1993, abandoned, which is a continuation of Ser. No. 941,156, Sep. 4, 1992, abandoned. This application May 30, 1995, Ser. No. 453,346
Int. Cl.[6] B65D *85/672*
U.S. Cl. 206—387.11 2 Claims

1. A reusable package and display construction for storing a pre-recorded media and displaying a card, the construction comprising:
a plastic housing having a storage compartment;

5,593,035
PROTECTIVE CASE FOR ROLLS OF SHEET MATERIAL
Peter M. Taylor, 39 Olivers Lane, Caledon East, Ontario, Canada, and David G. Roylance, 18 DeRose Ave., Bolton, Ontario, Canada
Filed Mar. 8, 1996, Ser. No. 613,141
Int. Cl.[6] B65D *85/672*
U.S. Cl. 206—397 10 Claims



1. An apparatus for protecting, transporting and dispensing standardized rolls of sheet material of the kind having an open centre core, and an inner end which is bent sharply inwardly so as to project into the open core and define a tang transverse to the roll, the apparatus comprising:
an elongate mandrel which includes two opposed end structures and an intermediate structure bridging between the end structures, the intermediate structure and one end structure being shaped and sized so as to permit the mandrel to be inserted into the open centre core of a standardized roll from one end thereof, recess means on said intermediate structure for receiving said tang, the other end structure including a part

that abuts one end of a standardized roll, thus preventing said other end structure from entering the open centre core,

a housing sized to receive, surround and protect the mandrel when the mandrel is inserted into a standardized roll,

bearing means mounting said mandrel for rotation with respect to said housing,

access means on the housing through which an end of a roll of material on the mandrel can be drawn out of the housing while the mandrel rotates,

crank means accessible from outside the housing by which the mandrel can be positively rotated, and

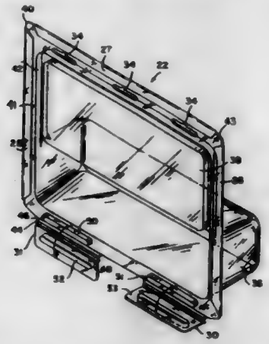
protective mens operatively associated with said one end structure to protect the corresponding end of a roll against damage during mandrel rotation.

5,593,036

LOCKING PACKAGE

Richard J. Dyble, and Timothy M. Stirnael, both of Janesville, Wis., assignors to Panoramic, Inc., Janesville, Wis.

Filed Nov. 2, 1995, Ser. No. 552,057
Int. Cl.[6] B65D *73/00*
U.S. Cl. 206—464 **19 Claims**



1. A locking package, comprising:

(a) a product holding member including a product holding portion, and a pair of flanges on opposite sides of the product holding member, each flange forming a channel for retaining a graphics card;

(b) a graphics card slid into the channels formed by the flanges and having an internal edge defining a locking hole; and

(c) locking means for securing the graphics card to the product holding member to close the product holding portion to form a closed product holding chamber, the locking means being attached to the product holding member and including means for engaging the graphics card by passing through the locking hole, wherein the locking means is a hinged snap including a first raised snap portion and a second raised snap portion, the first and second raised snap portions separated by a snap hinge and arranged such that when the hinged snap is folded over at the snap hinge the first raised portion and Second raised portion are interlocked and a ode of the first or second raised portions passes through the graphics card locking hole to engage the graphics card.

14. A product holding member for a locking package, comprising:

(a) a product holding portion;

(b) a pair of foldover flanges on opposite sides of the product holding member formed by folded over portions of the product holding member and forming graphics card retaining channels on opposite sides of the product holding member; and

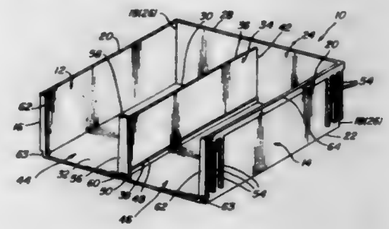
(c) a hinged snap lock including a first raised snap portion and a second raised snap portion, the first and second raised snap portions separated by a snap hinge and arranged such that when the hinged snap lock is folded over at the snap hinge the first raised portion and second raised portion are interlocked.

5,593,037

STACKABLE BINS

Abraham Ohayon, 1345 E. 38 St., Brooklyn, N.Y. 11234

Filed Sep. 1, 1995, Ser. No. 522,601
Int. Cl.[6] B65D *1/24;1/34;1/36;21/032*
U.S. Cl. 206—509 **6 Claims**



1. A stackable bin comprising:

two spaced apart side walls, each having a front edge, a rear edge, an upper edge and a lower edge;

a rear wall having opposite side edges connecting said rear edges of said side walls together, and said rear wall further having an upper edge and a lower edge;

said side walls and said rear wall being slightly inclined inwardly with respect to a vertical plane from the upper edge to the lower edge thereof such that the lower edges of said side walls and a rear wall of a second said stackable bin fit within the upper edges of said side walls and said rear wall to form a supporting stackable arrangement therewith;

a bottom wall connected to lower portions of said side walls and said rear wall;

a partition wall extending generally parallel to said side walls and extending therebetween, said partition wall including an upper edge, a lower edge connected with said bottom wall, a front face and a rear face connected with said rear wall;

a first compartment defined by one said side wall, said rear wall, said bottom wall and said partition wall;

a second compartment defined by the other said side wall, said rear wall, said bottom wall and said partition wall;

said first and second compartments being open at front ends thereof defined between front edges of said partition wall and respective said side walls; and

a channel extending parallel to and in alignment with said partition wall, and formed at an underside of said bottom wall, for receiving the upper edge of a partition wall of a third said stackable bin therein to form a supporting stackable arrangement therewith; and

means for preventing forward sliding movement of said stackable bin when stacked on said third stackable bin, said means for preventing forward sliding movement of said stackable bin including:

an elongated post formed at the front face of said partition wall and extending from said bottom wall to a position above the upper edge of said partition wall so as to define a post extension, and

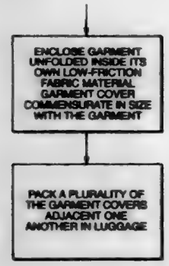
a recess at a lower end of said elongated post for receiving a post extension of said third stackable bin to thereby prevent forward sliding movement of said stackable bin in relation to said third stackable bin.

5,593,038

WRINKLE PREVENTING METHOD OF PACKING GARMENTS FOR TRANSPORTATION OR STORAGE

John Lyon, 1013 Baquera Ct., Roseville, Calif. 95678

Filed Jan. 30, 1995, Ser. No. 380,827
Int. Cl.[6] B65B *5/00;* **B65D** *85/18;* **A45C** *11/00*
U.S. Cl. 206—527 **1 Claim**



1. A method of packing garments for transportation or storage comprising

enclosing unfolded each garment inside its own garment cover, the garment cover commensurate in size with the garment and the garment cover formed from a low-friction fabric material, and

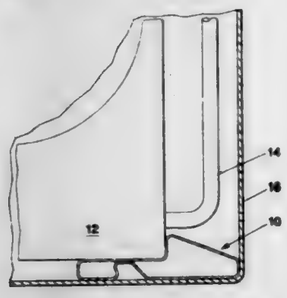
packing the garment covers adjacent one another in luggage, whereby friction between the garments is reduced so that fewer wrinkles in the garments occur when they are transported or stored.

5,593,039

CORNER POST FOR PACKAGING SYSTEM

Orlen J. Ortlieb, Antioch, Tenn., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 22, 1995, Ser. No. 562,027
Int. Cl.[6] B65D *81/02*
U.S. Cl. 206—586 **5 Claims**



1. A corner support post for a product packaging system, said post having a length and a width defined by substantially coextensive first and second side walls laterally spaced from each other with a space therebetween, said post, across the width thereof, comprising first and second transversely aligned sections substantially coextensive along the length of said post, said first and second side walls having opposed longitudinal edges, first and second transverse end walls joining corresponding edges of said side walls and defining a first transverse outer end on said first section and a second transverse outer end on said second section, at least one bead integrally defined solely from one of said first and second side walls along the length of said first section, said bead extending from said one of said first and second side walls across said space and toward engagement with a second one of said first and second side walls in said first section, said space being interrupted solely by said bead, said bead, under predetermined compressive loading, resisting collapse of said side walls inward toward each other, said bead, upon compressive loading greater than said predetermined compressive loading, folding upon itself and defining multiple layers between said side walls, said first side wall being substantially planar for the width of said post, said first and second side walls being substantially parallel for the width of said first section, said second section including a shoulder thereon between said first and second outer ends and inward from said first end and toward said second end beyond a point of engagement of said bead with said second of said side walls, said bead extending at an angle inclined relative to said second section, said shoulder comprising a shoulder-defining portion of said second side wall extending laterally from that portion of said second side wall within said first section and defining a substantially right angle therewith, said shoulder-defining portion, at the outer extent thereof, being integral with a remaining portion of the width of said second side wall extending to said second transverse end wall, said remaining portion of said second side wall between said shoulder and said second end wall being planar, inclined at an acute angle to said shoulder and adapted to transmit compressive forces from said second end wall to a packaged product spaced from a corresponding corner of the product.

5,593,040

ROTARY CLIP FOR SOLDER PALLET

Gary R. Shelton, Greentown, and Kyle R. Street, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 4, 1995, Ser. No. 566,750
Int. Cl.[6] B65D *73/02;* **H01B** *17/56*
U.S. Cl. 206—706 **8 Claims**



1. In a solder pallet for holding a circuit board for processing; a rotary clip for receiving and holding the board comprising:

a disk having a central axis;

means for mounting the disk for rotary motion about the axis;

a notch in the disk periphery for receiving an edge of a circuit board;

detent means for holding the disk in either of first and second positions, the first position aligning the notch for receiving the circuit board and the second position for holding the board, whereby insertion of the board into the notch while in first position effects rotation of the disk to second position.

5,593,041

COMBINATION ARTICLE AND PACKAGE CONSTRUCTION

Lee Caporzi, Ridgefield, N.J., assignor to Dan-Dee International Limited, Jersey City, N.J.

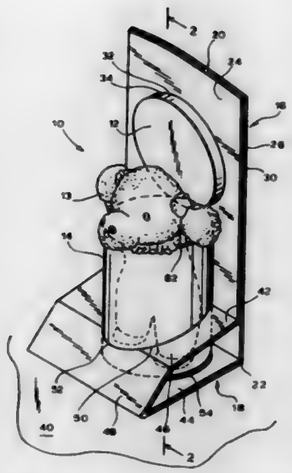
Filed Jun. 8, 1995, Ser. No. 488,587
Int. Cl.[6] B65D *73/00*
U.S. Cl. 206—784 **8 Claims**

1. A display package, comprising

a first article to be displayed;

a second article to be displayed;

a back wall having a top end, a bottom end, a front surface defined by a first panel, a rear surface defined by a second panel, a first display means for displaying said first article and holding said first article in place relative to said display package, said first display means comprising an aperture



defined in said first panel for receiving at least a portion of said first article and holding said first article in place by positioning at least a portion of said first article between said first panel and said second panel;

a base connected to said back wall, said base comprising a top panel, a bottom panel, and a second display means for displaying said second article and holding said second article in place relative to said display package, said second display means comprising an aperture defined in said base top panel for receiving at least a portion of said second article, such that said first article and said second article are displayed together in a complimentary fashion; and

support means for supporting said back wall in a substantially perpendicular orientation relative to said bottom panel of said base, said support means adapted for engaging a portion of said second article.

5,593,042

QUALITY-CONTROL SIEVE AND METHOD OF USING IT

Alois Keller, Uzwil, Switzerland, assignor to Bühler AG, Switzerland

PCT No. PCT/CH94/00053, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/20228, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 11, 1994, Ser. No. 335,732

Claims priority, application Germany, Mar. 12, 1993, 43 07 789.7

Int. Cl.[6] B07B *1/18*

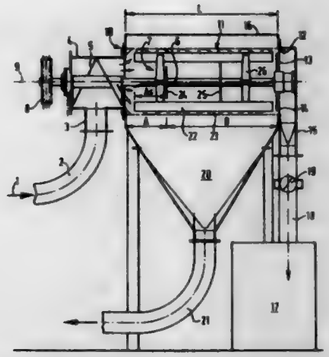
U.S. Cl. 209—261 **15 Claims**

1. A screen apparatus to be used in a pneumatic material feed system comprising:

a screen housing having an inlet;

a cylindrical screen shell disposed within the screen housing; and

a centrifuging rotor rotatably positioned within the cylindrical screen shell, the centrifuging rotor rotating about an axis and having a plurality of centrifuging bars extending along a substantial portion of the cylindrical screen shell, the centrifuging bars having a plurality of radially projecting conveying and cleaning lobes, the lobes being disposed in the vicinity of the screen shell and having a longitudinal spacing relative to one another along the same centrifuging bar and offset relative to the lobes on an adjacent centrifuging bar to helically move the material through the apparatus.



5,593,043

ROTOR FOR MECHANICAL AIR CLASSIFIERS

Levent Özmerih, Trondheim, Norway, assignor to Sinvent A/S, Trondheim, Norway

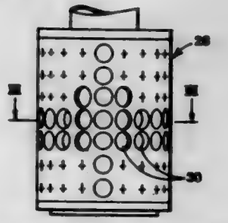
PCT No. PCT/NO93/00179, § 371 Date Jul. 19, 1995, § 102(e) Date Jul. 19, 1995, PCT Pub. No. WO94/12290, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 30, 1993, Ser. No. 448,415

Claims priority, application Norway, Dec. 1, 1992, 924635

Int. Cl.[6] B07B *1/22*

U.S. Cl. 209—303 **4 Claims**



1. Rotor for mechanical classifier apparatus for classifying particulate materials composed of a mixture of particles of various sizes, the mechanical classifier comprising a housing with a chamber, a hollow rotor disposed in the chamber and journalled for rotation about an axis, the rotor being an axially-symmetrical body with a circumferential wall, the wall defining a pattern of inlet openings for classified material, the material to be classified being imported into the chamber through inlet openings together with air subjected to certain excess pressure, resulting in that the air together with the classified part of the material composed of finer particles is sucked into the inside space of the rotor and from there is conveyed axially out of the rotor and thereby is discharged from the classifying apparatus, while the part of the material which substantially consists of coarser particles by gravity falls down to a lower part of the chamber and from there is discharged out of the housing,

characterized in that the openings in the rotor wall are substantially circular, square, quadrangular, rectangular, or polygonal, and in that the radial thickness of the rotor wall is larger than the diameter of the circular openings, or at least larger than the smallest transverse dimension of the other opening configurations, and

further characterized in that the relationship between the shortest and the longest side of axis of the openings are defined with the following formula:

$$L/W=30/W+1.5$$

for all values of L/W which are smaller than or equal to 4.0, where:

L/W is the relationship between length and width of the openings in the rotor, respectively, and

W (width) is the dimension in millimeters of the shortest side or along the shortest axis of the opening or openings in the rotor, and

L (length) is the dimension in millimeters of the longest side or along the longest axis of the opening or openings in the rotor.

5,593,044

APPARATUS FOR SORTING SHEETS OR THE LIKE

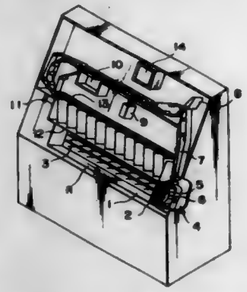
Taichiro Yamashita; Yasunori Hamada, both of Tsuchiura; Kazushi Yoshida, Ibaraki-ken; Tadashi Osaka, Ibaraki-ken, and Junichi Tanamoto, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,877

Claims priority, application Japan, Dec. 28, 1993, 5-334947

Int. Cl.[6] B07C *5/36*; B65H *85/00*

U.S. Cl. 209—584 **17 Claims**



1. An apparatus for sorting sheet-like items having address codes thereon, each sheet-like item having a top edge, a bottom edge, a first side edge, and a second side edge, said apparatus comprising feeder means for holding a plurality of sheet-like items in standing positions in which each sheet-like item is standing on one of its top edge and its bottom edge; separation means for taking up the items one by one from the feeder means; address code reading means for reading the address codes on the items which have been taken up by the separation means; stacking means positioned above the feeder means, said stacking means including a plurality of stacking sections in which the items are to be stacked in standing positions; conveyer means, including reversing means, for conveying the items from the separation means to the reversing means with each item conveyed with its first side edge as leading edge, and for conveying the items from the reversing means to the stacking means with each item conveyed with its second side edge as leading edge; and sorting means for sorting each of the items to one of the stacking sections of the stacking means in accordance with the address code on such item as read by the address code reading means.

5,593,045

EYEGLASS AND EYEGLASS FRAME DISPLAY FIXTURE AND SYSTEM

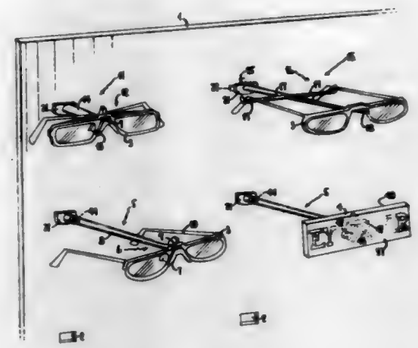
James B. Eldon, III, Barto; Richard J. Winig, Bluebell, and Alan M. Winig, Lafayette Hill, all of Pa., assignors to Eye Designs, Inc., Norristown, Pa.

Filed Sep. 12, 1994, Ser. No. 304,385

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—13 **28 Claims**

1. A display system for manufactured articles, comprising: a display panel having at least one aperture formed therein and at least one manufactured article holding fixture, the fixture having a forward end adapted to hold the manufactured article in a position for display and a rear end having a face plate adapted to contact the front surface of the display panel around the periphery of a selected aperture, a pair of opposed side lugs and a flanged top clip in which the opposed side lugs are inclined along a bottom edge thereof opposite from the flanged top clip, the side lugs and the top clip being integral with the face plate and dimensioned such that upon insertion into the same said selected aperture, the bottom edge of the side lugs bears against a corresponding edge of the selected aperture to force the top clip upwardly against an opposite edge of the selected aperture so as to reasonably secure to fixture to the display panel.



5,593,046

COLLAPSIBLE HOUSING FRAME

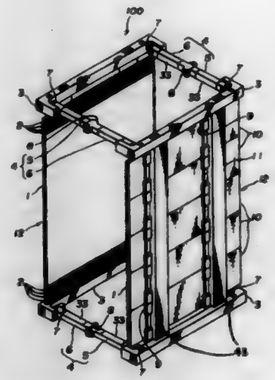
Nobuo Katsuura, and Takashi Dei, both of Kanagawa, Japan, assignors to Nikko Kogyo Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 30, 1994, Ser. No. 315,356

Claims priority, application Japan, May 9, 1994, 6-117453

Int. Cl.[6] H05K *5/00*

U.S. Cl. 211—41 **4 Claims**



1. A collapsible housing frame comprising:

a pair of frame boards opposed to each other; and

connecting mechanisms to connect both opposing ends of said frame boards, each of said connecting mechanisms comprising:

first hinges provided on the opposing ends of said frame boards;

connecting members with one end connected to said frame boards via each of said first hinges, wherein a length in a lengthwise direction of each of said connecting members is made adjustable;

a second hinge which connects the other ends of said connecting members to each other to make said connecting mechanisms collapsible; and

a lock-unlock system to lock and unlock said second hinge,

wherein a plurality of grooves which are parallel to each other with a constant distance in between is formed on the inside surface of each of said frame boards, and housed articles are held in the collapsible housing frame by being supported in said grooves corresponding to a pair of said frame boards.

5,593,047

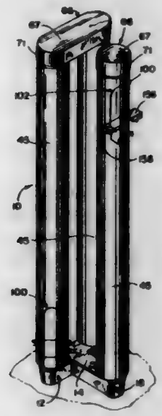
DISPLAY ASSEMBLY

Larry C. Haugen, Racine, Wis., assignor to Great Northern Corporation, Racine, Wis.

Filed Oct. 27, 1994, Ser. No. 330,318

Int. Cl.[6] A47F 5/10

U.S. Cl. 211—58 **12 Claims**



1. A display assembly, comprising:

a plurality of display stands, each display stand comprising:

a T-shaped base having an upper surface lying in a horizontal plane and a plurality of rod receiving openings therein, the upper surface of the T-shaped base includes a plurality of spaced grooves radially extending from one or more rod receiving openings;

one or more rods extending perpendicular to the horizontal plane, each rod having a first end extending into a distinct rod receiving opening in the T-shaped base and a second, opposite end;

one or more tower members, each tower member positioned about a distinct rod between the first and second ends; and

one or more end caps, each end cap having a lower surface lying in a second horizontal plane parallel to the first horizontal plane, and one or more rod receiving openings therein for receiving the second end of a distinct rod such that each tower member is positioned between the respective end cap and the T-shaped base;

a connector plate for interconnecting a pair of the plurality of the display stands; and

one or more display racks interconnected to each tower member for receiving and displaying one or more products, each display rack including an alignment member for aligning each of the one or more products received within the display rack.

5,593,048

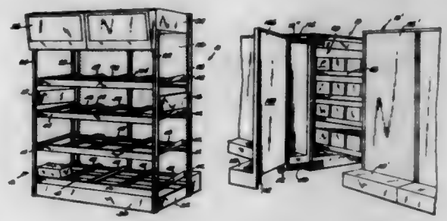
PRODUCT DISPENSING UNIT

Allen E. Johnson, Hartford, Wis., assignor to DCI Marketing, Milwaukee, Wis.

Filed Mar. 17, 1995, Ser. No. 405,592

Int. Cl.[6] A47F 5/00

U.S. Cl. 211—59.2 **15 Claims**



1. A product dispensing unit comprising:

a housing having an open front and an open back;

vertically spaced shelves in said housing, exposed at said open front and extending rearwardly in said housing structure relative to said open front whereby products supported on said shelves are accessible through said open front;

a rear wall spaced from said open front and generally coextensive with said housing, said rear wall movable relative to said housing; and

at least one hinge mechanism for selectively moving said rear wall relative to said housing to provide access to said open back of said housing, said hinge mechanism including two opposed U-shaped channel members fixed to said housing and opening toward each other, an elongated base member having first and second opposite edges, said first edge engaged in one of said channel members and said second edge engaged in the other of said channel members, said base member being movable in and relative to said channel members to move said rear wall toward and away from said housing, a plate connected to said rear wall, and a connector between said base member and said plate to permit said rear wall to pivotally move toward and away from said housing.

5,593,049

SUPPORT STRUCTURE WITH WIRING

Howden W. Farham, 69 Grey Avenue, Table View, Cape Province, South Africa

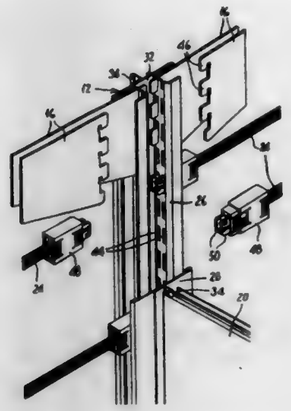
Filed Aug. 19, 1993, Ser. No. 109,314

Claims priority, application South Africa, Aug. 19, 1992, 92/6242

Int. Cl.[6] A47B 57/00

U.S. Cl. 211—193 **8 Claims**

1. A support structure which comprises an elongate slotted member defining a passage along the member and having slots therein at regularly spaced intervals, brackets which have teeth and are connected to the member by the teeth entering into the passage through the slots, and a conductor for carrying power and/or signalling to or from electrical equipment associated with the support structure, the conductor running along the passage and being electrically insulated from the support structure.



5,593,050

BRIDGE CRANE

Walter Lange, Ludesch, Austria, assignor to Liebherr-Werk Nenzing Ges.M.B.H., Nenzing, Austria

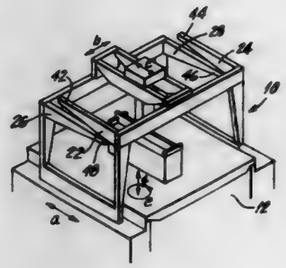
PCT No. PCT/EP93/03153, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO94/11292, PCT Pub. Date May 26, 1994

PCT Filed Nov. 11, 1993, Ser. No. 360,809

Claims priority, application Germany, Nov. 11, 1992, 42 38 096.0; Feb. 2, 1993, 43 02 894.2

Int. Cl.[6] B66C 5/04

U.S. Cl. 212—325 **16 Claims**



1. A ship's bridge crane, comprising a bridge, said bridge having two transverse bearers extending parallel to one another and constituting a track for a travelling crane and said traverse bearers having folding lateral parts, respectively pivoted at the ends of the bearers, for the selective extension of the track,

wherein the lateral parts are able to be pivoted from a position, in which they are in line with the transverse bearers through 90° into a folded inactive position, the transverse bearers are arranged at different levels so that the lateral parts are arranged over each other in their folded, inactive position, and

wherein the travelling crane has wall parts carrying a running gear, said running gear being so adapted in height to a height of the transverse bearers that the travelling crane is arranged substantially horizontally.

5,593,051

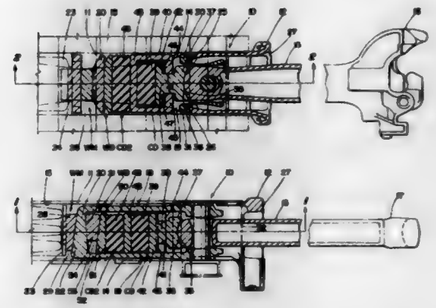
SLACKLESS CUSHIONING DEVICE FOR RAILROAD CARS

Richard A. Openchowski, Bolingbrook, Ill., assignor to National Castings Incorporated, Downers Grove, Ill.

Filed Nov. 14, 1994, Ser. No. 356,917

Int. Cl.[6] B61G 9/00

U.S. Cl. 213—47 **32 Claims**



22. A railroad car coupling mechanism designed to be positioned within a carsill which has a top side which is closest a railroad car when the carsill is attached thereto at each end of a railroad car between front and rear stops which are spaced longitudinally of the carsill, and which are so designated relative to the spacing thereof from the adjacent end of the car, comprising:

a) a yoke having a longitudinal axis and designed to extend longitudinally between the front and rear stops, the yoke including;

i) a back end which is closer the rear stops than a front end thereof which is closer the front stops adjacent the end of an attached railroad car, the back end including an outer surface opposite an inner surface which faces in a direction towards the front stops, the outer surface sloping downward from the top side of the carsill in a direction towards the rear stops, and

ii) a pair of parallel straps extending from the back end in a direction towards the front stops and terminating at a front end which can be coupled to the shank of a coupler of the group of couplers consisting of drawbars and AAR Standard knuckle and rigid jaw type couplers;

b) at least one tapered first wedge disposed between the back end of the yoke and the rear stops, the first wedge designed to slidably engage the sloping outer surface of the back end of the yoke and eliminate any slack which develops between the yoke and front and rear stops;

c) a front follower disposed between the yoke straps in spaced relation from the rear stops, the front follower having a parti-spherical cavity which is designed to seat the butt end of a coupler shank;

d) at least one resilient load cushioning device disposed between the yoke straps, the cushioning device including;

p) at least one resilient cushion pad which is disposed in a plane that is normal to the longitudinal axis of the yoke,

q) a housing at least partially enclosing the at least one cushion pad, the housing disposed between the front follower and back end of the yoke and having a closed back end opposite a pair of laterally spaced coplanar front flanges which face the front follower and which define between them, an opening into the housing, and

r) a first, rigid flat plate disposed between the front flanges and the at least one cushion pad for compressive engagement with such cushion pad, the first plate having a tail which extends therefrom through the opening in a direction towards the front follower;

e) a wedging device disposed between the yoke straps, in tandem, with the load cushioning device and front follower, the wedging device including;

s) at least one pair of confronting, sloping wedging surfaces which form between them, a generally V-shaped space which increases, in size, when slack develops between worn parts within the yoke, and

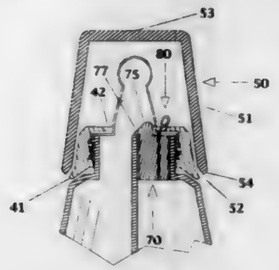
t) a second tapered wedge matingly shaped to fit into the V-shape space and slidably engage the pair of sloping wedging surfaces of the wedging device within the yoke, the second wedge designed to fall, by gravity, further into the space, when the size thereof increases.

5,593,052

BABY BOTTLE WITH TWO SEPARATE FLUID CHAMBERS

Michael McGee, 1711 E. 55th St., Chicago, Ill. 60615

Filed Aug. 7, 1995, Ser. No. 511,781
Int. Cl.[6] A61J *9/00;9/08;11/00*
U.S. Cl. 215—11.1 **7 Claims**



7. A baby bottle, comprising:

(a) a two-sided bottle comprising:

(a) a body;

(b) a lengthwise center divider having a perimeter, the perimeter attached to the body, thereby dividing the body into a left cavity and a right cavity; and

(c) a cylindrical neck, divided by the lengthwise center divider, and attached to the body of the two-sided bottle, comprising:

(a) an inside portion and an outside portion;

(b) a rim;

(c) threads on the outside portion;

(d) a left opening; and

(e) a right opening;

(b) a threaded collar having internal threads sized to releasably attach to the threaded outside portion of the neck;

(c) a nipple having an annular flange, the flange carried between the rim of the neck and the threaded collar,

(d) stopper means, attached to the nipple and removably carried by either of the openings in the cylindrical neck, for preventing the passage of fluid from one side of the bottle, comprising a flexible, fluid-proof mass, which comprises:

(a) a half circle side, sized to frictionally fit against the inside portion of the cylindrical portion of the neck of the bottle;

(b) a flat side, sized to frictionally fit against the center divider;

(c) a bottom side;

(d) a top side; and

(e) a sloping top portion having a lip sized to fit over the center divider;

(e) handle means for pulling the stopper means out of either of the openings in the cylindrical neck of the bottle, comprising:

(a) a ring;

(b) a stem, attached to the ring; and

(c) an anchor, attached to the stem and to the stopper, and

(f) a cover, comprising:

(a) a conical wall;

(b) a circular closed end, attached to the conical wall; and

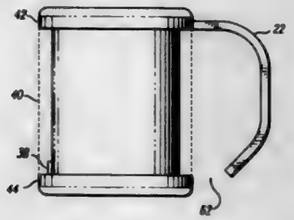
(c) a circular open end with a rim incrementally greater in diameter than the outside diameter of the collar, whereby the rim is suitably sized to engage the threaded collar in a releasable fit.

5,593,053

DRINKING MUG

Alan Kaufman, Lomita, and Jim Podhalsky, North Hollywood, both of Calif., assignors to Applause, Inc., Woodland Hills, Calif.

Filed Sep. 14, 1994, Ser. No. 306,084
Int. Cl.[6] B65D *23/02*
U.S. Cl. 215—12.1 **11 Claims**



1. A drinking mug comprising:

a liquid holding member having an outer surface with a top and bottom;

a first and a second radially outwardly extending continuous flange at said top and bottom respectively;

a handle affixed only to said top of said outer surface at said first flange;

a first indexing means disposed on said outer surface between said top and bottom;

a decorative hollow sleeve received upon and extending substantially the length of and covering said outer surface and having an inner surface defining a second indexing means;

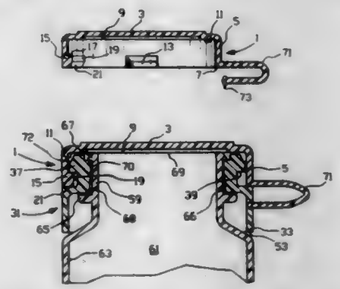
said first and second indexing means being matably received one with respect to the other for non-rotatably holding said sleeve on said outer surface.

5,593,054

CHILD RESISTANT FLIP CAP WITH COLLAR

Kenneth P. Glynn, Raritan Township Hunterdon Cty., N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.

Filed Apr. 28, 1995, Ser. No. 431,107
Int. Cl.[6] B65D *55/02*
U.S. Cl. 215—225 **13 Claims**



1. A container and closure device therefor, which comprises:

(a) a container having a neck, an open top and a horizontal retainer track thereon, adapted to receive and rotatably affix a collar ring thereto;

(b) a collar ring having a circular inside wall with a horizontal track thereon for attachment to the track of said container so as to connect said collar ring to said container so as to be horizontally and freely rotatable thereabout, said collar ring also having a top with a ledge thereon for frictionally engaging and retaining a cap, said ledge forming at least a horizontal arc track thereon of a predetermined length, for rotation of at least one protrusion of a cap to be rotated therein for a predetermined distance when frictional engagement is overcome, and said ledge having at least one cut out thereon to permit a cap to be inserted and removed from said collar ring;

(c) a cap having semi-flexible walls and having at least one protrusion which corresponds to and has a geometry of adequate size to freely move through said at least one cut out of said ledge of said collar ring and to be rotatable within said horizontal arc track of said collar ring for a predetermined distance when frictional engagement is overcome, and such that when said cap is so inserted and rotated, said at least one protrusion also being of adequate size and geometry to cause frictional engagement between said cap and said ring and to cause simultaneous rotation of said cap and said collar ring when at least one of said cap and collar ring is rotated, and to prevent removal of said cap from said collar ring, except when said cap and said collar ring are held separately and are rotated relative to one another such that said at least one protrusion and said at least one cut out are in alignment for lift up removal of said cap from said collar ring; and,

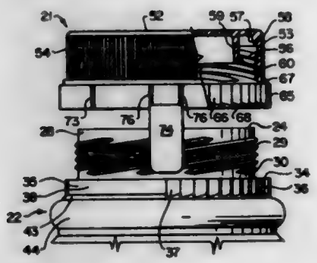
(d) a semi-flexible tether having a first end connected to said collar ring and having a second end connected to said cap, said tether having a rest position and a twisted position, said tether being connected to said collar ring and said cap at locations such that when said tether is in its rest position, said at least one protrusion is within said horizontal arc track of said collar ring, and said at least one protrusion and said at least one cut out are not in alignment, and such that when said cap is rotated relative to said ring and said tether is in a twisted position, said at least one cut out and said at least one protrusion are in alignment to permit lift up removal of said cap from said collar ring.

5,593,055

SNAP-ON, SCREW-OFF CAP WITH TAMPER-EVIDENT SKIRT AND CONTAINER NECK

Richard E. Repp; William R. West, both of San Jose, and Daniel Luch, Morgan Hill, all of Calif., assignors to Portola Packaging, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 29,177, Mar. 10, 1993, Pat. No. 5,456,376, which is a continuation-in-part of Ser. No. 830,133, Jan. 31, 1992, Pat. No. 5,267,661, which is a continuation-in-part of Ser. No. 772,945, Oct. 8, 1991, Pat. No. 5,213,224, which is a continuation-in-part of Ser. No. 565,638, Aug. 9, 1990, Pat. No. 5,190,178. This application Mar. 16, 1994, Ser. No. 213,864
Int. Cl.[6] B65D *41/34*
U.S. Cl. 215—256 **18 Claims**



1. In combination, a container having a neck and a container closure,

said neck having an upper opening, a lip surrounding said opening, a downward extending neck stretch below said lip, said neck stretch having an exterior, at least one first helical engagement means formed on said exterior of said neck stretch, a locking wall portion below said neck stretch, a plurality of first teeth on said locking wall portion,

said closure having a top, a downward extending upper skirt depending from said top adapted to fit over said neck stretch, said upper skirt having an interior, at least one second helical engagement means formed on said interior of said upper skirt shaped to engage said at least one first helical engagement means, a lower skirt below said upper skirt, frangible means frangibly joining said lower skirt and said upper skirt together, a line of weakness extending through said lower skirt, a plurality of second teeth on said lower skirt interengaging said first teeth upon direct, axial application of said closure to said neck to prevent unscrewing of said closure in a first rotational direction relative to said neck without breaking said frangible means,

said at least one first and second helical engagement means being shaped to slip over each other and then to interengage upon direct axial downward movement of said closure on said neck without relative rotation by external means of said closure and said neck,

said lower skirt being configured to rupture substantially along said line of weakness before said lower skirt is completely separated from said upper skirt, said lower skirt having a circumferentially extending engaged portion defined by the interengagement of selected ones of said first teeth and selected ones of said second teeth and a disengaged portion disengaged from said locking wall portion, said engaged portion preceding said disengaged portion in said first rotational direction, said selected ones of said first teeth and said selected ones of said second teeth preventing movement of said engaged portion of said lower skirt relative to said locking wall portion, said line of weakness being positioned in said disengaged stretch at a position relative to said engaged portion to produce the rupturing of said lower skirt when said closure is rotated in said first rotational direction, whereby said lower skirt is split while said lower skirt is at least partially attached to said upper skirt when said closure is unscrewed from said neck.

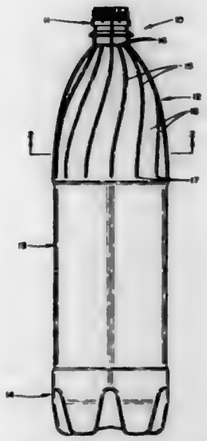
5,593,056

RIB FOR PLASTIC CONTAINER

Christopher J. Mero, New Milford, and Richard F. Bellas, Stamford, both of Conn., assignors to PepsiCo., Inc., Purchase, N.Y.

Filed May 8, 1995, Ser. No. 436,652
Int. Cl.[6] B65D *1/02;1/42;23/00*
U.S. Cl. 215—382 **20 Claims**

1. A blow molded plastic container which comprises a neck portion adapted to receive a closure; a shoulder portion; a body portion; and a bottom portion, said shoulder portion having along at least a part of the length thereof a plurality of upwardly directed rib-like protrusions, each protrusion in horizontal cross-section having a first transition portion, a central portion and a second transition portion connected in series, said first transition portion being concave outwardly and having a substantially uniform radius of curvature R_1, said central portion being concave inwardly and having a substantially uniform radius of curvature R_2, and said second transition portion being concave outwardly and having a



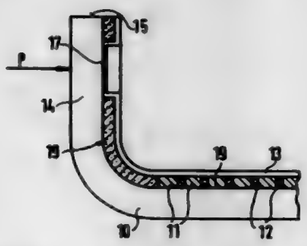
substantially uniform radius of curvature R_3 wherein R_1 and R_3 are substantially the same and are about 7 to 9 times greater than R_2.

5,593,857

IDENTIFICATION MARKS OF PICTURE TUBE PARTS

Martin Kunzmann, Wernau, and Erwin Rommel, Denkendorf, both of Germany, assignors to Nokia Technology GmbH, Pforzheim, Germany

Continuation of Ser. No. 302,523, Sep. 8, 1994, abandoned.
This application Dec. 28, 1995, Ser. No. 579,886
Claims priority, application Germany, Sep. 10, 1993, 43 30 654.3
Int. Cl.[6] H01J 31/00
U.S. Cl. 220—2.3 A 14 Claims



1. A picture tube part made of glass, having an identification mark and having an inside surface with at least one layer of material applied thereto that is used during the operation of the picture tube part,

wherein the identification mark (16) is formed on the inside surface (19) by removing a part of said at least one layer of material.

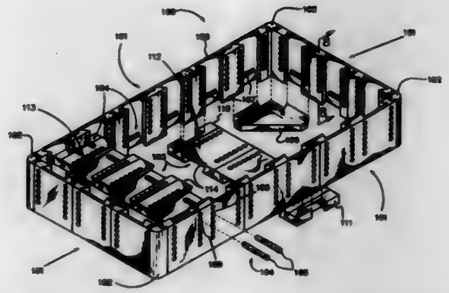
5,593,858

ADJUSTABLE CRATES

Richard Spencer, 468 E. Margarita Rd., Rialto, Calif. 92376, and Robert Pinkus, 26375 Palo Mita Cir., Mission Viejo, Calif. 92691

Filed Aug. 7, 1995, Ser. No. 511,996
Int. Cl.[6] B65D 6/24
U.S. Cl. 220—4.31 10 Claims

1. An adjustable crate, comprising:



(1) four sidewalls, each said sidewall having one or more sidewall panels, each said sidewall panel having an inner sidewall panel side having one or more mateable portions;

(2) four corner pieces connectable to said sidewalls, each said corner piece adapted such that when said corner pieces are connected to said sidewall panels of said sidewalls, a four-walled member with two pairs of opposing sidewalls is formed;

(3) two or more corner braces, each said corner brace being fixedly connectable to said mateable portions of said sidewall panels immediately adjacent to each said corner piece, and said sidewall panels, said corner pieces, and said corner braces being adapted such that said sidewall panels, said corner pieces, and said corner braces are adjustably and fixedly connectable:

(4) each said sidewall panel further comprising a first panel connector end and a second panel connector end opposite said first panel connector end, each said first panel connector end being connectable only to a second panel connector end but not connectable to another first panel connector end and each said second panel connector end being connectable only to a first panel connector end but not connectable to another second panel connector end; and

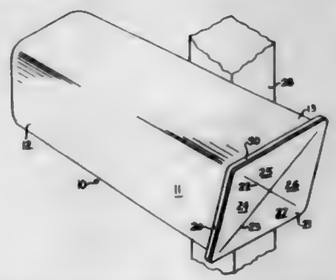
(5) each said corner piece further comprising an elongated member having a first corner connector end and a second corner connector end, said first corner connector end being connectable to said second panel connector end, said second corner connector end being connectable to said first panel connector end.

5,593,859

PROTECTIVE NEWSPAPER DELIVERY RECEPTABLE

Kirsten L. Neilson, 434 Oak Creek Dr. South, Vadnais Heights, Minn. 55127

Filed May 31, 1995, Ser. No. 455,352
Int. Cl.[6] B65D 51/00
U.S. Cl. 220—229 6 Claims



1. A weather-shielding protective newspaper delivery receptacle that completely encloses its contents and has no removable or hinged door for access to the interior thereof, said receptacle

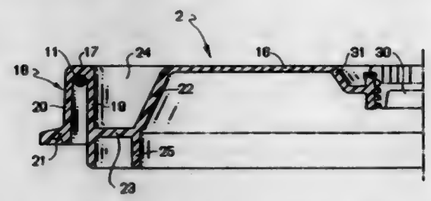
consisting essentially of a tapered elongated tube having a smaller end and a larger end and a longitudinal axis extending between said smaller and larger ends, said tube having its tube-structure terminating in a solid immovable wall closure at its smaller end and having its tube structure terminating at a rim edge at its larger end, said rim edge at the larger end of said tube being equipped with a planar flexible wall permanently united about its perimeter to said rim edge, said flexible wall functioning as the sole entrance for placing a newspaper inside said tube and sole exit for removing a newspaper from said tube, the sole structure of said flexible wall permitting placement of a newspaper inside said tube and removal of a newspaper from said tube consisting of intersecting slits that form plural flaps extending from the perimeter to a central location of said flexible wall, said flaps being deformed inwardly of the tube as a newspaper is inserted into said tube through said flexible wall and deformed outwardly of the tube as a newspaper is removed from said tube through said flexible wall, said flaps being sufficiently resilient to return to a non-deformed state after deformation and thereby shield a newspaper in said tube from dirt, snow, rain, sleet, and other weather and wind-driven conditions, said rim edge and said flexible wall being at a sloped orientation with respect to the longitudinal axis of said tube with a portion of said rim edge projecting more greatly in said longitudinal direction than all other portions of said rim edge such that the mounting of said receptacle to perform its function as a newspaper delivery receptacle, with its longitudinal axis in substantially horizontal orientation and with the portion of the rim edge that has the greatest projection in said longitudinal axis direction oriented uppermost, results in the placement of said flexible wall at an angular orientation with respect to the vertical and with the slope of said flexible wall oriented downwardly and underneath said uppermost portion of the rim edge of said tapered tube having the greatest projection in said longitudinal axis direction.

5,593,060

PLASTIC DRUM LID

Dietmar Przytulla, Kerpen, Germany, assignor to Mauser-Werke GmbH, Bruhl, Germany

Continuation of Ser. No. 49,722, Apr. 20, 1993, abandoned.
This application Aug. 1, 1994, Ser. No. 283,695
Claims priority, application Germany, Oct. 28, 1992, 42 36 338.1
Int. Cl.[6] B65D 45/32
U.S. Cl. 220—319 14 Claims



1. In a plastic drum lid (2) for a liquid-tight lidded drum (1) having a drum body with an outer body wall (3) ending in a top end (8) to define a drum opening, the lid having a central lid section (16), a lid rim (18) with an inner rim wall (19) and an upper end (17) surrounding the central section (16) for engaging with the body wall (3) to close the opening defined by the top end (8), thereof, and a clamping region at which the lid is to be clamped to said drum, the improvement comprising:

a) the central lid section (16) is spaced radially inwardly from said lid rim (18);

b) said lid (2) further includes a first conical section (22) disposed along the periphery of said central section (16) and exteading downwardly and radially outwardly from said central section (16) to define an annular circumferential groove (24) between the central section (16) and the inner rim wall (19);

c) the first section (22) extends downwardly to a first lower end;

d) a second annular section (23) is coanected between said lower end of the first section (22) and the inner rim wall (19);

e) the second annular section (23) is spaced below said central section and extends substantially at a right angle from the inner rim wall (19) of the lid rim;

f) the inner rim wall (19) extends downwardly to define a lower end portion dispoaed below the second annular section (23);

g) an inner ring piece (25) extends downwardly from the lower end of the first section (22) in spaced relation to the inner rim wall (19) to define, with the second annular section (23) and the lower end portion of said inner rim wall (19), a reinforced, inverted U-shaped support; and

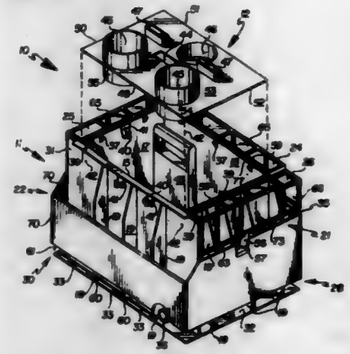
h) the second annular section (23) is connected to the inner rim wall (19) of the lid rim at a height level no higher than the clamping region of said lid.

5,593,861

FISHING TACKLE STORAGE AND CARRYING APPARATUS

Neal Prochnow, N7971 900th St., River Falls, Wis. 54022

Filed Oct. 13, 1995, Ser. No. 542,668
Int. Cl.[6] B65D 1/24
U.S. Cl. 220—507 15 Claims



1. A fishing tackle storage and carrying apparatus, comprising:

(a) a unitary, rectilinear body having a bottom wall and a plurality of interconnected side walls connected to and extending vertically from said bottom wall, said side walls defining an interior reservoir bounded by said bottom wall and said side walls; and

(b) a plurality of compartments disposed outside said body, said compartments being formed by an outer wall disposed a predetermined distance from at least one of said side walls and a plurality of divider walls connected to and extending between said at least one side wall and said outer wall, said divider walls being spaced parallel a predetermined distance from each other, each said compartment having an open top end for ingrees and egress of fishing tackle thereinto, each said compartment further being open at a bottom end thereof to permit drying of the fishing tackle disposed therein by draining of water and substantial flow of air therethrough.

5,593,862

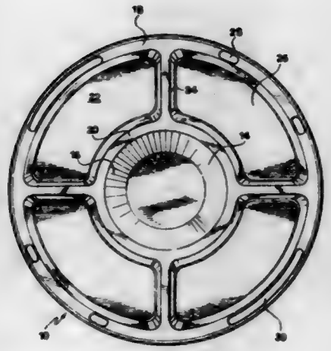
SOCIAL SERVING PLATE

Melvin E. Martin, 122 E. Little Bay Ave., Yorktown, Va. 23693

Filed Oct. 10, 1995, Ser. No. 540,466
Int. Cl.[6] B65D 1/36
U.S. Cl. 220—574.1 8 Claims

1. A serving plate comprising:

a circular plate having

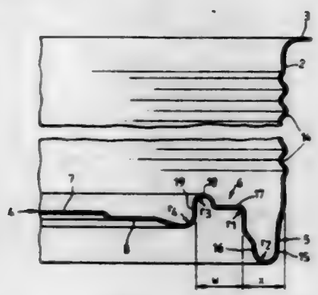


an upper surface,
a lower surface,
a depression in the center of said plate for holding a beverage container, said depression having ridges formed in said lower surface for facilitating manual holding of said plate,
an outer rim around the perimeter of said plate including at least one small hole therethrough for holding an eating utensil, said outer rim further including at least one elongated hole for holding a napkin, and
an inner rim around said depression, said inner rim and said outer rim defining a food holding area of said plate.

5,593,863
DEFORMABLE END WALL FOR A PRESSURE-RESISTANT CONTAINER

Paul C. Clayden, and Neil D. McMahon, both of Oxfordshire, United Kingdom, assignors to Carnaudmetalbox plc, United Kingdom

PCT No. PCT/GB93/01457, § 371 Date Jan. 10, 1996, § 102(e) Date Jan. 10, 1995, PCT Pub. No. WO94/03367, PCT Pub. Date Feb. 17, 1994
PCT Filed Jul. 13, 1993, Ser. No. 373,204
Claims priority, application United Kingdom, Jul. 30, 1992, 9216247
Int. Cl.[6] B65D *7/42*
U.S. Cl. 220—608 **18 Claims**



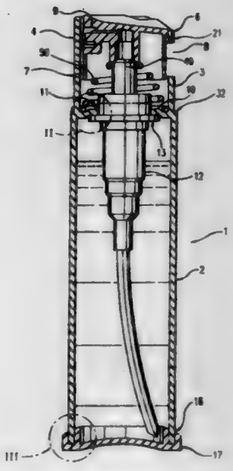
1. A container end wall (4) comprising a peripheral channel portion opening in an axially upward direction and being defined by an outer wall (15) an inner wall (16) and an annular bead therebetween; a center panel (7) spaced radially inboard of said inner wall (16), an inner peripheral wall (19) joined to said center panel, a deformable bistable annulus (6) extending both radially and axially inward away from said inner wall (16) and being joined to said inner peripheral wall (19), and said deformable bistable annulus (6) being constructed and arranged to

(a) occupy a first stable position under ambient pressure at which said centre panel (7) and said deformable bistable annulus (6) are undeflected, and
(b) occupy a second bistable position under internal pressure above ambient pressure at which said centre panel (7) is temporarily deflected axially upward and said deformable bistable annulus (6) is permanently deflected from its first stable position to a second stable position which permanently increases the volume of the container.

5,593,864
PROMOTIONAL DISPENSER AND METHOD FOR ITS USE

Philip Meshberg, 2770 S. Ocean Blvd. Apt. 602, Palm Beach, Fla. 33480

Filed Dec. 9, 1993, Ser. No. 163,787
Int. Cl.[6] B05B *11/00*; B67D *5/32*
U.S. Cl. 222—39 **15 Claims**



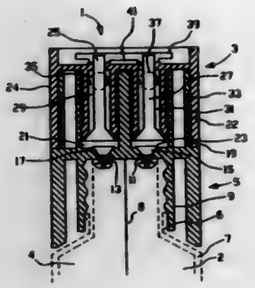
1. A method of providing a dispensing container comprising the steps of:
providing a package comprising an open lower end and a retaining wall in an upper end, said retaining wall comprising a retaining opening, said lower end comprising a plurality of circumferentially spaced angled tabs;
providing a pump structure;
inserting said pump structure into said retaining opening;
filling said package with a fluid product through said open lower end;
providing a one-piece bottom portion comprising a retaining groove and a horizontal portion; and
attaching said bottom portion to said lower end by inserting said lower end into said retaining groove until said plurality of angled tabs engage said horizontal portion.

5,593,865
METERED DUAL DISPENSER CAP FOR SQUEEZE CONTAINERS

John E. Harrold, Bloomsbury, N.J., assignor to Paknax, Inc., Bloomsbury, N.J.

Filed Apr. 10, 1995, Ser. No. 419,138
Int. Cl.[6] B65D *35/22*
U.S. Cl. 222—94 **14 Claims**

1. A metered multiple dispenser cap which comprises:

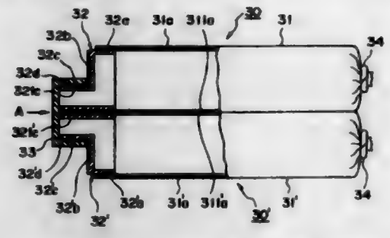


a main housing having a lower portion with means for connection to a multicomponent, multicompartmented squeezable container, and having multiple inlets located within said lower portion, each such inlet having a one-way valve permitting movement of flowable material only from said multicomponent, multicompartmented squeezable container into said cap, said main housing also having an upper portion which is slidably and reciprocally connected to said lower portion, said lower portion having multiple chambers corresponding to said multiple inlets, said upper portion having multiple outlet shafts connected to said chambers, and said upper portion having a multiple dispensing outlets connected to said multiple outlet shafts, each of said multiple outlet shafts having a one-way exit valve which prevents movement of flowable material from said chambers to said outlet shafts when said upper portion is being moved away from said lower portion and so as to permit movement of flowable material through said outlet shafts and through said dispensing outlets when said one-way exit valves and said upper portion are moved toward said lower portion, said one-way exit valves having extensions which protrude to an outside area of said upper portion of said main housing so as to be passable to an open position from a closed position.

5,593,866
CONTAINER, METHOD OF MANUFACTURING THE SAME, AND INSTALLATION JIG FOR CARTRIDGE CONTAINER FOR DISCHARGE GUN

Ritaro Kosuna, Shiki, and Yoji Tanaka, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Hosokawa Yoko, and Kabushiki Kaisha Polymer Systems, both of Japan

Continuation of Ser. No. 170,929, Dec. 21, 1993, abandoned.
This application Sep. 28, 1995, Ser. No. 535,961
Claims priority, application Japan, Dec. 22, 1992, 4-92269; Apr. 16, 1993, 5-25007; May 28, 1993, 5-151135; Aug. 31, 1993, 5-215602
Int. Cl.[6] B65D *35/12*
U.S. Cl. 222—94 **17 Claims**

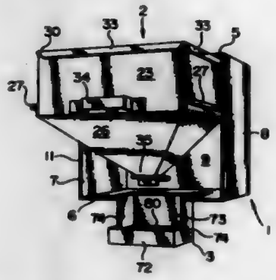


1. A cartridge container adapted for use with a discharge gun having an open supporting barrel, comprising:
a cylindrical main body comprised of a flexible multi-layered film including a metal foil layer, an upper end portion and a lower end portion, said cylindrical main body being axially collapsible without a sleeve along a longitudinal axis thereof;
an upper member secured to said upper end portion, said upper member being comprised of a solid resin material and having an aperture extending therethrough;
a lower member secured to said lower end portion, said lower member being circular and being comprised of a solid resin material; and
a lid provided on said upper member to close said aperture.

5,593,867
MODULAR DISPENSER FOR FLUENT SOLIDS OR LIQUIDS

Teresa M. Shaw, 7804 - 159 Avenue, Edmonton, Alberta, Canada, and Barrie J. Shaw, 7804 - 159 Avenue, Edmonton, Alberta, Canada

Filed Nov. 29, 1994, Ser. No. 350,886
Int. Cl.[6] B67D *1/16*
U.S. Cl. 222—108 **8 Claims**



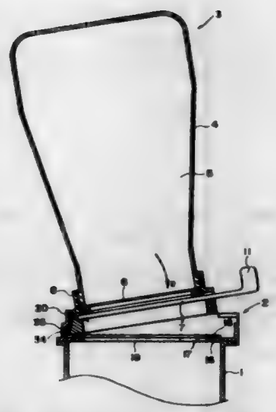
1. A modular dispenser for a fluent solid or a liquid material comprising casing means for mounting the dispenser on a retaining surface, said casing means having an open front end, bottom wall means and recess means in said bottom wall means at said open front end; hopper means in said casing means; valve means normally closing the bottom end of said hopper means, said hopper means being slidable in said casing means for movement between a storage position in the casing means and a dispensing position in which the hopper extends partially out of said casing means, whereby said valve means is accessible in said recess means for dispensing material from said casing means.

5,593,868
TONER SUPPLY APPARATUS AND TONER CARTRIDGE THEREFOR

Kunihiko Kitayama, Kawasaki; Toshiaki Nagashima, Yokohama, and Kiyoshi Oyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 265,937
Claims priority, application Japan, Jun. 25, 1993, 5-155383
Int. Cl.[6] B65B *1/06*; G03G *15/08*
U.S. Cl. 222—167 **32 Claims**

1. A toner cartridge mountable to a cartridge mount of a main assembly of an image forming apparatus comprising an electrostatic latent image bearing member, and a toner container for containing toner for developing an electrostatic latent image on said image bearing member, wherein said toner cartridge in said cartridge mount is disposable in a mounting position, where said cartridge can be mounted on or dismounted from said cartridge mount, and a toner supply position, where toner can be supplied from said toner cartridge into said toner container, and wherein when toner is to be supplied from said toner cartridge into said toner container, said toner cartridge is rotatable in a predetermined direction from the mounting position to the supply position, and when the toner cartridge is to be dismounted from the cartridge mount, the toner cartridge is rotatable in a direction opposite from



the predetermined direction from the toner supply position to the mounting position, said toner cartridge comprising:

a container body for containing toner, said container body including a toner discharge opening for discharging toner from the container body;

a shutter for opening and shutting the discharge opening of said container body; and

a shutter support for supporting said shutter for movement between a closed position for shutting the discharge opening, and an open position, away from the closed position, for opening the discharge opening of said container body, said shutter support including a projection at a corner portion of said shutter support, said projection being engageable with an engaging portion of said cartridge mount;

wherein when the toner cartridge is at the toner supply position, said projection is engaged with the engaging portion to prevent removal of said toner cartridge from the cartridge mount.

5,593,069

AEROSOL VALVES WITH MOVABLE AGITATOR

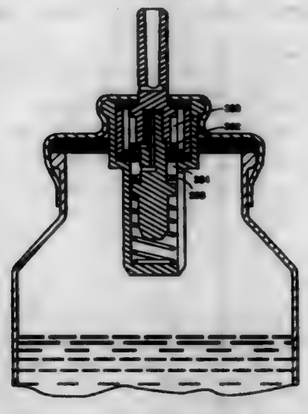
Philip A. Jinks, Mountsorrel, Great Britain, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1995, Ser. No. 419,836

Claims priority, application United Kingdom, May 6, 1994, 9409001; Oct. 18, 1994, 9421071

Int. Cl.[6] G01F *11/14*

U.S. Cl. 222—246 **22 Claims**



1. A metered dose dispensing valve for dispensing metered volumes of a pressurized aerosol formulation, said valve comprising a metering chamber, a valve stem extending through the metering chamber, and a movable agitator within said metering chamber, wherein the movable agitator is configured so as to encircle the valve stem within the metering chamber.

5,593,070

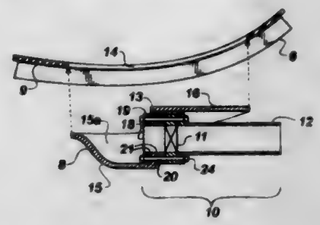
TRUCK MOUNTED TANK HAVING LOW CENTER OF GRAVITY

Gary E. Steadman, Sherwood Park, Canada, assignor to Quicksilver Manufacturing Ltd., Alberta, Canada

Filed Feb. 7, 1995, Ser. No. 384,863

Int. Cl.[6] B67D *5/64*

U.S. Cl. 222—608 **8 Claims**



1. A tank assembly for mounting on the frame of a vehicle for conveying liquid cargo, comprising:

an elongate, generally cylindrical, hollow tank formed of fiberglass and having an oval or circular cross-section, said tank having a curved side wall and end walls, said tank having at least one interior compartment, said side wall having a bottom portion when the tank is horizontally mounted on its side for use, said bottom portion forming an opening for discharging liquid from the compartment;

a hollow sump of fiberglass and integral with the wall bottom portion along the periphery of the opening, said sump protruding downwardly from the bottom portion, said sump having a generally vertical wall segment at one end, said wall segment forming an outlet for connection with a discharge assembly.

5,593,071

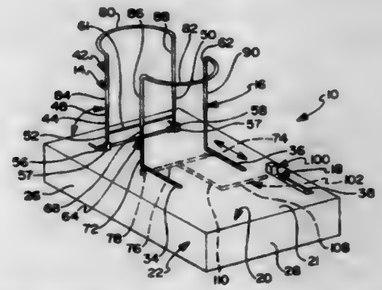
DEVICE FOR AIDING IN DONNING GARMENTS

Robert A. Lusk, 1411 S. Wilson, Royal Oak, Mich. 48067

Filed Jan. 9, 1995, Ser. No. 370,266

Int. Cl.[6] A47G *25/90*

U.S. Cl. 223—112 **2 Claims**



2. An apparatus to assist an individual donning a garment, the apparatus comprising:

(a) base;

(b) at least a pair of stands, each of the at least a pair of stands comprising:

(1) a mounting portion attached to the base;

(2) a garment receiving portion attached to the mounting portion;

wherein at least one of the at least a pair of stands is pivotally mounted to the base;

(c) means for extending at least one of the at least a pair of stands the means extending comprising means for locking the at least one stand in an elongated position.

5,593,072

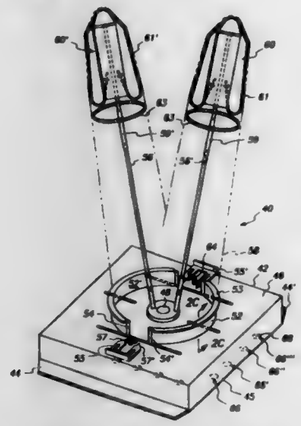
AUTOMATED GARMENT FINISHING SYSTEM

Gary K. Hester, Richardson, Tex.; Conrad L. Fernandez, Charlotte, N.C.; Jon McNeill, Arlington, Tex.; Ted M. Ray, McKinney, Tex., and William Traynor, San Antonio, Tex., assignors to Levi Strauss & Co., San Francisco, Calif.

Division of Ser. No. 154,853, Nov. 18, 1993, Pat. No. 5,458,265. This application Jun. 6, 1995, Ser. No. 468,498

Int. Cl.[6] A41H *5/00; 5/02;* B65G *37/00*

U.S. Cl. 223—120 **22 Claims**



1. A fixture for use in an automated finishing apparatus, said automated finishing apparatus including a conveyor for moving said fixture to a finishing station, a means for maintaining the orientation of the fixture on the conveyor, and a computer for controlling the movement of the fixture and the equipment which performs finishing procedures, said fixture comprising:

a free standing base for floating movement along the conveyor;

a form on which a garment can be mounted and oriented for finishing, said form mounted to said base for supporting the garment; and,

a means for holding the garment in a predetermined orientation relative to said base;

a means for identifying the fixture and distinguishing it from other fixtures, said means for identifying the fixture acting together with said computer wherein, when a garment is mounted and oriented on said form, and said fixture is placed upon the conveyor for movement to the finishing station, the orientation of the garment will be fixed and known to the computer regardless of its location on the conveyor, and the computer will be able to control the application of finishing procedures to preselected areas on the garment.

5,593,073

WORKMAN'S WRIST BAND

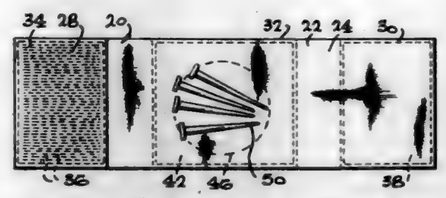
Danny Finnegan, 6840 Hickory Ave., Orangevale, Calif. 95662

Filed Apr. 11, 1995, Ser. No. 420,096

Int. Cl.[6] A45F *5/00*

U.S. Cl. 224—183 **6 Claims**

1. An improved workman's wrist band, said band comprising, in combination:



A) an elongated flexible resilient strip of a length sufficient to fit around the wrist of a workman, said strip having opposite end portions and a wrist spanning central portion between said end portions, said strip having an upper surface and an opposite lower surface, said upper surface bearing on one end portion thereof an adhesive patch connected thereto and having one of a plurality of upstanding hooks and a plurality of hook receptors and said lower surface bearing on the opposite end portion thereof an adhesive patch connected thereto and having the other of said plurality of hooks and plurality of hook receptors, whereby said band is adjustably releasably connectable only around a workman's wrist; and,

B) a cushion connected to spanning and depending from said central portion of said lower surface of said strip, said cushion containing at least one permanent magnet, whereby workman's magnetically attractable metallic work items are magnetically adhered to said upper surface of said wrist band for easy access.

5,593,074

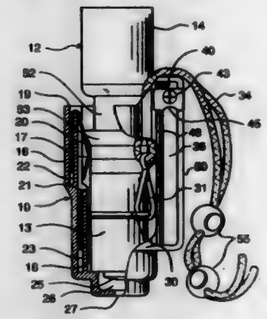
BIDIRECTIONAL HOLSTERS

John W. Matthews, Corona del Mar, Calif., assignor to Laser Products Ltd., Fountain Valley, Calif.

Filed May 26, 1995, Ser. No. 451,483

Int. Cl.[6] A45F *5/00*

U.S. Cl. 224—251 **26 Claims**



1. A combination of a holster with a flashlight having a barrel having a lateral projection, and having a lamp housing wider than said barrel, wherein:

said holster comprises a sheath for part of said flashlight having a first bore receiving said lamp housing, having a narrower second bore receiving said barrel, and an internal channel accommodating said lateral projection.

5,593,075

PARKING GARAGE KEY OR DOCUMENT HOLDER

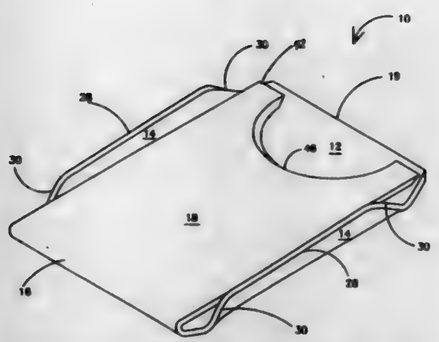
Donald A. Schumer, 1 Nightstepper Ct.- Condominium #310, Baltimore, Md. 21208

Filed Sep. 19, 1995, Ser. No. 505,160

Int. Cl.[6] B60R *7/00*

U.S. Cl. 224—483 **15 Claims**

11. A holder for parking-garage keys and rectangular documents, comprising:



a rectangular back face having a top edge, a bottom region, a first side region, and a second side region;

two trapezoidal side faces each having a long-length side, a medium-length side, and two short-length sides, one of said long-length sides joined to said first side region at a first side crease-line, and another one of said long-length sides joined to said second side region at a second side crease-line;

a generally rectangular front face having a length, a top edge, side edges and a bottom region, said top edge of said front face being beveled and having a notch extending into one-eighth to one-half of said length of said front face;

a rounded rectangular bottom face joining said bottom region of said back face at a back crease-line and said bottom region of said front face at a front crease-line;

said side faces are oriented at a normal angle relative to said back face;

said back face and said front face are oriented at a normal angle relative to said bottom face; and

said back face and said front face are oriented opposite to one another.

5,593,876

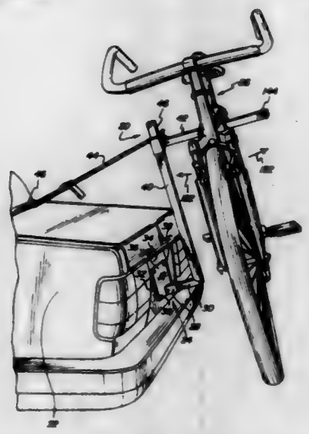
CAR CARRIER RACK AND CAR MOUNT

Barry Biondo, 87 Willard Ter., Stamford, Conn. 06903

Continuation of Ser. No. 173,648, Dec. 27, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 524,053

Int. Cl.[6] B60R *9/10*

U.S. Cl. 224—488 **21 Claims**



1. A carrier rack for a vehicle having a longitudinal axis from front to rear, the vehicle having a car mounted receiver, comprising;

(a) a main rack member adapted to be mounted to the car mount receiver and extending generally upward therefrom;

(b) an upper member slidably mounted directly to the main rack member in interlocking relationship therewith, so that the upper member generally lies parallel to a vertical plane defined by the longitudinal axis of the vehicle, the upper member being adjustably mountable to the main rack member so as to face forwardly when mounted in a first direction and to face rearwardly when mounted in a second direction which is opposite to the first direction; and

(c) a single bike mount slidably mounted directly to the upper member in interlocking relationship therewith, wherein the bike mount receives the weight of a bike to be carried and comprises:

(i) a sleeve slidingly mounted around the upper member;

(ii) a grooved member affixed to said sleeve and having an externally open groove shaped to partially receive a top tube and a seat tube of a bike;

(iii) means for holding said top tube and said seat tube in said groove;

(iv) elongate resilient means placed within said groove to enable said holding means to firmly grip said top and seat tubes of the bike; and

(v) wherein said grooved member further comprises an angle bracket having perpendicular sides which define said groove and being bent along an angle selected to enable said top and seat tubes of the bike to partially fit between the sides of said angle bracket.

5,593,877

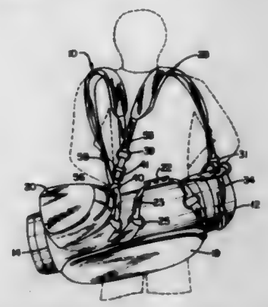
SHOULDER-BORNE CARRYING STRAP ASSEMBLY FOR ARTICLES, SUCH AS, GOLF BAGS

Theodore-James Izzo, Evergreen, Colo., assignor to Izzo Systems, Inc., Lakewood, Colo.

Continuation of Ser. No. 185,760, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 967,784, Oct. 29, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 482,320

Int. Cl.[6] A45F *3/14*

U.S. Cl. 224—627 **19 Claims**



1. In a golf bag having an elongated enclosure, a closed end, an opposite open end, a handle on said enclosure between said open end and said closed end, and a first shoulder strap of open loop configuration extending in a generally longitudinal direction between spaced attachment points along an outer surface of said enclosure, one of said attachment points disposed adjacent to said open end and another of said attachment points longitudinally spaced from said one attachment point with said handle disposed between said attachment points whereby golf clubs may be placed in said golf bag and said golf bag carried by passing said strap over one shoulder of a person, the improvement comprising:

a second elongated shoulder strap member having opposite connecting ends, and attaching means for attaching both of said connecting ends closer to said other attachment point of said first shoulder strap than to said handle for extension of said second shoulder strap over another shoulder of the person whereby said golf bag may be suspended by said first shoulder strap from said one shoulder or by said first and second shoulder straps for balanced load distribution from both shoulders of the person.

5,593,878

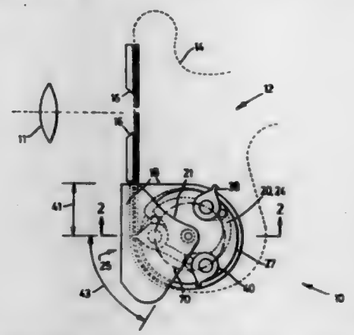
MOTION PICTURE FILM ADVANCEMENT APPARATUS WITH VIBRATION REDUCTION

Ivan Putera, Scarborough, Canada, assignor to Precision Camera Inc., Toronto, Canada

Filed Dec. 22, 1994, Ser. No. 362,685

Int. Cl.[6] B65H *20/22*

U.S. Cl. 226—81 **20 Claims**



1. A rotary film advance apparatus for use in a motion picture camera or projector using film having pairs of evenly spaced perforations located near the edges of the film, the rotary film advance apparatus comprising:

(a) a stator including cam means for defining a closed loop path having a pre-selected contour;

(b) a rotor mounted on the stator and rotatable at a selected angular velocity in a given direction of rotation about a rotor axis extending through the interior of the closed loop contour; and

(c) at least one claw pivotally mounted to the rotor about a pivot axis radially spaced from the rotor axis including a claw tip dimensioned to engage a film perforation, the claw tip rotating with the rotor at a claw tip rotational speed, and cam follower means spaced from the claw tip and pivot axis, for following the path of the cam means;

(d) wherein the contour is shaped to pivot the claw tip both radially outwardly and backwardly relative to the direction of rotation thereby reducing the claw tip rotational speed to approximately zero at the point of engagement with the film perforation.

5,593,879

NAILING MACHINE

Kenji Mukoyama, and Noriaki Hayashi, both of Anjo, Japan, assignors to Makita Corporation, Anjo, Japan

Filed Mar. 10, 1995, Ser. No. 402,520

Claims priority, application Japan, Mar. 11, 1994, 6-041405

Int. Cl.[6] B25C *1/04*

U.S. Cl. 227—8 **11 Claims**

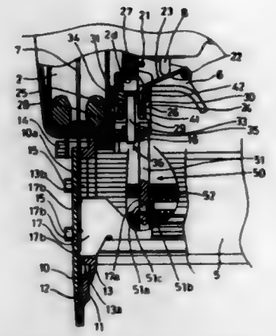
1. A nailing machine comprising:

a body;

a driver extending downwardly from said body and vertically reciprocally movable for driving nails;

a driver guide for guiding said driver;

a contact arm capable of movement between a lower first position and an upper second position and having a lower end for abutment on a work;



a magazine mounted on said body for feeding the nails into said driver guide;

a trigger to be operated by an operator for driving said driver;

trigger control means interlocked between said trigger and said contact arm for permitting said driver to be driven by the operation of said trigger when said contact arm is positioned in said upper second position; and idle driving prevention means adapted to prevent said driver from being driven while said trigger is operated when the amount of the nails has been reduced to a predetermined amount, said idle driving prevention means being operating independently of the operation of said trigger control means caused by the movement of said contact arm.

5,593,880

MASK FOR PRINTING SOLDER PASTE

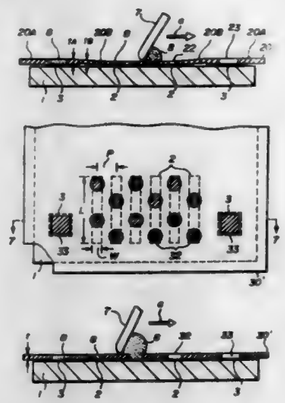
Yasuhiro Teshima, and Tetsuo Kurokawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 198,391, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 965,702, Oct. 23, 1992, abandoned. This application Jun. 12, 1995, Ser. No. 489,616

Claims priority, application Japan, Oct. 29, 1991, 3-281794; Jun. 4, 1992, 4-143084

Int. Cl.[6] B23K *37/06*; H05K *3/34*

U.S. Cl. 228—39 **12 Claims**

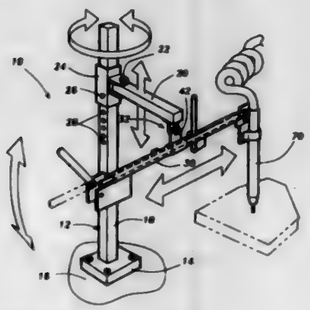


1. A mask for printing solder paste comprising:

a mask plate defined by top and bottom surfaces having first mask holes formed therein in a first surface region having a first thickness and second mask holes formed therein in a second surface region having a second thickness, the second thickness being less than the first thickness

said first mask holes having a first uniform cross-sectional shape extending throughout a depth of the first mask holes from said top surface to said bottom surface of said first surface region, said second mask holes having a second uniform cross-sectional shape extending throughout a depth of the second mask holes from said top surface to said bottom surface of said second surface region, the area of the second cross-sectional shape being smaller than the area of the first cross-sectional shape, wherein said first mask holes and said second mask holes are formed entirely separately from each other such that none of said first mask holes and second mask holes overlap.

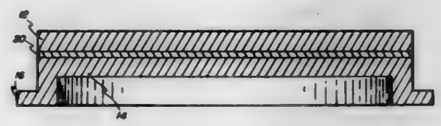
5,593,081
WELDING APPARATUS
J. Peter Kilbuen, 31785 Homewood, Farmington Hills, Mich. 48334
Filed Nov. 28, 1995, Ser. No. 563,374
Int. Cl.[6] B23K *37/02*
U.S. Cl. 228—45 **10 Claims**



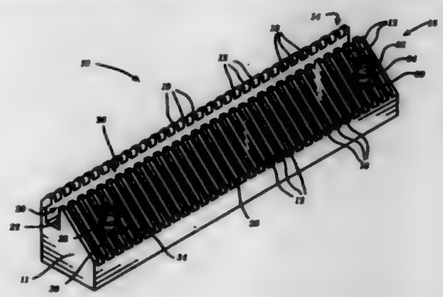
1. A welding apparatus comprising:
an elongated actuating arm,
a welding gun,
a main support having one end supported on a ground support surface,
means for attaching said actuating arm to said main support,
an elongated linkage bar extending through said actuating arm and having one end secured to said welding gun wherein axial movement of said linkage bar relative to said actuating arm moves said welding gun,
a handle secured to said linkage bar adjacent a second end of said actuating arm for axially moving said linkage bar, and
a lever secured to a midpoint of said linkage bar for axially moving said welding gun.

5,593,082
METHODS OF BONDING TARGETS TO BACKING PLATE MEMBERS USING SOLDER PASTES AND TARGET/BACKING PLATE ASSEMBLIES BONDED THEREBY
Eugene Y. Ivanov, Grove City, Ohio; Tatyana F. Grigoriva, Spartaks, and Vladimir V. Boldyrev, Tereshkove, both of Russian Federation, assignors to Tosoh SMD, Inc., Grove City, Ohio
Filed Nov. 15, 1994, Ser. No. 340,167
Int. Cl.[6] B23K *31/02*
U.S. Cl. 228—122.1 **29 Claims**

1. Method of solder bonding a sputter target to a backing plate member comprising the steps of:
(a) applying a thin coating of a solder paste to an interface defined by adjacent surfaces of said target and said backing plate member, said solder paste comprising a low melting point metallic component having a melting point of about 70° C. or less and a solid component, said solid component being formed by mechanically alloying at least two metals to form a solid solution having particles of between about 5–100 microns, said at least two metals comprising i) at least one metal selected from the group consisting of groups IB, VIII, and IVB of the periodic chart; and ii) at least one metal selected from the group consisting of groups IVA, IIIA and VA of the periodic chart;
(b) allowing said solder past to solidify.



5,593,083
CASTELLATED NOZZLE AND METHOD OF USE THEROF
Bernie Hernandez, Norwack, Conn.; Raymond R. Horton, Dover Plains; Michael J. Palmer, Walden, both of N.Y., and Frederick G. Weindelmayer, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 14, 1995, Ser. No. 388,327
Int. Cl.[6] H05K *3/34*
U.S. Cl. 228—180.21 **6 Claims**



1. A method for soldering a flexible circuit carrier to a semiconductor substrate, comprising:
(a) fabricating a flexible circuit carrier comprising an insulative layer having a series of apertures arranged thereon, wherein said insulative layer has a plurality of conductive leads formed thereon, a portion of each one of said plurality of conductive leads being suspended over a respective aperture of said series of apertures;
(b) aligning said flexible circuit carrier over a substrate, said substrate having a plurality of contact pads arranged thereon so that said each one of said apertures of said flexible circuit carrier is alignable above an associated contact pad of said plurality of contact pads, each of said plurality of contact pads having a solder coating thereon;
(c) aligning a castellated nozzle over said flexible circuit carrier, said castellated nozzle having a plurality of castellations protruding therefrom, said castellations being arranged in a like manner to said plurality of apertures so that each one of said castellations is alignable above an associated contact pad of said plurality of contact pads;
(d) applying force to said castellated nozzle so that each of said plurality of leads are displaced into said plurality of apertures and into contact with said plurality of contact pads; and
(e) melting said solder coatings of said contact pads so as to facilitate solder bonding of said contact pads to their respective conductive leads.

5,593,084
METHOD OF ASSEMBLING CONSTANT VELOCITY FIXED JOINT
Peter Harz, Hennef; Werner Krude, Neunkirchen, and Herbert Taureg, Hennef, all of Germany, assignors to GKN Automotive AG, Siegburg, Germany
Division of Ser. No. 41,544, Apr. 2, 1993, Pat. No. 5,433,668.
This application Mar. 1, 1995, Ser. No. 396,549
Claims priority, application Germany, Apr. 3, 1992, 42 11 170.6; Apr. 3, 1992, 42 11 042.4; Feb. 10, 1993, 43 03 901.4
Int. Cl.[6] B23K *37/04*
U.S. Cl. 228—182 **4 Claims**

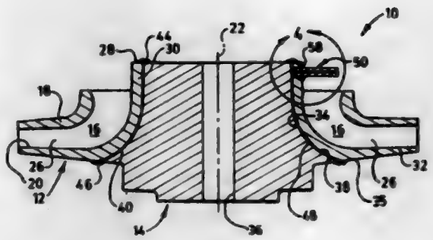




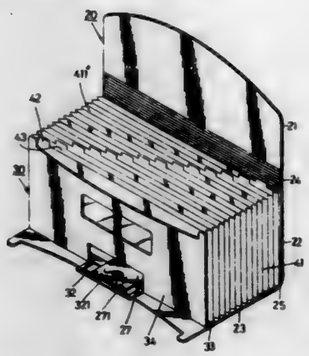
1. A method of attaching a plurality of supporting inserts for axially securing a cage of a constant velocity fixed joint, said constant velocity fixed joint comprising an outer joint part having a plurality of substantially axially extending circumferentially, distributed outer running grooves, an inner joint part having a plurality of inner running grooves corresponding to said plurality of outer running grooves, said cage being arranged between said outer joint part and said inner joint part and having a plurality of windows, and a torque transmitting ball received in each of said plurality of inner and outer running grooves and guided in a respective window of said cage, said method comprising the steps of:
providing a recess in said outer joint part between at least two pairs of adjacent outer running grooves of said outer joint part;
inserting at least one of said plurality of supporting inserts into each recess in said outer joint part, said supporting inserts being connected to one another by an annular strip;
positioning said supporting inserts to axially secure said cage within said outer joint part;
welding each of said supporting inserts to its respective recess; and
removing said annular strip between said plurality of supporting inserts.

5,593,085
METHOD OF MANUFACTURING AN IMPELLER ASSEMBLY
Henry J. Tuhill, Chula Vista, Calif.; Russell B. Gallagher, Painesville, Ohio; Kenneth G. Kuburych, Delmar, and Nils O. Hallstrom, San Diego, both of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.
Filed Mar. 22, 1995, Ser. No. 408,434
Int. Cl.[6] B23K *20/00*; B23P *15/04*
U.S. Cl. 228—193 **13 Claims**

1. A method for diffusion bonding first and second mating articles defining a cavity therebetween, comprising:
tack welding the first article to the second article at several locations;
providing an evacuation tube having a sidewall and a passageway therethrough, sealing the evacuation tube in a hole defined in the articles and sealing the evacuation tube and the periphery of said mating articles together and defining a cavity between the articles with said evacuation passageway in communication with said article cavity;
drawing air through the passageway of the evacuation tube to verify that the passageway remained open after sealing the evacuation tube and prior to sealing the periphery of the mating articles;
drawing a vacuum in the article cavity and the tube passageway;
testing the vacuum integrity of the cavity;
sealing the passageway at a location spaced from the sealed articles;
subjecting the sealed articles having the associated evacuation tube to a temperature and pressures sufficient to diffusion bond the articles together;
inspecting the associated evacuation tube and
determining successful diffusion bonding of the articles in response to the evacuation tube sidewall being collapsed, providing visual confirmation that the seal was maintained during hot isostatic pressing and determining the unsuccessful diffusion bonding of the articles in response to the evacuation tube sidewalls not being collapsed.



5,593,086
DOCUMENT HOLDER WITH AN EXTENSIBLE-RETRACTABLE BAG
Chin-Lien He, No. 36, Le-Yang Rd., Hsi-Tun Dist., Taichung City, Taiwan
Filed Jun. 16, 1995, Ser. No. 491,857
Int. Cl.[6] B65D *30/20*
U.S. Cl. 229—67.3 **3 Claims**



1. A document holder including a bag body with an open top, said bag body having an elongated bottom plate with a first long side and a second long side parallel to said first long side, a vertical first side plate extending integrally from said first long side of said bottom plate, a cover plate extending integrally from an upper end portion of said first side plate and covering said open top, a vertical second side plate mounted on said bottom plate and spaced apart from said first side plate, a pair of collapsible connecting members mounted over said bottom plate and interconnecting said first and

second side plates in such a manner that said second side plate is generally parallel to said first side plate and that a document receiving space is defined between said first and second side plates and between said connecting members, and a plurality of partition sheets attached to said connecting members and generally parallel to said first and second side plates so as to divide said document receiving space into a plurality of first document holding rooms accessible from said open top, wherein the improvement comprises:

said second side plate having a horizontal support section lying movably on said bottom plate and a vertical section formed integrally with said horizontal support section, an inner peripheral portion defining an opening through said vertical section and located adjacent to said horizontal support section, and a fastener installed on said inner peripheral portion;

said bag body including a vertical guideway plate projecting integrally from said second long side of said bottom plate in such a manner that said second side plate is located at a first position which is situated on said bottom plate between said guideway plate and said first side plate, an elongated vertical guide sheet mounted on an inner surface of said guideway plate, and a resilient pull strap interconnecting said guide sheet and one of said first side plate and said bottom plate so as to pull said guideway plate toward said first side plate, said guideway plate being unfoldable relative to said bottom plate when said cover plate is removed from said top of said bag body so as to keep said guideway plate and said bottom plate in a plane, and so as to permit outward movement of said second side plate from said first position to a second position which is situated on said guideway plate and in which said fastener of said second side plate can be fastened to said guideway plate in order to prevent said second side plate from being pulled back to said first position by said resilient pull strap and from outward movement from said second position;

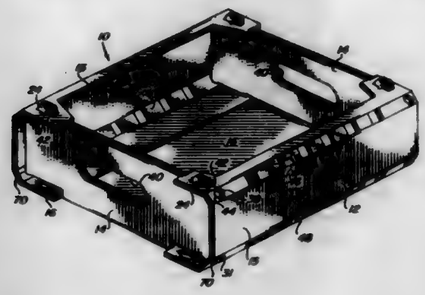
said guide sheet being capable of being turned together with said guideway plate to a horizontal position so as to guide said horizontal support section of said second side plate to move horizontally between said guide sheet and said guideway plate from said first position to said second position, thereby unfolding said connecting members and permitting said plurality of partition sheets to define a plurality of second document holding rooms which have a size greater than that of said first document holding rooms.

5,593,087

OPEN-TOP CONTAINER WITH INTEGRAL END PANELS

John A. Rose, and James C. Fogle, both of Marietta, Ga., assignors to Riverwood International Corporation, Atlanta, Ga.

Filed Aug. 24, 1995, Ser. No. 518,695
Int. Cl.[6] B65D *5/32;21/032*
U.S. Cl. 229—199 **19 Claims**



1. A container, comprising:

two spaced, substantially parallel, relatively rigid end panels;

each end panel having two spaced upper corner areas and two upwardly extending projections, each projection being inwardly spaced from one of the upper corner areas;

a flexible sheet forming bottom and side panels extending between the end panels;

each side panel including an upper inwardly sloped portion;

the upper corner areas of the end panels extending through slots in the upper sloped portions;

a top panel segment extending inwardly from each upper sloped portion;

means for securing the top panel segments to associated of said end panel projections; and

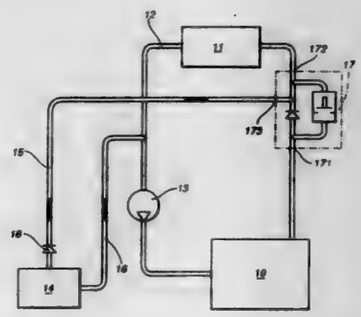
each end panel including an end panel flap connected by a fold line to the bottom panel, the end panel flaps extending upwardly for substantially the entire height of the end panels.

5,593,088

HEATING DEVICE FOR MOTOR VEHICLES

Werner Heanrich, Fellbach, and Clemens Bentele, Stuttgart, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Oct. 13, 1995, Ser. No. 542,777
Claims priority, application Germany, Oct. 15, 1994, 44 36 943.3
Int. Cl.[6] B60H *1/02*
U.S. Cl. 237—12.3 C **10 Claims**



1. Heating device for motor vehicles with a water-cooled internal combustion engine, with a water/air heat exchanger which is connected to a cooling water circuit of the internal combustion engine on the one hand and to an auxiliary heating unit which is independent of the internal combustion engine on the other hand, and with a thermostatically activated switching element which is constructed such that when the auxiliary heating unit is switched on the heating water heated up by the auxiliary heating flows via the heat exchanger below a temperature prescribed by the switching element and additionally via the internal combustion engine above the prescribed temperature, and when the auxiliary heating unit is switched off the engine cooling water heated up by the internal combustion engine flows via the heat exchanger, for which purpose the switching element has an inflow chamber which is connected to the cooling circuit of the internal combustion engine and an outflow chamber which is connected both to the heat exchanger and to the auxiliary heating unit as well as a non-return valve which is arranged between the inflow chamber and outflow chamber and has a valve element and valve seat, the blocking direction of which non-return valve is directed towards the inflow chamber, wherein the inflow chamber and outflow chamber are connected to one another via at least one leakage hole,

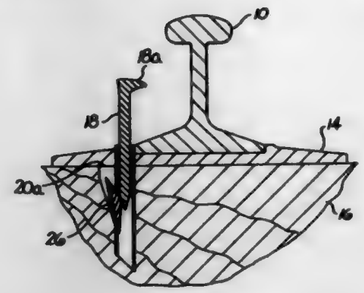
and wherein the thermostat is arranged in the inflow chamber and has an activation element which lifts off the valve element of the non-return valve from its valve seat above a prescribed temperature.

5,593,089

CROSSTIE PLUG FOR A RAILROAD SPIKE

Ralph L. Conner, 3969 Flat Lick Rd., Mount Washington, Ky. 40047; Charles L. Stalker, Rte. 2, 550 Thompson Ln., Bloomfield, Ky. 40008, and Joseph T. Wilson, 506 Maplecrest Dr., LaGrange, Ky. 40031

Filed Oct. 13, 1995, Ser. No. 542,991
Int. Cl.[6] E01B *9/06*
U.S. Cl. 238—370 **17 Claims**



1. A railroad device, adapted to be positioned within an existing spike hole in a crosstie, for restoring a predetermined gage between parallel railroad rails comprising

a sleeve having a slot along one side thereof, said sleeve further having a substantially hollow interior adapted to receive a railroad spike and having a configuration complimentary to the configuration of the spike;

a member pivotally associated with said sleeve at a first end for pivoting movement between an initial position, in which said member is housed substantially within said sleeve, through said slot to an extended position, in which said member is positioned substantially outside of said sleeve, said member in said extended position having a distal end projecting outwardly from said sleeve, said member having

a first surface positioned adjacent to and extending along said slot from said first end toward a top edge of said slot when said member is in the initial position,

a second surface positioned across a portion of the interior of said sleeve when said member is in the initial position and adapted to be contacted by an edge of the spike when being urged into said sleeve thereby causing said member to pivot into said extended position, and

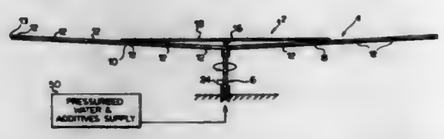
a third surface being aligned in an essentially parallel relationship with said one side of said sleeve when said member is in the extended position and adapted to abut against the spike when positioned in said sleeve.

5,593,090

SNOW GUN

Richard Werner, R.R. #4,, Uxbridge, Ontario, Canada

Filed Dec. 28, 1994, Ser. No. 362,998
Int. Cl.[6] F25C *3/04*
U.S. Cl. 239—2.2 **17 Claims**



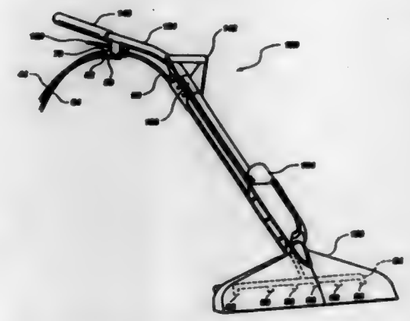
1. An arrangement for making snow comprising an elongate snow boom having a tube arrangement with a series of nozzles spaced there along with said tube arrangement closed either end, said snow boom having a liquid feed arrangement for supplying pressurized liquid to said snow boom which liquid when exhausted through said nozzles forms a fine dispersion of liquid droplets, means for centrally supporting said boom generally horizontally at a raised position and to allow at least limited rotation about a vertical axis, and wherein said nozzles being orientated such that the fine dispersion of liquid droplets is generally from one side of said boom.

5,593,091

DUAL SOLUTION APPLICATION SYSTEM

Robert D. Harris, Logan, Utah, assignor to Harris Research, Inc., Logan, Utah

Filed Nov. 7, 1994, Ser. No. 335,210
Int. Cl.[6] B05B *7/26*
U.S. Cl. 239—127 **14 Claims**



1. A solution application system for mixing at least two solutions and applying the mixed solutions to textiles comprising:

supply means on a mobile base said means containing containers for separately holding each solution, means for heating the solution in each container to a desired temperature and means for delivery of solution from each container to a feed means,

applicator means comprising a portable elongate support structure having a proximal solution receiving end and a distal solution application end said support frame being contoured from the proximal to distal end outwardly and downwardly and containing an intermediate handle means between said proximal and distal ends, valve means attached to said proximal end containing a valve for each solution to be delivered, each valve having a connector for receiving solution from a container through a feed means and adapted to deliver said solution to a mixing means, mixing means for receiving said solutions from said valve means and causing said solutions to form a mixed solution at essentially ambient pressure, conveying means for directing said mixed solution at essentially ambient pressure from said mixing means to an application manifold means and application manifold means attached to the distal solution application end of said support structure for receiving mixed solution from said conveying means, said manifold means having exit ports to direct said mixed solution to a textile fiber, and

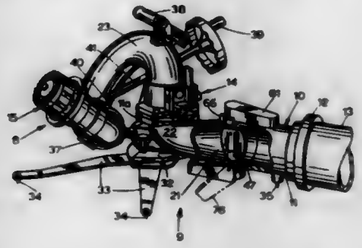
feed means interconnecting each container of said supply means to a connector of said valve means of said applicator means for conveying solution from each of said containers of said supply means to said valve means of applicator means.

5,593,092

MONITOR WITH SAFETY VALVE

Stewart G. McMillan, Valparaiso, and David J. Kolacz, Plymouth, both of Ind., assignors to Task Force Tips, Inc., Valparaiso, Ind.

Continuation of Ser. No. 253,227, Jun. 2, 1994, abandoned, which is a continuation of Ser. No. 166,722, Dec. 13, 1993, abandoned. This application Oct. 23, 1995, Ser. No. 546,662
Int. Cl.[6] B05B 15/06; A62C 39/00
U.S. Cl. 239—285 12 Claims



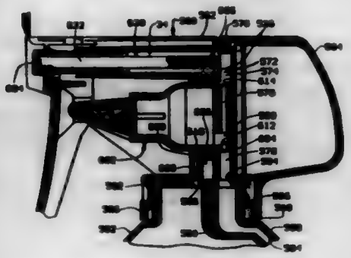
1. A portable base for a monitor, said base being operable to convey a liquid from a supply to the monitor, said base when in customary use being placed in an operating position on a support surface, said base comprising a conduit forming a flow passage between an inlet end and an outlet end, said inlet end being connectable to said supply and said outlet end being connectable to the monitor, and valve means mounted on said conduit for automatically closing said flow passage in the event that said base lifts off the support surface, said valve means including a valve pivotably mounted in said flow passage and movable between open and closed positions, and trip means connected to said valve and responsive to the base lifting from the support surface for moving said valve to said closed position.

5,593,093

LOW COST TRIGGER SPRAYER HAVING ELASTOMERIC PUMP AND INLET VALVE

Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.

Division of Ser. No. 964,158, Oct. 21, 1992, Pat. No. 5,385,302, which is a continuation-in-part of Ser. No. 683,281, Oct. 25, 1990, Pat. No. 5,234,166. This application Jan. 12, 1995, Ser. No. 372,897
Int. Cl.[6] B05B 9/043
U.S. Cl. 239—333 17 Claims



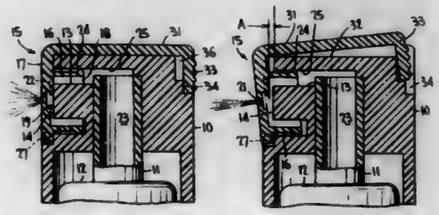
1. A trigger sprayer comprising:
a sprayer housing;
a connector on the sprayer housing for connecting the sprayer housing to a liquid container;
a discharge passage in the sprayer housing, the discharge passage having an orifice for dispensing liquid from the sprayer housing;
a vent opening in the sprayer housing for venting air into a liquid container when the sprayer housing is connected to a liquid container;
a trigger mounted on the sprayer housing for movement relative to the sprayer housing between charge and discharge positions of the trigger; and,
a pump on the sprayer housing and operatively connected to the trigger for drawing liquid from a container and into the pump in response to the trigger being moved to the charge position, and for dispensing the liquid from the pump and through the discharge passage orifice in response to the trigger being moved to the discharge position, the pump having a resilient cylindrical sidewall having a center axis and axially opposite forward and rearward ends, the rearward end is connected to the sprayer housing and the forward end covers over the vent opening in the sprayer housing, and the pump has a front wall that is connected to the sidewall forward end and together with the sidewall encloses an interior volume of the pump, the front wall is operatively connected to the trigger whereby the front wall is pushed rearwardly into the interior volume of the pump causing the forward end of the sidewall to be folded rearwardly into the interior volume of the pump uncovering the vent opening in the sprayer housing in response to the trigger being moved to the discharge position.

5,593,094

PUMP SPRAYER HAVING VARIABLE DISCHARGE

Jacques J. Barriac, Claremont, and R. Pat Gragan, Downey, both of Calif., assignors to Calmar Inc., City of Industry, Calif.

Filed Feb. 7, 1995, Ser. No. 385,133
Int. Cl.[6] B05B 1/34
U.S. Cl. 239—476 18 Claims



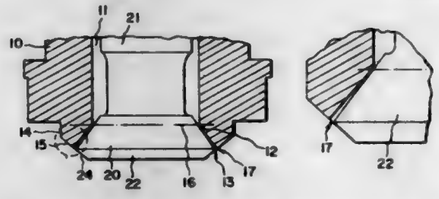
1. A pump sprayer having a reciprocable hollow piston stem defining a fluid discharge passage, a plunger head mounted on said stem and having a probe extending transversely from said stem, a nozzle cap assembly including a nozzle cap surrounding said probe, said cap having a discharge orifice and means including a spin chamber in communication with said orifice for imparting a spin at a given velocity to fluid to be discharged through said orifice as a fine mist spray of a given discharge spray pattern in a first position of said cap, a fluid path defined between said head and said nozzle cap and extending from said passage to said orifice via said spin imparting means, the improvement wherein:
said nozzle cap assembly is hinged to said plunger head for movement of said spin imparting means a given distance away from a free end of said probe to a second position for negating the spin imparted to the fluid for varying the discharge spray pattern, said assembly having a cover plate overlying said plunger head to facilitate the hinged movement between said first and second positions.

5,593,095

NOZZLES FOR FUEL INJECTIONS

Robert M. Davis, Maylands, and Jorge M. P. da Silva, West Leederville, both of Australia, assignors to Orbital Engine Company (Australia) Pty. Limited, Balcatta, Australia

Continuation of Ser. No. 194,306, Feb. 4, 1994, abandoned, which is a continuation of Ser. No. 768,841, Sep. 26, 1991, abandoned. This application Mar. 10, 1995, Ser. No. 402,399
Claims priority, application Australia, Jan. 26, 1990, PJ8341
Int. Cl.[6] F02M 61/08;61/18;67/12;69/04
U.S. Cl. 239—584 13 Claims



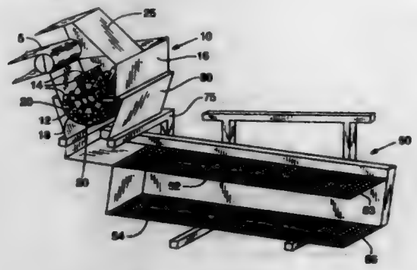
1. An internal combustion engine fuel injector having a selectively openable nozzle through which fuel entrained in a gas is delivered directly to a combustion chamber of the engine, said nozzle comprising a port having an internal annular surface and a valve member having an external annular surface co-axial with respect to the internal annular surface, said valve member being axially movable relative to the port to selectively provide between said internal and external annular surfaces a continuous passage for the delivery of fuel entrained in gas therethrough or sealing contact therebetween along a circular seat line substantially co-axial to the respective annular surfaces to prevent the delivery of fuel entrained in gas therebetween, each said annular surface being of an openly divergent form in the direction of fuel delivery with said annular surfaces being relatively configured so that when the internal and external annular surfaces are in sealing contact along said circular seat line the maximum width of the passage between said surfaces downstream from said seat line is not substantially more than 30 microns.

5,593,096

METHOD AND APPARATUS FOR SEPARATING ADHERED PAPER FROM PAPER COVERED GYPSUM BOARD

Byron W. Harker, 8557 - 213th Street, and John A. McCamley, 20321 - 80th Avenue, both of Langley, British Columbia, Canada

Continuation of Ser. No. 51,579, Apr. 23, 1993, abandoned, which is a continuation of Ser. No. 561,370, Jul. 31, 1990, abandoned, which is a continuation of Ser. No. 321,229, Mar. 8, 1989, abandoned. This application Oct. 24, 1994, Ser. No. 328,332
Int. Cl.[6] B28C 19/00;19/12
U.S. Cl. 241—14 13 Claims



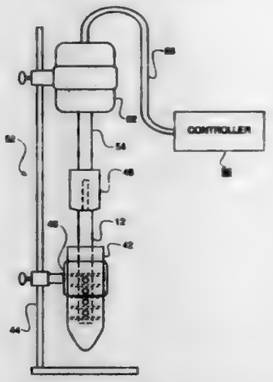
1. A method of separating adhered paper from paper covered gypsum board, including relatively damp gypsum board, comprising:
hammermilling said gypsum board by fracturing impact down through holes of a hammermill grate, said holes having a circular cross-section to size and seperate a substantial amount of said adhered paper from said gypsum board to a screenable mixture of pieces of paper and smaller separated gypsum board particles, said pieces of paper having a maximum transverse dimension less than the minimum transverse dimension of said holes;
feeding said mixture from the grate; and
screening said mixture to segregate a substantial amount of said pieces of paper from said gypsum board particles.

5,593,097

MICRO MEDIA MILL AND METHOD OF ITS USE

Douglas D. Corbin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1994, Ser. No. 258,010
Int. Cl.[6] B02C 17/16;17/20
U.S. Cl. 241—21 40 Claims



13. A method of wet batch grinding comprising providing a generally cylindrical vessel containing grinding media, said vessel having a volume of between about 30 and 75 ml, extending into said vessel an agitator rotatable about its shaft and having pegs extending generally perpendicular to said shaft wherein said pegs extend within about 1 to about 3 mm of said cylinder and wherein the diameter of said vessel is between about 10 and about 20 mm, placing said agitator into said grinding media such that the uppermost peg is generally at the upper level of the media, adding vehicle liquid, adding the material to be ground, and agitating said media and said material, by rotation of said agitator, with the proviso that said vessel comprises a test tube, and said agitator consists of said shaft and said pegs.

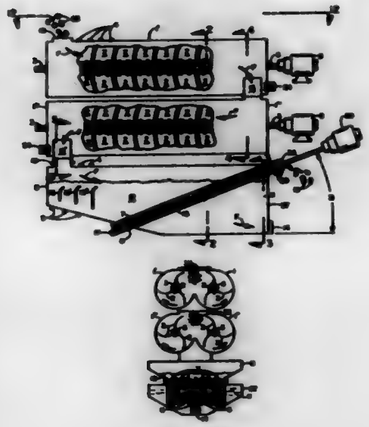
5,593,098

APPARATUS FOR AND METHOD OF PULPING WASTE PAPER

Mark W. Spencer, 1451 Milwaukee St., Delafield, Wis. 53018, and Donald C. Cheesman, 993 Lake Country Ct., Oconomowoc, Wis. 53066

Filed Jun. 7, 1996, Ser. No. 659,878
Int. Cl.[6] B02C 18/40;23/18
U.S. Cl. 241—46.01 3 Claims

1. Apparatus for pulping of waste paper comprising;
a—twin tube pulping cylinder tank mounted horizontally and water inlets and
b—said twin tube pulping cylinder tank mounted horizontally above and parallel to a lower twin tube pulping cylinder and,



c—paper feed opening on the top of said twin tube pulping cylinder mounted over said lower twin tube pulping cylinder and,

d—said paper feed opening of said twin tube pulping cylinder tank located at the top end of said upper twin tube pulping cylinder tank and,

e—a shaft in each of said twin tube pulping cylinders, and each said shaft extending to an electric motor and,

f—a plurality of flinger arms in sets of three attached to split ring fasteners on said shafts and,

g—a pulp slurry outlet extending from said upper twin tube pulping cylinder tank mounted above said lower twin tube pulping cylinder, and said outlet extending into said lower twin tube pulping cylinder tank and,

h—a pulp slurry outlet from said lower twin tube pulping cylinder tank to crude pulp slurry tank and

i—aeration nozzles for compressed air inlet into bottom of said crude pulp slurry tank and said aeration nozzles directed upward to vertically mounted baffle plates and

j—a plurality of perforated conveyor troughs mounted diagonally upward in said crude pulp slurry tank and,

k—a perforated screw conveyor mounted in each of said perforated troughs and,

l—a tank mounted under said plurality of perforated conveyor troughs.

5,593,099

APPARATUS FOR PRODUCING SOLID FERTILIZER FROM LIQUID SUBSTANCES SUCH AS MANURE FROM LIVERSTOCK OR SLUDGE

Bertwin Langmeier, St. Martiner Weg 9, A-8570 Voitsberg, Austria

Filed Dec. 14, 1993, Ser. No. 167,477
Int. Cl.[6] B02C 23/36
U.S. Cl. 241—46.02 **5 Claims**

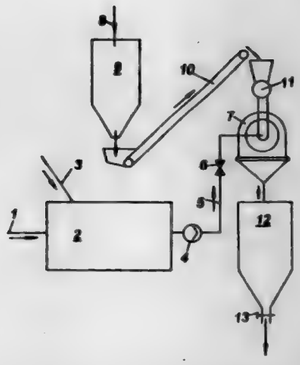
1. An apparatus for producing solid fertilizer, comprising

a grinding and blending device;

harvest leftover supply means communicating with said grinding and blending device for supplying harvest leftovers to said grinding and blending device;

liquid substance supply means communicating with said grinding and blending device for supplying a liquid substance selected from the group consisting of liquid manure and sludge to said grinding and blending device;

said grinding and blending device including means for grinding the harvest leftovers to a particle size in the range of a few microns and for simultaneously absorbing the liquid substance in the ground harvest leftovers for forming solid fertilizer.

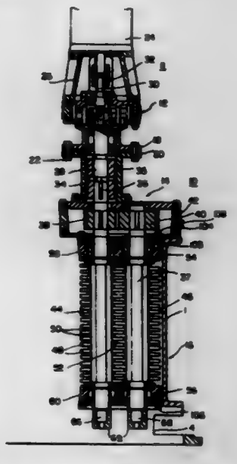


5,593,100

SOLID WASTE COMMINUTOR WITH REMOVABLE BEARING ASSEMBLY AND IMPROVED SIDE RAILS

Joseph W. Chambers, Sr., Rancho Mirage; Robert T. Sobol, Aliso Viejo; Craig J. Fennessy, Huntington Beach, and Rodney E. Graham, Tustin, all of Calif., assignors to Disposable Waste Systems, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 275,724, Jul. 19, 1994, Pat. No. 5,478,020, which is a continuation of Ser. No. 77,106, Jun. 16, 1993, Pat. No. 5,354,004. This application Dec. 4, 1995, Ser. No. 567,046
Int. Cl.[6] B02C 18/16
U.S. Cl. 241—101.2 **22 Claims**



1. Apparatus for comminuting solid waste material comprising:

drive means for providing rotary motion, a pair of cutter stacks with cutter elements of one stack interleaved with cutter elements of the other, and gear means to transmit the rotary motion of said drive means into counter-rotation of cutter elements of one stack with cutter elements of the other, each of said cutter stacks comprising a central shaft journaled for rotation proximate each end,

means to tighten each of said cutter stacks positioned on said stacks proximate to said gear means, and

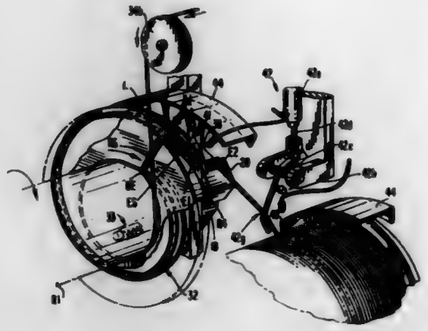
an access port providing direct access to said means to tighten without disassembly of any portion of said drive means.

5,593,101

APPARATUS FOR AND METHOD OF CONTINUOUSLY SPOOLING A FILAMENT ON REELS WITH ACCESSIBLE LONG INSIDE ENDS

Joseph Varga, Woodbridge, Canada, assignor to Ceeco Machinery Manufacturing, Ltd., Concord, Canada

Filed Feb. 27, 1995, Ser. No. 394,794
Int. Cl.[6] B65H 67/044;54/00
U.S. Cl. 242—25 A **19 Claims**



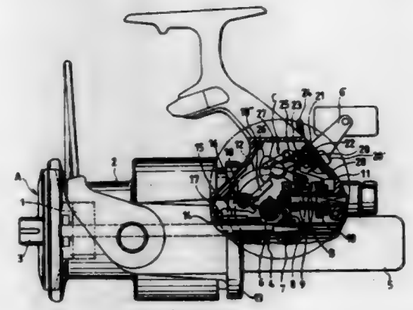
1. Spooling apparatus for continuously winding of a continuous advancing filament on reels each having a cylindrical drum and circular end flanges at each axial end of the drum, comprising support means for supporting two spaced reels for rotation about substantially parallel axes and for substantially aligning one set of corresponding flanges of the reels within a region between spaced, substantially parallel winding and cutting reference planes that are substantially normal to said axes; guide means for alternately guiding the filament to one of the reels for spooling, said guide means including positioning means for selectively guiding the filament to said winding reference plane during transfer of spooling to an empty reel and to position at least a portion of the filament in a direction substantially tangent with the periphery of the flange of the empty reel just prior to transfer of spooling to the empty reel while permitting continued winding of the filament on the other, wound reel; deflection means situated between the reels for momentarily deflecting the advancing filament from said winding to said cutting reference planes just prior to snagging and cutting of the filament while maintaining the advancing filament in said substantially tangent orientation; cutting means in said cutting reference plane for cutting the filament at said substantially tangent portion; snagging means for snagging the filament and cutting the filament on said cutting means and retaining an upstream end of the cut filament substantially at the periphery of the flange of the empty reel at an outer radial position while permitting the downstream end to be wound on the wound reel; long end storage means for storing a long end of the filament prior to spooling the empty reel, said long end storage means comprising means for defining an elongate generally spiral path arranged in said cutting reference plane and which gradually extends from said snagging means at the flange periphery to an intermediate radial position substantially co-extensive with the surface of the empty reel drum, the flange of the empty reel drum which is arranged between said winding and cutting reference planes being provided with a generally radial slot which extends substantially from a point on the periphery of the flange just prior to the position of said snagging means to said intermediate radial position on said elongate path, whereby said positioning means causes the filament to deposit a long length along said elongate path and enter said radial slot to provide a smooth transition of movement of the filament from said elongate path in said cutting reference plane to the drum of the empty reel in said winding reference plane; drive means for driving said reels at selected speeds and for initially driving the empty reel at a first speed when the filament is pulled into said cutting reference plane; and control means for accelerating the speed of rotation of the empty reel from said first speed as the filament is initially deposited along said elongate path to a higher, second speed as the filament is removed from said elongate path and applied to the drum of the empty reel to at least partially compensate for variable radial distances from the time that the filament is cut and held at the rim of the empty reel to the time that the filament is initially wound on the drum of the empty reel, and whereby the filament is subjected to minimal bending and tensile stresses during transfer of spooling from one reel to the other.

5,593,102

SPINNING REEL FOR FISHING HAVING A MECHANISM FOR LINKING THE SPOOL REVERSE PREVENTIVE AND THE DRAG DEVICE

Akira Yamaguchi, Saitama, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,348
Claims priority, application Japan, Feb. 24, 1994, 6-049980; Mar. 4, 1994, 6-058311
Int. Cl.[6] A01K 89/01
U.S. Cl. 242—246 **11 Claims**



1. A spinning reel for fishing, comprising:

a reel main body;

a spool rotatably arranged with respect to said reel main body;

a drag mechanism for frictionally coupling said spool to said reel main body;

a rotor rotatably arranged with respect to, said reel main body for winding a fishline onto said spool;

a switch-over mechanism for switching over said spool between a secured state and a freely rotatable state, wherein said drag mechanism frictionally couples said spool to said reel main body in said secured state;

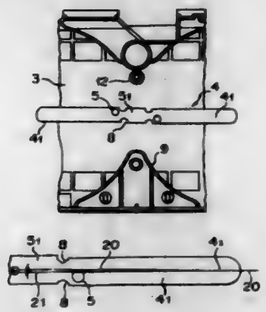
a first reversal preventive device for switching over said rotor between a first reversal preventive state and a first reversal permissible state;

a linking mechanism having a switch-over lever for coupling said switch-over mechanism to said first reversal preventive device such that said first reversal preventive device is activated to switch said rotor into said reversal permissible state when said switch-over mechanism switches said spool into said secured state, and that said first reversal preventive device is activated to switch said rotor into said reversal preventive state when said switch-over mechanism switches said spool into said freely rotatable state.

5,593,103
REEL SPRING FOR TAPE CASSETTE AND METHOD FOR PREPARING IT

Masatoshi Okamura, Saku, and Hiroshi Kaneda, Asahina-mura, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 18, 1994, Ser. No. 245,488
Claims priority, application Japan, May 18, 1993, 5-138906
Int. Cl.[6] G11B *23/04*; F16F *1/18*
U.S. Cl. 242—345.2 12 Claims

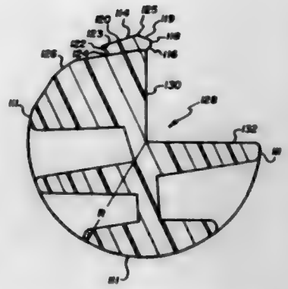


1. A reel spring for tape cassettes comprising:
a substantially flat, central base portion;
first and second elongated end portions extending from opposite edges of the base portion, the first and second end portions being bent with respect to a plane of the base portion such that at least part of each of the first and second end portions extends outside of said plane, the first and second end portions having respective first and second contact points respectively positioned adjacent the opposite ends of the spring for urging a pair of tape reels at reel centers; and
at least two mounting holes disposed in the base portion at opposite sides of a tape reel centerline wherein said tape reel centerline is a straight line which connects the reel contact points, and wherein said at least two mounting holes are spaced in a longitudinal direction of the reel spring;
wherein the base portion is arranged so as to have a center disposed along the tape reel centerline; the first and second end portions each having a straight centerline, which respectively extend through the respective first and second contact points, the centerline of the first end portion extending at a middle of the first end portion, the centerline of the second end portion extending at a middle of the second end portion, and wherein the centerline of the first end portion is parallel to the centerline of the second end portion, and further wherein the centerlines of the first and second end portions are each offset from the tape reel centerline, and the width of the base portion is substantially the same as that of the first and second end portions, with said width of said base portion extending substantially in a direction transverse to said centerline of said first end portion, and wherein said tape reel centerline is disposed within a width of each of said first and second end portions along an entire length of each of said first and second end portions.

5,593,104
FILM SPOOL

Jude A. SanGregory, Spencerport, and James G. Rydelek, Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1994, Ser. No. 341,784
Int. Cl.[6] B65H *75/28*
U.S. Cl. 242—348.1 11 Claims

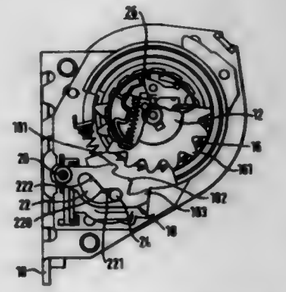


1. A rotatable film spool for winding and unwinding a filmstrip comprising a spool core having an outer peripheral surface for supporting the filmstrip and a film-catching member radially projecting from said outer peripheral surface for securing the filmstrip to said spool, is characterized in that:
said spool core includes a cutout portion adjacent said film-catching member sized for retaining an end portion of the filmstrip in an undeformed condition when said filmstrip is being unwound from said spool, wherein said film-catching member includes a film retaining portion which extends into said cutout portion for retaining the filmstrip on said spool after the end portion of the filmstrip has been secured thereto.

5,593,105
SEAT BELT RETRACTOR FOR PASSENGER RESTRAINING SYSTEMS

Johannes Schmid, Schwäbisch Gmünd, and Helmut Mika, Waldstetten, both of Germany, assignors to TRW Repa GmbH, Alfdorf, Germany

Filed Aug. 2, 1994, Ser. No. 284,180
Claims priority, application Germany, Aug. 12, 1993, 43 27 135.9
Int. Cl.[6] B60R *22/40*; B65H *75/48*
U.S. Cl. 242—383.4 9 Claims

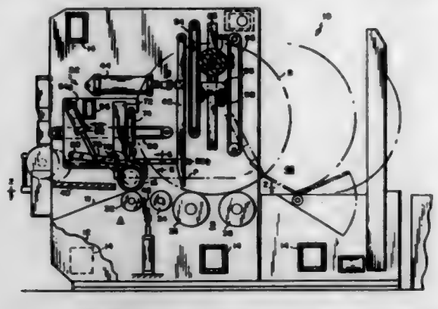


1. A seat belt retractor comprising a frame, a belt reel rotatably mounted in said frame about a fixed axis of rotation and provided with peripheral ratchet teeth, a locking pawl provided with at least two locking teeth and swivably mounted on said frame about a fixed swivel axis to be movable between a locking position in engagement with said ratchet teeth and a normal position retracted from said ratchet teeth, and a control mechanism for moving said locking pawl between said locking and normal positions, said locking pawl having a cam and said control mechanism comprising a cam follower engaging said cam and constrained to move along a predetermined path in synchronism with rotation of said belt reel in an uncoiling direction, and said cam being shaped in relation to said predetermined path so that upon movement of said cam follower along said predetermined path
a) said locking pawl is forcingly moved from said normal position to an initial engagement position where one of said locking teeth has a tip portion starting to contact a flank portion of one of said ratchet teeth, and
b) said cam disengages from said cam follower upon further pivotal movement of said locking pawl caused by rotation of said belt reel until said locking teeth fully engage said ratchet teeth.

5,593,106
SURFACE WINDER

Kenneth M. Cavanagh, Warwick, R.I., assignor to Parkinson Machinery and Manufacturing Corp., Woonsocket, R.I.

Filed Dec. 8, 1995, Ser. No. 567,888
Int. Cl.[6] B65H *18/20;19/26;19/30*
U.S. Cl. 242—527 13 Claims

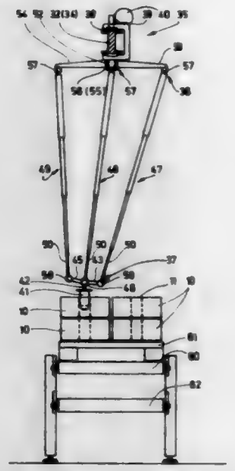


1. Apparatus for continuously winding web material into a succession of rolled packages, said apparatus comprising:
a support structure having fixed mutually spaced side frames extending along opposite sides of a transfer path leading from a first winding station to a second winding station;
tubular core members onto which the web material is wound into said packages;
a plurality of rotatably driven winding drums extending between said side frames in a cross machine direction perpendicular to said transfer path, said winding drums being operative to rotatably support said cores and the packages being wound thereon during a winding
operation which begins at said first winding station and which continues during transfer of said cores along said transfer path to said second winding station where the winding operation is completed;
tracks fixed to said side frames;
a transfer carriage mounted on said tracks for movement between said first and second winding stations;
bearing means for resisting shifting of said transfer carriage relative to one of said tracks in said cross machine direction and for accommodating shifting of said transfer carriage relative to the other of said tracks in the same direction;
mandrels adapted to be inserted through and to be removably fixed relative to said core members, said mandrels having opposite ends which protrude from opposite ends of said core members and which are rotatable relative to said core members;
transfer means for moving said transfer carriage in forward and reverse directions between said first and second winding stations;
first hold down means associated with said transfer carriage, said first hold down means being releasably engageable with the ends of said mandrels and being operative to yieldably urge said mandrels downwardly towards said winding drums while transporting said mandrels in said forward direction with said transfer carriage;
second hold down means for engaging and downwardly urging the ends of said mandrels at said second winding station, thereby enabling said first hold down means to be released from the ends of said mandrels and enabling said transfer means to return said transfer carriage in the reverse direction to said first winding station;
means for severing said web material at the conclusion of a roll winding operation at said second winding station, and for applying the leading end of the severed web material to another core member positioned at said first winding station; and
means for removing fully wound packages from said second winding station.

5,593,107
APPARATUS FOR HANDLING REELS OF WEBS OF MATERIAL

Heinz Focke; Harald Gaschruch, both of Verden, and Thomas Häfker, Etelsen, all of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Continuation of Ser. No. 83,773, Jun. 30, 1993, abandoned.
This application Oct. 16, 1995, Ser. No. 543,687
Claims priority, application Germany, Jun. 30, 1992, 42 21 052.6
Int. Cl.[6] B65H *19/00;67/00*
U.S. Cl. 242—559.4 19 Claims



1. An apparatus for handling reels (10) formed from wound webs of packaging material used in conjunction with packaging machines, said apparatus comprising:
conveyor rails (32) mounted in a horizontal plane above the packaging machines and extending in a horizontal direction;
an overhead reel conveyor (35) comprising an undercarriage (36) movably mounted on said rails;
means (40, 38, 39) for moving said reel conveyor (35) on said conveyor rails (32) above the packaging machines;
arranged on a bottom side of the reel conveyor (35) and below said undercarriage (36), a reel holder (37) for grasping and holding one of the reels (10) at a time, said reel holder (37) being movable up and down,
three pressure medium cylinders (47, 48, 49) which solely connect said reel holder (37) to said undercarriage (36) so that said reel holder (37) is exclusively supported by said three pressure medium cylinders, and which move said reel holder up and down,
a horizontal supporting frame (52, 53, 54) on said undercarriage (36); three first ball-and-socket joints (57) connecting upper ends of said three pressure medium cylinders (47, 48, 49), respectively, to said horizontal supporting frame; and
three second ball-and-socket joints (58) connecting lower ends of said three pressure medium cylinders (47, 48, 49) to said reel holder (37), said upper ends being spaced apart

from one another at a greater distance than said lower ends, so that the pressure medium cylinders (47, 48, 49) downwardly converge relative to one another,

said pressure medium cylinders (47, 48, 49) being individually extendible and retractable.

5,593,108

BOBBIN FOR RECEIVING ELONGATED WINDING MATERIAL

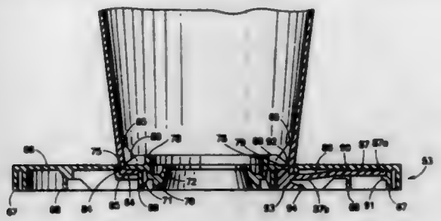
Werner Eck, Herzogenaurach; Georg-Michael Hornaber, Bartholomäusrach, and Werner Lepach, Schwabach, all of Germany, assignors to Maschinenfabrik Nicholf GmbH & Co. KG, Germany

PCT No. PCT/EP93/03404, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO94/13570, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 3, 1993, Ser. No. 284,450

Int. Cl.[6] B65H *75/14;75/22*

U.S. Cl. 242—608.5 **16 Claims**



1. A winding bobbin for receiving elongated string-like winding material and comprising:

a winding core formed with substantial rotational symmetry about a rotational axis and having a first end upon which a first flange is arranged, and a second end, opposite to the first end, upon which a second flange is arranged,

joining means provided at least between the first end of the winding core and the first flange joining the first flange and the winding core removably with one another,

catch projections spaced from one another on the first end of the winding core and projecting radially inward towards the rotational axis,

support projections on the first flange, each of said support projections having a space separating each said support projections from another of said support projections in a circumferential direction of the first flange, which space is greater than a length of the catch projections,

the support projections and the catch projections being in engagement with one another such that the first flange and the winding core are held relative to one another in an axial direction which corresponds to the longitudinal direction of the rotating axis of the winding core as a result of the catch projections of the winding core being placed in the spaces between the support projections followed by rotation of the first flange and the winding core relative to one another about a predetermined angle whereby the support projections and the catch projections come into said engagement with one another, and

at least one locking element on the first flange, said at least one locking element being releasably engaged in one of the spaces between the support projections and blocking relative rotational movement of the winding core and the first flange.

5,593,109

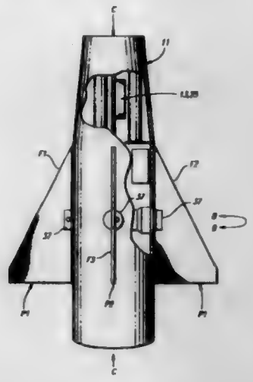
ACTUATOR SYSTEM AND METHOD

Andrew S. Williams, Brea, Calif., assignor to Lucas Western, Inc., Brea, Calif.

Filed Jan. 10, 1995, Ser. No. 370,792

Int. Cl.[6] F42B *10/64*

U.S. Cl. 244—3.21 **36 Claims**



15. A method for controlling motion of an aeronautical device using at least one aeronautical surface that provides lift within a prescribed range of motion, an input torque command provided by a guidance system, an electronic drive circuit, a motor controlled by the drive circuit, an output shaft that rotates the aeronautical surface, and a torque sensor that senses torque in the output shaft, the method comprising:

establishing a range of motion for said aeronautical surface;

sensing rotational torque of the output shaft using the torque sensor and generating an electronic representation of that rotational torque;

receiving both the electronic representation from the torque sensor and the input torque command, and computing a difference between the electronic representation and the input torque command to obtain a torque error command;

generating a motor drive signal with the drive circuit in response to the torque error command; and

using the motor to rotate the output shaft to compensate for the torque error command, at all times that the aeronautical surface is within said range of motion; and rotating the output shaft to compensate for the torque error command only if the rotation displaces the aeronautical surface closer to the range of motion, when the aeronautical surface is not within said range of motion.

5,593,110

APPARATUS FOR CONTROLLING THE STRUCTURAL DYNAMIC RESPONSE OF A ROCKET

Stephen Ransom, Stuhr, and Klaus-Dieter Relotius, Bremen, both of Germany, assignors to Daimler-Benz Aerospace AG, Munich, Germany

PCT No. PCT/DE94/00825, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO94/16286, PCT Pub. Date Jul. 21, 1994

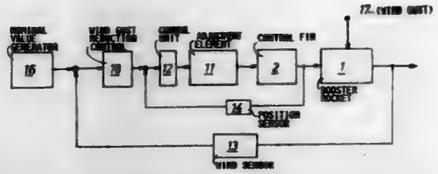
PCT Filed Jan. 13, 1994, Ser. No. 302,809

Claims priority, application Germany, Jan. 14, 1993, 43 00 761.9

Int. Cl.[6] F42B *10/02*

U.S. Cl. 244—3.23 **17 Claims**

1. An apparatus for controlling the structural dynamic response characteristic of a multi-stage booster rocket that has a plurality of stages and a lengthwise axis, the apparatus comprising a control fin that is arranged at a lateral side of said rocket at the area of a transition between said stages and that is supported rotatably



relative to said rocket for altering the structural dynamic response of said rocket, an adjustment element connected to said control fin, a sensor for measuring lateral wind loads and providing corresponding measured values, and a control for evaluating said measured values and activating said adjustment element to adjust a position of said control fin so as to compensate for crosswise forces effective on said rocket perpendicularly to said lengthwise axis.

5,593,111

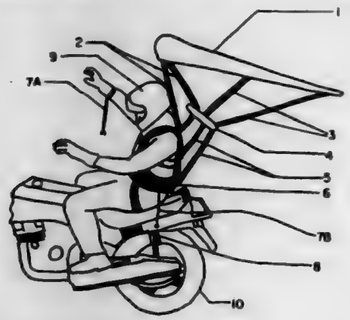
SAFETY SYSTEM FOR REMOVING A RIDER FROM A VEHICLE BY DEPLOYING A PARACHUTE

Troy Jackson, 3265 Newkirk St., Philadelphia, Pa. 19129, and Joseph S. Leak, Sr., 3931 N. 17th St., Philadelphia, Pa. 19140

Filed Jul. 18, 1994, Ser. No. 276,338

Int. Cl.[6] B64D *17/80;* **B64C** *9/32*

U.S. Cl. 244—110 D **20 Claims**



1. Apparatus comprising:

a drag-inducing device affixed to a rider for lifting the rider from a vehicle and reducing the rider's velocity after separation from the vehicle;

an active deployment system connected to the drag inducing device; and

a sensor system communicating with the deployment system,

whereby the sensor system senses a crash condition and signals the active deployment system to actively deploy the drag-inducing device.

5,593,112

NACELLE AIR PUMP FOR VECTOR NOZZLES FOR AIRCRAFT

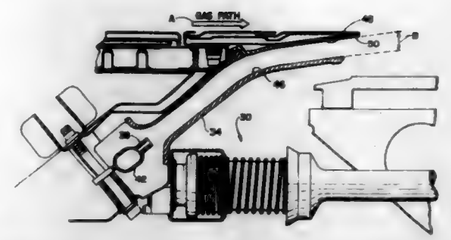
Mark S. Maier, West Palm Beach; Eric J. Gamble, Jupiter; Jack W. Wilson, West Palm Beach; Elliott L. Calzadilla, North Palm Beach, all of Fla., and Gerald F. Goetz, Seattle, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1994, Ser. No. 349,844

Int. Cl.[6] B64C *30/00*

U.S. Cl. 244—117 A **15 Claims**

1. For aircraft having a nacelle and sidewalls, a gas turbine engine mounted in said nacelle, a source of fan air from the gas turbine engine, and a two-dimensional exhaust nozzle disposed



adjacent said sidewalls mounted on said gas turbine engine, means for purging the nacelle and cooling the side walls comprising a booster pump attached to said sidewalls upstream of the discharge end of said two-dimensional exhaust nozzle, first nozzle means in said booster pump driven by the fan air, a mixing chamber for mixing air in said nacelle with said fan air, a diffuser attached to said mixing chamber, a second nozzle in series flow relationship with said first nozzle means disposed on the end of said diffuser, and a step defined by said sidewall and said second nozzle for reducing the static pressure of the gaspath for laying a blanket of cooling air adjacent the exposed surface of said sidewalls whereby said nacelle is continuously being purged and said sidewalls are continuously being cooled when the gas turbine engine is in operation.

5,593,113

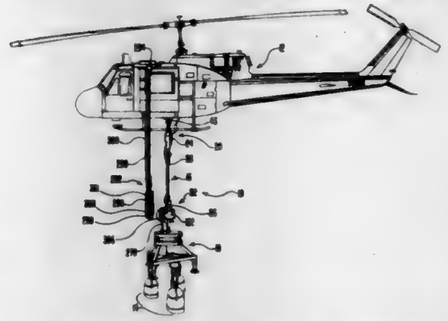
METHODS AND APPARATUS FOR SELECTIVELY ATTACHING AND RELEASING MULTIPLE PAYLOADS SUSPENDED FROM AN AIRCRAFT

Donald P. Cox, 539 E. 400 South, Orem, Utah 84058

Filed Feb. 6, 1995, Ser. No. 384,414

Int. Cl.[6] B64D *1/08*

U.S. Cl. 244—137.1 **46 Claims**



1. An apparatus for selectively attaching and selectively releasing multiple payloads suspended from an aircraft, the apparatus comprising:

(a) an airframe capable of supporting multiple payloads;

(b) a plurality of payload hooks attached to the airframe;

(c) means mounted on each of the payload hooks for sensing the loading position of each of the plurality of payload hooks;

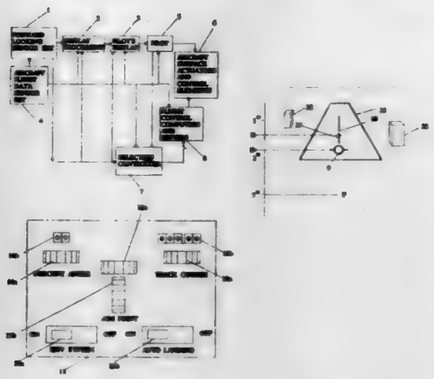
(d) means for suspending the airframe at a distance below the aircraft; and

(e) means for electrically and selectively actuating each of the payload hooks.

(f) means for supporting the plurality of payload hooks a distance off the ground during repetitive landing of the apparatus for attaching the individual payloads;

wherein the means for supporting the airframe off the ground comprises a plurality of legs attached to the airframe and extending below the airframe such that the plurality of legs support the payload hooks off the ground during landing of the apparatus.

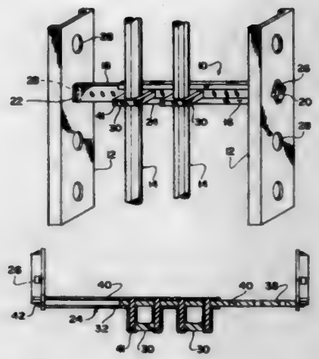
5,593,114
SYNTHETIC VISION AUTOMATIC LANDING SYSTEM
Louis F. Ruhl, Santa Ana, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.
Filed Apr. 19, 1994, Ser. No. 229,655
Int. Cl.[6] B64D 45/04
U.S. Cl. 244—183 24 Claims



1. An aircraft automatic landing system capable of utilizing ground based ILS input signals input to said landing system adapted for use without ground based ILS signals, comprising:
a. a computer,
b. a display device coupled to said computer,
c. a vector cursor generated by said computer for displaying aircraft vector information on said display device,
d. an on-board forward looking sensor set coupled to said computer for detecting environmental information forward of said aircraft having an output for transmitting the information received from the sensor set to the computer for display on the display device,
f. at least one reference cursor, selectively movable with respect to said display, displayed on said display,
g. a cursor control for selecting the position of said reference cursor on the display,
h. a computing unit for computing the difference in position between the vector cursor and the reference cursor and generating difference information,
i. a converter for converting the difference information into a signal suitable for input to the automatic landing system, and
j. an interface for applying said signal to the input of the automatic landing system.

5,593,115
PIPE HANGER
James M. Lewis, 1349 Brenda Rd., Severn, Md. 21144
Filed Jan. 15, 1994, Ser. No. 260,424
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—68.1 9 Claims

1. A pipe hangar bracket for supporting pipe between spaced metal construction studs having openings of standard configuration formed or formable therein, said bracket comprising:
elongate first and second bracket members having opposed end portions and having top, bottom, front and back sides, said first and second bracket members being retained in telescoping relation to each other and having a plurality of spaced boreholes along said front sides for receiving attaching screws for selectively securing at lease one pipe clamp along at least one of said bracket members; and
first and second resilient connecting grommets attached to said opposed end portions, said grommets configured to snap rigidly from the space between the studs into said openings defined in the opposed sides of the spaced metal studs, said



bracket members being attached off-center with respect to said grommets to permit passage of electrical cable through said grommets.

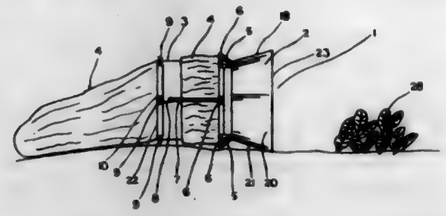
5,593,116
HOSE RETRACTOR
Martin C. Pettesch, Cranford; Douglas T. Main, Jr., Basking Ridge, and Robert J. Milo, Chatham, all of N.J., assignors to Universal Valve Co., Inc., Elizabeth, N.J.
Filed Oct. 11, 1994, Ser. No. 320,293
Int. Cl.[6] A62C 13/76
U.S. Cl. 248—75 20 Claims



1. A hose retractor comprising
a standard portion for mounting in a substantially vertical position,
a head portion having one portion coupled to the standard portion,
said head portion having a substantial length curved upward and outward from said one portion,
a cord-like member having at least one end portion extending external of said head portion for coupling to a hose, said member having a length extending internally through said head portion,
retraction means for enabling the extension and causing the retraction of the cord-like member in response to tension forces applied to said end portion,
a cartridge for guiding and reducing the friction for the cord-like member movement through the head portion, said cartridge being shaped to match the curvature of the head portion and being dimensioned for insertion into and removal and from the interior of the head portion,

at least one securing member operable from the exterior of the head portion for releasably securing said cartridge in the head portion.

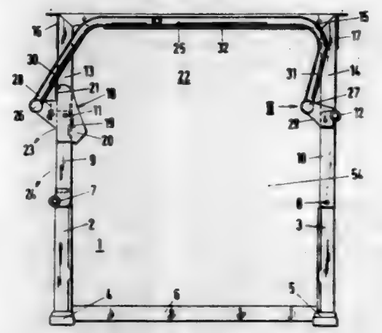
5,593,117
LEAF AND LAWN DEBRIS COLLECTING APPARATUS
Claibourne N. Alexander, III, 2025 Lee's Ct., Clearwater, Fla. 34624-4770
Filed Aug. 11, 1995, Ser. No. 514,482
Int. Cl.[6] B65B 67/04
U.S. Cl. 248—99 9 Claims



1. A gardening apparatus for collecting leaves and debris, said apparatus comprising:
(a) a forward component having four panels, a front opening, a back opening, and a hollow center, said four panels having a bottom panel, two lateral panels, and a top panel, said four panels having front leading edges and back edges, said forward component having grooves formed thereto in proximity to said back edges,
(b) a first substantially rectangular member affixed thereto said groove,
(c) a rear component having four panels, a front opening, a back opening, and a hollow center, said four panels having a bottom panel, two lateral panels, a top panel, said four panels having front leading edges and back edges, said front leading edges fitting therein said grooves of said forward component,
(d) a second substantially rectangular member affixed thereto said rear component in proximity to said rear edges,
(e) a means of affixing said first member thereto said second member, said means comprising a flexible strap having one end affixed thereto said first member, and another end affixed thereto said second member,
(f) a bag having an open mouth at one end, said open mouth of said bag affixed therebetween said leading edge of said rear component and said groove.

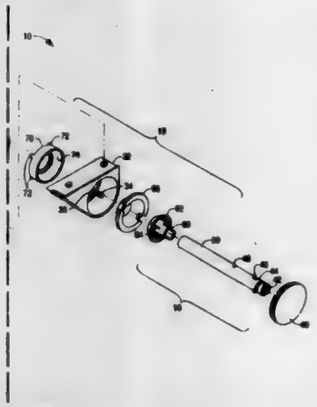
5,593,118
FURNITURE FRAME
Karl Kuelle, Holzmaden, Germany, assignor to Robert Krause GmbH & Co. KG Zweigniederlassung Weilheim/Teck, Weilheim/Teck, Germany
Filed May 17, 1995, Ser. No. 443,056
Claims priority, application Germany, May 18, 1994, 94 08 173 U
Int. Cl.[6] A47G 23/02
U.S. Cl. 248—150 14 Claims

1. A furniture frame comprising:
support means having upright support parts;
intermediate link members pivotably connected to said support parts;
a carrier member that carries a panel and has carrier parts that are pivotably connected to said intermediate link members, said carrier member being moveable between a lower position of use and an upper position of use in which said support parts, said intermediate link members, and said carrier parts extend upwardly and together with said panel enclose a free space; and



at least one connecting member having a center portion and also having end portions that are pivotably connected to said intermediate link members at pivot locations, said end portions of said connecting member extending upwardly from said pivot locations, and said center portion of said connecting member, in said upper position of use, extending at least substantially in a region beyond said free space when viewed in a direction of pivot axes of said furniture frame.

5,593,119
APPARATUS AND METHOD FOR MOUNTING A TERMINAL
Charles A. Moore, Lawrenceville, Ga., and Douglas J. Kinton, Huber Heights, Ohio, assignors to AT&T Global Information Solutions Company, Dayton, Ohio
Filed Jan. 12, 1995, Ser. No. 371,636
Int. Cl.[6] F16M 11/10
U.S. Cl. 248—185.1 6 Claims



1. A mounting apparatus comprising:
a base member;
a top member;
a pivot member for connecting the base member and the top member wherein the pivot member further includes a shaft, a cross pin extending through the shaft, and a shaft retainer for securing the shaft to the base member; and
a conical brake mechanism located around the pivot member for adjusting and maintaining the position of the top member wherein the conical brake mechanism further includes:
a plunger having a conical base, a cam groove, and a pair of wings to secure the plunger to the top member;

a conical foam spring pad nesting to the conical base of the plunger; and

a floating brake plate having a tapered inner surface which has a friction fit with the top member and also having tabs for securing the floating brake plate to the base member.

5,593,120

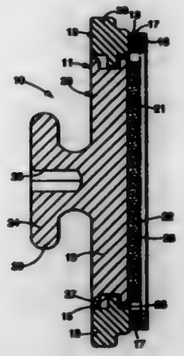
QUICK-MOUNTING FASTENING ASSEMBLY

Michael B. Hamerski, Baldwin Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 21, 1994, Ser. No. 342,715

Int. Cl.[6] A47G 29/00

U.S. Cl. 248—285.3 **20 Claims**



1. A quick-mounting fastening assembly comprising:

a fastening structure having an initial attachment surface, and a main attachment surface that is approximately co-planar with said initial attachment surface;

a layer of pressure-sensitive adhesive on said initial attachment surface that affords adhering the fastening structure to a surface of a substrate by pressing the layer of pressure sensitive adhesive against the substrate;

a layer of solidified hot-melt adhesive on said main attachment surface; and

frictional heating means for affording sufficient frictionally heating to melt the layer of hot-melt adhesive with the layer of pressure sensitive adhesive adhered to a substrate so that when it again solidifies, the layer of hot melt adhesive will be adhered to the substrate.

5,593,121

DETACHABLE TREE MOUNT FOR ARROW QUIVERS

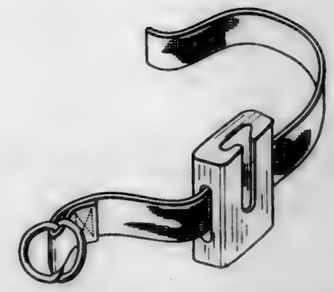
Roy E. Tackett, 2902 Witteville Dr., Poteau, Okla. 74953

Filed Jul. 6, 1995, Ser. No. 498,573

Int. Cl.[6] F16L 3/08

U.S. Cl. 248—218.4 **1 Claim**

1. An apparatus for mounting bow mounted arrow quivers to a tree trunk, tree branch or post, said apparatus comprising a mounting block and a strap with means for securing said strap to said tree, trunk, tree branch or post, where said mounting block is a short section of tubular plastic pipe with two rectilinear holes cut out on opposing sides of the wall of said tubular plastic pipe through which holes said strap is inserted and an opening extending from one end of said tubular plastic pipe section extending about two thirds the length of said tubular pipe section into which the bow mounted quiver mounting means may be inserted.



5,593,122

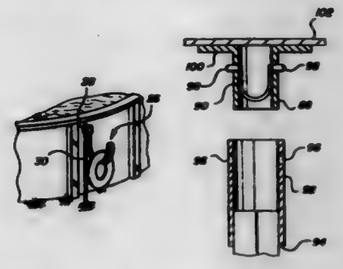
HANGER/HOOK ACCESSORY

Tim E. Robertson, 6480 Cranston Pl., Saginaw, Mich. 48603, and Ted W. Robertson, 5340 E. Jordan Rd., Mt. Pleasant, Mich. 48858

Filed Oct. 6, 1994, Ser. No. 319,111

Int. Cl.[6] E04H 4/16

U.S. Cl. 248—222.12 **7 Claims**



1. A hanger accessory for supporting articles on a vertically dependent member hung from an outer underside of a pool rim member comprising:

a mounting bracket adapted to be connected to the outer underside of the pool rim member, said mounting bracket supporting a generally vertically extending dependent portion adapted to extend from the underside of the pool rim member;

a hook having a mounting connector portion at one end thereof connectable with said dependent portion;

a removable fastener device securing said mounting connector portion of said hook releasably to said dependent portion of said bracket for disposing said hook to be vertically dependent from the outer underside of the pool rim member;

said hook including a spaced end for forming a support surface located laterally of said bracket at a point below said pool rim.

5,593,123

VACUUM SYSTEM COMPONENTS

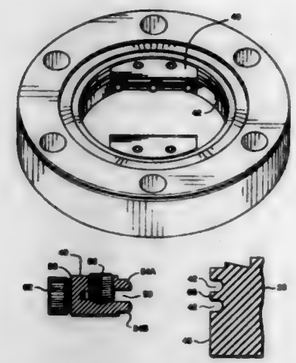
Charles K. Crawford, Wilton, N.H., assignor to Kimball Physics, Inc., Wilton, N.H.

Filed Mar. 7, 1995, Ser. No. 399,906

Int. Cl.[6] F21L 15/08

U.S. Cl. 248—231.21 **6 Claims**

1. A system for attaching an internal apparatus within a vacuum device, said system having a vacuum joint comprising a pair of substantially parallel flanged members, at least one of said flanged members having at least one groove formed in an inner surface,



and further comprising a substantially U-shaped mounting assembly which has a pair of substantially parallel webs, each of said webs having a distal end engaging at least one said groove and a means for urging said webs to engage side wall surfaces of said groove.

5,593,124

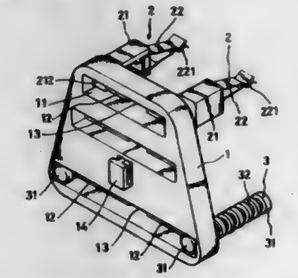
ARTICLE HANGER

Chin-Yang Wang, No. 167, Lane 131, Sec. 2, Ture Hsing Rd., Panchiao City, Taipei Hsien, Taiwan

Filed Oct. 11, 1995, Ser. No. 540,946

Int. Cl.[6] F21L 15/08; B60R 7/00

U.S. Cl. 248—231.81 **9 Claims**



1. An article hanger comprising:

a base plate having a plurality of transverse slots at different elevations, and a hanging member at a front side for holding things, each transverse slot comprising at least two pairs of vertically spaced tongues and an opening between each two pairs of vertically spaced tongues;

a plurality of clamps respectively fastened to said pairs of vertically spaced tongues for clamping on the louvers of an automobile's air conditioner, each clamp comprising a mounting rod and a clamping plate coupled to said mounting rod for clamping on the louvers of the automobile's air conditioner, said mounting rod comprising a coupling hole at one end, which holds said clamping plate, a first outward flange at one end, a second outward flange dispose between said first outward flange and said coupling hole, and a neck connected between said first outward flange and said second outward flange, the size of said first and second outward flanges being slightly smaller than the opening of each transverse slot but bigger than the space between each pair of vertically spaced tongues, the diameter of the neck of said mounting rod being slightly smaller than the space between each pair of vertically spaced tongues, the length of the neck of said mounting rod being equal to the thickness of said vertically spaced tongues; and

a plurality of stop rods respectively coupled to said pairs of vertically spaced tongues of said base plate and stopped against the instrument board of the automoible, each stop rod comprising a plurality of rod sections and a plurality of necks alternatively connected in a line, the diameter of the necks of said stop rods being slightly shorter than the space between each pair of vertically spaced tongues, the diameter of said rod sections being slightly smaller than the opening of each transverse slot but slightly longer than the space between each of vertically spaced tongues.

5,593,125

WINDSHIELD WIPER ASSEMBLY FASTENING ARRANGEMENT

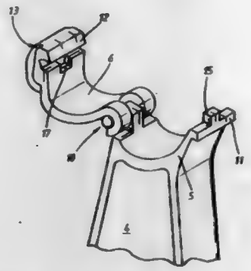
Andreas Storz, Boeblingen; Siegmund Czesnikowski, Unterjettingen, and Wolfram Frey, Altehengstett, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed Apr. 14, 1995, Ser. No. 421,933

Claims priority, application Germany, Apr. 20, 1994, 44 13 635.8

Int. Cl.[6] B60S 1/34

U.S. Cl. 248—316.5 **14 Claims**



1. An arrangement, comprising a windshield wiper assembly, a fixed supporting wall, a central adjustable holding element having a lower extending portion operatively mounted on the fixed supporting wall to secure, in a mounted condition, a holding part of the windshield wiper assembly, wherein the holding element includes two hingedly joined half shells which are adapted to reach around the holding part of the wiper assembly, a first of the half shells having the lower extending portion mounted at the fixed supporting wall and being rigidly arranged on the holding element, and the second of the half shells being releasably and lockably held on the first half shell.

5,593,126

SEAT POST BAG CLIP

Kenneth J. Muderlak, Shorewood, Wis., assignor to Trek Bicycle, Corp., Waterloo, Wis.

Division of Ser. No. 218,572, Mar. 28, 1994, Pat. No. 5,496,089. This application Oct. 23, 1995, Ser. No. 547,867

Int. Cl.[6] A47G 1/10

U.S. Cl. 248—316.7 **12 Claims**

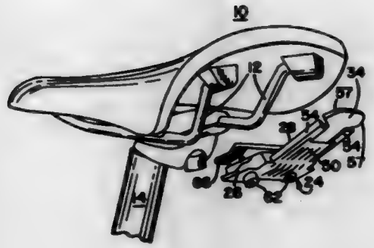
1. A clip for mounting an accessory to a cycle seat assembly, said clip having a longitudinal axis extending from a first end to an opposite end, a lateral axis being generally horizontal normal to said longitudinal axis and a generally vertical axis comprising:

a tab with a mounting cleat at said first end, and a resilient leaf extending longitudinally outwardly therefrom toward said opposite end;

a pawl formed on said tab longitudinally opposite the mounting cleat at said opposite end;

an actuator for biasing the leaf;

a tubular receiver for receiving said tab, said receiver having a rearward edge;



a pair of side guides defining laterally outward portions of the tab;

said resilient leaf being defined by a plurality of slits disposed laterally inwardly of said side guides;

said tubular receiver defining an uninterrupted passage between opposite longitudinal ends with said rearward edge on one of said opposite ends of said receiver;

said resilient leaf biasing the pawl into engagement with the rearward edge of the receiver in a locked position, and said actuator biasing the leaf for release of the tab from the receiver when manipulated;

said actuator extending laterally outward beyond said slits to facilitate gripping by the user's fingers.

5,593,127

ICE GUARD

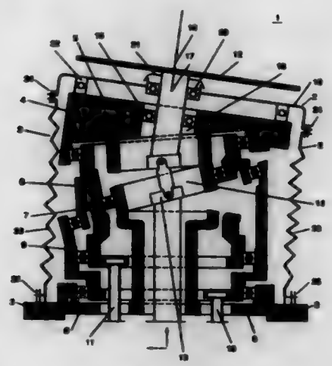
Torsten G. Lindberg, öckerö , Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 14, 1993, Ser. No. 91,014

Claims priority, application Sweden, Aug. 7, 1992, 9202312

Int. Cl.[6] A47B *95/00*

U.S. Cl. 248—345.1 **9 Claims**



1. An ice guard for breaking ice formations on and protecting from stress components of a turntable platform apparatus, comprising a turntable platform apparatus including at least a tiltable platform at an upper end and a supporting base at a lower end, the ice guard comprising:

a bellows structure having a first and a second end, the first end fastened to the supporting base, the bellows structure extending from the supporting base to the tiltable platform and enclosing all components of the turntable apparatus between the supporting base and the tiltable platform; and,

means for attaching the second end of the bellows structure at the upper end of the turntable platform apparatus to permit relative rotation between the bellows and the turntable platform apparatus.

5,593,128

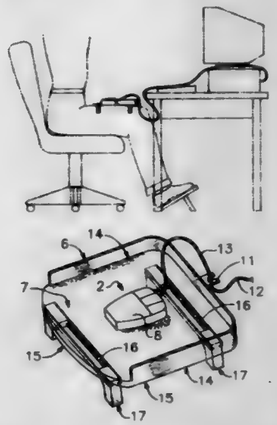
LAP SUPPORTED COMPUTER MOUSE SURFACE

Patricia B. Odom, and Harold A. Odom, Jr., both of P.O. Box 697, Missouri City, Tex. 77549-0697

Filed Feb. 16, 1995, Ser. No. 389,497

Int. Cl.[6] A47B *91/00*

U.S. Cl. 248—346.01 **19 Claims**



1. A remote work surface for a computer cursor control device, comprising platform means for providing an area for seating a computer cursor control device; locating means for positioning and securing the surface; and retaining means for constraining movement of the computer cursor control device, wherein said platform means further comprises a left side edge, a right side edge and a rear edge and wherein said retaining means for constraining movement of the computer cursor control device further comprises post means spaced apart in series and upwardly extending from said platform means adjacent said left side edge, right side edge and rear edge for preventing said computer cursor control device from escaping said surface of said seating area.

5,593,129

TELESCOPING MAST WITH IMPROVED HOLDDOWN-LOCKING MECHANISM

Daniel S. Adams, Visalia; Gene R. Butler, Kingsburg, and Kenneth J. Pereira, Hanford, all of Calif., assignors to Tri-Ex Tower Corporation, Visalia, Calif.

Continuation-in-part of Ser. No. 772,167, Oct. 7, 1991, Pat. No. 5,163,650. This application Jun. 7, 1993, Ser. No. 72,817

Int. Cl.[6] E04H *12/00*; F16B *7/00*

U.S. Cl. 248—405 **3 Claims**

1. In a telescoping mast, including

at least three nesting elongate tubular sections having upper and lower ends,

a bottom section, and

upper sections, including

a top section, and

at least one intermediate section,

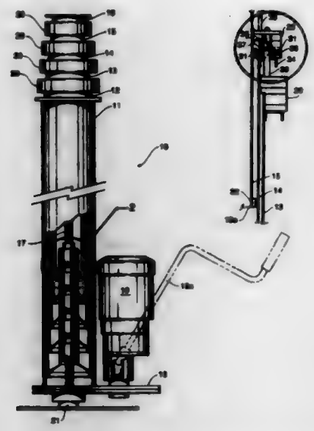
means for extending and retracting said upper sections in a predetermined sequence,

and

means responsive to extending and retracting said upper sections for automatically locking adjacent sections together when fully extended,

the improved holddown-locking means comprising:

(A) a lock projection-lock engagement pair, one of said pair being carried on the outer surface of each of said upper sections, spaced from the lower end thereof, and the other of said pair being carried on the upper ends of each of said intermediate sections;



(B) a lock actuator stud carried on the upper end of each of said intermediate and bottom sections;

each said pair cooperating to

operatively lock together in response to disengagement with the lock actuator stud carried by the next lower section, to restrain substantial relative vertical movement between an upper section which is fully extended from its next lower section, and

operatively unlock from each other in response to engagement with said lock actuator stud carried by the next lower section.

5,593,130

VALVE, ESPECIALLY FOR FLUID HANDLING BODIES WITH MICROFLOWCHANNELS

Thord Hansson, Bälinge, and Stefan Sjölander, Uppsala, both of Sweden, assignors to Pharmacia Biosensor AB, Uppsala, Sweden

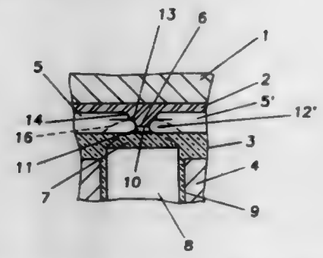
PCT No. PCT/SE94/00824, § 371 Date Mar. 6, 1996, § 102(e) Date Mar. 6, 1996, PCT Pub. No. WO95/07425, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 6, 1994, Ser. No. 605,166

Claims priority, application Sweden, Jun. 9, 1993, 9302865

Int. Cl.[6] F16K *7/12*

U.S. Cl. 251—61.1 **11 Claims**



1. A valve comprising a valve body with two fluid flow channels separated by a land portion which forms a valve seat having a sealing surface for co-operation with a flexible membrane mounted over a duct which opens in front of the valve seat and is arranged for fluid pressure actuation of the membrane between a closed position, where the membrane sealingly contacts the valve seat, and an open position where there is a flow channel communicating space between the valve seat and the membrane, wherein said sealing surface of the valve seat comprises

(i) a primary sealing surface located nearest and facing the membrane, and

(ii) a secondary sealing surface provided on each fluid channel side of the valve seat, so that when the valve is closing, the membrane successively seals against the primary sealing surface and the secondary sealing surfaces, and, inversely, when the valve is opening, the membrane is successively separated from the secondary sealing surfaces and the primary sealing surface.

5,593,131

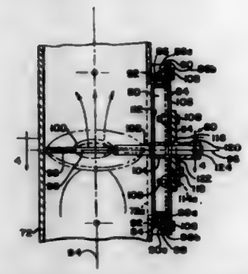
VARIABLE ORIFICE PLATE FOR COAL PIPES

Oliver G. Briggs, Jr., Jefferson, and John A. Sund, Jr., Oakham, both of Mass., assignors to DB Riley, Inc., Worcester, Mass.

Filed Nov. 13, 1995, Ser. No. 559,169

Int. Cl.[6] F16K *51/00*

U.S. Cl. 251—117 **11 Claims**



1. Flow control apparatus for a coal pipe containing a stream of primary combustion air carrying pulverized solid fuel particles, comprising:

frame means sealingly secured to an outside surface of the coal pipe around a window opening formed on one side of the pipe;

an orifice plate having an orifice opening at the center supported for pivotal movement in said coal pipe on a spindle extending radially outwardly from an edge on one side of said plate through said window opening;

bearing means for supporting said spindle for rotating movement about a spindle axis extending transversely of the coal pipe across the center thereof;

mounting plate means for closing off said frame means and supporting said bearing means mounted thereon; and

handle means adjacent an outer end of said spindle for rotating the same to vary the effective flow cross-section of said orifice opening in the coal pipe.

5,593,132

ELECTROMAGNETIC ACTUATOR ARRANGEMENT FOR ENGINE CONTROL VALVE

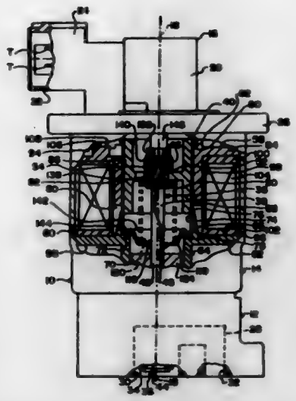
Bernard J. Hrytzak, Chatham, Canada, assignor to Siemens Electric Limited, Chatham, Canada

Filed Jun. 30, 1995, Ser. No. 497,680

Int. Cl.[6] F02M *25/07*; F16K *31/06*

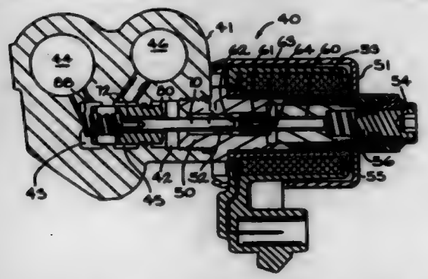
U.S. Cl. 251—129.15 **9 Claims**

1. An electric exhaust gas recirculation (EEGR) valve for an internal combustion engine comprising an enclosure including a base, an entrance at which engine exhaust gas to be recirculated enters said base, a passage that extends through said base for conveying engine exhaust gas that has entered said entrance, an exit at which engine exhaust gas that has passed through said passage exits said base, an annular valve seat that is disposed within said passage concentric with an imaginary axis, an armature-pintle assembly that comprises an armature and a pintle and that is disposed within said enclosure for selective positioning along said axis, said pintle comprising a shaft extending from said



armature to a valve head that is cooperatively associated with said valve seat for selectively setting the extent to which flow can pass through said passage in accordance with the position of said armature-pintle assembly along said axis, electromagnetic actuating means comprising a solenoid coil disposed within said enclosure concentric with said axis and stator structure disposed in association with said solenoid coil to provide a magnetic circuit for magnetic flux created when electric current flows in said solenoid coil, said stator structure comprising an air gap disposed concentric with said axis in proximate surrounding relationship to a cylindrical tubular walled portion of said armature that is concentric with said axis, said air gap being defined by two confronting, but axially spaced apart, axially extending wall portions of said stator structure, a non-magnetic sleeve member comprising a tubular cylindrical side wall concentric with said axis and disposed radially between said wall portions of said stator structure and said cylindrical tubular walled portion of said armature, said sleeve further comprising an end wall disposed for abutment with said armature to define a limit of axial travel for said armature-pintle assembly and to provide a spring seat, a helical coiled spring disposed between said spring seat and said armature biasing said valve head to seat on said seat member and close said passage in the absence of current flow in said solenoid coil, and being increasingly compressed as current flow in said coil increases to unseat said valve head from said valve seat and increasingly open said passage to flow.

5,593,133
VARIABLE ASSIST STEERING PRESSURE CONTROL VALVE
Harry A. Hunnicutt, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed May 19, 1995, Ser. No. 444,464
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.15 **19 Claims**



1. A pressure control valve for use in a variable assist power steering system of a vehicle, the control valve comprising:

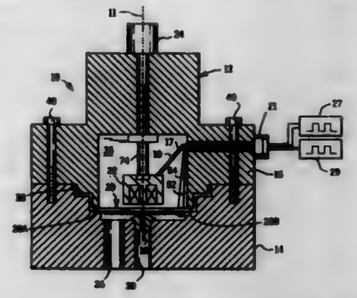
a housing having a valve chamber formed therein, said housing also having inlet and outlet ports formed therein which communicate with said valve chamber, said inlet port adapted to receive fluid and said outlet port adapted to discharge fluid;

a valve element disposed within said valve chamber between said inlet and outlet ports, said valve element defining a valve element axis and cooperating with said housing to define an orifice for communication between said inlet and outlet ports, said valve element being axially movable within said valve chamber to vary the size of said orifice for controlling the flow of fluid through said valve chamber;

a solenoid having an axially movable armature which is separate from said valve element, said armature defining an armature axis and being carried by said housing; and

a coupling disposed between said solenoid armature and said valve element for transferring axial movement of said armature to said valve element, said coupling including an actuator rod defining an actuator rod axis and having first and second ends, said first end slidably engaging said valve element and said second end slidably engaging said solenoid armature to allow said actuator rod axis to move transversely relative to at least one of said valve element axis and said armature axis to minimize the transfer of transverse movement of one of said solenoid armature and valve element to the other of said solenoid armature and valve element while transferring axial movement therebetween.

5,593,134
MAGNETICALLY ASSISTED PIEZO-ELECTRIC VALVE ACTUATOR
George R. Steber, Mequon, and Dale A. Knutson, Nashotah, both of Wis., assignors to Applied Power Inc., Butler, Wis.
Filed Feb. 21, 1995, Ser. No. 391,887
Int. Cl.[6] F16K *31/02*
U.S. Cl. 251—129.17 **16 Claims**



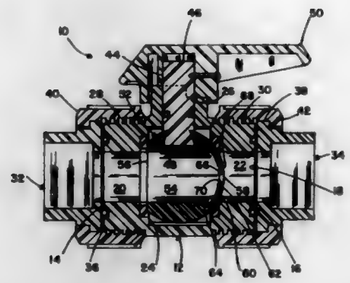
1. In a valve of the type having a piezo-electric actuator for varying a flow area past a valve seat, said actuator being of the type having a layer of piezoelectric material and an electrode sheet laminated to said piezo-electric layer, the improvement wherein;

said valve includes a magnet opposite from said seat with said actuator between said magnet and said seat; and

said actuator includes a material which is magnetically attractable by said magnet.

5,593,135
PRECISE THROTTLING BALL VALVE
Leo M. Lester, Medford, Mass., and Yasunori Kuroki, Nobeoka, Japan, assignors to Asahi/America, Inc., Malden, Mass.
Filed May 12, 1995, Ser. No. 440,240
Int. Cl.[6] F16K *5/10*
U.S. Cl. 251—209 **9 Claims**

1. A throttling valve comprising:

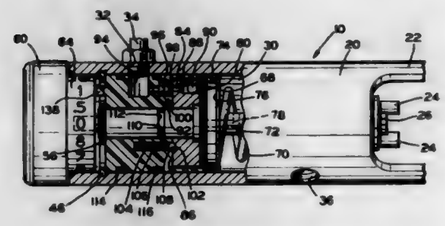


a valve housing having a cylindrical upstream passage, a substantially identical cylindrical downstream passage axially aligned with the upstream passage and a valve seat therebetween, a stem aperture extending through said housing and into said valve seat substantially orthogonally aligned to the upstream and downstream passages;

a valve stem rotatably mounted in the stem aperture and extending from a location outside said valve housing to a location within said valve seat; and

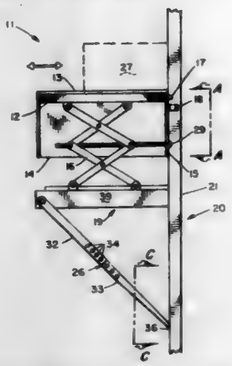
a spherical valving member rigidly mounted to said valve stem and rotatably mounted in said valve seat, said spherical valving member having a fluid passageway extending therethrough, said fluid passageway having opposed upstream and downstream ends, portions of said fluid passageway extending from said upstream end to a location substantially adjacent said downstream end defining a cylinder axially alignable with the respective upstream and downstream passages in said housing, said downstream end of said fluid passageway being characterized by a throttling wall spherically generated about the center of the spherical valving member, said throttling wall having an oblong outlet opening formed therethrough.

5,593,136
GAS FLOW RATE REGULATOR
George D. Reed, Toledo, and Robert L. Weaver, Sylvania, both of Ohio, assignors to B&F Medical Products, Inc., Toledo, Ohio
Filed Aug. 5, 1994, Ser. No. 286,651
Int. Cl.[5] F16K *5/10*
U.S. Cl. 251—366 **14 Claims**



1. A rotor retainer housing for a gas flow regulator, comprising an elongated cylindrical molded plastic body having opposite ends, said cylindrical body including a rotor-receiving skirt at one of said ends, a bore extending axially through a sleeve within the plastic body, at least one O-ring receiving recess formed in an outer surface of said cylindrical body and extending circumferentially therearound, and at least one cavity extending into said plastic body from the other of said ends, said one cavity being open at said other end and disposed between said sleeve and an outer circumferential wall of said cylindrical body.

5,593,137
BI-DIRECTIONAL ELEVATING AND RACK-ATTACHED SUPPORT DEVICE FOR POSITIONING MODULES DURING INSTALLATION AND REMOVAL FROM RACKS
Charles L. Johnson, 177 Old Canton Hills Dr., Jackson, Miss. 39211
Filed Mar. 31, 1995, Ser. No. 414,798
Int. Cl.[6] B66F *3/22*
U.S. Cl. 254—122 **3 Claims**



1. An improved combination device for assisting in the installation, removal and repair of items such as electronic telecommunications modules which are mounted in a rack, comprising:

a. a support platform adapted to be removably mounted to at least a pair of vertically-arranged, spaced-apart elements having a plurality of apertures therein and forming a rack means for mounting modules thereto;

b. a bi-directional adjustable elevating and support mechanism adapted to be operatively supported by the support platform, said mechanism comprising:

a work platform;

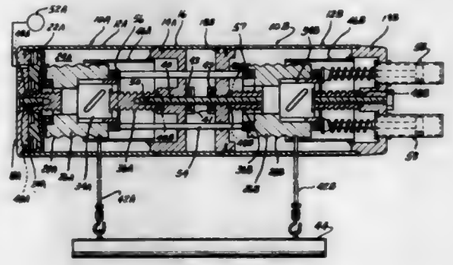
scissor lift means operably secured between said support platform and said work platform for bi-directional elevation of said work platform;

panel section means operably secured to the front of said work platform and depending therefrom;

handle means operatively secured to said front section panel means; and

c. level indicator means operably secured to said front panel section means.

5,593,138
AIR BALANCING HOIST COMBINATION
James Zagaroli, Jr., Drayton Plains, Mich., assignor to Knight Industries, Inc., Auburn Hills, Mich.
Continuation-in-part of Ser. No. 414,589, Mar. 31, 1995, abandoned. This application Jun. 14, 1995, Ser. No. 490,202
Int. Cl.[6] B66D *1/10*
U.S. Cl. 254—314 **10 Claims**



1. A fluid pressure balancing hoist combination, comprising: a master air balancing hoist including a housing, a fluid pressure chamber defined in said housing and a piston axially movable in said housing and defining in part said fluid pressure chamber so that said fluid pressure in said chamber is exerted thereon, a cable drum mounted in said housing for rotation and axial movement in said housing and having a load cable fixed thereto and adapted to be wound thereon and unwound therefrom by rotation of said cable drum either direction, said piston engaging one end of said cable drum to urge axial movement thereof in a first direction;

means causing said cable drum to rotate to wind said cable thereon upon movement axially in said first direction;

a slave balancing hoist including a housing, a cable drum mounted in said housing for rotation and axial movement in said housing, a cable fixed thereto and adapted to be wound thereon and unwound therefrom upon rotation of said cable drum in either direction;

means causing said slave hoist cable drum to rotate when moved axially in said first direction; and,

force transmitting means acting between said hoists causing said master hoist cable drum and said slave hoist cable drum to axially move with each other when said master hoist cable drum moves axially in said first direction, whereby said master hoist and slave hoist cable drums rotate to wind or unwind their respective cables in synchronism with each other.

5,593,139

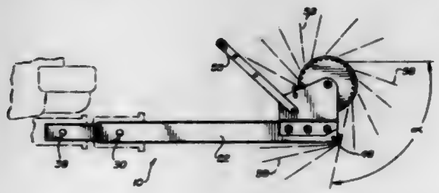
DEVICE FOR CONNECTING A WINCH TO A BOX HITCH

Samuel Julian, 341 Marlborough Rd., Syracuse, N.Y. 13206

Filed Nov. 8, 1994, Ser. No. 336,177

Int. Cl.[6] B66D *1/28;3/02;3/26*

U.S. Cl. 254—325 **4 Claims**



1. A device for connecting a cable carrying winch to a box hitch, said hitch having a pair of axially aligned, pin receiving holes formed therethrough, said device comprising:

a) an elongated tubular member of square cross-section having first, second, third and fourth planar walls, wherein each of said walls includes respective inwardly and outwardly facing surfaces, and said first and third walls are parallel to one another and said second and fourth walls are parallel to one another, and further having first and second opposite ends and a longitudinal axis extending centrally therealong;

b) said first end of said tubular member having means for attaching said winch to said outwardly facing surface of said first wall thereof;

c) said second end of said tubular member having means for attaching said tubular member to said box hitch in a plurality of orientations; and

d) a pulley having a longitudinal axis about which it is rotatable, said pulley being mounted transversely across said first end of said tubular member longitudinally between said second and fourth planar walls and adjacent said inwardly facing surface of said first wall, whereby said pulley and said winch are positioned on opposite sides of said first wall and said pulley is engaged by said cable only when said cable is paid out from said winch above a predetermined external cable angle.

5,593,140

WINCH HAVING A HOUSING WITH A SMOOTH-SURFACED CENTRAL PORTION

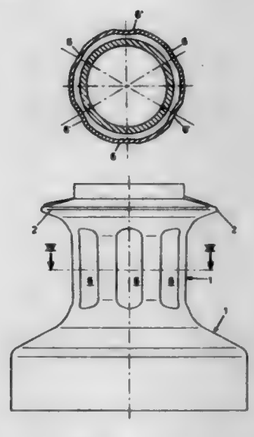
Willem P. van Beers, Geersdijk, Netherlands, assignor to Meissner Engineering B.V., Hellevoetsluis, Netherlands

Filed Jul. 5, 1994, Ser. No. 270,935

Claims priority, application Netherlands, Jul. 5, 1993, 9301178

Int. Cl.[6] B66D *1/00*

U.S. Cl. 254—374 **8 Claims**



1. A winch for use on a sailing vessel, the sailing vessel having a sail and a line or sheet coming from the sail, the winch comprising:

a substantially cylindrical housing having a bottom portion, the housing rotatably disposed around a central shaft;

said housing comprising, at a top thereof, a flange and having a central portion of a diameter smaller than a diameter of the flange and smaller than a diameter of the bottom portion, the central portion holding the line or sheet coming from the sail of the vessel;

the central portion of the housing including a smooth outer surface and a plurality of faces extending over the central portion in a vertical direction, a gradual and even transition being between each of the plurality of faces and the smooth outer surface; said faces, viewed in a horizontal direction along the outer surface, being concave; and

wherein said faces cause an uneven surface on the central portion to prevent the line or sheet from slipping over the central portion.

5,593,141

CLOSE FITTING GATE

David A. Cain, and David Drowns, both of Arlington, Tex., assignors to Cain Fence Rental, Inc., Arlington, Tex.

Filed Oct. 31, 1994, Ser. No. 331,758

Int. Cl.[6] E05D *7/00*

U.S. Cl. 256—26 **9 Claims**

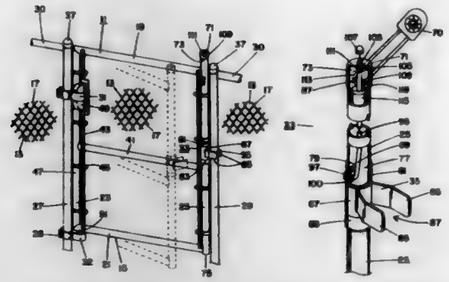
1. A close fitting gate, comprising:

a frame;

fencing material supported by said frame, said fencing material forming a barrier;

said frame having a side member, said side member having a main portion, said main portion having elbows therein so as to form offset portions, said offset portions being parallel to said main portion of said side member;

a hinge coupled to each offset portion; wherein said offset portions rotate within said respective hinges.



5,593,142

STRETCH THRU FASTENER

Thomas L. Gerhart, 6265 US Highway 89, Belt, Mont. 59412

Filed Dec. 11, 1995, Ser. No. 570,556

Int. Cl.[6] E04H *17/02*

U.S. Cl. 256—54 **9 Claims**



1. A fastener for securing a fence wire to a steel T-post, comprising:

an elongated, hollow tube having a body portion and flared end portions;

said hollow tube having a back portion which is positioned adjacent the T-post when the fastener is mounted thereon;

said hollow tube having a slit formed therein which extends the length thereof for receiving the fence wire to enable the fence wire to be positioned in and extend through said hollow tube;

said body portion of said hollow tube having an inside diameter substantially greater than the diameter of the fence wire to enable the fence wire to be selectively longitudinally moved with respect thereto when it is desired to stretch the fence wire;

and first connection means for securing said hollow tube to the T-post whereby said hollow tube is substantially horizontally disposed.

5,593,143

UNIVERSAL FENCE POST CONNECTOR

James A. Ferrarin, 15025 S. Beaton Rd., Oregon City, Oreg. 97045

Filed Mar. 30, 1995, Ser. No. 413,968

Int. Cl.[6] E04H *17/14;* **F16L** *3/22;* **B25G** *3/36;* **F16D** *1/00*

U.S. Cl. 256—68 **16 Claims**

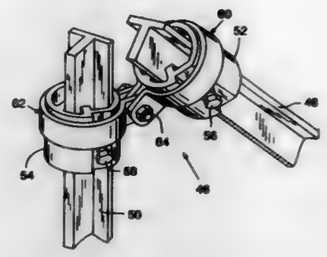
1. A post connector adapted for pivotally interconnecting a first post to a tee post comprising:

a first collar having an opening therethrough;

a second collar having an opening therethrough adapted for receiving the first post;

a coupler pivotally interconnecting the first collar to the second collar; and

a sleeve sized to closely fit within the opening of the first collar and including a fastening member adapted for attaching the sleeve to the tee post, the sleeve defining a bore therethrough adapted for receiving the tee post.



5,593,144

OSCILLATING ROD MEMBER EQUIPPED WITH DYNAMIC DAMPER

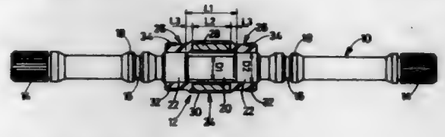
Masaaki Hamada, and Takahiro Aoi, both of Komaki, Japan, assignors to Tokai Rubber Industries, Ltd., Japan

Filed May 1, 1995, Ser. No. 431,837

Claims priority, application Japan, May 13, 1994, 6-099551; Oct. 13, 1994, 6-247545

Int. Cl.[6] F16F *7/00*

U.S. Cl. 267—141 **10 Claims**



1. A rod-damper combination comprising:

an oscillating rod member including a small-diameter portion formed between two large-diameter portions on respective axially opposite sides of the small-diameter portion; and

a dynamic damper including (i) a mass portion having a substantially cylindrical shape and including a cylindrical mass member, and (ii) two elastic support members formed integrally with and on axially opposite sides of said mass portion to elastically support said mass portion with respect to said rod member, said dynamic damper being mounted on said rod member such that said mass portion of said dynamic damper is disposed diametrically outwardly of said rod member by a suitable distance, wherein

said two elastic support members of said dynamic damper are mounted on said two large-diameter portions of said oscillating rod member, respectively, and

said small-diameter portion of said oscillating rod member has an axial length L1 which is larger than an axial length L2 of said mass member of said mass portion.

5,593,145

SHEET MATERIAL HOLDING TOOL

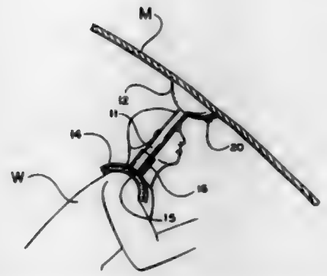
Barry S. Sprayberry, 124 Julie Ln., Stockbridge, Ga. 30281

Filed Feb. 27, 1995, Ser. No. 395,118

Int. Cl.[6] B25B *11/00*

U.S. Cl. 269—3 **10 Claims**

1. A tool for supporting sheet material from the body of a worker, said tool comprising body engaging means for engaging a shoulder of the worker, a shank mounted on said body engaging means, and a material engaging means carried by said shank, said body engaging means comprising a rigid plate shaped to fit said shoulder of the worker, and padding fixed to said rigid plate



between said shoulder and said plate, said material engaging means comprising means to prevent slipping between said shank and said sheet material.

5,593,146

HYDRAULICALLY ACTUATED BAR-LIKE CLAMPING TOOL

Gerhard Dittrich, Plön; Marius Beben, Eutin, and Wolfgang Mehlert, Röbel, all of Germany, assignors to Kuhnke GmbH, Malente, Germany

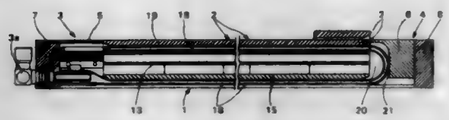
PCT No. PCT/DE94/00318, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/22638, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 19, 1994, Ser. No. 341,557

Claims priority, application Germany, Mar. 26, 1993, 9304652 U

Int. Cl.[6] B25B *11/00*

U.S. Cl. 269—22 **6 Claims**



1. Hydraulically operated, bar clamping tool with an elongated base body (1) having first and second ends, an elongated clamping body (2) attached to the base body for reciprocating movement relative to the base body, and a tubular inflatable body arranged between the base body and the clamping body for moving the clamping body, the inflatable body (18) having first and second ends, the first end of the inflatable body being secured in a fluid-tight manner and the second end of the inflatable body being connected to a fluid connection, the base body (1) and the clamping body (2) each comprising a U-shaped section with two legs (9; 10) that mesh with each other, an elongated reciprocating thrust piece (15) being located between the legs (9) of the base body (1) adjacent to the legs of the clamping body (2), a fixed, elongated abutment (13) located in a fixed position in the base body (1) between the legs (9) of the base body, the tubular inflatable body (18) having a first portion which extends between the base body (1) and the thrust piece (15) and a second portion, which extends parallel and adjacent to the first portion between the abutment (13) and the clamping body (2), the first and second portions of the inflatable body being joined in a deflection region, and a close-off member (3) located at least at one of the first and second ends of the base body that includes the fluid connection (3*a*).

5,593,147

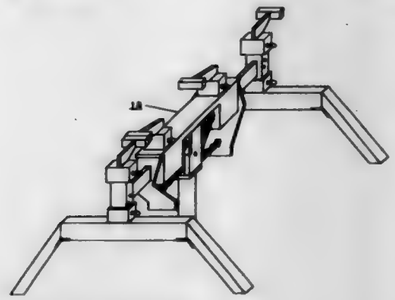
FREE-STANDING TWO-WAY BAR CLAMP

Kenric W. Read, 82 Lawton Foster Rd. South, Hopkinton, R.I. 02833

Filed Sep. 25, 1995, Ser. No. 533,387

Int. Cl.[6] B25B *5/02*

U.S. Cl. 269—170 **7 Claims**



1. A hand tool comprising:
(a) a movable jaw mount;
(b) a stationary jaw mount;
(c) a movable jaw, said movable jaw releasably mounted to said movable jaw mount;
(d) a stationary jaw, said stationary jaw releasably mounted to said stationary jaw mount, said stationary jaw being interchangeable with said movable jaw;
(e) a support structure mount;
(f) a slide bar, said movable jaw mount being mounted to said slide bar, said support structure mount being mounted to said slide bar;
(g) a support structure, said support structure being removably mounted to said support structure mount;
(h) support means for said slide bar, said stationary jaw mount being spaced away from said support means;
(i) two-way drive means for releasably engaging, and when engaged, for advancing said slide bar and said movable jaw to an advanced position, said two-way drive means having at least an engagement lever; and
(j) a handle means pivotably mounted at said support means, and contacting said engagement lever, said handle means engaging said engagement lever when two-way drive means engages said slide bar, and said handle means disengaging said engagement lever when said two-way drive means is released from said slide bar.

5,593,148

PROCESS AND APPARATUS FOR COLLECTING PRINTED PRODUCTS

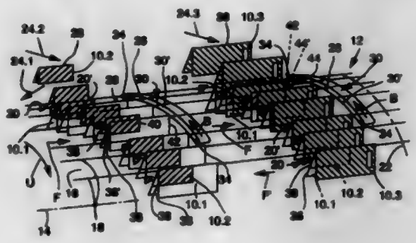
Egon Hanach, Wetzikon, Switzerland, assignor to Ferag AG, Switzerland

Filed May 24, 1995, Ser. No. 449,348

Claims priority, application Switzerland, Jun. 23, 1994, 02007/94

Int. Cl.[6] B65H *39/065*

U.S. Cl. 270—52.3 **10 Claims**



1. A method for collecting folded printed products, wherein the printed products are deposited individually, at a plurality of feeding stations in a straddling manner on elongate rests which are driven in a circulating direction and spaced apart one behind the other in the circulating direction; the method comprising the steps of:
depositing further printed products in an offset manner onto printed products which have already been deposited onto the rests, the further printed products being deposited with a border portion projecting beyond one of the edges of the already deposited printed products;
advancing the deposited printed products step by step with drivers in a conveying direction running in the direction of the rests, the drivers being assigned to the rests and butting against a trailing edge of the printed products, as seen in the conveying direction;
forcing the leading edge of the printed products against a stop element, in order to align printed products which have been deposited one upon the other in an offset manner; and
driving the drivers such that they carry out a conveying displacement in the conveying direction and a return displacement in the opposite direction, the relevant drivers, at the end of the conveying displacement, being spaced apart from the stop element by the length of the fold of the largest printed product, the relevant drivers, at the end of the return displacement, being spaced apart from the printed products to be advanced, the further printed products being deposited before the drivers, in the conveying displacement, come to bear against the trailing edge of the printed products.

5,593,149

AUTOMATIC TELLER MACHINE MANAGING SYSTEM

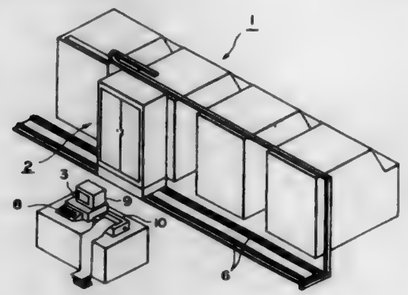
Haruo Kimura; Isao Miyake; Toshihiro Nakano, and Yukihiro Nemoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1995, Ser. No. 369,937

Claims priority, application Japan, Jan. 13, 1994, 6-002111; Nov. 22, 1994, 6-312583

Int. Cl.[6] B65H *5/02*

U.S. Cl. 271—3.01 **16 Claims**



1. An automatic teller machine managing system having an automatic teller machine and a carrier for exchanging a medium with the automatic teller machine, said automatic teller machine managing system comprising:
moving means for moving said carrier;
coupling means movably arranged and coupling said carrier and said automatic teller machine; and
carrying means for carrying, via said coupling means, said medium one by one from said carrier to said automatic teller machine or from said automatic teller machine to said carrier;
wherein said coupling means includes a supply passage for supplying said medium from said carrier to said automatic teller machine and a recovery passage for recovering said medium from said automatic teller machine to said carrier, and wherein each of said supply passage and said recovery passage is formed by a pair of plates and includes a first passage supported on a side of said carrier and a second passage supported on a side of said automatic teller machine.

5,593,150

SHEET FEEDING APPARATUS FOR A RECORDING APPARATUS

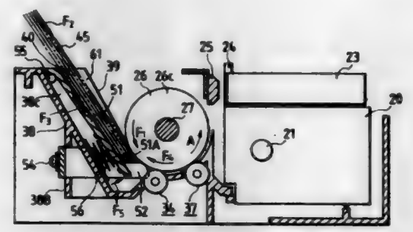
Jun Katayanagi, Musashino, and Takeji Nilkura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 771,534, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 658,433, Feb. 20, 1991, abandoned, which is a continuation of Ser. No. 223,109, Jul. 22, 1988, abandoned. This application Jan. 29, 1993, Ser. No. 13,190

Claims priority, application Japan, Aug. 18, 1987, 62-204344; Aug. 18, 1987, 62-204345; Aug. 21, 1987, 62-207554; Aug. 21, 1987, 62-207555; Aug. 21, 1987, 62-207559

Int. Cl.[6] B65H *3/52*

U.S. Cl. 271—121 **20 Claims**



1. A sheet feeding apparatus comprising:
sheet feeding means comprising a sheet supply roller;
guide means comprising first and second guide surfaces of a first height separated in a lateral direction of a sheet for guiding large-sized sheets to said sheet feeding means, and a third guide surface of a second height lower than the first height disposed between said first and second guide surfaces for guiding small-sized sheets to said sheet feeding means; and
a pair of protruding portions protruding from one of said guide surfaces to be positioned at both sides of said sheet supply roller for flexing lateral portions of the sheet, each of said pair of protruding portions having an abutment surface to which a leading end of a sheet guided by said third guide surface is abutted, and each of said pair of protruding portions having a tip with a tip end, each of said tip ends of said pair of protruding portions extending to a position near to a rotation center of said sheet supply roller beyond an outer surface of said sheet supply roller where said sheet supply roller contacts the sheet,
wherein, when a sheet stack is loaded on said guide surfaces, an uppermost sheet, to which a sheet supply force is applied directly by said sheet supply roller, rides over said pair of protruding portions at a leading end thereof and is bent to pass through a gap between said side surfaces of said sheet supply roller and said protruding portions at side peripheries thereof in order to be separated from the sheet stack, while sheets other than the uppermost sheet, which are not applied the sheet supply force directly by said sheet supply roller, abut against said pair of protruding portions.

5,593,151

SELF BIASING ELECTROSTATIC PAPER TRANSPORT

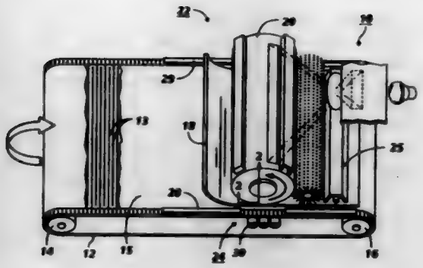
Dale R. Mashtare, Macedon, and Christopher Snelling, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1994, Ser. No. 358,500

Int. Cl.[6] B65H *29/16;29/28*

U.S. Cl. 271—193 **18 Claims**

1. A sheet handling apparatus for transporting a sheet along a path, comprising:



a flexible member; and

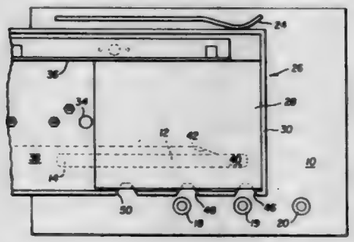
a ferroelectric material layer associated with said flexible member for generating an electrostatic force on a surface thereof to retain the sheet on said flexible member, said ferroelectric material layer comprises a piezoelectric material layer that generates the electrostatic force in response to being deformed.

5,593,152

SHEET MEDIA SUPPLY TRAY ORIENTS SHEETS TO REGISTRATION POSTS IN IMAGING APPARATUS

Henry G. Wirth, and Mark A. Bobb, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1995, Ser. No. 398,287
Int. Cl.[6] B65H *9/12*
U.S. Cl. 271—241 **3 Claims**



1. Imaging apparatus for receiving a stack of sheets, said imaging apparatus comprising:

a sheet supply tray having a width alignment rail on one side of a generally rectangular cavity adapted to receive a stack of rectangular sheets;

a registration member against which the side of a received stack of sheets opposed to the one side directly abuts when the stack is fully received in the imaging apparatus;

urging means for moving the sheet supply tray and the width alignment rail toward the registration member with a resilient force when the sheet supply tray is being received in the imaging apparatus; and

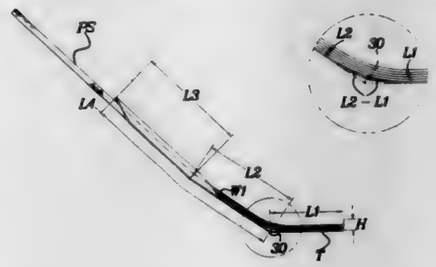
means for holding the sheet supply tray and the width alignment against the resilient force of the urging means until the sheet supply tray is substantially fully received in the imaging apparatus to keep the received stack of sheets from contact with the registration member until the sheet supply tray is substantially fully received in the imaging apparatus.

5,593,153

TRAY CONFIGURATION FOR SHEET RECEIVING APPARATUS

Peter M. Coombs, Tustin, Calif., assignor to Gradco (Japan) Ltd., Tokyo, Japan

Filed Oct. 23, 1995, Ser. No. 546,848
Int. Cl.[6] B65H *39/10*
U.S. Cl. 271—287 **3 Claims**



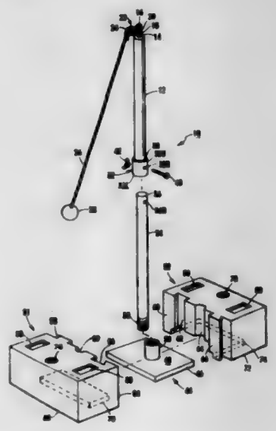
1. In a sheet receiver including a plurality of sheet receiving trays, said trays being arranged in a vertical stack and extending horizontally with sections of each of the trays disposed at an angle upwardly inclined from a horizontal plane, and means for feeding sheets into said trays from a printing apparatus, said trays each including a horizontally extended section adjacent to said means for feeding, the improvement wherein said upwardly inclined sections include a first portion disposed at a first angle of about 35 degrees from a horizontal plane and extending upwardly from said horizontally extended section, a second section disposed at a second angle of about 45 degrees from a horizontal plane and extending further upwardly from said first section and having wing portions for forming a transverse bow longitudinally of sheets extending upwardly beyond said second angle section, said wing portions combined with the angle from horizontal of said first and second sections preventing drooping of the upwardly extending sheets, said trays having a combined length versus the length of the longest sheets received therein of 0.67.

5,593,154

BASEBALL TETHENED BALL TRAINING APPARATUS

Lance Allen, 6245 Lawton Ave., Las Vegas, Nev. 89107

Filed Mar. 25, 1996, Ser. No. 622,187
Int. Cl.[6] A63B *69/00*
U.S. Cl. 473—429 **7 Claims**



1. Apparatus for training a batter to hit a baseball, comprising:

a pole;

a swivel connected to a top end of said pole;

a rope that connects said baseball to said swivel;

a rectangular base plate connected to a bottom end of said pole;

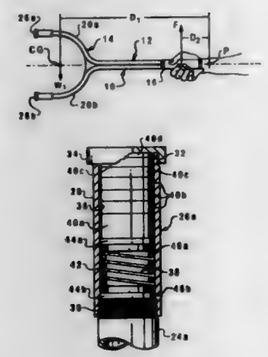
a pair of rectangular blocks that are disposed on top of said base plate, said blocks each having a groove in a side thereof and a tongue that extends therefrom, the tongue of one block being of a shape that is substantially complimentary to the shape of the groove of the other block, and a semi-cylindrical vertical slot.

5,593,155

TRAINING DEVICE FOR RACKET SPORTS

Curtis D. Fauble, 2001 Grove Ave., Quincy, Ill. 62301, and David L. Fauble, 505 W. High St., Urbana, Ill. 61801

Filed Sep. 13, 1995, Ser. No. 527,623
Int. Cl.[6] A63B *69/00*
U.S. Cl. 473—463 **13 Claims**



1. A simulant weighted sports racket, including:

a) elongated handle means;

b) head means joined to said handle means;

c) said head means comprising divergent legs terminating in laterally spaced end segments;

d) weight attachment means joined to said end segments of said legs;

e) weight means removably secured to each of said end segments by said attachment means;

f) said weight attachment means includes hollow housings; and,

g) said weight means are disposed in said housings.

5,593,156

GROUND MARKER AND METHODS OF USING SAME TO MARK DISTANCES AND/OR ADVERTISE ON A GOLF COURSE

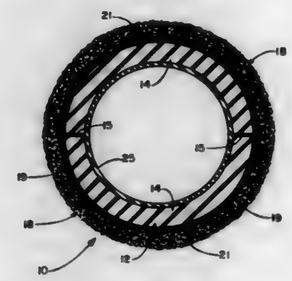
Charles E. Jambor, Simcoe, Canada, assignor to Karoly-J Ltd., Simcoe, Canada

Continuation-in-part of Ser. No. 165,615, Dec. 13, 1993, abandoned. This application Feb. 14, 1995, Ser. No. 388,544
Int. Cl.[6] A63B *57/00*
U.S. Cl. 40—584 **20 Claims**

1. A ground marker comprising:

a body having a top portion and a base;

said top portion having a generally cylindrical side wall and a horizontal substantially planar transparent top face, said side wall having a greater outer diameter than the outer dimension of said base to define a peripheral lip having a bottom edge; and



display means being disposed beneath said transparent top face, said display means being visible through said transparent top face;

wherein said body is adapted to fit in a predetermined size hole defined in the ground with said top face being generally flush with the ground surface and said side wall contacting the side of said hole.

5,593,157

LONG LIFE, LOW AIR PERMEABLE PRESSURIZED ARTICLES SUCH AS PLAY BALLS

William J. Koros, Austin, Tex.; I. G. Hargis, Tallmadge, Ohio; Richard A. Olson, Phoenix, Ariz., and Jason S. Harris, Austin, Tex., assignors to GenCorp Inc., Fairlawn, Ohio

Filed May 10, 1995, Ser. No. 438,674
Int. Cl.[6] A63B *41/00*
U.S. Cl. 473—606 **15 Claims**

1. A tennis ball having improved rebound retention, comprising;

a pressurized hollow vulcanized rubber core having a barrier layer thereon, said barrier layer being the reaction product of a Lewis acid with said rubber core.

5,593,158

SHOCK ATTENUATING BALL BAT

Gary W. Filice, Moorpark, and Dewey Chauvin, Simi Valley, both of Calif., assignors to Jas D. Easton, Inc., Van Nuys, Calif.

Filed Dec. 21, 1995, Ser. No. 576,005
Int. Cl.[6] A63B *59/06*
U.S. Cl. 473—520 **19 Claims**

1. A shock attenuating bat adapted to reduce shock transmitted to the hands of a user resulting from striking a ball with a bat, comprising:



a barrel having a proximal end and a distal end, having an opening at the proximal end, and an inner surface;

a handle having a proximal end and a distal end, having an enlarged interference segment having an outer surface, said enlarged interference segment being configured so as to interfere with movement of said handle through the opening at the proximal end of the barrel;

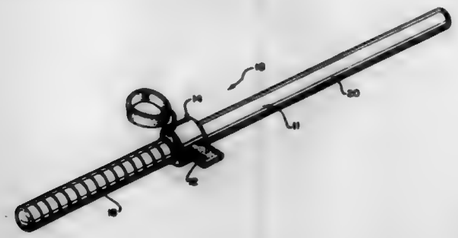
an elastomeric isolation union disposed between said inner surface of said barrel and said outer surface of said handle enlarged interference segment, separating said barrel from said handle, and, said elastomeric isolation union being the only connection between said handle and said barrel, said elastomeric isolation union allowing relative movement between said barrel and said handle so as to reduce shock transmitted from said handle to the hands of a user in hitting a ball with the bat.

5,593,159

RESTRAINING BATON AND STRAP

Ben Otake, Glendale, Calif., assignor to Nobutake Enterprises, Inc., Carpenteria, Calif.

Filed Aug. 18, 1995, Ser. No. 516,871
Int. Cl.[6] A63B *15/02*
U.S. Cl. 463—47.2 **6 Claims**



1. A restraining apparatus, comprising:

an elongated shaft including a hand grip portion at one end,

a strap having one end affixed to the shaft, at a point other than at the hand grip portion, and a strap other end being left unattached;

a hollow storage canister having a first open end, a second open end and a slot therein and mounted onto the shaft such that the shaft extends through the canister and its open ends in a surrounding relationship to the affixed strap end such that the strap extends through the slot to an outside portion of the canister, wherein said strap can be rolled about the shaft and stored within the canister during nonuse;

a circular shoulder extending about the shaft and abutting a surface of the canister near the first open end; and

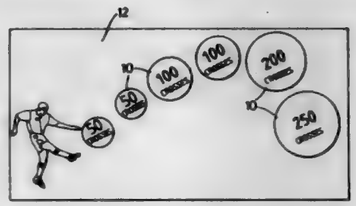
a circular washer extending about the shaft and abuts against a surface of the canister near the second open end.

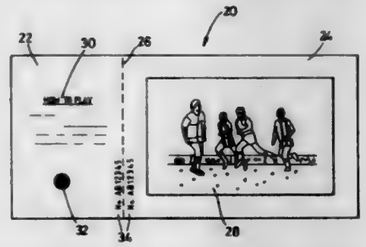
5,593,160

PICTORIAL COMPETITION ENTRY METHOD AND MEANS AND APPARATUS FOR CONDUCTING SAID COMPETITION

William Constantine, and William R. Constantine, both of 18 Lawson Road, Seaton Carew, Hartlepool, Cleveland TS25 1AD, England

PCT No. PCT/GB93/01696, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO94/04234, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 10, 1993, Ser. No. 379,626
Claims priority, application United Kingdom, Aug. 11, 1992, 9216965
Int. Cl.[6] A63F *3/06*
U.S. Cl. 273—139 **14 Claims**





1. A method of entering a pictorial competition including

a) displaying a picture of an event upon an entry coupon,

b) providing multiple identical indicia in a selected amount on an indicia member of selected size that is positioned away from the picture, and

c) applying the indicia member with the selected amount of identical indicia to the picture to identify possible locations of a missing element from the picture.

5,593,161

WAGERING GAME WITH A SET OF ROUNDS AND BETS

Eugene B. Boylan, Minden; Robert F. Koerner, Gardnerville, and Russell R. Hebert, Carson City, all of Nev., assignors to Bet Technology, Inc., Carson City, Nev.

Filed Dec. 5, 1995, Ser. No. 567,575
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—274 **10 Claims**

1. A method of wagering in a banking type wagering game comprising the steps of:

a. selecting a wagering game having rules to be played as well as a predetermined number of rounds of the wagering game which is designated as a set,

b. providing a wagering area for each player for a plurality of first bets and for a second bet, wherein the number of first bets corresponds to the predetermined number of rounds in the set,

c. playing the predetermined number of rounds of the wagering game to complete the set, said playing step including the steps of:

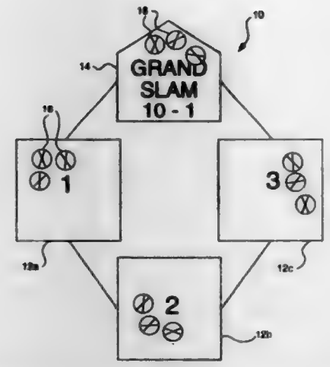
i. each player wagering a plurality of first bets and a second bet,

ii. playing a round of the selected wagering game and determining whether a respective first bet of each respective player is a winning or a losing wager according to the rules of the selected wagering game,

(1) if the first bet is a winning bet, then paying off the first bet according to a first predetermined odds and commencing a subsequent round by repeating step ii if the number of rounds already played in the set does not equal the predetermined number of rounds,

(2) if the first bet is a losing wager, then collecting said respective first bet along with said second bet and commencing a subsequent round by repeating step ii if the number of rounds already played in the set does not equal the predetermined number of rounds, and

iii. completing the set when the number of rounds equals the predetermined number of rounds and paying off the second bet at a second predetermined odds of any respective player who did not lose any rounds in the playing step ii such that said second bet was collected whereby the second bet is a wager that a respective player will win each round played in the set.

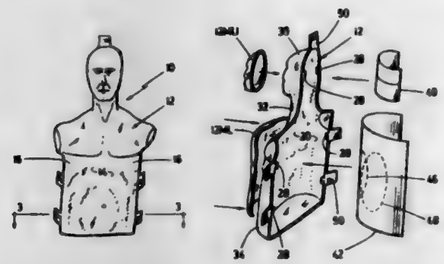


5,593,162

TARGET DEVICE

Steven E. Minuskin, 30 Bevshire Circle, Thornhill, Ontario, Canada

Filed Jun. 5, 1995, Ser. No. 461,905
Int. Cl.[6] F41J *1/00*
U.S. Cl. 273—403 **15 Claims**



1. A shooting target suitable for gun training comprising

a hollow three dimensional body defining a cavity therein for removably locating a marking member;

a marking member disposed to extend in three dimensions within said cavity;

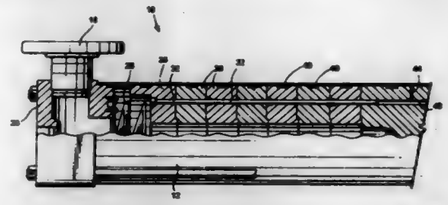
wherein said target is formed from a material having light transmitting properties and wherein said marking member has a surface coloration visible through said target.

5,593,163

DIFFERENTIAL PRESSURE ACCUMULATOR

Paul C. Dalber, Ballston Lake, and William L. Bird, Jr., Scotia, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Division of Ser. No. 266,815, Jun. 27, 1994, Pat. No. 5,474,304. This application Mar. 21, 1995, Ser. No. 408,501
Int. Cl.[6] F16J *15/00*; F16L *55/04*
U.S. Cl. 277—3 **10 Claims**



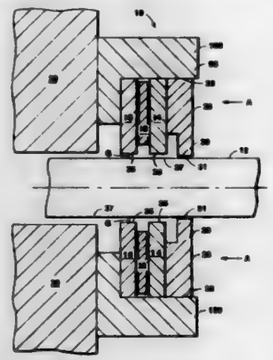
1. A differential pressure accumulator for use in an oil supply system and adapted to temporarily supply oil to a destination during a transient event, the accumulator comprising a barrel having an inlet at one end and an outlet at the other end; a piston slidably received within said barrel to provide upper and lower chambers on opposite sides of said piston, wherein said piston comprises a body portion extending more than one half the length of the piston, and a plurality of axially aligned intermediate disks extending substantially the remaining length of the piston, said body portion and said plurality of axially aligned intermediate disks being sandwiched between a pair of end disks, wherein said body portion, plurality of axially aligned disks and end disks have substantially identical diameters, and further wherein weight and length of the piston can be altered by addition or removal of one or more of said axially aligned intermediate disks.

5,593,164

FERROFLUIDIC SEAL CENTERING RING

William B. Mraz, Epping; Thomas J. Black, Jr., Merrimack, both of N.H.; Paul E. McMahan, Walker, La.; Larry A. Hufford, Valley Center; David T. Mooney, San Rafael, both of Calif., and Robert C. Watkins, Moss Point, Miss., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 424,578, Apr. 17, 1995, abandoned, which is a continuation of Ser. No. 960,818, Oct. 8, 1992, abandoned. This application Nov. 22, 1995, Ser. No. 561,563
Int. Cl.[6] F16J *9/00*; B23B *49/00*
U.S. Cl. 277—9.5 **24 Claims**



1. A ferrofluid seal apparatus for establishing a ferrofluid seal about a shaft having a periphery with a known diameter d_s, the apparatus comprising:

a ferrofluid seal comprising at least one magnet creating a magnetic field and at least one pole piece axially disposed about the shaft, the pole piece extending toward the shaft to form a seal gap between the pole piece and the shaft which gap is fillable with ferrofluid;

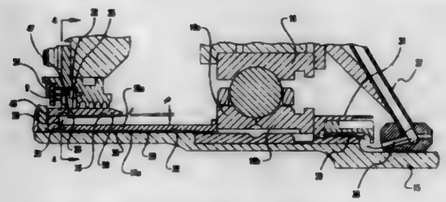
a centering ring the position of which may be fixed in a predetermined position relative to the pole piece and which has an inner periphery the diameter of which is substantially d_1, the inner periphery being precisely located on the centering ring such that, when the centering ring is in the predetermined position relative to the pole piece, the inner periphery is precisely located relative to the pole piece and the inner periphery contacts the periphery of the shaft, locating the pole piece relative to the shaft so as to force the seal gap to become substantially uniform around the shaft.

5,593,165

CIRCUMFERENTIAL FLOW CHANNEL FOR CARBON SEAL RUNNER COOLING

Stephen G. Murray, Indianapolis, and Joseph C. Smith, Plainfield, both of Ind., assignors to Allison Engine Company, Inc., Indianapolis, Ind.

Filed Sep. 28, 1994, Ser. No. 309,881
Int. Cl.[6] F02C *7/28*
U.S. Cl. 277—22 **39 Claims**



1. A fluid cooled seal arrangement, comprising:

a mechanical housing;

a shaft rotatably mounted within said housing;

a first sealing element coupled to said housing;

a second sealing element connected to said shaft, said second sealing element arranged adjacent to said first sealing element to form rubbing interface therebetween;

a channel on the radially inward side of said second sealing element for receiving cooling fluid therein and allowing escape of received cooling fluid along the entire edge of said channel; and

a passageway along said shaft for delivering cooling fluid to said channel for cooling said second sealing element.

5,593,166

LOW FRICTION PACKING

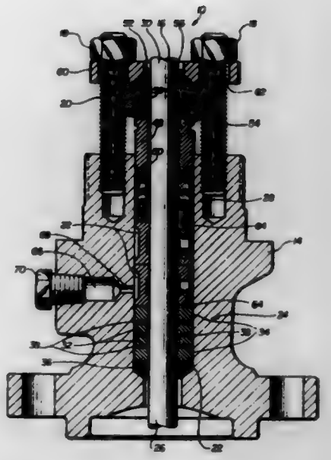
Michel K. Lovell; Randall S. Jackson, and Ronald R. Brestel, all of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Mar. 2, 1994, Ser. No. 204,637
Int. Cl.[6] F16J *15/20*
U.S. Cl. 277—59 **14 Claims**

1. A two-part, low friction live load packing system for fire safety and low fugitive emission sealing of an operating member extending in a housing containing fluid from one operating member end adjacent said fluid to a second operating member end away from said fluid comprising:

a two-part packing assembly mounted on said operating member including a respective first and second packing rings set providing a fluid seal surrounding the operating member at said first and second packing rings set for preventing fluid from leaking from said housing around said operating member;

at least one spacer ring between said first and second packing ring sets;



spring means for applying a spring loading on said two-part packing assembly to maintain said fluid seal;

said first packing ring set mounted on said operating member end adjacent said fluid including, from an inner portion of said first packing ring set outwardly toward each opposite end of said first packing ring set along said operating member,

a. at least one graphite ring;

b. at least two anti-extrusion bushing rings adjacent said graphite ring; and

c. a washer formed of PTFE material and mounted between each of said adjacent rings a. and b. in said first packing ring set,

said first packing ring set providing low friction operation of said operating member in said housing and fire safety for said fluid;

said second packing ring set mounted on said operating member second end away from said fluid including at least two PTFE rings sandwiched between a respective anti-extrusion bushing ring;

said second packing ring set providing low fugitive emission sealing of said fluid and low friction operation of said operating member in said housing; and

said spring loading on said first and second packing ring sets sufficient to reliably seal said fluid and providing low fiction operation of said operating member,

wherein said spring means initially applies a temporary spring loading in excess of the normal operating load and sufficient to cause permanent deformation of said PTFE washer, and thereafter applies an optimal spring loading for low fugitive emission sealing of said second packing ring set and maintains a sufficient spring loading of substantial packing stress on said two-part packing assembly to enable said PTFE washer to partially extrude PTFE material on said operating member and to lubricate said operating member in movements through said two-part packing assembly.

5,593,167

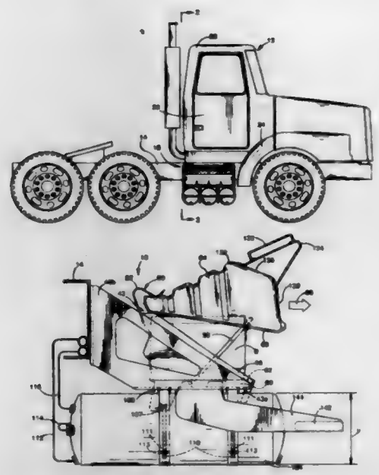
HIGHWAY VEHICLE

Steve L. Barnhardt, High Point, N.C.; Steven L. Hadley, Delaware, Ohio, and Jeff M. Terry, Birmingham, Ala., assignors to Volvo GM Heavy Truck Corporation, Greensboro, N.C.

Filed Dec. 22, 1994, Ser. No. 363,002
Int. Cl.[6] B60R *3/00*
U.S. Cl. 280—164.1 **27 Claims**

1. An apparatus for supporting at least one battery and attaching at least one fluid pressure reservoir to a vehicle having longitudinally extending rails supporting a cab, said apparatus comprising:

support members for attachment to a rail of the vehicle;



a container having a tray member supportedly connected to said support members for supporting at least one battery, the container having a cover detachably secured to the troy member for enclosing such at least one battery;

a fluid pressure reservoir;

mounting structure attached to one of said members and fixing the fluid pressure reservoir in reinforcing relationship with the tray member; and,

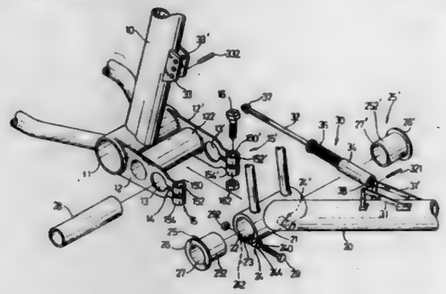
said mounting structure depending from a bottom surface of said container.

5,593,168

BICYCLE SHOCK ABSORBING ASSEMBLY

Chi-nan Chou, No. 9, Chingchuan Rd., Chungyi Village, Taya Hsiang, Taichung Hsien, Taiwan

Filed Aug. 31, 1995, Ser. No. 522,094
Int. Cl.[6] B62K *19/00*
U.S. Cl. 280—275 **6 Claims**



1. A bicycle frame with shock absorbing system, comprising:

a bicycle frame comprising a seat tube connected to a bottom bracket, and a down tube connected to the bottom bracket via pivoting means such that the down tube is pivotal with respect to the bottom bracket, said pivoting means comprising a pair of pivot supporting brackets integrally extending from the bottom bracket and having a pair of supporting holes therein, a pivot mounting tube fixedly connected to the down tube, a pivot received in the pivot mounting tube, said pivot having first and second ends respectively received in the supporting holes, and clamping means for clamping the pivot supporting brackets onto the first and second ends of the pivot; and

a shock absorber mounted between the seat tube and the down tube.

5,593,169

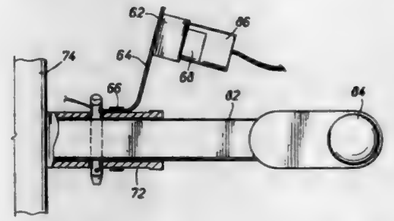
Patent Not Issued For This Number

5,593,170

TRAILER HITCH BOX BEAM COVER WITH INTEGRAL TRAILER WIRING CONNECTOR

Donald W. Chiu, 7118 Treewater, Houston, Tex. 77072

Continuation of Ser. No. 89,285, Jul. 8, 1993, Pat. No. 5,407,219. This application Feb. 28, 1995, Ser. No. 395,317
Int. Cl.[6] B60D *1/60;1/62*
U.S. Cl. 280—422 **4 Claims**



1. An apparatus for sealing the open end of a trailer hitch box beam, comprising:

(a) a removable cover sized to seal the open end of the trailer hitch box beam;

(b) a resilient plug member projecting from said cover and sized for moveable insertion into the open end of the trailer hitch box beam;

(c) a wiring connector integrally formed with said plug member for coupling to a source of electrical signals;

(d) a wiring cable extending through said plug member; and

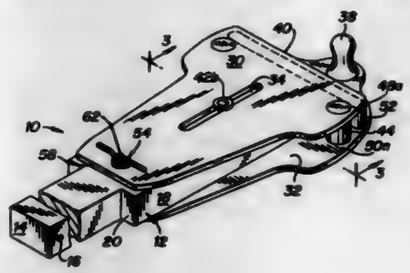
(e) wherein said cover includes a hinge strap and means for fastening said hinge strap to the trailer hitch box beam and said wiring connector is capable of coupling to the source of electrical signals when said plug member is removed from the trailer hitch box beam.

5,593,171

TRAILER HITCH

Samuel Shields, Box 43, Colchester, Ill. 62326

Filed May 9, 1995, Ser. No. 437,648
Int. Cl.[6] B60D *1/40*
U.S. Cl. 280—479.2 **10 Claims**



1. A trailer hitch comprising:

(a) a draw bar having a first end dimensioned and configured for receipt in a hitch receiver, the draw bar defining a longitudinal axis and including at least one pin-receiving aperture formed therein and wherein said draw bar further comprises an end opposite said first end, said opposite end being of rounded shape;

(b) at least one plate movably mounted with respect to the draw bar, the plate including a locking aperture and a longitudinal slot;

(c) an upwardly extending hitching ball mounted to the plate;

(d) a tranverse member fixedly mounted with respect to the draw bar and extending through the longitudinal slot; and

(e) a locking pin removably received by the pin-receiving aperture in the draw bar and the locking aperture in the plate.

5,593,172

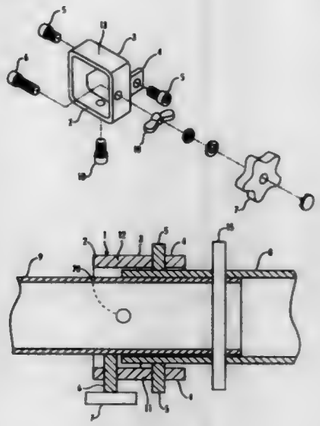
RECEIVER HITCH WITH ANTI-RATTLE DEVICE

Patrick W. Brelin, Wickenburg, Ariz., assignor to U-Haul International, Inc., Phoenix, Ariz.

Division of Ser. No. 281,828, Jul. 28, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 470,663

Int. Cl.[6] B60D *1/00*

U.S. Cl. 280—586 **5 Claims**



1. A receiver hitch comprising

(i) a receiver tube having an end,

(ii) a mount shank receivable in said end of said receiver tube, and

(iii) an anti-rattle device comprising:

(a) an elongated collar having a front end including a receiving aperture and a rear end including a plurality of receiving apertures;

(b) means for mounting said rear end of said collar on an end of said receiver tube of said receiver hitch,said means for mounting being operably inserted in said plurality of rear end receiving apertures; and

(c) means for applying a force to said mount shank of said receiver hitch beyond said end of said receiver tube, whereby movement of said mount shank within said receiver tube is prevented, said means for applying a force being operably inserted in said front end receiving aperture.

5,593,173

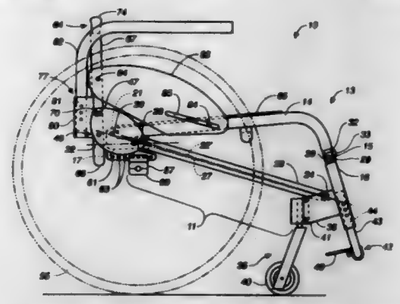
VERTICAL FOLDING WHEELCHAIR FRAME

Daniel E. Williamson, Clovis, Calif., assignor to Quickie Designs Inc., Fresno, Calif.

Filed Nov. 8, 1994, Ser. No. 336,297

Int. Cl.[6] B62B *7/10*

U.S. Cl. 280—642 **29 Claims**



1. A vertically foldable frame for a lightweight wheelchair comprising:

a pair of side frame assemblies connected together as a unit by at least one cross-frame member;

said side frame assemblies each having frame members coupled together for selective movement of said side frame assemblies between a vertically extended deployed condition and a relatively vertically compact collapsed condition;

at least one of said side frame assemblies having frame members pivotally coupled together to provide a bi-stable, over-center, linkage assembly movable between and biased toward both of:

(i) a first stable position on one side of a linkage assembly centerline when said side frame assemblies are in said deployed condition; and

(ii) a second stable position on an opposite side of said centerline when said side frame assemblies are in said collapaed condition; and

a biasing structure cooperating with said linkage assembly and being sufficiently resilient to retain said linkage assembly in said first stable position when said linkage assembly is positioned on the one side of the centerline, and biasing said linkage assembly toward said second stable positioned when positioned on the opposite side of the centerline.

5,593,174

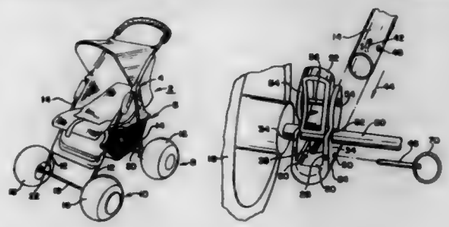
CHILD CARRIAGE WITH DETACHABLE WHEEL-AXLE ASSEMBLIES

Edward Graziano, and Denise Graziano, both of 24 HighPoint Dr., Springfield, N.J. 07081

Filed Mar. 17, 1995, Ser. No. 406,062

Int. Cl.[6] B62B *7/00;9/08*

U.S. Cl. 280—647 **15 Claims**



1. A child carriage assembly comprising:

a carriage structure for supporting a child, said structure including a frame and a seat assembly supported by the frame, the frame including a pair of front spaced legs and a pair of rear spaced legs depending from the seat assembly;

first and second wheel and axle assemblies each including a pair of spaced wheels, each pair of wheels being secured to a corresponding axle in fixed axial and rotational position on the corresponding axle; latch means for receiving each leg and secured to each axle assembly for releasably attaching the first axle assembly to the front spaced legs and for releasably attaching the second axle assembly to the rear spaced legs; and

a brace attached to and between at least one pair of legs and mating brake means secured to the brace and to the axle of the corresponding axle assembly to preclude rotation of the axle of the corresponding axle assembly and the pair of wheels associated with said corresponding axle assembly.

5,593,175

LEG APPARATUS FOR THE MAGNETICALLY LEVITATED VEHICLE

Kazuhiro Oda, Murayama; Masayoshi Azakami; Hideyuki Takizawa, both of Kokubunji; Fumio Iwamoto, Takatsuki, and Shoji Iwai, Akashi, all of Japan, assignors to Railway Technical Research Institute, Tokyo, and Sumitomo Precision Products Company Limited, Hyogo, both of Japan

Continuation of Ser. No. 215,473, Mar. 21, 1994, abandoned, which is a continuation of Ser. No. 992,126, Dec. 17, 1993, abandoned. This application May 22, 1995, Ser. No. 445,503

Claims priority, application Japan, Dec. 17, 1991, 3-353805; Feb. 24, 1992, 4-73363; Dec. 15, 1992, 4-354416; Dec. 15, 1992, 4-354417

Int. Cl.[6] B60G *11/26*

U.S. Cl. 280—704 **4 Claims**

1. A leg apparatus for supporting a wheel relative to a magnetically-levitated vehicle defining a wheel base, said leg apparatus comprising:

a support means for said wheel, said support means comprising a swing arm which extends horizontally from a first end pivotally connected to a first bracket mounted on a wall of said wheel base to a second end, said wheel being rotatably mounted to said swing arm between said first and second ends thereof; a bell crank-shaped hanging element pivotally connected to said first bracket, said hanging element including a lifting lever portion and a flat spring portion which extends from said first bracket to a free end near said second end of said swing arm; a link arm connected between said second end of said swing arm and said free end of said flat spring: a lifting actuator connected at a first end to a second bracket mounted on a wall of said wheel base, and a connecting lever connecting a second end of said lifting actuator with said lifting lever portion of said hanging element, such that extension and contraction of said lifting actuator will cause said swing arm to move said wheel from a storage position within said wheel base to an operational position and vice versa.

5,593,176

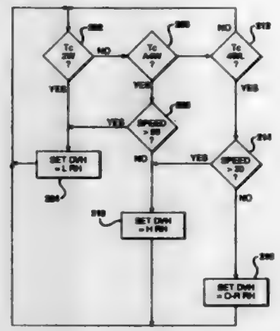
RIDE HEIGHT SETTING BASED ON TRANSFER CASE SETTING

Douglas C. Campbell, Dearborn; Gary J. Gleceri, West Bloomfield; Daniel M. McCoy, Shelby Township; Thomas G. Reichenbach, Livonia; Lenard J. Duchnowski, Saline; Jerome C. Ivan, Troy, and Joseph M. Raad, Southgate, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1994, Ser. No. 357,673

Int. Cl.[6] B60G *11/26*

U.S. Cl. 280—707 **12 Claims**



1. A method for controlling the ride height of a vehicle having selectable drive wheels including at least a two wheel drive setting and a four wheel drive setting for said vehicle, said method comprising the steps of:

sensing the speed of the vehicle;

selecting the drive wheel setting of the vehicle; and

selecting a desired vehicle ride height at which the vehicle is maintained by combining the drive wheel setting and the speed of the vehicle.

5,593,177

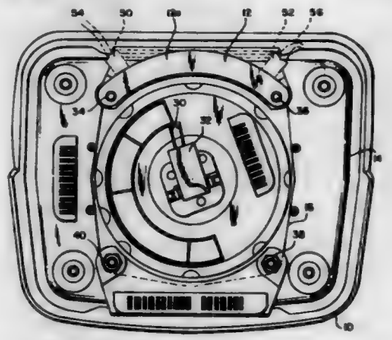
AIRBAG MODULE ELECTRIC COMPONENT ATTACHMENT USING STUDS

Merle Ricks, Layton, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Jan. 17, 1995, Ser. No. 373,673

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—731 **8 Claims**



3. In a driver's side vehicle occupant restraint module of the type including an inflator, a housing, and a folded cushion that are fastened together by spaced studs, said module having a back side from which said spaced studs protrude,

the improvement comprising an electric component having a first end and a second end, said electric component having at

least one of said first and second ends mounted on one of said studs, said electrical component having mounted thereon a first female electrical connector to which a plug-in electrical conector may be attached,

wherein said electric component is mounted on said first end and on said second end on a respectively associated one of said spaced studs,

wherein said first electrical connector is mounted adjacent said first end of said electric component, and

further including a second female electrical connector mounted adjacent said second end of said electric component.

5,593,178

STEERING WHEEL WITH AIR BAG AND HORN SWITCH

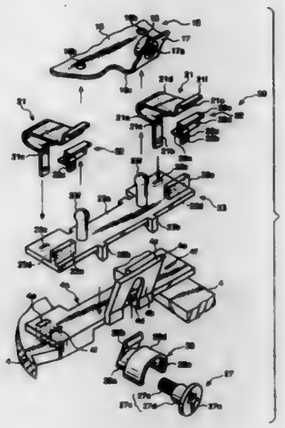
Ichizou Shiga, Aichi-ken; Atsushi Nagata, Inazawa; Tooru Koyama, Aichi-ken, and Katsunobu Sakane, Ichinomiya, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai-gun, Japan

Filed Dec. 1, 1995, Ser. No. 530,461

Claims priority, application Japan, Dec. 7, 1994, 6-303759; Oct. 9, 1995, 7-261807

Int. Cl.[6] B60R *21/20*; H01H *9/00*

U.S. Cl. 280—731 **6 Claims**



1. A steering wheel assembly comprising:

a steering wheel body including a mandrel, said mandrel including a plurality of brackets, each of said brackets having an opening therein,

an air bag device arranged at an upper portion of said steering wheel body and including a bag holder,

horn switch mechanisms arranged between the mandrel of the steering wheel body and the bag holder, said switch mechanisms including a plurality of pairs of upper and lower contact pieces, said upper and lower contact pieces of each pair being vertically spaced from each other in a first position and constructed and arranged to contact each other in a second position to actuate the horn, said bag holder including abutments constructed and arranged to abut against surfaces of contacts of said upper contact pieces and including mounting holes generally adjacent said openings in said brackets,

a mounting fastener in each opening, each of said mounting fasteners having a portion engaging with an associated one of said mounting holes to mount said bag holder with respect to said mandrel in such a manner that the bag holder is restricted from moving upwardly with respect to the brackets but capable of moving downwardly with respect to the brackets.

5,593,179

AIR BAG DEVICE FOR VEHICLE

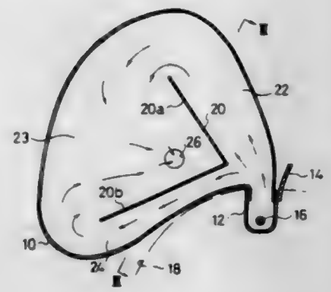
Shigenori Maruyama, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Jun. 9, 1995, Ser. No. 492,588

Claims priority, application Japan, Jun. 13, 1994, 6-130329

Int. Cl.[6] B60R *21/28*

U.S. Cl. 280—740 **8 Claims**



1. An air bag attached to an air bag device having a container and an inflator for inflating the air bag, comprising,

a panel for constituting the air bag, said panel including a rear portion attached to the container and having an opening for receiving gas from the inflator, a front portion located at a side opposite to the rear portion, upper and lower portions located between the front and rear portions, and two side portions located between the front and rear portions, and

a guide member having first and second pieces fixed between the two side portions in the panel, said first piece extending diagonally upwardly from a lower end near the opening to form an upper chamber and said second piece extending diagonally downwardly from the lower end to form a lower chamber so that a middle chamber is defined by the front portion and first and second pieces, said gas generated by the inflator and flowing into the air bag through the opening, firstly, entering into both the upper and lower chambers to expand the same and then flowing into the middle chamber.

5,593,180

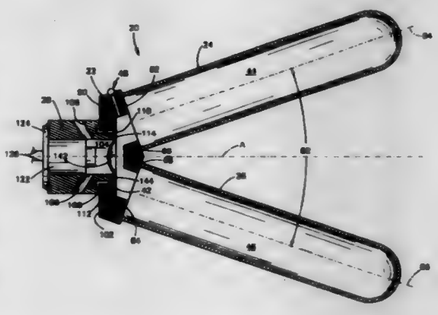
DUAL CHAMBER INFLATOR FOR SIDE IMPACT AIR BAG

Jess A. Cuevas, Scottsdale, and Mitchell P. Zakula, Tempe, both of Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Apr. 24, 1995, Ser. No. 427,406

Int. Cl.[6] B60R *21/02*

U.S. Cl. 280—741 **20 Claims**



1. An air bag inflator comprising:

first and second tubes defining respective first and second chambers for storing inflation fluid under pressure;

a manifold defining a manifold passage;

means for securing an end of each of said first and second tubes to said manifold with said chambers extending at an acute angle relative to one another, each of said first and second chambers being in fluid communication with said manifold passage;

a housing fixed to said manifold defining a third chamber for fluid communication with said manifold passage;

a rupturable wall fixed to said housing and blocking fluid communication of said third chamber with said manifold passage;

diffuser passages in said housing for providing fluid communication between said third chamber and an air bag; and

an actuatable initiator in said third chamber for rupturing said wall, upon actuation, to enable fluid communication between said third chamber and said manifold passage.

5,593,181

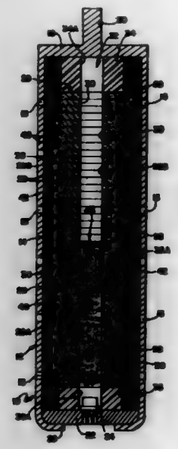
GENERANT WAFER CORE IGNITION SYSTEM FOR PASSENGER SIDE AIRBAG INFLATOR

Kerry C. Walker, and David W. Parkinson, both of North Ogden, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Mar. 15, 1996, Ser. No. 616,697

Int. Cl.[6] B60R *21/28*

U.S. Cl. 280—741 **20 Claims**



1. An airbag inflator including a stack of gas generant wafers, each having a central core opening and said stack contained in an elongated housing having an initiator at one end aligned with an elongated passage formed by said core openings of said stack of gas generant wafers, comprising:

a thin disk extending across said core opening passage dividing said passage into separate core chambers; and

a charge of granular pyrotechnic ignition material contained in one of said core chambers formed between said disk and said initiator for igniting said gas generant wafers forming said one chamber followed by ignition of said gas generant wafers forming the other chamber after said disk is consumed following activation of said initiator and ignition of said granular pyrotechnic ignition material.

5,593,182

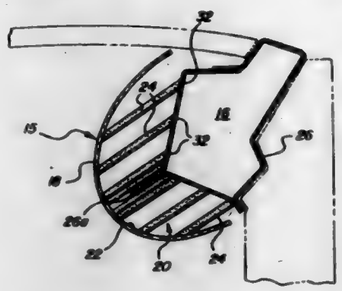
ENERGY ABSORBENT INTERIOR TRIM FOR VEHICLE

Colin Frost, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Sep. 1, 1995, Ser. No. 523,038

Int. Cl.[6] B60R *21/04*

U.S. Cl. 280—751 **16 Claims**



1. A trim assembly for a vehicle providing energy absorption between a body member and a trim cover and a cover having a generally curvilinear configuration with opposite ends thereon and including a curved inner surface and an energy absorbing arrangement having an undeformed position and a deformed position that is plastically buckled upon the cover being impacted and the energy absorbing arrangement having a first segment thereon engaged with the curved inner surface of the cover and a second segment engaged with the body member to form an plastically and/or elastically deformable structure that will absorb energy by buckling or elastic deformation as the cover is impacted characterized by:

a plurality of columnar elements interposed between the cover and the body member each of which will break or bend when the trim cover is impacted so as to absorb energy by either plastic or elastic deformation.

5,593,183

ENERGY-ABSORBING DEVICE FOR VEHICLE STEERING COLUMN

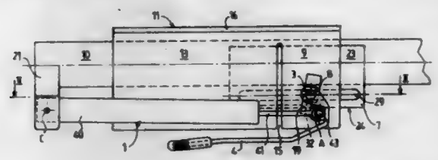
Jean-Michel Fouquet, and Benoit Duval, both of Vendome, France, assignors to NACAM, Vendome, France

Filed Jan. 5, 1995, Ser. No. 368,992

Claims priority, application France, Jan. 6, 1994, 94 00087

Int. Cl.[6] B62D *1/19*

U.S. Cl. 280—775 **9 Claims**



1. An energy-absorbing device for an automobile steering column adjustable in depth and inclination comprising:

a support structure fixed to the vehicle body for receiving an axially extending steering column body-tube and a steering shaft therein and mounting the body-tube and steering shaft to the vehicle body for selective depth and inclination adjustment;

a locking device for locking the body-tube in said support structure and including a rotatable elongate locking element mounted on the support structure and having an axis extending in a direction normal to the longitudinal axis of the steering column;

said locking device having an operator operable in a direction for rotating the locking element in a direction to increase tightening and locking of the body-tube in said support structure;

clamping elements mounted on said support structure coactive therewith and with said locking element for clamping the body-tube and locking it in said support structure;

said clamping elements and support structure having parts through which said locking element extends axially to accommodate positioning of the axis of the locking element in accordance with a selected depth and inclination of the steering column;

a damping device having a body mounted and connected at an end of the body-tube facing toward a driving wheel of the vehicle and translating therewith in response to an impact force applied to the body-tube at said end and in a direction parallel to the axis of the body-tube and effecting axial translation thereof;

an intermediate element coupling the damping device to the locking device operator for effecting rotation of the locking element about its axis in response to axial translation of the body-tube relative to said support structure to thereby preliminarily increase tightening of said body-tube in said support structure when the impact force is applied and if the impact force reaches a value of locking forces of the body-tube in said support structure said damping device is rendered effective and absorbs the energy of the impact force.

5,593,184

LOOSE-LEAF BINDER WITH SUSPENSION DEVICE

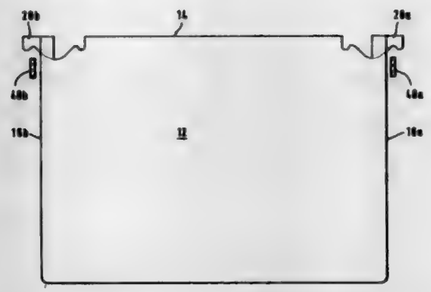
Wolfgang Deugler, Berlin, Germany, assignor to Off Data GmbH, Berlin, Germany

Filed Jan. 3, 1995, Ser. No. 367,694

Claims priority, application Germany, Jan. 4, 1994, 44 00 061.8

Int. Cl.[6] B42D *17/00*

U.S. Cl. 281—43 **5 Claims**



1. A device for binding and suspending loose-leaf paper, comprising:

a one-piece loose-leaf binder cut from a material sheet, said binder including two spaced-opposite lateral edges, a margin adjacent each lateral edge and a spine; and

a suspension element formed by perforations in each margin, wherein each of said suspension elements is formed by a perforated fold line, with two ends, extending parallel to the corresponding lateral edge and a perforated incision beginning and terminating at said perforated fold line ends, the incision comprising:

(a) a rectilinear cut line, with two ends, extending parallel to the corresponding lateral edge;

(b) a convex cut line communicating with each end of said rectilinear cut line;

(c) a concave cut line communicating with each convex cut line; and

(d) a further cut line communicating with each concave cut line and extending to one end of said perforated fold line at an angle of 45° with said spine.

5,593,185

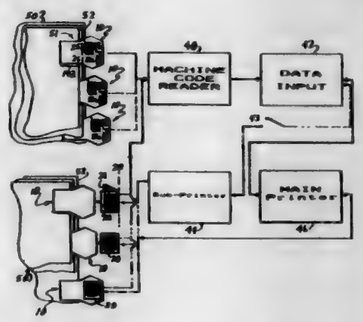
SYSTEM FOR MACHINE READING/INDEX MARKING PUBLICATIONS

Craig W. Olson, 154 W. Main St., Fontana on Geneva Lake, Wis. 53125

Continuation-in-part of Ser. No. 819,792, Jan. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 599,734, Oct. 19, 1990, Pat. No. 5,080,399. This application Jan. 6, 1994, Ser. No. 177,937

Int. Cl.[6] B42D *15/00*

U.S. Cl. 283—70 **21 Claims**



1. A process for index code-marking and/or machine reading a system of index reference markers for publications, comprising machine means for information coding, and/or labelling and/or reading at least one index reference marker means for at least one publication vessel means thereof for the system of said publications, wherein such machine readable information means indentifies at least one index/reference marker means within a reference marker group and/or distinguishes at least one reference marker group from another reference marker group to the same and/or other publications for the system;

each of said reference marker means designated for each publication vessel means having at least one said machine readable information field consisting of at least one machine readable code information means thereon;

machine means to input enter/read said machine readable marker information to storage for publication machine-aided retrieval means and/or reading means to relocate and/or identify certain said at least one marker and selected said at least one code on said at least one reference marker means to relocate at least one certain publication for the system and/or contents within the respective publication to which such at least one marker correspondingly represents thereto.

5,593,186

COUPLING FOR OUTER SURFACE ENGAGEMENT OF POLYMERIC PIPE

Wayne A. Harris, Adelaide, Australia, assignor to Philmac Pty Ltd, North Plympton, Australia

PCT No. PCT/AU94/00406, § 371 Date Mar. 17, 1995, § 102(e) Date Mar. 17, 1995, PCT Pub. No. WO95/03508, PCT Pub. Date Feb. 2, 1995

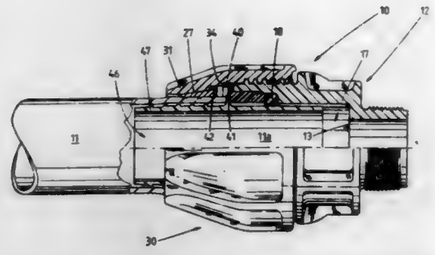
PCT Filed Jul. 28, 1994, Ser. No. 403,798

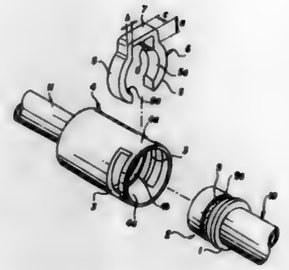
Claims priority, application Australia, Jul. 28, 1993, PM0050

Int. Cl.[6] B65D *59/00*

U.S. Cl. 285—23 **6 Claims**

1. A polymeric pipe coupling comprising:





a) a body having an external thread, axially aligned annular inner surfaces and a radially extending axially outwardly facing inner end surface defining a socket within the body, said axially aligned annular inner surfaces being of larger diameter at an outer end of said socket than inwardly thereof;

b) a nut having an internal thread adjacent an inner end thereof engaging said body external thread, the nut also having a radially extending axially inwardly facing internal abutment surface between ends of said nut and an axially outwardly converging internal circular surface between said abutment surface and another end of said nut, the nut further having a sleeve retention surface adjacent seid inwardly facing internal abutment surface;

c) an annular compression sleeve having a first abutment surface at an outer end co-operable with said nut abutment surface, the sleeve also having a second abutment surface spaced axially inwardly from the first said abutment surface and co-operable with said outer end of said body upon tightening of said nut, the sleeve further having a retention surface co-operable with said nut retention surface to be loosely retained by said nut;

d) a resilient gasket ring secured to an inner end of said sleeve;

e) a deformable gripping member having an axially outwardly converging outer surface complementary to said axially outwardly converging internal nut surface, the gripping member having an internal surface with barbs extending radially inwardly therefrom,

f) internal diameters of said socket inner end, sleeve and gripping member all being only slightly greater than an external diameter of a pipe to which said coupling is securable, such that an end of such pipe is freely insertable through said gripping member, sleeve and gasket ring into said socket inner end, and tightening of said nut over said external thread causes axial movement of said sleeve, sealing engagement of said gasket ring with said body and such pipe, and radially inward deformation of said gripping member such that said barbs clamp such pipe; and,

g) said retention surfaces of said nut and said annular compression sleeve being loosely engaging axially outwardly diverging surfaces which retain said sleeve to said nut as a preliminary assembly.

5,593,187

PIPE JOINT

Nobuyuki Okuda, Oyama; Koichi Inoue, Koga; Toshinori Tokutake, and Shinji Ito, both of Oyama, all of Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Continuation of Ser. No. 126,203, Sep. 24, 1993, abandoned. This application Nov. 22, 1995, Ser. No. 587,757

Claims priority, application Japan, Sep. 24, 1992, 4-254990; Dec. 10, 1992, 4-330633

Int. Cl.[6] F16L *37/08*

U.S. Cl. 285—305 **6 Claims**

1. A structure for joining pipes comprising a first pipe having a spigot portion formed with an annular projection on an outer periphery of a base end thereof, a stopper having a pair of circular-arc resilient legs formed with slanting surfaces for receiving the annular projection of the spigot portion and holding surfaces for fixedly holding the annular projection, a second pipe having a socket portion having a pair of apertures into which the legs fit to project inward and bridges provided between respective end portions of the pair of apertures, the legs being opposed to each other with inwardly curved surfaces thereon facing each other, a distance between fittable ends of the legs of the stopper being substantially equal to a width of the bridges to that the legs pass the bridges of the socket portion and fit into the apertures of the socket portion to be matched, the annular projection of the spigot portion expanding the legs to be inserted while abutting the slanting surfaces of the legs and the legs contracting behind the annular projection when the stopper is to be installed in the socket portion with the slanting surfaces of the legs facing a pipe insertion side, the annular projection being engaged and held by the holding surfaces of the legs so that the first pipe and the second pipe are joined.

5,593,188

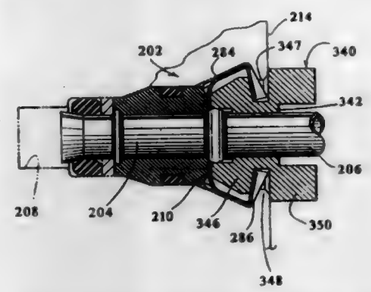
QUICK CONNECT TUBING CONNECTOR AND METHOD OF ASSEMBLY

James McNaughton, Rochester; Walfred J. Lilmatta, Rochester Hills, and Mark G. Ketcham, Marine City, all of Mich., assignors to Bundy Corporation, Warren, Mich.

Division of Ser. No. 183,182, Jan. 18, 1994, Pat. No. 5,538,297, which is a continuation-in-part of Ser. No. 757,393, Sep. 10, 1991, Pat. No. 5,350,203. This application Jan. 3, 1996, Ser. No. 581,807

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—319 **3 Claims**



1. A quick connector for forming a joint in a fluid line system comprising:

a female connector body defining a bore, said bore extending axially inwardly into said connector body from an entrance, a radial face being defined by said bore axially inwardly of said entrance;

a male member formed at an end of a tube, said male member being received within said bore and having a first enlarged upset formed thereon;

a sleeve surrounding said male member axially outwardly of said first upset, an axially inner end of said sleeve contacting said upset to retain said tube in said bore;

a retainer surrounding said male member axially outwardly of said sleeve, an axially inner end of said retainer contacting an axially outer end of said sleeve to retain said sleeve in said bore, said retainer having arms extending away from said axially inner end of said retainer and contacting said radial face of said connector body to retain said retainer in said bore; and

a plug positioned in said entrance to said bore, said plug including a ring surrounding said male member and extending radially between an axially outer surface of said connector body and and said male member to block said entrance, and further including plug retention means extending from an axially inner surface of said ring into said bore to secure said plug in said bore entrance.

5,593,189

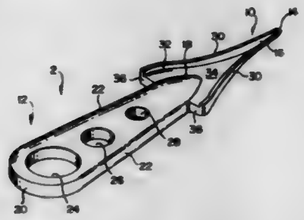
KNOT-TYING DEVICE

Joe Little, 1941 Bishop Rd., Chehalis, Wash. 98532

Filed Feb. 12, 1996, Ser. No. 600,298

Int. Cl.[6] D03J *3/00*

U.S. Cl. 289—17 **4 Claims**



1. A tool to assist in the tying of knots, comprising:

a unitary elongated main body member, including a first working end and a second handle end, wherein the working end includes a narrow bifurcated tip flaring outwardly toward the handle end, including an upstanding edge along the flared portion and terminating in opposing handle facing shoulders, and wherein the handle member includes a curved end and a pair of sides which intersect the end curve tangentially and, if extended toward the tip, would intersect each other.

5,593,190

CONSISTENT-FORCE QUICK LATCHING SYSTEM

James E. Shepard, Atlanta, Ga., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

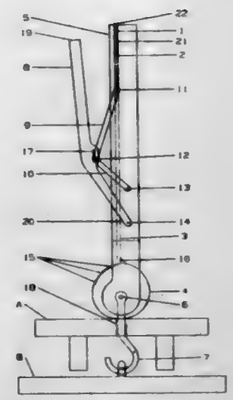
Filed Sep. 11, 1995, Ser. No. 528,625

Int. Cl.[6] E05C *19/10*

U.S. Cl. 292—98 **19 Claims**

1. A system for removably joining a first object with a second object, said system being adapted for securement to the first object and comprising:

a rotatable cam having on the circumference thereof several notches, said cam being susceptible to being motivated by an initiating motion; a hook for hooking thereon the second object, said hook being pivotally coupled to said cam such that said hook rises or falls in response to the rotation of said cam, thereby attaching to or detaching from, respectively, the first object the second object; a handle for supplying said initiating motion and rotating said cam, said handle having a pre-initiating position and being coupled simultaneously and pivotally to said cam and said hook; a detent adapted to enter and exit said notches; and a means for applying a predetermined amount of pressure to said detent such that said detent enters one of said notches in response to said pressure



and causes the rotation of said cam in consonance with the movement of said handle.

5,593,191

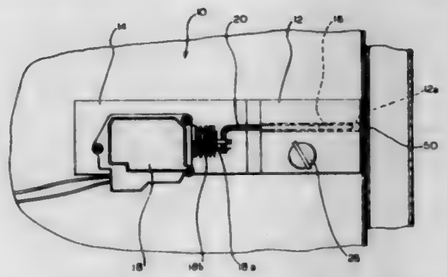
AUTOMATIC PIN-TYPE DOOR LOCK ASSEMBLY FOR HOBBY CARS

Stephen R. DeMarco, Rte. 3, Box 376-M, Clinton, N.C. 28328

Filed Jun. 8, 1995, Ser. No. 488,681

Int. Cl.[6] E05C *1/06*

U.S. Cl. 292—144 **5 Claims**



1. An automatic pin-type locking assembly with a manual override mechanism for locking the door of a hobby-type car comprising:

a) a mounting frame structure;

b) a locking pin movably mounted within the frame structure;

c) an electric actuator secured to the frame structure and operatively connected to the locking pin for moving the locking pin back and forth between a retracted disengaged position and an extended locked position;

d) an overcenter type manual override mechanism secured on the mounting frame structure for manually moving the locking pin between the disengaged and locked positions independently of the electric actuator, including:

i) a rotary shaft;

ii) a hand actuator for rotating the rotary shaft;

iii) an arm including a slot and fixed to the rotary shaft at one end. the arm being rotatable back and forth with the rotary shaft;

iv) a connecting pin extending from the locking pin through the slot within the arm such that as the arm is rotated back and forth via the rotation of the rotary shaft, the locking pin is likewise caused to move back and forth between the disengaged and locked positions, independently of the electric actuator; and

v) a spring connected at one end to an anchor point and connected at the other end to the arm for biasing the same over center towards either the disengaged position or the locked position in response to the rotary shaft being rotated.

5,593,192

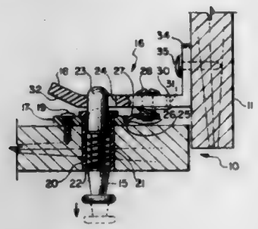
CABINET DOOR LATCH

Yoram Stuchinsky, 5502 Costello Ave., Sherman Oaks, Calif. 91401

Filed Sep. 18, 1995, Ser. No. 529,446

Int. Cl.[6] E05C *3/04*

U.S. Cl. 292—287 **7 Claims**



1. A cabinet door latch comprising:

a stationary base member;

a movable latch member adapted to engage and disengage with said base member;

a plunger movably disposed on said base member;

resilient means operably carried between said base member and said plunger normally biasing said plunger into an engagement position with said latch member;

said latch member having opposite ends separated by a midsection with an opening in said midsection;

said plunger insertably receivable in said midsection opening to engage said latch member in said engagement position; and

resilient means carried on said latch member engageable with said base member to separate said latch member from said base member when said plunger is disengaged from said latch member.

5,593,193

THUMB ACTUATED LATCH RETRACTING MECHANISM FOR GRIP HANDLE LOCKS INCLUDING INTEGRAL INSTALLATION GRIPPING AID

Jonathan R. Heim, Pacifica, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Continuation of Ser. No. 296,886, Aug. 29, 1994, abandoned. This application May 15, 1996, Ser. No. 648,455

Int. Cl.[6] E05B *3/00*

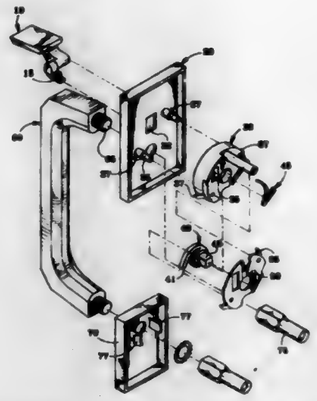
U.S. Cl. 292—336.3 **8 Claims**

1. A modular thumb actuated latch retracting mechanism, for mounting with a grip handle on a door, comprising:

a thumbpiece having a laterally offset cam on a second end thereof;

an escutcheon plate having an opening through which the second end of said thumbpiece and said cam protrude into a door preparation cavity and a second opening through which said grip handle protrudes for engagement with fastening means for attachment to said door; and

a chassis mounted to said escutcheon, said chassis comprising a laterally offset opening for the cam of said thumbpiece and another, centered, opening providing a bearing surface for a lever-equipped spindle assembly; the lever of said spindle assembly resting against said cam of the thumbpiece; a spring for biasing said spindle to a bolt latched position; and a cover plate providing another bearing surface for said spindle assembly.



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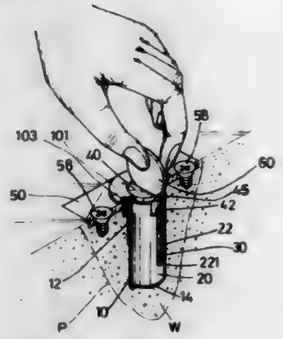
DOOR LOCATING DEVICE

Wan-Lai Liau, 3F., No. 6, Torng Yang Road, Nan Gaang District, Taipei, Taiwan

Continuation-in-part of Ser. No. 301,452, Sep. 6, 1994, abandoned. This application Jan. 2, 1996, Ser. No. 581,978

Int. Cl.[6] E05C *1/08*

U.S. Cl. 292—340 **5 Claims**



1. A door locating device, including

an anchorage hole provided on the concrete or ground;

an outer sleeve being anchored into the anchorage hole, the outer sleeve being provided with threads at its outer wall, the bottom of said sleeve being provided with a bottom plate which has a flange thereof, said flange being provided with a plurality of threaded holes;

a fixing plate having a threaded hole at the center portion thereof, and side portion both side portions of the fixing plate being provided with through holes said outer sleeve being screwed into said threaded hole;

an immediate sleeve to be incorporated with the outer sleeve, said immediate sleeve being provided with longitudinal slot at its inner wall, said longitudinal slot being provided with an enlarged cut which forms upper and lower positioning edges;

a spring being disposed within the bottom of said immediate sleeve,

a top press block having a transverse slot an upper and a lower portion of said block having a first and second posts which have different diameter from one another. an interconnection

between the first and second posts forming a biasing ring to bias the spring, said first post having a boss at its side wall which can move up and down within the longitudinal slot;

when the device is assembled, the outer sleeve is inserted into said anchorage hole first, then is filled with concrete in such a manner that the concrete is filled within said threads of said outer sleeve.

5,593,195

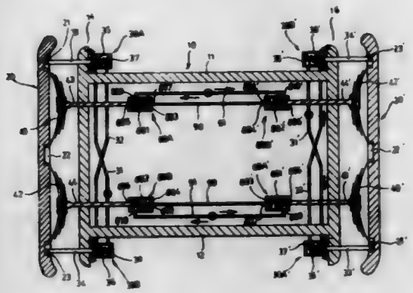
IMPACT MODERATING MECHANISM FOR AUTOMOBILES

Fa-Chun Lei, Suite 1, 11 F, 95-8 Chang Ping Road, Sec. 1, Taichung, Taiwan

Continuation of Ser. No. 19,098, Feb. 18, 1993, abandoned. This application Jul. 24, 1995, Ser. No. 506,388

Int. Cl.[6] B60R *19/02*

U.S. Cl. 293—134 **6 Claims**



1. An impact moderating mechanism comprising:

a pair of identical shock absorbing and transferring devices equipped one on each end of a chassis of an automobile respectively;

each said shock absorbing and transferring device comprising an outer bumper positioned parallel and in front of an original bumper of the automobile, a pair of first hydraulic cylinders perpendicularly and respectively secured with their fore ends adjacent to an inner surface of the lateral ends of said original bumper, each of first hydraulic cylinders having a cock stem passing through a first passage in said original bumper and a first valve port, said cock stem having a first end perpendicularly connected to an inner surface of said outer bumper and a second end perpendicularly connected to a first valve gate inside said first hydraulic cylinder and biased by a pair of first coil springs therein, a pair of first conduits connected crosswise to the inner peripheries of said first hydraulic cylinders;

a pair of second hydraulic cylinders spacedly and respectively secured on their upper peripheries to the bottom of the floor panel of said automobile, each of said second hydraulic cylinders having a second cock stem passing through a second passage on said original bumper which has a first end connected to one of a pair of leaf springs on said outer bumper and a second end connected to a second valve gate through a second valve port and biased by a pair of second coil springs;

said pair of leaf springs juxtaposed and connected to the inner surface of said outer bumper, each having a plurality of arcuate plates in progressive lengths and centrally packed by a packing member which has a tubular connecter with a portion facing inwards for coupling with said second cock stem;

a pair of second conduits for respectively connecting the rear ends of said pair of second hydraulic cylinders on one end of said chassis to the rear ends of said pair of hydraulic cylinders on the other end of said chassis; and

a pair of supplementary conduits respectively connecting the outer peripheries of said pair of second hydraulic cylinders between two ends of said chassis thereof;

whereby said pair of first hydraulic cylinders and said pair of leaf springs can absorb a small portion of a bump wave on their own end when said outer bumper is subjected to an external impact and transfer a larger portion of the bump wave to the other end of said chassis.

5,593,196

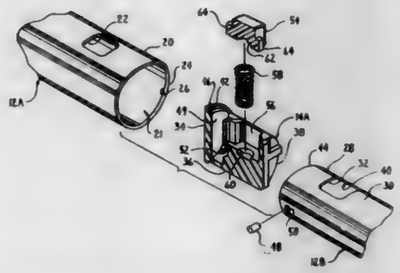
TELESCOPIC HOT STICK

Larry R. Baum, Hastings; Gary L. James, Middleville, and Mark A. Schmidt, Hastings, all of Mich., assignors to Hastings Fiber Glass Products, Inc., Hastings, Mich.

Filed Nov. 29, 1994, Ser. No. 346,008

Int. Cl.[6] F16B *7/10*

U.S. Cl. 294—19.1 **20 Claims**



1. A telescoping pole for manipulating a tool from a position a selected distance away from a workpiece, said pole having an extremity with means for connecting the tool thereto and further comprising:

a tubular first section having a female end and a predetermined non-circular cross-sectional shape defined by a plurality of first side portions and a plurality of convex first arcuate portions, each mutually adjacent pair of said first side portions having one of said first arcuate portions disposed therebetween, said first section being formed of a dielectric material and including an interior which defines an axial path;

a second section being formed of a dielectric material and having a male end slidably engaged within said interior of said first section through said female end, said second section having a predetermined non-circular cross-sectional shape corresponding to said shape of said first section which said cross-sectional shape of said second section is defined by a plurality of second side portions and a plurality of convex second arcuate portions, each mutually adjacent pair of said second side portions having one of said first arcuate portions disposed therebetween, each said second arcuate portion aligned in a facing relation with a respective one of said first arcuate portions when said first and second sections are engaged together so as to prevent rotation of said second section relative to said first section when engaged therein while being slidable along said axial path; and

cooperating locking means between said first and second sections for releasably restraining said male end within said first section proximate said female end to maintain said second section in an extended position, said locking means being engagable so as to restrain said second section relative to said first section to prevent said sliding of said second section and being releasable so as to permit said sliding.

5,593,197

SPARK PLUG WIRE PULLER

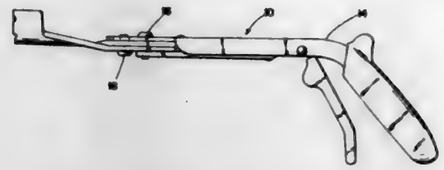
Raymond J. Mathieu, Troy; James F. Mellott, Washington, and Dean E. Myers, South Solon, all of Ohio, assignors to MAC Tools, Inc., Columbus, Ohio

Continuation of Ser. No. 194,615, Feb. 10, 1994, abandoned. This application Mar. 13, 1995, Ser. No. 403,056

Int. Cl.[6] B25J *15/08*

U.S. Cl. 294—19.1 **1 Claim**

1. A spark plug wire puller, comprising:



an elongate handle having a distal end and a proximal end, wherein said handle has a pivot at said distal end, wherein said handle has a first longitudinal cam slot adjacent said pivot, wherein said handle has an elongate trigger cavity extending from said distal end to said proximal end, wherein said handle has a first spring retainer located between a proximal end of said longitudinal slot and a distal end of said trigger cavity;

a handle grip on said proximal end of said handle;

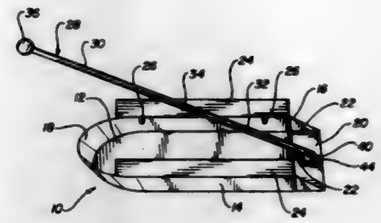
an elongate trigger received in said elongate trigger cavity having a distal end and a proximal end, wherein said trigger has a cam at said trigger distal end, wherein said trigger has an elongate spring cavity, wherein said trigger has a second spring retainer at a proximal end of said spring cavity, wherein said cam extends through said first longitudinal cam slot;

a trigger grip on said proximal end of said trigger;

an elongate spring located within said spring cavity of said trigger and attached to said first spring retainer at a distal end of said spring and to said second spring retainer at a proximal end of said spring;

a first elongate jaw member having a distal end and a proximal end and an inside and an outside, wherein said first jaw member rotates about said pivot, wherein said first jaw member has a spark plug wire grip on said inside at said distal end, wherein said first jaw member has a second longitudinal cam slot for receiving said cam, wherein said second longitudinal cam slot crosses said first cam slot in a first direction;

a second elongate jaw member having a distal end and a proximal end and an inside and an outside, wherein said second jaw member rotates about said pivot, wherein said second jaw member has a spark plug wire grip on said inside at said distal end, wherein said second jaw member has a third longitudinal cam slot for receiving said cam, wherein said third longitudinal cam slot crosses said first cam slot in a second direction that opposes said first direction, wherein said spark plug wire grip of said first jaw member faces said spark plug wire grip of said second jaw member, wherein said spark plug wire puller operates when said trigger grip is moved toward said handle grip thereby moving said cam in said first cam slot away from said pivot toward said proximal end of said handle and toward said proximal ends of said jaw members thereby forcing said jaw members to rotate about said pivot and to thereby move said spark plug wire grips closer to each other to grip a spark plug wire boot.



enable elevation of said open end of said scoop to discharge snow over said rear wall of said scoop.

5,593,199

METHOD AND GRAPLE APPARATUS FOR GRASPING AND LIFTING BULK MATERIALS

Helmut E. Faudrich, 2461 Sunnyside Place, Abbotsford, B.C., Canada, and Kelly A. Krammer, Abbotsford, Canada, assignors to Helmut Edward Faudrich, Abbotsford, Canada

Filed Aug. 22, 1994, Ser. No. 293,705

Int. Cl.[6] B66C *3/00*

U.S. Cl. 294—88 **6 Claims**



1. A grapple comprising:

a pair of arms rotatably connected near proximal ends thereof and having mutually facing concave surfaces;

a pair of elongate frames respectively rotatably attached at proximal ends thereof to each of said arms, the distal ends of said frames being attached to cables for lifting; and

weight-activated latch means rotatably connected at opposite ends thereof between each said frame and the one of said arms to which said frame is rotatably attached,

wherein said latch means further comprise shock absorber means.

5,593,198

SNOW SCOOP APPARATUS

Frank D. Vogel, II, 1108 36th St., Parkersburg, W. Va. 26101

Filed Oct. 10, 1995, Ser. No. 541,517

Int. Cl.[6] E01H *5/02*

U.S. Cl. 294—54.5 **6 Claims**

1. Apparatus for snow removal comprising a scoop having a bottom wall for sliding along the ground, said scoop including a pair of side walls and a rear wall, an open end of said scoop being provided at one end of said side walls, a movable handle connected adjacent said open end of said scoop, a scraper, hinge means to connect said scraper to said bottom wall at said open end of said scoop, and pivot means mounted on said scraper to enable said handle to move from an acute angle suitable for pushing said open end of said scoop into snow to a generally vertical alignment to

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5,593,200

REAR SEAT BENCH FOR AN ESTATE CAR

Hans-Juergen Schlaffke, Sasigau, and Armin Kienzle, Rottenburg, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

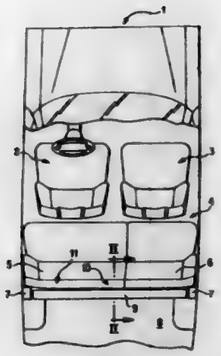
Filed Feb. 16, 1996, Ser. No. 602,947

Claims priority, application Germany, Feb. 16, 1995, 195 05 160.2

Int. Cl.[6] B60R *5/04*

U.S. Cl. 296—37.16 **5 Claims**

1. A rear seat bench for an estate car, comprising a backrest having two backrest parts of unequal length with each of the backrest parts being configured to fold down separately, and each backrest part having a backrest frame and being secured to an outer side of the car facing rearwardly, and at least two horizontally



spaced-apart closure arrangements arranged on the frame of the larger backrest part for releasably fastening a rolling-boot-shutter housing profile arranged to extend over an entire width of the backrest, wherein an energy absorber is arranged in a region of the at least two closure arrangements between the frame of the larger backrest part and the profile.

5,593,201

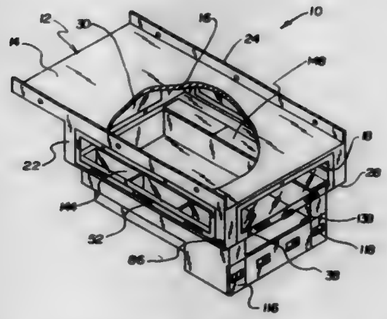
TRUCK TOOL ORGANIZER SYSTEM

Nick Bateman, 1620 Bowling La., San Jose, Calif. 95118

Filed Feb. 5, 1996, Ser. No. 596,740

Int. Cl.[6] B60P *7/02*

U.S. Cl. 296—100 **1 Claim**



1. A new and improved truck tool organizer system for placement in a truck bed of a pickup truck comprising in combination:

a generally rectangular truck bed cover being formed by a top planar portion, a front wall, a rear door and a pair of side walls therebetween, the top planar portion having a pair of linear side projections integral therewith and extending vertically upwardly from the side walls of the truck bed cover, each side projection being contiguous the top planar portion and being extended to hang over a pickup truck cab member, the top planar portion capable of having elongated planks positioned thereon, the truck bed cover having a base for coupling with a pickup truck;

the front wall of the truck bed cover having a window therein, the rear door having a window centrally positioned therein and turn handle extending from a bottom end of the door, the door having a pair of lift handles proportionately spaced along the bottom end of the door, the door capable of being opened by lifting up on the lift handles, the door being capable of remaining opened with a hydraulic mechanism being attached to an interior side of the door and cover, each side wall having a window positioned therein, each window of each side wall having a plurality of lift handles for opening and a support rod for holding the window in the open position;

a generally rectangular bottom shell being fixedly attached to the truck bed cover, the bottom shell capable of being positioned within a truck bed adjacent a pair of wheel wells with the truck bed cover attached thereto, each wheel well extends upwardly a distance into the truck bed, the shell having a height equal to the distance each wheel well extends upward into the truck bed, the shell having a length equal to an interior length of the truck bed, the shell having an interior bottom, each bottom having a pair of front casters with each caster being attached by a bracket along each bottom;

the shell being in receipt of a slidable drawer, the slidable drawer having a front face and a pair of sides, the front face having a pair of generally rectangular notches for using as handles to pull the slidable drawer back and forth, the slidable drawer having a pair of rear casters attached, the slidable drawer capable of being slid in and out of the shell by each rear caster bearing against the respective interior bottom, and each front caster bearing against the slidable drawer to allow cantilever support for the slidable drawer, the slidable drawer capable of extending beyond a tailgate of the pickup truck when positioned within the bottom shell, the slidable drawer having an H-shaped support stand attached to a bottom surface thereof for balanced support of the slidable drawer when extended;

a pair of tool box housings with each tool box housing having a tool drawer positioned therein, one each of the tool box housings being interconnected to the bottom shell on opposites sides of the shell, each tool drawer being capable of sliding back and forth within the respective tool box housing;

a center unit being positioned in the truck bed and having a floor portion with a pair of elongated tool bins positioned thereon, the floor portion extending the length of the truck bed and providing an upper closure for the bottom shell, each tool bin being positioned above the wheel wells of the truck bed and having the floor portion as a tool bin base, each tool bin being divided into three tool sectionals, the three sectionals of each tool bin having a common rear wall interconnected with the floor portion, the three tool sectionals of each tool bin having a common front wall interconnected to the base of the truck bed cover, each sectional having a lid being hingedly attached to the rear wall of the respective sectional, each lid being opened for allowing access to an inside area of the sectional from the window of the side wall of the cover being adjacent the respective bin; and

whereby the truck bed cover, the bottom shell and the center unit being interconnected forming the truck tool organizer system, and the truck bed cover allowing material to be placed on the planar portion for transport while the bottom shell and the center unit hold a variety of tools.

5,593,202

CONVERTIBLE TOP

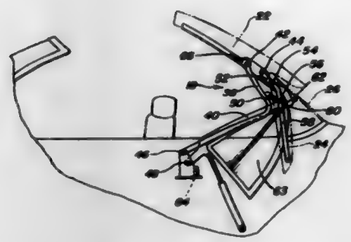
George A. Corder, Romulus, Mich., and Charles C. Turney, Toledo, Ohio, assignors to ASC Incorporated, Southgate, Mich.

Division of Ser. No. 398, Jan. 4, 1993, Pat. No. 5,429,409. This application Jun. 7, 1995, Ser. No. 484,472

Int. Cl.[6] B60J *7/12*

U.S. Cl. 296—108 **40 Claims**

1. A convertible top for an automotive vehicle, comprising: a plurality of relatively rigid panels for covering portions of a passenger compartment when in a raised operative position, each of said relatively rigid panels being pivotally coupled to a plurality of links, each of said links being pivotally coupled to said vehicle, at least one of said links having a slotted cammed section whereby



said plurality of panels can be moved from said raised operative position to a folded storage position within said vehicle.

5,593,203

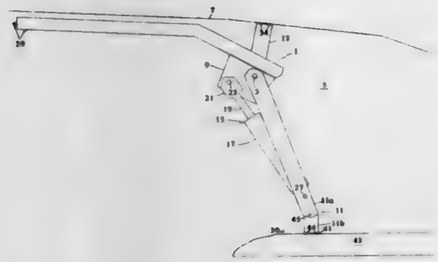
RETROFITTED DOOR FOR OPEN LUGGAGE RACK ON PASSENGER BUSSES

Jay D. Abbott, Rte. 3, Box 180, Rocky Mount, Va. 24151

Filed Jun. 8, 1995, Ser. No. 488,682

Int. Cl.[6] B60R *7/04*

U.S. Cl. 296—198 **11 Claims**



5. In an overhead storage compartment of a bus, the overhead compartment having a roof, a shelve, a hinged door and a latch closure, the improvement comprising an upper bracket extending downwardly from the roof of the compartment and a lower bracket extending upwardly from the shelve at each end of the door, a door bracket extending from a top inner surface at each end of the door, and a hinge positioned at least one fourth inch below a top of the door bracket and inwardly from the door between the upper bracket and the door bracket at each end of the door, whereby when the door is opened the top edge of the door swings into the overhead compartment leaving more space in an aisle adjacent the passenger compartment for a passenger to move.

5,593,204

GUIDE ROCKER (OR CRANK) FOR A SLIDING COVER OF A SUN ROOF FOR A MOTOR VEHICLE

Peter Wahl, Kreuzwertheim, and Rudolf Ackermann, Offenbach, both of Germany, assignors to Peter Wahl GmbH & Co., Kreuzwertheim, Germany

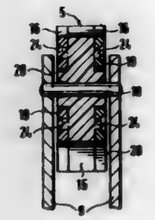
Filed Feb. 23, 1995, Ser. No. 393,297

Claims priority, application Germany, Feb. 23, 1994, 44 05 742.3

Int. Cl.[6] B60J *7/057*

U.S. Cl. 296—223 **7 Claims**

1. A guide rocker for being connected to a side edge region of a sliding cover of a roof opening of a sun roof of a motor vehicle for displacing the sliding cover relative to the roof opening, the guide rocker comprising:



a rocker body formed as a flat bar of a wear-resistant plastic material and having a guide slot for receiving a guide pin connected to and displaceable with a rear slide block for displacing the guide rocker and thereby the sliding cover, the rocker body further having edge projections formed on opposite side surfaces of the rocker body, surrounding the guide slot and projecting outwardly from the opposite side surfaces of the rocker body; and

two reinforcing plates which are formed as punched metal sheets, which are arranged on the opposite side surfaces of the rocker body, respectively, tightly abutting, along their entire surfaces, respective opposite side surfaces for the rocker body, and each of which has a slot having a width larger than a width of the guide slot for form-lockingly receiving a respective edge projection,

wherein each edge projection has an end surface, which is aligned with an outer surface of a respective reinforcing plate, and an inner surface which extends transverse to the end surface and is aligned with a guide path of the guide slot so that the guide slot has an increased width.

5,593,205

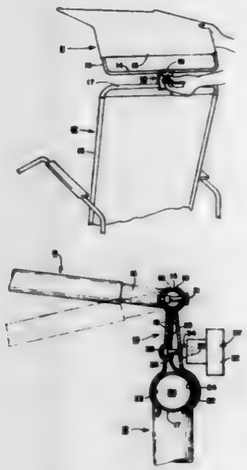
CANOPY CLAMP FOR A CHAIR

Robert D. Vanderminden, Sr., and Nathan Butler, both of Granville, N.Y., assignors to Telescope Casual Furniture Co., Granville, N.Y.

Filed May 18, 1994, Ser. No. 246,313

Int. Cl.[6] A47C *7/66*

U.S. Cl. 297—184.15 **15 Claims**



8. In combination,

a chair having a backrest with a tubular cross-piece;

a canopy having a cross-piece member; and
a clamp secured to said cross-piece member of said canopy and removably clamped to said tubular cross-piece of said chair, said clamp including a pair of metal plates, each plate being secured at one end to said cross-piece member of said canopy and having an arcuate recess at an opposite end disposed about said tubular cross-piece of said chair, a plastic strap between one of said plates and said tubular cross-piece and means biasing said plates towards each other to clamp said tubular cross-piece between said strap and the other of said plates while deforming said strap about said tubular cross-piece of said chair.

5,593,206

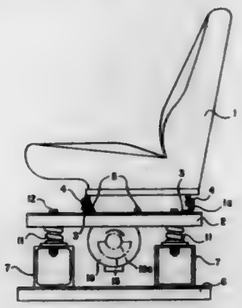
APPARATUS FOR VIBRATING SEATS

Manshiro Fukuoka, Aichi, Japan, assignor to Fukuoka Kagaku Ltd., Nishikamo-gun, Japan

Continuation of Ser. No. 194,356, Feb. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 987,481, Dec. 4, 1992, Pat. No. 5,348,370. This application Mar. 27, 1996, Ser. No. 622,158

Int. Cl.[6] A47C *31/00*

U.S. Cl. 297—217.7 **1 Claim**



1. An apparatus for vibrating a seat comprising a driver's seat; means for vibrating said driver's seat; and means for controlling vibration of said means for vibrating the driver's seat,

wherein said means for vibrating said driver's seat comprises a vibrating motor connected to said driver's seat, and at least one fixed eccentric load and at least one adjustable eccentric load mounted on both ends of an output shaft of said vibrating motor, a first end of said both ends of said output shaft being on a first side of said vibrating motor and a second end of said both ends being on a second side of said motor which is opposite said first side, wherein said fixed and adjustable eccentric loads are operably coupled to said output shaft.

5,593,207

SEAT FOR CHILD SWING

Dennis M. Turner, Scipio, Ind., assignee to Cosco, Inc., Columbus, Ind.

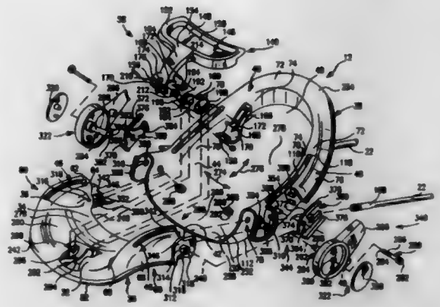
Filed Nov. 4, 1994, Ser. No. 334,723

Int. Cl.[6] A63G *9/00*

U.S. Cl. 297—281 **46 Claims**

18. A child seat having an adjustable seat back arranged to pivot relative to a seat bottom between an upright position and a reclined position, the child seat comprising

a seat shell having a proximal end and a distal end, the seat shell being formed to include a seat bottom, a first pivot axis adjacent to the proximal end and lying in spaced-apart relation to the seat bottom, and a bottom surface formed to include a nesting surface appended to the proximal end, the



nesting surface being arranged to curve along an arc having a radius that is constant about the first pivot axis, and
a seat back shell having a proximal end and a distal end, the seat back shell being formed to include a seat back, a second pivot axis adjacent to the distal end and lying in spaced-apart relation to the seat back, and a top surface having a mating surface appended to the distal end, the mating surface being arranged to curve along an arc having a radius that is constant about the second pivot axis thereby defining a shell-receiving cavity adjacent to the distal end of the seat back shell,
the seat back shell being rotatably appended to the seat shell with the proximal end of the seat shell being positioned to lie in the shell-receiving cavity, the first pivot axis being coincident with the second pivot axis, and the nesting surface engaging the mating surface.

5,593,208

VEHICLE SEAT

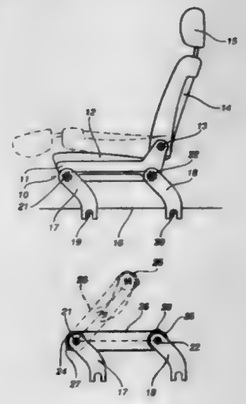
Rolf Mitschelen, Kirchheim; Werner Hauser, Calw, and Thomas Geisel, Böblingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Dec. 13, 1994, Ser. No. 357,206

Claims priority, application Germany, Dec. 13, 1993, 43 42 438.4

Int. Cl.[6] B62N *2/30*

U.S. Cl. 297—336 **18 Claims**



1. A vehicle seat comprising:

a seat cushion including a seat frame and seat upholstery,
a backrest pivotally supported on the seat frame to be foldable over onto the seat upholstery when the seat is in a stowed position,

pairs of downwardly projecting front and rear legs pivotally connected to the seat frame and serving to fasten the seat frame on a vehicle floor, said rear legs being releasably lockable on the floor to accommodate upward pivoting movement of the seat cushion,
a first belt pulley arranged coaxially with respect to a pivot connection of the front legs on the seat frame and connected in a rotationally fixed manner to at least one front leg,
a second belt pulley arranged coaxially with respect to a pivot connection of the rear legs on the seat frame and connected in a rotationally fixed manner to at least one rear leg,
and a drive belt connecting the first and second belt pulleys such that the rear legs are forced to move to a stowed position when the seat cushion is pivoted upwardly to a seat stowed position.

5,593,209

LOCKING DEVICE FOR A LONGITUDINAL-ADJUSTMENT DEVICE OF A VEHICLE SEAT WITH A SEAT SUPPORT TO WHICH AN ACTIVATION LEVER OF THE LOCKING DEVICE IS LATERALLY HINGED

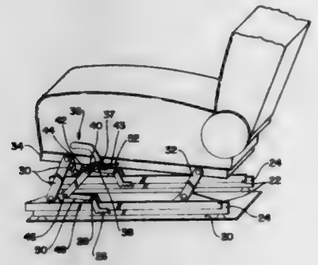
Heinz Bauer; Burckhard Becker, and Ernst-Reiner Frohnhaus, all of Solingen, Germany, assignors to Firma C. Rob. Hammerstein GmbH, Germany

Filed Nov. 15, 1993, Ser. No. 152,818

Claims priority, application Germany, Nov. 14, 1992, 42 38 483.4; Dec. 5, 1992, 42 40 943.8

Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—344.13 **14 Claims**



1. In a vehicle seat having a longitudinal adjustment device, wherein the longitudinal-adjustment device includes two pairs of rails (22, 24), each of said two pairs of rails being releasably lockable by means of a locking device having a catch (26), and including a floor rail (24) and a seat rail (22), said vehicle seat including a seat support and a height adjustment device for height adjustment of the vehicle seat independent of the longitudinal adjustments thereof, the seat rails (22) being connected to the seat support (34) through the height-adjustment device (30, 32), said locking device comprising

an activation lever (36) of the locking device laterally hinged to the seat support (34) and defining a hinge point, said activation lever serving to activate the catch (26), said locking device having a movable transmission link and a locking lever, wherein the activation lever (36) is connected to the transmission link (44) by means of a hinge connection for transmitting a movement of the activation lever to the locking lever independent of the position of the height adjustment device which in turn is hinge-connected to the locking lever (48), said locking lever being hinged to the seat rail and having a locking area which includes one from a group including the catch (26) and means for activating a separate catch.

5,593,210

ADJUSTING MECHANISM FOR A VEHICLE SEAT BACK

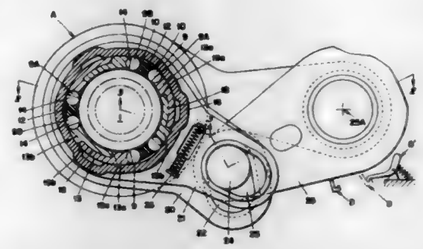
Jörg Schwarzbich, Wertherstrasse 15, D-33615 Bielefeld, Germany

Filed May 24, 1995, Ser. No. 448,986

Claims priority, application Germany, May 24, 1994, 9408426 U

Int. Cl.[6] B60N *2/02*

U.S. Cl. 297—361.1 **11 Claims**



10. An adjustment mechanism in combination with an adjustable seat back of a vehicle seat structure, comprising:

a rotary shaft connected to said seat back for rotation during adjustment of said seat back; and
a brake mechanism for selectively inhibiting and permitting rotation of said shaft to correspondingly inhibit and permit adjustment of said seat back, said brake mechanism including:
a plurality of circumferentially spaced wedge structures positioned around said shaft, each wedge structure including a pair of circumferentially spaced wedge surfaces spaced radially outwardly from said shaft,
a plurality of circumferentially spaced clamping structures arranged in a space formed between said shaft and respective ones of said wedge structures, each clamping structure including:
a pair of clamping bodies located in said space adjacent respective ones of said wedge surfaces, and
an elastic member disposed circumferentially between said pair of clamping bodies for biasing said pair of clamping bodies toward their respective wedge surfaces to be urged into clamping engagement with said shaft for braking said shaft against rotation in both direction of rotations and thereby prevent adjustment of said seat back; and
an actuating mechanism for displacing said clamping bodies toward their respective elastic members and out of said clamping engagement with said shaft, said actuating mechanism including:
a plurality of claws each disposed circumferentially between two of said clamping structures, each claw including first and second parts movable circumferentially relative to one another, said first claw part arranged to bear against a clamping body of one of said two clamping structures, and said second claw part arranged to bear against a clamping body of the other of said two clamping structures;
first and second slotted members, said first slotted member fixed to said first claw parts, said second slotted member fixed to said second claw parts, said first and second slotted members arranged to rotate about a common axis of rotation coinciding with a longitudinal axis of said shaft, each of said slotted members including a slot, said slots being superimposed over one another in overlapping relationship and arranged at an oblique angle to one another; and
a pin extending through both of said first and second slots, said pin being movable within said slots in a first direction for rotating said first and second slotted members opposite one another to displace said claw parts toward respective clamping bodies and thereby push said clamping bodies into non-clamping relationship with said

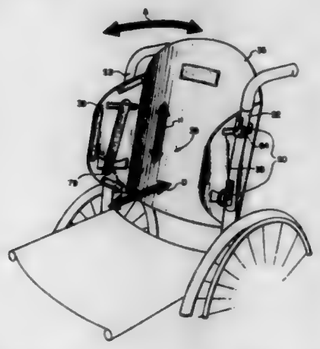
shaft, and in a second direction for rotating said first and second slotted members opposite one another to displace said claw parts away from said respective clamping bodies to enable said elastic members to push said clamping bodies into clamping relationship with said shaft.

5,593,211

DEFORMITY BACK SYSTEM

Eric C. Jay, Boulder; John A. Dyer, and John C. Dinsmoor, III, both of Westminster, all of Colo., assignors to Jay Medical Ltd., Boulder, Colo.

Division of Ser. No. 110,489, Aug. 23, 1993, Pat. No. 5,407,248, which is a continuation of Ser. No. 968,255, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 658,045, Feb. 20, 1991, abandoned. This application Jan. 6, 1995, Ser. No. 369,382
Int. Cl.[6] A47C 7/42
U.S. Cl. 297—383 10 Claims



1. An adjustable back system for releasable attachment to spaced-apart substantially vertical wheelchair frame posts, said back system comprising:

a relatively rigid shell back formed to extend transversely between the posts for support of a user's back when seated in the wheelchair;

a plurality of post-engaging assemblies coupled to said shell back by a plurality of independently adjustable coupling assemblies, said post-engaging assemblies including an upper pair of post-engaging assemblies extending transversely from opposite sides of said shell back and a lower pair post-engaging assemblies extending transversely from opposite sides of said shell back below said upper post-engaging assemblies, said post-engaging assemblies each being formed to releasably secure said shell back to the posts; and

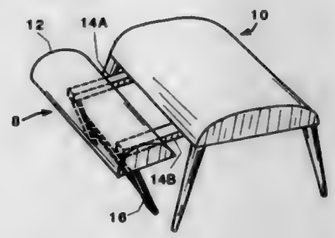
said adjustable coupling assemblies each being formed for independent fore and aft adjustment of the position of coupling of said post-engaging assemblies to said shell back for adjustment of the angle and depth at which said shell back is mounted to the posts, and said adjustable coupling assemblies further including a connecting member extending between an upper post-engaging assembly and a lower post-engaging assembly on each side of said shell back, said connecting member being formed to rigidly interconnect said coupling assemblies to enable fore and aft adjustment of the depth of said shell back relative to said posts while maintaining substantially the same angle of said shell back relative to said posts.

5,593,212

FOOTSTOOL EXTENSION PROVIDING LEG SUPPORT

Helen T. Praria, and Guy B. Praria, both of 14 George St., Wayland, Mass. 01778

Filed May 30, 1995, Ser. No. 452,892
Int. Cl.[6] A47C 16/02
U.S. Cl. 297—423.44 6 Claims



1. A footstool appendage comprising:

a) a pad or cushion mounted on,

b) a platform of suitable size and shape to accommodate use by a human resting his or her legs,

c) at least one rail made of relatively rigid material having sufficient width and thickness to support the weight of the legs and/or feet of a human and having a length somewhat greater than the width of said platform, one end of which is attached to a footstool,

d) at least one U shaped bracket with outwardly extending flanges, said at least one U-shaped bracket being sized to fit closely but not tightly around said at least one rail and attached by screws, bolts, or other such fasteners through said flanges to the underside of said platform,

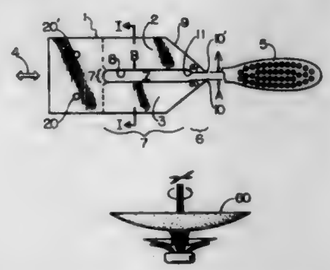
such that when said at least one rail is attached to said footstool, and said flanged brackets placed around said at least one rail and attached to the underside of said platform is capable of sliding back and forth on said at least one rail thereby allowing said platform to be extended greater or lesser distances from the footrest to accommodate users of different sizes and allowing placement of said platform where it will be most effective.

5,593,213

BRISTLE FINISHING FORK

Jeffrey S. Meessmann, Iowa City, Iowa, assignor to Gillette Canada Inc., Kirkland, Canada

Filed Mar. 11, 1994, Ser. No. 209,189
Int. Cl.[6] A46D 1/04;9/00
U.S. Cl. 300—21 19 Claims



18. A method for isolating and end-rounding bristles affixed to a toothbrush head comprising the steps of:

(1) providing a device for isolating and end-rounding bristles affixed to a toothbrush head within a bristle finishing region comprising:

(a) a means for holding a toothbrush with bristles affixed thereto; and

(b) a bristle finishing fork comprising a planar base plate which is furcated into at least two elongated prongs having tips spaced at a distance "A" defining the width of the bristle swath to be isolated, wherein starting at said tip, the distance between the blades increases to a distance "B" defining the sidewall of the bristle finishing region, whereby said fork has a backwards and forwards motion, in such a way that the tip of said prongs can be introduced between toothbrush bristles through a parallel relative motion between fork and brush, so that the swath of bristles to be isolated are positioned in said bristle finishing region; and

(c) a means for rounding the distal ends of the bristles positioned in said bristle finishing region;

(2) engaging a toothbrush with a plurality of bristles affixed to the head within said means for holding a toothbrush;

(3) introducing said fork between the toothbrush bristles; and

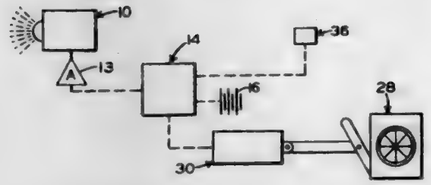
(4) rounding the distal ends of the bristles positioned in said bristle finishing region.

5,593,214

RAILWAY PARKING BRAKING APPARATUS

Wajih Kanjo, Lockport, Ill.; Eric Smith, Burlington, Canada; Thomas J. Demoise, Export, Pa.; Michael Girotti, Thorold; Thomas McCabe, Dorval, both of Canada; Charles B. Fessler, Lancaster, Pa., and Scott Natschke, Kankakee, Ill., assignors to Westingbouse Air Brake Company, Wilmerding, Pa.

Division of Ser. No. 278,937, Jul. 22, 1994. This application Jun. 6, 1995, Ser. No. 471,607
Int. Cl.[6] B60T 13/00;15/32
U.S. Cl. 303—7 13 Claims



1. An apparatus for effecting a change in a condition of a brake system disposed on a railway car wherein said brake system includes a hand brake and a service brake, said change being effected in response to at least one of a predetermined group of response triggering conditions, said apparatus comprising:

(a) a first means for detecting at least one of such response triggering conditions, said first means including a motion sensor for sensing relative motion between such railway car and at least one of several stationary objects;

(b) a second means operatively associated with said first means for producing a predetermined signal indicating that such condition has been detected;

(c) a quick release mechanism for releasing such hand brake;

(d) a third means responsive to said predetermined signal for operating such quick release mechanism to release such hand brake; and

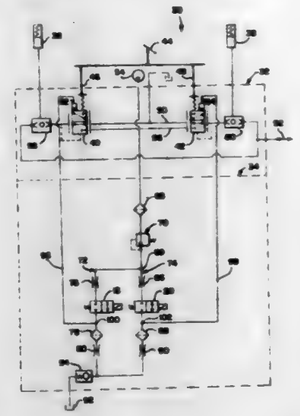
(e) a switch means for making said apparatus operative only when such hand brake is applied.

5,593,215

ELECTRO-HYDRAULIC CONTROLS FOR BRAKE TYPE TRACTION CONTROL SYSTEM

Feng-Rong Shaw, Menomonee Falls, and Allen L. Flio, Sussex, both of Wis., assignors to Fluid Power Industries, Inc., Lincolnshire, Ill.

Continuation of Ser. No. 319,760, Oct. 7, 1994, abandoned. This application Mar. 26, 1996, Ser. No. 622,258
Int. Cl.[6] B60T 17/04
U.S. Cl. 303—113.2 7 Claims



1. In a vehicle traction control system of the type having a hydraulic pressure operated brake system for controlling the braking torque on at least two powered wheels on opposite sides of a vehicle and a hydraulic pressure control system including at least two pulse width modulated valves for operating said brake system, said brake system being of the type which can apply a braking torque to a powered wheel on one side of the vehicle or to a powered wheel on the other side of a vehicle in response to sensing a difference in speeds between the wheels on the two sides, the braking torque being applied to the faster rotating wheel, the improvement wherein:

said hydraulic pressure control system includes, for each of at least two powered wheels:

a hydraulic pressure passage for conducting a flow stream of hydraulic fluid;

an upstream orifice in said passage through which said stream flows; and

a downstream orifice in said passage through which said stream flows; and

wherein one of said pulse width modulated valves is provided in said passage in communication with said orifices in said passage for developing a hydraulic control pressure in said passage between said orifices for operating said brake system; and

means for communicating said hydraulic control pressure from a point in said passage between said orifices to said brake system;

wherein said flow stream enters said passage through said upstream orifice and is relieved from said passage through said downstream orifice; and

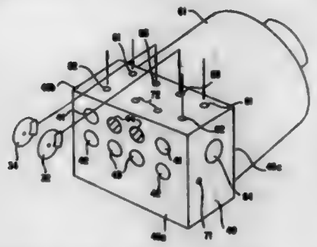
wherein the pressure of said flow stream on the side of said upstream orifice which is between said orifices is less than the pressure of said flow stream on the opposite side of said upstream orifice and the pressure of said flow stream on the side of said downstream orifice which is between said orifices is greater than the pressure of said flow stream on the opposite side of said downstream orifice.

5,593,216

ANTILOCK BRAKE DEVICE VALVE ARRANGEMENT

Yukio Hosoya, and Kei Fukuyo, both of Hamakita, Japan, assignors to Nishinbo Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 204,455, Mar. 2, 1994, abandoned.
This application Apr. 5, 1996, Ser. No. 628,443
Claims priority, application Japan, Mar. 5, 1993, 5-069134
Int. Cl.[6] B60T 8/36
U.S. Cl. 303—119.2 4 Claims



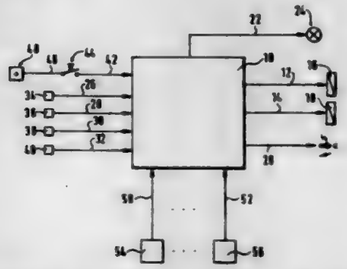
1. An antilock brake system for installation in brake lines connecting a master cylinder with wheel brakes, comprising a housing; a motor-driven pump and several solenoid valves and connecting lines thereof mounted in said housing wherein said housing has a motor disposed on one planar surface, and a maximum of eight valve mounting bores arranged in lattice-fashion on one planar surface of said housing directly opposite to the one planar surface on which said motor is disposed; valves placed inside the mounting bores wherein a longitudinal axis of the valves is parallel with that of the motor; and depending on the brake circuit configuration, plural electromagnetically-actuated valves mounted in said valve mounting bores and at least one pressure control valve, actuated by the pressure of the brake fluid within the brake lines, mounted in at least one other bore.

5,593,217

TRACTION CONTROL SYSTEM

Johannes Schmitt, Markgroeningen, Germany; Andreas Burg, Clayton, Australia, and Ralf Donath, Ditzingen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 19, 1995, Ser. No. 531,286
Claims priority, application Germany, Sep. 20, 1994, 44 33 460.5
Int. Cl.[6] B60T 8/32; B60K 28/16; B60Q 9/00
U.S. Cl. 303—139 7 Claims



1. Apparatus for controlling slippage of driving wheels in a vehicle having an engine which develops torque to drive said wheels and brakes at each wheel, said apparatus comprising

means for detecting instability at said driving wheels,

first traction control means for at least one of limiting engine torque and applying brake pressure at the wheels where instability is detected,

means for switching off the first traction control means,

monitoring means for providing the driver with information about the operating state of the vehicle, said monitoring means having three different states comprising

a first state which is activated when the first traction control means is switched off and no instability is detected,

a second state which is activated when instability is detected, and

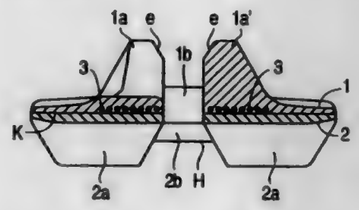
a third state which is activated when the first traction control means is switched on and no instability is detected.

5,593,218

HIGHLY ELASTIC RUBBER CRAWLER

Yusaku Katoh, and Tsuyoshi Uchiyama, both of Hiroshima-ken, Japan, assignors to Fukuyama Gomu Kogyo Kabushiki Gaisha, Hiroshima-ken, Japan

PCT No. PCT/JP92/00691, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/21549, PCT Pub. Date Dec. 10, 1992
PCT Filed May 27, 1992, Ser. No. 142,347
Claims priority, application Japan, May 31, 1991, 3-229826
Int. Cl.[6] B62D 55/24
U.S. Cl. 305—174 13 Claims



1. A method of manufacturing a highly elastic rubber crawler in which no core bars are embedded and whose inner peripheral layer (1) including projections (1*a*, 1*a*') for preventing falls which protrude on the inner peripheral face of the crawler body (R) is formed of highly rigid urethane rubber and whose outer peripheral layer (2) including ground lugs (2*a*, 2*b*) provided on the outer peripheral face is formed of vulcanized rubber such as natural rubber or an equivalent elastic member, wherein first an endless outer peripheral layer (2) is formed by being pressed and vulcanized as in the conventional method of producing a rubber crawler, and then on the non-grounding side of the outer peripheral layer (2) liquid urethane rubber is injected and molded to form the inner peripheral layer (1).

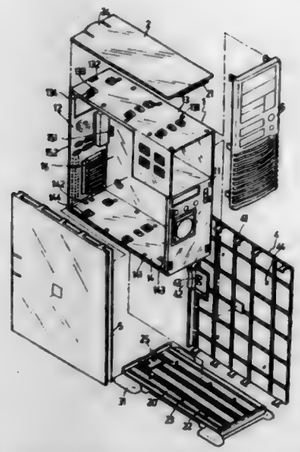
5,593,219

MAINFRAME HOUSING OF A PERSONAL COMPUTER

Hsin C. Ho, 20F-1, 268, Sec. 1, Wen-Hua Road, Pan Chiao City, Taipei, Taiwan

Filed Dec. 14, 1995, Ser. No. 572,564
Int. Cl.[6] A47B 47/00
U.S. Cl. 312—263 4 Claims

1. A mainframe housing comprising a rectangular metal base frame having two opposite square sides and two pairs of opposite rectangular sides with borders connected between the square sides, a front panel covered on one rectangular side of said base frame, two rectangular cover panels fastened to two opposite rectangular sides of said base frame, and at least one square cover panel respectively covered on the square sides of said base frame, wherein: one pair of the two pairs of opposite rectangular sides of said base frame comprises two rows of lugs longitudinally and bilaterally disposed along the border, a retaining hole near one end, rows of hooks longitudinally disposed between said rows of lugs, and one row of sliding slots longitudinally disposed between one row of lugs and said rows of hooks; each rectangular cover panel



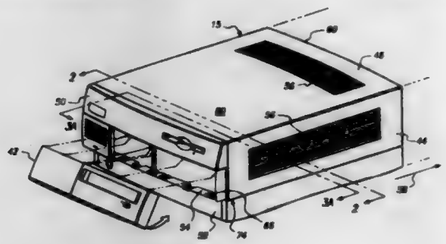
comprises a front flange forced into engagement with said front panel, a plurality of longitudinally grooved reinforcing ribs at an inner side, a plurality of rows of crossed tenons respectively respectively disposed in said longitudinally grooved reinforcing ribs and respectively forced into the sliding slots of one rectangular side of said base frame, a rear finger strip, and a hook raised from said rear finger strip and forced into engagement with one retaining hole of said base frame; each square cover panel comprises two rows of inward hooks respectively forced into engagement with the lugs of said base frame, a finger strip, and a hook raised from the finger strip and forced into engagement with a respective retaining hole on said base frame.

5,593,220

CANTILEVERED LATCH MECHANISM FOR AN ENCLOSURE

Calvin Q. Seid, Palo Alto, and David H. Titzler, Newbury Park, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 432,917
Int. Cl.[6] A47B 47/00
U.S. Cl. 312—265.6 15 Claims



1. An apparatus comprising:

a chassis;

a removable enclosure extending around said chassis; and

at least one manually actuable latch attached to one of said chassis and enclosure and releasably connectable to the other of said chassis and enclosure, said at least one manually actuable latch comprising:

a fixed end fixed to said one of said chassis and enclosure,

a movable end opposite said fixed end and releasably connectable to said other of said chassis and enclosure, and

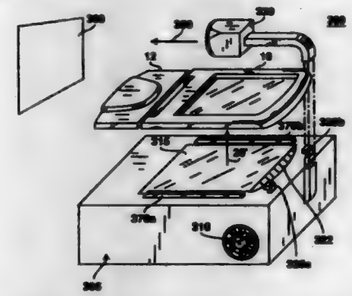
at least two flexible cantilevered arms connected together at said movable end and interconnecting said fixed end and said movable end for constraining said movable end to move translationally in an imaginary plane passing through said fixed and movable ends and said cantilevered arms.

5,593,221

OVERHEAD PROJECTOR FOR FLAT PANEL DISPLAY CAPABILITY

Daniel E. Evanicky, San Jose; Leroy B. Keely, Portola Valley, and Steven Siefert, Belmont, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Jun. 27, 1995, Ser. No. 495,881
Int. Cl.[6] G03B 21/16
U.S. Cl. 353—122 18 Claims



4. An overhead projector for displaying an image within a flat panel display matrix of a display assembly, said overhead projector comprising:

an illuminated display screen for radiating light through said flat panel display matrix to project said image on a receiving surface;

a pair of tracks positioned on opposite sides of said illuminated display screen for supporting said display assembly thereon;

an air inlet vent positioned adjacent to said illuminated display screen for providing passage to an air current to flow within a channel formed by a top surface of said display screen, side walls of said pair of tracks, and a surface of said display assembly facing said illuminated display screen when said display assembly is positioned on said pair of tracks;

a fan for causing said air current to flow through said air inlet vent, wherein said air current is for cooling said flat panel display matrix; and

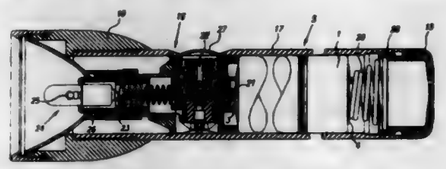
a pair of clamps positioned adjacent to said illuminated display screen for mating with receiving holes within said display assembly for positioning and securing said display assembly with respect to said illuminated display screen.

5,593,222

FLASHLIGHT

Anthony Maglica, Anaheim, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.

Division of Ser. No. 196,860, Feb. 15, 1994. This application Jun. 7, 1995, Ser. No. 472,528
Int. Cl.[6] F21L 7/00
U.S. Cl. 362—157 6 Claims



1. A flashlight comprising

a barrel including a plurality of batteries arranged in physical series therein;

a head assembly at one end of said barrel, including a head, a lens, a lamp bulb and a reflector, said lens, lamp bulb and reflector being arranged in said head to direct a beam of light therefrom;

at least one device between said batteries, each said device including a resilient conductor, a nonconductive ring annularly disposed about and holding said resilient conductor, said resilient conductor extending axially outwardly of said ring in a first direction.

5,593,223

ILLUMINATION DEVICE

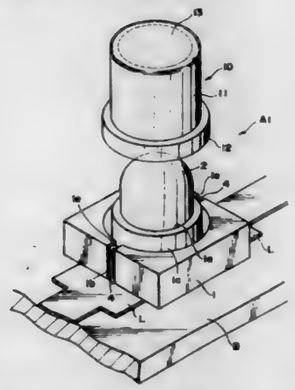
Hiroyuki Koizumi, Joubon Iwaki, Japan, assignor to Alpine Electronics, Inc., Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,613

Claims priority, application Japan, Oct. 13, 1994, 6-274598

Int. Cl.[6] F21M *3/14*

U.S. Cl. 362—255 **7 Claims**



1. An illumination device for mounting on a circuit board, the illumination device comprising:

a light emitting element;

a casing for supporting said light emitting element; and

a cap which is fitted on said light emitting element;

wherein said cap includes an external flat top surface, a cylindrical section which surrounds said light emitting element, and a curving surface section formed between an external surface of the cylindrical section and an edge of said flat top surface;

wherein the flat top surface of the cap has a diameter which is smaller than an outer diameter of the cylindrical section; and

wherein said cap includes a base section located below the cylindrical section which is received in a socket section formed on an external surface of said casing.

5,593,224

FIELD-ADJUSTABLE INTERNAL PIVOT TENSION DEVICE

Michael D. Kunkel, Ontario, and Raymond J. Kusmer, Yorba Linda, both of Calif., assignors to Thomas Industries, Los Angeles, Calif.

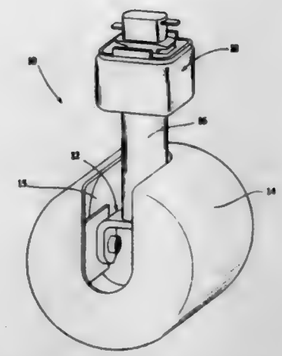
Filed Sep. 22, 1995, Ser. No. 532,879

Int. Cl.[6] F21V *21/29*

U.S. Cl. 362—287 **22 Claims**

1. A light fixture bracket assembly comprising:

a key having a bolt passage therethrough;



a first bracket securable to a light housing, said key extending through said first bracket;

a second bracket securable to a mounting post, said second bracket being cooperatively shaped to engage said key at an engagement so that said key is rotatable relative to said first bracket, wherein said engagement preventing rotation of said key relative to said second bracket;

a bolt extending through said brackets and said key, said bolt being operable to secure said first and second brackets; and

wherein a head of said bolt is accessible through an opening in said light housing.

5,593,225

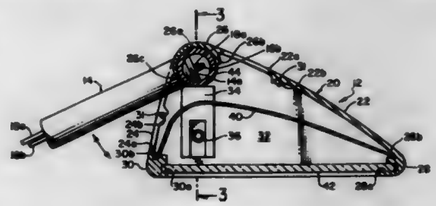
WALL WASHER LIGHT WITH INTERNAL SWIVEL CONNECTOR AND SUPPORT ARM

Bernard Safyan, Los Angeles, Calif., assignor to CCC Industries, LLC, Wrentham, Mass.

Filed Jun. 15, 1995, Ser. No. 490,852

Int. Cl.[6] F21S *3/02*

U.S. Cl. 362—427 **9 Claims**



1. In a pivoted head lighting device for illuminating exhibit and display panels, display objects and work surfaces with a substantially uniform, spot-free spread of light consisting of: an elongated metal shell structure defining a pivoted head lighting device, said shell structure having an upper corner transition section and a lower front opening; a concave metallic light reflector within said shell structure extending over the length thereof; a high intensity electric lamp tube positioned centrally within said shell structure between said reflector and said front opening; a tempered glass lens spanning the front opening of said shell structure; and an elongated support arm pivotally interconnected to said shell structure, the improvement comprising:

a) an integral internally-projecting tube gripping means of semi-circular cross section within said shell structure located within the upper corner transition section and extending along the length thereof, said tube gripping means having an internal semi-circular surface, and

b) a terminal cross-tubular swivel member seated within and held by said gripping means for adjustable rotation therein, said swivel member being interconnected to an end of the support arm of said lighting device, the external diameter of said cross-tubular swivel member and the internal diameter of the semi-circular tube gripping means being substantially equal whereby rotation of said swivel member within said gripping means to position the pivoted head of said lighting device and the light illumination therefrom is only accomplished by overcoming the rotational friction resistance between said swivel member and said gripping means.

5,593,226

APPARATUS FOR RECEIVING AND TRANSPORTING MATERIAL MIXED IN INTERNAL MIXERS USED FOR PROCESSING RUBBER MIXTURES

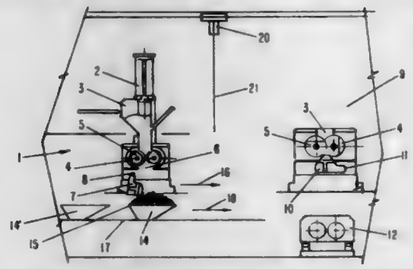
Julius Peter, Donnauergasse 7, A-1130 Vienna, Austria, assignor to Julius Peter, Vienna, Austria, and Continental Aktiengesellschaft, Hannover, Germany

Filed Apr. 21, 1995, Ser. No. 426,612

Claims priority, application Germany, Apr. 22, 1994, 44 14 039.8

Int. Cl.[6] B01F *7/02*

U.S. Cl. 366—69 **13 Claims**



1. An apparatus for receiving and transporting material mixed in internal mixers that are used for processing rubber mixtures, said apparatus comprising:

at least one mixer having a discharge opening on an underneath side thereof, and also having a closure means that is pivotable about a horizontal axis for opening and closing said discharge opening;

at least one receptacle adapted to be disposed below said discharge opening of said at least one mixer for receiving mixed material from said mixer;

means for withdrawing a receptacle, after it has received mixed material from said mixer and prior to closure of said closure means, in a direction of a horizontal component of a closing pivoting path of said closure means; and

a further device, with said at least one receptacle being movable between said at least one mixer and said further device.

5,593,227

TWIN-SHAFT SCREW-TYPE EXTRUDING MACHINE HAVING MIXING ELEMENTS WITH WINGS

Bernhard Scheuring, Affalterbach, and Edgar Schlipf, Stuttgart, both of Germany, assignors to Werner & Pfleiderer, GmbH, Germany

Filed Jul. 25, 1995, Ser. No. 506,667

Claims priority, application Germany, Jul. 26, 1994, 44 26 441.0

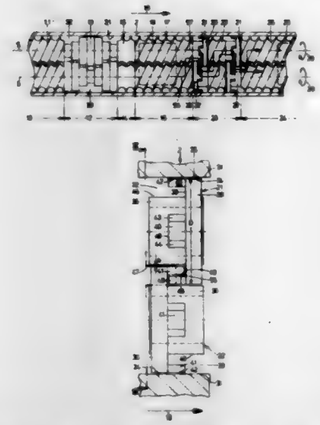
Int. Cl.[6] B29B *7/48*

U.S. Cl. 366—82 **14 Claims**

1. A twin-shaft screw-type extruding machine, comprising

a casing (2) having a first end and a second end,

a first casing bore (32) and a second casing bore (33) intersecting and parallel to said first casing bore (32) and each of said first and said second casing bore (32, 33) having an inside wall (31),



a feed opening (9) at said first end of the casing (2) and a discharge opening (28) at said second end of the casing (2),

a first shaft (3) disposed in said first casing bore (32) and a second shaft (4) disposed in said second casing bore (33) said first and said second shaft (3, 4) driven to rotate in the same direction of rotation (29) and having axes (5, 6),

screw elements (11, 15, 17, 26) disposed non-rotatably on said first and said second shaft (3, 4), and

a first mixing element (21) comprising a first disk (30) which is non-rotatably connected to said first shaft (3) and a second mixing element (22) comprising a second disk (30), non-rotatably connected with said second shaft (4),

wherein said first disk (30) has a front (39) and said second disk (30) has a front (39) which fronts (39) face each other, and wherein each of said first and said second disk (30) have a circumference (34),

wherein mixing wings (40, 41) are provided at equal angular distances (d) on said fronts (39), facing each other, of said first and said second disk (30) and in the vicinity of the circumference (34) of each of said first and second disk (30), and wherein one of said mixing wings (40) of said first mixing element (21) and one of said mixing wings (41) of said second mixing element (22) interengage and rotate past each other, while leaving open a first gap (50).

5,593,228

ROTARY SHAKER WITH FLEXIBLE STRAP SUSPENSION

Myron Tannenbaum, Cranbury, N.J., assignor to New Brunswick Scientific Co., Inc., Edison, N.J.

Filed May 3, 1996, Ser. No. 642,341

Int. Cl.[6] B01F *11/00*

U.S. Cl. 366—209 **10 Claims**

1. A rotary shaker apparatus comprising:

a base;

a motor attached to said base;

an eccentric drive attached to said base;

drive means connecting said motor to said eccentric drive;

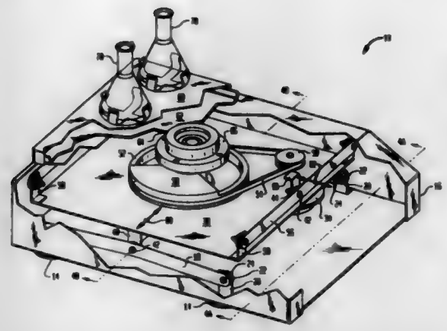
first flexible strap means attached to said base;

first plate means attached to said first flexible strap means so that said first plate means is constrained to oscillate in a first direction relative to said base;

a second flexible strap means attached to said first plate means; and,

a second plate means attached to said eccentric drive and also attached to said second flexible strap means so that said second plate means can oscillate in a second direction substantially perpendicular to said first direction; and,

tray means for supporting mixing containers attachable to said second plate means,



wherein said tray means and said second plate means oscillate in an orbit constrained by said first and second flexible strap means.

5,593,229

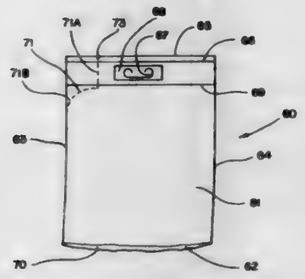
HEAVY DUTY BAG WITH EASILY-REMOVABLE CORNER FOR POURING

Charles J. Warr, High Point, N.C., assignor to Rex-Rosenlew International Corporation, Thomasville, N.C.

Filed Jul. 10, 1995, Ser. No. 500,173

Int. Cl.[6] B65D *33/36;33/08*

U.S. Cl. 383—209 **9 Claims**



1. In a bag including first and second walls having joined first and second opposed side edges, an end edge and at least one seal line spaced from the end edge and extending laterally from one side to the other for sealing closed the end of the bag, the improvement comprising an easy-open corner portion of the bag removable to form a pourer, said corner portion comprising:

(a) a cut formed in both side walls closer to one side edge than the other and communicating with the end edge of the bag and extending towards the spaced-apart seal line;

(b) a plurality of closely spaced-apart perforations in both side walls extending in a line from within close proximity of said cut to the closer side edge and forming a tear line for permitting a portion of the side walls, including a portion of the end edge of the bag, to be torn away from the bag in a progressive tearing motion to form a hole in the bag from which the contents can be poured without interference from a remaining portion of the end edge of the bag; and

(c) said perforated line having a first segment extending perpendicular to the end edge and parallel to the first and second side edges, and a second segment extending in a curved line convex towards the end edge, whereby said first and second segents cooperate when torn to define a predetermined size and shape of the pourer.

5,593,230

AIR BEARING

Michael C. Tempest, Dorset, United Kingdom, and Florin Dimofte, Fair View Park, Ohio, assignors to Westwind Air Bearings Limited, Dorset, United Kingdom

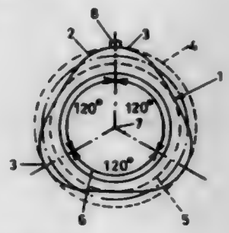
PCT No. PCT/GB94/01176, § 371 Date Nov. 27, 1995, § 102(e) Date Nov. 27, 1995, PCT Pub. No. WO94/28323, PCT Pub. Date Dec. 8, 1994

PCT Filed May 31, 1994, Ser. No. 545,776

Claims priority, application United Kingdom, Jun. 1, 1993, 9311231

Int. Cl.[6] F16C *32/06*

U.S. Cl. 384—100 **4 Claims**



1. An air bearing comprising

a non-circular bearing having a longitudinal bearing axis, and

a plain cylindrical horizontal shaft rotatably mounted in said bearing,

wherein said bearing surface, when developed into a flat plane, has a shallow sinusoidal wave form including at least three wave peaks, one of said peaks having a groove therein, extending longitudinally, parallel to said bearing axis.

5,593,231

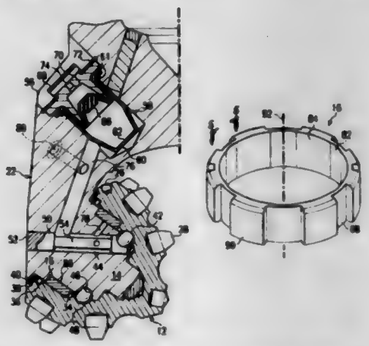
HYDRODYNAMIC BEARING

Rodolfo M. Ippolito, Colleyville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 17, 1995, Ser. No. 373,086

Int. Cl.[6] F16C *17/02;43/02;* **E21B** *10/24*

U.S. Cl. 384—114 **44 Claims**



1. A journal bearing for a rotating body, comprising:

a bearing body having an uninterrupted bearing surface, a longitudinal axis and an opening concentric with said axis for receiving a journal; and

means disposed in said bearing body for creating undulations in said uninterrupted bearing surface due to the compressive stresses acting on said bearing body when said bearing body is pressed into position for rotation such that said undulations provide pockets for collecting lubricant to produce a hydrodynamic film on said bearing surface.

20. A rotary cone drill bit for forming a bore hole, comprising:

a bit body having an upper portion adapted for connection to a drill string for rotation of said drill bit;

said bit body having a longitudinal axis corresponding approximately with the projected axis of rotation of said drill bit;

a number of support arms attached to said bit body and extending opposite from said upper portion, each of said support arms having an inside surface with a journal connected thereto, each journal projecting generally downwardly and inwardly with respect to its associated support arm;

each of said support arms having a longitudinal axis extending substantially parallel with the longitudinal axis of said bit body;

a number of cutter cone assemblies mounted respectively to one of said journals, each said cutter cone assembly comprising a beating recess;

a number of journal bearings with each of said journal bearings having a bearing body with a longitudinal axis, a plurality of grooves formed in an outer surface of said bearing body, and an uninterrupted inner bearing surface having undulations opposite the grooves formed due to the compressive stresses acting on said bearing body when the bearing body is pressed into the bearing recess of an associated cutter cone assembly, said undulations providing pockets for collecting lubricant to produce upon rotation a hydrodynamic film between said inner bearing surface and said journal.

5,593,232

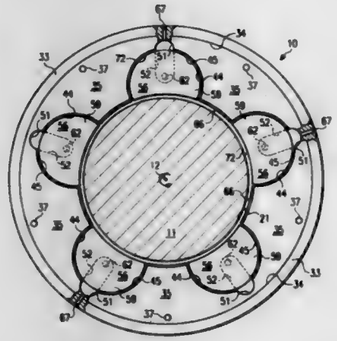
INTEGRAL PIVOT PAD BUSHING SEAL BEARING

Martin D. Maier, Olean, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Nov. 22, 1995, Ser. No. 562,037

Int. Cl.[6] F16C *32/06*

U.S. Cl. 384—119 **28 Claims**



1. An integral pivot pad bushing seal bearing adapted for providing sealing about and support of an adjacent portion of a rotatable shaft when the rotatable shaft is positioned coaxially therewith, said integral pivot pad bushing seal bearing comprising:

a carrier ring having a central longitudinal axis, a radially inner generally cylindrical surface, a radially outer surface, a first annular end wall, and a second annular end wall; said radially inner generally cylindrical surface having a diameter which is only slightly larger than a diameter of the adjacent portion of said rotatable shaft when said carrier ring is positioned coaxially with and about said rotatable shaft, so as to provide a sealing clearance therebetween;

said carrier ring having a plurality of longitudinally extending cavities formed therein with each of said cavities forming a respective opening in said radially inner generally cylindrical surface, each of said cavities being defined by an arcuate cavity wall and first and second cavity end walls;

a plurality of pivot pads, each pivot pad having a radially outer arcuate pad surface, a radially inner pad surface, and first and second pad ends; each of said pivot pads being positioned in a respective one of said plurality of cavities with its radially outer arcuate pad surface facing the arcuate cavity wall of the associated cavity, each said first pad end facing the first cavity end wall of the associated cavity, and each radially inner pad surface being substantially flush with the radially inner generally cylindrical surface of the carrier ring; each pivot pad being configured substantially the same as the associated cavity, the pivot pads having dimensions such that there is a slight clearance between each pivot pad and the associated arcuate cavity wall to allow creation of a fluid film in that clearance.

5,593,233

RADIALLY AND AXIALLY LOADABLE BUSH BEARING FOR CHASSIS PARTS IN MOTOR VEHICLES

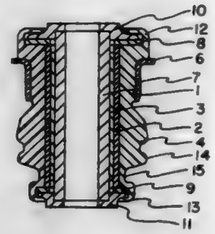
Helmut Kammel, Damme, and Jürgen Weitzmann, Neuenkirchen, both of Germany, assignors to Lemförder Metallwaren AG, Lemförder, Germany

Filed Jul. 27, 1995, Ser. No. 507,813

Claims priority, application Germany, Aug. 17, 1994, 44 29 102.7

Int. Cl.[6] F16C *27/06*

U.S. Cl. 384—222 **7 Claims**



1. A radially and axially loadable slide bush bearing for chassis parts in motor vehicles, including a first vehicle pan and a second vehicle part with a bearing eye portion, the slide bush bearing comprising:

an inner pipe rigidly mounted to the first vehicle part;

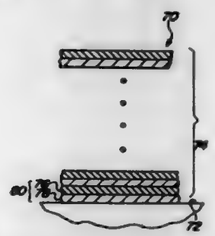
an outer bush arranged on said inner pipe, substantially without clearance between said outer bush and said inner pipe;

a first end thrust bearing disposed adjacent said inner pipe and said outer bush at a first axial end of said inner pipe;

a second end thrust bearing disposed adjacent said inner pipe and said outer bush at a second axial end of said inner pipe;

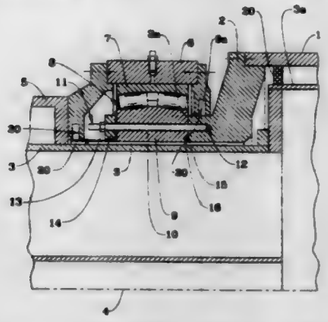
an elastomer body adhesively connected to said outer bush and surrounding said outer bush, said elastomer body being axially pressed into the bearing eye of the second vehicle chassis part, said elastomer body having a first axial end sealing lip and a second axial end sealing lip formed integrally therewith, said elastomer body extending axially over said thrust bearing and extending in the direction of a center of the bearing, said thrust bearings defining axial force transmission means including said first axial end sealing lips surrounding said first axial end thrust bearing, said second axial end sealing lips surrounding said second axial end thrust bearing, at least one of said two thrust bearings having a diameter which is smaller compared to a diameter of the bearing eye portion.

5,593,234
BEARING ASSEMBLY WITH POLYCRYSTALLINE SUPERLATTICE COATING
Mary-Jo A. Liston, Whitmore Lake, Mich., assignor to NTN Corporation, Osaka, Japan
Filed May 16, 1995, Ser. No. 442,301
Int. Cl.[6] F16C *33/32*
U.S. Cl. 384—492 **22 Claims**



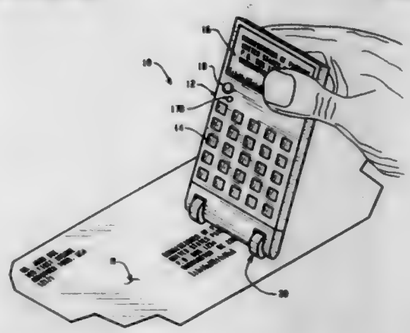
1. A rolling element bearing assembly comprising:
a first race having a first load supporting surface;
a second race disposed in a spaced relation with said first race, said second race having a second load supporting surface; and
a rolling element assembly disposed in contact with said first race and said second race and sized for rolling movement between said first load supporting surface of said first race and said second load supporting surface of said second race;
wherein at least one component selected from the group consisting of said first race, said second race and said rolling element assembly includes a coating located on at least a portion thereof;
said coating comprising a plurality of polycrystalline layers disposed in a repetitive sequence forming a superlattice structure, said sequence including at least two adjacently disposed layers of different composition;
said coating being operable to enhance the rolling contact fatigue life of said bearing assembly.

5,593,235
ARRANGEMENT FOR ROLLER BEARINGS
Sven Göthberg, and Hans Wendeberg, both of Fröluuda, Sweden, assignors to Aktiebolaget SKF, Gothenburg, Sweden
Filed Nov. 27, 1995, Ser. No. 562,799
Claims priority, application Sweden, Nov. 28, 1994, 9404151
Int. Cl.[6] F16C *43/00;35/06*
U.S. Cl. 384—542 **17 Claims**



1. An arrangement for supporting large radial loads about a relatively thin-walled tubular shaft, comprising a self aligning bearing positioned about the tubular shaft, the bearing including an outer race ring, an inner race ring and a plurality of rolling bodies provided between the inner and outer race rings, the inner race ring having a side face, the inner and outer race rings being connected to respective assembly elements, means for fitting said inner race ring with at least a portion of the side face of the inner race ring against a counter surface located in a substantially radial plane, said inner race ring being positioned without radially contacting the tubular shaft.

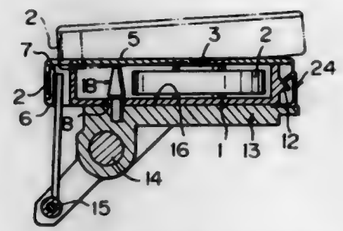
5,593,236
HAND-HELD SWEEP ELECTRONIC PRINTER WITH COMPENSATION FOR NON-LINEAR MOVEMENT
Howard H. Bobry, 18416 Olympic View Dr., Edmonds, Wash. 98020
Filed Nov. 6, 1995, Ser. No. 554,043
Int. Cl.[6] B41J *3/39*
U.S. Cl. 400—88 **43 Claims**



1. A hand-held and self contained electronic printing apparatus for printing indicia on a medium disposed outside the apparatus, comprising: a housing that can be manually positioned adjacent a surface of the medium and manually swept across a printing area on the medium during a printing sequence; a printer disposed in the housing and having a print head with a plurality of print elements for printing indicia in a selectable pattern of dots on the medium within the printing area; and electronic control means disposed in the housing for controlling the printer to print indicia on the medium during a printing sequence, said control means comprising compensation means for reducing printed indicia distortion caused by movement of said print head along a non-linear path during a printing sequence.

5,593,237
PRINTING APPARATUS AND INK RIBBON CASSETTE THEREFOR
Mineo Nozaki, Kawasaki; Osamu Asakura, Tokyo; Yoshio Uchikata, Kawasaki, and Masasumi Nagashima, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 8,829, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 384,068, Jul. 24, 1989, abandoned, which is a continuation of Ser. No. 228,766, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 935,082, Nov. 24, 1986, abandoned, which is a continuation of Ser. No. 667,363, Nov. 1, 1984, abandoned. This application May 23, 1995, Ser. No. 447,424
Claims priority, application Japan, Nov. 7, 1983, 58-207576; Nov. 7, 1983, 58-207577; Nov. 7, 1983, 58-207578; Nov. 7, 1983, 58-207579
Int. Cl.[6] B41J *32/00;35/28*
U.S. Cl. 400—208 **12 Claims**

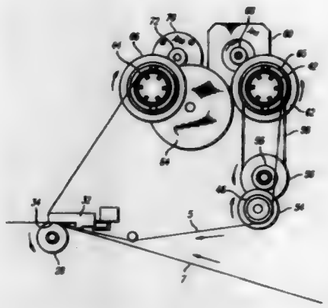
1. A cassette member in combination with a mounting mechanism provided in a recording apparatus, comprising:
a mounting mechanism having a mounting surface for detachably receiving a cassette member, said mounting mechanism including an elastic engaging member and first and second positioning members projecting from said mounting surface;



a cassette member having a box-like shape in which a bottom surface and an upper surface are connected with a side wall, said side wall including a first side wall which is opposed to a recording medium of the recording apparatus in a state that said cassette member is mounted on the recording apparatus, and a second side wall opposed to said first side wall;
an engaging section formed at substantially a center of an outer surface of said second side wall for engaging with said elastic engaging member of said mounting mechanism, with said engaging section having a projection with a first inclined surface being substantially flat along its entire length and a second inclined surface inclined with respect to a plane parallel to said bottom surface of said cassette member, said first inclined surface receiving a force having a first force component for stabilizing said cassette member in a direction transverse to the mounting surface and a second force component stabilizing said cassette member in a direction parallel to the mounting surface;
a first fitting section fittable with said first positioning member of said mounting mechanism projecting from said mounting surface proximate to a first end of said first side wall, said first positioning member having a member with a sloped portion sloping upward and going away from said first side wall, said first fitting section converting part of a biasing force by said elastic engaging member toward said first side wall to a pressing force for pressing said bottom surface proximate to said first side wall against said mounting surface, said first fitting section having an edge portion for limiting movement of said cassette member to the recording medium when said fitting section engages with the sloped portion of said first positioning member; and
a second fitting section for limiting movement of said cassette member in a direction transverse to said first and second side walls and positioning said cassette member in a plane parallel to said bottom surface and transverse to the first force component by said elastic engaging member toward the recording medium in cooperation with said first fitting section when said second fitting section engages with said second positioning member of said mounting mechanism which projects from said mounting surface proximate to a second end of said first side wall.
wherein when said cassette is mounted on said mounting surface of said mounting mechanism, said elastic engaging member applies a first positioning force that is utilized as a positioning force for pressing said bottom surface to said mounting surface and a second positioning force for positioning said cassette member in a plane parallel to said bottom surface.

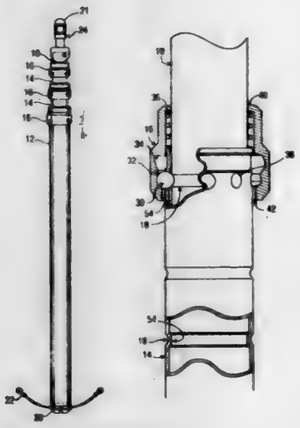
5,593,238
METHOD AND APPARATUS FOR CONTROLLING TRANSPORT OF THERMAL TRANSFER RIBBON
Duane M. Fox, Snohomish, and Joel Schoen, Woodinville, both of Wash., assignors to Intermec Corporation, Everett, Wash.
Filed Aug. 22, 1994, Ser. No. 294,082
Int. Cl.[6] B41J *33/52*
U.S. Cl. 400—234 **9 Claims**

1. An apparatus for use in a thermal printer for printing information onto a paper substrate material, comprising:



a platen;
a thermal head disposed adjacent the platen having a region defined therebetween through which said paper substrate material is transported at a first step rate;
means for transporting an ink ribbon to said region so that ink from said ink ribbon can be transferred onto said paper substrate by operation of said thermal head to print said information, said means transporting said ribbon to said region at a second step rate that is substantially less than said first step rate, wherein said transporting means further comprises:
a supply hub carrying a supply of said ribbon;
a first motor mechanically linked to said supply hub, the first motor rotating said hub in a direction opposite to advancement of the ribbon at said second step rate;
a roller mechanically linked to said first motor and having a surface engaging said ribbon, said roller surface having a friction coefficient sufficient to prevent slippage of said ribbon;
a second motor applying a tension on said ribbon; and
a clutch interposed between said first motor and said supply hub, said clutch permitting slippage of said supply hub to permit advancement of said ribbon at said second step rate.

5,593,239
EXTENDABLE SUPPORT POLE
Bradley T. Sallee, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.
Filed Apr. 28, 1994, Ser. No. 234,147
Int. Cl.[6] F16B *7/14*
U.S. Cl. 403—109 **17 Claims**



1. A telescoping pole comprising:

a bottom tube having a locking collar whose bottom end encloses the bottom tube in a slidable and rotatable relation and is slotted to permit contamination to fall out of the collar, the collar having a circumferential locking groove and a circumferential release groove; and

a top tube slidably disposed within the bottom tube in a telescoping manner, the top tube having at least one circumferential groove, the top tube being operably moveable between a retracted position wherein it is substantially contained within the outer tube, and an extended position wherein the top tube is locked in position extended from the bottom tube.

5,593,240

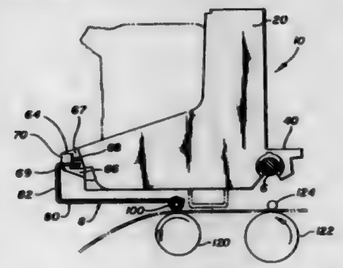
CARRIAGE SUPPORT SYSTEM FOR COMPUTER DRIVEN PRINTER

Damon Broder; Abdolreza Movaghar, both of San Diego, and W. Wistar Rhoads, Escondido, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 321,637, Oct. 11, 1994, abandoned, which is a continuation of Ser. No. 56,639, Apr. 30, 1993, Pat. No. 5,368,403. This application Mar. 14, 1996, Ser. No. 615,747

Int. Cl.[6] B41J *11/22*

U.S. Cl. 400—352 **11 Claims**



1. A carriage support system for a computer driven inkjet printer having a moveable print head carriage having a print head receptacle with an aperture therein for receiving a nozzle portion of a print head cartridge forgetting ink downwardly onto a print medium; said support system comprising: a chassis; a horizontally extending slider rod; and a horizontally extending slider bar parallel to and spaced from said slider rod, said slider rod and said slider bar each being affixed to said chassis, said slider bar having a carriage support surface, said slider rod being engageable with a distal side of said carriage and said slider bar being engageable with a proximal side of the carriage such that said carriage is suspended above and substantially between said slider rod and said slider bar with most of the weight of the carriage on said slider rod and with the print head receptacle being positioned between said slider rod and said slider bar whereby a nozzle portion of a print head cartridge is supported slightly above a print medium to be printed.

5,593,241

RELEASING SHEET

Takashi Kawaguchi, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 18, 1995, Ser. No. 529,442

Claims priority, application Japan, Oct. 3, 1994, 6-238923

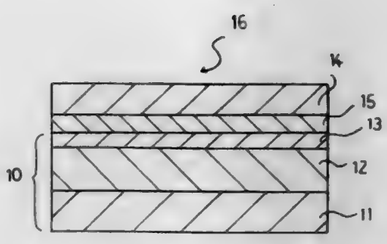
Int. Cl.[6] B41J *15/06*

U.S. Cl. 400—613 **20 Claims**

1. A tape cassette for holding an elongated recording medium, comprising:

a cassette shell;

a spool that is rotatably mounted on the cassette shell; and



an elongated recording medium that is wound around the spool, the elongated recording medium comprising:

a recording layer,

an adhesive layer formed on at least one side of the recording layer, and

a releasing sheet that is releasably adhered to the adhesive layer, the releasing sheet comprising:

a backing layer that includes an electrically conductive material and has a surface electrical resistance of less than approximately $1.0\times10^{12}\Omega$; and

a separation layer formed over said backing layer, the separation layer being capable of releasably adhering to an adhesive layer.

5,593,242

FILING OF SHEETS OF PAPER

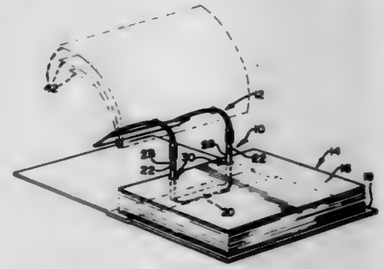
Claudia B. Mathias, Frauenfeld, Switzerland, assignor to Kemtek SA, Zollikon, Switzerland

Filed Sep. 14, 1994, Ser. No. 306,107

Claims priority, application South Africa, Sep. 15, 1993, 93/6804

Int. Cl.[6] B42F *13/10;13/42*

U.S. Cl. 402—7 **11 Claims**



1. A combination of a filing strip and a filing accessory in which the filing strip is of a bendable material and comprises a central elongate anchor strip and a substantially flat prong extending from each end of the strip, each prong having a width substantially greater than its thickness and having a tip portion and an intermediate portion, with each tip portion being substantially flat and being narrower than its adjacent intermediate portion and having a substantially constant width, and

each prong being stepped to define the narrowed tip portion and a pair of shoulders at the transition from each tip portion to its adjacent intermediate portion, and in which the filing accessory has a pair of elongate members and a socket-defining element, which defines a socket, arranged on an end of each member, each socket having a substantially rectangular, internal transverse profile with internal dimensions complementary to the tip portion of the prong, and each element having a substantially rectangular external transverse profile at its free end which has a width substantially equal to that of the intermediate portion of the prong, the tip portion being entirely receivable in the socket with the socket defining element engaging the shoulders of the prong, the intermediate portion of the prong having longitudinal edges the longitudinal edges of the intermediate portion and the longitudinal edges of the socket-defining element being substantially collinear when the tip portion is entirely received within the socket such that a smooth transition is provided from the intermediate portion of the filing strip to the socket-defining element.

5,593,243

BINDER

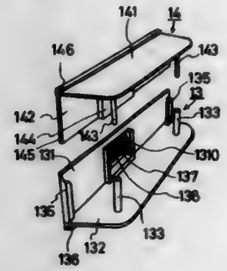
Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed May 12, 1995, Ser. No. 439,890

Claims priority, application Japan, May 20, 1994, 6-131024; Jul. 12, 1994, 6-182960

Int. Cl.[6] B42F *3/02*

U.S. Cl. 402—52 **5 Claims**



1. A binder to bind papers between a paper supporting plate and a paper holding plate by inserting paper binding cylinders into holes within said papers, comprising:

said paper binding cylinders,

a rear plate joined at about a 90° angle to an edge of said paper supporting plate,

a rack forming plate joined at about a 90° angle to an edge of said paper holding plate, said rack forming plate having an external surface opposing and overlapping an internal surface of said rear plate,

guide portions provided along both side edges of said internal surface of the rear plate for guiding both side edges of the rack forming plate and allowing a vertical and parallel movement of the rack forming plate against the rear plate,

saw-toothed rack teeth provided on the external surface of said rack forming plate opposing the internal surface of the rear plate,

a click member rotatably mounted on the rear plate, having a click pawl for selectively engaging with said rack teeth to prevent the rack forming plate from moving upward, and

a spring means provided on said click member to bias said click pawl resiliently against the rack teeth.

5,593,244

BACKREST LOCK

Edvard Rückert, Velbert, Germany, assignor to Ewald Witte GmbH & Co. KG, Velbert, Germany

Filed Aug. 8, 1994, Ser. No. 287,168

Claims priority, application Germany, Sep. 2, 1993, 43 29 634.3

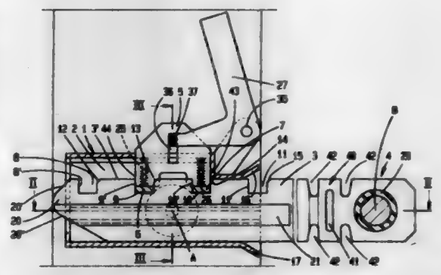
Int. Cl.[6] B60N *2/20*

U.S. Cl. 403—322 **21 Claims**

1. A locking device suitable for orienting a backrest relative to a body part of a seat, the locking device comprising;

a closure part formed as a notched strap, a latch member having an insertion pocket for receiving the strap, and a detent element comprising a latch head, the the detent element being displaceable substantially transverse to a direction of insertion of the strap into the pocket for engagement of the latch head with notching of the strap; and

fastening means for fastening said latch member and said closure part between the backrest and the body part, said fastening means having rubber members located at interfaces of the locking device with the backrest and the body part.



5,593,245

PUSH-FIT CONNECTING JOINT

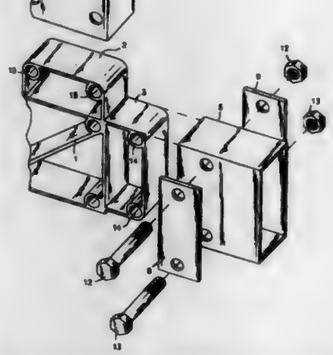
Erich Herz, Singen, and Heiko Habich, Rheinfelderstr, both of Germany, assignors to Alusuisse Technology & Management Ltd., Switzerland

Filed Nov. 15, 1994, Ser. No. 340,861

Claims priority, application Switzerland, Dec. 14, 1993, 3726/93

Int. Cl.[6] F16B *7/18;* **B62D** *27/02*

U.S. Cl. 403—403 **20 Claims**



1. Push-fit connecting joint comprising a node and at least one hollow section, wherein said node and hollow section are of aluminum or aluminum alloys, said node including at least one attachment part, wherein the attachment part fits within the hollow section and the attachment part including at least one opening to accommodate at least one connecting element, and the hollow section having an outside and including at least one hollow chamber and at least one opening for the connecting element, wherein openings in the attachment part are aligned with openings in the hollow section, and wherein openings in the hollow section are oversized with respect to the corresponding openings in the attachment part to permit adjustment of the hollow section with respect to the attachment part and the hollow section openings on the

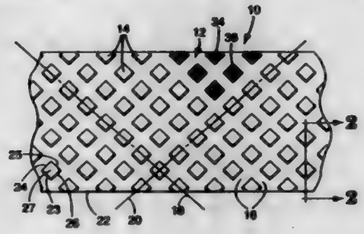
outside of the hollow section are covered over by a cover sheet, the cover sheet for each connecting element including an opening of the dimensions of the opening in the attachment part, with the cover sheet opening aligned with an opening in the hollow section, and an adhesive is provided between the cover sheet and the hollow section.

5,593,246

PATTERNED CHALK-RESISTANT PAVEMENT MARKING AND METHOD OF MAKING

Thomas P. Hedblom, Eagan, Minn.; Kathleen A. Hachey, Hudson, Wis., and Robert L. Keech, White Bear Lake, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 26, 1994, Ser. No. 296,677
Int. Cl.[6] E01F 9/00
U.S. Cl. 404—9 **27 Claims**



23. A method of making a patterned pavement marking, which comprises:

(a) providing a base sheet that contains rubber and fillers, the base sheet having a first major surface that has protuberances disposed thereon which are separated by valleys;

(b) forming a barrier layer suitable for preventing chalking of the base sheet at least on the valleys of the base sheet;

(c) applying a bonding material selectively to the protuberances so as to be substantially absent from the valleys; and

(d) embedding optical elements in the bonding material.

24. A pavement marking, which comprises:

(a) a base sheet having first and second major surfaces, the first major surface having a plurality of protuberances located thereon, the protuberances being separated by valleys, and the base sheet being comprised of a robber and fillers;

(b) a barrier layer suitable for preventing chalking of the base sheet disposed on the first major surface of the base sheet in the valleys and over the protuberances, the barrier layer containing UV stabilizers, colored pigments, or a combination thereof,

(c) a layer of bonding material disposed selectively on the protuberances so as to be substantially absent from the valleys; and

(d) a plurality of optical elements secured to the protuberances of the base sheet by the bonding material and being substantially absent from the valleys.

5,593,247

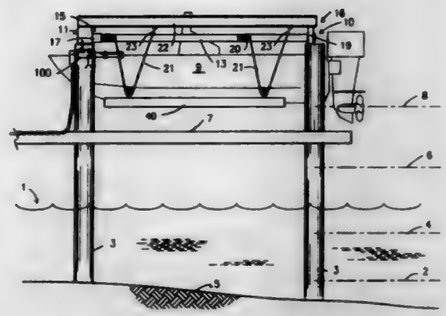
PROGRAMMABLE BOAT LIFT CONTROL SYSTEM

James A. Endres, Clearwater; Francis J. DiRenzi, Palm Harbor, and Gideon Hecht, Seminole, all of Fla., assignors to Endcor Inc., Clearwater, Fla.

Filed Sep. 7, 1995, Ser. No. 524,868
Int. Cl.[6] E02C 5/00; B63B 21/00;23/40
U.S. Cl. 405—3 **18 Claims**

1. In a boat lifting system including a device for supporting a boat, lifting and lowering means for listing and lowering said device including a motor and a control therefor, the improvement comprising:

(a) button means for inputting "up" and "down" commands to said control;



(b) said control including programmable means for programmably controlling operation of said motor responsive to signals received from said button means to lift or lower said device a preselected distance to a preselected elevation and causing said motor to deactivate when said device arrives at said preselected elevation; and

(c) said control further including timer means for timing duration of motor operation, said timer means providing timer signals indicative of a time period of motor operation to said programmable means whereby said preselected elevation may be set through deactivation of said motor when said time period has elapsed.

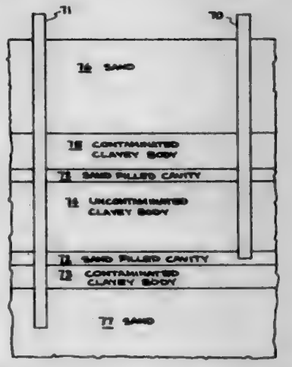
3. The system of claim **1**, wherein said button means is on a remote control device which may transmit wireless signals to be received by said control.

5,593,248

NONTOXIC CHEMICAL PROCESS FOR IN SITU PERMEABILITY ENHANCEMENT AND ACCELERATED DECONTAMINATION OF FINE-GRAIN SUBSURFACE SEDIMENTS

Edward J. Kanna, Livermore; Ananda M. Wijesinghe, Tracy, and Brian E. Viani, Oakland, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 27, 1995, Ser. No. 495,294
Int. Cl.[6] B09C 1/08; E02D 3/10; E21B 43/40
U.S. Cl. 405—128 **20 Claims**



1. A nontoxic chemical permeability in situ enhancement process for accelerating decontamination of subsurface fine-grain sediments (FGS), comprising:

flooding a contaminated region of the subsurface with a flooding solution comprising nontoxic, water soluble chemicals that increase the hydraulic conductivity of said FGS; and

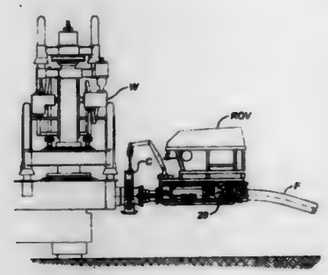
extracting to the surface said flooding solution containing mobilized contaminants.

5,593,249

DIVERLESS FLOWLINE CONNECTION SYSTEM

David S. Cox, Hilarys Wa, and Stephen M. Gates, Gooseberry Hill Wa, both of Australia, assignors to Sonsub, Inc., Houston, Tex.

Filed May 2, 1995, Ser. No. 433,240
Int. Cl.[6] F16L 1/12
U.S. Cl. 405—191 **16 Claims**



1. A diverless flowline connection system for connection to a remotely operated vehicle, the diverless flowline connection system for connecting a flowline to a subsea wellhead at a subsea structure, the diverless flowline connection system comprising:

a frame assembly;

means for clamping said frame assembly to the subsea structure or flowline; and

means for releasing said clamping means from the subsea structure or the flowline in the event of hydraulic system failure.

5,593,250

HYJACK PLATFORM WITH BUOYANT RIG SUPPLEMENTAL SUPPORT

Mark A. Smith, Houston, Tex.; Dale M. Gallaher, Metairie, and George E. Sgouros, New Orleans, both of La., assignors to Shell Offshore Inc., New Orleans, La.

Filed Dec. 23, 1994, Ser. No. 370,764
Int. Cl.[6] E02B 17/00
U.S. Cl. 405—205 **11 Claims**



3. An offshore platform structure for temporarily using a jack-up rig for well operations in deepwater applications, comprising:

a bottom founded jacket base;

a surface tower supported by the jacket base and extending above the ocean surface;

a platform deck supported by the surface tower;

a subsea rig support interface presented at the top of the jacket base and adapted to support the jack-up rig for well operations; and

at least one selectively ballastable rig support buoyancy tank connected to the rig support interface for providing temporary support to substantially offset the load of the jack-up rig when it is installed for drilling operations.

5,593,251

METHOD OF INSTALLING A COMPOSITE TIMBER AND CONCRETE PILE

Gerard Gillen, Harvey, La., assignor to Gillen Pile Driving, Inc., Harvey, La.

Filed Dec. 17, 1993, Ser. No. 168,424
Int. Cl.[6] E02D 5/26
U.S. Cl. 405—250 **4 Claims**



1. A method of installing a composite timber and concrete piling system at a job site comprising the steps of:

a) partially filling a vertically extending metallic cylindrical tube with concrete, wherein the concrete extends to the lower end of the tube and wherein the concrete approaches but does not reach the upper end of the tube to define an unfilled portion, the unfilled portion forming a connector portion;

b) allowing the concrete to set over an extended period of time prior to use at the job site;

c) field driving a timber pile member into the earth at the job site at a selected position and a partial distance which leaves a small portion of the timber pile exposed above ground;

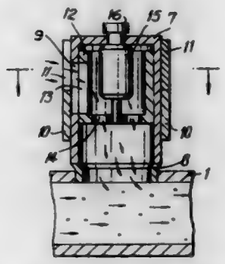
d) inverting the tube after the concrete has set;

e) placing the inverted metallic tube on the exposed portion of the timber pile at the job site;

f) forcing the metallic, concrete filled tube downward until the unfilled portion is imbedded into the exposed portion of the timber pile, and wherein the concrete in the tube approaches the top of the timber pile; and

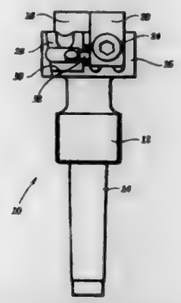
g) driving the metallic tube to force the assembly of the metallic tube and timber pile into the earth.

5,593,252
METHOD OF AND DEVICE FOR SUCTION TRANSPORTING
Arkadi Reiin, 12 Woodbridge Pl., Langhorne, Pa. 19053, and Anatole Milstein, 3 Covered Bridge Path, Philadelphia, Pa. 19115
PCT No. PCT/US93/03385, § 371 Date Jan. 3, 1995, § 102(e) Date Jan. 3, 1995, PCT Pub. No. WO93/22228, PCT Pub. Date Nov. 11, 1993
Continuation of Ser. No. 874,122, Apr. 24, 1992, Pat. No. 5,201,877. This PCT application Apr. 12, 1993, Ser. No. 325,202
Int. Cl.[6] B65G *53/66*
U.S. Cl. 406—85 **10 Claims**



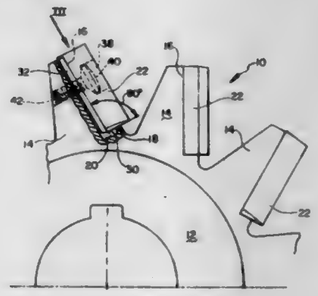
1. A method of suction transporting, comprising the steps of applying a suction to a transporting line by suction means so that a material is transported through the transporting line from an inlet thereof to an outlet thereof; and modulating a suction force of the suction produced in the transporting line by communicating an interior of the transporting line with atmosphere through a passage, and periodically changing an area and a shape of the passage during the transporting by power drive.

5,593,253
ROUTER BIT WITH INTERCHANGEABLE KNIVES
Gianfranco Pozzo, Via Padova 3, 33010 Feletto U., Italy
Filed Jan. 26, 1995, Ser. No. 379,394
Int. Cl.[6] B26D *1/12*
U.S. Cl. 407—36 **3 Claims**



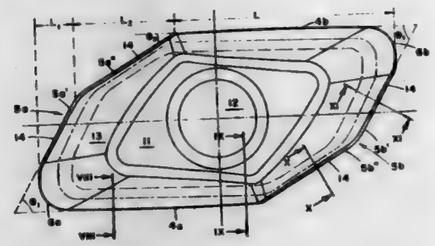
1. A router bit for attachment to a rotating machine for cutting predetermine configurations in a workpiece comprising:
generally longitudinally extending body portion;
means for mounting aid bit to a rotating machine formed at a first end of said body portion;
a knife support head for removably attaching a plurality of knives thereto and including at least two generally longitudinally extending recessed opposed knife guide surfaces which are inclined and formed in a converging relationship toward said second end portion, a knife support Shoulder formed adjacent each of said recessed knife guide surfaces for positioning and supporting a knife, and a threaded bore in each of said recessed guide surfaces;
a plurality of knives for mounting to said knife support head, each of said knives including a generally elongate slot formed therein and oriented generally longitudinally with respect to said body portion, each of said knives being mounted to the knife support head by screws extending through said slot for threaded receipt in said threaded bore of said knife support head with said knives being generally longitudinally adjustable along said knife support head to an extent according to the length of said slot.

5,593,254
GENERATING MILLING CUTTER
Walter Peters, Hohnstorf, Germany, assignor to Wilhelm Fette GmbH, Schwarzenbek, Germany
Filed Sep. 2, 1994, Ser. No. 300,323
Claims priority, application Germany, Sep. 9, 1993, 43 30 484.2
Int. Cl.[6] B23C *5/20*
U.S. Cl. 407—48 **6 Claims**



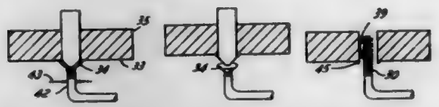
1. A hobbing cutter comprising a support body having a plurality of outwardly extending supporting teeth circumferentially and selectively, axially spaced, the support teeth having an inward portion, a radially extending first seating surface having a groove and a second seating surface at the inward portion of the support teeth, said support teeth extending substantially perpendicularly to said second seating surface, said first and said second seating surfaces being adapted to accommodate cutting inserts having lateral cutting edges on opposite sides and which converge radially outwards, said cutting inserts being of heavy duty material adapted to be mounted on the support teeth, said cutting inserts having a rearward first contact surface and a lower second contact surface engaging said first and said second seating surfaces, respectively, said cutting inserts being ground on said supporting teeth and each associated with a corresponding tooth, the cutting inserts further having a key on the rear side having a third contact surface which extends transversely to said first and said second contact surfaces and cooperates with the groove formed in said first seating surface, the interengagement of said key and said groove being substantially backlash-free, and said cutting inserts being adapted to be removably fixed to the supporting teeth by a clamping means, the clamping means including a threaded bolt cooperating with a threaded bore of said supporting teeth such that said first and said second contact surfaces are urged against said first and said second seating surfaces, respectively, and said third contact surface is urged against the wall of said groove in said support tooth.

5,593,255
CUTTING INSERT FOR A ROTARY MILLING CUTTER
Amir Satran, Kfar Vradim, and Rafael Marguliz, Karmiel, both of Israel, assignors to Iscar Ltd., Migdal Tefen, Israel
Filed Aug. 11, 1995, Ser. No. 514,047
Claims priority, application Israel, Aug. 25, 1994, 110785
Int. Cl.[6] B23C *5/22;5/10*
U.S. Cl. 407—113 **13 Claims**



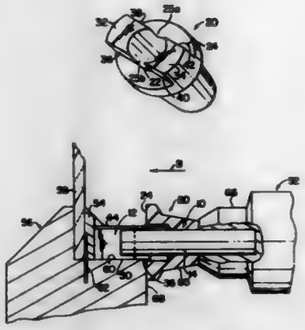
1. A cutting insert for a rotary cutter tool having a rotary axis, said insert being of substantially parallelepipedal shape, having a pair of opposite, parallel, major cutting edges of length L and a pair of opposite subsidiary cutting edges, each subsidiary cutting edge being transversely directed with respect to the major cutting edges and comprising at least two successive, angularly disposed, component subsidiary cutting edges, a first component cutting edge of each subsidiary cutting edge merging, via a rounded nose portion, with an adjacent end of a major cutting edge and defining therewith an angle Θ_1 lying between 50°–70°, a further component cutting edge of each subsidiary cutting edge merging with an adjacent end of an opposite major cutting edge and defining therewith an angle Θ_2 lying between 20°–40°; the total projected length of the component subsidiary cutting edges of each subsidiary cutting edge being approximately 0.6 L, wherein the insert is further adapted to be seated on said tool such that the projected length of each subsidiary cutting edge on an adjacent major cutting edge of the insert defines, during a cutting operation, the maximal penetration depth of the tool in the direction along the rotary axis.

5,593,256
ELIMINATING HINGED DRILL CAPS
Charles R. Bielak, Plymouth, and Richard J. Furness, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 5, 1995, Ser. No. 498,208
Int. Cl.[6] B23B *35/00*
U.S. Cl. 408—1 R **7 Claims**



1. A method of through-hole drilling of metal workpieces having sufficient ductility to create hinged drill caps, comprising: while carrying out through-drilling with low thrust drill tips, directing a fluid jet stream against the drill exit side of the workpiece with sufficient force to retain the cap closed against the exit side of the workpiece until the cap is completely annularly severed from the workpiece, said jet stream being oriented to be substantially coincident with the revolving axis of the drill.

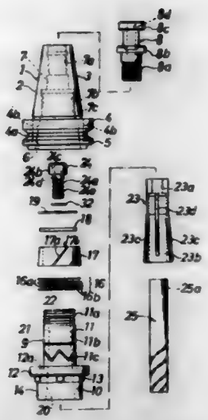
5,593,257
APPARATUS FOR REMOVING HARDENED SUBSTANCES
Richard W. Fuchs, 17 Deerfield Ln., Simsbury, Conn. 06070
Filed Nov. 4, 1994, Ser. No. 334,278
Int. Cl.[6] B27C *1/00*
U.S. Cl. 409—218 **5 Claims**



1. An apparatus for connection to and use with a hand held powered rotary drive means for removing hardened putty from a window sash having a front surface and a putty holding surface extending rearwardly from and perpendicular to said front surface and holding a putty strip, said apparatus comprising:
a rotary cutter member having a longitudinal axis and including a cutting blade and a shank to be connected to and rotated about said longitudinal axis by said rotary drive means; and
a sleeve member including an axial bore, said shank of said cutter member being rotatably received in said bore and said sleeve member extending axially along a portion of said cutting blade, said sleeve member having a substantially flat front face perpendicular to said longitudinal axis of said cutter member to engage said front surface of a window sash to accurately position the rotary cutter member forwardly with respect to said front surface, said sleeve member further having at least one substantially flat guide ledge extending forwardly from said front face to engage said putty holding surface or said putty strip to position said cutting blade relative to said putty holding surface in a direction perpendicular to said putty holding surface,
said cutting blade having at least one straight cutting edge extending parallel to and spaced radially from said longitudinal axis so as to trace a cylindrical path as said cutter member is rotated about said longitudinal axis, and said at least one guide ledge extending from the front face of the sleeve member is a composite ledge made up of a first pair of two separate aligned ledges located in a first common plane perpendicular to said front face and which two separate aligned ledges are spaced from one another by a gap and are so positioned relative to said longitudinal axis that a part of said cylindrical path of said cutting edge is located within said gap and another part of said cylindrical path of said cutting edge protrudes from said gap through and beyond said first common plane of said first pair of aligned ledges.

5,593,258
TOOL HOLDER
Masakazu Matsumoto; Masahiro Taguchi, and Yusuke Yamamoto, all of Osaka, Japan, assignors to Nikken Kosakusho Works Ltd., Osaka-fu, Japan
Filed Oct. 3, 1995, Ser. No. 538,737
Claims priority, application Japan, Oct. 25, 1994, 6-260615
Int. Cl.[6] B23C *5/26; B23B 31/20;31/117*
U.S. Cl. 409—234 **15 Claims**

1. A tool holder comprising:



a main sleeve having a tapered shank which is to be inserted into a tapered bore of a spindle of a machine tool, a flange provided at the forward end of said tapered shank and having a diameter larger than that of said tapered shank, and a tapered hole formed in the forward end surface of said main sleeve and having a taper angle smaller than that of said tapered shank;

a subholder comprising a subholder body having a shank portion and a flange portion provided at the forward end of said shank portion, a tapered sleeve which is elastically deformable in the radial direction and is fitted onto the outer circumferential surface of said shank portion of the subholder body in an axially movable manner, and an elastic member disposed between said tapered sleeve and said flange portion of said subholder body, said elastic member comprising a plurality of alternating compressible and incompressible rings; and

a clamping means for drawing said subholder toward the rear end of said main sleeve, so that the rear end surface of said flange portion of said subholder body intimately contacts the forward end surface of said main sleeve and the outer circumferential surface of said tapered sleeve intimately contacts the circumferential surface of said tapered hole of said main sleeve, thereby removably coupling said subholder with said main sleeve.

5,593,259

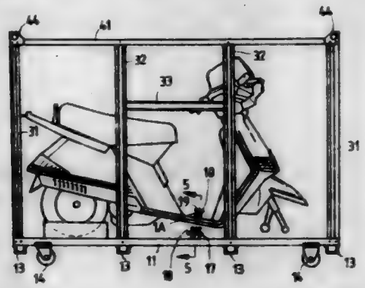
MOTOR SCOOTER PACKAGING CASE

Hui-Kuei Kuo, Kaohsiung, Taiwan, assignor to Shin Yowu Industry Co., Ltd., Kaohsiung, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,228

Int. Cl.[6] B60P *7/06*

U.S. Cl. 410—3 **8 Claims**



1. A motor scooter packaging case comprising:

a rectangular base frame having four side portions each having a first longitudinal recess open at a top;

a rectangular upper frame having four side portions each having a second longitudinal recess open at a bottom;

a rectangular front side frame having a lower end fitted within one said first longitudinal recess of said rectangular base frame and one said second longitudinal recess of said rectangular upper frame;

a rectangular rear side frame having a lower end fitted within a second one of said first longitudinal recesses of said rectangular base frame and a second one of said second longitudinal recesses of said rectangular upper frame;

a rectangular left side frame having a lower end fitted with a third one of said first longitudinal recesses of said rectangular base frame and a third one of said second longitudinal recesses of said rectangular upper frame;

a rectangnular right side frame having a lower end fitted within a fourth one of said first longitudinal recesses of said rectangular base frame and a fourth one of said second longitudinal recesses of said rectangular upper frame; and

two reinforcing bars secured on said rectangular base frame;

two U-shaped members each arranged on one of said two reinforcing bars;

a cross bar mounted on said rectangular base frame and located across said two reinforcing bars; and

a fixing rod provided at both ends with a hook adapted engaged with said cross bar.

5,593,260

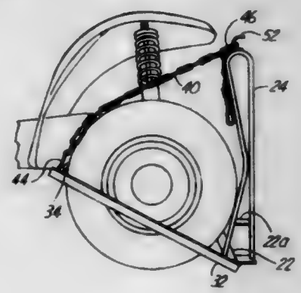
APPARATUS FOR SECURING A VEHICLE TO A TRAILER

Casey Zimmerman, 22818 Xenon St. NW., Elk River, Minn. 55330

Filed Mar. 20, 1995, Ser. No. 405,742

Int. Cl.[6] B60P *3/075*

U.S. Cl. 410—20 **13 Claims**



1. An apparatus for securing a vehicle to a trailer, the apparatus comprising:

a cylindrical sleeve member capable of being fastened to the trailer;

a first wheel stop bar connected substantially perpendicular to the cylindrical sleeve member;

a second wheel stop bar connected substantially perpendicular to the cylindrical sleeve member;

a lift bar having a body, a first arm, a first finger, a second arm and second finger, the body positioned substantially within the cylindrical sleeve member for rotational movement about an axis within the cylindrical sleeve member;

first securing means connected to the first finger of the lift bar and connected to the first wheel stop bar for securing a first wheel of the vehicle to the trailer, wherein the first arm prevents lateral movement of the vehicle in a first direction; and

second securing means connected to the second finger of the lift bar and connected to the second wheel stop bar for securing a second wheel of the vehicle to the trailer, wherein the second arm prevents lateral movement of the vehicle in a second direction, opposite of the first direction.

5,593,261

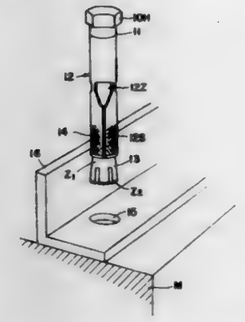
FAIL-SAFE ANCHOR BOLT ASSEMBLY FOR CRACKED MASONRY

Anthony C. Giannuzzi, and Louis N. Giannuzzi, both of 59 Dingletown Rd., Greenwich, Conn. 06830

Filed Feb. 21, 1995, Ser. No. 391,777

Int. Cl.[6] F16B *13/04;13/06*

U.S. Cl. 411—55 **12 Claims**



1. A fail-safe anchor bolt assembly installable in a hole drilled in masonry subject to cracking to fasten an object thereto, said assembly comprising a bolt turnable by a torque tool having a head and a shank extending therefrom, an expansible shell surrounding the shank, and a wedge nut threadably received on the shank and adapted when the bolt is turned to enter into and expand the shell outwardly against the wall of the hole, said wedge nut having a generally conical frustrum shape defining a leading end followed by a leading portion which merges with a compressible trailing portion terminating in a trailing end, said shape being characterized by a substantially uninterrupted transition in diameter which increases progressively from the leading end to the trailing end, said leading portion having a maximum diameter close to the diameter of the drilled hole, said compressible trailing portion having a normal maximum diameter greater than the diameter of the drilled hole whereby:

(a) when the assembly is driven into the drilled hole, the trailing portion of the wedge nut is then compressed to permit entry therein and to prevent its rotation so that as the bolt is turned by the tool, the non-rotating wedge nut advances axially on the shank to cause the leading portion to enter into and expand the shell outwardly against the wall of the hole to produce an anchoring force to fasten the object to the masonry; and

(b) should the masonry thereafter develop a crack resulting in enlargement of the drilled hole, the fastened object loading the assembly will then move the trailing portion of the wedge into the shell to further expand it outwardly against the wall of the enlarged hole, this movement of the wedge nut causing a non-interrupted and continuous expansion of the shell as the wedge nut advances into the shell, thereby avoiding an uncontrolled slip of the wedge nut and maintaining the anchoring force fastening the object to the masonry.

5,593,262

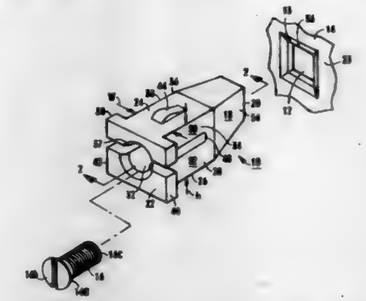
REMOVABLE PLASTIC BOSS FOR AUTOMOBILE INSTRUMENT PANEL

Dale G. Gedeon, Sterling Heights; Mark B. Schatz, Metamora; Robert J. Stephens, and Shawn E. Roberts, both of Clarkston, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed May 25, 1995, Ser. No. 450,328

Int. Cl.[6] F16B *13/06;37/04*

U.S. Cl. 411—182 **6 Claims**



1. A removable plastic boss snappingly engageable with a receptacle defining a periphery in an instrument panel of an automobile, comprising:

a body defining a back end advanceable into the instrument panel, a front end opposed to the back end, and top, bottom, left, and right sides extending therebetween, the body being formed with a cylindrical bore from the front end to the back end for receiving a threaded fastener therein to thereby hold an instrument or molding against the instrument panel, the body including:

a parallelepiped-shaped front portion extending from the front end to a break point substantially midway between the front and back ends;

a flat seating flange formed on the front portion at the front end, the flange including left and right ears respectively protruding outwardly from the left and right sides;

top and bottom ramp-shaped engagement abutments formed on the front portion on the top and bottom sides thereof, respectively, each engagement abutment including a respective rearwardly-oriented gently sloped surface and a respective frontwardly-oriented steeply sloped surface seamlessly joining with the rearwardly-oriented gently sloped surface at a respective gently arcuate apex;

a slit formed in the front portion from the front end to the break point, the slit extending transversely through the front portion from the left side to the right side to establish top and bottom halves of the front portion, such that the front portion is materially biased to an engaged configuration, wherein the top and bottom halves are distanced from each other, and such that the front portion is deformable to an advancement configuration, wherein the top and the bottom halves are urged towards each other.

5,593,263

SNAP-IN FASTENER

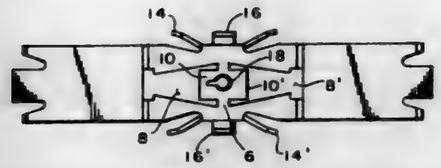
James P. Clinch, Farmington Hills, Mich., and Michael Danby, Stoney Creek, Canada, assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 9, 1995, Ser. No. 489,204

Int. Cl.[6] F16B *37/04*

U.S. Cl. 411—182 **4 Claims**

1. A snap-in fastener, said fastener having a base number having a central portion having a substantially H-shaped configuration defined by a bridging member extending between a pair of openings through the base member, means on one side of the base



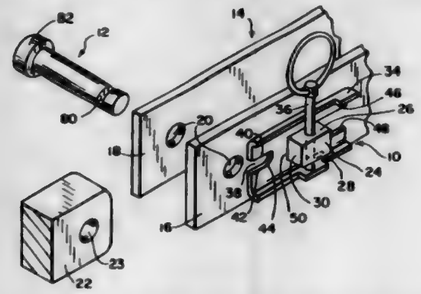
member for inhibiting rotation of the fastener relative an object to be secured to a panel thereby, an opening through the bridging member surrounded by a warped helical edge adapted to threadingly engage a threaded member received thereunto from the base member, a pair of resilient arms respectively disposed on opposite sides of the bridging member opening, said arms respectively extending away from the base member and ending at respective spaced-apart free-ends in overhanging relationship to the bridging member opening, said free-ends respectively adapted to engage threads of the threaded member received through the bridging member opening for securing the object to the fastener, a pair of resilient fingers respectively disposed on opposite sides of the bridging member opening in substantial transverse relationship to the arms, said fingers respectively extending away from the base member and ending at respective spaced apart free-ends facing away from the base member in overhanging relationship to the arms, each of said fingers having a resilient tab extending therefrom and ending in a free-end facing toward the base member, said tabs respectively adapted to engage opposite edges of an aperture in the panel and compress towards each other upon receipt of the fingers thereunto and thence spring outwardly away from each other upon passage of said free-ends through the panel aperture and lockingly secure the fastener to the panel, and each of said finger free-ends respectively adapted not to engage the threaded member received through the base member opening for securing the object to the fastener.

5,593,264

PIN RETAINER AND FLAG ASSEMBLY

Daniel K. Schlegel, Racine, and Michael D. Morton, Salem, both of Wis., assignors to Case Corporation, Racine, Wis.

Filed Aug. 15, 1995, Ser. No. 515,352
Int. Cl.[6] F16B 21/16
U.S. Cl. 411—522 **17 Claims**



1. A pin retainer and flag assembly for retaining a pin having a longitudinal axis and extending through a bore in a structural member, comprising:

a rectangular boss protruding from the structural member in spaced apart relation to the bore;

a flag in engagement with the rectangular boss and supported for sliding movement on the structural member between a locking position and a service position, the flag including an opening having an engagement surface for contacting a corresponding surface of the pin to retain the pin in the bore and abutment surfaces contacting the rectangular boss and guiding the flag between the locking and service positions, the abutment surfaces forming a slot including two opposing surfaces engaging the rectangular boss, the flag transmitting forces exerted on the pin to the rectangular boss; and

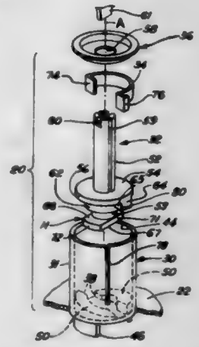
a flag retainer coupled to the rectangular boss for maintaining the flag in engagement with the rectangular boss.

5,593,265

QUICK-CONNECT STORED ENERGY TORSIONAL FASTENER

Thomas L. Kiser, Farmington Hills, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 16, 1995, Ser. No. 515,848
Int. Cl.[6] F16B 21/00; B25G 3/18
U.S. Cl. 411—552 **18 Claims**



1. A quick-connect fastening device for releasably securing first and second components comprising:

a housing adapted to be secured to the first component, said housing formed with a cylindrical socket aligned on a principal axis, said socket being open at one end while its opposite end is formed with a pair of base segments defining a cross-slot having parallel edges symmetrically disposed about a socket diametrical axis, opposed arcuate cutouts concentrically formed in associated ones of said cross-slot edges, each said segment having an interior spiral ramp portion with said ramp portions providing a helical pitch thread support;

a rotor concentrically disposed in said socket, said rotor rotationally biased by spring means interconnecting said rotor and said housing, said rotor formed with a first stem having one end extending in one axial direction to said socket open end and an opposite end terminating in a radial disc, a concentric hub, extending from an underside of said disc, is journalled in said cutouts;

a pair of opposite lugs extend from said hub and are symmetrically disposed about a socket diametrical axis, each lug having an underface formed with a helical pitch surface mating with an associated ramp portion for axial threaded rotor travel;

said hub having a distal annular shoulder from which a second stem extends to said socket opposite end terminating in a latching cross-head adapted to extend through said cross-slot and having engaging surface means in opposed axially spaced relation to said shoulder, said cross-head being aligned on a socket diametrical axis normal to said lug diametrical axis;

said rotor adapted to be threaded in one rotational direction to a "cocked and armed" mode with said hub shoulder disposed axially below said segments with each lug rotationally biased against an opposed cross-slot edge; whereby

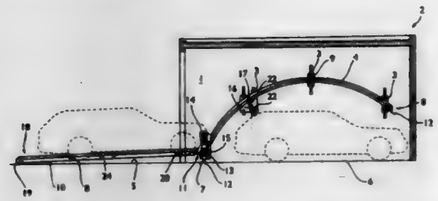
upon said cross-head being inserted through a second component slot the second component engages said hub shoulder and displaces said rotor in said one axial direction, such that each lug clears its associated cross-slot edge thereby releasing a portion of the spring means stored energy and threads said rotor in an opposite rotational direction through a predetermined angle, whereby said cross-head engaging surface means urges said second component into releasable engagement with said first component.

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MECHANICAL PARKING ARRANGEMENT

Vinzenz Wurzinger, Untergriesbach, Germany, assignor to Vinzenz Maschinenbau GmbH, Untergriesbach, Germany

Filed Sep. 8, 1995, Ser. No. 526,804
Claims priority, application Germany, Mar. 10, 1993, 43 07 450.7
Int. Cl.[6] E04H 6/12
U.S. Cl. 414—228 **13 Claims**



1. A mechanical parking facility having a length direction and a width direction and at least a first parking space and a second parking space, comprising:

a pair of fixed guide rails spaced apart in said width direction and extending generally parallel in said length direction, said rails each having a first portion approximately at a level of a driveway and a second portion that is elevated above said driveway level;

a moveable platform for carrying a vehicle, and having a front end and a rear end, said platform having contact means in the region of its rear end for contact on said driveway, said platform being moveable from a lower position to an elevated position;

a driving mechanism for connecting between said fixed guide rails and said moveable platform, said drive means causing reversible motion of said platform lengthwise along said guide rails, said front end of said platform following contours of said guide rails and being reversibly moveable from said first portions of said guide rails at said driveway level to said elevated second of said fixed guide rails by operation of said driving mechanism, said guide rails being contoured to position said platform substantially horizontally when said platform front end is at said first portions of said guide rails, and when said platform front end is at said second portions of said guide rails;

rear supporting means, fixed in position relative to said guide rails and elevated above said driveway level, said rear supporting means supporting said platform substantially horizontally by contact in between said front and back ends of said platform when said front end of said platform is at said second elevated portions of said guide rails;

said contact means in the region of said rear end of said platform and said guide rails supporting weight including said platform and objects thereon when a vehicle is entered onto said platform at said lower position, said rear supporting means and said guide rails supporting the weight including said platform and objects thereon when said platform is horizontal and elevated;

said guide rails being contoured to transfer said platform weight between said contact means and said rear supporting means by raising said contact means from said driveway level as said platform is elevated from said driveway level, and vice versa;

said contoured guide rails also providing said first parking space for a vehicle below said substantially horizontal and elevated platform, and said second parking space, for a vehicle that is resting on said horizontal and elevated platform, above said first parking space;

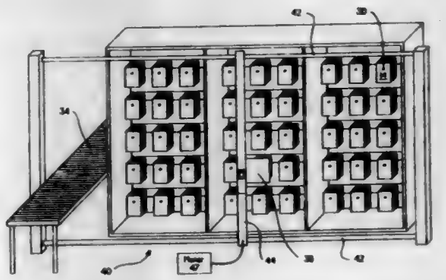
said front end of said first platform tilting above said rear end of said platform when said platform is in transition between said lower position and said elevated position.

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AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

Sean C. McDonald, Pittsburgh, Pa.; Ellen J. Hertz, Clemmons, N.C.; James A. Smith, Allison Park, Pa., and Gregory Toto, Santa Cruz, Calif., assignors to Automated Healthcare, Inc., Pittsburgh, Pa.

Division of Ser. No. 295,495, Aug. 25, 1994, Pat. No. 5,468,110, which is a continuation of Ser. No. 871,832, Apr. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 469,217, Jan. 24, 1990, abandoned. This application May 25, 1995, Ser. No. 452,646
Int. Cl.[6] B65G 1/04
U.S. Cl. 414—273 **11 Claims**



1. A system for selecting and delivering medicine packages from a holding means to fill orders comprising:

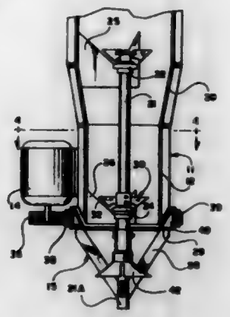
a) holding means comprised of a frame having a plurality of support rods each support rod sized for holding a plurality of medicine packages, each rod associated with a given medicine and holding medicine packages with only the same medicine each support rod having a distinct X, Y coordinate location;

b) means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means; the picking means capable of holding a plurality of medicine packages which have been picked from the holding means;

c) a computer having a database containing an X, Y coordinate location for all packages in the holding means, the computer able to receive orders for packages and able to direct the means for picking packages; and

d) a supply structure having a plurality of supply support rods which extend from said structure to form an X, Y coordinate system, with each supply support rod and medicine package thereon having a unique X and Y coordinate, said picking means disposed to have access to said structure such that a given medicine package on an associated supply support rod can be picked by the picking means to fill a patient's prescription, or a given medicine package in the supply structure can be picked by the picking means to restock an associated rod in the holding means.

5,593,268
CARGO LOADING SYSTEM
Frank K. Peeples, Savannah; David Raith, Statesboro, and Charles E. Donnelly, Savannah, all of Ga., assignors to East Coast Terminal Assoc. Ltd., Savannah, Ga.
Division of Ser. No. 964,388, Oct. 21, 1992, Pat. No. 5,348,434. This application Sep. 19, 1994, Ser. No. 308,697
Int. Cl.[6] B65G *65/30*
U.S. Cl. 414—301 5 Claims

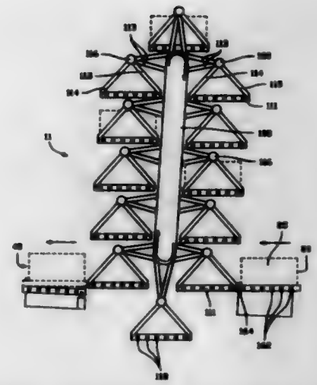


1. A method for orienting and distributing pieces of plate-like material in a cargo space, said method including the steps of feeding a plurality of pieces in a stream towards said cargo space by dropping said plurality of pieces so that said pieces fall by gravity towards said cargo space, feeding said stream to a propelling means for propelling said plurality of pieces away from said propelling means by contacting each piece of said plurality of pieces with a paddle having a vertical flat face for engaging of pieces, said paddle being rotated about an axis having an upper end farther away from said axis than the lower end, said step of contacting each piece being carried out while such piece is falling by gravity through said propelling means, thereby dispersing said stream and distributing said pieces over a large area, and allowing each piece of said plurality of pieces to fall generally flat before being covered by additional pieces, wherein said propelling means includes a plurality of said paddles, said upper end rotating about a large radius for providing a high linear speed, and said lower end rotating about a small radius for providing a low linear speed, and including the steps of engaging a first group of said pieces with a portion of said paddles having a high linear speed for propelling said first group of pieces a great distance from said paddles, and engaging a second group of pieces with a portion of said paddles having a lower linear speed for propelling said second group of pieces a smaller distance from said paddles, said second group of pieces being below said first group of pieces.

5,593,269
AUTOMATED WORK CENTER
Clay Bernard, II, Pt. Richmond, Calif., assignor to Computer Aided Systems, Inc., Hayward, Calif.
Continuation of Ser. No. 931,648, Aug. 17, 1992, Pat. No. 5,273,392, which is a continuation of Ser. No. 484,050, Feb. 22, 1990, abandoned, which is a division of Ser. No. 214,568, Jul. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 815,808, Jan. 2, 1986, abandoned, and a continuation-in-part of Ser. No. 15,083, Feb. 17, 1987, abandoned, and a continuation-in-part of Ser. No. 158,310, Feb. 22, 1988, abandoned. This application Dec. 3, 1993, Ser. No. 163,654
Int. Cl.[6] B65G *1/10*
U.S. Cl. 414—331 17 Claims

1. A randomly accessible consolidation queue for presenting article containing means used in material handling operations to an operator, the consolidation queue comprising:

a frame;



queue track means carried by the frame and forming a vertically oriented endless loop having a first travel reach and a second travel reach;

a multiplicity of vertically spaced shelves carried by the queue track means for holding said article containing means, said shelves being pivotally coupled to said queue track means such that they remain substantially horizontal as they are carried between the first travel reach and the second travel reach;

drive means for rotating the shelves about the endless loop;

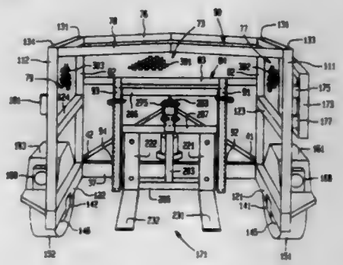
opening means for transferring said article containing means from a shelf on the first travel reach to a loading area to facilitate inserting articles into and removing articles from said article containing means;

means for unloading an article containing means from the consolidation queue on a back side thereof by extracting said article containing means from a shelf located on the second travel reach;

the opening means and the unloading means being arranged to allow simultaneous transfer of a container to said loading area from a shelf on the first travel reach and extraction of a container from a shelf on the second travel reach of the queue track means; and

control means for directing the drive means to rotate the shelves and for actuating said opening and unloading means.

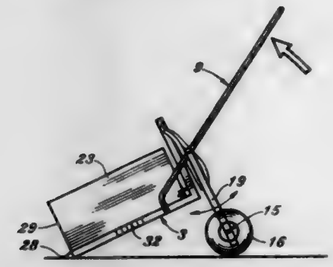
5,593,270
COMPACT TRAILER HAVING HYDRAULIC FORK LIFT
Howard E. Richards, 405 Daniel Dr., West Melbourne, Fla. 32904
Continuation of Ser. No. 273,501, Jul. 11, 1994, Pat. No. 5,415,516. This application Feb. 14, 1995, Ser. No. 388,626
Int. Cl.[6] B60P *3/07*
U.S. Cl. 414—458 11 Claims



1. A compact utility trailer towable behind a towing vehicle, comprising a trailer hitch attachment element for attachment to a

trailer attachment fixture that is secured to said towing vehicle, a forklift support structure supported by way of trailer support wheels that allow said trailer to be towed, said forklift support structure including a pair of vertically extending, mutually opposed rectilinear forklift guide channels, and a forklift by which a pallet is seized for transport by said trailer, said forklift being comprised of a vertically extending, rectilinear forklift frame having rectilinear vertical members that are sized to fit and extend vertically and rectilinearly within said pair of vertically extending, mutually opposed rectilinear forklift guide channels and be vertically and linearly slidable within said pair of vertically extending, mutually opposed rectilinear forklift guide channels of said forklift support structure, and a pair of generally L-shaped fork plates affixed to said vertically extending, rectilinear forklift frame, with vertical and linear slidable translation of said vertically extending, rectilinear forklift frame within said pair of vertically extending, mutually opposed rectilinear forklift guide channels precluding rotation of said generally L-shaped fork plates in the course of seizure and lifting of said pallet by said generally L-shaped fork plates, and a jack supported by said forklift support structure and having a driven element that is translatable relative to said forklift support structure, said driven element being coupled by a linkage to said vertically extending, rectilinear forklift frame, whereby operation of said jack causes said vertical and rectilinear sliding translation of said vertically extending, rectilinear forklift frame within said pair of vertically extending, mutually opposed rectilinear forklift guide channels, and thereby vertical and linear translation, without rotation, of said generally L-shaped fork plates.

5,593,271
CONVERTIBLE BARROW FOR GROUND LEVEL LOADING
John R. Hall, 38 Willow La., New Hartford, Conn. 06057
Filed Apr. 10, 1996, Ser. No. 630,342
Int. Cl.[6] B62B *1/04*
U.S. Cl. 414—490 14 Claims



1. A convertible barrow for ground level loading, comprising:

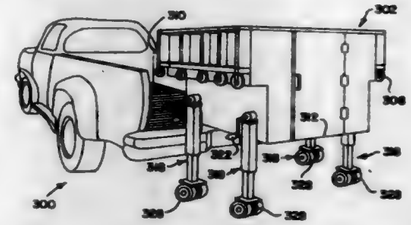
a frame having a substantially flat platform adapted for resting flat on the ground and receiving a load from substantially ground level to be transported,

a handle having a pair of handle arms, each one of the handle arms being attached to the frame and extending upwardly and outwardly from the frame, said handle being adapted to be grasped by an operator so as to allow the operator tilt the platform to raise the end of the platform adjacent the operator,

a wheel carriage having at least two wheels rotatably mounted thereon spaced apart greater than the width of the platform, and

a pair of support legs each pivotably connected to the barrow at a point above the platform at one end of the respective support legs and pivotably connected to the wheel carriage at the other end thereof, and spaced apart by a width greater than the width of the platform, the length of the support legs being such that the wheel carriage may rest on the ground beneath the handle when the platform is flat on the ground, but may swing beneath one raised end of the platform to a central support section of the platform, wherein the load is supported on the platform above the wheel carriage when transporting the load.

5,593,272
ROLL ON ROLL OFF DEVICE WITH A PORTABLE SUPPORT
Richard Green, P.O. Box 249, Titus, Ala. 36080
Continuation-in-part of Ser. No. 1,960, Jan. 8, 1993, Pat. No. 5,490,753. This application Feb. 24, 1994, Ser. No. 200,958
Int. Cl.[6] B65G *67/02*
U.S. Cl. 414—498 23 Claims



1. A transport vehicle, a container that can be supported on said transport vehicle at a fixed elevation above the ground and an independent support that can support said container at said fixed elevation above the ground;

said transport vehicle adapted to receive said container from and unload said container to said independent support;

said transport vehicle and container having cooperating anti-friction mechanisms that provide the sole support for said container along a plane on said transport vehicle to thereby provide a stable support for said container during transport and to facilitate relative movement between said container and said transport vehicle to a first position at which said transport vehicle is the sole support of said container and said independent support can be engaged to accept responsibility for a portion of the support for the container and then to a second position at which said transport vehicle supports a portion of the weight of said container and said indepeadent support can be further engaged to accept responsibility for the remaining portion of the support for the container from the transport vehicle;

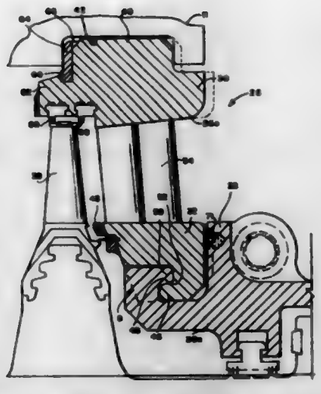
said anti-friction mechanism of said container including a pair of substantially horizontal bottom support surfaces and two sets of rollers, one set of rollers being secured to each of said substantially horizontal bottom support surfaces;

said container has a bottom surface and a center of gravity, said center of gravity being a given vertical distance above said bottom surface;

said center of gravity being displaced vertically from said plane of the cooperating anti-friction mechanisms a distance less than said given distance.

5,593,273
DOUBLE FLOW TURBINE WITH AXIAL ADJUSTMENT AND REPLACEABLE STEAM PATHS AND METHODS OF ASSEMBLY
Earl H. Brinkmann, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.
Filed Mar. 28, 1994, Ser. No. 218,772
Int. Cl.[6] F01D *05/14*
U.S. Cl. 415—108 14 Claims

1. In a double-flow steam turbine having an axis, first-stage rotors spaced axially one from the other, a reheat tub disposed between said first-stage rotors and including first and second arcuate diaphragms axially spaced one from the other and disposed



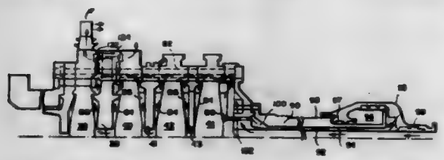
about said turbine axis, each said diaphragm having an outer ring, an inner ring and a plurality of nozzles circumferentially spaced one from the other about said axis and between said outer and inner rings whereby the nozzles of said axially spaced diaphragms define steam paths in generally axially opposite directions relative to one another, said nozzles having trailing edges spaced a predetermined axial distance from said rotors, and an inner annulus disposed about said axis and extending axially between said inner rings of said axially spaced diaphragms; the improvement wherein said first and second diaphragms each comprise arcuate diaphragm segments each including a portion of said inner ring, said inner ring portion having a flange directed generally axially away from said annulus, said annulus comprising discrete arcuate segments with each segment including a flange directed generally axially toward said annulus, said flanges engaging one another to maintain said diaphragm segments and said annulus segments in assembly with one another.

5,593,274

CLOSED OR OPEN CIRCUIT COOLING OF TURBINE ROTOR COMPONENTS

Diether E. Carreno, Schenectady; Albert Myers, Amsterdam; Gene D. Palmer, Clifton Park; Philip M. Caruso, Selkirk; Ian D. Wilson, Clifton Park, all of N.Y., and Martin C. Hemsworth, Cincinnati, Ohio, assignors to General Electric Co., Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,695
Int. Cl.[6] F01D *5/08*; *5/06*
U.S. Cl. 415—115 **20 Claims**



1. A turbine comprising:

a multi-stage rotor having an axis and including a plurality of turbine wheels having rims for mounting turbine buckets and spacer discs having rims, said spacer discs being disposed alternately between the wheels and defining wheel cavities therebetween, said wheels and spacer discs being secured to one another;

a reservoir for supplying a cooling medium to the rotor;

a plurality of generally axially extending passages through the wheel and spacer disc rims and in communication with said cooling medium supply reservoir for supplying the cooling medium to the turbine buckets of at least one stage of the rotor; and

said rotor having a passageway in communication with said cooling medium supply reservoir for supplying cooling medium into the wheel cavities and passing the cooling medium therefrom into the turbine buckets of said one stage.

19. A transition assembly for sealing between registering ports of adjacent discrete first and second parts at a juncture of the parts, enabling flow of a cooling medium between the ports, comprising:

tubular bushings sealingly secured at one end to said ports, respectively, at the juncture of the first and second parts and extending into said parts, respectively, said bushings at locations remote from said one end thereof being spaced from interior walls of the ports, respectively; and

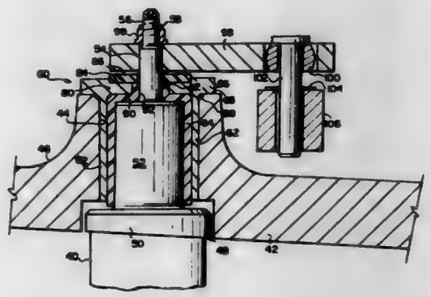
a coaxial tubular element extending within and between said bushings terminating in ends engaging said bushings forming a seal enabling flow of cooling medium between said parts through said tubular element with reduced stress from thermal mismatch between the first and second parts.

5,593,275

VARIABLE STATOR VANE MOUNTING AND VANE ACTUATION SYSTEM FOR AN AXIAL FLOW COMPRESSOR OF A GAS TURBINE ENGINE

Srinivasan Venkatasubbu, Cincinnati, Ohio; Jeffrey J. Eschenbach, Ft. Mitchell, Ky.; Stephen J. Waymeyer, Batavia, and Bruno G. Lampont, Cincinnati, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1995, Ser. No. 509,883
Int. Cl.[6] F01D *17/12*
U.S. Cl. 415—160 **13 Claims**



1. A variable angle stator vane assembly for use in an axial flow compressor of a gas turbine having a compressor casing with a bore formed therein at the position of the variable angle stator vane assembly, said assembly comprising:

a boss on said casing surrounding the casing bore;

a first bushing extending in said bore and having a flange overlying and removably secured to said boss, said bushing having an outer end portion;

a second bushing disposed within said first bushing and having a bearing portion underlying and bearing against said outer end portion of said first bearing;

said first and second bushings having openings through said outer end and bearing portions, respectively, in registration with one another; and

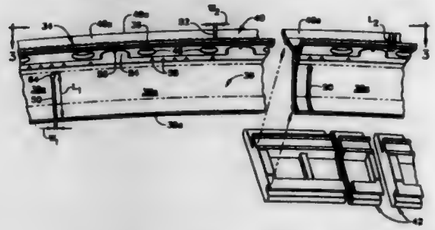
a stator vane having a base, a spindle projecting from said base within said second bushing, and a first reduced diameter spindle portion extending through said registering openings whereby radial thrust loads on said vane are transmitted through said bearing portion to said outer end portion and said flange attached to said casing, said second bushing being removable and replaceable from the exterior of said casing without removing the casing from the compressor or the stator vane from the casing bore.

5,593,276

TURBINE SHROUD HANGER

Robert Proctor, West Chester; David R. Linger, Cincinnati; David A. Di Salle, West Chester; Steven R. Brassfield, Cincinnati, and Larry W. Plemmons, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 6, 1995, Ser. No. 467,436
Int. Cl.[6] F01D *11/18*
U.S. Cl. 415—173.1 **11 Claims**



1. A turbine shroud hanger being suspendable radially inwardly from a pair of adjacent radial flanges of an outer casing comprising:

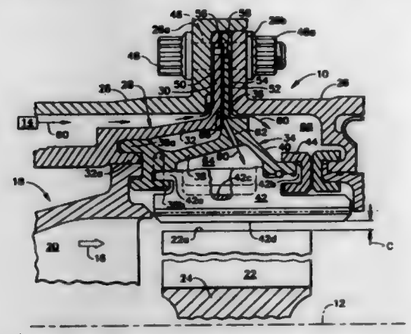
a one-piece annular hanger radial flange and an integral hanger leg at a radially inner end thereof; said hanger leg including a plurality of circumferentially spaced apart slots extending axially therethrough to bifurcate said leg into circumferential segments for reducing transient thermal expansion of said hanger.

5,593,277

SMART TURBINE SHROUD

Robert Proctor, West Chester; David R. Linger, Cincinnati; David A. Di Salle, West Chester; Steven R. Brassfield, Cincinnati, and Larry W. Plemmons, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 6, 1995, Ser. No. 467,418
Int. Cl.[6] F01D *11/18*
U.S. Cl. 415—173.1 **10 Claims**



1. A turbine shroud positionable radially above a plurality of turbine rotor blades for controlling tip clearance therebetween comprising:

an annular outer casing axially split at a pair of adjacent first and second radial flanges;

an annular shroud support having a radial support flange and an integral support leg at a radially inner end thereof;

an annular shroud hanger having a radial hanger flange and integral forward and aft hanger legs at a radially inner end thereof, said shroud hanger forward leg being supported on said support shroud forward leg;

a plurality of shroud panels joined to said hanger legs and having a radially inner surface positionable radially above said rotor blades to define said tip clearance therebetween;

said support flange and said hanger flange being axially positioned between said first and second casing flanges in abutting contact with each other, and said four flanges having a plurality of bolt holes arranged on a common circumferential bolt line, each bolt hole receiving a respective bolt for axially clamping together said four flanges to support said shroud panels from said casing;

said four flanges having pluralities of circumferentially spaced apart first, second, and third recesses disposed respectively between said casing first flange and said shroud flange, between said shroud flange and said hanger flange, and between said hanger flange and said casing second flange for providing radial flowpaths therebetween; and

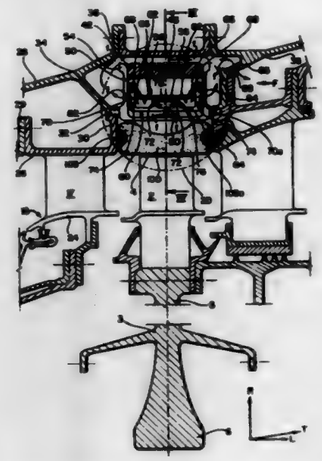
said support flange and said hanger flange having respective pluralities of circumferentially spaced apart first and second metering holes extending axially therethrough for providing flow communication between said first, second, and third recesses for channeling compressor bleed air therethrough for controlling said tip clearance.

5,593,278

GAS TURBINE ENGINE ROTOR BLADING SEALING DEVICE

Gerard E. A. Jourdain, Soisitry sur Seine; Jean-Paul Lagrange, Le Chatelet en Brie; Gerard M. F. Mandet, Perlcy; Jacques H. Mouchel, Paris; Jean-Philippe E. Richard, Saint-Mesard en Jalles, and Marcel R. Soligny, Chevilly-LaRue, all of France, assignors to Societe National d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris Cedex, France

Filed Dec. 30, 1983, Ser. No. 568,223
Claims priority, application France, Dec. 31, 1982, 82 22166; Jul. 12, 1983, 83 11583; Jul. 12, 1983, 83 11584
Int. Cl.[6] F01D *11/08*
U.S. Cl. 415—173.2 **34 Claims**

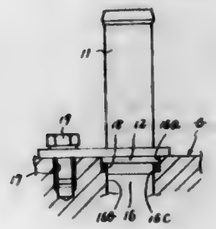


1. A device for maintaining a small positive clearance from turbine blade tips of a rotating turbine wheel in a gas turbine engine under stabilized and transient engine operating modes comprising:

a) a short response time ring located generally coplanar with the turbine wheel;

b) a long response time ring located generally coplanar with the turbine wheel;
c) a plurality of displacement elements pivotally attached to the short response time ring and the long response time ring;
d) sealing sectors attached to the displacement elements, the sealing sectors forming a sealing ring disposed around the turbine wheel a predetermined distance from the blade tips; and
e) means to supply ventilating air to the short response time ring and the long response time ring such that the rings expand as the turbine wheel speed increases and contract as the turbine wheel speed decreases thereby causing the sealing ring to expand or contract to maintain the predetermined distance from the blade tips.

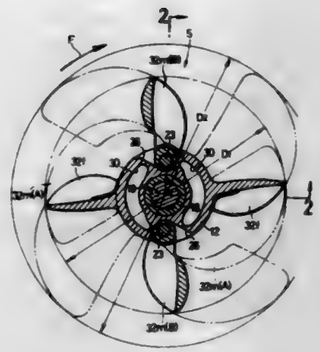
5,593,279
SUCTION CONNECTOR FOR PUMP
Tetsuji Hayashi, Gifuken, Japan, assignor to Kaysbe Industry Co., Ltd., Minato-ku, Japan
Filed Feb. 29, 1996, Ser. No. 608,709
Int. Cl.[6] F01D *25/26*
U.S. Cl. 415—213.1 **5 Claims**



1. A suction connector for a pump which is adapted to be fixed to a suction port of a pump body, comprising:
a pipe provided with at least one flange;
said flange being formed by compressing a predetermined portion of said pipe in an axial direction thereof to radially outwardly project said portion; and
a plate formed with a recess in which said pipe is fitted, resulting in said pipe being inserted through said plate;
said flange being forced while fitting said pipe in said recess of said plate;
said plate being fixed to the pump body.

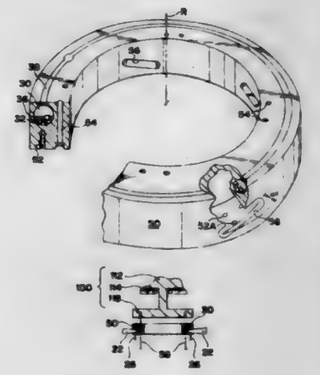
5,593,280
PROPELLER FOR BOAT
Hideaki Takada; Takao Aihara, and Ikuo Nakazato, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 19, 1995, Ser. No. 545,532
Claims priority, application Japan, Oct. 20, 1994, 6-255014; Oct. 6, 1995, 7-260264
Int. Cl.[6] B63H *1/24;3/00*
U.S. Cl. 416—44 **7 Claims**

1. A propeller for a boat, comprising:
a propeller boss connected to a propeller shaft;
a stationary blade integrally formed on said propeller boss;
a variable blade pivotally supported on said propeller boss through a blade shaft, such that a diameter or pitch of said variable blade is increased in accordance with an increase in rotation speed of said propeller; and



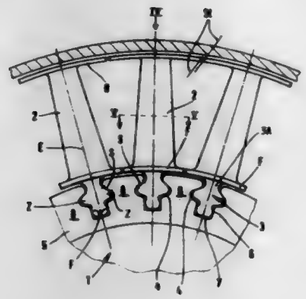
an exhaust passage for an engine exhaust gas provided in said propeller boss to axially pass through said boss at a location corresponding to said stationary blade.

5,593,281
DYNAMIC BALANCING APPARATUS FOR CEILING FANS
Jen-Lung D. Tai, 5616 W. Aster Dr., Glendale, Ariz. 85304, assignor to Jen-Lung D. Tai; Sandy H. Tai; Avon Tai, and Rose Tai, all of Glendale, Ariz.
Filed Oct. 2, 1995, Ser. No. 538,007
Int. Cl.[6] F04D *29/66*
U.S. Cl. 416—145 **11 Claims**



9. A dynamic balancing apparatus for a ceiling fan, wherein the ceiling fan includes a body turning on an axis of rotation and a plurality of fan blades, said balancing apparatus comprising:
first attachment means for fixing said balancing apparatus with respect to the fan blades;
an annular chase concentrically surrounding the axis of rotation, said annular chase lies in a plane orthogonally oriented with respect to the axis of rotation; and
weight means for counteracting rotational imbalance of the ceiling fan, said weight means is centrifugally distributed within said annular chase;
wherein said first attachment means comprise a plurality of slots obliquely oriented with respect to said plane, each of said plurality of slots receives a respective one of the plurality of fan blades.

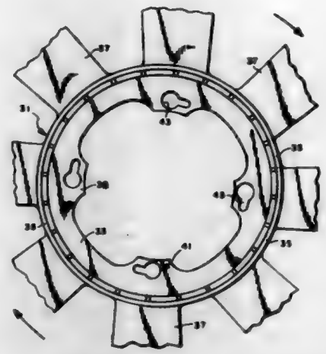
5,593,282
TURBOMACHINE ROTOR CONSTRUCTION INCLUDING A SERRATED ROOT SECTION AND A ROUNDED TERMINAL PORTION ON A BLADE ROOT, ESPECIALLY FOR AN AXIAL-FLOW TURBINE OF A GAS TURBINE ENGINE
Wolfgang Krueger, Reichertshausen, Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Germany
Filed Sep. 14, 1995, Ser. No. 527,876
Claims priority, application Germany, Sep. 16, 1994, 44 32 999.7
Int. Cl.[6] F01D *5/30;5/20;5/28*
U.S. Cl. 416—219 R **17 Claims**



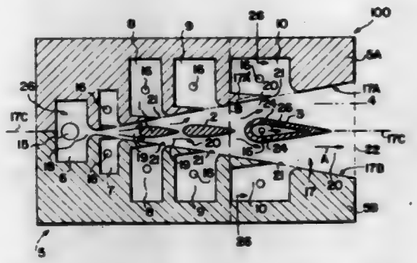
1. A rotor for a turbomachine, comprising a rotor disk having a plurality of axial slots spaced around a rim of said rotor disk, and a plurality of rotor blades each including an airfoil and a blade root that is anchored in a corresponding one of said slots, wherein each of said rotor blades is made of a lightweight material, each of said blade roots comprises a serrated root section and a terminal portion, said serrated root section has only a single bilaterally symmetrical serration, said terminal portion has bilaterally symmetrical rounded surfaces and a reduced root cross-section relative to said serrated root section, and each of said axial slots includes a serrated socket that matingly receives one of said serrated root sections and a recess at a radially inner end of said socket that receives one of said terminal portions so as to allow radial movement of said terminal portion in said recess.

5,593,283
FAN AND FAN DRIVE AND ASSEMBLY THEREOF
George E. Scott, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 287,388, Aug. 8, 1994, Pat. No. 5,501,010. This application Mar. 21, 1996, Ser. No. 620,062
Int. Cl.[6] F04D *29/64*
U.S. Cl. 416—244 R **15 Claims**

1. A fan and fan drive assembly including a fan drive of the type comprising an output assembly, and a fan of the type comprising a mounting portion adapted to be attached to said output assembly of said fan drive and a plurality of fan blades oriented for a normal direction of operation; said output assembly of said fan drive including a plurality N of fastener members, each including a head portion; said mounting portion of said fan defining an axial thickness and further defining a plurality N of fastener openings, each of which is adapted to receive one of said fastener members; characterized by:
(a) each of said fastener openings comprising a relatively larger head receiving portion and a relatively smaller retainer receiving portion;
(b) each head portion of said plurality N of fastener members being spaced from an adjacent surface of said output assembly by an axial dimension, said dimension being at least slightly greater than said axial thickness;
(c) a retainer operably associated with each of said retainer receiving portions, and disposed axially between said adjacent surface of said output assembly and the respective one of said head portions, and operable to retain each of said fastener members in a fixed position, circumferentially, relative to said fan, as said fan drive output assembly and fan are in an assembled position and rotate in said normal direction of operation.



5,593,284
EJECTOR PUMP HAVING TURBULENCE REDUCING FLOW DIRECTING PROFILES
Thilo Volkmann, Zum Vulting 12, D-59514 Welver, Germany
Continuation of Ser. No. 379,511, Feb. 1, 1995, abandoned. This application Feb. 23, 1996, Ser. No. 605,704
Claims priority, application Germany, Aug. 6, 1992, 9210497 U
Int. Cl.[6] F04F *5/00*
U.S. Cl. 417—174 **17 Claims**



17. Ejector pump for the sucking or transporting of materials or mixtures of materials that are capable of flowing with the aid of a fluid driving medium, within a housing including,
at least one inlet for the driving medium,
at least one inlet for the materials located downstream of said inlet for said driving medium,
at least one flow channel having opposite side walls and a middle portion therebetween, said flow channel for the mixing and joint flowing through of the driving medium and the materials, said flow channel including at least one jet, at least one mixing zone, and at least one diffusing zone between said opposite side walls,
at least one suction chamber, which is fluidly joined with the inlet for the materials on a first side, and with the flow channel by means of a pass-through slot on a second side

from which said materials are drawn by vacuum created by said driving medium in said flow channel, and

at least one common outlet for the driving medium and the materials downstream of said flow channel, wherein an original direction of flow is defined by a line extending between said inlet for said driving medium and said common outlet,

the improvement comprising:

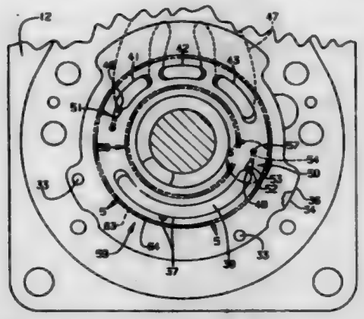
at least two flow management profiles, which are placed in the flow channel and which displace the fluid that is flowing against the profiles and guide said fluid with a lateral direction component away from said original direction of flow, so that the fluid in the middle portion of said flow channel makes its way closer to one of the flow channel opposite side walls, each said flow management profile having a rounded end, each said rounded end facing said inlet end of said flow chamber to reduce turbulence in said flow channel, wherein the location of the narrowest cross-section of said flow channel which is caused by one of said at least two profiles lies upstream of each said pass-through slot.

5,593,285

HYDRAULIC AXIAL PISTON UNIT WITH MULTIPLE VALVE PLATES

Thomas A. Watts, Ottawa, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jan. 13, 1995, Ser. No. 372,623
Int. Cl.[6] F04B *1/20*
U.S. Cl. 417—269 **3 Claims**



1. An axial piston hydraulic unit comprising:

a head having an intake passage and a discharge passage therein;

a rotatable cylinder barrel having a plurality of equally spaced circumferentially arranged piston bores opening toward the head;

a valve plate assembly positioned between the head and the barrel and secured against rotation relative to the head, the valve plate assembly having at least two valve plates stacked together to function as a single valve plate, the valve plates having an arcuate shaped intake port and an arcuate shaped discharge port extending therethrough to selectively serially communicate the piston bores with the intake and discharge passages as the barrel rotates, the valve plates defining a restricted flow path between the head and the end of the barrel for establishing initial communication between an approaching piston bore and one of the discharge and intake ports, wherein a first portion of the flow path is defined in the valve plate adjoining the head and a second portion of the flow path is defined in the plate adjacent the barrel, wherein the first portion of the flow path includes a first slot in the valve plate adjoining the head and extending a predetermined distance from the one port, and the second portion includes a second slot in the valve plate adjacent the barrel and opening into the one port, the second slot extending from the one port a distance greater than said predetermined distance.

5,593,286

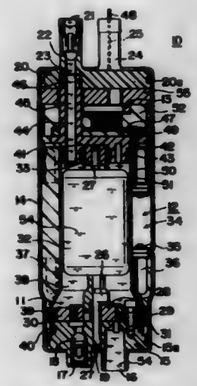
Patent Not Issued For This Number

5,593,287

FUEL FEED PUMP

Nobuyasu Sadakata, Isesaki; Benji Honma, Ota; Hideyuki Iwamoto, Maebashi; Yoichi Shindo, Kiryu, and Akira Yamada, Tamamuramachi, all of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Nov. 18, 1994, Ser. No. 342,263
Claims priority, application Japan, Nov. 19, 1993, 5-314431
Int. Cl.[6] F04B *39/06*
U.S. Cl. 417—366 **19 Claims**



1. A fuel feed pump wherein a housing, a pump in a housing, a brushless motor for driving the pump, a control circuit unit for controlling the brushless motor are assembled, a fuel duct is formed on the inside of the housing, a fuel is lead from an introductory duct which is opened at one end portion of the housing to the fuel duct, and is delivered from a delivery duct which is opened at the other end portion of the housing;

the fuel feed pump comprising:

an inner cylinder, which is provided between a stator and the rotor of the brushless motor, the fuel duct is formed by a space therein;

a holder plate, which is provided at one end portion of the inner cylinder, which is blockaded thereby and the control circuit unit is held thereon;

a contacting pipe for a constructing duct, which is provided at the holder plate, the fuel duct of the inner cylinder and the delivery duct are connected to each other by the constructing duct;

a resin sealed portion, which is formed in an outside space of the inner cylinder and the circumference of the control circuit unit in the housing by a potting resin.

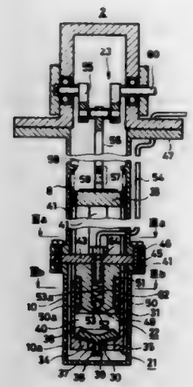
5,593,288

LIQUEFIED GAS PUMP

Isao Kikutani, Kobe, Japan, assignor to Nabco Limited, Kobe, Japan

Filed Nov. 22, 1995, Ser. No. 561,813
Claims priority, application Japan, Nov. 25, 1994, 6-315830
Int. Cl.[6] F04B *21/00*
U.S. Cl. 417—435 **3 Claims**

1. A liquefied gas pump including a pump chamber defined by walls of a piston and a cylinder, said pump chamber having a liquefied gas entrance path having a liquefied gas entrance port and a liquefied gas discharge path having a liquefied gas discharge port,



said ports opening into said pump chamber, in which relative movement between said piston and said cylinder in the upward and downward directions provides a repetition of alternating suction and discharge strokes, liquefied gas being sucked into said pump chamber through said liquefied gas entrance path during said suction stroke, said liquefied gas being discharged out of said pump chamber through said liquefied gas discharge path during said discharge stroke; wherein:

said pump chamber further includes a separate bubble discharge path having a bubble discharge port opening into said pump chamber which enables said pump chamber to communicate with the exterior of said pump chamber during an initial stage of said discharge stroke;

a recess is formed in the top wall of said pump chamber in such a manner that the highest point of said recess is located at a level higher than the level of said liquefied gas discharge port, said bubble discharge port opening into said pump chamber at said highest point of said recess;

said top wall of said pump chamber is provided by an end wall of said piston;

said piston is fixed to the lower end of a pipe of which the upper end is adapted to be fixed;

said cylinder is fixed to the lower end of a rod extending through a longitudinal bore which extends through said pipe; and

a reciprocating arrangement for reciprocating said cylinder in the upward and downward directions is coupled to the upper end of said rod.

5,593,289

STANDING VALVE ASSEMBLY FOR SUCKER ROD OPERATED SUBSURFACE PUMPS

Leon Tarpley, 405 22nd St., Crane, Tex. 79731

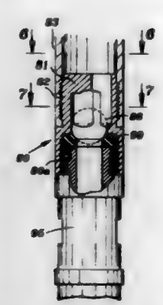
Continuation of Ser. No. 318,077, Oct. 5, 1994, Pat. No. 5,472,326, which is a continuation of Ser. No. 40,356, Mar. 30, 1993, abandoned. This application Sep. 15, 1995, Ser. No. 529,626
Int. Cl.[6] F04B *53/10;53/22*
U.S. Cl. 417—454 **4 Claims**

1. In a subsurface rod pump having a barrel and a plunger for pumping fluid from an oil and gas reservoir, the improvement comprising a standing valve assembly which includes:

a cylindrical valve body having a lower section, said lower section having a counterbore with internal threads, and an upper section having a reduced external diameter and externally threaded for attachment within the barrel below the plunger, said upper section with an upset end forming a cage integral with and completely within said upper section reduced external diameter of the cylindrical valve body;

a valve ball positioned within said cage;

a valve seat abutting said cage; and



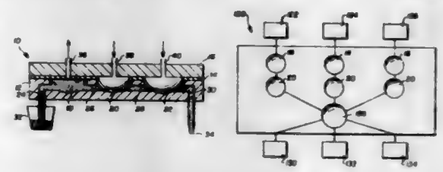
a holddown threaded into the lower section of said valve body for retaining said valve seat in said valve body.

5,593,290

MICRO DISPENSING POSITIVE DISPLACEMENT PUMP

Danny L. Greisch, Hilton, and John B. Chemelli, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,367
Int. Cl.[6] F04B *43/05*
U.S. Cl. 417—478 **2 Claims**



1. Apparatus for intermittently dispensing a plurality of volumes of fluid, comprising;

a) a plurality of sources of fluids to be dispensed;

b) a support member having surfaces and a dispensing orifice in at least one of said surfaces and having a plurality of sets of first and second chambers having first and second volumes, respectively, said first and second volumes being independently and selectively variable, and having a third chamber having a maximum volume larger than the combined volumes of the plurality of second chambers, and having a plurality of first conduits, one to each set of chambers, extending from said sources of fluids to said first chambers, and having a plurality of second conduits, one to each set of chambers, extending from said first chambers to said second chambers, and having a plurality of third conduits, one to each set of chambers, extending from said second chambers to said third chamber to said dispensing orifice;

c) means for selectively increasing said first volumes to draw fluid from respective of said sources through respective of said first conduits into respective of said first chambers;

d) means for selectively increasing said second volumes to draw fluid from respective of said sources through respective of said first conduits and said first chambers and said second conduits into respective of said chambers;

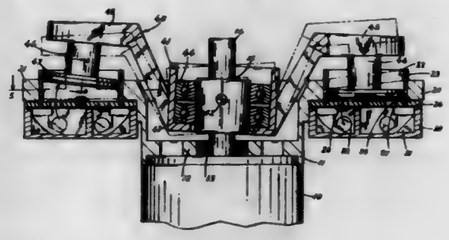
e) means for selectively decreasing said first volumes to return fluid to respective of said sources and to close respective of said second conduits;

f) means for selectively increasing the volume of said third chamber to said maximum volume to withdraw fluid from said fourth conduit;

g) means for selectively decreasing said second volumes to first expel respective of said fluids from said second chambers into said third chamber and thereby combine said second volumes of the respective fluids, and to then close said second and third conduits;

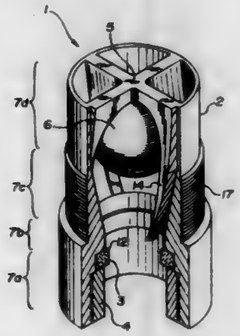
h) means for selectively decreasing said increased third volume to first expel said combined second volumes of fluids from said third chamber through said fourth conduit toward said dispensing orifice and to then close said third conduits.

5,593,291
FLUID PUMPING APPARATUS
William H. Lynn, Kohler, Wis., assignor to Thomas Industries Inc., Sheboygan, Wis.
Filed Jul. 25, 1995, Ser. No. 506,491
Int. Cl.[6] F04B *1/18*
U.S. Cl. 417—539 **14 Claims**



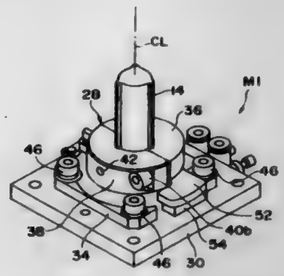
1. A fluid pumping apparatus, comprising:
a drive shaft;
a cylinder having a bore parallel to the axis of the shaft;
a fluid inlet and a fluid outlet communicating with the cylinder bore;
a bearing mounted on the shaft with the center line of the bearing at an angle to the shaft axis;
an arm mounted on the bearing; and
wobble piston disposed in the bore and rigidly attached to the arm.

5,593,292
VALVE CAGE FOR A ROD DRAWN POSITIVE DISPLACEMENT PUMP
Ray K. Ivey, 315 - 19 Street, Calgary, Alberta, Canada
Filed May 4, 1994, Ser. No. 237,808
Int. Cl.[6] F04B *47/00;53/12*
U.S. Cl. 417—554 **3 Claims**



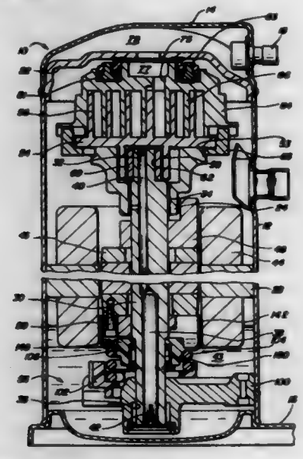
1. A cage for a reciprocating rod drawn positive displacement pump valve, comprising:
a generally tubular side wall forming an axial bore for containing a valve ball, said side wall having upper and lower ends and forming an external thread for connection with one of the pump plunger or barrel, said side wall forming an internal annular seat shoulder adjacent its lower end, against which a seat may abut to provide an annular seating area against which the valve ball may seal;
said external thread being located intermediate the upper and lower ends of the side wall;
stop means, integral with the side wall and extending transversely of the bore in spaced relation above the seat shoulder, for limiting upward rise of the ball from the seat, said side wall and stop means forming a confining enclosure within which the ball may travel vertically when unseated;
said stop means being located at the upper end of the side wall;
said side wall diminishing progressively in thickness between the seat shoulder and the stop means so that a tapered and upwardly enlarging portion of the bore is defined, whereby the flow area around the valve ball will increase as the ball rises from the seat toward the stop means; and
said side wall forming a plurality of internal, elongated, circumferentially spaced apart, inwardly projecting ball guide ribs which extend longitudinally between the seat shoulder and the stop means and progressively increase in height, as the side wall diminishes, along their lengths from the seat shoulder to the stop means, so that they form a race of substantially constant diameter for vertically guiding the valve ball.

5,593,293
HAND MECHANISM FOR ROBOT
Masaki Machino, Ogawa-machi; Sumiyoshi Ito, Ushiku; Shojiro Danmoto, Edosaki-machi; Fumio Kanno, Amimachi, and Takao Kosaiya, Ushiku, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1992, Ser. No. 936,642
Claims priority, application Japan, Aug. 30, 1991, 3-219822; Aug. 30, 1991, 3-219823; Aug. 30, 1991, 3-219824; Aug. 30, 1991, 3-219825; Aug. 30, 1991, 3-219826; Aug. 30, 1991, 3-219827; Aug. 30, 1991, 3-219828; Jan. 10, 1992, 4-002638
Int. Cl.[6] B25J *17/02*
U.S. Cl. 414—729 **9 Claims**



1. A hand mechanism for a robot, which is attachable to a distal end of an arm portion of the robot, having independent modules for executing predetermined elementary motions, which modules can be combined with each other in selected arbitrary combinations to attain desired elementary motions, said hand mechanism comprising:
a holder module having a fixing member fixable to the arm portion, an attaching plate to be attached to another module, and coupling means for coupling said fixing member and said attaching plate,
said coupling means comprising angle adjustment means for adjusting an attaching angle of said attaching plate about said fixing member and thus the arm portion, and a release mechanism for releasing a coupling state between said fixing member and said attaching plate upon application of a shock to said hand mechanism.

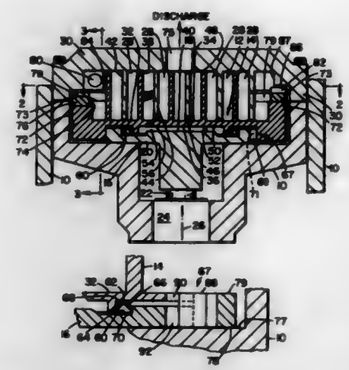
5,593,294
SCROLL MACHINE WITH REVERSE ROTATION PROTECTION
Timothy R. Houghtby; Roger W. Reinecke, and Kenneth J. Monnier, all of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio
Filed Mar. 3, 1995, Ser. No. 397,793
Int. Cl.[6] F01C *17/00;* F04C *18/04;* F16D *63/00;67/02*
U.S. Cl. 418—55.1 **31 Claims**



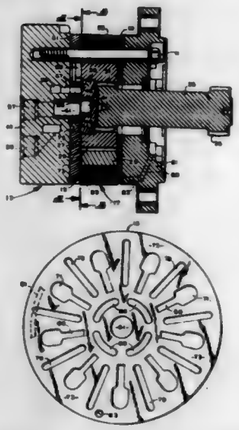
1. A powered work producing apparatus comprising:
a powered mechanism for performing work;
a motor including a drive shaft and a stationary housing, said drive shaft being coupled to said mechanism for operatively driving same; and
one-way drive means disposed between said drive shaft and said housing, said one-way drive means including a resilient member secured to said housing, such that undesirable rotation of said drive shaft in one direction is opposed by loading of said resilient member by said drive shaft, said one-way drive means permitting free rotation of said drive shaft in the opposite direction.

5,593,295
SCROLL COMPRESSOR CONSTRUCTION HAVING AN AXIAL COMPLIANCE MECHANISM
Joe T. Hill, Bristol, Va., assignor to Bristol Compressors, Inc., Bristol, Va.
Filed Apr. 19, 1995, Ser. No. 424,975
Int. Cl.[6] F04C *18/04;27/00*
U.S. Cl. 418—55.2 **2 Claims**

1. A scroll compressor having housing means, a fixed scroll on said housing means and an orbiting scroll nested therewith and providing for suction, intermediate, and high pressure regions during compressor operation, base means on said orbiting scroll, thrust plate means axially slidably mounted on said base means of said orbiting scroll by guide means, cooperating elements of coupling means on said fixed scroll and on one or both of said thrust plate means or said orbiting scroll for allowing axial motion while preventing angular motion of said orbiting scroll with respect to said fixed scroll, perimetric configured axial compliance seal means positioned between and contacting said base means of said orbiting scroll and said thrust plate means and defining thereby an axial compliance pressure chamber means, and conduit means connecting said chamber means with one or more desired ones of said pressure regions, said guide means comprises cooperating structural elements selected from the group consisting of (a) key and keyway means, (b) posts and sleeve means, (c) perimetric chine and groove means, and (d) a combination of any of (a), (b) or (c), said guide means allowing axial compliance motion of said orbiting scroll means relative to said thrust plate means without allowing relative angular motion therebetween, and wherein said guide means constitutes a segment of said coupling means.



5,593,296
HYDRAULIC MOTOR AND PRESSURE RELIEVING MEANS FOR VALVE PLATE THEREOF
Marvin L. Bernstrom, Eden Prairie; Karen J. Radford, Minneapolis, and Gary R. Kassen, Chanhassen, all of Minn., assignors to Eaton Corporation, Cleveland, Ohio
Filed Feb. 16, 1996, Ser. No. 602,389
Int. Cl.[6] F01C *1/10;* F03C *2/08*
U.S. Cl. 418—61.3 **8 Claims**



1. A rotary fluid pressure device of the type comprising housing means including an endcap assembly defining a fluid inlet port and a fluid outlet port; a gerotor gear set associated with said housing means and including an internally-toothed ring member, defining a plurality N+1 of internal teeth, and an externally-toothed star member defining a plurality N of external teeth, said star member being eccentrically disposed within said ring member for relative orbital and rotational movement therebetween, the teeth of said ring member and said star member interengaging to define a plurality N+1 of expanding and contracting fluid volume chambers during said relative orbital and rotational movements; said endcap assembly including an endcap member, and a stationary valve member, and defining a first fluid pressure region in continuous fluid communication with said inlet port and a second fluid pressure region in continuous fluid communication with said outlet

port, said first fluid pressure region surrounding said second fluid pressure region; said stationary valve member further defining a plurality N+1 of valve passages, each being oriented generally radially and being in continuous fluid communication with one of said fluid volume chambers; said star member defining first and second manifold zones in continuous fluid communication with said first and second fluid pressure regions, respectively, said star member including an end surface disposed in sliding, sealing engagement with an adjacent surface of said stationary valve member, said end surface defining a first plurality N of fluid ports and a second plurality N of fluid ports, said first and second pluralities of fluid ports being in continuous fluid communication with said first and second manifold zones, respectively; characterized by:

(a) each of said valve passages extending axially through the entire axial extent of said stationary valve member over at least a portion of the area thereof;

(b) one of said endcap member and said stationary valve member defining a plurality of pressure relieving recesses, each of said pressure relieving recesses being elongated and oriented generally radially, and each of said recesses being disposed circumferentially between an adjacent pair of said valve passages;

(c) one of said endcap member and said stationary valve member defining a region of relatively low fluid pressure disposed radially outward from said valve passages; and

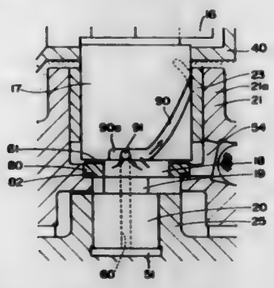
(d) each of said pressure relieving recesses being in fluid communication with said region of relatively low fluid pressure, thereby relieving any fluid pressure buildup between said endcap member and said stationary valve member tending to exert a separating force therebetween.

5,593,297

SCROLL TYPE COMPRESSOR

Nobuyuki Nakajima; Masakuni Ishikawa; Norikatsu Kiso; Nobukazu Takagi; Yukio Kazahaya, all of Konan, and Seiji Kuchiki, Ohra, all of Japan, assignors to Zexel Corporation, Tokyo, and Tama Manufacturing Co., Ltd., Gunma, both of Japan

Filed Jun. 16, 1995, Ser. No. 491,378
Claims priority, application Japan, Jun. 16, 1994, 6-157987
Int. Cl.[6] F01C *21/04*
U.S. Cl. 418—88 **16 Claims**



1. A scroll type compressor comprising:

a sealed case having a high pressure space;

a block having a through hole and being secured in said sealed case;

a main bearing positioned in said through hole of said block;

a drive unit mounted in said sealed case and having a rotary drive shaft which is rotatably mounted in said main bearing;

an orbiting shaft extending eccentrically from said drive shaft;

an orbiting scroll member having a bearing in which said orbiting shaft is inserted, said orbiting bearing and said orbiting shaft defining a bearing space;

a fixed scroll member secured to said block and being operably engaged with said orbiting scroll member;

a lubricating oil reservoir defined by an upper portion of said block and an interior surface of said sealed case, said reservoir being located within said high pressure space;

an oil space defined between said block and said main bearing and being in communication with said lubricating oil reservoir;

a spiral groove formed in an external surface of said drive shaft at an axial location thereof corresponding to said main bearing, and having a first end and a second end, wherein said first end is in fluid communication with said oil space and is the leading end relative to the direction of drive shaft rotation;

an oil intake opening formed in a sidewall of said drive shaft and communicating with said oil space;

an oil outlet opening formed in said orbiting shaft and communicating with said bearing space;

an oil induction passage fluidically communicating between said oil intake opening and said oil outlet opening to allow oil to flow from said oil space to said bearing space; and

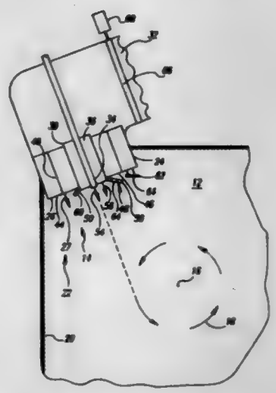
an oil intake assistance means for facilitsting the flow of oil into said spiral groove.

5,593,298

POLLUTANT REDUCING MODIFICATION OF A TANGENTIALLY FIRED FURNACE

John F. Hurley, Easton, and Edward O. Hartel, Orange, both of Conn., assignors to Combustion Components Associates, Inc., Monroe, Conn.

Filed Apr. 10, 1995, Ser. No. 419,366
Int. Cl.[6] F23M *3/00*
U.S. Cl. 431—9 **26 Claims**



10. A method for lowering NOX/SOX emissions in a tangentially fired furnace having a firing chamber with a vertical axis for providing a central location for a fireball, said method comprising:

(a) providing a main air-fuel compartment having a discharge face for air and fuel flow including a centrally positioned fuel nozzle and surrounding air passage;

(b) orienting said discharge face relative to a vertical axis providing a central location for a fireball in a tangentially fired furnace firing chamber whereby said discharge face has a half portion further from the axis and a half portion closer to the axis;

(c) discharging from said discharge face fuel and air flows oriented to a given side of the axis;

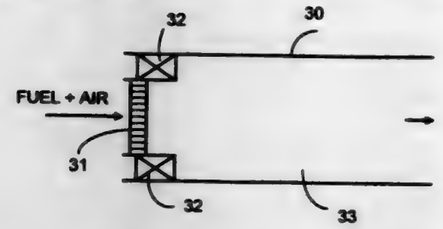
(d) restricting for air flow a part of said compartment discharge face half portion located closer to the axis so that less air flow from said compartment is directed into said central location for a fireball and a larger fraction of the total air for combustion of the fuel is supplied from said discharge face half portion further from the axis and therefore directed outside said central location for a fireball.

5,593,299

CATALYTIC METHOD

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 22,767, Feb. 25, 1993, abandoned, which is a continuation of Ser. No. 639,012, Jan. 9, 1991, abandoned. This application Feb. 17, 1994, Ser. No. 197,931
Int. Cl.[6] F02M *27/02*
U.S. Cl. 431—170 **2 Claims**



1. A catalytically stabilized gas phase combustion system comprising:

a. a thermal reaction chamber having a chamber inlet and containing means for inducing effective circulation and mixing of gases flowing from the conduit and through said chamber;

b. continuous catalytic ignition means mounted in the chamber inlet for stabilizing lean gas phase combustion in said chamber at a combustion temperature below about 1400° Kelvin; and

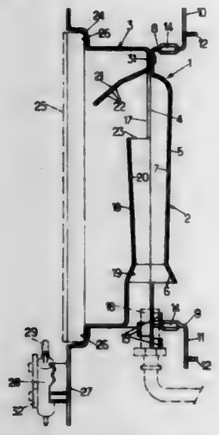
c. conduit means connected to the reaction chamber inlet for passing a lean admixture of fuel and air into the chamber for contact with said catalytic ignition means.

5,593,300

RADIANT BURNER BODY

Jean-Bernard L. M. de Gouville, Joue-les-Tours, France, assignor to Sourdillon, Veigne, France

Filed Dec. 20, 1994, Ser. No. 359,647
Claims priority, application France, Dec. 21, 1993, 93 15368
Int. Cl.[6] F23D *14/16*
U.S. Cl. 431—328 **10 Claims**



1. A metal body (1) for a gas burner suitable for use with an infrared radiant heater appliance, the body (1) having a generally elongate shape with an open front which is designed to receive a plate of an infrared heating appliance that generates infrared radiation, the body being constituted by two sheet metal parts (2, 3) that are cut out, stamped, and folded, said sheet metal parts (2, 3) comprising:

a generally U-shaped back part (2) formed by two branches (8, 9) and an elongate main face (4) with a depression (5) that projects outwards between the branches (8, 9) of the U-shaped back part (2) and that is longitudinally elongate, which depression (5) has an maximum depth and constitutes one-half of a tubular venturi shape, the branches (8, 9) of the U-shaped back part (2) extending a distance that is significantly greater than the maximum depth of the depression (5) such that the branches (8, 9) can engage a support; and

a front part (3) that is generally dish-shaped having an inside and an elongate bottom (17) of substantially the same shape as the main face (4) of the U-shaped back part (2) and presenting a longitudinally elongate depression (18) projecting into the dish-shaped front part (3), said depression (18) being shaped to constitute half a tubular venturi shape with an inlet and an outlet, a portion of said bottom (17) situated beyond the outlet of the venturi shape being cut out and folded towards the inside of the dish-shaped front part (3), so as to define an outlet opening (23) through which a mixture of gases flows from the outlet of the venturi shape and the inside of the dish-shaped front part (3), thereby forming a deflector (21) suitable for distributing the mixture of gases inside the dish-shaped front part (3); and

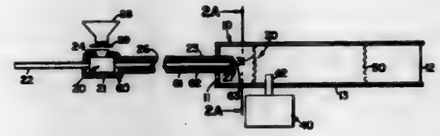
wherein said back and front parts (2, 3) are secured to each other after each of them has been formed individually by securing the main face (4) of the back part (2) to the bottom (17) of the dish-shaped front part (3).

5,593,301

APPARATUS AND METHOD FOR BURNING ENERGETIC MATERIAL

Millard M. Garrison, Edina, and Paul L. Miller, Minnetonka, both of Minn., assignors to Alliant Techsystems, Inc., Edina, Minn.

Filed Jul. 9, 1993, Ser. No. 89,240
Int. Cl.[6] F23D *14/46*
U.S. Cl. 431—350 **21 Claims**



1. An apparatus for burning combustible material comprising:

(a) a combustion chamber comprising an interior wall and having an intake end and an exhaust end;

(b) means for injecting the combustible material into the intake end of the chamber;

(c) means for igniting the combustible material whereby a flame front is generated, the ignition means positioned within the chamber; and

(d) means for providing a variance in pressure in the chamber between the intake and the ignition means, said pressure variance means comprising a baffle affixed to said combustion chamber interior wall, said baffle positioned in the flow of combustible material through the chamber, the baffle having at least one point thereon elevated from said plane in the direction of the intake end of the chamber and at least one surface tapering away from the elevated point generally in the direction of the exhaust end whereby the flame front is held substantially stationary in the chamber adjacent the pressure variance means.

5,593,302

COMBUSTION CHAMBER HAVING SELF-IGNITION

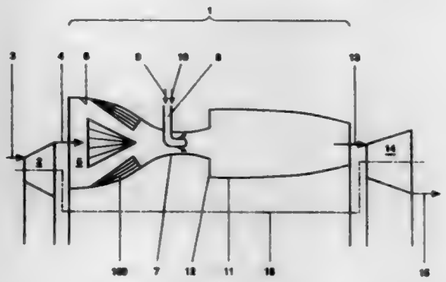
Rolf Althaus, Kobe, Japan; You-Pin Chyou, Taipei, Taiwan; Franz Joos, Weilheim/Bannholz, Germany, and Jakob J. Keller, Redmond, Wash., assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 31, 1995, Ser. No. 414,725

Claims priority, application Germany, May 19, 1994, 44 17 538.8

Int. Cl.[6] F23D *14/02*

U.S. Cl. 431—353 **11 Claims**



1. A combustion chamber for self-ignition of a fuel, comprising:
an inflow duct for a main gaseous flow;
a premixing duct downstream of and in fluid communication with the inflow duct;
a combustion duct downstream of and in fluid communication with the premixing duct, wherein the inflow duct, premixing duct and combustion duct are aligned on an axial direction of flow;
a plurality of vortex generators mounted adjacent one another about a periphery of the inflow duct;
a fuel nozzle for injecting into the premixing duct at least one of a gaseous and liquid fuel as a secondary flow into the gaseous main flow;
wherein the premixing duct is venturi-shaped and the fuel nozzle is positioned to inject fuel in a minimum cross sectional flow area of the premixing duct, and wherein a radially outward portion of the combustion duct forms a jump connecting the premixing duct and the combustion duct, the combustion duct having a greater cross sectional flow area than the premixing duct.

5,593,303

ATTACHMENT OF ORTHODONTIC BRACKETS

Morton Cohen, 647 Meadowbrook Dr., Huntingdon Valley, Pa. 19006, and Elliott Silverman, 1 Spring La., Linwood, N.J. 08221

Continuation-in-part of Ser. No. 215,266, Mar. 21, 1994, abandoned. This application Oct. 21, 1994, Ser. No. 327,233

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—9 **20 Claims**

1. A method for attaching an orthodontic bracket having a mounting surface to the surface of a tooth comprising:
placing, in the presence of saliva, a cement capable of setting in the presence of saliva between the surface of said tooth and said mounting surface; and
attaching said bracket to said tooth by permitting said cement to bond, in the presence of saliva, to both the surface of said tooth and said mounting surface.

5,593,304

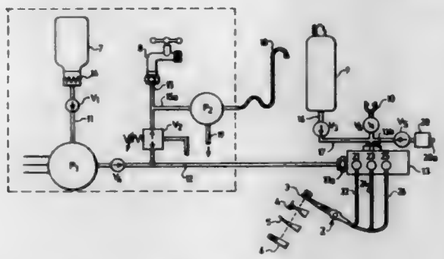
DENTAL APPARATUS INCLUDING MULTIPLE-USE ELECTRICALLY-OSCILLATED HANDPIECE

Zeev Ram, 9 Yaacov Street, 76262 Rehovot, Israel

Filed Jun. 16, 1995, Ser. No. 491,447

Int. Cl.[6] A61C *1/10;1/07;17/06*

U.S. Cl. 433—82 **20 Claims**



1. Dental apparatus, comprising:
a handpiece graspable at one end by a user;
a head at the opposite end of the handpiece including nozzle means for discharging a fluid;
a first conduit connectible at one end to a source of a flowable material, and connected at its opposite end to said nozzle means in the handpiece;
a second conduit connectible at one end to a source of a gas, and connected at its opposite end to said nozzle means in the handpiece;
an electrical oscillating drive within said handpiece for oscillating said head;
and a manual fluid selector device for manually selecting either said flowable material, said gas, or both, for conduction via their respective conduits to and through said nozzle means in the handpiece.

5,593,305

MOLDABLE DENTAL COMPOSITION

Itzhak Shoher, 50 Shlomo Hamelech St., Tel Aviv, and Aharon E. Whiteman, J. L. Peretz St., 13 Petach Tikvah, both of Israel

Continuation-in-part of Ser. No. 55,326, May 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 887,245, May 19, 1992, Pat. No. 5,234,343, which is a continuation of Ser. No. 801,028, Dec. 2, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 229,358

Int. Cl.[6] A61C *5/08*

U.S. Cl. 433—218 **19 Claims**



1. A moldable dental composition for forming a porous structure upon heat treatment having a void volume of at least 20%, said composition comprising high-fusing temperature metal particles and a binder comprising wax wherein said high-fusing particles have an irregular non-spherical geometry and a thin cross-sectional average thickness with at least 50% of the high fusing particles having an average thickness of less than 1.5 microns determined by measuring The surface area of the largest two dimensional planar image of each high fusing particle, computing the total surface area of all of the high fusing particles and dividing the cumulative surface area of the high fusing particles which are below 1.5 microns in average thickness by the computed total surface area.

5,593,306

MANIKIN UNIT

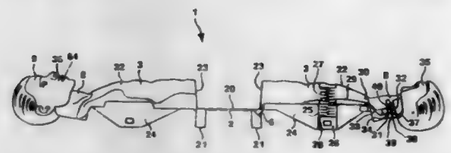
Ole B. Kohnke, Lyngby, Denmark, assignor to Ambu International A/S, Glostrup, Denmark

Filed Oct. 18, 1995, Ser. No. 544,888

Claims priority, application Denmark, Oct. 19, 1994, 1209/94

Int. Cl.[6] G09B *23/32*

U.S. Cl. 434—267 **10 Claims**



1. A manikin unit for teaching cardio-pulmonary resuscitation (CPR) techniques, including ventilation and external cardiac massage, said unit being adapted for being arranged flat on a substantially horizontal surface and comprising a first manikin and a second manikin and a chest extension structure, each of said manikins respectively comprising
a head means having a mouth opening,
a neck means connected to said head means,
a throat means in communication with said mouth opening,
a lung means in communication with said throat means, and
a chest means having a proximal and a distal end and connected by said proximal end to said neck means, said chest means comprising a flexible front plate formed to imitate the human chest, a back plate and a resilient compression means arranged between said front plate and said back plate and adapted to provide a force counteracting compression of said plates,
said chest extension structure being provided with a first pivot means and a second pivot means defining, respectively, a first pivot axis and a second pivot axis, the chest means of said first manikin being pivotably connected by said first manikin chest means' distal end to said first pivot means with said first pivot axis extending in a direction transversely to said first manikin chest means, and
the chest means of said second manikin being pivotably connected by said second manikin chest means' distal end to said second pivot means with said second pivot axis extending in a direction transversely to said second manikin chest means,
whereby said first and said second chest means may pivot relative to said chest extension structure between an in-use position wherein said first and said second chest means may be arranged flat on a common, substantially horizontal surface and a storage position wherein said first and said second chest means extend generally parallel to one another.

5,593,307

CONNECTOR INCLUDING AN INSULATIVE BRIDGE

Alain Bale, Chauffour Notre Dame, and Patrick Champion, Change, both of France, assignors to Framatome Connectors International, Paris, France

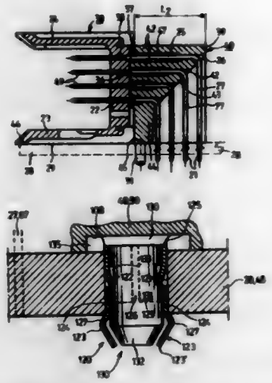
Filed Oct. 18, 1994, Ser. No. 325,656

Claims priority, application France, Oct. 19, 1993, 93 12445

Int. Cl.[6] H01R *23/70*

U.S. Cl. 439—79 **9 Claims**

1. Connector including an insulative bridge having a U-shape cross-section, said bridge comprising a central region and two lateral branches, and elbow electrical contact members having front contact regions force-fitted in through openings of the central region of the bridge, and extended rearwardly by straight regions, a rear insulative body assembled to said bridge, elbow regions joining said straight regions and holding together said U-shaped bridge and said rear insulative body, and rear contact regions, a retaining peg for fixing the connector to a flat support, said rear insulative body surrounding said electrical contact members in at least one area between said front contact region and said elbow region, said retaining peg being fastened to one side of said rear insulative body.



5,593,308

CONNECTING ASSEMBLY FOR IGNITION PLUG IN GASOLINE ENGINE AND METHOD FOR PRODUCING SAME

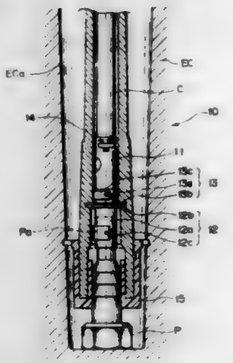
Yoshinao Kobayashi, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Continuation of Ser. No. 120,272, Sep. 10, 1993, abandoned. This application Sep. 3, 1995, Ser. No. 538,787

Claims priority, application Japan, Sep. 25, 1992, 4-280851

Int. Cl.[6] H01R *13/44*

U.S. Cl. 439—125 **2 Claims**



1. A connecting assembly for an ignition plug for a gasoline engine wherein a high tension cable is connected to said ignition plug, said assembly comprising:
a high tension supply terminal electrically connected to said cable;
an ignition plug connecting terminal having a terminal flange at one end and a pair of through holes at another end, said terminal being formed by deep-drawing a sheet of thin metal plate and adapted to receive a distal end of said ignition plug at said other end;

a high tension supply terminal socket between said connecting terminal and said supply terminal, said socket having a socket flange at one end and a pair of through holes at another end, said socket being formed by deep-drawing a sheet of thin metal plate and adapted to receive a distal end of said supply terminal, said terminal flange and said socket flange being in electrical contact with each other;

a retainer ring at least partially encircling each of said connecting terminal and socket and having two retaining protuberances on an inner surface thereof, two through holes in each of said connecting terminal and socket complementary to said retaining protuberances, whereby said retaining protuberances project radially inwardly of said inner surface so that, when said distal ends of said plug and terminal are introduced into said connecting terminal and socket respectively, said rings are urged resiliently and radially outwardly, thereby retaining said distal ends in said connector terminal and socket; and

a substantially cylindrical, non-conducting plug cap adapted to receive said connecting terminal and socket with said flanges embedded therein.

5,593,309

ELECTRICAL CONNECTOR HAVING IMPROVED LATCHING/UNLATCHING FEATURE

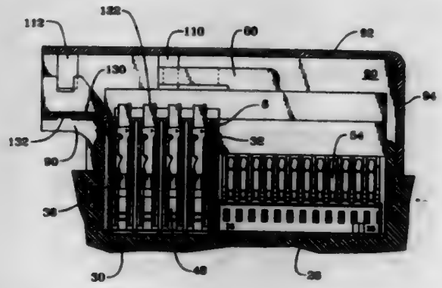
Lothar A. Post, Offenbach, and Jörg Kunze, Rüsselsheim, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 362,383

Claims priority, application United Kingdom, Feb. 10, 1994, 9402570

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—157 **19 Claims**



1. An electrical connector assembly comprised of a first electrical connector, a second electrical connector, and a camming slide having either inclined camming grooves or camming lugs, with said second connector having either camming lugs or camming grooves, the assembly being characterized in that said camming slide is profiled as a cover member movable transversely of said first connector in an axially retained manner, from a prelocked position, where said camming lugs can enter said camming grooves, to a position where said cover member substantially encloses a rear wire entry face of said first connector.

5,593,310

CABLE TYPE ELECTRIC CONNECTOR

Akio Kawamoto, and Kazuhiro Kaneko, both of Fuji City, Japan, assignors to Nihon Plast Co., Ltd., Fuji City, Japan

Filed Dec. 27, 1994, Ser. No. 364,043

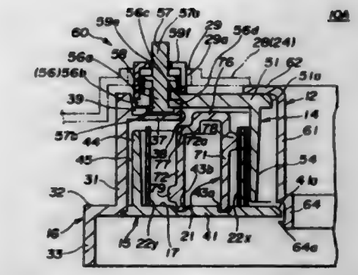
Claims priority, application Japan, Dec. 27, 1993, 5-333872; Mar. 24, 1994, 6-053705; Mar. 28, 1994, 6-057685

Int. Cl.[6] H01R *35/00*

U.S. Cl. 439—164 **7 Claims**

1. A cable type electric connector comprising:

an annular housing structure having a first cable leading portion;



an annular guide body rotatably and coaxially received in said annular housing structure, said annular guide body having a cable passing slot;

an annular rotor coaxially disposed on said annular housing structure, said annular rotor having a second cable leading portion;

a flat cable passed through said cable passing slot of said annular guide body so that said flat cable is divided into an inner flat cable part movably received in a circular space surrounded by said annular guide body and an outer flat cable part movably received in an annular space formed around said annular guide body, said inner flat cable part having an inner end exposed to the outside of the connector through said second cable leading portion and said other flat cable part having an outer end exposed to the outside of the connector through said first cable leading portion; and

a lock mechanism for preventing rotary movement of at least one of said annular rotor and said annular guide body relative to said annular housing structure,

in which said lock mechanism comprises:

a lock bar detachably connected to said annular rotor, said lock bar being axially movable between an inoperative position wherein said lock bar is disengaged from said annular housing structure and an operative position wherein said lock bar is engaged with said annular housing structure;

biasing means for biasing said lock bar in a direction to take said inoperative position; and

lock assuring means for assuring the engagement of said lock bar with said annular housing structure when said lock bar in the operative position is turned about a longitudinal axis thereof by a given angle.

5,593,311

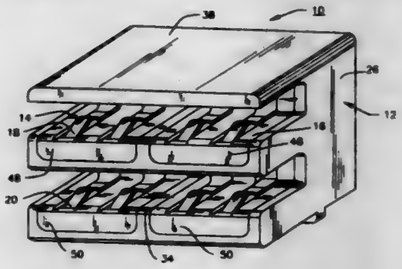
SHIELDED COMPACT DATA CONNECTOR

Brent B. Lybrand, Spartanburg, S.C., assignor to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jul. 14, 1993, Ser. No. 92,049

Int. Cl.[6] H01R *13/28;13/658*

U.S. Cl. 439—295 **27 Claims**



1. An electrical connector comprising:

an electrically conductive outer housing having a plurality of discrete bounded compartments;

electrically insulative terminal support elements, each said support element being accommodated in one of said bounded compartments, a pair of said electrically insulative terminal support elements being formed integrally in stacked relation,

said stacked terminal support elements having portions resident in a pair of vertically aligned said bounded compartments of said outer housing; and

plural transmission terminal devices supported in at least one said support element;

said terminal devices of said one support element being electrically shielded from the other said support elements by said bounded compartment.

5,593,312

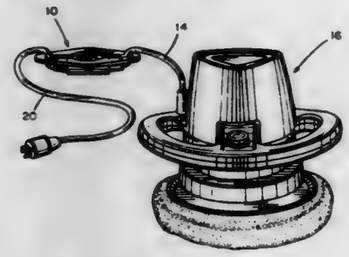
ELECTRICAL CORD LOCK

Robert E. McCracken, Tucson, Ariz., assignor to Waxing Corporation of America, Inc., Elmhurst, Ill.

Filed Jun. 7, 1995, Ser. No. 488,269

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—369 **11 Claims**



1. A locking device for maintaining a mating connection between female male ends of electrical cords, the locking device comprising:

a locking member comprising a flat rigid element having opposed flat sides;

aperture means in the locking member for receiving an electrical cord having an enlarged plug head or socket head at an end thereof to be inserted through said aperture means in a direction from one side to the other side of opposed flat sides; and

at least one elongated slot extending transversely with respect to said insertion direction, said at least one slot formed in the locking member connected to the aperture means and being configured so that after the cord and its head are inserted through the aperture means the cord can be slid in the slot, and so that the cord is press fit into the slot thereby creating a frictional resistance to force on the cord.

5,593,313

SOCKET WITH A PLUG LOCKING MECHANISM

Norio Shibuya, and Norihiro Oura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 325,150, Oct. 20, 1994, abandoned. This application Nov. 20, 1995, Ser. No. 560,631

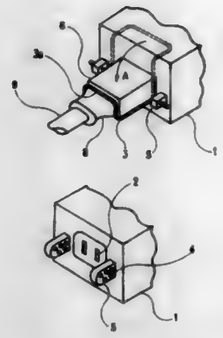
Claims priority, application Japan, Nov. 25, 1993, 5-294978

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—373 **10 Claims**

1. A socket with a plug locking mechanism and for receiving a plug, said plug including a first end, a second end, a rear part at said first end, and a terminal projecting from said second end, said socket comprising:

a socket body having a first surface and an opening on said first surface for receiving said terminal of said plug;



a receptacle provided in said body for supplying electric power to said terminal of said plug when said terminal is inserted in said opening of said socket body;

first and second projecting pans provided on said first surface of said socket body, each of said first and second projecting parts having a plurality of holes; and

a spring having a first end, a second end, and a locking part coupled between said first and second ends thereof, said first end of said spring being positioned in one of said plurality of holes of said first projecting part,

said second end of said spring being positioned in one of said plurality of holes of said second projecting part, said spring being rotatably movable in first and second positions about an axis between said first and second ends thereof, said locking part engaging said rear part of said socket when said spring is positioned in said first position.

5,593,314

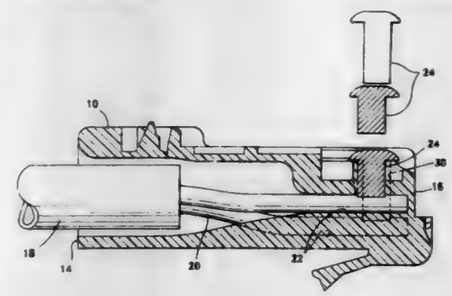
STAGGERED TERMINAL ARRAY FOR MOD PLUG

Clifford F. Lincoln, Atlanta, Ga., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 31, 1995, Ser. No. 381,383

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—418 **4 Claims**



1. An electrical connector of the modular plug type, comprising:

a dielectric housing which opens inwardly to a plurality of conductor receiving slots disposed in a vertically staggered array, the slots being arranged to receive a respective plurality of insulated conductors extending longitudinally in the housing, the housing carrying a plurality of insulation piercing blades which are arranged for being driven into respective ones of said slots, each of said blades being substantially planar with the plane of each blade being aligned in a respective longitudinal plane, each of said blades having an insulation piercing end for electrically engaging a respective one of said conductors, and a contact end for electrically engaging a respective terminal in a matable connector, said insulation

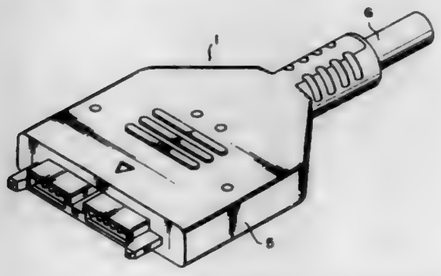
piercing ends being arranged in a vertically staggered array corresponding to the vertically staggered array of said slots, and said blades being further arranged in a longitudinally staggered array, thereby reducing mutually opposed areas of adjacent said blades so as to decrease capacitive coupling and mutual inductance between said adjacent blades during high speed signal transmission.

5,593,315

CONNECTOR READILY ASSEMBLED WITH A CABLE ACCURATELY POSITIONED WITHOUT USING TOOLS

Hiroaki Kinoshita, and Tadashi Ishiwa, both of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited, Japan

Filed Mar. 30, 1995, Ser. No. 413,627
Claims priority, application Japan, Mar. 31, 1994, 6-063414
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—459 **7 Claims**



1. A connector connected to a cable composed of a plurality of electric wires, each of said wires comprising a metal wire covered with an insulator, and a sheath having an opening formed at its terminal end, said sheath covering said electric wires with one end portion of each of said electric wires projecting from said opening, said connector comprising an insulating base member, a plurality of conductive contact elements fixedly supported in said base member, an insulating cover member removably coupled to said base member and covering terminal portions of said contact elements respectively connected to said metal wires, and an outer cover formed by molding plastic material to surround said base member and said cover member, wherein said cover member comprises:

an electric wire positioning portion for holding terminal ends of said one end portions of said electric wires so that said terminal ends confront said contact elements corresponding thereto, respectively;

a cable holding portion for holding said cable at an end portion of said sheath adjacent said opening;

an electric wire receiving portion between said electric wire positioning and said cable holding portions for receiving remaining parts of said one end portions of said electric wires except said terminal ends, each of said remaining parts being between each of said terminal ends of said electric wires and said opening of said sheath; and

an electric wire pushing portion for pressing said remaining parts against said electric wire receiving portion.

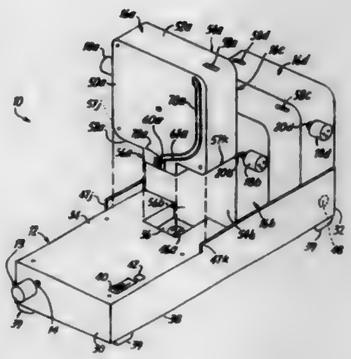
5,593,316

RETRACTABLE EXTENSION CORD

Terry L. Lyons, 8580 Braxton Dr., Eden Prairie, Minn. 55347

Filed Sep. 12, 1995, Ser. No. 527,033
Int. Cl.[6] H01R *13/72*
U.S. Cl. 439—501 **17 Claims**

8. A device for electrically connecting a plurality of electrical devices with a source of electrical energy, the devices comprising:



a base unit, including:

a base support having a channel therein;

a primary power cord adapted for connection to the source of electrical energy;

a primary reel rotatably attached to the base support and having the primary power cord at least partially wound thereon; and

a plurality of separate connectors electrically connected to the primary power cord; and a plurality of modular units suitable for removable seating in the channel of the base support of the base unit, wherein each modular unit includes:

a modular conductor adapted for connection to one of the plurality of separate connectors when the modular unit holding the modular conductor is seated in the channel of the base support, and adapted for providing a remote source of electrical energy to the plurality of electrical devices; and

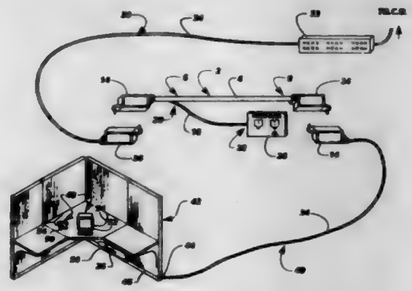
a modular reel having the modular conductor at least partially wound thereon, the modular reel being configured for extension and retraction of the modular conductor while the modular unit is seated in the channel.

5,593,317

MODULAR FURNITURE COMMUNICATION SYSTEM

Marvin L. Humbles, Collinsville, Ill., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 31, 1994, Ser. No. 298,197
Int. Cl.[6] H01R *11/00*
U.S. Cl. 439—502 **20 Claims**



1. A telecommunications cabling assembly comprising:

a first cable segment having first and second ends, said first cable segment having a plurality of wires;

a first connector of a first gender type disposed on said first end of said first cable segment, wherein at least two of said wires located at said first end of said first cable segment are terminated according to a predetermined wiring plan in said first connector and the remaining complementary wires remain unterminated in said first connector;

a second connector of an opposite gender type disposed on said second end of said first cable segment, wherein said terminated wires of said first connector are terminated in said second connector at said second end of said first cable segment;

a second cable segment having first and second ends, said second cable segment having a plurality of wires, wherein a wire of said second cable segment is terminated according to the predetermined wiring plan in said first connector in a location conventionally reserved for said unterminated wires of said first cable segment;

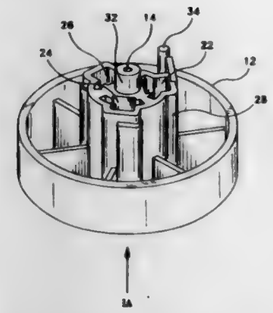
whereby a single preselected signal path is provided for connection to a user telecommunications device enabling transmission of electrical signals at a rate of 100 Mbs through said telecommunications cabling assembly.

5,593,318

ELECTRICAL RECEPTACLE FOR PHOTOELECTRIC CONTROLLER

Edward B. Bilson, Memphis; Mark T. Wedell, Germantown, both of Tenn., and Thomas A. Zimmermann, Southaven, Miss., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jul. 10, 1995, Ser. No. 500,385
Int. Cl.[6] H01R *13/73*
U.S. Cl. 439—573 **15 Claims**



1. A photoelectric control receptacle assembly for attachment to a luminaire housing, the receptacle assembly comprising:

an insulative body having a plurality of contact seating channels extending therethrough along axes parallel to a contact member insertion axis,

said body defining a projecting anti-rotation member extending rearwardly from a bottom surface thereof and parallel to the contact member insertion axis;

a plurality of electrical contact members seated in said housing channels individually along said axes parallel to said contact member insertion axis;

a clamp member for securing said receptacle assembly to the luminaire housing, said clamp member having means in engagement with said body anti-rotation member; and,

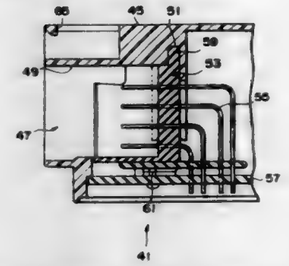
a fastener for joining said body and said clamp member, said clamp member being prevented from rotational movement relative to said body as a result of said engagement between said clamp surface and said body anti-rotational member.

5,593,319

CONNECTOR MEMBER COMPRISING A CASING HAVING A COUNTERPART MEMBER RECEIVING SPACE LINED WITH A WATER-TIGHT SEALING MEMBER

Akira Ohno, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Limited, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 338,253
Claims priority, application Japan, Mar. 18, 1994, 6-048569
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—587 **10 Claims**



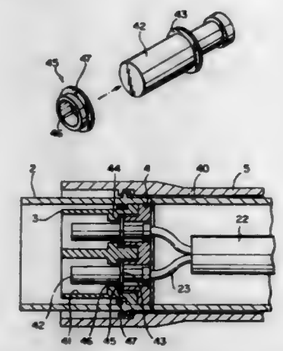
1. A connector member for making a connection to a counterpart member, said connector member comprising an insulator body having peripheral side walls, a plurality of conductive contacts rigidly held by said insulator body, a casing having an inside surface defining an opening forming a complementary counterpart member receiving space for receiving said counterpart member, and said counterpart member comprising a peripheral counterpart sealing means for providing a water-tight seal together with a connector sealing member integrally attached to said inside surface of said opening for providing a water-tight seal between said peripheral side walls and said peripheral sealing means and said counterpart member when said counterpart member is received within said counterpart member receiving space.

5,593,320

WATERPROOF CONNECTOR

Kazumoto Kondo, Yokkaichi, and Yoshihiko Hotta, Wako, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Nov. 1, 1994, Ser. No. 333,146
Claims priority, application Japan, Nov. 4, 1993, 5-301068
Int. Cl.[6] H01R *13/436;13/52*
U.S. Cl. 439—589 **1 Claim**



1. A waterproof connector wherein terminal metal contacts are inserted in cavities in a connector housing, characterized in that a waterproofing annular member comprised of a short sleeve portion

and a rear flange portion to form an L-shaped cross-section is disposed between an inner periphery of each cavity and an outer periphery of each of said terminal metal contacts

said flange portion of the waterproofing annular member being compressed in an axial direction and between an engaging face formed on said inner periphery of said cavity and an engaging flange formed on said outer periphery of each of said terminal metal contacts and the sleeve portion compressed radially between the outer periphery of each of said contacts and the inner periphery of said cavity.

5,593,321

INTEGRAL SEAL AND STRAIN RELIEF MEMBER FOR A CONNECTOR

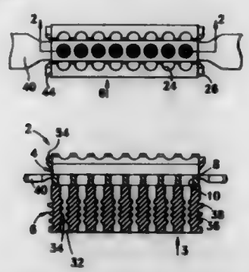
Gheorghe Boteu, Griesheim, Germany, assignor to The Whitaker Corporation, Wilmington, Del.

Filed May 1, 1995, Ser. No. 432,308

Claims priority, application United Kingdom, May 3, 1994, 9408755

Int. Cl.[6] H01R *13/40*

U.S. Cl. 439—589 **18 Claims**



1. A seal and strain relief assembly comprising a molded elastomeric seal for sealing between one or more conductors and a connector housing, the seal comprising one or more conductor receiving cavities extending therethrough for sealing around the conductors, and an outer sealing surface for sealing against the housing, the assembly further comprising a molded strain relief member of more rigid material than the seal, having a strain relief section for securely gripping the one or more conductors, the assembly characterized in that the strain relief member and said seal are molded together as an integral part and that the strain relief member comprises at least one support wall extending into the seal in substantially the same direction as the conductor receiving cavities.

5,593,322

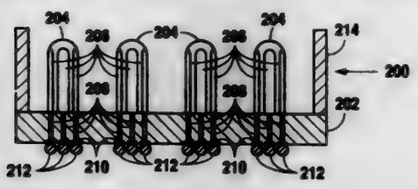
LEADLESS HIGH DENSITY CONNECTOR

Deepak Swamy, and Victor Pecone, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Jan. 17, 1995, Ser. No. 375,328

Int. Cl.[6] H01R *23/00*

U.S. Cl. 439—660 **19 Claims**



1. A high density connector, comprising:

a connector body having top and bottom surfaces including a plurality of non-conductive connector pins integrally mounted on said top surface of said connector;

a plurality of conductive traces brazed on each of said plurality of connector pins;

a plurality of solder balls forming a ball grid array on said bottom surface of said connector body; and

a plurality of conductors for electrically coupling each of said plurality of conductive traces to corresponding ones of said plurality of solder balls.

5,593,323

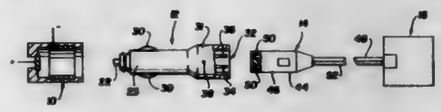
REVERSIBLE POLARITY ACCESSORY CABLE

James U. Dernehl, Arlington, Tex., assignor to Operating Technical Electronics, Inc., Grand Prairie, Tex.

Filed Jan. 13, 1995, Ser. No. 372,348

Int. Cl.[6] H01R *17/18*

U.S. Cl. 439—668 **20 Claims**



1. An adapter for supplying D.C. current from a conventional D.C. lighter receptacle to a remote accessory comprising:

(a) a plug having a first positive terminal and a first negative terminal adapted to mate with the respective positive and negative terminals of a conventional D.C. lighter receptacle and having an output receptacle with a second positive terminal and a second negative terminal;

(b) a D.C. cable having first and second ends;

(c) a reversible connector on the first end of said cable having first and second substantially oppositely disposed surfaces and first and second contacts adapted to mate with said second positive terminal and said second negative terminal in said output receptacle in two alternative orientations which change the polarity of electrical connection; and

(d) a display on at least one of said first and second surfaces visually indicating the polarity of the interconnection between said reversible connector and said output receptacle.

5,593,324

ELECTRIC BULB SOCKET

Katsuya Ito, Mie Pref., Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Dec. 23, 1994, Ser. No. 362,854

Claims priority, application Japan, Dec. 27, 1993, 5-350074

Int. Cl.[6] H07R *13/625*

U.S. Cl. 439—672 **5 Claims**

1. An electric bulb socket to which an electric bulb having an electrode on the bottom of a cylindrical base thereof is attached, the electric bulb socket comprising:

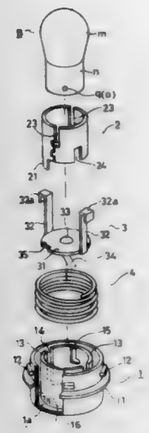
a generally cylindrical socket housing having an open end through which the base of the electric bulb is inserted thereinto, and a bottom;

a spring support accommodated in the socket housing so as to face the bottom of the base of the electric bulb, the spring support having an electric supply side electrode against which the electrode of the electric bulb abuts when the base of the electric bulb is inserted in the socket housing;

a spring member provided in the socket housing so as to be located outside the spring support, the spring member urging the spring support so that the spring support is raised toward the open end of the socket housing;

wherein the spring support comprises a bottom plate facing the bottom of the base of the electric bulb and an arm extending from the peripheral edge of the bottom plate toward the open end of the socket housing; and

wherein the spring member is disposed to be parallel to the arm of the spring support and has one of two ends abutting against the bottom of the socket housing and the other end connected to an end of the arm.



5,593,325

LOW-VOLTAGE SWITCHING APPARATUS

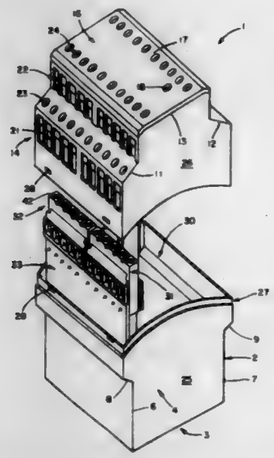
Werner Bender, Ostfildern, Germany, assignor to Pilz GmbH & Co., Germany

Filed Jan. 11, 1995, Ser. No. 371,020

Claims priority, application Germany, Jan. 11, 1994, 44 00 484.2

Int. Cl.[6] H01R *9/22*

U.S. Cl. 439—709 **25 Claims**



1. A low-voltage switching apparatus for connecting wires to an electrical circuit disposed within the switching apparatus, comprising in combination:

(a) a two-part housing enclosing an interior space, the two-part housing including a back side, two side surfaces lying parallel and spaced from one another, and first and second connection sides lying parallel and spaced from one another and disposed at a right angle to the side surfaces, the two-part housing including an operating surface;

(b) a conductor plate held in a fixed position within the two-part housing by a holding arrangement and arranged substantially parallel to the first connection side;

(c) an electrically insulating molded body having a support surface lying against the conductor plate;

(d) at least one screw terminal arranged in the electrically insulating molded body, each screw terminal having a terminal opening, a terminal screw standing at a right angle to the terminal opening, and a soldering lug arranged parallel to the terminal opening and soldered to the conductor plate;

(e) the two-part housing including connection openings on at least the first connection side, the connection openings providing access to terminal openings of the screw terminals from outside the two-part housing, and

(f) the two-part housing further including access openings on the operating surface, the access openings providing access to terminal screws of the screw terminals to allow actuation of the terminal screw.

5,593,326

ELECTRICAL CONNECTOR WITH SECONDARY LATCH

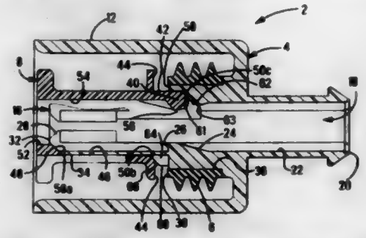
Martin Listing, Langen, Germany, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 27, 1995, Ser. No. 411,007

Claims priority, application Germany, Apr. 13, 1994, 9407293.1

Int. Cl.[6] H01R *13/514*

U.S. Cl. 439—752 **10 Claims**



1. An electrical connector comprising a housing having a body with a cavity therethrough for receiving a contact, the body having a nose portion and an opening transversely across and into communication with the cavity, the connector further including a secondary locking member for retaining the contact within the cavity, the secondary locking member being fitted at the nose portion and including a retention member that is receivable through the opening, a first bearing surface and a second bearing surface, the secondary locking member having a first position where the retention member is sufficiently clear of the cavity such that the contact can be inserted as removed therefrom and the first bearing surfaces correspond to the nose portion and a second position where the retention member extends through the opening and into the cavity for cooperation with a shoulder of the contact to prevent withdrawal of the contact and the second bearing surfaces correspond to the nose portion, the secondary locking member being displaceable transversely and longitudinally between the first and second positions.

5,593,327

CABLE CONNECTOR

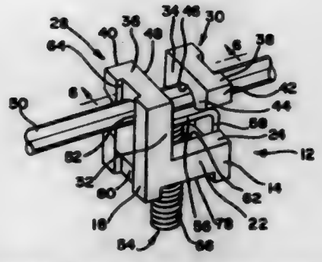
Emil J. Hlinsky, Oak Brook, and Yury Galperin, Niles, both of Ill., assignors to MacLean-Fogg Company, Mundelein, Ill.

Filed Aug. 4, 1995, Ser. No. 511,358

Int. Cl.[6] H01R *4/36*

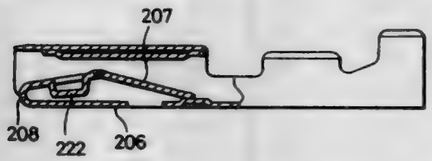
U.S. Cl. 439—811 **19 Claims**

1. A cable connector for attachment to a cable and comprising:



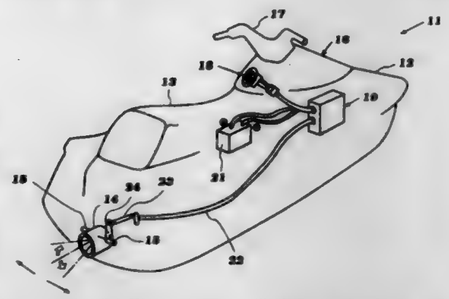
a base lying in an X-Y plane of a generally orthogonal X-Y coordinate system;
a pair of cable retention structures each including an upstanding post and a cable retention arm extending from said post;
said upstanding posts extending from said base at locations spaced apart from one another along both the X and Y axes;
said cable retention arms being spaced from said base and being generally parallel to one another and extending from said posts in opposite X axis directions;
each cable retention arm having a free end opposed in the Y direction from said post of the other cable retention structure;
a cable entry slot extending in the X axis direction between said cable retention arms and between said posts;
a cable retention path extending in the Y axis direction above said base and beneath said cable retention arms and between said posts; and
means for clamping a cable against said cable retention arms.

5,593,328
FEMALE TERMINAL FITTING FOR CONNECTOR
Hajime Okada; Masahiko Aoyama, and Tomonari Ito, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Nov. 1, 1994, Ser. No. 332,084
Claims priority, application Japan, Nov. 4, 1993, 5-064261 U; Nov. 15, 1993, 5-065966 U; Nov. 24, 1993, 5-067563 U; Dec. 22, 1993, 5-073558 U
Int. Cl.[6] H01R *11/22*
U.S. Cl. 439—851 **7 Claims**



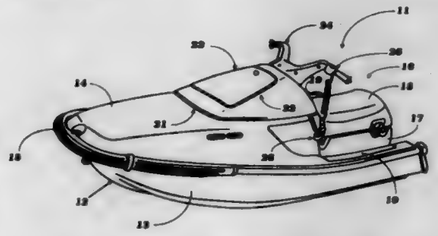
1. A female terminal fitting for a connector comprising:
a cylindrical insertion portion whose front end is and
a resilient contact piece is disposed within said cylindrical insertion portion, said resilient contact piece including,
a first fold being formed by extending an extending end portion from a wall portion of said cylindrical insertion portion and folding the extending end portion back into a hollow of the cylindrical insertion portion, said first fold being given resiliency,
a second fold being formed by further folding the extending end portion inward, said second fold being given resiliency, and
a stopper for regulating an amount of flexure of said resilient contact piece, said stopper being formed by bending the extending end portion of said second fold so as to confront a back surface between said first fold and said second fold, wherein a male terminal fitting is retained in pressure contact with said resilient contact piece by inserting said male terminal fitting into said cylindrical insertion portion.

5,593,329
WATER INJECTION PROPULSION DEVICE
Naoki Kato, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Sep. 20, 1993, Ser. No. 124,297
Claims priority, application Japan, Sep. 18, 1992, 4-273389
Int. Cl.[6] B63H *11/113*
U.S. Cl. 440—42 **4 Claims**



1. A jet propelled watercraft hull having a discharge nozzle pivotal about a vertically extending steering axis and configured to discharge water at all times when water is pumped by an associated impeller for powering an associated watercraft, a handlebar steering control carried by said hull remotely from said discharge nozzle for pivoting said steering nozzle about said steering axis, said watercraft hull having a portion juxtaposed to said discharge nozzle, said discharge nozzle also being pivotal about a generally horizontal axis for adjusting the trim of said watercraft, and power means comprising a reversible electric drive motor and a transmission for transmitting motion from said reversible electric drive motor to said discharge nozzle for effecting said pivotal movement, said transmission being self-locking at all trim positions of said discharge nozzle so as to preclude pivotal movement under the force of water pressure when said drive motor is not energized, and a control for controlling said drive motor comprised of an electrical switch carried by said handlebar steering control.

5,593,330
LOCK SYSTEM FOR A WATERCRAFT
Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan
Filed Dec. 1, 1994, Ser. No. 347,857
Int. Cl.[6] B60K *41/00*
U.S. Cl. 440—84 **17 Claims**



1. A control for a watercraft comprised of a hull having a passenger's area for accommodating a rider, a battery for supplying electrical power to said watercraft, a safety switch coupled to a rider for disabling a circuit from said battery if a rider leaves the passenger's area, a key operated water sealed main, switch positioned in an enclosed area and serving the sole function of controlling the transmission of electrical power from said battery to all electrically operated components of said watercraft and controlling said circuit and all other electrical circuits for precluding the supply of electrical power from said battery to said circuit and all other electrical circuits.

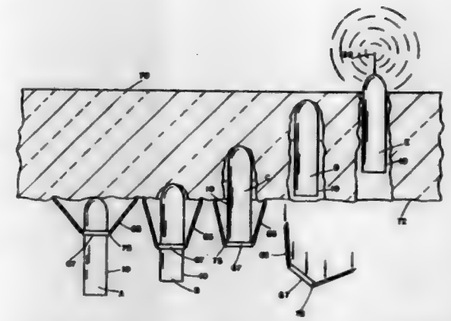
5,593,331
MARINE MARKER
John J. Duren, West Bend, Wis., assignor to Smith & Newphew Rolyan Inc., Germantown, Wis.
Filed Jul. 3, 1995, Ser. No. 497,806
Int. Cl.[6] B60L *11/02*
U.S. Cl. 441—6 **10 Claims**



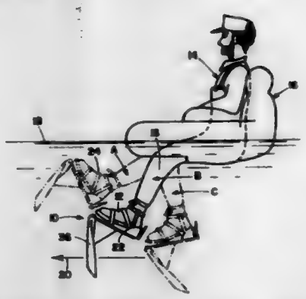
1. A marine marker for placement in a navigable body of water comprising:
a closeable elongated container of generally circular cross section between its two ends and having an opening at one end whereby said container may be filed with a buoyant material lighter than water;
ballast material disposed in the end of said container opposite said open end;
said container being constructed of multiple layers of resin material including an inner structural layer of high density polyethylene, an outermost layer of nylon and having therebetween a layer of ethylene vinyl alcohol;
and means for closing said container in watertight condition whereby said ballast material is maintained in water-free condition.

5,593,332
ICE PENETRATING COMMUNICATION BUOY
Jeffry H. Green, S. Elgin, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Sep. 20, 1988, Ser. No. 247,123
Int. Cl.[6] B63B *22/00;22/24*
U.S. Cl. 441—7 **8 Claims**

1. A signal buoy, comprising:
a containment member having a first portion and a second portion, said first and second portions being generally cylindrical and arranged in coaxial relation with each other, said first and second portions being arranged in slidable relation with each other along a common axis in response to an increase of pressure within said containment member, said containment member having a first end and a second end, said second end being heavier than said first end, said containment member being generally impermeable to water and buoyant in water;
a heat source disposed within said containment member;
means for disposing a pool of liquid in thermal communication with said heat source, said pool dispensing means being disposed within said containment member;
means for directing vaporized fluid, resulting from said thermal communication of said pool of liquid and said heat source, into thermal communication with said first end of said containment member;
a transmitter disposed within said containment member;
an antenna connected in signal communication with said transmitter; and
means attached to an outer surface of said containment member for maintaining said buoy in a predetermined attitude with respect to a surface of an external body when said buoy is in contact with said surface.



5,593,333
FIN ASSEMBLY FOR FLOAT TUBE USERS
Carroll L. Johnson, 2658 Paradise Way, Grand Junction, Colo. 81506
Filed Oct. 30, 1995, Ser. No. 550,021
Int. Cl.[6] A63B *31/11*
U.S. Cl. 441—62 **29 Claims**



1. A fin assembly for attachment to a boot of a float tube user, said boot having a sole, a toe, and a heel, said assembly comprising:
a base member including means for attachment to a boot, said base member having a front portion for attachment proximate the toe of said boot and a rear portion for attachment proximate the heel of said boot;
a fin member having front and rear ends;
hinge means for pivotally mounting the front end of said fin member to the front end portion of said base member, said fin member being pivotally movable between a first operational position wherein said fin member rear end projects below said base member to provide substantial resistance to flow of water as said fin member is moved in a rearward direction relative to said user for propelling said user forwardly in the water, and a second operational position wherein said fin member

rear end is aligned proximate said base member rear portion to provide substantially reduced resistance to flow of water as said fin member is moved in a forward direction relative to said user, said hinge means including bias means for urging said fin member toward its first operational position wherein said fin member rear end projects below said base member; and

means for limiting the maximum angle between said fin member in its first operational position and the plane of said base member.

5,593,334

WATER WALKERS

Thomas E. Thayer, 5204 Roosevelt St., Bethesda, Md. 20814

Filed Aug. 9, 1995, Ser. No. 512,977
Int. Cl.[6] B63B *35/83*
U.S. Cl. 441—77 **30 Claims**



1. A water walking system comprising:

a pair of flotation devices, each flotation device comprising:

a plurality of inflatable tubes substantially attached to one another along a longitudinal portion of each said tubes;

a foot well located between said plurality of inflatable tubes;

a foot plate at a bottom portion of said foot well for providing a platform for such foot; and

a tubular support structure which is connected to said plurality of inflatable tubes through a sleeve located at a bottom portion of said inflatable tubes along a center longitude of said flotation device, in order to provide structural support to said flotation device.

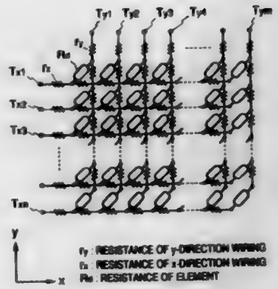
5,593,335

METHOD OF MANUFACTURING AN ELECTRON SOURCE

Hidetoshi Suzuki, Fujisawa; Yoshiyuki Osada; Ichiro Nomura, both of Atsugi; Takeo Ono, Machida; Hisaki Kawade, Yokohama; Eiji Yamaguchi, Zama; Toshihiko Takeda, Atsugi; Hiroaki Tochima, Tokyo; Yasuhiro Hamamoto, Atsugi; Tatsuya Iwasaki, Atsugi; Aoji Iseno, Atsugi; Noritake Suzuki, Atsugi; Yasuyuki Todokoro, Yokohama; Masahiro Okuda, Zama, and Katsuhiko Shinjo, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 223,528
Claims priority, application Japan, Apr. 5, 1993, 5-077900; Apr. 5, 1993, 5-078164; Apr. 5, 1993, 5-100067; Apr. 5, 1993, 5-100068; Oct. 28, 1993, 5-270343; Mar. 25, 1994, 6-055493
Int. Cl.[6] H01J *1/30;9/02*
U.S. Cl. 445—50 **37 Claims**

32. The method according to claim 31, wherein the plurality of wires included a plurality of row-direction wires and column-direction wires, and the plurality of surface-conduction electron-emitting devices are arranged in a matrix form to connect with the plurality of row-direction wires and column-direction wires.

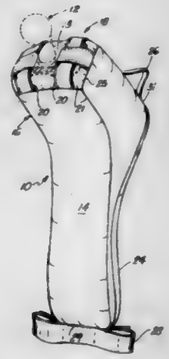


5,593,336

PACIFIER HOLDER

Kristina M. Thomas, 4382 W. Avenida de Golf, Pace, Fla. 32571

Continuation-in-part of Ser. No. 24,663, Jun. 20, 1994, Pat. No. Des. 358,653, and a continuation-in-part of Ser. No. 24,653, Jun. 20, 1994, Pat. No. Des. 360,693, and a continuation-in-part of Ser. No. 24,684, Jun. 20, 1994, Pat. No. Des. 360,694. This application Mar. 20, 1995, Ser. No. 406,685
Int. Cl.[6] A63H *5/00*
U.S. Cl. 446—81 **15 Claims**



1. A pacifier holder comprising:

(a) an elongated member of a soft, cushioning material having a first end region and an opposing second end region, said first end region being offset from said elongated member by curvature from said elongated member;

(b) means secured to said first end region for holding a pacifier thereon, said means comprising flexible strap members connected to opposing marginal side edges of a first surface of said first end region;

(c) a plurality of loops secured to a second surface of said first end region; and,

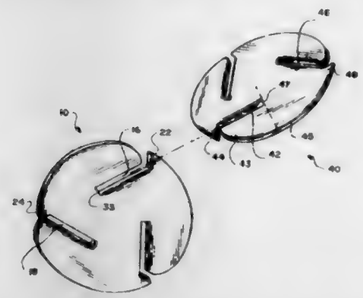
(d) a fabric shell encasing said elongated member.

5,593,337

FLEXIBLE TOY PIECE SET FOR ASSEMBLY INTO POLYHEDRAL SHAPES

Brian Lapointe, 53 Jerdens La., Rockport, Mass. 01966

Filed Jan. 11, 1996, Ser. No. 584,781
Int. Cl.[6] A63H *33/08;33/00*
U.S. Cl. 446—125 **33 Claims**



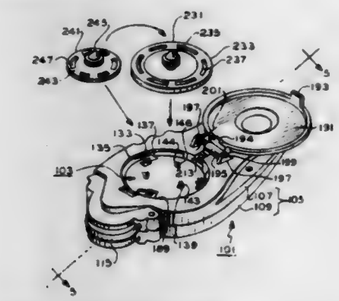
1. A toy set that can be assembled into roughly polyhedral shapes, the toy set including a number of toy pieces each made from a relatively thin, flexible material, each having an external edge with a defined edge shape, and each including at least three elongated, non-radial slots communicating with the edge and sized and shaped to hold another toy piece inserted on edge in the slot, slot-to-slot, to allow the toy pieces to be interfitted and assembled into roughly polyhedral shapes; in which there is a single tab projecting into each slot at the edge of the piece, interrupting and changing the course of the slot, to firmly hold together the interfitted toy pieces.

5,593,338

SPINNER AND ADAPTER FOR TOY TOPS AND COMBINATION OF SPINNER AND TOY TOP

Keisuke Itoh, and Minoru Sawada, both of Tokyo, Japan, assignors to Kabushiki Kaisha Bandai, Japan

Filed Dec. 2, 1994, Ser. No. 348,465
Claims priority, application Japan, Dec. 6, 1993, 5-339752; Jan. 24, 1994, 6-023120
Int. Cl.[6] A63H *1/06;27/127*
U.S. Cl. 446—259 **4 Claims**



1. A spinner for a toy top, comprising:

(a) a body including a rotor having an axle, spinning means including a spinning wheel and braking means;

(b) hook means provided on said rotor for removably engaging the toy top to rotate the top in a predetermined direction of rotation;

(c) a gear train interposed between said spinning wheel and said axle for transmitting the rotation of said spinning wheel to said rotor and thereby to the toy top;

(d) said gear train including an idle gear for isolating the rotation of said axle from said spinning wheel;

(e) said braking means including a braking member provided with an end portion and adapted to be operated from outside the body;

(f) a braked member mounted on said axle which is opposed to said end portion of said braking member and engageable therewith upon operation of said braking means to stop rotation of said rotor and to release the top from the rotor for spinning; and

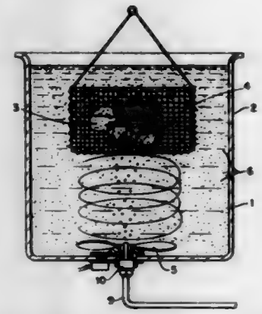
(g) said hook means including a first engagement member for engaging a larger toy top, and a second engagement member for engaging a smaller toy top such that said first engagement member is fixed on said rotor whereas said second engagement member can appear out of and disappear into said rotor.

5,593,339

SLURRY CLEANING PROCESS

Benny S. Yam, Holmdel; Robert C. Jorgensen, Cherry Hill, and William E. Spears, Jr., Lawrenceville, all of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 105,486, Aug. 12, 1993, Pat. No. 5,384,990. This application Jan. 10, 1995, Ser. No. 370,641
Int. Cl.[6] B24B *31/06*
U.S. Cl. 451—36 **27 Claims**



1. A method of cleaning a solid surface comprising: bringing a cleaning slurry into contact with said solid surface to be cleaned by immersing said solid surface in a bath of said cleaning slurry, said cleaning slurry comprising an aqueous cleaning liquid and water soluble alkaline salt abrasive particles which are soluble in said aqueous cleaning liquid, said aqueous cleaning liquid comprising a saturated solution of said water soluble alkaline salt abrasive particles so as to substantially inhibit the dissolution of said water soluble alkaline salt abrasive particles in said aqueous cleaning liquid, causing an eddy flow in the aqueous cleaning liquid so that said water soluble alkaline salt abrasive particles scrub said solid surface and aid in the removal of contaminants therefrom, said water soluble alkaline salt abrasive particles comprising alkali metal carbonates, bicarbonates or mixtures thereof, said aqueous cleaning liquid further including adjuvants which are soluble or readily dispersable in said aqueous cleaning liquid and which aid in the removal of said contaminants, said adjuvants including at least one surfactant.

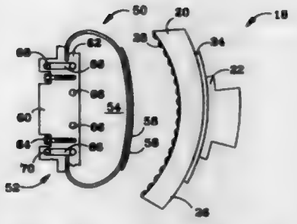
5,593,340

CASTABLE OPHTHALMIC LENS POLISHING LAP AND METHOD

Thomas E. Nelson, Goleta, Calif., and Erik A. Larsen, Seattle, Wash., assignors to DAC Vision, Inc., Carpinteria, Calif.

Filed Sep. 28, 1995, Ser. No. 535,887
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—42 **20 Claims**

9. A castable ophthalmic lens polishing lap, comprising:



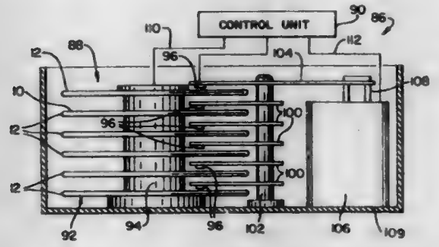
a mounting plate having a front surface and a conduit for circulating a liquid to apply thermal energy to the lap;
a mass of castable material disposed on the front surface of the mounting plate; and
a flexible membrane that is affixed to said mounting plate and encases said castable material,
said castable material having a fluid phase in which it can be deformed such that said membrane has a desired curvature and having a solid phase in which it retains the desired curvature, said castable material being in its solid phase under ambient conditions and responding to the application of thermal energy by changing to its fluid phase.

5,593,341

METHOD FOR MANUFACTURING A DISK DRIVE UNIT HAVING MAGNETIC DISKS WITH TEXTURED DATA AREAS AND HEAD LANDING ZONES

Norman T. Gounella, and Steven F. Starcke, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 358,856, Dec. 19, 1994, Pat. No. 5,482,497, which is a division of Ser. No. 998,277, Dec. 30, 1992, abandoned. This application Nov. 15, 1995, Ser. No. 559,298
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—57 **1 Claim**



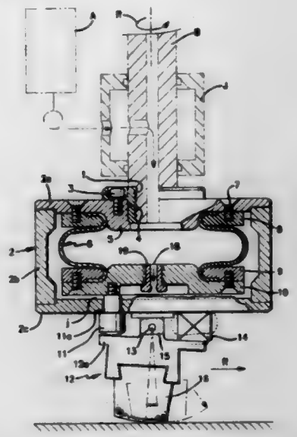
1. A method of manufacturing a magnetic disk drive unit comprising:
texturing magnetic surfaces of a plurality of magnetic disks to form a data area and a head landing zone on each magnetic surface;
supporting the textured disks in a stack on a rotatable spindle;
mounting a plurality of transducer heads for movement across the data areas and head landing zones of the magnetic surfaces of the disks; and
enclosing the spindle, disks and heads within a drive unit housing;
said texturing step including polishing a relatively fine texture pattern having a surface elevation upon both the data area and the head landing zone of each disk; and
after said polishing step, further abrading only the head landing zone of each disk to make a relatively coarse texture pattern having peaks at substantially the same surface elevation as the relatively fine texture pattern.

5,593,342

DEVICE FOR SMOOTHING AND POLISHING STONE

Bernard Thibaut, Vire, France, assignor to Thibaut S.A., Vire, France

Filed May 11, 1995, Ser. No. 439,423
Claims priority, application France, May 11, 1994, 94.05791
Int. Cl.[6] B24B *7/22*
U.S. Cl. 451—159 **8 Claims**



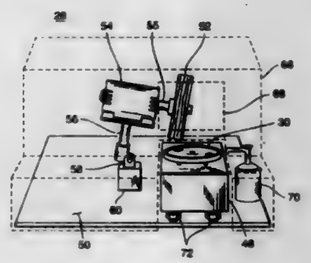
1. In a device for smoothing or polishing stone, comprising at least two carrying segments for abrasive members, means to drive the device in rotation about an axis during smoothing or polishing, and means to drive said segments with oscillatory movement so as to cause the abrasive members to operate along a generatrix when the device is driven in rotation about an axis during smoothing or polishing; the improvement wherein the drive means for driving the abrasive elements in oscillation comprises means to create a variable flow of a cooling liquid, means responsive to the flow of cooling liquid to cause said oscillatory movement, and means thereafter to apply the same said cooling liquid to the stone, so as to ensure simultaneously lubrication in the course of abrading and the driving in oscillation of the carrying segments.

5,593,343

APPARATUS FOR RECONDITIONING DIGITAL RECORDING DISCS

Jason Bauer, 534 W. Pepper, Mesa, Ariz. 85201

Filed Apr. 3, 1995, Ser. No. 415,734
Int. Cl.[6] B24B *29/02;55/04*
U.S. Cl. 451—254 **12 Claims**



1. An apparatus for reconditioning a protective surface of an optically-read digital recording disc, said apparatus comprising:

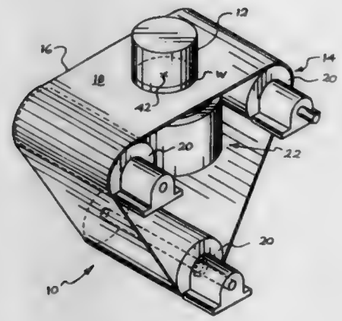
a turntable configured to receive said disc with said protective surface exposed;
first means for rotating said turntable at a first rotational speed;
a buffing element having a circumferential buffing surface located around said buffing element, said buffing surface being configured to recondition said protective surface; and
second means for rotating said buffing element at a second rotational speed, said second means for rotating being configured such that said buffing surface rotates in a substantially outward radial direction with respect to said turntable; wherein
said buffing element removes an amount of material from said protective surface as said turntable rotates said disc through at least one revolution.

5,593,344

WAFER POLISHING MACHINE WITH FLUID BEARINGS AND DRIVE SYSTEMS

David E. Weldon, Los Gatos; Boguslaw A. Nagorski, and Homayoun Talieh, both of San Jose, all of Calif., assignors to Ontrak Systems, Inc., Milpitas, Calif.

Filed Oct. 11, 1994, Ser. No. 321,085
Int. Cl.[6] B24B *21/00*
U.S. Cl. 451—296 **25 Claims**



1. In a semiconductor wafer polishing machine of the type comprising at least one polishing pad assembly and at least one wafer holder positioned to hold a semiconductor wafer against the polishing pad assembly, the improvement comprising:
a support positioned adjacent the polishing pad assembly, at least one of said support and said polishing pad assembly comprising a plurality of fluid inlets connectable to at least one source of a fluid at a higher pressure, a plurality of fluid outlets connectable to at least one fluid drain at a lower pressure, and a plurality of bearing surfaces over which fluid flows from the respective source to the respective drain, said polishing pad assembly supported by the fluid over the bearing surface for low-friction movement with respect to the support, both said fluid inlets and said fluid outlets interspersed among the bearing surfaces.

5,593,345

ABRASIVE-BELT CONVERSION WHEEL FOR CYLINDRICAL GRINDERS

James N. Johnson, 15 S. Worthington St., Youngstown, Ohio 44502

Filed Feb. 5, 1996, Ser. No. 596,771
Int. Cl.[6] B24B *21/00*
U.S. Cl. 451—296 **12 Claims**

1. A grinding apparatus for a grinding machine, the grinding apparatus comprising:



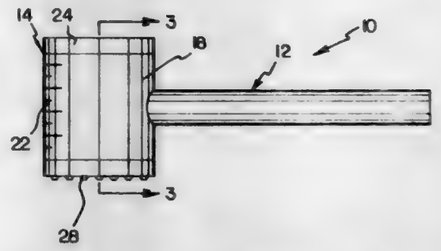
a) a spindle for mounting a grinding wheel frame, the grinding wheel frame having an outer surface, the outer surface of the grinding wheel frame having a working surface and a mounting surface;
b) wheel clamping assembly for holding the grinding wheel frame to the spindle;
c) a plurality of apertures passing laterally through the outer surface of the grinding wheel frame, the apertures being spaced longitudinally and circumferentially along the outer surface;
d) an abrasive belt being diametrically undersized for the working surface of the grinding wheel frame when in unstressed condition; and
e) a valve for passing fluid under pressure to the grinding wheel frame, the fluid issues radially outward from the outer surface of the grinding wheel frame through said apertures, when the abrasive belt is slid over the mounting surface of outer surface the fluid emerging from the apertures permit sliding of the abrasive belt onto the working surface.

5,593,346

MEAT TENDERIZING MALLET

Dyral Washington, 1536 Arch St., Norristown, Pa. 19401-3529

Filed May 28, 1996, Ser. No. 654,870
Int. Cl.[6] A22C *9/00*
U.S. Cl. 452—146 **6 Claims**



1. A new and improved meat tenderizing mallet for use in association with meat and meat tenderizer fluid, the apparatus comprising, in combination:
a handle being fabricated of wood and formed in an elongated cylindrical configuration with an inboard end including external screw threads and an outboard end;
a mallet head being fabricated of plastic and formed as a cylindrical container having an open top, an open bottom and

a radially extending bore formed therein, the container further including indicia marked thereupon, the indicia being formed as a plurality of lines to permit a user to determine fluid volume levels, the bore containing internal screw threads and adapted to be coupled to the inboard end of the handle, a lid being formed in a planar circular configuration, the lid being threadedly coupled to the open top of the mallet head; and

a base plate being fabricated of metal and formed in a generally circular configuration with an outer surface and an inner surface, the outer surface having a plurality of generally pyramidal shaped protrusions, each protrusion including an aperture positioned therethrough, the inner surface of the base plate being threadedly coupled to the open bottom of the container, in an operative orientation a user filling the container with tenderizing fluid and striking the meat, this action causing injection of tenderizing fluid into the meat thereby facilitating meat tenderizing.

5,593,347

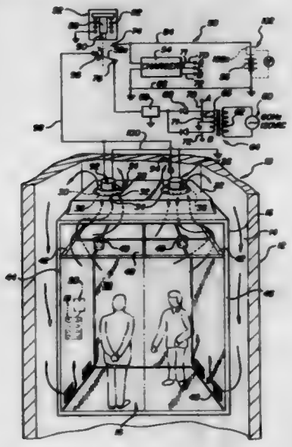
EMERGENCY VENTILATION SYSTEM FOR ELEVATOR CAB

Terry R. Mandy, Troy; Robert R. Mandy, Bingham Farms, and Nazar Bally, Southfield, all of Mich., assignors to Man-D-Tec, Inc., Scottsdale, Ariz.

Continuation of Ser. No. 242,676, May 13, 1994, abandoned, which is a continuation of Ser. No. 955,416, Oct. 2, 1992, Pat. No. 5,354,233. This application Dec. 18, 1995, Ser. No. 573,883

Int. Cl.[6] F24F *11/00*

U.S. Cl. 454—68 **5 Claims**



1. In a ventilation system for use in an elevator cab that includes a DC motor driven fan mounted at an air outlet of the elevator cab and a power supply for the motor driven fan, the improvement comprising:

an emergency control for providing continuous power to said DC motor driven fan during normal and emergency operation; said emergency control including a main power supply and a battery powered emergency power supply operative to maintain said motor driven fan continuously operative during both normal and emergency operation for supplying continuous ventilation through said elevator cab during both normal operation and when said main power supply fails;

a stepdown transformer having a primary winding connected to a main power supply and having a secondary winding; a rectifier connected to said secondary winding;

said battery powered emergency power supply including a battery and a battery charger;

said secondary winding and said rectifier providing power to said motor driven fan when said main power supply is operative; said main power supply providing power to said battery charger when said main power supply is operative to maintain the charge on said battery for use during emergency ventilating; and

means including switch means for selectively connecting said motor driven fan either to said battery when said main power supply fails or to said rectifier when said main power supply is on.

5,593,348

VENTILATING ELEMENT FOR ROOFS

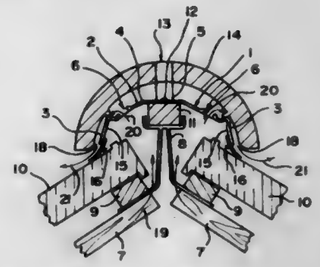
Hubert Rickert, Nagold-Emmingen, Germany, assignor to Norm A.M.C. AG, Switzerland

Filed Jan. 17, 1995, Ser. No. 372,912

Claims priority, application Germany, Jan. 17, 1994, 44 01 139.3

Int. Cl.[6] F24F *7/02*

U.S. Cl. 454—365 **8 Claims**



1. Ventilating element for roofs, with a ventilator cover in one of a ridge, hip and arris area, at least one elastically flexible sealing member being disposed along a longitudinal edge thereof, wherein the sealing member is formed of loop filament seal having a multiplicity of filament loops, and wherein at least some of the loops are interconnected by means of transverse filaments.

5,593,349

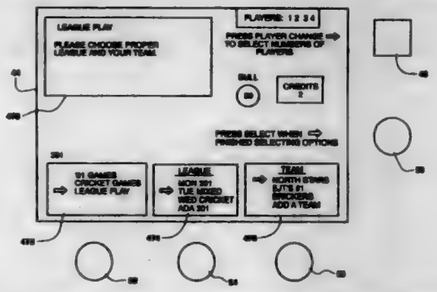
AUTOMATED LEAGUE AND TOURNAMENT SYSTEM FOR ELECTRONIC GAMES

Edward K. Miguel, DeKalb, Ill.; Martin G. Bohn, Saginaw, Mich.; Stephen R. Zastera, Bloomington, Minn., and Eugene B. Lilly, Overland Park, Kans., assignors to Valley Recreation Products Inc., Bay City, Mich.

Filed Sep. 9, 1994, Ser. No. 303,604

Int. Cl.[6] A63F *9/24*

U.S. Cl. 463—30 **17 Claims**



1. A system for league and tournament play utilizing a plurality of electronically scored games, comprising:

a microcomputer having memory for storing a computer program and a contest database, said microcomputer being operable under control of said program to access player names from the database;

a plurality of electronic dart machines, each of said dart machines having a monitor and including memory storage and a microprocessor operable under control of a game program to utilize data received from said microcomputer via a communication medium;

said dart machines being operable under control of said game program to display on said monitor a user interface that includes a plurality of user-selectable menu items; and

said dart machines further being operable under control of said game program to incorporate at least some of the player names received from said microcomputer into the user-selectable menu items displayed on said monitor.

5,593,350

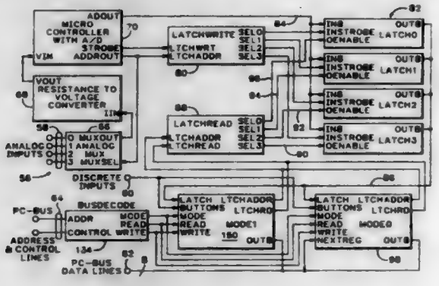
VIDEO GAME CARD HAVING INTERRUPT RESISTANT BEHAVIOR

Frank M. Bouton, Beaverton, Oreg.; Robert L. Church, Tujunga, Calif., and Joseph C. Rayhawk, Beaverton, Oreg., assignors to Thrustmaster, Inc., Hillsboro, Oreg.

Filed Nov. 4, 1994, Ser. No. 334,877

Int. Cl.[6] G06F *3/05;13/10*

U.S. Cl. 463—36 **41 Claims**



1. A video game card for interfacing a game controller having one or more analog input devices to a personal computer including a microprocessor having digital data and control buses and a card slot for receiving I/O cards, the game card comprising:

a circuit board for mounting electrical components and connectors thereupon, the circuit board sized to fit in the card slot of the personal computer;

a game card connector for receiving an analog signal from the game controller, the analog signal having a signal level corresponding to a state of a corresponding game controller input device;

a bus connector for connecting the circuit board to the computer data and control bus; and

a game card circuit for providing to the microprocessor a digital signal corresponding to the analog signal level, the circuit including means for asserting the digital signal responsive to a "write" to the game card by the personal computer microprocessor and means for deasserting the digital signal responsive to a number of "reads" sent to the game card by the personal computer, the "read" at which the digital signal is deasserted being determined from the analog signal level.

5,593,351

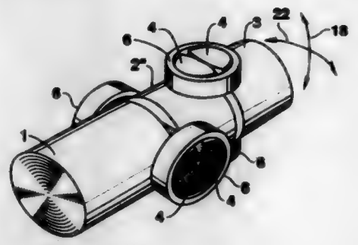
AXIALLY STIFF LINK

Gordon W. Culp, 13832 Haynes St., Van Nuys, Calif. 91401

Continuation of Ser. No. 208,505, Mar. 10, 1994, abandoned, which is a continuation of Ser. No. 909,521, Jul. 6, 1992, abandoned. This application Mar. 15, 1995, Ser. No. 405,411

Int. Cl.[6] F16D *3/16*

U.S. Cl. 464—114 **7 Claims**



1. An axially stiff link comprising:

two shaft segments;

a shaft rolling element with transverse plain-curved ends attached to each of the shaft segments, the shaft rolling elements being in rolling line contact with each other, the shaft rolling elements having a curved transverse ring spring engaging portion on opposing sides of the shaft segments,

a ring spring for encompassing adjacent ring spring engaging portions, engaging them by rolling line contact and preloading the shaft rolling elements.

5,593,352

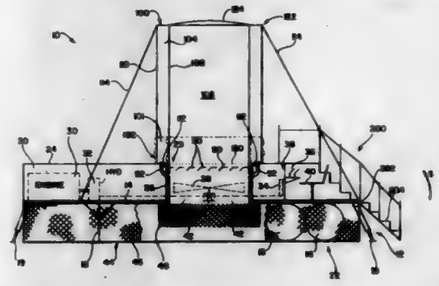
MOBILE GROUND LEVEL SKYDIVING APPARATUS

Harley A. J. Methfessel, 6011 Union Springs Ct., and Terry L. Langston, 6010 Union Springs Ct., both of Clifton, Va. 22024

Continuation-in-part of Ser. No. 202,582, Feb. 28, 1994, abandoned. This application Aug. 15, 1994, Ser. No. 288,724

Int. Cl.[6] A63G *31/12*

U.S. Cl. 472—50 **28 Claims**



1. Apparatus for the simulation of skydiving at substantially ground level comprising:

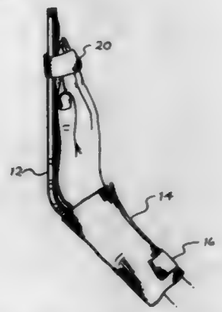
a platform operatively coupled to a means for transporting the apparatus via road transport;

means connected to said platform for generating an upwardly moving stream of air of sufficient speed and volume to support an object in said air stream;

air containment means disposed on said platform for confining said upwardly moving stream of air through a predetermined vertical distance, said air containment means having an open volume therein and being open at an upper end thereof, and being collapsible from an operational configuration extending vertically upwardly to a height of at least several feet above said platform, to a transport configuration in which the vertical projection of said air containment means is greatly

reduced as compared to the height in the operational configuration, wherein said air containment means comprises an inflatable air containment unit disposed on said platform and wherein, when said air containment unit is inflated, said air containment unit takes on a substantially hollow configuration defining an inner chamber in which the skydiving simulation is accomplished.

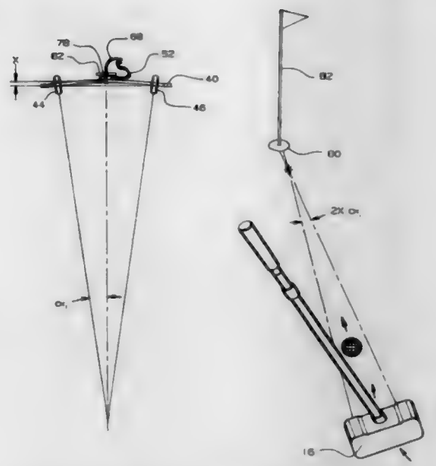
5,593,353
PUTTING STROKE TRAINING APPARATUS
Jeffrey Kramer, 3545 Lake Ave., Wilmette, Ill. 60091
Filed Jul. 19, 1995, Ser. No. 504,185
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—205 **3 Claims**



1. A putting stroke training apparatus comprising:
an arcuate elongated rigid member having a first planar surface and a second planar surface opposite said first planar surface, said first and second planar surfaces being adapted to fit over the front of the hand and front forearm respectively, including the wrist;
a first strap affixed to said first planar surface for adjustably holding at least the third, fourth and fifth fingers of said hand in place against said first planar surface;
an elastic band affixed on said second planar surface positioned thereon such that it encompasses a substantial portion of said wrist; and
a second strap affixed to said elastic band for adjustably closing the elastic band and holding said wrist in place against said second planar surface.

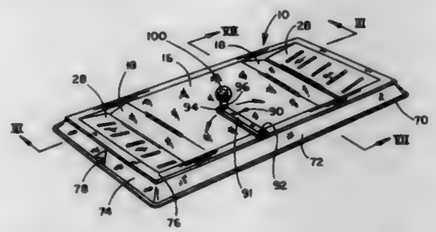
5,593,354
GOLF CLUB INCLUDING LIGHT EMITTING POSITIONING SYSTEM
Aldo Faloni, 920 Cloudview Cir., Reno, Nev. 89512, and Paul Thomas, 1257 W. O'Farrell St., San Pedro, Calif. 90731
Filed Feb. 16, 1996, Ser. No. 602,296
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—220 **27 Claims**

17. A club for assisting a user to properly direct the travel path of a golf ball, comprising:
a. a rear housing, a flexible plate disposed within the rear housing, and a front housing attached to the rear housing to enclose the flexible plate, the front housing having a pair of spaced apart openings;
b. at least two light beams supported on said flexible plate emitting its lights through said pair of spaced apart openings to intersect each other at a distance;
c. a shaft fixedly attached to said rear housing of said head portion; and
d. means for bending said flexible plate which in turn moves said at least two light beams inwardly to cause them to intersect each other;



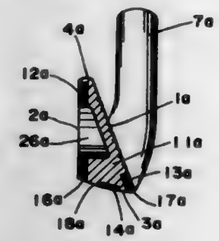
e. whereby when said at least two light beams are transmitting their lights, said means for bending said flexible plate moves said at least two light beams inwardly such that the lights intersect each other at a remote point, thereby allowing the user to precisely select the correct angle and position of said head portion in relation to the user selected golf ball direction.

5,593,355
GOLF PRACTICE APPARATUS
Michael L. Beaver, Grand Haven, Mich., assignor to Fore-Mat Products, Inc., Grand Haven, Mich.
Filed Mar. 29, 1995, Ser. No. 412,464
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—278 **25 Claims**



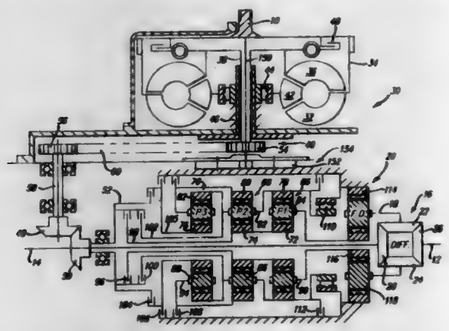
1. A golf practice apparatus, comprising:
a housing having at least one guide disposed therein;
a single leaf spring retained within said housing, and having a centrally disposed striking surface shaped to support a ball thereon, and opposite ends;
at least one of said ends of said single leaf spring being slidably captured in said housing by said guide and preventing inadvertent separation of said spring from said housing, yet permitting at least one of said spring ends to shift longitudinally, such that when a golf club head strikes a ball positioned on said striking surface, said single leaf spring deflects resiliently downwardly, and at least one of said ends is displaced longitudinally to permit the club head to pass over said striking surface and through the ball, and thereby simulate the response of a golf club head hitting a natural turf surface.

5,593,356
GOLF CLUB HEAD WITH PERIPHERAL WEIGHTS
Hitoshi Takeda, Tsubame, Japan, assignor to K.K. Endo Seisakusho, Japan
Division of Ser. No. 250,431, May 27, 1994, Pat. No. 5,564,705. This application Jan. 16, 1996, Ser. No. 586,294
Claims priority, application Japan, May 31, 1993, 5-129627; Jul. 22, 1993, 5-181685; Oct. 4, 1993, 5-248195; Mar. 30, 1994, 6-61178
Int. Cl.[6] A63B *53/04*
U.S. Cl. 473—335 **6 Claims**



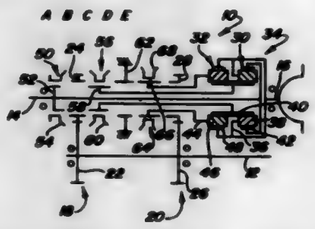
1. A golf club head comprising:
a head body defined by a face, a back, a tip, a sole, a toe, a heel and a neck;
three separate balance weights each being denser than the head body comprising: a first balance weight which is annular and provided along a peripheral portion of the head body at the back side; a second balance weight which s semi-annular and provided along a peripheral portion of the head body at the face side, said second balance weight extending along the toe, sole and heel sides only; a third balance weight provided in the sole of the head body,
wherein said third balance weight is widened at least at one of its toe side and heel side.

5,593,357
MULTIPLE SPEED-RATIO TRANSAXLE ASSEMBLY FOR AUTOMOTIVE VEHICLES
Clinton F. Justice, Northville, and William Miller, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Oct. 4, 1995, Ser. No. 538,932
Int. Cl.[6] F16H *37/08*
U.S. Cl. 475—204 **8 Claims**



1. A multiple speed automatic transmission, comprising:
a first member adapted for a drive connection to a power source;
first, second and third input shafts;
first second and third planetary gear units, each having a sun gear, ring gear, planet pinions meshing with the sun gear and ring gear, and carrier rotatably supporting the planet pinions;
first clutch alternately driveably connecting and releasing the first member and first input shaft;
second clutch for alternately driveably connecting and releasing the first member and third input shaft;
first, second and third gear units, each having a sun gear, ring gear, planet pinions meshing with the sun gear and ring gear, and carrier rotatably supporting the planet pinions;
the carrier of the second gear unit, ring gear of the first gear unit, and ring gear of the third gear unit being mutually driveably connected;
the carrier of the third gear unit and ring gear of the second gear unit being mutually driveably connected;
the sun gears of the first and second gear units and first input shaft being mutually driveably connected;
the sun gear of the third gear unit driveably connected to the third input shaft;
the ring gear of the third gear unit drive ably connected to the second input shaft;
a first brake for holding the ring gear of the first gear unit against rotation;
a second brake for releasably holding the ring gear of the second gear unit and carrier of the third gear unit against rotation; and
a third brake for releasably holding the sun gear of the third gear unit against rotation.

5,593,358
MULTI-SPEED MANUAL TRANSMISSION WITH TWO SIMPLE PLANETARY GEARSETS
Barry L. Frost, Waterford, Mich., assignor to New Venture Gear, Inc., Troy, Mich.
Filed Jun. 1, 1995, Ser. No. 457,830
Int. Cl.[6] F16H *37/08*
U.S. Cl. 475—218 **34 Claims**



1. A multi-speed transmission for use in a motor vehicle comprising:
a transmission housing;
a brake fixed to said housing;
an input shaft supported for rotation in said transmission housing;
a first input gear fixed to said input shaft for rotation therewith;
a second input gear fixed to said input shaft for rotation therewith;
a mainshaft supported for rotation in said transmission housing;
a first drive gear supported for rotation on said mainshaft and in constant mesh with said first input gear;
a second drive gear supported for rotation on said mainshaft and in constant mesh with said second input gear;
an output shaft supported for rotation in said transmission housing;
a double planetary gearset including a sun gear supported from said mainshaft for rotation relative thereto, a first ring gear fixed to said mainshaft for rotation therewith, a first pinion carrier coupled to said output shaft and rotatably supporting a plurality of first pinions in constant mesh with said sun gear and said first ring gear, a second ring gear fixed to said output shaft for rotation therewith, and a second pinion carrier rotat-

ably supporting a plurality of second pinions in constant mesh with said sun gear and said second ring gear;

a first clutch including a first hub fixed to said mainshaft for rotation therewith and a first clutch sleeve, said first clutch sleeve being selectively movable from a disengaged position to a gear-engaging position for engagement with said first drive gear;

a second clutch including a second hub coupled to said sun gear for rotation therewith and a second clutch sleeve, said second clutch sleeve being selectively movable in a first direction from a disengaged position to a gear-engaging position for engagement with said first drive gear and in a second direction from said disengaged position to a brake-engaging position for engagement with said brake; and

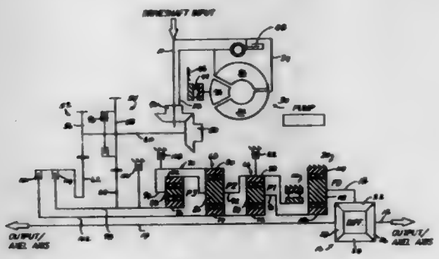
a third clutch including a third hub coupled to said second pinion carrier for rotation therewith and a third clutch sleeve, said third clutch sleeve being selectively movable in said first direction from a disengaged position to brake-engaging position for engagement with said brake and in said second direction from said disengaged position to a gear-engaging position for engagement with said second drive gear.

5,593,359

MULTIPLE SPEED-RATIO TRANSAXLE ASSEMBLY FOR AUTOMOTIVE VEHICLES

Clinton F. Justice, Northville, and Daniel W. McCarrick, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 21, 1995, Ser. No. 517,396
Int. Cl.[6] F16H *3/64*
U.S. Cl. 475—280 **17 Claims**



1. A multiple speed automatic transmission, comprising:

a first shaft adapted for a drive connection to a power source;

first and second input shafts;

first means for alternately driveably connecting and releasing the first shaft and first input shaft;

second means for alternately driveably connecting and releasing the first shaft and second input shaft;

first, second and third gear units, each having a sun gear, ring gear, planet pinions meshing with the sun gear and ring gear, and carrier rotatably supporting the planet pinions;

the carrier of the second gear unit, ring gear of the first gear unit, and ring gear of the third gear unit being mutually driveably connected;

the carrier of the third gear unit and ring gear of the second gear unit being mutually driveably connected;

the sun gears of the first and second gear units and first input shaft being mutually driveably connected;

the sun gear of the third gear unit driveably connected to the second input shaft;

brake means for holding the ring gear of the first gear unit against rotation, comprising

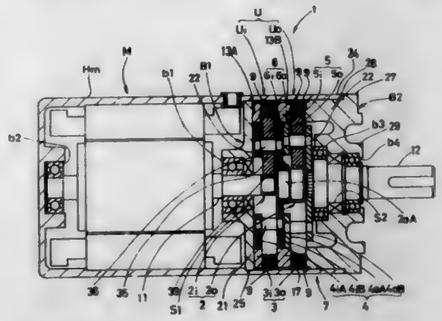
a friction brake having one element fixed against rotation and a second element connected to the ring gear of the first gear unit and an overrunning brake for producing a one-way drive connection of the ring gear of the first gear unit and a nonrotating member.

5,593,360

PLANETARY GEAR SYSTEM

Hiroki Ishida, Osaka; Junichi Tani, Daitou, and Hiroshi Horie, Mukoh, all of Japan, assignors to Tsubakimoto Chain Co., Osaka-fu, Japan

Filed Sep. 6, 1995, Ser. No. 524,217
Claims priority, application Japan, Sep. 8, 1994, 6-242265; Sep. 8, 1994, 6-242266; Sep. 8, 1994, 6-242267
Int. Cl.[6] F16H *1/00*
U.S. Cl. 475—331 **7 Claims**



1. A planetary gear system comprising

a case,

a driving sun gear pivotally supported on the case,

an internal gear fixed on the case concentrically with the sun gear, and

a planetary carrier assembly having plural planetary gears pivotally supported on a carrier and engaged with the sun gear and the internal gear, wherein

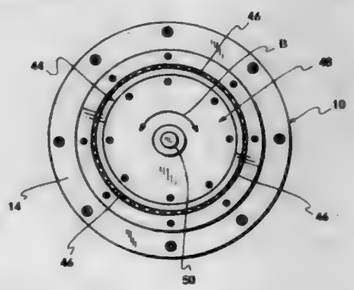
the internal gear comprises a lamination of plural ring-shaped punched plates with internal teeth formed by punching which are laminated so that the internal teeth of the punched plates are in phase with each other.

5,593,361

SPEED CHANGER

Ken Yanagisawa, Matsumoto, Japan, assignor to Yugen Kaisha Sozoan, Nagano-ken, Japan

Filed Dec. 27, 1994, Ser. No. 363,817
Claims priority, application Japan, Dec. 27, 1993, 5-330493
Int. Cl.[6] B23Q *1/18*
U.S. Cl. 475—342 **12 Claims**



1. A speed changer comprising:

a movable gear section having a first pinion gear and a second pinion gear, which are coaxially integrated and which are capable of spinning about their common axis;

driving means for spinably moving said movable gear section on a circular orbit, said driving means including a hollow cylindrical member, said movable gear section being affixed to an outer circumferential surface of said hollow cylindrical member, and said hollow cylindrical member being disposed within a space surrounded by said movable gear section and coaxial with respect to said circular orbit, and capable of spinning about its axis;

a fixed ring gear fixedly encompassing the circular orbit, said fixed ring gear having a first inner gear section, formed on an inner circumferential face, wherein said first pinion gear is capable of engaging with said first inner gear section and rolling thereon;

an output ring gear rotatably encompassing the circular orbit, said output ring gear being coaxial to said fixed ring gear, said output ring gear having a second inner gear section, formed on an inner circumferential face, wherein said second pinion gear is capable of engaging with said second inner gear section and rolling thereon;

a casing for housing said movable gear section, said fixed ring gear, said output ring gear and said hollow cylindrical member, said casing having a through hole coaxial with respect to said hollow cylindrical member; and

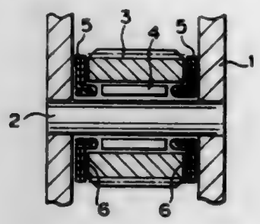
a hollow motor having a hollow section coaxial with respect to the through hole of said casing.

5,593,362

CARRIER STRUCTURE FOR PLANETARY GEAR SYSTEM

Muneo Mizuta, Fuji, Japan, assignor to Jatco Corporation, Fuji, Japan

Filed Apr. 26, 1995, Ser. No. 429,497
Int. Cl.[6] F16H *1/28*
U.S. Cl. 475—348 **8 Claims**



1. A carrier structure for a planetary gear system comprising:

a pinion shaft rotatably supporting a pinion gear;

a carrier body fixedly supporting said pinion shaft;

needle bearings disposed between an internal periphery of said pinion gear and an external periphery of said pinion shaft; and

a pinion washer disposed between each end face of said pinion gear and said carrier body and mounted on said pinion shaft for supporting a thrust load of said pinion gear,

wherein said pinion washer has a support portion for supporting a thrust load of said needle bearings,

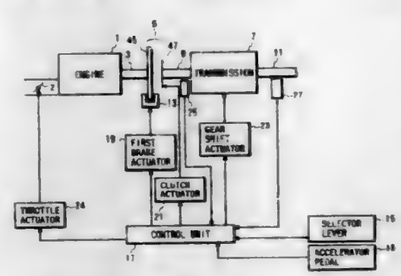
wherein said pinion washer has sliding surfaces for contacting said pinion gear and said carrier body, at least one of said sliding surfaces having a plain bearing member, an outer periphery portion of said plain bearing member extending radially outward beyond an outer peripheral edge of said pinion washer and covering said outer peripheral edge.

5,593,363

DRIVE LINE APPARATUS FOR AUTOMOTIVE VEHICLE

Jirou Asai, Okazaki; Yuichi Iwasa, Hamamatsu, and Akira Ito, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 14, 1995, Ser. No. 557,327
Claims priority, application Japan, Nov. 14, 1994, 6-278818; Jun. 12, 1995, 7-144450; Sep. 4, 1995, 7-226495
Int. Cl.[6] B60K *17/06*
U.S. Cl. 477—74 **13 Claims**



1. A drive line apparatus for an automotive vehicle comprising:

a transmission having an input shaft, an output shaft, an intermediate shaft, a transfer gear, a plurality of transmission gear sets having different gear ratios, respectively, the input shaft connecting with the intermediate shaft through the transfer gear, the output shaft selectively connecting with the intermediate shaft through engagement with a selected one of the transmission gear sets to establish a desired speed;

a clutch unit for connecting a crankshaft of an engine and the input shaft of said transmission, said clutch unit including a flywheel connected to the crankshaft and a clutch disc connected to the input shaft of said transmission;

braking means for applying a brake force to a given peripheral portion of the flywheel of said clutch unit;

first speed determining means for determining a speed of the selected one of the transmission gear sets of said transmission;

second speed determining means for determining a speed of the output shaft of said transmission; and

controlling means for controlling operations of said clutch unit and said braking means, when a gear shift is performed to achieve the engagement with the selected one of the transmission gear sets to establish the desired speed of the output shaft, said controlling means bringing said clutch unit into a given degree of engagement and activating said braking means to modify the speed of the flywheel so as to establish synchronization of rotation of the selected one of the transmission gear sets with rotation of the output shaft based on the speeds determined by said first and second speed determining means.

5,593,364

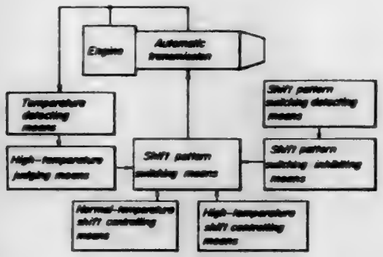
SHIFT CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION

Shigeru Ishii, Atsugi; Yoshihide Shimo, Zama; Kosei Murata, Tsuchiura; Shigeki Shimanaka, Hadano; Shuji Kurokawa, Machida, and Hideharu Yamamoto, Odawara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 28, 1995, Ser. No. 430,717
Claims priority, application Japan, Apr. 28, 1994, 6-092831
Int. Cl.[6] B60K *41/10*
U.S. Cl. 477—98 **4 Claims**

1. A shift control apparatus for an automatic transmission comprising:

a normal-temperature shift control means for providing a first shift pattern and performing a shift operation under a normal temperature condition, based on said first shift pattern;



a high-temperature shift control means for providing a second shift pattern and performing a shift operation under a high temperature condition, based on said second shift pattern;

a temperature detecting means for detecting a temperature relating to at least one of the automatic transmission and an engine connected to said automatic transmission;

a high-temperature judging means for judging whether or not the temperature detected by said temperature detecting means is higher than a predetermined temperature;

a shift pattern switching means for performing a switching between said normal-temperature shift control means and said high-temperature shift control means, and activating said high-temperature shift control means when the temperature detected by said temperature detecting means has been judged to be higher than said predetermined temperature;

a shift pattern switching detecting means for detecting the switching between said normal-temperature shift control means and said high-temperature shift control means by said shift pattern switching means; and

a shift pattern switching inhibiting means for inhibiting the switching between said normal-temperature shift control means and said high-temperature shift control means by said shift pattern switching means, for a predetermined duration after the switching between said normal-temperature shift control means and said high-temperature shift control means has been detected.

5,593,365

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Atsushi Tabata, Okazaki; Nobuyuki Takahashi; Takashi Ohta, both of Toyota; Yasuo Hojo, Nagoya; Shinji Kasuga; Masahiro Hayabuchi, both of Anjo; Masahiko Ando, Okazaki; Kazumasa Tsukamoto, Toyota, and Akira Fukatsu, Anjo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Aishin A.W. Co., Ltd., Anjo, both of Japan

Filed Jul. 31, 1995, Ser. No. 509,456

Claims priority, application Japan, Aug. 2, 1994, 6-200158; Jun. 29, 1995, 7-186417; Jun. 29, 1995, 7-186418

Int. Cl.[6] B60K *41/06;* **F16H** *61/26;63/00*

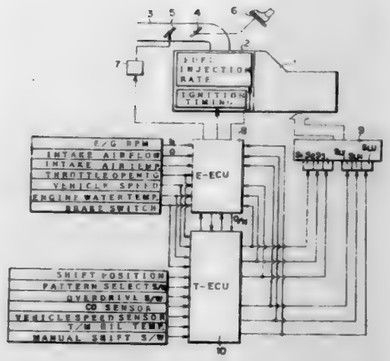
U.S. Cl. 477—119 **21 Claims**

1. A control system for an automatic transmission including a main transmission unit for setting a reverse stage and a plurality of forward stages and an auxiliary transmission unit connected in series to said main transmission unit and capable to be changed between two higher and lower stages, comprising:

a solenoid valve for outputting a signal pressure when at least said reverse stage and a predetermined one of said forward stages are set;

a change-over valve for changing said signal pressure selectively into a signal pressure for controlling said auxiliary transmission unit and a signal pressure for controlling an engine braking state; and

an engine braking control valve for controlling engaged or released states of an engine braking frictional element at said predetermined forward stage on the base of said signal pressure coming from said change-over valve,



wherein the acting state of said solenoid valve when said reverse stage is set and the acting state of said solenoid valve when said predetermined forward stage for making the engine braking ineffective is set are identical to each other.

5,593,366

BEADED GUIDE ROLLER

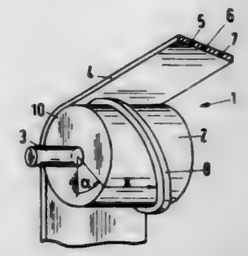
Alois Puzik, Gifhorn, Germany, assignor to Volkswagen AG, Wolfsburg, Germany

Filed May 2, 1995, Ser. No. 432,782

Claims priority, application Germany, May 4, 1994, 44 15 634.0

Int. Cl.[6] F16H *55/36*

U.S. Cl. 474—177 **8 Claims**



1. A guide roller comprising a roller member supported for rotation about a longitudinal axis and having a peripheral surface extending between opposite side surfaces, and at least one bead formed on the peripheral surface and following approximately a sine curve in a direction transverse to the side surfaces.

5,593,367

SWITCHABLE IGNITION AND STARTER CONTROL SYSTEM

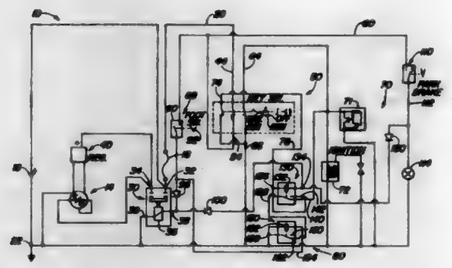
Jimmy N. Eavenson, Sr., Juneau, and Barry M. Hough, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Aug. 18, 1995, Ser. No. 516,887

Int. Cl.[6] B60K *41/20*

U.S. Cl. 477—203 **20 Claims**

1. In a utility vehicle having an engine with a starter circuit, an electrical power source, an ignition system with an ignition switch having a plurality of positions, an engagable accelerator control and an engagable park brake structure, control circuitry for selectively operating the vehicle in one of two modes, including a



runabout mode wherein the engine starts when the accelerator control is engaged and stops when the control is released and a continuous operation mode wherein the engine is generally maintained in a continuous running condition, the control circuitry including:

interlock structure connected to the ignition system and responsive to engagement of the park brake structure, the interlock structure operable in the runabout mode to kill the engine when the accelerator control is released; and

switch structure connected to the interlock structure for switching from the runabout mode to the continuous operation mode and preventing killing of the engine when the park brake is engaged.

5,593,368

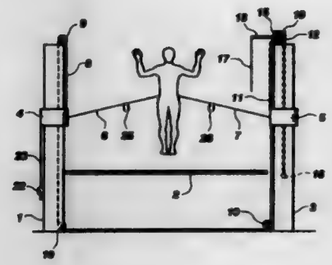
DEVICE FOR REDUCING IMPACT AND LATERAL MOVEMENT ON RESILIENT SURFACES

Stanley J. Checketts, P.O. Box 55, Providence, Utah 84332

Continuation-in-part of Ser. No. 12,257, Feb. 1, 1993, abandoned. This application Aug. 4, 1993, Ser. No. 101,654

Int. Cl.[6] A63B *5/11*

U.S. Cl. 482—27 **2 Claims**



1. A device for reducing impact and lateral movement of a participant on a horizontal resilient surface, which comprises:

a horizontal resilient surface;

a means for exerting a lateral restraining force on the participant which is proportional to the distance that the participant moves laterally from the center of said horizontal resilient surface;

a means for exerting a vertical restraining force on the participant which is proportional to the distance that the participant has moved vertically from said horizontal resilient surface, said vertical restraining means being connected to the lateral restraining means; and

a trailer on which are mounted said horizontal resilient surface, the means for exerting a lateral restraining force, and the means for exerting a vertical restraining force.

5,593,369

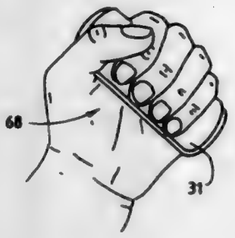
INFLATABLE HAND ORTHOSIS

Elliot L. Stern, Auburn, Ala., assignor to Orthotic Rehabilitation Products, Inc., Tampa, Fla.

Division of Ser. No. 325,883, Oct. 19, 1994, Pat. No. 5,466,202, which is a continuation of Ser. No. 31,676, Mar. 15, 1993, Pat. No. 5,383,827. This application Aug. 16, 1995, Ser. No. 515,957

Int. Cl.[6] A63B *23/16;* **A61F** *5/00*

U.S. Cl. 482—47 **15 Claims**



1. A therapeutic method of extending fingers and thumb on a hand closed in a substantially clenched fist, said method comprising the steps of:

(a) inserting a deflated bladder under the fingers and between the thumb and fist, said bladder being shaped to conform to the shape of a hand with its palm, fingers, and thumb;

(b) attaching said bladder around said hand;

(c) pumping up said bladder to extend said fingers and thumb in the shape of said bladder and to force said hand out of said clenched fist; and forming said bladder to guide and direct said fingers and thumb as they extend in response to pumping up said bladder.

5,593,370

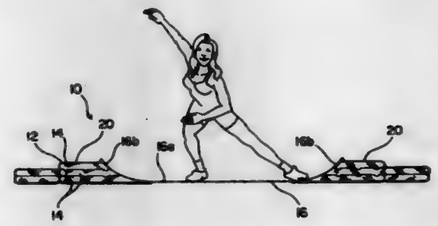
COMBINED STEPPING AND SLIDING EXERCISE APPARATUS

William B. Meldeau, 200 Pacific Coast Hwy., #245, Huntington Beach, Calif. 92648

Filed Oct. 19, 1995, Ser. No. 546,091

Int. Cl.[6] A63B *23/04*

U.S. Cl. 482—51 **10 Claims**



1. In combination, a stepping exercise device and a sliding exercise device comprising:

at least one stepping exercise platform having a base for placement on a support surface, an upper stepping surface having a front and rear end raised above said support surface and an exterior angular side surface extending from one end of said upper stepping surface; and

a sliding surface having opposite ends and a central sliding area to be supported on said support surface and having at least one of said opposite ends removably connected to said stepping exercise platform and interfacing with said exterior

angular side surface of said stepping exercise platform; said sliding surface extending downwardly from said upper stepping surface to said support surface.

5,593,371

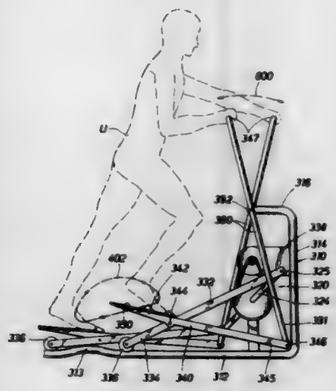
STATIONARY EXERCISE APPARATUS

Robert E. Rodgers, Jr., Houston, Tex., assignor to CCS, LLC, Denver, Colo.

Division of Ser. No. 426,467, Apr. 19, 1995, Pat. No. 5,549,526, and a continuation-in-part of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,480. This application Feb. 16, 1996, Ser. No. 602,661

Int. Cl.[6] A63B *69/16;22/04*

U.S. Cl. 482—51 **8 Claims**



1. An exercise device comprising:

a frame having a base portion adapted to be supported by a floor;

camming means supported by said frame;

a first linkage assembly having a first reciprocating member and a first foot member, said first reciprocating member having a first end and a second end, said first end of said first reciprocating member being adapted for linear movement substantially parallel with the floor, said first foot member having a first and second end, said first foot member being pivotally attached proximate said first end of said first foot member between said first and second ends of said first reciprocating member proximate said first end of said first reciprocating member, said second end of said first foot member adapted to engage and move along said camming means;

a second linkage assembly having a second reciprocating member and a second foot member, said second reciprocating member having a first end and a second end, said first end of said second reciprocating member being adapted for linear movement substantially parallel with the floor, said second foot member having a first and second end, said second foot member being pivotally attached proximate said first end of said second foot member between said first and second ends of said reciprocating member proximate said first end of said second reciprocating member, said second end of said second foot member being adapted to engage and move along said camming means; and

a coupling member having a pulley supported by said frame defining a pivot axis and means for attaching said second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in the rotation of the second ends of said reciprocating members in a substantially circular path about said axis and wherein each foot of the user of the device follows a predetermined closed path having a preferred anatomical pattern.

5,593,372

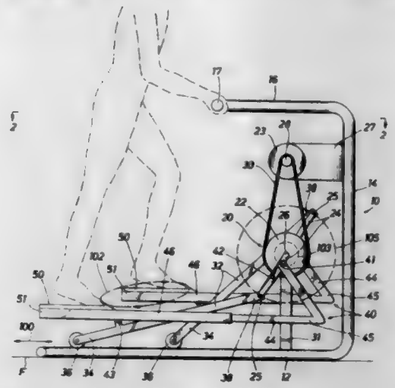
STATIONARY EXERCISE APPARATUS HAVING A PREFERRED FOOT PLATFORM PATH

Robert E. Rodgers, Jr., Houston, Tex., assignor to CCS, LLC, Denver, Colo.

Continuation-in-part of Ser. No. 377,846, Jan. 25, 1995. This application Jun. 30, 1995, Ser. No. 497,612

Int. Cl.[6] A63B *69/16;22/04*

U.S. Cl. 482—52 **30 Claims**



1. An apparatus for exercising comprising:

a frame having a base portion adapted to be supported by a floor;

first and second reciprocating members, each reciprocating member having a first end and a second end, said first end of said first and second reciprocating members adapted for linear motion substantially parallel with the floor;

a coupling member having (i) a pulley supported by said frame defining a pivot axis, and (ii) means for attaching said second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in the rotation of said second ends of said first and second reciprocating members in a substantially circular path about said pivot axis; and

means for orienting the bottom of the foot of the user of the apparatus, said orienting means including first and second foot platforms so that during operation of the apparatus each said foot platform remains substantially parallel with a predetermined reference plane while revolving in a predetermined substantially elliptical path.

5,593,373

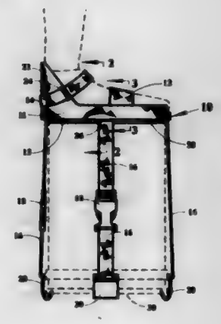
ECONOMICAL FOOT CONNECTED STILT ASSEMBLY

Russell S. Hale, 5174 Bristol St., Arvada, Colo. 80002

Filed Mar. 7, 1995, Ser. No. 399,918

Int. Cl.[6] A63B *25/00*

U.S. Cl. 482—75 **20 Claims**



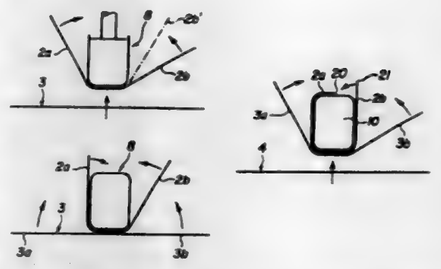
1. A foot connected stilt assembly using a conventional bucket means as an elevating object, comprising:

a) a foot support base assembly including an attachment strap having an adjustable attachment buckle and a strap attachment hook connected to outer ends thereof;

b) an elevating object resembling a bucket having a bottom wall and an entrance opening defining a bucket's top rim;

c) said foot support base assembly mounted against said bottom wall and said strap attachment hooks mounted about said top rim of said elevating object; and

d) said attachment strap tightened by said adjustable attachment buckle to securely fasten said foot support base assembly on said elevating object whereby said elevating object whereby raises the user's foot above a support surface to act as an elevating support stilt.



5,593,374

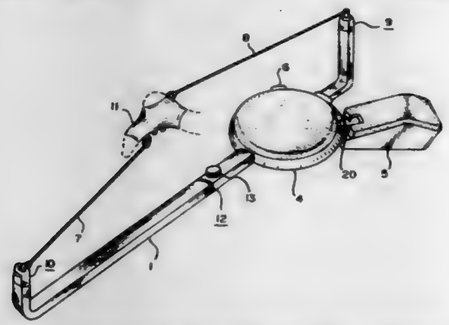
EXERCISE DEVICE FOR CONDITIONING THE MUSCLES OF THE GLUTEAL REGION

Ned Gvoich, Beamsville, Canada, assignor to Kor-One, Ltd., Scottsdale, Ariz.

Filed Jul. 19, 1995, Ser. No. 504,127

Int. Cl.[6] A63B *21/02*

U.S. Cl. 482—123 **7 Claims**



1. A device for exercising the muscles of the leg, comprising:

a rigid frame comprising an elongated bar having a first end and a second end said first and second ends being angled upward;

a hip support intermedially attached to said rigid frame;

a back support removably attached to said hip support;

a bootie having a toe end and a heel end;

a first resistance means connecting the toe end of said bootie to said rigid frame for providing resistance to lateral rotation of the leg; and

a second resistance means connecting the heel end of said bootie to said rigid frame for providing resistance to the extension of the leg.

5,593,375

CONTINUOUS TUBULAR BOX BODY PRODUCTION PROCESS, PARTICULARLY FOR CARDBOARD BOXES

François-Marie Franci, Pontault-Combault, France, assignor to Pack'Industrie S.A., Rixheim, France

PCT No. PCT/IB94/00036, § 371 Date Nov. 10, 1994, § 102(e) Date Nov. 10, 1994, PCT Pub. No. WO94/20281, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 11, 1994, Ser. No. 335,785

Claims priority, application France, Mar. 12, 1993, 93 03052

Int. Cl.[6] B29C *53/50;* **B31B** *5/36*

U.S. Cl. 493—302 **13 Claims**

1. In a process for continuous manufacture of tubular container bodies (17) from a plurality of continuously moving, superposed longitudinal webs (2,3,4) wherein:

glue is applied on at least one surface of at least one of said webs (2,3,4) and said webs are then applied lengthwise against each other in a superposed relationship and against a longitudinally extending, stationary guide (8) that terminates longitudinally in a mandrel (10) having a circumference defining a transverse profile of said container bodies (17); and

said webs (2,3,4) are applied against each other and against said guide (8) along a longitudinally extending generating line of each of said container bodies so that each web has two side flaps (*2a,2b;3a,3b;4a,4b*) on opposite lateral sides of said generating line and said guide (8) and then said side flaps are folded around said guide (8) and said mandrel (10) while said webs move longitudinally along said guide and said mandrel; the improvement comprising the steps of:

a) successively applying and folding each of said webs (2,3,4) against said guide (8) and along said generating line, so that the two side flaps (*2a,2b*) of an inner first web (2) of the container body (17) are partially folded around said guide (8) and said mandrel (10), but are not completely folded around said guide (8) and said mandrel (10), before an adjacent outer second web (3) of the container body is applied against said guide, whereby the successive application and folding of each of said webs (2,3,4) against and around said guide (8) and said mandrel (10), after partially folding respective side flaps (*2a,2b;3a,3b;4a,4b*) of previously applied webs (2,3,4), avoids glueing between said webs (2,3,4) in parts which are not completely folded and shaped around said guide (8) and said mandrel (10); and

b) folding at least partially asymmetrically said two side flaps (*2a,2b;3a,3b;4a,4b*) of each web (2,3,4) about said guide (8), so that one of the two side flaps of each inner web is completely folded around said guide (8) before the other flap of the inner web is completely folded around said guide (8); said other flap being completely folded around said guide (8) before a first flap of an adjacent outer web is completely folded around said guide (8).

5,593,376

CUSHIONING CONVERSION MACHINE AND METHOD

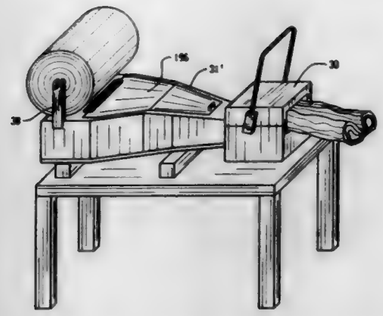
Steven E. Armington, Gates Mills, and Richard O. Ratzel, Westlake, both of Ohio, assignors to Ranpak Corp., Concord Township, Ohio

Filed Jul. 22, 1994, Ser. No. 279,150

Int. Cl.[6] B31D *5/00;5/04*

U.S. Cl. 493—464 **28 Claims**

1. A cushioning conversion machine for converting sheet-like stock material into a relatively low density cushioning dunnage product, comprising a shaping member over which the sheet-like stock material is drawn to form the stock material into a three-dimensional shape, a feed mechanism for drawing the stock material over the shaping member, and an outer shell having a wall with an exterior surface forming the exterior of the machine and an



interior surface forming a converging chute cooperative with said shaping member to roll edges of the stock material to form lateral pillow-like portions, said shell including a base portion and a removable cover portion.

5,593,377

WEIR AND CHOKE PLATE FOR A SOLID-JACKET CENTRIFUGE DRUM

Helmut Figgener, and Paul Brüning, both of Oelde, Germany, assignors to Westfalia Separator Aktiengesellschaft, Oelde, Germany

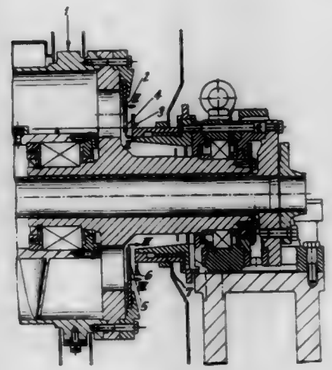
PCT No. PCT/EP94/01380, § 371 Date May 26, 1995, § 102(e) Date May 26, 1995, PCT Pub. No. WO95/00249, PCT Pub. Date Jan. 3, 1995

PCT Filed Apr. 30, 1994, Ser. No. 446,877

Claims priority, application Germany, Jun. 18, 1993, 43 20 265.9

Int. Cl.[6] B04B *11/20;11/00*

U.S. Cl. 494—56 **5 Claims**



1. In a solid-jacket centrifuge drum for separating out a liquid phase, a weir rotatable with the drum around an axis and disposed in a path of the separated out liquid phase and having at least one channel for the separated out liquid phase and a choke plate for regulating flow through the at least one channel in the weir and thereby the level of liquid inside the drum, wherein the choke plate is stationary relative to the rotation of the weir and the drum and is axially displaceable relative to the weir to form a gap therebetween through which the separated out liquid phase passes, the gap having a distance which is varied with the axial displacement of the choke plate.

5,593,378

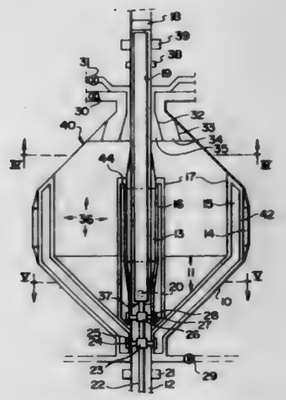
CENTRIFUGAL SEPARATOR FOR FLOWABLE MIXTURES AND HAVING MAGNETS AND HOUSING SCRAPERS

Howard F. Dyck, G.B. #1301, R.R. #1, Trenton, Ontario, Canada

Filed Mar. 7, 1995, Ser. No. 409,349

Int. Cl.[6] B04B *11/08;1/04*

U.S. Cl. 494—55 **13 Claims**



1. A centrifugal separator comprising a centrifuge housing defining a separation chamber, the housing rotatable around an axis of rotation, the housing having an inlet for a flowable mixture of materials to be separated within the separator with the inlet at a radially inward location relative to the separation chamber, a magnet arrangement rotatable with the housing, the magnet arrangement extending around the rotational axis to create a magnetic field within the housing with magnetic lines of force carried around the axis of rotation during rotation of the housing for polarizing molecules of the mixture which are aligned with the lines of force to decrease molecular bonding, a plurality of baffle plates extending radially within and rotatable with the housing, the baffle plates separated angularly around the rotational axis to divide the separation chamber into sub-chambers between the baffle plates for stabilization of the flowable mixture within each sub-chamber during rotation of the housing to draw molecules of the mixture towards alignment with the rotating lines of force, and a housing scraper facing an inside surface of the housing to remove from the housing surface material attracted to the magnet arrangement during centrifugal separation, the housing having at least two outlets spaced apart in the direction of the rotational axis, each outlet for removal of at least one separated material from the mixture.

5,593,379

MAGNETIC OPERATING TABLE

Reiza Rayman, London, Canada, assignor to Surgery Futures Research, Inc., London, Canada

Division of Ser. No. 210,576, Mar. 18, 1994, Pat. No. 5,529,568. This application Jun. 5, 1995, Ser. No. 464,265

Int. Cl.[6] A61B *17/52*

U.S. Cl. 600—9 **4 Claims**

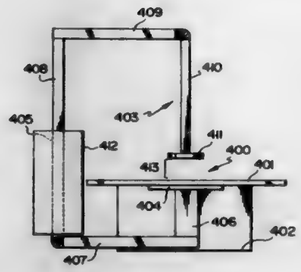
1. An improvement in a method for carrying out laparoscopic surgery on an intestine of a patient, said improvement comprising:

a) establishing discrete magnetic or magnetizable zones within a preselected segment of said intestine by having said patient ingest a magnetic or magnetizable medium;

b) inducing an electromagnetic field which can be focused and translated around said patient by means of an electromagnet comprising an upper electromagnet pole and a lower electromagnet pole which are spaced both above and below said patient;

c) attracting poles of said magnetic or magnetizable medium which is within said preselected segment of said intestine to a pole of said electromagnet; and

d) manipulating said intestine by at least one of suspension of a preselected segment of said intestine which contains said magnetic or magnetizable medium, or retraction of a preselected segment of said intestine which contains said magnetic or magnetizable medium, or lengthwise translation of the entire said intestine which contains said magnetic or magnetizable medium in a segment-by-segment fashion, by the essential step of selectively focusing and translating said electromagnetic field by way of manipulation of said upper electromagnet pole; said upper electromagnet pole including a plurality of expandable pole heads which are supported on a rotatable shaft magnet; said electromagnetic field being focused and translated by means of rotation of said rotatable shaft magnet of one of said expandable pole heads about an axis which is perpendicular to said patient.



5,593,380

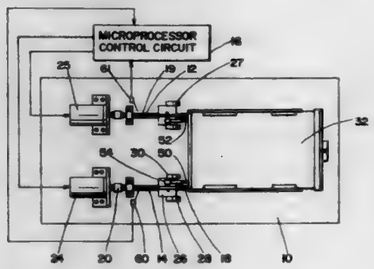
APPARATUS FOR PRODUCING MULTIPLE MOTIONS

Raymond P. Bittikofer, 215 Park La., Springboro, Ohio 45066

Continuation of Ser. No. 212,118, Mar. 14, 1994, Pat. No. 5,474,520. This application Sep. 12, 1995, Ser. No. 527,271

Int. Cl.[6] A61H *1/00*

U.S. Cl. 601—27 **4 Claims**



1. An apparatus for moving an object through a multiplicity of orientations about two pivot axes, the apparatus comprising:

(a) a support frame;

(b) a pair of independently operable actuators mounted to said support frame;

(c) a support platform mounted to said support frame for permitting pivotal movement about said two pivot axes;

(d) a first drive link having two ends and including a universal joint at each said end, wherein said first drive link is connected to said support platform by a respective first said universal joint, and wherein said first drive link is connected to a first one of said actuators by a respective second said universal joint; and

(e) a second drive link having two ends and including a universal joint at each said end, wherein said second drive link is connected to said support platform by a respective first said universal joint, and wherein said second drive link is connected to a second one of said actuators by a respective second said universal joint.

5,593,381

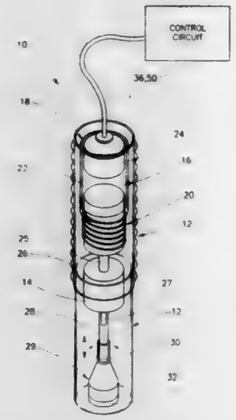
SKIN AND TISSUE TREATMENT AND STIMULATION DEVICE AND METHOD

Joseph Tannenbaum, Jerusalem, and Eli S. Pasternak, Petach Tikva, both of Israel, assignors to Neptune Pundak & Ayalon Ltd., Haifa, Israel

Filed Jul. 25, 1994, Ser. No. 279,350

Int. Cl.[6] A61H *7/00;23/00*

U.S. Cl. 601—93 **20 Claims**



16. A skin and tissue treatment and stimulation device comprising:

a housing;

electromechanical transducer means mounted in said housing, said electromechanical transducer means having applicator means mounted at an end thereof, said applicator means contacting the skin and tissue; and

control means for applying electrical signals to said transducer means to control movement thereof, for controlled manipulation of the skin and tissue via said applicator means;

wherein said transducer means comprises:

a rotation-reversible motor; and

an electromagnetic solenoid comprising a fixed portion and a slidably movable portion, said motor being connected to said slidably movable portion so as to move therewith, said applicator means being mounted on a shaft of said motor, such that said applicator means is reversibly rotatable, and vertically movable, said reversibly rotatable applicator means being rotatable in each of forward and reverse rotation directions with a controllable rotational deflection angle, at a controllable rotation rate and torque,

said reversibly rotatable applicator means being rotatable in each of said forward and reverse rotation directions with said rotational deflection angle being of one of said direction uneven to that of the opposite direction, such that said applicator means advances horizontally, stretching the skin.

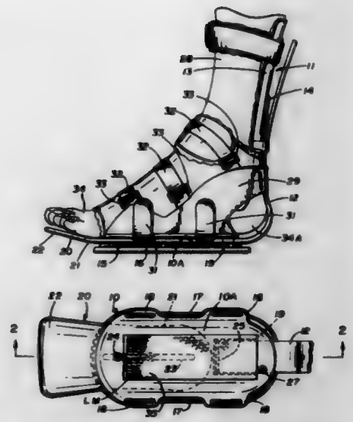
5,593,382
EXTRICATION CERVICAL COLLAR WITH ADJUSTABLE SUPPORTS
Ronald M. Rudy, Jr., 10728 Kanmir Ct., Boynton Beach, Fla. 33437, and Freddy T. Lee, 1502 SW. 22nd Ave., Boynton Beach, Fla. 33426
Filed Sep. 29, 1994, Ser. No. 314,653
Int. Cl.[6] A61F 5/00
U.S. Cl. 602—18 10 Claims



1. An extrication cervical collar suitable for rescue operations comprising:
(A) a single wide band in the form of a loop of supporting material of sufficient length to surround the neck of a patient,
(B) a mandibular support extending upwardly from said band, said mandibular support comprising a substantially horizontal surface component, and
(C) a plurality of spaced-apart structural members adjustably and independently supporting said mandibular support from said band at a distance required for the length of the neck of said patient, wherein;
(i) a central of said structural members comprises a first stiff strap extending downwardly from said mandibular support,
(ii) said first strap comprises a vertical row of perforations therethrough,
(iii) said band supports a pin projecting forwardly therefrom and fitable snugly into said perforations,
(iv) the remaining two of said structural members comprise second and third stiff straps that extend downwardly from either side of said first strap, and
(v) said band comprises two pairs of essentially rectangular openings therein for engaging said second and third structural members to level said mandibular support.

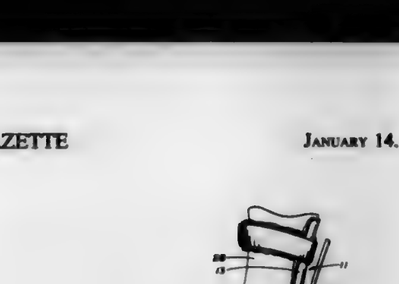
5,593,383
SECURING APPARATUS FOR AN ANKLE AND FOOT ORTHOSIS
William DeToro, 930 Trailwood Dr., Boardman, Ohio 44512
Filed Mar. 20, 1995, Ser. No. 407,112
Int. Cl.[6] A61F 5/00
U.S. Cl. 602—27 9 Claims

1. Securing apparatus for a therapeutic leg and foot brace for use on a patient, said apparatus comprising:
a) leg portion connected to a resilient interconnecting heel portion, the interconnecting heel portion being positionable behind the patient's heel and being substantially flat;
b) a foot portion connected to the interconnecting heel portion, said foot portion having a generally flat and rigid foot pad connected to a flat walking Dad which provides stable mobility by the patient, said heel portion is attached between the foot Dad and the walking Dad, said foot pad having at least two apertured tabs formed within the outer perimeter of said foot pad, said aperture tabs being in transverse-spaced paired relation to one another;
c) a foot engagement enclosure releasably secured to said foot pad through said apertured tabs; and



d) means for selectively securing said foot engagement enclosure to said foot pad and to and about a patient's foot.

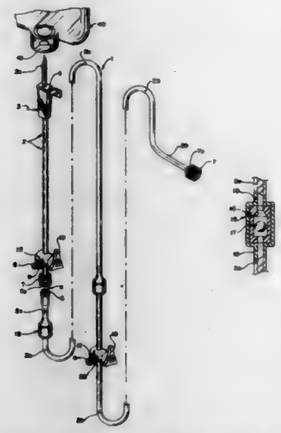
5,593,384
CONTROLLED INFUSION ADMINISTRATION OF PHARMACEUTICALS
Stephen H. Hsiao, 47 Sargent St., Newton, Mass. 02158
Filed Mar. 23, 1989, Ser. No. 327,824
Int. Cl.[6] A61M 31/00
U.S. Cl. 604—54 35 Claims



1. A method for administering a pharmaceutical to an animal, comprising
imbibing a plurality of carriers with the pharmaceutical,
placing a barrier into the animal, said barrier defining a first zone and a second zone within the animal, said barrier permitting passage of the pharmaceutical between said zones and impeding passage of said carriers between said zones,
and placing said imbibed carriers into said first zone,
wherein the step of placing said imbibed carriers includes injecting said imbibed carriers into said first zone.

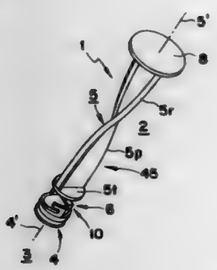
5,593,385
CONTRAST MEDIA DISPENSING APPARATUS
Samuel W. Harrison, 4003 Scenic Dr., Shreveport, La. 71119, and John Hardin, III, 948 Trahue, Shreveport, La. 71106
Continuation-in-part of Ser. No. 19,848, Feb. 18, 1993, Pat. No. 5,423,751. This application Mar. 24, 1995, Ser. No. 409,831
Int. Cl.[6] A61M 3/00
U.S. Cl. 604—83 11 Claims

1. A dispensing apparatus for dispensing a fluid from a container to a manifold, comprising a first length of tubing having one end



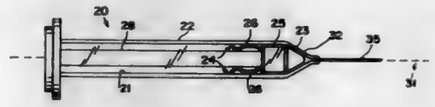
connected in fluid communication to the container; first adjustable valve means connected to the opposite end of said first length of tubing from said one end for controlling the flow of fluid from the container through said first length of tubing; first connecting means provided on said first adjustable valve means; tubing connecting means provided for removably engaging said first connecting means; a second length of tubing having one end connected to said tubing connecting means, whereby said tubing connecting means releasably engages said first connecting means and removably connects said one end of said second length of tubing to said adjustable valve means; a pair of check valves provided in said second length of tubing in spaced relationship with respect to each other; second adjustable valve means attached to the opposite end of said second length of tubing from said one end for further controlling the flow of fluid from the container through said second length of tubing; a third length of tubing having one end attached to said second adjustable valve means; and manifold connecting means provided on the opposite end of said third length of tubing from said one end for removably connecting said third length of tubing to the manifold.

5,593,386
NON-REUSABLE SYRINGE ADAPTED ROD-AND-PISTON UNIT AND METHOD FOR ASSEMBLING SUCH SYRINGE
Göran Helldin, Götene, Sweden, assignor to Dille Safe AB, As, Sweden
PCT No. PCT/SE93/00607, § 371 Date Dec. 29, 1994, § 102(e) Date Dec. 29, 1994, PCT Pub. No. WO94/01151, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 1, 1993, Ser. No. 360,813
Claims priority, application Sweden, Jul. 2, 1992, 9202052
Int. Cl.[6] A61M 5/315
U.S. Cl. 604—110 17 Claims



1. A method of assembling a syringe which, when assembled, includes a rod which is intended to move reciprocatingly in relation to a syringe tube, one end of which is comprised of or can coact with a needle, a piston which can coact with the rod, and means for connecting and disconnecting the piston to and from the rod respectively, comprising the steps of:
positioning an integral rod-and-piston unit so that an extension of a center line on the rod and the piston substantially coincides with an extension of a center line on the syringe tube;
inserting the integral rod-and-piston unit into the syringe tube;
separating the rod from the piston within the syringe tube; and
bringing the means for connecting and disconnecting the piston to and from the rod to a unit connecting position;
wherein the separating step includes separating said rod and piston with the aid of a separate device.

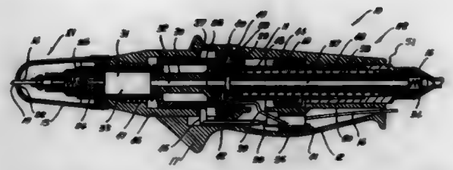
5,593,387
NON-REUSABLE SYRINGE
Roberta N. Rupp, 126 Vinal St., Revere, Mass. 02151
Continuation-in-part of Ser. No. 284,810, Mar. 2, 1994, Pat. No. 5,419,773. This application May 24, 1995, Ser. No. 448,988
Int. Cl.[6] A61M 5/00
U.S. Cl. 604—110 1 Claim



1. A non-reusable syringe comprising:
a hollow tubular cylinder including an inner wall having a first diameter and an opening at one end for the entering and exiting of fluids;
a curved bracket extending from said inner wall of said cylinder;
a plunger attached to a shaft within said cylinder, said plunger adapted to travel along an axis of travel between a fully extended position in which the head of the plunger is adjacent to a rear end of the cylinder to a fully depressed position in which the head of the plunger is adjacent to a front end of the cylinder; and
a flexible rim extending from a rear portion of said plunger along the axis of travel, said flexible rim continually extending outwardly from said plunger to a distal end having a second diameter greater that said first diameter when said rim is in an un-flexed position;
wherein when said plunger is initially positioned at said fully depressed position said curved bracket operates in conjunction with said outer rim to prevent said plunger from being permanently secured in said fully depressed position;
wherein when said plunger is pulled from said initial position toward said fully extended position said plunger inverts said curved brackets; and
whereafter said curved bracket operates in conjunction with said outer rim to lock said plunger in place when said plunger is subsequently positioned in said fully depressed position.

5,593,388
INJECTOR WITH RETRACTABLE SHROUD
Ian R. Phillips, Killara, Australia, assignor to N.J. Phillips Pty. Limited, New South Wales, Australia
Filed Nov. 14, 1994, Ser. No. 339,392
Claims priority, application Australia, Nov. 11, 1993, PM2350
Int. Cl.[6] A61M 5/20
U.S. Cl. 604—135 11 Claims

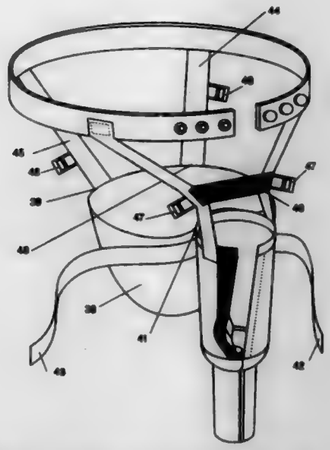
1. An injector comprising:
a body having a forward end;



a needle extending away from said forward end and through which a volume of liquid is to be injected;
a first interacting piston and cylinder mounted in said body and cooperating to enclose a first variable volume space;
a second interacting piston and cylinder mounted in said body and cooperating to enclose a second variable volume space;
a first passage extending from said first space to said needle so that upon a reduction in the volume of said first space, liquid contained therein is caused to move from said first space through said first passage to said needle wherefrom the liquid is injected;
a second passage exteading from said second space to enable a fluid under pressure to be delivered thereto cause to relative movement between said second piston and cylinder;
a connection between said first piston and cylinder and said second piston and cylinder so that said relative movement causes movement between said first and second cylinders to reduce the volume of said first space;
a valve connected to said second passage to regulate supply of said fluid to said second space;
a delivery duct extending to said first space to permit the liquid to be injected to be delivered thereto;
a trigger member extending away from said forward end, said trigger member being movable in a direction generally parallel to the needle between an extended position and a retracted position, said trigger member being mounted relative to said needle so that upon penetration of said needle said trigger member is moved from said extended position towards said retracted position; and wherein
said trigger member is operatively associated with said valve to cause operation thereof to deliver said fluid to said second space upon said trigger member moving a predetermined distance from said extended position towards said retracted position.

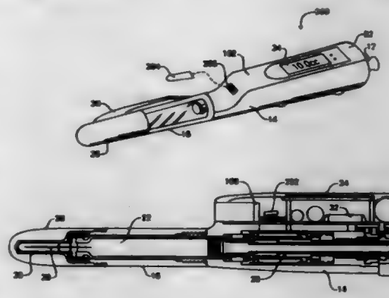
5,593,389
URETHRAL CATHETER HOLDER WITH ANCHORING DEVICE
Hau H. Chang, 7704 Calle Espada, Bakersfield, Calif. 93309
Filed May 25, 1995, Ser. No. 452,663
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—174 **3 Claims**

1. A urethral Foley catheter holder and anchoring device for supporting the Foley catheter holder in a urethral meatus comprising:
a) a first short semicylindrical segment with a semicylindrical rim extension at one end that exteads to a diameter larger than said short semicylindrical segment, said short segment comprising a foam pad lining an inner surface thereof and said rim extension including a foam pad impregnated with an antimicrobial agent lining the inner surface thereof;
b) a second short semicylindrical segment with a semicylindrical rim extension at one end that exteads to a diameter larger than said second short semicylindrical segment, said short segment comprising a foam pad lining an inner surface thereof and said rim extension including a foam pad impregnated with an antimicrobial agent lining the inner surface thereof;
c) a web at one edge of each short semicylindrical segment to allow connection of said short semicylindrical segments together to form a central lumen within the foam pads to accommodate the Foley catheter;
d) locking means on the first and second short semicylindrical segments for locking the device in a operative position;



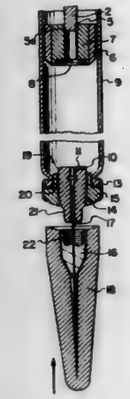
e) A single or multi-layered condom shaped tubular structure attached to the upper end of said rim extension, and;
f) a flexible belt attached to the condom shaped tubular structure, the flexible belt and condom shaped tubular structure acting together to anchor the Foley catheter holder in the urethral meatus.

5,593,390
MEDICATION DELIVERY DEVICE WITH A MICROPROCESSOR AND CHARACTERISTIC MONITOR
Thomas P. Castellano, and Robert Schumacher, both of Beverly Hills, Calif., assignors to Visionary Medical Products, Inc.
Continuation-in-part of Ser. No. 350,405, Dec. 5, 1994, which is a continuation-in-part of Ser. No. 208,636, Mar. 9, 1994, Pat. No. 5,536,249. This application Feb. 28, 1995, Ser. No. 396,420
Int. Cl.[6] A61M *5/00;5/20*
U.S. Cl. 604—187 **44 Claims**



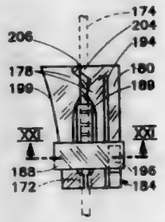
1. A portable, hand-held medical device for use by a patient, the medical device comprising:
an external hand-held medication delivery mechanism for manually administering a dosage of a medication, the medication delivery mechanism only contacting the patient's body when a dosage of medication is administered;
a hand-held blood characteristic monitor for analyzing a blood sample removed from the patient's body and the sample being placed into contact with the characteristic monitor for analysis external to the body of the patient;
a processor coupled to the hand-held medication delivery device and the hand-held characteristic monitor, wherein the processor determines a value equal to the dosage of the medication to be administered by the hand-held medication delivery device, and wherein the processor determines characteristics from the blood sample analyzed by the hand-held characteristic monitor; and
a single hand-held housing shaped and sized to fit in a shirt pocket, the housing holding the medication delivery mechanism, characteristic monitor and the processor.

5,593,391
AMPULE SAFETY SYRINGE
Sydney D. Stanners, Box 11, 9169 Barnes Pl., Sidney, Canada
Continuation-in-part of Ser. No. 834,854, Feb. 13, 1992, Pat. No. 5,403,288. This application Mar. 31, 1995, Ser. No. 414,736
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—232 **17 Claims**



1. An ampule safety syringe combination comprising:
(a) an elongated plunger having a first end and a second end, the first end of the plunger having a thumb press thereon, the second end of the plunger having a member thereon for releasably engaging a piston;
(b) a finger grip with an opening therein for slidably receiving therethrough the elongated plunger, and enabling the plunger to be reciprocally moved through the opening in the finger grip, said finger grip having a member thereon for releasably engaging a first end of an ampule, and enabling the second end of the plunger to penetrate through the opening into the interior of the ampule;
(c) a hollow cylindrical ampule having a first end and a second end, the first end of the ampule being proximate and releasably affixed to the finger grip member and the second end opposite the first end having an ampule cap;
(d) a plunger moveable piston having a first end proximate to and releasably connected to the second end of the plunger and a second end of the piston opposite the first end of the piston, the piston being located and slidably held in the interior of the hollow cylindrical ampule, the piston reciprocating along the longitudinal axis within the interior of the hollow cylindrical ampule, the first end of the plunger extending from the first end of the ampule and the finger grip to the exterior of the ampule opposite the second end of the ampule;
(e) an ampule cap affixed to the second end of the ampule in longitudinal axial alignment with and proximate to the second end of the piston and on a side of the second end of the piston opposite the plunger;
(f) a hollow needle with first and second pointed ends and having a needle hub between the first and second pointed ends, the needle and needle hub being located at the second end of the ampule and the ampule cap with the second pointed end of the needle protruding from the second end of the ampule and ampule cap; and
(g) a cap and hub fitting with a first end connected to the ampule cap and a second end proximate the second end of the ampule and the second end of the piston, the fitting enabling the needle hub and needle to be releasably affixed to the ampule cap at the second end of the ampule, whereby the first pointed end of the needle penetrates into the interior of the ampule and the second pointed end of the needle extends from the second end of the ampule in a direction opposite to the plunger and the first pointed end of the needle; wherein the first end and the second end of the piston are enclosed in the first end of the ampule, the first end of the piston being releasably engaged by the engagement member on the second end of the plunger, the fitting being proximate to the first end of the needle, and being penetrated by the first pointed end of the needle, the fitting releasably engaging with the cap at the second end of the ampule, the fitting engaging the second end of the piston when contacted by the piston and being detached from the cap and ampule and withdrawn into the interior of the ampule by withdrawal of the plunger and piston, said piston when engaged by the second end of the plunger and moved by the plunger in the direction of the second end of the needle protruding from the second end of the ampule and pumping liquid contents from the interior of the ampule through the second end of the needle, said second end of the piston engaging the first pointed end of the needle and the fitting at the end of travel of the piston and the plunger towards the second end of the ampule, said piston and plunger when moved by the plunger towards the first end of the ampule away from the second end of the ampule, disengaging the fitting from the cap and withdrawing the fitting and the first and second pointed ends of the needle into the interior of the ampule.

5,593,392
INTRAVENOUS FLOW REGULATING AND MOUNTING ASSEMBLY
Jovanka Starchevich, 138 Sullivan St., New York, N.Y. 10012
Continuation-in-part of Ser. No. 186,441, Jan. 25, 1994, Pat. No. 5,429,615, which is a continuation-in-part of Ser. No. 949,148, Sep. 22, 1992, Pat. No. 5,328,487. This application Oct. 6, 1994, Ser. No. 319,167
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—246 **25 Claims**



1. A flow regulator device for intravenous tubing, comprising:
a frame body;
means on said frame body for attaching a flexible tube to said frame body;
first pressure application means including a first clamping surface and a second clamping surface movable relative to one another, disposed on said frame body and engageable with said tube for alternately compressing and releasing said tube along a first line of action in a first plane;
second pressure application means, disposed on said frame body spaced from said first pressure application means along a flow path of said tube and engageable with said tube, for alternately compressing and releasing said tube along a second line of action in a second plane, said second line of action

being oriented at a substantial angle with respect to said first line of action, said second plane being spaced from said first plane along the flow path of said tube, said second pressure application means including a third clamping surface and a fourth clamping surface movable relative to one another; and

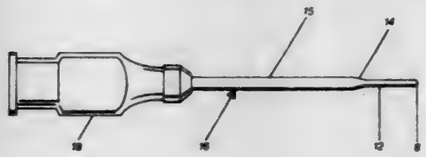
actuator means disposed on said frame and operatively connected to said first pressure application means and said second pressure application means for operating said first and second pressure application means to vary a fluid flow cross-section in said tube to enable a steady fluid flow through said tube at any of a plurality of different positive feed rates.

5,593,393

LACRIMAL IRRIGATING CANNULA

Roger J. Trudell, 2565 Tamarack Ave., Boulder, Colo. 80304, and Robert E. Prouty, 16006 E. Lehigh Clr., Aurora, Colo. 80013

Filed Sep. 7, 1995, Ser. No. 524,484
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—264 **4 Claims**



1. A lacrimal canaliculus insertion, dilation, probing, and irrigation device comprising:

a hollow fluid transmission tube ending in a smooth distal tip, with a tube diameter sufficiently small to insert into the lacrimal puncta, tapering to a larger proximal diameter sufficiently large enough to seal the puncta during fluid irrigation, of sufficient length to extend into the lacrimal canaliculus, whereby a practitioner could dilate a lacrimal puncta, probe, estimate depth of insertion, irrigate and seal the irrigation process with one device.

5,593,394

SHAFT FOR A CATHETER SYSTEM

Nozomu Kanesaka, 36 Cathy Rd., and George A. Tashji, 24 Cathy Rd., both of Hillsdale, N.J. 07642

Filed Jan. 24, 1995, Ser. No. 378,247
Int. Cl.[6] A61M *25/14*
U.S. Cl. 604—282 **4 Claims**



1. A shaft for a catheter system introduced into a vascular system, comprising:

an elongated tube made of a flexible material and having an inner wall, said tube having an equal thickness in radial and longitudinal directions; and

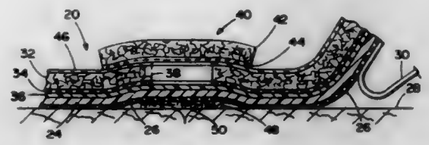
a plurality of ribs projecting radially inwardly from the inner wall of said tube and being integrally formed with said tube, said ribs having constant and equal heights and widths and being arranged parallel to each other to have an equal space between two ribs situated adjacent to each other, each of Said ribs having a substantially rectangular shape in cross section perpendicular to a longitudinal direction of the tube, said ribs extending from a proximal end to a distal end of the shaft along a longitudinal direction of said tube so that said shaft has flexibility and stiffness to manipulate the catheter system.

5,593,395

VAPOR PERMEABLE DRESSING

Joel D. Martz, 5 Sealy Dr., Lawrence, N.Y. 11559

Continuation-in-part of Ser. No. 777,679, Oct. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 504,111, Apr. 3, 1990, Pat. No. 5,061,258, which is a continuation-in-part of Ser. No. 377,269, Jul. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 83,690, Aug. 7, 1987, Pat. No. 4,846,164. This application Sep. 6, 1994, Ser. No. 300,807
Int. Cl.[6] A61F *13/00*
U.S. Cl. 604—304 **58 Claims**



5. A moisture-vapor-permeable dressing for use on human and animal skin comprising:

a conformable elastomeric film permeable to water vapor but impermeable to liquid water;

a layer of conformable elastomeric fabric of nonwoven filamentary material bonded to said film to form therewith a composite laminated structure, said layer of nonwoven material having a discontinuous form open to a transpiration of water vapor at a rate substantially greater than the permeability of said film, said layer of nonwoven material having a recoverable elastic strain so as to be conformable to a human or animal body.

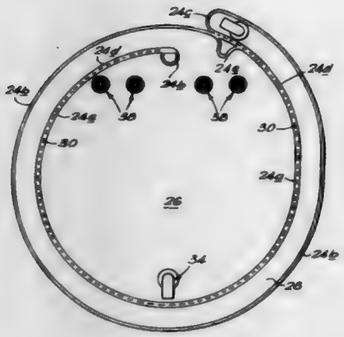
5,593,396

BAG FOR CONTAINING LIQUID

Peter L. Steer, Kingscote; Graham E. Steer, London, and John A. Gent, Lipbook, all of United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 17, 1994, Ser. No. 214,893
Claims priority, application United Kingdom, Mar. 18, 1993, 9305558; Feb. 15, 1994, 9402876
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—327 **7 Claims**

1. A bag for containing liquid comprising a pair of superimposed plastic sheets joined by a weld to form a bag, said sheets being formed so as to reduce their ability to stick together, said weld outlining in part a shape defining a tube about a periphery of said bag, said tube having an inlet for receiving fluid and an outlet for dispensing fluid into a portion of said bag, said weld including a line of weakening for permitting separation of a portion of said tube from said bag along said line of weakening while maintaining fluid communication between said tube and said bag portion.

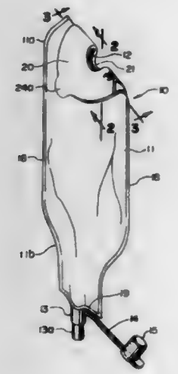


5,593,397

FECAL COLLECTOR WITH ELASTIC ATTACHMENT PATCH

Phillip A. La Gro, Hawthorn Woods, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Jul. 13, 1995, Ser. No. 501,774
Int. Cl.[6] A61F *5/44*
U.S. Cl. 604—355 **4 Claims**



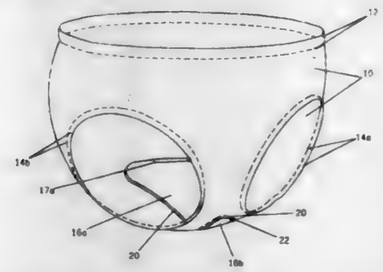
1. A fecal collector comprising a bag of elastomeric heat-sealable film having an opening for receiving fecal discharge; a thin annular attachment patch having a central opening in register with the opening of said bag; said patch comprising a skin barrier layer of rubbery pressure-sensitive adhesive having liquid-absorbing hydrocolloid particles dispersed therein and having a backing layer secured to one side of said skin barrier layer; said backing layer being formed of flexible, stretchable and contractable heat-sealable material and being joined to said bag along a narrow heat seal line immediately surrounding said opening of said bag and patch; said openings of said bag and patch being expandable and contractable, and said patch and bag being stretchable and recoverable, to conform with changes in size and shape of perianal surfaces during evacuation; and a flexible but substantially non-stretchable release sheet removably attached to the side of said adhesive layer opposite from said backing layer and carrying guidelines outlining a removable perineal section extending from the outer periphery of said patch and terminating inwardly at a point spaced from the central opening of said patch; said guidelines defining a section of generally triangular shape.

5,593,398

PROTECTIVE UNDERWEAR WITH MALODOROUS FLATUS FILTER

Chester L. Weimer, 419 W. 22nd St., Pueblo, Colo. 81003

Filed May 25, 1994, Ser. No. 248,766
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—359 **1 Claim**



1. A protective underwear comprising:

a bifurcated vinyl-covered underwear with elastic bands around the waist and legs, a hole in a lower back area of the underwear in the shape of a modified triangle and

a pocket of porous fabric shaped in a triangle larger than said hole, having a front and back piece sewn onto an edge of said hole leaving an opening with a fastener at the top of said front piece; and

a filter in the shape of said triangular hole larger than said hole and smaller than said pocket, comprising an outer top and bottom layer of wool felt followed by an inner top and bottom layer of unwoven polypropylene fabric followed by an inner top and bottom layer of fiber glass wool followed by an inner most single layer of activated carbon on an open cell foam base, and sewn together at an edge of said layers.

5,593,399

ABSORBENT ARTICLE WHICH INCLUDES SUPERABSORBENT MATERIAL LOCATED IN DISCRETE, ELONGATE POCKETS PLACED IN SELECTED PATTERNS

Richard W. Tanzer, Neenah, Wis.; Frank P. Abuto, Alpharetta, Ga.; Stanley R. Kellenberger, Appleton, Wis.; Daniel R. Laux; Brian K. Nortman, both of Appleton, Wis.; William S. Pomplun, Neenah, Wis.; Carl G. Rippl; Mark L. Robinson, both of Appleton, Wis.; Lorry F. Sallee, Pine River, Wis.; Wen Z. Schroeder, Appleton, Wis.; Sandra M. Yarbrough, Menasha, Wis., and David L. Zenker, Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 145,926, Oct. 29, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,558
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—368 **33 Claims**

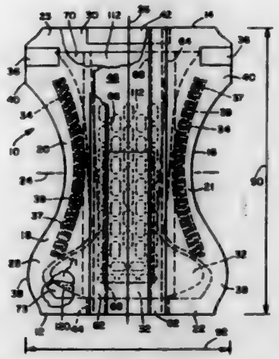
1. An absorbent article, comprising:

a first, liquid-permeable carrier layer and at least a second carrier layer;

water-sensitive carrier attaching means for securing together said carrier layers at substantially attached zones thereof, said carrier layers having substantially unattached zones providing a plurality of pocket regions with said substantially attached zones located between said pocket regions; and

high-absorbency material located within said pocket regions to provide an absorbent laminate having a laminate length and a laminate width; wherein

said water-sensitive carrier attaching means provides a wet strength adequate to hold said carrier layers together when wet, and said wet strength is less than a separating force imparted by a swelling of said high-absorbency material when said high-absorbency material is exposed to an aqueous liquid;



said plurality of pocket regions are included within a dispersed pocket array;

said pocket array includes a plurality of elongate pocket regions which have major and minor axes thereof; and

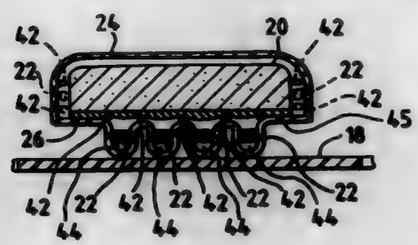
said elongate pocket regions are arranged in a non-contiguous and staggered configuration with immediately adjacent pocket regions of said staggered configuration having a separation distance therebetween.

5,593,400

DISPOSABLE ABSORBENT ARTICLE WITH SUSPENDED ABSORBENT STRUCTURE

Audrey A. O'Leary, Bellair, Wash., assignor to Paragon Trade Brands, Norcross, Ga.

Filed Feb. 9, 1994, Ser. No. 193,737
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.2 **2 Claims**



1. An absorbent article, comprising:

a liquid permeable outer cover having a front section and a rear section;

a substantially non-extensible elongate absorbent structure having a front end, a rear end, top and bottom surfaces and opposite side surfaces, said absorbent structure being positioned within said outer cover with said front and rear ends of said absorbent structure extending into said front and rear sections of said outer cover, respectively, said absorbent structure including a barrier layer on at least one surface thereof facing said outer cover;

at least one elastic element having opposite ends joined to said front and rear sections of said outer cover, respectively, for suspending and supporting said absorbent structure for substantially independent movement with respect to said outer cover and for enabling substantially independent longitudinal movement of said at least one elastic element with respect to said absorbent structure and said outer cover except at said opposite joined ends so that said absorbent structure can conform to a body of a wearer during use; and

a channel positioned on one surface of said absorbent structure and extending between said front and rear ends thereof, said at least one elastic element being positioned within said channel for laterally constraining said at least one elastic element with respect to said absorbent structure and enabling said substantially independent longitudinal movement of said at least one elastic element with respect to said absorbent structure and said outer cover and enabling said absorbent structure to conform to the body of the wearer during use,

wherein said channel is formed by a sheet of liquid permeable material and including means for attaching said sheet with respect to said absorbent structure for enabling said substantially independent longitudinal movement of said at least one elastic element,

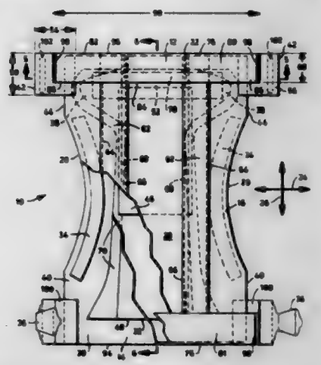
wherein said sheet completely surrounds said absorbent structure and said at least one elastic element, and includes first and second opposite longitudinal ends connected to said front and rear sections, respectively, of said outer cover.

5,593,401

ABSORBENT ARTICLE WITH BRIDGE FLAP

Paula M. Sosalla; Yong Li, and Dan D. Endres, all of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 3, 1994, Ser. No. 286,083
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—385.2 **19 Claims**



1. An absorbent article having a front waistband portion, a back waistband portion and an intermediate portion which interconnects said front and back waistband portions, said article comprising:

a backsheet layer;

an absorbent retention portion superposed on said backsheet layer;

a liquid permeable topsheet layer superposed on said retention portion and connected to sandwich said retention portion between said topsheet and backsheet layers;

a laterally extending, elasticized bridge flap connected to extend over a body-facing surface of said article and constructed to extend laterally beyond opposed side edge regions of at least one waistband portion of said backsheet layer, said bridge flap having a laterally extending, substantially fixed edge region attached to said at least one waistband portion of said article and having a laterally extending, movable edge region positioned longitudinally inboard of said substantially fixed edge region; and

an elasticized panel member directly connected to each side edge region of said at least one waistband portion of said backsheet layer and extending laterally therefrom, each said elasticized panel member having a portion thereof which is laterally outward of said waistband side edge region and is connected to said bridge flap at a bridge flap portion located laterally outward of said waistband side edge region to stretch

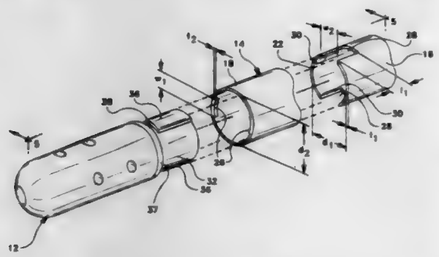
said bridge flap when said panel members are tensioned, and having a longitudinally extending length dimension which is not less than a length dimension of said bridge flap.

5,593,402

LAPAROSCOPIC DEVICE HAVING A DETACHABLE DISTAL TIP

Algird Patrick, Franklin Park, N.J., assignor to Biosearch Medical Products Inc., Somerville, N.J.

Filed Nov. 14, 1994, Ser. No. 338,417
Int. Cl.[6] A61B *19/00;17/28*
U.S. Cl. 606—1 **7 Claims**



1. A laparoscopic device comprising:

an inner cannula having an inner distal end and an inner operative end;

a detachable distal tip having a tip locking device thereon;

an outer cannula having an outer distal end and an outer operative end, said outer cannula dimensioned for insertion of said inner cannula therein and for free rotation therebetween, said inner cannula positioned inside said outer cannula, said distal ends including first and second end locking apparatus on said inner and outer distal ends respectively, said first and second end locking apparatus configured and dimensioned to simultaneously cooperate with said tip locking device of said detachable distal tip upon rotation between said inner distal end and said outer distal end, whereby said detachable distal tip may be selectively locked, relative to said distal ends, against rotational and axial movement; and

a mechanism operatively associated with said inner and outer cannulae for providing selective axial locking between said cannulae;

wherein:

said tip locking device of said detachable distal tip includes an insertion end of said tip having a rotational locking member and axial locking means thereon;

said first end locking apparatus includes a slot dimensioned to receive said rotational locking member thereby providing rotational fixity between said detachable distal tip and said distal ends; and

said second end locking apparatus includes a locking lug dimensioned to engage said axial locking means thereby providing translational fixity between said detachable distal tip and said distal ends.

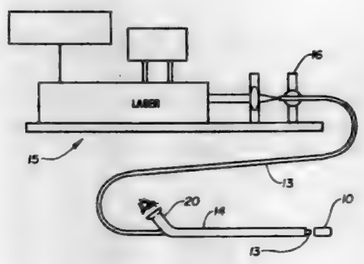
5,593,403

METHOD FOR MODIFYING A STENT IN AN IMPLANTED SITE

Paul J. Buscemi, Long Lake, Minn., assignor to SciMed Life Systems Inc., Maple Grove, Minn.

Filed Sep. 14, 1994, Ser. No. 306,008
Int. Cl.[6] A61B *17/00;17/04;* **A61F** *2/04*
U.S. Cl. 606—2 **11 Claims**

1. A method for modifying an implanted stent in an implant site comprising subjecting the stent to blasts of energy of sufficient



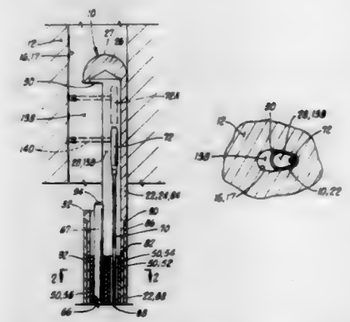
wavelength, intensity, energy per blast and blast duration to affect the physical structure of the stent without substantially affecting the implant site.

5,593,404

METHOD OF TREATMENT OF PROSTATE

Anthony J. Costello, Fitzroy, Australia; William W. Gardetto, Bedford, Tex., and Royice B. Everett, Edmond, Okla., assignors to MyriadLase, Inc., Forest Hill, Tex.

Division of Ser. No. 928,854, Aug. 11, 1992, Pat. No. 5,322,507. This application Mar. 8, 1994, Ser. No. 209,678
Int. Cl.[6] A61B *1/307;1/018;17/36*
U.S. Cl. 606—15 **18 Claims**



1. A method of treating a prostate of a patient, said prostate having an interior wall defining a prostatic urethra, said prostatic urethra being communicated by a urethra with an exterior of the patient's body, comprising:

(a) inserting a rigid endoscopic instrument through the patient's urethra and inserting a distal portion of said endoscopic instrument into the patient's prostatic urethra, engaging said interior wall with said instrument, and applying a lateral force to said instrument to spread opposed portions of said interior wall such that an open space is defined within the patient's prostatic urethra between a portion of said interior wall and said instrument, said distal portion of said endoscopic instrument having a lateral window defined therein;

(b) placing a laterally transmitting laser fiber tip of a laser fiber within said endoscopic instrument adjacent said window;

(c) spacing said tip laterally from an area of said interior wall exposed through said window;

(d) directing said tip so that a beam of laser light transmitted therefrom will be directed through said window and said open space; and

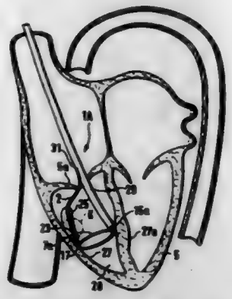
(e) transmitting said beam of laser light laterally in substantially a single direction from said tip through said window and said open space onto said area of said interior wall and thereby treating said area of said interior wall.

5,593,405

FIBER OPTIC ENDOSCOPE

Peter Osypka, Basler Str. 109, D-79639 Grenzach-Wyhlen, Germany

Continuation-in-part of Ser. No. 318,312, Oct. 5, 1994, abandoned. This application Jan. 9, 1995, Ser. No. 370,034
Claims priority, application Germany, Jul. 16, 1994, 44 25 195.5; Sep. 14, 1994, 44 32 680.7
Int. Cl.[6] A61B 17/36
U.S. Cl. 606—15 26 Claims



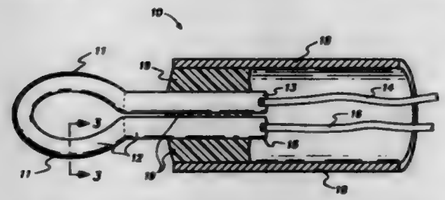
1. An endoscope comprising an elongated flexible sheath having a distal end insertable into an internal space of a body organ and a proximal end; a plurality of elongated flexible radiation- and and image-transmitting conductors surrounded by and extending longitudinally of said sheath and having exposed distal ends at the distal end of said sheath to direct radiation against and to transmit images of a surface bounding the internal space of the body organ receiving the distal end of said sheath; at least one inflatable and deflatable balloon surrounding the distal ends of said conductors; means for inflating and deflating said at least one balloon, including means for establishing for the flow of a fluid into and from said at least one balloon a path extending longitudinally of said sheath; an elongated flexible guide extending longitudinally of said sheath and including an elongated loop disposed at the distal end of said sheath and supporting said at least one balloon and the distal ends of said conductors for movement longitudinally of said loop; and means for moving said at least one balloon and the distal ends of said conductors along said loop.

5,593,406

ENDOSCOPIC INSTRUMENT WITH AUTO-REGULATING HEATER AND METHOD OF USING SAME

Philip E. Eggers, Dublin, Ohio, and Anthony J. Manlove, Menlo Park, Calif., assignors to Hemostatic Surgery Corporation, Georgetown, Cayman Islands

Continuation of Ser. No. 877,476, May 1, 1992, abandoned. This application Jan. 14, 1994, Ser. No. 182,528
Int. Cl.[6] A61B 17/32
U.S. Cl. 606—29 20 Claims



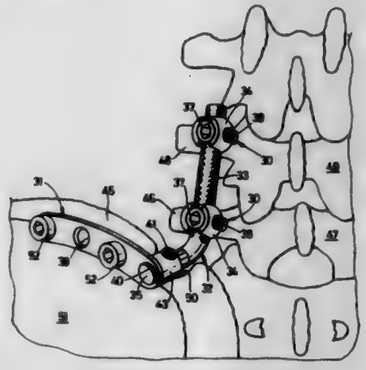
1. An instrument for use in endoscopic surgery comprising:
an elongated shaft having a proximal end and a distal end;
a working end connected to the distal end of the elongated shaft, the working end having a working surface for contacting tissue and a cross-section extending perpendicularly to the working surface, the working end integrally formed of a heating element, the working surface maintained at an auto-regulated temperature by conducting a current throughout the cross-section of the working end, the heating element comprising a material having a skin depth extending substantially throughout the cross-section of the working end responsive to the temperature of the heating element and that decreases as the temperature of the element falls below the auto-regulated temperature, the working end including a U-shaped portion having first and second legs and an electrically insulative gap located between the first and second legs;
first and second electrode leads connected to the proximal end of the elongated shaft; and
means for connecting the first and second electrode leads to the working end.

5,593,407

INTERNAL ILIO-LUMBAR FIXATOR

Nicolas D. Reis, 11A Hague Street, Dania (PODB 55560) 34 980 Haifa, Israel

PCT No. PCT/GB92/01957, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO93/07823, PCT Pub. Date Apr. 29, 1993
PCT Filed Oct. 26, 1992, Ser. No. 211,913
Claims priority, application United Kingdom, Oct. 26, 1991, 9122753
Int. Cl.[6] A61B 17/70
U.S. Cl. 606—61 17 Claims



1. An internal ilio-lumbar fixator comprising at least one pedicle screw with a bifurcated head, a pelvic plate and a bent rod having a spinal portion for engagement in the bifurcated head of the pedicle screw and a pelvic portion for engagement with the pelvic plate; in which combination:
the pedicle screw has a washer within said bifurcated head to embrace the spinal portion of the bent rod and to be pressed into firm engagement therewith by a grubscrew secured into the bifurcated head, and at least one additional locking screw in a screwthreaded hole through one side of the bifurcated head to engage the spinal portion of the bent rod;
the pelvic plate has at least two holes for bone screws, another hole having a non-circular female cross-section, and a locking screw in a screwthreaded hole opening into at least one side of the female hole;
and the bent rod having a mating male cross-section along a major part of its pelvic portion affording a close sliding fit in the female hole in the pelvic plate.

5,593,408

VERTEBRAL INSTRUMENTATION ROD

Louis E. Gayet, Saint-Benoit, and Yves Rideau, Gisse, both of France, assignors to Sofamor S.N.C, Rang Du Fliers, France

Filed Nov. 30, 1994, Ser. No. 346,902
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—61 29 Claims



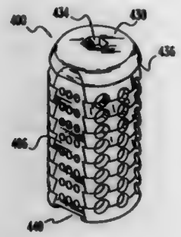
1. A vertebral instrumentation rod (5) having a first end and a second end and a solid cross-section from said first end to said second end for the fixation of an unstable spine, comprising:
a first elongated rod portion (6) defining a longitudinal axis (Ox), a sagittal plane (Ox, Oy) and a front plane (OX, Oz) perpendicular to the sagittal plane, both planes passing through said longitudinal axis, said first rod portion having a first length (L1) along said longitudinal axis and a substantially uniform first solid cross-section along said first length configured such that said first rod portion is substantially equally rigid in both the sagittal plane and the frontal plane; and
a second elongated rod portion (7) integral with said first rod portion said second rod portion having a second length (L2) extending along said longitudinal axis and a second solid cross-section along said second length configured such that said second rod portion has a substantially different rigidity between the frontal plane and the sagittal plane.

5,593,409

INTERBODY SPINAL FUSION IMPLANTS

Gary K. Michelson, Venice, Calif., assignor to Sofamor Danek Group, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 23,926, Jun. 3, 1994, Ser. No. 23,923, Jun. 3, 1994, and Ser. No. 968,240, Oct. 29, 1992, which is a continuation of Ser. No. 698,674, May 10, 1991, which is a division of Ser. No. 205,935, Jun. 3, 1988, Pat. No. 5,015,247. This application Feb. 17, 1995, Ser. No. 390,131
Int. Cl.[6] A61B 17/56; A61F 2/44
U.S. Cl. 606—61 18 Claims



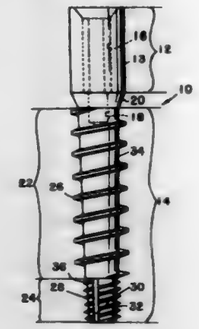
1. A partially cylindrical spinal fusion implant made of a material appropriate for human implantation, said implant comprising a cylinder having a longitudinal central axis and at least a first flat side parallel to said central axis.

5,593,410

SCREW DEVICE FOR FIXING PROSTHESES TO BONES

Giuseppe Vrespa, Via C. Battisti 26, 20025 Legnano, Italy

Division of Ser. No. 601,416, Oct. 22, 1990. This application Mar. 2, 1993, Ser. No. 25,119
Claims priority, application Italy, Oct. 26, 1989, 22139/89
Int. Cl.[6] A61F 5/04
U.S. Cl. 606—73 10 Claims



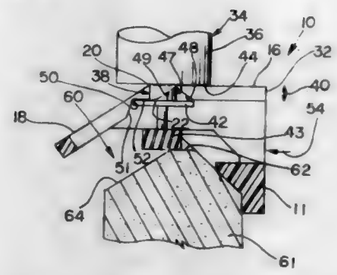
1. A screw device for fixing a prosthesis to a bone, the device comprising:
a substantially cylindrical neck having a diameter; and
a shank having a core of generally frusto-conical shape and thread on the core, the thread having a diameter equal to or less than the diameter of the neck, the thread comprising a first thread portion of large pitch, and having a number of starts the first thread portion being suitable for fixing to trabecular bone tissue and a separate second thread portion of smaller pitch adjacent the first thread portion and suitable for fixing into a cortical part of the bone, the second thread portion having a number of starts which is a multiple of the number of starts on the first thread portion.

5,593,411

ORTHOPAEDIC MILLING GUIDE FOR MILLING INTERSECTING PLANES

Gregory C. Stalcup, Columbia City, and James C. Harris, Warsaw, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

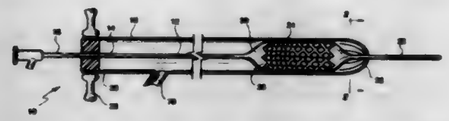
Filed Mar. 13, 1995, Ser. No. 403,034
Int. Cl.[6] A61B 17/58
U.S. Cl. 606—88 3 Claims



1. In combination a milling guide and a milling device, said milling device including a bobbin shaped nose portion defined by a plate held in space relationship from a body of the nose by a cylinder, the milling device further including a burr having a shaft, wherein said shaft exteads through the cylinder and contacts a drive member to rotate the burr relative to the nose portion, said burr is spaced from the plate by said shaft, said milling guide being

adapted for connection to an exposed end of a bone, said milling guide including a first wall and a second wall positioned intersecting planes, each of said first and second walls including a slot therein defined by a pair of rails, said bobbin shaped nose portion being accommodated by said slots such that the plate is on one side of said rails and the body of the nose is on another side of the rails with the cylinder passing between said rails such that said bobbin shaped nose portion is captured by the slot in said walls, the first wall including a notch formed therein adjacent said second wall, said notch accommodating a portion of said plate as said bobbin shaped nose portion moves along the notch in said first wall into the notch in said second wall, said notch constituting means for permitting the milling device to shift from the slot in the first wall into the slot in the second wall without removing the milling device from the milling guide.

5,593,412
STENT DELIVERY METHOD AND APPARATUS
Susana Martinez, Pembroke Pines, and Margaret F. Yoklavich, Miami, both of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.
Division of Ser. No. 283,885, Mar. 1, 1994, Pat. No. 5,453,090. This application May 2, 1995, Ser. No. 432,886
Int. Cl.[6] A61F *11/00*
U.S. Cl. 606—108 **10 Claims**

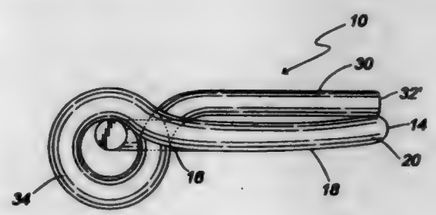


1. An apparatus for delivering a stent to a site in a lumen of a vessel, said apparatus comprising:
an elongate sheath having an elongate axis and having a distal end and distal end portion which reduces in cross-section toward said distal end of said elongate sheath and which has a central opening in said distal end of said sheath;
said distal end portion being made of a material which expands and softens by exposure to a warm, physiologically compatible liquid;
an open, but closeable, proximal end for receiving a stent on a balloon of one of (a) a balloon catheter or (b) a balloon on a wire catheter and guidewire means;
a source of warm, physiologically compatible liquid; and,
delivery means coupled to said source of warm liquid and to the interior of said sheath for supplying the warm physiologically compatible liquid to said distal end portion of said sheath.

5,593,413
DEVICE FOR ASSISTING CHILDBIRTH
Gary E. Alexander, Baton Rouge, La., assignor to Medisys Technologies, Inc.
Continuation-in-part of Ser. No. 36,568, Mar. 25, 1993, Pat. No. 5,318,573, which is a continuation-in-part of Ser. No. 982,016, Nov. 24, 1992, Pat. No. 5,217,467, which is a continuation of Ser. No. 851,068, Mar. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 522,592, May 14, 1990, Pat. No. 5,122,148. This application May 27, 1994, Ser. No. 250,054
Int. Cl.[6] A61B *17/42;17/44*
U.S. Cl. 606—122 **11 Claims**

1. An apparatus for assisting delivery of a fetus, comprising:
an elongated member having an open first end and a second end connected by a passageway, said elongated member constructed of braid material comprising loosely interwoven series of fibers, said series of fibers being in slidable relation with one another and said fibers being terminated at each end of said elongated member in such a manner that said elongated member will exert axial gripping forces when pulled from said second end, said open first end and said passageway sized to receive therein, and surround, the neck and the head of a fetus, said fibers being terminated at said open first end by folding said elongated member within the opening of said open first end so that said elongated member comprises a double-layer of said fibers;
a restricting means cooperating with said open first end to tighten said open first end about said neck and said head of said fetus at a location below the maximum diameter of said head as said head is presented in the birth canal in order to initiate said axial gripping forces when said elongated member is pulled from said second end; and
one or more insertion means for positioning of said elongated member about said head of said fetus so that said open first end is positioned below the maximum diameter of said head as presented in the birth canal.

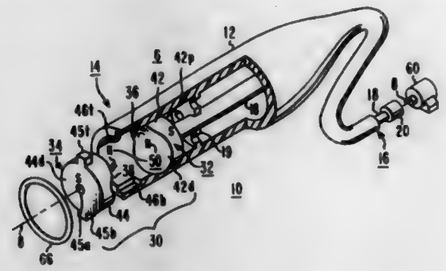
5,593,414
METHOD OF APPLYING A SURGICAL LIGATION CLIP
John I. Shipp, Tullahoma, Tenn.; George Crothall, Santa Clara, Calif.; Robert L. Lathrop, Jr., San Jose, Calif., and Donald R. Reichel, Saratoga, Calif., assignors to Apollo Camera, L.L.C., Tullahoma, Tenn.
Continuation of Ser. No. 111,634, Aug. 25, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 407,038
Int. Cl.[6] A61B *17/122*
U.S. Cl. 606—142 **4 Claims**



3. A method of achieving hemostasis of a fluid duct in conjunction with and as a part of an endoscopic surgical procedure comprising the steps of:
a. endoscopically placing a pre-formed surgical ligation clip having a clamping arm, a duct support member and means connecting said arm and said support member and biasing them into clamping juxtaposition into a surgical field proximate said duct by passing said clip through a 5 millimeter or smaller open channel of an endoscopic trocar;
b. compressing said duct to create a reduced diameter prior to placing said clip around said duct;
c. bending said clamping arm away from said duct support member, thereby placing said clamping arm in an open position;

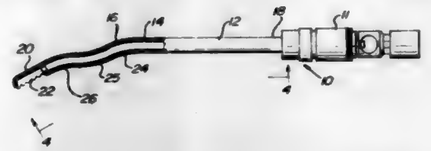
d. placing said clip around the reduced diameter duct whereby said duct is positioned between said clamping arm and said support member; and
e. releasing said clamping arm, thereby placing said duct under compression between said clamping arm and said support member.

5,593,415
ACOUSTIC CATHETER WITH REDUCED FRICTION DRIVE
Sorin Adrian, 311 Fawn Hill La., Penn Valley, Pa. 19072
Filed May 23, 1996, Ser. No. 652,124
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—169 **13 Claims**



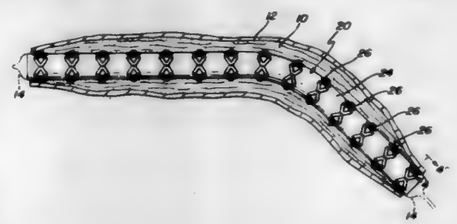
1. A catheter for generating acoustic energy in a biological medium when portions of said catheter are driven by a rotary motor, said catheter comprising:
an elongated body defining a distal end and a proximal end;
a shaft extending longitudinally through at least a portion of said body, said shaft being associated with drive coupling means located near said proximal end of said body of said catheter, which drive coupling means is adapted to be coupled to a rotary motor for causing said shaft to be driven with a rotary motion;
rotary-to-axial motion conversion means coupled to said shaft near said distal end of said catheter, and also coupled-to said biological medium, for converting said rotary motion into reciprocal axial motion in the form of acoustic energy, said rotary-to-axial motion conversion means including
(a) a rotary portion coupled to said shaft for being driven in a rotary manner thereby, said rotary portion of said rotary-to-axial motion conversion means also defining a bearing surface including portions which, relative to a point fixed on said body of said catheter, move axially in response to rotation of said rotary portion,
said rotary-to-axial motion conversion means further including
(b) follower means restrained from rotation relative to said body, said follower means including a bearing surface coupled to said bearing surface of said rotary portion of said rotary-to-axial motion conversion means, for axial motion in response to said motion of said bearing surface of said rotary portion of said rotary-to-axial motion conversion means, said follower means, when said catheter is in operation, also being coupled to said biological medium for coupling said axial motion to said biological medium in the form of acoustic waves; and
magnetic means coupled to said rotary portion of said rotary-to-axial motion conversion means and to said follower means, for generating a magnetic force between said bearing surface of said rotary portion of said rotary-to-axial motion conversion means and said bearing surface of said follower means which tends to reduce friction between said bearing surfaces of said rotary portion and said follower portion of said rotary-to-axial motion conversion means.

5,593,416
METHOD OF USING FLEXIBLE SURGICAL INSTRUMENT
John R. Donahue, 530 Rosedale Dr., Pottstown, Pa. 19464
Filed Jan. 26, 1993, Ser. No. 8,918
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—170 **2 Claims**



1. A method of performing a surgical procedure involving cutting in a body, comprising the steps of:
inserting a flexible surgical instrument through an incision wherein said surgical instrument has markings on its outer surface;
viewing the location of the flexible surgical instrument in relation to the natural curvatures of body components and determining the location of desired bends in the instrument;
withdrawing said flexible instrument and manually placing bends at the noted locations along the instrument as indicated by the markings; and
reinserting said flexible bent instrument into the body through said incision.

5,593,417
INTRAVASCULAR STENT WITH SECURE MOUNTING MEANS
Valentine J. Rhodes, 608 Winding River Rd., Bricktown, N.J. 08723
Filed Nov. 27, 1995, Ser. No. 562,727
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—191 **15 Claims**



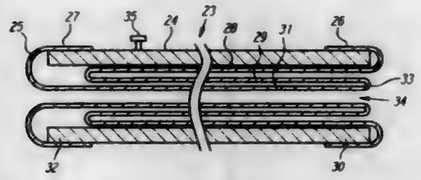
1. An intraluminal medical device for securement within a vessel, duct, or lumen of a living being, the vessel, duct, or lumen having an interior surface, said device comprising a tubular member and anchoring means, said tubular member having a passageway extending therethrough and an outer periphery, said tubular member being arranged to have a body fluid flow through said passageway in a first direction when said device is located within the vessel, duct, or lumen, whereupon a force is applied to said tubular-member, said anchoring means being located adjacent said outer periphery of said tubular member and comprising plural projections arranged for engagement with the interior surface of the vessel, duct, or lumen, each of said projections having a leading portion located in the upstream direction of the fluid flow and a trailing portion located in the downstream direction thereof, said trailing portion including at least one surface preferentially oriented to extend at an acute angle to the first direction, whereupon the force applied to said tubular member by the fluid flowing through said passageway produces on each of said projections a force component to cause said at least one surface to tightly engage the interior surface of the vessel, duct, or lumen to fixedly secure said device in place.

5,593,418

METHODS AND DEVICES FOR HARVESTING BLOOD VESSELS WITH BALLOONS

Kenneth H. Mollenauer, Santa Clara, Calif., assignor to General Surgical Innovations, Inc., Palo Alto, Calif.

Filed May 19, 1995, Ser. No. 444,426
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—192 **13 Claims**



1. A device for enveloping an elongate structure, said device comprising:

A tube having a first end and a second end, with an inflation port communicating with the inside of the tube;

a tubular membrane having first end and a second end, said tubular membrane disposed coaxially within the tube, said first end of the tubular membrane being sealed to the first end to the tube, and said second end of the tubular membrane being sealed to the second end of the tube, said tubular membrane having an uninflated state and an inflated state;

said tubular membrane in its uninflated state being longitudinally and coaxially folded within the tube, and said tubular membrane in its inflated state being unfolded and extending from the tube.

5,593,419

FIXED WIRE DILATATION CATHETER WITH DISTAL TWISTABLE SEGMENT

Lori K. Segar, Rochester, Minn., assignor to C.R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 539,707, Jun. 18, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 189,293
Int. Cl.[6] A61M *25/10*
U.S. Cl. 606—194 **11 Claims**



1. In a balloon dilatation catheter having proximal and distal ends and an integral support wire and a balloon at the distal end of the catheter, the distal end of the catheter having a construction comprising:

the balloon having a central cylindrical portion and proximally and distally extending tapering portions, each of the tapering portions terminating in a reduced diameter cylindrical neck portion;

the support wire extending through the balloon;

a separate tubular distal extension member connected integrally to and extending distally from the distal neck of the balloon, the distal end of the distal extension being attached to the support wire;

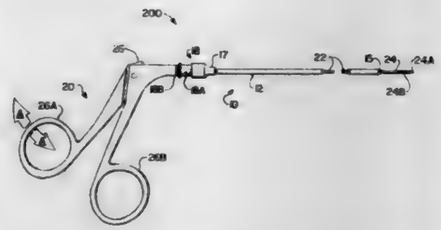
the distal extension being constructed and supported to present less resistance to twisting than the balloon and the more proximal portions of the catheter.

5,593,420

MINIATURE ENDOSCOPIC SURGICAL INSTRUMENT ASSEMBLY AND METHOD OF USE

William S. Eubanks, Jr; William L. Athas, both of Durham; Marvin E. York, and Leon R. Subsetsky, both of Raleigh, all of N.C., assignors to Mist, Inc., Smithfield, N.C.

Filed Feb. 17, 1995, Ser. No. 390,625
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—205 **6 Claims**



1. A surgical instrument assembly for performing an endoscopic medical procedure in a human or veterinary body, said assembly comprising:

(a) a support sheath, having an elongated, tubular portion, a distal end, and a proximal end, and said support sheath being adapted for introduction into a tissue forming part of the body and for advancement therewithin;

(b) a miniature medical implement member, having an elongated portion, a working end, and a handle end, and said miniature medical implement member being adapted for insertion into and advancement axially through said support sheath until the working end extends beyond the distal end of said support sheath; and

(c) a securing mechanism adapted for securing said miniature medical implement member and said support sheath to one another at their handle end and proximal end, respectively, when said miniature medical implement member is advanced axially through said support sheath with the working end extending beyond the distal end of said support sheath to form a co-axial unit wherein the securing mechanism comprises a female portion of said sheath and a male portion of said miniature medical implement member which are matingly engageable with each other;

whereby when said miniature medical implement member is secured to said support sheath, said support sheath provides rigid support and will prevent the elongated portion of the miniature medical implement member from breaking during an endoscopic medical procedure inside the body, and said miniature medical implement member and said support sheath form a unitary surgical instrument assembly which allows for a full range of movement during an endoscopic medical procedure without withdrawal of said medical implement member from said support sheath.

5,593,421

SUTURE ELEMENT DELIVERY DEVICE AND METHOD

William Bauer, Newnan Medical Plaza, Suite 204, 58 Hospital Rd., Newnan, Ga. 30263

Filed Jun. 6, 1995, Ser. No. 467,139
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—213 **18 Claims**

1. A suture element delivery device comprising:

an elongated arm assembly including a housing assembly having proximal and distal ends;

a series of successive suture elements carried by said arm assembly;

suture delivery structure mounted to said housing assembly for movement between a retracted position disposed within said housing assembly and an extended position extending distally from said housing assembly, said suture delivery structure being constructed and arranged to engage and displace a forwardmost suture element;

receptacle delivery structure mounted to a distal end of said housing assembly and movable between receptacle loading and unloading positions, said receptacle delivery structure being constructed and arranged to engage and displace a forwardmost receptacle element;

actuating structure carried by said arm assembly constructed and arranged to move said suture delivery structure between its retracted and extended positions and said receptacle delivery structure between its loading and unloading positions; and

handle structure coupled to said proximal end of said arm assembly and operatively coupled to said actuating structure, said handle structure being movable between first and second positions such that movement of said handle structure from said first position to said second position thereof during a suturing operation moves said actuating structure between first and second positions, thereby moving said suture delivery structure from its retracted position to its extended position and moving said receptacle delivery structure with a forwardmost receptacle element therein from its loading position to its unloading position such that a forwardmost suture element and the associated forwardmost receptacle element are displaced from the distal end of said housing assembly and into engagement, and

movement of said handle structure from said second position to said first position thereof returns said actuating structure to its first position thereby moving said suture delivery structure from said extended position to said retracted position and moving said receptacle delivery structure from said unloading position to said loading position.



5,593,422

OCCLUSION ASSEMBLY FOR SEALING OPENINGS IN BLOOD VESSELS AND A METHOD FOR SEALING OPENINGS IN BLOOD VESSELS

Wouter M. Muijs Van de Moer, Grindweg 56, 3055 VB Rotterdam, and Rienk Rienks, Meunestraat 17, 3882 AN Putten, both of Netherlands

Continuation of Ser. No. 248,571, Mar. 24, 1994, abandoned, which is a continuation of Ser. No. 776,281, Nov. 21, 1991, abandoned. This application Jan. 6, 1995, Ser. No. 369,588
Claims priority, application Netherlands, May 29, 1989, 8901350
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—213 **68 Claims**

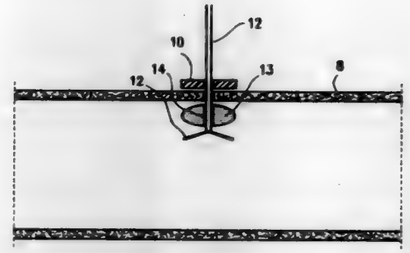
1. An occlusion assembly for percutaneously sealing a puncture in the wall of an artery or vein in the human body comprising:

a flexible retaining element;

a pair of clamping members mounted to the retaining element each of said clamping members being sized to be placed entirely beneath the surface of the skin and in turn having a surface for engaging the wall; both of the clamping members being insertable percutaneously below the skin to be engageable with the wall of the artery or vein;

one of the clamping members being capable of being passed through the puncture in the artery or vein and being constructed to lie in facing contact against the internal surface of the artery or vein adjacent the site of the puncture, the other clamping member being movable along the retaining element toward the first mentioned clamping member to engage and lie in facing contact against the outside surface of the artery or vein thereby to clamp the wall of the artery or vein directly between the two clamping members to prevent blood flow through the puncture sufficiently to enable the puncture to heal;

at least one of the clamping members being formed from a bioabsorbable material.

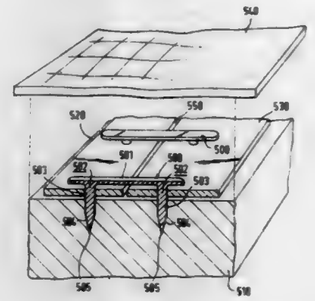


5,593,423

SKIN FASTENER

Wayne C. Person, Newtown, Conn.; Marc J. Theroux, Slatersville, R.I., and Maria E. Lopez-Isa, Huntington, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 131,504, Oct. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 097,303, Jul. 23, 1993, abandoned, which is a continuation of Ser. No. 817,578, Jan. 7, 1992, abandoned, which is a continuation of Ser. No. 601,335, Oct. 22, 1990, Pat. No. 5,108,422. This application Jan. 27, 1995, Ser. No. 380,225
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—219 **24 Claims**



1. A fastener for securing adjacent layers of body tissue to each other and being configured so as to emerge from the body tissue after a limited period of time, the fastener comprising:

a backspan having a substantially uniform cross sectional configuration along its length;

at least two spaced apart prongs extending from said backspan, each of said prongs having a tapered tip portion and a shaft

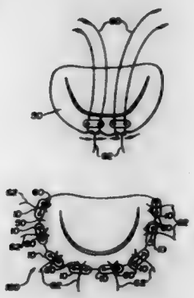
portion having a first surface facing said opposing prong and a second surface facing away from said opposing prong, each of said prongs further having at least one projecting surface at an intermediate portion thereof extending around said first surface and terminating before said second surface, the projecting surface increasing frictional engagement with the body tissue, and said fastener retained in the body tissue without engaging a retainer and configured so as to emerge from the body tissue after a limited period of time.

5,593,424

APPARATUS AND METHOD FOR REDUCING AND STABILIZING THE CIRCUMFERENCE OF A VASCULAR STRUCTURE

William F. Northrup III, Edina, Minn., assignor to Segmed, Inc., Edina, Minn.

Filed Aug. 10, 1994, Ser. No. 288,124
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—232 **24 Claims**





1. A method of reducing the circumference of a vascular structure having an upper portion and a lower portion, said upper and lower portions of the vascular structure defining an upper circumference and a lower circumference of said vascular structure, said method comprising the steps of:

a) providing a plurality of discrete suture support segments of a non-deformable biocompatible inert material, each suture support segment further comprising an upper surface, a lower surface, opposite sides, a proximal end, a distal end and two suture holes extending from the upper surface to the lower surface thereof and being spaced a predetermined distance (D) apart, each suture support segment further being rigid or semi-rigid in a longitudinal dimension defined by said opposite sides;

b) providing a plurality of sutures with a first end and a second end and at least one surgical needle attached to an end thereof;

c) individually suturing each said suture support segment to the vascular structure whose circumference is to be reduced by using one of the plurality of sutures to effect a horizontal mattress (U-shaped) suture along a length of tissue of the vascular structure defined by an entry point and an exit point of said suture in the vascular structure such that the length (D') of tissue sutured is greater than distance (D);

d) tightening the mattress suture; and

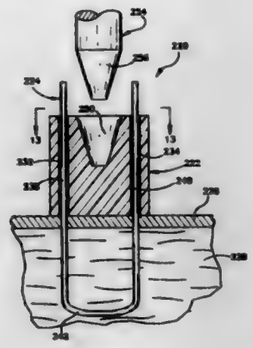
e) tying off the suture such that a suture knot is formed which sits on the upper surface of the suture support segment between two suture holes, whereby each sutured suture support segment creates an imbrication in the vascular structure thereby reducing the circumference thereof by an amount corresponding to (D')–(D).

5,593,425

SURGICAL DEVICES ASSEMBLED USING HEAT BONABLE MATERIALS

Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401, and Mark V. Brillhart, Effingham, Ill., assignors to Peter M. Bonutti, Effingham, Ill.

Continuation-in-part of Ser. No. 833,085, Feb. 10, 1992, abandoned, which is a division of Ser. No. 545,919, Jun. 28, 1990, Pat. No. 5,163,960. This application May 30, 1995, Ser. No. 453,631
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 **20 Claims**



1. A method of suturing body tissue, said method comprising the steps of placing a suture formed of a plastic material relative to the body tissue, inserting a portion of the suture into an opening in a retainer formed of a plastic material, heating at least a portion of the retainer to a temperature in a transition temperature range of the plastic material forming the retainer while maintaining the plastic material of the suture at a temperature below the transition temperature range of the plastic material forming the suture, flowing the plastic material of the retainer around the plastic material of the suture while the plastic material of the suture is at a temperature below the transition temperature range of the plastic material of the suture, and, thereafter, bonding the plastic material of the retainer to the plastic material of the suture by cooling the plastic material of the retainer to a temperature below the transition temperature range of the plastic material of the retainer.

5,593,426

DEFIBRILLATOR SYSTEM USING MULTIPLE EXTERNAL DEFIBRILLATORS AND A COMMUNICATIONS NETWORK

Carlton B. Morgan; Daniel Powers, both of Bainbridge Island; Clinton Cole, Seattle; Steven T. Mydynski, Bothell, all of Wash., and Michael J. Leventhal, Palo Alto, Calif., assignors to Heartstream, Inc., Seattle, Wash.

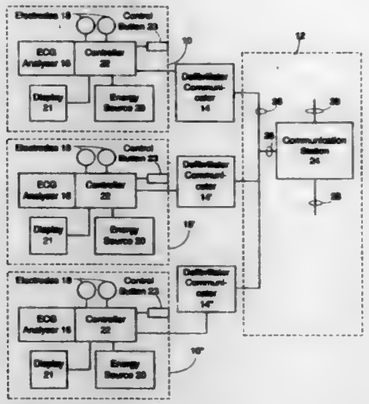
Filed Dec. 7, 1994, Ser. No. 351,654
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **44 Claims**

36. In a system comprising a plurality of external defibrillators and a communication network, a method for maintaining the defibrillators comprising the following steps:

establishing a communication link between a station on the communication network and a first defibrillator of the plurality of external defibrillators when the first defibrillator is not being used;

transferring defibrillator status information from the first defibrillator to the station;

establishing a communication link between the station and a second defibrillator of the plurality of external defibrillators when the second defibrillator is not being used; and



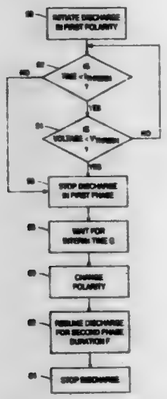
transferring defibrillator status information from the second defibrillator to the station.

5,593,427

ELECTROTHERAPY METHOD

Bradford E. Gliner, Bellevue; Thomas D. Lyster, Bothell; Clinton S. Cole, Kirkland; Daniel J. Powers, Bainbridge Island, and Carlton B. Morgan, Bainbridge Island, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Division of Ser. No. 103,837, Aug. 6, 1993. This application Feb. 14, 1996, Ser. No. 601,617
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—7 **18 Claims**



1. A method for applying electrotherapy to a patient through electrodes external to a patient, the electrodes being electrically connected in a predetermined polarity to an energy source charged to an initial level, the method comprising the following step:

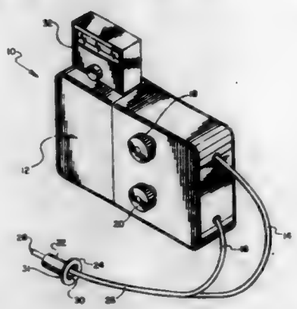
discharging the energy source across the electrodes in the predetermined polarity until the end of a predetermined time period or until an electrical unit measured across the electrodes decays to a predetermined terminal level, whichever occurs first.

5,593,428

EMERGENCY EXTERNAL CARDIAC DEFIBRILLATOR AND PACING METHOD AND APPARATUS

Khosrow Jamshidi, 610 Winston Ct., St. Paul, Minn. 55118, assignor to Khosrow Jamshidi, St. Paul, Minn.

Filed Sep. 27, 1993, Ser. No. 127,200
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—10 **10 Claims**



1. An emergency external defibrillator and pacing apparatus for applying an electrical current to a heart, said apparatus comprising:

a. a tubular sleeve having an axial passage therethrough, said sleeve insertable through an incision in a chest cavity to a predetermined depth proximate said heart;

b. a first electrode having a first end and second end, said second end having an electrically conductive exposed blunt end;

c. a second electrode having a first end and a second end, said second end having an electrically conductive exposed blunt end, said second end of said first electrode and said second end of said second electrode connected in close proximity to form a single blunt end for insertion through said axial passage of said tubular sleeve proximate said heart;

d. first means for applying an electrical current of selected voltage, said first means connected to the first end of said first electrode; and

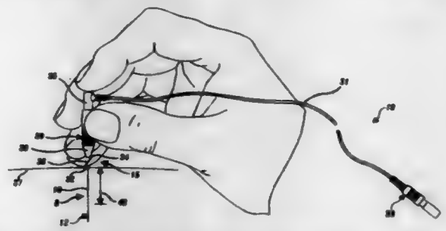
e. second means for applying an electrical current of selected voltage, said second means connected to the first end of said second electrode.

5,593,429

NEEDLE ELECTRODE WITH DEPTH OF PENETRATION LIMITER

Leonard H. Ruff, Kennewick, Wash., assignor to Cadwell Industries, Inc., Kennewick, Wash.

Filed Jun. 28, 1994, Ser. No. 267,428
Int. Cl.[6] A61M *1/00*
U.S. Cl. 607—116 **21 Claims**



1. A needle electrode for insertion into a patient's muscle, the electrode comprising:

(a) a single elongate needle portion, located at the distal end of the needle electrode, and having sufficient length to be inserted through a single penetration location into a patient's muscle.

(b) a shank, located at a proximal end of the needle electrode, and used to connect the needle electrode to a needle electrode holder; and

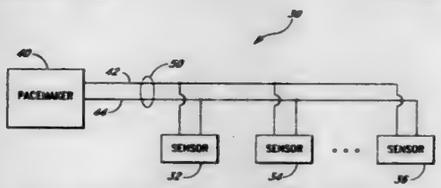
(c) a mid-section, located between the needle portion and the shank, that lies adjacent an exterior surface of the patient's skin to regulate a depth that the needle portion penetrates the patient's muscle when the needle portion is fully inserted into the patient's muscle and to regulate a depth that the shank extends into the needle electrode holder when the shank is fully inserted into the needle electrode holder, the mid-section including an elongate portion extending outward approximately normal to the shank to regulate the depth that the shank extends into the needle electrode holder.

5,593,430

BUS SYSTEM FOR INTERCONNECTING AN IMPLANTABLE MEDICAL DEVICE WITH A PLURALITY OF SENSORS

Herman L. Renger, Calabasas, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 27, 1995, Ser. No. 379,827
Int. Cl.[6] A61N *1/365*
U.S. Cl. 607—18 **12 Claims**



1. An apparatus for providing physiologic information to an implantable medical device, comprising:

a pair of conductors adapted for connection to the medical device; and

a plurality of implantable sensors, each sensor connected to said pair of conductors, each sensor having

(a) a current receiving circuit for receiving a current from the medical device over said pair of conductors; and

(b) a signalling circuit for generating and transferring an information signal to said medical device over said pair of conductors, wherein said signalling circuit generates said information signal by controlling a rate at which said current receiving circuit receives said current.

5,593,431

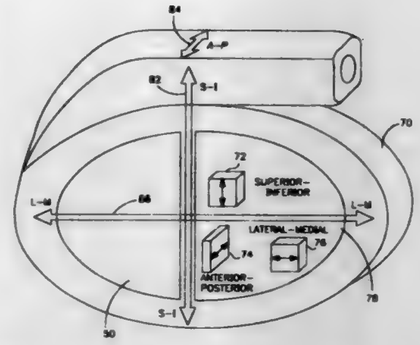
MEDICAL SERVICE EMPLOYING MULTIPLE DC ACCELEROMETERS FOR PATIENT ACTIVITY AND POSTURE SENSING AND METHOD

Todd J. Sheldon, Eagan, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 30, 1995, Ser. No. 413,736
Int. Cl.[6] A61N *1/365*
U.S. Cl. 607—19 **29 Claims**

1. A method of determining the physical posture of a patient's body, having a superior-inferior body axis, an anterior-posterior body axis and a lateral-medial body axis, in relation to earth's gravitational field comprising the steps of:

implanting a multi-axis, solid state sensor, comprising first and second DC accelerometers having first and second sensitive axes, respectively, which respond to earth's gravitational field to provide first and second respective DC accelerometer signals of a magnitude and polarity dependent on the degree of alignment therewith, in the patient's body so that said first and second sensitive axes are generally aligned with a respective first and second one of said superior-inferior, anterior-posterior or lateral-medial body axes;



defining a first characteristic magnitude and polarity of said first and second DC accelerometer signals on alignment of the sensitive axes of said first and second DC accelerometers with earth's gravitational field, a second characteristic magnitude and polarity of said first and second DC accelerometer signals on alignment against earth's gravitational field, and a third characteristic magnitude and polarity of said first and second DC accelerometer signals on alignment normal to earth's gravitational field;

deriving first and second DC accelerometer signals from said first and second DC accelerometers as the patient assumes various body positions moving said first or second sensitive axes generally into alignment with earth's gravitational field; and

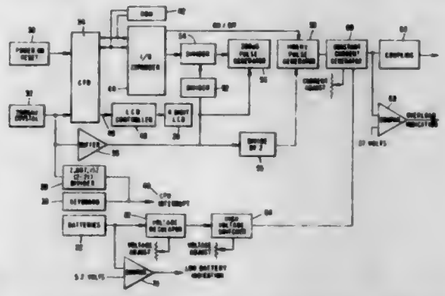
determining the body posture of the patient through comparison of the magnitudes and polarities of said derived first and second DC accelerometer signals with the magnitudes and polarities of said first, second and third characteristic magnitudes and polarities.

5,593,432

METHOD FOR NEUROSTIMULATION FOR PAIN ALLEVIATION

Gordon H. Crowther, deceased, late of Los Angeles County, and by Donn Younce, executor, Oxnard, both of Calif., assignors to Neuroware Therapy International, Inc., Pasadena, Calif.

Filed Jun. 23, 1993, Ser. No. 81,977
Int. Cl.[6] A61N *1/00*
U.S. Cl. 607—46 **3 Claims**



1. A method of alleviating pain and the symptoms of withdrawal of a patient during detoxification, comprising sequentially applying a multiplicity of electrical pulses to the patient's mastoid processes at a pulse repetition rate of between about 10 Hertz and about 300 Hertz, said electrical pulses being current controlled and being comprised of generally square waves having a pulse width of between approximately 100 and 300 microseconds, said electrical pulses being applied intermittently for about four days as follows:

(a) for two days and 23 hours at a frequency of 90 Hertz;

(b) for about 1 hour at a frequency of 300 Hertz;

(c) for about 22 hours at a frequency of 90 Hertz; and

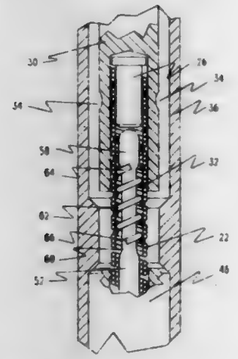
(d) for about 2 hours at a frequency of 300 Hertz.

5,593,433

IMPLANTABLE ENDOCARDIAL LEAD WITH SELF-HEALING RETRACTABLE FIXATION APPARATUS

Paul R. Spehr, Lake Jackson; Mark M. Frankovich, Sugarland, and Mark A. White, Friendswood, all of Tex., assignors to Intermedics, Inc., Angleton, Tex.

Filed Dec. 19, 1994, Ser. No. 358,936
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—128 **12 Claims**



1. A lead assembly for implantation in a patient, the assembly comprising:

a catheter adapted for insertion into a chamber of the patient's heart having a proximal end and a distal end and a lumen extending therethrough from said proximal end to said distal end thereof;

an electrode slidingly received within said lumen at said distal end of said catheter,

a coil conductor having at least one wire attached to said electrode and being disposed within said lumen and adapted to transmit electrical impulses between the electrode and said proximal end of said catheter, said coil conductor having an inside diameter;

fixation means for securing said electrode to the lining of the heart chamber, the fixation means being adapted to fit within the lumen of said catheter;

a wire coil attached to said electrode, said coil having an inside diameter smaller than said inside diameter of said coil conductor and said wire coil is disposed along said at least one wire of said coil conductor; and

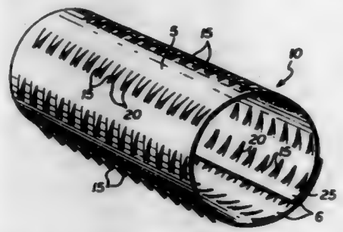
a stylet having a distal end and a threaded segment at said distal end thereof, said threaded segment being adapted to engage said wire coil, whereby said wire coil can be displaced into said coil conductor by said threaded segment of said stylet, thereby disengaging said stylet by expanding said inner diameter of said wire coil, said wire coil being restored to its original inner diameter after removal of said threaded segment from said wire coil.

5,593,434

STENT CAPABLE OF ATTACHMENT WITHIN A BODY LUMEN

Michael S. Williams, Cupertino, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 91,453, Jul. 14, 1993, Pat. No. 5,423,885, which is a continuation of Ser. No. 830,219, Jan. 31, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 473,003
Int. Cl.[6] A61F *2/06*; A61M *29/00*
U.S. Cl. 623—1 **17 Claims**



1. A method of securing an intravascular stent in a patient's vasculature, comprising:

placing an intravascular stent over a balloon catheter, said stent having a length and circumference, a plurality of protrusions projecting from about the length and circumference of said stent, and a plurality of apertures about the length and circumference of said stent;

positioning said intravascular stent in a patient's vasculature with said balloon catheter;

expanding said balloon catheter to expand said stent from a reduced diameter to an enlarged diameter form; and

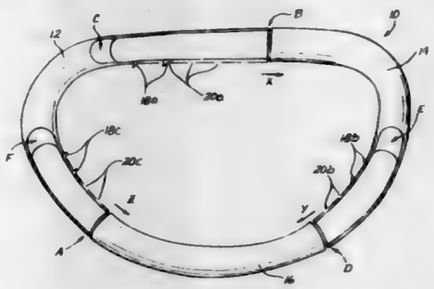
securing said stent in said patient's vasculature when said stent is in said enlarged diameter form, said securement occurring through said protrusions engaging said apertures as well as said protrusions engaging said patient's vasculature.

5,593,435

DISTENSIBLE ANNULOPLASTY RING FOR SURGICAL REMODELLING OF AN ATRIOVENTRICULAR VALVE AND NONSURGICAL METHOD FOR POST-IMPLANTATION DISTENSION THEREOF TO ACCOMMODATE PATIENT GROWTH

Alexandre C. Carpentier, and Alain F. Carpentier, both of Paris, France, assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 29, 1994, Ser. No. 283,059
Int. Cl.[6] A61F *2/06*
U.S. Cl. 623—2 **24 Claims**



1. A distensible annuloplasty ring defining an annular opening therethrough, said annular opening having a first annular size, said ring comprising:

a ring member having an outer diameter and an inner diameter, the inner diameter having an outer surface, said ring member comprising a plurality of segments movably coupled to one another such that exertion of dilatory pressure against the outer surface of the inner diameter of said ring member will cause said segments to move apart from one another to distend to a second annular size that is larger than the first annular size, such that the ring member remains at the second annular size when the dilatory force is withdrawn;

wherein said segments further comprise frictional locator means formed on said segments to control the amount of annular distension that the ring will undergo upon application of dilatory pressure thereto and to prevent inadvertent movement of the segments relative to one another; and

a suturable material disposed on said ring member to facilitate suturing-in-place of said ring member to surrounding anatomical tissue.

5,593,436

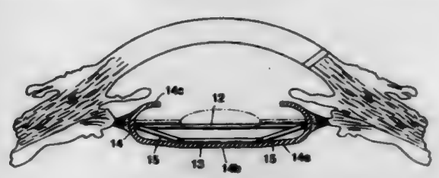
CAPSULAR BAG IMPLANTS WITH DUAL 360 RING STRUCTURES FOR INHIBITING POSTERIOR CAPSULAR OPACIFICATION

David W. Langerman, 99 Dutch Hill Plz., Orangeburg, N.Y. 10962

Continuation-in-part of Ser. No. 60,636, May 12, 1993, Pat. No. 5,366,501. This application Nov. 21, 1994, Ser. No. 343,086

Int. Cl.[6] A61F 2/14;2/16

U.S. Cl. 623—4 **16 Claims**



1. A posterior capsular opacification-inhibiting device for implantation into an eye between the posterior capsule and the anterior capsular flap of the residual capsular bag that remains in the eye following an extracapsular cataract extraction, comprising:

a pair of resiliently flexible, concentric, closed, rings having respective planes and having different outer diameters, the larger of said rings being connected to the smaller of said rings by bridging means extending therebetween, the plane of said larger ring being parallel to but offset anteriorly from the plane of said smaller ring, and the outer diameter of said larger ring at its outer periphery being slightly larger than the inner diameter of said residual capsular bag in the equatorial region thereof;

whereby, upon proper implantation of the device into an eye, (i) said larger ring presses along its entire circumference against the interior surface of said residual capsular bag in the equatorial region thereof without overstressing the latter and without engendering an unfurling of said anterior capsular flap, said larger ring thereby constituting a primary mechanical barrier for inhibiting migration of epithelial cells from said equatorial region onto and toward the optic region of said posterior capsule of said residual capsular bag, and (ii) said smaller ring presses along its entire circumference against the anterior surface of said posterior capsule a short distance radially inwardly of said equatorial region to constitute a secondary mechanical barrier for inhibiting migration, over said posterior capsule and toward said optic region thereof, of epithelial cells that were not blocked by said larger ring.

5,593,437

DEVICE FOR ADJUSTING A POSITION OF A FOCAL POINT OF AN INTRAOCULAR IMPLANT

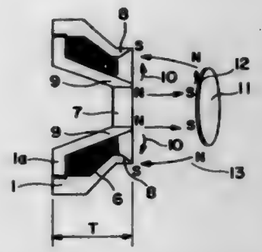
Tatsuo Arita, Kumamoto; Ichiro Sakurai, Yatsushiro, and Noboru Kosaiya, Kawasaki, all of Japan, assignors to Sakurai Seigi Company, Ltd., Kumamoto, Japan

Filed Oct. 28, 1994, Ser. No. 330,445

Claims priority, application Japan, Nov. 1, 1993, 5-297364

Int. Cl.[6] A61F 2/16; G02C 1/00; A61B 17/52

U.S. Cl. 623—6 **6 Claims**



1. A device for adjusting a position of a focal point of an intraocular implant comprising an intraocular implant provided partially with a magnetic material and a magnetic flux generating spectacles for applying variable magnetism to the intraocular implant to attract the same, so that the intraocular implant can be moved forward or backward with respect to the retina, wherein the intraocular implant is at the outer peripheral part except the paraxial region, provided with said magnetic material and a spring is provided for urging the intraocular implant toward the retina, and the flux generating spectacles has in the frame a coil through which a controlled electric current is flowed and further the frame of the spectacles to be placed before the intraocular implant is made of an annular magnetic material having a cross section in a substantially rolled U-like shape and opening toward the implant, a winding wire is wound on the U-like shaped part, and an inner frame and an outer frame is tapered to their utmost ends, where the U-like shape of the cross section opens, to form magnetic poles at the utmost ends.

5,593,438

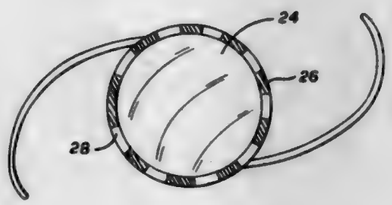
INTRAOCULAR LENS WITH METALLIC COATINGS FOR PREVENTING SECONDARY CATARACTS

David S. Akhavi, and Damian A. C. Akhavi, both of 10966 Roebling Ave. #6A, Los Angeles, Calif. 90024

Filed Jan. 20, 1995, Ser. No. 375,819

Int. Cl.[6] A61F 2/16

U.S. Cl. 623—6 **7 Claims**



1. In a transparent intraocular lens having an anterior surface and a posterior surface joined by an annular edge, the improvement comprising an oligodynamic metal coating and a more electronegative metal coating in direct contact with the oligodynamic metal coating extending across the annular edge.

5,593,439

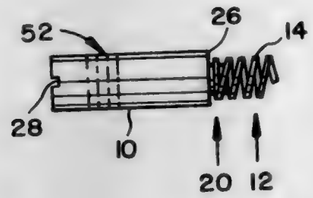
VOCAL CORD LATERALIZATION AND MEDIALIZATION DEVICE AND METHOD

Charles W. Cummings; Paul W. Flint, and Peter J. Scranton, all of Baltimore, Md., assignors to Johns Hopkins University, Baltimore, Md.

Filed May 22, 1995, Ser. No. 446,315

Int. Cl.[6] A61F 2/20

U.S. Cl. 623—9 **22 Claims**



1. A method of improving a patient's airway while voice is minimally impaired, comprising:

providing an anchor component having a bore defined therethrough;

forming an aperture in a thyroid cartilage of a patient at substantially a vertical level of a vocal cord and an arytenoid cartilage;

inserting the anchor component through the aperture formed in the thyroid cartilage;

providing a lateralization/medialization assembly including a displaceable component having a tissue grasping device defined at a distal end thereof;

inserting said assembly into the bore of the anchor component;

grasping tissue including at least one of said arytenoid cartilage and tissue in a region thereof with said tissue grasping device; and

displacing said displaceable component relative to said anchor component so as to displace said grasped tissue, thereby improving the patient's airway while voice is minimally impaired.

5,593,440

TISSUE IMPLANT SYSTEMS AND METHODS FOR SUSTAINING VIABLE HIGH CELL DENSITIES WITHIN A HOST

James H. Brauker, Harvard; Ronald S. Hill, Grayslake; Laura A. Martinson, Lake Villa; Daniel R. Boggs, Libertyville, and Robert C. Johnson, Bartlett, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

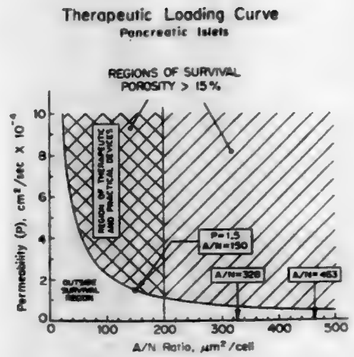
Division of Ser. No. 861,921, Apr. 1, 1992, Pat. No. 5,314,471, which is a continuation-in-part of Ser. No. 735,401, Jul. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 606,791, Oct. 31, 1990, abandoned. This application May 23, 1994, Ser. No. 247,294

Int. Cl.[6] A61F 2/02

U.S. Cl. 623—11 **6 Claims**

1. A method of implanting cells comprising the steps of

providing a wall comprising a porous boundary, wherein the wall defines a chamber for holding cells for implantation and the porous boundary has a given area (A);



placing within the chamber a given number of cells (N) such that the quantity A/N is less than about 200 μm^2/cell; and

embedding the chamber within host tissue.

5,593,441

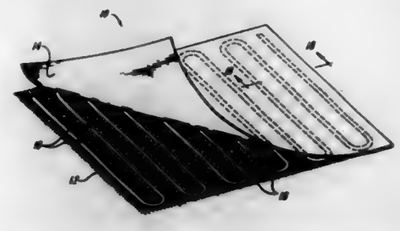
METHOD FOR LIMITING THE INCIDENCE OF POSTOPERATIVE ADHESIONS

Irving L. Lichtenstein, Marina Del Rey, Calif.; Carl R. Turnquist, Concord, Mass., and Parviz K. Amid, Calabasas, Calif., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 376,735, Jan. 23, 1995, abandoned, which is a continuation of Ser. No. 846,131, Mar. 4, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,261

Int. Cl.[6] A61F 2/02

U.S. Cl. 623—11 **5 Claims**

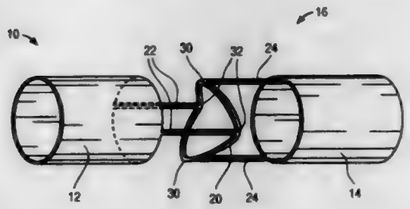


1. A method for limiting the incidence of postoperative adhesions arising from a repair of an opening in a tissue or muscle wall, wherein the opening is located near a region of potential postoperative adhesion, comprising:

providing a composite prosthesis including an implantable material constructed and arranged to occlude the opening and having a plurality of interstices constructed and arranged to allow tissue ingrowth, and a barrier which does not substantially stimulate the formation of postoperative adhesions, the barrier covering the implantable material, whereby the composite prosthesis is securable in place by growth of neighboring tissue into the implantable material; and

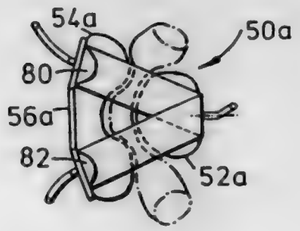
positioning the composite prosthesis for limiting the formation of postoperative adhesions with the implantable material filling or covering, thereby occluding, the tissue or muscle wall opening, and with the barrier facing away from the tissue or muscle wall opening and extending between the region of potential postoperative adhesion and the implantable material.

5,593,442
RADIALLY EXPANSIBLE AND ARTICULATED VESSEL SCAFFOLD
Enrique J. Klein, Los Altos, Calif., assignor to Localmed, Inc., Palo Alto, Calif.
Filed Jun. 5, 1995, Ser. No. 463,166
Int. Cl.[6] A61F 2/04
U.S. Cl. 623—12 6 Claims



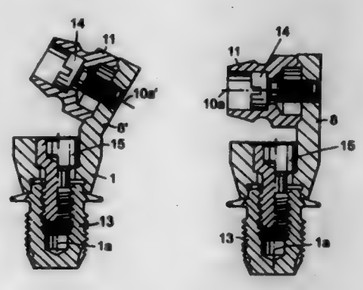
1. A radially expansible lumenal prosthesis comprising:
a plurality of radially expansible body segments, wherein the expansible body segments each comprise a plurality of box elements which expand into arcuate, diamond-shaped elements as the body segment is expanded and wherein circumferentially adjacent box elements are joined to each other near their longitudinal centers by circumferentially oriented tabs, and wherein said beam members are joined to tabs which are offset from each other by 90°; and
a universal articulation structure between each pair of consecutive body segments, wherein said articulation structure consists of (a) a radially expansible serpentine ring, wherein the serpentine ring of the universal articulation structure is configured so that the ends of the beam member pairs which are attached to the serpentine ring longitudinally overlap when said ring is radially constricted and move axially apart as the ring is radially expanded and (b) two pairs of beam members, wherein said beam member pairs are rotationally offset by 90° and wherein beam member pairs are disposed longitudinally on each side of the ring and each beam member pair is attached to one of said consecutive body segments.

5,593,443
PROSTHETIC ANAL SPHINCTER
Kenneth B. Carter; Ian G. Finlay, both of Glasgow, and William Richardson, Johnstone, all of United Kingdom, assignors to NPH Ltd., Onchan, United Kingdom
Continuation of Ser. No. 117,181, Nov. 3, 1993, abandoned.
This application Oct. 31, 1995, Ser. No. 551,052
Claims priority, application United Kingdom, Mar. 13, 1991, 9105346; Sep. 14, 1991, 9119685
Int. Cl.[6] A61F 2/02
U.S. Cl. 623—14 10 Claims



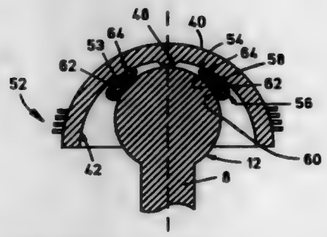
1. A prosthetic anal sphincter for use with an artificial sphincter system, said prosthetic anal sphincter comprising:
a first inflatable prosthetic sphincter portion for disposing at one side of an anal canal;
a second non-inflatable prosthetic sphincter portion for disposing at the other side of the anal canal, said second portion comprising a bag mounted on a rigid or semi-flexible backing, said bag being at least as wide as the first portion and being filled with a liquid or gel;
the first and second portions configured to be connected together to form a structure to surround the anal canal at a location along its length in which said first portion is disposed opposite a central area of said bag;
wherein when said first portion is inflated, the anal canal is squeezed between said first portion and said bag, the backing provides a reaction force against said bag to augment angulation between said bag and said first portion to form a bend in the anal canal, and a lumen of the anal canal is flattened, occluding the anal canal and providing a seal against the leakage of solids, liquid or gas; and
wherein when said first portion is deflated, the backing no longer provides the reaction force against said bag and pressure on the anal canal is released, allowing the canal to open and facilitate defecation.

5,593,444
SPACING MEMBER FOR ATTACHING CRANIAL FACIAL PROSTHESIS
Thomas Svensson, Göteborg; Bo Rangert, Mölnlycke; Kerstin Jansson, Frölunda, and Einar Jörgensen, Hisingskärra, all of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden
Continuation of Ser. No. 38,186, Mar. 29, 1993, abandoned, which is a continuation of Ser. No. 827,451, Jan. 29, 1992, abandoned. This application Jun. 27, 1994, Ser. No. 265,822
Claims priority, application Sweden, Jan. 29, 1991, 9100256
Int. Cl.[6] A61F 2/14
U.S. Cl. 623—16 13 Claims



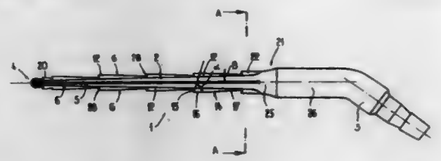
8. A spacing member designed and dimensioned for connecting a craniofacial prosthesis to a fixture implanted in the facial bone of a patient, said fixture having a threaded end for being anchored in said bone and an opposite end, said spacing member comprising an integral member for at least partially projecting outside said facial bone and including:
a) a first sleeve-shaped base portion having a cylindrical wall and having one end attachable onto said opposite end of the fixture, said base having a line of symmetry which generally coincides with a line of symmetry of the fixture, and
b) a second portion projecting from an opposite end of said base portion and being formed by upwardly extending a portion of said cylindrical wall in a direction away from said base portion and said fixture, said second portion forming an acute angle with respect to the line of symmetry of said base portion, said second portion including means for attachment of the craniofacial prosthesis at substantially a 90° angle to said second portion whereby facilitating installation of the craniofacial prosthesis in a limited facial space.

5,593,445
BI-AXIAL PROSTHETIC JOINT
C. Thomas Waits, 305 Oak Ridge Dr., Pflugerville, Tex. 78660
Filed Mar. 24, 1995, Ser. No. 409,746
Int. Cl.[6] A61F 2/30
U.S. Cl. 623—18 20 Claims



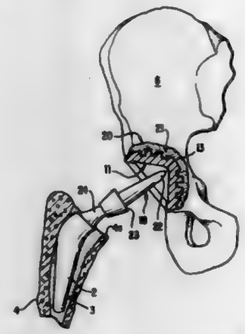
1. A bi-axial prosthetic joint comprising
a first member having means for fixation to a first bone and having a convex head,
a second member which is shaped for attachment to a second bone and which includes a generally smooth concave surface portion of a size sufficient to receive said head, and
a ring bearing which has a central opening and is shaped and proportioned to generally form a first ring of contact with said convex head of said first member and a second ring of contact with said concave surface of said second member, said ring bearing having sufficient rigidity such that some clearance will always be maintained under normal physiological load between facing surface portions of said first member head and said ring bearing adjacent said first ring of contact and between facing surface portions of said ring bearing and said second member concave surface adjacent said second ring of contact, and said ring bearing being free to shift and slide along said concave surface of said second member and along said convex head.

5,593,446
ANCHORING SHAFT FOR JOINT ENDOPROSTHESIS
Xaver Kuoni, Alter Zurichweg 33, 8952 Schlieren, Switzerland
Filed Apr. 19, 1995, Ser. No. 423,443
Claims priority, application Switzerland, Nov. 9, 1994, 03355/94
Int. Cl.[6] A61F 2/30
U.S. Cl. 623—18 21 Claims



1. An anchoring shaft for a joint endoprosthesis, the shaft comprising:
a rectilinear core having longitudinal axis, a distal end and an attachment end, the core tapering inwardly toward the distal end and having a cross-section symmetrical with respect to the longitudinal axis;
a plurality of ribs provided on the core, each rib protruding from the core in a radial direction and extending in the longitudinal direction of the core from the distal end toward the attachment end, each rib having a rectangular cross-section and a uniform thickness; and
a plurality of teeth provided on each rib, each tooth being defined by a flank and a steep flank, each flank extending essentially in the longitudinal direction of the associated rib and ascending in the direction of the distal end, each steep flank extending from the flank toward the core to define a tooth point, each steep flank having a surface facing the distal end of the core.

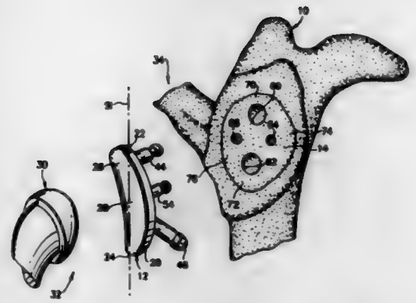
5,593,447
MINIMAL CONTACT PROSTHESIS
José A. Angeli, R. Francisco Luiz de Souza Jr. P.3 C-12, Agua Branca - São Paulo-S.P., Brazil
Filed Aug. 31, 1995, Ser. No. 522,185
Claims priority, application United Kingdom, Aug. 25, 1995, 9517492
Int. Cl.[6] A61F 2/30
U.S. Cl. 623—18 9 Claims



1. A prosthetic arthoplastic device comprising:
a first component adapted to be affixed in a prepared bone cavity in a first bone structure;
a second component having a first end portion adapted to be affixed in a prepared cavity in a second bone structure which is cooperative with said first bone structure;
the first component having a receiving cavity substantially conically shaped and having a first engagement surface defined by an apex area of said receiving cavity;
said second component having a second engagement surface at a second end thereof for pivotally engaging said first engagement surface; and
the second component being free to move through an arc of normal cooperative motion of said first and second bone structures, said arc of motion having an apex maintained within said apex area during a range of said normal operative motion whereby load is transferred from the first component to the second component via the pivotal engagement of said first and second engagement surfaces.

5,593,448
GLENOID COMPONENT FOR SHOULDER PROSTHESIS AND IMPLANT METHOD
Nicholas N. G. Dong, Little Falls, N.J., assignor to Osteonics Corp., Allendale, N.J.
Filed Nov. 14, 1995, Ser. No. 555,720
Int. Cl.[6] A61F 2/40
U.S. Cl. 623—19 19 Claims

1. A glenoid component for affixation to a scapula to provide a bearing for a humeral head in a shoulder prosthesis, the glenoid compoaent comprising:
a glenoid member extending in a superior-inferior direction and having a superior edge, an inferior edge, a lateral face and a medial face;
bearing means at the lateral face for providing the bearing for the humeral head;



an affixation surface along the medial face for affixing the glenoid member to the scapula;

a superior affixation peg integral with the glenoid member and projecting from the medial face of the glenoid member in a medial direction, essentially perpendicular to the superior-inferior direction, the superior affixation peg having a root at the glenoid member, the root being located closely adjacent the superior edge of the glenoid member for placement of the superior affixation peg at a superior location in the scapula, the superior location providing maximum available bone for anchoring the superior affixation peg in the scapula while establishing a minimal superior moment arm for superior forces acting upon the glenoid member and tending to rock the glenoid member about the root, when the glenoid member is affixed to the scapula; and

an inferior affixation peg integral with the glenoid member and projecting from the medial face of the glenoid member in an offset direction making an acute angle with the medial direction of the superior affixation peg, in a medial-inferior direction, the inferior affixation peg being located adjacent the inferior edge of the glenoid member for placement of the inferior affixation peg at an inferior location in the scapula, the inferior location providing maximum available bone for anchoring the inferior affixation peg in the scapula while establishing an inferior moment arm for inferior counterbalancing forces, with the inferior moment arm being greater than the superior moment arm such that upon affixation of the glenoid member to the scapula and subjecting the glenoid member to the superior forces, the inferior moment arm enables lesser inferior counterbalancing forces to counterbalance greater superior forces for resisting said rocking of the glenoid member in response to the superior forces.

5,593,449

DUAL TAPER STEM EXTENSION FOR KNEE PROSTHESIS

Raymond H. Roberson, Jr., Bartlett, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.

Filed Mar. 4, 1994, Ser. No. 206,515
Int. Cl.[6] A61F *2/38*
U.S. Cl. 623—20 **19 Claims**

1. A joint prosthesis for surgical implantation to a patient's intramedullary canal adjacent one of the patient's leg joints comprising:

a) a joint prosthesis body portion that extends transversely relative to the patient's intramedullary canal for carrying a bearing surface that can articulate with an adjacent bone of the patient or with an adjacent prosthesis component;

b) a connector on the prosthesis body portion opposite the bearing surface said connector having a linear central axis;

c) an elongated slender generally cylindrically-shaped stem member of a generally uniform diameter sized and shaped to be contained within the patient's intramedullary canal along a majority of the stem length said stem member having a length many times greater than its diameter, a linear stem longitudinal axis and first and second end portions;

d) each of said first and second end portions having stem connector means for forming a selected first or second connection between the stem and the body portion at the connector either of a selected one of first or second end portions of the stem; said connector means comprising sockets;

e) at least one of the stem end portions being so configured that the stem member linear axis forms an acute angle with said connector linear axis upon assembly of said stem and said body portion; and

f) wherein the central axis of each socket forms an angle of between zero and ten degrees (0°–10°) with the linear axis of the stem.

5,593,450

OVAL DOMED SHAPED PATELLA PROSTHESIS

Richard D. Scott, Dedham; Thomas S. Thornhill, Dover, and John Slamin, Wrentham, all of Mass., assignors to Johnson & Johnson Professional, Inc., Raynham, Mass.

Filed Feb. 27, 1995, Ser. No. 396,181
Int. Cl.[6] A61F *2/38*
U.S. Cl. 623—20 **11 Claims**



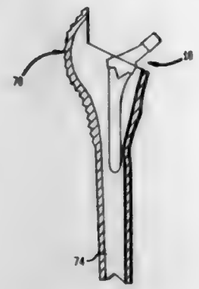
1. In a knee prosthesis having a femoral component that includes two condyles as articulating surfaces, a tibial component that articulates with respect to said femoral component and a patella prosthesis for sliding engagement with a groove formed between said condyles, the improvement comprising said patella prosthesis having a non-circular outer periphery and a contact surface of substantially constant spherical radius terminating at said non-circular periphery for contacting said groove in sliding engagement.

5,593,451

PROSTHETIC DEVICE AND METHOD OF IMPLANTATION

Robert G. Averill, Ringwood; Robert C. Cohen, Rockaway Township, and Rafail Zubok, Midland Park, all of N.J., assignors to Implex Corp., Allendale, N.J.

Division of Ser. No. 252,450, Jun. 1, 1994, abandoned. This application May 5, 1995, Ser. No. 435,893
Int. Cl.[6] A61F *2/32*
U.S. Cl. 623—23 **6 Claims**



1. A prosthesis for implanting into a bone, said prosthesis comprising:

a stem portion for implanting into the bone, said stem including a locking zone comprising four locking surfaces located proximally an end thereof, said locking surfaces extending circumferentially about said stem to provide an interference press-fit with the bone, wherein two of said four locking surfaces are located on an anterior and posterior side of said stem and have planar surfaces, each of said planar surfaces being disposed at an angle ranging from between 5 and 10 degrees measured relative to a longitudinal axis defined by said stem, another of said four locking surfaces is conically shaped and extends between and merges into said two locking surfaces on a lateral side of said prosthesis, and another of said four locking surfaces is curve shaped and extends between and merges into said two locking surfaces on a medial side of said prosthesis.

5,593,452

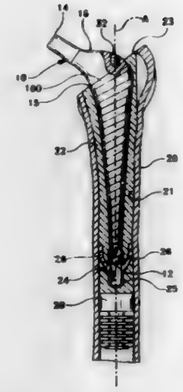
COATED FEMORAL STEM PROSTHESIS

Paul A. Higham, Ringwood, N.J., and Larry T. Warfield, Hellertown, Pa., assignors to Howmedica Inc., New York, N.Y.

Continuation of Ser. No. 189,629, Feb. 1, 1994, abandoned. This application Jul. 18, 1995, Ser. No. 503,572
Int. Cl.[6] A61F *2/32;2/28*
U.S. Cl. 623—23 **2 Claims**

1. A method for implanting a femoral hip joint prosthesis having a reduced adhesion to bone cement in an intramedullary canal comprising the steps of:

providing a prosthesis having an elongated stem extending from a proximal end to a distal end, said stem tapering from a relatively larger cross-sectional size adjacent said proximal end to a smaller cross-sectional size adjacent said distal end and being formed of a biocompatible metal alloy and having substantially all surfaces with a polished finish with the polished surface being coated with a layer of diamond-like carbon to reduce adhesion to bone cement, said layer of material is from about 1 to 3 microns thick with an outer surface maintaining said polished surface roughness: and



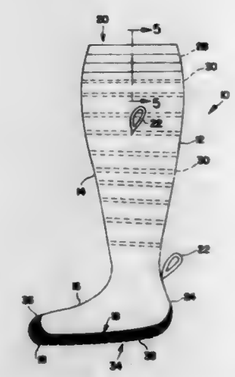
implanting said prosthesis in bone cement.

5,593,453

PROSTHESIS COVER

Gary Ahlert, 135½ Dearborn Ave., Rye, N.Y. 10580

Filed Apr. 21, 1995, Ser. No. 426,227
Int. Cl.[6] A61F *2/78*
U.S. Cl. 623—27 **13 Claims**

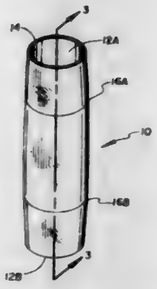


1. A prosthesis cover formed of waterproof sheet material having leg and foot portions, the foot portion having sole, toe and heel portions and side marginal edges between the toe and sole on both sides of the cover, an antiskid surface covering the foot portion, an open top end, the leg portion having a frusto-conical top segment for engagement with the prosthesis at the top end of the cover, finger loops positioned behind the heel and on opposite sides of the leg portion just below the open top, the leg and foot portions having contours and shape closely conforming to the shape of the prosthesis being covered, and a plurality of inwardly directed ribs being formed on the inner surface of the leg portion of the cover, the plurality of ribs being spaced apart from each other with each rib extending concentrically of the leg portion, the plurality of ribs extending along said inner surface from just above an ankle portion throughout the height of the leg portion to just below the top segment, so that the plurality of ribs spaces the inner cover surface from the prosthesis thereby to reduce frictional engagement when the cover is being applied by sliding over the prosthesis, and so

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that when the cover is in place the ribs engage the prosthesis and prevent the cover from slipping down along the prosthesis during use.

5,593,454
ARTIFICIAL LIMB MOUNTING APPARATUS
Nashat N. Helmy, 2035 Ordway Rd., Golden Valley, Minn. 55422
Filed Jan. 12, 1995, Ser. No. 371,742
Int. Cl.[6] A61F 2/78
U.S. Cl. 623—32 **7 Claims**



1. Apparatus for retaining a prosthesis securely to a stump of an amputee, comprising:

a) a single, enduringly resilient elastomeric sleeve having a generally open cylinder shape with opposed open first and second ends sized to secure a prosthesis to a stump, and having opposed outer and inner surfaces essentially parallel to one other; said sleeve having the property of being able to be stretched up to two times an original unstretched dimension without tearing, but when released return to substantially the original dimension; and

b) said sleeve having a mesh reinforcement formed integral therewith and embedded therein; said mesh having perpendicular first circumferential and second longitudinal directions in a plane of said mesh; said mesh having stretch control means for controlling the total amount of sleeve stretch in different directions such that the total amount of stretch along the first direction is approximately in a range of two to six times the total amount of stretch along the second direction.

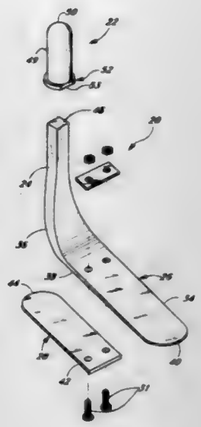
5,593,455
PLUG MOUNTED PROSTHESIS
Van L. Phillips, 5499 Maravillas, Rancho Santa Fe, Calif. 92067
Filed May 27, 1994, Ser. No. 250,016
Int. Cl.[6] A61F 2/66
U.S. Cl. 623—47 **16 Claims**

1. A prosthetic foot adapted to be attached to a rigid tubular pylon defining a lower interior attachment surface, comprising:

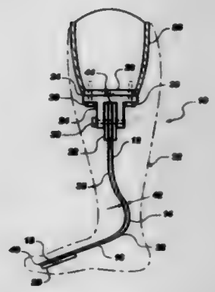
a horizontal foot portion comprising a spring-like support member;

an upstanding ankle portion connected to said horizontal foot portion, said ankle portion defining an axis and having an upper attachment end having a generally rectangular cross-section;

a plug fixedly secured to said upper attachment end of said ankle portion having a substantially closed top and a substantially open bottom, said plug defining a radially extending flange spaced downward from said top of said plug, said plug further having a generally rectangular inner surface or cavity sized to closely receive said upper attachment end of said ankle portion and an outer surface generally corresponding to a mating inner surface of said tubular pylon, the inner and outer dimensions of said plug being sized so that said plug and said attachment end of said ankle portion fit tightly within one end of said tubular pylon, said flange having sufficient strength to resist downward axial loads exerted on said flange by said pylon when said prosthetic foot is worn.

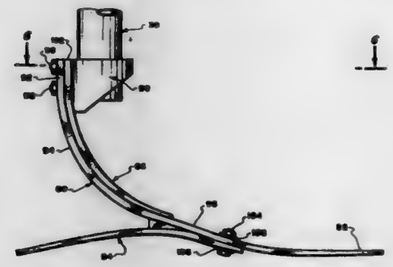


5,593,456
FOOT AND LEG PROSTHESIS AND METHOD OF MAKING SAME
John Merlette, Sandy, Utah, assignor to CRP, Inc., Salt Lake City, Utah
Filed May 17, 1994, Ser. No. 243,989
Int. Cl.[6] A61F 2/66
U.S. Cl. 623—49 **20 Claims**



1. A foot and leg prosthesis for use by an amputee having a natural limb forefoot length comprising an elongated monolithic composite member having a semi-flexible shank strut section, an arcuate ankle section, a forefoot section, and a toe section; one end of said shank strut section being connected to a socket adapted to receive an amputated leg stump, the other end extending straight to said ankle section, said member beginning said ankle section by smoothly curving rearwardly from the straightly extended portion of the shank strut section and then forwardly through said ankle section, said forefoot section and said toe section.

5,593,457
FOOT PROSTHESIS HAVING AUXILIARY ANKLE CONSTRUCTION
Van L. Phillips, 4702 San Jacinto Ter., Fallbrook, Calif. 92028
Continuation of Ser. No. 270,231, Jul. 1, 1994, Pat. No. 5,486,209, which is a continuation of Ser. No. 977,654, Nov. 17, 1992, abandoned, which is a continuation of Ser. No. 337,374, Apr. 13, 1989, Pat. No. 5,181,932. This application Sep. 22, 1995, Ser. No. 532,530
Int. Cl.[6] A61F 2/66
U.S. Cl. 623—52 **7 Claims**



1. A lower limb prosthesis adaptable to a socket fitted to the stump of an amputee for providing resilient kinematic support to said amputee during normal walking, running and jumping activities, comprising:

a pylon member having a proximal end sized and configured to engage said socket and a distal end extending substantially vertically downward and terminating at about the location of a natural human ankle joint, said distal end having front and rear sides; and

a flexible foot prosthesis adapted to be selectively attached to the rear side of the distal end of said pylon member according to a particular desired degree of kinematic resilience, said foot member prosthesis comprising:

an upper attachment section configured to mount said foot prosthesis at said rear side of the distal end of said pylon member;

an intermediate section formed integrally with and curving substantially continuously downward and forward from said upper attachment section such that bending stress is distributed substantially evenly therethroughout;

a distal section curving substantially continuously forward from said intermediate section such that bending stress is distributed substantially evenly therethroughout; and

a heel member extending substantially continuously rearward and downward from a point tangential to said intermediate section such that bending stress is distributed substantially evenly therethroughout, said heel member providing a resilient lever arm for said foot prosthesis during heel-strike;

whereby said foot prosthesis can be detached from said pylon member and is interchangeable with like feet prostheses having different resiliency characteristics without having to change or adjust said socket or pylon member, such that a wide range of activities may be sustained in a single prosthetic device.

5,593,458

PROCESS AND COMPOSITION FOR DECORATING A DYED CLOTH FABRIC

Glen A. Dickson, St. Hedwig, and Donnie R. Gray, Dilley, both of Tex., assignors to Ocean Wash, Inc., Dilley, Tex.

Filed Mar. 16, 1995, Ser. No. 405,001
Int. Cl.[6] D06L *3/02;3/14;3/16*
U.S. Cl. 8—102 10 Claims

1. A process of altering the appearance of a dyed cloth fabric, the process comprising the steps of:

providing a dye reactive oxidizer medium consisting of:

a dye reactive oxidizing agent;

a gelling or thickening agent selected from magnesium aluminum silicates, nonorganic smectite clays, bentonite clays, attapulgite clay, silicon dioxide, fumed silica, colloidal silicas, modified montmorillonite clay, or amorphous silica powder;

an additional component selected from a stabilizer to stabilize the activity of said dye reactive oxidizing agent or an accelerator to accelerate the activity of said dye reactive oxidizing agent; and

water;

laying said fabric on a flat surface;

overlaying the fabric with a stenciling member having a dye reactive oxidizer carrying medium transparent portion and a dye reactive oxidizer carrying medium opaque portion;

at least partially covering the stenciling member with the dye reactive oxidizer carrying medium;

forcing the dye reactive oxidizer carrying medium through the dye reactive oxidizer carrying medium transparent portion of the stenciling member until the dye reactive oxidizer medium contacts the fabric;

allowing the dye reactive oxidizer carrying medium to react with the dye of the fabric; and

removing the stenciling member of the overlaying step from the fabric.

5,593,459

SURFACTANT ENHANCED DYEING

Rodger L. Gamblin, 8 Springhouse Road, Dayton, Ohio 45409

Filed Oct. 24, 1994, Ser. No. 327,631
Int. Cl.[6] D06P *1/62*
U.S. Cl. 8—539 12 Claims

1. A dye bath for textile fibers selected from the group consisting of nylon, silk, wool, human hair, fur, alpaca or other animal fibers; fibers of polyester, polyamide, or polyolefins that have been polymerized with some portion of moniomers that contain sulfonic acid groups to render them receptive to cationic dyes; triacetate and acetate fibers; vinyl fibers, and cellulose fibers treated so as to make them receptive to cationic dyes comprising between 10^{-4} and 15 percent of one or more (cationic) dyes selected from the list of basic, disperse and solveat dyes in *The Color Index, Third Editio-n*and its supplements, a sufficiency of an anionic surfactant for solubilizing and protonating said dye or dyes, and water maintained at a pH such that said dye is in protonated form.

5,593,460

ARM EXTENDER TOOL

Wilfred E. Lessard, 283 Commonwealth Ave., New Britain, Conn. 06053

Continuation-in-part of Ser. No. 953,895, Sep. 30, 1992, Pat. No. 5,402,550. This application Dec. 5, 1994, Ser. No. 349,443
Int. Cl.[6] A47L *13/16*
U.S. Cl. 15—143.1 10 Claims

1. A manual arm extending device attachable to the forearm of a user comprising:

(a) a pair of extending arm members each having opposite first and second ends, each of said extending arm members being crowed along a substantial portion of its length between said opposite first and second ends, said first ends of each of said extending arm members being connected to define a connected end;

(b) a grip member connected between said extending members at a predetermined distance from said second ends of said extending arm members;

(c) a strap having an attachment member thereon, said strap having a length sufficient to permit said strap to be wrapped about both of said extending arm members with a user's forearm disposed therebetween, said attachment member being located between said grip member and the said second ends of said extending arm members, wherein said strap is attachable to itself by said attachment member; and

(d) a work performing article having attachment means thereon removably disposed on said connected end.

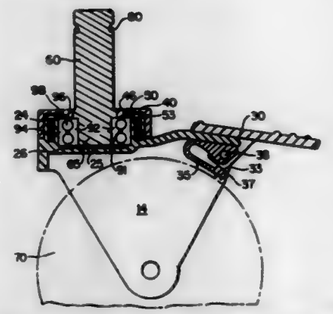


5,593,461

METHOD OF MANUFACTURING A CASTER WITH A FOULING-RESISTANT BEARING CUP FEATURE

David A. Reppert, Brodheadsville, Pa., and James A. Kinion, Fostoria, Ohio, assignors to Metro Industries, Inc., Reno, Nev.

Division of Ser. No. 8,554, Jan. 22, 1993, Pat. No. 5,390,393. This application Nov. 23, 1994, Ser. No. 347,093
Int. Cl.[6] B60B *33/00*
U.S. Cl. 29—11 3 Claims



1. A method of manufacturing a caster, comprising the steps of:

integrally forming a unitary U-shaped caster horn having a web portion, a pair of downwardly-extending, opposed leg portions, and a bearing cup formed on a top surface of said caster horn, said bearing cup being defined by an annular wall portion and a closed bottom portion, said wall portion and said bottom portion being continuous with each other;

pressing a first end of a stem into a bearing assembly such that said stem is rotatable with respect to said bearing assembly;

seating said bearing assembly in said bearing cup such that a top surface of said bearing assembly is substantially coplanar with a top surface of said bearing cup;

securing said bearing assembly to said bearing cup by means of a retainer and at least one fastener, said at least one fastener engaging said bearing cup;

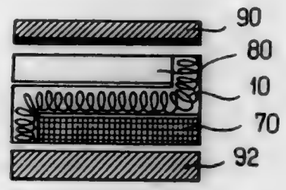
covering said bearing cup while allowing access to a second end of said of stem; and

rotatably supporting a wheel between said opposed leg portions.

5,593,462
METHOD OF MANUFACTURING A MULTILAYER ELECTROCHEMICAL ASSEMBLY COMPRISING AN ELECTROLYTE BETWEEN TWO ELECTRODES, AND AN ASSEMBLY MADE THEREBY

Michel Gueguen, Fouesnant; Marc Billion, Guidel Plage, and Hervé Majastre, Quimper, all of France, assignors to Bollore Technologies, France

Filed Nov. 14, 1994, Ser. No. 339,017
Claims priority, application France, Nov. 16, 1993, 93 13635
Int. Cl.[6] H01M *4/04*
U.S. Cl. 29—623.3 **47 Claims**



1. A method of manufacturing a multilayer electrochemical assembly, comprising the-following steps:

extruding an element comprising at least one electrode film and an electrolyte film based on an ionic conductor polymer, the extrusion being through a die shaped in such a manner that the electrode is accessible from at least one main face of-the extruded element and from no more than one of the edges of said element;

spiral winding a complex based on the above-specified extruded element, the complex comprising the electrolyte layer plus two electrodes, disposed on respective opposite sides of the electrolyte, to form a structure having, on different edge faces thereof, means for making electrical contact with respective ones of the two electrodes; and

metallizing said edge faces of the structure.

5,593,463
FUEL COMPOSITION

Paola Gambini, and Emilio Gatti, both of Milan, Italy, assignors to Agippetroli S.p.A., Rome, Italy

Filed Sep. 29, 1995, Ser. No. 536,445
Claims priority, application Italy, Oct. 13, 1994, MI94A2089
Int. Cl.[6] C10L *1//16*
U.S. Cl. 44—300 **12 Claims**

1. Fuel composition for internal combustion engines which comprises a larger portion of fuel and a smaller quantity of almost totally saturated hydrocarbon oligomers having a degree of unsaturation of less than about 10% wherein the composition of almost totally saturated hydrocarbon oligomers:

(1) is obtained by the oligomerization and subsequent hydrogenation of a hydrocarbon composition comprising C_{15}–C_{18} internal oligomers, in a quantity of more than 90% by weight;

(2) is without hydrocarbons having a number of carbon atoms equal to or less than 13; and

(3) has a viscosity at 100° C. of between 5.0 and 12.0 cst.

5,593,464
FUEL ADDITIVES

Stephen L. Cook, Chester; Maurice W. Rush, Buckingham; Paul J. Richards, Milton Keynes, and Donald Barr, Little Sutton, all of United Kingdom, assignors to The Associated Octel Company Limited, London, England

PCT No. PCT/GB94/01695, § 371 Date May 17, 1995, § 102(e) Date May 17, 1995, PCT Pub. No. WO95/04119, PCT Pub. Date Feb. 9, 1995
PCT Filed Aug. 2, 1994, Ser. No. 406,863
Claims priority, application United Kingdom, Aug. 2, 1993, 9315974
Int. Cl.[6] C10L *1/30*
U.S. Cl. 44—362 **22 Claims**

1. An additive composition for liquid hydrocarbon fuels effective to reduce particulate emission when the fuel is burned and/or reduce unburnt hydrocarbon emission, the additive composition comprising one or more oil-soluble Lewis base metallo-organic complexes consisting of the formula $M(R)_m.nL$ where

M is the cation of an alkali metal, an alkaline earth metal, or a rare earth metal of valency m, not all metal cations (M) in the complex necessarily being the same;

R is the residue of an organic compound RH, where R is an organic group containing an active hydrogen atom H replaceable by the metal M and attached to an O, S, N or C atom in the group R, that R group containing an electron withdrawing group adjacent or close to the O, S, N or C atom carrying the active H atom and being in a position to form a dative bond, in said complex, with the metal cation M, but not including active hydrogen atom(s) forming part of a carboxyl group (COOH);

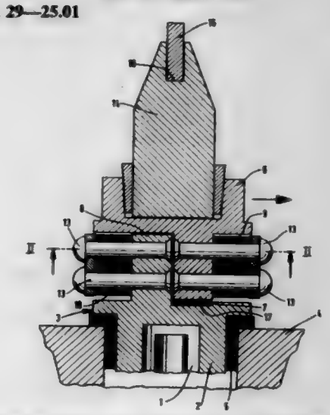
n is a positive number indicating the number of donor ligand molecules forming a dative bond with the metal cation, but which can be zero when M is a rare earth metal cation; and

L is an organic donor Ligand (Lewis base); in solution in an organic carrier liquid miscible in all proportions with the fuel.

5,593,465
MOUNTING FOR CARRIER BODIES IN AN APPARATUS FOR THE DEPOSITION OF SEMICONDUCTOR MATERIAL

Dieter Seifert, Neuoetting, and Heinz Kraus, Zellarn, both of Germany, assignors to Wacker-Chemie GmbH, München, Germany

Filed Jun. 14, 1995, Ser. No. 490,303
Claims priority, application Germany, Jul. 14, 1994, 44 24 929.2
Int. Cl.[6] H01L *21/68*
U.S. Cl. 29—25.01 **5 Claims**



1. A mounting for a carrier body in an apparatus for the deposition of semiconductor material on a heated carrier body, said apparatus having a base plate, said mounting comprising

a fixed current leadthrough passing through the base plate of the deposition apparatus;

an electrode holder having a bottom which is disposed above the current leadthrough and a top which is joined to a graphite electrode into which a carrier body can be inserted; and

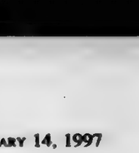
at least one spring element which is disposed between the current leadthrough and the electrode holder, which permits a movement of the electrode holder relative to the current leadthrough and which cushions said movement.

5,593,466
OIL AND FUEL OIL COMPOSITIONS

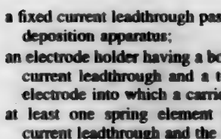
Robert D. Tack, Oxford, and Kenneth Lewtas, Wantage, both of United Kingdom, assignors to Exxon Chemical Patents Inc, Linden, N.J.

Continuation of Ser. No. 235,111, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 891,522, Jun. 1, 1992, abandoned, which is a continuation of Ser. No. 516,149, Apr. 30, 1990, abandoned, which is a continuation of Ser. No. 405,712, Sep. 11, 1989, abandoned, which is a continuation of Ser. No. 271,103, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 905,286, Sep. 8, 1986, abandoned. This application Sep. 21, 1995, Ser. No. 531,800
Claims priority, application United Kingdom, Sep. 6, 1985, 8522185
Int. Cl.[6] C10L *1/18*
U.S. Cl. 44—398 **3 Claims**

1. A composition consisting of a major proportion by weight of a fuel oil and 0.0001 to 5 wt. % by weight of a itaconate or citraconate homopolymer flow improver additive containing the repeating units:



or



wherein x is an integer and R^1 and R^2 represent a C10–C30 alkyl and the polymer has a molecular weight of 1,000 to 500,000.

5,593,467
ABRASIVE GRAIN

Larry D. Monroe, Eagan, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 151,540, Nov. 12, 1993, abandoned. This application Nov. 2, 1994, Ser. No. 333,224
Int. Cl.[6] C09G *1/68*
U.S. Cl. 51—309 **15 Claims**

1. An alpha alumina-based abrasive grain comprising alpha alumina crystallites that are randomly oriented with respect to adjacent crystallites and rare earth aluminate platelets that are present between at least some of said alpha alumina crystallites, said aluminate platelets exhibiting a magnetoplumbite crystal structure, said abrasive grain having a hardness of at least 16 GPa, a density of at least 3.58 g/cm^3, and an average alpha alumina crystallite size of less than 2 micrometer.

5,593,468
SOL-GEL ALUMINA ABRASIVES

Arup K. Khaund; Ajay K. Garg, both of Northborough, Mass., and Ralph Bauer, Niagara Falls, Canada, assignors to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed Jul. 26, 1995, Ser. No. 506,940
Int. Cl.[6] C09C *1/66*
U.S. Cl. 51—309 **14 Claims**

1. A seeded sol-gel alumina abrasive grain wherein the grain comprises minor amounts of metal oxide impurities selected from the oxides of alkali metals, alkaline earth metals, transition metals, rare earth metals and silica wherein the amount of calcia present is less than 100 ppm and the total amount of impurities is less than 3000 ppm, all impurities being measured as the oxides of the respective elements.

5,593,469
EXHAUST GAS SCRUBBER

Steve Crawford, Chilliwack, Canada, assignor to MEC Systems, Inc., Canada

Filed Dec. 8, 1995, Ser. No. 569,692
Int. Cl.[6] B01F *3/04*
U.S. Cl. 55—228 **11 Claims**



1. A misting assembly for an exhaust gas scrubber tower, comprising:

(a) an elongated central member;

(b) a plurality of perforated baffle plates affixed to said elongated central member at spaced apart distances thereto such that the perforations from each baffle plate are out of alignment with those of the next higher baffle plate;

(c) an inner tubular ring and an outer tubular ring affixed to each baffle plate wherein the diameter of the inner tubular ring and of the outer tubular ring are different from the diameters of the inner and outer tubular rings of the other baffle plates; and

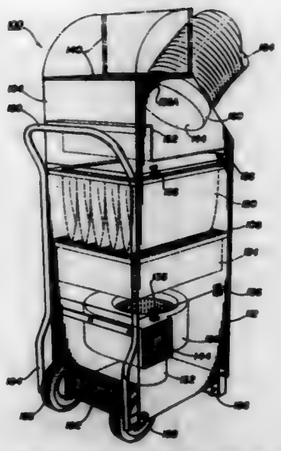
(d) spray nozzles affixed to each ring at regular radially spaced apart locations around each of said inner and outer rings such that the integrated density of fog generated by said spray nozzles over all of said baffle plates is substantially uniform.

5,593,470
PORTABLE FILTRATION UNIT

David M. Shagott, Duluth; Gary E. Kruse, Lawrenceville, both of Ga.; Blair L. Harber, Jr.; Daniel N. Sutherland, both of Ontario, Canada, and Terrell F. Travis, Oxford, Miss., assignors to Abatement Technologies, Inc., Lawrenceville, Ga.

Continuation-in-part of Ser. No. 97,753, Jul. 26, 1993, Pat. No. 5,433,763, which is a continuation-in-part of Ser. No. 766,000, Sep. 26, 1991, Pat. No. 5,230,723, which is a continuation-in-part of Ser. No. 613,212, Nov. 14, 1990, Pat. No. 5,069,691. This application Apr. 6, 1995, Ser. No. 418,255
Int. Cl.[6] B01D *35/143*
U.S. Cl. 55—274 **14 Claims**

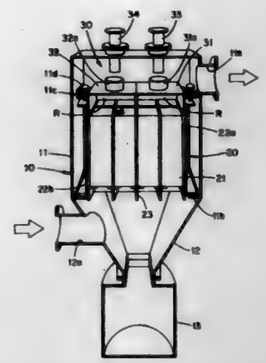
1. A portable filtration unit for cleaning HVAC ductwork containing fluid and particles, comprising:



a. a first modular assembly of substantially rectangular cross-section and having an inlet, an outlet, a surface, and a plurality of sides;
b. means, comprising a rim connected to the surface and circumscribing the inlet of the first modular assembly, for receiving a hose attached to the HVAC ductwork;
c. a second modular assembly having an inlet and an outlet; and
d. means for detachably rigidly sealing the first modular assembly to the second modular assembly in fluid communication therewith to form a housing having a length and a width and comprising:
i. a filtration system comprising:
A. a first filter; and
B. a HEPA filter;
ii. means for maintaining the first filter within the housing between the inlet of the first modular assembly and the HEPA filter so as to encounter fluid entering the inlet before the fluid encounters the HEPA filter;
iii. means, comprising a motor, for drawing a substantial volume of fluid through the filtration system;
iv. an external control panel comprising means for indicating any substantial disruption of fluid flow through the filtration system;
v. a plurality of external wheels; and
vi. external means, protruding from the housing intermediate the external wheels and providing a bearing surface when the housing is tilted, for facilitating conveying the housing up and down stairs.

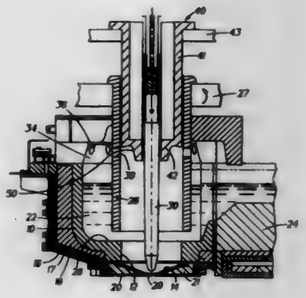
5,593,471
DUST COLLECTING APPARATUS
Yoshiaki Hori, Nagoya, and Yasuo Akitsu, Handa, both of Japan, assignors to NGK Insulators, Inc., Japan
Filed May 30, 1995, Ser. No. 452,692
Claims priority, application Japan, May 31, 1994, 6-118498
Int. Cl.[6] B01D *29/66*
U.S. Cl. 55—302 **7 Claims**

1. A dust collecting apparatus, comprising:
a housing including an inlet duct and a discharge duct, the housing having a filter provided therein, the filter having a honeycomb cellular structure including an inlet end, an outlet end, and a plurality of thin partition walls forming a plurality of axial passages, wherein the filter has a first group of passages closed along the inlet end of the filter and open along the outlet end of the filter, and a second group of passages that are open along the inlet end of the filter and closed along the outlet end of the filter; and
a cover body provided in the housing to form a chamber between the cover body and the outlet end of the filter, said



chamber being in open communication with the first group of passages, said cover body being provided with an outlet duct for passage of gas therethrough and to the discharge duct, and said housing being provided with an induction duct that opposes the outlet duct, whereby washing gas is introduced through the induction duct and passes through the outlet duct and into the chamber.

5,593,472
GLASS FEEDER HEAT BAFFLE
Kenneth J. Paul, Tolland, Conn., assignor to Emhart Glass Machinery Investments Inc., Wilmington, Del.
Filed Nov. 2, 1995, Ser. No. 552,325
Int. Cl.[6] C03B *5/26;7/084*
U.S. Cl. 65—327 **2 Claims**

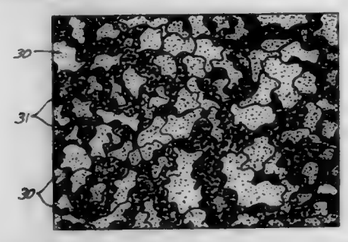


1. A tube assembly for use in a spout bowl assembly including a bowl for receiving molten glass having a central orifice closed by an orifice plate having one or more openings and a corresponding plurality of vertically reciprocating plungers associated with the orifice openings, said tube assembly comprising
a tube mounted for rotation about a vertical axis,
said tube including a plurality of vent holes arranged horizontally around the tube, and
a heat baffle including a cylindrical side wall and a bottom wall for closing said cylindrical side wall,
an opening in said bottom wall for accommodating one or more reciprocating plungers,
said bottom wall including a downwardly projecting conical surface extending substantially around said bottom wall, and
said heat baffle mounted so that said conical surface is horizontally adjacent said tube vent holes.

5,593,473
PROCESS FOR THE TREATMENT OF PORCINE EXCREMENT AND PRODUCT OBTAINED BY THIS PROCESS
Edoardo Marchese, 3 rue de Mouzin, 78230 Le Pecq, France
Filed Mar. 10, 1995, Ser. No. 401,901
Claims priority, application France, Mar. 10, 1994, 94 02797
Int. Cl.[6] C05F *3/00*
U.S. Cl. 71—15 **4 Claims**

1. Process for producing fertilizer from porcine excrement, comprising the steps of adding phosphorous pentoxide and potassium oxide to a liquid solution of porcine excrement, mixing the resulting solution with granules of a water-swellable polyacrylamide such that aqueous components of said resulting solution are absorbed by said granules whereas organic components of said resulting solution coat said granules, and drying the material thus obtained.

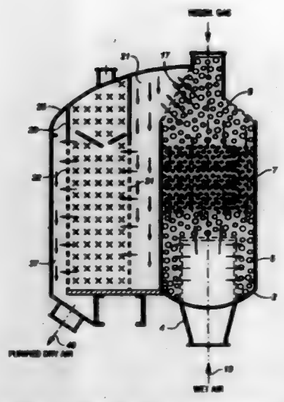
5,593,474
COMPOSITE CEMENTED CARBIDE
Madapusi K. Keshavan, Irvine, and Proserfina C. Rey, Laguna Beach, both of Calif., assignors to Smith International, Inc., Houston, Tex.
Filed Aug. 4, 1988, Ser. No. 228,099
Int. Cl.[6] C22C *29/08*
U.S. Cl. 75—240 **6 Claims**



1. A sintered body of cemented metal carbide comprising:
a plurality of regions of a first type of cemented metal carbide; and
a plurality of regions of a second type of cemented metal carbide, the first type of cemented metal carbide having a larger average particle size than the second type of cemented metal carbide and the second plurality of regions being interspersed with the first plurality of regions, the regions collectively forming the body of cemented metal carbide with the two types of regions being approximately uniformly distributed throughout the body.

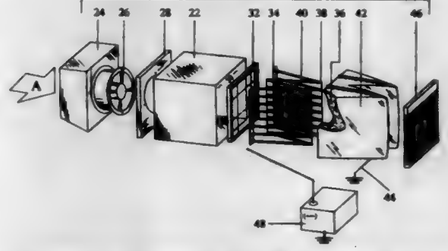
5,593,475
MIXED BED ADSORBER
Pham H. Minh, Houston, Tex., assignor to Liquid Air Engineering Corporation, Houston, Tex.
Filed Apr. 13, 1995, Ser. No. 422,024
Int. Cl.[6] B01D *53/04*
U.S. Cl. 95—123 **17 Claims**

1. A process for removing contaminants from a gaseous air feed stream comprising flowing said air feed stream to a first adsorbent zone and contacting said gaseous air feed stream with a first adsorbent displaced about an axis effective in the adsorption of water by flowing said gaseous air stream in a direction within said first adsorbent zone substantially parallel with the axis to form a dry gas;
flowing said dry gas from said first adsorbent zone to a second adsorbent zone comprising a second adsorbent in a radial bed having an interior and an exterior and which is disposed in a radial arrangement about said first adsorbent zone and also about said axis;



contacting said dry gas with said second adsorbent effective in retention of carbon dioxide in said second adsorbent zone by flowing said dry gas through said radial bed from the interior to the exterior of said radial bed.

5,593,476
METHOD AND APPARATUS FOR USE IN ELECTRONICALLY ENHANCED AIR FILTRATION
Rex R. Coppom, Longmont, Colo., assignor to Coppom Technologies, Boulder, Colo.
Continuation-in-part of Ser. No. 257,729, Jun. 9, 1994, Pat. No. 5,549,735. This application Dec. 13, 1995, Ser. No. 571,382
Int. Cl.[6] B03C *3/155*
U.S. Cl. 95—78 **18 Claims**



1. A method for electronically enhancing the ability of a filter to remove airborne particulate, said method comprising the steps of:
charging airborne particles to provide charged particles;
creating a potential difference between an electrode pair that includes an insulated electrode and an uninsulated electrode separated by a filter;
inducing a polarization state in said filter, in response to said creating step, wherein surfaces of said filter proximal to said insulated electrode have a dipole oppositely charged with respect to the charge of said charged particles, and wherein surfaces of said filter remote from said insulated electrode have a dipole of the same charge with respect to the charge of said charged particles;
contacting said filter in said polarization state with an air flow that includes naturally charged particles to impart net charges provided by said naturally charged particles to said filter medium; and
removing a portion of said net charges from said filter through contact between said filter and said charged particles.

10. An electronically enhanced air filtration apparatus for use in filtering air, comprising:

means for charging airborne particles to provide charged particles;

an electrode pair assembly including an insulated electrode and an uninsulated electrode separated by a filter

means for creating a potential difference between said insulated electrode and said uninsulated electrode across said filter to induce a polarization state in said filter,

said filter in said polarization state including filter surfaces proximal to said insulated electrode having a dipole oppositely charged with respect to the charge of said charged particles provided by said charging means, and filter surfaces remote from said insulated electrode have a dipole of the same charge with respect to the charge of said charged particles;

means for contacting said filter in said polarization state with an air flow including naturally charged particles to impart net charges provided by said naturally charged particles to said filter medium; and

removing a portion of said net charges from said filter through contact between said filter and said charged particles.

5,593,477

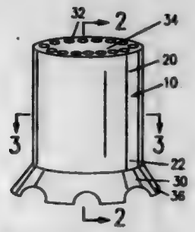
GAS AND ODOR ABSORBER

Edward E. Elson, 4356 Clayter Clr., Anaheim, Calif. 92807, assignor to Edward E. Elson, Anaheim, Calif.

Filed Sep. 2, 1994, Ser. No. 300,043

Int. Cl.[6] B01D *53/04*

U.S. Cl. 96—108 **6 Claims**



1. A device for filtering gases comprising:

a) a vessel having an outer wall, a closed top and a bottom enclosing a central area, the central area having a vertical axis extending from the top to the bottom, the central area being filled with granular absorbent material; and

b) a plurality of channels within the wall, said channels arranged around the central area and positioned so a vertical axis passing through any one of the plurality of channels is oriented in substantially the same orientation as the vertical axis of the central area, each channel having an opening extending at least a portion of the distance from the bottom to the top connecting a space in each channel to the central area.

5,593,478

FLUID FRACTIONATOR

Charles C. Hill, Del Mar, and Theodore B. Hill, San Diego, both of Calif., assignors to Sequal Technologies, Inc., San Diego, Calif.

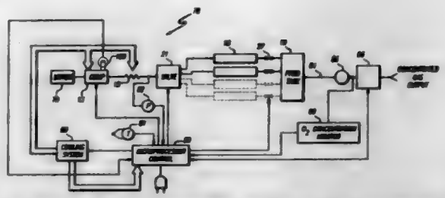
Filed Sep. 28, 1994, Ser. No. 314,213

Int. Cl.[6] B01D *53/053*

U.S. Cl. 96—111 **72 Claims**

1. In combination for removing a first component from a compressed fluid also having a second component and for providing for the flow of such first component to a user at a prescribed rate,

a plurality of columns constructed to provide initially for the introduction of the compressed fluid into such columns and to adsorb the second component of the compressed fluid in such columns and to pass the first component in such columns and constructed to desorb the second component in such columns,



first means for compressing the fluid before the introduction of the compressed fluid into the columns in the plurality,

second means for providing for the introduction of the compressed fluid into at least a first one of the columns in the plurality on a cyclic basis to obtain the adsorption of the second component in such at least first one of the columns and the passage of the first component from such at least first one of the columns and for providing for the passage of the compressed fluid from at least a second one of the columns in the plurality on the cyclic basis to obtain the desorption of the second component from such at least second one of the columns,

third means for collecting the first component passing through the at least first one of the columns in the plurality on the cyclic basis, and

fourth means having variable characteristics for providing for the compression of the fluid by the first means at a variable rate of flow dependent upon the prescribed rate of the first component through the at least first one of the columns in the plurality.

5,593,479

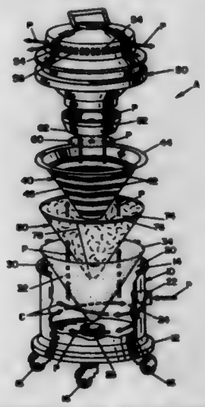
FILTER SYSTEM

Robert A. Frey, Westlake, and Philip H. Stevenson, Cleveland, both of Ohio, assignors to HMI Industries, Inc., Cleveland, Ohio

Filed Feb. 2, 1995, Ser. No. 382,784

Int. Cl.[6] B03C *3/011*

U.S. Cl. 96—57 **64 Claims**



1. In a vacuum cleaner or air cleaner comprising a reduced velocity chamber with a high velocity air inlet, an electric motor, a rotary means driven by said motor for creating a vacuum in said chamber, an outlet for exhausting air from said chamber, said air flows in a selected path from said air inlet, through said chamber and out said air exhaust outlet, the improvement comprising: filter means positioned between said air inlet and said motor for removing particles in said air, said filter means including at least one layer of electrically charged fiber material substantially encapsulated between at least two layers of support material, said layer of electrically charged fiber material and said at least two layers of support material connected together by at least one melted seam

positioned substantially at the peripheral edge along the entire periphery of said filter means, said melted seam forming a substantially airtight barrier between said filter means layers.

5,593,480

APPARATUS FOR THE OXYGEN ENRICHMENT OF AIR

Günter Pöschl, Schwalkheim, Germany, assignor to PPV Verwaltungs AG, Zurich, Switzerland

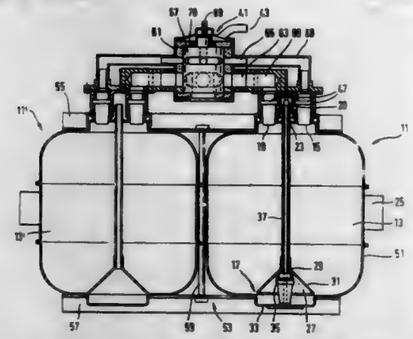
PCT No. PCT/EP94/00049, § 371 Date Jul. 11, 1995, § 102(e) Date Jul. 11, 1995, PCT Pub. No. WO94/15698, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 10, 1994, Ser. No. 495,600

Claims priority, application Germany, Jan. 15, 1993, 43 00 988.3

Int. Cl.[6] B01D *53/047*

U.S. Cl. 96—124 **22 Claims**



1. An apparatus for the oxygen enrichment of air, with at least one container (11) holding a packed zeolite bed (13) and having a container inlet (15) for compressed air, a container outlet (23) for oxygen-enriched air, a container inlet (15) for scavenging air and a container outlet (19) for nitrogen, characterized in that the container (11) includes a separate chamber (27) capable of being opened and gastightly closed relative to the interior of the container (11) by means of the internal container pressure and comprising an upper and a lower portion (31, 33) separable from one another by the internal container pressure, thus producing an annular gap as a chamber inlet (17) said chamber (27) having a chamber outlet (29) connected to the container outlet (23).

5,593,481

ACTIVATED CARBON AIR PURIFIER

Carl R. Redner, Walled Lake, Mich., assignor to General Filters, Inc., Novi, Mich.

Filed Sep. 25, 1995, Ser. No. 533,452

Int. Cl.[6] B01D *53/04*

U.S. Cl. 96—132 **15 Claims**

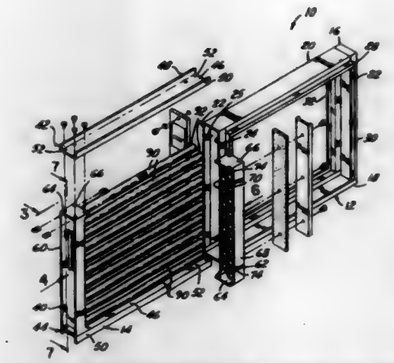
1. An air purifier for use in a forced air heating and cooling system comprising:

a cabinet assembly having a front side, a rear side and a peripheral frame, with said front and rear sides being open to permit air to flow therethrough;

an adsorber media carrier assembly located within said cabinet assembly between said front and rear sides to intercept and clean the air flowing through said cabinet assembly;

said adsorber media carrier assembly comprising a frame, having a pair of parallel and spaced apart rails each having a pair of end portions and a pair of parallel and spaced apart tube carrying members located, respectively, between the end portions of said rails;

said tube carrying members each having a pair of rows of tubular sockets, with the tubular sockets of one row of the one tube carrying member being aligned with the tubular sockets



in one row of the other tube carrying member and the tubular sockets of the other row of said one tube carrying member being aligned with the tubular sockets in the other row of said other tube carrying member; and

a plurality of adsorber tubes, each of generally the same length, made from porous material and adapted to carry pelletized adsorbent media, said tubes having the ends thereof carried by said rows of aligned tubular sockets, said adsorber tubes in each row being spaced apart in a direction which is perpendicular to said rails, the air flowing through said cabinet assembly striking and impinging on said adsorber tubes and adsorbent media in order to purify the air.

5,593,482

ADSORBENT ASSEMBLY FOR REMOVING GASEOUS CONTAMINANTS

Edwin G. Dauber, Chesapeake City; Christian E. Bailey, Port Deposit, both of Md., and Robert L. Sassa, Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 496,484, Mar. 28, 1990, abandoned, and a continuation-in-part of Ser. No. 666,435, Mar. 11, 1991, abandoned. This application Apr. 7, 1992, Ser. No. 864,700

Int. Cl.[6] B01D *53/04*

U.S. Cl. 96—135 **20 Claims**



1. An adsorbent assembly having a low profile container for removing unfiltered gaseous contaminants generated within an enclosure consisting of three layers including a layer of an adhesive; a flattened adsorbent layer; and a layer of filtering media of expanded porous polytetrafluoroethylene membrane wherein the adsorbent layer is placed between the adhesive layer and the filtering layer.

5,593,483

WATER REPELLENT COMPOSITION FOR CELLULOSE CONTAINING MATERIALS AND METHOD FOR PRODUCING SAME

Dean E. Brunken, Edmond, Okla., assignor to Advanced Chemical Technologies, Inc., Oklahoma City, Okla.

Filed Mar. 27, 1995, Ser. No. 411,044

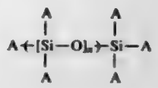
Int. Cl.[6] C08L *83/00*; **B32B** *9/04*

U.S. Cl. 106—2 **31 Claims**

1. A water based water repellent composition for rendering cellulose containing materials water repellent, the water based water repellent composition consisting essentially of:

water;

from about 2.5 to about 20 percent by volume of a water repellent compound compatible with the cellulose containing material, wherein the water repellent compound comprises a mixture of a fluoropolymer capable of providing a beading effect when water is applied to the cellulose containing material treated with the water repellent composition, an anionic silicone possessing organo-functional characteristics which enhance bonding of the water repellent composition to the cellulose containing material., and an amino-functional siloxane capable possessing water repellent properties wherein the amino-functional siloxane is represented by the general formula:



wherein Si is silicon; O is oxygen; n is a positive integer; and A is selected from the group consisting essentially of H, R or X;

H is a hydrogen atom;

R is selected from the group consisting essentially of an alkyl group containing from about 1 to about 30 carbon atoms, an alkenyl group, an aryl group, a cycloalkyl group, a cycloalkenyl group, at an arylalkenyl, an arylalkenyl group, or any substituted group thereof, wherein the cyclo substituent contains from about 4 to about 8 carbon atoms, the alkyl substituent contains up to about 8 carbon atoms and the alkenyl substituent contains up to about 8 carbon atoms;

X is selected from a group consisting of a halogen, hydroxyl group, OR group wherein O is oxygen, a carboxylic group, or RNR or RNH wherein N is nitrogen; and

with the proviso that at least one A is X, and at least one A is R; and

from about 0.1 to about 1 percent by volume of a surfactant compatible with the water repellent compound and capable of enhancing the wetting properties of the water repellent compound.

5,593,484

Patent Not Issued For This Number

5,593,485

EXTINGUISHING COMPOSITIONS AND PROCESS FOR PRODUCING THE SAME

Chih-Cheng Wang, No. 20, Yang Ming Eight Street, Tao-Yuan City, Taiwan

Filed Jan. 29, 1996, Ser. No. 593,053

Int. Cl.[6] A62D *1/00*; C09K *21/04;21/10*

U.S. Cl. 106—18.13 **7 Claims**

1. A concentrated fire extinguishing composition which comprises:

a reagent A which contains diammonium hydrogen phosphate, disodium hydrogen phosphate, dicyandiamide, and sodium borate decahydrate as components; and

a reagent B which contains 2-(2-butoxyethoxy)ethanol and water as components.

5,593,486

PHOTOCHROMIC HOT MELT INK COMPOSITIONS

John F. Oliver, Calgary; Trevor I. Martin, Burlington; Carol A. Jennings, Etobicoke, all of Canada; Eric G. Johnson, Plant City, Fla., and Stephan V. Drappel, Toronto, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1995, Ser. No. 567,457

Int. Cl.[6] C09D *11/02*

U.S. Cl. 106—22 A **19 Claims**

1. A hot melt ink composition comprising (a) an ink vehicle, said ink vehicle being a solid at about 25° C. and having a viscosity of from about 1 to about 20 centipoise at a temperature suitable for hot melt ink jet printing, said temperature being greater than about 45° C., (b) a photochromic material selected from the group consisting of spiropyrans, spirooxazines, spirothiopyrans, bis-imidazole compounds, bis-tetraphenyl pyrroles, hydrazine compounds, aryl disulfide compounds, stilbene compounds, photoisomerizable azo compounds, naphthacenequinones, and mixtures thereof, (c) an optional colorant, and (d) an optional propellant.

5,593,487

COMPOSITION HAVING A BASE OF CELLULOSE FORMATE CAPABLE OF PRODUCING FIBERS OF FILMS

Jean-Paul Meraldi; Vlastimil Clzek, and Rima Huston, all of Zurich, Switzerland, assignors to Micheline Recherche et Techuique S.A., Granges-Paccot, Switzerland

PCT No. PCT/CH94/00017, § 371 Date Sep. 13, 1994, § 102(e) Date Sep. 13, 1994, PCT Pub. No. WO94/17136, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 26, 1994, Ser. No. 302,753

Claims priority, application France, Jan. 27, 1993, 93 01121

Int. Cl.[6] C09D *101/10*; C08L *1/10*

U.S. Cl. 106—170.1 **12 Claims**

1. A composition capable of giving fibers or films having a base of cellulose formate, characterized by the following points:

a) the composition is a solution;

b) the concentration of cellulose formate in the composition is at least equal to 8% by weight;

c) the degree of substitution of the cellulose by formate groups is greater than 20%;

d) the composition contains as solvent one or more compounds selected from the group consisting of alkylsulfoxides, lactams, acyclic amides and cyclic derivatives of urea.

5,593,488

ACID RESISTANT CALCIUM CARBONATE COMPOSITION AND USES THEREFOR

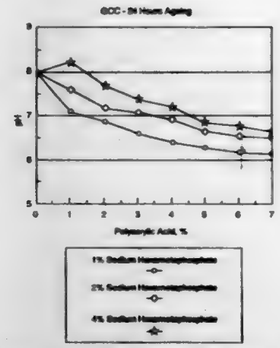
Kuan-Ting Wu, Sandersville, Ga., assignor to ECC International Inc., Atlanta, Ga.

Filed Aug. 24, 1995, Ser. No. 518,652

Int. Cl.[6] C09C *1/02*

U.S. Cl. 106—464 **23 Claims**

1. An acid resistant calcium carbonate composition comprising calcium carbonate in admixture with at least about 0.1 percent, based on the dry weight of the calcium carbonate, of a weak base and at least about 0.1 percent, based on the dry weight of the



calcium carbonate, of a weak acid, wherein either the weak base or the weak acid is derived from an organic polymeric acid.

5,593,489

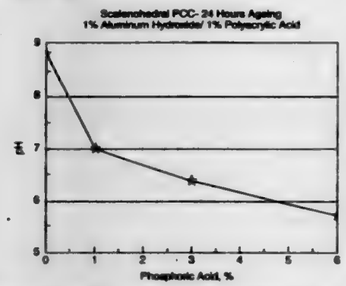
ACID RESISTANT CARBONATE COMPOSITION CONTAINING AN ALUMINUM OR MAGNESIUM HYDROXIDE METHODS OF PREPARATION AND USES THEREFOR

Kuan-Ting Wu, Sandersville, Ga., assignor to ECC International Inc., Atlanta, Ga.

Filed Oct. 20, 1995, Ser. No. 546,222

Int. Cl.[6] C09C *1/02*

U.S. Cl. 106—464 **18 Claims**



1. An acid resistant calcium carbonate comprising calcium carbonate in admixture with at least about 0.1 percent, based on the dry weight of the calcium carbonate, of an aluminum or magnesium hydroxide and at least about 0.1 percent, based on the dry weight of the calcium carbonate, of a mixture of two or more weak acids.

5,593,490

KAOLIN CLAY SLURRIES HAVING REDUCED VISCOSITIES AND PROCESS FOR THE MANUFACTURE THEREOF

Owen E. Etheridge, Jr.; Jorge L. Yordan, both of Sandersville, and Robert A. Lowe, Milledgeville, all of Ga., assignors to Thiele Kaolin Company, Sandersville, Ga.

Filed Jun. 26, 1995, Ser. No. 494,892

Int. Cl.[6] C04B *33/04;14/10*

U.S. Cl. 106—484 **7 Claims**

1. A process for reducing low shear viscosity of a kaolin clay material, wherein the process consists essentially of the sequential steps of:

A. mechanically working an undispersed crude kaolin clay material having a solids content of at least about 65 percent, by weight, said material being subjected to an energy level of at least 10 horsepower-hours per ton of dry kaolin clay material; and

B. subjecting the mechanically worked kaolin clay material to centrifugation to substantially remove any particles having a diameter of less than about 0.2 microns;

wherein the kaolin clay material has a low shear viscosity less than the starting kaolin clay material.

5,593,491

METHOD OF PREPARING TRIARYLMETHANE DYES AND PIGMENTS

Leigh Ann Karnell, Huntington, W. Va., assignor to BASF Corporation, Southfield, Mich.

Filed Dec. 22, 1994, Ser. No. 362,360

Int. Cl.[6] C08K *5/16*

U.S. Cl. 106—493 **11 Claims**

1. A method of preparing a triarylmethane dye or pigment comprising the steps of

(A) reacting an amino-substituted triarylmethane compound with a primary or secondary aromatic amine in solvent using an acid catalyst until a composition having a desired hue is obtained,

(B) vacuum distilling the composition to remove the solvent and any unreacted aromatic amine, whereby a molten composition having a temperature of at least 165° C. is produced,

(C) adding a group IA or group II metal hydroxide to the composition before, during, or after step (B), and

(D) cooling said molten composition under conditions such that a temperature of at least 165° C. is maintained for at least 1 hour.

5,593,492

WELD THROUGH PRIMER

Peter Schaffer, Phoenixville, Pa., and Scott Armstrong, Lakewood, Ohio, assignors to Inorganic Coating, Inc., Malvern, Pa.

Filed Aug. 30, 1995, Ser. No. 521,552

Int. Cl.[6] B23K *35/22*; C09D *1/04;5/00*

U.S. Cl. 106—623 **10 Claims**

1. A primer composition for metal to be welded comprising:

(a) a binder including an alkali metal silicate, a silicone wetting agent and water;

(b) a powdered metal; and

(c) an oxygen scavenger for the metal to be welded.

5,593,493

METHOD OF MAKING CONCRETE FROM BASE METAL SMELTER SLAG

David Krofchak, 256 Bronte Rd., Oakville, Ontario, Canada

Filed Jun. 26, 1995, Ser. No. 494,665

Int. Cl.[6] C04B *7/147;7/153;7/19*

U.S. Cl. 106—714 **2 Claims**

1. A method of making concrete from base metal smelter slag produced by a nickel, copper, lead or zinc smelter, said slag containing (by weight) from about 15 to about 40% silica (SiO_2), from about 35 to about 60% iron oxide (Fe_2O_3), and from about 2 to about 20% calcium oxide (CaO), comprising:

grinding the slag to a size within the range of from about −250 to about 425 mesh to produce ground slag cement,

mixing the ground slag cement with Type 3 high early strength Portland cement in a ratio of from about 1.25:1 to about 1.75:1 by weight, and

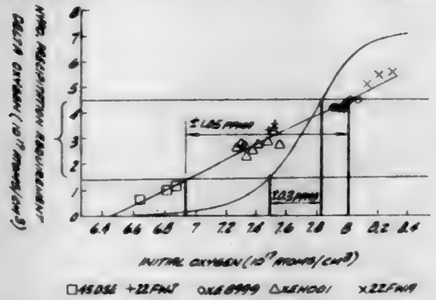
adding sand and stone to produce a concrete.

5,593,494

PRECISION CONTROLLED PRECIPITATION OF OXYGEN IN SILICON

Robert Falster, Milan, Italy, assignor to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Mar. 14, 1995, Ser. No. 403,301
Int. Cl.[6] C30B 1/02
U.S. Cl. 117—2 **33 Claims**



1. A process for controlling the density of oxygen precipitate nucleation centers in single crystal silicon comprising the steps of:

annealing the single crystal silicon at temperatures of at least about 350° C., the annealing comprising (i) heat-treating the single crystal silicon at a temperature, T_1, between about 350° C. and about 500° C. to form oxygen precipitate nucleation centers in the single crystal silicon and (ii) increasing the temperature of the single crystal silicon from T_1 to a second temperature, T_2, between about 500° C. and about 750° C., and (iii) controlling the rate of temperature increase from T_1 to T_2 such that the single crystal silicon, upon achieving T_2, contains oxygen precipitate nucleation clusters formed at T_1, and

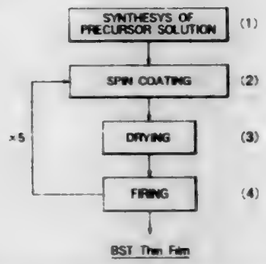
terminating said annealing at a point in time when the oxygen precipitate nucleation centers are capable of being dissolved by heat-treating the silicon at a temperature not in excess of about 1150° C.

5,593,495

METHOD FOR MANUFACTURING THIN FILM OF COMPOSITE METAL-OXIDE DIELECTRIC

Yoshiyuki Masuda, Noda; Ryusuke Kita, Matsudo; Hisako Arai, Kashiwa; Noboru Ohtani, Tokyo, and Masayoshi Kobo, Kashiwa, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1995, Ser. No. 435,135
Claims priority, application Japan, Jun. 16, 1994, 6-134026
Int. Cl.[6] C30B 1/10
U.S. Cl. 117—4 **7 Claims**



1. A method for manufacturing a thin film of composite metal-oxide dielectric, comprising the steps of:

a) preparing a precursor solution in a sol state containing component elements of materials of the composite metal-oxide dielectric;

b) forming a thin film in a sol state with said precursor solution;

c) drying the thin film in the sol state by removing residual moisture therefrom to form a thin film of dry gel;

d) subjecting an obtained dry gel thin film to a heat treatment at 500° to 600° C. for thermally decomposing and removing organic substances within the thin film in the gel state and simultaneously crystallizing the obtained dry gel thin film; and

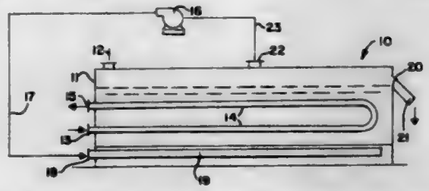
e) repeating steps (b) to (d) several times to obtain a thin film of composite metal-oxide dielectric having a desired thickness.

5,593,496

SLURRY CRYSTALLIZATION METHOD USING BUBBLES DIRECTED AT A HEAT EXCHANGER

Martin B. Schranz, Glenwood, Ill., assignor to Swenson Process Equipment, Inc., Harvey, Ill.

Division of Ser. No. 333,271, Nov. 2, 1994. This application Jun. 2, 1995, Ser. No. 460,530
Int. Cl.[6] C30B 7/50
U.S. Cl. 117—36 **15 Claims**



1. A process for forming crystals from a slurry body, said process comprising:

containing a body of slurry in a vessel, said slurry body including a solvent component, a solute component, and a plurality of crystal particles;

contacting said body of slurry with a heat exchanger submerged therein;

supplying a gas into said slurry body to produce a stream of gas bubbles which flow onto and around the heat exchange surfaces of said submerged heat exchanger; and,

withdrawing a crystal product from said slurry body, whereby the localized velocity of said slurry at the heat exchanger surfaces is increased and the formation of solids build-up on the heat transfer surfaces of said submerged heat exchanger is minimized.

5,593,497

METHOD FOR FORMING A DEPOSITED FILM

Jinsho Matsuyama, Nagahama; Yutaka Hirai, Hikone; Masao Ueki, Urayasu, and Akira Sakai, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

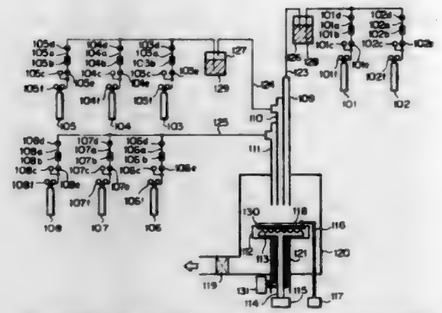
Continuation of Ser. No. 182,387, Jan. 18, 1994, abandoned, which is a continuation of Ser. No. 629,006, Dec. 18, 1990, abandoned, which is a continuation of Ser. No. 289,504, Dec. 23, 1988, abandoned, which is a continuation of Ser. No. 29,893, Mar. 25, 1987, abandoned. This application Apr. 3, 1995, Ser. No. 415,580
Claims priority, application Japan, Mar. 31, 1986, 61-73093; Mar. 20, 1987, 62-67334
Int. Cl.[6] C30B 25/02
U.S. Cl. 117—90 **14 Claims**

1. A method for forming a crystalline deposited film employing starting materials (A) and (B), comprising:

(a) introducing one of the starting materials into a film forming space having a substrate therein to be adsorbed onto the substrate as an adsorption layer; said material being capable of selectively forming a crystal nucleus for a deposited film upon said substrate; said substrate having a first surface and a second surface on said first surface, said first surface being an amorphous material adapted to readily form crystal nuclei and having exposed areas at specific intervals through said second surface, said second surface having a reduced capacity to form crystal nuclei compared to said first surface, wherein the pressure of said film forming space is maintained within a range of 1×10^{-7} Torr to 10 Torr;

(b) evacuating said film forming space to adjust the pressure therein to a pressure within a range of 1×10^{-10} torr to 1 Torr; and

(c) introducing the other starting material into said film forming space after said adsorption layer is formed, to thereby cause a surface reaction on said adsorption layer to form said crystal nucleus on said first surface and to grow a crystalline deposited film from said crystal nucleus without adding heat to promote the reaction; said starting material (A) being a gaseous material for forming a deposited film; and said starting material (B) being a gaseous halogenic oxidizing agent capable of having an oxidative action on said starting material (A).

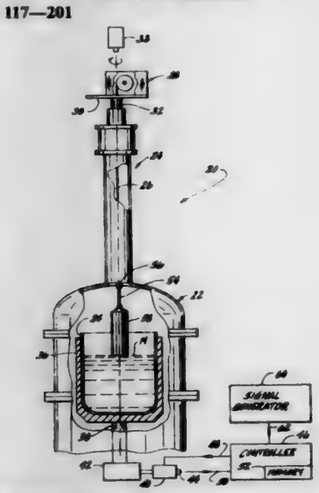


5,593,498

APPARATUS FOR ROTATING A CRUCIBLE OF A CRYSTAL PULLING MACHINE

Steven L. Kimbel, St. Charles; Harold W. Korb, Town & Country, and Cynthia F. Hall, St. Peters, all of Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Jun. 9, 1995, Ser. No. 488,924
Int. Cl.[6] C30B 35/00
U.S. Cl. 117—201 **15 Claims**



1. An apparatus for pulling a semiconductor crystal according to a Czochralski method, the apparatus comprising:

a crucible containing a melt;

a crystal pulling mechanism for pulling the semiconductor crystal from the melt in the crucible;

a motor coupled to the crucible;

a signal generator for generating a continuously varying speed signal; and

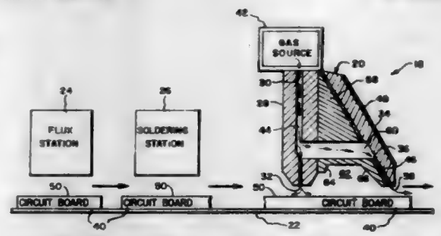
a control circuit connected to the motor receiving and responsive to the continuously varying speed signal generated by the signal generator for energizing the motor, said control circuit energizing the motor to rotate the crucible at a continuously varying acceleration and continuously varying rotational speed as a function of the continuously varying speed signal while the crystal pulling mechanism is pulling at least a portion of the semiconductor crystal from the melt in the crucible.

5,593,499

DUAL AIR KNIFE FOR HOT AIR SOLDER LEVELLING

Louis J. Stass, Setauket; James Tullo, Lindenhurst, and Thomas S. Kohm, Huntington, all of N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.

Filed Dec. 30, 1994, Ser. No. 366,984
Int. Cl.[6] H05K 3/24
U.S. Cl. 118—63 **31 Claims**



1. A dual air knife assembly for removing excess solder and leveling any remaining solder on a circuit board with a gas from a gas source comprises:

a first air knife having a first passage with a first inlet adapted to connect to the gas source and a first outlet adapted to be positioned adjacent to one side of the circuit board; and

a second air knife having a second passage with a second inlet connected to the gas source and a second outlet adapted to be positioned adjacent to the same side of the circuit board as said first air knife, wherein at least one of said first or second air knives is positioned to be substantially perpendicular to the circuit board.

5,593,500

DEVICE FOR COATING SOLID PARTICLES

Axel König, Stuttgart; Matthias Kleinhans, Waiblingen, and Janéz Michelic, Remseck, all of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

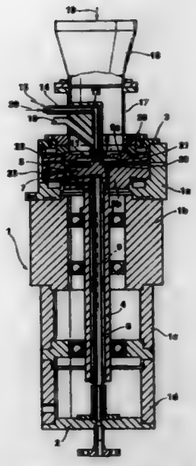
PCT No. PCT/EP94/02608, § 371 Date May 2, 1995, § 102(e) Date May 2, 1995, PCT Pub. No. WO95/07135, PCT Pub. Date Mar. 16, 1995
PCT Filed Aug. 5, 1994, Ser. No. 397,134
Claims priority, application Germany, Sep. 10, 1993, 43 30 632.2
Int. Cl.[6] B05C 5/00
U.S. Cl. 118—303 **14 Claims**

1. A device for coating solid particles with a coating material which is solid at room temperature comprising:

a housing;

a rotatable turbine body mounted within the housing, said rotatable turbine body including a first disk and a second disk which form an annular gap between adjacent surfaces of the first and second disks;

a first conduit within the housing for delivering a melt of the coating material to the annular gap between the disks and into an annular space in the housing;



a second conduit within the housing for delivering the solid particles to be coated to a surface of the first disk opposite the annular gap so that the solid particles are spun off into the annular space; and

adjusting means operably connected to the turbine body for adjusting the size of the annular gap between adjacent surfaces of the first and second disks from an outside of the housing.

5,593,501

DEVICE FOR COATING SMALL SOLID BODIES

Axel König, Stuttgart; Matthias Kleinhans, Waiblingen, and Jasiz Michelic, Remseck, all of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

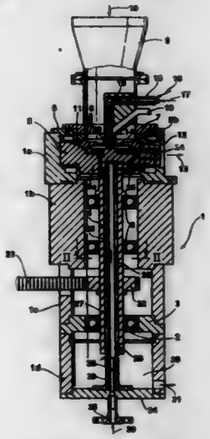
PCT No. PCT/EP94/02609, § 371 Date May 2, 1995, § 102(e) Date May 2, 1995, PCT Pub. No. WO95/07136, PCT Pub. Date Mar. 16, 1995

PCT Filed Aug. 5, 1994, Ser. No. 397,213

Claims priority, application Germany, Sep. 10, 1993, 43 30 633.0

Int. Cl.[6] B01F *5/22*

U.S. Cl. 118—410 **13 Claims**



1. A device for coating solid particles with a coating material which is solid at room temperature comprising:

a housing;

a rotatable turbine body mounted within the housing and including heating channels and a separate melt passage formed therein;

a drive shaft connected to the turbine body for rotating the turbine body;

a first conduit for supplying a melt of a coating material to the melt passage of the rotatable turbine body; and

a second conduit for supplying solid particles to be coated to the rotatable turbine body, the melt passage arranged to conduct melt to the particles to coat the particles;

the drive shaft being hollow to define therein a space accommodating a flow of heating agent to the heating channels to heat the turbine body independently of the melt and maintain the melt in a liquid state.

5,593,502

METHOD OF MAKING CRYSTALLINE SUGAR AND PRODUCTS RESULTING THEREFROM

Richard C. Fuisz, Great Falls; Gerald E. Battist, and Garry L. Myers, both of Reston, all of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Continuation of Ser. No. 133,669, Oct. 7, 1993. This application Jun. 6, 1995, Ser. No. 468,383

Int. Cl.[6] C13F *3/00;1/02*

U.S. Cl. 127—30 **15 Claims**



1. A sugar product comprising:

bi-dimensionally stabilized crystalline sugar produced by

i) forming a sugar crystalline frame from an outer portion of an amorphous shearform sugar mass in the presence of a controlled amount of water which initiates crystallization of amorphous sugar, and

ii) subsequently converting the remaining portion of said mass to a substantially completely crystalline structure by continued controlled contacting of said shearform amorphous sugar mass having a shell which has a cross-sectional dimension. said shell formed thereon with water in a substantially non-aqueous gaseous environment rate and in an amount sufficient to maintain said shell and permit said remaining portion of said mass to crystallize to form said crystalline structure.

5,593,503

PROCESS FOR PRODUCING AMYLASE RESISTANT GRANULAR STARCH

Yong-Cheng Shi, Somerville, and Peter T. Trzasko, Plainsboro, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jun. 7, 1995, Ser. No. 479,873

Int. Cl.[6] C08B *30/00;30/12;* **A23L** *1/05*

U.S. Cl. 127—71 **27 Claims**

1. A method for preparing a resistant granular starch with increased total dietary fiber content by heating a high amylose starch having at least 40% by weight amylose content under a combination of moisture and temperature conditions such that the starch remains in the granular state and is birefringent, the total moisture content of the starch being from about 10 to 80% by weight and the temperature being from about 60° to 160° C., with the resulting resistant granular starch having a total dietary fiber content of at least 12%.

5,593,504

METHOD OF CLEANING SOLDER PASTES FROM A SUBSTRATE WITH AN AQUEOUS CLEANER

Francis R. Cala, Highalnd Park; Richard A. Reynolds, Plainsboro, and Eric E. Eichhorn, Princeton, all of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Apr. 26, 1995, Ser. No. 429,514

Int. Cl.[6] B08B *3/04;3/12*

U.S. Cl. 134—1 **25 Claims**

1. A method of cleaning solder paste from a substrate wherein said paste comprises unreflowed solder and a fluxing agent, said method comprising contacting the solder paste with an aqueous solution containing alkaline salts and a surfactant formulation containing at least one nonionic surfactant for a time sufficient to loosen the solder paste from the substrate.

5,593,505

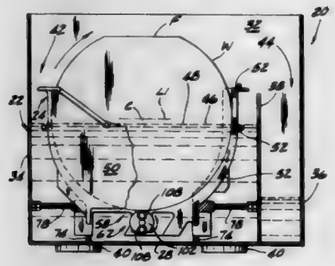
METHOD FOR CLEANING SEMICONDUCTOR WAFERS WITH SONIC ENERGY AND PASSING THROUGH A GAS-LIQUID-INTERFACE

Henry F. Erk, St. Louis; Ronald D. Bartram, Webster Groves; Eugene R. Hollander, Wentzville, and Jing Chai, St. Charles, all of Mo., assignors to MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Apr. 19, 1995, Ser. No. 424,904

Int. Cl.[6] B08B *3/12*

U.S. Cl. 134—1.3 **9 Claims**



1. A method of cleaning a semiconductor wafer comprising the steps of:

placing liquid in a bath, said liquid having a surface defining a level of said liquid, a gas-liquid-interface being defined at the surface of the liquid;

positioning the semiconductor wafer in the bath so that at least part of the wafer is in the liquid and below the gas-liquid-interface;

directing sonic energy through the liquid;

carrying out at least one of the following steps a plurality of times: (a) raising and lowering the semiconductor wafer so that the entire surface of the wafer passes through the gas-liquid-interface and (b) raising and lowering the level of liquid in the bath relative to the semiconductor wafer so that the entire surface of the wafer passes through the gas-liquid-interface; and

withdrawing the semiconductor wafer from the bath.

5,593,506

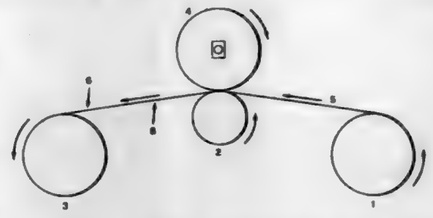
CLEANING METHOD FOR FOIL

Neil A. Johnson, Schenectady; Thomas R. Raber, East Berne; Louis E. Hibbs, Jr., Schenectady; Melissa L. Murray, Schaghticoke, and Mark G. Benz, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1995, Ser. No. 415,804

Int. Cl.[6] B08B *1/02*

U.S. Cl. 134—9 **8 Claims**



1. A method for cleaning niobium-based foil that is used to produce superconducting material comprising the steps of:

(a) passing continuously at a uniform speed, the foil having a thickness greater than about 0.0005 inches, between an abrasive pad and a smooth backing roller, where the abrasive pad contacts a top surface of the foil with an applied pressure from the smooth backing roller pressing against the foil so that the foil maintains contact with the abrasive pad to produce an effective amount of scratches to remove substantially all of a contaminant layer from the top surface of the foil; and then

(b) repeating step (a) on a bottom surface of the foil, so that the abrasive pad contacts the bottom surface of the foil with the applied pressure that produces the effective amount of scratches to remove substantially all of the contaminant layer from the bottom surface of the foil.

5,593,507

CLEANING METHOD AND CLEANING APPARATUS

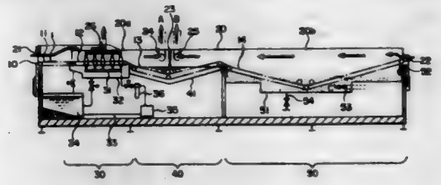
Minoru Inada, Yokohama; Yasutaka Imajo, Hachioji, and Masahide Uchino, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Japan Field Company, Ltd., Tokyo, both of Japan

Continuation of Ser. No. 842,169, Apr. 1, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 355,312

Claims priority, application Japan, Aug. 22, 1990, 2-220304; Aug. 30, 1990, 2-229221; Sep. 12, 1990, 2-241974; Sep. 12, 1990, 2-241975; Jan. 21, 1991, 3-020471

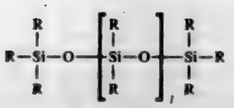
Int. Cl.[6] B08B *3/08;3/10;3/12;5/00*

U.S. Cl. 134—11 **80 Claims**



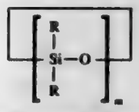
1. A method of cleaning a metal, electronic, semiconductor, ceramic, glass, plastic, optical or surface-treated part comprising the steps of:

a) cleaning the part by use of a cleaning agent consisting essentially of a solvent selected from at least one of the group consisting of perfluorocarbons, hydrocarbons selected from the group consisting of terpenes, kerosene, hydrocarbons having from 4 to 30 carbon atoms, paraffins, and alkylbenzenes, and silicones selected from the group consisting of straight chain polyorganosiloxanes represented by the formula:



(I)

and a cyclic polyorganosiloxane represented by the formula:



(II)

wherein R in each formula is indepeadently a substituted or unsubstituted monovalent hydrocarbon group, 1 is an integer from 0 to 5, and m is an integer from 3 to 7, and

b) drying said part by the use of a vapor drying agent comprising perfluorocarbons,

wherein during the drying step the part is at a temperature lower than the boiling point of the vapor drying agent, such that during said drying said vapor drying agent condenses on the part and at a temperature below the boiling point of the perfluorocarbon, forms a miscible blend with cleaning agent which remains on the part after step (a), and wherein said blend washes off the surface of the part, thereby drying and cleaning said part.

5,593,508

MOIST, ABSORBENT MATERIAL FOR CLEANING ARTICLES AND SURFACES

Shimon Gatt; Yechezkel Barenholz; Herve Bercovier, all of Jerusalem, and Zvi Elder, Haifa, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation-in-part of Ser. No. 13,846, Feb. 5, 1993, Pat. No. 5,376,183, which is a continuation-in-part of Ser. No. 653,319, Feb. 11, 1991, Pat. No. 5,401,413. This application Dec. 27, 1994, Ser. No. 364,587

Int. Cl.[6] A61K *7/50*; D04H *1/58*

U.S. Cl. 134—40 **9 Claims**

1. A moist, absorbent material for cleaning articles and surfaces, wherein said material is moistened with an aqueous solution containing unilamellar liposomes having vesicles of a diameter of up to about 100 nm.

5,593,509

PORTABLE THERMO-PHOTOVOLTAIC POWER SOURCE

Anthony C. Zuppero; Burton Krawetz; C. Rodger Barklund, and Gary D. Seifert, all of Idaho Falls, Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Mar. 17, 1995, Ser. No. 406,236

Int. Cl.[6] H01L *31/058*

U.S. Cl. 136—253 **51 Claims**

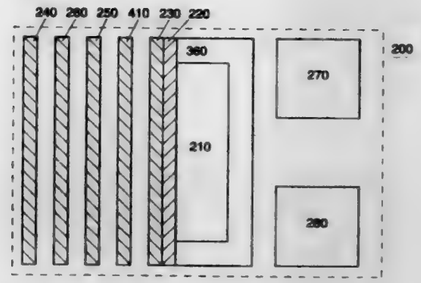
1. A miniature thermophotovoltaic (TPV) power chamber means for use in portable and hand-held electronic devices, said power chamber means comprising:

an energy source reactor chamber having a fuel inlet, an oxidant inlet, and an outlet for heat and exhaust gases;

a burner element coupled to the outlet of said energy source reactor chamber such that said burner element is heated by a burning of a fuel and an oxidant in said chamber to produce photon energy;

an emissive spectrum converter disposed on an outer face of the burner whereby heat from the burner causes a thermal excitation of said converter such that photon energy is produced in a narrow spectrum;

a transparent protector sheet separated from and locally parallel to the emissive spectrum converter on the outer burner face, said sheet reflecting excess heat energy back to said converter;



a hot exhaust port and shaft disposed between the energy source and the transparent protector sheet, whereby exhaust gases from the combustion of said fuel and said oxidant are expelled from the power chamber;

an array of photovoltaic elements spaced a distance from and parallel to the transparent protector sheet and optically coupled to the spectrum converter, whereby said array generates electricity in response to photon energy from said converter;

a miniaturized air transport means to move air from the ambient surroundings into the power chamber both for the purpose of providing oxygen and for thermal management; and

a heat recuperator means coupled to the hot exhaust port and shaft for reclaiming heat energy from the exhaust gases being expelled from the reactor chamber, whereby said exhaust port and shaft is thermally coupled to a fuel line and an oxidant line to (i) preheat said fuel and oxidant in the lines to increase efficiency of the power chamber, and (ii) cool the exhaust gases so that said TPV power chamber may be used in a hand-held device.

5,593,510

METHOD OF CARBURIZING AUSTENITIC METAL

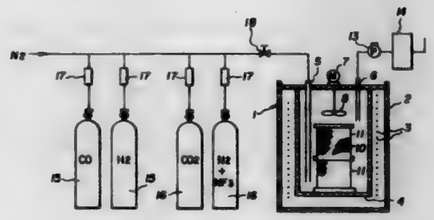
Masaaki Tahara, Takatsuki; Haruo Senbokuya, Tondabayashi; Kenzo Kitano, Kawachinagano, and Tadashi Hayashida, Sakai, all of Japan, assignors to Daido Hoxan, Inc., Hokkaido, Japan

Filed Apr. 17, 1995, Ser. No. 423,644

Claims priority, application Japan, Apr. 18, 1994, 6-078677; Sep. 30, 1994, 6-237057

Int. Cl.[6] C23C *8/22*

U.S. Cl. 148—225 **8 Claims**



1. A method of carburizing austenitic metal comprising the steps of holding austenitic metal in a fluoride-containing gas atmosphere with heating prior to carburizing and carburizing the austenitic metal at a temperature not more than 680° C.

5,593,511

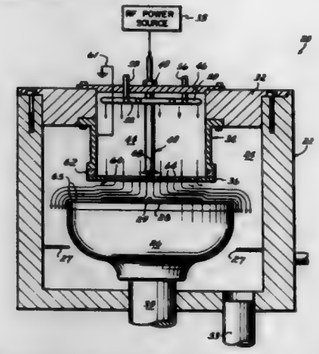
METHOD OF NITRIDIZATION OF TITANIUM THIN FILMS

Robert F. Foster, Phoenix, and Joseph T. Hillman, Scottsdale, both of Ariz., assignors to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Park Ridge, N.J.

Continuation of Ser. No. 253,394, Jun. 3, 1994, abandoned. This application Dec. 6, 1995, Ser. No. 567,830

Int. Cl.[6] C23C *8/20*

U.S. Cl. 148—238 **10 Claims**



1. A method of applying a titanium nitride layer over a titanium film comprising:

exposing said titanium film to a plasma selected from the group consisting of a nitrogen plasma and an ammonia plasma at a temperature less than about 500° C. for 20 to 300 seconds, wherein said plasma is created by subjecting a nitriding gas selected from the group consisting of ammonia and nitrogen to an Rf electrode, thereby forming a titanium nitride layer on said titanium film;

and depositing on said titanium nitride layer a titanium nitride film by chemical vapor deposition wherein said titanium nitride film is formed from titanium tetrachloride and a gas selected from the group consisting of nitrogen, ammonia and mixtures of nitrogen and ammonia.

5,593,512

Patent Not Issued For This Number

5,593,513

AMORPHOUS FE-B-SI-C ALLOYS HAVING SOFT MAGNETIC CHARACTERISTICS USEFUL IN LOW FREQUENCY APPLICATIONS

V. R. V. Ramanan, Cary, N.C.; Gordon E. Fish, Upper Montclair, N.J.; Howard H. Liebermann, Succasunna, N.J., and John Silgailis, Cedar Grove, N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

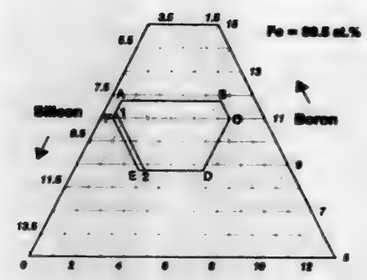
Continuation of Ser. No. 162,691, Dec. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 996,288, Dec. 23, 1992, abandoned. This application May 9, 1996, Ser. No. 647,152

Int. Cl.[6] H01F *1/153*

U.S. Cl. 148—304 **19 Claims**

1. A metallic alloy composed of iron, boron, silicon, and carbon, which is at least about 70% amorphous, and which consists essentially of the composition $Fe_aB_bSi_cC_d$, where "a"–"d" are in atomic percent, the sum of "a", "b", "c", and "d" equals 100, "a" ranges from about 79 to about 80.5, "b" ranges from about 8.5 to about 10.25, "c" ranges from about 5.25 to about 8.5, and "d" ranges from about 3.25 to about 4.5, with the provisos that:

(i) for "c">7.5, "d" is at least about 4; and



(ii) for "a">80, "b" is at least about 8.75;

said alloy having up to 0.5 atom percent of impurities therein, and having a crystallization temperature of at least about 500° C.

5,593,514

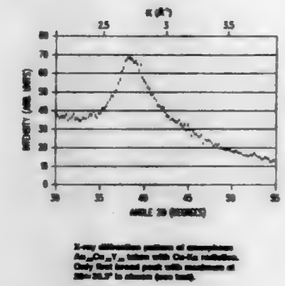
AMORPHOUS METAL ALLOYS RICH IN NOBLE METALS PREPARED BY RAPID SOLIDIFICATION PROCESSING

Bill C. Giessen, Cambridge; Sunil V. Gokhale, North Chelmsford, and Krassimir G. Marchev, Boston, all of Mass., assignors to Northeastern University, Boston, Mass.

Filed Dec. 1, 1994, Ser. No. 348,017

Int. Cl.[6] C22C *5/02;5/04;5/06;45/00*

U.S. Cl. 148—403 **16 Claims**



X-ray diffraction pattern of amorphous $Ag_{40}Cu_{25}Y_{35}$ taken with Cu-Kα radiation. Only first broad peak with maximum at 2θ=38.3° is shown (see text).

1. An amorphous metal alloy having the formula

$$M_aG1_bG2_c,$$

wherein

M is at least one element selected from the group consisting of Ag, Au, Ru, Os, Rh, Ir, and Pd,

G1 is at least one element selected from the group consisting of Cu, Ni, Si, and Be,

G2 is at least one element selected from the group consisting of Y, the lanthanides, Zr, Hf, Ca, Mg, Ti, Nb, and Ta;

wherein a, b, and c are atomic percentages, a ranges from 70 to 90 percent, b and c range from 5 to 15 percent each, and a +b+c total 100 percent; and

wherein the alloy has been produced by rapid solidification from a liquid melt.

5,593,515
HIGH STRENGTH ALUMINUM-BASED ALLOY

Tsuyoshi Masumoto, 3-8-22, Kamisugi, Aoba-ku, Sendai-shi, Miyagi; Akihisa Inoue, 11-806, Kawauchijutaku, Mubanchi, Kawauchi, Aoba-ku, Sendai-shi, Miyagi; Hisamichi Kimura, Azatobichuoki; Yoshiyuki Shinohara, Tokyo; Yuma Horio, Hamamatsu, and Kazuhiko Kita, Sendai, all of Japan, assignors to Tsuyoshi Masumoto; Akihisa Inoue, both of Miyagi; Teikoku Piston Ring Co., Ltd., Tokyo; Yamaha Corporation, Shizuoka, and YKK Corporation, Tokyo, all of Japan

Filed Mar. 27, 1995, Ser. No. 411,164
Claims priority, application Japan, Mar. 29, 1994, 6-59145
Int. Cl.[6] C22C *21/00*
U.S. Cl. 148—415 16 Claims

1. A high strength aluminum-based alloy having a composition of the general formula:

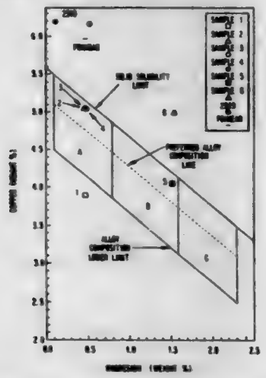
$$Al_{bal.}Q_aM_bX_cT_d$$

wherein Q represents at least one element selected from the group consisting of Mn, Cr, V, Mo and W; M represents at least one element selected from the group consisting of Co, Ni, Cu and Fe; X represents at least one element selected from rare earth elements including Y or misch metal; T represents at least one element selected from the group consisting of Ti, Zr and Hf; and a, b, c and d represent the following atomic percentages: a is greater than or equal to 1, but less than or equal to 7, b is greater than 0, but less than or equal to 5, c is greater than 0, but less than or equal to 5, and d is greater than 0, but less than or equal to 2 , and containing quasi-crystals in the structure thereof.

5,593,516
HIGH STRENGTH, HIGH TOUGHNESS ALUMINUM-COPPER-MAGNESIUM-TYPE ALUMINUM ALLOY

William A. Cassada, III, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 267,869, Jun. 27, 1994, which is a division of Ser. No. 937,935, Aug. 28, 1992, Pat. No. 5,376,192. This application Jun. 7, 1995, Ser. No. 481,578
Int. Cl.[6] C22C *21/16*
U.S. Cl. 148—418 14 Claims



1. An aluminum-based alloy having an improved combination of high strength and high fracture toughness, said alloy consisting essentially of:

about 2.5–5.5% by weight of copper;
about 0.10–2.30% by weight of magnesium; and
the balance aluminum and incidental impurities;
wherein the amounts of copper and magnesium together are less than the solid solubility limit for copper and magnesium in aluminum and are interrelated by the following equations:

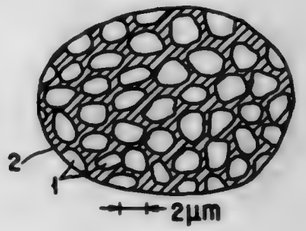
$$Cu_{max.}=-0.91\ Mg+5.59$$

$$Cu_{min.}=-0.91\ Mg+4.59.$$

5,593,517
REGENERATING MATERIAL AND REFRIGERATOR USING THE SAME

Akiko Saito, Kawasaki; Masashi Sahashi; Yoichi Tokai, both of Yokohama; Akihiko Tsutai, Kawasaki; Masami Okamura, Yokohama; Yukiko Nishiyama, Kawaguchi, and Michihiko Inaba, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 15, 1994, Ser. No. 305,916
Claims priority, application Japan, Sep. 17, 1993, 5-253698
Int. Cl.[6] H01F *1/055*
U.S. Cl. 148—301 14 Claims



1. A regenerating material, comprising a rare earth alloy containing a main phase and a sub-phase which differ in content of rare earth elements, wherein a cross section of said main phase has an average diameter of 0.01 μm to 20 μm and a cross section of said sub-phase has an average width of 0.01 μm to 3 μm; and

wherein said rare earth alloy has a composition represented by the formula:

$$RM_Z$$

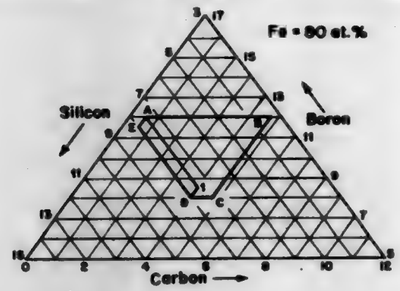
wherein R is a rare earth element; M is an element selected from the group consisting of Fe, Ni, Co, Cu, Ru, Rh, Pd, Ag, Pt, Au, Al, Ga and In; and Z is $0.001 \leq Z \leq 13$; and

wherein said main phase is contained in an amount of 50 to 85% by volume and said sub-phase is contained in an amount of 15 to 50% by volume.

5,593,518
AMORPHOUS FE-B-SI-C ALLOYS HAVING SOFT MAGNETIC CHARACTERISTICS USEFUL IN LOW FREQUENCY APPLICATIONS

V. R. V. Ramanan, Dover, N.J., assignor to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 246,393, May 20, 1994, abandoned, which is a continuation of Ser. No. 996,288, Dec. 23, 1992, abandoned. This application May 9, 1996, Ser. No. 647,151
Int. Cl.[6] H01F *1/153*
U.S. Cl. 148—304 13 Claims

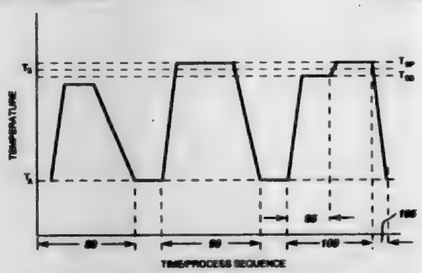


1. A metallic alloy composed of iron, boron, silicon, and carbon, which is at least about 70% amorphous, and which consists essentially of the composition $Fe_aB_bSi_cC_d$, where "a"–"d" are in atomic percent, the sum of "a", "b", "c", and "d" equals 100, "a" ranges from about 79 to about 80, "b" ranges from about 8.5 to about 10.25, "c" ranges from about 5.25 to about 8.5, and "d" ranges from about 3.25 to about 4.5, with the proviso that for "c">7.5, "d" is at least about 4, said alloy having up to 0.5 atomic percent of impurities present therein, and a crystallization temperature of at least 500° C.

5,593,519
SUPERSOLVUS FORGING OF NI-BASE SUPERALLOYS

Charles P. Blankenship, Jr., and Michael F. Henry, both of Niskayuna, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 7, 1994, Ser. No. 271,611
Int. Cl.[6] C22F *1/10*
U.S. Cl. 148—514 22 Claims



1. A method of producing a forged article which has a grain size within a range of about 50–150 microns from a Ni-base superalloy, comprising the steps of:

selecting a forging preform which has a grain size within a range of about 1–40 microns formed from the Ni-base superalloy and having a microstructure comprising a mixture of γ and γ′ phases, a γ′ solvus temperature and an incipient melting temperature, wherein the γ′ phase occupies at least 40% by volume of the Ni-base superalloy;

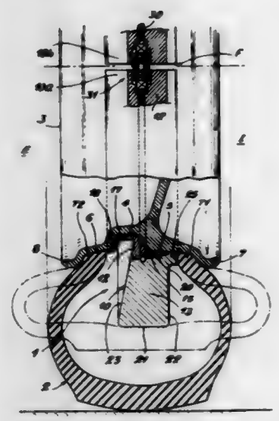
forging the preform at a forging temperature that is above the γ′ solvus temperature and below the incipient melting temperature of the Ni-base superalloy and at a strain rate in the range of 0.01–0.0001 s^{-1} for a time sufficient to form the forging preform into a forged article having a maximum grain size of about 150 microns; and

cooling the forged article below the γ′ solvus temperature where said forged article has the grain size within the range of about 50–150 microns.

5,593,520
RING DEVICE FOR RUNNING ON A FLAT TIRE

Bernard Boni; Eric Carpentier, both of Compagne-Sur-Oise, and Laurent Babillon, Paris, all of France, assignors to Hutchinson, Paris, France

Continuation of Ser. No. 157,229, Nov. 23, 1993, abandoned. This application Jul. 10, 1995, Ser. No. 500,444
Claims priority, application France, Dec. 3, 1992, 92 14561
Int. Cl.[6] B60C *17/04*
U.S. Cl. 152—158 15 Claims



1. A ring device in combination with a vehicle tire to be mounted on a vehicle rim having a well, said ring device comprising:

an abutment lip for contacting the well of the rim and securing a bead of the tire;

a wedge diametrically opposing said abutment lip for contacting said rim and for subjecting an opposing force upon another bead of the tire wherein said wedge contacts said bead of the tire when said tire is in an inflated as well as a less than fully inflated position;

said ring being a single piece of material which contains a split on its circumference so as to present two end portions that are moveable to each other;

a core comprising said abutment lip and having an inner peripheral surface configured to come into contact with the rim; and

an annular projecting portion comprising said wedge and being integral with said core and having an outer peripheral surface forming the outer surface of the ring so that when the tire is deflated partially or totally, the ring device enables the vehicle to continue to operate.

5,593,521

PNEUMATIC TIRE INCLUDING CORD LAYERS

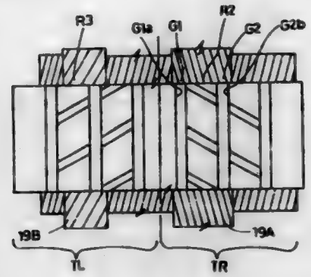
Tsutomu Iseki, Fukushima-ken, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Division of Ser. No. 7,956, Jan. 22, 1993, abandoned, which is a division of Ser. No. 651,585, Feb. 6, 1991, abandoned. This application Apr. 6, 1994, Ser. No. 223,755

Claims priority, application Japan, Feb. 15, 1990, 2-13911 U; Feb. 19, 1990, 2-15468 U

Int. Cl.[6] B60C *9/30;115/00*

U.S. Cl. 152—209 R **3 Claims**



1. A pneumatic tire comprising

a tread portion, said tread portion having a pair of tread edges,

a pair of axially spaced bead portions,

a pair of sidewall portions, one of said pair of sidewall portions extending between one of said pair of tread edges and one of said pair of bead portions,

a pair of bead cores, one of said pair of bead cores being disposed in one of said bead portions and the other of said bead cores being disposed in the other of said bead portions,

a carcass extending between said bead portions and turned up around each of said pair of bead cores,

a belt reinforcement layer disposed radially outside said carcass in said tread portion and including at least one ply of parallel cords which ply extends between said tread edges to reinforce a substantially full width of said tread portion, and

a first and a second layer of cords disposed radially outside said belt reinforcement layer, each of said first and second cord layers having a width narrower than that of said belt reinforcement layer, wherein

said tread portion is provided with a plurality of circumferential grooves extending circumferentially of the tire in parallel with the tire equator,

each of said plurality of circumferential grooves having a first and a second sidewall, and dividing said tread portion into a plurality of ribs, said plurality of ribs comprising a pair of axially inner ribs and a pair of axially outer ribs, the axially inner ribs being positioned between the axially outer ribs,

said first cord layer is disposed on one side of the tire equator,

said second cord layer is disposed on the other side of the tire equator,

said two cord layers are disposed axially outward of the tire equator and asymmetrically in axial positions with respect to the tire equator,

each of said inner and outer ribs is provided with a plurality of lateral grooves extending across the entire width thereof to divide the rib into a plurality of blocks,

said lateral grooves being substantially straight and parallel with each other within each of said inner and outer ribs,

said circumferential grooves and said lateral grooves form a tread pattern which is symmetrical with respect to the tire equator,

the cords of said first cord layer and lateral grooves located on said one side of the tire equator have a left-side-upward-inclination and the cords of said second cord layer and lateral grooves located on the said other side of the tire equator have a right-side-upward-inclination, and

said first cord layer being centered beneath one of said inner ribs and said second cord layer having and edge positioned at one position beneath the other of said inner ribs and another edge positioned at another position beneath the outer rib which is adjacent said other of said inner ribs so that the second cord layer extends between said one position and said another position.

5,593,522

PNEUMATIC VEHICLE TIRE WITH OPTIMIZED RECYCLABILITY

Thomas Neddenriep, Schwarmstedt, and Theodor Frucht, Hanover, both of Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany

Division of Ser. No. 255,642, Jun. 7, 1994, Pat. No. 5,467,807. This application Aug. 25, 1995, Ser. No. 519,363

Claims priority, application Germany, Jun. 7, 1995, 43 18 825.7

Int. Cl.[6] B60C *9/00;9/20;9/22;15/04*

U.S. Cl. 152—458 **10 Claims**



1. A pneumatic vehicle tire comprising:

two beads each having a bead core;

a carcass of at least one layer anchored at said bead cores within said beads;

said beads further comprising bead profiling members;

a reinforcement structure located radially outwardly of said carcass;

a tread positioned radially outwardly of said reinforcement structure;

said carcass consisting essentially of aramid cord fabric;

said bead cores consisting essentially of aramid cords;

said reinforcement structure consisting essentially of aramid cords; and

said bead profiling members consisting essentially of rubber reinforced with synthetic fibers.

5,593,523

RADIAL TIRE FOR MOTORCYCLE INCLUDING SPIRAL CORD BELT

Shigehiko Suzuki, Amagasaki; Itsuo Yasui, Nishinomiya, and Sadaaki Naito, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Division of Ser. No. 135,590, Oct. 13, 1993, Pat. No. 5,400,847, which is a continuation of Ser. No. 692,559, Apr. 29, 1991, abandoned. This application Nov. 29, 1994, Ser. No. 348,995

Claims priority, application Japan, May 2, 1990, 2-116510

Int. Cl.[6] B60C *9/08;9/22;15/00*

U.S. Cl. 152—527 **3 Claims**

1. A radial tire for motorcycles having its maximum cross section width lying between tread edges, comprising:

a pair of bead cores disposed one in each bead portion of the tire;

a carcass extending between the bead portions through sidewall portions and a tread portion of the tire, the carcass having at least one ply of organic fiber cords arranged radially at an angle of 70 to 90 degrees to the tire equator and turned up around the bead cores to form two turned up portions and a main portion therebetween;

a tread disposed radially outside the carcass to define the tread portion; and

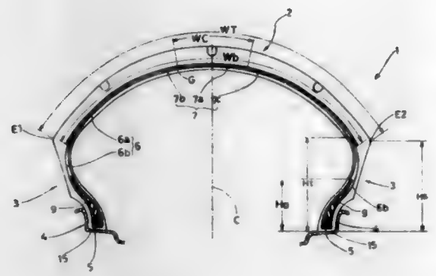
a belt disposed radially outside the carcass and inside the tread, wherein;

the radial height Ht of the radially outer edge of each carcass turned up portion being 0.5 to 1.2 times the radial height of the tread edge, both from the bead base,

said belt comprises two lateral pieces and a central piece therebetween, the central piece being either spaced from or overlapped with each of the lateral pieces, each piece made of at least one spirally wound cord having an elastic modulus of not less than 600 kgf/mm^2 and formed by winding spirally a ribbon of rubber in which said at least one cord is embedded,

the width of the central piece is 0.1 to 0.6 times the tread width, and

the central piece differs from at least one of said lateral pieces in respect of at least one of cord material and cord thickness.



5,593,524

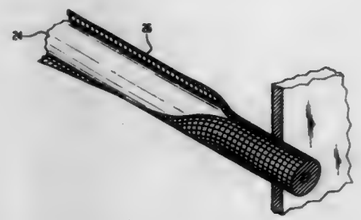
ELECTRICAL CABLE REINFORCED WITH A LONGITUDINALLY APPLIED TAPE

Peter A. Phillips, 63 Mountain View Ter., Hillsdale, N.J. 07642

Filed Nov. 14, 1994, Ser. No. 339,493

Int. Cl.[6] H01B *7/02;13/22*

U.S. Cl. 156—51 **8 Claims**



1. A method of manufacturing a cable, comprising the steps of:

providing conductive means for conducting electrical current;

applying a first layer of insulation over said conductive means;

wrapping a mesh tape longitudinally around said first layer of insulation at substantially same time as a second layer of insulation is applied over said mesh tape, wherein said mesh tape and said second layer of insulation are interwoven with each other.

5,593,525

PROCESS OF MAKING STRUCTURED FIBER MATERIAL

Hideo Isoda, Otsu; Tadaaki Hamaguchi; Mitsuhiro Sakuda, both of Iwakuni, and Yasushi Yamada, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 169,642, Dec. 20, 1993, Pat. No. 5,462,793. This application May 8, 1995, Ser. No. 438,866

Claims priority, application Japan, Dec. 22, 1992, 4-342577; Apr. 23, 1993, 5-097838

Int. Cl.[6] D04H *5/00*

U.S. Cl. 156—622 **20 Claims**



1. A process for producing a structured fiber material, comprising the steps of:

blending non-elastic crimped short fibers (A) with heat-bonding composite fibers (B') exhibiting no three-dimensional crimps based on their own potential crimpability, said composite fibers (B') comprising a non-elastic polymer and a thermoplastic elastomer having a melting point that is at least 40° C. lower than the melting point of a polymer constituting said non-elastic crimped short fibers (A), at least part of said thermoplastic elastomer being exposed to an outer periphery of the cross-section of said composite fiber (B');

opening said blended fibers (A) and (B') to form opened fibers having three-dimensional fiber contact points between said heat-bonding composite fibers (B') as well as between said heat-bonding composite fibers (B') and said non-elastic crimped short fibers (A);

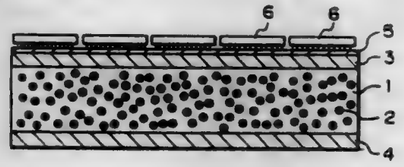
heat-treating said opened fibers at a temperature that is at least 10° C. higher than the melting point of said thermoplastic elastomer contained in said composite fibers (B') as a heat-bonding component, so that the potential crimpability of said heat-bonding composite fibers (B') is developed as the three-dimensional crimps, whereby said composite fibers (B') are formed into three-dimensionally crimped composite fibers (B) partially interlocked with other three-dimensionally and crimped composite fibers having coiled-spring shaped portions coiled around said non-elastic crimped short fiber (A); and

heat-bonding at least part of said fiber contact points to form a structured fiber material comprising said non-elastic crimped short fibers (A) and three-dimensionally crimped short fibers (B), said fibers (B) being partially interlocked with each other, in which contact portions said fibers (B) are partially heat-bonded with each other, at least a portion of said fibers (B) being wound around said fibers (A) at their contact points, in which contact portions said fibers (A) and (B) are partially heat-bonded with each other.

5,593,526
PROCESS FOR PREPARING A MULTI-LAYER WIRING BOARD

Kishio Yokouchi; Hiroshi Kamezaki; Masato Wakamura; Nobuo Kamehara, and Koichi Niwa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 107,807, Aug. 17, 1993, abandoned, which is a division of Ser. No. 763,248, Sep. 20, 1991, Pat. No. 5,275,889. This application Sep. 30, 1994, Ser. No. 316,376
Claims priority, application Japan, Sep. 28, 1990, 2-252580
Int. Cl.[6] C04B 37/00
U.S. Cl. 156—89 25 Claims



1. A process for producing a multi-layer wiring board having a dielectric constant not higher than 4 and which comprises alternate layers of a glass ceramic material and conductor patterns, said glass ceramic material layers each being made up of a fired admixture comprising a glass ceramic matrix and a multitude of ceramic particles dispersed in the glass ceramic matrix, said process comprising:

providing a multitude of ceramic particles comprising porous or hollow silica glass spheres having an average diameter of not more than 20 μm, said spheres being covered with an aluminum containing ceramic coating layer which prevents crystallization of the spheres as a result of a firing process for sintering the glass ceramic layers and which raises the softening temperature of the spheres to a temperature higher than a firing temperature of a firing process required to produce a highly reliable multi-layer wiring board;

mixing glass powders, said multitude of ceramics particles, a binder resin, a plasticizer, and a solvent to thereby form a slurry;

forming said slurry into ceramics green sheets;

cutting the ceramics green sheets to a predetermined size and forming through holes therein;

forming a conductor pattern on the ceramics green sheets;

stacking the green sheets having the conductor patterns thereon on and the through holes therein to present a laminate structure;

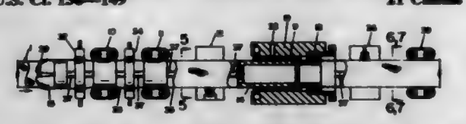
subjecting said laminate structure to isostatic pressing; and

firing the isostatically pressed laminate structure at a temperature of from 980° C. to 1010° C.

5,593,527
DOUBLE JACKETED FIRE HOSE AND A METHOD FOR MAKING A DOUBLE JACKETED FIRE HOSE

Josef B. Schoonaker, Edinboro; Michael Kirjk, Jr., Union City, and Donald A. Ruffcorn, Erie, all of Pa., assignors to Snap-Tite, Inc., Union City, Pa.

Division of Ser. No. 100,048, Jul. 30, 1993, abandoned. This application May 15, 1995, Ser. No. 440,683
Int. Cl.[6] B29C 47/02; F16L 11/02; 11/08; 11/20
U.S. Cl. 156—149 21 Claims

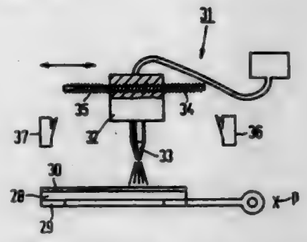


1. A method for manufacturing a fire hose having an inner woven jacket and an outer woven jacket, each having a twist imparted thereto during weaving, comprising the steps of untwisting said twisted inner woven jacket such that the remaining twist, if any, is small relative to the twist imparted during weaving, heating and drying said untwisted inner woven jacket, extruding a thermoplastic material onto, into, and through said untwisted inner woven jacket, cooling said untwisted inner woven jacket, inserting said inner woven jacket into said a twisted outer woven jacket, and pressurizing and heating said untwisted inner and said twisted outer woven jackets.

5,593,528
METHOD OF PROVIDING A PATTERN OF APERTURES AND/OR CAVITIES IN A PLATE OR LAYER OF NON-METALLIC MATERIAL

Jacobus M. Dings; Remko Horse; Gerardus N. A. Van Veen, and Joseph C. M. Bouman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1994, Ser. No. 359,377
Claims priority, application Belgium, Dec. 20, 1993, 09301422
Int. Cl.[6] B24C 1/00
U.S. Cl. 156—154 8 Claims



1. A method of manufacturing a display device including a luminescent screen and at least one plate comprising a non-metallic material having a predefined pattern of precisely-positioned passages through which charged particles are guided to effect excitation of the screen, characterized in that the passages are made by means of the following steps:

a. securing to the plate, by means of an adhesive layer, a mask having apertures arranged in the predefined pattern and having areas substantially corresponding to cross-sectional areas of the passages, said adhesive layer having a predetermined thickness;

b. producing at least one jet of abrasive-powder particles having a predetermined average size;

c. directing the at least one jet at a surface of the plate through the apertures in the mask;

d. performing a relative movement between the at least one jet and the plate to effect formation of the passages; and

e. removing the mask from the plate;

said adhesive layer thickness being smaller than said abrasive-powder particle size.

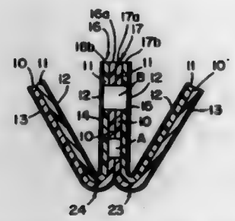
5,593,529
CYLINDRICAL FILTERS AND THEIR MANUFACTURE

Michael Grimes, Hayling Island, England, assignor to Pall Corporation, East Hills, N.Y.

Division of Ser. No. 642,652, Jan. 17, 1991, Pat. No. 5,185,190. This application Dec. 3, 1992, Ser. No. 985,154
Claims priority, application United Kingdom, Jan. 18, 1990, 9001141
Int. Cl.[6] B32B 31/04; 31/20; B01D 29/07
U.S. Cl. 156—218 22 Claims

1. A method of forming a filter from a sheet of filter material including at least first and second layers of filter media, each layer having first and second edges, comprising the steps of:

(a) contacting a portion of the first layer of filter media near the first edge with a portion of the first layer near the second edge;



(b) sealing the contacting portions together with a first seal with the first seal extending along the length of the edges at a first position spaced from the edges, without a seal at the edges;

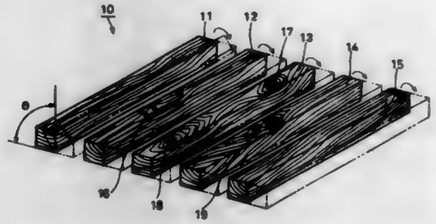
(c) positioning a portion of the second layer of filter media near the first edge of the first layer and a portion of the second layer near the second edge of the first layer so that the second layer portions at least partially overlie the sealed first layer portions; and then

(d) forming a second seal between the second layer portions, with the second seal extending along the length of the edges at a second position spaced from the edges, without a seal at the edges, and spaced from the first seal.

5,593,530
LAMINATED LUMBER AND METHOD OF MANUFACTURING THE SAME

Tetsuya Hashiguchi, 614, 5-cho, Showa-cho, Hamadera, Sakai-shi, Osaka 592, Japan

Filed Aug. 16, 1994, Ser. No. 291,018
Claims priority, application Japan, Jul. 14, 1994, 6-161856
Int. Cl.[6] B32B 31/00
U.S. Cl. 156—260 8 Claims



1. A method of manufacturing laminated lumber, comprising the steps of:

(A) providing a log of a natural tree;

(B) cutting along first cutting lines drawn from the outside of the log of a natural tree into a vicinity of the core of the log in a direction perpendicular to a large knot in the log, and subsequently, cutting along second cutting lines drawn in a direction perpendicular to said first cutting lines on an outside part of the log, and then, cutting along third cutting lines drawn from the outside into the vicinity of the core in a direction perpendicular to said second cutting lines to produce a plurality of boards from said log;

(C) cutting said boards in a thickness direction into pieces of prismatic wood, wherein at least one cutting line is cut to avoid knot parts;

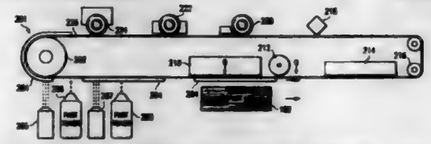
(D) arranging said pieces of prismatic wood in a transverse direction, wherein inside pieces of prismatic wood composing said laminated lumber are arranged such that inside knots are present in a transverse direction and so that knots are not present at least on the surface of said laminated lumber; and

(E) applying an adhesive between said pieces of prismatic wood and bonding them together by pressurization to produce laminated lumber and thereafter smoothing the surface of said laminated lumber.

5,593,531
SYSTEM, METHOD AND PROCESS FOR FABRICATION OF 3-DIMENSIONAL OBJECTS BY A STATIC ELECTROSTATIC IMAGING AND LAMINATION DEVICE

Steven M. Penn, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 9, 1994, Ser. No. 336,634
Int. Cl.[6] B32B 31/00
U.S. Cl. 156—272.6 26 Claims



1. A method for fabricating a prototype including a part and support comprising the steps of:

forming a first charged area on a belt;

applying a first material to said belt so that said first material is attracted to said first charged area;

forming a second charged area on said belt;

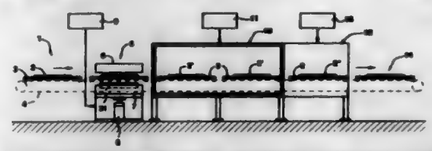
applying a second material to said belt so that said first material is attracted to said second charged area;

transferring said first material and said second material from said belt to said prototype in order to form said part and support.

5,593,532
PROCESS FOR MANUFACTURING PHOTOVOLTAIC MODULES

Johann Falk, Graz, and Albert K. Plessing, Bruck, both of Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Austria

PCT No. PCT/AT94/00073, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO94/29106, PCT Pub. Date Dec. 22, 1994
PCT Filed Jun. 7, 1994, Ser. No. 374,523
Claims priority, application Austria, Jun. 11, 1993, 1132/93
Int. Cl.[6] B32B 31/20; H01L 31/04
U.S. Cl. 156—285 9 Claims



1. A method for manufacturing a laminated photovoltaic module comprising a core layer which is a system of solar cells clad by encapsulating materials consisting of glass/plastic foil composites and/or plastic-foil composites, comprising:

depositing a module-stack comprising a solar cell system, encapsulating materials containing plastic sealing layers and spacing foils at a loading station onto a thermally conductive carrier plate, the temperature of said plate being maintained below the softening point of the plastic sealing layers in the encapsulating materials;

moving the module-stack from said loading station into a vacuum laminator which is then closed and evacuated;

heating the module-stack in said closed and evacuated vacuum laminator to the softening point of the plastic sealing layers by pressing a heater plate against the carrier plate;

ventilating the vacuum laminator to remove vacuum compression on the module-stack, without cooling the heater plate;

moving the module-stack into a hardening oven and heating it in said oven in the absence of compression to harden the plastic sealing layers to form a laminated module;

moving the laminated module into a cooling zone and cooling it therein; and

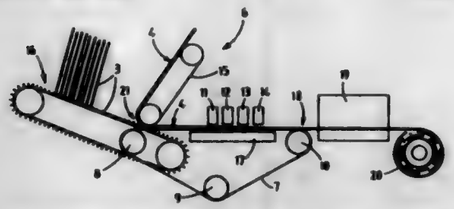
removing the laminated module at a removal station.

5,593,533

THERMOBONDING INTERLINING COMPRISING A LAYER OF FIBERS INTERMINGLED WITH TEXTURED WEFT YARNS AND ITS PRODUCTION METHOD

Pierre Groubens, Peronne, France, assignor to Laniere de Picardie S.A., France

Division of Ser. No. 317,577, Oct. 4, 1994, Pat. No. 5,534,330. This application Jun. 1, 1995, Ser. No. 457,874
Claims priority, application France, Oct. 11, 1993, 93 12384
Int. Cl.[6] B05D *5/10*; D04H *5/02*
U.S. Cl. 156—305 **4 Claims**



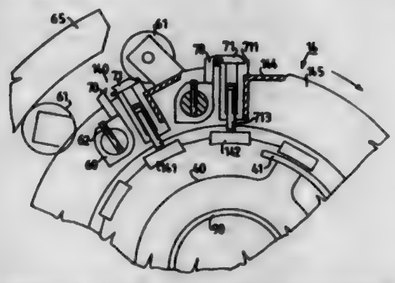
1. A method of producing a thermobonding interlining having a non-woven layer of intermingled fibers or filaments and dots of thermofusible polymer deposited on one face of the non-woven layer, said method comprising the steps of depositing a non-woven layer of intermingled fibers or filaments on a conveyor constituted of a wire netting, said fibers or filaments oriented generally in a single direction; directing toward said conveyor weft yarns that are made of textured continuous filaments and kept in a stretched condition and parallel with one another; depositing said weft yarns on the conveyor in a zone where the non-woven layer is being deposited such that the weft yarns are oriented crosswise to the direction of the non-woven layer and covered by the non-woven layer to form an assembly; subjecting the assembly of the weft yarns and the non-woven layer to high pressure jets of water from injectors disposed above the wire netting conveyor so that the fibers or filaments of the non-woven layer are intermingled with the weft yarns; subsequently subjecting said assembly to a drying treatment to obtain a base material of interlining; and depositing dots of thermofusible polymer on one of two faces of the base material to obtain the thermobonding interlining.

5,593,534

APPARATUS FOR MANUFACTURING CAMOUFLAGE NETTING

Hermann Thuswaldner, and Sören Andersson, both of Gamleby, Sweden, assignors to Barracuda Technologies AB, Gamleby, Sweden

Division of Ser. No. 698,999, Jun. 28, 1991, Pat. No. 5,492,748. This application May 22, 1995, Ser. No. 446,402
Claims priority, application Sweden, Nov. 6, 1987, 8903709
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—380.04 **4 Claims**



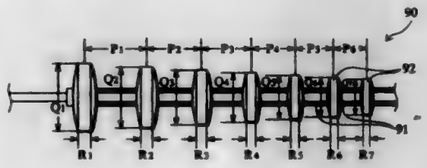
1. Apparatus for fastening a web material having periodic string parts, comprising means for advancing the web material in an ordered, outspread fashion, means for advancing garnishing material, and means for attaching garnishing material to said string parts of said web material, and in which the attachment means include an endless, rotating path on which there are disposed periodically arranged apertures for receiving said string parts and garnishing material entrained therewith, and pairs of electrodes including means for moving said pairs of electrodes towards and away frown one another and means for supplying high frequency energy to said electrodes, each of said electrodes being located on a respective side of said apertures and functioning to bring together and to mutually secure garnishing material which wraps around said string parts as they enter said apertures.

5,593,535

APPARATUS FOR PRODUCING CORRUGATED TUBE

Noboru Hasegawa, Ichihara; Mitsuo Kagabu, deceased, late of Ichihara, and Setsu Kagabu, heir, Akita, all of Japan, assignors to Toyo Chemical Co., Ltd., Kanagawa-Ken, Japan

PCT No. PCT/JP93/01616, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO94/11188, PCT Pub. Date May 26, 1994
PCT Filed Nov. 8, 1993, Ser. No. 256,620
Claims priority, application Japan, Nov. 13, 1992, 4-328723; Nov. 13, 1992, 4-328724
Int. Cl.[6] B29C *47/88*;*53/22*;*53/62*;*53/72*
U.S. Cl. 156—428 **12 Claims**



1. An apparatus for producing a corrugated tube comprising a roller assembly composed of a plurality of rollers, each being rotatable at equal speed, said roller assembly substantially forming a single rotating axial body so that said rollers are arrayed on a cylindrical surface of an imaginary cylinder, roller supporting means mounted axially opposite said roller assembly for rotatably supporting said rollers, means for continuously supplying a synthetic resin strip to an outer circumferential surface of said roller assembly from a lateral side thereof, and driving means for rotating said rollers at equal speed, each axis of said rollers being inclined in a circumferential direction of the roller assembly, plural convexed rings provided along the axial direction of each of said rollers being arrayed so that the convexed rings form a helix in their entirety, with a pitch between the convexed rings and diameters and widths of said convexed rings on each of said rollers being gradually reduced in accordance with a contraction percentage of said synthetic resin strip at least within a section of said rollers in which the synthetic resin strip spirally wound and advanced along the axis of said roller assembly is contracted.

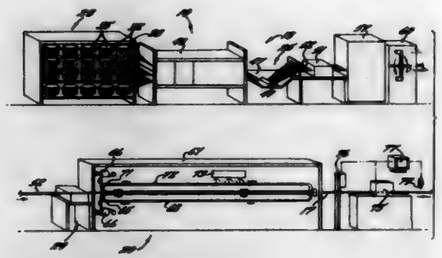
5,593,536

APPARATUS FOR FORMING REINFORCING STRUCTURAL REBAR

Mark A. Kaiser, Elida, Ohio, assignor to Marshall Industries Composites, Lima, Ohio

Continuation of Ser. No. 267,565, Jun. 28, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 467,157
Int. Cl.[6] B65H *81/00*;*81/06*; B32B *31/00*
U.S. Cl. 156—433 **12 Claims**

1. An apparatus for forming reinforcing structural rebar comprising a core of a thermosetting resin containing reinforcing material and an outer layer of sheet molding compound, said apparatus comprising:



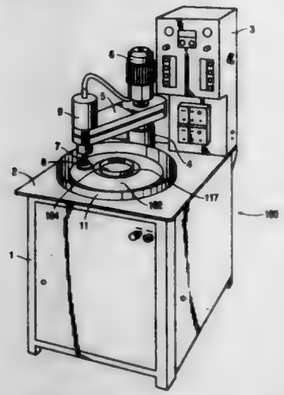
a thermosetting resin supply means;
a shaping die;
means for impregnating the reinforcing material with resin;
means for pulling the reinforcing material through the shaping die to form the core of the thermosetting resin containing reinforcing material;
first heating means associated with said shaping die configured to partially cure the core;
means for guiding a supply of sheet molding compound onto the core to provide an outer layer; and
mold means for molding the outer cladding of sheet molding compound into a desired configuration on the core, said mold means including second heating means configured to cure the sheet molding compound and to complete the curing of the thermosetting resin of the core.

5,593,537

APPARATUS FOR PROCESSING SEMICONDUCTOR WAFERS

William J. Cote, Poughquag, N.Y.; James G. Ryan, Newtown, Conn.; Katsuya Okumura, Poughkeepsie, and Hiroyuki Yano, Wappingers Falls, both of N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan, and International Business Machines, Corp., Armonk, N.Y.

Division of Ser. No. 280,818, Jul. 26, 1994, Pat. No. 5,534,106. This application Mar. 13, 1996, Ser. No. 613,944
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—636.1 **11 Claims**



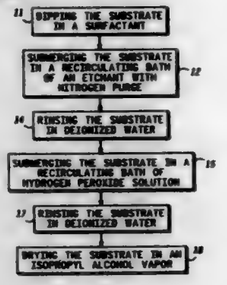
5. A method for fabricating a chip on the surface of a semiconductor wafer, the method comprising:
disposing the wafer on a rotatable wafer carrier such that rotating motion is imparted to the wafer;
bringing the rotating wafer into contact with the upper surface of an annular rotating pad having an open central region; and
disposing the wafer in a fluid bath, wherein,
the fluid bath is disposed within the open central region of the rotating pad such that the wafer may be moved vertically and laterally by action of the wafer carrier so as to selectively come into contact with the rotatable pad or be disposed in the fluid bath.

5,593,538

METHOD FOR ETCHING A DIELECTRIC LAYER ON A SEMICONDUCTOR

Michael J. Davison; Paul W. Dryer, and Wendy K. Wilson, all of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1995, Ser. No. 537,053
Int. Cl.[6] H01L *21/311*
U.S. Cl. 156—637.1 **20 Claims**



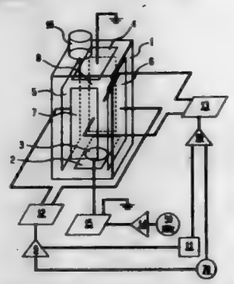
1. A method for etching a dielectric layer on a semiconductor, comprising the steps of:
providing a semiconductor substrate having the dielectric layer disposed thereon;
providing a purged etchant; and
submerging a portion of the semiconductor substrate in the purged etchant to etch the dielectric layer on the semiconductor substrate.

5,593,539

PLASMA SOURCE FOR ETCHING

Masafumi Kubota, Osaka; Nobuo Nomura, Kyoto, and Tokuhiko Tamaki, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 805,864, Dec. 10, 1991, Pat. No. 5,330,606. This application Apr. 8, 1994, Ser. No. 224,960
Claims priority, application Japan, Dec. 14, 1990, 2-402319; Feb. 25, 1991, 3-030019
Int. Cl.[6] B44C *1/22*
U.S. Cl. 156—643.1 **5 Claims**



1. A plasma generating method comprising the steps of:
disposing three or more lateral electrodes at lateral sides of a plasma generating part in a vacuum chamber such that said three or more lateral electrodes surround said plasma generating part, and further disposing a sample stage at a lower part of said plasma generating part;

supplying a first high frequency electric power from a high frequency power supply to one of said three or more lateral electrodes;

respectively supplying, to other lateral electrodes of said three or more lateral electrodes, high frequency electric powers which are supplied from said high frequency power supply through delay means, of which frequencies are the same as the frequency of said first-mentioned high frequency electric power and of which respective phases are successively different from the phase of said first-mentioned high frequency electric power; and

supplying, to said sample stage, second high frequency electric power of a second frequency which is lower then said first frequency;

whereby there is excited, in said plasma generating part, a rotational electric field to cause electrons therein to present rotational motions.

5,593,540

PLASMA ETCHING SYSTEM AND PLASMA ETCHING METHOD

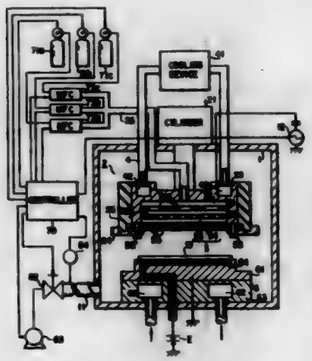
Kazuhiki Tomita, Kawaguchi; Yoshikazu Ito, Yamanashi-ken; Motohiro Hirano, Hachioji; Akira Nozawa, Hiranuki; Hiromitsu Matsuo, Shirano-machi; Shunichi Hasaro, Yamanashi-ken; Shigeki Tozawa, Hiranuki, and Yutaka Miura, Koufu, all of Japan, assignors to Hitachi, Ltd.; Hitachi Tokyo Electronics Co., Ltd.; Tokyo Electron Limited, all of Tokyo, and Tokyo Electron Yamanashi Limited, Hiranuki, all of Japan

Division of Ser. No. 138,839, Oct. 19, 1993, Pat. No. 5,423,936. This application Apr. 27, 1995, Ser. No. 429,648

Claims priority, application Japan, Oct. 19, 1992, 4-306121

Int. Cl.[6] B44C *1/22*

U.S. Cl. 156—643.1 **13 Claims**



1. A plasma etching method, comprising the steps of:

mounting a substrate on a chuck electrode disposed in a process chamber;

evacuating said process chamber to set up a reduced pressure within the process chamber;

introducing a process gas into the process chamber such that said gas flows through small holes made in a shower electrode at a mass flow rate of at least 620 kg/m^2/hr so as to prevent said process gas from being deposited within said small holes; and

applying a voltage between said shower electrode and said chuck electrode to generate a plasma between these two electrodes, with active species within said plasma acting on said substrate.

5,593,541

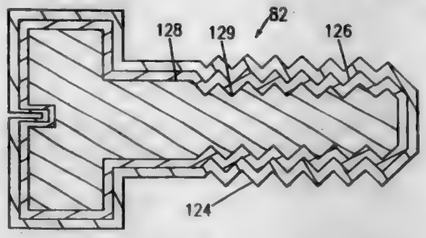
METHOD OF MANUFACTURING USING CORROSION-RESISTANT APPARATUS COMPRISING RHODIUM

Maseus K. Wong, and Sandy M. Chew, both of San Jose, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 62,979, May 14, 1993. This application Jun. 2, 1995, Ser. No. 459,985

Int. Cl.[6] B44C *1/22*; C03C *15/00*; C23F *1/00*; H01L *21/306*

U.S. Cl. 156—643.1 **19 Claims**



1. A method of using a corrosion-resistant apparatus to process a substrate in a plasma, the method comprising the steps of:

(a) selecting an apparatus comprising a processing chamber, having processing components therein, wherein at least one of the processing components is made of metal, is exposed to the plasma, and has a corrosion-resistant coating comprising rhodium;

(b) introducing a process gas into the processing chamber; and

(c) generating the plasma from the process gas for processing the substrate.

5,593,542

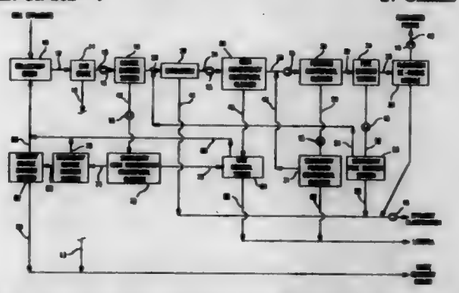
METHOD FOR RECOVERING FIBER FROM EFFLUENT STREAMS

Ernest P. Wolfer, Allendale; Brent Willemsen, Westfield; Venkat B. Maraju, Washington Township, and Andres Martiny, Bridgewater, all of N.J., assignors to Marcal Paper Mills, Inc., Elmwood Park, N.J.

Filed May 8, 1995, Ser. No. 436,735

Int. Cl.[6] D21D *5/00*

U.S. Cl. 162—4 **27 Claims**



9. A method for recovering papermaking fibers from mill effluent in a secondary fiber deinking papermaking mill, the effluent containing papermaking fibers, wood and plastic scraps, and other contrary materials, comprising the steps of:

(a) collecting mill effluent in a collection basin;

(b) directing the effluent from the collection basin through a bar grate to separate wood and plastic scraps from the mill effluent;

(c) passing the mill effluent from step (b) through a coarse barrier screen;

(d) extracting long fibers from the effluent in an extraction unit;

(e) cleaning the extracted long fibers in a high consistency centrifugal cleaner to remove contrary materials having a specific gravity greater than the long fibers;

(f) further cleaning the accept material including long fibers from the high consistency centrifugal cleaner in a forward centrifugal cleaner and conveying the accept material including long fibers to a fine barrier screen;

(g) screening the accept material from the forward centrifugal cleaner in the fine barrier screen; and (h) removing ink from accept material including long fibers from the fine barrier screen.

5,593,543

PROCESS FOR REPULPING WET STRENGTH PAPER

Barbara Balou, Newark, Del.; Nancy S. Clungeon, Wyndmoor, Pa.; James V. Patterson, Charlotte, N.C.; José M. Rodriguez, Fort Mill, S.C., and Stephen A. Fischer, Yardley, Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 112,779, Aug. 26, 1993. This application Sep. 30, 1993, Ser. No. 129,837

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—6 **14 Claims**

1. A process for repulping unbleached wet strength paper containing at least one wet strength resin comprising:

(a) repulping the wet strength paper in a slurry containing at least 0.1% by weight of a non-chlorinated oxidizing agent selected from the group consisting of persulfates and peroxymonosulfates based on the dry weight of the wet strength paper and having a first pH to initiate the breakdown of the paper to fibers wherein said slurry is heated to a reaction temperature of from about 25° C. to 100° C.; and

(b) repulping the slurry in step (a) at a second pH which is higher than the first pH until conversion of the wet strength paper is at least substantially complete.

5,593,544

PULP PRODUCTION

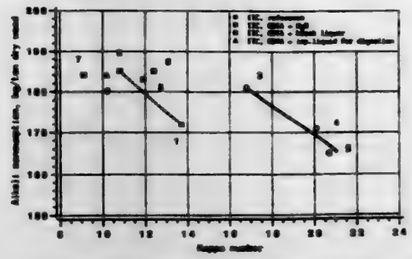
Christer Fahlgren; Sören Gustavsson, both of Karlstad; Petter Tibbling, Vålberg, and Ewa W. Johansson, Kil, all of Sweden, assignors to Kvaerner Pulping Aktiebolag, Karlstad, Sweden

Filed Apr. 8, 1994, Ser. No. 224,711

Claims priority, application Sweden, Jul. 12, 1993, 9302409

Int. Cl.[6] D21C *1/04*;*3/00*

U.S. Cl. 162—65 **33 Claims**



1. A method of manufacturing chemical pulp out of comminuted cellulosic fiber material comprising digesting the fiber material with digestion liquid, said method excluding any peroxide stage before said digesting, characterized in that the comminuted fiber material is treated in at least one stage prior to said digestion, in the presence of a liquid containing at least one sequestering agent forming complexes with metals existing naturally in the fiber material, said sequestering agent being selected from the group consisting of nitrogenous polycarboxylic acids, non-nitrogenous polycarboxylic acids and phosphoric acids, at least part of said liquid present during treatment of the fiber material and containing sequestering agent, consists of spent liquor, fresh digestion liquid, effluent from bleaching processes, condensate, mains water or lake water or mixtures thereof, said spent liquor having a reduced, low content of metals that is obtained at said digestion following said treatment with a sequestering agent, said digestion being preceded by pre-impregnation of the fiber material with cooking liquid, and said treatment with sequestering agent being performed in combination with the pre-impregnation as an integrated treatment, metal complexes formed during said integrated treatment and any excess of unreacted sequestering agent being permitted to accompany the fiber material into the digestion in order to be removed after the digestion when the cooking liquor is withdrawn.

5,593,545

METHOD FOR MAKING UNCREPED THROUGHDRIED TISSUE PRODUCTS WITHOUT AN OPEN DRAW

James S. Rugowski; Michael J. Rekoske, both of Appleton, Wis.; Phillip S. Lin, Tulsa, Okla.; Ronald F. Gropp, St. Catharines, Canada, and Paul A. B. L. M. Arnold, Nancy, France, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 6, 1995, Ser. No. 384,306

Int. Cl.[6] D21H *25/04*

U.S. Cl. 162—207 **12 Claims**

1. A method for making an uncreped throughdried tissue comprising depositing an aqueous suspension of papermaking fibers onto a forming fabric to form a wet web, transferring the wet web to a throughdrying fabric, throughdrying the web to form a tissue sheet, and transferring the tissue sheet to a reel such that the sheet does not traverse an open draw while being wound onto the reel in the winding nip formed between the reel and a reel drum wherein the tissue sheet is: (a) transferred from the throughdrying fabric to a first dry end transfer fabric using a vacuum roll; (b) carried between the first dry end transfer fabric and the top side of a second dry end transfer fabric, the underside of which partially wraps around the reel drum; (c) transferred to the top side of the second dry end transfer fabric and maintained thereon by air pressure created by an air foil positioned on the underside of the second dry end transfer fabric; and (d) wound onto the reel.

5,593,546

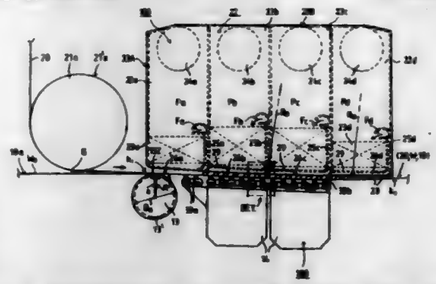
HYBRID FORMER WITH AN MB UNIT IN A PAPER MACHINE

Heikki Hvespää, Jyväskylä; Jyrki Jaakkola, Korpilahti; Ari Linsuri, Muurame; Erkki Partanen, and Lauri Verkasalo, both of Jyväskylä, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed May 11, 1995, Ser. No. 439,514

Int. Cl.[6] D21F *1/00*

U.S. Cl. 162—301 **20 Claims**



1. In a hybrid former in a paper machine including a lower wire guided in a loop and forming an initial single-wire portion of a forming zone, draining elements arranged in said lower-wire loop in said single-wire portion, wire-guide and draining elements arranged in said lower-wire loop after said single-wire portion, an upper wire guided in a loop by guide rolls, a breast roll arranged in said upper-wire loop for guiding said upper wire into contact with

a web being carried on said lower wire to form a subsequent twin-wire portion of the forming zone following said single-wire portion, and a draining and forming unit arranged in said twin-wire portion, the improvement comprising

a revolving guide and forming roll arranged at an initial part of said twin-wire portion and in contact with said lower-wire loop, said twin-wire portion being guided over said guide and forming roll such that an angle of contact between said lower wire and said guide and forming roll is from about 0° to about 5°,

said draining and forming unit being arranged immediately after said guide and forming roll and comprising at least one pressure-loaded press unit arranged in one of said upper-wire loop or said lower-wire loop and at least one draining-chamber and support unit arranged in the other of said loops, said at least one press unit and said at least one draining-chamber and support unit comprising loading ribs and at least one draining chamber and being arranged to drain water from the web aided by negative pressure in said at least one draining chamber.

5,593,547

PRESS SECTION OF A PAPER MACHINE

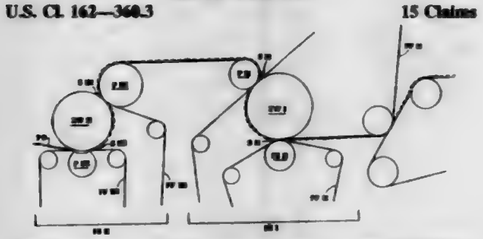
Franz Pleiger, Heidenheim, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Germany

Filed Jan. 27, 1995, Ser. No. 379,884

Claims priority, application Germany, Jan. 28, 1994, 44 02 513.0

Int. Cl.[6] D21F *3/04*

U.S. Cl. 162—360.3 **15 Claims**



1. A press section of a paper making machine for dewatering a paper web, the press section comprising:

a first press section comprising:

a first central press roll; a first press element pressing against the first central roll for defining a first press nip; a second press element spaced from the first press nip and pressing against the first central roll for defining a second press nip;

a first press felt for supporting the web and passing through the first press nip, wrapping around the first central press roll and then passing through the second press nip and first guide means for causing the first press felt to leave the web after the second press nip;

a second press section following the first press section in the path of the web through the press section of the paper making machine, the second press section comprising:

a second central press roll which is smooth and unfelted; a third press element pressing against the second central roll for defining a third press nip located against the upper half of the second central press roll; a fourth press element spaced from the third press nip so that the fourth press element is located substantially below the second central press roll and pressing against the second central roll for defining a fourth press nip;

a second press felt in position for receiving the web from the first press section and for carrying the web into the third press nip; the second felt passing through the third press nip and forming a single felt press nip there; second guide means for guiding the second felt off the web after the third press nip, so that the web travels on and with the unfelted second central roll toward the fourth press nip;

a third press felt, third guide means for guiding the third felt through the fourth press nip and forming a single felt press nip there, and the third guide means guiding the third felt off the web after the fourth press nip;

at least one of the third and fourth press elements comprising a long nip, shoe press;

a fourth press felt passing through the first press nip at the opposite side of the web from the first felt and respective fourth guide elements for the fourth press felt for directing the fourth press felt toward and then away from the first press nip and away from the web; and

wherein the first press element comprises a first rotatable press roll which presses against the first central roll and the second press element comprises a second rotatable press roll which presses against the first central roll.

5,593,548

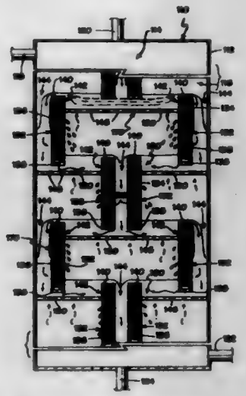
METHOD FOR CONCURRENT REACTION WITH DISTILLATION

Neil Yeoman, Merrick, N.Y.; Ronald Pinaire, Wichita, Kans.; Michael A. Ulowetz, Wichita, Kans.; Timothy P. Nace, Wichita, Kans., and David A. Furse, Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Continuation of Ser. No. 962,266, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 775,010, Oct. 11, 1991, Pat. No. 5,291,989, which is a continuation of Ser. No. 475,971, Feb. 6, 1990, Pat. No. 5,108,550. This application Nov. 7, 1994, Ser. No. 335,216

Int. Cl.[6] B01D *3/00*

U.S. Cl. 203—29 **20 Claims**



1. A process for operating a column containing a plurality of reaction with distillation structures comprising a tray and first and second catalyst beds extending downwardly below the tray, the first and second catalyst beds having a zone formed therebetween which is open at the top to the passage of liquid, at least one of said reaction with distillation structures additionally comprising a bypass which allows a liquid stream to descend from the tray without passing through the first and second catalyst beds, said process comprising the steps of:

supplying a liquid stream to one of said reaction with distillation structures and causing an accumulation of said liquid stream on the tray of said reaction with distillation structure;

directing at least a first portion of the accumulated liquid stream into said zone between the first and second catalyst beds;

passing at least part of said first portion of the liquid stream from the zone through said first and second catalyst beds for catalytic reaction to form a reaction product;

directing a second portion of the accumulated liquid stream into said bypass without passing through said first and second catalyst beds;

passing a first part of said second portion of the accumulated liquid stream through said bypass; and

directing a vapor stream upwardly through said reaction with distillation structures for contact with said accumulated liquid stream on the tray.

14. A process for operating a column containing a plurality of reaction with distillation structures, each of said reaction with distillation structures comprising a tray, a first pair of spaced apart catalyst beds coupled with and extending downwardly below the tray, and a second pair of spaced apart catalyst beds coupled with and extending downwardly below the tray,

directing a vapor stream upwardly through said reaction with distillation structures for contact with said accumulated liquid stream on the tray.

5,593,549

METHOD FOR CHANGING SOLAR ENERGY DISTRIBUTION

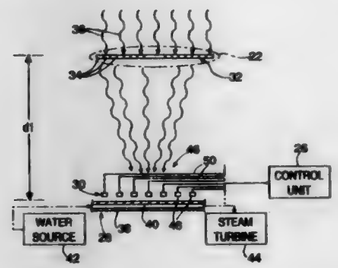
Robert C. Stirbl, 247 Wadsworth Ave., New York, N.Y. 10033, and Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023

Continuation-in-part of Ser. No. 70,680, Jun. 2, 1993, Pat. No. 5,269,288. This application Nov. 30, 1993, Ser. No. 159,690

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.[6] B01D *3/42*; C02F *1/14*; F24J *2/40*

U.S. Cl. 203—10 **33 Claims**



1. A method for concentrating solar energy, comprising the steps of:

generating waveform energy;

directing said energy to a predetermined region of the atmosphere located a pre-established distance above a surface of the earth;

controlling said step of directing to modulate an index of refraction of air in said predetermined region of the atmosphere to produce a predetermined refraction index pattern in said region; and

modifying a distribution of solar radiation passing through said region to thereby concentrate the solar radiation at a predetermined location.

4. The method defined in claim 1, further comprising the steps of:

absorbing, in a body of salt water at said location, a substantial quantity of the concentrated solar radiation;

evaporating water from said body of salt water in response to said step of absorbing; and

collecting the evaporated water to form a distillate.

5,593,550

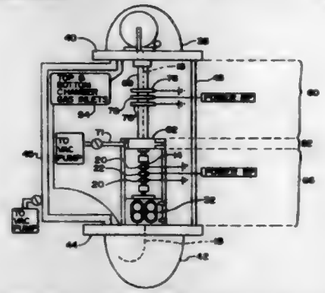
PLASMA PROCESS FOR REDUCING FRICTION WITHIN THE LUMEN OF POLYMERIC TUBING

Mark T. Stewart, Brooklyn Center; Mary M. Morris, Mounds View; Edward Di Domenico, Anoka, and Kenneth W. Keeney, Forest Lake, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 6, 1994, Ser. No. 239,807

Int. Cl.[6] H05H *1/24*; B29C *59/14*

U.S. Cl. 204—165 **34 Claims**



18. A method for modifying slip characteristics of a surface of an elongated passageway in polymeric tubing comprising:

introducing a gas into a reaction chamber;

passing the polymeric tubing through a first radio frequency glow discharge zone in the reactor chamber;

accomplishing a first glow discharge, the first glow discharge being produced in the gas only on an outside diameter of the tubing such that tackiness of an outside cylindrical surface of the tubing is reduced;

passing the tubing containing in the passageway thereof a discharge gas at low pressure through a second glow discharge zone in the reactor chamber;

accomplishing a second glow discharge, the second glow discharge being produced in the gas in the passageway by reactance coupling utilizing power provided by a radio frequency power source wherein the power source is pulsed on and off in a continuous sequence to sustain the glow discharge, the reactor chamber having an inside diameter in a close fitting relative to the outside diameter of the tubing such that the glow discharge occurs only within the passageway of the tubing, and

maintaining a reduced pressure within the reactor chamber to establish and maintain glow discharge conditions within the passageway.

5,593,551

MAGNETRON SPUTTERING SOURCE FOR LOW PRESSURE OPERATION

Kwok F. Lai, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 58,153, May 5, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,366

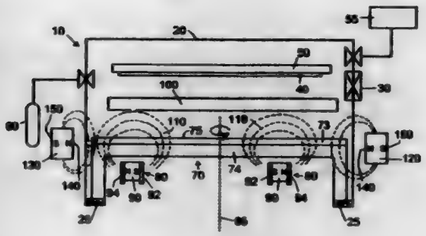
Int. Cl.[6] C23C *14/34*

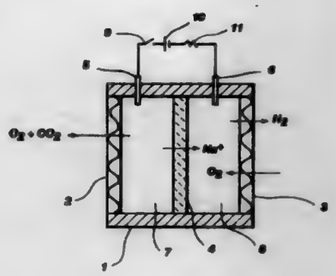
U.S. Cl. 204—192.12 **12 Claims**

1. A magnetron sputtering system for depositing a selected material onto a substrate, said system comprising:

a chuck for holding a generally flat wafer-type substrate disposed generally in a first plane, said substrate having a first surface on which the selected material is to be deposited facing outwardly from said chuck;

a single, generally dish-shaped sputter target having a front surface disposed generally in a second plane and comprising a selected material to be sputtered and a back surface, said dish-shaped target having a perimeter, said second plane





being substantially parallel to said first plane and separated therefrom by a fixed distance while said system is in operation;

a first closed-loop magnet means positioned proximate said sputter target back surface for creating a closed-loop magnetic tunnel adjacent to said sputter target front surface, said first closed-loop magnet means having inner and outer edges relative to a central axis of said dish-shaped sputter target and having opposite magnetic polarities at said inner and outer edges, said first closed-loop magnet means comprising a plurality of magnets each having a first magnetic pole and a second magnetic pole of opposite magnetic polarity to said first pole, each of said magnets having a magnetic polar axis passing through both said first pole and said second pole, each said polar axis disposed generally in a third plane generally parallel to said second plane;

a second closed-loop magnet means positioned proximate said sputter target perimeter, said second closed-loop magnet means having inner and outer edges relative to said central axis and having opposite magnetic polarities at said inner and outer edges, said second closed-loop magnet means comprising a plurality of bucking magnets each having a first magnetic pole and a second magnetic pole of opposite magnetic polarity to said first pole, each of said bucking magnets having a magnetic polar axis passing through both said first pole and said second pole, each said polar axis disposed generally in a fourth plane generally parallel to said third plane, the magnetic polarity at the inner edge of said second closed-loop magnet means being the same as the magnetic polarity of said outer edge of said first closed-loop magnet means such that the magnetic field generated by said second closed-loop magnet means prevents said closed-loop magnetic tunnel from intersecting said sputter target perimeter, and the magnetic field intensity generated by each of said bucking magnets being fixed during operation of the system.

5,593,552

DEVICE FOR ELECTROCHEMICAL GENERATION OF GAS

Ashok V. Joshi, and John H. Gordon, both of Salt Lake City, Utah, assignors to Ceramatec, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 58,438, May 7, 1993, Pat. No. 5,454,922, and a continuation-in-part of Ser. No. 204,026, Feb. 28, 1994. This application Mar. 30, 1995, Ser. No. 413,635

Int. Cl.[6] C25B *9/00;15/00*

U.S. Cl. 204—228 **27 Claims**

1. A device for electrochemically generating carbon dioxide gas or a mixture of carbon dioxide and oxygen gases in an adjustable quantity proportional to the cell current, comprising:

an electrochemical cell having a corrosion resistant container or housing;

a cathode chamber containing an electronically conductive current collector and adapted to contain a reducible material;

an anode chamber containing an electronically conductive current collector and adapted to contain an oxidizable material wherein said oxidizable material is a metal carbonate, metal bicarbonate, or combination thereof, and wherein the anode chamber structure has perforations or diffusion pores to permit gas to be released;

an ionically conductive separator between the anode chamber and cathode chamber structured to maintain physical separation of the materials in each chamber; and

optionally a switch and variable or fixed resistor forming a circuit with said power source and electrochemical cell.

5,593,553

ELECTROLYTIC CELL AND ELECTRODE THEREFOR

Robin A. Woolhouse, Nantwich, and Brian K. Revill, Runcorn, both of United Kingdom, assignors to Imperial Chemical Industries PLC

PCT No. PCT/GB93/02221, § 371 Date May 16, 1995, § 102(e) Date May 16, 1995, PCT Pub. No. WO94/12692, PCT Pub. Date Jun. 9, 1994

PCT Filed Oct. 28, 1993, Ser. No. 436,263

Claims priority, application United Kingdom, Nov. 20, 1992, 9224372

Int. Cl.[6] C25B *9/00*

U.S. Cl. 204—252 **14 Claims**



1. An electrode comprising a first plate having an active electrode surface on a first face thereof and a second plate facing and spaced from the first plate, and at least one barrier plate which is a) positioned between said first and second plates, b) spaced from the active electrode surface of said first plate and from the facing surface of said second plate, and c) in contact with the opposite face of said first plate.

5,593,554

ELECTROLYTIC IONIZED WATER PRODUCING APPARATUS

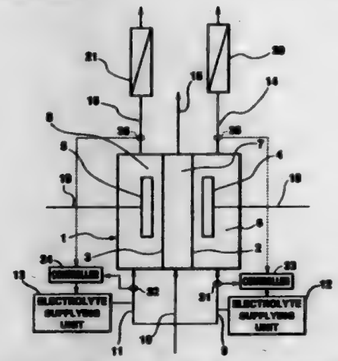
Koji Yamanaka; Takashi Imaoka; Takashi Futatsuki, and Yukinari Yamashita, all of Saitama, Japan, assignors to Organo Corporation, Tokyo, Japan

Filed Oct. 27, 1995, Ser. No. 549,647

Claims priority, application Japan, Oct. 28, 1994, 6-265809

Int. Cl.[6] C02F *1/461;1/469;* B01D *61/48*

U.S. Cl. 204—252 **13 Claims**



1. An apparatus for producing an electrolytic ionized water by applying DC voltage between an anode and a cathode, said apparatus comprising:

(a) an anode chamber housing an anode and having an inlet line and an outlet line in fluid communication therewith;

(b) the cathode chamber housing a cathode and having an inlet line and an outlet line in fluid communication therewith;

(c) an intermediate chamber disposed between the anode chamber and the cathode chamber, the intermediate chamber being partitioned from the anode chamber and the cathode chamber via a pair of diaphragms and having an inlet line and an outlet line in fluid communication therewith;

(d) a source of influent water in fluid communication with said inlet lines so as to supply water to the anode chamber, the cathode chamber and intermediate chamber; and

(e) at least one electrolyte supplying unit for providing a controlled introduction of electrolyte into at least one of the anode chamber inlet line and the cathode chamber inlet line.

5,593,555

ELECTRODE STRUCTURE FOR A MONOPOLAR ELECTROLYSIS CELL OPERATING BY THE DIAPHRAGM OR MEMBRANE PROCESS

Bruno Klatt; Günter Kreutzberger, both of Wolfen, and Manfred Suchi, Bitterfeld, all of Germany, assignors to Heraeus Electrochemie Bitterfeld GmbH, Bitterfeld, Germany

Filed May 19, 1995, Ser. No. 446,045

Claims priority, application Germany, Jun. 1, 1994, 44 19 091.3

Int. Cl.[6] C25B *11/00*

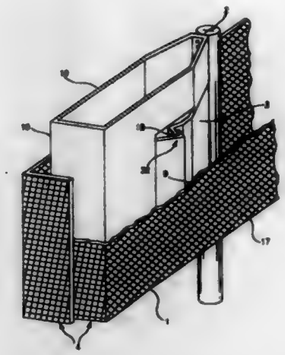
U.S. Cl. 204—286 **3 Claims**

1. Electrode assembly for a monopolar electrolysis cell for chlor-alkali electrolysis by the diaphragm or membrane cell process, said assembly comprising

vertically oriented power feed means,

a channel member welded to said feed means and comprising a pair of feed conductors extending from said feed means in vertical planes, each feed conductor having a distal end provided with detent means remote from said power feed means,

a flow guide plate having a U-shaped cross section and distal ends provided with detent means which engage respective said detent means of said distal ends of said feed conductors to form a closed vertical flow channel, said flow guide plate



further comprising a top section which extends over said feed conductors to extend said closed vertical channel above said channel member, and

an electrode structure welded to said feed conductors, said top section of said flow guide plate extending above said electrode structure.

5,593,556

HIGHLY DURABLE ELECTRODES FOR ELECTROLYSIS AND A METHOD FOR PREPARATION THEREOF

Naokazu Kumagai, Matsudo; Shuji Jikihara, Noda, and Yoshimitsu Sawada, Kashiwa, all of Japan, assignors to Daiki Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 133,371, Oct. 8, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,691

Claims priority, application Japan, Oct. 14, 1992, 4-275896; Apr. 28, 1993, 5-102450

Int. Cl.[6] C25B *11/00*

U.S. Cl. 204—290 F **8 Claims**

1. In an electrolysis electrode comprising a Ti substrate having a platinum group metal oxide layer, the improvement wherein the electrode comprises an intermediate Ta-containing layer interposed between the platinum group metal oxide layer and the Ti substrate, the Ta-containing layer comprising thermodynamically stable crystalline α phase Ta and having at its interface with the metal oxide layer a content of a platinum group metal, where the durability of the electrode is increased.

5,593,557

ELECTRODE CONSISTING OF AN IRON-CONTAINING CORE AND A LEAD-CONTAINING COATING

David Sopher, Stockton-on-Tees, Great Britain; Andreas Gieseler, Bad Durkheim, Germany; Hartmut Hibst, Schriesheim, Germany; Klaus Harth, Altleiningen, Germany, and Peter Jaeger, Battenberg, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 255,746, Jun. 7, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 518,680

Claims priority, application Germany, Jun. 16, 1993, 43 19 951.8

Int. Cl.[6] C25B *11/00*

U.S. Cl. 204—290 R **8 Claims**

1. An electrode consisting of an electrically conductive core of iron and a covering of an electrically conductive coating of lead.

5,593,558

OXYGEN CONCENTRATION DETECTOR

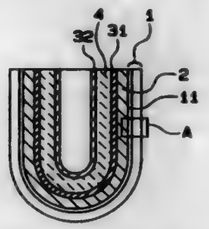
Hiroshi Sagino, Chita-gun; Yasunichi Hotta, Mie-gun; Namitsugu Fujii, Yokkaichi; Masahiro Shibata, and Hiromi Sano, both of Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 6, 1995, Ser. No. 467,144

Claims priority, application Japan, Jun. 9, 1994, 6-127509; Aug. 8, 1994, 6-208025

Int. Cl.[6] G01N 27/26

U.S. Cl. 204—429 23 Claims



1. An oxygen concentration detector for detecting oxygen concentration in a gas, comprising:

an oxygen sensing element including inside and outside electrodes provided on an inner side and outer side thereof respectively and an electrode protecting layer made of ceramics porous member provided further outside of said outside electrode;

output pickup means electrically connected to said inner electrode on said inner side of said oxygen sensing element;

a housing for accommodating said oxygen sensing element; and

a trap layer of ceramics porous member having a surface roughness of 20 to 100 μm measured according to a 10 point mean roughness measurement and provided at an outerperiphery of the said electrode protecting layer.

5,593,559

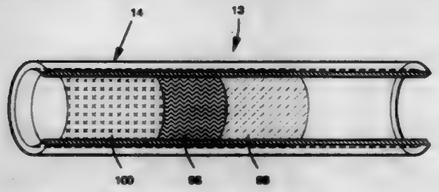
ON LINE ION CONTAMINANT REMOVAL APPARATUS AND METHOD FOR CAPILLARY ELECTROPHORESIS

John Wiktorowicz, San Jose, Calif., assignor to The Perkin-Elmer Corporation, Foster City, Calif.

Division of Ser. No. 186,080, Jan. 25, 1994, Pat. No. 5,423,966. This application Jan. 13, 1995, Ser. No. 372,737

Int. Cl.[6] G01N 27/26;27/447

U.S. Cl. 204—453 9 Claims



1. An electrophoresis apparatus comprising

an elongated chamber containing a separation medium in which to electrophorese a sample;

a high voltage power supply means for providing an electrical potential difference between opposite ends of said chamber;

meltable plug means positioned in one end of said chamber adjacent said medium for substantially retarding passage of analytes in said sample through said plug means into said medium only when said plug means is solid;

injection means for injecting said sample into said one end of said chamber; and

heating means for selectively heating a portion of said chamber to melt said plug means.

5,593,560

FLUID-FILTERING DEVICE FOR FILTERING OUT PARTICULATES IN FLUID

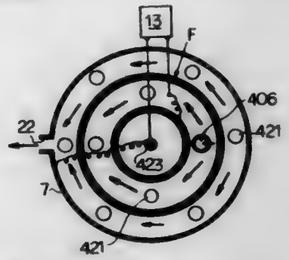
Noboru Inoue, 727 Funaki-cho, Ono-shi, Hyogo 675-13, Japan

Continuation of Ser. No. 32,043, Mar. 16, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,283

Claims priority, application Japan, Mar. 16, 1992, 4-022959 U

Int. Cl.[6] B01D 35/06; B03C 5/02

U.S. Cl. 204—671 5 Claims



1. A fluid-filtering device comprising:

an outer cylinder having an entrance port through which a fluid to be filtered is introduced;

a central grounded electrode taking the form of a pipe, the electrode acting also as an outflow passage for filtered fluid, the central electrode having the same polarity as the outer cylinder;

a space formed between the outer cylinder and the central grounded electrode;

a cylindrical filter element having a filtering layer acting also as an electrically charging electrode, the filtering layer being made of a conductive material, the filter element being mounted in the space;

and means for supplying a voltage consisting of an AC voltage between the filter element, and each of the outer cylinder and the central grounded electrode according to the resistivity of the fluid so as to cause an attracting force and a repulsive force to alternately act on particulates in the fluid, wherein said voltage between the filter element and each of the outer cylinder and the central grounded electrode consists of an AC voltage.

5,593,561

MULTIPLE ELECTROPHORESIS METHOD AND APPARATUS FOR MIGRATION AND TRANSFER OF MACROMOLECULES

Dominique Cognard, Guyancourt, and Jean Hache, Voisin-le-Bretonneux, both of France, assignors to Bertin & Cie, Plaisir, France

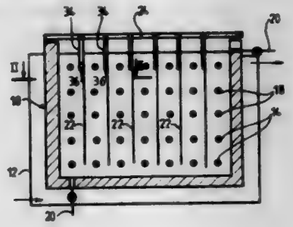
PCT No. PCT/FR93/01185, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO94/14526, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 2, 1993, Ser. No. 464,652

Claims priority, application France, Dec. 22, 1992, 92 15451

Int. Cl.[6] G01N 27/26

U.S. Cl. 204—456 16 Claims



1. A multiple electrophoresis method for controlled migration of macromolecules and transfer thereof onto membranes in a vessel containing a plurality of parallel elongate electrodes and having means for applying electrical potentials to the electrodes for establishing between them successively a first electric field for macromolecule migration, and then a second electric field perpendicular to the first for transferring the macromolecules onto the membranes, the method comprising placing in the vessel membranes which are parallel to one another and to the electrodes and which extend between the electrodes, and filling the vessel with an electrophoresis gel in the liquid phase, the filling being performed before or after the membranes have been placed in the vessel, then solidifying the gel, subsequently placing samples of macromolecules in wells formed in the gel along one of the edges of the membranes, applying electrical potentials to the electrodes initially to cause the macromolecules to migrate through the gel, and then to transfer them onto the membranes, then liquefying, dissolving, or decomposing the gel, and removing the membranes from the vessel.

5,593,562

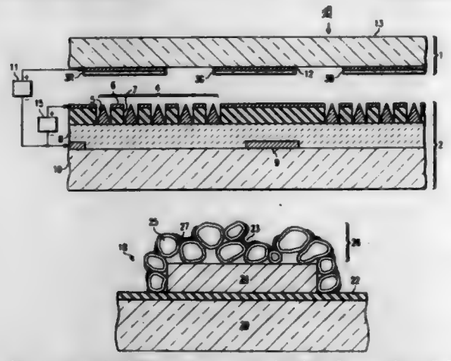
METHOD FOR IMPROVING FLAT PANEL DISPLAY ANODE PLATE PHOSPHOR EFFICIENCY

Kenneth G. Vickers, Whitesboro, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 28, 1996, Ser. No. 608,964

Int. Cl.[6] C25D 13/00

U.S. Cl. 204—486 23 Claims



20. A method of fabricating an anode plate for use in a field emission display device, said method comprising the steps of:

providing a transparent substrate;

depositing a first layer of a transparent, electrically conductive material on a surface of said substrate;

removing portions of said first layer of conductive material to form regions of said conductive material;

applying a film layer of luminescent material on said conductive regions;

applying a second layer of electrically conductive material on said luminescent film; and

removing portions of said second conductive layer and portions of at least some of said luminescent film by abrading.

5,593,563

ELECTRODEIONIZATION PROCESS FOR PURIFYING A LIQUID

Jeffrey P. Demoncourt, Winchester, Mass., and Jacques Moulin, Plaisir, France, assignors to Millipore Corporation, Bedford, Mass.

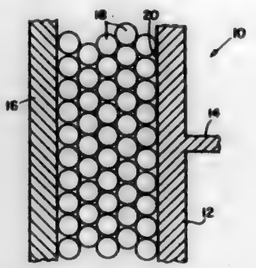
Filed Apr. 26, 1996, Ser. No. 638,040

Int. Cl.[6] C02F 1/469; B01D 61/48

U.S. Cl. 204—524 10 Claims

1. In a process for purifying an impure aqueous liquid to remove ionic species in an electrodeionization apparatus by passing said impure aqueous liquid through at least one ion depleting compartment bounded by an anion permeable membrane and a cation permeable membrane and containing ion exchange resin beads and passing water for accepting said ionic species through at least one ion concentrating compartment bounded by an anion permeable membrane and a cation permeable membrane while producing an electrical potential between a cathode compartment and an anode compartment and passing electrical current through each of said at least one ion depleting compartment and through each of said at least one ion concentrating compartment, the improvement which comprises:

including in said cathode compartment particles capable of conducting electrons.



5,593,564

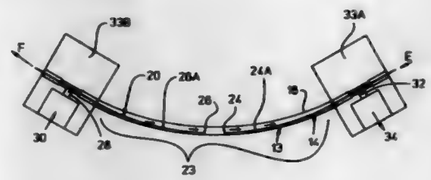
MICROCOLUMN-MICROCOLUMN FLOW INTERFACE AND METHOD

Catherine K. Templin, Los Altos, and Douglass McManigill, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 24, 1995, Ser. No. 506,233

Int. Cl.[6] C25B 7/00; G01N 27/26

U.S. Cl. 204—451 27 Claims



1. A flow gating interface apparatus for interfacing a first fluid conduit and a second fluid conduit, comprising:

(A) a first microcolumnar section operatively connected to and in fluid communication with the first fluid conduit and having a center line, an outlet end portion having an outlet end, and a lumen for conducting a fluid flow;

(B) a second microcolumnar section operatively connected to and in fluid communication with the second fluid conduit and having a center line, an inlet end portion having an inlet end, and a lumen for conducting a fluid flow; and

(C) a channel having an inwardly facing wall and a center line, the channel enclosing at least a portion of the first microcolumnar section and at least a portion of the second microcolumnar section for conducting a flush fluid flow past said ends of the microcolumnar sections, the inwardly facing wall of the channel nonfixedly constraining by spring action of the microcolumnar sections and aligning said end portions of the first and second microcolumnar sections.

5,593,565

DEVICES FOR SEPARATING PARTICLES CONTAINED IN A FLUID

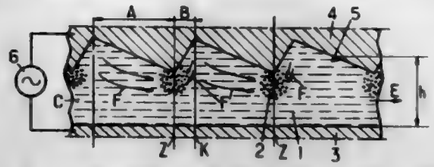
Armand Ajdari, 14, rue de Bellechasse, 75007 Paris; Jacques Lewiner, 7, avenue de Suresnes, 92210 Saint-Cloud; Jacques Prost, 50, avenue Ledru Rollin, 75012 Paris, and Jean-Louis Viovy, 26, rue de l'Espérance, 75013 Paris, all of France

Filed Sep. 22, 1994, Ser. No. 310,401

Claims priority, application France, Sep. 23, 1993, 93 11346

Int. Cl.[6] B03C *5/02*; B01D *57/02*

U.S. Cl. 204—643 **16 Claims**



1. A separation device for separating, within a fluid, particles contained therein, comprising at least two electrodes facing each other and defining therebetween at least one separation zone in which said fluid is substantially stationary, and potential difference source means connected between said at least two electrodes for producing an electric field and thereby exciting particles in the separation zone, wherein at least one of the electrodes has a corrugated surface facing the separation zone and consisting, along a separation direction, of a sequence of asymmetric grooves transverse to said separation direction, means being provided for repetitively varying the excitation of the particles in the separation zone.

5,593,566

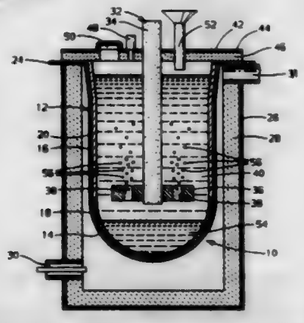
ELECTROLYTIC PRODUCTION PROCESS FOR MAGNESIUM AND ITS ALLOYS

Ram A. Sharma, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 9, 1995, Ser. No. 488,698

Int. Cl.[6] C25C *3/04*

U.S. Cl. 205—363 **4 Claims**



1. A method of producing magnesium or magnesium alloys from a feedstock containing magnesium oxide comprising:

providing an electrolytic cell comprising (a) a molten salt electrolyte initially consisting essentially of one part by weight magnesium chloride and three to five parts by weight potassium chloride; (b) a molten metal cathode comprising a magnesium alloy having a density greater than that of said electrolyte; and (c) a noaconsumed anode immersed in said electrolyte,

heating the contents of the electrolytic cell to an operating temperature at which the electrolyte and cathode are molten,

applying a direct current potential between said anode and cathode to produce chlorine gas at said anode and to reduce magnesium cations in said electrolyte to produce magnesium metal at the interface of said electrolyte and said cathode, such magnesium being absorbed into said cathode layer, and adding said feedstock to said electrolyte where it reacts with said chlorine gas as it is emitted to replenish magnesium cations in said electrolyte.

5,593,567

GASOLINE FUEL

Peter J. Jessup, 1261 Edgeview Dr., and Michael C. Croudace, 13811 Glenmere Ave., both of Santa Ana, Calif. 92705

Continuation of Ser. No. 77,243, Jun. 4, 1993, abandoned, which is a division of Ser. No. 628,488, Dec. 13, 1990, Pat. No. 5,288,393. This application Mar. 22, 1995, Ser. No. 409,074

Int. Cl.[6] C10L *1/04*

U.S. Cl. 208—46 **40 Claims**

1. A method for operating an automotive vehicle having a spark-induced, internal combustion engine and a catalytic converter to yield a reduced amount of NOx, CO, or unburned hydrocarbons as compared to combusting fuel A/O AVE in said engine, the method comprising:

(1) introducing into the engine an unleaded gasoline, suitable for combustion in an automotive engine, having the following properties:

(a) a Reid Vapor Pressure less than 7.5 psi;

(b) a 10% D-86 distillation point no greater than 158° F.;

(c) a 50% D-86 distillation point less than 203° F.;

(d) a 90% D-86 distillation point less than 300° F.;

(e) a paraffin content greater than 65 volume percent;

(f) an olefin content less than 8 volume percent; and

(g) an octane value of at least 87; and thereafter

(2) combusting the unleaded gasoline in said engine;

(3) introducing at least some of the resultant engine exhaust emissions into the catalytic converter; and

(4) discharging emissions from the catalytic converter to the atmosphere.

5,593,568

COKER/VISBREAKER AND ETHYLENE FURNACE ANTIFOULANT

Harold K. Leuke, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 242,222, May 13, 1994, abandoned. This application Apr. 26, 1995, Ser. No. 427,915

Int. Cl.[6] C10G *9/12*

U.S. Cl. 208—48 AA **9 Claims**

1. A method of preventing fouling and coke formation on the high temperature sections of refinery equipment in contact with a hydrocarbon fluid which comprises adding to the hydrocarbon fluid prior to its contact with the high temperature sections of such refinery equipment an effective amount to prevent fouling and coke formation of tri-t-butylphenol phosphate ester.

5,593,569

HYDROCRACKING PROCESSES USING A HOMOGENOUS CATALYSIS SYSTEM COMPRISING A METAL HALIDE LEWIS ACID, A BRONSTED ACID AND AN ALKANE

Larry G. Sherman, Edmond, Okla., assignor to Kerr-McGee, Oklahoma City, Okla.

Filed Jan. 9, 1995, Ser. No. 370,856

Int. Cl.[6] C10G *47/02*

U.S. Cl. 208—108 **15 Claims**

1. A method of hydrocracking a high molecular weight hydrocarbon feedstock into lower molecular weight components comprising the steps of:

(1) forming a catalyst complex comprising the product of reaction of

(a) a Lewis acid of the formula $R_{(m-2-c)}MX_{2+c}$ wherein M is aluminum or boron, X is a halide, R is a hydrocarbyl radical having 1 to 12 carbon atoms, "m" is an integer equal to the greatest oxidation state of M, and "z" is an integer of 0, 1 or m−2;

(c) a hydrogen halide which upon addition to the solution forms a catalyst complex;

(b) a paraffinic hydrocarbon having from about six to about fourteen carbon atoms, said paraffinic hydrocarbon being in an amount sufficient to form a solution with the Lewis acid; and

(2) adding an amount of said paraffinic hydrocarbon sufficient to solubilize said catalyst complex to thereby form a catalysis system wherein the concentration of catalyst complex is maintained between from about 5.0 to about 50 millimoles of Lewis acid per 1,000 grams of said non-complexed paraffin hydrocarbon;

(3) adding hydrogen and the feedstock to the catalysis system while maintaining the catalysis system at a temperature such that the catalyst complex does not precipitate for a time sufficient in order for hydrocracking to occur in a homogeneous solution of the feedstock and catalysis system; and

(4) separating the lower molecular weight components of the hydrocracked product from the catalyst complex.

5,593,570

CATALYST SYSTEM FOR COMBINED HYDROTREATING AND HYDROCRACKING AND A PROCESS FOR UPGRADING HYDROCARBONACEOUS FEEDSTOCKS

Mohammad M. Habib, Benicia; Philip L. Winslow, Hercules, and Richard O. Moore, Jr., San Rafael, all of Calif., assignors to Chevron Research and Technology Company, A Division of Chevron U.S.A. Inc., San Francisco, Calif.

Division of Ser. No. 044,359, Apr. 7, 1993, Pat. No. 5,439,860, which is a continuation-in-part of Ser. No. 869,666, Apr. 16, 1992, abandoned. This application May 9, 1995, Ser. No. 438,150

Int. Cl.[6] C10G *47/16;45/12*

U.S. Cl. 208—108 **11 Claims**

1. A combined hydrotreating and hydrocracking process which comprises contacting a hydrocarbonaceous feedstock with hydrogen under hydrocracking conditions in the presence of a dual function catalyst system comprising two randomly intermixed distinctly different particulate catalysts, the first of which is a hydrotreating catalyst having substantially no cracking activity and the second of which is a hydrocracking catalyst, wherein the catalyst particles of both particulate catalysts are substantially the same size, having an effective diameter within a factor of about 4 of each other.

5,593,571

TREATING OXIDIZED STEELS IN LOW-SULFUR REFORMING PROCESSES

John V. Heyse, Crockett, and Bernard F. Mulaskey, Fairfax, both of Calif., assignors to Chevron Chemical Company, San Francisco, Calif.

Division of Ser. No. 286, Jan. 4, 1993, Pat. No. 5,413,700. This application Dec. 19, 1994, Ser. No. 358,385

Int. Cl.[6] C10G *35/04*; C25D *11/00*

U.S. Cl. 208—134 **48 Claims**

1. A method for reforming hydrocarbons comprising (i) treating oxide scales in a reforming reactor system, at least one surface thereof to be exposed to hydrocarbons, by coating at least a portion of the surface of said oxide scales with a material resistant to carburization, reacting said material with metal oxide on said surface and fixating or removing at least a portion of said metal oxide from the reactor system, and (ii) reforming hydrocarbons in said reactor system under conditions effective for reforming those hydrocarbons and conditions of low sulfur.

5,593,572

SETTLING AIDS FOR SOLIDS IN HYDROCARBONS

Paul R. Hart, The Woodlands, Tex., assignor to BetzDearborn Inc., Trevose, Pa.

Filed Aug. 4, 1994, Ser. No. 286,824

Int. Cl.[6] C10G *21/27*

U.S. Cl. 208—177 **10 Claims**

1. A method for accelerating the settling of finely divided solids in hydrocarbon fluids comprising adding to said hydrocarbons an effective settling amount of a hetero-atom punctuated C_{10} to C_{30} alkyl or alkenyl polymer having a molecular weight of from 10^3 to 10^6 wherein said alkyl or alkenyl groups are separated by smaller hetero-atom groups.

5,593,573

DEMETALATION OF HYDROCARBONACEOUS FEEDSTOCKS USING SULFURIC ACID AND SALTS THEREOF

David C. Kramer, San Anselmo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 4,212, Jan. 13, 1993, abandoned, which is a continuation of Ser. No. 709,085, May 30, 1991, abandoned, which is a continuation of Ser. No. 222,472, Jul. 21, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 465,850

Int. Cl.[6] C10G *17/08;17/09*

U.S. Cl. 208—252 **20 Claims**

1. A method for removing organically-bound, Group IIA metals from hydrocarbonaceous feedstock comprising:

mixing said hydrocarbonaceous feedstock with an aqueous solution of a demetalating agent, said agent comprising sulfuric acid or salts thereof in a weight ratio range of 0.00001 units to 0.015 units demetalating agent per unit of feedstock and,

separating the substantially demetalated hydrocarbonaceous feedstock from the aqueous solution.

5,593,574

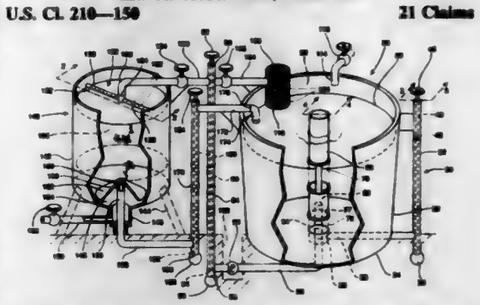
WATER TREATMENT SYSTEM PARTICULARLY FOR USE IN AQUACULTURE

J. Wayne VanToever, R.R. #2, North Wiltshire, P.E.I., Canada

Filed Mar. 11, 1994, Ser. No. 208,716

Int. Cl.[6] A01K *63/04*; C02F *3/04*

U.S. Cl. 210—150 **21 Claims**



1. In a fish culture water treatment system wherein waste water, clarified of all substantially solid waste material but containing fine particulates and dissolved waste, is to be filtered, a biofilter for the clarified water, comprising:

an open top tank having side walls and a bottom and containing water and a bed of biofilter media pellets having a density of about 0.91–0.93 freely floating in the water;

manifold means for delivering clarified water to be filtered to the open top of said tank;

distribution means in flow communication with said manifold means, said distribution means comprising a rotating spray bar spaced above the bed of floating media pellets for distrib-

uting said clarified water over the top of the media bed, means for rotating said spray bar, said spray bar having nozzle means from which water exits and is directed onto a defined surface area of the media pellets as said spray bar is rotated, said clarified water exiting from said spray bar nozzle means to cyclically and repeatedly dynamically load said defined surface area of said media pellets to gently agitate the media pellets on and substantially below the surface of said defined area, the gentle agitation causing the pellets to gently scour each other and permit fine particles and/or excess scoured biofilm to gravitate to the tank bottom;

filtered water outlet means completely below the free floating bed of media pellets and above said tank bottom; and

means in flow communication with said outlet means for returning filtered water to said water treatment system.

5,593,575

FLOATING COVER AND BAFFLE SYSTEM

Gus R. Cretini, 5920 Sevenoaks Ave., Baton Rouge, La. 70806

Filed Apr. 14, 1994, Ser. No. 227,522

Int. Cl.[6] C02F *3/30*

U.S. Cl. 210—170 **10 Claims**



1. A wastewater treatment lagoon baffle system comprising:

a wastewater treatment lagoon having a bottom and sides, said lagoon having a wastewater inlet and outlet forming a direction of wastewater flow therebetween, said lagoon containing wastewater with a surface and a total depth generally divided into a lower substantially anaerobic zone and an upper substantially aerobic zone;

one or more aerobic baffles of a material substantially impermeable to liquid flow having a generally rectangular sheetlike shape with upper and lower edges, said aerobic baffles fixed in said wastewater and spanning said wastewater lagoon in a direction transverse to said direction of wastewater flow, said lower edges of said aerobic baffles sealingly contacting said lagoon bottom, said aerobic baffles extending upward from said lagoon bottom with said upper edges of said aerobic baffles at a height above said substantially anaerobic zone, said aerobic baffles forming an angle to an upward vertical plane;

fastening means for fixing said aerobic baffles in position;

one or more anaerobic baffles of a material substantially impermeable to liquid flow having a generally rectangular sheetlike shape with upper and lower edges, said anaerobic baffles fixed in said wastewater and spanning said wastewater lagoon in a direction transverse to the direction of wastewater flow, said upper edges of said anaerobic baffles fixed at said wastewater surface, said anaerobic baffles extending downward from said wastewater surface with said lower edges of said anaerobic baffles fixed at a depth below said substantially aerobic zone, said anaerobic baffles forming an angle to an upward vertical plane; and

fastening means for fixing said anaerobic baffles in position.

5,593,576

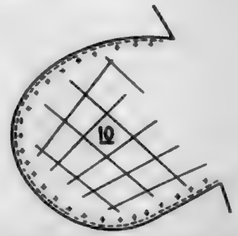
PASSIVATED POROUS POLYMER SUPPORTS AND METHODS FOR THE PREPARATION AND USE OF SAME

Pierre Girot, Paris, and Egisto Boschetti, Croissy sur Seine, both of France, assignors to BioSepra, Inc., Marlborough, Mass.

Division of Ser. No. 254,625, Jun. 6, 1994, Pat. No. 5,445,732, which is a continuation of Ser. No. 955,935, Oct. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 901,326, Jun. 19, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,412

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 **2 Claims**



1. A passivated porous support comprising (i) a porous polymeric matrix having interior and exterior surfaces and innate hydrophobic groups that render said matrix susceptible to undesirable non-specific interaction with one or more biological molecules, and (ii) a polymer network derived from a passivation mixture comprising a main monomer, a passivating monomer different from said main monomer, and a crosslinking agent, said mixture having been allowed to come into intimate contact with said surfaces of said matrix such that on polymerization of said mixture said innate groups of said matrix become deactivated, resulting in the substantial elimination of said undesirable non-specific interaction, said main monomer comprises a vinyl monomer having at least one polar substituent which is nonionic.

5,593,577

FILTER HAVING INTERNALLY THREADED COVER NON-ROTATABLY MOUNTED TO CASING OF THE FILTER

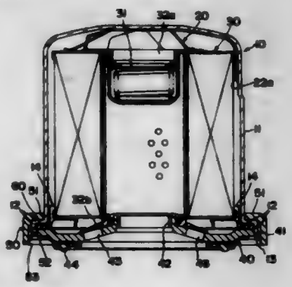
Koji Imai; Toshiya Wakaboi; Hiromitsu Adachi, all of Wako; Keiichi Terada, Hamakita; Hiroaki Yamashita, Hamakita, and Hiroshi Morikawa, Hamakita, all of Japan, assignors to Toyo Roki Seizo Kabushikikaisha, Shizuoka-ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Sep. 30, 1994, Ser. No. 328,267

Claims priority, application Japan, Oct. 1, 1993, 5-269857; Oct. 1, 1993, 5-269858

Int. Cl.[6] B01D *35/30*

U.S. Cl. 210—232 **19 Claims**



1. A filter comprising:

a case having a closed end and an open end, said case comprising a shell portion constituting a peripheral side wall of the case, a bottom at one end of said shell portion and constituting the closed end of the case, and a large-diameter portion which has a larger diameter than that of said shell portion and constituting the open end of the case, said large-diameter portion including a convexity forming an engagement tab;

filtering material housed within said case;

a cover which covers the open end of said case, said cover having a port defining a communication hole placing the interior and exterior of said case in communication, said cover having a screw thread on the outer periphery thereof, and said cover having a notch in the screw thread thereof and into which notch the convexity extends with the engagement tab engaging said cover to prevent said cover from rotating relative to said case; and

an annular fastener having a screw thread on the inner periphery thereof mated with the screw thread on the outer periphery of said cover, said annular fastener also having a small-diameter portion the inner diameter of which is smaller than that of the large-diameter portion of said case.

5,593,578

FILTER ADAPTER AND DISPOSABLE FILTER

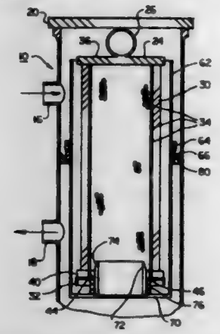
George H. Bryan, Concord, and Mihai G. M. Pop, Lynchburg, both of Va., assignors to B & W Nuclear Technologies, Lynchburg, Va.

Filed Nov. 15, 1994, Ser. No. 339,947

The portion of the term of this patent subsequent to Aug. 8, 2014, has been disclaimed.

Int. Cl.[6] B01D *27/50*

U.S. Cl. 210—232 **31 Claims**



1. A filter assembly configured and arranged for removing particulate matter from an aqueous flow by means of a filter vessel having (i) a support housing, (ii) a removable top for said housing, (iii) an input port located in said housing for the aqueous flow, (iv) an exit port located in said housing for the aqueous flow and (v) an internal seal located within said housing, said filter assembly comprising:

(a) a filter adapter sized and configured to be substantially entirely received within said housing and sealingly engage said internal seal located within said housing, said filter adapter having an annular bottom plate defining an adapter outlet; and

(b) a filter cartridge sized and configured to be substantially entirely received within said filter adapter and to simultaneously engage said filter vessel top and sealingly engage said filter adapter outlet and having a filter medium that extends across a path from said input port to said exit port when received in said housing, whereby said filter adapter may be installed in said filter vessel for an extended period and repeatedly during the extended period, said filter cartridge may be installed within said filter adapter to seal said cartridge to said filter adapter and said filter adapter to said filter vessel, aqueous flow may be directed through said filter medium, and the cartridge may be removed and discarded.

5,593,579

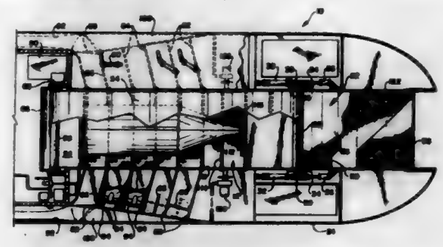
MECHANICALLY ASSISTED HYDRAULIC FILTER

Michael L. Reynolds, P.O. Box 1722, Klamath Falls, Oreg. 97601

Filed Feb. 16, 1996, Ser. No. 601,321

Int. Cl.[6] B01D *33/04*; E02B *15/04*

U.S. Cl. 210—242.1 **20 Claims**



1. A filter system for removing a material from a body of water, said filter system comprising:

a container having a closed rear, a bottom, a left side, a right side, and an open front;

means for supporting support rollers relative to said container;

means for propelling said container through a body of water having a surface with a portion of said container including at least said bottom of said container being submerged below the surface of the body of water to a predetermined depth, whereby t water rushes into said open front of said container as said container is propelled through the body of water;

an endless filter screen supported by said support rollers such that the water rushing into said open front passes through said filter screen, said filter screen being in continuous motion about said support rollers, said filter screen circumscribing a space, whereby material to be separated from the water is trapped by said filter screen and moved out of the water; and

discharge means communicating with said space circumscribed by said filter screen, said discharge means passing through at least one of said left side and said right side of said container, said discharge means allowing for filtered water in said container to be discharged to the body of water, said discharge means having a flow area at least as large as the flow area of the water rushing into said container.

5,593,580

FILTRATION CASSETTE ARTICLE, AND FILTER COMPRISING SAME

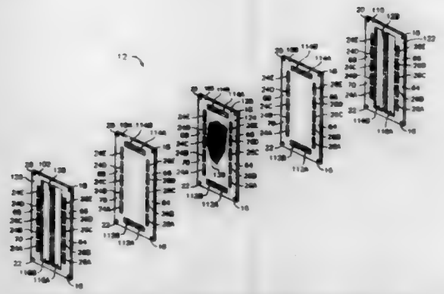
Henry B. Kopf, 108 Cambridge Cir., Cary, N.C. 27511

Continuation-in-part of Ser. No. 19,362, Mar. 1, 1994, Pat. No. Des. 357,059, Ser. No. 442,240, Nov. 28, 1989, Pat. No. 5,528,713, and Ser. No. 207,655, Jun. 21, 1988, said Ser. No. 442,240is a division of Ser. No. 936,486, Nov. 26, 1986, Pat. No. 4,885,087. This application Mar. 15, 1995, Ser. No. 405,493

Int. Cl.[6] B01D *63/00*

U.S. Cl. 210—321.75 **29 Claims**

1. A filtration cassette comprising a multilaminate array of sheet members of generally rectangular and generally planar shape with main top and bottom surfaces, wherein the sheet members include in sequence in said array a first retentate sheet, a first filter sheet, a permeate sheet, a second filter sheet, and a second retentate sheet, wherein each of the sheet members in said array has at least one inlet basin opening at one end thereof, and at least one outlet basin opening at an opposite end thereof, with permeate passage openings at longitudinal side margin portions of the sheet members;



each of the first and second retentate sheets having at least one channel opening therein, wherein each channel opening extends longitudinally between the inlet and outlet basin openings of the sheets in the array and is open through the entire thickness of the retentate sheet, and with each of the first and second retentate sheets being bonded to an adjacent filter sheet about peripheral end and side portions thereof, with their basin openings and permeate passage openings in register with one another and the filtrate passage openings of each of the retentate sheets being circumscribingly compression bonded to the adjacent filter sheet, and with a central portion of each of the retentate sheets and adjacent filter sheets being unbonded to permit permeate contacting the retentate sheet to flow through the filter sheet to the permeate sheet; and

each of the filter sheets being secured at its peripheral portions on a face thereof opposite the retentate sheet, to the permeate sheet.

5,593,581

INORGANIC FILTRATION UNIT

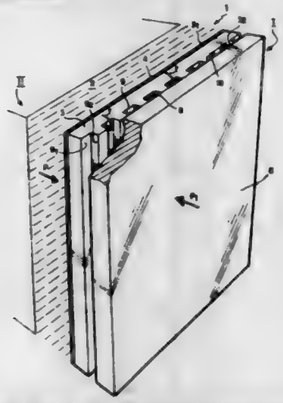
Philippe Lescoche, Nyons, France, assignor to Societe Anonyme: T.A.M.I. Industries, Nyons, France

Continuation of Ser. No. 170,320, Dec. 22, 1993, abandoned. This application Aug. 7, 1995, Ser. No. 512,130

Claims priority, application France, Jun. 25, 1991, 91 08136

Int. Cl.[6] B01D *63/08*

U.S. Cl. 210—321.84 **20 Claims**



1. An inorganic unit for the filtration of a liquid medium in order to recover a filtrate, the unit comprising:

at least one filter element (I) composed of:

an inorganic rigid porous support (3) having first and second spaced apart planar faces (3_1 and 3_2), the first face being covered with at least one separating layer (4) arranged to be in contact with the liquid medium, which exerts a given pressure (P) on said separating layer,

a counterthrust element (6) arranged to exert, on the support (3), an opposing pressure (P_1) approximately equivalent to that (P) applied to the separating layer (4),

and at least one cavity (8) formed in the second face of the porous support at a position spaced from the separating layer (4), said cavity being arranged to recover the filtrate which has passed through the porous support from the separating layer,

and at least one element (II) for the circulation of the liquid medium (2), wherein:

the separating layer is bonded to the porous support by sintering,

and the at least one element (II) is spaced from the at least one filter element (I) by means for causing, with the planar face (3_1) of the filter element, the liquid medium to circulate as a sheet of liquid with a height (h) of between 0.1 and 3 mm.

5,593,582

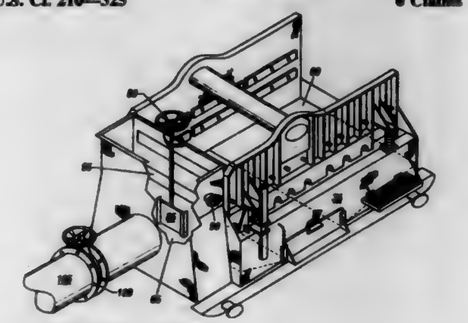
TWO FOR ONE SHALE SHAKER

John W. Roff, Jr., P.O. Box 881, Conroe, Tex. 77305

Continuation-in-part of Ser. No. 198,030, Feb. 17, 1994, Pat. No. 5,382,091, which is a continuation-in-part of Ser. No. 49,124, Apr. 19, 1993, Pat. No. 5,454,957. This application Feb. 22, 1995, Ser. No. 392,054

Int. Cl.[6] B01D *33/03*

U.S. Cl. 210—325 **6 Claims**



1. A shale shaker, comprising:

a mud box;

a first feed inlet;

a first screen positioned below said first feed inlet and having two sides;

a second feed inlet;

a second screen positioned below said second feed inlet and said first screen;

said first feed inlet and said second feed inlet in fluid communication with said mud box;

a mud tank located below said second screen; and

a bypass mechanism in fluid communication with the side of said first screen opposite the side facing said first feed inlet, said bypass mechanism in fluid communication with said mud tank.

5,593,583

FILTER FOR CONTINUOUS FILTRATION OF LIQUIDS CONTAINING SOLIDS IN A CLOSED CYLINDRICAL VESSEL

Joachim Geldmacher, Heidnuechelsweg 20, 51588 Nuembrecht, Germany

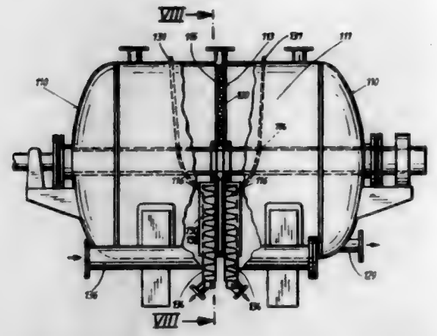
Filed Nov. 22, 1994, Ser. No. 343,751

Claims priority, application Germany, Nov. 30, 1993, 43 40 691.2; Aug. 4, 1994, 44 27 552.8

Int. Cl.[6] B01D *33/23;33/46*

U.S. Cl. 210—331 **14 Claims**

1. In a filter for continuous filtration of liquids containing solids in a closed cylindrical vessel with filter disks which are formed by



a plurality of hollow filter sectors and supported at a distance from one another on a horizontal hollow shaft normal to the shaft, with filter plates on both sides of every filter sector and a hollow space located between the filter plates allowing the filtrate to flow out through the hollow shaft, and with devices which are disposed along both sides of every filter disk for removing and discharging solids from filter plates forming outer sides of the filter disks and for cleaning these filter plates, wherein every device for removing and discharging solids from and cleaning the filter plates is formed by a closed hollow box unit which is completely surrounded by the liquid to be filtered and has a plurality of chambers which are separated from one another, wherein every chamber has at least one inlet gap extending over the entire radius of the filter disk and at least one of the chambers contacts the respective filter plate so as to be sealed relative to it, the improvement comprising that:

support means in the hollow space of each said filter sector engaging inner sides of the filter plates;

wherein said filter plates are formed of a sintered microporous material;

wherein the filter plates of each sector include an outer circumferential edge, a radially inner circumferential edge, and a pair of space apart radial edges, a cover disposed between the filter plates along the outer circumferential edges thereof, wherein said cover is concentrically connected to said shaft with a pair of sector supports which are disposed between the filter plates along the respective radial edges thereof, said outer circumferential edges and said radial edges including slots formed therein with first pressing strips disposed in said slots, a first plurality of fastening screws extending through said filter plates, first pressing strips, and cover for sealingly clamping said filter plates against said cover, a second plurality of screws extending through said filter plates, first pressing strips, and sector supports for sealingly clamping said filter plates against said sector supports, a pair of shaft receiving rings connected to said shaft and sealingly receiving the respective inner circumferential edges of said filter plates, second pressing strips arranged on the outer surface of said filter plates along the inner circumferential edges thereof for sealingly pressing said filter plates against the respective shaft receiving rings, and a third plurality of screws extending through said second pressing strips and filter plates for sealingly holding said filter plates against said shaft receiving rings;

wherein each said chamber defines a scraper for scraping solids from outer surfaces of said filter plates;

sealing strips disposed on said box units between adjacent said chambers and contacting said filter plates for sealing each said chamber from an adjacent said chamber;

wherein each said box unit extends radially along outer sides of the respective filter disk and has front wall slanted with respect to an adjacent filter plate down to a gap opening located as an inlet to a solids collecting space defined by one of said chambers the respective box unit;

wherein one of said chambers is a spray chamber, means for ventilating said spray chamber including a pipe connecting the spray chamber to the outside atmosphere, said spray chamber further including spray nozzles for directing rise water against said filter plate and means for defining a rinse water outlet;

wherein one of said chambers is a backwash chamber disposed adjacent an upstream side of said spray chamber;

wherein one of said chambers is a vacuum duct disposed adjacent a downstream side of said spray chamber; and,

means for connecting a vacuum source to said backwash chamber and said vacuum duct, whereby a vacuum within said backwash chamber and said vacuum duct forces said sealing strips against the respective filter plate to seal said spray chamber from a surrounding pressurized suspension in the filter vessel.

5,593,584

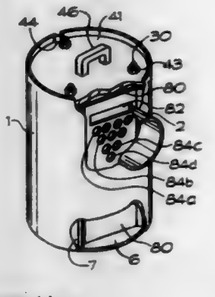
SEPTIC TANK FILTER

Harry L. Nurse, Jr., 10409 Watterson Trail, Louisville, Ky. 40299

Filed May 8, 1995, Ser. No. 436,103

Int. Cl.[6] B01D *29/39*

U.S. Cl. 210—346 **6 Claims**



1. A filter unit comprising:

a cylindrical housing having two chambers therein, a first chamber having a plurality of stacked disc-dam filtering units with a liquid upstream side and a liquid downstream side, and a second chamber in flow communication with said liquid downstream side of said stacked disc-dam units and a liquid discharge means from a side of said housing;

said housing having an opening in the bottom thereof in flow communication with said first chamber; and,

a partition separating said first chamber from said second chamber, said partition including flow-through openings therethrough of preselected size to control the rate of flow from said first chamber to said second chamber.

5,593,585

SPRAY SYSTEM FOR CLEANING A FILTER SCREEN

John K. Groetzinger, 12811 Gramlich Rd., LaVale, Md. 21502

Filed Sep. 15, 1994, Ser. No. 306,396

Int. Cl.[6] B01D *29/62;33/44*

U.S. Cl. 210—409 **9 Claims**



1. In combination, a filter screen located in a screening chamber and apparatus for cleaning the surface of the filter screen comprising:

(a) a screening chamber having an inlet;

(b) at least one screen element positioned generally horizontally in the screening chamber which extends from one side of said screening chamber to the other;

(c) a plurality of spray bars (18, 20, 21) positioned transversely across said screening chamber, located above and in close proximity to said screen element wherein a first spray bar (18)

is positioned in the inlet to said screening chamber, said first spray bar including at least two spray nozzles spaced equidistant from the centerline of said screening chamber and oriented downwardly with respect to the horizontal at an angle of about 30–35 degrees for directing cleaning liquid to provide spray patterns of generally elliptical shade on the leading edge of said screen element, and wherein a second spray bar (20) is located at the inlet end of said screening chamber, said second spray bar including a multiplicity of spray nozzles spaced across said spray bar which are oriented downwardly with respect to the horizontal at different angles ranging from about 0–45 degrees with respect to the horizontal for directing cleaning liquid to provide overlapping spray patterns on said screen surface and on the interior side walls of said screening chamber, and wherein a third spray bar (21) is located within said screening chamber at an intermediate position between the inlet end of said screening chamber and the end remote from said inlet end, said third spray bar including multiple spray nozzles of different types spaced across said spray bar which are oriented at different angles ranging from about 0–10 degrees above, to about 0–15 degrees below the horizontal, for directing cleaning liquid to provide overlapping spray patterns on said screen surface and on the interior side walls of said screening chamber; and,

(d) means for supplying a cleaning liquid under pressure to said spray bars.

5,593,586

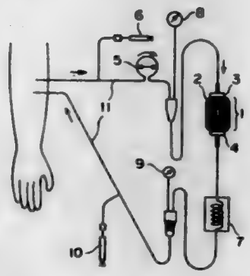
GRANULOCYTE ADSORBING CARRIER AND GRANULOCYTE REMOVER

Kazutoshi Yamazaki, Obira; Kazuo Shimamura, Osaka, and Yoshiko Abe, Amagasaki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha of Osaka, Japan, Osaka, and Japan Immuno Research Lab. Co., Ltd. of Gunma, Japan, Takasaki, both of Japan

Division of Ser. No. 222,710, Apr. 4, 1994, Pat. No. 5,525,279. This application Mar. 21, 1995, Ser. No. 407,601

Int. Cl.[6] B01D *24/00;39/04*

U.S. Cl. 210—435 **3 Claims**



1. A granulocyte remover comprising:

a granulocyte adsorbing part storing a granulocyte adsorbing carrier being provided on its surface with irregularities having a center line average height Ra, being defined under Japanese Industrial Standard B0601-1982, of 0.2 μm to 10 μm and a mean spacing Sm of unevenness being within a range of 5 μm to 200 μm;

a blood incurrent part for introducing blood into said granulocyte adsorbing part; and

blood excurrent part for discharging said blood being introduced into said granulocyte adsorbing part to the exterior thereof.

5,593,587

CELL STRAINER

Hato Fumihiko, Sakai, Japan, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

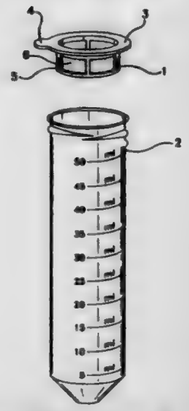
PCT No. PCT/JP92/00878, § 371 Date Jan. 25, 1994, § 102(e) Date Jan. 25, 1994, PCT Pub. No. WO93/01271, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 8, 1992, Ser. No. 175,431

Claims priority, application Japan, Jul. 8, 1991, 3-052535 U

Int. Cl.[6] B01D *29/085*

U.S. Cl. 210—470 **2 Claims**



1. A cell strainer and tube assembly for removing impurities from a suspension of cells or tissues comprising:

a tube comprising an open end, a closed end, a side wall extending from said open end to said closed end;

a cell strainer associated with said open end of said tube comprising a body frame defining a chamber including an upper portion and a lower portion, said body frame including open sections between said upper portions and said lower portion, a filter component located in said chamber and exposed at said open sections of said body frame; a projecting flange extending radially outwardly from said upper portion; and a grip extending radially outwardly from said flange.

5,593,588

COMPOSITE REVERSE OSMOSIS MEMBRANE HAVING ACTIVE LAYER OF AROMATIC POLYESTER OR COPOLYMER OF AROMATIC POLYESTER AND AROMATIC POLYAMIDE

Jae-Jin Kim; Chang-Keun Kim, and Seung-Yeop Kwak, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Dec. 8, 1995, Ser. No. 569,983

Claims priority, application Rep. of Korea, Jul. 7, 1995, 95-19906

Int. Cl.[6] B01D *29/00*

U.S. Cl. 210—490 **11 Claims**

1. A composite reverse osmosis membrane comprising a polymeric porous support layer and an active layer of an aromatic polyester superposed thereon, the active layer being prepared by the interfacial polymerization of an aqueous solution having a pH of 8 to 13, of polyhydric phenol of formula (I),

wherein, R_f represents an alkylene, alkylidene, cycloalkylene, cycloalkylidene or arylene linkage, or a linkage selected from the group consisting of ether, carbonyl, amine, and a sulfur-or phosphorus-containing linkage;

Ar and Ar' are each arene radicals;

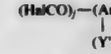
Y represents a bromine or chlorine atom, a hydroxyl group, an alkyl or alkoxy group, which can be substituted for hydrogen on the Ar or Ar';

d represents a number equal to or greater than zero;

X represents a chlorine or bromine atom, or a monovalent hydrocarbon selected from the group consisting of alkyl, aryl, and cycloalkyl group;

e represents a number of 0 to a maximum controlled by the number of replaceable hydrogens on the R_f; and

aa and cc are each a number equal to or greater than one; and bb is a number equal to or greater than zero, and when bb is a number equal to zero, Ar and Ar' are directly linked together via carbon; with a solution in an organic solvent of an aromatic acyl halide of formula (II),



(II)

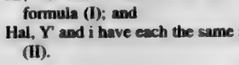
wherein, Hal represents a halogen atom;

h represents a number of no less than 2;

i represents a number of no more than 4;

Y' represents a hydrogen, bromine or chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group, a carboxylic acid group, or a carboxylate group; and

Ar is an arene radical; or an aromatic acyl halide of formula (III),



(III)

wherein, j and k are each the number of acyl halides, and satisfying j+k≧2;

Ar, Ar' and X have each the same meanings as defined in formula (I); and

Hal, Y' and i have each the same meanings as defined in formula (II).

5,593,589

CLARIFIER

William H. Boyle, Milwaukee, Wis., assignor to Envirex Inc., Waukesha, Wis.

Continuation of Ser. No. 110,305, Aug. 20, 1993, Pat. No. 5,470,475. This application Mar. 7, 1995, Ser. No. 399,761

Int. Cl.[6] C02F *1/40*

U.S. Cl. 210—519 **3 Claims**



1. A clarifier for separating suspended solids from waste water to provide clarified water, said clarifier comprising

a rectangular tank for containing waste water to be separated, the tank including upper and lower regions, a bottom, endwalls and parallel spaced apart first and second sidewalls, and each of the sidewalls having upper and lower sidewall portions;

an influent passage including an aperture for introducing waste water into the tank, the influent passage extending along at least a portion of the sidewall upper portion of the first sidewall;

an effluent passage for removing clarified water from the tank, the effluent passage being adjacent to and extending in parallel side by side relation to the influent passage and including a weir having a weir upper edge over which clarified water flows from the upper region of the tank; and

space-defining means mounted in the tank and extending along the first sidewall to define a space between the first sidewall and the space-defining means, and wherein the aperture of the influent passage is located to admit waste water into the space.

5,593,590

PROCESS FOR SEPARATE TREATMENT AND DISPOSAL OF MIXTURES OF SOLID AND LIQUID, ORGANIC WASTES

Felix Steykal, Vienna, Austria, assignor to Technoegrar Consulting AG, Vaduz, Liechtenstein

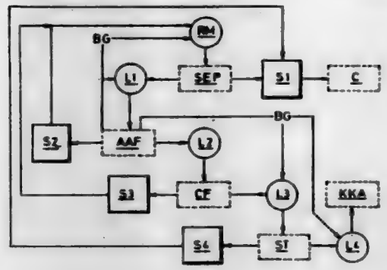
PCT No. PCT/EP92/00413, § 371 Date Aug. 26, 1993, § 102(e) Date Aug. 26, 1993, PCT Pub. No. WO93/13454, PCT Pub. Date Aug. 7, 1993

PCT Filed Feb. 27, 1992, Ser. No. 107,827

Claims priority, application Switzerland, Feb. 27, 1991, 596/91

Int. Cl.[6] C02F *3/28;11/12;11/14*

U.S. Cl. 210—603 **10 Claims**



1. A process for the treatment of a starting mixture of liquid and solid organic wastes, said mixture being susceptible to at least partial micro biological degradation, with formation of biogas, the process comprising:

separating said starting mixture into a first sludge phase with enriched dry substance and a first liquid phase containing dilute solids;

subjecting said first liquid phase to anaerobic treatment, said treatment leading to said formation of biogas and to the development of a second sludge and a second liquid phase; and

subjecting said first sludge phase to aerobic treatment resulting in the formation of a product wherein the product is compost, fertilizer or feed;

the process further comprising:

recirculating at least part of said second sludge phase into said starting mixture, thereby causing the formation of biogas in said starting mixture, and recirculating at least part of said biogas obtained from said anaerobic treatment of the first liquid phase into said starting mixture, thereby reducing the pH of said starting mixture by absorption of carbon dioxide contained in said biogas.

5,593,591

PRODUCTION OF DRY, FREE FLOWING SOLIDS FROM BIO-WASTE SLUDGE

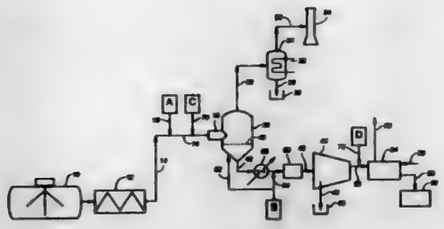
Ernest O. Ohsol, Crosby, and Thomas G. Callery, Houston, both of Tex., assignors to Unipure Corporation, Houston, Tex.

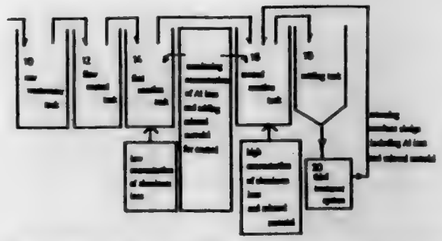
Filed Jun. 7, 1995, Ser. No. 475,811

Int. Cl.[6] C02F *1/54*

U.S. Cl. 210—609 **6 Claims**

1. A process for the production of dry, free flowing, particulate solids suitable for convenient handling, transporation and/or dis-





posal from an aqueous, substantially oil-free, biologically treated sludge feed containing a suspension of solids in water, comprising:

(a) pressurizing said sludge feed to a pressure between about 80 and 110 psig; and

(b) injecting pressurized steam into the pressurized sludge feed so as to raise the temperature of said sludge feed to between about 280° F. and about 360° F.; and

(c) flashing said sludge feed into a flash vessel maintained at a pressure between about 5 and about 10 psig, in order to induce the vaporization of between about 5 and about 15 percent of the water contained in said sludge feed, thereby forming a vapor containing a first, vaporized portion of said water, and an unvaporized fluid stream comprising a second, unvaporized portion of said water and said solids; and

(d) separating said vapor from said unvaporized fluid stream; and

(e) cooling said unvaporized fluid stream downstream of said flash vessel to a temperature between about 120° F. and about 180° F.; and

(f) adding a polyacrylamide flocculant into the cooled unvaporized fluid stream, such addition being in an amount sufficient to provide a concentration of one or more partially hydrolyzed polyacrylamide polymers in said fluid stream between about 800 and about 3,000 wppm, and wherein said polymer(s) has (have) an average molecular weight of between about 500,000 and about 1,000,000, and has (have) between about 1 and about 10 percent of the carboxyamide groups originally present in said polymer(s) hydrolyzed to carboxyl groups; and

(g) contacting said flocculant with said unvaporized fluid stream during a reaction period so as to form a precipitate containing said flocculant and substantially all of said solids; and

(h) separating said precipitate from the remainder of said fluid stream, so as to produce (1) said dry, free flowing particulate solids having a water content less than about 30 weight percent, and (2) liquid water which together with said first, vaporized portion of water comprises at least about 98 percent of the total water from said sludge feed.

5,593,592

BIODEGRADATION PROCESS FOR TREATING ORGANIC WASTEWATER

Haruo Kagawa, 13-29 Inosoeche; Eiichiro Nakayama, 18-13 Miyanowakiche, both of Kyoto-shi Kyoto-fu, and Fumihiko Yoshimura, 34-5 Sobata, Aza, Shimobel-gun Iwate, all of Japan

Filed Dec. 15, 1994, Ser. No. 356,868

Claims priority, application Japan, Dec. 16, 1993, 5-344444; Nov. 24, 1994, 6-315680

Int. Cl.[6] C02F *1/52*

U.S. Cl. 210—611 **7 Claims**

1. A biodegradation process for treating and accelerating the decomposition of organic matter and ammonia in waste water selected from the group consisting of domestic sewage, sanitary sewage, livestock waste and industrial runoff and having a density more than 2000 ppm BOD comprising the steps of:

adding to said waste water in a processing tank, between about 0.1 mM/liter and 0.5 mM/liter of aluminum ions:

a) to selectively and rapidly raise a specific group of bacteria in solution that form phenolic compounds which absorb and decompose unpleasant odor, including ammonia; and concurrently

b) to terminate other bacteria in said waste water which produce unpleasant odor, including ammonia, during the decomposition of said organic matter in said waste water;

whereupon after said organic matter is decomposed, said treated water, opaque as a result of said specific group of bacteria which remains suspended in aluminum ion solution, is transferred to a settling tank in which said treated water is subjected to a biodegradation step by adding thereto more than 4 mM/liter of aluminum ions to form aluminum hydroxide flocculate and precipitating said suspended specific group of bacteria which settles as sludge at the bottom of said tank, said biodegradation process resulting in a substantially clear supernatant.

5,593,593

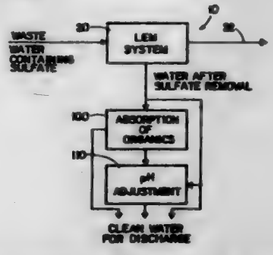
PROCESS FOR REMOVING SULFATE ANIONS FROM WASTE WATER

David N. Nilsen, Lebanon; Gloria J. Galvan, Albany; Gary L. Hundley, Corvallis, and John B. Wright, Albany, all of Oreg., assignors to United States of America, Washington, D.C.

Filed Apr. 19, 1995, Ser. No. 424,852

Int. Cl.[6] B01D *61/40*

U.S. Cl. 210—638 **5 Claims**



1. A liquid emulsion membrane process for removing sulfate anions from waste water, comprising the steps of:

(a) providing a liquid emulsion formed from an aqueous strip solution and an organic phase that contains an extractant capable of removing sulfate anions from waste water;

(b) dispersing said liquid emulsion in globule form into a quantity of waste water containing sulfate anions to allow the organic phase in each globule of said liquid emulsion to extract and absorb sulfate anions from said waste water, said dispersing including

(i) transferring the extracted sulfate anions absorbed by the organic phase of each globule of said liquid emulsion to the aqueous strip solution; and

(ii) transferring a stripping agent within the aqueous strip solution to the organic phase to replace the previously transferred extracted sulfate anions and thereby regenerate the extractant in said organic phase and concentrate all of the sulfate anions removed from the waste water in said aqueous strip solution;

(c) after dispersing, applying a high voltage electrical field to said liquid emulsion to break down said liquid emulsion and recover the organic phase and the aqueous strip solution containing said extracted sulfate anions; and

(d) separating the emulsion including its organic phase and absorbed sulfate anions from said waste water to provide waste water containing substantially no sulfate anions.

5,593,594

FILTER MATERIAL AND PROCESS FOR REMOVING OZONE FROM GASES AND LIQUIDS

Heinz Strutz, Usingen; Dietrich Fleischer, Darmstadt; Jürgen Kulpe, Frankfurt am Main, and Andreas Schleicher, Einhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 110,586, Aug. 23, 1993, Pat. No. 5,423,982. This application Mar. 2, 1995, Ser. No. 396,475

Claims priority, application Germany, May 4, 1993, 43 14 734.8

Int. Cl.[6] C02F *1/28*

U.S. Cl. 210—660 **7 Claims**

1. A process for removing ozone from liquids which comprises the steps of:

providing a filter material having repeating units of the formula

$$-\{Ar^1)_n-X)]_m-[(Ar^2)_i-Y)]_j-[(Ar^3)_k-Z)]_l-\{Ar^4)_o-W)]_p- \quad (I)$$

in which Ar^1, Ar^2, Ar^3, Ar^4, W, X, Y and Z, independently of each other, are identical or different, the indices n, m, i, j, k, l, o and p, independently of each other, are zero or integers 1, 2, 3 or 4, their sum being at least 2, Ar^1, Ar^2, Ar^3 and Ar^4 are arylene systems having 6 to 18 carbon atoms, and W, X, Y and Z are divalent linking groups, selected from $—SO_2—$, —S—, —SO—, —CO—, —O—, $—CO_2—$, or alkylene groups or alkylidene groups having 1 to 6 carbon atoms, as ozone removing compound, and

bringing the liquid into contact with the surface of the filter material.

5,593,595

METHOD FOR CONTROLLING SCALE USING A SYNERGISTIC PHOSPHONATE COMBINATION

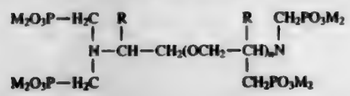
Jasbir S. Gill, McKees Rocks, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1995, Ser. No. 540,270

Int. Cl.[6] C02F *5/14*

U.S. Cl. 210—700 **18 Claims**

1. A method of inhibiting the formation, deposition and adherence of scale forming salts including calcium phosphate in an aqueous system having a pH of at least 8.5 and a calcite saturation level of at least 100 times the solubility limit of calcium as calcite, comprising adding to said aqueous system an effective synergistic amount of a combination of (A) an amount to establish a concentration of at least about 1.0 mg/L, of a polyether polyamino methylene phosphonate of the formula:



where n is an integer or fractional integer which is, or on average is, from about 2 to about 12, inclusive; M is hydrogen or a cation of an alkali metal salt; and each R may be the same or different and is independently selected from hydrogen and methyl; (B) an amount sufficient to establish a concentration of at least about 2.0 mg/L of a terpolymer comprising the monomers of acrylic acid, sulfophenomethallyl ether and maleic acid, wherein said terpolymer has a weight average molecular weight in the range from about 4,000 to 10,000; and (C) an amount sufficient to establish a concentration of at least about 1.0 mg/L of a hydroxyphosphonoacetic acid.

5,593,596

SYSTEM AND METHOD FOR COLLECTING CUTTING FLUID LIQUID AND CHIPS

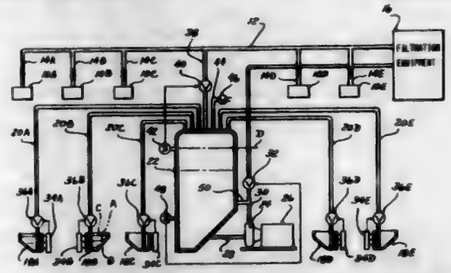
Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48322

Continuation-in-part of Ser. No. 262,143, Jun. 20, 1994, Pat. No. 5,466,380. This application Jun. 7, 1995, Ser. No. 473,350

The portion of the term of this patent subsequent to Jun. 20, 2014, has been disclaimed.

Int. Cl.[6] B01D *37/00;36/00*

U.S. Cl. 210—741 **16 Claims**



12. A method of collecting liquid from a plurality of locations to be filtered in filtration equipment, said method comprising:

disposing an individual sump at each location so as to receive said liquid to be filtered;

providing a single sealed collection tank containing liquid and connecting all of said individual sumps with said sealed collection tank with drawpipes, each having one end extending into said sealed collection tank; and

pumping liquid from said sealed collection tank out to said filtration equipment to generate a vacuum in said sealed collection tank and enable drawing liquid from each sump into said sealed collection tank and back to said filtration equipment;

opening a drawpipe valve whenever the liquid level reaches a predetermined level in a respective sump, said predetermined level above the level of said one end of each drawpipe, said valves opened so that periodically the suction generated by said vacuum in said sealed collection tank is applied to a single sump to cause a rapid drawdown of liquid therein.

5,593,597

FILTRATION SYSTEM COMPRISING SIEVING TROUGH, HELIX AND ADDITIONAL SIEVING APPARATUS

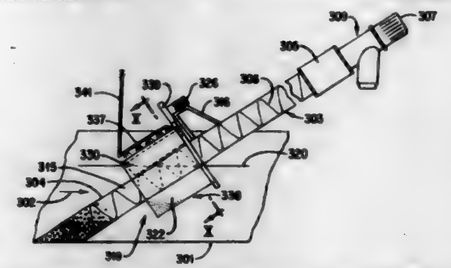
Rüdolf Bischof, Eching, Germany, assignor to Rudolf Bischof GmbH, Germany

Filed Aug. 24, 1994, Ser. No. 295,583

Claims priority, application Germany, Aug. 24, 1993, 43 28 476.0

Int. Cl.[6] B01D *33/80;33/76;33/42;33/46*

U.S. Cl. 210—744 **18 Claims**



16. Process for removing solid components from a fluid flowing in a first trough, in which the fluid is guided into a sieving helix which consists of a transport helix or transport worm rotatably

driven within a transport pipe or transport trough, at least portions of which are formed as a sieving surface, the solid components being sieved from the fluid through the sieving surface and then carried away by the transport helix or transport worm in the axial direction of the transport pipe or transport trough to a solids discharge,

characterized in that,

the fluid is led in amounts above a predetermined flow quantity past an additional sieving apparatus, which is located between the solids discharge and the sieving surface at a predetermined height above the bottom of the first trough, the additional sieving apparatus having a larger sieving surface in comparison with the sieving surface of the transport pipe or the transport trough, the solid components sieved-out by the additional sieving apparatus being discharged into the transport pipe or the transport trough, and

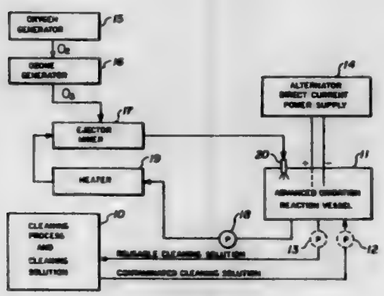
the additional sieving apparatus has discharge devices which are activated at said predetermined height in the first trough.

5,593,598

METHOD AND APPARATUS FOR CLOSED LOOP RECYCLING OF CONTAMINATED CLEANING SOLUTION

Michael P. McGinness, 2710 S. Shaver, Unit D, Pasadena, Tex. 77502, and Warren Short, 855 Queen Annes, Suite 61, Houston, Tex. 77024

Filed Apr. 20, 1994, Ser. No. 230,346
Int. Cl.[6] C02F 1/78
U.S. Cl. 210—748 **11 Claims**



1. An oxidation process for treating a contaminated cleaning solution containing water, used surfactants, ionic salts, fats, oils, greases, and inorganic and organic contaminants to convert the contaminated cleaning solution into a reusable cleaning solution containing useful polar water soluble surfactants, detergents, wetting agents and emulsifiers, comprising the steps of:

mixing said contaminated cleaning solution with an ozone containing gas in an amount sufficient to convert the organic contaminants contained in the contaminated cleaning solution into useful polar water soluble surfactants, detergents, wetting agents and emulsifiers; and

subjecting the liquid phase of said contaminated cleaning solution to an electric current in an amount sufficient to convert the fats, oils, greases and organic contaminants into useful polar water soluble surfactants, detergents, wetting agents and emulsifiers and simultaneously convert excess organic surfactants, detergents, wetting agents, and emulsifiers into carbon dioxide, nitrogen, and water;

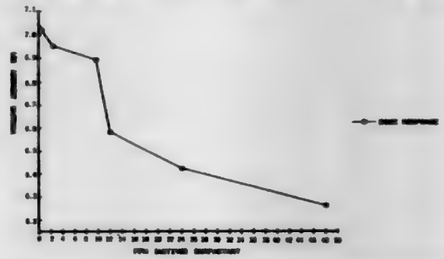
said treated reusable cleaning solution having a cleaning strength at least as great as the strength of the original cleaning solution prior to contamination.

5,593,599

METHOD FOR INHIBITING MICROBIAL ADHESION ON SURFACES

J. Barry Wright, and Daniel L. Michalopoulos, both of Jacksonville, Fla., assignors to BetzDearborn Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 430,569, Apr. 28, 1995, Pat. No. 5,512,186. This application Apr. 26, 1996, Ser. No. 638,631
Int. Cl.[6] C02F 1/50
U.S. Cl. 210—764 **18 Claims**



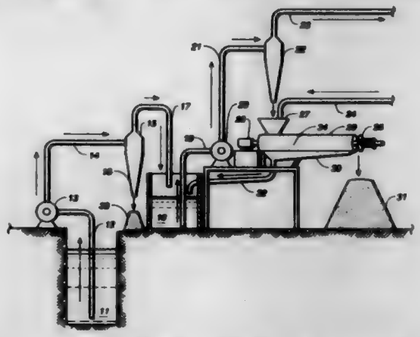
1. A method for inhibiting the microbial colonization of surfaces in contact with an aqueous system which comprises adding to said system an effective amount of an alkylsulfosuccinate surfactant, said method substantially preventing the adhesion of microbes to said surfaces while preserving the viability of the microbes in said system, allowing for the discharge of the microbes from said system.

5,593,600

METHOD OF DESANDING, DESALTING AND CONCENTRATING ORGANIC WASTES

William E. Solomon, 6700 E. Larimer County Rd. 92, Carr, Colo. 80612

Filed Sep. 5, 1995, Ser. No. 523,153
Int. Cl.[6] B01D 21/26
U.S. Cl. 210—787 **3 Claims**



1. A method of desalting, desanding, and concentrating an organic waste slurry, said slurry comprising a mixture of organic plant parts, sand and dirt, water soluble salts, and water, said method comprising the steps of:

collecting the slurry;

subjecting the collected slurry to a first cyclonic action having a first cyclone pressure to remove the sand and dirt from the slurry mixture;

subjecting the slurry from said first cyclonic action to a second cyclonic action having a second cyclone pressure greater than said first cyclone pressure to wash and remove the water soluble salts from the organic plant parts; and

subjecting the organic plant parts from said second cyclonic action to a mechanical press for dewatering.

5,593,601

ETCHING RECIPE FOR THE CRSI FILM

Hsien-Fen Hsieh, and Ming-Teh Hsu, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 1, 1995, Ser. No. 456,918
Int. Cl.[6] B44C 1/22; C23C 1/00
U.S. Cl. 216—41 **6 Claims**



1. A method for the photo-etching of a CrSi film comprising 40 to 85% of Cr and 15 to 60% of Si, comprising:

covering at least a portion of said CrSi film with a protection layer; and

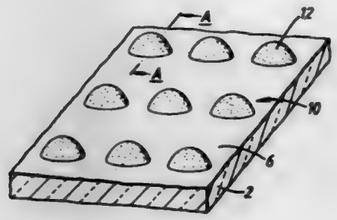
etching the exposed portion of said CrSi film with an etchant comprising 100 to 120 parts of 36.5 to 38% HCl, 1.0 to 2.0 parts of 48.8 to 49.2% HF, 0 to 10 parts of 30.0 to 32.0% H_2O_2 and 50 to 100 parts of 85 to 87% H_3PO_4.

5,593,602

METAL SUBSTRATE FOR A MAGNETIC DISC AND MANUFACTURE THEREOF

Richard Gelder, Preston, and John M. Bradshaw, Chorley, both of United Kingdom, assignors to Pilkington PLC, United Kingdom

Filed Mar. 1, 1994, Ser. No. 203,623
Claims priority, application United Kingdom, Mar. 29, 1993, 9306542; Jan. 7, 1994, 9400260
Int. Cl.[6] C23F 1/00
U.S. Cl. 216—42 **9 Claims**



1. A process for preparing a metal substrate surface of a thin film magnetic data storage disc, the process comprising the steps of:

(a) providing a disc having a metal substrate surface;

(b) printing onto at least a portion of the substrate surface a masking pattern comprising spaced printed dots, the printed dots each having a diameter of about 5 to 30 microns; and

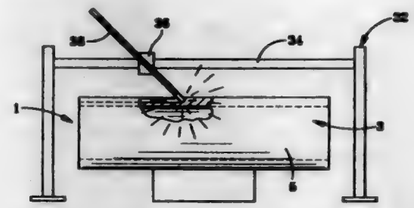
(c) etching the unmasked substrate surface to texture the unmasked substrate surface.

5,593,603

METHOD FOR PRODUCING HARDENED FLUTES IN A KELLY BAR

James N. Sajstovic, Nazareth, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 5, 1995, Ser. No. 465,487
Int. Cl.[6] B23K 9/013
U.S. Cl. 219—69.1 **9 Claims**



1. A method for producing a kelly bar having hardened flutes therein comprising:

(a) providing a kelly bar having an elongated carbon steel body with an outer surface to be fluted, said body terminating in a first end and a second end, said carbon steel body comprising the following weight percentages of elements: Carbon from 0.28% to 0.33% , Manganese from 0.40% to 0.60% Phosphorus no more than 0.035%, Sulfur no more than 0.040%, Silicon from 0.15% to 0.30%, Chromium from 0.80 to 1.10% Molybdenum from 0.15% to 0.25%; and

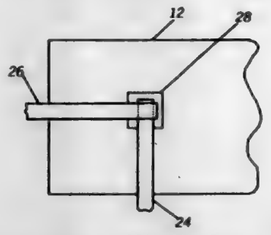
(b) gouging a plurality of flutes in said outer surface with a carbon electrode and an electric arc, each flute extending axially lengthwise along said body substantially the distance between said first and second end, each flute extending radially inwardly into said body and terminating at a curved bottom surface, each flute having a hardened, heat-affected zone beneath said bottom surface, said heat-affected zone comprising finely dispersed martensite.

5,593,604

METHOD OF RESISTANCE WELDING THIN ELEMENTS

Jeff Beasley, Buford; Michael B. Kirschner, Alpharetta; Robert A. Charles, Chamblee, and Sacha C. Hall, Atlanta, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 4, 1995, Ser. No. 434,632
Int. Cl.[6] B23K 11/11
U.S. Cl. 219—117.1 **6 Claims**



1. A method of resistance welding thin elements in an electrical apparatus, said electrical apparatus having an integral structural member and at least two tabs to electrically interconnect parts of said electrical apparatus, said method comprising the steps of:

providing a thin current sink adhered to said integral structural member;

aligning portions of said at least two tabs over said thin current sink;

compressing said at least two tabs against said thin current sink with a pair of weld electrodes; and

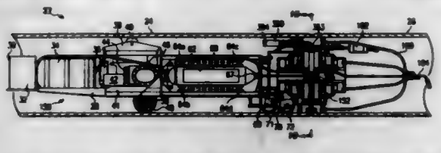
applying a weld current pulse between said weld electrodes.

5,593,605

INTERNAL LASER WELDER FOR PIPELINE

Richard L. Jones, Houston, Tex., assignor to CRC-Evans Pipeline International, Inc., Houston, Tex.

Filed Oct. 11, 1994, Ser. No. 321,214
Int. Cl.[6] B23K 26/08
U.S. Cl. 219—121.63 40 Claims



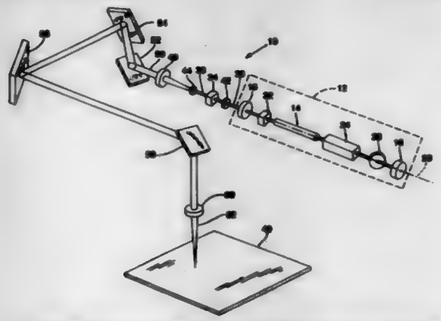
1. An internal welder for a pipeline for welding together abutting ends of first and second pipe segments, comprising:
a carriage assembly for travelling inside said pipeline;
a laser source mounted on said carriage assembly to produce a laser beam;
first and second line-up clamp assemblies mounted on said carriage assembly for aligning the respective abutting ends of said first and second pipe segments together, said first line-up clamp assembly positioned such that said beam passes essentially through the center of said first line-up clamp assembly;
a reflecting surface positioned between said first and second line-up clamp assemblies along the axis of said beam for directing said beam to the abutting ends of said first and second pipe segments; and
a drive mounted on said carriage assembly for rotating said reflecting surface around the axis of said beam to direct the beam to the abutting ends of said pipe segments for welding said pipe segments together.

5,593,606

ULTRAVIOLET LASER SYSTEM AND METHOD FOR FORMING VIAS IN MULTI-LAYERED TARGETS

Mark D. Owen, Beaverton, and James N. O'Brien, Bend, both of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Jul. 18, 1994, Ser. No. 276,797
Int. Cl.[6] B23K 26/00
U.S. Cl. 219—121.71 30 Claims



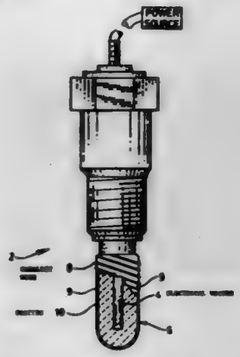
1. A method for laser processing a multi-layered target including at least two layers having different chemical compositions, comprising:
generating, from a non-excimer laser at a repetition rate of greater than about 1 kHz, high power ultraviolet laser output pulses having a predetermined spatial spot size, a wavelength shorter than about 400 nm, a temporal pulse width shorter than about 100 ns, and an average output power of greater than about 100 mW measured over the spatial spot size; and
applying the laser output pulses to the target so that the laser output pulses cleanly remove at least two layers within the spatial spot size.

5,593,607

COMBUSTION CATALYST WIRE WRAPPED ON CORROSION RESISTIVE GLOW PLUGS

Chuong Q. Dang; Kent A. Koshkarian, and Martin L. Willi, all of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 21, 1995, Ser. No. 493,065
Int. Cl.[6] F23Q 7/00
U.S. Cl. 219—270 10 Claims



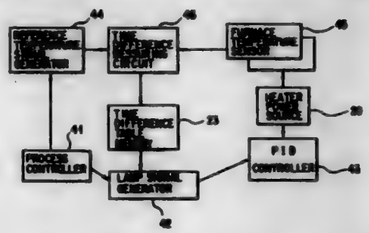
1. A glow plug having a heating element and having a tip, said tip having an outer surface, comprising:
a low porosity refractory metal oxide coating covering at least a portion of the tip outer surface; and
a catalyst wrapped about and in intimate contact with the glow plug tip coating, said catalyst having a shape in the form of a wire, said wire having a cross-sectional area in the range of about 10×10^{-6} in^2 to about 300×10^{-6} in^2, and being formed of one of platinum group metals, transition metals or a combination thereof and said catalyst being free of charge carrying connection to a power source.

5,593,608

TEMPERATURE CONTROL METHOD AND APPARATUS FOR USE IN THERMAL PROCESSING EQUIPMENT

Fujio Suzuki, Kanagawa-ken, Japan, assignor to Tokyo Electron Limited, Tokyo, and Tokyo Electron Tohoku Limited, Esashi, both of Japan

Filed Sep. 9, 1994, Ser. No. 303,747
Claims priority, application Japan, Sep. 9, 1993, 5-249920; Sep. 9, 1993, 5-249921; Sep. 9, 1993, 5-249922
Int. Cl.[6] H05B 1/02
U.S. Cl. 219—492 22 Claims



1. A method for controlling temperature in a thermal processing equipment having a vertical processing furnace, comprising the steps of:
providing a plurality of heaters in a respective plurality of vertical zones of said vertical processing furnace;
heating the plurality of zones of the processing furnace by the plurality of heaters provided in said processing furnace which contains materials to be processed;
measuring respective temperatures in said zones;

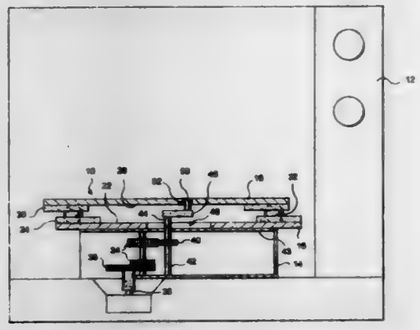
measuring respective periods of time which elapse until the respective temperatures in said zones increase from a predetermined value to at least one reference value;
obtaining time differences among the periods measured;
storing the time differences in memory means; and
energizing the plurality of heaters, respectively, at timing sequences corresponding to the stored time differences to raise the respective temperatures of the zones to the reference value at substantially a same time.

5,593,609

MIXING DEVICE FOR A MICROWAVE OVEN

David J. Fletcher, 18 Lovell Rd., Cambridge, CB4 2QR, United Kingdom

Filed Jun. 16, 1995, Ser. No. 490,897
Claims priority, application United Kingdom, Jun. 15, 1994, 9411971
Int. Cl.[6] H05B 6/78
U.S. Cl. 219—726 10 Claims



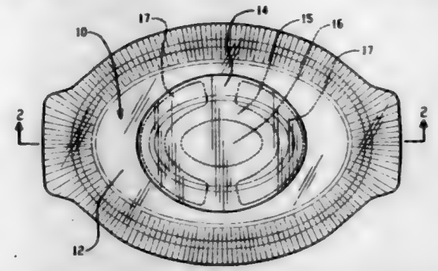
1. A mixing device for a microwave oven, comprising:
an upper element;
a lower element;
a multiplicity of bearing members situated between said upper and lower elements;
said upper element having at least a connecting surface, a plurality of individual separated from each other bearing cups being disposed about an exterior part of said upper element and extending outwardly from said connecting surface, each said bearing cup having a limited receiving area for receiving at least a portion of the corresponding bearing element, each said receiving area being larger than the largest outside periphery of the corresponding bearing member;
said lower element having at least an attaching surface, a plurality of individual separated from each other bearing cups being disposed about an exterior part of said lower element and extending outwardly from said attaching surface, each said bearing cup of the lower element having a limited receiving area for receiving at least a portion of the corresponding bearing element, each said receiving area of the lower element being larger than the largest outside periphery of the corresponding bearing member; and
a driving rod having an output crank shaft at one end thereof;
whereby in an assembled condition of said mixing device said connecting surface faces said attaching surface, so that said receiving areas of the upper element are substantially aligned with said receiving areas of the lower element forming a plurality of bearing pairs therebetween, each said bearing pair accommodates free movement therein of the corresponding bearing element, and said output crank shaft is connected to said upper element, upon rotation of said driving rod said upper element undergoes orbital motion relative to said lower element.

5,593,610

CONTAINER FOR ACTIVE MICROWAVE HEATING

Phillip L. Minerich, Austin, Minn.; Bryan C. Hewitt, Kingston, Canada; Cindy M. Lacroix, Kingston, Canada, and Melville D. Ball, Kingston, Canada, assignors to Hormel Foods Corporation, Austin, Minn.

Filed Aug. 4, 1995, Ser. No. 511,383
Int. Cl.[6] H05B 6/80
U.S. Cl. 219—728 25 Claims



1. In a container comprising a tray having an open end, a closed base and side walls extending from said closed base to said open end, and a lid covering said open end, the improvement wherein:
said side walls comprise a microwave transparent material which extends from said closed base to said open end, and conductive, microwave opaque material which extends from said side walls onto said closed base and forms a lip at the edge of said closed base;
said closed base comprises an annular base ring of conductive, microwave opaque material encompassing a first area of microwave transparent material, and a second area of microwave transparent material between said annular base ring and said lip, said annular base ring and said lip being designed and adapted to establish boundary conditions at said base ring and at said lip that produce a central energy maxima within said first area and a subsidiary energy maxima in said second area;
said lid comprises a microwave transparent material and a first conductive, microwave opaque element, said element being separated from said side walls by an annular area of said microwave transparent material and designed and adapted to enhance microwave intensity under said element;
whereby said side walls, said base and said lid co-operate to produce more uniform heating within said container.

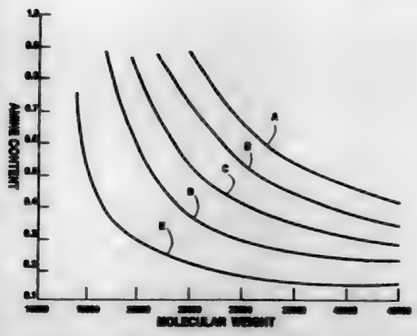
5,593,611

METHOD FOR IMPARTING SOFTNESS WITH REDUCED YELLOWING TO A TEXTILE USING A LOW AMINE CONTENT, HIGH MOLECULAR WEIGHT AMINOPOLYSILOXANE

Anna M. Czech, Cortlandt Manor, N.Y., assignor to OSi Specialties, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 905,388, Jun. 29, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,480
Int. Cl.[6] D06M 15/643
U.S. Cl. 252—8.63 7 Claims

1. A method for treating a textile to impart amine-like softness and reduced yellowing, which method consists essentially of:
(a) treating a textile with an aminopolysiloxane composition consisting essentially of aminopolysiloxanes having an amine content as NH_2 ranging from about 0.15 to 0.25% by weight and having a molecular weight of at least about 30,000, which are essentially free of organotitanate, organozirconate or organogermanate, wherein the aminopolysiloxane is of the formula $PR_2SiO(R_2SiO)_x(RQSiO)_ySiR_2P$, where each R is the same or different and is a monovalent hydrocarbon selected from the group consisting of an alkyl having 1 to 10 carbon atoms, an aryl having 6 to 10 carbon atoms, and an aralkyl having from 7 to 10 carbon atoms; P is selected from the group consisting of R, Q, hydroxy and an alkoxy having 1 to 4 carbon atoms; Q is of the formula $(X)_a(X^1)_b(Y)_c$—



$N(R^1)(R^2)$, where X is alkylene group having 1 to 8 carbon atoms, X^1 is selected from the group consisting of alkylene having 1 to 4 carbon atoms, a phenylene and an oxypropylene, the oxygen atom of which is bonded to the carbon atom of Y; Y is a hydroxyl-substituted acyclic or cyclic alkylene group having no more than eight carbon atoms, d, e and f are 0 or 1 provided the sum d+e is one and the sum e+f is 0 or 2, the ratio of a:b is between about 83:1 to about 330:1 and R^1 and R^2 are independently hydrogen, an alkyl group, having 1 to 8 carbon atoms or alkyleneamino having the formula: $C_gH_{2g}N(R^3)(R^4)$ wherein R^3 and R^4 are independently hydrogen, an alkyl group having 1 to 8 carbon atoms or a hydroxyalkyl group having 2 to 4 carbon atoms, and g is an integer from 2 to 8; and a and b are selected such that the amine content of the aminopolysiloxane ranges from 0.15 to 0.25 weight percent as NH_2 and the molecular weight ranges from 30,000 to 80,000.

5,593,612

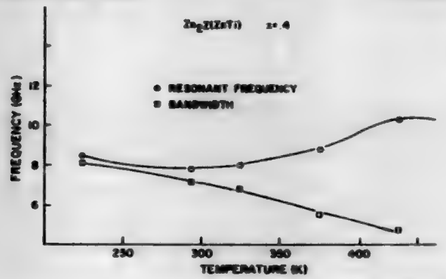
U, W, X, Y AND Z-TYPE FERRITES

Peter Lubitz, Great Falls, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1990, Ser. No. 627,394

Int. Cl.[6] C01G *49/08*

U.S. Cl. 252—62.56 **11 Claims**



1. A U, W, X, Y, or Z-type hexagonal ferrite of the formula

$$N_QZn_{2-z}Fe_{H-2z}Ti_xM_xO_EA_z$$

where:

M is Zn, (Ni_tCo_u), Cu, Cd, Mn or a mixture thereof;

$0<t\leq 1$;

$t+u=1$;

$0\leq u<1$;

N has an average +2 valence state and is selected from the group consisting of Pb, Ba, Sr and mixtures thereof;

Q is the total number of N atoms in a molecule of a U, W, X, Y, or Z-type hexagonal ferrite;

H is the number of Fe atoms in a molecule of a U, W, X, Y, or Z-type hexagonal ferrite without substitution for Fe or O;

E is the number of O atoms in a molecule of a U, W, X, Y, or Z-type hexagonal ferrite without substitution for Fe or O;

x is greater than zero and no more than 4;

A is selected from the group consisting of Co, Cu, Ni; and

z is 0 to 2.

5,593,613

HEAT TRANSFER FLUIDS COMPRISING MONO- AND BIS(METHYLBENZYL)XYLENE ISOMERS

Raymond Commandeur, Vizille, and Jean-Pierre Sarron, Chateu, both of France, assignors to Elf Atochem S.A., Puteaux, France

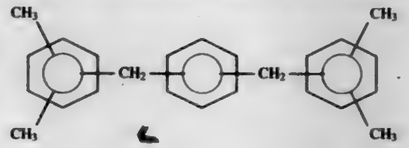
Continuation of Ser. No. 90,441, Apr. 20, 1993, Pat. No. 5,384,058, which is a continuation of Ser. No. 840,199, Feb. 24, 1992, abandoned. This application Aug. 3, 1994, Ser. No. 283,183

Claims priority, application France, Feb. 22, 1991, 91 02172

Int. Cl.[6] C09K *5/00*

U.S. Cl. 252—73 **2 Claims**

1. In a heat transfer process employing a heat transfer fluid medium, the improvement which comprises using as the heat transfer fluid therefor a composition comprising (methylbenzyl)xylene and further comprising a compound (B) having the formula:



(B)

5,593,614

FABRIC SOFTENING COMPOSITION BASED ON HIGHER FATTY ACID ESTER AND DISPERSANT FOR SUCH ESTER

Leopold Laitem, Lebanon, N.J., and Regis Cesar, Villers le Bouillet, Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 945,715, Sep. 16, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 350,394

Int. Cl.[6] D06M *13/325*

U.S. Cl. 510—524 **5 Claims**



1. A fabric softening product comprising from about 1 to about 30%, by weight, of the formula:

$$\begin{array}{l} CH_2-O\text{+}CH_2-CH_2-O\text{+}_xR_1 \\ | \\ CH-O\text{+}CH_2-CH_2-O\text{+}_yR_2 \\ | \\ CH_2-O\text{+}CH_2-CH_2-O\text{+}_zR_3 \end{array}$$

wherein R_1, R_2, and R_3 may be the same or different and are H, $(CH_2)_xOR_5$ or $(CH_2)_xCH_3$; R_5 is H, $—OCR_6$, $\{(CH_2)_mO\}_nH$ or $\{(CH_2)_mO\}_nOCR_6$ and $—OCR_6$ is a higher fatty acid acyl group having 8 to 24 carbon atoms;

x is an integer from 0 to 3, y is an integer front 0 to 4, m is an integer from 1 to 3, and n is an integer from 1 to 10:

with the proviso (1) that only one of R_1, R_2, and R_3 may be H or $(CH_2)_xCH_3$ and (2) that there be a mixture of mono-, di-, and tri-esters;

from about 0.2 to about 10%, by weight, of a dispersant selected from the group consisting of C8-C24 alkyl dialkanolamine or C8-C24 alkyl trialkanolpropylene diamines; and

the balance being water.

5,593,615

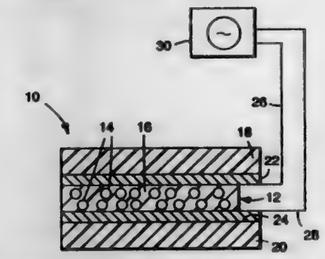
LIGHT MODULATING DEVICE HAVING A MATRIX PREPARED FROM ACID REACTANTS

Bruce A. Nerad, Oakdale, Minn., and George F. Vesley, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 235,101, Apr. 29, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 484,690

Int. Cl.[6] C09K *19/52*; G02F *1/13*

U.S. Cl. 252—299.01 **24 Claims**



1. An optically responsive film comprising liquid crystal dispersed in a polymer matrix comprising the reaction product of (1) one or more polymerizable matrix reactants other than an acid reactant and (2) at least one acid reactant copolymerizable with said one or more matrix reactants in an amount ranging from about 2 to about 15 weight percent,

said amount being sufficient to enhance the T-peel strength of said film by a factor of at least 2 relative to the same film prepared in the absence of said acid reactant,

said acid reactant comprising an unsaturated carboxylic acid, a mono-ester of a dicarboxylic acid, an amine-functional carboxylic acid, a hydroxy-functional carboxylic acid, a mercapto-functional carboxylic acid, or a sulfonic acid.

5,593,616

OPTICALLY INACTIVE, MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING THE COMPOUND, LIQUID CRYSTAL DEVICE USING THE COMPOSITION, LIQUID CRYSTAL APPARATUS AND DISPLAY METHOD

Shinichi Nakamura, Isehara; Takao Takiguchi, Tokyo; Takashi Iwaki, Machida; Takeshi Togano, Yokohama, and Yoko Kosaka, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

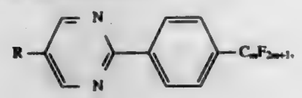
Filed Sep. 19, 1994, Ser. No. 306,450

Claims priority, application Japan, Sep. 17, 1993, 5-231678

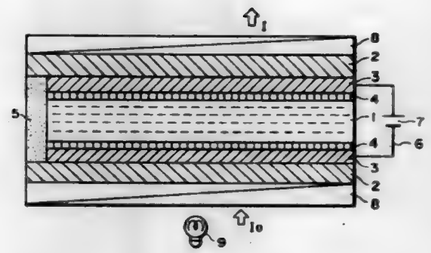
Int. Cl.[6] C09K *19/34*; G02F *1/13*

U.S. Cl. 252—299.61 **19 Claims**

1. An optically inactive mesomorphic compound represented by the following formula (I):



(I)



wherein R denotes a linear or branches alkyl group having 1–18 carbon atoms or a linear or branched alkoxy group having 1–18 carbon atoms; and m is an integer of 6–18.

5,593,617

PHOTOCHEMICALLY POLYMERIZABLE LIQUID CRYSTALS

Stephen Kelly, Möhlin, and Teodor Lukac, Allschwil, both of Switzerland, assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

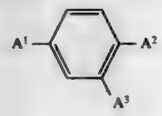
Filed Aug. 21, 1995, Ser. No. 517,480

Claims priority, application Switzerland, Sep. 12, 1994, 2771/94

Int. Cl.[6] C09K *19/20;19/52*; C07C *69/76*

U.S. Cl. 252—299.67 **13 Claims**

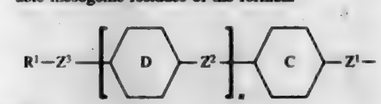
1. Compounds of the general formula



I

wherein

A^1, A^2 and A^3 are, independently, photochemically polymerizable mesogenic residues of the formula



II

wherein

C and D are, independently selected from the group consisting of pyridine-2,5-diyl, pyrimidine-2,5-diyl, trans-1,4-cyclohexylene, trans-1,3-dioxane-2,5-diyl and 1,4-phenylene, which phenylene may be substituted with one or more nitro, acetyl, halogen, methyl and cyano;

Z^1 is selected from the group consisting of a single bond, $—CH_2CH_2—$, $—CH_2O—$, $—COO—$, $—OOC—$, $—(CH_2)_4—$ and $—(CH_2)_3O—$;

Z^2 is selected from the group consisting of a single bond, $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$, $—COO—$, $—OOC—$, $—(CH_2)_4—$, $—O(CH_2)_3—$ and $—(CH_2)_3O—$;

Z^3 is selected from the group consisting of $—(CY_2)_m—$, $—(CY_2)_mO—$, $—(CY_2)_mCOO—$, $—(CY_2)_mOOC—$, $—(Si[(CH_3)_2]O)_p—$, $—OCH_2(Si[(CH_3)_2]O)_pSi[(CH_3)_2]CH_2O—$ and $—NHCH_2(Si[(CH_3)_2]O)_pSi[(CH_3)_2]CH_2NH—$;

Y is hydrogen or fluorine;

m is a whole number of 1 to 16;

p is a whole number of 1 to 16;

n is 0 or 1; and

R^1 is a polymerizable group selected from the group consisting of acrylate, methacrylate, epoxy and vinyl ether.

5,593,618

CONDUCTIVE FIBERS

Marian K. Okoniewski; Jerzy S. Smolowski; Piotr J. Bajda; Jerzy Z. Kobus; Joanna Koprowska, and Barbara E. Ratajczyk, all of Lodz, Poland, assignors to Instytut Wlokiennictwa, Lodz, Poland

Division of Ser. No. 39,129, Apr. 8, 1993, Pat. No. 5,431,856. This application Mar. 7, 1995, Ser. No. 399,457

Claims priority, application Poland, Oct. 9, 1990, 287267; United Kingdom, Mar. 28, 1991, 9106709; Oct. 1, 1991, 9120836

Int. Cl.[6] H01B *1/00;1/02;1/08;1/10*

U.S. Cl. 252—512 3 Claims

1. A polymeric substrate material having an increased level of electrical conductivity, comprising:

a) polymeric substrate material physically bonded to an intermediate composition having a complexing or reacting group;

b) transition metal ion complexed or reacted with said complexing or reacting group of said intermediate composition; and

c) anion moiety combined with said transition metal ion;

wherein said intermediate composition is selected from the group consisting of an acid dyestuff, a disperse dyestuff, a cationic dyestuff, a reactive dyestuff, an anionic dyestuff, and a direct dyestuff.

5,593,619

GRANULATED FLAME RETARDANT PRODUCTS

Scott A. Bottelberghe, Waldo, Ark.; Dustin H. Thomas, Baton Rouge, La.; Terry M. Shurtleff, Emerson, and Roland G. Peertzc, Magnolia, both of Ark., assignors to Albemarle Corporation, Richmond, Va.

Continuation of Ser. No. 152,292, Nov. 12, 1993, abandoned, which is a division of Ser. No. 964,941, Oct. 22, 1992, abandoned. This application Mar. 16, 1995, Ser. No. 406,225

Int. Cl.[6] C09K *21/08;21/14*

U.S. Cl. 252—609 3 Claims



1. A process for producing unscorched, binder-free, granulated hexabromocyclododecane which exhibits enhanced compaction efficiency and friability, said process comprising the following steps:

(a) feeding a binder-free hexabromocyclododecane powder to a set of heated compaction rollers to effect the formation of a hexabromocyclododecane compacted material, the rollers having been heated to a temperature from about 35° C. to about 150° C. which is in excess of the fed hexabromocyclododecane powder temperature such that the compaction efficiency is increased by at least 10 percent over that obtained with non-heated compaction rollers, and wherein the compaction step is performed without scorching the compacted material; and

(b) granulating the compacted material to produce. granules which have a friability loss of less than about 10 percent.

5,593,620

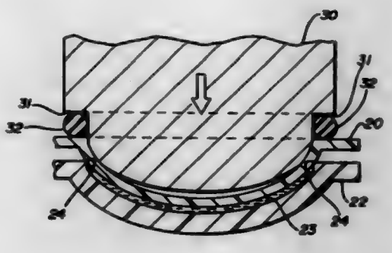
APPARATUS AND METHOD FOR RELEASABLY FUSING LENS MOLD PIECES

Stephen Gaiss, Jacksonville, Fla., assignor to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 285,888, Aug. 4, 1994, abandoned, which is a continuation of Ser. No. 746,396, Aug. 16, 1991, abandoned. This application Mar. 26, 1996, Ser. No. 622,095

Int. Cl.[6] B29D *11/00*

U.S. Cl. 264—1.1 8 Claims



1. A method of joining contact lens mold pieces, comprising:

forming first and second mold pieces from materials suitable for ultrasonic welding,

wherein one of said mold pieces has a convex surface portion for shaping a first contact lens surface, and the other of said mold pieces has a concave surface portion for shaping a second contact lens surface, and

wherein the first of said mold pieces includes an annular projection extending completely around the surface portion of said first mold piece;

moving the first and second mold pieces together to form a mold cavity therebetween for molding a contact lens therein, including the step of moving said annular projection into engagement with the second mold piece along an annular boundary extending completely around the surface portion of the second mold piece; and

holding stationary one of the mold pieces, and applying ultrasonic vibrational energy to the other of the mold pieces to fuse the first and second mold pieces together over the complete length of said annular boundary, and wherein the mold pieces are capable of later being separated,

wherein a centering force is applied to said mold piece comprising the outer-concave portion by a vibration absorbing ring attached to an ultrasonic generating horn.

8. An apparatus for releasably joining contact lens forming mold pieces having a projecting portion along a path exterior to and continuously adjoining the lens forming surfaces of said pieces, said apparatus comprising:

means for holding one of said pieces stationary,

an ultrasonic energy horn sized to extend within an outer-concave portion of said mold piece comprising said outer-concave portion,

means coupled to said horn for generating ultrasonic energy of a frequency and amplitude, and for a duration between that necessary to initiate softening of the projecting portion and to soften all of said projecting portion continuously adjoining the lens forming surface, and

a vibration absorbing ring attached to said ultrasonic energy horn for applying a centering force to said mold piece comprising said outer-concave mold portion.

5,593,621

METHOD OF MANUFACTURING PLASTIC OPTICAL TRANSMISSION MEDIUM

Yasuhiro Kokio, 534-23, Ichigao-cho, Midori-ku, Yokohama-shi, Kanagawa, 225, and Ryo Nihei, Room 302, Aburaraifunamura, 1-8-20, Nakanoshima, Tama-ku, Kawasaki-shi, Kanagawa, 214, both of Japan

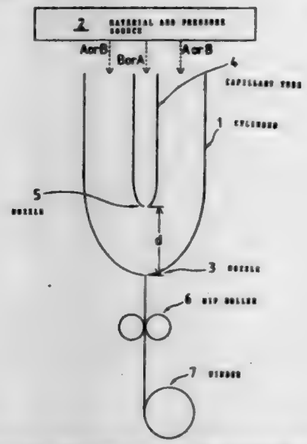
PCT No. PCT/JP93/01148, § 371 Date Apr. 14, 1994, § 102(e) Date Apr. 14, 1994, PCT Pub. No. WO94/04949, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 16, 1993, Ser. No. 211,666

Claims priority, application Japan, Aug. 17, 1992, 4-238811

Int. Cl.[6] B29D *11/00*

U.S. Cl. 264—1.29 20 Claims



1. A method of manufacturing a plastic optical fiber transmission medium, comprising the steps of:

providing a cylinder with a melt transparent first polymer;

injecting into a central portion of said cylinder either a transparent and diffusible non-polymerizing material alone or a mixture of a transparent and diffusible non-polymerizing material and a melt transparent second polymer, said non-polymerizing material having a refractive index different from that of said first polymer;

allowing the non-polymerizing material to diffuse into the first polymer without polymerizing, and toward a peripheral region of the cylinder; and

performing an extrusion melt molding from the cylinder, thereby forming a plastic optical fiber transmission medium having a region in which the refractive index continuously varies.

5,593,622

PREPARATION OF LIPOSOMES WITH PEG-BOUND PHOSPHOLIPID ON SURFACE

Hiroshi Yoshioka, and Hiroshi Goto, both of Shizuoka-ken, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 433,803, May 3, 1995, which is a continuation of Ser. No. 887,851, May 22, 1992, abandoned, which is a continuation of Ser. No. 802,702, Dec. 5, 1991, abandoned, which is a continuation of Ser. No. 391,952, Aug. 10, 1989, abandoned. This application Jun. 2, 1995, Ser. No. 460,714

Claims priority, application Japan, Aug. 11, 1988, 63-198915; Mar. 17, 1989, 1-63587

Int. Cl.[6] A61K *9/127;* B01J *13/22*

U.S. Cl. 264—4.32 18 Claims

1. A process for the preparation of a liposome comprising PEG-bound phospholipid on the surface thereof, wherein said PEG-bound phospholipid extends outwardly, and does not substantially extend inwardly from the surface of said liposome, said process comprising preparing a liposome and adding PEG-bound phospholipid to said liposome thereby fixing the PEG-bound phospholipid on the surface of said liposome.

5,593,623

CASTING MOULD

Anders Mohns, Västmäker 8460, Hudiksvall, Sweden

PCT No. PCT/SE93/00776, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO94/09228, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 27, 1993, Ser. No. 411,883

Claims priority, application Sweden, Oct. 9, 1992, 9202965

Int. Cl.[6] B04G *13/02;* E02D *5/34*

U.S. Cl. 264—32 20 Claims



16. A method for casting an elongated, vertically extending object, comprising:

hanging a flexible and substantially inelastic elongated envelope with a lower end thereof resting on an underlayer, an opposite and upper end of said flexible and substantially inelastic elongated envelope being open;

casting a casting material through said opening at said upper end thereof so as to fill said flexible and substantially inelastic envelope from said lower end thereof while gradually stretching said envelope from below and upwardly with internal pressure provided by said casting material to form a substantially circular cross-section and without exterior support of said circular cross-section, wherein said envelope by itself is capable of supporting and keeping said casting material together so that said envelope with a portion of said casting material therein can stand freely on an underlayer during said casting; and

permitting said casting material in said envelope to harden.

5,593,624

METHOD FOR MAKING CELLULAR PACKAGING BOARD WITH INHIBITOR

Eugene R. Lewis, 25 Chatfield Rd., Prospect, Conn. 06712

Filed May 24, 1995, Ser. No. 449,832

Int. Cl.[6] B29C *44/02*

U.S. Cl. 264—48 12 Claims

1. A method for making beaded foam molded products with a vapor phase corrosion inhibitor incorporated therein comprising:

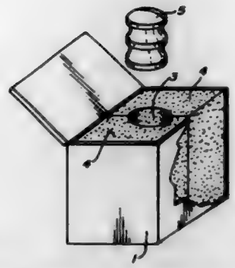
(a) expanding a foamable synthetic resin with a blowing agent into puffed beads;

(b) transporting said beads through a conduit in suspension in air;

(c) coating said puffed beads with a liquid containing a vapor phase corrosion inhibitor as they are being transported in suspension in said conduit;

(d) depositing said coated beads into a metallic mold;

(e) applying heat and pressure to said coated beads in said mold to fuse said beads and form a beaded foam molded product with said corrosion inhibitor incorporated therethroughout.



said inhibitor being able to migrate to the surface of said product and emanate therefrom;

(f) forming said molded product into packaging inserts; and

(g) placing said inserts in an enclosure to provide a vapor phase inhibitor within said enclosure.

5,593,625

BIOCOMPOSITE MATERIAL AND METHOD OF MAKING

Michael J. Riebel, Mankato; Paul L. Torgusen, New Ulm; Kenneth D. Ross, Nicollet; Donald E. Anderson, Northfield, and Carl Gruber, Le Sueur, all of Minn., assignors to Phenix Biocomposites, Inc., St. Peter, Minn.

Continuation-in-part of Ser. No. 211,567, Apr. 11, 1994, which is a continuation-in-part of Ser. No. 928,965, Aug. 11, 1992. This application Jan. 10, 1994, Ser. No. 258,187

Int. Cl.[6] D21B *1/00*; B27N *3/02*; *3/20*

U.S. Cl. 264—115 **58 Claims**



1. A method of preparing a rigid pressure-formed biocomposite material comprising:

(a) preparing an aqueous legume-based resin having a pH of about 10–14;

(b) combining a fibrous cellulosic material with the aqueous legume-based resin in an amount and manner effective to form discrete biocomposite particles having a moisture content of about 55–75% by weight, a particle size of no greater than about 0.5 inch (1.3 cm), and a ratio of cellulose solids to resin solids of about 0.8:1.0 to 1.5:1.0;

(c) reducing the moisture content of the discrete biocomposite particles to less than about 20% by weight to form dry biocomposite particles;

(d) coating the dry biocomposite particles with a secondary thermosetting binder; and

(e) pressing the coated dry biocomposite particles under an elevated temperature and pressure for a time effective to fuse the particles into a rigid biocomposite pressure-formed material.

5,593,626

METHOD OF FABRICATING MOLDED FILTER ELEMENT

Aisaburo Yagishita, 4-5-2 Shinpocho, Chikusa-ku, Nagoya-shi, Aichi, 464, Japan

Filed Apr. 18, 1994, Ser. No. 228,623

Int. Cl.[6] B29C *39/02*

U.S. Cl. 264—122 **7 Claims**

1. A method of fabricating a molded filter element comprising the steps of:

uniformly mixing together water, a powder-grain adsorbent of 100 parts by weight, an emulsion of synthetic resin binder of 5–20 parts by weight having a film-making capacity at room temperature and an aqueous polymer binder of 0.5–5 parts by weight, thereby forming a wet plastic composition, the amount of the water used being in excess of a quantity sufficient to provide the resulting composition a shape holding property;

pressure-filling said plastic composition in a mold composed of plural members to provide a shaped filter element;

evaporating said water from the plastic composition until said shaped element has a shape-holding strength in a state where at least one member of said mold is removed; and

heat-treating the shaped filter element at a temperature of 100°–160° C. to form the molded filter element.

5,593,627

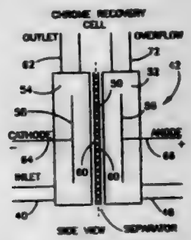
ELECTROLYTIC TREATMENT OF AN ELECTROLYTIC SOLUTION

Jeries I. Bishara, Mentor; James R. Brannan, Perry; Roland J. Horvath, Lyndhurst; Anthony R. Secco, Mentor, and Jean M. Hladen, Chardon, all of Ohio, assignors to Eltech Systems Corporation, Chardon, Ohio

Division of Ser. No. 401,381, Mar. 9, 1995, Pat. No. 5,474,661, which is a continuation of Ser. No. 67,918, May 27, 1993, Pat. No. 5,405,507, which is a continuation-in-part of Ser. No. 799,653, Nov. 29, 1991, Pat. No. 5,246,559. This application Sep. 27, 1995, Ser. No. 534,683

Int. Cl.[6] B27J *5/00*

U.S. Cl. 264—127 **7 Claims**



1. A method of making a diaphragm comprising:

preparing a slurry comprising organic halocarbon polymer fibers along with finely divided inorganic particulates, the ratio of polymer fibers to inorganic particulates comprising 5–70 weight percent polymer fibers to 30–95 weight percent inorganic particulate;

forming a mat of said fibers plus particulates having a thickness in the range of 0.03–3 centimeters and a weight per unit of surface area of about 3–12 kilograms per square meter;

heating said mat of fibers plus particulates at a temperature in the range of 300°–390° C. effective to fuse said fibers together;

compressing the mat of fused fibers plus particulates at a pressure in the range of about one to ten tons per square inch, said compressed mat having a permeability less than 0.03 $mm^{-1}Hg$ at two liters per minute air flow through a 30 inch square area of the mat.

5,593,628

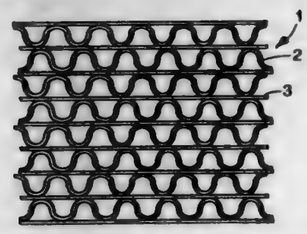
METHOD OF MAKING AN ORTHOPEDIC CASTING ARTICLE COMPRISING AN APERTURED, EXTRUDED SHEET

Matthew T. Scholz, Woodbury; Jason L. Edgar, Bloomington, and Dennis G. Welygan, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 391,111, Feb. 21, 1995, which is a continuation of Ser. No. 48,891, Apr. 16, 1993, abandoned. This application May 24, 1995, Ser. No. 449,585

Int. Cl.[6] B29C *47/92*

U.S. Cl. 264—154 **20 Claims**



1. A method of making a casting tape, comprising the steps of:

charging an extrudable material selected from the group consisting of low temperature thermoplastic polymers and viscous curable resins to an extruder; and

extruding said material through a die to form an apertured sheet, wherein said sheet contains a plurality of apertures and has at least 20 percent aperture volume.

5,593,629

METHOD FOR INCREASED PRODUCTIVITY OF INDUSTRIAL FIBER

Frederick L. Travelute, Charlotte, N.C.; Robert E. Hoffman, Catawba, and Mendel L. Poston, Jr., Pamplico, both of S.C., assignors to Wellman, Inc., Shrewsbury, N.J.

Filed Feb. 22, 1995, Ser. No. 392,033

Int. Cl.[6] D01D *5/24*

U.S. Cl. 264—209.3 **11 Claims**

1. A process for producing industrial denier hollow filaments of a thermoplastic polymer at higher rates of production and while avoiding the use of liquid quenching media, the process comprising:

extruding the liquid polymer in the form of hollow filaments at a throughput and rate of take up that produces individual filaments of greater than about 130 spun denier; and

directing a flow of a gas at the plurality of hollow liquid polymer filaments at a flow rate and temperature that are sufficient to quench and solidify the individual filaments in the absence of any other quenching fluid.

5,593,630

METHOD OF INJECTION MOLDING OF CABLE TIES WITH A MOLD HAVING AN ENHANCED CORE SECTION

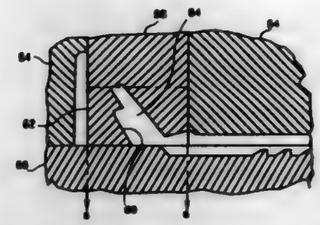
Soren C. Sorensen, San Diego, and Jens O. Sorensen, Rancho Santa Fe, both of Calif., assignors to GB Electrical, Inc., Milwaukee, Wis.

Division of Ser. No. 71,474, Jun. 4, 1993, Pat. No. 5,440,786. This application Apr. 25, 1995, Ser. No. 428,337

Int. Cl.[6] B29C *45/44*; *33/42*

U.S. Cl. 264—219 **2 Claims**

1. A method of injection molding a tie that includes an elongated tongue with two ends and two broad sides, a locking head at one end of the tongue, a tip at the other end of the tongue, a first set of ratchet teeth extending along one broad side of the tongue, and a second set of ratchet teeth on the other broad side of the tongue, wherein the locking head has sides defining an opening for receiving the tip of the tongue, the sides including a movable pawl that is hinged at one side of said opening and an abutment surface that is at least in pan directly opposite across the opening from the pawl, with at least one tooth being disposed on the abutment surface for engaging the second set of ratchet teeth when the tip of the tongue has been inserted through the opening with the second set of ratchet teeth facing eh abutment surface, and wherein the pawl has at least one pawl tooth disposed for engaging the first set of ratchet teeth when the tip of the tongue has been inserted through said opening with the first set of ratchet teeth facing the pawl, the method comprising the steps of



(a) providing a mold that includes mold parts including a cavity in the general shape of the tie, wherein one of the mold parts includes a core section that forms the surface of the pawl that includes the at least one pawl tooth and that forms at least the part of the abutment surface that is directly opposite the at least one pawl tooth;

(b) injecting molten plastic material into the mold cavity;

(c) solidifying the plastic material in the mold cavity to form the tie; and

(d) ejecting the solidified tie from the mold;

wherein step (a) comprises providing said mold in which the core section further forms a notch within the at least one tooth in the part of the abutment surface that is directly opposite the at least one pawl tooth.

5,593,631

METHOD FOR MOLDING RESIN ARTICLES

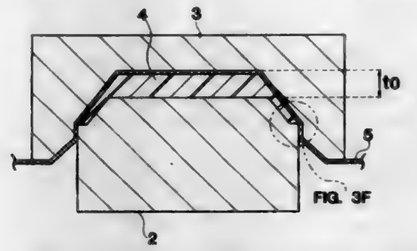
Takahisa Hara, Toyonaka; Masahito Matsumoto, Ibaraki, and Nobuhiro Usui, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 873,885, Apr. 24, 1992, abandoned, which is a division of Ser. No. 545,566, Aug. 29, 1990, abandoned. This application Jan. 5, 1995, Ser. No. 369,256

Claims priority, application Japan, Jun. 30, 1989, 1-170811

Int. Cl.[6] B29C *43/20*

U.S. Cl. 264—257 **10 Claims**



1. A method for molding resin articles comprising the steps of:

providing opposing male and female mold portions, the mold portions being movable between open and closed states;

forming an annular mating gap (W) between the male and female mold portions in the closed state, the annular mating gap (W) being formed by a flange on said female mold

portion which overhangs sidewalls of said male mold portion by a distance (L) in a mold closing direction forming a mating edge therewith;

providing the distance (L) to satisfy the equation

$$(t_1-t_0+10)mm \geq L \geq (t_1-t_0)mm,$$

wherein:

t_1 is a distance (mm) in the mold closing direction between the male and female mold portions when the resin material first reaches the mating edge of the male mold portion, and

t_0 is a distance (mm) in the mold closing direction between the same points on the male and female portions as those used for measuring t_1, when the mold closing is complete;

making the width of the mating gap (W) between the male and female mold portions from 0.25 to 3 times a minimum thickness from which a compressed skin material can return to the original thickness thereof;

placing skin material between the mold portions while the mold portions are in the open state;

supplying a resin material between the mold portions in the open state;

moving the mold portions toward one another from the open state to the closed state;

pressing the skin material against the resin material during the step of moving; and

stopping movement of the mold portions when the mold portions reach the closed state.

5,593,632

METHOD OF MAKING A POROUS FILM

Seiji Kagawa, 1-17-13-601, Honcho, Kawaguchi-shi, Saitama-ken, Japan, assignor to Seiji Kagawa, Japan

Division of Ser. No. 226,373, Apr. 12, 1994, Pat. No. 5,458,951, which is a continuation of Ser. No. 888,850, May 27, 1992, abandoned. This application May 18, 1995, Ser. No. 445,221

Claims priority, application Japan, May 27, 1991, 3-121319; Jan. 13, 1992, 4-4154

Int. Cl.[6] B29C *59/04*

U.S. Cl. 264—284 **8 Claims**

1. A method for manufacturing a porous film having non-through pores by a porous film manufacturing apparatus which comprises:

a perforating unit including a first roll having a surface on which particles having sharp pointed portions and a Mohs hardness value of not less than 5 are deposited at a density of 500 to 200,000 particles/cm^2, and a second roll having smooth surface, said first and second rolls being arranged to oppose each other; and

pressure control means for adjusting a pressure applied to an elongated organic film which is fed between said first and second rolls, the method comprising the steps of:

feeding the elongated organic film between said first and second rolls;

adjusting a force acting on the elongated organic film between said first and second rolls by said pressure control means to be uniform over the entire surface which is brought into contact with each of said first and second rolls;

rotating said first and second rolls in opposite directions to pass the elongated organic film between said first and second rolls and causing said sharp pointed portions of said particles deposited on the surface of said first roll to press into the elongated organic film, thereby forming non-through pores in the elongated organic film at a density of 500 to 200,000 pores/cm^2.

5,593,633

EDGE AND SURFACE BREATHER FOR HIGH TEMPERATURE COMPOSITE PROCESSING

Kenneth M. Dull, 3017 Deer Island Dr., Sumner, Wash. 98390, and Terry L. Schneider, 24156 Falconer Dr., Murrieta, Calif. 92362

Filed May 3, 1990, Ser. No. 518,363

Int. Cl.[6] B29D *9/00*

U.S. Cl. 264—510 **8 Claims**



1. A method of vacuum forming fiber reinforced thermoplastic having a glass transition or melting temperature of at least about 260° C. comprising the steps of laying up one or more pieces of said fiber reinforced thermoplastic of suitable size and shape; stabilizing the positions of said pieces as necessary preparatory to forming; placing one or more caul plates in shape determining relation with said thermoplastic; laying metal mesh adjacent at least one said caul plates; covering all said components with a vacuum-tight bag; sealing said bag; positioning vacuum probes in said sealed bag such that their outlets are adjacent said metal mesh; and heating said bag and its contents to a temperature above the glass transition or melting temperature of said thermoplastic; and drawing a vacuum through the vacuum probes, said metal mesh providing uniform vacuum draw over the thermoplastic and promoting complete consolidation thereof in the desired shape.

5,593,634

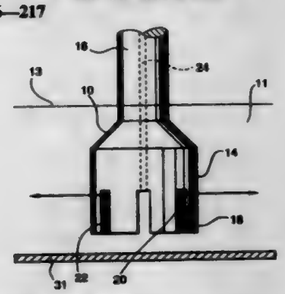
GAS TREATMENT OF MOLTEN METALS

Peter D. Waite, Chicoutimi, and Robert DuMont, Cap de la madeleine, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Division of Ser. No. 191,635, Feb. 4, 1994. This application May 30, 1995, Ser. No. 452,515

Int. Cl.[6] C21C *7/00*

U.S. Cl. 266—217 **9 Claims**



1. An injector for injecting gas into a molten metal, comprising:

a rotor having a projection-free cylindrical side surface, a projection-free and unbroken upper surface, and a bottom surface;

a plurality of openings in said side surface spaced symmetrically around the rotor, said openings occupying an area of said outer surface corresponding to less than 60% of a total area swept by said openings upon rotation of said rotor,

at least one opening in the bottom surface, and

at least one internal passageway for gas delivery and an internal structure for interconnecting said openings in said side surface, said at least one opening in said bottom surface and said at least one internal passageway;

said internal structure in use being at least partially filled with molten metal or metal/gas mixtures, and being adapted to cause gas emanating from said internal passageway to break up into bubbles to form a metal/gas mixture and to cause said metal/gas mixture to issue from said openings in said side surface in a generally horizontal and radial manner, said side surfaces being adapted on rotation of said rotor in said molten metal to cause said gas bubbles to be broken up into finer bubbles,

wherein said internal structure consists of vanes and passageways separating said vanes.

5,593,635

METHOD FOR PERFUMING CONVEYANCES AND PERFUMING ARTICLE THEREFOR

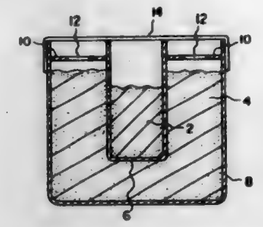
Noritsune Matsumoto, and Kazuo Kamitani, both of Hyogo, Japan, assignors to F. Cube Co. Ltd., Hyogo, Japan

Filed Aug. 3, 1995, Ser. No. 510,865

Claims priority, application Japan, Aug. 5, 1994, 6-204645

Int. Cl.[6] A61L *9/02;9/03*

U.S. Cl. 422—5 **10 Claims**



1. A method of perfuming vehicles, comprising mixing an oily fragrance liquid which emits the scent of a new vehicle, said oily fragrance liquid comprising at least two perfuming ingredients which together are capable of providing the scent of a new vehicle with an organic blowing agent, generating heat around the fragrance liquid inside a vehicle by activating a pyrogenic agent so as to make said blowing agent blow to atomize the fragrance liquid and make the atomized fragrance liquid adhere to the interior of the vehicle, thereby perfuming the vehicle.

5,593,636

METHOD FOR THERMAL CONTROL OF MACROFOULING

Frank L. Putz, 5 Ginger Meadow Ct., Glen Carbon, Ill. 62034

Continuation of Ser. No. 240,337, May 10, 1994, abandoned. This application May 30, 1995, Ser. No. 454,430

Int. Cl.[6] C02F *1/02;* B08B *17/00*

U.S. Cl. 422—6 **8 Claims**

1. A method for treating macroinvertebrate infestations in service water systems while maintaining the normal operational flow of water therethrough and without diverting the water therefrom, comprising the steps of:

raising the temperature of water in a treatment area in a service water system to an elevated temperature using a heater located within the service water system, said treatment area being infested with a plurality of macroinvertebrates, said water being heated as it flows in the direction of its normal operational flow past said heater;

maintaining said elevated temperature in said treatment area for a period of time sufficient to achieve mortality of a substantial portion of said macroinvertebrates.

5,593,637

METHOD AND COMPOSITION FOR DISINFECTING CONTACT LENSES

Mary Mowrey-McKee, Naperville; Kenneth Bilzuk, Lansing, and Ralph Stone, Naperville, all of Ill., assignors to Allergan, Waco, Tex.

Division of Ser. No. 401,847, Mar. 10, 1995, Pat. No. 5,580,186, which is a division of Ser. No. 78,164, Jun. 17, 1993, Pat. No. 5,422,873, which is a continuation-in-part of Ser. No. 634,994, Dec. 27, 1990, abandoned. This application Jan. 26, 1996, Ser. No. 592,750

Int. Cl.[6] A61L *2/00;2/16*

U.S. Cl. 422—28 **20 Claims**

1. A method of disinfecting a contact lens comprising contacting a contact lens with an aqueous solution comprising water, an effective disinfecting amount of a microbicide selected from the group consisting of PHMB, N-alkyl-2-pyrrolidone, chlorhexidine, polyquaternium-1, hexetidine, bronopol, alexidine, from 50 to 200 ppm hydrogen peroxide, ophthalmologically acceptable salts thereof and mixtures thereof; and at least about 0.5 percent (w/v) of a tromethamine component selected from the group consisting of tromethamine, ophthalmologically acceptable salts of tromethamine and mixtures thereof, said contacting occurring for a time sufficient to disinfect said contact lens.

5,593,638

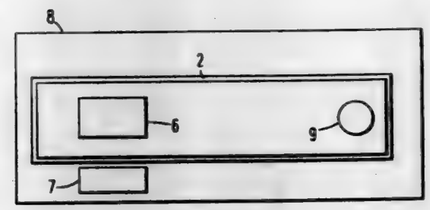
APPARATUS FOR ESTIMATING THE CHANGE IN AN ANALYTE FROM HEMOLYSIS IN A FLUID SAMPLE

Graham Davis, Plainsboro, N.J., assignor to I-Stat Corporation, Princeton, N.J.

Division of Ser. No. 131,527, Oct. 4, 1993, Pat. No. 5,416,026. This application Dec. 20, 1994, Ser. No. 359,595

Int. Cl.[6] G01N *21/01;31/22;33/20;33/72*

U.S. Cl. 422—56 **16 Claims**



1. An apparatus for estimating a change in an analyte in a blood sample which is due to the hemolysis of red blood cells comprising:

(a) a dry separation material to which a portion of said blood sample may be applied and a remainder, said material having physical characteristics effective to separate a fraction of said sample by wicking action, which fraction would essentially be free of red blood cells but would contain a representative amount of any extracellular hemoglobin that may be present in said sample;

(b) a location in said remainder providing means for ascertaining the amount of said extracellular hemoglobin in said fraction; and,

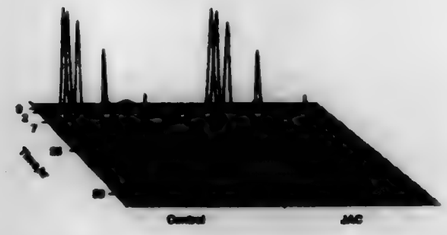
(c) a correlation means for estimating a change in said analyte in said sample from the amount of said extracellular hemoglobin in said fraction.

5,593,639

BLOOD-SAMPLING VESSEL

Kenya Makino; Yoshitaka Yamakawa, both of Tsuchiura; Mitsuhiro Murata, Tsukuba, and Toshio Hayashi, Kyoto, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 26, 1995, Ser. No. 450,144
Claims priority, application Japan, May 26, 1994, 6-136548
Int. Cl.[6] B01L 3/14; A61B 5/14
U.S. Cl. 422—102 6 Claims



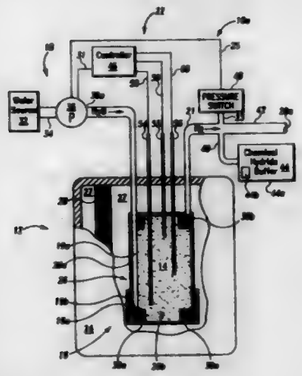
1. A vessel comprising a blood-sampling vessel containing therein an anticoagulating comprising an conjugated diene polymer with a weight average molecular weight, reduced to sodium polystyrene sulfonate, of at least 3,000 and containing 2 mmol/g or more of at least one sulfonic acid group or a salt thereof.

5,593,640

PORTABLE HYDROGEN GENERATOR

Eugene Long, Boulder; Jeff Schmidt, Superior, and Frank Lynch, Conifer, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jun. 7, 1995, Ser. No. 476,729
Int. Cl.[6] B01J 7/02
U.S. Cl. 422—111 54 Claims



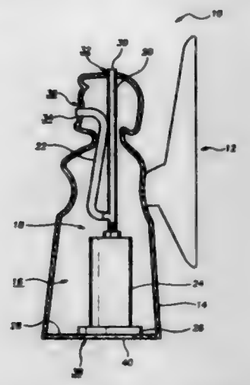
1. A hydrogen generator, comprising:
a thermally isolated container;
a first chemical hydride placed in said thermally isolated container;
heating means for heating said first chemical hydride to a predeterminded temperature;
a water supply for hydrolysis of said first chemical hydride only after said first chemical hydride reaches said predetermined temperature;
buffer means for recovering hydrogen from said container; and
control means for controlling the rate of hydrogen generation by said hydrogen generator.

5,593,641

SCULPTURED AIR FRESHENER DISPENSER

Frederick C. Hornberger, Sr., 62 Flamingo St., New Orleans, La. 70124

Filed Aug. 22, 1995, Ser. No. 517,922
Int. Cl.[6] A61L 9/14; B05B 11/02
U.S. Cl. 422—123 1 Claim



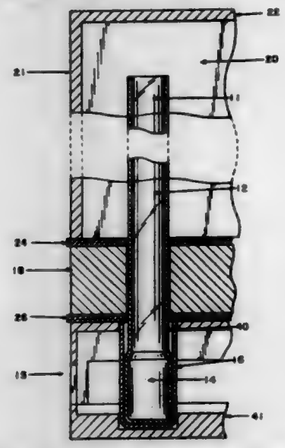
1. A sculptured air freshener dispenser comprising:
a sculptured shell defining an interior cavity and a top opening, a second opening and a third opening in connection with said interior cavity;
a canister of pressurized air freshener having a stem for releasing said air freshener;
a housing defining a chamber therein removably holding said canister, said housing having a base having a base aperture defined therein, said base being adhesively secured to an interior surface of said sculptured shell in a manner such that said base aperture is concentrically aligned with said third opening of said sculptured shell;
said housing having an inner surface defining an L-shaped slot adjacent said base aperture;
said housing having a top section defining a top aperture having said stem of said canister disposed therethrough;
a cap defining a first and second recess, said cap being lockably disposed within said base aperture, said first recess having a bottom portion of said canister disposed therein in a manner to hold said canister in said chamber;
a peg extending perpendicularly from said cap disposed in said L-shaped slot;
a rib extending laterally across said cap within said second recess;
a plunger having a first end passing through said top opening of said sculptured shell, said plunger defining a fluid passage in connection between a first end port and a second port, said first end port being in fluid connection with said stem;
an arm extending substantially perpendicular from said plunger defining said second port;
a U-shaped bracket extending from said top section of said housing, said U-shaped bracket having a first leg, a second leg and a planar member, said planar member defining a hole therethrough concentrically aligned with said top aperture, said hole having a portion of said plunger disposed between said arm and said first end port;
a helical spring positioned over a portion of said plunger located between said arm of said plunger and said planar member of said U-shaped bracket;
a flange connected about said plunger and positioned between said planar member and said first end port;
a flexible hose defining a fluid pathway in connection between an initial end opening in fluid connection with said second port and a terminal end opening disposed through said second opening of said sculptured shell; and
a nozzle in fluid connection with said terminal end opening of said flexible hose for exhausting said air freshener as a mist.

5,593,642

APPARATUS FOR MULTIPLE SIMULTANEOUS SYNTHESIS

Sheila H. H. DeWitt, Dexter, Mich.; John S. Kiely, San Diego, Calif.; Michael R. Pavia, Newton, Mass.; Mel C. Schroeder, Dexter, and Charles J. Stankovic, Saline, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 430,696, Apr. 28, 1995, which is a continuation of Ser. No. 217,347, Mar. 24, 1994, abandoned, which is a division of Ser. No. 12,557, Feb. 2, 1993, Pat. No. 5,324,483, which is a continuation-in-part of Ser. No. 958,383, Oct. 8, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,475
Int. Cl.[6] B01J 19/00;8/00; C12M 1/00; C07K 17/00
U.S. Cl. 422—131 11 Claims



1. An apparatus for multiple, simultaneous synthesis of compounds comprising:
a plurality of reaction tubes, each reaction tube having an upper end and a lower end, said lower ends each having a filter device,
a reservoir member having means for receiving the filter devices on the lower ends of said plurality of reaction tubes,
a holder member removably located adjacent to the reservoir member having a plurality of apertures for supporting said plurality of reaction tubes, and
a manifold member having a central cavity for enclosing the upper ends of said plurality of reaction tubes,
said filter devices each having a lower portion, annular side surface portions and a hollow cavity therein.

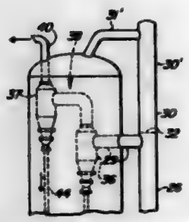
5,593,643

FCC ARRANGEMENT WITH EXTERNALLY SUSPENDED CATALYST SEPARATION ZONE

Ricardo Castillo, Arlington Heights, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 28, 1994, Ser. No. 365,624
Int. Cl.[6] B01J 8/08
U.S. Cl. 422—144 2 Claims

1. An apparatus for the fluidized catalytic cracking (FCC) of an FCC feedstock, said apparatus comprising:
a) a reactor vessel;
b) at least one catalyst separator located in said reactor vessel;
c) an upwardly directed riser conduit located outside said reactor vessel and extending above said reactor vessel;
d) a first transfer conduit for communicating a first locus of said riser conduit with said catalyst separator;
e) a second transfer conduit for communicating a second locus of said riser with said reactor vessel, wherein said second locus is located above said first locus and said second transfer conduit communicates with a portion of said riser located above said reactor vessel.

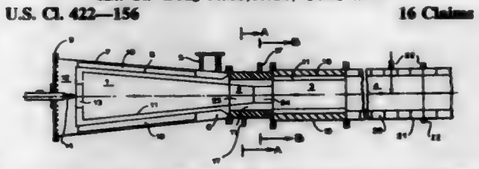


5,593,644

APPARATUS FOR PRODUCING IMPROVED CARBON BLACKS

Don T. Norman, 12410 Piping Rock Dr., Houston, Harris County, Tex. 77077, and Gary L. Marney, 713 Phillips Dr., Dumas, Moore County, Tex. 79029

Division of Ser. No. 419,839, Apr. 11, 1995, which is a continuation of Ser. No. 59,886, May 10, 1993, abandoned, which is a continuation of Ser. No. 647,490, Jan. 28, 1991, abandoned, which is a division of Ser. No. 117,021, Nov. 4, 1987, Pat. No. 4,988,493. This application Jun. 6, 1995, Ser. No. 468,701
Int. Cl.[6] B01J 10/00;19/26; C09C 1/48
U.S. Cl. 422—156 16 Claims



1. In a reactor for producing carbon black which reactor includes a combustion zone, an injection zone, a reaction zone and a quenching zone in series flow communication, the improvement wherein said reactor further includes means for supplying a linear, substantially non-swirling flow of combustion gases into said injection zone, and said injection zone contains multiple and separately controlled feedstock input means which are positioned to supply said feedstock oil into spearte segments of said linear substantially non-swirling flow of combustion gases.

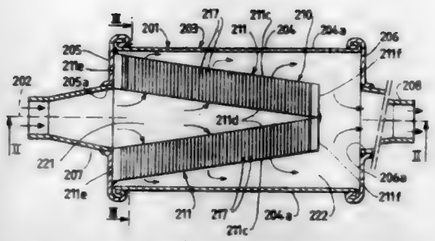
5,593,645

CATALYTIC CONVERTER FOR THE CATALYTIC TREATMENT OF EXHAUST GAS

Pieter D. Steenackers, Heverlee, and Frédéric P. D. F. Petitjean, Jupille-sur-Meuse, both of Belgium, assignors to Scambia Industrial Developments Aktiengesellschaft, Liechtenstein

Filed Apr. 11, 1995, Ser. No. 420,177
Claims priority, application Switzerland, Apr. 11, 1994, 1065/94
Int. Cl.[6] F01N 3/10; B01D 53/92
U.S. Cl. 422—176 38 Claims

1. Catalytic converter for the catalytic treatment of exhaust gas, comprising a housing and catalyst means arranged therein, an inner cavity located at least partially between regions of the catalyst means, and an outer cavity located between the catalyst means and at least a part of the housing, the catalyst means having at least two packets of sheet metal members which bound passages leading from the inner cavity to the outer cavity,
wherein each of the two packets has pairs of adjacent sheet metal members, at least one sheet metal member of each pair of the adjacent sheet metal members having protuberances,
wherein, sheet metal members belonging to the same packet define osculating surfaces which abut said sheet metal mem-



bers and extend parallel to one another, the passages bounded by the packets leading away from the inner cavity on different sides of the inner cavity,

wherein the housing further comprises an inlet having an inner space and an orifice leading into the inner cavity, and an outlet having an inner space connected to the outer cavity, the inner space of the inlet having, at the orifice, essentially a same cross-sectional shape and essentially same cross-sectional dimensions as the inner cavity at the orifice, and

wherein the inner cavity has at least one free region which borders the catalyst means and cross-sectional area of which decreases, in a direction away from the inlet, essentially along an entire dimension of the free region, which is taken in the direction away from the inlet, essentially linearly.

5,593,646

METHOD FOR PRODUCING AN EXHAUST GAS CLEANING METAL CARRIER

Yoshikazu Koshiba; Yasuhide Kuroda; Yukio Aoki; Tsuyoshi Minakata, and Masaru Iizuka, all of Tokyo, Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

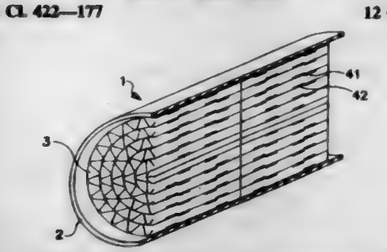
PCT No. PCT/JP94/00919, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO94/29062, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 7, 1994, Ser. No. 381,822

Claims priority, application Japan, Jun. 7, 1993, 5-135699; Dec. 27, 1993, 5-332805; Dec. 27, 1993, 5-332806; Dec. 27, 1993, 5-332807

Int. Cl.[6] B01D *50/00*

U.S. Cl. 422—177 **12 Claims**



1. A method for producing an exhaust gas cleaning metal carrier in the form of a metal honeycomb core body formed by winding a stack of a flat plate and a corrugated plate, with the core being inserted into a metal outer cylinder, said method comprising

conveying a corrugated plate having peaks on each opposed surface thereof through a slurry coating zone;

applying to the peaks of corrugations on each of the opposed surfaces of the corrugated plate while the corrugated plate is being conveyed through the slurry coating zone a plurality of parallel rows of spots or stripes of slurry comprising powder-formed solder material and binder, such that each parallel row on one surface is offset with respect to the next adjacent parallel row on the opposed surface, and while controlling the amount of slurry such that the thickness of the solder material in the to be soldered portions of the flat plate and corrugated plate is 100 μm or less;

stacking the slurry coated corrugated plate and a flat plate;

winding the stack to form the metal honeycomb core body;

coating a slurry comprising powder-formed solder material and binder in the form of a plurality of stripes on an inner wall surface of the metal outer cylinder, said stripes being offset from an end face of the metal honeycomb core body a distance corresponding to more than 5% of the length of the metal honeycomb core body;

pressing the metal honeycomb core body into the metal outer cylinder; and

joining the core body and outer cylinder by soldering the applied stripes of solder.

5,593,647

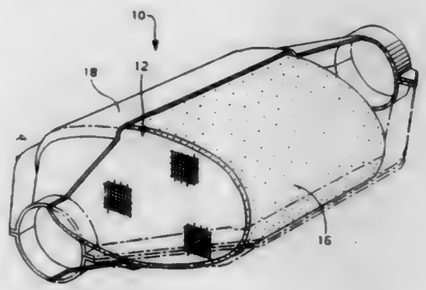
CATALYTIC CONVERTER HAVING TRI PRECIOUS METAL CATALYSTS

Charles W. Kirby, Northville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1995, Ser. No. 414,839

Int. Cl.[6] F01N *3/10*; B01D *53/34*

U.S. Cl. 422—180 **5 Claims**



1. A product comprising:

a catalytic converter for use in a vehicle including a substrate having cells defined therein, and a dual coating catalyst system coated on the substrate;

said dual coating catalytic system having a first layer coated on the substrate, said first layer comprising a metal catalyst consisting essentially of Pd; and a second layer applied to said first layer, said second layer comprising a metal catalyst consisting essentially of Pt and Rh; and wherein said first and second layers have a mass ratio ranging from about 3:1 to about 1.25:1.

5,593,648

CHILD-RESISTANT DISPENSING DEVICE FOR AUTOMATIC WASHING MACHINES

Julie A. Christie, Newcastle upon Tyne, and Brian E. Talkes, Northumberland, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

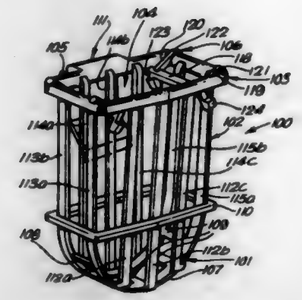
Filed Jun. 29, 1995, Ser. No. 496,783

Claims priority, application United Kingdom, Jul. 9, 1994, 9413874

Int. Cl.[6] B01F *1/00*

U.S. Cl. 422—266 **18 Claims**

1. A liquid permeable dispensing device for a tableted automatic washing machine detergent composition, said device comprising a liquid permeable container having an opening for receiving a detergent tablet to be dissolved, and a liquid permeable body portion for holding a detergent tablet therewithin, and further comprising a restraint adjacent to said opening, said restraint having an original position which at least partially obstructs said opening and being attached to said container such that it can be selectively deflected



to allow a detergent tablet to be moved through said opening, wherein said restraint substantially returns to its original position after deflection to restrict removal of a detergent tablet in said body portion through said opening.

5,593,649

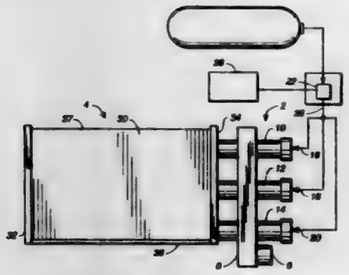
CANISTER WITH PLASMA GAS MIXTURE FOR STERILIZER

Jim Fisher, Hawthorne, Ill.; Bryant A. Campbell, deceased, late of Los Gatos, Calif., and Kern A. Moulton, Reno, Nev., assignors to Abtox, Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 213,613, Mar. 21, 1994, Pat. No. 5,472,664, which is a continuation-in-part of Ser. No. 73,653, Jun. 7, 1993, Pat. No. 5,413,759, which is a continuation of Ser. No. 817,714, Jan. 7, 1992, abandoned, which is a division of Ser. No. 576,292, Aug. 31, 1990, Pat. No. 5,115,166, which is a continuation-in-part of Ser. No. 475,602, Feb. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 321,483, Mar. 8, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 462,982

Int. Cl.[6] A61L *9/00*

U.S. Cl. 422—305 **3 Claims**



2. A sterilization apparatus, comprising:

means for sterilizing articles with a neutral active species of a gas plasma generated from a gas mixture; and,

a gas mixture operably connected to the sterilizing means such that gases from the gas mixture can be supplied to the sterilizing means, the gas mixture being pressurized to between about 2200 psig to about 2500 psig, the gas mixture comprising about 2.0 to 2.4 (v/v) percent hydrogen and about 2.6 to 3.0 (v/v) percent oxygen, and the rest one or more noble gas(es).

5,593,650

METHOD FOR PRODUCING A HIGH-DENSITY SALINE CESIUM AND RUBIDIUM SOLUTION

Horst Prinz, Friedberg; Hartmut Hofmann, Bad Soden; Klaus Köbele, Dietzenbach, and Marion Wegner, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP93/03143, § 371 Date Jul. 17, 1995, § 102(e) Date Jul. 17, 1995, PCT Pub. No. WO94/11303, PCT Pub. Date May 26, 1994

PCT Filed Nov. 10, 1993, Ser. No. 436,260

Claims priority, application Germany, Nov. 11, 1992, 42 37 954.7

Int. Cl.[6] C22B *26/00*

U.S. Cl. 423—283 **24 Claims**

1. A method of making a high density saline cesium and rubidium solution, said method comprising the steps of:

a) comminuting at least one mineral selected from the group consisting of uncalcined pollucite and calcined lepidolite to a grain size of less than 0.1 mm to form a comminuted material;

b) combining the comminuted material formed in step a) in the presence of water with $Ca(OH)_2$ at a mol ratio of SiO_2 to CaO of not less than 1:2;

c) hydro-thermally decomposing the combined comminuted material from step 6 at a temperature of 200° to 280° C., a pressure of 20 to 40 bar and with a suspension density of 4 to 15% by weight for a time period of one to three hours to form a suspension containing insoluble solids;

d) filtering the insoluble solids from the suspension formed in step c) and washing the insoluble solids to form a filtrate;

e) blowing carbon dioxide into the filtrate to precipitate calcium carbonate and lithium carbonate;

f) filtering the filtrate containing the precipitated calcium carbonate and lithium carbonate to form a remaining solution and solid carbonates; and

g) adding an acid or acid anhydride to the remaining solution until the pH of the remaining solution reaches about 6 and then evaporating the pH adjusted remaining solution to form the high density saline cesium and rubidium solution.

5,593,651

CONVERSION OF SO_2 GASEOUS EFFLUENTS INTO SOLUTIONS OF AMMONIUM OR ALKALI/ALKALINE EARTH METAL BISULFITES

Jean-Yves Chane-Ching, Rambouillet; Gerard Hustache, Rousillon, and Jean-Louis Sabot, Lafflite, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Mar. 16, 1995, Ser. No. 404,926

Claims priority, application France, Mar. 16, 1994, 94 03108

Int. Cl.[6] C01B *17/00*

U.S. Cl. 423—242.1 **20 Claims**

1. A process for the treatment of a gaseous effluent containing oxygen and no greater than 2% by volume of sulfur dioxide which comprises the steps of:

(1) absorbing said gaseous effluent in a solution of ammonium sulfite and bisulfite or an alkali metal sulfite and bisulfite or an alkaline earth metal sulfite and bisulfite wherein the solution is at a pH of 5 to 7; and

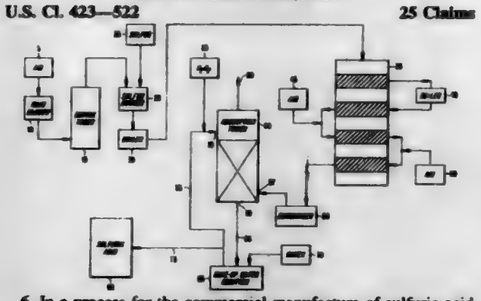
(2) contacting the solution thus produced with a gaseous feed-stream containing oxygen and greater than 2% by volume of sulfur dioxide, the O_2/SO_2 ratio by volume thereof being less than 5, whereby said sulfur dioxide in the gaseous effluent is absorbed to produce a solution of ammonium bisulfite or an alkali metal bisulfite or an alkaline earth metal bisulfite.

5,593,652

METHOD FOR INCREASING THE PRODUCTION CAPACITY OF SULFURIC ACID PLANTS AND PROCESSES

Peter H. Peng, Lakeland, Fla., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Jun. 28, 1995, Ser. No. 495,396
Int. Cl.[6] C01B 17/69; 17/20
U.S. Cl. 423—522 25 Claims



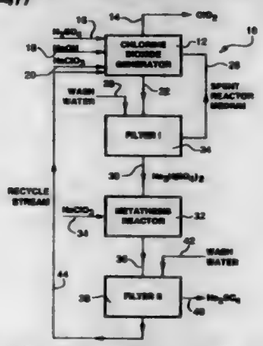
6. In a process for the commercial manufacture of sulfuric acid in a sulfuric acid manufacturing plant in which a sulfur dioxide containing gas and an oxygen-containing gas are reacted in a catalytic oxidation zone into a mixture comprising sulfur trioxide and sulfur dioxide having a volume ratio of SO_3 to SO_2 greater than 1, which process comprises introducing said mixture of sulfur trioxide and sulfur dioxide into an SO_3 absorber containing an aqueous sulfuric acid medium possessing an H_2SO_4 concentration greater than 90%; the improvement which comprises introducing 1 to 25 parts of a peroxide compound per million parts of said aqueous sulfuric acid medium into said SO_3 absorber; absorbing sulfur trioxide in said medium to produce H_2SO_4; dissolving and oxidizing the sulfur dioxide in said medium to produce additional sulfuric acid, reducing the SO_2 concentration in said mixture such that the sulfur dioxide content in the remaining gas phase is maintained at a concentration of less than 4 lb SO_2 per short ton of H_2SO_4 produced; and removing a stream of sulfuric acid and a stream of emission gas from said absorber.

5,593,653

METATHESIS OF ACIDIC BY-PRODUCT OF CHLORINE DIOXIDE GENERATING PROCESS

Herbert C. Scribner, Mouroe, La.; Maurice C. J. Fredette, Mississauga; Edward J. Bechberger, Etobicoke, and Chunmin Pu, Mississauga, all of Canada, assignors to Sterling Canada, Inc., Houston, Tex.

Continuation of Ser. No. 973,760, Nov. 9, 1992, abandoned. This application Aug. 23, 1994, Ser. No. 294,604
Int. Cl.[6] C01D 5/00; C01B 11/02
U.S. Cl. 423—477 75 Claims



1. A process for the conversion of sodium sesquisulfate to neutral anhydrous sodium sulfate, which consists of:

contacting said sodium sesquisulfate in solid crystalline form with an aqueous medium consisting of about 0.01 to about 7 molar sodium chlorate for a time and at a temperature at least sufficient to effect conversion of said solid crystalline sodium sesquisulfate to neutral anhydrous sodium sulfate at least partially in solid crystalline form and to form an aqueous acid-containing medium having a total acid normality of up to about 6.5 normal.

5,593,654

PREPARATION OF STABILIZED ALUMINA HAVING ENHANCED RESISTANCE TO LOSS OF SURFACE AREA AT HIGH TEMPERATURES

Lewis B. Decker, Jr., Lago Vista, and Kevin J. McLaughlin, Austin, both of Tex., assignors to CONDEA Vista Company, Houston, Tex.

Continuation of Ser. No. 145,652, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 849,882, Mar. 12, 1992, abandoned. This application Feb. 22, 1995, Ser. No. 392,029
Int. Cl.[6] C01F 7/02
U.S. Cl. 423—625 11 Claims

1. A process for preparing stabilized alumina comprising:

forming a gel of a treated boehmite alumina, said gel containing from about 15 to about 55 percent-by-weight Al_2O_3, said treated boehmite alumina being obtained by hydrothermally treating an aqueous mixture of precursor boehmite alumina and acid for a period of time sufficient to convert the greater portion of said precursor boehmite alumina to a colloidal sol of treated boehmite alumina having a pH of above about 4;

subjecting said gel to a sufficient shearing force at a temperature of from ambient to about 100° C. for a sufficient period of time to increase the pore volume of said treated boehmite alumina in said gel by at least 30% and the median pore radius of said treated boehmite alumina in said gel by at least 20% over that of said boehmite alumina in said gel prior to shearing and produce a worked boehmite alumina; and

adding a stabilizer to said boehmite alumina, said stabilizer being selected form the group consisting of an oxide of barium, an oxide of a lanthanide metal, a compound of barium that is converted to an oxide upon heating at an elevated temperature, a compound of a lanthanide metal that is converted to an oxide upon heating at an elevated temperature, and mixtures thereof, said stabilizer being added in an amount sufficient to enhance resistance to loss of surface area of a calcined alumina produced from said worked boehmite alumina.

5,593,655

PROCESS FOR PREPARING A LARGE MOLECULAR SIEVE

Hermanus Jongkind; Martijn A. Van Koten; Alain Seive, and Willem H. J. Stork, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1995, Ser. No. 437,727
Claims priority, application European Pat. Off., May 10, 1994, 94201325
Int. Cl.[6] C01B 39/00
U.S. Cl. 423—702 11 Claims

1. A process for the preparation of a large-pore molecular sieve having in its calcined state an X-ray diffraction pattern with at least one peak at a d-spacing of at least 1.8 nanometers, comprising crystallizing the molecular sieve from a starting mixture at a pH in the range of from 3 to 8, and recovering a large-pore molecular sieve, the said starting mixture having a molar composition satisfying the following molar ratios:

$$(0.01\text{–}2)R_{2/n}O:(0\text{–}1.5)M_{2/m}O:(0\text{–}0.5)X_2O_3:1YO_2:(5\text{–}1000)H_2O:(0.01\text{–}3)F^-,$$

wherein n and m are the weighted average valences of R and M respectively, M is an alkali- or alkaline earth metal, X is a trivalent metal and Y is a tetravalent element, wherein R comprises at least one main organic template R_m having the formula $R_1R_2R_3R_4Q^+$ wherein Q is nitrogen or phosphorus, wherein at least one and at most three of R_1, R_2, R_3 and R_4 is an aryl or alkyl group having 6 to 36 carbon atoms and each of the remainder of R_1, R_2, R_3 and R_4 is selected from hydrogen and an alkyl group having 1 to 5 carbon atoms, and wherein the fluorine source is selected from the group consisting of HF, NH_4F and mixtures thereof.

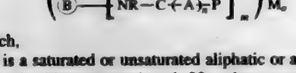
5,593,656

METAL-BINDING TARGETED POLYPEPTIDE CONSTRUCTS

Benjamin A. Belinka, Jr., Kendall Park; Daniel J. Coughlin, Robbinsville, both of N.J.; Vernon L. Alvarez, Morrisville, Pa., and Richard Wood, Rocky Hill, N.J., assignors to Cytogen Corporation, Princeton, N.J.

Division of Ser. No. 127,351, Sep. 28, 1993, Pat. No. 5,449,761. This application Jun. 7, 1995, Ser. No. 487,221
Int. Cl.[6] A61K 51/00; A61M 36/14
U.S. Cl. 424—1.69 10 Claims

1. A method of obtaining an image of an internal region of a subject comprising administering to a subject an effective amount of the complex of the formula (II):



(II)

in which,

"B" is a saturated or unsaturated aliphatic or aromatic hydrocarbon backbone comprises 1–20 carbon atoms and, optionally, one or more heteroatoms selected from the group consisting of nitrogen, oxygen, phosphorus and sulfur;

"P" is a polypeptide comprising 2–100 amino acids, said polypeptide capable of targeting particular cells, tissues or organs of the body;

"A" may be the group —NR'—NR'— or the group —NR'—NR"—L— in which L may be an aliphatic or aromatic linker group comprising 1– 12 carbon atoms and, optionally, one or more heteroatoms selected from the group consisting of nitrogen, oxygen, phosphorus and sulfur;

R, R', R" may be the same or different and may be hydrogen or an aliphatic group comprising 1–6 carbon atoms and, optionally, one or more heteroatoms selected from the group consisting of nitrogen, oxygen, phosphorus and sulfur; and

m is an integer≧2, provided that the groups R, R', R", L and "P" of a given chain may be the same or different from the groups R, R', R", L and "P" or another chain;

n is an integer≧0≦2;

o is an integer≧1≦m;

"M" is a metallic moiety;

or a pharmaceutically acceptable salt thereof in which said metallic moiety is radioactive, and recording the scintigraphic image obtained from the decay of said radioactive metallic moiety.

5,593,657

BARIUM SALT FORMULATIONS STABILIZED BY NON-IONIC AND ANIONIC STABILIZERS

Stephen B. Ruddy, Schwenkville; W. Mark Eickhoff, Downingtown; Gary Liversidge, West Chester, and Mary E. Roberts, Downingtown, all of Pa., assignors to NanoSystems L.L.C., Collegeville, Pa.

Filed Feb. 9, 1995, Ser. No. 386,027
Int. Cl.[6] A61K 49/04
U.S. Cl. 424—9.41 22 Claims

1. A composition of matter, free of iodinated compounds, comprising:

nanoparticles of a barium salt having associated with the surface thereof a combination of a non-ionic and an anionic stabilizer.

5,593,658

MEDICAL COMPOSITIONS

Alexei A. Bogdanov, Newton, and Thomas J. Brady, Winchester, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 940,590, Sep. 4, 1992, abandoned. This application May 27, 1994, Ser. No. 250,635
Int. Cl.[6] A61B 5/055
U.S. Cl. 424—9.34 32 Claims

1. A biocompatible medical composition comprising:

a non-polysaccharide polymeric carrier;

a plurality of protective chains linked to said polymeric carrier, wherein each protective chain is at least 500 Daltons; and

a reporter group linked to said carrier and not linked to said protective chain, wherein said reporter group is a complexone or a therapeutic agent, and both said carrier and said reporter group are protected by said protective chains from contact with macromolecules other than in said composition.

5,593,659

MRI IMAGE ENCHANCEMENT OF BONE AND RELATED TISSUE USING COMPLEXES OF PARAMAGNETIC CATIONS AND POLYPHOSPHONATE LIGANDS

Harry S. Winchell, Lafayette, Calif.; Joseph Y. Klein, Haifa, Israel; Elliot D. Simhon, Haifa, Israel; Rosa L. Cyjon, Haifa, Israel; Ofer Klein, Haifa, Israel, and Haim Zaklad, Haifa, Israel, assignors to Concat, Ltd., Concord, Calif.

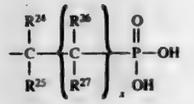
Division of Ser. No. 346,868, Nov. 29, 1994, which is a division of Ser. No. 96,141, Jul. 22, 1993, Pat. No. 5,380,515, which is a division of Ser. No. 757,880, Sep. 11, 1991, Pat. No. 5,236,695, which is a continuation-in-part of Ser. No. 441,144, Nov. 27, 1989, abandoned. This application May 30, 1995, Ser. No. 453,425
Int. Cl.[6] A61B 5/055
U.S. Cl. 424—9.363 31 Claims

1. A pharmaceutical agent comprising a chromatographically distinct, physiologically compatible salt of a chelate of a paramagnetic metal cation and a compound having the formula



in which:

the R^{21} moieties are each independently



in which R^{24}, R^{25} and R^{26} are independently selected from the group consisting of H and alkyl and aryl groups which do not interfere with complexation; R^{27} is selected from the group consisting of H, OH, NH_2, and alkyl and aryl groups which do not interfere with complexation; and x is zero or 1;

the R^{22} moieties are each independently selected from the group consisting of H and alkyl and aryl groups which do not interfere with complexation; and

the R^{23} moieties are each independently selected from the group consisting of H and alkyl and aryl groups which do not interfere with complexation.

5,593,660

CASCADE POLYMERS WITH IODOAROMATIC COMPOUNDS

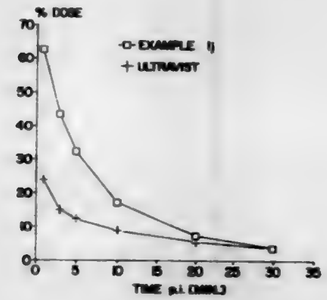
Werner Krause; Franz-Karl Maier; Michael Bauer; Gabriele Schuhmann-Giampieri, and Wolf-Rüdiger Press, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Dec. 21, 1994, Ser. No. 360,934

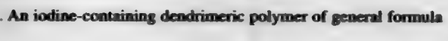
Claims priority, application Germany, Dec. 22, 1993, 43 44 464.4

Int. Cl.[6] A61K *49/04*

U.S. Cl. 424—9.451 **27 Claims**



1. An iodine-containing dendrimeric polymer of general formula I



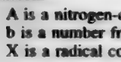
$$A—(X)_b \qquad (I),$$

wherein

A is a nitrogen-containing nucleus of basic multiplicity b;

b is a number from 1 to 8;

X is a radical composed of

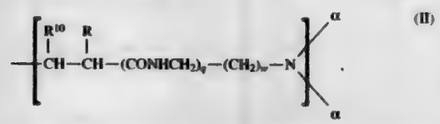


$$\sum_{k=0}^{n-1} 2^k$$

reproduction units S having at most 2^n imaging radicals Z;

n represents the number of generations and is a number from 1 to 10;

S is a radical of formula II



$$\left[\begin{array}{l} R^{10} \quad R \\ | \quad\quad | \\ —CH—CH—(CONHCH_2)_q—(CH_2)_w—N \end{array}\right]^{\alpha}_{\alpha} \qquad (II)$$

R and R^{10}, independently of one another, are each a hydrogen atom or a methyl group,

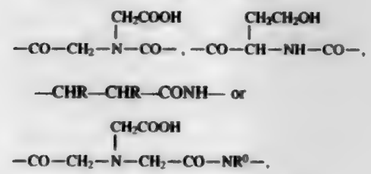
w is 1 or 2,

q is 0 or 1, and

positions α for each generation up to n−1 is, in each case, occupied by a further reproduction unit S, and for n-th generation is in each case, occupied by a radical Z or by radical $—(CO)_q—U—COOH$, in which q has the above-indicated meaning and U stands for a direct bond or an alkylene chain with up to 6 C atoms, which is optionally interrupted by 1–2 oxygen atoms and/or optionally substituted by 1–4 hydroxy groups and/or 1–2 carboxy groups, provided that at most 20% of positions α in the n-th generation are occupied by $—(CO)_q—U—COOH$;

Z is an imaging radical Y—B, which contains at least one aliphatic carboxy, aliphatic sulfo or aliphatic phosphono group, and is made up of a linking element Y and a triiodoaromatic group B;

Y is —CO—, —CONH— —CSNH—,



$$—CO—CH_2—N(CH_2COOH)—CO—, \quad —CO—CH(CH_2CH_2OH)—NH—CO—,$$

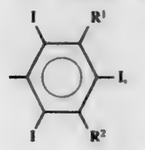
$$—CHR—CHR—CONH— \text{ or}$$

$$—CO—CH_2—N(CH_2COOH)—CH_2—CO—NR^0—,$$

wherein R has the above-mentioned meaning;

R^0 is a hydrogen atom, methyl or carboxymethyl;

B is a benzene ring of the formula



R^1 and R^2, independently of one another, are each a hydrogen atom, $—CONR^3R^4$ or $—NR^6COR^5$;

R^3 and R^4, independently of one another, are each a hydrogen atom, a straight-chain or branched-chain or cyclic alkyl group with up to 12 C atoms optionally substituted by 1–5 hydroxy and/or 1–3 C_1–C_3 alkoxy and/or 1–3 carboxy, sulfo or phosphono group(s), or R^3 and R^4 together with the nitrogen atom, are a 5- or 6-membered ring optionally containing an oxygen atom, SO_2 group or $N—CO—R^7$;

R^7 is a carboxy group or an alkyl group with up to 12 C atoms optionally containing 1–5 hydroxy, 1–3 C_1–C_3 alkoxy or 1–3 carboxy, sulfo or phosphono group(s);

R^5 is a carboxy group, an alkyl group with up to 12 C atoms optionally interrupted by an oxygen atom and/or optionally substituted by 1–3 carboxy, sulfo or phosphono and/or 1–5 hydroxy and/or 1–3 C_1–C_3 alkoxy group(s); and

R^6 is a hydrogen atom, an alkyl group with up to 12 C atoms optionally substituted by 1–3 carboxy, sulfo or phosphono group(s) and/or optionally substituted by 1–3 hydroxy group(s) and/or 1–3 Ch_1–C_3 alkoxy groups;

wherein reproduction units S must be identical only within a generation;

or a physiologically acceptable salt thereof with organic and/or inorganic bases, amino acids or amino acid amides.

5,593,661

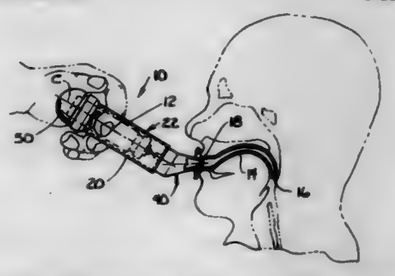
LIDOCAINE AEROSOL ANAESTHETIC

Richard A. Henry, 7 Toronto Street, Kingston, Ontario, Canada

Continuation of Ser. No. 216,476, Mar. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 38,930, Mar. 29, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 405,930

Int. Cl.[6] A61K *9/12*

U.S. Cl. 424—45 **6 Claims**



1. An aerosol-dispensable topical anaesthetic composition consisting of lidocaine free base dissolved in a propellant selected from the group consisting of 1,1,1,2-tetrafluoroethane and 1,1,1,2,3,3,3-heptafluoropropane, or a combination thereof, the percentage of lidocaine free base by weight of the composition being at least 1%.

5,593,662

MOISTURIZING LIPSTICK COMPOSITIONS

George E. Deckner, Cincinnati, Ohio; Crystal Turner, Baltimore, Md.; Sharron Hunter, Dallas, Tex., and Kim Watts-McMillan, Owings Mills, Md., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 947,874, Sep. 21, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 274,113

Int. Cl.[6] A61K *7/025;7/00*

U.S. Cl. 424—64 **17 Claims**

1. A moisturizing lipstick essentially free of water comprising:

a. from about 30% to about 80% lipophilic materials wherein about 20% to about 90% is a liquid selected from the group consisting of hydrocarbon oils, fatty acid esters, fatty alcohols and mixtures thereof, from about 10% to about 80% is a solid selected from the group consisting of fatty alcohols, fatty acids esters, waxes having melting points from about 55° C. to about 110° C., and mixtures thereof;

b. from about 2% to about 20% hydrophilic moisturizer dispersed in the lipophilic materials selected from the group consisting of polyhydric alcohols, ethoxylated polyols, propoxylated polyols, polysaccharides and mixtures thereof;

c. from about 5% to about 15% of a colorant;

d. from about 2% to about 20% of a coupling agent selected from the group consisting of glyceryl esters of fatty acid esters, phospholipids, glyceryl monoalkanoates, glyceryl monoalkenoates, sucrose esters, sorbitan fatty alcohol mono esters, polyglyceryl esters, beeswax wherein free fatty acids are removed, and mixtures thereof; and

e. other ingredients selected from the group consisting of skin conditioning agents, stabilizers, preservatives and mixtures thereof.

5,593,663

ANTIPERSPIRANT MATERIALS AND COMPOSITIONS

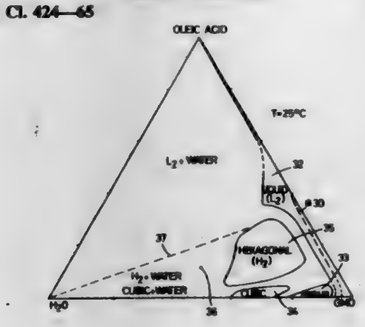
Francis J. Leng, Gayton, and David T. Parrott, Birkenhead, both of United Kingdom, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Continuation of Ser. No. 975,309, Nov. 12, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 339,378

Claims priority, application United Kingdom, Nov. 12, 1991, 9123978; Nov. 12, 1991, 9123979

Int. Cl.[6] A61K *7/32*

U.S. Cl. 424—65 **5 Claims**



1. An antiperspirant composition suitable for topical application to human skin comprising an antiperspirant active which comprises an amphiphilic material in an amount of from 5 to 100% by weight of the composition, the amphiphilic material having a solubility in water at 35° C. of less than about 0.1% by weight and being one which forms, at a temperature in the range of 30°–40° C., upon contact with perspiration, water-insoluble liquid crystal structures selected from the group consisting of liquid crystal structures which have three-dimensional periodicity, liquid crystal structures which have two-dimensional periodicity, and mixtures thereof.

5,593,664

ANTIANGIOGENIC OLIGOMERS

Paul S. Wright, Cincinnati, and Alan J. Bitonti, Maineville, both of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

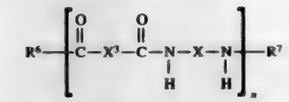
PCT No. PCT/US93/06792, § 371 Date Apr. 5, 1995, § 102(e) Date Apr. 5, 1995, PCT Pub. No. WO94/04165, PCT Pub. Date Mar. 3, 1994

Continuation of Ser. No. 55,950, Apr. 30, 1993, abandoned, which is a continuation of Ser. No. 932,111, Aug. 19, 1992, abandoned. This PCT application Jul. 20, 1993, Ser. No. 379,466

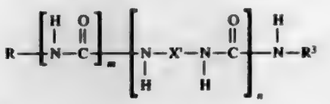
Int. Cl.[6] A61K *31/785;31/795*

U.S. Cl. 424—78.08 **18 Claims**

1. A method of inhibiting angiogenesis in a patient in need thereof which comprises administering to the patient an antiangiogenic amount of an anionic polyamide or polyurea oligomer of formulae 1a and 1b, respectively,



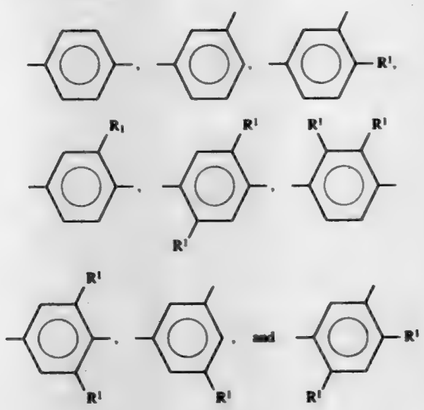
$$R^6—\left[\begin{array}{l} O \quad\quad O \\ \| \quad\quad \| \\ C—X^3—C—N—X—N \\ \quad\quad\quad\quad | \quad | \\ \quad\quad\quad\quad H \quad H \end{array}\right]_n —R^7 \qquad 1a$$



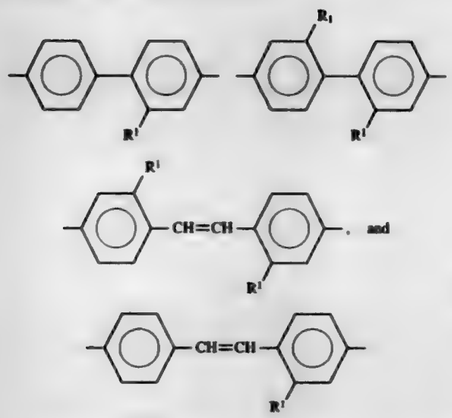
$$R—\left[\begin{array}{l} H \quad O \\ | \quad\quad \| \\ N—C \end{array}\right]_m \left[\begin{array}{l} \quad\quad\quad O \quad\quad H \\ \quad\quad\quad\quad \| \quad\quad | \\ N—X'—N—C—N—R^3 \\ | \quad\quad | \quad\quad\quad | \\ H \quad\quad H \end{array}\right]_n \qquad 1b$$

wherein

X and X^3 each independently represent either a phenylene group of the formulae

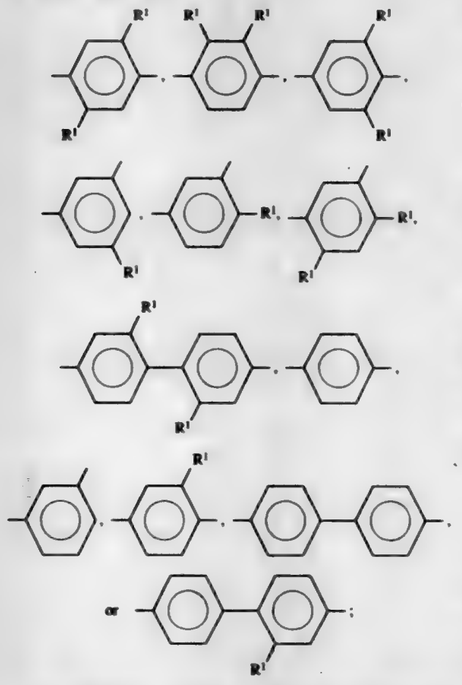


or a biphenylene group of the formula



with the proviso that in a compound of formula Ia at least one of X and X^3 must be a biphenylene moiety;

X" is a group of the formulae



m is an integer 0 or 1, with the proviso that in a compound of formula Ib when m is 0, R is a hydrogen atom;

X' can be selected from any of the phenyl or biphenyl groups of X and X^3;

n is an integer of from 3 to 50;

R represents a hydrogen atom, a C_1-C_4 alkyl group, a phenyl group, or a phenyl group optionally substituted with 1 or 2 substituents selected from $—SO_3R^2$, $—CO_2R^2$, $—PO_3(R^2)_2$, or $—OPO_3R^2$ and optionally substituted with from 1 to 3 substituents selected from chloro, bromo, or C_1-C_4 alkyl;

R^1 represents $—SO_3R^2$, $—CO_2R^2$, $—PO_3(R^2)_2$, or $—OPO_3R^2$;

R^2 represents a hydrogen atom or a pharmaceutically acceptable cation;

R^3 represents —R or $—X"—NH_2$, where R and X" are defined as before;

R^6 represents $H_2N—X"—NH—$, $R^2O—$, RNH—, or $R—C(=O)—NH—X"—NH—$; and

R^7 represents a hydrogen atom, $R^2O—C(=O)—X"—C(=O)—$, $R—C(=O)—$, or $RNH—C(=O)—X"—C(=O)—$.

5,593,665

PHARMACEUTICAL COMPOSITIONS

Rolf W. Pfirrmann, Lucerne, and Peter Geistlich, Stansstad, both of Switzerland, assignors to Ed Geistlich Söhne AG für Chemische Industrie, Wolhusen, Switzerland

Continuation of Ser. No. 46,933, Apr. 13, 1993, abandoned, which is a continuation of Ser. No. 778,988, Nov. 14, 1991, abandoned. This application May 17, 1994, Ser. No. 243,739

Claims priority, application United Kingdom, Mar. 15, 1990, 9005856

Int. Cl.[6] A61K *45/05*

U.S. Cl. 424—85.1 **8 Claims**

1. In combination: tumour necrosis factor (TNF) and a member selected from the group consisting of taurolidine, taurultam and a mixture thereof, for simultaneous, seperate or sequential use for treatment of patients suffering from medical coaditions mediated by TNF.

5,593,666

METHODS AND COMPOSITIONS FOR TREATING THROMBOCYTOPENIA

Ted P. McDonald, Knoxville, Tenn., assignor to The University of Tennessee Research Corp., Knoxville, Tenn.

Continuation-in-part of Ser. No. 291,376, Aug. 16, 1994, abandoned. This application Oct. 27, 1994, Ser. No. 330,517

Int. Cl.[6] A61K *45/05;38/00;* C07K *1/00*

U.S. Cl. 424—85.1 **27 Claims**

1. A method of increasing platelet cell counts in a patient in need thereof which comprises administering to the patient a therapeutic composition comprising a therapeutic amount of a C-terminal fragment of thrombopoietin and a pharmaceutically acceptable carrier, said therapeutic amount being sufficient to increase platelet cell counts in said patient by at least about 20% above a baseline count within about 2 to 4 days after C-terminal fragment administration.

5,593,667

RECOMBINANT IMMUNE INTERFERON HAVING AN INTACT CARBOXYL TERMINUS

Haiang-Fu Kung, Verona, N.J.; Hiromu Sugino, Kamigoryomiko-machi, and Susumu Honda, Osaka, both of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J., and Takeda Chemical Ind. Ltd., Japan

Continuation of Ser. No. 59,785, May 10, 1993, abandoned, which is a continuation of Ser. No. 16,610, Feb. 19, 1987, Pat. No. 5,278,286, which is a division of Ser. No. 639,551, Aug. 10, 1984, Pat. No. 4,681,930, which is a continuation-in-part of Ser. No. 534,048, Sep. 20, 1983, abandoned. This application Dec. 19, 1994, Ser. No. 359,356

Int. Cl.[6] A61K *38/21;* C07K *14/57*

U.S. Cl. 424—85.2 **2 Claims**

1. An unglycosylated, recombinant human immune interferon having at its carboxyl terminus the amino acid sequence:

Lys—Arg—Lys—Arg—Ser—Gln—Met—Leu—Phe—Arg—Gly—Arg—Arg—Ala—Ser—Gln—CO_2H,

wherein said interferon has been extracted from a microorganism, and wherein said interferon is essentially free of proteolytic fragments thereof.

5,593,668

CONTROLLING A PLANT PARASITIC NEMATODE WITH PASTEURIA

Koichi Nishimoto, Fukuya; Hiroshi Kawada, and Takanori Kanzaimoto, both of Tsukuba, all of Japan, assignors to Nematech Co., Ltd., Kawasaki, Japan

Filed Jan. 24, 1995, Ser. No. 377,348

Claims priority, application Japan, Jan. 26, 1994, 6-023512

Int. Cl.[6] A01N *63/04;* C12N *1/12;1/20*

U.S. Cl. 424—93.4 **10 Claims**

1. An aqueous-suspended composition for controlling a plant parasitic nematode, which comprises, in water:

a) an effective amount of a species of Pasteuria which is parasitic to a plant parasitic nematode; and

b) about 1 to 30% by weight of a surfactant effective to facilitate redispersion and to control propagation of other microorganisms, said surfactant being selected from the group consisting of polyoxyethylene alkyl ether, polyoxyethylene alkylallyl ether, sorbitan fatty acid ester, polyoxyethylene sorbitan fatty acid ester, glycerol fatty acid ester, polyoxyethylene fatty acid ester and polyalkyl glycol.

5,593,669

STABLE PRE-OCCLUDED VIRUS PARTICLE

H. Alan Wood, Ithaca, N.Y., assignor to Boyce Thompson Institute for Plant Research, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 91,535, Jul. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 875,691, Apr. 29, 1992, abandoned. This application Aug. 25, 1994, Ser. No. 295,925

Int. Cl.[6] A01N *63/00;* C12N *7/01;7/02;* C12P *21/00*

U.S. Cl. 424—93.6 **14 Claims**

1. A method of infecting insect larvae per os with a form of a baculovirus which is highly efficient at establishing infection and is normally destined to become occluded within the polyhedrin, comprising the steps of:

a. infecting an insect host larva with baculoviruses lacking a functional polyhedrin gene;

b. waiting for the pre-occluded virus particles derived from said baculovirus to form in said insect host larva;

c. harvesting said pre-occluded virus particles from said insect host larva prior to the liquification of said insect host larva;

d. stabilizing the infectivity of said pre-occluded virus particles; and

e. feeding said stabilized pre-occluded virus particles per os to insect larvae.

5,593,670

UNCOMPLEXED CYCLODEXTRIN SOLUTIONS FOR ODOR CONTROL ON INANIMATE SURFACES

Toan Trinh, Maineville; Jerome P. Cappel, Cincinnati; Philip A. Geis, West Chester; Mark L. McCarty, Loveland; David Pliseef, Cincinnati; Susan S. Zwerdling, Wyoming, and Helen B. Terdil, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 12, 1994, Ser. No. 289,732

Int. Cl.[6] A61L *9/01*

U.S. Cl. 424—76.1 **31 Claims**

1. An aqueous odor absorbing composition, comprising:

A. from about 0.1% to about 5%, by weight of the composition, of solubilized, water-soluble, uncomplexed cyclodextrin;

B. from about 0.01% to about 1%, by weight of the composition of low molecular weight polyol selected from the group consisting of propylene glycol, ethylene glycol, glycerol, and mixtures thereof;

C. aqueous carrier; and

D. additional ingredient selected from the group consisting of:

(a). from about 0.0001% to about 0.5%, by weight of the composition of solubilized, water-soluble, antimicrobial preservative having a water-solubility of greater than about 0.3%;

(b). perfume at a level of from about 0.003% to about 0.3%, by weight of the composition;

(c). metallic salt selected from the group consisting of water-soluble zinc salts, water-soluble copper salts, and mixtures thereof; and

(d). mixtures of (a), (b), and (c),

D. being optional when the cyclodextrin is selected from the group consisting of:

(a) methylated-alpha-cyclodextrin (b) methylated-beta-cyclodextrin; (c) hydroxypropyl beta-cyclodextrin; (d) hydroxypropyl alpha-cyclodextrin; and (e) mixtures thereof.

5,593,671

METHOD OF ATTENUATING LUNG CAPILLARY LEAK IN A MAMMAL

Suresh S. Kerwar, Ossining, N.Y., and Michael M. Wick, Brookline, Mass., assignors to American Cyanamid Company, Wayne, N.J.

Filed Jul. 1, 1994, Ser. No. 269,702

Int. Cl.[6] A61K *38/20;45/05;38/20;31/505*

U.S. Cl. 424—85.2 **9 Claims**

1. A method of attenuating lung capillary leak in a mammal induced by the administration of interleukin-2 which comprises administering to said mammal an amount of methotrexate effective to attenuate lung capillary leak.

5,593,672

METHOD OF PREPARING AND MAINTAINING THE IMMUNE SYSTEM FOR LYMPHOKINE, CYTOKINE AND BIOLOGICAL RESPONSE MODIFIER ADMINISTRATION

Robert Sabin, Goosedown Estate, Horsenhoe Rd., Mill Neck, Long Island, N.Y. 11765

Filed Oct. 17, 1994, Ser. No. 324,470

Int. Cl.[6] A61K *45/05;38/20;33/30;* C07K *14/55*

U.S. Cl. 424—85.2 **6 Claims**

1. A method of increasing immune effector cell populations in vivo and up-regulating high affinity Interleukin-2 receptors on the effector cells, comprising the step of exposing a subject to zinc oxide fume by inhalation for a period of time sufficient to induce a physical condition in said subject manifested by fever, perspiring, polymorphonuclear leukocytosis, lymphocytosis, and shaking, and thereby causing active non-specific immune stimulation of said subject within about 8 to 12 hours subsequent to exposure, and an increase in Interleukin-2 receptors on the effector cells within about 4 to 7 days.

5,593,673

ISOLATED PORCINE PANCREATIC CELLS FOR USE IN TREATMENT OF DISEASES CHARACTERIZED BY INSUFFICIENT INSULIN ACTIVITY

Jonathan Dinsmore, Brookline, Mass., assignor to Diacrin, Inc., Charlestown, Mass.

Division of Ser. No. 327,586, Oct. 21, 1994. This application May 12, 1995, Ser. No. 440,285

Int. Cl.[6] A01N *63/00;* C12N *5/00*

U.S. Cl. 424—93.7 **23 Claims**

1. An isolated non-insulin-secreting porcine pancreatic cell having the ability to differentiate into an insulin-secreting cell upon introduction into a xenogeneic subject.

5,593,674

PLASMA CARBOXYPEPTIDASE

Dennis T. Drayna, San Francisco, and Dan L. Eaton, San Rafael, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 277,540, Jul. 19, 1994, Pat. No. 5,474,901, which is a division of Ser. No. 167,727, Dec. 15, 1993, Pat. No. 5,364,934, which is a continuation of Ser. No. 959,944, Oct. 14, 1992, abandoned, which is a division of Ser. No. 649,591, Feb. 1, 1991, Pat. No. 5,206,161. This application Apr. 27, 1995, Ser. No. 430,787

Int. Cl.[6] A61K *38/48*

U.S. Cl. 424—94.63 1 Claim

1. A method for coagulating blood comprising adding to the blood an effective amount of an isolated monomeric human plasma carboxypeptidase B (PCPB) having a molecular weight on non-reducing SDS-polyacrylamide gel electrophoresis of about 60 kD and having in its mature form the N-terminal sequence PheGlnSer.

5,593,675

METHOD OF PRODUCING AN ANTI-D IMMUNOGLOBULIN CONCENTRATE AND A PHARMACEUTICAL PREPARATION

Gerhard Hodler, Worb; Peter Lerch, Bern, and Martin Stucki, Laupen, all of Switzerland, assignors to Rotkreuzstiftung Zentrallaboratorium Blutspendedienst, Bern, Switzerland

Filed Dec. 21, 1994, Ser. No. 360,334

Claims priority, application Switzerland, Dec. 27, 1993, 93810912.1

Int. Cl.[6] A61K *39/395*; C07K *16/46;1/14*

U.S. Cl. 424—130.1 20 Claims

1. A method of producing an anti-D immunoglobulin G-preparation with a specific activity of more than 2% anti-D IgG per gram total IgG, from human plasma, wherein plasma from rhesus negative blood of rhesus factor D sensitized donors or a plasma fraction containing an anti-D IgG:

(a) with a pH value in the range of pH 3.5 to 6.5 and a conductivity value in the range of 2 to 4 mS/cm is subjected to ion exchange chromatography, with an adsorbent which has carboxymethyl groups as functional groups, the anti-D IgG being bound to the adsorbent,

(b) the adsorbent, with the bound anti-D IgG is first rinsed with a wash solution at a pH value in the range of 5 to 8 and a conductivity value in the range of 2 to 4 mS/cm, and the anti-D IgG is subsequently eluted, and then

(c) the eluted anti-D IgG with a pH value in the range of 6 to 8 and conductivity value in the range of 2 to 4 mS/cm is treated with an alkaline adsorbent with ion-exchange characteristics in order to bind undesired components, and finally the anti-D IgG is concentrated.

5,593,676

METHOD OF KILLING B CELLS USING ANTIBODIES WHICH BIND CDIM

Neelima M. Bhat, Cupertino; Marcia M. Bieber, Los Altos, and Nelson N. H. Teng, Hillsborough, all of Calif., assignors to The Leland Stanford Junior University, Palo Alto, Calif.

Continuation of Ser. No. 101,436, Aug. 2, 1993, Pat. No. 5,417,972. This application Feb. 23, 1995, Ser. No. 394,673

Int. Cl.[6] A61K *39/395*; C07K *16/28*

U.S. Cl. 424—137.1 14 Claims

1. A method for killing B cells within a mixed population of cells, said method comprising:

contacting said mixed population of cells with a cytotoxic amount of an antibody that binds a CDIM epitope and is capable of cross-linking CDIM epitopes on the surface of the B cell.

5,593,677

METHOD FOR PREVENTION OF GRAFT VERSUS HOST DISEASE

Thomas A. Reichert, Los Altos, and Richard Champlin, Los Angeles, both of Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 960,657, Oct. 14, 1992, abandoned, which is a continuation of Ser. No. 742,463, Aug. 5, 1991, Pat. No. 5,178,858, which is a continuation of Ser. No. 127,736, Dec. 21, 1987, abandoned. This application May 26, 1994, Ser. No. 249,651

Int. Cl.[6] A61K *39/395;38/13;* C07K *16/38*

U.S. Cl. 424—154.1 3 Claims

1. A method for prevention of or prophylaxis against GVHD in a patient to undergo a bone marrow transplant, where bone marrow of an allogenic donor has been matched to the patient for HLA compatibility, comprising the steps of treating the bone marrow of the donor with one or more anti-CD8 monoclonal antibodies and complement in an amount sufficient to deplete T cytotoxic/suppressor cells to less than 1%, transplanting the treated bone marrow to the patient, and administering to the patient an effective amount of Cyclosporine A sufficient to inactivate $CD4^+$ cells.

5,593,678

PROTECTION OF TELEOST FISH

Donald L. Evans, and Liliana Jaso-Friedmann, both of Athens, Ga., assignors to University of Georgia Research Foundation, Athens, Ga.

Filed Oct. 11, 1994, Ser. No. 321,231

Int. Cl.[6] A61K *39/00;* A01N *59/26;* C01B *7/00*

U.S. Cl. 424—184.1 18 Claims

1. A method for the therapeutic or prophylactic treatment of a teleost fish against infection caused by a microorganismic pathogen comprising the step of providing in soluble form into an aquatic environment administering a therapeutically or prophylactically effective concentration of an orthovanadate salt such that said infected fish is protected against the development or progression of an infection or disease associated with said pathogen.

5,593,679

POULTRY VACCINE AGAINST *E. COLI* AIR SAC INFLAMMATION AND SEPTICAEMIA

Johannes F. van den Bosch, Boxmeer, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 33,699, Mar. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 764,991, Sep. 23, 1991, Pat. No. 5,208,024, which is a continuation of Ser. No. 255,806, Oct. 11, 1988, abandoned. This application Apr. 5, 1994, Ser. No. 224,119

Claims priority, application Netherlands, Oct. 26, 1987, 8702536

Int. Cl.[6] A61K *39/02;39/108;39/395;39/40*

U.S. Cl. 424—242.1 7 Claims

1. A method for protecting poultry against *E. coli* septicaemia and air sac inflammation, comprising administering an effective amount of a vaccine to the poultry, said vaccine comprising an immunologically effective amount of at least one immunogenic component selected from the group consisting of purified *E. coli* fimbriae of the F11 type and an 18 kD subunit of said fimbriae, and at least one additional antigen selected from the group consisting of infectious bronchitis virus, infection bursal disease virus, Newcastle disease virus and a purified *E. coli* antigen other than an F11 fimbriae antigen, and a pharmaceutically acceptable carrier or diluent.

5,593,680

COSMETIC OR DERMOPHARMACEUTICAL COMPOSITIONS IN THE FORM OF AQUEOUS GELS MODIFIED BY THE ADDITION OF EXPANDED MICROSPHERES

Isabelle Bara, Paris, and Myriam Mellul, L'Hay Les Roses, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 28, 1994, Ser. No. 187,467

Claims priority, application France, Jan. 29, 1993, 93 00990

Int. Cl.[6] A61K *7/02*

U.S. Cl. 424—401 14 Claims

1. A cosmetic or dermopharmaceutical composition, or a vehicle for a cosmetic or dermopharmaceutical composition comprising hollow microspheres dispersed in an aqueous gel, said aqueous gel comprising at least one gelling agent selected from the group consisting of a water-soluble polymer, a polymer providing a colloidal solution in water, colloidal silicate and hydrophilic silica gel, said gelling agent being present in an aqueous vehicle in an amount such that the viscosity ranges from 3 to 200 poises, said hollow microspheres being expanded thermoplastic microspheres having a density ranging from 15 to 200 kg/m^3, said composition or said vehicle containing from 0.1 to 10 percent by weight of said microspheres relative to the total weight of said composition or said vehicle, said composition or said vehicle being free of fats.

5,593,681

GLYCINE ANHYDRIDE DIMETHYLOL AS A BIOCIDE AND PRESERVATIVE

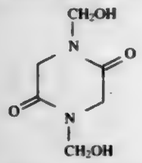
Philip A. Berke, Madison, and William E. Rosen, Summit, both of N.J., assignors to ISP Chemicals Inc., Chatham, N.J.

Division of Ser. No. 58,238, May 10, 1993, abandoned, which is a division of Ser. No. 694,252, May 1, 1991, Pat. No. 5,244,653. This application Apr. 24, 1995, Ser. No. 427,267

Int. Cl.[6] A61K *7/00;7/07*

U.S. Cl. 424—401 9 Claims

1. A preserved product comprising a substance susceptible to contamination by microbes selected from the group consisting of bacteria, yeast and mold and an effective microbial growth inhibiting amount of glycine anhydride dimethylol of the formula



wherein said glycine anhydride dimethylol is present in an amount up to about 1% by weight.

5,593,682

SKIN TREATING COMPOSITION

Andreas M. Papas, and Howard K. Hobbs, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 29, 1995, Ser. No. 580,870

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 1 Claim

1. A skin treating composition comprising:

(A) 1 to 25 weight percent of vitamin E;

(B) 1 to 20 weight percent of a blend comprising acetylated monoglyceride and polyoxyethylene fatty acid ester;

(C) 1 to 30 weight percent of a blend comprising distilled monoglyceride, distilled propylene glycol monoester, and sodium or calcium stearoyl lactylate;

(D) 25 to 95 weight percent water;

(E) 0.1 to 10 weight percent of oxidized cellulose, wherein the weight percents are based on the total skin treating composition.

5,593,683

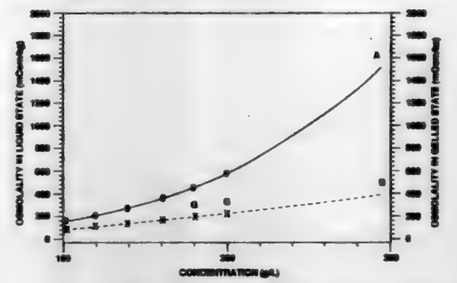
METHOD OF MAKING THERMOREVERSIBLE POLYOXYALKYLENE GELS

Tacey X. Viegas, Canton; Lorraine E. Reeve, Dexter, and Raymond L. Henry, St. Clair Shores, all of Mich., assignors to MDV Technologies, Inc., Dearborn, Mich.

Continuation-in-part of Ser. No. 759,234, Sep. 13, 1991, Pat. No. 5,300,295, Ser. No. 895,949, May 9, 1992, Pat. No. 5,298,260, Ser. No. 791,119, Nov. 8, 1991, Pat. No. 5,306,501, and Ser. No. 790,664, Nov. 8, 1991, Pat. No. 5,292,516, which is a continuation-in-part of Ser. No. 517,273, May 1, 1990, abandoned, said Ser. No. 759,234is a continuation-in-part of Ser. No. 517,273, May 1, 1990, abandoned, said Ser. No. 895,949is a continuation-in-part of Ser. No. 517,282, May 1, 1990, abandoned, said Ser. No. 791,119is a continuation-in-part of Ser. No. 517,277, May 1, 1990, abandoned. This application Mar. 3, 1994, Ser. No. 205,305

Int. Cl.[6] A61K *9/10;47/34*

U.S. Cl. 424—427 2 Claims



1. A method for making a pharmaceutical carrier, where said carrier is a gel with a desired osmolality at mammalian body temperature, comprising:

(a) providing in an aqueous solution containing a pharmaceutical agent and a surfactant and

a polyalkylene polyether, said surfactant and said polyalkylene polyether being present in a combined total amount not exceeding about 10% by weight, said polyether having a molecular weight of about 5,000 to about 100,000, wherein said polyether is selected from the group consisting of

(A) polyoxyalkylene polyethers prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing compound having form 3 to 10 carbon atoms and from 3 to 6 active hydrogens to prepare a heretic or block copolymer intermediate and further reacting said copolymer intermediate with at least one alpha-olefin oxide having an average carbon chain length of about 20 to 45 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 0.1 to 10 percent by weight based upon the total weight of said polyether or

(B) polyoxyalkylene polyethers prepared by reacting ethylene oxide with at least one active hydrogen-containing compound having from 2 to 10 carbon atoms and from 2 to 6 active hydrogens to prepare a homopolymer intermediate and further reacting said homopolymer intermediate with at least one alpha-olefin oxide having an average carbon chain length of about 20 to 45 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 0.1 to 10 percent by weight based on the total weight of the polyether, and

(b) adjusting the osmolality of the aqueous solution to a predetermined level to achieve the desired value of the osmolality

of the gel by assuming that the polyoxyalkylene polyether does not contribute to the osmolality of the gel.

5,593,684

METHOD AND THERAPEUTIC SYSTEM FOR SMOKING CESSATION

Richard W. Baker, Palo Alto, Calif.; Giancarlo Santus, Milan, Italy, and Susan Vintillo-Friedman, Cupertino, Calif., assignors to Pharmacia AB, Sweden

Continuation of Ser. No. 103,262, Aug. 4, 1993, Pat. No. 5,362,496. This application Mar. 31, 1994, Ser. No. 221,914

Int. Cl.[6] A61F *13/00*; A61K *31/44*

U.S. Cl. 424—435 **14 Claims**

1. A method for treating a condition responsive to nicotine therapy comprising

the concurrent transdermal and transmucosal administration of nicotine, wherein the transmucosal administration provides transient blood levels of nicotine about 5 ng/ml above that provided by the transdermal administration of nicotine.

5,593,685

RANITIDINE COMPOSITIONS

Alan Bye, Greenford; Jill Evans; Paul D. Huckle, both of Ware; Laurence F. Lacey, Greenford, and Peter J. Rue, Ware, all of Great Britain, assignors to Glaxo Group Limited, London, England

PCT No. PCT/EP93/02763, § 371 Date Apr. 11, 1995, § 102(e) Date Apr. 11, 1995, PCT Pub. No. WO94/08560, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 11, 1993, Ser. No. 411,664

Claims priority, application United Kingdom, Oct. 13, 1992, 9221414

Int. Cl.[6] A61K *9/20*

U.S. Cl. 424—439 **18 Claims**

1. A chewable ranitidine tablet consisting essentially of ranitidine, or a physiologically acceptable salt thereof, a chewable base selected from sucrose, glucose, lactose, maltose, or a mixture thereof, a flavouring and, optionally, saccharin or aspartame.

5,593,686

PHARMACEUTICAL COMPOSITIONS

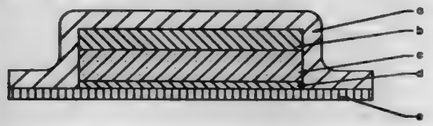
Thomas Kissel, Ehrenkirchen, Germany; Henriette Schrank, Richen, Switzerland, and Hans-Rainer Hoffmann, Neuwied, Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 141,832, Oct. 22, 1993, Pat. No. 5,364,628, which is a continuation of Ser. No. 804,630, Dec. 9, 1991, abandoned, which is a continuation of Ser. No. 597,470, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 298,457, Jan. 19, 1989, abandoned, which is a continuation of Ser. No. 96,571, Sep. 3, 1987, abandoned, which is a continuation of Ser. No. 748,917, May 31, 1985, abandoned. This application Sep. 28, 1994, Ser. No. 314,167

Claims priority, application Switzerland, Mar. 1, 1984, 1008/84; Apr. 6, 1984, 1753/84

Int. Cl.[6] A61F *13/02*

U.S. Cl. 424—448 **3 Claims**



1. A pharmaceutical composition for the transdermal systemic administration of an active agent comprising, in the form of an adhesive plaster or patch, a cover layer and a drug reservoir containing a homogeneous dispersion of active agent particles or a solution of active agent in a polymer matrix wherein said active agent is bopindolol in the free base or pharmaceutically acceptable acid addition salt form.

5,593,687

AQUEOUS DISPERSION CONTAINING LIPOSOMES

Georg Rössling, and Andreas Sachse, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Germany

Division of Ser. No. 596,920, Oct. 15, 1990, Pat. No. 5,110,475. This application Dec. 31, 1991, Ser. No. 815,224

Claims priority, application Germany, Oct. 13, 1989, 39 34 656.0

Int. Cl.[6] A61K *9/127*

U.S. Cl. 424—450 **11 Claims**

1. An aqueous dispersion comprising an aqueous dispersion medium, liposomes, and iopromide encapsulated in said liposomes, wherein said dispersion is prepared by removing an organic solvent from a liquid mixture of an aqueous phase and an organic solvent, said solvent having liposome-forming compounds contained therein, by means of membrane distillation.

5,593,688

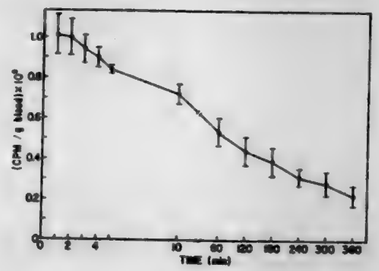
LIPOSOMAL TARGETING OF ISCHEMIC TISSUE

John D. Baldeschwieler, Pasadena, Calif., assignor to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Continuation of Ser. No. 83,123, Jun. 25, 1993. This application Jun. 6, 1995, Ser. No. 469,292

Int. Cl.[6] A61K *9/127;9/133*

U.S. Cl. 424—450 **4 Claims**



1. A method for targeting reversible ischemic myocardial tissue in a patient, comprising introducing into the patient's bloodstream an amount of unilamellar liposomes, of a size of less than 200 nanometers and containing a therapeutic or diagnostic agent, that preferentially delivers a quantity of the agent to the ischemic myocardial tissue such that the concentration of the agent present in the ischemic myocardial tissue is in a ratio exceeding 5:1 versus the concentration in non-ischemic myocardial tissue, wherein the liposomes consist essentially of cholesterol and chemically pure phospholipids that are essentially neutral and contain saturated fatty acids of between 16 and 18 carbon atoms.

5,593,689

Patent Not Issued For This Number

5,593,690

SUSTAINED RELEASE PREPARATIONS

Yohko Akiyama, Ibaraki; Hidetoshi Horibe, Toyonaka, and Minoru Yoshioka, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 807,630, Dec. 13, 1991, Pat. No. 5,399,357, which is a continuation of Ser. No. 433,223, Nov. 8, 1989. This application Feb. 14, 1995, Ser. No. 388,520

Claims priority, application Japan, Nov. 8, 1988, 63-282994; Nov. 21, 1988, 63-294379; Oct. 3, 1989, 1-259674

Int. Cl.[6] A61K *9/16;9/26;9/50;47/34*

U.S. Cl. 424—457 **7 Claims**

1. Fine granules or granules which comprise a pharmaceutically active ingredient dispersed into a matrix which is solid at ambient temperature and and contains a fatty acid ester of a polyglycerol, the ester being present throughout the fine granules or granules; wherein said fine granules are composed of not less than 75 weight % of particles of 500 to 10 μm, not more than 5 weight % of particles of not less than 500 μm, and not more than 10 weight % of particles of not more than 10 μm; and wherein said granules are composed of not less than 90 weight % of particles of 1410 to 500 μm and not more than 5 weight % of particles of not more than 177 μm.

5,593,691

BIOTENSIDE SOLVENTS FOR PHARMACEUTICALS AND COSMETICS

Carl Engster, Richen; Conrad H. Engster, Wallisellen; Walter Haldemann, Binningen, all of Switzerland, and Giorgio Rivara, Turin, Italy, assignors to Marigen S.A., Richen, Switzerland

Filed Jan. 11, 1994, Ser. No. 179,729

Claims priority, application Switzerland, Jun. 3, 1993, 1882/92

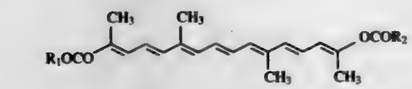
Int. Cl.[6] A61K *9/62*

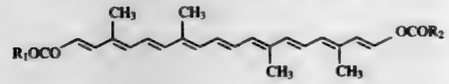
U.S. Cl. 424—461 **16 Claims**

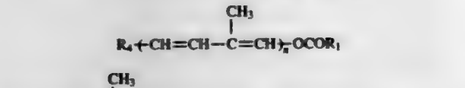
1. A spontaneously dispersible concentrate formulated by using as a hydrotropic agent or coemulgator 0.001 to 50% by weight of a biotenside ester or a combination of biotenside esters having one of the following formulae (I) to (VII):

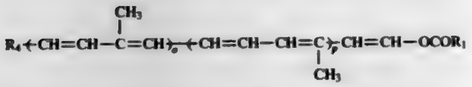
(I) $R_1OCO{+}CH_2{\rightarrow}_m OCOR_2$

(II) $R_1OCO-C(R_3)=CH-OCOR_2$

(III) 

(IV) 

(V) 

(VI) 

(VII) R_5-OCOR_1

wherein

R_1 is citronellyl, geranyl, farnesyl, phytyl or isophytyl;

R_2 is chlorine, methyl, citronellyl, geranyl, farnesyl, phytyl or isophytyl;

R_3 is hydrogen;

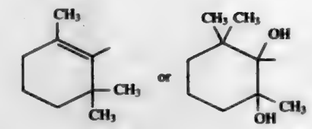
R_5 is a C_{8-22} alkyl, C_{8-22} alkenyl, or C_{8-22} alkapolyene group;

n is 1 or 2;

o is 1 or 2;

p is 1; and

R_4 is



said concentrate further comprising:

0.001 to 30% by weight of a therapeutic agent, a cosmetic agent, or a combination thereof,

0.001 to 90% by weight of a pharmaceutically acceptable tenside or combination of tensides,

up to 10% by weight of a vitamin or provitamin,

up to 10% by weight of a free fatty acid, excipient, diluent, or a combination thereof.

5,593,692

Patent Not Issued For This Number

5,593,693

EFFERVESCENT MIXTURE WITH ALKALI METAL SALTS OR LYSINATES OF ACIDIC, INSOLUBLE OR SLIGHTLY SOLUBLE ACTIVE INGREDIENTS

Gerhard Gergely, Gartengasse 8, A-1053 Vienna; Thomas Gergely, Vienna; Irmgard Gergely, Vienna, and Stefan Gergely, Vienna, all of Austria, assignors to Gerhard Gergely, Australia

Filed Sep. 7, 1994, Ser. No. 301,970

Claims priority, application Switzerland, Sep. 7, 1993, 2652/93

Int. Cl.[6] A61K *9/46*

U.S. Cl. 424—464 **19 Claims**

1. A preparation comprising:

at least one acidic, insoluble or slightly soluble pharmaceutically active ingredient in the form of particles of a soluble alkali metal salt or lysinate of said active ingredient; and

(ii) an effervescent system comprising particles of an alkaline component and particles of an acidic component, wherein

said active ingredient is intimately mixed with at least a part of said alkaline component, wherein

the quantity of said acidic component is sufficient to cause said active ingredient to precipitate from an aqueous solution into which the preparation has been introduced, and wherein

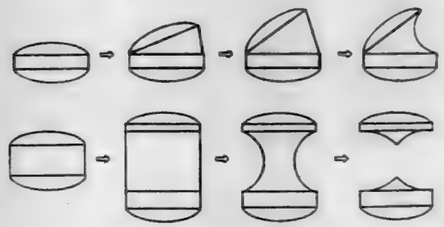
the particles of said active ingredient and the particles of said acidic component are passivated on their respective surfaces by alkali metal or earth alkali metal carbonates or bicarbonates.

5,593,694

SUSTAINED RELEASE TABLET

Tomohiro Hayashida; Kadoya Kikumaru, both of Chikujo-gun, and Omura Tomoyuki, Tokatsuki, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP92/01287, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO93/06821, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 5, 1992, Ser. No. 211,587
Claims priority, application Japan, Oct. 4, 1991, 3-285597
Int. Cl.[6] A61K 9/22;9/32;9/36
U.S. Cl. 424—468 10 Claims



1. A zero order dissolution sustained release tablet comprising a base tablet comprising a water-swellable gelling agent in a proportion of not less than 20% by weight per base tablet and a pharmaceutically active ingredient dispersed homogeneously in said gelling agent, said base tablet being coated with a film coating composition consisting essentially of one prepared by dissolving at least one member selected from the group consisting of ethylcellulose and acetylcellulose as a main component in an organic solvent, wherein the film coating composition is used in a proportion of 0.5–15% by weight relative to the base tablet, the thickness of the film is 0.002–0.05 mm at the side and 0.003–0.06 mm at the top or the bottom, and the ratio of the film thickness at the side to that at the top or the bottom is 0.55–0.85.

5,593,695

MORPHINE THERAPY

Sonya Merrill, San Jose; Atul D. Ayer, Palo Alto; Paul Hwang, Campbell, and Anthony L. Kuczynski, Mt. View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 266,875, Jun. 27, 1994, Pat. No. 5,460,826. This application May 24, 1995, Ser. No. 449,620
Int. Cl.[6] A61K 9/20;9/30;9/36
U.S. Cl. 424—480 4 Claims

1. A therapeutic tablet comprising 50 ng to 1,200 mg of morphine; 5 mg to 750 mg of a poly(alkylene oxide) having a 100,000 to 650,000 molecular weight; 0.5 mg to 80 mg of a poly(vinyl pyrrolidone) having a 3,000 to 350,000 molecular weight; and 0 to 7.5 mg of a lubricant, which tablet is encased by a composition comprising a member selected from the group consisting of a cellulose acylate, cellulose diacylate, and cellulose triacylate.

5,593,696

STABILIZED COMPOSITION OF FAMOTIDINE AND SUCRALFATE FOR TREATMENT OF GASTROINTESTINAL DISORDERS

Gerard P. McNally, Strafford, and Edward J. Roche, Paoli, both of Pa., assignors to McNeil-ppc, Inc., Milltown, N.J.

Filed Nov. 21, 1994, Ser. No. 342,775
Int. Cl.[6] A61K 9/24
U.S. Cl. 424—472 18 Claims

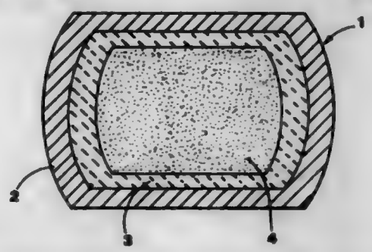
1. A stabilized solid oral dosage form for treatment of gastric disorders, which dosage form comprises famotidine and sucralfate, the famotidine being provided with a barrier layer which prevents interaction between the famotidine and the sucralfate in the dosage form.

5,593,697

SINGLE DOSE VACCINATION SYSTEM

Ian G. Barr, and William J. Thiel, both of Parkville, Australia, assignors to CSL Limited, Parkville, Australia

PCT No. PCT/AU92/00124, § 371 Date Nov. 17, 1993, § 102(e) Date Nov. 17, 1993, PCT Pub. No. WO92/17165, PCT Pub. Date Oct. 15, 1992
PCT Filed Mar. 25, 1992, Ser. No. 119,174
Claims priority, application Australia, Mar. 26, 1991, PK5268
Int. Cl.[6] A61F 2/02; A61K 9/16;9/50
U.S. Cl. 424—490 15 Claims



1. A pharmaceutical or veterinary implant, which when parenterally administered releases a pulse of at least one biologically active material at a controllable time interval after implantation, said implant comprising:

a) a core comprising the biologically active material and a tabletting excipient comprising at least one water soluble material and at least one water insoluble swellable material; and,

b) at least one polymer film coating adapted to rupture at a predetermined time after implantation, said coating being permeable or semi-permeable to physiological fluid and essentially surrounding said core and preventing release of the core prior to rupture,

wherein said excipient and said at least one polymer film coating are biocompatible.

5,593,698

SUPPRESSION OF PROLIFERATIVE RESPONSE AND INDUCTION OF TOLERANCE WITH POLYMORPHIC CLASS II MHC ALLOPEPTIDES

Howard L. Weiner, Brookline; David A. Hafler, West Newton; Charles B. Carpenter, Weston; Mohamed Sayegh, West Roxbury, and Zhengyi Zhang, Needham, all of Mass., assignors to Autoimmune, Inc., Lexington, Mass.

Continuation-in-part of Ser. No. 607,826, Oct. 31, 1990, abandoned, and a continuation-in-part of Ser. No. 871,289, Apr. 20, 1992, abandoned, and a continuation-in-part of Ser. No. 961,779, Oct. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 977,737, Nov. 13, 1992, abandoned. This application Mar. 5, 1993, Ser. No. 27,127
Int. Cl.[6] A61K 35/14; A01N 63/00; C07K 1/00;14/00
U.S. Cl. 424—534 3 Claims

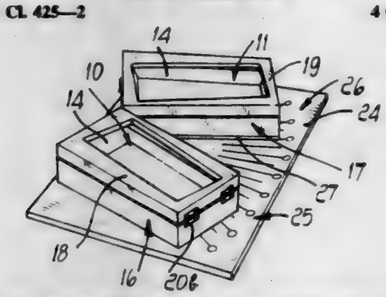
1. A method for suppressing the ability of T-cells from a first mammal to proliferate in response to stimulation by nonself mammalian tissue comprising orally administering to said mammal a composition comprising at least one member selected from the group consisting of: (i) a major histocompatibility complex Class II antigen from a second nonself mammal or from tissue of a mammal syngeneic to said nonself mammal; (ii) at least one synthetic peptide corresponding to a T-cell suppressive fragment of said Class II antigen, said composition being administered in an amount effective to suppress said proliferation.

5,593,699

APPARATUS FOR MANUFACTURING FORM-FITTING INSOLES

Silvano Grassi, Biadene Di Montebelluna, Italy, assignor to Sponsor S.n.c. di Grassi & C., Biadene Di Montebelluna, Italy

Filed May 22, 1995, Ser. No. 446,975
Int. Cl.[6] B29D 31/50
U.S. Cl. 425—2 4 Claims



1. Apparatus for manufacturing form-fitting insoles, comprising:

two trays, each of said trays defining an inner cavity, said cavity comprising a bottom;

a piece-shaped load-deformable fibrous spongy material, a piece of said material being placed on the bottom of each of said trays;

a foaming reagent preparation, said reagent preparation being impregnated in said spongy material placed in said trays for reacting with said material;

an impermeable double-stretch fabric, said fabric being extended on said cavities to cover an upper surface of said piece-shaped spongy material impregnated with said reagent preparation;

box-shaped structures for supporting said trays;

retention means for connecting said box-shaped structures;

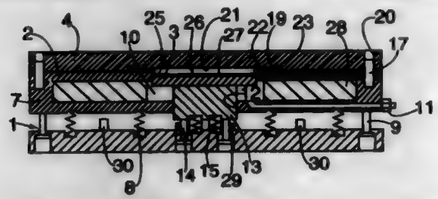
said retention means defining a vertical axis thereof, and said box-shaped structures being rotatable about said vertical axis to move between a position whereat they are spaced apart and a position in which they are positioned side-by-side, said box-shaped structures being further movable to execute translatory motions along said axis, wherein a user places himself with his feet on said impermeable fabric until reaction between said spongy material and said reagent preparation is completed.

5,593,700

FOLDING APPARATUS AND FOLDING METHOD

Günter Stilgenbauer, Bergstrasse 17, D-66957 Schweix, Germany

Filed Apr. 3, 1995, Ser. No. 415,813
Int. Cl.[6] B29C 53/04
U.S. Cl. 425—3 15 Claims



1. An apparatus for folding edge sections of a workpiece comprising:

a sizing plate having a cut-out, a sizing plate top surface and a sizing plate bottom surface;

a pressure plate for insertion into the cut-out and for supporting the workpiece;

a folding plate having a folding plate bottom surface, the folding plate bottom surface having rim edges for folding over edge sections of the workpiece, the folding plate being vertically moveable so as to allow the folding plate bottom surface to contact the sizing plate top surface; and

a base die for accommodating the sizing plate and the pressure plate, the pressure plate being vertically movable with respect to the sizing plate and capable of being pulled from below to lower the pressure plate.

5,593,701

RUBBER CURING BLADDERS HAVING SELF RELEASE OR LOW ADHESION TO CURING ADHESION TO CURING OR CURED HYDROCARBON RUBBERS

Daniel F. Graves, Clinton, and William L. Hergenrother, Akron, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 358,740, Dec. 19, 1994, Pat. No. 5,527,170, which is a division of Ser. No. 222,154, Apr. 4, 1994, Pat. No. 5,385,459, which is a continuation-in-part of Ser. No. 906,095, Jun. 29, 1992, abandoned. This application Mar. 28, 1996, Ser. No. 623,283
Int. Cl.[6] B29C 35/00; B29D 30/00; C08L 15/00
U.S. Cl. 425—52 13 Claims

1. An inflatable curing bladder or sleeve for use in vulcanizing and molding hydrocarbon materials, comprising:

a bladder or sleeve having at least one exterior surface exhibiting low adhesion with said hydrocarbon materials after vulcanization of said hydrocarbon materials;

said bladder or sleeve and said at least one exterior surface comprising from about 5 to about 100 weight percent of the reaction product from melt blending at least one brominated p-methylstyrene-isobutylene copolymer with one or more polar polymers;

wherein the amount of said polar polymer is from 2 to 100 parts by weight per 100 parts by weight of said brominated p-methylstyrene-isobutylene copolymer; and

said polar polymers comprising polymers or copolymers of polyethers having from 1 to 4 carbon atoms per repeat unit; or polycarbonates from the reaction of phosgene with glycols having from 1 to 4 carbon atoms; or polyesters made from polymerizing cyclic lactones having from 3 to 5 carbon atoms per repeat unit.

5,593,702

UNDERWATER PELLETIZER HAVING SHROUD ELEMENT MOUNTED TO DIE FACE

Ronald D. Harris, Houston, and Robert B. Wood, Bellville, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1995, Ser. No. 572,913
Int. Cl.[6] B29B 09/06
U.S. Cl. 425—67 13 Claims

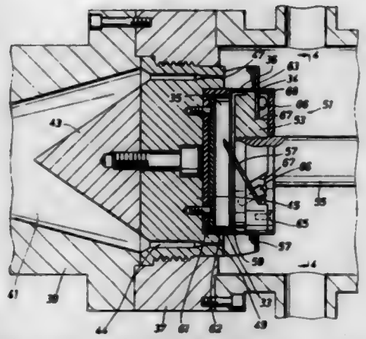
1. A pelletizing assembly for pelletizing an extruded material, said pelletizing assembly comprising:

an extrusion die plate comprising:

a die face at downstream side of the die plate:

a die ring formed on the downstream side of the die face having a wear surface projecting outwardly from the die face to form a recess in center of die ring; and

a channel means extending from upstream side of the die plate and the die ring to the die face adapted to deliver the extruded material from the upstream side of the die plate to the die face for extrusion, and said channel means forming an orifice in the die ring for extruded material to exit the die plate;



a cutting assembly mounted for rotation adjacent the die face, said cutting assembly comprising:

a hub attachable to a driving shaft for rotation in spaced relation with the die face;

and

a cutting element mounted on the hub for rotation therewith, said cutting element having a cutting edge for movement adjacent a downstream surface of the die ring;

and

a shroud element fixedly mounted to said die face, said shroud having a surface corresponding to a surface on said cutting assembly such that an interface is established between the cutting assembly and the extrusion die which permits free rotation of the cutting assembly and forms a barrier to prevent pellet from migrating (i) into said recess in center of die ring and between the die face and the hub.

5,593,703

MANDREL FOR COOLING

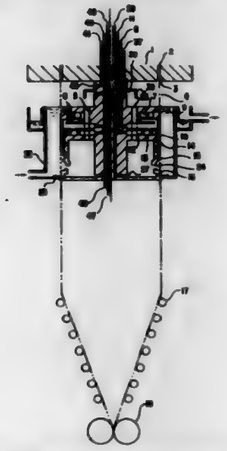
Tomomi Mizutani; Kateryuki Yokota; Masahobu Arita, and Hisashi Kojyou, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00917, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO95/01254, PCT Pub. Date Jan. 12, 1995

PCT Filed Jul. 2, 1993, Ser. No. 307,586

Int. Cl.[6] B29C *47/88*

U.S. Cl. 425—71 **3 Claims**



1. For use with a die containing a downwardly directed circular slit for extruding a tubular thin thermoplastic resin film in a melted condition, apparatus for cooling said tubular thin film while setting the diameter thereof, said apparatus comprising:

a mandrel having a body of cylindrical shape connected to said die in spaced relation to a lower surface thereof and including:

an air injecting nozzle operative to inject compressed air into the space formed between said lower die surface and said mandrel body to maintain the shape of an upper bubble part of said thin film between said die and said mandrel;

a coolant injecting nozzle formed with at least one stage of annular slits and being operative to inject coolant obliquely upwardly or downwardly toward an inner surface of said thin film for cooling said film,

a ring for setting said diameter of said thin film, concentrically mounted on said body;

means in said mandrel body for conducting coolant for cooling an interior side of said film diameter setting ring, said means including spirally formed grooves formed on said mandrel body and enclosed by said film diameter setting ring, said grooves extending continuously along said mandrel body from said setting ring to a lower portion of said mandrel body whereby the inside of said ring is cooled by coolant flowing in the grooves;

an external coolant storage tank concentrically mounted on said mandrel body and disposed for interposing said tubular thin film between said tank and said mandrel body;

means for conducting coolant for cooling said film through said coolant storage tank;

a coolant discharge opening in a side face of said mandrel operative for receiving coolant used to cool said film into said mandrel body; and

a seal ring on said mandrel body operative to prevent leakage of said coolant, said seal ring pressing said thin film while permitting passage thereof.

5,593,704

HEAD ASSEMBLY FOR BLOW-EXTRUDING A TUBULAR PLASTIC FOIL

Wilhelm Kahlen, Troisdorf, Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Germany

Filed May 16, 1995, Ser. No. 442,060

Claims priority, application Germany, May 25, 1994, 44 18 133.7

Int. Cl.[6] B29C *47/88*

U.S. Cl. 425—72.1 **7 Claims**



1. An apparatus for blow extruding a tubular plastic foil, the apparatus comprising:

means including a nozzle having an upwardly open annular mouth substantially centered on a longitudinal axis for longitudinally upwardly extruding a tubular plastic strand;

an inner tube extending longitudinally upward from the nozzle within the mouth thereof, having an upper end spaced axially from the mouth, and formed between the upper end and the mouth with at least one radially throughgoing hole;

a stabilizer head carried on the inner-tube upper end and formed with passages having inner ends opening into the inner tube at the upper end thereof and outwardly directed outer ends;

an outer tube surrounding the inner tube and defining an inner longitudinal passage therewith, extending longitudinally upward from the nozzle within the mouth thereof, and having an upper end above the hole and below the inner-tube upper end;

a partition extending crosswise across the inner tube immediately below the hole and subdividing the inner tube into a lower tube section and an upper tube section;

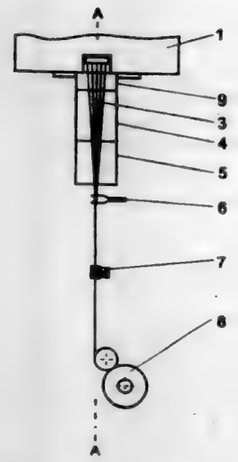
a blocking element engaged between the outer-tube upper end and the inner tube above the hole and closing the upper-tube upper end;

a sleeve having a foraminous upper portion, an imperforate lower portion, and an upper end secured to the head and a lower end secured to the outer tube below the partition and forming an annular outer passage with the outer sleeve;

at least one radially extending conduit below the partition between the inner and outer tubes and forming a flow path between the outer passage and an interior of the lower inner-tube section;

means for feeding cooling air to the inner passage at the mouth and to a space defined between the strand where it emerges from the mouth and the outer tube for flow of this cooling air longitudinally upward between the strand and the outer tube and along the inner passage and through the hole into the inner-tube upper section and thence through the passages of the head and outward, whereby the strand is expanded transversely into a tubular plastic foil; and

means connected to the inner-tube lower end for withdrawing the cooling air from within the strand by drawing the cooling air into the outer passage, through the conduit, and thence down along the inner-tube lower section.



porosity will produce a pressure drop of about 3 to 150 Pa at a cooling medium rate of 1 m/sec, said apparatus having structure inhibiting cooling medium from charging or discharging upstream of said porous tube portion.

5,593,705

APPARATUS FOR MELT SPINNING MULTIFILAMENT YARNS

Diederich Schilo, Klingenberg, and Wolfgang Peschke, Obernburg, both of Germany, assignors to Akzo Nobel NV, Arnhem, Netherlands

Filed Mar. 4, 1994, Ser. No. 205,744

Claims priority, application Germany, Mar. 5, 1993, 43 06 925.8

Int. Cl.[6] B29C *47/88*; D01D *5/088*

U.S. Cl. 425—72.2 **7 Claims**

1. An apparatus for melt spinning multifilament yarn from fiber-forming polymers at a wind-up speed of over 2000 m/min, said apparatus defining a spinning direction and comprising a spinnerette for filaments, a porous tube including a porous tube portion located downstream from said spinnerette for solidifying the filaments, at least one convergence element located downstream from said porous tube portion for the filaments and a wind-up means capable of winding the filaments at a wind-up speed of over 2000 m/min located downstream from said convergence element and having, at least between said spinnerette and a first convergence element of said at least one convergence element, an essentially vertical spinline, wherein said porous tube portion is open in the spinning direction and concentric relative to the spinline and has disposed downstream of it a non-porous tube portion, between said porous tube portion and said first convergence element, further wherein a cooling medium is drawn through said porous tube solely by the filaments themselves due to the wind-up speed of over 2000 m/min to cool and solidify the filaments and wherein a porosity of said porous tube is selected such that the

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5,593,706

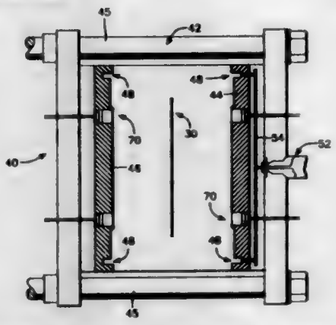
PANEL FRAMING SYSTEM

Paul Specht, Wilmette, Ill., assignor to The Tensar Corporation, Atlanta, Ga.

Division of Ser. No. 253,127, Jun. 2, 1994, Pat. No. 5,527,500. This application Apr. 26, 1995, Ser. No. 430,799

Int. Cl.[6] B29C *45/14*

U.S. Cl. 425—127 **12 Claims**



1. An apparatus for making a framed panel comprising:

a pair of molding members together defining a peripheral frame-forming mold cavity;

means for moving at least one of said molding members to open and close said mold cavity;

means to position peripheral portions of a thermoplastic panel-forming material within said mold cavity, central panel portions of said panel-forming material being molecularly oriented;

means to inject a molten frame-forming material into said mold cavity and to solidify said frame-forming material so as to capture said peripheral portions of said panel-forming material within a rigid frame; and

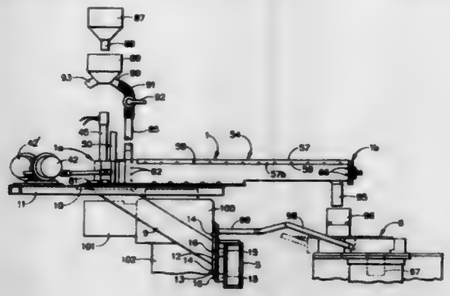
means to heat said central portions of said panel-forming material sufficiently to cause said panel-forming material to shrink and thereby tension said panel-forming material within said frame.

5,593,707

AUGER CONVEYOR ASSEMBLY FOR HEATING AND FEEDING POLYMER COATED POWDER TO THE SHUTTLE OF A COMPACTING PRESS

Bryan W. Gee, Dry Ridge, Ky., and Robert C. Hertlein, Evendale, Ohio, assignors to Cincinnati Incorporated, Cincinnati, Ohio

Filed Mar. 28, 1995, Ser. No. 412,876
Int. Cl.[6] B29C 47/84
U.S. Cl. 425—257 10 Claims



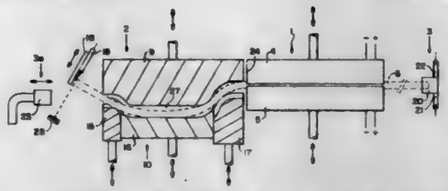
1. An auger conveyor assembly for heating and feeding polymer coated powder from a powder supply assembly to a shuttle assembly for delivery to the die cavity of a compacting press, said auger conveyor assembly comprising at least one auger conveyor having an elongated auger tube terminating in a rearward end with an inlet opening near said rearward end and terminating in a forward end with a discharge opening near said forward end, said discharge opening adapted to cooperate with said shuttle assembly, an inlet tube connected to said auger tube inlet and to said powder supply assembly, a hollow tubular auger having a length approximating that of said auger tube and being rotatably mounted in said auger tube, a prime mover operatively attached to said auger for rotation thereof, said auger having flight means on its exterior surface for advancing a tubular column of said polymer coated powder from said auger tube inlet to said auger tube outlet and to mix said polymer coated powder in said tubular column thereof, means to apply heat to said auger tube from without and means to apply heat to said auger from within, to more thoroughly and rapidly heat said polymer coated powder column therebetween from both the inside and the outside and to increase the throughput of said at least one auger conveyor, said means to apply heat to said auger from within comprising a manifold having an inlet and an outlet and to which said rearward end of said auger tube is operatively connected, a source of air, an air heater, said air source being connected to said air heater, said air heater being connected to said manifold inlet, an air tube, said manifold inlet being connected to the rearward end of said air tube, said air tube extending within and substantially the length of said auger with an annular space therebetween, said air tube having a closed forward end, said air tube having perforations therein adjacent said closed forward end, said annular space between said air tube and said auger being connected to said manifold outlet, a muffler connected to said manifold outlet, and means to move said air from said source through said air heater, said manifold inlet, said air tube, said air tube perforations, along said auger in said annular space between said air tube and said auger, said manifold outlet and said muffler to atmosphere, a cover structure for said auger conveyor, and means at the forward end of said auger conveyor to accommodate differential longitudinal thermal expansion of said cover structure said auger tube, said auger and said air tube.

5,593,708

APPARATUS FOR BENDING PLASTIC PIPE

Franz Schulte, Siemensstr. 7, 59557 Lippstadt, Germany

Division of Ser. No. 149,286, Nov. 9, 1993, Pat. No. 5,407,613.
This application Dec. 1, 1994, Ser. No. 352,135
Int. Cl.[6] B28B 21/78;21/98; B21D 7/16;7/022
U.S. Cl. 425—392 14 Claims



1. An apparatus to bend plastic pipe by first heating the pipe, placing it into a bending-path-determining apparatus and thereafter cooling the pipe comprising:

heating, bending and cooling stations arranged in series lengthwise of a pipe to be bent so that the pipe can be shoved lengthwise from the heating station to the bending station;

wherein the bending station has two selectively separable bending dies having respective adjacent surfaces, each adjacent surface having a groove therein, with the grooves forming a bending pipe-shaped channel when the adjacent die surfaces are together, said channel having a lengthwise pattern corresponding to a desired lengthwise pattern of the pipe after it is bent, with cross sections of the grooves being substantially the same as an outer surface of the pipe;

wherein the cooling station has a coupling joint for being connected to the pipe for causing a cooling medium to flow through the pipe;

wherein the heating station comprises two separable heating fixtures having grooves therein which together complete a heating pipe-shaped channel whose cross-sectional size approximately corresponds to that of an outer surface of the pipe, with a length axis of the heating pipe-shaped channel being approximately serially aligned with a length axis of the bending pipe-shaped channel, said heating station including means for closing said heating fixtures on a portion of the pipe so that said portion of said pipe is held in said pipe-shaped channel until said portion of said pipe is heated for bending, and for thereafter separating said heating fixtures to release said portion of said pipe and said portion of said pipe can be moved longitudinally in said groove, with said groove providing guidance, whereby said pipe, before it is bent, can be heated in said heating pipe-shaped channel of said heating station and then shoved longitudinally from said heating pipe-shaped channel into said bending pipe-shaped channel of said bending station with said heating pipe-shaped channel helping to guide said pipe.

5,593,709

MOLD FOR FORMING PANELS FOR PREFABRICATED CONSTRUCTION

Donald W. Thomson, San Jose, Costa Rica, and Frank B. Nichols, Redding, Calif., assignors to Comercio Can-Tico, S.A., Alajuela, Costa Rica

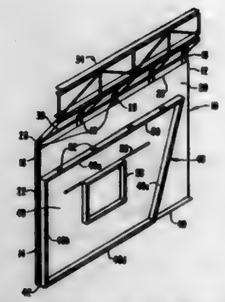
Filed Aug. 3, 1995, Ser. No. 511,854
Int. Cl.[6] B28B 7/16;7/22
U.S. Cl. 425—454 18 Claims

1. Apparatus for placement in confronting, spaced position to a generally upright surface for vertically forming a pre-fabricated panel from a pourable material with a predetermined periphery, the apparatus comprising:

a planar moldplate having a top periphery, a bottom periphery and a mold surface;

a lift foot formed to attach to the bottom periphery to extend generally laterally from the mold surface for supporting the pourable material;

a sidewall mold located on the mold surface having a configuration corresponding to the predetermined periphery;



means removably coupled to the top periphery for lifting and transporting the moldplate such that a vector normal to the mold surface having a horizontal component and an upward, vertical component;

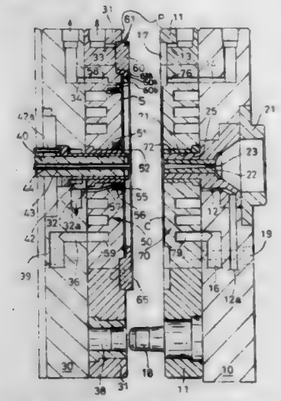
wherein a void is defined by the upright surface and mold surface in confronting relation to one another and the sidewall mold for receiving the pourable material to form the pre-fabricated panel.

5,593,710

MOLD CAPABLE OF CHANGING A SET POSITION OF A STAMPER PLATE

Ikuo Asai, Nagoya, Japan, assignor to Meiki Co., Ltd., Ohbu, Japan

Filed Jul. 19, 1995, Ser. No. 504,365
Claims priority, application Japan, Sep. 26, 1994, 6-257409
Int. Cl.[6] B29C 45/40
U.S. Cl. 425—552 2 Claims



1. In a mold with a cavity for injection molding of a resin disc between a pattern stamper plate (50, S) and a smooth mirror plate (70, C), the disc including a central aperture, the mold including

a stationary cylindrical member (11) including a stationary rear end surface and a first inner periphery,

a stationary platen plane (10) fixed to the stationary rear end surface and having a sprue bushing (22) for injection of melted resin material into the cavity,

a movable cylindrical member (31) including a movable rear end surface and a second inner periphery,

a movable platen plate (30) fixed to the movable rear end surface and having a male cutter (43) for forming the central aperture of the disc and an ejecting member (40) on an outer periphery of the male cutter for ejecting the disc;

the improvement, for changing a set position of the stamper plate, comprising:

an outer peripheral stamper holder (60) having a projection portion (60a);

an inner peripheral stamper holder (55);

vacuum means (57) for operating the inner peripheral stamper holder by vacuum;

the stamper plate being capable of insertion into selectively the first inner periphery and the second inner periphery;

the stamper plate including a first step portion (61a) for contacting a bottom side of the outer peripheral stamper holder,

a central stamper plate hole for accepting a first center bushing (52),

an annular air channel (58a) for attracting a stamper outer periphery toward the stamper plate;

a first air passage for attracting the inner peripheral stamper plate holder (55) toward the stamper plate; and

a first water channel for circulation of hot water at controlled temperature;

the mirror plate being capable of insertion into selectively the first inner periphery and the second inner periphery; and

the mirror plate including a second step portion (75) for contacting a front side of the outer peripheral stamper holder,

a central mirror plate hole for accepting a second center bushing (72),

a compressed air passage for blowing air to separate molded discs from the surface of the stamper plate, and

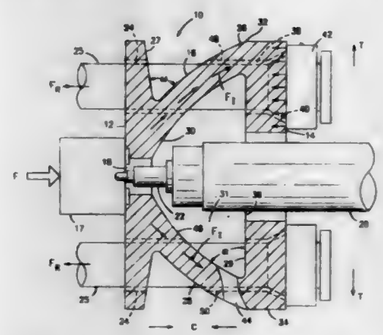
a second water channel for circulation of hot water at controlled temperature.

5,593,711

UNIFORMLY COMPRESSIBLE PLATEN

Pierre Glaesener, Mersch, Luxembourg, assignor to Husky Injection Molding Systems Ltd., Canada

Filed Jun. 7, 1995, Ser. No. 482,874
Int. Cl.[6] B29C 45/64; B30B 15/06
U.S. Cl. 425—595 23 Claims



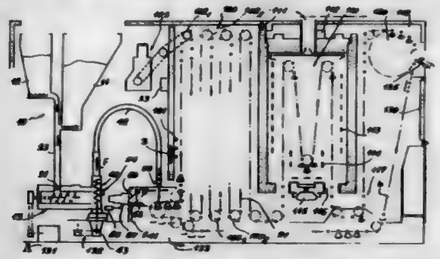
1. A platen for use in a clamping operation wherein a force is generated having a first direction, comprising:

a first wall having edges and a center area and first and second sides, wherein said first side is adapted to be positioned nearest said clamping operation;

a second wall spaced from and substantially parallel to said first wall, said first and second walls extending substantially transverse to said first direction of said force; and

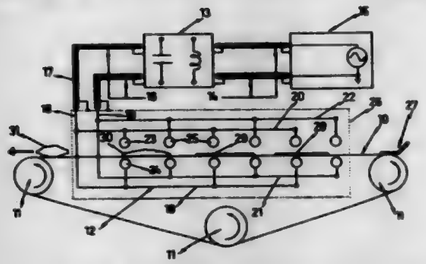
means for directing said force from said edges of said first wall toward said center area of said first wall for substantially preventing non-uniform deflection of said first wall along said first side, wherein said means for directing comprises an intermediate support structure positioned between said first and second walls and in contacting relationship therewith.

5,593,712
PROCESS FOR MAKING BREAD
Lionel Pellane, Paris, France, assignor to B.F.E. Limited, Dublin, Ireland
Division of Ser. No. 217,368, Mar. 24, 1994, Pat. No. 5,458,415. This application Aug. 7, 1995, Ser. No. 511,727
Claims priority, application Ireland, Mar. 29, 1993, 0252/93
Int. Cl.[6] A21D *8/00*
U.S. Cl. 426—19 7 Claims



1. In a bread-manufacturing process in which dough is prepared by kneading and the kneaded dough is shaped into dough pieces which are fermented and baked, the improvement which comprises kneading the dough in a kneader and pump which are equipped with self-cleaning means.

5,593,713
METHOD FOR COOKING TORTILLAS USING VERY LOW AND LOW FREQUENCY RADIO WAVES
Jose De La Luz-Martinez, Ignacio Mejia No. 33, Puebla, Pue.; Jesus Gonzalez-Hernandez, Tesoro No. 76, Col. Industrial, C.P. 07800, D.F.; Feliciano Sanchez-Sinencio, Fuente de Bianca No. 20,, Col. Tecamachalco, C.P. 53950, Edo de Mexico; Juan de Dios Figueroa C., Av. Juarez 4a, y 5a. No. 162 Valle Hermoso, Tamaulipas; Fernando Martinez-Bustos, Sur 15 No. 104, Orizaba, Veracruz, and Maximiano Ruiz-Torres, Ana Maria Gallaga 861, Morelia, Michoacan, all of Mexico
Filed Oct. 11, 1994, Ser. No. 322,015
Claims priority, application Mexico, Oct. 12, 1993, 936330
Int. Cl.[6] A23L *1/025;* A21D *8/00*
U.S. Cl. 426—237 6 Claims

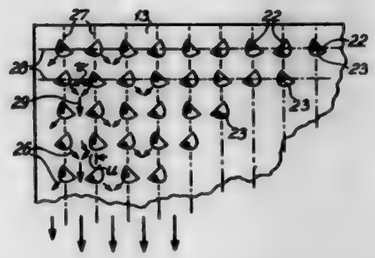


1. A method for cooking tortillas using very low and low frequency radio waves comprising:
a) preparing a dough from meal or flour to be cooked, with a moisture content in the range of 40 to 52% by weight;
b) cutting and shaping the dough with said moisture content in order to obtain pieces of food product to be cooked of predetermined size and thickness;
c) generating radio frequency waves of very low and low frequencies to be irradiated within a cooking space for the food product;
d) selecting an optimal frequency band of said radio frequency waves depending on the moisture content and the shape desired for the food product to be cooked; and
e) passing the pieces of food product to be cooked through said cooking space at a predetermined speed in order to produce the desired degree of cooking of the same.

5,593,714
METHOD OF PRESSURE PRESERVATION OF FOOD PRODUCTS
Gerald P. Hirsch, 3136 Brook Dr., Decatur, Ga. 30033-3912
Filed Dec. 6, 1994, Ser. No. 349,937
Int. Cl.[6] A23L *3/015;* B65B *55/00;31/00*
U.S. Cl. 426—268 6 Claims

1. A process for preserving a food product comprising the sequential steps of:
a. placing said food product in a compressible package and closing said package,
b. placing said food product containing package under a pressure of 25,000 psi,
c. holding said food product in said package at said pressure of 25,000 psi and a temperature of 18–23 degrees C. for a time period of at least 5 days, and then
d. reducing said pressure to ambient pressure.

5,593,715
METHOD AND APPARATUS FOR TREATING A PULVERULENT OR PARTICULATE MATERIAL WITH GAS
Mogens A. Christensen, Virum, Denmark, assignor to Niro Holding A/S, Soborg, Denmark
PCT No. PCT/DK93/00317, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO94/11698, PCT Pub. Date May 26, 1994
PCT Filed Sep. 30, 1993, Ser. No. 424,502
Claims priority, application European Pat. Off., Nov. 19, 1992, 92610080
Int. Cl.[6] A23C *1/00;* F26B *3/00*
U.S. Cl. 426—467 26 Claims



1. A method of treating a pulverulent or a particulate material with gas, said method comprising:
feeding the material to a first position on a bed plate,
directing a flow of gas upwardly through a plurality of gill-type openings in the bed plate so as to fluidize the material thereon, said plurality of openings being substantially uniformly distributed over at least a major part of the area of the bed plate, and the gas flow being directed through said plurality of openings having a flow component directed parallel with a plane including the bed plate and towards a second position on the bed plate spaced from said first position,
said plurality of openings being divided into pairs and the gill-type opening being arranged so as to direct the gas flow through the openings each pair in converging relationship so as to create a resultant gas flow component directed toward the second position,

moving the fluidized material along the bed plate in a general direction towards said second position, and
discharging material from the bed plate at the second position.

5,593,716
FOOD PRODUCT
Ingrid A. Appelqvist, Northampton; Charles R. Brown, Bedford, and Ian T. Norton, Northampton, all of United Kingdom, assignors to Van den Bergh Foods Co. Division of Conopco, Inc., Lisle, Ill.
Filed Jul. 14, 1995, Ser. No. 501,820
Claims priority, application European Pat. Off., Jul. 15, 1994, 94305213
Int. Cl.[6] A23L *1/05;1/39*
U.S. Cl. 426—589 9 Claims

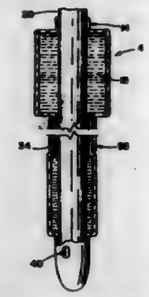
1. A liquid sauce, soup or gravy product comprising an aqueous phase and an oil phase wherein the aqueous phase comprises:
(a) from 50 to 80% by weight of the aqueous phase of a dispersed phase of non-starch polysaccharide microgel made from a chemically-or thermally-setting gelling polysaccharide; and
(b) from 0.3 to 15% by weight of the aqueous phase of continuous phase biopolymer.

5,593,717
METHOD OF MAKING VITAL WHEAT GLUTEN INTO FIBERS
Cynthia Huber, 5 Knox Mountain Rd., Sanborton, and Nancy Longo, 126 Calef Hill Rd., Tilton, both of N.H. 03269
Filed Oct. 5, 1994, Ser. No. 318,130
Int. Cl.[6] A23J *3/18*
U.S. Cl. 426—656 25 Claims



1. A method of permanently transforming a clumped putty-like untextured mass and relatively high viscoelastic adhesion, physical and chemical properties of hydrated vital wheat gluten into a loose layered minimally adhering textured fiber strand structure, that comprises, intimately mixing flour with vital wheat gluten powder to interleave with and separate the gluten powder particles in the mixture; at substantially room temperature, hydrating the mixture to enable the absorption of water by the mixture to expand the gluten into a less viscoelastic mass; shredding the mass into a plurality of separated streams of strands of elongated continuous fibers; dropping the separate strands under the action of gravity as a loose deposit upon a retaining surface; immediately subjecting the deposit to heated moisture along the separate fibers within and throughout the deposit; continuing the application of heated moisture for a sufficient time for the protein of the separate fibers within the deposit to become substantially denatured, to remove the bulk of the viscoelastic adhesion properties of the gluten; and permitting evaporation of excess moisture from the deposit to produce a loose layered permanent fiber structure of relatively low viscoelasticity.

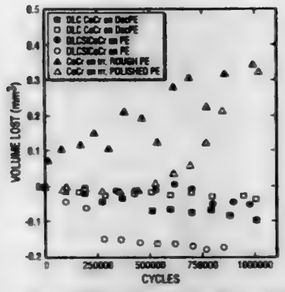
5,593,718
METHOD OF MAKING CATHETER
Anthony J. Conway; Philip J. Conway, both of Chatfield, and Richard D. Fryar, Jr., Rochester, all of Minn., assignors to Rochester Medical Corporation, Stewartville, Minn.
Division of Ser. No. 827,936, Jan. 29, 1992, Pat. No. 5,360,402, which is a continuation-in-part of Ser. No. 809,281, Dec. 13, 1991, Pat. No. 5,261,896, which is a continuation-in-part of Ser. No. 489,462, Mar. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 487,422, Mar. 1, 1990, Pat. No. 5,098,379, which is a continuation-in-part of Ser. No. 462,832, Jan. 10, 1990, Pat. No. 5,137,671. This application Aug. 2, 1994, Ser. No. 284,381
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Int. Cl.[6] A61L *29/00;* B05D *1/36;1/18*
U.S. Cl. 427—2.3 25 Claims



1. A method of making a silicone rubber catheter having an overcoat layer enclosing a cavity on an outer surface of an inner tube of the catheter, wherein the cavity separates the overcoat layer from the inner tube, said method comprising:
(a) providing a silicone rubber tube;
(b) initially coating portions of an outer surface of said silicone rubber tube with a bond preventing agent in a plurality of dipping steps, wherein the tube is immersed into the bond preventing agent to a depth for a length of time, and subsequently removed therefrom, said plurality of dipping steps being automated in series by mechanized automation means including computer control means, wherein the depth and the length of time for each of the plurality of dipping steps is prescribed so that a residual coating of bond preventing agent remains on portions of the silicone rubber tube following said plurality of dipping steps, said residual coating having a variable thickness as a result of a variation between the depth of any two of said plurality of dipping steps; and
(c) subsequently coating the silicone rubber tube having the residual coating of bond preventing agent with a polymeric bonding composition containing silicone rubber to form a shaped overcoat layer, wherein the shape of the overcoat layer results at least in part from the variable thickness of the residual coating.

5,593,719
TREATMENTS TO REDUCE FRICTIONAL WEAR BETWEEN COMPONENTS MADE OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE AND METAL ALLOYS
Geoffrey Dearnaley, and James Lankford, Jr., both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.
Filed Mar. 29, 1994, Ser. No. 220,234
Int. Cl.[6] B05D *3/00;* A61F *2/30;* C23C *14/12;* B29C *37/00*
U.S. Cl. 427—2.26 38 Claims

10. A method for making an orthopaedic implant comprising a metal alloy substrate in frictional contact with an ultra-high molecular weight polyethylene component, said method comprising the steps of:



immersing said ultra-high molecular weight polyethylene component in an organic solvent for a first amount of time and at a temperature sufficient to dissolve polyethylene fibrils that are susceptible to frictional shearing off during use but insufficient to result in damage due to swelling of said ultra-high molecular weight polyethylene component, said organic solvent being selected from the group consisting of an aromatic hydrocarbon, an alicyclic hydrocarbon, an aliphatic hydrocarbon, and a mixture thereof;

exposing said component to a vacuum at a pressure of about 10^{-3} torr for a second amount of time sufficient to remove residual solvent;

exposing a substrate comprising a metal alloy selected from the group consisting of cobalt, nickel, titanium, zirconium, chromium, molybdenum, tungsten, platinum, palladium, and combinations thereof, to a vacuum at a pressure of about 10^{-5} torr or less;

heating said substrate to about 300° C. or, if said metal alloy is temperature sensitive, to a highest temperature acceptable for said metal alloy;

depositing silicon onto said substrate to a thickness of between about 100–200 nm;

substantially simultaneously bombarding said deposited silicon with a first energetic beam of nitrogen ions having a first energy of between about 10–30 keV at a first ion density and for a third amount of a time sufficient to form an inner bonding layer of metal-silicide cohesively bonded to an outer layer of silicon;

cooling said substrate to about 80° C.;

condensing a diamond-like carbon precursor onto said outer layer of silicon for a fourth amount of time sufficient to form a film of precursor molecules on said outer layer of silicon;

substantially simultaneously bombarding said diamond-like carbon precursor with a second energetic beam of nitrogen ions having a second energy of between about 10–30 keV at a second ion density and for a fifth amount of time sufficient to form a silicon carbide bonding layer cohesively bonded to an outer coating of diamond-like carbon.

5,593,720

PROCESS FOR MAKING A MULTILEVELED ELECTRONIC PACKAGE

Kie Y. Ahn, Chappaqua, N.Y.; James L. Hedrick, Jr., Pleasanton; Jeffrey W. Labadie, Sunnyvale, both of Calif.; Kang-Wook Lee, Yorktown Heights, N.Y.; Robert J. Twieg, San Jose, Calif.; Alfred Viehbeck, Pinhill, and George F. Walker, New York, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 319,392, Oct. 6, 1994, Pat. No. 5,516,874, which is a continuation of Ser. No. 268,422, Jun. 30, 1994, abandoned. This application May 23, 1995, Ser. No. 447,564

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—97 **8 Claims**

1. A process of making a multileveled electronic package comprising the steps of:

(a) depositing a layer of poly(aryl ether benzimidazole), in the form of a solution, over a substrate;

(b) heating said poly(aryl ether benzimidazole) layer to drive off said solvent;

(c) adding a coating of polyamic acid to said layer of said poly(aryl ether benzimidazole) whereby a product is formed;

(d) heating said product of step (c) whereby said poly(aryl ether benzimidazole) is cured and said polymeric acid is converted to a cured polyimide to provide a randomly cured product;

(e) forming vias in said randomly cured product of step (d);

(f) depositing copper in said vias to complete a first layer; and

(g) repeating steps (a) to (f) whereby a second layer is formed.

5,593,721

METHOD FOR MANUFACTURING A PIEZOELECTRIC RESONANT COMPONENT

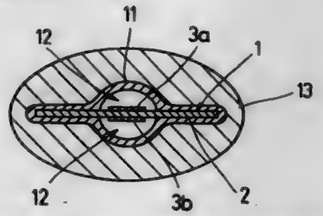
Muneyuki Daidai, and Masaho Sumita, both of Toyama, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 1, 1995, Ser. No. 457,141

Claims priority, application Japan, Jul. 26, 1994, 6-194973; Aug. 15, 1994, 6-214276; Apr. 13, 1995, 7-113587

Int. Cl.[6] B05D *5/12*; **H04R** *17/00*

U.S. Cl. 427—100 **5 Claims**



1. A method for manufacturing a piezoelectric resonant component having a cavity formed around a vibrating electrode of a piezoelectric resonant element comprising the steps of:

applying an organic silicon compound around said vibrating electrode of said piezoelectric resonant element;

forming a film around said piezoelectric resonant element and said organic silicon compound;

forming said cavity by dispersing said organic silicon compound to the outside through said film; and

forming an outer coating material around said film.

5,593,722

METHOD OF PRODUCING THICK MULTI-LAYER SUBSTRATES

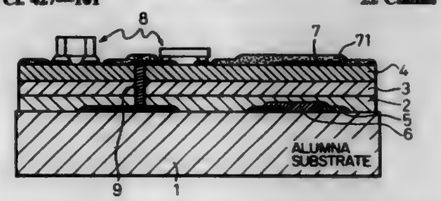
Yuji Otani, Okazaki; Takashi Nagaoka, Anjo, and Mitsuhiro Saitou, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 170,926, Dec. 21, 1993, abandoned. This application Feb. 9, 1996, Ser. No. 599,112

Claims priority, application Japan, Dec. 22, 1992, 4-342802; Dec. 22, 1992, 4-342803

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—101 **22 Claims**



1. A method of producing thick multi-layer substrates comprising the steps of:

forming a thick-film resistor by printing a thick-film resistor on a ceramic substrate followed by firing,

forming insulating layers by successively printing a plurality of insulating layers on the surfaces of said thick-film resistor and on said ceramic substrate followed by firing, and

forming wiring by printing a wiring pattern onto said insulating layers followed by firing,

wherein at least the firing of the thick film resistor and of the insulating layer in contact with the thick film resistor is done under the same atmosphere, and

wherein said thick-film resistor is fired at a temperature higher than a temperature of firing said insulating layers that are in contact with said thick-film resistor.

5,593,723

MAGNETIC RECORDING MEDIUM MANUFACTURING METHOD AND MANUFACTURING APPARATUS AND MAGNETIC RECORDING MEDIUM

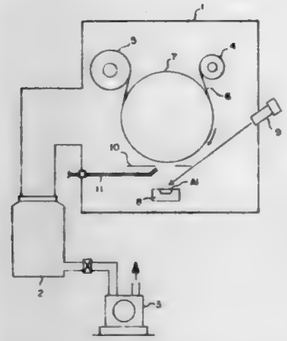
Noriyuki Kitaori; Osamu Yoshida, and Hirohide Mizunoya, all of Tochigi, Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Sep. 17, 1993, Ser. No. 122,286

Claims priority, application Japan, Sep. 17, 1992, 4-247922; Jul. 22, 1993, 5-181501

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—127 **18 Claims**



1. A method of manufacturing a magnetic recording medium having a magnetic layer disposed on a non-magnetic substrate having a first and a second surface which comprises

conducting the following steps in a housing having three chambers:

(a) applying a back coat layer comprising a metal having a surface resistance in the range of 5 to 10^5 ohms or semi-metal having a surface resistance in the range of 10^5 to 10^8 ohms on a first surface of said non-magnetic substrate in a first chamber maintained in a vacuum;

(b) applying a magnetic layer on a second surface of said-non-magnetic substrate in a second chamber maintained in a vacuum; and

(c) applying a top coat layer by ultrasonic spraying a lubricant on said magnetic layer in a third chamber maintained in a vacuum, to form said magnetic recording medium.

5,593,724

PROCESS FOR PRODUCING A PATTERN IN A GLAZE COMPOSITION AND PREPARATION OF MOLD THEREFORE

Russell P. Rich, Lutherville, and James E. Whipps, Ellicott City, both of Md., assignors to The Burns & Russell Company, Baltimore, Md.

Division of Ser. No. 831,246, Feb. 7, 1992, Pat. No. 5,393,471. This application Nov. 9, 1994, Ser. No. 338,186

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—135 **14 Claims**

1. A process for producing a pattern in a mold surface which comprises:

subjecting a mold surface with a coating of a fusible enameling composition to elevated temperature sufficient to at least partially fuse said fusible enameling composition wherein said fusible enameling composition is selected from the group consisting of glass enamel, ceramic enamel and porcelain enamel; and

patterning said fusible enameling composition by removing material from said fusible enameling composition to provide the pattern in said mold surface.

5,593,725

ANTI-REFLECTIVE LAYER AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE USING THE SAME

Chun-geun Park, Suwon; Gi-sung Yeo, and Jung-chul Park, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 136,833, Oct. 18, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 304,197

Claims priority, application Rep. of Korea, Sep. 8, 1993, 93-18016

Int. Cl.[6] B05D *5/00;5/06*

U.S. Cl. 427—160 **21 Claims**



1. A method for manufacturing an anti-reflective layer comprising the steps of:

coating a polymer solution containing at least one compound selected from the group consisting of phenol-based resins, water-soluble resins other than aryl resins or phenol resins and acryl resins as a main component on a substrate; and

baking the coated polymer solution at a high temperature under conditions to increase the amount of carbonyl groups present on said at least one compound.

5,593,726

HOT ISOSTATIC PRESSING PROCESS FOR APPLYING WEAR AND CORROSION RESISTANT COATINGS

John R. Nicholls, Flitwick; David J. Stephenson, Cranfield, and Geoffrey F. Archer, Warrington, all of England, assignors to APV Corporation Limited, England

Continuation of Ser. No. 947,804, Sep. 18, 1992, abandoned, which is a continuation of Ser. No. 697,882, May 9, 1991, abandoned. This application May 6, 1994, Ser. No. 238,819

Claims priority, application United Kingdom, May 10, 1990, 9010549; Dec. 19, 1990, 9027543

Int. Cl.[6] B05D 3/02

U.S. Cl. 427—189 22 Claims

1. A method of producing a coating resistant to at least one of wear and corrosion on a surface of a substrate made of at least one of metal and ceramic, said coating being produced from a coating material, said coating material comprising hard metallic alloys, said method comprising the steps of:

providing a layer of powder grains of the coating material in powder form bonded together with an organic binder;

subjecting said layer of bonded powder grains and said binder to a first heating step at a first temperature during which said binder is decomposed, whereby a rudimentary coating comprising said powder grains and decomposed binder is formed on said surface; and

subjecting said rudimentary coating on said surface to a second heating step being conducted in conjunction with the application of isostatic super-atmospheric pressure to densify said rudimentary coating by isostatic hot pressing of said powder grains and to permanently adhere the densified rudimentary coating to said surface to form said resistant coating,

wherein no liquid phase is produced in the layer of the powder grains during the first heating step or the second heating step.

5,593,727

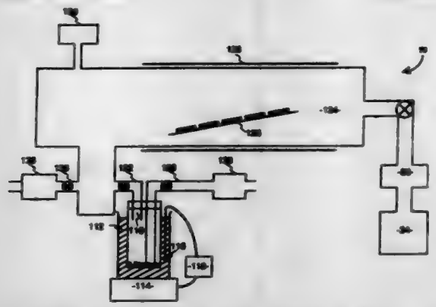
PRODUCTION OF FILMS OF SiO_2 BY CHEMICAL VAPOR DEPOSITION

Sesha B. Desu; Chien-Hsiung Peng, both of Blacksburg, Va.; Tian Shi, Beijing, China, and Pradyot A. Agarkar, Hopewell Township, N.J., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation of Ser. No. 871,309, Apr. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 668,032, Mar. 12, 1991, Pat. No. 5,106,604. This application Nov. 8, 1993, Ser. No. 148,391

Int. Cl.[6] C23C 16/00

U.S. Cl. 427—248.1 16 Claims



1. The low temperature generation of films of SiO_2, on substrates that cannot withstand temperatures greater than about 500° C., comprising the step of chemical vapor deposition of hydridospherosiloxane, wherein said hydridospherosiloxane is produced by the steps of:

a. preparing a biphasic reaction medium having a first solvent phase and a second solvent phase, said second solvent phase comprising a concentrated solution of a metal salt in a polar organic solvent and water;

b. adding to the biphasic reaction medium of step a), a silicon compound represented by the formula:

$$HSiX_3,$$

where X is a group which is hydrolyzable in the solvent of said first solvent phase;

c. separating said first solvent phase from said second solvent phase;

d. treating said separated first solvent phase with a metal salt containing carbonate ions, for a time period which is just sufficient to remove by-products;

e. isolating a mixture of crystals of $(HSiO_{3/2})_8$, and $(HSiO_{3/2})_{10}$ by evaporation of said first solvent phase solvent; and

f. washing said mixture of step e) with a hydrocarbon solvent and isolating crystals of $(HSiO_{3/2})_8$.

5,593,728

INTERFACE COATING FOR CERAMIC FIBERS

Arthur W. Moore, Strongsville, and Michael Dowell, Hudson, both of Ohio, assignors to Advanced Ceramics Corporation, Cleveland, Ohio

Filed Nov. 1, 1994, Ser. No. 332,924

Int. Cl.[6] C23C 16/34;16/52; C04B 35/58

U.S. Cl. 427—255.2 4 Claims

1. A process for forming an interface coating on a ceramic fibrous material having a differential in thermal expansion of at least 0.2% to 1500° C. with respect to the ceramic fibrous material so as to enable the coating to mechanically debond from the fibrous material comprising the steps of: placing the fibrous material to be coated within a furnace chamber of a reactor vessel; heating the atmosphere within the furnace chamber to a uniform temperature of between 1300° C. and 1750° C.; reducing the chamber pressure to between 0.1 and 1.5 Torr; introducing reactant vapors into said furnace chamber consisting essentially of ammonia and a gas of boron trichloride and trichlorosilane at a flow rate in accordance with the following gas volume ratio:

$$\frac{NH_3}{BCl_3 + HSiCl_3} = 1.3 \text{ to } 3.0$$

so as to fully nitride a deposited material for forming a coating complex of $BSi_xN_{1+1.33x}$ where $0.018<x<1.23$ on said fibrous material with a concentration of from 2 wt % to 42 wt % silicon and essentially no free silicon.

5,593,729

PORE-SIZE SELECTIVE MODIFICATION OF POROUS MATERIALS

Jean M. J. Frechet, and Frantisek Svec, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation-in-part of Ser. No. 964,085, Oct. 21, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 388,721

Int. Cl.[6] B05D 3/10

U.S. Cl. 427—337 14 Claims

1. A method of pore-size selective chemical modification of porous materials having pores of at least two different size ranges, said pores being substantially homogeneously distributed throughout the porous material and having reactive groups on the surfaces thereof, by means of a modifying agent, comprising (1) selecting a modifying agent having a size which precludes its penetration into all of the pores of one of the size ranges, (2) contacting the porous material with said modifying agent, and (3) allowing sufficient time for the modifying agent to chemically modifying the reactive groups only in the pores into which the modifying agent penetrates.

5,593,730

POWDER COATING COMPOSITION

Rajasingham Satgurunathan, Kingsley; David C. Hinde, Wirral; John C. Padget, Frodsham, and Stephen G. Yeates, Macclesfield, all of United Kingdom, assignors to Zeneca Limited, London, England

PCT No. PCT/GB93/01423, § 371 Date Jan. 13, 1995, § 102(e) Date Jan. 13, 1995, PCT Pub. No. WO94/01500, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 7, 1993, Ser. No. 367,352

Claims priority, application United Kingdom, Jul. 14, 1992, 9214900

Int. Cl.[6] C08L 33/02;37/00;29/02;43/04

U.S. Cl. 427—386 15 Claims

1. Process for the production of a powder coating composition, said composition comprising a hybrid polymer system in granular form of a polymer A formable from monomer(s) by aqueous suspension polymerisation and a polymer B, different to A, wherein said process comprises forming said hybrid polymer system by dissolving polymer B in monomeric material to be used in the formation of polymer A, polymerising the monomer(s) to form polymer A using an aqueous suspension polymerisation process, and removing the aqueous phase to form a hybrid of the polymers A and B in granular form, and wherein polymer A is a polymer formed by the free-radical addition polymerisation of at least one olefinically unsaturated monomer and polymer B is selected from the group consisting of polyester, polyurethane, polyurethane-urea, epoxy polymer, polyamide and fluorocopolymer, and wherein further polymer A and polymer B bear functional groups for imparting curability to the hybrid polymer system, and wherein further the hybrid polymer system formed has a number average molecular weight within the range of from 1500 to 15000.

5,593,731

AQUEOUS CURABLE RESIN COMPOSITIONS

Yuu Akagi, Yokohama; Yuichi Kawaguchi, Aichi-ken, and Donghai Yu, Tokyo-to, all of Japan, assignors to Kansai Paint Company Limited, Amagasaki, Japan

Filed Mar. 27, 1995, Ser. No. 411,308

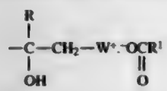
Claims priority, application Japan, Mar. 30, 1994, 6-061364; Dec. 8, 1994, 6-304521

Int. Cl.[6] B05D 3/02

U.S. Cl. 427—386 11 Claims

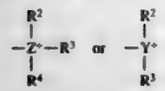
1. An aqueous curable resin composition which comprises:

[A] a resin component having, as functional groups, an aprotic onium salt-containing group represented by the formula (1)



(1)

wherein R is a hydrogen atom or a methyl group, R^1 is a hydrogen atom or a hydrocarbon group having 1 to 8 carbon atoms which may be substituted by a hydroxyl group, an alkoxyl group, an ester group or a halogen atom, W^+ represents



wherein Z is a nitrogen atom or a phosphorus atom, Y is a sulfur atom and R^2, R^3 and R^4 are the same or different and each represents an organic group having 1 to 14 carbon atoms, or R^2 and R^3, or R^2, R^3 and R^4 may combine to form a heterocyclic group together with the nitrogen atom, the phosphorus atom or the sulfur atom, a hydroxyl group, an alicyclic epoxy group and a hydrolyzable group directly bound to a silicon atom or a hydroxysilyl group, and

[B] a metal chelate compound selected from the class consisting of aluminum chelate compound, zirconium chelate compound and titanium chelate compound.

5,593,732

NONTOXIC ANTIFOULING SYSTEMS

James R. Griffith, Lanham, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 219,224, Mar. 28, 1994, Pat. No. 5,449,553, which is a continuation of Ser. No. 847,401, Mar. 6, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 430,995

Int. Cl.[6] B05D 1/36;5/08;7/24

U.S. Cl. 427—407.1 12 Claims

1. A method for applying an antifouling system to a substrate comprising applying a fluid silicone bonding layer to said substrate; allowing said bonding layer to solidify to a tacky surface; applying a fluid silicone release layer to said bonding layer after said bonding layer solidifies to a tacky surface; and allowing said release layer to solidify to a solid, non-tacky surface; wherein said release layer is characterized by mechanical toughness that is imparted to said release layer by said bonding layer which said release layer does not have in absence of said bonding layer; said release layer is obtained from a fluid, room temperature curable mixture comprising an organopolysiloxane, 0.1%–20 %, based on the weight of said organopolysiloxane in said release layer, of an alkyl silicate, and an effective amount of a first curing agent for curing said release layer; and said bonding layer is obtained from a fluid, room temperature curable mixture comprising an organopolysiloxane, an effective amount of a second curing agent for curing said bonding layer, and an effective amount of a toughening component for toughening said bonding layer comprising a monofunctional monomer and a polyfunctional monomer.

5,593,733

COATING COMPOSITION CONTAINING POLYESTER POLYMERS WITH TERMINAL CARBAMATE GROUPS AND POLYMERIC POLYOL DERIVED FROM ETHYLENICALLY UNSATURATED MONOMERS

Michael A. Mayo, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 21, 1995, Ser. No. 562,234

Int. Cl.[6] B05D 7/14

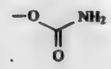
U.S. Cl. 427—407.2 18 Claims

1. A method of applying a composite coating to a substrate comprising:

(a) applying to the substrate a colored film-forming composition to form a base coat and

(b) applying to said base coat a clear film-forming composition to form a transparent top coat over the base coat wherein the clear film-forming composition comprises:

(i) 25 to 70 percent by weight of a polymer or oligomer containing repeating ester groups in the polymer or oligomer backbone and containing a plurality of terminal carbamate groups of the structure:



(ii) 30 to 75 percent by weight of a hydroxyl functional polymer derived from ethylenically unsaturated monomers;

(iii) 25 to 50 percent by weight of an aminoplast crosslinking agent having a plurality of functional groups that are reactive with said terminal groups of (i);

the percentages by weight of (i) and (ii) being based on total resin solids weight of (i) plus (ii); the percentage by weight of (iii) being based on total weight of resin solids in the clear film-forming composition.

5,593,734

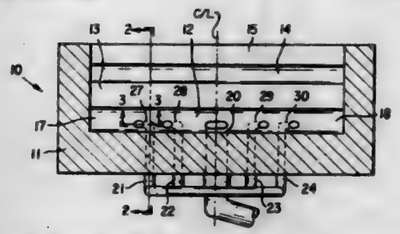
MULTIPLE INLET FLOW DISTRIBUTOR FOR LIQUIDS

Siah-Luh Yuan, Webster, and David W. Grunczynski, II, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 281,869, Jul. 28, 1994, abandoned, which is a continuation of Ser. No. 30,997, Mar. 12, 1993, abandoned. This application Feb. 7, 1996, Ser. No. 597,750

Int. Cl.[6] B05D 1/30

U.S. Cl. 427—420 9 Claims



1. A method of coating a liquid composition as a uniform layer on a substrate by means of a coating hopper having an elongated flow distribution cavity extending transversely within said hopper and communications throughout its length with an elongated outlet slot opening on an exterior surface of the hopper, said cavity having a central region and opposite ends, comprising:

a) introducing a primary stream of the liquid composition to the central region of said elongated cavity and thereby causing said composition to flow transversely within the cavity;

b) introducing secondary streams of the liquid composition to the cavity between the central region and the ends thereof concurrent with the transverse flow of said primary stream in said cavity; and each of said secondary streams resulting in flow toward both the slot and a nearest end of the cavity and liquid from the farthest angled inlet port, angled with respect to the primary inlet, flows toward the outlet slot and toward the end of the said cavity on the same side of the primary inlet, said cavity being distinct from said outlet slot, the streams being fed to said cavity at an angle with respect to said cavity wall toward and at a position spaced apart from the end of said cavity on the same side as the primary inlet such that the position of the farthest angled inlet port, angled with respect to the primary inlet, in the cavity does not exceed 90% of the distance from the primary inlet to either end of the cavity; and flow rates of said streams being selected to prevent or minimize stagnation of flow within the cavity

c) flow liquid composition from the cavity through the slot opening to the exterior surface of the hopper, and from the exterior surface of the hopper to the substrate.

5,593,735

AMINORESIN BASED COATINGS CONTAINING 1,3,5-TRIAZINE TRIS-CARBAMATE CO-CROSSLINKERS

Kuang-Jong Wu, Shelton, Conn., and Doris C. O'Toole, Carmel, N.Y., assignors to Cytec Technology Corp., Wilmington, Del.

Division of Ser. No. 998,313, Dec. 29, 1992. This application May 8, 1995, Ser. No. 437,192

Int. Cl.[6] B05D 3/02

U.S. Cl. 427—461 20 Claims

1. A method of coating a substrate comprising the steps of (a) contacting the substrate with a curable composition and, thereafter, (b) heat curing the curable composition, wherein the curable composition comprises:

(a) a polyfunctional hydroxy group containing material;

(b) an aminoresin crosslinking agent;

(c) a co-crosslinking agent comprising a 1,3,5-triazine-2,4,6-tris-carbamate of the formula $C_3N_3(NHCOOR)_3$ or an oligomer thereof; and

(d) an acid cure catalyst,

wherein the weight ratio of (a) to the sum of (b) and (c) is in the range of from 99:1 to 0.5:1, and wherein (d) is present in an amount of from 0.01 weight percent to 3 weight percent based on the sum of (a), (b) and (c).

5,593,736

PROCESS FOR MANUFACTURING A FIBER REINFORCED OPTIC MICROCABLE WITH A UV CURED RESIN

Steven J. Cowen; Christopher M. Young, both of San Diego; James H. Dombrowski, Encinitas; Michael E. Kono, Carlsbad, and James H. Daughtry, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1988, Ser. No. 199,820

Int. Cl.[6] C08F 2/48; C03C 25/02; G02B 6/22;6/44

U.S. Cl. 427—492 19 Claims



1. A process for fabricating a fiber reinforced fiber optic microcable comprising the steps of:

wetting a plurality of fibers with an ultraviolet light curable resin having a post-cure Young's modulus ranging from approximately 700,000 to 2,500,000 kPa, a post-cure tensile strength of approximately 28,000 to 56,000 kPa, a post-cure moisture resistance of less than one per cent after 24 hours of water immersion, an uncured viscosity of less than 100 centipoise at 27° C., a strain to failure of 1½ per cent after cure, and a glass transition temperature ranging anywhere from 60° C. to 105° C. after cure;

placing the wetted fibers around a buffered optical fiber core to form a matrix;

curing said matrix with ultraviolet light having a wavelength any where from 290 to 400 nanometers; and

cooling said curing matrix in a nitrogen atmosphere.

5,593,737

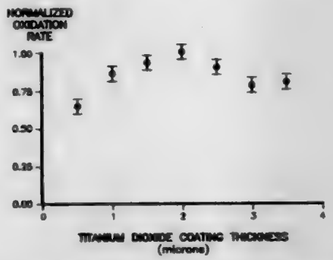
PHOTOCATALYTIC SEMICONDUCTOR COATING PROCESS

Richard A. Meisner, Glastonbury, and Philip J. Birbara, Windsor Locks, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 23, 1995, Ser. No. 448,147

Int. Cl.[6] C08J 7/06; C03C 25/02

U.S. Cl. 427—512 10 Claims



1. A method for coating a substrate with photocatalytic semiconductor, comprising:

a. mixing photocatalytic semiconductor powder with water to form a mixture having a pH;

b. acidifying said mixture to inhibit agglomeration of said powder;

c. sonicating said mixture to disperse said powder;

d. coating the substrate with said sonicated mixture; and

e. illuminating said coated substrate with UV to dry and harden said coating, wherein such drying and hardening is accomplished without substantially heating said coated substrate.

5,593,738

PROCESS FOR THE PREPARATION OF COMPOSITE SEMI-PERMEABLE MEMBRANE

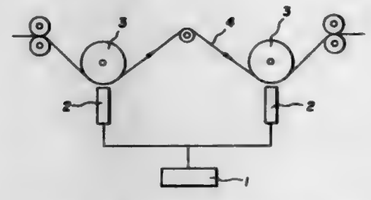
Dae W. Ihm; Jeong L. Kim, both of Seoul; Kwon I. Kim, Inchon, and Byeng H. Kim, Anyang, all of Rep. of Korea, assignors to Cheil Synthetics Inc., Kyungsangbuk-do, Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 359,301

Claims priority, application Rep. of Korea, Dec. 20, 1993, 93-28546

Int. Cl.[6] C23C 14/02

U.S. Cl. 427—534 4 Claims



1. A process for the preparation of composite semi-permeable membrane wherein a porous support layer is cast on polyester non-woven fabric and covered with an active layer of polyamide ultrathin film that is obtained by interfacial polycondensation of multifunctional amine solution with multifunctional halogen solution, comprising the steps of:

subjecting a surface of a polyester non-woven fabric to corona discharge;

spraying water on the corona-treated surface of the polyester non-woven fabric; and

casting a porous support substance on an other surface of the polyester non-woven fabric.

5,593,739

METHOD OF PATTERNED METALLIZATION OF SUBSTRATE SURFACES

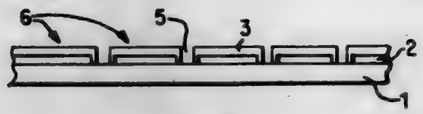
Joerg Kickelhain, Neustadt, Germany, assignor to LPKF CAD/CAM Systeme GmbH, Garbsen, Germany

Filed Feb. 14, 1996, Ser. No. 601,120

Claims priority, application European Pat. Off., Feb. 14, 1995, 95101969

Int. Cl.[6] B05D 3/00

U.S. Cl. 427—555 15 Claims



1. A method for patterned metallization of a substrate surface comprising the steps of:

applying a layer of primer to entirely cover a substrate surface in an area where a metallized pattern is to be formed;

selectively ablating portions of the primer layer from the substrate by exposing said portions to the action of electromagnetic ultraviolet radiation to completely remove the primer from the exposed portions so that a patterned primer layer with primer-free insulating channels formed therein remains on the substrate surface; and

thereafter depositing a metal layer on the remaining patterned primer layer to form conducting paths.

5,593,740

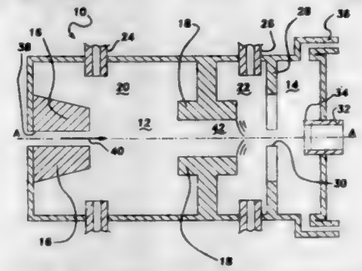
METHOD AND APPARATUS FOR MAKING CARBON-ENCAPSULATED ULTRAFINE METAL PARTICLES

Emil E. Strumban, Oak Park, Mich.; Edward K. Dobrinsky, Saratoy, Russian Federation; Anatoly A. Kuznetsov, and Avetik H. Harutyunyan, both of Moscow, Russian Federation, assignors to Synmatix Corporation, Farmington Hills, Mich.

Filed Jan. 17, 1995, Ser. No. 373,631

Int. Cl.[6] H05H 1/24

U.S. Cl. 427—577 16 Claims



1. A process for producing carbon encapsulated ultrafine metal particles comprising:

a) forming a plasma arc;

b) causing a powdered metal material to contact the plasma arc for vaporizing the metal and thereafter mixing the vaporized metal with a source of a carbon containing gas;

c) quenching of the product of step b) at a rate of from about 10^2 K./sec to about 10^6 K./sec, for forming the carbon encapsulated ultrafine metal material product; and;

d) collecting the product of step c).

5,593,741

METHOD AND APPARATUS FOR FORMING SILICON OXIDE FILM BY CHEMICAL VAPOR DEPOSITION

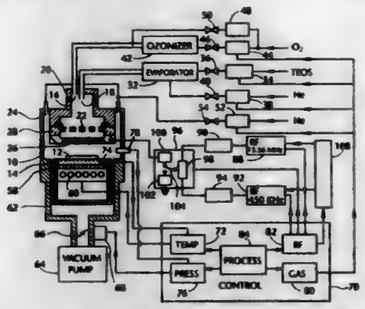
Yasuo Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 159,231, Nov. 30, 1993, abandoned. This application Jun. 28, 1995, Ser. No. 495,873

Claims priority, application Japan, Nov. 30, 1992, 4-328973

Int. Cl.[6] B05D 3/06

U.S. Cl. 427—579 21 Claims



1. A method of forming a silicon oxide film on a heated substrate by chemical vapor deposition (CVD) using an organosilicon com-

pound gas and oxygen gas as essential reactants in the presence of a plasma containing oxygen ions, said plasma having an intensity represented by the density of said oxygen ions impinging on a surface of said substrate, the method comprising the steps of:

(a) depositing a first plasma CVD silicon oxide film on the substrate while the intensity of said plasma is at a first level;

(b) lowering the intensity of said plasma from said first level to a second level and depositing an intermediate CVD silicon oxide film on said first plasma CVD silicon oxide film, said intermediate CVD silicon oxide film having a step coverage and a gap filling capability that are superior to that of said first plasma CVD silicon oxide film and having a film quality that is inferior to that of said first plasma CVD silicon oxide film, wherein said film quality is measured by criteria comprising moisture content; and

(c) raising the intensity of said plasma from said second level to said first level and depositing a second plasma CVD silicon oxide film on said intermediate CVD silicon oxide film, thereby converting said intermediate CVD silicon oxide film into a silicon oxide film which is substantially equivalent in film quality to said first and second plasma CVD silicon oxide films.

5,593,742

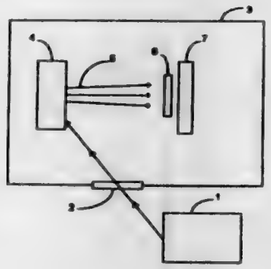
FABRICATION OF SILICON MICROCLUSTERS AND MICROFILAMENTS

Robert A. Lux, Toms River, N.J.; James A. Harvey, Apex, N.C.; Arthur Tauber, Elberon, and Steven C. Tidrow, Estontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1995, Ser. No. 518,770

Int. Cl.[6] C23C *8/00;14/30;* H05B *7/00*

U.S. Cl. 427—586 **10 Claims**



1. An ablation process for fabricating porous silicon microclusters comprising:

using laser light pulses in an inert atmosphere of argon gas pressurized in a range of 20–200 mTorr to derive a plasma of particles which have a surface chemistry and extend along a path from a block of silicon material, with the laser light pulses having a wavelength of 248 nanometers, a frequency ranging from 25 to 35 Hz and a laser fluence of 150 mJ/mm^2;

locating a substrate having a gold film on a quartz base, in the path of the particles; and

accumulating fused deposits of the particles on the substrate, with the particles having spherical configurations ranging in diameter from 200 to 1000 Angstrom units.

5,593,743

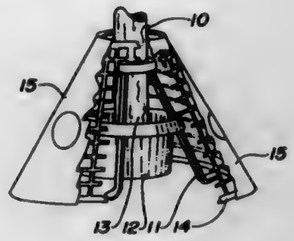
CHRISTMAS TREE SKIRT SUPPORT

Patricia M. Baker, Rte. 7, Box 587J, Mountain Home, Ark. 72653

Filed Jun. 6, 1995, Ser. No. 467,751

Int. Cl.[6] A47G *33/08*

U.S. Cl. 428—18 **8 Claims**



1. In combination with a Christmas tree, a Christmas tree stand for supporting the Christmas tree, and a Christmas tree skirt for covering the Christmas tree stand, a Christmas tree skirt support, comprising:

a grid of ribs surrounding the Christmas tree at its base and extending over the Christmas tree stand; and

a Christmas tree skirt supported around the Christmas tree at its base on said grid of ribs and prevented from contact with the Christmas tree stand by said grid of ribs.

5,593,744

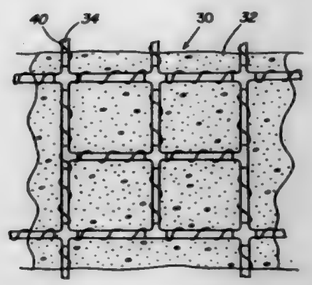
HOLLOW REINFORCING MEMBERS AND COMPOSITES CONTAINING THE SAME

James A. Van Vechten; James R. Lundy; Alan K. Wallace, and Chris A. Bell, all of Corvallis, Oreg., assignors to Oregon Reinforcement Engineering, Ltd., Corvallis, Oreg.

Continuation-in-part of Ser. No. 163,684, Dec. 6, 1993. This application Nov. 2, 1994, Ser. No. 333,485

Int. Cl.[6] B29D *23/00*

U.S. Cl. 428—34.4 **13 Claims**



1. A composite comprising a body of cast material having cast therein a plurality of structural elements that provide tensile and flexural strength reinforcement to said body of cast material, each of said structural elements comprising a substantially tubular rigid member that, following casting of said body of cast material, has an unobstructed lumen for containment of a fluid or an electrical or optical component and having an interior diameter greater than 4 mm but not greater than 50 mm, a wall thickness of 1 mm or at least 10% of the interior diameter, whichever is greater, a ridged outer surface engaging said body of cast material exterior to said structural elements, and a tensile strength of at least 10 megaPascals or four times the tensile strength of the material being reinforced, whichever is greater.

5,593,745

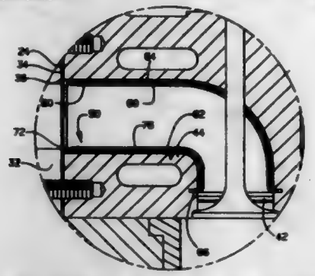
INSULATED PORT LINER ASSEMBLY

Michael H. Hamilton, Peoria, and Michael C. Long, Peoria Heights, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Feb. 24, 1994, Ser. No. 201,290

Int. Cl.[6] B32B *1/08;* F01N *7/10;* D03D *49/26*

U.S. Cl. 428—34.5 **42 Claims**



1. A port liner assembly adapted for use with an internal combustion engine, comprising:

a tubular port liner, the liner including a body composed of a ceramic material with a low coefficient of expansion within the range of 3 to 5 E-6/C and high thermal conductivity within the range of 15–150 W/M° K having an outer surface and a radial outwardly extending annular flange;

an insulating layer of material substantially surrounding the outer surface; and

means for totally encapsulating the insulating layer of material, the encapsulating means being composed of fiberglass cloth.

5,593,746

THERMALLY INSULATING BATT FOR WINTER APPAREL, QUILTS, SLEEPING BAGS AND THE LIKE, THE PROCESS OF PREPARATION THEREOF AND FABRICS TOGETHER AND THE THERMALLY INSULATING BATT

Lucio Siniscalchi, and Marciano Siniscalchi, both of Via Milano, 52, 22059, Robbiate (Como), Italy

Continuation-in-part of Ser. No. 942,750, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 688,031, Apr. 19, 1991, abandoned, which is a division of Ser. No. 424,883, Oct. 19, 1989, abandoned, which is a continuation of Ser. No. 103,356, Sep. 30, 1987, abandoned. This application Apr. 29, 1994, Ser. No. 235,546

Claims priority, application Italy, Jun. 30, 1987, 21127/87

Int. Cl.[6] A41D *31/02;* B32B *5/14;33/00*

U.S. Cl. 428—36.1 **10 Claims**

1. A thermally insulating batt for use as a warmth-retaining padding produced by the steps of:

1) forming at least one web of synthetic or natural fibers of mixtures of synthetic and natural fibers by means of carding machines, plying said at least one web, said at least one web having two sides:

2) applying on at least one side of said web a resin glue or a mixture of glues comprising components:

a) 50%–90% by weight of an emulsion of an acrylic copolymer, which contains a cross-linking agent said acrylic copolymer having a glass transition temperature of −15° C.–+40° C. and

b) 10%–50% by weight of an emulsion or dispersion of a polymer which contains a cross-linking agent, said polymer being a member of the group of aliphatic and aromatic polyurethanes, polyethers and polyesters, acrylics or meta-acrylics, said polymer having a glass transition temperature (Tg) of −60° C. to −12° C. and a minimum film-forming temperature (MFT) from 0° to 9° C., said emulsion or dispersion having a density from 1.02 to 1.06 g/cm^3, a pH from 3.2 to 10.4, a viscosity from 30 to 900 mPa.s and a particle size from 0.015 to 0.35 microns;

3) drying and heating said resin on said resin-treated batt; and

4) calendering said resin-treated batt from step 3) under controlled temperature and pressure conditions whereby an air chamber is obtained in the interior thereof, and a film is created on at least one face of said batt which has a low thermal exchange coefficient and a capability of dynamic adjustment to the wearer's body temperature, said thermally insulating batt exhibiting a low heat flow rate from an element whose temperature is 37° C. towards a cold 0° C. surrounding environment, and a 15% to 50% higher heat flow rate from an element heated at a temperature of about 38° C. to about 41° C. towards the same cold surrounding environment.

5,593,747

PUNCTURE RESISTANT HEAT SHRINKABLE FILM CONTAINING NARROW MOLECULAR WEIGHT ETHYLENE ALPHA OLEFIN

Paul N. Georgelos, Oak Park, Ill., assignor to Viskase Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 163,016, Dec. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 89,914, Jul. 12, 1993, Pat. No. 5,397,613. This application Feb. 24, 1995, Ser. No. 394,052

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—36.7 **27 Claims**

1. A heat shrinkable, puncture resistant biaxially stretched thermoplastic film suitable for use in fabricating bags for packaging food articles comprising a polyethylene which is a linear copolymer of ethylene and an alpha olefin containing from 4 to 8 carbon atoms, having a density between about 0.88 and about 0.905 g/cm^3, a melt index not exceeding about 1.5 g/10 min, a molecular weight/size distribution ratio Mw/Mn not exceeding about 3, a melting point not exceeding about 102° C., a Young's Modulus not exceeding about 850 kg/cm^2, and wherein said film shrinks at least about 45 percent at a temperature of about 90° C. in at least one of the machine and transverse directions.

5,593,748

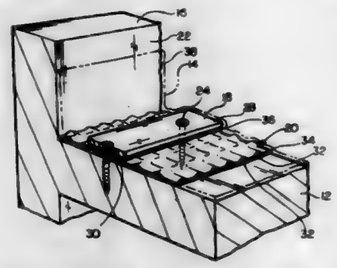
REINFORCED TAPE STRIP FOR PERIMETER SECUREMENT OF A MEMBRANE ROOF AND METHOD OF ATTACHING

Michael J. Hubbard, Holland, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

Continuation of Ser. No. 193,320, Feb. 9, 1994, abandoned. This application Dec. 12, 1994, Ser. No. 353,735

Int. Cl.[6] C09J *7/02*

U.S. Cl. 428—41.3 **16 Claims**



1. A reinforced tape strip composite for securing a membrane roof to a roof deck or a parapet wall of a roof deck, the reinforced tape strip composite consisting essentially of:

a reinforcement layer consisting essentially of a single ply fabric reinforcement material;

at least one adhesive layer of a uniform thickness prebonded to said single ply fabric reinforcement material before the reinforced tape strip is fastened to the roof deck or the parapet wall, said at least one adhesive layer capable of being adhered

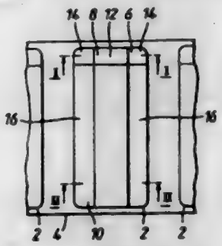
to the membrane roof; and
a protective layer covering said adhesive layer.

5,593,749

LABELS AND MANUFACTURE THEREOF

David J. Instance, Guinea Hall, Sellindge, Kent, TN25 6EG, United Kingdom

PCT No. PCT/GB94/01151, § 371 Date Jan. 12, 1995, § 102(e) Date Jan. 12, 1995, PCT Pub. No. WO94/28530, PCT Pub. Date Dec. 8, 1994
PCT Filed May 27, 1994, Ser. No. 373,213
Claims priority, application United Kingdom, May 27, 1993, 9310951
Int. Cl.[6] B31D *1/02*; G09F *3/02*
U.S. Cl. 428—40.1 **20 Claims**



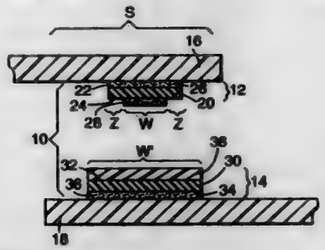
1. A self-adheseive label comprising:
a self-adhesive base portion which is adhered by its self-adhesive surface to a backing of release material, a folded leaflet portion which is disposed over the base portion and a self-adhesive overlaminate portion which is adhered by its self-adhesive surface to a part of the top surface of the folded leaflet portion and to exposed parts of the top surface of the base portion on opposed sides of the folded leaflet portion so as to retain the leaflet portion in a folded configuration, the overlaminate portion exposing an end part of the folded leaflet portion the exposed end part being of sufficient size to be pulled by a user thereby to open the label.

5,593,750

CLOTH BODY COVERINGS HAVING MULTI-CYCLE REFASTENABLE TAPE CLOSURE SYSTEMS

Robert J. Rotheran, Coon Rapids; Linda C. Chaffee, Little Canada, and Kelly T. McGurran, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 320,106, Oct. 6, 1994, which is a continuation of Ser. No. 58,439, May 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 788,255, Nov. 5, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,306
Int. Cl.[6] A61F *13/56*; B32B *3/02*
U.S. Cl. 428—40.1 **17 Claims**



1. A body covering, comprising:
(a) a natural or synthetic material having at least one edge capable of forming a seam; and
(b) a fastener tape component and a release tape component;
said fastener tape component comprising:
(a) a first field of a first pressure sensitive adhesive coated on a first surface of a first backing and firmly adhered to a first edge of the body covering, and
(b) a second field of a second pressure sensitive adhesive, the second pressure sensitive adhesive having the same or substantially similar pressure sensitive adhesive formulations as the first pressure sensitive adhesive, coated on a second surface of said first backing or coated on a second backing adhesively laminated to said second surface of said first backing and releasably adhered to a second body covering or along a second edge of the body covering opposing the first edge of the first body covering;
wherein surface area of said first pressure sensitive adhesive field adhered to the first edge of the body covering is larger than surface area of said second pressure sensitive adhesive field releasably adhered to the second body covering or the second edge of the body covering;
said release tape component comprising a backing having first and second opposing surfaces, said first surface of said release tape component covered with a low adhesion release layer, said second surface of said release tape component coated with a field of a third pressure sensitive adhesive,
said third pressure sensitive adhesive field capable of firmly adhering to the second body covering or along the second edge of the first body covering opposing the first edge of the body covering, and said second pressure seasitive adhesive field capable of adhering to said low adhesion release layer in a multi-cycle, refastenable manner to contact opposing body coverings or to close the opposing edges of the body covering to form an overlapping, low profile seam,
wherein said low adhesion release layer of release tape component is wider than said second field of pressure sensitive adhesive of said fastener tape component, such that all of said second field of pressure sensitive adhesive can releasably adhere to said low adhesion release layer when opposing body coverings or opposing edges of one body covering overlap, and
wherein said second field of pressure sensitive adhesive occupies a center zone along said fastener tape component and non-adhesive zones border said center zone.

5,593,751

NYLON FIBER BLENDS FOR SAXONY CARPETS

Jing-peir Yu; Mukesh Bheda, and Raymond S. Knorr, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 2, 1995, Ser. No. 458,152
Int. Cl.[6] B32B *3/02*; D05C *17/00*; D02G *3/02*;*3/36*
U.S. Cl. 428—97 **20 Claims**

1. A saxony carpet comprising a backing material having a top side and an underside and individual lengths of heatset pile yarn extending outwardly from said top side, said pile yarn comprising from 94% to 55% based on the total weight of the yarn of a first nylon fiber and from 6% to 45% based on the total weight of the yarn of a second nylon fiber wherein said first nylon fiber is formed from a first nylon which includes at least 95% by weight, based on the total weight of the first nylon, nylon 6,6 recurring units of the formula



wherein said second nylon fiber is formed from a second nylon including at most 85% by weight, based on the total weight of the second nylon, nylon 6,6 recurring units of the formula

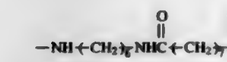


and at least 15% by weight, based on the total weight of the second nylon, of one or more recurring units selected from the group consisting of

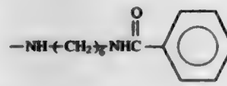
nylon 6,



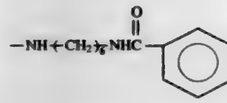
nylon 6,9,



nylon 6TA,



nylon 6IA,



and nylon 6,10,

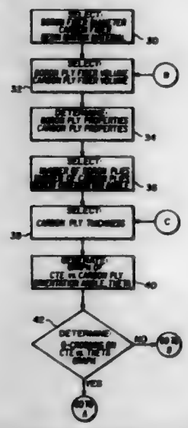


5,593,752

LOW CTE/CME BORON/CARBON FIBER LAMINATES AND METHOD OF MAKING THEM

David J. Pollatta, Webster, and Thomas N. Quinzi, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1995, Ser. No. 565,182
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—114 **5 Claims**



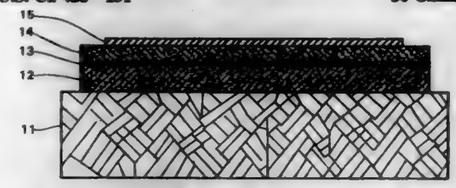
1. A boron/carbon laminate comprising a boron fiber ply consisting essentially of continuous unidirectional boron fibers, a carbon fiber layer having a balanced pair of carbon fiber plies, each carbon fiber ply consisting essentially of continuous unidirectional carbon fibers oriented at ±Theta with respect to a reference direction, said laminate having a Coefficient of Thermal Expansion between ±0.54 μm/m/°C., a Coefficient of Moisture Expansion between ±20.0 μm/m/%ΔM, and a specific modulus greater than 1.64×10^6 meter, said fiber plies being embedded in a plastic resin matrix.

5,593,753

PROTECTIVE SURFACE COVERING SYSTEMS AND METHODS OF PRODUCING SAME

Brian L. Rice, Perkiomenville, and Albert J. Turunsky, Slatington, both of Pa., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 23, 1994, Ser. No. 311,844
Int. Cl.[6] B32B *3/10*
U.S. Cl. 428—131 **30 Claims**



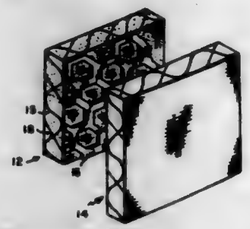
1. A protective flooring system for covering a base structure which has the capacity to produce positive fluid pressure at the surface thereof comprising:
(a) a fluid pervious substrate overlying the base structure;
(b) a protective layer, said protective layer being fluid impervious relative to the fluid perviousness of said substrate;
(c) a pressure relief layer between said substrate and said protective layer, said pressure relief layer comprising: an inner surface in fluid communication with said subetrate; an outer surface having at least a first portion and a second portion, said first portion being in fluid communication with the atmosphere surrounding said flooring system, said protective layer overlying a major portion of said second portion such that said major portion of said second portion is blocked by said protective layer from fluid communication with the atmosphere surrounding said flooring system; and a passageway connecting said relief layer inner surface to said first portion of said relief layer outer surface such that said relief layer maintains sufficient fluid communication between said atmosphere and said substrate to ensure that the greatest interfacial pressure in the system is less than about 200 psi.

5,593,754

BREATHABLE FABRIC CONSTRUCTION FOR OUTERWEAR

Stephen J. Blauer; Charles Blauer, both of Lexington, Mass., and Mark A. Mordecai, Hampton, N.H., assignors to Blauer Manufacturing Company, Inc., Boston, Mass.

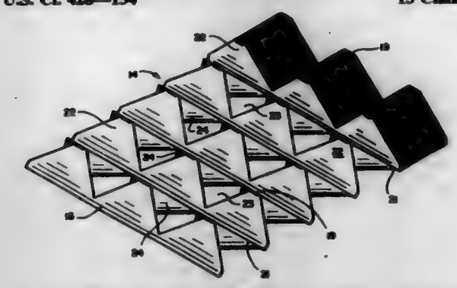
Continuation-in-part of Ser. No. 222,524, Apr. 4, 1994, Pat. No. 5,466,515. This application Nov. 2, 1995, Ser. No. 551,998
Int. Cl.[6] B32B *3/10*
U.S. Cl. 428—131 **48 Claims**



1. A fabric structure comprising:
(a) a shell and a lining secured in close proximity to each other and spaced from each other over a majority of the areas of said shell and said lining;

(b) said shell including an outer woven synthetic fabric, a stratum printed on the inner face thereof, and release agent impregnation thereof;
(c) said stratum having a pattern characterized by 10 to 90% coverage of the area of said outer shell fabric; and
(d) said stratum being composed of a high tensile strength material that is adhesively bonded to said shell outer fabric, adhesively free of said lining, and adapted to prevent said shell outer fabric from unraveling and to maintain the shape of said shell.

5,593,755
ACCORDION-FOLDED PAPER SHEET PACKING MATERIAL AND METHOD
Gunter G. Fuss, San Mateo, Calif., assignor to Free-Flow Packaging Corporation, Redwood City, Calif.
Filed Mar. 7, 1995, Ser. No. 399,916
Int. Cl.[6] B32B 3/10;31/00; B31B 1/26
U.S. Cl. 428—134 **13 Claims**



1. A packing material of folded paper stock, comprising a plurality of generally planar panels joined together in fanfold fashion along spaced apart parallel fold lines to form a series of ridges and valleys, openings in the stock at intervals spaced along the ridges, and downwardly extending pleats beneath the ridges comprising sections of the stock folded in a reverse direction along the fold lines adjacent to the openings.

5,593,756
HOLD-DOWN COVER FOR CABLES AND THE LIKE
Terry Q. Miller, 10195 Maynie Rd., Boise, Id. 83703
Continuation-in-part of Ser. No. 103,856, Aug. 9, 1993, abandoned, which is a continuation of Ser. No. 693,952, Apr. 29, 1991, Pat. No. 5,278,356, which is a continuation-in-part of Ser. No. 535,358, Jun. 8, 1990, abandoned. This application Dec. 16, 1994, Ser. No. 357,496
Int. Cl.[6] C09J 7/02
U.S. Cl. 428—194 **1 Claim**



1. An article of manufacture for retaining cables, wires, conduit, and the like on a support surface, said article comprising a thin, elongate strip of flexible material having top and bottom surfaces and a pair of longitudinal edges and including a pressure-sensitive adhesive disposed on the bottom surface in the form of two laterally spaced apart strips of approximately equal width, each said strip having an inner and an outer longitudinal edge, the outer longitudinal edges of each strip directly overlying a corresponding longitudinal edge of said flexible material, an elongate adhesive-free central section extending between the inner longitudinal edges of said adhesive strips such that a cable, wire, conduit, or the like, disposed beneath said article in use does not come into contact with the adhesive of the article, said article being so flexible that in use it is capable of bridging over underlying cables, wires, conduits, and the like in a bridge cross-section and being capable of coinciding and overlying curving or irregular pathways followed by underlying cables, wires, conduits, or the like.

5,593,757
PRODUCTION PROCESS OF COLOR FILTER AND COLOR FILTER PRODUCED THEREBY
Akio Kashiwazaki; Hiroshi Sato, both of Yokohama; Katsuhiro Shirota, Kawasaki; Hideto Yokoi, Yokohama, and Shoji Shiba, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 13, 1995, Ser. No. 489,735
Claims priority, application Japan, Jun. 17, 1994, 6-158272; May 29, 1995, 7-152733
Int. Cl.[6] B32B 3/00;27/14
U.S. Cl. 428—195 **28 Claims**



1. A process for producing a color filter, comprising the steps of:
providing color inks of red, green and blue and a black ink having a polarity opposite to that of the color inks; and
applying the color inks and the black ink directly on a base or on a heat-resistant resin layer provided on the base using an ink-jet system to form colored and black patterns
wherein the black pattern is formed with a black ink so as to adjoin the colored pattern.

5,593,758
METHOD FOR PREPARING PREFORMS FOR MOLDING PROCESSES
Leonardo C. Lopez, and Ronald R. Pelletier, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 246,020, May 19, 1994, Pat. No. 5,480,603. This application Dec. 14, 1995, Ser. No. 572,462
Int. Cl.[6] B32B 3/00
U.S. Cl. 428—195 **8 Claims**

1. A preform comprising reinforcement fibers having a substantially uniformly distributed tackifier on the surface thereof in the form of a discontinuous film coating.

5,593,759
PRESSURE-SENSITIVE STRUCTURAL ADHESIVE
Richard R. Vargas, Southgate; Sebastian S. Plamthottam, Upland, and John O. Landers, Duarte, all of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.
Continuation of Ser. No. 963,674, Oct. 20, 1992, abandoned. This application Apr. 13, 1994, Ser. No. 227,193
Int. Cl.[6] C09J 7/02
U.S. Cl. 428—200 **15 Claims**

1. A pressure-sensitive structural adhesive construction comprising:
(a) a core layer of a curable structural adhesive which is a partially cured B-stage epoxy resin or a blend of an epoxy resin, an acrylic ester resin and a hardener, said core layer having opposed surfaces and having applied on at least one of said opposed surface prior to cure of the core layer;

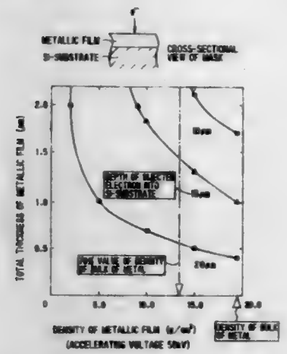


(b) a continuous or discontinuous layer of an inherently tacky pressure-sensitive adhesive, compositionally different from the core;
said pressure-sensitive adhesive layer providing an initial adhesion to a substrate to be bonded by cure of the core layer and being absorbed by the core layer when a permanent thermoset bond to such substrate is formed by thermal cure of the core layer.

5,593,760

Patent Not Issued For This Number

5,593,761
ELECTRON BEAM SHAPING MASK FOR AN ELECTRON BEAM SYSTEM WITH PATTERN WRITING CAPABILITY
Katsuyuki Itoh, and Hiroshi Yamashita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jun. 2, 1995, Ser. No. 458,849
Claims priority, application Japan, Jun. 2, 1994, 6-142233
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—210 **20 Claims**



1. An electron beam shaping mask for an electron beam system with pattern writing capability, comprising:
a substrate patterned with prescribed opening patterns, and
metallic films, which cover entire top- and bottom-surfaces of said substrate except said prescribed opening patterns, said metallic films and said substrate at said prescribed opening patterns for shielding electron beams.

5,593,762
INHERENTLY RIGID LAMINATE MATERIAL CONTAINING PLASTIC TRIMMINGS
Karl-Heinz Ahrweiler, Willich, Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & CO KG, Krefeld, Germany
Division of Ser. No. 976,798, Nov. 16, 1992, Pat. No. 5,456,872. This application Jun. 7, 1995, Ser. No. 483,831
Claims priority, application Germany, Nov. 15, 1991, 41 37 744.3
Int. Cl.[6] B32B 7/02
U.S. Cl. 428—218 **2 Claims**



1. An inherently rigid laminate material containing plastic trimmings, comprising:
a fibrous material having as a constituent textile fibers that are plastically moldable under the effect of heat, said fibrous material including;
a first filler layer having first fibrous sections; and
at least one base forming an outer surface of two fiber sections that have been melted together.

5,593,763
ACRYLIC FIBROUS MATERIAL AND HUMIDITY CONTROLLER PROVIDED THEREWITH
Noriyuki Kohara, and Shozo Shigita, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan
Filed Sep. 22, 1995, Ser. No. 532,988
Claims priority, application Japan, Oct. 18, 1994, 6-280881
Int. Cl.[6] B32B 7/02
U.S. Cl. 428—219 **2 Claims**

1. An industrial acrylic fibrous material, characterized in that said material is composed of acrylic fiber containing more than 50 weight % of acrylonitrile and having a monofilament fineness smaller than 1.5 deniers as a main component and a heat-fusible fiber as a subordinate component, said industrial acrylic fibrous material having an equilibrium water absorption height of greater than 100 mm, a water absorption rate of greater than 40 mm/20 sec, an ability to vaporize absorbed water at a rate of greater than 1.0 g/m^2/min in the atmosphere at 20° C. and 65% RH, and a density in the range of 0.15 to 0.60 g/cm^3.

5,593,764
THERMOPLASTIC COMPOSITION COMPRISING A COPOLYMER BASED ON ETHYLENE AND MALEIC ANHYDRIDE, AND INDUSTRIAL ARTICLES OBTAINED FROM SUCH A COMPOSITION
Lionel Guerdoux, Lillebonne, and Marius Hert, Aubigny en Artois, both of France, assignors to Societe Chimique des Charbonnages S.A., Paris la Defense, France
Continuation of Ser. No. 681,456, Apr. 4, 1991, abandoned, which is a continuation of Ser. No. 381,387, Jul. 18, 1989, abandoned, which is a division of Ser. No. 118,030, Nov. 6, 1987, Pat. No. 4,868,052, which is a continuation-in-part of Ser. No. 6,543, Feb. 19, 1987, abandoned. This application Mar. 17, 1993, Ser. No. 32,552
Claims priority, application France, Apr. 24, 1985, 85 06203
Int. Cl.[6] C08L 33/06;23/04; C08K 3/00; C08J 5/18
U.S. Cl. 428—220 **17 Claims**

1. A thermoplastic composition comprising an uncrosslinked blend of (A) from 1 to 80 weight percent of at least one partially crystalline polymer or copolymer of ethylene, having a density

lying between 0.870 and 0.945, and (B) from 20 to 99 weight percent of at least one hydrophobic, non-elastomeric random copolymer comprising:

(I) from 83 to 99.7 mole percent of units derived from ethylene,

(II) units derived from at least one ester of acrylic or methacrylic acid in an amount up to 14 mole percent, and

(III) from 0.3 to less than 3 mole percent of units derived from maleic anhydride,

the said copolymer (B) having a melt index in the range of 1 to 500 dg/min, wherein the total proportion of monomers II and III is limited to about 17 mole percent.

5,593,765

HOLOGRAPHIC IMAGE CONTAINING FOIL-TEXTILE LAMINATE

Richard A. Sharpe, and Mia J. Manners, bothof London, England, assignors to Holotex Limited, Essex, United Kingdom

Continuation of Ser. No. 916,843, Apr. 8, 1993, Pat. No. 5,510,911. This application Jun. 7, 1995, Ser. No. 474,513

Claims priority, application United Kingdom, Feb. 3, 1992, 9203272

Int. Cl.[6] G03H *1/00*; B32B *31/00*

U.S. Cl. 428—225 **13 Claims**

1. A flexible laminate of continuous length having an outer and visible layer providing a holographic effect, the laminate comprising:

a layer of metal foil bearing a holographic image;

a layer of flexible fabric; and

an adhesive layer between the fabric and the foil, the adhesive layer including at least one plastics material;

the laminate behaving essentially as the flexible fabric and being capable of flexing as the fabric such that clothing can be made therefrom.

5,593,766

COMPOSITE FOR REINFORCING BITUMINOUS ROOFING MEMBRANES INCLUDING A LIGHTWEIGHT GRID OF OVER-UNDER CONSTRUCTION

D. Mark Wolcoshyn, St. Catharines, Canada, assignor to Bay Mills Limited, St. Catharines, Canada

Division of Ser. No. 230,813, Apr. 21, 1994, Pat. No. 5,439,726, which is a division of Ser. No. 77,404, Jun. 16, 1993, Pat. No. 5,314,556, which is a continuation of Ser. No. 860,196, Mar. 26, 1992, abandoned, which is a continuation of Ser. No. 520,770, May 8, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 470,481

Int. Cl.[6] B32B *5/12*

U.S. Cl. 428—236 **20 Claims**



1. A puncture resisting and processability improving composite for reinforcing bituminous roofing membranes that are free of organic mats, the composite consisting essentially of:

a lightweight open grid of over-under construction, in which yarns in the cross-machine direction are held between pairs of yarns in the machine direction lying essentially one above the other, said grid having polyester yarns of about 30 to about 300 denier in the machine direction and about 30 to about 300 denier in the cross-machine direction, a yarns per inch count of about 3×3 to about 10×10 in each of the machine and cross-machine directions, and a dry weight pick-up of about 60 to about 250 parts of an adhesive binder to 100 parts by weight of polyester in the grid, in which the adhesive, which is one of dissolved and dispersed in a liquid is applied to the composite so that the open grid is held together by the adhesive alone, and

a high strength reinforcing fabric consisting essentially of a non-woven open grid of polyester having no mechanical connections at cross-over points in the grid, which is combined with the adhesively secured lightweight polyester open grid,

said lightweight grid and said high strength reinforcing fabric being so arranged and constructed as to have sufficient binder and surface area to hold the composite and any additional reinforcements inside bituminous material of a roofing membrane during manufacture of the roofing membrane and to provide a roofing membrane that is free of any organic mat.

5,593,767

LAMINATE, A GLASS FIBER WOVEN FABRIC AND A PRINTED WIRING BOARD

Masayuki Noda; Minoru Yonekura, both of Hikone, and Hiroyuki Yamanaka, Shiga-ken, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1996, Ser. No. 633,512

Claims priority, application Japan, Apr. 26, 1995, 7-101784

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—251 **5 Claims**

1. A laminate comprising glass fiber woven fabrics impregnated with thermo-setting resin and superposed one on another while heated and pressed and said glass fiber woven fabrics having warps and wefts which are of components different from each other while one of said warp and said weft having a coefficient of thermal expansion lower than that of the other.

5,593,768

NONWOVEN FABRICS AND FABRIC LAMINATES FROM MULTICONSTITUENT FIBERS

Scott L. Gessner, Encinitas, Calif., assignor to Fiberweb North America, Inc., Simpsonville, S.C.

Continuation of Ser. No. 783,696, Oct. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 344,744, Apr. 28, 1989, Pat. No. 5,108,827. This application Apr. 26, 1994, Ser. No. 233,634

Int. Cl.[6] D04H *3/14*; *3/16*

U.S. Cl. 428—286 **29 Claims**

1. A nonwoven fabric laminate comprising:

a thermally bonded nonwoven web comprising multiconstituent fibers formed of a highly dispersed blend of at least two different thermoplastic polymers which are present as a dominant continuous phase and at least one noncontinuous phase dispersed therein, the polymer of said at least one noncontinuous phase having a melting temperature below that of said continuous phase, and said lower melting noncontinuous phase comprising from about 2.5 to 20 percent by weight of the fiber, wherein said multiconstituent fibers are configured such that said at least one noncontinuous phase occupies a substantial portion of the fiber surfaces;

at least one other web bonded to said nonwoven web; and

a multiplicity of thermal bonds formed from the polymer of said multiconstituent fibers and bonding the multiconstituent fibers of said thermally bonded web to one another and to said at least one other web, said multiconstituent fibers exhibiting deformation and polymer flow in the vicinity of their juncture with said thermal bonds.

5,593,769

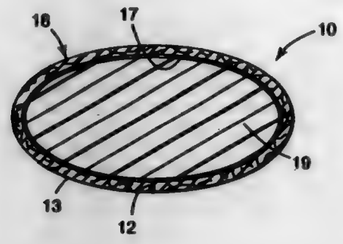
POLYURETHANE PAD COVERING FOR GEL FILLED ARTICLES

Robert J. Wolf, Woodbury; Scott M. Purrington, Maplewood; John M. Brandner; David A. Olson, both of St. Paul, and John F. Reed, North Oaks, all of Minn., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Filed Jun. 14, 1995, Ser. No. 490,464

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—286 **22 Claims**



1. A gel filled article comprising a viscoelastic gel covered on at least one outer face by a soft conformable barrier fabric, said barrier fabric comprising a calendered elastic laminate of a fluid impermeable film layer and an elastic polyurethane nonwoven fibrous web, wherein the film is positioned facing inward toward the viscoelastic gel such that the nonwoven fibrous web forms an exposed outer surface of the article, and wherein the fibers of the web have an average diameter of less than 50 μm, the exposed outer surface of the polyurethane nonwoven web has a friction value of less than about 200 g and the fabric hand of the barrier fabric is less than about 200 g.

5,593,770

CHEMORHEOLOGICALLY TAILORED MATRIX RESIN FORMULATIONS CONTAINING ANHYDRIDE CURING AGENTS

Neal A. Mumford, Brigham City; Cheng-Chi Chiu, Salt Lake City; Rolf M. Johns, Brigham City, and Ben A. Lloyd, Brigham City, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Continuation-in-part of Ser. No. 81,839, Jun. 23, 1993, Pat. No. 5,356,499, which is a continuation of Ser. No. 426,890, Oct. 25, 1989, abandoned. This application Feb. 14, 1994, Ser. No. 195,301

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—290 **9 Claims**

1. An incompletely cured prepreg composition comprising fibers impregnated with a chemorheologically viscosity tailored matrix resin formulation containing a curable matrix resin and an effective amount of a reactive curing agent reactive at room temperature and a latent curing agent substantially nonreactive at room temperature but activated upon heating or radiation, said reactive curing agent including at least one anhydride functional group, said prepreg composition having a plateau viscosity which remains substantially unchanged upon room temperature storage of the composition for at least thirty days, wherein said plateau viscosity is greater than approximately 50,000 cp.

5,593,771

BARRIER LAMINATE AND METHOD USING A PORTABLE CARRIER FOR SEALING GAPS IN BUILDING CONSTRUCTION

Joseph D. Lawless, Bloomington, Minn.; Robert H. Heil, New Richmond, Wis.; Scott R. Pribnow, Woodbury, and Duncan R. Russell, North Oaks, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 15,560, Feb. 9, 1993, Pat. No. 5,374,477. This application Dec. 19, 1994, Ser. No. 358,324

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—317.3 **15 Claims**



1. A barrier laminate for attachment to the outer surface of a structure such as a house, prior to attachment of its siding, to cover joints between structural members assembled to form the structure, said barrier laminate comprising:

a flexible elongate barrier layer having opposite edges and opposite first and second major surfaces said barrier layer having minute passageways between said major surfaces affording passage of water vapor between said major surfaces while restricting the passage of liquid water and air between said major surfaces; and

two lengths of tapes, with one length secured along each of the opposite edges of the barrier layer and each of said lengths of tape including a backing and a layer of pressure sensitive adhesive coated on one major surface of the backing, each of said lengths of tape having a first portion of said layer of pressure sensitive adhesive adhered on the first surface of said barrier layer adjacent one of said opposite edges and having a second portion of said layer of pressure sensitive adhesive projecting past the respective opposite edges of the barrier layer to expose said layer of pressure sensitive adhesive for adhering the barrier layer to structural members on opposite sides of a joint therebetween such that exterior liquid water and air are each restricted from entering the structure while water vapor is permitted to pass through the barrier layer intermediate the opposite edges, thus permitting any moisture trapped interior of the barrier laminate to escape as water vapor.

5,593,772

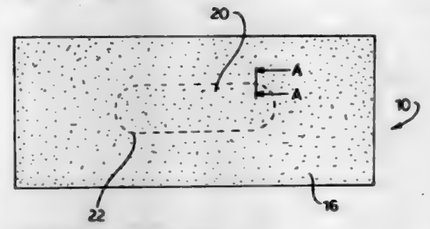
WALL CONSTRUCTED TO REDUCE THE IMPACT OF VISUAL IMPERFECTIONS

Daniel Zamot, 9569 E. Beach St., Bellflower, Calif. 90706

Filed Oct. 1, 1993, Ser. No. 130,377

Int. Cl.[6] B32B *5/16*;*35/00*; B05D *3/00*

U.S. Cl. 428—323 **17 Claims**



1. An exterior wall, comprising:

a structure constructed of concrete, having at least one vertical face;

a first basecoat of an exterior water-based flat paint having a hue covering said vertical face;

a first layer of a multicolor paint having a hue overlaying said first basecoat;

portions of said first multicolor layer being impacted by graffiti;

a second basecoat of an exterior water-based flat paint, having a hue similar to said hue of said first basecoat, covering said portions of said vertical face which have been impacted by said graffiti; and,

a second layer of a multicolor paint, having a hue similar to said first layer of said multicolor-paint, applied over said second basecoat; wherein there is no visible seam line around said portions covered with said second layer of multicolor paint.

5,593,773

METAL POWDER PIGMENT

Colin F. McKay; Angela McKay, and Eric S. Ringan, all of Fife, United Kingdom, assignors to Silberline Limited, Edinburgh, Scotland

PCT No. PCT/GB93/01562, § 371 Date Mar. 9, 1995, § 102(e) Date Mar. 9, 1995, PCT Pub. No. WO94/02551, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 23, 1993, Ser. No. 373,293

Claims priority, application United Kingdom, Jul. 23, 1992, 9215709

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—328 8 Claims

1. A metal powder pigment comprising atomized pigment particles of aluminum or an alloy thereof which particles have polished facets which increase their reflectivity with respect to unpolished unfaceted atomized metal powder particles by at least 10%, and have a median particle size of from 1 to 300 μm and an aspect ratio of from 5/1 to 1.1/1 wherein the particles having polished facets were made from said unpolished unfaceted atomized metal powder particles having an aspect ratio equal to or less than 5:1.

5,593,774

INSULATING FILM WITH IMPROVED PUNCHING CHARACTERISTICS AND LEAD FRAME USING THE SAME

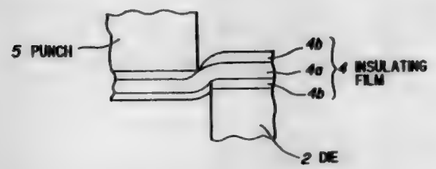
Toshikatsu Hiroe; Kenichi Kaneko; Noboru Imai; Hiroyuki Takaoka, and Toshio Kawamura, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Continuation of Ser. No. 249,734, May 26, 1994, abandoned. This application Jan. 16, 1996, Ser. No. 586,478

Claims priority, application Japan, May 26, 1993, 5-146989

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—343 3 Claims



1. An insulating film with improved punching characteristics, comprising:

a polyimide insulating base film having an edge tearing resistance in a range of 50 to 70 kgf/20 mm; and

one of insulating thermoplastic and insulating thermosetting adhesive layers provided on at least one surface of said insulating base film.

5,593,775

SINGLE-LAYERED HOT-MELT FILM ADHESIVE WHICH CAN BE WOUND ON A REEL WITHOUT USING RELEASE OR SEPARATING AGENTS RUNS EASILY ON MACHINES AND IS MADE FROM OLEFIN COPOLYMERS

Nicole Hargarter, Schneverdingen; Dirk Schultze, Fallingbostel, and Ulrich Reiners, Neuenkirchen, all of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Oct. 6, 1995, Ser. No. 540,410

Claims priority, application Germany, Oct. 14, 1994, 44 36 775.9

Int. Cl.[6] B32B *7/12*

U.S. Cl. 428—349 13 Claims

1. A single-layered, plastic and elastic thermoplastic hot-melt adhesive film which does not have a separating layer, which has a high adhesive strength for thermal backing, sealing and fixing processes, which can be wound up without the use of separating agents and can run on hot melt laminating machines and fixing presses without the tendency to block, is essentially free of antiblocking agents and lubricants, which has a maximum thermoanalytically determined main melting peak below 90° C. and which is essentially formed of at least two olefin copolymers, one comprising ethylene and at least one oxygen-containing comonomer A and the other comprising ethylene and at least one different oxygen-containing comonomer B, A and B each being selected from the group consisting of acrylic acid, methacrylic acid, a salt or ester of either and vinyl acetate optionally saponified, wherein the total proportion of oxygen-containing comonomer in the total weight of polymer resin forming the film is between 18 wt. % and 40 wt. % and the proportion of oxygen-containing comonomers in copolymer A is at least 60 wt. % of the total weight of oxygen-containing comonomers, and the A-containing copolymer and the B-containing copolymer are mutually degraded under a sufficient shearing force for the B-containing copolymer to be present as a finely distributed second phase in the A-containing copolymer.

5,593,776

FLUORORESIN COMPOSITES

Takuya Ueno; Masayuki Inamori, both of Osaka, and Hirofumi Kyutoku, Ikoma, all of Japan, assignors to Osaka Gas Company, Limited, Osaka-fu, Japan

Filed Feb. 8, 1994, Ser. No. 194,283

Int. Cl.[6] B32B *27/04;27/20;27/28;* D01F *9/12*

U.S. Cl. 428—367 5 Claims

1. A method of improving mechanical and sliding characteristics of a carbon fiber-reinforced fluororesin composite, which comprises molding into a shaped article a composition comprising a fluororesin and a carbon fiber having

(1) an X-ray wide-angle diffraction pattern with

(1a) an interplanar spacing d(002) value of 3.36 to 3.43 Å,

(1b) a c-axis crystallite dimension (Lc) of 35 to 250 Å and

(1c) an a-axis crystallite dimension (La) of 40 to 550 Å,

(2) a G value of 0.85 to 2.3 as given by the equation G=G2/G1 wherein G1 is the integral value of spectral intensities in the wavelength region of 1,360±100 cm^{-1} and G2 is the integral value of spectral intensities in the wavelength region of 1,580±100 cm^{-1} as determined by Raman spectrometric analysis using an argon laser beam at 514.5 nm,

(3) a mean filament diameter of 1 to 20 μm,

(4) a specific surface area of 0.6 to 5 m^2/g and

(5) an oxidation weight loss of not greater than 1.75% by weight on heating in the air at 575° C. for 4 hours,

(6) said carbon fiber being a carbon fiber obtained by heat treating a precursor fiber or carbon fiber at a temperature of 2,500 to 3,000° C. in the presence of an inert gas containing 30 to 1,000 ppm of an oxygen-containing gas.

5,593,777

TWO-COMPONENT LOOP YARNS, PRODUCTION THEREOF AND USE THEREOF AS SEWING AND EMBROIDERY YARNS

Ingolf Jacob, Untermeitingen; Eberhard Paulus, Bad Hersfeld; Gerhard Kreuzer, Bad Hersfeld; Bernd Schubert, Bad Hersfeld, and Josef Geirhos, Bobingen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jan. 20, 1995, Ser. No. 375,642

Claims priority, application Germany, Jan. 20, 1994, 44 01 514.3; Aug. 29, 1994, 44 30 633.4

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—370 10 Claims

1. A two-component loop yarn comprising a core of POY intermingled with effect yarn which is FOY, both made of synthetic polymers, and wherein:

i) at least some of the effect yarn is made of polyester,

ii) at least some of the effect yarn has a breaking extension of from 35 to 70%,

iii) at least some of the effect yarn has a birefringence of from $100=10^{-3}$ to $150*10^{-3}$,

iv) at least some of the effect yarn has a hot air shrinkage at 200° C. of from 3 to 14%, and

v) the effect yarn has a filament linear density of not greater than 1.5 dtex,

and wherein at first some of the effect yarn is obtainable by a process comprising the steps of;

vi) melt spinning multifilaments in a conventional spinning apparatus that includes spinning jets and a take-off element with a heating element between the spinning jets and the take-off element,

vii) cooling the spun multifilaments upstream of the heating element to a solidification temperature or below, and

viii) subsequently heating the multifilaments to temperatures above the solidification temperature,under the simultaneous action of a thread tension resulting from friction against a surrounding gaseous medium, which thread tension is subsequently equal to drawing tension.

5,593,778

BIODEGRADABLE COPOLYESTER, MOLDED ARTICLE PRODUCED THEREFROM AND PROCESS FOR PRODUCING THE MOLDED ARTICLE

Yoshikazu Kondo, Hofu; Masao Matsui, Takatsuki; Hideo Yoshideme, Kishiwada; Takuji Oseki, Sanda; Hiroshi Kajiyama, Hofu; Eiichi Ozeki, and Yasuhiro Fujii, both of Kyoto, all of Japan, assignors to Kanebo, Ltd., Tokyo, and Shimadzu Corporation, Kyoto, both of Japan

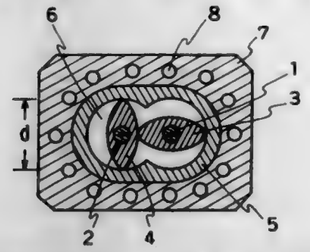
PCT No. PCT/JP94/01489, § 371 Date May 5, 1995, § 102(e) Date May 5, 1995, PCT Pub. No. WO95/07311, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 8, 1994, Ser. No. 433,324

Claims priority, application Japan, Sep. 9, 1993, 5-224767; May 6, 1994, 6-117490; May 6, 1994, 6-117491

Int. Cl.[6] D02G *3/00;* C08F *20/00;* B27B *3/08*

U.S. Cl. 428—373 24 Claims



1. A biodegradable copolyester comprising an L-lactic acid and/or D-lactic acid component as a main component and having a weight average molecular weight of at least 50,000, produced by copolymerizing said lactic acid component with at least one member of (A) 0.1 to 15% by weight of a polyethylene glycol having a number average molecular weight of at least 300, (B) an aliphatic polyester and (C) a sulfo group-containing aromatic compound having two ester-forming groups.

5,593,779

FIBER FOR CLOTHING AND PRODUCTION METHOD THEREFOR

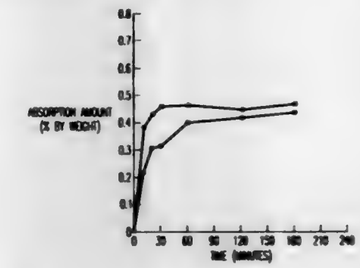
Kazuo Mori; Kazunori Nishizawa, and Yoshifumi Niki, all of Tochigi-ken, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 476,581

Claims priority, application Japan, Jun. 15, 1994, 6-133012; Mar. 30, 1995, 7-072970

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—375 9 Claims



1. A fiber for clothing, said fiber having a layer of crosslinked enzyme protein on a surface of a monofilament thereof,

wherein said fiber is selected from the group consisting of a natural cellulose fiber, a regenerated cellulose fiber and a synthetic fiber, and

wherein said layer of crosslinked enzyme protein is formed by crosslinking with a compound selected from the group consisting of an epoxy compound and an isocyanate compound.

5,593,780

IMPACT RESISTANT PHENOLICS

Hugh A. Yap, Marysville, Wash., assignor to Fiberite, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 791,824, Nov. 13, 1991, abandoned. This application May 11, 1994, Ser. No. 241,079

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—392 10 Claims

1. A prepreg comprising:

(a) a composition comprising a phenolic based resin and a toughening agent and

b) a substrate comprising graphite yarn

wherein said composition is impregnated into said substrate and wherein the toughening agent is a derivative of polyvinyl alcohol selected from the group consisting of polyvinyl butyral, polyvinyl formal and combinations thereof and wherein the amount of toughening agent is less than 15% by weight based upon the total weight of the phenolic based resin and toughening agent.

5,593,781
METHOD OF MANUFACTURING SURFACE-MODIFIED CERAMIC POWDERS WITH PARTICLES IN THE NANOMETER SIZE

Rüdiger Nass, Riegelsberg; Helmut Schmidt, Saarbrükken-Güdingen, and Peter Schmitt, Heusweiler, all of Germany, assignors to Institut Fue Neue Materialien Gemeinnützige GMBH, Saarbrücken, Germany

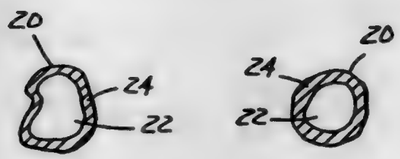
PCT No. PCT/EP93/00871, § 371 Date Nov. 3, 1994, § 102(e) Date Nov. 3, 1994, PCT Pub. No. WO93/21127, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 8, 1993, Ser. No. 295,788
Claims priority, application Germany, Apr. 15, 1992, 42 12 633.9
Int. Cl.[6] B32B *5/16*; B05D *7/00*
U.S. Cl. 428—403 26 Claims

1. A method for manufacturing a surface-modified nanometer size ceramic powder, comprising:
modifying the surface of a ceramic powder, by preparing, a suspension comprising
(i) water or an organic solvent;
(ii) said ceramic powder; and
(iii) an organic compound with a molecular weight of not more than 500, having at least one functional group, which interacts or reacts with groups present on the surface of said ceramic powder; and
removing wholly said water or said organic solvent from said suspension, thereby forming said surface-modified nanometer size ceramic powder.

5,593,782
ENCAPSULATED ELECTROLUMINESCENT PHOSPHOR AND METHOD FOR MAKING SAME

Kenton D. Budd, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 274,961, Jul. 14, 1994, Pat. No. 5,439,705, which is a continuation of Ser. No. 912,786, Jul. 13, 1992, Pat. No. 5,418,062. This application May 15, 1995, Ser. No. 441,190
Int. Cl.[6] B32B *5/16*; H01J *1/62*
U.S. Cl. 428—403 19 Claims

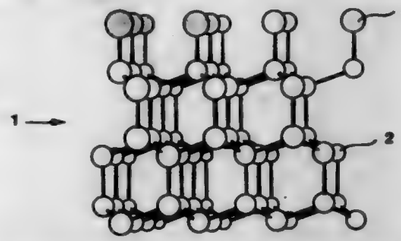


1. An electroluminescent thick film device comprising in order a first electrode, a layer of a dielectric matrix loaded with encapsulated electroluminescent phosphor particles, and a rear electrode, wherein said encapsulated phosphor particles each comprise a particle of zinc sulfide-based electroluminescent phosphor which is essentially completely encapsulated within a substantially transparent, continuous metal oxide coating formed via hydrolysis of vapor phase metal oxide precursors, and wherein said encapsulated phosphor particles have an initial electroluminescent brightness which is equal to or greater than about 50 percent of the initial electroluminescent brightness of the uncoated phosphor particle, and the percent of electroluminescent brightness retained by the encapsulated phosphor particles following 100 hours operation in an environment having a relative humidity of at least 95 percent is greater that about 70 percent of the intrinsic brightness retained following 100 hours operation, the initial brightness and change in electroluminescent brightness in an environment having a relative humidity of at least 95 percent and intrinsic brightness change being measured under substantially the same operating conditions.

5,593,783
PHOTOCHEMICALLY MODIFIED DIAMOND SURFACES, AND METHOD OF MAKING THE SAME

John B. Miller, Danbury, Conn., assignor to Advanced Technology Materials, Inc., Danbury, Conn.

Filed Jun. 17, 1994, Ser. No. 261,887
Int. Cl.[6] B23B *9/00*
U.S. Cl. 428—408 7 Claims

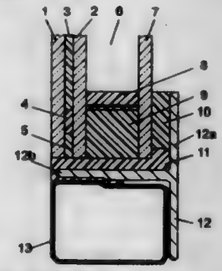


1. A surface-modified diamond or diamond-like material having (i) a chemically modified surface which is aminated with chemically bonded surface functional groups comprising amine functionality, and (ii) a bulk volume beneath said chemically modified surface wherein said bulk volume lacks such amine functionality therein, and wherein said chemically modified surface is characterized by an infrared spectrum including N—H stretch spectral peaks in the vicinity of 3150-CM^{-1} and 3050-CM^{-1}.

5,593,784
GLAZING UNIT AND A METHOD FOR ITS MANUFACTURE

Calogero Chinzi, La Louvière, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Nov. 22, 1994, Ser. No. 347,148
Claims priority, application United Kingdom, Nov. 23, 1993, 9324069
Int. Cl.[6] B32B *27/38*; *9/04*; *27/06*; *27/32*
U.S. Cl. 428—413 27 Claims



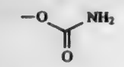
1. A glazing unit, comprising:
a composite glazing panel having a pair of vitreous sheets positioned parallel to one another and having respective marginal portions which face one another;
an intervening layer which is comprised of polymeric material, which is adhesively sandwiched between the pair of vitreous sheets, and which has viscoelastic properties such that the composite glazing panel has a critical frequency of coincidence (or a lower or lowest critical frequency of coincidence if there is more than one), (ϕ_p), which is greater than a critical frequency of coincidence of a notional monolithic vitreous sheet, (ϕ_m), the notional monolithic vitreous sheet having a shape and an area which are the same as that of the composite glazing panel and having a mass which is equal to the total mass of vitreous material in the composite glazing panel, and
an adhesive material which is in contact with each vitreous sheet of the pair of vitreous sheets at at least the respective marginal portions thereof, and which is in contact with an outer face of at least one vitreous sheet of the pair of vitreous sheets at a marginal portion thereof,
wherein the adhesive material exhibits, at 20° C., an elongation of not more than 12.5% when subjected to a tensile stress of 0.1 MPa, as measured according to ISO 8339.

5,593,785
COATING COMPOSITIONS CONTAINING ACRYLIC POLYMERS WITH PENDANT CARBAMATE GROUPS EXHIBITING IMPROVED INTERCOAT ADHESION

Michael A. Mayo, and Steven V. Barancyk, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 26, 1995, Ser. No. 494,905
Int. Cl.[6] C08L *33/14*; *67/02*
U.S. Cl. 428—423.1 39 Claims

1. An adherent film-forming composition comprising:
(a) 20 to 80 percent by weight of an acrylic polymer containing a plurality of pendant groups of the structure:



(b) 20 to 80 percent by weight of a polymer or oligomer containing repeating ester groups in the polymer or oligomer backbone; and
(c) 25 to 50 percent by weight of a fully alkylated aminoplast crosslinking agent;
the percentages by weight of (a) and (b) being based on total resin solids weight of (a) plus (b); the percentage by weight of (c) being based on total weight of resin solids in the film-forming composition.

5,593,786
SELF-ADHERING POLYVINYL CHLORIDE SAFETY GLASS INTERLAYER

Anthony A. Parker; David A. Strickler; Stephen P. Bartus, Jr., all of Toledo, and Susan M. Wolke, Ottawa, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 9, 1994, Ser. No. 336,477
Int. Cl.[6] B32B *17/06*
U.S. Cl. 428—426 30 Claims



1. A laminated glazing unit, comprising sequentially:
a first glass sheet;
a first adhesive layer including a polymeric material, said adhesive layer having a first refractive index;
a support layer including a plasticized vinyl chloride polymer having a number average molecular of at least about 30,000, said support layer having a second refractive index and a total plasticizer concentration of between about 20 phr to about 60 phr;
a second adhesive layer including a polymeric material: and
a second glass sheet;
wherein said first and said second refractive indices differ by no more than about 0.05.

5,593,787
ORGANOSILICON COMPOUNDS CONTAINING (METH) ACRYLOXY GROUPS, THEIR PREPARATION AND THEIR USE

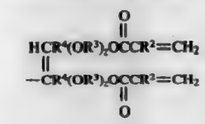
Jochen Dauth, Burghausen; Christian Herzig, Tacking am See; Bernward Deubzer; Thomas Hierstetter, both of Burghausen, and Petra Gratzl, Tüßling, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 25, 1995, Ser. No. 548,127
Claims priority, application Germany, Dec. 8, 1994, 44 43 749.8
Int. Cl.[6] B32B *9/04*
U.S. Cl. 428—447 9 Claims

1. An organosilicon compound containing (meth)acryloxy groups with units of the formula

$$A_aR_bSiX_cO_{\frac{4-(a+b+c)}{2}} \quad (I)$$

in which
R is identical or different and is a monovalent, optionally halogenated hydrocarbon radical having 1 to 18 carbon atom(s) per radical,
X is identical or different and is a chlorine atom or a radical of the formula —OR^1,
in which
R^1 is an alkyl radical having 1 to 8 carbon atom(s) per radical, which can be substituted by an ether oxygen atom,
a is 0 or 1,
b is0, 1, 2 or 3,
c is0, 1, 2or 3
and the sum a+b+c≦4 and
A is a radical of the formula

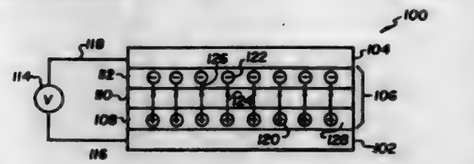


in which
z is 1, 2, 3 or 4,
R^2 is a hydrogen atom or a methyl radical,
R^3 is a linear or branched alkylene radical having 1 to 6 carbon atom(s) per radical and
R^4 is a linear or branched alkylene radical having 1 to 6 carbon atom(s) per radical,
with the proviso that the compounds contain at least one radical A per molecule.

5,593,788
ORGANIC ELECTROLUMINESCENT DEVICES WITH HIGH OPERATIONAL STABILITY

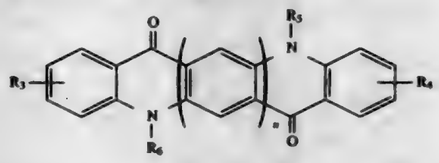
Jiannin Shi, Webster, and Ching Tang, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1996, Ser. No. 637,987
Int. Cl.[6] H05B *33/00*; *33/14*
U.S. Cl. 428—690 5 Claims



1. An organic EL device comprising an anode and a cathode, and an organic EL element disposed between the anode and cathode;
characterized in that the organic EL element has at least one fluorescent emitting layer containing a mixture of two or more materials;

the mixture contains a compound of the formula:



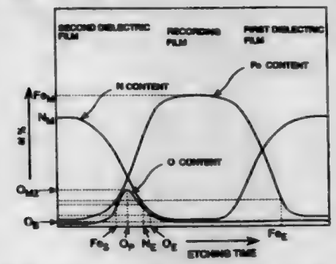
where R_3 and R_4 are independently alkyl, alkoxyl, substituted alkyl, aryl, fused aryl halogen; and R_5 and R_6 are independently alkyl, alkoxyl, substituted alkyl, aryl, or substituted aryl; and n=0, 1, 2 or 3.

5,593,789

MAGNETO-OPTICAL RECORDING MEDIUM

Hajime Utsunomiya; Kenji Uchiyama; Masanori Kosuda, and Hiroyasu Inoue, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 353,269
Claims priority, application Japan, Dec. 14, 1993, 5-342377
Int. Cl.[6] G11B 5/66
U.S. Cl. 428—694 ML **13 Claims**



1. A magneto-optical recording medium for recording light comprising a first dielectric film, a recording film of a rare earth element-transition metal alloy, a second dielectric film, and a film reflective to at least a portion of said light on a substrate transparent to said light the elements being in the described order, comprising:

a metal element M and nitrogen N are contained in the second dielectric film, Fe is contained in the recording film, and oxygen O is contained adjacent the boundary between the second dielectric and recording films,

said magneto-optical recording medium conforming to the following condition:

$$0.10 \leq (O_E - Fe_S)/(Fe_E - Fe_S) \leq 0.40$$

where

O_E is the etching time at which the O content in the vicinity of the boundary between the second dielectric and recording films becomes $\{(O_{M2}-O_B)/5\}+O_B$ where O_{M2} is the maximum value of the oxygen O content in the vicinity of the boundary between the second dielectric and recording time films, and O_B is the minimum value of the oxygen O content in the recording film, wherein $O_E > O_P$ where O_P is the etching time at which the oxygen O content becomes O_{M2},

Fe_S is the etching time at which the Fe content adjacent the boundary between the second dielectric and recording films decreases to ⅕ of Fe_M where Fe_M is the maximum value of the Fe content in the recording film,

Fe_E is the etching time at which the Fe content adjacent the boundary between the first dielectric and recording films decreases to ⅕ of Fe_M,

said magneto-optical recording medium conforming to the following condition:

$$0.10 \leq (N_E - Fe_S)/(Fe_E - Fe_S) \leq 0.35$$

where

N_E is the etching time at which the N content in the vicinity of the boundary between the second dielectric and recording films decreases to ⅕ of N_M where N_M is the maximum value of the N content in the second dielectric film,

said magneto-optical recording medium conforming to the following condition:

$$0 \leq (M_E - Fe_S)/(Fe_E - Fe_S) \leq 0.20$$

where

M_E is the etching time at which the content of the metal element M in the vicinity of the boundary between the second dielectric and recording films decreases to ⅕ of M_M where M_M is the maximum value of the content of the metal element M in the second dielectric film,

O_{M2} being 5 to 25 at %, and

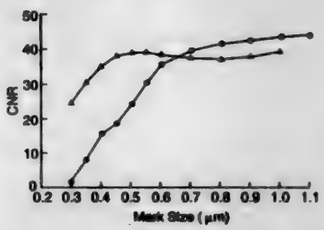
the thickness of the recording film being up to 65 nm.

5,593,790

INTERFERENCE SUPER-RESOLUTION USING TWO MAGNETIC LAYER CONSTRUCTION

Andrew D. Dubner, St. Paul, Minn., assignor to Imation Corp., St. Paul, Minn.

Filed Dec. 29, 1994, Ser. No. 365,911
Int. Cl.[6] G11B 5/66
U.S. Cl. 428—694 ML **23 Claims**



1. A magneto-optic super-resolution recording medium, comprising, in order:

a substrate;

a first magneto-optic layer, having a first thickness, t_1, and a first Curie temperature, T_{C1}; and

a second magneto-optic layer exchange-coupled to the first magneto-optic layer, having a second thickness, t_2, and a second Curie temperature, T_{C2}, wherein $T_{C2} > T_{C1}$;

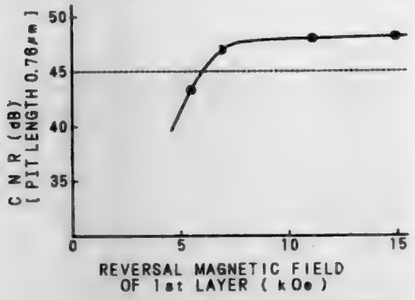
wherein the two magneto-optic layers exhibit a non-zero net magneto-optic rotation for temperatures, T, $< T_{C1}$, and wherein t_1 and t_2 are such that the first and second magneto-optic layers optically interfere to result in substantially zero net magneto-optic rotation at $T_{C1} < T < T_{C2}$, wherein super-resolution is achieved by a laser beam which detects a signal only at a front of a beam spot on the medium, where $T < T_{C1}$, and not at the rear of the beam spot, where $T_{C1} < T < T_{C2}$.

5,593,791

MAGNETO-OPTICAL RECORDING MEDIUM AND METHOD OF MANUFACTURING THE SAME

Yoshio Fujii; Takashi Tokunaga; Yoshiyuki Nakaki; Kazuhiko Tsutsumi; Kazuo Hashima; Tatsuya Fukami, and Yuji Kawano, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 45,437, Apr. 8, 1993, abandoned.
This application Oct. 16, 1995, Ser. No. 543,517
Claims priority, application Japan, Apr. 10, 1992, 4-090492; May 18, 1992, 4-124568; Jun. 25, 1992, 4-167358; Jul. 20, 1992, 4-192056; Jul. 20, 1992, 4-192057
Int. Cl.[6] G11B 5/66
U.S. Cl. 428—694 ML **9 Claims**



1. A magneto-optical recording medium for enabling direct overwrite by light power modulation with a recording means formed of plural magnetic layers on a transparent substrate, where the adjacent layers are exchange-coupled with each other, said recording means comprising:

a first magnetic layer for retaining a magnetization direction corresponding to information;

a second magnetic layer for transferring a magnetization direction thereof to the first magnetic layer,

wherein the second magnetic layer is made of a rare earth-transition metal alloy whose rare earth metal content percentage is 27 at % or less;

an initializing layer for initializing the recording means being on an opposite side of the recording means from the substrate; and

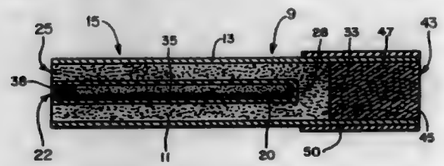
a resin layer formed on the initializing layer.

5,593,792

ELECTROCHEMICAL HEAT SOURCE

Ernest G. Farrier, Winston-Salem; Joseph J. Chiou, Clemmons, both of N.C.; Richard L. Lehman, Franklin Park, N.J., and Chandra K. Banerjee, Pfafftown, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 862,158, Apr. 2, 1992, Pat. No. 5,357,984, which is a continuation of Ser. No. 722,778, Jun. 28, 1991, Pat. No. 5,285,798. This application Jun. 25, 1993, Ser. No. 82,317
Int. Cl.[6] H01M 6/32; C22C 23/00
U.S. Cl. 429—8 **24 Claims**



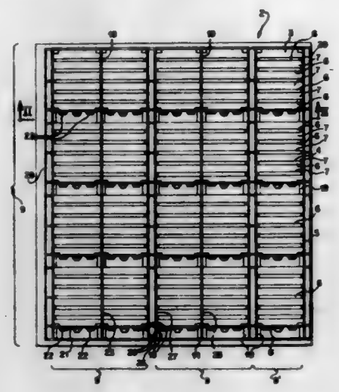
1. An electrochemical heat source comprising a frozen melt comprising magnesium and nickel.

5,593,793

BATTERY CONTAINER FOR SEVERAL ELECTROCHEMICAL ACCUMULATORS ARRANGED THEREIN

Johann Germann, Weinstadt, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

Filed Feb. 13, 1996, Ser. No. 600,614
Claims priority, application Germany, Feb. 13, 1995, 195 04 687.0
Int. Cl.[6] H01M 2/10
U.S. Cl. 429—62 **13 Claims**



1. Battery container for several electrochemical accumulator cells arranged therein, having a wall of the battery container which, on a housing side, is electrically insulated with respect to metallic cell housings of the cells which are electrically connected with one another on a terminal side, and having bypass ducts which are arranged between the flat sides of cell housings of adjacent cells and are bounded at least on one side by the flat sides of these cell housings, the cells being spaced away from one another on the flat side by means of spacers of an electrically insulating material arranged in the area of the cell housing, having an inflow duct which is arranged in an interior of the battery container and is fluidly connected with the bypass ducts and whose clear cross-section is reduced in the flow direction of a fluid flowing through, having an outflow duct which, on the flow side, is arranged to be opposite the inflow duct and is fluidly connected with the inflow duct via the bypass ducts, the clear cross-section of the outflow duct widening in the flow direction, characterized in

that the battery container which is fastenable directly into the supporting floor structure of a body of a vehicle in a sealing and detachable manner, is formed of sheet metal, which is ductile at low freezing temperatures, and is dimensioned such in its wall thickness such that it rips open in the case of a crash in a defined manner and does not tear open so far that individual cells can fall out of the battery container,

that the spacer spacing the flat sides of the cell housings of the cells has several strips arranged at a distance next to one another whose longitudinal course measured in the flow direction of the fluid corresponds to at least half of the cell measurement measured in the flow direction and which are made of an electrically insulating material,

that the cell housings are supported in an electrically insulating manner against the wall of the battery container, and

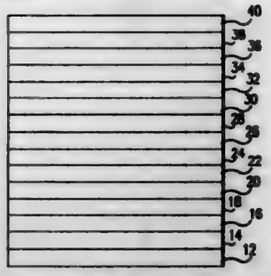
the height of the strips measured transversely to the flat side of a cell housing is equal to the height of a bypass duct, this height corresponding to the desired distance between two adjacent flat sides of cell housings.

5,593,794

MOISTURE BARRIER COMPOSITE FILM OF SILICON NITRIDE AND FLUOROCARBON POLYMER AND ITS USE WITH AN ON-CELL TESTER FOR AN ELECTROCHEMICAL CELL

Guang Wei, Somerville; Bryan C. Lagos, Needham, and Jack Treger, Quincy, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jan. 23, 1995, Ser. No. 376,700
Int. Cl.[6] H01M 2/02
U.S. Cl. 429—91 **10 Claims**



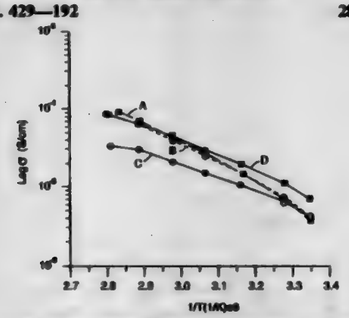
1. An electrochemical cell having a moisture sensitive cell condition tester and a light transparent moisture barrier for protecting said tester from moisture, wherein said moisture barrier comprises a composite on a polymeric substrate, said composite comprising at least one layer of amorphous silicon nitride and at least one layer of a hydrophobic fluorocarbon polymer, alternately deposited over each other, wherein the thickness of said silicon nitride and fluorocarbon polymer layers ranges between about 250 to 2,500 angstroms and between about 250 angstroms to about 1 micron, respectively, and wherein said moisture barrier is no greater than one and one half mils thick.

5,593,795

POLYMER ELECTROLYTE COMPOSITION BASED UPON THIOL-ENE CHEMISTRY

Kejian Chen, and Haitao Huang, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 1, 1995, Ser. No. 435,110
Int. Cl.[6] H01M 10/40;6/18
U.S. Cl. 429—192 **28 Claims**



1. An electrolyte composition comprising a salt disposed in a matrix comprising the reaction product of (a) a diene-functional alkylene oxide, b) a di-functional thiol, and (c) a multi-functional reactant having a functionality greater than two comprising a multi-ene-functional reactant, multi-functional thiol, or combination thereof,

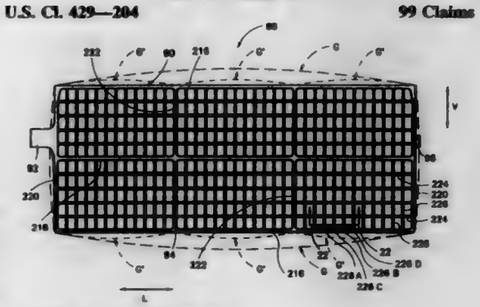
the relative amounts of said alkylene oxide, said thiol, and said multi-functional reactant having a functionality greater than two being selected such that (a) said composition, when formed into a shape, has sufficient mechanical integrity to retain said shape under operating conditions and (b) said composition exhibits an ionic conductivity of at least 1×10^{-6} S/cm when measured in the absence of solvent at 25° C.

5,593,796

RECOMBINANT LEAD-ACID CELL AND LONG LIFE BATTERY

Sudhan S. Misra, North Wales, and Franz Wagner, Lansdale, both of Pa., assignors to C & D Charter Power Systems, Inc., Blue Bell, Pa.

Division of Ser. No. 833,433, Feb. 10, 1992. This application May 18, 1995, Ser. No. 444,072
Int. Cl.[6] H01M 4/73
U.S. Cl. 429—204 **99 Claims**



1. A lead-acid cell comprising:

a. a case;

b. positive and negative plates within said case, at least one of said positive plates comprising:

i. a grid comprising:

(1) an outer peripheral member of polygonal cross-section;

(2) a plurality of elongated polygonal cross-section members extending between spaced apart portions of said peripheral member;

(3) said elongated polygonal cross-section members intersecting within said outer peripheral polygonal cross-section member to define an open lattice including adjacent lattice paste holding confinements offset from and communicating with one another transversely to said grid, for holding paste to form said grid;

(4) at least one intermediate member of polygonal cross section extending between spaced apart sections of said outer peripheral polygonal cross-section member and connecting said elongated polygonal cross-section members together at positions intermediate respective extremities thereof;

(5) said elongated polygonal cross-section members having common length sides;

(6) said polygon of said intermediate member having at least two more sides than polygons of said elongated members and

ii. pasted active material in said lattice; and

c. electrolyte within said case.

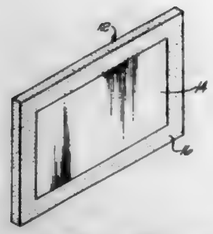
5,593,797

ELECTRODE PLATE CONSTRUCTION

William B. Brecht, Seal Beach, Calif., assignor to Trojan Battery Company, Santa Fe Springs, Calif.

PCT No. PCT/US93/01714, § 371 Date Aug. 9, 1993, § 102(e) Date Aug. 9, 1993, PCT Pub. No. WO94/19836, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 24, 1993, Ser. No. 104,898
Int. Cl.[6] H01M 4/70
U.S. Cl. 429—210 **34 Claims**

1. An electrode for an electrochemical battery in which the electrode is to participate with an electrolyte in an electrochemical reaction, the electrode comprising;



a conductive structural electrode core member;

a conductive interface material by for contact by and corrosive participation with a positive salve material in an electrochemical reaction in the presence of the electrolyte;

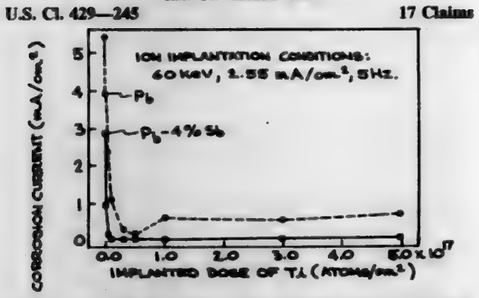
a conductive protective material carried by the electrode core member and carrying the interface material and which resists corrosion to a greater extent than the interface material, which participates in the desired electrochemical reaction less actively than the interface material and which can form an intimate relation with the positive active material.

5,593,798

ION IMPLANTATION OF HIGHLY CORROSIVE ELECTROLYTE BATTERY COMPONENTS

Rolf H. Muller, and Shengtao Zhang, both of Berkeley, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jul. 6, 1992, Ser. No. 909,047
Int. Cl.[6] H01M 4/66
U.S. Cl. 429—245 **17 Claims**



1. A process for improving the corrosion resistance of anodic and cathodic battery grids comprising;

A. ionizing an electrically conductive material,

B. accelerating the ionized material, and

C. impacting a grid structure target with the ionized material.

5,593,799

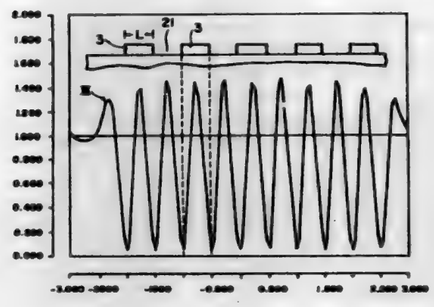
EXPOSURE MASK

Toshiro Tsumori, and Hideo Shimizu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 603,943
Claims priority, application Japan, Oct. 27, 1989, 1-280249
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 **9 Claims**

1. An exposure mask having phase shifting films of a predetermined thickness composed of a material transparent to a wavelength of exposure light and formed on a substrate transparent to said wavelength for causing a desired phase shift,

wherein said phase shifting films are so patterned as to have an arrangement of principally repeated patterns on said substrate without any separate light shielding members therebetween since said transparent film patterns themselves provide periodic light shielding through phase difference light interference.

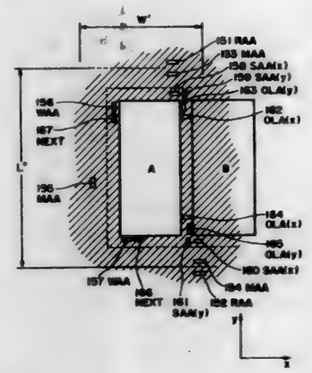


5,593,800

MASK MANUFACTURING METHOD AND APPARATUS AND DEVICE MANUFACTURING METHOD USING A MASK MANUFACTURED BY THE METHOD OR APPARATUS

Hidehiko Fujioka, Yamato; Noriyuki Nose, Atsugi; Ryuichi Ebinuma, Machida; Shinichi Hara, and Hiroshi Machara, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1995, Ser. No. 367,856
Claims priority, application Japan, Jan. 6, 1994, 6-000237; May 6, 1994, 6-094167; Aug. 30, 1994, 6-204958
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 **16 Claims**



1. A mask manufacturing method for manufacturing an X-ray mask, comprising the steps of:

holding, with a first stage, a master reticle having a pattern;

holding, with a second stage, a mask substrate;

irradiating the pattern of the master reticle held by the first stage with an ultraviolet beam to project the pattern onto the mask substrate held by the second stage at a predetermined reduction magnification;

scanningly moving the first and second stages at a predetermined speed ratio, whereby the pattern of the master reticle is transferred to the mask substrate; and

fabricating an X-ray mask by use of the mask substrate having the pattern transferred thereto.

5,593,801

ATTENUATING TYPE PHASE SHIFTING MASK, METHOD OF MANUFACTURING THEREOF AND SEMICONDUCTOR DEVICE MANUFACTURED BY USING THE MASK

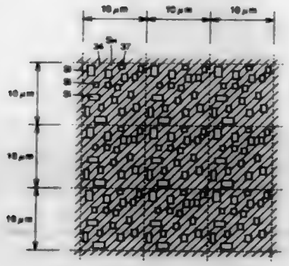
Nobuyuki Yoshioka, and Junji Miyazaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 194,445, Feb. 10, 1994, Pat. No. 5,429,897. This application Jun. 5, 1995, Ser. No. 462,723

Claims priority, application Japan, Feb. 12, 1993, 5-024198; Jan. 28, 1994, 6-008430

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 12 Claims



1. An attenuating phase shifting mask, comprising:

attenuating phase shifting pattern formed at a predetermined position on a photomask substrate; and

attenuating auxiliary phase shifting pattern including a transmitting portion and a phase shifter formed at a predetermined position at the periphery of said attenuating phase shifting pattern,

said attenuating auxiliary phase shifting pattern having a pattern smaller than the limit of resolution of the exposure apparatus, and said transmitting portion and said phase shifter being arranged irregularly.

5,593,802

METHOD OF FORMING A SPACER FOR USE IN A LIQUID CRYSTAL PANEL

Morimasa Sato, and Fumiaki Shinozaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1994, Ser. No. 319,567

Claims priority, application Japan, Oct. 7, 1993, 5-251777

Int. Cl.[6] C09K 19/00; G02F 1/13

U.S. Cl. 430—20 6 Claims

1. A method of forming a spacer for supporting two substrates which constitute a liquid crystal panel, wherein the spacer is disposed between the two substrates, at least one of which has thereon an alignment layer which has been subjected to aligning treatment comprising the steps of:

(1) laminating the substrate having the alignment layer on a transfer sheet comprising projections of a thickness having a variation of not more than ±10% on a temporary support in such a manner that the projections closely contact the alignment layer, and

(2) peeling-off the temporary support to transfer the projections onto the alignment layer.

5,593,803

PROCESS FOR APPLYING IMAGES TO NON-ADHESIVE SURFACES IN THERMAL DYE TRANSFER IMAGING

Choon-Woo Kim, Dongchoon-dong, Rep. of Korea, and Hsin-hsin Chou, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 3, 1995, Ser. No. 510,970

Int. Cl.[6] G03C 8/10;8/26; G03F 7/34

U.S. Cl. 430—22 7 Claims

1. A process for providing a mixed thermal mass transfer and thermal dye transfer image on a receptor surface comprising combining the gray scale information from at least two different color separation images to form data of a composite image, and then thermal mass transferring a thermal mass receptive or dye-receptive image onto a receptor surface, said thermal mass receptive or dye-receptive image corresponding to said composite image, and thermal dye transferring a dye or thermal mass containing a colorant on top of at least part of said thermal mass or dye-receptive image, wherein all areas of dye images and thermal mass transfer color images deposited on said composite image comprise 100% of the surface area of said composite image, and said composite image on a receptor surface is a discontinuous image.

5,593,804

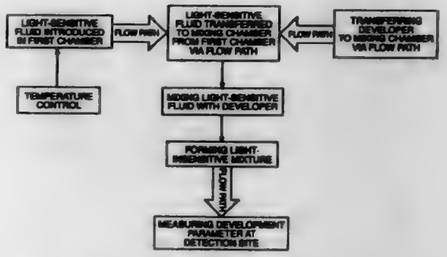
TEST POUCH

John B. Chenault, Webster; Walter J. Bernecker, and Craig A. Caprio, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1995, Ser. No. 567,751

Int. Cl.[6] G03C 5/02

U.S. Cl. 430—30 3 Claims



1. A method of measuring a development parameter of a light-sensitive fluid in a white-light environment comprising:

introducing a predetermined amount of the light-sensitive fluid into a first chamber of a light-impervious containment apparatus;

heating the light-sensitive fluid to a temperature above 100° F.;

applying a predetermined pressure along a flow path between said first chamber and a mixing chamber of said containment apparatus;

bursting a seal positioned across said flow path between said first chamber and said mixing chamber;

transferring the light-sensitive fluid from said first chamber to said mixing chamber;

mixing the light-sensitive fluid with a sufficient amount of developer in said mixing chamber to develop the light-sensitive fluid to a light-insensitive mixture; transferring the light-insensitive mixture to a detection site in communication with said mixing chamber and disposed in the white-light environment; and

measuring said development parameter in the white-light environment.

5,593,805

OXYTITANIUM PHTHALOCYANINE, PROCESS FOR PRODUCING SAME AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING SAME

Shintetsu Go; Hideyuki Takai; Hajime Miyazaki, all of Yokohama; Itaru Yamazaki, Kawasaki; Tetsuro Kanemaru, Tokyo, and Kazushi Inchi, Ebetsu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1992, Ser. No. 873,024

Claims priority, application Japan, Apr. 24, 1991, 3-094370

Int. Cl.[6] G03G 15/06; C07D 487/22

U.S. Cl. 430—78 21 Claims

10. An electrophotographic photosensitive member, comprising an electroconductive support and a photosensitive layer disposed thereon, said photosensitive layer containing oxytitanium phthalocyanine having a crystal form characterized by main peaks specified by Bragg angles (2θ±0.2 degrees) of only 7.4 degrees, 10.2 degrees, 12.5 degrees, 15.0 degrees, 16.3 degrees, 18.3 degrees, 22.4 degrees, 24.2 degrees, 25.2 degrees and 28.5 degrees in X-ray diffraction pattern based on CuKα characteristic X-rays.

5,593,806

TWO-COMPONENT DEVELOPER AND IMAGE-FORMING METHOD FOR WHICH THE DEVELOPER IS ADAPTED

Ryuji Nishiyama; Akira Fukano, both of Kadoma; Koji Harakawa, and Makoto Miura, both of Shizuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, and Tomoegawa Paper Co., Ltd., Tokyo, both of Japan

Filed Sep. 26, 1995, Ser. No. 533,831

Claims priority, application Japan, Sep. 30, 1994, 6-236398

Int. Cl.[6] G03G 9/083

U.S. Cl. 430—106.6 17 Claims

1. A two-component developer for an electrophotographic image-forming apparatus, said developer comprising

a toner formed of toner matrix particles containing a binder resin and a colorant as main components and a magnetic powder adhering to a surface of each toner matrix particle, said powder being present in an amount of 0.3 to 3% by weight based on the toner matrix particles, and

a magnetic carrier having a saturation magnetization of 90 to 200 emu/g in an external magnetic field of 3,000 oersted.

5,593,807

TONER PROCESSES USING SODIUM SULFONATED POLYESTER RESINS

Guerino G. Sacripante, and Raj D. Patel, both of Oakville, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 10, 1996, Ser. No. 644,882

Int. Cl.[6] G03G 9/87

U.S. Cl. 430—137 23 Claims

18. A process for the preparation of toner compositions comprising:

(i) preparing an emulsion latex comprised of sodium sulfonated polyester resin particles by heating said resin in water;

(ii) preparing a pigment dispersion in a water by dispersing in water a sodium sulfonated polyester and pigment;

(iii) adding the pigment dispersion to a latex mixture comprised of sodium sulfonated polyester resin particles in water with shearing, followed by the addition of an alkali halide; and

(iv) heating the resulting mixture thereby causing further aggregation and enabling coalescence.

5,593,808

LAT IMAGING ONTO INTERMEDIATE/RECEPTOR ELEMENTS/"LAT DECALCOMANIA"

Ernest W. Ellis, Leverett, Mass., assignor to Rexham Graphics Inc., South Hadley, Mass.

Continuation of Ser. No. 105,938, Aug. 13, 1993, abandoned. This application Oct. 13, 1995, Ser. No. 542,903

Int. Cl.[6] G03C 11/12; G03F 7/039;7/34;7/42

U.S. Cl. 430—261 24 Claims

1. A method for consolidating a contrasting pattern of intelligence borne by a backing therefor with a final receptor base element, comprising (a) imagewise laser-irradiating a LAT imaging film according to such pattern of intelligence with an intensity sufficient to effect the ablation mass transfer of the volume of the imagewise-exposed area of the laser radiation-ablative mass of said imaging film onto an intermediate receptor element therefor, said intermediate receptor element comprising an adhesively coated LAT image protective overcoat and a base substrate superposed thereon, and said ablation mass transfer being onto the adhesive face surface of such intermediate receptor element, (b) thence imageside laminating the intermediate receptor thus imaged onto any desired final receptor base element, and (c) removing said base substrate from said intermediate receptor element downstream of laminating same onto said final receptor base element.

5,593,809

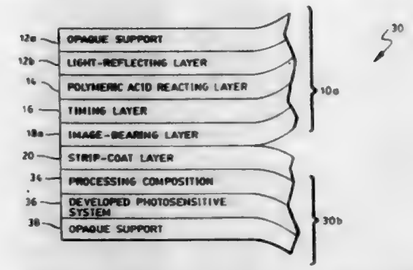
PEEL APART DIFFUSION TRANSFER COMPOUND FILM UNIT WITH CROSSLINKABLE LAYER AND BORATE

Gia Y. Kim, Laverne, Calif.; Lloyd D. Taylor, Lexington, and Kenneth C. Waterman, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 7, 1995, Ser. No. 568,964

Int. Cl.[6] G03C 8/26;8/28;8/56;8/50

U.S. Cl. 430—213 26 Claims



1. A diffusion transfer photographic film unit wherein an image-receiving element is adapted to be separated from a photosensitive element after photographic processing, said film unit comprising:

a photosensitive element comprising a support carrying at least one silver halide emulsion;

an image-receiving element arranged in superposable relationship with said photosensitive element, said image-receiving element comprising in sequence: a support, an image-receiving layer and optionally an overcoat layer, wherein at least one of said image-receiving layer and said overcoat layer includes a crosslinkable material which can be crosslinked by a borate compound during photographic processing, provided that said image-receiving layer includes said crosslinkable material when said overcoat layer is not present and at least one of said image-receiving layer and said overcoat layer includes said crosslinkable material when said overcoat layer is present; and

means for providing an aqueous alkaline processing composition to said photosensitive element and said image-receiving element during photographic processing, said aqueous alkaline processing composition including a borate compound for crosslinking said crosslinkable material of said image-receiving element during processing.

5,593,810

DIFFUSION TRANSFER FILM UNIT

Edward P. Lindholm, Brookline, and James J. Manning, Braintree, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 14, 1996, Ser. No. 645,803
Int. Cl.[6] G03C 8/54
U.S. Cl. 430—213 **22 Claims**

1. A diffusion transfer photographic film unit which comprises:
a support;
a polymeric acid-reacting layer;
at least one silver halide emulsion layer;
an image-receiving layer; and
a layer exhibiting temperature inverting properties and comprising from about 15% to about 50% by weight of a polyester urethane polymer which is inert to alkali and from about 50% to about 85% by weight of a second polymeric material.

5,593,811

MULTILAYER, SHEET-LIKE, PHOTOSENSITIVE RECORDING MATERIAL FOR THE PRODUCTION OF PRINTING PLATES

Thomas Loerzer, Neustadt; Stefan Wegener, Saulheim, and Friedrich Gofling, Limburgerhof, all of Germany, assignors to BASF Lacke+Farben Aktiengesellschaft, Munich, Germany

Filed Dec. 21, 1995, Ser. No. 576,770
Claims priority, application Germany, Dec. 23, 1994, 44 46 196.8
Int. Cl.[6] G03C 11/12;1/805;1/85; G03F 7/30
U.S. Cl. 430—258 **4 Claims**

4. A process for the production of a letterpress, gravure printing, flexographic printing or relief plate from a sheet-like recording material containing the layers (A), (B) and (C) arranged one on top of the other
(A) being a photosensitive relief-forming layer in which imagewise exposure to actinic light results in a difference between the solubilities of the exposed and unexposed parts, so that the layer can be developed with organic, aqueous alcoholic, aqueous alkaline or aqueous liquid media, and this layer consisting of a mixture of:
(a1) from 20 to 98.999% by weight of one or more polymeric binders,
(a2) from 0.001 to 10% by weight of one or more photopolymerization initiators,
(a3) from 1 to 60% by weight of one or more organic compounds which are compatible with the binder (a1) and contain photopolymerizable olefinically unsaturated groups and
(a4) from 0 to 40% by weight of one or more assistants, with the proviso that the sum of the percentages stated under (a1) to (a4) is 100,
(B) being a smooth or dull, nontacky release layer (B) which is transparent to light, soluble or swellable in the liquid developer media and formed by a film-forming polymer and the additives contained therein, and
(C) being a cover sheet which can be detached from the release layer (B),
wherein the release layer (B) contains, as additives, from 0.001 to 20% by weight, based on its total amount, of one or more salts of the general formula $M_n X_m$, where
M=an alkali metal, alkaline earth metal, aluminum, divalent manganese, copper, zinc, tin, trivalent titanium or chromium or divalent or trivalent iron, cobalt or nickel ion,
X is a hydride, hydroxide, halide, sulfate, nitrite, nitrate, phosphate, acetylacetonate or trifluoromethanesulfonate ion and
n and m are each 1, 2 or 3, depending on the valency of the particular opposite ion,
which process comprises: detaching the cover sheet (C) from the release layer (B), placing an image mask or photographic negative on the release layer (B), imagewise exposing the photosensitive relief-forming layer (A) to actinic light having a wavelength of from 230 to 450 nm, washing out (development) of the unexposed parts of the imagewise exposed relief-forming layer (A) by means of organic, aqueous alcoholic, aqueous alkaline or aqueous liquid media (developers), the release layer (B) also being washed away, and drying and optionally aftertreating the photopolymerized printing plates and relief plates obtained in this manner, which now contain or consist of a relief layer (A').

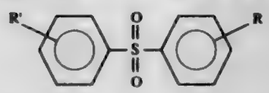
5,593,812

PHOTORESIST HAVING INCREASED SENSITIVITY AND USE THEREOF

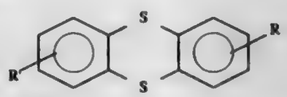
Edward D. Babich, Chappaqua; Karen E. Petrillo, Mahopac; John P. Simons, Cold Spring, and David E. Seeger, Congers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1995, Ser. No. 389,864
Int. Cl.[6] G03F 7/039;7/004;7/30;7/38
U.S. Cl. 430—270.1 **18 Claims**

1. A positive photoresist having increased sensitivity comprising:
a polymer matrix,
a photosensitive acid generator wherein said acid generator is an onium salt, and
at least one compound selected from the group consisting of phenylsulfone, and derivatives thereof having the formula:

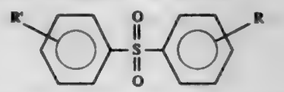


4,5-diphenyl-1,3-dioxol-2-one; thianthrene and its derivatives having the formula:

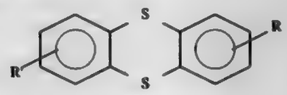


and 4,6-diphenylthieno(3,4-d)-1,3-dioxol-2-one-5,5-dioxide;
and wherein R and R' in the above formulae are individually selected from the group of H, alkyl having 1 to 12 carbon atoms, aryl having 6 to 18 carbon atoms, $-(CH_2)_n$, $-C(=O)-OH$, $-NO_2$, $-OR^{IV}$, $-OCH_2CH_2OR^{IV}$ wherein R^{IV} is H or alkyl having 1 to 12 carbon atoms.

3. A method for producing a resist image on a substrate comprising:
a) coating the substrate with a positive photoresist having increased sensitivity comprising:
a polymer matrix, a photosensitive acid generator, wherein said acid generator is an onium salt, and a compound selected from the group consisting of phenylsulfone and derivatives thereof having the formula:



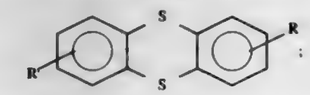
4,5-diphenyl-1,3-dioxol-2-one; thianthrene and its derivatives having the formula:



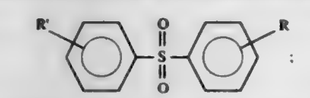
and 4,6-diphenylthieno(3,4-d)-1,3-dioxol-2-one-5,5-dioxide;

and wherein R and R' in the above formulae are individually selected from the group of H, alkyl having 1 to 12 carbon atoms, aryl having 6 to 18 carbon atoms, $-(CH_2)_n$, $-C(=O)-OH$, $-NO_2$, $-OR^{IV}$, $-OCH_2CH_2OR^{IV}$ wherein R^{IV} is H or alkyl having 1 to 12 carbon atoms,
(b) imagewise exposing the photoresist to actinic light, and
(c) then developing the photoresist to produce the resist image.

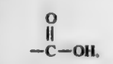
5. A positive photoresist having increased sensitivity comprising:
a polymer matrix, wherein said polymer matrix comprises a copolymer of hydroxystyrene and a member selected from the group consisting of acrylate, methacrylate and mixtures thereof;
a photosensitive acid generator wherein said acid generator is an onium salt, and
at least one compound selected from the group consisting of dye selected from the group consisting of
thianthrene and its derivatives having the formula:



phenylsulfone, and derivatives thereof having the formula:



4,5-diphenyl-1,3-dioxol-2-one and mixtures thereof and wherein R and R' in the above formulae are individually selected from the group of H, alkyl having 1 to 12 carbon atoms, aryl having 6 to 18 carbon atoms, $-(CH_2)n$,



$-NO_2$, $-OR^{IV}$, $-OCH_2CH_2OR^{IV}$ wherein R^{IV} is H or alkyl having 1 to 12 carbon atoms.

13. A method for producing a resist image on a substrate comprising:
a) coating the substrate with a positive photoresist having increased sensitivity comprising:
a polymer matrix comprising a copolymer of hydroxystyrene and a member selected from the group consisting of acrylate, methacrylate and mixtures thereof, a photosensitive acid generator, wherein said acid generator is an onium salt, and a compound selected from the group consisting of thianthrene, phenylsulfone and mixtures thereof;
b) imagewise exposing the photoresist to actinic light, and
c) then developing the photoresist to produce the resist image.

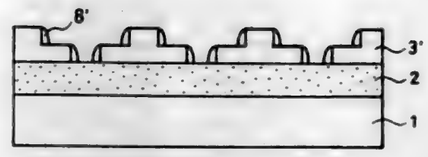
5,593,813

METHOD FOR FORMING SUBMICROSCOPIC PATTERNS

Hyeong S. Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co. Ltd., Kyoungki-do, Rep. of Korea

Filed Jul. 12, 1995, Ser. No. 501,605
Claims priority, application Rep. of Korea, Jul. 14, 1994, 94-16980
Int. Cl.[6] G03F 7/22
U.S. Cl. 430—312 **7 Claims**

1. A method for forming submicroscopic patterns of a semiconductor device, comprising the steps of:
coating a photoresist film on a lower layer to be patterned;



primarily exposing the photoresist film through a mask having chrome patterns to a light with an energy lower than the threshold energy for the thickness of the photoresist film;
secondarily exposing the photoresist film through the mask to a light with an energy lower than the threshold energy, said mask having been shifted at a predetermined distance;
subjecting the exposed photoresist film to development, to completely remove the regions in which the primarily exposed regions overlap with the secondarily exposed regions and half remove the once-exposed regions to form photoresist film patterns, each having four side walls;
depositing an insulating layer entirely over the resulting structure;
subjecting the insulating layer to anisotropic etch, to form insulating layer spacers at the side walls of the photoresist film patterns; and
dry etching the photoresist film patterns and the lower layer with the insulating layer spacers serving as a mask, to form lower layer patterns having a submicroscopic width and a submicroscopic distance therebetween.

5,593,814

CONTROL OF CELL ARRANGEMENT

Takehisa Matsuda, Minoo; Kazuhiko Inoue, Kobe, and Nobutaka Tani, Osaka, all of Japan, assignors to Kanegafuchi kagaku kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 985,201, Dec. 3, 1992, abandoned, which is a division of Ser. No. 531,596, Jun. 1, 1990, Pat. No. 5,202,227. This application Sep. 19, 1994, Ser. No. 308,204
Claims priority, application Japan, Jun. 3, 1989, 1-141964; Jun. 3, 1989, 1-141965
Int. Cl.[6] G03F 7/012; C12N 5/00
U.S. Cl. 430—320 **18 Claims**

1. A biological cell culture device for controlling cell arrangement said device comprising:
(1) a substrate having a cell non-adhesive surface on which biological cells cannot grow, wherein said cell non-adhesive surface is
(A) a layer of a cell non-adhesive material provided on the substrate, or
(B) a surface of the substrate, said substrate being a cell non-adhesive material;
(2) a cell adhesive surface on which biological cells can grow, said cell adhesive surface being provided on said substrate having a cell non-adhesive surface, wherein said cell adhesive surface is:
(A) a surface having a functional group with an electric charge directly introduced onto said cell non-adhesive surface, or
(B) a surface of a layer having a cell adhesive peptide chemically bonded to said cell non-adhesive surface, or
(C) a surface of a layer of cell adhesive high molecular weight compound, wherein said cell adhesive high molecular weight compound is covalently bonded to said cell non-adhesive surface
(i) by a reaction between a functional group of said high molecular weight compound and a functional group of said cell non-adhesive surface, or
(ii) by a graft-polymerization of said high molecular weight compound onto said cell non-adhesive surface said graft-polymerization being effected by addition of a monomer or

(iii) by a photochemical reaction of (a) a photosensitive azido-group-containing cell adhesive high molecular weight compound or (b) a photosensitive composition containing a cell adhesive high molecular weight compound and an azido group-containing photosensitive compound, said photosensitive azido group-containing cell adhesive high molecular weight compound in (iii)(a) being the cell adhesive high molecular weight compound in (2)(C), and said cell adhesive high molecular weight compound in (iii)(b) being the cell adhesive high molecular weight compound in (2)(c),

(3) wherein said cell non-adhesive surface and said cell adhesive surface form a surface pattern.

11. A biological cell culture device for controlling cell arrangement said device comprising:

(1) a substrate having a cell adhesive surface on which biological cells can grow, wherein said cell adhesive surface is

(A) a layer of a cell adhesive material provided on the substrate, or

(B) a surface of the substrate, said substrate being a cell adhesive material;

(2) a cell non-adhesive surface on which biological cells cannot grow, wherein said cell non-adhesive surface is covalently bonded to said cell adhesive surface

(A) by a graft-polymerization by means of a monomer onto the cell adhesive surface, or

(B) by a photochemical reaction of a

(i) photosensitive azido group-containing cell non-adhesive high molecular weight compound, or

(ii) a photosensitive composition containing a cell non-adhesive high molecular weight compound and an azido group-containing photosensitive compound,

(3) wherein said cell adhesive surface and said covalently bonded cell non-adhesive surface form a surface pattern.

5,593,815

CLEAVING PROCESS IN MANUFACTURING A SEMICONDUCTOR LASER

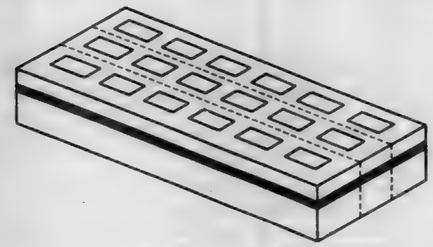
Hyung S. Ahn, Kyonggy-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 208,033, Mar. 9, 1994, abandoned, which is a continuation of Ser. No. 948,307, Sep. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 556,421, Jul. 24, 1990, abandoned. This application Feb. 17, 1995, Ser. No. 390,379

Claims priority, application Rep. of Korea, Jul. 31, 1989, 10858/1989

Int. Cl.[6] **H01L** *21/302*; **G03F** *7/40*

U.S. Cl. 430—321 **3 Claims**



1. A method of cleaving a semiconductor wafer comprising the steps of:

a) coating a first photoresist on a front surface of a semiconductor wafer having a plurality of semiconductor laser elements formed on said semiconductor wafer;

b) patterning the first photoresist so as to form guide mark patterns for cleaving in the first photoresist;

c) coating a second photoresist on a rear surface of said semiconductor wafer;

d) removing an edge part of the second photoresist, wherein said edge part is located at the guide mark patterns for cleaving;

e) etching the semiconductor wafer to form guide marks using the patterned first photoresist and the second photoresist as masks, the guide marks being formed through said semiconductor wafer;

f) patterning the second photoresist so as to form stripe patterns in the second photoresist on the rear surface;

g) etching the rear surface of said semiconductor wafer so as to form V-shaped grooves;

h) removing said first photoresist and said second photoresist; and

i) cleaving said semiconductor wafer along said V-shaped grooves into bars, each bar being a semiconductor laser.

5,593,816

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND COLOR IMAGE FORMING METHOD

Hiroo Takizawa, and Toshiyuki Makuta, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 7, 1994, Ser. No. 178,884

Claims priority, application Japan, Jan. 11, 1993, 5-017836; Jul. 16, 1993, 5-197673

Int. Cl.[6] **G03C** *7/42*

U.S. Cl. 430—393 **18 Claims**

1. A silver halide color photographic material capable of being processed with a processing solution having a bleaching ability after imagewise exposure to light and color development, wherein the silver halide color photographic material comprises a support having thereon a silver halide emulsion layer and at least one layer containing at least one compound represented by formula (I) in an amount of 0.0002 to 20 g per m^2 of said photographic material:

$$R^1—SO_2NH_2 \quad (I)$$

wherein R^1 represents an unsubstituted aliphatic group having 6 or more carbon atoms, an unsubstituted aryl group or an aryl group substituted by at least one substituent selected from the group consisting of an aliphatic group, an aryloxy group, a carbamoyl group, an acylamino group, an aliphatic oxycarbonyl group, an aryloxycarbonyl group and a halogen atom provided that R^1 does not contain any coupler residue.

5,593,817

DEVELOPING SOLUTION AND METHOD FOR DEVELOPING AN EXPOSED SILVER HALIDE PHOTOGRAPHIC MATERIAL

Freddy Hendrickx, Olen; Ann Verbeeck, Begijnendijk; Pascal Meens, Turnhout, and Hieronymus Andriessen, Beerse, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Jan. 31, 1996, Ser. No. 594,144

Claims priority, application European Pat. Off., Feb. 21, 1995, 95200417

Int. Cl.[6] **G03C** *5/305*

U.S. Cl. 430—488 **21 Claims**

1. Photographic developing solution comprising hydroquinone in an amount from 0 to 30 g per litre, an auxiliary developer, and silver halide complexing agents in an amount from 0 to 50 g per litre, characterized in that said developer further comprises

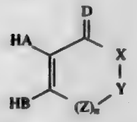
in amounts from 0.1 to 5 g per litre a compound corresponding to the formula (I), accompanied by charge compensating anions,

$$Z^1N^+—R—N^+Z^2 \quad (I)$$

wherein at least divalent group R contains at least one oxyethylene group and wherein Z' and Z", being the same or different, are composed of enough atoms to form a heterocyclic aromatic 5- or 6-ring;

and

at least 1 g of a compound corresponding to the formula (II), a precursor thereof, a derivative thereof and/or a metal salt thereof



(II)

wherein

each of A, B and D independently represents an oxygen atom or NR^1;

X represents an oxygen atom, a sulphur atom, NR^2; CR^3R^4;C=O; C=NR^5 or C=S;

Y represents an oxygen atom, a sulphur atom, $NR^{'2}$; $CR^{'3}R^{'4}$; C=O, C=$NR^{'5}$ or C=S;

Z represents an oxygen atom, a sulphur atom, $NR^{''2}$; $CR^{''3}R^{''4}$; C=O; C=$NR^{''5}$ or C=S;

n equals 0, 1 or 2;

each of R^1 to R^5, R^1 to R^5 and $R^{'1}$ to $R^{'5}$, independently represents hydrogen, alkyl, aralkyl, hydroxyalkyl, carboxyalkyl; alkenyl, alkynyl, cycloalkyl, cycloalkenyl, aryl or heterocyclyl;

and wherein

R^3 and R^4, R^3 and $R^{'4}$, $R^{'3}$ and $R^{''4}$, may further form together a ring; and wherein

in the case that X=CR^3R^4 and Y=$CR^{'3}R^{'4}$, R^3 and $R^{'3}$ and/or R^4 and $R^{'4}$ may form a ring and wherein

in the case that Y=$CR^{'3}R^{'4}$ and Z=$CR^{''3}R^{''4}$ with n=1 or 2, $R^{'3}$ and $R^{''3}$ and/or $R^{'4}$ and $R^{''4}$ may form a ring.

5,593,818

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Fumio Kawamoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 263,893, Jun. 22, 1994, abandoned. This application Oct. 2, 1995, Ser. No. 536,493

Claims priority, application Japan, Jun. 22, 1993, 5-173574; Jun. 23, 1993, 5-174623

Int. Cl.[6] **G03C** *1/815*; *1/825*

U.S. Cl. 430—512 **20 Claims**

11. A silver halide photographic material having a support and at least one silver halide emulsion layer on at least one side of the support, wherein the support is made of a polyethylene naphthalate compound and contains 0.02 to 10 g/m^2 of at least one ultraviolet absorbent, with the support having a thickness of 40 to 500 μm.

units of which comprise 60 to 100 mol. % ethylene glycol, with the proviso that when 100 mol. % of the acid units are 2,6-naphthalenedicarboxylic acid then from 60 to 99.5 mol. % of the glycol units comprise ethylene glycol and when 100 mol. % of the glycol units comprise ethylene glycol then 90 to 99.5 mol. % of the acid units comprise 2,6-naphthalenedicarboxylic acid, wherein

(B) light transmittance, T_{400}, of the film, measured through a solution of 10 mg/ml of said film in a hexafluoroisopropanol/chloroform mixed solvent having a hexafluoroisopropanol/chloroform weight ratio of 2/3 is at least 97%/cm at a wavelength of 400 nm,

(C) the film has a yellow index, Y_{in}, of 5 or less, and

(D) the film has a haze value of 2.0% or less.

5,593,820

SILVER HALIDE EMULSION AND SILVER HALIDE PHOTOGRAPHIC MATERIAL USING THE SAME

Hideyuki Shirai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

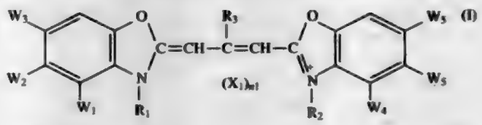
Filed Dec. 20, 1994, Ser. No. 360,001

Claims priority, application Japan, Dec. 20, 1993, 5-320112

Int. Cl.[6] **G03C** *1/035*; *1/18*

U.S. Cl. 430—567 **5 Claims**

1. A silver halide emulsion which contains tabular silver halide grains having {100} faces as the parallel two major planes, having an aspect ratio of 2 or more and having a mean silver chloride content of 50 mol % or more, in an amount of 50% or more of the total projected area of all the silver halide grains therein, and which is spectrally sensitized with a dye represented by formula (I):



(I)

wherein

W_1, W_3, W_4 and W_6 each represents a hydrogen atom; and W_2 and W_5 each represents a substituted phenyl group;

R_1 and R_2 may be the same or different and each represents an unsubstituted or substituted alkyl or alkenyl group having 10 or less carbon atoms in total, and at least one of R_1 and R_2 has a sulfo group or a carboxyl group;

R_3 represents a lower alkyl group or a phenyl-substituted alkyl group;

X_1 represents a pair ion necessary for neutralizing the charge of the compound; and

n_1 represents 0 or 1, and when the compound is an internal salt, n_1 is 0.

5,593,819

BASE FILM FOR PHOTOGRAPHIC FILM

Manabu Kimura; Hideshi Kurihara; Tetsuo Ichihashi, all of Matsuyama, and Satoshi Kitazawa, Saganihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 223,681, Apr. 6, 1994, Pat. No. 5,457,017. This application Oct. 3, 1995, Ser. No. 538,580

Claims priority, application Japan, Apr. 9, 1993, 5-083213; Sep. 20, 1993, 5-233288; Jan. 12, 1994, 6-001643

Int. Cl.[6] **G03C** *1/76*

U.S. Cl. 430—533 **19 Claims**

1. A film suitable as a base film for photographic film, consisting essentially of

(A) polyethylene-2,6-naphthalenedicarboxylate copolymer, the acid component units of which comprise 90 to 100 mol. % 2,6-naphthalenedicarboxylic acid and the glycol component

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5,593,821

SILVER HALIDE EMULSION AND PHOTOGRAPHIC MATERIAL HAVING THE SAME

Takayoshi Oyamada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1995, Ser. No. 486,580

Claims priority, application Japan, Jun. 30, 1994, 6-149209

Int. Cl.[6] **G03C** *1/035*; *1/09*

U.S. Cl. 430—567 **15 Claims**

1. A silver halide emulsion which comprises multi-layered silver halide grains having a total Cl^- content of 30 mol % to 90 mol % based on silver in the grains, having {100} faces as major faces and having an aspect ratio of 2 or more, wherein the multi-layered silver halide grains occupy not less than 30% of the total projected area of the total silver halide grains in the emulsion, wherein the multi-layered silver halide grains have been sensitized with a selenium sensitizer, a tellurium sensitizer, or a selenium sensitizer and a tellurium sensitizer; and wherein the multi-layered silver

halide grains have been produced by growth of a shell around a core grain, said growth being conducted by adding fine silver halide grains to the core grains.

5,593,822

IGG DEPLETED SERUM PREPARATIONS AND METHODS FOR ANTIBODY PRODUCTION

Qing S. Zeng, Alhambra, and Reiko F. Irie, Los Angeles, both of Calif., assignors to John Wayne Cancer Institute, Santa Monica, Calif.

Filed Dec. 7, 1993, Ser. No. 163,186

Int. Cl.[6] A01N *1/02*; C12P *21/04*; C12N *5/00*

U.S. Cl. 435—2 **34 Claims**

1. A serum preparation comprising an animal serum containing less than about 1 μg/ml of IgG antibody.

5,593,823

METHOD FOR INACTIVATING PATHOGENS IN BLOOD USING PHOTOACTIVATION OF 4'PRIMARY AMINO-SUBSTITUTED PSORALENS

Susan Wollowitz, Walnut Creek; Stephen T. Isaacs, Orinda; Henry Rapoport, Berkeley, all of Calif.; Hans P. Spielmann, Lexington, Ky., and Aileen Nerio, Santa Clara, Calif., assignors to Cerus Corporation, Concord, Calif.

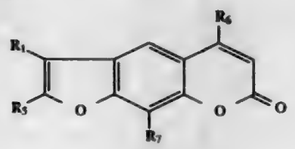
Continuation-in-part of Ser. No. 212,113, Mar. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 83,459, Jun. 28, 1993, Pat. No. 5,399,719. This application Nov. 14, 1994, Ser. No. 337,987

Int. Cl.[6] A01N *1/02*; C12N *7/06*

U.S. Cl. 435—2 **23 Claims**

1. A method of inactivating pathogens in a composition comprising a blood product, comprising the steps of:

a) contacting one or more psoralen compounds or salts thereof of formula I,



wherein R_1 is

$-(CH_2)_2-NH_2$,

$-(CH_2)_w-R_2-(CH_2)_z-NH_2$,

$-(CH_2)_w-R_2-(CH_2)_z-R_3-(CH_2)_z-NH_2$, or

$-(CH_2)_w-R_2-(CH_2)_x-R_3-(CH_2)_y-R_4-(CH_2)_z-NH_2$;

and R_2, R_3, and R_4 are independently Q or NH_2, and w is a whole number from 1 to 5, x is a whole number from 2 to 5, y is a whole number from 2 to 5, and z is a whole number from 2 to 6; R_5, R_6 and R_7 are independently H and $(CH_2)_vCH_3$, and v is a whole number from 0 to 5 in a concentration sufficient to inactivate pathogens upon photoactivation, with a blood product suspected of being contaminated with pathogens; and

b) photoactivating said compound for a duration and at an intensity and a wavelength sufficient to inactivate the pathogens.

5,593,824

BIOLOGICAL REAGENT SPHERES

Suzanne B. Treml, Whitefish Bay; Cristine J. Dall, Shorewood; Connie A. Draveling, New Berlin; James F. Jolly, Glendale, and Rama P. Ramasunjam, Brookfield, all of Wis., assignors to Pharmacia Biotech, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 308,015, Sep. 2, 1994. This application Apr. 12, 1995, Ser. No. 420,933

Int. Cl.[6] C12Q *1/00;1/34;1/37*; C12P *21/06*

U.S. Cl. 435—4 **32 Claims**

1. A reagent sphere comprising:

at least one biological reagent; and

a glass-forming filler material in a concentration sufficient to facilitate formation of a glassy, porous composition wherein the glass-forming filler comprises a mixture of a high molecular weight synthetic carbohydrate polymer and a second carbohydrate;

wherein the reagent sphere is water soluble and has a T_g of at least 10° C.

5,593,825

HEPATITIS B VIRUS MUTANTS, REAGENTS AND METHODS FOR DETECTION

William F. Carman, Glasgow, Scotland; Richard H. Decker, Deerfield, Ill.; Lesley Wallace, Glasgow, Scotland; Larry T. Mimms, Lake Villa, and Larry R. Solomon, Mundelein, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 59,831, May 7, 1993. This application May 23, 1995, Ser. No. 450,943

Int. Cl.[6] C12Q *1/70*; C12N *15/36*

U.S. Cl. 435—5 **12 Claims**

1. An isolated or purified polynucleotide comprising a sequence encoding a modified "a" determinant of HBsAg, wherein the modification is insertion of Asn and Thr between positions 122 and 123 of the HbsAg sequence.

5,593,826

ENZYMATIC LIGATION OF 3'AMINO-SUBSTITUTED OLIGONUCLEOTIDES

Steven Fung, Palo Alto, and Sergei M. Gryaznov, San Mateo, both of Calif., assignors to Perkin-Elmer Corporation, Applied Biosystems, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 38,663, Mar. 22, 1993, abandoned. This application Apr. 16, 1993, Ser. No. 48,975

Int. Cl.[6] C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—6 **18 Claims**

1. In a ligation-based assay for detecting one or more target nucleic acids wherein a first oligonucleotide having a 3' terminus and a second oligonucleotide having a 5' terminus are annealed to contiguous complementary regions of a target nucleic acid such that the 3' terminus of the first oligonucleotide is made to abut the 5' terminus of the second oligonucleotide, an improvement comprising:

providing a first oligonucleotide having a 3' amino group at the 3' terminus and a second oligonucleotide having a 5' monophosphate group at the 5' terminus; and

enzymatically ligating the first and second oligonucleotides through the formation of a phosphoramidate bond when both the first and second oligonucleotides are annealed to a target nucleic acid.

5,593,827

AUTOINDUCER

Barrie W. Bycroft; Paul Williams, both of Nottingham; Gordon S. A. B. Stewart; Siri R. Chhabra, both of Loughborough; Paul Stead, Broadstone; Michael K. Winson, Nottingham; Philip J. Hill, Nottingham; Catherine E. D. Rees, Nottingham, and Nigel J. Bainton, Nottingham, all of United Kingdom, assignors to The University of Nottingham, Nottingham, United Kingdom

PCT No. PCT/GB92/00713, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO92/18614, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 16, 1992, Ser. No. 137,036

Claims priority, application United Kingdom, Apr. 18, 1991, 9108307

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **21 Claims**

1. A method of testing for the presence in a sample of a first bacterium known to generate N-(β -ketocaproyl) homoserine lactone or analogue under particular conditions, which method comprises incubating the sample under the particular conditions in contact with a test bacterium chosen for enhancement of gene expression by the lactone or analogue, and detecting the gene expression as a test for the first bacterium.

5,593,828

MEMBRANE FOR CHEMILUMINESCENT BLOTTING APPLICATIONS

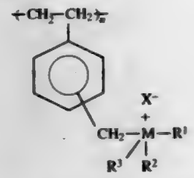
Ireun Bronstein, Newton; Brooks Edwards, Cambridge, and John Voyta, Sudbury, all of Mass., assignors to Tropix, Inc., Bedford, Mass.

Continuation of Ser. No. 811,620, Dec. 23, 1991, Pat. No. 5,336,596. This application Apr. 26, 1994, Ser. No. 233,850

Int. Cl.[6] G01N *33/545*; B32B *27/00*

U.S. Cl. 435—6 **6 Claims**

1. A membrane suitable for use in a blotting assay, comprising a support bearing a polymer coating formed directly on said support, said polymer coating consistently essentially of repeating units of at least one monomer of the formula:



wherein M is N, S or P, wherein R^1-R^3 are independently alkyl, cycloalkyl, polycycloalkyl, aralkyl or aryl, having 1 to 20 carbon atoms, unsubstituted or substituted with hydroxyl, amino, amido or ureido groups, or combine to form, via a spiro linkage to the M atom a heterocyclic (aromatic, aliphatic or mixed, having 1–2 N, S or O atom in addition to the M atom) onium moiety, wherein X is halogen, a sulfate group or a sulfonate, and wherein n is selected such that the molecular weight of said polymer is 800–200,000.

5,593,829

METHOD FOR LABELING DNA BY RING-OPENING OF PURINE BASES

Mead M. McCabe, Miami, Fla., assignor to University of Miami, Miami, Fla.

Continuation of Ser. No. 802,815, Dec. 6, 1991, abandoned. This application May 3, 1994, Ser. No. 241,385

Int. Cl.[6] C07H *21/04*;*19/167*; C12Q *1/68*; G01N *33/53*

U.S. Cl. 435—6 **19 Claims**

1. A method for detecting in a sample a purine base-containing polynucleotide analyte, comprising the steps of:

(a) hybridizing to said polynucleotide analyte a detectably-labeled, imidazole ring-opened N^7-alkyl-N^7-formyl purine contained within a polynucleotide probe capable of hybridizing to said polynucleotide analyte to form a complex; and,

(b) detecting said polynucleotide analyte by detecting said label in said complex.

5,593,830

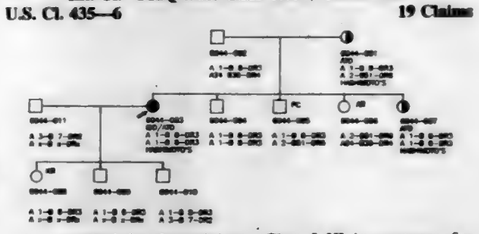
DNA SEQUENCE-BASED HLA CLASS I TYPING METHOD

Pedro Santamaria, Calgary, Canada; Michael T. Boyce-Jacino, Finksburg, Md.; Jose J. Barbosa, Roseville, Minn.; Stephen S. Rich, Mocksville, N.C., and Anthony J. Faras, Long Lake, Minn., assignors to Regents of the University of Minnesota, Minn.

Continuation-in-part of Ser. No. 697,421, May 8, 1991, Pat. No. 5,424,184. This application Jul. 28, 1994, Ser. No. 283,203 The portion of the term of this patent subsequent to May 8, 2008, has been disclaimed.

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **19 Claims**



1. A method for determining a Class I HLA genotype of a subject in a sample containing subject nucleic acid comprising:

(a) isolating nucleic acid from said sample;

(b) amplifying said nucleic acid by polymerase chain reaction to generate sufficient polymerase chain reaction product for each allele of at least one gene locus to be sequenced, all of said alleles for each said gene locus and chromosome to be sequenced being amplified with at least one Class I loci-specific primer annealing to all possible alleles at all Class I loci at each chromosome and a locus-specific primer that anneals preferentially to a region of each said gene locus which has a sequence that is shared by all alleles at each said locus;

(c) sequencing directly each polymerase chain reaction product for each allele at each gene locus of each chromosome with Taq polymerase and either a locus-specific primer or two Class I loci-specific primer or two Class I loci-specific oligonucleotide primers; and

(d) analyzing each sequenced poly merase chain reaction product to determine the genotype of said subject.

5,593,831

NUCLEIC ACID PROBES FOR THE DETECTION OF YERSINIA ENTEROLITICA

Jyotsna S. Shah, Nashua, N.H.; Samuel W. Chan, Newton, Mass.; Theodore B. Pitman, Lynnfield, Mass., and David J. Lane, Milford, Mass., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 936,886, Aug. 27, 1992, Pat. No. 5,370,992, which is a continuation of Ser. No. 169,646, Mar. 18, 1988, abandoned. This application Aug. 29, 1994, Ser. No. 297,103

Int. Cl.[6] C07H *21/02*;*21/04*; C12Q *1/68*

U.S. Cl. 435—6 **5 Claims**

1. A nucleic acid probe which hybridizes to the *Yersinia enterocolitica* target nucleic acid 5' -CCAAUAACUUAAUACGUUGUUGG-3', or the complement of the target nucleic acids following incubation at 60° C., for 14–16

hours in a hybridization solution containing 0.9M NaCl, 0.12M Tris-HCl, pH 7.8, 6 mM EDTA, 0.1M KPO4, 0.1% SDS, 0.1% pyrophosphate, 0.002% ficoll, 0.02% BSA, and 0.002% polyvinylpyrrolidine, followed by three, 15 minutes post-hybridization washes at 60° C. in a solution containing 0.03M NaCl, 0.004M Tris-HCl, pH 7.8, 0.02 mM EDTA and 0.1% SDS, and which does not hybridize to rRNA or DNA of non-*Yersinia enterocolitica* species selected from the group consisting of *Yersinia kristensenii* 29911; *Yersinia kristensenii* 33638; *Yersinia fredericksenii* 33641; *Yersinia ruckeri* 29908; and *Yersinia pseudotuberculosis* 29.833, under otherwise identical hybridization conditions.

5,593,832

METHOD FOR FORENSIC ANALYSIS

Jeffrey Glassberg, Chappaqua, N.Y., assignor to Lifecodes Corporation, Stamford, Conn.

Continuation of Ser. No. 931,482, Aug. 19, 1992, abandoned, which is a continuation of Ser. No. 150,465, Feb. 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 582,334, Feb. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 468,113, Feb. 28, 1983, abandoned. This application Jan. 23, 1995, Ser. No. 376,487

Int. Cl.[6] C12Q *1/68*; C12N *15/70*; C07H *21/04*

U.S. Cl. 435—6 **4 Claims**

1. A method of forensic analysis, not including paternity testing, comprising:

(a) obtaining a first sample containing DNA from an individual organism, said individual organism being a human;

(b) obtaining a second sample containing a quantity of DNA sufficient for restriction endonuclease digestion and DNA hybridization;

(c) isolating the DNA of the first sample;

(d) isolating the DNA of the second sample;

(e) subjecting said DNA in each of the samples to the action of at least one restriction endonuclease thereby forming, in each of the two samples, a set of DNA fragments containing one or more polymorphic genetic regions;

(f) in each of the samples, separating by size the DNA fragments generated in step (e);

(g) in each of the samples, hybridizing the DNA fragments separated in step (f) with at least one probe, wherein said probe is a single locus probe and hybridizes with a DNA fragment containing a polymorphic genetic region;

(h) detecting said hybridized probe; and

(i) comparing the size of the hybridized fragments generated from the first sample with the size of the hybridized fragments generated from the second sample, thereby analyzing said sample for forensic purposes.

5,593,833

ASSESSMENT OF ALLELIC VARIATION IN VITAMIN D RECEPTOR CORRELATED TO BONE DENSITY OR TURNOVER

Nigel A. Morrison, Pagewood; John A. Eisman, Lindfield, and Paul J. Kelly, Waverly, all of Australia, assignors to Garvan Institute of Medical Research, Darlinghurst, Australia

PCT No. PCT/AU93/00394, § 371 Date Mar. 2, 1995, § 102(e) Date Mar. 2, 1995, PCT Pub. No. WO94/03633, PCT Pub. Date Feb. 17, 1994

PCT Filed Aug. 2, 1993, Ser. No. 379,496

Claims priority, application Australia, Jul. 31, 1992, PL3893

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C07H *21/02*;*21/04*

U.S. Cl. 435—6 **7 Claims**

1. A method of assessing an individual's predisposition to low or high bone density, development of high or low bone turnover and/or responsiveness to therapy for conditions relating to bone density or bone turnover comprising analyzing allelic variation in the vitamin D receptor gene of the individual, thereby determining an individual's predisposition to low or high bone density, development of high or low bone turnover and/or responsiveness to therapy for conditions relating to bone density or bone turnover.

5,593,834

METHOD OF PREPARING DNA SEQUENCES WITH KNOWN LIGAND BINDING CHARACTERISTICS

Michael J. Lane, Baldwinsville, N.Y.; Albert S. Benight, Schaumburg, Ill., and Brian D. Faldasz, Maynard, Mass., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation of Ser. No. 78,759, Jun. 17, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 427,863

Int. Cl.[6] C12Q *1/68*;*1/70*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **11 Claims**

5. A method of detecting the presence or absence of a preselected or native DNA sequence or sequences which comprises determining at least one set of DNA primers which amplify, or generate amplification products for, at least two different regions from the preselected or native DNA sequence at approximately equal rates, by:

iterating through the preselected or native DNA sequence to select at least one DNA subsequence for use as a potential DNA primer or set of DNA primers;

calculating free energies ΔG_D° of duplex melting for each potential DNA primer, which comprises:

summing free-energy values for hydrogen-bonding and stacking interactions for nucleotide bases constituting each potential DNA primer, wherein such free-energy values are predetermined by semi-empirical thermochemical methods;

determining calculated composite reaction rates for amplifying the corresponding preselected or native DNA sequence using each selected or permuted potential DNA primer or set of DNA primers by means of the equation:

$$\ln (k^{II}/k^{I}) = (\kappa/RT)(\Delta G_D^{oI} - \Delta G_D^{oII}),$$

or, if the composite reaction rates are binding limited, determining calculated binding constants of the corresponding preselected DNA sequence by means of the equation:

$$\ln (k^{II}/k^{I}) = (\kappa/RT)(\Delta G_D^{oI} - \Delta G_D^{oII}),$$

wherein k^{I} and k^{II} are composite reaction rate constants for amplification using potential DNA primers I and II, respectively, K^{I} and K^{II} are binding constants for an amplifying reagent binding to the preselected or native DNA sequence to which potential DNA primers I and II anneal, respectively, R is the universal gas constant, T is absolute temperature, κ is a proportionality constant or function.

wherein κ is predetermined in accord with said equations for the amplifying reagent and for set sequence length by relating measured composite rates of amplification or binding with potential DNA primers or set of potential DNA primers I and II to their respective differences in free energies of melting ΔG_D^{oI} and ΔG_D^{oII}, which comprises:

calculating free energies of melting ΔG_D° for at least two potential DNA primers if κ is a proportionality constant, or at least three if a function, determined in accord with the summing step;

measuring composite rates of amplification or generation of amplification products or binding constants for synthetic or native DNA sequences to which the potential DNA primers anneal; and

relating the measured composite rates of reaction or binding constants to their respective differences in free energy of melting ΔG_D° in accord with said equations; and

synthesizing the potential DNA primers by chemical or biochemical methods;

measuring composite reaction rates of amplification or generation of amplification products using the potential DNA primers by any method suited for the purpose;

repeating the iterating, calculating, synthesizing and measuring steps to determine at least one additional potential DNA primer which amplifies, or generates amplification products for, the preselected or native DNA sequence, does not interact with any other primer, and has a composite reaction rate approximately equal to that of the first potential DNA primer or set of potential DNA primers; and

choosing at least one set of potential DNA primers with approximately equal calculated composite reaction rates for amplifying, or generating amplification products for, at least two different regions from the corresponding preselected or native DNA sequence using each set of potential DNA primers, wherein calculated composite reaction rates fall within a predefined deviation about a mean composite reaction rate; and

using at least one set of potential DNA primers to detect the presence or absence of a preselected or native DNA sequence, which comprises:

combining aliquots of at least one set of DNA primers with an analytical unknown sample which may or may not contain a preselected or native DNA sequence;

performing the amplifying reaction to generate amplified concentrations or amplification products of the preselected or native DNA sequence, if present; and

observing by any suitable qualitative or quantitative method the presence or absence of, the preselected or native DNA sequence, thereby detecting the presence or absence of the preselected or native DNA sequence.

5,593,835

METHODS AND KITS FOR RNA BINDING COMPOUNDS

Robert R. Rando, Newton Center, and Yong Wang, Boston, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed May 12, 1995, Ser. No. 440,084

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **22 Claims**

1. A method of screening for compounds which bind to a target RNA, the method comprising the steps of:

(a) measuring the fluorescence of a fluorescently-labelled antibiotic;

(b) binding the fluorescently-labelled antibiotic to a preselected region of the target RNA, thereby forming a complex which is less fluorescent than the uncomplexed fluoreacent antibiotic;

(c) mixing the complex with a compound-to-be-tested, and;

(d) measuring the fluorescence of the antibiotic, the antibiotic becoming more fluorescent if the compound displaces the antibiotic in the complex and binds to the preselected region of the target RNA.

5,593,836

PRIMERS AND PROBES FOR DETECTING *PNEUMOCYSTIS CARINII*

John T. Niemiec, 2871 San Jose Ave., Alameda, Calif. 94501, and Karen K. Y. Young, 9943 Brunswick Ct., San Ramon, Calif. 94583

Continuation of Ser. No. 62,089, May 14, 1993, abandoned. This application May 23, 1995, Ser. No. 448,204

Int. Cl.[6] C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—6 **11 Claims**

5. A process for detecting nucleic acid from *Pneumocystis carinii* contained in a sample comprising:

(a) carrying out a polymerase chain reaction using pair of oligonucleotide primers between 15 and 40 nucleotides in length consisting of a first primer exactly complementary to SEQ ID No. 1 and a second primer exactly complementary to the complement of SEQ ID No. 1, wherein said first primer comprises a subsequence of PC22 (SEQ ID No. 5) at least 15 nucleotides in length and said second primer comprises a subsequence of PC41 (SEQ ID No. 4) at least 15 nucleotides in length;

(b) mixing said nucleic acid amplified in step (a) with an oligonucleotide probe between 10 and 50 nucleotides in length consisting of a nucleic acid sequence exactly complementary to a region of SEQ ID No. 1, wherein said region encompasses a base position of SEQ ID No. 1 selected from the group consisting of base positions 508, 540, 632, 668, 778, 837, 855, 856, 857, 858, 862, 863, 876, 878 and 884, or the exact complement thereof; and

(c) detecting hybrids formed between said nucleic acid and said probe, which indicate the presence of said nucleic acid *Pneumocystis carinii*.

5,593,837

CLINICAL DISORDERS ASSOCIATED WITH CARBOXYPEPTIDASE E MUTATION

Jürgen K. Naggert, and Edward H. Leiter, both of Bar Harbor, Me., assignors to The Jackson Laboratory, Bar Harbor, Me.

Filed May 26, 1995, Ser. No. 452,262

Int. Cl.[6] C12G 1/68; C12N 9/48

U.S. Cl. 435—6 **5 Claims**

1. A method for identifying a clinical disorder associated with a mutation in the carboxypeptidase E gene, the method comprising:

a) isolating DNA encoding carboxypeptidase E from the individual;

b) expressing the isolated DNA encoding carboxypeptidase E using recombinant DNA techniques; and

c) determining the enzymatic activity of the expressed carboxypeptidase E and comparing the determined activity to that determined for wild-type carboxypeptidase E which is produced and assayed in an otherwise identical manner, a substantial reduction in the enzymatic activity relative to that of wild-type being indicative of the clinical disorder associated with a mutation in the carboxypeptidase E gene, the clinical disorder being selected from the group consisting of obesity, diabetes or impaired glucose tolerance associated with aberrant insulin processing.

5,593,838

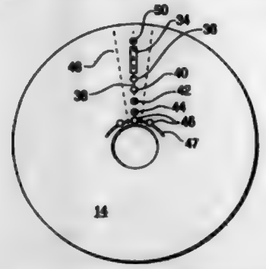
PARTITIONED MICROELECTRONIC DEVICE ARRAY

Peter J. Zanzucchi, West Windsor Township; Satyam C. Cherukuri, Cranbury; Sterling E. McBride, Lawrence Township, all of N.J., and Amrit K. Judd, Belmont, Calif., assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Division of Ser. No. 338,703, Nov. 10, 1994. This application May 31, 1995, Ser. No. 455,016

Int. Cl.[6] C12Q *1/68*; B01J *19/00*; G01N *33/48*

U.S. Cl. 435—6 **21 Claims**



1. A method of assaying nucleic acid which comprises separately and in parallel for each of two or more nucleic acid-containing samples:

placing a first nucleic acid-containing sample and a second nucleic-acid-containing sample into an array comprising a solid substrate, a plurality of wells and channels, wherein at least one channel is formed in the upper surface of the

substrate and is situated above another channel formed in the lower surface of the substrate, so as to form crossovers comprising crossing but non-intersecting channels;

moving said first sample into a first well for isolating nucleic acid;

moving said second sample into a second well for isolating nucleic acid;

moving the isolated nucleic acid from the first sample to a third well;

moving the isolated nucleic acid from the second sample to a fourth well;

amplifying the nucleic acid in the third and fourth wells by cycling the temperature of the third and fourth wells;

moving the amplified nucleic acid in the third well to a fifth well for assay;

moving the amplified nucleic acid in the fourth well to a sixth well for assay; and

assaying the amplified nucleic acid.

5. A method of assaying nucleic acid which comprises separately and in parallel for each of two or more nucleic acid-containing samples:

placing a first nucleic acid-containing sample and a second nucleic acid-containing sample into an array comprising a solid substrate, a plurality of wells and channels, wherein at least one channel is formed in the upper surface of the substrate and is situated above another channel formed in the lower surface of the substrate, so as to form crossovers comprising crossing but non-intersecting channels;

separately isolating nucleic acid from the first and second sample;

separately amplifying the nucleic acid from the first and second sample; and

assaying the amplified nucleic acid.

5,593,839

COMPUTER-AIDED ENGINEERING SYSTEM FOR DESIGN OF SEQUENCE ARRAYS AND LITHOGRAPHIC MASKS

Earl A. Hubbell, Mt. View; Robert J. Lipshutz, Palo Alto; Macdonald S. Morris, San Jose, and James L. Winkler, Palo Alto, all of Calif., assignors to Affymetrix, Inc., Santa Clara, Calif.

Division of Ser. No. 249,188, May 24, 1994. This application Jun. 2, 1995, Ser. No. 460,411

Int. Cl.[6] C12Q *1/68*; C07H *21/04*; G03F *9/00*

U.S. Cl. 435—6 **16 Claims**

1. A method of designing a synthesis method for an array of materials to be synthesized on a substrate, said array formed from groups of diverse biological materials, comprising the steps of:

inputting genetic sequences to a design computer system;

determining a sequence of monomer additions used to form said genetic sequences in said computer by the steps of:

identifying a monomer addition template; and

for monomer additions in said template, determining if said monomer additions are needed in formation of said genetic sequence and, if not, removing said monomer additions from said template;

generating an output file comprising a series of desired monomer additions not removed from said template; and

providing said series of monomer additions as an input file to a synthesizer.

5,593,840

AMPLIFICATION OF NUCLEIC ACID SEQUENCES

Satish K. Bhatnagar; Albert L. George, Jr., and Irina Nazarenko, all of Gaithersburg, Md., assignors to Oncor, Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 168,621, Dec. 16, 1993, which is a continuation-in-part of Ser. No. 10,433, Jan. 27, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,823

Int. Cl.[6] C12Q *1/68*; *1/70*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **59 Claims**

1. A process for amplifying enzymatically a target nucleic acid sequence contained in a nucleic acid or a mixture of nucleic acids while reducing strand displacement by polymerase, comprising the steps of:

a) selecting the target nucleic acid sequence;

b) providing primers, said primers comprising a first primer which is substantially complementary to a first segment at a first end of the target nucleic acid sequence and a second primer which is substantially complementary to a second segment at a second end of the target nucleic acid sequence and whose 3' end is adjacent to the 5' end of the first primer and a third primer which is substantially complementary to at least a portion of said first primer such that when the third primer is hybridized to the first primer, the position of the third primer complementary to the base at the 5' end of the first primer contains a modification which reduces strand displacement under polymerizing conditions;

c) providing at least four different nucleotide bases;

d) hybridizing said first and second primers to the target nucleic acid sequence in a target dependent manner to form a primer-target complex;

e) ligating under conditions such that the adjacent 5' end of the first primer and the 3' end of the second primer will ligate to form a fused amplification product substantially complementary to said target nucleic acid sequence;

f) dissociating said fused amplification product from said target nucleic acid sequence;

g) hybridizing said third primer to said fused amplification product;

h) extending said third primer in the presence of the nucleotide bases under conditions such that an extended amplification product is formed substantially complementary to said fused amplification product and which contains said modification;

i) dissociating the extended amplification product from the fused amplification product;

j) allowing the extended, modified amplification product to hybridize to additional first and second primers in a target dependent manner; and

k) ligating the 5' end of the additional first primer to the 3' end of the additional second primer while reducing strand displacement of the additional first primer, to form additional amplification product.

5,593,841

NUCLEIC ACID PROBES FOR DETECTION AND/OR QUANTITATION OF NON-VIRAL ORGANISMS

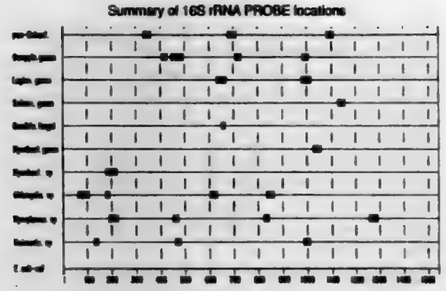
James Hogan; Richard Smith, both of San Diego, and Joann Kop, San Marcos, all of Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 171,325, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 906,106, Jun. 26, 1992, abandoned, which is a division of Ser. No. 806,929, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 295,208, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 83,542, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,244, Nov. 24, 1986, abandoned. This application Dec. 5, 1994, Ser. No. 349,764

Int. Cl.[6] C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—6 **22 Claims**

1. A probe comprising an oligonucleotide 10 to 100 nucleotides in length able to hybridize to a *Mycobacterium avium* nucleic acid target region to form a detectable target:probe duplex under selective hybridization assay conditions, said target region corresponding to, or perfectly complementary to a nucleic acid corresponding to, bases 185–225 of *E. coli* 16S rRNA; wherein said oligonucleotide comprises a sequence which is at least 75% complementary to a target sequence of 10 contiguous nucleotides present in said target region and said oligonucleotide does not hybridize to nucleic acid from either *Mycobacterium intracellulare* or *Mycobacterium tuberculosis* to form a detectable non-target:probe duplex under said hybridization conditions.



5,593,842

METHOD OF MEASURING THYMOPOIETIN PROTEINS IN PLASMA AND SERUM INCLUDING ACIDIFICATION OF THE PLASMA AND SERUM

Gideon Goldstein, 30 Dorison Dr., Short Hills, N.J. 07078, and Michael D. Culler, Easton, Pa., assignors to Gideon Goldstein, Short Hills, N.J.

Filed Sep. 20, 1994, Ser. No. 309,419

Int. Cl.[6] G01N *33/53*; *1/00*; *1/18*

U.S. Cl. 435—7.1 **11 Claims**

1. A method for measuring total thymopoietin levels in a human serum or plasma sample comprising

dissociating by acidification thymopoietin (TP) from its association with any complexing protein with which it is bound, and releasing said bound TP into said sample in a unbound state;

extracting said unbound TP from association with any interfering substances;

preparing a sample of said TP for a selected assay format by removing contaminating solvents and reagents incompatible with said assay format; and

measuring said TP in said assay.

5,593,843

STABILIZED MICROSPHERES AND METHODS OF PREPARATION

Adrien Malick, Granite, and Hans H. Feindt, Parkton, both of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 1,907, Jan. 4, 1993, Pat. No. 5,393,527. This application Nov. 22, 1994, Ser. No. 343,795

Int. Cl.[6] G01N *33/53*; *33/567*; *33/537*; *33/543*

U.S. Cl. 435—7.1 **9 Claims**

1. A method for detecting the presence of an analyte in a sample comprising:

a) capturing the analyte by binding to an immobilized first ligand for the analyte;

b) contacting the analyte bound to the first ligand with a tracer composition comprising microspherical particles, the microspherical particles comprising a liquid silicone core, a water-insoluble dye contained in the liquid silicone core, and an amphiphilic compound covalently linked to a second ligand for the analyte such that the second ligand is capable of binding to the analyte, the amphiphilic compound forming a monolayer on the surface of the microspherical particles;

c) binding the microspherical particles to the captured analyte through binding of the second ligand to the analyte, and;

d) detecting the water-insoluble dye contained in the microspherical particles bound to the captured analyte as an indication of the presence of the analyte.

5,593,844

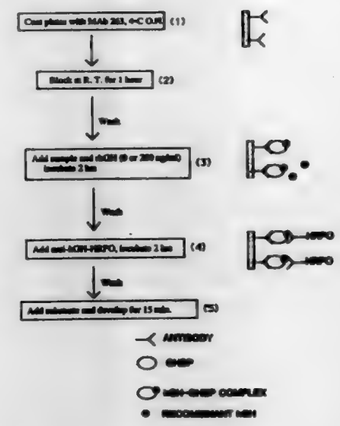
LIGAND-MEDIATED IMMUNOFUNCTIONAL HORMONE BINDING PROTEIN ASSAY METHOD

Lena M. S. Carlsson, Goteborg, Sweden; Ross G. Clark, Pacifica, and Wai L. T. Wong, Los Altos, both of Calif., assignors to Genentech, Inc., San Francisco, Calif.

Continuation of Ser. No. 408,894, Mar. 21, 1995, which is a continuation of Ser. No. 39,893, Apr. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 615,538, Nov. 19, 1990, Pat. No. 5,210,017. This application May 15, 1995, Ser. No. 441,357

Int. Cl.[6] G01N *33/536*;*33/566*; C07K *16/26*; C12N *5/12*

U.S. Cl. 435—7.1 **7 Claims**



1. A ligand mediated immunofunctional method for determining the amount of a polypeptide hormone binding protein selected from the group consisting of a growth hormone binding protein factor, an epidermal growth factor binding protein, an insulin-like growth factor (IGF) binding protein, a platelet derived growth factor (PDGF) binding protein, a nerve growth factor (NGF) finding protein, an insulin binding protein, a corticotropin releasing factor (CRF) binding protein, a transforming growth factor beta (TGF-β) binding protein and an activin binding protein in a liquid sample comprising:

(a) contacting said liquid sample with: 1) a first antibody attached to a solid phase carrier, wherein said first antibody is specific for epitopes on said polypeptide hormone binding protein such that in the presence of antibody the hormone binding sites remain available on the binding protein for binding to the ligand polypeptide hormone, thereby forming a complex between said first antibody and said polypeptide hormone binding protein; and 2) said ligand polypeptide hormone for a period of time sufficient to saturate all available ligand hormone binding sites on said polypeptide hormone binding protein thereby forming a saturated complex;

(b) contacting said saturated complex with a detectably labeled second antibody which is specific for epitopes on said ligand polypeptide hormone which are available for binding when said ligand polypeptide hormone is bound to said polypeptide hormone binding protein; and

(c) quantitatively analyzing the amount of said labeled second antibody bound as a measure of said polypeptide hormone binding protein in said liquid sample.

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5,593,845

ARYL N-ALKYLACRIDANCARBOXYLATE DERIVATIVES USEFUL FOR CHEMILUMINESCENT DETECTION

Hashem Akhavan-Tafti, Sterling Heights; Renuka DeSilva, Northville; Zahra Arghavani, Sterling Heights, and Barry A. Schoenfelner, Livonia, all of Mich., assignors to Lumigen, Inc., Southfield, Mich.

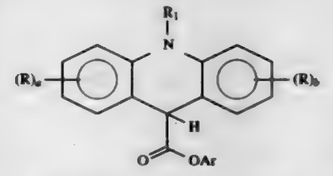
Continuation-in-part of Ser. No. 61,810, May 17, 1993. This application Mar. 2, 1994, Ser. No. 205,893

The portion of the term of this patent subsequent to May 17, 2013, has been disclaimed.

Int. Cl.[6] G01N *33/535*

U.S. Cl. 435—7.9 **38 Claims**

1. A method for producing chemiluminescence which comprises reacting a peroxide and a peroxidase with an acridan of the formula:



wherein R_1 is selected from the group consisting of alkyl, heteroalkyl and aralkyl groups, wherein R is a group which allows production of chemiluminescence and a and b are integers between 0 and 4 and wherein OAr is a leaving group selected from the group consisting of di- and polyhalosubstituted phenoxy groups, which leaving group allows the production of chemiluminescence from the acridan by reaction with the peroxide and the peroxidase.

5,593,846

METHODS FOR THE DETECTION OF SOLUBLE β-AMYLOID PEPTIDE

Dale B. Schenk, Pacifica; Peter A. Seubert, South San Francisco, and Carmen Vigo-Pelfrey, Mountain View, all of Calif., assignors to Athena Neurosciences, South San Francisco, Calif., and Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 965,972, Oct. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 911,647, Jul. 10, 1992, abandoned. This application May 9, 1995, Ser. No. 437,067

Int. Cl.[6] G01N *33/53;33/537;33/543*

U.S. Cl. 435—7.9 **16 Claims**

12. A method for detecting a soluble β-amyloid peptide (βAP) in a fluid sample which may contain βAP and βAP fragments as well as soluble fragments of β-amyloid precursor protein (APP) other than βAP, said method comprising:

exposing the fluid sample to a first binding substance under conditions in which the first binding substance will bind to an epitope on soluble βAP and βAP fragments but will not bind to epitopes on APP fragments which may be present in the sample; and

detecting binding between the first binding substance and the soluble βAP and βAP fragments.

5,593,847

MONITORING OF NC 50/90 IN BLOOD SAMPLES OF BREAST CANCER PATIENTS

Thomas R. Barnett, Prospect; James J. Elting, Madison, both of Conn., and William J. Allard, Poughquag, N.Y., assignors to Bayer Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 35,125, Mar. 19, 1993, abandoned, which is a continuation of Ser. No. 815,934, Dec. 30, 1991, abandoned. This application Dec. 20, 1993, Ser. No. 170,141

Int. Cl.[6] G01N *33/574;33/53;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 435—7.23 **14 Claims**

1. A method for aiding in the diagnosis of breast cancer in . a patient, comprising the steps of determining the amount of NCA 50/90 in a blood sample obtained from said patient and comparing said measured amount of NCA 50/90 to the mean amount of NCA 50/90 in the normal population, whereby the presence of a significantly increased higher amount of NCA 50/90 in the patient's blood is an indication of breast cancer in the patient.

5,593,848

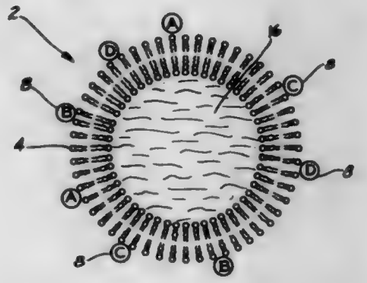
TARGET COMPONENT ASSAY UTILIZING SPECIFIC GRAVITY-ALTERING LIPOSOMES

Robert A. Levine, Guilford; Stephen C. Wardlaw, Old Saybrook, both of Conn.; Rodolfo Rodriguez, Owings Mills; Judith Britz, Laurel, both of Md., and Thomas J. Mercolino, Pleasanton, Calif., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 841,976, Feb. 25, 1992, abandoned. This application Nov. 7, 1994, Ser. No. 335,310

Int. Cl.[6] G01N *33/533;33/536;33/537*

U.S. Cl. 435—7.24 **5 Claims**



1. A method for assaying a biological fluid sample for the presence of a target component in the sample, said method comprising the steps of:

a) providing a plurality of liposome vesicles having an antibody attached to an external surface of said vesicles, said antibody being specific to a surface antigen on said target component; said vesicles having an incorporated marker material and/or carrier which renders said vesicles detectable in the biological fluid sample, and said marker material and/or carrier imparting to said vesicles a specific gravity which is different from the specific gravity of said target component;

b) adding said vesicles to the fluid sample to form a mixture thereof;

c) centrifuging the mixture to gravimetrically separate any liposome-target combinations into a distinct band in the mixture; and

d) identifying and/or quantifying said distinct band in the centrifuged mixture.

5,593,849

METHOD FOR DETECTING ANTIBODY AGAINST *STAPHYLOCOCCUS AUREUS* FOR REPLICATION PROTEIN B SEQUENCE 275-290 AND ARG-LYS-LEU IN HUMAN BODY FLUIDS

Benjamin F. Roy, Suite 102, 69 Trinity Pl., Albany, N.Y. 12202

Continuation of Ser. No. 76,727, Jun. 14, 1993. This application Feb. 24, 1994, Ser. No. 201,081

Int. Cl.[6] G01N *33/569*

U.S. Cl. 435—7.33 **4 Claims**

1. A method for detecting in a sample of human body fluid antibodies reactive with *Staphylococcus aureus* REPB 275–290 and Arg-Lys-Leu-Lys (SEQ ID NO: 1) comprising the following steps:

(a) coating a multiwell plate with a solution of *Staphylococcus aureus* REPB 275–290 and a solution of Arg-Lys-Leu-Lys (SEQ ID NO: 1), sealing said plate with an adhesive cover, incubating said plate for more than 24 hours with said solutions at about 0° to 4° C. followed by a blocking step;

(b) allowing said sample of human body fluid to react with said coated plate, in humidified air containing about 5 to 7 percent CO_2 for about 1.5 to 3 hours at about 37° C.;

(c) washing said plate with a buffered detergent more than 5 times to remove unbound material from said plate;

(d) adding anti-human antibody conjugated with a marker entity to said washed plate of step (c) and, after sealing the plate with an adhesive cover, incubating the plate in humidified air containing about 5–7 percent CO_2 for about 1.5 to 3 hours at about 37° C. to allow conjugated-antibody to bind with human antibody bound to said neuropeptide;

(e) removing unreacted material from said plate by washing more than 5 times;

(f) detecting said marker entity and comparing with a control sample treated identically as in step (a) through step (e).

5,593,850

MONITORING OF INDUSTRIAL WATER QUALITY USING MONOCLONAL ANTIBODIES TO POLYMERS

Robert L. Wetegrove, Winfield, Ill.; Krishna Balakrishnan, Richmond, and Richard E. Bruehl, San Francisco, both of Calif., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 752,746, Aug. 30, 1991, abandoned, and Ser. No. 786,154, Oct. 31, 1991, abandoned. This application Oct. 4, 1993, Ser. No. 132,600

Int. Cl.[6] G01N *33/531*

U.S. Cl. 435—7.92 **14 Claims**

1. A method for the determination of the concentration of a water soluble, vinyl polymer used to prevent corrosion and mineral deposits in a container of water employed for industrial purposes, said process comprising the steps of:

(a) incubating a sample of water obtained from an industrial container, said sample having been treated with the polymer to prevent corrosion and mineral deposits prior to obtaining said sample, with a monoclonal antibody having an affinity for the polymer said affinity being strong enough to recognize the polymer and to differentiate it from other polymers in the sample; and

(b) detecting and measuring the degree of the binding of the monoclonal antibody from which the concentration of said polymer can be determined.

5,593,851

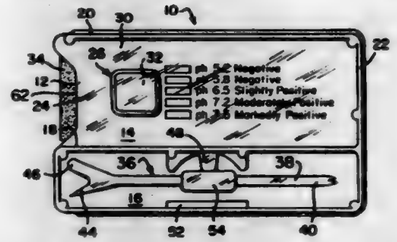
TEST KID FOR THE RAPID DETECTION OF HELICOBACTER PYLORI IN GASTRIC BIOPSY TISSUE

Frank W. Jackson, Camp Hill, Pa., assignor to Chek-Med Systems, Inc., Camp Hill, Pa.

Continuation of Ser. No. 221,311, Apr. 1, 1994, abandoned. This application Feb. 23, 1995, Ser. No. 392,670

Int. Cl.[6] C12Q *1/58;1/62;1/04*

U.S. Cl. 435—12 **3 Claims**



1. A test kit for diagnosing gastric disease by detecting a presence of *Helicobacter pylori* in a gastric biopsy specimen, which comprises:

an elongated body member divided into first and second parallel longitudinally extending upwardly open compartments;

the first compartment having a closed lower surface and walls upstanding from said first compartment lower surface at the rear, at one end, and between said first compartment and the second compartment; one end of said first compartment being open;

a well having an opening in said first compartment;

a peelable sealing means for opening and closing the opening of said well;

said well containing a composition containing urea and a dye indicator for detecting a presence of *Helicobacter pylori* in a gastric biopsy specimen inserted in the well;

said dye indicator comprising a combination of at least two dyes capable of providing to the biopsy specimen one of a spectrum of colors in response to presence of *Helicobacter pylori* in the biopsy specimen;

said peelable means having a color spectrum thereon for determining the presence of *Helicobacter pylori* by comparison with the color, as changed by the dye indicator, of the test biopsy specimen in the well; and

said second compartment containing a pick for placing a gastric biopsy specimen in the well.

5,593,852

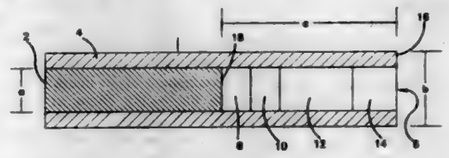
SUBCUTANEOUS GLUCOSE ELECTRODE

Adam Heller, 5317 Valburn Cir., Austin, Tex. 78731, and Michael V. Pishko, 4304C Duval Rd., Austin, Tex. 78759

Continuation-in-part of Ser. No. 161,682, Dec. 2, 1993, Pat. No. 5,356,786. This application Sep. 1, 1994, Ser. No. 299,526

Int. Cl.[6] C12Q *1/00;1/54;1/26;* **G01N** *33/48*

U.S. Cl. 435—14 **31 Claims**



1. A biosensor for measuring the concentration of a biochemical, comprising:

a non-corroding metal or carbon electrode;

a sensing layer comprising a redox polymer and a redox enzyme, adjacent to and in electrical contact with the electrode; and

a biocompatible layer overcoating the sensing layer, comprising a polymer and not less than 20% water by weight when in equilibrium with physiological body fluids.

5,593,853

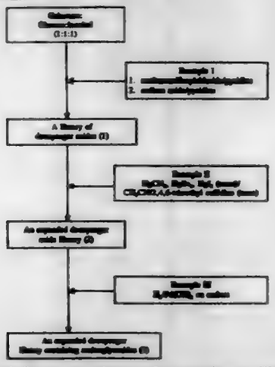
GENERATION AND SCREENING OF SYNTHETIC DRUG LIBRARIES

Hao Chen, Adelphia, and Richard Radner, Baltimore, both of Md., assignors to Martek Corporation, Columbia, Md.

Filed Feb. 9, 1994, Ser. No. 194,224

Int. Cl.[6] C12Q *1/02;1/00;1/18*

U.S. Cl. 435—29 **59 Claims**



1. A method for generating and screening a library of compounds, comprising:

reacting one or more polyhydroxyl-containing organic compounds with subequimolar amounts of displacing groups to form a first mixture comprising displacing group-substituted polyhydroxyl-containing organic compounds;

testing said first mixture or a reaction product made therefrom for the presence of a component displacing group-substituted polyhydroxyl-containing organic compound in said first mixture or said reaction product having a biological activity;

fractionating said mixture or reaction product which demonstrates biological activity to form fractions;

testing said fractions for said biological activity.

5,593,854

DATA ANALYSIS METHOD FOR USE WITH FLUORESCENT BACTERIAL SENSORS

Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 16, 1994, Ser. No. 197,833

Int. Cl.[6] C12Q *1/22;1/04;* G01N *21/64*

U.S. Cl. 435—31 **11 Claims**

1. A method of determining whether a sample vial containing a sample with bacteria is experiencing bacterial growth, said method comprising the steps of:

(a) directing an excitation radiation into a fluorescent chemical sensor in a sample vial containing a sample with bacteria, said radiation having an intensity modulated at a first frequency;

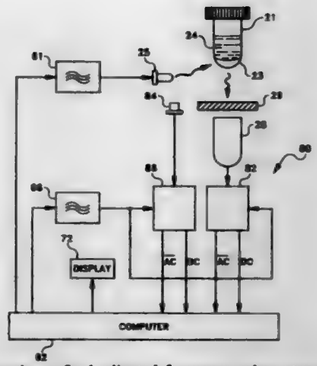
(b) measuring an AC and DC component of an intensity of a fluorescent emission from the fluorescent chemical sensor caused by the excitation radiation of step (a);

(c) calculating a ratio based on the AC and DC components of the intensity of the fluorescent emission;

(d) comparing the ratio calculated in step (c) to a desired ratio;

(e) adjusting the first frequency of the excitation radiation directed into the fluorescent chemical sensor in step (a), if the ratio calculated in step (c) and the desired ratio differ;

(f) repeating steps (a)–(e) until the ratio calculated in step (c) is equal to the desired ratio;



(g) measuring a final adjusted frequency when step (f) is completed;

(h) comparing the final adjusted frequency to the first frequency to determine whether the final frequency is lower than the first frequency; and

(i) determining that the sample in the sample vial is experiencing bacterial growth, if the comparing step determines that the final adjusted frequency is lower than the first frequency.

5,593,855

METHOD OF USING YEAST TO RECOVER PHYTIN BY PRECIPITATION FROM CORNSTEEP LIQUOR OR LIGHT STEEP WATER

Youl-Lark Lee, and Sang-Jae Park, both of Seoul, Rep. of Korea, assignors to Doosan Technical Center, Kyunggi-do, Rep. of Korea

Continuation-in-part of Ser. No. 149,972, Nov. 10, 1993, abandoned. This application Apr. 4, 1995, Ser. No. 417,137

Claims priority, application Rep. of Korea, Dec. 8, 1992, 92-23622

Int. Cl.[6] C12P *1/00*

U.S. Cl. 435—41 **6 Claims**

1. A process for the recovery of phytin consisting essentially of the steps of:

preparing light steep water of 5 to 13% solid content or corn steep liquor of 5 to 20% solid content;

inoculating a yeast selected from the group consisting of *Saccharomyces cerevisiae, Saccharomyces uvarum, Saccharomyces awamori, Saccharomyces diastaticus, Candida albicans, Candida lusitaniae* and *Kluyveromyces lactis* into the light steep water or corn steep liquor;

culturing the yeast therein under conditions to precipitate phytin; and separating the precipitated phytin by sedimentation.

5,593,856

METHOD FOR PRODUCING PROTEIN IN A CELL-FREE SYSTEM

Cha-yong Choi, 223-1301, Olympic Family Apt., 150, Munjeong 2-dong Songpa-gu; Dong-myung Kim, and Gyoo-yeol Jung, all of Seoul, Rep. of Korea, assignors to Cha-yong Choi, Seoul, Rep. of Korea

Filed Aug. 25, 1994, Ser. No. 296,230

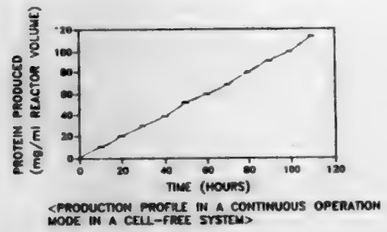
Claims priority, application Rep. of Korea, May 4, 1994, 94-9850; Jul. 25, 1994, 94-17978

Int. Cl.[6] C12P *21/00*

U.S. Cl. 435—68.1 **10 Claims**

1. A method for producing protein in a cell-free system, comprising the steps of:

preparing a cell-free extract for synthesizing a desired protein by culturing a biological cell, rupturing the cultured cell, and extracting a cell-free extract;



<PRODUCTION PROFILE IN A CONTINUOUS OPERATION MODE IN A CELL-FREE SYSTEM>

supplying the cell-free extract with a reaction medium comprising (i) a genetic source, (ii) adenosine triphosphate and guanosine triphosphate as a first energy source for synthesizing protein, (iii) a phosphate compound as a second energy source for in situ replacement of the first energy source, (iv) amino acids as a substrate, (v) a porous solid material, wherein the porous solid material has a diameter ranging from 0.1 μm to 1,000 μm and a surface area ranging from 10 m^2/g to 1,000 m^2/g; in a protein synthesis reactor comprising a membrane; and

operating the protein synthesis reactor to produce a desired protein.

5,593,857

PRODUCTION OF HOMOGENEOUS TRUNCATED CNTF

Jeffrey N. Higaki, Mountain View; Edmund G. Tischer; Barbara Cordell, both of Palo Alto, and Stewart A. Thompson, Mountain View, all of Calif., assignors to Scios Inc., Mountain View, Calif.

Filed Aug. 23, 1991, Ser. No. 749,446

Int. Cl.[6] C12N *15/12;* C07K *14/47;14/475*

U.S. Cl. 435—69.1 **15 Claims**

1. A recombinant DNA sequence encoding a neurotrophic factor which can be expressed as an homogeneous polypeptide, said polypeptide having the amino acid sequence of residues No. m through n of FIG. 1 (SEQ ID NO. 002), wherein m is an integer from 1 to 21 and n is an integer from 180 to 192.

5,593,858

HIGHLY STABLE RECOMBINANT YEASTS FOR THE PRODUCTION OF RECOMBINANT PROTEINS

Reinhard Fleer, Bures sur Yvette; Alain Fournier, Chatenay Malagry, and Patrice Yeh, Paris, all of France, assignors to Rhone-Poulenc Rorer SA, Antony, France

PCT No. PCT/FR92/00769, § 371 Date May 20, 1994, § 102(e) Date May 20, 1994, PCT Pub. No. WO93/03159, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 3, 1992, Ser. No. 190,103

Claims priority, application France, Aug. 2, 1991, 91 09854

Int. Cl.[6] C12P *21/02;* C12N *1/15;15/81*

U.S. Cl. 435—69.1 **27 Claims**

1. Yeast of the Kluyveromyces genus exhibiting the Pgk^- phenotype.

5,593,859

SYNTHESIS OF HUMAN PROCOLLAGENS AND COLLAGENS IN RECOMBINANT DNA SYSTEMS

Darwin J. Prockop, Philadelphia; Leena Ala-Kokko, Andalusia, both of Pa.; Andrzej Fertala, Voorhees, N.J.; Aleksander Sieron, Conshohocken, Pa.; Kari I. Kivirikko, Oulu, Finland; Amy Geddis, Philadelphia, Pa., and Taina Pihlajaniemi, Oulunsalo, Finland, assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 37,728, Mar. 24, 1993, Pat. No. 5,405,757, which is a continuation of Ser. No. 780,899, Oct. 23, 1991, abandoned. This application Aug. 11, 1994, Ser. No. 211,820

Int. Cl.[6] C12N *1/19;5/10;15/12;* C07K *14/78*

U.S. Cl. 435—69.1 **23 Claims**

1. Recombinant eukaryotic host cells comprising at least one transfected human procollagen or collagen gene, wherein said transfected human collagen or procollagen gene is selected from the group consisting of a gene encoding at least one polypeptide chain of human type I, human type II, or human type III procollagen or collagen, and at least one transfected gene encoding prolyl 4-hydroxylase or a subunit of prolyl 4-hydroxylase.

5,593,860

EXPRESSION PLASMIDS CONTAINING THE DEO PROMOTER, AND BACTERIAL HOSTS CONTAINING THE PLASMIDS

Meir Fischer, Rehovot, Israel, assignor to Bio-Technology General Corp., Iselin, N.J.

Continuation of Ser. No. 92,279, Jul. 15, 1993, abandoned, which is a continuation of Ser. No. 962,033, Oct. 15, 1992, abandoned, and a continuation of Ser. No. 225,895, Jul. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 86,159, Aug. 14, 1987. This application Jun. 17, 1994, Ser. No. 261,750

Int. Cl.[6] C12P *21/00;* C12N *15/00*

U.S. Cl. 435—69.1 **39 Claims**

1. A double-stranded DNA plasmid which upon introduction into an *Escherichia coli* host cell renders the host cell capable of effecting expression of DNA encoding human copper/zinc superoxide dismutase or an analog having the biological activity of, and an amino acid sequence which is the same as that of the naturally-occurring human copper/zinc superoxide dismutase, and thereby effecting production of the human copper/zinc superoxide dismutase or analog comprising in 5' to 3' order the following:

a) DNA which includes in 5' to 3' order the tandem promoters deo P1 and deo P2;

b) DNA which includes a ribosomal binding site for rendering mRNA transcribed from the DNA encoding the human copper/zinc superoxide dismutase or analog capable of binding to ribosomes within the host cell;

c) an ATG initiation codon; and

d) DNA encoding the human copper/zinc superoxide dismutase or analog in phase with the ATG initiation codon;

and which additionally includes a DNA sequence comprising an origin of replication from a bacterial plasmid capable of autonomous replication in the host cell and a DNA sequence which encodes a selectable or identifiable phenotypic trait which is manifested when the plasmid is present in the host cell.

5,593,861

DOG-MOUSE HETEROHYBRIDOMA AND GENE FRAGMENT CODING FOR CONSTANT REGION OF CANINE IMMUNOGLOBULINS

Hiroaki Maeda, Kumamoto; Yasuyuki Eda, Koshi-machi; Kazuhiko Kimachi, Kumamoto; Yoichi One, Kumamoto, and Sachio Tokiyoshi, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto-ken, Japan

Continuation of Ser. No. 46,983, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 571,215, Aug. 23, 1990, abandoned. This application Sep. 15, 1994, Ser. No. 306,520

Claims priority, application Japan, Aug. 25, 1989, 1-219889; Sep. 30, 1989, 1-255425; Jun. 7, 1990, 2-150673

Int. Cl.[6] C12N *15/00;* C07H *21/04;* C12P *21/06;21/04*

U.S. Cl. 435—69.1 6 Claims

1. An isolated DNA molecule consisting of a DNA sequence encoding an amino acid sequence of a constant region of a canine immunoglobulin gamma chain, wherein the amino acid sequence of said constant region includes the following amino acid sequences:

-Ala-Cys-Leu-Val-Ser, and

-Cys-Leu-Ile-Lys-Asp-Phe-Phe-Pro-Pro.

5,593,862

NUCLEIC ACIDS ENCODING DROSOPHILA TIPE CATION CHANNEL PROTEINS AND RECOMBINANT EXPRESSION OF THE SAME

Linda M. Hall, and Guoping Feng, both of Williamsville, N.Y., assignors to Research Foundation of State University of New York, Buffalo, N.Y.

Filed Oct. 4, 1994, Ser. No. 317,880

Int. Cl.[6] C12N *15/12;5/10;1/21*

U.S. Cl. 435—69.1 24 Claims

2. An isolated nucleic acid encoding a Drosophila tipE protein, wherein the amino acid sequence of said protein is encoded by a cDNA isolated from a *Drosophila melanogaster* library.

5,593,863

ADMINISTRATION OF AN RNA STEM LOOP STRUCTURE TO MODULATE PROTEIN SYNTHESIS

James H. Eberwine, and Corinne Spencer, both of Philadelphia, Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 178,600, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 844,305, Feb. 28, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 327,393

Int. Cl.[6] C12P *21/00;* C12N *15/67;* C07K *14/575;14/665*

U.S. Cl. 435—69.1 5 Claims

1. A method of increasing synthesis of a selected protein in a cell or tissue capable of expressing the selected protein comprising contacting the cell or tissue with an effective amount of at least a portion of an mRNA stem loop structure corresponding to the stem loop structure of mRNA encoding the selected protein so that the synthesis of the selected protein is increased.

5,593,864

PROCESS FOR FUNCTIONAL EXPRESSION OF THE PARA CATION CHANNEL

Joseph P. Arena, West Orange, N.J.; Guoping Feng, Clayton, Mo.; Linda M. Hall, Williamsville, N.Y.; Ken Liu, Laurence Harbor, N.J.; Leonardus H. T. Van Der Ploeg, Scotch Plains, N.J.; Peiyi Wang, North Brunswick, N.J., and Jeffrey W. Warmke, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J., and The Research Foundation of State University of New York, Amherst, N.Y.

Filed Nov. 10, 1994, Ser. No. 337,339

Int. Cl.[6] C12P *21/06;* C12N *5/00*

U.S. Cl. 435—69.1 2 Claims

1. A recombinant host cell containing one or more recombinantly cloned genes encoding a voltage-activated cation channel protein or functional derivative thereof.

5,593,865

PROCESS FOR THE ACTIVATING OF GENE-TECHNOLOGICALLY PRODUCED, HETEROLOGOUS, DISULPHIDE BRIDGE-CONTAINING EUKARYOTIC PROTEINS AFTER EXPRESSION IN PROKARYOTES

Rainer Rudolph, Regensburg; Stephan Fischer, Weilheim, and Ralf Mattes, Oberhausen, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Continuation of Ser. No. 206,044, Mar. 2, 1994, Pat. No. 5,453,363, which is a continuation of Ser. No. 942,370, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 498,500, Mar. 23, 1990, abandoned, which is a continuation of Ser. No. 76,207, Jul. 27, 1987, abandoned. This application Jun. 1, 1995, Ser. No. 457,845

Claims priority, application Germany, Oct. 23, 1986, 33 87 708.9

Int. Cl.[5] C12P *1/04;21/02;* C12N *15/00;15/63*

U.S. Cl. 435—69.1 18 Claims

1. A process for activating a heterologous, disulphide bridge containing protein expressed in a prokaryotic cell, comprising:

(i) expressing said heterologous, disulphide bridge containing protein in a prokaryote to form refractile bodies;

(ii) digesting prokaryotic cells which contain said refractile bodies;

(iii) solubilizing said refractile bodies under conditions which reduce and denature said molecule; and

(iv) oxidizing said solubilized, reduced and denatured molecule by contact with (a) reduced glutathione (GSH)/oxidized glutathione (GSSG) at a pH of from 8 to 12, wherein GSH is at a concentration of from 0.01 to 20 mmol/liter, GSSG is at a concentration of from 0.01 to 3 mmol/liter, and (b) a denaturing agent present at a non-denaturing concentration, wherein said denaturing agent is selected from the group consisting of arginine, guanidine hydrochloride, and a compound of formula R_2—CO—NRR_1, wherein R and R_1 are H or C_1–C_4 alkyl, and R_2 is H, NHR_1, or C_1–C_3 alkyl.

5,593,866

CATIONIC PEPTIDES AND METHOD FOR PRODUCTION

Robert E. W. Hancock, Vancouver; Kevin L. Piers, Richmond, and Melissa H. Brown, Vancouver, all of Canada, assignors to The University of British Columbia, Canada

Continuation of Ser. No. 110,502, Aug. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 933,492, Aug. 21, 1992, abandoned. This application Dec. 20, 1995, Ser. No. 575,052

Int. Cl.[6] C12P *21/02*

U.S. Cl. 435—69.7 19 Claims

1. A method of producing a biologically active cationic peptide which has antimicrobial activity comprising:

a) constructing an expression vector containing a DNA sequence encoding the cationic peptide adjacent to a DNA sequence encoding an anionic carrier peptide, wherein the anionic carrier peptide inhibits bacterial proteases;

b) transforming a bacterial host cell with the vector of a) and culturing the transformed host cell such that a fusion peptide comprising the cationic peptide and anionic peptide is expressed and;

c) recovering the biologically active cationic peptide.

5,593,867

FLUORERSCENCE POLARIZATION DETECTION OF NUCLEIC ACID AMPLICATION

G. Terrance Walker; James G. Nadeau, both of Chapel Hill, and C. Preston Linn, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 229,281, Apr. 18, 1994. This application Sep. 23, 1994, Ser. No. 311,474

Int. Cl.[6] C12P *19/34;* C12Q *1/68*

U.S. Cl. 435—91.2 18 Claims

1. A method for detecting amplification of a double-stranded nucleic acid target sequence in a Strand Displacement Amplification reaction (SDA), the method comprising:

a) including in the SDA reaction a first amplification primer for SDA which hybridizes to a first strand of the target sequence, and a fluorescently-labeled single-stranded detector probe which hybridizes to the first strand of the target sequence downstream of the first amplification primer;

b) extending the first amplification primer and the detector probe on the target sequence, thereby producing (i) a detector probe extension product which is displaced from the first strand of the target sequence by extension of the first amplification primer and (ii) a first amplification primer extension product;

c) hybridizing a second amplification primer for SDA to the detector probe extension product and the first amplification primer extension product;

d) extending the second amplification primer on the detector probe extension product and the first amplification primer extension product, thereby converting the detector probe extension product to double-stranded form and amplifying the target sequence, and;

e) detecting an increase in fluorescence polarization as an indication of amplification of the target sequence.

5,593,868

METHOD OF PRODUCING HIGH FRUCTOSE CORN SYRUP FROM GLUCOSE USING NOBLE GASES

Kevin C. Spencer, Riverside; Christine E. Boisrobert, Chicago; Steven A. Fisher, Berwyn; Patricia A. Rojak, Wheaton, and Karen S. Sabatini, Summit, all of Ill., assignors to American Air Liquide, New York, N.Y.

Continuation of Ser. No. 270,224, Jul. 1, 1994, Pat. No. 5,512,464, which is a continuation of Ser. No. 816,732, Jan. 3, 1992, abandoned. This application Feb. 6, 1996, Ser. No. 596,012

Int. Cl.[6] C12P *19/24;19/02;* C13K *11/00*

U.S. Cl. 435—94 41 Claims

1. A process for producing high fructose corn syrup from glucose containing syrup, comprising isomerizing said glucose containing syrup through an enzymatic reaction to make high fructose corn syrup, wherein said enzymatic reaction occurs in a noble-gas containing solution, wherein the noble gas is selected from the group consisting of neon, xenon, krypton and mixtures thereof; and further wherein said enzymatic reaction exhibits either an enhanced rate or yield relative to when said enzymatic reaction is conducted under nitrogen.

5,593,869

METHOD OF MANUFACTURING SUGARS BY TREHALASE

Sumio Kitahata; Hirofumi Nakano; Tsutomu Washino, and Masamitsu Moriwaki, all of Osaka, Japan, assignors to Sen-Ei Gen F.F.I, and Osaka, both of Japan

Division of Ser. No. 231,318, Apr. 22, 1994, Pat. No. 5,529,927. This application Jun. 7, 1995, Ser. No. 474,783

Claims priority, application Japan, Dec. 28, 1993, 5-350260

Int. Cl.[6] C12P *19/12;* C12N *1/12*

U.S. Cl. 435—100 7 Claims

1. Trehalase which is characterized in having the following characteristics:

(1) it hydrolyzes α,α'-trehalose, 2,2'-dideoxy-α,α'-trehalose and 2-deoxy-α,α'-trehalose into their constituting sugars, respectively while it does not act on neotrehalose, lactose, maltose, cellobiose and sucrose;

(2) its optimum pH is 5 to 6;

(3) its optimum temperature is 65° C.;

(4) it is stable against heating up to 65° C.;

(5) the molecular weight measured by a gel filtration is 400,000 to 500,000 and the molecular weight of the subunit as measured by an SDS-PAGE is 180,000 to 250,000;

(6) its isoelectric point as measured by an isoelectric-focusing is 2.7; and

(8) it is a glycoprotein.

5,593,870

PROCESS FOR PRODUCING FRENOLICIN B

David E. Block, Lawrenceville; Theron E. Hermann, Kinnelon; Jih-Han Hsieh, Parsippany; Nikhil S. Mehta, Livingston, and Vishva R. Rai, Randolph, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1994, Ser. No. 305,625

Int. Cl.[6] C12P *17/18*

U.S. Cl. 435—119 5 Claims

1. A process for producing deoxyfrenolicin which comprises:

(a) culturing under aerobic conditions in an aqueous culture medium containing assimilable sources of carbon and nitrogen and inorganic substances the strain of *Streptomyces roseofulvus* deposited with the American Type Culture Collection as ATCC No. 55598 or a mutant thereof which is capable of producing frenolicin, so as to produce frenolicin;

(b) then continuing the culturing under anaerobic conditions to cause a conversion of frenolicin to deoxyfrenolicin under anaerobic conditions; and

(c) recovering deoxyfrenolicin produced,

wherein the anaerobic conditions are created at about the point in time when the titer of frenolicin is at its maximum.

5,593,871

PROCESS FOR THE PREPARATION OF ENANTIOMETRIC 2-ALKANOIC ACID AMIDES FROM NITRILES

David L. Anton, Wilmington, Del.; Robert D. Fallon, Elkton, Md.; Barry Stieglitz, Overbrook Hills, Pa., and Vincent G. Witterholt, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 30,015, Mar. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 585,554, Sep. 20, 1990, abandoned. This application Feb. 15, 1995, Ser. No. 388,921

Int. Cl.[6] C12P *13/02;17/18;17/14;17/10*

U.S. Cl. 435—129 10 Claims

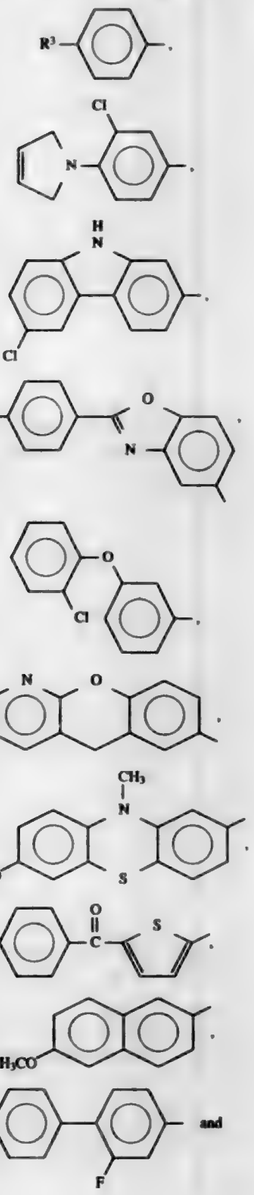
1. A method for converting a nitrile in an R, S mixture of nitriles of the formula



(R, S)

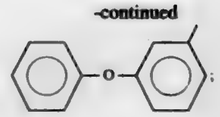
wherein:

A is selected from the group consisting of:



and

-continued



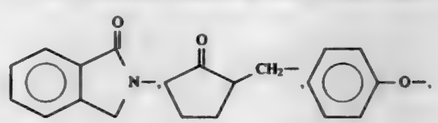
A-11

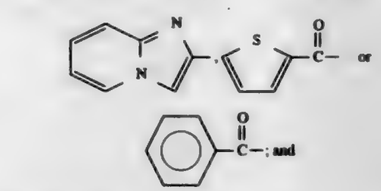
R^1 is C_1–C_4 alkyl;

R^2 is H or OH;

R^3 is H, Cl, OCF_2H, $(CH_3)_2CHCH_2$, $H_2C{=}C(CH_3)CH_2NH$,

A-1

A-2 

A-3 

R^4 is Cl or F;

A-4 to the corresponding amide comprising contacting said nitrile mixture with a biological material that stereospecifically converts the R- or S-nitrile in said mixture to the corresponding enantiomeric R or S-amide, the biological material being located in or obtained from *Pseudomonas putida, Pseudomonas aureofaciens* or *Serratia liquefaciens*.

A-5 ---

5,593,872

ENZYMATIC OXIDATION OF ALCOHOLS TO ALDEHYDES IN A CONTINUOUS REACTION SYSTEM USING *CANDIDA BOIDINII*

Alan Gabelman, West Chester, Ohio, and Gary A. Luzio, Newark, Del., assignors to Tastemaker, Cincinnati, Ohio

A-6 **Continuation of Ser. No. 165,748, Dec. 10, 1993, abandoned. This application Sep. 8, 1995, Ser. No. 524,911**

Int. Cl.[6] C12P *7/24*

U.S. Cl. 435—147 **7 Claims**

A-7 1. A process for the enzymatic oxidation of alcohols to aldehydes in a continuous reaction system with two reactors operating in series comprising:

continuously producing a fermenter effluent containing growing, intact *Candida boidinii* cells at a cell concentration of about 0.5 to about 3% by weight of the effluent by continuous culture of the *Candida boidinii* cells using a carbon source

A-8 consisting essentially of methanol in the first reactor, said *Candida boidinii* cells having intracellular methanol oxidase and catalase activity,

continuously introducing the effluent from the first reactor without purification of the effluent, to the second reactor,

A-9 adding an alcohol feed and oxygen to the second reactor to form the reaction mixture, said reaction mixture comprising about 0.2% to about 10% by weight of said feed alcohol, the alcohol being selected from the group consisting of ethanol, n-propanol, n-butanol, 2-chloroethanol, 2-bromoethanol, allyl

A-10 alcohol, 2-buten-1-ol, benzyl alcohol and mixtures thereof,

enzymatically oxidizing said alcohol in the reaction mixture to its aldehyde while maintaining a steady-state aldehyde and alcohol concentration in the reaction mixture wherein said alcohol concentration is about 0.1 to about 9% by weight of the reaction mixture by controlling the rates of introduction of said effluent and alcohol feed to the reaction mixture and,

recovering the aldehyde from the reaction mixture.

5,593,873

RECOMBINANT INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS

Mark D. Cochran, Carlsbad, and Richard D. Macdonald, San Diego, both of Calif., assignors to Syntro Corporation. Lenexa, Kans., and PruTech Research and Development Partnership, San Jose, Calif.

Continuation-in-part of Ser. No. 649,388, Jan. 31, 1991, abandoned, Ser. No. 225,032, Jul. 27, 1988, Pat. No. 5,223,424, Ser. No. 823,102, Jan. 27, 1986, Pat. No. 5,068,192, and Ser. No. 192,866, May 19, 1988, Pat. No. 5,047,237, and a continuation of Ser. No. 732,584, Jul. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 696,262, Apr. 19, 1991, abandoned, which is a continuation of Ser. No. 933,107, Nov. 19, 1986, abandoned, said Ser. No. 649,388is a continuation of Ser. No. 78,519, Jul. 27, 1987, abandoned. This application May 23, 1994, Ser. No. 247,475

Int. Cl.[6] C12N *15/00;15/86*

U.S. Cl. 435—172.3 **18 Claims**

1. A live recombinant infectious bovine rhinotracheitis virus comprising a viral genome of a naturally-occurring infectious bovine rhinotracheitis virus from which DNA encoding US2 gene has been deleted.

5,593,874

ENHANCED EXPRESSION IN PLANTS

Sherri M. Brown, Chesterfield, and Colleen G. Santino, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 181,364, Nov. 13, 1994, Pat. No. 5,424,412, which is a continuation of Ser. No. 855,857, Mar. 19, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 333,665

Int. Cl.[6] A01H *1/04;* C12N *15/00*

U.S. Cl. 435—172.3 **23 Claims**

1. In a method for the expression of a chimeric plant gene in monocot plants, the improvement which comprises expressing a chimeric plant gene comprising an intron selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 and SEQ ID NO:3 in the non-translated leader 5' of the structural DNA sequence encoding a protein.

5,593,875

METHODS FOR CALCIUM PHOSPHATE TRANSFECTION

Florian M. Wurm, Strasbourg, France, and Martin Jordan, San Bruno, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 303,245, Sep. 8, 1994, Pat. No. 5,484,720. This application Apr. 26, 1995, Ser. No. 430,533

Int. Cl.[6] C12N *15/64*

U.S. Cl. 435—172.3 **20 Claims**

1. A method for introducing a desired nucleic acid into a eukaryotic host cell in suspension, comprising

(a) admixing Ca^{2+}, PO_4^{3-} and the desired nucleic acid to form a precipitation mixture;

(b) incubating the precipitation mixture to form particles comprising calcium phosphate and the desired nucleic acid, and allowing the particles to grow to an average length of up to about 300 nm;

(c) performing a step selected from the group consisting of: (1) diluting the precipitation mixture and simultaneously admixing the precipitation mixture to a mixture containing in suspension a eukaryotic host cell lacking a cell wall to form a transfection mixture wherein the particles are capable of growth at a rate that is substantially lower than the rate at which the particles grew in the precipitation mixture in step (b); and (2) diluting the precipitation mixture to form a diluted precipitation mixture, and thereafter admixing the diluted precipitation mixture to a mixture containing in suspension a eukaryotic host cell lacking a cell wall to form a transfection mixture wherein the particles are capable of growth at a rate that is substantially lower than the rate at which the particles grew in the precipitation mixture in step (b); and

(d) incubating the transfection mixture to allow the eukaryotic host cell to take up the particles to form a transfected cell in suspension.

5,593,876

NITROSYLATION OF PROTEIN SH GROUPS AND AMINO ACID RESIDUES AS A THERAPEUTIC MODALITY

Jonathan Stamler, Boston; Joseph Loscalzo, Dedham; Daniel Simon, Waban, and David Singel, Arlington, all of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Division of Ser. No. 198,854, Feb. 17, 1994, which is a division of Ser. No. 943,835, Sep. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 791,668, Nov. 14, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 287,830

Int. Cl.[6] C12N *9/96;9/72;9/70;9/48*

U.S. Cl. 435—188 **16 Claims**

1. A nitrosylated thrombolytic polypeptide selected from the group consisting of a nitrosylated tissue-type plasminogen activators, nitrosylated streptokinase and nitrosylated urokinase produced by a method selected from the group consisting of:

(a) exposing the polypeptide to a nitric oxide donor compound under conditions which permit the release or transfer from said donor and the binding or transfer to said polypeptide of at least one nitric oxide moiety:

(b) passing a gaseous source of nitric oxide through a solution of the polypeptide to an extent sufficient to effect the binding or transfer to said polypeptide of at least one nitric oxide moiety;

(c) incubating the polypeptide with cells which have been stimulated to secrete EDRF to an extent sufficient to effect the binding or transfer to said polypeptide of at least one nitric oxide moiety; and

(d) incubating the polypeptide with nitric oxide synthase, and a substrate and cofactor therefor, to an extent sufficient to effect the binding to said polypeptide of at least one nitric oxide moiety.

5,593,877

NUCLEIC ACID AND RECOMBINANT PRODUCTION OF VESPID VENOM HYALURONIDASE

Te P. King, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 31,400, Mar. 11, 1993, abandoned. This application Jan. 11, 1994, Ser. No. 180,289

Int. Cl.[6] C12N *15/55;15/70*

U.S. Cl. 435—197 **12 Claims**

1. An isolated nucleic acid encoding vespid venom hyaluronidase from the species *Dolichovespula maculata* having the amino acid sequence shown in SEQ ID NO: 55.

5,593,878

RECOMBINANT PHOSPHOLIPASE A_2 ENZYME

John L. Knopf, and James Clark, both of Acton, Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Division of Ser. No. 2,447, Jan. 13, 1993, Pat. No. 5,354,677, which is a division of Ser. No. 486,628, Feb. 28, 1990. This application Jun. 22, 1994, Ser. No. 263,590

Int. Cl.[6] C12N *9/20;15/55*

U.S. Cl. 435—198 **3 Claims**

1. A composition comprising a purified homogeneous murine phospholipase A_2 enzyme characterized by an apparent molecular weight of approximately 110 kD under reducing conditions as

determined by SDS-PAGE, by enzymatic activity in a mixed micelle assay and by the amino acid sequence set forth in Table II.

5,593,879

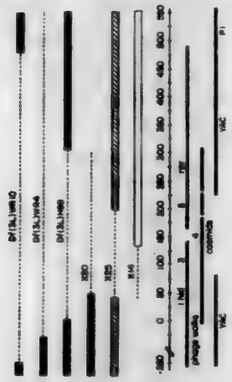
CELL DEATH GENES OF *DROSOPHILA MELANOGASTER* AND VERTEBRATE ANALOGS

Hermann Steller, Natick; John M. Abrams; Megan E. Grether, both of Cambridge, and Kristin White, Lynnfield, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 4,957, Jan. 15, 1993. This application Sep. 17, 1993, Ser. No. 123,343

Int. Cl.[6] C12N *1/00;5/10;15/12;15/63*

U.S. Cl. 435—240.1 **6 Claims**



1. Isolated and purified DNA having a nucleotide sequence selected from the group consisting of:

a) rpr cDNA having the nucleotide sequence of SEQ ID NO:1;

b) rpr cDNA having the nucleotide sequence of SEQ ID NO:3;

c) hid genomic DNA having the nucleotide sequence of SEQ ID NO:4;

d) hid cDNA having the nucleotide sequence of SEQ ID NO:6;

e) DNA encoding a cell death gene which hybridizes at 42° C. in 30% formamide, 5×SSC, 0.1% SDS and 5×Denhardt's Solution to DNA having a complementary nucleotide sequence of SEQ ID NO. 4; and

f) DNA encoding a cell death gene which is detected with primers having the nucleotide sequences of SEQ ID NO:11 and 13.

5,593,880

DUAL-STATE NUTRITIONAL MEDIUM FOR THE TRANSPORT AND MAINTENANCE OF CELLS

William J. Northam, San Antonio; John D. Barry, Boerne, and Richard L. Heberling, San Antonio, all of Tex., assignors to Viratest International, Inc., San Antonio, Tex.

Filed Feb. 10, 1994, Ser. No. 194,575

Int. Cl.[6] C12N *5/02;* C12M *1/18;1/16;* A01N *1/02*

U.S. Cl. 435—240.1 **14 Claims**

1. A method for transporting animal cells, comprising:

providing a layer of cells in a first medium in a container,

providing a second medium which assumes a liquid state above a first temperature and a solid state below a second temperature,

covering the layer of cells in the first medium with a layer of the second medium in a liquid state,

reducing the temperature of the second medium to a temperature at which the second medium assumes a solid state,

maintaining the second medium in a solid state while transporting the cells in the first medium,

increasing the temperature of the second medium to a temperature at which the second medium assumes a liquid state, and

removing at least a portion of the second medium from the layer of cells in the first medium.

5,593,881

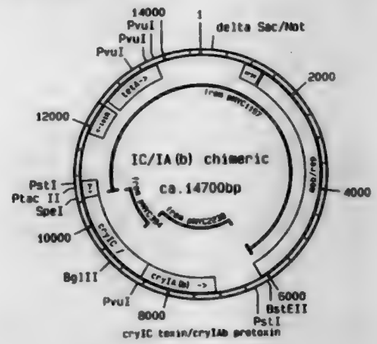
***BACILLUS THURINGIENSIS* DELTA-ENDOTOXIN**

Mark Thompson, San Diego; George E. Schwab, Encinitas; H. Ernest Schnepf, and Brian Stockhoff, both of San Diego, all of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed May 6, 1994, Ser. No. 239,474

Int. Cl.[6] C12N *5/10;15/63;* C07H *21/04*

U.S. Cl. 435—240.1 **7 Claims**



1. An isolated DNA molecule comprising a nucleotide sequence encoding a chimeric *Bacillus thuringiensis* toxin of approximately 1150 to 1200 amino acids, wherein said toxin comprises a cryIC core N-terminal toxin portion having a sequence of at least about 600 amino acids and no more than about 1100 amino acids, wherein the amino acid sequence from the end of said core N-terminal sequence to the C-terminus of the chimeric toxin is a cryIA(b) C-terminal protoxin portion having a cryIA(b) sequence.

5,593,882

SELECTIN VARIANTS

David V. Erbe, San Francisco; Laurence A. Lasky, Sausalito, and Leonard G. Presta, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 956,701, Oct. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 879,036, Apr. 30, 1992, abandoned. This application Jul. 13, 1994, Ser. No. 274,661

Int. Cl.[6] C12N *5/10;* C07K *14/435*

U.S. Cl. 435—240.2 **25 Claims**

1. A human E-, L- or P-selectin variant which has an amino acid substituted at a site or sites selected from the group consisting of amino acid residues 7–9, 97, 111 and 113 of the lectin domain of the corresponding native human E-, L- or P-selectin SEQ. ID. NOs: 36, 38 and 39, respectively), and otherwise retains the sequence of the corresponding native human selectin, provided that said variant is other than a native selectin molecule.

5,593,883

ANCIENT MICROORGANISMS

Raul J. Cano, San Luis Obispo, Calif., and Monica K. Borucki, Laporte, Colo., assignors to Ambergene Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 298,319, Aug. 15, 1994, abandoned, which is a continuation of Ser. No. 187,961, Jan. 28, 1994, abandoned. This application Oct. 28, 1994, Ser. No. 330,894

Int. Cl.[6] C12N *1/20;5/00*

U.S. Cl. 435—252.1 **48 Claims**

1. An isolated, viable culture of a microorganism obtained from within a naturally occurring resin selected from the group consisting of amber and copal by sterilizing such resin, extracting the microorganism from said resin, reviving said microorganism to a viable state, and culturing said extracted microorganism.

5,593,884

ONCOPROTEIN PROTEIN KINASE

Michael Karin, 2565 Chalcedony; Masahiko Hibi, 7528 Charmant Dr., No. 418, both of San Diego, Calif. 92122, and Anning Lin, 8655 Via Mallorca Dr., Apt. 93, La Jolla, Calif. 92093

Continuation-in-part of Ser. No. 220,602, Mar. 25, 1994, which is a continuation-in-part of Ser. No. 094,533, Jul. 19, 1993. This application Jul. 18, 1994, Ser. No. 276,860

Int. Cl.[6] C12N *15/54;15/74*

U.S. Cl. 435—252.3 **8 Claims**

1. An isolated polynucleotide sequence encoding a polypeptide characterized by:

a. having a molecular weight of 46 kD as determined by reducing SDS-PAGE;

b. having serine and threonine kinase activity; and

c. phosphorylating the c-Jun N-terminal activation domain.

5,593,885

PHAGE DEFENSE ROTATION STRATEGY

Todd R. Klaenhammer, Raleigh, N.C.; Wesley D. Sing, Indianapolis, Ind., and Colin J. Hill, Cork, Ireland, assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 117,550, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 987,854, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 578,660, Sep. 5, 1990, abandoned. This application Jan. 18, 1995, Ser. No. 375,072

Int. Cl.[6] C12N *1/20;1/21*

U.S. Cl. 435—252.3 **44 Claims**

1. A phage defense rotation strategy for use in the successive fermentations of a substrate in a fermentation plant, comprising:

(a) fermenting said substrate with a first bacterial culture comprising a bacterial strain capable of fermenting the substrate and carrying a first DNA-encoded phage defense mechanism; and then

(b) fermenting said substrate with a second bacterial culture comprising a second bacterial strain isogenic with said first bacterial strain and having the same bacteriophage binding characteristics as said first bacterial strain, wherein the second strain carries a second DNA-encoded phage defense mechanism different from the first phage defense mechanism.

5,593,886

CLOSTRIDIUM STAIN WHICH PRODUCES ACETIC ACID FROM WASTE GASES

James L. Gaddy, 2287 Tall Oaks Dr., Fayetteville, Ark. 72703

Division of Ser. No. 968,857, Oct. 30, 1992, abandoned. This application Jun. 10, 1994, Ser. No. 258,446

Int. Cl.[6] C12N *1/20*

U.S. Cl. 435—252.7 **7 Claims**

1. A biologically pure culture of the microorganism *Clostridium ljungdahlii* having all of the identifying characteristics of ATCC No. 55380.

5,593,887

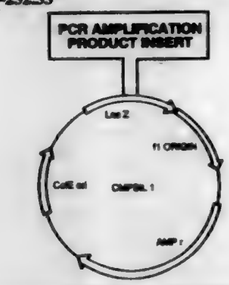
OLIGOSACCHARIDE ENZYME SUBSTRATES AND INHIBITORS: METHODS AND COMPOSITIONS

Chi-Huey Wong; Yoshitaka Ichikawa, both of San Diego, and Gwo-Jenn Shen, Carlsbad, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 219,242, Mar. 29, 1994, Pat. No. 5,461,143, which is a continuation-in-part of Ser. No. 852,409, Mar. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 738,211, Jul. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 670,701, Mar. 18, 1991, Pat. No. 5,278,299, and Ser. No. 707,600, May 30, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 476,685

Int. Cl.[6] C12N *1/21;15/00;* C07H *5/04*

U.S. Cl. 435—252.33 **4 Claims**



1. *E. coli* transformed with phagemid CMPSIL-1.

5,593,888

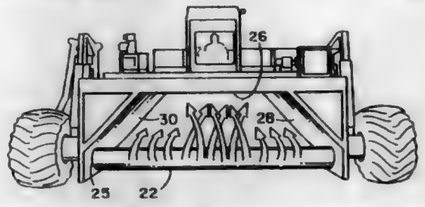
METHOD FOR ACCELERATED BIOREMEDIATION AND METHOD OF USING AN APPARATUS THEREFOR

Bradley S. Glaze, Lyons; Kenneth R. Warner, Gladstone, both of Oreg.; Terry D. Horn, White Salmon, and Ronald D. Horn, Vancouver, both of Wash., assignors to H&H Eco Systems, Inc., North Bonneville, Wash.

Continuation-in-part of Ser. No. 43,666, Apr. 6, 1993, abandoned, which is a division of Ser. No. 918,528, Jul. 21, 1992, abandoned. This application Apr. 5, 1994, Ser. No. 223,523

Int. Cl.[6] A62D *3/00;* B01F *7/00;15/00;15/02;* B02C *1/00;13/00;13/28;* B09B *3/00;* C12S *1/00;13/00*

U.S. Cl. 435—262.5 **44 Claims**



1. A method of using an apparatus in the accelerated bioremediation of a hydrocarbon-containing contaminated material which

has been combined with chemical and/or biological amendments to form a treated hydrocarbon-containing contaminated material, the method comprising the steps of generating an air stream at a velocity sufficient for entraining the treated hydrocarbon-containing contaminated material therein, entraining the treated hydrocarbon-containing contaminated material in said air stream, and microenfractionating the treated hydrocarbon-containing contaminated material under conditions sufficient to form a microenfractionated treated hydrocarbon-containing contaminated material thereby facilitating subsequent accelerated bioremediation under conditions sufficient for conducting said accelerated bioremediation.

29. In a method of accelerated bioremediation for treating hydrocarbon-containing contaminated material, wherein said hydrocarbon-containing contaminated material is treated with chemical and/or biological amendments, the improvement which comprises:

a. providing said treated hydrocarbon-containing contaminated material;

b. providing an entraining air stream having a sufficient velocity for entraining the treated hydrocarbon-containing contaminated material therein;

c. entraining the treated hydrocarbon-containing contaminated material in the air stream;

d. microenfractionating the treated hydrocarbon-containing contaminated material; and

e. discharging the microenfractionated treated hydrocarbon-containing contaminated material from the air stream for acceleratedly bioremediating the treated hydrocarbon-containing contaminated material under conditions sufficient for conducting said accelerated bioremediation.

5,593,889

BIODESULFURIZATION OF BITUMEN FUELS

James M. Valentine, 480 Hemlock Rd., Fairfield, Conn. 06430

Continuation of Ser. No. 308,191, Sep. 19, 1994, abandoned, which is a continuation of Ser. No. 78,909, Jun. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 616,610, Nov. 21, 1990, abandoned. This application Oct. 3, 1995, Ser. No. 538,254

Int. Cl.[6] C10C *3/00*

U.S. Cl. 435—282 **20 Claims**

1. A process for desulfurizing bitumen containing sulfur and exhibiting a kinematic viscosity of at least about 10,000 centistokes at 50° C., to reduce the oxidizable sulfur content of the bitumen in a bitumen-in-water emulsion, comprising:

contacting the bitumen-in-water emulsion with a microbiological desulfurization agent;

maintaining contact at a temperature of less than about 50° C. under conditions effective to convert at least a portion of the sulfur content of the bitumen to sulfate oxidation products;

at least partially breaking the emulsion following reaction to produce a separable aqueous layer containing the majority of the desulfurization agent and sulfate oxidation products;

separating the aqueous layer containing the sulfate oxidation products from the bitumen;

and recovering the desulfurized bitumen so produced.

5,593,890

APPARATUS SUITABLE FOR CONDUCTING GAS-LIQUID REACTIONS

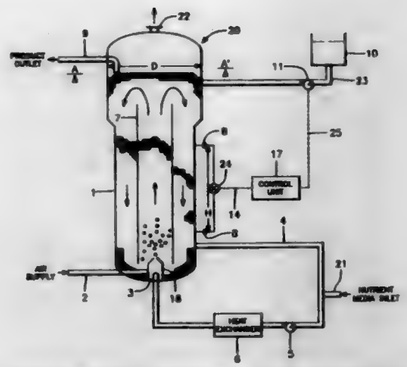
Luis B. Flores-Cotera, and Sergio García-Salas, both of Mexico City, Mexico, assignors to Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico City, Mexico

Division of Ser. No. 963,980, Oct. 23, 1992, Pat. No. 5,426,024. This application Apr. 27, 1995, Ser. No. 429,687

Int. Cl.[6] C12M *1/21;1/36*

U.S. Cl. 435—286.5 **6 Claims**

1. An apparatus for contacting a liquid with a gas comprising:



a closed cylindrical vessel having an upper region, a lower region and guiding means, said guiding means providing at least one ascending flow chamber and at least one descending flow chamber, said chambers communicating at said upper and lower regions of said vessel;

a first inlet for introducing a liquid into said vessel;

a second inlet for introducing a gas into said vessel;

means for dispersing said gas into said liquid, in said vessel, forming a gassed liquid;

a liquid outlet for withdrawing said liquid from said vessel to maintain a gassed liquid level above said guiding means in said vessel; such that in use a liquid vortex is induced as a result of liquid flow deflection from said ascending flow chamber to said descending flow chamber, thereby preventing foam formation;

a gas outlet located in the upper region of the vessel above said gassed liquid level;

a gas holdup sensing means at least partially disposed within said vessel for sensing the gas holdup of the gassed liquid in said vessel;

antifoam supply means for delivery of an antifoam agent into said vessel; and

control means operatively linked to said gas holdup sensing means and to said antifoam supply means, such that in operation the detected gas holdup is used by said control means so as to regulate the amount of antifoam agent added to said vessel by said antifoam supply means.

5,593,891

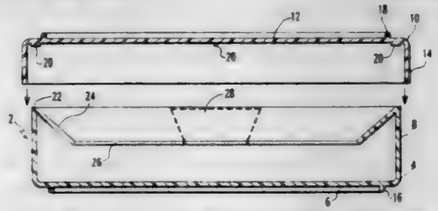
CULTURE PLATE WITH SPLASH GUARD

Albert J. Banes, 1821 Coleman Loop Rd., Hillsborough, N.C. 27278

Filed Nov. 10, 1994, Ser. No. 337,261

Int. Cl.[6] C12M *1/22*

U.S. Cl. 435—305.1 **20 Claims**



1. A culture plate comprising an open-topped base having a bottom wall and a sidewall extending upwardly from said bottom wall and attached thereto, a lid having a top wall and a skirt extending downwardly from said top wall and attached thereto, said lid configured to fit over and sit on a top edge of the base sidewall and cover an inner area enclosed by said base, and a splash guard including a baffle attached to an inner surface of said lid top wall and extending partially inward into an inner area of said base, said splash guard configured to direct liquid flows away from the top edge of said base sidewall and back into said base.

5,593,892

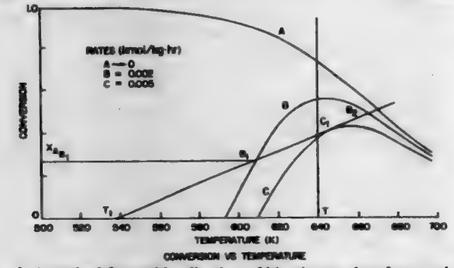
TEMPERATURE SCANNING REACTOR METHOD

Bohdan W. Wojciechowski, and Norman M. Rice, both of Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 274,887, Jul. 14, 1994, Pat. No. 5,521,095, which is a continuation-in-part of Ser. No. 51,413, Apr. 23, 1993, Pat. No. 5,340,745, which is a continuation-in-part of Ser. No. 833,182, Feb. 10, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 465,803

Int. Cl.[6] G01N *31/10*

U.S. Cl. 436—34 **2 Claims**



1. A method for rapid collection of kinetic rate data from a plug flow temperature scanning reactor in which a feed stock is reacted under non-steady state thermal conditions to form a conversion product and which method comprises:

repeatedly ramping the temperature and space velocity of said feed stock over selected ranges of temperature at selected ramping rates from a constant inlet temperature; continuously monitoring output conversion and output temperature of said feed stock and conversion product for the same time in each run, and determining therefrom a reaction rate which is representative of steady state conditions although such data is obtained when said feed stock is reacted in said reactor under said non-steady state conditions.

5,593,893

DISPENSING DEVICE WITH SYRINGE DRIVING COMPENSATOR FOR FLEXIBLE TUBE

Masayuki Kobashi; Noriaki Koeda; Yoshiteru Mizuno, all of Kobe, and Satoru Okada, Akashi, all of Japan, assignors to TOA Medical Electronics Co., Ltd, Hyogo-ken, Japan

Filed Mar. 15, 1995, Ser. No. 404,604

Claims priority, application Japan, Mar. 15, 1994, 6-044394

Int. Cl.[6] G01N *35/10*

U.S. Cl. 436—50 **8 Claims**

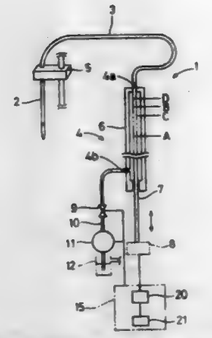
4. A method of operating a dispensing device including a flexible tube having a pipetting nozzle at a first end and a syringe connected at a second end, comprising the steps of:

washing the pipetting nozzle with a washing solution;

compensating for a variation from an initial state of an inner volume of the flexible tube due to a reduction or an increase in liquid pressure which causes deformation of the flexible tube during said washing step, said compensating step including supplying into or discharging out of the syringe an amount of the washing solution sufficient to compensate for the reduction or increase in liquid pressure;

beginning said compensating step in response to completion of said washing step, thereby maintaining a liquid surface of the washing solution in the pipetting nozzle at a constant level;

generating a driving signal which corresponds to a time function for the restoration of the deformed tube; and



performing said compensating step in accordance with said driving signal.

5,593,894

DIRECT CHOLESTEROL ASSAY

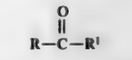
Neil Purdie, Stillwater, Okla., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 91,499, Jul. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 785,998, Oct. 31, 1991, Pat. No. 5,252,488, which is a continuation-in-part of Ser. No. 639,222, Jan. 9, 1991, Pat. No. 5,246,864, which is a continuation-in-part of Ser. No. 463,473, Jan. 11, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 468,458

Int. Cl.[6] G01N *33/92;21/31*

U.S. Cl. 436—71 **40 Claims**

1. A method for forming a spectrophotometrically active product of cholesterol which comprises contacting cholesterol with an acyl compound having the formula:



wherein R^1 is halogen,

R is selected from the group consisting of lower alkyl, aryl, alkaryl and aralkyl;

and a perchlorate effective to form a spectrophotometrically active product of said cholesterol, said perchlorate selected from the group consisting of zinc perchlorate, barium perchlorate and perchloric acid.

5,593,895

METHOD FOR THE DETECTION OF PROTEIN IN URINE

Sally E. Cahill, Union, Mich.; Michael J. Pugia, Granger, and Robert J. Schaeper, South Bend, both of Ind., assignors to Bayer Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 429,584, Apr. 27, 1995, abandoned. This application Oct. 26, 1995, Ser. No. 548,437

Int. Cl.[6] G01N *33/00*

U.S. Cl. 436—86 **13 Claims**

1. In a test strip for the detection of protein in urine which comprises an absorbant carrier impregnated with a reagent system of a buffer and a protein error indicator which undergoes a color change in the presence of protein, the improvement which comprises the use of tartaric acid as a cation sensing agent in the reagent system in combination with a non-cation sensing buffer as the buffer in an amount capable of preventing the pH of the reagent system from being elevated to a level at which the protein error indicator will change color in the absence of a significant amount of protein in urine wherein the amount of tartaric acid is the residue left in the absorbant carrier after dipping it into a solution

comprising both tartaric acid and the non-cation sensing buffer having a tartaric acid concentration of 50 to 750 mM and the amount of non-cation sensing buffer is the residue left in the absorbant carrier after dipping it into the same solution in which the ratio of tartaric acid to non-cation sensing buffer is from 25 mM:700 mM to 200 mM:100 mM.

5,593,896

REAGENTS AND METHODS FOR THE DETECTION AND QUANTIFICATION OF THYROXINE IN FLUID SAMPLES

Maciej Adamczyk, Gurnee; Donald D. Johnson, Lindenhurst; Phillip G. Mattingly, Grayslake; Diana E. Clarine, Naperville; Joan D. Tyner, Beach Park, and Mary M. Perkowitz, Lake Zurich, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

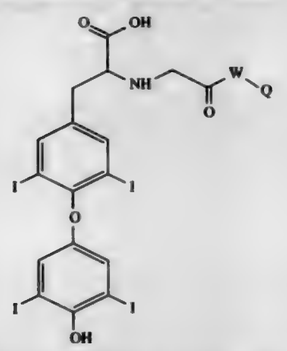
Division of Ser. No. 973,140, Nov. 6, 1992, Pat. No. 5,359,093, which is a continuation-in-part of Ser. No. 859,775, Mar. 30, 1992, Pat. No. 5,352,803. This application Jul. 13, 1994, Ser. No. 275,064

Int. Cl.[6] G01N *33/78;33/533;* C07K *16/26*

U.S. Cl. 436—500 **35 Claims**

1. A competitive immunoassay method for the quantification of thyroxine in a test sample, said method comprising the steps of:

(a) contacting said test sample with an antibody reagent comprising antibodies which are capable of binding to thyroxine and a labelled reagent of the following formula:



wherein Q is a detectable moiety and W is a linking moiety, to form a reaction solution; and

(b) measuring the amount of said labelled reagent in said reaction solution which is bound to said antibodies as a function of the amount of thyroxine in said test sample.

5,593,897

BINDING OF IMMUNE COMPLEXES BY MODIFIED FORMS OF C-REACTIVE PROTEIN

Lawrence A. Potempa, Deerfield, and Byron E. Anderson, Morton Grove, both of Ill., assignors to Northwestern University, Evanston, Ill.

Continuation of Ser. No. 582,884, Oct. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 176,923, Apr. 4, 1988, abandoned. This application Jul. 6, 1994, Ser. No. 271,137

Int. Cl.[6] G01N *33/564;33/543;33/53;* A61M *1/38*

U.S. Cl. 436—507 **19 Claims**

1. A method of binding aggregated immunoglobulin or immune complexes comprising contacting the aggregated immunoglobulin or immune complexes with modified C-reactive protein which expresses neo-CRP antigenicity.

5,593,898

DIAGNOSTIC METHOD FOR THE IMMUNOLOGICAL DETERMINATION OF NCAM

Bernhard Auerbach, and Helmut Peters, both of Marburg, Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 46,177, Apr. 14, 1993, abandoned. This application Nov. 2, 1994, Ser. No. 334,035

Claims priority, application Germany, Apr. 16, 1992, 42 12 706.8

Int. Cl.[6] G01N *33/53*

U.S. Cl. 436—518 **7 Claims**

1. A method for the determination of an analyte, NCAM, in a sample of a biological fluid containing a cross-reacting substance by means of specific binding partners comprising the steps of:

a) binding a first analyte-specific binding partner to a carrier;

b) incubating the bound first analyte-specific binding partner with the sample of the biological fluid to obtain bound analyte;

c) reacting the bound analyte with a second analyte-specific binding partner which second analyte-specific binding partner is labeled with a label either directly or via a binding partner specific for the second analyte-specific binding partner; and

d) determining the amount of analyte bound to the bound first analyte-specific binding partner, wherein a measurement signal is derived from said label; wherein either step b) or c) is carried out in the presence of a suppressor substance which specifically binds to said first analyte-specific binding partner or said second analyte-specific binding partner, which is not directly labeled,

wherein said suppressor substance has a lower affinity for said first analyte-specific binding partner in step b) than said analyte and said suppressor substance has a higher affinity for said first analyte specific binding partner than said cross-reacting substance or said suppressor substance has a lower affinity for said second analyte-specific binding partner in step c) than said analyte and said suppressor substance has a higher affinity for said second analyte specific binding partner than said cross-reacting substance.

5,593,899

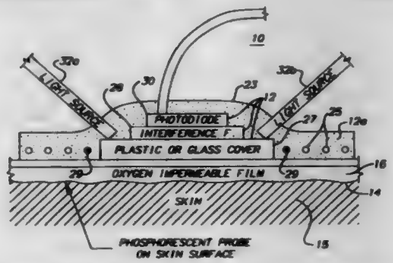
DEVICE AND METHOD FOR MEASURING TISSUE OXYGENATION THROUGH THE SKIN USING OXYGEN DEPENDENT QUENCHING OF PHOSPHORESCENCE

David F. Wilson, Philadelphia, Pa., and Marek Pawlowski, Roslyn Heights, N.Y., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 22,190, Feb. 25, 1993, Pat. No. 5,501,225. This application Jul. 22, 1994, Ser. No. 278,880

Int. Cl.[6] G01N *33/49*

U.S. Cl. 436—127 **12 Claims**



12. A method for measuring tissue oxygenation through the skin using oxygen dependent quenching of phosphorescence comprising:

applying a phosphorescent probe to the skin surface of a patient;

covering said probe with an oxygen impermeable film so as to isolate the area of skin with the phosphorescent probe from ambient oxygen;

applying a single modulated excitation light for exciting said phosphorescent probe such that said probe emits an excitation light on the skin surface of said patient caused by said excitation light;

filtering said emitted phosphorescent light; and

outputting an electrical signal characteristic of phosphorescent decay time and the oxygen pressure for the patient.

5,593,900

IMMUNOLOGICAL METHODS FOR THE DETECTION OF THE HUMAN TYPE IV COLLAGEN α5 CHAIN

Karl Tryggvason, Fyysinkoutie 8, SF-90570 Oulu; Sirkka L. Hostikka, Tapiontie 9 A 21, SF-90750 Oulu, and Matti Höyhtyä, Valtatie, SF-90500 Oulu,"all of Finland

Continuation of Ser. No. 630,563, Dec. 20, 1990, Pat. No. 5,354,690, which is a continuation-in-part of Ser. No. 377,238, Jul. 7, 1989, Pat. No. 5,114,840. This application Oct. 11, 1994, Ser. No. 321,084

Int. Cl.[6] C12P *21/00;* C07K *16/18*

U.S. Cl. 436—547 **3 Claims**

1. A method for producing antibodies that react specifically with the basement membrane human type IV collagen α5 chain and not with the basement membrane human type IV collagen α1 or α2 chains, comprising the steps of:

a) immunizing an animal with the synthetic peptide consisting of the residues Ser-Asp-Met-Phe-Ser-Lys-Pro-Gln-Ser-Glu; and

b) collecting the antiserum produced by the animal.

5,593,901

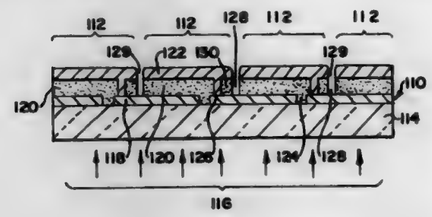
MONOLITHIC SERIES AND PARALLEL CONNECTED PHOTOVOLTAIC MODULE

Robert Oswald, Newtown, Pa.; John Mongon, Trenton, N.J., and Peggy Weiss, Pennsburg, Pa., assignors to Amoco/Enron Solar

Division of Ser. No. 188,606, Jan. 28, 1994, abandoned, which is a continuation of Ser. No. 698,321, May 6, 1991, abandoned, which is a continuation of Ser. No. 405,265, Sep. 8, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 475,951

Int. Cl.[6] H01L *27/14*

U.S. Cl. 437—2 **5 Claims**



1. A method of manufacturing a photovoltaic device on a monolithic substrate, comprising the steps of:

(a) depositing a transparent conductive oxide film on a monolithic substrate to form a front contact layer;

(b) forming connection strips and solder pads substantially on said front contact layer by pumping and depositing conductive fluid providing a paste comprising at least one conductive material selected from the group consisting of silver, copper, nickel, aluminum, gold, platinum and palladium, through a nozzle in a predefined pattern on said front contact layer, said nozzle being positioned by an X-Y-Z positioner comprising an automated positioning system controlled by a computer, said predefined pattern defined only by said computer and thermally curing said conductive material after said conductive material has been deposited on said front contact layer;

(c) laser scribing substantially parallel first grooves in said front contact layer with a laser beam at a first power density to form front electrode segments on said monolithic substrate;

(d) depositing and forming a layer of a semiconductor material on said front electrode segments and said connection strips, and filling said first grooves with said semiconductor material;

(e) laser scribing second grooves in said layer of semiconductor material at positions substantially parallel to said first grooves with a laser beam at a second power density lower than said first power density to ablate said layer of semiconductor material in the absence of ablating said front electrode segments so as to form photovoltaic elements;

(f) depositing and forming a back contact layer comprising conductive material selected from the group consisting of aluminum and tin oxide, on said layer of semiconductor material, and filling said second grooves with said conductive material to form a series connection to connect said front electrode segments and said back contact layer; and

(g) laser scribing third grooves in said back contact layer and photovoltaic elements at positions substantially parallel to said second grooves with a laser beam at a third power density of about 10 to 20 times higher than said second power density to ablate said semiconductor material of said photovoltaic elements in the absence of ablating said front electrode segments to form gaps in said back contact layer so as to form a plurality of back electrodes for photovoltaic cells.

5,593,902

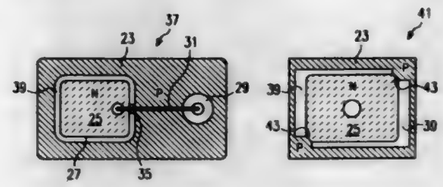
METHOD OF MAKING PHOTODIODES FOR LOW DARK CURRENT OPERATION HAVING GEOMETRIC ENHANCEMENT

Peter D. Dreiske, Plano; Arthur M. Turner, Allen, and David L. Forehand, Wylie, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 23, 1994, Ser. No. 247,747

Int. Cl.[6] H01L *31/18*

U.S. Cl. 437—4 **16 Claims**



1. A method of making a photodiode comprising the steps of:

(a) providing a first region of semiconductor material of a first conductivity type;

(b) implanting an impurity of a second conductivity type opposite said first conductivity type into a portion of said first region to form a second region surrounded by and contacting the remainder of said first region at the periphery of said second region and extending to a surface of said semiconductor material to provide a pn junction area at the interface of said remainder of said first region and said second region; and

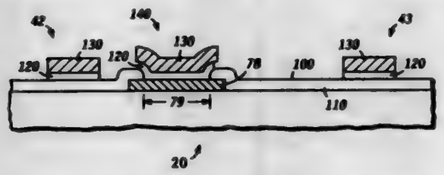
(c) electrically isolating a major portion of said first region from a major portion of said second region to remove said pn junction therefrom.

5,593,903

METHOD OF FORMING CONTACT PADS FOR WAFER LEVEL TESTING AND BURN-IN OF SEMICONDUCTOR DICE

William M. Beckenbaugh, Scottsdale; William H. Lytle, Chandler; and Bernard Berman, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1996, Ser. No. 606,472
Int. Cl.[6] H01L 21/66
U.S. Cl. 437—8 22 Claims



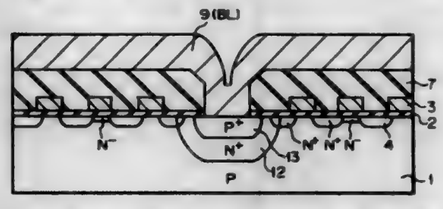
1. A method for forming contact pads for wafer level testing of integrated circuit die comprising the steps of:
providing a semiconductor substrate having a plurality of integrated circuit die formed thereon, wherein each integrated circuit die has a plurality of bonding pads;
forming a conductive etch-barrier layer overlying and electrically coupled to the plurality of bonding pads; and
forming a conductive layer overlying the conductive etch-barrier layer, wherein the conductive layer is electrically coupled to the plurality of bonding pads, and whereby the conductive etch-barrier layer protects the plurality of bonding pads when the conductive layer is patterned and etched to form a contact pad overlying at least one of the plurality of bonding pads.

5,593,904

METHOD FOR MANUFACTURING NAND TYPE SEMICONDUCTOR MEMORY DEVICE

Teiichiro Nishizaka, and Kazutaka Otsuki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 26, 1995, Ser. No. 451,548
Claims priority, application Japan, May 26, 1994, 6-134884
Int. Cl.[6] H01L 21/8246
U.S. Cl. 437—29 9 Claims



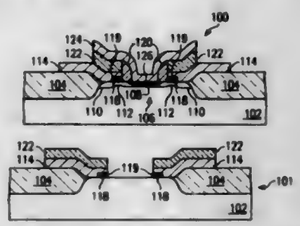
1. A method for manufacturing a NAND type semiconductor memory device, comprising the steps of:
forming a plurality of gate electrodes over a semiconductor substrate of a first conductivity type;
forming a photoresist pattern on said semiconductor substrate adjacent to said plurality of gate electrodes;
introducing first impurities of a second conductivity type opposite to said first conductivity type with a mask of said gate electrodes and said photoresist pattern to form a plurality of first impurity regions within said semiconductor substrate;
forming an insulating pattern on said plurality of gate electrodes and said plurality of first impurity regions;
introducing second impurities of said second conductivity type into said semiconductor substrate with a mask of said insulating pattern to form a second impurity region within said semiconductor substrate, a junction depth of said second impurity region being larger than a junction depth of said first impurity regions;
introducing third impurities of said first conductivity type into said semiconductor substrate with a mask of said insulating pattern to form a third impurity region within said semiconductor substrate; and
forming a conductive layer on said insulating pattern and said third impurity region.

5,593,905

METHOD OF FORMING STACKED BARRIER-DIFFUSION SOURCE AND ETCH STOP FOR DOUBLE POLYSILICON BJT WITH PATTERNED BASE LINK

F. Scott Johnson, and Kelly Taylor, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 23, 1995, Ser. No. 392,597
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—31 14 Claims



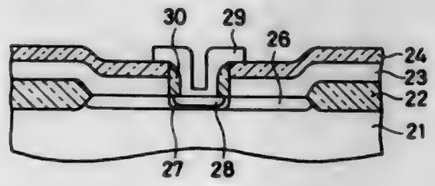
1. A method for forming a bipolar transistor, comprising the steps of:
forming a collector region;
forming a base-link diffusion source layer over a portion of said collector region;
forming a barrier layer over said base-link diffusion source layer;
forming a base electrode overlying at least one end portion of said barrier layer and said base-link diffusion source layer;
removing said barrier layer and said base-link diffusion source layer except for said at least one end portion; and
forming an extrinsic base region by diffusion from said base electrode and a base link-up region by diffusion from said at least one end portion of said base link layer.

5,593,906

METHOD OF PROCESSING A POLYSILICON FILM ON A SINGLE-CRYSTAL SILICON SUBSTRATE

Junzoh Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 28,428, Mar. 9, 1993, abandoned.
This application Jun. 12, 1995, Ser. No. 489,234
Claims priority, application Japan, Mar. 9, 1992, 4-050218
Int. Cl.[6] H01L 21/306;21/328
U.S. Cl. 437—31 9 Claims



7. A method of manufacturing a semiconductor device comprising the steps of:
(a) forming a P-type polysilicon film on and in contact with a major surface of a single-crystal silicon substrate;

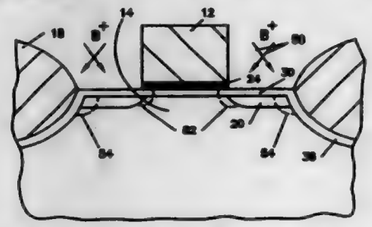
(b) forming a mask layer on said P-type polysilicon film, said mask layer having a window therein which exposes said P-type polysilicon film;
(c) selectively introducing an N-type impurity into said P-type polysilicon film via said window of said mask layer in order to form an N-type region in said P-type polysilicon film, said N-type region extending through the entire thickness of said P-type polysilicon film;
(d) selectively etching said N-type region of said P-type polysilicon film through said window in said mask layer, said etch continuing until said major surface of said substrate is exposed to form an opening in said polysilicon film;
(e) selectively introducing a P-type impurity into said substrate to form a P-graft base region of a bipolar transistor in an area surrounding said opening of said P-type polysilicon film;
(f) selectively introducing a P-type impurity through said opening and into said substrate to form a P-active base region of said bipolar transistor, said P-active base region being connected to said P-graft base region;
(g) making a sidewall spacer on a side face of said opening in said P-type polysilicon film; and
(h) selectively introducing an N-type impurity into said P-active base region to form an N-type emitter region of said bipolar transistor using said sidewall spacer;
wherein said N-type region of said P-type polysilicon film has an etching rate which is greater than an etch rate of said P-type polysilicon film so that the etching rate difference between said N-type region and said substrate becomes greater than an etch rate between said P-type polysilicon film itself and said substrate;
whereby said major surface of said substrate which is exposed by said opening of said P-type polysilicon film is not overetched during said step (d).

5,593,907

LARGE TILT ANGLE BORON IMPLANT METHODOLOGY FOR REDUCING SUBTHRESHOLD CURRENT IN NMOS INTEGRATED CIRCUIT DEVICES

Mohammed Anjum, Austin; Klaus H. Koep, Elgin, and Maung H. Kyaw, Austin, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Mar. 8, 1995, Ser. No. 400,609
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—35 3 Claims



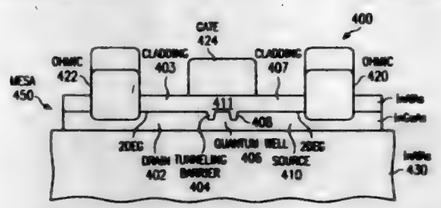
1. A method for replenishing diffusion and segregation of boron from a channel region and from a field oxide region to adjacent source and drain regions in order to reduce drain induced barrier lowering currents, the method comprising the steps of:
implanting boron ions into a field oxide region, wherein the field oxide region is a portion of a semiconductor substrate residing below a field oxide;
implanting boron ions into a channel region laterally spaced from said field oxide region, wherein said channel region resides within said substrate below a patterned polysilicon trace element;
implanting boron ions into a portion of said channel region and said field oxide region at a non-perpendicular angle relative to said semiconductor substrate to reduce drain-induced barrier lowering currents, wherein a first concentration peak density of a set of the non-perpendicularly placed said implanted boron ions reside at a first depth within said channel region and said field oxide region; and
implanting arsenic ions into a source and drain region, wherein a second concentration peak density of said implanted arsenic ions reside at a second depth, and wherein the source and drain region resides between said field oxide region and said channel region.

5,593,908

LATERAL RESONANT TUNNELING

Dejan Jovanovic, Dallas, and John N. Randall, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 323,983, Oct. 17, 1994, Pat. No. 5,504,347.
This application Jun. 7, 1995, Ser. No. 485,249
Int. Cl.[6] H01L 21/265;21/20
U.S. Cl. 437—40 5 Claims



1. A method of fabricating a lateral resonant tunneling structure, comprising the steps of:
(a) providing a semiconductor layer with a bandgap less than a first energy;
(b) forming at least two trenches in said semiconductor layer at a first surface of said semiconductor layer, each of said at least two trenches of lateral tunneling barrier dimensions and terminating within said semiconductor layer;
(c) forming a layer of a second material over said first surface and in said at least two trenches, said second material with a bandgap greater than said first energy; and
(d) forming first and second contacts to said semiconductor layer with said at least two trenches laterally between said first and second contacts.

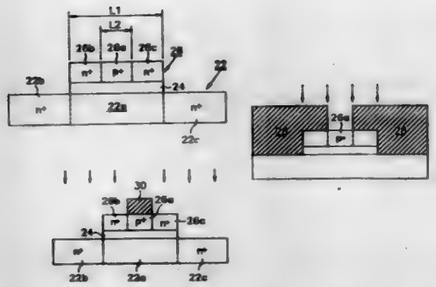
5,593,909

METHOD FOR FABRICATING A MOS TRANSISTOR HAVING AN OFFSET RESISTANCE

Min-Koo Han, and Byung-Hyuk Min, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 266,420, Jun. 27, 1994. This application Jun. 6, 1995, Ser. No. 467,715
Claims priority, application Rep. of Korea, Jun. 25, 1993, 11738/1993
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—41 6 Claims

1. A method for manufacturing a metal oxide semiconductor transistor having an offset resistance when turned off, comprising the steps of:
forming a gate insulation layer on an active region of a substrate;
forming a gate electrode on said gate insulation layer;
forming a first photoresist pattern on said gate electrode having a central portion of said gate electrode exposed;
implanting first ions of a first conductivity type into said central portion of said gate electrode using said first photoresist pattern as a first mask;
removing said first photoresist pattern;
forming a second photoresist pattern on said central portion of said gate electrode;



implanting second ions of a second conductivity type onto opposite portions of said gate electrode adjacent said central portion using said second photoresist pattern as a second mask; and

removing said second photoresist pattern.

5,593,910

CHARGE DETECTION DEVICE, A METHOD FOR PRODUCING THE SAME, AND A CHARGE TRANSFER AND DETECTION APPARATUS INCLUDING SUCH A CHARGE DETECTION DEVICE

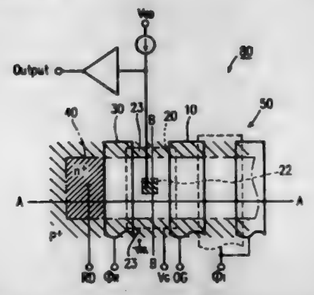
Takashi Watanabe, Soraku-gun, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 284,928, Aug. 2, 1994, Pat. No. 5,464,997. This application May 19, 1995, Ser. No. 445,304

Claims priority, application Japan, Apr. 1, 1994, 6-65283

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—41 **2 Claims**



1. A method of producing a charge detection device including a first semiconductor layer having a first conductivity;

an insulating layer provided on the first semiconductor layer;

gate electrodes provided above the insulating layer; and a MOS transistor having the first conductivity, wherein a characteristic of the MOS transistor is changed by a signal charge having a second conductivity, accumulated in a surface region of the first semiconductor layer immediately below an interface between the first semiconductor layer and the insulating layer, to thus detect the quantity of the signal charge, the method comprising the steps of;

forming the insulating layer on the first semiconductor layer;

forming the first gate electrode on the insulating layer;

implanting an impurity having a second conductivity to a surface region of the first semiconductor layer to form a second semiconductor layer and a third semiconductor layer, using the first gate electrode as a mask, in self-alignment with the first gate electrode; and

forming the second gate electrodes on the insulating layer,

wherein the second semiconductor layer and the third semiconductor layer are covered with the second gate electrodes via the insulating layer, and become a buried channel for signal charge.

5,593,911

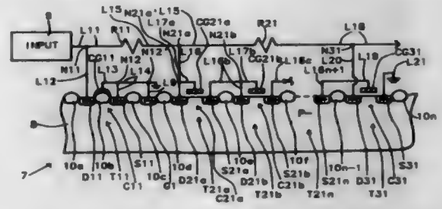
METHOD OF MAKING ESD PROTECTION CIRCUIT WITH THREE STAGES

Jin-Yuan Lee, and Meng-Song Liang, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Jul. 26, 1995, Ser. No. 507,143

Int. Cl.[6] H01L *21/8234*

U.S. Cl. 437—51 **14 Claims**



1. A method of forming an MOS electrostatic discharge, ESD, protection circuit for protecting a semiconductor device from ESD damage, said ESD protection circuit formed on a doped silicon semiconductor substrate comprising:

forming a field oxide, FOX mask and ion implanting through said mask,

forming a silicon dioxide gate oxide,

forming gate electrodes by depositing a blanket polysilicon layer, forming a mask pattern for the gate electrodes and etching said blanket polysilicon layer to form said gates,

removing said mask,

ion implanting source/drain regions, and

forming a ground ion implant,

forming first and second resistors each having a proximal end and a distal end,

forming an input line, an output line, a first node, a second node and a third node, and ground connections, said first node connected to said input line, and said proximal end of said first resistor, said second node connected to said proximal end of said second resistor, and said distal end of said first resistor, and said third node connected to said distal end of said second resistor, and said output line,

forming a first stage including a first MOSFET transistor and a grounded region formed in said substrate,

forming said first MOS transistor having a source/drain circuit connected between said first node and ground, said first MOS transistor having a control gate electrode connected to ground,

forming a second stage including a string of MOSFET transistors connected in a series string with the last transistor in said string having a second stage output,

forming a third stage including a third stage MOSFET device with a control gate connected to said second stage output and a source and drain circuit connected between said third node and a said ground connection.

5,593,912

SOI TRENCH DRAM CELL FOR 256 MB DRAM AND BEYOND

Thekkemadathil V. Rajeevakumar, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1994, Ser. No. 319,833

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—52 **5 Claims**

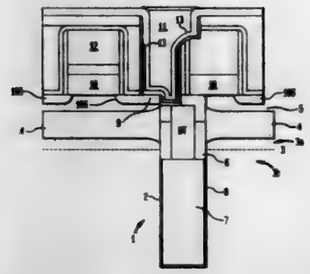
1. A method for fabricating a silicon-on-insulator ("SOI") trench structure, comprising:

providing an SOI substrate having an insulator layer and a silicon layer on the insulator layer;

etching a trench in the substrate, the trench extending through the silicon layer into the insulator layer;

forming an oxide layer on the walls of the trench;

forming a first masking layer on the oxide layer in the trench;



removing the first masking layer from an upper portion of the trench above the insulator layer, and leaving a remaining portion of the masking layer in a lower portion of the trench;

forming a second masking layer on the remaining portion of the first masking layer and on a part of the trench above the remaining portion of the first masking layer;

forming a masking collar on the upper portion of the trench above the second masking layer;

removing the second masking layer to expose a band of the trench between the masking collar and the first masking layer;

oxidizing the exposed band of the treach to form an annular oxide region in the substrate below the surface thereof.

5,593,913

METHOD OF MANUFACTURING SOLID STATE IMAGING DEVICE HAVING HIGH SENSITIVITY AND EXHIBITING HIGH DEGREE OF LIGHT UTILIZATION

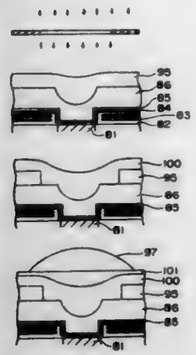
Tetsuro Aoki, Fukuyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 314,231, Sep. 28, 1994, abandoned. This application May 24, 1995, Ser. No. 449,835

Claims priority, application Japan, Sep. 28, 1993, 5-241030

Int. Cl.[6] H01L *31/18;21/70;27/00;* **G02B** *27/10*

U.S. Cl. 437—53 **11 Claims**



1. A method of manufacturing a solid state imaging device wherein a concave type micro-lens layer, a support layer, and a convex type micro-lens are sequentially formed on a photoelectric conversion portion, the method comprising the steps of:

forming a layer of transparent material above the photoelectric conversion portion, said layer of transparent material having a refractive index higher than that of each of the convex type micro-lens and the support layer;

forming a resist lattice pattern of photosensitive resin material over the surface of the layer of transparent material, said lattice pattern having a through-hole opposite to the photoelectric conversion portion;

hot-melting the resist lattice pattern to convert the resist lattice pattern into a resist layer having a concave micro-lens configuration; and

etching the resist layer, thereby transferring the concave micro-lens configuration of the resist layer onto the layer of transparent material underlying the resist layer so that the layer of transparent material is converted into the concave type micro-lens layer.

5,593,914

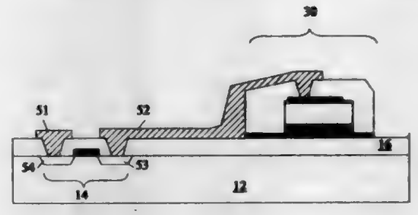
METHOD FOR CONSTRUCTING FERROELECTRIC CAPACITOR-LIKE STRUCTURES ON SILICON DIOXIDE SURFACES

Joseph T. Evans, Jr., and Leonard O. Boyer, both of Albuquerque, N.M., assignors to Radiant Technologies, Inc., Albuquerque, N.M.

Filed Mar. 19, 1996, Ser. No. 616,526

Int. Cl.[6] H01L *21/70*

U.S. Cl. 437—60 **5 Claims**



1. A method for fabricating an integrated circuit comprising at least one integrated circuit component fabricated in a silicon substrate and a second device to be fabricated on a silicon oxide layer that covers said integrated circuit component, said integrated circuit component having a terminal that is to be connected a corresponding terminal on said second device, said second device comprising an electrode structure in contact with a dielectric component comprising a layer of ceramic material, said method comprising the steps of:

depositing a boundary layer comprising non-conducting silicon over said silicon oxide layer;

fabricating said electrode structure by depositing one or more layers over said boundary layer;

depositing said layer of ceramic material over said electrode structure;

etching said ceramic layer to provide said dielectric component utilizing an etchant that etches said ceramic material at least 1.5 times faster than polysilicon; and

removing said boundary layer with an etchant that etches said boundary layer at least 2 times faster than silicon oxide.

5,593,915

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Tsukasa Ohoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,183

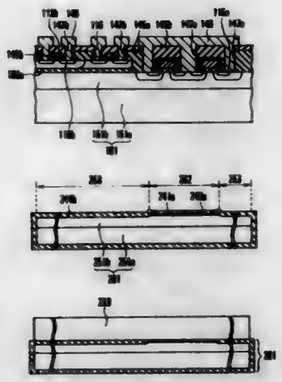
Claims priority, application Japan, Sep. 9, 1993, 5-224316

Int. Cl.[6] H01L *21/302;21/20;21/76;21/306*

U.S. Cl. 437—62 **11 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of:

forming a silicon oxide film having a film thickness on a major surface of a first silicon substrate of a first conductivity type having a first region wherein a power transistor is to be formed;



bonding said major surface of said first silicon substrate and a major surface of a second silicon substrate having a conductivity type opposite said first conductivity type;

polishing the other surface of said second silicon substrate bonded to said first silicon substrate to form a silicon layer having a film thickness and a second region wherein a transistor constituting a control circuit for driving said power transistor is to be formed;

removing said silicon layer and said silicon oxide film from a portion in the first region;

forming said power transistor in the form of a vertical type on said silicon substrate in the first region, wherein said silicon layer and said silicon oxide film are removed;

the step of forming said silicon oxide film further comprising the added steps of:

making the silicon oxide film thickness in the first region on the major surface less thick than the film thickness of the silicon oxide in the second region on the other surface; and

removing a projecting portion of a bird's beak formed at a boundary between said first and second regioas by polishing to form a flat surface.

5,593,916

PROCESSING OF GLASS SUBSTRATES USING HOLDING CONTAINER AND HOLDING CONTAINER

Yoshihiro Getoh; Motoo Kawamata, both of Yokohama, and Toshiaki Takahashi, Hatano, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

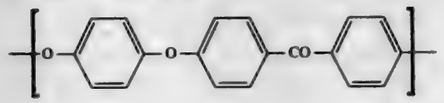
Continuation of Ser. No. 152,260, Nov. 12, 1993, Pat. No. 5,455,201, which is a continuation of Ser. No. 867,062, Apr. 10, 1992, abandoned, which is a continuation of Ser. No. 595,691, Oct. 4, 1990, abandoned, which is a continuation of Ser. No. 237,739, Aug. 12, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 485,012

Int. Cl.[6] H01L *21/68;21/469*

U.S. Cl. 437—83 **3 Claims**

1. A process for fabricating a substrate of a glass plate, ceramic plate, or a porcelain-enameled plate for a thin-film semiconductor while the substrate is being held in a holding container comprising the steps of:

placing the substrate in a holding container comprising two panels which are disposed in opposing relation to each other and define a plurality of grooves for holding the substrates spacedly, the holding container being made of polyether ether ketone having a recurring unit:



and having a melt flow index of 1–5 g/10 minutes at 360° C. under a load of 2.16 kg in accordance with ASTM D 1238;

subjecting the container holding the substrate to chemical treatments, masking, and etching without giving off fine powder;

washing the substrates and then subjecting the substrates to heat drying without deformation of the holding container, even in a 200° C. drying step; and

forming a semiconductor on the substrates in a form of thin film.

5,593,917

METHOD OF MAKING SEMICONDUCTOR COMPONENTS WITH ELECTROCHEMICAL RECOVERY OF THE SUBSTRATE

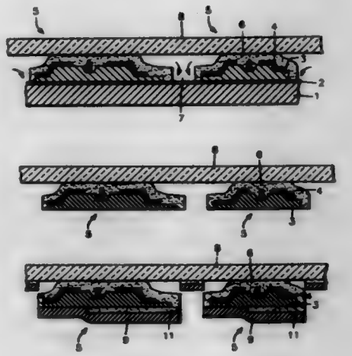
Linh T. Nayen, Paris, France, assignor to Picogiga Societe Anonyme, Les Ulis, France

Filed Jun. 6, 1994, Ser. No. 275,445

Claims priority, application France, Dec. 6, 1991, 91 15139

Int. Cl.[6] H01L *21/20;21/14;21/306;21/465*

U.S. Cl. 437—86 **7 Claims**



1. A method of making semiconductor components, comprising the sequential steps of:

a) obtaining a substrate;

b) forming a separating layer of a p⁺-type doped material on the surface of said substrate;

c) forming an active layer stack on said separating layer, the active layer stack including a bottom layer with n-type doping;

d) etching and metalizing said active layer stack to make a set of semiconductor components;

g) fixing a common support plate on the set of semiconductor components; and

h) dissolving the separating layer anodically and without illumination, to which frees, without dissolving, the substrate and exposes the rear surface of the active layer stack.

5,593,918

TECHNIQUES FOR FORMING SUPERCONDUCTIVE LINES

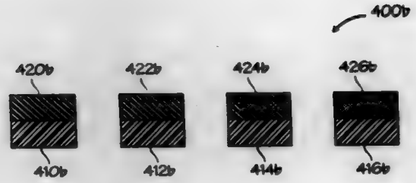
Michael D. Rostoker, Boulder Creek; Mark Schneider, San Jose; Nicholas F. Pasch, Pacifica; Abraham Yee, Santa Clara, and William C. Schneider, Mountain View, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Apr. 22, 1994, Ser. No. 233,607

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—187 **4 Claims**

1. A method, of forming a superconductive leadframe, comprising: providing a sheet of an insulating backing material;



stamping the insulating backing material to form a leadframe shape having a plurality of leadframe fingers; and

providing a coating of a superconductive material over a surface of the leadframe fingers.

5,593,919

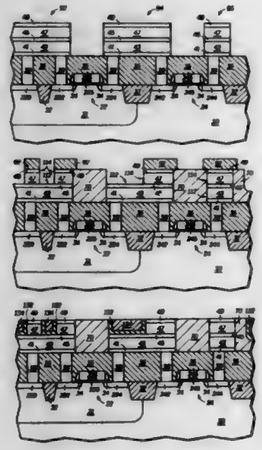
PROCESS FOR FORMING A SEMICONDUCTOR DEVICE INCLUDING CONDUCTIVE MEMBERS

Chil-Chang Lee, and Hisao Kawasaki, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 5, 1995, Ser. No. 523,174

Int. Cl.[6] H01L *21/3213*

U.S. Cl. 437—190 **21 Claims**



1. A process for forming a semiconductor device comprising the steps of:

forming a conductive layer over a semiconductor substrate;

patterning the conductive layer for a first time to remove an entire thickness of the conductive layer;

forming a first insulating layer over the conductive layer after the step of patterning the layer for the first time, wherein the first insulating layer includes a material selected from a group consisting of oxide, nitride, and oxynitride;

removing a portion of the first insulating layer such that a top surface of the conductive layer is exposed;

patterning the conductive layer for a second time to remove only a part of and not the entire thickness of the conductive layer to form an exposed edge of the conductive layer, wherein this step is performed after the step of removing the first insulating layer;

forming a second insulating layer over the first insulating layer and along the exposed edge of the conductive layer, wherein the second insulating layer includes a material selected from a group consisting of oxide, nitride, and oxynitride and wherein, this step is performed after the step of patterning the conductive layer for a second time; and

polishing the second insulating layer to remove all of a portion of the second insulating layer that overlies the top surface of the conductive layer.

5,593,920

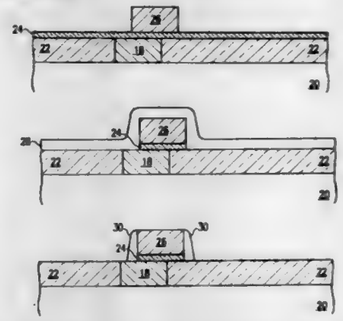
METHOD FOR FORMING CONTACT STRUCTURES IN INTEGRATED CIRCUITS

Michael E. Haslam, Highland Village, and Charles R. Spinner, III, Dallas, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 876,953, Apr. 30, 1992, Pat. No. 5,331,116. This application Apr. 12, 1994, Ser. No. 226,672

Int. Cl.[6] H01L *21/441*

U.S. Cl. 437—195 **7 Claims**



1. A method for forming a contact structure in an integrated circuit, comprising the steps of:

forming an oxide insulating layer;

forming an opening in the oxide insulating layer;

forming a region of conductive material in the opening to define a conductive element;

forming an insulating buffer layer over the oxide layer and the conductive element;

depositing a first conductive layer over the buffer layer;

patterning the first conductive layer to define a first interconnect layer, wherein the buffer layer acts as an etch stop and protects the conductive element from damage;

removing portions of the buffer layer not covered by the first interconnect layer;

depositing a second conductive layer over the integrated circuit; and

anisotropically etching the second conductive layer to form conductive sidewall spacers alongside the vertical sidewalls of the first interconnect layer, wherein at least one of the conductive sidewall spacers makes electrical contact with a portion of the conductive element.

5,593,921

METHOD OF FORMING VIAS

Fusen E. Chen, Dallas; Fu-Tai Liou, Carrollton, and Girish A. Dixit, Dallas, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 150,762, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 763,947, Sep. 23, 1991, abandoned. This application May 9, 1995, Ser. No. 438,167

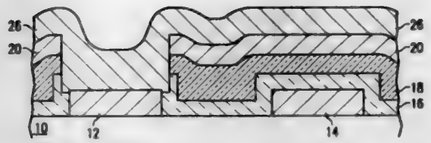
Int. Cl.[6] H01L *21/441*

U.S. Cl. 437—195 **12 Claims**

1. A method of forming a via in a semiconductor integrated circuit, comprising the steps of:

forming a conductive structure over portions of an underlying region;

forming a conformal oxide layer over the conductive structure and the underlying region;

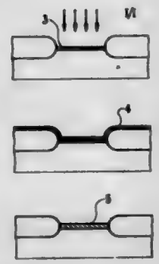


forming a planarizing oxide layer over the conformal oxide layer;
etching back the planarizing oxide layer to expose a portion of the conformal oxide layer over the conductive structure;
forming a metal oxide layer over the planarizing oxide layer and the exposed portion of the conformal oxide layer;
forming and patterning a resist layer over the metal oxide layer to define a selected via region;
etching the metal oxide layer to remove it from the selected via region, wherein the metal oxide etch is performed so as to selectively etch the metal oxide layer over the underlying conformal oxide layer;
etching the conformal oxide layer to remove it from the selected via region, wherein the conformal oxide etch is performed so as to selectively etch the conformal oxide layer over the metal oxide layer;
removing the resist layer; and
forming an upper interconnect structure over the metal oxide layer and extending into the via to contact the conductive structure.

5,593,922
METHOD FOR BURIED CONTACT ISOLATION IN SRAM DEVICES
Jhon-Jhy Liaw, Taipei, and Hsien W. Chin, Hsin Chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan
Filed Jun. 7, 1996, Ser. No. 660,301
Int. Cl.[6] H01L *21/44;21/60*
U.S. Cl. 437—195 **34 Claims**

1. A method for forming a buried contact on a silicon semiconductor wafer with improved isolation comprising:
providing a semiconductor wafer having field isolation regions within its surface which define isolated areas of exposed silicon wherein semiconductor devices are to be formed;
forming a silicon oxide layer over said areas of exposed silicon;
forming a first layer of polysilicon over said semiconductor wafer;
depositing a first layer of photoresist over said semiconductor wafer;
patterning said first layer of photoresist to define buried contact openings;
etching said first layer of polysilicon with a unidirectional dry etching technique to provide vertical walled buried contact openings in said first layer of polysilicon, thereby exposing the subjacent silicon oxide layer;
removing said silicon oxide layer within said buried contact openings;
implanting a first dose of dopant atoms;
implanting a second dose of dopant atoms;
removing said first layer of photoresist;
forming a second layer of polysilicon over said semi conductor wafer;
depositing a second layer of photoresist over said semi conductor wafer;
patterning said second layer of photoresist to define local interconnect structures and gate structures for semiconductor devices;
etching said second layer of polysilicon and subjacent first layer of polysilicon with a unidirectional dry etching technique to provide vertical walled openings in said first and second layers of polysilicon, thereby exposing the subjacent silicon oxide layer;
implanting a third dose of dopant atoms; and
annealing said semiconductor wafer.

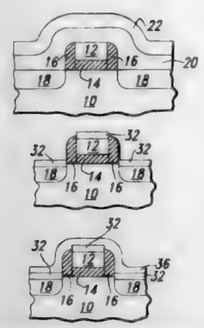
5,593,923
METHOD OF FABRICATING SEMICONDUCTOR DEVICE HAVING REFRACTORY METAL SILICIDE LAYER ON IMPURITY REGION USING DAMAGE IMPLANT AND SINGLE STEP ANNEAL
Tadahiko Horiuchi; Takashi Ishigami; Hiroyuki Nakamura; Tohru Mogami; Hitoshi Wakabayashi; Takemitsu Kunio, and Koichiro Okumura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed May 31, 1995, Ser. No. 454,735
Claims priority, application Japan, Dec. 6, 1994, 6-301947
Int. Cl.[6] H01L *21/28*
U.S. Cl. 437—200 **20 Claims**



1. A method of fabricating a semiconductor device comprising steps of:
implanting ions selected from a group of silicon, germanium, phosphor, arsenic, antimony and boron in a surface portion of a semiconductor region to form an ion-implanted portion at said surface portion of said semiconductor region;
depositing on said ion-implanted portion a refractory metal film having thickness that is not smaller than four tenths of a thickness of said ion-implanted portion and not larger than the thickness of said ion-implanted portion; and
performing a one-step annealing process in which annealing for reacting said refractory metal film with said ion-implanted portion is performed once.

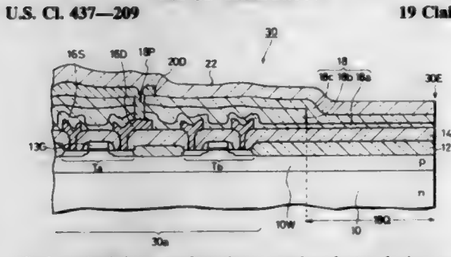
5,593,924
USE OF A CAPPING LAYER TO ATTAIN LOW TITANIUM-SILICIDE SHEET RESISTANCE AND UNIFORM SILICIDE THICKNESS FOR SUB-MICRON SILICON AND POLYSILICON LINES
Pushkar P. Apte, Dallas, and Ajit P. Paranjpe, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 2, 1995, Ser. No. 460,345
Int. Cl.[6] H01L *21/28*
U.S. Cl. 437—200 **10 Claims**

1. A silicide process for a polysilicon line, comprising the steps of:
depositing a layer of titanium over said polysilicon line;
reacting said layer of titanium with said polysilicon line to create a silicide layer with an overlying titanium nitride layer;
removing said titanium nitride layer;



depositing an anneal capping barrier layer on said silicide layer, said anneal capping barrier layer comprising a material selected from the group consisting of titanium-nitride, titanium-tungsten, silicon-nitride, and metal carbides; and
annealing said silicide layer at a temperature greater than 600° C. after said depositing an anneal capping barrier layer step.

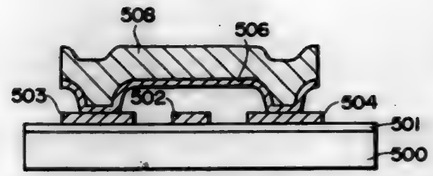
5,593,925
SEMICONDUCTOR DEVICE CAPABLE OF PREVENTING HUMIDITY INVASION
Takahisa Yamaha, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan
Filed Jul. 22, 1994, Ser. No. 279,338
Claims priority, application Japan, Jul. 24, 1993, 5-202702
Int. Cl.[6] H01L *21/304*
U.S. Cl. 437—209 **19 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of:
(a) providing a semiconductor wafer having a plurality of chip areas and scribe regions connecting the plurality of chip areas, each of the chip areas having an underlying structure;
(b) forming a first insulating layer over the underlying structure of the plurality of chip areas;
(c) forming a second insulating layer on the first insulating layer, the second insulating layer having moisture permeability; and
(d) removing the second insulating layer from a periphery of the chip areas so that the second insulating layer is removed from the scribe region.

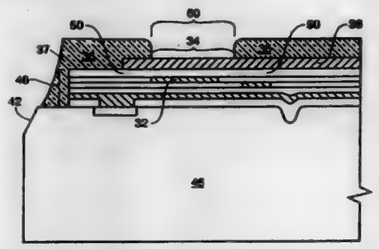
5,593,926
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE
Mitsuaki Fujihira, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Oct. 7, 1994, Ser. No. 319,546
Claims priority, application Japan, Oct. 12, 1993, 5-253978
Int. Cl.[6] H01L *21/60*
U.S. Cl. 437—209 **8 Claims**

1. A method for manufacturing a semiconductor device, comprising the steps of:



(a) forming first, second, and third wiring layers on a surface of a wafer, wherein said third wiring layer is arranged between said first and said second wiring layers;
(b) coating surfaces of said first, second, and third wiring layers and a remaining exposed surface of said wafer with a resist;
(c) partially removing said resist to expose a part of the surfaces of said first and second wiring layers;
(d) coating said exposed surfaces of said first and second wiring layers, and a surface of said resist, with a fourth wiring layer to connect said first wiring layer to said second wiring layer via said fourth wiring layer;
(e) removing said resist arranged between said fourth wiring layer and said third wiring layer to form an air gap between said third and fourth wiring layers, thereby forming an air bridge structure;
(f) forming a chip from said wafer having said air bridge structure, said chip being covered with a protective coat;
(g) die bonding said chip having said protective coat to a package; and
(h) removing said protective coat from said chip while keeping said chip fixed on said package.

5,593,927
METHOD FOR PACKAGING SEMICONDUCTOR DICE
Warren M. Farnworth, Nampa; Alan G. Wood, Boise; Trung T. Doan, Boise, and John O. Jacobson, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.
Continuation-in-part of Ser. No. 294,183, Aug. 22, 1994, abandoned, which is a continuation of Ser. No. 137,645, Oct. 14, 1993, abandoned. This application Dec. 1, 1995, Ser. No. 565,864
Int. Cl.[6] H01L *21/60*
U.S. Cl. 437—209 **19 Claims**



1. A method for packaging a semiconductor die comprising:
providing the semiconductor die with exposed bond pads embedded in a passivation layer formed on a face of the die;
forming conductive traces on the passivation layer in electrical contact with the exposed bond pads;
forming a protective layer on the face of the die and over the conductive traces;
forming vias through the protective layer to expose contact pads on the conductive traces in desired locations on the face of the die;
providing a die holder for the die said holder including connectors for contacting the contact pads; and
placing the die into the holder with the connectors in electrical contact with the contact pads.

5,593,928

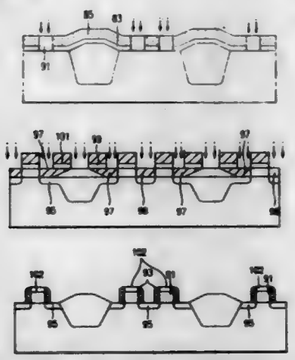
METHOD OF MAKING A SEMICONDUCTOR DEVICE HAVING FLOATING SOURCE AND DRAIN REGIONS

Jeung S. Lee, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

Filed Nov. 30, 1993, Ser. No. 158,763

Int. Cl.[6] H01L *21/265;21/70;27/00;21/20*

U.S. Cl. 437—41 **10 Claims**



1. A method of making a semiconductor device, comprising the steps of:

forming field oxide films on a semiconductor substrate;

forming an oxide film on said semiconductor substrate;

forming a nitride film on said oxide film;

coating a photoresist film on said nitride film;

patterning said photoresist film to define channel regions;

etching said nitride film and said oxide film on said channel regions using said photoresist film as an etch mask;

forming epitaxial layers on said channel regions;

implanting impurity ions of a first type for controlling a threshold voltage into said semiconductor substrate;

removing said nitride film and said oxide film to provide recess regions on said semiconductor substrate;

forming spacers at sidewalls of said epitaxial layers;

forming buried oxide films on said semiconductor substrate and said epitaxial layers;

removing said spacers;

depositing a polysilicon film on said buried oxide films that are formed on said semiconductor substrate;

etching back said polysilicon film to fill said recess regions with said polysilicon film;

forming a gate oxide film on said polysilicon film and said epitaxial layers;

forming gates on said gate oxide film corresponding to said epitaxial layers; and

implanting impurity ions of a second type into said polysilicon film filled in said recess regions, to form source and drain regions.

5,593,929

ULTRAVIOLET ABSORBING GREEN TINTED GLASS

John F. Krumwiede, ChesWick; Joseph A. Gulotta, New Kensington, and Larry J. Shelestak, Bairdford, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 857,983, Mar. 26, 1992, Pat. No. 5,385,872, which is a continuation-in-part of Ser. No. 559,915, Jul. 30, 1990, Pat. No. 5,240,886. This application Nov. 13, 1992, Ser. No. 976,059

Int. Cl.[6] C03C *3/087;* **C03B** *5/16*

U.S. Cl. 501—70 **109 Claims**

1. A green tinted, ultraviolet absorbing, soda lime silica glass composition comprising, on a weight percent basis, 66 to 75% SiO_2, 10 to 20% Na_2O, 5 to 15% CaO, 0 to 5% MgO, 0 to 5% Al_2O_3,0 to 5% K_2O and a colorant portion consisting essentially of total iron (expressed as Fe_2O_3) in an amount greater than 0.6% with a ratio of FeO/total iron less than 0.35, and TiO_2 in a sufficient amount but less than 2% to produce glass exhibiting ultraviolet transmittance no greater than 38 percent (300 to 400 nanometers), a total solar energy transmittance less than 45 percent, and luminous transmittance (illuminant A) of at least 70 percent at thicknesses ranging from 0.154 to 0.189 inches.

5,593,930

COMPOSITION FOR HIGH PRESSURE CASTING SLIP, HIGH PRESSURE CASTING SLIP AND METHOD FOR PREPARING THE COMPOSITION AND SLIP

Ritsu Sato, Iwakura, Japan, assignor to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 150,113, Dec. 14, 1993, abandoned. This application Sep. 13, 1995, Ser. No. 527,500

Claims priority, application Japan, Mar. 26, 1992, 4-067945

Int. Cl.[6] C04B *33/04;35/66*

U.S. Cl. 501—141 **43 Claims**

1. A method of preparing a pressure casting slip, comprising the steps of:

uniformly dry mixing a first starting powder and a second starting powder, wherein the first starting powder forms a frame of a mold body,

and the second starting powder forms a frame of the mold body and acts as a plastic agent, said second starting powder being prepared by drying at a temperature of 120°–400° C.;

producing a diluted slip having the same composition as that of the first and second starting powders; and

mixing the first and second starting powders with the diluted slip to produce a high pressure casting slip having 25–40 wt. % by weight water.

5,593,931

CYCLOPENTADIENYL GROUP 6B METAL ALPHA-OLEFIN POLYMERIZATION CATALYSTS AND PROCESS FOR POLYMERIZING ALPHA-OLEFINS

David L. Beach, Kingwood, Tex.; Michael J. Carney, Eldersburg, Md., and Javier M. Mora, Houston, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Filed Mar. 3, 1995, Ser. No. 397,828

Int. Cl.[6] C08F *4/622;10/00;* **B01J** *31/00*

U.S. Cl. 502—117 **20 Claims**

1. A catalyst system for the homopolymerization of alpha-olefins having from 2–8 carbon atoms, said catalyst system comprising a mixed-valent dimeric Group 6b metal compound catalyst precursor wherein one atom of said Group 6b metal is a cyclopentadienyl Group 6b metal hydrocarbyl complex in which the Group 6b metal has an oxidation state +3 and wherein one atom of said Group 6b metal is a cyclopentadienyl alkaryl complex in which the Group 6b metal has an oxidation state +1, said dimeric Group 6b metal compound being supported on an inorganic support.

5,593,932

PROCESS FOR SWEETENING A SOUR HYDROCARBON FRACTION USING A MIXTURE OF A SUPPORTED METAL CHELATE AND A SOLID BASE

Ralph D. Gillespie, Elgin; Jeffery C. Bricker, Buffalo Grove; Blaise J. Arena, Chicago, and Jennifer S. Holmgren, Bloomingdale, all of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 151,633, Nov. 15, 1993, Pat. No. 5,413,704. This application Jan. 17, 1995, Ser. No. 373,720

Int. Cl.[6] C10G *25/00;* **B01J** *31/22*

U.S. Cl. 502—163 **12 Claims**

1. A catalyst for oxidizing mercaptans comprising a mixture of (1) a non-basic solid support on which a metal chelate is dispersed, and (2) a physically discrete and separate solid base selected from

the group consisting of a) alkaline earth metal oxides, b) metal oxide solid solutions having the formula $M_a(II)M_b(III)O_{(a+b)}(OH)_b$ where M(II) is a divalent metal selected from the group consisting of magnesium, nickel, zinc, copper, iron, cobalt, calcium, and combinations thereof, M(III) is a trivalent metal selected from the group consisting of aluminum, chromium, gallium, scandium, iron, lanthanum, cerium, yttrium, boron, and combinations thereof, and a/b is between 1 to about 15, and c) layered double hydroxides represented by the formula $M_a(II)M_b(III)(OH)_{(2a+2b)}(X^{-n})_{b/n}\cdot cH_2O$ where X^- is an anion selected from the group consisting of carbonate, nitrate, halide, and combinations thereof, n is 1 where X^- is a univalent anion and 2 where X^- is a divalent anion, and cH_2O is water of hydration.

5,593,933

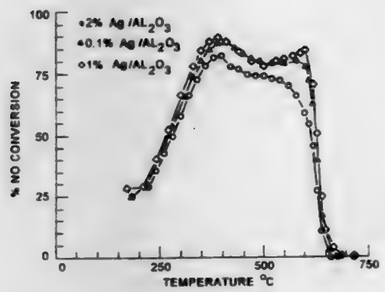
REFRACTORY OXIDES BASED SILVER-TUNGSTEN LEAN-NOX CATALYST

Mohinder S. Chattha, Northville, and Robert J. Kudla, Warren, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 30, 1995, Ser. No. 521,500

Int. Cl.[6] B01J *23/30;23/50*

U.S. Cl. 502—317 **7 Claims**



1. A lean-burn engine catalyst for promoting oxidation-reduction reactions of exhaust gases containing nitrogen oxides, carbon monoxide, and hydrocarbons, the catalyst consisting essentially of:

a support material comprising more than 50% by weight γ-alumina,

a layer of tungsten deposited on said support material, the tungsten comprising between about 0.01 and 1.5 weight percent based on the weight of said support material, and

a layer of silver deposited on the support material carrying tungsten, the silver comprising between about 1 and 3 weight percent based on the weight of said support material.

5,593,934

PLATINUM ALLOY CATALYST

Paul Stonehart, Madison, Conn., assignor to Tanaka Kikinzoku Kogyo K.K., Japan, and Stonehart Associates Inc., Madison, Conn.

Continuation-in-part of Ser. No. 167,224, Dec. 14, 1993. This application Dec. 7, 1994, Ser. No. 350,710

Int. Cl.[6] B01J *23/42*

U.S. Cl. 502—326 **1 Claim**

1. A non-carburized platinum alloy catalyst comprising a carbon support and, 40 to 90 atomic % of platinum, 30 to 5 atomic % of manganese and 30 to 5 atomic % of iron supported thereon.

5,593,935

CATALYSTS

Stanislaw E. Golunski, and John W. Hayes, both of Reading, United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Aug. 1, 1994, Ser. No. 283,569

Claims priority, application United Kingdom, Aug. 14, 1993, 9316955

Int. Cl.[6] B01N *23/00;23/40;23/42*

U.S. Cl. 502—339 **11 Claims**

1. A catalyst for alkane dehydrogenation, comprising by weight 0.1 to 3% platinum, calculated as metal, 6 to 60% tin oxide, and 37 to 94.9% zirconium oxide, the platinum deposited upon a support which is a mixture of the tin oxide and the zirconium oxide.

5,593,936

HYDRATED NIOBIUM OXIDE AND HYDRATED TANTALUM OXIDE CATALYSTS, THEIR PREPARATION AND A PROCESS FOR PREPARING N-ALKYLATED ANILINES USING THESE CATALYSTS

Volker Glock, Krefeld; Ursula Pentling, Kempen; Bernd Pennemann, Köln; Joerg-Dietrich Jentsch, Mülheim; Eberhard Zirngiebl, Köln, and Horst Köller, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1995, Ser. No. 410,466

Claims priority, application Germany, Mar. 31, 1994, 44 11 234.3

Int. Cl.[6] B01J *23/20*

U.S. Cl. 502—354 **4 Claims**

1. A catalyst comprising at least one oxide selected from the group consisting of hydrated niobium oxide and hydrated tantalum oxide, having pores with diameters in the range from 0.4 to 10,000 nm, in which catalyst the volume of pores having a diameter of from 100 to 1,000 nm makes up at least 30% of the total pore volume of the catalyst, the catalyst having a lateral fracture hardness of over 20N.

5,593,937

IMAGE-BEARING MEMBER AND METHOD FOR RECYCLING THE SAME

Tadashi Saito; Kiyoshi Tanikawa, both of Yokohama; Eiichi Kawamura, and Toshiyuki Kawanishi, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 278,844

Claims priority, application Japan, Jul. 22, 1993, 5-201886

Int. Cl.[6] B41M *5/128*

U.S. Cl. 503—201 **10 Claims**

1. A method of recycling an image-bearing member comprising a support material, at least part of said support material comprising a paper layer which comprises cellulose fibers and bears an image formed by a thermofusible or heat-softening ink which comprises a dye coloring component, comprising the steps of:

bringing said image-bearing member and image into contact with an aqueous solution of a discoloring agent capable of discoloring said dye coloring component of said thermofusible or heat-softening ink; and

peeling said image off said paper layer by an image peeling-off member which is adhesive to said image which has been contacted with said aqueous solution with the application of heat and/or pressure thereto.

5,593,938

THERMAL-SENSITIVE RECORDING MATERIAL

Koh Takeuchi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

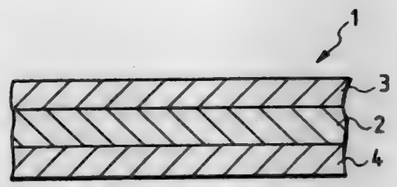
Filed May 24, 1995, Ser. No. 449,271

Claims priority, application Japan, May 27, 1994, 6-115253

Int. Cl.[6] B41M *5/40*

U.S. Cl. 503—206 **4 Claims**

1. A thermal-sensitive recording material comprising (a) a transparent support, (b) a thermal-sensitive recording layer formed on one surface of the transparent support, and (c) a light reflection reducing layer formed on the other surface of the transparent support, wherein the chromaticity coordinates according to JIS-Z8701 of said transparent support are within a quadrilateral region having 4 points A(x = 0.2805, y=0.3005), B(x= 0.2820, y=0.2970), C(x= 0.2885, y=0.3015) and D(x=0.2870, y= 0.3040) as vertices, and the thermal-sensitive recording material on the side of said light reflection reducing layer has a glossiness of from 1 to 50% at an incident angle of 20°.



resins and predominantly comprises a styrene-acrylonitrile copolymer, the styrene-acrylonitrile copolymer having an acrylonitrile copolymerization ratio of 20 to 40 mol %, a molecular weight of 10×10^4 to 20×10^4 and a softening point of about 400° to about 450° C., and the back coating layer has a thickness of 0.01 to 0.5 μm.

5,593,939

THERMAL TRANSFER IMAGE RECEIVING SHEET, PRODUCTION PROCESS THEREFOR AND THERMAL TRANSFER SHEET

Hitoshi Saito; Kazunobu Imoto; Takeshi Ueno; Katsuyuki Oshima; Mineo Yamauchi; Hiroshi Eguchi; Hideaki Sato; Hideo Fujimura, and Mikio Asajima, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Division of Ser. No. 755,116, Sep. 5, 1991, Pat. No. 5,356,853.

This application Jul. 27, 1994, Ser. No. 281,453

Claims priority, application Japan, Sep. 7, 1990, 2-235618; Sep. 27, 1990, 2-255162; Sep. 27, 1990, 2-255163; Sep. 27, 1990, 2-255167; Oct. 4, 1990, 2-265105; Oct. 4, 1990, 2-265110; Nov. 2, 1990, 2-297597; Jan. 21, 1991, 3-19192; Mar. 1, 1991, 3-57703

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **6 Claims**



1. A thermal transfer image receiving sheet comprising a substrate sheet, a cushion layer disposed on at least one surface side of the substrate sheet and a dye receptor layer disposed on the cushion layer, wherein said dye receptor layer contains substantially no filler and has a surface glossiness of 30% or below and said cushion layer contains a foaming agent.

5,593,941

PROCESS FOR PRODUCTION OF THERMALLY TRANSFERRED IMAGE-RECEPTIVE SHEET

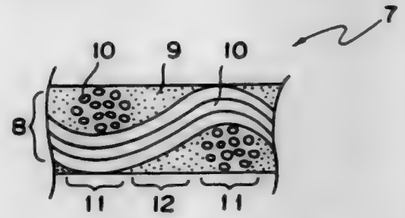
Hiromoto Kato, Omihachiman, and Hiroshi Fukuhara, Hikone, both of Japan, assignors to Dynic Corporation, Kyoto, Japan

Filed Dec. 27, 1994, Ser. No. 363,827

Claims priority, application Japan, Dec. 28, 1993, 5-335100; Nov. 1, 1994, 6-268615

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **4 Claims**



4. A thermally imaged image-receptive sheet comprising a) a woven fabric substrate, b) a coating of microporous receiving material and c) a thermally transferred image, wherein said sheet has a cover factor which is not lower than 1700 and a ratio of cover factor of woven fabric immediately after coating relative to that of the final product of from 0.97 to 1.03.

5,593,940

THERMAL TRANSFER SHEET

Shigeki Umise; Taro Suzuki, both of Tokyo-to, and Kyoichi Yamamoto, Kanagawa-ken, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 105,457, Aug. 10, 1993, abandoned, which is a division of Ser. No. 548,094, Jul. 5, 1990, Pat. No. 5,260,127. This application Nov. 17, 1994, Ser. No. 341,625

Claims priority, application Japan, Jul. 7, 1989, 1-176537; Jul. 7, 1989, 1-176538

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **2 Claims**

1. A thermal transfer sheet comprising a substrate film, a recording material layer formed on one surface side of the substrate film, and a back coating layer formed on the other surface side of the substrate film to be in contact with a thermal head, wherein the back coating layer comprises a binder which excludes silicone

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5,593,942

HERBICIDAL AGENTS BASED ON HETEROARYLOXYACETAMIDES AND METRIBUZIN

Hans-Joachim Santel, Leverkusen, and Dieter Feucht, Monheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP93/01732, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO94/02014, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 5, 1993, Ser. No. 356,401

Claims priority, application Germany, Jul. 16, 1992, 42 23 465.4

Int. Cl.[6] A01N *43/707;43/824*

U.S. Cl. 504—134 **10 Claims**

1. A herbicidal composition comprising (1) N-isopropyl-N-(4-fluorophenyl)-5-trifluoromethyl-1, 3, 4-thiadiazol-2-yl oxy)-acetamide and (2) a synergistically effective amount of metribuzine.

5,593,943

HETEROAROMATICALLY CONDENSED HYDROXYPYRIDONECARBOXAMIDES, THEIR PREPARATION AND USE AS HERBICIDES

Christoph Nuebling, Hasuloch; Wolfgang von Deyn, Neustadt; Hans Theobald, Limburgerhof; Karl-Otto Westphalen, Speyer; Uwe Kardorff, Mannheim; Helmut Walter, Obrigheim, all of Germany; Thomas Kappe, Graz, Austria, and Matthias Gerber, Limburgerhof, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

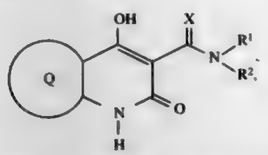
Division of Ser. No. 107,383, Aug. 17, 1993, Pat. No. 5,378,679. This application Jun. 17, 1994, Ser. No. 261,967

Claims priority, application Germany, Aug. 21, 1992, 42 27 747.7

Int. Cl.[6] C07D *401/06;401/02;* A01N *43/42;43/44*

U.S. Cl. 504—221 **5 Claims**

1. Heteroaromatically condensed hydroxypyridonecarboxamides of the structure I



(I)

where the substituents and the ring have the following meanings:

R^1 hydrogen, hydroxyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl, C_3–C_{12}-alkynyl, C_3–C_8-cycloalkyl or C_1–C_{12}-alkoxy, wherein the alkyl, alkenyl, alkynyl, cycloalkyl or alkyl portion of the alkoxy group is substituted or unsubstituted;

R^2 hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl, C_3–C_{12}-alkynyl, C_3–C_8-cycloalkyl, C_3–C_8-alkenyloxy or di-C_1–C_4-alkylamino wherein the alkyl, alkenyl, alkynyl, cycloalkyl, alkenyl portion of the alkenyloxy or the di-alkyl portion of the di-alkylamino group is substituted or unsubstituted;

or

R^1, R^2 together denote a C_2–C_6-alkylene chain, wherein the alkylene chain is uninterrupted or is interrupted by oxygen, sulfur or N-methyl;

X is oxygen or sulfur;

Q is a 5-membered heterocyclic ring which is unsubstituted or mono- to tri-substituted,

and environmentally tolerated salts thereof.

5,593,944

AMINOARYL-1,3-OXAZINE-2,4-DIONES

Pieter Ooms, Krefeld; Hans-Joachim Santel, and Markus Dollinger, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

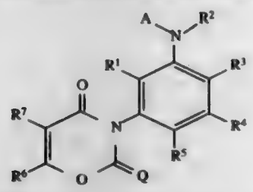
Filed Aug. 2, 1994, Ser. No. 284,763

Claims priority, application Germany, Aug. 9, 1993, 43 26 649.5

Int. Cl.[6] A01N *43/86;* C07D *265/12;265/10*

U.S. Cl. 504—240 **12 Claims**

1. An aminoaryl-1,3-oxazine-2,4-dione of the formula



(I)

in which

A represents hydrogen or C_1–C_6-alkyl,

Q represents oxygen or sulphur,

R^1 represents hydrogen or halogen,

R^2 represents, C_2–C_6-alkenyl, C_2–C_6-alkynyl, C_1–C_6-alkylcarbonyl, C_1–C_6-alkoxycarbonyl, C_1–C_6-alkylaminocarbonyl, C_1–C_6-alkylsulphonyl, or di(C_1–C_4-alkyl)-aminosulphonyl wherein each of said groups is optionally substituted by halogen or C_1–C_4-alkoxy,

R^2 furthermore represents phenyl, phenylcarbonyl, phenyl-C_1–C_4-alkyl, phenylsulphonyl or phenyl-C_1–C_4-alkylsulphonyl wherein each said groups is optionally substituted by halogen, cyano, nitro, carboxyl, carbamoyl, optionally substituted C_1–C_4-alkyl, optionally substituted C_1–C_4-alkoxy, optionally substituted C_1–C_4-alkylthio, optionally substituted C_1–C_4-alkylsulphinyl, optionally substituted C_1–C_4-alkylsulphonyl or C_1–C_4-alkoxycarbonyl wherein the optionally substituent is halogen,

R^3 represents hydrogen, halogen, cyano, methyl, trifluoromethyl or methoxycarbonyl,

R^4 represents hydrogen or halogen,

R^5 represents hydrogen or halogen,

R^6 represents hydrogen, halogen, or represents C_1–C_4-alkyl or phenyl, each of

which is optionally substituted by halogen, and

R^7 represents hydrogen, halogen, or represents C_1–C_6-alkyl or phenyl, each of which is optionally substituted by halogen, or together with R^6 represents C_3–C_5-alkanediyl, or together with R^6 forms a benzo group.

5,593,945

N-CYANOARYL-NITROGEN HETEROCYCLES

Roland Andree; Mark-Wilhelm Drewes, both of Langenfeld; Albrecht Marhold, Leverkusen; Hans-Joachim Santel, Leverkusen, and Markus Dollinger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

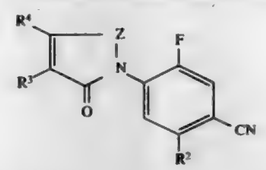
Filed Aug. 11, 1994, Ser. No. 289,071

Claims priority, application Germany, Aug. 18, 1993, 43 27 743.8; Apr. 8, 1994, 44 12 079.6

Int. Cl.[6] A01N *43/48;* C07D *498/02;239/24;403/02*

U.S. Cl. 504—243 **26 Claims**

1. A N-cyanoaryl-nitrogen heterocycle of the formula



wherein

R^2 is fluorine, chlorine, bromine, cyano, amino or the group —$N(A^1)SO_2A$ in which

A is a radical selected from the group consisting of alkyl, alkenyl and alkinyl, each of which has up to 10 carbon atoms and each of which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy, or

A is cycloalkyl or cycloalkylalkyl, each of which has 3 to 8 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkyl, or

A is aryl or arylalkyl, each of which has 6 or 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, carboxyl, carbamoyl, by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (each of which is optionally substituted by at least one of fluorine and chlorine), by dimethylaminosulphonyl or diethylaminosulphonyl, by C_1–C_4-alkoxycarbonyl (which is optionally substituted by fluorine,

chlorine, bromine, methoxy or ethoxy), by phenyl, phenyloxy or phenylthio (each of which is optionally substituted by at least one of fluorine, chlorine, bromine, cyano, methyl, methoxy, trifluoromethyl and trifluoromethoxy), or

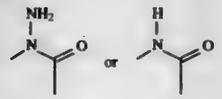
A is thienyl, pyrazolyl or pyridyl, or thienyl-pyrazolyl- or pyridyl-alkyl having 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, carboxyl, carbamoyl, by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl or C_1–C_4-alkoxycarbonyl (each of which is optionally substituted by at least one of fluorine and chlorine), by phenyl, phenoxy or phenylthio (each of which is optionally substituted by at least one of fluorine, chlorine, bromine, cyano, methyl, methoxy, trifluoromethyl and trifluoromethoxy),

A^1 is hydrogen or alkyl, alkenyl, alkinyl, alkoxy, alkylcarbonyl or alkoxycarbonyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen or C_1–C_4-alkoxy, or is phenylcarbonyl, naphthylcarbonyl, phenylmethylcarbonyl, naphthylmethylcarbonyl, phenoxycarbonyl or napthyloxycarbonyl (each of which is optionally substituted by at least one of fluorine, chlorine, bromine, cyano, methyl, methoxy, trifluoromethyl and trifluoromethoxy),

R^3 is hydrogen, fluorine, chlorine, bromine, cyano or alkyl having 1 to 6 carbon atoms which is optionally substituted by at least one of fluorine and/or chlorine,

R^4 is alkyl having 1 to 6 carbon atoms which is optionally substituted by fluorine, chlorine, bromine, methoxy or ethoxy, or together with R^3 is alkanediyl having 2 to 8 carbon atoms, and

Z is



or a salt thereof with a base.

5,593,946

OXADIAZOLE CARBONAMIDE HERBICIDAL COMPOUNDS

Wolfgang Buck, In der Dorrwies 37, 55218 Ingelheim, Germany

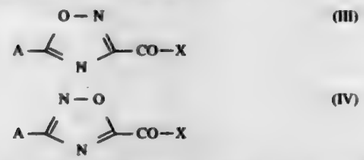
Division of Ser. No. 318,327, Oct. 5, 1994. This application Jun. 1, 1995, Ser. No. 457,252

Claims priority, application European Pat. Off., Oct. 8, 1993, 93116308

Int. Cl.[6] A01N *43/836;* **A61K** *31/41;* **C07D** *271/06*

U.S. Cl. 504—265 **4 Claims**

1. A herbicidal compound of formula III or IV



(III)

(IV)

where X represents a halogen atom or a C_{1-4} alkoxy group, and A represents a branched alkyl, alkenyl, or cycloalkyl group.

5,593,947

METHOD FOR MORE EFFICIENT UPTAKE OF PLANT GROWTH NUTRIENTS

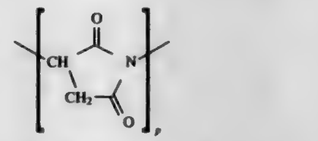
Alan M. Klaneruley, Knoxville, Tenn.; Larry P. Koskan, Orland Park, Ill.; David J. Strom, New Market, Tenn., and Abdul R. Y. Meah, Justice, Ill., assignors to Donlar Corporation, Bedford Park, Ill.

Continuation-in-part of Ser. No. 972,375, Nov. 5, 1992, Pat. No. 5,350,735. This application Sep. 27, 1994, Ser. No. 313,436

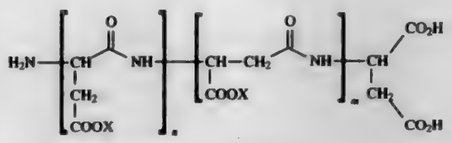
Int. Cl.[6] A01N *43/36;59/06;37/30*

U.S. Cl. 504—283 **8 Claims**

1. A method for enhancing a more efficient uptake and utilization of plant growth nutrients by supplying to the plant a polyaspartic acid either directly or hydrolyzed from polysuccinimide that is water soluble, has a weight average molecular weight (Mw) larger than 1500 and is a non-chelating, non-aromatic polymer that cannot be absorbed by the plant having one of the following structures:



alpha-linked monomer



beta-linked monomer

where $X=H^+$, Na^+, NH_4^+, K^+, Ca^{++}, Mg^+, Zn^{++}, Co^{++}, Li^+, Ba^{++}, Fe^{++} and Fe^{+++}; n=0–100 mole % of aspartic acid mer units linked by α-peptide bonds or α form units; m=0–100 mole % of aspartic acid mer units linked by β-peptide bonds or β form units; and p=10–1000.

5,593,948

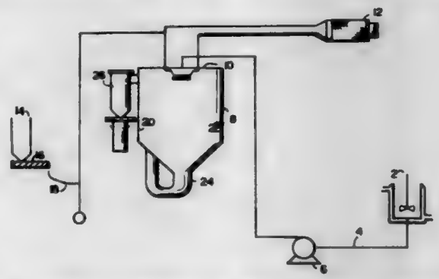
HIGHLY CONCENTRATED, SOLID ACIFLUOREN POWDERS AND PROCESSES FOR MAKING DRY FORM SOLID ACIFLUORFEN POWDERS

Rudolph E. Lisa, Grosse Ile, and Terence K. Klibride, Jr., Bloomfield Hills, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.

Filed Apr. 28, 1994, Ser. No. 234,886

Int. Cl.[6] A01N *25/14;37/10*

U.S. Cl. 504—324 **22 Claims**



1. A method of making a dry, flowable powder of acifluorfen or its agronomically acceptable salts using a spray dryer comprising dissolving a citrate sequestrant in an aqueous solution of acifluorfen salt at an elevated temperature and drying said acifluorfen.

5,593,949

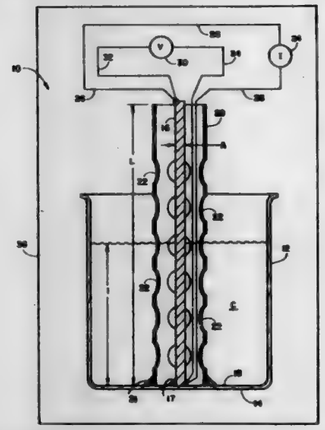
HIGH TEMPERATURE CONDUCTOR PROBES FOR DETERMINING LIQUID LEVEL OF CRYOGENS

Eddie M. Leung, San Diego, and Kenneth R. Dawson, Alpine, both of Calif., assignors to Lockheed Martin Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 86,585, Jul. 6, 1993, abandoned. This application May 31, 1994, Ser. No. 251,211

Int. Cl.[6] G01F *23/24;* **H01L** *39/04*

U.S. Cl. 505—160 **19 Claims**



1. A method of detecting the level of a liquid cryogen having a predetermined boiling point and held in a container which comprises:

positioning a longitudinally extending, self-supporting, sensing member, composed of a high temperature superconductor material having a cross sectional area of A, a predetermined length L, a resistivity ϵ and a critical temperature that exceeds the boiling point of the liquid cryogen, vertically in a body of the liquid cryogen and normal to the surface of the liquid cryogen, said liquid cryogen being held in a container having a relatively flat bottom inner surface against which the lower end of said sensing member is maintained in contact;

positioning a porous protective sheathing around the high temperature superconductor member so that the level of the liquid cryogen within the container penetrates said sheathing to surround said high temperature superconductor member and assume the same level within the sheathing as in the container and causing the portion of the sensing member below the level of the liquid cryogen to reach its superconducting state;

passing an electrical current having a predetermined value through the length of the high temperature superconductor member;

measuring the voltage drop across such member in response to the passage of electrical current therethrough; and

determining the level of the liquid cryogen within the container according to the voltage drop measured across said high temperature superconductor member.

13. An arrangement for detecting the level of a liquid cryogen having a predetermined boiling point and held in a container which comprises:

a container adapted to receive a liquid cryogen having a predetermined boiling point, said container configured to provide a uniform depth of the liquid cryogen within said container;

a longitudinally extending self-supporting sensing member having a predetermined length and having a uniform cross section over its length and being composed of a high temperature superconductor material that has a critical temperature that exceeds the boiling point of the liquid cryogen, said member being vertically positioned within the container so that one end contacts the bottom of the container and the other end extends normally to the surface of the liquid cryogen;

a hollow tube provided with a plurality of apertures longitudinally extending along the tube and positioned vertically within the container to surround said superconductor member, and

electrical means coupled to the superconductor sensing member and adapted to pass an electrical current through said superconductor member whereby the voltage drop across the length of the superconductor member that is not in its superconducting state due to being immersed in the liquid cryogen is representative of the depth of the liquid cryogen within said container.

5,593,950

LATTICE MATCHING SUPER CONDUCTING DEVICE WITH A- AND C- AXES

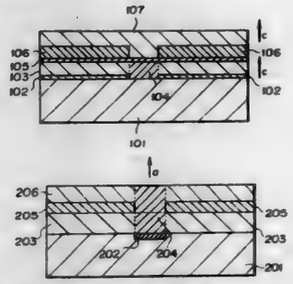
Masashi Mukaida; Shintaro Miyazawa, both of Isehara, and Junya Kobayashi, Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Corporation, Chiyoda-ku, Japan

Filed Jul. 27, 1993, Ser. No. 97,235

Claims priority, application Japan, Jul. 28, 1992, 4-220778; Aug. 24, 1992, 4-223796; Sep. 9, 1992, 4-240501

Int. Cl.[6] H01L *39/00;39/22;39/24*

U.S. Cl. 505—234 **5 Claims**



1. A superconducting thin film interlayer wiring comprising:

a substrate having a main surface;

first and second adjacent regions provided in parallel to said main surface of said substrate;

a lower superconducting thin film formed on said substrate in said first and second regions thereof and consisting essentially of a superconductor represented by a formula:

$LnBa_2Cu_3O_x$

wherein Ln represents an element selected from the group consisting of yttrium and a lanthanide, and $6<x<7$;

an upper superconducting thin film formed on said lower superconducting thin film and consisting essentially of said superconductor represented by said formula $LnBa_2Cu_3O_x$;

said superconducting thin films having both a larger coherent length region having a larger coherence length in a direction perpendicular to the main surface of said substrate, and a smaller coherent length region having a smaller coherence length in a direction perpendicular to the main surface of said substrate, the larger coherent length regions of said upper and lower superconducting thin films being provided in one of the first and second adjacent regions of the main surface of said substrate;

a first layer provided between said main surface of said substrate and said lower superconducting thin film in said first region of the main surface of said substrate, said first layer having a lattice mismatch with respect to said superconductor represented by said formula $LnBa_2Cu_3O_x$ different from the lattice mismatch of said substrate with respect to said superconductor;

a second layer provided between said lower superconducting thin film and said upper superconducting thin film in said

smaller coherent length region, said second layer having a lattice mismatch with respect to said superconductor represented by said formula $LaBa_2Cu_3O_x$;

whereby electron pairs are transmitted between said upper and lower superconducting thin films in said larger coherent length regions.

5,593,951

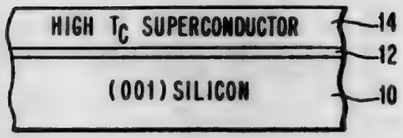
EPITAXY OF HIGH T_C SUPERCONDUCTORS ON SILICON

Franz J. Himpsel, Mt. Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 208,114, Feb. 22, 1994, abandoned, which is a division of Ser. No. 893,958, Jun. 4, 1992, Pat. No. 5,296,458, which is a continuation of Ser. No. 632,589, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 560,242, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 351,288, May 9, 1989, abandoned, which is a continuation of Ser. No. 151,772, Feb. 3, 1988, abandoned. This application May 18, 1995, Ser. No. 443,826

Int. Cl.[6] B32B *9/00*

U.S. Cl. 505—235 **3 Claims**



1. A high T_c copper-oxide superconductor-substrate combination comprising:

a substrate including a layer of silicon having a (001) surface thereof,

an intermediate layer over said silicon layer, said intermediate layer being substantially epitaxial with said (001) silicon surface and being essentially non-reactive with said silicon layer and said superconductor at the temperatures used to form a high T_c copper-oxide superconductor layer and which is selected from the group consisting of BaO, SrO, CuO, Y_2O_3, CaF_2, BaF_2, alloys thereof and metal silicide; and

said layer of high T_c copper-oxide superconductor formed on said intermediate layer and having lattice matching to said (001) silicon surface on said intermediate layer, said superconductor having a unit cell characterized by crystallographic axes a, b, c, two out of said a, b, c, axes being oriented substantially 45 degrees with respect to the corresponding two axes of the unit cell of said silicon layer and the remaining axis of said superconductor unit cell being substantially perpendicular to said (001) surface of said silicon layer, said high T_c copper-oxide superconductor is comprised of Y-Ba-Cu oxide.

5,593,952

AMPHOTERIC ACETATES AND GLYCINATES AS SHALE STABILIZING SURFACTANTS FOR AQUEOUS WELL FLUIDS

Michael Jarrett, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 12, 1995, Ser. No. 421,373

Int. Cl.[6] B01F *17/42*

U.S. Cl. 507—131 **13 Claims**

1. A method for minimizing hydration and preventing erosion loss of water-sensitive shale substrates by aqueous-base drilling fluids comprising the step of treating an aqueous-base drilling fluid with an effective amount of an amphoteric surfactant selected from the group consisting of acetates, diacetates, and glycinates.

5,593,953

FRICTION MODIFIER FOR OIL-BASED (INVERT) WELL DRILLING FLUIDS AND METHODS OF USING THE SAME

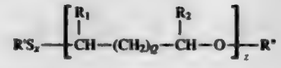
George A. Malchow, Jr., Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 26, 1995, Ser. No. 429,413

Int. Cl.[6] C09K *7/06*

U.S. Cl. 507—135 **30 Claims**

1. A drilling fluid composition comprising a water-in-oil emulsion formed from a brine, a liquid oil, (A) an emulsifier, (B) a friction modifier of the following formula:



where X=1 to 4,

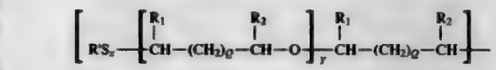
z=1 to 6,

Q=0 to 2

R_1 and R_2 are independently H or an aliphatic group containing from 1 to about 16 carbon atoms, provided that the sum of the carbon atoms in R_1 and R_2 is between 0 and about 16,

R' is an aliphatic group containing an average of from about 8 to about 24 carbon atoms, and

R* is selected from the group consisting of H, an aliphatic group containing between 1 and an average of about 18 carbons, and



where Q, X, z, R_1, R_2, R' and R* are defined as set forth above, and Y is 0 to 5.

5,593,954

FRICTION MODIFIER FOR WATER-BASED WELL DRILLING FLUIDS AND METHODS OF USING THE SAME

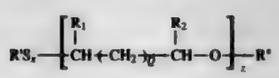
George A. Malchow, Jr., Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 26, 1995, Ser. No. 429,436

Int. Cl.[6] C09K *7/02*

U.S. Cl. 507—135 **33 Claims**

1. A water-based drilling fluid composition comprising a mixture of a brine (A) an emulsifier, and (B) an oil soluble friction modifier of the following formula:



where

X=1 to 4,

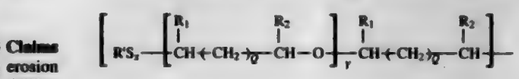
z=1 to 6,

Q=0 to 2

R_1 and R_2 are independently H or an aliphatic group containing from 1 to about 16 carbon atoms, provided that the sum of the carbon atoms in R_1 and R_2 is between 0 and about 16,

R' is an aliphatic group containing an average of from about 8 to about 24 carbon atoms, and

R* is selected from the group consisting of H, an aliphatic group containing between 1 and an average of about 18 carbons, and



where

Q, X, z, R_1, R_2, R' and R* are defined as set forth above, and Y is 0 to 5.

5,593,955

METHOD FOR REDUCING THE POUR POINT OF AN OIL AND COMPOSITIONS FOR USE THEREIN

Charles L. Kissel, Anaheim, Calif., assignor to Entek Corporation, Brea, Calif.

Filed Dec. 21, 1994, Ser. No. 360,380

The portion of the term of this patent subsequent to Dec. 21, 2014, has been disclaimed.

Int. Cl.[6] E21B *37/06;43/22*

U.S. Cl. 507—239 **36 Claims**

1. A method for lowering the pour point of an oil in a system for producing, transporting, holding, or processing the oil, the method comprising the step of forming an aqueous, carbon disulfide precursor- and compound-containing solution in situ in the system by:

(a) introducing an aqueous, carbon disulfide precursor-containing solution into the oil-containing system; and

(b) introducing an aqueous, compound-containing solution into the oil-containing system, where the compound is selected from the group consisting of urea, biuret, oxyalkylated urea, methylurea, ethylene urea, triuret, formamide, dimethylformamide, acetamide, propionamide, butyramide, valeramide, caproamide, benzamide, acetanilide, and mixtures thereof, where the ratio of the weight percent of the carbon disulfide precursor to the weight percent of the compound in the solution is less than 2:1.

5,593,956

DRY WIRE DRAWING LUBRICANTS

David P. Gozsh, Lisle, N.Y., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 400,688, Mar. 8, 1995, abandoned, which is a continuation of Ser. No. 46,042, Apr. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 34,926, Mar. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 889,027, May 26, 1992, abandoned. This application Feb. 7, 1996, Ser. No. 597,651

Int. Cl.[6] C10M *129/26*

U.S. Cl. 508—459 **15 Claims**

1. Shaped, dust-free dry wire drawing lubricants which are comprised of metal soaps and have a fatty acid content of at least about 30% by weight, have at least one reproducibly controlled dimension, and are pulverizable by the wire in wire drawing processes at a force between about 10 psi and about 300 psi into viscous lubricating films.

5,593,957

SYNTHETIC LUBRICATING OIL CONTAINING AN ESTER AND WORKING FLUID COMPOSITION FOR REFRIGERATING MACHINE CONTAINING SAME

Nobutoshi Obara; Nobuhiko Shizuka, and Fujio Takahashi, all of Hyogo, Japan, assignors to NOF Corporation, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 268,023

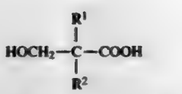
Claims priority, application Japan, Jun. 30, 1993, 5-188712; Jun. 30, 1993, 5-188713

Int. Cl.[6] C10M *105/38;103/42*

U.S. Cl. 508—501 **13 Claims**

1. A synthetic lubricating oil comprising an ester derived from (a) a monohydric alcohol having 4 to 18 carbon atoms which has a branched alcohol content of not less than 50 mol % and/or a neopentyl polyol having not more than 30 carbon atoms, (b) a hydroxycarboxylic acid condensate having an average degree of polymerization of not less than 12, and (c) a monocarboxylic acid having 4 to 18 carbon atoms which has a branched carboxylic acid content of not less than 50 mol %, said hydroxycarboxylic acid condensate being selected from the group consisting of:

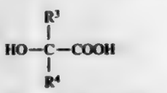
(i) a condensate of a hydroxycarboxylic acid represented by formula (1):



(1)

wherein R^1 and R^2 each represents a hydrogen atom, a hydroxyl group, a $—CH_2OH$ group, or an alkyl group, provided that when one of R^1 and R^2 is a hydrogen atom, the other is not a hydrogen atom;

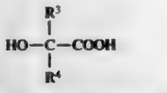
(ii) a condensate of a 2-hydroxycarboxylic acid represented by formula (2):



(2)

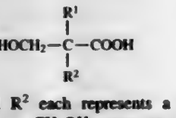
wherein R^3 and R^4 each represents a hydrogen atom, a hydroxyl group, or an alkyl group, provided that when one of R^3 and R^4 is a hydrogen atom, the other is not a hydrogen atom; and

(iii) a condensate of a 2-hydroxycarboxylic acid represented by formula (2);



(2)

wherein R^3 and R^4 each represents a hydrogen atom, a hydroxyl group, or an alkyl group, provided that when one of R^3 and R^4 is a hydrogen atom, the other is not a hydrogen atom with a hydroxycarboxylic acid represented by formula (1):



(1)

wherein R^1 and R^2 each represents a hydrogen atom, a hydroxyl group, a $—CH_2OH$ group, or an alkyl group, provided that when one of R^1 and R^2 is a hydrogen atom, the other is not a hydrogen atom.

5,593,958

CLEANING COMPOSITION IN MICROEMULSION, CRYSTAL OR AQUEOUS SOLUTION FORM BASED ON ETHOXYLATED POLYHYDRIC ALCOHOLS AND OPTION ESTERS'S THEREOF

Myriam Mondin, Seraing; Myriam Loth, Saint-Nicholas; Guy Broze, Grace-Hollogne, all of Belgium; Emmanuel Mehreteab, Piscataway; Barbara Thomas, Princeton; Steven Adamy, Hamilton, and Frank Bain, Jr., Middlesex, all of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

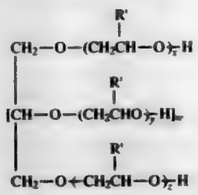
Filed Feb. 6, 1995, Ser. No. 385,212

Int. Cl.[6] C11D *17/00;1/74;1/83*

U.S. Cl. 510—417 **19 Claims**

1. A microemulsion composition comprising:

(a) about 0.1 wt. % to about 20 wt. % of



wherein w equals one to four and x, y and z have a value between 0 and 60, provided that (x+y+z) equals about 2 to about 100 and R' is hydrogen;

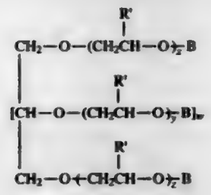
(b) about 0.1 wt. % to about 20 wt. % of an anionic surfactant wherein said anionic surfactant is selected from the group consisting of sulfonated anionic surfactants and anionic sulfate surfactants;

(c) about 0.1 wt. % to about 50 wt. % of a cosurfactant, wherein said cosurfactant is selected from the group consisting of polypropylene glycols of the formula $HO(CH_3CHCH_2O)_nH$ wherein n is 2 to 18, aliphatic mono- and di-carboxylic acid containing 2 to 10 carbon atoms and a water soluble glycol ether and mixtures thereof;

(d) about 0.1 wt. % to about 10 wt. % of a water insoluble hydrocarbon or a perfume; and

(e) the balance being water.

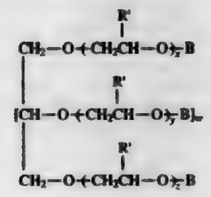
13. The composition of claim 1 further including 0 to 10 wt. % of a monoester of an ethoxylated polyhydric alcohol having the formula:



wherein w equals one to four, and two of the B's are hydrogen and one B is selected from the group consisting of a group represented by:



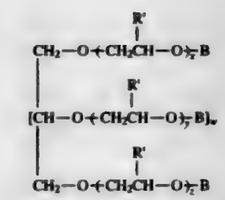
wherein R is selected from the group consisting of alkyl group having about 6 to 22 carbon atoms, and alkenyl groups having about 6 to 22 carbon atoms and x, y and z have a value between 0 and 60, provided that (x+y+z) equals about 2 to about 100 and R' is hydrogen; and 0 to 2 wt. % of a diester of an ethoxylated polyhydric alcohol and having the formula:



wherein w equals one to four, and one of the B's is hydrogen and two B's are selected from the group consisting of a group represented by:



wherein R is selected from the group consisting of alkyl group having about 6 to 22 carbon atoms, and alkenyl groups having about 6 to 22 carbon atoms and x, y and z have a value between 0 and 60, provided that (x+y+z) equals about 2 to about 100 and R' is hydrogen; and a triester of an ethoxylated polyhydric alcohol having the formula:



wherein w equals one to four, and the three B's are selected from the group consisting of a group represented by:



wherein R is selected from the group consisting of alkyl group having about 6 to 22 carbon atoms, and alkenyl groups having about 6 to 22 carbon atoms, x, y and z have a value between 0 and 60, provided that (x+y+z) equals about 2 to about 100 and R' is hydrogen.

5,593,959

MUTATIONS IN THE GENE ENCODING THE ALPHA CHAIN OF PLATELET GLYCOPROTEIN IB

Jonathan L. Miller; David Cunningham; Vicki A. Lyle, all of Syracuse; Clara N. Finch, Webster, and Matthew R. Pincus, Syracuse, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Division of Ser. No. 770,968, Oct. 7, 1991, Pat. No. 5,317,097. This application Oct. 14, 1993, Ser. No. 135,929

Int. Cl.[6] C07K *14/705;14/745;* A61K *38/17;38/36*

U.S. Cl. 514—8 **17 Claims**

1. An isolated polypeptide encoded by an amino acid sequence for wild-type platelet glycoprotein Ib alpha having a mutation other than at amino acid 233 and within the region 228–238 which renders said polypeptide more reactive with von Willebrand factor than wild-type platelet glycoprotein Ib alpha, as measured by a ristocetin assay, wherein said mutation alters the three dimensional structure of said polypeptide, such that the lowest energy conformation of the polypeptide changes from a beta bend conformation to an amphipathic alpha helix conformation within the region 232–233 of said polypeptide.

5,593,960

CYCLIC HEPTAPEPTIDE ANTI-INFLAMMATORY AGENT

William H. Fenical, Del Mar; Robert S. Jacobs, Santa Barbara, and Paul R. Jensen, San Diego, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 198,859, Feb. 18, 1994, Pat. No. 5,444,043. This application May 23, 1995, Ser. No. 447,627

Int. Cl.[6] A61K *38/12;38/00*

U.S. Cl. 514—9 **3 Claims**

1. A biologically purified composition comprising a Streptomyces sp. bacterium which is capable of producing cyclomarin-A when said Streptomyces sp. is fermented in seawater-based media, said bacteria having the identifying characteristics of ATCC Depoait No. 55656.

5,593,961

Patent Not Issued For This Number

5,593,962

FIBRILLATED CALCITONIN PHARMACEUTICAL COMPOSITIONS

Tudor Arvinte; Amelia Cudd, both of Billingshurst, and Judith Phillips, Sevenoaks, all of England, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 866,672, Apr. 10, 1992, abandoned. This application Aug. 4, 1993, Ser. No. 102,117

Claims priority, application United Kingdom, Apr. 23, 1991, 9108634

Int. Cl.[6] A61K *38/00;38/02;38/30;* C07K *5/00*

U.S. Cl. 514—12 **13 Claims**

1. A method of treating calcium deficiency diseases which comprises administering a pharmaceutical composition comprising fibrillated calcitonin.

5,593,963

EXPRESSION OF PHYTASE IN PLANTS

Albert J. J. Van Ooijen, Voorburg; Krijn Rietveld, Vlaardingen; Andreas Hoekema, Oegstgeest; Jan Pen, Leiden; Peter C. Sijmons, Amsterdam, and Teunis C. Verwoerd, Leiden, all of Netherlands, assignors to Mogen International, Leiden, and Gist-brocades, B.V., Delft, both of Netherlands

Continuation-in-part of Ser. No. 756,864, Sep. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,765, Sep. 21, 1990, abandoned. This application Nov. 2, 1993, Ser. No. 146,424

Claims priority, application European Pat. Off., Mar. 25, 1991, 91200687

Int. Cl.[6] A61K *38/46;* C12N *15/83;* A01H *5/00;* A23K *1/165*

U.S. Cl. 514—12 **13 Claims**

1. A recombinant expression system capable, when contained in a higher plant cell or the cells of an intact higher plant, of expressing a first nucleotide sequence encoding a microbial protein which catalyzes the liberation of inorganic phosphate from myo-inositol hexakis-phosphate,

said expression system comprising said first nucleotide sequence encoding said protein operably linked to transcription controlling nucleotide sequences operable in a higher plant cell or in the cells of a higher plant.

5,593,964

METHOD OF TREATING SEPTIC SHOCK BY PREVENTING ACTIN POLYMERIZATION

Allan L. Goldstein, Bethesda, Md., and Mirela O. Fagarasan, Washington, D.C., assignors to The George Washington University Medical Center, Washington, D.C.

Continuation of Ser. No. 132,902, Oct. 7, 1993, abandoned. This application Aug. 18, 1994, Ser. No. 292,757

The portion of the term of this patent subsequent to Oct. 10, 2014, has been disclaimed.

Int. Cl.[6] A61K *38/17*

U.S. Cl. 514—12 **9 Claims**

1. A method of preventing septic shock by protecting a mammal against endotoxin shock following endotoxin introduction in said mammal, comprising administering to said mammal an effective amount of an actin antipolymerizer to said mammal, so as to protect said mammal against endotoxin shock.

5,593,965

ANTI-TUMOR EFFECTS OF GNRH-III

Sandor Lovas; J. Michael Conlon, both of Omaha, Nebr.; Borbala Vincze, Budapest, Hungary; Istvan Palyi, Budapest, Hungary; Dezso Gaal, Budapest, Hungary; Adrienn Kalnay, Budapest, Hungary; Imre Mezo, Budapest, Hungary; Istvan Teplan, Budapest, Hungary; Geza Toth, Szeged, Hungary, and Magdolna Kovacs, Pecs, Hungary, assignors to Creighton University, Omaha, Nebr.

Filed Oct. 20, 1994, Ser. No. 326,710

Int. Cl.[6] A61K *38/00*

U.S. Cl. 514—15 **4 Claims**

1. A method of inhibiting the proliferation of mammary tumor cells, comprising the step of administering a pharmacologically effective dose of the pharmaceutical composition of Gonadotropin Releasing Hormone-III to an human in need of such treatment.

5,593,966

PEPTIDE DERIVATIVES OF CYTOCHROME B_{558} AND THEIR USE AS MEDICAMENTS

Harry L. Malech, Bethesda, and Daniel Rotrosen, Takoma Park, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 331,652, Mar. 31, 1989, Pat. No. 5,585,346. This application May 24, 1990, Ser. No. 527,767

Int. Cl.[6] A61K *38/00;* C07K *7/00;7/06*

U.S. Cl. 514—16 **13 Claims**

1. A peptide which blocks superoxide production in phagocytic cells which has 7 amino acid residues and which is from a domain of the 91 kDa subunit of human cytochrome b_{558}, wherein said domain is from the carboxyl-terminal peptide portion of the molecule.

5,593,967

CHOLECYSTOKININ ANTAGONISTS, THEIR PREPARATION AND THERAPEUTIC USE

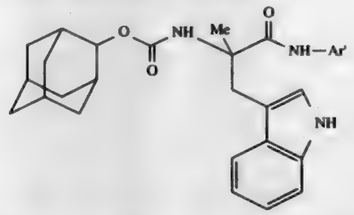
David C. Horwell, Cambridge; Edward Roberts, Wood Ditton, both of England; Ann Holmes, Dexter, Mich.; Janak K. Padia, Ann Arbor, Mich.; William H. Roark, Ann Arbor, Mich.; Bruce D. Roth, Ann Arbor, Mich.; Bharat K. Trivedi, Farmington Hills, Mich.; Jurgen Kleinschroth, Deuzlingen, Germany; David C. Rees, Cambridge, and Reginald S. Richardson, Haverhill, both of England, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 839,647, Feb. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 726,655, Jul. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 576,628, Aug. 31, 1990, abandoned. This application Apr. 1, 1993, Ser. No. 41,647

Int. Cl.[6] C07D *209/18;217/00;209/20;* A61K *38/00*

U.S. Cl. 514—18 **8 Claims**

1. A compound having the following formula



wherein Ar' is perhydroaryl or substituted perhydroaryl.

5,593,968

VIRUS-INACTIVATED FACTOR XA PREPARATION

Peter Turecek; Eibl Johann, and Hans-Peter Schwarz, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft, Vienna, Austria

Filed Aug. 2, 1994, Ser. No. 285,040

Claims priority, application Germany, Aug. 2, 1993, 43 25 872.7

Int. Cl.[6] A61K *38/36;35/16;* **C07K** *14/745;1/16*

U.S. Cl. 514—21 **32 Claims**

1. A method for the production of a virus-safe Factor Xa pharmaceutical preparation, comprising the steps of:

obtaining a human Factor Xa preparation having an activity of at least 100 units of Factor Xa activity per mg protein; and

treating said human Factor Xa preparation to inactivate viruses while substantially avoiding denaturation of Factor Xa in order to obtain said virus-safe Factor Xa pharmaceutical preparation.

5,593,969

LIPID-A ANALOGS: MONOSACCHARIDE AND DISSACCHARIDE COMPOUNDS FOR INHIBITING BINDING OF LIPID A RECEPTORS TO LIPID A RECEPTORS

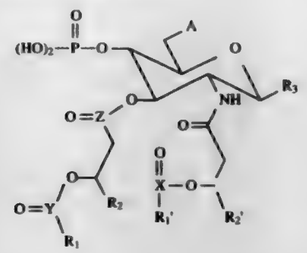
Balreddy Kamireddy; Michael J. Darsley, both of Rockville; David M. Simpson, Adelphi, and Richard J. Massey, Rockville, all of Md., assignors to IGEN Incorporated, Gaithersburg, Md.

Continuation of Ser. No. 871,229, Apr. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 861,362, Mar. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 761,868, Sep. 3, 1991. This application Sep. 17, 1993, Ser. No. 123,590

Int. Cl.[6] A61K *31/70;* **C07H** *3/02;3/04*

U.S. Cl. 514—25 **4 Claims**

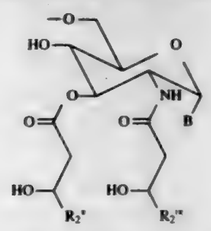
1. A compound of the formula:



(I)

wherein

each of R_1, R_1', R_2 and R_2' independent of each other is a branched or linear, substituted or unsubstituted, C_{1-12} alkyl, alkene or alkyne group, R_3 is OH, OCH_3, CH_2COOH or



wherein each of $R_{2''}$ and $R_{2'''}$, independent of each other is a branched or linear, substituted or unsubstituted C_{1-12} alkyl, alkene or alkyne group and:

A=NH_2, X=P(OH), Y=Z carbon, B, if present,=OCH_3, or

A=OH, X=P(OH), Y=Z=carbon, B, if present,=OCH_3, or

A=$OCO(CH_2)_nNH_2$, X=P(OH), Y=Z=carbon, B, if present,=OCH_3, wherein n=1–10, or

A=OH, X=P(OH), Y=Z=carbon, B, if present,=$O(CH_2)_nCO_2H$, wherein n=1–10, or

A=OH, X=P(OH), Y=Z=carbon, B, if present,=$C(CH_2)_nCO_2H$, wherein n=1–10, or

A=NH_2, X=Z=carbon, Y=P(OH), B, if present,=OCH_3, or

A=OH, X=Z=carbon, Y=P(OH), B, if present,=OCH_3, or

A=$OCO(CH_2)_nNH_2$, X=Z=carbon, Y=P(OH), B, if present,=OCH_3, wherein n=1–10, or

A=OH, X=Z=carbon, Y=P(OH), B, if present ,= $O(CH_2)_nCO_2H$, wherein n=1–11, or

A=OH, X=Z=carbon, Y=P(OH), B, if present,= $(CH_2)_nCO_2H$, wherein n=1–10, or

A=NH_2, X=Y=carbon, Z=P(OH), B, if present,=OCH_3, or

A=OH, X=Y=carbon, Z=P(OH), B, if present,=OCH_3, or

A=$OCO(CH_2)_nNH_2$, X=Y=carbon, Z=P(OH), B, if present,=OCH_3, wherein n=1–10, or

A=OH, X=Y=carbon, Z=P(OH), B, if present,=$O(CH_2)_nCO_2H$, wherein n=1–10, or

A=OH, X=Y=carbon, Z=P(OH), B, if present,=$(CH_2)_nCO_2H$ and n=1–11.

5,593,970

HETEROCYCLIC ANTHRACYCLINE ANALOGS

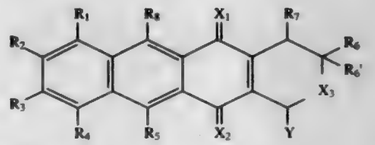
Giorgio Attardo, Laval, Canada; Jean-Louis Kraus, Marseilles, France; Marc Courchesne, Laval-des-Rapides, Canada; Serge Lamouthe, Boisbriand, Canada; Jean-François Lavallée, Laval, Canada; Elaine Lebeau, Kamloops, Canada; Dieu Nguyen, Chomedey, Canada; Rabindra Rej; Yves St-Denis, both of Montreal, Canada; Wuyi Wang, St-Laurent, Canada; Yao-Chang Xu, Indianapolis, Ind.; France Barbeau, Ste-Thérèse, and Bernard Belleau, deceased, late of Westmount, both of Canada, assignors to Biochem Pharma Inc., Laval, Canada

Continuation-in-part of Ser. No. 2,766, Jan. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 859,244, Mar. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 536,107, Jun. 11, 1990, abandoned. This application Jun. 20, 1994, Ser. No. 263,925

Int. Cl.[6] C07M *15/24;* **A61K** *31/70*

U.S. Cl. 514—34 **34 Claims**

1. A compound of the formula:



(10)

wherein

X_1 and X_2 are independently O; S; unsubstituted amino; or amino which is mono- or disubstituted by alkyl groups, hydroxyl groups, acyl groups, aryl groups or other amino groups;

X_3 is selected from the group consisting of: O; S; SO; SO_2; unsubstituted amino and amino which is mono- or disubstituted by alkyl groups, acyl groups, aryl groups or other amino groups;

R_1, R_2, R_3, R_4, R_5 & R_8 are each independently selected from the group consisting of: hydrogen; hydroxy; C_{1-16} alkyl; C_{1-16} acyl; halogen; silane; sulfonate; ureido; unsubstituted amino; and amino which is mono- or disubstituted by alkyl groups, acyl groups, aryl groups, alkenyl groups, alkynyl groups, or other amino groups;

R_6 is hydrogen; C_{1-16} alkyl or alkoxy, C_{1-16} acyl or acyloxy, C_{7-20} aryl or aryloxy; squaric acid or salts thereof; phosphonate; or a 5 or 6 membered aromatic or non-aromatic heterocycle, wherein the beteroatom is selected from the group consisting of O, S, N, SO, SO_2, P, PO and NR_{28} wherein R_{28} is selected from the group consisting of hydrogen, oxygen, hydroxyl, C_{2-8} acyl, C_{1-4} alkyl and C_{6-14} aryl;

R_6' is hydrogen; halogen; C_{1-16} alkyl or alkoxy; unsubstituted amino; amino which is mono- or disubstituted by alkyl groups, acyl groups, aryl groups or other amino groups; hydroxy; thiol; cyano; sulfide; C_{1-16} acyl or acyloxy;

R_7 is selected from the group consisting of:

hydrogen; halogen; hydroxy; C_{1-16} alkyl; cyano; amino; C_{1-16} acyl and acyloxy; and

Y is a saccharide which is a 5 or 6-membered sugar ring of natural or unnatural configuration linked to the heteroanthracycline through a carbon chain or through a heteroatom selected from the group consisting of oxygen, sulfur and amino.

32. A method of treating a tumor in an animal or human in need of such treatment, which method comprises the step of administering to said animal or human a therapeutically effective amount of at least one compound of claim 1.

5,593,971

METHOD FOR PREVENTING ONSET OF HYPERTENSION EMPLOYING A CHOLESTEROL LOWERING DRUG

Werner Tschollar, Lawrenceville, N.J.; Cary S. Yonce, Newtown, Pa.; James L. Bergey, Lansdale, Pa., and James C. Kawano, Narberth, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 143,968, Nov. 1, 1993, Pat. No. 5,461,039, which is a division of Ser. No. 891,243, Jun. 1, 1992, Pat. No. 5,298,497, which is a continuation of Ser. No. 524,269, May 15, 1990, abandoned. This application May 22, 1995, Ser. No. 445,621

Int. Cl.[6] A61K *31/70;31/675;31/44;31/40;31/04;31/235;31/225, 31/195;31/19;31/10*

U.S. Cl. 514—39 **14 Claims**

1. A method for treating a normotensive mammalian species having insulin resistance to inhibit hypertension, which comprises administering to a mammalian species in need of such treatment an effective amount of a cholesterol lowering drug which is a fibric acid derivative, probucol, dextrothyroxine or its sodium salt, colestipol or its hydrochloride, cholestyramine, nicotinic acid, neomycin, p-aminosalicylic acid or aspirin.

5,593,972

GENETIC IMMUNIZATION

David B. Weiner, Merion; William V. Williams, and Bin Wang, both of Havertown, all of Pa., assignors to The Wistar Institute, and The Trustees of the University of Pennsylvania, both of Philadelphia, Pa.

Continuation-in-part of Ser. No. 29,336, Mar. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 8,342, Jan. 26, 1993, abandoned. This application Sep. 21, 1993, Ser. No. 125,012

Int. Cl.[6] A61K *45/05;48/00;31/00*

U.S. Cl. 514—44 **9 Claims**

1. A method of immunizing an individual comprising:

injecting into skeletal muscle tissue of said individual at a site on said individual's body, bupivacaine and a DNA molecule that comprises a DNA sequence that encodes an antigen from a pathogen, said DNA sequence operatively linked to regulatory sequences which control the expression of said DNA sequence;

wherein said DNA molecule is taken up by cells in said skeletal muscle tissue, said DNA sequence is expressed in said cells and an immune response is generated against said antigen.

5,593,973

TREATMENT OF VIRAL HEPATITIS WITH MISMATCHED DSRNA

William A. Carter, Birchrunville, Pa., assignor to Hemispherx Biopharma Inc., Philadelphia, Pa.

Continuation of Ser. No. 158,357, Nov. 29, 1993, abandoned, which is a continuation of Ser. No. 967,579, Oct. 27, 1992, abandoned, which is a continuation of Ser. No. 713,083, Jun. 10, 1991, abandoned, which is a continuation of Ser. No. 560,273, Jul. 30, 1990, abandoned, which is a continuation of Ser. No. 237,018, Aug. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 93,523, Sep. 4, 1987, abandoned. This application Oct. 5, 1994, Ser. No. 318,514

Int. Cl.[6] A61K *31/70;* **C12Q** *1/68*

U.S. Cl. 514—44 **3 Claims**

1. A method of treating viral hepatitis comprising administering to a person having vital hepatitis an effective amount of a mismatched double-stranded RNA of the formula $ri_n{\cdot}r(C_{11-14}\cdot U)_n$.

5,593,974

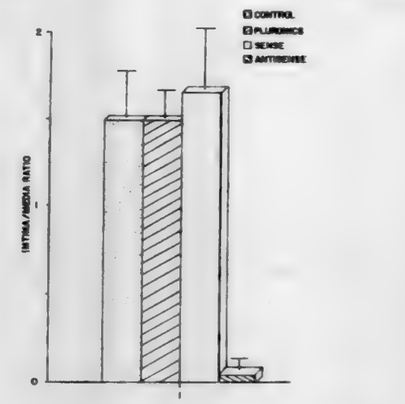
LOCALIZED OLIGONUCLEOTIDE THERAPY

Robert D. Rosenberg, Jamestown, R.I.; Michael Simons, Chestnut Hill, Mass.; Elazer Edelman, Brookline, Mass.; Robert S. Langer, Newton, Mass., and Jean-Luc DeKeyser, Brussels, Belgium, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 855,416, Mar. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 792,146, Nov. 8, 1991, which is a continuation-in-part of Ser. No. 723,454, Jun. 28, 1991, abandoned. This application Jan. 6, 1995, Ser. No. 369,282

Int. Cl.[6] A61K *48/00*

U.S. Cl. 514—44 **20 Claims**



1. A method of inhibiting translation of a target nucleic acid sequence preferentially at a vascular tissue locus in vivo to thereby inhibit restenosis at said locus, the method comprising:

directly applying to said vascular tissue locus within the body of a mammal an antisense oligonucleotide, comprising 14 to 38 nucleotide bases, that is complementary to a target nucleic acid sequence expressed in smooth muscle cells and necessary to initiate a target nucleic acid sequence expressed in smooth muscle cells and necessary to initiate or support proliferation thereof, in an amount sufficient to penetrate smooth muscle cells of the tissue at said locus, to hybridize with said target nucleic acid, and to inhibit intracellular translation of said target sequence to thereby inhibit restenosis at said locus, wherein said target nucleic acid is a gene coding for a protein selected from the group consisting of c-myb, NMMHC and PCNA.

5,593,975

ADENOSINE DERIVATIVES HAVING A_2 AGONIST ACTIVITY

Gloria Cristalli, Camerino, Italy, assignor to Schering Corporation, Kenilworth, N.J.

PCT No. PCT/EP93/00972, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO93/22328, PCT Pub. Date Nov. 11, 1993

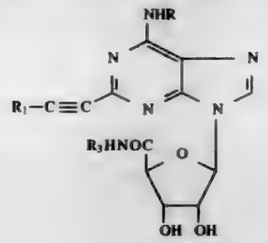
PCT Filed Apr. 21, 1993, Ser. No. 325,201

Claims priority, application Italy, Apr. 24, 1992, MI92A0973

Int. Cl.[6] A61K *31/70;* **C07H** *19/167*

U.S. Cl. 514—46 **8 Claims**

1. A compound represented by the structural formula



wherein

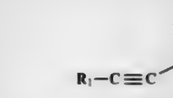
R is hydrogen, C_1-C_6 alkyl, C_3-C_7 cycloalkyl or phenyl-C_1-C_3 alkyl;

R_1 is selected from the group consisting of

a) phenyl or naphthyl optionally substituted with one to three halogen atoms selected from the group consisting of chloro, fluoro and bromo, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_2-C_6 alkoxycarbonyl, C_2-C_6 alkoxyalkyl, C_1-C_6 alkylthio, thio, CHO, cyanomethyl, nitro, cyano, hydroxy, carboxy, C_2-C_6 acyl, amino, C_1-C_3 monoalkylamino, C_2-C_6 dialkylamino, methylenedioxy or aminocarbonyl;

b) a group of formula $-(CH_2)_m$—Het wherein m is 0 or an integer from 1 to 3 and Het is a 5- or 6-membered heterocyclic aromatic or non-aromatic ring, optionally benzocondensed, containing 1 to 3 heteroatoms selected from the group consisting of oxygen, nitrogen and sulphur, linked through a carbon atom or through a nitrogen atom;

c) C_3-C_7 cycloalkyl optionally containing unsaturations or C_2-C_4 alkenyl; and

d) 

wherein

n is 0 or 1 to 4;

R_2 is hydrogen, methyl or phenyl;

R_4 is OH, NH_2, dialkylamino, halogen or cyano;

R_5 is hydrogen, C_1-C_6 linear or branched alkyl, C_3-C_6 cycloalkyl, C_3-C_7 cycloalkenyl or phenyl-C_1-C_2-alkyl; or R_2 and R_5, taken together, form a 5 or 6-membered carbocyclic ring; or R_5 is hydrogen and R_2 and R_4, taken together, form an oxo group or a corresponding acetalic derivative; and

R_3 is C_1-C_6 alkyl, C_3-C_7-cycloalkyl, phenyl or benzyl; provided that when R is different from hydrogen or when R is hydrogen and R_3 is cyclopeantyl, phenyl or benzyl, R_1 can also be C_1-C_6 linear or branched alkyl.

8. A pharmaceutical composition containing a compound of claim 1 in admixture with a suitable pharmaceutical carrier.

5,593,976

UREIDO DERIVATIVES OF POLY-4-AMINO-2-CARBOXY-1-METHYL COMPOUNDS

Nicola Mongelli, Milan; Giovanni Biasoli, Gavirate; Alfredo Palo, Cerusco sur Naviglio; Maria Grandi, Reggio Emilia, and Marina Clomel, Torre d'Isola, all of Italy, assignors to Farmitalia Carlo Erba S r l, Milan, Italy

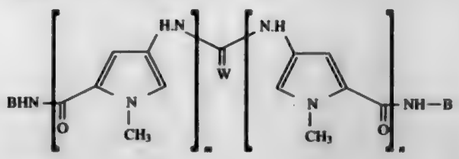
Division of Ser. No. 66,583, May 25, 1993, Pat. No. 5,420,296, and Ser. No. 752,577, Sep. 9, 1991, Pat. No. 5,260,329. This application Apr. 21, 1995, Ser. No. 426,130

Claims priority, application United Kingdom, Jan. 11, 1990, 9000644

Int. Cl.[6] A61K *31/40*

U.S. Cl. 514—48 **4 Claims**

1. A method of treating AIDS, comprising administering to a host suffering from AIDS a therapeutically effective amount of a compound of the formula (I):



(I)

wherein:

each of n and m, being the same, is an integer of 1 to 3;

W is oxygen or sulphur;

each of the B groups, which are the same, are a member selected from the group consisting of a phenyl group, a naphthyl group, a tetrahydropyranyl ring, a tetrahydrofuranyl ring, a quinoline ring, a pyranyl sugar residue and a furanyl sugar residue, wherein said member is substituted by 1 to 3 acid groups independently selected from the group consisting of sulfonic, sulfuric, sulfamic, sulfinic, phosphoric, phosphonic, phosphamic and carboxylic acid groups, or each of said B groups is a $—CH_2(CHA)_r(CH_2A$ group, wherein each A group is an acid group independently selected from the group consisting of sulfonic, sulfuric, sulfamic, sulfinic, phosphoric, phosphonic, phosphamic and carboxylic acid groups; and

r is 0, 1 or 2;

or a pharmaceutically acceptable salt thereof.

5,593,977

Patent Not Issued For This Number

5,593,978

GROWTH PROMOTING COMPOSITION FOR FISH AND METHOD OF USING THE SAME

Martin J. Jacobs, Terre Haute, Ind., and Fred J. Hart, Glen Alpine, Australia, assignors to Mallinckrodt Veterinary, Inc., Mundelein, Ill.

Filed Dec. 15, 1993, Ser. No. 166,870

Int. Cl.[6] A61K *31/715;* **C07D** *313/08*

U.S. Cl. 514—58 **15 Claims**

1. A growth promoting composition useful for promoting growth in fish comprising a complex of zearalanol and a cyclodextrin compound.

5,593,979

PYRIDOBENZO-AND PYRIDIOTHIENO-DIAZEPINES USEFUL FOR THE TREATMENT OF HIV INFECTION

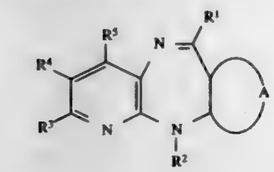
Karl D. Hargrave, Brookfield; Ernest Cullen; John R. Proudfoot, both of Newtown; Karl G. Grozinger, Ridgefield; Kollol Pal, New Milford, and Julian Adams, Ridgefield, all of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Continuation of Ser. No. 239,634, May 9, 1994, abandoned, which is a continuation of Ser. No. 95,779, Jul. 21, 1993, abandoned, which is a continuation of Ser. No. 966,993, Oct. 27, 1992, abandoned, which is a continuation of Ser. No. 837,714, Feb. 19, 1992, abandoned, which is a continuation of Ser. No. 652,157, Feb. 7, 1991, abandoned. This application Dec. 29, 1994, Ser. No. 366,131

Int. Cl.[6] A61K *31/55;* **C07D** *471/04;495/14*

U.S. Cl. 514—81 **4 Claims**

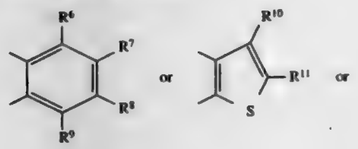
1. A compound of the formula I



(I)

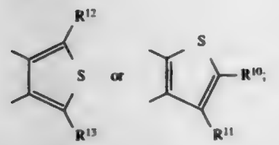
wherein,

A is a fused ring of the formula

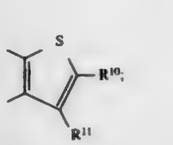


or

or



or



R^1 is cyano, chloro, bromo, imidazolyl, phosphetanyl, phospholanyl, or phosphorinanyl, or a group of the formula $—OR^{14}$, $—SR^{14}$, $—SOR^{14}$, $—SO_2R^{14}$, $—NH_2$, $—NHR^{14}$, $—NR^{14}R^{15}$, $—PR^{14}R^{15}$, $—P(OR^{14})(OR^{15})$, $—P(O)(OR^{14})(OR^{15})$, $—PO_3H_2$, $—P(NR^{14}R^{15})(NR^{14}R^{15})$, or $—P(O)(NR^{14}R^{15})(NR^{14}R^{15})$, wherein R^{14} and R^{15} are each independently alkyl of 4 carbon atoms, which may optionally be substituted by a cyano or alkoxycarbonyl group of 2 to 4 carbon atoms, cyclopropyl or cyclobutyl, or the group $—NR^{14}R^{15}$ may be pyrrolidine, piperidine, or morpholine;

R^2 is alkyl or fluoroalkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 5 carbon atoms, alkenyl or alkynyl of 2 to 4 carbon atoms, alkoxyalkyl or alkylthioalkyl of 2 to 3 carbon atoms, alkanoyl of 2 to 3 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms, arylmethyl (wherein the aryl moiety is phenyl, thienyl or furanyl, which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, hydroxyl or halogen), phenyl (which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, halogen or hydroxyl) or alkoxycarbonylmethyl wherein the alkoxy moiety contains 1 to 5 carbon atoms;

R^3, R^4 and R^5 are each independently hydrogen, alkyl of 1 to 3 carbon atoms or chloro, with the proviso that at least one of these substituents is hydrogen or methyl; or,

one of R^3, R^4 and R^5 is butyl, alkanoyl of 2 to 4 carbon atoms, alkoxycarbonyl or 2 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy and alkyl moieties each contain 1 to 2 carbon atoms, halogen, trihalomethyl, hydroxyl, alkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, aryl or aryialkyl (wherein the alkyl moiety contains 1 to 3 carbon atoms, and the aryl moiety is phenyl, thienyl, furanyl, pyridyl, or imidazolyl, which is either unsubstituted or substituted by alkyl or alkoxy of 1 to 3 carbon atoms, hydroxyl or halogen), alkanoyloxy of 2 to 3 carbon atoms, alkanoylamino of 1 to 3 carbon atoms, aminoalkyl of 1 to 3 carbon atoms, mono- or di-alkylamino wherein each alkyl moiety contains 1 to 3 carbon atoms, N-pyrrolidino, N-piperidino, N-morpholino, carboxyalkyl of 2 to 3 carbon atoms, cyano, nitro, carboxyl, carbamyl, amino, azido, mono- or di-alkylaminoalkyl wherein each alkyl moiety contains 1 to 2 carbon atoms, with the proviso that the remaining two substituents are hydrogen or methyl;

R^6, R^7, R^8 and R^9 are each hydrogen; or

one of R^6, R^7, R^8 and R^9 is alkyl of 1 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, hydroxyalkyl of 1 to 4 carbon atoms, alkoxycarbonylalkyl wherein the alkoxy and alkyl moieties each contain 1 to 2 carbon atoms, halogen, trihalomethyl, hydroxyl, alkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, alkanoyloxy of 2 to 3 carbon atoms, alkanoylamino of 1 to 3 carbon atoms, aminoalkyl of 1 to 3 carbon atoms, mono- or di-alkylamino wherein each alkyl moiety contains 1 to 2 carbon atoms, carboxyalkyl of 2 to 3 carbon atoms, cyano, nitro, carboxyl, carbamyl, amino, azido, mono- or di-alkylaminoalkyl wherein each alkyl moiety contains 1 to 2 carbon atoms, and the remaining three substituents are hydrogen or two of the remaining three substituents are hydrogen and one is methyl, ethyl or halogen;

R^{10} and R^{11} are each independently hydrogen, alkyl of 1 to 3 carbon atoms or halogen; and,

R^{12} and R^{13} are each independently hydrogen, methyl, ethyl, or halogen;

or a pharmaceutically acceptable addition salt thereof.

3. A method for treating infection by HIV-1 which comprises administering to a human exposed to or infected by HIV-1 a therapeutically effective amount of a compound according to claims 1 or 2.

5,593,980

ARYLMETHYLPHOSPHONATES AND PHOSPHONIC ACIDS USEFUL AS ANTI-INFLAMMATORY AGENTS

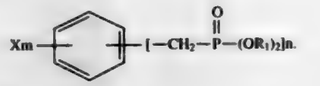
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 403,229, Mar. 16, 1995, Pat. No. 5,500,417, which is a continuation-in-part of Ser. No. 964,618, Oct. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 954,093, Sep. 30, 1992, abandoned, said Ser. No. 403,229is a division of Ser. No. 65,056, May 20, 1993, abandoned, which is a continuation of Ser. No. 949,738, Sep. 23, 1992, abandoned. This application Nov. 13, 1995, Ser. No. 556,681

Int. Cl.[6] A61K *31/66;31/685;* **C07F** *9/40;9/38*

U.S. Cl. 514—107 **5 Claims**

1. A method for treating arthritis or inflammation comprising: administering a therapeutically effective amount of a compound of Formula II



II

wherein

R_1 is independently selected from the group consisting of hydrogen, Na^+, K^+, NH_4^+, $(R_2)_4N^+$, C_1–C_{10} alkyl, $—CH_2C_6H_5$, $—C_6H_5$ or adjacent R_1 can be taken together to form $—CH_2(CH_2)_pCH_2—$ or $—CH_2C(CH_3)_2CH_2—$ (where p is 0–2);

X is independently hydrogen, —OH, —Br, —F or —Cl;

R_2 is C_1–C_{10} alkyl; and

n is 3 or 4

to a patient in need thereof.

5,593,981

METHOD AND TREATMENT OF ANDROGEN-RELATED DISEASES

Fernand Labrie, Ste-Foy, Canada, assignor to Endorecherche Inc., Canada

Division of Ser. No. 963,278, Oct. 19, 1992, Pat. No. 5,372,996, which is a continuation of Ser. No. 376,710, Jul. 7, 1989, abandoned. This application Sep. 10, 1993, Ser. No. 98,607

Int. Cl.[6] A61K *31/56;38/00*

U.S. Cl. 514—170 **29 Claims**

1. A method for treatment of prostate cancer in a human or other warm-blooded animal in need of such treatment, said method comprising the steps of inhibiting the sex steroid formation by administering a therapeutically effect amount of an inhibitor of sex steroid formation that does not suppress adrenal activity and having, as part of the molecular structure, a sex-steroid nucleus and, as another part of its molecular structure, a side chain represented by the formula: $-R^1[-B-R^2]_xL-G$ wherein:

x is an integer from 0 to 6, wherein at least one of L and G is a polar moiety distanced from said ring carbon by at least three intervening atoms, and wherein:

R^1 and R^2 are independently either absent or selected from the group consisting of straight or branched-chain alkylene, straight or branched-chain alkenylene, straight or branched-chain alkynylene, phenylene and fluoro-substituted analogs of the foregoing;

B is either absent or selected from the group consisting of —O—, —S—, —SO—, $—SO_2—$, $NR^3—$, $—CR^3OR^3—$, and phenylene (R^3 being hydrogen or lower alkyl);

L is either a moiety which together with G, forms a heterocyclic ring having at least one nitrogen atom or is selected from the group consisting of lower alkyl, $—CONR^4—$, $—CSN^4—$, $—NR^5CO—$, $—NR^5CS—$, $NR^5CONR^4—$, $—SO_2—N^4$, $—NR^5SO_2—$, $—NR^4—$, —S—, —SO— and $—SO_2—$ (R^4 and R^5 being independently selected from the group consisting of hydrogen and lower alkyl); and

G is selected from a group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, (C_3–C_7) cycloalkyl, bromo(lower)alkyl, chloro(lower)alkyl, fluoro(lower)alkyl, cyano(lower-)alkyl, carboxyl(lower)alkyl, (lower)alkoxycarbooyl(lower-)alkyl, (C_6–C_{10}) aryl, (C_7–C_{11})-arylalkyl, di(lower)alkylamino(lower)alkyl, fluoro-substituted analogs of the foregoing and a moiety which together with L forms a heterocyclic ring having at least one nitrogen atom,

said method of treating prostate cancer further comprising the step of administering a therapeutically effective amount of an antiandrogen that is distinct from said inhibitor of sex steroid formation.

5,593,982

CYCLOPENTANPERHYDROPHENANTHREN-17β-(3-FURYL)-3-DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAME FOR THE TREATMENT OF CARDIOVASCULAR DISORDERS

Luisa Quadri, Cernusco; Luigi Bernardi, Milan; Patrizia Ferrari, Varese; Mauro Gobbini, Mercallo; Piero Melloni, Brusso, and Loredana Valentino, Buccinasco, all of Italy, assignors to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

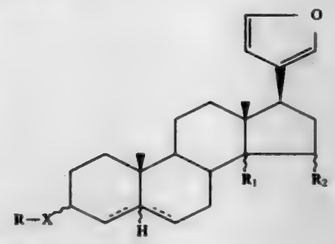
Division of Ser. No. 81,111, Jun. 25, 1993, Pat. No. 5,432,169. This application May 9, 1995, Ser. No. 437,801

Claims priority, application Germany, Jul. 1, 1992, 42 21 636.2

Int. Cl.[6] C07G *17/00;* A61C *31/56*

U.S. Cl. 514—172 **6 Claims**

1. Cyclopentanperhydrophenanthren-17β(3-furyl)-3-derivatives of formula (I)



(I)

wherein

X is O or S;

the symbol ⁻⁻ means that the substituents in positions 3, 5, 14, and 15 can have an α or β configuration, with the proviso that when X=S only the 3β configuration is present;

the symbol ⁻⁻ means that single or double bonds can be present;

R is C2–C6 alkyl or C3–C6 alkenyl, substituted independently by a quaternary ammonium group or 2-(2-imidazolinyl) or one or more OR3, SR3, NR4R5, C(NH)NR6R7, with the proviso that when X is oxygen and R1 is βOH and R2 is H and the configuration in position 5 is β and C2–C6 alkyl is ethyl or n-propyl, NR4R5 is not dimethylamino or morpholino;

R1 is H or hydroxy or methoxy or $O(CH_2)_nNR8R9$; wherein n is 2 or 3;

R2 is H or R1 and R2 taken together form an oxirane ring;

R3 is C2–C4 alkyl substituted by one or more NR6R7 or by NR6R7 and OH;

R4, R5 are independently H, methyl, C2–C6 alkyl or C3–C6 alkenyl unsubstituted or substituted by an oxirane or by one or more NR6R7, or NR6R7 and OH, or R4 and R5 taken together with the nitrogen atom form a saturated or unsaturated heteromonocyclic ring optionally containing another heteroatom chosen from oxygen or sulfur or nitrogen, or R4 is hydrogen and R5 is C(NH)NH2;

R6, R7 are independently H, C1–C4 alkyl, or R6 and R7 taken together with the nitrogen atom form a saturated or unsaturated penta- or hexa-monoheterocyclic ring optionally containing another heteroatom chosen from oxygen, sulphur or nitrogen;

R8, R9 are independently H, methyl, ethyl or R8 and R9 taken together with the nitrogen atom form a saturated or unsaturated heteromonocyclic ring, and the pharmaceutically acceptable salts thereof,

wherein said cyclopentanperhydrophenanthren-17β-(3-furyl)-3-derivatives contain at least one heterocyclic ring.

5,593,983

SUBSTITUTED 2β-MORPHOLINO-ANDROSTANE DERIVATIVES

Alexander C. Campbell, Falkirk, Scotland, assignor to Akzo Nobel N.V., Arnhem, Netherlands

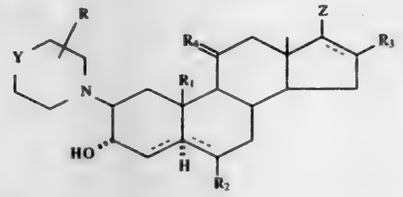
Filed Dec. 1, 1994, Ser. No. 347,974

Claims priority, application European Pat. Off., Dec. 2, 1993, 93309663

Int. Cl.[6] A61K *31/58;* C07J *43/00*

U.S. Cl. 514—176 **16 Claims**

1. A substituted 2β-morpholino-androstane derivative having the formula II



wherein

R represents one to four substituents, each one independently selected from (1–4C) alkyl, phenyl and benzyl, or two at the same carbon atom being together $—(CH_2)_n—$ wherein n is 2–6;

R_1, R_2, and R_3 are independently H or methyl;

R_4 is H_2, (H, OH) or O;

Z is CN or $COCH_2X$;

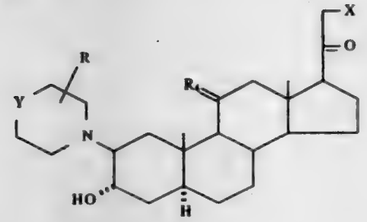
X is selected from H, halogen, OH, CN, N_3, SCN, (1–6C) alkyl (optionally substituted by halogen), cyclohexyl, (1–6C) alkoxy, phenoxy, phenyl-(1–6C) alkoxy, (1–6C) acyloxy, (1–6C) acylthio, pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl and amino which is optionally substituted by (1–6C) alkyl;

Y is O or S;

and the dotted lines are optional bonds, H(5) being absent when the 4,5- or 5,6-linkage is a double bond;

or a pharmaceutically acceptable salt thereof.

2. A substituted 2β-morpholino-androstane derivative having formula III



wherein

R represents one to four substituents independently selected from (1–4C) alkyl, phenyl and benzyl, or two substituents R are together $—(CH_2)_n—$ wherein n is 2–6;

R_4 is H_2, (H,OH) or O;

X is selected from H, halogen, OH, CN, N_3, SCN, (1–6C) alkyl (optionally substituted by halogen), cyclohexyl, (1–6C) alkoxy, pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl and amino which is optionally substituted by (1–6C) alkyl; and

Y is O or S;

or a pharmaceutically acceptable salt thereof.

5,593,984

CEPHALOSPORIN DERIVATIVES

Jong W. Lee, Kwacheon; Jeong S. Chae, Seoul; Young R. Choi, Euiwang; Yeong N. Lee, Suwon; Eun R. Rho, Anyang; Heui I. Kang, Kunpo, and Jae W. Hyun, Seoul, all of Rep. of Korea, assignors to Yuhan Corporation, Seoul, Rep. of Korea

PCT No. PCT/KR93/00087, § 371 Date Mar. 31, 1995, § 102(e) Date Mar. 31, 1995, PCT Pub. No. WO94/07898, PCT Pub. Date Apr. 14, 1994

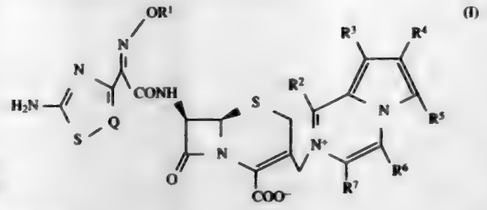
PCT Filed Sep. 28, 1993, Ser. No. 411,767

Claims priority, application Rep. of Korea, Oct. 1, 1992, 92-17969

Int. Cl.[6] C07D *501/46;* A61K *31/545*

U.S. Cl. 514—202 **4 Claims**

1. A cephalosporin compound of formula(I) or a pharmaceutically acceptable non-toxic salt thereof:



(I)

wherein:

R^1 is a hydrogen or an optionally halogen-substituted C_{1-3} alkyl group, a propargyl group or $—C(R^a)(R^b)COOH$, wherein R^a and R^b are independently a hydrogen or a C_{1-3} alkyl group;

R^2, R^3, R^4, R^5, R^6 and R^7 are independently a hydrogen or halogen or a C_{1-3} alkyl, amino or hydroxy C_{1-3} alkylthio, cyano, carbamoyl, carboxyl, hydroxy C_{1-3} alkyl, nitro, acetyl or formyl group; and

Q is CH, N or CCl.

5,593,985

CEPHALOSPORIN COMPOUNDS

Joong H. Kim; Sung H. Kim; Ghil S. Nam; Ha Y. Kim; Hyen J. Son, and Eun S. Jang, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science And Technology, Seoul, Rep. of Korea

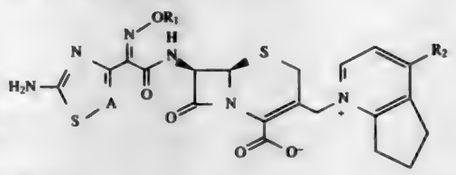
Filed May 22, 1995, Ser. No. 446,353

Claims priority, application Rep. of Korea, May 23, 1994, 94-11215; May 18, 1995, 95-12480

Int. Cl.[6] C07D *501/46;* A61K *31/545*

U.S. Cl. 514—203 **5 Claims**

1. A cephalosporin compound of the formula (I), a hydrate and a pharmacologically acceptable salt thereof,



(I)

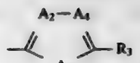
wherein

A is CH or N;

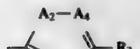
R_1 is hydrogen, C_{1-3} alkyl, C_{1-3} halogenated alkyl, C_{3-5} alkenyl, or C_{2-5} carboxyalkyl group: and

R_2 is an amino group optionally substituted with a formyl, acetyl or methoxycarbonyl group or with one or two C_{1-3} alkyl groups; an aminoalkyl or formylaminoalkyl group; a cyano group;

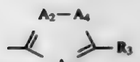
wherein X is O, S or NOH, and Y is hydroxy, C_{1-5} alkoxy, hydrazino, formylhydrazino, acyl-protected hydrazino, or an amino group optionally substituted with a formyl, C_{1-3} alkylcarbonyl, C_{1-3} alkoxycarbonyl or C_{1-3} alkyl group or with a thiazole ring having an optional carboxyalkyl substituent; or a group represented by formula (VI-1), (VI-2) or (VI-3),



(VI-1)



(VI-2)



(VI-3)

wherein R_3 is hydrogen or methyl, A_2 is N, O or S, A_3 is N or O, and A_4 is N, O or CH.

5,593,986

CEPHALOSPORIN ANTIBIOTICS

Burton G. Christensen, Lebanon, N.J.; In-Seop Cho, Mountain View, Calif.; Tomasz W. Glinka, Sunnyvale, Calif., and Scott J. Hecker, Los Gatos, Calif., assignors to Microcide Pharmaceuticals, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 369,798, Jan. 6, 1995, which is a continuation-in-part of Ser. No. 222,262, Apr. 1, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 415,869

Int. Cl.[6] C07D *501/60*; A61K *31/545*

U.S. Cl. 514—204 **22 Claims**

1. A compound active against methicillin resistant bacteria, as demonstrated by a lower minimum inhibitory concentration against methicillin resistant strains than cefotaxime, having the formula:



and its pharmaceutically acceptable salts, wherein

R^1 is —NHC(O)ZR^3 or —NR^4R^5, where Z is —$CH_2(X)_m$—, —C(NOR^6)—, —CH(OR^7)—, —C(CHCO$_2R^8$)— or —CH(NR^9R^{10})—, wherein X is O or S and m is 0 or 1;



or R^1 is —NHC(O)

R^2 is hydrogen, alkyl, alkenyl, aryl, heterocycle, aralkyl, heteroaralkyl, or trialkylsilyl;

R^3 may be cyano, alkyl, aryl, heterocycle or heteroaralkyl;

R^{4-7} may be independently hydrogen, alkyl, aryl or acyl;

R^8 may be selected from the group of hydrogen, alkyl or aryl;

R^9 and R^{10} are selected independently from the group consisting of hydrogen, alkyl, acyl, and heterocyclecarbonyl;

p=1 or 2;

R^{11} is H or halogen;

R^{12} is S-R^{17} where R^{17} is alkyl, cycloalkyl, or a 5- or 6-membered ring heterocycle containing 0–4 nitrogen atoms, 0–1 oxygen atoms, and 0–1 sulfur atoms, and which is optionally substituted by alkyl, hydroxyl, alkoxyl, amino, hydroxymethyl, aminomethyl, or mono- or dialkylaminomethyl.

5,593,987

METHODS OF INHIBITING BREAST DISORDERS

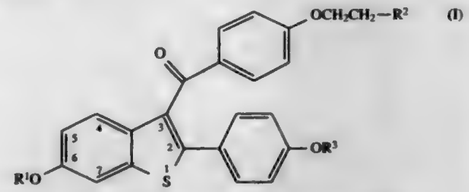
George J. Cullinan, Trafalgar, and James J. Sales, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 171,955

Int. Cl.[6] A61K *31/55;31/445;31/40*

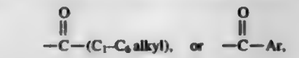
U.S. Cl. 514—212 **3 Claims**

1. A method of treating breast disorders selected from hyperprolactinemia or polythelia, compriaing administering to a human in need of treatment an effective amount of a compound having the formula



(I)

wherein R^1 and R^3 are independently hydrogen, —CH_3,



wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamethylenimino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,593,988

THERAPEUTIC AGENT FOR OSTEOPOROSIS AND DIAZEPINE COMPOUND

Tetsuya Tahara; Minoru Moriwaki, both of Chikujo-gun; Kenji Chiba, Iruma; Shunichi Manabe; Masanori Shindo, both of Takatsuki; Takashi Nakagawa, and Takeshi Nakamura, both of Takatsuki, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, and Japan Tobacco, Inc., Tokyo, both of Japan

PCT No. PCT/JP92/01325, § 371 Date Aug. 2, 1994, § 102(e) Date Aug. 2, 1994, PCT Pub. No. WO93/07129, PCT Pub. Date Apr. 15, 1993

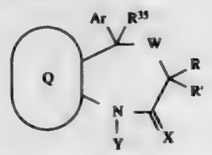
PCT Filed Oct. 12, 1992, Ser. No. 211,572

Claims priority, application Japan, Oct. 11, 1991, 3-327954

Int. Cl.[6] A61K *31/55*; C07D *495/14;498/04;495/04*

U.S. Cl. 514—219 **7 Claims**

1. A method for treating osteoporosis comprising administering an azepine compound or a pharmaceutically acceptable salt thereof of the formula



(I)

wherein

Ar is phenyl;

X and Y combinedly form =N—N=C(R^6)— or =N—N(R^5)—CO— wherein R^5 and R^6 are each hydrogen,

halogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, aryloxyalkyl, —$(CH_2)_a$COOR^7 wherein a is an integer of 1 to 6 and R^7 is hydrogen, alkyl, alkenyl or aralkyl, or —$(CH_2)_a$NHCOR^{43} wherein a is an integer of 1 to 6 and R^{43} is alkyl or aralkyl;

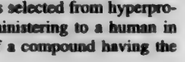
W is —N(R^{36})— wherein R^{36} is hydrogen or forms a bond with R^{35};

R^{35} is hydrogen or forms a bond with

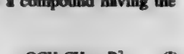
R is hydrogen, alkyl, haloalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of a formula selected from the group consisting of:

—$(CH_2)_b$N(R^8)(R^9) (1)

—$(CH_2)_b$OR^{10} (2)



(3)



(4)

—$(CH_2)_b$N(R^{10})COR^{a11}

(5)

—$(CH_2)_b$N(R^{10})SO_2R^{44}

(6)

—$(CH_2)_b$N(R^{10})COOR^{45}

(7)

(8)

—$(CH_2)_b$OCOR^{46}

(9)

—$(CH_2)_b$CON(R^{47})(R^{48})

(10)

—$(CH_2)_b$OSO_2R^{44}

(11)

—$(CH_2)_b$COR^{49}

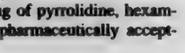
(12)

—$(CH_2)_b$S(O)$_n R^{11}$

(13)

—CON(R^{10})OR^8

(14)



(15)

—CON(R^{10})N(R^{10})SO_2R^{a11}

(16)



(17)



(18)

—CON(R^{10})N(R^{10})(R^{11})

(19)

—$(CH_2)_b$N(R^{10})COCON(R^{11})(R^{12})

and

(20)

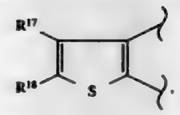
—$(CH_2)_a$COOR^1

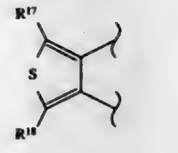
wherein

b is 0 or an integer of 1 to 6, Z is an oxygen atom or sulfur atom, R^8 and R^9 are the same or different and each is hydrogen, alkyl, aryl or aralkyl, R^{10} is hydrogen, alkyl or aralkyl, R^{11} and R^{12} are the same or different and each is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{a11} is alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{44} is alkyl, aryl, aralkyl, cycloalkyl or heteroaryl, R^{45} is alkyl, aryl or aralkyl, R^{46} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{47} and R^{48} are the same or different and each is hydrogen, alkyl, acyl, aryl or aralkyl, R^{49} is alkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, n is 0, 1 or 2, a is an integer of 1 to 6 and R^1 is hydrogen, alkyl, aryl or aralkyl;

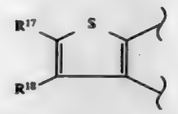
R' is hydrogen or —COOR^8 wherein R^8 is hydrogen, alkyl, aryl or aralkyl,

ring Q is a ring selected from





and



R^{17} and R^{18} are the same or different and each is hydrogen, halogen, alkyl, alkenyl, alkynyl, haloalkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino selected from the group consisting of pyrrolidinyl, piperidino, morpholino, thiomorpholino and piperazinyl in each of which the nitrogen atom may be substituted by alkyl or aralkyl, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, cycloalkyl, alkylcarbonyl, a group of the formula

R^{19}—A—

wherein

A is alkylene, alkenylene or alkynylene each of which may be substituted by 1 to 3 hydroxys and R^{19} is alkoxy, nitro, amino, hydroxy, acyloxy, cyano, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, pheayl optionally substituted by 1 to 3 substituents selected from the group consisting of halogen, hydroxy, alkyl, alkoxy, aryl, aryloxy, aralkyl, aralkyloxy, alkenyl having 2 to 18 carbon atoms which may be substituted by 1 to 3 hydroxys, alkynyl having 2 to 18 carbon atoms which may be substituted by 1 to 3 hydroxys, aralkenyl having an alkenyl moiety having 2 to 18 carbon atoms which may be substituted by 1 to 3 hydroxys and aralkynyl having an alkynyl moiety having 2 to 18 carbon atoms which may be substituted by 1 to 3 hydroxys, a group of the formula

$(R^{20})(R^{21})$NCO— or $(R^{20})(R^{21})$N—SO_2—

wherein

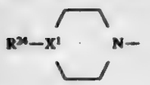
R^{20} and R^{21} are the same or different and each is hydrogen, aryl, aralkyl or straight- or branched chain alkyl, alkenyl or alkynyl wherein the alkyl, alkenyl and alkynyl may be substituted by halogen, hydroxy, nitro or amino or R^{20} and R^{21} may, together with the adjacent nitrogen atom, form a 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (the additional nitrogen atom may be substituted by straight- or branched chain alkyl having to 1 to 4 carbon atoms, aralkyl or diarylalkyl), a group of the formula

$(R^{22})(R^{23})$N—

wherein

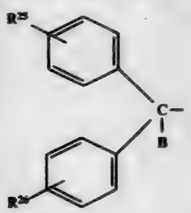
R^{22} and R^{23} are the same or different and each is hydrogen, straight- or branched chain alkyl, alkenyl or alkynyl wherein the alkyl, alkenyl and alkynyl may be substituted by halogen, hydroxy, amino, alkylamino, dialkylamino, cyclic amino selected from the group consisting of pyrrolidinyl, piperidino,

morpholino, thiomorpholino and piperazinyl in each of which the nitrogen atom may be substituted by alkyl or aralkyl, or C-bonded heterocyclic group (carbons may be interrupted by nitrogen, oxygen or sulfur atom), straight- or branched chain alkylcarbonyl which may be mono- or di-substituted by hydroxy, halogen, amino, alkylamino, dialkylamino, cyclic amino selected from the group consisting of pyrrolidinyl, piperidino, morpholino, thiomorpholino and piperazinyl in each of which the nitrogen atom may be substituted by alkyl or aralkyl, or straight- or branched chain alkyl (this alkyl may be substituted by halogen or hydroxy), arylcarbonyl, arylsulfonyl, alkylsulfonyl, or R^{22} and R^{23} may form, together with the adjacent nitrogen atom, a saturated or unsaturated 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (each additional nitrogen atom may be substituted by straight- or branched chain alkyl), a group of the formula



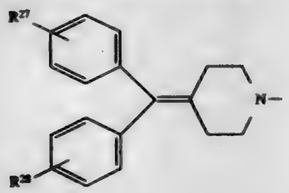
wherein

R^{24} is aryl, aralkyl, arylcarbonyl, a group of the formula



wherein

R^{25} and R^{26} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy and B is hydrogen, hydroxy or esterified hydroxy, or alkyl having hydroxy and/or carbonyl and X^1 is CH or nitrogen atom, or a group of the formula



wherein

R^{27} and R^{28} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy,

a group of the formula

$$R^{29}—(CH_2)d—C{\equiv}C—$$

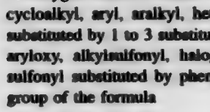
wherein

R^{29} is aryl or optionally hydrogenated heteroaryl and d is 0, 1 or 2, a group of the formula

$$R^{29}—O—(CH_2)e—C{\equiv}C—$$

wherein

R^{29} is as defined above and e is 1 or 2, or a group of the formula

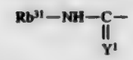


wherein

X^0 is —OCO—, —CO— or —$N(R^{51})$CO— where R^{51} is hydrogen or alkyl, m is 0 or 1, R^{50} is alkyl, alkynyl, 2-phenylethynyl, 2-thienylsulfonyl, —$(CH_2)_a$CN where a is an integer of 1 to 6, —$(CH_2)_b$—R^{52} where b is 0 or an integer of 1 to 6 and R^{52} is cycloalkyl, morpholino, thienyl, alkoxy, aryl, imidazolyl or tetrahydropyranyl or $SO_2N(R^{53})$ (R^{54}) where R^{53} and R^{54} are the same or different and each is hydrogen, alkyl, or R^{53} and R^{54}, with the adjacent nitrogen atom, form a heterocycle, or

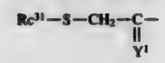
adjacent R^{17} and R^{18} may combinedly form a saturated or unsaturated 5, 6 or 7-membered ring which is condensed to a thiophene ring, said ring being optionally substituted by a substituent Ra^{30} selected from hydrogen, halogen, alkyl, a group of the formula R^{19}—A— wherein each symbol is as defined above and a group of the formula (R^{20}) (R^{21})NCO— or (R^{20}) (R^{21})N—SO_2— wherein each symbol is as defined above, or R^{17} and R^{18} may combinedly form a 5, 6 or 7-membered hetero ring which may have oxygen, sulfur or —$N(Rb^{30})$— as a hetero atom;

Rb^{30} is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxycarbonyl, alkanoyl, aroyl, cycloalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylaminocarbonyl, a group of the formula R^{19}—A— wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})NCO— wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})N—SO_2— wherein each symbol is as defined above, a group of the formula Ra^{31}—SO_2— wherein Ra^{31} is alkyl, phenyl, phenyl substituted by halogen, alkyl, alkoxy, carboxy, alkylsulfonyl, alkylthio, haloalkyl or optionally substituted phenoxy, heteroaryl or naphthyl, a group of the formula



wherein

Y^1 is oxygen atom or sulfur atom and Rb^{31} is alkenyl, alkyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroarylalkyl, phenyl substituted by 1 to 3 substituents selected from alkyl, alkoxy, aryloxy, alkylsulfonyl, halogen and haloalkyl, quinolyl or sulfonyl substituted by phenyl, heteroaryl or naphthyl, or a group of the formula



wherein

Y^1 is oxygen atom or sulfur atom and Rc^{31} is alkyl, phenyl substituted by phenyl, halogen, alkyl, alkoxy, haloalkyl or phenoxy, or heteroaryl;

in the above definitions, phenyl, aryl, aryloxy, aryloxyalkyl, arylcarbonyl, arylsulfonyl, aralkyl, aralkyloxy, aralkyloxycarbonyl, aralkenyl, aralkynyl, diarylalkyl, heteroaryl and heteroarylalkyl may have, on the ring, 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkyl, hydroxy, nitro, amino, cyano and acyloxy; cycloalkyl of cycloalkyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkoxycarbonyl and cycloalkylaminocarbonyl may have 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkoxy and aryl.

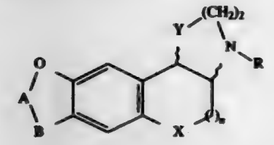
5,593,989

TETRACYCLIC 1,4-OXAZINE COMPOUNDS

Jean-Louis Peglion, Le Vesinet; Joel Vian, Chaville; Bertrand Goumont, Viroflay; Mark Millan, Paris; Valérie Audinot, Croissy sur Seine; Jean-Charles Schwartz, Paris, and Pierre Sokoloff, Le Plessis Bouchard, all of France, assignors to Adir et Compagnie, Courbevoie, France

Filed Jun. 1, 1995, Ser. No. 456,504
Claims priority, application France, Jun. 8, 1994, 94 06985
Int. Cl.[6] A61K *31/535*; C07D *498/04;498/14*
U.S. Cl. 514—229.5 4 Claims

1. A compound selected from those of formula I



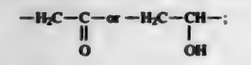
wherein:

X and Y, which may be the same or different, each represents an oxygen atom or CH_2;

A—B represents —$(CH_2)_2$— or —HC=CH— and, in addition:

when Y represents an oxygen atom, A-B may also represent —$(CH_2)_3$— and

when Y represents CH_2, A-B may also represent



R represents a hydrogen atom or a (C_1—C_{10})alkyl, (C_3–C_{10})alkenyl or (C_3–C_{10})alkynyl radical, each of which may be in straight or branched chain and each of which may optionally be substituted by a cycloalkyl radical having from 3 to 8 carbon atoms, or by an aryl radical selected from the radicals phenyl, thienyl and pyridyl, each of which may optionally be substituted by one or more substituents selected from halogen atoms, hydroxy radicals, and alkyl and alkoxy radicals each having 1 to 6 carbon atoms in straight or in branched chain; and

n represents:

0 or 1 when X represents CH_2 and

1 only, when X represents an oxygen atom

their geometric isomer forms, cis and trans,—their racemic mixture or racemate, and their optical isomer or enantiomer forms,

and their salts with a pharmaceutically acceptable acid.

3. A method for treating a mammal afflicted with a condition selected from psychotic disorders, depression, Parkinson's disease, memory disorders, and disorders associated with drug abuse, comprising the step of administering to the mammal an amount of a compound of claim 1 which is effective for alleviation of said condition.

5,593,990

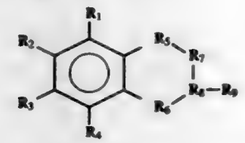
METHODS AND COMPOSITIONS FOR INHIBITION OF ANGIOGENESIS

Robert D'Amato, Lancaster, Pa., assignor to The Children's Medical Center Corporation, Boston, Mass.

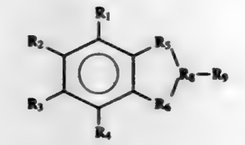
Continuation-in-part of Ser. No. 168,817, Dec. 15, 1993, which is a continuation-in-part of Ser. No. 25,046, Mar. 1, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 371,987
Int. Cl.[6] A61K *31/535;31/445;31/40*
U.S. Cl. 514—236.2 15 Claims

1. A method of treating chronic inflammation in a human or animal comprising the step of administering to the human or animal with the chronic inflammation a composition comprising an epoxide hydrolase inhibitor and an effective amount of an angiogenesis-inhibiting compound selected from the group consisting of the following compounds:

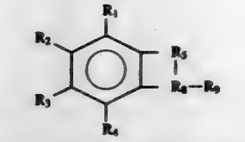
A)



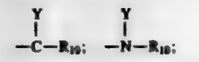
B)



C)

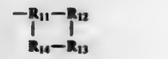


In the above formulae A), B), and C), R_1, R_2, R_3 and R_4 can be selected from: —H; —OH; =O, straight chained and branched alkanes, alkenes, alkynes; cyclic alkanes, alkenes, and alkynes; combinations of cyclic and acyclic alkanes, alkenes, and alkynes; alcohol, aldehyde, ketone, carboxylic acid, ester, or ether moieties in combination with acyclic, cyclic, or combination acyclic/cyclic moieties; aza; amino; —XO_n or —O—XO_n, where X=N and n=2; X=S and n=2 or 3; or X=P and n=1–3; and halogens; R_5, R_6, R_7, and R_8 are each independently selected from:

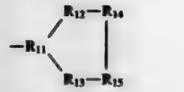


or —O— where Y is optional and is the same as defined above for R_1; and R_{10} is the same as defined above for R_1, or where Y is absent R_{10} is =O; and R_9 is a moiety having formula D), E), F), G) or H):

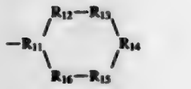
D)



E)



F)



G)

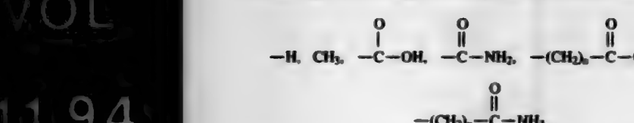


where each of R_{11}–R_{17} is independently the same as defined above for R_5;

H)



where R_{18}, R_{19} and R_{20} are, independently selected from



and n=1 to 4.

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IMIDAZOLE COMPOUNDS, USE AND PROCESS OF MAKING

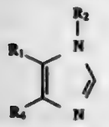
Jerry L. Adams, and Jeffrey C. Boehm, both of SmithKline Beecham Corporation Corporate Intellectual Property UW-2220 P.O. Box 1539, King of Prussia, Pa. 19406-0939

Continuation-in-part of Ser. No. 369,964, Jan. 9, 1995, which is a continuation-in-part of Ser. No. 92,733, Jul. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,934

Int. Cl.[6] A61K *31/47;31/535;* **C07D** *401/04;413/14*

U.S. Cl. 514—235.2 **28 Claims**

1. A compound represented by the formula:



(I)

R_1 is quinolyl, or isoquinolinyl ring, which ring is optionally substituted with one or two substituents each of which is independently selected from C_{1-4}alkyl, halogen, hydroxyl, C_{1-4} alkoxy, C_{1-4}alkylthio, C_{1-4}alkylsulfinyl, CH_2OR_{12}, amino, mono or di-C_{1-4}alkyl substituted amino, $N(R_{10})C(O)R_a$ or an N-heterocyclyl ring which ring has from 5 to 7 members and optionally contains an additional heteroatom selected from oxygen, sulfur or NR_{15};

R_4 is phenyl, naphth-1-yl or naphth-2-yl which is optionally substituted by one or two substituents, each of which is independently selected, and which, for a 4-phenyl, 4-naphth-1-yl, 5-naphth-2-yl or 6-naphth-2-yl substituent, is halogen, cyano, nitro, $—C(Z)NR_7R_{17}$, $C(Z)OR_{16}$, $—(CR_{10}R_{20})_vCOR_{12}$, $—SR_5$, $—SOR_5$, $—OR_{12}$, halo-substitutedC$_{1-}$ alkyl, C_{1-4} alkyl. $—ZC(Z)R_{12}$, $—NR_{10}C(Z)R_{16}$, or $—(CR_{10}R_{20})_vNR_{10}R_{20}$ and which, for other positions of substitution, is halogen, cyano, $—C(Z)NR_{13}R_{14}$, $—C(Z)OR_3$, $—(CR_{10}R_{20})_m"COR_3$, $—S(O)_mR_3$, $—OR_3$, halo-substitutedC$_{1-4}$alkyl, $—C_{1-4}$alkyl, $—(CR_{10}R_{20})_m"NR_{10}C(Z)R_3$, $—NR_{10}S(O)_m"R_8$, $—NR_{10}S(O)_m"NR_7R_{17}$, $—ZC(Z)R_3$ or $—(CR_{10}R_{20})_m"NR_{13}R_{14}$;

v is 0, or an integer having a value of 1 or 2;

m is 0, or the integer 1 or 2;

m' is an integer having a value of 1 or 2,

m" is 0, or an integer having a value of 1 to 5;

R_2 is C_{1-10}alkyl N_3, $—(CR_{10}R_{20})_n"OR_9$, heterocyclyl, heterocyclylC$_{1-10}$ alkyl, C_{1-10}alkyl, halo-substituted C_{1-10}alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC$_{1-10}$alkyl, C_{3-7}cycloalkenyl, C_{3-7}cycloalkenyl-C_{1-10}-alkyl, aryl, arylC$_{1-}$alkyl, heteroaryl, heteroaryl-C_{1-10}-alkyl, $(CR_{10}R_{20})_nOR_{11}$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_{13}R_{14}$, $(CR_{10}R_{20})_nNO_2$, $(CR_{10}R_{20})_nCN$, $(CR_{10}R_{20})_n'SO_2R_{18}$, $(CR_{10}R_{20})_mS(O)_m"NR_{13}R_{14}$, $(CR_{10}R_{20})_nC(Z)R_{11}$, $(CR_{10}R_{20})_nOC(Z)R_{11}$, $(CR_{10}R_{20})_nC(Z)OR_{11}$, $(CR_{10}R_{20})_nC(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nC(Z)NR_{11}OR_9$, $(CR_{10}R_{20})_nNR_{10}C(Z)R_{11}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nN(OR_9)C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nN(OR_9)C(Z)R_{11}$, $(CR_{10}R_{20})_nC(=NOR_9)R_{11}$, $(CR_{10}R_{20})_nNR_{10}C(=NR_{19})NR_{13}R_{14}$, $(CR_{10}R_{20})_nOC(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nNR_{10}C(Z)OR_{10}$, 5 -($R_{18}$-1,2,4-oxadizaol 3-yl or 4-(R_{12})-5-($R_{18}R_{19}$)-4,5-dihydro-1,2,4-oxadiazol-3-yl; wherein the cycloalkyl, cycloalkyl-alkyl, aryl, arylalky, heteroaryl, heteroaryl alkyl, heterocyclic and heterocyclic alkyl groups may be optionally substituted,

n is an integer having a value of 1 to 10;

n' is 0, or an integer having a value of 1 to 10;

Z is oxygen or sulfur;

R_9 is hydrogen, C_{1-6}alkyl, C_{2-7}cycloalkyl, aryl, arylC$_{1-4}$alkyl, heteroaryl, heteroarylC$_{1-4}$alkyl, heterocyclyl, or heterocyclylC$_{1-4}$alkyl;

R_3 is heterocyclyl, heterocyclylC$_{1-10}$alkyl or R_8;

R_5 is hydrogen, C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl or NR_7R_{17}, excluding the moieties —SR_5 being —SNR_7R_{17} and —SOR_5 being –SOH;

R_8 is hydrogen, a pharmaceutically acceptable cation, C_{1-10}alkyl, C_{3-7}cycloalkyl, aryl, arylC$_{1-4}$ alkyl, heteroaryl, heteroarylalkyl, heterocyclyl, aroyl, or C_{1-10}alkanoyl;

R_7 and R_{17} is each independently selected from hydrogen or C_{1-4}alkyl or R_7 and R_{17} together with the nitrogen to which they are attached form a heterocyclic ring of 5 to 7 members which ring optionally contains an additional heterostom selected from oxygen, sulfur or NR_{15};

R_6 is C_{1-10}alkyl, halo-substituted C_{1-10}alkyl, C_{2-10}alkenyl, C_{2-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkenyl, aryl, arylC$_{1-10}$alkyl, heteroaryl, heteroarylC$_{1-10}$alkyl, $(CR_{10}R_{20})_nOR_{11}$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_{13}R_{14}$; wherein the aryl, arylalkyl, heteroaryl, heteroaryl alkyl may be optionally substituted;

R_9 is hydrogen, $—C(Z)R_{11}$ or optionally substituted C_{1-10}alkyl, $S(O)_2R_{18}$, optionally substituted aryl or optionally substituted aryl—C_{1-4}alkyl;

R_{10} and R_{20} is each independently selected from hydrogen or C_{1-4}alkyl:

R_{11} is hydrogen, C_{1-10}alkyl, C_{3-7}cycloalkyl, heterocyclyl, heterocyclyl C_{1-10}alkyl, aryl, arylC$_{1-10}$alkyl, heteroaryl or heteroarylC$_{1-10}$alkyl;

R_{12} is hydrogen or R_{16};

R_{13} and R_{14} is each independently selected from hydrogen or optionally substituted C_{1-6}alkyl, optionally substituted aryl or optionally substituted aryl-C_{1-4}alkyl, or together with the nitrogen to which they are attached form a heterocyclic ring of 5 to 7 members which ring optionally contains an additional heteroatom selected from oxygen, sulfur or NR_9;

R_{15} is R_{10} or C(Z)—C_{1-6}alkyl;

R_{16} is C_{1-4}alkyl, halo-substituted-C_{1-4}alkyl, or C_{3-7}cycloalkyl;

R_{18} is C_{1-10}alkyl, C_{3-7}cycloalkyl, heterocyclyl, aryl, arylalkyl, heterocyclyl, heterocyclyl-C_{1-10}alkyl, heteroaryl or heteroaryl-alkyl;

R_{19} is hydrogen, cyano, C_{1-4}alkyl, C_{3-7}cycloalkyl or aryl;

or a pharmaceutically acceptable salt thereof.

5,593,992

COMPOUNDS

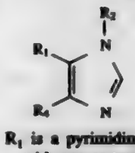
Jerry L. Adams, Wayne, Pa.; Peter W. Sheldrake, Tunbridge Wells, England; Timothy F. Gallagher, Harleysville, and Ravishankar Garigipati, Wayne, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 369,964, Jan. 9, 1995, which is a continuation-in-part of Ser. No. 92,733, Jul. 16, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 472,366

Int. Cl.[6] A61K *31/505;31/535;* **C07D** *403/04;413/14*

U.S. Cl. 514—235.8 **41 Claims**

1. A compound represented by the formula:



(I)

R_1 is a pyrimidinyl ring, which ring is optionally substituted with one or two substituents each of which is independently selected from C_{1-4} alkyl, halogen, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulfinyl, CH_2OR_{12}, amino, mono or di-C_{1-6} alkyl substituted amino, $N(R_{10})C(O)R_a$ or an N-heterocyclyl ring which ring has from 5 to 7 members and optionally contains an additional heteroatom selected from oxygen, sulfur or NR_{15};

R_4 is phenyl, naphth-1-yl or naphth-2-yl which is optionally substituted by one or two substituents, each of which is independently selected, and which, for a 4-phenyl, 4-naphth-1-yl, 5-naphth-2-yl or 6-naphth-2-yl substituent, is halogen, cyano, nitro, $—C(Z)NR_7R_{17}$, $C(Z)OR_{16}$, $—(CR_{10}R_{20})_vCOR_{12}$, $—SR_5$, $—SOR_5$, $—OR_{12}$, halo-substituted C_{1-4} alkyl, C_{1-4} alkyl, $—ZC(Z)R_{12}$, $—NR_{10}C(Z)R_{16}$, or $—(CR_{10}R_{20})_vNR_{10}R_{20}$ and which, for other positions of substitution, is halogen, cyano, $—C(Z)NR_{13}R_{14}$, $—C(Z)OR_3$, $—(CR_{10}R_{20})_{m'}—COR_3$, $—S(O)_mR_3$, $—OR_3$, halo-substituted C_{1-4} alkyl, $—C_{1-4}$ alkyl, $—(CR_{10}R_{20})_{m'}—NR_{10}C(Z)R_3$, $—NR_{10}S(O)_mR_8$, $—NR_{10}S(O)_{m'}—NR_7R_{17}$, $—ZC(Z)R_3$ or $—(CR_{10}R_{20})_{m'}—NR_{13}R_{14}$;

v is 0, or an integer having a value of 1 or 2;

m is 0, or the integer 1 or 2;

m' is an integer having a value of 1 or 2,

m" is 0, or an integer having a value of 1 to 5;

R_2 is C_{1-10} alkyl N_3, $—(CR_{10}R_{20})_nOR_9$, heterocyclyl, heterocyclylC$_{1-10}$ alkyl, C_{1-10}alkyl, halo-substituted C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{3-7}cycloalkylC$_{1-10}$ alkyl, C_{3-7} cycloalkenyl, C_{3-7}cycloalkenyl-C_{1-10}-alkyl, aryl, arylC$_{1-10}$ alkyl, heteroaryl, heteroaryl-C_{1-10}-alkyl, $(CR_{10}R_{20})_nOR_{11}$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_{13}R_{14}$, $(CR_{10}R_{20})_nNO_2$, $(CR_{10}R_{20})_nCN$, $(CR_{10}R_{20})_nSO_2R_{18}$, $(CR_{10}R_{20})_nS(O)_{m'}—NR_{13}R_{14}$, $(CR_{10}R_{20})_nC(Z)R_{11}$, $(CR_{10}R_{20})_nOC(Z)R_{11}$, $(CR_{10}R_{20})_nC(Z)OR_{11}$, $(CR_{10}R_{20})_nC(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nC(Z)NR_{11}OR_9$, $(CR_{10}R_{20})_nNR_{10}C(Z)R_{11}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nN(OR_9)C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nN(OR_9)C(Z)R_{11}$, $(CR_{10}R_{20})_nC(=NOR_9)R_{11}$, $(CR_{10}R_{20})_nNR_{10}C(=NR_{19})NR_{13}R_{14}$, $(CR_{10}R_{20})_nOC(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{13}R_{14}$, $(CR_{10}R_{20})_nNR_{10}C(Z)OR_{10}$, 5-($R_{18}$)-1,2,4-oxadizaol-3-yl or 4-(R_{12})-5-($R_{18}R_{19}$)-4,5-dihydro-1,2,4-oxadiazol-3-yl; wherein the cycloalkyl, cycloalkyl-alkyl, aryl, arylalkyl, heteroaryl, heteroaryl alkyl, heterocyclic and heterocyclic alkyl groups may be optionally substituted;

n is an integer having a value of 1 to 10;

n' is 0, or an integer having a value of 1 to 10;

Z is oxygen or sulfur;

R_9 is hydrogen, C_{1-6} alkyl, C_{2-7} cycloalkyl, aryl, arylC$_{1-4}$ alkyl, heteroaryl, heteroarylC$_{1-4}$alkyl, heterocyclyl, or heterocyclylC$_{1-4}$ alkyl;

R_3 is heterocyclyl, heterocyclylC$_{1-10}$ alkyl or R_8;

R_5 is hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl or NR_7R_{17}, excluding the moieties —SR_5 being —SNR_7R_{17} and —SOR_5 being —SOH;

R_8 is hydrogen, a pharmaceutically acceptable cation, C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, arylC$_{1-4}$ alkyl, heteroaryl, heteroarylalkyl, heterocyclyl, aroyl, or C_{1-10} alkanoyl;

R_7 and R_{17} is each independently selected from hydrogen or C_{1-4} alkyl or R_7 and R_{17} together with the nitrogen to which they are attached form a heterocyclic ring of 5 to 7 members which ring optionally contains an additional heterostom selected from oxygen, sulfur or NR_{15};

R_6 is C_{1-10} alkyl, halo-substituted C_{1-10} alkyl, C_{2-10}alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkenyl, aryl, arylC$_{1-10}$ alkyl, heteroaryl, heteroarylC$_{1-10}$ alkyl, $(CR_{10}R_{20})_nOR_{11}$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_{13}R_{14}$; wherein the aryl, arylalkyl, heteroaryl, heteroaryl alkyl may be optionally substituted;

R_9 is hydrogen, $—C(Z)R_{11}$ or optionally substituted C_{1-10} alkyl, $S(O)_2R_{18}$, optionally substituted aryl or optionally substituted aryl-C_{1-4} alkyl;

R_{10} and R_{20} is each independently selected from hydrogen or C_{1-4} alkyl;

R_{11} is hydrogen, C_{1-10} alkyl, C_{3-7} cycloalkyl, heterocyclyl, heterocyclyl C_{1-10}alkyl, aryl, arylC$_{1-10}$ alkyl, heteroaryl or heteroarylC$_{1-10}$ alkyl;

R_{12} is hydrogen or R_{16};

R_{13} and R_{14} is each independently selected from hydrogen or optionally substituted C_{1-4} alkyl, optionally substituted aryl or optionally substituted aryl-C_{1-4} alkyl, or together with the nitrogen to which they are attached form a heterocyclic ring of 5 to 7 members which ring optionally contains an additional heteroatom selected from oxygen, sulfur or NR_9;

R_{15} is R_{10} or C(Z)-C_{1-4} alkyl;

R_{16} is C_{1-4} alkyl, halo-substituted-C_{1-4} alkyl, or C_{3-7} cycloalkyl;

R_{18} is C_{1-10} alkyl, C_{3-7} cycloalkyl, heterocyclyl, aryl, arylalkyl, heterocyclyl, heterocyclyl-C_{1-10} alkyl, heteroaryl or heteroaryl-alkyl;

R_{19} is hydrogen, cyano, C_{1-4} alkyl, C_{3-7} cycloalkyl or aryl;

or a pharmaceutically acceptable salt thereof.

5,593,993

METHOD FOR INHIBITION OF HIV RELATED VIRUSES

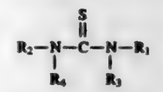
John M. Morin, Jr., Brownsburg; Robert J. Turnansky, Indianapolis, both of Ind.; Rolf Noreen, and Tomas Lind, both of Huddinge, Sweden, assignors to Medivir AB, Huddinge, Sweden

Division of Ser. No. 11,940, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 921,890, Jul. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 739,927, Aug. 2, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 395,702

Int. Cl.[6] A61K *31/425*

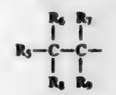
U.S. Cl. 514—247 **9 Claims**

1. A method for inhibiting the replication of HIV which comprises contacting a compound of the formula below



in which R_1 is a cyclo(C_3–C_8)alkyl, cyclo (C_3–C_8) alkenyl; isothiazolyl, substituted isothiazolyl, tetrazolyl, substituted tetrazolyl, triazolyl, substituted triazolyl, pyridyl, substituted pyridyl, imidazolyl, substituted imidazolyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, benzoxazolyl, substituted benzoxazolyl, benzimidazolyl, substituted benzimidazolyl, thiazolyl, substituted thiazolyl, oxazolyl, substituted oxazolyl, benzothiazolyl, substituted benzothiazolyl, pyrazinyl, substituted pyrazinyl, pyridazinyl, substituted pyridazinyl, thiadiazolyl, substituted thiadiazolyl, benzotriazolyl, substituted benzotriazolyl, pyrrolyl, substituted pyrrolyl, indolyl, substituted indolyl, benzothienyl, substituted benzothienyl, thienyl, substituted thienyl, benzofuryl, substituted benzofuryl, furyl, substituted furyl, quinolinyl, substituted quinolinyl, isoquinolinyl, substituted isoquinolinyl, pyrazolyl, and substituted pyrazolyl;

R_2 is a group of the formula



wherein

R_3 is R_1 as defined above; or R_3 is a group of the formula

$(R_{10})y—X—$

wherein

y is 1 or 2; X is N, S, O and R_{10} is R_1 as defined; or R_{10} is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, or C_2–C_6 alkynyl; or R_3 is hydrogen, halo, cyano, carboxy, amino, thio, hydroxy, C_1–C_4 alkoxy, C_1–C_6 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, or C_2–C_8 alkenoxy;

R_6, R_7, R_8, and R_9 are independently C_3–C_8 cycloalkyl, hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, halo, amino, nitro, cyano, C_1–C_5 alkoxy, hydroxy, carboxy, hydroxymethyl, aminomethyl, carboxymethyl, C_1–C_4 alkylthio, C_1–C_4 alkanoyloxy, carbamoyl, or a halo substituted C_1–C_6 alkyl; or two of which, along with the carbons to which they are attached, combine to form a stable, saturated or unsaturated, substituted or unsubstituted, 3 to 7 membered organic monocylic ring having 0 to 4 hetero atoms selected from S, O, or N; or R_6 and R_8, or R_7 and R_9, along with the carbon to which they are attached, form a stable, saturated or unsaturated, substituted or unsubstituted, 3 to 7 membered organic monocylic ring having 0 to 4 hetero atoms selected from S, O, or N;

R_3 and R_4 are independently hydrogen, hydroxy, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, amine, cyano, nitro, C_1–C_5 alkoxy, carboxy, hydroxymethyl, aminomethyl, carboxymethyl, C_1–C_4 alkylthio, C_1–C_4 alkanoyloxy, halo-substituted (C_1–C_6) alkyl, or carbamoyl; or salts thereof, with HIV.

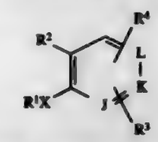
5,593,994

PROSTAGLANDIN SYNTHASE INHIBITORS

Douglas G. Batt, Wilmington; Donald J. P. Pinto, Newark; Michael J. Orwat, Wilmington, all of Del.; Joseph J. Petraitis, Glenmoore, Pa., and William J. Pitts, Newark, Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Filed Sep. 29, 1994, Ser. No. 314,991
Int. Cl.[6] A01N *43/58*
U.S. Cl. 514—252 13 Claims

1. A pharmaceutical composition comprising an antiinflammatory amount of a compound of Formula I:



(I)

or a pharmaceutically acceptable salt or prodrug form thereof, wherein:

J, K, and L are independently CR^3, CR^4 or N;

X is a single bond, $—(CHR^5)_z—$, $—CH═CR^5—$, $—CR^5═CH—$, $—C≡C—$, $—(CHR^5)_zZ—$, $—Z(CHR^5)_z—$, $—C(═O)CH_2$, or $—CH_2C(═O)—$;

Z is O or S;

R^1 is:

phenyl substituted with 0–2 R^7,

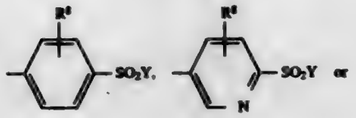
2-naphthyl substituted with 0–2 R^7,

C_5–C_7 cycloalkyl substituted with 0–1 R^9,

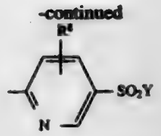
C_5–C_7 cycloalkenyl, provided that when R^1 is attached directly to a heteroatom, said heteroatom is not attached to a carbon bearing a double bond in the cycloalkene ring,

a 5- to 10-membered heterocyclic ring system selected from furyl, thienyl, pyrrolyl, thiazolyl, oxazolyl, N-methylpyrrolyl, isoxazolyl, isothiazolyl, pyrazolyl, 3-pyridinyl, pyridazinyl, pyrazinyl, indolyl, benzofurazyl, benzothienyl, benzothiazolyl, benzoxazolyl, benzotriazolyl, benzoisothiazolyl, benzisoxazolyl, quinolinyl, isoquinolinyl, or piperidinyl, said heterocyclic ring system being substituted with 0–2 R^7;

R^2 is:



-continued



Y is $—CH_3$ or NH_2;

R^3 is: H, F, Br, Cl, I, CN, C_1–C_4 alkyl substituted with 0–1 R^{12}, C_1–C_4 haloalkyl, C_1–C_4 alkenyl substituted with 0–1 R^{13}, NO_2, $NR^{15}R^{16}$, $S(O)_mR^{11}$, $SO_2NR^{15a}R^{16}$, $—C(═O)R^6$, $—COOR^{17}$, $—C(═O)NR^{15a}R^{16}$, or OR^{18};

R^4 is H, F, Br, Cl, I, C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 haloalkyl, $—CF_3$, $—SR^{10a}$, or

alternately, when R^3 and R^4 are substituents on adjacent carbon atoms, R^3 and R^4 can be taken together with the carbon atoms to which they are attached to form a 5–7 membered carbocyclic or heterocyclic ring system, said heterocyclic ring system containing from 1–3 heteroatoms selected from N, O or S;

R^5 is C_1–C_2 alkyl, C_1–C_2 alkoxy, or C_1–C_2 haloalkyl;

R^6 is

hydrogen,

C_1–C_6 alkyl substituted with 0–1 R^{14},

phenyl substituted with 0–2 R^9,

C_5–C_7 cycloalkyl substituted with 0–1 R^9,

a 5- to 10-membered heterocyclic ring system selected from furyl, thienyl, thiazolyl, oxazolyl, N-methylpyrrolyl, isoxazolyl, isothiazolyl, pyrazolyl, pyridinyl, pyridazinyl, pyrazinyl, or pyrimidinyl, said heterocyclic ring system being substituted with 0–2 R^7;

R^7 is a substituent on carbon that is selected from: H, F, Br, Cl, I, C_1–C_4 alkyl, phenyl, CH_2OH, CH_2OCH_3, C_1–C_4 alkoxy, C_1–C_4 haloalkyl, $—SR^{10}$, $NR^{15}R^{16}$, $—C(═O)R^{10}$, CH_2COOR^{17}, or OR^{19}; provided that when X is a single bond then R^7 is not ortho to X;

R^8 is H, F, Br, Cl, I, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, $—(CH_2)_nCOOR^{17}$, or $—CH═CHCOOR^{17}$;

R^9 is H, F, Br, Cl, I, hydroxy, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

R^{10} is H or C_1–C_4 alkyl;

R^{10a} is C_1–C_4 alkyl;

R^{11} is C_1–C_4 alkyl, C_1–C_2 fluoroalkyl, phenyl, or benzyl;

R^{12} is F, OR^{18}, $NR^{15}R^{16}$, phenyl substituted with 0–2 R^9, —CN, $—C(═O)R^6$, $—COOR^{17}$, $—C(═O)NR^{15}R^{16}$, or

a heterocyclic ring system selected from morpholinyl, piperidinyl, pyrrolidinyl, furyl, thienyl, pyridinyl, piperidazinyl, pyrimidinyl, pyrazinyl, or tetrahydropyridinyl, said heterocyclic ring system being substituted with 0–2 R^9;

R^{13} is —CN, $—C(═O)R^6$, $—COOR^{17}$, $—NO_2$, or $NR^{15}R^{16}$;

R^{14} is F, OH, C_1–C_4 alkoxy, NH_2, phenyl substituted with 0–2 R^9, alkylcarbonyl, arylcarbonyl, $—COOR^{17}$, or $—C(═O)NH_2$;

R^{15} is H, C_1–C_4 alkyl substituted with 0–1 R^{23}, C_6–C_{10} aryl, C_3–C_7 cycloalkyl, C_4–C_{11} cycloalkylalkyl, C_2–C_4 alkenyl, C_1–C_4 alkoxy, C_1–C_6 alkylcarbonyl, C_1–C_6 alkoxycarbonyl, C_7–C_{14} arylalkoxycarbonyl, C_6–C_{10} aryloxycarbonyl, C_1–C_6 alkylaminocarbonyl, C_6–C_{10} arylcarbonyl, C_1–C_6 alkylsulfonyl, C_6–C_{10} arylsulfonyl, C_7–C_{14} alkylarylsulfonyl, C_7–C_{14} arylalkylsulfonyl;

R^{15a} is H, C_1–C_4 alkyl substituted with 0–1 R^{23}, C_6–C_{10} aryl, C_3–C_7 cycloalkyl, C_4–C_{11} cycloalkylalkyl, C_2–C_4 alkenyl, C_1–C_4 alkoxy;

R^{16} is H, or C_1–C_4 alkyl;

alternately, R^{15} and R^{16} can be taken together to be $—(CH_2)_4—$, $—(CH_2)_5—$, $—(CH_2)_2O(CH_2)_2—$, or $—(CH_2)_2NR^{21}(CH_2)_2—$,

R^{17} is C_1–C_4 alkyl, or arylalkyl;

R^{18} is C_1–C_6 alkyl substituted with 0–2 R^{24}, C_6–C_{10} aryl, C_3–C_7 cycloalkyl, C_1–C_6 alkylcarbonyl, C_1–C_6 alkylaminocarbonyl, C_7–C_{14} arylalkylcarbonyl, or C_6–C_{10} arylcarbonyl substituted with 0–2 R^9;

R^{19} is C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_1–C_4 alkoxyalkyl, C_1–C_6 alkylcarbonyl, C_1–C_6 alkylaminocarbonyl, C_7–C_{14} arylalkylcarbonyl, or C_6–C_{10} arylcarbonyl substituted with 0–2 R^9;

R^{21} is C_1–C_4 alkyl or benzyl;

R^{23} is H, F, phenyl substituted with 0–2 R^9, $—C(═O)R^6$, $—COOR^{17}$, $—C(═O)NHR^{16}$, or

a heterocyclic ring system selected from morpholinyl, piperidinyl, pyrrolidinyl, furyl, thienyl, or tetrahydropyridinyl, said heterocyclic ring system being substituted with 0–2 R^9;

R^{24} is H, F, $NR^{15}R^{16}$, phenyl substituted with 0–2 R^9, C_1–C_4 alkoxy, C_1–C_4 alkylcarbonyloxy, $C(═O)R^6$, $—COOR^{17}$, $—C(═O)NR^{15}R^{16}$, or

a heterocyclic ring system selected from morpholinyl, piperidinyl, pyrrolidinyl, furyl, thienyl, piperidinyl, or tetrahydropyridinyl, said heterocyclic ring system being substituted with 0–2 R^9;

m is 0–2;

p is 0–1;

provided that when J and L are both nitrogen and K is CR^4, then R^4 cannot be SR^{10}; and

a pharmaceutically acceptable carrier.

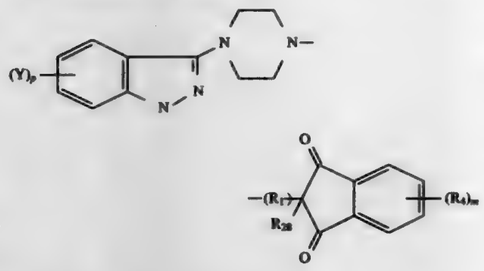
5,593,995

2-[(4-HETEROARYL-1-PIPERAZINYL)ALKYL]-1,3-INDANDIONES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

Edward J. Glamkowski, Warren, and Yulin Chiang, Covent Station, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,008, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,785, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 471,514
Int. Cl.[6] A61K *31/495;31/55;31/505;* C07D *401/00;403/00;417/00;419/00;221/04;275/04;239/02*
U.S. Cl. 514—254 16 Claims

1. A compound of the formula:



wherein

X is —O—, —S—, —NH—, or $—N(R_2)$;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, (C_3–C_{10}) cycloalkyl, aroyl, (C_2–C_{18}) alkanoyl, (C_1–C_{18}) alkoxycarbonyl and phenylsulfonyl groups;

aryl is as defined hereinafter;

is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is $—CR_{24}R_{27}—(CR_{23}R_{27})_n—$ where n is 0,1,2 or 4; or

$—CHR_{24}CH═CH—CHR_{24}—$,

$—CHR_{24}—C≡C—CHR_{24}—$,

$—CHR_{24}—CH═CH—CR_{23}R_{24}—CHR_{24}—$,

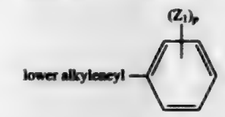
$—CHR_{24}—CR_{23}R_{24}—CH═CH—CHR_{24}—$,

$—CHR_{24}—C≡C—CR_{23}R_{24}—CHR_{24}—$, or

$—CHR_{24}—CR_{23}R_{24}—C≡C—CHR_{24}$,

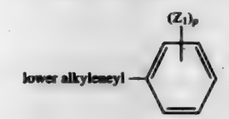
the —CH═CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18}) alkoxy, aryloxy, aryl (C_1–C_{18}) alkyloxy, (C_1–C_{18}) alkanoyloxy, hydroxy(C_1–C_6) alkyl, (C_1–C_{18}) alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6) alkyloxy, aryl(C_1–C_{18}) alkyloxy(C_1–C_6) alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



where Z_1 is lower alkyl, —OH, lower alkoxy, $—CF_3$, $—NO_2$, $—NH_2$, or halogen, and p is as previously defined;

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6) alkyloxy, aryl(C_1–C_{18})alkyoxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C═O or C═S;

where R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(═O)—(C_1–C_{19}straight or branched chain)-alkyl or —C(═O)—aryl;

where aryl is phenyl or

where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

where R_{28} is hydrogen, (C_1–C_6)alkyl, aryl(C_1–C_6)alkyl, phenyl, or substituted phenyl;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_6–C_{18}) carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

m is 1, 2, or 3;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

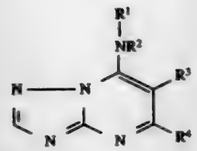
5,593,996

TRIAZOLOPYRIMIDINE DERIVATIVES

Klaus-Jurgen Pees, Mainz, and Guido Albert, Hackenheim, both of Germany, assignors to American Cyanamid Company, Madison, N.J.

Continuation-in-part of Ser. No. 276,384, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 998,113, Dec. 29, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 412,401
Claims priority, application European Pat. Off., Dec. 30, 1991, 9112422
Int. Cl.[6] C07D *487/04;* A01N *43/50*
U.S. Cl. 514—258 13 Claims

1. A fungicidal compound of formula I



(I)

wherein

R_1 represents a C_{1-12}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, C_{4-12}alkadienyl, C_{3-6}cycloalkyl, benzyl, furyl, or bicycloheptyl group optionally substituted by one to three substituents selected from the group consisting of halogen atoms, hydroxyl, C_{1-4}alkyl, C_{1-4}haloalkyl, C_{1-4}alkoxy, C_{1-4}haloalkoxy, carboxyl, phenyl and C_{1-4}alkoxycarbonyl, and

R_2 represents a hydrogen atom or an alkyl group having 1–4 carbon atoms, or

R_1 and R_2 together with the adjacent nitrogen atom represent a pyrrolidinyl, piperidyl, or dihydropyridyl ring optionally substituted by one or more C_{1-4}alkyl groups;

R_3 represents a phenyl or naphthyl group optionally substituted by one to three substituents selected from the group consisting of halogen atoms, hydroxyl, nitro, cyano, C_{1-12}alkyl, C_{1-12}haloalkyl, C_{1-4}alkoxy, C_{1-12}haloalkoxy, amino, C_{1-4}alkylamino, di-C_{1-4}alkylamino, formyl, carboxyl, phenyl, phenoxy, benzyloxy, and C_{1-4}alkoxycarbonyl; and

R_4 represents a halogen atom or a group NR_5R_6 where R_5 represents a hydrogen atom or an amino, C_{1-4}alkyl, C_{3-6}cycloalkyl or bicycloheptyl group and R_6 represents a hydrogen atom or an C_{1-4}alkyl group.

5,593,997

4-AMINOPYRAZOLO(3-,4-D)PYRIMIDINE AND 4-AMINOPYRAZOLO-(3,4-D)PYRIDINE TYROSINE KINASE INHIBITORS

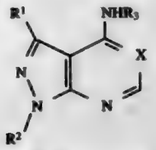
Robert L. Dow; Kevin Koch, and Gary R. Schulte, all of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 23, 1995, Ser. No. 449,381

Int. Cl.[6] C07D *239/70;* **A61K** *31/415*

U.S. Cl. 514—258 **16 Claims**

1. A compound of Formula I



Formula I

and the pharmaceutically-acceptable salts and prodrugs thereof wherein

X is N;

R_1 is phenyl, mono- or di-alkyl (C_1–C_4)phenyl or furyl;

R_2 is mono- or di-halophenyl, mono- or di-alkoxy (C_1–C_4)phenyl, mono- or di-alkyl (C_1–C_4)phenyl, perhaloalkyl (C_1–C_4)phenyl, alkyl (C_1–C_4), cycloalkyl (C_1–C_7), pyridyl, naphthyl, pyrrolyl imidazolyl, pyrazolyl, pyridyl, pyrimidinyl, pyrazinyl, pyridazinyl, furyl or thienyl; and

R_3 is H.

5,593,998

2,4-DIAMINO-5,6-DISUBSTITUTED-AND 5,6,7-TRISUBSTITUTED-5-DEAZAPTERIDINES AS INSECTICIDES

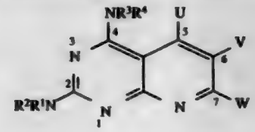
Robert N. Hearle, II, East Windsor; Clinton J. Peake, Trenton; Thomas G. Cullen, Milltown; Muniruthnam K. Chaguturu, Lawrenceville, all of N.J.; Partha S. Ray, Memphis, Tenn., and Brian D. Bennett, Lake Hopatcong, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 249,586, May 26, 1994, Pat. No. 5,547,954. This application May 15, 1996, Ser. No. 647,550

Int. Cl.[6] A01N *43/54;* **A61K** *31/535*

U.S. Cl. 514—258 **5 Claims**

1. An insecticidal composition comprising, in admixture with an agriculturally acceptable carrier, and a surface-active agent, an insecticidally effective amount of a compound of the formula:



(I)

wherein

R_1 is hydrogen, lower alkyl or arylalkyl;

R_3 is hydrogen, lower alkyl or arylalkyl;

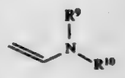
R^2 and R^4 are independently hydrogen, lower alkyl, arylalkyl, or



wherein R^7 is straight or branched chain alkyl, lower haloalkyl, lower alkynyl, straight or branched chain alkoxy, alkylsulfonylalkyl, aryl, arylalkyloxy, or ethers or polyethers of two to twelve carbon atoms in length containing one to four ether linkages; or

R^1 and R^2 taken together, form the group $—R^8—O—R^8$, wherein R^8 is lower alkylene; or

R^1 and R^2, taken together, and R^3 and R^4 taken together, each form the group



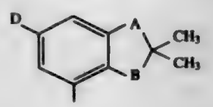
wherein R^9 and R^{10} are independently straight or branched chain lower alkyl; or

R^9 and R^{10} taken together with two to five methylene groups form an alkylene ring;

W is hydrogen, halogen, lower alkyl, or hydroxy;

U is hydrogen, halogen, lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkoxy, lower dialkylamino, aryl, arylalkyl, substituted arylthio, substituted arylsulfinyl, or substituted arylalkylthio;

V is thienyl or a benzo-fused oxygen-containing heterocycle of the formula:



wherein

A and B are independently selected from methylene, carbonyl, and oxygen, and wherein at least one of A and B is oxygen;

an wherein D is hydrogen, halogen, lower alkyl, or lower haloalkyl; to form the heterocycle 2,3-dihydro-2,2-dimethylbeazofuran-4-yl, 2,3-dihydro-2,2-dimethylbenzofuran-7-yl, 6-halo-2,3-dihydro-2,2-dimethylbenzofuran-4 -yl, 5-halo-2,3-dihydro-2,2-dimethylbenzofuran-7-yl, 2,3-dihydro-2,2 -dimethyl-3-benzofuranon-4-yl, or 2,2-dimethyl-5-halobenzodioxol-7-yl; and

agriculturally acceptable salts thereof and wherein aryl is optionally-substituted phenyl or naphthyl, and aroyl is optionally-substituted benzoyl or naphthoyl; the substituents of the substituted arylthio, arylsulfinyl, and aryalkylthio of the U moiety being one or more halogens; and wherein the alkyl groups contain from 1 to 6 carbon atoms.

5,593,999

NON-CLASSICAL FOLATE ANALOGUE INHIBITORS OF GLYCINAMIDE RIBONUCLEOTIDE FORMYLTRANSFERASE (GARFT)

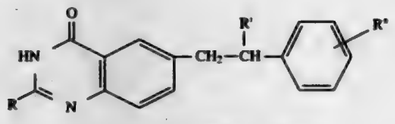
Madhavan G. Nair, 7005 Charleston Oaks Dr. N., Mobile, Ala. 36695, and Li Liu, 207 Hillcrest Rd. Apt #118, Mobile, Ala. 36608

Filed Jun. 7, 1995, Ser. No. 480,814

Int. Cl.[6] C07D *401/06;409/06;405/06;239/90*

U.S. Cl. 514—260 **25 Claims**

1. Quinazoline compounds having the following formula wherein R*



R = —NH_2; R' = —CHO;

selected from the group consisting of —C(=O)—OCH_3; —F; —CF_3; —NO_2; —NH_2 —Cl; —Br; —CH_3; —OCH_3; —OH; —C_6H_5; or —OC_6H_5.

5,594,000

SPIROFURANE DERIVATIVES

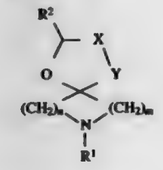
Edwin S.-C. Wu, Rochester, and Ronald C. Griffith, Pittsford, both of N.Y., assignors to Astra AB, Södertälje, Sweden

Continuation of Ser. No. 304,422, Sep. 12, 1994, abandoned, which is a continuation of Ser. No. 28,687, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 629,797, Dec. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 369,324, Jun. 21, 1989, Pat. No. 5,075,317. This application Jun. 6, 1995, Ser. No. 469,791

Int. Cl.[6] C07D *471/10;405/06;211/44;* **A61K** *31/445*

U.S. Cl. 514—278 **9 Claims**

1. A compound of formula I,



I

wherein

R^1 represents hydrogen or alkyl C_{1-3},

R^2 represents hydrogen, alkyl C_{1-6}, alkenyl C_{3-6} or alkynyl C_{3-6},

n and m are integers from 1 to 3, provided that n+m=4, and

one of X and Y represents CH_2 and the other represents CHR^3, $C{=}CHR^4$ or $C{=}NR^5$, in which

R^3 represents NR^6R^7, NR^8R^9, CO_2R^{10}, 3-methyl-1,2,4-oxadiazol-5-yl, or 3-amino-1,2,4-oxadiazol-5-yl,

R^4 represents alkanoyl C_{1-6} or $COOR^{11}$,

R^5 represents OR^{12}, alkanoyloxy C_{1-6}, benzoyloxy, C_{1-6} alkanoylamino, $OCONR^{13}R^{14}$, $NHCONR^{15}R^{16}$ or $NHCOOR^{17}$,

R^6 represents C_{1-6} alkanoyl or C_{1-6} alkoxycarbonyl, and

R^7, R^8, R^9, R^{10}, R^{11}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} represent hydrogen or C_{1-6} alkyl, and

R^{12} represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl or C_{3-6} alkynyl,

and salts and solvates thereof.

5,594,001

POLYCYCLIC SYSTEMS, AND DERIVATIVES THEREOF, AS NEUROTRANSMITTER RELEASE ENHANCERS USEFUL IN THE TREATMENT OF COGNITIVE DISORDERS

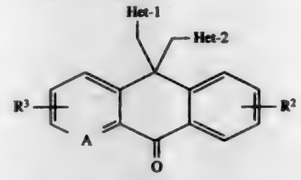
Christopher A. Teleha; Wendell W. Wilkerson, both of New Castle, and Richard A. Earl, Wilmington, all of Del., assignors to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 44,012, Apr. 8, 1993, abandoned. This application Mar. 28, 1994, Ser. No. 216,881

Int. Cl.[6] A61K *31/435;31/44;* **C07D** *491/052;221/08*

U.S. Cl. 514—290 **51 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt or prodrug thereof, wherein:

A is N or CH;

Het-1 and Het-2 are each independently selected from 2-pyridyl, 3-pyridyl or 4-pyridyl substituted with X

R^2 and R^3 are independently selected from H, F, Cl, Br, I, CF_3, R^4, or —C≡CH;

R^4 is alkyl of 1 to 4 carbons;

X in each instance is independently selected from H, F, Cl, Br, I, or CF_3, provided that at least one X is other than H.

5,594,002

BENZAZABICYCLIC CARBAMATES AS NOVEL CHOLINESTERASE INHIBITORS

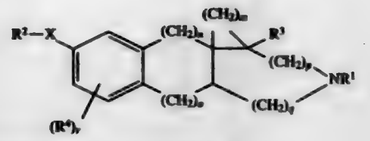
Yuhpyng L. Chen, Waterford, Conn., assignor to Pfizer Inc, New York, N.Y.

Division of Ser. No. 835,904, Feb. 28, 1992, Pat. No. 5,387,590. This application Oct. 25, 1994, Ser. No. 328,285

Int. Cl.[6] C07D *221/22;* **A61K** *31/445*

U.S. Cl. 514—295 **5 Claims**

1. A compound of the formula



wherein each of n, o and q is zero;
m is one;
p is two;
X is oxygen or sulfur;
R^1 is hydrogen; $(C_1–C_4)$ alkyl; $(C_3–C_8)$cycloalkyl; $(C_3–C_8)$ cycloalkyl-$(C_1–C_4)$ alkyl; $(C_1–C_4)$ alkenyl-$(C_1–C_4)$ alkyl; aryl-$(C_1–C_4)$ alkyl wherein the aryl moiety is selected from the group consisting of phenyl and naphthyl, and wherein said aryl moiety may be optionally substituted with one or more substituents selected from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, halogen, amino, and trifluoromethyl; or heteroaryl-$(C_1–C_4)$ alkyl wherein said heteroaryl moiety is selected from the group consisting of pyridyl, thienyl, furanyl, pyrazinyl, pyrrolyl, indolyl, pyrimidyl, and wherein said heteroaryl moiety may be optionally substituted with one or more substituents selected from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, halogen, amino, and trifluoromethyl;
R^2 is $—CYNR^5R^6$;
Y is oxygen or sulfur;
R^5 is $(C_1–C_{12})$ alkyl; $(C_3–C_8)$ cycloalkyl; $(C_6–C_{12})$ bicycloalkyl; $(C_3–C_8)$ cycloalkenyl; aryl; $(C_1–C_4)$ alkyl wherein said aryl moiety is selected from the group consisting of phenyl and naphthyl, and wherein said aryl moiety may be optionally substituted with one or more substituents independently selected from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, amino, halogen and trifluoromethyl; heteroalkyl wherein the hetero atom is selected from the group consisting of nitrogen, oxygen and sulfur; aryl selected from the group consisting of phenyl and naphthyl; heteroaryl selected from the group consisting of pyridyl, thienyl, furanyl, pyrazinyl, pyrrolyl, indolyl and pyrimidyl; and wherein said aryl and heteroaryl groups may be optionally substituted with one or more substituents independently selected from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, halogen, amino, and trifluoromethyl;
R^6 is hydrogen or $(C_1–C_{12})$ alkyl;
or R^5 and R^6, together with the nitrogen to which they are attached, form a heterocyclic containing group wherein the heterocyclic moiety is selected from the group consisting of 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 4-thiomorpholinyl, 1-piperazinyl, and all other 3 to 12 membered azacyclic and azabicyclic moieties, and wherein said heterocyclic, azacyclic and azabicyclic moieties may be optionally substituted with one or more substituents from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, halogen, trifluoromethyl, hydroxy, amino, phenyl and benzyl; aryl selected from the group consisting of phenyl and naphthyl; aryl $(C_1–C_4)$ alkyl wherein said aryl moiety is selected from phenyl and naphthyl, or heteroaryl selected from the group consisting of pyridyl, thienyl, furanyl and indolyl; and wherein said aryl moiety and aryl and heteroaryl groups may be optionally substituted with one or more substituents independently selected from the group consisting of $(C_1–C_4)$ alkyl, $(C_1–C_4)$ alkoxy, halogen, amino and trifluoromethyl;
R^3 is hydrogen; $(C_1–C_4)$alkyl; $(C_1–C_4)$ alkoxy; amino; $(C_1–C_4$ alkylamino; or $(C_1–C_4)$ dialkylamino;
and each R^4 is independently selected from the group consisting of hydrogen; nitrile; $(C_1–C_4)$ alkyl; phenyl; halogen; nitro; trifluoromethyl; $(C_1–C_4)$ alkoxy; carboxylate; hydroxy; amino; $(C_1–C_4)$alkylcarbonyl; phenylcarbonyl; $(C_1–C_4)$ alkoxycarbonyl; aminocarbonyl; $(C_1–C_4)$ alkylaminocarbonyl; $(C_1–C_4)$ dialkylaminocarbonyl; $(C_1–C_4)$ alkylamino; $(C_1–C_4)$ dialkylamino; benzylamino; $(C_1–C_4)$ alkylbenzylamino; $(C_1–C_4)$ alkylcarbonylamino; and phenylcarbonylamino;
and the pharmaceutically acceptable salts of such compounds.

5,594,003

TETRAHYDROIMIDAZO[1,2-A]PYRIDIN-2-YL-(BENZIMIDAZOL-1-YL)-METHYL-BIPHENYLS USEFUL AS ANGIOTENSIN-II ANTAGONISTS

Norbert Hanel, Schemmerhofen; Berthold Narr, deceased, late of Biberach; Uwe Ries, Biberch; Jacobus C. A. van Meel, Mittelbiberach; Wolfgang Wiesen, Biberach/Riss; and Michael Entzeroth, Warthausen, all of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

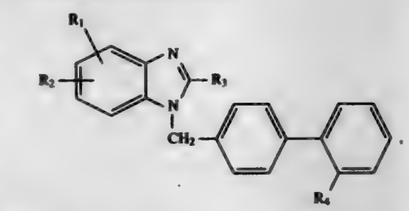
Division of Ser. No. 385,936, Feb. 9, 1995, which is a continuation-in-part of Ser. No. 201,139, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 832,193, Feb. 6, 1992, abandoned, and a continuation of Ser. No. 257,608, Jun. 9, 1994, which is a continuation of Ser. No. 7,315, Jan. 21, 1993, abandoned, and a continuation of Ser. No. 237,477, May 3, 1994, abandoned, which is a continuation of Ser. No. 40,778, Mar. 31, 1993, abandoned, and a continuation of Ser. No. 94,835, Jul. 20, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 456,337

Claims priority, application Germany, Feb. 6, 1991, 41 03 492.9; May 25, 1991, 41 17 121.7; Nov. 16, 1991, 41 37 812.1; Jan. 22, 1992, 42 01 554.5; Apr. 11, 1992, 42 12 250.3; Jun. 17, 1992, 42 19 782.1; Jul. 22, 1992, 42 24 133.2; Jul. 27, 1992, 42 24 752.7; Aug. 4, 1992, 42 25 756.5

Int. Cl.[6] A61K 31/44; C07D 471/02

U.S. Cl. 514—300 6 Claims

1. A compound of the formula I



(I)

wherein
R_1 is in the 4-position and represents a C_{1-4}-alkyl, C_{3-7} cycloalkyl or trifluoromethyl group,
R_2 represents a 5,6,7,8-tetrahydro-imidazo[1,2-a]pyridin-2-yl group,
R_3 represents a C_{1-5}-alkyl group or cyclopropyl, and
R_4 denotes a 1H-tetrazolyl group or an $R_aO—CO—$ group, wherein
R_a denotes a hydrogen atom or a straight-chained or branched C_{1-4}-alkyl group,
or a pharmaceutically acceptable salt thereof.

5,594,004

COMPOUND WITH PLATELET AGGREGATION INHIBITOR ACTIVITY

Kiyoaki Katano; Shokichi Obuchi; Eiki Shitara; Masaro Shimabuu; Kazue Yasgashi; Tomoaki Miura; Yasuko Isomura; Hiroyuki Iida; Midori Ishikawa; Kenji Asai; Emiko Hatsushibe; Masai Kawaguchi, and Takashi Tsuruoka, all of Kanagawa-ken, Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo-to, Japan

PCT No. PCT/JP94/00437, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO94/21599, PCT Pub. Date Sep. 29, 1994

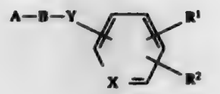
PCT Filed Mar. 17, 1994, Ser. No. 347,402

Claims priority, application Japan, Mar. 17, 1993, 5-057463; Apr. 8, 1993, 5-082145; Oct. 22, 1993, 5-265273

Int. Cl.[6] A61K 31/435; C07D 211/34;211/62;471/04

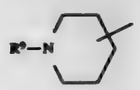
U.S. Cl. 514—301 21 Claims

1. A compound represented by the formula (I) or a pharmaceutically acceptable salt and solvate thereof:



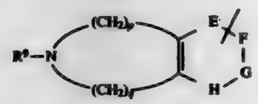
(I)

wherein
R^1 represents a group $—W—(CH_2)_i—COOR^3$, where W represents —O— or a bond, R^3 represents hydrogen, lower alkyl, C_{5-7} cycloalkyl or an ester moiety which may be removed under a physiological condition, and i is an integer from 1 to 4,
R^2 represents hydrogen or a group $—W—(CH_2)_i—COOR^3$, where W, R^3 and i have the same meanings as defined above, or a group $—OR^4$, where R^4 represents hydrogen, lower alkyl, mono lower alkylaminocarbonyl or phenyl-lower alkyl,
X represents CH or N,
Y represents
(i) a group $—(CO)_k—N(R^5)—Z—$,
where k represents 0 or 1,
R^5 represents hydrogen; lower alkyl; or acyl,
Z represents a bond, or a group $—(CH_2)_m—CO—$ or a group $—(CH_2)_m—CHR^6—$, where m is an integer from 1 to 3 and R^6 represents hydrogen or hydroxyl,
(ii) a group $—CO—(CH_2)_m—N(R^5)—(CO)_k—$
where k, m and R^5 have the same meanings as defined above, or
(iii) a group $—(CO)_k$-Het
where Het represents a five-membered heterocyclic ring containing 1 to 4 nitrogen atoms, or a six-membered ring which has 1 or 2 nitrogen atoms, which may optionally contain an oxygen atom or a sulfur atom when the ring contains 1 or 2 nitrogen atoms, and
where k has the same meaning as defined above,
A represents
(i) the following group (III):



(III)

wherein
R^9 represents hydrogen; lower alkyl in which one or more hydrogen atoms may be substituted by hydroxyl, halogen, amino or lower alkyl amino; or amidino, or
(ii) the following group (IV):



(IV)

wherein
R^9 has the same meanings as defined above,
one of E or H represents $—NR^{10}—$, —O— or —S— and the other represents a bond, F and G represent $—CR^{10}—$, where R^{10} represents hydrogen, lower alkyl or phenyl-lower alkyl, p and q independently are 1 or 2 provided that p+q is 3, and
B represents a bond, C_{1-6} alkylene or C_{2-6} alkenylene.

5,594,005

USE OF QUINOLINE-3-CARBOXAMIDE COMPOUNDS FOR TREATMENT OF DIABETES

Shimon Slavin; Lola Weiss, and David Gross, all of Jerusalem, Israel, assignors to Pharmacia AB, Stockholm, Sweden

PCT No. PCT/SE93/00272, § 371 Date Dec. 23, 1994, § 102(e) Date Dec. 23, 1994, PCT Pub. No. WO93/19756, PCT Pub. Date Oct. 14, 1993

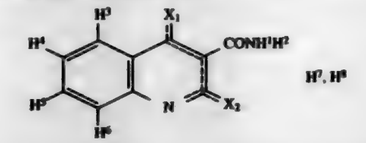
PCT Filed Mar. 31, 1993, Ser. No. 313,302

Claims priority, application Sweden, Apr. 6, 1992, 9201076

Int. Cl.[6] A61K 31/47

U.S. Cl. 514—311 9 Claims

1. A method for preventing, treating or ameliorating Type I diabetes, which comprises:
administering an effective amount of an anti-diabetic quinoline-3-carboxamide of formula I, or a pharmaceutically acceptable salt thereof, to a patient in need thereof:



H^7, H^8

wherein —— represents two conjugated double bonds between the atoms comprised by the dashed line, X_1 and X_2 are independently selected from an oxygen atom or NH^9, H^{1-9} independently represent a hydrogen atom or a substituent, wherein H^7 and H^8 are attached to different atoms selected from X_1, X_2 and the ring nitrogen atom of the quinoline ring, said X_1 and X_2 being bound by a single bond to the ring when H^7 or H^8 is bonded thereto and by a double bond when H^7 or H^8 is not bonded thereto.

5,594,006

CARBOSTYRIL DERIVATIVES AS MATRIX METALLOPROTEINASES INHIBITORS

Makoto Sakamoto; Takashi Inuoka; Masashi Moteyama; Yoshihito Yamamoto, and Hideki Takase, all of Otsu, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

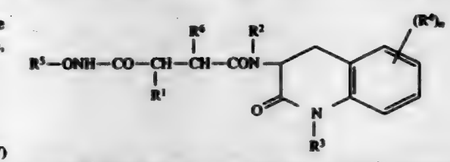
Continuation-in-part of Ser. No. 338,600, Nov. 18, 1994, abandoned. This application Feb. 16, 1995, Ser. No. 389,645

Claims priority, application Japan, Mar. 18, 1993, 5-58264; Oct. 14, 1993, 5-256873; Sep. 12, 1994, 6-216890

Int. Cl.[6] C07D 215/227;215/38; A61K 31/47

U.S. Cl. 514—312 27 Claims

1. A carbostyril derivative or a salt thereof of formula (1):



(I)

wherein R^1 is a hydrogen atom or a group $—A—R^{1a}$, wherein A is a lower alkylene group, and R^{1a} is selected from the group consisting of a hydrogen atom, an amino group, a phthalimido group, a thienylthio group, a lower alkanoylthio group, a mercapto group, a phenyl group which may possess one to three groups selected from the group consisting of a halogen atom, a hydroxy group, a lower alkyl group, a lower alkoxy group, a carboxy group, a lower alkoxycarbonyl group and a lower alkylenedioxy group as a substituent, a carboxy group, a lower alkoxycarbonyl group, a phenylthio group, and a lower alkylthio group;
R^2 is a hydrogen atom or a lower alkyl group;
R^3 is selected from the group consisting of a hydrogen atom, a hydroxy group, a lower alkoxy group, a lower alkoxy-lower alkoxy group, a lower alkoxy-lower alkoxy-lower alkoxy group, a lower alkoxy-lower alkoxy-lower alkoxy-lower

alkoxy group, and a group —B—R^{3a} wherein B is a lower alkylene group, a lower alkenylene group or a lower alkynylene group, and R^{3a} is selected from the group consisting of a hydrogen atom, a hydroxy group, a lower alkoxy group, a lower alkoxy-lower alkoxy group, a phenyl group which may possess one to three groups selected from the group consisting of a halogen atom, a cyano group, a hydroxy group, a lower alkyl group, a lower alkoxy group, a carboxy group and a lower alkoxycarbonyl group as a substituent, a thienyl group which may possess a halogen atom as substituent, a phthalimido group, a carboxy group, a lower alkoxycarbonyl group, a group —CO—$N(R^{3b})$—R^{3c} wherein R^{3b} is a hydrogen atom or a lower alkyl group, and R^{3c} is a hydrogen atom, a lower alkyl group or a lower alkoxy group, and a group —$N(R^{3b})$—R^{3c} wherein R^{3b} and R^{3c} are as defined above and may form a saturated heterocyclic ring with five or six members which may further possess one hetero atom selected from the group consisting of a nitrogen atom, an oxygen atom and a sulfur atom;

R^4 is selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxy group, a lower alkyl group, a lower alkoxy group, and a lower alkylenedioxy group;

R^5 is selected from the group consisting of a hydrogen atom, a benzoyl group, a lower alkanoyl group, and a phenyl-lower alkyl group;

R^6 is an alkyl group with 1 to 12 carbon atoms, a lower alkoxy-lower alkyl group, or a phenyl-lower alkyl group which may possess a lower alkylenedioxy group as a substituent on the phenyl ring; and

n is 1 or 2, or its salt].

5,594,007

METHOD FOR TREATING SPINAL CORD TRAUMA WITH PHENOLIC 2-PIPERIDINO-1-ALKANOLS

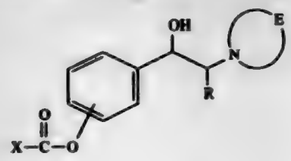
Bertrand L. Chenard, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 119,122, Sep. 16, 1993, Pat. No. 5,455,258, which is a continuation of Ser. No. 687,273, Apr. 18, 1991, abandoned. This application Feb. 14, 1994, Ser. No. 195,797

Int. Cl.[6] A61K *31/445;31/40;31/05*

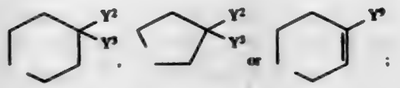
U.S. Cl. 514—315 **1 Claim**

1. A method for treating spinal cord trauma in a mammal in need of such treatment comprising administering to said mammal an effective NMDA blocking amount of a compound of the formula



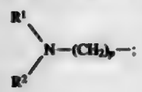
wherein

E is



R is H, $(C_1–C_6)$alkyl, $(C_2–C_6)$alkenyl or $(C_2–C_6)$alkynyl;

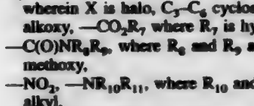
X is phenyl, benzyl, $(C_1–C_3)$alkoxy, phenoxy or one of said groups substituted on aromatic carbon by



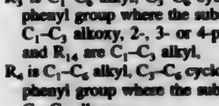
p is 1 or 2;

R^1 and R^2 are taken separately and are each independently hydrogen or $(C_1–C_6)$ alkyl, or R^1 and R^2 are taken together with the nitrogen to which they are attached to form a pyrrolidine, piperidine or morpholine ring, or one of said rings substituted by $(C_1–C_3)$alkyl;

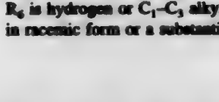
Y^2 and Y^3 are taken together and are



Y^2 and Y^3 are taken separately, and Y^1 is OH and Y^3 is



Y^9 is



n is 0, 1, 2 or 3;

m is 0, 1, 2, 3 or 4;

Q is S or CH═CH; and

X^1 is hydrogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy or halo;

or a pharmaceutically acceptable acid addition salt thereof.

5,594,008

PYRROLIDINE DERIVATIVES INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

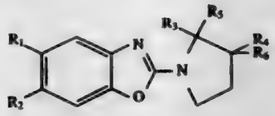
Kelkel Pal, New Milford; Mark Behnke, Danbury, and Julian Adams, Ridgefield, all of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Continuation of Ser. No. 143,270, Oct. 26, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 362,373

Int. Cl.[6] A61K *31/44;* C07D *213/06*

U.S. Cl. 514—338 **9 Claims**

1. A compound of formula 1



wherein

R_1 and R_2, independently, are hydrogen, $C_1–C_4$ alkyl, —CX_3 wherein X is halo, $C_3–C_6$ cycloalkyl, halogen, nitrile, $C_1–C_6$ alkoxy, —CO_2R_7 where R_7 is hydrogen or $C_1–C_6$ alkyl, —$C(O)NR_8R_9$, where R_8 and R_9 are hydrogen, $C_1–C_3$ alkyl or methoxy, —NO_2, —$NR_{10}R_{11}$, where R_{10} and R_{11} are hydrogen or $C_1–C_3$ alkyl, —SO_2-phenyl-CH_3, or —$C(O)R_{12}$, where R_{12} is $C_1–C_6$ alkyl,

R_3 is $C_1–C_6$ alkyl, $C_3–C_6$ cycloalkyl, an optionally substituted phenyl group where the substituents are halo, $C_1–C_4$ alkyl, or $C_1–C_3$ alkoxy, 2-, 3- or 4-pyridyl, or —$NR_{13}R_{14}$, where R_{13} and R_{14} are $C_1–C_3$ alkyl,

R_4 is $C_1–C_6$ alkyl, $C_3–C_6$ cycloalkyl, or an optionally substituted phenyl group where the substituents are halo, $C_1–C_4$ alkyl or $C_1–C_3$ alkoxy,

R_5 is hydrogen or $C_1–C_6$ alkyl

R_6 is hydrogen or $C_1–C_3$ alkyl

in racemic form or a substantially pure enantiomer thereof.

5,594,009

FUSED PYRROLOCARBAZOLES

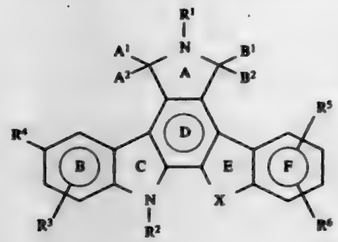
Robert L. Hudkins, Chester Springs, Pa., and Ernest Knight, Jr., Wilmington, Del., assignors to Cephalon, Inc., West Chester, Pa.

Continuation-in-part of Ser. No. 427,160, Apr. 24, 1995, which is a continuation-in-part of Ser. No. 323,755, Oct. 14, 1994, Pat. No. 5,475,110. This application May 26, 1995, Ser. No. 452,335

Int. Cl.[6] A61K *31/40*

U.S. Cl. 514—336 **27 Claims**

1. A method for effecting the function of a trophic factor responsive cell, comprising the step of contacting said cell with at least one fused pyrrolocarbazole defined by the following general formula:



wherein:

a) R^1 is selected from the group consisting of H, alkyl of 1–4 carbons, aryl, arylalkyl, heteroaryl, heteroarylalkyl, COR^9, where R^9 is selected from the group consisting of alkyl of 1–4 carbons, and aryl; —OR^{10}, where R^{10} is selected from the group consisting of H and alkyl of 1–4 carbons; —$CONH_2$, —NR^7R^8, —$(CH_2)_nNR^7R^8$, where n is an integer of 1–4; and —$O(CH_2)_nNR^7R^8$ wherein either

1) R^7 and R^8 independently are selected from the group consisting of H and alkyl of 1–4 carbons; or

2) R^7 and R^8 are combined together to form a linking group of the general formula —$(CH_2)_2$—X^1—$(CH_2)_2$—, where X^1 is selected from the group consisting of O, S and CH_2;

b. R^2 is selected from the group consisting of H, —SO_2R^9, —CO_2R^9, —COR^9, alkyl of 1–8 carbons, alkenyl of 1–8 carbons, alkynyl of 1–8 carbons, and a monosaccharide of 5–7 carbons wherein each hydroxyl group of the monosaccharide is independently selected from the group consisting of unsubstituted hydroxyl group and a replacement moiety replacing said hydroxyl group, said replacement moiety, selected from the group consisting of H, alkyl of 1–4 carbons, alkylcarbonyloxy of 2–5 carbons and alkoxy of 1–4 carbons; wherein either

1) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons, or alkynyl of 1–8 carbons is unsubstituted; or

2) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons, or alkynyl of 1–8 carbons is independently substituted with a moiety selected from the group consisting of phenyl, naphthyl, heteroaryl, F, Cl, Br, I, —CN, —NO_2, OH, —OR^9, —$O(CH_2)_nNR^7R^8$, —$OCOR^9$, —$OCONHR^9$, O-tetrahydropyranyl, NH_2, —NR^7R^8, —$NR^{10}COR^9$, —$NR^{10}CO_2R^9$, —$NR^{10}CONR^7R^8$, —$NHC(=NH)NH_2$, —$NR^{10}SO_2R^9$, —$S(O)_yR^{11}$, where R^{11} is selected from the group consisting of H, alkyl of 1–4 carbons, aryl of 6–10 carbons, and heteroaryl wherein y is 1 or 2; —SR^{11}, —CO_2R^9, —$CONR^7R^8$, —CHO, COR^9, —CH_2OR^7, —CH═$NNR^{11}R^{12}$, —CH═NOR^{11}, —CH═NR^9, —CH═$NNHCH(N=NH)NH_2$, —$SO_2NR^{12}R^{13}$, —$PO(OR^{11})_2$, and OR^{14}, where R^{14} is the residue of an amino acid after the hydroxyl group of the carboxyl group is removed; and wherein either

i) R^{12} and R^{13} are each independently selected from the group consisting of H, alkyl of 1–4 carbons, aryl of 6–10 carbons, and heteroaryl; or

ii) R^{12} and R^{13} are combined together to form a linking group of the general formula —$(CH_2)_2$—X^1—$(CH_2)_2$;

c) R^3, R^4, R^5 and R^6, are each independently selected from the group consisting of H, aryl, heteroaryl; F, Cl, Br, I, —CN, CF_3, —NO_2, OH, —OR^9, —$O(CH_2)_nNR^7R^8$, —$OCOR^9$, —$OCONHR^9$, NH_2, —CH_2OH, CH_2OR^{14}, —NR^7R^8, —$NR^{10}COR^9$, —$NR^{10}CONR^7R^8$, —SR^{11}, —$S(O)_yR^{11}$ where y is 1 or 2; —CO_2R^9, —COR^9, —$CONR^7R^8$, —CHO, —CH═NOR^{11}, —CH═NR^9, —CH═$NNR^{11}R^{12}$, —$(CH_2)_nSR^9$, where n is an integer of 1–4, —$(CH_2)_nS(O)_yR^9$, —CH_2SR^{15}, where R^{15} is alkyl of 1–4 carbons; —$CH_2S(O)_yR^{14}$, —$(CH_2)_nNR^7R^8$, —$(CH_2)_nNHR^{14}$, alkyl of 1–8 carbons; alkenyl of 1–8 carbons; alkynyl of 1–8 carbons, wherein either

1) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons or alkynyl of 1–8 carbons is unsubstituted; or

2) each alkyl of 1–8 carbons, alkenyl of 1–8 carbons or alkynyl of 1–8 carbons is substituted as described in b)2), above;

d) X is selected from the group consisting of

1) an unsubstituted alkylene of 1–3 carbons; or

2) an alkylene of 1–3 carbons substituted by R^2, OR^{10}, —SR^{10}, R^{15}, where R^{15} is an alkyl of 1–4 carbons; phenyl, naphthyl, arylalkyl of 7–14 carbons; or

3) —CH═CH—, —CH(OH)CH(OH)—, —O—, —S—, —S(═O)—, —$S(=O)_2$—, —$C(R^{10})_2$—, —C(═O)—, —C(═NOR^{11})—, —$C(OR^{11})$ (R^{11})—, —C(═O)$CH(R^{15})$—, —$CH(R^{15})C(=O)$—, —C(═NOR^{11})$CH(R^{15})$—, —$CH(R^{15})C(=NOR^{11})$—, —CH_2Z—, —ZCH_2—, —CH_2ZCH_2—, where Z is selected from the group consisting of —$C(OR^{11})$ (R^{11})—, —O—, —S—, —C(═O)—, —C(═NOR^{11})—, and NR^{11};

e) A^1 and A^2 are selected from the group consisting of H,H; H,—OR^{11}; H, —SR^{11}; H^1, —$N(R^{11})_2$; and a group wherein A^1 and A^2 together form a moiety selected from the group consisting of ═O, ═S; and ═NR^{11}, and

f) B^1 and B^2 are selected from the group consisting of H,H; H,—OR^{11}; H, —SR^{11}; H^1, —$N(R^{11})_2$; and a group wherein B^1 and B^2 together form a moiety selected from the group consisting of ═O, ═S, and ═NR^{11}

with the proviso that at least one of the pairs A^1, A^2 or B^1, B^2 is ═O.

5,594,010

SUBSTITUTED MONOPYRIDYLMETHYL DERIVATIVES

Peter Fey; Thomas Krämer, both of Wuppertal; Jürgen Dressel, Radevormwald; Rudolf Hanko, Essen; Walter Hübsch; Ulrich Müller, both of Wuppertal; Matthias Müller-Gliemann, Solingen; Martin Bosch, Erkrath; Hilmar Bischoff, Wuppertal; Stefan Wohlfeil, Hilden; Dirk Denner; Stanislav Kanka, both of Wuppertal; Johannes-Peter Stasch, Solingen; Andreas Knorr, Erkrath, and Siegfried Zeiss, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

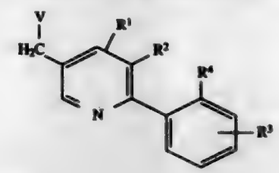
Filed Jun. 17, 1994, Ser. No. 262,085

Claims priority, application Germany, Jun. 21, 1993, 43 20 432.5

Int. Cl.[6] A61K *31/44;* C07D *401/14*

U.S. Cl. 514—340 **7 Claims**

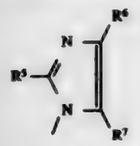
1. A substituted monopyridylmethyl derivative of the formula



(I)

in which

V represents a radical of the formula



in which

R^5 denotes straight-chain or branched alkyl having up to 10 carbon atoms which is optionally substituted by cycloalkyl having 3 to 6 carbon atoms, by hydroxyl, or by straight-chain or branched alkoxy or alkylthio having in each case up to 6 carbon atoms, or denote cycloalkyl having 3 to 6 carbon atoms,

R^6 denotes halogen,

R^7 denotes formyl, carboxyl, straight-chain or branched alkoxycarbonyl having up to 6 carbon atoms, or straight-chain or branched alkyl having up to 6 carbon atoms which is optionally substituted by hydroxyl,

R^1, R^2 and R^3 are identical or different and represent hydrogen, halogen, cyano, nitro, trifluoromethyl or amido, or represent straight-chain or branched alkyl or alkoxycarbonyl having up to 6 carbon atoms,

R^4 represents a group of the formula —CO—R^{14}, —SO_2R^{15}, —CO—$NR^{16}R^{17}$, —NH—SO_2R^{18} or —$SO_2NR^{19}R^{20}$,

in which

R^{14} denotes hydroxyl or straight-chain or branched alkoxy having up to 6 carbon atoms,

R^{15} denotes hydroxyl, trifluoromethyl, straight-chain or branched alkoxy or alkyl having in each case up to 5 carbon atoms, phenyl or benzyl which are optionally substituted identically or differently up to 2 times by halogen, trifluoromethyl or straight-chain or branched alkyl having up to 4 carbon atoms,

R^{16} and R^{17} are identical or different and denote hydrogen, cycloalkyl having 3 to 8 carbon atoms, or straight-chain or branched alkyl having up to 8 carbon atoms which is optionally substituted by phenyl, or

R^{16} denotes hydrogen and

R^{17} denotes the group —SO_2R^{15},

in which

R^{15} has the abovementioned meaning,

R^{18} as the abovementioned meaning of R^{15} and is identical to or different from the latter,

R^{19} and R^{20} have the abovementioned meaning of R^{16} and R^{17} and are identical to or different from the latter, or

R^{19} denotes hydrogen or straight-chain or branched alkyl having up to 4 carbon atoms, and

R^{20} has the abovementioned meaning of R^{15} and is identical to or different from the latter, or

R^4 represents a radical of the formula



in which

R^{21} denotes hydrogen or straight-chain or branched alkyl having up to 8 carbon atoms which is optionally substituted by straight-chain or branched acyl having up to 6 carbon atoms, or denotes the triphenylmethyl group,

or a salt thereof.

5,594,011

MODULATORS OF ACETYLCHOLINE RECEPTORS

Ian A. McDonald; Jeffrey P. Whitten, both of San Diego, and Nicholas D. Cosford, La Jolla, all of Calif., assignors to SIBIA Neurosciences, Inc., La Jolla, Calif.

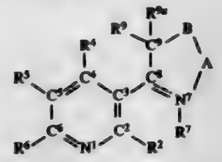
Filed Nov. 10, 1994, Ser. No. 337,640

Int. Cl.[6] C07D *401/04*; A61K *31/44*

U.S. Cl. 514—343 **27 Claims**

1. A compound having the structure:

I



wherein:

A is a 1 atom bridging species which forms part of a saturated or monounsaturated 8-membered ring including N^7, C^8, C^9 and B;

B is —$C^{10}HR^{10a}$, wherein R^{10a} is selected from hydrogen, lower alkyl, hydroxyalkyl, aryl, aryloxyalkyl, fluoro, trifluoromethyl, cyano, cyanomethyl, —OR', —NR'_2, or —SR', wherein each R' is independently hydrogen, lower alkyl, alkenyl, alkynyl or aryl, provided, however, that neither the —NR'_2 nor the —SR' functionality is conjugated with an alkenyl or alkynyl functionality; or B is =$C^{10}R^{10a}$—, provided there is no double bond in the ring between A and B, or between B and C^9 when there is a double bond between N^7 and C^8;

R^2, R^4 and R^6 are each independently selected from hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, heterocyclic, substituted heterocyclic, trifluoromethyl, halogen, cyano, nitro;

—S(O)R', —$S(O)_2R'$ or —$S(O)_2NHR'$, wherein each R' is as defined above, provided, however, that when R^2, R^4, R^5 or R^6 is —S(O)R', R' is not hydrogen, alkenyl or alkynyl, and provided that when R^2, R^4, R^5 or R^6 is $S(O)_2NHR'$, R' is not alkenyl or alkynyl;

—C(O)R", wherein R" is selected from hydrogen, alkyl, substituted alkyl, alkoxy, alkylamino, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, aryloxy, arylamino, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, heterocyclic, substituted heterocyclic or trifluoromethyl, provided, however, that the carbonyl functionality is not conjugated with an alkenyl or alkynyl functionality;

—OR'" or —$NR'"_2$, wherein each R'" is independently selected from hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, aroyl, substituted aroyl, heterocyclic, substituted heterocyclic, acyl, trifluoromethyl, alkylsulfonyl or arylsulfonyl, provided, however, that the —OR'" or —$NR'"_2$ functionality is not conjugated with an alkenyl or alkynyl functionality;

—SR"", wherein R"" is selected from hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, heterocyclic, substituted heterocyclic or trifluoromethyl, provided, however, that the —SR"" functionality is not conjugated with an alkenyl of alkynyl functionality; or

—$SiR""_3$, wherein R"" is selected from alkyl or aryl;

R^5 is alkynyl or substituted alkynyl;

R^7 is selected from hydrogen, lower alkyl, aryl, substituted aryl, alkylaryl, or substituted alkylaryl, or R^7 is absent when there is a double bond between N^7 and C^8; and

R^9 and R^{9a} are each independently selected from hydrogen, lower alkyl, hydroxyalkyl, aryl, aryloxyalkyl, fluoro, trifluoromethyl, cyano, cyanomethyl, —OR', —NR'_2, or —SR', wherein each R' is as defined above, provided, however, that neither the —NR'_2 nor the —SR' functionality is conjugated with an alkenyl or alkynyl functionality.

5,594,012

AMINO ACID DERIVATIVES AND ANTI-ACTIVE OXYGEN AGENTS

Manabu Kitazawa, and Keiji Iwasaki, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

PCT No. PCT/JP93/01842, § 371 Date Oct. 6, 1994, § 102(e) Date Oct. 6, 1994, PCT Pub. No. WO94/14755, PCT Pub. Date Jul. 7, 1994

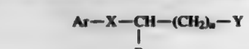
PCT Filed Dec. 20, 1993, Ser. No. 284,668

Claims priority, application Japan, Dec. 21, 1992, 4-340426

Int. Cl.[6] A61K *31/44*; C07D *215/50*; C07C *229/14*;*251/18*

U.S. Cl. 514—345 **22 Claims**

1. A method for inhibiting the generation of active oxygen species in a material, comprising applying an effective amount of an amino acid derivative represented by the following formula (I):



(I)

wherein Ar represents a 2-hydroxy-1-naphthyl or pyridyl group, and one or more of the hydrogen atoms attached to the aromatic ring may be independently substituted with a halogen atom, or a C1–6 alkyl, hydroxy, C1–6 hydroxyalkyl, nitro, or C1–6 alkoxy group; R represents the side chain of an amino acid; X represents —CH_2—NH— or —CH_2—NH—; Y represents a hydrogen atom, —$COOR^1$, —SO_3H, —$CON(R^2)^{R3}$, —$CONHCH(R^5)COOR^4$ or —CH_2OH (wherein each of R^1 to R^4 represents a hydrogen atom or a C1–6 alkyl group, and R^5 represents the side chain of an amino acid); and n represents an integer of 0 or 1;

or its salt.

5,594,013

PHARMACEUTICAL COMPOSITIONS CONTAINING NIFEDIPINE AND PROCESS FOR THE PREPARATION THEREOF

David Trigger, Norfolk, Great Britain, assignor to Ethical Pharmaceuticals Limited, Great Britain

PCT No. PCT/GB93/00055, § 371 Date Jul. 11, 1994, § 102(e) Date Jul. 11, 1994, PCT Pub. No. WO93/13773, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 12, 1993, Ser. No. 256,398

Claims priority, application United Kingdom, Jan. 13, 1992, 9200607

Int. Cl.[6] A61K *31/04*

U.S. Cl. 514—356 **17 Claims**

1. A slow-release pharmaceutical composition which comprises particles of a finely divided pharmaceutically acceptable water soluble carrier coated with a solid solution containing a mixture of nifedipine, polyvinylpyrrolidone or a copolymer of N-vinylpyrrolidone and vinyl acetate, and a pharmaceutically acceptable acrylic based polymer, the weight ratio of the polyvinylpyrrolidone or copolymer of N-vinyl-pyrrolidone and vinyl acetate to the content of nifedipine being in a range of from 1:1 to 1:10 and the weight ratio of the acrylic based polymer to the content of nifedipine being in the range of from 1:4 to 1:20.

5,594,014

INDOLE DERIVATIVES AS 5-HT1 AGONISTS

John E. Macor, Salem, and Johnnie T. Nowakowski, Haddam, both of Conn., assignors to Pfizer Inc, New York, N.Y.

PCT No. PCT/US93/01667, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO93/18032, PCT Pub. Date Sep. 16, 1993

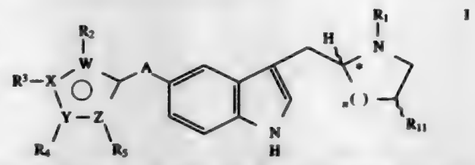
PCT Filed Mar. 3, 1993, Ser. No. 284,662

Int. Cl.[6] C07D *417/14*;*413/14*; A61K *31/40*

U.S. Cl. 514—364 **17 Claims**

1. A compound of the formula

I



where A represents a direct bond, C_1–C_4 alkylene, or C_1–C_4 alkenylene; n is 0, 1, or 2; R_1 is hydrogen, C_1–C_6 alkyl, aryl, C_1–C_3 alkylaryl, C_1–C_3 alkylheteroaryl, or —$(CH_2)_m$—R_9; W, X, Y, and Z are each independently oxygen, sulfur, nitrogen or carbon, provided that at least one of W, X, Y or Z is nitrogen; R_2, R_3, R_4, and R_5 are each independently hydrogen. C_1–C_6 alkyl, aryl, C_1–C_3 alkylaryl, C_1–C_3 alkylheteroaryl, halogen, cyano, trifluoromethyl, nitro, —OR_7, —NR_7R_8, —$(CH_2)_rOR_7$, —SR_7, —$SO_2NR_7R_8$, —$NR_7SO_2R_8$, —$NR_7CO_2R_8$, —$CONR_7R_8$, or —CO_2R_7; one of R_2 and R_3, R_3 and R_4, or R_4 and R_5 may be taken together to form a five- to seven-membered alkyl ring, a six-membered aryl ring, a five- to seven-membered heteroalkyl ring having 1 heteroatom of N, O, or S, or a five- to six-membered heteroaryl ring having 1 or 2 heteroatoms of N, O, or S; R_6 is cyano, trifluoromethyl, or —OR_9; R_7, R_8, and R_9 are each independently hydrogen, C_1 to C_6 alkyl, —$(CH_2)_m$—R_{10}, C_1 to C_3 alkylaryl, or aryl; R_7 and R_8 may be taken together to form a C_4–C_7 alkyl ring; R_{10} is cyano, trifluoromethyl, or C_1–C_4 alkoxy; R_{11} is hydrogen, —OR_{12}, or —$NCHOR_{12}$; R_{12} is C_1 to C_6 alkyl, aryl, or C_1 to C_3 alkyl-aryl; m is 1, 2, or 3; s is 0, 1, 2, or 3; and the above aryl groups and the aryl moieties of the above alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one to three groups selected from C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and C_1 to C_4 alkoxy, and the pharmaceutically acceptable salts thereof.

5,594,015

THIAZOLIDINE DERIVATIVES FOR THE TREATMENT OF PSORIASIS

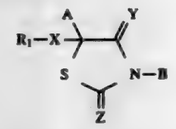
Theodore W. Kurtz, Mill Valley, and Harrihar A. Pershadsingh, Bakersfield, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Jun. 22, 1994, Ser. No. 263,446

Int. Cl.[6] A61K *31/425*

U.S. Cl. 514—369 **23 Claims**

1. A method for treating psoriasis in a human in need thereof by administration of an effective amount of a 5-aryl substituted thiazolidine derivative of formula I



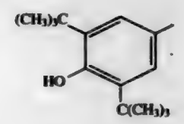
where: R_1 is an unsaturated carbocyclic or an unsaturated heterocyclic;

A is H or methyl;

B is H or methyl;

X is a lower alkylene or a bond; or —HC=CH—; or O, CH_2, CH_2S, CH_2SO_2, S, SO, or SO_2;

Y is oxo or imino;
Z is oxo or imino;
and pharmaceutically acceptable salts thereof with the proviso that if X is H_2C= and Y is imino, then R_1 is not of the formula

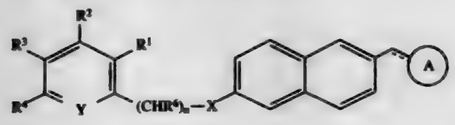


5,594,016
NAPHTHALENE DERIVATIVES

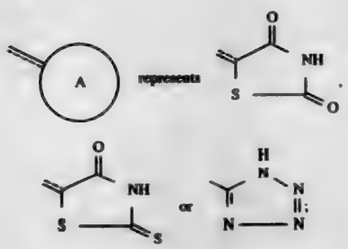
Hiroaki Ueno, Tokyo-to; Takayuki Oe, Yokohama; Ichiro Sunhiro, Machida, and Fumiko Nakamura, Tsukuba, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 171,709, Dec. 22, 1993, abandoned. This application Oct. 23, 1995, Ser. No. 546,732
Claims priority, application Japan, Dec. 28, 1992, 4-349172
Int. Cl.[6] A61K *31/425*
U.S. Cl. 514—369 **7 Claims**

1. A naphthalene derivative of the formula:



wherein the symbol



—X— represents —O— or —S—; =Y— represents =CR^5—; each of R^1, R^2, R^3, R^4 and R^5 represents independently hydrogen, halogen, C_1–C_8 alkyl, C_6–C_{12} aryl, C_1–C_8 alkoxy, C_2–C_6 alkoxyalkoxy, C_6–C_{12} aryloxy, C_2–C_9 alkanoyloxy, C_7–C_{13} arylcarbonyloxy, carboxy, C_2–C_9 alkoxycarbonyl, C_7–C_{13} aryloxycarbonyl, carbamoyl, C_2–C_9 alkylaminocarbonyl, C_7–C_{13} arylaminocarbonyl, amino, C_1–C_8 alkylamino, C_2–C_9 alkanoylamino, C_7–C_{13} arylcarbonylamino, ethylenedioxymethyl, formyl, cyano, nitro or trihalomethyl; R^6 represents (1) hydrogen, (2) C_1–C_8 alkyl which is unsubstituted or is substituted by at least one substituent selected from the group consisting of phenyl, halogen, nitro and cyano, or (3) C_6–C_{12} aryl which is unsubstituted or is substituted by at least one substituent selected from the group consisting of C_1–C_8 alkyl, halogen, nitro and cyano; n represents an integer of 0 to 3; and the dotted and solid lines show that the bond may be a single or double bond; or a pharmaceutically acceptable salt thereof.

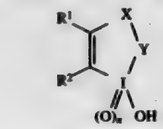
5. A pharmaceutical composition for the treatment of diabetes which comprises an effective amount of a compound or salt thereof as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

5,594,017
STABILIZATION OF AQUEOUS 3-ISOTHIAZOLONE SOLUTIONS

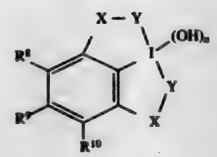
John R. Matter, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 25, 1995, Ser. No. 450,190
Int. Cl.[6] A01N *43/80*; C07D *275/03*
U.S. Cl. 514—372 **9 Claims**

1. A composition comprising water, microbicidally active 3-isothiazolone compound, and an effective stabilizing amount of unsaturated, cyclic iodosyl or iodyl compound of formula I and II



(I)



(II)

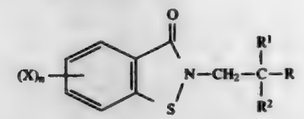
wherein:
X=C(O), SO_2, OPO_3H, $CH_2C(O)$;
Y=O, NR^3;
R^1=H, Cl, Br, I, substituted or unsubstituted C_1–C_{18} alkyl, substituted or unsubstituted C_2–C_{18} alkenyl, substituted or unsubstituted C_4–C_6 aryl, substituted or unsubstituted C_7–C_{10} aralkyl;
R^2=H, Cl, Br, I, substituted or unsubstituted C_1–C_{18} alkyl, substituted or unsubstituted C_2–C_{18} alkenyl, substituted or unsubstituted C_4–C_6 aryl, substituted or unsubstituted C_7–C_{10} aralkyl, SO_3H, CO_2R^4, $C(O)NR^5R^6$;
R^1 and R^2 may by joined to form a substituted or unsubstituted 5 or 6 membered ring, optionally fused to another 5 or 6 membered aromatic ring;
R^3=H, $C(O)R^7$, substituted or unsubstituted C_1–C_{18} alkyl, substituted or unsubstituted C_2–C_{18} alkenyl, substituted or unsubstituted C_4–C_6 aryl, substituted or unsubstituted C_7–C_{10} aralkyl;
R^4=H, substituted or unsubstituted C_1–C_{18} alkyl, substituted or unsubstituted C_2–C_{18} alkenyl, substituted or unsubstituted C_4–C_6 aryl, substituted or unsubstituted C_7–C_{10} aralkyl, $(CH_2CH_2)_p$—OH, M;
R^5=H, substituted or unsubstituted C_1–C_{18} alkyl, $CH_2CH_2SO_3H$, $CH_2CH_2SO_3M$;
R^6=H, substituted or unsubstituted C_1–C_{18} alkyl;
R^7=H, substituted or unsubstituted C_1–C_{18} alkyl, substituted or unsubstituted C_2–C_{18} alkenyl, substituted or unsubstituted C_6–C_6 aryl, substituted or unsubstituted C_7–C_{10} aralkyl;
R^8, R^9, R^{10} are independently selected from the group consisting of CN, OH, C_1–C_4 alkyl, C_1–C_4 alkoxy, Cl, Br, F, NO_2, SO_3H, SO_3M, $OCH_2CH_2N^+R^63$ X^-, CO_2H, CO_2M, OPO_3H;
M=a monovalent or divalent metal cation;
X=halogen;
n=0, 1; and
p=1–30.

5,594,018
2-(B-BRANCHED ALKYL)-BENZIOSOTHIAZOLIN-3-ONES

Peter W. Austin, Bury, United Kingdom, assignor to Zeneca Limited, London, England

PCT No. PCT/GB94/00320, § 371 Date Aug. 9, 1995, § 102(e) Date Aug. 9, 1995, PCT Pub. No. WO94/20479, PCT Pub. Date Sep. 15, 1994
PCT Filed Feb. 17, 1994, Ser. No. 501,039
Claims priority, application United Kingdom, Mar. 10, 1993, 9304983
Int. Cl.[6] C09D *5/16*; A01N *43/80*; C07D *275/04*
U.S. Cl. 514—313 **8 Claims**

1. A compound of formula I



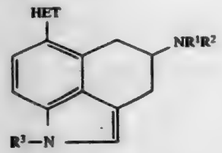
and salts thereof wherein
R and R^1 are alkyl or substituted alkyl containing at least 2 carbon atoms;
R^2 is hydrogen, alkyl or substituted alkyl; or
R and R^1 together with the carbon atom to which they are attached complete an alicyclic ring;
X is halogen, C_{1-4}-lower alkyl, C_{1-4}-lower alkoxy, nitro, nitrile, hydroxy, carboxy, or alkoxycarbonyl, and
n is 0 to 4, the total number of carbon atoms represented by R, R^1 and R^2 when not hydrogen being less than 18.

5,594,019
6-HETEROCYCLIC-4-AMINO-1,3,4,5-TETRAHYDROBENZ[CD]INDOLES

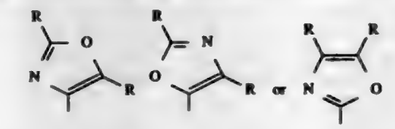
Richard N. Booher; Michael E. Flaugh, both of Indianapolis; David E. Lawhorn, Greenfield; Charles J. Paget, Jr., Indianapolis, and John M. Schaus, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 954,105, Sep. 30, 1992, Pat. No. 5,364,856, which is a continuation-in-part of Ser. No. 677,016, Mar. 28, 1991, Pat. No. 5,244,912. This application Aug. 31, 1994, Ser. No. 299,175
Int. Cl.[6] A61K *31/42*; C07D *403/04*
U.S. Cl. 514—374 **12 Claims**

1. A compound of the formula



wherein:
R^1 is hydrogen, C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopropylmethyl, phenyl (C_1–C_4 alkyl), naphthyl (C_1–C_4 alkyl), phenyl (C_1–C_4 alkyl) substituted with one or two substituents selected from the group consisting of C_1–C_3 alkoxy, halo, hydroxy, C_1–C_3 thioalkyl, nitro, C_1–C_3 alkyl or trifluoromethyl, naphthyl (C_1–C_4 alkyl) substituted with one or two substituents selected from the group consisting of C_1–C_3 alkoxy, halo, hydroxy, C_1–C_3 thioalkyl, nitro, C_1–C_3 alkyl or trifluoromethyl, —$(CH_2)_nS(C_1$–C_4 alkyl), —$C(O)R^4$, or —$(CH_2)_nC(O)NR^5R^6$;
R^2 is hydrogen, C_1–C_4 alkyl, cyclopropylmethyl or C_3–C_4 alkenyl;
R^3 is hydrogen, C_1–C_4 alkyl or an amino blocking group;
n is 1–4;
R^4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy or phenyl;
R^5 and R^6 are independently hydrogen, C_1–C_4 alkyl, or C_5–C_8 cycloalkyl with the proviso that when one of R^5 or R^6 is a cycloalkyl the other is hydrogen;
HET is a heterocyclic ring selected from the group consisting of



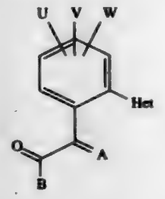
each R is independently hydrogen, C_1–C_3 alkyl, halogen, hydroxy, C_1–C_3 alkoxy, C_1–C_3 thioalkyl, NH_2, CN, or phenyl;
or pharmaceutically acceptable salts thereof.

5,594,020
DIARYL DERIVATIVES AND THEIR USE AS CROP PROTECTION AGENTS

Horst Wingert, Mannheim; Beate Hellendahl, Schifferstadt; Hubert Sauter, Mannheim, and Gisela Lorenz, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 22, 1994, Ser. No. 231,487
Claims priority, application Germany, Apr. 23, 1993, 43 13 267.7
Int. Cl.[6] C07D *261/08*; A01N *43/80*
U.S. Cl. 514—378 **5 Claims**

1. Diaryl derivatives of formula I



where:
A is =$CHOR^1$, =$CHSR^1$, =CHR^1, =CHCl or =NOR^1,
B is OR^2, SR^2 or NR^2R^3,
Het is isoxazol-5-yl which may carry from one to three radicals R,
wherein
R is halogen, nitro, cyano CO_2R^4, NR^4R^5, $CONR^4R^5$, $S(O)_nR^4$ $P(O)(OR^4)_2$, substituted or unsubstituted C_1–C_{10}-alkyl, C_1–C_4-haloalkyl, substituted or unsubstituted C_3–C_6-cycloalkyl, C_1–C_4· -alkoxy-C_1–C_4-alkyl, C_1–C_4-alkylthio-C_1–C_4-alkyl, substituted or unsubstituted C_2–C_6-alkenyl, substituted or unsubstituted C_2–C_6-alkynyl, C_1–C_6-alkoxy, C_1–C_4-thioalkoxy, substituted or unsubstituted benzylthio,
C_1–C_4-alkylcarbonyl, substituted or unsubstituted phenylcarbonyl, substituted or unsubstituted aryl, substituted or unsubstituted aryloxy, substituted or unsubstituted arylthio, substituted or unsubstituted aryl-C_1–C_4-alkyl, substituted or unsubstituted aryl-C_2–C_4-alkenyl, substituted or unsubstituted aryl-C_2–C_4-alkynyl, substituted or unsubstituted aryloxy-C_1–C_4-alkyl, substituted or unsubstituted arylthio-C_1–C_4-alkyl, substituted or unsubstituted hetaryl, substituted or unsubstituted hetaryloxy, substituted or unsubstituted hetaryl-C_1–C_4-alkyl, substituted or unsubstituted hetaryl-C_2–C_4-alkenyl, substituted or unsubstituted hetaryloxy-C_1–C_4-alkyl, "substituted or unsubstituted" denoting the radicals halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy or C_1–C_4-alkoximino-C_1–C_2-alkyl and where n is 0, 1 or 2;
R^1, R^2, R^3, R^4, R^5 are identical or different and each is hydrogen or C_1–C_4-alkyl; and U, V, and W are identical or different and each is halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy.

5,594,821

THIENYL-, FURYL- AND PYRROLYL SULFONAMIDES AND DERIVATIVES THEREOF THAT MODULATE THE ACTIVITY OF ENDOTHELIN

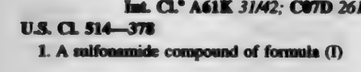
Ming F. Chan; Bore G. Raju; Adam Kois; Erik J. Verner; Chengde Wu; Rosario S. Castillo; Venkatachalapathi Yakemoori, all of San Diego, and Vitukudi N. Balaji, Encinitas, all of Calif., assignors to Texas Biotechnology Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 247,872, May 20, 1994, Ser. No. 222,287, Apr. 5, 1994, Ser. No. 142,552, Oct. 21, 1993, Pat. No. 5,514,691, Ser. No. 142,159, Oct. 21, 1993, Pat. No. 5,464,853, Ser. No. 142,631, Oct. 21, 1993, abandoned, Ser. No. 100,565, Jul. 30, 1993, abandoned, Ser. No. 100,125, Jul. 30, 1993, abandoned, Ser. No. 65,282, May 20, 1993, abandoned, and Ser. No. 417,875, Apr. 4, 1995, abandoned, which is a continuation-in-part of Ser. No. 247,872, which is a continuation-in-part of Ser. No. 222,287, said Ser. No. 417,875Ser. No. 247,872, and Ser. No. 222,287, , each is a continuation-in-part of Ser. No. 142,552, Ser. No. 142,159, Ser. No. 142,631, Ser. No. 100,565, Ser. No. 100,125, and Ser. No. 65,282, said Ser. No. 142,159Ser. No. 142,552, and Ser. No. 142,631, , each is a continuation-in-part of Ser. No. 100,565, Ser. No. 100,125, and Ser. No. 65,282, said Ser. No. 100,565and Ser. No. 100,125, , each is a continuation-in-part of Ser. No. 65,282. This application Jun. 6, 1995, Ser. No. 477,223

Int. Cl.[6] A61K 31/42; C07D 261/10

U.S. Cl. 514—378 **174 Claims**

1. A sulfonamide compound of formula (I)



(I)

wherein:

Ar^1 is a substituted or unsubstituted group, containing from 1 to 30 carbon atoms, selected from the group consisting of alkyl, alkenyl and alkynyl groups, which may be straight or branched chains or include cyclic portions, aryl groups, heterocyclic rings and fused bicyclic or tricyclic rings; and

Ar^2 is a substituted or unsubstituted group selected from thienyl, furyl, pyrrolyl, benzothienyl, benzofuryl, indolyl, benzo[b]thienyl, benzo[b]furyl, and benzo[b]pyrrolyl.

5,594,822

TACHYKININ ANTAGONISTS

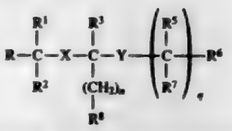
David C. Harwell, Foxton; William Howson, Weston Colville; Martyn C. Pritchard, St. Ives; Edward Roberts, Wood Ditton, all of England, and David C. Rees, Glasgow, Scotland, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 97,264, Jul. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 930,252, Aug. 13, 1992, abandoned. This application Nov. 29, 1994, Ser. No. 344,864

Int. Cl.[6] C07D 209/12;403/12;407/12; A61K 31/40

U.S. Cl. 514—419 **51 Claims**

1. A compound of formula

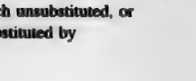


I

or a pharmaceutically acceptable salt thereof wherein

R is phenyl,
thienyl,
furanyl,
naphthyl,
indolyl,
benzofuranyl, or
benzothiophenyl each unsubstituted,
mono-, di-, or trisubstituted by
alkyl,
hydroxy,
alkoxy,
NO_2,
halogen,
NH_2, or
CF_3;

X is



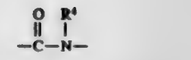
wherein R^{11} is hydrogen or alkyl of from 1 to 3 carbon atoms;

R^3 is hydrogen or $(CH_2)_mR^{13}$ where m is an integer of from 1 to 6 and R^{13} is H, CN, NH_2, $N(CH_3)_2$or $NHCOCH_3$;

n is an integer of from 1 to 2;

R^8 is
2-or 3-indolyl,
unsubstituted, or mono-, di-, or trisubstituted by
alkyl,
hydroxy,
alkoxy,
NO_2,
halogen,
NH_2, or
CF_3;

Y is



wherein R^4 is hydrogen or alkyl of from 1 to 3 carbon atoms,
$—CO_2—$,
$—COCH_2—$,
$—CH_2O—$,
$—CH_2NH—$,
—CH=CH—,
$—CH_2CH_2—$, or
$—CHOHCH_2—$;

R^5 and R^7 are each independently hydrogen or alkyl of from 1 to 4 carbon atoms;

q is an integer of from 0 to 1; and

R^6 is phenyl,
thiophenyl,
furanyl,
naphthyl,
indolyl,
benzofuranyl, or
benzothiophenyl each unsubstituted, or
mono-, di-, or trisubstituted by
alkyl,
hydroxy,
alkoxy,
NO_2,
halogen,
NH_2, or
CF_3;

straight alkyl of from 1 to 8 carbons, branched alkyl of from 3 to 8 carbons, cycloalkyl of from 5 to 8 carbons.

5,594,823

1,3-DIHYDROINDOL-2-ONE DERIVATIVES SUBSTITUTED IN THE 3-POSITION BY A NITROGEN-CONTAINING GROUP, THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Jean Wagnon, Montpellier; Bernard Tonnerre, Vailhauquès; Alain Di Malta, Saint Clement de Riviere; Richard Roux, Vailhauquès; Marie-Sophie Amiel, Perols, and Claudine Serradell-Legal, Escalquens, all of France, assignors to Sanofi, Paris, France

PCT No. PCT/FR94/01528, § 371 Date Jul. 31, 1995, § 102(e) Date Jul. 31, 1995, PCT Pub. No. WO95/18105, PCT Pub. Date Jul. 6, 1995

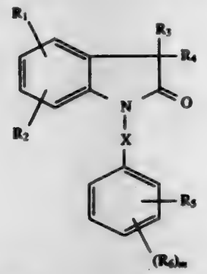
PCT Filed Dec. 23, 1994, Ser. No. 508,924

Claims priority, application France, Dec. 24, 1993, 93 15638

Int. Cl.[6] A01N 43/52; C07D 209/10

U.S. Cl. 514—423 **12 Claims**

1. A compound of the formula



(I)

in which:

R_1 and R_2 are each independently a hydrogen; a halogen; a $(C_1–C_7)$alkyl; a $(C_1–C_7)$alkoxy; or a trifluoromethyl;

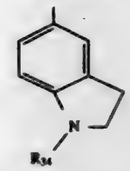
R_3 is a $(C_1–C_7)$alkyl; a $(C_3–C_7)$cycloalkyl; a cyclohexyl substituted by one or two $(C_1–C_4)$alkyls; a cyclohexylmethyl; a phenyl which is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy; or a benzyl which is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy;

R_4 is an azido; a 2,2-dimethylhydrazino group; a $(C_1–C_7)$alkylsulfonamido; a phenylsulfonamido in which the phenyl is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy; a dimethylaminosulfonamido; a group NR_7R_8; a group NR_8R_{10}; a group NR_8R_{11}; a heterocyclic radical R_{12}; a piperazin-1-yl substituted in the 4-position by a $(C_2–C_{10})$alkylene group substituted by an amino group which is free or carries a protective group; a lactoylamino group; a mandeloylamino group; an N'-(1-phenylethyl)ureido group; or an N'-(1-naphth-1-ylethyl)ureido group;

R_5 is hydrogen or has one of the meanings given for R_6;

R_6 is a halogen; a $(C_1–C_7)$alkyl; a trifluoromethyl; a cyano; an aminomethyl in which the amino is free or substituted by one or two $(C_1–C_7)$alkyls; a nitro; a group NR_8R_{11}; a heterocyclic radical selected from pyrrol-1-yl, Δ3-pyrrolin-1-yl, pyrrolidin-1-yl and morpholin-4-yl; a group OR_{13}; a group SR_{13}; a guanidino which is unsubstituted or substituted in the 3-position by one or two $(C_1–C_7)$alkyls, a phenyl or a benzyl; a formyl; a $(C_1–C_7)$alkylcarbonyl; a carbamoyl substituted by R_{14} and R_{15}; a thiocarbamoyl which is free or substituted by one or two $(C_1–C_7)$alkyls; a sulfamoyl substituted by R_{16} and R_{17}; a carboxyl; a $(C_1–C_7)$alkoxycarbonyl; a phenoxycarbonyl; a benzyloxycarbonyl; a $(C_1–C_7)$alkylsulfonamido; a phenylsulfonamido in which the phenyl is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy; a dimethylaminosulfonamido; or a 2-(4-methylphenyl)benzamido;

or R_5 and R_6, together with the phenyl to which they are bonded, form a group



with the proviso that X is $—SO_2—$;

R_7 is a $(C_1–C_7)$alkoxycarbonyl;

R_8 is a $(C_1–C_8)$alkoxycarbonylamino; or an N-methyl-N-$(C_1–C_7)$alkoxycarbonylamino;

R_9 is a hydrogen; or a $(C_1–C_7)$alkyl;

R_{10} is a group $CR_{18}R_{19}R_{20}$; a group $(CH_2)_nR_{35}$; a $(C_2–C_{10})$alkylene substituted by R_{21}; a group CH_2CN; a group $C(CH_3)(CH_2OH)_2$ or $C(CH_2OH)_3$; a non-aromatic $C_3–C_{15}$ carbocyclic radical; a phenyl which is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy, an acetoxy, a nitro or an amino which is free or substituted by one or two $(C_1–C_7)$alkyls; a benzyl in which the phenyl is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy, an acetoxy, a nitro or an amino which is free or substituted by one or two $(C_1–C_7)$alkyls; a phenethyl in which the phenyl is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy, an acetoxy, a nitro or an amino which is free or substituted by one or two $(C_1–C_7)$alkyls; or a phenethyl in which the phenyl is substituted by a 3,4-methylenedioxy or a 3,4-ethylenedioxy;

R_{11} is a hydrogen; a $(C_1–C_{12})$alkyl; a $(C_3–C_7)$cycloalkylmethyl; a group OR_{13}; a formyl; a $(C_1–C_7)$alkylcarbonyl; a $(C_1–C_7)$alkylthiocarbonyl; a $(C_1–C_7)$cycloalkylcarbonyl; a $(C_3–C_7)$cycloalkylthiocarbonyl; a benzoyl which is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy; a phenylacetyl in which the benzene ring is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy, a benzyloxy or an acetoxy; a pyridylcarbonyl; a thienylcarbonyl; a furylcarbonyl; a piperid-4-ylcarbonyl which is unsubstituted or substituted in the 1-position by a $(C_1–C_7)$alkyl or by a protective group; a $(C_1–C_7)$alkoxycarbonyl; a phenoxycarbonyl; a phenoxythiocarbonyl; a benzyloxycarbonyl; a carbamoyl substituted by R_{22} and R_{23}; a thiocarbamoyl substituted by R_{22} and R_{23}; a group CH_2R_{36}; an ω—$R_{24}(C_1–C_4)$alkylcarbonyl; or an ω—$R_{32}R_{33}N(C_1–C_4)$alkylcarbonyl;

R_{12} is a morpholin-4-yl; a thiomorpholin-4-yl; an azetidin-1-yl which is unsubstituted or substituted in the 2-position by a carboxyl or substituted in the 3-position by an amino which is free or carries a protective group; a perhydroazepin-1-yl; a piperazin-1-yl which is unsubstituted or substituted in the 4-position by R_{25}; a piperid-1-yl which is unsubstituted or substituted by R_{26}; a pyrrolidin-1-yl which is unsubstituted or substituted by R_{27}; or a thiazolidin-3-yl which is unsubstituted or substituted by R_{27};

R_{13} is a hydrogen; a $(C_1–C_7)$alkyl; a benzyl; an allyl; or a tetrahydropyran-2-yl;

$R_{14}$is a hydrogen or a $(C_1–C_7)$alkyl;

$R_{15}$is hydrogen; a $(C_1–C_7)$alkyl; a $(C_1–C_7)$alkylene substituted by R_{24}, a cyano, a trifluoromethyl or an amino which is free or substituted by one or two $(C_1–C_7)$alkyls; a $(C_3–C_7)$cycloalkyl; a phenyl which is unsubstituted or monosubstituted or polysubstituted by a halogen, a $(C_1–C_7)$alkyl, a hydroxyl, a $(C_1–C_7)$alkoxy or a benzyloxy; or a group R_{28};

or R_{14} and R_{15}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R_{12};

R_{16} is a hydrogen or a $(R_1–C_7)$alkyl;

R_{17} is a hydrogen; a $(C_1–C_7)$alkyl; a $(C_3–C_7)$cycloalkyl; or a group R_{28};

or R_{16} and R_{17}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R_{12};

R_{18} is a $(C_1–C_7)$alkyl; a phenyl; a benzyl; a cyclohexylmethyl; a phenethyl; an imidazol-4-ylmethyl which is free or carries a protective group; an indol-3-ylmethyl which is free or carries a protective group; a hydroxymethyl which is free or carries a protective group; a 2-hydroxyethyl which is free or carries a protective group; a 1-hydroxyethyl which is free or carries a protective group; a 4-hydroxybenzyl which is free or carries a protective group; a mercaptomethyl which is free or carries a protective group; a 2-mercaptoethyl which is free or carries a protective group; a 2-methylthioethyl; a 2-methylsulfinylethyl; a 2-methylsulfonylethyl; a 4-aminobutyl which is free or carries a protective group; a 3-aminopropyl which is free or carries a protective group; a carboxymethyl which is free or carries a protective group; a 2-carboxyethyl which is free or carries a protective group; a carbamoylmethyl; a 2-carbamoylethyl; a 3-guanidinopropyl which is free or carries a protective group; or a non-aromatic $C_3–C_{15}$ carbocyclic radical;

R_{19} is hydrogen or R_{19} is $(C_1–C_7)$alkyl if R_{18} is a $(C_1–C_7)$alkyl; R_{18} is a $(C_1–C_7)$alkyl;

or R_{18} and R_{19}, together with the carbon atom to which they are bonded, form a non-aromatic $C_3–C_{15}$ carbocyclic radical;

R_{20} is R_{24}; a group CH_2OR_{13}; or an aminomethyl in which the amino is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group;

R_{21} is R_{24}; a group OR_{37}; a group $NR_{32}R_{33}$; a cyano; a group $S(C_1–C_7)$alkyl; a group $SO(C_1–C_7)$alkyl; or a group $SO_2(C_1–C_7)$alkyl;

R_{22} is hydrogen or a $(C_1–C_7)$alkyl;

R_{23} is hydrogen; a $(C_1–C_7)$alkyl; a $(C_3–C_7)$cycloalkyl; a group $CR_{19}R_{19}R_{20}$; a group CH_2R_{24}; a group $C(CH_3)—(CH_2OH)_2$ or $C(CH_2OH)_3$; or a $(C_2–C_6)$alkylene substituted by R_{25};

or R_{22} and R_{23}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R_{12}; or a cis-2,6-dimethylpiperid-1-yl;

R_{24} is a carboxyl; a $(C_1–C_7)$alkoxycarbonyl; a benzyloxycarbonyl; or a carbamoyl which is free or substituted by one or two $(C_1–C_7)$alkyls;

R_{25} is a $(C_1–C_7)$alkyl; a phenyl; a benzyl; a formyl; a $(C_1–C_7)$alkylcarbonyl; a $(C_1–C_7)$alkoxycarbonyl; or a benzyloxycarbonyl;

R_{26} is R_{24}; an amino which is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group; a group OR_{13}; or a group CH_2OR_{13};

R_{27} is R_{24}; a group CH_2R_{24}; a group CH_2OR_{13}; or an aminoethyl in which the amino is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group;

R_{28} is a group $CH(CH_2OH)_2$, $CH(CH_3)CH_2OH$, $C(CH_3)—(CH_2OH)_2$, $C(CH_3)_2CH_2OH$, $C(CH_2OH)_3$ or CH_2CH_2OH;

R_{29} is a group R_{24}; a group OR_{13}; or a group $NR_{30}R_{31}$;

R_{30} and R_{31} are each independently a hydrogen; or a $(C_1–C_7)$alkyl;

or R_{30} and R_{31}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R_{12};

R_{32} is a hydrogen or a $(C_1–C_7)$alkyl;

R_{33} is a hydrogen; a $(C_1–C_7)$alkyl; an acetyl; a phenyl; a benzyl; a $(C_1–C_7)$alkoxycarbonyl; a benzyloxycarbonyl; a $(C_1–C_6)$alkylene substituted by R_{24}; a $(C_2–C_6)$alkylene substituted by a hydroxyl or a $(C_1–C_7)$alkoxy; or a $(C_2–C_6)$alkylene substituted by an amino which is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group;

or R_{32} and R_{33}, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R_{12};

R_{34} is a formyl; a $(C_1–C_7)$alkylcarbonyl; a $(C_1–C_7)$alkoxycarbonyl; a phenoxycarbonyl; a carbamoyl substituted by two $(C_1–C_7)$alkyls; or a group COR_{12};

R_{35} is a piperid-4-yl which is unsubstituted or substituted in the 1-position by a $(C_1–C_7)$alkoxycarbonyl or by a $(C_1–C_7)$alkyl; or a pyrid-2-yl;

R_{36} is a carboxyl; a $(C_1–C_7)$alkoxycarbonyl; a benzyloxycarbonyl; or a carbamoyl which is free or substituted by R_{38} and R_{39};

R_{37} is R_{13}; a $(C_3–C_7)$cycloalkyl; a $(C_1–C_6)$alkylene substituted by R_{24}; a $(C_2–C_6)$alkylene substituted by a hydroxyl or a $(C_1–C_7)$alkoxy; or a $(C_2–C_6)$alkylene substituted by an amino which is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group;

R_{38} is a hydrogen or a $(C_1–C_7)$alkyl;

R_{39} is a hydrogen; a $(C_1–C_7)$alkyl; a $(C_1–C_6)$alkylene substituted by R_{24}; a $(C_2–C_6)$alkylene substituted by a hydroxyl or a $(C_1–C_7)$alkoxy; or a $(C_2–C_6)$alkylene substituted by an amino which is free or substituted by one or two $(C_1–C_7)$alkyls or by a protective group;

X is SO_2; or CH_2;

m is 1, or if R_6 is halogen, a $(C_1–C_7)$alkyl or a $(C_1–C_7)$alkoxy, m is 1, 2, 3 or 4; or else $(R_6)_m$ is 2–4 substituents having different meanings selected from the group consisting of halogen, $(C_1–C_7)$alkyl and $(C_1–C_7)$alkoxy; and

p is an integer which varies from 0 to 3; and its salts.

5,594,824

CENTRALLY ACTIG SUBSTITUTED PHENYLAZACYCLOALKANES

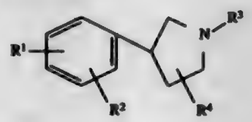
Kjell A. I. Svensson, Goteborg, Sweden; Hakan V. Wikstrom, Groningen, Netherlands; Per A. E. Carlsson, Goteborg, Sweden; Anna M. P. Boije, Lerum, Sweden; R. Nicholas Waters; Clas A. Sonnerus, both of Goteborg, Sweden; Nils P. Stjernlof, Vastra Frolunda, Sweden; Bengt R. Andersson, and Lars O. Hansson, both of Goteborg, Sweden, assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 133,606, Oct. 12, 1993, Pat. No. 5,462,947, which is a continuation-in-part of Ser. No. 686,799, Apr. 17, 1991, abandoned. This application May 31, 1995, Ser. No. 455,474

Int. Cl.[6] A61K *31/40*; C07D *207/04*

U.S. Cl. 514—429 **9 Claims**

1. A compound of Formula I



or a pharmaceutically acceptable salt thereof,

R^1 and R^2 are independently H (provided that not more than one is H), OH (provided that not more than one is OH), CN, CH_2CN, OSO_2CH_3, OSO_2CF_3, SSO_2CF_3, COR, SO_xCH_3 (where x is 0–2), SO_2CF_3, $O(CH_2)_2CF_3$, $SO_2N(R)_2$, CH=NOR, COCOOR, $COCOON(R)_2$, C_{3-6} cycloalkyl, $NRSO_2CF_3$, phenyl at position 2, 3 or 4, thienyl, furyl, pyrrolyl, oxazolyl, thiazolyl, N-pyrrolinyl, triazolyl, tetrazolyl or pyridinyl;

R^3 is hydrogen, CF_3, CH_2CF_3, $C_1–C_8$ alkyl, $C_3–C_8$ cycloalkyl, $C_4–C_9$ cycloalkyl-methyl, $C_2–C_8$ alkenyl, $C_2–C_8$ alkynyl, 3,3,3-trifluoropropyl, 4,4,4-trifluorobutyl, $—(CH_2)_m—R^1$ (where m is 1–8), CH_2SCH_3, or $C_4–C_8$ alkylene bonded to the N-atom and one of the adjacent carbon atoms whereby a heterocyclic structure is formed;

R^4 and R are independently selected from hydrogen, CF_3, CH_2CF_3, $C_1–C_8$ alkyl, $C_3–C_8$ cycloalkyl, $C_4–C_9$ cycloalkyl-methyl, $C_2–C_8$ alkenyl, $C_2–C_8$ alkynyl, 3,3,3 -trifluoropropyl, 4,4,4-trifluorobutyl or $—(CH_2)_m—R^5$ where m is 1–8;

R^5 is phenyl, phenyl substituted with CN, CF_3, CH_2CF_3, $C_1–C_8$ alkyl, $C_3–C_8$ cycloalkyl, $C_4–C_9$ cycloalkyl-methyl, $C_2–C_8$ alkenyl or $C_2–C_8$ alkynyl substituent, 2-thiophenyl, 3-thiophenyl, $—NR^6CONR^6R^7$ or $–CONR^6R^7$; and

R^6 and R^7 are independently hydrogen, $C_1–C_8$ alkyl, $C_3–C_8$ cycloalkyl, $C_4–C_9$ cycloalkylmethyl, $C_2–C_8$ alkenyl or $C_2–C_8$ alkynyl.

5,594,025

METHOD OF INHIBITING GASTRIC ACID SECRETION WITH 5-SUBSTITUTED-3-AMINOCHROMANE

Jaswant S. Gidda, Carmel, and John M. Schaus, Zionsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 387,492, Feb. 13, 1995, which is a division of Ser. No. 219,157, Mar. 29, 1994, Pat. No. 5,457,128, which is a division of Ser. No. 68,723, May 26, 1993, Pat. No. 5,340,838, which is a division of Ser. No. 898,991, Jun. 15, 1992, Pat. No. 5,258,379, which is a division of Ser. No. 707,357, May 29, 1991, Pat. No. 5,158,956, which is a continuation-in-part of Ser. No. 519,388, May 4, 1990, Pat. No. 5,096,908. This application Apr. 7, 1995, Ser. No. 418,722

Int. Cl.[6] A61K *31/35*

U.S. Cl. 514—453 **4 Claims**

1. A method of inhibiting gastric acid secretion in mammals in need of gastric acid secretion inhibition comprising administering to said mammal a pharmaceutically effective dose of a direct acting 5-HT_{1A} agonist which is a 5-substituted-3-aminochromane or a pharmaceutically acceptable acid addition salt thereof.

5,594,827

AMINOCYCLOALKANOBENZODIOXOLES AS BETA-3 SELECTIVE ADRENERGIC AGENTS

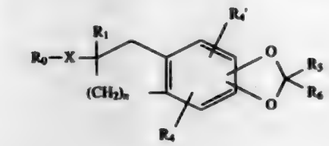
Joseph W. Epstein; Gary H. Birnberg, both of Monroe; Gary E. Walker, Spring Valley; Mimi D. Dutia, West Nyack, and Jonathan D. Bloom, Hartsdale, all of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 250,471, May 27, 1994, Pat. No. 5,510,376, which is a division of Ser. No. 10,973, Jan. 29, 1993, abandoned. This application May 5, 1995, Ser. No. 435,469

Int. Cl.[6] A61K *31/36*

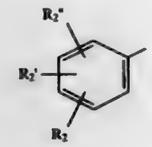
U.S. Cl. 514—463 **48 Claims**

1. A method of treating hyperglycemia in mammals which comprises administering to a hyperglycemic patient an antihyperglycemic effective amount of a compound of the formula:



wherein:

R_o is naphthyl, 5,6,7,8-tetrahydronaphth-(1 or 2)-yl, 5,8-dihydronaphth-(1 or 2)-yl; or



and R_2, R_2', $R_{2''}$ may be the same or different and are hydrogen, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, hydroxy, halogen (chlorine, bromine, fluorine or iodine), trifluoromethyl, carboxy, hydroxy$(C_1–C_{10})$ alkyl, $(C_1–C_{10})$-alkoxycarbonyl or thio$(C_1–C_4)$alkyl; a is an integer from 1 to 3;

X is the divalent radical:

$$—CH(OR_3)—CH_2—NR_3—$$
$$\quad\quad\quad

5,594,828

ANTI-TUMOR METHOD AND COMPOUNDS

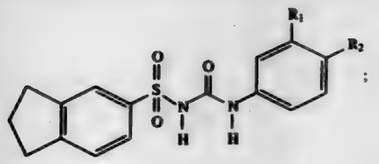
Richard W. Harper; J. Jeffry Howbert, both of Indianapolis; Gerald A. Poore, Martinsville; Brent J. Rieder, Greenfield; Eddie V. P. Tao, and James A. Allen, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 223,807, Apr. 6, 1994, abandoned, which is a continuation of Ser. No. 858,816, Mar. 27, 1992, abandoned, which is a division of Ser. No. 351,755, May 15, 1989, Pat. No. 5,116,874, which is a continuation of Ser. No. 49,185, May 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 888,675, Jul. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 779,354, Sep. 23, 1985, abandoned. This application Nov. 21, 1994, Ser. No. 343,856

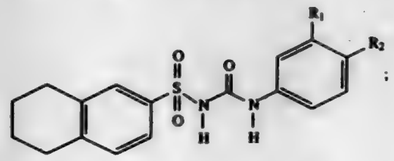
Int. Cl.[6] A61K *31/36;31/18;* C07C *311/16;* C07D *307/79*

U.S. Cl. 514—464 **4 Claims**

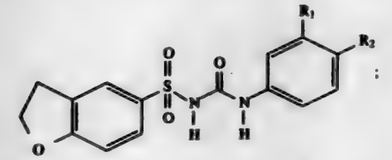
1. A compound selected from the group consisting of:



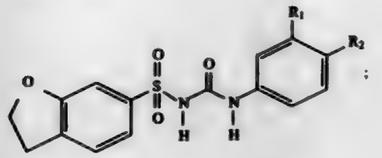
(i)



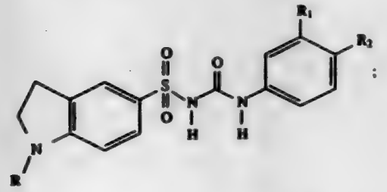
(ii)



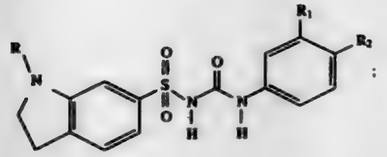
(iii)



(iv)

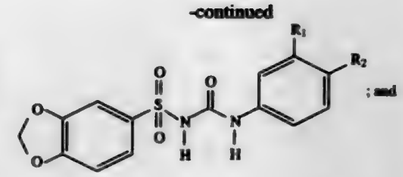


(v)



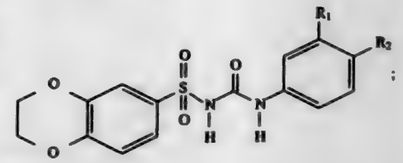
(vi)

-continued



(vii)

; and



(viii)

;

wherein

R is methyl or ethyl;

R_1 is hydrogen or halo; and

R_2 is halo or trifluoromethyl;

provided that:

when the compound is of formula (i), (ii), (iii), (iv), (v), or (vi) and R_2 is halo; R_1 must be halo.

5,594,829

USE OF FIRST RUNNINGS COCONUT FATTY ACID AS INSECT-REPELLENT

Franz Bencsits, Wehrenbachhalde 54, 8053 Zürich, Switzerland, assignor to Franz Bencsits, and Perycut-Chemie AG, both of Zurich, Switzerland

Filed May 11, 1995, Ser. No. 379,567

Claims priority, application Germany, Aug. 11, 1992, 42 26 581.9

Int. Cl.[6] A61K *31/23;31/19;35/60;35/12*

U.S. Cl. 514—552 **7 Claims**

1. A method for repelling insects from a surface comprising applying to said surface an effective amount of an insect repellent composition containing first runnings coconut fatty acid and an oil or fat selected from the group consisting of rape-seed oil, sunflower oil, peanut oil, peanut butter, soy oil, safflower seed oil, cuphea oil, coconut oil, palm kernel oil, palm oil, beef tallow, pig fat, mutton fat, and fish oil.

5,594,830

CONTROLLED RELEASE PHARMACEUTICAL COMPOSITIONS BASED ON ONE OR MORE PHARMACEUTICALLY ACCEPTABLE SALTS OF GAMMA HYDROXY-BUTYRIC ACID

Ubaldo Conte, Busto Arsizio; Aldo La Manna, Pavia, and Giuseppe Tonitero, Sanremo, all of Italy, assignors to Laboratorio Farmaceutico C.T. S.r.l., Sanremo, Italy

Filed Jul. 21, 1994, Ser. No. 278,517

Claims priority, application Italy, Jul. 22, 1993, MI93A1631

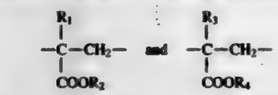
Int. Cl.[6] A61K *31/185*

U.S. Cl. 514—553 **12 Claims**

1. Controlled release pharmaceutical compositions administrable by the oral route, containing as the active principle at least one salt of the gamma-hydroxy-butyric acid having a pharmaceutically acceptable cation, consisting of:

(a) a nucleus in the form of granules or tablets comprising said active principle dispersed in from 2.5 to 75% by weight based on the active principle weight of a cellulosic matrix consisting of a mixture of ethylcellulose and hydroxy-propyl-methyl-cellulose having a viscosity of 100,000 cps, and wherein the weight ratio between ethylcellulose and hydroxy-propyl-methyl-cellulose is comprised between 5 and 50%,

(b) from 2.5 to 20% by weight based on the total nucleus weight of a filming coating consisting of a mixture of two water insoluble acrylic and methacrylic acid ester copolymers in a weight ratio comprised between 0.5:10 and 10:0.5, these copolymers containing the following repeating units:



wherein R_1 is H or methyl, R_2 is methyl or ethyl, R_3 is methyl, R_4 is R_4 is $—CH_2CH_2{}^{(+)}N(CH_3)_3Cl^{(-)}$, the first copolymer containing 5% by weight of the second repeating unit, and the second copolymer containing 10% by weight of the second repeating unit.

5,594,831

METHODS AND COMPOSITIONS FOR THE TREATMENT OF THE SKIN

David F. Herrobin, P.O. Box 818, Kentville, Nova Scotia, Canada

Continuation of Ser. No. 54,344, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 912,017, Jul. 10, 1992, abandoned, which is a continuation of Ser. No. 771,808, Oct. 7, 1991, which is a continuation of Ser. No. 560,005, Jul. 27, 1990, which is a continuation of Ser. No. 8,751, Jan. 30, 1987, which is a continuation of Ser. No. 846,893, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 628,268, Jul. 6, 1984, abandoned. This application Apr. 13, 1995, Ser. No. 422,614

Claims priority, application United Kingdom, Jul. 13, 1983, 83/8912

Int. Cl.[6] A61K *31/185*

U.S. Cl. 514—553 **9 Claims**

1. A method of skin treatment, which comprises the step of topically applying to skin affected by seborrheic dermatitis an amount of a composition comprising a topically acceptable excipient and, as an active ingredient, from about 1 to 30% of lithium ion, said amount being sufficient to reduce sebum production by said skin.

5,594,832

AMELIORATION OF HUMAN ERECTILE DYSFUNCTION BY TREATMENT WITH INOS, INDUCERS OF INOS OR INOS CDNA

Nestor F. Gonzalez-Cadavid, 3350 Calvert Rd., Pasadena, Calif. 91107, and Jacob Rajfer, 16 Quarterhorse La., Rolling Hills Estates, Calif. 90274

Filed Nov. 10, 1994, Ser. No. 337,357

Int. Cl.[6] A61K *31/13*

U.S. Cl. 514—645 **11 Claims**

1. A method of treatment of erectile dysfunction in a patient comprising the steps of:

a) providing an agent which produces an increase in in vivo penile tissue iNOS level;

b) said agent is selected from at least one of the group consisting essentially of penile iNOS inducers, penile iNOS protein, penile iNOS cDNA, and penile iNOS cDNA-transformed penile cells or tissue;

c) introducing an effective amount of said iNOS agent into penile tissue; and

d) maintaining an effective level of said agent for a time period sufficient to produce NO in vivo in said penile tissue.

5,594,833

SECOAPORPHINE COMPOUND ON ARRHYTHMIA

Ming-Jai Su; Che-Ming Tung, and Shoei-Sheng Lee, all of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

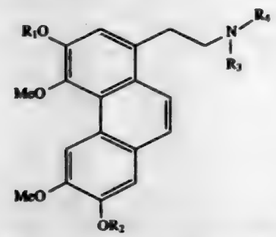
Filed Jan. 26, 1994, Ser. No. 186,521

Claims priority, application Japan, Aug. 13, 1993, 5-201587

Int. Cl.[6] A61K *31/135;* C07C *217/60*

U.S. Cl. 514—654 **6 Claims**

1. A compound of formula I



I

wherein each of R_1 and R_2 is H or CH_3; R_3 is allyl, or propyl, R_4 is methyl and a pharmaceutically acceptable salt thereof.

5,594,834

METHOD OF INHIBITING GASTRIC ACID SECRETION WITH 8-SUBSTITUTED-2-AMINO-1,2,3,4-TETRAHYDRONAPTHALENE

Jaswant S. Gidda, Carmel, and John M. Schoen, Zionsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 387,492, Feb. 13, 1995, which is a division of Ser. No. 219,157, Mar. 29, 1994, Pat. No. 5,457,120, which is a division of Ser. No. 68,723, May 26, 1993, Pat. No. 5,340,838, which is a division of Ser. No. 898,991, Jun. 15, 1992, Pat. No. 5,258,379, which is a division of Ser. No. 707,357, May 29, 1991, Pat. No. 5,158,956, which is a continuation-in-part of Ser. No. 519,388, May 4, 1990, Pat. No. 5,096,908. This application Apr. 7, 1995, Ser. No. 420,520

Int. Cl.[6] A61K *31/135;31/27*

U.S. Cl. 514—657 **9 Claims**

1. A method of inhibiting gastric acid secretion in mammals in need of gastric acid secretion inhibition comprising administering to said mammal a pharmaceutically effective dose of a direct acting 5-HT_{1A} agonist which is an 8-substituted-2-amino-1,2,3,4-tetrahydronaphthalene or a pharmaceutically acceptable acid addition salt thereof.

5,594,835

RECLAMATION OF POLYMERS, THAT CONTAIN STYRENE IN THE POLYMERIC BACKBONE, USING A WATER SOLUBLE SOLVENT BASED RECLAMATION PROCESS

William C. Walsh, Archbold, Ohio, assignor to BASF Corporation, Mount Olive, N.J.

Filed Nov. 13, 1995, Ser. No. 558,058

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—47 **10 Claims**

1. A process to reclaim styrene containing polymers comprising the steps of:

a) dissolving a water insoluble styrene containing polymer into a water soluble solvent;

b) forming a water soluble solvent/styrene containing polymer solution;

c) precipitating said styrene containing polymer by the addition of said water soluble solvent/styrene containing polymer solution into water;

d) collecting said precipitated styrene containing polymer;

e) drying said precipitated styrene polymer for re-use;
f) recycling of the water and water soluble solvent by heating said water soluble solvent to a point where the water boils away.

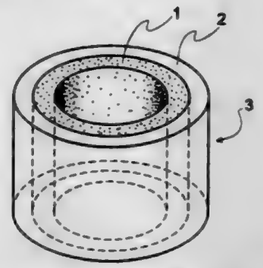
5,594,836
EXTRUDED, OPEN-CELL MICROCELLULAR ALKENYL AROMATIC POLYMER FOAMS AND PROCESS FOR MAKING
Creston D. Shmidt, Nashport; Daniel D. Imeokparia, Pickerington, and Kyung W. Suh, Granville, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.
Filed Apr. 27, 1995, Ser. No. 430,783
Int. Cl.[6] C08J 9/14
U.S. Cl. 521—79 **19 Claims**

1. A process for making an extruded, open-cell microcellular alkenyl aromatic polymer foam having an open cell content of about 70 percent or more and having an average cell size of about 70 micrometers or less and a density of about 16 to about 100 kilograms per cubic meter, comprising:
a) heating an alkenyl aromatic polymer material comprising more than 50 percent by weight alkenyl aromatic monomeric units to form a melt polymer material;
b) incorporating into the melt polymer material an amount of a nucleating agent additive at from about 0.01 to about 5 parts by weight based upon the weight of the polymer material;
c) incorporating into the melt polymer material at an elevated pressure to form a foamable gel a blowing agent of which about 50 mole percent or more is selected from the group consisting of 1,1-difluoroethane, 1,1,1-trifluoroethane, 1,1,1,2-tetrafluoro-ethane, chlorodifluoromethane, carbon dioxide, and mixtures of any of the foregoing based upon the total number of moles of blowing agent, the blowing agent being incorporated at about 0.06 to about 0.17 gram-moles per kilogram of polymer material;
d) adjusting the foamable gel to a foaming temperature sufficient to form a foam having 70 percent or more open cell content; and
e) extruding the foamable gel through a die into a region of lower pressure to form the foam.

5,594,837
POLYURETHANE SRIM COMPOSITIONS HAVING INTERNAL MOLD RELEASE PROPERTIES
Richard P. Harrison, Lincoln Park; Bari W. Brown, Trenton; Richard C. Reuzo, Troy; Gladys M. Aviles, Canton; Edward M. Dexheimer, Grosse Ile, all of Mich., and David Ho, Singapore, Singapore, assignors to BASF Corporation, Mt. Olive, N.J.
Division of Ser. No. 383,995, Sep. 9, 1994, Pat. No. 5,547,608. This application May 24, 1995, Ser. No. 448,713
Int. Cl.[6] C08G 18/48
U.S. Cl. 521—99 **14 Claims**

1. A polyurethane composition for the preparation of molded polyurethane articles having internal mold release properties, the composition comprising:
I.) an isocyanate component; and
II.) an isocyanate reactive polyol component, comprising:
A.) at least one polyoxyalkylene polyether polyol having as an initiator an aromatic diamine with vicinal amino groups as an initiator; and
B.) an effective amount of an internal mold release composition, consisting of:
a.) from 1 to 50 pbw of a secondary hydroxyl functional polydimethylsiloxane, based on the weight of the internal mold release composition; and,
b.) from 50 to 99 pbw of an epoxidized 2-ethylhexyl tallate ester, based on the weight of the internal mold release composition;
wherein the isocyanate reactive polyol component (II) is substantially free of separation behavior with respect to the internal mold release composition (B).

5,594,838
PLASTIC FOAM MATERIAL COMPOSED OF THERMOPLASTIC RESIN AND SILANE-MODIFIED THERMOPLASTIC RESIN AND METHOD FOR MAKING SAME
Tomoyuki Kobayashi; Kenji Miyazaki, both of Kyoto, and Masanori Nakamura, Osaka, all of Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan
Division of Ser. No. 389,960, Sep. 21, 1994, Pat. No. 5,552,448. This application May 22, 1996, Ser. No. 652,277
Claims priority, application Japan, Sep. 21, 1993, 5-235037
Int. Cl.[6] C08G 77/00
U.S. Cl. 521—154 **33 Claims**



1. A method for forming a tubular-celled resin sheet comprising:
forming an uncross-linked resin tube containing a foaming agent;
cross-linking said resin tube without activating said foaming agent;
cutting said resin tube into substantially uniform lengths;
arranging a plurality of said uniform lengths upon a surface with axes thereof parallel to each other;
peripheral surfaces of substantially all of said uniform lengths being in contact with peripheral surfaces of adjacent uniform lengths;
limiting an upper end of said uniform lengths; and
activating said foaming agent, whereby a unitary tubular-celled resin sheet is formed by adherence of peripheral surfaces to each other.

5,594,839
PROCESS FOR PREPARING FLEXIBLE FOAMS
Dirk Gerber, Grimbergen; Johan R. Derluyn, Roteslaar, and Eric Huygens, Heverlee, all of Belgium, assignors to Imperial Chemical Industries, London, England
Division of Ser. No. 464,493, Jun. 5, 1995, Pat. No. 5,521,225. This application Jan. 25, 1996, Ser. No. 591,047
Claims priority, application United Kingdom, Jun. 16, 1994, 9412105; European Pat. Off., Dec. 30, 1994, 94203786
Int. Cl.[6] C08G 18/32
U.S. Cl. 521—159 **7 Claims**

1. A process for preparing a flexible foam by reacting
1. a polyisocyanate composition, having an NCO value of 10–25% by weight and comprising
a) 70–90 parts by weight of an isocyanate prepolymer having an NCO value of 5–15% by weight prepared by reacting an excessive amount of an organic polyisocyanate and a polyol having an average nominal hydroxyl functionality of 2–3, a number average equivalent weight of 1000–3000 and an oxyethylene content of 5–25% by weight;
b) 10–30 parts by weight of a polyisocyanate having an NCO value of 30–33% by weight; and

2. a polyol composition in an amount of 30–150 parts by weight per 100 parts by weight of the above polyisocyanate composition, said polyol composition comprising
a) 70–90 parts by weight of a polyoxyethylene-polyoxypropylene polyol having an average nominal hydroxyl functionality of 2–3, a number average equivalent weight of 1000–3000 and an oxyethylene content of 5–25% by weight;
b) 5–25 parts by weight of a polyether polyol having an average nominal hydroxyl functionality of 2–8, a number average molecular weight of 200–3000 and an oxyethylene content of at least 80% by weight based on the total oxyalkylene content;
c) 2–8 parts by weight of water; the amount of 2a), 2b) and 2c) together being 100 parts by weight; and optionally
d) additives; at an isocyanate-index of 40–100.

5,594,840
PROCESS FOR PREPARING FLEXIBLE FOAMS
Dirk Gerber, Grimbergen; Johan R. Derluyn, Roteslaar, and Eric Huygens, Heverlee, all of Belgium, assignors to Imperial Chemical Industries PLC, London, England
Division of Ser. No. 464,493, Jun. 5, 1995, Pat. No. 5,521,225. This application Jan. 25, 1996, Ser. No. 591,073
Claims priority, application United Kingdom, Jun. 16, 1994, 9412105; European Pat. Off., Dec. 30, 1994, 94203786
Int. Cl.[6] C08G 18/32
U.S. Cl. 521—159 **6 Claims**

1. A reaction system comprising
a polyisocyanate composition, having an NCO value of 10–25% by weight and comprising based on 100 parts by weight
a) 8–60 parts by weight of free diphenylmethane diisocyanate;
b) 2–20 parts by weight of free polymethylene polyphenylene polyisocyanates having an isocyanate functionality of 3 or more; and
c) 30–90 parts by weight of an adduct of diphenylmethane diisocyanate and a polyol having an average nominal hydroxyl functionality of 2–3, a number average equivalent weight of 1000–3000 and an oxyethylene content of 5–25% by weight; and a polyol composition in an amount of 30–150 parts by weight per 100 parts by weight of the above polyisocyanate composition, said polyol composition comprising
a) 70–90 parts by weight of a polyoxyethylene-polyoxypropylene polyol having an average nominal hydroxyl functionality of 2–3, a number average equivalent weight of 1000–3000 and an oxyethylene content of 5–25% by weight;
b) 5–25 parts by weight of a polyether polyol having an average nominal hydroxyl functionality of 2–8, a number average molecular weight of 200–3000 and an oxyethylene content of at least 80% by weight based on the total oxyalkylene content;
c) 2–8 parts by weight of water; the amount of 2a), 2 b) and 2 c) together being 100 parts by weight; and optionally
d) additives.

5,594,841
METHODS FOR INCREASING STRUCTURAL INTEGRITY OF POLYMERS AND POLYMERS TREATED BY SUCH METHODS
Geoffrey Dearnaley, San Antonio, Tex., and Leonard F. Herk, Jr., Bridgeport, Mich., assignors to Southwest Research Institute, San Antonio, Tex.
Filed Jun. 7, 1995, Ser. No. 484,186
Int. Cl.[6] C08F 2/46
U.S. Cl. 522—2 **38 Claims**

1. A method for increasing the structural integrity of an organic polymer comprising the steps of:
diffusing into one or more selected surface of an organic polymer a crosslinking agent selected from the group consisting of three carbon cyclic compounds, three membered heterocyclic organic rings, linear organic analogues of three carbon cyclic and three membered heterocyclic organic rings, and 1,3-butadiene; and
exposing said organic polymer and said crosslinking agent to high energy charged particle irradiation in a vacuum at a linear energy of transfer, a rate of ion arrival, and for a time sufficient to induce a desired amount of crosslinking to a desired depth within said polymer.

5,594,842
RADIATION CURABLE COMPOSITIONS CONTAINING VINYL ETHER FUNCTIONAL POLYORGANOSILOXANES
Shedric O. Glover; Valeria J. Bujanowski; Maris J. Ziemelis; Michael W. Skinner; Gary R. Homan, all of Midland; Susan V. Perz, Essexville, and John P. Cannady, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.
Continuation-in-part of Ser. No. 63,206, May 18, 1993. This application Aug. 17, 1994, Ser. No. 291,660
Int. Cl.[6] C08F 2/50; C08L 83/07
U.S. Cl. 522—31 **25 Claims**

1. A curable coating composition comprising:
(A) a siloxane compound having the general formula:

$$(R_{3-a}SiO_{1/2})_w(R_{2-b}SiO)_x(RSiO_{3/2})_y(SiO_2)_z$$
$$\qquad\qquad\quad |\qquad\qquad\quad |$$
$$\qquad\qquad (OR^1)_a \qquad (OR^1)_b$$

wherein R is a monovalent hydrocarbon radical or halohydrocarbon radical having from 1 to 20 carbon atoms, R^1 is selected from the group consisting of monovalent hydrocarbon or halohydrocarbon radicals having from 1 to 8 carbon atoms and a group having its formula selected from the group consisting of (i) $—R^2OCH{=}CH_2$ and (ii) $—R^2Si(OR^2OCH{=}CH_2)_{3-c}R_c$ wherein R^2 is a divalent hydrocarbon or halohydrocarbon radical having from 1 to 20 carbon atoms, c has a value of 0 to 2, R is as defined above, w has a mole percent of from greater than 0 to 100, x has a mole percent of from 0 to less than 100, y has a mole percent of from 0 to less than 100, z has a mole percent of from 0 to less than 100, a is an integer of from 0 to 3, b is an integer of from 0 to 2, the sum of w+x+y+z being equal to 100 mole percent, with the proviso that at least one $≡SiOR^2OCH{=}CH_2$ group or $≡SiOR^2Si(OR^2OCH{=}CH_2)_{3-c}R_c$ group exists in each compound; and
(B) a photoinitiator having its general formula selected from:

$$R'_aArI^+ArR''_aX^-$$ or

$$R'''_aAr—I^+—Ar—R^{iv}_b—O_3S—Ar—R'''_aY^-$$

wherein R' is selected from monovalent hydrocarbon or halohydrocarbon radicals free of aliphatic unsaturation having from 1 to 40 carbon atoms, halogen atoms, a radical selected from NO_2, CN, COOH, SO_3H, or alkoxy radicals, hydrocarbon groups substituted with nitro groups, nitrile groups, carboxylic acid groups, sulfonic acid groups, or alkoxy groups, R'' is selected from monovalent hydrocarbon radicals free of aliphatic unsaturation and having from 1 to 40 carbon atoms, hydrocarbon groups substituted with alkoxy groups, arylalkoxy radicals, aryloxy radicals, or halogen atoms, each R''' is independently selected from monovalent hydrocarbon or halohydrocarbon radicals free of aliphatic unsaturation and having from 1 to 20 carbon atoms, halogen atoms, a radical selected from NO_2, CN, COOH, SO_3H, or alkoxy radicals, hydrocarbon groups substituted with nitro groups, nitrile groups, carboxylic acid groups, sulfonic acid groups, or alkoxy groups, R^{iv} is selected from alkoxy radicals or aryloxy radicals, Ar denotes arene radicals having from 6 to 40 carbon atoms, a has a value of from 0 to 10, b has value of from 0 to 10, X^-

is an anion selected from the group consisting of perfluoroalkylsulfonic acid anions, tetrahaloboronic acid anions, tetrakis(perfluoroaryl)boronic acid anions, and tetrakisperfluoroalkylsulfonatoboronic acid anions, and Y^- is an aryl sulfonate anion.

5,594,043

METHOD OF FORMING SHAPED HYDROGEL ARTICLES INCLUDING CONTACT LENSES USING INERT, DISPLACEABLE DILUENTS

Ivan M. Nunez, Jacksonville; Frank F. Molock, Orange Park; Laura D. Elliott, Jacksonville, and James D. Ford, Orange Park, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Division of Ser. No. 96,145, Jul. 22, 1993, Pat. No. 5,457,140. This application May 31, 1995, Ser. No. 454,881

Int. Cl.[6] B29D *11/00*; C08L *33/14*; C08K *5/05*

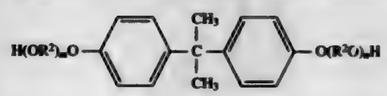
U.S. Cl. 523—106 2 Claims

1. A process for producing shaped hydrogel articles which comprises the steps of:

(1) molding or casting a polymerization mixture comprising:

(a) a monomer mixture comprising a major proportion of one or more hydrophilic monomers, and one or more crosslinking monomers; and

(b) an inert, displaceable, non-aqueous diluent comprising a composition or mixture of compositions of Formula (I):



wherein R^2 represents $—CH_2—CH_2—$, and m+n is a number within the range of from about 2 to about 100

under conditions to polymerize said monomer mixture to produce a shaped gel of a copolymer of said monomers and said diluent; and

(2) thereafter replacing said diluent with water,

provided that said inert, displaceable, non-aqueous diluent is selected such that when said polymerization mixture is polymerized in a photo differential scanning calorimeter wherein said polymerization is induced by ultraviolet irradiation at a light intensity of from about 2.5 to 3 mW/cm^2, the time to maximum exotherm of said polymerization is within the range of from about 0.2 to about 3.5 minutes and the percent conversion to polymer of the monomer mixture at maximum exotherm is at least 40 percent.

5,594,044

INK JET INK WHICH IS RUB RESISTANT TO ALCOHOL

Edward Yang, Inverness, Ill., assignor to Videojet Systems International, Inc., Wood Dale, Ill.

Filed Mar. 3, 1995, Ser. No. 398,095

Int. Cl.[6] C03C *17/00*; C09D *5/00*;*11/00*; C08L *1/10*

U.S. Cl. 523—160 19 Claims

1. A jet ink composition for printing on glass, plastic, and metal surfaces messages having good adhesion and isopropyl alcohol rub resistance, said composition comprising an organic solvent, a flexible thermoplastic polyurethane resin, a dye, a cellulose nitrate resin, and an adhesion promoter, said composition having (1) a viscosity from about 1.6 to about 7.0 centipoises at 25° C.; (2) an electrical resistivity from about 50 to about 2000 ohm-cm; and (3) a sonic velocity from about 1100 to about 1300 meters/second.

5,594,045

CORRECTION FLUIDS

Michael Alexiou, 1 Rivermeadow Avenue, Twickenham, Middlesex TW2 5JL, Great Britain

PCT No. PCT/GB93/01071, § 371 Date Dec. 1, 1994, § 102(e) Date Dec. 1, 1994, PCT Pub. No. WO93/24579, PCT Pub. Date Dec. 9, 1993

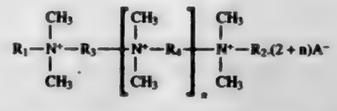
PCT Filed May 25, 1993, Ser. No. 347,413

Claims priority, application United Kingdom, Jun. 3, 1992, 9211760

Int. Cl.[6] C09D *10/00*

U.S. Cl. 523—161 11 Claims

1. A water-based correction fluid, which comprises a particulate opacifier, a water-soluble or water-dispersible polymeric binder, water and a di- or tri-quaternary ammonium compound of the formula:



where R_1 and R_2, which may be the same or different, are substituted or unsubstituted aliphatic groups containing from 4 to 20 carbon atoms, R_3 and R_4, which may be the same or different, are substituted or unsubstituted alkylene groups containing up to 8 carbon atoms, which groups may be interrupted by one or more ethereal oxygen atoms, wherein A is an anion, and n is 0 or 1.

5,594,046

INTUMESCENT ONE-COMPONENT SEALANT

Roland Joachimi, Romanshorn, Switzerland, assignor to Bostik, Inc., Middleton, Mass.

PCT No. PCT/EP93/02494, § 371 Date May 3, 1995, § 102(e) Date May 3, 1995, PCT Pub. No. WO94/06886, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 15, 1993, Ser. No. 403,734

Claims priority, application Germany, Sep. 18, 1992, 42 31 342.2

Int. Cl.[6] C09K *21/14*; B22C *1/22*; C08J *3/00*; C08L *75/00*

U.S. Cl. 523—179 15 Claims

1. An intumescent one-component sealant comprising a polyurethane binder, an intumescent agent, a vitreous fusible filler and wherein the intumescent agent and the vitreous filler have been pretreated by reaction with an isocyanate having a functionality of at least 2.

5,594,047

METHOD FOR FORMING PHOTOGRAPHIC DISPERSIONS COMPRISING LOADED LATEX POLYMERS

Ralph B. Nielsen, Rochester; Thomas A. Resick, Honeoye Falls; David F. Bates, Rochester; James S. Hennan, Spencerport, and Hwei-Ling Yau, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,400

Int. Cl.[6] G03C *1/815*

U.S. Cl. 523—315 21 Claims

1. A process for forming a photographic dispersion comprising mixing a liquid organic composition comprising one or more hydrophobic photographically useful compounds with an aqueous solution containing a dispersed polymer latex under conditions of high-shear or turbuleace sufficient to cause loading of the hydrophobic photographically useful compound into the dispersed polymer latex wherein the pH of the mixture is not significantly changed.

5,594,048

WATER-BASED INK COMPOSITION FREE OF VOLATILE ORGANIC COMPOUNDS FOR DEPOSITION ON A SUBSTRATE

Donald E. Weder, and Mettur Rahman, both of Highland, Ill., assignors to Southpac Trust International, Inc., Okla. City, Okla.

Filed May 24, 1995, Ser. No. 448,950

Int. Cl.[6] C08J *3/03*; C09D *11/02*

U.S. Cl. 523—335 1 Claim

1. A method for producing a water-based ink composition free of volatile organic compounds for deposition on a substrate selected from a group consisting of cellulose, cellophane, natural fibers, synthetic fibers, metal foils, synthetic organic polymer films and combinations thereof to produce three-dimensional patterns on the substrate, the method comprising the steps of:

admixing a blowing agent, a water-based pigment dispersion free of volatile organic compounds and a water-based composition free of volatile organic compounds to provide a foamed water-based ink composition free of volatile organic compounds wherein the blowing agent is present in an amount sufficient to foam the water-based ink composition and produce a three-dimensional pattern on curing, the water-based pigment dispersion having a Hegman gauge reading of at least about 7.5 and being present in an amount sufficient to provide the water-based ink composition with a predetermined color, the water-based ink in an uncured condition comprising:

from about 5 to about 98.9 weight percent of a water resistance agent having a glass transition point of from about minus 40 C. to about 30 C.;

from about 1 to about 85 weight percent of an anti-blocking agent having a glass transition point of from about 30 C. to about 100 C.;

an effective amount of the blowing agent to foam the water-based ink composition and produce a three-dimensional pattern on curing; and

from about 0.1 to about 25 weight percent of a water-based pigment dispersion free of volatile organic compounds and having a Hegman gauge reading of at least about 7.5 wherein the water-based pigment dispersion is formed by the steps of:

admixing a substantially homogeneous aqueous emulsion and a particulate pigment free of volatile organic compounds to disperse the particulate pigment in the homogeneous aqueous emulsion;

shearing the particulate pigment dispersed in the substantially homogeneous emulsion to reduce the particle size of the particulate pigment and provide the water-based pigment dispersion free of volatile organic compounds having a Hegman gauge reading of at least about 7.5 whereby the sheared particulate pigment remains dispersed in the homogeneous emulsion under quiescent conditions, the water-based pigment dispersion having a Hegman gauge reading of at least about 7.5 comprising, in an uncured state:

water;

from about 5 to about 25 weight percent of the water-based polymeric acrylic emulsion compatible with the dispersing agent and the particulate pigment;

from about 0.5 to about 5 weight percent of the dispersing agent capable of preventing agglomeration of the sheared particulate pigment; and

from about 15 to about 70 weight percent of the sheared particulate pigment.

5,594,049

CATIONIC ELECTRODEPOSITION COATING COMPOSITION

Mitsuo Yamada, Saita, and Yusuke Kobata, Higashiosaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

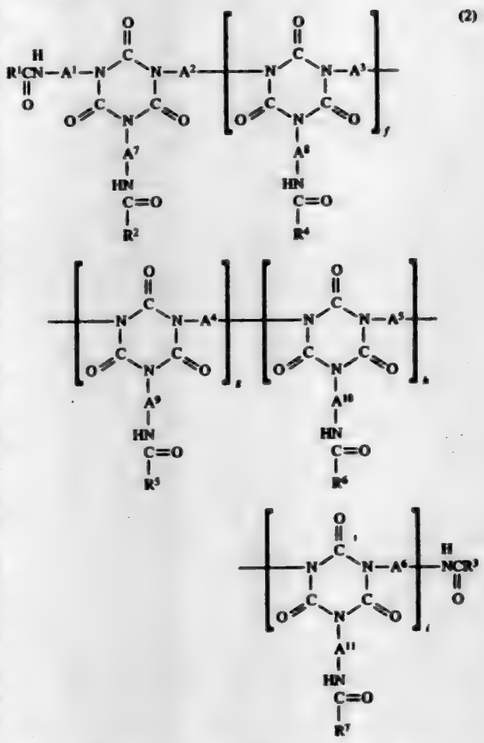
Division of Ser. No. 392,170, Feb. 22, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 474,677

Claims priority, application Japan, Feb. 22, 1994, 6-49806

Int. Cl.[6] C08K *3/20*; C08L *63/02*

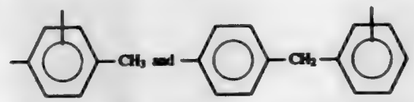
U.S. Cl. 523—415 8 Claims

1. A cationic electrodeposition coating composition containing a base resin and a curing agent represented by the following general formula (2):



(2)

wherein each of A^1–A^{11} is a structure derived from an aromatic diisocyanate compound chosen from among a group represented by



each of R^1–R^7 is a residue obtained by removing active hydrogen from an active hydrogen containing compound and at least one of which is a residue obtained by removing active hydrogen from glycol ether; and f, g, h and i are 0 or 1, said glycol ether being represented by the following general formula (1)

$$Ra(OCH_2CHRb)_nOH \quad (1)$$

wherein

Ra: Alkyl group with a carbon number of 5–12

Rb: Hydrogen atom or methyl group

n: Integer 1–4,

at least twenty percent of the total amount (mol) of said R^1–R^7 is residues obtained by removing active hydrogen from glycol ether represented by said general formula (1), the group of residues comprising said R^1–R^7 containing not only residues derived from glycol ether represented by said general formula (1) but also residues obtained by removing active hydrogen from at least one type of active hydrogen containing compound chosen from among RcOH (Rc denotes a hydrocarbon group with a carbon number of 1–10 which may contain a hydroxyl group), Rd(OCH$_2$CHRe)$_n$OH (Rd denotes an alkyl group with a carbon number of 1–4, Re denotes a hydrogen atom or a methyl group, and n denotes an integer 1–4), compounds which contain active methylene, oxime compounds, amino alcohols, imidazole and lactam.

5,594,850

CEMENT COMPOSITION CONTAINING CHEMICALLY CROSSLINKED POLYVINYL ALCOHOL (PVA)

Roland Audebert, Saint-Leu-La-Foret; Joseph Jouca, La Rochelle; Pierre Marcy, Duc, and Hugo Hendrikx, Grenoble, all of France, assignors to Dowell Schlumberger Incorporated, Sugar Land, Tex.

Continuation of Ser. No. 514,514, Aug. 11, 1995, abandoned, which is a continuation of Ser. No. 226,213, Apr. 11, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 622,821
Claims priority, application France, Apr. 23, 1993, 93 04925
Int. Cl.[6] C04B 7/00
U.S. Cl. 524—5 8 Claims

1. A cement slurry comprising cement, water, and a chemically crosslinked polyvinyl alcohol formed by condensing polyvinyl alcohol in solution with a di- or poly- functional crosslinking agent, the molar concentration of said crosslinking agent employed with respect to monomer residues of the polyvinyl alcohol being between about 0.01 and 1 percent.

5,594,851

Patent Not Issued For This Number

5,594,852

SULFUR VULCANIZABLE RUBBER CONTAINING SODIUM THIOSULFATE PENTAHYDRATE

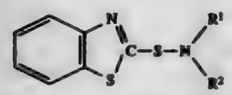
Richard M. D'Sidocky, Ravenna, and Shingo Futamura, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 11, 1995, Ser. No. 526,394
Int. Cl.[6] C08K 5/46;3/30
U.S. Cl. 524—83 18 Claims

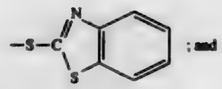
1. A method for increasing the rate of vulcanization of a sulfur vulcanizable rubber composition by heating a sulfur vulcanizable composition to a temperature ranging from 100° C. to 200° C., said rubber composition comprising

(a) a sulfur vulcanizable rubber

(b) from 0.5 phr to 5 phr of a sulfenamide compound of the general formula:



wherein R^1 is hydrogen, an acyclic aliphatic group having from about 1 to 10 carbon atoms, or a cyclic aliphatic group having from about 5 to 10 carbon atoms; and R^2 is hydrogen, a cyclic aliphatic group having from 5 to 10 carbon atoms or a mercaptobenzothiazolyl group of the formula:



; and

(c) from 0.05 to 10 phr of a hydrated thiosulfate.

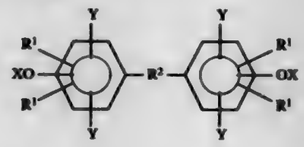
5,594,853

AROMATIC CYCLIC BISPHOSPHITE ESTERS AND POLYMERIC COMPOSITIONS THEREOF

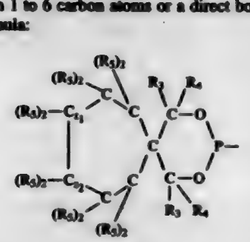
Roger W. Avakian, Parkersburg; Vallinath S. Prabhu, Vienna, both of W. Va.; William P. Enlow, and Carlton L. Gray, both of Delphos, Ohio, assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 22, 1996, Ser. No. 589,231
Int. Cl.[6] C08K 5/527; C07F 9/6574
U.S. Cl. 524—120 21 Claims

1. A phosphite of the formula:

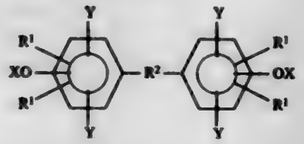


R_1 is independently selected from the group consisting of alkyl groups having from 1 to 9 carbon atoms, Y is independently selected from the group consisting of hydrogen, halogen, or alkyl; and the R_1 groups and said bi-phenyl linkage is positioned at the respective ortho- or para- positions with respect to the OX group whereby said O—X groups are hindered by the presence of at least one R_1 group; R^2 group is a divalent alkylidene radical having from 1 to 6 carbon atoms or a direct bond; and wherein X has the formula:

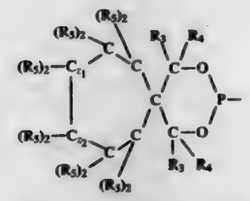


wherein R_2 is independently selected from the group consisting of alkyl groups having from 1 to 12 carbon atoms, and R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen, halogen, or alkyl, and z is 0 or 1.

7. A thermoplastic composition comprising a stabilizing amount of a phosphite of the formula:



R_1 is independently selected from the group consisting of alkyl groups, Y is independently selected from the group consisting of hydrogen, halogen, or alkyl; and the R_1 groups and said bi-phenyl linkage is positioned at the respective ortho- or para- positions with respect to the OX group whereby said O—X groups are hindered by the presence of at least one R_1 group; and wherein X has the formula:



wherein R_2 is independently selected from the group consisting of alkyl groups having from 1 to 12 carbon atoms, and R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen, halogen, or alkyl, and z is 0 or 1.

5,594,854

FLAME RETARDANT FLEXIBILIZED POLYPHENYLENE ETHER COMPOSITIONS

Glen F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 386,219, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 53,981, Apr. 27, 1993, abandoned, which is a division of Ser. No. 118,525, Nov. 9, 1987, Pat. No. 5,206,276, which is a continuation of Ser. No. 948,233, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 603,663, Apr. 26, 1984, Pat. No. 4,684,682, which is a continuation of Ser. No. 197,933, Oct. 17, 1980, abandoned, which is a continuation of Ser. No. 752,731, Dec. 21, 1976, abandoned. This application Jun. 7, 1995, Ser. No. 476,829
Int. Cl.[6] C08L 71/12; C08K 5/52
U.S. Cl. 524—141 12 Claims

1. A flame retardant, flexibilized thermoplastic composition having a tensile yield less that about 3700 psi which comprises, in admixture:

(a) a normally flammable polyphenylene ether resin;

(b) 65 to 100 parts by weight of a flame retardant aromatic phosphate plasticizer based upon 100 parts by weight of (a); and

(c) 15 to 65 parts by weight of a thermoplastic elastomer, based upon 100 parts by weight of (a), comprising an A-B-A^1 block copolymer wherein terminal blocks A and A^1 are polymeric units of a vinyl aromatic compound and center block B is a polymer of a conjugated diene and wherein said A-B-A^1 block copolymer is a hydrogenated A-B-A^1 block copolymer.

5,594,855

ANTIOXIDANT SYSTEM FOR POLYOLEFINS

Sol-Shek Yeung, Spring Valley, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 22, 1995, Ser. No. 392,454
Int. Cl.[6] C08K 5/05;5/10;5/15
U.S. Cl. 524—291 24 Claims

1. A stabilizing mixture for plastic materials comprising:

(a) a α-tocopherol solution comprising: α-tocopherol, glycerin, glyceryl monocaprylate-caprate, and PEG; and

(b) a compound selected from (i) tetrakis[methylene(3,5-di-tert.-butyl- 4-hydroxyhydrocinnamate]methane or (ii) octadecyl 3,5-di-tert.-butyl- 4-hydroxyhydrocinnamate.

5,594,856

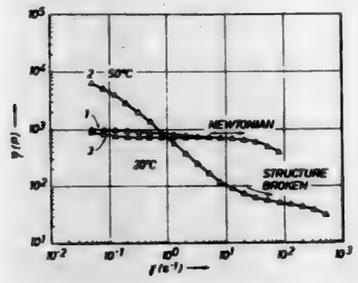
Patent Not Issued For This Number

5,594,857

REVERSIBLY HEAT STIFFENING SUSPENSION

Burton R. Patterson, and Jeffrey A. Horn, both of Birmingham, Ala., assignors to University of Alabama Research Foundation, Birmingham, Ala.

Filed Feb. 13, 1995, Ser. No. 388,143
Int. Cl.[6] C08K 3/10
U.S. Cl. 524—496 24 Claims



1. A heat stiffening suspension, comprising:

a polymer liquid, wherein said polymer liquid is selected from the group consisting of polybutene and polyisoprene; and oxides selected from the group consisting of TiO_2, Al_2O_3, ZrO_2 and MoO_3 and wherein said suspension is reversibly activated by temperature to change from a liquid-like state to a solid-like state.

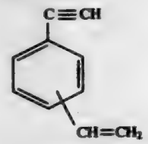
5,594,858

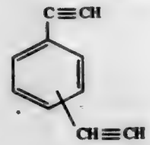
POLYPHENYLENE RESINS FROM VINYLETHYNYLBENZENE, DIETHYNYLBENZENE AND PHENYLACETYLENE

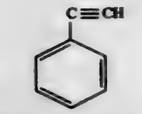
Robert E. Olsen, Placerville; Harlan F. Reese, Sacramento, and Stephen J. Backlund, Fair Oaks, all of Calif., assignors to Aerojet- General Corporation, Sacramento, Calif.

Filed Jun. 15, 1988, Ser. No. 207,324
Int. Cl.[6] C08F 38/04;4/44; C08K 5/01; C08L 49/00
U.S. Cl. 524—481 36 Claims

1. A polyphenylene polymer formed by the copolymerization of the following monomers


(a)

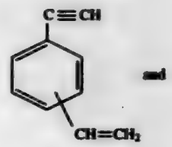

(b)


(c)

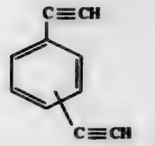
said polymer containing at least a substantial portion of the vinyl groups of monomer (a) unreacted.

26. A polyphenylene resin solution comprising a copolymer of

(a) a monomer mixture comprising

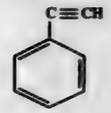


and



and

(b) a chain terminator having the formula



said copolymer containing at least a substantial portion of the vinyl groups of monomer (i) unreacted, and said copolymer dissolved in a further amount of said monomer mixture.

5,594,859

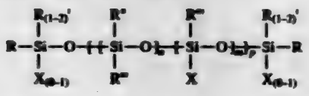
IMPACT MODIFIED THERMOPLASTIC MOLDING COMPOSITION CONTAINING POLYCARBONATE AND POLYESTER

James P. Mason, McKees Rocks, and James A. DiBernardo, North Braddock, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Jul. 6, 1995, Ser. No. 498,737
Int. Cl.[6] C08K 3/36;9/06; C08L 67/00;69/00
U.S. Cl. 524—493 11 Claims

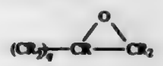
1. A thermoplastic molding composition comprising (a) a polycarbonate resin, (b) thermoplastic polyester and (c) a silicone rubber powder, wherein said powder is present in the composition in an amount of about 3 to 25 percent relative to the weight of the composition, said silicone rubber powder having an average particle size of about 1 to 1000 microns and containing

(i) 100 pbw of a polydiorganosiloxane having a viscosity at 25° C. is about 10^6 to 10^9 centipoise and siloxane structural units represented by the general formula



wherein

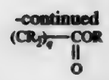
R', R" and R"' independently denote a member selected from the group consisting of hydrogen atom, C_{1-10}-alkyl, alkenyl, cycloalkyl and aryl radicals, and where p is about 1000 to 8000 and where the relative weight proportions of n and m is 98.5 to 100:0 to 1.5, and where X denotes a member selected from the group consisting of



and

-continued

(i)



where R denotes a member selected from the group consisting of hydrogen, C_{1-10}-alkyl, alkenyl, cycloalkyl and aryl radicals and where q is 1 to 10, and

(ii) about 10 to 80 pbw of a finely divided silica selected from the group consisting of fumed silica, precipitated silica and silica gel having a surface area of at least 50 m^2/g,

(ii)

said composition characterized in that it has a notched Izod impact strength value which is greater than that of the composition in the absence of said (c).

5,594,860

VAPOR GROWN CARBON FIBERS WITH INCREASED BULK DENSITY AND METHOD FOR MAKING SAME

Robert L. Alig, Dayton; Jason R. Guth, and David J. Burton, both of Fairborn, all of Ohio, assignors to Applied Sciences, Inc., Cedarville, Ohio

Continuation-in-part of Ser. No. 276,434, Jul. 18, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,246
Int. Cl.[6] C08K 3/04; B32B 5/16
U.S. Cl. 524—496 20 Claims



1. A method for increasing the bulk density and reinforcement capability of vapor grown carbon fibers comprising:

mixing a quantity of vapor grown carbon fiber which have been surface treated during formation and which have an average diameter of less than about 1 μm and an initial bulk density of less than about 0.2 lb/ft^3 with an aqueous-based solution containing a latex;

blending said mixture to evenly disperse said carbon fibers in said aqueous solution and to deposit said latex on said carbon fibers; and,

drying said blended mixture to form a mass of carbon fibers whereupon drying said mass of carbon fiber has a final bulk density of at least about 3 lb/ft^3.

5,594,861

AQUEOUS COATING FOR VINYL CHLORIDE POLYMER SUBSTRATE

Satish C. Sharma, Stow; John P. Kovalchin, Akron, and Raymond J. Weinert, Garfield Heights, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 944,585, Sep. 14, 1992, abandoned. This application Mar. 11, 1994, Ser. No. 212,619
Int. Cl.[6] C08L 33/14
U.S. Cl. 524—503 9 Claims

1. A latex coating composition comprising a crosslinkable acrylic polymer which is prepared substantially in the absence of chain transfer agents, an amino resin crosslinking agent, and from about 3 to about 50 parts by weight of a polyvinyl alcohol for improving shelf-stability and for reducing gloss on a coated substrate, at least a majority weight of the monomeric units comprising said acrylic polymer being one or more alkyl acrylates, alkyl methacrylates or a combination thereof, about 2 to about 9 percent by weight of the monomeric units of said acrylic polymer being one or more hydroxyalkyl acrylates, hydroxyalkyl methacrylates or a combination thereof, and wherein said parts by weight are per 100 parts by weight on a dry basis of said acrylic polymer and said amino resin crosslinking agent.

5,594,862

POLYCARBONATE/POLYOLEFIN BASED RESIN COMPOSITIONS AND THEIR PRODUCTION PROCESSES AND USES

Kazuya Takemura; Masahiko Kajioka; Kazunichi Sashi; Shigeru Takano, and Eiichi Sumita, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Mar. 13, 1995, Ser. No. 402,688
Claims priority, application Japan, Mar. 16, 1994, 6-071555; Aug. 4, 1994, 6-202824; Oct. 4, 1994, 6-240044
Int. Cl.[6] C08L 69/00;23/00;23/36;51/06
U.S. Cl. 524—504 16 Claims

1. A polycarbonate/polyolefin based resin composition exhibiting an improved polycarbonate/polyolefin compatibility prepared by melt kneading

(A) a polycarbonate resin;

(C) a polyolefin resin that has been modified with at least one functional group selected from the group consisting of epoxy, carboxyl, and an acid anhydride groups; and

(D) a compound represented by the formula:

$$HOOC—R—NH_2$$

wherein R represents at least one member selected from the group consisting of an alkene group, an alkylidene group, and an oligomethylene group containing 5 or more carbon atoms, and phenylene group and naphthylene group optionally substituted with an alkyl group.

5,594,863

STABLE CHLOROSULFONATED RESIN LATEX RELATED APPLICATIONS

Edward G. Brugel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 866,764, Apr. 7, 1992, Pat. No. 5,491,191, which is a continuation-in-part of Ser. No. 864,118, Apr. 6, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 476,823
Int. Cl.[6] C08L 51/00
U.S. Cl. 524—504 5 Claims

1. A composition comprising a chlorosulfonated copolymer of ethylene and propylene having grafted thereon C_3–C_{10} unsaturated acid or anhydride units, the chlorosulfonated copolymer containing 20–70 weight percent chlorine and 1.5–10 weight percent sulfur, the copolymer prior to chlorosulfonation containing about 0.5–10 weight percent, based on the weight of the copolymer, of grafted C_3–C_{10} unsaturated acid or anhydride units and 2–10 weight percent, based on the weight of the copolymer, of copolymerized ethylene units.

5,594,864

POLYMERIC COMPOSITIONS CONTAINING INORGANIC FILLERS AND USE THEROF

Richard L. Bradshaw, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 76,896, Jun. 15, 1993, Pat. No. 5,446,085. This application May 3, 1995, Ser. No. 433,560
Int. Cl.[6] C08L 75/00;27/00;51/00;69/00
U.S. Cl. 524—507 18 Claims

1. An composition comprising:

A) an inorganic filler having absorption sites selected from the group consisting of unhydrated oxide sites, hydrated oxide sites and mixtures thereof; and

1) a glassy polymer having a: glass transition temperature of at least about 60° C., and having polar groups that interact with said adsorption sites on the surface of said filler to thereby remain in contact with and to encapsulate said filler; and

2) a polyurethane rubbery polymer having polar groups and being compatible with said glassy polymer wherein the relative amounts of B) 1) and B) 2) are about 50% to about 80% by weight of B) 1) and correspondingly about 20% to about 50% by weight of B) 2) based upon the total weight of B) 1) and B) 2) in the composition; and wherein said glassy polymer and said rubbery polymer are chlorine free;

and wherein the relative amounts of A) and B) are about 35% to about 60% of A) and correspondingly 65% to about 40% by volume of B) based upon the total volume of A) and B) in the composition, said composition being obtained by forming a premix of said inorganic filler, said glassy polymer and an organic diluent, which contains a volatile polar organic solvent wherein said premix contains about 2 to about 20% by weight of said glassy polymer, and about 20 to about 50% by weight of said filler; and admixing said premix and said rubbery polymer; and providing in the composition a high boiling secondary diluent in an amount to provide a blend of diluent of about 70 to about 90% by weight of said volatile polar organic solvent and correspondingly about 10 to about 30% by weight of said secondary diluent; and wherein said high boiling diluent is a non solvent for said glassy polymer; and thereby causing said glassy polymer to adsorb onto said inorganic filler and interact with adsorption sites on said filler to thereby encapsulate said filler, and to intertwine said rubbery particle within the matrix of said glassy polymer.

5,594,865

TWO COMPONENT WATERBORNE CROSSLINKABLE POLYURETHANE/ACRYLATE-HYBRID SYSTEMS

Chao-Feng Tien, Macungie; Charles R. Hegedus, Coopersburg; Thomas M. Santosusso, Macungie; Jeanine M. Snyder, Schnecksville, and Lisa A. Mercando, Pennsburg, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 9, 1995, Ser. No. 436,534
Int. Cl.[6] C08L 75/04; C08F 8/32
U.S. Cl. 524—507 11 Claims

1. In a two componeat coating system based upon crosslinkable hydroxy containing polymers and a polyisocyanate crosslinker, the improvement which resides in (a) the utilization of a water-borne polyurethane prepolymer/hybrid containing polymerized acrylate units, wherein the polyurethane prepolymer component of said polyurethane prepolymer/hybrid is terminated by reaction with a C_{2-10} alkanolamine and (b) a water-disperisble polyisocyanate as said polyisocyanate crosslinker.

5,594,866

LOW-VISCOSITY, STABLE, AGGLOMERATE-FREE POLYMER POLYOLS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN PRODUCING POLYURETHANE PLASTICS

Torsten Heinemann, Cologne; Manfred Dietrich, Leverkusen; Gundolf Jacobs, Rösrath; Mark Kratz, Krefeld; Josef Sanders, Leverkusen; Uwe Schulz, Cologne, and Helmut Woynar, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 23, 1995, Ser. No. 518,370
Claims priority, application Germany, Sep. 2, 1994, 44 31 226.1
Int. Cl.[6] C08G 18/48
U.S. Cl. 524—761 9 Claims

1. A process for the preparation of stable, agglomerate-free, low-viscosity graft copolymer dispersions by polymerizing 25 to 65% by weight, based on the total weight of the dispersion, of ethylenically unsaturated monomers in the presence of a base

polyol, a macromer, and a low-molecular weight regulator, wherein said macromer has a molecular weight of 4700 to 15,000 and a functionality of 2 to 6, and said macromer is prepared by reacting a polyol which has a molecular weight of 4500 to 15,000 and a functionality of 2 to 6 with an isocyanate which is the reaction product of one or more ethylenically unsaturated, low-molecular weight monohydroxy acrylates with one or more polyisocyanates, and wherein said macromer contains from 0.1 to 1 moles of double bonds per mole of polyol.

5,594,067

METHOD OF MANUFACTURING WATER-BASED SILICONE-TYPE GRAFT COPOLYMER EMULSION

Yukio Doi, Ibe-gun; Wei-Zhong Zhang, and Masayoshi Kinugasa, both of Tatsuno, all of Japan, assignors to Showa Highpolymer Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00512, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO94/06838, PCT Pub. Date Mar. 31, 1994

PCT Filed Apr. 20, 1993, Ser. No. 244,044

Claims priority, application Japan, Sep. 21, 1992, 4-278113

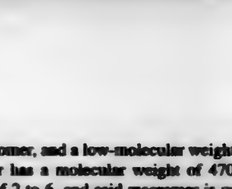
Int. Cl.[6] C08J *3/24*

U.S. Cl. 524—806 **4 Claims**

1. A method of manufacturing a water based silicone type graft copolymer emulsion consisting essentially of:

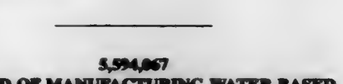
emulsifying and dispersing in water a mixture of a first and a second silicone macromonomer having a radical polymerizable functional group and another vinyl monomer such that the particle size of the emulsion is 0.5 μm or less, in the presence of an initiator and a surface active agent having a radical polymerizable functional group, and raising the temperature to copolymerize the emulsified and dispersed material, and wherein said first macromonomer comprising the silicone structural unit repetition number N of less than 20, and said second macromonomer comprising the silicone structural units repetition member of at least 20, and said first macromonomer being present in a quantity of 5 to 80 wt %, based on total weight of said macromonomers

said macromonomer being expressed by a Formula I:

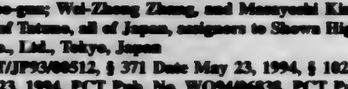


(I)

and wherein R is:

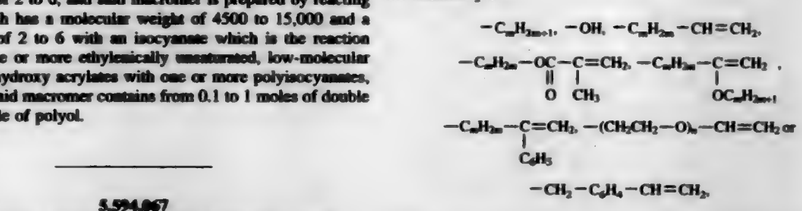


and wherein R_1 is



-continued

and wherein R_2 is:



where Ph is phenyl group or alkyl substituted pheayl group; m is 0 to 10; n is 1 to 10 and with the proviso that: x+y+z=N, where x=0 to 150, y=0 to 150 and z=0 to 150.

5,594,068

CELLULOSE ESTER BLENDS

Charles M. Buchanan, Bluff City; Robert M. Gardner, Gray; Alan W. White, Kingsport, and Matthew D. Wood, Gray, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 69,246, May 28, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,717

Int. Cl.[6] C08L *1/10;1/12*

U.S. Cl. 525—54.3 **45 Claims**

1. A compatible blend comprising

(c) about 4% to 97% by weight of one or more C_1–C_{10} ester of cellulose having a high D.S. of about 2.3 to 3.0 and an inherent viscosity of about 0.2 to about 3.0 deciliters/gram as measured at a temperature of 25° C. for a 0.5 g sample in 100 ml of a 60/40 parts by weight solution of phenol/tetrachloroethane,

(d) about 2% to 95% by weight of one or more C_1–C_{10} ester of cellulose having an intermediate D.S. of about 1.5 to 2.2 which is lower than the D.S. of the cellulose ester of (c) and which has an inherent viscosity of about 0.2 to about 3.0 deciliters/gram as measured at a temperature of 25° C. for a 0.5 g sample in 100 ml of a 60/40 parts by weight solution of phenol/tetrachloroethane, and

(e) about 1% to 94% of one or more aliphatic polyesters or aliphatic-aromatic polyesters,

said percentages being based on the weight of component (c) plus component (d) plus component (e).

5,594,069

PROCESS FOR PRODUCING MIXED POLY(VINYL ACETAL)S

Donald J. David, Amherst, and Nestor A. Rotstein, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

PCT No. PCT/US92/10510, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO94/13710, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 4, 1992, Ser. No. 387,821

Int. Cl.[6] C08F *8/28*

U.S. Cl. 525—61 **34 Claims**

1. A process for producing mixed poly(vinyl acetal)s containing, based on the weight of poly(vinyl acetal), 20 to 85 weight % butyral acetal groups, 10 to 30 weight % vinyl alcohol groups and up to 65 weight % long chain acetal groups derived from one or more aldehydes containing at least six C atoms, said process comprising the steps of:

a) conducting an acetalization reaction forming said long chain acetal groups in the substantial absence of butyraldehyde until gel break occurs;

b) adding butyraldehyde after gel break; and

c) continuing acetalization until reaching the desired reaction end point, wherein substantially the entire acetalization reaction is performed in the presence of an acid catalyst and the temperature during substantially the entire acetalization reaction is between about 40° to about 98° C.

5,594,070

ORIENTED POLYMERIC MICROPOROUS FILMS

Phillip Jacoby, Naperville; Charles W. Bauer, Batavia; Scott R. Clingaman, Glen Ellyn, all of Ill., and William T. Tapp, Marietta, Ga., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 298,283, May 27, 1994, abandoned, which is a division of Ser. No. 933,308, Aug. 21, 1992, Pat. No. 5,272,744, which is a division of Ser. No. 749,213, Aug. 23, 1991, Pat. No. 5,176,953, which is a continuation-in-part of Ser. No. 633,087, Dec. 21, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 475,323

Int. Cl.[6] C08L *53/00;23/16*

U.S. Cl. 525—88 **6 Claims**

1. A polymeric composition for the manufacture of films comprising,

about 30 to about 95 parts by weight of a component A comprising an ethylene-propylene block copolymer having an ethylene content of about 10 to about 50 wt %,

about 70 to about 5 parts by weight of a component B comprising a propylene homopolymer or random copolymer having up to about 10 wt % of a comonomer of ethylene or an α-olefin of 4 to 8 carbon atoms,

about 5 to about 20 parts by weight, per 100 parts by weight of components A and B, of a component C comprising a low molecular weight polypropylene having a melt viscosity of about 50 to about 1,000 poise measured at a shear rate of 136 sec^{-1} and 190° C., and

about 0.01 to about 50 ppm, by weight of components A and B, of a component E comprising a beta-spherulite nucleating agent.

5,594,071

ETHYLENE COPOLYMER COMPOSITION

Masaru Takahashi; Akira Tode; Seiichi Ikeyama; Toshiyuki Tsutsui; Shinya Matsunaga, and Norio Kawabige, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 77,352, Jun. 16, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,572

Claims priority, application Japan, Jun. 17, 1992, 4-157937; Jun. 17, 1992, 4-157938; Sep. 8, 1992, 4-239279; Sep. 8, 1992, 4-239280; Mar. 26, 1993, 5-068281; Mar. 26, 1993, 5-068282; Mar. 26, 1993, 5-068850; Mar. 26, 1993, 5-068851

Int. Cl.[6] C08L *23/04;23/18*

U.S. Cl. 525—240 **2 Claims**

1. An ethylene copolymer composition prepared by the process comprising:

copolymerizing ethylene with an α-olefin of 3 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising a metallocene compound containing at least two of 1,3-substituted alkylcyclopentadienyl groups (wherein alkyl group is selected from methyl group and ethyl group) as ligand to form an ethylene/α-olefin copolymer (A-2) having such properties that

(i) the density (d) is in the range of 0.880 to 0.940 g/cm^3,

(ii) the intrinsic viscosity (η_{I4-2}) as measured in decahydronaphthalene at 135° C. is in the range of 1.0 to 10.0 dl/g,

(iii) the temperature (Tm (° C.)) at which the endothermic curve of said copolymer measured by a differential scanning calorimeter (DSC) shows the maximum peak and the density (d) satisfy the relation

$$Tm<400\times d-250,$$

(iv) the melt tension (MT (g)) at 190° C. and the melt flow rate (MFR) satisfy the relation

$$MT>2.2\times MFR^{-0.84}$$

(v) the flow index (FI (1/sec)) defined by a shear rate which is given when a shear stress of molten copolymer at 190° C. reaches 2.4×10^6 $dyne/cm^2$ and the melt flow rate (MFR) satisfy the relation

$$FI>75\times MFR, \text{ and}$$

(vi) the amount (W (% by weight) of a decane-soluble portion at room temperature and the density (d) satisfy the relation

$$W<80\times\exp(-100(d-0.88))+0.1;$$

copolymerizing ethylene with an α-olefin of 3 to 20 carbon atoms in the presence of an olefin polymerization catalyst comprising metallocene compound to form an ethylene/α-olefin copolymer (A-3) having such properties that

(i) the density (d) is in the range of 0.910 to 0.960 g/cm^3,

(ii) the intrinsic viscosity (η_{I4-3}) as measured in decahydronaphthalene at 135° C. is in the range of 0.5 to 2.0 dl/g,

(iii) the temperature (Tm (° C.)) at which the endothermic curve of said copolymer measured by a differential scanning calorimeter (DSC) shows the maximum peak and the density (d) satisfy the relation

$$Tm<400\times d-250, \text{ and}$$

(iv) the amount (W (% by weight)) of a decane-soluble portion at room temperature and the density (d) satisfy the relation,

in the case of MFR≦10 g/10 min,

$$W<80\times\exp(-100(d-0.88))+0.1$$

in the case of MFR>10 g/10 min,

$$W<80\times(MFR-9)^{0.26}\times\exp(-100(d-0.88))+0.1;$$

mixing the ethylene/α-olefin copolymer (A-2) and the ethylene/α-olefin copolymer (A-3) in a weight ratio ((A-2)/(A-3)) of 95/5 to 5/95 to form an ethylene/α-olefin copolymer composition (Ia) having such properties that

(i) the density ratio ((A-2)/(A-3)) of the density of said ethylene/α-olefin copolymer (A-2) to the density of said ethylene/α-olefin copolymer (A-3) is less than 1,

(ii) the intrinsic viscosity ratio ($(\eta_{I4-2})/(\eta_{I4-3})$) of the intrinsic viscosity of said ethylene/α-olefin copolymer (A-2) to the intrinsic viscosity of said ethylene/α-olefin copolymer (A-3) is not less than 1,

(iii) the density of said composition is in the range of 0.890 to 0.955 g/cm^3, and

(iv) the melt flow rate (MFR) of said composition at 190° C. under a load of 2.16 kg is in the range of 0.1 to 100 g/10 min; and

mixing the ethylene/α-olefin copolymer composition (Ia) with (IIa) (B-1) a high-pressure radical polymerization low-density polyethylene having such properties that

(i) the melt flow rate (MFR) is in the range of 0.1 to 50 g/10 min, and

(ii) the molecular weight distribution (Mw/Mn, Mw=weight-average molecular weight, Mn=number-average molecular weight) measured by GPC and the melt flow rate (MFR) satisfy the relation

$$Mw/Mn\geq7.5\times\log(MFR)-1.2;$$

wherein a weight ratio ((Ia):(IIa)) between said ethylene/α-olefin copolymer composition (Ia) and said high-pressure radical polymerization low-density polyethylene (IIa) is in the range of 99:1 to 60:40.

5,594,872

LIQUID STAR POLYMERS HAVING TERMINAL HYDROXYL GROUPS

Dale L. Handlin, Jr.; Carl L. Willis, both of Houston; Daniel E. Goodwin, Katy, and David J. St. Clair, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 383,560, Sep. 9, 1994, which is a continuation of Ser. No. 85,224, Jun. 30, 1993, abandoned. This application Aug. 1, 1995, Ser. No. 510,822

Int. Cl.[6] C08F 297/02

U.S. Cl. 525—314 7 Claims

1. A polymer, comprising:
the structure:



wherein each A is a hydrogenated or unsaturated block or segment comprising a preponderance of a polymerized conjugated diene having a peak molecular weight from 400 to 40,000 as measured by GPC, t is from 2 to 30, B is the residue of a hydrogenated or unsaturated monolithium conjugated diene polymer having a peak molecular weight from 1,500 to 15,000 as measured by GPC, Y is a crosslinked core comprising a compound having at least two independently polymerized vinyl groups, t>t, and 0<u<(t−t).

5,594,873

DIALKYLTHIOUREA CURED ELASTOMERIC ROOFING COMPOSITION

Allen E. Creason, Southbury, and Thomas L. Jablonowski, Naugatuck, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 825,747, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 415,802, Sep. 29, 1989, abandoned. This application May 18, 1995, Ser. No. 443,841

Int. Cl.[6] C08C 19/20

U.S. Cl. 525—331.8 13 Claims

1. A roofing composition comprising:
(a) 100 parts of an elastomer selected from the group consisting of ethylenepropylene non-conjugated diene terpolymer, butyl rubber, and mixtures thereof;
(b) 0.1 to 3.0 parts of a dialkylthiourea selected from the group consisting of N,N'-diethyl-thiourea, ethylene thiourea, dimethylethylthiourea, trimethylthiourea, and tetraalkylthiourea;
(c) 0.4 to 5.0 parts of sulfur;
(d) 0.4 to 5.0 parts of one or more accelerators selected from the group consisting of thiazoles thiurams and dithiocarbamates,
wherein components (b), (c) and (d) are all parts by weight per one hundred parts by weight of (a),
said composition being free of hexasulfide compounds having the structural formula $[(CH_2)_nNCS]_2S_x$, wherein "n" is 4 or 5; and
(e) a cure activating amount of an activator of a metal oxide, fatty acid or metal stearate of a type useful in rubber curing.

5,594,874

PROCESS FOR IMPROVING PROCESSABILITY OF ULTRA LOW MELT VISCOSITY POLYMER

Charles C. Hwa; Chin-Yuan G. Ma, both of Sugar Land, and James D. McCullough, Jr., Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 21, 1995, Ser. No. 395,365

Int. Cl.[6] C08F 8/00

U.S. Cl. 525—387 21 Claims

1. A process for making polymer pellets comprising unreacted free radical generator which can be degraded upon thermal treatment to form an ultra low melt viscosity polyolefin having a melt viscosity of from about 500 to about 300,000 centipoise (cps) measured by Brookfield Viscometer using ASTM D2556 at 350° F., which process comprises the steps of:
(1) feeding a polymeric feedstock comprising a polyolefin having a melt index of from about 0.2 to about 100 dg/minute measured by ASTM 1238 condition E at 190° C. and 2.16 g wt to a main extruder through a feeding device,
(2) determining amount (x) of free radical generator required to degrade said polyolefin from step (1) in said main extruder, under temperature(s) and residence time of said main extruder, to a polymer having a viscosity in a range which is (i) sufficiently high to allow easy pelletization by pelletizer into tractable uniform non-sticky pellets with less than 2% pellet agglomerates, and (ii) sufficiently low to allow blending without causing mechanical breakdowns of the mixing device by end user of the pellets;
(3) determining amount of loss (y) of unreacted free radical generator during extrusion process;
(4) determining total amount (z) of free radical generator required for degradation and loss in the main extruder by adding the amount x from step (2) with the amount of y from step (3), wherein z=x+y;
(5) adding said free radical generator in an amount from about 0.7 to about 1.2 time of z determined in step (4) above to (i) first one-half section of the main extruder or (ii) prior to the feeding of said polymeric feedstock to form a first mixture;
(6) cracking said first mixture in said main extruder under heat;
(7) adding a second mixture comprising (i) from about 0.1 to about 100 wt % of a free radical generator, and (ii) from about 0 to about 99.9 wt % of said polymeric feedstock into last half section of the main extruder to form a third mixture;
(8) passing said third mixture exiting the end of the main extruder to a pelletizer to form pellets;
wherein said second mixture is added in step (7) in an amount which provides sufficient amount of unreacted free radical generator in the pellets produced from step (8) above available for subsequent decomposition and cracking of the polymer in the pellets to form an ultra low melt flow polymer having from about 500 to about 300,000 cps,
wherein the half life of the free radical generator used in step (5) is within about 0.1–1.0 times the half life of the free radical generator used in step (7).

5,594,875

ACETYLENIC HETEROCYCLIC NONLINEAR OPTICAL THERMOSET MONOMERS

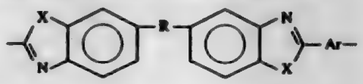
Bruce A. Reinhardt, Tipp City, and Jayprakash C. Bhatt, Riverside, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 7, 1995, Ser. No. 505,715

Int. Cl.[6] C08G 73/22;75/32; C08L 79/06

U.S. Cl. 525—426 5 Claims

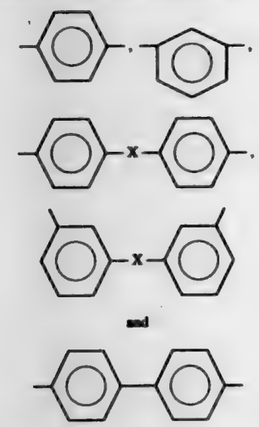
1. A composite film with second-order nonlinear optical activity consisting essentially of about 5 to 30 weight percent 2-ethynyl-5-(4-pyridyl)ethynyl thiophene, and a high performance thermoplastic polymer having repeating units of the formula:



wherein X is —O— or —S—, and R is selected from the group consisting of:



and Ar is selected from the group consisting of:



wherein X is as previously defined and said weight percent of 2-ethynyl- 5-(4-pyridyl)ethynyl thiophene is based on the weight of the thermoplastic polymer.

5,594,876

HYDRODEGRADABLE POLYESTERS

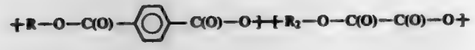
Bernard Gordon, III, State College, Pa., and Prabodh P. Sharma, Bombay, Ind., assignors to The Pennsylvania Research Foundation, University Park, Pa.

Continuation of Ser. No. 135,835, Oct. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 60,763, May 11, 1993, abandoned, and a continuation-in-part of Ser. No. 764,652, Sep. 24, 1991, abandoned, said Ser. No. 60,763is a continuation of Ser. No. 764,652, which is a continuation of Ser. No. 391,894, Aug. 10, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 485,162

Int. Cl.[6] C08G 63/183

U.S. Cl. 525—444 2 Claims

1. A hydrodegradable polyester copolymer consisting essentially of a substantially non-degradable aromatic polyester subunit and a hydrodegradable oxalate subunit and having the formula



wherein R is selected from the group consisting of a straight or branched alkylene of 2 to 16 carbons in length, a polyether of the formula $—[(CH_2)_n—O]_x—(CH_2)_n—$, or a mixture thereof, wherein n is a number from 2 to 16 and X is a number from 1 to 1000; R_2 is selected from the group consisting of a straight or branched alkylene of 2 to 16 carbons in length, a polyether of the formula $—[(CH_2)_n—O]_x—(CH_2)_n—$, or a mixture thereof, wherein n is a number from 2 to 16 and X is a number from 1 to 1000, said hydrolyzable oxalate subunit being randomly distributed in, and comprising 5–30 weight percent of said copolymer, the balance of said copolymer being said aromatic polyester subunit, and said copolymer exhibiting a significant decrease in intrinsic viscosity when hydrolyzed in water at a temperature of about 50° C. for about 3–4 days.

5,594,877

PROCESS FOR PREPARING POLYMERS WHICH CONTAIN ASPARTIC ACID

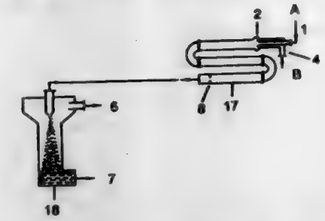
Torsten Groth; Winfried Jeschke, both of Köln; Paul Wagner, Düsseldorf; Hans-Joachim Traenckner, Leverkusen, and Dorde Jovcic, Burscheid, all of Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Oct. 25, 1994, Ser. No. 328,868

Claims priority, application Germany, Nov. 2, 1993, 43 37 337.2; Jul. 21, 1994, 44 25 951.4

Int. Cl.[6] C08G 69/00

U.S. Cl. 525—451 31 Claims



1. A process for the continuous preparation of polymers with repeating succinyl units, in which maleic anhydride, maleic acid, malic acid or fumaric acid, or mixtures thereof, (educt A) is mixed with ammonia, ammonium hydrogen carbonate, diammonium carbonate, isourea (ammonium cyanate), ammonium salts of carbonic acid or amides of carbonic acid, or mixtures thereof, (educt B) and are reacted in a first exothermic reaction stage to give a nitrogen-containing low molecular derivative of maleic acid and this derivative is polymerized in a subsequent second reaction stage, characterised in that the educts A and B are fed to a jet mixer having a nozzle containing an inner tube and an outer tube wherein said inner tube has an external surface and said inner tube is contained within said outer tube so that the external surface of said inner tube defines an annular passageway within said outer tube, simultaneously feeding one of the educts through the inner tube and the other educt through the annular passageway within the outer tube so that when said educts exit the inner tube and the annular passageway within said outer tube, said educts are intensively mixed and exothermically reacted in the jet mixer to form a reaction mixture;
discharging the reaction mixture from the jet mixer into a tubular reactor which is connected downstream and in series with the jet mixer;
conveying the reaction mixture through the tubular reactor as the exothermic reaction continues to form a nitrogen-containing low molecular derivative of maleic acid in a first reaction stage and a polymer with repeating succinyl units in a second reaction stage which also takes place in the tubular reactor, wherein the heat of reaction which is released in the exothermic reaction in the first reaction stage is used to take the reaction mixture to polymerization temperature for at least partially polymerizing the nitrogen-containing low molecular derivative of maleic acid in the second reaction stage within the tubular reactor to obtain the polymer with repeating succinyl units.

28. A process according to claim 1, wherein the resulting polymer is hydrolysed to the corresponding acid form.

5,594,078

PROCESS FOR PRODUCING BROAD MOLECULAR WEIGHT POLYOLEFIN

M. Bruce Welch; Ralf L. Geerts; Syriac J. Palackal, all of Bartlesville, Okla., and Ted M. Pettijohn, Marshall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 226,600, Apr. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 192,223, Feb. 3, 1994, Pat. No. 5,571,880, which is a continuation-in-part of Ser. No. 734,853, Jul. 23, 1991, Pat. No. 5,436,305. This application Sep. 13, 1994, Ser. No. 305,243

Int. Cl.[6] C08F 4/643;210/14

U.S. Cl. 526—119 47 Claims

1. A process for producing a polyolefin having a molecular weight distribution[, i.e. M_w/M_n] greater than 3 comprising polymerizing an olefin or copolymerizing at least two olefins under suitable polymerization conditions in the presence of a catalyst system prepared by combining at least a first and a second metallocene characterized by the fact that said first metallocene is a bridged metallocene containing a fluorenyl group and said second metallocene is an unbridged metallocene and further by the fact that said first metallocene if used as the sole metallocene to prepare polyolefin under those same polymerization conditions would produce a higher molecular weight than said second metallocene would produce if used as the sole metallocene to prepare polyolefin under those same polymerization conditions.

5,594,079

METHOD FOR PRODUCING A POLYOLEFIN

Daiji Hara; Masahiro Adachi, both of Yokkaichi, and Mitsuhiro Mori, Aichi, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 462,317, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 98,863, Jul. 29, 1993, abandoned. This application Feb. 14, 1996, Ser. No. 601,473

Claims priority, application Japan, Aug. 6, 1992, 4-229373

Int. Cl.[6] C08F 4/653;4/655;10/06

U.S. Cl. 526—119 5 Claims

1. A method for producing a stereoregular polypropylene in the presence of a catalyst comprising a transition metal compound and an organometallic compound, which comprises polymerizing propylene at a temperature from 20° to 100° C. and a pressure from 2 to 50 kg/cm^{2}G olefin in the presence of a catalyst system comprising:

(A) a solid catalyst component comprising Mg, Ti, halogen and an electron donative compound, prepared by reacting

(i-1) metal magnesium and a C_{1-18} alcohol,

(i-2) an oxygen-containing organic compound of aluminum having formula $Al(OR^2)_mX_{3-m}$ wherein R^2 is a C_{1-20}-hydrocarbon group, X is a halogen, and $0<m\leq 3$, and

(i-3) an oxygen-containing organic compound of titanium having the formula $(O_pTi_q(OR^3)_u)_v$, wherein R^3 is a C_{1-20}-hydrocarbon group, p, q and u are such that $p\geq 0$, $q>0$ and $u\geq 1$ and they are numbers agreeable with the valence of Ti, and s is an integer, to obtain a homogeneous solution; reacting the homogeneous solution with

(i-4) an aluminum halide having the formula $AlR^4_rX_{3-r}$ wherein R^4 is a C_{1-20}-hydrocarbon group, X is a halogen atom, and $0<r\leq 2$, to obtain a solid product; and reacting the solid product with

(i-5) an electron donative compound selected from the group consisting of ethers, esters, ketones, phenols, amines, amides, imines, nitriles, phosphines, phosphites, stilbines, arsines, phosphoryl amides and alcoholates, and

(i-6) a titanium halide compound having the formula $Ti(OR^5)_fX_{4-f}$ wherein R^5 is a C_{1-20}-hydrocarbon group, X is a halogen atom, and $0\leq f<4$,

(B) at least one organoaluminum compound

(C) an electron donative compound selected from the group consisting of organic acid esters, oxygen-containing organic compounds of silicon and nitrogen-containing organic compounds, and

(D) tris(pentafluorophenyl)borane;

wherein the molar ratio of magnesium atoms in component (i-1) to oxygen-containing organic compound of aluminum in component (i-2) is from 1:0.01 to 1:20; the molar ratio of magnesium atoms in component (i-1) to oxygen-containing organic compound of titanium in component (i-3) is from 1:0.01 to 1:20; the ratio of magnesium atoms in component (i-1) to aluminum atoms in said aluminum halide of component (i-4) is from 1:0.1 to 1:100; the molar ratio of magnesium atoms in component (i-1) to electron donative compound in component (i-5) is from 1:0.05 to 1:5.0; the molar ratio of magnesium atoms in component (i-1) to halogenated titanium compound in component (i-6) is from 1:1 to 1:100; and

wherein catalyst component (A) is used in an amount of 0.001 to 2.5 mg atom of titanium atoms in said catalyst component (A) per liter of reactor, catalyst component (B) is used in an amount of 1 to 2,000 mol per gram atom of titanium in catalyst component (A), catalyst component (C) is used in an amount of 0.001 to 20 mol per mol of said trialkyl aluminum or alkyl aluminum halide compound of component (B), and catalyst component (D) is used in an amount of 0.0001 to 20 mol per mol of said electron donative compound in component (C), wherein components (i-1), (i-2) and (i-3) are heated to a temperature from −50° to 300° C. for 0.5–50 hours in an inert gas atmosphere to form said homogeneous solution; components (i-4), (i-5) and (i-6) are reacted with said homogeneous solution at a temperature of from −50° to 200° C. for 0.2–50 hours under an inert gas atmosphere to form solid catalyst component (A), and then catalyst components (A), (B), (C) and (D) are contacted with one another.

5,594,080

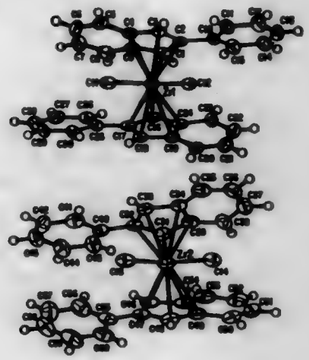
THERMOPLASTIC ELASTOMERIC OLEFIN POLYMERS, METHOD OF PRODUCTION AND CATALYSTS THEREFOR

Robert M. Waymouth; Geoffrey W. Coates, both of Palo Alto, Calif., and Elizabeth M. Hauptman, Wilmington, Del., assignors to Leland Stanford, Jr. University, Stanford, Calif.

Filed Mar. 24, 1994, Ser. No. 218,210

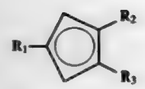
Int. Cl.[6] C08F 4/643;4/642;10/06

U.S. Cl. 526—126 63 Claims

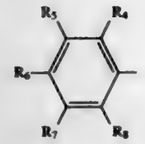


49. In a method of polymerization of olefin monomers by contacting at least one olefin monomer with a metallocene catalyst/cocatalyst system, the improvement which comprises the steps of:

a) providing a metallocene having a pair of hydrocarbon or substituted hydrocarbon ligands L and L' independently rotatable about a ligand-metal bond, at least one of which ligands is a substituted cyclopentadiene ring and the other is a substituted cyclopentadienyl ring having the formula:



where R_1 is a, or R_1 and R_2 are, aryl or substituted aryl substituent(s) of the formula;



where R_4, R_5, R_6, R_7 and R_8 are hydrogen, halogen, aryl, hydrocarbyl, silahydrocarbyl or halohydrocarbyl substituents; and at least one of R_2 or R_3 are C_1–C_{20} alkyl, C_1–C_{20} alkylsilyl, or R_2 and R_3 are connected as a ring having at least three carbon atoms;

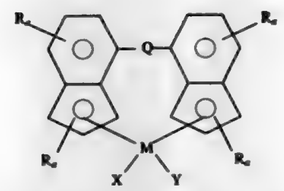
b) controlling the rate of rotation of said ligands by selecting ligand substituents to provide a preselected degree of static hindrance to ligand rotation on said ligand-metal bond, said degree of hindrance being selected on the principle that sterically larger substituents provide greater hindrance, said hindered rotation permitting said catalyst to alternate between two distinct states, wherein the rate of rotation between said states is less than the rate of monomer addition at the catalyst active site such that the lifetime of a given state is greater than the time required for insertion of a monomer unit to a growing polymer chain but shorter than the time required to form said polymer chain;

c) said states are characterizable as rac-like and meso-like states wherein:

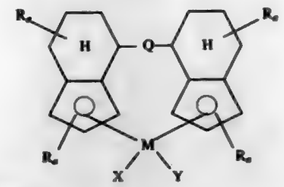
i) when L=L' said metallocene alternates between chiral rac and achiral meso states; and

ii) when L≠L' said metallocene alternates between a chiral rac-like state and a state which is chiral by virtue of the difference in substituents on the ligands, but meso-like in relative orientation of the two ligands including their substituents; and

d) reacting said monomer(s) for a time sufficient to produce an alpha olefin block polymer having a block index of greater than about 5, and elastomeric properties.



[I_A]



[I_B]

wherein:

M represents a transition metal selected from the group consisting of titanium, zirconium and hafnium;

R's, respectively, represent independently a halogen atom, a hydrocarbon group having 1–20 carbon atoms, a halogen-containing hydrocarbon group having 1–20 carbon atoms, or a silicon-containing hydrocarbon group having 1–20 carbon atoms, with a proviso that, when two or more of R's are on the identical indenyl or hydroindenyl group, two R's are optionally bonded to each other at their ω-terminals to form a ring together with the part of the indenyl or hydroindenyl group;

a's, respectively, denote independently an integer from 0 to 3, and b's, respectively, denote independently an integer from 0 to 7;

Q represents a divalent hydrocarbon or silicon- or germanium-containing hydrocarbon group having 1–30 carbon atoms; and

X and Y, respectively, represent independently a hydrogen atom, a halogen atom, or a monovalent hydrocarbon or nitrogen-, oxygen-, silicon- or phosphorus-containing hydrocarbon group having 1–20 carbon atoms.

6. A catalyst for polymerizing an α-olefin which comprises a combination of Component (A) which is a catalyst component for polymerizing an α-olefin according to claim 1 and Component (B) which is (i) an aluminumoxy compound, (ii) a Lewis acid, or (iii) an ionic compound capable of reacting with the Component (A) to convert the Component (A) into a cation.

14. A process for producing an α-olefin polymer which comprises contacting an α-olefin with a catalyst as claimed in claim 6 thereby to polymerize the α-olefin.

5,594,081

CATALYST COMPONENT FOR THE POLYMERIZATION OF α-OLEFINS AND A PROCESS FOR PREPARING α-OLEFIN POLYMERS WITH USE OF SAME

Hideshi Uchino; June Endo, both of Yokkaichi; Toshihiko Sugano, Yokohama; Tomohiko Takahama, Yokkaichi; Taku Kato, Yokohama; Eiji Taniyama, Ami-machi, and Naoshi Iwama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jul. 20, 1995, Ser. No. 504,825

Claims priority, application Japan, Jul. 22, 1994, 6-171194

Int. Cl.[6] C08F 4/642

U.S. Cl. 526—127 14 Claims

1. A catalyst component for polymerizing an α-olefin comprising a metallocene compound represented by the formulae [I_A] or [I_B]:

5,594,082

PROCESS FOR POLYMERIZATION OF OLEFINIC HYDROCARBON

Yoshio Tajima; Naoki Kataoka; Yosuke Numano; Takashi Seki, and Kazuo Matsuura, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Division of Ser. No. 905,583, Jun. 26, 1992, Pat. No. 5,451,555. This application Jun. 6, 1995, Ser. No. 467,337

Claims priority, application Japan, Jun. 27, 1991, 3-183272; Sep. 27, 1991, 3-276673

Int. Cl.[6] C08F 4/64

U.S. Cl. 526—160 25 Claims

1. A process for the homo- or co-polymerization of olefinic hydrocarbons which comprises polymerizing an olefinic hydrocarbon in the presence of a catalyst composition comprising a catalyst component comprised of

(i) a compound (A) of the formula

$$Me^1(OR^1)_pR^2_qX_{4-p-q}$$

where R^1 and R^2 are independently hydrocarbon moieties of 1–24 carbon atoms selected from the group consisting of alkyl, alkenyl, aryl and aralkyl groups; X^1 is a halogen atom; Me^1 is Ti, Zr or Hf; $0 \leq p \leq 4$; $0 \leq q \leq 4$; and $0 \leq p+q \leq 4$;

(ii) a compound (B) of the formula

$$Me^2(OR^3)_m R^4_n X^2_{z-m-n}$$

where R^3 and R^4 are independently hydrocarbon moieties of 1–24 carbon atoms; X^2 is a halogen atom; Me^2 is an element included in Groups I–III of the Periodic Table; z is a valeace of Me^2; $0 \leq m \leq 3$; $0 \leq n \leq 3$; and $1 \leq n+m \leq 3$;

iii) an organocyclic compound (C) selected from the group consisting of (a) cyclopolyenes having two or more conjugated double bonds and a total carbon number of 4–24, (b) substituted cyclopolyenes having two or more conjugated double bonds and a total carbon number of 4–24, and (c) organosilicon compounds having a cyclic hydrocarbon group containing two or more conjugated double bonds and a total carbon number of 4–24; and

iv) a modified organoaluminum compound derived from reacting an organoaluminum compound with water and having 1–100 Al—O—Al bonds in the molecule.

5,594,883

WATER-SWELLABLE HYDROPHILIC POLYMERS

Rüdiger Funk, Niederhausen; Fritz Engelhardt; Ulrich Riegel, both of Frankfurt am Main, and Michael Wessling, Maintal, all of Germany, assignors to Cassella Aktiengesellschaft, Germany

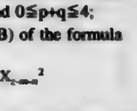
Filed Mar. 22, 1995, Ser. No. 408,534

Claims priority, application Germany, Apr. 2, 1994, 44 11 536.9

Int. Cl.[6] C08F 20/58;4/36

U.S. Cl. 526—232.3 **19 Claims**

1. Water-swellable hydrophilic polymers which comprise polymers prepared by free radical (co)polymerization of one or more hydrophilic monomers of the formula I

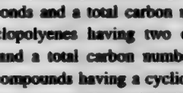


(I)

wherein

R^1 is hydrogen, methyl or ethyl,

R^2 is the group —COOR[4], the sulphonyl group, the phosphonyl group, the phosphonyl group esterified by (C_1–C_4)-alkanol or a group of the formula



R^3 is hydrogen, methyl, ethyl or the carboxyl group,

R^4 is hydrogen, amine or hydroxy-(C_1–C_4)-alkyl and

R^5 is the sulphonyl group, the phosphonyl group or the carboxyl group, or grafting (co)polymerization of one or more hydrophilic monomers of the formula I onto a grafting base, using a free radical initiator which forms three or more free radical sites per molecule, and wherein crosslinking is accomplished in the absence of a crosslinking agent.

5,594,884

ALKYL-ALLYLPHOSPHONATE COPOLYMER USED FOR BOILER WATER TREATMENT

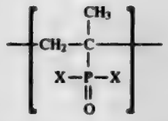
Scott M. Boyette, Wilmington, Del., and Alan E. Goliaszewski, The Woodlands, Tex., assignors to BetzDearborn Inc., Trevose, Pa.

Division of Ser. No. 350,879, Dec. 7, 1994, Pat. No. 5,512,183. This application Dec. 8, 1995, Ser. No. 569,623

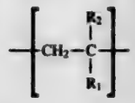
Int. Cl.[6] C08F 30/02

U.S. Cl. 526—278 **1 Claim**

1. A water soluble copolymer consisting essentially of repeat unit moieties (a) and (b), said repeat unit (a) is an ionic moiety having the structure:



wherein X=OH or OM, wherein M is a cation, said repeat unit moiety (b) is a nonionic moiety having the structure:



wherein R_1 and R_2 are independently hydrogen, C_{1-10} linear or branched alkyl, phenyl or alkyl substituted phenyl, said copolymer having a molar ratio of a:b of from about 3:1 to about 0.5:1.

5,594,885

UREA AND URETHANE MONOMERS FOR CONTACT LENS MATERIALS

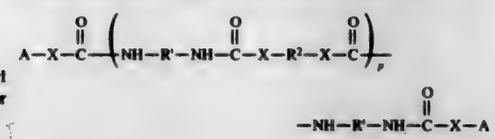
Yu-Chin Lai, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 169,824, Dec. 17, 1993, Pat. No. 5,451,651. This application May 16, 1995, Ser. No. 441,904

Int. Cl.[6] C08F 226/02;220/60;218/14;220/58

U.S. Cl. 526—302 **11 Claims**

1. A shaped article which is formed of the polymerization product of a mixture comprising a hydrophilic monomer and a monomer selected from compounds of the general formula:



wherein:

each A is independently an ethylenically unsaturated polymerizable radical;

each X is independeatly —O— or —NH—;

each R' is independently a divalent radical having 5 to 30 carbon atoms selected from the group consisting of branched alkylene, optionally substituted cycloalkylene, optionally substituted alkylene-cycloalkylene, optionally substituted arylene, and optionally substituted alkylene-arylene;

each R^2 is independently a divalent organic radical; and

p is 0, 1 or 2,

and wherein the article is optically clear and shaped as a contact lens.

5,594,886

PREPARATION AND USE OF POLY(3,5 DISUBSTITUTED-4-HYDROXYSTYRENE/N-SUBSTITUTED MALEIMIDE)

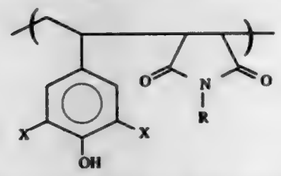
Richard Vicari, Corpus Christi, Tex., assignor to Hoechst Celanese Corp, Somerville, N.J.

Division of Ser. No. 673,243, Mar. 19, 1991, Pat. No. 5,462,840, which is a continuation of Ser. No. 506,508, Apr. 9, 1990, abandoned, which is a continuation of Ser. No. 97,810, Sep. 16, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 487,944

Int. Cl.[6] C08F 22/40

U.S. Cl. 526—262 **9 Claims**

1. An alternating copolymer having the structure



wherein X is independently H, alkyl, alkoxy, primary or secondary amino or halogen, and R is aliphatic, cycloaliphatic, or aliphatic heterocyclic.

5,594,887

POLYURETHANE THICKENERS AND THEIR USE FOR THICKENING AQUEOUS SYSTEMS

Klaus König, Odenthal; Jan Mazanek, Köln; Jürgen Schwiandt; Manfred Dietrich, both of Leverkusen, and Gerhard Klein, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 4, 1994, Ser. No. 286,040

Claims priority, application Germany, Aug. 16, 1993, 43 27 481.1

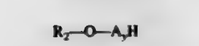
Int. Cl.[6] C08G 18/00

U.S. Cl. 528—44 **17 Claims**

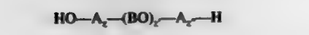
1. A water soluble or water dispersible polyurethane, which is suitable as a thickener for aqueous systems, and is prepared by reacting at an NCO/OH equivalent ratio of 0.8:1 to 1.4:1

a) an alcohol component containing

a1) 25 to 80 mol-% of one or more compounds corresponding to the formula

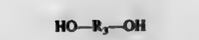


a2) 10 to 60 mol-% of one or more compounds corresponding to the formula



and

a3) 5 to 60 mol-% of one or more compounds corresponding to the formula



with

b) an isocyanate component having an average NCO-functionality of 1.5 to 2.5 and containing at least one organic isocyanate corresponding to the formula



wherein

R_1 represents an aliphatic, cycloaliphatic, aromatic or araliphatic hydrocarbon radical having 6 to 28 carbon atoms and optionally inert substituents,

R_2 represents an aliphatic hydrocarbon radical having 12 to 24 carbon atoms,

R_3 represents an aliphatic or araliphatic hydrocarbon radical having 4 to 36 carbon atoms and optionally ether oxygen atoms, provided that at least 3 carbon atoms are arranged between the two hydroxyl groups and the numerical ratio of carbon atoms to the ether oxygen atoms optionally present is at least 2.5:1,

A) represents an alkylene oxide radical having 2 or 3 carbon atoms, wherein the proportion of radicals having 3 carbon atoms is not greater than 40 mol-%, and different alkylene oxide radicals may be present in any distribution,

B) represents an aliphatic hydrocarbon radical having 2 to 18 carbon atoms, a cycloaliphatic hydrocarbon radical having 4 to 13 carbon atoms or an aromatic hydrocarbon radical having 6 to 15 carbon atoms,

x represents an integer or on average a fractional number from 1.5 to 2.5,

y represents a number of 5 to 200,

z and z" each represent numbers from 0 to 400, provided that the sum of z+z" is 10 to 400, and

z' represents 0 or 1,

wherein the sum of the percentages of a1), a2) and a3) total 100 and the weight of the radicals R_2 and R_3, based on the total weight of the component a), is less than 15% by weight.

5,594,888

PLASTIC LENSES HAVING A HIGH-REFRACTIVE INDEX, PROCESS FOR THE PREPARATION THEREOF AND CASTING POLYMERIZATION PROCESS FOR PREPARING SULFUR CONTAINING URETHANE RESIN LENS AND LENS PREPARED THEREBY

Teruyuki Nagata; Koju Okazaki, both of Fukuoka-ken; Tohru Miura, Chiba-ken; Nobuyuki Kajimoto, Kanagawa-ken; Yoshinobu Kanemura, Kanagawa-ken; Katsuyoshi Sanagawa, Kanagawa-ken, and Manso Imai, Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 700,508, May 15, 1991, which is a continuation-in-part of Ser. No. 311,353, Feb. 15, 1989, abandoned, and Ser. No. 548,623, Jul. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 357,962, May 30, 1989, abandoned, and Ser. No. 361,764, May 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 130,650, Dec. 9, 1987, abandoned, said Ser. No. 357,962is a continuation-in-part of Ser. No. 130,650, Dec. 9, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 478,653

Claims priority, application Japan, Dec. 15, 1986, 61-298198; Mar. 10, 1987, 62-54353; Apr. 15, 1987, 62-92685; Feb. 17, 1988, 63-32840; Feb. 17, 1988, 63-32841; Feb. 22, 1988, 63-37524

Int. Cl.[6] C08G 18/32

U.S. Cl. 528—77 **29 Claims**

1. A process for producing a plastic lens comprising adding at least one surface active agent selected from the group consisting of fluorine-containing nonionic surface active agents, silicone-containing nonionic surface active agents and alkyl quaternary ammonium salts as an internal mold releasing agent to a mixture of one or more polyisocyanate compounds and one or more active hydrogen compounds selected from the group consisting of polyol compounds and polythiol compounds having at least one sulfur atom in addition to the mercapto groups and conducting cast polymerization in a lens mold made of glass or metal so as to form a plastic lens.

5,594,089

HETEROCYCLE OR HETEROCYCLE SULFONE OLIGOMERS WITH MULTIPLE CHEMICALLY FUNCTIONAL END CAPS

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Port Falls, Id., assignors to The Boeing Company

Continuation-in-part of Ser. No. 773,381, Sep. 5, 1985, Ser. No. 137,493, Dec. 23, 1987, Ser. No. 167,656, Mar. 14, 1988, Ser. No. 168,289, Mar. 15, 1988, Ser. No. 176,518, Apr. 1, 1988, Ser. No. 212,404, Jun. 27, 1988, Ser. No. 241,997, Sep. 6, 1988, Pat. No. 5,530,089, Ser. No. 460,396, Jan. 3, 1990, Pat. No. 5,446,128, Ser. No. 619,677, Nov. 29, 1990, Ser. No. 639,051, Jan. 9, 1991, Ser. No. 43,824, Apr. 6, 1993, Pat. No. 5,367,083, Ser. No. 79,999, Jun. 21, 1993, Pat. No. 5,403,666, Ser. No. 159,823, Nov. 30, 1993, Pat. No. 5,455,115, Ser. No. 161,164, Dec. 3, 1993, Ser. No. 232,682, Apr. 25, 1994, Pat. No. 5,516,876, Ser. No. 269,297, Jun. 30, 1994, Pat. No. 5,550,204, and Ser. No. 280,866, Jul. 26, 1994, Pat. No. 5,512,676. This application Oct. 21, 1994, Ser. No. 327,180

Int. Cl.[6] C08G 75/00

U.S. Cl. 528—171 20 Claims

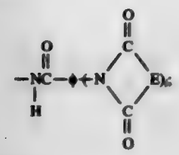
1. A linear or multidimensional heterocycle or heterocycle sulfone oligomer having two or four crosslinking sites at each end of its backbone, comprising:

$$(Z—)_i—Ø—(—R_4—)—Ø—(—Z)_i \text{ or}$$

$$∂—[—(—R_4—)—Ø—Z_i]_w$$

wherein

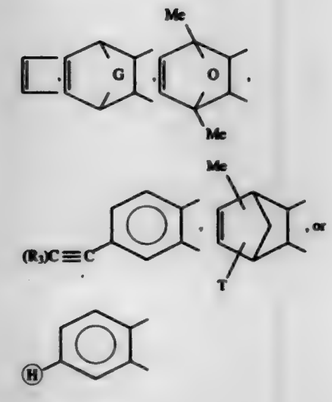
Z=



i=1 or 2;

Ø=phenylene;

E=



∂=an organic hub;

w=3 or 4;

Me=methyl;

G=—CH_2—, —S—, —SO_2—, —O—, or —CO—;

R_3=phenylene or hydrogen;

T=allyl or methallyl;

R_4=a divalent heterocycle or heterocycle sulfone radical; and

Θ=—C≡N, —OC≡N, —SC≡N, or —CH=CH_2.

5,594,090

ALKYLENE SULFIDE GROUP-CONTAINING PREPOLYMER, POLYMERIZABLE COMPOSITION AND OPTICAL MATERIAL

Tsuyoshi Miyazaki, Tsukuba; Hiromitsu Nakajima, Mitsukaido; Shuji Ichikawa, Tsukuba; Yasumi Koinuma, Tsukuba; Kazuo Matsuyama, Tsukuba; Koji Kamemoto, Tsukuba, and Yoshihiro Minoshima, Tsukuba, all of Japan, assignors to NOF Corporation, Tokyo, Japan

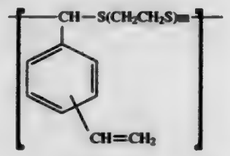
Filed Apr. 4, 1995, Ser. No. 416,341

Claims priority, application Japan, Apr. 6, 1994, 6-068758; Apr. 7, 1994, 6-069540; Aug. 5, 1994, 6-184392

Int. Cl.[6] C08G 12/20

U.S. Cl. 528—265 6 Claims

1. A prepolymer comprising a structural unit represented by the formula



where m denotes a positive number of from 2 to 20 with a polymerization degree of 2 to 1000.

5,594,091

MATRIX FOR SUSTAINED-RELEASE PREPARATION

Yasutaka Igari, Hyogo; Akira Saikawa; Kayoko Okamoto, both of Osaka; Shigeru Kamei, Hyogo; Masahiro Oka, Kanagawa, and Atsunori Sano, Saitama, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 21, 1995, Ser. No. 391,699

Claims priority, application Japan, Feb. 21, 1994, 6-022858; Feb. 21, 1994, 6-022880

Int. Cl.[6] C08G 63/06;63/08;63/66; A61K 47/32

U.S. Cl. 528—271 4 Claims

1. An ester formed at a terminal carboxyl group of a straight-chain polyester consisting essentially of an α-hydroxymonocarboxylic acid, the polyester having a weight-average molecular weight of about 1,500 to about 50,000.

5,594,092

PROCESS FOR MANUFACTURING POLYESTER COPOLYMERS

Eugene J. Burkett, Scott Depot, W. Va.; Douglas D. Callander, Akron, Ohio; Joseph Golike, Akron, Ohio, and Edwin A. Sisson, Akron, Ohio, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 355,945, Dec. 14, 1994, Pat. No. 5,539,078. This application Feb. 1, 1996, Ser. No. 595,322

Int. Cl.[6] C08G 63/02

U.S. Cl. 528—272 2 Claims

1. A process for manufacturing a random polyethylene terephthalate/naphthalate copolymer comprising:

contacting dimethyl-2,6-naphthalene-dicarboxylate with ethylene glycol and a suitable transesterification catalyst under transesterification conditions to form a bis(hydroxyethyl-2,6-naphthalate) and subsequently deactivating the transesterification catalyst;

contacting the bis(hydroxyethyl-2,6-naphthalate) and a suitable polycondensation catalyst under polycondensation conditions to form a low molecular weight polyethylene naphthalate polymer product, wherein the polyethylene naphthalate has a number average molecular weight of from about 4800 to about 24,200;

combining the low molecular weight polyethylene naphthalate, terephthalic acid and ethylene glycol, under esterification conditions to form a random polyethylene terephthalate/naphthalate copolymer;

wherein the low molecular weight polyethylene naphthalate, terephthalic acid, and ethylene glycol are combined in the presence of a preformed polyethylene terephthalate oligomer having a degree of polymerization of from about 1.4 to about 10; and

wherein the random copolymer contains from about 95 mole percent to about 98 mole percent terephthalate-based units and from about 5 mole percent to about 2 mole percent of naphthalate-based units, based upon total moles of carboxylate units.

5,594,093

NONLINEAR OPTICAL MATERIAL AND NONLINEAR OPTICAL DEVICE AND DIRECTIONAL COUPLING TYPE OPTICAL SWITCH USING SAME

Wataru Setoyama; Satoshi Tatsura; Tetsuo Yoshimura; Azuma Matsuura, and Tomoaki Hayama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

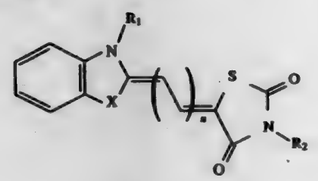
Continuation-in-part of Ser. No. 88,649, Jul. 9, 1993, Pat. No. 5,459,232. This application Jun. 5, 1995, Ser. No. 463,853

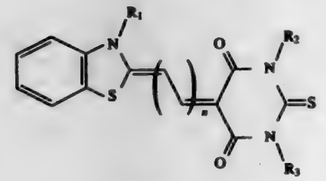
Claims priority, application Japan, Jul. 13, 1992, 4-184895; Jun. 25, 1993, 5-155418

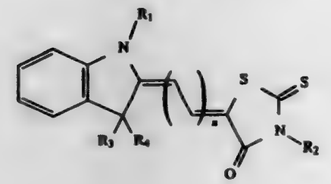
Int. Cl.[6] C08G 73/10

U.S. Cl. 528—353 6 Claims

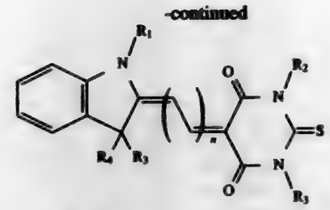
1. A nonlinear optical polymer material comprising at least one polymer selected from the group consisting of polyimides and benzocyclobutene resins containing, as a guest molecule or a side chain or in the main chain, a molecule or a chemical moiety having a basic structure of merocyanine dye selected from the group consisting of:

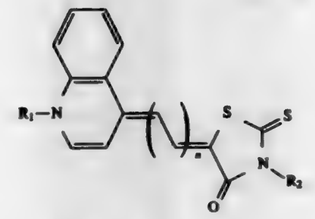


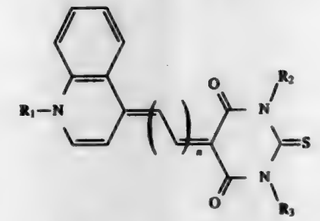


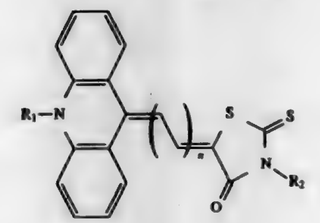


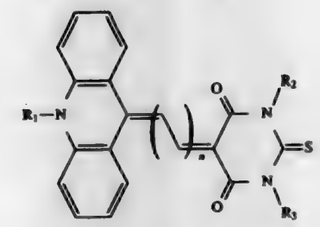
-continued











wherein R^1, R^2, R^3, R^4, and R^5 independently represent hydrogen or an organic group, X represents O or S, and n is an integer of 1 to 3.

5,594,094

Patent Not Issued For This Number

5,594,095

VISCOSITY-MODIFIED LACTIDE POLYMER COMPOSITION AND PROCESS FOR MANUFACTURE THEREOF

Patrick R. Gruber, St. Paul; Jeffrey J. Kolstad, Wayzata; David R. Witzke, Minneapolis; Mark H. Hartmann, Minnetonka, and Andrea L. Brosch, Eden Prairie, all of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 108,559, Jul. 30, 1993, Pat. No. 5,399,826. This application Jul. 27, 1994, Ser. No. 279,732

Int. Cl.[6] C08G 63/08

U.S. Cl. 528—354 24 Claims

1. A method of producing a polylactide polymer composition; said method including the step of:

(a) providing in the polylactide polymer composition, polylactide polymer molecules which have been modified, relative to linear non-substituted polylactide, to provide increased molecular interaction among polylactide backbone chains in the composition and a polydispersity index of at least 2.5.

5,594,096

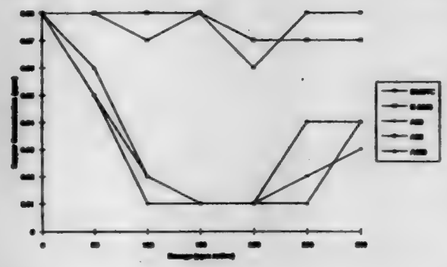
POLYMERIC DITHIOCARBAMIC ACID SALT COMPOSITIONS AND METHODS OF USE

William S. Carey, Ridley Park; Ellen M. Meyer, Doylestown, and Jeffrey H. Pohler, King of Prussia, all of Pa., assignors to BetzDearborn Inc., Trevose, Pa.

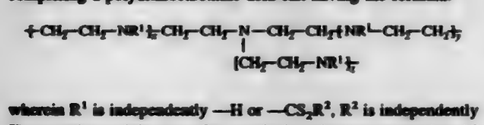
Division of Ser. No. 390,332, Feb. 17, 1995, Pat. No. 5,523,082. This application Mar. 1, 1996, Ser. No. 609,587

Int. Cl.[6] C08G 75/14; C02F 1/54

U.S. Cl. 528—387 6 Claims



1. A water soluble, branched, polymeric composition for precipitating contaminants from an aqueous solution, said composition comprising a polydithiocarbamic acid salt having the formula:



wherein R^1 is independently —H or $—CS_2R^2$, R^2 is independently H or a cation and the sum of x, y and z is an integer greater than 15 and wherein either the molecular weight of said polydithiocarbamic acid salt is less than 100,000 and more than 50 mole percent of R^1 are $—CS_2R^2$, or the molecular weight of said polydithiocarbamic acid salt is greater than 100,000.

5,594,097

POLYETHER POLYOLS

Pierre G. Chalfinejos, Tervuren; Peter F. Strechants, Haan, and Gerhard J. Bleys, Heverlee, all of Belgium, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Division of Ser. No. 190,518, Feb. 1, 1994, which is a continuation-in-part of Ser. No. 64,190, May 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 472,204

Claims priority, application United Kingdom, Feb. 2, 1993, 9301995

Int. Cl.[6] C08G 65/04; C07C 41/00

U.S. Cl. 528—419 2 Claims

1. Polyether polyol comprising as alkylene oxide units ethylene oxide and propylene oxide units, said polyol having a nominal average hydroxyl functionality of 2–6, an hydroxyl value of 16–45 mg KOH/g, a primary hydroxyl content of at least 50% calculated on the total amount of hydroxyl groups, an amount of ethylene oxide units, calculated on the weight of the alkylene oxide units in the polyol, of 21–49% by weight and which polyol has been prepared by reacting an initiator and an amount of propylene oxide equivalent to 20–75% by weight of propylene oxide units calculated on the total amount of alkylene oxide units in the final polyol, followed by reaction of the polyol so obtained with a mixture of ethylene oxide and propylene oxide, followed by reaction of the polyol so obtained with an amount of ethylene oxide equivalent to 10–20% by weight of ethylene oxide units calculated on the total amount of alkylene oxide units in the final polyol.

5,594,098

METAL ION REDUCTION IN NOVOLAK RESINS AND PHOTORESISTS

M. Dalil Rahman, Warwick, and Dana L. Durham, East Greenwich, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 142,882, Oct. 22, 1993, abandoned, which is a continuation of Ser. No. 809,591, Dec. 18, 1991, abandoned. This application Jul. 11, 1994, Ser. No. 272,962

Int. Cl.[6] C08F 6/00; G03C 1/52

U.S. Cl. 528—482 7 Claims

1. A method for producing a positive photoresist composition comprising:

a) washing an acidic ion exchange resin with water, washing said ion exchange resin with a mineral acid solution and thereby reducing the level of sodium and iron ions in the ion exchange resin to less than 100 ppb;

b) passing a water/formaldehyde solution through said ion exchange resin and thereby reducing the total sodium and iron ion level of said solution to less than 40 ppb;

c) providing one or more phenolic compounds having a sodium and iron ion content of less than 50 ppb;

d) condensing said formaldehyde with said one or more phenolic compounds, in the presence of an acid catalyst, and thereby producing a water insoluble, aqueous alkali soluble novolak resin having a total metal ion level of less than 40 ppb;

e) providing an admixture of: 1) a photosensitive component in an amount sufficient to photosensitize the photoresist composition, 2) said water insoluble, aqueous alkali soluble novolak resin and 3) a suitable solvent.

5,594,099

MODIFIED RESINATES

Albert Bender, Mainz, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Mar. 31, 1995, Ser. No. 414,501

Claims priority, application Germany, Apr. 29, 1994, 44 15 004.9

Int. Cl.[6] C09F 1/02

U.S. Cl. 530—218 7 Claims

1. A modified resinate prepared by reacting

A) rosins or rosin acids with

B) aldehyde components and optionally

C) α,β-olefinically unsaturated carboxylic acids or anhydrides thereof, subsequently reacting the resultant adduction products with

D) phenols and optionally

E) alcohols containing at least two hydroxyl groups and subsequently forming resinates with

F) basic compounds of divalent metals.

5,594,100

EPITOPE FOR PREVENTION OF TYPE I DIABETES

Dale R. Wegmann, Denver, Colo., assignor to Regents of the University of Colorado, Boulder, Colo.

Filed Feb. 22, 1995, Ser. No. 394,004

Int. Cl.[6] A61K 38/28; C07K 77/00

U.S. Cl. 530—303 1 Claim

1. A peptide having the amino acid sequence Ser-His-Leu-Val-Glu-Ala-Leu-Tyr-Leu-Val-Cys-Gly-Glu-Arg-Gly (SEQ ID NO:1) of the B chain of insulin, said peptide characterized by acting as a tolerogen for preventing type I diabetes.

5,594,101

ANTI-OBESITY PROTEINS

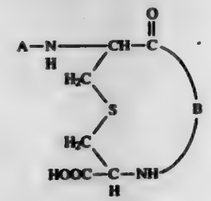
Gerald W. Becker; John E. Hale, both of Fishers, and Warren C. MacKellar, Plainfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 3, 1995, Ser. No. 398,021

Int. Cl.[6] A61K 38/00; C07K 5/12; 14/00

U.S. Cl. 530—317 6 Claims

1. A compound of the Formula:



wherein:

A is SEQ ID NO: 1; and

B is SEQ ID NO: 2; or a pharmaceutically acceptable salt thereof.

5,594,102

CHEMICAL PROCESS FOR PREPARING ANTIBIOTIC L 17932 (DEGLUCOTEICOPLANIN) AND ITS SALT

Giambattista Passeno, Cernusco, and Anacleto Ciananteschi, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Geroonne, Italy

Continuation of Ser. No. 323,162, Oct. 13, 1994, abandoned, which is a continuation of Ser. No. 126,670, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 907,103, Dec. 7, 1992, abandoned, which is a continuation of Ser. No. 827,553, Jan. 28, 1992, abandoned, which is a continuation of Ser. No. 453,443, Dec. 20, 1989, abandoned. This application May 30, 1995, Ser. No. 453,114

Claims priority, application European Pat. Off., Dec. 27, 1988, 88121707

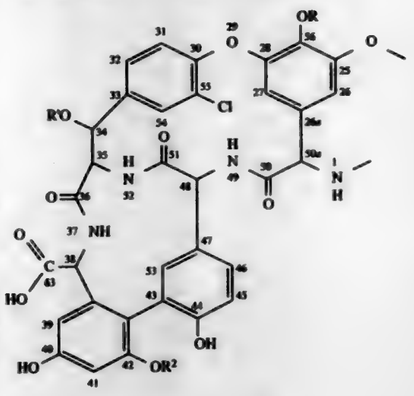
Int. Cl.[6] C07K 7/64

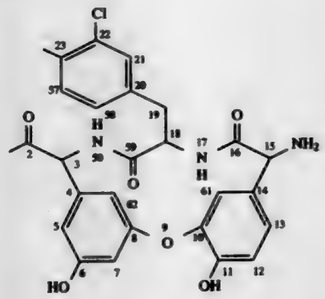
U.S. Cl. 530—317 20 Claims

1. A process for preparing pure deglucoteicoplanin or a salt thereof with bases and acids comprising:

1) a hydrolysis of a compound of Formula I

I





wherein

R is hydrogen or a N-[(C_9–C_{12})aliphatic acyl]-D-glucosamine;

R1 is hydrogen, or a N-acetyl-D-glucosamine;

R2 is hydrogen or d-manose;

with the proviso that R, R_1, and R_2 cannot be simultaneously hydrogen or a mixture of two or more of any of the above substances; to yield a deglucoteicoplanin crude product wherein the hydrolysis is a controlled acid hydrolysis in a homogeneous media which employs;

a) a reaction temperature between about 50° C. and 120° C.

b) an organic aprotic solvent, which is a liquid at the reaction temperature and which is selected from the group consisting of N,N dimethylformamide (DMF), hexamethylphosphoramide (HMPA), 1,3-dimethyl-3,4,5,6-tetrahydro-2(1H)pyrimidine (DMPU), and dimethylsulfoxide (DMSO) or mixtures thereof,

c) water,

d) a strong mineral acid or organic acid which is compatible with the organic aprotic solvent selected,
2) isolation of the crude product; and
3) purification of the deglucoteicoplanin crude product.

5,594,103
LANTIBIOTICS SIMILAR TO NISIN A
William M. De Vos, Bennekom; Roelant J. Siezen, Ede, and Oscar P. Kuipers, Utrecht, all of Netherlands, assignors to Stichting Nederlands Instituut Voor Zuivelonderzoek (NIZO), Ede, Netherlands
PCT No. PCT/NL92/00068, § 371 Date Oct. 7, 1993, § 102(e) Date Oct. 7, 1993, PCT Pub. No. WO92/18633, PCT Pub. Date Oct. 29, 1992
PCT Filed Apr. 9, 1992, Ser. No. 129,151
Claims priority, application Netherlands, Apr. 11, 1991, 9100634
Int. Cl.[6] C07K 14/315
U.S. Cl. 530—324 2 Claims



1. The isolated lantibiotic nisin Z having the structure according to FIG. 4 or a derivative thereof having the pentacyclic structure of nisin Z but differing from nisin Z by substitution, insertion or deletion of one or more amino acids, with the proviso, that nisin A and subtilin are excluded.

5,594,104
ANTI-OBESITY PROTEINS
Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Heath, Jr., Fishers; James A. Hoffmann, Greenwood; Brigitte E. Schoner, Monrovia; James R. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Continuation-in-part of Ser. No. 381,266, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 384,492
Int. Cl.[6] A61K 38/00; C07K 7/10;7/00
U.S. Cl. 530—324 21 Claims

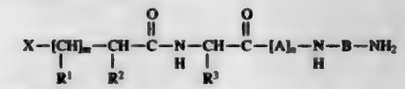
1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,594,105
PEPTIDE INHIBITORS OF MITOGENESIS AND MOTOGENESIS
Paolo Comoglio, Torino, and Carola Ponzetto, Moncalieri, both of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy
Filed Jun. 27, 1994, Ser. No. 266,514
Claims priority, application United Kingdom, Jun. 30, 1993, 9313528; Apr. 18, 1994, 9407673
Int. Cl.[6] A61K 38/10; C07K 7/00
U.S. Cl. 530—326 17 Claims

1. A peptide having the sequence (SEQ ID NOS: 5 and 6)
X_N-YVN(or H)V-X_C
wherein X_N and X_C are each sequences of from 0 to 16 amino acids, said peptide being selected from the group consisting of
H-Asp-Asp-Pro-Ser-Tyr*-Val-Asn-Val-Glu-OH
H-Val-Asn-Ala-Thr-Tyr*-Val-Asn-Val-Lys-OH
H-Ile-Gly-Glu-His-Tyr*-Val-His-Val-Asn-OH
H-Ile-Gly-Glu-His-Tyr*-Val-His-Val-Asn-Ala-Thr-Tyr*-Val-Asn-Val-Lys-OH
H-Tyr*-Val-His-Val-Asn-Ala-Thr-Tyr-OH
H-Tyr*-Val-His-Val-Asn-Ala-Thr-Tyr*-Val-Asn-Val-Lys-OH
H-Tyr*-Val-Asn-Val-Lys-Cys-Val-Ala-OH
(SEQ ID NOS: 27, 28, 30, 31, 20, 21, and 22, respectively) wherein Tyr* is a phosphorylated or unphosphorylated tyrosine residue.

5,594,106
INHIBITORS OF TNF-α SECRETION
Roy A. Black; Jeffrey N. Fitzner, and Paul R. Sleath, all of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.
Continuation-in-part of Ser. No. 110,601, Aug. 23, 1993, abandoned. This application Aug. 18, 1994, Ser. No. 292,547
Int. Cl.[6] A61K 31/00
U.S. Cl. 530—331 17 Claims

1. A compound of the formula:



(I)

wherein:
X is hydroxamic acid, phosphoryl or carboxyl;
m is 0, 1 or 2;
R^1, R^2 and R^3 each independent of the other is hydrogen, alkylene(cycloalkyl), OR^4, SR^4, $N(R^4)(R^5)$, halogen, substituted or unsubstituted C_1 to C_8 alkyl, C_1 to C_8 alkylenearyl, aryl, a protected or unprotected side chain of a naturally occurring α-amino acid; or the group $—R^6R^7$, wherein R^6 is substituted or unsubstituted C_1 to C_8 alkyl and R^7 is OR^4, SR^4, $N(R^4)(R^5)$ or halogen, wherein R^4 and R^5 are each, independent of the other, hydrogen or substituted or unsubstituted C_1 to C_8 alkyl;
n is 1 or 2;
provided that when n is 1, A is a protected or an unprotected α-amino acid radical;
when n is 2, A is the same or different protected or unprotected α-amino acid radical; and
B is unsubstituted or substituted C_2 to C_8 alkylene; and the pharmaceutically acceptable salts thereof.

5,594,107
CHIMERIC PROTEIN COMPRISING AN RTX-FAMILY CYTOTOXIN AND INTERFERON-2 OR INTERFERON
Andrew Potter, Saskatoon, Canada; Manuel Campos, Lincoln, Nebr., and Huw P. A. Hughes, Saskatoon, Canada, assignors to University of Saskatchewan, Saskatchewan, and Ciba-Geigy Canada Ltd., Mississauga, both of Canada
Continuation-in-part of Ser. No. 777,715, Oct. 16, 1991, Pat. No. 5,273,889, which is a continuation-in-part of Ser. No. 571,301, Aug. 22, 1990, Pat. No. 5,238,823. This application Dec. 20, 1993, Ser. No. 170,126
Int. Cl.[6] C12N 15/19; A61K 39/102
U.S. Cl. 530—350 13 Claims

1. An immunogenic chimeric protein comprising a cytokine selected from the group consisting of interleukin-2 (IL2), and gamma-interferon (γIFN), linked to at least one epitope of an RTX cytotoxin which comprises the amino acid sequence Gly-Gly-X-Gly-(Asn or Asp)-Asp (SEQ ID NO: 5), wherein X is selected from the group consisting of an aliphatic amino acid, and a charged amino acid or its corresponding neutral amino acid.

5,594,108
HUMAN DOPAMINE RECEPTOR AND ITS USES
Olivier Civelli, Portland, Oreg., and Hubert H. Van Tol, Toronto, Canada, assignors to State of Oregon, Acting by and Through the Oregon State Board of Higher Education on Behalf of the Oregon Health Sciences University, Portland, Oreg.
Division of Ser. No. 626,618, Dec. 7, 1990, Pat. No. 5,422,268. This application Nov. 3, 1994, Ser. No. 333,977
Int. Cl.[6] C07K 14/705
U.S. Cl. 530—350 1 Claim

1. A homogeneous composition of a 41 kilodalton human dopamine receptor D_4 or derivative thereof, having an amino acid sequence that is the sequence identified as Seq. I.D. No. 17.

5,594,109

Patent Not Issued For This Number

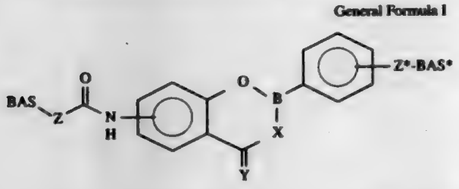
5,594,110
PROCESS OF CONJUGATION OF ANTIVIRAL NUCLEOSIDES WITH LACTOSAMINATED HUMAN ALBUMIN
Luigi Flume; Corrado Busi; Giuseppina D. Stefano, and Alessandro Mattioli, all of Bologna, Italy, assignors to Laboratori Baldacci SpA, Pisa, Italy
PCT No. PCT/EP93/03261, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO94/12218, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 20, 1993, Ser. No. 256,415
Claims priority, application Italy, Nov. 23, 1992, MI92A2673
Int. Cl.[6] C07K 1/00; A61K 38/16
U.S. Cl. 530—362 6 Claims

1. A process for the preparation of conjugates of antiviral nucleosides with lactosaminated human albumin (L-HSA) in which an antiviral phosphorylated nucleoside in the form of an imidazolide is reacted with L-HSA, wherein the reaction is carried out at a pH higher than 7.5 and at a temperature above 25° C., and prolonging the conjugation reaction until the desired molar ratio of drug:L-HSA is obtained.

5,594,111
PHENYLBORONIC ACID COMPLEXES FOR BIOCONJUGATE PREPARATION
Mark L. Stolowitz, Long Beach, Calif., assignor to Prolinx, Inc., Redmond, Wash.
Filed Jan. 28, 1994, Ser. No. 188,958
Int. Cl.[6] C07F 5/02
U.S. Cl. 530—391.1 3 Claims

1. A bioconjugate complex having the general formula:

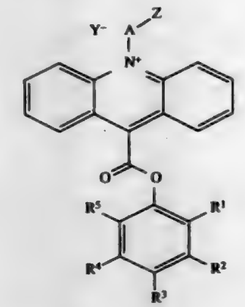
General Formula I



wherein group X is selected from the group consisting of O, NH, N-alkyl, NC_6H_5, NCH_2CH_2OH, $NCOCH_2CH_2OH$, NOH, and NO-alkyl, wherein alkyl denotes an alkyl hydrocarbon moiety of from 1 to 4 carbons in length and which may be linear or branched,
wherein group Y is selected from the group consisting of O, S, NH, and N-alkyl,
wherein groups Z and Z* each being a spacer selected from an alkyl chain of from 1 to 16 carbon equivalents in length, and
wherein groups BAS and BAS* are bioactive species.

5,594,112
ACRIDINIUM COMPOUNDS AND CONJUGATES THEREOF
Naofumi Sato, Saitama; Hiroshi Mochizuki, Tokyo, and Toshinori Kanamori, Saitama, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan
Division of Ser. No. 188,724, Jan. 31, 1994, Pat. No. 5,438,139. This application Apr. 28, 1995, Ser. No. 430,866
Claims priority, application Japan, Feb. 4, 1993, 5-17465
Int. Cl.[6] C07K 16/00; C07D 219/08
U.S. Cl. 530—391.3 17 Claims

1. A conjugate of an acridinium compound comprising an acridinium compound represented by formula (I)



(I)

where A is an alkylene group having 1–4 carbon atoms or an arylene group, in which one or more carbon atoms may be replaced by hereto atoms or which may optionally have substituents; Z is a carboxyl group, an alkoxycarbonyl group, a carbamoyl group, an aryloxycarbonyl group, a hydroxyl group, a cyano group, a carboximide group, an isocyanate group, an isothiocyanate group, an azide group, a sulfonic acid group, a sulfonamide group, a halogenated sulfonyl group, a halogenated carbonyl group, an N-succinimidyloxycarbonyl group or an N-phthalimidyloxycarbonyl group; R^1 is a halogen atom, an alkyl group or an aryl group; R^2, R^3, R^4 and R^5 which may be the same or different represent a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an acetyl group, a nitro group, a halogen atom or a carbonyl group, provided that adjacent groups as selected from among R^2, R^3, R^4 and R^5 may combine to form a ring; and Y is a counter ion; and
a binding substance selected from the group consisting of an antigen, an antibody, a protein other than an antigen or an antibody, a nucleic acid sequence, avidin and biotin, wherein the acridinium compound is bound to the binding substance via the active group Z of the acridinium compound.

5,594,113

ENDOTOXIN BINDING AND NEUTRALIZING PROTEIN AND USES THEREOF

Norman R. Wainwright, Falmouth, and Thomas J. Novitsky, E. Falmouth, both of Mass., assignors to Associates of Cape Cod, Inc., Falmouth, Mass.

Continuation of Ser. No. 883,457, May 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 701,501, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 480,957, Feb. 16, 1990, abandoned, which is a division of Ser. No. 210,575, Jun. 23, 1988, abandoned. This application Jun. 22, 1994, Ser. No. 264,244

Int. Cl.[6] C07K *14/435;14/46;* C12N *1/19;15/81*

U.S. Cl. 530—395 **1 Claim**

1. An endotoxin binding protein consisting of the amino acid sequence of SEQ ID NO. III.

5,594,114

SCHWANN CELL MITOGENIC FACTOR, ITS PREPARATION AND USE

Andrew D. J. Goodearl, Hertfordshire; Paul Stroobant, London, and Michael D. Waterfield, Berkshire, all of England, assignors to Ludwig Institute for Cancer Research, New York, N.Y.

Continuation of Ser. No. 931,041, Aug. 17, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,365

Claims priority, application United Kingdom, Aug. 14, 1992, 92 17316

Int. Cl.[6] C07K *14/475*

U.S. Cl. 530—399 **1 Claim**

1. Purified glial growth factor-III having mitogenic activity stimulating the division of Schwann cells, and exhibiting a molecular weight of from about 43 kD to about 45 kD when carrying native glycosylation when assessed on SDS PAGE.

5,594,115

PROCESS OF PURIFYING RECOMBINANT PROTEINS AND COMPOUNDS USEFUL IN SUCH PROCESS

Satish K. Sharma, Portage, Mich., assignor to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 941,043, Oct. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 506,605, Apr. 9, 1990, abandoned. This application Dec. 29, 1994, Ser. No. 365,994

Int. Cl.[6] G01N *33/553;* C12P *21/04*

U.S. Cl. 530—413 **15 Claims**

1. A fusion protein represented by the formula

R_1-(His-X)$_n$-R_2

wherein (His-X)$_n$ represents a metal-chelating peptide;

n=3 to 6

each X is selected from the group consisting of Asp, Pro, Glu, Ala, Gly, Val, Ser, Leu, Ile and Thr; and

R_2 is a desired polypeptide directly or indirectly covalently linked to the metal-chelating peptide, and R_1 is a hydrogen or one or more amino-acid residues.

5,594,116

TRYPTASE POLYCLONAL ANTIBODY AND PURIFICATION METHOD FOR USE IN HUMAN TRYPTASE IMMUNOASSAY

Andrew L. Niles, and Mary Hauk-Freudenthe, both of Madison, Wis., assignors to Promega Corporation, Madison, Wis.

Filed Nov. 8, 1995, Ser. No. 555,130

Int. Cl.[6] A23J *1/00;* C07K *1/00;14/00;16/00*

U.S. Cl. 530—413 **10 Claims**

1. A method for isolating high affinity tryptase-specific polyclonal antibodies comprising:

a) inoculating an avian with tryptase;

b) isolating immunoglobulins from serum taken from the avian or from the yolk of eggs laid by the avian;

c) contacting the immunoglobulins to a tryptase-immobilized affinity matrix, thereby binding tryptase-specific immunoglobulins to the affinity matrix;

d) eluting non-tryptase-specific immunoglobulins from the affinity matrix;

e) eluting a first fraction of low affinity tryptase-specific antibodies from the affinity matrix by washing with a first buffered solution;

f) eluting a second fraction of high affinity tryptase-specific antibodies from the affinity matrix by washing with a second buffered solution; and

g) collecting the second fraction of high affinity tryptase-specific antibodies.

5,594,117

POLYNUCLEOTIDE REAGENTS CONTAINING MODIFIED DEOXYRIBOSE MOIETIES AND ASSOCIATED METHODS OF SYNTHESIS AND USE

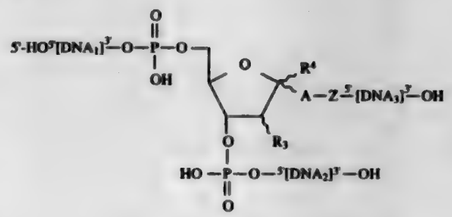
Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 296,368, Aug. 25, 1994. This application Apr. 26, 1995, Ser. No. 429,197

Int. Cl.[6] C07H *21/02;21/04;19/00;* C12Q *1/68*

U.S. Cl. 536—23.1 **5 Claims**

4. A branched polynucleotide reagent having the structural formula



wherein:

DNA_1 is a first segment of DNA;

DNA_2 is a second segment of DNA;

DNA_3 is a third segment of DNA;

R^3 is selected from the group consisting of hydrogen, hydroxyl, sulfhydryl, halogeno, amino, alkyl, allyl, —OR^6 wherein R^6 is alkyl, allyl, silyl or phosphate;

R^4 is either hydrogen or —$(CH_2)_m$—OR^7 wherein R^7 is alkyl or —$(CO)R^8$, R^8 is alkyl, and m is an integer in the range of 0 to 12 inclusive;

A is oxygen, sulfur or methylene; and

Z is arylene, C_6–C_{18} aralkylene or C_1–C_{12} alkylene containing 0 to 6 heteroatoms selected from the group consisting of O, S, N, Si and Se and 0 to 6 linkages selected from the group consisting of —CO—, —COO—, —CONH—, —NHCO—, —S—S—, —SO_2—, —CH(OH)—CH(OH)—, —CH(OR^{15})—CH(OR^{15})—, —O—PO(O^-)—O—, —O—PO(R^{15})—, —O—PO(OR^{15})—O—, —O—PO(OR^{15})—R^{16}— and —PO(OR^{15})—O—R^{16}— in which R^{15} is lower alkyl and R^{16} is lower alkylene, and, if Z is aralkylene or alkylene, containing 0 to 3 unsaturated bonds.

5,594,118

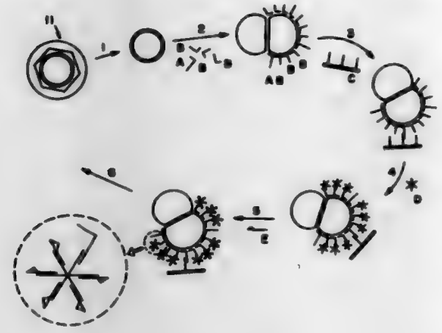
MODIFIED N-4 NUCLEOTIDES FOR USE IN AMPLIFIED NUCLEIC ACID HYBRIDIZATION ASSAYS

Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

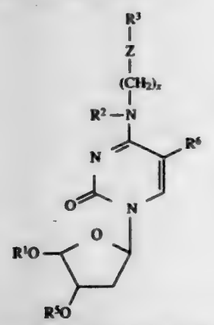
Division of Ser. No. 163,916, Dec. 8, 1993, which is a continuation of Ser. No. 823,890, Jan. 22, 1992, abandoned, which is a division of Ser. No. 340,831, Apr. 18, 1989, Pat. No. 5,124,246, which is a continuation-in-part of Ser. No. 252,638, Sep. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 185,201, Apr. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 109,282, Oct. 15, 1987, abandoned. This application May 16, 1995, Ser. No. 438,413

Int. Cl.[6] C07H *21/02;21/04;* C12Q *1/68;1/70*

U.S. Cl. 536—23.1 **5 Claims**



1. A nucleic acid having the structure



where Z is a nucleophile, R^1 is a prosective group that is base-stable and acid sensitive, R^2 is methyl, R^3 is a protective group that can be removed and replaced with hydrogen without affecting R^1, R^5 is a phosphorus derivative that enables addition of nucleotides to the 5' position of an oligonucleotide chain during chemical synthesis, R^6 is methyl, hydrogen, I, Br or F, and X is an integer in the range of 1 to 8, inclusive.

5,594,119

GENE ENCODING CARBOXYPEPTIDASE OF *ASPERGILLUS NIGER*

Debbie S. Yaver, and Sheryl A. Thompson, both of Davis, Calif., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Sep. 20, 1994, Ser. No. 309,341

Int. Cl.[6] C07H *21/04*

U.S. Cl. 536—23.2 **9 Claims**

1. A nucleic acid construct containing a nucleic acid sequence encoding an *Aspergillus niger* carboxypeptidase Y.

5,594,120

INTEGRIN ALPHA SUBUNIT

Michael B. Brenner, Sherborn, and Christina M. Parker, Arlington, both of Mass., assignors to Brigham and Women's Hospital, Inc., Boston, Mass.

Filed Feb. 18, 1994, Ser. No. 199,776

Int. Cl.[6] C12N *15/12;15/85;5/10;* C07H *21/00*

U.S. Cl. 536—23.5 **14 Claims**

1. An isolated oligonucleotide comprising Sequence I.D. No. 1 or a portion thereof encoding the human mucosal lymphocyte-10α chain.

5,594,121

ENHANCED TRIPLE-HELIX AND DOUBLE-HELIX FORMATION WITH OLIGOMERS CONTAINING MODIFIED PURINES

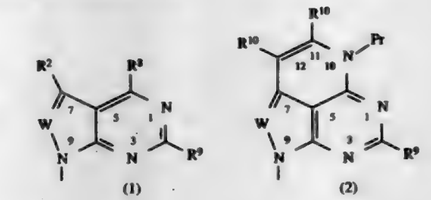
Brian Froehler, Belmont, and Mark Matteucci, Burlingame, both of Calif., assignors to Gilead Sciences, Inc., Foster City, Calif.

Continuation of Ser. No. 50,698, Apr. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 787,928, Nov. 7, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,248

Int. Cl.[6] C07H *21/00;19/00;19/16;* C12Q *1/68*

U.S. Cl. 536—23.5 **58 Claims**

1. An oligomer comprising from 2 to 30 nucleomonomers wherein at least one of said nucleomonomers comprises a base having the formula (1) or (2):



wherein

Pr is hydrogen or a monovalent or divalent protecting group;

W is N or CH;

R^2 is aryl, heteroaryl or 1-alkynylheteroaryl;

R^8 is OH, SH, NPr, NHPr or NH_2;

R^9 is H, OH, SH, NPr, NHPr or NH_2;

R^{10} is independently H, OH, CN, F, Cl, Br, I, alkyl (C1–12), alkenyl (C2–12), alkynyl (C2–12), aryl (C6–9), heteroaryl (C4–9), or both R^{10}, taken together with the carbon atoms to which they are linked at positions 11 and 12, form

(a) a 5 or 6 membered carbocyclic ring or,

(b) a 5 or 6 membered heterocyclic ring comprising 1–3 N, O or S ring atoms, provided that no 2 adjacent ring atoms are O—O, S—S, O—S or S—O,

and wherein any unsaturated C atom of the carbocyclic or heterocyclic ring is substituted by R^{11} and any saturated carbons contain 2 R^{11} substituents, wherein;

R^{11} is independently H, alkyl (C1–4), alkenyl (C2–4), alkynyl (C2–4), OR^{12}, SR^{12}, or $N(R^{12})_2$ or halogen provided that there are no more than four halogens per 5 or 6 member ring;

R^{12} is independently H, or alkyl (C1–4);

and salts thereof.

10. A method of synthesizing the oligomer of claim 1, comprising the steps of:

synthesizing a protected nucleomonomer synthon having a protecting group and a base and further having a coupling group capable of coupling to a nucleomonomer or oligomer;

coupling the nucleomonomer synthon to an acceptor nucleomonomer or oligomer;

removing the protecting group; and repeating the cycle until said oligomer is synthesized.

5,594,122

ANTISENSE OLIGONUCLEOTIDES TARGETED AGAINST HUMAN IMMUNODEFICIENCY VIRUS

Albert D. Friesen, Winnipeg, Canada, assignor to Genesys Pharma Inc., Vancouver, Canada

Continuation of Ser. No. 81,572, Jun. 23, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,869
Int. Cl.[6] C07H 21/04; C12Q 1/68; A61K 48/00
U.S. Cl. 536—24.5 12 Claims

1. An oligonucleotide having the nucleotide sequence complementary to the human immunodeficiency virus nucleic acid sequence +1189 to +1208.

5. An oligonucleotide having the nucleotide sequence:

5'GGTTCTTTTGGTCCTTGTCT3' (sequence ID No. 8).

9. An oligonucleotide having the nucleotide sequence:

5'G'GTTC'TTTTG'G'TCC'TTG'TC'T3' (sequence ID No. 7)

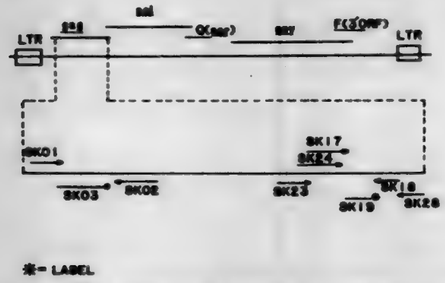
wherein s stands for a sulfur atom.

5,594,123

PRIMERS AND PROBES FOR THE AMPLIFICATION AND DETECTION OF AIDS ASSOCIATED NUCLEIC ACIDS

John J. Sninsky, El Sobrante, and Shirley Y. Kwok, San Ramon, both of Calif., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 92,767, Jul. 16, 1993, Pat. No. 5,386,022, which is a continuation of Ser. No. 918,907, Jul. 22, 1992, abandoned, which is a continuation of Ser. No. 639,103, Jan. 9, 1991, abandoned, which is a continuation of Ser. No. 394,276, Aug. 15, 1989, Pat. No. 5,008,182, which is a continuation of Ser. No. 935,581, Nov. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 818,127, Jan. 10, 1986, abandoned, said Ser. No. 394,276is a continuation-in-part of Ser. No. 828,144, Feb. 7, 1986, Pat. No. 4,683,195, which is a continuation-in-part of Ser. No. 824,044, Jan. 30, 1986, abandoned, which is a division of Ser. No. 791,308, Oct. 25, 1985, Pat. No. 4,683,202, which is a continuation-in-part of Ser. No. 716,975, Mar. 28, 1985, abandoned. This application Oct. 24, 1994, Ser. No. 287,385
Int. Cl.[6] C07H 21/04; C12Q 1/70; C12P 19/34
U.S. Cl. 536—24.32 5 Claims



*= LABEL

1. A pair of oligonucleotide primers for a polymerase chain reaction, which primers are sufficiently complementary to conserved regions among the nucleic acid sequences of AIDS viruses to hybridize therewith and not sufficiently complementary to HTLVI nucleic acids to hybridize therewith, wherein said conserved regions are at least 20 nucleotides long, wherein said primer pair consists of a member that comprises a nucleic acid sequence at least 14 nucleotides in length, which nucleic acid sequence is contained within a sequence selected from the group of nucleic acid sequences consisting of:

5'-CAGGGAGCTAGAACGAT-3' and

5'-ACCTGCCACCTGTAGTAG-3',

and a member that comprises a nucleic acid sequence at least 14 nucleotides in length, which nucleic acid sequence is contained within a sequence selected from the group of nucleic acid sequences consisting of:

5'-CTTCTGATCCTGTCTGA-3' and

5'-GCCATATTCCTGGACTACAG-3'.

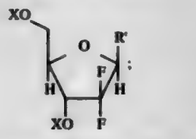
5,594,124

STEREOSELECTIVE GLYCOSYLATION PROCESS FOR PREPARING 2'-DEOXY-2',2'-DIFLUOROPYRIMIDINE NUCLEOSIDES AND 2'-DEOXY-2'-FLUOROPYRIMIDINE NUCLEOSIDES AND INTERMEDIATES THEREOF

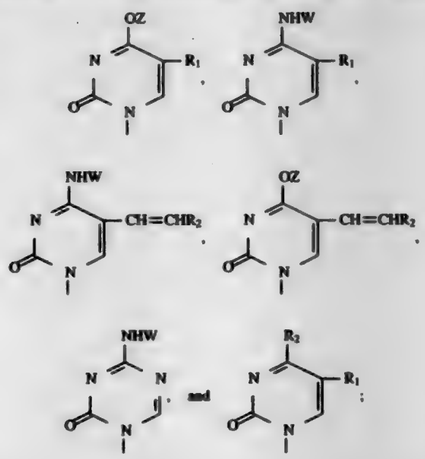
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 902,313, Jun. 22, 1992, abandoned. This application Apr. 7, 1993, Ser. No. 44,345
Int. Cl.[6] C07H 1/00; 1/06; 19/06
U.S. Cl. 536—28.4 23 Claims

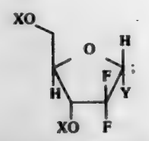
1. A stereoselective glycosylation process for preparing a beta-anomer enriched nucleoside of the formula


(I)

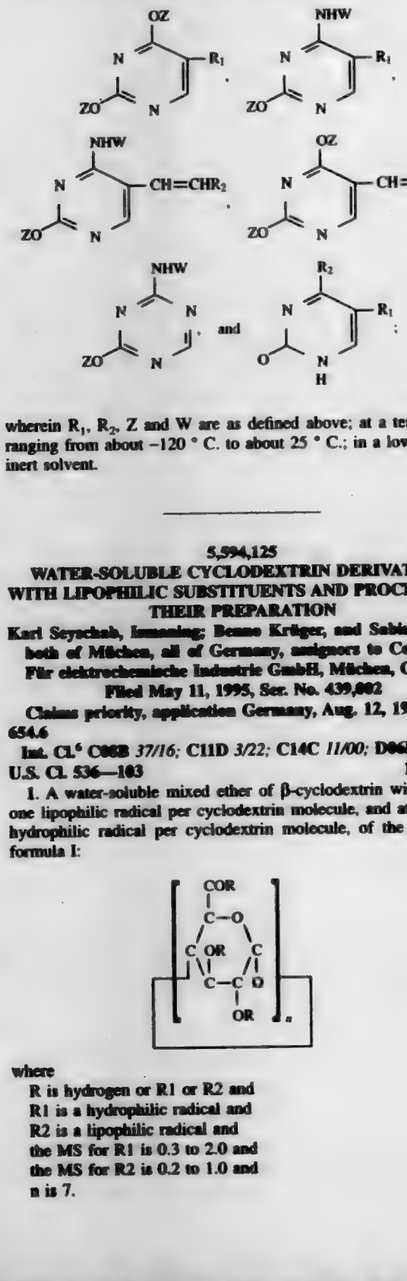
wherein each X is independently selected from hydroxy protecting groups and R' is a nucleobase selected from the group consisting of


and

wherein R_1 is selected from the group consisting of hydrogen, alkyl, C_1–C_7 alkyl substituted with cyano, halo, carboalkoxy, aryl, nitro, C_1–C_7 alkoxy, or di(C_1–C_7 alkyl)amino, and halo; R_2 is selected from the group consisting of hydrogen, C_1–C_7 alkyl and halo; Z is a hydroxy protecting group and W is an amino protecting group; comprising reacting an alpha-anomer enriched 2,2-difluorocarbohydrate in a anomer ratio of greater than 1:1 alpha to beta of the formula


(II)

wherein Y is selected from the group consisting of trifluoromethanesulfonyloxy, 1,1,1-trifluoroethanesulfonyloxy, octafluorobutanesulfonyloxy and nonafluorobutanesulfonyloxy and X is as defined above; with at least 3 molar equivalents of a nucleobase derivative, R*, selected from the group consisting of


and

wherein R_1, R_2, Z and W are as defined above; at a temperature ranging from about −120 ° C. to about 25 ° C.; in a low freezing inert solvent.

5,594,125

WATER-SOLUBLE CYCLODEXTRIN DERIVATIVES WITH LIPOPHILIC SUBSTITUENTS AND PROCESS FOR THEIR PREPARATION

Karl Seyschab, Ismaning; Benno Krüger, and Sabine Delica, both of München, all of Germany, assignors to Consortium Für elektrochemische Industrie GmbH, München, Germany

Filed May 11, 1995, Ser. No. 439,002
Claims priority, application Germany, Aug. 12, 1994, 44 28 654.6
Int. Cl.[6] C08B 37/16; C11D 3/22; C14C 11/00; D06M 15/03
U.S. Cl. 536—103 14 Claims

1. A water-soluble mixed ether of β-cyclodextrin with at least one lipophilic radical per cyclodextrin molecule, and at least one hydrophilic radical per cyclodextrin molecule, of the following formula I:

(I)

where

R is hydrogen or R1 or R2 and
R1 is a hydrophilic radical and
R2 is a lipophilic radical and
the MS for R1 is 0.3 to 2.0 and
the MS for R2 is 0.2 to 1.0 and
n is 7.

5,594,126

Patent Not Issued For This Number

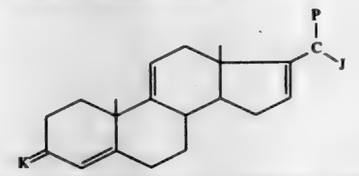
5,594,127

INTERMEDIATES FOR THE PREPARATION OF $\Delta^{4,9(11),17(20)}$-PREGNATRIENE-3-ONES

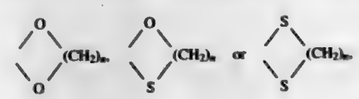
Francis Brion, Gagny; Jean Buendia, Perreux Sur Marne; Christian Dioiez, Palaiseau, and Michel Vivat, Lagny Sur Marne, all of France, assignors to Roussel Uclaf, Romainville, France

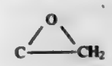
Division of Ser. No. 343,050, Feb. 21, 1995, Pat. No. 5,502,223, which is a division of Ser. No. 145,890, Oct. 29, 1993, Pat. No. 5,401,864, which is a division of Ser. No. 971,189, Nov. 4, 1992, Pat. No. 5,294,704, which is a division of Ser. No. 885,150, May 18, 1992, Pat. No. 5,187,273. This application Nov. 14, 1995, Ser. No. 557,594
Claims priority, application France, May 23, 1991, 91 06202
Int. Cl.[6] C07J 33/00
U.S. Cl. 540—30 1 Claim

1. A compound having a formula


G

in which K is a protective group selected from the group consisting of


or



n is 2 or 3; C—P being CH_2, —C=CH_2 or

and J is SO_2R_2; or C—P is C=O and J is CH_2Hal_2; or C—P is —C⌒ SO_2R_2 and J is ⌒ CO_2R or Hal_1; R_2 is methyl, phenyl, tolyl or xyiyl, R is alkyl of 1 to 6 carbon atoms, aralkyl of 7 to 15 carbon atoms or a silylated remainder selected from the group consisting of trimethylsilyl, tert.-butyldimethylsilyl, triphenylsilyl and diphenyltert.-butylsilyl, Hal_1 is halogen; Hal_2 is chlorine, bromine or iodine and the wavy lines symbolize any one of the isomer forms or their mixtures.

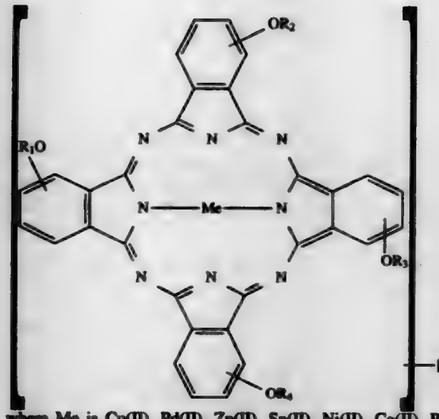
5,594,128

PROCESS FOR THE PREPARATION OF BROMINATED, ALKOXY-SUBSTITUTED METAL PHTHALOCYANINES

Heinz Wolleb, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Sep. 20, 1995, Ser. No. 530,973
Claims priority, application Switzerland, Sep. 23, 1994, 2907/94; Nov. 30, 1994, 3611/94
Int. Cl.[6] C09B 47/04
U.S. Cl. 540—122 25 Claims

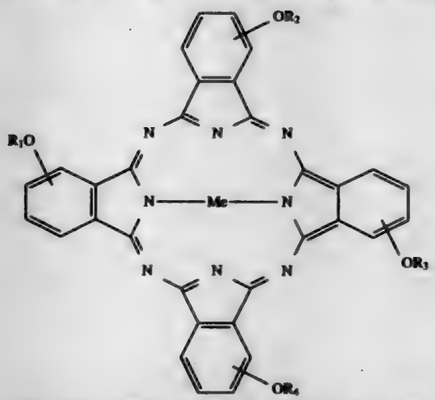
1. A process for the preparation of a mixture of positionally isomeric brominated tetraalkoxymetal phthalocyanines of the formula I



where Me is Cu(II), Pd(II), Zn(II), Sn(II), Ni(II), Co(II), Pb(II), Mn(O) or V(O), x is a number from 1 to 5, and R_1 to R_4, independently of one another, are linear or branched C_1–C_{16}alkyl, C_3–C_{16}alkenyl or C_3–C_{16}alkynyl radicals which are unsubstituted or substituted by C_1–C_{12}alkoxy, —CN, NO_2, halogen, —OH, phenyl, cyanophenyl, nitrophenyl, halophenyl, hydroxyphenyl or (C_1–C_{12}alkoxy)phenyl,

by reacting a tetraalkoxy metal phthalocyanine of the formula II

(II)



with bromine, which comprises carrying out the reaction in a halogenated, essentially water-immiscible aromatic solvent in the presence of a second, aqueous phase.

5,594,129

PROCESS FOR THE PREPARATION OF A CEPHALOSPORIN ANTIBIOTIC

Gary M. F. Lim, Fayetteville; John M. Rouble, East Syracuse, and Elizabeth A. Garofalo, Marcellus, all of N.Y., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 241,267, May 11, 1994, abandoned, which is a continuation of Ser. No. 124,327, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 941,456, Sep. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 757,104, Sep. 10, 1991, abandoned. This application Dec. 19, 1994, Ser. No. 359,310

Int. Cl.[6] C07D *501/56*

U.S. Cl. 540—222 **22 Claims**

1. A process for the preparation of antibiotic, cefepime dihydrochloride hydrate which is substantially free of the anti-isomer and the Δ^2 isomer which comprises reacting a silylated derivative of 7-amino-3-[(1-methyl-1-pyrrolidinio)methyl]ceph-3-em-4-carboxylate with the syn-isomer of 2-(2-aminothiazol-4-yl)-2-methoxyimino acetyl chloride hydrochloride substantially free of the anti-isomer in an inert organic solvent.

5,594,130

PREPARATION OF A CEPHALOSPORIN ANTIBIOTIC USING THE SYN-ISOMER OF A THIAZOLYL INTERMEDIATE

Gary M. F. Lim, Fayetteville, and John M. Rouble, East Syracuse, both of N.Y., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 253,838, Jun. 2, 1994, abandoned, which is a continuation of Ser. No. 123,818, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 941,993, Sep. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 757,108, Sep. 10, 1991, abandoned. This application Feb. 2, 1995, Ser. No. 382,555

Int. Cl.[6] C07D *501/56*

U.S. Cl. 540—222 **17 Claims**

1. A process for the preparation of an antibiotic, cefepime dihydrochloride hydrate which is substantially free of the anti-isomer and the Δ^2 isomer which comprises reacting 7-amino-3-[(1-methyl-1-pyrrolidinio)methyl]ceph-3-em-4-carboxylate with the syn-isomer of 2-(2-aminothiazol-4-yl)-2-methoxyimino acetyl chloride hydrochloride substantially free of the anti-isomer in an aqueous-organic solvent at a pH of about 5.0 to 7.5.

5,594,131

PROCESS FOR PREPARING CEPHALOSPORIN INTERMEDIATES

Gary M. F. Lim, Fayetteville, and John M. Rouble, East Syracuse, both of N.Y., assignors to Bristol-Myers Squibb COmpany, New York, N.Y.

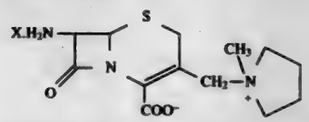
Continuation of Ser. No. 252,814, Jun. 2, 1994, abandoned, which is a continuation of Ser. No. 110,468, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 920,232, Jul. 24, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 382,556

Int. Cl.[6] C07D *501/46;501/24*

U.S. Cl. 540—222 **10 Claims**

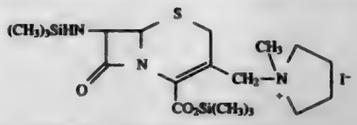
1. A process for the preparation of a stable, crystalline compound having the Formula I

I



wherein X is HI, HCl or H_2SO_4 which is substantially free of the Δ^2 isomer, which comprises treating the compound of Formula II

II



in a C_{5-8} cycloalkane optionally substituted by one or two (lower-)alkyl with a (lower)alkanol to remove the silyl groups, followed by acidification to produce a compound of Formula I.

5,594,132

7-ACYLAMINO-3-SUBSTITUTED CEPHALOSPORANIC ACID DERIVATIVES

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohama-nishi; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

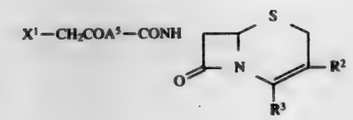
Division of Ser. No. 461,340, Jan. 5, 1990, Pat. No. 5,026,695, which is a division of Ser. No. 785,048, Oct. 9, 1985, Pat. No. 4,904,652, which is a continuation of Ser. No. 489,236, Apr. 28, 1983, abandoned, which is a division of Ser. No. 206,831, Nov. 14, 1980, Pat. No. 4,409,215. This application Apr. 12, 1991, Ser. No. 684,194

Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991

Int. Cl.[6] C07D *501/36;501/34*

U.S. Cl. 540—227 **5 Claims**

1. A compound of the formula:



in which

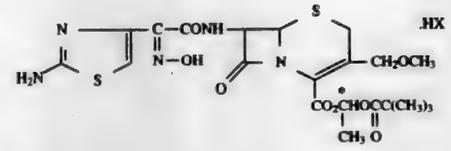
R^2 is lower alkoxymethyl, lower alkylthiomethyl or lower alkenylthiomethyl,

R^3 is carboxy or a protected carboxy group,

A^5 is lower alkylene which may have a group of the formula: =N–OR^6, wherein R^6 is hydrogen, lower alkenyl, lower alkynyl, lower alkyl or lower alkyl substituted by one or more substituent(s) selected from carboxy, a protected carboxy group, amino a protected amino group and a heterocyclic group, and

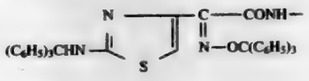
X^1 is halogen,

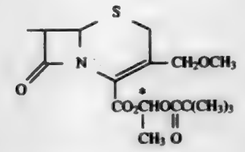
or a salt thereof.



comprising:

a) preparing a diastereomer mixture of compounds of the formula III

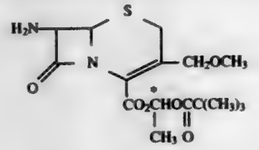




separating the diastereomers by chromatography, splitting off the trityl groups, and preparing acid addition products compounds of the formula II; or

b) preparing a mixture of diastereomers of the formula II, and crystallizing the mixture to concentrate the less polar diastereomer from the mixture; or

c) preparing separated diastereomers of the formula IV



and converting the diastereomers into the separated diastereomers of the formula II.

5,594,133

CRYSTALLINE ACID ADDITION SALTS OF DIASTEREOMERICALLY PURE 1-(2,2-DIMETHYLPROPINONYLOXY)-ETHYL-3-CEPHEM-4-CARBOXYLATE

Elisabeth Defosse, Idstein; Gerd Fischer, Limburg; Joachim-Heiner Jendralla, Frankfurt am Main; Rudolf Lattrell, Königstein/Taunus; Theodor Wollmann, Hofheim am Taunus, and Dieter Isert, Eschborn, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 866,143, May 21, 1992, abandoned. This application May 22, 1995, Ser. No. 447,045

Claims priority, application Germany, May 24, 1991, 41 16 937.9

Int. Cl.[6] C07D *501/56;501/54*

U.S. Cl. 540—228 **10 Claims**

1. A process for preparing a diastereomeric compound of 1-(2,2-dimethyl-propionyloxy)-ethyl- 3-cephem-4-carboxylate having formula II as follows:

5,594,134

PROCESS OF SYNTHESIZING N-ACYL AUXILIARIES

Guo-Jie He, Rahway, and David J. Mathre, Skillman, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

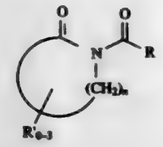
Filed Mar. 31, 1995, Ser. No. 414,541

Int. Cl.[6] C07D *205/04;207/12*

U.S. Cl. 540—362 **4 Claims**

1. A process of synthesizing an N-acyl auxiliary compound of the formula:

(A)



wherein:

R and R' independently represent members selected from the group consisting of:

(a) —C_{1-6} alkyl, —C_{2-6} alkenyl or —C_{2-6} alkynyl;

(b) —C_{1-6} alkyl, —C_{2-6} alkenyl or —C_{2-6} alkynyl substituted with from 1–3 groups selected from: —NH_2; —OH; —COOH, —$COO(C_{1-4})$ alkyl, —OC_{1-4} alkyl; —C(O)—C_{1-4} alkyl; —$OC(O)C_{1-4}$ alkyl; —$NH(C_{1-6}$ alkyl); —$NH(C_{2-6}$ alkenyl); —$NH(C_{2-6}$ alkynyl); —$N(C_{1-6}$ alkyl)$_2$; —$N(C_{2-6}$ alkenyl)$_2$; —$N(C_{2-6}$ alkynyl)$_2$; —$OC(O)NH_2$; —$OC(O)NHC_{1-4}$ alkyl; —$OC(O)N(C_{1-4}$ alkyl)$_2$; -aryl; -heteroaryl; —C_{3-8} cycloalkyl; -heterocyclyl; -halo; —$NHC(O)OC_{1-6}$ alkyl; —$N(C_{1-4}$ alkyl)$C(O)OC_{1-6}$ alkyl, and -aryl, heteroaryl, C_{3-8} cycloalkyl or heterocyclyl substituted with from 1–3 groups selected from halo, hydroxy, —C_{1-4} alkyl, —C_{1-4} alkoxy, hydroxy-C_{1-4} alkyl, -amino, —$NH(C_{1-4}$ alkyl) and —$N(C_{1-4}$ alkyl)$_2$;

(c) aryl, heteroaryl, C_{3-8} cycloalkyl or heterocyclyl, unsubstituted or substituted with from 1–3 groups selected from halo, hydroxy, C_{1-4} alkoxy, hydroxy-C_{1-4} alkyl, amino, C_{1-4} alkylamino, and di-C_{1-4} alkylamino;

(d) C_{1-6} alkyl, C_{2-6} alkenyl or C_{2-6} alkynyl substituted with

(1) 1 to 3 groups selected from: —NHP; —NP_2; —OP; —CO_2P; —$NP(C_{1-6}$ alkyl); —$NP(C_{2-6}$ alkenyl); —$NP(C_{2-6}$ alkynyl); —$OC(O)NHP$; —$OC(O)NP_2$; $OC(O)NP(C_{1-6}$ alkyl); —$NPC(O)O(C_{1-6}$ alkyl); aryl, heteroaryl, C_{3-8} cycloalkyl or heterocyclyl substituted with from 1–3 groups selected from —OP, —C_{1-3} alkyl-OP, —NHP, —NP_2, —C_{1-3} alkyl-NHP, —C_{1-3} alkyl-NP_2, —NP—C_{1-3} alkyl, and 0–3 members selected from the group consisting of: halo, C_{1-3} alkyl, C_{1-3} alkoxy, and —$N(C_{1-3}$ alkyl)$_2$;

and

(2) 0 to 3 groups selected from the group consisting of: —$COO(C_{1-3}$) alkyl, —OC_{1-4} alkyl; —C(O)—C_{1-4} alkyl; —$N(C_{1-6}$ alkyl)$_2$; —$N(C_{2-6}$ alkenyl)$_2$; —$N(C_{2-6}$ alkynyl)$_2$; —$OC(O)N(C_{1-4}$ alkyl)$_2$; aryl; heteroaryl; C_{3-8} cycloalkyl; heterocyclyl; halo; —$N(C_{1-3}$ alkyl)$C(O)OC_{1-6}$ alkyl; and aryl, heteroaryl, —C_{3-8} cycloalkyl or heterocyclyl substituted with from 1–3 groups selected from: halo, —C_{1-3} alkyl, —C_{1-3} alkoxy and —$N(C_{1-3}$ alkyl)$_2$,

and (e) aryl, heteroaryl, C_{3-8} cycloalkyl or heterocyclyl substituted with:

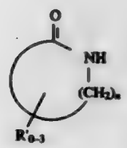
(1) from 1 to 3 members selected from the group consisting of: —OP, —C_{1-4} alkyl-OP, —NHP, —NP_2, —C_{1-4} alkyl-NHP, —C_{1-4} alkyl-NP_2 and —NPC_{1-4} alkyl,

and

(2) from 0 to 3 members selected from the group consisting of: halo, —C_{1-4} alkoxy and —$N(C_{1-4}$ alkyl)$_2$;

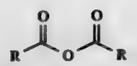
wherein P represents a protecting group, and n represents an integer of from 2 through 7,

comprising reacting a compound of the formula:



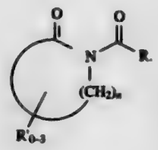
(B)

wherein n and R' are as previously defined, with an anhydride represented by the formula:



(C)

wherein the R groups are the same or different, and are as previously defined, in the presence of a lithium salt and an amine base to produce:



(A)

5,594,135

TRICYCLIC DNA GYRASE INHIBITORS

Jürgen Geiwitz, Lörrach, Germany; Erwin Götschi, Reinach, Switzerland; Paul Hebeisen; Helmut Link, both of Basle, Switzerland, and Thomas Lübbers, Lörrach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

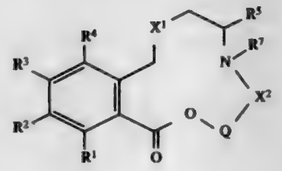
Division of Ser. No. 407,730, Mar. 20, 1995. This application Oct. 11, 1995, Ser. No. 541,077

Claims priority, application European Pat. Off., Mar. 30, 1994, 94104995; Feb. 7, 1995, 95101595

Int. Cl.[6] A61K *31/395;* **C07D** *515/08;515/18*

U.S. Cl. 540—468 **19 Claims**

1. A compound of the formula



IB

wherein

X^1 is —S— or —SO—;

R^1 is hydrogen, halogen or optionally substituted lower alkyl, the optional substituent being halogen;

R^2 is hydrogen, hydroxy, amino, lower alkylamino, di-lower alkylamino, optionally substituted lower alkoxy or a group —OP;

OP is an easily hydrolyzable group;

R^3 is hydrogen, hydroxy, lower alkyl, halogen or a group —OP;

R^4 is halogen, hydroxy or a group —OP;

R^5 is hydrogen, cyano, optionally substituted esterified carboxy, optionally substituted amidated (thio)carboxy, optionally substituted alkyl, optionally substituted alkenyl or optionally substituted heterocycle;

R^7 is hydrogen or lower alkyl;

X^2 is heterocycle,

Q is —$CH(R^8)$— or —$CH(R^8)$—W—;

R^8 is hydrogen or optionally substituted lower alkyl, and

W is optionally substituted mono-, di-, tri-, tetra-or pentamethylene; or the

pharmaceutically acceptable salts thereof carrying an acidic and/or basic substituent.

5,594,136

TEXAPHYRIN SOLID SUPPORTS AND DEVICES

Jonathan L. Sessler; Brent L. Iverson; Vladimir Král, all of Austin, Tex.; Richard E. Thomas, Chesapeake, Va.; Darren Magda, Cupertino, Calif., and Daniel A. Smith, Goshen, Ind., assignors to Pharmacyclics, Inc., Sunnyvale, Calif., and Board of Regents, The University of Texas, Austin, Tex.

Continuation-in-part of Ser. No. 236,218, Apr. 28, 1994, which is a continuation-in-part of Ser. No. 964,607, Oct. 21, 1992, Pat. No. 5,457,195, which is a continuation-in-part of Ser. No. 454,298, Dec. 21, 1989, Pat. No. 5,159,065. This application May 3, 1995, Ser. No. 433,573

Int. Cl.[6] C07D *487/22;* **C07F** *15/02*

U.S. Cl. 540—472 **44 Claims**

1. A composition comprising a matrix-supported texaphyrin.

5,594,137

PROCESS FOR THE PREPARATION OF CAPROLACTAM

Brajesh K. Jha; Ajay S. Chhatre; Bhaskar D. Kulkarni, and Subramanian Sivasanker, all of Pune, Ind., assignors to Council of Scientific and Industrial Research, New Delhi, Ind.

Division of Ser. No. 221,188, Mar. 31, 1994, Pat. No. 5,401,843. This application Jan. 4, 1995, Ser. No. 368,647

Int. Cl.[6] C07D *201/04*

U.S. Cl. 540—535 **22 Claims**

1. A process for preparation of caprolactam which comprises preparing a micellar solution, a macroemulsion, or a microemulsion of a cationic surfactant in dilute sulfuric acid, adding to this solution cyclohexanone oxime under constant stirring, maintaining the solution at a temperature in the range of 15° C. to 40° C. for a period of from 10 minutes to 3 hours, neutralizing the excess acid with an aqueous solution of an alkali, filtering, and extracting the filtrate with a solvent.

5,594,138

METHOD OF FLUORESCENT DETECTION OF NUCLEIC ACIDS AND CYTOSKELETON ELEMENTS USING BIS-DICATIONIC ARYL FURANS

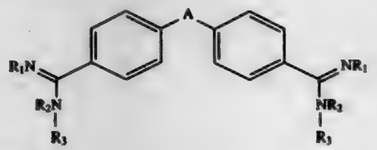
Christine C. Dykstra; Richard R. Tidwell, both of Chapel Hill, N.C.; David W. Boykin; W. David Wilson, both of Atlanta, Ga.; Jaroslaw Spychala, Poznan, Poland; Bijan P. Das, and Arvind Kumar, both of Atlanta, Ga., assignors to Georgia State University Research Foundation, Atlanta, Ga., and The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Division of Ser. No. 238,766, May 6, 1994. This application May 30, 1995, Ser. No. 453,232

Int. Cl.[6] C07D *405/00*

U.S. Cl. 540—596 **8 Claims**

1. A compound having the Formula (I)



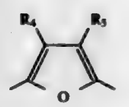
(I)

wherein:

R_1 and R_2 together represent a C_2 to C_3 alkylene;

R_3 is H;

A is:



wherein R_4 is H; and

R_5 is OCH_3 or $O(C_6H_4)R$, wherein R is H or lower-alkyl;

or a physiologically acceptable salt thereof.

5,594,139

PROCESSES FOR PREPARING ANTIPROLIFERATIVE GARFT-INHIBITING COMPOUNDS

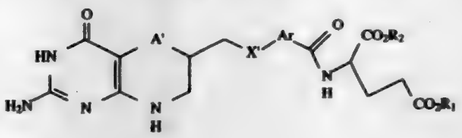
Michael D. Varney, Carlsbad; William H. Romines, San Diego, and Cynthia L. Palmer, La Mesa, all of Calif., assignors to Agouron Pharmaceuticals, Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 10,861, Jan. 29, 1993, abandoned. This application Jul. 28, 1994, Ser. No. 282,293

Int. Cl.[6] C07D *513/04;517/04*

U.S. Cl. 544—48 **12 Claims**

1. A process for preparing a compound of the formula II:



wherein:

A' is sulfur or selenium;

X' is CH_2, sulfur, oxygen or NH;

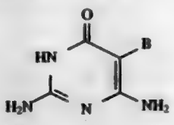
Ar is a substituted or unsubstituted monocyclic carbocyclic or heterocyclic ring, or a substituted or unsubstituted fused or nonfused polycyclic carbocyclic or heterocyclic ring system; and

R_1 and R_2 are each independently hydrogen or a moiety which forms with the attached CO_2 a readily hydrolyzable ester group, provided that neither R_1 nor R_2 is hydrogen;

or a pharmaceutically acceptable salt thereof;

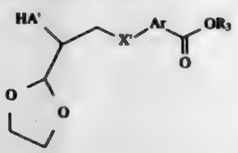
which process comprises the steps of:

(a) reacting a compound having the formula III:

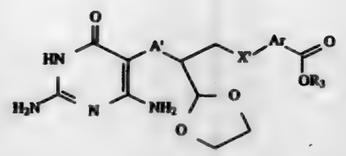


wherein B is a halogen,

with a compound having the formula IV:

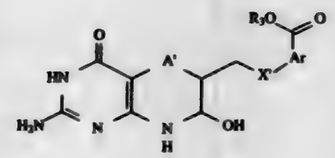


wherein X', A', and Ar are as defined in formula II and R_3 is hydrogen or a straight, branched or cyclic C_1–C_6 alkyl group optionally carrying one or more halogen, hydroxyl or amino group; in the presence of base other than the compound of formula III in a solvent in which at least one of the reactants is at least partially soluble under conditions sufficient to obtain a compound of formula V:



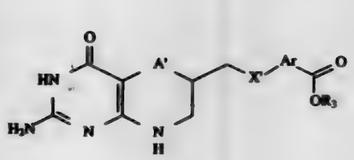
wherein A', X', and Ar are defined as in formula II and R_3 is as defined in formula IV;

(b) reacting the compound of formula V with an acid in a suitable solvent under conditions sufficient to obtain a compound of the formula VI:



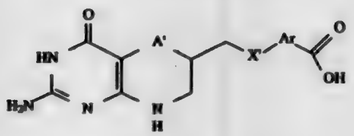
wherein A', X', and Ar are defined as in formula II and R_3 is as defined in formula IV;

(c) reducing the compound of formula VI under conditions sufficient to obtain a compound of the formula VII:



wherein A', X', and Ar are defined as in formula II and R_3 is as defined in formula IV;

(d) where R_3 in the compound of formula VII is not hydrogen, hydrolyzing the compound of formula VII under basic conditions to form a compound of the formula VIII:



wherein A', X', and Ar are defined as in formula II; and

(e) peptide coupling the compound of formula VIII or, where R_3 is hydrogen, the compound of formula VII with a glutamic acid diester hydrochloride to form the compound of the formula II.

5,594,140

IMIDAZO[1,5-A]QUINOLINES FOR TREATMENT OF ANXIETY AND SLEEP DISORDERS

Eric J. Jacobsen, Plainwell, and Ruth E. VanDrink, Richland, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

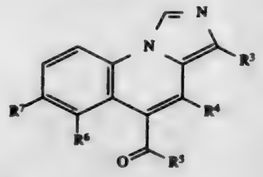
PCT No. PCT/US94/12197, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/14020, PCT Pub. Date May 26, 1995

Continuation of Ser. No. 242,556, May 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 155,405, Nov. 19, 1993, abandoned. This PCT application Oct. 27, 1994, Ser. No. 648,973

Int. Cl.[6] C07D 471/04

U.S. Cl. 544—126 15 Claims

1. Imidazo[1,5-a]quinolines of formula (I)



(I)

where

(I) R_3 is

(A) —CO—OR_{3-1} where R_{3-1} is

(1) —H,

(2) C_1–C_6 alkyl,

(3) C_3–C_7 cycloalkyl,

(4) —(C_1–C_6 alkyl)—C_3–C_7 cycloalkyl,

(5) —$(CH_2)_n$—CF_3 where n is 0 thru 4,

(6) —$(CH_2)_n$—CHF_2 where n is defined above,

(7) —$(CH_2)_n$—CH_2F where n is defined above,

(8) —♦ optionally substituted with one or two

(a) —F,

(b) —Cl,

(c) —Br,

(d) —I,

(e) C_1–C_4 alkyl,

(f) —$NR_{3-2}R_{3-3}$ where R_{3-2} and R_{3-3} are the same or different and are selected from the group consisting of

(i) —H,

(ii) C_1–C_6 alkyl,

(iii) C_3–C_7 cycloalkyl,

(iv) —(C_{1-C6} alkyl)—C_3–C_7 cycloalkyl, and where R_{3-2} and R_{3-3} are taken together with the attached nitrogen atom to form a heterocyclic moiety selected from the group consisting of pyrrolidinyl, morpholinyl, piperazinyl and piperidinyl,

(B) —CO—R_{3-5} where R_{3-5} is

(1) —H,

(2) C_1–C_6 alkyl,

(3) —♦ optionally substituted with one or two

(a) —F,

(b) —Cl,

(c) —Br,

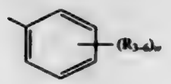
(d) —I,

(e) C_1–C_4 alkyl,

(f) —$NR_{3-2}R_{3-3}$ where R_{3-2} and R_{3-3} are defined above,

(C) aryl where aryl is

(1) phenyl



where w is 1 or 2 and where R_{3-4} is

(a) —H,

(b) —F,

(c) —Cl,

(d) —Br,

(e) —I,

(f) —CN,

(g) —NO_2,

(h) —O—CO—R_{3-1} where R_{3-1} is defined above,

(i) —$(CH_2)_n$—CF_3 where n is defined above,

(j) C_1–C_6 alkyl,

(k) C_3–C_7 cycloalkyl,

(l) —(C_1–C_6 alkyl)—C_3–C_7 cycloalkyl,

(m) —$NR_{3-2}R_{3-3}$ where R_{3-2} and R_{3-3} are defined above,

(n) —$(CH_2)_n$—O—R_{3-1} where R_{3-1} and n are defined above,

(o) —$(CH_2)_n$—S—R_{3-1} where R_{3-1} and n are defined above,

(P) —$(CH_2)_n$—CO—O—R_{3-1} where R_{3-1} and n are defined above,

(q) —N_{3-1}—CO—R_{3-1} where the R_{3-1}'s are the same or different and are defined above,

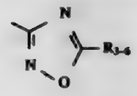
(r) —SO_2—$NR_{3-2}R_{3-3}$ where R_{3-2} and R_{3-3} are defined above,

(s) —CO—R_{3-5} where R_{3-5} is defined above,

(t) —NH—SO_2—CH_3,

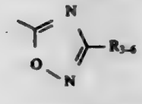
(u) —CO—$N(R_{3-4})_2$ where the R_{3-4} may be the same or different and are —H or C_1–C_3) alkyl,

(2) 5-substituted-1,2,4-oxadiazol-3-yl



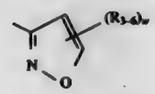
where R_{3-6} is defined above,

(3) 3-substituted-1,2,4-oxadiazol-5-yl



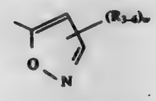
where R_{3-6} is as defined above,

(4) 4- or 5-substituted isoxazol-3-yl



where w and R_{3-6} are defined above,

(5) 3- or 4-substituted isoxazol-5-yl



where w and R_{3-6} are defined above;

(II) R_4 is

(A) —H,

(B) C_1–C_6 alkyl,

(C) —CF_3;

(III) R_5 is

(A) C_1–C_6 alkyl,

(B) —♦ optionally substituted with 1 or 2

(1) —F,

(2) —Cl,

(3) —Br,

(4) —I,

(5) —CN,

(6) —NO_2,

(7) —O—CO—R_{5-1} where R_{5-1} is

(a) —H,

(b) C_1–C_6 alkyl,

(c) C_3–C_7 cycloalkyl,

(d) —(C_1–C_6 alkyl)—C_3–C_7 cycloalkyl,

(e) —$(CH_2)_b$—CF_3 where b is 0 thru 4,

(f) —$(CH_2)_b$—CHF_2 where b is defined above,

(g) —$(CH_2)_b$—CH_2F where b is defined above,

(8) —$(CH_2)_b$—CF_3 where b is defined above,

(9) C_1–C_6 alkyl,

(10) C_3–C_7 cycloalky,

(11) —(C_1–C_4 alkyl)—C_3–C_7 cycloalkyl,

(12) —NR_{5-2} where R_{5-2} and R_{5-3} are the same or different and are defined above,

(13) —$(CH_2)_b$—O—R_{5-1} where R_{5-1} and b are defined above,

(14) —$(CH_2)_b$—S—R_{5-1} where R_{5-1} and b are defined above,

(15) —$(CH_2)_b$—CO—O—R_{5-1} where R_{5-1} and b are defined above,

(16) —NR_{5-1} 13 CO—R_{5-1} where the R_{5-1}'s are the same or different and are defined above,

(16) —SO_2—$NR_{5-2}R_{5-3}$ where R_{5-2} and R_{5-3} are defined above,

(18) —CO—R_{5-4} where R_{5-4} is

(a) —H,

(b) C_1–C_6 alkyl,

(c) —$N(R_{5-1})_2$ where the R_{5-1}s are the same or different and are as defined above,

(C) —O—R_{5-5} where R_{5-5} is

(1) —H,

(2) C_1–C_6 alkyl,

(3) C_3–C_7 cycloalkyl,

(4) —(C_1–C_6 alkyl)—C_3–C_7 cycloalkyl,

(5) —$(CH_2)_b$—CF_3 where b is defined above,

(6) —$(CH_2)_b$—CHF_2 where b is defined above,

(7) —$(CH_2)_b$—CH_2F where b is defined above,

(8) —♦ optionally substituted with one or two

(a) —F,

(b) —Cl,

(c) —Br,

(d) —I,

(c) C_1–C_4 alkyl,

(f) —$NR_{5-2}R_{5-3}$ where R_{5-2} and R_{5-3} are defined above,

(D) —$NR_{5-6}R_{5-7}$ where R_{5-6} and R_{5-7} are the same or different and are selected from the group consisting of

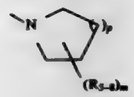
(1) —H,

(2) C_1–C_6 alkyl,

(3) C_3–C_7 cycloalkyl,

(4) —(C_1–C_4 alkyl)—C_3–C_7 cycloalkyl and where R_{5-6} and R_{5-7} are taken together with the attached nitrogen atom to form a heterocyclic moiety selected from the group consisting of

(a)



where m is 1 thru 4, p is 0 thru 4 and R_{5-8} is selected from the group consisting of

(i) —H,

(ii) C_1–C_6 alkyl,

(iii) C_3–C_7 cycloalkyl,

(iv) —(C_1–C_6 alkyl)—C_3–C_7 cycloalkyl,

(v) —$(CH_2)_b$—CF_3 where b is defined above,

(vi) —$(CH_2)_b$—CHF_2 where b is defined above,

(vii) —$(CH_2)_b$—CH_2F where b is defined above,

(viii) —♦ optionally substituted with 1 or 2

(I) —F,

(II) —Cl,

(III) —Br,

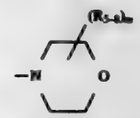
(Iv) —I,

(v) C_1–C_4 alkyl,

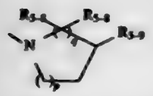
(VI) —NH_2,

(VII) —CO—NH_2.

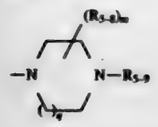
(VIII) $—SO_2—NH_2$,
(IX) $—NH—SO_2—CH_3$,
(b)



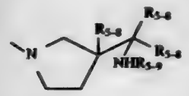
where m and R_{5-8} are defined above,
(c)



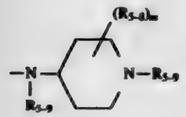
where q is 1 or 2, where p and R_{5-8} are defined above and where R_{5-9} is
(A) —H,
(B) C_1–C_6 alkyl,
(C) C_3–C_7 cycloalkyl,
(D) $—(C_1–C_6$ alkyl$)—C_3–C_7$ cycloalkyl,
(E) $—(CH_2)_b—CF_3$ where b is defined above,
(F) $—(CH_2)_b—CHF_2$ where b is defined above,
(G) $—(CH_2)_b—CH_2F$ where b is defined above,
(H) —♦ optionally substituted with one or two
(1) —F,
(2) —Cl,
(3) —Br,
(4) —I,
(5) C_1–C_4 alkyl,
(6) $—NH_2$,
(d)



where m, q, R_{5-8} and R_{5-9} are defined above,
(e)

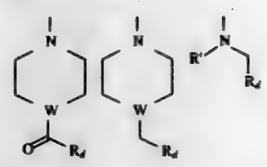


where R_{5-8} and R_{5-9} are defined above,
(f)



where m, R_{5-8} and R_{5-9} are defined above,
(IV) R_6 is
(A) —H,
(B) —F,
(C) —Br,
(D) —I,
(E) C_1–C_6 alkyl,
(F) —CN,
(G) $—NO_2$,
(H) $—(CH_2)_g—CF_3$ where g is 0 thru 4,
(I) $—(CH_2)_g—OR_{6-1}$ where R_{6-1} is
(1) —H,
(2) C_1–C_6 alkyl
(3) —♦ optionally substituted with one or two
(a) —F,
(b) —Cl,
(c) —Br,
(d) —I,
(e) C_1–C_4 alkyl,
(f) $—NR_{6-2}R_{6-3}$ where R_{6-2} and R_{6-3} are the same or different and are selected from the group consisting of
(i) —H,
(ii) C_1–C_6 alkyl,
(iii) C_3–C_7 cycloalkyl,
(iv) $—(C_1–C_4$ alkyl$)—C_3–C_7$ cycloalkyl, and where R_{6-2} and R_{6-3} are taken together with the attached nitrogen atom to form a heterocyclic moiety selected from the group consisting of pyrrolidinyl, morpholinyl, piperazinyl, piperdinyl,
(J) $—CO—O—R_{6-4}$ where R_{6-4} is
(1) —H,
(2) C_1–C_6 alkyl,
(3) C_3–C_7 cycloalkyl,
(4) $—(C_1–C_6$ alkyl$)—C_3–C_7$ cycloalkyl,
(5) $—(CH_2)_g—CF_3$ where g is defined above,
(6) $—(CH_2)_g—CHF_2$ where g is defined above,
(7) $—(CH_2)_g—CH_2F$ where g is defined above,
(8) —♦ optionally substituted with one or two
(a) —F,
(b) —Cl,
(c) —Br,
(d) —I,
(e) C_1–C_4 alkyl,
(f) $—NR_{6-2}R_{6-3}$ where R_{6-2} and R_{6-3} are as defined above,
(K) $—CO—NR_{6-2}R_{6-3}$ where R_{6-2} and R_{6-3} are as defined above,
(L) $—(CH_2)_g—NR_{6-2}R_{6-3}$ where g, R_{6-2} and R_{6-3} are defined above,
(M) $—NH—CO—R_{6-4}$ where R_{6-4} is defined above,
(N) $—SO_2—NR_{6-2}R_{6-3}$ where R_{6-2} and R_{6-3} are defined above,
(O) $—N_3$;
(V) R_7 is
(A) —H,
(B) —F,
(C) —Br,
(D) —I,
(E) C_1–C_4 alkyl,
(F) —CN,
(G) $—NO_2$,
(H) $—(CH_2)_g—CF_3$ where g is 0 thru 4,
(I) $—(CH_2)_g—OR_{7-1}$ where R_{7-1} is
(1) —H,
(2) C_1–C_6 alkyl,
(3) —♦ optionally substituted with one or two
(a) —F,
(b) —Cl,
(c) —Br,
(d) —I,
(e) C_1–C_4 alkyl,
(f) $—NR_{7-2}R_{7-3}$ where R_{7-2} and R_{7-3} are the same or different and are selected from the group consisting of
(i) —H,
(ii) C_1–C_6 alkyl,
(iii) C_3–C_7 cycloalkyl,
(iv) $—(C_1–C_4$ alkyl$)—C_3–C_7$ cycloalkyl, and where R_{6-2} and R_{7-3} are taken together with the attached nitrogen atom to form a heterocyclic moiety selected from the group consisting of pyrrolidinyl, morpholinyl, piperazinyl, piperdinyl,
(J) $—CO—O—R_{7-4}$ where R_{7-4} is
(1) —H,
(2) C_1–C_6 alkyl,
(3) C_3–C_7 cycloalkyl,
(4) $—(C_1–C_6$ alkyl$)—C_3–C_7$ cycloalkyl,
(5) $—(CH_2)_g—CF_3$ where g is defined above,
(6) $—(CH_2)_g—CHF_2$ where g is defined above,
(7) $—(CH_2)_g—CH_2F$ where g is defined above,
(8) —♦ optionally substituted with one or two
(a) —F,
(b) —Cl,
(c) —Br,
(d) —I,
(e) C_1–C_4 alkyl,
(f) $—NR_{7-2}R_{7-3}$ where R_{7-2} and R_{7-3} are as defined above,
(K) $—CO—NR_{7-2}R_{7-3}$ where R_{7-2} and R_{7-3} are as defined above,
(L) $—(CH_2)_g—NR_{7-2}R_{7-3}$ where g, R_{7-2} and R_{7-3} are defined above,
(M) $—NH—CO—R_{7-4}$ where R_{7-4} is defined above,
(N) $—SO_2—NR_{7-3}$ where R_{7-2} and R_{7-3} are defined above,
(O) $—N_3$; and pharmaceutically acceptable salts thereof.

R_c is a group of the formula:



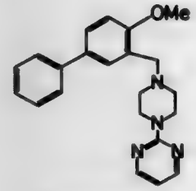
where
W is N or CH;
R' represents hydrogen or alkyl; and
R_d represents pyridyl, pyrimidinyl, or phenyl, each of which is optionally substituted with halogen, alkyl or alkoxy, or
when R' represents hydrogen or alkyl, R_d may further represent hydrogen.

5,594,141

CERTAIN AMINOMETHYL BIPHENYL, AMINOMETHYL PHENYL PYRIDINE AND AMINOMETHYL PHENYL PYRIMIDINE DERIVATIVES; NOVEL DOPAMINE RECEPTOR SUBTYPE SELECTIVE LIGANDS

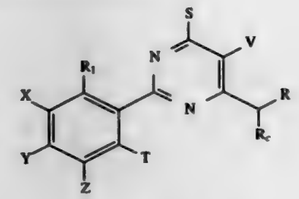
Jun Yuan, Clinton, and Andrew Thurkauf, Danbury, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Filed Nov. 23, 1994, Ser. No. 344,497
Int. Cl.[6] C07D *239/24;239/34;239/52*
U.S. Cl. 544—242 **8 Claims**



Compound 1

1. A compound of the formula:



or the pharmaceutically acceptable salts thereof wherein:
R_1, X, Y, Z and T are the same or different and represent hydrogen, halogen, cyano, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, straight or branched chain lower alkoxy having 1–6 carbon atoms or SO_2R_4 where R_4 is straight or branched chain lower alkyl having 1–6 carbon atoms or where R_4 is NH_2 or $NHCH_3$;
S and V are the same or different and represent hydrogen, halogen, hydroxy, phenyl, straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms;
R is hydrogen or alkyl having 1–6 carbon atoms; and

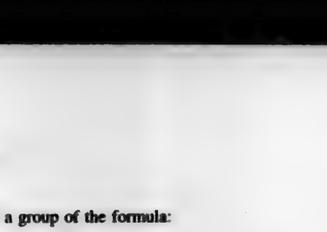
5,594,142

PROCESS FOR THE PREPARATION OF POLYALKYL-1-OXA-DIAZASPIRODECANE COMPOUNDS

Karl Gas, Burtenbach; Günter Nowy, Aystetten, and Georg Schmaltz, Neusäss, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 16, 1995, Ser. No. 389,310
Claims priority, application Germany, Feb. 19, 1994, 44 05 387.8
Int. Cl.[6] C07D *498/10*
U.S. Cl. 546—19 **8 Claims**

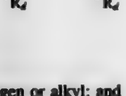
1. A process for the preparation of a polyalkyl-1-oxa-diazaspirodecane compound of the Formula I



(I)

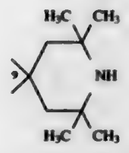
in which
n is an integer from 1 to 50 and
Y is a group of the formula II or III

(II)



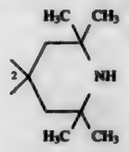
(III)

in which the indices 3 and 4 indicate the ring positions in the diazaspirodecane system and one bond of the nitrogen is linked to a CH_2 group of the propylene-2-oxy group,
R^1 is a hydrogen atom, an oxygen atom, an NO group, a C_1–C_{12}-alkyl group, an allyl group, a C_1–C_{22}-acyl group, a benzyl group, a C_1–C_{12}-alkyloxy group or a C_3–C_{12}-cycloalkoxy group,
R^2 and R^3 are either identical or different and are a hydrogen atom or a C_1–C_5-alkyl, in which case R^4 is a methyl group, or
R^2 is a hydrogen atom or a C_1–C_5-alkyl group and R^3 and R^4, together with the carbon atoms joining them, form a C_5- or C_6-cycloalkyl group or a group of the formula



R^5 and R^6 are identical or different and represent a hydrogen atom, a C_1–C_{30}-alkyl group or a C_7–C_{12}-phenylalkyl group which is unsubstituted or substituted by chlorine or C_1–C_4-alkyl, or

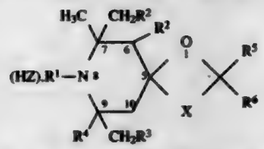
R^5 and R^6, together with the carbon atom joining them, form a C_5–C_{18}-cycloalkyl group which is unsubstituted or substituted by up to four C_1–C_4-alkyl groups, or a group of the formula



R^7, if n=1, has no meaning, so that the oxygen atom is bonded to the terminal CH_2 group and forms an oxirane ring, or

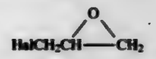
R^7, if n>1 is a hydrogen atom or a C_1–C_{22}-acyl group, or has no meaning in the terminal monomer unit, so that the oxygen atom is bonded to the terminal CH_2 group and forms an oxirane ring,

which process comprises reacting a compound of the formula IV



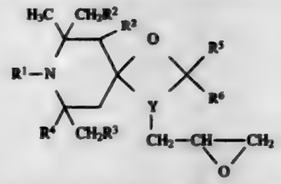
(IV)

in which R^1, R^2, R^3, R^4, R^5 and R^6 have the above-mentioned meaning, and X is a group of the formula II or formula III in which the indices 3 and 4 indicate the ring positions in the diazospirodecane system and one bond of the nitrogen is linked to a hydrogen atom and HZ is an acid radical, or a salt thereof with a proton acid, with an epihalohydrin of the formula V



(V)

in which Hal is a chlorine, bromine or iodine atom, in a molar ratio of 1:1 to 1:10 in the presence of an equimolar to twenty times the molar amount of solid alkali metal hydroxide or of the corresponding amount of solid alkali metal hydroxide in a mixture with water in a weight ratio of 1:9 to 9:1 as the sole catalyst in a solvent mixture of at least one alcohol and if appropriate an inert organic solvent and, if n>1, heating the resulting epoxy compound VI



(VI)

in which R^1, R^2, R^3, R^4, R^5 and R^6 have the above mentioned meaning, to a temperature of 100° to 240° C.

5,594,143

PHOTOTHERMOGRAPHIC MATERIALS

Mark P. Kirk, Sevenoa, and Andrew W. Mott, Bishops Stortford, Great Britain, assignors to Imation Corp., Woodbury, Minn.

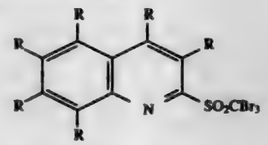
Division of Ser. No. 247,651, May 23, 1994, Pat. No. 5,460,938. This application Jun. 5, 1995, Ser. No. 464,162

Claims priority, application United Kingdom, Jun. 8, 1993, 9311790

Int. Cl.[6] C07D 215/36

U.S. Cl. 546—157 4 Claims

1. A compound of the formula:



wherein each R is independently selected from H, methyl and ethyl groups.

5,594,144

TROPOLONE DERIVATIVES AND PHARMACEUTICAL COMPOSITION THEREOF FOR PREVENTING AND TREATING ISCHEMIC DISEASES

Norile Itoh, Ami-machi; Mineo Kamihara, Tsukuba; Hiroshi Kushida, Shimodate, all of Japan; William W. McWhorter, Parchment, Mich.; Syunji Nomura, Tsukuba, Japan; Kazunori Ozawa, Tsukuba, Japan; Mikio Taniguchi, Tsukuba, Japan, and Kazuo Tsuzuki, Tsukuba, Japan, assignors to The Upjohn Company, Kalamazoo, Mich.

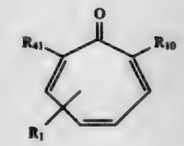
Division of Ser. No. 975,924, Feb. 18, 1993, abandoned. This application May 18, 1995, Ser. No. 442,710

Claims priority, application Japan, Aug. 29, 1990, 2-229536; Jan. 31, 1991, 3-056252; Feb. 8, 1991, 3-039173

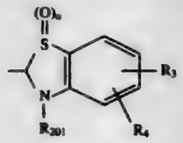
Int. Cl.[6] C07D 277/66;401/10; A61K 31/425;31/445

U.S. Cl. 548—166 3 Claims

1. A tropolone derivative of the formula:



wherein R_{10} is a moiety of the formula III



III

wherein R_1 is:
(a) hydrogen,
(b) C_1–C_5 alkyl, or
(c) substituted or non-substituted aryl;
wherein R_3 and R_4 are the same or different and are:
(a) hydrogen,
(b) C_1–C_5 alkyl,
(c) C_1–C_5 alkyl substituted by —OH, —$COOR_5$, or —CN,
(d) C_7–C_{20} arylalkyl,
(e) halogen,
(f) —OH,
(g) C_1–C_5 alkoxy,
(h) —CN,
(i) —CO_2R_5, or
(j) —NO_2;
wherein R_{41} is
(a) —OR_3,
(b) —OR_6,
(c) —NR_7R_8,
(d) —$N(R_{51})$—$(CH_2)_m$—R_{61}, or
(e) a group represented by the formula IV



wherein R_5 is
(a) hydrogen, or
(b) C_1–C_5 alkyl;
wherein R_6 is
(a) hydrogen,
(b) C_1–C_5 alkyl,
(c) C_1–C_5 alkyl substituted by OH, $COOR_5$ or CN, or containing O, S, or N as heteroatoms,
(d) C_7–C_{20} aralkyl, or
(e) substituted C_7–C_{20} aralkyl containing O, S or N as heteroatoms;
wherein R_7 and R_8 are the same or different and are:
(a) hydrogen,
(b) C_1–C_5 alkyl,
(c) C_1–C_5 alkyl substituted by —OH, —$COOR_5$, or —CN, or
(d) C_7–C_{20} aralkyl;
wherein R_9 is
(a) hydrogen,
(b) C_1–C_5 alkyl, or
(c) C_7–C_{20} aralkyl;
wherein R_{11} is
(a) hydrogen,
(b) C_1–C_3 alkyl,
(c) substituted or unsubstituted aryl, or
(d) substituted or unsubstituted heterocycle;
wherein R_{21} and R_{31} are the same or different and are
(a) hydrogen, or
(b) C_1–C_3 alkyl;
wherein R_{61} is
(a) substituted or unsubstituted aryl,
(b) —OR_{71},
(c) —CO_2R_{81}, or
(d) —$NR_{91}R_{101}$;
wherein R_{51}, R_{71}, and R_{81} are the same or different and are
(a) hydrogen, or
(b) C_1–C_3 alkyl;
wherein R_{91} and R_{101} are the same or different and are
(a) hydrogen,
(b) C_1–C_3 alkyl, or
(c) a substituted or unsubstituted aryl group;
wherein R_{201} is
(a) hydrogen,
(b) C_1–C_5 alkyl,
(c) C_7–C_{20} aralkyl, or
(d) C_6–C_{10} arylsulfonyl;
wherein X is
(a) —O—,
(b) —CH_2—, or
(c) —$N((CH_2)_p$—$R_{11})$—;
wherein m is 1, 2, 3, or 4;
wherein n is 0, 1, or 2;
wherein p is 0, 1, or 2; and
wherein q is 1 or 2;
or a pharmaceutically acceptable ester or salt thereof.

5,594,145

PROCESS FOR THE PREPARATION OF 2(3H)-BENZOTHIAZOLONES

Klaus Forstinger, Kelsterbach; Heinrich Volk, Bad Vilbel, and Werner Wykypiel, Gründau, all of Germany, assignors to Hoechst AG, Germany

Filed Apr. 25, 1994, Ser. No. 232,748

Claims priority, application Germany, Apr. 28, 1993, 43 13 930.2

Int. Cl.[6] C07D 277/68

U.S. Cl. 548—173 24 Claims

1. A process for the preparation of 2(3H-benzothiazolones which comprises the steps of

reacting a 2-amino-benzothiazole with a diazotization agent in the presence of hydrochloric acid to give a diazonium chloride,

reacting the diazonium chloride without intermediate isolation to form a 2-chlorobenzothiazole, and

hydrolyzing the 2-chlorobenzothiazole, without intermediate isolation, at 120°–120° C. under reaction pressure, wherein the complete reaction is conducted without the addition of organic solvents.

5,594,146

PROCESS FOR PRODUCING 5-AMINOTETRAZOLE

Masahiro Murotani, Toyama; Hajime Mura, Uozu; Makoto Takeda, Takaoka, and Hiroshi Shibafuchi, Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1995, Ser. No. 392,308

Claims priority, application Japan, Feb. 24, 1994, 6-049930

Int. Cl.[6] C07D 257/06

U.S. Cl. 548—251 5 Claims

1. A process for producing 5-aminotetrazole comprising the steps of:

(a) reacting cyanamide with hydrazine in a solvent to form a salt of aminoguanidine;

(b) adding thereto an acid and then a nitrite to form a salt of diazoguanidine; and

(c) cyclizing the salt of diazoguanidine, upon heating, to thereby produce the 5-aminotetrazole, without isolating the intermediate product.

5,594,147

PROCESS FOR THE PREPARATION OF ALKOXYTRIAZOLINONES

Heinz-Jürgen Wroblowsky, Langenfeld, and Klaus König, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

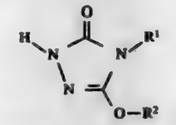
Filed Sep. 15, 1995, Ser. No. 528,584

Claims priority, application Germany, Sep. 23, 1994, 44 33 966.6

Int. Cl.[6] C07D 249/12

U.S. Cl. 548—263.6 10 Claims

1. A process for the preparation of an alkoxytriazolinone of the formula



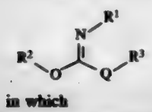
(I)

in which

R^1 represents hydrogen, or represents alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen or C_1-C_4-alkoxy, or represents cycloalkyl or cycloalkylalkyl, each of which has 3 to 6 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to

4 carbon atoms in the alkyl moiety and each of which is optionally substituted by halogen or C_1-C_4-alkyl, or represents aryl or arylalkyl, each of which has 6 or 10 carbon atoms in the aryl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by carboxyl, cyano, nitro, halogen, C_1-C_4-alkyl, C_1-C_4-halogenoalkyl, C_1-C_4-alkoxy, C_1-C_4-halogenoalkoxy or C_1-C_4-alkoxy-carbonyl, and

R^2 represents alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen or C_1-C_4-alkoxy, or represents cycloalkyl or cycloalkylalkyl, each of which has 3 to 6 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by halogen or C_1-C_4-alkyl, or represents aryl or arylalkyl, each of which has 6 or 10 carbon atoms in the aryl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by carboxyl, cyano, nitro, halogen, C_1-C_4-alkyl, C_1-C_4-halogenoalkyl, C_1-C_4-alkoxy, C_1-C_4-halogenoalkoxy or C_1-C_4-alkoxy-carbonyl, which comprises in a first step reacting an imino(thio)carbonic diester of the formula



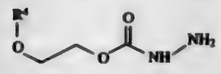
(II)

in which

Q represents oxygen or sulphur, and

R^3 represents in each case optionally substituted C_1-C_4-alkyl, phenyl or benzyl wherein the substituents are carboxyl, hydroxyl C_1-C_4-alkoxy, C_1-C_4-alkoxy-carbonyl, phenoxy or benzyloxy,

with an alkoxyethyl carbazinate of the formula

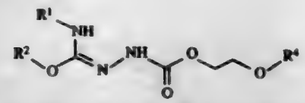


(III)

in which

R^4 represents optionally substituted C_1-C_4-alkyl, wherein the substituents are C_1-C_4-alkoxy, phenoxy or benzyloxy,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent at a temperature between −20° C. and +150° C. wherein the reaction auxiliary is a protonic acid, or an acidic ion exchanger thereby to form a semicarbazide derivative of the formula



(IV)

and in a second step subjecting the compound of the formula (IV) to a cyclizing condensation reaction at a temperature between 0° C. and 200° C., optionally after intermediate isolation, in the presence of a base and optionally in the presence of a diluent, optionally under reduced pressure.

5,594,148

PROCESS FOR THE PREPARATION OF ALKOXYTRIAZOLINONES

Heinz-Jürgen Wroblowsky, Langenfeld, and Klaus König, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

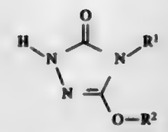
Filed Sep. 15, 1995, Ser. No. 529,185

Claims priority, application Germany, Sep. 23, 1994, 44 33 969.8

Int. Cl.[6] C07D 249/12

U.S. Cl. 548—263.6 **13 Claims**

1. A process for the preparation of an alkoxytriazolinone of the formula



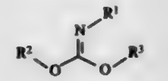
(I)

in which

R^1 represents alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen or C_1-C_4-alkoxy, or represents cycloalkyl or cycloalkylalkyl, each of which has 3 to 6 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by halogen or C_1-C_4-alkyl, or represents aryl or arylalkyl, each of which has 6 or 10 carbon atoms in the aryl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by carboxyl, cyano, nitro, halogen, C_1-C_4- alkyl, C_1-C_4-halogenoalkyl, C_1-C_4-alkoxy, C_1-C_4-halogenoalkoxy or C_1-C_4-alkoxy- carbonyl, and

R^2 represents alkyl, alkenyl or alkinyl, each of which has up to 6 carbon atoms and each of which is optionally substituted by halogen or C_1-C_4-alkoxy, or represents cycloalkyl or cycloalkylalkyl, each of which has 3 to 6 carbon atoms in the cycloalkyl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by halogen or C_1-C_4-alkyl, or represents aryl or arylalkyl, each of which has 6 or 10 carbon atoms in the aryl moiety and, if appropriate, 1 to 4 carbon atoms in the alkyl moiety and each of which is optionally substituted by carboxyl, cyano, nitro, halogen, C_1-C_4-alkyl, C_1-C_4, halogenoalkyl, C_1-C_4-alkoxy, C_1-C_4-halogenoalkoxy or C_1-C_4-alkoxy- carbonyl,

which comprises in a first step reacting an iminocarbonic diester of the formula

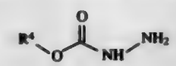


(II)

in which

R^3 represents in each case optionally substituted C_1-C_4-alkyl, phenyl or benzyl wherein the substituents are C_1-C_4-alkoxy, phenoxy or benzyloxy,

with a carbazinic ester of the formula

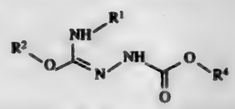


(III)

in which

R^4 represents optionally substituted C_1-C_4-alkyl, phenyl or benzyl wherein the substituents are C_1-C_4-alkoxy, phenoxy or benzyloxy,

optionally in the presence of a reaction auxiliary and optionally in the presence of a diluent at a temperature between −20° C. and +120° C. wherein the reaction auxiliary is a protonic acid, a polymeric acid or an acidic ion exchanger thereby to form a semicarbazide derivative of the formula



(IV)

and in a second step subjecting the compound of the formula (IV) to a cyclizing condensation reaction at a temperature between 20° C. and 100° C., optionally after intermediate isolation, in the presence of a base and optionally in the presence of a diluent.

5,594,149

PROCESS FOR PRODUCING 1,3-DIALKYL-2-IMIDAZOLIDINONE

Hiroshi Naruse; Hideki Minato; Shinichi Umeda, and Teruyuki Nagata, all of Fukuoka-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 494,735, Jun. 26, 1995. This application Apr. 17, 1996, Ser. No. 633,533

Claims priority, application Japan, Jul. 7, 1994, 6-155763

Int. Cl.[6] C07C 273/18; C07D 233/32;233/34

U.S. Cl. 548—316.4 **15 Claims**

1. A process for producing a compound represented by the formula (3)



(3)

wherein is an alkyl group, comprising reacting N,N',N" -trialkyldiethylenetriamine represented by the formula (1);



(1)

wherein R is an alkyl group, with urea.

5,594,150

PROCESS FOR THE PREPARATION OF A SECONDARY OR TERTIARY HYDROXYLATED AMINE COMPOUND FROM A PRIMARY OR SECONDARY AMINE COMPOUND AND A PRODUCT MADE BY THE PROCESS

Catherine David, Antony; Gilles Teral, Paris; Henry Ledon, Versailles, and Jean-Pierre Boiteux, Saix, all of France, assignors to Chemunol S.A., Paris, France

Filed Jul. 6, 1994, Ser. No. 268,530

Claims priority, application France, Jul. 6, 1993, 93 08245

Int. Cl.[6] C07D 233/72; C07C 205/27

U.S. Cl. 548—573 **35 Claims**

1. A process for the preparation of a hydroxylated secondary or tertiary amine compound having a hydroxyl group β to the amine group comprising reacting a primary or secondary amine compound with an epoxy compound in the presence of a phase transfer catalyst and in the absence of an organic solvent.

27. A composition comprising:

(i) at least one hydroxylated secondary or tertiary amine compound having a hydroxyl group β to the amine group; and

(ii) a phase transfer catalyst, said composition being free of organic solvents.

5,594,151

PHENYLBORONIC ACID COMPLEXING REAGENTS DERIVED FROM AMINOSALICYLIC ACID

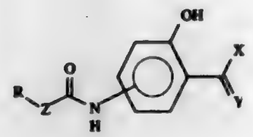
Mark L. Stolowitz, Long Beach, Calif., assignor to Prelinx, Inc., Redmond, Wash.

Filed Jan. 28, 1994, Ser. No. 188,531

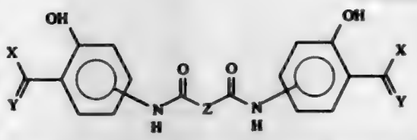
Int. Cl.[6] C07C 259/10

U.S. Cl. 548—542 **7 Claims**

1. A phenylboronic acid complexing reagent for conjugating biologically active molecules through a phenylboronic acid complex, said phenylboronic acid complexing reagent having the general formula selected from the group consisting of General Formula I and General Formula II:



General Formula I



General Formula II

wherein group X is selected from the group consisting of NHOH and $NHOCH_3$, wherein group Y is selected from the group consisting of O, S and NH, and wherein group Z is a spacer selected from the group consisting of an alkyl chain of from 1 to 16 carbon equivalents in length and a polyethyleneglycol chain, up to 12 carbon equivalents in length, wherein said alkyl chain may contain intermediate amide functionalities; and wherein group R is a reactive electrophilic or nucleophilic moiety suitable for reaction of the phenylboronic acid complexing reagent with a bioactive species.

5,594,152

PROCESS FOR THE PREPARATION OF TRICYCLIC-HETEROCYCLES

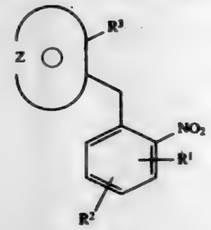
Aranapakam M. Venkatesan, Elmhurst, and Jay D. Albright, Nanuet, both of N.Y., assignors to American Cyanamid Company, Madison, N.J.

Division of Ser. No. 287,015, Aug. 5, 1994, Pat. No. 5,436,333. This application Mar. 10, 1995, Ser. No. 402,262

Int. Cl.[6] C07D 207/333;213/26;333/12

U.S. Cl. 549—71 **1 Claim**

1. A process for production of a compound of the formula:



in which

R^1 is selected from the group consisting of H, lower alkyl(C_1–C_3), alkoxy(C_1–C_3), bromo, chloro, fluoro, iodo, —COlower alkyl(C_1–C_3), and —CF_3;

R^2 is selected from the group consisting of H, lower alkyl(C_1–C_3), alkoxy(C_1–C_3), amino, bromo, chloro, fluoro, iodo, and—COlower alkyl(C_1–C_3);

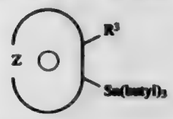
or R^1 and R^2 taken together are methylenedioxy or ethylenedioxy;

R^3 is an aldehyde or carboxylic acid moiety; and

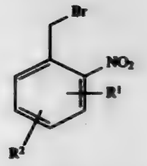
the moiety



represents: (1) a 5-membered aromatic (unsaturated) heterocyclic ring having one heteroatom selected from O, N, or S; (2) a 6-membered aromatic (unsaturated) heterocyclic ting having one nitrogen atom; (3) a 5 or 6-membered aromatic (unsaturated) heterocyclic ring having having two nitrogen atoms; or (4) a 5-membered aromatic (unsaturated) heterocyclic ting having one nitrogen atom together with either one oxygen or one sulfur atom; wherein the 5 or 6-membered heterocyclic rings are optionally substituted by (C_1–C_3)lower alkyl, halogen or (C_1–C_3)lower alkoxy;
the process comprising reacting a compound of the formula:



with a compound of the formula:



in the presence of a palladium (O) catalyst.

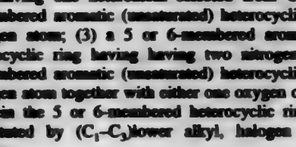
5,594,153

PROCESS FOR THE PREPARATION OF 1,3-DIOXANE DERIVATIVES USEFUL IN THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS

John K. Thottathil, Robbinsville; Yadagiri Pendri, Old Bridge; Wen-Sen Li, Lincroft, all of N.J., and David R. Kronenthal, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 135,694, Oct. 8, 1993, Pat. No. 5,457,227, which is a division of Ser. No. 858,907, Mar. 27, 1992, Pat. No. 5,278,313. This application Jul. 5, 1995, Ser. No. 498,493
Int. Cl.[6] C07D *319/06*
U.S. Cl. 549—374 11 Claims

1. A method for the preparation of a compound of the formula VII:



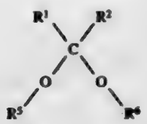
(VII)

where
X is a halogen atom;
R^1 and R^2 are each independently hydrogen, an alkyl group, a cycloalkyl group, an aryl group or, taken together with the carbon atom to which they are attached, form a cycloalkyl group; and
R^3 is hydrogen, an alkyl group or an aryl group,
or a pharmaceutically acceptable salt thereof,
comprising the step of reacting a compound of the formula V:

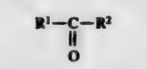


(V)

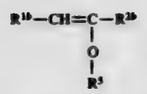
where
X and R^3 are as defined in the formula VII, or a pharmaceutically acceptable salt thereof, with a compound of the formula VIa, VIb or VIc:



(VIa)



(VIb)



(VIc)

where
R^1 and R^2 are as defined in the formula VII;
R^{1b} and R^{2b} are each independently hydrogen, an alkyl group, a cycloalkyl group, an aryl group or, taken together with the carbon atoms to which they are attached, form a 1,2-cycloalkenyl group; and
R^5 and R^6 are each independently an alkyl group, in the presence of an acidic condensation agent,
wherein alkyl employed herein alone or as part of another group has from 1 to 21 carbons;
cycloalkyl employed herein alone or as part of another group has from 3 to 21 carbons;
aryl employed herein alone or as part of another group has from 6 to 12 carbons;
cycloalkenyl employed herein alone or as part of another group has from 3 to 21 carbons.

5,594,154

INTERMEDIATES FOR PHARMACEUTICALLY USEFUL AMINOCOUMARAN DERIVATIVES

Tetsuya Aono, Nagaokakyo; Shigeneri Ohkawa, Takatsuki, and Takayuki Doi, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 305,717, Sep. 14, 1994, Pat. No. 5,478,844, which is a division of Ser. No. 784,988, Oct. 30, 1991, Pat. No. 5,376,681. This application May 23, 1995, Ser. No. 447,450
Claims priority, application Japan, Nov. 1, 1990, 2-298650; Sep. 25, 1991, 3-245667
Int. Cl.[6] C07D *307/79*
U.S. Cl. 549—462 2 Claims

1. A d- or l-isomer of 5-amino-2-bromomethyl-2,4,6,7 -tetramethyl-2,3-dihydrobenzo[b]furan.

5,594,155

ANOMERIC FLUORORIBOSYL AMINES

Larry W. Hertel; Charles D. Jones; Julian S. Kvols, and Thomas E. Mabry, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 122,876, Sep. 16, 1993, Pat. No. 5,480,992. This application May 30, 1995, Ser. No. 453,734
Int. Cl.[6] C07D *307/12;307/14*
U.S. Cl. 549—475 11 Claims

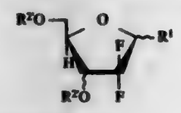
1. A process for preparing a compound of formula I



formula I

or a mixture thereof wherein
each R^2 is the same or different hydroxy protecting group; or a salt thereof, which comprises

a) reacting a compound of formula III



formula III

or a mixture thereof, wherein
R^1 is a leaving group; and
R^2 is as defined above, with an azide nucleophile;
b) reducing the reaction product from step a); and
c) optionally salifying the reaction product from step b).

5,594,156

SYNTHESIS OF SILYL CYANOHYDRINS

Chitoor S. Subramanium, Kendall Park, N.J., and Gerald L. Larson, Newtown, Pa., assignors to Huls America Inc., Somerset, N.J.

Filed Aug. 18, 1995, Ser. No. 516,644
Int. Cl.[6] C07F *7/10;7/18*
U.S. Cl. 556—417 11 Claims

1. A method for forming a silylated cyanohydrin comprising the steps of:
a) combining a carbonyl compound selected from the group consisting of aldehydes and ketones with hydrogen cyanide and a trisubstituted halosilane selected from the group consisting chlorosilane, bromosilane and iodosilane; and
b) forming a reaction mixture by adding a reactant selected from the group consisting of disilazane and silyl amine to the combination of step (a).

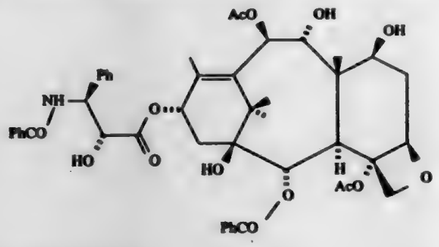
5,594,157

PROCESS FOR MAKING TAXOL DERIVATIVES

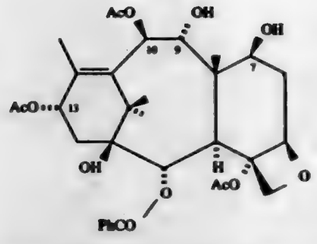
Geewananda P. Gunawardana, Libertyville; Larry L. Klein, Lake Forest, and James B. McAlpine, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 317,978, Oct. 4, 1994, Pat. No. 5,530,028, which is a division of Ser. No. 46,678, Apr. 14, 1993, Pat. No. 5,352,806, which is a continuation-in-part of Ser. No. 914,720, Jul. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,509, Apr. 17, 1992, abandoned. This application Apr. 6, 1995, Ser. No. 427,925
Int. Cl.[6] C07D *305/14*
U.S. Cl. 549—510 6 Claims

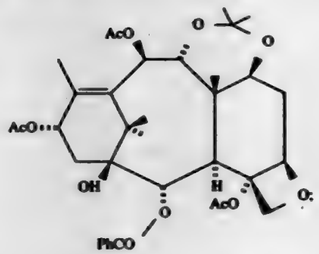
1. A process for preparing a taxol derivative, having the formula



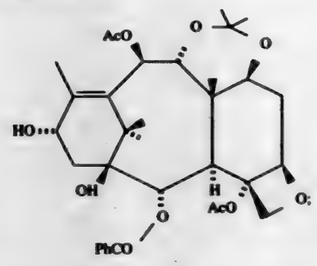
comprising the steps of:
(a) protecting the C-7 and C-9 hydroxy groups of a compound having the formula



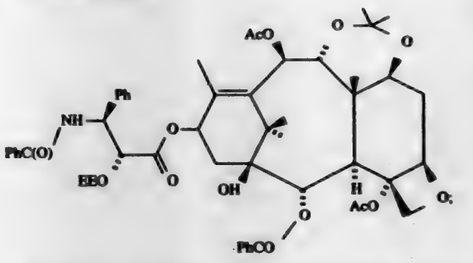
by reaction with acetone and an acid catalyst and isolating a first intermediate compound having the formula



(b) deacetylating the first intermediate compound at the C-13 position by reaction with a reagent selected from the group consisting of butyllithium, methyllithium or lithium triethylborohydride and isolating a second intermediate compound having the formula



(c) reacting the second intermediate compound with (2R,3S)-N-benzoyl-O-(1-ethoxyethyl)-3-phenylisoserine or (3R, 4S)-N-benzoyl-3-O-(1-ethoxyethyl)- 4-phenyl-2-azetidinone in the presence of base and isolating a third intermediate compound having the formula



(d) removing the acetonide and ethoxyethyl protecting groups from the third intermediate compound with 0.5% to 1% alcoholic HCl and isolating the desired product.

5,594,158
PROCESSES FOR PRODUCING DOXORUBICIN, DAUNOMYCINONE, AND DERIVATIVES OF DOXORUBICIN
Desmond M. S. Wheeler, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.
Continuation-in-part of Ser. No. 542,982, Jun. 22, 1990, Pat. No. 5,200,513. This application Jul. 16, 1992, Ser. No. 915,466
Int. Cl.[6] C07H *15/24*
U.S. Cl. 552—201 23 Claims

1. A process for the production of daunomycinone, or its 6-desoxy-6-nitro, 6-desoxy-6-amino, 6 desoxy-6-cyano, 6-desoxy, or 6-halo-6-desoxy analogues comprising the steps of:

condensing the acetonide of methyl 3alpha,5alpha-dihydroxy-5beta-(trimethylsilylethynyl)-2alpha-nitromethylcyclohexano-1alphacarboxylate with 1,4-dihydro-4,4,5-trimethoxy-1-oxonaphthalene in the presence of 1,8-diazabicyclo [5.4.0]undec-7-ene in the presence of a hydrogen bond acceptor to produce 3 -[2beta-carbomethoxy-4beta-ethynyl-4alpha,6alpha-(di-O-isopropylidenyl)cyclohexan- 1-yl]-nitromethyl-4,4,5-trimethoxy-1-oxo-1,2,3,4-tetrahydronaphthalene; and

cyclizing said 1-oxotetrahydronaphthalene to produce 7alpha,9alpha-(di-O-isopropylidenyl)-9beta-ethynyl-12-hydroxy-6-nitro- 4,5,5-trimethoxy-5,5a,6, 6a,7,8,9,10,10a,11-decahydro-11-naphthacenone;

the step of cyclizing said 1-oxotetrahydronaphthalene including the steps of converting said decahydro-11-naphthacenone to 7alpha,9alpha-(di-O-isopropylidenyl)-4,5-dimethoxy-9beta-ethynyl-12-hydroxy- 6-nitro-6,6a,7,8,9,10,10a, 11-octahydro-11-naphthacenone, oxidizing said octahydro-11-naphthacenone to 7alpha,9alpha-(di-O-isopropylidenyl)-9beta-ethynyl-11 -hydroxy-4-methoxy-6-nitro-7,8,9,10-tetrahydro-5,12-naphthacenedione, hydrolysing said 5,12-naphthacenedione to 6-desoxy-6-nitrodaunomycinone, reducing said nitronaphthacenedione to 6-amino-7alpha,9alpha-(di-O-isopropylidenyl)-9 beta-ethynyl-11-hydroxy-4-methoxy-7,8,9,10-tetrahydro-5,12-naphthacenedione, and converting said aminonaphthacenedione by way of the 6-diazonium derivatives to daunomycinone, 6-desoxydaunomycinone, the 6-desoxy-6-halodaunomycinones, or said analogues.

5,594,159
PRODUCING $CF_3CH_2CF_3$ AND/OR $CF_3CH{=}CF_2$ BY THE CONVERSION OF ALPHA-HYDROPERFLUOROISOBUTYRIC ACID COMPOUNDS
Scott C. Jackson, Kennett Square, Pa.; Paul R. Resnick, and Steven H. Swearingen, both of Wilmington, Del., assignors to E I Du Pont De Nemours and Company, Wilmington, Del.
Filed Apr. 13, 1995, Ser. No. 421,095
Int. Cl.[6] C07C *17/363;17/361;19/08;21/18*
U.S. Cl. 570—142 12 Claims

1. A process for producing at least one compound selected from the group consisting of 1,1,1,3,3,3-hexafluoropropane and 1,1,1,3,3-pentafluoropropene, comprising:

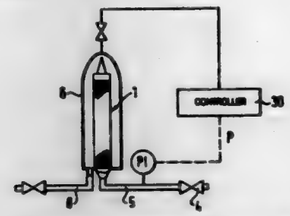
(1) providing a mixture comprising water and at least one carboxy compound selected from the group consisting of $(CF_3)_2CHCO_2H$ and its water soluble salts, said mixture having a pH of less than about 4; and

(2) reacting the mixture provided in (1) at an elevated temperature of at least about 75° C.

5,594,160

Patent Not Issued For This Number

5,594,161
METHOD AND APPARATUS FOR RAPIDLY TESTING THE INTEGRITY OF FILTER ELEMENTS
Horst Randhahn, Darmstadt-Eberstadt, and Hartmut Vogelman, Dreieich, both of Germany, assignors to Pall Corporation, East Hills, N.Y.
Continuation of Ser. No. 142,431, Feb. 22, 1994, abandoned. This application Feb. 27, 1995, Ser. No. 395,289
Claims priority, application Germany, Mar. 24, 1992, 42 09 519.0
Int. Cl.[6] G01N *15/08*
U.S. Cl. 73—38 30 Claims



1. A method of testing the integrity of a filter element in a filter assembly comprising the steps of:

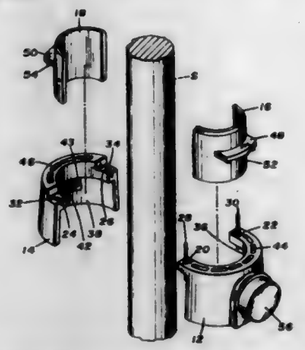
a) wetting filter material of a filter element having an inlet side and an outlet side connected to an outlet conduit,

b) subjecting the inlet side of the filter element to a gas pressure,

c) measuring the pressure in the outlet conduit as a function of time with a downstream outlet valve for the outlet conduit closed wherein the gas pressure at the inlet side of the filter is held at a constant value during said pressure measuring step, and

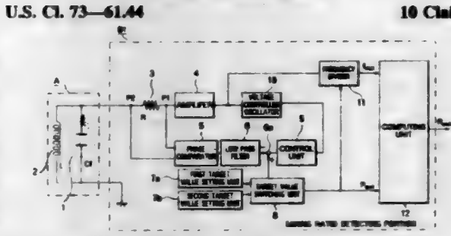
d) determining whether the pressure measured at a preselected time exceeds a reference pressure by a predetermined amount.

5,594,162
VALVE STEM GAS LEAK DETECTOR
James P. Dolan; Patrick M. Dolan; James T. Dolan, and Margaret R. Dolan, all of 4119 NE. 96th St., Seattle, Wash. 98115
Filed Jun. 6, 1995, Ser. No. 465,819
Int. Cl.[6] F16L *55/168;* G01W *1/11;* F16K *41/04*
U.S. Cl. 73—46 11 Claims



1. A valve stem gas leak sensor comprising a generally cylindrical enclosure closely surrounding the valve stem of a possibly leaking petroleum flow line valve, said cylindrical enclosure being situated adjacent the valve packing gland and being interiorly open around said valve stem, a hydrocarbon gas sensing material layer on the interior surface of said enclosure, and electrical conductor means electrically connected to said hydrocarbon gas sensing material with portions of said conductor means exposed exteriorly of said enclosure so as to be contactable by external monitoring equipment which, by sensing a change in the electrical resistance of said gas sensing material caused by adsorption of hydrocarbon gas into the sensing material layer, provides an indication of there being hydrocarbon gas present interiorly of said enclosure, said generally cylindrical enclosure comprising two substantially semi-cylindrical segments, each having mating surfaces designed to mate together in a complementary manner with metallic pins in one segment fitting in jacks in the other segment which are arranged to hold said segments together around the valve stem.

5,594,163
FUEL MIXING RATIO DETECTING DEVICE
Hiroyoshi Suzuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 8, 1995, Ser. No. 436,763
Claims priority, application Japan, May 12, 1994, 6-98650
Int. Cl.[6] G01R *27/26*
U.S. Cl. 73—61.44 10 Claims



1. A fuel mixing ratio detecting device comprising:

an LC resonance circuit having an electrostatic capacity detecting portion for detecting an electrostatic capacity of fuel and means electrically equivalent to a coil connected in parallel with the electrostatic capacity detecting portion;

a phase lock circuit having a voltage-controlled oscillator for generating a high-frequency signal having a frequency determined by a control voltage and for applying the generated high-frequency signal to the LC resonance circuit, a phase comparator for detecting a phase difference between a voltage and a current of the high-frequency signal applied to the LC resonance circuit, and a control unit for controlling the control voltage supplied to the voltage-controlled oscillator according to a difference between the phase difference detected by the phase comparator and a preliminarily set phase-difference target value;

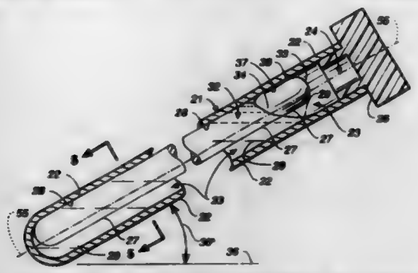
target value switching means for changing the phase difference target value between a first target value and a second target value different from the first target value to thereby set the changed target value in the control unit;

dielectric-constant computing means for computing a dielectric constant of the fuel on the basis of a first control output of the phase lock circuit after the phase-difference target value is changed to the first target value by the target value switching means;

electric-conductivity computing means for computing an electric conductivity of the fuel on the basis of an amount of shift between the first control output, which is outputted from the phase lock circuit after the phase-difference target value is changed to the first target value by the target value switching means, and a second control output, which is outputted from the phase lock circuit after the phase-difference target value is changed to the second target value by the target value switching means; and

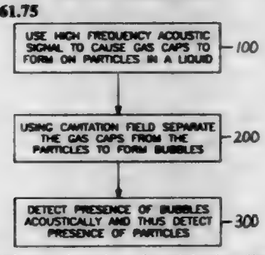
mixing-ratio detecting means for detecting a fuel mixing ratio of the fuel from the computed dielectric constant and the computed electric conductivity.

5,594,164
METHOD AND APPARATUS FOR RAPID DETERMINATION OF BLOOD SEDIMENTATION RATE
Brian S. Ball, 2526 Loma Linda University Medical Center, Loma Linda, Calif. 92350
Filed Jul. 12, 1994, Ser. No. 270,681
Int. Cl.[6] G01N *33/49*
U.S. Cl. 73—61.66 **19 Claims**



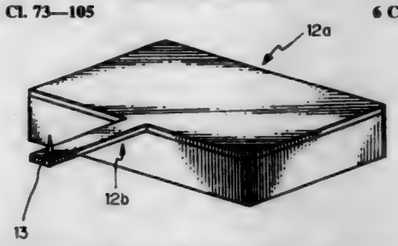
1. A specimen container for use in determining the erythrocyte sedimentation rate of a blood specimen comprising:
a container body having a wall defining a lumen formed to hold said blood specimen therein, said lumen including a lumen portion in fluid communication with a remainder of said lumen and defined by opposed portions of said wall spaced apart by a distance less than a distance required for entry of a liquid mixing bubble into said lumen portion, and said opposed portions of said wall further being sufficiently close together to accelerate the formation of rouleaux, as compared to the rate of formation of rouleaux in a Westergren sedimentation tube, during a lag phase of sedimentation.

5,594,165
METHOD AND APPARATUS FOR DETECTION OF PARTICLES IN ULTRA-PURE LIQUIDS USING ACOUSTIC SCATTERING AND CAVITATION
Sameer I. Madanshetty, Cambridge, Mass., assignor to Trustees of Boston, Boston, Mass.
Continuation of Ser. No. 257,416, Jun. 7, 1994, abandoned. This application Mar. 25, 1996, Ser. No. 621,511
Int. Cl.[6] G01N *15/06*
U.S. Cl. 73—61.75 **23 Claims**



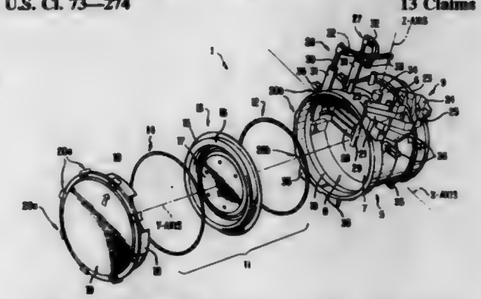
1. A method for the detection of particles in a liquid comprising the steps of:
nucleating cavitation from each particle within the liquid by simultaneous application of a high frequency acoustic field and a low frequency, high tensile pressure pulsed cavitation field said step of nucleating cavitation comprising:
inducing gas caps to form on said particles; and,
separating said gas caps from said particles to form bubbles in said liquid; and
detecting an acoustic signature which comprises a reflection of said high frequency acoustic field or said low frequency, high tensile pressure pulsed cavitation filled off of said bubbles, whereby said acoustic signature indicates that the particles are present in the liquid.

5,594,166
CANTILEVER FOR USE WITH ATOMIC FORCE MICROSCOPE AND PROCESS FOR THE PRODUCTION THEREOF
Junju Itoh, and Yasushi Toma, both of Iberaki-ken, Japan, assignors to Ebara Research Co., Ltd., Fujisawa, and Agency of Industrial Science and Technology, Tokyo, both of Japan
Filed Sep. 22, 1994, Ser. No. 311,018
Claims priority, application Japan, Sep. 24, 1993, 5-261480
Int. Cl.[6] G01B *5/28*
U.S. Cl. 73—105 **6 Claims**



1. A cantilever for use with an atomic force microscope that comprises a single-crystal silicon base having adequate mechanical strength, a cantilever beam that is made from a silicon oxide film and which is joined at one end to said base, and a conical stylus with a sharp tip that is formed on said cantilever beam at the other end which is opposite the end joined to said base, said conical stylus being made of single-crystal silicon and having a height of 8–10 μm, an aspect ratio of at least 2, and said sharp tip having a curvature of 10 nm or below, and wherein all surfaces of said cantilever are covered with a thin electroconductive film.

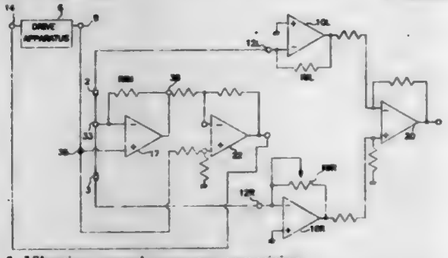
5,594,167
GAS METER HAVING CAM FOR RECIPROCATING VALVE COVERS AND RELATED METHODS
Edward R. Ward, Crittenden, Ky., assignor to Schlumberger Industries, Inc., Norcross, Ga.
Filed May 5, 1995, Ser. No. 435,596
Int. Cl.[6] G01F *15/10*
U.S. Cl. 73—274 **13 Claims**



1. A gas meter comprising:
a housing defining first and second cavities, and defining an outlet passage with first and second ends, the housing defining first and second passages on opposite sides of the outlet passage in proximity to the first end of the outlet passage, and the housing defining third and fourth passages on opposite sides of the outlet passage in proximity to the second end of the outlet passage;
a first diaphragm mounted to the housing in the first cavity, the first and second passages communicating with opposite sides of the first diaphragm;
a second diaphragm mounted in the second cavity of the housing, the third and fourth passages communicating with opposite sides of the second diaphragm;
a first cam rotation assembly coupled to the first diaphragm;

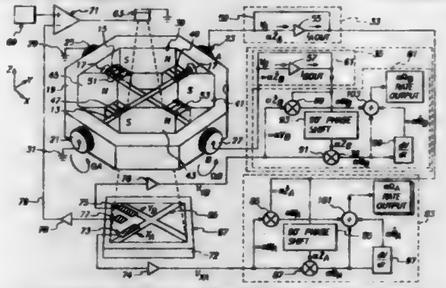
a second cam rotation assembly coupled to the second diaphragm;
a cam coupled to and rotated by the first and second cam rotation assemblies;
a first valve cover slidably mounted to reciprocate between a first position uncovering the first passage and connecting the second passage to the outlet passage, and a second position uncovering the second passage and connecting the first passage with the outlet passage;
a second valve cover slidably mounted to reciprocate between a first position uncovering the third passage and coupling the fourth passage to the outlet passage, and a second position connecting the fourth passage to the outlet passage and uncovering the third passage;
a first arm coupled between the cam and the first valve cover, to reciprocate the first valve cover between the first and second positions of the first valve cover as the cam rotates; and
a second arm coupled between the cam and the second valve cover, to reciprocate the second valve cover between first and second positions of the second valve cover as the cam rotates.

5,594,168
VIBRATION CONTROL APPARATUS HAVING OSCILLATION FREQUENCY REGULATION
Kokichi Terajima, Tokyo, Japan, assignor to Akai Electric Co., Tokyo, Japan
Filed Jan. 10, 1995, Ser. No. 371,026
Claims priority, application Japan, Aug. 10, 1994, 6-188403; Aug. 30, 1994, 6-205405
Int. Cl.[6] G01P *9/04*; H01L *41/08*
U.S. Cl. 73—496 **25 Claims**



1. Vibration control apparatus comprising:
(a) a vibrator having a vibration member having at least one side surface with a resonance point,
(b) first and second piezo-electric elements on said side surface, each of said piezo-electric elements having first and second electrodes,
(c) a drive apparatus having a signal output terminal to output a vibrator drive signal and a signal input terminal,
(d) first and second feedback amplifiers, each of said feedback amplifiers having a feedback input terminal, and
(e) a third feedback amplifier having a feedback input terminal, a signal input terminal and a signal output terminal,
wherein said feedback input terminal of said first feedback amplifier is connected to said first electrode of said first piezo-electric element and the feedback input terminal of said second feedback amplifier is connected to said first electrode of said second piezo-electric element, said feedback input terminal of said third feedback amplifier is connected to said second electrode of said first piezo-electric element and to said second electrode of said second piezo-electric element, said signal input terminal of said third feedback amplifier is connected to said signal output terminal of said drive apparatus, and said signal output terminal of said third feedback amplifier is connected to said signal input terminal of the drive apparatus, so that a signal based on an output signal of said third feedback amplifier is fed back to said drive apparatus.

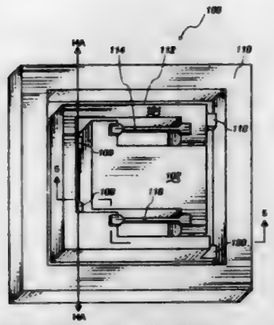
5,594,169
OPTICALLY SENSED WIRE GYROSCOPE APPARATUS AND SYSTEM, AND METHODS FOR MANUFACTURE AND CURSOR CONTROL
John Field, Woodside, and Steven P. Hotelling, Cupertino, both of Calif., assignors to Gyration,Inc., Saratoga, Calif.
Filed Nov. 4, 1994, Ser. No. 334,675
Int. Cl.[6] G01P *9/04*; G01C *19/00*
U.S. Cl. 73—504.14 **48 Claims**



1. A gyroscopic device for sensing motion and comprising:
a frame;
a first tensioned wire having first and second ends suspended by the frame and including a suspended wire portion therebetween:
a first pair of magnets mounted on the frame and having opposite poles spaced apart about the first tensioned wire for forming a first gap and a first magnetic field therein oriented across the first gap with the suspended wire portion of the first tensioned wire disposed within the first magnetic field;
a first oscillator connected to the first tensioned wire for supplying a first oscillating signal to the first tensioned wire to vibrate the first tensioned wire within the first magnetic field in substantially perpendicular orientation thereto and at a selected vibration frequency;
a source of radiation spaced above the first tensioned wire for radiantly illuminating a selected portion thereof;
a detector spaced beneath the first tensioned wire for producing a first output proportional to lateral displacement of a portion of the first tensioned wire along the first magnetic field in response to variations in the radiant illumination received thereby caused by the vibrating first tensioned wire; and
a first circuit connected to the first tensioned wire and responsive to back potential on the first tensioned wire for producing a second output proportional to velocity of vibration of a portion of the first tensioned wire in a direction substantially perpendicular to the first magnetic field.

5,594,170
K_{ip} CANCELLATION IN A PENDULOUS SILICON ACCELEROMETER
Rex B. Peters, Woodinville, Wash., assignor to AlliedSignal Inc., Redmond, Wash.
Continuation of Ser. No. 260,140, Jun. 15, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 558,049
Int. Cl.[6] G01P *15/10;15/00*
U.S. Cl. 73—514.29 **10 Claims**

1. An accelerometer for sensing acceleration along an input axis comprising:
a mounting base;
a pendulum;
an isolator coupled to said mounting base and said pendulum, said mounting base, said pendulum and said isolator defining a common plane;
one or more flexures for rotatably mounting said pendulum relative to said isolator about a predetermined axis;
means for constraining the movement of said pendulum, said constraining means coupled between said pendulum and said



isolator and including a plurality of resonators formed in the common plane adjacent a top side of said accelerometer; and at least one isolator flexure for rotatably coupling said mounting base and said isolator, said isolator flexure disposed adjacent a bottom side of said accelerometer, wherein the stiffness of said isolator flexure is selected to reduce cross-coupling errors in the output signal of the accelerometer.

5,594,171

CAPACITANCE TYPE ACCELERATION SENSOR

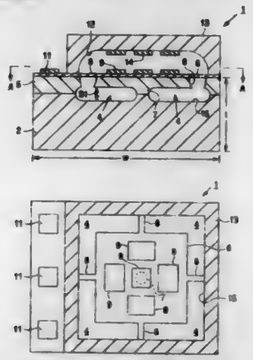
Tatsuya Ishida, and Yasuo Imaeda, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 25, 1995, Ser. No. 548,043

Claims priority, application Japan, Oct. 31, 1994, 6-267804

Int. Cl.[6] G01P *15/125;* **H01G** *7/00*

U.S. Cl. 73—514.32 **6 Claims**



1. A capacitance type acceleration sensor comprising:
- a silicon bass plate having a first recess portion on the surface thereof;
- a mass portion movably arranged in said first recess portion;
- a plurality of movable electrodes disposed on said mass portion;
- a plurality of stationary electrodes arranged so as to oppose to said movable electrodes and being separate from said movable electrodes;
- a support for elastically supporting said mass portion from the lower side of said mass portion; and
- a plurality of beams for elastically supporting said mass portion from the lateral side of said mass portion.

5,594,172

SEMICONDUCTOR ACCELEROMETER HAVING A CANTILEVERED BEAM WITH A TRIANGULAR OR PENTAGONAL CROSS SECTION

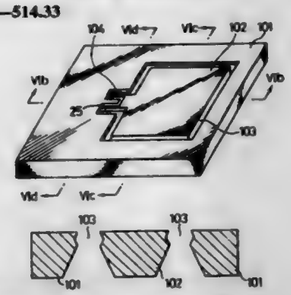
Toshiro Shinohara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 20, 1990, Ser. No. 540,613

Claims priority, application Japan, Jun. 21, 1989, 1-156836; Aug. 4, 1989, 1-201360

Int. Cl.[6] G01P *15/12*

U.S. Cl. 73—514.33 **10 Claims**



1. A semiconductor accelerometer, comprising:
- a silicon semiconductor substrate as a frame having a (100) surface;
- a weight formed in the substrate and surrounded by the substrate with a gap therebetween;
- a silicon cantilevered beam formed in the substrate for connecting the weight to the substrate; and
- a strain sensing device formed in a surface portion near a support portion of the cantilevered beam,

the silicon cantilevered beam having a triangular cross section defined by one (100) surface and two (111) surfaces.

5,594,173

TEST DEVICE FOR VEHICLES HAVING A WHEEL ROTATION SPEED SENSOR WHICH IS SENSITIVE TO MAGNETIC FIELDS

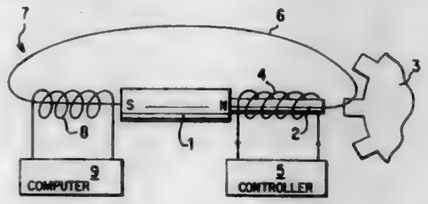
Gerhard Frey, Esslingen; Thomas Hirth, Stuttgart; Dieter Grohmann, Karlsruhe, and Willi Reichart, Jettingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Aug. 18, 1995, Ser. No. 516,702

Claims priority, application Germany, Aug. 18, 1994, 44 29 311.9

Int. Cl.[6] G01P *3/44;* **G01B** *7/00;* **G01N** *27/72;* **G01R** *35/00*

U.S. Cl. 73—520.01 **8 Claims**



1. A test device for a vehicle having a wheel rotation speed sensor which is sensitive to magnetic fields, comprising:
- a wheel rotation simulation device including a magnet coil positionable in a magnetic field region of said wheel rotation speed sensor such that a magnetic field coupling is provided to stimulate said wheel rotation speed sensor; and
- a control unit coupled to said magnet coil for applying an AC voltage thereto, and controlling an AC voltage frequency of said magnet coil to determine a sensed rotation speed of a simulated wheel rotation.

5,594,174

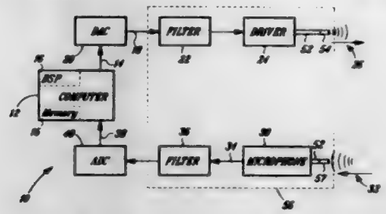
SYSTEM AND METHOD FOR MEASURING ACOUSTIC REFLECTANCE

Douglas H. Keefe, Seattle, Wash., assignor to University of Washington, Seattle, Wash.

Division of Ser. No. 254,311, Jun. 6, 1994, abandoned. This application May 26, 1995, Ser. No. 450,870

Int. Cl.[6] A61B *5/12*

U.S. Cl. 73—585 **33 Claims**



1. A system for the measurement of a linear response of an acoustic waveguide having unknown acoustical transfer characteristics, the system comprising:
- a probe assembly positionable in proximity with the acoustic waveguide;
- an acoustic source within said probe assembly to produce an acoustic stimulus and deliver said acoustic stimulus to the acoustic waveguide in response to an electrical input signal;
- an acoustic energy detector within said probe assembly to detect acoustic energy signals and convert said detected acoustic energy signals to detected electrical signals;
- an acoustic calibration waveguide having a known acoustic transfer characteristic determined using a calibration waveguide model, including viscothermal losses, for said acoustic calibration waveguide;
- a stimulus signal generator coupled to said acoustic source to generate said electrical input signal, said stimulus generator, at a first time, generating a first electrical input signal when said probe assembly is positioned in said acoustic calibration waveguide, said electrical input signal having a selected duration so that said acoustic stimulus is a short duration sound field having a duration less than a propagation time required for said acoustic stimulus to travel from said acoustic source and be reflected from said acoustic calibration waveguide back to said acoustic energy detector, said stimulus generator, at a second time, generating a second electrical input signal when said probe assembly is positioned in proximity with the unknown acoustic waveguide; and
- a signal processor receiving a first detected electrical signal from said acoustic energy detector at said first time and a second detected electrical signal from said acoustic energy detector at said second time, said signal processor processing said first detected electrical signal to determine a measurement system transfer characteristic of said acoustic source and said acoustic energy detector using said known acoustic transfer characteristic, said signal processor processing said second detected electrical signal to determine a transfer characteristic of the unknown acoustic waveguide based on said measurement system transfer characteristic.

5,594,175

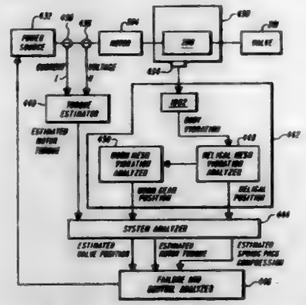
APPARATUS AND METHOD FOR NON-INVASIVE DIAGNOSIS AND CONTROL OF MOTOR OPERATED VALVE CONDITION

Richard H. Lyon, Belmont, Mass.; Jangbom Chai, Seoul, Rep. of Korea; Jeffrey H. Lang, Sudbury, Mass.; Wayne H. Hagman; Stephen D. Umans, both of Belmont, Mass., and Olli J. Saarela, Helsinki, Finland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 6, 1994, Ser. No. 239,073

Int. Cl.[6] G01M *13/00*

U.S. Cl. 73—593 **80 Claims**



1. An apparatus for generating a parametric signature signal that corresponds to an operational aspect of a motor operated valve (an "MOV"), the MOV having:
- I. an electric motor, having input electrical connections, a stator, a rotor and an output shaft;
- II. within a housing, a first gear pair having a first gear and a second gear, the first gear being coupled to said output shaft; and
- III. a valve plug that is coupled to the second gear and that is movable, relative to a valve seat, in response to rotation of the output shaft;

said signature signal generating apparatus comprising:
- a. vibrationally coupled with said housing, a vibrations pickup arranged to generate an electromagnetic signal that corresponds to vibration of said housing (designated a "housing signal");
- b. electromagnetically coupled with the output of said vibration pickup, a vibration analyzer, which generates a position signal that corresponds to an estimate of the position of at least one element of said MOV that is coupled to said first gear, with respect to time;
- c. a torque estimator, which generates a signal that corresponds to an estimate of the torque between the stator and the rotor of said motor with respect to time (designated the "torque estimate signal"); and
- d. a system analyzer, coupled to the outputs of the torque estimator and the vibration analyzer, which system analyzer generates a signature signal that corresponds to the relation between the motor torque and the at least one MOV element position.

5,594,176

SCAN ASSEMBLY AND METHOD FOR TRANSFERRING POWER AND DATA ACROSS A ROTARY INTERFACE

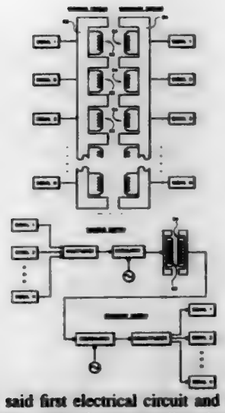
Karl F. Kiefer, Woodlands, Tex., assignor to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 222,621, Apr. 5, 1994. This application Jul. 3, 1995, Ser. No. 497,775

Int. Cl.[6] G01R *33/12*

U.S. Cl. 73—623 **8 Claims**

1. A method for transferring power and a data signal across a rotating interface of a scan assembly used for inspecting gas pipes, said scan assembly comprising a rotating sensor section having a first electrical circuit and a stationary end section having a second



electrical circuit, said first electrical circuit and said second electrical circuit forming a pair of corresponding electrical circuits, the rotating interface being defined by said sensor section and said stationary end section, and wherein a plurality of data signals are to be transmitted across the rotating interface, the method comprising the steps of:

multiplexing the plurality of data signals;

modulating said multiplexed signals onto a carrier signal;

placing said carrier signal on said first electrical circuit of said rotating sensor section;

magnetically coupling said first electrical circuit with said second electrical circuit;

decoupling said carrier signal at said second electrical circuit;

demodulating said data signals from said carrier signal; and

demultiplexing said multiplexed data signals.

5,594,177

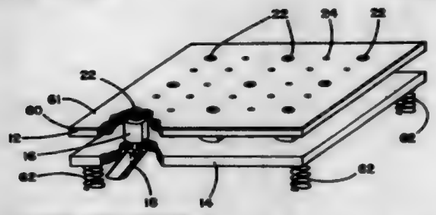
SHAKER TABLE

John K. Hasse, 2745 - 136th Ave., Hopkins, Mich. 49328

Filed May 17, 1995, Ser. No. 443,861

Int. Cl.[6] G01M *7/06*

U.S. Cl. 73—663 **8 Claims**



1. A shaker table comprising:

an upper plate on which a test product is mounted, the upper plate having a plurality of vibrator mounting openings therein;

a lower plate spaced below the upper plate, the lower plate having a plurality of vibrator mounting openings therein that are aligned with vibrator mounting openings in the upper plate;

a plurality of spacers mounted between the plates, the spacers each having a central portion positioned between the plates, a upper shaft extending upwardly therefrom, and a lower shaft extending downwardly therefrom, the upper and lower shafts fitting respectively in the corresponding vibration mounting openings in the upper and lower plates, the central portion abutting the upper and lower plates so as to space the plates a predetermined distance apart, the shafts having concentric axial openings therein that extend into the central portion, the openings being threaded;

fastener means for securely mounting the spacers to the upper plates; and

fastener means for mounting vibrators to an underside of the lower plate, said fastener means including threaded fasteners that extend through openings in the vibrators and engage the threaded internal openings in the lower shafts, the fastener means thereby serving to attach the lower plate to the spacers and the upper plate.

5,594,178

STRENGTH EVALUATION METHOD FOR BRITTLE MATERIAL PIECES

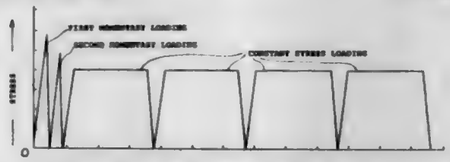
Hideo Takahashi, Yokohama; Shinji Tanaka, Funabashi, and Hiroshi Maeno, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 2, 1995, Ser. No. 552,118

Claims priority, application Japan, Nov. 8, 1994, 6-273554

Int. Cl.[6] G01N *3/32*

U.S. Cl. 73—808 **8 Claims**



1. A strength evaluation method for evaluating the strength of brittle material pieces by applying a stress, the method comprising the steps of:

repeating momentary loading a plurality of times to a brittle material piece, the momentary loading momentarily applying a tensile stress to the brittle material piece and then immediately releasing the tensile stress; and

gradually decreasing a peak load value of a subsequent momentary loading of said repeated momentary loadings.

5,594,179

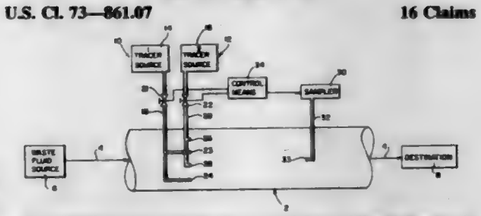
TRACER TYPE FLOWMETER AND METHOD USING TWO OR MORE INJECTED TRACE MATERIALS

Lawrence B. Marsh, Buckeystown, Md., assignor to Marsh-McBirney, Inc., Frederick, Md.

Filed Nov. 6, 1995, Ser. No. 553,985

Int. Cl.[6] G01F *1/708*

U.S. Cl. 73—861.07 **16 Claims**



1. Apparatus for measuring the rate of flow of liquid flowing in a conduit, comprising:

(a) injecting means for injecting a known quantity and concentration of at least two trace materials into the liquid;

(b) sample collecting means arranged in the liquid downstream from said injecting means for collecting at least one sample containing the liquid and a concentration of said trace materials;

(c) concentration determining means for determining said concentration of said trace materials in said sample;

(d) comparing means for comparing said concentration of said trace materials in said sample; and

(e) calculating means for calculating the flow rate of the liquid as a function of said trace material concentrations in said sample.

5,594,180

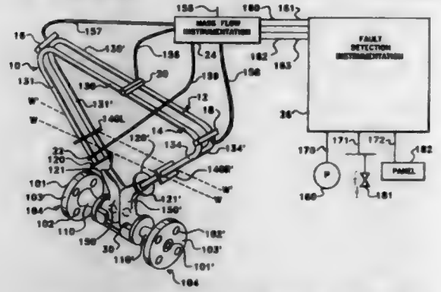
METHOD AND APPARATUS FOR FAULT DETECTION AND CORRECTION IN CORIOLIS EFFECT MASS FLOWMETERS

Brent L. Carpenter, Broomfield, and Antonio X. Luna, Longmont, both of Colo., assignors to Micro Motion, Inc., Boulder, Colo.

Filed Aug. 12, 1994, Ser. No. 289,413

Int. Cl.[6] G01F *1/84*

U.S. Cl. 73—861.356 **34 Claims**



1. A method for detecting abnormal operating conditions in an operating Coriolis effect mass flowmeter comprising the steps of:

measuring the values of operating parameters of said operating Coriolis effect mass flowmeter, wherein said operating parameters include the vibration frequency of said operating Coriolis effect mass flowmeter and the drive power of said operating Coriolis effect mass flowmeter;

selecting at least one value selected from the group consisting of the measured values of said operating parameters, slopes of said measured values of said operating parameters, and curvatures of said measured values of said operating parameters;

determining that said at least one value has deviated from a nominal value by a predetermined amount indicative of an occurrence of one of said abnormal operating conditions;

generating an output signal indicating said occurrence of said one of said abnormal operating conditions in response to said determination that said at least one value has deviated from a nominal value by said predetermined amount; and

applying said output signal to utilization means for purposes including the correction of said one of said abnormal operating condition in said flowmeter.

5,594,181

ULTRASONIC FLOW METER

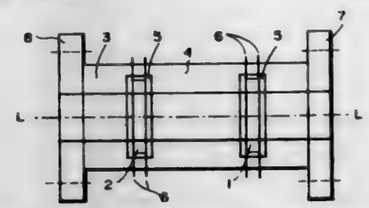
Gerd Stange, Nortorf, Germany, assignor to Nu-Tech GmbH, Neumuenster, Germany

Filed May 4, 1995, Ser. No. 434,804

Claims priority, application Germany, May 4, 1994, 44 16 367.3

Int. Cl.[6] G01F *1/66*

U.S. Cl. 73—861.28 **20 Claims**



1. Ultrasonic flow meter, comprising two ring-shaped piezoelectric transducers which have ring-shaped piezo elements, the transducers being spaced to each other in axial symmetry and one of them being operated as an ultrasonic transmitter and the other one as an ultrasonic receiver, a medium, the flow rate of which is to be measured, flows through both the transducers essentially parallel to the symmetry axis of the transducer, wherein an output voltage of the transducer operated as the ultrasonic receiver is fed back to the transducer operated as the ultrasonic transmitter after amplification.

5,594,182

APPARATUS FOR TAKING A SAMPLE OF A FLUID AND PART FOR SUCH AN APPARATUS

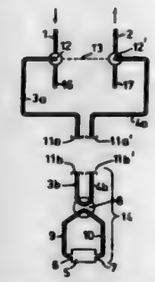
Adolf E. Jansen, Rotterdam, Netherlands, assignor to Dobart Holding B.V., Rotterdam, Netherlands

Filed Feb. 24, 1995, Ser. No. 393,484

Claims priority, application Netherlands, Feb. 25, 1994, 9400291

Int. Cl.[6] G01N *1/10*

U.S. Cl. 73—863.71 **11 Claims**



1. Apparatus for taking a sample of a fluid enclosed in a container, which apparatus is provided with a sampling station which is connectable to the container via a fluid supply conduit and a fluid discharge conduit, with a sample supply conduit connected by a fluid supply valve to the fluid supply conduit and a sample discharge conduit connected by a fluid discharge valve to the fluid discharge conduit, with a sampling bomb for containing the fluid sample, which sampling bomb comprises a sampling bomb space, a sampling bomb supply opening and a sampling bomb discharge opening, which are connectable to the sample supply conduit and the sample discharge conduit, respectively, and with a four-way cock, in one of the two positions of the four-way cock the fluid supply conduit being connected to the sampling bomb supply opening and the fluid discharge conduit being connected to the sampling bomb discharge opening, characterized in that the sampling bomb supply opening and the sampling bomb discharge opening are firmly connected to the four-way cock by a sampling bomb supply conduit and a sampling bomb discharge conduit, respectively, that the sample supply conduit is formed by a first sample supply sub conduit having a first end connected to the fluid supply valve and a second end comprising a rapid-action coupling and by a second sample supply sub conduit having a first end with a rapid-action coupling for coupling to the rapid-action coupling of the first sample supply sub conduit and a second end firmly connected to the four-way cock, that the sample discharge conduit is formed by a first sample discharge sub conduit having a first end connected to the fluid discharge valve and a second end comprising a rapid-action coupling and by a second sample discharge sub conduit having a first end with a rapid-action coupling for coupling to the rapid-action coupling of the first sample discharge sub conduit and a second end firmly connected to the four-way cock, each of said rapid-action couplings including a coupling element which shuts off its respective sub conduit when detaching, in a first position of the four-way cock the second sample supply sub conduit which is connected to the four-way cock being connected to the second sample discharge sub conduit which is connected to the four-way cock and the sampling bomb supply conduit with the sampling bomb discharge conduit, and in a second position of the four-way cock the second sample supply sub conduit which is connected to the four-way cock being connected to the sampling

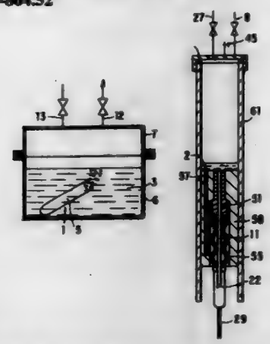
bomb supply conduit and the second sample discharge sub conduit which is connected to the four-way cock being connected to the sampling bomb discharge conduit.

5,594,183

PROCESS FOR METERING, IN PARTICULAR MICROVOLUMES OF A LIQUID; APPLICATION TO OBTAINING CONTROLLED DILUTIONS, ESPECIALLY NANOMOLAR DILUTIONS

Bruno Colin, Tassin La Demi-Lune, France, assignor to Bio Merieux, L'Etoile, France

Filed Jul. 26, 1994, Ser. No. 272,398
Claims priority, application France, Jul. 28, 1993, 93 09517
Int. Cl.[6] G01N *1/14*
U.S. Cl. 73—864.52 **21 Claims**



1. A process for metering a predetermined quantity of a liquid, comprising the steps of:

(a) providing at least one capillary cavity that is capable of containing said liquid, the at least one capillary cavity having an outwardly emerging orifice that is used for introducing and emptying said liquid, the outwardly emerging orifice being dimensioned such that the liquid cannot enter or leave said cavity spontaneously;

(b) providing a body of said liquid;

(c) evacuating said cavity via the orifice, initially free of any liquid, at least partially in order to bring a residual internal pressure of said cavity to a value which is less than a pressure prevailing on the liquid body during step (d);

(d) communicating the interior of the at least partially evacuated capillary cavity to the liquid body via the orifice, and subsequently introducing into said cavity a predetermined volume of said liquid in said liquid body;

(e) separating the capillary cavity from a remainder of the liquid body;

(f) emptying only the predetermined volume of said liquid contained in said capillary cavity via the orifice, which has been separated from the liquid body.

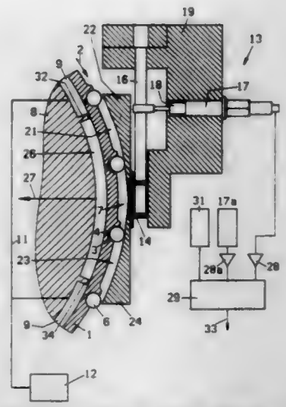
5,594,184

METHOD OF AND APPARATUS FOR DETERMINING THE WEIGHT OF ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

Dierk Schröder, Hamburg; Dirk Sacher, Westorf, and Peter Straube, Hamburg, all of Germany, assignors to Hauni Maschinenbau AG, Hamburg, Germany

Filed Jul. 6, 1995, Ser. No. 498,641
Claims priority, application Germany, Aug. 4, 1994, 44 27 605.2
Int. Cl.[6] G01G *13/00*
U.S. Cl. 73—865 **28 Claims**

1. A method of determining the weight of rod-shaped articles of the tobacco processing industry, comprising the steps of conveying



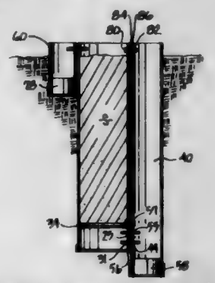
successive articles of a series of articles along an arcuate path between different levels through a testing station wherein the articles are acted upon by centrifugal force of a magnitude which is indicative of the weight of the respective articles; generating first signals denoting the magnitude of centrifugal force acting upon the articles being conveyed through the testing station; and converting the first signals into second signals denoting the weight of the respective articles.

5,594,185

SELF-CONTAINED, MODULAR LYSIMETER AND METHOD OF USING THE SAME

Martin W. Wimberry; Ranga R. Velagaleti; Mark D. Williams; Donna Daly, all of Columbia, Mo.; Len R. Swain, Raleigh, and Jerome B. Weber, Wake Forest, both of N.C., assignors to Analytical Bio Chemistry Laboratories, Inc., Columbia, Mo.

Filed Jun. 7, 1995, Ser. No. 473,732
Int. Cl.[6] G01N *1/00*
U.S. Cl. 73—866 **15 Claims**



13. A self-contained, modular lysimeter for evaluating the mobility, dissipation and degradation of chemicals and their degradates through a soil matrix, comprising:

a. a first vessel having a hollow construction and having a capped bottom end, said first vessel for receiving a soil matrix;

b. said first vessel bottom end having a screen mounted upwardly thereof and means forming a chamber in said bottom and for receiving leachate dissipated through said soil matrix;

c. a second vessel of hollow construction and having capped top and bottom ends, said second vessel for receiving and collecting leachate from said first vessel;

d. means joining said first and second vessels together in contacting side-by-side relationships to comprise a modular structure, said means being connectible and disconnectible to join and separate said first and second vessels from one another; and

e. a flow conduit extending from said first vessel from said chamber in the bottom thereof to said second vessel above its bottom end to form a reservoir, whereby said leachate flows from said first vessel and collects in said reservoir in said second vessel.

5,594,186

HIGH DENSITY METAL COMPONENTS MANUFACTURED BY POWDER METALLURGY

Robert F. Krause, Valparaiso; Joseph H. Butarzik, Munster, both of Ind., and Harold R. Kokal, Glenwood, Ill., assignors to Magnetics International, Inc., Burns Harbor, Ind.

Filed Jul. 12, 1995, Ser. No. 501,670
Int. Cl.[6] B22F *1/00*
U.S. Cl. 75—228 **30 Claims**



1. A method of manufacturing a metal component comprising:

(a) forming a metal particle mixture, said metal particle mixture comprising:

(i) metal particles, and

(ii) about 0.015% to about 0.5% by weight of a lubricant, wherein the metal particles are substantially linear, nonspiralled, acicular particles having a substantially triangular cross section;

(b) subjecting the metal particle mixture to a cold uniaxial pressing operation to form a green compact having a density at least 95% of the theoretical density of the metal component; and

(c) subjecting the green compact to a heating operation for a sufficient time and at a sufficient temperature to pyrolyze the lubricant and to form the metal component.

5,594,187

FORGED POWDER METAL CONNECTING ROD WITH STRESS RISER CREASE FORMED IN SIDE THRUST FACE

Jean C. Lynn, Bloomfield Hills, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Apr. 2, 1996, Ser. No. 626,658
Int. Cl.[6] C22C *38/00*
U.S. Cl. 75—246 **3 Claims**

1. An improved unitary connecting rod which is easily cracked to form a separable bearing cap manufactured by hot forging a molded powder metal sintered preform which has an apertured large end portion and a notched side thrust face, the improved unitary rod comprising: a stress riser crease formed in a side thrust face by to concentrate stress developed during cracking caused by the application of a large tension force upon the rod and across the stress riser crease; the stress riser crease being forge formed by inward movement of the spaced surfaces defining the notch in the sintered preform and being characterized by a great depth with respect to its width.

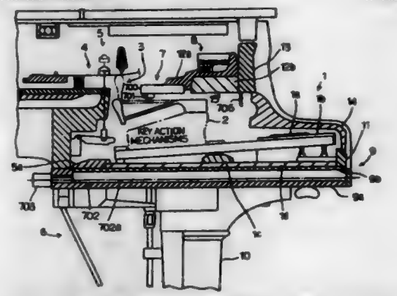


5,594,188

KEYBOARD MUSICAL INSTRUMENT HAVING KEY ACTION MECHANISMS MOVABLE TO AND FROM STRINGS

Kiyoshi Kawamura; Taroh Muramatsu; Manshiro Wada; Nobuo Sugiyama, and Shinya Koseki, all of Shizuoka-ken, Japan, assignors to Yamaha Corporation, Japan

Filed Sep. 17, 1993, Ser. No. 123,294
Claims priority, application Japan, Sep. 22, 1992, 4-279470
Int. Cl.[6] G10D *15/00*
U.S. Cl. 84—171 **6 Claims**



1. A keyboard musical instrument having a silent mode and an acoustic sound mode comprising:

a) a keyboard having a plurality of keys assigned respective notes of a scale, said plurality of keys being swingably supported by a rail so as to be movable between a rest position and an end position;

b) a movable key bed mounting said keyboard;

c) a plurality of sets of strings respectively assigned said notes;

d) a plurality of hammer assemblies associated with said plurality of sets of strings, each of said plurality of hammer assemblies including means for allowing said hammer assemblies to rotate around an axis to strike at least one set of said plurality of sets of strings, said plurality of hammer assemblies being attached to said movable key bed such that said plurality of hammer assemblies move with said movable key bed and said axis of each of said plurality of hammer assemblies remains in a fixed position with respect to said movable key bed;

e) a plurality of key action mechanisms associated with said plurality of hammer assemblies and linked with said plurality of keys for driving said plurality of hammer assemblies through predetermined motions, said plurality of key action mechanisms being attached to said movable key bed such that said plurality of key action mechanisms move with said movable key bed and said predetermined motions remain in a fixed position with respect to said movable key bed;

f) a stopper movably supported by a first stationary member of said keyboard musical instrument and associated with said plurality of hammer assemblies;

g) means for moving said stopper between a blocking position in which said stopper blocks said plurality of hammer assemblies from striking said plurality of sets of strings while said keyboard musical instrument is in said silent mode and a non-blocking position in which said stopper allows said plurality of hammer assemblies allows to strike said plurality of sets of strings while said keyboard musical instrument is in said acoustic sound mode; and

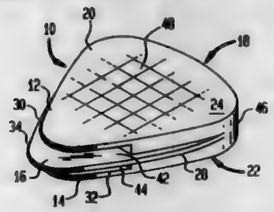
h) driving means for moving said movable key bed away from said plurality of sets of strings when said keyboard musical instrument is placed in said silent mode and moving said movable key bed toward said plurality of sets of strings when said keyboard musical instrument is placed in said acoustic sound mode.

5,594,189

TRIPOINT PLECTRUM FOR STRING INSTRUMENTS

Keith Latteri, 5122 Blue Ridge Ct., Wallington, N.J. 07057

Filed May 5, 1995, Ser. No. 435,730
Int. Cl.[6] G10D *3/16*
U.S. Cl. 84—322 **15 Claims**



1. A one piece plectrum for string instruments, comprising:
a body portion comprising:
opposed surfaces to be gripped,
a continuous sidewall interconnecting the opposed surfaces, the continuous sidewall comprising:
a front region,
a rear region,
opposed side regions;
a pair of spaced-apart pick members integral with the body portion and extending from the front region to a distance from the body portion; and
a central pick member integral with the body portion and extending from the front region in the space between the pair of pick members to a distance from the body portion, and a peripheral edge on the central pick member projecting from the opposed side regions of the body portion.

5,594,190

METHOD OF SUPPORTING HANDBELLS ON AN INFLATED TABLE COVERING PAD

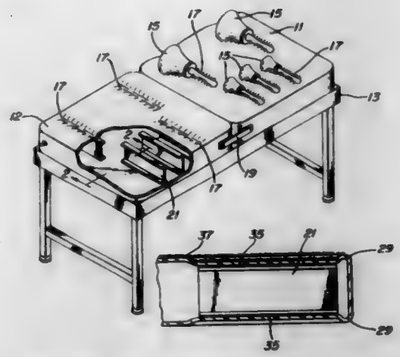
Jacob H. Malta, New Britain, Pa., assignor to Malmark, Inc., Plumsteadville, Pa.

Filed Aug. 21, 1995, Ser. No. 517,424
Int. Cl.[6] G10G *5/00*
U.S. Cl. 84—453 **4 Claims**

1. A method of supporting handbells on a table comprising the steps of:

a) positioning an inflated pad on the table, said pad including an internal air-filled void for providing a cushioned support for handbells resting upon a top surface of said pad;

opposing horizontal top and bottom panels of said pad affixed along their perimeter to vertical side panels, the outside surface of said top panel being said top surface; and, a plurality of internal ribs interconnected between inside surfaces of the top and bottom panels of said pad, the height of said ribs being less than the expands free height of said top



panel when inflated, thus creating gathered valleys in said top panel for positioning said handbells;

b) positioning handbels on the top surface of said pad, adjacent said gathered valleys.

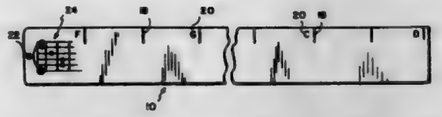
5,594,191

SYSTEM FOR INSTRUCTING NOTE AND CHORD FINGER PLACEMENT ON STRINGED INSTRUMENTS

Gary Epstein, 15 Bonad Rd., West Roxbury, Mass. 01232, and Nicholas C. Vecchio, 110 Dean St., #63, Taunton, Mass. 02780

Continuation of Ser. No. 283,810, Mar. 1, 1994, abandoned.
This application Nov. 20, 1995, Ser. No. 559,895
Int. Cl.[6] G09B *15/00*
U.S. Cl. 84—485 R **3 Claims**





1. A system for instructing note and chord finger placement on a stringed instrument having a neck, said neck having a front side and back side, and a plurality of strings and frets arranged along a fingerboard on the front side of the neck comprising:

at least one self-adherent plastic instruction element having means for reversibly attaching via electrostatic interaction the instruction element to the back side of the neck adjacent to the fingerboard, said instruction element having thereon a first indicia corresponding to the frets and a second indicia corresponding to the strings and frets, said second indicia denoting notes capable of being sounded by the instrument when a string depression is made at a corresponding location on the fingerboard.

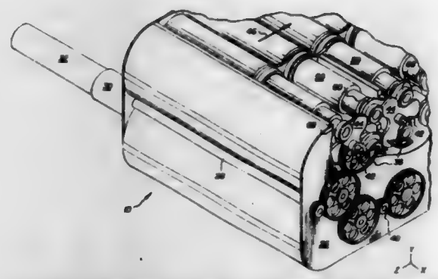
5,594,192

ACTIVE AMMUNITION MAGAZINE WITH IMPROVED CHAIN CONVEYOR

Derek A. Rodriguez, Milton, Vt., assignor to Martin Marietta Corporation, King of Prussia, Pa.

Filed Mar. 10, 1995, Ser. No. 402,213
Int. Cl.[6] F41A *9/30;9/79*
U.S. Cl. 89—33.16 **26 Claims**

1. An ammunition magazine comprising, in combination:
a housing having a port;



an endless ammunition conveyor contained by the housing, the ammunition conveyor including:
a series of units, each said unit including a pair of cells rigidly joined to prevent all movements relative to each other, each said cell adapted to retain an ammunition round, and
connectors pivotally interconnecting the units to form a conveyor chain; and
a drive train coupled to the conveyor chain for indexing the cells along a serpentine path successively to an extraction position confronting the port, through which downloading of the ammunition rounds is conducted.

5,594,193

BULLET PROOF SHIELD FOR VEHICLE WINDOWS

Ronald J. Sheridan, 1890 Tropic St., Titusville, Fla. 32796

Filed Jun. 29, 1995, Ser. No. 496,521
Int. Cl.[6] F41H *5/013;5/06*
U.S. Cl. 89—36.08 **4 Claims**



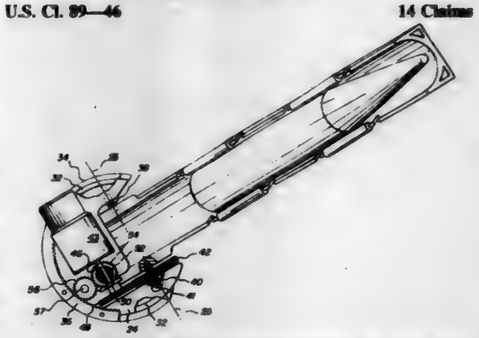
1. A window shield for mounting on the inside of a vehicle side window to protect persons in a vehicle from injury from projectiles, comprising:
a window shield of transparent projectile resistant material of a size to substantially cover a vehicle side window opening of a vehicle door;
upper and lower support means to secure said window shield to said vehicle door having a window frame and a channel means surrounding said opening, said vehicle door having a slot means for said vehicle window to move vertically up and down within said slot means to open and close said window;
said lower support means being fixed on said window shield to engage and lock in said vehicle door slot means to prevent removal of said window shield without tilting said window shield away from the vehicle window opening;
said upper support means being vertically adjustable to secure said window shield in said vehicle window opening, where said upper support means engages said channel means and has means to lock said upper support means in said channel;
said lower support means has a downwardly projecting arcuately curved hook means to slide into said slot means and curve into said vehicle door to avoid interfering with the operation of said window and movement thereof, said arcuate curve of said hook means permitting said window to move without binding on said lower support means.

5,594,194

DUAL-AXIS AMMUNITION REORIENTER

Anthony R. Steward, Essex Junction, and Peter A. Bates, Underhill, both of Vt., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed May 1, 1995, Ser. No. 432,558
Int. Cl.[6] F41A *9/11*
U.S. Cl. 89—46 **14 Claims**



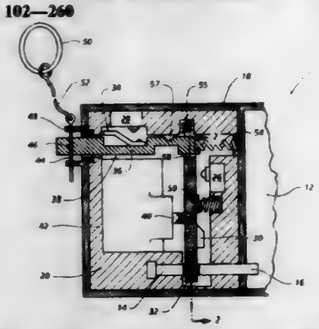
1. An ammunition round reorienter comprising, in combination:
a base;
a platform mounted by the base for rotation about a first axis;
an ammunition round-holding tray mounted by the platform for rotation about a second axis angularly offset from the first axis;
a first gear fixed to the base;
a second gear fixed to the tray; and
a drivetrain carried by the platform, the drivetrain including:
a motor, and
a gear set meshing with the first and second gears to convert input drive from the motor to combined rotational motions of the tray about the first and second axes along a desired path.

5,594,195

MINIATURE, LOW POWER, ELECTROMECHANICAL SAFETY & ARMING DEVICE

Daniel S. Lenko, Monrovia, and Thomas P. Frederick, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 853,221, Mar. 16, 1992. This application Mar. 17, 1995, Ser. No. 447,828
Int. Cl.[6] F24C *15/188*
U.S. Cl. 102—260 **11 Claims**



1. In combination with selectively emplaced ordnance having an explosive charge, an electrically operated detonator and an explosive initiation train between the detonator and said charge having arming means therein for enabling detonation of the charge upon elapse of a safe separation time and interrupter means therein for preventing said detonation of the charge inadvertently before

elapse of the safe separation time, including a blocking element displaceable between safe and armed positions, the improvement residing in: electrically energized motor means connected to the blocking element for effecting displacement thereof from the safe position, a locking rod in latching engagement with the blocking element in the safe position thereof, spring means for yieldably resisting displacement of the locking rod from said latching engagement with the blocking element, regulating means for frictionally resisting said displacement of the blocking element toward the armed position and motor control means responsive to release of the locking rod from said latching engagement for said displacement of the blocking element by a predetermined amount to said armed position enabling the explosive initiation train.

5,594,196

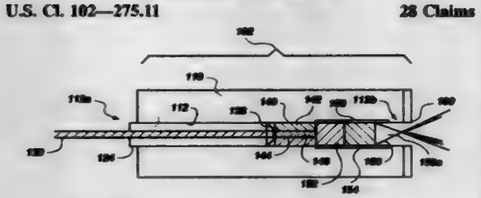
SHOCK TUBE SURFACE CONNECTOR

Daniel Rontey, Woodstock; Glen C. Schallenkamp, Kingston; Margaret R. Seeger, Kingston, and David Steedman, Kingston, all of N.Y., assignors to Ireco, Inc., Salt Lake City, Utah

Filed Apr. 20, 1995, Ser. No. 425,859

Int. Cl.[6] C06C *5/00*

U.S. Cl. 102—275.11 **28 Claims**



1. A shock tube surface connector for transferring an ignition signal to one or more shock tubes comprising:

(a) a housing forming an elongate cylindrical void containing open first and second ends,

(b) initiation means for igniting a charge, the ignition means being at least partly disposed within the elongate cylindrical void,

(c) means for isolating static charges disposed within the cylindrical void and adjacent to the ignition means,

(d) sealer means disposed in the cylindrical void on a side of the static isolation means opposite the ignition means, the sealer means comprising a combustible charge for transferring an ignition signal from the initiation means to a delay means,

(e) delay means for transferring an initiation signal from the sealer means to an output charge, the delay means being within the cylindrical void and adjacent to the sealer element,

(f) an output charge positioned within the cylindrical void adjacent to the delay means and opposite the sealer means, the output charge comprising a heat sensitive explosive composition,

(g) sleeve means for circumscribing the delay means and the output charge, the sleeve means being disposed within the cylindrical void adjacent to the sealer means, and

(h) an airspace disposed within the sleeve means adjacent to the output charge on a side opposite the delay means and near the second end of the housing cylinder such that the sleeve means confines radial expansion of an explosive force created by ignition of the output charge while the explosive force is within the airspace.

5,594,197

SECONDARY PROJECTILE FOR A TANDEM WARHEAD

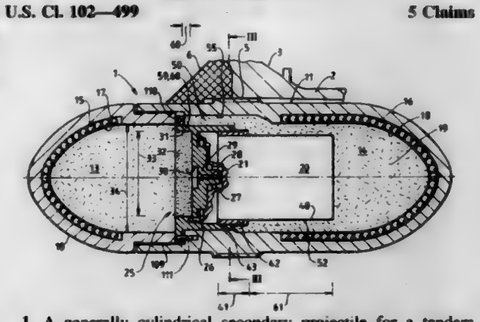
Klaus Lindstädt, Schwaig, and Manfred Klare, Simmelsdorf, both of Germany, assignors to Diehl GmbH & Co., Nurnberg, Germany

Filed Oct. 11, 1995, Ser. No. 540,935

Claims priority, application Germany, Sep. 15, 1995, 195 34 211.9

Int. Cl.[6] F42B *12/20*

U.S. Cl. 102—499 **5 Claims**



1. A generally cylindrical secondary projectile for a tandem warhead, said secondary projectile containing a forward active charge, a rearward active charge; a fuze extending between said charges and having a triggering direction oriented towards the forward active charge, said fuze being substantially located within said rearward active charge, a booster charge located between said fuze and said forward active charge for directing the triggering transmission forwardly; and cross-triggering means operatively connected with said booster charge for directing the triggering transmission rearwardly, said booster charge being activatable by said fuze and consisting of an explosive material lying in direct contact with the forward active charge, the booster charge on peripheral surface portions thereof being separated by cross-triggerable wall sections of a housing of the cross-triggering means from at least two peripherally spaced and axially forwardly extending plate-shaped explosive material poles of the rearward active charge.

5,594,198

DEVELOPING DEVICE USING ONE-COMPONENT TYPE DEVELOPER

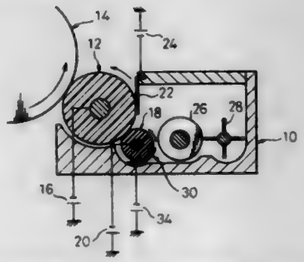
Masae Ikeda, and Teturoo Nakashima, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 18, 1995, Ser. No. 444,098

Claims priority, application Japan, May 18, 1994, 6-103534; Apr. 27, 1995, 7-104162

Int. Cl.[6] G03G *15/08*

U.S. Cl. 399—281 **10 Claims**



1. A developing device for developing an electrostatic latent image with a one-component type developer, the electrostatic latent image being formed on an electrostatic latent image carrying body, said developing device comprising:

a vessel for holding the one-component type developer;

a developer carrying body formed of a conductive material and rotatably provided in said vessel such that a portion of said developer carrying body is exposed therefrom and faces the electrostatic latent image carrying body so as to form a developing zone therebetween, the one-component type developer being adhered to a rotating surface of said developer carrying body with an electrostatic image force to be brought to said developing zone;

a developer-feeding roller formed of a conductive material and rotatably provided in said vessel so as to feed the one-component type developer to said developer carrying body, said developer-feeding roller being in frictional engagement with said developer carrying body such that the one-component type developer fed thereto is subjected to triboelectrification therebetween; and

a friction means engaged with said developer-feeding body, said friction means being formed as a metal plate spring resiliently pressed against said developer feeding roller, said metal plate spring being at least partially curved to be fitted to said developer-feeding roller such that the one-component type developer fed to said developer carrying body by said developer-feeding roller is subjected to triboelectrification therewith.

5,594,199

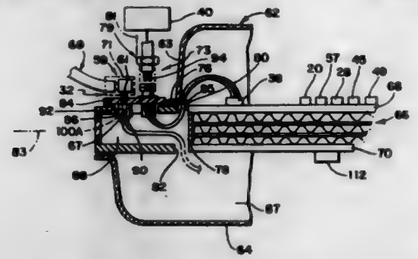
EMI BAFFLE FOR ELECTRONIC CONTROL

Michael P. Ciaccio, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 23, 1995, Ser. No. 408,802

Int. Cl.[6] H05K *9/00*

U.S. Cl. 174—35 R **11 Claims**



1. An electronic control module package for a plurality of electrical circuits comprising:

a cold plate having at least one first lateral surface area carrying at least one circuit of said plurality of circuits and an opening laterally spaced from said first area and extending into said cold plate;

an electrical coupler including at least one conductor carried in a plug body, said plug body being dimensioned to be received in said opening;

a first cover defining a chamber disposed over said first surface area and having a side wall positioned between said laterally spaced opening and a second opening in said cold plate communicating with said chamber.

5,594,200

ELECTROMAGNETIC ISOLATION CHAMBER

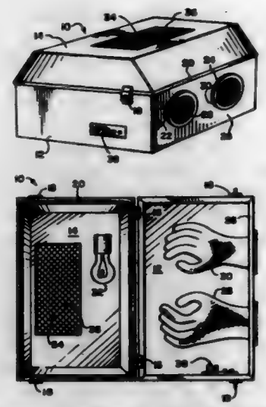
John G. Ramsey, Pittsford, N.Y., assignor to Ramsey Electronics, Inc., Victor, N.Y.

Filed Jun. 9, 1995, Ser. No. 488,876

Int. Cl.[6] H05K *9/00*

U.S. Cl. 174—35 R **13 Claims**

1. An electromagnetic isolation chamber containing a volume of space electromagnetically isolated from the surrounding environment, comprising:



a) a wall enclosing said volume, said wall having first electromagnetic shielding surrounding said volume and having an aperture therethrough wherein said first shielding is disrupted; and

b) a flexible, conductive second electromagnetic shielding disposed within said chamber and covering said aperture in said wall and being conductively and shieldingly attached to said first electromagnetic shielding of said wall around the periphery of said aperture, said second shielding being deformable and of sufficient size to enclose objects which may be inserted into said chamber through said aperture and to permit tactile feel and manipulation of said objects within said chamber, so that continuity of electromagnetic isolation of said volume is maintained through said insertion.

5,594,201

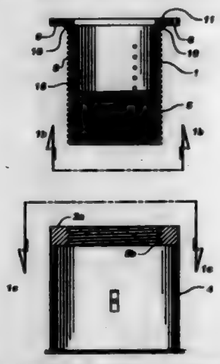
ADJUSTABLE CONTAINER SET APPARATUS AND METHOD

Gary L. Reinert, Sr., 4319 Middle Rd., Allison Park, Pa. 15101

Filed May 10, 1993, Ser. No. 58,356

Int. Cl.[6] F21V *19/02*

U.S. Cl. 174—37 **18 Claims**



1. An adjustable alignment container set apparatus, comprising:

(a) a light fixture support having a container base for placement as a partially embedded support for a light fixture in an airport runway, taxiway, or other aircraft ground traffic area; and

(b) variable length extension means connected to said container base for adjusting the height and alignment of an airport inset light supported by said light fixture support, wherein said variable length extension means comprises a light support extension canister for holding said airport inset light and having screw threading means for rotatable attachment to said container base and rotation locking means for securing said

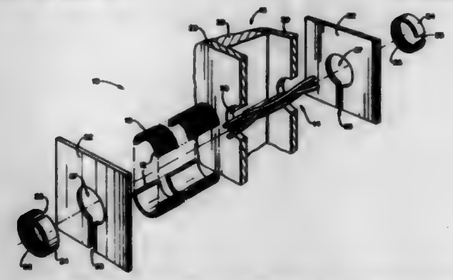
light support extension canister against rotation through said screw threading means connected to said container base.

5,594,202

SPLIT SLEEVE SYSTEM

Michael A. Tobias, 421 Second Ave., Saraland, Ala. 36571

Filed Apr. 6, 1995, Ser. No. 354,251
Int. Cl.[6] H02G *3/10*
U.S. Cl. 174—48 **10 Claims**



1. A split sleeve system for encasing wiring or cabling passing through a wall or floor, comprising:

a pair of mating sleeve units having at least one outer end portion and having a hollow interior when mated; and

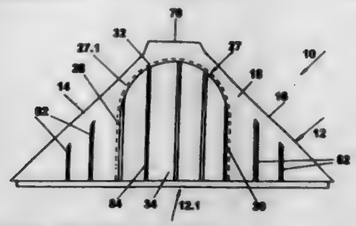
securing means for securing said sleeve units within said wall or floor, whereby said wiring or cabling can pass through said securing means and said hollow interior of said pair of mating sleeve units, said securing means including at least one hollow slotted flange capable of fitting over said pair of mating sleeve units and at least one slotted coupler capable of threadedly engaging said at least one outer end portion of said pair of mating sleeve units.

5,594,203

ELECTRICAL FITTING

Christian J. Veermeer, 18 Theresa Avenue, Camps Bay, 8001, South Africa

Filed Jan. 9, 1995, Ser. No. 369,806
Claims priority, application South Africa, Jan. 10, 1994, 94/0118
Int. Cl.[6] G02G *3/08*
U.S. Cl. 174—48 **4 Claims**



1. An electrical fitting comprising:

(a) a housing for fitting into a recess provided in an outside corner defined by two meeting building walls of a building;

(b) the housing including two side walls provided at an angle to each other, an upper wall and a bottom wall;

(c) the walls of the housing defining a chamber in the housing with an open front face;

(d) at least one joining formation provided on the housing for joining an electrical conduit leading into the chamber of the housing;

(e) a connection formation for removably connecting a cover plate to the housing for closing the open front face of the housing;

(f) a cut-out provided in the upper wall; and

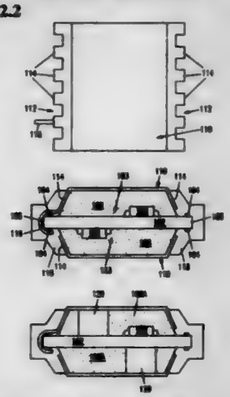
(g) a removable closure plate for covering the cut-out.

5,594,204

OVERMOLDED PC BOARD WITH ESD PROTECTION AND EMI SUPPRESSION

Carl J. Taylor, Morgan Hill; Michael W. Patterson, Pleasanton, and Gordon Force, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 406,450, Mar. 20, 1995. This application Jul. 25, 1995, Ser. No. 506,886
Int. Cl.[6] H01L *23/28*
U.S. Cl. 174—52.2 **14 Claims**



1. A portable peripheral card comprising:

a printed circuit board (PC board) having an active region where one or more electrical components are mounted;

an electrical connector attached to the PC board, whereby external devices electrically access said one or more electronic components via said electrical connector;

a solid package encapsulating the PC board yet leaving a portion of said electrical connector exposed, said solid package being composed of a conductive segment and a non-conductive segment;

a conductive layer overlying a portion of said package and including a plurality of extensions extending into said package and in contact with the conductive segment of the package.

5,594,205

MOLDED PLASTIC ELECTRIC OUTLET BOX WITH SNAP-ON BASE AND PUSH-IN ELECTRIC DEVICE

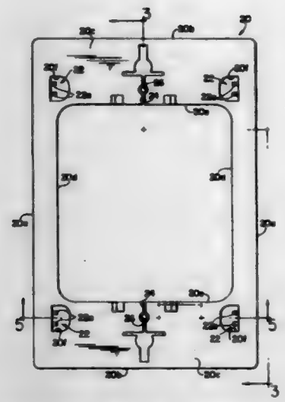
Salvatore A. Cancelliere, Plainville, and Wilfred R. Rogers, Bristol, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed Feb. 2, 1995, Ser. No. 382,603
Int. Cl.[6] H02G *3/08*
U.S. Cl. 174—53 **10 Claims**

1. An electrical outlet box comprising:

a molded plastic box defining an enclosure adapted to accommodate an electrical device and electrical connections thereto,

said molded plastic box having side and end walls, and a top wall defining an electrical device opening, said device opening having side edges arranged parallel to and proximate said side walls thereby providing resilient flexibility of said side walls in bending,



said top wall including oppositely arranged end portions adjacent said end walls, each of said top wall end portions defining a bisector slot,

each of said bisector slots having an open end communicating with said device opening such that said bisector slots bisect said top wall end portions,

each of said bisector slots further including an enlarged region spaced from said open end and defining a fastener hole adapted to receive a fastener of predetermined diameter regardless of thread size but being of the type used with conventional electrical devices generally,

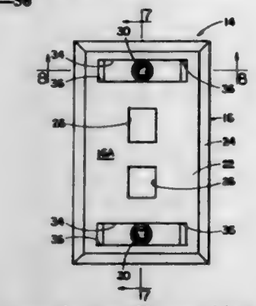
whereby said side walls flex outwardly as a fastener is pushed downwardly into each of said fastener holes, and said resilient side walls and integrally defined bisector slots exerting a gripping force on said fastener and said fastener holes.

5,594,206

LABEL COVER CONSTRUCTION AND ARRANGEMENT THEREOF ON SWITCH FACEPLATE

Daniel E. Kiss, Black Mountain; John M. Gentry, Candler; Regina L. Tipton, Nebo, and Richard H. Dwyer, Marion, all of N.C., assignors to Hubbell Incorporated, Orange, Conn.

Filed Jun. 3, 1994, Ser. No. 254,069
Int. Cl.[6] H01H *9/02;13/04*
U.S. Cl. 174—56 **16 Claims**



1. A switch cover plate assembly, comprising:

(a) at least one label cover having an elongated main portion and a pair of opposite end portions; and

(b) a switch faceplate including a flat main panel and at least a pair of mounting slots defined through said main panel, said mounting slots being spaced apart from one another and adapted to receive therethrough said opposite end portions of said label cover, said label cover being slidable relative to said main panel to insert and remove said opposite end portions of said label cover into and from said mounting slots;

(c) said flat main panel including at least one mounting recess defined in a front surface thereof and extending between said pair of mounting slots, said mounting recess being adapted to receive and seat said main portion of said label cover within said mounting recess with said opposite end portions of said label cover extending through said mounting slots;

(d) said flat main panel also including at least one mounting hole defined through said main panel and being adapted to receive therethrough a fastener to mount said faceplate to a switch box, a portion of said mounting recess overlying said mounting hole;

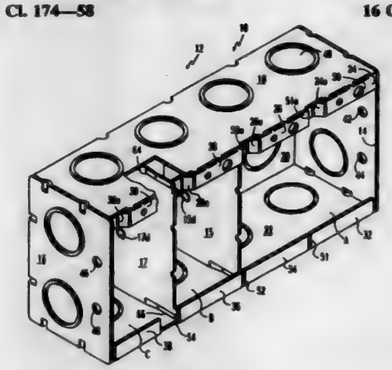
(e) said faceplate also including a pair of opposite edge surface portions extending generally parallel to one another and spaced from one another on opposite sides of each of said slots, said parallel opposite edge surface portions extending in an inclined relation to the plane of said flat main panel of said faceplate so as to extend along and parallel to a path through which a respective one of said opposite end portions of said label cover must slidably move in order to insert into and withdraw from a respective one of said mounting slots.

5,594,207

SELF-LOCKING DIVIDER PLATE FOR AN ELECTRICAL BOX

Mark E. Fabian, St. Jean, and Serge Michaud, Brossard, both of Canada, assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed May 20, 1994, Ser. No. 246,458
Claims priority, application Canada, Jun. 2, 1993, 2097544
Int. Cl.[6] H01R *13/508*
U.S. Cl. 174—58 **16 Claims**



1. An electrical box, comprising:

a body formed by a back wall, a top wall, a bottom wall, a first sidewall, a second sidewall, and a partially formed front wall,

said front wall having at least two adjacently spaced-apart ledges extending along said top wall and forming a first slot therebetween, and two adjacently spaced-apart ledges extending along said bottom wall and forming a second slot therebetween, said first slot being aligned with said second slot in a cooperative fashion, and

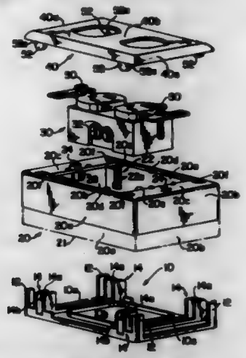
a removable plate slidable in said cooperating aligned first and second slots of said front wall to form compartments in said electrical box, said plate further including integrally formed self-locking means which are operated by said aligned first and second slots when said plate is slid into said first and second slots to secure said plate in said body.

5,594,208

MOLDED PLASTIC ELECTRIC OUTLET BOX WITH SNAP-ON BASE AND SNAP-ON FACE PLATE

Salvatore A. Cancellieri, Plainville, and Wilfred R. Rogers, Bristol, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed Feb. 2, 1995, Ser. No. 382,887
Int. Cl.[6] H02G 3/08
U.S. Cl. 174—58 16 Claims



1. An electrical outlet box comprising:

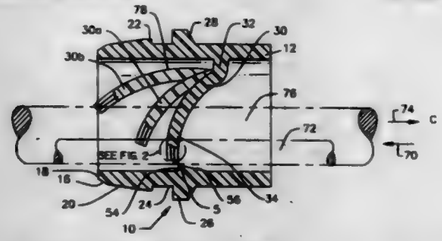
a molded generally rectangular base having upstanding legs integrally molded at the four corners of the rectangular base, and upstanding posts integrally formed adjacent said legs, each post defining a channel shaped slot that is upwardly opened, and each channel shaped post having a channel web portion that defines an opening into said upwardly opened channel, a molded rectangular box having side and end walls that define an open bottom, and corners for snugly receiving said upstanding legs to locate the rectangular box on the base, said base cooperating with said box to define an enclosure for an electrical device, said rectangular box side walls defining inwardly projecting ribs with abutment surfaces defined on said ribs to be received in said channel web openings whereby said box and base are releasably secured to one another.

5,594,209

CABLE CONNECTOR CLAMP

William Nattel, Montreal, Canada, and Alain Michaud, Quebec City, both of Canada, assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Apr. 13, 1994, Ser. No. 227,746
Claims priority, application Canada, Apr. 23, 1993, 2094789
Int. Cl.[6] H02G 3/22
U.S. Cl. 174—65 G 23 Claims



1. A cable connector clamp comprising:

a housing having first and second ends and an inner wall defining a passage between the first and second ends, for an insulated electrical cable;

means on the housing for engaging an opening in an enclosure wall;

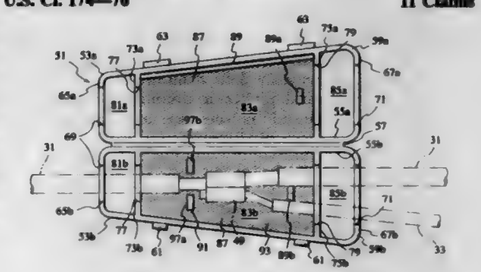
a clamping element extending from one side of the inner wall across the passage and inclined towards the second end, the clamping element including a free end portion and being resiliently deflectable to permit insertion of the electrical cable through the passage from the first end, the free end portion being resiliently biased against the cable to secure the cable from withdrawal through the first end, wherein the clamping element includes a neck portion attached to the inner wall of the housing, the neck portion curving towards the second end of the housing to present a convex surface to the first end of the housing, and the clamping element including a body portion extending from the neck portion to the free end portion, the body portion being curved in a direction opposite to the neck portion to present a concave surface towards the first end of the housing, the free end portion of the clamping element being substantially perpendicular to a longitudinal axis of the housing in a rest position, thereby permitting a range of cable sizes to be positively clamped therein.

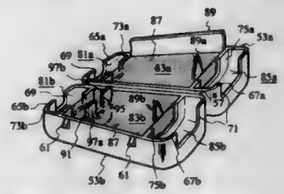
5,594,210

WATERPROOF PROTECTIVE COVER

Kazuyoshi Yabe, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 314,383
Int. Cl.[6] H02G 15/08
U.S. Cl. 174—76 11 Claims





1. A waterproof protective cover for protecting a connection part of electrical wires in a waterproof manner, comprising:

an upper casing member having bores formed at two upper endwalls thereof to pass said electrical wires therethrough, said two upper endwalls defining a longitudinal direction of said cover;

a lower casing member pivotably connected to said upper casing member through a hinge attached to a sidewall of each of said upper and lower casing members, said lower casing member having bores formed at two lower endwalls thereof to pass said electrical wires therethrough;

a storage chamber for accommodating said connection part and for holding an insulating sealant, said storage chamber being defined by said upper and lower casing members when said upper casing member is engaged with said lower casing member;

reservoir chambers for retaining said insulating sealant flowing out of said storage chamber, said reservoir chambers being arranged between said bores of said upper and lower casing members and said storage chamber; and

a seal plate provided on either one of said upper casing member and said lower casing member, said seal plate being arranged on a leading edge of a sidewall opposite to said sidewall to which said hinge is attached, said seal plate being accommodated inside another sidewall of the casing member which is not provided with seal plate when said upper casing member is engaged with said lower casing member;

wherein said upper casing member and said lower casing member are provided with triangular pins formed on laterally extending walls of said upper casing member and said lower casing member, respectively; and

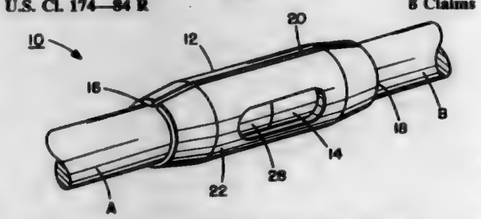
wherein said triangular pins project from said upper casing member and said lower casing member and provide clearance between said electrical wires.

5,594,211

ELECTRICAL SOLDER SPLICE CONNECTOR

Gary W. Di Troia, Nashua, and Richard E. Robicheau, Amherst, both of N.H., assignors to Burndy Corporation, Norwalk, Conn.

Filed Feb. 22, 1995, Ser. No. 392,373
Int. Cl.[6] H01R 4/02
U.S. Cl. 174—84 R 8 Claims



1. An electrical conductor solder sleeve comprising:

a housing having a conductor channel extending between opposite ends of the housing and a first slot extending between the ends through a side wall of the housing and a second slot, wherein the second slot does not extend entirely through the side wall; and

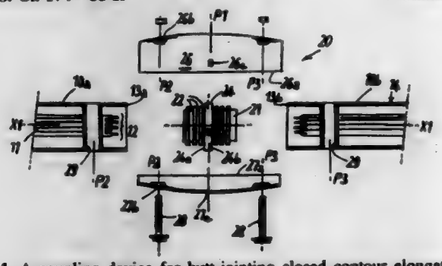
means for accessing ends of conductors positioned in the conductor channel, the means for accessing including a hole, separate from the slot, that extends through the side wall of the housing.

5,594,212

COUPLING DEVICE FOR ELECTRICAL TRUNKING

Daniel Nourry, Dijon; Gérard Jego, Brazey En Plaine, and Jean-Pierre Thierry, Couternon, all of France, assignors to Schneider Electric SA, Boulogne-Billancourt, France

Filed Jul. 11, 1995, Ser. No. 500,754
Claims priority, application France, Jul. 12, 1994, 94 08789
Int. Cl.[6] H01R 4/38
U.S. Cl. 174—88 R 7 Claims



1. A coupling device for butt-jointing closed contour elongate enclosure sections of prefabricated electrical trunking, with each section housing a conductor assembly, said device comprising:

an internal member which is inserted into ends of two of said enclosure sections so as to fasten them together mechanically;

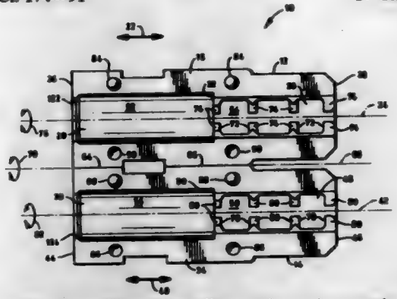
said internal member having water drainage grooves on its outer surface with the grooves being arranged near a mating plane between said enclosure sections.

5,594,213

WIRE SPLICE

Albert D. Skopic, York, Pa., assignor to Osram Sylvania Inc., Danvers, Mass.

Filed Jun. 19, 1995, Ser. No. 491,798
Int. Cl.[6] H02G 15/113
U.S. Cl. 174—91 17 Claims



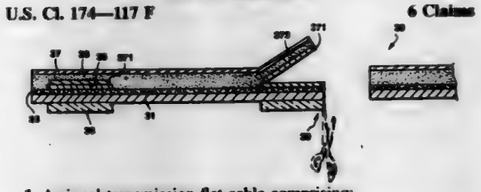
1. A splice, comprising a first splice member and a second splice member each comprising a first surface, an opposite second surface, a first channel extending into said first surface towards said opposite second surface, said first channel further extending in the direction of a horizontal axis of a respective splice member from a first end of said first surface towards an opposite second end of said first surface, and a second channel extending into said first surface towards said second surface, said second channel further extending in the direction of said horizontal axis from said opposite second end of said first surface towards said first end of said first surface, said second channel opening into said first channel, said first splice member being pivotally connected to said second splice member along a pivot axis, said first channel and said second channel of said first splice member being radially in alignment relative to said pivot axis with said first channel and said second channel, respectively, of said second splice member, said first splice member and said second splice member being pivotal into and out of engagement with each other in a closed mode and an open mode, respectively, at least one second channel including a channel surface which comprises one or more protuberances.

5,594,214

SIGNAL TRANSMISSION FLAT CABLE

Pin-Chien Liao, Taoyuan, Taiwan, assignor to Acer Peripherals, Inc., Taoyuan, Taiwan

Filed Feb. 3, 1995, Ser. No. 383,415
Int. Cl.[6] H01B 7/08
U.S. Cl. 174—117 F 6 Claims



1. A signal transmission flat cable comprising:

a first layer of substrate membrane;

a second layer of a plurality of traces for transmitting the signal;

a third layer of a plurality of finger arrays covering on the plurality of parallel traces;

a fourth layer of thin polyester membrane for protecting the second layer and third layer from electrical contact with an unexpected electric device;

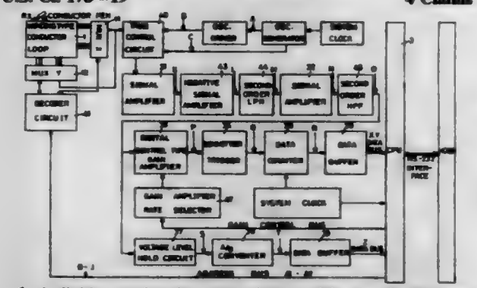
the signal transmission flat cable being characterized in that the plurality of finger arrays are provided in the third layer at a plurality of predetermined locations along the flat cable, each of the plurality of finger arrays is spaced from each other by a given distance, and a glue material is provided to bond the fourth layer and the second layer along said given distance.

5,594,215

WIRELESS DIGITIZER AND STYLUS PEN UNIT

James H. Jeng, No. 5, Lane 50, Ming Tzu Rd., Tamshui Chen, Taipei Hsien, Taiwan

Filed Jan. 20, 1995, Ser. No. 375,733
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—19 **4 Claims**



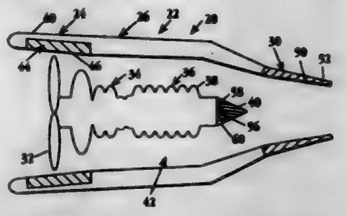
1. A digitizer and stylus pen unit comprising a winding type conductor loop, a inductor device, a central processing unit, a first signal amplifier, a second signal amplifier, a digital control type gain amplifier, a schmitter trigger, a data counter, a first data buffer, a voltage level hold circuit, an A/D converter, a second data buffer, a TX/RX control circuit, a decoder circuit, a X-multiplexer, a Y-multiplexer, a negative signal amplifier, a second order low pass filter, a second order high pass filter and a gain amplifier rate selector, wherein when the signal input device is started to provide an oscillatory signal and TX/RX control signal to said TX/RX control circuit for driving said winding type conductor loop, said central processing unit scans the transmission through a scanning circuit, which consists of said decoder circuit, said X-multiplexer, and said Y-multiplexer, and at the same time said winding type conductor loop transmits the high-frequency oscillatory signal to said inductor device, enabling said inductor device to carry an oscillation source; when the TX/RX clock is turned from high to low, said winding type conductor loop serves as a receiver loop to receive the location current from said conductor device, permitting it to be amplified by said first signal amplifier circuit and said negative signal amplifier in proper order, and then transmitted to said second order low pass filter, which eliminates noises from the negative signal and then amplifies the filtrated negative signal, the well amplified negative signal being then amplified by said second signal amplifier, and then filtrated by said second order high pass filter, the output signal from said second order high pass filter being then transmitted through said digital control type gain amplifier and said voltage level hold circuit; if said conductor device is moved at a fixed high potential when the signal from said second order high pass filter is transmitted to said digital control type gain amplifier, the gain is maintained at the initial fixed gain amplification ratio; if the potential of said conductor device is changed, said central processing unit will give a different amplification parameter to maintain said conductor device at the same location, and therefore the coordinate value will not be changed due to a potential difference (more particularly when an oscillatory signal of different voltage value is produced after said conductor device is depressed, different X-axis and Y-axis values will be produced at the same location, however the digital control type gain amplifier will give a different gain parameter subject to the Z-axis value, so that the X-axis and Y-axis values of said conductor device can be maintained unchanged upon the operation of said conductor device or a pressure on said conductor device); the output signal from said digital control type gain amplifier is converted into a digital signal by said schmitter trigger, then carried into the system time sequencing signal by said data counter, and then transmitted to said data buffer through which the X-axis and Y-axis values are further transmitted to said central processing unit, said central processing unit calculates the coordinates of said conductor device according to the data received from said data buffer; the signal from said second order high pass filter is simultaneously transmitted to said voltage level hold circuit, permitting the analog signal to be converted into a voltage level signal, the voltage level signal from said voltage level hold circuit being then converted by said A/D converter into a Z-axis digital data, which is further sent through said second data buffer to said central processing unit; when said central processing unit receives the X-axis, Y-axis and Z-axis coordinate values, it can then transmit data to the host through a RS-232 interface for further processing.

5,594,216

JET ENGINE SOUND-INSULATION STRUCTURE

Robert D. Yasukawa, San Jose; James P. Woolley, Sunnyvale, and Venecia M. Grobelny, San Jose, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Nov. 29, 1994, Ser. No. 346,881
Int. Cl.[6] F01N *1/02*; F02K *1/00*
U.S. Cl. 181—213 **20 Claims**



1. An acoustic structure for use as a sound insulator in a jet engine having a sound-absorbing compartment enclosed by a perforated sound-absorbing wall, said structure comprising

a framework adapted to be held within said compartment, and

disposed within said framework, an acoustical insulation material (a) having a sound-absorbing face adapted to confront the jet engine's sound-absorbing wall, and (b) composed of a rigid matrix of randomly oriented, fused silica fibers having fiber diameters predominantly in the range 2–8 μm, said matrix having (i) a three-dimensionally continuous network of open, intercommunicating voids, (ii) a flow resistivity between about 10–200K rayls/m, and (iii) a density of between about 2 and 8 lb/ft3.

5,594,217

EXHAUST MUFFLER FOR SMALL MARINE CRAFT

Wayne A. LeQuire, 701 Southwind Rd., Maryville, Tenn. 37801

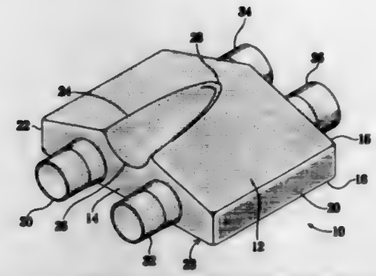
Filed Aug. 9, 1995, Ser. No. 512,935
Int. Cl.[6] F01N *7/12*
U.S. Cl. 181—235 **16 Claims**

1. An exhaust muffler for marine craft having a shaft exiting a hull proximate a transom through a shaft log, the muffler comprising:

a shell having an internal cavity defined by an inlet wall, an outlet wall oppositely disposed from said inlet wall, a top wall, oppositely disposed side walls and a bottom wall;

at least one inlet pipe penetrating said inlet wall to communicate with said cavity to convey at least exhaust gases from an engine into said cavity;

means for providing a water pool within said cavity to a selected height below said inlet pipe;



at least one outlet pipe penetrating said outlet wall to communicate with said water pool to convey the gases passing through said water pool to an exterior of the marine craft with an amount of water to maintain said water pool at substantially said selected height; and

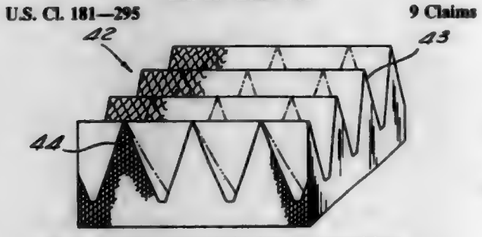
wherein said bottom surface of said shell is provided with a concave depression extending from proximate said inlet wall, toward said outlet wall, said depression to receive the shaft and shaft log of the marine craft.

5,594,218

ANECHOIC CHAMBER ABSORBER AND METHOD

Rodolfo E. Diaz; Mark C. Squires, both of Phoenix, and Michael C. Miller, Chandler, all of Ariz., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jan. 4, 1995, Ser. No. 368,785
Int. Cl.[6] E04B *1/82*
U.S. Cl. 181—295 **9 Claims**



1. An absorber for an anechoic chamber comprising:

a block of honeycomb material;

said block of honeycomb material comprising sheets of corrugated material; and

a lossy material formed upon said sheets of corrugated material so as to define at least one of a plurality of wedges and a plurality of pyramids of lossy material within said block of honeycomb material.

5,594,219

ELEVATOR POSITION APPARATUS

Sanjay Kamani, Unionville; Daniel S. Williams, Meridan, and Christopher H. Koenig, Bristol, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jan. 23, 1995, Ser. No. 378,111
Int. Cl.[6] B66B *1/34*
U.S. Cl. 187—394 **18 Claims**

10. An elevator position apparatus for determining if an elevator car is positioned within a door zone, said apparatus comprising:

an encoded medium disposed vertically in an elevator hoistway;

decoding means for providing first and second door zone sensor signals up and down sensor signals, and first and second position loss recovery signals in response to said medium;

means for determining if the elevator car is positioned within the door zone, said means responsive to the first and second door zone sensor signals, the up and down sensor signals, and the first and second position loss recovery signals, said means operates in accordance with the following algorithm:

Door Zone=(1LV and 2LV) or [(1LV or 2LV) and ((UIS and DIS) or (PR1 and PR2))],

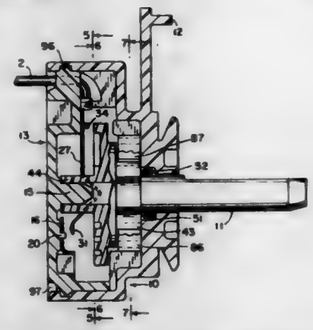
wherein Door Zone equals the value of a door zone signal which is indicative of the presence of the door zone; 1LV equals the value of the first door zone sensor signal; 2LV equals the value of the second door zone sensor signal; UIS equals the value of the up sensor signal; and DIS equals the value of the down sensor signal; PR1 equals the value of the first position loss recovery sensor signal and PR2 equals the value of the second position loss recovery sensor signal.

5,594,220

ROTARY SWITCH WITH CAM OPERATED SLIDING CONTACT ENGAGING NOBLE METAL STATIONARY CONTACT BAR SURFACE

David G. Hackbarth, New Berlin, Wis.; Kenyon A. Hapke, Libertyville, Ill., and Spencer C. Schantz, Dousman, Wis., assignors to US Controls Corp., New Berlin, Wis.

Filed Aug. 22, 1995, Ser. No. 517,646
Int. Cl.[6] H01H *19/60;21/80;1/00*
U.S. Cl. 200—6 B **8 Claims**



1. A switch comprising:

a base composed of insulating material, an elongated contact bar fixedly mounted to said base and having an exposed surface coated with a noble metal, a housing joinable with said base, a row of movable spring contacts each comprised of a spring metal strip having one end portion mounted to said base and having an opposite deflectable free end portion extending in cantilever fashion away from said one end portion, said free end portion having an offset and having a part continuing

beyond said offset and terminating in a contact tip which is spaced from said exposed surface of said stationary contact when the offset in said free end portion is not deflected, a shaft journaled in said housing, said shaft having a coaxial disk on which there are a plurality of concentric cam segments of such circumferential length, axial height relative to said disk and arrangement as to engage said offsets in succession in response to rotation of said shaft to thereby deflect said spring contacts, respectively, causing said contact tips thereof to contact said noble metal coated surface and subsequently slide laterally on said stationary bar surface to acquire a coating of said noble metal.

5,594,221

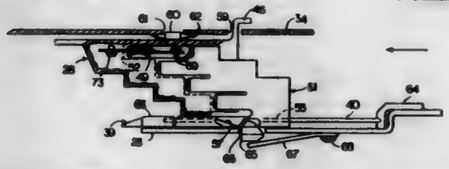
HIGH AMPERE-CIRCUIT BREAKER SECONDARY DISCONNECT ARRANGEMENT

Rebecca C. Drumbor, Farmington; William H. Calder, Plainville, both of Conn., and Martin C. Ignasiak, Sarasota, Fla., assignors to General Electric Company, New York, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,847

Int. Cl.[6] H01H *9/20*

U.S. Cl. 200—50.27 **6 Claims**



1. A circuit breaker secondary disconnect arrangement comprising:

a secondary disconnect plug mounted to an exterior of a circuit breaker, said circuit breaker having means for movement in and out of an associated circuit breaker compartment, said plug including a plurality of connector arrays of connectors arranged in a step-wise configuration; and

a secondary disconnect receptacle mounted to an interior of said circuit breaker compartment said receptacle being arranged to accept a part of said disconnect plug, said receptacle including a plurality of stab arrays arranged in a step-wise configuration.

5,594,222

TOUCH SENSOR AND CONTROL CIRCUIT THEREFOR

David W. Caldwell, Lapeer, Mich., assignor to Integrated Controls, Lapeer, Mich.

Filed Oct. 25, 1994, Ser. No. 328,852

Int. Cl.[6] H03K *17/975*

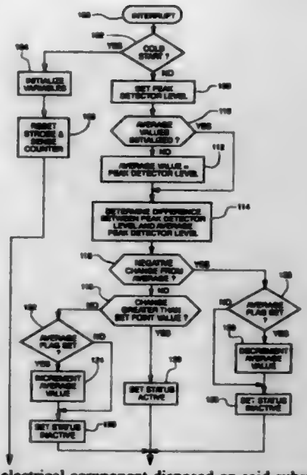
U.S. Cl. 200—600 **32 Claims**

1. A low impedance touch sensor apparatus for detecting manual contact by a human user and capable of activating a controlled device, said touch seasor apparatus comprising:

a dielectric substrate of substantially uniform thickness having first and second opposite surfaces;

a first thin, conductive electrode pad disposed on said first surface of said substrate in a closed, continuous geometric form having an area which affords substantial coverage by a human appendage;

a second thin, conductive electrode disposed on said first surface of said substrate in a spaced, coplanar and substantially surrounding relationship to said first electrode pad; and



an active electrical component disposed on said substrate proximate said first and second electrodes and electrically coupled to said first and second electrodes, such that human contact of said substrate activates the controlled device.

5,594,223

VACUUM SWITCH BULB TYPE CHANGE OVER SWITCH FOR ON-LOAD TAP CHANGER

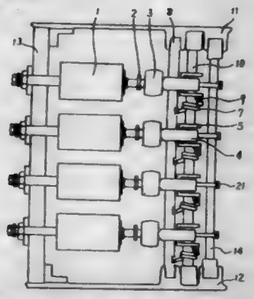
Akira Fukushi, and Tomio Yamaguchi, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1994, Ser. No. 352,075

Claims priority, application Japan, Dec. 7, 1993, 5-305644

Int. Cl.[6] H01H *33/66*

U.S. Cl. 218—120 **10 Claims**



1. A vacuum switch bulb type change over switch for an on-load tap changer for changing taps in an on-load state comprising:

a plurality of single phase switch cassettes, each of the switch cassettes including a plurality of vacuum switch bulbs and a plurality of coupling means connected to said vacuum switch bulbs for actuating the same; and

a common controller for the switch cassettes, said common controller including a plurality of holding means for holding said vacuum switch bulbs in an opened or closed state to thereby hold the taps of the switch, said single phase switch cassettes being independently mounted on and coupled with said common controller through said holding means.

5,594,224

VACUUM CIRCUIT INTERRUPTER

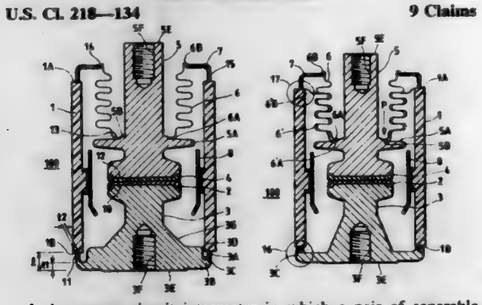
Toru Tanimizu; Yoshimi Hakamata; Masato Kobayashi, all of Hitachi; Akira Osaka, Hitachinaka, and Katsuhiro Komuro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,954

Claims priority, application Japan, Dec. 24, 1993, 5-326607; Dec. 24, 1993, 5-326608

Int. Cl.[6] H01H *33/66*

U.S. Cl. 218—134 **9 Claims**



4. A vacuum circuit interrupter in which a pair of separable conductors constituting a stationary conductor and a movable conductor are disposed in a hollow cylindrical insulation body and one end side of said hollow cylindrical insulation body is sealed in vacuum tightness via an end plate and a bellows, characterized in that said stationary conductor is attached to the other end side of said hollow cylindrical insulation body so as to seal said hollow cylindrical insulation body in vacuum tightness thereby: and further, at least one of a space between said stationary conductor and said hollow cylindrical insulation body and space between said movable conductor and said hollow cylindrical insulation body is double sealed in vacuum tightness.

5. A vacuum circuit interrupter according to claim 4, characterized in that said stationary conductor is provided with at least two joint portions with said hollow cylindrical insulation body, wherein the space between the joint portions is evacuated.

6. A vacuum circuit interrupter according to claim 4, further comprising a plurality of bellows, wherein one ends of the plurality of bellows are jointed to said movable conductor, at least one of the other ends of the plurality of bellows is jointed to said hollow cylindrical insulation body, and the space between the plurality of bellows is evacuated.

5,594,225

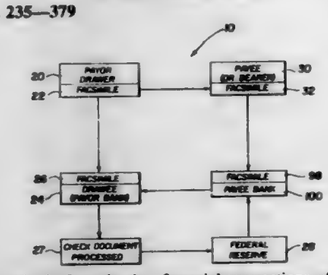
METHODS AND SYSTEMS FOR CONDUCTING FINANCIAL TRANSACTIONS VIA FACSIMILE

Arthur D. Botvin, 5200 Keller Springs Rd. - Unit 533, Dallas, Tex. 75247

Filed Jun. 7, 1995, Ser. No. 476,655

Int. Cl.[6] G06F *17/60*

U.S. Cl. 235—379 **6 Claims**



1. A method of conducting financial transactions of a commercial paper document having a drawer party, a drawee party and a payee party, comprising the steps of:

(a) delivering an image of the commercial paper document to a payee party;

(b) electronically delivering an image of the commercial paper document from a facsimile machine at the site of the drawer to a facsimile machine at the site of the drawee party;

(c) processing the image of the commercial paper document using a computer responding to software commands for retrieving electronically encrypted information contained on the commercial paper document; and

(d) clearing the financial transaction by the drawee party after receiving a request for payment of the commercial document from the payee party or party with title to the document by comparing the information received from the drawer party image with the image presented for payment on a computer responding to software commands.

5,594,226

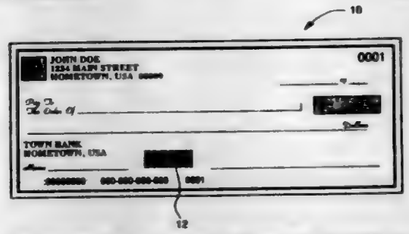
AUTOMATED CHECK VERIFICATION AND TRACKING SYSTEM USING BAR CODE INFORMATION

Paul Steger, 2624 E. Shorewood Blvd., Shorewood, Wis. 53211

Continuation of Ser. No. 273,372, Jul. 11, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,646

Int. Cl.[6] G06F *17/60*

U.S. Cl. 235—379 **12 Claims**



1. An apparatus for automatically accessing and verifying with an underwriting institution the status of an account underlying a negotiable instrument and the authority of a purchaser to issue said negotiable instrument against said account when said negotiable instrument is presented to a merchant based on account information and security information contained in a bar code printed on the instrument for establishing that the purchaser is recognized by the underwriting institution as an authorized issuer of said negotiable instrument against said account, comprising:

a terminal for use by the merchant at a point of sale;

a bar code scanner electrically coupled to said terminal for reading the bar code printed on the negotiable instrument;

means for automatically determining an underwriting institution code and an account number from the bar code, said means for determining located in said terminal;

means for automatically deriving a personal identification number from the security information contained in the bar code, said means located in said terminal;

a modem electrically coupled to said terminal transmitting and receiving electrical communication therewith:

a bi-directional underwriting institution switch electrically coupled to said modem and capable of automatically establishing electrical communication with the underwriting institution based on the underwriting institution code contained in the bar code;

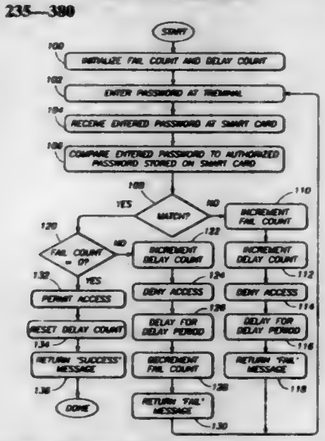
a display screen attached to said terminal for displaying transaction information to the merchant; and

means for printing a receipt including a reproduction of the bar code contained on the negotiable instrument, said receipt capable of coordinating said negotiable instrument presented to the merchant with said receipt.

5,594,227
SYSTEM AND METHOD FOR PROTECTING UNAUTHORIZED ACCESS TO DATA CONTENTS

Vinay Deo, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Mar. 28, 1995, Ser. No. 412,295
Int. Cl.[6] G06K 5/00
U.S. Cl. 235—380 28 Claims



1. An integrated circuit (IC) card protection device for protecting against unauthorized access of data contents on an IC card, the IC card protection device comprising:

a memory to store a password;

a data input to receive an entered password;

a comparator to compare the entered password to the stored password;

a fail counter, operatively coupled to the comparator, to keep a fail count that is incremented away from a reference value when the entered password fails to match the stored password and decremented back toward the reference value when the entered password successfully matches the stored password;

a delay generator to produce a delay period when the entered password fails to match the stored password;

the IC card denying access to the data contents when the fail counter is not equal to the reference value and delaying for a delay period before undertaking comparison of the next entered password: and

the IC card permitting access to the data contents when the fail counter is at the reference value and the entered and stored passwords match.

5,594,228
SELF-CHECKOUT, POINT-OF-TRANSACTION SYSTEM INCLUDING DEACTIVATABLE ELECTRO-OPTICALLY CODED SURVEILLANCE TAGS

Jerome Swartz, Old Field, and William Tracy, Floral Park, both of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

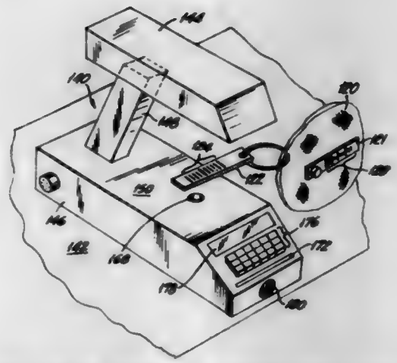
Continuation-in-part of Ser. No. 728,575, Jul. 11, 1991, abandoned, which is a continuation of Ser. No. 414,450, Sep. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 236,249, Aug. 25, 1988, abandoned. This application Jul. 27, 1992, Ser. No. 919,410
Int. Cl.[6] G06K 07/10
U.S. Cl. 235—383 42 Claims

1. A self-checkout apparatus for processing a sales transaction of an article selected from a plurality of articles, each of the plurality of articles having an associated first coded indicia and an attached surveillance tag, each surveillance tag having an activated state and a deactivated state, each of the surveillance tags bearing a second coded indicia and being initially in an activated state, the self-checkout apparatus defining a deactivating region in space in which a surveillance tag may be positioned in order to change the surveillance tag from an activated state into a deactivated state, the apparatus comprising:

a) means for reading coded indicia for reading said first coded indicia of an article selected for purchase from said plurality of articles and for generating a purchase signal indicative of the identity of said article selected for purchase, said means for reading coded indicia also arranged to read the second coded indicia on said surveillance tag positioned in said deactivation region and forming a first signal indicative of the second coded indicia on said surveillance tag placed in said deactivation region;

b) means for verifying, on the bases of the purchase signal and the first signal, whether said surveillance tag positioned in said deactivation region is associated with the article selected for purchase and for forming a positive verification signal when the surveillance tag positioned in said deactivation region is associated with the article selected for purchase; and

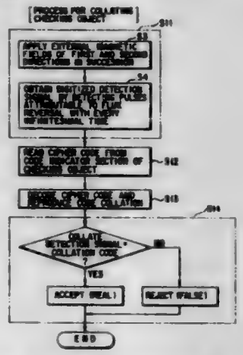
c) means for deactivating said surveillance tag attached to said article when the surveillance tag is positioned in the deactivation region and when a positive verification signal is obtained.



5,594,229
METHOD AND APPARATUS FOR CHECKING THE AUTHENTICITY OF A CHECKING OBJECT BY DETECTING MAGNETIC FLUX REVERSALS

Hidekazu Hoshino, and Tatsuya Kurihara, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Division of Ser. No. 90,792, Jul. 12, 1993. This application Jun. 2, 1995, Ser. No. 458,919
Int. Cl.[6] G06K 7/08
U.S. Cl. 235—449 5 Claims



1. A method for checking the authenticity of a checking object which includes a base formed of a nonmagnetic material and a number of bistable magnetic devices randomly dispersed in a scanning region of the base, comprising:

a manufacturing process for manufacturing the checking object; and

a collating process for checking the checking object,

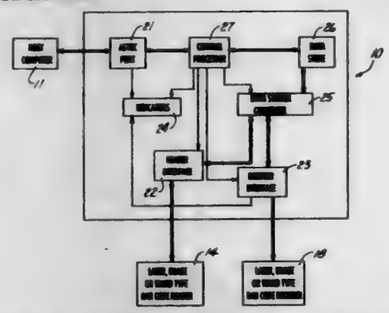
the manufacturing process including a step of randomly distributing the bistable magnetic devices in the base of the checking object, a step of magnetizing the bistable magnetic devices within the scanning region in one direction by applying an external magnetic field of a first direction to the bistable magnetic devices and then reversing the magnetization direction of the bistable magnetic devices by applying thereto a second external magnetic field of a direction opposite to the first direction, a step of detecting a detection signal corresponding to the intensity of magnetic pulses generated as the bistable magnetic devices are subjected to the flux reversal, a step of obtaining a cipher code by enciphering the detection signal, and a step of recording the cipher code in a code indicator section of the checking object, and

the collating process including the step of magnetizing the bistable magnetic devices within the scanning region in the one direction by applying the external magnetic field of the first direction to the bistable magnetic devices and then reversing the magnetization direction of the bistable magnetic devices by applying thereto the second external magnetic field of the direction opposite to the first direction, the step of detecting the detection signal corresponding to the intensity of the magnetic pulses generated as the bistable magnetic devices are subjected to the flux reversal, a step of reading the cipher code recorded in the code indicator section, a step of reproducing a code for collation by decoding the cipher code, and a step of collating the collation code reproduced in the code reproduction step with the detection signal detected in the detection step and concluding that the checking object is real when the collation code and the detection signal correspond to each other.

5,594,230
ANALYZER FOR BAR CODE READERS AND DECODERS

James E. Waite, and Roger L. Wolf, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Filed Feb. 18, 1993, Ser. No. 19,459
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 17 Claims



1. A bar code reader/decoder analyzer system, comprising:

an analyzer unit having a bar code reader interface means for interfacing with a series of bar code readers of various types to be tested and for receiving digitized bar code signals as a result of scanning by a series of bar code readers under test of an array of bar code patterns selected to test the relative effectiveness of the respective bar code readers of a series;

said analyzer unit having a bar code signal processing means for measuring the time interval between transitions of each of the digitized bar code signals from the interface means;

said analyzer unit having a data output means for transmitting time interval data representing the time intervals measured by the processing means;

a host processor unit interfaced with said data output means for receiving and storing the time interval data obtained by the analyzer unit, said host processor unit storing information with respect to the respective bar code patterns scanned to generate the time interval data so that the time interval data can be analyzed in relation to the respective bar code patterns, thereby to enable evaluation and objective comparison of the respective bar code readers of various types for reading effectiveness;

said host processor unit storing time interval data capable of use to generate a wide range of test digitized bar code signals and being interfaced with said analyzer unit for supplying a wide range of test time interval data corresponding to a wide range of bar code signals suitable for testing the capability of a series of decoders;

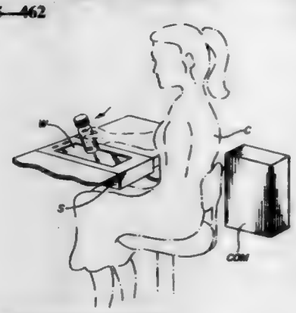
said analyzer unit having a digitized signal output means for interfacing with any of a series of various types of decoders and said bar code signal processing means being responsive to sets of test time interval data from the host processor unit to generate a wide range of test digitized bar code signals and to supply the same to said digitized signal output means; and

said host processing unit controlling said analyzer unit to supply successive test digitized bar code signals to each decoder, and having decoded data input means for interfacing with a series of various types of decoders so as to store decoded data from such decoders for analysis in relation to the respective corresponding set of test time interval data thereby to enable comparison of respective decoders in relation to the wide range of test digitized bar code signals.

5,594,231
SCANNER WINDOW

Samuel F. Pellicori, Santa Barbara, Calif.; Sean Sullivan, and Michael J. Ahten, both of Eugene, Oreg., assignors to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Division of Ser. No. 647,540, Jan. 29, 1991, abandoned. This application Oct. 17, 1994, Ser. No. 323,844
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 88 Claims



1. A bar code scanner comprising:

a. a laser light source for emitting a laser beam;

b. a scanner window;

c. optics for projecting a laser beam through said scanner window to define a scanning pattern comprised of a plurality of scan lines projecting into a volume extending beyond said scanner window, said scanner window comprising:

i. a substrate formed of light transmissive material;

ii. a light transmissive interlayer of a hard material deposited onto said substrate, wherein said hard material is selected from the group consisting of aluminum oxide, aluminum nitride, zirconium oxide, yttrium oxide, diamond film, diamond-like carbon, silicon nitride, boron nitride and combinations thereof; and

iii. a light transmissive lubricous outermost layer deposited onto said interlayer; wherein said lubricous layer is selected from the group consisting of diamond-like carbon, diamond film, polytetrafluoroethylene, polyethylene, tin oxide, indium oxide, silicon polymers, boron nitride, aluminum oxide and combinations thereof; wherein

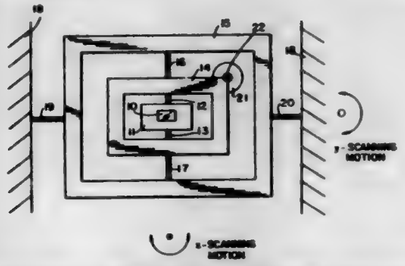
iv. the transmission level of said window is at least 75% so as to allow said laser beam to project through and define said scanning pattern comprised of a plurality of scan lines in said volume and further allow light reflected from a bar code within said volume to be received back through said window and read successfully.

5,594,232

PLANAR ARRANGEMENT FOR TWO-DIMENSIONAL OPTICAL SCANNING

Joseph Giordano, Bayville, N.Y., assignor to Symbol Technologies, Inc., Holtsville, N.Y.

Filed May 5, 1995, Ser. No. 435,973
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—472 **16 Claims**



1. An optical scanning arrangement for reading indicia having parts of differing light reflectivity, the arrangement comprising:

a) an oscillatable scanner element;

b) a mounting bracket, the scanner element being mounted for oscillation with respect to the mounting bracket by first and second wires having a relatively high modulus of elasticity, the scanner element having a relatively low inertia when oscillating by elastic movement of the first and second wires; and

c) a stationary frame, the mounting bracket being mounted for oscillation with respect to the frame by third and fourth wires having a relatively high modulus of elasticity; the scanner element, mounting bracket and first and second wires taken together having a relatively high inertia when oscillating by elastic movement of the third and fourth wires; and

d) driving means arranged to oscillate the scanner element with respect to the mounting bracket at a relatively high frequency of oscillation along a first direction, and the mounting bracket arranged to oscillate with respect to the frame at a relatively low frequency of oscillation along a second direction generally orthogonal to said first direction.

5,594,233

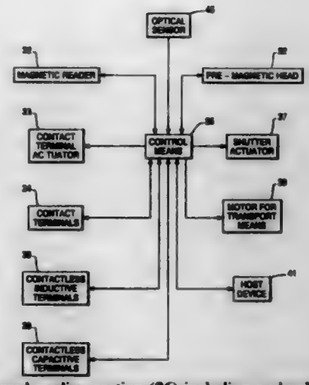
MULTIPLE STANDARD SMART CARD READER

Alexander R. Kenneth, Dundee, Scotland, and Munther S. Mahroub, Yokohama, Japan, assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Apr. 24, 1995, Ser. No. 427,373
Claims priority, application United Kingdom, Nov. 11, 1994, 94228038
Int. Cl.[6] G06K 19/06
U.S. Cl. 235—492 **15 Claims**

1. A card reader (16) comprising:

an entry slot (18) for cards (2);



a smart card reading section (26) including a plurality of smart card reading means (34,38,36) for reading multiple types of ISO standard smart cards, said multiple types of ISO standard smart cards including contact smart cards, capacitive contactless smart cards and inductive contactless smart cards;

transport means (28) for moving a card (2) inserted through said entry slot (18) along a path through said reader (16) and for positioning said card (2) in said smart card reading section (26); and

electronic control means (35) for:

activating said plurality of smart card reading means (34,38,36) in sequence while said card (2) is positioned in said smart card reading section (26),

determining which type of ISO standard smart card has been inserted into said reader if said card is an ISO standard smart card (16), and

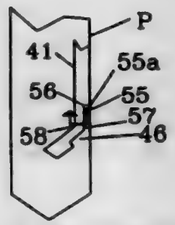
implementing an appropriate communications protocol to read data from said card (2) if it is determined that said card (2) is an ISO standard smart card.

5,594,234

DOWNSET EXPOSED DIE MOUNT PAD LEADFRAME AND PACKAGE

Buford H. Carter, Jr., Richardson; Dennis D. Davis, Garland; David R. Kee, Richardson; Jesse Clark, Farmers Branch; Steven P. Laverde, Dallas, and Hai Tran, Cedarhill, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 14, 1994, Ser. No. 337,798
Int. Cl.[6] H01L 23/495
U.S. Cl. 257—676 **12 Claims**



1. A leadframe for use with semiconductor devices, comprising:

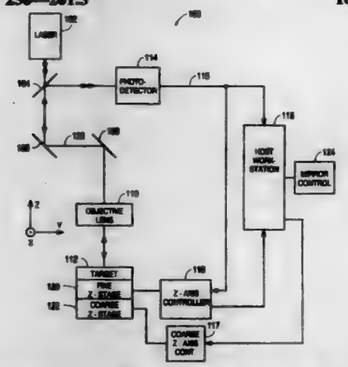
a plurality of leadframe leads in a first horizontal plane; a die mount pad downset from said first plane to a second plane, the die mount pad downset includes a base, and a plurality of notched wings extending upward from said base.

5,594,235

AUTOMATED SURFACE ACQUISITION FOR A CONFOCAL MICROSCOPE

Ken K. Lee, Los Altos, Calif., assignor to Ultrapointe Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 80,014, Jun. 17, 1993, Pat. No. 5,479,252, and a continuation-in-part of Ser. No. 183,536, Jan. 18, 1994, Pat. No. 5,483,055. This application Jun. 7, 1995, Ser. No. 483,234
Int. Cl.[6] G01J 1/20
U.S. Cl. 250—201.3 **10 Claims**



1. A method of obtaining an image of a surface with a confocal microscope having an objective lens, the surface comprised of a plurality of points, each of the points having a unique location represented by X, Y, and Z Cartesian coordinates, the method comprising the steps of:

selecting a first starting position for the objective lens along a Z vector from which to scan the surface, the Z vector substantially normal to the surface, the objective lens having a range of travel relative to the surface along the Z vector beginning at the first starting position;

dividing the range of travel into a plurality of Z positions along the Z vector, the plurality of Z positions including the starting position;

for each of the plurality of Z positions, positioning the objective lens at the Z position and scanning the surface to generate a plurality of signals, each of the signals corresponding to a given one of the points on the surface and representing an intensity of light reflected through the objective lens from the given point;

for each of the points on the surface, finding the Z coordinate of the point by determining which of the plurality of Z positions results in a maximum signal for the point, wherein the maximum signal, when correlated to the Z position of the objective lens, gives the Z location of the point on the surface;

comparing the Z locations of the points on the surface to determine a low point on the surface and a high point on the surface; and

selecting a second starting position and a stopping position based on the high point and the low point.

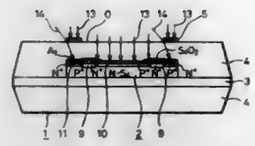
5,594,236

SUNLIGHT SENSOR

Yasutoshi Suzuki, Okazaki; Kenichi Yokoyama, Nagoya; Koki Mizuno; Inao Toyoda, both of Okazaki, and Yukio Tsuzuki, Nukata-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 14, 1994, Ser. No. 356,083
Claims priority, application Japan, Dec. 14, 1993, 5-313020; May 20, 1994, 6-106491
Int. Cl.[6] H01J 40/14; H01L 31/0203
U.S. Cl. 250—214.1 **16 Claims**

1. A sunlight sensor comprising:



a light-detection element having a light-receiving surface, said light-receiving surface comprising:

a light-responsive section which generates a signal corresponding to an amount of light which strikes said light-responsive section, and

a light-nonresponsive section which generates no signal in response to light which strikes said light-nonresponsive section, said light-responsive section and said light-nonresponsive section being substantially co-planar with one another;

a substantially transparent material covering at least a top portion of said light-detection element; and

a light-cutoff means, disposed above said light-detection element at a prescribed distance therefrom, said light-cutoff means having a hole portion disposed directly above at least a portion of said light-responsive section and an outside edge, said light-cutoff means selectively passing sunlight incident upon said sensor through said hole portion and outside of said outside edge to said light-receiving surface of said light-detection element so that the selectively passed sunlight strikes at least a portion of said light-responsive section and said light-nonresponsive section, said light-responsive section generating a signal corresponding to a sum of sunlight passing through said hole portion and striking said light-responsive section, and sunlight passing outside of said outside edge of said light-cutoff means and striking said light-responsive section, the light-responsive section, the light-nonresponsive section, and the light-cutoff means being oriented with respect to each other such that the sum of sunlight striking said light-responsive section is dependent on an incident angle of the sunlight.

5,594,237

PIN DETECTOR HAVING IMPROVED LINEAR RESPONSE

John D. Kulick, Pittstown, and Eric S-F. Mak, Bellemeade, both of N.J., assignors to The Whitaker Corporation, Wilmington, Del.

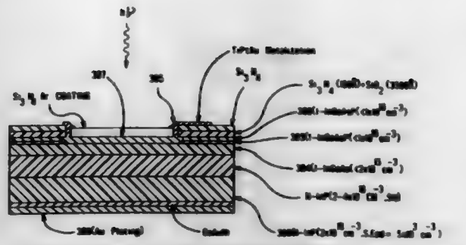
Filed Feb. 24, 1995, Ser. No. 393,753
Int. Cl.[6] H01L 27/14
U.S. Cl. 250—214.1 **11 Claims**

1. A P-I-N photodetector, comprising:

a.) a substrate of a selected doping type and level, having a bottom side, a top side and a selected thickness therebetween;

b.) a first layer of doped semiconductor material grown on said top side of said substrate having the same doping type as said substrate;

c.) a multi-layer of intrinsic semiconductor material deposited on said first layer of doped semiconductor material, one of said layers of said multi-layer intrinsic semiconductor material further comprising a cap layer of the photodetector and at



least one layer of said multi-layer intrinsic semiconductor material functioning as the photosensitive region of the photodetector;

d.) a second layer of semiconductor material selectively doped in type opposite said doping type of said first layer of semiconductor material and of a selected doping level disposed above said at least one layer of said multi-layer intrinsic semiconductor material that functions as the photosensitive region and said cap layer of said photodetector, and

e.) an annular electrical contact disposed above and circumferentially about said second layer of semiconductor material, and an electrical contact disposed on said bottom surface of said substrate, whereby selected layers of said multi-layer intrinsic semiconductor material that function as the photosensitive region do so in a manner such that the photodetector response is highly uniform, linear and with low distortion across substantially all of the photosensitive region.

5,594,238

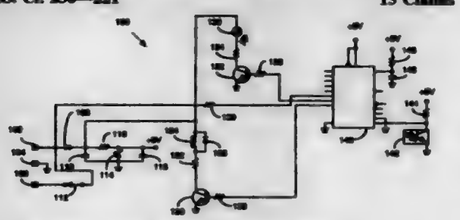
TOUCHLESS SWITCH WHICH DISCRIMINATES BETWEEN MOTION INTENDED TO TOGGLE THE SWITCH AND OTHER FORMS OF MOTION

Albert J. Endruschat, 392 Glenbrook Dr., Atlantis, Fla. 33462; Charles W. Staples, and Arthur K. Cassday, both of Boca Raton, Fla., assignors to Albert J. Endruschat, Atlantis, Fla.

Filed Feb. 17, 1995, Ser. No. 390,683

Int. Cl.[6] G01V *9/04*; E03C *1/05*

U.S. Cl. 250—221 **15 Claims**



1. An object sensing toggle switch, comprising:

a housing assembly having an outer wall transparent to radiant energy;

a barrier;

the outer wall further having a groove in the inside surface and sized such that the edge of the barrier can fit within the groove;

an emitter;

a detector for determining the ambient energy level by detecting background energy when the emitter is not activated and for determining the reflected energy level when the emitter is activated;

the barrier positioned between the emitter and the detector such that energy is substantially prevented from being directly transmitted from the emitter to the detector;

the groove having a sufficient depth and the edge of the barrier located a sufficient depth within the groove such that energy transmitted from the emitter is substantially prevented from being reflected by the outer wall back to the detector;

a processor, the processor further comprising:

an input to accept the output of the detector;

means to determine a value representative of the ambient energy level;

means to determine a value representative of the reflected energy level when the emitter is activated;

comparison means to generate a difference value representing the difference between the value representing the ambient energy level and the reflected energy level;

means to selectably activate the emitter and to selectably monitor the detector; and

means to toggle the switch when the difference value exceeds a predetermined amount.

5,594,239
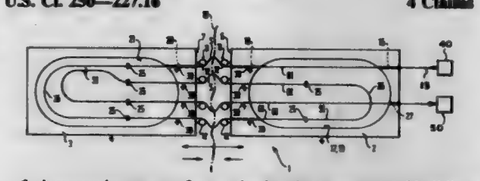
MEASURING SYSTEM FOR MONITORING BUILDINGS, TERRAIN SECTIONS OR THE LIKE

Rainer Lessing, Overath, Germany, assignor to SICOM, Langenfeld, Germany

Filed Oct. 25, 1994, Ser. No. 330,130

Int. Cl.[6] H01J *5/16*

U.S. Cl. 250—227.16 **4 Claims**



1. A measuring system for monitoring the movement of building sections resulting from movement of terrain section relative movement, wherein a first and second support plate is fixed to a first and second building section comprising:

a first receiving chamber including a first gradient beam waveguide on said first support plate,

a second receiving chamber including a first reversing step index beam waveguide on said second support plate;

said first gradient beam waveguide extending over a first arch shaped sensor path into said second receiving chamber;

first means for connecting the first gradient beam waveguide to the first reversing step index beam waveguide;

a second gradient beam waveguide extending over a second arch shaped sensor path into said first receiving chamber;

second means for connecting said first reversing step index beam waveguide to said second gradient beam waveguide;

a light source for feeding light to the first gradient beam waveguide;

a light receiving unit for receiving the light from said second gradient beam waveguide; and

said light being attenuated in response to curvature changes of the first and second arch shaped sensor path.

5,594,240

STRAIN-OPTIC VOLTAGE MONITOR WHEREIN STRAIN CAUSES A CHANGE IN THE OPTICAL ABSORPTION OF A CRYSTALLINE MATERIAL

Jonathan D. Weiss, Albuquerque, N.M., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 20, 1995, Ser. No. 407,148

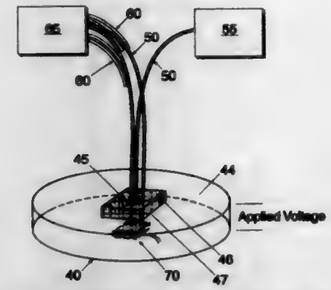
Int. Cl.[6] G01R *31/00*

U.S. Cl. 250—227.23 **22 Claims**

1. A voltage monitor comprising:

a substrate capable of undergoing electric field-induced deformation,

a crystalline material, having a conduction band with an edge in operative association with said substrate, in which strain is generated as a consequence of said electric field-induced deformation of said substrate, and in which said strain causes



a change in optical absorption at the edge of said conduction band of said crystalline material, and

a means for optically detecting said change in optical absorption at the edge of said conduction band of said crystalline material.

5,594,241

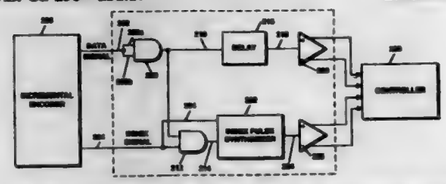
APPARATUS AND METHOD FOR JITTER ATTENUATION IN ROTARY ENCODERS

Zhixin Li, Hudson, and Steve Ham, Nashua, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Feb. 7, 1995, Ser. No. 384,941

Int. Cl.[6] G01D *5/34*

U.S. Cl. 250—231.17 **25 Claims**



1. An incremental rotary encoding system which provides digital signals indicative of the position and speed of a rotating shaft, the system comprising:

A. an incremental rotary encoder coupled to the rotating shaft, which generates a digital data signal indicative of shaft position and shaft speed, and a digital index signal which indicates the beginning of a shaft revolution to provide an absolute indication of the angular position of the shaft; and

B. means for reducing jitter on at least one of said data signal and said index signal and for providing at least one of a jitter attenuated data signal and a jitter attenuated index signal wherein said means comprises a digital logic gate having a plurality of inputs wherein at least one of the data signal and the index signal has a jitter component and is coupled to an input of said logic gate and wherein an output of the logic gate is a jitter attenuated signal.

5,594,242

POSITION DETECTING APPARATUS WHICH USES A CONTINUOUSLY MOVING LIGHT SPOT

Yoshikazu Konishi, and Shigeyuki Akimoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Japan

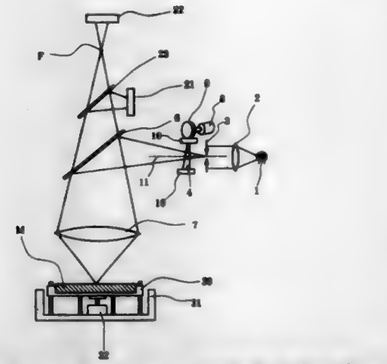
Filed Aug. 31, 1994, Ser. No. 296,936

Claims priority, application Japan, Sep. 9, 1993, 5-247308

Int. Cl.[6] G01J *1/20*

U.S. Cl. 250—234 **20 Claims**

1. A position detecting apparatus comprising: optical projection means for projecting a light beam to form a light spot within a prescribed range on an object under test;



a first light sensor which receives a reflected light beam from said object, said first light sensor receiving the reflected light beam at a position with a prescribed distance short of a convergent position;

a second light sensor which receives the reflected light beam from said object, said second light sensor receiving the reflected light beam at a position with the prescribed distance ahead of the convergent position; and

scanning means for continuously deflecting the light spot relative to said object in such a manner that the light spot moves on the object.

5,594,243

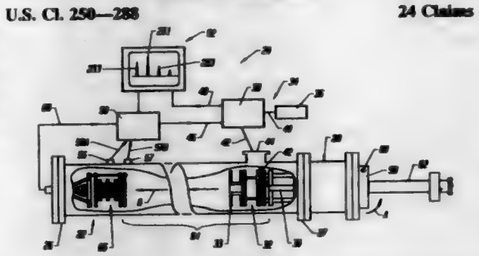
LASER DESORPTION IONIZATION MASS MONITOR (LDIM)

Scot R. Weinberger, Reno; Robert W. Egan, Reno; Thomas W. Hoppe, deceased, late of Reno, all of Nev.; Ernst Gassmann, Hofstetten, Switzerland; Martin M. Schär, Spiegel, Switzerland; Klaus O. Börnsen, Staufen, Germany, and E. Rocco Tarantino, Reno, Nev., assignors to Hewlett Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 847,450, Mar. 6, 1992, Pat. No. 5,382,793. This application Mar. 4, 1993, Ser. No. 27,317

Int. Cl.[6] B01D *59/44*

U.S. Cl. 250—288 **24 Claims**



1. An apparatus for measuring the mass of organic molecules desorbed and ionized by laser irradiation of a layer of a host matrix including said molecules, said apparatus comprising:

detector means for detecting said desorbed ionized molecules and generating an electrical signal therefrom;

ion optics means for directing the desorbed molecules to said detector means;

said detector means and said ion optics means located in a first vacuum chamber; and

a second vacuum chamber mounted on said first vacuum chamber said second chamber including means for holding a plurality of probe tips each having a tip face holding a layer of a host matrix including said organic molecules to be measured, and means for removably inserting a predetermined one of said probe tips into said first vacuum chamber without breaking a vacuum therein.

5,594,244

ELECTRON ENERGY SPECTROMETER

Martin Prutton, York, Great Britain, assignor to University of York, York, Great Britain

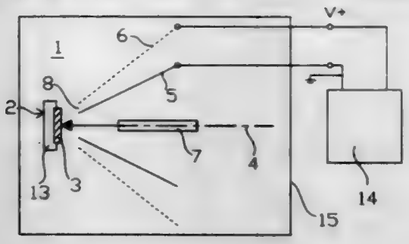
PCT No. PCT/GB93/01957, § 371 Date Jun. 12, 1995, § 102(e) Date Jun. 12, 1995, PCT Pub. No. WO94/07258, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 15, 1993, Ser. No. 406,875

Claims priority, application United Kingdom, Sep. 23, 1992, 9220097

Int. Cl.[6] H01J *49/48*

U.S. Cl. 250—305 **18 Claims**



1. A spectrometer comprising a sample holder, an excitation source, first and second electrodes, biassing means and a detector, wherein:

the excitation source is arranged to emit an excitation beam to a sample in said holder thereby to cause electron emission from the sample;

the biassing means is arranged to establish an electric field between said electrodes;

said electrodes are conical or part-conical in shape and are coaxial with one another;

there is defined between adjacent ends of said electrodes a gap adjacent said sample holder to receive electrons emitted from a sample in the holder, in use;

said electrodes diverge from one another in a direction extending away from said sample holder, and said detector diverges from said electrodes in a direction extending away from said sample holder, with the second electrode disposed between the first electrode and the detector; and

in a region where said electrodes diverge from one another and said detector diverges from said electrodes, the second electrode is at least partially transparent to electrons such that, in use, electrons entering said electric field through said gap are deflected to pass through the second electrode and impinge upon the detector, which is operative to detect the impinging electrons.

5,594,245

SCANNING ELECTRON MICROSCOPE AND METHOD FOR DIMENSION MEASURING BY USING THE SAME

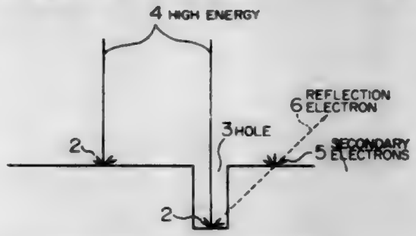
Hideo Todokoro, Tokyo; Kenji Takamoto, Ome; Tadashi Otaka, Katsuta; Fumio Mizuno, Tokorozawa; Satoru Yamada, Ome; Sadao Terakado, Katsuta; Katsuhiro Kuroda, Hachioji; Ken Ninomiya, Higashimatsuyama, and Tokuo Kure, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 160,336, Dec. 2, 1993, Pat. No. 5,412,210, which is a continuation-in-part of Ser. No. 39,705, Mar. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 773,729, Oct. 9, 1991, abandoned. This application Feb. 10, 1995, Ser. No. 386,766

Claims priority, application Japan, Oct. 12, 1990, 2-272258; Apr. 10, 1992, 4-089189; Dec. 2, 1992, 4-323128

Int. Cl.[6] H01J *37/26*

U.S. Cl. 250—310 **20 Claims**



1. A scanning electron microscope, comprising:

means for irradiating a primary electron beam which can transmit through part of a specimen to reach a portion of the specimen that is not directly exposed to the electron beam, said primary electron beam having energy sufficient to produce reflection electrons reflected from within a depression in the object that penetrate through the object so as to escape from the surface of the object or that generate secondary electrons in the surface of the object while penetrating through the object;

means for detecting a signal secondarily generated from the specimen irradiated with the electron beam;

means for generating a scanning image of the specimen on the basis of said secondary signal; and

means for performing measurement of a dimension of a specimen article between dimension-measuring start and end points on the basis of said scanning image.

5,594,246

METHOD AND APPARATUS FOR X-RAY ANALYSES

Yoshimi Sudo, Hachioji; Takuo Kure, Tokyo; Ken Ninomiya, Higashi-Matsuyama; Katsuhiro Kuroda, Hachioji; Takashi Nishida; Hideo Todokoro, both of Tokyo; Yasuhiro Mitsui, Fuchu, and Hiroyasu Shichi, Tanashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 211,575, Apr. 11, 1994, Pat. No. 5,481,109. This application Apr. 25, 1995, Ser. No. 430,535

Claims priority, application Japan, Apr. 28, 1994, 6-091034

Int. Cl.[6] H01J *37/252;* **G01N** *23/223;23/225*

U.S. Cl. 250—310 **75 Claims**

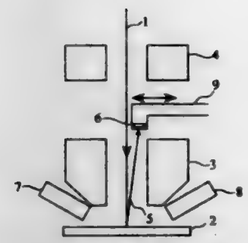
1. An X-ray analyzing method comprising the steps of:

applying an irradiated electron beam converged by a condenser lens and an objective lens into a thin beam to the inside of a fine hole existing on a surface of a sample;

observing X-rays generated from a residual substance existing inside said fine hole at the above step of applying said irradiated electron beam thereto; and

performing a qualitative and quantitative analysis of said residual substance,

said X-ray analyzing method characterized in that:



said X-rays are observed by means of an X-ray detector having an energy analyzing function installed in an internal space of said condenser lens, an internal space of said objective lens or between said condenser lens and said objective lens; and

only said X-rays radiated within the angular range $-\theta$ to $+\theta$ are detected by said X-ray detector, where θ is an angle formed with a center axis of said electron beam and so defined that $\tan\theta$ is substantially equal to a/d, and where a and d are the radius and the depth of said fine hole, respectively.

5,594,247

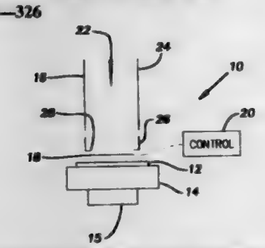
APPARATUS AND METHOD FOR DEPOSITING CHARGE ON A SEMICONDUCTOR WAFER

Roger L. Verkuil, Wappinger Falls, N.Y.; Gregory S. Horner, Solon, and Thomas G. Miller, Shaker Hts., both of Ohio, assignors to Keithley Instruments, Inc., Cleveland, Ohio

Filed Jul. 7, 1995, Ser. No. 499,326

Int. Cl.[6] H01T *19/04*

U.S. Cl. 250—326 **17 Claims**



1. An apparatus for depositing a desired charge on a surface of a semiconductor wafer, said apparatus comprising:

an ion source;

a conductive screen between said source and said surface, said screen having a plurality of apertures, wherein said apertures flare toward said surface; and

a screen potential control for applying a desired potential to said screen.

5,594,248

INFRARED IMAGING DEVICE AND INFRARED IMAGING SYSTEM USING SAME

Akio Tanaka, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 201,207, Feb. 24, 1994, abandoned. This application Mar. 12, 1996, Ser. No. 615,013

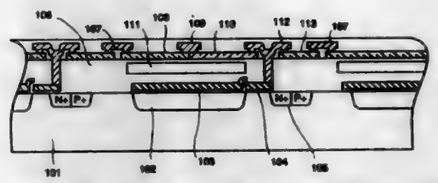
Claims priority, application Japan, Feb. 25, 1993, 5-035930

Int. Cl.[6] H04N *5/33*

U.S. Cl. 250—332 **14 Claims**

1. An infrared imaging device comprising:

a plurality of detectors for converting infrared radiation into an electric signal, each of said detectors comprising an infrared radiation detecting device and a readout transistor connected thereto; and



a scanner for scanning output signals respectively from said detectors and producing a signal representing the scanned output signals;

each of said detectors including a bypass circuit for limiting the output signal from the detector within a fixed voltage range when the infrared radiation detecting device thereof is inoperative.

5,594,249

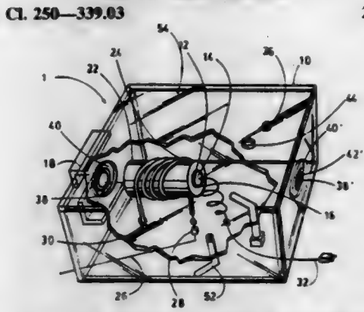
SUBAMBIENT TEMPERATURE CONTROLLED CELL FOR INFRARED SPECTROSCOPIC ANALYSIS AND A METHOD FOR THE DETECTION OF PARAFFINIC HYDROCARBONS

David L. Benefiel, Oakland City; Louis R. Kessler, and Alan J. Mitchell, both of Evansville, all of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 16, 1995, Ser. No. 491,225

Int. Cl.[6] G01N *21/35;21/01*

U.S. Cl. 250—339.03 **20 Claims**



1. A system for analyzing a sample in a test chamber using infrared spectrophotometry, the system comprising:

a sample holder in the test chamber capable of holding the sample to be analyzed;

a refrigerant input line capable of receiving a refrigerant to cool the sample in the sample holder; and

receiving means freestanding in the test chamber and supported by the refrigerant input line wherein the receiving means supports the sample holder and is capable of receiving infrared transmissions from a source such that the transmissions are subjected through the receiving means to the sample in the sample holder.

5,594,250

METHOD FOR DETECTING WATER EQUIVALENT OF SNOW USING SECONDARY COSMIC GAMMA RADIATION

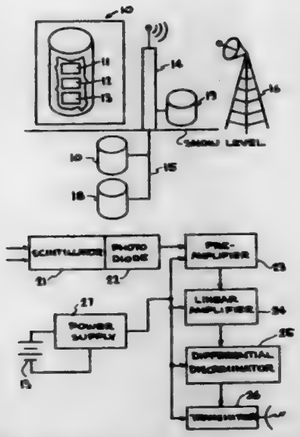
Kenneth J. Condreva, 1420 Fifth St., Livermore, Alameda County, Calif. 94550

Filed Apr. 3, 1995, Ser. No. 415,406

Int. Cl.[6] G01T *1/20*

U.S. Cl. 250—361 R **11 Claims**

1. A method for determining the water equivalent of an accumulation of snow, comprising:



a) obtaining a measurement of a first flux of secondary cosmic gamma rays which has passed through an accumulation of snow; and

b) comparing said measurement with calibration data to determine the water equivalent of said accumulation of snow.

3. An apparatus for determining the water equivalent of an accumulation of snow comprising:

a) a scintillation detector located at the bottom of an accumulation of snow, said scintillation detector generating a light pulse when struck by a gamma ray;

b) a photodetector to detect said light pulse and convert said light pulse to an electrical pulse;

c) an electronics system receiving said electrical pulse, comprising;

i) at least one amplifier to amplify said electrical pulse to a magnitude useful for a differential discriminator;

ii) a differential discriminator for counting said pulse whenever said pulse falls within a range of from about 3 to about 10 MeV, accumulating pulses that fall within said range for a time interval, and formatting the accumulated pulses into a serial data stream suitable for transmission;

d) a period timer circuit for determining the time interval over which pulses are accumulated;

e) a telemetry transmitter for transmitting accumulated pulses; and

f) a power supply for powering the electronics system.

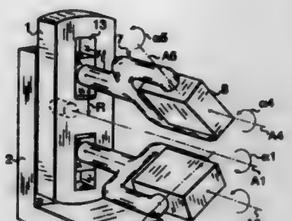
5,594,251

GAMMA CAMERA WITH ROTATING ARM

Christophe J. M. Fleury, Guyancourt, and Bertrand Legue, Paris, both of France, assignors to Sopha Medical, Paris, France

Filed Feb. 2, 1995, Ser. No. 382,570
Claims priority, application France, Feb. 2, 1994, 94 01166
Int. Cl.° G01T *1/166*
U.S. Cl. 250—363.05 **34 Claims**

1. A gamma camera comprising a frame, a base rotationally fixed to the frame along a substantially horizontal axis of rotation of the gamma camera, said base having an arm supported thereto at one end to extend substantially parallel to the axis of rotation of the gamma camera and supporting at a free end thereof a first detector head, said arm being rotationally movable about an axis of angulation of the first detector head, said arm being disposed substantially parallel to the axis of rotation of the gamma camera and said axis of angulation passing through a first position at which said one end of the arm is supported to the base, and further wherein the axis of angulation of the first detector head is offset with respect to the axis of orientation of the first detector head towards a detection



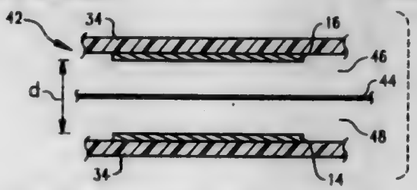
surface of said first detector head and passes substantially through the center of gravity formed by said one arm and said first detector head.

5,594,252

THREE TERMINAL ION CHAMBERS

Derek J. Day, Los Gatos, Calif.; Rolf Stähelin, Schlieren, Switzerland; Salvatore Provenzale, Gebenstorf, Switzerland; Heinrich Riem, Wettingen, Switzerland, and Willi Fencl, Kloten, Switzerland, assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 9, 1995, Ser. No. 555,815
Int. Cl.° H01J *47/02*
U.S. Cl. 250—385.1 **15 Claims**



1. A three terminal ionization chamber, comprising:

a first electrode coupled to a bias voltage source;

a second electrode, spaced a distance apart from said first electrode, coupled to ground;

a third electrode, positioned between said first and second electrodes;

a dielectric sheet positioned between said second and third electrodes; and

measurement circuitry, coupled to said second and third electrodes for measuring radiation incident to said chamber.

5,594,253

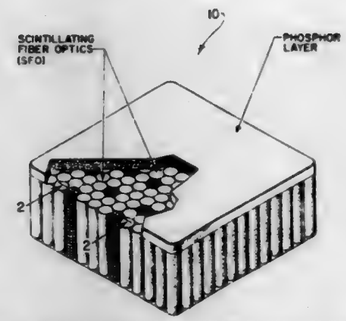
HYBRID LUMINESCENT DEVICE FOR IMAGING OF IONIZING AND PENETRATING RADIATION

Clifford Bueno, Sunnyvale; Robert A. Betz, Fremont; Mark H. Ellisman, Solana Beach, and Gary G. Y. Fan, San Diego, all of Calif., assignors to Lockheed Missiles and Space Company, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 365,443, Dec. 28, 1994, abandoned.
This application May 28, 1996, Ser. No. 650,225
Int. Cl.° G01T *1/20*
U.S. Cl. 250—486.1 **35 Claims**

1. A hybrid luminescent device for converting penetrating or ionizing radiation into light that can be detected by an electronic or film recording medium and which provides high luminescence output, high radiation absorption efficiency and high spatial resolution irrespective of radiation energy levels, the hybrid luminescent device comprising:

a) a fiber optics scintillator including an entrance face and an exit face, said exit face is adapted for coupling to a light detection device for image recordation, said fiber optics scin-



tillator formed from a non-crystalline amorphous substance and characterized as having:

i) a first radiation absorption efficiency;

ii) a first brightness value;

iii) a first spatial resolution value;

b) a phosphor layer disposed on said entrance face of said fiber optics scintillator, said phosphor layer characterized as having:

i) a second radiation absorption efficiency lower than the first radiation absorption efficiency of said fiber optics scintillator;

ii) a second brightness value higher than the first brightness value of said fiber optics scintillator;

iii) a second spatial resolution value lower than the first spatial resolution value of said fiber optics scintillator; and wherein

c) the hybrid luminescent device exhibits:

i) a third radiation absorption efficiency higher than the first radiation absorption efficiency of said fiber optics scintillator;

ii) a third brightness value higher than a combined total of the first and second brightness values of said fiber optics scintillator and phosphor layer, respectively; and

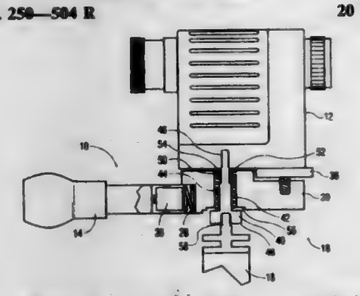
iii) a third spatial resolution value about that of the first spatial resolution value of said fiber optics scintillator.

5,594,254

ILLUMINATOR DEVICE FOR USE WITH NIGHT VISION DEVICES

Gary L. Palmer, Vinton, Va., assignor to ITT Corporation, New York, N.Y.

Filed Nov. 29, 1995, Ser. No. 564,386
Int. Cl.° F21V *33/00*
U.S. Cl. 250—504 R **20 Claims**



1. An illuminator device for use with an optical device, said optical device having a tripod mount on a surface thereof, wherein said optical device has a predetermined line of sight, comprising:

a light source having a housing for projecting a beam of light along a predetermined center line;

a mounting structure attached to said housing;

biasing means for providing a biasing force that biases said mounting structure against the optical device in a first orientation, wherein said biasing means includes an elongated element that couples to the tripod mount of the optical device, thereby maintaining a predetermined directional relationship between said center line of said beam of light and the line of sight of the optical device; and

an adjustable element disposed between said mounting structure and the optical device for selectively moving said mounting structure against said biasing force and away from said first orientation, thereby selectively altering said predetermined directional relationship between said center line of said light beam and the line of sight of the optical device.

5,594,255

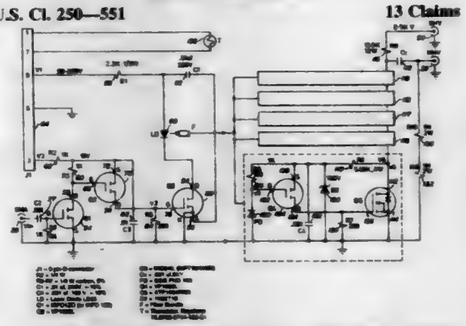
Patent Not Issued For This Number

5,594,256

HIGH VOLTAGE SWITCH FOR POCKELS CELLS

Larry D. Siebert, Ann Arbor, Mich., assignor to Clark-MXR, Inc., Dexter, Mich.

Filed Jan. 13, 1995, Ser. No. 372,149
Int. Cl.° G02B *27/00*
U.S. Cl. 250—551 **13 Claims**



1. A semiconductor switch for applying a high voltage across a pockels cell, comprising:

a plurality of semiconductor devices connected in series with the pockels cell and a capacitor, each of the semiconductor devices having a control input;

a plurality of fast light responsive devices, one fast light responsive device connected to the control input of each semiconductor device of the plurality of semiconductor devices respectively for switching the respective device from a non conducting state to a conducting state; and

a controlled, fast rise time light source optically coupled to all of the fast light responsive devices for simultaneously triggering all of the semiconductor devices.

5,594,257

SUPERCONDUCTING DEVICE HAVING A SUPERCONDUCTING CHANNEL FORMED OF OXIDE SUPERCONDUCTOR MATERIAL AND METHOD FOR MANUFACTURING THE SAME

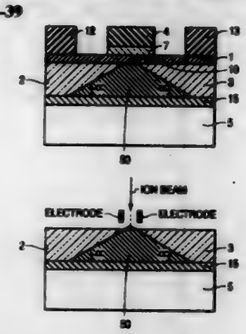
Takao Nakamura, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 24, 1993, Ser. No. 80,844

Claims priority, application Japan, Jun. 24, 1992, 4-190100; Jun. 24, 1992, 4-190101; Jun. 25, 1992, 4-191671; Jun. 26, 1992, 4-193014

Int. Cl.[6] H01L 39/22; B05D 5/12; H01B 12/00

U.S. Cl. 257—39 13 Claims



1. A superconducting device comprising

a substrate having a principal surface,

a non-superconducting oxide layer having a similar crystal structure to that of an oxide superconductor formed on the principal surface, which can compensate the lattice mismatch between the substrate and the oxide superconductor,

a superconducting source region and a superconducting drain region formed of c-axis oriented oxide superconductor thin films on the non-superconducting oxide layer,

an insulating region formed of a doped oxide superconductor on the non-superconducting oxide layer separating the superconducting source region and the superconducting drain region,

an extremely thin superconducting channel on the insulating region, formed of a c-axis oriented oxide superconductor thin film which is prolonged to the superconducting source region and the superconducting drain regions which electrically connects the superconducting source region to the superconducting drain region, so that superconducting current can flow through the superconducting channel between the superconducting source region and the superconducting drain region, and

a gate electrode through a gate insulating layer on the superconducting channel for controlling the superconducting current flowing through the superconducting channel by a signal voltage applied to the gate electrode,

wherein the insulation region has predetermined inclined straight side surfaces having predetermined tilt angles smaller than 40° such that the insulating region is narrower at the top than at the bottom and the superconducting source region, the superconducting drain region and the insulating region have the same thickness so that the extremely thin oxide superconductor thin film which constitutes the superconducting channel is formed flatwise.

5,594,258

SEMICONDUCTOR DEVICE WITH RETICLE SPECIFIC IMPLANT VERIFICATION INDICATOR

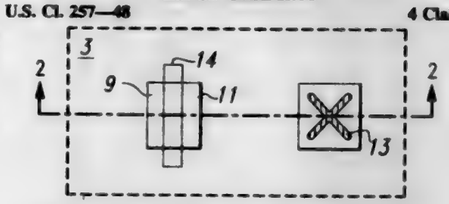
Catherine M. Huber, Allen; Debra J. Dolby, Plano, and Wayland B. Holland, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 92,043, Jul. 15, 1993, Pat. No. 5,403,753.

This application Feb. 3, 1995, Ser. No. 382,811

Int. Cl.[6] H01L 23/58

U.S. Cl. 257—48 4 Claims



1. A semiconductor device which includes:

(a) a semiconductor substrate having an ion implant implanted within an electrical component area of said substrate at a given reticle level point in a process flow; and

(b) a non-electrical component window area in said substrate spaced from said electrical component area and having an ion implant therein, said ion implant of said window area being implanted at the same reticle level point as said ion implant of said electrical component area and being patterned in the form of a pattern identifying said reticle level point.

5,594,259

SEMICONDUCTOR DEVICE AND A METHOD FOR PRODUCING THE SAME

Yasunori Shimada, Nara; Masahito Goto, Tenri; Hisashi Saito, Nara, and Koji Taniguchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

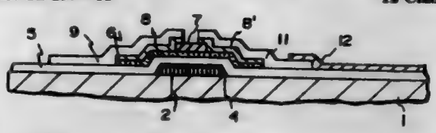
Continuation of Ser. No. 935,439, Aug. 26, 1992, abandoned.

This application Nov. 9, 1994, Ser. No. 338,195

Claims priority, application Japan, Aug. 29, 1991, 3-219031

Int. Cl.[6] H01L 29/76

U.S. Cl. 257—66 12 Claims



1. A semiconductor device, comprising:

an insulating substrate; and

an electrode wiring having a single layer structure provided on an area of the insulating substrate by sputtering,

wherein the electrode wiring is formed of an alloy consisting essentially of Ta and Nb, wherein the alloy has a body-centered cubic structure.

5,594,260

PHOTOELECTRIC CONVERTER WITH PHOTOELECTRIC CONVERSION DEVICES MOUNTED SEPARATELY FROM WIRING BOARDS

Tsuyoshi Tsutsui, and Muneharu Tsujikawa, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Japan

Filed May 31, 1994, Ser. No. 251,788

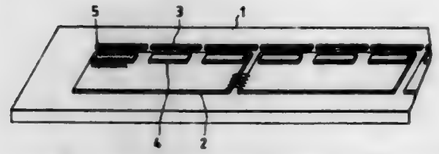
Claims priority, application Japan, Sep. 3, 1993, 5-219976; Sep. 16, 1993, 5-230025

Int. Cl.[6] H01L 33/00

U.S. Cl. 257—80 10 Claims

1. A photoelectric converter, comprising:

a single support board;



a plurality of printed wiring boards arranged in a line on said single support board; and

a plurality of photoelectric conversion devices arranged in a linear line spaced from the line of printed wiring boards on said single support board, said printed wiring boards being separated from said photoelectric conversion device and each of the printed wiring boards being electrically joined to only a selected portion of the plurality of photoelectric conversion devices.

5,594,261

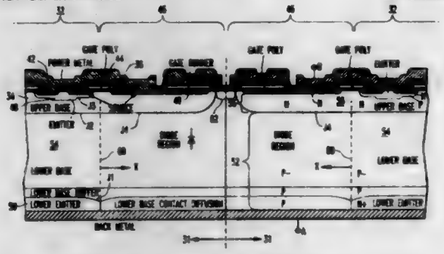
DEVICE FOR ISOLATING PARALLEL SUB-ELEMENTS WITH REVERSE CONDUCTING DIODE REGIONS

Victor A. K. Temple, Clifton, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 5, 1994, Ser. No. 223,425

Int. Cl.[6] H01L 29/10

U.S. Cl. 257—140 25 Claims



1. A semiconductor switching device comprising:

a. a single semiconductor member having first and second surfaces;

b. plural sub-elements in said semiconductor member, each of said plural sub-elements having an active area with a multiplicity of cells therein, comprising,

a first emitter layer of a first semiconductor type,

a first base layer of a second semiconductor type on said first emitter layer,

a second base layer of the first semiconductor type on said first base layer,

plural second emitter regions of the second semiconductor type in said second base layer,

an anode and a cathode for conveying current to and from said active area, and

a gate for conveying signals causing said active area selectively to carry current therethrough; and

c. a diode region surrounding each of said plural sub-elements, each said diode region comprising a junction of (a) a first junction layer of the second semiconductor type that contacts one of said anode and said cathode and (b) a second junction layer of the first semiconductor type that contacts the other one of said anode and said cathode.

5,594,262

ELEVATED TEMPERATURE GALLIUM ARSENIDE FIELD EFFECT TRANSISTOR WITH ALUMINUM ARSENIDE TO ALUMINUM GALLIUM ARSENIDE MOLE FRACTIONED BUFFER LAYER

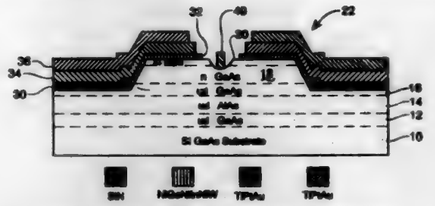
Hyong Y. Lee, Beavercreek; Belinda Johnson, Dayton; Rocky Reston, Beavercreek, all of Ohio; Chris Ito, Colorado Springs, Colo.; Gerald Trombley, Centerville, and Charles Havasy, Beavercreek, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 254,722, Jun. 6, 1994, Pat. No. 5,411,902.

This application Apr. 7, 1995, Ser. No. 418,747

Int. Cl.[6] H01L 31/0256; 29/20

U.S. Cl. 257—192 12 Claims



1. A Gallium arsenide field effect transistor comprising:

a semi-insulating GaAs substrate member;

an undoped first GaAs buffer layer received on an exposed surface portion of said semi-insulating GaAs substrate member;

an undoped second GaAs buffer layer received over said undoped first GaAs buffer layer;

a n type GaAs channel layer received over said undoped second GaAs buffer layer;

a n+ type GaAs ohmic layer received on said n type GaAs channel layer;

means including an undoped homogeneous AlAs barrier layer disposed intermediate said undoped first and second GaAs buffer layers for limiting a flow of charge carriers between said semi-insulating GaAs substrate member and said n type GaAs channel layer during elevated temperature operation of said field effect transistor;

said undoped homogeneous barrier layer having a layer thickness greater than that of any other of said layers.

5,594,263

SEMICONDUCTOR DEVICE CONTAINING A SEMICONDUCTING CRYSTALLINE NANOPOROUS MATERIAL

Robert L. Bedard, Mc Henry, Ill.; Geoffrey A. Ozin; Homayoun Ahari, both of Toronto, Canada; Carol L. Bowes; Tong Jiang, both of Toronto, Canada, and David Young, Toronto, Canada, assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 329,388, Oct. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 37,965, Mar. 26, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,892

Int. Cl.[6] H01L 29/12; 29/18; 31/0328; 31/109

U.S. Cl. 257—201 12 Claims

1. A semiconductor device comprising at least one p-n junction, said junction formed from a "p" semiconductor contacting an "n" semiconductor, where the "p" semiconductor is a nanoporous semiconducting crystalline material having a crystallographically ordered nanoporous framework structure, an intracrystalline pore system whose pores have an average pore diameter of about 2.5 to about 30 Å and a band gap of greater than zero to about 5 eV said material selected from the group consisting of a metal sulfide or selenide having an empirical formula expressed in molar ratios: $xR:MA_{2\pm0.2}:zH_2O$ where x has a value of greater than 0 to about 1.0, R represents at least one organic structure-directing agent

present in the intracrystalline pore system, M is germanium, tin, or combinations thereof, A is sulfur, selenium, or combinations thereof, z has a value of about 0 to about 4.0; a metal sulfide or selenide having an empirical formula of $xR:M_{1-y}M'_yA_{2\pm0.2}:zH_2O$ where x has a value of greater than 0 to about 1.0, R represents at least one organic structure-directing agent present in the intracrystalline pore system, M is germanium, tin, or combinations thereof, y varies from greater than 0 to about 0.5, M' is a metal selected from the group consisting of thallium, silver, lead, mercury, chromium, arsenic, antimony, indium, molybdenum, tungsten, cobalt, zinc, copper, manganese, iron, nickel, cadmium and gallium, A is sulfur, selenium, or combinations thereof, z has a value of about 0 to about 4.0; and a metal oxysulfide composition having an empirical formula of

$$(M^e_sAl_tP_uSi_vS_w)O_{2-w}$$

where M^e is selected from the group consisting of cobalt, tin, zinc, iron, chromium, manganese, germanium, gallium and arsenic, s varies from greater than zero to about 1, t varies from 0 to less than 0.5, u varies from 0 to about 0.5, v varies from 0 to less than 0.5, w varies from greater than zero to about 2s and t, u and v are chosen such that when t is greater than zero, u is greater than zero and s+t+u+v=1 and the "n" semiconductor is a conventional semiconductor selected from the group consisting of silicon, germanium, a III-V semiconductor and a II-VI semiconductor.

5,594,264

LDD SEMICONDUCTOR DEVICE WITH PEAK IMPURITY CONCENTRATIONS

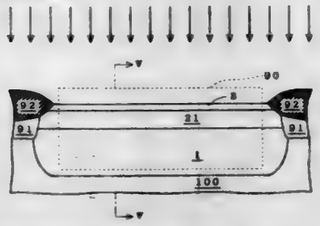
Masayoshi Shirahata, and Yoshinori Okumura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1995, Ser. No. 528,564

Claims priority, application Japan, Dec. 16, 1994, 6-313395

Int. Cl.[6] H01L *27/088*

U.S. Cl. 257—335 **5 Claims**



1. A semiconductor device comprising:

(a) a semiconductor substrate including a first conductivity type impurity, said substrate having a first peak concentration of said first conductivity type impurity located along a depth direction of said semiconductor substrate;

(b) source and drain regions of a second conductivity type impurity selectively formed in an upper portion of said semiconductor substrate and including a concentration of said first conductivity type impurity, said source and drain regions making a pair to form an LDD construction said drain region having a second peak concentration of said first conductivity type impurity located along a depth direction of said drain region and said substrate; and

(c) a buried layer formed in said upper portion of said semiconductor substrate between said source and drain regions,

wherein a valley concentration of said first conductivity type impurity is located between said first peak concentration and said second peak concentration of the first conductuvity type impurity.

5,594,265

INPUT PROTECTION CIRCUIT FORMED IN A SEMICONDUCTOR SUBSTRATE

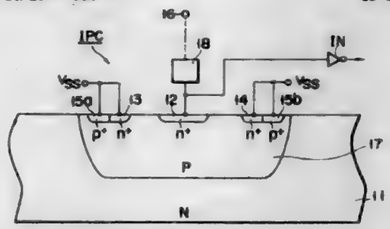
Mitsuru Shimizu, Sakura; Syuso Fujii, Kawasaki; Kenji Numata, Yamato, and Masaharu Wada, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1991, Ser. No. 799,342

Claims priority, application Japan, Nov. 30, 1990, 2-340617; Nov. 30, 1990, 2-340618

Int. Cl.[6] H01L *23/62*

U.S. Cl. 257—355 **13 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

a well region of a second conductivity type formed in a part of a surface region of said semiconductor substrate;

a first semiconductor region of the first conductivity type formed in a part of a surface region of said well region and connected to an input pad for receiving an external signal;

second semiconductor regions of the first conductivity type respectively formed at opposing sides of the first semiconductor region in the surface region of said well region, said second semiconductor regions being connected to a ground potential; and

a third semiconductor region of the second conductivity type formed entirely within the surface region of said well region and connected to the ground potential, said third semiconductor region being arranged around said second semiconductor regions, wherein each of said second semiconductor regions contacts said third semiconductor region;

wherein said first semiconductor region, said well region, and said second semiconductor regions form a parasitic bipolar transistor between said input pad and the ground potential, and said first semiconductor region, said well region, and said third semiconductor region form a parasitic diode in parallel with said parasitic bipolar transistor between said input pad and the ground potential, and

wherein said well region includes no semiconductor region other than said first, second, and third semiconductor regions and is formed independently of other semiconductor circuits arranged in said semiconductor substrate.

5,594,266

INTEGRATED CIRCUIT (IC) WITH A TWO-TERMINAL DIODE DEVICE TO PROTECT METAL-OXIDE-METAL CAPACITORS FROM ESD DAMAGE

David F. Beigel, Swampscott; William A. Krieger, North Andover, and Susan L. Feindt, Boston, all of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 363,384, Dec. 23, 1994, Pat. No. 5,477,078, which is a continuation of Ser. No. 198,856, Feb. 18, 1994, abandoned. This application Oct. 20, 1995, Ser. No. 546,188

Int. Cl.[6] H01L *23/62*

U.S. Cl. 257—355 **4 Claims**

1. An integrated-circuit (IC) chip comprising circuitry with transistors and capacitors, said circuitry being connected by a lead to an external terminal point of said IC chip, said IC chip further being formed with a clamp device to prevent damage to any capacitor element of said circuitry from electrostatic discharge (ESD) striking said terminal point, said clamp device comprising a diode with first and second electrodes and being formed during the process of forming the chip including:

isolation means defining a clamp device region within which said clamp device is formed;

said clamp device region including a silicon region with dopant of one type;

said silicon region including a first plug with dopant of said one type and extending at least part way along the outer reaches of said silicon region to serve as a low resistance current path for one electrode of the diode;

first contact means to establish a first contact to make electrical connection to said first plug;

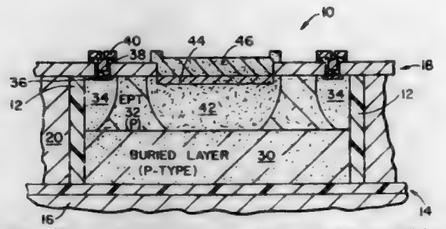
said silicon region further including a second plug laterally interiorly of and separate from said first plug, said second plug being diffused throughout with dopant of type opposite said one type to serve the function of the other electrode of the diode;

said second plug with said diffusion of opposite-type dopant being free of dopant of said one type so as to provide homogeneity of dopant type throughout said second plug;

second contact means to establish a second contact to make electrical connection to said second plug;

means connecting one of said contacts to a line of fixed potential; and

means connecting the other of said contacts to said lead between said terminal point and said IC circuitry so as to intercept and shunt to said line of fixed potential electrostatic pulse energy received from said terminal point thereby to provide for dissipation of the ESD energy to prevent it from damaging said IC circuitry.



5,594,267

SEMICONDUCTOR MEMORY DEVICE HAVING THIN FILM TRANSISTOR AND METHOD OF PRODUCING THE SAME

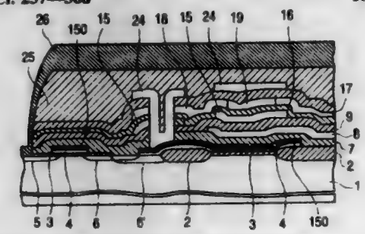
Taiji Ema, and Kazuo Itabashi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 857,643, Mar. 24, 1992, abandoned. This application Jan. 4, 1994, Ser. No. 178,355

Claims priority, application Japan, Mar. 27, 1991, 3-085916; Jun. 18, 1991, 3-145940

Int. Cl.[6] H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—368 **10 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate; and

a memory cell formed on the semiconductor substrate and including two transfer transistors, two driver transistors and two thin film transistor loads,

said thin film transistor loads including a first gate electrode, a first insulator layer formed on the first gate electrode, a semiconductor layer formed on the first insulator layer, a second insulator layer thicker than said first insulator layer formed on the semiconductor layer, and a shield electrode formed on the second insulator layer,

said shield electrode shielding the thin film transistor loads and being out of direct electrical connection with said first gate electrode and said semiconductor substrate,

wherein the thin film transistor loads further include a channel region formed in the semicopductor layer, and the shield electrode has a pattern identical to that of the semiconductor layer where the channel region is formed.

5,594,268

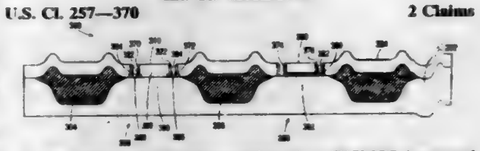
METHOD OF MANUFACTURING HIGH PERFORMANCE BIPOLAR TRANSISTORS IN A BICMOS PROCESS

Johan A. Darmawan, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 3, 1994, Ser. No. 285,315

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—370 **2 Claims**



1. An emitter of a bipolar transistor in a BiCMOS integrated circuit fabricated by a process comprising the steps of:

forming a oxide layer over the surface of a silicon substrate;

depositing a layer of nitride overlying the oxide layer;

patterning the oxide and nitride layers to furnish footings for prospectively bearing edges of the emitter;

depositing a first layer of polysilicon film overlying the surface of the silicon substrate and the footings;

patterning the emitter by selectively etching the polysilicon film so that the bottom surface of the emitter has a medial opening abutting the surface of the silicon substrate and lateral edges abutting the oxide and nitride footings;

removing the footings by stripping the nitride layer and etching the oxide layer, leaving lateral notches at the bottom of the emitter;

depositing a second layer of polysilicon film overlying the surface of the first polysilicon film layer and the emitter and filling the emitter lateral notches; and

etching back the second layer of polysilicon film, leaving the second layer of polysilicon film as emitter sidewalls and filling the notches of the emitter.

5,594,269

RESISTIVE LOAD FOR INTEGRATED CIRCUIT DEVICES

Charles R. Spinner, III, Dallas, and Fu-Tai Liou, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

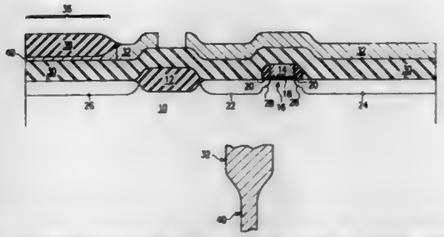
Continuation of Ser. No. 85,970, Jun. 30, 1993, abandoned, which is a division of Ser. No. 741,793, Aug. 6, 1991, Pat. No. 5,268,325. This application Oct. 12, 1994, Ser. No. 322,387

Int. Cl.[6] H01L *21/768;23/52*

U.S. Cl. 257—380 **9 Claims**

1. An integrated circuit structure having a resistive load element and polycrystalline silicon interconnect in a single polycrystalline silicon layer, comprising:

a patterned, single layer of polycrystalline silicon interconnect on an insulating layer of the integrated circuit, the layer having a resistive load element region and an interconnect region, wherein the load element region has a first thickness and a first width, and wherein the interconnect region has a



second thickness and a second width, both the second width and the second thickness being greater than the first width and first thickness, respectively;

a transition region between, and connected to, the load element region and the interconnect region, wherein the transition region has a thickness which continuously increases from its connection with the load element region to its connection with the interconnect region, and wherein the transition region has a width which continuously increases from its connection with the load element region to its connection with the interconnect region;

impurities at a high doping concentration within the interconnect region of the polycrystalline silicon layer, wherein such region has a high conductivity; and

oxide regions on an upper surface of the load element region and on sides thereof, wherein the oxide regions have physical properties characteristic of the type formed from oxidation of polycrystalline silicon.

5,594,270

SEMICONDUCTOR MEMORY DEVICE

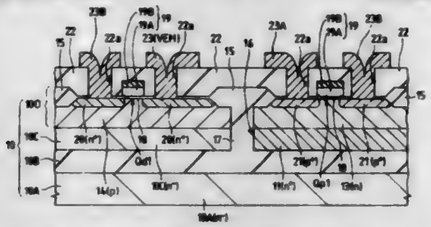
Toshiro Hiramoto, Yokohama; Nobuo Tamba, and Motoki Kasai, both of Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 314,775

Claims priority, application Japan, Sep. 29, 1993, 5-243002

Int. Cl.° H01L *29/76*; **G11C** *11/00*

U.S. Cl. 257—393 **11 Claims**



1. A semiconductor memory device comprising:

a) word lines formed on a substrate and extending in a column direction;

b) complementary data line pairs formed on said substrate and extending in a row direction;

c) memory cells formed on said substrate and being arranged in said column and row directions so that each of said memory cells is coupled to a corresponding word line and a corresponding complementary data line pair, each of said memory cells comprising a first inverter circuit and a second inverter circuit, inputs and outputs of said first and second inverter circuits being cross-coupled to each other, each of said first and second inverter circuits comprising a p-channel type MISFET and an n-channel type MISFET, the drain region of said p-channel type MISFET being coupled to the drain region of said n-channel type MISFET, a source region of said p-channel type MISFET being coupled to a first fixed potential line, the source region of said n-channel type MISFET being coupled to a second fixed potential line, said p-channel type MISFET being formed on the main surface of a first n-type semiconductor region in said substrate; and

d) conductor layers formed on said substrate, each of said conductor layers electrically connecting said first n-type semiconductor region with the source region of said p-channel type MISFET,

wherein said conductor layers are independently formed each other, with respect to said memory cells arranged in said column direction.

5,594,271

LOAD CURRENT DETECTING DEVICE INCLUDING A MULTI-EMITTER BIPOLAR TRANSISTOR

Hitoshi Iwata; Koichi Jinkai, and Yasuo Imaeda, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

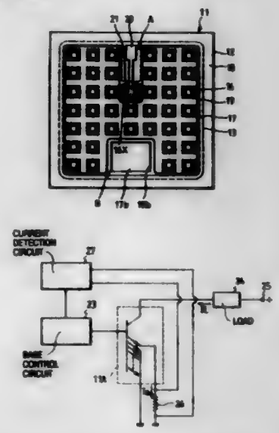
Continuation of Ser. No. 166,890, Dec. 15, 1993, abandoned, which is a division of Ser. No. 29,966, Mar. 9, 1993, Pat. No. 5,296,732, which is a continuation of Ser. No. 317,410, Mar. 1, 1989, abandoned. This application Dec. 6, 1994, Ser. No. 354,885

Claims priority, application Japan, Mar. 2, 1988, 63-49427

The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.

Int. Cl.° H01L *29/72*;*27/102*

U.S. Cl. 257—469 **3 Claims**



1. A load current detecting device, comprising:

a power source terminal;

a bipolar transistor comprising

a substrate,

a base diffusion layer formed on said substrate,

a base electrode film of a mesh configuration formed on said base diffusion layer, said base diffusion layer and said base electrode film providing a base of said bipolar transistor,

a plurality of emitter diffusion layers formed on said base diffusion layer in a two-dimensional array and individually surrounded by said base electrode film,

a plurality of emitter electrode films formed respectively on said emitter diffusion layers, said plurality of emitter diffusion layers and said plurality of emitter electrode films providing a plurality of emitters of said bipolar transistor,

a collector electrode film formed on said substrate and constituting a collector of said bipolar transistor, and

a wiring film commonly connected to said plurality of emitter electrode films except at least one of said emitter electrode films;

a load supplied with a current from said power source terminal through the collector and emitters of said bipolar transistor;

base control means, connected to said base of said bipolar transistor, for turning on and off said bipolar transistor; and

means for detecting a value of the current flowing into said load, said current detecting means outputting a signal to said base control means, thereby turning off said bipolar transistor when the value of the current flowing in said load exceeds a predetermined value.

5,594,272

BIPOLAR TRANSISTOR WITH BASE AND EMITTER CONTACT HOLES HAVING SHORTER CENTRAL PORTIONS

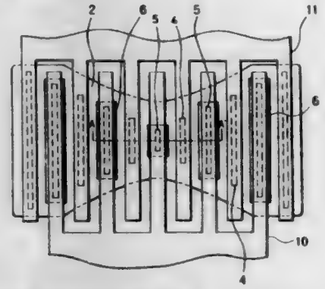
Junichi Matsuki, Yamagata, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1995, Ser. No. 494,707

Claims priority, application Japan, Jun. 27, 1994, 6-144226

Int. Cl.° H01L *27/082*;*23/057*

U.S. Cl. 257—579 **2 Claims**



1. A bipolar transistor comprising:

a semiconductor substrate of one conductivity type;

a base region formed on one major surface of said semiconductor substrate, said base region having an opposite conductivity type to that of said substrate;

an insulating film provided on a surface including said base region;

stripe-shaped emitter contact holes and base contact holes formed alternately in said insulating film on said base region in such a way that said emitter contact holes and base contact holes are short in a center portion of said base region and become longer toward both ends of said base region;

an emitter region formed on a surface of said base region in alignment with said emitter contact holes; and

a comb-shaped emitter electrode and a comb-shaped base electrode respectively connecting to said emitter region and said base region.

5,594,273

APPARATUS FOR PERFORMING WAFER-LEVEL TESTING OF INTEGRATED CIRCUITS WHERE TEST PADS LIE WITHIN INTEGRATED CIRCUIT DIE BUT OVERLY NO ACTIVE CIRCUITRY FOR IMPROVED YIELD

Edward C. Danse, Austin; Donald R. Kost, Round Rock, and Lawrence J. Day, Manchaca, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 342,960, Nov. 21, 1994, Pat. No. 5,504,369, which is a division of Ser. No. 96,094, Jul. 23, 1993, Pat. No. 5,399,505. This application Jun. 7, 1995, Ser. No. 482,330

Int. Cl.° G01R *31/00*;*31/28*; **H01L** *21/66*

U.S. Cl. 257—620 **14 Claims**

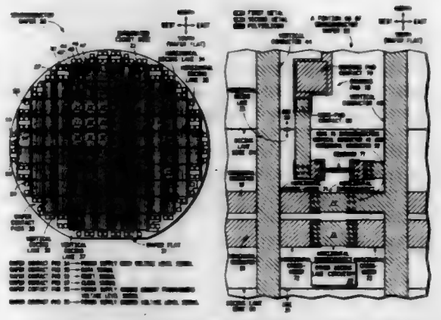
1. A semiconductor wafer comprising:

a substrate region;

a plurality of N integrated circuits formed over the substrate wherein the N integrated circuits are separated by scribe lines which isolate one integrated circuit from all other integrated circuits adjacent the one integrated circuit, the N integrated circuits being divided into M sub-groups of integrated circuits wherein N and M are finite positive integers wherein N>M;

a plurality of L interconnect conductive regions formed overlying the integrated circuits within each of the M sub-groups, L being any finite positive integer, each interconnect conductive region overlying a single sub-group, being isolated from all other interconnect conductive regions which overly adjacent subgroups, and having at least one pad contact area coupled to the plurality of L interconnect conductive regions, the at least one pad contact area directly overlying at least one of the N integrated circuits; and

wherein the at least one pad contact area lies within a perimeter of the at least one of the N integrated circuits where no active circuitry is positioned directly underneath the pad contact area.



5,594,274

LEAD FRAME FOR USE IN A SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SEMICONDUCTOR DEVICE USING THE SAME

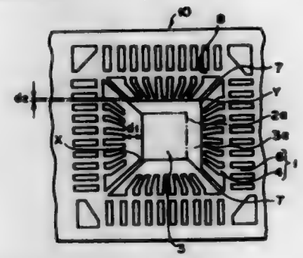
Kenji Suetaki, Tokyo, Japan, assignor to NEC Corporation, Minato-ku, Japan

Continuation of Ser. No. 267,006, Jun. 27, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 587,825

Claims priority, application Japan, Jul. 1, 1993, 5-163050

Int. Cl.° H01L *23/495*;*23/28*

U.S. Cl. 257—667 **12 Claims**



1. A lead frame, comprising:

a rectangular semiconductor chip placing portion for receiving a semiconductor chip thereon;

a first suspension lead, one end of which is connected to a first corner of said semiconductor chip placing portion;

a second suspension lead, one end of which is connected to a second corner of said semiconductor chip placing portion, said second corner being located diagonally across said chip placing portion with respect to said first corner;

a frame portion surrounding said semiconductor chip placing portion, wherein an opposite end of said first suspension lead and an opposite end of said second suspension lead are each

connected to said frame portion to support said semiconductor chip placing portion via said first suspension lead and said second suspension lead;

a plurality of lead members extending from said frame portion toward said semiconductor chip placing portion, wherein inner ends of said lead members define a rectangle and, a diagonal of said rectangle and a diagonal of said semiconductor chip placing portion overlap each other, said lead frame being utilized in a process for manufacturing a plastic package type semiconductor device in which process a semiconductor chip is mounted on said semiconductor chip placing portion, said lead frame being sandwiched by a pair of mold members defining a cavity, a mold resin gate for injecting molten plastic into a cavity formed between said mold members, said gate being located on one of said mold members at a position corresponding to said first suspension lead; and

two overhanging portions attached to an outer periphery of said semiconductor chip placing portion at two sides adjacent to said second corner, each of said overhanging portions extending toward said inner ends of said lead members so as to have a constant width along each of said sides.

5,594,275

J-LEADED SEMICONDUCTOR PACKAGE HAVING A PLURALITY OF STACKED BALL GRID ARRAY PACKAGES

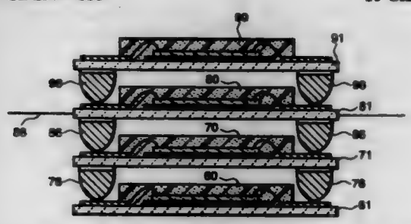
Young S. Kwon, Inchon-jikal, and Seung H. Ahn, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 18, 1994, Ser. No. 345,385

Claims priority, application Rep. of Korea, Nov. 18, 1993, 93-24581

Int. Cl.[6] H01L *23/02;23/48;23/82*

U.S. Cl. 257—686 **10 Claims**



1. A semiconductor device comprising a stacked plurality of ball grid array (BGA) packages, each said BGA package comprising:

a circuit board having:

a lower surface and an upper surface,

a plurality of connection leads provided on said lower surface,

a plurality of first and second land patterns electrically connected to respective said connection leads, and

a plurality of solder ball pads provided on said upper surface and electrically connected to said first land patterns;

a semiconductor chip mounted on said lower surface of said circuit board;

a encapsulation resin portion covering at least said semiconductor chip; and

a plurality of solder balls formed on said solder ball pads,

wherein said plurality of BGA packages are stacked and interconnected by connecting said plurality of solder balls of a first said BGA package to respective said first land patterns of a second said BGA package, and

wherein one of said stacked BGA packages has external leads electrically connected to respective said first and second land patterns.

5,594,276

SEMICONDUCTOR DEVICE PACKAGE WITH SHAPED PARTS FOR DIRECT COUPLING TO STANDARD CONNECTORS

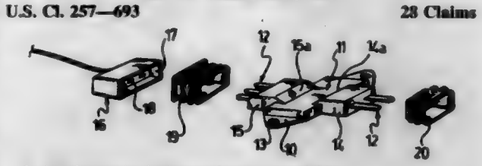
Bruno Murari, and Giuseppe Libretti, both of Milan, Italy, assignors to SGS-Thomson Microelectronics, S.A., Agrate Brianza, Italy

Continuation of Ser. No. 960,529, Oct. 13, 1992, Pat. No. 5,412,248. This application May 2, 1995, Ser. No. 432,835

Claims priority, application European Pat. Off., Mar. 3, 1992, 92830097.9

Int. Cl.[6] H01L *23/48;29/41*

U.S. Cl. 257—693 **28 Claims**



1. An electronic device package, comprising:

a metal plate;

an electronic active semiconductor device mounted to said plate;

a polymer body totally enclosing said device, and enclosing only part of said plate;

a first plurality of contact terminals

partially embedded in a first face of said body to define, in combination with said first face, a first predetermined standard geometry for harsh-environment electrical connectors,

each said contact terminal being operatively electrically connected to a separate respective portion of said device;

and a second plurality of contact terminals partially embedded in a second face of said body

to define, in combination with said second face, a second predetermined standard geometry for harsh-environment electrical connectors,

each said contact terminal being operatively electrically connected to a separate respective portion of said active semiconductor device;

said first and second faces being on opposite sides of said body; and

said first and second pluralities of contact terminals being oriented to define opposite directions of contact insertion.

5,594,277

Patent Not Issued For This Number

5,594,278

SEMICONDUCTOR DEVICE HAVING A VIA HOLE WITH AN ASPECT RATIO OF NOT LESS THAN FOUR, AND INTERCONNECTIONS THEREIN

Tomoyuki Uchiyama, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,484

Claims priority, application Japan, Apr. 22, 1994, 6-108002

Int. Cl.[6] H01L *23/522;29/41;29/43*

U.S. Cl. 257—751 **15 Claims**

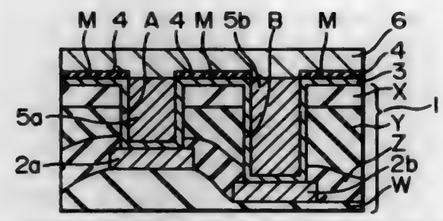
1. A semiconductor device in which an inter-level insulating film is formed on a semiconductor substrate, comprising:

a wiring layer formed in said inter-level insulating film;

an open aperture portion formed in said inter-level insulating film in such a manner as to reach said wiring layer, wherein said open aperture portion has an aspect ratio of not less than four;

a first conductor layer formed on an inner surface of said open aperture portion and on said inter-level insulating film;

an insulating film formed on said first conductor layer, wherein a thickness of said insulating film formed over the inner surface of said open aperture portion is substantially negligible; and



a second conductor layer selectively formed inside said open aperture portion.

5,594,279

SEMICONDUCTOR DEVICE HAVING SHIELD WIRING FOR NOISE SUPPRESSION

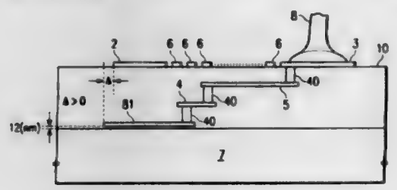
Yutaka Itou; Hidetoshi Iwai, both of Ohme, Japan; Toshiyuki Sakuta, Plano, Tex.; Takumi Nasu, Tsuchiura, and Tomohiro Suzuki, Tsukuba, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi Ltd., Japan

Filed Nov. 10, 1993, Ser. No. 149,876

Claims priority, application Japan, Nov. 12, 1992, 4-327264

Int. Cl.[6] H01L *23/48*

U.S. Cl. 257—758 **10 Claims**



1. A semiconductor device comprising:

a semiconductor substrate having an upper surface and being of one conductivity type;

an insulating layes disposed on the upper surface of said substrate;

a plurality of wiring layers including at least one wiring layer arranged on said insulating layer and at least one wiring layer embedded in said insulating layer in stacked insulated relation with respect to each other;

electrical connectors extending between adjacent wiring layers at particular locations thereon to selectively electrically interconnect respective regions of the adjacent wiring layers;

said plurality of wiring layers being patterned to define at least a power source wiring conductor disposed in spaced relation to said substrate;

a shield wiring conductor embedded in said insulating layer and disposed in a position in spaced registering relationship with said power source wiring conductor and between said substrate and said power source wiring conductor;

the distance between said shield Wiring conductor and said substrate being smaller than the distance between said shield wiring conductor and said power source wiring conductor such that the electrostatic capacitance between said shield wiring conductor and said substrate is relatively large and the electrostatic capacitance between said power source wiring conductor and said shield wiring conductor is relatively small; and

means connected to said shield wiring conductor for applying a fixed potential to said shield wiring conductor of a magnitude enabling said shield wiring conductor to suppress power source noise.

5,594,280

METHOD OF FORMING A THIN FILM AND APPARATUS OF FORMING A METAL THIN FILM UTILIZING TEMPERATURE CONTROLLING MEANS

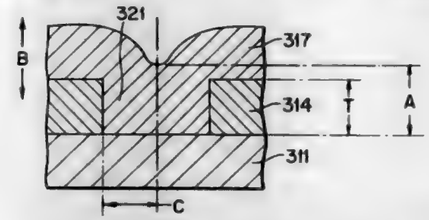
Atsushi Sekiguchi; Tsukasa Kobayashi, and Shinji Takagi, all of Fuchu, Japan, assignors to Anelva Corperation, Tokyo, Japan

Continuation-in-part of Ser. No. 760,830, Sep. 18, 1991, abandoned, which is a continuation of Ser. No. 466,562, Jan. 17, 1990, abandoned, which is a division of Ser. No. 424,796, Oct. 20, 1989, abandoned. This application Jan. 27, 1993, Ser. No. 9,446

Claims priority, application Japan, Oct. 8, 1987, 62-254268; Feb. 2, 1988, 63-22463; Mar. 25, 1988, 63-71160

Int. Cl.[6] H01L *23/48;23/52;29/40*

U.S. Cl. 257—771 **6 Claims**



1. In an electronic device, an interconnecting material comprising:

a flat substrate;

an insulative layer bonded on a first surface thereof to the substrate, the insulative layer including step-down voids formed therein, exposing the substrate;

an aluminum film, having a single crystal layer and bonded to a second surface of the insulative layer;

the aluminum film deposited in the voids and integrally extending above the voids;

wherein mixture of carbon into the film is less than about 20 ppm.

5,594,281

SEMICONDUCTOR APPARATUS HAVING WIRING STRUCTURE OF AN INTEGRATED CIRCUIT IN WHICH A PLURALITY OF LOGIC CIRCUITS OF THE SAME STRUCTURE ARE ARRANGED IN THE SAME DIRECTION

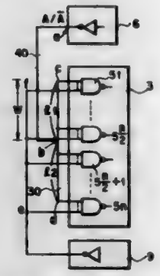
Masami Masuda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 291,775, Aug. 17, 1994, abandoned. This application Feb. 29, 1996, Ser. No. 608,937

Claims priority, application Japan, Sep. 6, 1993, 5-245946

Int. Cl.[6] H01L *23/48;29/44*

U.S. Cl. 257—773 **21 Claims**



1. A semiconductor apparatus comprising:

a semiconductor substrate;

a first circuit arranged on a major surface of said semiconductor substrate and including a plurality of logic circuits of an identical structure, said logic circuits having input terminals supplied with identical signals;

first metal wiring arranged on said semiconductor substrate in a direction substantially identical to a direction of arrangement of said logic circuits, said first metal wiring connected to one of the input terminals of each of the logic circuits;

a second circuit arranged on the major surface of said semiconductor substrate in an outside area which does not overlap an area extending in a direction substantially perpendicular to the direction of arrangement of the logic circuits, said second circuit having an output terminal supplying an identical signal to said one of the input terminals of each of the logic circuits of said first circuit; and

second metal wiring connected between said output terminal of said second circuit and said first metal wiring and having a portion extending substantially parallel to and partially overlapping with said first metal wiring.

5,594,282

RESIN SEALING TYPE SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

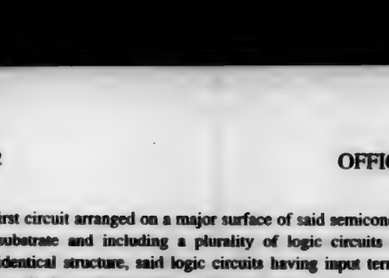
Tetsuya Otsuki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 358,621

Claims priority, application Japan, Dec. 16, 1993, 5-316963; Nov. 8, 1994, 5-298748

Int. Cl.[6] H01L *23/28;23/10;23/34*

U.S. Cl. 257—796 **14 Claims**



1. A resin sealing type semiconductor device comprising:

a first heat radiating portion having an element placing surface;

a semiconductor element bonded onto said element placing surface of said first heat radiating portion;

a plurality of leads;

a first insulating portion fixed between said first heat radiating portion and said plurality of leads;

wires that electrically connect said plurality of leads to electrode pads of said semiconductor element;

a second heat radiating portion located opposite to said first heat radiating portion, said second heat radiating portion not contacting said semiconductor element, said plurality of leads and said wires;

a second insulating portion located between said second heat radiating portion and said plurality of leads, said first and second heat radiating portions and said first and second insulating portions enclosing said semiconductor element, wires and a portion of each of said plurality of leads; and

a resin sealing portion formed at least on an exterior of said first and second heat radiating portions and said first and second insulating portions.

5,594,283

LOCK SYSTEM FOR MOTOR VEHICLE WITH SLIDING DOOR

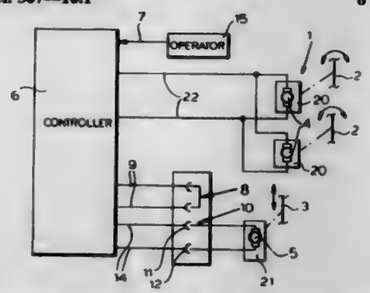
Peter Bartel, Hattingen, and Frank Kleefeldt, Velligenhaus, both of Germany, assignors to Kiekert Aktiengesellschaft, Velligenhaus, Germany

Filed May 10, 1995, Ser. No. 437,894

Claims priority, application Germany, May 11, 1994, 44 16 642.7

Int. Cl.[6] H02P *3/00*

U.S. Cl. 307—10.1 **6 Claims**



1. In a motor vehicle having a plurality of pivotal doors and a sliding door each movable between a closed and an open position, a lock system comprising:

a respective lock on each of the doors having an electrical motor energizable to set the respective lock in a locked position and in an unlocked position;

sensor means at the sliding door for generating a closed-door output while the sliding door is closed and an open-door output while the sliding door is open;

contacts mounted directly on the sliding door and connected to the respective motor;

contacts mounted directly on the vehicle and engageable with the sliding-door contacts only in the closed position of the sliding door;

command means for generating a lock-doors output and an unlock-doors output; and

electrical control means connected to the sensor means, to the command means, to the pivotal-door motors, and to the motor-vehicle contacts for

energizing the pivotal-door motors to place the pivotal-door locks in the locked position after generation of the lock-doors signal,

energizing the pivotal-door motors to place the pivotal-door locks in the unlocked position after generation of the unlock-doors signal, and

energizing the sliding-door motor via the sliding-door contacts to place the sliding-door lock in the locked position after generation of the lock-doors signal and during generation of the closed-door output by the sensor means.

5,594,284

VEHICLE SECURITY DEVICE USING KEY DEVICE WHICH COMPLETES INTERRUPTED CIRCUITS

George H. Hill, Grasonville, and Steve S. Sahebjam, Columbia, both of Md., assignors to George Hill, Columbia, Md.

Filed Oct. 6, 1994, Ser. No. 321,034

Int. Cl.[6] B60R *25/04*

U.S. Cl. 307—10.5 **21 Claims**

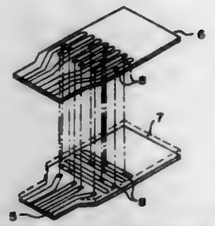
1. A vehicular security system comprising:

a key having a first and second side;

said key having longitudinal contacts;

said longitudinal contacts selectively connectable on each of said first and second side in a first connection;

said key additionally comprising one or more feed through holes for selective connection of said longitudinal contacts between said first and second side in a second connection;



said first and second connections being arranged in a plurality of predetermined configurations, said configurations corresponding to a plurality of unique security codes;

a key receiving means, including receiving contacts, for receiving said key;

said key receiving means connecting one or more electrical devices located within the vehicle;

said key containing at least one of a plurality of predetermined security codes, and

wherein said key is selectively inserted into said receiving means to form an electrical connection between vehicle electrical circuits.

5,594,285

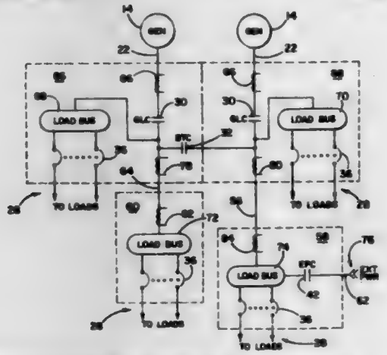
POWER DISTRIBUTION CENTER

Peter J. Wisbey, Machensey Park, and Lee R. Rateike, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 27, 1993, Ser. No. 113,866

Int. Cl.[6] H02J *1/10;* **H02B** *1/015*

U.S. Cl. 307—18 **18 Claims**



18. An electric power distribution center, comprising:

an insulative space frame having first and second generally parallel faces defining a volume therebetween, said first face including a plurality of screw-in type sockets formed therein, and said second face including a plurality of connector ports formed therein;

a plurality of screw-in type resettable thermal circuit breaker devices screwably seated within said screw-in type sockets;

a plurality of connectors penetrating said second surface through said connector ports formed therein, said connectors providing coupling to external devices;

at least one contactor device mounted on said second surface;

a plurality of power feeder terminal connectors penetrating the volume of said insulative space frame, said power feeder terminal connectors providing coupling to an external source of electric power;

a plurality of conducting bus bars encapsulated within said insulative space frame, said conducting bus bars utilizing a three dimensional routing configuration within said space frame and being switchably connected through said at least one contactor device to said power feeder terminal connectors;

current transformers integrally mounted within said space frame for monitoring the flow of electrical current through said conducting bus bars; and

at least one printed circuit board of at least one layer mounted within said space frame for providing electrical circuit pathways from said conducting bus bars to a first contact on said plurality of screw-in sockets, said at least one printed circuit board additionally routing electrical power from a second contact on said plurality of screw-in sockets to said plurality of connectors.

5,594,286

POWER CONTROL SYSTEM FOR ELECTRICAL POWER SUPPLY MODULES

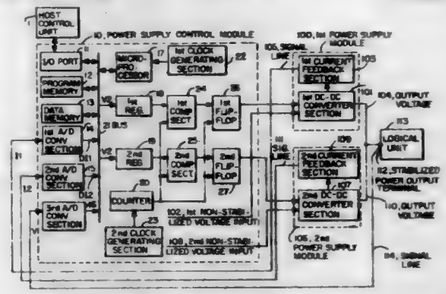
Hiroshi Tachikawa, Yamanashi, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 2, 1993, Ser. No. 85,837

Claims priority, application Japan, Jul. 2, 1992, 4-197436

Int. Cl.[6] H02J *1/00*

U.S. Cl. 307—43 **6 Claims**



1. A power control system equipped with a host control unit, a power supply control module, a plurality of switching power supply modules whose stabilized power output terminals connected to each other in parallel, and a logical unit, wherein said power supply control module comprises:

first processing means for converting first analog data corresponding to a voltage level, supplied for the logical unit from a plurality of switching power supply modules connected in parallel into digital data;

second processing means for comparing said digital data, converted by said first processing means, with predetermined reference voltage data and computing a voltage deviation between said digital data and said predetermined reference voltage data;

third processing means for judging whether or not said voltage deviation computed by said second processing means is within a permissible extent;

fourth processing means for performing an arithmetic operation with said voltage deviation and a stored reference pulse width data when said voltage deviation is judged to be beyond the predetermined permissible extent; and

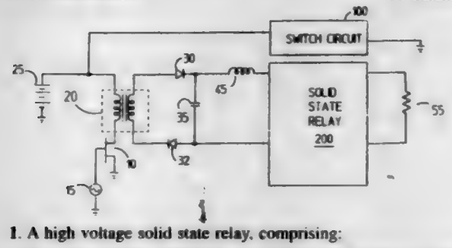
fifth processing means for supplying each of said switching power supply modules with the result of said arithmetic operation by said fourth processing means as first pulse width data.

5,594,287

HIGH VOLTAGE SOLID STATE RELAY

David B. Cameron, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 79,115, Jun. 17, 1993, Pat. No. 5,395,394.
This application Nov. 4, 1994, Ser. No. 334,469
Int. Cl.[6] H01H 47/00
U.S. Cl. 307—132 E 11 Claims



1. A high voltage solid state relay, comprising:

a first relay section responsive to a switch and having an input for a high voltage source;

a second relay section responsive to said switch, connected to said first relay section, and having an output for a load; and

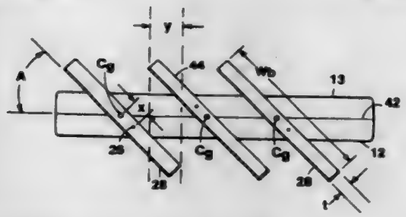
circuitry in at least one of said relay sections for preventing an overvoltage condition due to parametric variations.

5,594,288

LAMINATED ROTOR ASSEMBLY

Zaki D. Hussin, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

Continuation of Ser. No. 480,960, Jun. 7, 1995, abandoned, and Ser. No. 198,864, Feb. 18, 1994, abandoned. This application Apr. 12, 1996, Ser. No. 631,118
Int. Cl.[6] H02K 9/06; F03B 3/12; F04D 29/38
U.S. Cl. 310—62 19 Claims



1. A laminated rotor assembly, comprising:

a plurality of laminates, each of said laminates comprising integral rotor blades and associated shafts;

each rotor blade and each associated shaft having a center of mass;

said centers of mass for each rotor blade and said centers of mass for each associated shaft being offset by a predetermined amount;

each of said rotor blades angled at a predetermined amount with respect to a hub portion of said rotor assembly, each of said rotor blades having a leading edge portion and a trailing edge portion; and

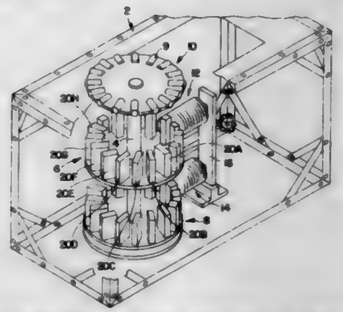
said plurality of laminates adjoined to form a closed laminated rotor assembly, said leading edge portions lie in a common plane, and said trailing edge portions lie in another common plane.

5,594,289

MAGNETIC ROTATING APPARATUS

Kohei Minato, No. 901, 28-20, 4-Chome, Yotsuya, Shinjuku-Ku, Tokyo, Japan

Continuation of Ser. No. 385,563, Sep. 14, 1994, abandoned. This application Dec. 14, 1995, Ser. No. 574,582
Claims priority, application Japan, Sep. 16, 1993, 5-230162
Int. Cl.[6] H02K 16/00
U.S. Cl. 310—152 12 Claims



1. A magnetic rotating apparatus comprising a rotating shaft; a rotor which is fixed to said rotating shaft and which has disposed thereon a plurality of permanent magnets and balancers for balancing rotation, the permanent magnets being disposed such that one magnetic polarity type is arranged along an outer peripheral surface in the direction of rotation and the other magnetic polarity type arranged along an inner peripheral surface, with each pair of corresponding magnetic poles of one and the other polarities obliquely arranged with respect to a radial line; an electromagnet, which is disposed facing this rotor, for developing a magnetic field which produces the other magnetic polarity type on the facing surface and energizing means for intermittently energizing said electromagnet means from where the leading permanent magnet, based on the rotation of said rotor, passes the facing surface of the electromagnet in the direction of rotation.

5,594,290

COMMUTATOR BRUSH

Larry S. Shannon; David W. Welch, and Daniel P. Bexten, all of Columbus, Miss., assignors to United Technologies Motor Systems, Inc., Columbus, Miss.

Division of Ser. No. 248,777, May 25, 1994, Pat. No. 5,485,049. This application Jun. 7, 1995, Ser. No. 473,175
Int. Cl.[6] H02K 13/10
U.S. Cl. 310—251 9 Claims



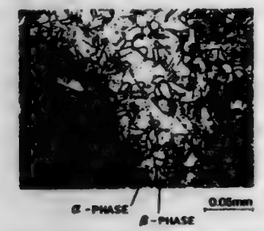
1. A brush for use in a direct current electric motor of the type having a rotating commutator providing a commutation contact surface, said brush comprising a body of conductive material having an end face on said body interfacing with the commutation contact surface of the commutator; said end face having a leading edge and trailing edge with respect to the rotating commutator, a first surface formed thereon extending from the leading edge of the end face and a second surface formed thereon extending from the trailing edge of the end face; said first and second surfaces intersecting at a line of intersection for contacting the commutation contact surface of the commutator, said line of intersection being displaced away from a central region of the end face of said brush toward the leading edge of said brush, said second surface being offset from said first surface at an angle of less than about 25 degrees.

5,594,291

VIBRATION DEVICE FOR VIBRATION DRIVEN MOTOR

Jun Tamai; Yutaka Maruyama, and Ichiro Chiba, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 87,858, Jul. 9, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 365,035
Claims priority, application Japan, Jul. 16, 1992, 4-189664
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—323 12 Claims



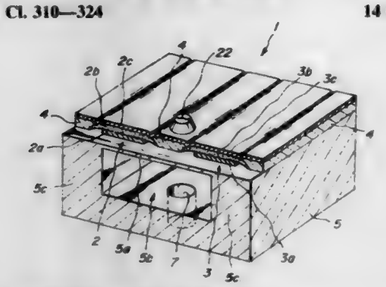
1. A vibration driven actuator or a vibration driven system using the actuator as a driving source, the actuator comprising a metallic vibrating member for generating therein a plurality of vibration waves having respective directions, and being formed of a metallic material having an elastic modulus deviation of 0.6% or less between respective vibration directions.

5,594,292

PIEZOELECTRIC DEVICE

Yukihisa Takeuchi, Nishikamo-Gun; Koji Kimura, and Mitsuru Kurashina, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Nov. 28, 1994, Ser. No. 348,252
Claims priority, application Japan, Nov. 26, 1993, 5-296804; Oct. 5, 1994, 6-241653
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—324 14 Claims



1. A piezoelectric device, comprising:

a ceramic substrate having a cavity partially defined by a thin-walled region, said thin-walled region having an outer surface;

at least one piezoelectric transducer provided on the thin-walled region; and

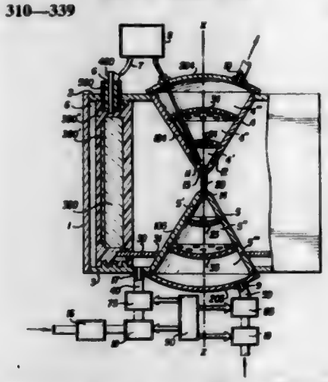
an inactive portion provided on the thin-walled region and adjacent the at least one piezoelectric transducer, wherein in at least one cross-section through the cavity the at least one piezoelectric transducer forms first and second piezoelectric portions spaced apart from each other such that the inactive portion is positioned therebetween.

5,594,293

ELECTROACOUSTIC ENERGY CONVERTER FOR TRANSFORMATION BETWEEN THERMAL AND ELECTRICAL ENERGY

Victor Spivak, Haifa, Israel, assignor to Igor Gorlitsky, Kiriat Motzkin, Israel

Continuation-in-part of Ser. No. 2,907, Jan. 11, 1993. This application Jun. 7, 1995, Ser. No. 474,153
Claims priority, application Israel, Jan. 14, 1992, 100648
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—339 21 Claims



1. Electroacoustic energy converter for transformation between thermal and electrical comprising:

i) an assembly providing a working chamber filled with a working medium;

ii) at least one electroacoustic transducer provided with an electric terminal, wherein said transducer, upon being exposed to electric voltage applied to said terminal, emits acoustic waves transmitted to said working chamber and, upon being exposed to acoustic waves transmitted from said working chamber, converts them into electrical energy to be released as an electrical signal from the electric terminal;

iii) at least one pair of oppositely disposed acoustical filters communicating with said working chamber, wherein a first filter is provided with an inlet nozzle and a second filter is provided with an outlet nozzle;

iv) a source of a gaseous substance, said substance to be supplied under pressure within said assembly so as to initiate a stream of said substance directed from said first filter toward said second filter, wherein said stream pulsates to form a pulsating stream while emitting acoustic waves and transmitting acoustic waves to said transducer via said working medium and pulsates to form a pulsating stream subject to acoustic waves transmitted from said transducer to said stream.

wherein said transducer is acoustically connected with said working medium consisting of a substance with mechanical properties satisfying the following relationship:

$$\delta V \geq V(A-1)/(A+1),$$

where

A is the required rate of compression of the gaseous substance in said pulsating stream,

V is a mean volume of said pulsating stream, included between said filters, and

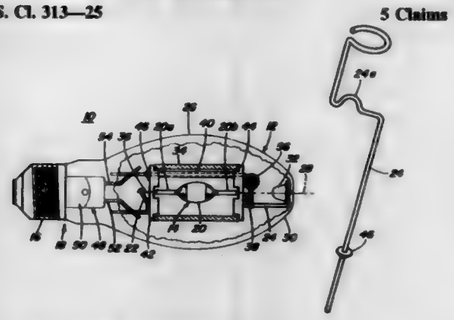
δV is the ultimate volume change of said pulsating stream without destruction of its continuity.

5,594,294

LAMP ASSEMBLY WITH A RESILIENT RETAINING LAMP MOUNT STRUCTURE

Gerald E. Duffy, University Hts.; John J. Cowling, Streetsboro; D. Aaron Crites, Canal Fulton, and Dale K. Mikol, Brecksville, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1994, Ser. No. 331,413
Int. Cl.[6] H01J *61/34*
U.S. Cl. 313—25 **5 Claims**



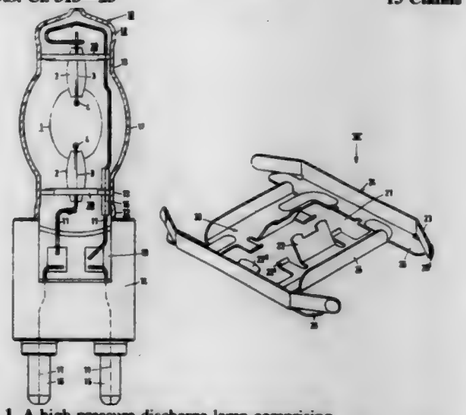
1. A lamp assembly comprising:
a light source having an arc tube associated therewith, said arc tube being under pressure and being excitable to a light emitting state upon energy being applied thereto;
lead wires connected to said arc tube and effective so as to allow such energy to be coupled to said light source;
a cylindrically shaped shroud member made of a light transmissive material and being disposed in surrounding relation to said arc tube;
a top and a bottom support member disposed respectively on opposite ends of said shroud member, said top and bottom support members being made of an insulative material;
an outer envelope surrounding said light source, shroud member and said support members, said outer envelope having a screw base member disposed on a bottom end, said base member being receptive of such energy;
a stem support structure mounted within said bottom end of said lamp envelope, said stem support structure having stem leads extending therefrom, said stem leads being connected to said lead wires so as to couple such energy to said light source and further being effective so as to support said light source and shroud within said lamp envelope;
a resilient clip member disposed on one of said lead wires at a position beneath said bottom support member, said resilient clip member contacting said bottom support member and preventing movement of said bottom support member and said shroud member along said one lead wire, said resilient clip member being flexible so that vibration and shock forces are transmitted away from said arc tube thereby;
wherein said resilient clip member has a neck portion which, when slid over said one lead wire in a first direction, prevents movement of said resilient clip member back on said lead wire in an opposite direction, said resilient clip member further having an essentially flat upper portion which contacts a bottom region of said bottom support member, said flat upper portion being resilient such that said one lead wire on which said resilient clip member is mounted becomes a tension member interposed between compression members which include said support members and said shroud member; and,
wherein said one lead wire acting as said tension member extends through said shroud member for a portion thereof.

5,594,295

HIGH PRESSURE DISCHARGE LAMP WITH DISCHARGE VESSEL CENTERED WITH CLAMPING PLATES

Nicasius G. T. Van Gennip; Johannes A. A. M. Van Heeswijk, and Ronald A. Piantinga, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1995, Ser. No. 376,703
Claims priority, application Belgium, Jan. 24, 1994, 09400076
Int. Cl.[6] H01J *5/00*
U.S. Cl. 313—25 **15 Claims**



1. A high-pressure discharge lamp comprising
a discharge vessel having mutually opposed seals, a pair of discharges electrode arranged in the discharge vessel, and a respective current conductor extending to each said electrode;
around the discharge vessel, an outer bulb from which conductors connected to respective ones of said current conductors issue to the exterior;
a respective metal clamping plate on each seal, each clamping plate having a central opening through which the relevant seal extends and mutually opposed tags along said opening which hold the seal securely,
elastic tongues extending away from the clamping plate and resting against a cylindrical portion of the outer bulb,
characterized in that:the clamping plate has rims flanged transversely thereto, from which rims the elastic tongues extend in a direction towards and substantially tangential to the outer bulb, and the elastic tongues press with clamping force against the outer bulb.

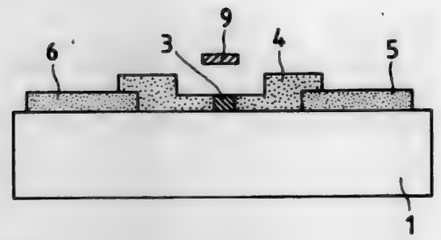
5,594,296

ELECTRON SOURCE AND ELECTRON BEAM APPARATUS

Hideaki Mitsutake, Yokohama; Naoto Nakamura, Isehara, and Yoshihisa Sano, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1994, Ser. No. 353,903
Claims priority, application Japan, Dec. 27, 1993, 5-346990
Int. Cl.[6] H01J *1/30;21/10;31/12*
U.S. Cl. 313—309 **38 Claims**

1. An electron source comprising a substrate having a surface, an electron-emitting device having an electron-emitting region between a higher potential electrode and a lower potential electrode disposed side by side on said surface, and a shield member for blocking off positive ions flying toward said electron-emitting device, said shield member having an opening for allowing electrons emitted from said electron-emitting device to pass therethrough, wherein said shield member covers the area right above said electron-emitting device, and said opening deviates from the direction normal to the electron-emitting region toward the higher potential electrode side by a distance δ (in μm) represented by the



formula:

$$\delta = 2d\sqrt{(V_f/V_c)}$$

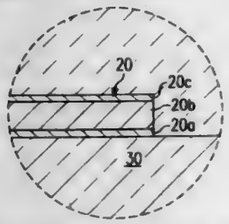
where
d: height from device to opening (μm);
V_f: device-driving voltage applied to device (V);
V_c: potential difference between opening and electron-emitting region (V).

5,594,297

FIELD EMISSION DEVICE METALLIZATION INCLUDING TITANIUM TUNGSTEN AND ALUMINUM

Chi-Cheong Shen, Richardson, and Lester L. Hodson, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 19, 1995, Ser. No. 424,915
Int. Cl.[6] H01J *1/02;1/16;19/10*
U.S. Cl. 313—309 **30 Claims**



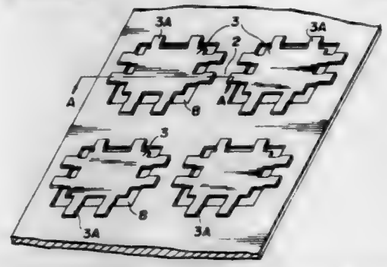
5. An emitter assembly for use in a field emission flat panel display device, said emitter assembly comprising:
an insulating substrate;
a conductive mesh structure overlaying said insulating substrate;
a resistive layer overlaying said mesh structure and said insulating substrate;
an insulating layer overlaying said resistive layer;
a layer of an electrically conductive material overlaying said insulating layer, said electrically conductive layer having a plurality of apertures formed therethrough and through said insulating layer within spacings of said mesh structure; and
microtip emitters formed on said resistive layer within said apertures,
wherein at least one of said conductive mesh structure and said electrically conductive layer is formed as sublayers comprising titanium tungsten and aluminum.

5,594,298

FIELD EMISSION CATHODE DEVICE

Shigeo Itoh; Teruo Watanabe, and Takahiro Niiyama, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 27, 1994, Ser. No. 312,643
Claims priority, application Japan, Sep. 27, 1993, 5-260390
Int. Cl.[6] H01J *1/30*
U.S. Cl. 313—336 **5 Claims**



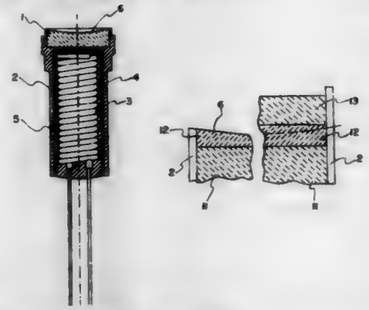
1. A field emission cathode device of the Spindt type comprising:
a cathode conductor formed with cutouts;
resistive layers provided in said cutouts, respectively;
a plurality of conical emitters formed on each of said resistive layers;
an insulating layer arranged on said cathode conductor and said resistive layers;
a gate conductor arranged on said insulating layer so as to be positioned around a distal end of each of said conical emitters; and
a plurality of terminals for connecting each of said resistive layers to said cathode conductor;
said terminals being fused by a short-circuit current flowing when short-circuiting between any of said conical emitters and said gate conductor occurs.

5,594,299

DISPENSER CATHODE WITH POROUS SINTERED COMPACTED METAL DISPENSER BODY CONTAINING CHROMIUM OXIDE

Frank Bossert, Ulm; Manfred Hacker, Illerkirchberg, and Rolf Lotthammer, Dornstadt, all of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Mar. 9, 1995, Ser. No. 401,728
Claims priority, application Germany, Mar. 16, 1994, 44 08 941.4
Int. Cl.[6] H01J *19/06*
U.S. Cl. 313—346 DC **21 Claims**



14. A dispenser cathode comprising:
a dispenser body including a porous sintered metal matrix, said porous sintered metal matrix being prepared from a powder

mixture of at least one metal from a first group consisting of W, Mo, Cr at least one metal of a second group, consisting of Fe, Co, Ni, Ru, Rh, Pd, Re, Os, Ir or Pt, and chromium oxide; and

an emission material forming an emission surface on said dispenser body, said emission material impregnating said dispenser body metal matrix to form the dispenser cathode.

5,594,300

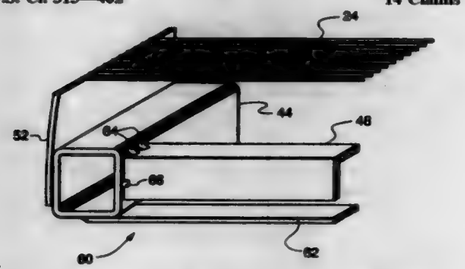
COLOR PICTURE TUBE HAVING A TENSIONED MASK AND COMPLIANT SUPPORT FRAME ASSEMBLY

Richard W. Nosker, Princeton; Joey J. Michalchuk, Lambertville, both of N.J.; Richard C. Bauder, Millersville, and Frank R. Ragland, Jr., Lancaster, both of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Nov. 15, 1995, Ser. No. 558,315

Int. Cl.[6] H01J *29/80*

U.S. Cl. 313—402 **14 Claims**



1. In a color picture tube having a tensioned mask and support frame assembly, each of said mask and said support frame being rectangular and having two long sides paralleling a central major axis thereof and two short sides paralleling a central minor axis thereof, said mask having a substantially cylindrical contour, being curved along said major axis and straight along said minor axis, the improvement comprising

said frame including two first members paralleling the major axis and two second members, attached to the ends of said first members, paralleling the minor axis, each of said first members having a rigid section and a compliant section cantilevered from said rigid section, and said mask being attached to the distal ends of said compliant sections.

5,594,301

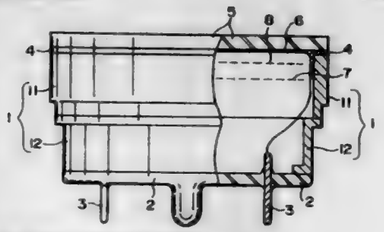
ELECTRON TUBE INCLUDING ALUMINUM SEAL RING

Toshihiko Sawai; Masayuki Inuzuka, and Toyohiko Terada, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Continuation of Ser. No. 268,944, Jun. 30, 1994, abandoned. This application Jan. 22, 1996, Ser. No. 589,576

Int. Cl.[6] H01J *40/02*

U.S. Cl. 313—523 **6 Claims**



1. An electron tube, comprising:

a cylinder made of Kovar, having an opening;

a quartz glass plate for receiving light and covering said opening of said cylinder;

a photocathode for converting light passing through said quartz glass plate into electrons, said photocathode coating a surface of said quartz glass plate; and

an aluminum seal ring disposed between said cylinder and said quartz glass plate.

5,594,302

METAL HALIDE LAMP INCLUDING IRON AND MOLYBDENUM

Yuri Yakub, and Yitzhak Azran, both of Ashkelon, Israel, assignors to Lamptech Ltd., Ashkelon, Israel

Filed Aug. 22, 1995, Ser. No. 517,866

Int. Cl.[6] H01J *61/20*

U.S. Cl. 313—642 **13 Claims**



1. A metal halide lamp having a working volume, the lamp for producing high-intensity ultraviolet radiation, the lamp comprising an inert gas and a filler, said filler including:

(a) a halide component selected from iodine, bromine and a combination of iodine and bromine, said halide component being present in a concentration of from about 0.030 to about 1.110 mg per cubic cm of the working volume;

(b) mercury, present in a concentration of from about 0.318 to about 5.250 mg per cubic cm of the working volume;

(c) iron, present in a concentration of from about 0.005 to about 0.036 mg per cubic cm of the working volume; and

(d) molybdenum, present in a concentration of from about 0.006 to about 0.120 mg per cubic cm of the working volume.

5,594,303

APPARATUS FOR EXCITING AN ELECTRODELESS LAMP WITH AN INCREASING ELECTRIC FIELD INTENSITY

James Simpson; Mohammad Kamarehi, both of Gaithersburg; Michael Ury, Bethesda, and Brian Turner, Myersville, all of Md., assignors to Fusion Lighting, Inc., Rockville, Md.

Filed Mar. 9, 1995, Ser. No. 402,065

Int. Cl.[6] H01J *65/04*

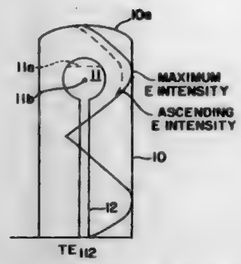
U.S. Cl. 315—39 **10 Claims**

1. An apparatus for exciting an electrodeless lamp with microwave energy comprising:

a source of microwave energy;

a cylindrical cavity coupled to said source of microwave energy, having a plurality of light emitting apertures, said cylindrical cavity supporting microwave energy coupled from said source having an electric field which varies sinusoidally along an axis of said cylindrical cavity; and

an electrodeless lamp supported for rotation on a motor driven shaft in said cylindrical cavity along the axis of said cavity at a location which is distant from a location which produces



fringe fields from coupling said microwave source to said cylindrical cavity, and located so that a portion of said electrodeless lamp above a center of said electrodeless lamp is illuminated by a portion of said electric field which is increasing in intensity along the length of said cavity, whereby said electrodeless lamp has a surface area which is heated at a substantially constant temperature across the surface area thereof.

5,594,304

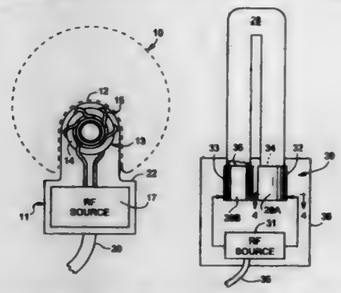
PORTABLE FLUORESCENT LAMP FOR USE IN SPECIAL APPLICATIONS

Warren S. Graber, Iverness, Ill., assignor to Woodhead Industries, Inc., Buffalo Grove, Ill.

Filed Jul. 31, 1995, Ser. No. 508,378

Int. Cl.[6] H01J *1/52;65/04*

U.S. Cl. 315—85 **10 Claims**



1. An electrodeless lamp for use in special applications such as hazardous or wet environments, comprising:

a light-transmissive envelope enclosing a gaseous medium adapted to sustain an electric discharge and luminous phosphors disposed on interior surfaces of said envelope and adapted to emit visible light when excited by ultraviolet radiation emitted from said gaseous medium:

a source of RF energy adapted to receive electrical power for generating an RF electrical signal;

an energy coupler electrically coupled to the output of said RF source and for being excited by said RF signal, said coupler being shaped to conform to the shape of a portion of said envelope and to cooperate therewith such that said coupler may be assembled to said envelope in energy-transfer relation; and

potting material encasing said RF source and said coupler and conforming to the shape of said coupler as it is accommodated by said envelope;

said lamp being characterized in that said envelope is removably assembled to said coupler in said energy-transfer relationship and may readily be removed and replaced.

5,594,305

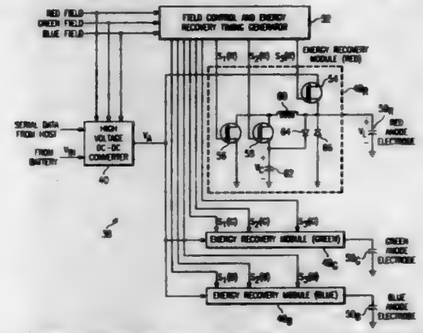
POWER SUPPLY FOR USE WITH SWITCHED ANODE FIELD EMISSION DISPLAY INCLUDING ENERGY RECOVERY APPARATUS

Charles E. Primm, Plano, Tex., and Gary Fourer, San Luis Obispo, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 7, 1995, Ser. No. 472,167

Int. Cl.[6] G09G *3/10*

U.S. Cl. 315—169.3 **11 Claims**



1. A switching power supply for providing a dc potential intermittently across a substantially capacitative load device, said power supply comprising:

means responsive to an energy source for providing said dc potential, said providing means including a control input terminal responsive to a control signal thereat for controlling the amplitude of said dc potential;

voltage storage means;

first switching means for selectively coupling said dc potential to said load device and to said voltage storage means;

energy storage means coupled at a first terminal thereof to said load device;

second switching means for selectively coupling a second terminal of said energy storage means to said voltage storage means; and

third switching means for selectively coupling said second terminal of said energy storage means to a reference potential.

5,594,306

ELECTRIC MOTOR FOR PORTABLE MACHINE TOOLS

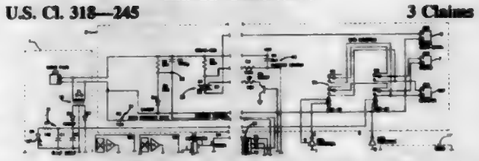
Alessandro Caporuno; Capruno Mario, both of Piedimonte S. Germano; Ramandi Romano, and Ramandi Stefano, both of Frosinone, all of Italy, assignors to C.M.I. Costruzioni Meccaniche Llrl S.r.l., Frosinone, Italy

Filed Mar. 2, 1995, Ser. No. 397,871

Claims priority, application Italy, Mar. 10, 1994, RM94A0127

Int. Cl.[6] H02P *5/418*

U.S. Cl. 318—245 **3 Claims**



1. In a reversible electric motor for portable machine tools, comprising an output shaft for operating; means for sensing the magnitude and the phase of the input voltage of the electric motor itself; means for sensing the electric current absorbed by the load, the improvement comprising:

a plurality of Hall sensors making up an encoder for sensing the speed of said output shaft;

and programmable microprocessor means for processing the information provided by said encoder

so as to be able to create a working cycle and so to operate automatically.

5,594,307

CURRENT SERVO AMPLIFICATION/CONTROL APPARATUS AND METHOD FOR REVERSIBLE DC MOTOR

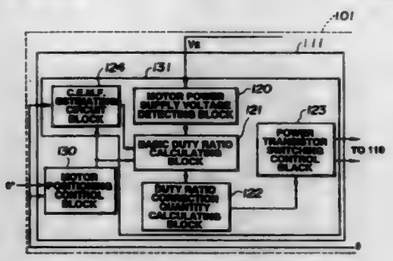
Kazutaka Adachi, Yokohama, and Hideki Sudo, Machida, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 7, 1995, Ser. No. 384,892

Claims priority, application Japan, Feb. 10, 1994, 6-016133; May 31, 1994, 6-117738

Int. Cl.[6] H02P *7/00*

U.S. Cl. 318—280 **19 Claims**



1. An apparatus comprising:

a) a reversible DC motor;

b) a power transistor circuit which is connected across the DC motor so as to supply an input current to rotate the DC motor in response to a switching on signal;

c) power supply voltage detecting means for detecting a power supply voltage (V_E) by which a power to drive the DC motor is supplied via said power transistor circuit;

d) motor rotation angular position detecting means for detecting a rotation angular position θ of the motor;

e) robust compensating means for receiving the angular position θ of the motor, for converting a motor dynamic characteristic into an identified model having a constant linearized transfer function, and for calculating and outputting a motor dynamic characteristic compensation current (I_R*, I_{RB}) such that a response of the motor is coincident with the identified model;

f) model matching control means, responsive to a motor rotation instruction value (θ* θ_R) from an external of the apparatus, for calculating and outputting a motor rotation positioning current (I_M*, I_{MB}) to achieve a rotation positioning of the motor and rotation positioning response of the motor which are desired by a designer of the apparatus;

g) motor input current instruction value determining means for receiving the motor dynamic characteristic compensation current (I_R*, I_{RB}) of said robust compensating means and the motor positioning current (I_M*, I_{MB}) of said model matching control means and for determining a motor input current instruction value (I_R*, I_{RB}) on the basis of the motor dynamic characteristic compensation current (I_R, I_{RB}) of said robust compensating means and the motor positioning current (I_M*, I_{MB}) of said model matching control means;

h) counter-electromotive force estimating means for receiving the motor angular position (θ) and at least the motor positioning current (I_M* I_{MB}) of said model matching control means, for estimating an angular velocity (dθ#, $d\theta_H$) of the motor using the constant linearized transfer function in said robust compensating means on the basis of the angular position (θ) and motor positioning current (I_M*, I_{MB}) and for estimating a counter-electromotive force (V_R, V_{RB}) generated in said rotating motor from the estimated angular velocity (dθ#, $d\theta_H$) of the motor;

i) storing means for storing previously measured specification values of said motor, operational parameters in linearized transfer function, and internal impedances of said power transistor circuit;

j) basic switching on duration calculating means for receiving the specification values of said motor, the impedance values of said power transistor circuit, the motor power supply voltage value (V_E), and estimated counter-electromotive force value (V_R, V_{RH}) and for calculating a basic switching on duration (T_D) of said power transistor circuit on the basis of the received values thereinto; and

k) power transistor switching control means for generating the switching on signal (T_{ON}) to be supplied to said power transistor circuit on the basis of the motor input current instruction value (I* , I_R) and the basic switching on duration (T_D).

5,594,308

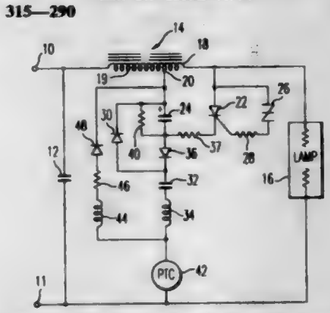
HIGH INTENSITY DISCHARGE LAMP STARTING CIRCUIT WITH AUTOMATIC DISABLEMENT OF STARTING PULSES

Joe A. Nuckholls, and Isaac L. Flory, IV, both of Blacksburg, Va., assignors to Hubbell Incorporated, Orange, Conn.

Filed Aug. 29, 1995, Ser. No. 520,514

Int. Cl.[6] H05B *41/14*

U.S. Cl. 315—290 **21 Claims**



1. An apparatus for starting and operating a high intensity discharge lamp, comprising the combination of:

a pair of input terminals for supplying voltage to the apparatus;

a pair of output terminals for connection to said high intensity discharge lamp;

a step-up transformer for coupling said input terminals to said output terminals;

a voltage multiplier circuit coupled to a primary winding of said transformer, said voltage multiplier circuit comprising:

a device for blocking high-frequency current;

a first capacitor and a first rectifier element connected in a first series circuit with said device for blocking high-frequency current to said primary winding;

a second capacitor and a second rectifier element connected in a second series circuit with said device for blocking high-frequency current to said primary winding;

a voltage responsive switching device connected in a closed-loop series circuit with said second capacitor and said primary winding, whereby when said second capacitor is charged to the breakdown voltage of said switching device, said switching device becomes conductive to provide a discharge path for said second capacitor through said primary winding, thereby to induce in a secondary winding of said transformer a high voltage pulse for igniting a discharge lamp connected to said output terminals; and

an inhibiting circuit for inhibiting the action of said second capacitor and starting of said lamp after a predetermined interval if said lamp has not ignited, said inhibiting circuit comprising a positive temperature coefficient resistor connected in series with at least one of said first and second series circuits and a current path through said positive temperature coefficient resistor for conducting a separate heating current

which does not flow as charging current to either of said first and second capacitors.

5,594,309

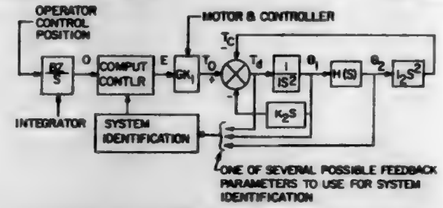
ROBOT CONTROL SCHEME

Kenneth G. McConnell, Ames, Iowa, and Wan-Shik Jang, Kwang-Ju, Rep. of Korea, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 15, 1994, Ser. No. 260,305

Int. Cl.[6] G05B *19/04*

U.S. Cl. 318—568.22 **12 Claims**



1. A method of controlling a moving robot arm to minimize vibrations, comprising the steps of:

determining a maximum step distance the robot arm can move in a single step;

determining a total task distance the robot arm is required to move to complete a specified task, wherein the total task distance is less than or equal to the maximum step distance;

applying a series of discrete step inputs of varying magnitudes in a timed sequence to the robot arm, the series comprising:

applying a first step input of a magnitude corresponding to approximately one-half the total task distance:

measuring the time it takes the robot arm to move one-half of the total task distance, wherein a measured time and a measure velocity are determined;

estimating robot arm damping using the measured time and the measured velocity;

calculating and applying a second step input magnitude and application time and a third step magnitude and application time, wherein the magnitude and application time of both the second and third step inputs are based on the estimated robot damping, and further wherein the third step input magnitude is approximately equal to the magnitude of the first step input less the second step input magnitude.

5,594,310

APPARATUS AND METHOD FOR EXPANDING AND CONTROLLING THE MULTIFUNCTION MECHAPOSITION

Kyung-su Kim, Kyunggi-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Division of Ser. No. 491,599, Mar. 12, 1990, Pat. No. 5,159,252. This application Sep. 18, 1992, Ser. No. 946,074

Claims priority, application Rep. of Korea, Oct. 28, 1989, 89-14647

Int. Cl.[6] G05B *19/06*; H04N *5/783*

U.S. Cl. 318—578 **21 Claims**

1. An apparatus, in multifunction electronic machineries using a recording medium, comprising:

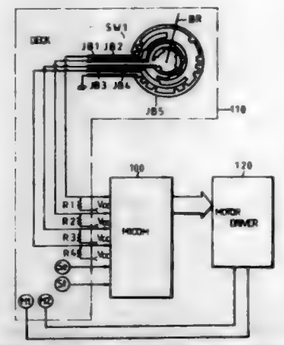
a microcomputer for controlling a system;

a capstan motor and a loading motor for making the recorded interval of a recording medium travel;

a program switch of a rotary type having multiple detecting contact plates for supplying, to said microcomputer, multiple logic signals having first and second positions for providing first and second logic values, respectively; penultimate and last positions for providing false first logic values and false second logic values, respectively, and a plurality of different logic values varying according to each position of said program switch between said second and penultimate positions, said penultimate and last positions being selectable after said program switch has been rotated past 360 degrees;

a deck including a starting and an ending sensor for detecting the ending and the starting points of a tape; and

a motor driving portion for driving a variety of motors within said deck under the control of said microcomputer with said microcomputer controlling said capstan motor and said loading motor through said motor driving portion according to the output logic values of said program switch of a rotary type and controlling a function of said motor driving portion according to the position of said program switch and in response output signals from said starting and ending sensors.



5,594,311

LENS CONTROLLING APPARATUS

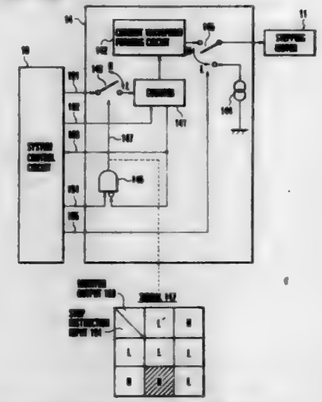
Hitoshi Yasuda, Tokyo, and Masahide Hirasawa, Kanagawa-ken, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 258,762

Claims priority, application Japan, Jun. 15, 1993, 5-143631; Jun. 30, 1993, 5-161025

Int. Cl.[6] G05B *19/40*

U.S. Cl. 318—685 **22 Claims**



1. A motor controlling apparatus, comprising:

(a) a motor;

(b) means for forming a driving current waveform to be supplied to said motor;

(c) means for inputting a stop instruction to stop said motor;

(d) means for executing the stop operation corresponding to the instruction;

(e) phase detecting means for detecting a phase of the driving current waveform; and

(f) inhibiting means for inhibiting the stop operation of said motor when the phase of the drive current waveform detected by said phase detecting means is a predetermined phase.

5,594,312

APPARATUS HAVING AN AUTOMATIC FIRING ARRANGEMENT

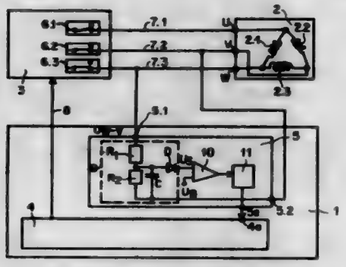
Eckhard Schwendemann, Böhl-Iggelbach, and Klaus Bott, Durmersheim, both of Germany, assignors to Landis & Gyr Technology Innovation AG, Zug, Switzerland

Filed Feb. 28, 1995, Ser. No. 395,921

Claims priority, application Switzerland, Mar. 14, 1994, 747/94

Int. Cl.[6] H02P *1/24*

U.S. Cl. 318—799 **8 Claims**



1. An apparatus having an automatic firing arrangement for actuating a fan, comprising:

said fan,

a controllable-speed asynchronous motor connected to and driving said fan,

a frequency converter connected to and receiving power from an external source, connected to said asynchronous motor and controlling the speed of rotation of said asynchronous motor,

a switching device connected at the output of said frequency converter, said switching device temporarily disconnecting said frequency converter from said asynchronous motor for a predetermined period of time,

a measuring circuit connected across at least one winding of said motor, said measuring circuit receiving an output signal from said motor winding during said predetermined period of time of disconnecting said converter from said motor,

a programmer connected to said converter and said switching device, said programmer outputting a control signal from said programmer to said converter and said switching device, said programmer also connected to said measuring circuit and receiving at least one input signal from said measuring circuit,

wherein when said programmer causes said switching device to disconnect said converter from said motor, the continuing rotation of said motor generates a Faraday-effect electric field across said motor winding,

wherein said electric field causes a voltage signal to be outputted from said winding into said measuring circuit, said measuring circuit then processing said voltage input signal and deriving therefrom an output signal for transmission to said programmer, and

wherein said programmer receives said output signal from said measuring circuit and determines therefrom the speed and direction of rotation of said motor.

5,594,313

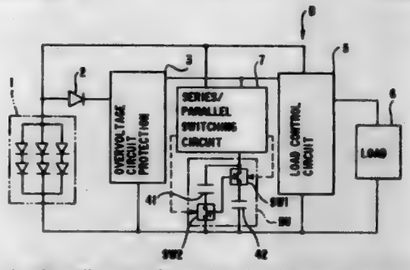
SOLAR CELL SYSTEM

Harumi Takeda, Osakasayama, Japan, assignor to Ueda Co., Ltd., Osaka, Japan

Filed Jun. 12, 1995, Ser. No. 489,578

Int. Cl.[6] H02J *15/00*

U.S. Cl. 320—1 **2 Claims**



1. A solar cell system for storing electric power generated by solar cells and supplying the electric power to a load, said system comprising:

a solar cell assembly having a capacity for generating electric power in a quantity consumed by said load in one day, said quantity being determined form an estimated quantity of solar radiation available on a rainy or cloudy day;

electric double layer capacitor means for storing the electric power generated by said solar cell assembly, said electric double layer capacitor means having a storage capacity corresponding at least to said quantity consumed by said load in one day; and

an overvoltage protection circuit, interposed between said solar cell assembly and said electric double layer capacitor means, for shutting off output of said solar cell assembly when an output voltage of said solar cell assembly reaches an overcharge voltage of said double layer capacitor means.

5,594,314

SECONDARY BATTERY DISCHARGE ADAPTOR

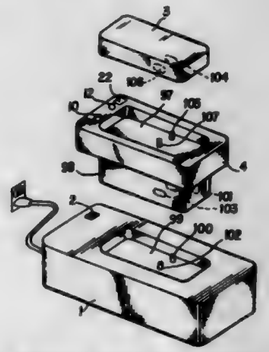
Nobuyoshi Haginda, Yokohama; Hideki Matsui, Fujisawa; Hiroshi Sakamoto, Kawasaki, and Ryotaro Takayanagi, Yokohamashi, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 202,025

Claims priority, application Japan, Mar. 17, 1993, 5-017867 U

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—2 **32 Claims**

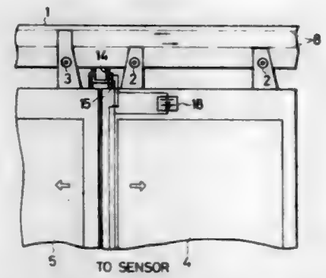


1. A battery discharge adaptor for discharging at least one battery, the adaptor removably connectable between a preexisting recharging unit and the at least one battery, comprising:

a load discharge circuit for discharging the at least one battery;

a discharge detector connected to the load discharge circuit that detects when the at least one battery is discharged; and

a switch connected to the discharge detector having first positions connecting the at least one battery to the load discharge circuit and second positions connecting the at least one battery to the recharging unit.



stopper having socket-shaped plus and minus contacts and said second contact portion is a stopper having plug-shaped plus and minus contacts.

5,594,315

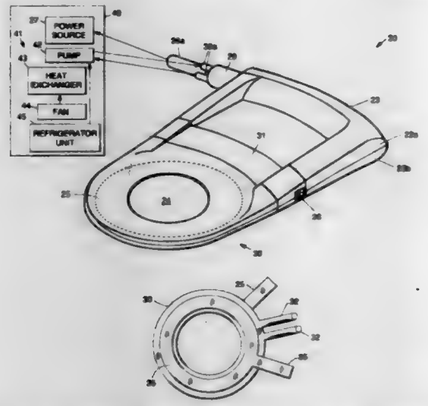
LIQUID COOLED METALLIC INDUCTIVE PROBE FOR HIGH POWER CHARGING

Sergio Ramos, Wilmington; John T. Hall, Woodland Hills; Herbert J. Tanzer, Topanga, and William Quon, Alhambra, all of Calif., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 29, 1994, Ser. No. 237,493

Int. Cl.[6] H02J *7/00*

U.S. Cl. 320—2 **2 Claims**



1. In an inductive charging apparatus for use in charging a battery, which apparatus comprises a charging coupler that is insertable into a charge port that is coupled to the battery, and wherein the charge port comprises a housing, an opening into which the charging coupler is inserted, and a secondary core surrounded by secondary windings, wherein said charging coupler comprises:

a housing;

a primary magnetic core disposed in the housing;

a primary winding having an even number of primary turns disposed around the primary magnetic core;

a hollow coolant conducting heat exchanger symmetrically disposed between the primary turns of the primary winding.

5,594,316

POWER SUPPLY DEVICE FOR CONTROLLING AUTOMATIC DOOR

Tatekazu Hayashida, Kanagawa, Japan, assignor to Tsuden Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 13, 1994, Ser. No. 258,988

Int. Cl.[6] H02T *7/00;* **E06B** *3/42*

U.S. Cl. 320—2 **10 Claims**

1. A power supply device for automatic door control, wherein a first contact portion connected to an outside power source is mounted on a transom for suspending a door therefrom, said door is provided with a secondary power source to be charged by said outside power source and a second contact portion wherein said first and second contact portions are connected to each other when said door is closed or opened so as to supply power to said secondary power source, wherein said first contact portion is a

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5,594,317

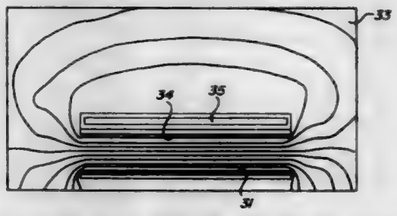
INDUCTIVE CHARGER FIELD SHAPING USING NONMAGNETIC METALLIC CONDUCTORS

Eddie Y. Yeow, San Gabriel; Ray G. Radys, Santa Monica; George R. Woody, Redondo Beach, and Sergio Ramos, Wilmington, all of Calif., assignors to Delco Electronics Corp., Kokomo, Ind.

Filed Dec. 2, 1994, Ser. No. 348,667

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—2 **5 Claims**



1. An inductive charging system for use in charging batteries of an electric vehicle, wherein said inductive charging system comprises a power source, a charge station coupled to the power source, a charge paddle that comprises a primary core and a primary winding of a transformer coupled to the charge cable by means of an extendable charging cord, a charge port disposed in the electric vehicle that comprises a secondary core and secondary windings of the transformer, and a charge controller coupled between the charge port and the batteries of the electric vehicle, wherein the improvement comprises:

a charge paddle that comprises a primary heat exchanger having a width that overlaps the primary winding, and wherein the primary heat exchanger shapes leakage flux at edges of the primary winding to reduce AC losses therein by reducing two-dimensional losses; and

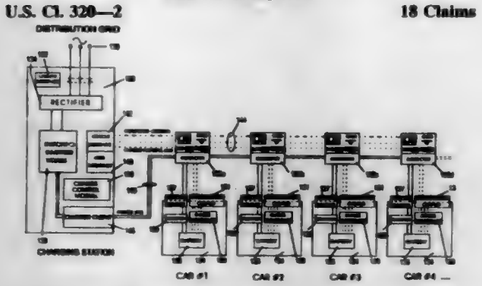
a charge port that comprises secondary heat exchangers each having a width that overlaps the secondary windings, and wherein the secondary heat exchangers shape leakage flux at edges of the secondary windings to reduce AC losses therein by reducing two-dimensional losses.

5,594,318

TRACTION BATTERY CHARGING WITH INDUCTIVE COUPLING

Jiri K. Nor, Oakville, and Josef V. Soltys, Mississauga, both of Canada, assignors to Norvik Traction Inc., Mississauga, Canada

Filed Apr. 10, 1995, Ser. No. 419,188
Int. Cl.[6] H02J 7/04
U.S. Cl. 320—2 **18 Claims**



1. A method of charging a battery for an electric vehicle, where the battery is capable of accepting initial charging current at a rate greater than 1 C, and where a charging station from which the charging energy is delivered to the battery is arranged to deliver charging energy at a predetermined voltage and at a delivery frequency which is in the range of from 10 kHz up to 200 kHz, where charging energy is transferred to said vehicle through an inductive coupler having a primary side connected to said charging station and a secondary, side mounted within said vehicle, and thence through a rectifier mounted in said vehicle to said battery; said method comprising the steps of:

(a) providing said vehicle with said secondary side of said inductive coupler, whereby charging energy is delivered to said vehicle, and thence through said rectifier to said battery as direct current and at a charging voltage which is determined by the transformation characteristic of said secondary side of said inductive coupler, based on said predetermined voltage and delivery frequency of charging energy delivered by said charging station to said primary side of said inductive coupler, so as to render said charging voltage to be suitable for said battery being charged;

(b) physically placing the primary and secondary sides of said inductive coupler into spatial relationship so as to establish inductive coupling therebetween;

(c) establishing communication means capable of transferring data concerning the state of charge of the battery being charged between the battery and the charging station;

(d) interrogating the vehicle over said communication means to determine if there is present and associated with said battery in said vehicle a battery specific charging control module; or if there exists in said vehicle a personality module which identifies at least the criterion of maximum charging current under which the battery may be charged at said predetermined charging voltage in the shortest possible time period; or in the absence of a battery specific charging module associated with said battery or a personality module which identifies at least the criterion of maximum charging current under which the battery may be charged at said predetermined charging voltage in the shortest possible time period, to determine if there exists in said vehicle at least a monitoring means to measure the value of terminal voltage of the battery being charged;

wherein said method further comprises one of the steps of:

(e) in the event that a battery specific charging control module is present in said vehicle, charging said battery by delivering charging current through said inductive coupler and said rectifier under the control of said battery specific charging control module, stopping the delivery of charging current to said battery in keeping with a signal to do so issued by said battery specific charging control module, and subsequently physically displacing said primary and secondary sides of said inductive coupler so as to disconnect said battery from said charging station; or

(f) in the event that a personality module which at least identifies the maximum charging current is present in said vehicle, charging said battery by delivering charging current through said inductive coupler and said rectifier initially at said maximum charging current, periodically halting the delivery of charging current and determining the instantaneous resistance free terminal voltage of said battery during each interval of time when delivery of charging current has been halted and comparing said instantaneous resistance free terminal voltage to a reference voltage stored in a charge control module which is present in said charging station, reducing the charging current by reducing the current of said charging energy being delivered to said primary, side of said inductive coupler under the control of said charge control module present in said charging station, stopping the delivery of charging current through said inductive coupler and said rectifier to said battery in keeping with a signal issued by said charge control module present in said charging station, and subsequently physically displacing said primary and secondary sides of said inductive coupler so as to disconnect said battery from said charging station; or

(g) in the event that there at least exists in said vehicle a monitoring means to measure the value of the terminal voltage of the battery being charged, presetting the charge station to a predetermined allowable value of current of said charging energy at said predetermined voltage and presetting a maximum amount of charging energy to be permitted to be delivered to said battery, periodically halting the delivery of charging current and determining the instantaneous resistance free terminal voltage of said battery during each interval of time when delivery of the charging current has been halted and comparing said instantaneous resistance free terminal voltage to a reference voltage stored in a charge control module which is present in said charging station, reducing the charging current by reducing the current of said charging energy being delivered to said primary side of said inductive coupler under the control of said charge control module present in said charging station, stopping the delivery of charging current through said inductive coupler and said rectifier to said battery in keeping with a signal issued by said charge control module present in said charging station or when said preset maximum amount of charging energy has been delivered to said battery, and subsequently physically displacing said primary and secondary sides of said inductive coupler so as to disconnect said battery from said charging station;

wherein, in step (e), signals to control the delivery of charging current from said charging station are delivered over said communication means; and in each of steps (f) and (g), the data which are indicative of the instantaneous terminal voltage of said battery, are transferred between said battery and said charging station over said communication means.

10. A charging station for charging a battery for an electric vehicle, where the battery is capable of accepting initial charging current at a rate greater than 1 C, where said charging station is arranged to deliver charging energy at a predetermined voltage and at a delivery frequency which is in the range of from 10 kHz up to 200 kHz to a primary side of an inductive coupler, and wherein said battery is mounted in a vehicle having a secondary side for said inductive coupler mounted wherein together with a rectifier connected between said secondary side of said inductive coupler and said battery; whereby said predetermined voltage at which said charging current is delivered to said battery is determined by the transformation characteristic of said secondary side of said inductive coupler, based on said predetermined voltage and delivery frequency delivered to said primary side of said inductive coupler, so as to render said charging voltage to be suitable for said battery being charged; wherein said charging station comprises:

means for delivering energy at said predetermined voltage and said delivery frequency to said primary side of said inductive coupler;

communication means capable of transferring data between said battery and said charging station concerning the state of charge of said battery being charged;

means for interrogating the vehicle over said communication means to determine if there is present and associated with said battery in said vehicle a battery specific charging control module; or to determine if there exists in said vehicle a personality module which identifies at least the criterion of maximum charging current under which the battery may be charged at said predetermined charging voltage in the shortest possible time period; or in the absence of a battery specified charging module associated with said battery or a personality module which identifies at least the criterion of maximum charging current under which the battery may be charged at said predetermined charging voltage in the shortest possible time period, to determine if there exists in said vehicle at least a monitoring means to measure the value of terminal voltage of the battery being charged;

means for charging said battery by delivering charging energy to said inductive coupler and thence through said rectifier to said battery under the control of a battery specific charging control module in said vehicle, in the event that a battery specific charging control module is present in said vehicle, and means for stopping the delivery of charging energy to said inductive coupler in keeping with a signal to do so issued by said battery specific charging control module;

means for charging said battery by delivering charging energy to said inductive coupler and through said rectifier to said battery, initially at a maximum charging current, in the event that a personality module which at least identifies the maximum charging current is present in said vehicle, means for periodically halting the delivery of charging current and determining the instantaneous resistance free terminal voltage of said battery during each interval of time when delivery of charging current has been halted, means for comparing said instantaneous resistance free terminal voltage to a reference voltage stored in a charge control module which is present in said charging station, means for reducing the charging current by reducing the current of said charging energy being delivered to said primary side of said inductive coupler under the control of said charge control module present in said charging station, and means for stopping the delivery of charging current through said inductive coupler and said rectifier to said battery in keeping with a signal issued by said charge control module present in said charging station; and

means for presetting the charge station to deliver a predetermined allowable value of current of said charging energy at said predetermined voltage in the event that there at least exists in said vehicle monitoring means to measure the value of the terminal voltage of the battery being charged, means for presetting a maximum mount of charging energy to be pertained to be delivered to said bakery, means for periodically halting the delivery of charging current, means for determining the instantaneous resistance free terminal voltage of said battery during each interval of time when delivery of the charging current has been halted, means for comparing said instantaneous resistance free terminal voltage to a reference voltage stored in a charge control module which is present in said charging station, means for reducing the charging current by reducing the current of said charging energy being delivered to said primary side of said inductive coupler under the control of said charge control module present in said charging station, and means for stopping the delivery of charging current through said inductive coupler and said rectifier to said battery in keeping with a signal issued by said charge control module present in said charging station or when said preset maximum value of charging energy has been delivered to said battery;

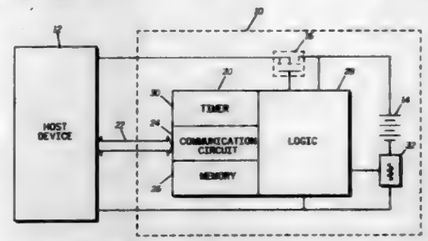
wherein signals to control the delivery of charging energy from said charging station under the control of said battery specific charging control module in said vehicle, are delivered over said communication means; and data which are indicative of the instantaneous terminal voltage of said battery, are transferred between said battery and said charge control module in said charging station over said communication means.

5,594,319

BATTERY PACK HAVING THEFT DETERRENT CIRCUIT

Ilonga P. Thandiwe, Atlanta, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1996, Ser. No. 664,925
Int. Cl.[6] H02J 7/00; H01M 10/44
U.S. Cl. 320—2 **12 Claims**



1. A battery pack, for use with a host device, having a battery current discharge prevention circuit, said battery pack comprising:

at least one battery cell;

a switch coupled in series with said host device and said at least one battery cell;

memory for storing a password;

means for comparing a data word received from said host device with said password; and

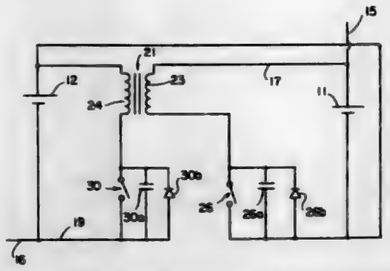
means for controlling said switch, and said switch being opened upon a predetermined number of occurrences of said data word differing from said password.

5,594,320

CHARGE EQUALIZATION OF SERIES CONNECTED CELLS OR BATTERIES

David R. Pacholok, Sleepy Hollow, Ill.; David T. Fouchard, Madison, and Walter B. Ebner, Lodi, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Sep. 9, 1994, Ser. No. 303,703
Int. Cl.[6] H02J 7/00
U.S. Cl. 320—4 **21 Claims**



13. A method of equalizing the charge on two or more cell units connected in series, comprising the steps of:

(a) providing a transformer having two windings on a core for each cell unit, the two windings for each cell unit connected in parallel to such cell unit, the two windings for each cell unit comprising a first winding and a second winding, each of the first windings having the same number of turns and being tightly coupled to one another and each of the second windings having the same number of turns and being tightly coupled to one another; and

(b) simultaneously electrically connecting each one of the first or second windings to one of the cell units for a selected period of time such that the voltage at the highest charged cell unit appears across each of the windings to transfer energy from the most highly charged cell unit to a cell unit of lower charge, and then simultaneously disconnecting the windings

from the cell units, wherein the step of simultaneously electrically connecting and disconnecting is carried out alternatively for the first windings and then the second windings, and repeating the step of connecting and disconnecting the windings from the cell units at a selected frequency thereby to equalize the charge on the cell units.

5,594,321

BATTERY CHARGING APPARATUS WITH FAULT DETECTION

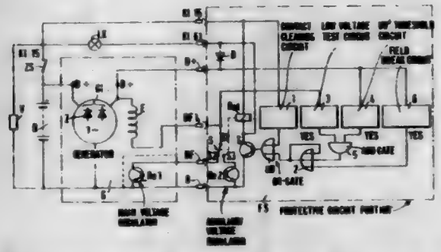
Walter Kohl, Bietigheim-Bissingen; Rainer Mittag, Kornwestheim, and Matthias Hoeber, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 11, 1994, Ser. No. 273,225

Claims priority, application Germany, Aug. 16, 1993, 43 27 484.6

Int. Cl.[6] H02J 7/24

U.S. Cl. 320—48 **6 Claims**



1. A battery charging apparatus comprising a generator (G) having an excitation circuit and two terminals (B+, D–) for connection of at least one battery to be charged and another terminal (D+) for at least one consuming device; rectifier means connected with said generator for rectifying an output current of the generator; main voltage regulator means for controlling a generator output voltage, means for fault detection, means for fault indication including a charge control lamp, and means for protecting against overvoltages;

wherein said means for fault detection and means for protecting against overvoltages are included in circuit means electrically connected to said generator and said main voltage regulator means;

wherein said means for fault detection includes means for comparing a voltage to a voltage threshold value to produce a comparison result indicating when said voltage exceeds said voltage thresbold value and logic circuit means for signalling occurrence of a fault only when said voltage exceeds said voltage threshold value, said logic circuit means including logic circuit components;

wherein said means for fault detection includes means for detecting a conduction defect in said main voltage regulator means and means for detecting an interruption of said excitation circuit of said generator, and said means for fault indication includes means for signalling when both the conduction defect in said main voltage regulator means and the interruption of said excitation circuit occurs are detected;

wherein said means for fault detection includes means for determining whether a voltage supplied by said generator exceeds a supplied voltage threshold value so as to detect a fully excited condition of said generator and means for determining whether said main voltage regulator means has been turned on longer than a predetermined time interval to indicate continuous operation of said main voltage regulator means, and wherein said logic circuit means includes means for determining whether simultaneously both said voltage supplied by said generator exceeds said supplied voltage threshold value and said main voltage regulator means is turned on longer than said predetermined time interval.

5,594,322

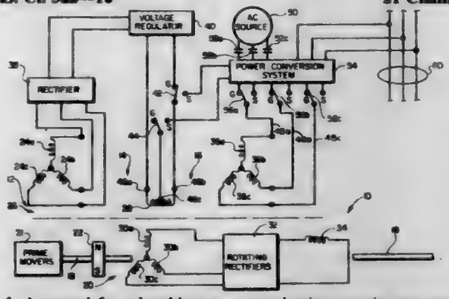
STARTER/GENERATOR SYSTEM WITH VARIABLE-FREQUENCY EXCITER CONTROL

Gregory I. Rozman, Rockford; Albert L. Markunas, Roscoe, and Paul E. Nuechterlein, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 12, 1993, Ser. No. 60,958

Int. Cl.[6] F02N 11/04; H02P 9/00

U.S. Cl. 322—10 **21 Claims**



1. A control for a brushless generator having a main generator portion including a field winding disposed on a rotor and which receives field current and an armature winding disposed in a stator wherein the rotor is movable with respect to the stator and a permanent magnet generator (PMG) having an armature winding coupled to a rectifier which is coupled to a voltage regulator wherein the generator is operable in a generating mode to convert motive power into electrical power and in a starting mode to convert electrical power provided to the main generator portion armature winding into motive power, comprising:

an exciter having an exciter field winding disposed in the stator and an armature winding disposed on the rotor and coupled to the main generator portion filed winding;

first and second power converters each having an input and an output;

means operable in the starting mode for coupling a source of electrical power to the inputs of the first and second power converters, the output of the first power converter to the main generator portion armature winding and the output of the second power converter to the exciter field winding and operable in the generating mode for disconnecting the source of electrical power from the first and second power converters and connecting the voltage regulator to the exciter field winding and the input of one of the power converters to the main generator portion armature winding; and

means coupled to the first and second power converters and operable in the starting mode for controlling the power converters such that the first and second power converters provide first and second AC waveforms at first and second frequencies to the main generator portion armature winding and to the exciter field winding, respectively, at the beginning of a star sequence and such that the second AC waveform changes to a third frequency less that the second frequency after the beginning of the start sequence and operable in the generating mode for controlling the power converter coupled to the main generator portion armature winding such that AC power is produced at the output of such power converter.

5,594,323

CONTROL PROCESS FOR A VOLTAGE TRANSFORMER WITH A WIDE INPUT VOLTAGE RANGE AND THE APPLICATION OF SUCH A PROCESS

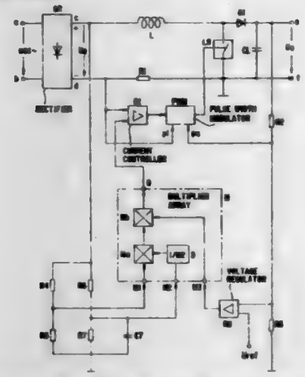
Michael Herfurth, Gilching, and Helmut Bichler, Gräfelfing, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 110,383, Aug. 23, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 431,495

Claims priority, application Germany, Feb. 21, 1991, 41 05 463.6

Int. Cl.[6] G05F 1/614

U.S. Cl. 323—222 **2 Claims**



1. A control process for a voltage transformer for sine-wave line current input with a large input voltage range, which comprises the steps of:

controlling an input current of the voltage transformer as a function of a first current control value;

controlling the output voltage of the voltage transformer with a voltage control signal, wherein said voltage control signal is a function of an output voltage of the voltage transformer, and

obtaining a second current control value by multiplying a signal proportional to a rectified input voltage of the voltage transformer by the voltage control signal, and multiplying by a direct current voltage signal being a reciprocal of an average value of the input voltage of the voltage transformer.

5,594,324

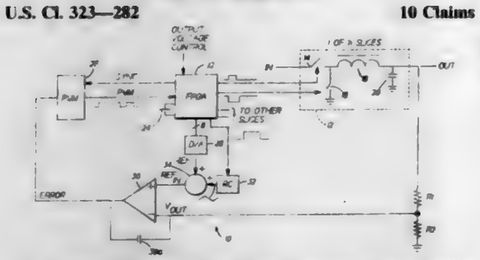
STABILIZED POWER CONVERTER HAVING QUANTIZED DUTY CYCLE

Stanley Canter, Phoenix, Ariz., and Ronald Lenk, Sunnyvale, Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Mar. 31, 1995, Ser. No. 414,527

Int. Cl.[6] G05F 1/575

U.S. Cl. 323—282 **10 Claims**



1. A method for stabilizing a power converter against oscillations due to a mismatch between an output voltage setpoint and available ones of a plurality of quantized duty cycles, comprising the steps:

generating a reference voltage for indicating a desired output voltage setpoint:

comparing the reference voltage to an actual output voltage of the power converter to derive an error signal;

varying the pulsewidth of a first pulsewidth modulated control signal in accordance with the error voltage, the first pulsewidth modulated control signal having a first frequency;

converting the first pulsewidth modulated control signal to at least one second pulsewidth modulated control signal for varying a conduction time of a converter switching means so as to make the actual output voltage conform to the desired output voltage, the step of converting including a step of quantizing the pulsewidth to one of a plurality of quantized duty cycles; and

injecting a dither signal such that the dither signal appears in the error signal, the dither signal having a second frequency that is less than the first frequency and greater than a bandwidth frequency of the power converter, the dither signal functioning to effectively increase the number of possible duty cycles by a factor given by the ratio of the second frequency to the bandwidth frequency.

5,594,325

SPACECRAFT POWER SYSTEM ARCHITECTURE TO MITIGATE SPACECRAFT CHARGING EFFECTS

David B. Manner, 1035 Burntwood Dr., Medina, Ohio 44256, assignor to David B. Manner, and Brooke Schumm, III, both of Medina, Ohio

Filed Aug. 10, 1995, Ser. No. 513,475

Int. Cl.[6] G05F 1/56

U.S. Cl. 323—282 **46 Claims**

1. An improved power system for a spacecraft for providing negatively grounded power to at least one electrical load at improved higher ambient voltages while reducing the voltage potential between said spacecraft and space plasma, said spacecraft having a spacecraft containing means, said power system having at least one means for generating electrical energy from solar energy, said at least one means for generating electrical energy from solar energy having at least one positive generator feed terminal and at least one negative generator feed terminal, and said at least one electrical load having at least one electrical load input terminal and having at least one electrical load ground terminal.

said improved power system comprising:

means for connecting said at least one positive generator feed terminal to said spacecraft containing means;

at least one power converter to convert energy from negatively charged input into positively charged output having at least one electronic energy storage element;

said at least one power converter having a power converter negative input feed and at least one power converter positive output feed;

means for connecting said at least one negative generator feed terminal to said power converter negative input feed through said spacecraft containing means and electrically insulated from said spacecraft containing means;

means for connecting said at least one power converter positive output feed and said at least one electrical load input terminal; and

means for connecting said at least one positive generator feed terminal and said at least one electrical load ground terminal.

5,594,326

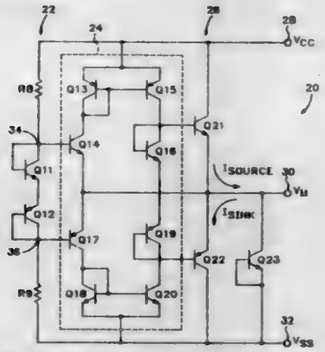
SUB-RAIL VOLTAGE REGULATOR WITH LOW STAND-BY CURRENT AND HIGH LOAD CURRENT

Barrie Gilbert, Portland, Oreg., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jun. 7, 1995, Ser. No. 484,824

Int. Cl.[6] G05F *3/16*

U.S. Cl. 323—313 **20 Claims**



1. A voltage reference generator comprising:

an output stage having an output terminal for supplying a sub-rail voltage;

a voltage divider network; and

a current gain stage connected between the voltage divider network and the output terminal of the output stage, the gain stage providing a first bias current to the output stage that is responsive to a sinking load current detected at the output terminal and a second bias current to the output stage that is responsive to a sourcing load current detected at the output terminal, the output stage being responsive to the first and second bias currents to supply the demanded load currents.

5,594,327

METHOD FOR DETERMINING THE DEGREE OF DETERIORATION OF OILS OR FATS USED FOR FRYING FOODS

Angelos N. Sagredos, Hamburg, and Ilmar Neumeister, Groebenzell, both of Germany, assignors to Wanzler Groenkuechentechnik GmbH, Munich, Germany

Filed Aug. 26, 1994, Ser. No. 297,000

Claims priority, application Germany, Aug. 27, 1993, 43 28 966.5

Int. Cl.[6] G01N *27/06;33/03;33/28*

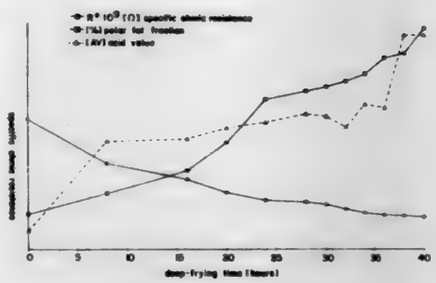
U.S. Cl. 324—71.1 **18 Claims**

1. A method for determining the degree of deterioration of oils or fats used in a process for frying foods and/or the frying time at which the oil or fat is no longer usable, which comprises:

applying a direct current voltage to the frying oils and fats,

measuring the specific electrical resistance of the frying oils or fats at different frying times, and

determining the degree of deterioration and/or the frying time at which the oil or fat is no longer usable by a first correlation between the decrease of the resistance with increasing frying time and a second correlation between the specific resistance and the degree of deterioration.



5,594,328

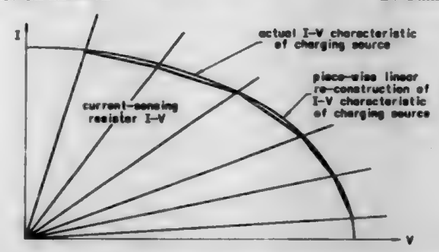
PASSIVE PROBE EMPLOYING CLUSTER OF CHARGE MONITORS FOR DETERMINING SIMULTANEOUS CHARGING CHARACTERISTICS OF WAFER ENVIRONMENT INSIDE IC PROCESS EQUIPMENT

Wieslaw A. Lukaszek, 129 Marine Rd., Woodside, Calif. 94063

Filed Feb. 14, 1995, Ser. No. 389,699

Int. Cl.[6] H01L *27/02*

U.S. Cl. 324—72 **24 Claims**



1. A method of determining charging characteristics of a wafer environment inside of integrated circuit process equipment, said method comprising the steps of

a) providing a wafer based probe including a cluster of individual charge each monitors in a wafer with each monitor including a voltage memory device, a charge collection electrode and a current-sensing element connecting said charge collection electrode to said wafer, the characteristics of said current sensing element varying among said individual charge monitors,

b) placing said wafer based probe inside said integrated circuit environment, and

c) determining resultant voltages across said current-sensing elements from said voltage memory devices as a measure of said charging characteristics.

5,594,329

METHOD AND APPARATUS FOR OBTAINING VOLTAGE-ISOLATED MEASUREMENT CHANNELS WITH AN ISOLATION TRANSFORMER AND MULTIPLIER

Rudolf G. van Ettinger, Vriezenveen, and Martinus P. Eikendal, Almelo, both of Netherlands, assignors to Fluke Corporation, Everett, Wash.

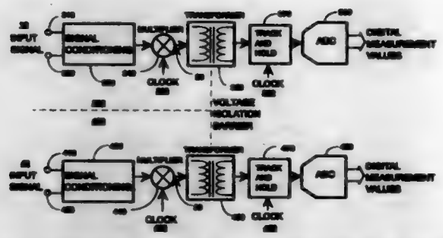
Filed Sep. 11, 1995, Ser. No. 526,650

Int. Cl.[6] G01R *19/00*

U.S. Cl. 324—96 **10 Claims**

1. A voltage-isolated measurement channel, comprising:

(a) a multiplier adapted for receiving an input signal and coupled to a clock signal, said multiplier multiplying said input signal by said clock signal to produce a modulated input signal at a multiplier output;



(b) a transformer coupled to said multiplier output to receive said modulated input signal at an input winding, said transformer reproducing said modulated input signal in an output winding wherein said input winding is voltage-isolated from said output winding by a voltage isolation barrier,

(c) a sampling circuit coupled to said output winding to receive said modulated input signal and further coupled to said clock signal to capture voltage samples of said modulated input signal responsive to said clock signal; and

(d) an analog to digital converter coupled to said sampling circuit to receive said voltage samples and produce digital measurement values from said voltage samples.

5,594,330

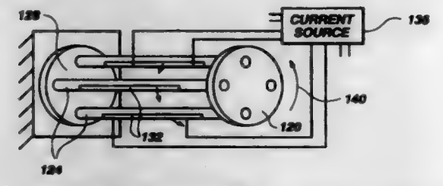
MOVEMENT ACTUATOR/SENSOR SYSTEMS

Stephen C. Jacobsen, Salt Lake City, Utah, assignor to Sarcos Group, Salt Lake City, Utah

Division of Ser. No. 898,216, Jun. 12, 1992, Pat. No. 5,481,184, which is a continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882. This application Jun. 7, 1995, Ser. No. 480,018

Int. Cl.[6] H02M *7/00*

U.S. Cl. 324—106 **3 Claims**



1. A movement actuator comprising

an elongate bar made of a piezoelectric material and anchored at one end,

conductive elements disposed on a side of the bar so that as voltages are applied to the elements, the bar is caused to move, and

means for selectively supplying voltages to the elements.

5,594,331

MICROELECTROMECHANICAL POWERLINE MONITORING APPARATUS

Richard M. White, Berkeley, and Gregory A. Campbell, Pleasanton, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

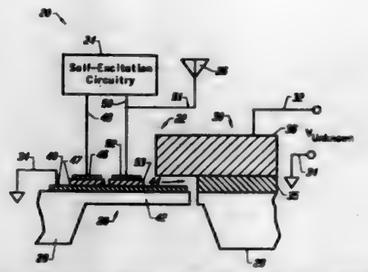
Filed Jun. 7, 1995, Ser. No. 487,192

Int. Cl.[6] G01R *27/26*

U.S. Cl. 324—117 R **18 Claims**

1. A microelectromechanical power line monitoring apparatus, comprising:

a microelectromechanical power line attachment assembly comprised of a housing for coupling with a power line, said housing supporting



a microelectromechanical resonating structure configured to mechanically resonate in response to an electric field generated by a signal carried by said power line so as to produce an induced variable frequency voltage signal,

self-excitation circuitry connected to said resonating structure to process said induced variable frequency voltage signal and produce a variable frequency voltage signal in a resonant pass band of interest that is applied to said resonating structure to augment the effect of said electric field on said resonating structure, and

an output device to transmit an output signal corresponding to said amplified variable frequency voltage signal.

5,594,332

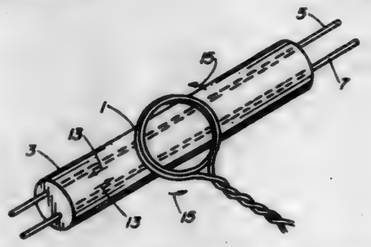
ALTERNATING CURRENT DETECTOR

R. Keith Harman, Kanata; C. Brian Wong, Kirkland; Gennady Reshetnikov, and Brian McLaughlin, both of Ottawa, all of Canada, assignors to Iris Electronics Corporation, Ottawa, Canada

Filed Oct. 12, 1994, Ser. No. 321,802

Int. Cl.[6] G01R *1/20*

U.S. Cl. 324—127 **20 Claims**



1. A method of sensing alternating current in a cable having at least a pair of longitudinal conductors, each of the pair carrying a current equal in absolute value to the other in mutually opposite directions, comprising disposing a generally flat flexible coil with its lateral plane adjacent said cable in a position whereby electromagnetic fields caused by said currents directly intersect the coil and induce current in the coil by wrapping the coil with its lateral plane around the cable, detecting the induced current in the coil; moving the coil to maximize the induced current in the coil by rotating the coil around the periphery of the cable, and then fixing the coil to the cable.

5,594,333

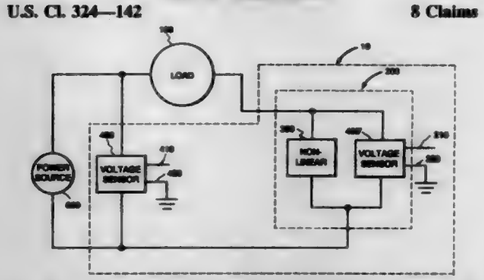
ZERO CURRENT SENSOR

Walter Whipple, III, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 208,760, Mar. 9, 1994, abandoned, which is a division of Ser. No. 132,772, Oct. 6, 1993, Pat. No. 5,319,304, which is a continuation of Ser. No. 877,305, May 1, 1992, abandoned. This application Feb. 13, 1996, Ser. No. 600,324

Int. Cl.[6] G01R *27/00*

U.S. Cl. 324—142 **8 Claims**



1. A sensor for detecting at least one zero current point of an alternating current in a load, comprising;

a power source;

a first rectifier element having a first direction of conduction, said first rectifier element being coupled in series with said load and said power source;

a second rectifier element having a second direction of conduction said second rectifier element being coupled in series with said load and said power source and in parallel with said firsts rectifier element so that said second direction of conduction opposes said first direction of conduction, said first and second rectifier elements each respectively comprising a diode;

a third diode, said first and third diodes being coupled in series across said second diode, said third diode having a direction of conduction in the same direction as said first direction of conduction; and

a voltage sensor coupled in parallel with said first and third diodes and said second diode.

5,594,334

BEARING HAVING A SENSOR INCORPORATED IN A BEARING SEAL AND A CIRCUMFERENTIAL SENSOR CABLE EXTENDING THROUGH AND ALONG THE SIDE OF THE BEARING SEAL

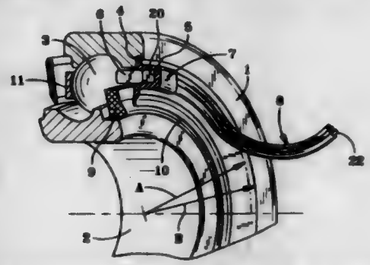
Claude Sonnerat, Annecy le Jleux; Denis Alff, and Christian Hajzler, both of Annecy, all of France, assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 171,133, Dec. 21, 1993. This application May 17, 1996, Ser. No. 651,198

Claims priority, application France, Jun. 25, 1993, 93 07745

Int. Cl.[6] G01P *3/48;* **G01B** *7/14;* **F16C** *41/04*

U.S. Cl. 324—173 **7 Claims**



1. An industrial-type bearing with integrated data sensor comprising:

a stationary bearing ring having an axis;

a rotatable bearing ring coaxial with the stationary bearing ring;

rolling elements in contact with said bearing rings;

encoding means mounted on the rotatable bearing ring for generating a signal;

an annular sealing gasket mounted on the stationary bearing ring and having an external side;

sensor means carried by said sealing gasket, extending inward from the sealing gasket, for sensing the signal;

a sensor cable having a portion connected to the sensor means; and

a sleeve which is integrally connected to the sealing gasket, the sleeve housing the sensor means and the portion of the sensor cable connected to the sensor means, the sleeve having a first extremity wall which is substantially perpendicular to the external side of the sealing gasket, the sensor cable exiting through the first extremity wall and extends circumferentially along the external side of the sealing gasket.

5,594,335

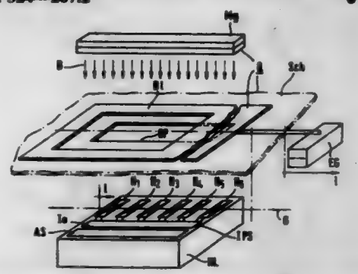
POSITION-DETECTING APPARATUS WITH HALL ELEMENTS AND AN INTERPOLATION CIRCUIT FOR INTERPOLATING ANALOG OUTPUT SIGNALS OF THE HALL ELEMENTS

Joachim Melbert, Deisenhofen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 9, 1995, Ser. No. 401,475

Int. Cl.[6] G01D *5/14;* **G01B** *7/14;7/30;* **H03F** *3/45*

U.S. Cl. 324—207.2 **6 Claims**



1. An apparatus for detecting a geometric relation, comprising:

a configuration of a multiplicity of Hall elements disposed at predetermined distances from one another along a given line, each of said Hall elements connected to a respective first current source;

a device having a magnetic field source and providing said configuration of Hall elements with a magnetic induction dependent on a relative geometric position between said configuration of Hall elements and an object having a geometric position to be detected;

each of said Hall elements converting the geometry-dependent magnetic induction into a separate analog electric output signal; and

an interpolation circuit for interpolating the analog output signals of at least two of said Hall elements, said interpolation circuit comprising, for each of said Hall elements, a differential amplifier stage with an output, and a differential input connected to the respective Hall element and receiving the analog output signal from the respective Hall element as an input voltage, wherein each said differential amplifier stage generates a current signal output and wherein the current signal outputs of the differential amplifier stages are combined to form a common current node, each said differential amplifier stage including two transistors each having an emitter, a base and a collector, a resistor connected between said emitters of said two transistors, said emitters being connected to reference potential through a second current source, said bases being connected to receive the input voltage, and said collectors issuing the current signal output, and wherein one

of said transistors has a further collector terminal from which a collector current component of the one transistor is fed to the collector of the other of said two transistors.

5,594,336

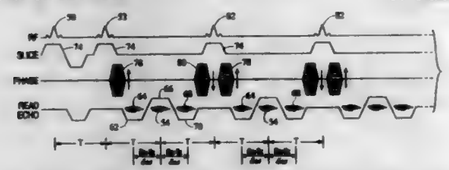
THREE POINT TECHNIQUE USING SPIN AND GRADIENT ECHOES FOR WATER/FAT SEPARATION

Rao P. Gullapalli, Richmond Heights; Haiying Liu, Euclid, and Mark J. Loncar, Willoughby Hills, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Jun. 2, 1995, Ser. No. 459,051

Int. Cl.[6] G01R *33/48*

U.S. Cl. 324—309 **16 Claims**



1. In a magnetic resonance imaging method in which a resonance excitation pulse and a resonance refocusing pulse are applied to generate a spin echo and in which read gradients are reversed in order to induce gradient echoes in association with each spin echo, the improvement comprising:

inducing the spin echo when resonance signals of a first and second species are substantially in-phase; and,

generating the gradient echoes at a time when the resonance signals of the first and second species are substantially 180° out-of-phase such that an in-phase spin echo and out-of-phase gradient echoes are generated in each repetition of the imaging sequence;

reconstructing a spin echo image from the spin echo signals from a plurality of repetitions of the imaging sequence;

generating first and second gradient echo images from the gradient echo signals of the plurality of repetitions of the imaging sequence;

generating a phase correction map from the spin echo image and the first and second gradient echo images;

correcting phase error in the first gradient echo image in accordance with the phase map;

additively combining the spin echo image with the phase corrected first gradient echo image to generate a first species image; and,

subtractively combining the spin echo image with the phase corrected first gradient echo image to generate a second species image.

5,594,337

LOCAL COIL FOR MAGNETIC RESONANCE ANGIOGRAPHY

Eddy B. Boskamp, Menomonee Falls, Wis., assignor to Medical Advances, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 57,939, May 7, 1993, Pat. No. 5,361,765. This application Oct. 20, 1994, Ser. No. 326,556

Int. Cl.[6] G01V *3/00*

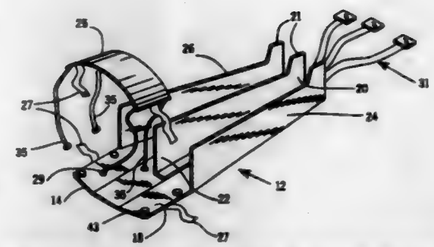
U.S. Cl. 324—318 **22 Claims**

1. An MRI coil for angiographic imaging of the lower trunk and legs comprising:

a base sized to fit against a table of an MRI machine and extending along a longitudinal axis;

a cover unit opposing the base and positionable above the base, together with the base to define an imaging volume therebetween;

a plurality of first coils attached to the base and cover and having first reception patterns which couple to RF magnetic fields of a first orientation within the imaging volume to produce first signals; and



a plurality of second coils attached to the base and cover and opposed substantially symmetrically to the first coils about the imaging volume, the second coils having at least one diametric conductor to divide each second coil into a pair of loops, the second coils having second reception patterns which couple to RF magnetic fields of a second orientation within the imaging volume to produce second signals, the second orientation having an angular separation from the first orientation of substantially 90 degrees;

wherein the first and second coils are alternated along the longitudinal axis.

5,594,338

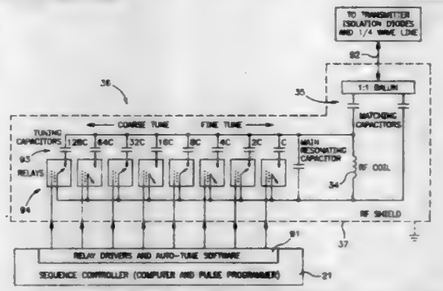
AUTOMATIC TUNING APPARATUS AND METHOD FOR SUBSTANCE DETECTION USING NUCLEAR QUADRUPOLE RESONANCE AND NUCLEAR MAGNETIC RESONANCE

Erik E. Magnuson, Escondido, Calif., assignor to Quantum Magnetics, Inc., San Diego, Calif.

Filed Mar. 8, 1995, Ser. No. 400,673

Int. Cl.[6] G01R *33/28*

U.S. Cl. 324—318 **7 Claims**



1. An automatic tuning apparatus to establish maximum power transfer efficiency at least one selected predetermined frequency in nuclear quadrupole and nuclear magnetic resonant (NQR/NMR) detection systems when a specimen is inserted into the detection element of an NQR/NMR detection system in order to enable such detection systems to detect nuclear quadrupole or nuclear magnetic resonant frequencies of predetermined substances if present in the specimen, the predetermined substances having predetermined characteristic nuclear resonant frequencies, wherein nuclear resonant frequency is the frequency of nuclear precession due either to quadrupolar interaction with molecular electric field gradients (NQR) or to an applied static magnetic field (NMR), said apparatus comprising:

a sequence controller having means for providing timing and programming pulses to said apparatus;

a variable frequency RF source to provide pulsed RF exitation at a predetermined frequency generally corresponding to the nuclear resonant frequency of a predetermined substance;

a single turn distributed RF coil sheet shaped and configured to define a cavity of predetermined volume therewithin and to receive the specimen within the cavity defined by said coil,

the RF signals from said RF source being transmitted within said cavity and being uniformly applied to the specimen within said RF coil cavity and generating a uniform field within said cavity, said RF coil also functioning as the pickup coil for the NQR/NMR signals from the specimen and providing an output signal;

means for measuring the power transfer efficiency of said RF coil at the predetermined nuclear resonant frequency;

an array of fixed value capacitors connected in said apparatus and selectively switchable into circuit with said RF coil; and

a plurality of individually controllable switch means for selectively connecting said capacitors into said RF coil circuit;

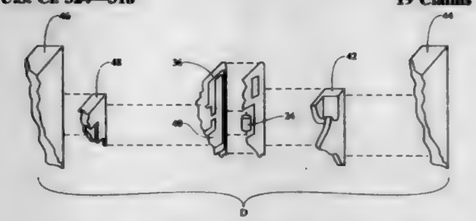
said sequence controller controlling the switching of said capacitors into and out of circuit with said RF coil pursuant to power transfer efficiency measurements from said measuring means to establish and maintain maximum power transfer efficiency of said RF coil at the predetermined nuclear resonant frequency.

5,594,339

FLEXIBLE NUCLEAR MAGNETIC RESONANCE RECEIVER COILS AND SYSTEMS

Robert G. Henderson, Wickliffe; James W. Kristoff, Lyndhurst, and David A. Molyneaux, Mentor, all of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Jul. 11, 1995, Ser. No. 500,821
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—318 **19 Claims**



1. A flexible coil assembly for magnetic resonance imaging, the flexible receiving coil assembly comprising:

a first sheet of flexible plastic material;

an electrically continuous flexible foil strip mounted to and extending along the first sheet of flexible plastic material to receive radio frequency magnetic resonance signals;

a circuit for enhancing the radio frequency magnetic resonance signals received by the foil, the circuit being mounted on the first sheet of flexible plastic material and being connected to the foil strip;

a cable extending from the circuit to a remote location for conveying the received radio frequency magnetic resonance signals to the remote location;

a first layer of soft material mounted to a first face the first sheet of flexible plastic material;

a second layer of soft material mounted to a second face of the first sheet of flexible plastic material;

a first flexible housing, for protecting said circuit, mounted to the first face of the first sheet of flexible plastic material; and

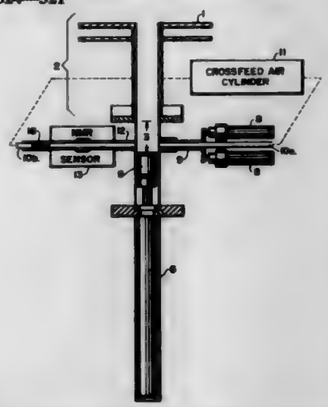
a second flexible housing, for protecting said circuit, mounted to the second soft material layer.

5,594,340

APPARATUS FOR ACCURATELY CONTROLLING MOISTURE LEVELS OF AQUEOUS SURFACTANT COMPOSITIONS DURING ON LINE PROCESSING INCLUDING A CROSS-FEED PISTON ASSEMBLY

Laurie Coyle, North Arlington; Kevin M. Finucane, Saddle Brook, both of N.J.; James D. King, San Antonio, Tex.; Harold F. Doncbo, San Antonio, Tex., and Armando De Los Santos, San Antonio, Tex., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Sep. 8, 1994, Ser. No. 302,285
Int. Cl.[6] G01V *3/18; G01N 1/14*
U.S. Cl. 324—321 **8 Claims**



1. An apparatus for controlling moisture content of aqueous surfactant compositions which apparatus comprises:

(a) means for delivering composition to a main collection port;

(b) means for forming a sample of said composition;

(c) means for delivering said sample into an NMR sensor area using a cross feed assembly piston, said NMR sensor area being in an area separate from said main collection port; and;

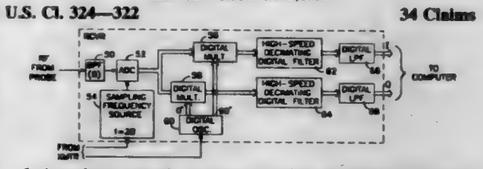
(d) means for measuring the amount of water in said sample in said separate NMR sensor area.

5,594,341

NUCLEAR MAGNETIC RESONANCE RECEIVER, METHOD AND SYSTEM

Reza Majidi-Ahy, Los Altos, and Howard Hill, Cupertino, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 27, 1994, Ser. No. 266,076
Int. Cl.[6] G01V *3/00; 3/14*
U.S. Cl. 324—322 **34 Claims**



1. A nuclear magnetic resonance receiver responsive to an analog signal within a selected passband derived in response to an output of a nuclear magnetic resonance detecting probe, the signal having a center frequency and a bandwidth that is a small fraction of the center frequency, information about an analyte in the probe being contained in the signal in said passband, the receiver comprising an analog to digital converter for (i) sampling the analog signal at a frequency substantially less than the center frequency and that is at least twice the bandwidth of the signal and (ii) deriving a digital signal having values commensurate with the amplitude of the analog signal samples, a bandpass filter having a bandpass B connected to supply said signal to a signal input

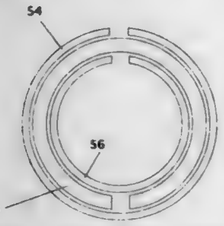
terminal of said converter, the converter sampling the signal with first and second waves each having a frequency of at least 2B, the first wave being at a first phase of a sinusoidal wave corresponding to the center frequency of the filter, the second wave being at a second phase of the sinusoidal wave, and digital processing means responsive to the digital signal derived by the converter for deriving another digital signal having a value determined by the information.

5,594,342

NUCLEAR MAGNETIC RESONANCE PROBE COIL WITH ENHANCED CURRENT-CARRYING CAPABILITY

William W. Brey, and Richard S. Withers, both of Sunnyvale, Calif., assignors to Conductus, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 489,506, Mar. 23, 1995, and Ser. No. 313,624, Sep. 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 891,591, Jun. 1, 1992, Pat. No. 5,351,007. This application Jun. 5, 1995, Ser. No. 462,663
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—322 **18 Claims**



1. An RF coil for magnetic resonance spectroscopy or microscopy comprising a conductive material comprising a capacitive element and an inductive element, wherein the inductive element comprises an interior loop comprising two interior fingers of width w and two exterior loops, each exterior loop comprising two exterior fingers of width about w/2 and the fingers are proximately disposed whereby a capacitive element is formed between adjacent pairs of fingers.

5,594,343

WELL LOGGING APPARATUS AND METHOD WITH BOREHOLE COMPENSATION INCLUDING MULTIPLE TRANSMITTING ANTENNAS ASYMMETRICALLY DISPOSED ABOUT A PAIR OF RECEIVING ANTENNAS

Brian Clark, Redding, Conn.; Peter T. Wu, Sugar Land, Tex., and Victor E. Grijalva, Greenwich, Conn., assignors to Schlumberger Technology Corporation, Sugar Land, Tex.

Filed Dec. 2, 1994, Ser. No. 349,355
Int. Cl.[6] G01V *3/08; 3/10*
U.S. Cl. 324—338 **55 Claims**

1. Apparatus for determining a property of earth formations surrounding a borehole, comprising:

an elongated logging device movable through the borehole;

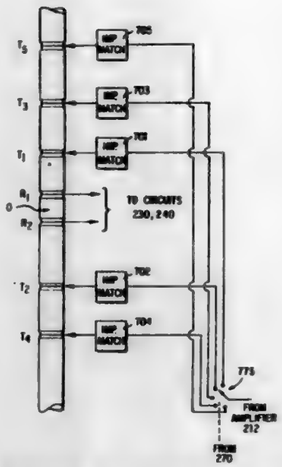
a transmitter array consisting of only first, third, and second transmitting antennas longitudinally spaced on said device;

a pair of longitudinally spaced receiving antennas on said device, said pair of receiving antennas being located between said second transmitting antenna and one of said first and third transmitting antennas;

said first, third, and second transmitting antennas being spaced from the midpoint between said receiver pair by first, third, and second distances, respectively, said first and second distances being substantially the same and being different from said third distance;

means for energizing said first, third, and second transmitting antennas with electromagnetic energy;

means for receiving, at said pair of receiving antennas, electromagnetic energy from said transmitting antennas;



means for determining, from electromagnetic energy received at said pair of receiving antennas, first, third, and second phase shift and/or attenuation measurements of electromagnetic energy transmitted from said first, third, and second transmitting antennas, respectively; and

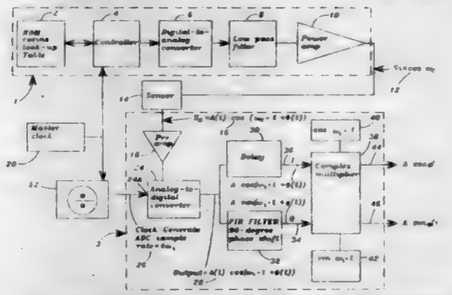
means for determining a property of said earth formations from said first, third, and second phase shift and/or attenuation measurements.

5,594,344

METHOD AND APPARATUS FOR GENERATING AND DETECTING AMPLITUDE AND PHASE MODULATED SENSOR SIGNALS

Mark R. Doyle, and John T. Evans, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Aug. 9, 1995, Ser. No. 512,893
Int. Cl.[6] G01V *3/30; 3/18;* G01R *13/02*
U.S. Cl. 324—338 **21 Claims**



1. A method of extracting a phase and amplitude modulation signal impressed on a carrier comprising the steps of:

generating said carrier at a frequency, said frequency a multiple of a bandwidth of said phase and amplitude modulation signal, said multiple equal to 4N+ 1, where N is an integer;

causing said modulation signal to be impressed on said carrier, thereby generating a phase and amplitude modulated carrier;

digitally sampling said phase and amplitude modulated carrier, said digital sampling having a frequency of four times said bandwidth of said phase and amplitude modulation signal, said digital sampling initiated at a time substantially contemporaneous with initiation of said step of generating said carrier;

applying a 90-degree phase shift to said digitally sampled carrier thereby generating a quadrature component of said digitally sampled carrier;

applying a time delay to said digitally sampled carrier, said time delay restoring time coincidence between said quadrature component and said digitally sampled carrier; and

extracting said phase and amplitude modulation signal by commutation of said time-delayed digitally sampled carrier and said quadrature component of said digitally sampled carrier.

5,594,345

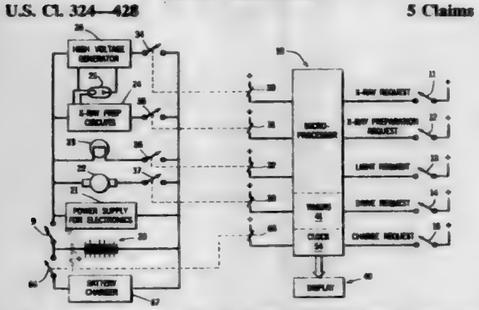
BATTERY CAPACITY INDICATOR FOR MOBILE MEDICAL EQUIPMENT

Manfred D. Boehm, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 183,560, Jan. 19, 1994, abandoned. This application Feb. 22, 1995, Ser. No. 392,303

Int. Cl.[6] G01R *27/26*

U.S. Cl. 324—428 **5 Claims**



1. In a system having a finite number of different operating modes that each draw a known amount of current from a battery, the combination comprising:

a set of timers, one for each of said different operating modes;

means for enabling the corresponding timer to accumulate time values while the system is operated in any of its operating modes;

means for periodically calculating the current drawn from the battery, including means for multiplying the accumulated time value in each timer by the known current draw for its corresponding operating mode;

means for calculating the remaining capacity of the battery including means for summing the values calculated by the last named means, and means for subtracting the resulting sum from a value indicating available battery capacity; and

means for displaying the remaining capacity.

5,594,346

APPARATUS AND METHODS FOR IDENTIFYING AND QUANTIFYING COMPOUNDS USING A PLURALITY OF PULSED RARE GAS PHOTOIONIZATION DETECTORS

Stanley D. Stearns, Houston, and Wayne E. Wentworth, Pearland, both of Tex., assignors to Valco Instruments Co., Inc., Houston, Tex.

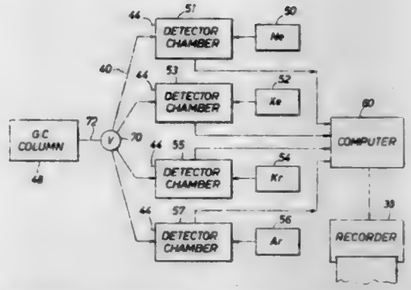
Continuation-in-part of Ser. No. 662,149, Feb. 28, 1991, Pat. No. 5,153,519, Ser. No. 956,632, Oct. 5, 1992, Pat. No. 5,317,271, Ser. No. 176,968, Jan. 3, 1994, Pat. No. 5,394,092, Ser. No. 201,467, Feb. 25, 1994, Pat. No. 5,394,090, and Ser. No. 201,469, Feb. 25, 1994, Pat. No. 5,394,091. This application Dec. 2, 1994, Ser. No. 349,046

Int. Cl.[6] G01N *27/62;27/68*

U.S. Cl. 324—464 **23 Claims**

1. A method for analyzing a sample gas comprising the steps of:

(a) serially forming a plurality of carrier gases wherein at least one of said carrier gases comprises an inert gas and a dopant gas selected from a set of dopant gases;



(b) flowing a current through said carrier gases;

(c) energizing at least one component of said carrier gases to an excited state as a result of exposure to said current flow;

(d) mixing a sample gas comprising one or more compounds with said energized carrier gases;

(e) forming charged particles of said sample gas as a result of ionizing radiation emitted in the decay of said excited component of said carrier gases interacting with one or more compounds contained in said sample gas;

(f) measuring the electrical currents resulting from the flow of said charged particles wherein said measurement step occurs after forming charged particles; and

(g) selectively identifying one or more said compounds contained in said sample utilizing said current measurements.

5,594,347

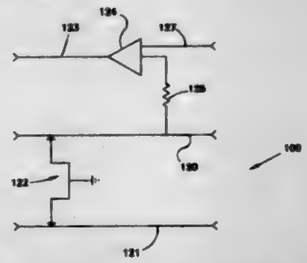
NON-INVASIVE TESTING OF VIDEO SIGNALS WITH A JACK MODULE AND AMPLIFICATION CIRCUIT

Dominic J. Louwagie; Steven L. Carolus, both of Eden Prairie; John M. Field, Edina; Daniel J. Murphy, Eden Prairie; Jeffery O. Brown, St. Paul, and James D. Dewey, Plymouth, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed May 22, 1995, Ser. No. 447,261

Int. Cl.[6] H01R *29/00;* **H01H** *31/02*

U.S. Cl. 324—539 **2 Claims**



1. In a signal transmission network having signals carried from a plurality of sources connected to individual ones of a first plurality of coaxial cables, a non-invasive testing system comprising:

A. a plurality of jacks each having:

1. a jack module housing;

2. at least a first central conductor disposed within said housing and having means for connection of opposite first and second ends of said first central conductor to external coax conductors with said first central conductor carrying a main signal having a power level between said opposite ends, said means including at least a first port formed through said housing for receiving a jack plug at said first end and said means further including a coax connector at said second end;

3. a monitor conductor disposed within said housing with means for connection of said monitor conductor to an external coax conductor;

4. a monitor circuit for connecting said monitor conductor to said first central conductor at a point intermediate said opposite ends;

5. at least one power conductor contained within said housing with means for connection of said power conductor to an external source of electric power;

6. said monitor circuit connected to said first central conductor across a resistive load selected to draw a portion of said main signal on said first central conductor to said monitor circuit without substantial reduction in said power level of said main signal on said first central conductor;

B. said individual ones of said first plurality of coaxial cables electrically connected to individual ones of said first ends of said first central conductors of said plurality of jacks;

C. a second plurality of coaxial cables electrically connected to individual ones of said second ends of said first central conductors of said plurality of jacks;

D. a test equipment for testing a signal on a selected one of said first plurality of coaxial cables;

E. a patch cable for selectively connecting said test equipment to an individual one of said monitor conductors of said plurality of jacks; and

F. said monitor circuit including amplification means for receiving said portion of said main signal and amplifying said portion to a power selected for a power at said test equipment to equal a power on said first central conductor and delivering said amplified signal to said monitor conductor, said amplifying means connected to said power conductor.

5,594,348

SURGE TESTING METHOD IN DECOMPRESSED ATMOSPHERE FOR A SMALL-SIZE ELECTRIC MACHINE AND APPARATUS THEREOF

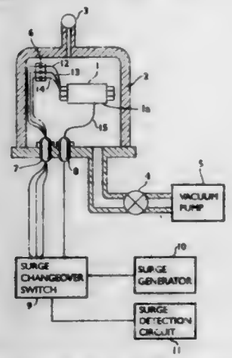
Yasuo Iijima, and Masahiro Tsubokawa, both of Takefu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 25, 1995, Ser. No. 450,638

Claims priority, application Japan, Jun. 17, 1994, 6-135564

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—546 **3 Claims**



1. A non-destructive insulation testing method for a small-size electric machine having a coil, comprising the steps of:

mounting said electric machine in a container whose inner pressure is kept from 15 to 25 [Torr];

applying a surge voltage to said coil; and

detecting whether a glow discharge is generated or not from said coil.

5,594,349

DIELECRTRIC BREAKDOWN PREDICTION APPARATUS AND METHOD, AND DIELECTRIC BREAKDOWN LIFE-TIME PREDICTION APPARATUS AND METHOD

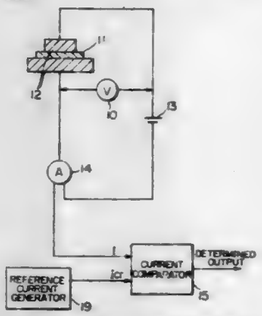
Mikihiro Kimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 91,359, Jul. 15, 1993, Pat. No. 5,420,513. This application Mar. 14, 1995, Ser. No. 404,065

Claims priority, application Japan, Jul. 16, 1992, 4-189362

Int. Cl.[6] G01R *31/26;27/02;* **G01N** *27/60*

U.S. Cl. 324—551 **6 Claims**



1. A dielectric breakdown prediction apparatus comprising:

a pair of electrodes placed across a specimen;

a voltage applying apparatus for applying a voltage this pair of electrodes;

an amperemeter for measuring electric current flow through said specimen;

a reference current generator for generating a dielectric breakdown reference current whose value varies the function of a voltage applied to said specimen; and

a current comparator for determining the dielectric breakdown of said specimen by comparing the value of current flowing through said amperemeter with the value of said dielectric breakdown reference current.

5,594,350

SIGNAL DETECTING CIRCUIT FOR DIGITAL CONTROLLER

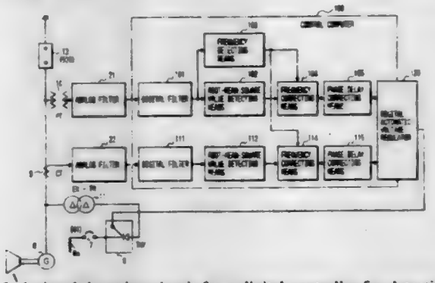
Yutaka Koizumi; Minoru Banjo, and Takeshi Wakugawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Electric System Company, Ltd., Hitachi, both of Japan

Filed Dec. 1, 1994, Ser. No. 347,635

Claims priority, application Japan, Dec. 9, 1993, 5-308968

Int. Cl.[6] G01R *27/28*

U.S. Cl. 324—616 **6 Claims**



1. A signal detecting circuit for a digital controller for detecting a signal representing a quantity of system state necessary for control from an instantaneous value of an alternating current signal obtained from an instrument potential transformer or an instrument current transformer, which comprises:

an analog filter removing a direct current component and absorbing surges in a detected signal; and

means for correcting the gain of the detected signal depending on the change in a detected frequency

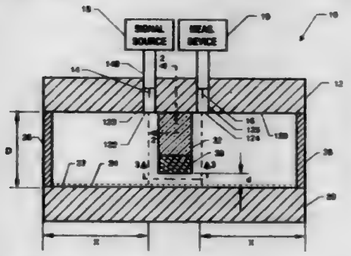
said means for correcting comprises means for correcting the gain of the detected signal using the standard electric power system frequency when the detected signal input from the instrument potential transformer or the instrument current transformer is lower than a constant value and correcting the gain of the detected signal corresponding to the change in the detected signal when the detected signal is higher than a constant value.

5,594,351

APPARATUS FOR USE IN DETERMINING SURFACE CONDUCTIVITY AT MICROWAVE FREQUENCIES

Chase P. Hearn, Williamsburg, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 23, 1995, Ser. No. 448,286
Int. Cl.[6] F26B *3/34*
U.S. Cl. 324—637 **16 Claims**



1. An apparatus comprising:

a first plate having an electrically conductive surface and having first and second holes passing through said electrically conductive surface into said first plate;

a first coupling loop electrically shielded within said first hole;

a second coupling loop electrically shielded within said second hole;

means for supplying microwave energy at an operating frequency f to said first coupling loop;

means for measuring microwave energy received at said second coupling loop;

a second plate supporting an electrically conductive material under test (MUT);

non-conductive spacer means for maintaining said electrically conductive surface of said first plate and said MUT in a spaced apart relationship;

a dielectric resonator; and

means for positioning said dielectric resonator between said first coupling loop and said second coupling loop, and for positioning said dielectric resonator closer to said MUT than said electrically conductive surface of said first plate.

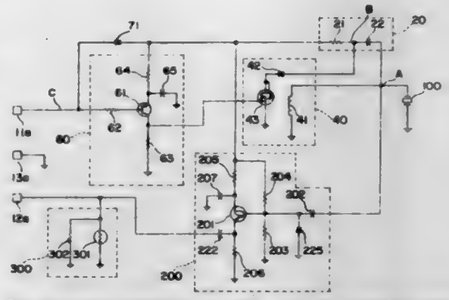
5,594,352

FUEL TANK TRANSDUCER MODULE CIRCUIT

Glen A. Johnson, Mesa, Ariz., assignor to Arizona Instrument Corporation, Phoenix, Ariz.

Filed Mar. 10, 1995, Ser. No. 401,938
Int. Cl.[6] G01R *27/26; G01F 23/00*
U.S. Cl. 324—664 **11 Claims**

1. A circuit for use in a system for measuring liquid stored in a tank, comprising:



first and second terminals coupleable to a cable, said first terminal being at a first voltage level relative to said second terminal and receiving voltage pulses;

a first capacitor having one end coupled to said first terminal;

an inductor coupled in series between the other terminal of said first capacitor and said second terminal;

an ultrasonic transducer coupled in parallel to said inductor;

an electronic switch having a control input coupled to said first terminal and having a switched path coupled in parallel with said first capacitor and said inductor, said switched path being switchable between first and second conductive states, said switch being operable such that said each of said voltage pulses received at said first terminal causes said switch to switch from said first conductive state to said second conductive state, said switch remaining in said second conductive state for a predetermined period of time after which said switch switches back to said first conductive state;

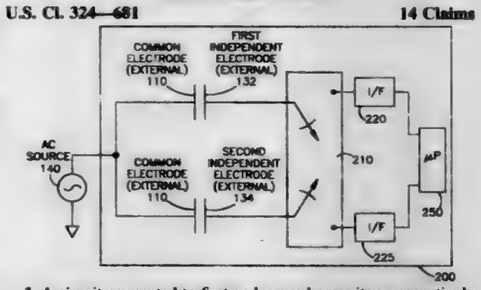
said circuit being operable such that when said switch is in said first conductive state said capacitor stores energy, and operable such that when said switch is in said second state said energy stored in said capacitor is transferred from said capacitor to said inductor, and operable such that after said switch switches from said second state back to said first state said inductor transfers said energy to said transducer.

5,594,353

METHOD AND APPARATUS FOR MEASURING THE CHANGE IN CAPACITANCE VALUES IN DUAL CAPACITORS

Brian D. Hemphill, Sagamore Hills, Ohio, assignor to Elsag International N.V., Amsterdam, Netherlands

Filed May 11, 1995, Ser. No. 439,305
Int. Cl.[6] G01R *27/26*
U.S. Cl. 324—681 **14 Claims**



1. A circuit connected to first and second capacitors respectively laving first and second capacitance values C_1 and C_2, said first and second capacitors each having an independent electrode and sharing one common electrode, said circuit calculating a ratio, R, having C_1 in inverse relation to C_2, said circuit comprising:

a) means for generating an AC voltage, V_r, and supplying V_r to said common electrode of said first and second capacitors to

respectively produce first and second AC current signals at said independent electrodes of said first and second capacitors;

b) rectifying means connected to said independent electrodes for respectively converting said first and second AC current signals to first and second half-wave current signals;

c) means connected to said rectifying means for respectively converting said first and second half-wave current signals to first and second frequency signals respectively having frequency values f_1 and f_2; and

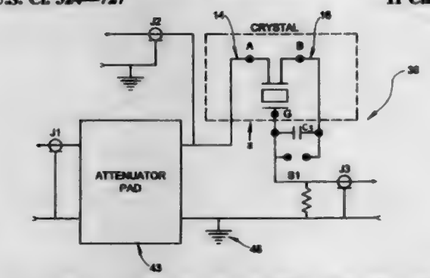
(d) means for calculating R from f_1 and f_2.

5,594,354

METHOD FOR MEASURING SELECTED FREQUENCIES OF A COUPLED-DUAL RESONATOR CRYSTAL

Gerald E. Roberts, and Michael E. Roberts, both of Lynchburg, Va., assignors to Xtal Technologies, Ltd., Carle Place, N.Y.

Filed Jan. 9, 1995, Ser. No. 370,495
Int. Cl.[6] G01R *29/22*
U.S. Cl. 324—727 **11 Claims**



1. A method of accurately measuring frequencies of a coupled-dual resonator crystal having a piezoelectric plate, a first electrode on the plate, a common electrode on the plate, a second electrode on the plate, the method comprising the steps of:

connecting a frequency synthesizer to the first electrode and to a reference point;

applying a plurality of frequencies to the first electrode;

monitoring a phase response of the crystal with respect to frequency;

monitoring a time response of the crystal with respect to frequency;

determining time delay relative maxima from the time response; and

determining critical frequencies corresponding to the time delay relative maxima, whereby the critical frequencies are used in the calculation of crystal frequency characteristic values, and all of the critical frequencies and the crystal frequency characteristic values can be determined and calculated, respectively, at any stage in a fabrication process without the necessity of re-tuning or re-calibration.

5,594,355

ELECTRICAL CONTACTOR APPARATUS FOR TESTING INTEGRATED CIRCUIT DEVICES

Kevin E. Ludwig, El Cajon, Calif., assignor to Delta Design, Inc., San Diego, Calif.

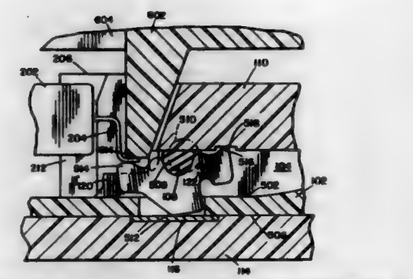
Filed Jul. 19, 1994, Ser. No. 277,236
Int. Cl.[6] H01R *9/09*
U.S. Cl. 324—755 **21 Claims**

1. A contactor socket for electrically interconnecting a lead of an electrical device to a conductive area on a board, comprising:

a housing having at least one slot;

an elastomeric element disposed transverse said slot; and

at least one probe disposed within said at least one slot, said probe engaging said elastomeric element, said probe having a



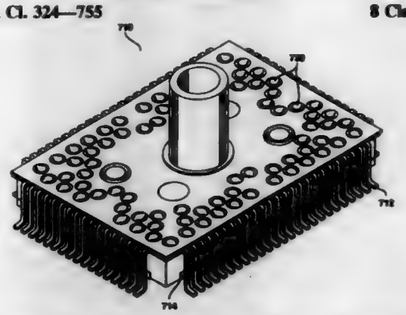
fulcrum for engaging said conductive area on said board and an arm for engaging said lead of said electrical device, said probe pivoting within said slot about said fulcrum as said lead of said electrical device engages said arm, such that said fulcrum rocks on said conductive area of said board with no appreciable, lateral sliding movement by said probe on said conductive area.

5,594,356

INTERCONNECTION DEVICE FOR CONNECTING TEST EQUIPMENT WITH A CIRCUIT BOARD DESIGNED FOR FINE PITCH SOLDER LEAD INTEGRATED CIRCUIT COMPONENTS

Leonard Turner, Beaverton; Mark Trobough, Aloha; Ashok Kaboli, Beaverton, and Ron Flamm, Newberg, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 343,842, Nov. 23, 1994, Pat. No. 5,418,469, which is a continuation of Ser. No. 79,242, Jun. 17, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 382,295
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—755 **8 Claims**



1. A circuit board test device interconnect apparatus comprising:

a body; and

a lead frame coupled to said body, said lead frame including,

i. a plurality of fine pitch leads for electrically coupling said apparatus to a circuit board;

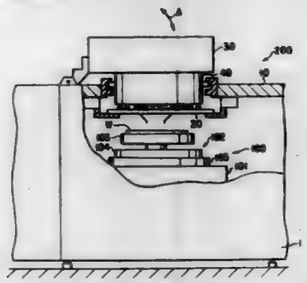
ii. an array of electrical contact pads integrally formed with said plurality of fine pitch leads, each contact pad of said array of contact pads being electrically connected with a corresponding one of said plurality of fine pitch leads, said array of electrical contact pads being more widely spaced than said plurality of fine pitch leads; and

iii. alignment holes integrally fabricated with said plurality of fine pitch leads and said array of electrical contact pads.

5,594,357
TESTING APPARATUS AND CONNECTION METHOD FOR THE TESTING APPARATUS

Hiroshi Nakajima, Yamanashi-ken, Japan, assignor to Tokyo Electron Limited, Tokyo, and Tokyo Electron Yamanashi Limited, Nirasaki, both of Japan

Division of Ser. No. 246,334, May 19, 1994, Pat. No. 5,489,853. This application Dec. 6, 1995, Ser. No. 568,284
Claims priority, application Japan, May 19, 1993, 5-140166
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—758 11 Claims

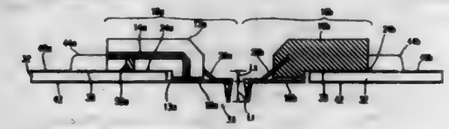


1. A testing apparatus comprising:
a probe card having a plurality of first contact elements to be put in contact with an object to be tested, and a plurality of electrodes electrically connected with the first contact elements;
a test head to be shifted between a retreat position and a test position, for performing electrical measurement of the object in the test position;
a connection member, having a plurality of second contact elements to be put in contact with the electrodes of the probe card in the test position, for electrically connecting the probe card with the test head, the connection member being supported by the test head;
a support mechanism for movably supporting the connection member on the test head;
guide means for guiding the connection member such that the second contact elements are aligned to the electrodes of the probe card in the test position;
limiting means for limiting movement of the connection member towards the test head after the test head is moved to the test position; and
fixing means for fixing the probe card in the state in which movement of the connection member is limited by the limiting means and the probe card is pressed on the connection member.

5,594,358
RADIO FREQUENCY PROBE AND PROBE CARD INCLUDING A SIGNAL NEEDLE AND GROUNDING NEEDLE COUPLED TO A MICROSTRIP TRANSMISSION LINE

Osamu Ishikawa, Soraku-gun, and Hiroyasu Takehara, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 1, 1994, Ser. No. 299,495
Claims priority, application Japan, Sep. 2, 1993, 5-218332
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—762 4 Claims

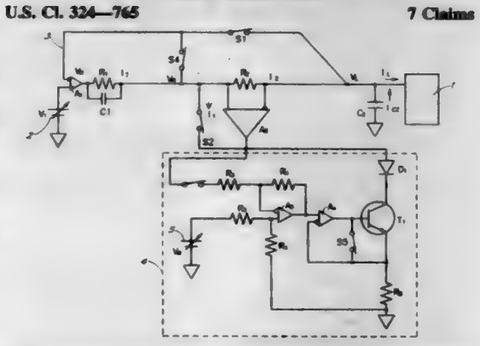


4. A probe card comprising:
a radio frequency probe for measuring radio frequency characteristics of a semiconductor device, the radio frequency probe including:
a first insulating substrate including a front surface, a back surface, and a side face;
a first microstrip transmission line including a first signal line made of conductive material formed on the front surface of the first insulating substrate and a first grounding electrode made of conductive material formed on the substantially entire portion of the back surface of the first insulating substrate; and
a signal needle and a grounding needle electrically connected to the first signal line and the first grounding electrode, respectively, the signal needle and the grounding needle being close to each other and being disposed so that the distances from the side face to the top ends of the needles are substantially equal to each other so as to allow the signal needle and the grounding needle to contact a signal electrode pad and a grounding electrode pad of the semiconductor device simultaneously; and
the probe card further comprising:
a second insulating substrate having a top surface, a bottom surface, a first through hole, and a plurality of second through holes, the first through hole and the plurality of second through holes being formed through the second insulating substrate;
a second microstrip transmission line including a second signal line made of conductive material formed on the top surface of the second insulating substrate, a second grounding electrode formed on the substantially entire portion of the bottom surface of the second insulating substrate, and a top surface grounding electrode formed on the top surface of the second insulating substrate and connected to the second grounding electrode via the plurality of second through holes; and
an impedance matching component disposed at least on the first and second microstrip transmission lines,
wherein the radio frequency probe is held on the top surface of the second insulating substrate so as to be substantially vertical to the second insulating substrate, the signal needle and grounding needle extend to contact the semiconductor device through the first through hole, the first signal line is electrically connected to the second signal line, and the first grounding electrode is electrically connected to the top surface grounding electrode.

5,594,359
VOLTAGE GENERATING CIRCUIT FOR IC TEST

Yoshihiro Hashimoto, Urawa, Japan, assignor to Advantest Corporation, Tokyo, Japan

Filed Jun. 2, 1995, Ser. No. 459,318
Claims priority, application Japan, Jun. 2, 1994, 6-143951
Int. Cl.[6] G01R *31/28*
U.S. Cl. 324—765 7 Claims

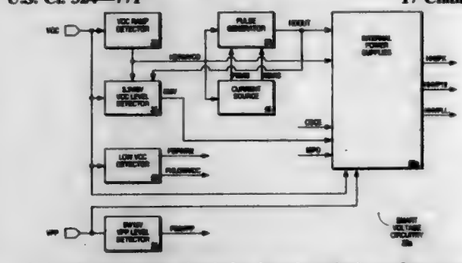


1. A voltage generating circuit for testing an IC device, comprising:
an operational amplifier for supplying a specified DC voltage to a power supply terminal of an IC device to be tested; one input terminal of said operational amplifier is provided with a reference voltage to determine said DC voltage;
a bypass capacitor connected between said power supply terminal and a ground of said voltage generating circuit in parallel with said IC device;
a feedback circuit to feedback said DC voltage to other input terminal of said operational amplifier;
a first current detection resistor connected between an output of said operational amplifier and said power supply terminal for detecting a current flowing to said IC device based on a voltage drop across said first detection resistor;
a phase compensation capacitor connected in parallel with said first current detection resistor;
a second current detection resistor connected between said first current detection resistor and said power supply terminal for detecting a transient current which is an abrupt change in said current to said IC device arises when said IC device changes its logic state, said transient current is detected based on a voltage drop across said second detection resistor; and
a variable current supply for withdrawing a current from or supplying a current to said current flowing to said IC device to cancel said transient current when said voltage drop across said second current detection resistor deviates from a predetermined voltage value.

5,594,360
LOW CURRENT REDUCED AREA PROGRAMMING VOLTAGE DETECTOR FOR FLASH MEMORY

Kenneth E. Wojciechowski, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 326,668, Oct. 19, 1994, abandoned.
This application Feb. 27, 1996, Ser. No. 607,521
Int. Cl.[6] G01R *31/36*
U.S. Cl. 324—771 17 Claims

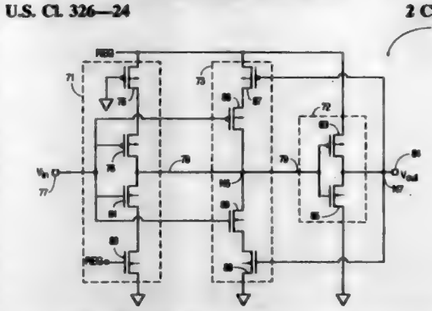


1. A voltage detector circuit for detecting whether a first supply voltage exceeds a predetermined voltage as the first supply voltage ramps towards its final value comprising:
a first transistor having a first terminal coupled to the first supply voltage, a second terminal coupled to a first node, and a control electrode coupled to receive a first voltage that varies as the first supply voltage ramps towards its final value, the first transistor being operative to set the first node to a logic high level in response to the first voltage when the first supply voltage exceeds the predetermined voltage; and
a second transistor having a first terminal coupled to the first node, a second terminal coupled to system ground, and a control electrode coupled to receive a second voltage that varies as the first supply voltage ramps towards its final value, the second transistor being operative to set the first node to a logic low level when the first supply voltage is less than the predetermined voltage, wherein the first and second voltages are such that a difference in potential between the control electrode of the first transistor and the first terminal of the first transistor is always approximately equal to a difference in potential between the control electrode of the second transistor and the second terminal of the second transistor.

5,594,361
LOGIC GATE WITH CONTROLLABLE HYSTERESIS AND HIGH FREQUENCY VOLTAGE CONTROLLED OSCILLATOR

David L. Campbell, Sunnyvale, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Division of Ser. No. 241,241, May 10, 1994, Pat. No. 5,459,437. This application Jun. 6, 1995, Ser. No. 479,483
Int. Cl.[6] H03K *17/16;19/094*
U.S. Cl. 326—24 2 Claims



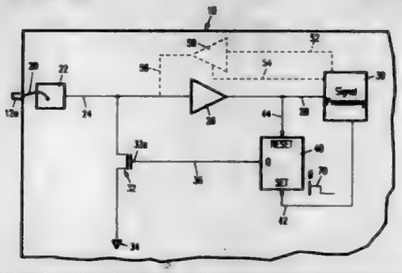
1. A circuit having an input lead and an output lead, said circuit comprising:
a first logic section having an input lead connected to said input lead of said circuit, an output lead, a first supply voltage lead, and a second supply voltage lead, said first logic section comprising a first complementary symmetry inverter;
a second logic section having an input lead, an output lead connected to said output lead of said circuit, a first supply voltage lead, and a second supply voltage lead, said second logic section comprising a second complementary symmetry inverter, said input lead of said second logic section coupled to said output lead of said first logic section; and
a hysteresis control section having a first lead, a second lead, a third lead and a supply voltage lead, said first lead coupled to said output lead of said first logic section, said second lead coupled to said output lead of said second logic section, said third lead coupled to said input lead of said first logic section, said hysteresis control section comprising:
a first P-channel field effect transistor having a gate, a source and a drain, said gate of said first P-channel field effect transistor being coupled to said input lead of said first logic section, said drain of said first P-channel field effect transistor being coupled to said input lead of said second logic section;
a second P-channel field effect transistor having a gate, a source and a drain, said gate of said second P-channel field effect transistor being coupled to said output lead of said second logic section, said drain of said second P-channel field effect transistor being coupled to said source of said first P-channel field effect transistor, said source of said second P-channel field effect transistor being coupled to said first supply voltage lead of said second logic section;
a first N-channel field effect transistor having a gate, a source and a drain, said gate of said first N-channel field effect transistor being coupled to said input lead of said first logic section, said drain of said first N-channel field effect transistor being coupled to said input lead of said second logic section; and
a second N-channel field effect transistor having a gate, a source and a drain, said gate of said second N-channel field effect transistor being coupled to said output lead of said second logic section, said drain of said second N-channel field effect transistor being coupled to said source of said first N-channel field effect transistor, said source of said second N-channel field effect transistor being coupled to said second supply voltage lead of said second logic section.

5,594,362

GATABLE LEVEL-PULLING CIRCUIT

Jeffrey R. Owen, Portland, Oreg., assignor to Seiko Communications Systems, Inc., Beaverton, Oreg.

Filed Oct. 13, 1995, Ser. No. 543,248
Int. Cl.[6] H03K *19/0175*
U.S. Cl. 326—38 **11 Claims**



1. A level-pulling device for an integrated circuit device pin, the level-pulling device comprising:

a level-pulling element coupling said pin to a selected electrical potential, said level-pulling device including a gate receiving a mode-setting signal selecting one of enabling level-pulling and disabling level-pulling by said level-pulling element relative to said pin; and

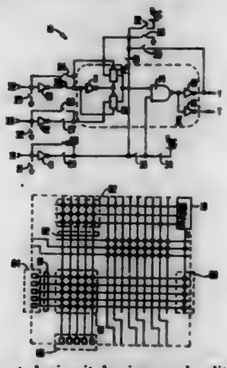
a mode-setting element producing said mode-setting signal as a function of signal activity at said pin.

5,594,363

LOGIC CELL AND ROUTING ARCHITECTURE IN A FIELD PROGRAMMABLE GATE ARRAY

Richard D. Freeman, San Carlos; Joseph D. Lindoff, San Jose, and Timothy Sanz, Los Altos, all of Calif., assignors to Zycad Corporation, Fremont, Calif.

Filed Apr. 7, 1995, Ser. No. 418,972
Int. Cl.[6] H03K *19/177*
U.S. Cl. 326—39 **35 Claims**



1. In an integrated circuit having a plurality of logic cells, interconnect lines and switches for programmably connecting said logic cells and interconnect lines, each logic cell comprising

first and second transfer gates, each transfer gate having an input node, control terminals programmably connectable to a first true or inverted signal, or to a fixed logic level, and an output node connected in common to said other transfer gate, an input node of said first transfer gate programmably connectable to a fixed logic level or an output signal from said logic cell, an input node of said second transfer gate programmably connectable to a second true or inverted signal, or to a fixed logic level; and

a logic gate having a plurality of input nodes, a first input node connected to said commonly connected output nodes of said transfer gates and a second input node programmably connectable to a third true or inverted signal, or to a fixed logic level, and an output node for generating said logic cell output signal;

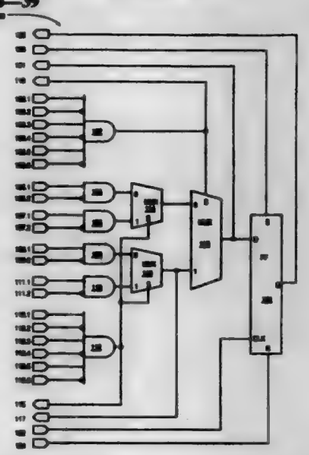
whereby said logic cells, individually or severally, may be programmed to provide logic or memory functions to configure said integrated circuit.

5,594,364

PROGRAMMABLE APPLICATION SPECIFIC INTEGRATED CIRCUIT AND LOGIC CELL THEREFOR

Andrew K. Chan, Palo Alto; John M. Birkner, Portola Valley, and Hua-Thye Chua, Los Alto Hills, all of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 245,309, May 17, 1994, Pat. No. 5,430,390, which is a continuation of Ser. No. 847,382, Mar. 6, 1992, abandoned, which is a continuation of Ser. No. 665,103, Mar. 6, 1991, Pat. No. 5,122,685. This application Jun. 23, 1995, Ser. No. 493,981
Int. Cl.[6] H03K *19/177*
U.S. Cl. 326—39 **2 Claims**



1. A field programmable gate array comprising a logic cell, the logic cell comprising:

a first multiplexer having a first data input lead, a second data input lead, a select input lead and an output lead;

a second multiplexer having a first data input lead, a second data input lead, a select input lead and an output lead;

a third multiplexer having a first data input lead, a second data input lead, a select input lead and an output lead, the first data input lead of the third multiplexer being coupled to the output lead of the first multiplexer, the second data input lead of the third multiplexer being coupled to the output lead of the second multiplexer;

a first gate having a plurality of input leads and an output lead, the output lead of the first gate being coupled to the select input lead of the first multiplexer;

a second gate having a plurality of input leads and an output lead, the output lead of the second gate being coupled to the select input lead of the third multiplexer;

a third gate having an output lead, the output lead of the third gate being coupled to the first data input lead of the first multiplexer;

a fourth gate having an output lead, the output lead of the fourth gate being coupled to the second data input lead of the first multiplexer;

a fifth gate having an output lead, the output lead of the fifth gate being coupled to the first data input lead of the second multiplexer;

a sixth gate having an output lead, the output lead of the sixth gate being coupled to the second data input lead of the second multiplexer; and

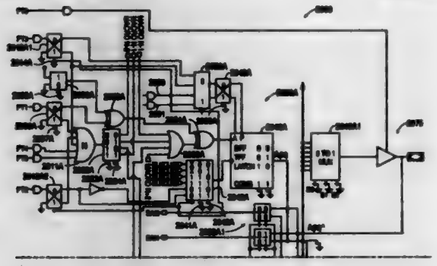
a sequential logic element having a data input lead and a clear input lead, the data input lead of the sequential logic element being coupled to the output lead of the third multiplexer, the clear input lead of the sequential logic element being electrically isolated from all of the input leads of the first gate and from all of the input leads of the second gate.

5,594,365

FLEXIBLE BLOCK CLOCK GENERATION CIRCUIT FOR PROVIDING CLOCK SIGNALS TO CLOCKED ELEMENTS IN A MULTIPLE ARRAY HIGH DENSITY PROGRAMMABLE LOGIC DEVICE

Om P. Agrawal, Los Altos, Calif., and Jerry D. Moench, Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 924,685, Aug. 3, 1992, Pat. No. 5,457,409. This application Jun. 6, 1995, Ser. No. 486,174
Int. Cl.[6] H03K *19/177*
U.S. Cl. 326—40 **14 Claims**



1. In a programmable logic device, a block clock generation circuit comprising:

a plurality of pins;

a plurality of programmable block clock multiplexers;

wherein each programmable block clock multiplexer has a plurality of input terminals and an output terminal; and further wherein

each input terminal in said plurality of input terminals is coupled to a different pin in said plurality of pins;

said output terminal is connected to an output line so that said plurality of programmable block clock multiplexers has a plurality of output lines; and

said programmable block clock multiplexer passes therethrough a signal on a selected input terminal to said output terminal in response to an input select signal;

a macrocell comprising:

a storage element having a clock terminal;

a programmable macrocell clock multiplexer having a plurality of input terminals and an output terminal;

wherein each output line in said plurality of programmable block clock multiplexer output lines is connected to a different input terminal in said plurality of programmable macrocell clock multiplexer input terminals;

said output terminal of said programmable macrocell clock multiplexer is connected to said clock terminal of said storage element; and

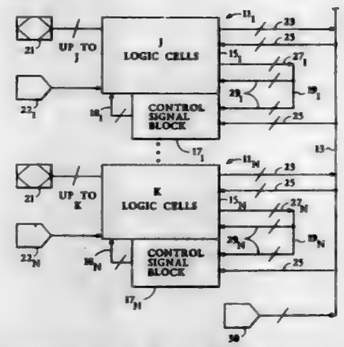
said programmable logic device is a very high density programmable logic device.

5,594,366

PROGRAMMABLE LOGIC DEVICE WITH REGIONAL AND UNIVERSAL SIGNAL ROUTING

James C. K. Khong, San Jose; Wendey E. Mueller, Fremont; Joe Yu, Palo Alto; Neal Berger, Cupertino; Keith H. Gudger, Soquel, and Geoffrey S. Gongwer, Campbell, all of Calif., assignors to Atmel Corporation, San Jose, Calif.

Continuation of Ser. No. 238,156, May 4, 1994, abandoned. This application Jun. 19, 1995, Ser. No. 492,390
Int. Cl.[6] H01L *25/00*; H03K *19/177*
U.S. Cl. 326—41 **9 Claims**



1. A programmable logic device (PLD), comprising

a plurality of logic cells receiving input signals through logic cell inputs, said logic cells arranged in groups defining separate logic regions of such cells,

a plurality of bus lines for conducting signals thereon, and

a crosspoint switch matrix programmably connecting bus lines to said logic cell inputs, each logic cell input being programmably connectable via a set of crosspoint switches of said matrix to at most one of any one of a plurality of said bus lines, each crosspoint switch being located at each intersection of said logic cell inputs and said bus lines and including a transmission gate connected from one of said bus lines to one of said logic cell inputs, said transmission gate being controlled by a programmable nonvolatile latch, each bus line being connectable to the logic cell inputs of the logic cells of at least one of said logic regions, at least one bus line being a regional bus line connectable only to logic cell inputs of the logic cells in only one of said logic regions and at least one bus line being a multi-regional bus line connectable to logic cell inputs of logic cells in multiple logic regions, each said regional bus line being directly connectable to logic cell inputs of all of the logic cells of a logic region.

5,594,367

OUTPUT MULTIPLEXER WITHIN INPUT/OUTPUT CIRCUIT FOR TIME MULTIPLEXING AND HIGH SPEED LOGIC

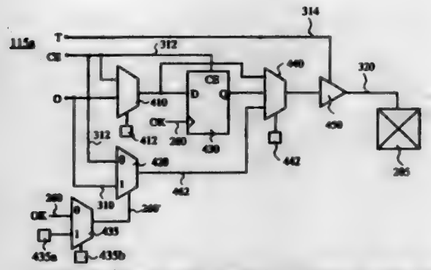
Stephen M. Trimberger; Khue Duong, both of San Jose, and Robert O. Conn, Jr., Los Gatos, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Oct. 16, 1995, Ser. No. 543,521
Int. Cl.[6] H03K *19/177*
U.S. Cl. 326—41 **23 Claims**

1. In a programmable integrated circuit, an input/output circuit (IOB) comprising:

a first multiplexer circuit receiving a first data signal and receiving a second data signal and generating an output data signal in response thereto, said first multiplexer circuit having a select line controlled by a signal;

a second multiplexer circuit coupled to receive said output data signal from said first multiplexer circuit and coupled to receive at least one other alternate data signal, said second multiplexer circuit having a select line controlled by a pro-



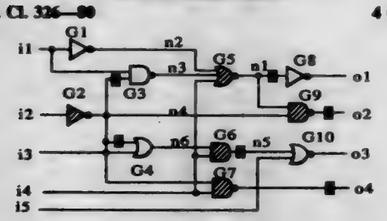
grammable memory cell, wherein an output of said multiplexer circuit is coupled to an input/output pad of said programmable integrated circuit.

5,594,368

LOW POWER COMBINATIONAL LOGIC CIRCUIT

Kimiyoshi Usami, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1995, Ser. No. 423,943
Int. Cl.[6] H03K *19/0175*
U.S. Cl. 326—80 **4 Claims**



■ GATE DRIVEN WITH VODL
▮ LEVEL CONVERTER

1. A combinational logic circuit having at least one primary input terminal and at least one primary output terminal, comprising:
a plurality of first gates each of which has input and output nodes and is driven with a first operating voltage; and
a plurality of second gates each of which has input an output nodes and is driven with a second operating voltage which is lower than said first operating voltage,
wherein any one of the output nodes of said second gates is connected only to either one of the input nodes of said second gates or one of said primary output terminals but not to any one of the input nodes of said first gates, and
wherein a level converter circuit is provided between at least one of said primary output terminals and at least one of said second gates.

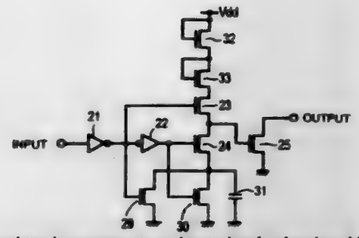
5,594,369

OPEN-DRAIN FET OUTPUT CIRCUIT

Haruhisa Kondoh, and Katsushi Asahina, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1995, Ser. No. 449,146
Claims priority, application Japan, May 24, 1994, 6-109953
Int. Cl.[6] H03K *19/0175*
U.S. Cl. 326—83 **7 Claims**

1. An output circuit of a semiconductor device, comprising:
an output field effect transistor of a first conductivity type having a drain opened for outputting a signal;
driving means for applying a driving signal having an amplitude centered at a value of an on voltage or at a threshold voltage of said output transistor to an input electrode of said output transistor in response to an input signal, wherein said driving means includes a first field effect transistor of the first conductivity type for pulling up a driving signal and a second field effect transistor of the first conductivity type for pulling down said driving signal, which have a first electrode and a second electrode, respectively, serially connected to each other and output said driving signal from a connection point therebetween, and
voltage supplying means for supplying a voltage lower than a power supply voltage to a first electrode of said first field effect transistor, said voltage supplying means including means for outputting a voltage twice a threshold voltage of said output transistor.

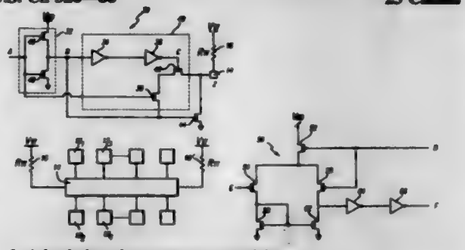


5,594,370

HIGH PERFORMANCE BACKPLANE DRIVER CIRCUIT

Trung Nguyen, San Jose, and Anthony Y. Wong, Saratoga, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 828,404, Jan. 31, 1992, Pat. No. 5,408,146. This application Apr. 17, 1995, Ser. No. 423,637
Int. Cl.[6] H03K *19/0185;29/0948*
U.S. Cl. 326—86 **23 Claims**



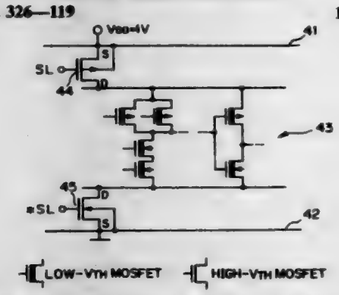
1. A backplane bus system, comprising:
a terminated bus line for signal transmission;
a plurality of electronic circuit units electrically connected to the terminated bus line, each of the electronic circuit units comprising:
a CMOS circuit; and
a driver/receiver circuit for receiving an input logic signal from the CMOS circuit and for inducing a corresponding signal onto the terminated bus line and for receiving an output signal from the bus line and providing a corresponding output logic signal to the CMOS circuit, the driver/receiver circuit comprising:
a predriver inverter to invert a logic state of the input logic signal;
a driver transistor for providing the corresponding signal;
control means for controlling the corresponding signal during a transition of the input logic signal from a first logic state to a second logic state;
a receiver transistor of P-channel type having a gate electrically connected to the terminated bus line, a source electrically connected to a voltage source, and a drain for producing a current in relation to the received signal;
comparing means for comparing a voltage level of the received signal to a reference voltage level and for splitting the current into a first path having a current inversely proportional to the received signal and a second path having a current in proportion to the received signal; and
output means for providing the CMOS logic signal at a binary 1 logic state when the current in the first path is greater than the current in the second path and for providing the CMOS logic signal at a binary 0 logic state when the current in the first path is less than the current in the second path.

5,594,371

LOW VOLTAGE SOI (SILICON ON INSULATOR) LOGIC CIRCUIT

Takakuni Douseki, Atsugi, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 27, 1995, Ser. No. 495,785
Claims priority, application Japan, Jun. 28, 1994, 6-168851; Dec. 20, 1994, 6-334640
Int. Cl.[6] H03K *19/094;19/0175*
U.S. Cl. 326—119 **16 Claims**



9. A low voltage SOI (Silicon On Insulator) logic circuit comprising:
a first power supply line;
a second power supply line;
a power switching SOI FET (Field Effect Transistor) whose source and body are connected to said first power supply line; and
a logic circuit connected between a drain of said power switching SOI FET and said second power supply line;
wherein said logic circuit is constituted by a plurality of SOI FETs whose bodies are made floating state, and a connection between said first power supply line and said logic circuit is switched by a signal supplied to a gate of said power switching SOI FET.

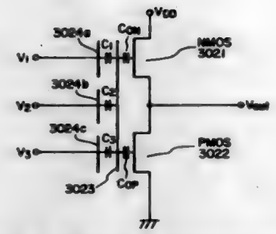
5,594,372

SOURCE FOLLOWER USING NMOS AND PMOS TRANSISTORS

Tadashi Shibata, 19-1393, Aza-Koshizi, Nagamachi,Taihaku-ku, Sendai-shi, Miyagi-ken 980, and Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, both of Japan

Continuation-in-part of Ser. No. 60,362, May 11, 1993, which is a continuation of Ser. No. 777,352, Jan. 6, 1992, Pat. No. 5,258,657, and Ser. No. 87,675, Oct. 13, 1993, Pat. No. 5,469,085. This application Aug. 4, 1995, Ser. No. 511,495
Claims priority, application Japan, Jun. 2, 1989, 1-141463; Jan. 12, 1991, 3-13780; Jul. 2, 1991, 3-188147
Int. Cl.[6] H03K *19/0948*
U.S. Cl. 326—121 **1 Claim**

1. A source follower circuit comprising:
an NMOS transistor having a source and a floating gate;
a PMOS transistor having a source and a floating gate;
the source of said NMOS transistor connected to both the source of said PMOS transistor and to an output terminal;
the floating gate of said NMOS transistor connected to the floating gate of said PMOS transistor; and
a plurality of input gates respectively capacitively coupled to said respective floating gates of said NMOS transistor and PMOS transistor and respectively connected to a plurality of input terminals.

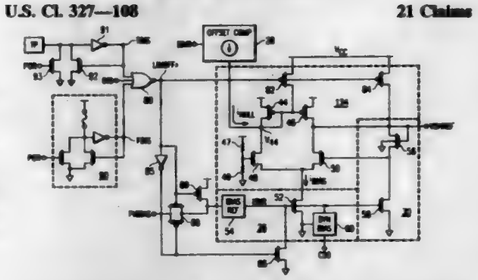


5,594,373

OUTPUT DRIVER CIRCUITRY WITH SELECTIVE LIMITED OUTPUT HIGH VOLTAGE

David C. McClure, Denton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 20, 1994, Ser. No. 359,397
Int. Cl.[6] H03B *21/00*
U.S. Cl. 327—108 **21 Claims**



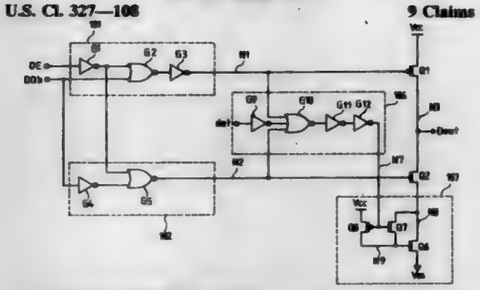
1. An output driver circuit for an integrated circuit, comprising:
a pull-up drive transistor, having a conduction path coupled between a power supply voltage and an output terminal, and having a control electrode;
circuitry for limiting the drive of the pull-up drive transistor responsive to a bias voltage; and
a voltage reference and regulator circuit for producing the bias voltage, comprising:
means for generating a target voltage based upon the power supply voltage;
a current mirror having a reference leg and a mirror leg, said reference leg receiving the target voltage and conducting a reference current responsive thereto, said mirror leg conducting a mirrored current responsive to the reference current and deriving the bias voltage at a bias voltage output based upon said mirrored current;
a bias current source, coupled to the reference leg and the mirror leg of the current mirror, for controlling the reference current and the mirror current conducted thereby; and
circuitry for selectably biasing the bias voltage output to the power supply voltage.

5,594,374

DATA OUTPUT BUFFER

Young N. Oh, Kyounggi-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co. Ltd., Kyounggi-do, Rep. of Korea

Filed Jul. 13, 1995, Ser. No. 502,807
Claims priority, application Rep. of Korea, Jul. 14, 1994, 94-16974
Int. Cl.[5] H03K 5/12
U.S. Cl. 327—108 9 Claims



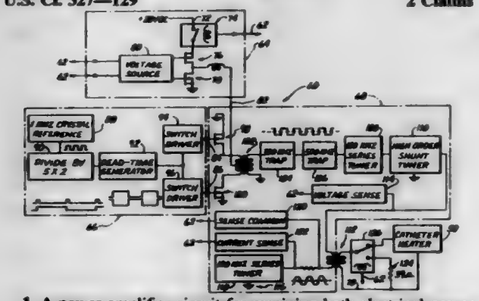
1. A data output buffer comprising:
a pull-up signal transfer circuit for generating a first logic value of an input data signal in accordance with a data output buffer control signal;
a pull-down signal transfer circuit for generating a second logic value of said input data signal in accordance with said data output buffer control signal;
a pull-up driver connected between a first voltage source and a data output line, for amplifying the first logic value of said input data signal;
a pull-down driver connected between a second voltage source and said data output line, fir amplifying the second logic value of said input data signal;
a pull-down driver control circuit for generating a control signal in accordance with said first logic value and said second logic value; and
a pull-down driver connection circuit connected between said pull-down driver and said second voltage source, for varying an impedance of said pull-down driver in respond to said control signal.

5,594,375

ELECTRICAL POWER AMPLIFIER FOR CONTINUOUS CARDIAC OUTPUT MONITORING

Gary Carlson, Newport Beach, and Jeffrey A. Norris, Lake Forest, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 268,217, Jun. 29, 1994. This application Jun. 6, 1995, Ser. No. 466,544
Int. Cl.[6] H03K 4/94
U.S. Cl. 327—129 2 Claims



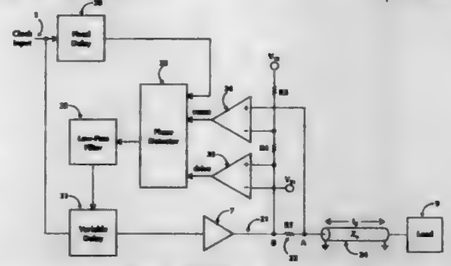
1. A power amplifier circuit for receiving both electrical power in the form of direct-current and a frequency signal in the form of time-sequenced mirror-image square waves having a 50 percent duty cycle, and providing an essentially pure sinusoidal output voltage and current signal to an electrical load having resistive qualities, said power amplifier circuit comprising:
a pair of power-switching switches; and
a transformer having a center-tapped primary winding, each of said pair of power-switching switches connecting to a respective opposite side of the primary winding of said transformer and receiving one of said time-sequenced mirror-image square waves of said frequency signal, in response to said frequency signal said power-switching switches switching said direct-current power through respective opposite sides of the primary winding of said center-tapped transformer;
a trap circuit connecting to the secondary winding of said center-tapped transformer and blocking at least the first odd-numbered harmonic frequency multiple of said frequency signal;
a series tuner circuit receiving electrical power from said trap circuit and allowing essentially unrestricted passage of a frequency matching said frequency signal;
a high-order shunt tuner circuit receiving electrical power from said series tuner circuit and shunting higher-ordered multiples of the frequency of said frequency signal.

5,594,376

CLOCK DESKEWING APPARATUS INCLUDING THREE-INPUT PHASE DETECTOR

Ken McBride, Sunnyvale, and Cecil Aswell, Orangevale, both of Calif., assignors to Micro Linear Corporation, San Jose, Calif.

Filed Oct. 5, 1994, Ser. No. 317,674
Int. Cl.[6] H03K 5/13; G01R 25/04
U.S. Cl. 327—236 23 Claims



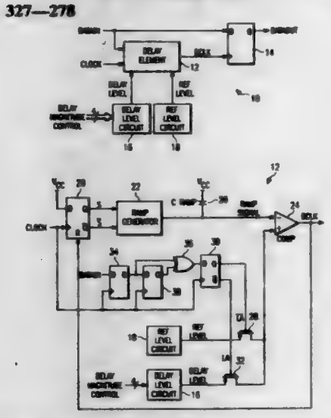
1. A clock deskewing apparatus for delivering a clock signal input to a load, comprising:
a. first means for delay coupled to a clock signal input, for delaying the clock signal input a maximum delay time and outputting a first delayed clock signal;
b. second means for delay coupled to the clock signal input, for variably delaying the clock signal input and outputting a second delayed clock signal;
c. a termination network coupled to a load having a drive output signal line and a reflection signal line, the drive output signal line coupled to the second means for delay; and
d. means for synchronizing coupled to the first delayed clock signal, the drive output signal, the reflection signal and the second means for delay for controlling the second means for delay so that the first delayed clock signal, the drive output signal and the reflection signal are all in phase.

5,594,377

DELAY CIRCUIT FOR A WRITE DATA PRECOMPENSATOR SYSTEM

Davy H. Choi, Garland; William H. Giebler, Dallas, both of Tex., and Owen Lee, Hsin-Tien, Taiwan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 188,265, Jan. 27, 1994, abandoned. This application Sep. 14, 1995, Ser. No. 528,169
Int. Cl.[6] H03H 11/26
U.S. Cl. 327—278 7 Claims



1. A circuit, comprising:
a delay element circuit operable to receive a clock signal and to selectively output a delayed clock signal;
a delay level circuit coupled to the delay element circuit and operable to output a delay voltage level responsive to a digital delay magnitude control signal; and
a reference level circuit coupled to the delay element circuit and operable to output a reference voltage level to the delay element circuit, the delay element circuit operable to selectively delay or not delay a clock edge of the clock signal responsive to either the delay voltage level or the reference voltage level, wherein the delay element circuit comprises:
a ramp generator circuit operable to generate a ramp signal;
a comparator circuit having first and second inputs, the first input of the comparator circuit coupled to receive the ramp signal generated by the ramp generator circuit; and
the second input of the comparator circuit selectively coupled to either the reference level circuit or the delay level circuit, the comparator operable to output the delayed clock signal, where output stages associated with the delay level circuit, the reference level circuit and the ramp generator circuit are matched such that the source impedances to both inputs of the comparator circuit are substantially equal.

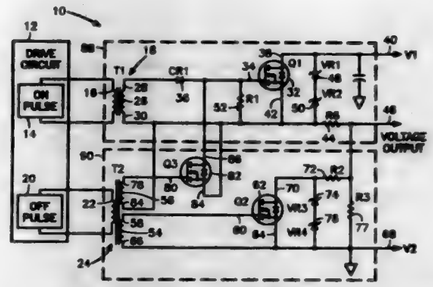
5,594,378

FAST HIGH VOLTAGE MODULATOR CIRCUIT

Neils A. Kruse, 7415 Cove Dr., Cary, Ill. 60013, and Donald A. Brichta, 3909 Rose St., Western Springs, Ill. 60558

Filed Apr. 13, 1995, Ser. No. 423,330
Int. Cl.[6] H03K 17/687;17/04
U.S. Cl. 327—384 13 Claims

1. A fast, high voltage modulator circuit, comprising:
a first transformer having a secondary;
a first MOSFET, having a gate, a drain and a source,
a diode having a cathode and an anode,
said gate being connected to the cathode of said diode, the anode of which is connected to a positive side of the secondary of said first transformer,
the source connected to a negative side of the secondary of the first transformer and connected to an output,
the drain connected to a first input voltage;



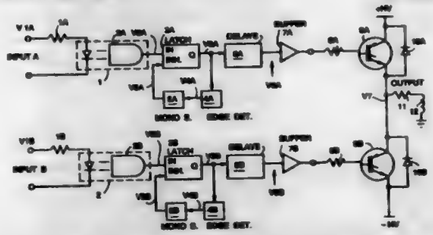
a second transformer having a first secondary and a second secondary;
a second MOSFET, having a gate, a source and a drain, the gate connected to a positive side of the first secondary of the second transformer,
the source of said second MOSFET being connected to a negative side of the first secondary of the second transformer and connected to a second input voltage, the second input voltage being more negative than the first input voltage,
the drain of said second MOSFET being connected to the output; and
a third MOSFET, having a gate, a source and a drain;
the gate of said third MOSFET being connected to a positive side of the second secondary of the second transformer,
the source of said third MOSFET being connected to both a negative side of the second secondary of the second transformer and the negative side of the secondary of the first transformer,
the drain of said third MOSFET being connected to the gate of the first MOSFET.

5,594,379

METHOD AND CIRCUIT TO ELIMINATE FALSE TRIGGERING OF POWER DEVICES IN OPTICALLY COUPLED DRIVE CIRCUITS CAUSED BY DV/DT SENSITIVITY OF OPTOCOUPLERS

Laszlo Kiraly, El Segundo, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Filed Jul. 7, 1995, Ser. No. 499,306
Int. Cl.[6] H03K 17/16;17/30
U.S. Cl. 327—381 14 Claims



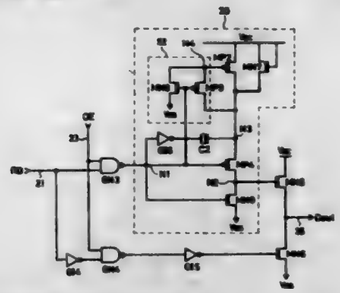
1. A circuit for preventing false turning on and false turning off of a power device in an optically coupled drive circuit caused by dv/dt sensitivity of an optocoupler of the drive circuit, said circuit comprising:
a latch circuit having a latch input coupled to an output of the optocoupler, a latch output, and an inhibit input for receiving a signal inhibiting said latch output; and
an inhibit signal generating circuit coupled to the latch output for detecting a change of state in the latch output and for supplying the inhibit input of the latch circuit with an inhibit signal of preset duration when the latch output change state, thereby preventing said latch circuit from passing to the latch output any spurious signals that are received by the latch input during the preset duration.

5,594,380

BOOTSTRAP CIRCUIT AND DATA OUTPUT BUFFER HAVING THE BOOTSTRAP CIRCUIT

Jeng G. Nam, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Apr. 28, 1995, Ser. No. 430,873
Claims priority, application Rep. of Korea, Apr. 29, 1994, 94-9309
Int. Cl.[6] H03K 17/16
U.S. Cl. 327—390 4 Claims



1. A bootstrap circuit comprising:
an inverter means inverting a signal from an input line;
a capacitive device connected between said inverter means and a boost node to boost said inverted signal from said inverter means;
a first voltage supply path being selectively driven in response to a voltage on said boost node to transfer or block a supply voltage from a supply voltage source to said boost node;
a second voltage supply path connected in parallel to said first voltage supply path to transfer or block the supply voltage from said supply voltage source to said boost node;
a first switching means for transferring a ground voltage from a ground voltage source to a control input of said second voltage supply path when the signal from said input line is high in logic;
a second switching means for transferring the voltage on said boost node to said control input of said second voltage supply path when the signal from said input line is low in logic;
a PMOS transistor connected between said boost node and an output line for transferring a boosted voltage on said boost node to said output line in response to the signal from said input line; and
an NMOS transistor connected between said output line and said ground voltage-source for transferring the ground voltage from said ground voltage source to said output line in response to the signal from said input line.

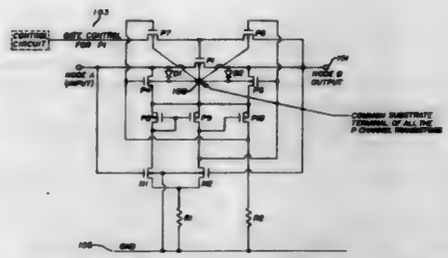
5,594,381

REVERSE CURRENT PREVENTION METHOD AND APPARATUS AND REVERSE CURRENT GUARDED LOW DROPOUT CIRCUITS

David Bingham, San Jose, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Filed Apr. 29, 1994, Ser. No. 235,688
Int. Cl.[6] H03K 3/01
U.S. Cl. 327—534 22 Claims

1. A circuit for coupling between a first and a second terminals for providing a minimum reverse current low dropout voltage output comprising:
a MOS pass transistor having a source, a drain, a gate and a substrate, the source and the drain of the MOS pass transistor being coupled in series between the first terminal and the second terminal;
connection means for connecting the substrate of the MOS pass transistor to either one of the first terminal and the second terminal based on relative magnitudes of voltages of the first terminal and the second terminal, the connection means coupled to the MOS pass transistor, to the first terminal and to the second terminal;
switch means for controlling the gate of the MOS pass transistor based on the relative magnitudes of the voltages of the first terminal and the second terminal, the switch means coupled to the MOS pass transistor; and
comparison and control means for (1) comparing the voltage of the first terminal and the voltage of the second terminal and for (2) controlling the connection means and the switch means, the comparison and control means coupled to the connection means, to the switch means, to the first terminal and to the second terminal.

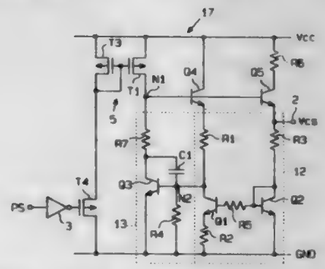


5,594,382

CONSTANT VOLTAGE CIRCUIT

Susumu Kato; Moriaki Mizuno; Kazumi Ogawa, and Kazuyuki Nonaka, all of Kanagai, Japan, assignors to Fujitsu Ltd., Kanagawa, and Fujitsu VLSI Limited, Aichi, both of Japan

Continuation of Ser. No. 138,084, Oct. 20, 1993, abandoned. This application Mar. 20, 1995, Ser. No. 407,248
Claims priority, application Japan, Oct. 20, 1992, 4-282071
Int. Cl.[6] G05F 1/10;3/02
U.S. Cl. 327—541 7 Claims



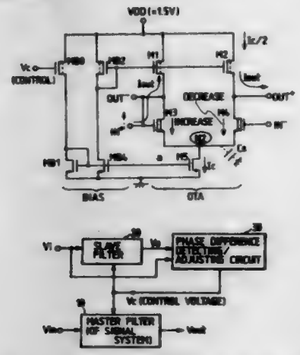
1. A constant voltage circuit connected between a high voltage power source and a low voltage power source for outputting a constant voltage signal from an output terminal thereof in response to a control signal inputted to an input terminal thereof, the constant voltage circuit comprising:
resistance circuit means including a first P type MOS transistor, a second P type MOS transistor connected to said first P type MOS transistor to form a current mirror circuit, and a third P type MOS transistor connected to said second P type MOS transistor, said first and second P type MOS transistors being activated when the control signal is inputted to a gate of said third P type MOS transistor to flow a constant current into said first P type MOS transistor;
a current mirror section connected between said resistance circuit means and the low voltage power source for generating an output voltage to be output from the output terminal; and
a feedback section connected between said resistance circuit means and the low voltage power source for controlling said current mirror section to keep the output voltage constant by detecting deviation of the output voltage.

5,594,383

ANALOG FILTER CIRCUIT AND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE USING THE SAME

Yuko Tamba, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1995, Ser. No. 370,660
Claims priority, application Japan, Jan. 12, 1994, 6-001747
Int. Cl.[6] H03B 1/00; H03K 5/00
U.S. Cl. 327—552 21 Claims



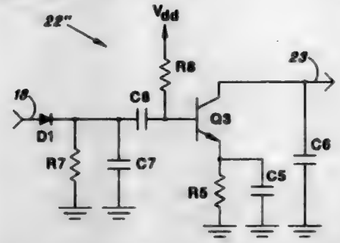
18. A semiconductor integrated circuit device formed on a single semiconductor substrate and including a filter circuit, comprising:
a first filter circuit having a control terminal, an input terminal and an output terminal and having characteristics changed by a control signal applied to said control terminal;
a phase difference detector which receives a reference output signal outputted from said first filter circuit and a reference signal having a predetermined phase and outputs the control signal on the basis of said reference output signal and said reference signal; and
a second filter circuit having a control terminal; an input terminal and an output terminal and having characteristics changed by the control signal fed to said control terminal,
wherein said phase difference detector includes a phase difference detecting circuit which receives an input signal for the first filter circuit and the reference output signal and which outputs a phase signal having a phase in accordance with a difference between the input signal and the reference output, and a control signal generating circuit generating the control signal in accordance with difference between the reference signal and the phase signal in phase, wherein each of the first filter circuit and the second filter circuit includes:
a voltage/current conversion circuit having an inversion input node, a non-inversion input node coupled to the input terminal, an inversion output node and a non-inversion output node coupled to the inversion input node and to the output terminal, and including:
a first differential MOSFET having a source, a drain providing a first output signal to the inversion output node and a gate receiving a first input signal from the non-inversion input node;
a second differential MOSFET having a source connected to the source of said first differential MOSFET, a drain providing a second output signal to the non-inversion output node and a gate receiving a second input signal from the inversion input node;
a current source connected to the source of said first differential MOSFET;
a first current circuit connected between a power supply terminal to which a predetermined voltage is applied and the drain of said first differential MOSFET; and
a second current circuit connected between said power supply terminals and the drain of said second differential MOSFET;
a capacitance circuit connected to the non-inversion output node of said voltage/current conversion circuit; and
a control circuit coupled to the first current circuit, to the second current circuit of said voltage/current conversion circuit and to the control terminal, and used to determine the current values of the first and second current circuits.

5,594,384

ENHANCED PEAK DETECTOR

Gary T. Carroll, Boulder, and J. Donald Pauley, Estes Park, both of Colo., assignors to Gnuco Technology Corporation, Boulder, Colo.

Filed Jul. 13, 1995, Ser. No. 502,673
Int. Cl.[6] H03D 1/18
U.S. Cl. 324—369 16 Claims



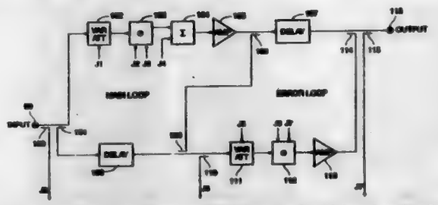
1. A peak detector circuit for amplitude demodulation of an incoming signal, the peak detector circuit comprises:
a rectifying means;
a peak detecting segment coupled to the rectifying means; and
a peak holding capacitor switchably connected via the rectifying means to be in a parallel relationship with the peak detecting segment;
wherein an output signal appears across the peak holding capacitor that represents the peaks of the incoming signal.

5,594,385

ULTRA-LINEAR FEEDFORWARD AMPLIFIER WITH ADAPTIVE CONTROL AND METHOD FOR ADAPTIVE CONTROL

Kiomars Anvari, Walnut Creek, Calif., assignor to Aval Communications, Inc., Walnut Creek, Calif.

Continuation-in-part of Ser. No. 282,132, Jul. 28, 1994, Pat. No. 5,485,120. This application Apr. 14, 1995, Ser. No. 422,596
Int. Cl.[6] H03F 1/26
U.S. Cl. 330—149 17 Claims



1. In a method for linear amplification of wideband radio frequency energy in a feed-forward amplifier system having at least a main amplifier, a method for correcting distortion in amplification of an information signal, said method comprising the steps of:
extracting nonlinear distortion components from the output of said main amplifier;
analyzing said nonlinear distortion components to produce analyzed signals;

formulating error correcting signals from said analyzed signals; and

correcting said distortion in amplification of said information signals by means of said error correcting signals applied to a distortion amplifier connected in parallel with said main amplifier, wherein said extracting step comprises I. F. sampling during analog-to-digital conversion of an I. F. signal for identifying distortion components within a amplifier output.

5,594,386

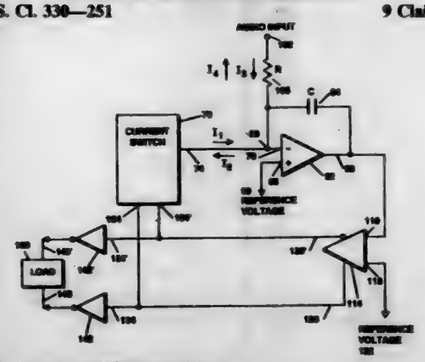
PULSE WIDTH MODULATED AMPLIFIER

Timothy A. Dhuyvetter, San Jose, Calif., assignor to Sipex Corporation, Billerica, Mass.

Filed Apr. 21, 1995, Ser. No. 426,391

Int. Cl.[6] H03F 3/217;3/45; H04R 25/00

U.S. Cl. 330—251 **9 Claims**



1. A pwm amplifier comprising:

a current source and sink having first and second input control terminals and an output terminal, said current source and sink sourcing and sinking current in response to first and second feedback signals applied to said first and second input control terminals;

an integrator having an input terminal electrically coupled to said output terminal of said current source and sink and an output terminal; and

a hysteresis switching comparator having a first input terminal electrically coupled to said output terminal of said integrator and first and second output terminals electrically coupled to said first and second input control terminals of said current source and sink, said first and second output terminals of said hysteresis switching comparator providing said first and second feedback signals;

said current source and sink, said integrator, and said hysteresis switching comparator thereby being connected as a feedback loop and generating a carrier frequeacy for said pwm amplifier.

5,594,387

AMPLIFIER CIRCUIT HAVING NAGATIVE FEEDBACK LOOP FOR SELF-BIAS

Shigeru Kagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

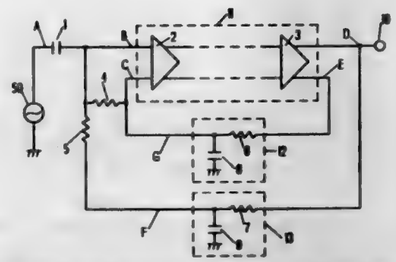
Filed Jun. 27, 1995, Ser. No. 495,894

Claims priority, application Japan, Jun. 29, 1994, 6-168603

Int. Cl.[6] H03K 3/45

U.S. Cl. 330—259 **7 Claims**

1. An amplifier circuit comprising a differential amplifier circuit having a first input node supplied with an input signal, a second input node, a first output node and a second output node, a first feedback loop including a first low-pass filter and provided between said first output node and said first input node, a second feedback loop including a second low-pass filter and provided between said second output node and said second input node, and first means coupled to said first and second feedback loops for suppressing an a.c. component of a signal to be fed back to said first input node by adding signals relative to signals at said first and second output nodes.



5,594,388

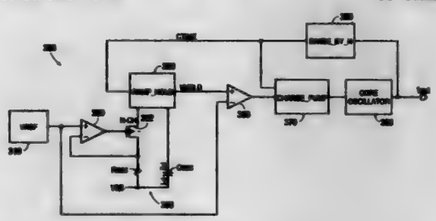
SELF-CALIBRATING RC OSCILLATOR

Timothy G. O'Shaughnessy, Colorado Springs, Colo., and David G. Brown, Pocatello, Id., assignors to American Microsystems, Inc., Pocatello, Id.

Filed Jun. 7, 1995, Ser. No. 479,304

Int. Cl.[6] H03B 5/20; H03K 3/0231; H03L 7/02

U.S. Cl. 331—1 R **33 Claims**



10. An RC oscillator comprising:

an RC network for setting an RC time constant;

a core oscillator for generating a timing signal at a controlled frequency;

a comparator coupled to the RC network and the core oscillator for comparing an indicator of the controlled frequency to an indicator of the RC time constant; and

means responsive to the comparator for adjusting the frequency of the core oscillator.

5,594,389

CARRIER REGENERATION CIRCUIT INCLUDING AREA JUDGING DEVICE

Hiroyuki Kiyanagi, Sendai, and Takanori Iwamatsu, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 30, 1995, Ser. No. 565,732

Claims priority, application Japan, Mar. 20, 1995, 7-060713

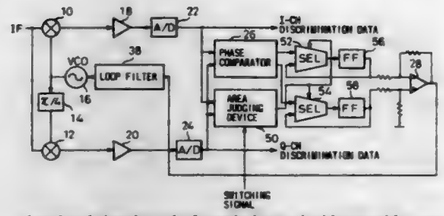
Int. Cl.[6] H03L 7/085; H04L 27/38

U.S. Cl. 331—12 **4 Claims**

1. A carrier regeneration circuit comprising:

a voltage-controlled oscillator for outputting a regenerated carrier;

a phase comparator for determining and outputting an error signal in accordance with the position in a phase plane of a baseband signal obtained by quadrature demodulating an input signal with the regenerated carrier, the error signal being output to control the voltage-controlled oscillator so that the



baseband signal can be brought into coincidence with any one of a plurality of predetermined signal points in the phase plane;

a loop filter for removing high-frequency components of the error signal output from the phase comparator and for supplying the thus filtered output as a control signal to the voltage-controlled oscillator;

an area judging device for outputting an area judging signal indicating whether the baseband signal lies inside a designated area in the phase plane, the designated area being set so that the direction of control indicated by the output of the phase comparator, just before the baseband signal rotating in the phase plane exits the area, is opposite to the direction of rotation of the baseband signal; and

holding circuits for holding, when the area judging signal indicates that the baseband signal has exited the designated area, the immediately preceding output of the phase comparator until the baseband signal reenters the area.

5,594,390

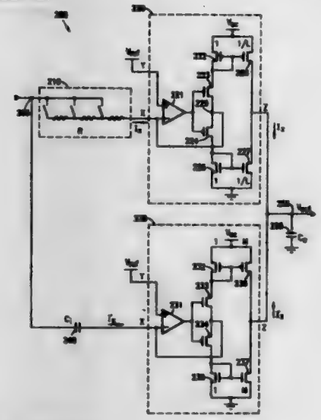
REDUCED AREA, FIRST ORDER R-C FILTERS USING CURRENT CONVEYORS

Reuven Holzer, Herzlia, Israel, assignor to National Semiconductor Corporation, Del.

Filed Nov. 27, 1995, Ser. No. 563,065

Int. Cl.[6] H03L 7/093; H03K 5/13; H03H 11/04;11/12

U.S. Cl. 331—17 **12 Claims**



1. A filter comprising:

an input terminal;

an output terminal;

a first capacitor coupled to the input terminal;

a first current conveyor coupled between the first capacitor and the output terminal;

a resistor coupled to the input terminal;

a second current conveyor coupled between the resistor and the output terminal; and

a second capacitor coupled between the output terminal and ground.

5,594,391

N-STAGE RING CONNECTED VOLTAGE CONTROLLED OSCILLATOR

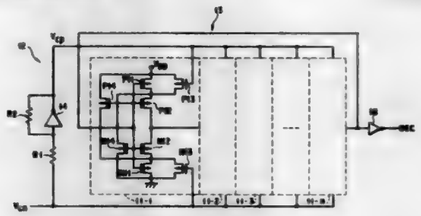
Akihiko Yoshizawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1994, Ser. No. 229,791

Claims priority, application Japan, Apr. 21, 1993, 5-094246

Int. Cl.[6] H03B 5/00

U.S. Cl. 331—57 **9 Claims**



1. A voltage controlled oscillator comprising:

an odd number of stages of delay circuits connected in a ring form, each for delaying a signal input thereto and outputting the signal;

each of said delay circuits including:

a first transistor of first conductivity type whose current path is connected at one end to a first potential supplying source and whose conduction state is controlled by an input signal;

a second transistor of the first conductivity type whose current path is connected at one end to the other end of the current path of said first transistor and whose conduction state is controlled by the input signal;

a third transistor of second conductivity type whose current path is connected at one end to the other end of the current path of said second transistor and whose conduction state is controlled by the input signal;

a fourth transistor of the second conductivity type which is connected between the other end of the current path of said third transistor and a second potential supplying source and whose conduction state is controlled by the input signal;

a fifth transistor of the first conductivity type which is connected between said first potential supplying source and a connection node of said first and second transistors and whose conduction state is controlled by a first control voltage;

a sixth transistor of the second conductivity type which is connected between a connection node of said third and fourth transistors and said second potential supplying source and whose conduction state is controlled by a second control voltage which is symmetrical to the first control voltage with respect to an intermediate potential between the potentials of said second and first potential supplying source;

a seventh transistor of the first conductivity type which is connected between said first potential supplying source and the connection node of said third and fourth transistors and whose conduction state is controlled by the input signal; and

an eighth transistor of the second conductivity type which is connected between the connection node of said first and second transistors and said second potential supplying source and whose conduction state is controlled by the input signal;

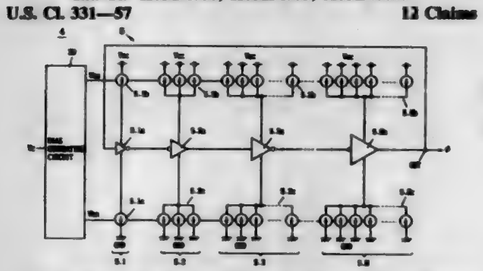
wherein a delayed input signal is output from a connection node of said second and third transistors.

5,594,392

RING OSCILLATOR HAVING LARGE LOAD DRIVING CAPABILITY FOR USE AS VCO IN PHASE LOCKED LOOPS

Haruhisa Kondoh, and Hiromi Notani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1995, Ser. No. 460,939
Claims priority, application Japan, Jun. 7, 1994, 6-124999
Int. Cl.[6] H03B 5/00; H03K 3/03; H03L 7/099
U.S. Cl. 331—57 12 Claims



1. A voltage controlled oscillator which oscillates at a frequency corresponding to a control voltage, comprising

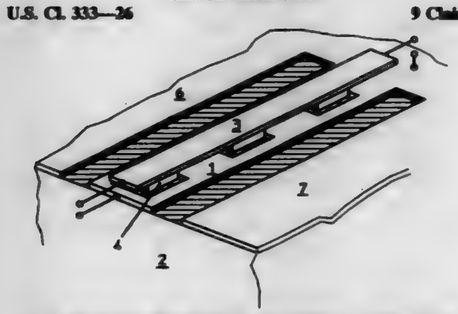
a plurality of delay time variable elements connected in a ring shape, each having a delay time varied corresponding to said control voltage, with respective load driving capabilities increased gradually toward the output.

5,594,393

MICROWAVE LINE STRUCTURE

Werner Bischof, Backnang, Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Germany

Filed Apr. 17, 1995, Ser. No. 423,033
Claims priority, application Germany, May 21, 1994, 44 17 976.6
Int. Cl.[6] H01P 5/10
U.S. Cl. 333—26 9 Claims



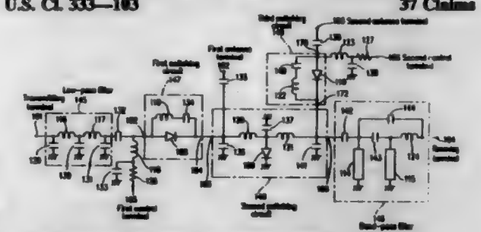
1. A microwave line structure, comprising a substrate; a first conducting track applied on said substrate; a second conducting track supported on posts and extending at a distance above said first conducting track so that said first conducting track and said second conducting track together form a microstrip line; a coplanar line arranged in addition to said microstrip line on said substrate and coupled to said microstrip line, said coplanar line having two further conducting tracks formed so that said microstrip line extends between said two further conducting tracks, said two further conducting tracks being electrically conductingly short-circuited to one another and to said first conducting track at one end of said coplanar line, while said coplanar line being open at the other end, said coplanar line having a length which is approximately equal to one quarter of a wavelength of an average operating frequency; an asymmetrical line coupleable to said first conducting track and said second conducting track at said short-circuited end of said coplanar line; and a symmetrical two-wire line coupleable to said open end of said coplanar line.

5,594,394

ANTENNA DIVERSITY SWITCHING DEVICE WITH SWITCHING CIRCUITS BETWEEN THE RECEIVER TERMINAL AND EACH ANTENNA

Atsushi Sasaki, Toyonaka; Toshio Ishizaki, Kobe; Hiroshi Takahashi, Neyagawa; Tooru Sakuragawa, Osaka; Hideaki Nakakubo, Kyoto; Ryuo Ohta, Hirakata; Tsutomu Matsumura, Yao; Hiroaki Kosugi; Naoki Yuda, both of Hirakata, and Yoichi Morinaga, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 30, 1994, Ser. No. 298,461
Claims priority, application Japan, Aug. 31, 1993, 5-215523; May 23, 1994, 6-108724
Int. Cl.[6] H01P 1/15
U.S. Cl. 333—103 37 Claims



1. An antenna switching device comprising:

a transmitting terminal for receiving a transmitting signal;

a first antenna terminal connected to a first antenna;

a second antenna terminal connected to a second antenna;

a receiving terminal for outputting receiving signals received at the first antenna terminal and the second antenna terminal; and

selecting means for selecting one mode among a first mode for outputting a transmitting signal from the transmitting terminal to the first antenna terminal, a second mode for outputting the receiving signal from the first antenna terminal to the receiving terminal, and a third mode for outputting the receiving signal from the second antenna terminal to the receiving terminal;

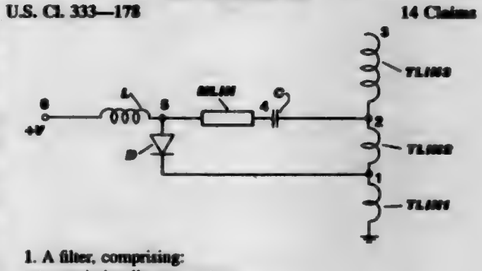
wherein the first, second and third modes are exclusive to each other, and the selecting means cannot select another mode in which the transmitting signal from the transmitting terminal is outputted to the second antenna terminal and the receiving terminal is not connected to the transmitting terminal.

5,594,395

DIODE TUNED RESONATOR FILTER

Erkki Niiranen, Ii, Finland, assignor to LK-Products Oy, Kempele, Finland

Filed Sep. 9, 1994, Ser. No. 303,840
Claims priority, application Finland, Sep. 10, 1993, 933987
Int. Cl.[6] H03H 7/01
U.S. Cl. 333—178 14 Claims



1. A filter, comprising:

a transmission line resonator;

a reactance; and

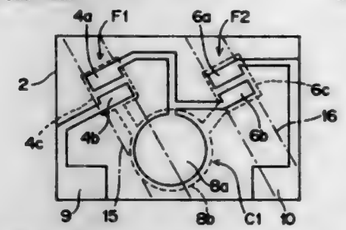
coupling means for selectively coupling said reactance in parallel with a portion of said transmission line resonator such that said reactance is conductively coupled to a part of said transmission line resonator between two coupling points along a part of the length of the transmission line resonator.

5,594,396

PIEZOELECTRIC DEVICE INCLUDING SUBSTANTIALLY PARALLEL PROPAGATION PATHS FOR SECONDARY OSCILLATIONS

Taketoshi Hino, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 23, 1995, Ser. No. 393,461
Claims priority, application Japan, Feb. 23, 1994, 6-025340; Feb. 23, 1994, 6-025341
Int. Cl.[6] H03H 9/00
U.S. Cl. 333—189 18 Claims



1. A piezoelectric device comprising:

a substantially rectangular piezoelectric substrate having a plurality of peripheral edges; and

a plurality of piezoelectric resonators provided on the piezoelectric substrate, each of the piezoelectric resonators including a plurality of oscillation electrodes; wherein

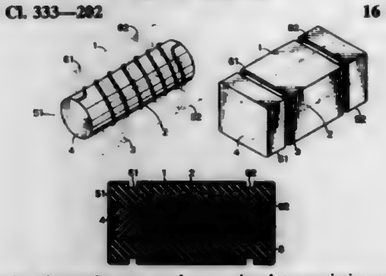
at least two of the piezoelectric resonators are arranged on the piezoelectric substrate to have propagation paths of vibration waves which are slanted relative to the peripheral edge of the piezoelectric substrate and are substantially parallel to each other.

5,594,397

ELECTRONIC FILTERING PART USING A MATERIAL WITH MICROWAVE ABSORBING PROPERTIES

Fumio Uchikoba; Shigeyuki Nakajima; Takashi Ito; Taro Miura; Makoto Kobayashi; Takahide Kurahashi, and Yasushi Iijima, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 409,682
Claims priority, application Japan, Sep. 2, 1994, 6-209586; Sep. 2, 1994, 6-209587; Oct. 5, 1994, 6-241640; Jan. 24, 1995, 7-009333
Int. Cl.[6] H01P 1/20
U.S. Cl. 333—202 16 Claims



1. An electronic part used as a signal transmission element, comprising:

at least one ground conductor;

at least one signal conductor; and

an insulating magnetic body, wherein each of said conductors is in contact with said insulating magnetic body and said insulating magnetic body includes a compound member in which ferromagnetic metal particles and an insulating resin are mixed; and

said ground conductor is provided on a surface of said insulating magnetic body and said signal conductor is embedded in said insulating magnetic body; and

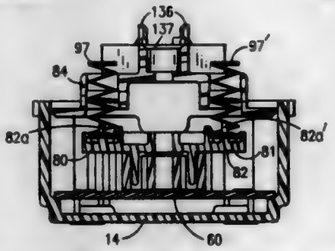
said signal conductor is formed spirally.

5,594,398

GROUND FAULT INTERRUPTER WIRING DEVICE WITH IMPROVED MOVEABLE CONTACT SYSTEM

Jean-Claude Marcon, DeWitt; Thomas N. Packard, Syracuse; James K. Fladley, Manlius, and Patrick J. Murphy, Marcellus, all of N.Y., assignors to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Oct. 24, 1994, Ser. No. 327,602
Int. Cl.[6] H01H 73/00
U.S. Cl. 335—18 41 Claims



1. A ground fault interrupter (gfi) wiring device for connection in an electrical circuit, said device comprising:

a) housing means defining an enclosed space;

b) at least one pair of electrical terminals fixedly supported in spaced relation within said enclosed space;

c) a unitary, electrically conducting member carrying a pair of spaced electrical contacts;

d) mounting means for said conducting member to permit movement thereof between a first position, wherein said pair of contacts are in respective, circuit-making engagement with said pair of terminals, and a second position, wherein both of said pair of contacts are in spaced, circuit-breaking relation to said pair of terminals;

e) biasing means urging said conducting member toward movement to said second position;

f) latching means releasably retaining said conducting member in said first position; and

g) actuating means for releasing said latching means to permit said biasing means to move said conducting member to said second position in response to a predetermined fault condition in said electrical circuit.

5,594,399

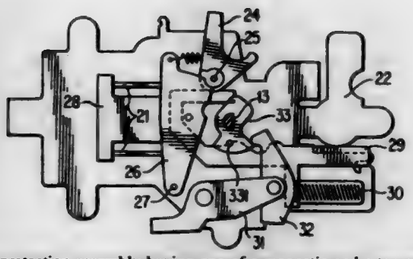
PROTECTIVE SWITCHING DEVICE

Christian Blanchard, Singapore, Singapore; Michel Lauraire, Saint Maur Des Fosses, and Didier Vigouroux, Jouy-Le-Moutier, both of France, assignors to Schneider Electric SA, Boulogne Billancourt, France

Filed Feb. 24, 1995, Ser. No. 394,243
Claims priority, application France, Feb. 25, 1994, 94 02308
Int. Cl.[6] H01H 67/02
U.S. Cl. 335—132 7 Claims

1. Protective switching device which comprises:

power poles having mobile contacts supported on a contact support,



a protection assembly having one of a magnetic and a temperature tripping mechanism detecting one of an overload and an overcurrent on each pole current path;

a lock operated by a manual control knob wherein the lock includes a control mechanism controlling one of direct opening of power contacts of a circuit breaker-motor in manual control, and opening of an auxiliary contact interrupting the current in a coil in a control electromagnet of a contactor-circuit breaker wherein the lock comprises a tripping device stage mounted on a plate acted upon by a manual control knob and the protection assembly and a motor stage installed on a plate and activating the mobile contacts, said tripping device stage and motor stage being superimposed; and

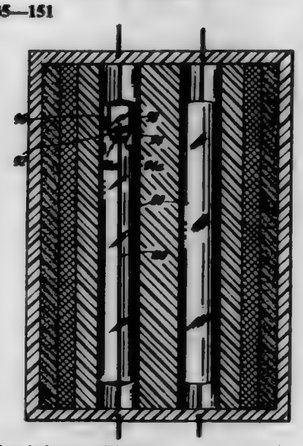
a main shaft and a reset rod wherein the motor stage includes a reset handle which rotates freely about said main shaft and is hinged to said reset rod, said reset handle locking the reset carriage in an "on" or "off" position.

5,594,400

REED RELAY

George King, Pompano Beach, Fla., assignor to Siemens Stromberg-Carlson, Boca Raton, Fla.

Filed Jan. 3, 1995, Ser. No. 367,656
Int. Cl.[6] H01H *1/66*
U.S. Cl. 335—151 12 Claims



1. A reed switch comprising:

a. a housing;

b. a stationary contact that has a contact end contained in the housing and a termination end extending from one end of the housing; and

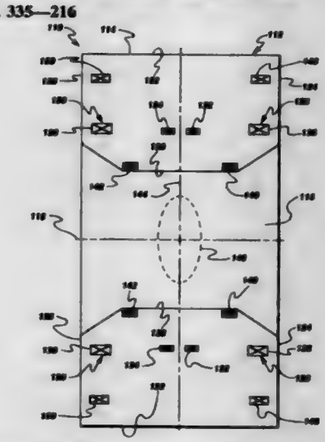
c. a movable armature contact that has a contact end contained in the housing and a termination end extending from the other end of the housing, the contact end of one of the contacts having at least two prongs which project adjacent the contact end of the other contact for contacting a respective surface area of the other contact when the armature contact moves toward the stationary contact in the normal operation of the switch.

5,594,401

CLOSED SUPERCONDUCTIVE MAGNET WITH UNIFORM IMAGING VOLUME

Bizhan Dorri, Clifton Park; Evangelos T. Laskaris, Schenectady, and Michele D. Ogle, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 20, 1996, Ser. No. 603,521
Int. Cl.[6] H01F *6/00*; G01V *3/00*
U.S. Cl. 335—216 9 Claims



1. A closed magnetic-resonance-imaging magnet comprising a single superconductive coil assembly including:

a) a generally toroidal-shaped coil housing surrounding a bore and having a generally longitudinally-extending axis;

b) a pair of longitudinally-spaced-apart, generally identical, and generally annular-shaped superconductive main coils each generally coaxially aligned with said axis, each carrying an electric current in a same first electric-current direction, each disposed within said coil housing, and each having a longitudinally-outermost portion;

c) a pair of longitudinally-spaced-apart, generally identical, and non-permanently-magnetized ferromagnetic rings each generally coaxially aligned with said axis, each radially disposed inward and apart from said pair of superconductive main coils, and each longitudinally disposed completely between said longitudinally-outermost portions of said pair of superconductive main coils, wherein said pair of ferromagnetic rings are the only ferromagnetic rings included in said single superconductive coil assembly;

d) at least one generally annular-shaped additional superconductive main coil generally coaxially aligned with said axis, carrying an electric current in said first electric-current direction, and disposed within said coil housing and longitudinally between said pair of ferromagnetic rings; and

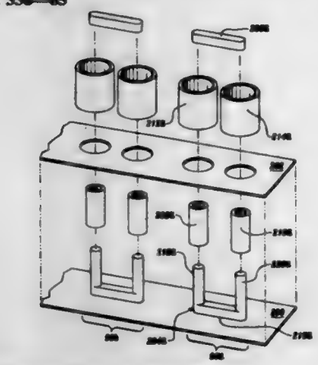
e) superconductive shielding coils carrying an electric current in a direction opposite to said first electric-current direction, radially disposed outward from said pair of superconductive main coils and from said at-least-one additional superconductive main coil, and longitudinally disposed outward from said at-least-one additional superconductive main coil.

5,594,402

HIGH VOLTAGE ISOLATING TRANSFORMER MODULE

Igor A. Krichtafovitch, Kirkland, and Irina Z. Sinitsyna, Bothell, both of Wash., assignors to International Power Group, Inc., Woodinville, Wash.

Filed Jun. 2, 1995, Ser. No. 460,072
Int. Cl.[6] H01F *27/06;27/02;* H02M *1/00*
U.S. Cl. 336—65 20 Claims



1. A transformer module comprising:

(a) a casing;

(b) a first substrate formed with a plurality of holes and mounted in said casing;

(c) a second substrate mounted in said casing;

(d) a support that maintains the second substrate at a distance from the first substrate;

(e) a plurality of transformer stages mounted on the first and second substrates, each of the plurality of transformer stages comprising:

(i) a core mounted on the second substrate, the core extending through the plurality of holes in the first substrate;

(ii) a primary winding surrounding the core; and

(iii) a secondary winding mounted on the first substrate, the secondary winding surrounding the core at a distance, wherein a current through the primary winding will induce a current through the secondary winding and generate a voltage across the transformer stage; and

(f) an insulating material surrounding the first substrate, the second substrate, and the plurality of transformer stages.

5,594,403

HIGH-VOLTAGE FUSE BOX

Shunji Taga, and Takeshi Yomura, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Dec. 12, 1994, Ser. No. 355,273
Claims priority, application Japan, Dec. 20, 1993, 5-067813
Int. Cl.[6] H01H *85/02*
U.S. Cl. 337—186 5 Claims

1. A high-voltage fuse box comprising:

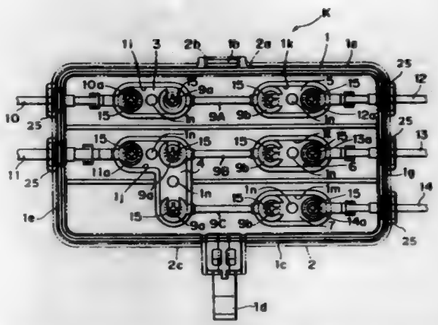
a box body;

at least one first connection plate, the at least one first connection plate having first and second opposite end portions, the at least one first connection plate being electrically conductive and being secured to the box body;

at least one second connection plate, the at least one second connection plate having first and second opposite end portions, the at least one second connection plate being electrically conductive and being secured to the box body;

a plate fuse which has opposite first and second fixing terminals such that the first terminal is fixed to the first end portion of the first connection plate and the second fixing terminal is fixed to the first end portion of the second connection plate, respectively, with machine screws;

a first electric wire which has a first terminal; and



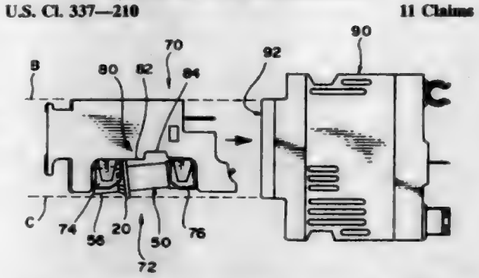
a second electric wire which has a second terminal such that the first and second terminals are fixed to the second end portion of the first connection plate and the second end portion of the second connection plate, respectively, with machine screws, whereby heat from the plate fuse is dissipated by the first and second connection plates.

5,594,404

FUSE ORIENTATION DEVICE

Lawrence R. Happ, Mundelein; Conrad F. Alfaro, Harwood Heights, both of Ill., and Bruce B. Grossmann, St. Louis, Mo., assignors to Cooper Industries, Houston, Tex.

Filed Mar. 15, 1994, Ser. No. 212,836
Int. Cl.[6] H01H *85/22;85/50;85/30*
U.S. Cl. 337—210 11 Claims

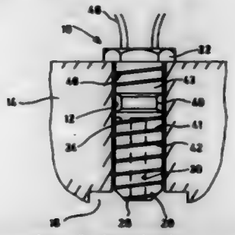


1. A fuse orientation device for an alarm indicating fuse element of the type having an elongated body and electrical contact portions at opposing ends, the device comprising:

an orientation ring removably positionable on a body of a fuse element between end portions and axially adjacent to a selected end portion so that the orientation ring extends laterally from an outer surface of the fuse element, the orientation ring comprising a plurality of resilient projections to removably secure the ring on a body of a fuse element, the resilient projections extending obliquely from an annular portion of the ring, remote ends of the projections defining a fuse element engaging passage; and,

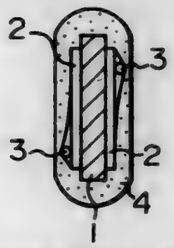
a fuse element holder having mounting means for a fuse element to receive a fuse laterally inserted in the mounting means, the mounting means include a pair of spaced fuse clips for securing opposing head ends of a fuse element and means adjacent to a first fuse clip for interfering with the orientation ring secured to a fuse element to prevent an incorrectly oriented fuse element from being mounted to the fuse clips and means adjacent to a second fuse clip for receiving the orientation ring to allow a correctly oriented fuse element to be mounted to the fuse clips.

5,594,405
PRESSURE TRANSDUCER WITH PRESSURE SENSITIVE CONDUCTOR
George Kadlicko, Mississauga, Canada, assignor to Microhydraulics, Inc., Canada
Filed Aug. 26, 1994, Ser. No. 296,724
Int. Cl.[6] G01L 1/22
U.S. Cl. 338—4 8 Claims



1. A pressure transducer for insertion in an opening in a wall of a fitting containing a fluid under pressure, the pressure transducer comprising a cylindrical body with an internal bore extending axially from one end of said body, a radially outwardly directed outer surface and a thread formed on said outer surface and extending helically along at least part of said outer surface for insertion within the opening in the wall of said fitting to expose said bore to the pressure in said fitting, said helical thread having opposed flanks forming a root therebetween, and an electrical conductor helically wound around said body and receivable within the helical thread thereon, said conductor being disposed adjacent the root of said helical thread and in abutment with said opposed flanks thereof, said helical thread and said conductor being receivable within a complementary threaded portion of said opening in the fitting wherein pressure applied to said bore induces a strain in said conductor to vary the electrical resistance thereof.

5,594,406
ZINC OXIDE VARISTOR AND PROCESS FOR THE PRODUCTION THEREOF
Kazuhige Koyama, Neyagawa; Naoki Mutoh, Kadoma, and Masaaki Katsumata, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP93/00224, § 371 Date Oct. 1, 1993, § 102(e) Date Oct. 1, 1993, PCT Pub. No. WO93/17438, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 24, 1993, Ser. No. 122,604
Claims priority, application Japan, Feb. 25, 1992, 4-037622; Mar. 27, 1992, 4-070759
Int. Cl.[6] H01C 7/10
U.S. Cl. 338—21 64 Claims

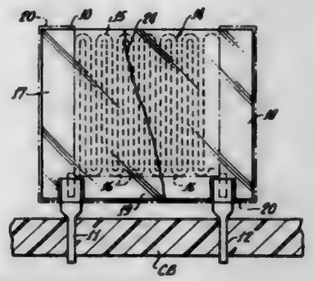


1. A zinc oxide varistor comprising a fired varistor element having opposite surfaces and at least two electrodes formed on said fired varistor element from an electrode paste, said fired varistor element comprising a lead borosilicate-type glass diffused into at least one of said surfaces of said fired varistor element during a heating operation employed to form said electrodes; said lead borosilicate-type glass comprising a mixture of lead borosilicate-type glass particulate material and at least one metal oxide selected from the group consisting of cobalt oxide, magnesium oxide, yttrium oxide, antimony oxide, manganese oxide, tellurium oxide, lanthanum oxide, cerium oxide, praseodium oxide, neodymium oxide, samarium oxide, europium oxide, gadolinium oxide, terbium oxide, dysprosium oxide, holmium oxide, erbium oxide, thulium oxide, ytterbium oxide and lutetium oxide;

wherein the glass particulate material and the at least one metal oxide are mixed to form said mixture, and then said mixture is fused and thereafter quenched;

with the provisos that if the at least one metal oxide comprises at least one member of the group consisting of cobalt oxide and manganese oxide, upon mixing the glass particulate material and the at least one metal oxide to form said mixture, said mixture contains 5.0–30% by weight of boron oxide, 5.0–30% by weight of silicon oxide, 40.0– 80% by weight of lead oxide, and 0.1%–30.0% by weight of said at least one metal oxide.

5,594,407
DEBRIS-REDUCING FILM-TYPE RESISTOR AND METHOD
Richard E. Caddock, Jr., Winchester, Oreg., assignor to Caddock Electronics, Inc., Riverside, Calif.
Filed Jul. 12, 1994, Ser. No. 274,018
Int. Cl.[6] H01C 7/10
U.S. Cl. 338—24 14 Claims



9. A single resistor comprising:

(a) a rectangular, thin, flat substrate having such a thermal coefficient of expansion that it will fracture in response to thermal stress,

(b) terminal means mechanically connected to only the bottom edge of said substrate and adapted to hold said substrate on a circuit board,

(c) single-resistor resistive film means provided on the frontside of at least a major portion of said substrate, and electrically connected to said terminal means, and

(d) first and second cold arm means each extending upwardly from the vicinity of said bottom edge to the vicinity of the top edge of said substrate,

said cold arm means being spaced from each other in a direction longitudinal to said substrate,

said cold arm means being so located as to divide said resistive film means into three film sections,

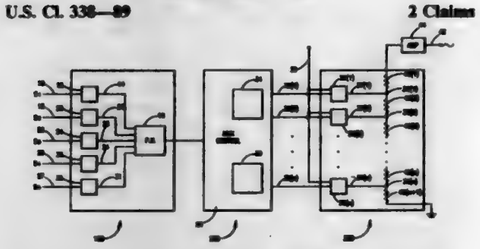
said film sections being electrically connected to each other,

each of said film sections generating substantial frontside heating of said substrate at the portions of said substrate respectively underlying said film sections,

each of said cold arm means being such that the portions of said substrate respectively underlying said cold arm means are not subjected to substantial frontside heating,

said cold arm means being so dimensioned, located and associated that when a sufficiently high overload voltage is applied to said terminal means, the portion of said substrate underlying one of said film sections is substantially repeatably cracked or fractured in a direction extending between said bottom edge and the top edge of said substrate, thereby breaking a circuit through said one film section.

5,594,408
POTENTIOMETER
Richard W. Exell, Carrollton, Tex., assignor to Dallas Semiconductor, Dallas, Tex.
Filed Jun. 30, 1995, Ser. No. 497,490
Int. Cl.[6] H01C 10/04
U.S. Cl. 338—89 2 Claims



1. A semiconductor potentiometer comprising:

a resistor array having a plurality of selectable wiper points;

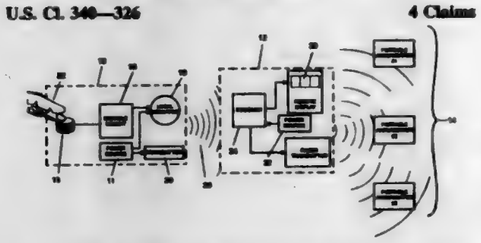
a multiplexer connected to and adapted for selecting said wiper points to create at least one signal path;

a processing unit connected to and adapted for controlling said multiplexer;

a plurality of external switches; and

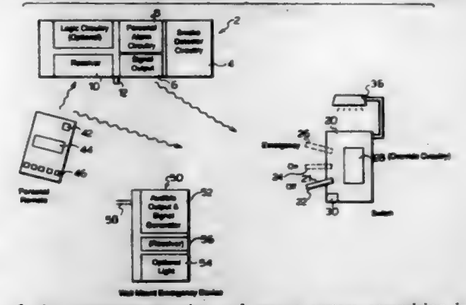
a plurality of debouace circuits connected therebetween each of said external switches and said processing unit.

5,594,409
CUSTOMER ACTIVATED DEVICE
Edward J. Shank, 6401 Randy Dr., Charlotte, N.C. 28241
Filed Jan. 31, 1994, Ser. No. 194,474
Int. Cl.[6] G08B 5/00
U.S. Cl. 340—326 4 Claims



1. A portable customer activated device for activating an indicator having an on and off state, said portable device including a proximity actuated circuit, a power source, and an enclosure; said enclosure comprising a simulated beverage bottle, said indicator, said proximity actuated circuit and said power source being mounted inside said enclosure, said proximity actuated circuit including a proximity sensor mounted near the opening of said simulated beverage bottle whereby said customer selectively activates said device by positioning a selected portion of said customer's body within a predetermined distance of said sensor to activate said proximity actuated circuit to switch said indicator to said on state to indicate to service personnel that said customer desires service and thereby causing said proximity actuated circuit to latch in the on state until switched to the off state.

5,594,410
EMERGENCY WARNING ESCAPE SYSTEM
Michael Lucas, 5223 Forest Hill Drive, Mississauga, Ontario, Canada; James M. Klotz, 355 Clinton Street, Toronto, Ontario, Canada; Frank Farfan, 2414 St. Frances Drive, Burlington, Ontario, Canada, and S. Warren Hall, 3 Cranleigh Court, Etobicoke, Ontario, Canada
Continuation of Ser. No. 112,082, Aug. 26, 1993, abandoned.
This application May 16, 1995, Ser. No. 442,474
Int. Cl.[6] G08B 5/00
U.S. Cl. 340—332 10 Claims



1. An emergency warning and escape system comprising in combination a detector/alarm arrangement that produces a first audible alarm signal upon detection of smoke or a combustion condition and means for receiving a separate signal from a remote control unit and producing an audible second alarm signal upon reception of the signal from said remote control unit; said second signal being easily distinguished from said first signal; said remote control unit includes a manually activated signal generating and transmitting arrangement to activate said detector/alarm arrangement causing the same to produce said audible distinct second alarm signal, and including an electrical switch which can be operated in a normal mode or an emergency mode, said electrical switch activates and deactivates current flow to a light fixture arrangement associated therewith, said electrical switch includes means for sensing when the first alarm signal or the audible distinct second alarm signal of the detector has been activated and upon sensing of this condition the switch operates in an emergency mode and automatically moves or remains in the activated condition causing current to flow to the light fixture for powering thereof.

5,594,411
ELECTROMOTIVE SCOOTER
Masao Ono, Yokohama, Japan, assignor to Tokyo R&D Co., Ltd., Tokyo, Japan
Division of Ser. No. 131,772, Oct. 4, 1993, Pat. No. 5,396,970.
This application May 13, 1994, Ser. No. 242,325
Claims priority, application Japan, Oct. 9, 1992, 4-271479; Oct. 9, 1992, 4-271482
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—425.5 14 Claims

1. An electromotive scooter comprising:

a scooter frame,

a rider's seat,

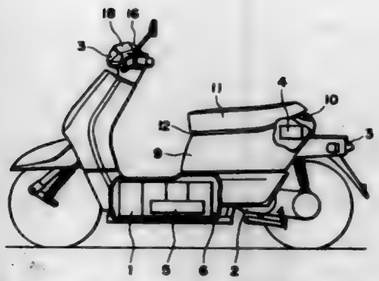
an electric drive motor for providing driving force for the scooter, said electric drive motor having an on condition and an off condition,

at least one battery mounted in the scooter frame for providing operating current for the electric drive motor,

a power source indicator that provides a visual indication when the electric drive motor is in the on condition,

a seat load sensor for sensing presence of a load on the rider's seat, and

a warning sound generator, said warning sound generator comprising an acoustic device that emits an acoustical warning when supplied with electric current and an electric circuit that



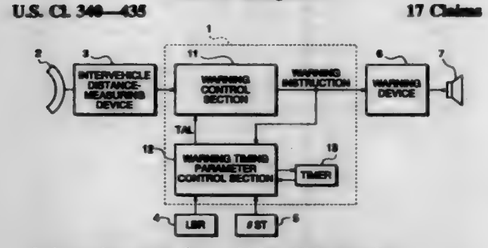
supplies electric current to said acoustic device when the electric drive motor is in the on condition and the seat load sensor does not sense a load on the rider's seat.

5,594,412

WARNING SYSTEM FOR VEHICLES

Yoshiyuki Matsumoto, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1994, Ser. No. 340,245
Claims priority, application Japan, Nov. 17, 1993, 5-311341
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—435 17 Claims



1. A warning system for a vehicle, which comprises:
warning issuing means for issuing warnings when said vehicle approaches objects;
driving operation-detecting means for detecting a driving operation by a driver of said vehicle;
reaction time-calculating means for calculating a value of a reaction time from the time one of said warnings is issued by said warning issuing means to the time it is detected by said driving operation-detecting means that said driver starts said driving operation in response to the one of said warnings; and
warning control means for controlling timing at which another of said warning should be issued by said warning issuing means, based on the calculated value of said reaction time from prior said warnings.

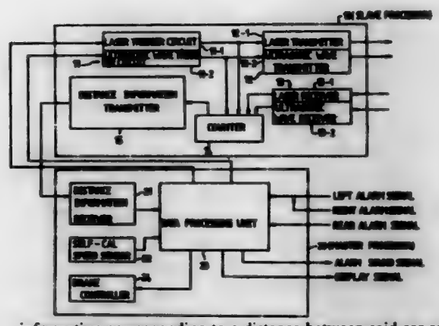
5,594,413

CAR COLLISION PREVENTION APPARATUS AND METHOD USING DUAL PROCESSOR AND AUTOMATIC SENSOR SWITCHING FUNCTION

Jung S. Cho, and Je S. Seog, both of Kyoungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Dec. 7, 1994, Ser. No. 350,554
Claims priority, application Rep. of Korea, Dec. 27, 1993, 93-29738; Dec. 29, 1993, 93-30578
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—435 4 Claims

1. A car collision prevention apparatus mountable in a car, comprising:
slave processing means for transmitting and receiving one of a laser beam and an ultrasonic wave signal to extract distance information corresponding to a distance between said car and a car in front of said car; and



master processing means for comparing the distance information from said slave processing means with a predetermined safety distance corresponding to a desired distance between said car and said car in front based on a car speed of said car and performing car accelerating or decelerating and alarm functions in accordance with a compared result, and for initiating one of a long-distance operation mode and a short-distance operation mode based upon said car speed and a reference speed; said slave processing means including:
laser trigger means for generating a laser trigger pulse signal in response to a drive signal from said master processing means, the laser trigger pulse signal being produced during said long-distance operation mode selected by said master processing means when said car speed is higher than said reference speed;
laser transmission means for emitting said laser beam externally in response to said laser trigger pulse signal from said laser trigger means;
laser reception means for receiving said laser beam after said laser beam is reflected off of said car in front;
ultrasonic wave trigger means for generating an ultrasonic wave trigger pulse signal in response to said drive signal from said master processing means, the ultrasonic wave trigger pulse being produced during said short-distance operation mode selected by said master processing means when said car speed is less than or equal to said reference speed;
ultrasonic wave transmission means for emitting said ultrasonic wave signal externally in response to said ultrasonic wave trigger pulse signal from said ultrasonic wave trigger means and an ultrasonic wave control signal;
ultrasonic wave reception means for receiving said ultrasonic wave signal after said ultrasonic wave signal is reflected off of said car in front;
counting means for generating time data by starting a counting operation in response to the laser trigger pulse signal from said laser trigger means or the ultrasonic wave trigger pulse signal from said ultrasonic wave trigger means and stopping the counting operation in response to an output signal from a respective one of said laser reception means or said ultrasonic wave reception means; and
distance information transmission means for converting said time data from said counting means into said distance information and transmitting said distance information to said master processing means; and
said ultrasonic wave reception means including:
an ultrasonic wave receiving sensor for receiving the ultrasonic wave signal emitted from said ultrasonic wave transmission means and reflected off of said car in front;
a first amplifier for amplifying said output signal from said ultrasonic wave receiving sensor to produce an amplified output signal;
a band pass filter for band pass filtering said amplified output signal from said first amplifier to remove a noise component therefrom;

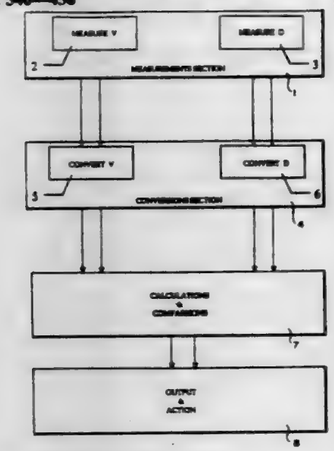
a second amplifier for amplifying an output signal from said band pass filter;
a detector for detecting an output signal from said second amplifier and outputting a detected signal in a digital form;
a comparator for comparing said detected signal from said detector with said ultrasonic wave control signal from said ultrasonic wave transmission means;
a reference time operating circuit for generating a reference time period signal in response to the ultrasonic wave control signal from said ultrasonic wave transmission means;
a time comparator for comparing an output signal from said comparator with the reference time period signal from said reference time operating circuit; and
a signal adjustment unit for adjusting an output signal from said time comparator to permit processing by said distance information transmission means.

5,594,414

COLLISION PROBABILITY DETECTION SYSTEM

Abdulatif Namangani, P.O. Box 13925, Jeddah 21414, Saudi Arabia

Filed Aug. 2, 1994, Ser. No. 284,114
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—436 22 Claims



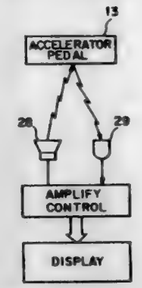
1. Apparatus, comprising:
a distance sensor;
a host vehicle velocity sensor;
a controller connected to the distance sensor and the velocity sensor,
wherein the controller includes
means for receiving a velocity signal from the velocity sensor;
means for monitoring a status of the host vehicle based on the velocity signal, said means for monitoring a status the host vehicle including
means for determining whether the vehicle is:
(1) moving with constant velocity,
(2) moving with acceleration,
(3) moving with deceleration, or
(4) not moving; and
means for assessing a status of object, said means for assessing a status of the object including
means for determining, based on the distance and velocity signals and on the previously determined status of the host vehicle, at least one of the following about the object:
(1) a direction in which the object is moving,
(2) whether the object is moving with constant velocity,
(3) the magnitude of the velocity of the object,
(4) whether the object is moving with acceleration or deceleration,
(5) the magnitude of the acceleration or deceleration of the object, and
(6) whether the object is not moving; and
means for generating an output signal representative of the probability that a collision will occur between the host vehicle and the object; and
an alarm which is activated upon generation of an output signal by said controller when a collision is likely to occur between the host vehicle and the object.

5,594,415

DISPLAY DEVICE FOR A VEHICLE

Masaaki Ishikawa, and Manso Yamada, both of Tokyo, Japan, assignors to Tamapack Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 22,886, Feb. 16, 1993, Pat. No. 5,463,378, which is a continuation of Ser. No. 498,551, Mar. 19, 1990, abandoned. This application Mar. 24, 1995, Ser. No. 409,523
Claims priority, application Japan, Jul. 18, 1988, 63-178332; Aug. 11, 1988, 63-200417; Aug. 11, 1988, 63-200418; Oct. 21, 1988, 63-265774; Oct. 28, 1988, 63-140870 U; Jan. 19, 1989, 1-10433; Mar. 2, 1989, 1-23981 U; Mar. 6, 1989, 1-53568; Apr. 18, 1989, 1-98565
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—467 9 Claims



1. An accelerator operation magnitude display apparatus, comprising:
a sensor that senses a magnitude of operation of an accelerator pedal, including a status in which said accelerator pedal is not operated, and at least one status in which the accelerator pedal is operated, without any mechanical movement of said sensor accompanying a mechanical movement of said accelerator pedal; and
means for indicating said magnitude of operation of said accelerator pedal based upon an output from said sensor.

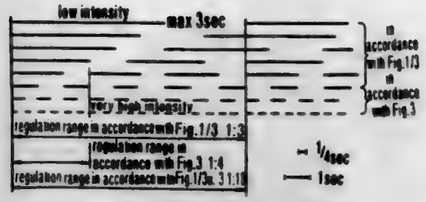
5,594,416

DECELERATION WARNING SYSTEM

Max Gerhaher, Dr.-Aicher-Str. 3, 94405 Landau/Isar, Germany

Continuation of Ser. No. 199,048, Feb. 18, 1994, abandoned. This application Nov. 20, 1995, Ser. No. 561,206
Claims priority, application Germany, Feb. 19, 1993, 43 05 186.3
Int. Cl.[6] B60Q 1/50
U.S. Cl. 340—467 23 Claims

1. A deceleration warning system for reduction in danger of rear end collisions in road traffic or in connection with other movements of objects, said warning system comprising two or more deceleration warning lights in a decelerating vehicle which are intermittently turned on, wherein an intensity of a warning produced by the deceleration warning lights of the decelerating vehicle is dependent on a level of a danger factor G which



originates from the decelerating vehicle and which is seen by following vehicles; wherein said deceleration warning system responds when a deceleration of the decelerating vehicle exceeds a selected deceleration value and the danger factor is an overall danger factor ΣG which is dependent on a level of an instantaneous or preceding level of a deceleration b of the decelerating vehicle; and wherein the overall danger factor ΣG is dependent on duration t or a deceleration distance s of a preceding deceleration b of the decelerating vehicle.

5,594,417

FIRE ALARM SYSTEM

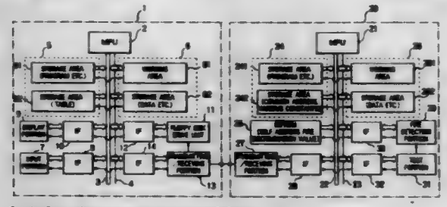
Toshikazu Morita, Tokyo, Japan, assignor to Nohmi Bosai, Ltd., Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 348,975

Claims priority, application Japan, Dec. 2, 1993, 5-303073; Dec. 9, 1993, 5-309361

Int. Cl.[6] G08B *29/00*

U.S. Cl. 340—506 **16 Claims**



1. A fire alarm system comprising:
terminal units; and
a setting unit for setting a variety of set values to said terminal units; wherein said setting unit comprises:
first command means for transmitting a first command and said set value to said terminal unit;
first discrimination means that receives a first response signal and said set value from said terminal unit in accordance with said first command to discriminate whether or not said set value received from said terminal unit coincides with said set value transmitted by said first command means;
second command means for transmitting a second command and said set value to said terminal unit when said first discrimination means has discriminated that said set value received from said terminal unit coincides with said set value transmitted by said first command means; and
second discrimination means that receives a second response signal and said set value from said terminal unit in accordance with said second command to discriminate whether or not said set value received from said terminal unit coincides with said set value transmitted by said first command means or said second command means;
wherein said terminal unit comprises:
first response means that transmits a first response signal and said received set value to said setting unit when receiving said first command and said set value from said first command means;
second response means that discriminates whether or not said received set value coincides with said set value received by said first response means when receiving said second command and said set value from said second command means and transmits a second response signal and said received set value to said setting unit when said two set values coincide with each other; and
writing means for storing a result of discrimination in storage means when said second response means has discriminated that said two received set values coincide with each other.

5,594,418

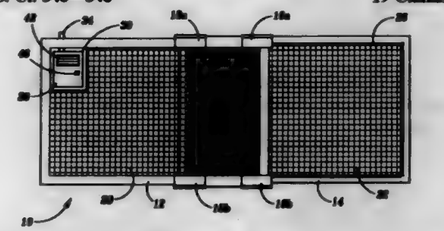
SELF-CONTAINED DUAL PANEL WINDOW SCREEN ALARM

Lyle B. Martin, 1510 Gary St., Bethlehem, Pa. 18018

Continuation-in-part of Ser. No. 489,041, Jun. 9, 1995, abandoned. This application Feb. 1, 1996, Ser. No. 595,181

Int. Cl.[6] G08B *13/08*

U.S. Cl. 340—546 **19 Claims**



1. A portable expandable intrusion detection screen for use with an electronic alarm means comprising first and second screen panels having bracket means which are affixed to both screen panels so as to form adjacent parallel channels in which said first screen panel is slidably movable in parallel relation to the second screen panel and said second screen panel is slidably movable in parallel relation to the first screen panel so that each screen panel can slidably move in relation to the other to be expandable to fit within different sized window openings, screen mesh mechanically mounted and retained within an internal peripheral channel in the frame of each screen panel, an alarm means permanently affixed to a mounting bracket attachable to one of said screen panels and having an intrusion detector means extending outward through the frame of the screen panel to which the alarm means is mounted for detecting the separation of the screen panel from any part of the window against which the screen panel onto which said alarm means is attached is placed when positioned in a window opening.

5,594,419

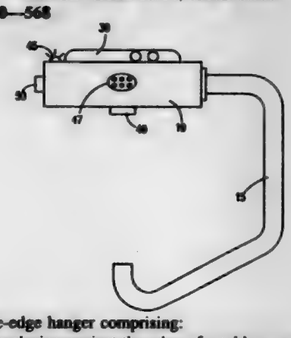
TABLE-EDGE HANGER

Allen K. W. Lo, 5022 Hidden Branches Dr., Dunwoody, Ga. 30338

Filed Jan. 11, 1996, Ser. No. 584,281

Int. Cl.[6] G08B *13/14*; A44B *21/00*

U.S. Cl. 340—568 **8 Claims**



4. A table-edge hanger comprising:
a base for placing against the edge of a table or a counter-top;
a hook connected to one side of said base;

an alarm;
a first switch on another side of said base; and
a second switch;
wherein said first switch is turned on when a personal item is placed on said hook while said base is replaced against the edge of a table or a counter-top;
wherein said first switch triggers said alarm when said personal item is removed from said hook or said base is lifted off said edge if said first switch has been turned on;
wherein said alarm can be turned off by activating said second switch;
wherein said alarm can be disabled by activating said second switch to prevent said alarm being triggered by said first switch when desired.

5,594,420

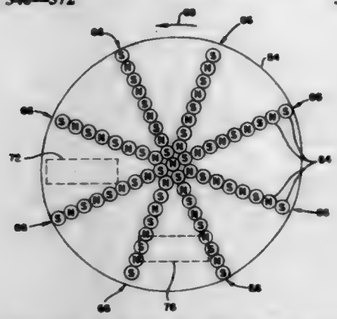
ROTATING MAGNET ARRAY FOR DEACTIVATING EAS MARKERS

Richard L. Copeland, and Paul Manente, both of Boca Raton, Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Feb. 2, 1995, Ser. No. 382,630

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—572 **35 Claims**



1. An apparatus for deactivating an electronic article surveillance marker, comprising:
a substantially planar support member;
means for rotating the support member in the plane of the support member and around a center of rotation; and
magnet means disposed on the support member for forming at least one linear array of magnetic field regions having respective polarities that alternate in space.

5,594,421

METHOD AND DETECTOR FOR DETECTING A FLAME

Marc P. Thuillard, Männedorf, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

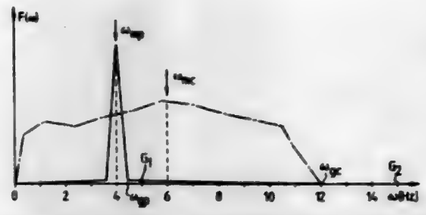
Filed Dec. 19, 1995, Ser. No. 574,773

Claims priority, application European Pat. Off., Dec. 19, 1994, 94120083

Int. Cl.[6] G08B *17/12*

U.S. Cl. 340—578 **9 Claims**

1. A method for detecting a flame having a magnitude which is not less than a predetermined minimum magnitude, the method comprising:
detecting radiation having time-varying intensity to produce a corresponding time-varying signal which has a frequency spectrum having a mid-frequency (ω_m) and a cut-off frequency (ω_c);
determining whether the time-varying signal is periodic; and
producing a flame-detection signal
(i) if the time-varying signal is periodic and its mid-frequency does not exceed a first frequency value (G_1) which is predetermined to be not less than flicker frequency of a stationary flame having minimum magnitude, or
(ii) if the time-varying signal is not periodic and its cut-off frequency does not exceed a second frequency value (G_2) which is predetermined to be greater than the first frequency value.



5,594,422

UNIVERSALLY ACCESSIBLE SMOKE DETECTOR

Richard W. Huey, Jr.; Neil D. Lerner, both of Silver Spring, Md.; David B. Chaney, and Joseph A. Koncelik, both of Westerville, Ohio, assignors to COMSIS Corporation, Silver Spring, Md.

Filed May 19, 1994, Ser. No. 246,094

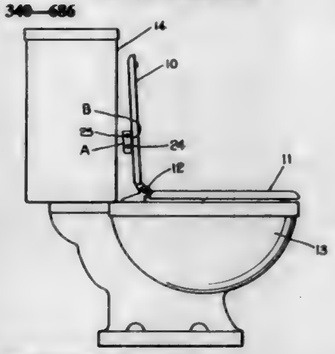
Int. Cl.[6] G08B *17/00*

U.S. Cl. 340—628 **11 Claims**



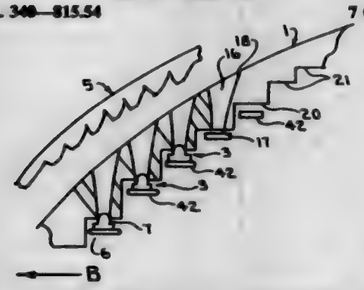
1. Smoke detector apparatus comprising a detector with an elongated housing, the housing having first and second ends, the first end forming a base for mounting on a wall of a room and the second end housing a sensor for positioning below a ceiling of the room, remote from the base, a rigid member supporting the sensor within the housing and connecting the sensor to the base within the room, a signal processor placed within the base and connected to the sensor for processing signals transmitted from the sensor, a display on the base for displaying conditions of the detector, wherein the first end of the elongated housing is wall mountable within easy reach without climbing, and display, controls and maintenance functions are at user eye level, further wherein the sensor comprises a smoke sensor, a signal conditioner connected to the smoke sensor, and a preamplifier connected to the smoke sensor, for respectively detecting smoke, conditioning, preamplifying and communicating signals from the sensor to the signal processor in the base, further comprising a power supply mounted in the base and connected to the signal processor and to the sensor, further comprising a drop flag attached to the housing for persistently indicating reduced status of the power supply, and audible and visual output means on the housing for providing system status and alarm indications in response to signals received from the signal processor.

5,594,423
TOILET LID ALARM AND METHOD
Kenneth H. East, 4689 Adrian Way, Plano, Tex. 75024
Filed Jul. 6, 1995, Ser. No. 498,564
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—686 2 Claims



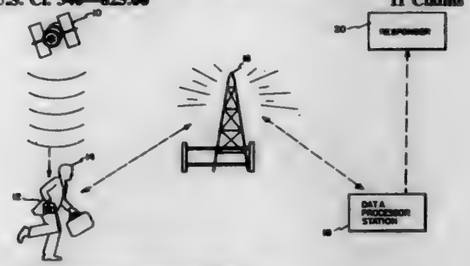
1. A toilet lid alarm comprising:
a housing;
means carried by the housing for securing said housing to a surface of said lid;
a receptacle for a battery carried by said housing;
an alarm device powered by said battery for supplying an audible signal carried by said housing;
a position operated switch carried by said housing actuating said alarm device when said toilet lid is raised through a predetermined angle;
a switch actuator on said housing for controlling and deactivating said position operated switch; and
a time delay after deactivating said position operated switch, so that said position operated switch is reactivated after said time delay;
whereby an audible signal is given indicating that the lid has been raised.

5,594,424
INDICATING DISPLAYS FOR MOTOR VEHICLES
Jean-François Louy, Paris, and Jean-Claude Gasquet, Saint-Clement, both of France, assignors to Valeo Vision, Bobigny Cedex, France
Filed Aug. 26, 1992, Ser. No. 936,842
Claims priority, application France, Sep. 2, 1991, 91 10836
Int. Cl.[6] G08B 5/36
U.S. Cl. 340—815.54 7 Claims



1. An optical collimating element for a motor vehicle indicator display comprising said collimating element, a support element associated with the collimating element, and electroluminescent diodes carried by the support element, wherein the collimating element defines an inner face which is formed with steps and the collimating element further having through holes, each of which is open into a said step to define a seating surface which mechanically engages a said diode, each said diode being shaped so that engagement of said diode with said seating surface centers said diode in said through hole.

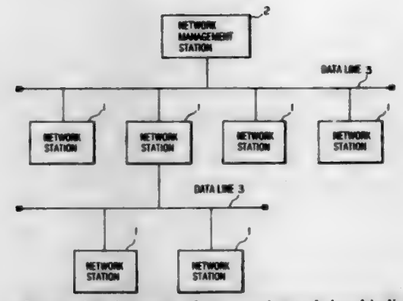
5,594,425
LOCATOR DEVICE
David L. Ladner, Minneapolis, and Andrea J. Grazzini, Eagan, both of Minn., assignors to Peoplenet, Inc., Minneapolis, Minn.
Filed Oct. 31, 1994, Ser. No. 332,351
Int. Cl.[6] H04Q 1/00
U.S. Cl. 340—825.06 11 Claims



1. A locator system, comprising:
a portable locator apparatus including:
a satellite receiver for receiving location information transmitted by a satellite, the location information being indicative of a location of the portable locator; and
a first cellular transmitter, coupled to the satellite receiver, for transmitting the location information over a cellular network;
a tracking system having a receiver for receiving the location information transmitted by the first cellular transmitter, the tracking system including a tracking controller for relating the location information to a map to provide a location output indicative of the location of the portable locator; and
wherein the tracking system further comprises:
an operator output apparatus, coupled to the tracking controller, for providing the location output to an operator to indicate the location of the portable locator;
a tracking memory, coupled to the tracking controller, storing response information indicative of a plurality of designated responders to be contacted upon receipt of location information from the portable locator; and
notifying means for notifying one of the plurality of responders in response to receiving location information from the locator apparatus, the notifying means attempting to notify at least one of the plurality of responders in a specific order.

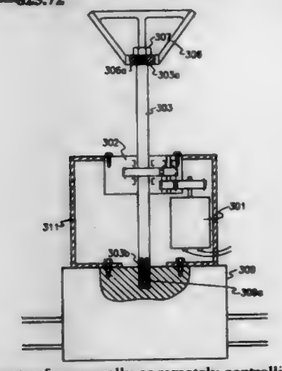
5,594,426
NETWORK STATION AND NETWORK MANAGEMENT SYSTEM
Kazuhiro Ushijima, Kanagawa-ken; Hitoshi Matsumura, Odawara, and Fumiaki Matsuura, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Software Engineering Co., Ltd, Yokohama, both of Japan
Filed Sep. 20, 1994, Ser. No. 309,414
Claims priority, application Japan, Sep. 20, 1993, 5-232841
Int. Cl.[6] H04L 12/24
U.S. Cl. 340—825.02 23 Claims

1. A network station connected to a communication network, the communication network being connected to a network management station, the network station comprising:
a power source;
a power switch for controlling power-on and power-off of the power source;
power control means for sensing a power-off state of the power switch, generating an event representing the power-off state,



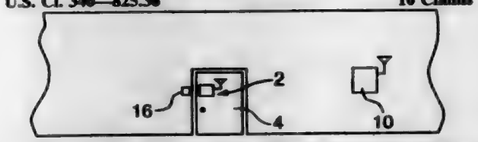
and outputting the even and a generation end signal indicating a complete creation of the event;
storage means for storing therein an address of the network management station;
connection control means electrically connected to the power control means and the storage means for receiving the generation end signal outputted from the power control means, acquiring the address of the network management station from the storage means, and issuing a connection request to establish connection between the network station and the network management station; and
network control means electrically connected to the power control means and the connection control means for enabling, in response the connection request issued from the connection control means, communication between the network station and the network management station, and transmitting to the network management station the event outputted from the power control means.

5,594,427
APPARATUS FOR AND METHOD OF REMOTE CONTROLLING OPERATION OF VIBRATION ROLLER
Jong P. Kim; Byung H. Kim, both of Kyungki-Do; Cheoul H. Ahn, Seoul; Tae H. Kim, Kyungki-Do, and Do H. Choi, Seoul, all of Rep. of Korea, assignors to Korea Institute of Construction Technology, and Korea Construction Financial Cooperative, both of Rep. of Korea
Filed Dec. 20, 1994, Ser. No. 359,893
Int. Cl.[6] H04Q 1/00
U.S. Cl. 340—825.72 15 Claims



1. An apparatus for manually or remotely controlling a vibration roller having an engine, comprising:
first means for enabling forward and rearward running operation of the vibration roller, the first means including
adjusting means for determining the forward and rearward running operations of the vibration roller, the adjusting means including a manually movable lever,
a rotatably mounted member,
first power generating means for causing the member to be rotated by remote control, and
power transmitting means for receiving a turning force from the first power generating means and rotating the adjusting means when the vibration roller is being operated under remote control, and for isolating the adjusting means from the member when the vibration roller is being operated under manual control;
second means for adjusting a direction of travel of the vibration roller, the second means including
a manually operable handle, and
a second power generating means for causing the handle to be rotated by remote control;
third means for stopping the engine of the vibration roller, the third means including
an engine stopping cable,
a manually operable stopping knob connected to the engine stopping cable,
a first screw,
a third power generating means for causing the first screw to be rotated by remote control,
a first nut engaged with the first screw when the first screw rotates, and
a first bracket connected to the first nut, the first bracket moving the stopping knob when the vibration roller is being operated by remote control; and
fourth means for accelerating and decelerating the engine, the fourth means including
an engine acceleration/deceleration cable,
a manually operable acceleration control knob connected to the acceleration/deceleration cable,
a second screw,
a fourth power generating means for causing the second screw to be rotated by remote control,
a second nut engaged with the second screw, such that the second nut moves along the second screw when the second screw rotates, and
a second bracket coupled to the second nut, the second bracket moving the acceleration control knob when the vibration roller is being operated by remote control.

5,594,428
COMBINATION SECURITY UNIT
John Peterson, Toronto, Canada, assignor to Digital Security Controls Ltd., Downsview, Canada
Continuation-in-part of Ser. No. 279,157, Jul. 22, 1994. This application Oct. 19, 1994, Ser. No. 325,670
Int. Cl.[6] G08B 5/22
U.S. Cl. 340—825.36 10 Claims



1. In combination a security system and a premise defined by exterior walls with a light transmitting medium forming part of said exterior walls, said security system interior to said premise having a plurality of sensors for sensing alarm conditions, a sounder for producing an audible alarm signal, and a control panel which processes signals from said sensors and determines whether an alarm condition is present, and an inside receiver/transceiver; said security system also including a small hand held user remote unit for use exterior to said premise;
said inside receiver/transceiver being battery powered and operates in a low power draw standby state until activated by receipt of an activate signal from said remote unit and thereupon powers up to a full function higher power draw requirement state;

said inside receiver/transceiver being located to communicate with said user remote unit exterior to the premise through said light transmitting medium and communicates with said control panel to arm or disarm the system;

said remote unit selectively generating an activation signal and transmitting said activation through said light transmitting medium to said inside receiver/transceiver;

said inside receiver/transceiver in said standby state recognizing receipt of said activation signal and powering up to said higher power draw full function state;

said inside receiver/transceiver, when said activation signal is received, producing a visible indication of the status of said security system which is visible from the exterior of the premise through said transparent medium;

said remote unit cooperating with said inside receiver/transceiver for effecting arming and disarming of the security system by using said remote unit to transmit signals through said transparent medium to said inside receiver/transceiver and said inside receiver/transceiver producing visual indications of the status of the system.

5,594,429

TRANSMISSION AND RECEPTION SYSTEM AND SIGNAL GENERATION METHOD FOR SAME

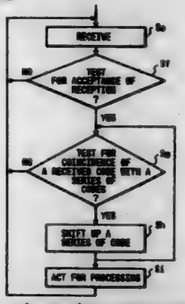
Ichiro Nakahara, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1994, Ser. No. 328,219

Claims priority, application Japan, Oct. 27, 1993, 5-292839

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.31 **18 Claims**



1. A transmission and reception system comprising:

a transmitter including a first variable code generator and means for transmitting a plurality of transmitted-signal groups, each transmitted-signal group including identification information and command information, the identification information including a fixed code and a variable code obtained from the first variable code generator, the command information including one of a security device activation command code and a security device deactivation code; and

a receiver including:

a memory;

means for receiving and comparing the transmitted fixed code and the command information with values stored in the memory;

a second variable code generator;

means for updating an operation state of the second variable code generator when the received fixed code coincides with the stored fixed code and the received command code coincides with a system activation command code such that the second variable code generator is synchronized with the first variable code generator; and

means for processing the command information when the transmitted identification information fixed code is the same as the stored value and the received command code coincides with a system deactivation command code.

5,594,430

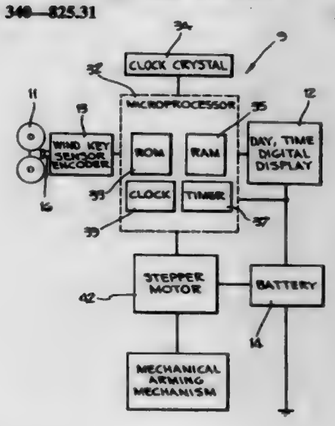
PROGRAMMABLE ELECTRONIC TIME LOCK

Larry Cutler, San Pedro; Klaus W. Gartner, Palos Verdes Estates, both of Calif.; Dieter Butterweck, Dortmund, Germany; P. Vuilleumier, Gletterens, Switzerland; Jean-Luc Mounier, La Chaux-de-Fonds, Switzerland, and P-A Sermet, Marin, Switzerland, assignors to La Gard, Torrance, Calif., and Cipem Microtechniques SA, Switzerland

Continuation of Ser. No. 874,191, Apr. 24, 1992, Pat. No. 5,387,903. This application Aug. 23, 1994, Ser. No. 294,315

Int. Cl.[6] E05B *43/00;49/00*

U.S. Cl. 340—825.31 **24 Claims**



1. A programmable time lock comprising:

a processor having two modes operation—a program mode and an armed mode;

memory connected to said processor for storing information used by said processor, including one or more unlocking days and times;

a rotatable key shaft for removably receiving a key;

a key shaft position sensor connected to said key shaft and electrically connected to said processor for supplying said processor with signals indicating said shaft's angular position;

a key shaft rotation encoder connected to said key shaft and electrically connected to said processor for supplying said processor with signals indicating said shaft's rotational direction;

a detent pin, with an armed locking position and a disarmed unlocking position, which is armed when said key shaft is rotated in a predetermined direction and is disarmed at unlocking days and times;

an electrically operated latch connected to said detent pin and to said processor for holding said detent pin in the armed position and for releasing said detent pin upon receiving an unlocking signal from said processor;

a display, connected to said processor, containing a series of display fields;

a timing device electrically connected to said processor which permits said processor to track a system day and time and passage of time;

said processor, when operating in said program mode, modifies the system day and time or one or more of the unlocking days and times in response to the signals from said key position sensor and said key rotation encoder; and

said processor, when operating in said armed mode, activates said latch to release said detent pin when the system day and time equals one of the unlocking days and times.

5,594,431

REMOTE METER READING

Frank Sheppard, Loughton, and Robert Gouldine, Bletchley, both of England, assignors to ABB Kent Plc, Bedfordshire, England

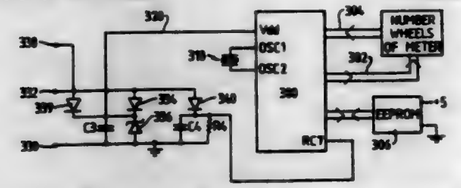
PCT No. PCT/GB93/00572, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO93/19439, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 19, 1993, Ser. No. 307,564

Claims priority, application United Kingdom, Mar. 19, 1992, 9205977

Int. Cl.[6] G08C *23/00*

U.S. Cl. 340—870.02 **14 Claims**



1. A remote meter reading system, comprising an encoder for association with a meter and a portable reader, the encoder having power terminal means for connection with a source of electrical power in the reader generating a periodic power signal and adapted when power by said signal to derive a digital encoding of the meter reading for transmission to the reader, wherein the encoder comprises impedance switch means serving to vary the input impedance at the power terminal means in representation of the digital encoding to provide a voltage variation detectable at said power source, said encoder comprising a frequency reference controlling the timing of said impedance switch means so that the operation of said impedance switch means is asynchronous with the power signal and there is no synchronous relationship required between the power signal and data transmitted from the encoder to the reader.

5,594,432

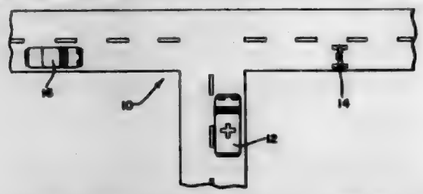
TRAFFIC INFORMATION WARNING SYSTEM

David C. Oliva, Chicago, and Max W. Rogers, Franklin Park, both of Ill., assignors to Cobra Electronics Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 297,969, Aug. 30, 1994, Pat. No. 5,497,148. This application Nov. 29, 1995, Ser. No. 564,468

Int. Cl.[6] G08G *1/09*

U.S. Cl. 340—905 **62 Claims**



1. A traffic information warning system for conveying a message regarding a traffic situation from a traffic advisory site to a vehicle, the system comprising a transmitter adapted for placement at the advisory site and a receiver adapted for placement at the vehicle, wherein:

the transmitter includes a first oscillator for transmitting a first carrier signal and a second oscillator for transmitting a second carrier signal, the first carrier signal having a first carrier frequency and the second carrier signal having a second carrier frequency, a modulator for modulating both carrier signals with an identical modulating signal reflective of a traffic situation, the first carrier frequency and the second carrier frequency being spaced apart by a predetermined frequency difference; and,

the receiver includes scanning circuitry for scanning across a predetermined frequency range to detect carrier signals separated by the predetermined frequency difference, a demodulator for retrieving a first retrieved modulating signal about the first carrier signal, means for comparing the first retrieved modulating signal to a series of acceptable stored traffic messages and for determining whether the first retrieved modulating signal matches one of the acceptable stored traffic messages, and means for announcing a message regarding the traffic situation.

5,594,433

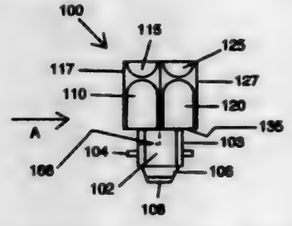
OMNI-DIRECTIONAL LED LAMPS

Stephen K. Turlep, 8000 Sugar Pine Dr., West Melbourne, Fla. 32904

Filed Aug. 9, 1995, Ser. No. 513,898

Int. Cl.[6] B60Q *7/00*

U.S. Cl. 340—908.1 **14 Claims**



1. An omni-directional LED lamp useful for traffic control and warning devices that reflects light in a 360 degree circumferential direction without having to rotate any components, comprising:

a first LED;

a first semi-spherical reflector having a continuous convex reflective surface, the first semi-spherical reflector mounted above the first LED, wherein light from the first LED is reflected substantially in a 360 degree circumference rendering the first LED omni-directional; and

a first clear plastic tubular holder for tightly holding the first semi-spherical reflector oriented directly above the first LED in a stationary non rotating position, wherein the first semi-spherical reflector reflects light in a 360 degree circumferential direction.

5,594,434

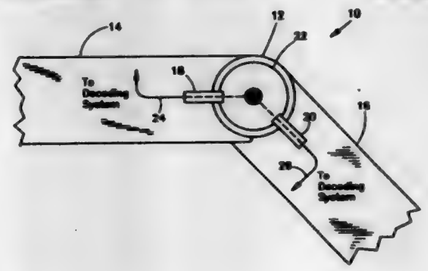
ANGULAR SENSING SYSTEM

Edward D. McCullough, Riverside, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Oct. 4, 1994, Ser. No. 317,456

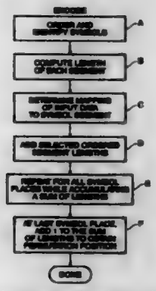
Int. Cl.[6] H03M *1/22*

U.S. Cl. 341—13 **11 Claims**



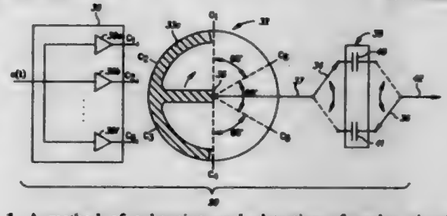
1. An angular sensing system, comprising:
a) a rotatable member coaxial with a joint between a first element and a second element, said joint defining an angle to be measured, said rotatable member having coded information thereon;
b) a first sensing head attached to said first element;
c) a second sensing head attached to said second element, said coded information being arranged on said rotatable member so as to periodically pass in readable proximity to said sensing heads once every revolution of said rotatable member; and,
d) a decoding system for each said sensing head, comprising:
i) threshold circuitry for converting pulses from its respective sensing head into an asynchronous bit stream;
ii) a state machine for recognizing unique coded information within said bit stream for the purpose of anticipating a timing pulse as the next bit emanating from its respective sensing head; and,
iii) a pulse generator enabled by said state machine for outputting a timing strobe in response to said next bit emanating from said threshold circuitry;
e) a first timer which uses said timing strobe from said first sensing head to continuously determine the average elapsed time for one complete revolution of said rotatable member;
f) a second timer which uses said timing strobes from said first and second sensing heads to continuously determine the average elapsed time for said coded information on said rotatable member to travel from said first sensing head to said second sensing head; and,
g) a time-based generator for providing time pulse references to said first and second timers;
h) ratio determining circuitry for calculating the ratio of said average elapsed time of said second timer to said average elapsed time of said first timer, said ratio defining the angle between said first element and said second element as a fraction of a revolution.

5,594,435
PERMUTATION-BASED DATA COMPRESSION
John F. Remillard, Boulder, Colo., assignor to Philosophers' Stone LLC, Cheyenne, Wyo.
Filed Sep. 13, 1995, Ser. No. 527,795
Int. Cl.[6] H03M 7/30
U.S. Cl. 341—51 6 Claims



1. In a data processing system having a data input means, a data output means, processing means and storage means, said processing system for operation on a non-empty closed set of symbols, a method for compressing data comprising the steps of:
receiving a bounded message via said data input means to said storage means, said bounded message consisting of a number of distinct symbol types;
examining said bounded message with said processing means; thereupon
selecting with said processing means a symbol set for describing said bounded message, said symbol set consisting of a closed set of unique symbols, each symbol being of multiple bit length, for use in representing said bounded message to a dictionary;
counting with said processing means numbers of occurrences of each said symbol found in said bounded message to obtain symbol counts; thereafter
determining with said processing means a unique permutation position of said bounded message with respect to all possible permutations of said symbols found in said bounded message; and
communicating said symbol counts with reference to said symbols found in said bounded message and said unique permutation position via said data output means as compressed information for use in the dictionary in order to reconstruct the bounded message.

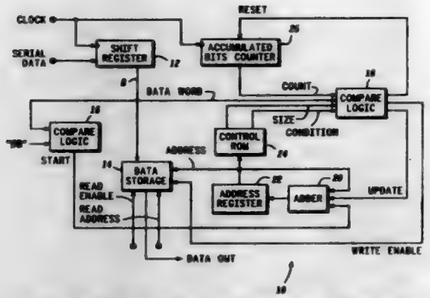
5,594,436
SIGNAL PROCESSING CHANNEL WITH HIGH DATA RATE AND LOW POWER CONSUMPTION
Martin A. Hassner, Palo Alto, Calif.; Uwe Schwiegelshohn, Dortmund Kirchhoerde, Germany, and Shmuel Winograd, Scarsdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 21, 1994, Ser. No. 327,062
Int. Cl.[6] H03M 7/00
U.S. Cl. 341—59 13 Claims



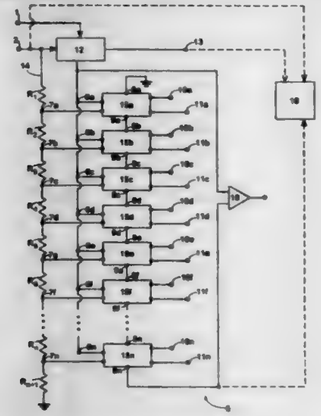
1. A method of enhancing peak detection of analog signals corresponding to patterns of n-bit RLL-encoded data read from a data storage device, comprising the steps of:
from peaks detected from said patterns, generating clock signals having a period consisting of n bit cycles, where n>1;
integrating the analog signal weighted by R sets of n preselected orthogonal staircase gain factors, each of which is active over a different set of n bit cycles to provide R integrated weighted outputs; and
every n-bit cycle, converting said R integrated weighted outputs into n-bit digital data patterns that correspond to the patterns of the n-bit RLL-encoded data.

5,594,437
CIRCUIT AND METHOD OF UNPACKING A SERIAL BITSTREAM
Patrick J. O'Malley, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 1, 1994, Ser. No. 283,350
Int. Cl.[6] G06F 7/20
U.S. Cl. 341—67 19 Claims

1. A bitstream unpacking circuit, comprising:
a shift register having a serial input, a clock input and a parallel output, said serial input being coupled for receiving a serial data stream, said clock input being coupled for receiving a clock signal;
a data storage circuit having a data input coupled to said parallel output of said shift register;
a counter having a clock input, a reset input and an output, said clock input being coupled for receiving said clock signal, said output providing a count value;
first means coupled for receiving said parallel output, said count value, a size control signal and a condition control signal, said first means comparing said count value to a first value of said size control signal and generating a reset control signal and an update control signal upon detecting a match, said reset control signal being applied to said reset input of said counter to reset said counter upon detecting said match, said update control signal having a value determined by a first value of said condition control signal; and
second means coupled for receiving said update control signal and generating a second value of said size control signal and a second value of said condition control signal in response to said update control signal.

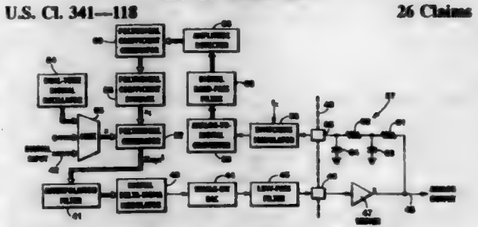


5,594,438
ANALOG-TO-DIGITAL CONVERTER
Spyros Panacoumis, Chicago, Ill., assignor to Cennoid Technologies Inc., Oakbrook, Ill.
Filed Sep. 30, 1994, Ser. No. 316,255
Int. Cl.[6] H03M 1/02
U.S. Cl. 341—166 21 Claims



1. An A/D converter circuit comprising:
a. a modifying filter comprising:
a first terminal for receiving an original analog input signal;
a first generating means coupled to the first terminal for generating a modified analog input signal that is received at a second terminal and that is equal to the original analog input signal when the original analog input signal is positive, and that is equal to a shifted analog input signal when the original analog input signal is negative, wherein the shifted analog input signal has a positive sign and has a magnitude equal to the magnitude of the original analog input signal;
an original reference terminal coupled to the first generating means for providing a predetermined original reference signal that has a negative sign and a magnitude greater than the magnitude of any original analog input signal;
b. a plurality of N converter stages, connected in parallel to the modifying filter and to each other, each converter stage comprising:
a modified analog input terminal coupled to the second terminal for receiving the modified analog input signal;
a stage reference terminal coupled to the original reference terminal for receiving a stage reference signal that has a negative sign and that is equal to the original reference signal divided by a power of two, where the power is equal to the number of preceding converter stages plus one;
an analog stage input terminal for receiving an analog stage input signal that is predetermined for the first stage, and that is received from the preceding stage for all stages except the first stage;
a generating means for generating a difference signal where the difference signal is equal to the sum of the magnitudes of the analog stage input signal and the stage reference signal;
a first comparing means for comparing the difference signal with the modified analog input signal and generating a first signal when the modified analog input signal is smaller than the difference signal and otherwise generating a second signal;
a first switching means responsive to the comparing means and having first and second switching modes, where the first switching mode is activated when the comparing means generates its first signal, and where the second switching mode is activated when the comparing means generates its second signal;
a digital stage output terminal coupled to the switching means for sending a first digital stage output signal when the first switching mode is activated, and for sending a second stage digital output signal when the second switching mode is activated; and
an analog stage output terminal coupled to the switching means for sending an analog stage output signal to the next converter stage, where the analog stage output signal is equal to the analog stage input signal when the first switching mode is activated, and where the analog stage output signal is equal to the difference signal when the second switching mode is activated, except that the analog stage output signal for the Nth converter stage is not sent to another converter stage;
wherein each stage digital output signal represents one bit of an N-bit binary word, where N is an integer, where the binary word represents the amplitude of the modified analog input signal, and where the most significant bit of the binary word is generated by the first converter stage, and each subsequent converter stage generates the next less significant bit; and
c. a second comparing means for comparing the modified analog input signal to the analog stage output signal of the Nth converter stage, and for generating a predetermined signal when they are equal.

5,594,439
DIAGNOSING PROBLEMS IN AN ELECTRICAL SYSTEM BY MONITORING CHANGES IN NONLINEAR CHARACTERISTICS
Eric J. Swanson, Buda, Tex., assignor to Crystal Semiconductor Corporation, Austin, Tex.
Filed Aug. 24, 1994, Ser. No. 295,451
Int. Cl.[6] H03M 1/06
U.S. Cl. 341—118 26 Claims



13. An electronic system comprising, in combination:
a) a signal processing circuit;
b) digital circuitry connected to said signal processing circuit for measuring nonlinearity of a transfer characteristic of said signal processing circuit; and

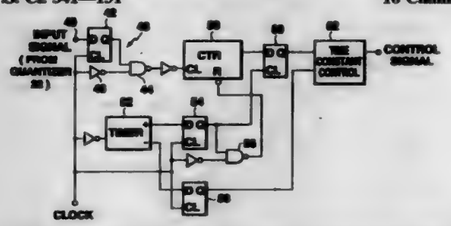
c) a programmed controller connected to said digital circuitry for controlling said digital circuitry and receiving from said digital circuitry measurements of said nonlinearity of said transfer characteristic of said signal processing circuit; said programmed controller being programmed for obtaining from said digital circuitry a first measurement of said nonlinearity of said transfer characteristic of said signal processing circuit, and at a later time, obtaining from said digital circuitry a second measurement of said nonlinearity of said transfer characteristic of said signal processing circuit, and comparing said second measurement to said first measurement to detect an abnormal change in said nonlinearity of said transfer characteristic of said electrical circuit.

5,594,440

A/D CONVERTER HAVING A VARIABLE INTEGRATOR WHOSE TIME CONSTANT CAN BE CHANGED

Masato Onaya, Gunma-ken, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jul. 20, 1994, Ser. No. 278,174
Claims priority, application Japan, Jul. 21, 1993, 5-179514
Int. Cl.[6] H03M 1/12
U.S. Cl. 341—131 **16 Claims**



1. An A/D converter having characteristics that can be changed, said A/D converter comprising:

a quantizer for quantizing an intermediate analog signal for outputting a pulse string signal;

a variable integrator for integrating the output of said quantizer with any desired time constant;

an adder for adding an input analog signal and an output of said variable integrator and supplying a result of the addition to said quantizer as the intermediate analog signal;

change direction detection means for detecting a direction of change in the input analog signal, said change direction detection means detecting a change in which the input analog signal becomes large versus a change in which the input analog signal becomes small; and

time constant control means for controlling the time constant of said variable integrator in response to an output signal from said change direction detection means,

wherein the time constant control means operates such that the time constant changes at a first speed when the input analog signal becomes large and the time constant changes at a second speed, which is slower than the first speed, when the input analog signal becomes small.

5,594,441

D/A CONVERTER WITH CONSTANT GATE VOLTAGE

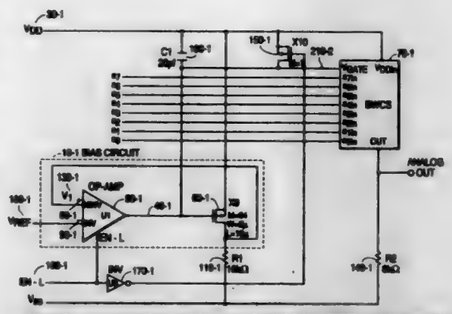
Edward P. Coleman, Jr., Fairport, N.Y., assignor to PSC, Inc., Webster, N.Y.

Filed Dec. 30, 1994, Ser. No. 366,566
Int. Cl.[6] H03M 1/06
U.S. Cl. 341—136 **21 Claims**

1. A Digital to Analog converter, comprising:

a bias FET having a gate, a source and a drain, said bias FET having a predetermined channel width and length and said source connected to a high DC voltage terminal;

an amplifier having an output terminal, an inverting input terminal and a non-inverting input terminal, said output terminal



directly connected to said gate of said bias FET, said inverting input connected to a reference voltage, and said non-inverting input connected to said drain of said bias FET, wherein said amplifier acts as a negative feedback amplifier;

a resistor having a first end connected to said drain of said bias FET and having a second end connected to a low DC voltage terminal; and

a weighted current source having n input ports each receiving one bit of an n-bit digital word, having n FETs each respectively connected to one of said n input ports, having a gate input connected to said output terminal of said amplifier, and having respective drains of each of said n FETs coupled together at an output port, wherein said gate input is connected to respective gates of said n FETs and wherein each of said n FETs has said predetermined channel width and length, and wherein

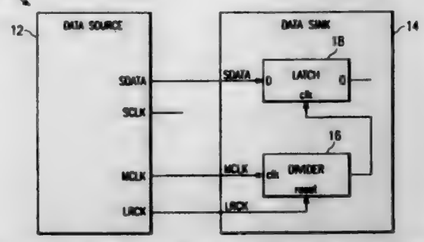
said amplifier supplies a compensated gate voltage on said output terminal of said amplifier to each of said n FETs to compensate for changes in operating characteristics in said Digital to Analog converter.

5,594,442

CONFIGURATION PROGRAMMING OF A DIGITAL AUDIO SERIAL PORT USING NO ADDITIONAL PINS

John J. Paulos; Gautham D. Kamath, and Andrew W. Krone, all of Austin, Tex., assignors to Crystal Semiconductor Corporation, Austin, Tex.

Filed Mar. 15, 1994, Ser. No. 212,978
Int. Cl.[6] H03M 6/66
U.S. Cl. 341—143 **34 Claims**



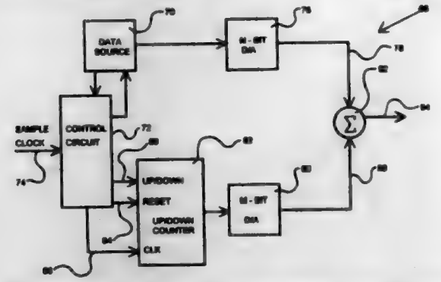
1. A delta-sigma digital-to-analog converter having a three-wire serial interface comprising a serial data terminal, a serial data clock terminal, and a left/right clock terminal, together with a pin for receiving a master clock signal, and providing left and right channels of analog signal, wherein said serial data clock can be generated inside said digital-to-analog converter by dividing said master clock signal, and wherein said serial data clock terminal is able to receive data for setting one or more of the functions selected from the group of serial data format, test mode, and de-emphasis selection.

5,594,443

D/A CONVERTER NOISE REDUCTION SYSTEM

Peter A. Lam, 20104 Wayne Ave., Torrance, Calif. 90503

Filed Apr. 28, 1994, Ser. No. 234,281
Int. Cl.[6] H03M 1/66
U.S. Cl. 341—144 **51 Claims**



1. Apparatus responsive to a first sequence of digital samples where each sample contains N bits, said apparatus comprising:

means for fetching P successively produced digital samples;

interpolation means for generating a plurality of digital pseudo-samples intermediate to each pair of said successively produced digital samples, each pseudo-sample being represented by M bits; and

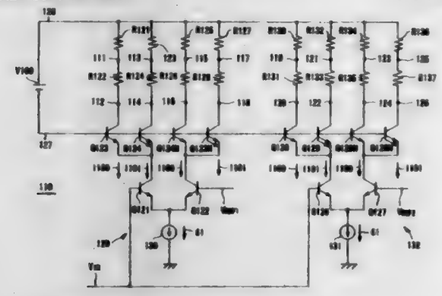
means for interleaving said first digital sample, said generated digital pseudo-samples and said second digital sample to form a second sequence of digital samples.

5,594,444

ANALOG-TO-DIGITAL CONVERTER HAVING REDUCED CIRCUIT AREA

Chikara Yamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 163,763, Dec. 9, 1993, Pat. No. 5,598,161. This application Mar. 5, 1996, Ser. No. 611,085
Claims priority, application Japan, Dec. 18, 1992, 4-355504; Dec. 22, 1992, 4-356837; Dec. 25, 1992, 4-358926; Dec. 29, 1992, 4-361550; Dec. 29, 1992, 4-361551
Int. Cl.[6] H03M 1/36; 1/14
U.S. Cl. 341—159 **6 Claims**



1. A voltage comparison circuit comprising:

a first differential amplifying means for comparing an input analog signal with a first reference potential to produce a first output current and a second output current;

a second differential amplifying means for comparing the input analog signal with a second reference potential to produce a third output current and a fourth output current;

a first current dividing means for dividing the first output current to produce a plurality of divided output currents as first divided output currents;

a second current dividing means for dividing the second output current to produce a plurality of divided output currents as second divided output currents;

a third current dividing means for dividing the third output current to produce a plurality of divided output currents as third divided output currents;

a fourth current dividing means for dividing the fourth output current to produce a plurality of output currents as fourth divided output currents;

a first output means for dividing each of a plurality of output voltages that are generated in accordance with the plurality of output currents as the first divided output currents into a plurality of output voltages, and for outputting the plurality of division-generated output voltages as reversed-phase comparison outputs that are in reversed-phase with the input analog signal;

a second output means for dividing each of a plurality of output voltages that are generated in accordance with the plurality of output currents as the second divided output currents into a plurality of output voltages, and for outputting the plurality of division-generated output voltages as in-phase comparison outputs that are in-phase with the input analog signal;

a third output means for dividing each of a plurality of output voltages that are generated in accordance with the plurality of output currents as the third divided output currents into a plurality of output voltages, and for outputting the plurality of division-generated output voltages as in-phase comparison outputs that are in-phase with the input analog signal;

a fourth output means for dividing each of a plurality of output voltages that are generated in accordance with the plurality of output currents as the fourth divided output currents into a plurality of output voltages, and for outputting the plurality of division-generated output voltages as reversed-phase comparison outputs that are reversed-phase with the input analog signal; and

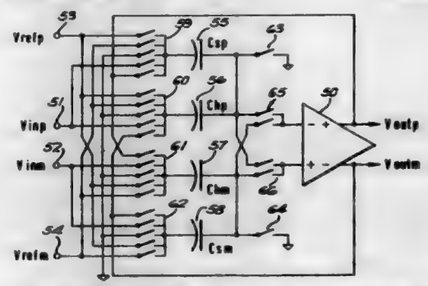
a processing means for outputting comparison outputs of the input analog signal with respect to virtual potentials that internally divide the first and second reference potentials at an arbitrary ratio by comparing comparison outputs in reversed-phase with each other that are selected from the plurality of comparison outputs produced by the first, second, third, and fourth output means.

5,594,445

PIPELINED ANALOG TO DIGITAL CONVERTERS AND INTERSTAGE AMPLIFIERS FOR SUCH CONVERTERS

Bernard Ginetti, Antibes, France, assignor to VLSI Technology, Inc., San Jose, Calif.

PCT No. PCT/EP93/03051, § 371 Date Jul. 20, 1995, § 102(e) Date Jul. 20, 1995, PCT Pub. No. WO94/11951, PCT Pub. Date May 26, 1994
PCT Filed Nov. 2, 1993, Ser. No. 448,597
Claims priority, application United Kingdom, Nov. 19, 1992, 9224238
Int. Cl.[6] H03M 1/42
U.S. Cl. 341—162 **8 Claims**



1. An interstage amplifier for a pipelined analog to digital converter, comprising an operational amplifier (**50**) having balanced amplifying paths; a first pair of capacitors (**55,58**); a second pair of capacitors (**56,57**); and switching (**59–66**) means connected to the capacitors and said amplifier and for:

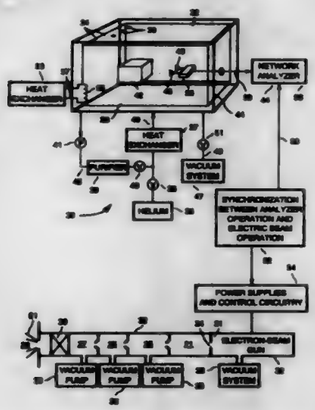
(i) during a first phase, enabling said first pair of capacitors to receive a respective first sample of a first signal;
(ii) during a second phase, enabling said second pair of capacitors to receive a second sample of the first signal;
(iii) during a third phase, enabling said first pair of capacitors to receive a first sample of a second or reference signal and to enable charge to be transferred from each of said first pair of capacitors by way of a respective path of the amplifier to a respective one of said second pair of capacitors; and
(iv) during a fourth phase, enabling said second pair of capacitors to receive a second sample of said second or reference signal and to enable charge to be transferred from each of said second pair of capacitors by way of a respective path of the amplifier to the respective one of said first pair of capacitors.

5,594,446

BROADBAND ELECTROMAGNETIC ABSORPTION VIA A COLLISIONAL HELIUM PLASMA

Robert J. Vidmar, Stanford; Donald J. Eckstrom, Portola Valley; Joseph J. Rath, San Carlos, and Walter G. Chestnut, Foster City, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jan. 28, 1988, Ser. No. 149,574
Int. Cl.[6] H01Q *17/00*
U.S. Cl. 342—1 **20 Claims**



1. An electromagnetic wave absorption system for absorbing electromagnetic waves over a frequency range from about 100 megahertz through about 10 gigahertz, which comprises a vessel for confining a body of helium gas, means for supplying helium gas to said vessel and maintaining said gas at a pressure from about atmosphere (750 mm of Hg) to about 10 torr, and at least one ionization source coupled to said vessel for ionizing the helium gas to produce a plasma.

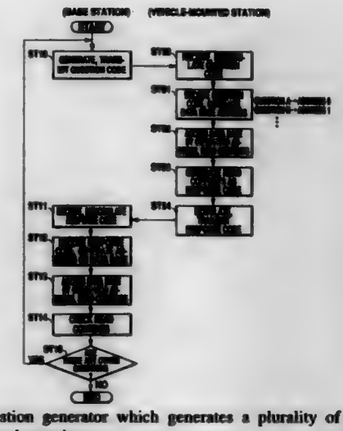
5,594,447

MOVING TARGET IDENTIFYING SYSTEM IN A BASE STATION RADAR UNIT FOR SPECIFYING INFORMATION ABOUT MOVING TARGETS CARRYING A MOBILE STATION RADAR UNIT

Ryumboro Usui; Masafumi Iwamoto; Kazuhiko Yamamoto; Takahiko Fujisaka, and Michimasa Kondo, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 457,614
Claims priority, application Japan, Jan. 11, 1995, 7-2682
Int. Cl.[6] G01S *13/76*
U.S. Cl. 342—42 **23 Claims**

1. A moving target identifying system comprising a base station radar unit comprising:



a question generator which generates a plurality of predetermined questions,
a base station transmitter which modulates and outputs said plurality of question signals output by said question generator,
a base station antenna which radiates the output of said base station transmitter outside said base station, and receives signals from outside said base station,
a base station receiver which processes signals received by said base station antenna,
a moving target information data base wherein anticipated responses to said plurality of questions are stored,
a response demodulator which demodulates a plurality of response signals contained in the output of said base station receiver so as to obtain a plurality of responses, and reads a corresponding plurality of anticipated responses from said moving target information data base based on these demodulated results, and
identifying means which identifies moving targets by comparing said plurality of responses with said plurality of anticipated responses, and further comprises:
a mobile station radar unit comprising:
a mobile station antenna which receives transmitted signals from said base station radar unit, and radiates transmitted signals outside said mobile station,
a mobile station receiver which processes signals received by said mobile station antenna,
a response data base containing pre-stored response data corresponding to said plurality of questions from said base station radar unit,
a question demodulator which demodulates said plurality of question signals contained in the output of said mobile station receiver, and reads a corresponding plurality of responses from said response data base based on these demodulated results,
a response generator which generates a plurality of response signals based on the output of said question demodulator, and
a mobile station transmitter which modulates said plurality of response signals output by said response generator, and outputs the results to said mobile station antenna.

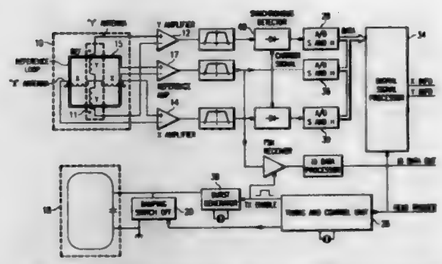
5,594,448

HIGHLY ACCURATE RF-ID POSITIONING SYSTEM

Lock d'Hont, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 141,444, Oct. 22, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 356,418
Int. Cl.[6] G01S *13/74*
U.S. Cl. 342—44 **20 Claims**

1. An antenna configuration for accurately determining the position of a transponder in an RF-ID system comprising:



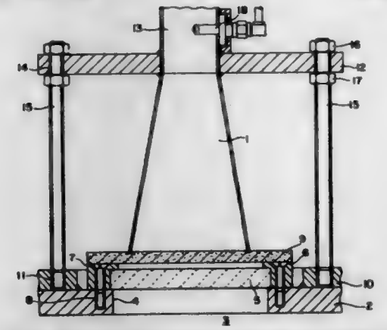
a first and a second balanced receive antenna for receiving a fieldstrength voltage and a phase measurement of a response telegram wherein said first and second receive antennas are physically rotated 90 degrees relative to one another;
a third reference antenna for receiving a fieldstrength voltage RF signal and a phase measurement of said response telegram and for providing a phase measurement of said response telegram;
a transmitter antenna for transmitting a charge-up signal to said transponder wherein said transponder is charged to a maximum allowable voltage;
a first, a second and a third receiver for narrowband filtering said receive fieldstrength voltages of said response telegram;
a synchronous detector circuitry for rectifying said filtered response signal via phase information of said response telegram provided by said reference antenna;
a first, a second and a third sample and hold circuit for sampling said synchronized signals for a first portion of said response telegram; and
a processing circuit for generating a position coordinate relating to a position of said transponder from said sampled signals.

5,594,449

TANK-CONTENTS LEVEL MEASURING ASSEMBLY

Johanngeorg Otto, Aalen-Hofherrnweiler, Germany, assignor to Endress + Hauser GmbH + Co., Maulburg, Germany

PCT No. PCT/DE94/01229, § 371 Date Jun. 20, 1995, § 102(e) Date Jun. 20, 1995, PCT Pub. No. WO95/12113, PCT Pub. Date May 4, 1995
PCT Filed Oct. 17, 1994, Ser. No. 464,614
Claims priority, application Germany, Oct. 26, 1993, 43 36 494.2
Int. Cl.[6] G01S *13/08*
U.S. Cl. 342—124 **13 Claims**



1. A tank-contents level measuring assembly comprising a horn antenna which transmits short electromagnetic waves through an opening in the tank toward the surface of contents of the tank, which electromagnetic waves are reflected at the surface and received by the same horn antenna, characterized by the following features:

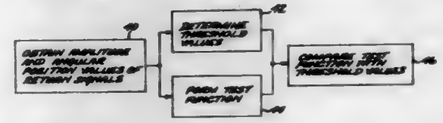
a) The level measuring assembly, including the horn antenna (1), is disposed outside an interior (3) of the tank at a tank wall (2) substantially along an axis of symmetry of the opening (4);
b) the opening (4) is closed with a plate (5);
c) a damping layer (9) is interposed between a microwave coupling element (18) of the level measuring assembly and a surface of the plate (5); and
d) the damping layer (9) occupies such a position between the microwave coupling element (18) and the plate (5) that each radiated or reflected electromagnetic wave passing through the damping layer is attenuated.

5,594,450

RADAR SYSTEM AND METHOD FOR DETECTING TARGETS CLUTTER USING TARGET INTENSITY AND ANGULAR POSITION

Michael B. Scholer, 11681 N. Europa Pl., Tucson, Ariz. 85737

Filed Jun. 7, 1995, Ser. No. 485,743
Int. Cl.[6] G01S *13/534*
U.S. Cl. 342—159 **20 Claims**



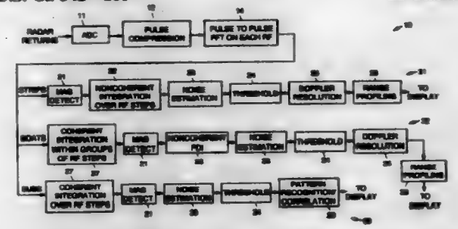
1. A radar system, comprising:
a radar receiver including means for determining the amplitude and the angular position of a plurality of return signals; and
means for identifying targets and clutter among the return signals, the means for identifying including
means for forming a test function of amplitudes and angular positions of the return signals, and
means for comparing the test function with a threshold value.

5,594,451

PROCESSING METHOD USING AN ADVANCED RADAR WAVEFORM FOR SIMULTANEOUS MATCHED PROCESSING AND RANGE PROFILING OF DIFFERENT SIZE TARGETS

Kapriel V. Krikorian, Agoura, and Arnold E. Victor, Marina del Rey, both of Calif., assignors to Hughes Aircraft Company

Filed Jun. 6, 1995, Ser. No. 466,553
Int. Cl.[6] G01S *13/53*
U.S. Cl. 342—160 **12 Claims**



1. A method of processing radar returns derived from a predetermined radar waveform that permits simultaneous match processing and profiling of different size targets, said method comprising the steps of:
transmitting radar signals having a predetermined radar waveform;
digitizing radar returns from targets;
pulse compressing the digitized radar returns;
pulse to pulse Fourier transforming the pulse compressed radar returns on each RF step;

simultaneously processing the Fourier transformed radar returns by first, second, and third processing channels that correspond to targets of different sizes; and wherein:

in the first processing channel, the Fourier transformed radar returns are processed by:

magnitude detecting the Fourier transformed radar returns from each of the RF steps;

noncoherently integrating the magnitude detected returns over the RF steps in the waveform;

estimating the noise content in the noncoherently integrated returns;

thresholding the returns to strip off noise contained therein;

coherently integrating the thresholded returns over the dwell time to provide fine Doppler resolution;

range profiling the coherently integrated returns; and

displaying the range profiled returns;

in the second processing channel, the Fourier transformed radar returns are processed by:

dividing the RF steps into groups;

coherently integrating the radar returns within each group of RF steps over the RF steps in the waveform;

magnitude detecting the coherently integrated returns;

noncoherently integrating the magnitude detected returns over the RF groups in the waveform;

estimating the noise content in the noncoherently integrated returns;

thresholding the returns to strip off noise contained therein;

coherently integrating the thresholded returns over the dwell time to provide fine Doppler resolution;

range profiling the coherently integrated returns; and

displaying the range profiled returns; and

in the third processing channel, the Fourier transformed radar returns are processed by:

coherently integrating the radar returns over the RF steps in the waveform;

magnitude detecting the coherently integrated returns;

estimating the noise content **23** in the magnitude detected returns;

thresholding the returns to strip off noise contained therein;

processing the thresholded returns to recognize patterns therein and correlate the patterns to known targets; and

displaying the recognized and correlated returns.

5,594,452

METHOD AND SYSTEM FOR LOCATING AN UNKNOWN TRANSMITTER USING CALIBRATED OSCILLATOR PHASES

John C. Webber, Herndon, Va., and Curtis A. Knight, Washington, D.C., assignors to Interferometrics, Inc., Vienna, Va.

Filed Dec. 1, 1994, Ser. No. 352,779

Int. Cl.[6] H04B 7/185

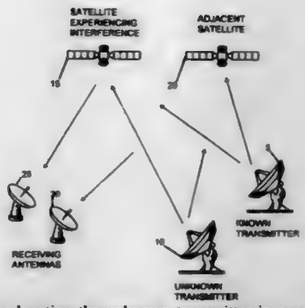
U.S. Cl. 342—353 **20 Claims**

14. A system for phase calibrating signals to locate an unknown transmitter, comprising:

at least two satellites receiving and retransmitting an interfering signal and a phase-calibrating signal;

at least two antennas, each antenna simultaneously receiving a band of signals from a respective satellite, the band of signals including the interfering signal and the phase-calibrating signal;

means for phase calibrating the received signals; and



means for locating the unknown transmitter in accordance with the phase-calibrated signals,

wherein the phase-calibrating means includes means for simultaneously cross-correlating the band of signals.

5,594,453

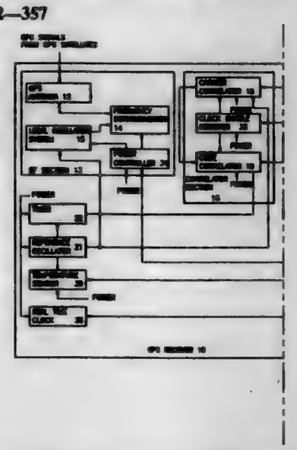
GPS RECEIVER HAVING A RAPID ACQUISITION OF GPS SATELLITE SIGNALS

Eric B. Rodal, Cupertino; Dominic G. Farmer, Milpitas, and Chung Y. Lau, Sunnyvale, all of Calif., assignors to Trimble Navigation, Ltd, Sunnyvale, Calif.

Filed Nov. 1, 1994, Ser. No. 332,958

Int. Cl.[6] G01S 5/02

U.S. Cl. 342—357 **17 Claims**



15. A method for rapidly acquiring a GPS signal from one or more GPS satellites in a GPS receiver when said receiver enters a normal mode after a time duration in a low power standby mode, the method including steps of:

generating a continuous reference frequency;

receiving said GPS signal with said GPS receiver when said receiver enters said normal mode from said standby mode;

generating an initial frequency adjustment for correcting for a drift in said reference frequency during said standby mode; and

providing a correlation signal for a correlation of said GPS signal with said reference frequency and said initial frequency adjustment.

5,594,454

GLOBAL POSITIONING SYSTEM (GPS) LINKED SATELLITE AND MISSILE COMMUNICATION SYSTEMS

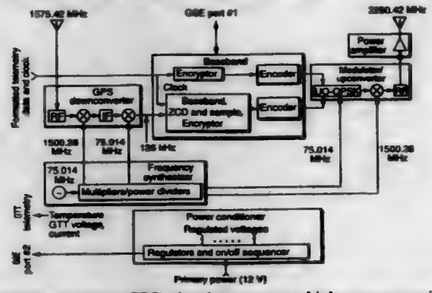
William S. Devereux, Glenwood; Michael H. Boehme, Sykesville; Lloyd Linstrom, Columbia; Thomas R. McKnight, Jr., Ellicott City; Robert C. Moore, Laurel; John R. Meyer, Baltimore; Paul R. Snow, Ellicott City, and Paul D. Grimm, Severna Park, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Continuation of Ser. No. 227,312, Apr. 13, 1994, abandoned. This application Apr. 10, 1996, Ser. No. 630,559

Int. Cl.[6] G01S 5/02

U.S. Cl. 342—357 **10 Claims**

1. A device for using telemetry data from a missile and global



positioning system (GPS) signals to generate high accuracy trajectory estimates for the missile, the device comprising:

means for downconverting the GPS signals;

means for simultaneously processing the downconverted GPS signals and the missile telemetry data;

means for modulating a carrier signal using the downconverted and processed GPS signals and the processed missile telemetry data; and

means for transmitting the modulated carrier signal, the modulated carrier signal being used to generate the missile trajectory estimates.

5,594,455

BIDIRECTIONAL PRINTED ANTENNA

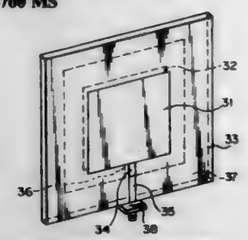
Toshikazu Hori, and Keizo Cho, both of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 488,055

Claims priority, application Japan, Jun. 13, 1994, 6-153122

Int. Cl.[6] H01Q 1/38;21/00

U.S. Cl. 343—700 MS **14 Claims**



1. A bidirectional printed antenna comprising:

a dielectric substrate having first and second surfaces which are substantially in parallel;

at least one pair of radiation element conductors having the same shape and the same size, each pair of said radiation element conductors being arranged on said first and second surfaces at positions opposing with each other, respectively;

a feeding circuit coupled to at least one edge of each of said radiation element conductors;

a ground conductor arranged on said second surface, said ground conductor covering at least an area outside of said at least one edge of said radiation element conductor on said second surface, coupled to said feeding circuit, and an area outside of an opposite edge with respect to said radiation element conductor on said second surface by leaving a gap of a predetermined width between the radiation element conductor on said second surface and the ground conductor;

a first strip conductor arranged on said first surface and connected to said radiation element conductor on the first surface; and

a second strip conductor arranged on said second surface, for connecting said radiation element conductor on the second surface with said ground conductor,

said feeding circuit including a first unbalanced feed line which consists of said ground conductor and said first strip conductor, and a balanced feed line which consists of said first and second strip conductors.

5,594,456

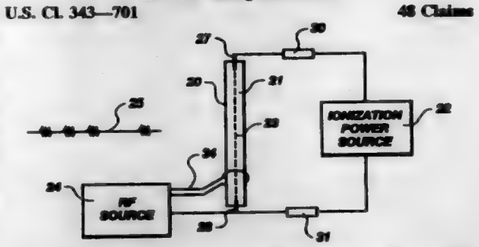
GAS TUBE RF ANTENNA

Elwood G. Norris, Poway, Calif., and David W. O'Bryant, Sandy, Utah, assignors to Patriot Scientific Corporation, Poway, Calif.

Filed Sep. 7, 1994, Ser. No. 302,129

Int. Cl.[6] H01Q 1/26;13/10

U.S. Cl. 343—701 **48 Claims**



1. An antenna device for transmitting a short pulse duration signal of predetermined radio frequency, said device comprising:

a gas filled tube;

means for generating an electrically conductive path along a length of the gas filled tube corresponding to a resonant multiple of a wavelength of the predetermined radio frequency;

means for decoupling from the electrically conductive path along a length of the gas filled tube any undesired radio frequency signals that might be produced by a power source generating the electrically conductive path; and

a radio frequency signal transmission means coupled to the gas filled tube for supplying the short pulse radio frequency signal to the electrically conductive path for transmission by the antenna.

5,594,457

RETRACTABLE ANTENNA

Donald E. Wingo, Lincoln, Nebr., assignor to Centurion International, Inc., Lincoln, Nebr.

Filed Apr. 21, 1995, Ser. No. 426,815

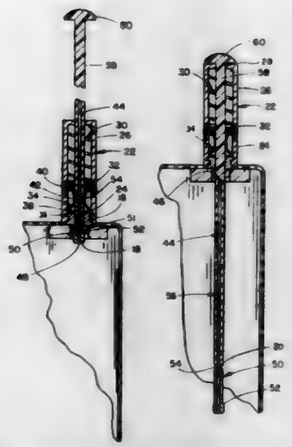
Int. Cl.[6] H01Q 1/24

U.S. Cl. 343—702 **12 Claims**

10. A retractable antenna for a communication device including a first housing having a receptacle at the upper end thereof which is RF coupled to the circuitry of the device, comprising:

an elongated radiator movable between extended and retracted positions with respect to said first housing;

a helical radiator fixed into position with respect to said first housing so that said helical radiator remains in its said fixed



position regardless of whether said elongated radiator is in its extended or retracted positions;

said helical radiator being RF operatively coupled to said receptacle when said elongated radiator is in its said retracted position;

said helical radiator being RF de-coupled from said receptacle when said elongated radiator is in its said extended position;

said helical radiator being operatively RF coupled to said receptacle when said elongated radiator is in transition between its extended and retracted positions.

5,594,458

COMB GENERATOR, DEVICE AND PROCESS FOR CALIBRATING MEASUREMENT SECTIONS

Heinrich Garn, Vienna; Josef Rasinger, Modling, and Wolfgang Mullner, Landegg, all of Austria, assignors to Oesterreichisches Forschungszentrum Seibersdorf Ges.m.b.H., Seibersdorf, Austria

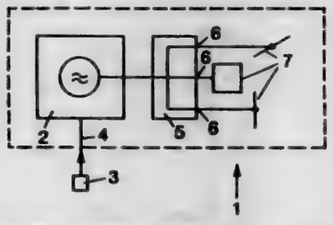
PCT No. PCT/AT90/00119, § 371 Date Jul. 17, 1992, § 102(e) Date Jul. 17, 1992, PCT Pub. No. WO91/09317, PCT Pub. Date Jun. 27, 1991

PCT Filed Dec. 10, 1990, Ser. No. 859,504

Claims priority, application Austria, Dec. 11, 1989, 2796/89

Int. Cl.[6] G01R 29/08

U.S. Cl. 343—703 **43 Claims**



1. A measuring transmitter comprising:

a comb generator which is preferably battery operated and which generates a frequency-stable comb spectrum and an amplitude-stable comb spectrum;

an anteana arrangement for generating selectable field distributions, said anteana arrangement being connected to said comb generator and having at least two antennas of different types;

powering means for connecting said at least two antennas to said comb generator, said powering means connecting said at least two antennas so that said comb generator will power said at least two antennas individually, in series, for use of the measuring transmitter to calibrate measurement sections for measurement of interference fields, and said powering means connecting said at least two antennas so that said comb generator will power said at least two antennas simultaneously, for use of the measuring transmitter as a radio interference simulator, said powering means comprising at least one coupling member for connecting said at least two antennas to said comb generator.

5,594,459

RETRACTABLE/EXTENSIBLE ANTENNA WITH INNER AND OUTER SECTIONS HAVING A FEED POINT COIL AND END MOUNTED COIL

Katsumi Hirota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1995, Ser. No. 518,725

Claims priority, application Japan, Sep. 6, 1994, 6-238427

Int. Cl.[6] H01Q 9/00

U.S. Cl. 343—749 **5 Claims**



1. An antenna comprising:

a cylindrical outer conductor;

an inner conductor arranged to be disposed inside the outer conductor, the inner conductor being movable between a first position wherein it has been pulled out from one end of the outer conductor and a second position wherein it has been received into the outer conductor;

a first coil connected between a feed point of the antenna and an end portion of the outer conductor at a feed side thereof;

a second coil mounted on an end portion of the inner conductor projecting from the outer conductor; and

an electrical contact mounted on the feed point,

wherein when the inner conductor has been received into the outer conductor the inner conductor contacts the electrical contact and the first coil is shorted and the electrical length is supplemented by the second coil.

5,594,460

TRACKING ARRAY ANTENNA SYSTEM

Kouichi Eguchi, Mitaka, Japan, assignor to Japan Radio Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 556,098

Claims priority, application Japan, Nov. 16, 1994, 6-282321; Oct. 6, 1995, 7-260273

Int. Cl.[6] H01Q 3/00

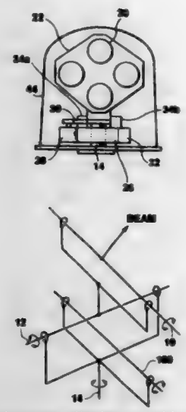
U.S. Cl. 343—765 **7 Claims**

1. An array antenna system, suitable to be mounted on a moving platform, comprising an array antenna supported by and steerable about a mechanical elevation axis, said mechanical elevation axis being supported by and steerable about a mechanical azimuth axis, and said array antenna having a beam which selectively directs to of a plurality of beam positions around a first virtual cross-elevation axis that is perpendicular to said mechanical elevation axis and has no mechanical substance,

beam-switch means for generating a tracking signal based on a signal received by said array antenna by selecting at least two of said plurality of beam positions and by forming the beam such that the beam alternately directs toward selected beam positions,

second virtual cross-elevation axis inclination angle detecting means for generating a first inclination angle signal by directly or indirectly detecting an inclination angle of said moving platform a second virtual cross-elevation axis that is perpendicular to said mechanical elevation axis and has no mechanical substance, and

azimuth axis beam-switch tracking means for steering said array antenna about said mechanical azimuth axis according to said tracking signal such that the azimuth of the array antenna approaches the azimuth of a target when it is determined that said moving platform is not inclined about said second virtual cross-elevation axis on the basis of at least said first inclination angle signal.



5,594,461

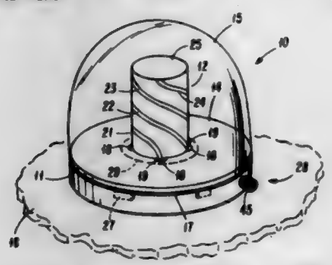
LOW LOSS QUADRATURE MATCHING NETWORK FOR QUADRIFILAR HELIX ANTENNA

Gregory A. O'Neill, Jr., Cedar Rapids, Iowa, assignor to Rockwell International Corp., Seal Beach, Calif.

Continuation of Ser. No. 126,836, Sep. 24, 1993, abandoned. This application May 25, 1995, Ser. No. 450,737

Int. Cl.[6] H01Q 1/36

U.S. Cl. 343—895 **3 Claims**



1. A quadrature matching network in a quadrifilar antenna assembly of a quadrifilar helical antenna of first, second, third and fourth antenna elements of a radio, each antenna element having a proximal end and a distal end being a free end, each antenna element being coupled, at its proximal end only, to the quadrature matching network each antenna element having an impedance, and each antenna element communicating signals in a 90 degree phase relationship with respect to any adjacent one of the antenna elements, the quadrature matching network comprising:

a first transmission line element of a characteristic impedance matching the impedance of the second antenna element to the impedance of the first antenna element, the first transmission line element coupling the second antenna element to the first antenna element and transforming the phase of the communicated signal of the second antenna element to the phase of the communicated signal of the first antenna element;

a second transmission line element of a characteristic impedance matching the impedance of the fourth antenna element to the impedance of the third antenna element, the second transmission line element coupling the fourth antenna element to the third antenna element and transforming the phase of the communicated signal of the fourth antenna element to the phase of the communicated signal of the third antenna element;

a third transmission line element having a characteristic impedance matching the impedance of the coupled third and fourth antenna elements to the impedance of the coupled first and second antenna elements, the third transmission line element coupling the third and fourth anteana elements to the first and second antenna elements and transforming the phase of the communicated signal of the coupled third and fourth antenna elements to the phase of the communicated signal of the coupled first and second antenna elements; and

a fourth transmission line element having a characteristic impedance matching the impedance of the coupled first, second, third and fourth antenna elements to the impedance of the radio wherein said first, second, third and fourth transmission line elements are combined on a single circuit board spaced at the proximal ends of said first, second, third and fourth antenna elements.

5,594,462

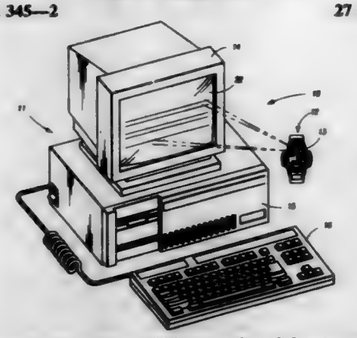
CALIBRATING DATA TRANSMISSION LINE SPACING ON A FRAME-SCANNING DISPLAY DEVICE FOR OPTICALLY TRANSMITTING DATA TO A PORTABLE PROGRAMMABLE DEVICE

Neil S. Fishman, Bothell; J. Mark Miller, Kirkland, both of Wash.; Thomas J. Dvorachek, III, Kensington, and Philip Brzezinski, Middlebury, both of Conn., assignors to Microsoft Corporation, and Timex Corporation

Filed May 5, 1995, Ser. No. 436,987

Int. Cl.[6] G09G 5/00

U.S. Cl. 345—2 **27 Claims**



1. In a computer system which uses selected data transmission raster lines of a frame-scanning display device for serial bit transmission to an external receiving device, wherein the data transmission raster lines are selected from a total number of available raster lines per display frame, a method of calibrating the spacing of the data transmission raster lines relative to each other within the total number of available raster lines to establish a desired serial transmission bit rate, the method comprising the following steps:

setting an internal timer of the computer system to generate timing signals at a predetermined frequency;

counting the number of the timing signals which occur during a selected measurement period;

counting the number of frame scans of frame-scanning display device which occur during the selected measurement period;

spacing the data transmission raster lines relative to each other within the total number of available raster lines in relationship to the counted number of timing signals and the counted number of frame scans, said spacing establishing the desired serial transmission rate to the external receiving device.

5,594,463

DRIVING CIRCUIT FOR DISPLAY APPARATUS, AND METHOD OF DRIVING DISPLAY APPARATUS

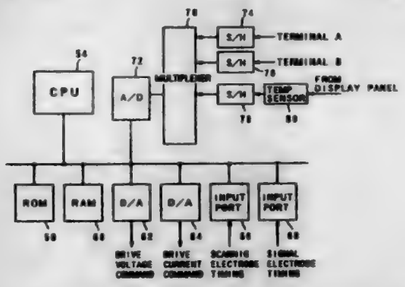
Mitsuno Sakamoto, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan

Filed Jul. 12, 1994, Ser. No. 273,816

Claims priority, application Japan, Jul. 19, 1993, 5-178325; Jul. 19, 1993, 5-178326

Int. Cl.[6] G09G 3/30

U.S. Cl. 345—76 **16 Claims**



1. A driving circuit for a display apparatus having a display panel, which compriaes a plurality of scanning electrodes and a plurality of signal electrodes arranged in a matrix shape, and a plurality of EL (Electroluminescence) elements connected to the scanning electrodes and the signal electrodes at intersections thereof, said driving circuit comprising:

a driving means for supplying a constant current driving signal to said signal electrodes in correspondence with an input signal, to drive said display panel;

a detection means for detecting a voltage drop in a forward direction of the EL element, and outputting a detection signal which indicates the detected voltage drop;

a control means for controlling voltage, which is supplied to said driving means, to have a predetermined voltage value for maintaining said driving means with respect to said EL elements in an initial usage condition and controlling the voltage to have an increased voltage value larger than the predetermined voltage value for compensating a voltage drop component of said EL elements due to degradation of said EL elements with respect to said EL elements in a used condition, in correspondence with the detection signal from said detection means; and

a temperature detection means for detecting a temperature of said display panel, said control means correcting the detected voltage drop of the detection signal on the basis of the detected temperature.

5,594,464

LIQUID CRYSTAL DISPLAY DEVICE HAVING TWO METASTABLE STATES AND DRIVING METHOD THEREFOR

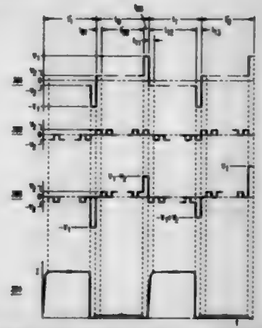
Takaaki Tanaka; Yuzuru Sato, and Hiroaki Nomura, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo-to, Japan

Filed May 7, 1993, Ser. No. 59,226

Claims priority, application Japan, May 7, 1992, 4-114480; Jun. 2, 1992, 4-141442; Jul. 12, 1992, 4-326914; Jul. 16, 1992, 4-189437; Aug. 17, 1992, 4-217932; Dec. 7, 1992, 4-326915; Apr. 26, 1993, 5-121996

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—94 **96 Claims**



21. A liquid crystal display device, comprising:

a chiral nematic liquid crystal medium interposing a pair of electrode substrates having alignment layers formed on their respective surfaces positioned in facing relation thereto, said chiral nematic liquid crystal medium having a twisted structure with a twist angle ϕ_0 in an initial state and having first and second metastable states different from the initial state, the first and second metastable states representing respective relaxation states in said chiral nematic liquid crystal medium after inducing a Frederick's transition therein; and

a drive circuit coupled to said chiral nematic liquid crystal display medium for

(a) applying a reset voltage to induce a Frederick's transition in said chiral nematic liquid crystal medium from a current state, the current state being selected from the group consisting of the initial state, the first metastable state, the second metastable state, and an arbitrary state; and

(b) after application of the reset voltage, applying one of:

(1) a first metastable voltage greater than a critical voltage and less than the reset voltage to place said chiral nematic liquid crystal medium in the first metastable state; and

(2) a second metastable voltage less than both the critical voltage and the reset voltage to place said chiral nematic liquid crystal medium in the second metastable state.

5,594,465

DEVICE FOR DYNAMIC DISPLAY OF INFORMATION RELATING TO AN ELECTRONIC SYSTEM OF VARIABLE CONFIGURATION AND/OR COMPOSITION

Daniel Poulachon, Les Clayes Sous Bois, France, assignor to Sextant Avionique, Meudon La Foret, France

Continuation of Ser. No. 527,160, Sep. 12, 1995, abandoned, which is a continuation of Ser. No. 395,483, Feb. 27, 1995, abandoned, which is a continuation of Ser. No. 99,832, Jul. 30, 1993, abandoned. This application Jul. 3, 1996, Ser. No. 674,992

Claims priority, application France, Jul. 31, 1992, 92 09737

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—98 **11 Claims**

1. A device for the dynamic display of information relating to an electronic system comprising a plurality of removable electronic modules, said device comprising:

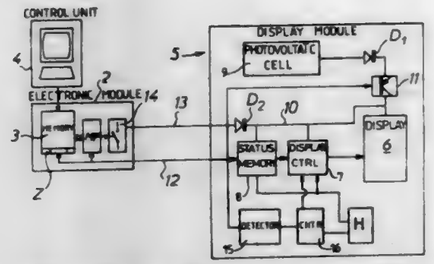
a plurality of local display modules each being connected to a respective electronic module, each local display module comprising, mounted in a support of small dimensions, a display circuit comprising a display driven by a display controller connected to a status memory for displaying on said display digital data stored in said status memory, and a source of renewable energy connected to the display circuit, said digital data relating to hardware and software configuration of the associated electronic module, and

a central display module connected to said system and connected to said local display modules, said central display module comprising means for scanning the status memories of said different local modules, and a microprocessor-managed table of correspondence enabling system identification information to be deduced as a function of the combination of data recorded in the status memories of said local display modules,

each electronic module comprising:

means for elaborating digital data characterizing hardware and software of said electronic module every time said hardware is modified, and

means for transmitting said data into the status memory of the local module connected to said electronic module every time a memory of the electronic module undergoes a downloading operation, said elaborating means being connected through transmitting means to the status memory of the local module connected to said electronic module.



5,594,466

DRIVING DEVICE FOR A DISPLAY PANEL AND A DRIVING METHOD OF THE SAME

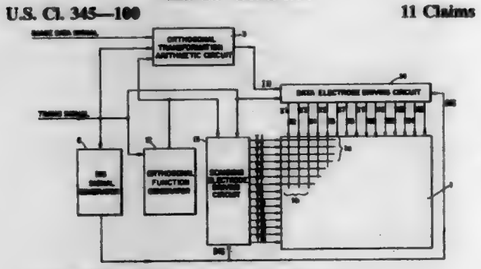
Kunihiko Yamamoto, Kashiba; Kiyohisa Matsui, Yamatokoriyama; Yutaka Ishii, Nara; Norio Yasunishi, Yamatokoriyama; Toshihiro Nakamura, Tenri; Hajime Washio, Hamamatsu, and Koki Taniguchi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 5, 1993, Ser. No. 132,651

Claims priority, application Japan, Oct. 7, 1992, 4-268962; Oct. 30, 1992, 4-293529

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—100 **11 Claims**



7. A method for driving a display apparatus:

the display apparatus comprising:

a matrix type display panel having a first substrate, a second substrate opposed to the first substrate, data electrodes disposed on the first substrate substantially in parallel with a first direction, scanning electrodes disposed substantially in parallel with a second direction on a surface of the second substrate facing to the first substrate, and display dots each provided on a crossing of each of the data electrodes and each of the scanning electrodes, the first direction being vertical to the second direction;

the method comprising the steps of:

generating data signals by orthogonally transforming display data by using orthogonal function series;

applying scanning signals corresponding to the orthogonal function series to the scanning electrodes by a scanning electrode driving circuit; and

applying data voltage signals corresponding to the data signals to the data electrodes by a data electrode driving circuit,

wherein the method further comprising the steps of:

applying a periodic signal to the scanning electrode driving circuit and the data electrode driving circuit;

causing the scanning signals to have first inactive portions in accordance with the periodic signal, the first inactive portions having a predetermined potential and a predetermined period; and

causing the data signals to have second inactive portions in accordance with the period signal, the second inactive portions having a predetermined potential and a predetermined period;

whereby a voltage signal applied to each of the display dots include a plurality of third inactive portions periodically provided in one frame of the voltage signal.

5,594,467

COMPUTER BASED DISPLAY SYSTEM ALLOWING MIXING AND WINDOWING OF GRAPHICS AND VIDEO

Anthony P. Marlton, Essex; Dennis A. Fielder, Cambridge; Victor G. Halstead, deceased, late of Essex, and Trevor R. Stockill, Essex, all of United Kingdom, assignors to Video Logic Ltd., United Kingdom

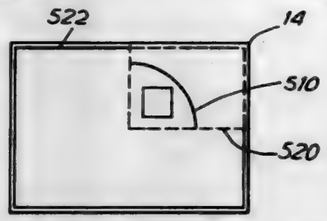
Continuation-in-part of Ser. No. 446,924, Dec. 6, 1989, Pat. No. 5,027,212. This application May 30, 1991, Ser. No. 707,618

Claims priority, application United Kingdom, Dec. 7, 1990, 9026667

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[6] G09G 1/06

U.S. Cl. 345—115 **18 Claims**



1. Signal combining apparatus for combining a computer graphics image and a video image as a visual display on a computer display monitor, comprising:

graphics signal input means for receiving a computer graphics signal from a computer graphics generator;

output means coupled to said computer display monitor for driving said computer display monitor;

means coupled between said graphics input means and said output means, for synchronising said computer display monitor to said graphics signal from said computer graphics generator;

video signal receiving means for receiving a video signal asynchronous with said computer graphics signal, said video signal corresponding to an input video image;

means coupled between said graphics input means and said output means, for generating in said visual display a graphics image corresponding to said graphics signal;

means coupled between said video signal receiving means and said output means, for generating in said visual display a video image corresponding to a portion of said input video image, said video image generating means comprising:

a) video display area defining means for defining in said visual display a display window area,

b) selectable region defining means for defining a selectable input region of said input video image, said selectable region corresponding to said portion of said input video image,

c) horizontal scaling means for magnifying or reducing the horizontal scale of said video image in said display window area,

d) vertical scaling means for magnifying or reducing the vertical scale of said video image in said display window area, and

e) means coupled to said horizontal scaling means, to said vertical scaling means, to said video display area defining means, and to said selectable region defining means, for controlling said horizontal scaling means and said vertical scaling means in response to the size of said display window area relative to the size of said selectable region; and

means for combining said graphics image and said video image in said display window area, pixel by pixel, according to an attribute of said graphics signal.

5,594,468

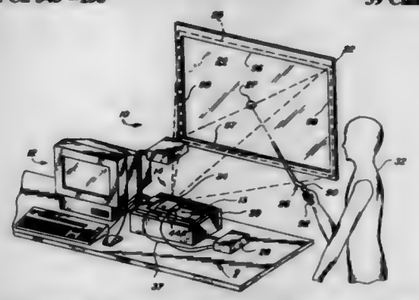
OPTICAL SYSTEM AUXILIARY INPUT CALIBRATION ARRANGEMENT AND METHOD OF USING SAME

Roger N. Marshall, Solana Beach; Richard M. Lizon, Escondido; Jeffrey W. Busch, Santee, and Lane T. Hauck, San Diego, all of Calif., assignors to Proxima Corporation, San Diego, Calif.

Continuation of Ser. No. 276,773, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 829,880, Feb. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 656,883, Feb. 14, 1991, abandoned, and a continuation-in-part of Ser. No. 611,416, Nov. 9, 1990, Pat. No. 5,181,015, which is a continuation-in-part of Ser. No. 433,029, Nov. 7, 1989, abandoned. This application Nov. 21, 1994, Ser. No. 342,814

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—158 **39 Claims**



1. A system for controlling a projected video image with auxiliary control light projected onto a viewing surface reflecting the projected video image, comprising:

means for generating a bright calibration video signal indicative of the combination of the projected video image and background light to facilitate discriminating accurately the projected video image from the background light reflecting from the viewing surface, said video signal having a minimum value and a maximum value;

means for determining the minimum value of said bright calibration video signal above a given background light level to facilitate the elimination of a portion of said video signal indicative of the background light;

means for storing the determined minimum value to facilitate modifying said video signal above said given background light level thereafter to facilitate responding to the auxiliary control light projected onto the viewing surface;

means for adjusting the value of said bright calibration video signal from said maximum value to a lesser value, said lesser value being equal to the maximum value less the stored minimum value to generate a modified video signal indicative of the projected video image only, said modified video signal having another minimum value and another maximum value; and

means for adjusting the value of a reference level signal to be greater than said lesser value to distinguish a video signal indicative of an auxiliary control light image from a video signal indicative of the combination of the projected video image and background light to facilitate discrimination accurately the projected auxiliary control light from the projected video image light reflecting from the viewing surface;

whereby the auxiliary control light is enabled to control the projected liquid crystal display image when projected onto the viewing surface.

5,594,469

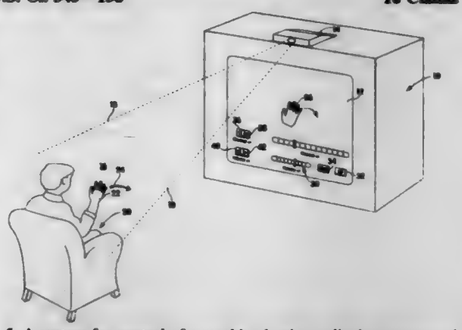
HAND GESTURE MACHINE CONTROL SYSTEM

William T. Freeman, Newton, Mass., and Craig D. Weissman, Coral Springs, Fla., assignors to Mitsubishi Electric Information Technology Center America Inc., Cambridge, Mass.

Filed Feb. 21, 1995, Ser. No. 391,955

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—158 **16 Claims**



1. A system for control of a machine having a display screen and means for controlling said machine via actuating on-screen machine control icons, comprising:

means for detecting the existence of and position in space of a predetermined hand gesture and for generating corresponding existence and position signals responsive thereto;

means for providing an on-screen hand icon corresponding in on-screen position to the detected position of said predetermined hand gesture in space, such that changes in position of said predetermined hand gesture result in a corresponding change in position of said on-screen hand icon, whereby the position of said on-screen hand icon is controllable by movement of said predetermined hand gesture; and,

means for detecting coincidence of said on-screen hand icon with an on-screen machine control icon as said hand icon made to move over said machine control icon by movement of said predetermined hand gesture and for generating corresponding machine control signal responsive to said detected coincidence wherein said means for detecting the existence and position of said predetermined hand gesture includes:

means for providing a hand gesture template including orientation vectors corresponding to orientations of edges of said predetermined hand gesture corresponding to said predetermined hand gesture;

means for optically scanning a region at which said predetermined hand gesture is expected to exist and for providing orientation vectors corresponding to orientations of edges of images within said scanned region;

means for correlating the orientation vectors of said hand template with orientations vectors of the images within said scanned region to provide a correlation values; and,

means for providing a trigger signal when said correlation value exceeds a predetermined threshold.

5,594,470

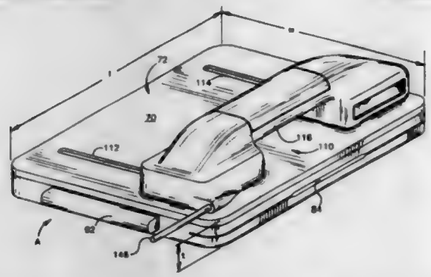
HIGHLY INTEGRATED PORTABLE ELECTRONIC WORK SLATE UNIT

Robert F. Meyerson, Captiva Island, Fla., and Yung-Fu Chang, Medina, Ohio, assignors to Teletransaction, Inc., Akron, Ohio

Continuation of Ser. No. 956,112, Oct. 2, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 268,806

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—169 **26 Claims**



1. A hand held work slate computer comprising:

a) a housing including a front side having a length and a width and a back side having a length and a width, the front side being spaced apart from the back side and defining a housing interior region, a distance between the front and back sides being substantially smaller than the length and the width of the front side and the length and the width of the back side;

b) a data input structure supported by the housing front side;

c) a data display structure including a display screen supported by the housing and visible through an opening in the front side of the housing;

d) data retention and processing components including a processor for controlling operations of the work slate computer mounted within and carried by the housing interior region, the processor electrically coupled to the data input structure and the data display structure;

e) a handle unit including an elongated gripping portion and a first distal portion attached to an end of the gripping portion, the first distal portion being attached to the housing back side and the handle portion, the gripping portion being spaced apart from and substantially parallel to the housing back side, the first distal portion including an internal compartment for receiving a selected one of an electronic component and a power supply component; and,

f) electronic circuitry supported within the housing including circuitry for electrically coupling the selected one of an electronic module and a power supply to the processor.

5,594,471

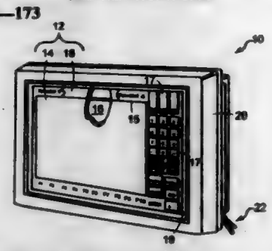
INDUSTRIAL TOUCHSCREEN WORKSTATION WITH PROGRAMMABLE INTERFACE AND METHOD

Richard J. Deeran, Falmouth; Michael J. Towle, Portland, and Steven P. Carll, Scarborough, all of Me., assignors to Casco Development, Inc., Portland, Me.

Continuation of Ser. No. 819,694, Jan. 9, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,472

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **16 Claims**



1. A computer workstation comprising:

a display including a unitary display screen on which computer-generated visual images are provided and a border area located outside of the display screen, the border area being incapable of displaying said computer-generated visual images;

a single-piece touch sensitive screen located on the display and dimensioned to cover said display screen and said border area, the touch sensitive screen having:

a first touch zone covering said display screen;

a second touch zone covering said border area; and

a signal output responsive to a touch in said first touch zone or said second touch zone;

an input interface responsive to said signal output, said input interface being programmable to define portions of said first touch zone and said second touch zone as user input areas; and

a removable template (i) positioned on the touch sensitive screen and dimensioned to overlay said second touch zone of said touch sensitive screen, (ii) made of a low-glare material so as to not interfere with operation of said touch sensitive screen, and (iii) including printed indicia which function as an array of user selectable buttons for identifying said user input areas of said second touch zone.

5,594,472

CHARACTER DEVELOPING APPARATUS

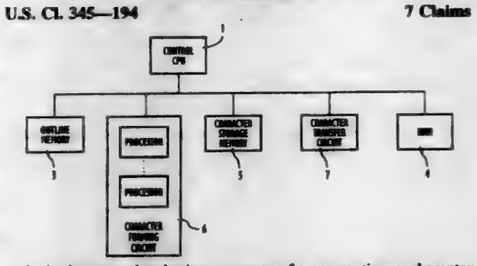
Masahiro Date, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed May 22, 1995, Ser. No. 446,493

Claims priority, application Japan, May 30, 1994, 6-139344

Int. Cl.[6] G06K *9/00*

U.S. Cl. 345—194 **7 Claims**



1. A character developing apparatus for converting a character code in a character string into a character pattern and then developing the character pattern on a bitmap memory, said apparatus comprising:

a character storage memory for storing the character pattern;

a character transfer circuit for selecting the character pattern corresponding to the character code from said character storage memory and transferring the selected character pattern to said bitmap memory;

an outline memory for storing outline data of a character;

a control circuit for determining whether the character code of the character string is an outline character, which is required to form the character pattern, or non-outline character, of which the character pattern is already formed and stored in the character storage memory, and creating character string data including information that the character code is the outline character in accordance with said determination; and

a character forming circuit for executing outline character extraction processing of consecutively extracting the outline character from information of the character string data and character formation processing of consecutively forming the character pattern of the outline character in said character storage memory using the outline data in said outline memory,

wherein said character forming circuit includes a plurality of pipeline connected processing circuits respectively taking charge of a plurality of divided processes including the character extracting processing and the character forming processing, and

wherein said control circuit simultaneously starts up said character transfer circuit and said character forming circuit.

5,594,473

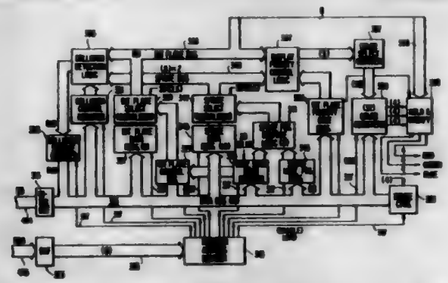
PERSONAL COMPUTER APPARATUS FOR HOLDING AND MODIFYING VIDEO OUTPUT SIGNALS

Jay G. Miner, Mountain View; Dave Dean, Ukiah; Joseph C. Decuir, Albany; Ronald H. Nicholson, Sunnyvale, and Akio Tanaka, Burlingame, all of Calif., assignors to Escom AG, Germany

Continuation of Ser. No. 863,874, Apr. 6, 1992, abandoned, which is a continuation of Ser. No. 422,022, Oct. 16, 1989, Pat. No. 5,103,499, which is a division of Ser. No. 886,796, Jul. 18, 1986, Pat. No. 4,874,164. This application Mar. 8, 1993, Ser. No. 29,306

Int. Cl.[6] G09G *5/06*

U.S. Cl. 345—199 **24 Claims**



1. A personal computer system to provide color video output signals to a display, wherein an image including a plurality of pixels is formed on the display by scanning the display, and wherein the visual characteristics of a pixel being scanned are determined by the video output signals provided by the personal computer system when the pixel is being scanned, and wherein the personal computer system comprises:

means for providing image data for defining the visual characteristics of a pixel;

palette means for providing a plurality of different intensity data codes corresponding to a plurality of available intensity levels which correspond to a plurality of available colors;

means for designating a hold-and-modify mode to increase the number of intensity levels that are available in response to the image data;

means for selecting one of the plurality of different intensity data codes from the palette means in accordance with the image data at times when hold-and-modify is not designated;

means for providing a video output signal corresponding to the a selected intensity data code at times when the hold-and-modify mode is not designated; and

hold- and-modify means for providing a video output signal corresponding to a previously selected intensity data code modified in accordance with the image data at times when the hold-and-modify mode is designated including means for modifying the previously selected intensity data code by retaining a portion of the previously selected intensity data code, and by replacing a portion of the previously selected intensity data code with at least a portion of the image data thereby increasing the number of intensity levels that are available in response to the image data.

5,594,474

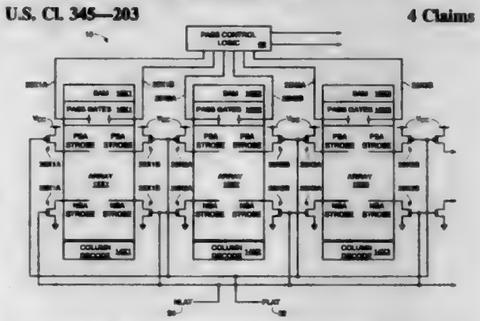
VRAM HAVING ISOLATED ARRAY SECTIONS FOR PROVIDING WRITE FUNCTIONS THAT WILL NOT AFFECT OTHER ARRAY SECTIONS

Loren L. McLeury, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 29,816, Mar. 11, 1993, Pat. No. 5,394,172. This application Feb. 27, 1995, Ser. No. 396,394

Int. Cl.[6] G11C *8/00*

U.S. Cl. 345—203 **4 Claims**



1. A random access memory device, comprising:

a) a dynamic memory array for storing dynamic data, said dynamic memory array having a first memory array portion and a second memory array portion;

b) a static memory in electrical communication with said dynamic memory array, said static memory for storing static data, said static data capable of transfer to said dynamic memory array for storage therein;

c) a first sensing means in electrical communication with said first memory array portion and said static memory, said first sensing means for sensing data stored and written in said first memory array portion;

d) a second sensing means in electrical communication with said second memory array portion and said static memory, said second sensing means for sensing data stored and written in said second memory array portion;

e) a first switching means, an output of said first switching means in electrical communication with said first sensing means, said first sensing means responding to an output signal of said first switching means to sense the data stored and written in said first memory array portion;

f) a second switching means, an output of said second switching means in electrical communication with said second sensing means, said second sensing means responding to an output signal of said second switching means to sense the data stored and written in said second memory array portion, said outputs of said first and said second switching means isolated from one another.

5,594,475

INK JET PRINTER HEAD AND A METHOD OF DRIVING THE SAME

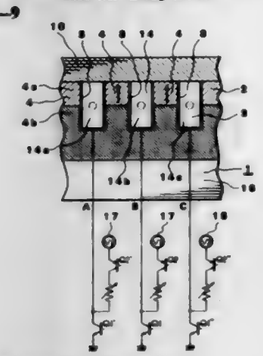
Shigeo Komakine; Kuniaki Ochiai, and Kazunori Mine, all of Shizuoka, Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan

Filed Aug. 26, 1994, Ser. No. 297,032

Claims priority, application Japan, Aug. 27, 1993, 5-212845

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—9 **14 Claims**



1. An ink jet printer head comprising:

a plurality of pressure chamber divided by side walls formed at least partially of a piezoelectric member;

electrodes formed on said side walls such that they contact said piezoelectric member;

ink jets formed within said pressure chambers; and

means for jetting ink in said pressure chambers through said ink jets by applying voltages to said electrodes which causes deformation in shearing strain mode to said side walls, said means applying different voltages to electrodes of different side walls of each pressure chamber so as to effect different operating characteristics in shearing strain mode by said different side walls of each pressure chamber, to jet ink droplets of varying size from said pressure chambers.

5,594,476

DRIVING METHOD OF INK JET HEAD AND INK JET APPARATUS

Tatsuyuki Tokunaga, and Jiro Moriyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 988,085, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 594,666, Oct. 9, 1990, abandoned, which is a continuation of Ser. No. 264,079, Oct. 28, 1988, abandoned. This application Feb. 1, 1995, Ser. No. 383,686

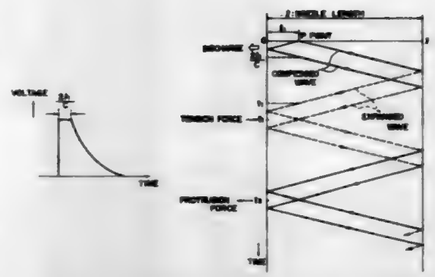
Claims priority, application Japan, Oct. 29, 1987, 62-271844; Oct. 29, 1987, 62-271845

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—10 **6 Claims**

1. An ink jet apparatus comprising:

an ink jet head having an ink path communicated with a discharge opening from which ink is discharged and an electric-mechanical converting element disposed along said ink path to provide a pressure generating point therein; and



means for applying to said electric-mechanical converting element a driving pulse having a predetermined waveform falling when a time period of $2l_1/C$ has passed after rising, with said driving pulse being maintained for said time period and beginning to fall after said time period has passed, wherein l_1 is a length along said ink path from said discharge opening to a location in said ink path at the pressure generating point provided by said electric-mechanical converting element and C is the transmission velocity of a pressure wave in the ink in said ink path.

5,594,477

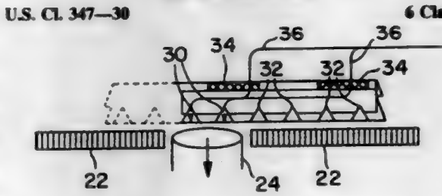
WET WIPER AND VACUUM PRIMER CONFIGURATION FOR FULL-WIDTH-ARRAY PRINTBAR

Brian S. Hilton, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 30, 1994, Ser. No. 351,087

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—30 **6 Claims**



1. A priming device for priming with ink a printbar having a plurality of print dies arrayed along a width of the printbar, each print die containing a plurality of channel outlets along a print face of the printbar, comprising:

a vacuum conduit movably mounted along the print face of the printbar, the vacuum conduit having a suction end opposite the channel outlets of the print dies and shorter in width than the width of the printbar; and

a wiper blade movably mounted along the face of the printbar and opposite the channel butlers of the print dies to wipe across the channel outlets, the wiper blade being shorter in width than the width of the printbar, wherein when the suction end of the vacuum conduit is positioned opposite a first set of channel outlets of a one of the plurality of print dies, the wiper blade is positioned adjacent to one side of the suction end of the vacuum conduit opposite a second set of channel outlets of the one of the plurality of print dies such that when suction is applied to the suction end of the vacuum conduit

opposite the first set of channel outlets the wiper blade substantially prevents air from entering the second set of channel outlets.

5,594,478

INK JET RECORDING APPARATUS FOR DIVISIONALLY DRIVING A RECORDING HEAD WITH A PLURALITY OF INK JET ORIFICES GROUPED INTO BLOCKS

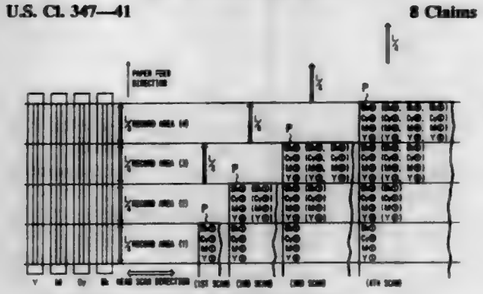
Miyuki Matsubara, Tokyo; Hiromitsu Hirabayashi, Yokohama; Shigeyasu Nagoshi; Atsushi Arai, both of Kawasaki; Yuji Akiyama; Takayuki Murata, both of Yokohama; Hitoshi Sugimoto, Kawasaki, and Kiichiro Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 921,231, Jul. 29, 1992. This application Jun. 7, 1995, Ser. No. 474,985

Claims priority, application Japan, Aug. 2, 1991, 3-194114; Aug. 2, 1991, 3-194130; Oct. 21, 1991, 3-272693; Dec. 20, 1991, 3-338610

Int. Cl.[6] B41J *2/01;2/145*

U.S. Cl. 347—41 **8 Claims**



1. An ink jet recording apparatus comprising:

a recording head having a plurality of ink eject orifices for ejecting an ink, said plurality of ink eject orifices being grouped into N blocks which can be driven simultaneously and being arranged in an eject orifice array, and said recording head ejecting an ink onto a recording medium to perform recording by divisionally driving said N blocks;

conveying means for conveying said recording head and the recording medium relative to each other by a conveying length obtained by equally dividing the eject orifice array of said recording head into n parts;

masking means for masking a signal to be recorded such that 1/n dots, where n<N, of all dots to be formed on an area of the recording medium having a width equal to the conveying length may be formed by one scan of said recording head; and

driving means for, based on the signal masked by said masking means, driving said recording head and performing recording in units of lengths of n equally divided areas of the recording head by using n equally divided different sections of the eject orifice array by repeating a scan operation n times,

wherein the number of times of divisional driving for said blocks of said recording head for ejecting the ink is set to be N/n.

5,594,479

METHOD FOR MANUFACTURING INK JET RECORDING HEAD HAVING WATER-REPELLENT MATERIAL

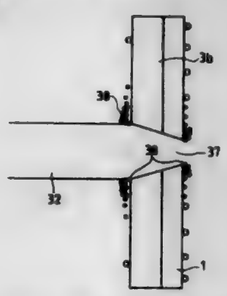
Makoto Inoue, deceased, late of Kawasaki; by Tamaco Inoue, heir, Yokosuka; Kazuaki Masuda, Kawasaki; Shigeo Toganoh, Tokyo; Masahu Sasaka, Kawasaki; Keiichi Murai, Kashiwa; Takashi Watanabe; Akira Goto, both of Yokohama, and Motoaki Sato, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 733,155, Jul. 19, 1991, abandoned. This application Nov. 15, 1993, Ser. No. 151,778

Claims priority, application Japan, Jul. 21, 1990, 2-193686; Mar. 8, 1991, 3-43658; Mar. 8, 1991, 3-043671; Mar. 8, 1991, 3-043672

Int. Cl.[6] B41N *2/16*

U.S. Cl. 347—45 **1 Claim**



1. A method of manufacturing a recording head for use in an ink jet printer, comprising the steps of:

providing a discharge port formation member having a surface in which a plurality of orifices is to be formed;

treating a discharge port face of the discharge port formation member with a water-repellent material;

forming a plurality of orifices by applying radiation from a pulsed laser beam to the discharge port formation member which has been treated by the material having a water-repellent property, wherein forming the plurality of orifices creates byproducts; and

sticking at least once a tape having an adhesive layer against the discharge port face of the discharge port formation member against at least peripheral portions of said orifices having the byproducts created in said orifice forming step sticking thereto and deposited therein, and peeling said tape therefrom.

5,594,480

PRINTING DEVICE AND PHOTOGRAPHIC PAPER

Shuji Sato, Kanagawa; Masanori Ogata, Saitama; Kengo Ito, Kanagawa, and Hiroyuki Shiota, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 12, 1993, Ser. No. 134,677

Claims priority, application Japan, Oct. 14, 1992, 4-300587; Oct. 14, 1992, 4-300588; Oct. 15, 1992, 4-277165

Int. Cl.[6] B41J *2/14*

U.S. Cl. 347—51 **9 Claims**

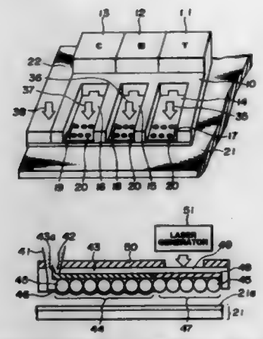
1. A printing device for thermal transcription of a vaporizable dye onto a photographic paper comprising:

containing section means for containing a vaporizable dye,

supplying section means for supplying the vaporizable dye supplied from said containing section, and

vaporizing section means for vaporizing the vaporizable dye supplied by said supplying section means into vapor form and for thermally transcribing the vaporized dye onto said photographic paper,

wherein the vaporizable dye contained in said containing section means is deposited on spherical-shaped bodies disposed in said containing section, and



wherein the vaporizable dye supplied by said supplying section means to said vaporizing section means is also deposited on spherical-shaped bodies disposed in said vaporizing section.

5,594,481

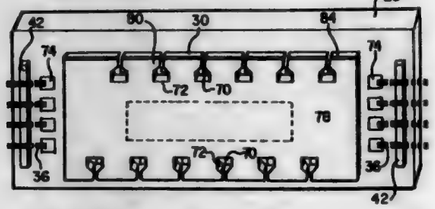
INK CHANNEL STRUCTURE FOR INKJET PRINTHEAD

Brian J. Keefe, La Jolla; May F. Ho, La Mesa; Kenneth J. Courian, San Diego; Steven W. Steinfeld, San Diego; Winthrop D. Childers, San Diego, all of Calif.; Ellen R. Tappon; Kenneth E. Trueba, both of Corvallis, Oreg.; Terri L. Chapman, Escondido, Calif.; William R. Knight, and Jules G. Moritz, III, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 179,866, Jan. 11, 1994, which is a continuation of Ser. No. 862,086, Apr. 2, 1992, Pat. No. 5,278,584. This application Oct. 6, 1994, Ser. No. 319,893

Int. Cl.[6] B41J *2/05*

U.S. Cl. 347—65 **19 Claims**



1. An inkjet printing system comprising:

an ink reservoir;

a substrate having a plurality of individual ink firing chambers with an ink firing element in each of said ink firing chambers along a top surface of said substrate and having a first outer edge along a periphery of said substrate;

said first outer edge being in close proximity to said ink firing chambers;

an ink channel connecting said ink reservoir with said ink firing chambers, said ink channel including a primary channel connected at a first end with said ink reservoir and at a second end to a secondary channel;

said primary channel allowing ink to flow from said ink reservoir, around said first outer edge of said substrate to said secondary channel along said top surface of said substrate; and

a separate inlet passage connecting said secondary channel with each ink firing chamber, said inlet passage defined by a barrier layer to form a peninsula and a pinch point along said inlet passage for allowing high frequency refill of said ink firing chamber.

5,594,482

INK JET PRINTER HEAD WITH INK CHANNEL PROTECTIVE FILM

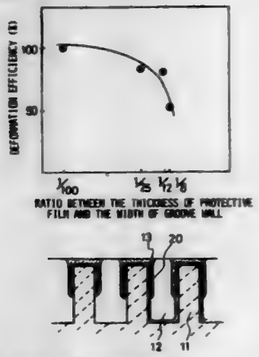
Yumiko Ohashi, Hashima, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 17, 1993, Ser. No. 153,898

Claims priority, application Japan, Feb. 26, 1993, 5-037880

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—69 **12 Claims**



1. An ink jet printer head comprising:

a channel plate having a plurality of upstanding spaced walls made of piezoelectric material defining ink channels therebetween, said walls having opposed sides and a thickness;

electrodes coupled to said opposed sides of said walls of said channel plate, said electrodes adapted to receive voltage to deform said walls to cause ink in said channels to be ejected therefrom; and

an inorganic passive state protective film formed on at least said electrodes, said protective film having a thickness of not less than 0.1 μm and not greater than ⅛ of said thickness of each of said walls of said channel plate.

5,594,483

INK-JET CARTRIDGE WITH INK FILTRATION

George T. Kaplinsky, San Diego, and David W. Swanson, Escondido, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 995,109, Dec. 22, 1992, Pat. No. 5,426,459. This application Apr. 20, 1995, Ser. No. 425,515

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—87 **22 Claims**

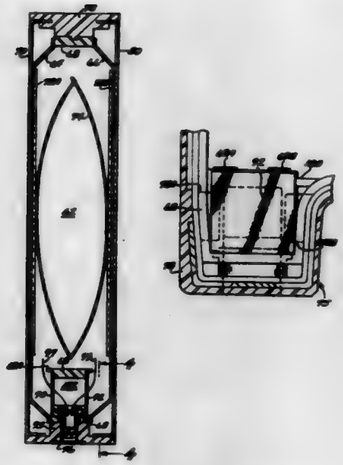
1. An ink-jet cartridge, comprising:

a cartridge case structure having an external length dimension along a length direction, an external width dimension extending along a width direction and an external height dimension extending along a height direction, and wherein one of said dimensions is larger than each of the other of said dimensions;

an ink-jet printhead;

an ink path through which liquid ink is supplied to said printhead, said ink path including a first fluid passageway and a second fluid passageway, wherein ink is supplied to said printhead through said first and second passageway to ensure an adequate supply of ink during printing operations; and

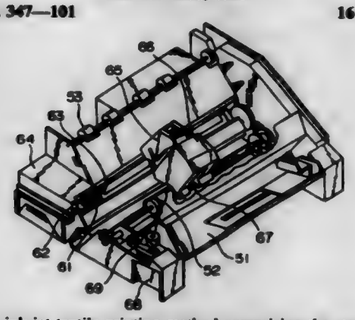
a first filter interposed within said case structure across said first fluid passageway of said ink path in a first filter plane substantially parallel to a direction along which said larger dimension extends, and a second filter interposed within said case structure across said second fluid passageway of said ink path, said first filter and said second filter for preventing particulate contamination from passing therethrough and reaching said printhead.



5,594,484
METHOD OF RECORDING IMAGES
Kenichi Furukawa, 6-7-2 Okjidai, Sakura-shi, Chiba-ken, 285, Japan
Filed Mar. 20, 1995, Ser. No. 406,610
Int. Cl.[6] B41J 2/005
U.S. Cl. 347—95 9 Claims

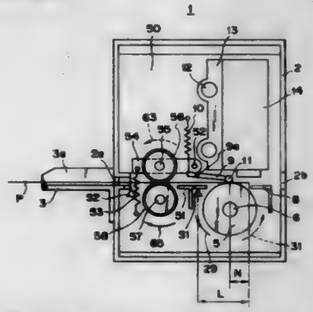
1. A method of recording image, comprising the steps of:
(a) providing a recording medium comprising a substrate and an adhesive layer made of a delayed-tack adhesive provided evenly or smoothly on a surface of the substrate;
(b) readering the adhesive layer tacky in accordance with image information to form an imagewise tacky portion; and
(c) applying powder to the imagewise tacky portion.

5,594,485
INK-JET TEXTILE PRINTING METHOD
Shoji Koike, and Tomoya Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 8,330, Jan. 25, 1993, Pat. No. 5,468,553.
This application Jun. 2, 1995, Ser. No. 458,283
Claims priority, application Japan, Jan. 27, 1992, 4-034063
Int. Cl.[6] B41J 2/01
U.S. Cl. 347—101 16 Claims



1. An ink-jet textile printing method comprising the steps of:
providing a cloth comprising silk threads made up mainly of silk fibers, said silk threads and silk fibers respectively having a thickness of 14 to 147 denier and 2.5 to 3.5 denier, and said cloth having a moisture regain of 17 to 112% by weight;
imparting ink to said cloth using an ink-jet printing process; and conducting a fixing process, and then a washing process on said cloth.

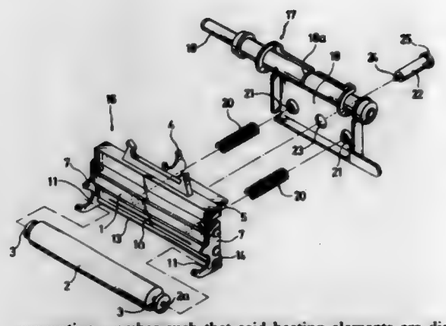
5,594,486
SHEET CONVEY APPARATUS
Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 174,008, Dec. 28, 1993, abandoned.
This application Mar. 5, 1996, Ser. No. 611,015
Claims priority, application Japan, Dec. 28, 1992, 4-361209; May 7, 1993, 5-106825
Int. Cl.[6] B41J 2/01; B65H 3/06
U.S. Cl. 347—104 24 Claims



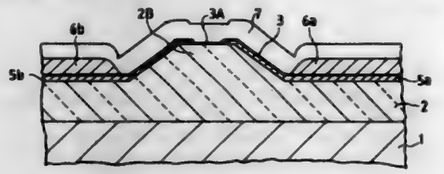
1. A sheet convey apparatus, comprising:
convey means for conveying a sheet in a convey direction;
a pair of rollers arranged downstream of said convey means in the convey direction for conveying a sheet in the convey direction or in a reverse direction by rotation of said pair of rollers in the convey direction or in the reverse direction; and
control means for controlling said convey means and said pair of rollers in such a manner that, after a sheet is conveyed by said pair of rollers in the convey direction by a predetermined amount past a nip between said pair of rollers, said pair of rollers are rotated in the reverse direction while applying a conveying force in the convey direction to the sheet with said convey means, said convey means allowing a part of the sheet which contacts said convey means to shift in the reverse direction when said pair of rollers rotate in the reverse direction, thereby conveying the sheet in the reverse direction until the sheet passes through the nip between said pair of rollers.

5,594,487
THERMAL HEAD SUPPORTING DEVICE
Akira Naito; Tsutomu Fujiwara; Hisao Suzuki; Tsuguo Narushima; Akira Suzuki; Mamoru Tago, and Eiichi Furuya, all of Shizuoka, Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan
Filed Oct. 13, 1994, Ser. No. 322,338
Claims priority, application Japan, Oct. 13, 1993, 5-255340; Oct. 13, 1993, 5-255341; May 13, 1994, 6-100243
Int. Cl.[6] B41J 25/304
U.S. Cl. 347—197 13 Claims

1. A thermal head supporting device comprising:
a pair of positioning members disposed at both ends and on a center axis of a platen, said positioning members being of the same shape and size;
a head press/release mechanism movable toward and away from said platen; and
a head unit, said head unit comprising:
a head supporting member removably coupled to said head press/release mechanism with a predetermined play;
a thermal head having a plurality of heating elements arranged in a straight line thereon and being supported on said head supporting member such that said heating elements are disposed in confronting relationship with said platen; and
a pair of engagement members attached to both sides of said thermal head adjustably for position and having a pair of cuttings formed therein allowing said positioning members to be removably fitted therein, said cuttings being of the same shape and size;
wherein said thermal head is adjustably attached for position to said pair of engagement members by having screws screwed into screw holes formed in said thermal head through fixing holes formed in said engagement members having a larger diameter than said screw holes.

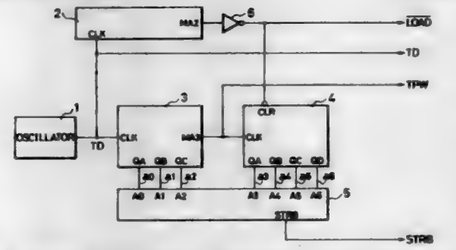


5,594,488
THERMAL HEAD
Noboru Tsushima; Toshiya Endoh, both of Takizawa-mura; Satoru Sasaki; Ken Yamamura, both of Morioka; Takashi Shirakawa, Takizawa-mura; Toshifumi Nakatani, Morioka, and Akinori Takahashi, Tamayama-mura, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed May 10, 1995, Ser. No. 438,573
Claims priority, application Japan, May 12, 1994, 6-098889; Jul. 28, 1994, 6-177099; Jul. 29, 1994, 6-178952
Int. Cl.[6] B41J 2/32;2/335
U.S. Cl. 347—208 17 Claims



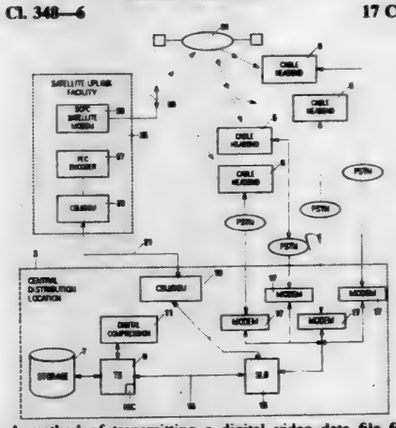
1. A thermal head comprising:
a temperature keeping layer disposed on a substrate,
a plurality of heat generating elements, each of said heat generating element including a heat generating portion formed on the temperature keeping layer,
a plurality of individual electrodes, each of said individual electrodes connected to a corresponding heat generating element, and
a common electrode connected to said heat generating elements, respectively, such that the heat generating portion of each of said heat generating elements is formed between one of the individual electrodes and the common electrode,
wherein each of the individual electrodes and the common electrode have a dual layered structure including a lower electrode and an upper electrode, the lower electrode is formed between the temperature keeping layer and the heat generating elements, and the upper electrode is formed above said heat generating elements.

5,594,489
THERMAL RECORDING APPARATUS WITH A THERMAL HEAD INCLUDING ENERGIZING TIME CONTROLLING
Fumikazu Nagano, Yamato-Koriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 4, 1993, Ser. No. 71,276
Claims priority, application Japan, Jun. 8, 1992, 4-147376
Int. Cl.[6] B41J 2/35
U.S. Cl. 347—211 3 Claims



1. A thermal type recording apparatus for performing printing a multi-tone density by changing an energizing time of a thermal head, comprising:
means for controlling said energizing time to match to a value corresponding to a tone density for printing; and
interrupting means for putting an interrupt period of energizing periodically into said energizing time if said energizing time is equal to or more than a predetermined time,
said interrupting means includes a plurality of counters each having different system for increasing said interrupt period in duration stepwisely in accordance with said energizing time.

5,594,490
SYSTEM FOR DISTRIBUTING VIDEO/AUDIO FILES FROM CENTRAL LOCATION TO A PLURALITY OF CABLE HEADENDS
William P. Dawson, Murray, Utah; Jay B. Schiller, Boulder, Colo.; Richard A. Schmelzer, Boulder, Colo., and Daniel J. Zigmond, Boulder, Colo., assignors to Cable Services Technologies, Inc., Boulder, Colo.
Filed May 23, 1994, Ser. No. 247,834
Int. Cl.[6] H04N 7/173
U.S. Cl. 348—6 17 Claims



1. A method of transmitting a digital video data file from a distribution station to a cable television or CATV headend, said method comprising the steps of:
a) selecting a data file at said distribution station for transmission to said cable headend;

b) after said selecting step, dividing or segmenting said digital data video file into a plurality of data packets, each packet including a header and a data payload section;

c) using a satellite to transmit said data packets to said cable headend;

d) identifying at said headend which of said packets are in error and need to be re-transmitted from said distribution station to said headend;

e) requesting from said headend that said distribution station re-transmit said packets identified as being in error;

f) deciding at the distribution station whether re-transmission is to be done via a land-link or via the satellite; and

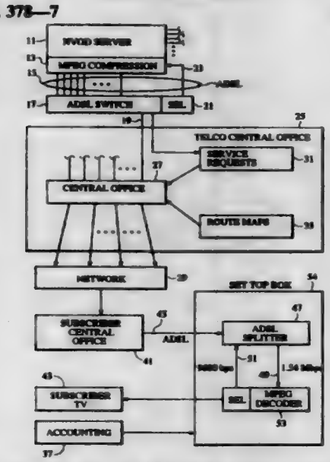
g) re-transmitting said identified packets from said distribution station to said headend over one of said land-link interconnecting said distribution station and said headend and said satellite as determined in said deciding step so as to allow said headend to more quickly and economically receive said video file.

5,594,491

NEAR-VIDEO-ON-DEMAND DIGITAL VIDEO DISTRIBUTION SYSTEM UTILIZING ASYMMETRIC DIGITAL SUBSCRIBER LINES

Winston W. Hodge, Yorba Linda, and Lawrence E. Taylor, Anaheim, both of Calif., assignors to VXL/HCR Technology Corporation, Yorba Linda, Calif.

Filed Dec. 29, 1995, Ser. No. 581,672
Int. Cl.[6] H04N 7/16
U.S. Cl. 378—7 **20 Claims**



1. A system for electronic distribution of near-video-on-demand programs to subscribers comprising,

a server having video program material in segments which are spooled from the server to a plurality of threads, the threads carrying the program with a time offset from one thread to another,

a plurality of ADSL channels handling said threads between said server and a means for replicating selected threads,

means for routing said threads to subscriber intermediate destinations,

a publicly accessible network exteading between said routing means and said subscriber intermediate destinations, and

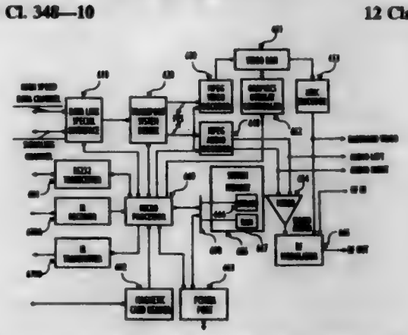
ADSL channels extending between said subscriber intermediate destinations and said subscribers.

5,594,492

METHOD AND APPARATUS FOR RAPID CHANNEL SELECTION

Daniel O'Callaghan, Fairfax Station, Va., and Eugene L. Lew, Olney, Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Division of Ser. No. 249,572, May 26, 1994, Pat. No. 5,477,263. This application Apr. 26, 1995, Ser. No. 428,993
Int. Cl.[6] H04N 7/173
U.S. Cl. 348—10 **12 Claims**



1. A channel decoder for decoding one of a plurality of programs, each program having properties which may vary from program to program and from time to time, comprising:

user activated selecting means, for selecting programs, comprising a transport stream demultiplexer which selects one program from a transport stream containing a plurality of programs;

a parameter monitor and storage means for identifying and storing at least one property of each program selected by said selecting means; and

at least one elementary stream decoder for decoding an elementary stream into output data in accordance with said at least one property stored by the monitoring and storing means of the program associated with the elementary stream;

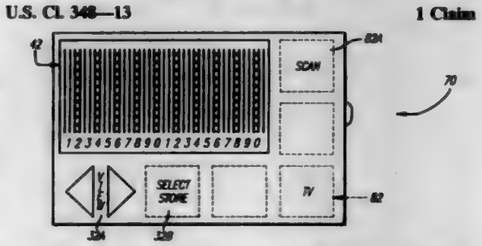
whereby, when a program is selected from said transport stream, the elementary stream decoder is initialized with stored information about the program.

5,594,493

TELEVISION SIGNAL ACTIVATED INTERACTIVE SMART CARD SYSTEM

Frank R. Nemirofsky, 71 Janis Ct., Danville, Calif. 94588

Filed Jan. 19, 1994, Ser. No. 183,525
Int. Cl.[6] H04N 7/08
U.S. Cl. 348—13 **1 Claim**



1. A card for receiving promotion data directly from a display, said promotion data encoded within a signal presented on said display, said card comprising:

a light sensor disposed on said card to receive said promotion data from said display;

a central processing unit (CPU) disposed on said card;

a promotion memory disposed on said card and coupled to said CPU for storing said promotion data, said promotion data being stored in the form of UPC codes; and

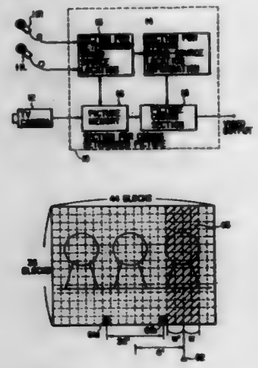
a program memory disposed on said card and coupled to said CPU, said program memory programmed to direct said CPU to store said promotion data in said promotion memory.

5,594,494

MOVING PICTURE CODING APPARATUS

Osamu Okada, Tokyo; Shigenobu Minami, Ayase, and Shoichiro Yamasaki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

PCT No. PCT/JP93/01213, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO94/06246, PCT Pub. Date Mar. 17, 1994
PCT Filed Aug. 27, 1993, Ser. No. 211,724
Claims priority, application Japan, Aug. 27, 1992, 4-228572
Int. Cl.[6] H04N 7/14
U.S. Cl. 348—15 **13 Claims**



1. A moving-picture coding apparatus comprising:

image pickup means for picking up a plurality of subjects including at least one subject specified as a sound source uttering a vocal sound and outputting a video signal;

right and left channel sound-sensitive means which comprises right and left microphones arranged from right to left with respect to said subjects and which collects sound from the subject picked up by said image pickup means and outputs audio signals for right and left channels;

estimating means which contains a delay circuit for delaying a left-channel audio signal from said left microphone, and an estimating circuit for estimating a left-channel audio signal on the basis of the delayed left-channel audio signal from said delay circuit and a right-channel audio signal from said right microphone, and which estimates the position of the sound source on the basis of the right and left channel audio signals outputted from said right and left channel sound-sensitive means; and

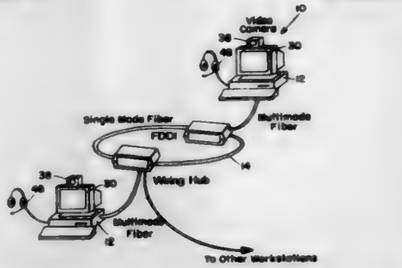
coding means for encoding the video signal corresponding to a specific range of picture area centered at the sound source position estimated by said estimating means with a larger coded bit rate than video signals corresponding to other picture areas.

5,594,495

VIDEO DATA SCALING FOR VIDEO TELECONFERENCING WORKSTATIONS COMMUNICATING BY DIGITAL DATA NETWORK

Larry G. Palmer, and Ricky S. Palmer, both of Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 915,887, Jul. 16, 1992, Pat. No. 5,475,421, which is a continuation-in-part of Ser. No. 893,074, Jun. 3, 1992, Pat. No. 5,375,068, and Ser. No. 893,234, Jun. 3, 1992, abandoned. This application May 22, 1995, Ser. No. 445,896
Int. Cl.[6] H04N 7/15
U.S. Cl. 348—17 **21 Claims**



1. Video teleconferencing apparatus for a distributed data processing system having a plurality of computer workstations connected by a digital data network, the computer workstations comprising:

a) source means for a local workstation to send frames of scaled video data across the digital data network to a remote workstation, frames of the unscaled video data having V horizontal lines of H pixels each, the source means comprising video data scaling means for scaling the frames of unscaled video data to reduce the quantity of horizontal lines and the quantity of pixels along each of the horizontal lines;

b) packeting means for dividing the scaled video data of each of the frames among plural packets for transmission across the digital data network, the packets containing header information indicating a height and width of the frames contained in the packets and timing information indicating when the frames should be displayed; and

c) receiver means for the local workstation to receive the packets and extract the frames of scaled video data from across the digital data network sent from source means of the remote workstation and display the frames in accordance with the timing information, the receiver means comprising pixel replication means for replicating the pixels of the received scaled video data to increase the quantity of horizontal lines to V and the quantity of pixels along each of the horizontal lines to H.

5,594,496

DETECTION OF CO-CHANNEL INTERFERENCE IN DIGITAL TELEVISION SIGNALS

Larry E. Nielsen, Chicago, and Gary J. Sgrignoli, Mount Prospect, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

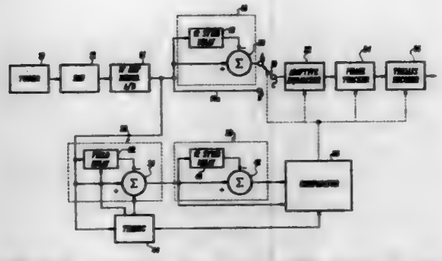
Filed Jun. 7, 1995, Ser. No. 475,713
Int. Cl.[6] H04N 5/38
U.S. Cl. 348—21 **23 Claims**

1. A method of receiving an ATV signal comprising a plurality of multi level symbols, having recurrent field sync signals, in an area of co-channel and other interference comprising:

combining corresponding portions of successive ones of said field sync signals to develop a subtraction signal;

processing the subtraction signal to reduce co-channel interference;

comparing the subtraction signal with the processed subtraction signal; and



selectively processing the received ATV signal to reduce co-channel interference based upon the comparison.

5,594,497

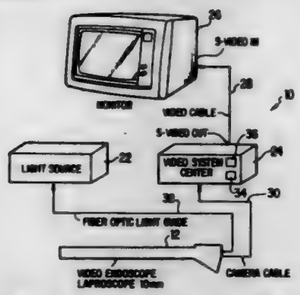
ENDOSCOPE PROVIDED WITH A DISTALLY LOCATED COLOR CCD

John M. Abern, 644 Santa Maria La., Davidsonville, Md. 21035, and Stephen Koo, 83-58 Charlecote Ridge, Jamaica, N.Y. 11432

Continuation of Ser. No. 43,904, Apr. 7, 1993, abandoned. This application Dec. 20, 1995, Ser. No. 575,463

Int. Cl.[6] A61B *1/04;1/06;* H04N *7/18*

U.S. Cl. 348—71 **7 Claims**



1. An endoscope for viewing a scene, within the body of a human or an animal, comprising

an elongated tube having distal and proximal ends, the diameter of said elongated tube being equal to or less than 10 mm;

an objective lens system provided in said distal end of said elongated tube, said objective lens system comprising first and second lenses, a lens diaphragm having an aperture therein, said lens diaphragm provided between said first and second lenses, a first spacer provided in front of said first lens, a second spacer provided between said lens diaphragm and said second lens;

a nut provided in front of said first spacer for positioning said objective lens system; and

a color charge coupled device having a diameter equal to or less than 8.6 mm provided in said distal end of said elongated tube behind said objective lens system, said charge coupled device directly providing a chromatic signal based upon the viewed scene, said charge coupled device connected to one or more electrical wires for transmitting said chromatic signal from said distal end of said elongated tube to said proximal end of said elongated tube.

5,594,498

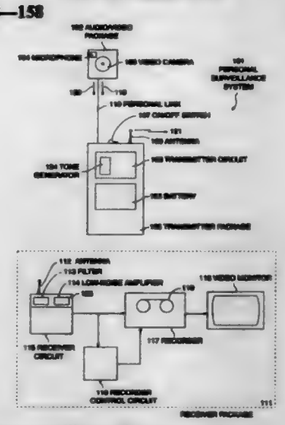
PERSONAL AUDIO/VIDEO SURVEILLANCE SYSTEM

Walter C. Fraley, Carlsbad, Calif., assignor to SEMCO, Inc., Carlsbad, Calif.

Filed Oct. 14, 1994, Ser. No. 323,219

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—158 **10 Claims**



1. A personal surveillance system, comprising

a video camera and a microphone integrated into a single audio/video package;

a transmitter package, physically separated from said audio/video package, said transmitter package having a transmitter capable of transmitting an audio and video signal to a remote station;

an electrical link coupled to said audio/video package and to said transmitter package, said link disposed to couple an audio signal and a video signal from said audio/video package to said transmitter package;

wherein said transmitter package comprises

a control circuit responsive to an operator control and generating a control signal;

a modulator circuit coupled to said video camera and to said microphone, said modulator circuit generating a modulated signal comprising a video signal and an audio signal;

said modulated signal comprising said control signal continuously superposed on a part of said modulated signal having a video or an audio signal;

an antenna; and

an amplifier coupled to said modulator circuit and to said antenna;

wherein said control signal comprises a continuous audio tone having substantially a single frequency above a normal range for audio transmission.

5,594,499

APPARATUS FOR PRODUCING A VIDEO SIGNAL IN THE COMMON INTERMEDIATE FORMAT (CIF)

Kenji Watanabe, Tokyo, and Hiroyuki Yasui, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1994, Ser. No. 301,469

Claims priority, application Japan, Sep. 14, 1993, 5-229070

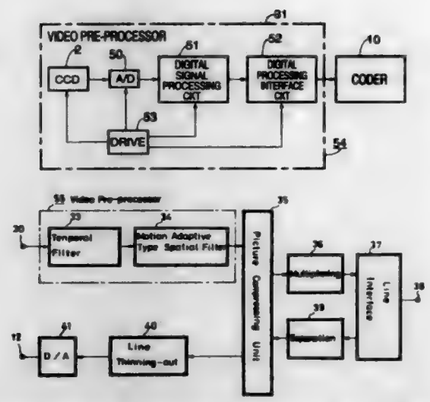
Int. Cl.[6] H04N *9/07*

U.S. Cl. 348—222 **11 Claims**

1. An apparatus for producing a video signal in the Common Intermediate Format (CIF), comprising in combination:

a solid-state image sensor having a predetermined number of effective pixels, where said predetermined number is an integer multiple or divisor of a number of pixels in said CIF format, said solid state image sensor producing an analog output;

an analog-to-digital converter for converting said analog output of said solid-state image sensor into digital data;



interface means for converting said digital data into CIF format video data and for outputting said CIF format video data for transmission.

5,594,500

IMAGE PICKUP APPARATUS

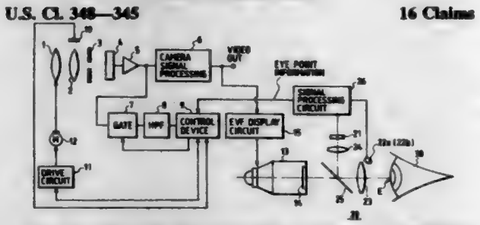
Taeko Tanaka, and Kitahiro Kaneda, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 959,600, Oct. 13, 1992, abandoned. This application Jun. 14, 1995, Ser. No. 490,515

Claims priority, application Japan, Oct. 17, 1991, 3-269474; Nov. 6, 1991, 3-290851

Int. Cl.[6] H04N *5/232*

U.S. Cl. 348—345 **16 Claims**



10. An image pickup apparatus for performing an adjustment operation according to a signal within an image detecting frame set on an image pickup frame, comprising:

(A) detection means for detecting position coordinates of any eye point of an operator in the image pickup frame;

(B) calculation means for calculating an average value of the position coordinates of the eye point detected by said detection means; and

(C) setting means for setting a position of the image detecting frame in the image pickup frame according to said average value output from said calculation means.

5,594,501

ACCUMULATION TIME CONTROL APPARATUS

Kenji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

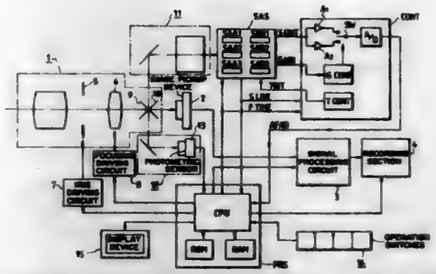
Continuation of Ser. No. 24,847, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 652,998, Feb. 7, 1991, abandoned. This application Oct. 4, 1994, Ser. No. 317,827

Claims priority, application Japan, Feb. 15, 1990, 2-35232

Int. Cl.[6] H04N *5/235*

U.S. Cl. 348—362 **40 Claims**

1. An accumulation time control apparatus comprising:



a plurality of sensor means for receiving image pickup light from an object, each sensor means having associated with the respective sensor means monitor means for monitoring brightness of the image pickup light received by the respective sensor means; and

control means for starting a charge accumulation operation of said plurality of sensor means simultaneously and for controlling charge accumulation times of said sensor means, respectively, on the basis of signals output from said monitor means,

wherein the control means detects the accumulation time of one of the sensor means whose accumulation amount has first reached a predetermined level, and the control means terminates an accumulation operation of the other sensor means on the basis of the detected accumulation time of said one of said sensor means.

5,594,502

IMAGE REPRODUCTION APPARATUS

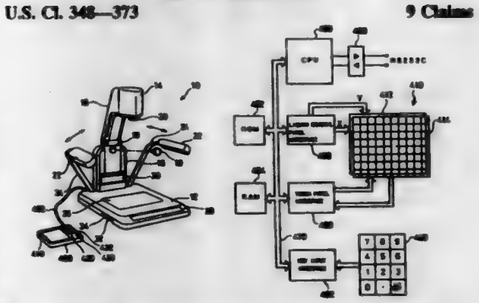
Nobutsune Bito; Tsuneo Tsuzuki; Nobuyuki Oda, and Akio Mizuno, all of Nagoya, Japan, assignors to Elmo Company, Limited, Japan

Division of Ser. No. 183,051, Jan. 18, 1994. This application Feb. 22, 1995, Ser. No. 392,146

Claims priority, application Japan, Jan. 20, 1993, 5-26140; Jan. 20, 1993, 5-26141; Feb. 24, 1993, 5-61004

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—373 **9 Claims**



1. An image reproduction apparatus comprising camera means for taking a visual image of a material, a sample, or another subject matter placed on a table, an image signal representing the visual image of said subject matter taken by said camera means being transmitted to an external display unit to show a reproduction image of said subject matter,

said image reproduction apparatus further comprising

presentation condition adjustment means for adjusting a presentation condition for said subject matter,

memory means for storing a plurality of presentation condition groups including a plurality of predetermined presentation conditions adjusted by said presentation condition adjustment means,

presentation condition selection means for selecting one of said plurality of presentation condition groups stored in said memory means, and

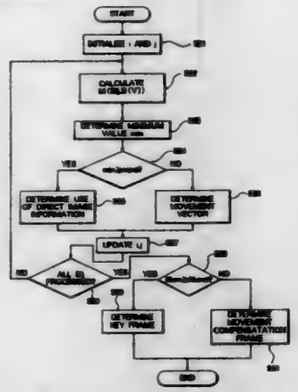
presentation condition setting means for setting presentation conditions included in said one presentation condition group selected by said presentation condition selection means in said presentation supporting system.

5,594,503

IMAGE INFORMATION COMPRESSING METHOD, COMPRESSED IMAGE INFORMATION RECORDING MEDIUM AND COMPRESSED IMAGE INFORMATION REPRODUCING APPARATUS

Takeo Miyazawa, Tokyo, Japan, assignor to Studio Gen Inc., Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,735
Claims priority, application Japan, Dec. 17, 1993, 5-318147
Int. Cl.[6] H04N 7/28
U.S. Cl. 348—414 **6 Claims**



1. An image information compressing method for compressing dynamic image information composed of a plurality of image frames, said method of compressing image information comprising the steps of:

(a) determining a plurality of image frames constituting said dynamic image information as key frames or movement compensation frames;

(b) dividing said plurality of image frames into a plurality of blocks each of which is composed of a predetermined number of pixels in a vertical direction and those in a horizontal direction;

(c) determining a movement vector of each block of said movement compensation frame determined in said step (a) with respect to an immediately forward key frame;

(d) dividing each of said movement compensation frames into large blocks each of which is composed of a predetermined number of said blocks in the vertical direction and those in the horizontal direction so as to obtain a plurality of movement vector pattern vectors by scanning each of said large blocks;

(e) determining a plurality of representative vectors that represent said plurality of movement vector pattern vectors obtained in said step (d) so as to make a code book for vector-quantizing said movement compensation frame of said dynamic image information; and

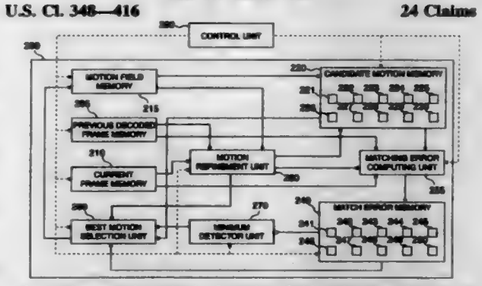
(f) selecting one representative vector that represents said movement vector pattern vector obtained in said step (d) from said code book made in said step (e) to code said movement vector pattern vector with the number of said selected representative vector.

5,594,504

PREDICTIVE VIDEO CODING USING A MOTION VECTOR UPDATING ROUTINE

Touradj Ebrahimi, Vaud, Switzerland, assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 6, 1994, Ser. No. 271,308
Int. Cl.[6] H04N 7/24
U.S. Cl. 348—416 **24 Claims**



1. An improved method of motion field estimation for use in motion compensated frame-to-frame prediction coding comprising the steps of:

dividing a frame having a plurality of pixels into a plurality of smaller regions to form a first segmentation level;

assigning to each of said plurality of smaller regions an initial motion vector;

computing a plurality of matching errors for each smaller region;

determining the value of the smallest matching error among the computed matching errors for each smaller region; and

performing for each of said plurality of smaller regions a motion vector updating routine which updates the motion vector of a smaller region by assigning to it a best motion vector selected from among the initial motion vector assigned to the smaller region, a matched motion vector obtained by performing a block matching technique for the smaller region, and motion vectors of the smaller region's neighboring regions, wherein the best motion vector is selected by comparing a predetermined threshold value to the magnitude of the difference between the smallest matching error and at least one matching error corresponding to said initial motion vector, said matched motion vector, or one of the motion vectors of said neighboring regions.

5,594,505

Patent Not Issued For This Number

5,594,506

LINE SYNC DETECTOR FOR DIGITAL TELEVISION RECEIVER

Jian Yang, Mansfield, Mass., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

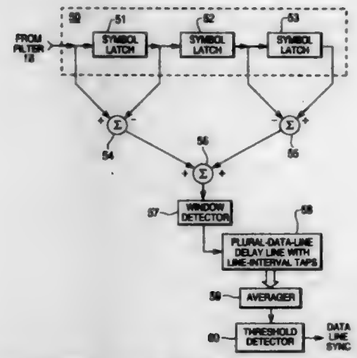
Filed Sep. 26, 1995, Ser. No. 534,241
Int. Cl.[6] H04N 7/04; 11/06; 5/10
U.S. Cl. 348—531 **15 Claims**

1. A line sync detector for a digital television receiver, said line sync detector comprising:

a source of digital television data including a line synchronization code group having a prescribed sequence of symbols at the beginning of each data line;

a matched filter receiving said digital television data and generating a matched filter response that is of prescribed value whenever said prescribed sequence of symbols occurs;

a window detector generating a response to said matched filter response having an amplitude within an amplitude window including said prescribed value;



a correlation filter responding to the response of said window detector for generating a re-inforced response to groups of said prescribed sequence of symbols that recur at data line intervals in said digital television data received by said matched filter; and

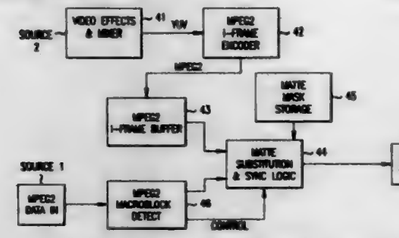
a threshold detector for detecting when said reinforced response exceeds a prescribed threshold value in a prescribed polarity, for generating an indication of when each said line synchronization code group occurs.

5,594,507

COMPRESSED DIGITAL OVERLAY CONTROLLER AND METHOD FOR MPEG TYPE VIDEO SIGNAL

W. Leo Hoarty, Morgan Hill, Calif., assignor to ICTV, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 56,958, May 3, 1993, which is a continuation-in-part of Ser. No. 877,325, May 1, 1992, Pat. No. 5,412,325, which is a continuation-in-part of Ser. No. 754,932, Sep. 10, 1991, Pat. No. 5,220,420, which is a continuation-in-part of Ser. No. 589,285, Sep. 27, 1990, Pat. No. 5,093,718. This application May 27, 1994, Ser. No. 250,723
Int. Cl.[6] H04N 5/272
U.S. Cl. 348—584 **13 Claims**



1. A controller, for providing, in a specified region of a television picture generated by a first digitally compressed video signal, an overlay of a second picture embodied in a second video signal, comprising:

an I-frame buffer for storing updated macroblock pixel data in I-frame format derived from the second signal;

matte mask storage register for storing data that identifies the specified region by means of macroblocks;

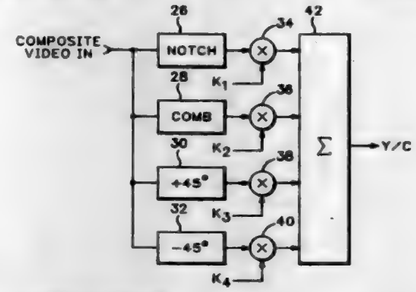
matte substitution processor, in communication with the matte mask storage register and having as an input the first signal and providing an overlayed output, for inhibiting transmission to the output of any macroblock, of the first signal's data stream, lying in the specified region and for substituting for such macroblock a corresponding macroblock from the I-frame buffer.

5,594,508

DECODER USING ADAPTIVE NON-SEPARABLE DIGITAL FILTER

Bruce J. Penney, Beaverton, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Nov. 7, 1994, Ser. No. 343,051
Int. Cl.[6] H04N 9/78
U.S. Cl. 348—665 **3 Claims**



1. A decoder comprising:

means for generating filter coefficients from a composite video signal as a function of an arbitrary correlation angle for an image represented by the composite video signal; and

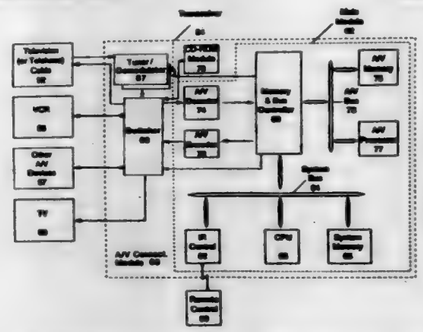
means for adaptively, non-separably filtering the composite video signal using the filter coefficients from the generating means to produce corresponding luminance and chrominance component signals for the composite video signal.

5,594,509

METHOD AND APPARATUS FOR AUDIO-VISUAL INTERFACE FOR THE DISPLAY OF MULTIPLE LEVELS OF INFORMATION ON A DISPLAY

Fabrice Florin, Mill Valley; Michael Buettner, Burlingame; Glenn Corey, San Rafael; Janey Fritsche, Mill Valley; Peter Maresca, Palo Alto; Peter Miller, Los Altos Hills; Bill Purdy, San Anselmo; Stuart Sharpe, and Nick West, both of San Francisco, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 22, 1993, Ser. No. 81,931
Int. Cl.[6] H04N 5/45
U.S. Cl. 348—731 **71 Claims**



1. An interactive user interface and audio-visual (A/V) system comprising:

a transceiver coupled to art audio-visual (A/V) display for receiving audio-visual signals in an electronic signal spectrum from a signal source, said transceiver including interface generation means for causing said A/V display to display an interface, said interface including selectively displayed multiple levels of information related to an audio-visual program viewed on said A/V display, wherein said multiple levels of

information include information received by said transceiver over a plurality of information tracks;

control means in communication with said transceiver for permitting a user viewing said A/V display to selectively display said multiple levels of information on said A/V display;

wherein said interface is displayed in an overlay region that includes at least one direction cue to identify at least one direction on said A/V display corresponding to at least one additional level of information.

3. An interactive user interface an audio-visual (A/V) system comprising:

a transceiver coupled to an audio-visual (A/V) display for receiving audio-visual signals in an electronic signal spectrum from a signal source, Said transceiver including interface generation means for causing said A/V display to display an interface, said interface including selectively displayed multiple levels of information related to a currently viewed program viewed on said A/V display;

control means in communication with said transceiver for permitting a user viewing said A/V display to selectively display said multiple levels of information on said A/V display;

wherein a plurality of direction cues are displayed on said A/V display, wherein one or more of said plurality of direction cues are available direction cues, said available direction cues being highlighted on said A/V display;

wherein said control means includes direction arrow buttons, said user activating one of said direction arrow buttons corresponding to the direction identified by one of said available direction cues resulting in said transceiver causing said A/V display to display an additional level of information related to said currently viewed program.

7. An interactive user interface and audio-visual (A/V) system, comprising:

a transceiver coupled to an audio-visual (A/V) display for receiving audio-visual signals in an electronic signal spectrum from a signal source, said transceiver including interface generation means for causing said A/V display to display an interface, said interface including selectively displayed multiple levels of information related to an audio-visual program viewed on said A/V display;

control means in communication with said transceiver for permitting a user viewing said A/V display to selectively display said multiple levels Of information on said A/V display;

wherein said transceiver further includes a switcher and at least one tuner/demodulator coupled to said signal source; said switcher coupling said at least one tuner/demodulator to said A/V display and a storage means, for switching digital and analog A/V data between said signal source, said A/V display and said storage means,

said transceiver further including

at least one processor unit,

at least one system memory, unit, and

a bus controller cooperatively coupled together for receiving input control and data signals and in response generating output control and data signals for said signal source, said A/V display, and said storage means.

15. An interactive user interface and audio-visual (A/V) system, comprising:

a transceiver coupled to an audio-visual (A/V) display for receiving audio-visual signals in an electronic signal spectrum from a signal source, said transceiver including interface generation means for causing said A/V display to display an interface, said interface including selectively displayed multiple levels of information related to an audio-visual program viewed on said A/V display;

control means in communication with said transceiver for permitting a user viewing said A/V display to selectively display said multiple levels of information on said A/V display;

wherein said interface generation means further includes listing means for causing said A/V display to selectively display a program listing that contains listing information related to A/V programs viewable on said A/V display;

wherein said program listing includes a first picture-in-a-picture (PIP) window in which the currently viewed program viewed by said user prior to said activation of said listing means is displayed on said A/V display.

35. A method for generating and displaying an interface on an audio-visual (A/V) system comprising the steps of:

receiving audio-visual (A/V) signals in an electronic signal spectrum from a signal source using a transceiver coupled to an A/V display, said transceiver including interface generation means;

said interface generation means causing said A/V display to display an interface, said interface including a currently viewed level of information that has been selected by a user from multiple levels of information related to an audio-visual program viewed on said A/V display;

said user selectively displaying said multiple levels of information on said A/V display using control means in communication with said transceiver;

said user pressing one or more direction buttons on said control means to cause said currently viewed level of information about said audio-visual program to be replaced in said interface with a next level of information about said audio-visual program.

5,594,510

METHOD FOR TUNING THE CHANNEL OF BROADCASTING WAVES AND IDENTIFYING CHANNEL PLAN BY APPLYING MEMORIZED FREQUENCY DATA

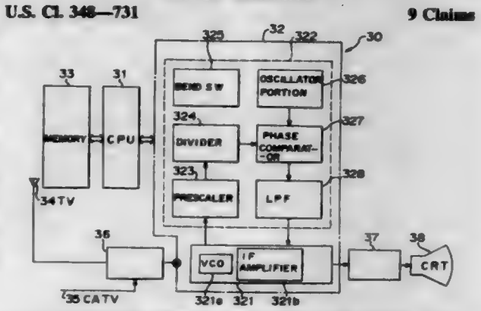
Shigeto Sakakibara, Osaka, Japan, assignor to Funai Electric Co., Ltd., Osaka, Japan

Filed Sep. 25, 1995, Ser. No. 533,480

Claims priority, application Japan, Jan. 19, 1995, 7-024797

Int. Cl.[6] H04N *5/50*

U.S. Cl. 348—731 **9 Claims**



1. A method for tuning a channel of a broadcasting wave, comprising steps of:

PLL tuning by applying memorized data of a center frequency of either a first channel plan or a second channel plan differing from allocation of frequencies of said first channel plan;

judging whether a tuned channel belongs to either the first channel plan or the second channel plan by applying a tuned frequency at a time that tuning is finished; and

renewing said memorized data of the center frequency according to a judged result.

5,594,511

EYEGLASSES WITH A LENS-FRAME BODY WHICH CAN BE SELECTIVELY COUPLED WITH EITHER A PAIR OF BOWS OR A HEAD STRAP

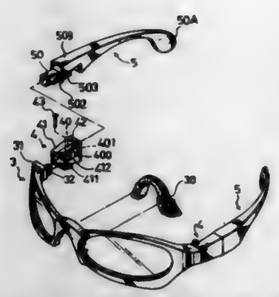
Jeng-Chiang Lin, Taipei City, Taiwan, assignor to Mao Lin Enterprise Co., Ltd., Taipei City, Taiwan

Filed Nov. 13, 1995, Ser. No. 555,891

Int. Cl.[6] G02C *5/14;3/00*

U.S. Cl. 351—116 **2 Claims**

1. A pair of eyeglasses comprising;



an elongated lens-frame body adapted to rest on the nose of a user and including two end portions, each of which has a generally vertical hole formed therethrough;

two connectors, each of said connectors having a front end portion provided with two aligned horizontal lugs which are respectively formed with threaded holes therethrough, and a bolt extending through the threaded holes of the lugs and the hole of a corresponding one of said end portions of said lens-frame body so as to hinge said connectors on said end portions of said lens-frame body; and

a fastener device coupled detachably with rear end portions of said connectors so as to retain said lens-frame body on the face of the user,

wherein each of said connectors has a rear end surface with a generally horizontal receiving bore formed therein, a rear end wall, two aligned integral stop elements disposed in two sides of a rear end of said bore and forming parts of the rear end wall of said connector so as to define in the rear end wall a T-shaped opening which has a wide upper section located above said stop elements, and a narrow lower section located between said stop elements, said fastener device including a pair of one-piece bows, each of which has a front connecting end portion received in a corresponding one of said receiving bores, a resilient barb section that is integrally formed with said front connecting end portion at a front end of said barb section and that is inclined rearward and downward from said front connecting end portion, a rear engaging end portion for engaging an ear of the user, and an inclined push section which has a front end integrally formed with said barb section and which inclines rearward and downward from said barb section, each of said barb sections being located in a corresponding one of said bores and having a rear end abutting against said stop elements of a corresponding one of said connectors so as to prevent said barb sections from rearward movement in said bores, thus preventing removal of said bows from said connectors, said push sections of each of said bows being pushable upward on said bow to move said barb section to a level above said stop elements so as to permit passage of said barb section through the upper section of said T-shaped opening of said connector, thereby removing said bow from said connector.

5,594,512

OPHTHALMOLOGICAL PHOTOGRAPHING INSTRUMENT

Yutaka Yoneda, and Hiroyuki Ohtsuka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

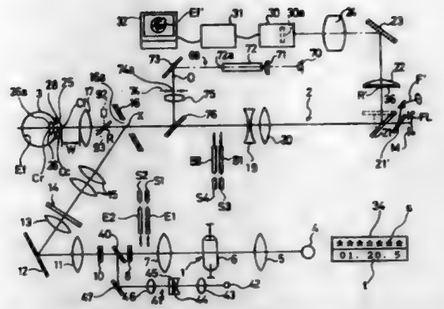
Filed Nov. 15, 1995, Ser. No. 558,194

Claims priority, application Japan, Nov. 16, 1994, 6-281629

Int. Cl.[6] A61B *3/14;3/10;* **G03B** *29/00*

U.S. Cl. 351—206 **8 Claims**

1. An ophthalmological photographing instrument for fluorescent photograph comprising irradiating means for irradiating illuminating light to a fundus of an eye to be tested, projecting means for projecting target luminous light to the eye, image receiving means capable of receiving a reflection image of the target luminous flux reflected by the eye together with an image of the fundus



of the eye, and observation/photographing means for observing and photographing an image of the eye received by said image receiving means, wherein said ophthalmological photographing instrument further comprises:

moving picture recording means into which the received image output coming from said image receiving means is input;

timer means for counting time which has elapsed since the time when a fluorescent agent for the use of the fluorescent photograph has been injected into a vein, and quenching means for reducing or quenching the target luminous flux after the passage of a predetermined time from the time when the injection of the fluorescent agent has been made, based on an output of said timer means.

5,594,513

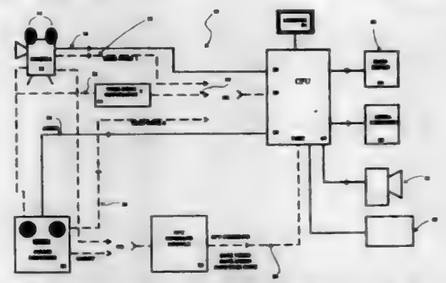
SYSTEM FOR MOTION PICTURE FILM PREVIEWING

Neil T. Stone, 9323 Rowell Ave., Chatsworth, Calif. 91311, and Jacques Nosco, 5805 Salisbury La., San Luis Obispo, Calif. 93401

Filed May 12, 1995, Ser. No. 440,342

Int. Cl.[6] G03B *31/00;31/04;24/00*

U.S. Cl. 352—6 **23 Claims**



1. In a motion picture film/audio recording system where a camera produces a motion picture film, a corresponding video signal, and associates with both the motion picture film and video signal a first time code signal providing a correspondence standard between the motion picture film and the video signal, and a camera status signal representative of whether the camera is on or off, and a sound recorder which produces an audio signal, a second time code signal having a known relationship to the first time code signal, and a recorder status signal representative of whether the sound recorder is on or off, a viewing system for the motion picture film comprising:

command module means, receiving the camera status signal and the recorder status signal, for generating a save signal whenever the camera status or the recorder status signals indicate that the camera or the recorder is on; and,

processor means, receiving said save signal, the video signal, the audio signal and the first and second time code signals, for

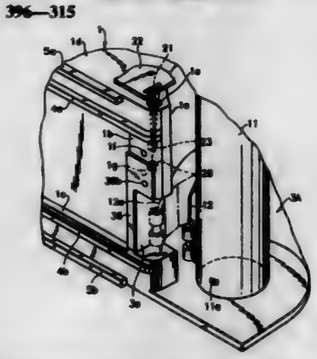
storing the video, audio and first and second time code signals in a storage medium for retrieval whenever said save signal is received.

5,594,514
IMAGE CAPTURE SYSTEM
Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 14, 1994, Ser. No. 355,721
Int. Cl.[6] G03B *29/00*
U.S. Cl. 396—429 **11 Claims**



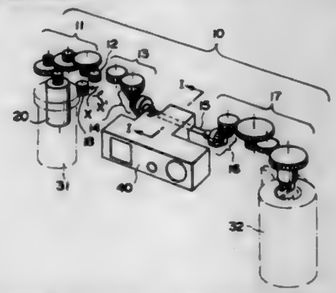
1. An image capture system comprising:
(a) an image recording medium;
(b) means for viewing a real image;
(c) means for capturing said real image onto the image recording medium; and
(d) means for capturing a stored image onto the image recording medium, comprising a projection device capable of projecting at least one stored image onto said image recording medium, wherein said projection device is selected from the group consisting of a CRT and a slide projector.

5,594,515
CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE
Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397. This application Jun. 7, 1995, Ser. No. 483,688
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.[6] G03B *17/24*
U.S. Cl. 396—315 **1 Claim**



1. A data imprinting device for use in a camera comprising:
a light source for emitting imprinting light;
a first part of said device for focusing said imprinting light upon a photosensitive surface at least two positions;
a second part of said device for selectively occluding said imprinting light from focusing upon at least one position of said at least two positions;
said first part including
a first reflecting unit for reflecting incident light of said imprinting light upon a first position of said at least two positions;
a second reflecting unit for reflecting incident light of said imprinting light upon a second position of said at least two positions; and
said first position being further from a center of said photosensitive surface than said second position.

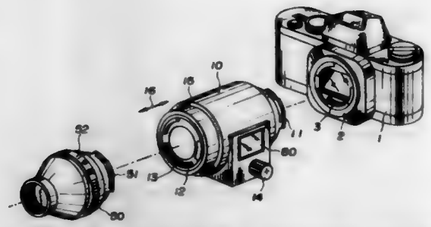
5,594,516
PHOTOGRAPHIC CAMERA
Yukio Noguchi, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan
Filed Oct. 13, 1994, Ser. No. 322,335
Claims priority, application Japan, Oct. 14, 1993, 5-256743
Int. Cl.[6] G03B *1/18;13/02*
U.S. Cl. 396—418 **2 Claims**



1. A compact photographic camera comprising a film magazine chamber and a film take-up chamber disposed on opposite sides of an optical system of a viewfinder that is optically isolated from a photographic lens of said camera and includes an upper surface that is coplanar with a body of said photographic camera, and a gear train for transmitting power such as that for taking up the film between the film magazine chamber and the film take-up chamber, wherein the improvement comprises that
said gear train has a power transmission shaft which has a length sufficient to extend across the optical system of the viewfinder and extends from said film magazine chamber to said film take-up chamber, and
a recess is formed in a contour of the optical system of the viewfinder as viewed from a side of the optical system, with the power transmission shaft extending through the recess.

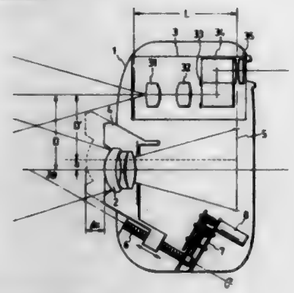
5,594,517
ENLARGEMENT PHOTOGRAPHING APPARATUS
Katsuhiko Tsunefuji, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed May 4, 1994, Ser. No. 237,685
Claims priority, application Japan, May 7, 1993, 5-106763; May 7, 1993, 5-106764
Int. Cl.[6] G03B *13/32*; G02B *7/105*
U.S. Cl. 396—87 **28 Claims**

1. An enlargement photographing apparatus arranged between photographing lens means and a camera body, comprising:
distance changing means being extendable and retractable in an optical-axis direction for changing a distance between said photographing lens means and said camera body;
feeding-quantity detecting means for detecting a quantity of feeding with respect to a reference position of said distance changing means;



computing means for computing a photographing scale factor based on output information of said feeding-quantity detecting means, information regarding said photographing lenses and said camera body and information of a reference length of said distance changing means which is arranged on said enlargement photographing apparatus; and
display means for displaying said photographing scale factor responsive to an output from said computing means.

5,594,518
CAMERA
Koichi Ohshita, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan
Continuation of Ser. No. 105,674, Aug. 13, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 470,573
Claims priority, application Japan, Aug. 18, 1992, 4-219091
Int. Cl.[6] G03B *3/00;13/14*
U.S. Cl. 396—133 **4 Claims**

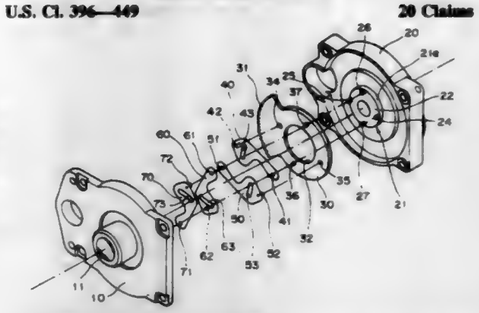


1. A camera comprising:
a photographing lens;
a shutter unit;
a finder having an optical axis disposed substantially in parallel with an optical axis of said photographing lens;
a camera body;
a lens barrel moveable in relation to said camera body and incorporating said photographing lens and said shutter unit therein for moving said photographing lens and said shutter unit rectilinearly in unison in a direction set at a predetermined angle to said optical axis at said photographing lens;
a feed screw engaging with said lens barrel for converting a rotational movement into a rectilinear movement to move said lens barrel rectilinearly in said set direction;
a motor; and
a reduction gear train for transmitting a rotational power from said motor to said feed screw;
wherein said feed screw is disposed at a predetermined angle θ inclined to the optical axis of said photographing lens toward the optical axis of said finder, and the following formula is satisfied:

$$0.8<(F\cdot\tan\theta)/D<1$$

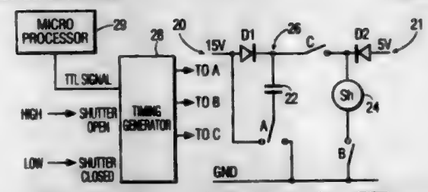
where
F: a focal length of said photographing lens,
D: a distance between said optical axes of said finder and said photographing lens.

5,594,519
BLADE MECHANISM
Hitoshi Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 4, 1995, Ser. No. 566,953
Claims priority, application Japan, Dec. 5, 1994, 6-329983
Int. Cl.[6] G03B *9/00;9/02*
U.S. Cl. 396—449 **20 Claims**



1. A blade mechanism comprising:
a first blade rotatably provided around a first pivot, said first blade having a first opening and a first driving point for rotating said first blade;
a second blade rotatably provided around a second pivot, said second blade having a second opening and a second driving point for rotating said second blade;
means for rotating said first and second blades, respectively, by driving said first and second driving points;
said first pivot being disposed between said second pivot and said second driving point, and said second pivot being disposed between said first pivot and said first driving point;
said first and second blades selectively forming an aperture therebetween;
said first opening being formed so as not to block rotation of said second blade; and
said second opening being formed so as not to block rotation of said first blade.

5,594,520
LOW SUPPLY VOLTAGE SHUTTER DRIVER
Hans-Jurgen Meyer, Tucson, Ariz., assignor to Photometrics, Ltd, Tucson, Ariz.
Filed Feb. 21, 1995, Ser. No. 391,710
Int. Cl.[6] G03B *9/08*
U.S. Cl. 396—463 **7 Claims**



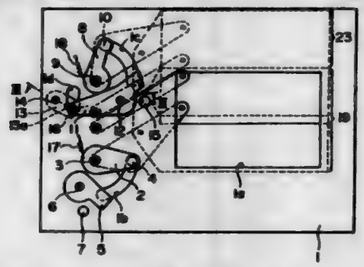
1. A driver circuit for a mechanical shutter for a CCD camera, said shutter requiring a first relatively high voltage for operation during an opening phase of a cycle of operation of said shutter and a second relatively low voltage during a holding phase, said circuit including a power supply supplying a third voltage equal to at least one half of said first voltage, said power supply also supplying said second voltage, said circuit including a capacitor and means for connecting said capacitor to said power supply for storing charge during said holding phase and for discharging during said opening phase to provide a fourth voltage additive to said third voltage for supplying said first voltage during said opening phase.

5,594,521

BRAKE APPARATUS FOR A SHUTTER

Masanori Hasuda, and Takashi Matsubara, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 457,536
Claims priority, application Japan, Aug. 24, 1994, 6-199870
Int. Cl.[6] G03B 9/40
U.S. Cl. 396—453 10 Claims



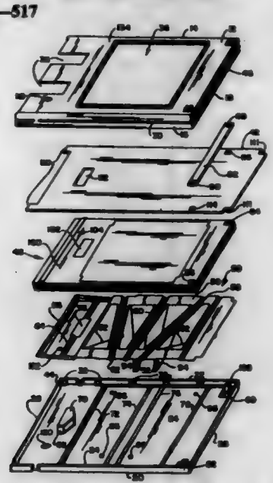
1. A brake apparatus for a shutter comprising:
a first brake mechanism including a first shaft, a first brake lever rotatably supported on said first shaft, and a first braking member for braking said first brake lever, said first brake lever being adapted to rotate in response to the operation of said shutter, whereby the braking of said shutter is done;
a second brake mechanism including a second shaft spaced apart by a predetermined distance from said first shaft, a second brake lever rotatably supported on said second shaft, and a second braking member for braking said second brake lever; and
a connecting mechanism linking said two mechanisms together so as to operate said second brake mechanism in connection with the operation of said first brake mechanism.

5,594,522

CASSETTE FOR ENCLOSING A PLURALITY OF NEGATIVE FILM UNITS

Harry R. Parsons, Reading; Robert M. Curry, Arlington, both of Mass., and Stephen G. Gilvar, Bedford, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 26, 1994, Ser. No. 312,420
Int. Cl.[6] G03B 17/26
U.S. Cl. 396—517 23 Claims



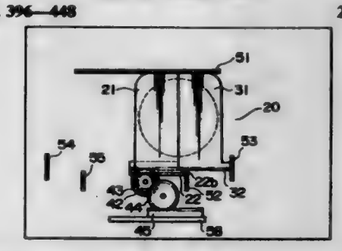
1. A cassette for holding a negative film unit, said cassette including a forward wall, a rear wall, two side walls, a leading end wall and a trailing end wall combined to form an enclosure for holding at least one film unit, comprising:
an exposure opening in said forward wall;
an egress opening in said leading end wall;
a spring platen mounted within said enclosure having legs for engaging said rear wall and for urging said film unit toward said forward wall;
a pick slot extending through said forward wall into said enclosure for the passage of a pick to advance said film unit through said egress opening, said pick slot being located intermediate said exposure opening and said egress opening; and,
an optical sensor opening in said rear wall aligned with said optical sensor opening in said forward wall.

5,594,523

LENS COVER MECHANISM FOR A CAMERA

Yoshifumi Fujisaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,075
Claims priority, application Japan, Dec. 27, 1993, 5-070104 U
Int. Cl.[6] G03B 17/02
U.S. Cl. 396—448 20 Claims



1. A lens cover mechanism for a camera, said lens cover mechanism comprising:
a plurality of lens cover plates disposed at an object facing side of an objective lens of said camera, said plurality of lens cover plates having a first state wherein each of said plurality of lens cover plates covers a portion of said objective lens and, said plurality of lens cover plates together cover said objective lens of said camera, and a second state wherein all of said cover plates are stacked one in front of the next and moved to a same side of said objective lens, completely exposing said objective lens of said camera; and
means for driving said cover plates between said first and said second states.

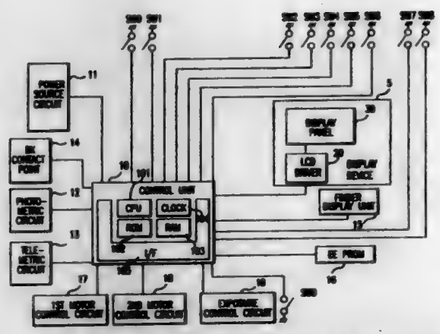
5,594,524

CAMERA FOR SELECTIVELY INPUTTING OPERATING PARAMETERS AND METHOD

Nobuaki Sasagaki, and Takashi Saegusa, both of Kanagawa-ken, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,839
Claims priority, application Japan, Feb. 4, 1994, 6-032946; Feb. 4, 1994, 6-032948
Int. Cl.[6] G03B 17/18
U.S. Cl. 396—287 31 Claims

1. A camera capable of the selective input of operating parameters, wherein said camera has at least two operating modes, said camera comprising:
a control unit;
a selection component for the selective input of operating parameters;
a display device for displaying said parameters; and
an operational component for selecting an operating mode from the at least two operating modes, wherein when a first operating mode is selected by said operational component, said control unit displays a designated number of preset parameters corresponding to said first operating mode on said display device and only permits selection of said designated preset parameters corresponding to said first operating mode by said selection component, and wherein when a second operating mode is selected by said operational component, said control unit displays a designated number of parameters corresponding to said second operating mode for selection by said selecting component and then permits selection of a plurality of additional parameters displayed on said display device by said operational component in place of said designated parameters in response to the selection by said selection component.

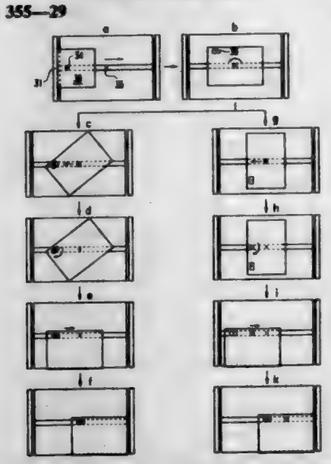


5,594,525

METHOD OF PRINTING PHOTOGRAPHS AND APPARATUS FOR CARRYING OUT THE METHOD

Gerhard Benker, Icking; Helmut Treiber; Ulrich Klötter, both of Munich; Bernhard Lorenz, Freising, and Reimund Münch, Munich, all of Germany, assignors to AGFA Geavert, Munich, Germany

Filed May 25, 1995, Ser. No. 450,822
Claims priority, application Germany, Jun. 15, 1994, 44 20 823.5
Int. Cl.[6] G03B 29/00
U.S. Cl. 355—29 16 Claims



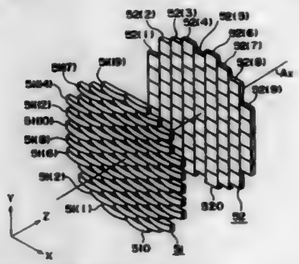
1. A method of exposing transparent masters onto light-sensitive material in the form of individual sheets, wherein each sheet is positioned with respect to the exposure field in an image plane of an optical projection device such that the optical axis of the projection device passes next to the center of the sheet, said method comprising the steps of:
(a) rotating the sheet by a prescribed angle about a first point in the image plane; and
(b) rotating the sheet about a second point in the image plane.

5,594,526

OPTICAL INTEGRATOR AND PROJECTION EXPOSURE APPARATUS USING THE SAME

Takashi Mori, and Hideki Komatsuda, both of Kawasaki, Japan, assignors to Nikon Corporation, Japan

Filed May 5, 1995, Ser. No. 436,070
Claims priority, application Japan, May 9, 1994, 6-094612; Sep. 21, 1994, 6-226395
Int. Cl.[6] F21V 29/00; G03B 27/54; G02B 27/09
U.S. Cl. 355—67 15 Claims



1. An optical integrator comprising:
a first lens group having first and second front lens element groups of first lens elements having a rectangular lens section and arranged along a first direction, said first and second front lens element groups being arranged along a second direction perpendicular to the first direction, said first front lens element group being adjacent to said second front lens element group, positions of said first lens elements belonging to said first front lens element group shifting by a predetermined length from positions of said first lens elements belonging to said second front lens element group along the first direction;
a second lens group having first and second rear lens element groups of second lens elements having a rectangular lens section different from the lens section of said first lens element and arranged along the second direction, said first and second rear lens element groups being arranged along the first direction, said first rear lens elemeat group being adjacent to said second rear lens element group, positions of said second lens elements belonging to said first rear lens element group shifting by a predetermined length from positions of said second lens elements belonging to said second rear lens element group along the second direction; and
a base arranged between said first and second lens groups for fixing said first and second lens groups relatively at a state in which a center of the lens section of said first lens element coincides with a center of the lens section of said second lens element.

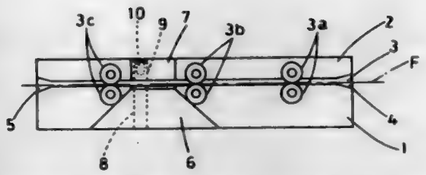
5,594,527

NEGATIVE FILM MASKING APPARATUS

Hiroshi Oku, and Eiji Motooka, both of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Apr. 19, 1995, Ser. No. 424,650
Claims priority, application Japan, Apr. 20, 1994, 6-081485
Int. Cl.[6] G03B 27/62; 27/52
U.S. Cl. 355—75 11 Claims

1. A negative film masking apparatus for use in printing a negative film which has patterns of latent image data recorded thereon outside of frames thereof, said apparatus comprising:
a negative holder having an exposure gate at an exposure station and a film transfer path to receive the negative film and along



which the negative film may be transferred to bring a frame thereof into alignment with said exposure gate for exposure of such frame;

a mask cover confronting said negative holder to cover the negative film such that the negative film can be held between said negative holder and said mask cover, said mask cover having therein an opening opposite said exposure gate of said negative holder;

a view window provided in one of said negative holder and said mask cover at a position therein enabling an operator of said apparatus to look toward patterns of latent image data adjacent a particular frame of the negative film in said film transfer path; and

means, provided in the other of said negative holder and said mask cover at a position thereof opposite said view window, to provide contrast at the patterns of latent image data adjacent the particular frame sufficient to enable the operator to view and read the same.

5,594,528

FLASH BULB TYPE THERMAL COPYING DEVICE

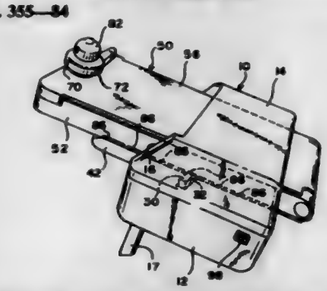
Takanori Hasegawa, Tokyo-to, Japan, assignor to Riso Kagaku Corporation, Tokyo-to, Japan

Filed Jul. 12, 1994, Ser. No. 273,718

Claims priority, application Japan, Jul. 16, 1993, 5-176966

Int. Cl.[6] G03B *27/04*

U.S. Cl. 355—84 **7 Claims**



1. A flash bulb type thermal copying device, comprising:

a holder for holding therein an assembly consisting of an original and a heat sensitive recording medium one over the other in an intimate contact with each other, said holder including a light transmitting region defined therein for exposing said assembly to external light;

an exposure unit capable of making exposures of said assembly through said light transmitting region, said exposure unit including a casing, a holder receiving passage defined in said casing for guiding movement of said holder in a first direction relative to said exposure unit, a light radiating window defined in said casing so as to successively scan a plurality of portions of said light transmitting region of said holder while said holder and associated light transmitted region are moved in said first direction relative to said exposure unit, and a flash light source for radiating flash light upon said portions of said light transmitting region through said light radiating window;

a feeder mechanism for moving said holder relative to said exposure unit in said holder receiving passage so as to cause said light radiating window to successively scan said portions of said light transmitting region of said holder; and

a synchronization electric circuit for synchronizing activation of said flash light source with said feeder mechanism so as to expose each of said portions of said light transmitting region to said flash light emitted from said light radiating window while said feeder mechanism moves said holder and associated light transmitting region through said exposure unit.

5,594,529

IMAGING DEVICE WITH STOCK SUPERVISION MEANS

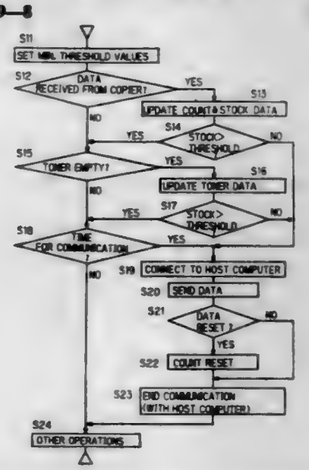
Yuji Yamashita; Jiro Nagira; Yasuhiro Hashimoto, and Fumio Aizawa, all of Osaka, Japan, assignors to Exedy Corporation, Osaka, Japan

Filed Nov. 27, 1995, Ser. No. 563,249

Claims priority, application Japan, Nov. 30, 1994, 6-297674; Nov. 30, 1994, 6-297676; Nov. 30, 1994, 6-297677; Nov. 30, 1994, 6-297680

Int. Cl.[6] G03G *15/00*

U.S. Cl. 399—8 **25 Claims**



14. A method for monitoring supplies of consumable items used by an imaging device comprising the steps of:

providing an imaging device with means for sensing paper usage and toner usage and a supply of paper proximate the imaging device;

transmitting use data indicating paper usage to a supervision device from the imaging device;

transmitting use data from the supervision device to a host computer, the host computer maintaining a database having information about the supply of paper proximate the imaging device;

calculating average use data based upon said use data;

calculating an estimated amount of consumable items used between a current date and an expected delivery date based upon said average use data;

calculating a required minimum amount of stock based on a time lag between said expected delivery date and an actual delivery date; and

calculating an appropriate amount of stock based on said minimum amount of stock and said estimated amount of consumable items used.

5,594,530

SERIAL PRINTER HAVING CARRIAGE WITH INDEPENDENTLY MOVABLE IMAGE BEARING MEMBER AND FIXING UNIT

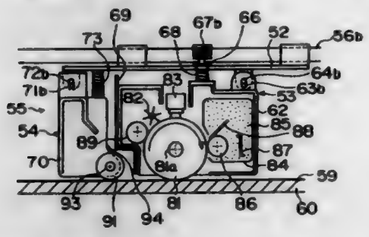
Syuzo Masuda, and Ryouichi Iwama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1995, Ser. No. 429,135

Claims priority, application Japan, May 18, 1994, 6-104085

Int. Cl.[6] G03G *15/04;15/22*

U.S. Cl. 399—111 **24 Claims**



1. A serial printer comprising:

transport means for transporting a recording sheet in a sheet transport direction;

processing means, including an image bearing member having a rotary shaft which extends in a direction parallel to the sheet transport direction, for forming a latent image on the image bearing member by charging the image bearing member and developing the latent image into a developed image;

fixing means for fixing the developed image, on the image bearing member, onto the recording sheet; and

a carriage movable in a carriage moving direction, perpendicular to the sheet transport direction, and supporting said processing means and said fixing means, said processing means and said fixing means being independently movable on said carriage.

5,594,531

ELECTROPHOTOGRAPHIC APPARATUS EMPLOYING CYLINDRICAL MEMBER HAVING SPACE CONTROLLING MEMBER AND PRESS-FITTED FLANGE

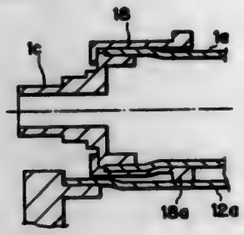
Kazuo Shishido, Kawasaki; Shinichi Sasaki, Fujisawa, and Koji Miura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 977,868, Nov. 17, 1992, abandoned. This application Dec. 15, 1995, Ser. No. 573,585

Claims priority, application Japan, Nov. 20, 1991, 3-329751

Int. Cl.[6] G03G *5/00*

U.S. Cl. 399—159 **21 Claims**



1. A cylindrical member comprising a sleeve, a flange bonded to an end portion of said sleeve, and a space-controlling member provided at the end portion of said sleeve, in which a press-fitted portion of said flange is press-fitted into the end portion of said sleeve to be bonded thereto, and a space-controlling and contacting portion of said space-controlling member contacts an outer side of said sleeve and is located farther from an end of said sleeve at the end portion thereof than the press-fitted portion of said flange.

5,594,532

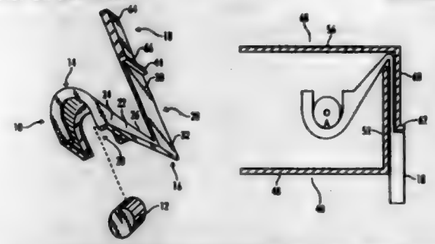
CARTRIDGE, CARTRIDGE CLEANING APPARATUS AND METHOD FOR CLEANING A CORONA WIRE

Eric Tavenner, Moorpark, and Efrem Lipetsky, Northridge, both of Calif., assignors to Dataproducts Corporation, Simi Valley, Calif.

Filed Mar. 15, 1995, Ser. No. 404,558

Int. Cl.[6] G03G *21/00;15/02*

U.S. Cl. 399—100 **18 Claims**



1. A cartridge cleaning tool adapted for use with a main charger unit having a housing unit with a lengthwise edge, a corona wire extending through the housing unit, and a lid, wherein the housing unit and the lid define a lengthwise slit opening extending along the direction of the lengthwise edge of the housing unit, the cartridge cleaning tool comprising:

a cleaning element adapted to contact the corona wire,

a cleaning support element for supporting the cleaning element,

a handle, and

a connecting portion coupling the cleaning support element and the handle, and configured to extend through the lengthwise slit opening and slidably mate with the lengthwise edge of the at least one side of the housing unit and the lengthwise slit opening.

5,594,533

IMAGE FORMING APPARATUS CAPABLE OF VARYING CHARGE AMOUNT IN ACCORDANCE WITH TONER DENSITY

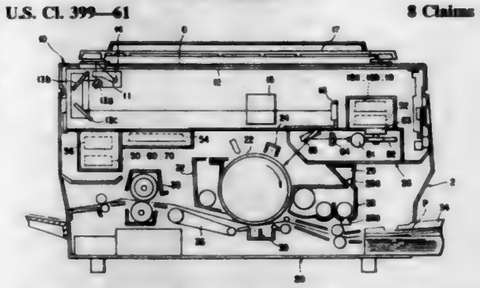
Tetsuo Katoh, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 22, 1995, Ser. No. 493,568

Claims priority, application Japan, Jun. 30, 1994, 6-150177

Int. Cl.° G03G *15/02*

U.S. Cl. 399—61 **8 Claims**



1. An image forming apparatus comprising:

an image bearing member for bearing an electrostatic latent image formed thereon;

means, storing a developing agent including toner and carriers, for developing the electrostatic latent image formed on the image bearing member by supplying the toner to the electrostatic latent image;

means, provided in the developing means, for sensing a toner density inside the developing means and for producing a sensing output; and

means for charging the image bearing member such that the image bearing member has a constant surface potential when

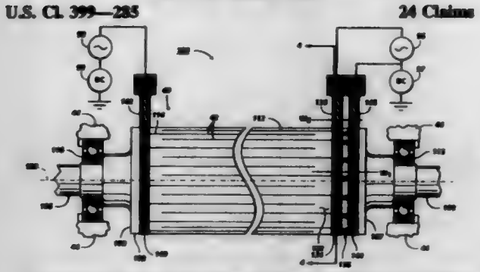
the sensing output is under a predetermined value, and for charging the image bearing member such that the image bearing member has a variable surface potential corresponding to the sensing output when the sensing output is over the predetermined value.

5,594,534

ELECTRODED DONER ROLL STRUCTURE INCORPORATING RESISTIVE NETWORK

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1996, Ser. No. 585,878
Int. Cl.[6] G03G *15/08*
U.S. Cl. 399—285 **24 Claims**



1. A donor roll for transporting marking particles to an electrostatic latent image recorded on a surface, said donor roll adaptable for use with an electric field to assist in transporting the marking particles from said donor roll to a development zone adjacent the surface, said donor roll comprising:

a rotatably mounted body;

a first electrode member mounted on said body;

a second electrode member mounted on said body and spaced from said first electrode member; and

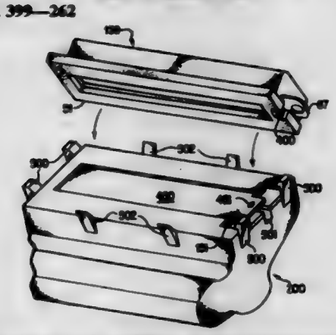
a resistive member electrically interconnecting said first electrode member and said second electrode member so that when the electric field is applied to said first electrode member a portion of the field will be transferred to second electrode member.

5,594,535

REFILLABLE TONER CARTRIDGE

Richard F. Beaufort, Boise; Robin P. Yergenson, Eagle, and Howard G. Hooper, Boise, all of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 7, 1995, Ser. No. 553,218
Int. Cl.[6] G03G *15/06*
U.S. Cl. 399—262 **8 Claims**



1. An apparatus for refilling an electrophotographic imaging system, said apparatus comprising:

a pack which defines an interior volume, said pack comprising:

a frame having a top face and a bottom face, said frame having an opening extending from said top face to said bottom face;

a removable seal attached to said frame between said top face and said bottom surface along said opening;

a collapsible bag permanently attached to said top face of said frame;

developer particles contained in said interior volume of said pack; and

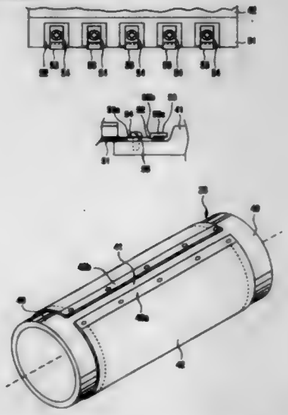
a cartridge having a receiving area arranged to receive said pack, said receiving area further having an opening passing from within said cartridge to outside said cartridge, said apparatus further comprising a flexible cover attached over said opening in said receiving area.

5,594,536

RELIABLE TRANSFER FILM ATTACHMENT STRUCTURE

Takashi Kawabata; Nobuo Hyakutake; Fumio Furusawa, and Masaaki Tokunaga, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,731
Claims priority, application Japan, Dec. 16, 1994, 6-313748
Int. Cl.[6] G03G *15/14*
U.S. Cl. 399—297 **9 Claims**



1. A transfer material carrying body used in an image forming apparatus which forms an image by sequentially forming a plurality of toner images of different colors on an image carrying body, and sequentially transferring, in superimposition, the toner images from the image carrying body onto a transfer material carried by the transfer material carrying body, said transfer material carrying body comprising:

a drum-like frame having a pair of annular members located at both axial ends of the transfer material carrying body and a coupling member for coupling the annular members to each other;

a transfer film attached to the frame such that a circumferential front end portion of the transfer film is fixed to the coupling member, and both side end portions of the transfer film are wound around outer peripheral surfaces of the respective annular members so as to conform to the latter so that the transfer film assumes a hollow cylinder; and

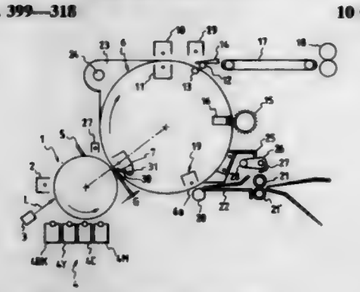
a restricting member fixed to the coupling member so as to abut only a top surface of only a rear end portion of the transfer film.

5,594,537

IMAGE FORMING APPARATUS WITH TRANSFER MATERIAL SUPPORT MEMBER

Yuji Hasegawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 998,864, Dec. 30, 1992, abandoned.
This application Feb. 6, 1995, Ser. No. 384,685
Claims priority, application Japan, Jan. 9, 1992, 4-019384
Int. Cl.[6] G03G *15/14*
U.S. Cl. 399—318 **10 Claims**



1. An image forming apparatus, comprising:

a rotatable image bearing member;

a transfer material bearing member for bearing a transfer material thereon, said transfer material bearing member having a circumferential length an integer number of times of that of said image bearing member and being driven independently of said image bearing member, and having a transfer material bearing sheet for bearing the transfer material thereon and a support member for supporting said transfer material bearing sheet, an image formed on said image bearing member being transferred onto the transfer material born by said transfer material bearing member at a transfer position;

a press member for pressing said transfer material bearing member against said image bearing member at the transfer position, a gap being formed between said transfer material bearing sheet and said image bearing member when pressing of the transfer material bearing member is released; and

varying means for varying a relative position between a peripheral surface of said image bearing member and a peripheral surface of said transfer material bearing member;

wherein as said varying means varies a relative position between the peripheral surface of said image bearing member and the peripheral surface of said transfer material bearing member, said press member releases pressing against the transfer material bearing sheet without shifting the support member in a direction away from said image bearing member.

5,594,538

IMAGE FORMING APPARATUS HAVING MULTI-LAYER TRANSFER MATERIAL BEARING MEMBER WITH DIFFERENT COEFFICIENT OF KINETIC FRICTIONS BETWEEN LAYERS

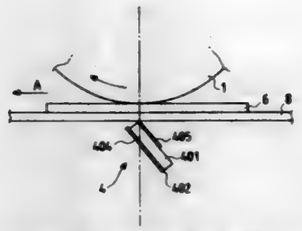
Nobuhiko Takekoshi, Tokyo, and Masahiko Inoue, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1993, Ser. No. 172,057
Claims priority, application Japan, Dec. 29, 1992, 4-361019; Jun. 1, 1993, 5-152645; Jun. 1, 1993, 5-154501
Int. Cl.[6] G03G *15/01;15/16*
U.S. Cl. 399—310 **33 Claims**

1. An image forming apparatus comprising:

an image bearing means for bearing an image;

a transfer material bearing member for bearing and conveying a transfer material; and



a transfer member for transferring the image on said image bearing means onto the transfer material born by said transfer material bearing member, said transfer member being arranged to contact with a surface of said transfer material bearing member opposite to a surface on which the transfer material is born;

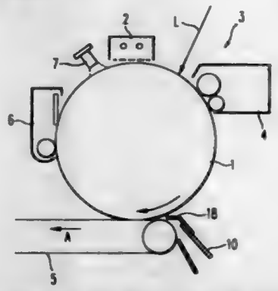
wherein said transfer member comprises a first layer contacting with said transfer material bearing member and a second layer not contacting with said transfer material bearing member, and wherein a coefficient of kinetic friction between the first layer and said transfer material bearing member is smaller than that between the second layer and said transfer material bearing member.

5,594,539

PAPER GUIDE DEVICE FOR IMAGE FORMING APPARATUS

Jun'ichi Murano, Sayama; Takaya Muraishi, Yokohama; Hiroshi Tanabe, Tokyo; Kazunori Karasawa, Tokyo; Kazuhiro Nishido, Tokyo, and Ichiro Komuro, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 26, 1995, Ser. No. 453,048
Claims priority, application Japan, Jun. 30, 1994, 6-150127; Jul. 25, 1994, 6-172565
Int. Cl.[6] G03G *15/16*
U.S. Cl. 399—316 **32 Claims**



1. A paper guide device for guiding a sheet of paper to an image transfer device in an image forming apparatus, comprising:

a pair of paper guide members; and

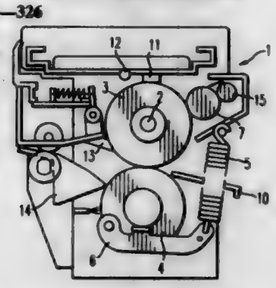
an elastic transfer guide plate which is attached to one of said paper guide members at a free end of said one of said paper guide members which faces said transfer device, wherein said elastic transfer guide plate is bent downward along a bending line, and wherein said bending line is perpendicular to a paper feed direction;

wherein a bending angle of said elastic transfer guide plate is from 135° to 145°.

5,594,540
FIXING APPARATUS WITH A RELEASE OIL APPLYING MEMBER

Toshiaki Higaya, Kawasaki; Yuzo Kouno, Ablkoshi, and Yukiti Shindou, Yamatoshi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 3, 1995, Ser. No. 383,181
Claims priority, application Japan, Feb. 23, 1994, 6-025580
Int. Cl.[6] G03G *15/20;21/00*
U.S. Cl. 399—326 5 Claims



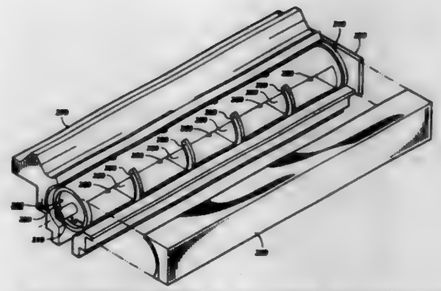
1. A fixing apparatus comprising:
a fixing roller having a peeling-off layer at a peripheral surface of said fixing roller;
a rotating member for coming into contact with and for pressurizing said fixing roller;
a rotatable applying member disposed so as to contact said fixing roller, said rotatable applying member having a fluororesin porous surface layer which has a plurality of minute holes and is of a same quality as that of said peeling-off layer of said fixing roller, and a core member made of foaming material which is filled in oil, such that a rotation of said fixing roller causes a rotation of said applying member so as to permit oil in said core member to pass through the minute holes and be applied to the peripheral surface of the fixing roller; and
a cleaning roller member for cleaning said applying member, said cleaning roller member including a metallic roller and a fluorinated rubber surface layer on said metallic roller which is not of a same quality as that of said porous surface layer of said applying member, said cleaning roller member further including a silicone rubber layer disposed between the metallic roller and the fluorinated rubber surface layer, said silicone rubber layer having a low hardness which increases an elasticity of the fluorinated rubber surface layer;
wherein a transferring material with non-fixed toner image is nipped and delivered with said fixing roller and said rotating member, and non-fixed toner image on said transferring material is fixed with heat and pressure.

5,594,541
CLEANER/WASTE BOTTLE INTERFACE SEALING VIA TONER VALVE

John M. Bouldawski, Jr., Ontario; Bruce E. Thayer, and Dennis G. Gerbasi, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1994, Ser. No. 352,485
Int. Cl.[6] G03G *21/00*
U.S. Cl. 399—358 16 Claims

1. A printing apparatus for cleaning particles from a surface, comprising:
means for cleaning particles from the surface;
a housing defining a chamber having a first open end and a second open end, said cleaning means being mounted in the chamber of said housing with a portion thereof being adapted to extend from the first open end of the chamber into contact with the surface;

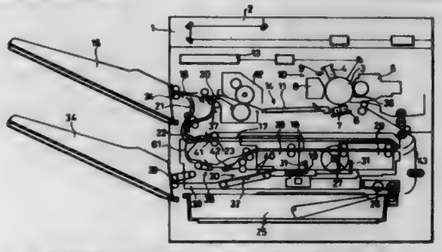


a waste container, attached to the second open end of said housing, for collecting particles removed from the surface by said cleaning means; and
means, rotatably movable between a closed position and an open position, for sealing the second open end of said housing and said waste container, said sealing means comprising a main valve enclosed in the housing between said cleaning means and said waste container, and a lid being movable when directly coupled to said main valve, said lid located between said main valve and said waste container, said main valve and said lid being coupled having simultaneous movement for opening the second open end of said housing and said waste container.

5,594,542
IMAGE FORMING APPARATUS HAVING DOUBLE-SIDED IMAGE FORMING AND POST PROCESSING CAPABILITY

Yuji Sugimoto, Nara; Fujikazu Nakayama, Ikoma, and Keizo Ito, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 10, 1995, Ser. No. 513,612
Claims priority, application Japan, Sep. 13, 1994, 6-218817
Int. Cl.[6] G03G *21/00*
U.S. Cl. 399—402 14 Claims



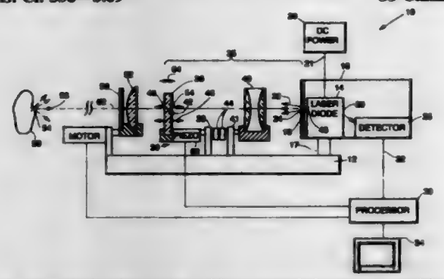
1. A double-sided image forming apparatus having a post-processing function, comprising:
a sheet storing section for storing and feeding sheets;
an image forming section for forming an image on sheets;
a feed transport path which extends from said sheet storing section to said image forming section;
a first discharge section for discharging sheets out of the apparatus, said first discharge section being opened on one side of the double-sided image forming apparatus;
a second discharge section for discharging sheets out of the apparatus, said second discharge section being opened on the same side where said first discharge section is formed;
a first transport path which extends from said image forming section to said first discharge section;
a second transport path for reversing a front and rear of a sheet transporting direction, said second transport path including a sheet insertion/discharge opening connected to a first discharge section side of the first transport path;

a third transport path having a sheet insertion opening and a sheet discharge opening, said sheet insertion opening being connected to said sheet insertion/discharge opening of said second transport path, said sheet discharge opening being connected to said feed transport path;
a fourth transport path having a sheet insertion opening and a sheet discharge opening, said sheet insertion opening being connected to said sheet insertion/discharge opening of said second transport path, said sheet discharge opening being connected to said second discharge section;
an adjusting means for adjusting sheets transported to said fourth transport path and sheets transported to said second transport path to a prescribed position; and
post-processing means for performing a post-process on image formed sheets which have been transported to said fourth transport path and have been adjusted by said adjusting means.

5,594,543
LASER DIODE RADAR WITH EXTENDED RANGE

Peter de Groot, Bethel; Gregg M. Gallatin, Monroe, and Chandra Roychoudhuri, Sandy Hook, all of Conn., assignors to Hughes Danbury Optical Systems, Inc., Danbury, Conn.

Filed Jan. 16, 1990, Ser. No. 464,797
Int. Cl.[6] G01C *3/08;* G01P *3/36*
U.S. Cl. 356—5.09 33 Claims



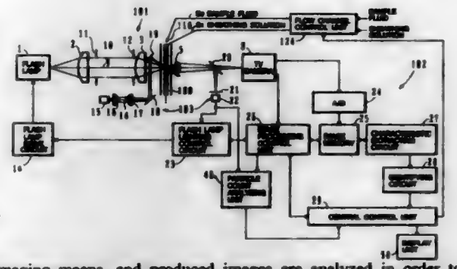
1. An optical radar system with an extended range, comprising:
a laser diode for producing laser emission including a laser beam;
external cavity means receptive of the beam, including a partial reflector spaced from the laser diode for reflecting a first portion of the beam back into the laser diode, the partial reflector passing a second portion of the beam out of the external cavity so as to allow backscatter of the second portion from a target object back through the partial reflector into the laser diode, whereby the emission has a modulation associated with spatial information on the target object;
a photodetector responsive to the emission for generating a signal representing the modulation; and
processing means receptive of the signal for computing the spatial information.

5,594,544
FLOW TYPE PARTICLE IMAGE ANALYZING METHOD AND APPARATUS

Hideyuki Horiuchi, Abiko; Koji Suda, Tokushima, and Masaeto Matsumoto, Sendai, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1994, Ser. No. 327,271
Claims priority, application Japan, Oct. 21, 1993, 5-263539
Int. Cl.[6] G01N *21/05*
U.S. Cl. 356—73 13 Claims

1. A flow type particle imaging analyzing apparatus in which a sample fluid containing suspended particles is flown while being closed with a purity solution, a light beam is irradiated to said sample fluid, said particles in said sample fluid are imaged by an



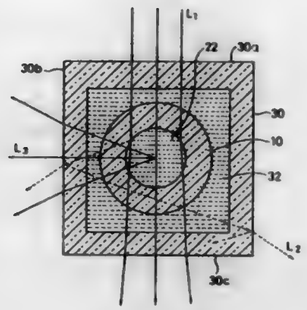
imaging means, and produced images are analyzed in order to categorize said particles, said flow type particle imaging analyzing apparatus comprising:
a light beam generating means for generating a beam to be irradiated to said sample fluid;
a flow chamber designed to flow said sample fluid enclosed with said purity solution and structured so that a dimension of a flow path for said sample fluid in a direction substantially orthogonal to the direction of said light beam remains substantially constant;
a particle detecting means for detecting whether or not particles are present in a given zone upstream of said particle imaging zone in said flow chamber;
a beam generation control means for driving said beam generating means according to a detected signal sent from said particle detecting means;
an image analyzing means for analyzing images that are produced with the same power for imaging by said imaging means so as to categorize said particles in said sample fluid; and
a flow channel control means that controls the ratio of a flow rate of a sample fluid to be flown into said flow chamber to the one of a purity solution to be flown thereinto so as to control a dimension of said sample fluid is said direction in which a beam travels, and thus enables setting of a plurality of measurement modes in association with types of particles to be measured wherein said plurality of measurement modes has at least one measurement mode in which said image analyzing means has a depth of field smaller than said dimension of said sample fluid in said direction in which said beam travels.

5,594,545
MICROFLOW CELL

Muneo Saito, Hachioji; Yasuyuki Kurosu, Tachikawa, and Toru Sasaki, Hachioji, all of Japan, assignors to Nihon Bunko Kabushiki Kaisha, Hachioji, Japan

Continuation of Ser. No. 958,473, Oct. 8, 1992, abandoned, which is a continuation of Ser. No. 688,107, Apr. 19, 1991, abandoned. This application Nov. 17, 1994, Ser. No. 306,523
Claims priority, application Japan, Sep. 5, 1990, 2-236031
Int. Cl.[6] G01N *1/10*
U.S. Cl. 356—246 24 Claims

1. A microflow cell for capillary electrophoresis and micro liquid chromatography comprising:
a circular cylindrical flow cell having an outer periphery and an inside surface;
a jacket disposed outside of said flow cell having flat exterior and interior surfaces on a light-entering face and a flat interior surface on a light-emitting face, said light-emitting face being at an angle of 90° with respect to excited light entering to said light-entering face;
a filling material inserted between said flow cell and said jacket having a refractive index substantially the same as said flow cell and said jacket;
an incoherent, changeable wavelength light source directed normal to said light-entering face; and
a detector located to receive fluoresced light emitted from said light-emitting face.

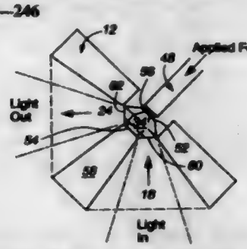


5,594,546

DIAMOND ANVIL CELL FOR SPECTROSCOPIC INVESTIGATION OF MATERIALS AT HIGH TEMPERATURE, HIGH PRESSURE AND SHEAR

Curtis L. Westerfield, Espanola; John S. Morris, and Stephen F. Agnew, both of Los Alamos, all of N.M., assignors to The Regents of the University of California, Los Alamos, N.M.

Filed Mar. 28, 1995, Ser. No. 412,383
Int. Cl.[6] G01N *21/03*
U.S. Cl. 356—246 **6 Claims**



1. A diamond anvil spectroscopic cell for observation of surface films under high pressure, temperature and shear using electromagnetic radiation having a chosen wavelength and bandwidth, which comprises in combination:

a. a diamond having a first flat face, a second, opposing flat face approximately parallel to the first face, a third flat face, and a fourth flat face separated by the first face and disposed at approximately 45° thereto and approximately 90° to each other;

b. means for holding said diamond in a fixed position, said means being adapted to permit electromagnetic radiation to enter the third face of said diamond and exit the fourth face and both enter and exit the second face thereof;

c. a hard pin having a rounded end; and

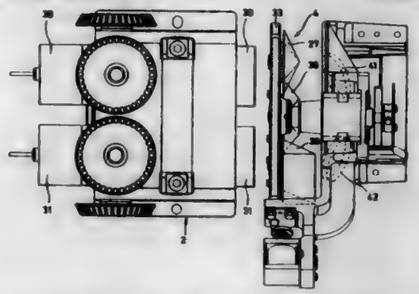
d. means for applying force to said metal pin such that the rounded end thereof is pressed against the second flat face of said diamond, thereby forcing the first face of said diamond against said means for holding said diamond; whereby a fluid of interest is compressed to a desired pressure between the second face of said diamond and the rounded end of said metal pin, and spectroscopic investigation can be accomplished by directing electromagnetic radiation having a chosen wavelength and bandwidth perpendicularly through the third face of said diamond and out of the second face thereof and into the liquid under investigation, where it is reflected by the rounded end of said pin and passes through the liquid under investigation a second time, reentering said diamond through the second face thereof and exits the fourth face of said diamond for analysis.

5,594,547

MULTIELEMENT ATOMIC ABSORPTION SPECTROMETER AND MEASUREMENT METHOD USING SUCH AN ATOMIC ABSORPTION SPECTROMETER

Günther Rödel, Owingen; Bernhard Radziuk, Frickingen; Michael Zeller, Owingen, and Herbert Stenz, Ueberlingen, all of Germany, assignors to Bodenseewerk Perkin-Elmer GmbH, Uberlingen, Germany

Filed Mar. 14, 1995, Ser. No. 404,017
Claims priority, application Germany, Apr. 15, 1994, 44 13 096.1
Int. Cl.[6] G01J *3/30*; G01N *21/74*
U.S. Cl. 356—312 **28 Claims**



1. A multielement atomic absorption spectrometer (1) comprising at least two lamps (20, 21; 30, 31) respectively emitting lines of at least one analyte element, a furnace (5) for heating the analyte sample into its atomized state, at least one optical dispersion element (9) having an entrance slit (41, 42) arranged upstream thereof, detector elements (55) means (4; 43, 47) for passing the radiation emanating from said lamps through said furnace, through said entrance slit and said dispersion element to said detector elements, and measuring means (10, 11; 6), characterized in that a rectangular prism (39), a roof prism (38) and a four-edged prism (27) are selectively movable into the optical path of said lamps in such a manner that the radiation emanating from one, two or four lamps can be passed through said furnace at the same time, that said dispersion element for producing a two-dimensional dispersion spectrum comprises an echelle grating (46) and a dispersion prism (44), and that said detector elements are formed by semiconductor photodiodes arranged in one plane.

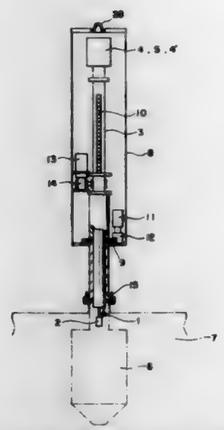
5,594,548

IN-FURNACE INSPECTION MACHINE UTILIZING A DOUBLE-WALLED STRUCTURE

Hiroaki Kobayashi; Hiroshi Igarashi, both of Hitachinaka; Junichi Adachi, Kashiwa; Shinichi Usui, Tokyo-To; Shunji Yoshizawa, Yokohama, and Hirotaka Uehara, Noda, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo-Ken, and Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo-To, both of Japan

Filed Jun. 5, 1995, Ser. No. 462,279
Claims priority, application Japan, Jun. 7, 1994, 6-125269
Int. Cl.[6] G01B *11/24*
U.S. Cl. 356—376 **5 Claims**

1. An in-furnace inspection machine for the interior of a furnace, comprising a light-projecting portion and an objective portion inserted into a furnace that contains a high-temperature, highly radioactive atmosphere; a light-source and an imaging portion located outside said furnace; means for connecting portions inside said furnace to portions outside said furnace; a main inspection machine portion having means for freely raising, lowering, and rotating all of said portions as a single assembly; and a data processing device located outside a hot cell through a cell wall, said in-furnace inspection machine comprises:



a laser-transmission optical fiber incorporated with a laser beam projector at one end thereof inserted into said furnace and being connected to a laser source at the other end thereof outside said furnace;

a fiberscope incorporated with said objective portion at one end thereof inserted into said furnace, said objective portion being arranged so as to be capable of observing an irradiated point on a structural wall surface inside said furnace onto which laser light projected from said laser projector falls, and being connected to an image sensor located at the other end of the fiberscope outside said furnace;

means for calculating the distance from a tip portion of said inspection machine to said structural wall surface on which said laser beam has fallen, by processing an image signal from said image sensor;

a double-walled tube of a structure such that said laser-transmission optical fiber is incorporated inside an inner tube thereof, and a coolant introduced from a supply port outside said furnace into a passageway within said inner tube turns in the vicinity of said laser projector at said tip portion and flows back through a gap between said inner tube and an outer tube thereof to an outflow port outside said furnace; and

a double-walled tube of a structure such that said fiberscope is incorporated inside an inner tube thereof, and a coolant introduced from a supply port outside said furnace into a passageway inside said inner tube turns in the vicinity of said objective portion at said tip portion and flows back through a gap between said inner tube and an outer tube thereof to the outflow port outside said furnace; wherein:

said double-walled tube accommodating said laser-transmission optical fiber and said double-walled tube accommodating said fiberscope are incorporated in a drive shaft provided with means for obtaining straight-line motion in an axial direction and means for obtaining rotational motion in a circumferential direction, and a portion below a lower end portion of said drive shaft is provided by a structure whereby the positional relationship between said laser projector of said double-walled tube accommodating said laser-transmission optical fiber and said objective portion of said double-walled tube accommodating said fiberscope is fixed;

external surfaces of said drive portions of said drive shaft, and said double-walled tube accommodating said laser-transmission optical fiber and said double-walled tube accommodating said fiberscope protruding from a lower end portion of said drive shaft, and penetration portions of said drive shaft through a case of said inspection machine have an airtight configuration; and

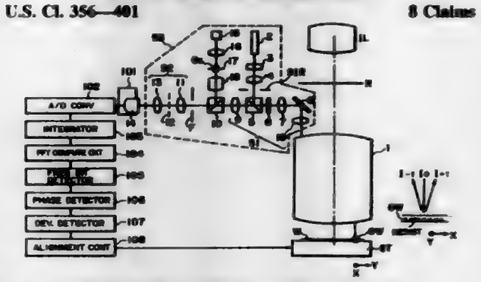
surface shape of structural members inside said furnace are determined from distance data obtained by continuously scanning said laser beam over said surfaces.

5,594,549

POSITION DETECTING METHOD AND PROJECTION EXPOSURE APPARATUS USING THE SAME

Tetsuya Mori, Yokohama; Eiichi Murakami, Kawasaki, and Hirohiko Shinonaga, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1993, Ser. No. 70,904
Claims priority, application Japan, Jun. 4, 1992, 4-171722
Int. Cl.[6] G01N *21/86*; H01L *21/027*
U.S. Cl. 356—401 **8 Claims**



1. A position detecting method, comprising steps of:

illuminating a grating mark of an object with monochromatic light;

forming an interference image on image pickup means by using ±n-th order light (n=1, 2, 3. . .) among reflective diffraction light from the grating mark;

integrating an image signal produced by the image pickup means, within a two-dimensional window of a predetermined size set with respect to the image signal and along one direction in two-dimensional coordinates, to produce a one-dimensional projection integration signal;

transforming, through rectangular transformation, the one-dimensional projection integration signal into a spatial frequency region;

selecting, on the spatial frequency region and from the one-dimensional projection integration signal, a spatial frequency component which appears in the interference image due to periodicity of the grating mark;

detecting the position of the grating mark in accordance with a spatial frequency component selected in said selecting step;

detecting a peak of a frequency intensity distribution in a neighborhood of the spatial frequency component peculiar to the periodicity of the grating mark; and

executing weighted averaging by using phase and intensity of frequency components in a neighborhood of the peak, to thereby detect the position of the grating mark.

5,594,550

DIGITAL SIGNAL RECORDING APPARATUS FOR RECORDING DIGITAL DATA COMPRISING A PLURALITY OF RECORDING BLOCKS

Tatsuro Juri, Osaka; Akira Iketani, Higashiosaka, and Chiyoko Matsumi, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

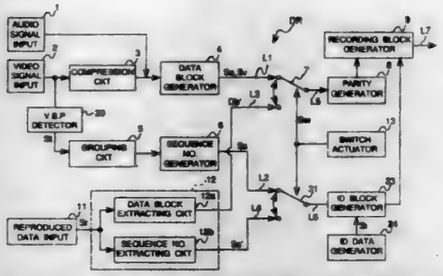
Filed Jun. 14, 1994, Ser. No. 261,044
Claims priority, application Japan, Jun. 16, 1993, 5-144658
Int. Cl.[6] H04N *9/79*
U.S. Cl. 386—40 **16 Claims**

1. A digital signal recording apparatus for recording digital data comprised of a plurality of recording blocks on a recording medium, said apparatus comprising:

grouping means for making a group of said digital data according to a predetermined time-based interval;

data block generating means for dividing said digital data into a plurality of data blocks;

sequence number generating means for dividing said group into "N" sequences, "N" being an integer, and for generating a sequence number for each of said data blocks associated with each of said recording blocks;



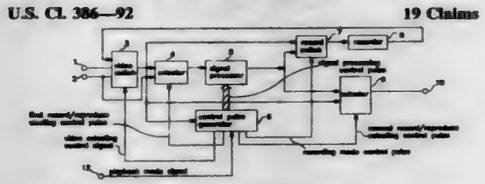
ID block generating means for generating an ID information for each of said data blocks based on said sequence number; and recording block generating means for generating said recording block based on said ID information and said data block.

5,594,551

METHOD AND APPARATUS FOR SELECTIVELY RECORDING MULTIPLE TELEVISION SIGNALS

Hiroki Monta, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 22, 1993, Ser. No. 156,101
Claims priority, application Japan, Nov. 20, 1992, 4-311755
Int. Cl.[6] H04N *5/76;5/91*
U.S. Cl. 386—92 **19 Claims**



19. A recording/reproducing apparatus comprising:

receiving and separating means for receiving a plurality of input television signals and for separating the video components out of each of said plurality of input television signals;

selecting means for selecting said video components of one of said plurality of television signals;

control pulse generator means for receiving said selected video components, for extracting a respective control signal from each of said selected video components, for determining whether said video components are to be recorded or played back and for producing a control pulse signal indicating whether said selected video components are to be displayed or recorded;

audio extracting means for extracting audio components from one of said input television signals corresponding to said video components to be recorded

recording means for receiving said selected video components, said control signal and said audio components, for recording said video components in response to said control signal and for recording said audio components;

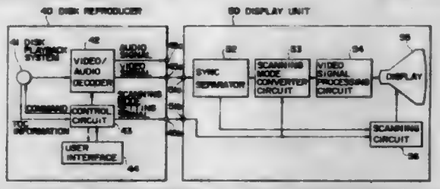
playback means for determining whether said recorded video components are to be played back and for reproducing said recorded video and audio components if said recorded video components are to be played back.

5,594,552

APPARATUS AND METHOD FOR PRODUCING DOWNWARDS COMPATIBLE VIDEO SIGNALS WITH INCREASED VERTICAL RESOLUTION, AND APPARATUS FOR REPRODUCING AND DISPLAYING SAME

Yasushi Fujinami, and Jun Yonemitsu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 144,749, Oct. 27, 1993. This application May 13, 1994, Ser. No. 242,352
Claims priority, application Japan, Oct. 30, 1992, 4-316302
Int. Cl.[6] H04N *5/76;7/01*
U.S. Cl. 386—131 **20 Claims**



1. Apparatus for reproducing a video signal recorded on a recording medium, the apparatus comprising:

reproducing means for reproducing the video signal from the recording medium; and

extracting means for extracting from the video signal reproduced from the recording medium a flag signal indicating a scanning mode with which the video signal is to be displayed,

wherein the flag signal indicates that the video signal is to be displayed using a progressive scanning mode

and the apparatus further comprising:

display means for displaying a motion picture in response to the video signal reproduced by the reproducing means; and

scanning means for scanning the display means in the scanning mode indicated by the flag signal, wherein

the video signal reproduced from the recording medium has a scanning mode different from the scanning mode indicated by the flag signal; and

the apparatus additionally comprises means, receiving the video signal reproduced from the recording medium, and operating in response to the flag signal, for converting the scanning mode of the video signal reproduced from the recording medium into the scanning mode indicated by the flag signal.

5,594,553

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS USING SIGNAL MODIFICATION TO REMOVE JITTER

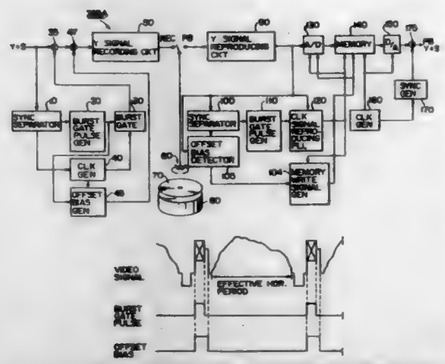
Koichi Sato, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 117,931, Sep. 7, 1993, abandoned. This application Oct. 3, 1994, Ser. No. 316,825
Claims priority, application Japan, Sep. 4, 1992, 4-263212
Int. Cl.[6] H04N *5/95;5/78*
U.S. Cl. 386—68 **11 Claims**

7. An apparatus for reproducing a video signal from a recording medium, said video signal being contained within a modified video signal, said modified video signal further comprising a first reference signal added to said video signal and a second reference signal added to said video signal, wherein said second reference signal comprises a DC component which is added to said video signal for at least a duration of said first reference signal, said DC component comprising a level higher than a vertical blanking level, and wherein falling trailing edges of said first reference signal and said DC component of said second reference signal are separated in time; said apparatus comprising:

reproducing means for reproducing said modified video signal from said recording medium;

signal extracting means for extracting said first reference signal from said modified video signal reproduced by said reproducing means;



signal detecting means for detecting said falling trailing edge of said DC component of said second reference signal in said modified video signal; and

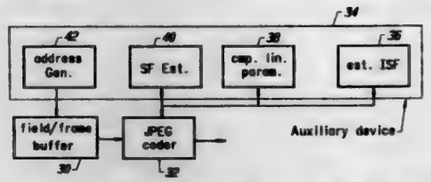
video signal extracting means for extracting said video signal from said modified video signal, wherein said video signal extracting means is controlled by signal characteristics of the extracted first reference signal and the detected falling trailing edge of said second reference signal, and wherein said falling trailing edge of said DC component of said second reference signal occurs prior in time, in the modified video signal, to a period for storing video information of the video signal.

5,594,554

IMAGE COMPRESSION CODER HAVING IMPROVED SCALE FACTOR CONTROL

Shmuel Farkash; Rafael Retter, both of Haifa; Ruth Adar, Nesher, and Aharon Gill, Haifa, all of Israel, assignors to Zoran Corporation, Santa Clara, Calif.

Filed Oct. 4, 1993, Ser. No. 131,790
Int. Cl.[6] H04N *1/415*
U.S. Cl. 358—426 **9 Claims**



1. An image compression coding device for use in efficient storage and transmission of digital image data comprising

a transform means for transforming spatial domain image data to frequency domain image data,

quantizing means for compressing said frequency domain image data by multiplying said frequency domain image data by quantization coefficients scaled by a Scale Factor, said Scale Factor being determined according to the following equation:

$$\log(NSF) = \frac{\log\left(\frac{ISF1}{ISF2}\right)}{\log\left(\frac{ACV\,data1}{ACV\,data2}\right)} \times \log\left(\frac{TCV}{ACV\,data1}\right) + \log(ISF1) \quad (4)$$

where NSF is the new scale factor for use in said quantizing means,

TCV is a target code volume,

ISF1, ISF2 are initial scale factors used in two statistical passes,

ACVdata1, ACVdata2 are accumulated code volume of coded data in said two statistical passes, and

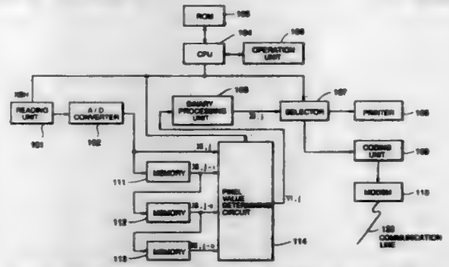
means for encoding said compressed frequency domain image data.

5,594,555

IMAGE PROCESSING METHOD AND APPARATUS EMPOLYING THE SAME

Shinichi Ishida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1993, Ser. No. 60,545
Claims priority, application Japan, May 19, 1992, 4-126113
Int. Cl.[6] H04N *1/21;1/40;1/393*
U.S. Cl. 358—448 **10 Claims**



10. An image processing method comprising the steps of:

selecting one of a first resolution and a second resolution with respect to the sub-scanning direction, the first resolution being higher than the second resolution;

inputting image data with whichever of the first resolution and the second resolution is selected;

edge-enhancing image data input in said inputting step; and

quantizing image data edge-enhanced in said edge enhancing step,

wherein, when the second resolution is selected, the amount of edge enhancement with respect to the sub-scanning direction is increased in said edge enhancing step to an amount that is larger than the amount of edge enhancement with respect to a main scanning direction.

5,594,556

SCANNER HAVING A MISALIGNMENT DETECTOR

Eliyahu Vronsky, Ramat Hasharon, and Boaz Kenan, Rehovot, both of Israel, assignors to Scitex Corporation Ltd., Israel

Filed Mar. 21, 1994, Ser. No. 215,840
Claims priority, application Israel, Mar. 28, 1993, 105188
Int. Cl.[6] H04N *1/04;* **G02B** *26/08*
U.S. Cl. 358—482 **10 Claims**

1. A laser scanning device, the device comprising:

a spinner for scanning a light beam having a light spot across a scanning line;

one light spot misalignment detector located generally at a beginning of said scanned line for measuring an initial misalignment of said light spot in a cross-scanning direction; and

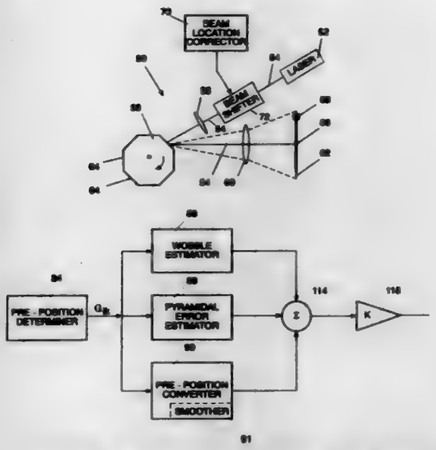
a beam misalignment corrector which, during scanning along said scanning line, dynamically corrects scanning misalignment of said light beam in accordance with at least said initial misalignment,

wherein beam said misalignment corrector comprises:

a pre-positioner which determines a pre-position signal which offsets said initial misalignment;

estimation means for producing, from at least said pre-position signal, an estimated scanning misalignment;

wherein said estimation means further comprises:



a pyramidal error estimator for estimating a first portion of said scanning misalignment due to pyramidal error and to an extent of wobble present at the beginning of said scanning line;

a wobble estimator for estimating a second portion of said scanning misalignment caused by said wobble; and

a summer for summing outputs of said pyramidal error estimator, said wobble estimator and said pre-positioner; and

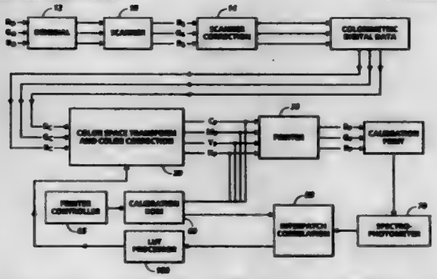
a beam shifter responsive to said estimated scanning misalignment for shifting said light beam thereby to correct said scanning misalignment.

5,594,557

COLOR PRINTER CALIBRATION CORRECTING FOR LOCAL PRINTER NON-LINEARITIES

Robert J. Rolleston, Penfield, and Martin S. Maltz, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1994, Ser. No. 316,968
Int. Cl.[6] H04N *1/46*; G03F *3/08*
U.S. Cl. 358—518 **9 Claims**



1. A method of improving calibration in a calibrated color printing system, the color printing system having a calibration derived from a filled rectangular array of color mappings defined by a first color mapping set A_0, in which printer signals are mapped to colorimetric signals throughout the gamut of the color printing system, including the steps of:

a) empirically generating a second color mapping set P_i, mapping printer signals to colorimetric signals, said second color mapping set P_i smaller than the first color mapping set A_0 and overlapping a portion of the printer gamut therewith;

b) using said second color mapping set P_i and a first set of planes corresponding to the first color mapping set A_0, identifying an expanded set of planes in which each mapping in the first color mapping set A_0 and each mapping in said second color mapping set P_i are defined by points located at an intersection of three planes, the intersecting points of the expanded number of planes defining a set of points $P_{K(expanded)}$ corresponding to a third color mapping set $P_{K(expanded)}$;

c) generating a full rectangular array of color mappings defined by color mapping set A_1, from the first color set mapping A_0, said second color set mappings P_i and said third color mapping set $P_{K(expanded)}$;

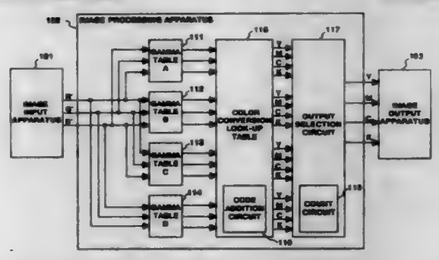
d) generating a new calibration for said printing system derived from said color mappings A_1.

5,594,558

COLOR IMAGE PROCESSING APPARATUS

Akihiro Usami, Yokohama; Ken-ichi Ohta, Kawasaki; Yoshiko Horie, Tokyo; Takashi Kawai, Yokohama; Seita Shono, Warabi, and Eiji Ohta, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 792,154, Nov. 14, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,090
Claims priority, application Japan, Nov. 15, 1990, 2-307248; Nov. 15, 1990, 2-307249; Nov. 15, 1990, 2-307250; Nov. 16, 1990, 2-308491; Nov. 16, 1990, 2-308492; Nov. 16, 1990, 2-308493; Dec. 18, 1990, 2-403313
Int. Cl.[6] G03K *3/08*
U.S. Cl. 358—518 **42 Claims**



1. A color image processing apparatus comprising:

at least two conversion means for respectively converting input color image signals into output color image signals, each of the conversion means having a different converting characteristic;

count means for checking if the color image signals converted by said conversion means fall within a reproduction range of an output apparatus, and counting the number of pixels falling outside the reproduction range; and

selection means for selecting the converted color image signals from a one of said at least two conversion means corresponding to the smallest count value of said count means.

5,594,559

STEREOSCOPIC DISPLAY APPARATUS

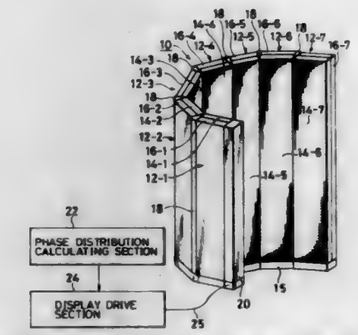
Noriko Sato; Hirokazu Aritake; Masayuki Kato; Manabu Ishimoto, and Masato Nakashima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 105,173, Aug. 12, 1993, abandoned. This application Apr. 10, 1996, Ser. No. 632,346
Claims priority, application Japan, Sep. 18, 1992, 4-248990
Int. Cl.[6] G03H *1/02*; G02B *5/32*
U.S. Cl. 359—8 **31 Claims**

1. A space light modulating apparatus comprising a plurality of flat space light modulating units, each flat space light modulating unit having a predetermined area for executing a wave front conversion while setting a position near a cross point position of a normal line from a virtual display surface of a non-flat shape to produce a solid image, wherein the flat light modulating units are arranged along said virtual display surface,

each of said space light modulating units comprises a display unit for displaying a phase distribution and an illuminating unit, integraliy fixed to a rear side of said display unit, for irradiating a reference light to said display unit, thereby allowing a solid image to be reproduced at the cross point position of the normal line from said virtual display surface, and

said illuminating unit comprises a laser light source, collimating means for inputting a laser beam from said laser light source, reflecting said laser beam toward an opening to said display unit, converting a spherical wave of said incident laser beam into a flat wave, and light distributing means for distributing a collimating light from said collimating means to said display unit and irradiating as a reproduction light.

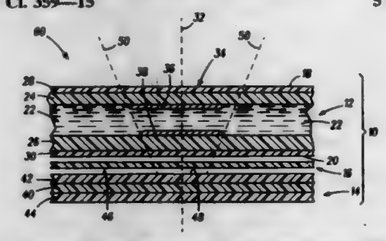


5,594,560

DISPLAY DEVICE COMPRISING FLUORESCENT ENHANCED REFLECTIVE HOLOGRAPHIC ILLUMINATION

Kevin W. Jelley, LaGrange Park; George T. Valliath, Buffalo Grove, and Alan G. Chen, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 7, 1994, Ser. No. 206,360
Int. Cl.[6] G02B *5/32*; G02F *1/1335*
U.S. Cl. 359—15 **5 Claims**



1. A display device illuminatable by diffuse ambient light and comprising

a display panel having a front side for viewing a display and a back side opposite the front side, said display panel comprising a transparent region,

a reflective holographic optical element effective for redirecting light having a wavelength within a predetermined spectral band in a reflection pattern and optically coupled to the display panel for receiving light transmitted through the panel and for directing light in the reflection pattern toward the back side of the display panel, whereupon light redirected toward a transparent region of the display panel is transmitted through the display panel to form a bright area for the display, and

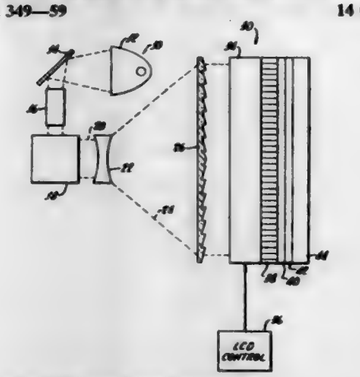
a fluorescence element containing a fluorescent compound that absorbs light having a wavelength outside the predetermined spectral band and emits fluorescent light having a wavelength within the predetermined spectral band and optically coupled to the display panel and the reflective holographic optical element to receive light transmitted through the display panel and to emit fluorescent light toward the reflective holographic optical element, whereupon fluorescent light received by the reflective holographic optical element is redirected within the reflection pattern to enhance brightness of the bright area for the display.

5,594,561

FLAT PANEL DISPLAY WITH ELLIPTICAL DIFFUSER AND FIBER OPTIC PLATE

Randall D. Blanchard, Vista, Calif., assignor to Palomar Technologies Corporation, Carlsbad, Calif.

Filed Mar. 31, 1993, Ser. No. 40,648
Int. Cl.[6] G02F *1/1335*; G02B *5/02*; G03B *21/00*
U.S. Cl. 349—59 **14 Claims**



1. A flat panel display system comprising:

a light modulating display module having front and rear faces,

collimated light source means for transmitting substantially collimated light to said rear face, and

a rear projection screen adjacent said front face, which comprises:

contrast enhancement means for attenuating ambient light,

a diffuser interposed between said contrast enhancement means and said display module, and

a fiber optic layer interposed between said diffuser and said display module, said fiber optic layer being formed of optical fibers having a low numerical aperture,

wherein said diffuser includes diffusion particles having a first density in a first direction and a second density in a second direction that is greater than said first density.

5,594,562

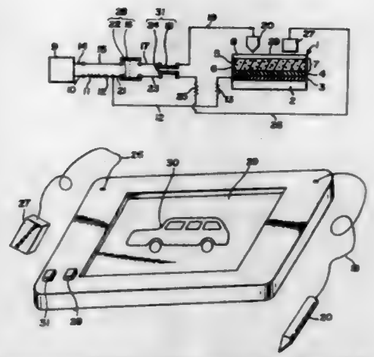
HAND-WRITABLE POLYMER DISPERSED LIQUID CRYSTAL BOARD SET WITH HIGH RESISTANCE LAYER ADJACENT CONDUCTIVE LAYER

Morio Sato, Fujisawa; Yutaka Abe, Hiratsuka; Jun Takano, Chigasaki; Hirokazu Ishii, Kamakura, and Yasuzo Murata, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Pilot, Tokyo-to, Japan

Continuation-in-part of Ser. No. 8,735, Jan. 25, 1993, Pat. No. 5,351,143. This application Feb. 1, 1994, Ser. No. 191,792
Claims priority, application Japan, Feb. 7, 1992, 4-56088; Apr. 2, 1992, 4-108372
Int. Cl.[6] G02F *1/1335*; *1/1333*
U.S. Cl. 349—12 **18 Claims**

6. A hand-writable liquid crystal board set comprising:

(A) a liquid crystal board of the externally charging type: a conductive layer; a transparent high-electric resistance layer having a thickness of 0.1–50 μm and a volume resistivity of 10^{13} Ω.cm or more in 20° C. air at a relative humidity of 90%; a liquid crystal-dispersed polymer layer in which liquid crystal is finely dispersed in a polymer matrix, said liquid crystal dispersed polymer layer having a volume resistivity of 10^{13}



Ω.cm or more in 20° C. air at a relative humidity of 90%; and a transparent insulator layer having a volume resistivity of 10^{13} Ω.cm or more in 20° C. air at a relative humidity of 90%, wherein all of said layers are successively layered in the order presented;

(B) display means for displaying recording images onto the board surface of said liquid crystal board, and erasing means for erasing said recorded images; and

(C) a power source for generating a surface potential between the surface of said liquid crystal board and said conductive layer by said display means;

wherein said display means employs a writing member electrically connected to one terminal of said power source which is connected at the other terminal thereof to said conductive layer; and

said erasing means employs an erasing member electrically connected to said conductive layer.

5,594,563

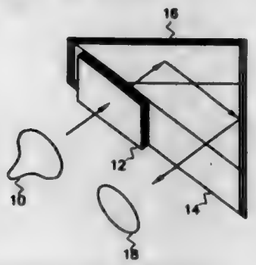
HIGH RESOLUTION SUBTRACTIVE COLOR PROJECTION SYSTEM

Brent D. Larson, Cave Creek, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 31, 1994, Ser. No. 250,964

Int. Cl.[6] G02F *1//133*

U.S. Cl. 349—74 **32 Claims**



1. A color projection system comprising:

light producing means;

a plurality of stacked, high resolution display panels with individual picture elements which modulate light produced by said light producing means to form an image;

high resolution compensating means to compensate for parallax artifacts arising from said plurality of stacked high resolution display panels, wherein the high resolution compensating means includes refracting media which retracts the modulated light, the refracting media includes refracting surfaces which receives the modulated light such that all of said refracting surfaces are substantially non-tilted with respect to the plurality of stacked display panels; and

high resolution optical focusing means to focus the modulated light and form a real or virtual composite image.

5,594,564

SPACE LIGHT MODULATING APPARATUS HAVING A LENGTH TO WIDTH RATIO OF 30:1 AND STAGGERED DRIVERS

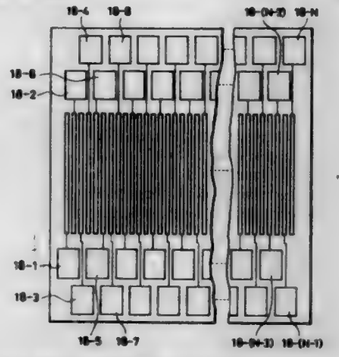
Manabu Ishimoto; Masayuki Kato; Hirokazu Aritake, and Noriko Sato, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 97,049, Jul. 27, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,505

Claims priority, application Japan, Aug. 21, 1992, 4-222589

Int. Cl.[6] G02F *1//1343*

U.S. Cl. 349—143 **24 Claims**



1. A space light modulating apparatus, comprising:

a plurality of pixels arranged in a horizontal direction, each of said plurality of pixels having a dimensional ratio of a vertical width in the vertical direction to a lateral width in the horizontal direction which is at least 30:1; and

a plurality of drivers for individually controlling optical characteristics of said plurality of pixels, respective ones of said plurality of drivers being connected to respective pixels and arranged in a staggered formation on One side of said plurality of pixels.

5,594,565

PROGRAMMABLE LIQUID CRYSTAL WAVEFRONT DEVICE

Michael C. DeJule, and Nabeel A. Riza, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 2, 1994, Ser. No. 348,403

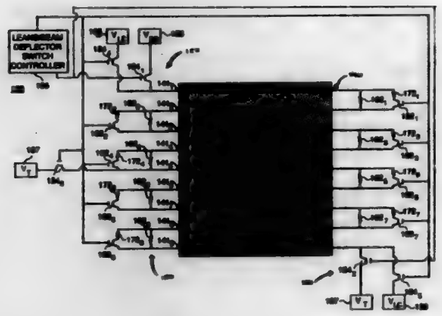
Int. Cl.[6] G02F *1//13*

U.S. Cl. 349—19 **27 Claims**

1. A programmable liquid crystal optical wavefront device adapted to exhibit a plurality of selectable optical characteristics, said device comprising:

a liquid crystal control apparatus disposed in a liquid crystal (LC) cell so as to control the orientation of LC material disposed in said LC cell to selectively deflect light beams passing through said LC cell, said LC control apparatus comprising a bias electrode network and a bias control circuit electrically coupled to said bias electrode network;

said bias control circuit comprising a first bias resistor circuit, a second bias resistor circuit, and a switch circuit for selectively coupling said first and second bias resistor circuit to one another; each of said resistor circuits comprising a plurality of respective bias resistor stages selectively coupled to said bias electrode network.



5,594,566

Patent Not Issued For This Number

5,594,567

SPATIAL LIGHT MODULATOR WITH A PHOTOCONDUCTOR HAVING UNEVEN CONDUCTIVITY IN A LATERAL DIRECTION AND A METHOD FOR FABRICATING THE SAME

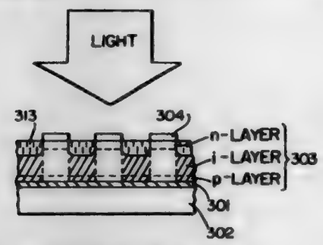
Koji Akiyama; Akio Takimoto, both of Neyagawa, and Hisahito Ogawa, Nara-ken, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 96,470, Jul. 22, 1993, Pat. No. 5,453,860. This application May 18, 1995, Ser. No. 445,208

Claims priority, application Japan, Jul. 24, 1992, 4-198596

Int. Cl.[6] G02F *1//135;1/03;1/13*

U.S. Cl. 349—28 **17 Claims**



1. A spatial light modulator, comprising:

a modulating layer having optical properties changeable depending on the strength of an applied electric field;

a pair of transparent electrode layers sandwiching said modulating layer for generating the electric field;

a photoconductor layer disposed between one of said pair of transparent electrode layers and said modulating layer for generating a photocurrent corresponding to the illumination by light; and

a plurality of reflecting layers arranged in a matrix between said modulating layer and said photoconductor layer,

wherein said plurality of reflecting layers respectively reflect part of light incident to said modulating layer from outside of said spatial light modulator, and

wherein the photoconductivity of uncovered portions of said photoconductor layer into which said light is transmitted without being reflected from said plurality of reflecting layers is smaller than that of the other portions of said photoconductor layer.

5,594,568

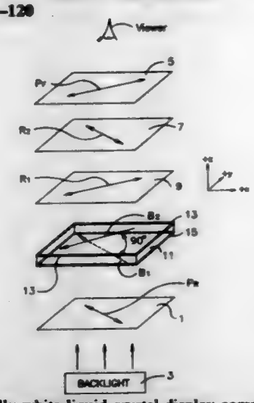
LCD WITH A PAIR OF RETARDATION FILMS ON ONE SIDE OF NORMALLY WHITE LIQUID CRYSTAL LAYER

Adiel Abileah, Farmington Hills; John VanDerploeg, Davison, and Gang Xu, Royal Oak, all of Mich., assignors to OIS Optical Imaging Systems, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 167,652, Dec. 15, 1993. This application Apr. 29, 1994, Ser. No. 235,691

Int. Cl.[6] G02F *1//1335*

U.S. Cl. 349—120 **23 Claims**



1. A normally white liquid crystal display comprising:

a rear, light-entrance polarizer having a transmission axis oriented in a first direction;

a front, light-exit polarizer having a transmission axis oriented in a second direction with respect to said first direction so as to define a normally white display;

first and second positively birefringent uniaxial retardation films both disposed between a twisted nematic liquid crystal layer and one of: (i) said rear, light-entrance polarizer; and (ii) said front, light-exit polarizer;

wherein said liquid crystal layer in the off state twists at least one normally incident visible wavelength of light less than about 110° as it passes therethrough, and said first and second uniaxial retardation films each have retardation values of from about 80–200 nm; and

wherein the transmission axes of said polarizers and optical axes of said retardation films are so arranged each with respect to the others so as to achieve high contrast ratios over a large range of predetermined viewing angles.

5,594,569

LIQUID-CRYSTAL ELECTRO-OPTICAL APPARATUS AND METHOD OF MANUFACTURING THE SAME

Toshimitsu Kouzuma; Takeshi Nishi, both of Kanagawa; Michio Shimizu, Chiba; Haruni Mori, Kanagawa; Kouji Moriya, Kanagwa, and Satoshi Murakami, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Jul. 28, 1994, Ser. No. 278,008

Claims priority, application Japan, Jul. 22, 1993, 5-201832; Jul. 27, 1993, 5-205887; Jul. 31, 1993, 5-208060; Mar. 27, 1994, 6-080939

Int. Cl.[6] G02F *1//1333;1//1335*

U.S. Cl. 349—122 **37 Claims**

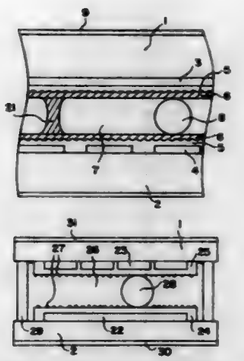
1. A liquid crystal device comprising:

a pair of substrates having an electrode arrangement thereon;

an orientation control means provided on at least one of said substrates; and

a liquid crystal layer interposed between said substrates, said liquid crystal layer being uniaxially oriented by virtue of said orientation control means,

wherein means, comprising a resin, for decreasing an orientation regulating force of said orientation control means with respect



to said liquid crystal layer is provided between said liquid crystal layer and said orientation control means in the form of a plurality of grains.

5,594,570

LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR PRODUCING THE SAME

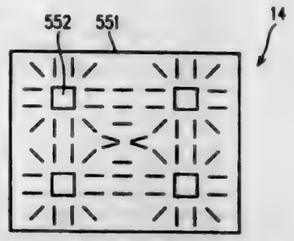
Mitsuaki Hirata; Akihiro Namamatsu, both of Tenri; Noriko Watanabe, Nara; Shigeaki Mizushima, Ikoma; Seiji Makino, Tenri; Hiroko Iwagoe, Yamatokoriyama, and Kei Oyobe, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 278,952, Jul. 22, 1994. This application May 30, 1995, Ser. No. 453,804

Claims priority, application Japan, Jul. 30, 1993, 5-190498; Aug. 27, 1993, 5-213226; Aug. 27, 1993, 5-213227; Aug. 27, 1993, 5-213230; Aug. 31, 1993, 5-216696; Oct. 14, 1993, 5-257265; Dec. 15, 1993, 5-315619

Int. Cl.[6] G02F *1/1337*

U.S. Cl. 349—129 14 Claims



1. A liquid crystal display device, comprising:

a pair of substrates;

a liquid crystal layer sandwiched between the pair of substrates and including liquid crystal molecules; and

an electrode layer for applying a voltage to the liquid crystal layer, wherein

the electrode layer includes a plurality of areas, and each of the plurality of areas and an area of the liquid crystal layer in positional correspondence with the each of the plurality of areas of the electrode layer are included in a pixel,

the liquid crystal layer includes two regions in the pixel, the two regions having opposite reference orientation directions and occupying different ratios of a surface area of the pixel, and

the liquid crystal layer includes a vertical orientation region between the two regions, the vertical orientation region including the liquid crystal molecules oriented vertically with respect to the substrates.

5,594,571

FERROELECTRIC LIQUID CRYSTAL DEVICE AND PROCESS FOR PRODUCTION THEREOF

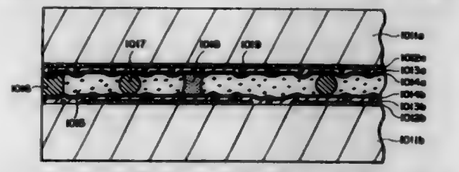
Yukio Haayu, Atsugi; Kenji Onuma, Isehara; Yoshio Hotta, Atsugi; Osamu Taniguchi, Chigasaki; Hideaki Takao, Sagamihara; Masanobu Asaoka, Yokohama; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa; Makoto Kojima, Hino; Katsutoshi Nakamura, and Takatsugu Wada, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 314,421, Sep. 28, 1994, which is a division of Ser. No. 988,830, Dec. 10, 1992, Pat. No. 5,381,256. This application Jun. 2, 1995, Ser. No. 458,725

Claims priority, application Japan, Dec. 10, 1991, 3-349775; Dec. 13, 1991, 3-351280; Jan. 6, 1992, 4-018150; Jan. 8, 1992, 4-031358; Jan. 23, 1992, 4-032860; Jan. 29, 1992, 4-036901; Jan. 31, 1992, 4-040606

Int. Cl.[6] G02F *1/1337;1/1333*

U.S. Cl. 349—138 17 Claims



1. A ferroelectric liquid crystal device, comprising: a pair of electrode plates each having an alignment control layer, and a ferroelectric liquid crystal disposed between the electrode plates, wherein at least one of the alignment control layers has a surface unevenness having a difference in height of 2–30 nm comprising dimples or dots with a diameter of 0.1–10 μm formed at a density of at least $10^4/mm^2$.

5,594,572

LIQUID CRYSTAL DISPLAY ELEMENT WITH GAP UNIFORMITY

Hiroshi Fukutani, Tsuzuki-gun; Hiroshi Ohnishi; Shuichi Uebe, both of Nara, and Akihiro Horita, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1995, Ser. No. 402,335

Claims priority, application Japan, Mar. 18, 1994, 6-049197; Feb. 2, 1995, 7-016040

Int. Cl.[6] G02F *1/1339*

U.S. Cl. 349—155 2 Claims



1. A liquid crystal display element comprising: liquid crystal which is injected into a gap between a pair of substrates oppositely arranged; and

at least two kinds of spherical particles in which each hardness is different and particle diameter accuracy is not more than 4% as a gap holding material for holding the gap in said liquid crystal;

said at least two kinds of spherical particles including a second particle composed of resin and a first particle composed of an inorganic material and wherein said particle composed of an inorganic material has a main ingredient of SiO_2 in which compression modulus at a time when the particle diameter is deformed 10% is approximately 5000 kg/mm^2.

5,594,573

IMAGE DISPLAY GLASSES HAVING AN LCD FOR DISPLAYING AN IMAGE WHEREIN THE IMAGE PROVIDES FOR VIEWING BY OTHERS

Gregg D. August, 2757 Hawthorn, Cape Girardeau, Mo. 63701

Filed Oct. 15, 1993, Ser. No. 136,165

Int. Cl.[6] G02F *1/1335;1/1333;1/1347*

U.S. Cl. 349—13 7 Claims



1. Image display glasses comprising a pair of lenses:

a transparent lens assembly for each of said lenses;

a frame which holds said lens assemblies;

said glasses capable of displaying an animated image viewable from the front of said lens assemblies;

a liquid crystal display contained sandwiched in each said lens assembly, said liquid crystal display containing a plurality of energizable crystals;

electronic means contained within said frame and operatively connected to said liquid crystal display for selectively activating said crystals to produce a visible image;

program means contained within said frame and for use for controlling the sequence of operations of the electronic means in selectively activating said liquid crystal displays;

a source of battery current within said frame operatively connected to said electronic means;

said electronic means selectively energizing said crystals to produce an animated display in each lens assembly;

said electronic means comprising a PC board which cooperates with the program means for selectively inducing said animated display; and

whereby the induced animated display upon the front surface of the lens assembly provides for viewing by others rather than the wearer of said image display glasses, without completely obstructing viewing by the wearer of said glasses.

5,594,574

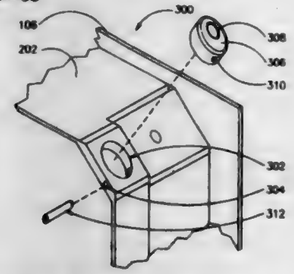
LCD MULTI-AXIS FLOATING MOUNT

Manuel Lara, and Mark Woytassek, both of Cedar Rapids, Iowa, assignors to Rockwell International Corp., Seal Beach, Calif.

Filed Nov. 30, 1994, Ser. No. 347,775

Int. Cl.[6] G02F *1/1333*

U.S. Cl. 349—58 20 Claims



1. A liquid crystal display mount comprising:

a frame having a first fastener receiving void and a first pin receiving aperture, the first pin receiving aperture at least partially intersecting the first fastener receiving void;

a first fastener having a first threaded member receiving hole and having a first pin receiving void, the first fastener being positionable in the first fastener receiving void such that the first pin receiving aperture is aligned with the first pin receiving void;

a first pin extending through the first pin receiving aperture and into the first pin receiving void to movably couple the first fastener to the frame and to inhibit complete rotation of the first fastener in the first fastener receiving void;

a chassis having a first threaded member receiving opening alignable with the first threaded member receiving hole when the first fastener is positioned in the first fastener receiving void of the frame; and

a first threaded member insertable through the first threaded member receiving opening and into the first threaded member receiving hole such that a distance between the first fastener and the chassis is reduced, thereby at least partially securing the frame to the chassis.

5,594,575

FERROELECTRIC LIQUID-CRYSTAL SYSTEMS HAVING THREE OR MORE CHIRAL ADDITIVES WITH DIFFERENT SIGNS OF THE HELICAL TWIST IN THE CHOLESTERIC PHASE

Claus Escher, Mühltal; Hans-Rolf Dübal, Königstein/Taunus, both of Germany; Takamasa Harada, Inzai-machi, Japan; Wolfgang Hemmerling, Sulzbach, Germany; Gerhard Illian, Frankfurt am Main, Germany; Ingrid Müller, Niedernhausen, Germany; Mikio Murakami, Kakegawa, Japan; Dieter Ohlendorf, Liederbach, and Rainer Wingen, Hattersheim am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 272,854, Jul. 8, 1994, abandoned, which is a continuation of Ser. No. 761,812, Oct. 28, 1991, abandoned. This application May 2, 1995, Ser. No. 432,673

Claims priority, application Germany, Mar. 22, 1989, 39 09 354.9

Int. Cl.[6] G02F *1/13*

U.S. Cl. 349—171 9 Claims

1. A method for producing a ferroelectric liquid crystal mixture having a smectic C* phase in a temperature range of from 10° C. to 50° C. and above the smectic phase a cholesteric phase having a width of 4° C. or more and having a spontaneous polarization with a value of 35 n Cm^{-2} or more in the ferroelectric phase at room temperature (25° C.) comprising

a) providing an optically non-active liquid crystalline base mixture,

b) adding three or more optically active compounds, which do not all induce twist of the same sign in the cholesteric phase, in an amount that does not exceed 50% by weight of the weight of the total mixture; and

c) adjusting relative concentrations of the optically active compounds so that the reciprocal value for the helical pitch (Z^{-1}) throughout the cholesteric phase is between 0 and 0.10 μm^{-1}.

5,594,576

OPTICAL SERIAL BUS INTERFACE

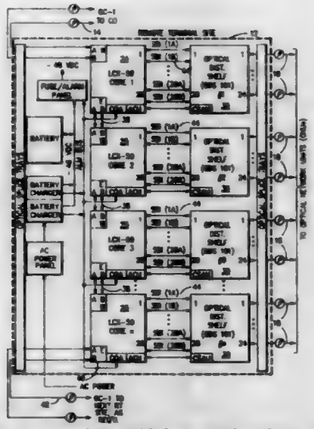
Joseph E. Sutherland, Raleigh, and Paul M. Matsumura, Carrboro, both of N.C., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Continuation of Ser. No. 739,603, Jul. 31, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 384,377

Int. Cl.[6] H04B *10/20;* H04J *14/08*

U.S. Cl. 359—118 5 Claims

1. In an optical fiber communications network having a remote terminal located in a subscriber neighborhood and fed by a high-rate optical fiber signal for providing, at a lower-rate signal interface of the remote terminal, lower-rate signals to various sites in said subscriber neighborhood, wherein the remote terminal includes a cross-connect having a high-rate interface connected to said high-rate optical fiber and having a plurality of internal electrical signal links each having a payload of a selected number



of channels connected to said low-rate interface, wherein an improved remote terminal lower-rate interface comprises:

means for directly converting the existing plurality of internal electrical signal links to corresponding optical signals; and

means for transmitting the optical signals along corresponding distribution fibers to corresponding optical network units located at said various sites in said subscriber neighborhood.

5,594,577

OPTICAL RECEIVER AND OPTICAL TRANSMISSION SYSTEM USING THE RECEIVER

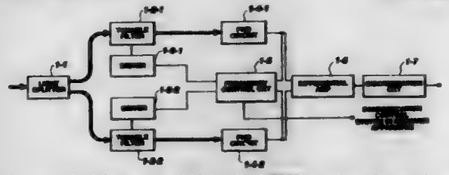
Masao Majima, Isehara; Toshihiko Ouchi, Machida, and Takeo Ono, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 127,344, Sep. 28, 1993, abandoned. This application Jun. 21, 1995, Ser. No. 492,964

Claims priority, application Japan, Oct. 3, 1992, 4-289552; Sep. 9, 1993, 5-248659

Int. Cl.[6] H04J *14/02;* **H04B** *10/00;10/06*

U.S. Cl. 359—124 **25 Claims**



1. An optical frequency shift keying (FSK) receiver for use in an optical frequency division multiplexing (FDM)-FSK transmission system, said receiver comprising:

light splitting means for splitting an optical FSK signal into at least two light portions;

at least two tunable optical filters, said filters respectively receiving the light portions from said light splitting means and being respectively capable of changing their transmission wavelengths;

at least two light receiving means for receiving lights from said filters, respectively, said light receiving means respectively supplying electrical signal outputs; and

producing means for producing a difference signal from the outputs of said light receiving means;

wherein mark and space optical frequencies of one optical FSK signal split by said light splitting means are respectively transmitted through said tunable optical filters whose transmission wavelengths are respectively tuned to the mark and space optical frequencies, the transmitted mark and space optical frequencies are directly and independently received by said light receiving means and the optical FSK signal is received by using the difference signal produced by said producing means.

5,594,578

OPTICAL COMMUNICATIONS SYSTEM INCLUDING DOPED OPTICAL FIBER FILTER

Benjamin J. Ainslie, Suffolk; Iain J. Wilkinson, Birmingham, and Timothy Finegan, Ipswich, all of England, assignors to British Telecommunications public limited company, London, England

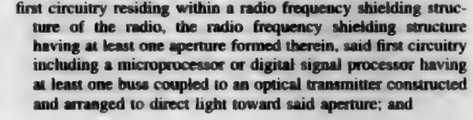
PCT No. PCT/GB91/02197, § 371 Date Aug. 25, 1993, § 102(e) Date Aug. 25, 1993, PCT Pub. No. WO92/10887, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 11, 1991, Ser. No. 75,459

Claims priority, application United Kingdom, Dec. 11, 1990, 9026898

Int. Cl.[6] H04J *14/02;* **H04B** *10/12*

U.S. Cl. 359—127 **31 Claims**



1. In an optical telecommunications system utilizing wavelength division multiplex, an optical transmission path comprising an optical fiber and at least one optical fiber filter for attenuating signals at unwanted wavelengths, wherein the filter includes a passive optical fiber doped to absorb the unwanted wavelengths and to pass substantially unattenuated signals at desired wavelengths.

5,594,579

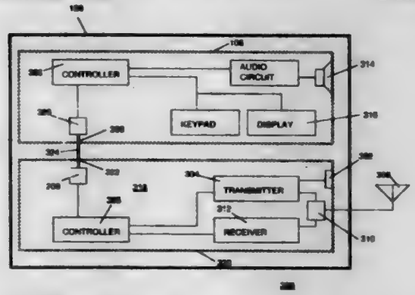
RADIO PERMITTING INFORMATION TRANSFER BETWEEN RADIO FREQUENCY SHIELDED SUB-SYSTEMS

M. William Branan, Jr., Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 813,466, Dec. 26, 1991. This application Apr. 26, 1994, Ser. No. 233,566

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—145 **2 Claims**



1. A radio, comprising:

means for receiving radio frequency information;

means for transmitting information via a radio frequency signal;

an antenna;

antenna switching means for selectively coupling the antenna to the receiving means and the transmitting means;

first circuitry residing within a radio frequency shielding structure of the radio, the radio frequency shielding structure having at least one aperture formed therein, said first circuitry including a microprocessor or digital signal processor having at least one buss coupled to an optical transmitter constructed and arranged to direct light toward said aperture; and

control circuitry optically coupled to the first circuitry and residing outside of the radio frequency shielding structure shielding the first circuitry, the control circuitry being coupled to the means for transmitting and to the means for receiving and hence to the antenna switching means for control thereof and including a microprocessor or digital signal processor having at least one buss coupled to an optical detector constructed and arranged to receive light from the optical transmitter via the aperture.

5,594,580

OPTICAL SPACE COMMUNICATION APPARATUS

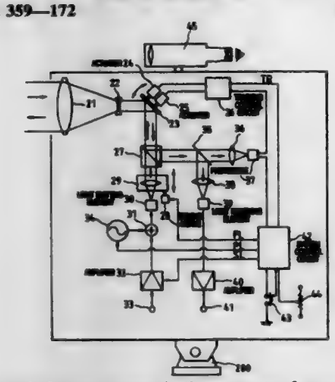
Tetsuo Sakanaka, Sagamihara, and Takehide Hamuro, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,301

Claims priority, application Japan, Nov. 16, 1993, 5-309734

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—172 **14 Claims**



1. An optical space communication apparatus for propagating a beam of light through free space to thereby effect communication, comprising:

transmitting means for transmitting a first optical signal converted into a beam of light;

expanse angle varying means for varying an angle of expanse of the beam of light into which the first optical signal has been converted;

level varying means for varying an output level of the first optical signal;

control means for controlling said expanse angle varying means and said level varying means, wherein said control means causes the output level to become greater when the angle of expanse of the beam of light is made greater; and

receiving means for receiving a second optical signal converted into a beam of light.

5,594,581

LOW LOSS OPTICAL TRANSMISSION/MONITORING PATH SELECTION IN REDUNDANT EQUIPMENT TERMINALS

Justin E. J. Alphonsus, Howell, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 175,015, Dec. 29, 1993, abandoned. This application Oct. 24, 1995, Ser. No. 547,392

Int. Cl.[6] H04B *10/02;* **H04J** *14/00*

U.S. Cl. 359—177 **10 Claims**

1. An optical line terminal, comprising:

a main input for receiving at least one incoming optical signal;

a main output for issuing at least one outgoing optical signal;

means for processing optical signals in a substantially identical manner in any one of a plurality of mutually redundant receiving and processing circuit branches located within the optical line terminal that extend in parallelism with one another between said main input and said main output;

means for joining at least one of said branches at a time with said main output to provide said outgoing output signal thereto;

optical switching means interposed between said main input and said plural branches of said optical signal processing means and including one switch input connected to said main input for receiving said incoming optical signal therefrom and an additional input, a plurality of switch outputs each connected to an associated one of said branches, connecting means for connecting said one switch input in each of a plurality of switching states of said optical switching means with only one of said switch outputs of said optical switching means to direct all optical power of said incoming optical signal exclusively into said one associated branch connected to said only one switch output, and additional connecting means for connecting said additional switch input in each of said switching states with another of said switch outputs that is different from said one switch output and that is connected to a different one of said branches;

means for supplying to said additional switch input an optical monitoring signal for direction by said additional connecting means to said different branch for monitoring the operation of said different branch; and

means for controlling the operation of said optical switching means to selectively switch between said switching states thereof so that the optical signal is directed from said one associated branch to said different one of said branches when a fault is detected in said one associated branch.

5,594,582

Patent Not Issued For This Number

5,594,583

APPARATUS FOR RE-SHAPING A TRAIN OF LIGHT PULSES, AND APPARATUS FOR RECOVERING A PERIODIC SIGNAL SYNCHRONIZED ON A TRAIN OF MODULATED LIGHT PULSES

Fabrice Devaux, Paris, France, assignor to France Telecom, Paris, France

Filed Jun. 17, 1994, Ser. No. 261,714

Claims priority, application France, Jun. 18, 1993, 93 07380

Int. Cl.[6] H04B *10/155;10/04*

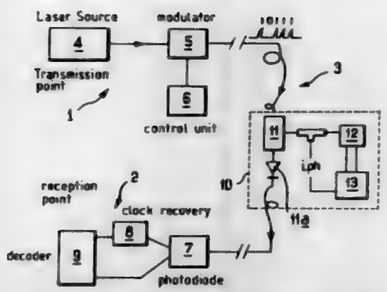
U.S. Cl. 359—184 **6 Claims**

1. Apparatus for reshaping a train of light pulses, the apparatus comprising:

a light modulator to which the train of pulses to be resynchronized and reshaped is applied;

a periodic signal generator that is adjustable in phase and in frequency which applies a periodic signal to the modulator, thereby providing voltage control for said modulator; and

means for synchronizing the generator on the train of modulated light pulses received by the modulator;



wherein the modulator is a modulator of the electro-absorbent type generating a photocurrent while it is in an absorbent state and is receiving a light pulse; and

wherein the means for synchronizing the generator include servo-control means for controlling the phase and frequency of said generator, for minimizing the mean photocurrent as generated by the modulator while it is in its absorbent state and receiving a light pulse, thereby reshaping and resynchronizing the train of pulses.

5,594,584

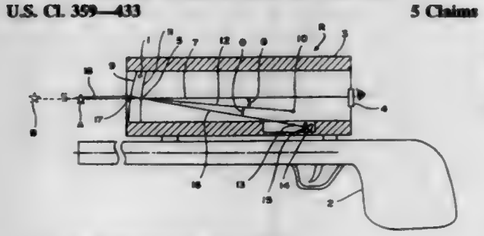
DOT SIGHTING DEVICE

Ira M. Kay, P.O. Box 1750, 7553 Gary Rd., Manassas, Va. 22110, and Ubao Jibiki, 2-7-3 Higashi Mita, Tama-Ku, Kawasaki-shi, Kanagawa Pref., Japan

Filed Dec. 29, 1994, Ser. No. 366,101

Int. Cl.[6] G02B *23/00;23/10;* **F41G** *1/32*

U.S. Cl. 359—433 **5 Claims**



1. A dot sighting device, comprising:

a) a lens-shaped transparent objective element with convex and concave surfaces, said convex surface extending outwardly toward a target and said concave surface extending toward a user's eye;

b) said concave surface having a first center of curvature lying on a baseline parallel to an optical axis of said element extending from a center of said element to the user's eye;

c) said concave surface having a first radius from said first center of curvature of said concave surface to a center of said concave surface;

d) said baseline and said first radius subtending an angle θ with each other;

e) said convex surface having a second center of curvature positioned eccentrically from said first center of curvature located in a plane containing said baseline and said first radius;

f) said convex surface having a second radius extending from said second center of curvature to a center of said convex surface;

g) a light source disposed behind said element and directed toward said center of concave surface such that a light flux makes an angle θ with said first radius, said light source being adapted to project a light dot on said concave surface to be reflected to the user's eye;

h) said baseline extends through said element at thickness t;

i) said first and second centers of curvatures are eccentric from each other at a distance E; and

j) said thickness t, said distance E and said angle θ satify substantially the equation,

$$\sqrt{t \sin(\theta)} = E/2,$$

where t and E have the same units and only the magnitudes of t and E are used and θ is in the range of 6°–7°.

5,594,585

VEHICLE MIRROR

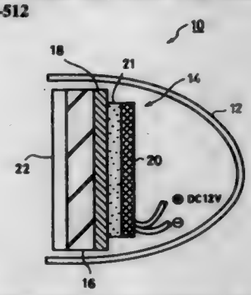
Toru Komatsu, Shimada, Japan, assignor to Murakami Kaimeido Co., Ltd., Japan

Filed Jun. 13, 1995, Ser. No. 490,073

Claims priority, application Japan, Jun. 29, 1994, 6-168582

Int. Cl.[6] B60R *1/06;* **G02B** *7/182;* **H05B** *3/84*

U.S. Cl. 359—512 **10 Claims**



1. A vehicle mirror having a glass substrate, having a front and a back surface, a reflecting film formed on said back surface of said glass substrate, said front surface of said glass substrate being fully covered with a continuous hydrophilic inorganic oxide film, which is in contact with said glass substrate, said hydrophilic inorganic oxide film having a porous surface.

5,594,586

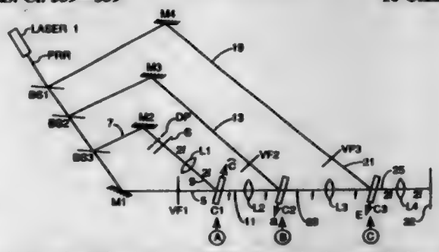
PHOTOREFRACTIVE LIMITING QUADRATIC PROCESSOR

Jehad Khoury, Arlington; Charles L. Woods, Stow; Mark Cronin-Golomb, Reading, and Jack Fu, Brighton, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 2, 1994, Ser. No. 236,936

Int. Cl.[6] G02B *27/46;5/23*

U.S. Cl. 359—559 **10 Claims**



1. A method of reducing multiplicative noise in an optical image comprising the steps of:

(a) directing a noisy signal beam having an optical image thereon corrupted by complex multiplicative noise at a first nonlinear optical device;

(b) directing a phase restoring reference beam, coherent with respect to the noisy signal beam, into said first nonlinear optical device for generating nonlinear coupling therein which produces a phase restored output beam having an intensity which is less than the intensity of the noisy signal beam;

(c) Fourier transforming said phase restored output beam from said first nonlinear optical device and directing the resulting transformed phase restored output beam into a second nonlinear optical device; and

(d) directing a coherent noise reducing reference beam into said second nonlinear optical device for producing two beam coupling therein and a noise reduced output signal therefrom.

5,594,587

ILLUMINATION DEVICE WITH ALLOWABLE ERROR AMOUNT OF TELECENTRICITY ON THE SURFACE OF THE OBJECT TO BE ILLUMINATED AND EXPOSURE APPARATUS USING THE SAME

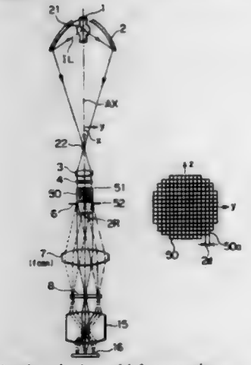
Hideki Komatsuda, Kawasaki; Hideo Hirose, Saitama-ken, and Tetsuo Kikuchi, Tokyo, all of Japan, assignors to Nikon Corporation, Japan

Filed Mar. 10, 1995, Ser. No. 402,250

Claims priority, application Japan, Mar. 11, 1994, 6-040771

Int. Cl.[6] G03B *27/10;27/54;27/72*

U.S. Cl. 359—619 **16 Claims**



1. An illumination device which comprises:

a light source system for generating illumination light;

an optical integrator which is constituted by lens elements each having a predetermined size, and forms a plurality of light source images on the basis of the light beam from said light source system;

a variable aperture stop arranged on a position where said plurality of light source images are formed; and

a condenser optical system for guiding the light beams from said optical integrator to a surface of an object to be illuminated,

wherein when a width, in a predetermined direction, of each of a plurality of lens elements constituting said optical integrator is represented by 2d, a focal length of said condenser optical system is represented by f_{con}, maximum and minimum values of an effective diameter of said variable aperture stop are respectively represented by $2R_{max}$ and $2R_{min}$, and average values of irradiance on the surface of the object to be illuminated respectively obtained when the effective diameter of said variable aperture stop assumes the maximum and minimum values are represented by E_{max} and E_{min}, and an allowable error amount of telecentricity on the surface of the object to be illuminated is represented by A, said illumination device satisfies:

$$d\{(R_{max}{}^2E_{min})/(E_{max}R_{min}{}^2)-1\} \leq f_{con} \cdot A$$

wherein d is a half width, in a predetermined direction, of each a plurality of lens elements constituting said optical integrator.

5,594,588

VISUAL DISPLAY

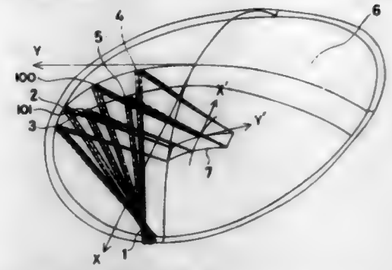
Takayoshi Togino, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1993, Ser. No. 51,386

Claims priority, application Japan, Apr. 24, 1992, 4-106912; Apr. 24, 1992, 4-106913

Int. Cl.[6] G02B *27/14*

U.S. Cl. 359—631 **16 Claims**



1. A visual display comprising:

a two-dimensional display device for displaying a two-dimensional image for observation;

an ocular optical system having a concave reflecting mirror, said concave reflecting mirror at least partially reflecting said image for observation to form a magnified image as observed by an observer's eyeball; and

distortion correcting means for correcting distortion of said magnified image by altering a concavity of said concave reflecting mirror aspherically such that a vertical radius of curvature of said concave reflecting mirror gradually decreases across a horizontal linear direction from a first side of said concave reflecting mirror corresponding to said observer's eyeball toward a second side of said concave reflecting mirror corresponding to said two-dimensional display device, said vertical radius of curvature being parallel to a linear direction approximately perpendicular to a plane defined by a reflected optical axis between a center of said display device and a center of said observer's eyeball before and after said at least partial reflection by said concave reflecting mirror, said distortion correcting means being formed by a rotationally asymmetric surface of said concave reflecting mirror.

5,594,589

ZOOM-LENS STRUCTURE FOR A CAMERA

Jim Chen, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed May 3, 1994, Ser. No. 237,113

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—826 **4 Claims**

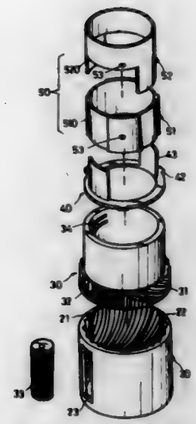
1. A zoom-lens structure for a camera comprising at least an outer cylinder, an inner cylinder, a fastening ring and a lens mount assembly;

said outer cylinder having a plurality of straight grooves therein for engaging with a plurality of projected keys, respectively, of a fastening ring so as to allow said fastening ring to be movably mounted outside said inner cylinder;

said lens mount assembly including a first lens mount and a second lens mount;

said structure having a plurality of features in that said fastening ring having at least two first positioning pieces to be engaged with positioning grooves of said second lens mount so as to limit said second lens mount from rotating;

at least two second positioning pieces provided on said first lens mount which are also engaged with said positioning grooves and are thus controlled by said second lens mount from being



able to rotate, so as to control said lens mount assembly to move back and forth along an optical axis to provide a zoom lens function;

further wherein an inner surface of said inner cylinder is furnished with a plurality of curved grooves for receiving corresponding rolling balls, respectively, provided on outer surfaces of said first lens mount and said second lens mount.

5,594,590

MIRROR-HOUSING POSITIONING DEVICE FOR CAR REARVIEW MIRROR

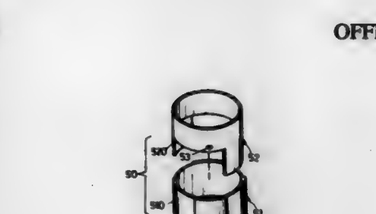
Yoshihiko Ishiyama, Ischara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 475,085

Claims priority, application Japan, Jun. 9, 1994, 6-127385

Int. Cl.[6] G02B 5/08

U.S. Cl. 359—841 **9 Claims**



1. A mirror-housing positioning device for a car rearview mirror, comprising:

a stationary member connected to a base provided in the rearview mirror, which is to be fixed to the body of a car;

a rotary member held rotatably on a stationary member and connected to the mirror housing in which a mirror unit of the rearview mirror is assembled;

a driving mechanism including a motor and a group of reversely rotatable gears and disposed between the stationary member and rotary member to rotate the rotary member;

a mechanism provided between the rotary member and stationary member to block the rotary member from being rotated when the mirror housing is turned to any of predetermined positions; and

a mechanism inhibiting the gear group from being rotated when the rotary member is blocked against rotation,

the mechanism to inhibit the gear group from being rotated, comprising:

a first gear component forming a part of one gear in the gear group and having teeth that are in mesh with an adjacent gear on one side thereof,

a second gear component also forming a part of the one gear in the gear group and having teeth that are in mesh with an adjacent gear on the other side thereof, and

an elastic member forcing the first gear component to the other gear component;

the first gear component having projections formed in an area thereof facing the second gear component;

the second gear component having formed therein concavities in which the projections of the first gear component are fitted;

the elastic member maintaining the projections fitted in the concavities.

5,594,591

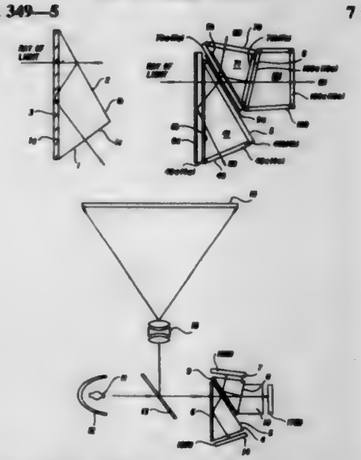
PRISM SYSTEM AND A LIQUID CRYSTAL PROJECTION DEVICE

Hideki Yamamoto, and Naruhiko Atsuchi, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1995, Ser. No. 595,238

Int. Cl.[6] G02F 1/1335

U.S. Cl. 349—5 **7 Claims**



1. A prism system having a prism comprising:

a dichroic mirror formed on a surface of the prism except an incident surface for reflecting an entered ray having a predetermined wavelength so as to travel in the prism toward the incident surface;

an optical thin film formed on the incident surface so as to totally reflect the ray reflected from the dichroic mirror,

the optical thin film having a phase control function.

5,594,592

NARROW LINEWIDTH BBO OPTICAL PARAMETRIC OSCILLATOR UTILIZING EXTRAORDINARY RESONANCE

Brian L. Harlamoff, 3490 Maplethorpe La., Soquel, Calif. 95073, and James J. Jacob, 292 Dry Creek Rd., Aptos, Calif. 95003

Continuation-in-part of Ser. No. 220,117, Mar. 30, 1994, Pat. No. 5,406,409. This application Mar. 9, 1995, Ser. No. 398,498

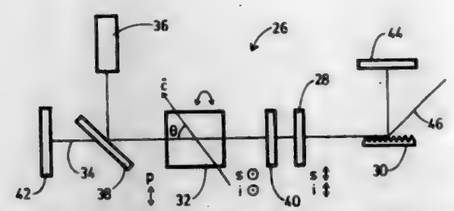
Int. Cl.[6] G02F 1/39

U.S. Cl. 359—330 **36 Claims**

1. An optical parametric oscillator comprising:

an optical cavity defined between two reflective elements;

a non-linear optical crystal having an extraordinary plane, said non-linear crystal located in the optical cavity and adapted to generate a product beam of ordinary polarization in response



to a pump beam of extraordinary polarization, said product beam having a different wavelength from the pump beam;

a grating in said optical cavity, said grating aligned so that the dispersion plane of the grating is not orthogonal to the extraordinary plane of the non-linear crystal; and

an optical element in the optical cavity adapted to rotate the polarization of the product beam from the ordinary polarization, wherein the optical cavity is aligned such that the pump beam and product beam are non-collinear.

5,594,593

REAR VIEW SYSTEM FOR A VEHICLE

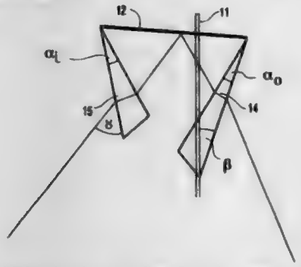
Peter J. Milner, 8 Juliet Close, Nuneaton, Warwickshire, England

Continuation-in-part of Ser. No. 833,824, Feb. 11, 1992, abandoned, which is a continuation of Ser. No. 555,413, Aug. 10, 1990, abandoned. This application Sep. 16, 1993, Ser. No. 121,905

Claims priority, application England, Dec. 17, 1988, 8829501

Int. Cl.[6] G02B 17/00;5/04;5/08; B60R 1/08

U.S. Cl. 359—726 **67 Claims**



1. An optical rear view system for a motor vehicle, adapted to be mounted on the body of a vehicle so as to have a minimal lateral projection from the vehicle, said system comprising:

a) a housing having an objective opening therein exteriorly of the vehicle body, through which light from an object to the rear of said vehicle can enter said system, and a viewing opening interiorly of said vehicle body through which light can exit said system towards an observer located at the driver's position within said vehicle,

b) a viewing system of optical components within said housing, said viewing system comprising

i) reflector means for reflecting incident light thereon;

ii) first refractor means for refracting light from said object towards said reflector means, said first refractor means being in the path of light front said object to the rear of said vehicle passing through said objective-opening towards said reflector means, said first refractor means having an incident face on which light from said object is incident and an exit face from which light passing through said first retractor means is directed towards said reflector means;

iii) second refractor means for compensating chromatic aberrations introduced into said viewing system by said first refractor means, said second refractor means being in by path of light from said reflector means to said observer, said second refractor means having an incident face on which light from said reflector means is incident and an exit face from which light passing through said second refractor means is directed towards said observer through said viewing opening of said housing; and

iv) said incident and exit faces of said first and second refractor means being substantially planar surfaces with an angle of inclination between said incident face and said exit face of said first refractor means being less than an angle of inclination between said incident face of said first refractor means and a longitudinal axis of said vehicle.

5,594,594

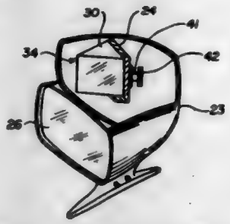
NON-DISTORTED BLIND SPOT MIRROR USING A TRIANGULAR PRISM FOR ALL TYPES OF VEHICLES

Ly W. Ung, 315 Dearborn St., Buffalo, N.Y. 14207

Filed Aug. 5, 1994, Ser. No. 286,682

Int. Cl.[6] G02B 5/08;5/26;5/04

U.S. Cl. 359—855 **6 Claims**



1. A first non-distorting blind spot prism mirror unit for use in a driven vehicle, said vehicle being provided with a first side view mirror, said first blind spot mirror unit being characterized by:

a first triangular prism having first, second and third plane sides, the first side being blocked causing an image entering the second side to be internally reflected so that it can be viewed from the third side; and

first mounting means for mounting the first triangular prism either above, below or forward of the first side view mirror in such a manner that the first triangular prism has the second side facing a blind spot area and the third side facing the driver so that the driver of the vehicle is provided with a clear non-distorted view of the blind spot area not normally visible through the first side view mirror.

5,594,595

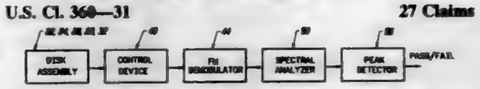
FM DETECTION OF SLIDER-DISK INTERFACE

Li-Yan Zhu, San Jose, Calif., assignor to Conner Peripherals, Inc., San Jose, Calif.

Filed Jan. 19, 1995, Ser. No. 374,052

Int. Cl.[6] G11B 27/36

U.S. Cl. 360—31 **27 Claims**



1. A method for testing slider/disk contact in a disk drive comprising a rotating disk and a head mounted by an actuator for selective positioning of the head over the disk, the head having a slider, and a flexure for attaching the head to the actuator, comprising the steps of:

rotating the disk of the disk drive at a first preselected rotational velocity;

using the head of the disk drive to write a signal having a substantially uniform pattern on the disk as it rotates;

thereafter rotating the disk at a second preselected rotational velocity;

while rotating at the second preselected rotational velocity, using the head to read back the signal written at the first preselected rotational velocity;

performing an FM demodulation of the read back signal through a frequency range corresponding to a range of natural frequencies of vibration of the flexure caused by slider/disk contact; and

analyzing the demodulated read back signal to detect frequency jitter indicating the presence of flexure vibration, thereby evidencing head-disc contact during rotation of the disc at said first or second velocity.

5,594,596

VIDEO TAPE RECORDER CARRYING OUT FIELD EXTRACTION RECORDING AND/OR REPRODUCTION OF A VIDEO SIGNAL

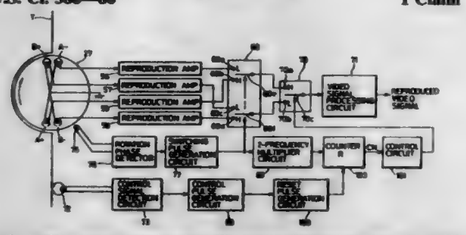
Kouichi Kawakami; Toshihide Hamaguchi; Satoru Kuge, and Yoshiaki Maida, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 120,930, Sep. 15, 1993, Pat. No. 5,452,144. This application Jun. 2, 1995, Ser. No. 458,284

Claims priority, application Japan, Sep. 17, 1992, 4-247915; Dec. 17, 1992, 4-337358; Mar. 18, 1993, 5-058959

Int. Cl.[6] H04N *5/78*

U.S. Cl. 386—80 **1 Claim**



1. A video tape recorder that allows special reproduction by field forwarding in a LP mode of the VHS system, comprising:

means for reproducing a video signal and a control signal recorded on a magnetic tape,

means for forming a pseudo control signal at a timing at which said control signal is to be reproduced when said reproduced control signal is missing,

means for driving and controlling a capstan motor in response to said reproduced control signal or said pseudo control signal at the time of said special reproduction by field forwarding, and

means for setting the generation period of said pseudo control signal so that the field forwarding amount of said capstan motor becomes ½ the general field forwarding amount in special reproduction by field forwarding in a LP mode, when said video signal and said control signal are reproduced by special reproduction by field forwarding from a magnetic tape on which said video signal has been intermittently recorded at a ratio of one field to every three fields and said control signal has been recorded once for every six fields at a tape running speed of 1/12 the tape running speed of a SP mode in the VHS system.

5,594,597

NEURAL NETWORK DISK DRIVE READ CHANNEL PATTERN DETECTOR

Robin Padden, Roy, Utah, assignor to Iomega Corporation, Roy, Utah

Continuation of Ser. No. 786,274, Nov. 1, 1991, abandoned. This application Apr. 28, 1994, Ser. No. 235,124

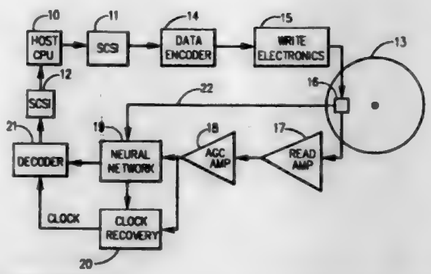
Int. Cl.[6] G11B *5/09*; G06E *1/00*

U.S. Cl. 360—46 **14 Claims**

1. A magnetic data recording system in which patterns of data bits are recorded and reproduced comprising:

a magnetic disk for storing said patterns of data bits;

means for recording said patterns of data bits on said recording medium;



a read channel;

means for reproducing a pattern of data bits from said recording medium;

the reproduced pattern of data bits being applied to said read channel to produce a read signal;

a rapidly setting automatic gain control amplifier which produces an instantaneous output representing the read signal squared; and

an electronically trainable neural network, the reproduced patterns of data bits from said read channel being applied to said neural network, said neural network being trained to produce an output representing the pattern of data bits which was recorded from the pattern of data bits which was reproduced from said magnetic medium.

5,594,598

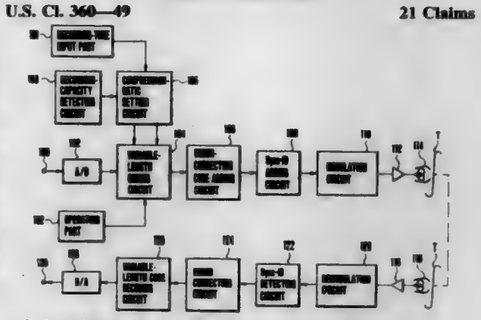
INFORMATION RECORDING APPARATUS HAVING VARIABLE COMPRESSION RATIO

Akihiro Shikakura, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1992, Ser. No. 963,119

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—49 **21 Claims**



1. An information recording apparatus comprising:

(a) inputting means for inputting information;

(b) quantizing means for quantizing the information inputted by said inputting means;

(c) coding means for coding the information quantized by said quantizing, means,

(d) generating means for generating first information relative to an amount of the information inputted by said inputting means;

(e) detecting means for detecting an available recording capacity of a recording medium;

(f) controlling means for controlling a quantizing step of said quantizing means in accordance with an output of said generating means and an output of said detecting means; and

(g) recording means for recording the information coded by said coding means on a recording medium.

5,594,599

APPARATUS FOR VERIFYING OPERATION OF A RECORDING AND REPRODUCING APPARATUS

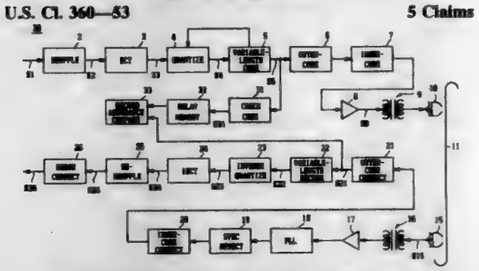
Mamoru Ueda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 220,176

Claims priority, application Japan, Apr. 2, 1993, 5-100230

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—53 **5 Claims**



1. Apparatus for recording and reproducing data comprising:

input means for receiving an input data signal;

compression means, coupled to said input means, for compressing said input data signal to produce a compressed signal;

first check means for generating a first check code as a function of said compressed signal;

recording and reproducing means for recording said compressed signal upon a medium and for reproducing from said medium a reproduced compressed signal;

second check means for generating a second check code as a function of said reproduced compressed signal;

comparator means for comparing said first check code with said second check code to verify an operation of said recording and reproducing means.

5,594,600

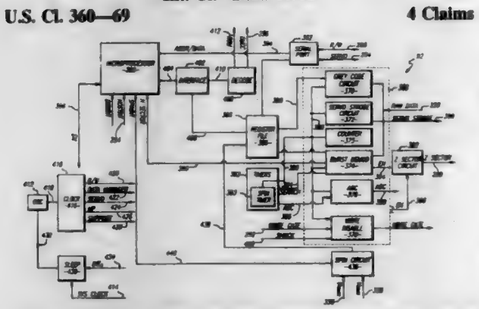
DUAL INTERNAL BUS SYSTEM ARCHITECTURE FOR HARD DISK DRIVE

Curt Bruner; Larry Hutsell; Jeff Reh, all of Longmont, and Robert Metz, Westminster, all of Colo., assignors to Maxtor Corporation, Longmont, Colo.

Continuation of Ser. No. 89,228, Jul. 8, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 401,670

Int. Cl.[6] G11B *19/02*

U.S. Cl. 360—69 **4 Claims**



1. An electronic architecture for a hard disk drive that can be coupled to an external device, comprising:

disk means for storing information;

spin motor means for rotating said disk means;

actuator arm assembly means for transferring information relative to said disk means, said actuator arm assembly means including a voice coil used to move a read/write head relative to said disk means;

data manager means for transferring information with the external device;

read/write means for transferring information between said read/write head and said data manager means;

servo module means containing voice coil control circuit means for controlling said voice coil, spin motor control circuit means for controlling said spin motor means, said servo module means further having digital to analog converter means for converting digital command signals to analog input signals that are provided to said voice coil and said spin motor control circuit means;

controller means for controlling said data manager means, said read/write means and said servo module means, said controller means providing digital command signals to said servo module means to control said spin motor means and said actuator arm assembly means, said controller means including a digital signal processor having separate internal first and second busses and a plurality of hardware elements communicating with said digital signal processor by means of a plurality of external conductors that are external to said digital signal processor and are different from said first and second internal busses, with said first internal bus for transferring instructions and said second internal bus for transferring data and in which said digital signal processor executes fetching, decoding, reading and execution routines in parallel including receiving data at the same time said digital signal processor is executing said instructions, said plurality of hardware elements and said digital signal processor being on the same structure, said plurality of hardware elements being all of said hardware elements on said same support structure that communicate with said digital signal processor, said plurality of external conductors constituting all of said conductors that communicate between said plurality of hardware elements and said digital signal processor, said digital signal processor operating with less instructions than instructions required when a conventional processor, different from said digital signal processor, is used as part of said controller means;

wherein a memory internal to said digital signal processor is powered by a voltage less than a voltage required when conventional processor, different from said digital signal processor, is used.

5,594,601

METHOD OF PROGRAMMING AUDIO TRACKS IN A SEQUENTIAL MEDIUM

Frank P. Mimick, Watauga, and Daniel W. Staudacher, Denton, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Continuation of Ser. No. 107,204, Aug. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 890,867, May 27, 1992, abandoned. This application May 3, 1995, Ser. No. 433,596

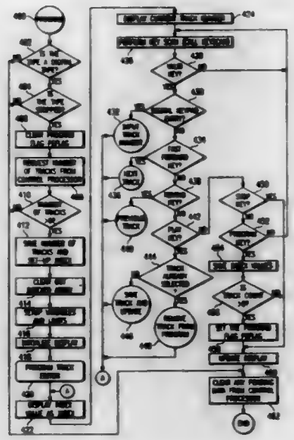
Int. Cl.[6] G11B *15/18*

U.S. Cl. 360—72.2 **32 Claims**

1. A method for editing a playback sequence of tracks stored in a memory comprising:

selecting a track number for editing, during a playback programming routine, wherein the track number is incremented upon pressing a first switch or decremented upon pressing a second switch; and

editing the playback sequence upon pressing a third switch wherein the track number selected is entered in the memory when it is not present therein and deleted from the memory when it is present therein.



5,594,602

TRACKING ERROR DETECTING CIRCUIT

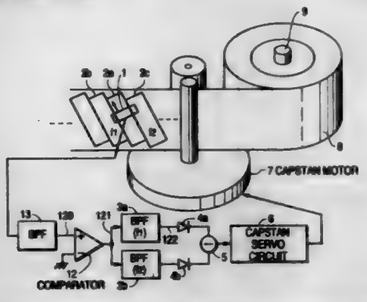
Haruo Isaka, Yawata; Toshihiko Maruoka, Ikeda; Kei Ichikawa, Osaka; Kenichi Honjo, Kobe, and Makoto Gotou, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 5, 1994, Ser. No. 286,201

Claims priority, application Japan, Aug. 11, 1993, 5-199341; Aug. 24, 1993, 5-209348

Int. Cl.[6] G11B *5/584;5/58*

U.S. Cl. 360—77.14 **9 Claims**



1. A tracking error detecting circuit for a magnetic reproducing apparatus which reproduces an information signal from tracks formed obliquely on a magnetic tape relative to a longitudinal direction of the magnetic tape, the tracks having selectively recorded thereon a pilot signal multiplexed with the information signal, said tracking error detecting circuit comprising:

a rotating magnetic head for scanning the tracks and reproducing the information signal on which the pilot signal is selectively multiplexed to obtain a reproduced signal;

a comparator for comparing a level of the reproduced signal with a specified level and for outputting a binary signal having a pulse width varying according to the level of a pilot signal contained in the reproduced signal; and

a level detecting circuit for detecting a level of the pilot signal contained in the reproduced signal from the binary signal output by the comparator.

5,594,603

SEEK CONTROL SYSTEM BASED UPON A DETECTED TEMPERATURE OF A POSITIONING MECHANISM IN A DISK DEVICE

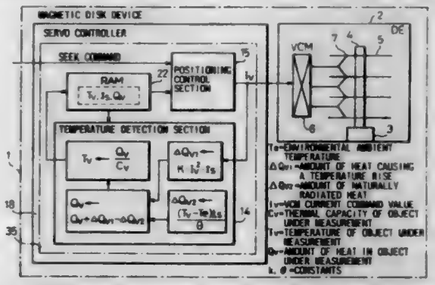
Kazunori Mori; Nobuyuki Suzuki, and Taturo Sasamoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 20, 1994, Ser. No. 326,471

Claims priority, application Japan, Dec. 2, 1993, 5-302467

Int. Cl.[6] G11B *5/596;33/14;* **G05B** *11/01*

U.S. Cl. 360—78.04 **14 Claims**



1. A seek control system in a disk device including a positioning mechanism having a voice coil motor which positions a head for carrying out read/write operations based upon a detected temperature of said positioning mechanism, said seek control system comprising:

means for determining an amount of heat causing a temperature rise in said positioning mechanism as the square of a voice coil motor current command value, by which said voice coil motor is controlled to position said head, multiplied by a predetermined coefficient;

means for storing an amount of naturally radiatrd heat which is calculated in advance;

means for integrating, for each of a number of sampling periods, the difference between the amount of naturally radiated heat and the amount of heat causing the determined temperature rise, to calculate a new amount of heat in said positioning mechanism; and

means for calculating the temperature of said positioning mechanism in accordance with the calculated new amount of heat in said positioning mechanism by determining the ratio between the calculated new amount of heat and the thermal capacity of the positioning mechanism.

5,594,604

TAPE LOADING DEVICE INCORPORATING THEREIN AN INTERMEDIATE GEAR FOR ACTUATING LOADING GEARS

Chang-Ho Lee, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 9, 1995, Ser. No. 401,312

Claims priority, application Rep. of Korea, Mar. 9, 1994, 94-4515

Int. Cl.[6] G11B *5/027;5/008*

U.S. Cl. 360—85 **3 Claims**

1. A video cassette recorder having a tape loading device adapted to draw a portion of a tape out of a loaded cassette in the video cassette recorder and to load said portion in a predetermined path along the circumferential peripbery of a head drum therein, wherein said device comprises:

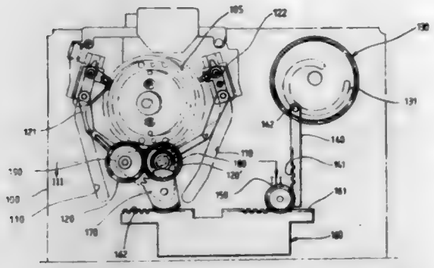
a cam gear having a loading groove;

an elongated member engaged with the loading groove at its one end and having a rack gear at its other end;

a transmittal gear meshed with the rack gear;

a function plate having a pair of rack gear portions, one of which is meshed with the transmittal gear;

an intermediate gear having a first sector gear portion at one end thereof selectively engageable with the other rack gear portion



of the function plate, a second sector gear portion at the other end of the intermediate gear, and a convex arcuate portion located adjacent to the second sector gear portion;

a loading means having a first loading gear provided with a stepped gear portion for engaging with the second sector gear portion, the first loading gear further having a concave arcuate portion for engaging with the convex arcuate gear portion, a second loading gear engaged with the first loading gear, a pair of linkages respectively fixed to each shaft of the first and the second loading gears, and a pair of pole bases respectively fixed to one end of a lever of the linkages; and

a main chassis, on which the cam gear is rotatably mounted, having a pair of loading slots formed to guide the pole bases toward the head drum.

5,594,605

DAMPER FOR A CASSETTE HOLDER

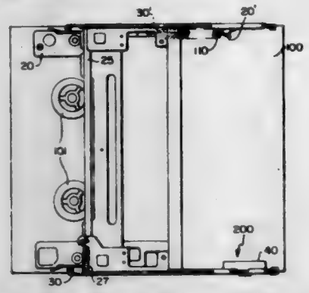
Jin-Soo Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Apr. 27, 1995, Ser. No. 429,550

Claims priority, application Rep. of Korea, Jun. 9, 1994, 94-13004

Int. Cl.[6] G11B *15/675*

U.S. Cl. 360—96.5 **2 Claims**



1. A rotary cassette loading device comprising a chassis; a cassette holder for receiving a cassette and which is rotatably connected to said chassis; a spring disposed between said chassis and said cassette holder and for normally biasing said cassette holder in an open position; and a damping liquid-free damper for reducing an opening force of said spring acting on said cassette holder,

wherein said chassis is formed with an opening having an arc-shaped edge, and said damping liquid-free damper comprises a casing member connected to one side of said cassette holder, said casing member defining an interior having a fixed supporting shaft extending therefrom, and a synthetic resin roller member which elastically deforms and which rotates in frictional contact with said arc-shaped edge of said opening while being rotatably supported on said fixed supporting shaft within the interior of said casing member.

5,594,606

DISK STORAGE DRIVE FOR MAINTAINING PRECISION DURING THERMAL VARIATIONS

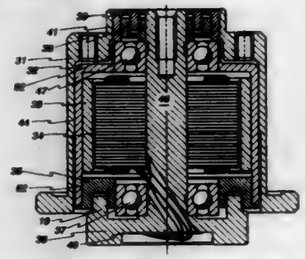
Helmut Hans, and Jürgen Oelsch, both of St. Georgen, Germany, assignors to Papst Licensing GmbH, Germany

Continuation of Ser. No. 883,029, May 14, 1992, abandoned. This application Feb. 17, 1995, Ser. No. 390,936

Claims priority, application Germany, Jun. 29, 1991, 41 21 425.0

Int. Cl.[6] G11B *17/02;* **H02K** *5/16*

U.S. Cl. 360—99.08 **13 Claims**



13. A disk storage drive with a brushless driving motor, comprising:

a stationary shaft defining an axis;

a stator comprising a laminated core disposed on the shaft and a stator winding having an axial length;

a bell-shaped outer rotor housing having an open end and comprising a permanent magnetic rotor magnet and a storage disc carrying hub for carrying at least one storage disc in a clean room; and

a bearing arrangement for rotatably mounting said rotor housing to the stationary shaft and comprising

a first bearing having an inner race disposed on the stationary shaft above the stator winding and an outer race disposed within and supporting a relatively closed-end of the bell-shaped outer rotor housing for rotatably mounting the outer rotor housing to the stationary shaft whereby the outer rotor housing encompasses the stator and forms a cylindrical air gap therewith,

a second bearing having an inner race disposed on the stationary shaft below the stator winding and having an outer race; and

a ring element disposed between the outer race of the second bearing and in contact with an inner surface of the open end of the bell-shaped outer rotor housing for bracing the open end of the bell-shaped outer rotor housing, said ring element having substantially the same heat expansion characteristics as the bell-shaped outer rotor contacted thereby, the open end of the bell-shaped outer rotor housing comprising a low retentivity keeper part which is braced by said ring element and said ring element having substantially the same heat expansion characteristics as the keeper part.

5,594,607

VISCOELASTICALLY DAMPED SLIDER SUSPENSION SYSTEM

A. David Erpelding, and Oscar J. Ruiz, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

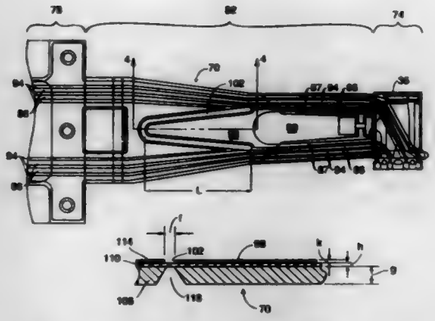
Division of Ser. No. 213,913, Mar. 15, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 477,461

Int. Cl.[6] G11B *5/60;21/21*

U.S. Cl. 360—104 **11 Claims**

7. A suspension system for a disk drive having a magnetic data storage medium comprising:

a slider means for reading data from the magnetic data storage medium;



an elongated arm comprised of a support region on which the slider means is mounted, an arm region which is attached to an actuator arm and a load beam which is positioned between the support region and the arm region, the elongated arm comprising a first layer, a second layer comprised of a viscoelastic material overlying the first layer, and a third layer comprised of an electrically conductive material overlying the second layer;

a first V-shaped channel positioned completely in the load beam, the first V-shaped channel comprising a first leg, a second leg and an apex, the first leg extending completely through the third layer so that the second layer is exposed through the first leg along the entire leagth of the first leg, the second leg extending completely through the third layer so that the second layer is exposed through the second leg along the entire length of the second leg, the second leg being oriented nonparallel to the first leg with the first leg and the second leg positioned in an approximate V-shape, the apex extending completely through the third layer so that the second layer is exposed through the apex with the apex connecting the first leg and the second leg at the narrowest end of the V-shape thereby forming a continuous channel in the third layer through which the second layer is exposed;

a V-shaped tongue comprising a region of the third layer circumscribed by the first leg, the second leg and the apex; and

a second V-shaped channel, the second V-shaped channel being formed in the first layer directly underneath the first V-shaped channel with the second V-shaped channel following the shape of the first V-shaped channel around the perimeter of the V-shaped tongue, and with the second layer being positioned between the first V-shaped channel and the second V-shaped channel.

5,594,608

MAGNETIC TAPE HEAD WITH A HIGH SATURATION FLUX DENSITY MAGNETIC POLE INTERPOSED BETWEEN A NONMAGNETIC CLOSURE SECTION AND A MAGNETIC FERRITE SUBSTRATE

Richard H. Dee, Louisville, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

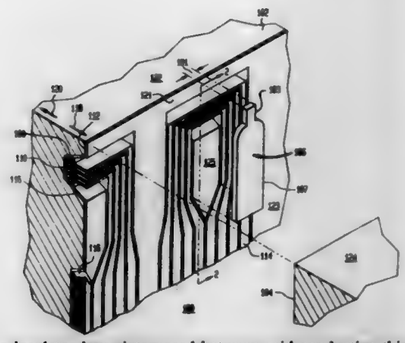
Filed Jun. 22, 1994, Ser. No. 263,884
Int. Cl.[6] G11B 5/147
U.S. Cl. 360—126 **12 Claims**

1. A write element for a magnetic tape head having a tape head surface, comprising:

a magnetic ferrite substrate having a first surface, wherein a recess is formed on said first surface, said recess having a portion extending substantially parallel to and adjacent with the tape head surface, and wherein a trench is formed in said portion of said recess;

a layer of nonmagnetic composition disposed in said trench to form an insulator;

a conductive thin film coil disposed in said recess;



an insulator layer interposed between said conductive thin film coil and said substrate to insulate said conductive thin film coil from said substrate and to form a magnetic gap layer, wherein a portion of said insulator layer is interposed between said layer of nonmagnetic composition in said trench and said conductive thin film coil;

a nonmagnetic closure section having a planar surface parallel and adjacent to said first surface of said substrate, said closure section engaging said first surface of said substrate and enclosing said conductive coil, wherein said substrate and said closure section serve as pole pieces to define a front gap and back gap therebetween; and

a substantially planar high saturation flux density magnetic pole piece interposed between said closure section and said substrate, comprising,

a top section interposed between said closure section and said ferrite substrate within said front gap, said top section having a width defining a track width, and

a bottom section, integrally formed with said top section, interposed between said closure section and said substrate within said back gap, said bottom section having a surface area substantially equivalent to a cross sectional area of said back gap,

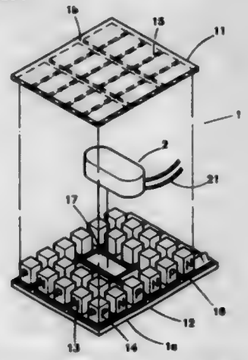
wherein said substrate and said closure section are connected to opposite sides of said top section at said front gap and said bottom section at said back gap.

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THERMOELECTRIC COUPLE DEVICE

Wei T. Lin, No. 20, Sec. 5, 3rd Fl., Cheng Teh Rd., Taipei, Taiwan

Filed Nov. 4, 1994, Ser. No. 334,550
Claims priority, application China, Apr. 23, 1994, 94209356.9
Int. Cl.[6] H02H 5/04
U.S. Cl. 361—104 **7 Claims**



1. A thermoelectric couple device comprising:

a thermoelectric couple comprising a first ceramic base plate, a second ceramic base plate, a plurality of copper foils respectively welded to said first and second ceramic base plates, and a first plurality of N type thermoelectric semiconductors and a second plurality of P type thermoelectric semiconductors respectively welded to said copper foils between said first and second ceramic base plates, wherein N type thermoelectric semiconductors of said first plurality of N type thermoelectric semiconductors and P type thermoelectric semiconductors of said second plurality of P type thermoelectric semiconductors being alternately connected in series; and

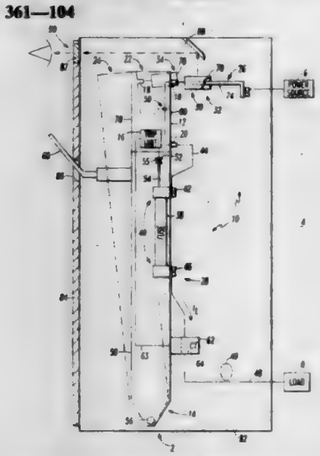
a temperature detecting device mounted on said first ceramic base plate and disposed between said first and second ceramic base plates to detect an interior temperature of said thermoelectric couple.

5,594,610

PIVOT-DISCONNECTING CIRCUIT BREAKER

Timothy G. Robirds; Mark L. Allen, and Ralph E. Baker, all of Sumter, S.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 14, 1995, Ser. No. 403,330
Int. Cl.[6] H02H 5/04
U.S. Cl. 361—104 **11 Claims**



1. A circuit interruption apparatus for a power circuit having a power source and a load, said circuit interruption apparatus comprising:

termination means for interconnection with said power source and said load;

circuit interrupter means for interrupting said power circuit between said power source and said load, said circuit interrupter means including a line terminal and a load terminal;

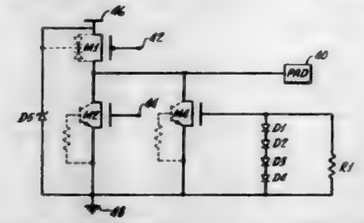
pivot means for pivoting said circuit interrupter means between a first position wherein the line terminal and the load terminal are interconnected with said termination means, and a second position wherein one of the line terminal and the load terminal is disconnected from said termination means; wherein a current flows in said power circuit between said power source and said load; wherein said pivot means includes current transformer means for sensing the current; and wherein said circuit interrupter means includes a circuit between the line terminal and the load terminal, and trip unit means for receiving the sensed current from the current transformer means and tripping open the circuit under predetermined conditions of the sensed current; and wherein said pivot means further includes a pivot point and a pivot arm which is pivotally mounted at the pivot point; wherein the current transformer means and the load termination means are both mounted to the pivot arm; wherein the current transformer means has a hole; and wherein the load termination means further includes load cable means for conducting the current through the hole of the current transformer means.

5,594,611

INTEGRATED CIRCUIT INPUT/OUTPUT ESD PROTECTION CIRCUIT WITH GATE VOLTAGE REGULATION AND PARASITIC ZENER AND JUNCTION DIODE

Rosario Consiglio, San Jose, and Gina M. Sparacino, Milpitas, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jan. 12, 1994, Ser. No. 180,741
Int. Cl.[6] H02H 9/00
U.S. Cl. 361—118 **10 Claims**



1. An electro-static discharge protection circuit adapted for use in an integrated circuit, comprising:

a first protective field effect transistor connected between a pad of said integrated circuit and a potential of said integrated circuit and having a gate, said first transistor responsive to a voltage applied to said gate to control a current through said first transistor; and

a voltage regulator connected between said gate of said first protective transistor and said potential of said IC, said voltage regulator operative to apply said voltage to said gate such that a desired amount of current flows through said first transistor when an electro-static discharge is applied to said pad, wherein:

said potential is a ground potential and said first protective transistor is an NMOS field effect transistor having a drain electrically connected to said pad, and a source electrically connected to said ground potential; and

said voltage regulator comprises:

a first diode having an anode connected to said gate of said first transistor, and a cathode;

a second diode having an anode connected to said cathode of said first diode, and a cathode; and

a third diode having an anode connected to said cathode of said second and a cathode connected to said ground potential of said IC.

5,594,612

ANALOG-TO-DIGITAL CONVERTER WITH DIGITAL LINEARITY CORRECTION

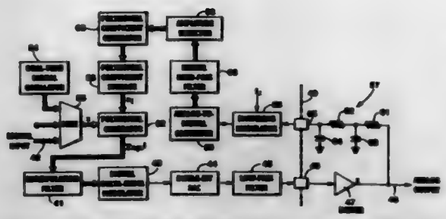
W. S. Hearion, Austin, Tex., assignor to Crystal Semiconductor Corporation, Austin, Tex.

Filed Aug. 24, 1994, Ser. No. 295,522
Int. Cl.[6] H03M 1/10
U.S. Cl. 341—120 **60 Claims**

1. A method of digitally compensating a digital signal produced by an analog-to-digital converter to reduce nonlinear distortion, said method comprising the steps of:

a) generating an analog calibration signal having at least one frequency component;

b) applying said analog calibration signal to said analog-to-digital converter to produce said digital signal by conversion of said analog calibration signal;



c) compensating said digital signal in accordance with at least one compensation coefficient to produce a compensated digital signal;

d) digitally processing said compensated digital signal to select a distortion component in said compensated digital signal produced by nonlinearity from said frequency component and to obtain a measurement of the selected distortion component; and

e) adjusting said compensation coefficient in response to said measurement for reducing said distortion component;

wherein said step (a) of generating includes generating a first frequency and a second frequency in said analog calibration signal, and wherein said distortion component is an intermodulation component produced by intermodulation between said first frequency and said second frequency.

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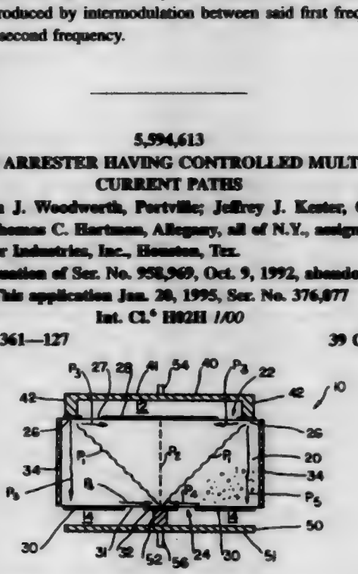
SURGE ARRESTER HAVING CONTROLLED MULTIPLE CURRENT PATHS

Jonathan J. Woodworth, Portville; Jeffrey J. Kester, Olean, and Thomas C. Hartman, Allegany, all of N.Y., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 958,969, Oct. 9, 1992, abandoned. This application Jan. 20, 1995, Ser. No. 376,877

Int. Cl.[6] H02H *1/00*

U.S. Cl. 361—127 **39 Claims**



9. A surge arrester comprising:

a nonlinear, voltage dependent resistive element having a longitudinal axis and a first surface and a second surface that is spaced apart from said first surface by the thickness of said resistive element, each of said surfaces having a central region and a peripheral region surrounding said central region;

an impulse current path between said central region of said first surface and said central region of said second surface for conducting surge current through the arrester, said impulse current path being substantially parallel to said longitudinal axis; and

a steady-state current path in said resistive element between said first and second surfaces for conducting steady-state current through the arrester, said steady-state current path in said resistive element being directed at an angle relative to said impulse current path.

5,594,614

SURGE ARRESTER

Johannes Kirch, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

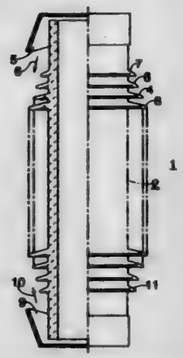
PCT No. PCT/DE93/01158, § 371 Date Aug. 25, 1995, § 102(e) Date Aug. 25, 1995, PCT Pub. No. WO94/14216, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 2, 1993, Ser. No. 481,412

Claims priority, application Germany, Dec. 16, 1992, 9217480 U

Int. Cl.[6] H02H *9/04*

U.S. Cl. 361—127 **2 Claims**



1. A housing for a cylindrical surge arrester where the housing is porcelain and comprises:

a plurality of surrounding safety shields; and

at least one blow-out aperture at one end aimed parallel to the cylindrical axis of the surge arrester at the surface of the housing;

wherein the safety shields closest to the blow-out aperture have diameters that increase with distance from the blow-out aperture from one safety shield to the next in at least two increments, and

wherein the safety shields closest to the blow-out aperture deflect a gas blown out of the blow-out aperture away from the housing and from the remaining safety shields.

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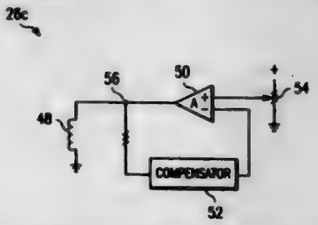
METHOD AND APPARATUS FOR REDUCING THE INTENSITY OF MAGENETIC FIELD EMISSIONS FROM DISPLAY DEVICE

Johannes Spijkerman, Arlington, and Hubert F. Flamant, Dallas, both of Tex., assignors to MTI, Inc., Dallas, Tex.

Continuation of Ser. No. 60,274, May 10, 1993, abandoned. This application Dec. 14, 1995, Ser. No. 572,686

Int. Cl.[6] H01J *1/52*

U.S. Cl. 361—150 **24 Claims**



1. Apparatus for reducing intensity of a magnetic field emanating from a screen of a display device, comprising:

means disposed adjacent said screen for producing a first current proportional to said magnetic field emanating from said screen;

means in electrical communication with said producing means for generating a second current responsive to said first current; and

means in electrical communication with said generating means for bucking said magnetic field, wherein said producing means and said bucking means comprise a single wire coil.

5,594,616

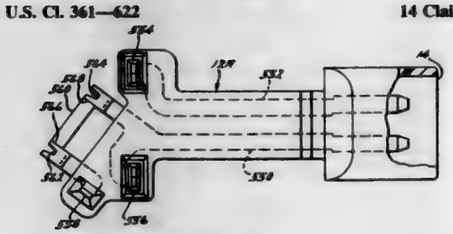
ELECTRICAL COMPONENT CONNECTING PROVISIONS FOR AN IGNITION COIL

David C. Brecht, Ann Arbor; Robert C. Bauman, Flat Rock, and Robert L. Hancock, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 27, 1995, Ser. No. 411,195

Int. Cl.[6] F02P *11/00*

U.S. Cl. 361—622 **14 Claims**



1. An ignition coil assembly comprising:

a primary coil having a first terminal and a second terminal;

a secondary coil having a third terminal and a fourth terminal, said secondary coil magnetically coupled to said primary coil; and

a conductor electrically coupling one said terminal of said primary coil and one said terminal of said secondary coil, said conductor comprising means for connecting an electrical component across a portion of said conductor.

5,594,617

ROTATING BATTERY HINGE FOR A NOTEBOOK COMPUTER

Mark J. Foster, Acton, and Michele Bovio, Boston, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 6, 1994, Ser. No. 350,369

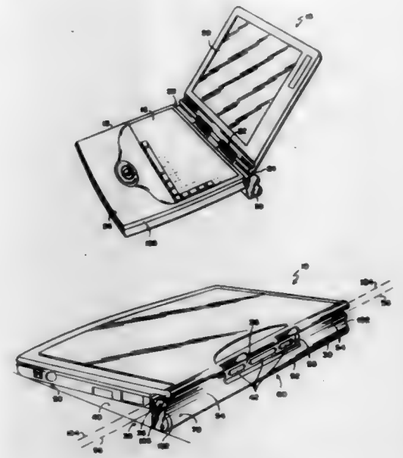
Int. Cl.[6] G06F *1/16*; H05K *5/00*

U.S. Cl. 361—679 **11 Claims**

1. A computer comprising:

a computer housing for holding electronic components;

a battery housing rotatably mounted external to the computer housing, said battery housing adapted for holding batteries for supplying power to said electronic components, said battery housing being an elongated housing having a narrow portion and wider end portions, the wider end portions forming opposing inwardly facing surfaces and an opening therebetween, the battery housing being rotatable between a closed position wherein the battery housing covers a rear wall of the computer housing and an open position wherein the battery is effective to elevate the rear wall to provide a convenient typing angle when the computer housing is resting on a support surface.



5,594,618

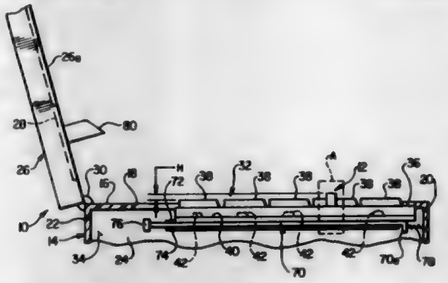
COLLAPSIBLE POINTING STICK APPARATUS FOR A PORTABLE COMPUTER

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 6, 1995, Ser. No. 384,153

Int. Cl.[6] G06F *1/16*; H01H *21/06*

U.S. Cl. 361—680 **19 Claims**



1. The portable computer comprising:

a base housing having a top side;

a lid housing secured to said base housing for pivotal movement relative thereto between a closed position in which said lid housing extends across and covers said top side of said base housing, and an open position in which said lid housing uncovers and exposes said top side of said base housing, said lid housing having a screen portion upon which a movable cursor may be displayed;

a keyboard carried on said top side of said base housing and having a series of manually depressible key cap members thereon; and

cursor positioning means operative to selectively move a cursor displayed on said screen portion, said cursor positioning means including a pointing stick structure comprising:

a stem structure having a length transverse to said keyboard, and upper and lower ends,

support means, carried on said keyboard, for supporting said stem structure for longitudinal movement relative to said support means between an upwardly extended operating position and a downwardly retracted storage and transport position, and for permitting said stem structure in said operating position thereof to be manually pivoted about an axis transverse to the length thereof,

detection means for sensing a manual pivoting of said stem structure about an axis transverse thereto and responsively generating an electrical output signal usable to reposition a cursor displayed on said screen portion,

spring means for resiliently biasing said stem structure toward said operating position thereof, and

stem structure positioning means operative to (1) permit said lid housing to downwardly engage said stem structure, forcibly move it from said operating position to said storage and transport position, and hold it in said storage and transport position, in response to movement of said lid housing from said open position to said closed position and then (2) permit said stem structure to be returned to said operating position thereof by said spring means, and then releasably preclude said stem structure from being moved from said operating position to said storage and transport position, in response to movement of said lid housing from said closed position to said open position.

5,594,619

PORTABLE COMPUTER COMPRISING KEYBOARD AND COORDINATE INPUT TABLET HINGEDLY CONNECTED TO A MAIN BODY CASE THROUGH A JUNCTION BASE HAVING A CYLINDRICAL ELEMENT DEFINING A LINEAR GROOVE THERETHROUGH

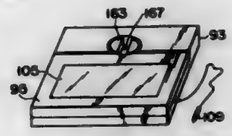
Shigenori Miyagawa, Tokyo; Koichi Kobayashi, Hanno; Shimpei Kunii, Tokyo; Shizuo Kanaie, Tokyo; Hiroyuki Sakamoto, Tokyo; Fumitaka Sato, Tokyo, and Ryoichi Ishiura, Matsudo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

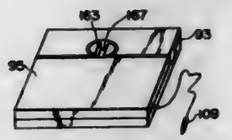
Division of Ser. No. 114,090, Aug. 31, 1993, Pat. No. 5,410,447, which is a division of Ser. No. 41,890, Apr. 2, 1993, Pat. No. 5,268,817, which is a continuation of Ser. No. 692,250, Apr. 26, 1991, abandoned. This application Dec. 22, 1994, Ser. No. 362,008

Claims priority, application Japan, Apr. 27, 1990, 2-112775; Nov. 21, 1990, 2-318403; Nov. 21, 1990, 2-318413; Nov. 21, 1990, 2-318414

Int. Cl.[6] G06F *1/16*; H05K *7/16*

U.S. Cl. 361—681 **6 Claims**





1. A portable computer comprising:

a main body case having two lateral sides;

a keyboard encased by said main body case;

an integrated display/input device having a coordinate input tablet overlaid on on a display device;

an upper cover encasing said integrated display/input device;

a junction base disposed between said two lateral sides;

a first hinge rotatably coupling said junction base to said main body case; and

a second hinge rotatably coupling said upper cover to said junction base,

said junction base comprising a cylindrical element defining a linear groove therethrough and said upper cover connects to said junction base through a projection that connects to said second hinge within said junction base at said linear groove; and

wherein relative rotation of said upper cover and said junction base changes a form of said portable computer between a first closed form at which said keyboard and said integrated display/input device face each other, and a second closed form at which said upper cover overlays said keyboard to expose said integrated display/input device.

5,594,620

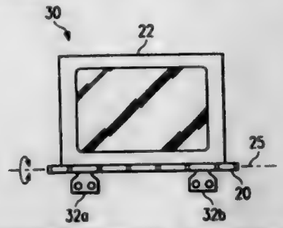
SECONDARY DISPLAY SYSTEM HAVING A PLURALITY OF CLAMPING DEVICES FOR MOUNTING ON A COMPUTER MONITOR

David S. Register, Austin, Tex., assignor to Dell U.S.A., L.P., Austin, Tex.

Continuation of Ser. No. 92,846, Jul. 16, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 544,341

Int. Cl.[6] G06F *1/16*; H05K *7/02*

U.S. Cl. 361—681 **8 Claims**



1. A secondary display system for a computer having a primary display, the system comprising:

a flat panel display operating as a secondary display to said primary display of said computer;

a display controller electrically connected between said computer and said flat panel display for interfacing said flat panel display to said computer;

means connected to said flat panel display for positioning said flat panel display relative to said computer and to said primary display, said positioning means defining an axis on which said flat panel display is rotatable; and

a plurality of clamping devices connected to said positioning means for clamping said system to said computer such that said positioning means is adjacent and parallel to an edge of said primary display.

5,594,621

MOTHERBOARD FOR A COMPUTER OF THE AT TYPE, AND A COMPUTER OF THE AT TYPE COMPRISING SUCH MOTHERBOARD.

Herman W. van Rumpt, 's-Hertogenbosch, Netherlands, assignor to Tulip Computers International B.V., Netherlands

Filed Jun. 13, 1995, Ser. No. 489,808

Claims priority, application Netherlands, Jun. 14, 1994, 9400967

Int. Cl.[6] H05K *7/04*; G06F *13/42*

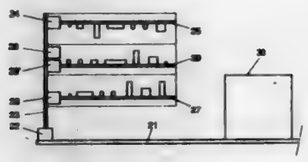
U.S. Cl. 361—686 **6 Claims**

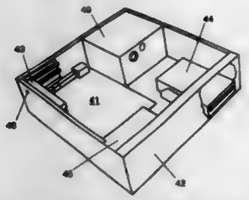
1. An assembly for use in a personal computer, said assembly comprising:

a motherboard;

a mating connector for a riser card, said mating connector situated on the motherboard and adjacent and parallel to a peripheral side edge thereof, said mating connector having an opening adapted to receive a riser card, said mating connector being oriented on the motherboard such that the opening extends in a direction perpendicularly upward from a horizontal surface of the motherboard; and

the riser card having a predetermined number of expansion positions thereon, each of said positions having at least one expansion connector associated therewith so as to form a plurality of expansion connectors located on the riser card





such that a plurality of expansion boards can be simultaneously mated through said expansion connectors to said riser card, said one expansion connector being either an ISA (industry standard architecture) or a PCI (peripheral connect interface) type connector so as to respectively accommodate an ISA or PCI type expansion board, all of the expansion connectors being horizontally oriented and successively arranged in a parallel fashion one above another, and said riser card being oriented with respect to the motherboard such that each one of the plurality of expansion boards inserted into a corresponding one of said expansion connectors is oriented in a direction substantially parallel to a horizontal plane of the motherboard and extends inward from a vicinity of the side edge towards a central portion of the motherboard;

wherein a predefined one of the positions on the riser card has both ISA type and PCI type expansion connectors associated therewith and situated one above another so as to accommodate either an ISA type or a PCI type expansion board in said predefined one position, wherein said predefined one position is located on the riser card below at least one of the positions having the ISA type expansion connector and above at least one of the positions having the PCI type expansion connector.

5,594,622

ELECTRONIC APPARATUS SYSTEM HAVING AN ELECTRONIC APPARATUS UNIT AND AN EXPANSION UNIT FOR EXPANDING THE FUNCTION OF THE ELECTRONIC APPARATUS UNIT BY CONNECTION TO AN EXPANSION CARD CONNECTOR

Ryo Hosoya, and Takaichi Kobayashi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 340,550, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 240,231, May 10, 1994, Pat. No. 5,434,743, which is a continuation of Ser. No. 940,641, Sep. 4, 1992, abandoned. This application Sep. 12, 1995, Ser. No. 526,877

Claims priority, application Japan, Sep. 6, 1991, 3-071836 U; Sep. 6, 1991, 3-226847

Int. Cl.[6] G06F *1/16*; H05K *7/12*

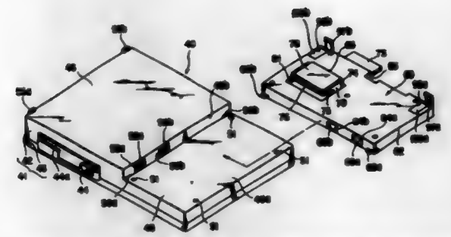
U.S. Cl. 361—686 **13 Claims**

1. An expanding apparatus for expanding a function of an electronic apparatus having a first connector, the expanding apparatus comprising:

a body having an upper surface on which the electronic apparatus is detachably mounted, the body including a mounting portion which comprises a recess and has a second connector;

means for expanding the function of the electronic apparatus, provided within the body, electrically connected to the second connector; and

a connector unit detachably mounted on the mounting portion of the body, the connector unit including a third connector and a fourth connector electrically connected to the third connector,



the third connector electrically connected to the first connector when the electronic apparatus is mounted on the upper surface after the connector unit is mounted on the mounting portion, and the fourth connector electrically connected to the second connector when the connector unit is mounted on the mounting portion.

5,594,623

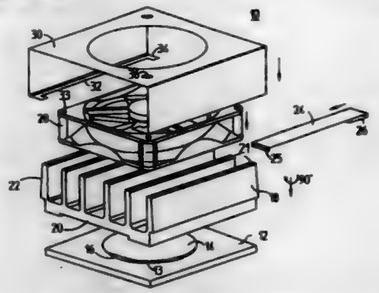
METHOD AND APPARATUS FOR ATTACHING A HEAT SINK AND A FAN TO AN INTEGRATED CIRCUIT PACKAGE

Tim Schwegler, Pforzheim, Germany, assignor to Hewlett-Packard Co, Palo Alto, Calif.

Continuation of Ser. No. 310,130, Sep. 21, 1994, abandoned. This application Mar. 14, 1996, Ser. No. 617,902

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—697 **9 Claims**



1. A heat sink assembly for dissipating heat from an integrated circuit with a package, said heat sink assembly comprising:

a heat spreader having a first side and a second side with a dove-tailed edge running around a periphery of said heat spreader between said first side and said second side such that the area of said first side is smaller than the area of said second side, said first side of said heat spreader being attached to said integrated circuit package; and

a heat sink with a first side and a second side, said first side having fins which dissipate heat extending from said first side, said second side having two substantially parallel outer struts with dove-tailed inner side walls that matingly correspond with the dove-tailed edge of the periphery of said heat spreader such that said heat sink can be slidingly mated to said heat spreader with the dove-tailed edge of said heat spreader and the dove-tailed inner side walls of said heat sink securing said heat sink to said integrated circuit package.

5,594,624

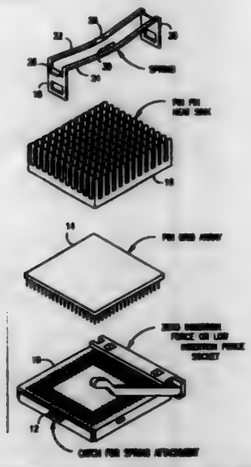
STRAP SPRING FOR HEAT SINK CLIP ASSEMBLY

Donald Clemens, The Colony, and Matthew C. Smithers, Lewisville, both of Tex., assignors to Thermalloy, Inc., Dallas, Tex.

Continuation of Ser. No. 349,672, Dec. 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 223,011, Apr. 5, 1994, Pat. No. 5,371,652. This application May 2, 1996, Ser. No. 643,079

Int. Cl.[6] H05K 7/20

U.S. Cl. 361—704 19 Claims



1. A strap mounting a heat sink having a plurality of spaced fins to an electronic device with an electrically insulating frame, comprising:

a flat, straight leg releasably gripping said frame urging said heat sink into thermal contact with the face of said electronic device, said leg having an opening mating with an ear on said frame;

at least two longitudinal spring members extending generally perpendicularly to said leg with an opening between said spring members, said spring members fitting between said fins of said heat sink to hold said heat sink; and

at least one spring tab extending from each spring, said tab flexibly engaging the fins of said heat sink to lodge said clip in said heat sink.

5,594,625

ELECTRIC APPLIANCE, ITS ASSEMBLING METHOD, AND ITS HOUSING STRUCTURE

Kazuo Sampei, and Tatsuo Yamauchi, both of Fukushima-ken, Japan, assignors to Hitachi Telecom Technologies Ltd., Koriyama, Japan

Division of Ser. No. 127,568, Sep. 28, 1993, Pat. No. 5,461,543. This application Jun. 7, 1995, Ser. No. 477,615

Claims priority, application Japan, Feb. 28, 1992, 4-281095; Sep. 28, 1992, 4-281094; Sep. 28, 1992, 4-281096; May 18, 1993, 5-138922

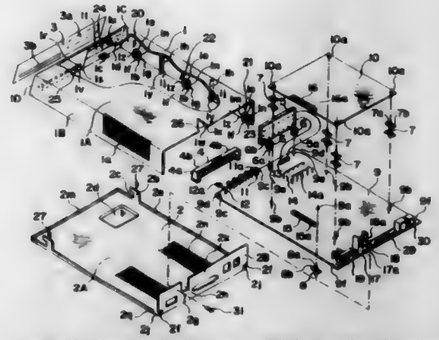
Int. Cl.[6] H05K 5/00

U.S. Cl. 361—755 19 Claims

7. An electric appliance comprising:

a plastic-made upper case provided with a plurality of logic package holding portions located inside of left and right side face portions of the upper case at a regular interval and an upper case side engagement means and a screw seat arranged on an interior portion of the upper case;

a conductive lower case having a lower case side engagement means and a screw hole formed on the bottom face portion of the lower case left and right front hooks, said hooks being



adapted to hook the logic package holding portions in order to position the lower case to overlap with the upper case such that pushing the lower case forward and against the upper case results in an engagement of the lower case side engagement means with the upper case side engagement means and said screw hole being matched to the screw seat so as to thread a screw into the screw seat through the screw hole; and

a logic package insertable in said logic package holding portions to be held in the upper case.

5,594,626

PARTIALLY-MOLDED, PCB CHIP CARRIER PACKAGE FOR CERTAIN NON-SQUARE DIE SHAPES

Michael D. Rostoker, San Jose; Chok J. Chia, Campbell, and Seng-Sooi Lim, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 79,499, Jun. 18, 1993, Pat. No. 5,434,750, which is a continuation-in-part of Ser. No. 834,182, Feb. 7, 1992, Pat. No. 5,262,927, and Ser. No. 933,430, Aug. 21, 1992, Pat. No. 5,329,157. This application May 2, 1995, Ser. No. 432,535

Int. Cl.[6] H05K 1/11

U.S. Cl. 361—784 30 Claims



1. Chip carrier package, comprising:

an upper substrate having an upper surface, a lower surface, and an outline shape;

a lower substrate having an upper surface, a lower surface, and an outline shape;

an opening extending through the lower substrate;

conductive lines interposed between the lower surface of the upper substrate and the upper surface of the lower substrate, the conductive lines contacting the lower surface of the upper substrate and the upper surface of the lower substrate, and extending between the upper and lower substrates towards the opening in the lower substrate;

a semiconductor die having a front face containing circuit elements and a back face, and mounted in the opening in the lower substrate;

wiring traces disposed on the lower surface of the lower substrate, and extending across the lower substrate to adjacent the opening in the lower substrate;

means for electrically connecting the circuit elements to the inner ends of the wiring traces;

means for electrically connecting outer portions of the wiring traces to the conductive lines;

plastic molding compound disposed over the front face of the die and extending partially over the lower surface of the lower substrate;

ball bumps disposed on the upper surface of the upper substrate; and

means for connecting the conductive lines to the ball bumps.

5,594,627

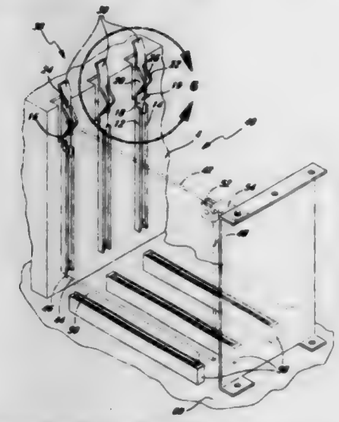
CIRCUIT CARD RETAINER

Bao G. Le, Orange, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jun. 28, 1994, Ser. No. 267,601

Int. Cl.[6] H05K 7/14

U.S. Cl. 361—801 14 Claims



1. A circuit card retainer comprising

a surface plane having a groove for receiving an edge of a circuit card, and

said groove comprising an abutment wherein said abutment is movable to enable said abutment to be displaced upon insertion of the circuit card, and wherein said abutment prevents movement of the circuit card out of said circuit card retainer unless said abutment is moved independent of the circuit card and in a manner to permit such removal.

5,594,628

DECORATIVE EXTERIOR LIGHTING SYSTEM FOR USE ON A BUILDING

John R. Reuter, 2065 Carroll Eastern Rd., Lancaster, Ohio 43130, and Raymond K. Kline, Box 68, Haydenville, Ohio 43127

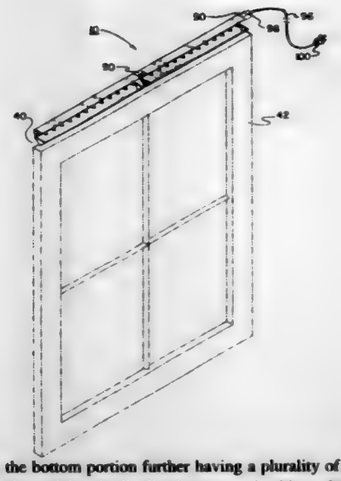
Filed Mar. 29, 1995, Ser. No. 412,996

Int. Cl.[6] F21V 21/00

U.S. Cl. 362—249 5 Claims

1. A decorative exterior lighting system for use on a building for providing an ornamental illuminated effect when placed in an opened orientation and further providing a trimmed appearance to the building when placed in a closed orientation comprising, in combination:

a rigid insulated elongated box-shaped housing including an upper section hingably coupled to a lower section, the upper section having L-shaped upper wall formed of a top portion and a bottom portion bounded by a flanged front edge, a rear edge, and a pair of opposed side edges extended therebetween, the upper section further having a pair of gussets with each gusset coupled to a separate side edge thereof to thereby create an upper holding space and with each gusset including a pair of aligned slots disposed thereon sized and spaced for receipt of a pair of prongs of a conventional male electrical



plug, the bottom portion further having a plurality of fastener holes formed longitudinally thereon and with each fastener hole sized for receiving a fastener for securing the upper section to a recipient surface, the lower section having an L-shaped lower wall formed of a top portion and a bottom portion bounded by a slotted front edge, a rear edge, and a pair of opposed side edges extended therebetween, the lower section further having a pair of gussets coupled to a separate side edge thereof to thereby create a lower holding space and with the lower section positionable away from the upper section to place the housing in an opened orientation and with the front edges of the sections snapidly securable to place the housing in a closed orientation;

a rigid planar insulated rectangular face plate perpendicularly coupled to the top portion of the upper section and extended downwards into the upper holding space to define a separate wire holding space, the face plate including a plurality of through holes formed longitudinally therealong and with each through hole placing the wire holding space in communication with the upper holding space;

an electrical lighting circuit further comprising a plurality of threaded electrically conductive light sockets with each light socket separately disposed within a through hole of the face plate, a plurality of incandescent lights with each light threadedly secured within a separate light socket, a female electrical plug disposed within the upper holding space of the upper section and coupled to one of the gussets in alignment with the slots thereon, a male electrical plug disposed within the upper holding space of the upper section and coupled to the other gusset and with the male electrical plug having a pair of prongs projected through the slots thereon, and a plurality of sheathed electrically conductive wires disposed within the wire holding space and interconnecting the plugs and light sockets in parallel and with the lights providing illumination when the circuit is electrically energized and the housing is placed in the opened orientation;

an electrical adapter plug having a female receptacle on one end and a male receptacle on the other end and with the female receptacle removably mated with the male plug of the electrical lighting circuit and thereby allowing another lighting circuit of another same exterior lighting system to be attached; and

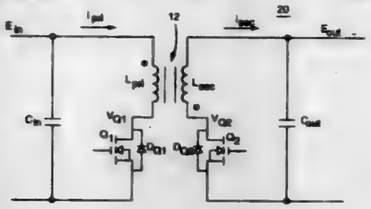
an insulated end cap formed of a rectangular planar plate with a pair of prongs projected outwards therefrom and with the prongs of the end cap removably mated within the female plug of the lighting circuit to thereby prevent its exposure.

5,594,629

HIGH-FREQUENCY SWITCHING CIRCUITS OPERABLE IN A NATURAL ZERO-VOLTAGE SWITCHING MODE

Robert L. Steigerwald, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 262,177, Jun. 20, 1994, abandoned. This application Feb. 20, 1996, Ser. No. 603,405
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—21 **11 Claims**



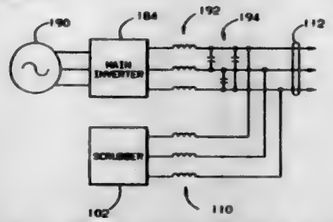
1. A dc-to-dc power converter, comprising:
a transformer comprising a primary winding and a secondary winding, said transformer dividing the converter into a higher dc voltage primary side and a lower dc voltage secondary side;
a single primary-side power switching device;
a parallel combination of a diode and a capacitance situated on said secondary side; and
control means for operating said power converter in a natural zero-voltage switching mode without actively reversing current in said secondary winding, thereby minimizing circulating currents in said switching device, such that the voltage across said power switching device resonates down to substantially zero as the current through said diode resonates substantially to zero whereupon said control means turns on said primary-side switching device with substantially zero-voltage thereacross.

5,594,630

ADD-ON DISTORTION SCRUBBER FOR AC POWER SYSTEMS

Donal E. Baker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 27, 1995, Ser. No. 495,161
Int. Cl.[6] H02M *1/12*
U.S. Cl. 363—40 **17 Claims**



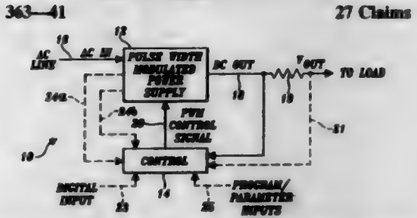
1. An add-on distortion scrubber for use in an AC power generation system, the system generating an AC voltage waveform having harmonics therein, comprising:
an inverter having a first DC link capacitor coupled in parallel therewith;
a series Connected inductive tie impedance electrically coupling said inverter in parallel with the AC power generation system; and
first means for controlling said inverter to produce an output voltage having magnitude, phase, and frequency components associated therewith, said first means sensing the AC voltage waveform of the AC power generation system and controlling said magnitude, said phase, and said frequency of said inverter output to fundamentally match the AC voltage waveform, said inverter appearing as a virtual no-load to the AC power generation system thereby and removing the harmonics therefrom.

5,594,631

DIGITAL PULSE WIDTH MODULATOR FOR POWER SUPPLY CONTROL

Mehdi Katoozi, and George S. La Rue, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 20, 1994, Ser. No. 230,320
Int. Cl.[6] H02M *1/12*
U.S. Cl. 363—41 **27 Claims**



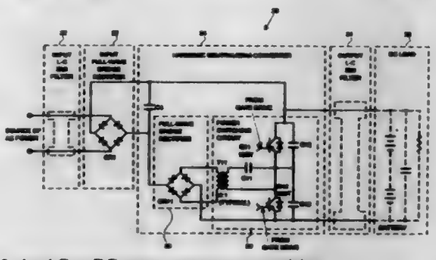
11. A control for a pulse width modulated power supply, comprising:
(a) means adapted to couple to the pulse width modulated power supply, for monitoring a plurality of operational parameters of the pulse width modulated power supply, producing corresponding digital values for each operational parameter that is monitored, the plurality of operational parameters including at least two operational parameters from the group consisting of an input voltage, an input current, an output voltage, and an output current of the pulse width modulated power supply;
(b) digital processing means, coupled to receive the corresponding digital values and to receive a predetermined desired reference value for each digital value, for determining a digital difference between the predetermined desired reference value and the digital value; and
(c) a digital pulse width modulator that is coupled to receive the digital difference for each operational parameter that is monitored and in response thereto, producing a pulse width control signal having a pulse width that is variable, the pulse width control signal controlling said at least one operational parameter of the pulse width modulated power supply.

5,594,632

POWER CONVERTER WITH HARMONIC NEUTRALIZATION

Alfred H. Barrett, Carmel, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 3, 1994, Ser. No. 316,974
Int. Cl.[6] H02M *1/14*
U.S. Cl. 363—44 **18 Claims**



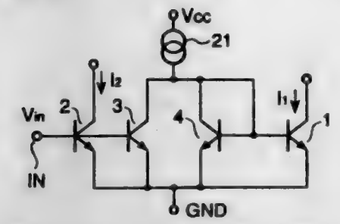
1. An AC to DC power converter comprising:
a first rectifier having an input to receive AC input power and having an output;
load output terminals for delivering DC power to a load,
a harmonic neutralizing converter comprising a power switching inverter having an input connected to the output of said first rectifier, said inverter including an LC resonant circuit and an output,
said harmonic neutralizing converter further comprising a second rectifier having an input connected to the output of said inverter and having an output connected in a voltage additive relationship to the output of said first rectifier, the added output of said rectifiers connected to said load terminals whereby the output voltage on the load terminals substantially equals the added output voltage of said rectifiers.

5,594,633

VOLTAGE-TO-CURRENT CONVERTING CIRCUIT OPERATING WITH LOW SUPPLY VOLTAGE

Hiroshi Asazawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 14, 1995, Ser. No. 514,930
Claims priority, application Japan, Aug. 12, 1994, 6-190270
Int. Cl.[6] H02M *7/00*
U.S. Cl. 363—73 **7 Claims**



1. A voltage-to-current converting circuit comprising:
a constant current source having one end connected to a voltage supply;
a first transistor having a base connected to a first input terminal and an emitter connected to ground, so that an output current is obtained from a collector of said first transistor;
a second transistor having a base connected to said first input terminal and an emitter connected to ground, a collector of said second transistor being connected to the other end of said constant current source;
a third transistor having an emitter connected to ground, and a base and a collector connected in common to the other end of said constant current source;
a fourth transistor having a base connected to said base and said collector of said third transistor, and an emitter connected to ground, so that an output current is obtained from a collector of said fourth transistor;
whereby a voltage applied to said first input terminal is converted into the output currents of said fourth and first transistors.

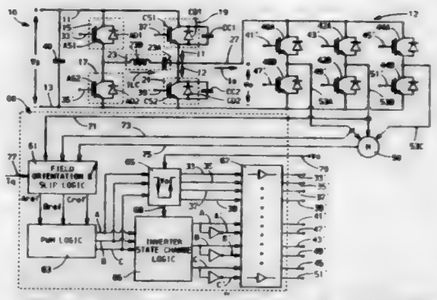
5,594,634

DC LINK INVERTER HAVING SOFT-SWITCHED AUXILIARY DEVICES

Kaushik Rajashekara, Carmel, and Alexander Kurnia, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1995, Ser. No. 443,306
Int. Cl.[6] H02M *7/44*
U.S. Cl. 363—98 **14 Claims**

1. A DC link having a DC input and a DC output, the DC input coupled to a DC source and the DC output having substantially a first voltage during power delivery intervals and substantially a second voltage during power interrupt intervals, the DC link comprising:
the DC input comprising a positive DC rail at the first voltage and a negative DC rail at the second voltage;



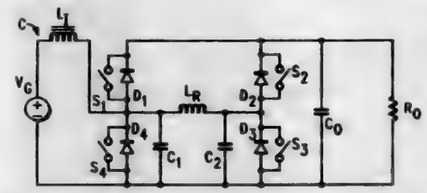
the DC output comprising a quasi-resonant rail and the negative DC rail;
a first controlled switch connected between the positive DC rail and the quasi-resonant rail;
a second controlled switch connected between the negative DC rail and the quasi-resonant rail;
first and second diodes, the first diode coupled in anti-parallel across the first controlled switch and the second diode coupled in anti-parallel across the second controlled switch;
first and second capacitors, the first capacitor coupled across the first controlled switch and the second capacitor coupled across the second controlled switch;
a series coupled inductor and capacitor coupled having first and second ends, the first end thereof being coupled to the quasi-resonant rail;
a third controlled switch coupled between the positive DC rail and the second end of the series coupled inductor and capacitor;
a third diode coupled in anti-parallel across the third controlled switch; and
a DC link control for executing power interrupt intervals intermediate power delivery intervals by sequentially commanding off the first controlled switch to release the quasi-resonant rail from the first voltage to thereby swing the quasi-resonant rail to the second voltage, commanding on the second controlled switch while the second diode is forward biased, commanding on the third controlled switch to catalyze a swing of the quasi-resonant rail to the first voltage, commanding off the second controlled switch to release the quasi-resonant rail from the second voltage to thereby swing the quasi-resonant rail to the first voltage, commanding on the first controlled switch while the first diode is forward biased, and commanding off the third controlled switch while the third diode is forward biased.

5,594,635

CONSTANT FREQUENCY, ZERO-VOLTAGE-SWITCHING CONVERTERS WITH RESONANT SWITCHING BRIDGE

Joel P. Gegner, Oak Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1993, Ser. No. 40,302
Int. Cl.[6] H02M *3/10*
U.S. Cl. 363—124 **6 Claims**



1. A constant frequency controlled, zero-voltage switched, quasi-resonant converter for receiving power from a DC power source and providing power to a DC load, said converter comprising:

switching bridge means for connecting and disconnecting said power from said DC power source to and from said DC load, said switching bridge comprising:

(a) a resonant inductor having a first end operatively connected to a first node and a second end operatively connected to a second node;

(b) a first diode having an anode operatively connected to said first node and a cathode operatively connected to a third node;

(c) a second diode having an anode operatively connected to said second node and a cathode operatively connected to said third node;

(d) a third diode having an anode operatively connected to a fourth node and a cathode operatively connected to said second node;

(e) a fourth diode having an anode operatively connected to said fourth node and a cathode operatively connected to said first node;

(f) first and second active switch means for connecting and disconnecting said DC power source to and from said DC load, said first active switch means operatively connected across said second diode, said second switch means operatively connected across said third diode;

(g) a first resonant capacitor;

(h) a second resonant capacitor;

wherein said first resonant capacitor is operatively connected to said first node such that any voltage change across said first resonant capacitor necessitates a substantially equal voltage change across said fourth diode as represented by

$$\frac{d}{dt} V_{\text{first resonant capacitor}} = \frac{d}{dt} V_{\text{fourth diode}}$$

and wherein said second capacitor is operatively connected to said second node such that any voltage change across said second resonant capacitor necessitates a substantially equal voltage change across said third diode as represented by

$$\frac{d}{dt} V_{\text{second resonant capacitor}} = \frac{d}{dt} V_{\text{third diode}}$$

when said switching bridge is operatively connected to said converter such that any voltage change across said fourth diode necessitates a substantially equal and opposite voltage change across said first diode;

at least one filtering inductor having first and second ends, said first end operatively connected to said first node, said second end operatively connected to said DC power source;

at least one filtering capacitor having a first terminal and a second terminal, the first terminal coupled to said third node and the second terminal coupled to said fourth node;

a timing means for controlling a conduction interval for each of said first active switch means and said second active switch means so that said second active switch means conducts current for a percentage D of a switching period T_S, and said first active switch means conducts current only when said second active switch means is turned off such that said first active switch means and said second active switch means and said first diode and said fourth diode turn on and turn off with substantially zero volts across them.

5,594,636

MATRIX CONVERTER CIRCUIT AND COMMUTATING METHOD

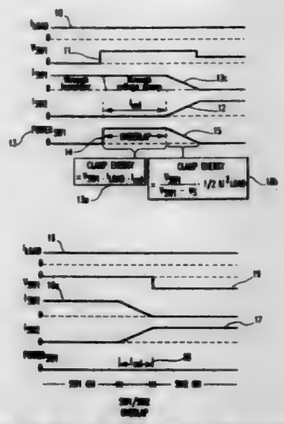
Colin D. Schauder, Murrysville, Pa., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 29, 1994, Ser. No. 267,730
Int. Cl.[6] H02M 5/20;5/257
U.S. Cl. 363—160 **12 Claims**

1. An AC-to-AC converter for connection between an input power source and an output load, said converter comprising:

a plurality of switch groups;

each of said plurality of switch groups having a plurality of switch means for selective unidirectional control of current flow in either of two directions;



each of said plurality of switch groups being associated with a corresponding common output phase line;

each of said plurality of switch means being associated with a respective input line phase;

each of said plurality of switch groups having a gating control means for delaying the turn-OFF of each of said plurality of switch means within respective ones of said plurality of switch groups by an overlap period without delaying the turn-ON of each of said plurality of switch means within respective ones of said plurality of switch groups so that two of said plurality of switch means within said switch group selected for conduction in sequence are simultaneously enabled for conduction during at least a portion of said overlap time period; and said gating control means being connectable with respective ones of said plurality of switch means within one switching group and interposed between said respective ones of said plurality of switch means and a matrix converter controller.

5,594,637

SYSTEM AND METHOD FOR ASSESSING MEDICAL RISK

Alan J. Eisenberg, Monmouth Junction, N.J., and Alexander Adelson, Peekskill, N.Y., assignors to Base Ten Systems, Inc., Trenton, N.J.

Filed May 26, 1993, Ser. No. 67,305
Int. Cl.[6] G06F 159/00
U.S. Cl. 395—282 **72 Claims**

1. A system for assessing the medical risk of a given outcome for a patient, the system comprising:

data input means receptive of test data from a given patient corresponding to at least one test marker for predicting the medical risk of a given outcome and at least one variable relating to the given patient;

means for transforming the test data with the variable to produce transformed data for each test marker;

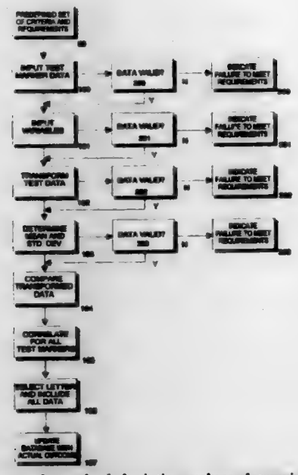
means storing a database of transformed data from other medical risk assessment systems for previously assessed patients;

means for determining mean and standard deviation values from the database in accordance with the actual occurrence of the given outcome for previously assessed patients;

means for comparing the transformed data with the mean and standard deviation values to assess the likelihood of the given outcome for the given patient; and

means for locally updating the database of said system with the actual occurrence for the given patient;

wherein the means for determining mean and standard deviation values includes means for locally adjusting the determined mean and standard deviation values of said system for the locally updated database, whereby the adjusted mean and standard deviation values for said system are adjusted for a particular patient population assessed by said system relative



to mean and standard deviation values determined from the database from other medical risk assessment systems;

means for storing predetermined requirements for risk data comprising the test data, the said at least one variable, the transformed data, the determined mean and the determined standard deviation;

means for validating data when received, transformed and determined with regard to the predetermined requirements comprising means for checking the integrity of the database for each comparison with the data therein and each update of the data therein; and

means for indicating when the data does not meet the predetermined requirements.

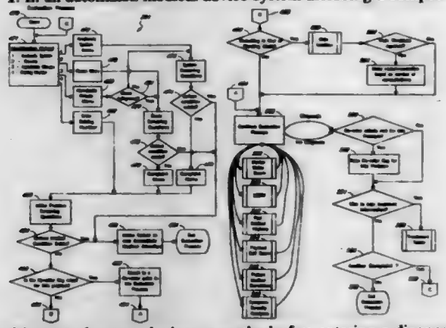
5,594,638

COMPUTERIZED MEDICAL DIAGNOSTIC SYSTEM INCLUDING RE-ENTER FUNCTION AND SENSITIVITY FACTORS

Edwin C. Iliff, La Jolla, Calif., assignor to First Opinion Corporation, La Jolla, Calif.

Filed Dec. 29, 1993, Ser. No. 176,858
Int. Cl.[6] G06F 159/00;17/60
U.S. Cl. 395—203 **25 Claims**

1. In an automated medical advice system including a computer,



and input and output devices, a method of re-entering a diagnosis of a patient's medical problem, comprising the steps of:

performing an initial diagnostic consultation with the patient, thereby collecting patient information;

identifying a situation wherein the patient is to consult the system again wherein an indicator associated with programmed re-enter criteria is set in the computer;

automatically instructing the patient to consult the system at a predetermined time in the future based upon the identified situation;

performing one or more additional diagnostic consultations with the patient, thereby collecting and storing additional patient information, wherein the execution path of the additional diagnostic consultation is responsive to the stored patient information and the indicator of satisified re-enter criteria; and

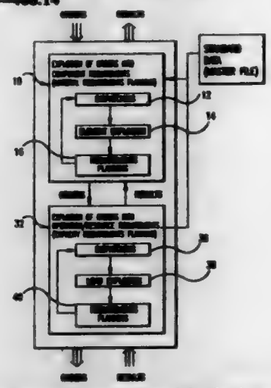
formulating a diagnosis from said collected patient information during a one of the diagnostic consultations.

5,594,639

ORDER PROCESSING CONTROL MODULE

Ryo Atsumi, c/o Mitsui Engineering & Shipbuilding Co., Ltd. 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo 104, Japan, assignor to Ryo Atsumi, Chiba, Japan

Filed Jun. 30, 1993, Ser. No. 84,066
Claims priority, application Japan, Jun. 30, 1992, 4-196555
Int. Cl.[6] G06F 17/60
U.S. Cl. 364—468.14 **10 Claims**



1. An order processing control module, for integrating production, schedule, and sequence control of at least one order, by making use of computer processing, and comprising:

an upper level order ledger into which an upper level order is input;

first means for exploding orders read from said upper level order ledger into component requirements and calculating a final required amount of individual components based on previously registered bills of materials and outputting the final required amount of individual components to a release order ledger;

an internal order ledger into which the final required amount of individual components is input from said release order ledger;

second means for exploding orders read from the internal order ledger into operation resource requirements, said second means comprising sequence and schedule control means for generating optimal process sequences for producing each component and calculating a resource load based on previously registered component resources data; and

an external release order ledger for outputting external orders based on an output from said second means;

wherein said first means comprises a first dispatching processing unit, an element explosion processing unit, and a requirements planning processing unit, wherein said first dispatching processing unit determines at least one of a starting date and an ending date of an order, said element explosion processing unit explodes the order into components by using a previously registered bill of materials and outputs an initial required amount of each component to said requirements planning processing unit which allocates stocked and previously ordered components, and if the stocked and previously ordered amount of a component is insufficient to supply the initial required amount of a component, an amount equal to

the difference between the initial required amount of the component and the stocked and previously ordered amount of the component is fed back to said first dispatching processing unit for output to the release order ledger as a final required amount of the individual component, unless the component is further exploded.

5,594,640

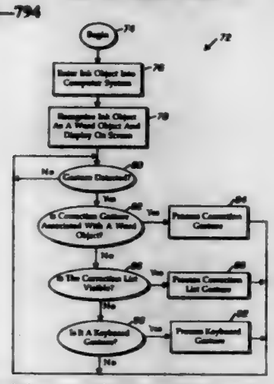
METHOD AND APPARATUS FOR CORRECTING WORDS

Stephen P. Capps; Ernest H. Beernink, both of San Carlos; John R. Meier, Cupertino, and David Tenkin, San Francisco, all of Calif., assignors to Apple Computer, Incorporated, Cupertino, Calif.

Continuation of Ser. No. 101,507, Aug. 2, 1993, Pat. No. 5,367,453. This application Oct. 19, 1994, Ser. No. 325,575

Int. Cl.[6] G06F *19/00*

U.S. Cl. 395—794 **24 Claims**



1. A method for correcting recognized words in a computer system comprising the steps of:

entering handwritten ink data into a computer system with a pointer;

recognizing the handwritten ink data as a word and a number of alternative words, said word and said alternative words being included in a word list;

displaying said word on a display screen of said computer system;

detecting an alternative word list gesture made by said user pertaining to said displayed word with said pointer;

displaying said word list for said displayed word on said display screen in response to detecting said alternative word list gesture; and

detecting a selection of one of said words in said list by said user and replacing said displayed word with said selection.

5,594,641

FINITE-STATE TRANSDUCTION OF RELATED WORD FORMS FOR TEXT INDEXING AND RETRIEVAL

Ronald M. Kaplan, Palo Alto, and Lauri Karttunen, Redwood City, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

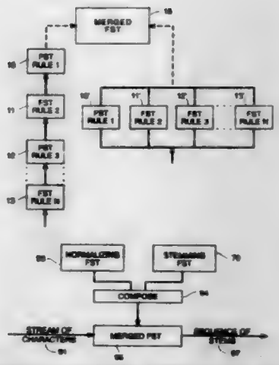
Division of Ser. No. 916,576, Jul. 20, 1992. This application Jun. 8, 1994, Ser. No. 255,504

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—601 **20 Claims**

1. A process of fabricating an FST stored upon a computer readable medium, the FST mapping surface forms to lexical forms of a language for use in text indexing and retrieval from documents in said language, the process comprising the steps of:

(a) constructing a first FST defining one or more rules of the language,



(b) constructing a second FST defining one or more other rules of the language,

(c) constructing a third FST derived from a list of identity stem-affix pairs of the language or defining one or more rules of the language other than the rules defined by the first and second FSTS, and

(d) computing simultaneously the composition of the third FST with the intersection of the first and second FSTs to produce a new single fourth FST that merges the first, second and third FSTs.

5,594,642

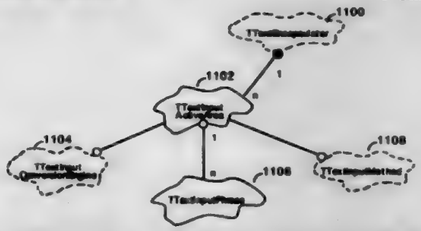
INPUT METHODS FRAMEWORK

Leland D. Collins, Palo Alto, and Judy Lin, San Jose, both of Calif., assignors to Object Technology Licensing Corp., Cupertino, Calif.

Continuation of Ser. No. 171,591, Dec. 22, 1993, abandoned. This application May 31, 1996, Ser. No. 653,067

Int. Cl.[6] G06F *17/20;3/14;17/21*

U.S. Cl. 395—797 **5 Claims**



1. A framework for creating input methods for converting input events corresponding to raw text elements, such as radicals, into converted text elements, such as ideograms, to be encapsulated in a model stored on a computing system and to be presented on a display of the computing system, the framework comprising:

input method classes, appearance classes, event mapping classes, and conversion engine classes, stored in the computing system;

means for creating an input method object, an appearance object, an event mapping object, and a conversion engine object, each from one of the respective classes;

wherein the appearance object includes logic for specifying how converted text and raw text should appear when displayed;

wherein the event mapping object includes logic for mapping keyboard events to raw text elements;

wherein the conversion engine object includes logic for converting raw text elements in a specified portion of the model into converted text elements; and

wherein the input method object includes

means for designating a portion of the model to be modified by input events as an active area;

means for using the event mapping object to map keyboard events to a raw text element and for updating the active area with the raw text element;

means for using the conversion engine object to convert raw text elements in the active area to converted text elements and for updating the model with the converted text elements; and

means for presenting the model on the display such that the active area is distinctively presented in relation to the remaining portion of the model, and wherein the presenting means uses the appearance object to specify how converted text elements and raw text elements should be presented in the active area.

5,594,643

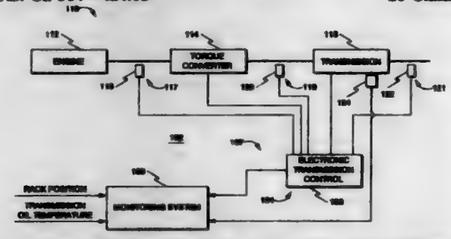
METHOD AND SYSTEM FOR DIAGNOSING A DRIVETRAIN DURING SHIFTING OPERATIONS

Charles W. Birchenough, Morton; Hans P. Dietz, Champaign; Dwight S. Holloway, Chillicothe; Noel J. Rytter; Rolland D. Scholl, both of Dunlap, and Lorne W. Tweed, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 21,439, Feb. 24, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 425,680

Int. Cl.[6] G06F *19/00;* F16H *59/74*

U.S. Cl. 364—424.08 **26 Claims**



1. A system for providing information relating to a drivetrain during shifting operations, the drivetrain includes an engine, a torque converter and a transmission, wherein a shifting operation is initiated by an electronic transmission control via actuation of a gear spool by a solenoid, comprising:

a sensor for detecting, after initiation of the shifting operation when said gear spool is in a valid position and responsively producing a gear spool signal;

means for sensing a rotational output speed of the engine and responsively producing an engine speed signal;

means for sensing an output speed of the torque converter and responsively producing a torque converter speed signal;

means for sensing an output speed of the transmission and responsively producing a transmission output speed signal; and

means for receiving said engine speed signal, torque converter speed signal and transmission output speed signal, responsively determining an actuator movement time as a function of said spool gear signal, for detecting transmission breakaway as a function of said torque converter speed signal and transmission output speed signal and determining a transmission breakaway time as a function of said spool gear signal and transmission breakaway, for detecting torque converter breakaway as a function of said engine speed signal and said torque converter speed signal and determining a LUC breakaway time as a function of torque converter breakaway, for detecting transmission engagement as a function of said torque converter speed signal and transmission output speed signal and determining a transmission output fill and slip time as a function of transmission breakaway and transmission engagement, and for detecting LUC engagement as a function of said engine speed signal and determining a LUC fill and slip time as a function of LUC breakaway and LUC engagement.

5,594,644

METHOD AND SYSTEM FOR GENERATING TRAJECTORY OF ROBOT AND THE LIKE

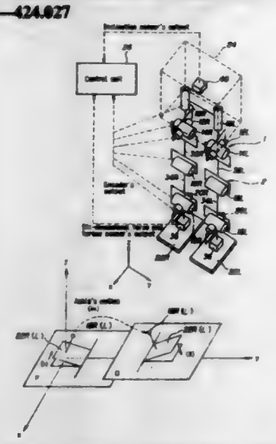
Tadaaki Hasegawa, and Toru Takenaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1993, Ser. No. 65,242

Claims priority, application Japan, May 22, 1992, 4-155915

Int. Cl.[6] G06F *7/70;* G05B *19/04*

U.S. Cl. 364—424.027 **27 Claims**



1. A method for controlling movement of a robot member by generating a trajectory of the member from a point P1 to a point P2 in real space, over a ground comprising:

(a) establishing a trajectory of the member defining a motion of said member including a constraint condition thereof with respect to the ground in a first coordinate system in a virtual space set in the real space;

(b) displacing the virtual space including the first coordinate system in the real space including a second coordinate system from the point P1 to the point P2 by translating or rotating the virtual space including the first coordinate system, wherein the virtual space including the first coordinate system is displaced in a period free from the constraint condition; and

(c) controlling movement of the robot member from P1 to point P2 using the displacement of the virtual space in the real space.

5,594,645

CRUISE CONTROLLER FOR VEHICLES

Eiji Nishimura, Higashihiroshima; Tamio Hirasawa; Kazuyoshi Okuda, both of Hiroshima-ken; Satoru Ando; Takahiro Inada, both of Higashihiroshima; Tsunehisa Okuda, Hiroshima; Tomoji Izumi, Hatsukaichi, and Kenji Shimizu, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 18, 1994, Ser. No. 245,702

Claims priority, application Japan, May 19, 1993, 5-117005; Dec. 21, 1993, 5-321585

Int. Cl.[6] B60T *8/58*

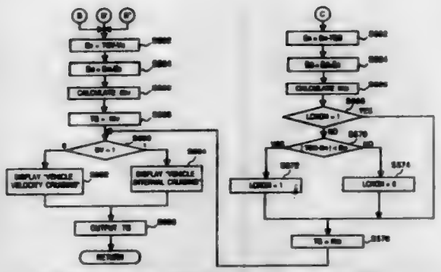
U.S. Cl. 364—426.044 **16 Claims**

11. A cruise control apparatus, comprising:

vehicle-interval distance detection means for detecting a vehicle-interval distance between an own vehicle and a vehicle ahead;

auto-cruise means for controlling a vehicle speed to maintain the vehicle-interval distance to the vehicle ahead to be a target vehicle-interval distance;

a mode setting means for setting said auto-cruise means to one of an active mode and an inactive mode;



an accumulation means including a first accumulation means, a second accumulation means and a third accumulation means,

said first accumulation means for accumulating vehicle-interval distance data detected when said auto-cruise means is set to the inactive mode,

said second accumulation means for accumulating vehicle-interval distance data detected when a driver operates an operation switch for enabling said auto-cruise means, and

said third accumulation means for accumulating vehicle-interval distance data detected when the driver adjusts the vehicle-interval distance between the own vehicle and the vehicle ahead while said auto-cruise means is set to the active mode;

generation means for generating reference vehicle-interval distance data on the basis of a plurality of vehicle-interval distance data accumulated by said accumulation means; and

distance-setting means for setting the target vehicle-interval distance while said auto-cruise means is set to the active mode on the basis of the reference vehicle-interval distance data generated by said generation means.

5,594,646

METHOD AND APPARATUS FOR SELF-DIAGNOSIS FOR AN ELECTRONIC CONTROL SYSTEM FOR VEHICLES

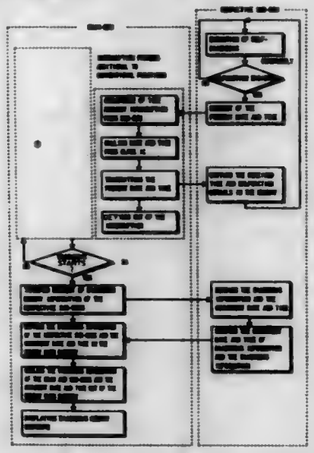
Yasunobu Itoh, Okazaki, and Kiyohide Kateh, Chiryu, both of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Dec. 19, 1994, Ser. No. 358,458

Claims priority, application Japan, Dec. 21, 1993, 5-345173

Int. Cl.[6] G06F *11/00;11/32*

U.S. Cl. 364—424.04 **9 Claims**



1. A self-diagnosis method for a vehicle electronic control system in which a plurality of subsidiary electronic control units are connected by a communication line to a main electronic control unit for governing the respective subsidiary electronic control units, the method comprising the steps of:

each subsidiary electronic control unit continuously diagnosing itself and signaling any detected malfunction to the main electronic control unit;

interrupting normal processing of said main electronic control unit in response to said signaling of a detected malfunction to retrieve the date and time of occurrence of the malfunction from a date and time clock; and

storing the date and time of occurrence of the detected malfunction, as well as details of the detected malfunction, in memory means of one of said main electronic control unit and the subsidiary electronic control unit detecting the malfunction.

5,594,647

APPARATUS FOR DETERMINING EMERGENCY CONDITIONS OF A VEHICLE

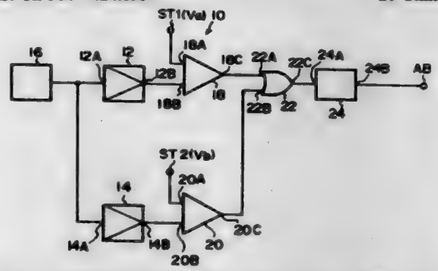
Shigekazu Yasuda, and Hirofumi Okada, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

Continuation of Ser. No. 111,553, Aug. 25, 1993, abandoned. This application May 2, 1995, Ser. No. 434,326

Claims priority, application Japan, Aug. 28, 1992, 4-230056

Int. Cl.[6] B60R *21/32*

U.S. Cl. 364—424.055 **20 Claims**



1. An apparatus for determining emergency conditions of a vehicle, comprising:

an acceleration sensor which detects acceleration of a vehicle and outputs a signal that is converted into a waveform;

a plurality of integration means, each of which integrates the signal outputted from said acceleration sensor and uses a different cut-off frequency associated with a time constant corresponding to different kinds of vehicle collision, each said cut-off frequency being set in advance to distinguish between waveforms corresponding to each of said different kinds of vehicle collision;

a plurality of comparison means which respectively correspond to said plurality of integration means and each of which outputs a signal when a signal outputted from a corresponding said integration means exceeds a reference value which is predetermined according to the kind of vehicle collision; and

logical operation means which inputs the signals outputted from said plurality of comparison means and outputs a signal for actuating said passenger safety device for protecting a passenger.

5,594,648

ANTISKID CONTROL APPARATUS

Tohru Nakaura, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

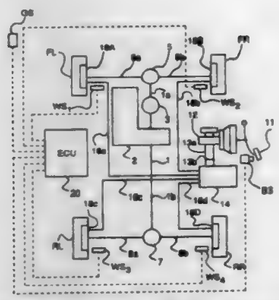
Filed Dec. 23, 1994, Ser. No. 362,885

Claims priority, application Japan, Dec. 29, 1993, 5-351026

Int. Cl.[6] B60K *17/34*

U.S. Cl. 364—426.01 **9 Claims**

1. An antiskid control apparatus for a vehicle capable of switching a drive state thereof between a 2WD and a 4WD comprising:



means for calculating an average front wheel speed and outputting a signal indicating the calculated average front wheel speed;

means for calculating an average rear wheel speed and outputting a signal indicating the calculated average rear wheel speed;

speed difference calculation means for calculating a speed difference between the average front wheel speed and the average rear wheel speed and outputting a signal indicating the calculated speed difference;

means for smoothing the speed difference and outputting a signal indicating the calculated smoothed speed difference; and

drive state decision means for deciding the drive state of the vehicle as a 4WD state if the smoothed speed difference is in a range between a predetermined upper threshold and a predetermined lower threshold and as a 2WD state if the smoothed speed difference is in a range above the predetermined upper threshold or below the predetermined lower threshold,

wherein according to the drive state determined by the drive state decision means, the antiskid control state of the vehicle is switched between an antiskid control for the 2WD and an antiskid control for the 4WD, wherein the antiskid control controls the hydraulic brake pressure at each wheel in accordance with the determined drive state.

5,594,649

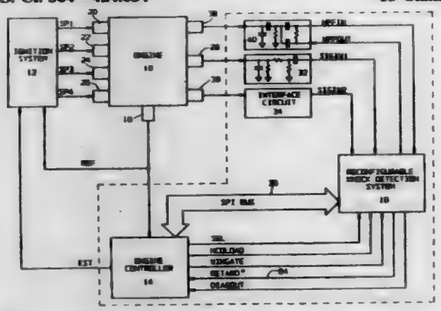
DIGITALLY RECONFIGURABLE ENGINE KNOCK DETECTING SYSTEM

Thomas D. Cook; Manuel R. Fairchild, both of Kokomo; Kenneth D. Mowery, Noblesville, and Jeffrey R. Scott, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 19, 1994, Ser. No. 357,883

Int. Cl.[6] G01L *23/22*

U.S. Cl. 364—424.034 **13 Claims**



1. In combination with an internal combustion engine in which knock induced vibrations occur, a reconfigurable knock detection system comprising:

a sensor means on said engine for detecting knock and generating an electrical knock signal corresponding to the detected knock;

a knock detection circuit having an input connected to receive said electrical knock signal and an output connected to an engine controller, said knock detection circuit including means for processing the knock signal and generating an appropriate output signal on said output if the knock signal is identified as valid;

said circuit including a plurality of circuit devices capable of being interconnected in a plurality of different circuit topology configurations to thereby process said knock signal using a desired knock processing mode selected from among a plurality of different knock processing modes corresponding to said different circuit topology configurations;

said circuit further including interconnect means for selecting said desired knock processing mode in response to a coded data signal input to said circuit.

5,594,650

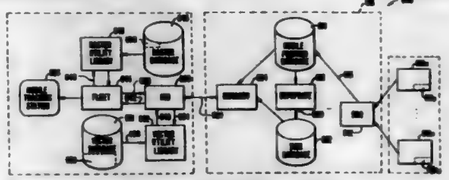
METHOD AND APPARATUS FOR TRACKING VEHICLE LOCATION

Mukesh C. Shah, and Sanjiv Prabhakaran, both of San Jose, Calif., assignors to Mobile Information Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 961,736, Oct. 16, 1992, Pat. No. 5,428,546. This application May 9, 1995, Ser. No. 437,772

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—449.1 **53 Claims**



1. Apparatus for fleet management comprising:

a first memory portion comprising a first value and a second value, said first value and said second value defining a mobile unit location for a mobile unit at a selected time;

a second memory portion comprising raster map data, said raster map data defining a digitized representation of a selected geographical area;

a third memory portion comprising street data, said street data defining said raster map in vector form; and

a display comprising a first display segment, said first display segment comprising said digitized representation of said selected geographical area, said street data, and a user locatable mark, said user locatable mark defining said mobile unit position based upon said first value and said second value.

5,594,651

METHOD AND APPARATUS FOR MANUFACTURING OBJECTS HAVING OPTIMIZED RESPONSE CHARACTERISTICS

James A. St. Ville, 2500 N. 24th St., Suite 200, Phoenix, Ariz. 85006

Filed Feb. 14, 1995, Ser. No. 388,580

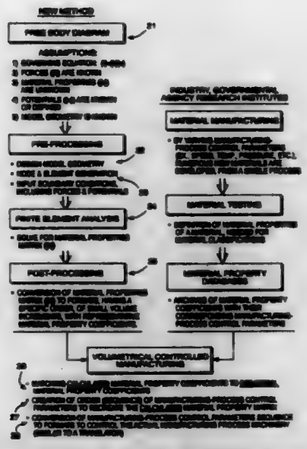
Int. Cl.[6] G06F *19/00;17/50*

U.S. Cl. 364—468.04 **24 Claims**

1. A method for manufacturing an object having a potential {x} which is generated in response to a field {f} applied thereto, the method comprising the steps of:

designing a geometric model of said object;

generating a computerized mathematical model of said object by discretizing said geometric model of said object into a plurality of finite elements and defining nodes at boundaries of said



elements, wherein values of the field {f} and potential {x} are specified at said nodes;

calculating a material property matrix [k] based on the relationship {f}=[k]{x};

extracting material property coefficients from said material property matrix [k] for each finite element in said computerized mathematical model;

comparing the extracted material property coefficients to material property coefficients for known materials to match the extracted material property coefficients to the material property coefficients for known materials;

determining manufacturing parameters corresponding to the matched material property coefficients; and

manufacturing the object in accordance with the determined manufacturing parameters.

5,594,652

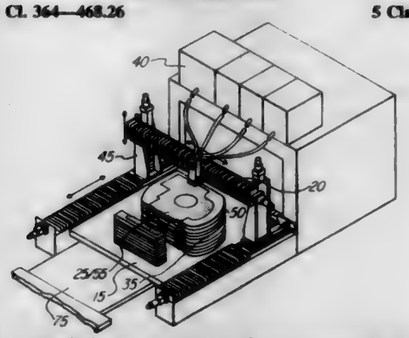
METHOD AND APPARATUS FOR THE COMPUTER-CONTROLLED MANUFACTURE OF THREE-DIMENSIONAL OBJECTS FROM COMPUTER DATA

Steven M. Penn, Plano; David N. Jones, Dallas, and Michael E. Embree, The Colony, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 301,508, Sep. 7, 1994, which is a continuation of Ser. No. 923,278, Jul. 31, 1992, which is a continuation-in-part of Ser. No. 905,069, Jun. 24, 1992, Pat. No. 5,260,009, which is a continuation of Ser. No. 648,881, Jan. 31, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 474,617

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.26 **5 Claims**



1. A method of producing an object from a computer data base, wherein said object is represented in said data base as a plurality of solid voxels surrounded by a plurality of support voxels within a volume, said method comprising the steps of:

converting said data base representation of said object as a plurality of solid voxels to a data base representation of said object as a shell of solid voxels surrounding a plurality of filler support voxels; and

constructing said object from said converted data base representation, in a layerwise fashion, by a method comprising the steps of:

dispensing a first material in liquid form at selected locations of a target surface, said selected locations corresponding to the shell locations of a cross-section of an object, wherein the first material solidifies after being dispensed;

applying a second material at locations of said target surface other than the shell locations at which said first material is dispensed, to form another target surface;

repeating said dispensing and applying steps to form an object comprising a shell of said first material surrounding said second material, and surrounded by said second material;

selectively removing the portion of said second material surrounding said shell, relative to said first material, to leave an object formed of a shell of said first material surrounding a portion of said second material.

5,594,653

PRINTING APPARATUS, A CONTROL METHOD THEREFOR, AND A DATA PROCESSING APPARATUS USING SAID PRINTING APPARATUS

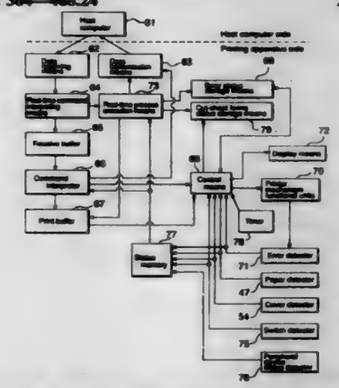
Takaaki Akiyama; Naohiko Koakutsu; Mitsuaki Teradaira; Masayo Miyasaka, and Takuya Hyonaga, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 335,604

Claims priority, application Japan, Nov. 8, 1993, 5-278637; Nov. 8, 1993, 5-278638; Nov. 8, 1993, 5-278639

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.24 **22 Claims**



1. A printing apparatus for controlling a printing mechanism in accordance with first control commands, second control commands and print data provided by a host device for printing on a print medium comprising:

receiving means for receiving the first control commands, the second control commands and the print data;

first control command interpreting means for interpreting the first control commands received by the receiving means;

storage means for storing the received second control commands in a first-in-first-out order;

second control command interpreting means for interpreting the second control commands stored in said storage means;

device condition detection means for detecting a condition of the printing mechanism; and

process execution means for executing corresponding processes in accordance with the interpreted results from said first control command interpreting means having a first priority and said second control command interpreting means having a second priority, wherein the first priority has precedence over the second priority, and for controlling the printing mechanism and for permitting and prohibiting said second control command interpreting means to interpret the second control commands in accordance with a detection result from said device-condition detection means, and for reporting the detection result to the host device,

wherein said receiving means continues to receive the first control commands and the second control commands, and said storage means continues to store the second control commands even if any previously received first and second control commands have not been executed by said process execution means.

5,594,654

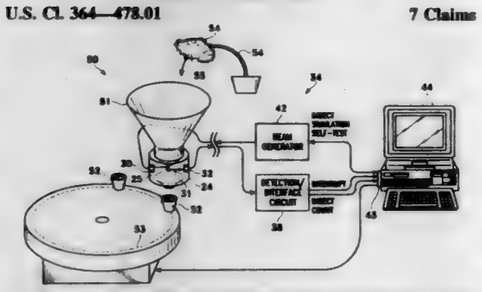
BENEFICIAL INSECT COUNTING AND PACKAGING DEVICE

Dennis Shuman, Gainesville; Carl A. Litzkow, Newberry, both of Fla.; Sergey Kruss, Norwood, Mass.; James A. Coffelt, Bakersfield, Calif.; Frederick L. Petitt, and David O. Wietlisbach, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 17, 1995, Ser. No. 390,833

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—478.01 **7 Claims**



1. A system for counting and packaging insect larvae and eggs comprising

a counting means for collecting and counting insect larvae, pupae or eggs comprising

at least one funnel-shaped container and sensor head, wherein said funnel-shaped container sits in the top of said sensor head, and

at least one turntable means with means for collecting said larvae, pupae or eggs located below each of at least one of said sensor head as they exit said sensor head;

a detecting means connected to each of said counting means for detecting passage of insect larvae, pupa or egg through said counting means; and

an analyzing means connected to said detecting means through a means for interfacing wherein said analyzing means receives and analyzes data from said detecting system.

5,594,655

METHOD AND APPARATUS FOR FREQUENCY TRIGGERING IN DIGITAL OSCILLOSCOPES AND THE LIKE

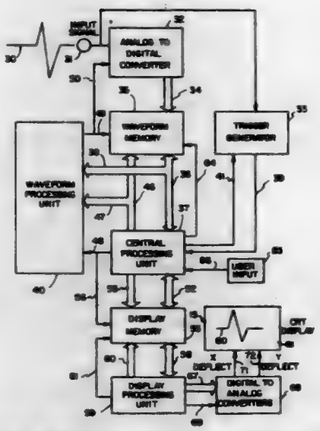
Gregory J. Berchin, Glen Ellyn, Ill., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Aug. 20, 1993, Ser. No. 110,417

Int. Cl.[6] G01R *23/16*

U.S. Cl. 364—487 **38 Claims**

1. A method of acquiring and retaining data corresponding to a signal comprising the steps of:



(a) acquiring digital data samples corresponding to a waveform of an input signal;

(b) updating a discrete transform of a selected frequency component with respect to a set comprising a selected number of the digital data samples as a new digital data sample is acquired;

(c) providing a trigger signal when a selected criterion for the frequency component is met by evaluating the updated frequency component and comparing the evaluated component with the selected criterion; and

(d) writing digital waveform data corresponding to the acquired digital data samples in a memory and saving the data in the memory when the trigger signal is provided.

5,594,656

METHOD OF VERIFICATION OF A FINITE STATE SEQUENTIAL MACHINE AND RESULTING INFORMATION SUPPORT AND VERIFICATION TOOL

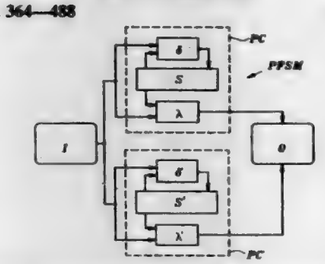
Thomas Tamisier, St Germain en Laye, France, assignor to Bull S.A., Puteaux, France

Filed Oct. 24, 1994, Ser. No. 327,870

Claims priority, application European Pat. Off., Nov. 2, 1993, 93402682

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—488 **21 Claims**



1. A method of verification of a finite state sequential machine, comprising the steps of:

determining a set Y using a data processor, said set Y being defined from two finite sets B and S encoded on boolean variables, a function $\delta: B \rightarrow S$ expressed by a vector of boolean functions, and an equivalence relation A on S, the set B being encoded on variables $s=s_1, \ldots, s_n$ and $x=x_1, \ldots, x_k$, in which x can be void, and Qx_i designating either $\exists x_i$ or $\forall x_i$, so that: $Y=\{(s,s') \in (\exists x_1, \ldots, \exists x_k B)^2 / Qx_1, \ldots, Qx_k((\delta(s,x),\delta(s', x) \in A)\}$, wherein the determination of set Y comprises the steps of:

(a) constructing in a canonical way, from a binary decision diagram (BDD) of a graph of the equivalence relation A,

the BDD of a graph of a total function from S×S, named cross-section and denoted C(A);

(b) constructing from the cross-section C(A) and the vector δ a new vector denoted δ*=C(A)o δ; and

(c) computing the pairs (s,s') such that Qx1, . . . Qxk ∝(δ*(s,x)=δ(s',x)); and

verifying with said data processor an operation of said finite state sequential machine based on an equivalence relation of the pairs (s,s').

5,594,657

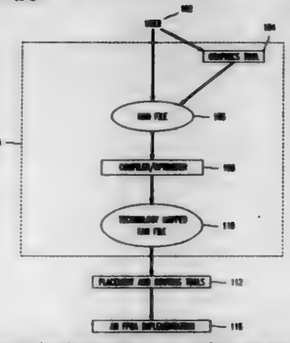
SYSTEM FOR SYNTHESIZING FIELD PROGRAMMABLE GATE ARRAY IMPLEMENTATIONS FROM HIGH LEVEL CIRCUIT DESCRIPTIONS

Michael R. Cantone, Westfield, and Nam-Sung Woo, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 127,564, Sep. 27, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 473,620

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—490 **29 Claims**



1. A structured circuit synthesis system for optimizing a circuit implementation in a field programmable gate array, wherein said field programmable gate array comprises a plurality of programmable logic cells connected by programmable routing, the system comprising:

a computer processor;

means for storing a description of a first electronic circuit design module specifying an output signal and a polarity of said output signal, and a second electronic circuit design module specifying an input signal and a polarity of said input signal, said output signal of the first module corresponding to the input signal of said second module; and

means for receiving the input signal and the output signal and reversing the signal polarities of said input signal and said output signal to synthesize multiple modules simultaneously to reduce the number of programmable logic cells required to implement said first module and said second module in the field programmable gate array.

5,594,658

COMMUNICATIONS SYSTEM FOR MULTIPLE INDIVIDUALLY ADDRESSED MESSAGES

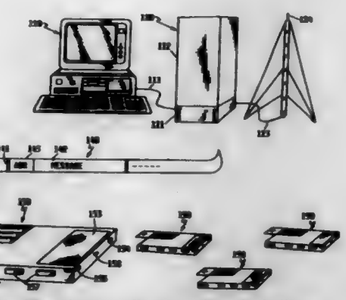
Charles A. Lemaire, and Bryan L. Striemer, both of Zumbrota, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 993,278, Dec. 18, 1992. This application Jun. 6, 1995, Ser. No. 469,307

Int. Cl.[6] G06F *17/00*; H04M *1/64*

U.S. Cl. 364—514 B **3 Claims**

1. A communications system for transmitting multiple individually addressed messages to a large number of users at different locations, comprising:



at a first physical location, a radio transmitter, including

a source of digitally coded messages, each having a text portion directly representing the content of the message itself and an address portion,

means for broadcasting said messages in a stream through a wireless medium;

at a large number of different locations, a plurality of radio receivers for receiving said messages, each adapted to be easily portable, and each including

receiving means for receiving said messages from said medium,

a set of identifiers, including multiple different identifier codes, and further including at least one identifier code unique to each receiver among all receivers, and further wherein one of said identifier codes is shared with. Some other receivers, but with less than all said receivers,

means for comparing said identifier set with the address portion of all messages in said stream and for selecting those whose addresses match at least one identifier in said set,

data storage means coupled to said comparing means for storing the text portion of those of said messages whose address portion matches said identifier set,

a first switch operable by a user for choosing a current one of said messages,

a second switch operable by said user for choosing a previous one of said messages,

a third switch operable by said user for choosing a next one of said messages,

text-to-speech conversion means responsive to said switch means and coupled to said data storage means for generating analog speech waveforms directly representing the text portion of said chosen message.

5,594,659

METHOD FOR PERFORMING A VOLTAGE STABILITY SECURITY ASSESSMENT FOR A POWER TRANSMISSION SYSTEM

Robert A. Schlueter, Holt, Mich., assignor to Michigan State University, East Lansing, Mich.

Continuation of Ser. No. 236,526, Apr. 29, 1994, abandoned. This application Feb. 22, 1996, Ser. No. 605,841

Int. Cl.[6] G06F *15/70*; H02J *3/06*; *3/14*

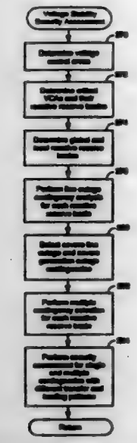
U.S. Cl. 364—492 **9 Claims**

9. A method of performing a voltage stability assessment for a region of an electric power transmission system having a plurality of buses and a plurality of sources of reactive reserves coupled thereto, the method comprising:

grouping the plurality of buses into a plurality of voltage control areas such that each of the plurality of buses within each voltage control area has a similar corresponding reactive power versus voltage relationship;

selecting at least one of the voltage control areas whose buses therewithin have a voltage at the minimum of the corresponding reactive power versus voltage relationship which exceeds a voltage threshold;

determining a reactive reserve basin for the at least one of the plurality of voltage control areas, the reactive reserve basin comprising at least one of the sources of reactive reserves



selected in dependence upon a measure of the depletion of reactive reserves at a predetermined operating point of the electric power transmission system;

performing a single contingency analysis by computing a corresponding quantity for each reactive reserve basin in response to each of a plurality of single contingencies, wherein the corresponding quantity is representative of a reduction in reactive reserves within the reactive reserve basin, and wherein the plurality of single contingencies includes at least one single generator outage and at least one single line outage;

selecting the single contingencies whose corresponding quantity exceeds a predetermined threshold; and

assessing the voltage stability for single and multiple contingencies with a plurality of transfer and loading patterns, wherein the single and multiple contingencies are based upon the selected single contingencies.

5,594,660

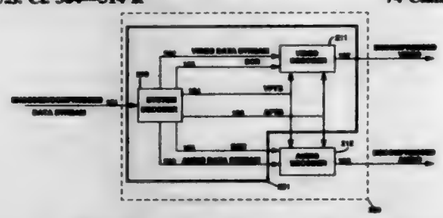
PROGRAMMABLE AUDIO-VIDEO SYNCHRONIZATION METHOD AND APPARATUS FOR MULTIMEDIA SYSTEMS

Chih-Ta Sung, Princeton, N.J.; Tzuyao Chan, Saratoga, Calif.; Richard Chang; Mark A. Rosenau, both of San Jose, all of Calif.; Jeffrey G. Ort, Bellevue, Wash.; Daniel T. Dunn, and Yunnyuan Sun, both of San Jose, Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 30, 1994, Ser. No. 316,015

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **74 Claims**



1. A multimedia system having an audio/video decoding/decompressing circuit for decoding an encoded/compressed data stream, the audio/video decoding/decompressing circuit comprising:

a parser for separating the encoded/compressed data stream into encoded/compressed audio data, encoded/compressed video data, an audio time value, and a video time value, wherein each of the audio time value and the video time value comprise a time stamp for the encoded/compressed audio data and the encoded/compressed video data respectively;

a memory having addressable storage, coupled to the parser, addressing addressable storage to selectively store and read the encoded/compressed audio data, the encoded/compressed video data, or decoded/decompressed video data to and from addressable storage;

a first decoder, coupled to the memory, for decoding the encoded/compressed video data and generating the decoded/decompressed video data; and

a synchronizer, coupled to the first decoder and the memory, for comparing the video time value with the audio time value and when the comparison exceeds a predetermined threshold, substantially synchronizing the generation of the decoded/decompressed video data by the first decoder with the addressing of addressable storage by the memory.

5,594,661

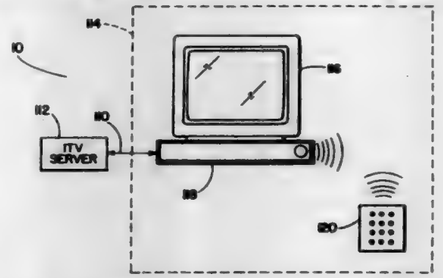
METHOD FOR INTERFACING WITH A MULTI-MEDIA INFORMATION SYSTEM

Nancy J. Bruner, and Patricia L. Smith, both of Denver, Colo., assignors to U. S. West Marketing Resources Group, Inc., Englewood, Colo.

Filed Sep. 23, 1994, Ser. No. 311,531

Int. Cl.[6] H04N *9/00*

U.S. Cl. 364—514 R **16 Claims**



1. In an interactive multi-media information system comprising a server having storage, said server in communication with a plurality of remote client subscriber stations, each subscriber station comprising a set-top having a processor and a memory, a display device coupled to the set-top, and an input device, in communication with the subscriber station, having a plurality of keys, a method for processing selections identified by a user utilizing the input device, the method comprising the steps of:

having a user request, via a remote subscriber station, a first set of digital data representing a first multi-media program from the server;

retrieving from the storage on the server the first multi-media program in response to the user request;

displaying the first multi-media program on the display device;

prompting the user to select a request for multi-media information by pressing a key on the input device;

receiving, at the server, a signal representing the pressed key;

retrieving from the storage on the server the requested multi-media information as a function of the received signal; and

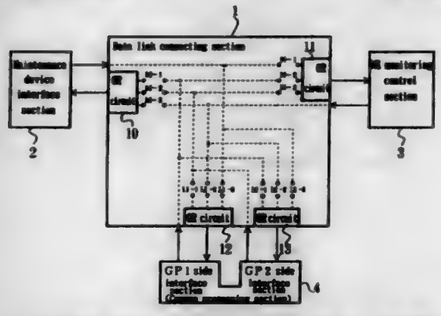
displaying the requested multi-media information on the display device.

5,594,662

DATA LINK CONTROL SYSTEM FOR MONITORING CONTROL

Toru Yabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 25, 1994, Ser. No. 296,490
Claims priority, application Japan, Mar. 16, 1994, 6-072510
Int. Cl.[6] G06F *13/00*
U.S. Cl. 364—550 **14 Claims**



1. A data link control system provided in each of a plurality of transmission devices constituting a network, for use in constructing data links to monitor and control the transmission devices from a maintenance device, the data link control system comprising:

a first interface section connected to the maintenance device for interfacing a signal from and to the maintenance device;

a second interface section connected to the transmission devices via transmission lines; and

a data link connecting section having a first interface circuit connected to the first interface section for interfacing a signal from and to the first interface section, a second interface circuit connected to the second interface section for interfacing a signal from and to each of the transmission line, and connection paths which are formed to make data link connection between the first and second interface circuits according to information about the data link connection,

wherein the second interface section is connected to a first transmission device via a first transmission line and to a second transmission device via a second transmission line, and the second interface circuit includes a first interface portion which interfaces a signal from and to the first transmission line and a second interface portion which interfaces a signal from and to the second transmission line via the second interface section.

5,594,663

REMOTE DIAGNOSTIC TOOL

David W. Mesaros, Wallingford; Robert E. Cook, and Ronald A. Modyklewicz, both of West Chester, all of Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1995, Ser. No. 376,585
Int. Cl.[6] G05B *19/04*
U.S. Cl. 364—550 **14 Claims**

1. A method for performing remote diagnostics of an instrument by a computer executing a diagnostic software tool, comprising the method steps of:

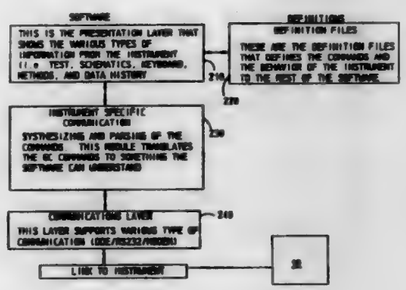
executing a software application on the computer to generate a graphical user interface depicting the instrument,

accessing the depiction of the instrument to identify a component of the instrument for diagnosis,

generating commands which can be understood by the instrument to request diagnostic information,

communicating the generated commands to the instrument,

sensing the requesting information on the instrument and communicating the sensed information to the computer for display and diagnosis.



5,594,664

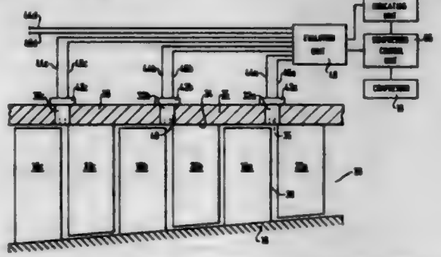
Patent Not Issued For This Number

5,594,665

PROCESS AND DEVICE FOR MONITORING AND FOR CONTROLLING OF A COMPRESSOR

Hilger A. Walter, Stade; Herwart Hönen, Uebach-Palenberg, and Heinz E. Gallus, Aachen, all of Germany, assignors to Dow Deutschland Inc., Stade, Germany

Filed May 20, 1994, Ser. No. 246,906
Claims priority, application European Pat. Off., Aug. 10, 1992, 92 113 586
Int. Cl.[5] G01H *3/00;7/00;* F03B *15/00*
U.S. Cl. 364—558 **36 Claims**



1. Process for controlling an axial compressor, said axial compressor comprising:

a rotor,

a housing,

an inlet where, in operation, gas enters at a first pressure, and

an outlet where, in operation, gas exits at a second pressure higher than said first pressure,

said rotor being rotatably mounted within said housing for rotation about a rotational axis,

said axial compressor further comprising at least one axial compressor stage, each said axial compressor stage comprising:

a row of rotor blades mounted on said rotor and being arranged one following the other in a circumferential direction with respect to said rotational axis, and

a row of stator blades mounted on said housing and being arranged one following the other in a circumferential direction with respect to said rotational axis,

each said axial compressor stage having, in operation, a turbulent fluid layer surrounding each said rotor in the region of said housing,

each said axial compressor stage further having, in operation, a characteristic frequency defined as the product of the number of rotor blades mounted in said row of rotor blades and the rotational speed of said rotor,

each said characteristic frequency having an associated frequency interval contiguous above and below said characteristic frequency,

said process comprising the following steps:

controlling said axial compressor to a first load level and known rotational speed such that the first load level is sufficiently low in value to avoid the risk of surge and stall conditions in said axial compressor;

measuring the pressure fluctuations of at least one said turbulent fluid layer with a pressure sensing means responsive at the characteristic frequency for the known rotational speed and generating thereby at least one sensor signal;

deriving a plurality of frequency components within the frequency interval from each sensor signal, wherein one of the plurality of frequency components is derived at a frequency essentially equivalent to said characteristic frequency;

smoothing said plurality of frequency components into a frequency signal;

respective to the above steps, incrementally increasing the load on said axial compressor at said known rotational speed and performing the steps of measuring

each resultant sensor signal, deriving respective resultant frequency components, and smoothing said respective resultant frequency components into a respective resultant frequency signal at each resulting load increment until at least one first characteristic peak is defined in a respective resultant frequency signal, said first characteristic peak having a frequency range proximate to said frequency interval and a mean frequency essentially equal to said characteristic frequency, and each said first characteristic peak further having at least one first peak parameter respective to those portions of the respective resultant frequency signal which are not a part of any said first characteristic peak;

retaining the value of said first peak parameter; respective to the above steps, further incrementally increasing the load on said axial compressor at said known rotational speed and performing the steps of measuring at least one resultant sensor signal, deriving respective resultant frequency components, and smoothing said respective resultant frequency components into a respective resultant frequency signal at the resulting load increment to define at least one second characteristic peak, said second characteristic peak having a frequency range proximate to said frequency interval and a mean frequency essentially equal to said characteristic frequency, and each said second characteristic peak further having at least one second peak parameter respective to that portion of the frequency signal which is not a part of any said second characteristic peak;

comparing the value of said second peak parameter with the value of said first peak parameter; incrementally modifying the load on said axial compressor at said known rotational speed to a higher level if the value of said second peak parameter is greater than or equal to the value of said first peak parameter, and to a lower level if the value of said second peak parameter is less than the value of said first peak parameter, and

respective to the above steps, perpetually repeating the steps of measuring a subsequent sensor signal, deriving respective subsequent frequency components, smoothing said respective subsequent frequency components into a subsequent frequency signal, comparing a subsequent peak parameter value with its respective prior peak parameter value, retaining each peak parameter value as the prior peak parameter value for the subsequent comparing step, and incrementally modifying the load on said axial compressor on a periodic basis to, in each case, increase the load on said axial compressor at said known rotational speed to a higher level if the value of a peak parameter is greater than or equal to the value of its respective prior peak parameter, and decrease the load on said axial compressor to a lower level if the value of a peak parameter is less than the value of its respective prior peak parameter.

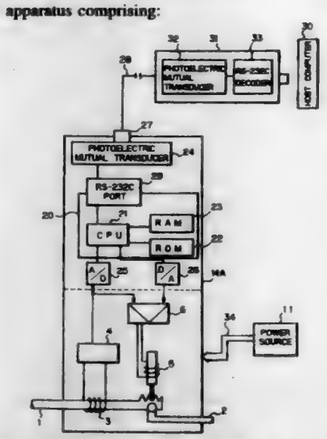
5,594,666

MASS FLOW CONTROL SYSTEM

Isao Suzuki, and Taisei Amano, both of Tokyo, Japan, assignors to MKS Japan, Inc., Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,468
Claims priority, application Japan, Dec. 20, 1993, 5-344565
Int. Cl.[6] G01F *25/00*
U.S. Cl. 364—571.01 **7 Claims**

1. An apparatus comprising:



an analog circuit including means for detecting a mass flow and outputting a signal corresponding to a detection, and means for controlling the flow of a fluid in accordance with a preset input and a signal from said detection means;

an analog-digital mutual converter for receiving a signal from said detection means;

means, electrically connected to said analog-digital mutual converter, for processing digital data;

a photoelectric mutual transducer for receiving information through an optical fiber and transmitting information through an optical fiber, said photoelectric mutual transducer being electrically connected to said processing means;

a first casing housing said analog circuit; and

a second casing housing said analog-digital mutual converter, said processing means, and said photoelectric mutual transducer, wherein said first casing and second casing are electrically interconnected.

5,594,667

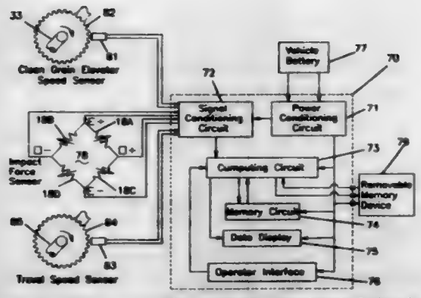
METHOD AND APPARATUS FOR BASELINE DRIFT CORRECTION FOR A SENSOR

Allen Myers, R.R. 2, Ames, Iowa 50010

Filed Jul. 10, 1992, Ser. No. 911,775
Int. Cl.[6] G01F *1/76;* G01D *1/02;* G01L *1/22*
U.S. Cl. 364—571.01 **6 Claims**

1. Apparatus for measuring mass flow rate of grain exiting a power driven conveying means that discharges grain at a substantially constant cycle period in a harvester, comprising:

an impact plate positioned to be impacted by grain exiting said conveying means;



force measuring means for generating an electrical signal proportional to the impact force exerted on said impact plate by said grain;

computing means in electrical communication with said force measuring means for generating a data mask for analyzing at least a portion of a finite time record of said electrical signal, said data mask having a duration that is an integral multiple of said cycle period;

wherein said computing means uses at least one position of said data mask relative to said finite time record to establish a value representative of the baseline value of said force; and

wherein said computing means calculates grain mass flow rate by using said baseline value in calculations to determine an average impact force and by utilizing a mass flow calibration characteristic which relates said grain mass flow rate to said average impact force.

5,594,668

METHOD FOR CORRECTING COORDINATE MEASUREMENT ON WORKPIECES BASED ON BENDING CHARACTERISTICS

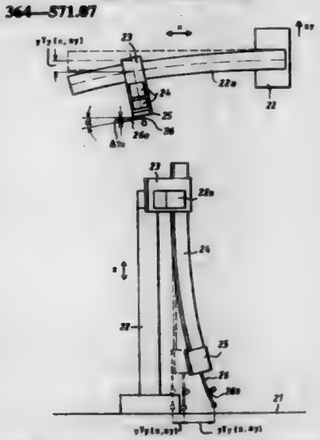
Ralf Bernhardt, Aalen, and Günter Grupp, Böhmenkirch, both of Germany, assignors to Carl-Zeiss-Stiftung, Brenz, Germany

Filed May 30, 1995, Ser. No. 454,461

Claims priority, application Germany, Oct. 13, 1994, 44 36 507.1

Int. Cl.[6] G06F *15/46*

U.S. Cl. 364—571.07 **17 Claims**



1. A method for measuring coordinates on workpieces using a coordinate measuring machine having at least one measuring slide, a certain measuring range and a probe head with a probe fixed to said measuring slide, said method comprising the steps of:

establishing parameters characterizing an elastic bending behavior of said coordinate measuring machine for several probe positions within said measuring range by determining components of said parameters, said components being dependent on position of said measuring slide and being at least dependent on acceleration forces acting on said measuring slide;

storing said components as correction values (c11, c22); and

performing correction calculations by taking into account said stored correction values in subsequent coordinate measurements on workpieces.

5,594,669

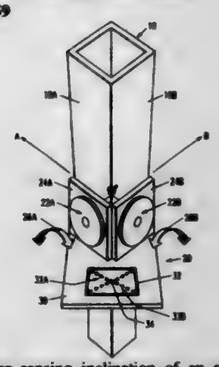
ELECTRONIC FENCE POST LEVEL

Charles E. Heger, Saratoga, Calif., assignor to Zircon Corporation, Campbell, Calif.

Filed Jul. 19, 1994, Ser. No. 277,860

Int. Cl.[6] G01C *9/06*

U.S. Cl. 364—559 **12 Claims**



1. A device for sensing inclination of an elongated member defining a longitudinal axis, comprising:

a support defining an indentation, the indentation being adapted to contact the member;

a first inclination sensor mounted on the support and arranged for sensing inclination in a first plane parallel to the longitudinal axis of the member and generating a first electrical signal indicative of the sensed inclination of the first sensor;

a second inclination sensor mounted on the support and arranged for sensing inclination in a second plane orthogonal to the first plane and parallel to the longitudinal axis of the member, and generating a second electrical signal indicative of the sensed inclination of the second sensor; and

a display operatively connected to the first and second sensors, indicating the sensed inclinations, the display including a first and a second scale each including a plurality of segments and the first scale being associated only with inclination in the first plane and the second scale being associated only with inclination in the second plane, the first and second scales intersecting on the display.

5,594,670

APPARATUS FOR MEASURING CIRCUIT CONSTANT OF INDUCTION MOTOR WITH VECTOR CONTROL SYSTEM AND METHOD THEREFOR

Yasuhiro Yamamoto, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Aug. 8, 1994, Ser. No. 286,245

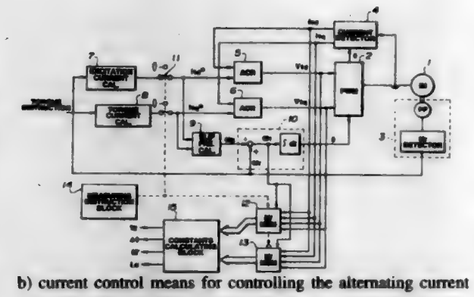
Claims priority, application Japan, Sep. 3, 1993, 5-219338; Nov. 25, 1993, 5-294848

Int. Cl.[6] G01R *11/48*

U.S. Cl. 364—571.01 **11 Claims**

1. An apparatus for an induction motor, comprising:

a) power inverting means for supplying a desired vector controlled alternating current to said induction motor;



b) current control means for controlling the alternating current supplied from said power inverting means to said induction motor in a vector control mode;

c) detecting means for detecting at least one of output and input parameters of said induction motor which is driven under a predetermined driving condition according to the vector controlled alternating current;

d) calculating means for calculating at least one desired motor constant of said induction motor in a predetermined equivalent circuit thereof on the basis of the detected parameter, said current control means controlling the alternating current in the vector control mode using the calculated motor constant; and

e) current instruction changing means for changing levels of excitation and torque current instructions (I_{1d0}, I_{q1}*) supplied to said current control means to a value of zero in a stepwise manner.

5,594,671

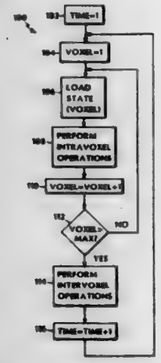
COMPUTER SYSTEM FOR SIMULATING PHYSICAL PROCESSES USING MULTIPLE-INTEGER STATE VECTORS

Hudong Chen, Waltham; Peter C. Churchill, Boxboro; Robert A. Iannucci, Lexington; Kim Molvig, Reading; Gregory Papadopoulos, Acton; Stephen A. Remondi, Reading; Christopher M. Teixeira, Cambridge, and Kenneth R. Traub, Watertown, all of Mass., assignors to Exa Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 30,573, Mar. 12, 1993, Pat. No. 5,377,129. This application Dec. 10, 1993, Ser. No. 165,293

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—578 **34 Claims**



1. A computer implemented method for simulating a physical process, comprising the steps of:

(1) storing in a memory a state vector for each voxel of a plurality of voxels,

the state vector comprising a plurality of integers,

each integer of the vector corresponding to a particular momentum state of a plurality of possible momentum states at the voxel,

each integer representing the number of elements having the particular momentum state, and

each integer having more than two possible values;

(2) performing interaction operations on the state vectors, the interaction operations being operations that model interactions between elements of different ones of the particular momentum states;

(3) performing move operations on the state vectors that reflect movement of elements to different voxels of the plurality of voxels.

5,594,672

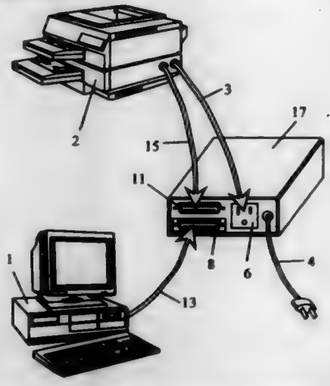
PERIPHERAL POWER SAVER

David S. Hicks, Fairfax Station, Va., assignor to Micro Energetics Corporation, Fairfax Station, Va.

Filed May 20, 1994, Ser. No. 247,138

Int. Cl.[6] G06F *1/00*; H02J *15/00*

U.S. Cl. 364—707 **2 Claims**



1. An apparatus for turning on and off a computer peripheral, comprising:

a. a means for monitoring the data from a computer data port;

b. a means for supplying power to a regulated power outlet when data is present at said computer data port;

c. a means for turning-off power to said regulated power outlet in the absence of data at said computer data port for a period of time: and

d. a means for mediating the transition between a power off and peripheral ready state through the use of a hold-off timer function, comprising:

a. requesting at most, the maximum number of bytes that can fit in one computer register from said computer data port at intervals to maintain a peripheral ready state in said host computer;

b. buffering requested data;

c. monitoring said computer peripheral for a ready signal; and

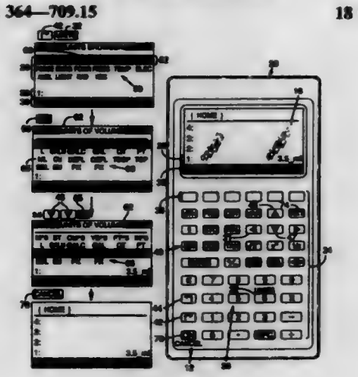
d. sending data from the buffer when peripheral is ready to receive data.

5,594,673

METHOD AND APPARATUS FOR DISPLAYING MENU OPTIONS FOR SELECTION WITH A MINIMUM OF KEY STROKE

Daniel R. Coffin, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 14,309, Feb. 5, 1993, abandoned.
This application Aug. 15, 1995, Ser. No. 513,414
Int. Cl.[6] G06F *3/00;15/02*
U.S. Cl. 364—709.15 18 Claims



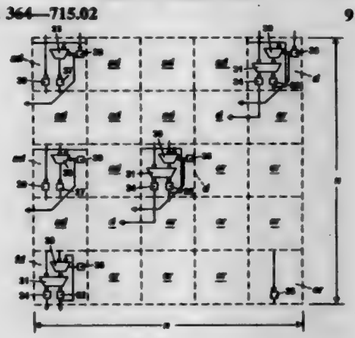
12. A computing system comprising:
a display;
a first number of menu keys;
a display controller, including
first display means, coupled to the display, for displaying a second number of function categories on the display in response to a first user command, wherein
the second number is greater than the first number,
the first display means highlights a third number of the function categories,
the third number is equal to the first number, and
each highlighted function category is associated with one of the menu keys, and
second display means, coupled to the display, for displaying a fourth number of functions in response to the user selecting a first menu key, wherein
the functions displayed are within a first highlighted function category associated with the first menu key,
the second display means highlights a fifth number of the displayed functions,
the fourth number is greater than the first number,
the fifth number is equal to the first number, and
each highlighted function is associated with one of the menu keys; and,
performance means for, in response to the user selecting a second menu key, performing a first function associated with the second menu key;
wherein the first display means additionally displays each highlighted function category adjacent to the menu key associated with the highlighted function category, and the second display means displays each highlighted function adjacent to the menu key associated with the highlighted function.

5,594,674

CODE POINT UPDATE DEVICE IN THE ARITHMETIC CODING METHOD

Harry W. Printz, New York, N.Y., and Peter R. Stubley, Outremont, Canada, assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 216,743, Mar. 23, 1994, abandoned.
This application Oct. 27, 1995, Ser. No. 549,467
Claims priority, application France, Mar. 29, 1993, 93 03589
Int. Cl.[6] H03M *7/30*
U.S. Cl. 364—715.02 9 Claims



1. Code point update device for an arithmetic coding system comprises:
an n^2 circuit array, said n^2 circuit array comprised of an n^2 number of array cells;
a first n(n−1)/2 portion of said n^2 number of array cells being disposed above a principal diagonal of said array, said first portion designated "ad" cells, each of said "ad" cells incorporating a first multiplexer,
a second n−1 portion of said n^2 number of array cells being disposed on said principal diagonal, said second portion designated "d" cells, each of said "d" cells incorporating a first adder, a second multiplexer, and at least one register associated with said second portion,
a third single cell portion of said n^2 number of array cells being disposed at the bottom end of the diagonal, said third portion designated "fd" cell, said "fd" cell incorporating a second adder, a third multiplexer, and at least one register associated with said third portion,
a fourth n(n−1)/2 output retiming cells portion of said n^2 number of array cells, said fourth portion designated "or" cells, said "or" cells incorporating a register associated with said fourth portion, wherein said first, second, and third multiplexers and said first and second adders are associated with a clock period, a lower limit of the clock period corresponding to

$$\tau \geq \max\{\tau_{mux}+\tau_{add},X_{max},\tau_{prop}\}$$

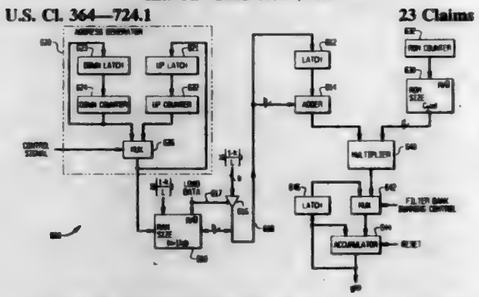
where τ_{mux} and τ_{add} correspond to the set-up times of the first, second, and third multiplexers and said first and second adders, respectively, and where τ_{prop} corresponds to the time lag necessary to enable a signal to propagate through a width of a cell and wherein a quantity Xmax represents a maximum shift of an input X with respect to a starting value of input X.

5,594,675

REDUCED SIGNAL PROCESSING REQUIREMENT SAMPLE AND HOLD LINEAR PHASE INTERPOLATIVE FIR FILTER

Yung-Chow Peng, Chutung, Taiwan, assignor to Industrial Technology Research Institute, Chutung, Taiwan

Filed Jul. 14, 1994, Ser. No. 275,158
Int. Cl.[6] G06F *17/17;7/38*
U.S. Cl. 364—724.1 23 Claims



1. A digital poly-phase FIR filter for producing an L phase interpolation of a input sample

$$x\left(\left\lfloor \frac{t-1}{L} \right\rfloor - i\right)$$

based on L filter banks and n tap coefficients $P_l(i)$ in each lth one of said filter banks where $1 \leq l \leq L$ and where $0 \leq i \leq (n-1)$, said digital filter comprising:
a first circuit for producing, for each time t, bank filter terms of a merged filter bank having an output value which changes between a previous time t−1 and said time t, said produced bank filter terms including at least one combination of two cross-symmetric bank filter terms, said cross-symmetric bank filter terms being:
for an in phase condition:

$$P_k(i)\cdot X\left(\left\lfloor \frac{t-k}{L} \right\rfloor - i\right) + P_{L-k+1}(i)\cdot X\left(\left\lfloor \frac{t-(L-k+1)}{L} \right\rfloor - i\right)$$

and

$$P_k(n-1-i)\cdot X\left(\left\lfloor \frac{t-k}{L} \right\rfloor - (n-1-i)\right) + P_{L-k+1}(n-1-i)\cdot X\left(\left\lfloor \frac{t-(L-k+1)}{L} \right\rfloor - (n-1-i)\right)$$

for an out of phase condition:

$$P_k(i)\cdot X\left(\left\lfloor \frac{t-k}{L} \right\rfloor - i\right) + P_{L-k+1}(i-1)\cdot X\left(\left\lfloor \frac{t-(L-k+1)}{L} \right\rfloor - (i-1)\right)$$

and

$$P_k(n-i)\cdot X\left(\left\lfloor \frac{t-k}{L} \right\rfloor - (n-i)\right) + P_{L-k+1}(n-1-i)\cdot X\left(\left\lfloor \frac{t-(L-k+1)}{L} \right\rfloor - (n-1-i)\right)$$

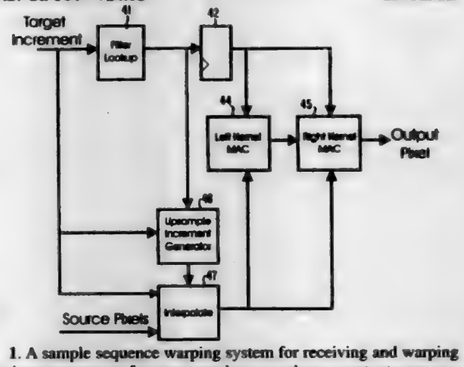
wherein $1 \leq k \leq L$, and
$t = w \cdot L + k$ for any non-negative integer w of said L filter banks on which said digital filter is based, and
a second circuit for adding together, for each time t, said bank filter terms produced in said first circuit to produce said merged filter bank output value which changes between said previous time t−1 and said time t.

5,594,676

DIGITAL IMAGE WARPING SYSTEM

Lance Greggain, Woodbridge; James Goel, Ajax, and Robert Beyer, Waterloo, all of Canada, assignors to Genesis Microchip Inc., Canada

Filed Dec. 22, 1994, Ser. No. 361,539
Int. Cl.[6] G06F *17/10;17/17*
U.S. Cl. 364—724.01 23 Claims



1. A sample sequence warping system for receiving and warping an input sequence of source samples to produce an output sequence of target samples, comprising:
a) first means for receiving successive target increments representing desired target spacing between respective ones of said target samples, and in response generating successive filter factor values representing respective FIR filters having sufficient filter coefficients to generate respective ones of said target samples with said desired target spacing;
b) second means for receiving said successive filter factor values and in response selecting predetermined left and right half kernels of said respective FIR filters for generating said respective ones of said target samples;
c) third means for receiving said successive target increments and said successive filter factor values and in response generating a predetermined number of upsampled intermediate samples from said input sequence of source samples; and
d) fourth means for applying said upsampled intermediate samples to said predetermined left and right half kernels of said respective FIR filters for generating said output sequence of target samples.

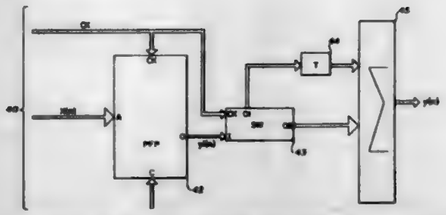
5,594,677

METHOD AND APPARATUS FOR FILTERING HIGH RESOLUTION DIGITAL SIGNALS

Carla Golla, Sesto San Giovanni, and Alessandro Cremonesi, S. Angelo Lodigiano, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jan. 28, 1994, Ser. No. 189,271
Claims priority, application European Pat. Off., Jan. 29, 1993, 93830031
Int. Cl.[6] G06F *17/10*
U.S. Cl. 364—724.16 8 Claims

8. A digital filter for filtering an input digital signal to obtain an output digital signal, comprising:
a programmable filter comprising a single memory structure having address inputs connected to receive the input digital signal and a clock signal, and wherein products, of all possible input signals and coefficients related to an impulse



response for first and second filtering operations, are stored at addresses defined by the input digital signals, and wherein the programmable filter outputs the products of to the input digital signal and the coefficients of the first filtering operation when the clock signal is in a first state and outputs the products of to the input digital signal and the coefficients of the second filtering operation when the clock signal is in a second state;

a switch having an input connected to receive the output of the programmable filter and an input connected to receive the clock signal and a first output which provides the input of the switch when the clock signal is in a first state and a second output which provides the input of the switch when the clock signal is in a second state;

a delay connected to the first output of the switch for delaying the first output; and

an adder having a first input connected to the delay and a second input connected to the second output of the switch and an output providing the sum of the first and second inputs as the output digital signal of the digital filter.

5,594,678

METHOD AND ARRANGEMENT FOR TRANSFORMATION OF SIGNALS FROM A FREQUENCY TO A TIME DOMAIN

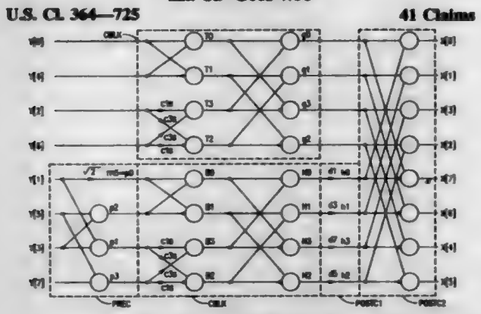
Anthony M. Jones, Nijmegen, Netherlands; Kevin D. Dewar, Clare, Ireland, and Martin W. Sotheran, Bristol, United Kingdom, assignors to Discovision Associates, Irvine, Calif.

Division of Ser. No. 82,807, Jun. 24, 1993, Pat. No. 5,479,364. This application Mar. 7, 1995, Ser. No. 400,723

Claims priority, application European Pat. Off., Jun. 26, 1992, 92305927

Int. Cl.[6] G06F *7/38*

U.S. Cl. 364—725 **41 Claims**



1. A system for transforming digital signals from a frequency to a time representation, in which the digital signals are arranged in groups of N data input words, comprising:

means for forcing predetermined bits of selected internal data words in the system to predetermined binary values, whereby the statistical accuracy of the system is improved relative to a predetermined test input data set,

pre-common processing means (PREC) arranged to perform predetermined pairing operations on odd-numbered ones of the input words and to transmit even-numbered ones of the input words to pre-common outputs; and

post-common processing means (POSTC) arranged to perform predetermined output scaling operations on the odd common processing means output values to form post-processed odd values and to arithmetically combine the post-processed odd values with the even common processing means output values to generate high- and low-order output words, the system being arranged such that the output words contain inverse discrete cosine transformation values corresponding to the input data words.

5,594,679

ADAPTIVE VIDEO SIGNAL PROCESSING APPARATUS

Eiji Iwata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

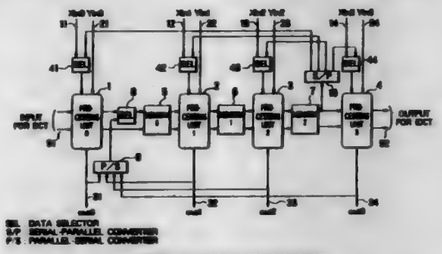
PCT No. PCT/JP94/00525, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO94/23384, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 30, 1994, Ser. No. 343,537

Claims priority, application Japan, Mar. 31, 1993, 5-074768

Int. Cl.[6] G06F *7/38*

U.S. Cl. 364—736 **24 Claims**



1. An adaptive video signal processing apparatus for adaptively performing image compression and encoding/expansion and decoding processing such as discrete cosine transformation/inverse discrete cosine transformation, quantization/inverse quantization, motion vector detection, motion compensation, inner product computation, image data addition, and image data difference processing on blocks of image data of m×n size,

said processing apparatus comprising

a plurality of processing units provided in parallel, each of which having an extended arithmetic and logic unit performing addition, subtraction, various logical computations, comparison of magnitude, computation of absolute values of differences, butterfly addition and subtraction processing, a first internal pipeline memory provided at a stage after said extended arithmetic and logic unit, a multiplier unit provided at a stage after said first internal pipeline memory, a coefficient memory supplying a coefficient to said multiplier unit, a second internal pipeline memory provided at a stage after said multiplier unit, an accumulation processing unit provided at a stage after said second internal pipeline memory, and a third internal pipeline memory provided at a stage after said accumulation processing unit;

mutually connected pipeline memories disposed so as to connect adjoining processing units among these plurality of parallel processing units; and

data selectors which selectively supply the input data to said plurality of processing units, wherein

adjoining processing units are coupled via said mutually connected pipeline memories and, the internal pipeline memories in said processing units are selected to constitute a predetermined data flow path,

to thereby perform a desired video signal processing such as discrete cosine transformation, wherein said adaptive video signal processor operates by a "single instruction stream-multiple data stream (SIMD)" control system for performing multiple data stream processing by a single instruction stream.

5,594,680

NOISE REDUCED CONTACTLESS PARALLEL DATA TRANSFER DEVICE AND METHOD THEREOF

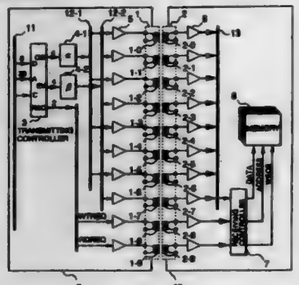
Masatoshi Ohtake, Oume; Takeshi Totteri, Kitaazuma-gun; Kazunari Nakagawa, Toride; Nobuo Hamamoto, Nishitama-gun; Takehiro Ohkawa, Kunitachi, and Yutaka Kinebuti, Sagamori-ku, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Maxell, Ltd., Osaka-fu, both of Japan

Filed Mar. 28, 1995, Ser. No. 411,463

Claims priority, application Japan, Mar. 29, 1994, 6-058486

Int. Cl.[6] G11C *5/06; 7/00*

U.S. Cl. 365—63 **23 Claims**



1. A contactless parallel data transfer device comprising:

a portable memory:

a first coil group which is installed in said portable memory so as to transfer access data to said portable memory in parallel;

a data server for supplying at least writing data to said portable memory;

a second coil group which consists of each coil mounted opposite to each coil of said first coil group and is installed in said data server so as to transfer data from said data server to said first coil group;

contactless holding means for holding said first coil group and said second coil group opposite and close to each other so as to transfer data; and

a parallel pulse generator having a delay means which generates data to be transferred between said first coil group and said second coil group in parallel as a parallel pulse and is installed at least in said data server, wherein said delay means is a means for dividing said parallel pulse at least into a first parallel pulse group consisting of a first number of bits and a second parallel pulse group consisting of a second number of bits and delaying the parallel transfer timing of said second parallel pulse group from the parallel transfer timing of said first parallel pulse group at least by a time which is longer than the pulse width of each bit.

5,594,681

DYNAMIC RANDOM ACCESS MEMORY WHEREIN TIMING OF COMPLETION OF DATA READING IS ADVANCED

Masao Taguchi, Sagamihara, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 178,682, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 777,315, Dec. 2, 1991, abandoned. This application Sep. 22, 1994, Ser. No. 310,369

Claims priority, application Japan, Mar. 30, 1990, 2-83758

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—149 **14 Claims**

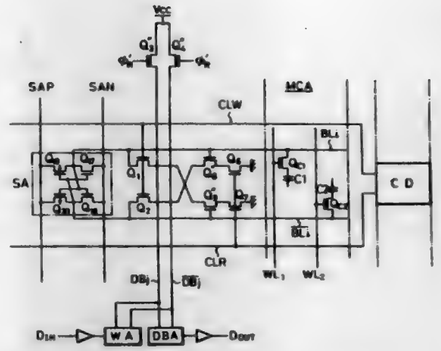
1. A method for reading data in a dynamic random access memory device having a read mode and a write mode and comprising:

a voltage supply,

a plurality of memory cells,

a bit line connected to said plurality of memory cells,

a sense amplifier connected to said bit line,



a common data bus,

impedance means connected between the voltage supply and the common data bus,

a read gate circuit having a read gate transistor connected between said common data bus and a reference voltage, wherein a gate of the read gate transistor is connected to said bit line and transfers read-out data from said bit line to said common data bus during said read mode,

a write gate circuit, provided independently from said read gate circuit and connected between said common data bus and said bit line for transferring write-in data from said common data bus during said read mode, and

a selection circuit having a read selection line connected to said read gate circuit and a write selection line connected to said write gate circuit, said read selection line being selectively activated during said read mode to active said read gate circuit, and said write selection line being selectively activated during said write mode to activate said write gate circuit; said method comprising the steps of:

a first step for outputting information stored in a memory cell, on the bit line; and

a second step for selectively activating the read selection line by the selection circuit whereby activating the read gate circuit before activating voltage amplifier means for amplifying a voltage, to readout an output data on the bit line, onto the common data bus line.

5,594,682

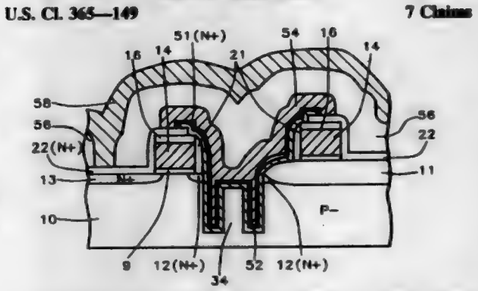
HIGH DENSITY SELF-ALIGNED STACK IN TRENCH DRAM TECHNOLOGY

Chih-Yuan Lu, and Horng H. Tseng, both of Hsin-Chu, Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Division of Ser. No. 263,455, Jun. 22, 1994, Pat. No. 5,429,978. This application Apr. 24, 1995, Ser. No. 428,773

Int. Cl.[6] G11C *11/24*

U.S. Cl. 365—149 **7 Claims**



1. A DRAM (Dynamic Random Access Memory) cell, comprising:

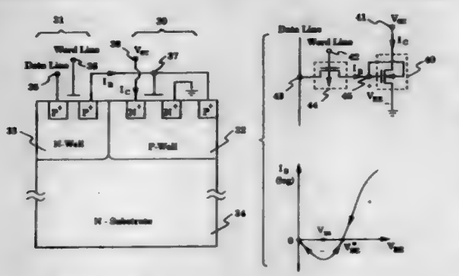
a silicon substrate having field oxide isolation regions;
a field effect transistor having a gate electrode, a source region and a drain region, formed in and on said silicon substrate;
a trench, formed in said silicon substrate in the region between said source region and said field oxide isolation region;
a pillar formed in the center of, and extending up from the bottom of, said trench;
a capacitor signal node at the surface of said trench and said pillar, that runs contiguously over said trench and said pillar, and contacts with said source region of said field effect transistor;
a capacitor dielectric over said capacitor signal node;
a capacitor ground plate over said capacitor dielectric;
an insulating layer over said field effect transistor, said capacitor ground plate and said field oxide isolation region; and
a metal bit line node contact connected to said drain region through an opening in said insulating layer.

5,594,683

SRAM CELL USING A CMOS COMPATIBLE HIGH GAIN GATED LATERAL BJT

Ming-Jer Chen, and Tzuen-Hsi Huang, both of Department of Electronics Engineering & Institute of Electronics, National Chiao-Tung University, Hsin-Chu, Taiwan

Filed Apr. 7, 1995, Ser. No. 418,485
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—177 **15 Claims**



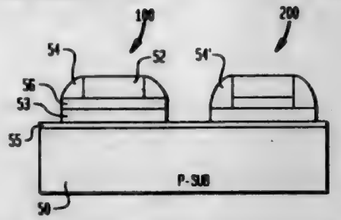
14. An SRAM cell comprising:
a high gain gated n-p-n lateral BJT in an n-MOSFET structure operated in base current reverse mode for providing two stable logic levels; and
a data passing means including a p-MOSFET for transferring data in and out of said SRAM cell;
said gated lateral BJT further including a gate, an emitter, a base, and a collector wherein said gate and said base are tied together; and said emitter is grounded, and said collector is connected to a power supply; and
said p-MOSFET further including a gate, a source, and a drain wherein said gate is connected to a word line; said source is connected to a data line; and said drain is connected to the base of said gated lateral BJT;
said drain of said p-MOSFET being disposed between a p-well and a n-well of said p-MOSFET for constructing a merged structure for reducing occupied areas by said p-MOSFET employed as a passing transistor therein; and
said passing transistor being connected to the base of said gated lateral BJT for providing an ohmic connection thereto.

5,594,684

POLYSILICON PROGRAMMING MEMORY CELL

Chen-Chin Hsue, Hsin-Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Continuation of Ser. No. 245,504, May 18, 1994, abandoned. This application Jun. 18, 1996, Ser. No. 665,532
Int. Cl.[6] B11C *16/06*
U.S. Cl. 365—185.01 **12 Claims**



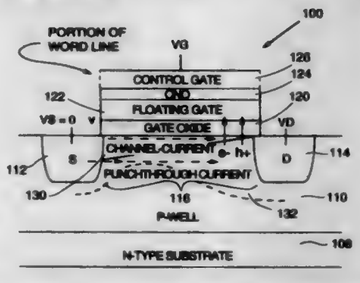
1. A read only memory cell programmed to be in an "off" state, comprising:
a gate oxide grown on a substrate of a first dopant type,
a floating gate disposed on said gate oxide,
an insulating layer extending over an entire length of said floating gate,
a control gate having two sides and extending over a portion of said insulating layer, leaving first and second portions of said insulating layer exposed on each side, and
first and second spacers disposed on each side of said control gate and over said first and second exposed portions of said insulating layer, wherein said first and second spacers are configured to not contact said floating gate, so that said first and second spacers do not short said control gate to said floating gate to result in an "off" state memory cell.

5,594,685

METHOD FOR PROGRAMMING A SINGLE EPROM OR FLASH MEMORY CELL TO STORE MULTIPLE BITS OF DATA THAT UTILIZES A PUNCHTHROUGH CURRENT

Albert Bergemont, and Min-hwa Chi, both of Palo Alto, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 357,115, Dec. 16, 1994. This application Apr. 13, 1995, Ser. No. 422,146
Int. Cl.[6] G11C *16/02*
U.S. Cl. 365—185.03 **6 Claims**



1. A method for programming a single floating-gate memory cell to have one of three or more threshold voltages, the memory cell having a source and drain formed a distance apart in the well that define a channel therebetween, a layer of first insulation material formed over the channel, a floating gate formed over the layer of first insulation material, a layer of second insulation material formed over the floating gate, and a control gate formed over the layer of second insulation material, the method comprising the steps of:

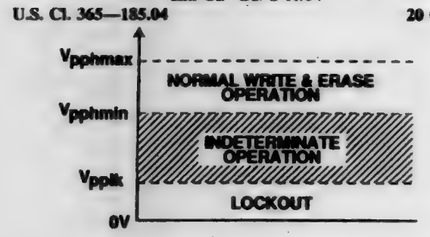
selecting one of three or more programming voltages as a selected programming voltage, the three or more programming voltages corresponding to said three or more threshold voltages;
applying a first voltage to the well;
applying the first voltage to the source so that the source-to-well junction is in equilibrium;
applying a second voltage to the drain so that the drain-to-well junction is reverse-biased, the drain-to-source voltage is positive, and a punchthrough current is induced to flow from the drain to the source; and
applying the selected programming voltage to the control gate of the memory cell.

5,594,686

METHOD AND APPARATUS FOR PROTECTING DATA STORED IN FLASH MEMORY

Peter K. Hazen, Auburn, Calif., and Michael J. Castillo, Provo, Utah, assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 29, 1995, Ser. No. 578,175
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.04 **20 Claims**



1. A method for protecting data stored in a nonvolatile memory, the method comprising the steps of:
initiating a locking signal, the locking signal indicating that write and erase operations in at least a first portion of the memory are to be prevented;
lowering a supply voltage to the memory below a threshold value in response to the locking signal, the supply voltage supporting write and erase operations in the first portion of the memory; and
engaging protection circuitry internal to the memory in response to lowering the supply voltage to the memory below the threshold value, thereby preventing write and erase operations in the first portion of the memory.

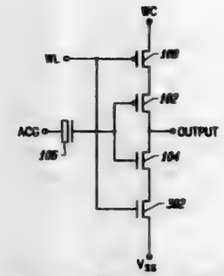
5,594,687

COMPLETELY COMPLEMENTARY MOS MEMORY CELL WITH TUNNELING THROUGH THE NMOS AND PMOS TRANSISTORS DURING PROGRAM AND ERASE

Jonathan Lin, Milpitas; Radu Barsan, Cupertino, and Bradley A. Sharpe-Geisler, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 427,117, Apr. 21, 1995. This application May 23, 1995, Ser. No. 447,991
Int. Cl.[6] G11C *16/04*
U.S. Cl. 365—185.1 **9 Claims**

1. A memory cell comprising:
a common floating gate;
a capacitor having a first terminal forming a control gate and a second terminal coupled to the common floating gate;
an NMOS transistor having a source coupled to Vss, a drain, a channel formed between its source and drain, and a tunneling oxide region and the common floating gate overlying its channel;
a PMOS transistor having a source, a drain coupled to the drain of the NMOS transistor, a channel formed between its source and drain, and a tunneling oxide region and the common floating gate overlying its channel; and
a first pass gate having a source to drain path coupling the source of the NMOS transistor to Vss, and a gate.

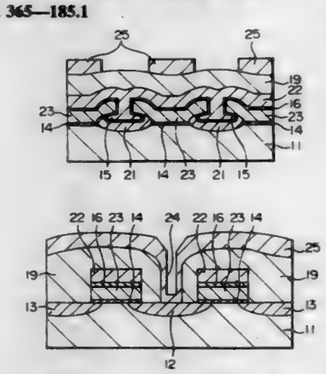


5,594,688

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF PRODUCING THE SAME

Yasuo Sato, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 7, 1995, Ser. No. 499,379
Claims priority, application Japan, Jul. 8, 1994, 6-180697
Int. Cl.[6] H01L *29/788*
U.S. Cl. 365—185.1 **11 Claims**



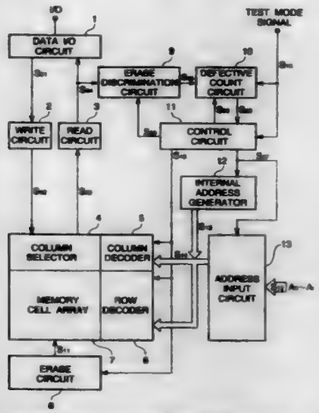
1. A nonvolatile semiconductor memory device comprising:
a semiconductor substrate of a first conductivity type;
at least a pair of element isolation insulating films;
a pair of spaced source/drawn regions of a second conductivity type different from said first conductivity type and formed in a surface of said semiconductor substrate;
a floating gate electrode formed above a channel region disposed between said pair of source/drain regions in the surface of said semiconductor substrate in an insulated relationship with said channel region, wherein said floating gate electrode overlaps each of said element isolation insulating films and a gap is formed between an underside of said floating gate electrode and each of said element isolation insulating films at each of portions thereof where said floating gate electrode overlaps said pair of element isolation insulating films, respectively; and
a control gate electrode formed above said floating gate electrode in an insulated relationship with said floating gate electrode, wherein a part of said control gate electrode extends beyond a side of said floating gate electrode to an underside of said floating gate electrode facing each of the gaps.

5,594,689

NON-VOLATILE SEMICONDUCTOR MEMORY CAPABLE OF ERASE- VERIFYING MEMORY CELLS IN A TEST MODE USING A DEFECTIVE COUNT CIRCUIT ACTIVATED BY A TEST MODE SIGNAL

Yasushi Kato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1996, Ser. No. 613,692
Claims priority, application Japan, Mar. 10, 1995, 7-079611
Int. Cl.[6] G11C *16/04*
U.S. Cl. 365—185.22 **8 Claims**



1. A non-volatile semiconductor memory including a plurality of memory cells arranged in the form of a matrix, an erase means for simultaneously erasing said plurality of memory cells, a discriminating means for discriminating whether or not each one of said plurality of memory cells has been erased, an internal address generating means for supplying said discriminating means with an internal address for accessing each of said plurality of memory cells, a control means for controlling said erase means and said discriminating means in such a manner that, after a pre-erase writing is performed, said simultaneous erasing of said erasing means and said discrimination of said discriminating means are alternately performed, and a count means for counting the number of memory cells which are discriminated to be unerased by said discriminating means, said count means outputting to said control means an erase failure signal when the counted number becomes higher than a predetermined count limit number, said control means responding to said erase failure signal for stopping an operation of said discriminating means and for causing said erasing means to restart said simultaneous erasing.

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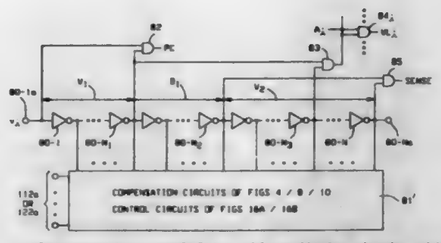
INTEGRATED CIRCUIT MEMORY HAVING HIGH SPEED AND LOW POWER BY SELECTIVELY COUPLING COMPENSATION COMPONENTS TO A PULSE GENERATOR

Roland D. Rothenberger, Poway; Greg T. Sullivan, and Kenny Y. Tung, both of Escondido, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 15, 1995, Ser. No. 573,306
Int. Cl.[6] G11C *7/00*; H03K *5/06*
U.S. Cl. 365—189.01 **18 Claims**

1. A memory, in an integrated circuit chip, which is comprised of:

an array of memory cells, coupled to a read/write circuit which performs a predetermined operation on said array for a time interval that is set by the width of a pulse signal;



a pulse generator, coupled to said read/write circuit, which contains transistors that switch on and off at an unpredictable speed to generate said pulse signal such that said width has a large tolerance;

a first module which generates an oscillating signal that oscillates at a frequency which is proportional to said unpredictable speed, and a second module which generates said control signals by counting cycles in said oscillating signal; and,

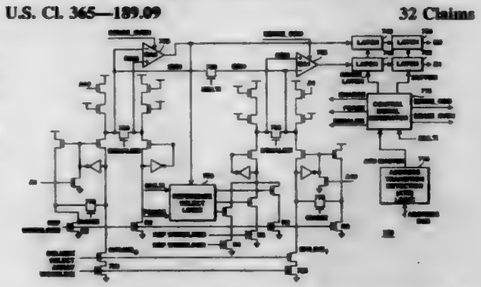
a compensation circuit, which includes a plurality of compensation components, that selectively couples said compensation components to said pulse generator in response to said control signals such that the selectively coupled components in combination with said transistors generate said pulse signal with a width that has a substantially smaller tolerance than said large tolerance.

5,594,691

ADDRESS TRANSITION DETECTION SENSING INTERFACE FOR FLASH MEMORY HAVING MULTI-BIT CELLS

Amir Bashir, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 15, 1995, Ser. No. 389,043
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—189.09 **32 Claims**



1. Sensing circuitry for determining a state of a memory cell, the sensing circuitry comprising:

a first sense amp for comparing a cell charge level of a first memory cell to a first reference and outputting a first result;

reference selection circuitry for selecting between second and third references in response to the first result;

a second sense amp for comparing the cell charge level of the first memory cell to the selected one of the second and third references and outputting a second result; and

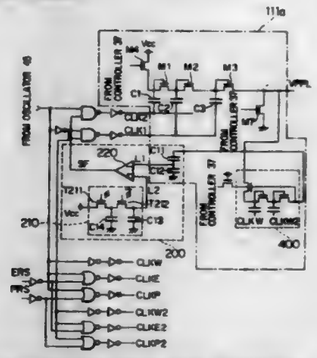
first forcing circuitry for providing the first reference in place of the selected one of the second and third references to the second sense amp for a predetermined period of time following output of the first result.

5,594,692

SEMICONDUCTOR INTEGRATED CIRCUIT

Atsuo Yamaguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 269,369, Jun. 30, 1994, Pat. No. 5,535,160. This application Mar. 29, 1996, Ser. No. 624,256
Claims priority, application Japan, Jul. 5, 1993, 5-165672
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.09 **2 Claims**



1. A semiconductor integrated circuit comprising:

an EEPROM memory cell array comprising a plurality of memory cells disposed in a matrix, each memory cell including a non-volatile memory transistor for electrically writing and erasing data;

means for generating a high voltage required to write data into and erase data from said memory cell array;

means for selectively supplying the high voltage to a memory cell;

means for shaping a waveform of the high voltage so that the high voltage does not rise too quickly, said means for shaping a waveform including a dummy circuit for supplying the high voltage to said means for shaping a waveform; and means for controlling said means for generating and said means for selectively supplying to control writing data into, reading data from, and erasing data from the memory cell array; said means for shaping the waveform receiving a high voltage which has passed through said means for selectively supplying the high voltage, said means for shaping the waveform performing waveform-shaping in response to the received high voltage.

5,594,693

MATRIX DEVICE WITH REDUNDANCY FUSES FOR INTEGRATED MEMORY

Olivier Rouy, Aix en Provence, and Jean-Marie B. Gaultier, Rousset, both of France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Filed Mar. 21, 1995, Ser. No. 408,016
Claims priority, application France, Mar. 31, 1994, 94 03845
Int. Cl.[6] G11C *29/00*
U.S. Cl. 365—200 **17 Claims**

17. An integrated circuit memory, comprising:

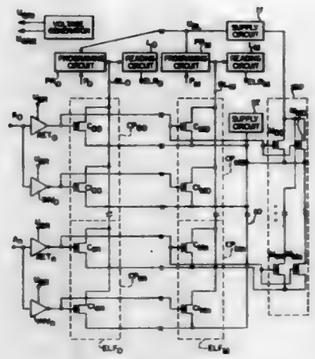
a plurality of memory cells disposed in rows and columns;

a plurality of redundant memory cells that replace a defective memory cell, each redundant memory cell comprising a pair of field effect transistors which are responsive to a respective bit of an address code;

means for programming each redundant memory cell with an address bit;

means for detecting a presence or an absence of a current in each redundant memory cell; and

means for substituting each redundant memory cell for a defective memory cell when no current is detected in the redundant memory cell.

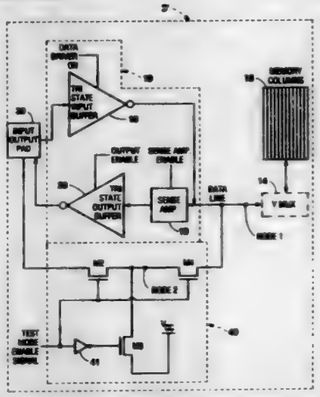


5,594,694

MEMORY CIRCUIT WITH SWITCH FOR SELECTIVELY CONNECTING AN INPUT/OUTPUT PAD DIRECTLY TO A NONVOLATILE MEMORY CELL

Farjborz F. Roohparvar, Cupertino, and Michael S. Briner, San Jose, both of Calif., assignors to Micron Quantum Devices, Inc., Santa Clara, Calif.

Filed Jul. 28, 1995, Ser. No. 508,848
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 **15 Claims**



1. An integrated circuit operable in a selected one of a test mode and a normal operating mode, said integrated circuit including:

an input/output pad providing an interface between the integrated circuit and its external environment;

component circuits;

selection means for connecting a selected one of the component circuits to a first node; and

a test mode switch having a closed state in the test mode and an open state in the normal operating mode, wherein the test mode switch connects the input/output pad directly with the first node in the closed state and isolates the input/output pad from the first node in the open state, said test mode switch including:

at least one element which is normally nonconductive during the open state, but which becomes conductive during said open state in response to at least one state of the integrated circuit; and

isolation means connected to the at least one element for maintaining the input/output pad in isolation from the first node even when said at least one element becomes conductive during the open state.

5,594,695

SENSE AMPLIFIER CONTROL CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

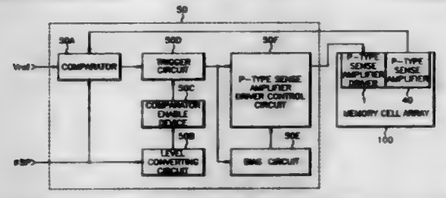
Sung-Min Yim, Pyeongtaek-gun, and Jung-Hyuck Lee, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Division of Ser. No. 379,693, Jan. 27, 1995. This application Nov. 3, 1995, Ser. No. 552,935

Claims priority, application Rep. of Korea, Jan. 27, 1994, 1465/1994

Int. Cl.[6] G11C 7/00

U.S. Cl. 365—205 **8 Claims**



1. A sense amplifier control circuit which adjusts a voltage generated by a sense amplifier control driver that has a control input and a power supply voltage terminal input that receives a power supply voltage and amplifies said power supply voltage to obtain an amplified voltage that is supplied to a memory cell, said sense amplifier control circuit comprising:

a comparator for inputting and comparing said amplified voltage and a predetermined reference voltage and outputting at a comparator output a compared voltage when a predetermined clock signal is received;

a level converting circuit for generating a comparator enable signal when said predetermined clock signal is received;

a comparator enable device for enabling said compared voltage of said comparator using said comparator enable signal to obtain an enabled compared voltage;

a trigger circuit which inputs said enabled compared voltage and outputs a trigger voltage corresponding to said enabled compared voltage;

a bias circuit which inputs said trigger voltage and generates a bias voltage; and

a sense amplifier driver control circuit that inputs said trigger voltage and said bias voltage, and outputs a current flow to said sense amplifier driver control input, said sense amplifier control circuit including a driving element having a current path and a control terminal, said control terminal controlled by a sensing signal which is generated when a data transmission occurs to allow for an increased second current flow through said current path when transmitting data to assist in obtaining said increase in said current flow.

5,594,696

IMPROVEMETNS IN A DETECTION CIRCUIT WITH A LEVEL SHIFTING CIRCUIT

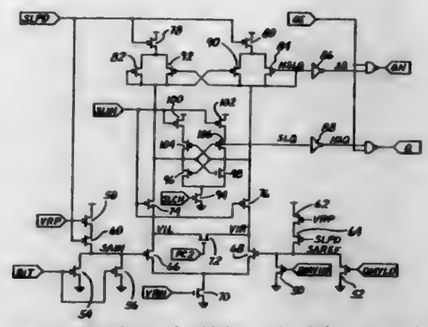
James A. Kemarek, Newport Beach; Clarence W. Padgett, Westminster; Robert D. Anmeus, Harbor City, and Scott B. Thamer, Irvine, all of Calif., assignors to Creative Integrated Systems, Inc., Santa Ana, Calif.

Division of Ser. No. 84,295, Jun. 28, 1993, Pat. No. 5,467,300, and a continuation-in-part of Ser. No. 16,811, Feb. 11, 1993, said Ser. No. 84,295is a continuation-in-part of Ser. No. 912,112, Jul. 9, 1992, Pat. No. 5,241,497, which is a continuation of Ser. No. 538,185, Jun. 14, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 487,841

Int. Cl.[6] G11C 7/00

U.S. Cl. 365—208 **25 Claims**

1. An improvement in a detection circuit having an input signal with a common mode voltage approximately at ground which input signal is sensed, said improvement comprising a level shifting subcircuit included in said detection circuit, said level shifting subcircuit for receiving said input signal and for raising said



common mode voltage of said input signal from approximate ground to a predetermined higher level to output a voltage shifted level of said input signal, said predetermined higher level being within an operative range of detection of said detection circuit.

5,594,697

SEMICONDUCTOR DEVICE

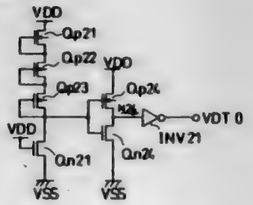
Hiroshige Hirano, Nara, and Toshiyuki Honda, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 26, 1995, Ser. No. 494,827

Claims priority, application Japan, Jun. 28, 1994, 6-146267; Jul. 8, 1994, 6-157363

Int. Cl.[6] G11C 7/06

U.S. Cl. 365—208 **17 Claims**



1. A semiconductor device comprising:

a memory cell;

a data line connected to the memory cell;

voltage supplying means for supplying a supply voltage;

first control signal input means for entering a first control signal for giving an instruction to generally read a data from the memory cell;

second control signal input means for entering a second control signal for giving an instruction to discriminate a current value of a current flowing through the memory cell;

current detecting means connected to the first and second control signal input means, the voltage supplying means and the data line, for detecting a current flowing from the voltage supplying means to the data line by using a level sensing current according to the supply voltage in response to the first and second control signals; and

level switching means connected to the second control signal input means, for switching the level sensing current so that a difference in a current value between the current detected by the current detecting means and the current flowing through the memory cell in the discrimination under instruction of the second control signal is smaller than a difference therebetween in a general reading operation.

5,594,698

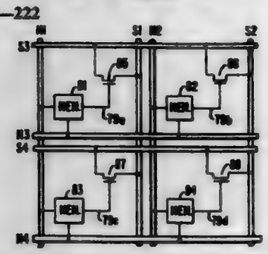
RANDOM ACCESS MEMORY (RAM) BASED CONFIGURABLE ARRAYS

Richard D. Freeman, San Carlos, Calif., assignor to Zycad Corporation, Fremont, Calif.

Continuation of Ser. No. 32,610, Mar. 17, 1993, abandoned. This application Nov. 4, 1994, Ser. No. 334,885

Int. Cl.[6] G11C 7/00

U.S. Cl. 365—222 **159 Claims**



7. An integrated circuit comprising

a configurable circuit including an array of configurable units and a plurality of signal lines; and

an array of memory cells, each memory cell directly coupled to a node in said configurable circuit and connected to no more than three conducting lines by which bit information is communicated to and from said memory cell, said memory cell holding electric charge representative of a single bit of information and placing said node in one logic state or another to define operation of said configurable circuit.

5,594,699

DRAM WITH REDUCED ELECTRIC POWER CONSUMPTION

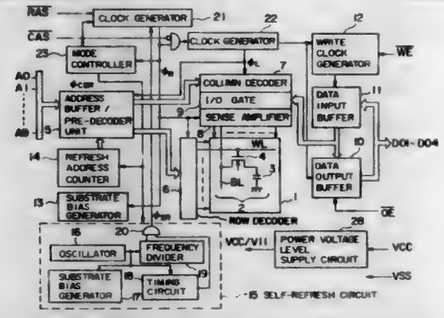
Yukihiro Nomura; Yasuharu Satoh; Yoshihiro Takemae, all of Kawasaki; Takaaki Furuyama, Kasugai; Mitsuhiro Nagao, Kasugai, and Masahiro Nilmi, Kasugai, all of Japan, assignors to Fujitsu Limited, Kawasaki, and Fujitsu Vlsi Limited, Kasugai, both of Japan

Filed Sep. 16, 1994, Ser. No. 308,105

Claims priority, application Japan, Sep. 20, 1993, 5-233860; Jan. 27, 1994, 6-007937

Int. Cl.[6] G11C 7/00

U.S. Cl. 365—226 **4 Claims**



1. A DRAM (Dynamic Random Access Memory) having a plurality of memory cells comprising:

a data read/write circuit reading or writing data for the memory cells;

a self-refresh circuit refreshing data stored in the memory cells; and

power supply means for supplying power supply voltage to said data read/write circuit and said self-refresh circuit, said power supply voltage having a first voltage level in a normal operation mode and a second voltage level in a self-refresh mode, wherein said second voltage level is smaller than said first voltage level.

5,594,700

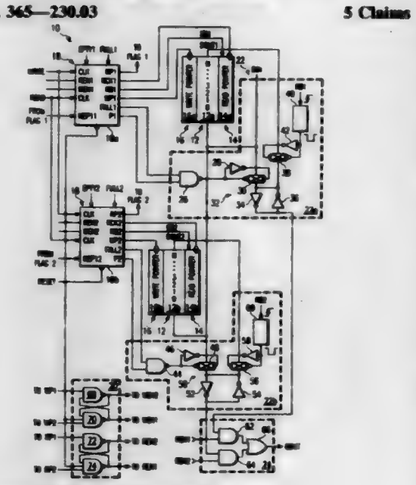
SEQUENTIAL MEMORY

Morris D. Ward, Garland, and Kenneth L. Williams, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

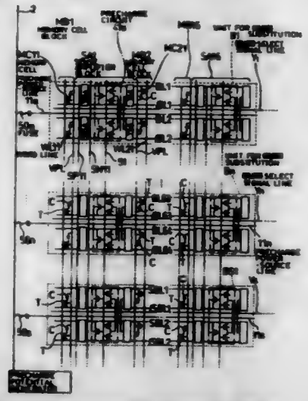
Continuation of Ser. No. 628,279, Dec. 17, 1990, abandoned. This application Feb. 7, 1994, Ser. No. 192,755

Int. Cl.[6] G11C 7/00; 8/04

U.S. Cl. 365—230.03 **5 Claims**



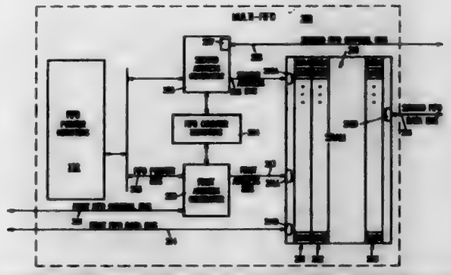
5,594,701
SEMICONDUCTOR MEMORY DEVICE HAVING A PLURALITY OF BLOCKS
Hideo Asaka, and Hiroyuki Yamauchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 13, 1995, Ser. No. 420,875
Claims priority, application Japan, Apr. 15, 1994, 6-077513
Int. Cl.[6] G11C *8/00;29/00*
U.S. Cl. 365—230.03 **3 Claims**



1. A semiconductor memory device comprising:
a plurality of memory cell blocks arranged in a column direction, each of said memory cell blocks comprising a plurality of word lines extending in a row direction and a plurality of pairs of bit lines extending in said column direction;
a plurality of sense amplifiers blocks arranged in said column direction, each of said sense amplifier blocks comprising a plurality of sense amplifiers coupled to said plurality of pairs of bit lines and a plurality of precharge circuits for precharging said plurality of pairs of bit lines; and
a redundant substitution unit comprising:
a memory cell group comprising at least one of said plurality of pairs of bit lines which is located within a same column range in each of said plurality of memory cell blocks;
a sense amplifier group corresponding to said memory cell group, said sense amplifier group comprising at least one of said plurality of sense amplifiers and one of said plurality of precharge circuits, located within a same column range in each of said plurality of sense amplifier blocks;
a column-select signal line extending in the column direction for selecting said sense amplifiers included in said sense amplifier group;
a precharge power-source line extending in the column direction for supplying precharge potential to said precharge circuits included in said sense amplifier group; and
disconnecting means for inhibiting the supply of the precharge potential to said precharge power-source line.

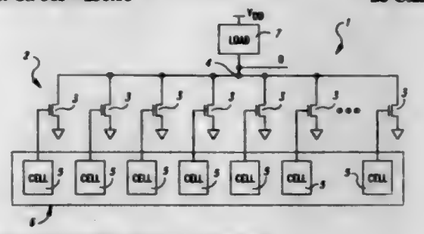
5,594,702
MULTI-FIRST-IN-FIRST-OUT MEMORY CIRCUIT
Larry N. Wakeman, Mountain View; Roy T. Myers, Jr., Santa Clara, and Wesley C. Lee, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Jun. 28, 1995, Ser. No. 495,867
Int. Cl.[6] G11C *8/00*; G06F *15/00*; H01J *3/00*
U.S. Cl. 365—230.05 **9 Claims**

1. A multi-first-in-first-out memory circuit comprising:
a memory comprising a plurality of first address terminals, a plurality of first data terminals, a plurality of second address terminals, a plurality of second data terminals and a plurality of groups, each group comprising a plurality of storage elements;



wherein said memory can supply data signals on said first data terminals driven by data values stored in a storage element identified by first address signals received on said first address terminals, and said memory can supply data signals on said second data terminals driven by data values stored in a storage element identified by second address signals received on said second address terminals;
further wherein said memory can use data signals received on said first data terminals to store data values in a storage element identified by first address signals received on said first address terminals, and said memory can use data signals received on said second data terminals to store data values in a storage element identified by second address signals received on said second address terminals;
a first address generator comprising a first address bus and a sequencer, said first address bus being coupled to said first address terminals;
wherein said sequencer allows said first address generator to supply first address signals of a storage element from each of said groups, said each group being successively selected by said sequencer from said plurality of groups; and
a second address generator comprising a second address bus and a group request terminal, said second address bus being coupled to said second address terminals;
wherein said second address generator supplies second address signals of successive storage elements from a second group, said second group being identified by a request signal on said group request terminal.

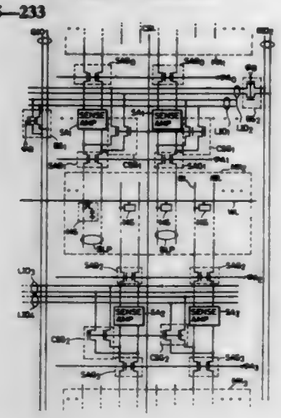
5,594,703
END-OF-COUNT DETECTING DEVICE FOR NONVOLATILE MEMORIES
Marco Olivo, Bergamo, and Marco Maccarrone, Palestro, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy
Filed Dec. 28, 1994, Ser. No. 365,510
Claims priority, application European Pat. Off., Dec. 28, 1993, 93830526
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—230.06 **28 Claims**



20. A nonvolatile memory, comprising:
a matrix of nonvolatile memory cells; and
a counting device, comprising,
a counter operable to generate a count value; and

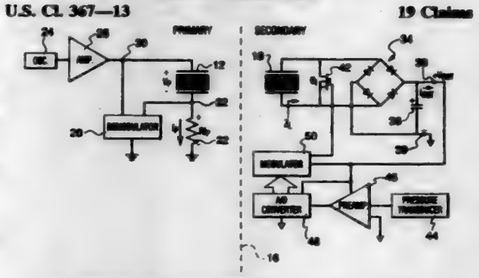
a wired-OR decoder in communication with said counter and operable to generate at an output terminal an end-of-count signal when said count value equals an end-of-count value.

5,594,704
SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE
Yasuhiro Konishi; Takayuki Miyamoto; Takeshi Kajimoto, and Hisashi Iwamoto, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 332,626, Oct. 31, 1994, which is a division of Ser. No. 46,333, Apr. 4, 1993, Pat. No. 5,384,745. This application Apr. 10, 1995, Ser. No. 419,566
Claims priority, application Japan, Apr. 27, 1992, 4-107424; Jun. 15, 1992, 4-155026
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—233 **5 Claims**



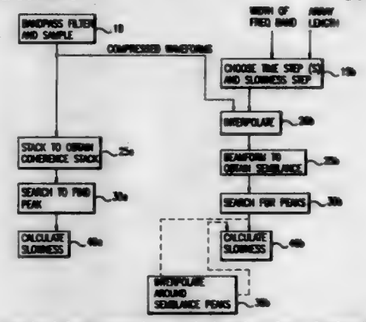
1. A synchronous semiconductor memory device, comprising:
a plurality of data input/output terminals for inputting or outputting data in parallel with each other;
a memory cell array having a plurality of memory cells arranged in a matrix of rows and columns;
a plurality of word lines each connecting one row of memory cells of said memory cell array;
a plurality of pairs of bit lines each connecting one column of memory cells of said memory cell array;
a data bus arranged over said memory cell array in parallel to said bit line pair;
column decode means for decoding a column selecting signal to select a column of said memory cell array;
column selecting lines arranged in parallel to said bit line pairs, for receiving and transmitting the column selecting signal from said column decode means; and
column selecting switch means provided for each of said bit line pair, responsive to a signal on said column selecting line for connecting the corresponding bit line pair to said data bus;
one column selecting line being coupled to said column selecting switch means such that the same number of bit line pairs as said data input/output terminals are simultaneously selected and the simultaneously selected bit line pairs are connected to said data bus through said column selecting switch means so as to correspond to different data input/output terminals from each other.

5,594,705
ACOUSTIC TRANSFORMER WITH NON-PIEZOELECTRIC CORE
Denis J. Connor; Gerald F. Cummings, both of Vancouver, and Michael J. Star, Richmond, all of Canada, assignors to Dynamotive Canada Corporation, Vancouver, Canada
Filed Feb. 4, 1994, Ser. No. 192,395
Int. Cl.[6] H04B *17/00*
U.S. Cl. 367—13 **19 Claims**



9. A transformer for transmitting energy across a medium, comprising:
(a) a primary piezoelectric transducer coupled to one side of said medium;
(b) a secondary piezoelectric transducer coupled to an opposite side of said medium;
(c) means for generating an AC signal driving across said primary transducer;
(d) means for varying the load on said secondary transducer;
(e) detecting means for detecting changes in current through and voltage across said primary transducer due to varying the load on said secondary transducer;
(f) a rectifier and filter at an output of said secondary transducer operative to produce a source of DC voltage on said opposite side.

5,594,706
DOWNHOLE PROCESSING OF SONIC WAVEFORM INFORMATION
Ramachandra Shenoy, W. Redding, and Shu-Kong Chang, Redding, both of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.
Filed Dec. 20, 1993, Ser. No. 170,567
Int. Cl.[6] G01V *1/40*
U.S. Cl. 367—76 **34 Claims**



1. A method for processing sonic logging data obtained from a borehole tool in a formation, said sonic tool having a sonic source, and a plurality of sonic receivers which are spaced apart from a reference point by distances Δz_i and which provide receiver waveforms x_i, said method comprising:
a) beamforming said sonic logging data by summing appropriately time-shifted versions of said receiver waveforms according to

$$b(\tau,p)=\sum_{k=0}^{M-1} x_k(\tau-(k\Delta z_k)p)$$

where k indexes said plurality of spaced sonic receivers, and b(τ,p) is a summation over a time variable τ and a slowness variable p; and

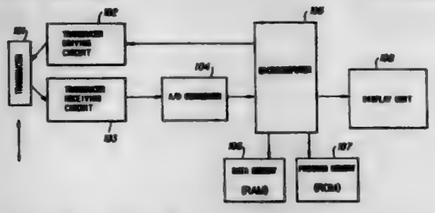
b) based on said summation, calculating semblance function values for said sonic logging data, wherein said semblance function values are calculated over a slowness-time grid utilizing a slowness step which is chosen based on the Nyquist sampling rate for the semblance function which relates to twice the bandwidth of said beamformed summation and to a distance between the furthest spaced of said plurality of spaced sonic receivers.

5,594,707

FISH FINDER

Minoru Goto, Kashiwa; Satoru Watanabe, Tokyo; Minoru Aoki, Chiba; Shuji Konishi, Narashino, and Koji Kato, Chiba, all of Japan, assignors to Uniden Corporation, Tokyo, Japan

Filed Oct. 2, 1995, Ser. No. 537,611
Claims priority, application Japan, Jun. 13, 1995, 7-146631
Int. Cl.[6] G01S *15/96*
U.S. Cl. 367—111 **43 Claims**



7. A fish finder comprising:

a transducer transmitting a supersonic wave and receiving an echo from obstacles under water;

a receiver for converting the echo received by said transducer to a supersonic echo signal;

a controller for measuring a depth of an obstacle based on a timing of receipt of said supersonic echo signal, obtaining an echo level depending on a physical quantity of said supersonic echo signal, removing a supersonic echo signal having an echo level less than a prespecified attenuation level, correcting an attenuation associated with propagation of a transmitted supersonic wave for a supersonic echo signal which is to be removed, prior to its removal, obtaining an echo level depending on a physical quantity of said supersonic echo signal after being subjected to attenuation correction, and determining the condition of the bottom based on echo signals of a series of supersonic echo signals which have been subjected to attenuation correction; and

a display unit having a first display area for providing graphic displays of said obstacle as well as of said bottom with a depth scale;

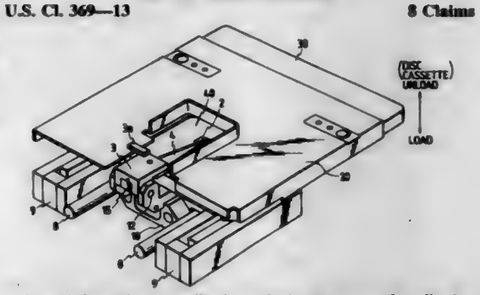
wherein said controller provides a result of detection at a position of corresponding depth scale on said first display area with the result depicted as a gradation or a pattern type corresponding to said echo level after attenuation correction.

5,594,708

MAGNETOOPTICAL DISC APPARATUS WITH MAGNETIC HEAD

Masahiko Chaya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 24,950, Mar. 2, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 467,395
Claims priority, application Japan, Mar. 6, 1992, 4-083053
Int. Cl.[6] G11B *11/00;33/02*
U.S. Cl. 369—13 **8 Claims**



1. An information recording/reproducing apparatus for effecting recording of information on and/or reproduction of information from a recording medium by applying a magnetic field modulated according to information while irradiating a light beam to the recording medium by an optical pickup, said apparatus comprising:

a magnetic head for generating the magnetic field;

a floating type slider for supporting said magnetic head;

a holder for supporting the recording medium, said holder being movable up and down for unloading and loading the recording medium;

discriminating means for discriminating whether the recording medium is a magnetic field modulation type or a non-magnetic field modulation type of recording medium, and for producing a discrimination result;

first escaping means, comprising a driving source, for moving said magnetic head to a first escaping position in accordance with the discrimination result of said discriminating means;

second escaping means for engaging a portion of said holder for moving said magnetic head to a second escaping position, which is a further distance from the recording medium than the first escaping position, in association with the up and down movement of said holder; and

a carriage on which said magnetic head, said floating slider, said first escaping means and said second escaping means are mounted.

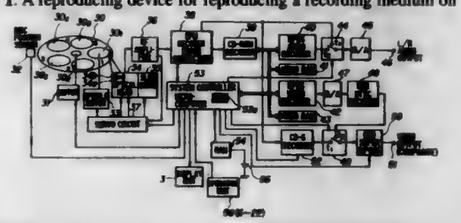
5,594,709

REPRODUCING DEVICE HAVING INDEX SEARCH FUNCTION AND ACCESS METHOD THEREFOR

Shuichi Nagano, and Kenji Tomizawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 13, 1995, Ser. No. 558,915
Claims priority, application Japan, Nov. 30, 1994, 6-319493
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—32 **11 Claims**

1. A reproducing device for reproducing a recording medium on



which plural programs and management information to manage the plural programs are recorded, comprising:

reproducing means for reproducing the management information and the programs from the recording medium;

judgment means for judging on the basis of the management information reproduced by said reproducing means whether index information to subdivide a program is recorded on the recording medium;

index access instruction means for instructing an access to an index point on a desired program;

setting means for judging on tile basis of a judgement result of said judgment means whether any index information exists in a program serving as an index access target when the access of the index point is instructed by said index access instruction means, and setting an index point through a predetermined calculation processing when no index information exists in the program serving as the index access target; and

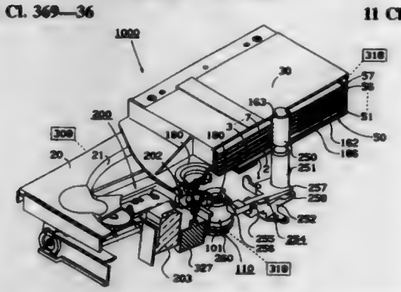
control means for performing a control operation to access to the set index point.

5,594,710

DISC PLAYER WITH A DISC-SECURING MECHANISM

Niro Nakamichi, Rancho Palos Verdes, Calif., assignor to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 3, 1994, Ser. No. 317,294
Claims priority, application Japan, Oct. 5, 1993, 5-273102
Int. Cl.[6] G11B *17/26*
U.S. Cl. 369—36 **11 Claims**



1. A disc player, for storing discs, each having a spindle hole, comprising:

a magazine having a plurality of means for holding a disc;

a playback position;

means for reading said selected disc, of said discs, in said playback position;

means for transporting said selected disc between said playback position and a store position in said magazine;

a first shaft extending into said magazine, through said spindle hole of at least one of said discs in said magazine and having an end in said magazine at a first position;

a second shaft extending into said magazine, coaxially aligned with and opposing said first shaft;

said second shaft extending through said spindle hole of at least another of said discs held in said magazine and having an end in said magazine at a second position;

said first and second positions defining a gap, aligned in a common plane with said playback position, said selected disc passing through said gap when said means for transporting said selected disc transports said selected disc between said store position in said magazine and said playback position;

means, responsive to all of said discs in said disc player being in said magazine, for moving said magazine to a predetermined position;

means for slidably mounting said second shaft; and

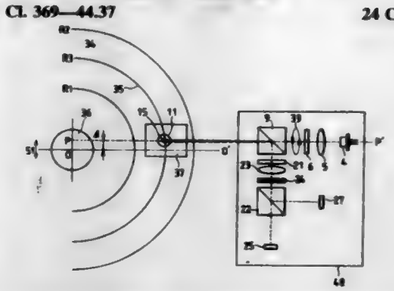
means for shifting said second shaft in an axial direction to a lock position, closing said gap, thereby securing said discs in said magazine by extensions of each of said first and second shafts through spindle holes of said discs.

5,594,711

OPTICAL RECORDING AND REPRODUCING APPARATUS USING A PLURALITY OF LIGHT SPOTS FOR RECORDING AND REPRODUCING

Osamu Koyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1994, Ser. No. 348,136
Claims priority, application Japan, Nov. 26, 1993, 5-296835
Int. Cl.[6] G11B *7/095*
U.S. Cl. 369—44.37 **24 Claims**



1. An optical recording and/or reproducing apparatus comprising:

focusing means for focusing a beam from a light source passing through an imaging optical system to image the beam as a plurality of fine light spots, for performing at least one of recording of information and reproduction of information, on the same track on an optical recording medium rotating and having substantially concentric tracks;

adjusting means for adjusting, with respect to a predetermined track, positions of a first light spot and a second light spot spaced apart from each other by a distance d, among the plurality of light spots;

tracking means for performing positioning in a direction transverse to the track of the optical recording medium, of the first light spot with respect to an arbitrary track, using return light from the optical recording medium, of the first light spot, while keeping a relative positional relation of the plurality of light spots relative to the predetermined track;

moving means for moving the plurality of light spots in parallel with a radial direction of the optical recording medium; and

means for setting Δ, P, R1, R2, and d so that the following relation holds:

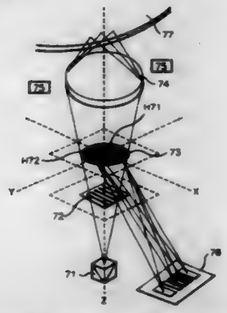
$$\Delta \leq P \cdot R1 \cdot R2/\{15 \cdot d \cdot (R2-R1)\}$$

where Δ is the distance between a center of rotation of the concentric tracks and a locus of the first light spot moving in the radial direction on the recording medium, d is the distance between the first light spot and the second light spot on said optical recording medium, R1 is the innermost radial position of the plurality of light spots moved by said moving means, from the center of rotation of the concentric tracks, R2 is the outermost radial position of the plurality of light spots moved by said moving means, from the center of rotation of the concentric tracks, and P is the track pitch of the optical recording medium.

5,594,712
OPTICAL PICKUP SYSTEM WITH FIVE LONGITUDINAL SPLITTED DETECTION AREAS TO PREVENT INFORMATION REPRODUCING ERROR BY WAVELENGTH VARIATIONS

Keun Y. Yang, Kyungki-do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Apr. 7, 1995, Ser. No. 418,511
Claims priority, application Rep. of Korea, Apr. 8, 1994, 7392/1994
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—112 **3 Claims**



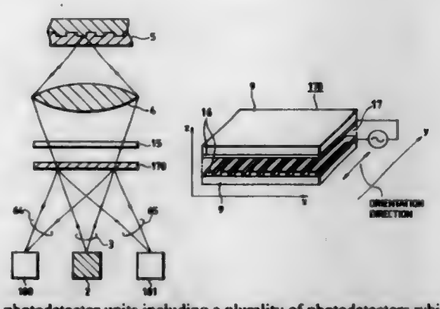
1. An optical pickup system for reading out/recording information from/on an optical disc comprising:
- a laser diode used as a light source;
- a grating for classifying a beam from said laser diode into three diffracted lights of zero, +first and −first orders;
- an objective lens placed between said grating and optical disc for focusing said three diffracted lights passed through said grating on said optical disc, and receiving the lights reflected from said disc;
- a photodetector divided-by-five for detecting a focus error and a tracking errors and reading out said information recorded on said optical disc, said photodetector formed of five split areas partitioned in the longitudinal direction to be arranged side by side in the sequence of fourth, first, second, third, and fifth split areas to receive said lights reflected from said optical disc; and
- a hologram element divide-by-two formed of a first hologram of which reference light position is a light-emitting point of said laser diode and an object light is focussed before passing said photodetector divided-by-five, and a second hologram of which reference light position is said light-emitting point of said laser diode and an object light is focussed after passing said photodetector divided-by-five, for diffracting the reflected lights from said optical disc prior to passing said photodetector divided-by-five.

5,594,713
OPTICAL PICKUP HEAD APPARATUS

Yoshiaki Komma, Kyoto; Seiji Nishino, Osaka; Makoto Kato, Nishinomiya, and Kaoru Matsuda, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 932,112, Aug. 19, 1992, Pat. No. 5,495,461. This application Nov. 29, 1995, Ser. No. 564,745
Claims priority, application Japan, Aug. 22, 1991, 3-210676; Jan. 8, 1992, 4-1313
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—112 **13 Claims**

2. An optical pickup head apparatus comprising:
- a radiation light source emitting a linearly polarized light beam;
- an imaging optics which receives a light beam emitted from said radiation light source, and converges the light beam to a small spot on an information medium;



photodetector units including a plurality of photodetectors which receive the light beam being reflected and diffracted at the information medium and output electric signals in accordance with received light quantities;
- a liquid crystal hologram which includes a liquid crystal of which a molecular axis is uniformly aligned in parallel to a substrate of said liquid crystal;

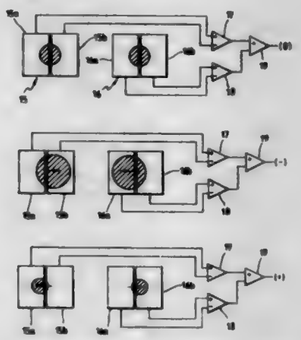
said liquid crystal hologram having a transparent substrate located closer to said information medium, said transparent substrate being made by a quarter wavelength plate which converts said linearly polarized light beam into a circular polarized light beam in a forward optical path leading from said radiation light source to said information medium and, to the contrary, restores thus converted circular polarized light beam into a linearly polarized light beam in a backward optical path leading from said information medium to said photodetector units; and

said photodetector units sensing light quantities of ±1-order diffraction light beams emitted from the liquid crystal hologram and calculating a summation of signals representing said light quantities so as to obtain an information signal.

5,594,714
FOCUS ERROR DETECTION WITH TWO SYMMETRICALLY SPLITTED REFLECTED BEAMS

Chul-woo Lee; Kyung-hwa Rim; Pyong-yong Seong, all of Seoul, and Chong-nam Chung, Sungnam, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,255
Claims priority, application Rep. of Korea, Jun. 30, 1994, 94-15695
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—118 **7 Claims**



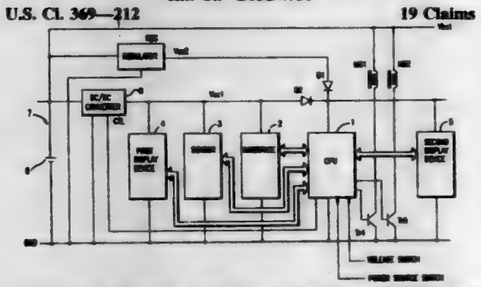
1. A focus error detector for detecting a focus error of an objective lens used for focusing a parallel incident light onto an optical disk, comprising:

a focusing lens for focusing a light having an optical axis, said optical axis defined by a left side and a right side to said axis, said light reflected from said optical disk and passed through said objective lens;
- a beam splitting member for splitting the reflected light focused by said focusing lens into two light rays, where said two light rays are positioned at an equal angle with respect to the left side and right side of the optical axis of said reflected light;
- two bi-segmented photo-detectors for detecting signals depending the received light intensity by respectively receiving said two light rays split by said beam splitting member; and
- circuit means for producing a focus error signal representing the degree of said focus error from the signal detected from said two bi-segmented photo-detectors, wherein said reflected light and said two light rays always have the same spot size.

5,594,715
EXPOSURE CONTROL DEVICE OF A CAMERA AND METHOD

Akira Ogasawara, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 13, 1995, Ser. No. 571,637
Claims priority, application Japan, Dec. 21, 1994, 6-318161
Int. Cl.[6] G03B 7/26
U.S. Cl. 369—212 **19 Claims**



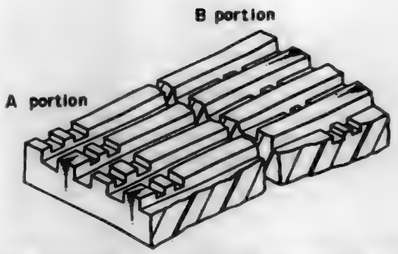
1. A camera exposure control device including a DC/DC converter on a power source line from a battery power source and exposure control means for controlling long exposure times, the camera exposure control device comprising control means for controlling the DC/DC converter to cease operation during film exposure by the exposure control means when the control means detects that the film exposure time of the exposure control means is set longer than a predetermined time.

5,594,716
OPTICAL DISK SUBSTRATE AND OPTICAL DISK EMPLOYING SAID OPTICAL DISK SUBSTRATE

Kazuo Inoue, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 137,985, Oct. 19, 1993, Pat. No. 5,477,526. This application Jun. 23, 1995, Ser. No. 494,178
Claims priority, application Japan, Mar. 10, 1993, 5-048836
Int. Cl.[6] G11B 7/00; 7/24
U.S. Cl. 369—275.4 **4 Claims**

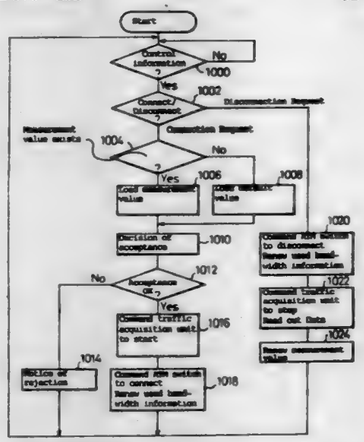
1. An optical disk substrate comprising:
- a plurality of sectors;
- tracks alternately formed into lands and grooves in a direction intersecting at right angles with a tracing direction during recording or reproducing of information;
- first address information regions formed with pit rows on a first track on a land; and
- second address information regions formed with pit rows on a second track in a groove neighboring said first track;
- wherein each of said first and second address information regions having opposite edges, and wherein said first and second address regions are disposed so as to have no overlapping relationship therebetween such that edges of said first address regions are spaced from edges of said second address regions.



5,594,717
CALL ADMISSION CONTROL IN ATM NETWORK

Yoshihiro Watanabe; Junichi Yamazaki, both of Kawasaki; Norihito Nishimoto; Yoshiharu Sato, both of Fukuoka; Shunji Abe, and Toshio Soumiya, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 373,453, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 87,807, Jul. 15, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 601,845
Int. Cl.[6] H04J 3/14
U.S. Cl. 370—232 **32 Claims**



30. A switch system for deciding admission of a call request, from a terminal station, requesting establishment of a call connection in a network, said switch system comprising:
- measuring means for measuring traffic characteristics with respect to call connections which are established;
- storing means for storing measured values of the traffic characteristics according to a type of the connection after the call connection is terminated; and
- deciding means for deciding propriety of a call admission in response to a call request, based on measured values corresponding to a type of a call connection required by the call request if the measured values are stored, and based on prescribed default values if the measured values are not stored.

5,594,718

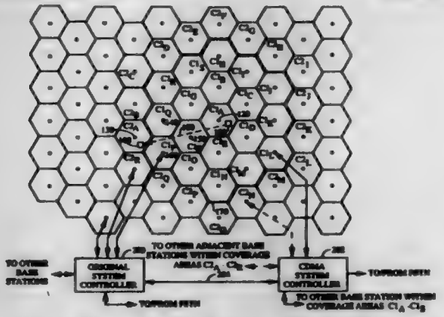
METHOD AND APPARATUS FOR PROVIDING MOBILE UNIT ASSISTED HARD HANDOFF FROM A CDMA COMMUNICATION SYSTEM TO AN ALTERNATIVE ACCESS COMMUNICATION SYSTEM

Lindsay A. Weaver, Jr., Boulder, Colo.; Gwain Bayley; Edward G. Tiedemann, Jr., both of San Diego, Calif., and Klein S. Gilhousen, Bozeman, Mont., assignors to Qualcomm Incorporated, San Diego, Calif.

Filed Mar. 30, 1995, Ser. No. 413,306

Int. Cl.[6] H04L 27/30

U.S. Cl. 370—331 **13 Claims**



1. In a system for providing communication with at least one mobile unit, said system comprising a first plurality of base stations providing code division multiple access (CDMA) communication, wherein said first plurality of base stations are clustered physically together, said system further comprising a second plurality of base stations providing communication using an alternative access communication technique wherein said second plurality of base stations surrounds said first plurality of base stations thereby creating a border set of base stations wherein said border set of base stations is a subset of said second plurality of base stations wherein each base station in said border set has a coverage area with a contiguous boundary with a coverage area corresponding to a base station of said first plurality of base stations, a method for providing handoff from said CDMA communication to said alternative access communication technique comprising the steps of:

transmitting from each base station in said first plurality of base stations an identifying pilot signal and CDMA call signals in a first frequency band;

transmitting from each base station in said border set of base stations an identifying pilot signal in said first frequency band and alternative access communication technique call signals in a different frequency band;

measuring at a first mobile unit a pilot signal strength of each of said identifying pilot signals corresponding to a neighboring set of base stations wherein said neighboring set of base stations comprises base stations having coverage areas in proximity to said first mobile unit;

receiving at said first mobile unit a first pilot signal corresponding to a target base station wherein said target base station is a member of said border set of base stations and wherein said target base station is a member of said neighboring set of base stations;

transmitting a message from said first mobile unit to a CDMA system controller via at least one base station in said first plurality of base stations wherein said message indicates receipt of said first pilot signal; and

initiating by said CDMA system controller an intersystem handoff procedure for said first mobile unit with an alternative access communication technique system controller, said CDMA system controller determining availability of resources among said second plurality of base stations through intersystem communication with said alternative access communication technique system controller during said intersystem handoff procedure.

6. A cellular communication system for providing communication with at least one mobile unit, said system comprising:

a first plurality of base stations clustered physically together for providing code division multiple access (CDMA) communication signals wherein each base station of said first plurality of base stations transmits an identifying pilot signal and wherein said first plurality of base stations are controlled by a CDMA system controller;

a border set of base stations controlled by an alternative system controller in intersystem communication with said CDMA system controller wherein said border set of base stations is a subset of a second plurality of base stations for providing communication using an alternative access communication technique wherein said second plurality of base stations surrounds said cluster of said first plurality of base stations and wherein each base station in said border set has a coverage area with a contiguous boundary with a coverage area corresponding to a base station of said first plurality of base stations and wherein each base station of said border set comprises a self contained pilot generator for providing a transmit pilot signal apparatus comprising:

I channel short code generator means for receiving a universal time input and creating an I channel spreading sequence at a time offset;

a first baseband filter for receiving said I channel spreading sequence and providing a filtered I channel spreading sequence;

a first mixer for modulating said filtered I channel spreading sequence and producing a modulated I output signal;

Q channel short code generator means for receiving a universal time input and creating a Q channel spreading sequence at said time offset;

a second baseband filter for receiving said Q channel spreading sequence and providing a filtered Q channel spreading sequence;

a second mixer for modulating said filtered Q channel spreading sequence and producing a modulated Q output signal;

a summer for summing said modulated I output signal and said modulated Q output signal to produce a summed modulated signal; and

upconversion and amplification means for receiving said summed modulated signal and producing said transmit pilot signal.

5,594,719

METHOD FOR CONTROLLING ECHO CANCELLER CIRCUIT

Dea-Sung Oh, and Dong-Jin Shin, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

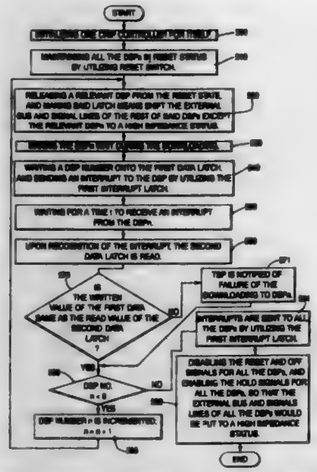
Filed Nov. 29, 1994, Ser. No. 350,019

Claims priority, application Rep. of Korea, Jul. 12, 1994, 94-16752

Int. Cl.[6] H04J 3/00

U.S. Cl. 370—286 **5 Claims**

1. A method for controlling an echo canceller circuit including a bus matching circuit for sending and receiving information to and from a time switched control processor of a public land mobile network, a buffer for temporarily storing information transmitted between the time switched control processor and the echo canceller circuit, a data storage for storing a program for processing digital signals to cancel the echo in PCM encoded voice data, a plurality of digital signal processors which are downloaded with the program to carry out removal of the echo in PCM encoded voice data, a one chip controller for performing control functions of the echo canceller circuit, a decoder for receiving addresses outputted from the one chip controller for selecting a device in accordance with the received address, a latch circuit for latching control data required for controlling the plurality of digital signal processors by the one chip controller, an interrupt encoder for sending the required control data to the one chip controller to provide an identification of which digital signal processor of the plurality of



digital signal processors generated an interrupt, and a matching circuit for transmitting PCM encoded voice data to a time switch device, said method comprising the steps:

after completion of initialization the one chip controller, controlling a reset latch to place respective reset terminals of the digital signal processors in a first state to maintain all of the digital signal processors in a reset state;

releasing one digital signal processor from the reset state for downloading the program to the one released digital signal processor from the data storage and downloading the program to the one released digital signal processor from the data storage and processing the PCM encoded data with the program to remove the echo from the PCM encoded voice data;

causing the latch circuit to place an external bus and signal lines of all of the plurality of digital signal processors except the one digital signal processor in a high impedance status and then, starting a downloading of the program to the released one digital signal processor;

waiting when the downloading of the program to the released one digital signal processor is being performed;

after the completion of the downloading of the program, writing a number of the released one digital signal processor into a first data latch to signal the number of the one released digital signal processor to the released one digital signal processor and sending an interrupt to another one of the plurality of digital signal processors;

writing the number of the one released digital signal processor into a second data latch;

waiting for a period of time until an interrupt comes from the another one of the plurality of digital signal processors;

upon recognizing the interrupt from the another one of the plurality of digital signal processors, reading data written into the second data latch, and making a comparison to determine if a value of the data written into the second data latch corresponds to a value of the data written into the first data latch;

if it is determined that the two values correspond with each other, determining if the downloading to the another one of the plurality of digital signal processors has been successfully carried out, and checking if any other of the plurality of digital signal processors is to be downloaded with the program;

if it is determined that there are other of the plurality of digital signal processors to be downloaded with the program, downloading the program to the other of the plurality of the digital signal processors from the data storage and;

if it is determined that the two values do not correspond with each other attempting to again download the program to the other of the plurality of digital signal processors;

if the attempting to again download is unsuccessful, signalling a failure of the downloading to the other of the plurality of digital signal processors to the time switched control processor;

when downloading of all of the plurality of digital signal processors with the program is completed, sending a second interrupt to all of the plurality of digital signal processors through the second data latch to command all of the digital signal processors to terminate downloading and resume their operations;

disabling reset and off signals for all of the plurality of digital signal processors, and enabling hold signals for all of the plurality of digital signal processors so that the external bus and signal lines of all of the plurality of digital signal processors are placed in a high impedance status; and

the plurality of digital signal processors process the PCM encoded data with the program to remove the echo from the PCM encoded data.

5,594,720

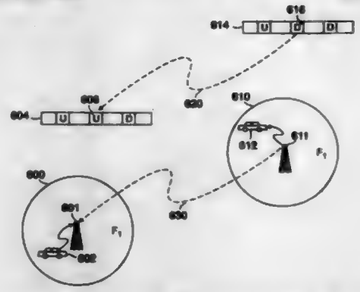
MULTIPLE ACCESS CELLULAR COMMUNICATION WITH DYNAMIC SLOT ALLOCATION AND REDUCED CO-CHANNEL INTERFERENCES

Haralabos C. Papadopoulos, Cambridge, Mass., and Carl-Erik W. Sundberg, Chatham, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 157,778, Nov. 24, 1993, Pat. No. 5,420,851. This application Dec. 27, 1994, Ser. No. 364,579

Int. Cl.[6] H04J 4/00; H04Q 7/36

U.S. Cl. 370—330 **34 Claims**



1. A communication system for communicating information in slots of a frame, the system comprising:

a first base station associated with a first cell and adapted to transmit downlink information to users in the first cell and to receive uplink information from users in the first cell, the first base station including a potentially-interfering antenna;

a second base station associated with a frequency reuse cell and adapted to transmit downlink information to users in the frequency reuse cell and to receive uplink information from users in the frequency reuse cell, the second base station including a potentially-interfered-with antenna, wherein the potentially-interfering antenna can interfere with reception of uplink information in the potentially-interfered-with antenna; and

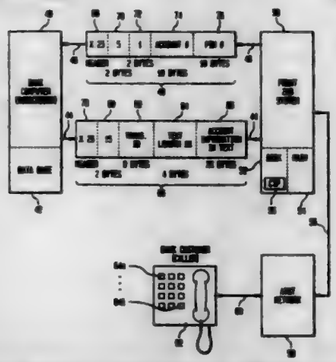
means for allocating the slots to users in each of the cells such that the potentially-interfering antenna transmits downlink information in a different portion of the frame than that in which the potentially-interfered-with antenna receives uplink information.

5,594,721

METHOD AND SYSTEM FOR IMPLEMENTING AN APPLICATION PROTOCOL IN A COMMUNICATION NETWORK

Lyndon M. Pan, Little Silver, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 28, 1994, Ser. No. 365,273
Int. Cl.[6] H04L 12/56
U.S. Cl. 370—392 29 Claims



15. An apparatus for implementing an application protocol in a communication network, comprising:

a) means for defining one or more customer transaction profiles, each of said one or more profiles associated with a unique subscriber identification number and an application protocol; and

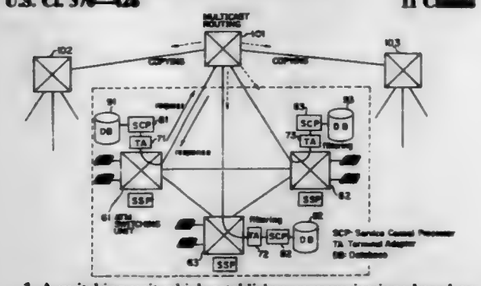
b) a front end system having a disk memory for storing said one or more customer transaction profiles, a main memory into which said one or more customer transaction profiles can be loaded to create one or more loaded profiles, and a means for using said loaded profiles to translate one or more input messages sent from a user of the communication network to a communication network subscriber, and for using said loaded profiles to translate one or more output messages sent from said subscriber to said user.

5,594,722

PERSONAL COMMUNICATION METHOD AND SYSTEM

Ichiro Iida, and Toshihiko Kurita, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 99,163, Jul. 29, 1993, Pat. No. 5,440,541. This application May 2, 1995, Ser. No. 433,924
Claims priority, application Japan, Dec. 16, 1992, 4-336026
Int. Cl.[6] H04J 3/12;3/26,
U.S. Cl. 370—426 11 Claims



1. A switching unit which establishes communications based on a group number of a group to which each user belongs and a local number specifying a user in the group, comprising:

source user personal number receiving means for receiving from a source terminal unit the group number and the local number of a source user;

storage means for storing the group number of the source user;

destination user number receiving means for receiving the local number of a destination user from the source terminal unit; and

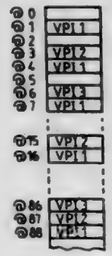
control means for establishing communications to an entered terminal unit of the destination user according to a destination user personal number obtained by adding the group number of the source user stored in said storage means to the local number of the destination user.

5,594,723

ATM INFORMATION SYSTEM AND MULTIPLEXER FOR ASSIGNING AND CONTROLLING ACCESS TIME

Georges Tibi, Fontenay aux Roses, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1994, Ser. No. 217,525
Claims priority, application France, Mar. 31, 1993, 93 03775
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—396 11 Claims



1. A communication system comprising:

a network for transmitting information cells from one of a plurality of accesses to another access; and

an information multiplexing device operatively connected to said one of said accesses, said multiplexing device comprising:

a plurality of access terminals for receiving information cells to be transmitted to a destination access at a predetermined rate;

a connecting terminal for connecting said multiplexing device to said network;

a plurality of service circuits, each service circuit including at least one queue element for storing said information cells;

a common data line for coupling an output of each of said plurality of service circuits to said connecting terminal;

an assigning element for assigning access time to said common data line for each queue element within each service circuit, said assigning element including:

an assignment table including destination codes defining respective destinations, wherein a selected one of said destination codes is distributed throughout said assignment table whereby the number of occurrences of said selected one of said destination codes corresponds to a respective transmit rate for a corresponding one of said respective destinations; and

a table reading element for reading said destination codes at a predetermined rate; and

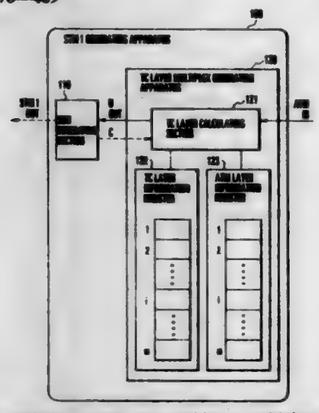
a decoding set for analyzing said destination codes output by said assigning element to control the access to the common data line by said at least one queue element of each of said service circuits.

5,594,724

TRANSMISSION CONVERGENCE SUBLAYER MULTIPLEX GENERATING/TERMINATING APPARATUS

Masao Akata; Takao Miura; Takeshi Ogawa, all of Tokyo; Yukihiro Doi; Isao Higashi, both of Saitama, and Hitoshi Imagawa, Tokyo, all of Japan, assignors to NEC Corporation, and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Sep. 1, 1995, Ser. No. 522,555
Claims priority, application Japan, Sep. 2, 1994, 6-209563
Int. Cl.[6] H04L 12/66
U.S. Cl. 370—469 2 Claims



1. A transmission convergence sublayer multiplex generating apparatus which receives ATM layer cells through an ATM layer information input line, generates ATM transmission convergence sublayers (TC layers) for a plurality of paths, and receives a TC layer information output request on a control line to output TC layer information to a TC layer information output line, comprising:

a TC layer calculating section;

a TC layer information storing section for storing TC layer information in correspondence with each of said plurality of paths; and

an ATM layer information storing section for storing ATM layer information in correspondence with each of said plurality of paths,

wherein said TC layer calculating section includes means for, when receiving an ATM layer cell, storing the ATM layer cell in said ATM layer information storing section corresponding to a path number on the basis of header information of the ATM layer cell, and for, when receiving a TC layer information read request for one of said plurality of paths through said control line, generating header error control information and scrambling a payload portion of the ATM layer cell by time division multiplex processing using ATM layer information of a corresponding path which is stored in said ATM layer information storing section to generate TC layer information, storing the TC layer information in said TC layer information storing section of the corresponding path, and outputting the TC layer information of the corresponding path to the TC layer information output line.

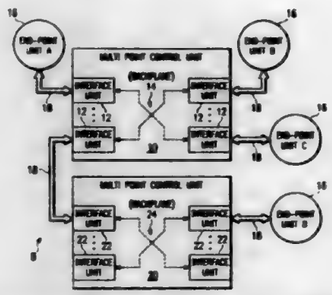
5,594,725

PROCESS AND SYSTEM FOR VIDEO RATE CONTROL IN A MULTIPOINT VIDEO CONFERENCE

Paul V. Tischler, and Bill Clements, both of Austin, Tex., assignors to Vtel Corporation, Austin, Tex.

Filed Dec. 28, 1995, Ser. No. 580,137
Int. Cl.[6] H04N 7/18; H04J 3/22
U.S. Cl. 370—260 20 Claims

1. A multipoint video conference system having video rate control and allowing communication of audio, video and data



information between end-point units, the multipoint video conference system comprising:

a multipoint control unit having a plurality of interface units located therein, each interface unit operable to communicate with other interface units via a backplane of the multipoint control unit; and

a plurality of end-point units, each end-point unit coupled to an associated interface unit;

each end-point unit operable to communicate and process real data information and operable to receive and resend fill data information;

the multipoint control unit operable, with respect to each participating end-point unit in a data channel, to allow communication of real data information and, with respect to each non-participating end-point unit, to allow communication of an equal amount of fill data information;

each interface unit operable to transmit real data information to a participating end-point unit and to transmit fill data information to a non-participating end-point unit; and

each non-participating end-point unit operable to retransmit fill data information back to an associated interface unit;

such that available bandwidth for video information remains balanced for all end-point units when a data channel is open between participating end-point units.

5,594,726

FREQUENCY AGILE BROADBAND COMMUNICATIONS SYSTEM

Leo J. Thompson, Lilburn; Gregory T. Dubberly, Atlanta, and John A. Ritchie, Jr., Duluth, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

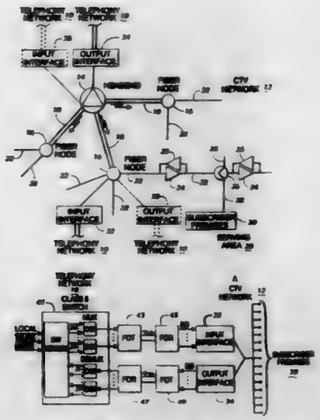
Continuation-in-part of Ser. No. 123,363, Sep. 17, 1993, Pat. No. 5,499,241. This application Mar. 30, 1994, Ser. No. 219,848
Int. Cl.[6] H04J 1/00
U.S. Cl. 370—485 113 Claims

12. An apparatus for the communication of telephony signals to and from a telephony network and to and from a plurality of subscribers of a subscription system including a subscription network having a first band of frequencies for communicating signals to subscribers in the subscription network and a second band of frequencies for communicating signals from the subscribers, comprising:

a telephony network modulator for modulating the telephony signals from the telephony network on said first band of said subscription network utilizing a first modulation scheme;

a subscriber terminal including a subscriber terminal demodulator for demodulating the telephony signals in said first band from the subscription network and coupling them to a subscriber;

at least one frequency agile second modulator for modulating telephony signals from said subscriber in a selected one of a plurality of frequeacy subbands in said second band of the subscription network utilizing a second modulation scheme; and



a telephony network demodulator for demodulating the telephony signals from said second band of the subscription network and coupling them to the telephony network.

5,594,727

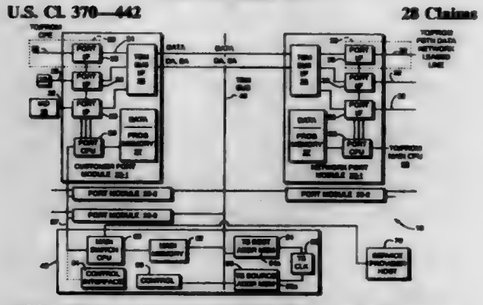
TELEPHONE SWITCH PROVIDING DYNAMIC ALLOCATION OF TIME DIVISION MULTIPLEX RESOURCES

Chuck Kelleneon, North Andover; Paul Nelson, Georgetown, both of Mass.; Kenneth St. Hilaire, Hollis; Alan Tingley, Salem, both of N.H.; Gerry Tenuta, Burlington, Mass., and Peter Sandstrom, Sanbornton, N.H., assignors to Summa Four, Inc., Manchester, N.H.

Filed Sep. 19, 1994, Ser. No. 308,135

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—442 **28 Claims**



24. A method of connecting signals from a customer port on a customer port module to a network port on a network port module, the method including the steps of:

A. receiving at a customer port module signals that indicate a connection request to a network port module;

B. determining a bandwidth demand for the port requesting the connection by

a. detecting protocols that include in-band signaling information that indicates the bandwidth demand of the requesting port; and

b. determining from the in-band signaling information the number of time slots required to support the bandwidth demand;

C. dynamically allocating to the requesting port a number of time slots required to meet the bandwidth demand; and

D. establishing a connection between the requesting port and a network port.

5,594,728

REALTIME ADDRESSING FOR HIGH SPEED SERIAL BIT STREAM

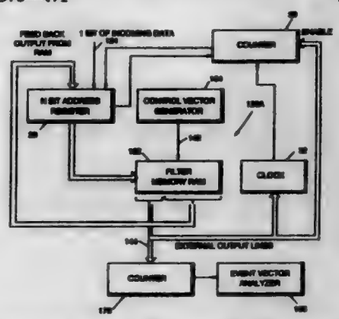
Paul C. Hershey, Manassas, Va., and John G. Waclawsky, Frederick, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 188,167, Jan. 26, 1994, abandoned.

This application Oct. 31, 1995, Ser. No. 551,283

Int. Cl.[6] H04L *12/417;12/46*

U.S. Cl. 370—471 **6 Claims**



1. In a system for monitoring and controlling a data communications network which communicates a serial stream of binary bits having a characteristic pattern representing a data frame comprising a starting delimiter, a frame sequence field, an end delimiter, a physical control field, and a presence bit, a method for locating a variably placed frame information field in said data frame with respect to said starting delimiter, a method comprising the steps of:

transmitting on the network said data frame which includes said presence bit indicating the presence of a variable length routing field whose length is defined by a length field in said data frame, said length field containing a numeric value indicative of the length of said variable length routing field;

inputting said data frame into a dynamically re-programmable passive digital filter (DRPDF) programmed to identify said starting delimiter and said presence bit;

branching in said DRPDF to a first path in response to said presence bit, to ignore a plurality of bits in said variable length routing corresponding to said numeric value in said length field; and

branching in said DRPDF to a second path after said plurality of bits have been ignored, to locate the variably placed frame information field in said data frame; and interpreting in said DRPDF the variably placed frame information field in said data frame for network monitoring and control purposes on a real time basis.

5,594,729

SYSTEM AND METHOD FOR EMPLOYING SINGLE-BIT FEEDBACK CONTROL WITHIN A VARIABLE BIT RATE DATA TRANSMISSION NETWORK

Hemant R. Kanakia, New Providence, and Partho P. Mishra, Chatham, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

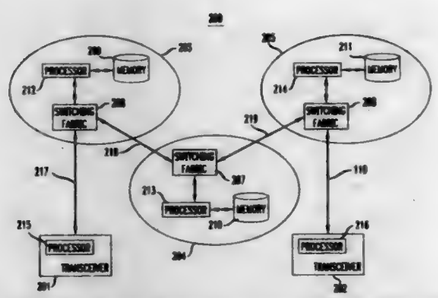
Filed Sep. 23, 1994, Ser. No. 311,879

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—391 **13 Claims**

1. A method for effecting single-bit feedback control within a data transmission system, comprising the steps of:

determining the instantaneous value of a particular varying parameter, for example, queue size, current transmission rate or link utilization;



retrieving a specific number P associated with the determined instantaneous value of said varying parameter, wherein P has a value between 0 and P_{max};

generating a random number having a value that is uniformly distributed between 0 and P_{max}; and

conditionally setting a feedback bit as a function of the comparative values of the generated number and the retrieved number P.

5,594,730

DATA DISTRIBUTION SYSTEM AND METHODS FOR ITS USE

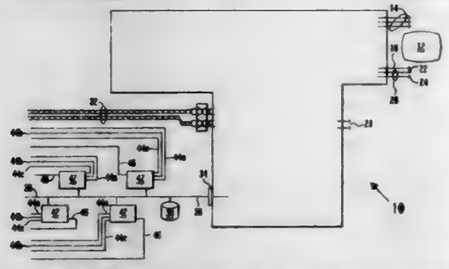
Mark C. Koz, 2752 Glorietta Cir., Santa Clara, Calif. 95051, and Masato Hata, 970 Corte Mader Ave.,#808, Sunnyvale, Calif. 94086

PCT No. PCT/US92/04944, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO93/26095, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 11, 1992, Ser. No. 196,203

Int. Cl.[6] H04H *1/00*

U.S. Cl. 370—488 **19 Claims**



1. A subscriber system adapted for autonomous operation in combination with other similar subscriber systems for collectively and swiftly distributing multiple copies of digital data respectively to a large number of other subscriber systems, each subscriber system comprising:

a control processor for controlling overall operation of said subscriber system:

a communication subsystem operating under the supervision of said control processor for receiving a copy of the digital data transmitted to said subscriber system;

a storage device operating under the supervision of said control processor for storing the copy of the digital data received by said communication subsystem; and

an autonomous digital data communication subsystem operating under the supervision of said control processor for autonomously obtaining a copy of the digital data directly from said storage device and transmitting the digital data to another subscriber system.

5,594,731

ACCESS POINT TRACKING FOR MOBILE WIRELESS NETWORK NODE

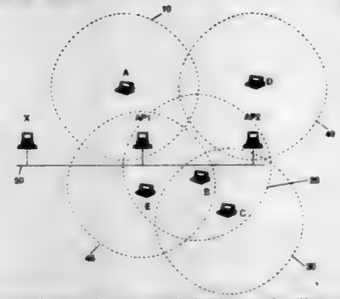
Peter E. Reissner, Belleville, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 24, 1995, Ser. No. 506,411

Claims priority, application Canada, Jul. 29, 1994, 2129193

Int. Cl.[6] H04L *12/40;* H04J *3/02*

U.S. Cl. 370—338 **18 Claims**



1. A node for use in a network having a plurality of internetworking nodes, said node comprising

wireless network adapter means to send data by wireless communication to other nodes in the network and to receive data by wireless communication from other nodes in the network;

recognition means to select data received through said wireless network adapter means from an internetworking node and containing information as to the address of such internetworking node.

means for maintaining a table of internetworking nodes using the selected data,

means for updating said table each time data is selected. and

means for deleting from said table any internetworking node for which the selected data does not meet a desired criterion.

5,594,732

BRIDGING AND SIGNALLING SUBSYSTEMS AND METHODS FOR PRIVATE AND HYBRID COMMUNICATIONS SYSTEMS INCLUDING MULTIMEDIA SYSTEMS

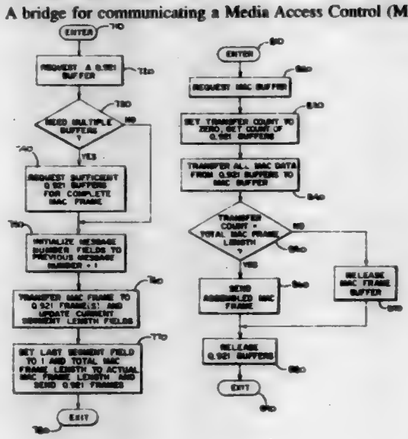
Robert T. Bell, Garland, and Richard B. Platt, Allen, both of Tex., assignors to Intecom, Incorporated, Dallas, Tex.

Filed Mar. 3, 1995, Ser. No. 397,986

Int. Cl.[6] H04J *3/02*

U.S. Cl. 370—401 **64 Claims**

1. A bridge for communicating a Media Access Control (MAC)



layer frame over an isochronous signalling channel, comprising:

a frame reception and storage circuit coupled to a nonisochronous network, said frame reception and storage circuit capable of receiving said MAC layer frame from said nonisochronous network and storing said MAC layer frame in said frame reception and storage circuit; and

a frame encapsulation circuit coupling said frame reception and storage circuit and said isochronous signalling channel, said frame encapsulation circuit capable of encapsulating said stored MAC layer frame into a first frame and queuing said first frame for transmission over said isochronous signalling channel.

5,594,733

MULTI-STATION BUS SYSTEM HAVING MEANS FOR POLLING AND UPDATING OF GLOBALLY RELEVANT INFORMATION, IN PARTICULAR A STATION ADDRESS, AND STATION FOR USE IN SUCH SYSTEM

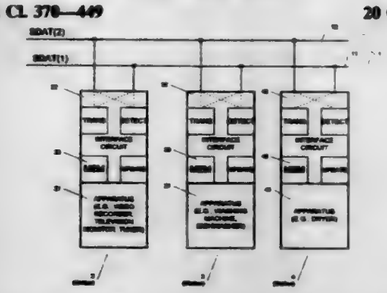
Joost-Pieter Katoen, and Marnix C. Vlot, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1992, Ser. No. 943,368

Claims priority, application European Pat. Off., Sep. 10, 1991, 91202304

Int. Cl.[5] H04L *12/403*

U.S. Cl. 370—449 20 Claims



1. A communication system having multiple and uniformly weighted stations interconnected by a shared digital bus, wherein no single station acts as overall controller of bus interactions, characterized in that a particular station comprises:

a) transmitting means for recurrently transmitting on the digital bus a data packet, representing an information item globally relevant to the other stations of the system, with a predetermined maximum recurrence interval between recurring transmissions of the data packet;

b) detecting means for detecting counter signalizations by a subset of the other stations; and

c) updating means for changing the information item in response to a non-unanimous counter signalization from the subset of other stations, and wherein the counter signalization of each station is one of (i) a response by a station and (ii) no response by a station, and the non-unanimous counter signalization for a transmitted data packet is one of i) a response from less than all of the stations of the subset when all of the stations of the subset should have responded to the transmission of the data packet and ii) a response from a station of the subset when none of the stations of the subset should have responded to the transmission of the data packet.

5,594,734

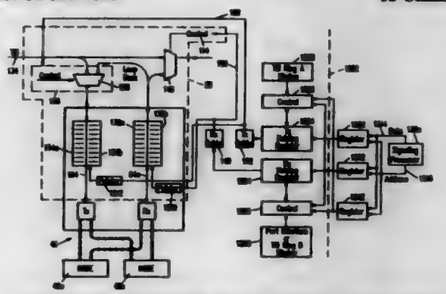
ASYNCHRONOUS PROCESSOR ACCESS TO A SWITCH TABLE IN A NETWORK WITH ISOCHRONOUS CAPABILITY

Debra J. Worsley, Vista; Michael T. Werstleia, Sunnyvale, and Richard W. Thaik, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 969,916, Nov. 2, 1992, abandoned. This application Nov. 1, 1993, Ser. No. 146,336

Int. Cl.[6] H04L *12/43*

U.S. Cl. 370—395 18 Claims



1. In a computer-controlled system having a microprocessor operating according to a clock and an updatable table operating asynchronously of said clock, said updatable table outputting control data for controlling data transfer in said system, apparatus for updating said updatable table, comprising:

register means for receiving update data from said microprocessor during a first time period at a data rate corresponding to said clock and outputting said update data to said updatable table;

means, coupled to said register means, for determining the beginning of a second period of time during which said updatable table is not being used and for updating said updatable table during said second period, asynchronously with said clock, using at least some of said update data.

5,594,735

TDMA MOBILE UNIT FREQUENCY SYNTHESIZER HAVING POWER SAVING MODE DURING TRANSMIT AND RECEIVE SLOTS

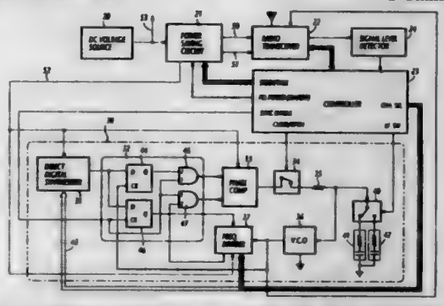
Jun Jokura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 46,194, Apr. 12, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 353,974

Claims priority, application Japan, Apr. 10, 1992, 4-91172; Apr. 30, 1992, 4-111492; Apr. 30, 1992, 4-111541

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—337 2 Claims



1. A frequency synthesizer of a mobile unit for a time division multiple access cellular communication system, said system having a plurality of cell site stations each being assigned a channel of

unique frequency for carrying a sequence of transmit/receive slots and idle slots, the frequency synthesizer comprising:

a reference pulse source for generating a reference pulse;

a phase comparator having a first input terminal responsive to said reference pulse, a second input terminal and an output terminal;

first and second loop filters;

a voltage-controlled oscillator;

first switch means for establishing a connection between the output terminal of said phase comparator and the loop filters;

second switch means for connecting one of said first and second loop filters to said voltage-controlled oscillator; and

a frequency divider connected to said voltage-controlled oscillator for supplying a pulse at a submultiple of an output frequency of the voltage-controlled oscillator to the second input terminal of said phase comparator;

a controller for:

a) activating said reference pulse source and said frequency divider and operating said first switch means to establish said connection;

b) operating said second switch means to exclusively connect said first loop filter to said voltage-controlled oscillator, and operating one of the reference pulse source and the frequency divider so that a channel is established between the mobile unit and a first cell site station;

c) operating said first switch means to clear said connection and deactivating said reference pulse source and said frequency divider to thereby allow signals to be exchanged between the mobile unit and said first cell site station during a transmit/receive slot of said channel in a power saving mode;

d) activating said reference pulse source and the frequency divider, operating said first switch means to re-establish said connection, operating said second switch means to exclusively connect said second loop filter to said voltage-controlled oscillator, and operating one of the reference pulse source and the frequency divider during an idle slot of the channel to receive a signal from a second cell site station;

e) operating one of the reference pulse source and the frequency divider and operating said second switch means to exclusively connect said first loop filter to said voltage-controlled oscillator so that signals can be exchanged between said mobile unit and the first cell site station during a subaequent transmit/receive slot of the channel; and

f) repeating the steps (c) to (e).

5,594,736

IMAGE-INFORMATION STORAGE REGENERATING DEVICE

Masahiro Tatsumi; Noritaka Koizumi, both of Chiba; Keiichi Hibi, Matsudo; Tsuneaki Iwano, Tokyo; Hiroyuki Ito, Chiba; Osamu Nakamura, Hanno, and Hirotaka Nakano, Musashino, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

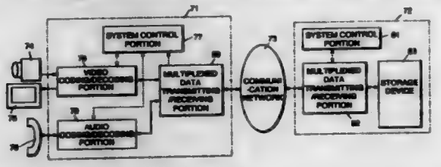
Filed Dec. 23, 1994, Ser. No. 364,891

Claims priority, application Japan, Dec. 24, 1993, 5-328365; Dec. 24, 1993, 5-328555; Dec. 24, 1993, 5-328717; Dec. 24, 1993, 5-328822

Int. Cl.[6] H04J *3/24*

U.S. Cl. 370—474 11 Claims

1. An image-information storage regenerating device comprising:



multiplexed data transmitting and receiving means for receiving multiplexed data from a terminal and storing the received multiplexed data, said terminal multiplexing any of video data, audio data and control data to provide the multiplexed data, and for transmitting the stored multiplexed data to said terminal as regenerated data; and

storage means for storing therein the received multiplexed data received by said multiplexed data transmitting and receiving means and for outputting therefrom the stored multiplexed data to said multiplexed data transmitting and receiving means for regeneration,

said multiplexed data transmitting and receiving means separating the received multiplexed data into separated video data, audio data and control data and storing the separated video data in said storage means frame by frame as continuous video frames.

5,594,737

ARRANGEMENT FOR CONTROLLING A TRANSMITTING/RECEIVING DEVICE OF BASE STATIONS AND/OR MOBILE UNITS, IN PARTICULAR OF A CORDLESS TELEPHONE SYSTEM

Klaus-Dieter Pilhekamp, Erkrath, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

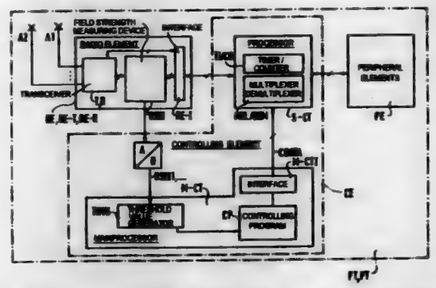
PCT No. PCT/DE93/01045, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO94/10812, PCT Pub. Date May 11, 1994

PCT Filed Nov. 2, 1993, Ser. No. 424,275

Claims priority, application Germany, Nov. 2, 1992, 9214886 U

Int. Cl.[6] H04J *3/16*; H04M *11/00*

U.S. Cl. 370—278 8 Claims



1. An arrangement for controlling a transmitting/receiving device of base stations and/or mobile units, in particular of a cordless telephone system, comprising:

each of the base stations and the mobile units having a processor, to which a controlling program is assigned and voice to be transmitted being compressed on a transmission side, transmitted by a transmitting device of a first transmitting/receiving device within a radio link and received by a receiving device of a second transmitting/receiving device and expanded;

the controlling program effecting actuation of the transmitting device of the first transmitting/receiving device substantially only during fixed, predetermined transmission times within a transmission time frame and effecting actuation of the receiving device of the second transmitting/receiving device substantially only during fixed, predetermined reception times within the transmission time frame;

modules for monitoring a frame clock that determines the transmission time frame, the modules being excepted from the time-related activation.

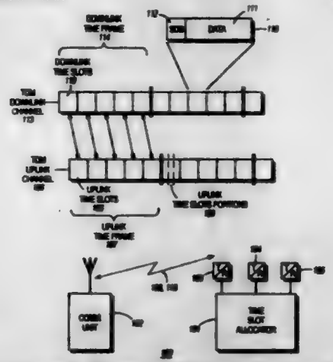
5,594,738
TIME SLOT ALLOCATION METHOD

Kenneth J. Crisler, Lake Zurich, and Michael L. Needham, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 137,541, Oct. 18, 1993, Pat. No. 5,515,379. This application Jun. 23, 1995, Ser. No. 494,618

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—347 **13 Claims**



1. In a communication system that includes a communication unit, an uplink communication channel, a downlink communication channel, and a time slot allocator, the uplink communication channel being divided into a plurality of uplink time slots, the downlink communication channel being divided into a plurality of downlink time slots having a one-to-one correspondence with the plurality of uplink time slots, a method for allocating the plurality of uplink time slots to the communication unit, the method comprising the steps of:

a) transmitting, by the communication unit, a first packet in an available uplink time slot of the plurality of uplink time slots;

b) upon receiving the first packet, determining, by the time slot allocator, whether the first packet contains a request for allocation of N uplink time slots, wherein N is an integer greater than one;

c) when the first packet contains the request for allocation of N uplink time slots, determining, by the time slot allocator, whether N uplink time slots are available;

d) when the N uplink time slots are available, allocating, by the time slot allocator, the N uplink time slots to the communication unit to produce N allocated uplink time slots, wherein the N allocated uplink time slots are substantially contiguous in time; and

e) transmitting, by the time slot allocator, an allocation indication to the communication unit in each of N downlink time slots, wherein the N downlink time slots correspond to the N allocated uplink time slots and wherein the allocation indication indicates a number of the N allocated uplink time slots remaining in said allocation.

5,594,739
SYSTEM AND METHOD FOR RAPID SELECTION OF SYNCHRONIZATION SOURCES IN A MOBILE TELECOMMUNICATIONS NETWORK

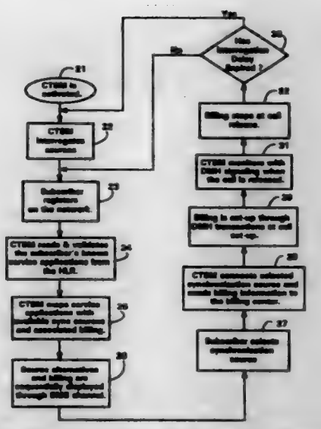
Yves Lemieux, Kirkland, Canada, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Nov. 1, 1995, Ser. No. 548,336

Int. Cl.[6] H04J *3/06*; H04L *7/04*

U.S. Cl. 370—350 **24 Claims**

1. A network management system in a telecommunications network for selectively accessing a plurality of synchronization sources of varying levels of accuracy, availability, and cost, and for enabling an individual subscriber to select one of said plurality of



synchronization sources for each telecommunication service application utilized by said subscriber, said system comprising:

means for informing said subscriber which of said plurality of synchronization sources are available for each of said service applications;

means for enabling said subscriber to select one of said plurality of synchronization sources for use with a service application;

a centralized transport synchronization module (CTSM) that interrogates said plurality of synchronization sources and selectively connects said sources to said telecommunications network; and

means for informing said CTSM which of said plurality of synchronization sources is selected by said subscriber.

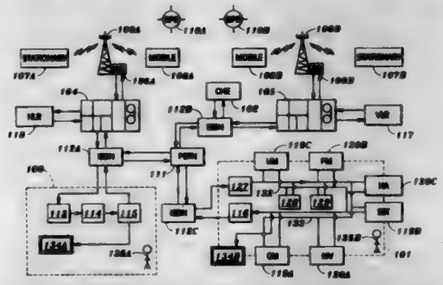
5,594,740
WIRELESS COMMUNICATIONS APPLICATION SPECIFIC ENABLING METHOD AND APPARATUS

Christoph K. LaDue, Soquel, Calif., assignor to Axion Logistics Corporation, Soquel, Calif.

Continuation of Ser. No. 250,665, May 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 112,476, Aug. 27, 1993, abandoned. This application Apr. 3, 1996, Ser. No. 624,111

Int. Cl.[6] H04J *3/12*; H04Q *7/00;9/00*

U.S. Cl. 379—59 **24 Claims**



1. A method for communicating messages between a remote monitoring device coupled to a communicator and a central monitoring station over a cellular telephone network that includes a voice channel and a control channel wherein the voice channel conveys data and the control channel conveys control signals that manage access to and use of the voice channel, the method comprising the steps of:

a) transmitting a message from the remote monitoring device to the communicator, the message comprising data related to a specific application;

b) receiving at the communicator the message transmitted from a remote monitoring device;

c) encoding at the communicator the message transmitted from the remote monitoring device to create an encoded message for transmission over the the control channel as control signals to the central monitoring station;

d) transmitting the encoded message from the communicator to the central monitoring station over the control channel, bypassing the voice channel;

e) receiving at the central monitoring station the encoded message transmitted from the communicator over the control channel; and

f) decoding at the central monitoring station the encoded message transmitted from the communicator over the control channel to extract the message transmitted by the remote monitoring device to the communicator.

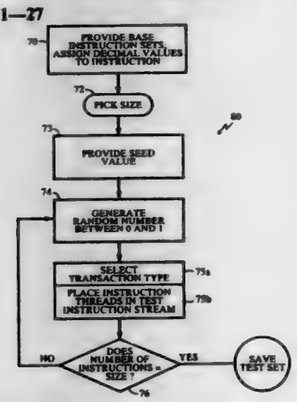
5,594,741
METHOD FOR CONTROL OF RANDOM TEST VECTOR GENERATION

Paul M. Kinzelman, Hudson, and Nicholas A. Warchol, Boxborough, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 40,796, Mar. 31, 1993, abandoned. This application Nov. 28, 1994, Ser. No. 345,271

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—27 **8 Claims**



7. A method of providing a test set for testing a computer model having a plurality of simulators, said method comprising the steps of:

selecting a base instruction set, said base instruction set including a plurality of instructions for each of said plurality of simulators;

randomly selecting an instruction from said base instruction set to provide said test set;

identifying instructions of said test set which require predetermined conditions to be completed before execution; and

modifying said identified instruction to preclude execution of said identified instruction until said predetermined condition is satisfied.

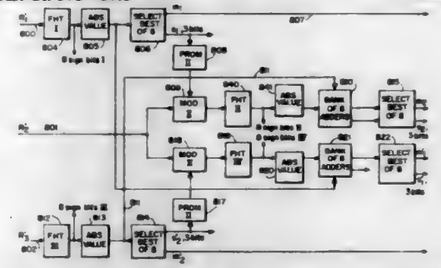
5,594,742
BIDIRECTIONAL TRELLIS CODING

Farhad Hemmati, Darnestown, Md., assignor to Communications Satellite Corporation, Bethesda, Md.

Continuation of Ser. No. 630,686, Dec. 20, 1990, abandoned. This application May 30, 1995, Ser. No. 453,092

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—37.1 **3 Claims**



1. In a decoder at a receive end of a communications link, a method of decoding a received block code representing information transmitted over said link, said method including the steps of:

generating a trellis diagram representing said received block code, said trellis diagram having first and second endpoints and a plurality of paths connecting said first and second endpoints, each path representing different information represented by said received block code;.

starting at said first endpoint and working toward said second endpoint, determining a first path of said plurality of paths which is most likely represented by said received block code;

starting at said second endpoint and working toward said first endpoint, determining a second path of said plurality of paths which is most likely represented by said received block code;

selecting one of said first and second paths as being represented by said received block code; and

decoding said received block code in accordance with the selected path.

5,594,743
FIFO BUFFER SYSTEM HAVING AN ERROR DETECTION AND CORRECTION DEVICE

Yong-Gyu Park, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 9, 1994, Ser. No. 336,606

Claims priority, application Rep. of Korea, Nov. 29, 1993, 1993-25674

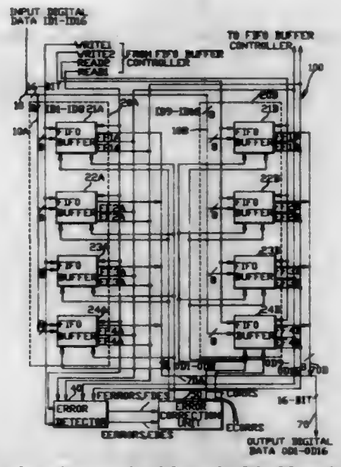
Int. Cl.[6] G11C *29/00;11/34*; H01J *1/00;5/06*

U.S. Cl. 371—40.1 **4 Claims**

1. A FIFO(First-In-First-Out) buffer system, capable of storing N-bit input digital data, for producing N-bit output digital data having a constant bit rate, N being a multiple of M with M being a positive integer, wherein the FIFO buffer system includes a buffer controller which generates a write control signal and a read control signal, the write and the read control signals consisting of a sequence of write enable and read enable signals, respectively, said FIFO buffer system comprising:

M number of data storage modules arranged in parallel for temporarily storing the N-bit input digital data in response to the write control signal and producing the N-bit output digital data in response to the read control signal, wherein each data storage module includes two or more cascaded FIFO buffers for sequentially storing (N/M)-bit input digital data and producing (N/M)-bit output digital data, each FIFO buffer generating a full flag and an empty flag signals when it becomes completely full and empty, respectively;

error detection means, in response to full flag signals and the write control signal, for detecting an onset of a full flag signal from an ith FIFO buffer included in each of the M number of data storage modules and generating a write designation sig-



nal and a write error signal for each of the M number of data storage modules, wherein the write designation signal indicates a data storage module which includes said each of the M number of ith FIFO buffers and the write error signal represents an offset between the onset of the full flag signal from said ith FIFO buffer and an earliest of all onsets of full flag signals from all the M number of ith FIFO buffers, the offset being expressed in terms of the number of write enable signals therebetween; and

error correction means, responsive to the write error signal and the write designation signal, for generating a state error correction signal to each of the M number of data storage modules to thereby compensate for the offset.

5,594,744

SINGLEMODE LASER SOURCE TUNABLE IN WAVELENGTH WITH A SELF-ALIGNED EXTERNAL CAVITY

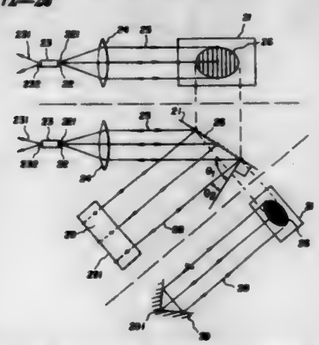
Hervé Lefevre, Paris; Philippe Martin, Pontchartrain; Bernard Laloux, Villepreux; Philippe Graindorge, Chevigny-St-Souveur, and Laurent Diedler, Marly-Le-Roi, all of France, assignors to Photonetics S.A., Marly-Le-Roy, France

Filed May 1, 1995, Ser. No. 432,021

Claims priority, application France, Sep. 13, 1994, 94 10925

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—20 **10 Claims**



1. Singlemode laser source tunable in wavelength with a self-aligned external cavity, comprising:

a resonant cavity having a partially reflecting output face and a retroreflecting dispersive device, defining a main collimating axis and a secondary collimating axis;

an amplifier wave guide placed in position inside the resonant cavity,

wherein the retroreflecting dispersive device comprises a plane diffraction grating having dispersion planes and an orthogonal reflecting dihedral whole line of intersection is parallel to the dispersion plane of the diffraction grating containing the collimating axes, wherein the amplifier medium is a doped optical fiber.

5,594,745

LASER LIGHT GENERATING APPARATUS

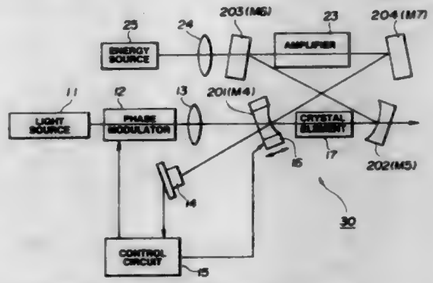
Michio Oka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1995, Ser. No. 413,741

Claims priority, application Japan, Mar. 30, 1994, 6-061084

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—21 **12 Claims**



1. A laser light generating apparatus comprising:

a first light source for generating a light beam of a fundamental wavelength;

an external resonator optically coupled to said first light source to receive said fundamental wavelength light beam, and comprising a plurality of reflection devices having high reflectance with respect to said fundamental wavelength of said light beam;

a non-linear optical crystal element located within said resonator for generating a light beam of harmonic wave length when said light beam of said fundamental wavelength is input thereto;

an amplifier element located within said resonator for amplifying said light beam of said fundamental wavelength therein, and

an energy source coupled to said amplifier and located external to said resonator for exciting said amplifier element.

5,594,746

METHOD AND APPARATUS FOR FABRICATING FERROELECTRIC DOMAIN REVERSALS

Akinori Harada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 18, 1994, Ser. No. 277,428

Claims priority, application Japan, Sep. 2, 1993, 5-218559

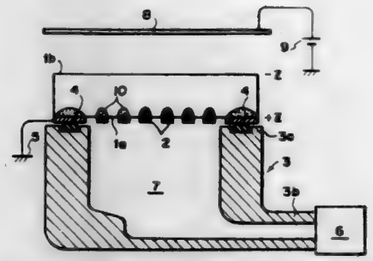
Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—22 **4 Claims**

3. An apparatus for creating ferroelectric domain reversals comprising:

an electrode formed in a predetermined pattern on one surface of a unipolarized ferroelectric substance;

a corona wire disposed above a surface of the ferroelectric substance which is opposite to the electrode-side surface;



a power source which supplies a voltage to the ferroelectric substance via the electrode and the corona wire, so that the ferroelectric substance is subjected to corona electrical charging;

a means for constituting an enclosed space which comprises the electrode-side surface as one surrounding wall when the means comes into contact with the periphery of the electrode-side surface of the ferroelectric substance; and

an evacuating means for keeping the inside of the enclosed space in a vacuum.

5,594,747

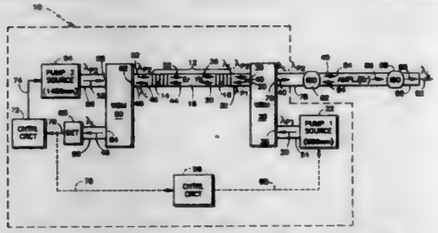
DUAL-WAVELENGTH PUMPED LOW NOISE FIBER LASER

Gary A. Ball, 19 Newbury Ct., Simsbury, Conn. 06070

Filed Mar. 6, 1995, Ser. No. 398,936

Int. Cl.[6] H01S *3/13*

U.S. Cl. 372—31 **10 Claims**



1. A polarization controlled waveguide laser, comprising:

a solid optical waveguide which propagates laser light;

a pair of reflective elements disposed a predetermined distance apart along said waveguide, each reflecting said laser light;

a gain portion of said waveguide between said reflective elements being doped with a first rare-earth dopant and a second rare-earth dopant;

one of said reflective elements passing a predetermined amount of said laser light as a laser output light;

first pump means, for providing a first pump signal at a first pump wavelength, said first pump signal being incident on said gain portion of said waveguide;

second pump means, responsive to a pump control signal, for providing a second pump signal at a second pump wavelength, said second pump signal being incident on said gain portion of said waveguide;

control means, for providing said pump control signal to said second pump means and for adjusting said pump control signal in response to said output light, so as to reduce relative intensity noise of said output light;

said first dopant absorbing said first pump wavelength and energy from said first dopant transitioning from said first dopant to said second dopant, and said second dopant emitting said laser light;

said second dopant absorbing said second pump wavelength and having a pump-to-lasing transition time which is faster than a pump-to-lasing transition time of said first dopant; and

said transition time of said first dopant being fast enough to allow said control means to reduce said relative intensity noise of said output light over a predetermined frequency range.

5,594,748

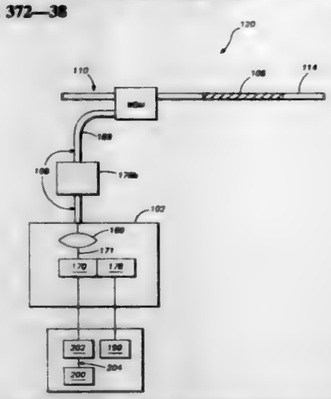
METHOD AND APPARATUS FOR PREDICTING SEMICONDUCTOR LASER FAILURE

Salim N. Jabr, Mountain View, Calif., assignor to Telephone Information Systems, Inc., Mountain View, Calif.

Filed Aug. 10, 1995, Ser. No. 513,361

Int. Cl.[6] H01S *3/00*

U.S. Cl. 372—38 **21 Claims**



1. In a system comprising a semiconductor laser, an apparatus to predict failure of said semiconductor laser, said semiconductor laser being characterized by at least one of a current threshold, a slope efficiency and a dynamic resistance and outputting a light beam, the power in said light beam being a function of injection current input to said laser, said apparatus comprising:

a photodetector configured to detect said power and output a corresponding power signal;

a modulating circuit configured to modulate said injection current with a predetermined modulation frequency and degree, said modulation frequency being selected so that operation of said system is not substantially disturbed by modulation in said power related to said modulated injection current; and

a processing circuit coupled to said photodetector and said laser for sampling said injection current and at least one of a laser voltage signal and said power signal while said modulating circuit modulates said injection current, the resulting samples forming a sample set;

said processing circuit being configured to extract from a multiplicity of said sample sets an updated laser characteristic which is a function of at least one of said current threshold, slope efficiency and dynamic resistance.

5,594,749

SEMICONDUCTOR LASER WITH LOW VERTICAL FAR-FIELD

Abbas Behfar-Rad, Wappingers Falls, N.Y.; Christoph S. Harder, Zurich, and Heinz P. Meier, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

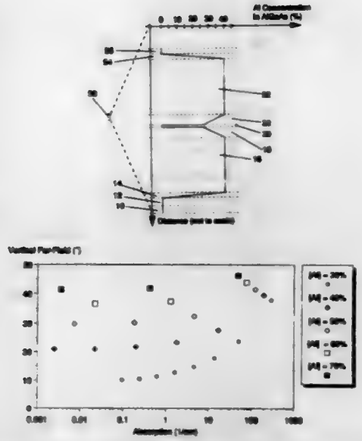
Division of Ser. No. 136,181, Oct. 15, 1993, Pat. No. 5,376,582.

This application Aug. 19, 1994, Ser. No. 292,900

Int. Cl.[6] H01S *3/18*

U.S. Cl. 372—45 **17 Claims**

1. A semiconductor laser having at least a quantum well structure and a plurality of layers of a base chemical composition that



includes at least a substitutional element, said at least one quantum well and layers deposited on a substrate, the semiconductor laser comprising:

a lower cladding layer having a first concentration value of the substitutional element;

a lower graded layer on the lower cladding layer having a chemical composition varying from a second concentration value of said substitutional element at a lower interface of the lower graded layer to a third concentration value at an upper interface of the lower graded layer;

the at least one quantum well layer having a fourth concentration value of said substitutional element on the lower graded layer;

an upper graded layer on the quantum well of a chemical composition having a concentration value of said substitutional element varying from a fifth concentration value of said substitutional element at a lower interface of the upper graded layer with the quantum well to a sixth concentration value of said constitutional element at an upper interface of the upper graded layer;

an upper cladding layer of a seventh concentration value of said substitutional element above the upper graded layer; and

a contact layer of an eighth concentration value of said substitutional element above the upper cladding layer, wherein

each of said layers thickness and its substitutional element concentration are selected to provide the semiconductor laser with an absorptive loss less than 0.3/cm.

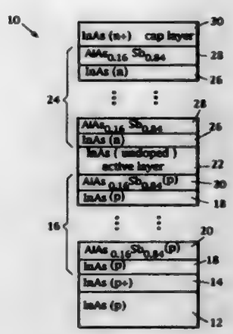
5,594,750

SELECTIVELY SI-DOPED INAS/A1ASSB SHORT-PERIOD-SUPERLATTICES AS N-TYPE CLADDING LAYERS FOR MID-IR LASER STRUCTURES GROWN ON INAS SUBSTRATES

Yong H. Zhang, Westlake Village, and David H. Chow, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 6, 1995, Ser. No. 468,179
Int. Cl.[6] H01S *3/19*; H01L *29/15*
U.S. Cl. 372—45 **18 Claims**

10. A short-period-superlattice comprising a plurality of alternating layers of either InAs and AlAsSb or InGaAlAs and AlSb lattice-matched to a GaSb or InAs substrate.

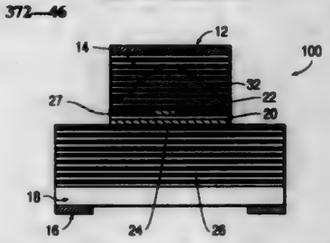


5,594,751

CURRENT-APERTURED VERTICAL CAVITY LASER

Jeffrey W. Scott, Carpinteria, Calif., assignor to Optical Concepts, Inc., Lompoc, Calif.

Filed Jun. 26, 1995, Ser. No. 494,823
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **24 Claims**



1. A vertical-cavity surface emitting laser device (VCSEL) comprising:

an active region;

first and second mirror stacks forming a resonant cavity, said first mirror stack placed above said active region and said second mirror stack placed below said active region, at least one of which allows the partial emission of the laser light;

first and second electrodes disposed so as to cause a current flow through said active region;

a first contacting region and a second contacting region on each of a first and second side of said active region in electrical contact with said respective first electrode and said second electrode, each one of said contacting regions providing a current path for distributing current through the active region; and

a thin dielectric slot forming a current aperature that is non-conductive placed above said active region for guiding current flowing through the active region to an area near the center of the active region, said slot being sufficiently thin so as not to constrict a fundamental optical mode of said VCSEL.

5,594,752

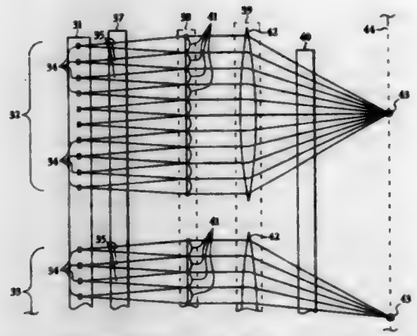
DIODE LASER SOURCE WITH CONCURRENTLY DRIVEN LIGHT EMITTING SEGMENTS

John Endriz, Belmont, Calif., assignor to SDL, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 986,207, Dec. 7, 1992. This application Jun. 30, 1994, Ser. No. 269,358
Int. Cl.[6] H01S *3/18*;*3/10*; G02B *27/10*
U.S. Cl. 372—50 **9 Claims**

1. A diode laser source, comprising

a plurality of individually addressable laser elements formed in a monolithic laser diode array heterostructure, each laser element being divided into a plurality of spaced apart laser segments addressed in parallel,



drive means for providing modulated drive current independently to each laser element but concurrently to every segment of the same laser element,

beam filling optics disposed in front of each laser element, said beam filling optics including a first lens array with each lenslet of said first lens array disposed in front of and aligned with a corresponding one of said laser segments, and

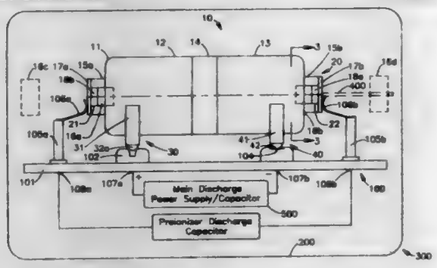
focusing optics disposed in front of said beam filling optics and condensing laser light received via said beam filling optics from said plurality of laser elements down to a like number of light spots, there being one corresponding light spot with modulated optical power per each independently driven laser element, said focusing optics including a second lens array with each lenslet of said second lens array aligned with a group of lenslets of said first lens array corresponding to one of said laser elements, light contributed by each of the plurality of individual laser segments of a laser element overlapping to form a single light spot for that laser element, whereby failure of any of at least one of the laser segments constituting that laser element will cause only a slight decrease in optical power and brightness and substantially no change in spot size of the corresponding light spot as opposed to a total loss of that entire laser element.

5,594,753

CARTRIDGE EXCIMER LASER SYSTEM

Rudolph W. Frey, and Philip D. Boles, both of Orlando, Fla., assignors to Autonomous Technology Corporation, Orlando, Fla.

Filed Apr. 25, 1994, Ser. No. 232,754
Int. Cl.[6] H01S *3/22*;*3/223*
U.S. Cl. 372—57 **16 Claims**



1. An excimer laser system comprising:

a laser cartridge, a mixture of a noble gas and a halogen within said laser cartridge, a plurality of electrodes within said laser cartridge having an external electrical connection, an assemble for transmitting a laser beam output located at both ends of said laser cartridge;

said assembly for transmitting a laser beam output comprising reflective window and a transmissive window, said windows being made of a material selected from the group consisting of magnesium fluoride and calcium fluoride;

a laser base; and

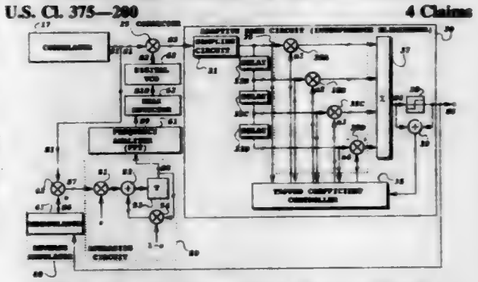
a compartment within said laser base for receiving said laser cartridge, said receiving compartment having a plurality of electrical connections for completing an electrical circuit with said external electrical connections of said laser cartridge when said laser cartridge is positioned within said receiving compartment.

5,594,754

SPREAD SPECTRUM COMMUNICATION RECEIVER

Tomohiro Dehi, Yokohama; Mamoru Sawahashi, Yokosuka, and Fumiyuki Adachi, Yokohama, all of Japan, assignors to NIT Mobile Communications Network Inc., Tokyo, Japan

PCT No. PCT/JP94/01701, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO95/10891, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 12, 1994, Ser. No. 448,396
Claims priority, application Japan, Oct. 13, 1993, 5-255633
Int. Cl.[6] H04B *15/00*; H04K *1/00*; H04L *27/30*
U.S. Cl. 375—200 **4 Claims**



1. A spread spectrum communication receiver comprising:

a detector for detecting a received signal using a local signal, thereby converting the received signal into a first baseband signal;

a despreader for despreading said first baseband signal using a spreading code, thereby outputting a second baseband signal corresponding to a primary modulated signal at a transmitter;

a corrector for correcting said second baseband signal by a correcting signal;

an interference eliminator for suppressing an interference component in a third baseband signal outputted from said corrector, thereby generating a desired signal component;

a remodulator for modulating said desired signal component, thereby generating a remodulated signal corresponding to the primary modulated signal at said transmitter;

a multiplier for multiplying said second baseband signal by a complex conjugate signal of said remodulated signal, thereby outputting a signal including a frequency offset component representing an offset frequency corresponding to a deviation of the frequency of said local signal with respect to the center frequency of said received signal;

an averaging circuit for averaging an output of said multiplier to eliminated noise components of the output of said multiplier, thereby outputting said frequency offset component; and

a correcting signal generator for generating said correcting signal by extracting said offset frequency from said frequency offset component.

5,594,755

APPARATUS FOR USE IN EQUIPMENT PROVIDING A DIGITAL RADIO LINK BETWEEN A FIXED RADIO UNIT AND A MOBILE RADIO UNIT

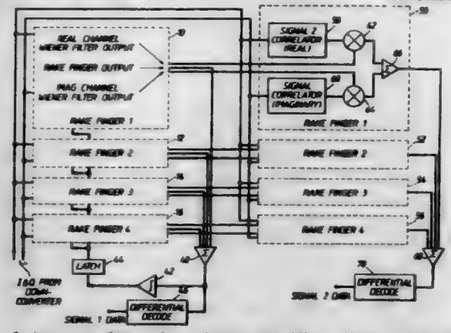
Anthony P. Hulbert, Shirley, England, assignor to Roke Manor Research Limited, Hampshire, England

Filed Aug. 18, 1994, Ser. No. 292,040

Claims priority, application United Kingdom, Aug. 26, 1993, 9317781

Int. Cl.[6] H04B *15/00;* **H04L** *27/22*

U.S. Cl. 375—288 **15 Claims**



1. Apparatus for use in equipment providing a digital radio link between a fixed radio unit and a mobile radio unit, said apparatus comprising:

demodulating means for receiving a plurality of inphase and quadrature phase data input signals; and

estimation means for deriving a decision directed channel estimate from at least one of said plurality of data signals for demodulating at least a first and a second data signal of said plurality of data signals transmitted over a radio channel using said demodulating means.

5,594,756

DECISION FEEDBACK EQUALIZATION CIRCUIT

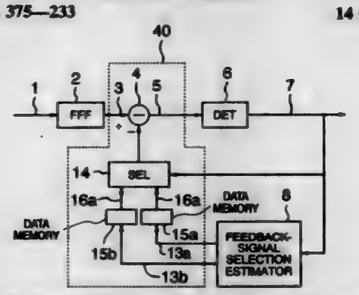
Wataru Sakurai, Odawara; Hideki Sawaguchi, Kodaira; Naoki Satoh, Odawara, and Masao Umemoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 492,616

Claims priority, application Japan, Jun. 23, 1994, 6-141407

Int. Cl.[6] H03H *7/30*

U.S. Cl. 375—233 **14 Claims**



1. A decision feedback equalization circuit for eliminating intersymbol interference from a received signal sequence, comprising:

first equalizer means for removing forward interference at a time antecedent to a time t in said received signal sequence;

second equalizer means for removing backward interference at a time subsequent to the time t in said received signal sequence;

detector means for receiving a signal sequence subjected to removal of the intersymbol interference by said first equalizer means and said second equalizer means and outputting a decision result for a signal value at the time t; and

estimation means, prior to obtaining the decision result for the input signal value at the time t from the detector means, for outputting a plurality of candidate values of the backward interference estimated to be contained in an output signal of said first equalizer means at a time t+1 by using signal values of the output decision results of said detector means up to a time t−1;

wherein said second equalizer means includes selector means for selecting one of said plurality of candidate values as the backward interference to be removed from the received signal sequence in accordance with the decision result output of said detector means at the time t.

5,594,757

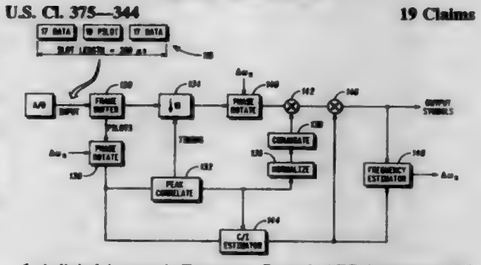
METHOD AND APPARATUS FOR DIGITAL AUTOMATIC FREQUENCY CONTROL

Kamyar Rohani, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1994, Ser. No. 281,945

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—344 **19 Claims**



1. A digital Automatic Frequency Control (AFC) having an AFC input for receiving a first digital signal, comprising:

(a) first frequency control means, operatively coupled to the AFC input, for automatic frequency controlling at least a predetermined information portion of the first digital signal and outputting a first frequency controlled signal;

(b) correlation means, operatively coupled to first frequency control means, for correlating a characteristic of the predetermined information portion with a known characteristic of the predetermined information portion and outputting a timing information signal and channel estimation signal;

(c) decimation means, operatively coupled to the AFC input and the correlation means, for receiving the timing information signal and decimating the first digital signal based on the timing information signal, and outputting a first decimated signal;

(d) second frequency control means, operatively coupled to the decimation means, for automatic frequency controlling the first decimated signal and outputting a frequency controlled output signal;

(e) signal quality estimation means, operatively coupled to the first frequency control means and the correlation means, for receiving the first frequency controlled signal and the channel estimation signal and determining an estimated signal quality; and

(f) frequency estimation means, operatively coupled to the second frequency control means and signal quality estimation means for receiving the estimated signal quality and the frequency controlled output signal and for determining an estimated frequency correction signal, and having an output operatively coupled to the first and second frequency control means, wherein the first and second frequency control means automatic frequency control the at least a predetermined information portion of the first digital signal and the first decimated signal, respectively, based on the estimated frequency correction signal.

5,594,758

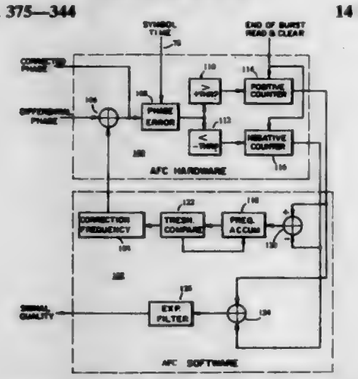
FREQUENCY CONTROLLER AND METHOD OF CORRECTING PHASE ESTIMATES IN A PSK DEMODULATOR USING FREQUENCY CONTROL

James E. Petranovich, Encinitas, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.

Division of Ser. No. 289,061, Aug. 11, 1994, which is a continuation of Ser. No. 999,210, Dec. 31, 1992, Pat. No. 5,376,894. This application Jun. 7, 1995, Ser. No. 487,455

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—344 **14 Claims**



1. A frequency controller for use in a receiver of a digital communications system, said receiver being capable of receiving a phase shift keyed (PSK) signal representing a sequence of transmitted symbols, each of said transmitted symbols corresponding to one of a set of known phases, said receiver generating phase estimates related to the symbols of the PSK signal so received, said PSK signal being transmitted at a predetermined frequency and said received PSK signal having a frequency with a variable offset from said predetermined frequency, the frequency controller comprising:

phase correction means having an input indicative of said variable offset for correcting said phase estimates to produce corrected phase estimates;

phase error detection means interfaced with said phase correction means for determining whether at least some of said corrected phase estimates contain a phase error, and if so, for determining for each of those said phase estimates whether said phase estimate has a phase either 1) greater than the known phase corresponding to the symbol of the received PSK signal, or 2) less than the known phase corresponding to the symbol of the received PSK signal;

counting means interfaced with said phase error detection means for maintaining a positive count of those phase estimates greater than the corresponding known phase and a negative count of those phase estimates less than the corresponding known phase; and

frequency offset means interfaced with said counting means and said phase correction means for generating a frequency offset based on a difference between said positive and negative counts, said frequency offset so generated defining said variable offset used to produce said corrected phase estimates.

5,594,759

QUASI-SYNCHRONOUS DETECTION AND DEMODULATION CIRCUIT AND FREQUENCY DISCRIMINATOR USED FOR THE SAME

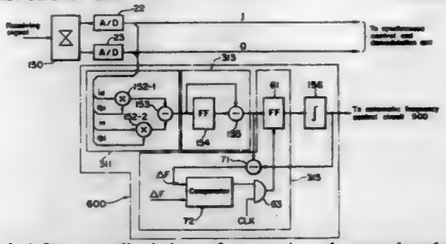
Takanori Iwamatsu, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 337,243, Nov. 10, 1994, abandoned, which is a division of Ser. No. 89,786, Jul. 13, 1993, Pat. No. 5,400,366. This application Apr. 26, 1996, Ser. No. 638,317

Claims priority, application Japan, Jul. 9, 1992, 4-182182; Jul. 29, 1992, 4-202555

Int. Cl.[6] H04L *27/22*

U.S. Cl. 375—344 **5 Claims**



1. A frequency discriminator for a quasi-synchronous detection and demodulation device for demodulating a quadrature amplitude modulation signal, the frequency discriminator comprising:

phase error detecting means for receiving an output of an analog-to-digital converter and obtaining signs i_r, q_r and errors i_e, q_e of a coordinate at a normal signal point from a coordinate at a signal point in a signal space showing each of symbols, said symbols being obtained by digital-converting of the output from the analog-to-digital converter which converts an analog output obtained by demodulating said quadrature amplitude modulation signal, and for obtaining a phase error $\Delta\odot$ of a reference carrier signal for demodulation with respect to a carrier signal of said quadrature amplitude modulation signal by performing an arithmetic operation of expression $\Delta\odot=(i_r\times q_e)-(i_e\times q_r)$;

frequency deviation detecting means for differentiating the phase error $\Delta\odot$ obtained by said phase error detecting means with a time determining a timing of said digital converting to obtain a frequency deviation of said reference carrier signal with respect to said carrier signal; and

limiting means for limiting said frequeacy deviation obtained by said frequeacy deviation detecting means to less than an upper value according to the accuracy of said reference carrier signal.

5,594,760

AUTOMATIC GAIN CONTROL CIRCUIT AND APPARATUS INCLUDING SUCH A CIRCUIT

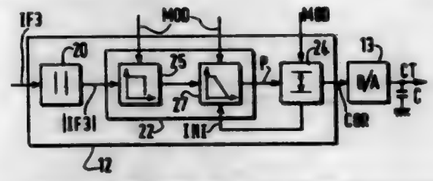
Jean-Michel Guilland, Montgeron, and Georges Martinez, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1995, Ser. No. 525,990

Claims priority, application France, Sep. 13, 1994, 94 10906

Int. Cl.[6] H04L *27/08*

U.S. Cl. 375—345 **8 Claims**



1. Automatic gain control circuit, comprising: first means for applying a gain to an input signal and for deriving therefrom an

output signal, second means for measuring the power of the output signal, third means for comparing the measured signal power with a window of permitted reference power values and for deriving therefrom a control signal for checking the gain applied by the first means, characterized in that the second means comprise low-pass recursive filter means, while the third means furthermore produces an initialization signal which enforces a reference power value on the filter means when the said value lies outside the window of permitted reference power values.

5,594,761

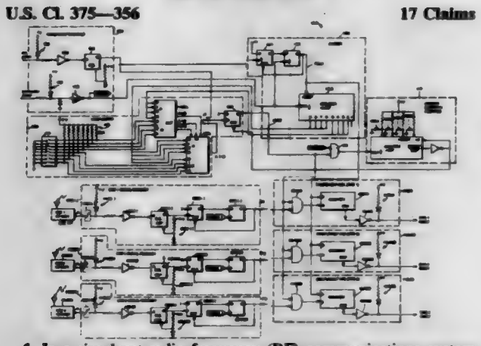
CONTROL CHANNEL TIMING DETECTION AND SELF CORRECTION FOR DIGITALLY TRUNKED SIMULCAST RADIO COMMUNICATIONS SYSTEM

Thomas A. Brown, Lynchburg, Va., assignor to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 906,438, Jun. 30, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,680

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—356 **17 Claims**



1. In a simulcast radio frequency (RF) communications system that simulcasts the same signals from at least first and second RF transmission sites to portable or mobile radio transceivers over a same outbound RF control channel and same RF working channels specified by digital trunking control signals simulcasted over the same outbound RF control channel which are divided into a continuous series of frames with each frame having a synchronization portion including repetitive synchronization signals for obtaining frame and bit synchronization and a message port, ion including a digital thinking control message, wherein at least one of said radio transceivers obtains frame and bit synchronization with said first RF transmission site using the repetitive synchronization signals transmitted over said outbound RF control channel by said first transmission site, a control channel timing monitoring system, comprising:

an RF receiver other than said radio transceiver and corresponding to said first RF transmission site that receives said series of frames transmitted over said outbound RF control channel by said first RF transmission site and generates a first pulse timing signal base detection of said repetitive synchronization signals included in each frame;

a reference timer for providing a reference timing signal; and

a fault detector, connected to receive said reference timing signal and said first pulse timing signal, for determining whether said first pulse timing signal is synchronized to a least within a predetermined tolerance with said reference timing signal and for generating a fault indication if said determination reveals that said first pulse timing signal is not synchronized with said reference timing signal to at least within said predetermined tolerance.

5,594,762

APPARATUS FOR RETIMING DIGITAL DATA TRANSMITTED AT A HIGH SPEED

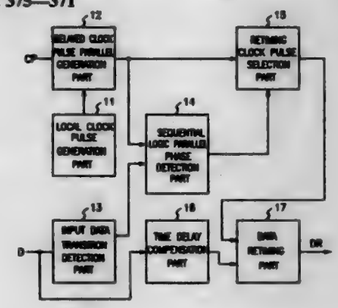
Bheom S. Joo; Bhum C. Lee; Jung S. Kim, and Seok Y. Kang, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Rep. of Korea

Filed Dec. 12, 1994, Ser. No. 354,417

Claims priority, application Rep. of Korea, Dec. 11, 1993 27360

Int. Cl.[6] H04L *7/00*; H03K *5/135*

U.S. Cl. 375—371 **4 Claims**



1. An apparatus for retiming digital data transmitted at a high speed, the apparatus comprising:

local clock pulse generation means for generating and outputting a local clock pulse;

delayed clock pulse parallel generation means for delaying an external clock pulse CP by a period independent of the local clock pulse from said local clock pulse generation means and outputting n delayed clock pulses in parallel, n being a natural number greater than or equal to 4, said delayed clock pulse parallel generation means including a plurality of flip-flops, each of said flip-flops having a minimum allowable clock pulse width;

input data transition detection means for receiving an external input data signal D having a unit bit interval with rising and falling portions and for outputting a pulse DT whenever the rising and falling portions are sensed in the external input data signal D, the pulse DT being shorter than the unit bit interval of the external data signal D and longer than the minimum allowable clock pulse width of the flip-flops;

sequential logic parallel phase detection means for providing (n−1) clock pulse selection data signals with a logic phase relation between a first transition point of input data signal DT from said input data transition detection means and a second transition point of n delayed clock pulses input from said delayed clock pulse parallel generation means;

retiming clock pulse selection means for outputting a retiming clock pulse by getting input of n−1 delayed clock pulses from said delayed clock pulse generation means and by selecting the delayed clock pulse having a nearest falling portion relative to the first transition point of input data signal DT according to the clock pulse selection data signals from said sequential logic parallel phase detection means;

time delay compensation means for outputting a compensated signal after compensating the input data signal D by a time delay due to retiming clock pulse selection in said retiming clock pulse selection means;

data retiming means for outputting retimed data signals after performing retiming for time compensated signals from said time delay compensation means according to retiming clock pulse input from said retiming clock pulse selection means.

5,594,763

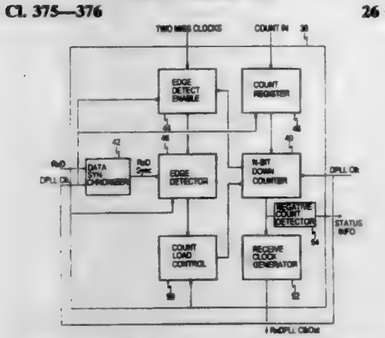
FAST SYNCHRONIZING DIGITAL PHASE-LOCKED LOOP FOR RECOVERING CLOCK INFORMATION FROM ENCODED DATA

Hanumanthrao Nimishakavi, Fremont, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Jun. 6, 1995, Ser. No. 467,645

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **26 Claims**



1. A digital phase-locked loop for receiving an encoded stream of data and generating a receive clock signal therefrom, the digital phase-locked loop comprising:

a counter having an adjustable start count value;

an edge detector that detects rising and falling edges within a stream of data, the detection of an edge causing the counter to start counting from the start count value towards a terminal value; and

a receive clock generator that generates a receive clock signal, the receive clock generator changing a level of the receive clock signal in response to the counter reaching at least a first predetermined value.

5,594,764

AUTOMATED VIDEO CHARACTERIZATION OF NUCLEAR POWER PLANT COMPONENTS

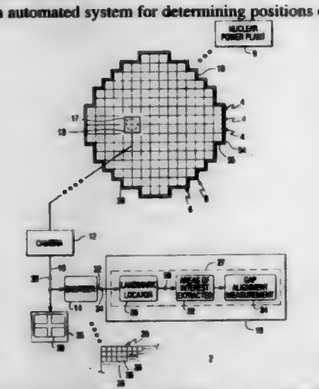
Barry F. Cooney, Bethel Park; Thomas M. Camden, Apollo; James P. Duke, and David J. Stefko, both of Jeannette, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 6, 1995, Ser. No. 467,778

Int. Cl.[6] G21C *17/00*

U.S. Cl. 376—248 **14 Claims**

10. An automated system for determining positions of a plurality



of nuclear fuel assemblies organized in an array within a reactor, the reactor having at least one reference location, said system comprising:

camera means for inputting at least one first image, with one of the first images including at least one of said nuclear fuel assemblies and the reference location;

digitization means for generating a second image of said at least one of said nuclear fuel assemblies from the first image, the second image being a digitized image including a plurality of pixel elements; and

determining means for determining a position of said at least one of said nuclear fuel assemblies with respect to the reference location from a count of the pixel elements.

5,594,765

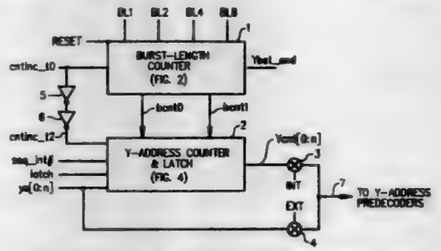
INTERLEAVED AND SEQUENTIAL COUNTER

Jong-Hoon Oh, Seoul, Rep. of Korea, assignor to Hyundai Electronics America, Milpitas, Calif.

Filed Jan. 3, 1995, Ser. No. 367,551

Int. Cl.[6] H03K *21/00*

U.S. Cl. 377—44 **10 Claims**



1. A counter system for producing an output count, the system comprising:

a first counter;

a second counter coupled to at least a first output from said first counter, said second counter producing said output count; and

a selection signal, input to said second counter, for selecting between an interleaved count format and a sequential count format for said output count.

5,594,766

METHOD AND APPARATUS FOR IMPROVING EFFICIENCY IN COMPUTING RADON DERIVATIVES FOR CT IMAGING

Kwok C. Tam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,815

Int. Cl.[6] A61B *6/03*

U.S. Cl. 378—4 **10 Claims**

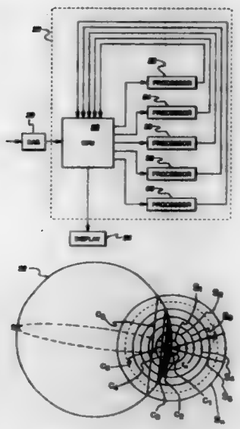
5. In an arrangement for computed tomography imaging of an object, wherein an x-ray cone-beam source irradiates an object at successive view angles to project an image of the object onto an associated detector plane to provide a set of line integral data, a method for computing the Radon derivatives for respective data points in a set of Radon data points for a given view angle, said method comprising the steps of:

defining a set of concentric spherical shells with respect to an origin in Radon space, so that each of said Radon data points having a non-zero value lies on one of said spherical shells;

identifying each of said non-zero Radon data points which also lies on the Radon shell for said given view angle;

assigning all of said identified non-zero Radon data points lying on a given one of said spherical shells to a given processor in an array of processors; and

operating said given processor to compute the Radon derivative for each of said assigned Radon data points from data contained in said line integral data set.

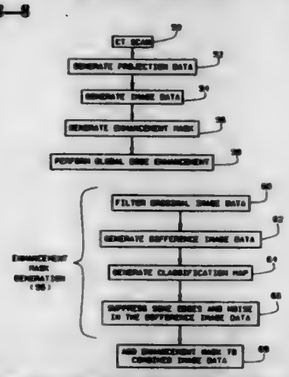


5,594,767

METHODS AND APPARATUS FOR ENHANCING IMAGE SHARPNESS

Jiang Hsieh, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 2, 1995, Ser. No. 556,745
Int. Cl.[6] A61B 6/03
U.S. Cl. 378—8 20 Claims



1. A method for enhancing original image data represented as CT numbers, said method comprising the steps of:

generating, from the CT numbers, an enhancement mask said step of generating an enhancement mask comprising the steps of:

generating a classification map by designating a plurality of CT number classes based on CT number values and assigning the CT numbers to certain classes to generate the classification map; and generating a difference image by filtering the original image data to generate low pass filtered image data and subtracting the low pass filtered data from the original image data; and

generating an edge enhanced image utilizing the enhancement mask and the CT numbers.

17. A method for enhancing original image data represented as CT numbers, said method comprising the steps of: generating, from the CT numbers, an enhancement mask, said step of generating an enhancement mask comprising the steps of:

designating a plurality of CT number classes based on CT number values; and

assigning the CT numbers to certain classes to generate a classification map, said step of assigning the CT numbers to certain classes comprising the steps of:

establishing threshold values for different image regions;

if a particular CT number satisfies a particular threshold criteria for an image region, classifying the particular CT number as a member of the image region; and

if a particular CT number satisfies no threshold criteria for an image region, utilizing a fuzzy logic function to determine a membership grade for the CT number; and

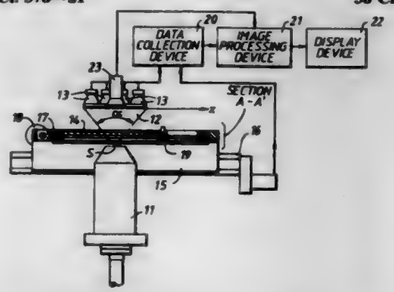
generating an edge enhanced image utilizing the enhancement mask and the CT numbers.

5,594,768

LAMINOGRAPH AND INSPECTION AND REPAIR DEVICE USING THE SAME

Masashi Fujii; Kiichiro Uyama; Takeo Tsuchiya, all of Tokyo; Miki Mori, Kanagawa-ken; Hideo Kosuge, Chiba-ken, and Hirokatsu Suzuki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 11, 1995, Ser. No. 439,106
Claims priority, application Japan, May 12, 1994, 6-097796; Aug. 10, 1994, 6-188297
Int. Cl.[6] G01N 23/04
U.S. Cl. 378—21 38 Claims



1. A laminograph, comprising:

an X-ray radiation source for generating radiation towards a subject;

radiation surface sensor means, with a two-dimensional resolution, fitted opposite to said X-ray radiation source for detecting said radiation from said X-ray radiation source which has passed through said subject;

scanning means for moving said subject to take a plurality of different positions between said X-ray radiation source and said radiation surface sensor means and for scanning said subject in each of said different positions by said radiation from said X-ray radiation source;

data collection means for collection a plurality of outputs of said radiation surface sensor means during said scanning by said scanning means to obtain a plurality of radiographic images of said subject in said different positions;

position measurement means for measuring multiple positions of a focal plane at multiple places of said subject;

displacement measurement means for measuring multiple displacements based on said multiple positions of said focal plane measured by said position measurement means; and

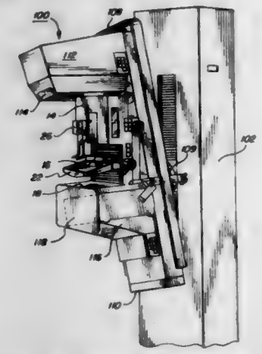
image processing means for displacing said plurality of radiographic images in relation to the multiple displacements measured by said displacement measuring means and for adding and averaging said plurality of displaced radiographic images to obtain a radiographic image of said subject focused on said focal plane as a tomographic image of said subject.

5,594,769

METHOD AND APPARATUS FOR OBTAINING STEREOTACTIC MAMMOGRAPHIC GUIDED NEEDLE BREAST BIOPSIES

Anthony J. Pellegrino, New Fairfield, Conn., and Kenneth F. DeFreitas, Patterson, N.Y., assignors to Thermotrex Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 388,810, Feb. 15, 1995, which is a division of Ser. No. 185,690, Jan. 24, 1994, Pat. No. 5,426,685, which is a division of Ser. No. 957,275, Oct. 6, 1992, Pat. No. 5,289,520, which is a continuation-in-part of Ser. No. 799,412, Nov. 27, 1991, abandoned. This application May 9, 1995, Ser. No. 437,793
Int. Cl.[6] A61B 6/04
U.S. Cl. 378—37 9 Claims



1. An apparatus for performing stereotactic mammographic needle biopsies on a breast, the apparatus comprising:

a base;

a pivot shaft having a first end attached to the base and a second end, the pivot shaft further defining a pivot axis;

an imaging arm having an X-ray source end and an X-ray receiving end, the imaging arm being attached to the second end of the pivot shaft at a point between the X-ray source end and the X-ray receiving end;

an X-ray tube having a focal spot, the X-ray tube being connected to the imaging arm at its X-ray source end;

an X-ray image receiver support affixed to the imaging arm at its X-ray receiving end;

an X-ray image receiver attached to the support; and

a removable needle biopsy apparatus further comprising:

a biopsy apparatus base having a first side, a second side and a compression plate engaging end,

a compression plate attached to the biopsy apparatus base at the compression plate engaging end, the compression plate further defining a compression plate plane,

a multi-dimensional positionable biopsy needle guiding stage attached to the biopsy apparatus base on its first side,

a biopsy needle holder attached to the needle guiding stage,

a compression paddle carriage slidably attached to the biopsy apparatus base on its first side between the biopsy needle guiding stage and the compression plate engaging end,

a compression paddle, having an opening therein permitting a biopsy needle to be inserted into a breast, attached to the compression paddle carriage,

a pivot member having first and second ends, wherein the first end of the pivot member is attached to the second side of the biopsy apparatus base near its compression plate engaging end, the pivot member allowing pivotal motion of the biopsy apparatus base relative to the imaging arm about the pivot axis defined by the pivot shaft; and

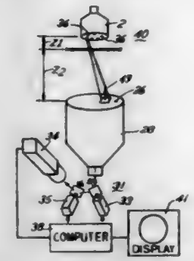
means for attaching the biopsy apparatus to the imaging arm, the means being affixed to the pivot member at its second end.

5,594,770

METHOD AND APPARATUS FOR IMAGING OBSCURED AREAS OF A TEST OBJECT

Phillip Bowles, Carmel, Ind.; Eric Duff, and Dale D. Thayer, both of San Diego, Calif., assignors to ThermoSpectra Corporation, Franklin, Mass.

Filed Nov. 18, 1994, Ser. No. 342,928
Int. Cl.[6] G01B 15/06
U.S. Cl. 378—58 60 Claims



1. An apparatus for imaging a region of interest that is positioned on or within a test object that is obscured by a first obscuration body positioned on or within said test object but positioned outside said region of interest, comprising:

an x-ray source having a cathode for producing a steerable electron beam;

a controller coupled to the x-ray source, wherein the controller directs the electron beam to predetermined locations on a target anode,

the predetermined locations being determined from an obscuration geometry of the first body relative to the area of interest;

a detector positioned to receive x-rays that are transmitted through the test object from each of the predetermined locations and to produce images corresponding to each of the predetermined locations; and

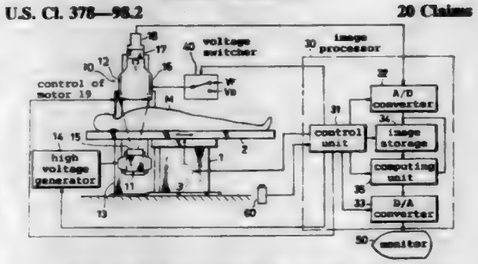
an imaging system that combines the images to produce an unobscured image of said region of interest.

5,594,771

DIGITAL ANGIOGRAPHIC APPARATUS

Masumi Kawai, Kusatsu, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed May 25, 1995, Ser. No. 449,955
Int. Cl.[6] H05G 1/64
U.S. Cl. 378—98.2 20 Claims



1. A digital angiographic apparatus for picking up a mask image and a live image of a predetermined site, and deriving a subtraction image from a subtraction between the mask image and the live image, said apparatus comprising:

(a) fluoroscopic means including an X-ray tube and an image intensifier for irradiating a patient with X rays, and picking up fluoroscopic images of said patient;

(b) signal converting means for converting said fluoroscopic images into digital data;

(c) image storage means for storing said fluoroscopic images (images picked up) converted into digital data;

(d) voltage switching means switchable between a position for applying a focusing voltage to a focus adjusting electrode of said image intensifier to pick up an image in focus, and a position for applying a defocusing voltage to pick up an image out of focus to a degree of removing an image of a blood vessel from an image of the patient having contrast material injected;

(e) computing means for deriving a subtraction image from a subtraction between a mask image picked up when said defocusing voltage is applied to said focus adjusting electrode, and a live image picked up when said focusing voltage is applied to said focus adjusting electrode; and

(f) control means for controlling said fluoroscopic means and other means to apply said defocusing voltage (or said focusing voltage) to said focus adjusting electrode, to pick up said mask image (or said live image) of said predetermined site of said patient with contrast material injected, to store at least said mask image (or said live image) in said image storage means, immediately thereafter to switch said voltage switching means to said position for applying said focusing voltage (or said defocusing voltage) to said focus adjusting electrode, to pick up said live image (or said mask image) of said predetermined site, and to apply said mask image and said live image to said computing means to acquire said subtraction image for said predetermined site.

5,594,772

COMPUTER TOMOGRAPHY APPARATUS

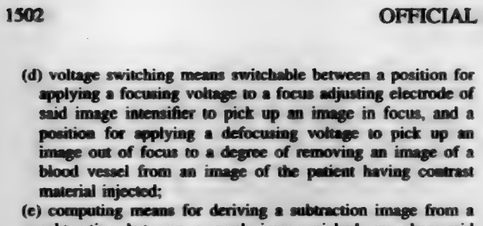
Yusuke Toki, Utsunomiya; Masabu Hiraoka, Nishinasunomachi; Ichiro Yamagishi, Otawara; Hiroyuki Ozaki, Tochigi-ken; Tatsuya Ban, Utsunomiya; Tetsuro Hada, Otawara; Takeo Nabetame, Tochigi-ken; Masao Yamahana, Otawara; Masakuni Fujise, Otawara; Yoshihiko Aechi, Otawara; Makoto Hayashibara, Tochigi-ken, and Masahiro Ozaki, Otawara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1994, Ser. No. 347,135

Claims priority, application Japan, Nov. 26, 1993, 5-297079; Apr. 5, 1994, 6-067343; Oct. 31, 1994, 6-267280

Int. Cl.[6] A61B *6/03*

U.S. Cl. 378—114 **4 Claims**



1. A computer tomography apparatus comprising:

an X-ray tube which is supported to be continuously rotatable around an object to be examined;

rotation control means for controlling rotation of said X-ray tube;

X-ray control means for controlling X-ray radiation from said X-ray tube;

data acquisition means, arranged to face said X-ray tube to sandwich the object to be examined therebetween for acquiring projection data on the basis of an X-ray transmitted through the object to be examined;

re-construction means for re-constructing tomographic image data on the basis of the projection data acquired by said data acquisition means;

display means for displaying the re-constructed tomographic image data;

input means, operated by an operator, for inputting an OFF signal during a scanning operation in which the X-ray is radiated, said X-ray tube is rotated and the projection data are acquired; and

control means for controlling said X-ray control means to interrupt a radiation of the X-ray and controlling said rotation control means to continue the rotation of said X-ray tube during a time when the OFF signal is input.

5,594,773

X-RAY LENS

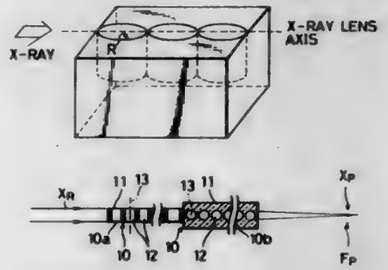
Toshihisa Tomie, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Feb. 16, 1995, Ser. No. 389,503

Claims priority, application Japan, Feb. 18, 1994, 6-045288

Int. Cl.[6] G21K *1/00*

U.S. Cl. 378—145 **35 Claims**



1. An X-ray refractive lens for focusing X-rays, comprising N number of unit lenses each constituted by forming a hollow cylinder in a place of lens material capable of transmitting X-rays to be focused, the hollow cylinders being aligned on a straight array axis along which the X-rays propagate with their axes parallel to each other; wherein N being greater than or equal to 2.

5,594,774

HOLDER FOR RECEIVING A SHEET-LIKE MEDIUM FOR X-RAY IMAGES

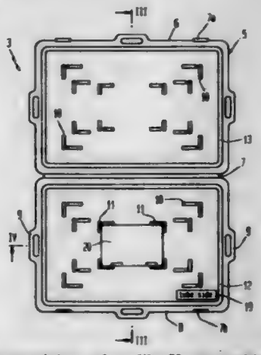
Manfred Schmidt, Schrobenhausen, Germany, assignor to AGFA Gevaert, Munich, Germany

Filed Jul. 17, 1995, Ser. No. 583,106

Claims priority, application Germany, Aug. 5, 1994, 44 27 783.0

Int. Cl.[6] G03B *42/02*

U.S. Cl. 378—177 **13 Claims**



1. A holder for retaining a sheet-like X-ray sensitive medium for making X-ray pictures, said holder comprising, in combination:

a) an inner cassette that can be opened to receive said sheet-like medium and thereafter closed, said inner cassette being light-proof when closed; and

b) an outer cassette comprising a top, a bottom and a hinge between said top and bottom; said top, bottom and said hinge all being formed of a single piece of plastic; said top being movable with respect to said bottom by means of said hinge between an open position and a closed position; said outer cassette forming, when closed, an enclosed compartment having a low-friction shape and surface; said outer cassette having a plurality of finger grips on at least one edge and having a compartment for holding said inner cassette.

5,594,775

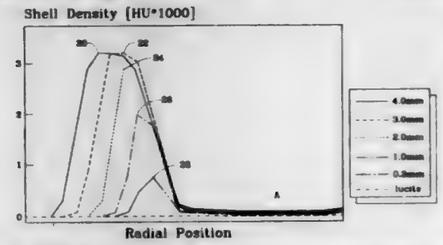
METHOD AND APPARATUS FOR THE EVALUATION OF CORTICAL BONE BY COMPUTER TOMOGRAPHY

Thomas N. Hangartner, Xenia, Ohio, assignor to Wright State University, Dayton, Ohio

Filed Apr. 19, 1995, Ser. No. 424,841

Int. Cl.[6] G01D *18/00*

U.S. Cl. 378—207 **14 Claims**



1. A method of measuring the width of a structure comprising the steps of:

obtaining x-ray image data of a structure with a computed tomography scanner;

determining a profile of density across the structure from the x-ray image data;

measuring a first half-width of the profile corresponding to a first density value, wherein said first density value is a function of a first threshold value;

measuring a second half-width of the profile corresponding to a second density value, wherein said second density value is a function of a second threshold value;

determining the width of the structure by adding the first half-width to the second half-width.

5,594,776

EFFICIENT PAGING SYSTEM

Paul W. Dent, Stehags, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Sep. 14, 1994, Ser. No. 305,652

Int. Cl.[6] H04Q *7/38*

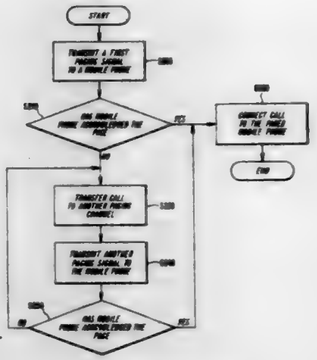
U.S. Cl. 379—58 **18 Claims**

1. A method for efficiently paging a mobile phone in a radio telephone system having a plurality of mobile phones, comprising the steps of:

transmitting a first paging signal for a first mobile phone on a first calling channel;

transferring the call to at least a second calling channel when said first mobile phone does not acknowledge said first paging signal within a predetermined period of time; and

transmitting a second paging signal for said first mobile phone on at least said second calling channel, wherein said second channel employs more error correction coding than the first calling channel.



5,594,777

WIRELESS PRIVATE BRANCH EXCHANGE SYSTEM FOR USE WITH MOBILE COMMUNICATION DEVICES

Matti Makkonen; Tapani Pökkä, and Markku Lehto, all of Helsinki, Finland, assignors to Telecom Finland Oy, Helsinki, Finland

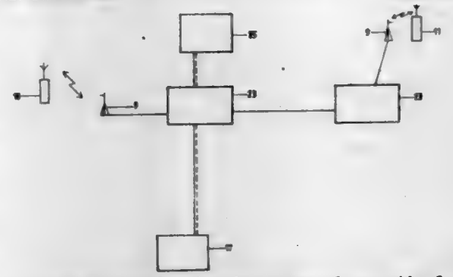
PCT No. PCT/FI93/00336, § 371 Date May 17, 1995, § 102(e) Date May 17, 1995, PCT Pub. No. WO94/05126, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 26, 1993, Ser. No. 392,751

Claims priority, application Finland, Aug. 26, 1992, 923824; Aug. 26, 1993, 933744

Int. Cl.[6] H04Q *7/22;7/24;7/26*

U.S. Cl. 379—58 **8 Claims**



1. A wireless private branch exchange system for use with a first plurality of mobile communication devices associated with a wireless network, and a second plurality of communication devices operable to communicate with the wireless network, each communication device of the first plurality of mobile communication devices and the second plurality of communication devices having a first unique identification number representative of a public exchange number, said wireless private branch exchange system comprising:

first control means operable to define, for each of the first plurality of mobile communication devices, a second unique identification number representative of a private branch exchange extension number, shorter than said first identification number;

communication control means, connected to said first control means and to the wireless network, operable to define a predetermined coverage area, to control and identify wireless communication between each mobile communication device of the first plurality of mobile communication devices within said predetermined coverage area via the wireless network, and to enable and identify communication between the first plurality of mobile communication devices and the second plurality of communication devices via the wireless network, such that:

when a first mobile communication device of the first plurality of mobile communication devices located within said coverage area transmits, to said communication control means, a unique second identification number associated with a second mobile communication device of the first plurality of mobile communication devices, also within said coverage area, said communication control means connects said first and second mobile communication devices via the wireless network to enable communication therebetween, and asserts a first signal indicative of an internal communication, and

when said first mobile communication device of the first plurality of mobile communication devices transmits, to said communication control means, a unique first identification number associated with a third communication device of the second plurality of communication devices, said communication control means connects said first mobile communication device to the wireless network to enable communication with said third communication device, and asserts a second signal indicative of an external communication; and

first register means, connected to said communication control means, operable to provide a record of internal wireless communications within the first plurality of mobile communication devices by recording said first signal for each instance of said internal wireless communication by each mobile communication device of the first plurality of mobile communication devices, and to provide a record of external wireless communications between the first plurality of mobile communication devices and the second plurality of communication devices by recording said second signal for each instance of said external wireless communication by each mobile communication device of the first plurality of mobile communication devices.

5,594,778

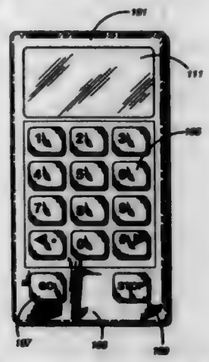
RADIO TELEPHONE OPERATING TECHNIQUE

George W. Schaupp, Jr., Schaumburg; Laura A. Sheley, Prospect Heights, and Kirk W. Dailey, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 228,173, Apr. 15, 1994, abandoned, which is a division of Ser. No. 650,346, Feb. 4, 1991, abandoned. This application Oct. 18, 1995, Ser. No. 544,742

Int. Cl.[6] H04M 11/00

U.S. Cl. 379—58 26 Claims



1. A method of operating a radiotelephone, the radiotelephone including a memory, a display and a keypad with at least a first single-throw function key, a second single-throw function key, and a plurality of data keys, the method comprising the steps of:

creating a first function key signal solely responsive to the first single-throw function key to turn on the radiotelephone;

selecting a phone number using the plurality of data keys;

creating a second function key signal solely responsive to said first single-throw function key activating the radiotelephone to call said phone number;

creating a third function key signal solely responsive to the second single-throw function key disconnecting the radiotelephone from said call;

creating a fourth function key signal solely responsive to said second single-throw function key turning off the radiotelephone; and

wherein said first single-throw function key does not revert back to creating said first function key signal unless said fourth function key signal has been created.

5,594,779

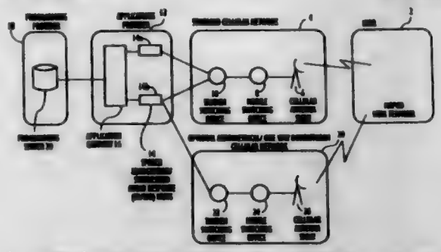
MOBILE AUDIO PROGRAM SELECTION SYSTEM USING PUBLIC SWITCHED TELEPHONE NETWORK

William Goodman, Collegeville, Pa., assignor to Bell Atlantic, Arlington, Va.

Filed Jan. 12, 1995, Ser. No. 371,902

Int. Cl.[6] H04Q 2/22

U.S. Cl. 379—59 22 Claims



1. A radio frequency based information distribution system having mobile users, comprising:

a mobile switching office selectively connecting the mobile users of the information distribution system;

information service providers, operatively connected to said mobile switching office, at least one of the information service providers receiving user selection signal inputs received by said mobile switching office from a mobile user, and transmitting user selected information to the mobile switching office responsive to the user selection signal inputs; and at least one mobile terminal, comprising:

a receiver, operatively coupling the at least one mobile terminal to the mobile switching office, receiving the user selected information from the at least one of the information service providers via said mobile switching office;

a control processor controlling operations of the at least one mobile terminal;

means for receiving a user selection from the mobile user, for generating user selection signal inputs responsive to the user selection, and for transmitting the user selection signal inputs to the mobile switching office;

signal format means for formatting the user selected information for broadcasting, and for outputting formatted user selected information; and

broadcast means for broadcasting the formatted user selected information,

wherein the user selection comprises an audio selection,

wherein the at least one of the information service providers include:

programming servers storing programs;

speech recognition means for receiving the audio selection via said mobile switching office, and for generating data selection signals; and

a gateway for receiving the data selection signals from said speech recognition means, said gateway selecting at least one of the programs stored in at least one of the programming servers responsive to the data selection signals,

wherein said at least one mobile terminal further comprises a memory operatively connected to said receiver, and

wherein said receiver receives the at least one of the programs corresponding to the data selection signals and stores the at least one of the programs entirely in said memory before broadcasting to the mobile user, thereby minimizing connection between said at least one mobile terminal and said mobile switching office.

5,594,780

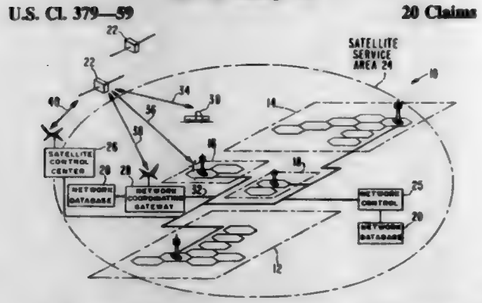
SATELLITE COMMUNICATION SYSTEM THAT IS COUPLED TO A TERRESTRIAL COMMUNICATION NETWORK AND METHOD

Robert A. Wiedeman, Los Altos, and Paul A. Monte, San Jose, both of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Continuation of Ser. No. 407,799, Mar. 20, 1995, Pat. No. 5,448,623, which is a continuation of Ser. No. 88,896, Jul. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 775,625, Oct. 10, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,105

Int. Cl.[6] H04Q 7/38

U.S. Cl. 379—59 20 Claims



14. A satellite communications system that is bidirectionally coupled to a terrestrial communications network, comprising:

a plurality of earth orbiting satellites;

a plurality of wireless transceivers associated with users of the satellite communications system, each of said wireless transceivers comprising first means for bidirectionally coupling said wireless transceiver, when active, through a first RF link to at least one satellite of the plurality of earth orbiting satellites for transmitting communications signals to, and for receiving communications signals from, the at least one satellite, said first means for bidirectionally coupling being response to input from the user for transmitting a request for service from the wireless transceiver over said first RF link to the at least one satellite;

said at least one satellite comprising means for repeating the request for service by receiving the request for service from the one of the first RF links, for frequency shifting the received request for service, and for transmitting the frequency shifted request for service to a second RF link, without regard for any informational content of the request for service; and

a plurality of gateways that are bidirectionally coupled through the second RF link to the at least one satellite for transmitting communications signals to, and for receiving communications signals from, the at least one satellite, each of the plurality of gateways also being bidirectionally coupled to a terrestrial communications network, at least one of said gateways functioning as a network coordinating gateway and comprising means for receiving requests for service from the second RF link, said network coordinating gateway further comprising means for determining a location of the wireless transceiver that is requesting service and for selecting one of the plurality of gateways to couple the wireless transceiver requesting service to the terrestrial communications network, the gateway being selected in accordance with at least the determined location of the wireless transceiver that is requesting service.

5,594,781

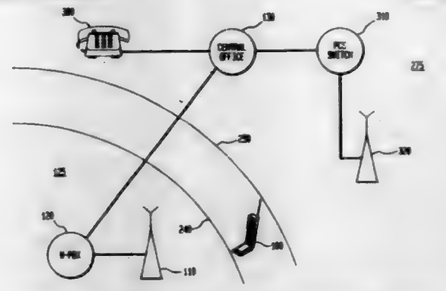
MOBILE TELEPHONE CONNECTION TRANSFER

Peter J. Kozdon, Santa Clara, and Neal J. King, Oakland, both of Calif., assignors to Roim Company, Santa Clara, Calif.

Continuation of Ser. No. 280,165, Jul. 25, 1994, abandoned. This application Apr. 2, 1996, Ser. No. 627,822

Int. Cl.[6] H04Q 7/20

U.S. Cl. 379—60 1 Claim



1. Method for transferring an active connection between a mobile telephone handset and a first mobile telephone system to a second mobile telephone system, the mobile telephone handset being addressed by a first telephone number in the first mobile telephone system and a second telephone number in the second mobile telephone system, a telephone connected to the second mobile telephone system being connected to the mobile telephone handset when the telephone dials the second telephone number, which method comprises the steps of:

detecting that a signal strength of the active connection has fallen below a predetermined threshold;

sending a request from the mobile telephone handset to the first mobile telephone system to set up an alternative connection from the first mobile telephone system to the mobile telephone handset through the second mobile telephone system, wherein the step of sending a request comprises the step of receiving user input to initiate the sending; and

causing the first mobile telephone system to connect to the second mobile telephone system via the alternate connection by causing the first mobile telephone system to place a call to the mobile telephone handset through the second mobile telephone system by dialing the second telephone number on a telephone circuit connecting the first mobile telephone system to the second mobile telephone system,

wherein the step of connecting comprises the step of requesting said first mobile telephone system to set up a conference call involving the mobile telephone handset using the second telephone number which is provided by the mobile telephone handset, and

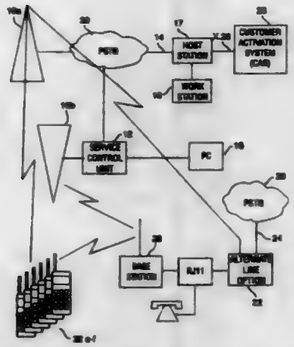
wherein the step of connecting further comprises the step of detecting whether the signal strength falls below a further predetermined threshold and, if so, suspending the active connection to create an inactive party to the conference call.

5,594,782

MULTIPLE MODE PERSONAL WIRELESS COMMUNICATIONS SYSTEM

Robert G. Zicker, and John K. Dion, both of Roswell, Ga., assignors to GTE Mobile Communications Service Corporation, Atlanta, Ga.

Filed Feb. 24, 1994, Ser. No. 201,445
Int. Cl.[6] H04Q *7/22*
U.S. Cl. 379—63 **15 Claims**



1. In a multiple mode communications system, a location analysis process including the steps of:

a) providing radio handsets capable of communicating selectively with cell sites of a cellular radiotelephone network and cordless stations of a local radio network;

b) configuring said cell sites to continuously broadcast data which identify said cell sites;

c) configuring said cordless stations to refrain from continuously broadcasting overhead message data streams;

d) comparing in one of said radio handsets, said data which identify said cell sites with a preselected profile of cell site identity data;

e) generating a trigger signal in response to a match of said data; and

f) transmitting an access request signal from said one radio handset in response to said trigger signal, said access request signal being configured to be received by one of said cordless stations.

5,594,783

TELEPHONE APPARATUS FOR RECORDING A PREDETERMINED MESSAGE IN PLACE OF A CNG TONE

Fumihiko Ito, Funabashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 546,734, Oct. 23, 1995, abandoned, which is a continuation of Ser. No. 195,638, Feb. 14, 1994, abandoned. This application Apr. 18, 1996, Ser. No. 632,731
Claims priority, application Japan, Feb. 15, 1993, 5-025651; Dec. 13, 1993, 5-311525
Int. Cl.[6] H04M *1/64*; H04N *1/32*
U.S. Cl. 379—68 **22 Claims**

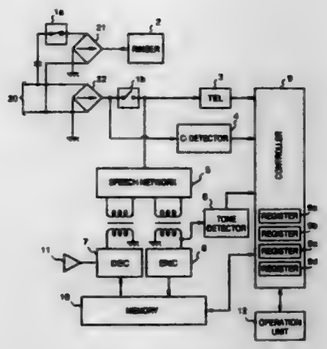
1. A telephone apparatus comprising:

memory means for storing a message;

recording means for recording a voice message inputted from a line; and

detection means for detecting a tone signal,

wherein, if said detection means detects the tone signal after said recording means has started the recording, said recording means records a switching message read out of said memory means so that the tone signal is written over by the switching message.

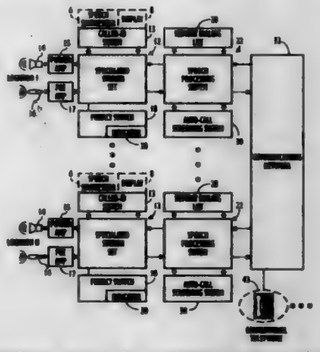


5,594,784

APPARATUS AND METHOD FOR TRANSPARENT TELEPHONY UTILIZING SPEECH-BASED SIGNALING FOR INITIATING AND HANDLING CALLS

George A. Vellus, Glencoe, Mo., assignor to Southwestern Bell Technology Resources, Inc., St. Louis, Mo.

Filed Apr. 27, 1993, Ser. No. 52,607
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—88 **39 Claims**



1. A telephony system for establishing voice communication over a communication network between a caller and a call recipient, comprising:

means for initiating a call from a caller's location to a call destination based on a voice utterance made by said caller; and

means for reproducing, at said call destination, an audible likeness of said voice utterance made by said caller subsequent to the call being initiated by said initiating means, so as to enable said call recipient to identify said caller on the basis of voice characteristics of said caller.

5,594,785

METHOD OF PRODUCING RING-BACK TONE IN ORDER WIRE

Kazutoshi Kawamura, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 7, 1995, Ser. No. 524,873
Claims priority, application Japan, Feb. 14, 1995, 7-025352
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—90 **2 Claims**

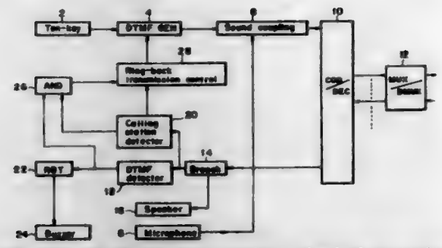
1. A method for producing a ring-back tone in a calling station when the calling station selects a called station from a plurality of stations and an order wire is established between said calling station and said called station to produce a ring-back tone only in said calling station, the method comprising the steps of:

transmitting a dual-tone multifrequency signal, on the side of the calling station, in accordance with the station number of the called station and the station number of the calling station;

determining, on the side of the called station, as to whether or not the station number detected from the received dual-tone multifrequency signal is in agreement with the station number of its own station and causing a call-in tone to be produced when they are in agreement with each other;

transmitting a ring-back tone signal, on the side of the called station, in accordance with the station number of the calling station detected from the received dual-tone multifrequency signal; and

determining, on the side of the calling station, as to whether or not the received ring-back tone signal is that addressed to its own station and causing a ring-back tone to be produced when the signal is that addressed to its own station.

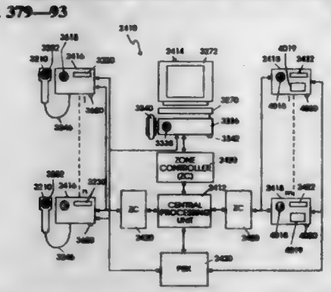


5,594,786

PATIENT CARE AND COMMUNICATION SYSTEM

John Chace, Seymour; Israel Hersh, Fairfield; Dmitry Orlovsky, Danbury; Joe Vincens, Prospect, and Yaron Ram, Stamford, all of Conn., assignors to Executone Information Systems, Inc., Darien, Conn.

Continuation-in-part of Ser. No. 87,394, Jul. 2, 1993, and a continuation-in-part of Ser. No. 33,287, Mar. 16, 1993, which is a continuation-in-part of Ser. No. 924,101, Aug. 3, 1992, which is a continuation-in-part of Ser. No. 559,196, Jul. 27, 1990, Pat. No. 5,291,399. This application Feb. 28, 1994, Ser. No. 203,909
Int. Cl.[6] H04M *11/00;11/04*; G06F *15/00*
U.S. Cl. 379—93 **28 Claims**



1. A patient care and communication system which comprises:

a central station having means for facilitating visual and data communications relating to patient care; and

a plurality of remote stations linked to said central station and having a processor for facilitating visual and data communications relating to patient care and having a display for displaying said visual communications; and

a private branch exchange connected to a telephone exchange and to a plurality of telephones for facilitating telephone communication between said telephones and said telephone exchange;

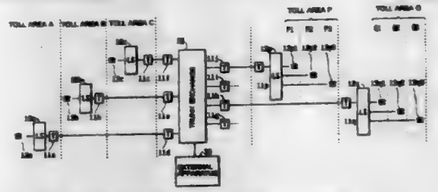
wherein said central station facilitates said visual and data communications between said plurality of remote stations, and includes means for determining which of said plurality of remote stations are transmitting said visual and data communications and which of said plurality of remote stations are to receive said visual and data communications, and wherein said central station further includes means for establishing a communication link between said transmitting stations and said receiving stations; wherein each of said plurality of remote stations includes telephone circuitry connected to said private-branch exchange for facilitating telephone communication, each of said plurality of remote stations further includes a sensor for sensing energy radiated from portable transmitter units, the radiated energy includes respective identification signals associated with each of said transmitter units wherein at least a portion of said plurality of remote stations are configured and adapted for association in a group network such that predefined visual and data signal communications are transmitted to each remote station in the group by said central station and audio communications are transmitted by said private-branch exchange.

5,594,787

CALL TOLL PROCESSING METHOD AND CALL TOLL PROCESSING APPARATUS

Kenichi Ohshima; Jun Ishikawa; Koji Kudoh, and Tomoki Nakaya, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 19, 1995, Ser. No. 503,941
Claims priority, application Japan, Jan. 9, 1995, 7-001475
Int. Cl.[6] H04M *15/00*
U.S. Cl. 379—114 **6 Claims**



1. A telephone communication system comprising:

a plurality of telephones; and

a plurality of exchanges for establishing calls among said plurality of telephones,

each exchange including:

called party toll area data transmitting means for transmitting when a call is established, a called party toll area data specifying a toll area in which a called telephone is located,

calling party toll area data determining means for determining a calling party toll area specifying a toll area in which a calling telephone is located,

location data determining means for determining location data regarding an exchange connected to the called telephone by analyzing a dialing data inputted from the calling telephone,

called party toll area data receiving means for receiving the called party toll area data transmitted by said called party toll area data transmitting means in the exchange connected to the called telephone,

measuring means for measuring a duration of the call,

means for obtaining a unit data from the called party toll area data received by said called party toll area data receiving means, the location data determined by said location data determining means, and the calling party toll area data determined by said calling party toll area data determining means, and

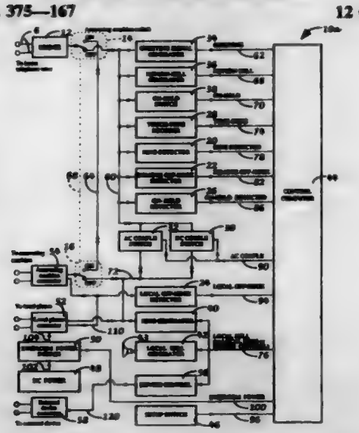
call toll computing means for computing a call toll for the call on the basis of the unit data obtained by said means for obtaining a unit data and the duration measured by said measuring means.

5,594,788

TELEPHONE SYSTEM AND INTERFACE DEVICE

Stephen T. Lin, 20344 Miljevich Dr., Saratoga, Calif. 95070; Bing-Heng Huang, 1217 McCormick La., Costa Mesa, Calif. 92626, and Steve Chow, 17522 Cantara St., Northridge, Calif. 91325

Filed Nov. 23, 1994, Ser. No. 344,772
Int. Cl.[6] H04M *1/60;9/00;1/00;3/00*
U.S. Cl. 375—167 12 Claims



1. A telephone interface device for use in communicatively coupling each of a plurality of telephone sets and/or answering machines connected in parallel in a local network and to an incoming telephone line from a central office of a telephone service provider, comprising:

a bridge having input terminal for connection to the local network and an output terminal coupled to an internal signal line;

local device terminals for connection to one of said plurality of telephone sets and/or answering machines; a control computer;

a tone decoder responsive to a tone sequence appearing on said internal signal line, and operative to decode the tone sequence into a plurality of bit signals and to input the bit signals to said computer;

a ring detector communicatively coupled between said internal signal line, and said computer, said ring detector being operative to generate a predetermined voltage for input to said computer if a ring signal is detected on said internal signal line;

a remote off-hook detector communicatively coupled between said internal signal line and said computer, said ring detector being responsive to a voltage appearing on said internal signal line and operative to generate a predetermined voltage for input to said computer if another of said plurality of telephone sets and/or answering machines is in the off-hook condition and causes the voltage to appear on said internal signal line;

coupling switch means for selectively coupling said internal signal line and a circuit node, said coupling switch means being responsive to an AC couple command signal from said computer and operative to toggle between a first state and a second state, wherein in said first state both AC and DC signals are transmitted between said circuit node and said internal signal line, and wherein in said second state only AC signals are transmitted between said circuit node and said internal signal line;

a local phone connector communicatively coupled to said local device terminals and having a ring signal line and a tip signal line, said ring signal line being communicatively coupled to said circuit node; and

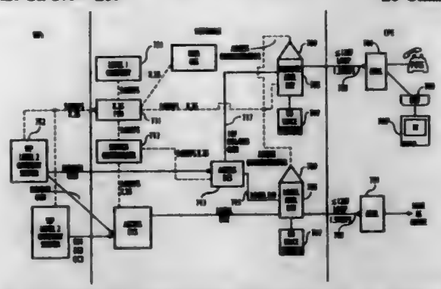
a local phone off-hook detector communicatively coupled to said computer and to said tip signal line, said local phone off-hook detector being responsive to a voltage appearing on said tip signal line, and operative to generate a voltage for input to said computer if a telephone set coupled to said local device terminals is in an off-hook condition.

5,594,789

TRANSACTION IMPLEMENTATION IN VIDEO DIAL TONE NETWORK

John W. Seazholtz, Great Falls, Va., and Alex McAllister, Wheaton, Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Oct. 13, 1994, Ser. No. 322,124
Int. Cl.[6] H04M *3/42;* H04N *7/173*
U.S. Cl. 379—207 20 Claims



1. A method of implementing transactions in an integrated communication system, which includes:

a plurality of telephone stations;

a plurality of separately located central office switching systems interconnected via trunk circuits for selectively providing switched telephone call communications between at least two of said telephone stations;

a service control point, separate from said central office switching systems, comprising a database storing call processing data associated with a plurality of said telephone stations for control of call processing through one or more of said central office switching systems;

a peripheral platform connected to at least one of said central office switching systems via a telephone call connection channel, said peripheral platform comprising means for providing at least one auxiliary telephone call processing capability via said telephone call connection channel including a database of personal speech identification templates pro-established by subscribing users;

a signaling communication system separate from said trunk circuits for two-way communications of data messages between said central office switching systems said central office switching systems and said service control point, and between said peripheral platform and said service control point;

a plurality of broadband information service provider systems, each service provider system being capable of transmitting broadband digital information;

a plurality of terminals for transmitting control signals upstream in response to user inputs and for providing displays in response to received digital information; and

a broadband communication network selectively providing broadband digital communications from said service provider systems to said terminals; wherein

said peripheral platform receives at least some of said control signals from said terminals,

said method comprising the steps of:

(a) receiving from one of said terminals a control signal comprising instructions to initiate a transaction at said peripheral platform;

(b) in response to said control signal received pursuant to (a), retrieving from said template database one of said pre-established identification templates which is identified by said control signal;

(c) sending to said one of said terminals from which originated said control signal which identified said retrieved template a request for a user to speak an utterance associated with said template retrieved pursuant to (b);

(d) receiving at said peripheral platform a signal resulting from said user speaking said utterance;

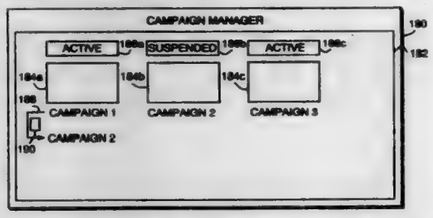
(e) comparing said received signal resulting from said utterance with said retrieved template and responsive to establishing a match completing said transaction.

5,594,790

METHOD FOR SELECTING AND CONTROLLING THE AUTOMATIC DIALING OF A CALL RECORD CAMPAIGN

Anthony Curreri, Litchfield; B. Scott Smith, Londonderry, and G. Mark Jennings, Brookline, all of N.H., assignors to Davox Corporation, Westford, Mass.

Continuation-in-part of Ser. No. 5,481, Jan. 14, 1993, Pat. No. 5,343,518. This application Jun. 1, 1994, Ser. No. 252,339
Int. Cl.[6] H04M *3/00*
U.S. Cl. 379—265 11 Claims



1. A method of controlling the flow of a first call record campaign to a second call record campaign by a telephony system, the method comprising the steps of:

establishing at least a first and second call record campaign on said telephony system, each established call record campaign for controlling the dialing, by said telephony system, of a plurality of predetermined call records;

establishing a call record campaign link between said at least first and second call record campaign;

initiating processing of said first call record campaign;

processing at least one call record from said first call record campaign;

determining said first call record campaign is not driven to maximum capacity;

if said first call record campaign is not driven to said maximum capacity, performing the steps of:

determining if more call records in said first call record campaign remain to be processed said first call record campaign is not driven to a maximum;

if there remain more call records to be processed from said first call record campaign, processing at least one additional call record from said first call record campaign;

if there remains no more call records to be processed from said first call record campaign performing the steps of:

initiating processing of said second call record campaign;

processing at least one call record from said second call record campaign;

detecting the completion of processing of at least one call record from said first call record campaign; and

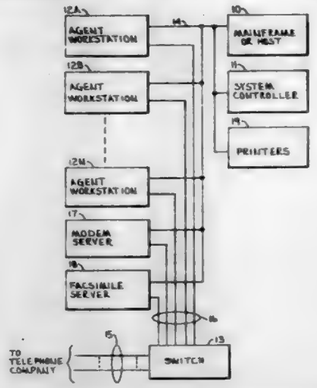
initiating processing of at least a second call record from said second call record campaign, said at least a second call record corresponding to a number of call records detected as completed processing from said first call record campaign.

5,594,791

METHOD AND APPARATUS FOR PROVIDING RESULT-ORIENTED CUSTOMER SERVICE

Aleksander Szlam, Norcross, and James E. Owen, Smyrna, both of Ga., assignors to Inventions, Inc., Norcross, Ga.

Filed Oct. 5, 1994, Ser. No. 318,506
Int. Cl.[6] H04M *3/00;3/42*
U.S. Cl. 379—265 25 Claims



1. A method for contacting a customer, comprising the steps of:

obtaining a customer sensitivity profile for said customer, said customer sensitivity profile comprising the following factors: a preferred address for contacting said customer, a preferred telephone number for contacting said customer by voice, and a preferred manner of contacting said customer, said preferred manner comprising the following: by voice, and by means other than voice;

extracting said preferred manner from said customer sensitivity profile;

if said preferred manner is by voice then extracting said preferred telephone number from said customer sensitivity profile and automatically calling said customer at said preferred telephone number for voice; and

if said preferred manner is by other than voice then automatically sending a document to said customer at said preferred address.

5,594,792

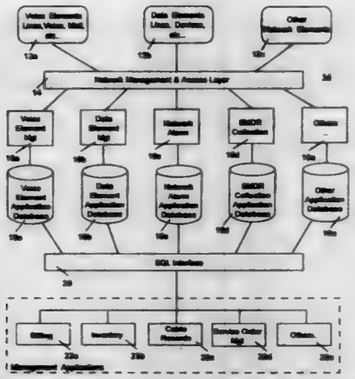
METHODS AND APPARATUS FOR MODELING AND EMULATING DEVICES IN A NETWORK OF TELECOMMUNICATION SYSTEMS

Philippe J. Chouraki, San Francisco; Simon F. Moloney, Redwood City; Mark A. Russell, San Francisco, and David R. Preston, Los Gatos, all of Calif., assignors to American Telecorp, Redwood Shores, Calif.

Filed Jan. 28, 1994, Ser. No. 188,473
Int. Cl.[6] H04M *1/57;1/64*
U.S. Cl. 379—269 22 Claims

1. A method for modeling and emulating a plurality of telecommunication devices of a network of telecommunication systems, wherein said telecommunication devices have device types, said method comprising the steps of:

(a) compiling statements specifying rules and behaviors of said device types into device type model databases and storing said device type model databases using a computer, each of said device type model databases comprising a plurality of meta data structures, each of said meta data structures comprising one or more data elements of one or more of said device types, one or more predicates, and at least one navigation sequence governing retrieval of and physically locating said data elements, said navigation sequences facilitating said governing in conjunction with said predicates; and



(b) interpreting user actions and device responses by retrieving appropriate ones of said data elements for said telecommunication devices using a computer, and traversing appropriate ones of said navigation sequences, each navigation sequence being traversed in a predetermined manner.

5,594,793

INTEGRATED CIRCUIT CONTAINING A PROTECTED MEMORY AND SECURED SYSTEM USING SAID INTEGRATED CIRCUIT

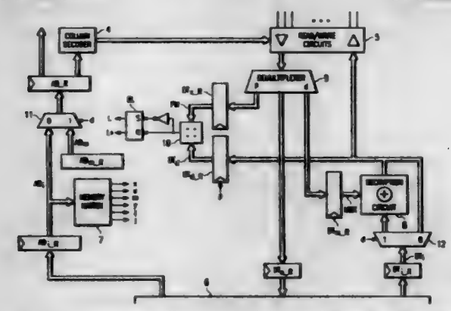
Yvon Bahout, Fuveau, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly Cedex, France

Filed Oct. 27, 1994, Ser. No. 329,975

Claims priority, application France, Oct. 28, 1993, 93 13091

Int. Cl.[6] G06F *12/14*

U.S. Cl. 380—4 **19 Claims**



1. An integrated circuit comprising an electrically modifiable non-volatile memory, an associated control circuit and at least one volatile memory element constituting a lock whose state, when it is powered on, defines a locked state of said memory, said integrated circuit being one wherein said memory has a first zone that can be read-protected by said lock and a second zone that is always read-protected, write-protected by said lock and contains at least one password at a determined address, wherein said control circuit has first means to detect a command for writing a data element addressed by said determined address while said memory is locked and second means to verify the compatibility of said data element with said password, said compatibility being different from identity, and wherein, in the event of compatibility, said lock is released.

5,594,794

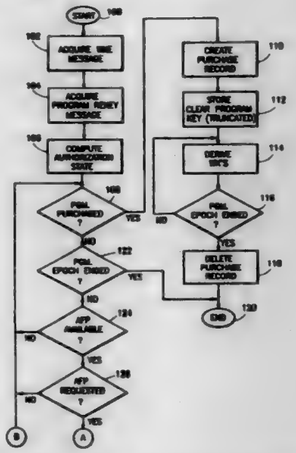
METHOD AND APPARATUS FOR FREE PREVIEWS OF COMMUNICATION NETWORK SERVICES

Mark Eyer, San Diego; Allen Shumate, Poway, and Paul Mooney, Olivenhain, all of Calif., assignors to General Instrument Corporation of Delaware, Chicago, Ill.

Filed Oct. 18, 1994, Ser. No. 324,591

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—20 **29 Claims**



1. A method for providing video services to consumers via an information network, comprising the steps of:

providing a video service on a pay-per-view basis during a program epoch of a particular program of said video service;

providing a program pre-key;

using said program pre-key to determine a fixed period during said program epoch when portions of said video service are available for viewing on a preview basis;

allowing a consumer to preview, without purchase, portions of said video service at any time during said fixed period for up to a maximum preview duration that is shorter than said fixed period; and

enforcing said maximum preview duration in a cryptographically secure manner.

5,594,795

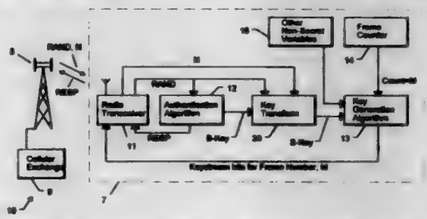
METHOD AND APPARATUS FOR KEY TRANSFORMS TO DISCRIMINATE BETWEEN DIFFERENT NETWORKS

Paul W. Dent, Stehag, Sweden, and Alex K. Raith, Durham, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Jul. 5, 1994, Ser. No. 270,565

Int. Cl.[6] H04N *9/32;9/16*

U.S. Cl. 380—23 **26 Claims**



1. A method for determining a key for scrambling radiotelephone traffic between a radiotelephone terminal and a radiotele-

phone network the radiotelephone network providing a data or voice communications service, said method comprising the steps of:

a) signal including a random number from said network to said terminal and using the random number to carry out an authentication procedure, said authentication procedure authenticating said terminal to said network and generating a session key, which is a byproduct of the authentication process:

b) transmitting an indication of the type of network providing service to said terminal, said indication indicating the way in which said session key shall be further transformed:

c) transforming said session key into a transformed session key dependent upon the indication of the type of network;

d) using said transformed session key to scramble traffic passed between said network and said terminal.

5,594,796

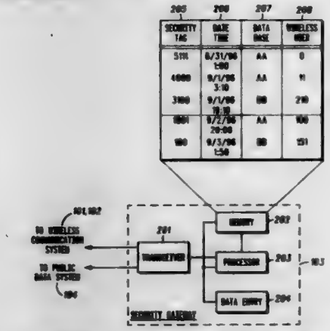
METHOD AND APPARATUS FOR DETECTING UNAUTHORIZED DISTRIBUTION OF DATA

Gary W. Grube, Palatine, Ill.; Timothy W. Markison, and Mathew A. Rybicki, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 5, 1994, Ser. No. 317,664

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—25 **11 Claims**



1. In a communication environment that includes a wireless communication system operably coupled to a public data system, wherein the wireless communication system includes a plurality of communication units, a method for preventing unauthorized distribution of data information within the wireless communication system, the method comprising steps of:

a) receiving, by a security gateway, the data information from a particular data base of the public data system;

b) searching, by the security gateway, the data information for a security tag;

c) when the security tag is found, determining, by the security gateway, whether the security tag is assigned to the particular data base; and

d) when the security tag is not assigned to the particular data base, identifying, by the security gateway, the particular data base as a potential unauthorized distributor of the data information.

5,594,797

VARIABLE SECURITY LEVEL ENCRYPTION

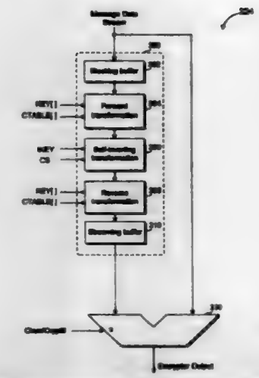
Seppo Alasaari, Oulu, Finland, and Thomas Berson, Palo Alto, Calif., assignors to Nokia Mobile Phones, Salo, Finland

Filed Feb. 22, 1995, Ser. No. 394,537

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—28 **9 Claims**

1. A method of securely encrypting a plaintext data block into a ciphertext data block, the method comprising the steps of:



converting the plaintext data block into a first intermediate data block according to a first encrypting process which uses a first key signal as its key and the plaintext data block as its data input;

determining a state of a compatibility switch, said state being one of a compatible state or a secure state;

converting said first intermediate data block into a second intermediate data block according to a second encrypting process which uses said first intermediate data block as its data input and uses a second key signal as its key when said state is said secure state and a compatibility value as its key when said state is said compatible state, wherein said second encrypting process is an involutory transformation of its data input; and

converting said second intermediate data block into the ciphertext data block according to an encrypting process which is an inverse transformation of said first encrypting process using said first key signal as its key and said second intermediate data block as its data input.

5,594,798

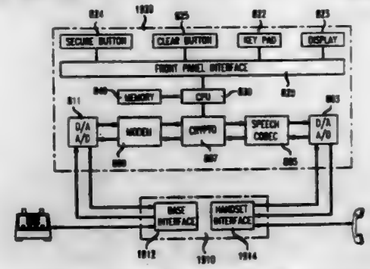
SECURE TELECOMMUNICATIONS

Richard V. Cox, New Providence, N.J., and Michael M. Kaplan, Rockport, Mass., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 113,376, Aug. 27, 1993, Pat. No. 5,434,920, which is a continuation-in-part of Ser. No. 803,809, Dec. 9, 1991, Pat. No. 5,392,357. This application Jun. 6, 1995, Ser. No. 468,168

Int. Cl.[6] H04N *9/12;* H04M *1/68*

U.S. Cl. 380—49 **16 Claims**



1. A method of transmitting information signals to a first device over a communications network, the information signals transmitted from a secure telephone device coupled between a telephone base and telephone microphone, the secure telephone device having a keypad, the first device having a cryptographic system, the method of comprising the steps of:

transmitting first signals to establish in the network a clear communication path between the secure telephone device and the first device;

transmitting second signals from the secure telephone device to the cryptographic system of the first device, the second signals for use in converting the clear communication path to a secure communication path;

generating information signals with use of the keypad of the secure telephone device; and

transmitting the information signals from the secure telephone device to the first device over the secure network communication path.

5,594,799

CIRCUIT FOR SUPPRESSION OF SHORT-LIVED NOISE-PHENOMENA IN A DIGITAL AUDIO SIGNAL

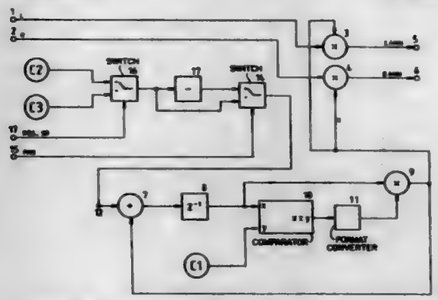
Matthias Herrmann, Hildesheim, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Mar. 28, 1994, Ser. No. 218,651

Claims priority, application Germany, Apr. 3, 1993, 43 10 985.3

Int. Cl.[6] H04H 5/00; H04B 1/10

U.S. Cl. 381—13 **14 Claims**



1. A circuit for suppressing short-lived noise phenomena in a digital audio signal, in particular during a temporary test reception of another transmitter, comprising

multiplying means (3, 4) for multiplying the audio signal by a factor (K) which, prior to the appearance of the noise phenomenon, is adjusted non-linearly from a maximum value to a minimum value in accordance with a predetermined non-linear time function thereby damping the audio signal, and, at the end of the noise phenomenon, is returned, non-linearly, to a maximum value; and

an integrator (7, 8) comprising an adder (7) and a delay element (8) which retards the signal, said integrator deriving said factor (K) and having its output coupled to said multiplying means.

5,594,800

SOUND REPRODUCTION SYSTEM HAVING A MATRIX CONVERTER

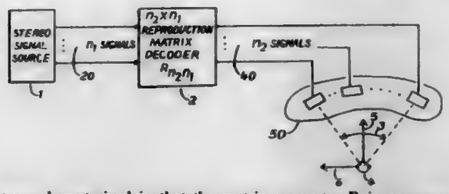
Michael A. Gerzon, Oxford, United Kingdom, assignor to Trifield Productions Limited, London, United Kingdom

Continuation of Ser. No. 513,166, Aug. 9, 1995, abandoned, which is a continuation of Ser. No. 104,897, Nov. 16, 1993, abandoned. This application Jan. 23, 1996, Ser. No. 589,994

Claims priority, application United Kingdom, Feb. 15, 1991, 9103287.8

Int. Cl.[6] H04R 5/00

U.S. Cl. 381—20 **44 Claims**



1. A matrix converter $R_{n2,n1}$ for converting a first audio signal (20) stereophonically encoded for reproduction over n_1 speakers into a second audio signal (40) stereophonically encoded for reproduction over n_2 loudspeakers, when n_1, n_2 are integers $n_1>2$ and $n_2>n_1$, characterised in that the matrix converter R is an energy preserving matrix arranged substantially to preserve to within an overall constant of proportionality, the total reproduced energy and the reproduced directional effect of the encoded audio signal.

5,594,801

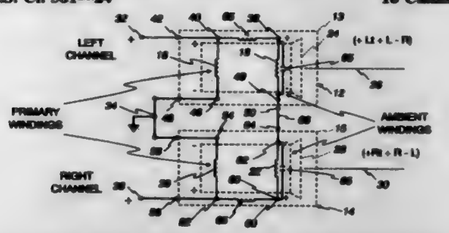
AMBIENT EXPANSION LOUDSPEAKER SYSTEM

Charles L. McShane, 1910 Seneca Ln., Mount Prospect, Ill. 60056

Filed May 26, 1994, Ser. No. 249,892

Int. Cl.[6] H04R 5/00; 25/00

U.S. Cl. 381—24 **16 Claims**



1. A sound reproduction system having audio drivers for producing audio outputs in response to a left channel signal and a right channel signal and for producing an expanded acoustic image, said sound reproduction system comprising: a left audio driver for radiating left total audio information corresponding to said left channel signal along a left acoustic axis and a right audio driver for radiating right total audio information corresponding to said right channel signal along a right acoustic axis, and image expansion means for radiating ambience audio information corresponding to predetermined combinations of said left channel signal and said right channel signal along the same said left acoustic axis and right acoustic axis as said left total audio information and said right total audio information; wherein said left audio driver includes a first voice coil for receiving said left channel signal and said right audio driver includes a first voice coil for receiving said right channel signal and wherein each of said left and right audio drivers includes a second voice coil comprising said image expansion means for receiving image expansion signals comprising said predetermined combinations of said right channel signal and said left channel signal.

5,594,802

SOUND SYSTEM FOR USE WITH GAS FIREPLACES AND SIMULATING BURNING WOOD

Jan S. Berghoff, 9514 Bennett Pl., Eden Prairie, Minn. 55347, and Jeff Hendrick, #338 5220 Lincoln Dr., Edina, Minn. 55436

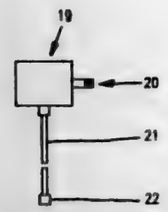
Filed Jul. 25, 1994, Ser. No. 279,540

Int. Cl.[6] H03G 3/00; F23Q 2/32; F24B 1/18

U.S. Cl. 381—61 **1 Claim**

1. An electronic burning wood sound generator for use with a gas flame fireplace and simulating the sound of a burning wood fire, comprising:

(a) an integrated circuit containing means to record and repeatedly playback a substantially 10 second sound pattern substantially similar to that produced by burning wood; and



(b) a speaker connected to said integrated circuit;

(c) means to convert 120 volt AC power to substantially 5 volt DC power, said means being connected to said integrated circuit and to said speaker;

(d) a substantially 10 Kohm PTC thermistor temperature sensor connected to said integrated circuit for detecting the presence of heat from the gas flame of the fireplace, said sensor signaling said integrated circuit to begin transmitting sounds, via said speaker, simulating burning wood, said sensor further signaling said integrated circuit to terminate transmitting sounds upon detecting the absence of heat due to gas flame stoppage;

(e) a double pole triple throw control switch connected to said power source and said integrated circuit;

(f) a volume control variable resistance potentiometer connected to said integrated circuit; and

(g) a microphone, connected to said integrated circuit, to receive sound signals representative of a burning wood fire.

5,594,803

SILENCING APPARATUS OPERABLE TO REDUCE VEHICLE NOISE AT A TELEPHONE

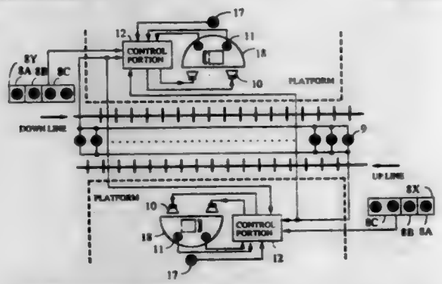
Susumu Fujiwara; Masahiko Sakata, and Mikio Ishizuka, all of Kanagawa-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 974,976, Nov. 12, 1992, abandoned. This application Jul. 13, 1995, Ser. No. 502,326

Claims priority, application Japan, Mar. 11, 1992, 4-052710

Int. Cl.[6] A61F 11/06

U.S. Cl. 381—71 **18 Claims**



1. A silencing apparatus comprising:

noise reduction means for generating noise cancellation signals which reduce noises from a vehicle at a telephone;

noise measuring means for measuring noises from the vehicle to be reduced by said noise reduction means;

sensor means for detecting the presence or absence of the vehicle when it is sufficiently close to the telephone that noise produced by the vehicle can be heard at the telephone, and

control means comprising:

first means responsive to the detection of the presence of the vehicle by the sensor means,

second means responsive to the noise from the vehicle measured by the noise measuring means becoming greater than a first threshold level,

third means, responsive to the first and second means, for selectively activating said noise reduction means in response to the detection of the presence of the vehicle by the sensor means and to the noise from the vehicle measured by said noise measuring means becoming greater than the first threshold level,

fourth means responsive to the noise measured by the measuring means becoming smaller than a second threshold level, and

fifth means, responsive to the fourth means, for deactivating said noise reduction means in response to the noise measured by said noise measuring means becoming smaller than the second threshold level.

5,594,804

MULTIPLE CONE TYPE LOUDSPEAKER

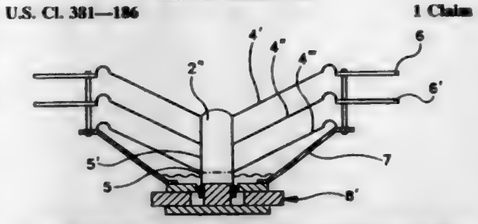
Kyung W. Kim, 3-391 Ju Kong Apt. Hupyung 2 Dong, Chooncheon City, Kangwon Do, Rep. of Korea

Filed May 1, 1995, Ser. No. 433,554

Claims priority, application Rep. of Korea, Apr. 29, 1994, 94-9745

Int. Cl.[6] H04R 25/00

U.S. Cl. 381—186 **1 Claim**



1. A loudspeaker comprising a housing, a bobbin attached with a voice coil and a frame fixedly mounted to the housing, a vibrating plate mounted at an inner peripheral edge thereof to the bobbin and at an outer peripheral edge thereof to the frame, the loudspeaker further comprising:

an additional bobbin attached to a front end of the bobbin such that it is coaxial with the bobbin and protruded forwards beyond a front surface of the housing;

a plurality of uniformly spaced additional vibrating plates arranged along the additional bobbin such that they are symmetrical with respect to an axis of the additional bobbin, each of the additional vibrating plates being bonded at an inner peripheral edge thereof to an outer surface of the additional bobbin and protruded forwards beyond the front surface of the housing; and

a plurality of radially extending baffle plates mounted to the frame such that they surround the additional vibrating plates, respectively, each of the baffle plates having an inner peripheral edge to which each corresponding one of the additional vibrating plates is bonded.

5,594,805

LOUDSPEAKER

Yoshio Sakamoto, Hachioji; Shiro Iwakura, Hamura; Akio Tanase, Hachioji, and Kaoru Yamazaki, Akigawa, all of Japan, assignors to Kabushiki Kaisha Kenwood, Tokyo, Japan

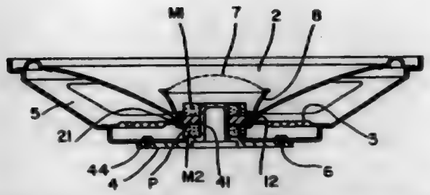
Division of Ser. No. 146,116, Nov. 19, 1993. This application Aug. 15, 1995, Ser. No. 515,331

Claims priority, application Japan, Mar. 31, 1992, 4-26566; Nov. 30, 1992, 4-88156

Int. Cl.[6] H04R 7/500

U.S. Cl. 381—199 **2 Claims**

1. A loudspeaker comprising a voice coil having a rigid bobbinless structure, said voice coil is of a self-sustained wound wire layer, a magnetic circuit for generating a repulsion magnetic field



to drive the voice coil, the magnetic circuit being constituted by disposing two magnets (M1, M2) magnetized in the direction of thickness with the same polarities facing each other and by sandwiching a center plate made of magnetic material between said magnets, a vibrating plate and a voice coil suspension, wherein

said voice coil is disposed on the outer side of said center plate in said repulsion magnetic field and the inner edge of said vibrating plate and/or said suspension is attached onto the outer surface of said voice coil wire layer,

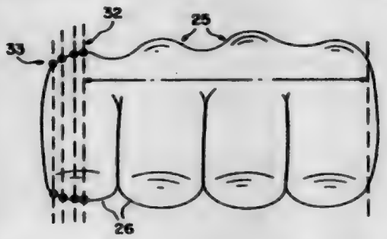
said magnetic circuit is fixed by a holder which passes through apertures provided on said magneta and the center plate.

5,594,806

KNUCKLE PROFILE INDENTITY VERIFICATION SYSTEM

Charles Colbert, Yellow Springs, Ohio, assignor to Personnel Identification & Entry Access Control, Inc., Yellow Springs, Ohio

Filed Jun. 20, 1994, Ser. No. 267,584
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—115 **19 Claims**



1. A biometric geometry method for preparing a unique identity characteristic of a potential user based on at least one of the user's fists placed in grip configuration by creating and storing as a template a reference profile of the undulating peaks and valleys of a knuckle pattern unique to each user, the method comprising the steps of

a) positioning the user's knuckle contours of said one fist,

b) capturing an image of the knuckles,

c) extracting the knuckle profile from the captured image,

d) digitizing the knuckle profile,

e) storing the digitized profile as a template in a storage medium, and

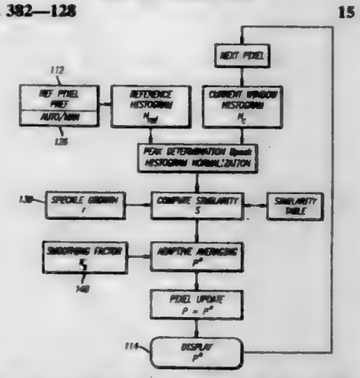
f) sharpening the peaks and valleys of the knuckle profile by convolving the profile using an autocorrelation algorithm, then storing the resulting autocorrelation curve information as the template in an auxiliary database.

5,594,807

SYSTEM AND METHOD FOR ADAPTIVE FILTERING OF IMAGES BASED ON SIMILARITY BETWEEN HISTOGRAMS

Dong-Chyuan Liu, Mercer Island, Wash., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Dec. 22, 1994, Ser. No. 363,191
Int. Cl.[6] G06K 9/40
U.S. Cl. 382—128 **15 Claims**



1. A method for imaging an interrogation region, comprising the following steps:

A. generating a multi-dimensional image of the interrogation region as a pattern of image elements;

B. assigning to each image element one of a predetermined, finite number of numerical values corresponding to a predetermined imaging property of the interrogation region;

C. displaying the image on a display;

D. selecting a reference element in a substantially homogeneous portion of the displayed image;

E. accumulating in a reference histogram a reference frequency distribution of the numerical values of all image elements in a reference region, which includes the reference element;

F. sequentially designating each image element as a current element;

G. for each current element, accumulating in a current histogram a current frequency distribution of the numerical values of all image elements in a current region, which includes the current element;

H. for each current element, determining a similarity value between the reference histogram and the current histogram; and

I. displaying each current element with an updated, filtered value, which is a predetermined filtering function of the corresponding similarity value.

5,594,808

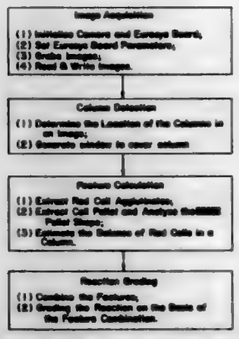
METHOD AND SYSTEM FOR CLASSIFYING AGGLUTINATION REACTIONS

Jian Shen, Somerset; Mykola Yaremko, Livingston; Rosemary Chachowski, Manville, all of N.J.; Josef Atzler, Hallein, Austria; Thierry Duplnet, Maennedorf, Switzerland; Daniel Kittrich, Praha, Czech Rep.; Hansjoerg Kunz, Zuerich, Switzerland; Karl Puchegger, Salzburg, Australia, and Reiner Rohlfs, Frellassing, Germany, assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Continuation of Ser. No. 75,302, Jun. 11, 1993, abandoned.
This application Dec. 8, 1993, Ser. No. 163,996
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—133 **15 Claims**

1. A method for analyzing a solution for an agglutination pattern, comprising:

producing an illuminated image of the solution on an array of pixels;



assigning to each pixel in the array and on said illuminated image, a data value representing an intensity of the illuminated image on the pixel; and

processing the data values according to a predetermined program to determine if an agglutination pattern is present in the solution; and if an agglutination pattern is present, classifying the agglutination pattern into one of a plurality of predefined classes, wherein the processing step includes the steps of

separating the array of pixels into a plurality of zones,

ii) processing the data values for the pixels in each zone according to a respective predetermined procedure to determine values for a predefined set of variables, and

iii) processing said determined values to determine whether an agglutination pattern is presented and, if an agglutination pattern is present, to classify the pattern into one of the predefined classes; and

wherein the solution is in a column having a bottom, a lower portion, and a filter disposed in said lower portion, and wherein the separating step includes the steps of:

identifying a first zone of pixels adjacent a top of the filter; and

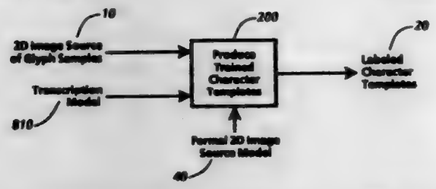
identifying a second zone of pixels adjacent the bottom of the column.

5,594,809

AUTOMATIC TRAINING OF CHARACTER TEMPLATES USING A TEXT LINE IMAGE, A TEXT LINE TRANSCRIPTION AND A LINE IMAGE SOURCE MODEL

Gary E. Kopec, Belmont; Philip A. Chou, Menlo Park, and Leslie T. Niles, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1995, Ser. No. 431,253
Int. Cl.[6] G06K 9/62
U.S. Cl. 382—161 **21 Claims**



1. A method of operating a machine to train a set of bitmapped character templates for use in a recognition system; each of the bitmapped character templates being based on a character template model defining character image positioning referred to as a side-bearing model of character image positioning; the machine including a processor and a memory device for storing data; the data stored in the memory device including instruction data the processor executes to operate the machine; the processor being connected to the memory device for accessing the data stored therein; the method comprising:

operating the processor to receive and store an image definition data structure defining an image including a plurality of glyphs indicating a single line of text, hereafter referred to as a text line image source of glyph samples; each glyph occurring in the text line image source of glyph samples being an image instance of a respective one of a plurality of characters in a character set, hereafter referred to as a glyph sample character set; each one of the set of bitmapped character templates being trained representing a respective one of the plurality of characters in the glyph sample character set;

operating the processor to receive and store in the memory device a text line image source model data structure, hereafter referred to as a text line image source model; the text line image source model modeling as a grammar a spatial image structure of a set of text line images; the text line image source of glyph samples being one of the set of text line images modeled by the text line image source model; the text line image source model including spatial positioning data modeling spatial positioning of the plurality of glyphs occurring in the text line image source of glyph samples;

operating the processor to determine, for each respective glyph occurring in the text line image source of glyph samples, an image coordinate position in the text line image source of glyph samples indicating an image origin position of the respective glyph using the spatial positioning data included in the text line image source model; each image coordinate position being hereafter referred to as a glyph sample image origin position;

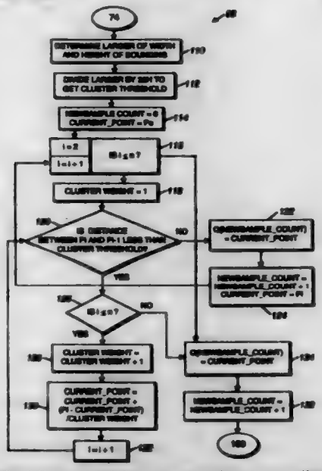
operating the processor to produce a glyph label data item paired with each glyph sample image origin position determined for the respective glyphs occurring in the text line image source of glyph samples; each glyph label data item being hereafter referred to as a respectively paired glyph label; each respectively paired glyph label indicating the character in the glyph sample character set represented by the respective glyph; the processor, in producing each respectively paired glyph label, using mapping data included in the text line image source model mapping respective ones of the glyphs occurring in the text line image source of glyph samples to respectively paired glyph labels; the processor, further in producing each respectively paired glyph label, using a text line transcription data structure associated with the text line image source of glyph samples, hereafter referred to as a transcription, including an ordered arrangement of transcription label data items; the processor using the transcription and the mapping data to pair each glyph label with the respective glyph sample image origin position of a respective glyph occurring in the text line image source of glyph samples; and

operating the processor to produce the set of bitmapped character templates using the text line image source of glyph samples, the glyph sample image origin positions and the respectively paired glyph labels; the processor determining, in each bitmapped character template produced, an image pixel position included therein indicating a template image origin position; each bitmapped character template produced having a characteristic image positioning property such that, when a second bitmapped character template is positioned in an image with the template image origin position thereof displaced from the template image origin position of a preceding first bitmapped character template by a character set width thereof, and when a first bounding box entirely containing the first bitmapped character template overlaps in the image with a second bounding box entirely containing the second bitmapped character template, the first and second bitmapped character templates have substantially nonoverlapping foreground pixels.

5,594,810
METHOD AND APPARATUS FOR RECOGNIZING GESTURES ON A COMPUTER SYSTEM

Armand P. J. Gourdol, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Division of Ser. No. 130,074, Sep. 19, 1993. This application Jun. 5, 1995, Ser. No. 463,293
Int. Cl.[6] G06K 9/00; 9/18
U.S. Cl. 382—187 38 Claims



1. A method for recognizing a gesture input on a display screen for a computer system, the method comprising the steps of:

(a) processing a stroke entered on a computer screen to smooth said stroke, said stroke including a plurality of points, said processing step including reducing the number of points that define said stroke such that said points of said smoothed stroke are located at least a threshold distance apart from one another, and including the substeps of:

(i) calculating a position for a new point that is positioned between two adjacent points in the stroke that are separated by less than the threshold distance; and

(ii) replacing a plurality of points that are separated by less than the threshold distance with said new point, wherein the weight given to the location of a specific new point is proportional to the number of points that are replaced by the specific new point;

(b) normalizing said smoothed stroke;

(c) determining whether said normalized stroke matches one of a plurality of gesture prototypes; and

(d) when at least one gesture prototype matches said normalized stroke, selecting the gesture represented by a best matched gesture prototype as an interpretation of said stroke.

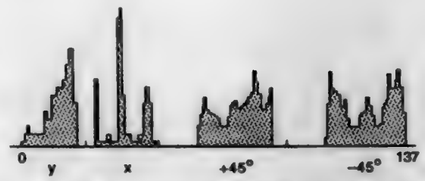
5,594,811
APPARATUS AND METHOD FOR RECOGNIZING A CHARACTER

Zi Quan Hong; Ryohei Kumagai, and Tetsuo Obairo, all of Tokyo, Japan, assignors to Yozan, Inc., Tokyo, Japan

Continuation of Ser. No. 66,661, May 25, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 329,143
Claims priority, application Japan, May 27, 1992, 4-158926
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—216 10 Claims

1. A method of recognizing a character by use of a computer, the method comprising the steps of:

causing said computer to perform a pre-recognition process, whereby a model of an optimal characteristic space is created, said pre-recognition process including:



causing an electronic image generator to transform sample characters that are contained on a first object into a first image,

using said computer to generate a plurality of first density projections from said first image, each first density projection corresponding to one of said sample characters,

using said computer to extract a first primitive characteristic vector from each said first density projection, and

using said computer to generate, based upon an optimal distinction vector, a second characteristic space having a second dimension,

said optimal distinction vector being determined by an optimal distribution of groups of said first primitive characteristic vectors; and

causing said computer to perform a character recognition process, said character recognition process including:

causing said electronic image generator to transform a character to be recognized that is contained on a second object into a second image,

using said computer to generate a second density projection from said second image,

using said computer to extract a second primitive characteristic vector from said second density projection,

using said computer to generate a secondary characteristic vector by projecting said second primitive characteristic vector into said second characteristic space, and

causing said computer to associate, based upon said secondary characteristic vector, one of said sample characters with said recognized character.

5,594,812
APPARATUS AND METHOD FOR COMPRESSING STILL IMAGES

Martin P. Bolick, Palo Alto; James D. Allen, Santa Clara, and Steven M. Bleiweiss, San Jose, all of Calif., assignors to Ricoh Corporation, Menlo Park, Calif.

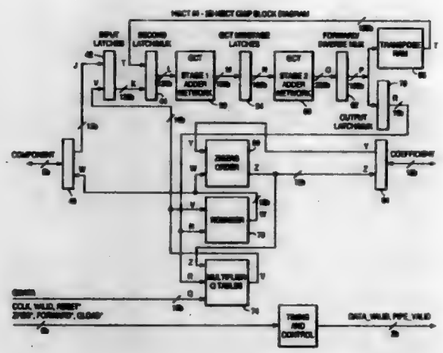
Continuation of Ser. No. 324,859, Oct. 18, 1994, abandoned, which is a continuation of Ser. No. 843,765, Feb. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 743,517, Aug. 9, 1991, Pat. No. 5,319,724, which is a continuation-in-part of Ser. No. 511,245, Apr. 19, 1990, Pat. No. 5,129,015. This application Aug. 10, 1995, Ser. No. 513,342
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—232 27 Claims

1. A data compression/decompression apparatus for performing/inverting a transform involving a multiplication of an input integer and a Qvalue to produce a product, said transform including a first subtransform which converts an original sequence of values to a first sequence of transform domain coefficients, and a second subtransform which divides each of said first sequence of transform domain coefficients by a corresponding compression factor to produce compressed transform domain coefficients, comprising:

(a) means for left shifting the input integer by a shift integer number of bits to produce a shifted input integer;

(b) an integer multiplier for multiplying a factor and the shifted input integer to produce said product; and

(c) a bimodal Qvalue processor, when the processor is in forward mode the shift integer is set to zero and the factor is set equal to Qvalue, and when the processor is in inverse mode the shift integer is set to Qexponent, and the factor is set equal to Qmantissa, where



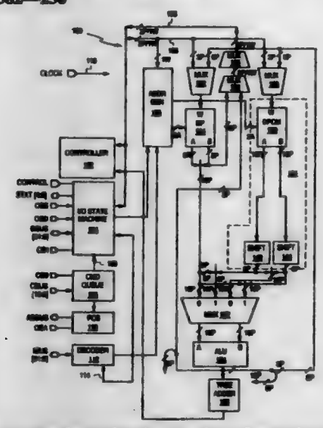
$$Qvalue=Qmantissa*2^{Qexponent},$$

in the forward mode Qvalue is inversely proportional to said compression factor and said input integer is one of said original sequence of values, and in the inverse mode Qvalue is proportional to said compression factor and said input integer is one of said compressed transform domain coefficients.

5,594,813
PROGRAMMABLE ARCHITECTURE AND METHODS FOR MOTION ESTIMATION

Jan Fandrianto, Los Gatos; Chi S. Wang, Los Altos Hills; Hedley K. J. Rainnie, Santa Clara; Sehat Sutardja, Cupertino, and Bryan R. Martin, Santa Clara, all of Calif., assignors to Integrated Information Technology, Inc., Santa Clara, Calif.

Filed Feb. 19, 1992, Ser. No. 838,380
Int. Cl.[6] H04N 7/12
U.S. Cl. 382—236 3 Claims



1. An apparatus for performing a variety of operations relating to motion estimation, including pixel differences, sum of absolute pixel differences, and pixel averaging, comprising:

a first memory having a plurality of addressable locations N pixels in width, a first write port, and first and second read ports, wherein N pixels from any one of said addressable locations are accessible in parallel on each of said first and second read ports during an address cycle;

a second memory having a plurality of addressable locations N pixels in width, a second write port, and third and fourth read ports, wherein N pixels from any one of said addressable locations and N pixels from an adjacent addressable location are accessible in parallel on each of said third and fourth read ports during an address cycle;

a first shifter having an input port coupled to said third read port and an output port N pixels in width;

a second shifter having an input port coupled to said fourth read port and an output port N pixels in width;

a first multiplexer having one input port coupled to said first and second read ports, another input port coupled to the output port of said first shifter, and an output port;

a second multiplexer having one input port coupled to the output ports of said first and second shifters, another input port coupled to the output port of said second shifter, and an output port;

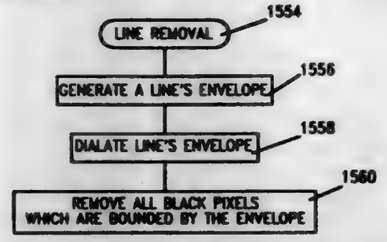
an arithmetic unit having a first operand input port coupled to the output port of said first multiplexer for receiving a first operandi, a second operand input port coupled to the output port of said second multiplexer for receiving a second operandi, a first output port for furnishing the absolute value of a difference between said first and second operandi, and a second output port for selectively furnishing one of a difference between said first and second operandi, and an average of said first and second operandi; and

an adder coupled to the first output port of said arithmetic unit; wherein the second output port of said arithmetic unit is routed to said first and second write ports.

5,594,814
OCR IMAGE PREPROCESSING METHOD FOR IMAGE ENHANCEMENT OF SCANNED DOCUMENTS

Bruce B. Fast, 2600 Prindle Rd., Belmont, Calif. 94402, and Dana R. Allen, 1745 Hunt Dr., Burlingame, Calif. 94010

Division of Ser. No. 963,851, Oct. 19, 1992, abandoned. This application May 22, 1995, Ser. No. 445,724
Int. Cl.[6] G06K 9/40
U.S. Cl. 382—254 6 Claims



1. A scanned document image enhancement process, said document image including a plurality of lines of textual matter and at least one horizontal line intersecting a section of one of said lines of textual matter, each of said at least one horizontal line having a first edge and a second edge; said process including

a step for detecting said horizontal line intersecting said section of said textual matter;

a step for establishing a work zone having a first border and a second border and enveloping said horizontal line, and

establishing a first buffer zone between said first border and said first edge of said horizontal line, and

establishing a second buffer zone between said second edge of said horizontal line and said second border;

a step for providing a first trace,

said first trace including said first border between said section of textual matter being intersected by said horizontal line and sections of said second edge of said horizontal line, said first trace providing first areas above said first trace overlapping with said horizontal line and said first buffer zone;

a step for providing a second trace,

said second trace including said second border between said section of textual matter being intersected by said horizontal line and sections of said first edge of said horizontal line, said second trace providing second areas below said second trace overlapping with said horizontal line and said second buffer zone;

a substep for generating a protective zone consisting of said first and said second areas;

a substep for deleting all black run-length segments of said horizontal line outside said protective zone.

5,594,815

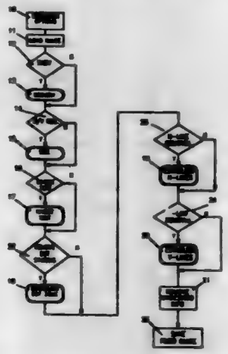
OCR IMAGE PREPROCESSING METHOD FOR IMAGE ENHANCEMENT OF SCANNED DOCUMENTS

Bruce B. Fast, 2600 Prindle Rd., Belmont, Calif. 94402, and Dana R. Allen, 1745 Hunt Dr., Burlingame, Calif. 94010

Division of Ser. No. 963,051, Oct. 19, 1992, abandoned. This application May 22, 1995, Ser. No. 447,215

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—254 **9 Claims**



1. A process for enhancing an image of a scanned document having boundaries, said image including a plurality of lines of textual matter, said plurality of lines potentially having at least one skew relative to the boundaries of said image, requiring registration, containing inverted text matter, undesired dots, and vertical and horizontal lines, said process comprising

a step for providing a primary scan line run-length coded image of said document;

a step for determining said skew;

a step for reducing said skew;

a step for determining said registration;

a step for correcting said registration;

a step for detecting said inverted text matter;

a step for reversing said inverted text matter;

a step for detecting said undesired dots;

a step for deleting said undesired dots;

a step for detecting said vertical lines;

a step for eliminating said vertical lines;

a step for detecting said horizontal lines;

a step for eliminating said horizontal lines.

5,594,816

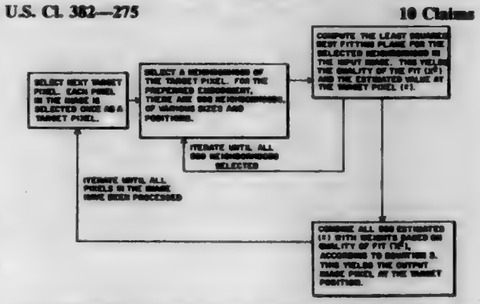
COMPUTER BASED DIGITAL IMAGE NOISE REDUCTION METHOD BASED ON OVER-LAPPING PLANAR APPROXIMATION

Martin C. Kaplan, Rochester, and Heemin Kwon, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 781,468, Oct. 23, 1991, Pat. No. 5,533,149, which is a continuation of Ser. No. 399,135, Aug. 28, 1989, abandoned. This application Aug. 21, 1995, Ser. No. 517,225

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—275 **10 Claims**



1. A method processing an image of a scene discernible by the human eye comprising the steps of:

(a) operating a photographic image processing system which transforms a photographic image of a scene discernible by the human eye into electrical signal representative of respective picture regions of a transformed version of said photographic image, said transformed version of said photographic image, when viewed by the human eye, containing discernible noise artifacts resulting from the transformation of said photographic image into said electrical signals; and

(b) processing said electrical signals to reduce noise artifacts introduced into said transformed version of said photographic image as a result of performing step (a), and thereby produce a resulting processed version of said transformed version of said photographic image which, upon being converted into an output image discernible by the human eye, will not contain such noise artifacts that are discernible to the human eye, said processing step (b) comprising the steps of:

(b1) selecting a target picture region within said transformed version of said photographic image,

(b2) prescribing a neighborhood of picture regions about said target picture region,

(b3) for the neighborhood prescribed in step (b2), generating an electrical signal representative of a goodness of fit (x^2) and an estimated value of the image picture region at said target picture region in accordance with a least squares best fit plane for said prescribed neighborhood;

(b4) iterating steps (b2) and (b3) for respectively different types and respectively different positions of said prescribed neighborhood;

(b5) generating an output picture region for said target picture region in accordance with a summation of all estimated values of the image picture region at said target picture region with weights based upon said goodness of fit (X^2), and

(b6) iterating steps (b1) through (b5) for all picture regions of said transformed version of said photographic image, so as to form said resulting processed version of said transformed version of said photographic image, in which said noise artifacts that have been introduced into said transformed version of said photographic image as a result of performing step (a), are reduced.

5,594,817

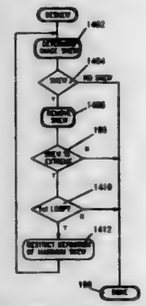
OCR IMAGE PRE-PROCESSOR FOR DETECTING AND REDUCING SKEW OF THE IMAGE OF TEXTUAL MATTER OF A SCANNED DOCUMENT

Bruce B. Fast, 2600 Prindle Rd., Belmont, Calif. 94402, and Dana R. Allen, 1745 Hunt Dr., Burlingame, Calif. 94010

Continuation of Ser. No. 963,051, Oct. 19, 1992, abandoned. This application May 22, 1995, Ser. No. 445,927

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—290 **9 Claims**



1. A process for enhancing an image of a scanned document, said image consisting of run-length coded scan lines including white run-length values and black-run-length values, and containing a first plurality of lines of textual matter, said textual matter including characters with descenders, said process including a de-skew step for reducing skew of said textual matter, said skew including a vertical skew component and a horizontal skew component, said de-skew step comprising

a sub-step for determining a line skew in scan lines per line of textual matter for each one of a second plurality of said lines of textual matter of said image,

a sub-step for defining a determined skew value and a skew direction using the line skew values so determined for said second plurality of lines of textual matter;

a sub-step for reducing said vertical skew component of said skew using said determined skew value;

a sub-step for reducing said horizontal skew component of said skew using said determined skew value,

said sub-step for reducing said vertical skew component includes sequentially dividing each of said run-length coded scan lines into a plurality of skewed line segments of substantially equal lengths,

wherein said plurality of skewed line segments equals said determined skew value plus 1 and includes a reference skew segment, and

wherein said sub-step for reducing said vertical skew moves each of said skewed line segments proportionally to the determined skew value and relative to its distance from said reference skew segment measured in skewed line segments.

5,594,818

DIGITAL OPTICAL SWITCH AND MODULATOR AND A METHOD FOR DIGITAL OPTICAL SWITCHING AND MODULATION

Edmond J. Murphy, Bethlehem, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 8, 1995, Ser. No. 399,082

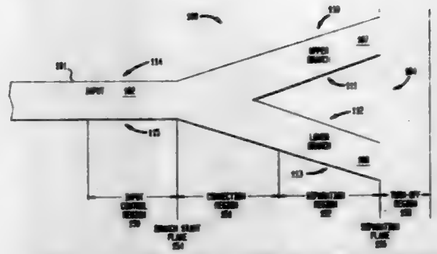
Int. Cl.[6] G02F *1/295*

U.S. Cl. 385—8 **11 Claims**

1. A digital optical switch comprising:

(1) an optical waveguide, positioned in a first plane, having an input control region, a connection region, a separation region, and a turn off region; and

(2) an electrode configuration, positioned in a second plane, substantially parallel to and distinct from said first plane, for generating an electric field through said optical waveguide, said electrode configuration smoothly increasing an intensity of an electric field along a first length of said input control region to said separation region, said electrode configuration generating a substantially constant electric field along a second length of said separation region.



5,594,819

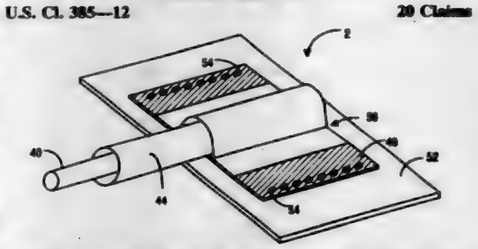
FIELD-MOUNTABLE FIBER OPTIC SENSORS FOR LONG TERM STRAIN MONITORING IN HOSTILE ENVIRONMENTS

Nadarajah Narendran, Clifton Park, N.Y., and Joseph M. Weiss, Cupertino, Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jul. 26, 1995, Ser. No. 507,786

Int. Cl.[6] G01L *1/24*

U.S. Cl. 385—12 **20 Claims**



15. A system for monitoring strain in a structure using a fiber optic sensor, the system comprising:

a metal shim having thermal properties substantially similar to thermal properties of said structure;

a fiber optic sensor having an exterior surface, a portion of said exterior surface being metallized;

said fiber optic sensor being attached to said metal shim using a technique selected from a group consisting of (i) brazing, (ii) soldering, and (iii) electro-plating;

said shim being affixed to said structure after attachment of said fiber optic sensor to said shim; and

means, coupled to said fiber optic sensor, for monitoring strain in said structure sensed by said fiber optic sensor.

5,594,820

OPTO-MECHANICAL DEVICE HAVING OPTICAL ELEMENT MOVABLE BY TWIN FLEXURES

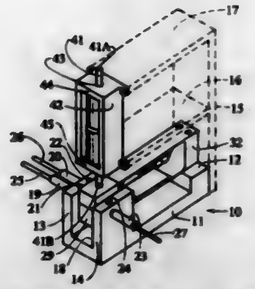
Philip M. Garel-Jones, Nepean; Murray R. Harman, and Timothy P. Cutts, both of Ottawa, all of Canada, assignors to JDS Fitel Inc., Nepean, Canada

Filed Feb. 8, 1995, Ser. No. 385,477

Int. Cl.[6] G02B *6/26;6/42*

U.S. Cl. 385—22 **15 Claims**

1. An opto-mechanical device comprising first port means and second port means interconnected by an optical path, an optical element, and actuator means for moving the optical element relative to the optical path so as to change coupling of light beams between the first port means and the second port means, the optical



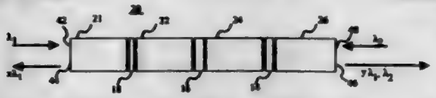
element being displaceably supported by a flexible suspension means comprising a pair of mutually-spaced twin elongate flexures, each of the flexures being attached at one end to an anchorage, the optical element being mounted to respective other ends of the flexures, the flexures being spaced apart in the direction of displacement of the optical element, the arrangement being such that the flexures flex together as the optical element is displaced and, during said displacement, the optical element maintains substantially the same angular orientation relative to the displacement direction.

5,594,821

INTEGRATED OPTICAL ISOLATOR

Yihao Cheng, Kanata, Canada, assignor to JDS Fitel Inc., Nepean, Canada

Filed May 16, 1995, Ser. No. 442,361
Claims priority, application Canada, Apr. 10, 1995, 2146737
Int. Cl.[6] G02B *6/28*
U.S. Cl. 385—24 **7 Claims**



1. A multi-port integrated optical isolating device comprising:
- a first collimating lens including a first port and a second port disposed along a same endface thereof;
- a second collimating lens including a third port and a fourth port disposed along a same endface thereof, the second collimating lens being optically aligned with said first collimating lens;
- at least two optical means comprising a beam splitter/filter and a wavelength selective means for reflecting predetermined wavelengths and transmitting others, and means for allowing a portion of a beam to pass while reflecting a remaining portion, said at least two optical means being disposed between the first collimating lens and the second collimating lens;
- optical isolating means disposed between the at least two optical means for allowing an optical beam to pass in a first direction and for substantially preventing the optical beam from counter propagating in a reverse direction.

5,594,822

FIBER OPTIC COUPLERS, PREFORM AND METHOD OF MAKING SAME

George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Dec. 5, 1995, Ser. No. 567,463
Int. Cl.[6] G02B *6/26*; C03B *37/023*
U.S. Cl. 385—43 **17 Claims**

1. A method of making a fiber optic coupler comprising the steps of:
- providing a glass tube having first and second end surfaces, a midregion and first and second opposite end regions extending from said midregion to said first and second end surfaces, respectively, and a longitudinal bore extending within said tube, said bore having a first portion and a recess extending from said first portion, said recess being capable of receiving two or more uncoated optical fibers in proximal arrangement;
- stripping protective coating from at least one optical fiber such that said at least one fiber is composed of an uncoated portion that joins first and second coated portions;
- stripping protective coating from a portion of another optical fiber such that said at least one fiber is composed of uncoated and coated portions;
- inserting said optical fibers into said bore such that said uncoated portions are located within said recess, the step of inserting said optical fibers including inserting the coated end of said at least one optical fiber into the first portion of said bore, threading said at least one optical fiber through said bore until the uncoated portion extends through said first portion of said bore, and transferring the uncoated portion of said at least one optical fiber from said first portion of said bore into said recess;
- thereafter, inserting a filler fiber into said first portion of said bore;
- heating said tube to collapse said tube midregion onto said fibers; and
- drawing at least a portion of said midregion such that the diameter of said portion of said midregion is smaller than the diameters of said tube at said end regions.

14. A fiber optic coupler comprising an elongated body of matrix glass having a neckdown region and two opposite end regions each having a non-circular longitudinal bore, and at least two optical fibers, each having a core surrounded by a cladding of diameter D, said fibers being fused together along a portion of their lengths in said neckdown region to form a coupling region and not being fused in each of said two opposite end regions, the cross-sectional configuration of said bore including a first portion and an adjacent non-circular portion forming an oblong recess having a width greater than D, said fibers being situated in said recess in said end regions, at least one of said fibers extending beyond one end of said tube, and at least two of said fibers extending beyond the remaining end of said tube, those portions of said fibers that extend beyond the ends of said tube having a coating of diameter d, the minimum cross-sectional dimension of said first portion of said bore being equal to or greater than d.

5,594,823

METHOD OF MANUFACTURING A MULTI-FIBER OPTICAL CROSS-COUPLER, AND AN OPTICAL CROSS-COUPLER OBTAINED BY PERFORMING THE METHOD

André Tardy, Egly, and Jean-Pierre Dumas, Villemoisson, both of France, assignors to Alcatel Cable, Cléchy Cedex, France

Filed Dec. 20, 1995, Ser. No. 575,528
Claims priority, application France, Dec. 21, 1994, 94 15406
Int. Cl.[6] G02B *6/26*
U.S. Cl. 385—46 **12 Claims**



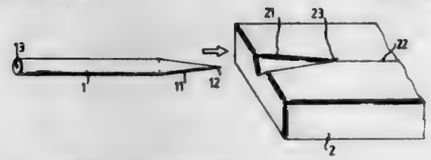
1. A method of manufacturing a multi-fiber optical cross-coupler, said cross-coupler including peripheral optical fibers and a central optical fiber that are at least locally coupled together optically and mechanically, wherein the method consists in forming a multi-waveguide cylindrical optical conductor containing N peripheral waveguides and one central waveguide, all of which are cylindrical, parallel and secured together in mechanical and optical coupling cladding, by drawing a primary preform corresponding to said conductor, said waveguides respectively defining said fibers, and having mutually relative opto-geometrical characteristics in said coupling cladding so that they are optically coupled over a defined length of said conductor, and wherein the method further consists in cutting off a segment of said conductor, said segment having a length equal to an odd integer number of times said defined length so as to obtain said cross-coupler.

5,594,824

COUPLING DEVICE BETWEEN A GLASS FIBER AND A DIELECTRIC WAVEGUIDE

Walter Kernbaumer, Berlin, Germany, assignor to Institut für Mikrotechnik Mainz GmbH, Mainz-Hechtsheim, Germany

Filed Dec. 13, 1994, Ser. No. 355,053
Claims priority, application Germany, Dec. 23, 1993, 43 44 179.3
Int. Cl.[6] G02B *6/30*
U.S. Cl. 385—49 **15 Claims**



1. A coupling device, comprising:
a glass fiber;
a substrate with a dielectric waveguide integrated on said substrate, said dielectric waveguide having a core dimension, said glass fiber having an end portion continuously reduced towards a coupling end of said glass fiber, said coupling end having a diameter in the order of said core dimension of said dielectric waveguide, said substrate having a fiber receiving portion for guiding said coupling end of said glass fiber into a position opposed to a front face of said dielectric waveguide, said substrate is composed of a polymer having an index of refraction comparatively smaller than an index of refraction of said glass fiber, said fiber receiving portion has a guide face formed of at least two converging planes.

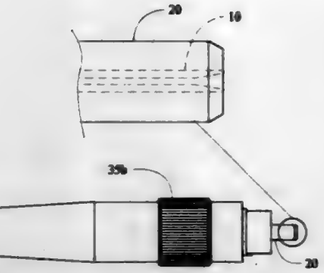
5,594,825

OPTICAL CONNECTOR COUPLING FOR REDUCING UNWANTED EFFECTS ASSOCIATED WITH HIGH POWER DENSITY

Brian S. Kawasaki, Manotick, and Richard R. Parker, Charleton Place, both of Canada, assignors to JDS Fitel Inc., Nepean, Canada

Filed Nov. 30, 1995, Ser. No. 565,573
Int. Cl.[6] G02B *6/38*
U.S. Cl. 385—60 **10 Claims**

1. An optical fiber connector assembly for reducing power density at connector end faces and for assembling a pair of substantially small core optical fibers in an aligned position, comprising:
- first and second ferrules, each adapted to be fixed to the end of an optical fiber, each of said first and second ferrules being formed with an aperture extending therethrough for accommodating an end portion of one of the optical fibers, an end face and adjacent portion of each optical fiber having an expanded mode field diameter, a substantial length of the optical fiber adjacent the expanded mode field portion having a mode field diameter of substantially about 10 μm or less; and,



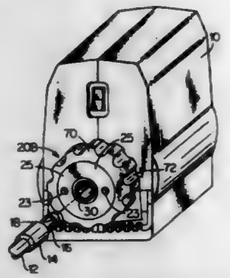
means for releasably locking two front ends of the ferrules in contact with one another so that light may pass from one ferrule to another through one fiber end face having an expanded mode field diameter to another fiber end face having an expanded mode field diameter.

5,594,826

INTERCHANGEABLE NOSE ADAPTER

Robert J. Wood, Syracuse; Terrence L. Salisbury, Weedsport; Connie R. Waits, Auburn, and Michael J. Pileski, Skaneateles, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 19, 1995, Ser. No. 504,218
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—88 **15 Claims**



1. A nose adapter for mountably positioning an end of a fiberoptic light bundle including a plurality of fiberoptic fibers in proximity to a light source located within a light box for providing illumination to an area to be illuminated, comprising:
- a) a retaining member adapted to be attached to said light box, said retaining member defining a central aperture having predetermined interior dimensions and a plurality of radially disposed mounting holes;
- b) an insert member having exterior dimensions which are approximately equal to the interior dimensions of said central aperture, said insert defining an interior opening for receiving the end of a light bundle having a predetermined size, and a plurality of radially disposed mounting holes which can be aligned with the mounting holes of the retaining member when the insert member is positioned within said central aperture;
- c) first fastening means, adapted to extend through the mounting holes of said retaining member and insert member, for clampingly holding said end in a predetermined position with respect to said light source; and
- d) a rotatably mounted light vane for controlling the amount of light from said light source which falls on said end.

5,594,827

ELECTRICAL INSULATOR EQUIPPED WITH OPTICAL FIBERS, AND MANFACTURING METHOD THEREFOR

René Joulie, Bellerives/Allier, and Gilles Bourdier, Beaumont les Randan, both of France, assignors to SEDIVER Societe Europeenne d'Isolateurs en Verre et Composite, Nanterre Cedex, France

Filed Sep. 29, 1995, Ser. No. 536,476
Claims priority, application France, Sep. 30, 1994, 94 11726
Int. Cl.[6] G02B 6/44
U.S. Cl. 385—101 7 Claims



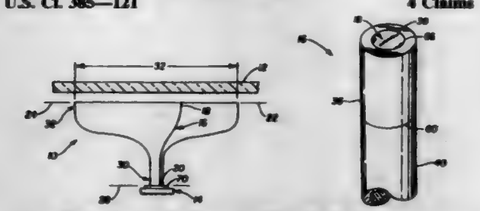
1. An electrical insulator including a support element having an outside wall extending along a longitudinal axis between two ends, two end fittings secured to respective ends of the support element on bearing surfaces formed in the outside wall thereof, and an optical waveguide installed inside the insulator so as to extend from one end of said insulator to the other end thereof, and so as to pass through the two end fittings, wherein said optical waveguide is received firstly in two circular grooves formed in the outside wall of the support element and being parts of the respective bearing surfaces for receiving the end fittings, and secondly in a helical groove formed in the outside wall of the support element and having ends that open out respectively into the circular grooves.

5,594,828

INVENTION USING FIBER OPTICS FOR LIGHT PATH FROM CLOSE PROXIMITY TO AN IMAGE TO AN AREA ARRAY IMAGE SENSOR

Kenneth R. Nielsen; Paul Bonome, both of Loveland, and Gene Pien, Fort Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 27, 1995, Ser. No. 411,135
Int. Cl.[6] G02B 6/04
U.S. Cl. 385—121 4 Claims



1. A fiber optic bundle for transmitting light from a source to a detector, said fiber optic bundle comprising a plurality of optic fibers, each of said plurality of optic fibers having a light input end and a light output end, the light input ends of said plurality of optic fibers being substantially coplanar with a first plane and arranged adjacent one another in a generally linear configurtion so that the light input ends define a line contained within the first plane, and the light output ends of said plurality of optic fibers being substantially coplanar with a second plane and arranged adjacent one another in a generally rectangular configuration so that the light output ends define a rectangle contained within the second plane, wherein each of said plurality of optic fibers comprises:

a light transmitting core having a light input end and a light output end, said light transmitting core having a first index of refraction;

a light absorbing sheath surrounding said light transmitting core and extending from the light input end to a terminus, the terminus being located between the light input end and the light output end, said light absorbing sheath having a second index of refraction, the second index of refraction of said light absorbing sheath being greater than the first index of refraction of said light transmitting core; and

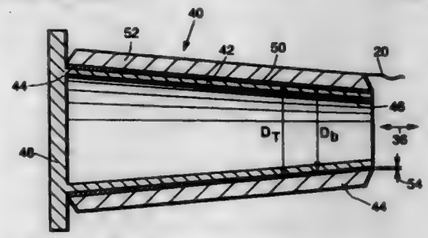
a cladding surrounding said light transmitting core and extending from the terminus of said light absorbing sheath to the light output end of said light transmitting core, said cladding having a third index of refraction, the third index of refraction of said cladding being less than the first index of refraction of said light transmitting core.

5,594,829

OPTICAL FIBER DISPENSER WITH THERMAL EXPANSION ACCOMMODATION LAYER

Gregory LaStracco, 1926 N. Tucker Dr., Tucson, Ariz. 85716; Ronald B. Chesler, 80 N. Calle Primavera, Tucson, Ariz. 85716-4936, and Hui-Pin Hsu, 9360 Zelzah Ave., Northridge, Calif. 91325

Filed Jun. 7, 1995, Ser. No. 478,297
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—134 15 Claims



1. An optical fiber dispenser, comprising:

a tapered cylindrical bobbin having an outer surface;

an optical fiber pack having an inner surface and positioned overlying the bobbin, the bobbin and the optical fiber pack having different longitudinal coefficients of thermal expansion; and

a thermal expansion accommodation layer lying between the bobbin and the optical fiber pack and contacting the outer surface of the bobbin and the inner surface of the optical fiber pack, the thermal expansion accommodation layer being made of a material that is readily deformable to accommodate the different longitudinal coefficients of thermal expansion and having a thickness dimension between the outer surface of the bobbin and the inner surface of the optical fiber pack sufficient to reduce any thermal stresses produced by the different longitudinal coefficients of thermal expansion to less than the failure strength of the optical fiber pack.

5,594,830

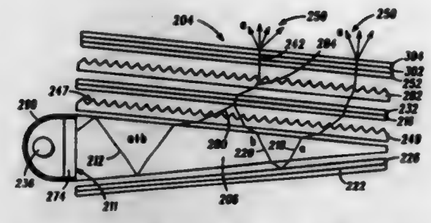
LUMINAIRE DEVICE

Roland Winston, Chicago; Robert L. Holman, Naperville; Benjamin A. Jacobson, Chicago, and Robert M. Emmons, Rolling Meadows, all of Ill., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 226,016, Apr. 11, 1994, Pat. No. 5,528,720, which is a continuation-in-part of Ser. No. 29,883, Mar. 11, 1993, Pat. No. 5,303,322, which is a continuation-in-part of Ser. No. 855,838, Mar. 23, 1992, Pat. No. 5,237,641.
This application Jun. 7, 1995, Ser. No. 486,784
Int. Cl.[6] G02B 6/26
U.S. Cl. 385—146 82 Claims

79. An optical device for operating on light from a source and for selectively outputting light to a viewer, comprising:

a base layer having an optical index of refraction n_1 and a first and second surface, said base layer further including a back surface spanning said first and second surfaces, and the light exiting said base layer when the light being reflected therein



decreases its angle relative to a normal to at least one of said first and second surfaces at the point of light incidence and achieves an angle of incidence less than a critical angle θ_c relative to the normal at the point of light incidence on said surfaces;

first layer means of index of refraction n_2 disposed beyond at least one of said first and second surfaces relative to said base layer and for enabling light to enter and pass across said first layer means after output from said base layer when the light in said base layer achieves the angle of incidence less than the critical angle θ_c characteristic of an interface between said base layer and said first layer, said first layer means outputting substantially collimated light;

a light redirecting layer disposed adjacent said first layer means receiving said collimated light output from said base layer with said light redirecting layer having facets with faceted face portions, each of said faceted portions being at least partly illuminated by the light and being oriented spatially to redirect the light along a selected direction in cooperation with said first layer means and said base layer;

second layer means for preferably outputting light of a first polarization state compared to a second polarization state, said second layer means disposed beyond at least one of said first and second surfaces relative to said base layer and said second layer means further enabling reflection of at least part of the light having the second polarization state; and

light control layer means for at least one of redirecting and diffusing light toward a viewer wherein the light has been output from said base layer and said light redirecting layer thereby providing light of controlled angular distribution to the viewer.

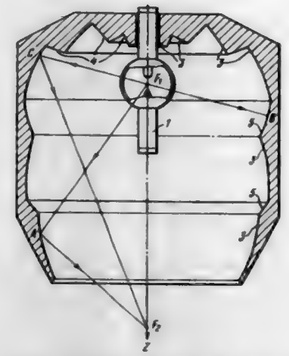
5,594,831

BEAM MACHINING DEVICE WITH REFLECTOR COMPRISED OF ARCS OF CONFOCAL ELLIPSES

Mikhail I. Oparin; Mikhail T. Borisov, and Georgy M. Alexeev, all of Moskva, Russian Federation, assignors to Nauchno-proizvodstvennay firma "MGM", and Nauchno-proizvodstvennaya firma "Adonis", both of Moskovskaya, Russian Federation

Filed Feb. 16, 1995, Ser. No. 351,344
Claims priority, application Russian Federation, Mar. 30, 1993, 93016355
Int. Cl.[6] G02B 5/10; F21V 7/09
U.S. Cl. 392—421 1 Claim

1. A beam machining device comprising a pin-point source of optical radiation and a concentrating reflector whose reflecting surface has the form of a surface of revolution with a generatrix constituted partly by an arc of an ellipse whose larger axis is coincident with the axis of rotation, one of its foci is coincident with the radiation source while the other one, with the surface of the material being machined characterized in that the surface of revolution of the concentrating reflector has a generatrix made up of the arcs of confocal ellipses, lengths of rays interconnecting the ends of said arcs and emitted from the focus coincident with the source of radiation, and of the arcs of circles with the center in said focus, the size of the generatrix segments and their relative positioning being selected so that any straight line passing through the point coincident with the radiation source and intersecting the reflector surface on the segment with the generatrix in the form of



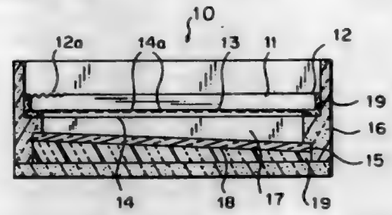
an arc of a circle intersects the reflector surface, and on the segment with the generatrix in the form of an arc of an ellipse any straight line passing through the focal point coincident with the surface of the machined material has only one point of intersection with the reflecting surface of the concentrating reflector while the number of arcs of generatrix ellipses k, the number of lengths of rays n and the number of arcs of circles m are interrelated by a relationship k=n+m+1 where n and m are whole numbers, n, m=0, 1, 2 . . . .

5,594,832

BLACK BODY RADIATOR WITH REFLECTOR

Peter Obermeier, Fürstenfeldbruck, Germany, assignor to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V., Köln, Germany

Continuation of Ser. No. 163,868, Dec. 9, 1993, abandoned.
This application Feb. 28, 1995, Ser. No. 396,535
Claims priority, application Germany, Dec. 10, 1992, 42 41 617.5
Int. Cl.[6] G01J 5/52
U.S. Cl. 392—435 7 Claims



1. A black body radiator comprising a body which is heatable by means of a heating device and further comprising temperature sensors, and

said body having radiating front and rear surfaces,

wherein the black body radiator further comprises,

a metallic heating foil of high thermal conductivity embedded in a plastic sheet, said metallic heating foil applied onto a rear surface of said body in a meandering fashion such that good thermal conductivity is achieved between said metallic heating foil and said body,

an infrared radiation reflecting mirror, comprised of low thermal conductivity material, said mirror being of the same size as said body, whereby said mirror is spaced away from the rear surface of the body,

a frame-like holder comprised of low thermal conductivity material, said frame-like holder connected to said body and said mirror such that an intermediate space is formed between said body and said mirror,

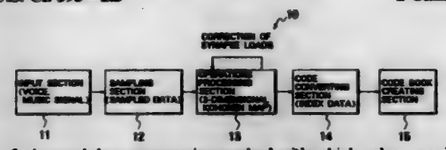
the intermediate space between said body and said mirror being evacuated,

wherein the mirror is positioned such that radiation passing through the heating foil and impinging on the mirror is reflected into said intermediate space and then passes through said heating foil and is absorbed by said rear surface.

5,594,833
RAPID SOUND DATA COMPRESSION IN CODE BOOK CREATION

Takeo Miyazawa, Prestige S & T W2, 12-3, Shimorenjaku 4-chome, Mitaka-shi, Tokyo 181, Japan

PCT No. PCT/JP93/00731, § 371 Date Jan. 28, 1994, § 102(e) Date Jan. 28, 1994, PCT Pub. No. WO93/25007, PCT Pub. Date Dec. 9, 1993
PCT Filed May 31, 1993, Ser. No. 182,105
Claims priority, application Japan, May 29, 1992, 4-138431
Int. Cl.[6] G10L *3/02;9/00*
U.S. Cl. 395—2.3 **2 Claims**



1. A sound data compressing method with which, when a series of sound data are sampled at predetermined time intervals and input as a sound data pattern having a predetermined number of samples, said input sound data pattern is replaced by an representative sound value for sorting and approximation of said input sound data pattern, said representative sound value being coded, thereby compressing said series of sound data, said method including:

map forming means for forming a plurality of division regions, in which representative sound values for sorting and making approximation of said input sound data pattern in accordance with change in said input sound data pattern are loaded as the centroids, into a three-or-more dimensional correlation map, and for modifying the representative sound values as the centroids of said respective division regions depending on change in said input sound data pattern to update said correlation map, and

coding means for converting the representative sound values, which are loaded in said respective division regions of said correlation map formed by said map forming means, into predetermined code data, whereby

the representative sound values as the centroids of said respective division regions are modified depending on change in said input sound data pattern to update said three-or-more or n-dimensional correlation map, and the representative sound values of said updated correlation map are converted into predetermined code data, thereby compressing the input sound data.

5,594,834
METHOD AND SYSTEM FOR RECOGNIZING A BOUNDARY BETWEEN SOUNDS IN CONTINUOUS SPEECH

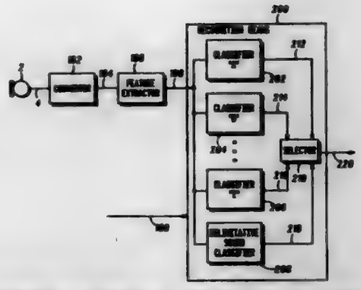
Shay-Ping T. Wang, Long Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1994, Ser. No. 315,474
Int. Cl.[6] G10L *9/00*
U.S. Cl. 395—2.62 **15 Claims**

1. In a speech recognition system, a method for recognizing a boundary between two contiguous spoken sounds, the method comprising the steps of:

(a) training a learning machine, with a plurality of spoken examples, to classify a delimitative sound that represents the boundary;

(b) receiving the continuously spoken speech which includes the delimitative sound;



(c) extracting a plurality of features from the continuously spoken speech; and

(d) recognizing the delimitative sound in the continuously spoken speech by classifying the plurality of features according to a polynomial discriminant function having a form

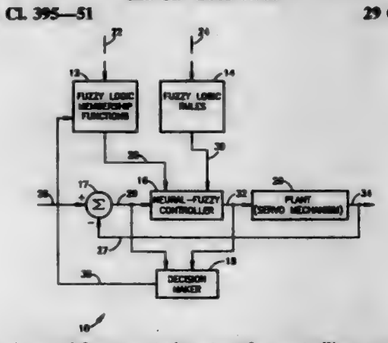
$$y = \sum_{i=1}^{m} w_{i-1} x_1^{g1i} x_2^{g2i} \ldots x_n^{gni};$$

wherein y represents a classifier output, w_{i-1} represents a coefficient of an ith term in the polynomial expansion, x_1, $x_2 \ldots x_n$ represent the plurality of features $g_{1i}, \ldots, g_{ni}$ represent exponents for the ith term in the polynomial expansion, and i, m, and n are integers.

5,594,835
NEURAL-FUZZY LOGIC CONTROL SYSTEM WITH ADJUSTABLE FUZZY LOGIC MEMBERSHIP FUNCTIONS

Sayeedur C. Rahman, San Francisco, and Emdadur R. Khan, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 36,634, Mar. 24, 1993. This application Aug. 2, 1994, Ser. No. 284,130
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—51 **29 Claims**



1. A neural-fuzzy control system for controlling a plant in accordance with signals representing fuzzy logic rules and membership functions, said neural-fuzzy control system comprising:

a rule source for providing a rule signal which represents a plurality of fuzzy logic rules;

a membership function source for receiving a membership function control signal and in accordance therewith outputting a membership signal which represents a plurality of fuzzy logic membership functions;

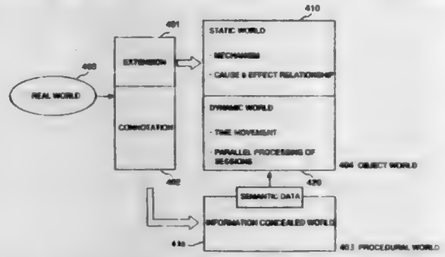
a controller, coupled to said rule source and said membership function source, for coupling to a plant and for receiving said rule signal, said membership signal and an input control signal which corresponds to a desired plant performance criterion for said plant and outputting in response thereto in accordance with fuzzy logic processing an output control signal representing said desired plant performance criterion for use by said plant; and

a decision maker, coupled to said controller and said membership function source, for receiving and comparing said output control signal and a performance signal which corresponds to an actual plant performance criterion for said plant and in accordance therewith outputting said membership function control signal to said membership function source, wherein said membership signal outputted by said membership function source is modified in accordance with said membership function control signal.

5,594,836
ENNOVERSION MANAGEMENT SYSTEM FOR DATA PROCESSING SYSTEM

Tadamitsu Ryu; Hiroyuki Izumi; Masahiko Murakawa; Masanobu Toyota; Takeshi Adachi, all of Kawasaki, and Naomi Ichikawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 23, 1994, Ser. No. 247,665
Claims priority, application Japan, May 25, 1993, 5-122559
Int. Cl.[6] G06F *17/00;7/00*
U.S. Cl. 395—62 **5 Claims**



1. An ennoversion management system adapted to a data processing system which executes a desired process by naming as objects single processing units and/or composite processing units which are combinations of the single processing units and combining the objects, said ennoversion management system comprising:

means for understanding a real world as an object model, for corresponding the real world to an extension representing things of the real world and a connotation providing a meaning of the extension including a procedural world, for placing the connotation in an information concealed region, and for forming identification information which specifies the connotation in correspondence with the extension;

means for describing the real world via a dynamic world including no spatial information and a static world including no time related information and forming a world of the objects in correspondence with the extension;

means for providing as a static model a system mechanism with respect to the static world using classes and/or composite classes, and for providing as a dynamic model a session corresponding to a motion of the dynamic model with respect to the dynamic world using instances of the composite classes and/or the classes;

means for providing cause and effect relationships generated from the dynamic model into the static model as information;

means for forming the classes and/or composite classes by combining a plurality of existing and/or newly generated methods, and for forming the instances in correspondence with the classes and/or the composite classes;

means for storing as a functional model the existing and/or newly generated methods, the formed classes and/or composite classes, and the session corresponding to the motion of the dynamic model in the information concealed region corresponding to the connotation as composite objects;

means for reusably forming in correspondence with the identification information the objects and/or composite objects stored in the connotation as the functional model; and

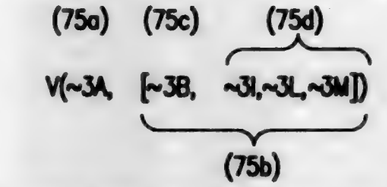
means for carrying out an ennoversion management with respect to the classes, the composite classes, the instances and the sessions and managing a relationship of the static world, the dynamic world, the procedural world, and cause and effect,

said ennoversion management including management of version, evolution and innovation.

5,594,837
METHOD FOR REPRESENTATION OF KNOWLEDGE IN A COMPUTER AS A NETWORK DATABASE SYSTEM

Dallas B. Noyes, 2500 George Washington Way, #124, Richland, Wash. 99352

Continuation-in-part of Ser. No. 11,355, Nov. 29, 1993, Pat. No. 5,379,366. This application Oct. 17, 1994, Ser. No. 323,881
Int. Cl.[6] G06F *15/18*
U.S. Cl. 395—63 **18 Claims**



1. A method for representing information in a computer system, comprising the steps of:

creating in said computer system a knowledge representation database made up of individual records, wherein each record is associated with a unique reference number (URN) by which each record is identified;

creating at least one system concept record which defines the nature of a relationship between two records in said database;

identifying records in said database as subjects of the relationship defined by said system concept record;

identifying records in said database which define objects of the relationship defined by said system concept record;

creating relationship data structures each comprising the URN of said system concept record together with the URN of at least one of said identified object records;

storing said relationship data structures in corresponding identified subject records;

designating said system concept record of said knowledge representation database as a System Concept by including the name and associated URN of said system concept record in a System Concept index to said knowledge representation database provided in said computer system; and

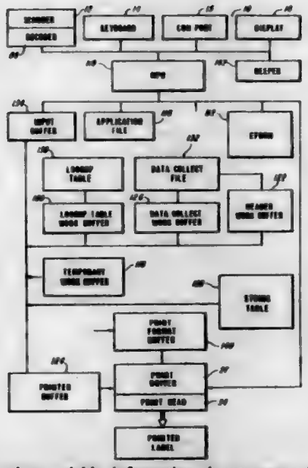
deriving comprehensible information through evaluation of said relationship data structures stored in said records of said knowledge representation database and recognition of System Concepts through consultation of said System Concept index.

5,594,838
PROGRAMMABLE HAND HELD LABELER

Amy S. Christopher, Miamisburg; Donald A. Morrison, Dayton; Mark W. Roth, Miamisburg; Rex D. Watkins, Franklin; Dale E. Lamprecht, Jr., Dayton, and James E. Globig, Kettering, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 858,703, Mar. 27, 1992, Pat. No. 5,483,624. This application Jun. 8, 1995, Ser. No. 482,152
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—117 **11 Claims**

1. A method of operating a portable label printer having a processor, a first memory storing fixed information, a second



memory storing variable information, input means for entering information to said label printer including a bar code scanner, a print head and at least one motor for advancing a label past the print head for printing thereon comprising:

storing in said first memory a plurality of output command routines including a print head and motor control routine to control said print head and at least one motor to perform a print operation, a communication routine for controlling communications with a remote host computer and a data collection routine to control an operation of said scanner for collecting data;

receiving from a remote host computer a sequence of commands forming an application program, a plurality of said commands in said application program selecting an associated command routine stored in said first memory for execution by said processor; and

storing said received sequence of commands in said second memory wherein the order in which the selected routines are executed is determined by the order of the associated commands in the application program and the order of execution of the stored routines is changeable without changing the stored routines.

5,594,839

APPARATUS AND METHOD FOR IMPROVING BLACK AND COLOR SEPARATION IN HALFTONED IMAGES BY PRINTING BLACK DOTS IN A DIFFERENT SCREEN PHASE

Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 17, 1994, Ser. No. 323,762
Int. Cl.[6] H04N *1/52*
U.S. Cl. 395—109 **25 Claims**

1. A K separation screen for printing halftone images comprised of three primary colors and black on a print medium, the screen comprising:

a square grid comprised of a first plurality of parallel lines spaced a first distance apart and extending in a screen direction and a second plurality of parallel lines spaced the first distance apart and extending in a second direction perpendicular to the screen direction, the first plurality of lines crossing the second plurality of lines to form a plurality of intersections;

a plurality of halftone dot printing positions, each of the plurality of printing positions being arranged at one of the plurality of intersections, each of the plurality of printing positions being divided into one of a first printing position type and a second printing position type wherein the first printing position type alternates in both the screen direction and the second direction with the second printing position type;

printed halftone dots on the print medium comprised of at least one primary color and white located at ones of the plurality of printing positions having the first printing position type; and

printed halftone dots on the print medium comprised of black and white located at ones of the plurality of printing positions having the second printing position type.

15. Apparatus for printing halftone images comprised of three primary input color values and black values, the apparatus comprising:

a read-only memory for storing a plurality of threshold values comprising a dither array pattern;

a first address generator responsive to the three primary color values for generating first addresses;

first means responsive to the first addresses for retrieving the threshold values from the read-only memory;

a second address generator responsive to the black color values for generating second addresses;

second means responsive to the second addresses for retrieving the threshold values from the read-only memory; and

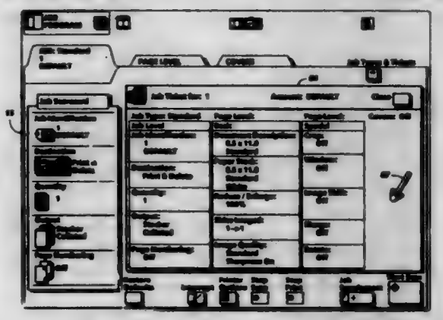
means responsive to the black values for adding a predetermined offset value to the second addresses.

5,594,840

APPARATUS AND METHOD FOR DIAGNOSING THE OPERATION OF A PRINTING SYSTEM

Bharat B. Sahay, Fairport; Max C. Nowacki, Red Creek; Gregory J. Meteyer, Pittsford, and Louis J. Cardinale, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1993, Ser. No. 68,724
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—113 **8 Claims**



1. In a printing system for processing a print job including an input image data file written in a page description language, the input image data file including image data and instructions directing the printing system in a manner of producing an electronic page including a first image based on the image data, a diagnostic system for diagnosing a capability of the printing system to interpret the input image data file within an acceptable degree of accuracy, comprising:

an interpreter for interpreting the input image data file so as to obtain a first output including the first image based on image data corresponding with the first image;

a memory for storing a reference output image data file corresponding substantially with a second output including a second image, the second output representing an ideal output that would be obtained as a result of interpreting the input image data file within the acceptable degree of accuracy; and

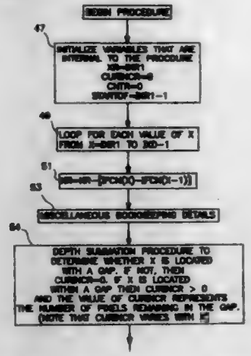
a comparator for comparing a substantial portion of the first image of the first output with a substantial portion of the second image of the second output to determine whether the input image data file has been interpreted within the acceptable degree of accuracy, a user of the printing system being provided with an indication, at an output device, as to whether the input image data file has been interpreted within the acceptable degree of accuracy so that an interaction between the user of the printing system and the printing system, with respect to interpretation accuracy, is obtained.

5,594,841

STEREOGRAM AND METHOD OF CONSTRUCTING THE SAME

Stephen A. Schutz, 7910 Ivanhoe, Suite 436, LaJolla, Calif. 92037

Filed Dec. 27, 1993, Ser. No. 175,054
Int. Cl.[6] G06T *15/00*
U.S. Cl. 395—119 **14 Claims**



1. A computer implemented process for making a stereogram comprising the steps of:

(a) inputting to a computer color information of continuous tone artwork and assigning the color information to picture elements arranged as a plurality of adjacent picture elements in a plurality of horizontal rows;

(b) inputting to the computer depth information and assigning the depth information to the picture elements;

(c) selecting a plurality of first picture elements;

(d) selecting a plurality of second picture elements and assigning to the first picture elements the color information of the second picture elements, wherein a first picture element is assigned the color information of a second picture element located on the same horizontal row and separated from the first picture element by a distance that depends on the depth information assigned to the picture elements in the same horizontal row;

(e) determining if a first picture element is in a gap;

(f) for all first picture elements in a gap, assigning to such first picture elements the color information of an adjacent picture element in the same horizontal row or the color information of a replacement strip of continuous tone artwork;

(g) determining the width of the gaps;

(h) comparing the width of each gap to a prescribed threshold; and,

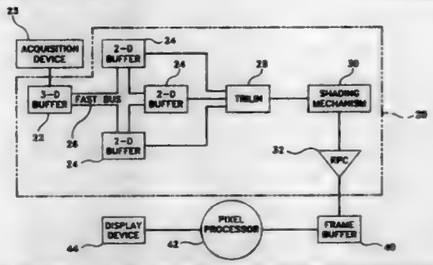
(i) if the width of a gap is less than the prescribed threshold, assigning to the first picture elements in such a gap the color information of the adjacent picture element in the same horizontal row.

5,594,842

APPARATUS AND METHOD FOR REAL-TIME VOLUME VISUALIZATION

Arie E. Kaufman, Plainview, and Hanspeter Pfister, Stony Brook, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Sep. 6, 1994, Ser. No. 301,285
Int. Cl.[6] G06T *17/00*
U.S. Cl. 395—124 **34 Claims**



20. Apparatus for generating a three-dimensional (3-D) volume projection image, the apparatus comprising:

a) at least two two-dimensional (2-D) memories, each of the at least two 2-D memories being capable of storing voxels provided thereto;

b) an interpolation mechanism coupled to the at least two 2-D memories, the interpolation mechanism generating a plurality of continuous ray sample points along each of a plurality of continuous rays, the interpolation mechanism using a plurality of discrete rays defining a plurality of discrete ray planes to sample points, the plurality of discrete rays being defined by a plurality of voxels received from the at least two 2-D memories, the interpolated sample signals for a given continuous ray being generated in response to signals associated with the voxels of each of at least two of said discrete ray planes which are proximate to said given continuous ray, the interpolated sample signals for each continuous ray sample point of any given one of said plurality of continuous rays being determined in parallel; and

(c) a projection mechanism coupled to the interpolation mechanism, the projection mechanism receiving the plurality of interpolated sample signals for each of the plurality of continuous rays, the projection mechanism generating a pixel value signal for each of the plurality of continuous rays, the pixel value signal corresponding to a pixel of the 3-D volume projection image.

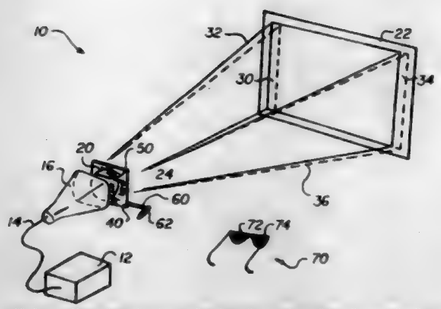
5,594,843

METHOD AND APPARATUS FOR CREATING THREE-DIMENSIONALITY IN A PROJECTED TELEVISION IMAGE

William J. O'Neill, Ann Arbor, Mich., assignor to Depth Enhancement, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 873,400, Apr. 24, 1992, abandoned. This application Aug. 13, 1993, Ser. No. 106,258
Int. Cl.[6] G06F *15/00*; G09G *5/00*
U.S. Cl. 395—127 **21 Claims**

1. A system for imparting a sense of three-dimensionality to a projected television image comprising:



a light-redirecting device which, when placed in the optical path of said projected image, is operative to separate said image into a first version of said image and a second version of said image, said first and second versions of said image being horizontally displaced relative to one another;

the construction of said light-redirecting device in said optical path being such that said first and said second versions of said image exhibit substantially uniform brightness;

a first filter operative to filter said first version;

a second filter operative to filter said second version;

switching means including a first position wherein said light-redirecting device and said filters are operative and a second position wherein said light-redirecting device and said filters are inoperative; and

a pair of glasses which enable a wearer of said glasses to view said first version of said image with one eye and said second version with the other eye when said switching means is in said first position.

5,594,844

THREE DIMENSIONAL VIEW USING RAY TRACING THROUGH VOXELS SUBDIVIDED NUMERICALLY USING OBJECT BASED PARAMETERS

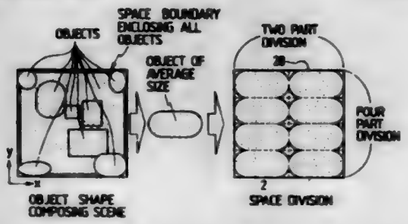
Toshio Sakai, Katsuta; Norito Watanabe, Hitachi; Masanori Miyoshi, Hitachi, and Yoshifumi Fukuda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1994, Ser. No. 186,710

Claims priority, application Japan, Jan. 26, 1993, 5-010465

Int. Cl.[6] G06T *15/40*

U.S. Cl. 395—127 **9 Claims**



1. A picture generating apparatus using ray tracing comprising:

three dimensional scene inputting means for inputting from a data base and storing data of objects including shape data, space distribution data and optical attribution data of said objects composing a virtual three dimensional space;

data registering means for storing in a voxel table data of said objects in individual voxels obtained by dividing said virtual three dimensional space including said objects into a plurality of voxels;

picture generating means for generating pictures by applying a ray tracing method to the data of said divided voxels in said voxel table and for displaying the generated pictures using a display device; and

division number deciding means for determining the number of voxels into which said three dimensional space circumscribing said objects is to be equally divided on the basis of a representative size for a size distribution of all of said objects composing said virtual three dimensional space.

5,594,845

METHOD AND DEVICE FOR PROCESSING AN IMAGE IN ORDER TO CONSTRUCT A TARGET IMAGE FROM A PLURALITY OF CONTIGUOUS SOURCE IMAGES

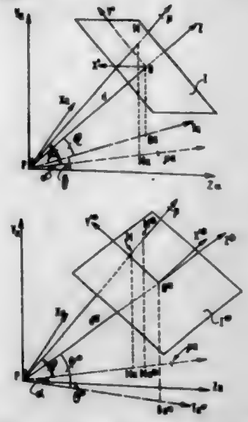
Raoul Florent, Valenton, and Pierre Lelong, Nogent-Sur-Marne, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 20, 1994, Ser. No. 359,378

Claims priority, application France, Dec. 29, 1993, 93 15805

Int. Cl.[6] G06T *3/00*

U.S. Cl. 395—127 **19 Claims**



1. A method of processing images for constructing a digitized target image (I*) from a digitized source image (I) having a fixed frame line, and whose pixels have a digital signal value, said source and target images having a substantially common view point (P) and respective optical axes (PZ, PZ*), comprising:

(A) calibration steps of:

determining a fixed set of orthonormal reference axes (PXa, PYa, PZa) originated at said common view point (P), defining a horizontal plane (PXa, PZa) and a vertical axis (PYa); and

storing addresses (X, Y) of points (M) situated in the source image (I), associated with respective corresponding couples of spherical coordinates (α_0, β_0), constituted of orientation angle values with respect to said set of orthonormal reference axes;

(B) initialization steps of:

storing parameters of the target image (I*), including a scale factor (d*), dimensions of the frame ($2V_x$*, $2V_y$*), and orientation angles of the optical axis constituted by a panning angle (Θ*) and a tilting angle (ρ*) defined in said fixed set of orthonormal reference axes;

(C) calculation steps of:

generating an address for each pixel of the target image (I*);

generating, from said target image (I*), an image called transformed target image (H*) by using an inverse perspective transform (G^{-1}) consisting in two successive sub-transforms;

a rotation sub-transform applied to the target image (I*) operating with a rotation angle (ρ*) having the opposite value to the target image tilting angle (ρ*), for generating a first vertical sub-image (R*);

a vertical translation sub-transform applied to said first vertical sub-image (R*), operating with a vertical translation vector (Y_0) for generating a second vertical sub-image (H*) constituting said transformed target image (H*), having the same frame dimensions ($2V_x$*, $2V_y$*) and the same azimuth angle

as the target image (I*), and a null sight angle, and having a geometrical center (Ω_H*) situated on the optical axis (PZ*) of the target image (I*);

localizing, on the basis of the address (X*, Y*) of a pixel called initial pixel (M*) in the target image (I*), a pixel (M_H*) called transformed initial pixel which corresponds to said initial pixel (M*) by said inverse perspective transform (G^{-1}) having the same address in the transformed target image (H*), and calculating orientation angles (α, β) called approximate angles, with respect to said fixed set of orthonormal reference axes, of a straight line (PM_H*) passing through said common view point (P) and through said transformed initial pixel (M_H*);

determining an address (X, Y) of a point (M) in the source image (I), by matching, at best, said approximate orientation angles (α, β) with a stored spherical coordinates couple (α_0, β_0); and

calculating a function characteristic of the digital signal value (Q) at said point (M) in said source image (I) and assigning said value to said initial pixel (M*) in said target image (I*);

(D) repeating calculation steps (C) for each pixel of the target image (I*).

5,594,846

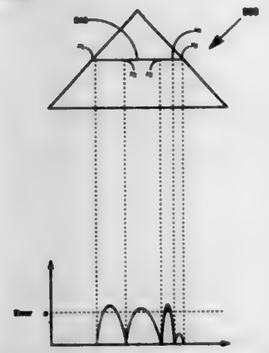
PERSPECTIVE CORRECTION OF TEXTURE IN GRAPHICS BY ADAPTIVE APPROXIMATION

Walter E. Donovan, Milpitas, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 19, 1994, Ser. No. 358,284

Int. Cl.[6] G06T *15/00*

U.S. Cl. 395—130 **36 Claims**



1. In a computer graphics system for generating and displaying images of objects on a display device, the images including pixels having pixel values, the graphics system including elements for modifying the images displayed on the display device, a method for efficiently computing texel values so as to display texture on a given object from a given perspective, said method comprising the steps of:

adaptively selecting a plurality of divisional points between a pair of end points along a scan line, said adaptive selection step including the steps of:

selecting a texel accuracy criteria; and

computing the locations of said divisional points located along said scan line as a function of said selected texel accuracy criteria; and

approximating a plurality of intermediate texel values for a corresponding plurality of pixels located between adjacent divisional points of said scan line.

5,594,847

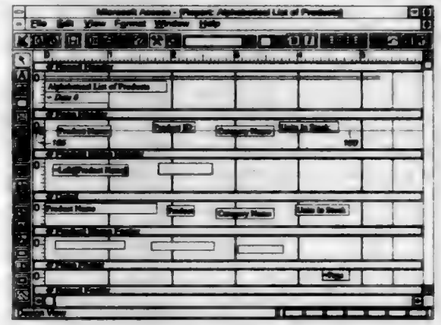
SYSTEM AND METHOD FOR SELECTING FREE FORM OBJECTS ASSOCIATED WITH A SELECTION REGION DISPLAYED BY A COMPUTER

Elizabeth A. Mourrund, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jan. 27, 1995, Ser. No. 378,710

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—133 **45 Claims**



1. A method for selecting a set of free form objects having a specific display relationship, comprising the steps of:

displaying an area containing a plurality of free form objects;

providing a selection identification zone associated with said area;

determining when a selection indicator is positioned within said selection identification zone;

displaying a selection region corresponding to the position of said selection indicator, said selection region comprising a line extending from said selection indicator;

selecting those free form objects that intersect said selection region; and

altering the appearance of said selected objects in order to indicate that said selected objects have been selected.

5,594,848

METHOD AND APPARATUS FOR EFFICIENTLY DETERMINING LINE SEGMENTS WITHIN A WINDOW USING ITERATIVE HALVING

Giang H. Dao, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 16, 1993, Ser. No. 17,778

Int. Cl.[6] G06T *15/30*

U.S. Cl. 395—134 **30 Claims**



1. A method of generating pixels in a computer representing a segment of a line relative to a predefined rectangle on a computer display, comprising the steps of:

determining, in the computer, whether one or more edges of the rectangle intersect the segment of the line and whether the coordinates of the corners of the rectangle defining an angle are disposed on opposite sides of the segment of the line, and further includes the steps of:

calculating a biased decision variable for the coordinates of each corner of the rectangle, said decision variable having a sign relative to the sign side of the line on which the corner of the rectangle is positioned; and

comparing the signs of the decision variable for two corners;

if one or more edges of the rectangle are intersected by the segment of the line, determining, in the computer, the point of intersection on at least one of the edges of the rectangle by

iteratively halving the distance between two points of an edge of the rectangle which is intersected by the segment of the line, where said two points are positioned on either side of the segment of the line; and

drawing the segment of the line using the point of intersection on at least one of the edges of the rectangle as an endpoint.

5,594,849

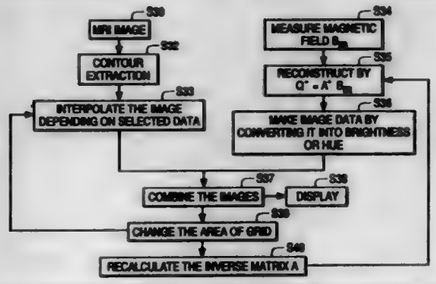
BIOMEDICAL MAGNETISM IMAGING APPARATUS AND METHOD

Roman B. Kuc; James J. Szinger, both of New Haven, Conn.; Takehiko Hayashi, Kawasaki, Japan; Takao Goto, Kawasaki, Japan; Yoshiyasu Nakashima, Kawasaki, Japan; Takaki Shimura, Kawasaki, Japan, and Kenji Kawabe, Kawasaki, Japan, assignors to Yale University, New Haven, Conn., and Fujitsu Limited, Kawasaki, Japan

Filed Aug. 9, 1991, Ser. No. 743,065

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—135 **4 Claims**



1. A method of displaying medical imaging data, comprising the steps of:

(a) providing biomedical magnetism image data;

(b) providing medical image data other than biomedical magnetism image data;

(c) selecting contour image data from the medical image data; and

(d) generating a display by superimposing the biomedical magnetism image on the selected contour image.

5,594,850

IMAGE SIMULATION METHOD

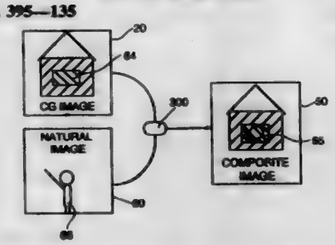
Hideo Noyama; Makoto Kato, both of Yokohama; Makoto Nohmi, Katsuta, and Yuri Takizawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1994, Ser. No. 186,312

Claims priority, application Japan, Jan. 29, 1993, 5-034721

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—135 **27 Claims**



1. A composite image simulation method performed by a computer system, comprising the following steps performed by the computer system of:

gathering computer graphics (CG) image data during creation of a CG image with computer graphics based on a shape model;

projecting the shape model on a projection plane for creating a projected image, assigning different mask numbers to different shape model regions of the projected image and at least another region outside the shape model regions, and saving the regions as masks associated with the mask numbers as a mask image, wherein said projecting, assigning, and saving are data transforming conducted automatically in response to said gathering; and

cutting only a desired image from the computer graphics image by using the mask image and the mask numbers to obtain a cut image, and as a part of image simulation combining the cut image and another image that is independent of the computer graphics image to obtain the composite image, wherein said cutting and combining are image simulation.

5,594,851

METHOD OF SIMULTATING AT LEAST ONE COMPONENT WHOSE CHARACTERIZING FEATURES ARE DESCRIBED BY A SET OF PAIRS OF VALUES, BY MEANS OF A SIMULATOR ON A COMPUTER

Eberhard Lange, Obermichelbach, and Haible Jürgen, Erlangen Tennenlohe, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

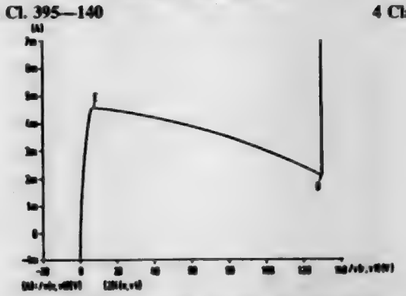
PCT No. PCT/EP93/01875, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO94/03867, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 16, 1993, Ser. No. 379,585

Claims priority, application European Pat. Off., Jul. 31, 1992, 92113107

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—140 **4 Claims**



1. A method for simulating at least one component, whose characterizing features are described by a set of pairs of values (A, V) by means of a simulator on a computer, the method comprising the steps of:

a) finding, in a first step, a function (s) by spline interpolation for all pairs of values (A, V) which function allocates in each instance to one value (A, V) of each respective pair of values the other value (V, A) of the pair of values;

b) using in the simulator, in a second step, the function to determine arbitrarily selectable pairs of values (A, V) for the component;

c) generating a non-differentiable point (D) in a progression of the function in that the set of pairs of values is subdivided in to two subsets, in which the point is included;

d) carrying out the spline interpolation for each subset of the two subsets, the point being used on one occasion as an upper interval bound and on the other occasion as a lower interval bound related to the two subsets for the spline interpolation.

5,594,852

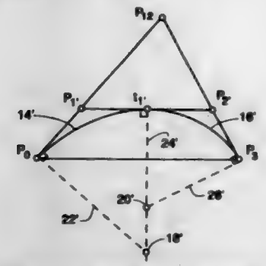
METHOD FOR OPERATING A CURVE FORMING DEVICE

Roman L. Tankelevich, Denver, Colo., assignor to Laser Products, Inc., Golden, Colo.

Filed Aug. 17, 1994, Ser. No. 291,444

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—141 **51 Claims**



1. A method for use in operating a curve forming device to form a curve connecting two end points, said curve forming device requiring guidance information to form said curve, said method comprising the steps of:

defining a polygon relative to said end points and at least one control point, said polygon including a polygon base defined relative to said end points and polygon sides defined relative to said at least one control point;

defining at least two isosceles triangles relative to said polygon, each of said isosceles triangles including a triangle base and two triangle sides, said triangle sides being of equal length, wherein one of said triangle sides of a first of said triangles is collinear with a first of said polygon sides of said polygon and one of said triangle sides of a second of said triangles is collinear with a second of said polygon sides of said polygon defining a curve relative to said isosceles triangles;

providing device guidance information by expressing said curve in a form for implementation by said curve forming device; and

outputting said device guidance information to a controller of said curve forming device such that said information can be used by said curve forming device to form said curve.

5,594,853

METHOD AND SYSTEM FOR EDITING THE GENERAL SWEEP AND DETAIL OF A FIGURE WITH A CURVE

David H. Salesin, and Adam Finkelstein, both of Seattle, Wash., assignors to University of Washington, Seattle, Wash.

Filed Jan. 3, 1995, Ser. No. 367,946

Int. Cl.[6] G06T *9/00*

U.S. Cl. 395—141 **32 Claims**



1. A method of editing a figure comprising the steps of:

storing a presentation of the figure as one or more curves in digital format on a storage medium;

separating the stored representation of the figure into a general sweep portion and a detail portion, the general sweep portion comprising a sweep component for each of the one or more curves, the detail portion comprising a detail component for each of the one or more curves;

editing at least one of the general sweep portion and the detail portion to generate a processed general sweep portion and a processed detail portion, respectively;

combining the processed general sweep portion and the processed detail portion into an edited representation of the figure; and

outputting the edited representation of the figure.

5,594,854

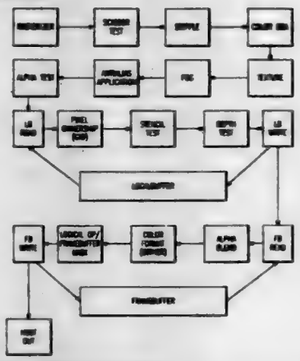
GRAPHICS SUBSYSTEM WITH COARSE SUBPIXEL CORRECTION

David R. Baldwin, Weybridge, and Andrew Bigos, Chertsey, both of United Kingdom, assignors to 3Dlabs Inc. Ltd., Hamilton, Bermuda

Filed Mar. 24, 1995, Ser. No. 410,220

Int. Cl.[6] G06T *15/00*

U.S. Cl. 395—141 **25 Claims**



1. A graphics system comprising:

a rasterizer which generates a sequence of pixel location identifiers and associated operation specifiers;

one or more digital differential analyzer units (DDA units) connected to receive said sequence of pixel location identifiers and associated operation specifiers from said rasterizer;

wherein ones of said operation specifiers generated by said rasterizer include commands for programming said DDA units to perform incremental changes in pixel attributes;

and wherein ones of said operation specifiers generated by said rasterizer include at least one delta value for incrementing, and also include a subpixel offset values which indicate a value proportional to said delta value;

and wherein said DDA units generate said incremental changes in pixel attributes, from said delta value and said subpixel offset value, using calculations which use multiplexing operations but do not use any multiply operations.

5,594,855

SYSTEM AND METHOD FOR GENERATING REAL TIME CALLIGRAPHIC CURVES

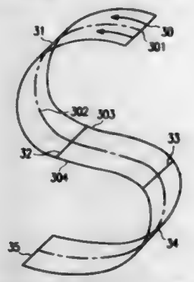
James R. Von Ehr, II; Steven R. Johnson, and Samantha Seals-Mason, all of Plano, Tex., assignors to Macromedia, Inc., San Francisco, Calif.

Continuation of Ser. No. 833,977, Feb. 11, 1992, abandoned. This application Jan. 9, 1995, Ser. No. 370,474

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—142 **50 Claims**

1. A system for generating a calligraphic curve from an input



consisting of aspect data pertaining to said calligraphic curve, said system comprising:

means for accepting trajectory data for said calligraphic curve to be generated;

means for accepting angle data pertaining to an angle with respect to radial coordinates of a plane;

means for accepting width data pertaining to a width of said curve; and

means, operable substantially concurrently with acceptance of said trajectory data, for generating said calligraphic curve based upon said trajectory data, said width data and said angle data, wherein said generating means further includes:

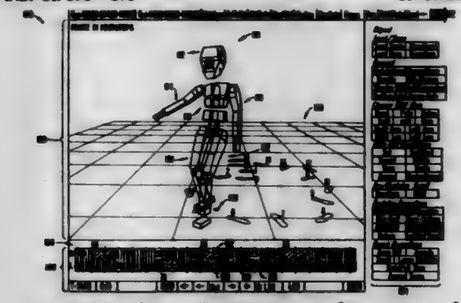
means for generating a spine, said spine comprising a plurality of points disposed along a longitudinal centerline of said calligraphic curve, each point having aspect data associated therewith, said aspect data comprising said trajectory data, said width data and said angle data at each said point, wherein said aspect data of each said point of said spine is used to generate a top control point associated with a top peripheral outline of said calligraphic curve and a bottom control point associated with a bottom peripheral outline of said calligraphic curve, wherein said top and bottom control points are movable to modify said calligraphic curve.

5,594,856

COMPUTER USER INTERFACE FOR STEP-DRIVEN CHARACTER ANIMATION

Michael Girard, 3324 Vernon Ter., Palo Alto, Calif. 94303

Filed Aug. 25, 1994, Ser. No. 296,214
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—173 **13 Claims**



1. A method of generating a sequence of movements of a simulated character in a computer system, the simulated character being a representation of a real or imaginary creature comprising a plurality of simulated body parts attached at prespecified attachment points, the plurality of simulated body parts including one or more feet, the method comprising the steps of:

displaying, using the computer system, a view of a space on a display coupled to the computer system;

accepting signals from a user input device coupled to the computer system, the signals specifying a location in the space and a time for each of a plurality of footsteps;

displaying, on the display, a footprint for each footstep indicating the location of the footstep in the space;

determining a plurality of parameters for the entire sequence of movements; and

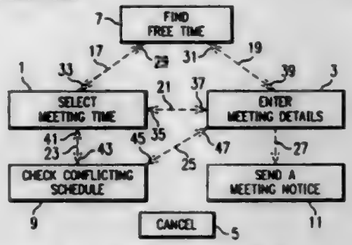
generating, using the computer system, a series of keyframes wherein the series of keyframes collectively describe a sequence of movements of the simulated character along a coherent trajectory which sequence simultaneously satisfies the constraints of (1) having the one or more feet coincide with the plurality of footsteps in space and time, and (2) the plurality of parameters on the plurality of simulated body parts, wherein at least one parameter of the plurality of parameters affects the content of a plurality of keyframes in the sequence of keyframes.

5,594,857

CONCEPTUAL MAP SHOWING THE WINDOWS OF A COMPLEX TASK

C. David King, and Robert J. Torres, both of Colleyville, Tex., assignors to IBM Corporation, Roanoke, Tex.

Continuation of Ser. No. 989,122, Dec. 11, 1992, abandoned.
This application Mar. 4, 1996, Ser. No. 610,797
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—352 **4 Claims**



1. A method for visually assisting a computer user to move between a plurality of related windows to perform a task, comprising the steps of:

a. displaying any one of said related windows on a computer display screen; and

b. generating and displaying in said displayed window a conceptual map including:

I. a plurality of action dialogs one of which corresponds to each of said related windows; and

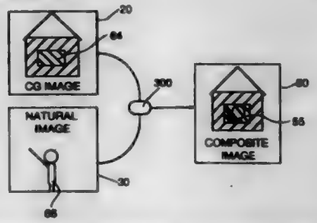
II. a plurality of potential paths extending between said action dialogs, said potential paths graphically indicating which of said related windows are selectable from each related window.

5,594,858

UNIFORM CONTROL TEMPLATE GENERATING SYSTEM AND METHOD FOR PROCESS CONTROL PROGRAMMING

Terrence L. Blevins, Round Rock, Tex., assignor to Fisher-Rosemount Systems, Inc., Clayton, Mo.

Filed Jul. 29, 1993, Ser. No. 98,790
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—326 **41 Claims**



1. A process control system which performs process control functions in a process environment using control templates, each template representing a selected process control function for a control environment and in which different control template views of a selected process control function may be displayed, the system comprising:

A. a central processing unit;

B. a plurality of control templates that can be accessed by the central processing unit wherein each control template includes:

(1) process control function information;

(2) attribute information pertaining to the process environment;

(3) a conversation set associated with the process control function information and the attribute information which enables a user to interact with the attribute information in a manner specified by a selected control template view; and

(4) control method instructions which use the attribute information and the conversation set to perform a process control function;

C. a user-interface device coupled to the central processing unit which enables a user to select a control template for display, including means for systematically prompting the user to input control template information comprising one of the attribute information, the conversation set and the control method instructions for a control template; and

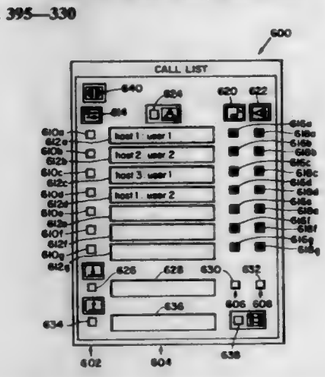
D. a control template generator which includes instructions that automatically generate a control template in response to the control template information input by the user.

5,594,859

GRAPHICAL USER INTERFACE FOR VIDEO TELECONFERENCING

Larry G. Palmer, and Ricky S. Palmer, both of Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 893,234, Jun. 3, 1992, abandoned.
This application Feb. 21, 1995, Ser. No. 391,086
Int. Cl.[6] G06F *15/00*; G09G *5/00*
U.S. Cl. 395—330 **50 Claims**



42. A call list window for a graphical user interface of a video teleconferencing computer, the graphical user interface including a video image area displaying live video images associated with a video teleconferencing session for an operator of the computer and providing a connection function for initiating display of the call list window, the call list window comprising:

a host computer field for indicating an identification of a target host computer to be connected to for the video teleconferencing session;

a connect function graphical indicator corresponding to the host computer field, wherein activation of the connect function graphical indicator by the operator causes a video teleconference call to be placed to the target host computer identified in the host computer field;

an audio function graphical indicator corresponding to the host computer field, wherein activation of the audio function graphical indicator by the operator changes whether or not audio data is sent to the target host computer identified in the host computer field during the video teleconferencing session; and

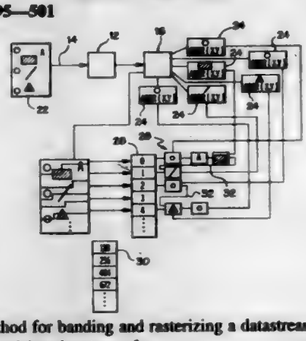
a video function graphical indicator corresponding to the host computer field, wherein activation of the video function graphical indicator by the operator changes whether or not video data is sent to the target host computer identified in the host computer field during the video teleconferencing session.

5,594,860

METHOD FOR BANDING AND RASTERIZING AN IMAGE IN A MULTIPROCESSOR PRINTING SYSTEM

Forrest P. Gauthier, Mainville, Ohio, assignor to Varis Corporation, Mason, Ohio

Filed Jan. 27, 1995, Ser. No. 379,735
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—501 **23 Claims**



1. A method for banding and rasterizing a datastream for a page image comprising the steps of:

interpreting a datastream containing a specification of said page image;

generating a plurality of rendering commands from said datastream;

dividing said page into a plurality of bands;

ordering said commands into a plurality of buckets corresponding to said bands;

accessing said commands from said buckets;

allocating memory for storing a bitmap of at least one of said plurality of bands;

processing one or more of said rendering commands from a bucket corresponding to said band to render a bitmap of said band in said allocated memory;

monitoring access to said allocated memory during said processing step to detect when said processing step attempts to access memory outside of said allocated memory; and

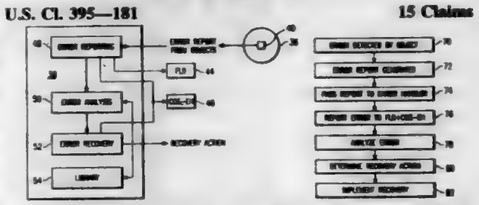
dispatching said bitmap of said band to a print engine.

5,594,861

METHOD AND APPARATUS FOR HANDLING PROCESSING ERRORS IN TELECOMMUNICATIONS EXCHANGES

Anders Jönsson, Stockholm; Ulle Winberg, Bandhagen; Charles G. E. Lignell, Alvsjo; Chung M. Lee, Uista, and Peter Larsen, Fredriksberg, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 18, 1995, Ser. No. 512,275
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—181 **15 Claims**



1. In a software application owning a plurality of processes, each such process including a plurality of objects, a process centralized method for handling errors, comprising the steps of:

defensively programming certain ones of the plurality of objects in each process to detect and report on the occurrence of errors within that process;

providing an error handler object for each process;

reporting of errors detected by the defensively programmed objects in the process to the error handler object in that same process; and

analyzing of the reported errors by the error handler object in that same process; and

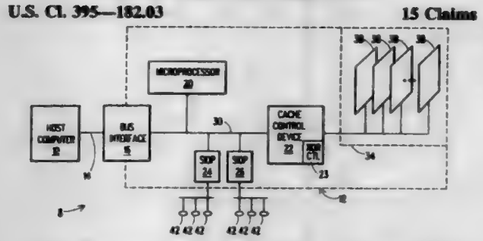
specifying of a recovery by the error handler object in that same process for returning the application owning the process in which the detected error occurs to a well defined state and thus effectuate a coordinated, process centralized; error handling response.

5,594,862

XOR CONTROLLER FOR A STORAGE SUBSYSTEM

Jeffrey L. Winkler, Princeton, and Jeffrey A. Wilcox, Bourne, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Filed Jul. 20, 1994, Ser. No. 278,870
Int. Cl.[6] G06F *11/00*; H03M *13/00*
U.S. Cl. 395—182.03 **15 Claims**



1. A method for XORing, in a disk controller, new data received from a host computer with old data and old parity information, wherein said disk controller interfaces to a plurality of disk drives and is operating under the control of a microprocessor within said disk controller, comprising the steps of:

receiving in said disk controller from said host computer at least one block of new data to be written to said disk drives commencing at a first disk address;

in a first storing step, storing in a cache memory having a plurality of memory locations said at least one block of new data commencing at a first one of said plurality of cache memory locations;

in a second storing step, storing in said cache commencing at second and third ones of said plurality of cache memory locations respectively, at least one block of old data corresponding to the block of data stored at said first disk address and at least one block of old parity information corresponding to the parity for said at least one block of old data;

providing at least one first control signal from said microprocessor within said disk controller to an XOR calculation controller;

generating with said XOR calculation controller, at least one block of new parity information by XORing said at least one block of new data, said at least one block of old data and said at least one block of old parity information in response to receipt by said XOR calculation controller of said at least one first control signal provided by said microprocessor;

in a third storing step, storing said at least one block of new parity information in said cache commencing at a fourth one of said plurality of memory locations; and

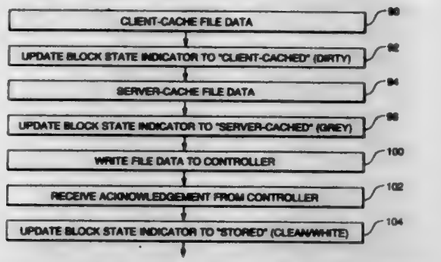
providing at least one second control signal from said XOR calculation controller to said microprocessor following the completion of said third storing step.

5,594,863

METHOD AND APPARATUS FOR NETWORK FILE RECOVERY

Ian J. Stiles, Salem, Utah, assignor to Novell, Inc., Orem, Utah

Filed Jun. 26, 1995, Ser. No. 494,919
Int. Cl.[6] G01R *31/28*; G06F *11/00*
U.S. Cl. 395—182.13 **54 Claims**



1. A method for assisting the recovery of files in a computer network after a network fault occurs, the network including a file server and a client connected to the file server, the client including a client cache data block and a corresponding client block state indicator, the file server including a server cache data block and a non-volatile store, the non-volatile store including a controller and a non-volatile medium, said method comprising the following steps in the order indicated:

client-caching a specified piece of file data by writing the file data to the client cache data block;

indicating that client-caching is complete by updating the client block state indicator;

server-caching the file data by writing the file data to the server cache data block;

indicating that server-caching is complete by updating the client block state indicator;

requesting storage of the file data by writing the file data to the controller in the file server;

receiving an acknowledgement from the controller that the file data has been stored on the non-volatile medium; and

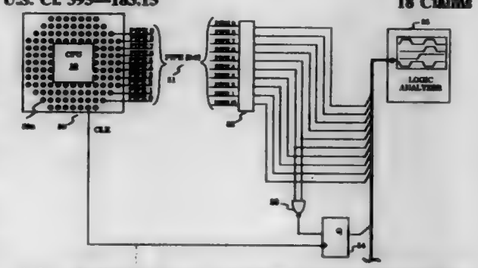
indicating that storing is complete by updating the client block state indicator.

5,594,864

METHOD AND APPARATUS FOR UNOBTRUSIVELY MONITORING PROCESSOR STATES AND CHARACTERIZING BOTTLENECKS IN A PIPELINED PROCESSOR EXECUTING GROUPED INSTRUCTIONS

Richard D. Trauben, Morgan Hill, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 875,961, Apr. 29, 1992, abandoned.
This application May 30, 1995, Ser. No. 454,406
Int. Cl.[6] G06F *11/25;11/34*
U.S. Cl. 395—183.15 **18 Claims**



1. In a pipelined processor comprising an integer unit pipeline, a floating point unit pipeline, embedded instruction and data caches, and an instruction control unit, a method for unobtrusively monitoring processor states during execution of a proprietary application workload, said method comprising the steps of:

issuing and queuing a plurality of sequential instructions to said instruction control unit;

issuing and queuing a plurality of branch target instructions to said instruction control unit;

tracing a number of completed instructions comprising a sum of said sequential and branch target instructions issued during a stall-free cycle of said pipelined processor including

providing a plurality of pins on a pin gate array for transmitting a plurality of PIPE signals;

coupling said pins through a coupler to a logic analyzer; and,

recording said PIPE signals on said logic analyzer.

storing said number of completed instructions,

determining the likely cause of a stall ending a stall free cycle based on a plurality of PIPE signals; and,

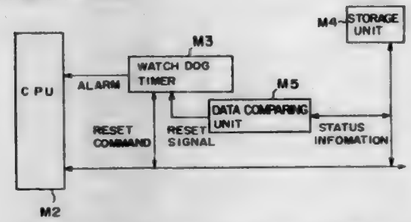
tabulating and logically combining said number of completed instructions to determine said processor states on a cycle by cycle basis during execution of said proprietary application workload.

5,594,865

WATCHDOG TIMER THAT CAN DETECT PROCESSOR RUNAWAY WHILE PROCESSOR IS ACCESSING STORAGE UNIT USING DATA COMPARING UNIT TO RESET TIMER

Hiroyuki Saitoh, Kawasakia, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 987,153, Dec. 8, 1992, abandoned.
This application Mar. 25, 1996, Ser. No. 621,325
Claims priority, application Japan, Dec. 11, 1991, 3-327186
Int. Cl.[6] G01R *31/28*; G06F *11/00*
U.S. Cl. 395—185.08 **11 Claims**



1. A watchdog timer circuit for a system including a central processing unit and a storage unit, wherein said central processing unit accesses said storage unit during predetermined time intervals and does not accept an interrupt request when accessing the storage unit, to avoid errors in data being processed, said watchdog timer circuit comprising:

watchdog timer means, coupled to the central processing unit, for counting up to a predetermined counter value and for generating an alarm signal when the predetermined counter value has been reached;

reset means, coupled to the central processing unit and to the watchdog timer means, for periodically resetting the watchdog timer means in response to a first reset signal generated by the central processing unit, so that the watchdog timer means is reset to an initial state; and

data comparing means, coupled to the central processing unit, the storage unit, the watchdog timer means and the reset means, for detecting whether or not the storage unit is accessible and for outputting a second reset signal to the watchdog timer means each time it is detected that the storage unit is accessible so that the watchdog timer means is caused to be reset by said second reset signal output from said data comparing means

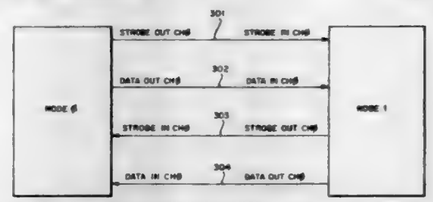
so that the watchdog timer means continues to operate while the central processing unit is accessing the storage unit.

5,594,866

MESSAGE ROUTING IN A MULTI-PROCESSOR COMPUTER SYSTEM WITH ALTERNATE EDGE STROBE REGENERATION

Steven F. Nugent, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 127,081, Sep. 23, 1993, abandoned, which is a continuation of Ser. No. 597,073, Oct. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 298,551, Jan. 18, 1989, abandoned. This application Mar. 18, 1996, Ser. No. 618,037
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.13 **18 Claims**



1. A computer system having a source node coupled to a destination node through at least one intermediate node, said at least one intermedinte node comprising:

a processor;

a router coupled to said processor, for routing messages between said nodes, said router including:

(a) data communication means for receiving and retransmitting data to a next router coupled to said router;

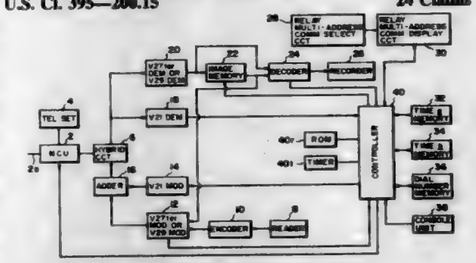
(b) strobe communication means coupled to said data communication means, for receiving a plurality of clock signals and transmitting a modified plurality of clock signals to said next router, each of said plurality of clock signals having odd and even edges, at least one edge of said modified plurality of clock signals clocking said data retransmitted to said next router, said strobe communication means generating each even edge of said modified plurality of clock signals by delaying a corresponding odd edge of said plurality of clock signals.

5,594,867

DATA COMMUNICATION APPARATUS WHICH TRANSMITS IN ACCORDANCE WITH A RECEPTION TIME ZONE OR A TERMINAL FROM WHICH DATA HAS BEEN RECEIVED

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 547,127, Jul. 3, 1990, abandoned.
This application Jan. 21, 1994, Ser. No. 190,681
Claims priority, application Japan, Jul. 4, 1989, 1-171128
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—200.15 **24 Claims**



1. A data communication apparatus comprising:

receiving means for receiving data from a transmitter station via a first communication line;

transmitting means for transmitting data to destination station via a second communication line;

a clock;

controlling means connected to said clock for controlling said transmitting means to transmit the data received by said receiving means, wherein said controlling means detects a receiving time at which said receiving means receives data in accordance with an output of said clock, and determines whether or not to cause said transmitting means to transmit the data received by said receiving means in dependence on the receiving time; and

time zone setting means for setting a time zone having a start time and an end time,

wherein when the receiving time is after the start time and before the end time so as to be within the time zone set by said time zone setting means, said control means causes said transmitting means to transmit the received data, and

when the receiving time is not within the time zone, said control means does not cause said transmitting means to transmit the received data in dependence on the receiving time.

5,594,868

PROCESSOR UNIT FOR A PARALLEL PROCESSOR SYSTEM DISCARDS A RECEIVED PACKET WHEN A RECEPTION BUFFER HAS INSUFFICIENT SPACE FOR STORING THE PACKET

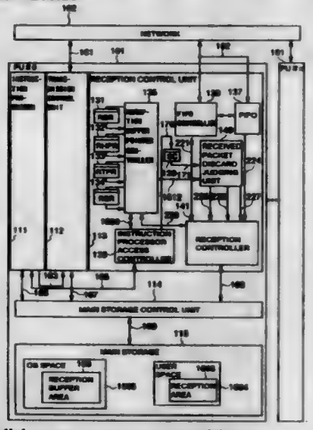
Junji Nakagoshi, Hadano; Tatsuo Higuchi, Fuchu; Shinichi Kato, Yokohama; Toshimitsu Ando, Isehara, and Masaaki Iwasaki, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1995, Ser. No. 407,853

Claims priority, application Japan, Mar. 24, 1994, 6-053406

Int. Cl.[6] G06F *13/14;15/16;15/163*

U.S. Cl. 395—200.16 **18 Claims**



1. A parallel processor system, comprising:

a plurality of processor units; and

a network for interconnecting said plurality of processor units and transferring packets of data therebetween,

each said processor unit comprising:

an instruction processor for executing an instruction;

a main storage for storing instructions and data;

a transmission unit responsive to an instruction of said instruction processor for reading data from said main storage and transmitting said packets to said network, each of said packets containing data and a packet header; and

a reception unit for receiving ones of said packets transmitted to said network and writing said received ones of said packets in a reception buffer formed in said main storage, and

said reception unit comprising:

a reception buffer controller for judging whether an area of said reception buffer has a space sufficient for storing said received ones of said packets; and

a packet discard circuit for discarding said data in said received ones of said packets without writing said data in said reception buffer, if said reception buffer controller judges that said reception buffer has an area of a size insufficient for storing said data in said received ones of said packets; wherein

said reception unit includes means for storing an instruction of whether a discard is performed or not, said instruction being capable of being externally set; and

said packet discard circuit includes a circuit for discarding said received ones of said packets if said means for storing said instruction of performing a discard.

5,594,869

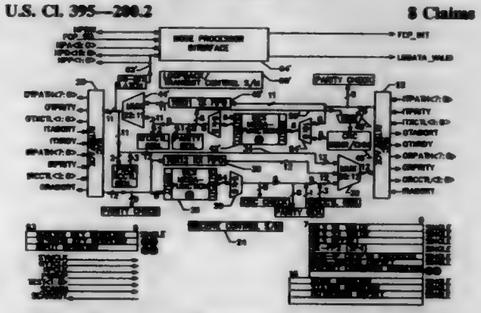
METHOD AND APPARATUS FOR END-TO-END ENCRYPTION OF A DATA PACKET IN A COMPUTER NETWORK

William R. Hawe, Pepperell; Butler W. Lampson, Cambridge, and Amar Gupta, Northboro, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 51,583, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 546,628, Jun. 29, 1990, abandoned. This application May 1, 1995, Ser. No. 432,331

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—200.2 **8 Claims**



2. A network interface, comprising:

a programmable register to store a protocol identifier corresponding to a particular protocol whose packets require decryption and a data offset value indicating the starting location of encrypted message data relative to a header in said packets;

means for comparing the stored protocol identifier with the contents of a field in the received packet to determine whether the received packet belongs to the particular protocol;

means for selecting data beginning at the indicated starting location in the received packet for decryption if the received packet belongs to the particular protocol; and

means for decrypting the selected data;

wherein the network interface further comprises:

said programmable register also stores an identifier offset value indicating the location of a protocol identifier value relative to said header; and

means for selecting the field at the indicated protocol identifier value location in the received packet and providing the selected field to the comparing means.

5,594,870

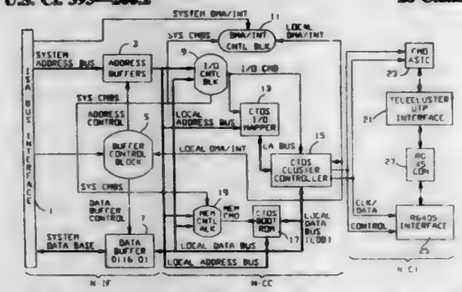
ADAPTER BETWEEN NON-CTOS HOST AND CTOS NETWORK

George W. Harris, Jr., Mountain View, and Sharl J. Nolan, San Jose, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 996,986, Dec. 23, 1992, Pat. No. 5,513,325. This application Apr. 25, 1996, Ser. No. 637,465

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.2 **28 Claims**



1. An arrangement for internetworking non-CTOS computer means with a network of CTOS terminals, this arrangement including:

non-CTOS computer means and associated system-bus means, CTOS-net bus means coupled and arranged to transfer signals to/from said system-bus means, plus associated communication control means and net-interface means coupled and adapted to transfer signals between said CTOS-net bus means and said communication controller means; and also associated network connections and coupled via a cluster-interface stage which is adapted to handle signals to/from said network connections;

said CTOS-net bus means being made to comprise ISA-bus means adapted to deliver address, data and control signals, plus associated interface logic means; wherein said communication controller means is coupled and adapted to transfer clock and data signals; and includes a CTOS cluster controller chip intercoupling said cluster-interface stage and said CTOS-net bus means;

wherein said interface means comprises address buffer means, data buffer means and intermediating buffer control means for controlling signal flow to and from both said address-buffer means and said data buffer means;

wherein said data buffer means is coupled to said CTOS cluster controller chip via CTOS boot ROM means which is made to include memory-control input means thereto; and

wherein said memory-control input means is inputted from both said buffer means and said buffer control means; and wherein said boot ROM is also coupled directly with both said buffer means,

accessed via CTOS server means which is arranged and adapted to transfer the CTOS operating system codes to said non-CTOS computer means.

5,594,871

DATA COMMUNICATION METHOD AND DATA COMMUNICATION SYSTEM USING DATA COMMUNICATION APPARATUS THEREIN

Yutaka Hiyama, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

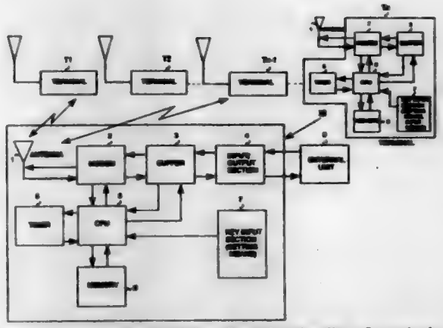
Continuation of Ser. No. 871,894, Apr. 21, 1992, abandoned. This application Nov. 21, 1994, Ser. No. 342,651

Claims priority, application Japan, Apr. 25, 1991, 3-122468

Int. Cl.[6] G06F *13/10;* **G05B** *23/02;* **G08C** *15/12*

U.S. Cl. 395—200.09 **14 Claims**

1. A data communication apparatus which performs data communications with a plurality of terminals, comprising:



reception means for receiving, from the plurality of terminals, a plurality of informations each indicating a time period when each of the plurality of terminals may be accessed;

storage means for storing the plurality of informations received by the reception means as communication periods of the plurality of terminals, respectively;

timer means for measuring a present time;

discrimination means for discriminating whether or not the present time is contained in each of the communication periods, stored in the storage means, of the plurality of terminals; and

communication means for executing the data communication with each of the plurality of terminals whose communication period is discriminated, by the discrimination means, to contain the present time.

5,594,872

METHOD OF COMMUNICATING MESSAGES IN A DISTRIBUTED PROCESSING SYSTEM

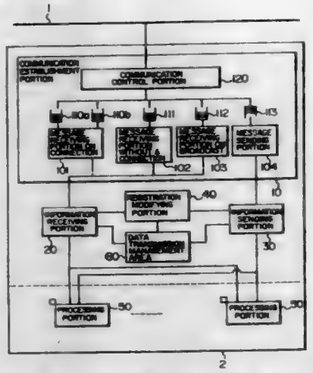
Shigeki Kawano, Yokosuka; Kinji Mori, Machida; Katsumi Kawano; Masayuki Orimo, both of Kawasaki, and Shigeki Hirasawa, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,743

Claims priority, application Japan, Apr. 27, 1993, 5-100600

Int. Cl.[6] H04L *12/28;29/06*

U.S. Cl. 395—200.15 **30 Claims**



1. A method for transmitting a message in an information processing system having plural processing units connected through a communication medium, said method comprising the steps of:

predetermining a data description corresponding to contents of information to be transmitted on the communication medium;

receiving the information to be transmitted on said communication medium from a processing portion of a first processing

unit included in said plural processing units and the predetermined data description corresponding to contents of said information;

determining a destination processing unit for receiving said information transmitted from said first processing unit, based on said data description; and

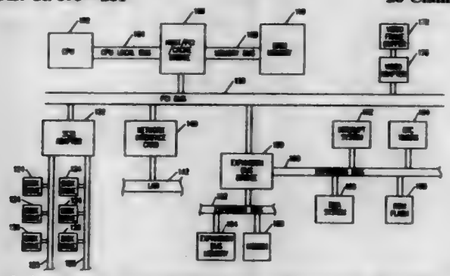
transmitting said information to said communication medium for said determined destination processing unit.

5,594,873

SYSTEM AND METHOD FOR IDENTIFYING EXPANSION DEVICES IN A COMPUTER SYSTEM

James E. Garrett, Round Rock, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Dec. 8, 1994, Ser. No. 353,847
Int. Cl.[6] H01J *13/00*
U.S. Cl. 395—281 **20 Claims**



1. A computer system having improved expansion device identification capabilities, comprising:

a CPU;

an expansion bus coupled to said CPU;

at least one expansion device coupled to said expansion bus including identification logic which generates an identification signal having a predetermined time duration, wherein said predetermined time duration identifies said expansion device; and

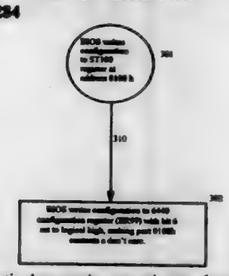
wherein said CPU receives said identification signal having said predetermined time duration and uses said identification signal to identify said expansion device.

5,594,874

AUTOMATIC BUS SETTING, SENSING AND SWITCHING INTERFACE UNIT

Puducode S. Narayanan, Sunnyvale; Tai T. Nguyen, San Ramon; Arunachalam Vaidyanathan, Fremont, and Edward C. Garcia, Milpitas, all of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 30, 1993, Ser. No. 130,090
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—284 **59 Claims**



1. An automatic bus setting, sensing and switching interface apparatus for configuring a first integrated circuit to interface with other integrated circuits via a selected one of a plurality of bus structures, the integrated circuit having a plurality of pins coupled to a bus, wherein there is no identity of a function and mode assigned for all the pins for any one of the bus structures relative to another bus structure, the apparatus comprising:

a. a sensor for detecting a logic level of a single bus signal representative of the selected one of the bus structures to be used, the sensor coupled to the first integrated circuit; and

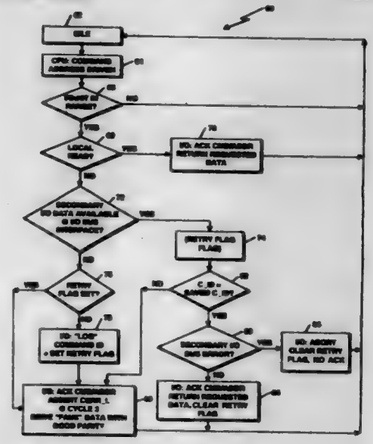
b. a logic structure coupled to the sensor and to the first integrated circuit for automatically configuring the first integrated circuit to communicate with the other integrated circuits according to the selected one of the bus structures wherein at least one of the pins has a different function and mode for one selection of bus structure than for another selection of bus structure.

5,594,875

METHOD AND APPARATUS TO PROVIDE PENDED TRANSACTION ON A NON-PENDED SYSTEM BUS

Kurt M. Thaller, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1994, Ser. No. 270,187
Int. Cl.[6] G06F *13/14;13/42*
U.S. Cl. 395—287 **14 Claims**



1. A data processing system comprising:

a plurality of nodes connected to a shared data path, one of said plurality of nodes being a commander node to initiate a transaction on said shared data path, and one of said plurality of nodes being a responder node;

means for asserting a signal by said responder node in a first plurality of predefined cycles;

means for providing, by said responder node, a response to said commander node indicating unavailability of said responder node wherein said response further comprises said means for asserting asserts said signal in a second, different plurality of predefined cycles and for providing an acknowledgement of said transaction over said shared data path; and

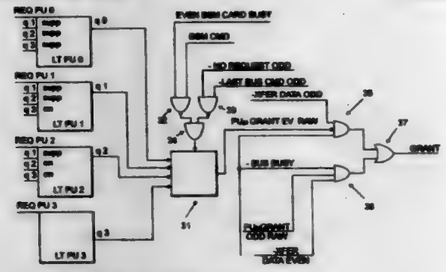
means, directly responsive to said response indicating that said responder node is unavailable to respond to said transaction, for retrying said transaction.

5,594,876

ARBITRATION PROTOCOL FOR A BIDIRECTIONAL BUS FOR HANDLING ACCESS REQUESTS TO A LOGICALLY DIVIDED MEMORY IN A MULTIPROCESSOR SYSTEM

Klaus J. Getzlaff, Schoenaich, and Udo Wille, Holzgerlingen, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 81,757, Jun. 23, 1993, abandoned. This application Jul. 27, 1995, Ser. No. 514,355
Claims priority, application European Pat. Off., Jun. 24, 1992, 92110650
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—293 **9 Claims**



1. A multiprocessor system comprising:

a plurality of processors;

storage means for storing information, said storage means being logically divided into a plurality of banks;

a bus interconnecting each of said processors for communication between said processors and interconnecting said processors and said storage means for transmitting said information from said processors to said storage means and from said storage means to said processors;

arbitration means for granting to said processors accesses to said bus in response to requests from said processors to access said banks, wherein a first one of said accesses to said bus is granted to a first one of said processors in response to a request from said first one of said processors to access a first one of said banks, and a second one of said accesses to said bus is granted to a second one of said processors in response to a request from said second one of said processors to access a second one of said banks, said second one of said accesses to said bus granted to said second one of said processors and said second one of said processors issuing an access command to said second one of said banks over said bus during a time when said first one of said banks is carrying out an access command from said first one of said processors;

wherein said processors each have a predetermined ranking and said banks each have a corresponding queue, and wherein said arbitration means comprises means for storing processor requests to access one of said banks in a queue corresponding to said one of said banks, said processor request to access one of said banks queued in a corresponding queue if one of the following conditions is fulfilled:

(a) a request of a higher ranking processor is already queued in said corresponding queue, or

(b) condition (a) is not fulfilled and a request from a lower ranking processor is not already queued in said corresponding queue; and

wherein said arbitration means grants an access to said bus to a processor whose request to access one of said banks is queued in one of said corresponding queues and

(A) there is no request from a higher ranking processor queued in said one of said corresponding queues, and

(B) one of the following conditions are fulfilled additionally:

(1) a last access to said bus was granted due to a processor request to access another one of said banks, or

(2) if (1) is not fulfilled, there is no request queued in another one of said corresponding queues, and

(C) one of the following conditions are fulfilled additionally:

(1) said one of said banks is not busy, or

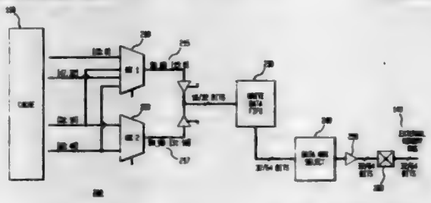
(2) if (1) is not fulfilled, said queued request is not a request to access the memory of said one of said banks and wherein if condition (2) is fulfilled, access to said bus is granted to allow said bus to be used for communication between said processors during a time when one of said banks is carrying out an access command from one of said processors.

5,594,877

SYSTEM FOR TRANSFERRING DATA ONTO BUSES HAVING DIFFERENT WIDTHS

Derek J. Lentz, Los Gatos, and Cheng-Long Tung, San Jose, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 853,604, Mar. 18, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 317,839
Int. Cl.[6] G06F *13/40*
U.S. Cl. 395—306 **3 Claims**



1. A system that provides access to a plurality of different width buses in a computer-based system, said system configured to efficiently transfer data between a memory and one or more bus requestors over a bus coupled to said computer-based system, said system comprising:

(a) means for determining the width of the bus currently coupled to the computer-based system;

(b) selecting means for transferring data between the bus requestor and temporary storage buffers wherein said selecting means comprises a plurality of multiplexers with an interface to said temporary storage buffers configured to select blocks of said data corresponding to said determined width;

(c) storage means for receiving and storing in said temporary storage buffers said selected blocks of data to be outputted in blocks corresponding to said determined width; and

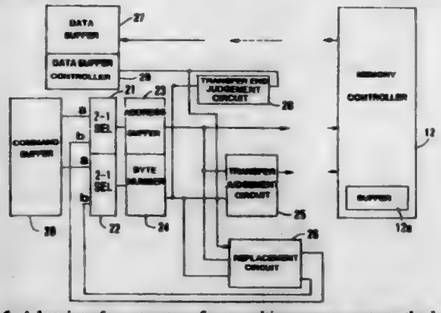
(d) a selection unit configured to select bytes of data from each said selected block of data that have been modified by the bus requestor for transfer to the memory, said selection unit includes a plurality of multiplexers each having only two data inputs, a first data input and a second data input, wherein said first data input is connected to a byte of data of said selected block of data originally read from the memory before modification by the bus requestor and said second data input is connected to a byte of data of said selected block of data modified by the bus requestor, said first data input is selected if said byte of data of said selected block of data has not been modified and said second data input is selected if said byte of data of said selected block of data has been modified.

5,594,878

BUS INTERFACE STRUCTURE AND SYSTEM FOR CONTROLLING THE BUS INTERFACE STRUCTURE

Yuji Shibata; Makoto Okazaki; Hisamitsu Tanihira, all of Kawasaki, and Katsuyuki Okada, Tokorozawa, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 84,985, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 629,726, Dec. 18, 1990, abandoned. This application Feb. 22, 1995, Ser. No. 392,604
Claims priority, application Japan, Dec. 18, 1989, 1-328040
Int. Cl.[6] G06F *13/28*
U.S. Cl. 395—309 5 Claims



1. A bus interface structure for a multiprocessor system, the bus interface structure comprising:

a bus interface having a first end connected to a system bus and a second end;

a local bus connected to said second end of said bus interface;

a common memory; and

a memory controller for controlling said common memory and being connected at one end thereof to said local bus and at another end thereof to said common memory to transfer data from an MPU of said multiprocessor system to said common memory, said memory controller including a buffer having a capacity for only one block transfer at a time, said memory controller reading out one-word data and block data from said common memory;

said bus interface comprising a burst disassembling control circuit for disassembling burst transfer data into one or a plurality of block data transfers and one or a plurality of one-word data transfers, wherein said first transfer data is disassembled to transfer the burst transfer data by using said buffer having a capacity for only one block transfer at a time, said disassembled burst transfer data being supplied to said memory controller, and said burst disassembling control circuit determining whether a block data transfer or a word data transfer is to be selected in accordance with a transmission starting address of said common memory and the number of words to be transferred.

5,594,879

METHOD OF AND APPARATUS FOR ARBITRARILY DISABLING UNDER PROCESSOR CONTROL INDIVIDUAL SLOTS ON A COMPUTER BUS

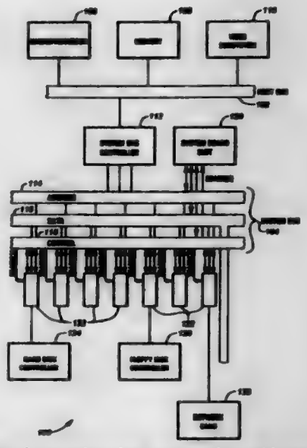
Brian V. Belmont, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 145,400, Oct. 29, 1993, abandoned.
This application Oct. 12, 1995, Ser. No. 541,225
Int. Cl.[6] G06F *13/40*
U.S. Cl. 395—309 15 Claims

1. A system for disabling devices, comprising:

an expansion bus having address, data, and control lines;

a processor coupled to said expansion bus, said processor executing instructions including memory and input/output operations:



a plurality of expansion slots connected to said expansion bus, each one of said expansion slots carrying a corresponding slot specific address enable signal of a plurality of slot specific address enable signals that when at an enabling value, enables a device installed in said one of said expansion slots, and when at a disabling value, disables the device installed in said one of said expansion slots, and wherein said plurality of expansion slots are for receiving devices implemented according to a standard in which all devices installed in said plurality of expansion slots are intended to be simultaneously enabled to respond or disabled from responding to a memory or input/output operation on the expansion bus and individually each device decodes the address of the memory or input/output operation and responds if the address is in a range selected for that device;

a mask register in the system with a plurality of inputs coupled to a portion of the data lines, said mask register storing the plurality of inputs responsive to a command executed by the processor, and said mask register providing as outputs a plurality of address enable mask signals corresponding to said stored plurality of inputs;

a source of a plurality of address enable signals, wherein said source provides the plurality of address enable signals in accordance with the standard such that all of the plurality of address enable signals are simultaneously provided at slot enabling or slot disabling values responsive to memory or input/output operations directed to the expansion bus such that expansion slots in a system implemented according to the standard are all intended to be simultaneously enabled or disabled; and

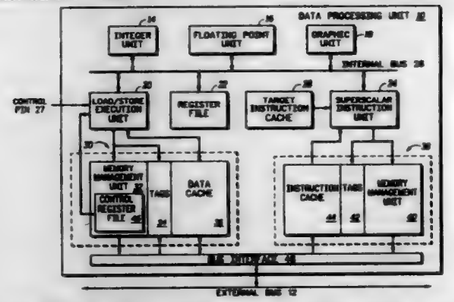
mask circuitry receiving said plurality of address enable signals and said plurality of address enable mask signals, said mask circuitry providing the plurality of slot specific address enable signals to the plurality of expansion slot, said mask circuitry providing each corresponding slot specific address enable signal at a device disabling value when a corresponding one of said plurality of address enable mask signals is at a first predetermined state, and said mask circuitry providing each corresponding slot specific address enable signal at a value responsive to a corresponding one of the plurality of address enable signals when said corresponding one of said plurality of address enable mask signals is at a second predetermined state.

5,594,880

SYSTEM FOR EXECUTING A PLURALITY OF TASKS WITHIN AN INSTRUCTION IN DIFFERENT ORDERS DEPENDING UPON A CONDITIONAL VALUE

William C. Meyer, Dripping Springs; James B. Gullette, and Kara B. Pepe, both of Austin, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 837,470, Feb. 14, 1992, abandoned.
This application May 17, 1994, Ser. No. 243,731
Int. Cl.[6] G06F *9/30*
U.S. Cl. 395—595 29 Claims



16. A method for determining an ordering of a plurality of tasks required to execute an instruction in a data processing unit, the method comprising the steps of:

representing the instruction by way of a plurality of bit field values, a first one of the plurality of bit field values having a predetermined fixed value, a second one of the plurality of bit field values having a user determinable control value;

selecting the user determinable control value for the second one of the plurality of bit field values;

providing the plurality of bits field values to the data processing unit;

if the control value has a first value, executing said plurality of tasks in a first order; and

if the control value has a second value, executing said plurality of tasks in a second order.

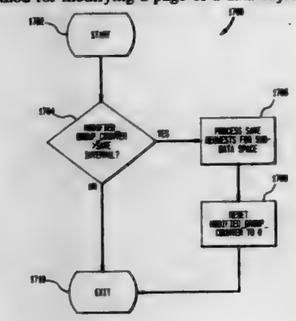
5,594,881

SYSTEM FOR UPDATING MODIFIED PAGES OF DATA OBJECT REPRESENTED IN CONCATENATED MULTIPLE VIRTUAL ADDRESS SPACES

Jean G. Fecteau, Toronto; Eugene Kligerman, and Lubor Kollar, both of North York, all of Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 975,245, Nov. 12, 1992, abandoned.
This application May 17, 1995, Ser. No. 443,397
Claims priority, application Canada, Dec. 11, 1991, 2055295
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—419 6 Claims

1. A method for modifying a page of a data object contained in



a database and stored in one or more database storage disks, wherein the database comprises one or more database data objects, wherein the database is accessed via a contiguous data space representation, the contiguous data space being represented by a plurality of concatenated sub-data spaces, wherein each sub-data space is a virtual data space of a maximum size that is addressable by a computer operating system, each sub-data space comprising a plurality of data segments, each data segment comprising a plurality of pages, wherein the pages in the contiguous data space representation are contiguous, each page comprising a known number of addressable storage locations, wherein the contiguous data space, the sub-data spaces, the data segments, and the pages are addressable by a database management system, wherein the address of a page to be modified has been determined to be placed in a sub-data space, the method comprising the steps of:

(1) mapping a data segment of the data object from a database storage disk to a data segment of the sub-data space, wherein said data segment from said database storage disk contains the page to be modified;

(2) creating a modified section bit map for the sub-data space, wherein said modified section bit map comprises a plurality of bits, each bit representing a group of pages of the sub-data space and indicating whether one or more pages in said group has been modified;

(3) indicating that the page to be modified has been modified, thereby creating a modified page, by setting a bit in said modified section bit map to a predetermined value, wherein said bit represents a group containing said modified page;

(4) generating a modified section count representing a number of bits in said modified section bit map that are equal to said predetermined value; and

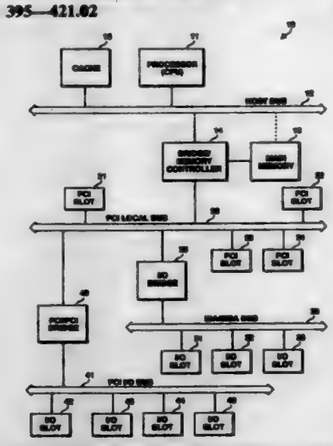
(5) issuing an asynchronous request to save one or more groups of pages of the sub-data space corresponding to bits in said modified section bit map that are equal to said predetermined value when said modified section count corresponds to a modified section threshold.

5,594,882

PCI SPLIT TRANSACTIONS UTILIZING DUAL ADDRESS CYCLE

D. Michael Bell, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 4, 1995, Ser. No. 368,332
Int. Cl.[6] G06F *12/00*
U.S. Cl. 395—421.02 11 Claims



1. A method for providing a split transaction on a bus having a set number of address bits in an address signal and in which said address signal is used to address a target unit, comprising the steps of:

providing additional address bits in addition to said set number of address bits, said additional address bits conveying identification information about an originating unit of a transaction signal comprising said address signal;

transmitting said address signal onto said bus, including said additional address bits conveying said identification information;

completing transfer of said transaction signal to said target if said target is capable of receiving said address signal including said additional address bits;

resending said address signal onto said bus without said additional address bits if said target is non-responsive to first transmission of said transmitting step above;

wherein identity of said originating unit is transferred with said transaction signal if said addressed target is acquired when said additional address bits are transmitted.

5,594,883

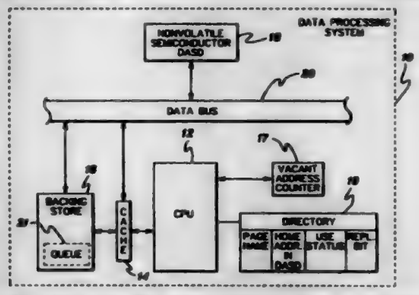
HIERARCHICAL DATA STORAGE SYSTEM EMPLOYING CONTEMPORANEOUS TRANSFER OF DESIGNATED DATA PAGES TO LONG WRITE AND SHORT READ CYCLE MEMORY

Wilbur D. Pricer, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 48,409, Apr. 14, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 556,671

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—440 **25 Claims**



1. In a data processing system having a first storage means, a long write cycle/short read cycle storage means, and a data bus coupled between said first storage means and said long write cycle/short read cycle storage means, said long write cycle/short read cycle storage means being operable in a read cycle and a write cycle, said write cycle being substantially longer than said read cycle, a control method for transfer of data pages from said first storage means to said long write cycle/short read cycle storage means, comprising the steps of:

(a) designating a first data page stored in said first storage means to be written to a home address in said long write cycle/short read cycle storage means;

(b) designating at least one additional data page stored in said first storage means to be written to home addresses said long write cycle/short read cycle storage means, each home address of each data page of said at least one additional data page being unique with respect to the home addresses of all previously designated data pages such that the writing of all designated data pages to said long write cycle/short read cycle storage means may be accomplished simultaneously; and

(c) upon occurrence of a time independent predetermined condition, contemporaneously transferring said first data page and said at least one additional data page from said first storage means to said long write cycle/short read cycle storage means via said data bus, and simultaneously writing said first data page and said at least one additional data pages into said long write cycle/short read cycle storage means at said home addresses.

5,594,884

CACHE MEMORY SYSTEM HAVING A PLURALITY OF PORTS

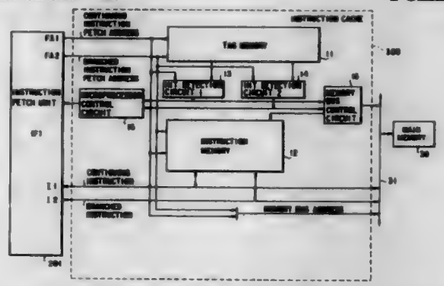
Tsukasa Matoba, Kawasaki, and Hiroyuki Satou, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1993, Ser. No. 170,766

Claims priority, application Japan, Dec. 22, 1992, 4-342125; Feb. 26, 1993, 5-038186

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—452 **2 Claims**



1. A cache memory system for storing part of a group of instructions executed by a CPU, comprising:

a plural-port type instruction cache memory having a first instruction readout port for sequentially reading out instructions which are successive in an address order to said CPU and a second instruction readout port for reading out a branched instruction designated by a branch address of a conditional branch instruction to said CPU;

an instruction fetch unit for accessing said instruction cache memory wherein an instruction succeeding said conditional branch instruction in an address order and the branched instruction of said conditional branch instruction are simultaneously read out from said instruction cache memory via said first and second instruction readout ports when said conditional branch instruction is fetched to said CPU;

a first hit detection circuit for detecting the presence in said instruction cache memory of the instruction succeeding said conditional branch instruction in an address order;

a second hit detection circuit for detecting the presence in said instruction cache memory of the branched instruction of said conditional branch instruction; and

a memory bus control circuit for preferentially refilling said instruction cache memory for said branched instruction when said first and second hit detection circuits have detected that neither said succeeding instruction nor said branched instruction is present in said instruction cache memory.

5,594,885

METHOD FOR OPERATING A CACHE MEMORY SYSTEM USING A RECYCLED REGISTER FOR IDENTIFYING A REUSE STATUS OF A CORRESPONDING CACHE ENTRY

Marvin Lautzenheiser, Springfield, Va., assignor to Zitel Corporation, Fremont, Calif.

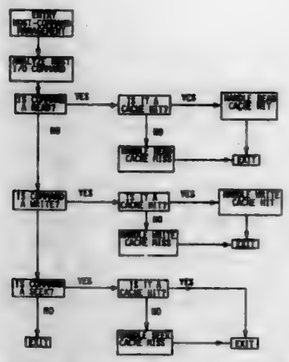
Continuation-in-part of Ser. No. 139,559, Oct. 20, 1993, Pat. No. 5,353,430, which is a continuation of Ser. No. 860,731, Feb. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 665,021, Mar. 5, 1991, abandoned. This application Jun. 7, 1994, Ser. No. 255,251

Int. Cl.[6] G06F *12/12*

U.S. Cl. 395—460 **16 Claims**

1. A method for operating a cache memory system having a mass storage device and a cache memory, said method comprising the steps of:

storing in said cache memory selected data from said mass storage device;



maintaining a Least Recently Used (LRU) table indicating the relative recency of use of each data entry stored in said cache memory;

updating a value in a recycle register for each entry in said LRU table upon the occurrence of one or more of:

when data stored in said cache memory associated with said LRU entry has been accessed;

when data associated with said LRU entry is added to said cache memory;

when said LRU table entry is rechained for reuse after a previous non-use; and

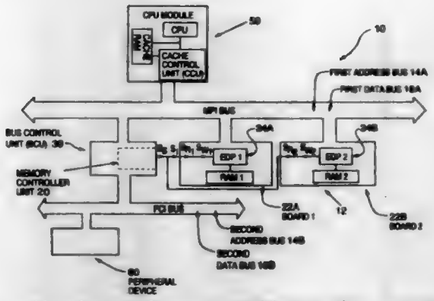
when said LRU table entry reaches the LRU position of said LRU table; and

when cache space is determined to be needed corresponding to an area of mass storage which is not currently assigned in said cache memory:

examining the entry at the LRU position of said LRU table to determine the value of said recycle register associated with said LRU table entry;

if said value is greater than a predefined threshold value, updating said value and placing said entry at the top of said LRU table and repeating said step of examining the entry at the LRU position of said LRU table to determine the value of said recycle register; and

if said value is not greater than said predefined threshold value, decaching said data in said cache memory associated with said LRU table entry, reusing said LRU entry for satisfying said current need for storing data not stored in said cache memory, and placing the new LRU entry at the MRU position of said LRU table or marking it dechained depending on the new usage of the entry.



said cache control means comprising a register means for storing binary values;

wherein the maximum number of memory locations is equal to 2^N where N is an integer greater than zero;

wherein the cache control means associates each memory location with a unique locating path, said locating path defined by one and only one node on each of N levels of nodes;

wherein for a first level of nodes, the cache control means associates each pair of memory locations with a first level node, said first level nodes being associated with a binary value which identifies each memory location of the pair of memory locations associated with each of the first level nodes, each first level node being associated with one of the bits in the register means for storing the binary value of the first level node;

wherein for each level of nodes to a (N-1)th level, the cache control means associates each pair of nodes on a level of nodes with a higher level node, each of said higher level nodes being associated with a binary value which identifies each node of the pair of nodes associated with each of the higher level nodes, each higher level node being associated with one of the bits in the register means for storing the binary value of the higher level node;

wherein after the cache control means retrieves a cache line of data from one of the memory locations, the cache control means sets the bits in the register means to identify the unique locating path of the memory location from which the cache line of data was retrieved; and

wherein when all of the memory locations have cache lines stored therein, the cache control means evicts a cache line of data stored in the memory location identified by a unique locating path passing through one node on each of the N levels of nodes such that the binary value associated with each node is opposite to the value of the bit in the register means corresponding to the one node on each of the N levels of nodes.

5,594,886

PSEUDO-LRU CACHE MEMORY REPLACEMENT METHOD AND APPARATUS UTILIZING NODES

Michael B. Smith, Mississauga, and Michael J. Tresidder, Scarborough, both of Canada, assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 376,152, Jan. 20, 1995, abandoned, which is a continuation-in-part of Ser. No. 362,409, Dec. 23, 1994, and Ser. No. 363,237, Oct. 23, 1994. This application May 31, 1995, Ser. No. 443,887

Int. Cl.[6] G06F *12/00;12/02;13/00*

U.S. Cl. 395—463 **19 Claims**

1. In a computer system having a first address bus and a first data bus, a cache device comprising:

cache memory means comprising a maximum number of memory locations, each memory location operable to store one cache line of data;

cache control means for controlling the storage of cache lines of data to the cache memory means from the first data bus and retrieval of cache lines of data from the cache memory means,

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5,594,887

MAIN MEMORY CONTROLLER RESPONSIVE TO SIGNALS INDICATIVE OF OWNED AND UNOWNED STATUS

Masataka Osaka, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 1, 1994, Ser. No. 332,759

Claims priority, application Japan, Nov. 4, 1993, 5-275725

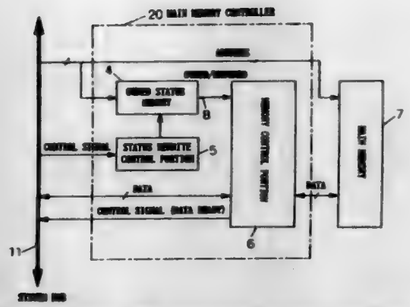
Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—471 **4 Claims**

1. A main memory controller comprising:

a status memory for storing owned and unowned statuses, in a main memory and a cache memory, of data associated with an access operation to a system bus connected to at least one CPU having a cache memory and performed by an access means of such CPU,

a memory control portion which is responsive to signals indicative of the stored statuses for reading the data in the main memory before a time for outputting a data invalidating signal from said cache memory elapses in the case of the owned



status, and for reading the data in the cache memory after said data invalidating signal is output in the case of the unowned status, and

a status rewrite control portion for monitoring accesses to the system bus and for rewriting the status in said status memory according to a result of the monitoring.

5,594,888

CIRCUIT FOR SPEEDING UP A READ OPERATION FROM A ROM, THE ROM SERVING TO STORE PROGRAM DATA CORRESPONDING TO EVEN-NUMBERED ADDRESSES, THE CIRCUIT INCLUDING AN ADDRESS GENERATOR FOR GENERATING AN INCREMENTED ADDRESS TO THE ROM

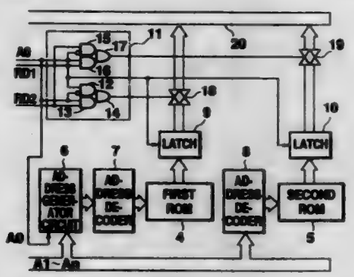
Susumu Yamada, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 27, 1994, Ser. No. 312,631

Claims priority, application Japan, Sep. 29, 1993, 5-243163

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—495 **3 Claims**



1. A read circuit for a ROM coupled to a data bus, the read circuit operable with a multibit address indicated by A0–An, the read circuit comprising:

a first ROM for storing program data corresponding to even-numbered addresses;

a second ROM for storing program data corresponding to odd-numbered addresses, so that when the first and the second ROMs are supplied with the same address the second ROM outputs program data which is subsequent to that of the first ROM;

an address generator for selectively adding 0 or +1 to an address indicated by A1–An in response to a least significant address bit A0 to generate a converted address AA1–AAn;

a first address decoder for decoding said address AA1–AAn to access said first ROM;

a second address decoder for decoding the address A1–An to access said second ROM;

a first latch for latching data read from said first ROM;

a second latch for latching data read from said second ROM;

a first gate for controlling transmission of data latched by said first latch;

a second gate for controlling transmission of data latched by said second latch;

a control circuit for generating a first control signal and a second control signal in a respective order for retrieving the program data stored in the first and second ROMs;and

a switching circuit, responsive to a number of bytes necessary to execute one instruction, said first control signal, and said second control signal, for generating a first switching signal which enables either said first gate only or said first and second gates in respective sequence when said least significant address bit A0 is equal to a first logic state, and for generating a second switching signal which enables either said second gate only or said first and second gates in reverse sequence when said least significant address bit A0 is equal to a second logic state.

5,594,889

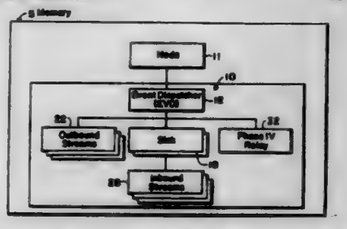
MEMORY RESOURCE ALLOCATION LOOK AHEAD SYSTEM AND METHOD

William K. Colgate, Kirkland, and Kelly C. Green, Woodinville, both of Wash., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 817,466, Jan. 3, 1992, abandoned. This application May 30, 1995, Ser. No. 451,836

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—497.02 **11 Claims**



1. A resource allocation system for memory comprising:

a first memory portion for storing data;

a second memory portion for temporarily storing pieces of the data from the first memory portion to be used in data processing operations by a processor; and

an event dispatcher means for transferring data from the first memory portion to the second memory portion in at least first and second steps, said event dispatcher means appending a size estimate of a second data piece to be transferred in the second step with a first data piece transferred from the first memory portion to the second memory portion of the first step,

the event dispatcher means also allocating memory in the second memory portion corresponding to the size estimate of the second data piece to be transferred in the second step.

5,594,890

EMULATION SYSTEM FOR EMULATING CPU CORE, CPU CORE WITH PROVISION FOR EMULATION AND ASIC HAVING THE CPU CORE

Shinichi Yamamura, Kobe; Keiichi Yoshioka, Sanda; Kazuhiko Hara, and Takao Katayama, both of Ikeda, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 23, 1994, Ser. No. 200,705

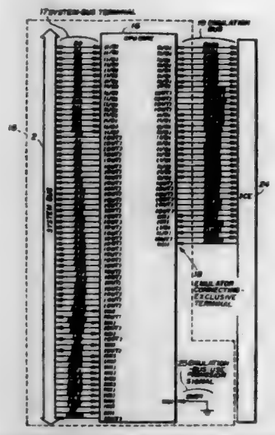
Claims priority, application Japan, Feb. 25, 1993, 5-036591

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—500 **34 Claims**

1. An emulation system comprising:

an integrated circuit (IC) provided with a central processing unit (CPU) core arbitrarily selected from a plurality of CPU cores,



each of said CPU cores having system-bus terminals, a system bus and a plurality of common emulator connecting-exclusive terminals, said IC being also connected to a predetermined device via said system bus associated with the selected CPU core;

an emulation bus connectable to said common emulator connecting-exclusive terminals of said selected CPU core; and

an emulator for performing emulation of said selected CPU core connected to said emulation bus when said selected CPU core is selectively in a monitor mode.

5,594,891

BUS CHECKING DEVICE AND BUS CHECKING METHOD

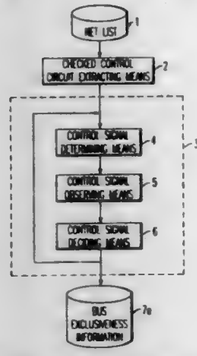
Yasushi Koseko, Nishinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1994, Ser. No. 328,514

Claims priority, application Japan, Oct. 28, 1993, 5-270497; Jul. 7, 1994, 6-155822

Int. Cl.[6] G06F *17/00; 17/50*

U.S. Cl. 395—500 **20 Claims**



1. A bus checking device for checking a bus including tri-state elements on the basis of information about a designed circuit for signal conflict or floating of said bus with control signals outputted from a bus control circuit for controlling said bus, comprising:

checked control circuit extracting means for extracting a control circuit portion which is concerned in determination of said control signals from said information about said designed circuit according to a predetermined rule; and

exclusiveness checking means for checking exclusiveness of said bus by checking exclusiveness of output signals of said control circuit portion extracted by said checked control circuit extracting means.

5,594,892

METHOD FOR AUTOMATED SOFTWARE APPLICATION TESTING

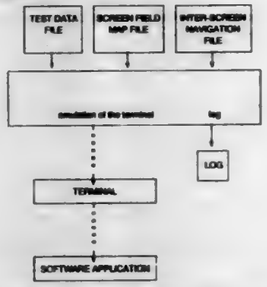
Francois Bonne, Bordeaux; Jean-Marie Grillet, Merignac; Guy Manuel, Pessac, and Paul Roush, Blanquefort, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1994, Ser. No. 336,358

Claims priority, application European Pat. Off., Dec. 22, 1993, 93480232

Int. Cl.[6] G06F *11/00; 11/28*

U.S. Cl. 395—500 **1 Claim**



1. A method for automatically testing a software application program by executing a plurality of test steps in a computer running the program and equipped with a displaying means for displaying information and a keying means for entering data into the computer, said computer also including;

a TEST DATA file containing data for testing the program,

a SCREEN FIELD MAP file containing a record for each screen specifying fields to be displayed, and

an INTER-SCREEN NAVIGATION file containing information defining the sequential relationships between the screens,

said method including the following steps:

collecting useful data for each of the test steps to be executed from the TEST DATA file and the SCREEN FIELD MAP file and storing the data in a STEP DATA work file;

for each of said test steps searching the INTER-SCREEN NAVIGATION file; for a Forward Path between an Objective Screen and an Entrance Screen, for an Ultimate Screen and for a Backwards Path between a Prior Screen and a Cross Screen; updating a Path work file setting the path for each of the test steps; and,

reading the PATH and STEP DATA work files in a predetermined sequence for emulating keying in by a user to the computer, for each of said test steps, the data stored in the STEP DATA work file to test the application program.

5,594,893

SYSTEM FOR MONITORING AND CONTROLLING OPERATION OF MULTIPLE PROCESSING UNITS

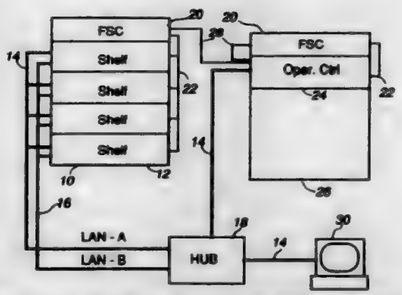
Russell F. Byers; Joseph M. G. Duchaine; Michael L. Schuett, all of Ottawa, Canada, and Cornelius J. Grootenboer, Bishop's Stortford, United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 1, 1994, Ser. No. 251,991

Int. Cl.[6] G06F *1/14*

U.S. Cl. 395—557 **16 Claims**

1. A controller unit for monitoring and controlling operation of a plurality of processing units, comprising:



means for determining status of the processing units which are physically separate from the controller unit and communicatively coupled thereto;

means, responsive to the determined status reflecting failure of a particular processing unit, for controlling through the communicative coupling the failed unit to initiate a shutdown procedure and for initiating a timer; and

means, responsive to the timer measuring a predetermined time interval, for resetting or powering off the failed unit.

5,594,894

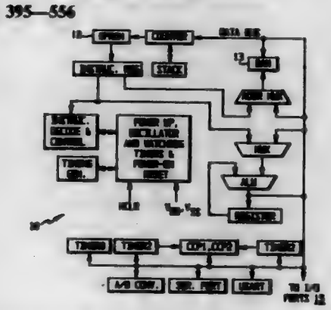
MICROCONTROLLER WITH PROGRAMMABLE POSTSCALER FOR PULSE WIDTH MODULATION INTERRUPT

Sumit K. Mitra, Tempe, Ariz., assignor to Microchip Technology Incorporated, Chandler, Ariz.

Filed Oct. 7, 1994, Ser. No. 319,985

Int. Cl.[6] G06F *1/14;9/06*

U.S. Cl. 395—556 **9 Claims**



1. A microcontroller device fabricated in a semiconductor integrated circuit (IC) chip for controlling an external system with which the device is to be installed in circuit, comprising:

a central processing unit (CPU),

a program memory coupled to the CPU for storing an instruction program to be implemented by the CPU,

a data memory coupled to the CPU for storing data including data representing parameters to be used by the CPU in controlling the external system, and

on-chip peripheral timing module means coupled to the CPU for establishing the timing and degree of control exercised over the external system by generating a repetitive event configured as a pulse waveform, said timing module means including

means for selectively setting the period of the pulse waveform to designate the frequency of occurrence of said repetitive event for timing said control,

means responsive to the selected setting of the period of the pulse waveform for selectively modulating the width of the pulse in each period of the pulse waveform for designating the duty cycle of the pulse waveform and, thereby the degree of said control, independently of the period of the pulse waveform, and

means further responsive to the selected setting of the pulse waveform period for generating periodic interrupts of the CPU, said interrupt generating means including means for selectively varying the frequency of the periodic interrupts of the CPU at any of a plurality of periods of the pulse waveform greater than two.

5,594,895

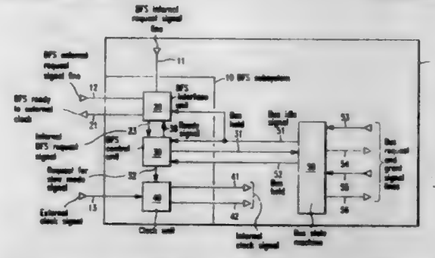
METHOD AND APPARATUS FOR SWITCHING BETWEEN CLOCK GENERATORS ONLY WHEN ACTIVITY ON A BUS CAN BE STOPPED

Jon H. Raymond, Underhill, and Sebastian T. Ventrone, Jericho, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 991,845, Dec. 15, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 430,120

Int. Cl.[6] G06F *1/08*

U.S. Cl. 395—556 **11 Claims**



6. A method for changing the frequency of an external clock signal from an external clock generator applied to a microprocessor circuit, said microprocessor receiving a stream of data and instructions, and in response to said instructions, operating on said dam, said microprocessor including a divide by one clock generator that receives said external clock signal and in response thereto generates an internal clock signal having the same frequency as said external clock signal but having modified characteristics, as compared to said external clock signal, and including a non-one divider type clock generator associated with said microprocessor that receives said external clock signal and in response thereto generates an internal clock signal having a fractional frequency of said external clock signal, said method comprising the stops of:

receiving a request signal indicating a request that the external clock signal frequency be allowed to change, and in response thereto monitoring said microprocessor to determining when a safe mode of operation of said microprocessor has occurred in which external bus activity can be stopped;

in response to the determination that said safe mode has occurred stopping said external bus activity, switching tho microprocessor from operation from said divide by one clock generator to operation from said non-one divider type generator, and then allowing said external bus activity to begin again; and

generating and providing a ready signal to the external clock generator responsive to operation from said non-one divider type clock generator indicating that the external clock signal frequency is allowed to change.

5,594,896

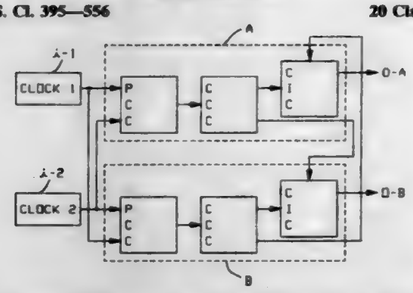
METHOD FOR SWITCHING BETWEEN A PLURALITY OF CLOCK SOURCES UPON DETECTION OF PHASE ALIGNMENT THEREOF AND DISABLING ALL OTHER CLOCK SOURCES

Robert H. Carlson, Laguna Niguel, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 339,426, Nov. 14, 1994, Pat. No. 5,467,466, which is a division of Ser. No. 737,303, Jul. 29, 1991, Pat. No. 5,381,542. This application Nov. 9, 1995, Ser. No. 556,247

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—556 **20 Claims**



1. A method for automatically, bilaterally switching between a first clock-generating unit and a second like, auxiliary clock-generating unit, upon detection of a prescribed switchover condition, this method comprising:

providing a pair of like first and second dynamic switchover circuits, each coupled to receive a respective clock output C-1, C-2 from said units and adapted to pass an associated version of the respective first or second clock output to common utilization means;

each said switchover circuit comprising, in combination; phase compere means and control means fed thereby

detecting said event with microprocessor means which responsively enables said compare means of the non-dominating clock unit to signal "in-phase" and responsively disable said dominating clock unit while simultaneously enabling and switching-over to the other clock unit.

5,594,897

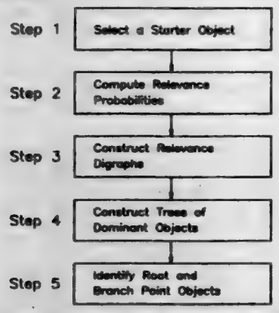
METHOD FOR RETRIEVING HIGH RELEVANCE, HIGH QUALITY OBJECTS FROM AN OVERALL SOURCE

William Goffman, Bratenahl, Ohio, assignor to GWG Associates, New York, N.Y.

Filed Sep. 1, 1993, Ser. No. 115,318

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—613 **13 Claims**



1. A method for selecting a core collection of objects from an overall source collection, wherein the objects have directed relations with each other and the numbers of directed relations of each object from the other objects of the source collection are given data, comprising the steps of:

(1) computing from said data a highest number of directed relations of an object with other objects of the source collection and selecting it as a starter object;

(2) computing frequencies of directed relations of all objects of the source collection from the starter object as measures of probabilities of relevance of the other objects with the starter object; and

(3) selecting a threshold relevance value, identifying all objects of the source collection having relevance probabilities with the starter object exceeding the threshold relevance value as a desired set of identified objects, and repeating steps (2) and (3) for each identified object until no new objects are identified,

whereby the set of identified objects are taken as a core collection of high-relevance objects selected from the overall source collection.

5,594,898

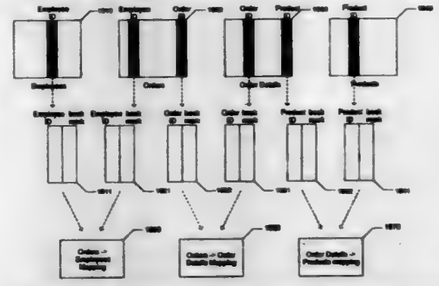
METHOD AND SYSTEM FOR JOINING DATABASE TABLES USING COMPACT ROW MAPPING STRUCTURES

Ketan Dalal, and Matthew Bellew, both of Seattle, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Mar. 25, 1994, Ser. No. 218,336

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—602 **12 Claims**



1. A method in a computer database system for joining matching rows of an arbitrary number of source tables, each of the source tables being comprised of rows and being adjacent to at least one other source table, each particular one of the source tables having a join column that corresponds to a join column of each of the at least one other source table to which the particular one of the source tables is adjacent, each of the source tables having an index for each of its join columns, the method comprising the steps of:

for each of one or more pairs of adjacent source tables, constructing a two-table row mapping structure that maps from each of a plurality of joined selected rows of one source table of the pair to a matching row of the other source table of the pair by accessing the indexes of the join columns and without accessing the source tables;

receiving a request to return references to the source table rows comprising a row of the join;

in response to receiving the request, selecting a starting source table;

selecting a row of the starting source table;

selecting one row in each of the source tables besides the starting source table that matches any other selected source table row using the two-table row mapping structure; and

returning references to the selected source table rows.

5,594,899

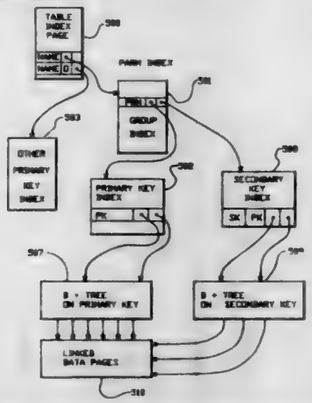
OPERATING SYSTEM AND DATA BASE HAVING AN ACCESS STRUCTURE FORMED BY A PLURALITY OF TABLES

Helge Knudsen, Oakville; Daniel T. Cheng, Woodbridge; John Yaffe, Mississauga; James E. Tougher, Mississauga; Michael Robertson, Mississauga, and Zbigniew Plazak, Etobicoke, all of Canada, assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 29,902, Mar. 11, 1993, abandoned, which is a division of Ser. No. 968,237, Oct. 29, 1992, abandoned, which is a continuation of Ser. No. 838,548, Jan. 31, 1992, abandoned, which is a continuation of Ser. No. 450,298, Dec. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 402,862, Sep. 1, 1989, abandoned. This application Dec. 1, 1994, Ser. No. 347,588

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **2 Claims**



1. A computer implemented object orientated relational database management system comprising:

a) a memory means for storing;

1) a plurality of data records;

2) a plurality of tables, each said table having a table name for identifying each said table;

3) a table index having an entry for each said table in said management system where each said entry for a table name including pointers to a location in said memory means of a primary key index and of a secondary key index and where said entries are ordered within said table index upon said table names;

4) at least one primary key index, each primary key index having an entry for at least one primary key where each said entry has a pointer to a location in said storage means of a data record identified by said table name and said primary key and where said entries are ordered within said row index upon said primary keys included in said primary key index;

5) at least one secondary key index having an entry for at least one combination of a primary key and a secondary key where each said entry has a pointer to a location in said storage means of a data record identified by said table name, said primary key and said secondary key where said entries are ordered within said secondary key index first upon said secondary keys and then upon said primary keys for each stationary key in said secondary key index;

b) access means for retrieving a data record identified by a table name, a primary key, and a secondary key, said access means comprising:

1) table search means for retrieving from said storage means said table index, for searching said entries in said retrieved table index for said requested table name and upon finding said entry retrieving said primary key index when no secondary key is identified in said data record and said secondary key index when a secondary key is identified in said record; and

2) first search means for searching said entries in said retrieved primary key index, when said primary index has been retrieved, for an entry for said primary key of said data record and upon finding said entry retrieving said data record from the location in said memory means pointed to in said found entry for said primary key; and

3) second search means for searching said entries in said retrieved secondary key index, when a secondary key index has been retrieved, for an entry having said primary key and said secondary key of said data recorded and upon finding said entry retrieving said data record from the location in said memory means pointed to in said found entry having said primary key and said secondary key.

5,594,900

SYSTEM AND METHOD FOR PROVIDING A BACKUP COPY OF A DATABASE

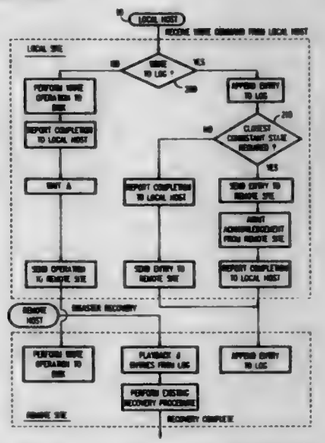
Oded Cohn, Haifa; Kenneth Nagin, Nazereth; Yoram Novick, and Alex Winokur, both of Haifa, all of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 158,103, Nov. 23, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 409,478

Claims priority, application United Kingdom, Dec. 2, 1992, 9225210

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—600 **6 Claims**



4. A data storage system connectable to and for use with a computer database system having database data stored in a portion of storage in the data storage system and a database log stored in a reserved portion of storage in the data storage system, the data storage system being in communication with a remote: data storage system having a copy of the database data and the database log stored in portions of storage in the remote data storage system, the data storage system comprising:

logic means for executing a write instruction in the data storage system received from the computer database system;

logic means for communicating the write instruction from the data storage system to the remote data storage system for execution in the remote data storage system;

logic means for determining from the write instruction whether the write is to a portion of storage in the data storage system reserved for a database log;

logic means for delaying the initiation of the communication to the remote data storage system of a write instruction to a portion of storage in the remote data storage system not reserved for the database log for a time at least equal to the upper limit on the data communication delay between the data storage system and the remote data storage system; and

logic means for executing the write instructions communicated to the remote data storage system against the copy of the database data stored in the remote data storage system, so that a consistent copy of the database data is recoverable from the copy of the database data and the copy of the database log stored in the remote data storage system after destruction of the data storage system.

5,594,901

CONTROL SYSTEM FOR PARALLEL EXECUTION OF JOB STEPS IN COMPUTER SYSTEM

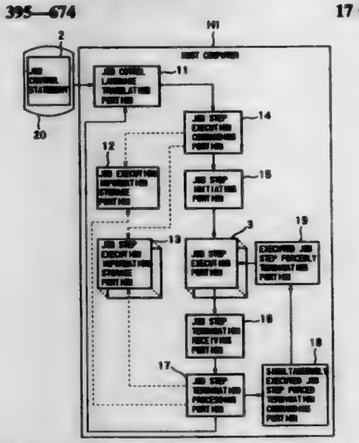
Mitsuru Andoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,687

Claims priority, application Japan, Dec. 28, 1992, 4-360617

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—674 **17 Claims**



9. A job step parallel execution control system for a job control language of a computer system including a plurality of host computers, comprising:

information storage means for storing information regarding a condition of a job and a plurality of job steps in execution;

job controlling means for describing a content of an execution control command of one of the job steps and execution order of the job steps by a job control language, the job control language including a job control statement having a job step execution command designating whether (1) the job step is to be executed by a specific host computer or by an arbitrarily selected host computer, and (2) whether said job is to be continued, said job is to be forcedly terminated or said job is to be terminated after termination of execution of a job step other than the one of the job steps in said job upon abnormal termination of the one of the job steps;

job control statement translating means for sequentially decoding said job control statement of a job to be executed;

job step execution commanding means for commanding execution of said job steps on the arbitrarily selected host computer designated by the execution command or on the host computer designated by said execution command upon detecting a job step execution command contained in said job control statement through decoding by said job control statement translating means;

job step executing means responsive to said job step execution command for initiating and executing a program designated by said job step execution command as an executed job step;

job step termination receiving means for receiving information indicative of a termination state of the one of the job steps upon termination of the one of the job steps which is executed;

termination processing means for making judgement for termination of the job step received by said job step termination receiving means and terminating said job according to the content of the job step execution command in said job control statement when the job step termination state is abnormal termination;

forced termination commanding means for commanding forced termination of the other of the job steps in execution when the job step execution command designates forced termination of the job; and

forced termination means for forcedly terminating the other of the job steps in execution when the job step execution command designates forced termination for the other of the job steps.

5,594,902

CUSTOM SERVICE CONTROL SYSTEM

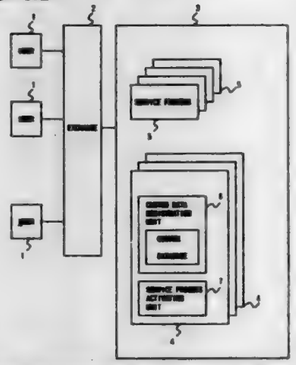
Takashi Nishigaya; Akira Hakata; Naoto Itoi; Toshihiro Ide, and Masahiro Hirayama, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 957,387, Oct. 7, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 286,910

Claims priority, application Japan, Oct. 9, 1991, 3-261682

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—672 **6 Claims**



1. A custom service control system connected to a communication system including a plurality of user terminals and an exchange, in which a request from a user terminal is execution of a service, said service being a basic process necessary to perform a service program registered in a service management process, and said service comprises program parts of an executed service program, said custom service control system comprising:

first memory means for storing service management processes respectively provided for the user terminals, wherein said service management processes can execute a process;

second memory means for storing a plurality of service processes respectively providing communication services, said service management processes comprising pieces of custom data showing service processes respectively usable by the user terminals; and

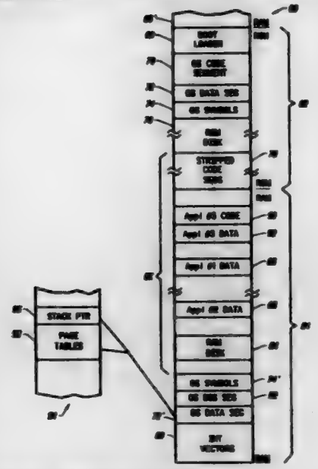
control means, coupled to said first and second memory means, for selecting the service processes in response to requests from the user terminals in accordance with the service management processes, such that when a service management process executes a service, the control means selects service processes necessary to execute the requested service and then executes the requested service.

5,594,903

OPERATING SYSTEM ARCHITECTURE WITH RESERVED MEMORY SPACE RESIDENT PROGRAM CODE IDENTIFIED IN FILE SYSTEM NAME SPACE

Mitchell Bunnell, Los Gatos, and Deepinder Sethi, San Jose, both of Calif., assignors to Lynx Real-Time Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 42,470, Apr. 5, 1993, abandoned, which is a continuation of Ser. No. 661,472, Feb. 26, 1991, abandoned. This application Dec. 7, 1993, Ser. No. 163,993
Int. Cl.[6] G06F *9/445*
U.S. Cl. 395—712 **16 Claims**



1. A computer architecture comprising:

a) a main memory providing for storage of programs and data accessible by address reference within a predefined memory space;

b) a processor capable of accessing said predefined memory space by address reference; and

c) a first program for controlling the operation of said processor upon execution by said processor, said execution of said first program providing for the reservation of a first portion of said predefined memory space for static storage of a second program, a second portion of said predefined memory space for execution of said second program by said processor, and a third portion of said predefined memory space, located within said second portion, for static storage of an executable code segment of said second program at a predefined address, said second program including an address reference to said executable code segment, said execution of said first program providing for said execution of said second program by execution of said executable code segment at said predefined address by said processor.

5,594,904

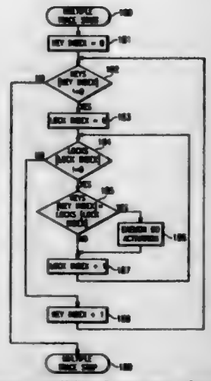
TRACING WITH KEYS AND LOCKS

Nils O. A. Lissermark, Tringsund, and Karl U. Carlsson, Skarpnack, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Division of Ser. No. 203,277, Feb. 28, 1994. This application Jun. 7, 1995, Ser. No. 479,807
Int. Cl.[6] H04M *1/24*; G06F *11/22*
U.S. Cl. 395—704 **22 Claims**

1. A method for efficiently tracing the execution of one or more software application programs running on a computer system having one or more processors, said efficient tracing method comprising the steps of:

creating a plurality of daemons, each of said daemons having a unique identity and comprising computer program instructions including a conditional statement for activating or deactivating said daemon if a lock value embodied in said daemon is found to match an associated key value;



implanting said plurality of daemons in one or more application programs to render the application programs traceable;

generating key values in response to trace commands received from one or more users of said traceable application programs;

storing said generated key values separately from said traceable application programs in the computer system;

activating or deactivating selected daemons to selectively trace the execution of said traceable application programs in response to the retrieval of a key value satisfying the conditional statements within each of said daemons;

generating trace information relating to the operation of said traceable application programs or the conditional occurrence of related events in response to the activation or deactivation of said daemons without interrupting execution of said traceable application programs; and

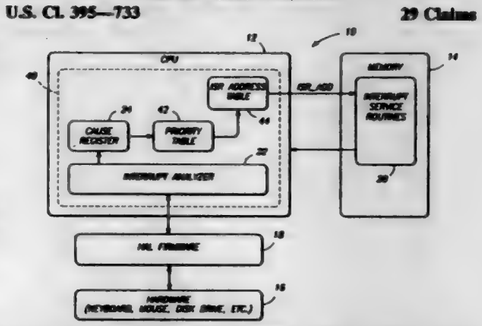
storing said generated trace information in the computer system.

5,594,905

EXCEPTION HANDLER AND METHOD FOR HANDLING INTERRUPTS

Amit Mital, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Apr. 12, 1995, Ser. No. 421,375
Int. Cl.[6] G06F *9/46*; *13/14*
U.S. Cl. 395—733 **29 Claims**



1. An exception handler for handling interrupts, the exception handler comprising:

a cause register to hold bits indicative of interrupt activity, individual cause register bits having a first binary value when an interrupt is active and a second binary value when an interrupt is non-active;

a priority table to store information pertaining to priorities for handling one or more active interrupts; and

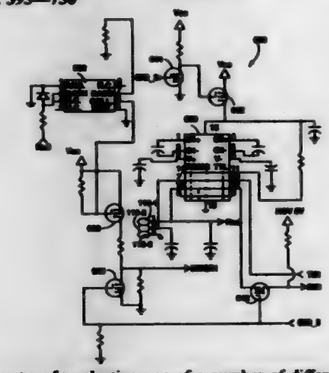
the cause register and priority table being correlated in a manner that the bits in the cause register form an indexing address to a location in the priority table that contains the priority information for one or more active interrupts.

5,594,906

ZERO POWER RECEIVE DETECTOR FOR SERIAL DATA INTERFACE

John S. Holmes, II, Indianapolis, and Joe E. Anderson, Greenwood, both of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Division of Ser. No. 979,634, Nov. 20, 1992, Pat. No. 5,371,687. This application Jul. 7, 1994, Ser. No. 271,436
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—750 **6 Claims**



1. A system for adapting one of a number of different types of instruments to a common protocol, each instrument having a first serial input-output (I/O) port, first means for controlling the serial I/O port, and second means for furnishing operating power to the instrument, the system including a different type of housing for each different type of instrument, each different type of housing including third means for coupling to a respective type of instrument's first serial I/O port, fourth means for coupling to a respective type of instrument's second means, a second serial I/O port, and a zero-power receive detector for the second serial I/O port, the zero-power receive detector including a receive data terminal, a received serial data out terminal and an operating power supply terminal, the detector comprising fifth means for furnishing operating power to the second serial I/O port, sixth means for switching power to the second serial I/O port, the sixth means coupled between the fifth means and the operating power supply terminal of the second serial I/O port, an optical isolator, seventh means for coupling a light source portion of the optical isolator to the receive data terminal, and eighth means for coupling a light activated switch portion of the optical isolator to the sixth means.

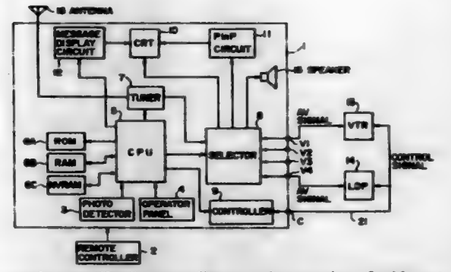
5,594,907

APPARATUS FOR LOCKING/UNLOCKING A NUMBER OF UNITS CONNECTED TO A MASTER UNIT

Shigeo Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 247,284, May 23, 1994, abandoned, which is a division of Ser. No. 133,838, Oct. 12, 1993, Pat. No. 5,402,183. This application Jul. 24, 1995, Ser. No. 506,225
Claims priority, application Japan, Oct. 13, 1992, 4-300387
Int. Cl.[6] G06F *1/32*
U.S. Cl. 395—750 **3 Claims**

1. A locking/unlocking apparatus included in a master apparatus comprising:



a main controller for controlling a main operation of said master apparatus including said locking/unlocking apparatus;

a sub controller for controlling a communication operation between said master apparatus including said locking/unlocking apparatus and other apparatus units including at least a designated upper-layer apparatus and a designated lower-layer apparatus;

a memory for storing any of a command and data necessary for said main controller, said sub controller, and a processing member of said other apparatus units to perform their processing;

a display for displaying data, an image, and a message including a control state; and

a selector for selecting a signal for connection to said display from among a plurality of input signals from said other apparatus units, said selector being controlled by said main controller;

said sub controller including means for performing processing comprising the steps of:

checking if a locking mode clear execution flag is set;

if said locking mode clear execution flag is set, proceeding to clear the locking mode execution flag;

if said locking mode clear execution flag is not set, causing a locking timer register to indicate that a predetermined unit of time as measured by said sub controller has elapsed and if a value of said locking timer register is greater than a predetermined total time value clearing the locking timer register and preparing for returning a locking mode flag to unlocking; and

when a system is ready to be unlocked again, clearing said locking mode flag.

5,594,908

COMPUTER SYSTEM HAVING A SERIAL KEYBOARD, A SERIAL DISPLAY, AND A DYNAMIC MEMORY WITH MEMORY REFRESH

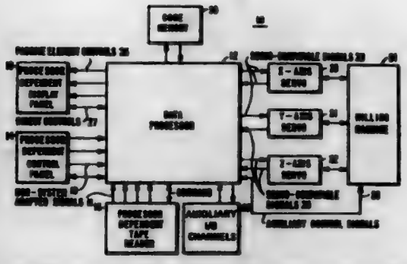
Gilbert P. Hyatt, 7841 Jennifer Cir., La Palma, Calif. 90623

Continuation of Ser. No. 457,451, Dec. 27, 1989, Pat. No. 5,537,565, which is a continuation of Ser. No. 289,115, Jan. 17, 1988, Pat. No. 4,942,516, which is a continuation-in-part of Ser. No. 879,293, Nov. 24, 1969, abandoned, Ser. No. 101,881, Dec. 28, 1970, abandoned, Ser. No. 860,253, Dec. 14, 1977, abandoned, Ser. No. 860,256, Dec. 14, 1977, Pat. No. 4,829,419, Ser. No. 402,520, Oct. 1, 1973, Pat. No. 4,825,364, and Ser. No. 223,959, Jan. 12, 1981, abandoned, said Ser. No. 457,451is a continuation of Ser. No. 343,112, Apr. 24, 1989, Pat. No. 4,896,260, which is a continuation of Ser. No. 402,520, Oct. 1, 1973, Pat. No. 4,825,364, which is a division of Ser. No. 101,881. This application Jan. 22, 1990, Ser. No. 468,430
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—800 **57 Claims**

1. A computer system comprising:

a plurality of operator switches generating switch signals;

a serial encoder coupled to the plurality of operator switches and generating a serial encoded signal having the switch signals encoded therein in response to the switch signals;



a serial interface circuit coupled to the serial encoder and generating a computer input signal in response to the serial encoded signal;

an integrated circuit read only memory storing computer instructions;

an integrated circuit dynamic MOS memory storing computer operands;

a dynamic memory address generator generating a first dynamic memory address and a second dynamic memory address;

a dynamic memory address multiplexer coupled to the dynamic memory address generator and generating a multiplexed dynamic memory address by multiplexing the first dynamic memory address and the second dynamic memory address;

a dynamic memory accessing circuit coupled to the integrated circuit dynamic MOS memory and to the dynamic memory address multiplexer and accessing computer operands stored by the integrated circuit dynamic MOS memory in response to the multiplexed dynamic memory address;

an integrated circuit processor coupled to the integrated circuit read only memory, to the dynamic memory accessing circuit, and to the serial interface circuit and executing the computer instructions stored by the integrated circuit read only memory to process the accessed computer operands in response to the computer input signal, the integrated circuit processor including an integrated circuit interrupt circuit that is coupled to receive an interrupt request signal, the integrated circuit interrupt circuit causing the integrated circuit processor to execute a program interrupt in response to a received interrupt request signal;

a refresh circuit coupled to the integrated circuit dynamic MOS memory and to the integrated circuit processor and refreshing the computer operands stored by the integrated circuit dynamic MOS memory;

a shift register coupled to the dynamic memory accessing circuit and generating a serial display refresh signal to refresh a display by shifting the accessed computer operands; and

the display coupled to the shift register and generating a refreshed display image in response to the serial display refresh signal.

5,594,909

FILE I/O CONTROL DEVICE WRITING BLOCKS TO FASTER DEVICE FIRST AND CANCELING EXCLUSIVE LOCK AS EACH BLOCK IS WRITTEN

Hiroyasu Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 6, 1992, Ser. No. 910,847

Claims priority, application Japan, Jul. 5, 1991, 3-190864

Int. Cl.[6] *G06F 13/00;13/38*

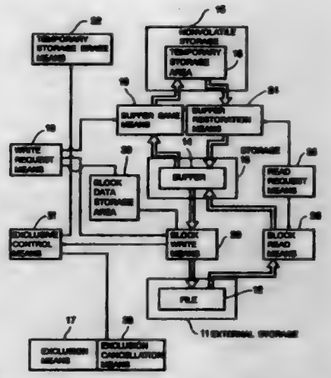
U.S. Cl. 395—872 8 Claims

1. A file input/output control device for a computer system comprising:

an external storage to store a file commonly accessed by a plurality of processing programs;

read means for reading a plurality of blocks in said file in said external storage block by block;

buffer means for storing the blocks read by said read means;



exclusion means for placing each of the blocks stored in said buffer means under exclusive control block by block;

block write means for writing each of the blocks stored in said buffer means to said external storage when a quiet point of one of said processing programs is established;

exclusion cancellation means for, each time said block write means finishes writing one of the blocks, canceling exclusive control for the one block;

temporary storage means for storing temporarily the blocks in said buffer means;

save means for saving the blocks to said temporary storage means before the block write means writes the blocks stored in said buffer means to said external storage;

buffer restoration means for writing each of said blocks stored in said temporary storage means into said buffer means in case of failure in writing each of said blocks into said external storage by said block write means;

wherein said external storage includes a plurality of storages with different processing speeds; and further comprising

block data storage means for storing data to indicate a one of the storages in said external storage from which the block was read; and

write request means for referring to said block data storage means and instructing said block write means to write the blocks starting from the blocks whose indicated one of the storages has the faster processing speed.

5,594,910

INTERACTIVE COMPUTER NETWORK AND METHOD OF OPERATION

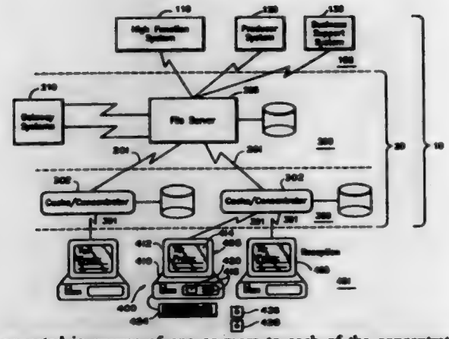
Robert Filepp, Springfield, N.J.; Michael L. Gordon, Dobbs Ferry, N.Y.; Alexander W. Bidwell, New York, N.Y.; Francis C. Young, Pearl River, N.Y.; Allan M. Wolf, Ridgefield, Conn.; Sam Moo, New York, N.Y.; Duane Tiemann, Ossining, N.Y.; Lawrence Abrahams, Hastings-on-Hudson, N.Y.; Michael J. Sillen, Croton-on-Hudson, N.Y.; Aldo R. Dukes, Oakland, N.J.; Florence M. Lee, Stamford, Conn., and Kenneth H. Appleman, White Plains, N.Y., assignors to IBM Corp., Armonk, N.Y.

Division of Ser. No. 388,156, Jul. 28, 1989, Pat. No. 5,347,632, which is a continuation-in-part of Ser. No. 328,798, Mar. 23, 1989, which is a continuation-in-part of Ser. No. 219,931, Jul. 15, 1988. This application Nov. 26, 1993, Ser. No. 158,026

Int. Cl.[6] *G06F 13/38*

U.S. Cl. 395—800 12 Claims

1. A method for operating a computer network so as to provide a multiplicity of users access to a multiplicity of applications, the applications each including data, the network having one or more host computers, a plurality of concentrator computers connected in groups of one or more to each of the host computers, and a plurality of reception system computers at which respective users may request applications, the reception system computers being



connected in groups of one or more to each of the concentrator computers, the method comprising the steps of:

a. establishing data stores at the host computers, the concentrator computers and the reception system computers;

b. distributing application data in accordance with a predetermined plan to data stores maintained, respectively, at the host computers, the concentrator computers and the reception system computers, the predetermined plan being implemented, at least in part, by ascribing a storage control attribute to the application data, the control attribute dictating eligibility of the application data for storage; wherein the predetermined plan for distributing application data includes providing the data at the respective data stores depending on the likelihood the application associated with the data will be requested, which at least in part depends upon the preferences of the user of the respective reception system computer; and

c. supplying application data to a respective reception system computer at which an application is requested so that the respective reception system computer can assemble the data which makes up the requested application by selectively collecting data from its own data store and the data stores of the respective host computer and concentrator computer to which it is connected, wherein the respective reception system determines if the requested application can be constituted from data stored at the respective reception system, and to the extent it is determined that required data is not stored at the respective reception system, requesting the required data from the network.

5,594,911

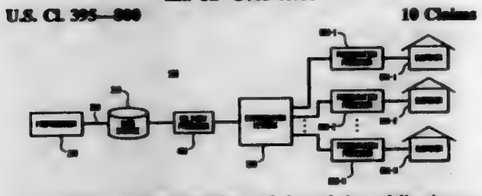
SYSTEM AND METHOD FOR PREPROCESSING AND DELIVERING MULTIMEDIA PRESENTATIONS

Gil C. Cruz, Annandale; Ralph D. Hill, Randolph; Thomas H. Judd, Madison; Darren H. New, Highland Park, and Jonathan Rosenberg, Annandale, all of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Jul. 13, 1994, Ser. No. 274,502

Int. Cl.[6] *G06F 15/00*

U.S. Cl. 395—800 10 Claims



1. A system for preprocessing and, in real time, delivering an interactive multimedia presentation to a customer, wherein said multimedia presentation includes presentation commands and associated multimedia objects and offers at least one interactive feature to the customer and wherein each presentation command has an associated presentation time, said system comprising:

a presentation processor for playing out objects of the presentation to the customer according to the presentation commands and the customer's selection of the interactive feature;

a distribution network having a bit rate;

a delivery processor, connected to said presentation processor via said distribution network, for delivering presentation commands and associated multimedia objects to said presentation processor, said delivery processor and said presentation processor having a round trip latency therebetween; and

a preprocessor including means for receiving as inputs an original multimedia presentation, including multimedia objects and presentation commands, and presentation technology parameters including said round trip latency between said delivery processor and said presentation processor and said bit rate of said distribution network, and means for generating, based upon said inputs, a preprocessed multimedia presentation including a delivery schedule which contains delivery commands to be executed by said delivery processor for delivering each presentation command and associated object to said presentation processor prior to the presentation time associated with the presentation command, wherein said preprocessor generates said delivery schedule such that upon the customer's selection of the interactive feature, presentation commands and associated objects to be executed in response to the customer's selection are available at said presentation processor to preclude delays and gaps in playing out the presentation to the customer.

5,594,912

DIGITAL SIGNAL PROCESSING DEVICE WITH OPTIMIZED ALU CIRCUIT AND LOGIC BLOCK FOR CONTROLLING ONE OF TWO REGISTERS BASED ON THE CONTENTS OF THE MULTIPLICATION REGISTER

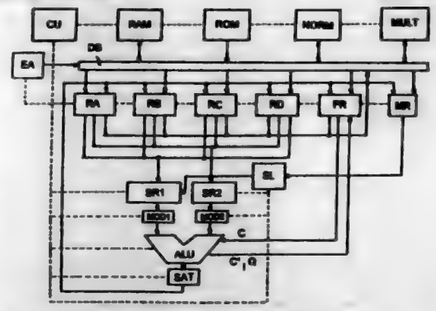
Dieter Brueckmann, Moerfelden-Walldorf, and Wilfried Preuss, Hockenkirchen-Siegerth, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 9, 1994, Ser. No. 287,766

Claims priority, application Germany, Aug. 9, 1993, 43 26 732.7

Int. Cl.[6] *G06F 7/00*

U.S. Cl. 395—800 18 Claims



1. A digital signal processing device, comprising:

at least one peripheral unit;

a data bus;

at least three data registers and a flag register exchanging binary-encoded data with said at least one peripheral unit through said data bus;

two shift registers each being loaded with contents of one of said data registers;

two modification units each being connected downstream of a respective one of said shift registers;

an arithmetic and logic unit connected to said modification units;

a multiplication register coupled to said data bus and output of said arithmetic and logic unit, said multiplication register to be written by said arithmetic and logic unit and by said at least one peripheral unit;

a logic block controlling shift operations of at least one of said two shift registers as a function of contents of said multiplication register; and

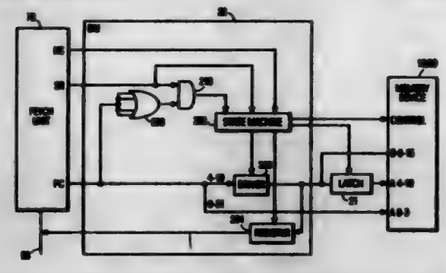
a programmable sequence control connected to said data registers, said at least one peripheral unit, said arithmetic and logic unit, said flag register, said shift registers, and said modification units for controlling data exchange between said data registers or said flag register and said at least one peripheral unit, and for controlling operations of the shift registers, the modification units and the arithmetic and logic unit.

5,594,913

HIGH SPEED MEMORY ACCESS SYSTEM FOR A MICROCONTROLLER WITH DIRECTLY DRIVEN LOW ORDER ADDRESS BITS

Farrell L. Ostler, Albuquerque, N.M.; Gregory K. Goodhue, and Ori K. Mizrahi-Shalom, both of San Jose, Calif., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Sep. 16, 1994, Ser. No. 308,060
Int. Cl.[6] G06F 12/00
U.S. Cl. 395—800 7 Claims



1. A bus interface unit of a microcontroller producing a fetch address for an address latch and a memory, connected to the latch, said unit comprising:

means for directly applying low order bits of the address to the memory;

means for applying high order bits of the address to the latch;

means for detecting whether current low order address bits are a sequential address of prior low order address bits of a prior fetch; and

enable means for providing a latch enable to signal to the latch responsive to the detecting means.

5,594,914

METHOD AND APPARATUS FOR ACCESSING MULTIPLE MEMORY DEVICES

Joseph A. Cosmas; Steve P. Marshall, both of Missouri City, and Lawrence R. Sinsac, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 598,372, Sep. 28, 1990, Pat. No. 5,390,304. This application Oct. 28, 1994, Ser. No. 326,677
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—800 16 Claims

1. A data processing system comprising:

a first data storage device having a first time for valid data and a plurality of addressable locations operative to hold first data;

a second data storage device having a second time for valid data which is different from said first time by at least one wait state and a plurality of addressable locations operative to hold second data;

a data processing device, connected to said first and said second data storage devices, having a peripheral port wherein said peripheral port includes a strobe generating circuit having first and second strobe outputs respectively connected to said first and second data storage devices, said strobe generating circuit having a means for modifying the operation of each of said strobe output signals in response to a command from said data processing device; and

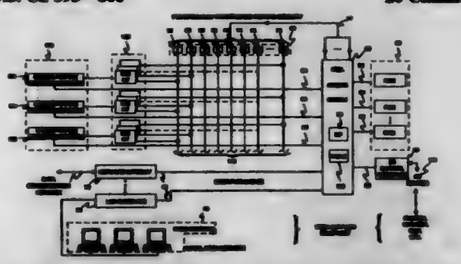
wherein said data processing device is operative to access data from a plurality of addressable locations in said first and second data storage devices in response to activation of one of said first and second strobe outputs and said first time is selected in response to said first strobe output and said second time is selected in response to said second strobe output.

5,594,915

MICROCELL COMPUTER SYSTEM AND METHOD USING CELL ACCESS SWITCH AND FUNCTIONALLY PARTITIONED MOVING MEMORY ARCHITECTURE

Martin M. Atalla, 18 Monte Vista Ave., Atherton, Calif. 94025

Continuation of Ser. No. 928,917, Aug. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 791,894, Nov. 13, 1991, abandoned. This application Nov. 16, 1994, Ser. No. 341,303
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—800 20 Claims



9. A computer system for operation from a plurality of user stations, the system comprising:

a plurality of computing units, each disposed to receive data and instructions for performing logical operations thereon;

a signal bus in communication with said computing units;

at least one memory module for storing at least one of data and instructions in a plurality of segregated arrays, the at least one memory module being disposed to sequentially and repetitively transmit on said signal bus the at least one of data and instructions from each of the plurality of segregated arrays of such memory module independently of requests therefor;

a bus interface associated with each of said plurality of computing units disposed between said computing units and said signal bus to receive the sequential and repetitive transmissions of the at least one of data and instructions from the at least one memory module for supplying to respective computing units portions of the at least one of data and instructions; and

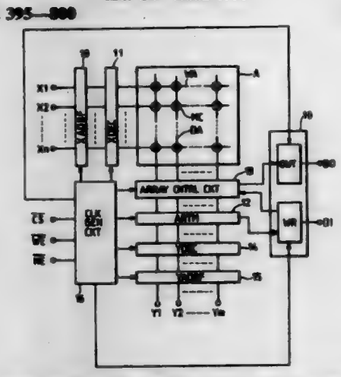
a cell access switch coupling selected ones of said plurality of user stations to selected ones of said plurality of computing units, wherein said cell access switch is operably disposed to create a communication path between said user stations and said computing units, said communication path carrying user data and instructions to said computing units directing said computing units to acquire data and instructions through said associated bus interface from said signal bus and further to return the results of logical operations on said data and instructions to said user stations, and wherein said cell access switch includes a plurality of signal ports at which the plurality of user stations and computing units are connected, and said cell access switch includes a processor coupled to the signal ports for controlling the coupling of the plurality of user station with the plurality of computing units in response to the computational requirements of the plurality of user stations.

5,594,916

NEURAL NETWORK PROCESSING SYSTEM USING SEMICONDUCTOR MEMORIES AND PROCESSING PAIRED DATA IN PARALLEL

Takao Watanabe, Itami; Katsutaka Kimura, Akishima; Kiyoo Itoh, Higashi-kurume, and Yoshiki Kawajiri, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 938,755, Sep. 1, 1992, Pat. No. 5,426,757, which is a continuation of Ser. No. 634,046, Dec. 26, 1990, Pat. No. 5,165,009. This application Jan. 4, 1995, Ser. No. 369,163
Claims priority, application Japan, Jan. 24, 1990, 2-12538; May 11, 1990, 2-119828
Int. Cl.[6] G06F 9/00
U.S. Cl. 395—800 3 Claims



1. A data processing system constructed on a semiconductor chip, the data processing system comprising:

a memory having a plurality of data lines, a plurality of word lines arranged to intersect with said plurality of data lines and a plurality of memory cells each formed at an intersection of a one of said plurality of data lines and a one of said plurality of word lines;

a word line selector for selectively selecting a one of said word lines; and,

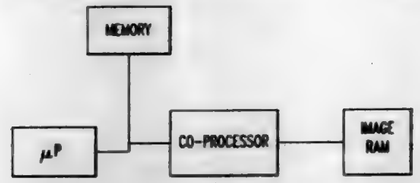
a plurality of processing circuits associated with said plurality of data lines for collectively executing a parallel processing on a pair of data items wherein said pair are sequentially output on a one of said plurality of data lines, said pair comprising a first data item and a second data item with the first data item being different from the second data item, each of said plurality of processing circuits including a register for storing first data comprising the first data item which is output through said one of said plurality of data lines to a corresponding one of said plurality of processing circuits from a first memory cell connected with the selected one of said plurality of word lines, and wherein each of said plurality of processing circuits includes means for executing an arithmetic processing according to the stored first data in the register simultaneously with an output of second data corresponding to the second data item on said one of said plurality of data lines corresponding to said one of said plurality of processing circuits from a second memory cell connected with a selected second word line of said plurality of word lines.

5,594,917

HIGH SPEED PROGRAMMABLE LOGIC CONTROLLER

Robert J. Palermo; Alan D. McNutt, and Daniel F. Moon, all of Johnson City, Tenn., assignors to Siemens Energy & Automation, Inc.

Continuation of Ser. No. 963,145, Oct. 19, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 410,418
Int. Cl.[6] G06F 9/38
U.S. Cl. 395—800 12 Claims



1. A high speed programmable logic controller, comprising:

memory means for storing instructions;

image register memory means for storing data;

first processor means for processing ones of said instructions;

boolean processor means for processing others of said instructions, said boolean processor means inquiring and and fetching instructions separately from said first processor means, said boolean processor means executing predetermined boolean instructions; and,

an instruction bus and data bus interconnecting said first processor means, said memory means, said boolean processor means and said image register memory means;

said boolean processor means comprising

an instruction queue;

a pre-fetch unit for fetching said others of said instructions from said instruction memory means and for a) executing a first set of said others of instructions and b) loading a second set of said others of said instructions in said instruction queue; and

an execution unit for executing said second set of said others of said instructions stored in said instruction queue.

5,594,918

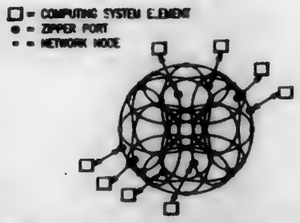
PARALLEL COMPUTER SYSTEM PROVIDING MULTI-PORTED INTELLIGENT MEMORY

Billy J. Knowles, Kingston; Clive A. Collins, Poughkeepsie; Christine M. Dennoyer, Pine Bush; Donald G. Grice, Kingston, and David B. Rolfe, West Hurley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 906,175, Dec. 4, 1992, abandoned, and a continuation-in-part of Ser. No. 888,684, May 22, 1992, abandoned, and a continuation-in-part of Ser. No. 887,630, May 22, 1992, and a continuation-in-part of Ser. No. 887,258, May 22, 1992, abandoned, and a continuation-in-part of Ser. No. 887,259, May 22, 1992, abandoned, and a continuation-in-part of Ser. No. 887,508, May 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 698,866, May 13, 1991, Pat. No. 5,313,645. This application Mar. 28, 1995, Ser. No. 412,354
Int. Cl.[6] G06F 13/28; 13/376
U.S. Cl. 395—800 16 Claims

1. A computing system device, comprising:

a plurality of functional units each having a ALU and a memory connected to said ALU and a communication interface,



a plurality of nodes interconnected in a network of nodes, each node including at least one of said plurality of functional units, to which a variety of computer system elements including computers and direct access storage devices are coupled, wherein the memory of said plurality of functional units provides a multi-ported intelligent shared memory switch for switch coupling said variety of computer system elements, at least one of said plurality of nodes being adjacent to a zipper, whereby said plurality of functional units in aggregate provide a finite computer memory and a processing unit which combines characteristics of a switch with characteristics of a shared memory and processor,

wherein objects in the shared memory change state without intervention of any of said variety of computer system elements that are coupled to said plurality of funtional units,

wherein each of said plurality of nodes of the multi-ported intelligent shared memory switch include a functional unit on a chip along with a switching means as a hedgehog processor memory element, and

wherein the hedgehog processor memory element resolves contention and coherency issues that arise for said variety of computing system elements which share the hedgehog processor memory element in a communication network.

5,594,919

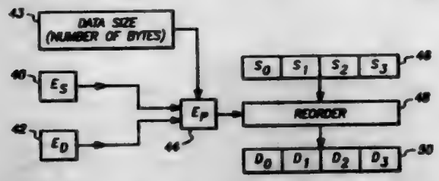
METHOD AND SYSTEM FOR REORDERING BYTES IN A DATA STREAM

Kenneth E. Turkowski, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 58,429, May 7, 1993, Pat. No. 5,524,256. This application Jun. 2, 1995, Ser. No. 458,496

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—800 **10 Claims**



6. A computer system for translating a source sequence of n ordered data units into a desired destination sequence having a different ordering, the computer system comprising:

means for using machine-specific data unit packing parameters to generate a source sequence signal, E_S, which identifies the ordering of units within the source sequence;

means for using machine-specific data unit packing parameters to generate a destination sequence signal, E_D, which identifies the ordering of units within the destination sequence;

means for combining the source sequence signal and destination sequence signal to produce a permutation signal, E_P defined by the formula: $E_P=(E_S \text{ XOR } E_D)\text{AND}(n-1)$ where n is greater than two; and

means for reordering the units from the source sequence in response to the permutation signal to produce a translated destination sequence of data units.

5,594,920

POINT-OF-SALE TERMINAL AND PRINTING APPARATUS THEREFOR

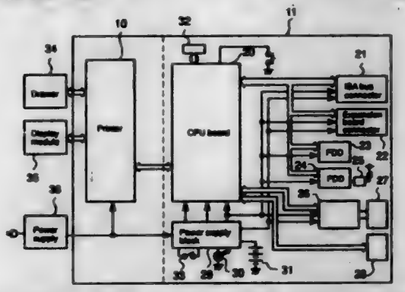
Kouichi Ebina; Ikuo Ito, and Kazuaki Kasai, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 23, 1994, Ser. No. 344,242

Claims priority, application Japan, Nov. 24, 1993, 5-293556

Int. Cl.[6] G07G *1/12; G06F 15/00; 13/00*

U.S. Cl. 395—224 **17 Claims**



5. A printing apparatus for a point-of-sale terminal, comprising:

first connection means for exchanging first data including at least one of printing data and control data with a first external device;

second connection means for exchanging second data including at least one of printing data and control data with a second external device;

verifying means for detecting if said second connection means is electrically connected to said second external device; and

data processing means for selectively processing said second data if said verifying means detects that said second connection means is electrically connected to said second external device, and for selectively processing said first data if said verifying means detects that said second connection means is not electrically connected to said second external device, wherein said printing apparatus is detachably mounted to said second external device.

5,594,921

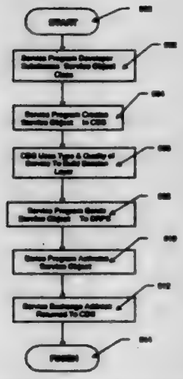
AUTHENTICATION OF USERS WITH DYNAMICALLY CONFIGURABLE PROTOCOL STACK

Christopher E. Pettus, San Francisco, Calif., assignor to Object Technology Licensing Corp., Cupertino, Calif.

Filed Dec. 17, 1993, Ser. No. 169,346

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—831 **4 Claims**



1. A multi-node computer system for connecting a client node to a server node over a network, the network operating according to a predefined network protocol defined by a plurality of layers including a session layer, the computer network system comprising:

(a) first storage apparatus located in the server node;

(b) a service program located in the first storage apparatus of the server node for offering a service to the client node;

(c) second storage apparatus located in the client node;

(d) communications directory service programs located in the client node and in the server node, each of the communications directory service programs having means for storing a service object for each service available on the network, each service object including a stack definition that defines layers of the network protocol needed to communicate with each corresponding service;

(e) first apparatus located in the client node for retrieving a stored service object from the communications directory service program in the client node and for dynamically configuring a protocol stack based on the stack definition included with the service object, the protocol stack having program code means for communicating on the network in accordance with the predefined network protocol, the protocol stack further having client authentication means for collecting information about a user and authenticating the user with the service, the first apparatus further including means for returning an access point to a client application executing on the client node, the access point referencing a portion of the protocol stack corresponding to the session layer; and

(g) second apparatus located in the client node for invoking the client authentication means in response to a protocol stack activation request by a user, wherein a client application first activates the protocol stack and then accesses the protocol stack at the access point to communicate with the service program.

5,594,922

SYSTEM FOR MONITORING A LIBRARY UNIT SHARED AS INPUT/OUTPUT WITH HIGHER LEVEL UNIT WHEREIN ABNORMAL OCCUPATION OF LIBRARY BY A HIGHER LEVEL UNIT IS RESET

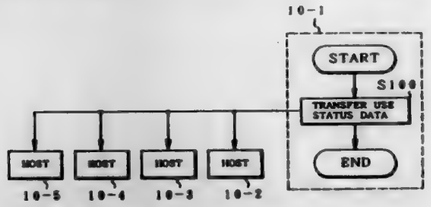
Yoshio Suzuki, Kawasaki, and Naoyuki Takeda, Kato-gun, both of Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 6, 1994, Ser. No. 301,128

Claims priority, application Japan, Dec. 13, 1993, 5-311447

Int. Cl.[6] G06F *13/10*

U.S. Cl. 395—837 **15 Claims**



1. A data processing system which comprises:

a plurality of higher-level units;

a library unit provided under said plurality of higher-level units and shared as an input/output unit by said plurality of higher-level units;

a lower-level interface which provides an interface control section for each of said plurality of higher-level units and said library unit, and exchanges information and data by connecting said individual interface control sections by means of an interface bus:

higher-level communication units which connect said plurality of higher-level units and exchange information regarding a status of use of said library unit; and

monitoring control sections provided for each of said plurality of higher-level units, wherein said monitoring control sections instruct said lower-level interface to perform necessary processing in response to said status of use of said library unit acquired by a use of said higher-level communication units and, upon recognition of an abnormal occupation of said library unit by any other higher-level units, instructs said lower level interface to reset said occupation.

5,594,923

DIRECT MEMORY ACCESS CONTROLLER COMPRISING A MULTI-WORD DATA REGISTER FOR HIGH SPEED CONTINUOUS DATA TRANSFER

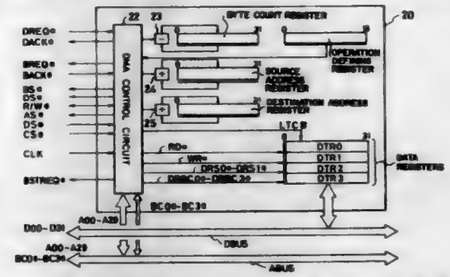
Satoshi Inoue, and Takashi Miyamori, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 994,710, Dec. 22, 1992, abandoned. This application Nov. 1, 1995, Ser. No. 551,700

Claims priority, application Japan, Dec. 24, 1991, 3-341222

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—842 **8 Claims**



1. A data transfer apparatus for transferring data of at least one word using a DMA (direct memory access) transfer between external devices, comprising:

a data bus;

a DMA controller to control direct memory access using said data bus;

a DMA control circuit for controlling a data transfer between said devices after having acquired a bus utility right from a processor;

a plurality of data registers, in said DMA controller, for storing multi-word data to be transferred to one of said devices based on instructions from said DMA control circuit;

an operation defining register for storing the source device type among said devices, the destination device type among said devices, and the transfer unit used to transfer multi-word data;

a source address register for storing the address of a source device;

a destination address register for storing the address of a destination device;

a byte count register for storing the number of transferred bytes in a DMA transfer;

a subtracter to decrease the value in said byte count register for every DMA transfer according to the control by said DMA control circuit; and

at least two adders to increase the values in said source address register and said destination address register for every DMA transfer according to the control by said DMA control circuit.

5,594,924

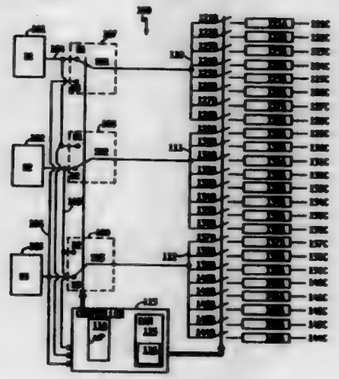
MULTIPLE USER MULTIMEDIA DATA SERVER WITH SWITCH TO LOAD TIME INTERVAL INTERLEAVED DATA TO PLURALITY OF TIME INTERVAL ASSIGNED BUFFERS

Hal H. Ottesen; Gordon J. Smith, and George W. Van Leeuwen, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 288,525, Aug. 10, 1994, which is a continuation-in-part of Ser. No. 184,417, Jan. 21, 1994. This application May 18, 1995, Ser. No. 443,838

Int. Cl.[6] G06F 9/312

U.S. Cl. 395—851 6 Claims



1. A multimedia data server, comprising:

a plurality of data buffers, each of said buffers corresponding to a respective time interval associated with a multimedia presentation, each buffer having a respective output port for outputting multimedia data stored in said buffer;

at least one mass storage device for storing a multimedia data presentation, wherein multimedia data stored on said mass storage device comprises a plurality of sequentially stored data segments, each data segment being associated with one of said time intervals,

wherein a plurality of data segments is associated with each said time interval, and wherein successive sequentially stored-data segments on said at least one mass storage device are associated with different ones of said time intervals, the data segments associated with a particular one of said plurality of time intervals being interleaved among data segments associated with other time intervals;

at least one data bus connected to said at least one mass storage device for communicating multimedia data from said at least one mass storage device to said buffers;

a plurality of switches connecting said data bus with said plurality of data buffers, each switch being associated with a respective one of said data buffers; and

a controller for operating said plurality of switches, said controller causing a switch associated with a selected data buffer to close when said at least one mass storage device outputs a data segment on said data bus associated with said a time interval corresponding to the selected data buffer.

5,594,925

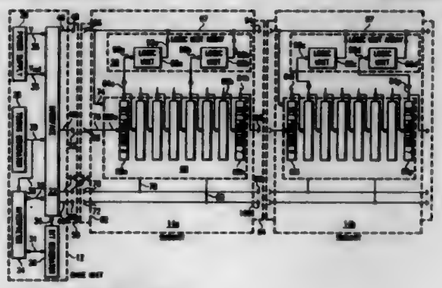
METHOD AND APPARATUS DETERMINING ORDER AND IDENTITY OF SUBUNITS BY INPUTTING BIT SIGNALS DURING FIRST CLOCK PERIOD AND READING CONFIGURATION SIGNALS DURING SECOND CLOCK PERIOD

Stanley D. Harder, Garland, Tex.; Richard A. Houghton, Cocoa Beach, Fla., and Richard H. Wallace, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 5, 1993, Ser. No. 755

Int. Cl.[6] H01J 3/00

U.S. Cl. 395—863 12 Claims



1. A unit train comprising:

a base unit comprising

a bit generator for generating a bit pulse,

a clock for generating a clock signal having first and second clock periods,

a bit signal line and a single clock/data line, and

an interpreter circuit coupled to the bit generator and the clock and responsive to couple the bit generator to output a ONE bit pulse on the bit signal line, and afterward responsive during the first clock period to couple the clock signal as output to the clock/data line only during the first clock period, and during the second period to couple itself to the clock/data line for input only of a subunit configuration data signal; and

a plurality of subunits responsive to the bit generator and clock for generating the subunit configuration data signal, each subunit comprising

a shift register having N bit positions, coupled in parallel to the clock and in series to the bit signal line, and

a logic unit coupled for input to the shift register at preselected bit positions identifying the particular subunit and coupled in parallel for outputting a ZERO on the clock/data line during the second clock period whenever there is a ONE in any of the preselected bit positions of the shift register.

5,594,926

HARD DISK ACCELERATING SYSTEM FOR COMPUTER

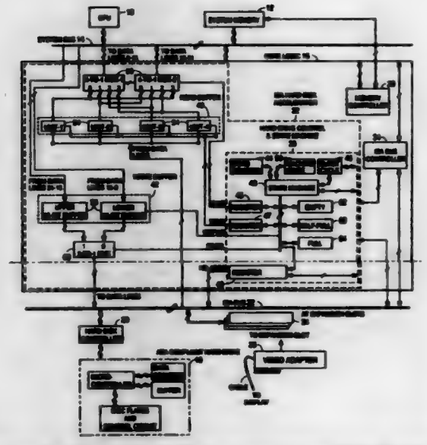
Ying-Feng Chang, and Jiuei-Sheng Shen, both of San Jose, Calif., assignors to EFAR Microsystems, Inc., Santa Clara, Calif.

Filed Jul. 19, 1993, Ser. No. 93,373

Int. Cl.[6] G06F 13/00

U.S. Cl. 395—872 21 Claims

1. A hard disk accelerating system for a computer that contains a hard disk drive, a system memory, and a central processing unit ("CPU") for generating input-output ("IO") read/memory write cycles to transfer data from the hard drive to the system memory and for generating memory read/IO write cycles to transfer data from the system memory to the hard drive, the hard drive being divided into sectors and having a hard-drive data register, the CPU and system memory being coupled to a first bus, the hard drive being coupled to a second bus that operates at a lower clock rate than the first bus, the accelerating system comprising the following



elements for decomposing disk access operation for each of read and write into at least two tasks which can be executed concurrently:

a read buffer for storing data received from the hard drive;

a write buffer for storing data to be moved to the hard drive; and

a control and state machine that comprises

(a) a word counter for keeping track of the number of data words moved into the read buffer from the hard drive since the accelerating system began to read a sector of the hard drive;

(b) a first address register for pointing to a unit of the read buffer for storing the incoming data from the hard drive;

(c) a second address register for pointing to a unit of the read buffer for the CPU to access;

(d) an address latch register for latching the address of the hard-drive data register;

(e) a plurality of buffer status flags for tracking the status of the read buffer; and

(f) a state machine for monitoring IO operations performed on the hard drive, determining when to start, suspend, resume, and end fetching data from a sector of the hard drive, generating hard drive read cycles to read data from the hard drive, causing data to be transferred from the hard drive to the read buffer during a hard drive read cycle concurrently while data is being transferred from the read buffer to the system memory during a prior IO read/memory write cycle, generating hard drive write cycles to write data to the hard drive, and causing data to be transferred from the write buffer to the hard drive during a hard drive write cycle concurrently while data is being transferred from the system memory to the write buffer during a subsequent memory read/IO write cycle.

5,594,927

APPARATUS AND METHOD FOR ALIGNING DATA TRANSFERRED VIA DMA USING A BARREL SHIFTER AND A BUFFER COMPRISING OF BYTE-WIDE, INDIVIDUALLY ADDRESSABE FIFO CIRCUITS

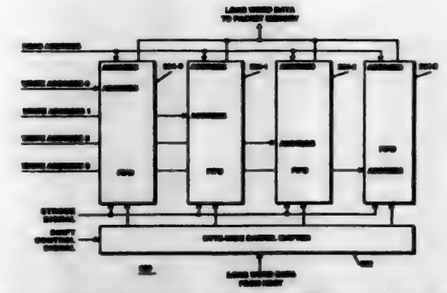
Ching S. Lee, Ashland, and Frank A. Ilkowsky, Jr., Leominster, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 818,594, Jan. 9, 1992, abandoned. This application Sep. 15, 1994, Ser. No. 306,855

Int. Cl.[6] G06F 13/00; 13/38

U.S. Cl. 395—886 23 Claims

1. A data storage circuit in a data processing system, wherein the data processing system includes a host system having a system bus coupled to a host memory, a communication network, and a communication adapter coupled between the system bus and the



communication network for transferring valid bytes of data from the host memory for transmission on the network, said valid bytes of data included as contiguous bytes in longwords stored in the host memory, the longwords in host memory each consisting of N bytes that are retrieved in longword format, N being a predetermined integer greater than or equal to one, said data storage circuit included in the communication adapter, said data storage circuit comprising:

a barrel shifter, coupled to receive a data longword retrieved from the host memory and responsive to a shift control signal, to shift the position of the N bytes of the received longword in accordance with the shift control signal;

N FIFO memory circuits, coupled to receive the N shifted bytes provided by said barrel shifter, and an address signal including N address signals, for storing the N shifted bytes in a sequence of N contiguous available memory locations respectively identified by said N address signals, the sequence of contiguous available locations commencing with a first available byte location in which a next valid byte is to be stored, each of said FIFO memory circuits having a write address port fed by separate address lines thus being separately addressable, said FIFO memory circuits being respectively coupled to receive the N bytes of the shifted longword provided by said barrel shifter; and

control means, operatively coupled to receive information from the host system describing the location of valid bytes in the longword retrieved from host memory, for generating said shift control signal to control the barrel shifter to provide the shifted longword such that the first valid byte of the retrieved longword is aligned with a first available byte location in said FIFO memory circuits , and for generating said address signal.

5,594,928

AUTOFOCUS CAMERA AND METHOD

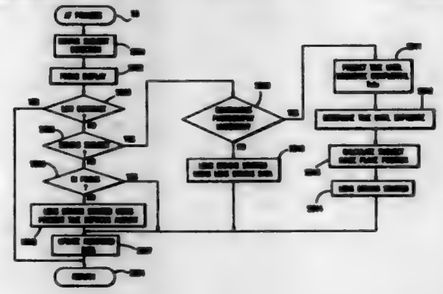
Shoso Yamana, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 19, 1995, Ser. No. 491,584

Claims priority, application Japan, Sep. 30, 1994, 6-237540

Int. Cl.[6] G03B 7/00

U.S. Cl. 396—95 18 Claims



1. An automatic focus camera comprising:
a photographic optical system that composes an image of a subject;
photographic mode selection means for selecting whether to continuously photograph a subject;
focus state detection means for performing focus state detection of the subject and for determining results of the focus state detection;
calculating means for determining a driving amount for focus adjustment of the photographic optical system;
prediction means for predicting a photographic preparation sequence completion time of a photographic preparation sequence;
position computation means for determining a subject image plane position of a next exposure based on the determined focus state detection results and the predicted photographic preparation sequence completion time when the photographic mode selection means selects continuous photography; and
driving means for focussing the photographic optical system based on at least the determined focus state detection results, the driving means further performing focus adjustment of the photographic optical system based on the determined subject image plane position.

5,594,929
METHOD OF PREPARING POWDERS FOR HARD MATERIALS
Mamoun Muhammed, Djurshehn; Sverker Wahlberg, Högersten, and Ingmar Grenthe, Österskär, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden
Filed Jun. 5, 1995, Ser. No. 465,356
Claims priority, application Sweden, Jun. 10, 1994, 9402081
Int. Cl.[6] B22F 1/00
U.S. Cl. 419—1 **12 Claims**

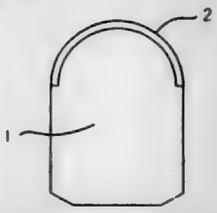
1. A method of preparing a powder containing tungsten and cobalt and/or nickel comprising mixing powders of ammonium paratungstate and a water insoluble basic salt of cobalt and/or nickel in water, reacting the mixture of powders and solution at a temperature from ambient to the boiling point of the solution under agitation to form a precipitate powder of tungsten and cobalt and/or nickel and removing the precipitate from the solution.

5,594,930
BRAZEABLE ALUMINUM MATERIAL AND A METHOD OF PRODUCING SAME
Takashi Terada, Nagimachi; Masahiro Kajima, Oyamashi; Taizo Morita, Oyamashi; Katsuyuki Arakawa, Oyamashi; Ichiro Iwai, Oyamashi, and Masakazu Furuta, Oyamashi, all of Japan, assignors to Showa Aluminum Corporation, Japan
Filed Oct. 27, 1993, Ser. No. 144,136
Claims priority, application Japan, Oct. 30, 1992, 4-333413
Int. Cl.[6] B22F 7/02; B23K 1/00
U.S. Cl. 419—5 **13 Claims**



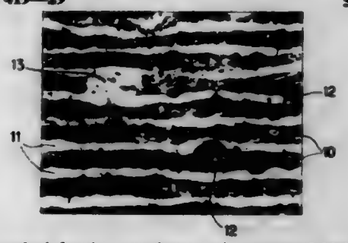
1. A method of producing a brazeable aluminum material wherein a brazing agent layer is thermally sprayed onto an aluminum core of the brazeable aluminum material, the method comprising the steps of:
preparing a powder composed of minute particles to be thermally sprayed to form the brazing agent layer; and
then thermally spraying the powder onto the aluminum core in such a state that only a surface of each of substantially all the minute particles is molten, with a pith of each particle remaining unmolten.

5,594,931
LAYERED COMPOSITE CARBIDE PRODUCT AND METHOD OF MANUFACTURE
Jack Krall, and Rodger Plyler, both of Latrobe, Pa., assignors to Newcomer Products, Inc., Latrobe, Pa.
Filed May 9, 1995, Ser. No. 437,869
Int. Cl.[6] B22F 3/10;7/02
U.S. Cl. 419—5 **10 Claims**



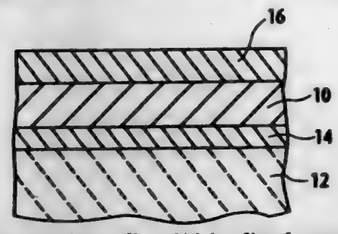
1. A method of making a rigid sintered hardmetal component having a core of a first grade of a hardmetal composition and at least one surface layer of a second hardmetal grade comprising the steps of:
a. manufacturing a slurry containing a powder of said second hardmetal grade as the particulate constituent of the slurry and a liquid vehicle consisting essentially of hydrocarbons, said liquid vehicle including solvents, surfactant, binder and plasticizer;
b. applying said slurry to a surface of a green compact, said green compact being formed from said first hardmetal grade;
c. allowing the slurry to dry on said green compact to form a green layered composite; and
d. sintering said green layered composite to form said rigid sintered hardmetal component.

5,594,932
METHOD OF MANUFACTURING AN ENCASED WIRE OF HIGH CRITICAL TEMPERATURE SUPERCONDUCTING MATERIAL
Gérard Duperray, La Norville, and Denis Legat, Lisses, both of France, assignors to Alcatel Alsthom Compagnie General d'Electricite, Paris, France
Filed Jun. 9, 1994, Ser. No. 257,304
Claims priority, application France, Jun. 10, 1993, 93 06993
Int. Cl.[6] B22F 3/16; C21D 1/00
U.S. Cl. 419—29 **5 Claims**



1. A method for the manufacture of an encased high critical temperature superconducting wire, a "powder in tube" method, comprising the following operations:
filling a first silver tube with a rod of compressed high critical temperature superconducting powder and sealing the first tube under vacuum;
drawing said tube through a wire-draw die to produce a single strand;
forming a billet by providing a second silver tube with sections of said single strand and sealing said second tube under vacuum;
drawing and/or rolling the billet to the dimensions desired for said wire; and
carrying out final heat treatment;
the method being characterized in that, prior to being introduced into said first silver tube, said rod of compressed powder is heat treated in the following stages:
a period at a high temperature T_1 in an oxygen atmosphere to recrystallize the superconducting phase of said powder in the presence of traces of liquids and to eliminate the unwanted phases as much as possible;
a slow descent at 1° C. to 5° C. per hour to a temperature T_2 to avoid precipitating microcrystals of said unwanted phases at the grain boundaries;
a rapid descent to a temperature T_3; and
a period at said temperature T_3 during which the concentration of carriers in said superconducting material is increased.

5,594,933
MAGNETORESISTANCE FILM WHICH IS A MATRIX OF AT LEAST TWO SPECIFIED METALS HAVING INCLUDED SUBMICRON PARTICLES OF A SPECIFIED MAGNETIC METAL OR ALLOY
Kazuhiko Hayashi; Hidefumi Yamamoto; Junichi Fujikata, and Kunihiko Ishihara, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jun. 30, 1995, Ser. No. 497,716
Claims priority, application Japan, Jul. 1, 1994, 6-150858
Int. Cl.[6] H01F 10/12
U.S. Cl. 428—846 **18 Claims**

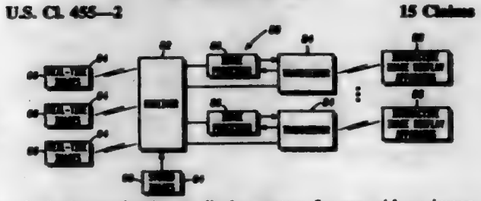


1. A magnetoresistance film, which is a film of a magnetoresistance material consisting essentially of a matrix of a conductive nonmagnetic material and submicron particles of a conductive ferromagnetic material dispersed in said matrix, formed on a substrate,
wherein said nonmagnetic material comprises at least two metal elements selected from the group consisting of Cu, Ag, Au and Pt, and wherein said ferromagnetic material is selected from the group consisting of Co, Ni—Fe alloys, Ni—Fe—Co alloys and Fe—Co alloys.

5,594,934
REAL TIME CORRELATION METER
Daocheng Lu, Dunedin, Fla., and Barry P. Cook, New Canaan, Conn., assignors to A.C. Nielsen Company, Northbrook, Ill.
Filed Sep. 21, 1994, Ser. No. 309,894
Int. Cl.[6] H04N 7/00
U.S. Cl. 455—2 **55 Claims**

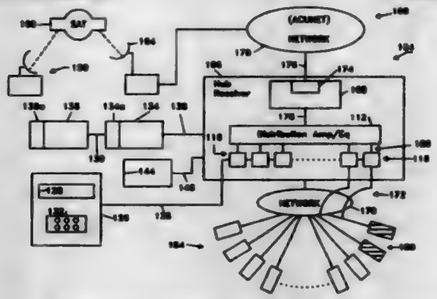
1. A correlation meter comprising:
first receiving means for receiving an output of a tunable receiver and for providing a sample side representation, wherein the sample side representation represents a pattern of the output of the tunable receiver;
second receiving means for receiving a plurality of reference side representations from a single remote source of reference side representations, wherein the reference side representations represent a plurality of patterns corresponding to signals carried by a plurality of channels to which the tunable receiver may be tuned; and,
correlating means for correlating the sample side representation and the reference side representations substantially as the reference side representations are received by the second receiving means and for thereby determining a tuning status of the tunable receiver.

5,594,935
INTERACTIVE IMAGE DISPLAY SYSTEM OF WIDE ANGLE IMAGES COMPRESING AN ACCOUNTING SYSTEM
William L. Rebec, Schaumburg, Ill., and Cary D. Perttunen, Shelby Township, Mich., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 392,705, Feb. 23, 1995, and a continuation-in-part of Ser. No. 392,593, Feb. 23, 1995, and a continuation-in-part of Ser. No. 431,185, Apr. 28, 1995. This application May 12, 1995, Ser. No. 440,015
Int. Cl.[6] H04N 7/16
U.S. Cl. 455—2 **15 Claims**



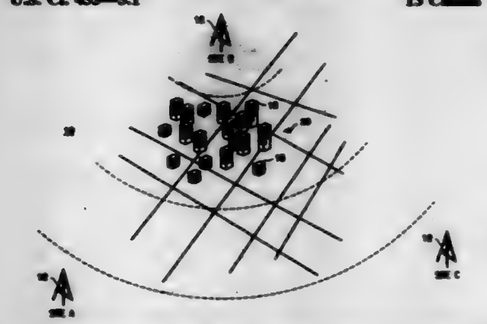
1. An interactive image display system for use with an image distribution system located remotely therefrom, the interactive image display system comprising:
a user interface to select a wide-angle image sequence from a plurality of wide-angle image sequences and to select a portion of the wide-angle image sequence;
a transceiver operatively associated with the user interface to transmit a first selection signal and a second selection signal to the image distribution system, the first selection signal indicative of the wide-angle image sequence, the second selection signal indicative of the portion of the wide-angle image sequence, the transceiver operative to receive an image signal from the image distribution system, the image signal representative of a perspective corrected image sequence of the portion of the wide-angle image sequence; and
a display device operatively associated with the transceiver to display the perspective corrected image sequence.

5,594,936
GLOBAL DIGITAL VIDEO NEWS DISTRIBUTION SYSTEM
Mohammad S. Rebec, and Milutin V. Rebec, both of Bristol, Ind., assignors to Trans Video Electronics, Inc., Bristol, Ind.
Continuation-in-part of Ser. No. 47,089, Apr. 16, 1993. This application Jul. 2, 1993, Ser. No. 85,329
Int. Cl.[6] H04N 7/20
U.S. Cl. 455—3.2 14 Claims



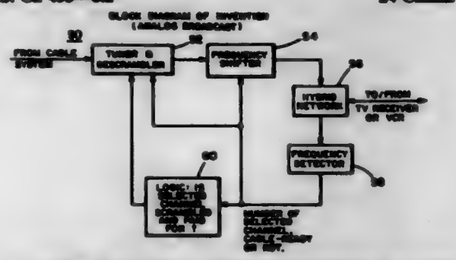
1. An information distribution system for a digital network, comprising:
master communications means coupled to the digital network for establishing communications with the network in order to receive a synchronous digital signal;
distribution amplifier means coupled to said master communications means for receiving and dividing said synchronous digital signal into a plurality of synchronous signals;
plurality of communications means coupled to said distribution amplifier means for establishing communications with a plurality of receiving stations and for receiving and outputting said plurality of synchronous signals to the plurality of receiving stations; and
master controller means coupled to said plurality of communications means for controlling said plurality of communications means from a central location.

5,594,937
SYSTEM FOR THE TRANSMISSION AND RECEPTION OF DIRECTIONAL RADIO SIGNALS UTILIZING A GIGAHERTZ IMPLOSION CONCEPT
Walter J. Stiles, Phoenix; Millford G. Richey, Chandler; Perry W. Hadden, Tempe, all of Ariz., and Malcolm L. Ziegler, Walnut Creek, Calif., assignors to GHZ Equipment Company, Tempe, Ariz.
Filed Sep. 2, 1994, Ser. No. 300,598
Int. Cl.[6] H04H 1/00
U.S. Cl. 455—5.1 13 Claims



1. A non-cellular, line-of-sight broadcast system for providing programming services to subscriber receivers in a unitary service area, comprising:
a plurality of spaced apart transmitter sites, each site having a transmitter and a directional transmit antenna, each said transmit antenna having a directional, line-of-sight radiated pattern focused toward said service area, all of said transmitters broadcasting on the same carrier frequency, said carrier frequency greater than one gigahertz,
a programming feed system connected to each of said transmitters for providing a substantially identical programming signal for broadcast by each of said transmit antennas, and
a plurality of said subscriber receivers at respective fixed sites in said service area, a first group of said subscriber receivers having the directional receiving antennas thereof focused toward a first of said transmit antennas which first transmit antenna provides the best reception of said programming signal for the subscriber receivers in said first group and a second group of said subscriber receivers having the directional antennas thereof focused toward a second of said transmit antennas which second transmit antenna provides the best reception of said programming signal for the subscriber receivers in said second group.

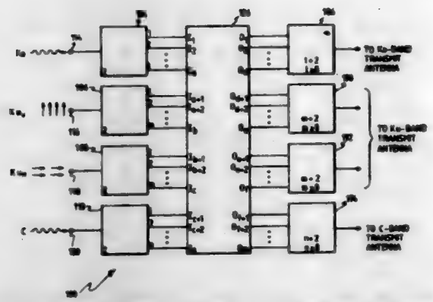
5,594,938
UNIVERSAL TV INTERFACE FOR SWITCH OF BROADCAST VIDEO DISTRIBUTION (AND RELATED METHOD)
Joel S. Engel, Highland Park, Ill., assignor to Ameritech Services, Inc., Hoffman Estates, Ill.
Continuation of Ser. No. 18,109, Feb. 17, 1993, abandoned. This application May 11, 1995, Ser. No. 440,330
Int. Cl.[6] H04N 7/10
U.S. Cl. 455—6.2 24 Claims



1. A method for selecting a video signal broadcast by a video distribution system for display on a television receiver, the television receiver having a channel selector, said method comprising the steps of:
selecting a particular video signal using the channel selector of the television receiver;
detecting a specific channel to which the television receiver is tuned, wherein the specific channel designates a selected video signal;
acquiring the selected video signal from the video distribution system; and
shifting the selected video signal to the specific channel to which the television receiver is tuned.

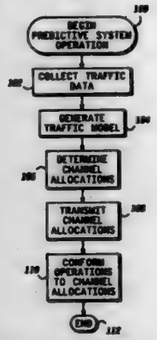
5,594,939
SYNTHESIZER ROUTING ARCHITECTURE FOR A SWITCHING APPARATUS
Charles C. Carrillo, Torrance; L. Mark Shoberlary, Santa Monica, and Arnold L. Berman, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Nov. 23, 1992, Ser. No. 979,952
Int. Cl.[6] H04B 7/14
U.S. Cl. 455—12.1 19 Claims

19. In a satellite communication system operative to switch input signal information received over a set of uplink channels to



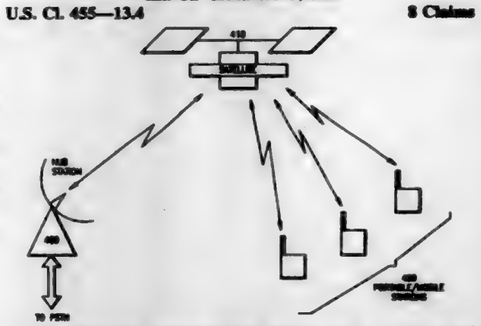
output signal information carried by a set of downlink channels, a switching apparatus having an improved routing architecture comprising:
receiver means for converting said received uplink signals into a plurality of I.F. signals spanning a range of intermediate frequencies;
switch matrix means for routing said I.F. signals to a set of matrix output ports; and
synthesized transmitter means, said transmitter means having a plurality of feed ports in communication with said matrix output ports, for converting said I.F. signals into said output signal information.

5,594,940
STATISTICALLY ROBUST TRAFFIC MODELING METHOD AND APPARATUS
Kenneth M. Peterson, Phoenix; Victor H. Cutler, Jr., Mesa, both of Ariz., and Gerald J. Davison, Eldersburg, Md., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 22, 1994, Ser. No. 361,402
Int. Cl.[6] H04Q 7/00
U.S. Cl. 455—12.1 14 Claims



1. A method for using a statistically robust traffic model to control access of communication units to communication channels in a communication system comprising the steps of:
a) dividing a surface into elemental areas, on which surface the communication units emanate signals, wherein an elemental area is defined by a geographical region, and an area defined by a cell comprises a set of elemental areas;
b) collecting traffic data describing past and present communication channel usage by the communication units located in the set of elemental areas;
c) generating a statistically robust traffic model based on the traffic data within the set of elemental areas by combining the traffic data of elemental areas comprising the cell;
d) determining channel allocations based on the statistically robust traffic model; and
e) allowing access to the communication channels based on the channel allocations determined using the statistically robust traffic model.

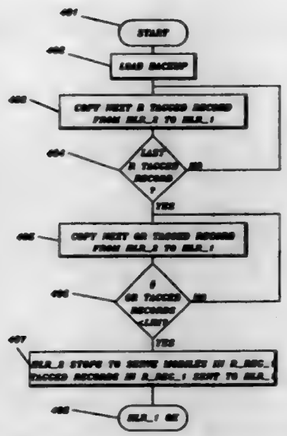
5,594,941
CELLULAR/SATELLITE COMMUNICATIONS SYSTEM WITH GENERATION OF A PLURALITY OF SETS OF INTERSECTING ANTENNA BEAMS
Paul W. Dent, Stehags, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.
Division of Ser. No. 179,953, Jan. 11, 1994. This application May 16, 1995, Ser. No. 442,168
Int. Cl.[6] H04B 7/185;7/26
U.S. Cl. 455—13.4 8 Claims



1. A system for communicating between one or more central ground stations and a plurality of mobile or portable stations via at least one orbiting satellite comprising:
at least one central ground station having transmitter means to transmit a plurality of signals to a satellite for transponding;
at least one satellite having multi-channel transponder means for receiving said plurality of signals, frequency translating, filtering and amplifying said signals and forming weighted combinations of said signals for applying after power amplification to a multiple element antenna such that a first subset of said signals will be radiated using a first set of antenna beams having radiation patterns that touch at approximately a −4 dB down point relative to beam peak, said approximately −4 dB down point defining an approximately −4 dB diameter for each of said beams, and such that at least one other subset of said signals will be radiated by another set of antenna beams displaced from said first set of beams by less than the approximately −4 dB beam diameter.

5,594,942
RESTORATION OF A HOME LOCATION REGISTER IN A MOBILE RADIO SYSTEM
Nenad Antic, Sollentuna, and Walter Ghisler, Upplands Väsby, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Continuation of Ser. No. 219,884, Mar. 30, 1994, abandoned. This application Dec. 22, 1995, Ser. No. 576,852
Claims priority, application Sweden, Mar. 31, 1993, 9301076
Int. Cl.[6] H04Q 7/00
U.S. Cl. 455—33.1 4 Claims

1. A method of restoring a home location register after a home location register crash in a first home location register unit in a mobile radio system, said method comprising:
loading said first home location register with a previously saved backup copy; and
updating, after loading said backup copy, records in said first home location register that are no longer valid with information from a second home location register unit that contains an up-to-date version of said first home location register, in



which up-to-date version records that have changed after said backup copy was saved have been updated and tagged for later identification, thereby minimizing the update time of said first home location register by reducing the number of records that have to be updated in said first home location register to records that are no longer valid after loading said backup copy and correspond to said tagged records in said second home location register unit.

5,594,943

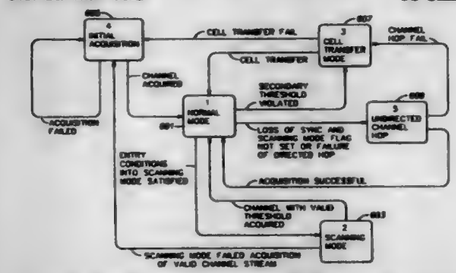
METHOD AND APPARATUS FOR EFFICIENT HANDOFFS BY MOBILE COMMUNICATION ENTITIES

Kumar Balachandran, San Diego, Calif., assignor to Pacific Communication Sciences, Inc., San Diego, Calif.

Continuation of Ser. No. 228,284, Aug. 9, 1994, abandoned. This application Apr. 2, 1996, Ser. No. 627,675

Int. Cl.[6] H04Q 7/00;9/00

U.S. Cl. 455—33.2 **51 Claims**



1. A method for determining when to change receive channels in a first communication trait operating in a wireless communication network, comprising the steps of:

a. monitoring at least one performance parameter of a channel received within the first communication unit to detect the relationship of each performance parameter with respect to at least both a primary and secondary threshold concurrently associated with each performance parameter, the primary threshold representing a higher level of performance than the secondary threshold;

b. scanning for a forward channel having the highest performance as determined by the relative levels of each performance parameter and attempting to receive data on that channel whenever (1) the monitored performance parameter of the last channel being received is below the secondary threshold or (2) the monitored performance parameter of the last channel being received is below the primary threshold for a predetermined amount of time.

5,594,944

COMMUNICATION CHANNEL SELECTION METHOD

Minoru Ogata, Yokohama; Shoji Suzuki, Atsugi; Shinji Tsuchida, Zama; Yuichiro Tsutsui; Shunji Arai, both of Yokohama, and Shigeru Hiroki, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 797,927, Nov. 26, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 191,755

Claims priority, application Japan, Nov. 27, 1990, 2-324785; Mar. 28, 1991, 3-089630

Int. Cl.[6] H04Q 7/20

U.S. Cl. 455—34.1 **12 Claims**

NUMBER OF ACCESS STOP SPEECH CHANNELS	NUMBER OF ALL SPEECH CHANNELS	STOP SPEECH CHANNEL RATIO(%) (NUMBER OF STOP SPEECH CHANNELS / NUMBER OF ALL SPEECH CHANNELS ×100)	OUTPUT THRESHOLD VALUE OF SPEECH CHANNEL ACCESS AUTHORIZATION TABLE (%)
10	87	115	90

3. A communication channel selecting method comprising the steps of:

discriminating states of a plurality of communication channels;

inhibiting a selection of the plurality of communication channels according to a discrimination in said discriminating step;

selecting an uninhibited one of the plurality of communication channels to be used for a communication according to the discrimination in said discriminating step; and

performing a display according to the discrimination in said discriminating step before the selection of all of the plurality of communication channels is inhibited, according to an excess of the number of the plurality of communication channels to which the selection is inhibited over a predetermined value.

5,594,945

METHOD OF PROVIDING REGISTRATION REMINDER MESSAGE TO A ROAMING PAGER UPON ENTRY INTO A NEW SERVICE AREA

John E. Lewis, Lawrenceville; Peter O. Roach, Jr., Doraville, both of Ga., and Thomas Poulos, Madison, Miss., assignors to BellSouth Corporation, Atlanta, Ga.

Filed Feb. 14, 1995, Ser. No. 388,361

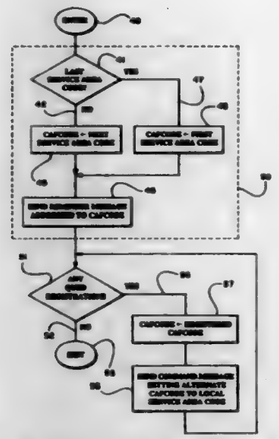
Int. Cl.[6] H04B 7/26; H04Q 7/08

U.S. Cl. 455—38.1 **13 Claims**

1. A method of operating a paging system comprising a plurality of service areas comprising the steps of:

assigning a unique paging device address code to each of said plurality of service areas; and

in at least one particular one of said plurality of service areas, repetitively broadcasting a set of reminder messages requesting recipient registration, said set of reminder messages



including at least one message addressed to said paging device address code for each of said plurality of service areas except said particular one of said plurality of service areas.

5,594,946

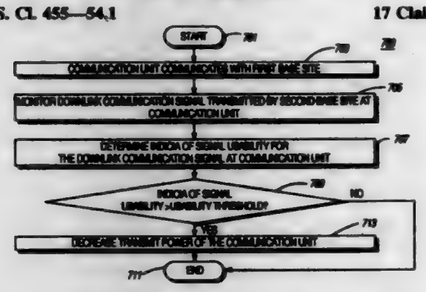
METHOD AND APPARATUS FOR MITIGATING INTERFERENCE PRODUCED BY A COMMUNICATION UNIT IN A COMMUNICATION SYSTEM

Barry J. Menich, Schaumburg, Ill., and Akinghade R. Akinalyi, Carrollton, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1995, Ser. No. 396,025

Int. Cl.[6] H04B 7/26

U.S. Cl. 455—54.1 **17 Claims**



1. A method for mitigating interference produced by a communication unit communicating with a first base site in a communication system, the method comprising the steps of:

a) monitoring, by the communication unit, a downlink communication signal transmitted from a second base site;

b) determining, by the communication unit, an indicia of signal usability for the downlink communication signal; and

c) comparing the indicia of signal usability to a usability threshold for the second base site; and

d) when the indicia of signal usability exceeds the usability threshold, decreasing the transmit power of the communication unit.

5,594,947

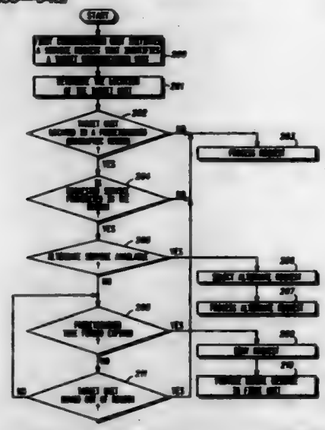
METHOD FOR PROVIDING ALTERNATE COMMUNICATION SERVICES BASED ON GEOGRAPHIC LOCATION

Gary W. Grube, Palatine; Marc C. Naddell, Schaumburg, and Mark L. Shaughnessy, Algonquin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1994, Ser. No. 209,329

Int. Cl.[6] H04Q 7/28

U.S. Cl. 455—54.2 **6 Claims**



1. A method for a communication resource controller to provide alternate communication services based solely on a geographic location of a target communication unit, the method comprises the steps of:

a) receiving a service request from a first communication unit, wherein the service request identifies the target communication unit and a service type;

b) determining the geographic location of the target communication unit;

c) when the geographic location of the target communication unit is within a predefined geographic region, determining whether the service type is prohibited within the predefined geographic region, the predefined geographic region being established independent of a geographic location of the first communication unit;

d) when the service type is prohibited, determining whether an alternate service type is available within the predefined geographic region; and

e) when the alternate service type is available, automatically executing the alternate service type between the first communication unit and the target communication unit.

5,594,948

METHOD FOR REALISING A GROUP CALL IN A DIGITAL RADIO NETWORK

Reino Talarmo, Riihimäki, and Pertti Breckman, Oulu, both of Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI92/00248, § 371 Date Mar. 31, 1994, § 102(e) Date Mar. 31, 1994, PCT Pub. No. WO93/07723, PCT Pub. Date Apr. 15, 1993

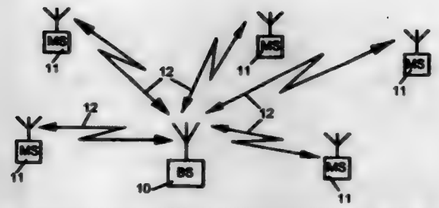
PCT Filed Sep. 22, 1992, Ser. No. 211,459

Claims priority, application Finland, Oct. 3, 1991, 914656

Int. Cl.[6] H04B 7/26

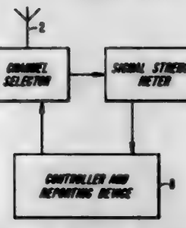
U.S. Cl. 455—54.2 **2 Claims**

1. A method for realizing a group call, in a digital radio network in which a plurality of mobile subscribers, while participating in a group call on a same radio channel, roam within a respective area of at least one base station, comprising:



(a) each of any of said subscribers desiring to speak signals their desire to do so, by performing a predetermining signalling;
(b) a respective said base station, based on a predetermined algorithm, selects a next speaker at random to speak in said group call on said same radio channel; and
(c) said base station transmits to the next speaker selected in step (b), an indication of their having been selected to be the next speaker.

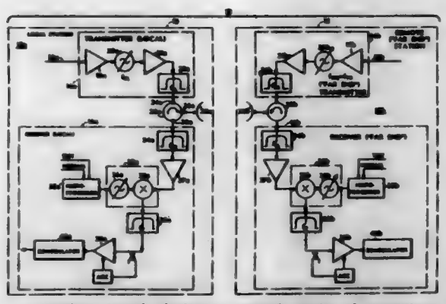
5,594,949
MOBILE ASSISTED CHANNEL ALLOCATION
Claes H. Andersson, Stockholm; Hakan O. Eriksson, Vallentuna; Magnus E. Madfors, Sollentuna, and Bengt Y. Persson, Djursholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Continuation of Ser. No. 14,222, Feb. 5, 1993, Pat. No. 5,375,123. This application Dec. 15, 1994, Ser. No. 356,634
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—62 **24 Claims**



1. A signalling method in a radiocommunication system for reporting measurements associated with downlink channels available to a base station in which the measurements can be used to allocate channels for new calls in a cell serviced by the base station by using a plurality of idle mobile stations within the cell as measurement probes to procure the measurements comprising the steps of:
broadcasting a single message from a base station on a control channel to a plurality of idle mobile stations instructing each of said idle mobile stations to perform said measurements; and
including, as part of said message, a list of frequencies on which each of said plurality of idle mobile stations are to perform said measurements.

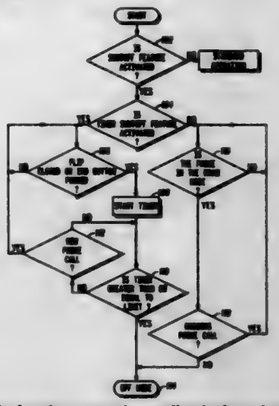
5,594,950
RADIO COMMUNICATION SYSTEM
Charles R. D'Amico, Cambridge, Mass., and David Blumberg, Jr., Manchester, N.H., assignors to Advanced TechCom, Inc., Lawrence, Mass.
Filed Nov. 23, 1994, Ser. No. 344,085
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—67.1 **1 Claim**

1. A radio communication system, comprising:
a local radio station having:
a transmitter, adapted to transmit signals to a remote station at a predetermined carrier frequency, f_{TL}; and,



a receiver tuned, during a normal mode of operation, to receive signals from the remote station, such received signals having a different predetermined carrier frequency, f_{TR};
an antenna coupled to the transmitter and the receiver;
such receiver having:
a band pass filter coupled to the antenna, the filter having a predetermined pass band selected to pass, substantially unattenuated, "in-band" signals received from the remote station, such "in-band" signals having frequencies within the band pass of the filter, and pass, substantially attenuated, "out-of-band" signals from the station transmitter, such "out-of-band" signals having frequencies outside of the band pass of filter;
a frequency converter, having a local oscillator adapted to produce, during a normal mode of operation, a local oscillator frequency, f_{LO} equal to the difference between f_{TR} and a predetermined intermediate frequency, f_{IF}, to translate the frequencies of signals passed substantially unattenuated by the band pass filter to a predetermined band of intermediate frequencies and, to produce, during a test mode of operation, a frequency, f_{LOTEST} equal to the difference between f_{TL} and f_{IF}, to translate the frequencies of the substantially attenuated, "out-of-band" signals from the local station transmitter to the predetermined band of intermediate frequencies.

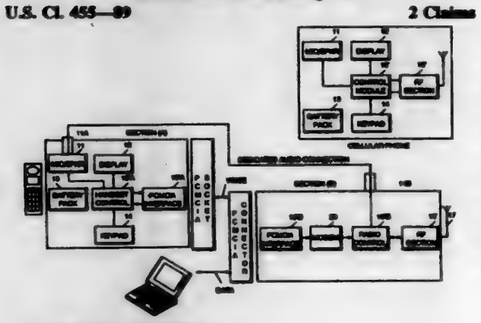
5,594,951
METHOD AND APPARATUS FOR SAVING POWER IN A RADIOTELEPHONE
Nathan P. Bellin, Mount Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 7, 1994, Ser. No. 319,984
Int. Cl.[6] H04B *1/40*
U.S. Cl. 455—89 **19 Claims**



1. A method of saving power in a radiotelephone having a power source, comprising the steps of:

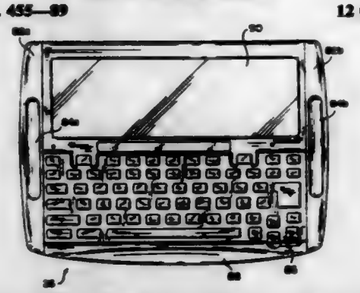
determining if a power saving feature is enabled;
when the power saving feature is enabled, determining if a timer shutoff feature is activated;
when the timer shutoff feature is activated, detecting when call termination occurs;
starting a timer in response to detecting call termination;
determining if the timer exceeds a predetermined period of time; and
when the timer exceeds the predetermined period of time, switching the radiotelephone to an off mode.

5,594,952
DEVICE FOR INTEGRATION BETWEEN VOICE AND DATA RADIO COMMUNICATION
Salvatore Virtuoso, Arcore, and Alberto Parolo, Milan, both of Italy, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 23, 1995, Ser. No. 392,720
Claims priority, application Italy, Apr. 29, 1994, MI94A0817
Int. Cl.[6] H04B *1/40*; H04Q *7/32*
U.S. Cl. 455—89 **2 Claims**



1. An adapter comprising:
a transmitter for transmitting radio signals;
a receiver for receiving radio signals;
a first interface means for outputting digital data from the adapter and for inputting digital data to the adapter;
a modem providing analog signals for transmission by the transmitter from digital data obtained by the first interface means and for providing digital data to the first interface means from analog signals obtained from the receiver;
a second interface means for outputting analog signals from the adapter obtained directly from the receiver and for inputting analog signals to the adapter directly to the transmitter; and
a control module for configuring the adapter to enable communication via the first interface means or the second interface means, said control module selecting the first interface means or the second interface means based upon a specified mode of operation obtained via the first interface means.

5,594,953
MOBILE COMMUNICATOR SYSTEM
David J. Ross, Leesburg, Va.; Blake L. Isaacs, Logan, Utah, and Kevin J. Williams, Eugene, Oreg., assignors to AMSC Subsidiary Corporation, Reston, Va.
Continuation-in-part of Ser. No. 187,996, Jan. 28, 1994, Pat. No. 5,512,912. This application Mar. 22, 1995, Ser. No. 408,526
Int. Cl.[6] H04B *1/03;1/08*
U.S. Cl. 455—89 **12 Claims**



12. In a mobile satellite system including a satellite communication switching office having a satellite antenna for receiving/transmitting a satellite message via a satellite from/to a vehicle using a mobile communication system, a satellite interface system, a fleet management system including a central controller receiving/transmitting the satellite message from/to the satellite communication switching office, the central controller at least one of mapping occurrences of predetermined conditions along a transport route responsive to the satellite message received from the vehicle via the satellite and the satellite interface system using a mobile sensing station mounted on the vehicle traversing said transport route, and receiving data in the satellite message received from the vehicle, the mobile communication system comprising:
a housing comprised of a shock resistant material, said housing including end bumpers comprised of an elastomeric material for absorbing shock experienced by said housing, the end bumpers each including recessed handles on an upper surface of the mobile communicator system and ribbed protruded finger grips on a bottom surface of the mobile communication system;
an input device for inputting data, said input device comprising a keyboard including a rubber/carbon membrane and mounted in said housing using a first seal to prevent fluid from entering the mobile communication system between said input device and said housing;
a central processing unit, disposed in said housing, and receiving at least one of the data from said input device, and sensor data received from the mobile sensing station;
a display monitor comprised of tempered glass having the ability to withstand a predetermined impact, said display monitor mounted in said housing using a second seal to prevent fluid from entering between said display monitor and said housing.

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377,257

VERTICAL, FREE-STANDING HOT DOG BUN

Charles A. Calvin, 4460 Cambridge Crossing Ln., Bridgeton, Mo. 63044

Filed Jan. 31, 1996, Ser. No. 49,803
Term of patent 14 years
U.S. Cl. D1—101

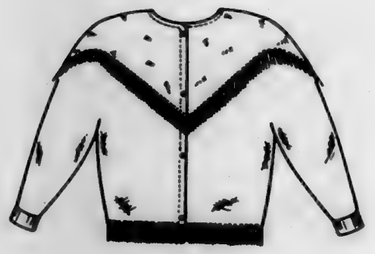


377,258

GARMENT

Sharon L. Burkholder, 5946 Poetry Ct., N. Ft. Myers, Fla. 33903

Filed Mar. 3, 1995, Ser. No. 35,603
Term of patent 14 years
U.S. Cl. D2—828



377,259

FOOTWEAR SOLE AND PERIPHERY

Ivan Davidowitz, Kingston; Michael Sproul, Mountaintop, both of Pa., and Rosemary Wright, Hinckley, England, assignors to Columbia Footwear Corporation, Hazleton, Pa.

Filed Nov. 17, 1994, Ser. No. 31,576
Term of patent 14 years
U.S. Cl. D2—952

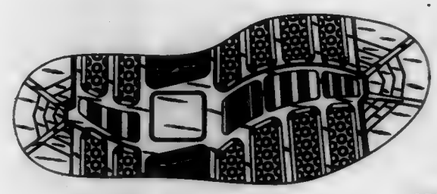


377,260

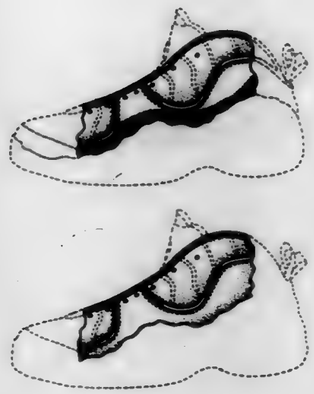
SHOE SOLE

Marco Brunani, Milan, Italy, assignor to Vibram S.p.A., Italy

Filed Jan. 30, 1995, Ser. No. 33,005
Term of patent 14 years
U.S. Cl. D2—954



377,261
SIDE ELEMENT OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 24, 1996, Ser. No. 49,367
Term of patent 14 years
U.S. Cl. D2—972



377,263
SIDE ELEMENT OF A SHOE UPPER
Robert J. Lucas, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 8, 1996, Ser. No. 50,895
Term of patent 14 years
U.S. Cl. D2—972



377,262
SIDE ELEMENT OF A SHOW UPPER
Robert J. Lucas, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 8, 1996, Ser. No. 50,894
Term of patent 14 years
U.S. Cl. D2—972



377,264
PERIPHERY OF A FOOTWEAR SOLE
Benjamin Wunsch, Palm Beach, Fla., assignor to U.S. Sports, Inc., LakeWorth, Fla.
Filed Jun. 29, 1995, Ser. No. 40,896
Term of patent 14 years
U.S. Cl. D2—977



377,265
SOCK WITH FASTENER
Glenn Lindaman, Buckwing, 690 S. 10th St., Allentown, Pa. 18103
Continuation-in-part of Ser. No. 17,856, Jan. 5, 1994, Pat. No. Des. 362,957. This application Oct. 10, 1995, Ser. No. 45,130
Term of patent 14 years
U.S. Cl. D2—993



377,267
POCKET FOR EYEGLASSES AND SUNGLASSES
Stephen B. DiPietro, 6345 SW. 34th St., Miami, Fla. 33155-4924
Filed Aug. 16, 1994, Ser. No. 27,283
Term of patent 14 years
U.S. Cl. D3—265



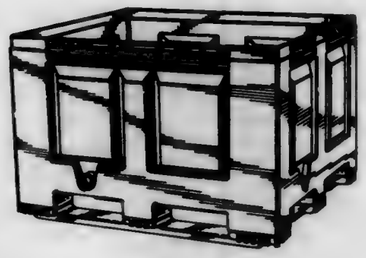
377,266
HOLSTER FOR A RADIO PAGER
Bee L. Khoo, Johor Bahru, Malaysia; Moy H. Toh, Singapore, Singapore; Chee T. Ong, Singapore, Singapore, and Chee T. Tai, Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 1, 1995, Ser. No. 43,480
Term of patent 14 years
U.S. Cl. D3—218



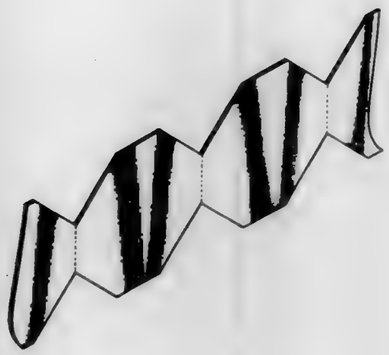
377,268
LUGGAGE BAG
Scott George, and Dennis Goddard, both of c/o 30th Fl., 10303 Jasper Ave., Edmonton, Alberta, Canada
Filed Nov. 4, 1994, Ser. No. 30,664
Term of patent 14 years
U.S. Cl. D3—287



377,269
PALLET CONTAINER
Jean M. Provot, Saint Avold, France, assignor to Perstorp AB, Perstorp, Sweden
Filed Feb. 9, 1995, Ser. No. 34,779
Claims priority, application Sweden, Aug. 9, 1994, 941635
Term of patent 14 years
U.S. Cl. D3—304



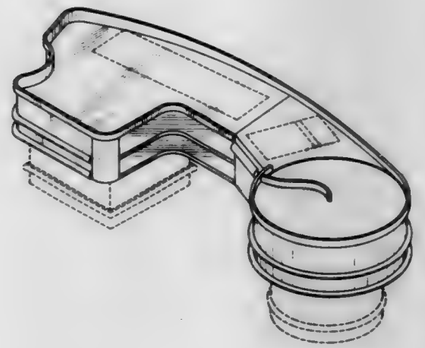
377,270
PAPER TOWEL
Curtiss F. Neal, 8986 Sunset Dr., Navarre, Fla. 32566
Filed May 19, 1995, Ser. No. 39,080
Term of patent 14 years
U.S. Cl. D5—53



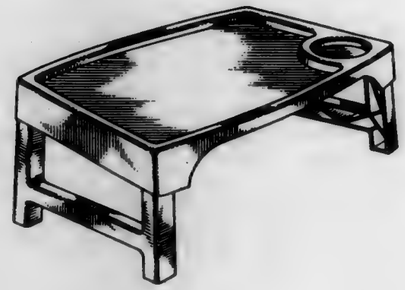
377,271
CHAIR
Mary Anne Podolski, 8896 Pure, Livonia, Mich. 48150
Filed Feb. 16, 1996, Ser. No. 50,375
Term of patent 14 years
U.S. Cl. D6—358



377,272
CHECK STAND COUNTER
Wayne Dewitt, Jacksonville, Fla., assignor to Load King Manufacturing Co., Inc., Jacksonville, Fla.
Filed Feb. 5, 1996, Ser. No. 49,957
Term of patent 14 years
U.S. Cl. D6—402



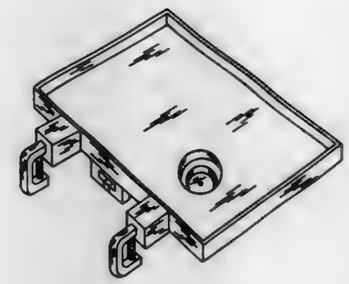
377,273
ARTICLE SUPPORT TRAY
Michael Amon, P.O. Box 624, Fallbrook, Calif. 92028
Filed Mar. 21, 1995, Ser. No. 36,461
Term of patent 14 years
U.S. Cl. D6—406



377,274
PROTECTIVE SLEEVE FOR COMPACT DISC
Luciano Spano, 23 Wolfe Ave., Scarborough, Ontario, Canada
Filed Apr. 11, 1995, Ser. No. 37,331
Term of patent 14 years
U.S. Cl. D6—407



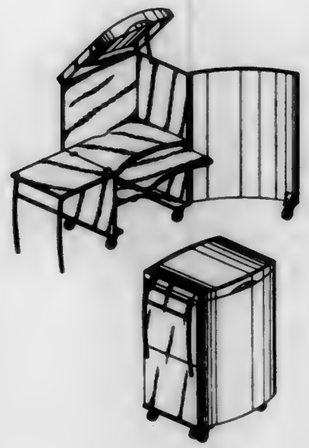
377,275
TRAY ATTACHMENT FOR A CHAIR
Mario Dilette, 1146 Remsen Ave., Brooklyn, N.Y. 11236
Filed May 15, 1995, Ser. No. 39,894
Term of patent 14 years
U.S. Cl. D6—418



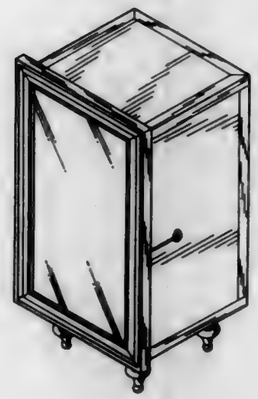
377,276
READING STAND
Steven Hirsch, 13040 Woodbridge St., Studio City, Calif. 91604, and Joseph Yedvab, 4915 Gaviota Ave., Encino, Calif. 91436
Filed Jul. 21, 1995, Ser. No. 41,678
Term of patent 14 years
U.S. Cl. D6—419



377,277
FOLDABLE MOBILE OFFICE
Ronna L. Jacobs, Saugatuck, and Allan B. Belka, Wayland, both of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Feb. 7, 1996, Ser. No. 50,045
Term of patent 14 years
U.S. Cl. D6—425



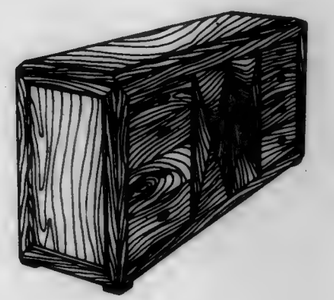
377,278
DISPLAY CABINET
Emily Patterman, 209 Columbus Ave., New York, N.Y. 10023, and Russell McIntosh, 264 W. 25th St., New York, N.Y. 10001
Filed Dec. 11, 1995, Ser. No. 47,707
Term of patent 14 years
U.S. Cl. D6—432



377,279
COUNTRY STORAGE TABLE
Sidney A. Langer, Kernersville, N.C., assignor to Schottenstein Stores Corporation, Columbus, Ohio
Filed Oct. 26, 1995, Ser. No. 46,705
Term of patent 14 years
U.S. Cl. D6—436



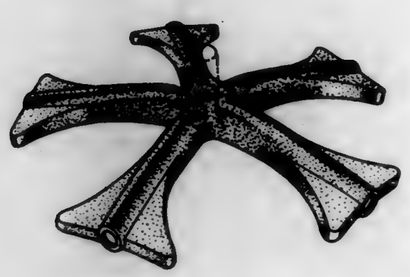
377,280
DRESSER
H. Thomas Keller, High Point, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Oct. 6, 1995, Ser. No. 45,858
Term of patent 14 years
U.S. Cl. D6—446



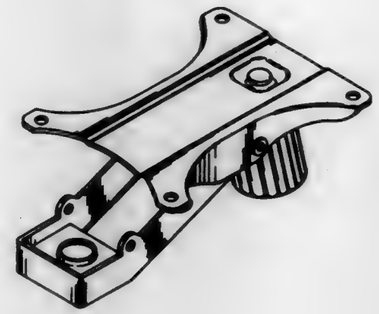
377,281
DESK
Sean B. McFarlane, Federal Way, Wash., assignor to Hon Industries Inc., Muscatine, Iowa
Filed Oct. 6, 1995, Ser. No. 45,868
Term of patent 14 years
U.S. Cl. D6—446



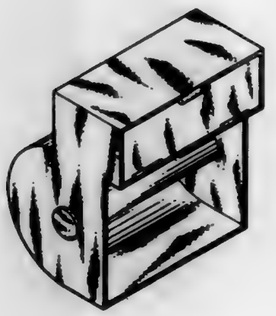
377,282
OFFICE CHAIR LEG
Chin-Ting Chen, Tainan Hsien, Taiwan, assignor to Chih Feng Industrial Co., Ltd., Tainan Hsien, Taiwan
Filed Mar. 19, 1996, Ser. No. 51,891
Term of patent 14 years
U.S. Cl. D6—498



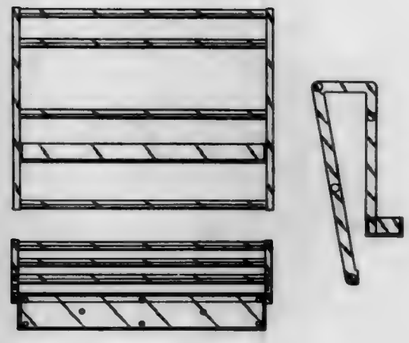
377,283
SEAT SUPPORT OF A CHAIR
Tung-Hua Su, Tainan, Taiwan, assignor to Jerng Well Industrial Co., Ltd., Tainan, Taiwan
Filed Nov. 17, 1995, Ser. No. 46,537
Term of patent 14 years
U.S. Cl. D6—500



377,284
COMBINED TOILET PAPER AND MOIST TOWELETTE DISPENSER
Kathryn C. Farrow, 5519 Ventnor La., Springfield, Va. 22151; Grace C. Cleary, 317 Lyndale Dr., Hartsville, S.C. 29550, and Sarah C. Steffee, 1252 Granite La., Loganville, Ga. 30249
Filed May 3, 1995, Ser. No. 38,312
Term of patent 14 years
U.S. Cl. D6—519



377,285
BATH TOWEL RACK AND BATHING ACCESSORY HOLDER
Jarvis D. Lynch, and Pauline M. Lynch, both of 7139 Prestwick Ct., University Park, Fla. 34201
Filed May 15, 1995, Ser. No. 39,273
Term of patent 14 years
U.S. Cl. D6—524



377,286
SHOWER CADDY
Raul Munoz, Chicago, Ill., assignor to Soltz, Inc., Chicago, Ill.
Filed Dec. 26, 1995, Ser. No. 48,346
Term of patent 14 years
U.S. Cl. D6—525



377,287
WINDOW BLIND PULL
Scott I. Biba, Mazomanie, Wis., assignor to Springs Window Fashions Division, Inc., Middleton, Wis.
Filed Jul. 17, 1995, Ser. No. 41,548
Term of patent 14 years
U.S. Cl. D6—581



377,288
VIDEO CARTRIDGE/CD CONTAINER
Craig Jackson, 195 Berry St., Hackensack, N.J. 07601
Filed Feb. 24, 1995, Ser. No. 35,362
Term of patent 14 years
U.S. Cl. D6—632



377,289
HOUSING FOR A BEVERAGE DISPENSER
William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 5, 1995, Ser. No. 39,736
Term of patent 14 years
U.S. Cl. D7—301



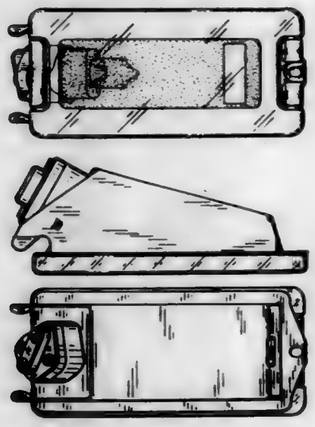
377,290
ELECTRIC COFFEE MAKER
Philippe Saltet, Chateaufort, France, assignor to Moulinex S.A., Paris, France
Filed Aug. 16, 1995, Ser. No. 42,747
Claims priority, application France, Feb. 16, 1995, 95 0934
Term of patent 14 years
U.S. Cl. D7—309



377,291
PITCHER
Richard B. Ahern, Jr., Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 10, 1995, Ser. No. 42,458
Term of patent 14 years
U.S. Cl. D7—319



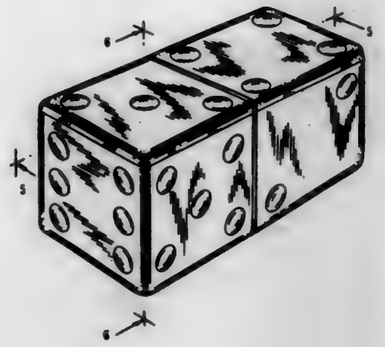
377,292
OVEN LAMP
Dieter Henrici, Arnsberg, Germany, assignor to Brokelmann, Jaeger & Busse, GmbH & Co., Arnsberg, Germany
Filed Aug. 14, 1995, Ser. No. 42,582
Claims priority, application WIPO, Mar. 22, 1995, DM/032494
Term of patent 14 years
U.S. Cl. D7—348



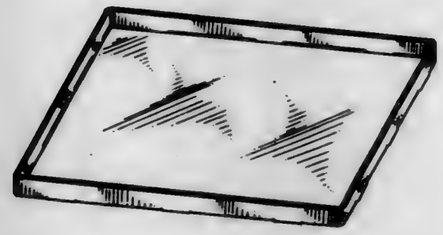
377,293
COMBINED TUMBLER WITH LID
Wayne D. Husted, 1953 Powell St., San Francisco, Calif. 94133
Filed Jan. 29, 1996, Ser. No. 49,562
Term of patent 14 years
U.S. Cl. D7—510



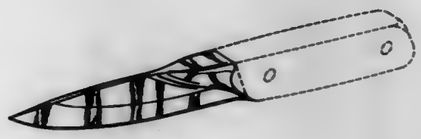
377,295
INSULATING CONTAINER
Louis Dionisio, 916 S. 5th St., Lindenhurst, N.Y. 11757
Filed Nov. 29, 1995, Ser. No. 47,229
Term of patent 14 years
U.S. Cl. D7—606



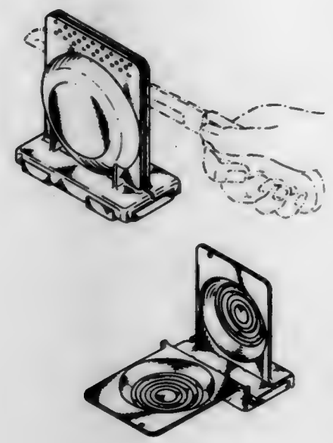
377,294
ELONGATED OVENABLE FOOD TRAY
Beth A. Brady, Pittsburgh, Pa., assignor to Package Products, Inc., Pittsburgh, Pa.
Filed Oct. 10, 1995, Ser. No. 45,881
Term of patent 14 years
U.S. Cl. D7—654



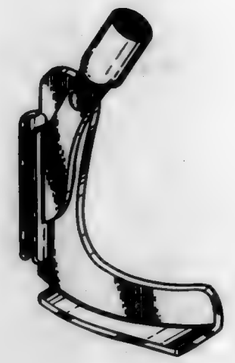
377,296
PARING KNIFE
Beverly C. Roberts, 3086 318th St., Truro, Iowa 50257
Filed Nov. 9, 1995, Ser. No. 46,226
Term of patent 14 years
U.S. Cl. D7—649



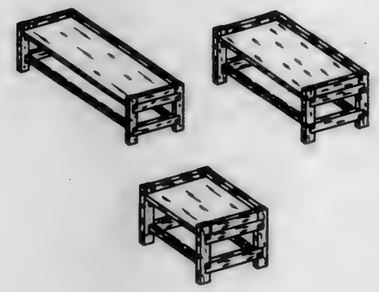
377,297
BAGEL, ROLL, AND BUN HOLDER DEVICE
Stephen M. Thompson, 10710 Esther Ave., Los Angeles, Calif. 90064
Filed Oct. 10, 1995, Ser. No. 45,113
Term of patent 14 years
U.S. Cl. D7—673



377,299
TREE SPROUT REMOVER
James A. McGill, 101E Kimble, Springfield, Ill. 62703-4625
Filed Mar. 17, 1995, Ser. No. 36,320
Term of patent 14 years
U.S. Cl. D8—1



377,298
BOTTLE RACK
D. Bruce Campbell, 128 Ashford Dr., Mount Pearl, Newfoundland, Canada
Filed Apr. 24, 1995, Ser. No. 38,192
Claims priority, application Canada, Mar. 7, 1995, 1995-0513
Term of patent 14 years
U.S. Cl. D7—708



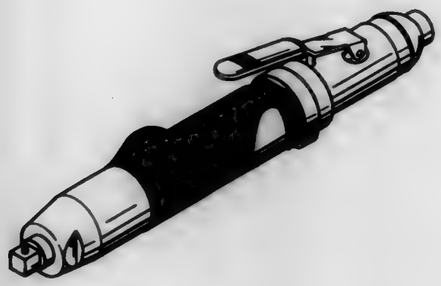
377,300
TWO-HANDLED SHOVEL
Hans P. Fredrick von Essen, 76 Christopher St., Providence, R.I. 02904
Filed Sep. 18, 1995, Ser. No. 44,133
Term of patent 14 years
U.S. Cl. D8—10



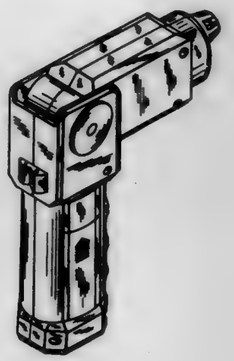
377,301
NAILING TOOL
Jean-Paul Dion, 990, Ste-Thérèse, Québec, Québec, Canada
Continuation-in-part of Ser. No. 22,786, May 12, 1994, abandoned. This application Aug. 15, 1995, Ser. No. 42,699
Term of patent 14 years
U.S. Cl. D8—51



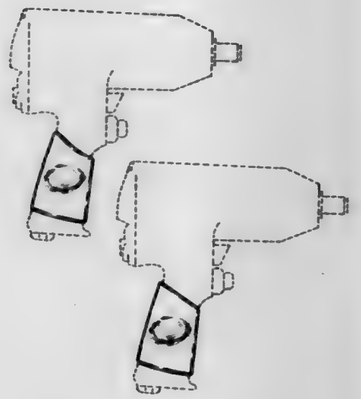
377,302
STRAIGHT-HANDLE PULSE TOOL
Yutaka Kanzaki, New Hartford; Joseph Greshens, Clinton, and Robert Stenkiewycz, Hamilton, all of N.Y., assignors to Chicago Pneumatic Tool Company, Utica, N.Y.
Filed May 11, 1995, Ser. No. 38,653
Term of patent 14 years
U.S. Cl. D8—61



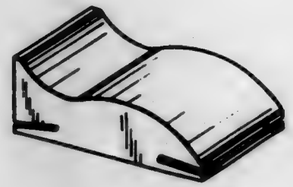
377,303
ADJUSTABLE HAND DRILL
Dietmar Nagel, Chester, N.J., assignor to Axrak-Hanway International, Inc., N.Y.
Filed Jul. 14, 1995, Ser. No. 41,456
Term of patent 14 years
U.S. Cl. D8—68



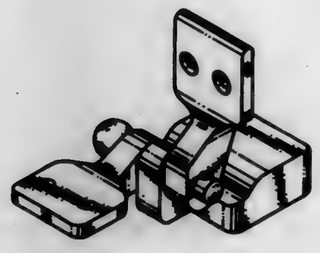
377,304
RESILIENT GRIP SLEEVE FOR AN AIR TOOL
Aaron G. Hogue, and Patrick L. Hogue, both of Atascadero, Calif., assignors to Hogue Grips, Atascadero, Calif.
Filed Dec. 27, 1995, Ser. No. 48,379
Term of patent 14 years
U.S. Cl. D8—70



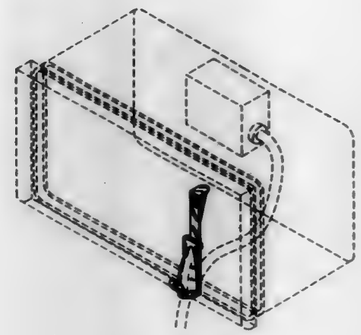
377,305
COMBINATION SANDING BLOCK AND SQUEEGEE
Jeffrey Bliss, 110 Silver St., North Granby, Conn. 06060
Filed Oct. 20, 1995, Ser. No. 46,668
Term of patent 14 years
U.S. Cl. D8—90



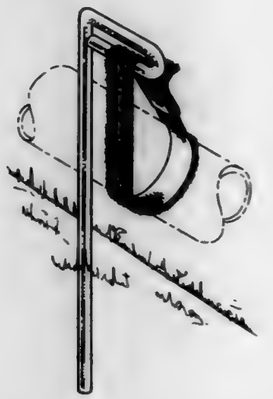
377,306
QUICK-RELEASE HINGE FOR TOILET SEAT
Dennis Decker, 19127 Roosevelt Ave., Port Charlotte, Fla. 33954
Filed Jun. 22, 1995, Ser. No. 40,499
Term of patent 14 years
U.S. Cl. D8—326



377,307
POWER CORD PORT
Anthony J. DiBiagio, Granger, Ind., assignor to Holiday Rambler, L.L.C., Wakarusa, Ind.
Filed Feb. 8, 1996, Ser. No. 50,887
Term of patent 14 years
U.S. Cl. D8—356



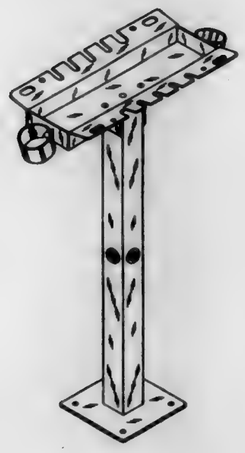
377,308
PIPE RETAINER
James E. McNamara, 521 Reading Dr., Springfield, Ohio 45505, and Joseph A. Gibson, 2457 Mechanicsburg Rd., both of Springfield, Ohio 45503
Filed Oct. 17, 1995, Ser. No. 45,347
Term of patent 14 years
U.S. Cl. D8—370



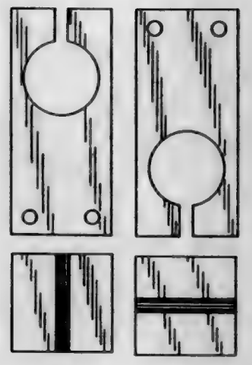
377,309
OVER DOOR HOOK
James A. Hofman, Warrenville, Ill., assignor to Solix, Inc., Chicago, Ill.
Filed Dec. 22, 1995, Ser. No. 48,852
Term of patent 14 years
U.S. Cl. D8—372



377,310
TOOL HOLDER
Jim C. Crump, Jr., 217 Leandro St., Anaheim Hills, Calif. 92807
Continuation-in-part of Ser. No. 43,762, Sep. 12, 1995. This application Nov. 21, 1995, Ser. No. 46,924
Term of patent 14 years
U.S. Cl. D8—373



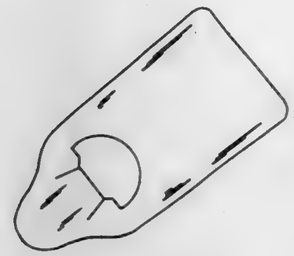
377,311
MUSICAL INSTRUMENT BRANCHING RACK CLAMP
Thomas R. Stiegler, 261 Sycamore La., Islandia, N.Y. 11722
Filed Aug. 23, 1995, Ser. No. 43,004
Term of patent 14 years
U.S. Cl. D8—382



377,312
PADDED EDGE COVERING FOR FURNITURE
Michael A. Ramaldes, 16 Laurie Dr., Ft. Walton Beach, Fla. 32548
Filed Aug. 31, 1995, Ser. No. 43,302
Term of patent 14 years
U.S. Cl. D8—403



377,313
BOTTLE CARRIER
Raymond P. Tipp, P.O. Box 3778, Missoula, Mont. 59806
Filed Jan. 23, 1996, Ser. No. 49,333
Term of patent 14 years
U.S. Cl. D9—434



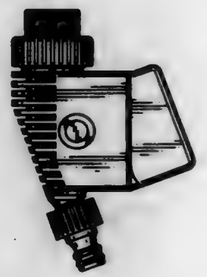
377,314
WRIST WATCH
Ryusuke Morisi, and Akihiro Sugisawa, both of Fussa, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1995, Ser. No. 46,015
Term of patent 14 years
U.S. Cl. D10—38



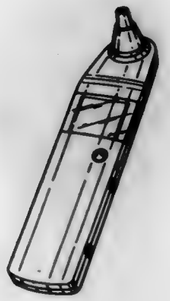
377,315
WRIST WATCH
Ryusuke Morisi; Akihiro Sugisawa, both of Fussa, and Takashi Nikaido, Ome, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 20, 1995, Ser. No. 46,879
Term of patent 14 years
U.S. Cl. D10—38



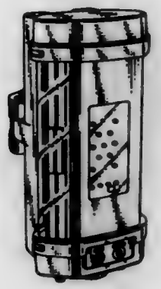
377,316
CASE FOR IRRIGATION TIMER
Gianfranco Roman, Paiano, and Claudio Pasut, Pordenone, both of Italy, assignors to Claber S.p.A., Veneto, Italy
Filed Nov. 27, 1995, Ser. No. 47,836
Claims priority, application Italy, May 30, 1995, MI95O8385
Term of patent 14 years
U.S. Cl. D10—40



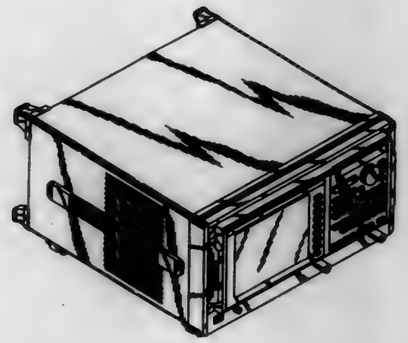
377,317
THERMOMETER
Peter Hartwein, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany
Filed Jan. 30, 1996, Ser. No. 49,729
Claims priority, application Germany, Jul. 31, 1995, M 95 06 024.3
Term of patent 14 years
U.S. Cl. D10—57



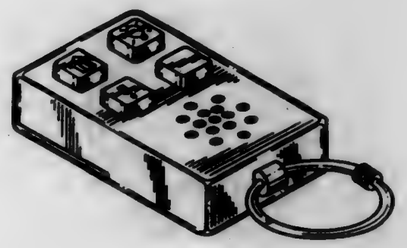
377,318
SURVEYING APPARATUS THAT RECEIVES A LASER BEAM
Mitsuo Ishii, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan
Filed Dec. 14, 1995, Ser. No. 48,776
Term of patent 14 years
U.S. Cl. D10—66



377,319
NETWORK ANALYZER
Hiroshi Amano, Koonom, and Chiharu Arai, Hanyu, both of Japan, assignors to Advantest Corporation, Tokyo, Japan
Filed Dec. 12, 1995, Ser. No. 47,760
Claims priority, application Japan, Jun. 14, 1995, 7-16977
Term of patent 14 years
U.S. Cl. D10—75



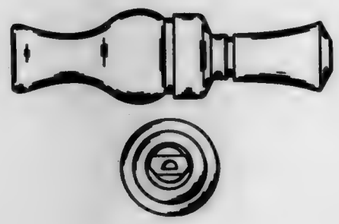
377,320
REMOTE CONTROL UNIT FOR AUTOMATIC DOOR OPENER
Delores McGuire, 412 McCallie Dr., Tunnel Hill, Ga. 30755
Filed Nov. 15, 1995, Ser. No. 46,464
Term of patent 14 years
U.S. Cl. D10—104



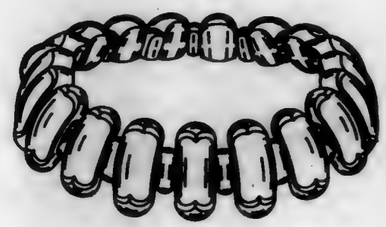
377,321
THERMAL DETECTOR
Toshikazu Tsunizawa, Hachioji, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 6, 1995, Ser. No. 45,836
Term of patent 14 years
U.S. Cl. D10—106



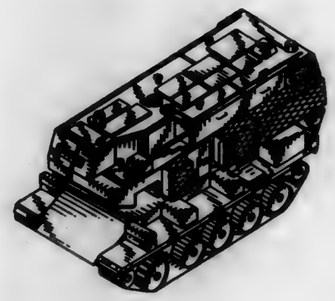
377,322
DUCK CALL
Roy A. Rhodes, Germantown, Tenn., assignor to Huntin Buddy Industries, L.L.C., Germantown, Tenn.
Filed Mar. 25, 1996, Ser. No. 52,138
Term of patent 14 years
U.S. Cl. D10—119



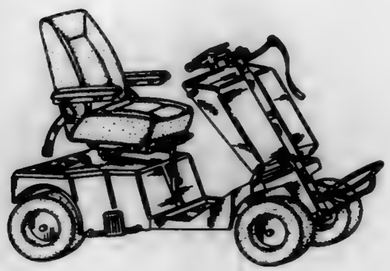
377,323
BRACELET
Paolo Bargeri, Rome, Italy, assignor to Bulgari S.p.A., Rome, Italy
Filed Sep. 29, 1995, Ser. No. 44,678
Claims priority, application WIPO, Apr. 18, 1995, DM/032.784
Term of patent 14 years
U.S. Cl. D11—6



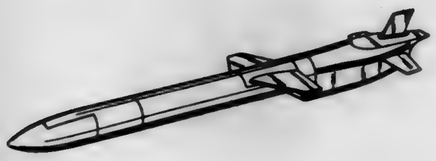
377,324
COMBINED FIREFIGHTING VEHICLE AND TURRET
Oldrich Pejcoch, Stary Jicin, and Petr Ondrejik, Novy Jicin, both of Czech Rep., assignors to Vojensky Opravarensky, Novy Jicin, Czech Rep.
Filed Jan. 27, 1993, Ser. No. 4,153
Term of patent 14 years
U.S. Cl. D12—12



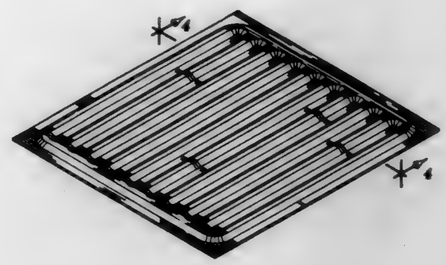
377,325
GOLFING VEHICLE
Fred C. Brown, St. Albans, England, and Maniel D. Marquardt, Littleton, Colo., assignors to Electric Mobility Corporation, Sewell, N.J.
Filed Mar. 20, 1995, Ser. No. 36,444
Term of patent 14 years
U.S. Cl. D12—16



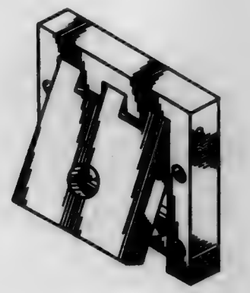
377,326
TACTICAL AIRCRAFT DECOY (TAD)
Stephen P. Grossman, El Segundo; Richard L. Ranes, Simi Valley; Perry B. Peterson, Newberry Park, and Bernaby S. Weinfan, Long Beach, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Aug. 31, 1995, Ser. No. 43,284
Term of patent 14 years
U.S. Cl. D12—16.1



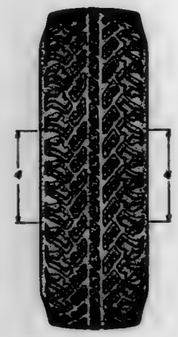
377,327
RAILCAR DOOR
Thomas M. Foster, Colchester, Ill., assignor to Composite Manufacturing & Research, Inc., Allen, Tex.
Filed Dec. 4, 1995, Ser. No. 47,399
Term of patent 14 years
U.S. Cl. D12—43



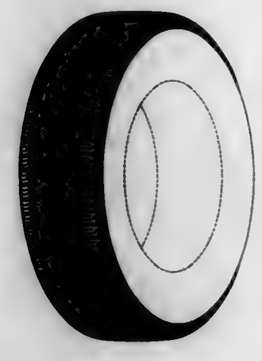
377,328
CAMBER ADJUSTMENT DEVICE FOR A WHEELCHAIR WHEEL
Phillip G. Stoddart, 852 Linda Ave., Pocatello, Id. 83201
Filed Sep. 26, 1995, Ser. No. 44,553
Term of patent 14 years
U.S. Cl. D12—133



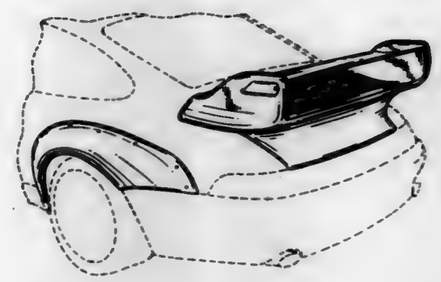
377,329
AUTOMOBILE TIRE
Koyo Hamamoto, Hiratsuka; Hiroshi Tokizaki, and Izumi Kuramochi, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 28, 1995, Ser. No. 40,840
Claims priority, application Japan, Feb. 27, 1995, 7-4824
Term of patent 14 years
U.S. Cl. D12—147



377,330
TIRE TREAD
Hiroki Kakegawa, Kodaira, Japan; James G. Gaspodin, Akron, and Francis J. Byrne, Olmstead, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
Filed May 16, 1996, Ser. No. 54,554
Term of patent 14 years
U.S. Cl. D12—147



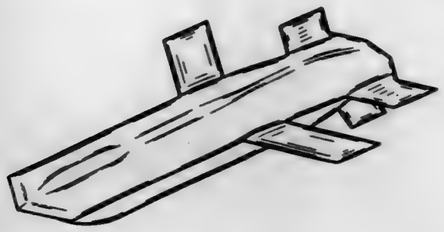
377,331
SET OF COMPONENTS FOR A MOTOR VEHICLE COMPRISING A PAIR OF FENDER PANELS AND A SPOILER
Stephen Markett, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed May 11, 1995, Ser. No. 38,765
Claims priority, application Germany, Nov. 11, 1994, M9408796.2
Term of patent 14 years
U.S. Cl. D12—181



377,332
VEHICLE WHEEL RIM PROTECTOR
Raymond Cruz, III, 24850-Hancock-Ave. #Q 285, Murrieta, Calif. 92562
Filed Aug. 24, 1995, Ser. No. 43,065
Term of patent 14 years
U.S. Cl. D12—213



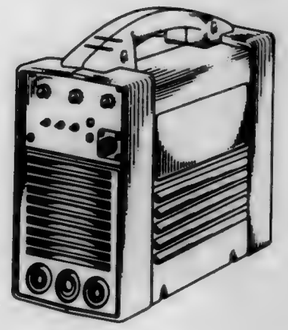
377,333
AIRCRAFT
Yu-Ping Liu, Rolling Hills; Haig Asdurian, Ceres, and Stephen R. Smith, Palos Verdes Estates, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Jun. 6, 1995, Ser. No. 39,831
Term of patent 14 years
U.S. Cl. D12—319



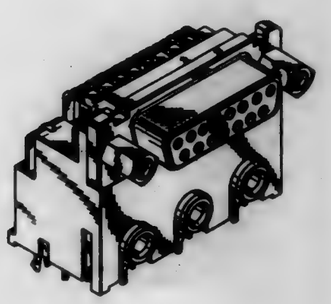
377,334
BICYCLE CARRIER
Raywood C. Weller, 14149 Calle Contento, Victorville, Calif. 92392
Filed Aug. 22, 1995, Ser. No. 42,985
Term of patent 14 years
U.S. Cl. D12—408



377,335
PORTABLE POWER SUPPLY UNIT WITH AC-DC CONVERTER
Masao Katooka, Kawanishi; Toru Arai, Kamigyo-ku; Shigeru Okamoto, Hirakata; Kenzo Deujo, Soraku-gun, and Masaharu Tanaka, Osaka, all of Japan, assignors to Sanshin Electric Manufacturing Company, Limited, Osaka, Japan
Filed Jun. 1, 1995, Ser. No. 39,633
Claims priority, application Japan, Dec. 6, 1994, 6-37410
Term of patent 14 years
U.S. Cl. D13—110



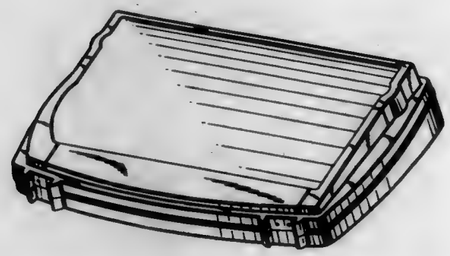
377,336
STACKED CONNECTOR
Haw-Chan Tan, and Frank C. Ma, both of Diamond Bar, Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan
Filed Dec. 8, 1995, Ser. No. 47,606
Term of patent 14 years
U.S. Cl. D13—147



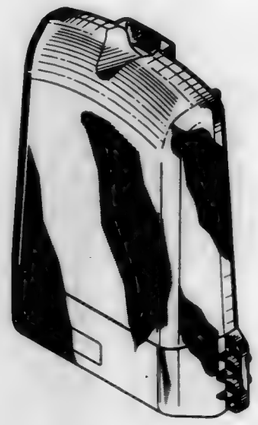
377,337
ACTUATOR FOR A PUSHBUTTON ELECTRICAL SWITCH
Maurice Schaeffer, Strasbourg, France, assignor to Baco Constructions Electriques - Anct. Baumgarten S.A., France
Filed Jan. 13, 1992, Ser. No. 820,847
Term of patent 14 years
U.S. Cl. D13—171



377,338
COMBINED CONTROL CONSOLE CASE AND COVER
Timothy W. Turienki, Garland, Tex., assignor to Vari-Lite, Inc., Dallas, Tex.
Filed Aug. 18, 1994, Ser. No. 27,320
Term of patent 14 years
U.S. Cl. D13—184



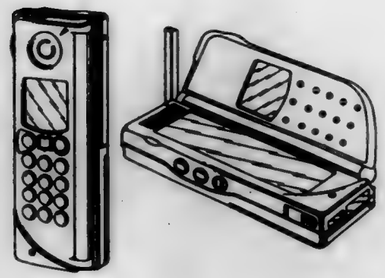
377,339
ELECTRONICS ENCLOSURE
Michael S. Berueche, Lake In The Hills, and Michael R. Lenz, Cary, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 30, 1995, Ser. No. 40,969
Term of patent 14 years
U.S. Cl. D13—184



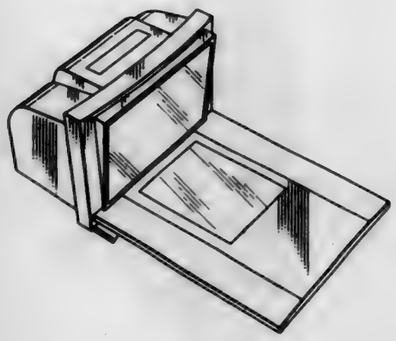
377,340
COMPUTER WITH PRINTER
Richard K. Brenner, Fanwood, N.J.; Mark S. Kimbrough, Austin, Tex.; Philip Leung, Newcastle, England; Robert H. Garrett, and Pearce Jones, both of Austin, Tex., assignors to Brother International Corporation, Somerset, N.J.
Filed Jan. 16, 1996, Ser. No. 49,844
Term of patent 14 years
U.S. Cl. D14—100



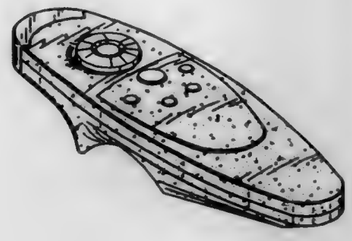
377,341
PORTABLE COMMUNICATION TERMINAL
Fumihito Imai; Michio Nagai, and Keigo Kawasaki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Feb. 15, 1996, Ser. No. 58,342
Claims priority, application Japan, Aug. 15, 1995, 7-23847
Term of patent 14 years
U.S. Cl. D14—100



377,342
DUAL APERTURE OPTICAL BAR CODE SCANNER
Heng-Juan Lin, Lawrenceville, Ga., assignor to AT&T Global Information Solutions Company, Dayton, Ohio
Filed Nov. 30, 1995, Ser. No. 47,264
Term of patent 14 years
U.S. Cl. D14—107



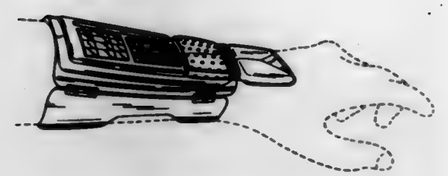
377,343
MOUSE
James D. Tickle, Thousand Oaks, Calif., assignor to Interlink Electronics, Inc., Camarillo, Calif.
Filed Aug. 1, 1995, Ser. No. 42,113
Term of patent 14 years
U.S. Cl. D14—114



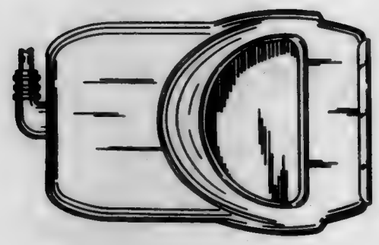
377,344
OPTICAL DISK CARTRIDGE
Takuzo Yamamoto, Sagamihara, and Nobuhiro Yamane, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Division of Ser. No. 35,675, Feb. 28, 1995, which is a division of Ser. No. 23,643, May 27, 1994. This application Aug. 24, 1995, Ser. No. 43,247
Claims priority, application Japan, Nov. 30, 1993, 5-36142; Nov. 30, 1993, 5-36143; Nov. 30, 1993, 5-36145
Term of patent 14 years
U.S. Cl. D14—114



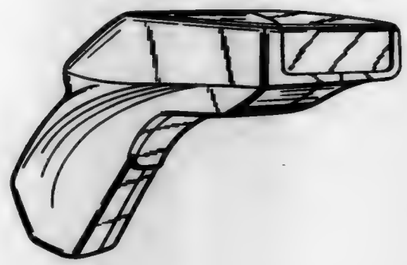
377,345
OPTICAL SCANNER
James H. Karlin, Fairport, N.Y., assignor to PSC Inc., Webster, N.Y.
Continuation of Ser. No. 32,970, Jan. 3, 1995. This application Jul. 3, 1995, Ser. No. 41,623
Term of patent 14 years
U.S. Cl. D14—116



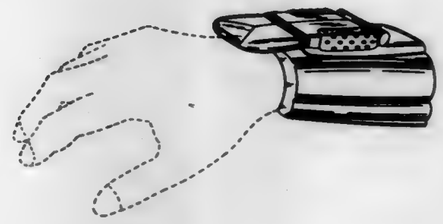
377,346
OPTICAL SCANNER
James H. Karlin, Fairport, N.Y., assignor to PSC Inc., Webster, N.Y.
Continuation of Ser. No. 34,925, Jan. 3, 1995. This application Jul. 3, 1995, Ser. No. 41,687
Term of patent 14 years
U.S. Cl. D14—116



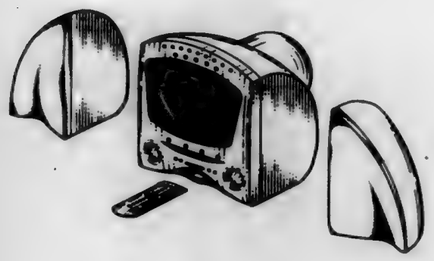
377,347
OPTICAL SCANNER
James H. Karlin, Fairport, N.Y., assignor to PSC Inc., Webster, N.Y.
Continuation of Ser. No. 33,018, Jan. 3, 1995. This application Jul. 3, 1995, Ser. No. 41,608
Term of patent 14 years
U.S. Cl. D14—116



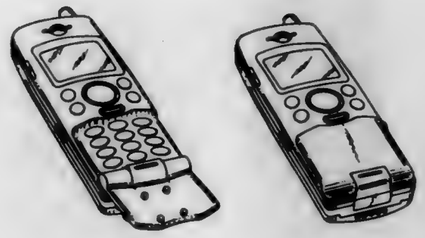
377,348
OPTICAL SCANNER
James H. Karlin, Fairport, N.Y., assignor to PSC Inc., Webster, N.Y.
Continuation of Ser. No. 33,017, Jan. 3, 1995. This application Jul. 3, 1995, Ser. No. 41,689
Term of patent 14 years
U.S. Cl. D14—116



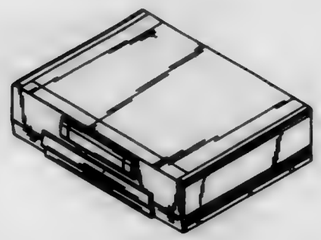
377,349
COMBINED TELEVISION, COMPACT DISC PLAYER AND INTEGRAL REMOTE CONTROL
Thomas E. Rank, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Aug. 23, 1995, Ser. No. 43,632
Term of patent 14 years
U.S. Cl. D14—129



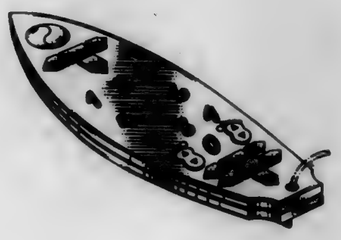
377,351
CELLULAR PHONE
Yuiko Tobi, Yokohama; Ryo Kodama; Yoji Ishii, both of Kamakura, and Hiroshi Ozaki, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 30, 1995, Ser. No. 43,452
Claims priority, application Japan, Mar. 3, 1995, 7-5975
Term of patent 14 years
U.S. Cl. D14—138



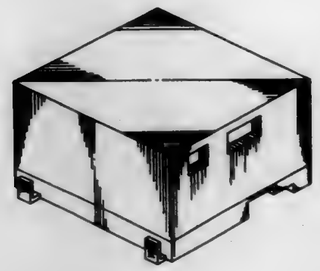
377,350
DIGITAL VIDEO CASSETTE RECORDER
Takuya Niitsu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jul. 18, 1995, Ser. No. 41,583
Term of patent 14 years
U.S. Cl. D14—135



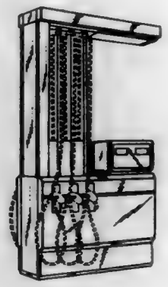
377,352
UNIVERSAL ELECTRONIC REMOTE CONTROL
James W. Bird, 2746 Bittersut Cir., Simi Valley, Calif. 93065, and Michael E. Bird, 835 W. Mendocino, Stockton, Calif. 95204
Filed Jul. 31, 1995, Ser. No. 42,874
Term of patent 14 years
U.S. Cl. D14—218



377,353
ELECTROACOUSTIC TRANSDUCER
Kazuhige Tajima, and Yoshio Imahori, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka, Japan
Filed Apr. 30, 1996, Ser. No. 53,800
Claims priority, application Japan, Oct. 31, 1995, 7-32990
Term of patent 14 years
U.S. Cl. D14—222



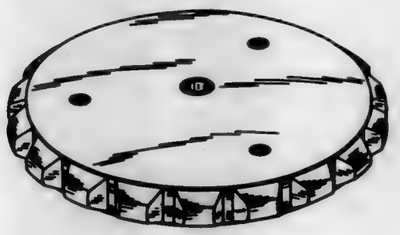
377,355
MAIN BODY OF A FUEL DISPENSER
Hiyoshi Tatsuno, Tokyo, Japan, assignor to Tatsuno Corporation, Tokyo, Japan
Filed Feb. 23, 1995, Ser. No. 35,264
Claims priority, application Japan, Aug. 29, 1994, 6-26069
Term of patent 14 years
U.S. Cl. D15—7



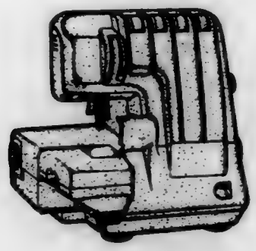
377,354
PORTABLE TELEPHONE HANDSET
Michael J. Nuttall, Portola Valley; Matthew D. Rohrbach, San Francisco, both of Calif.; John H. Schaffeld, New Vernon, N.J.; Lee W. Tan, Singapore, Singapore, and Steven M. Wheatley, Morristown, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Jan. 4, 1995, Ser. No. 33,837
The portion of the term of this patent subsequent to Nov. 19, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—248



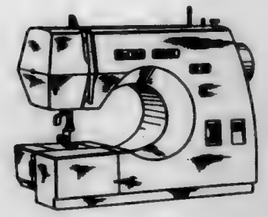
377,356
PLANTER CLOSING WHEEL
Mark W. Bruns, Gibbon, Minn., assignor to May-Wes Manufacturing, Inc., Gibbon, Minn.
Filed Feb. 3, 1995, Ser. No. 34,405
Term of patent 14 years
U.S. Cl. D15—28



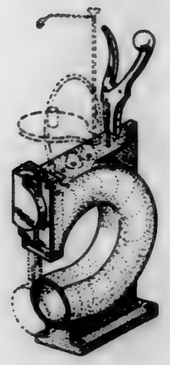
377,357
OVERLOCK SEWING MACHINE
Hsien-Chang Tzeng, No. 206-7, Sec. 1, Guo Guang Road, Da Li City, Taichung Hsien, Taiwan
Filed Jun. 23, 1995, Ser. No. 40,692
Term of patent 14 years
U.S. Cl. D15—69



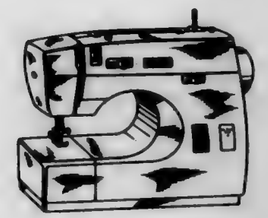
377,359
SEWING MACHINE
Don M.-C. Chung, and Robert S. Turnbull, both of Taichung, Taiwan, assignors to The Singer Company N.V., Curaco, Netherlands
Filed Jun. 16, 1995, Ser. No. 40,366
Term of patent 14 years
U.S. Cl. D15—70



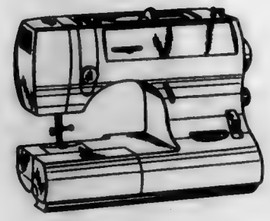
377,358
COMBINED HOUSING AND OPERATIVE HANDLE FOR A HAND-OPERATED SEWING MACHINE
Dennis J. Tippmann, Sr., New Haven, Ind., assignor to Tippmann Pneumatics, Inc., Fort Wayne, Ind.
Filed Nov. 6, 1995, Ser. No. 46,832
Term of patent 14 years
U.S. Cl. D15—69



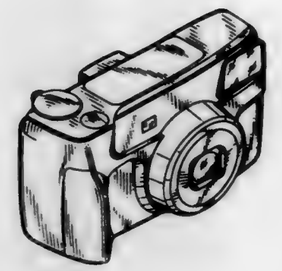
377,360
SEWING MACHINE
Don M.-C. Chung, and Robert S. Turnbull, both of Taichung, Taiwan, assignors to The Singer Company N.V., Curaco, Netherlands
Filed Jun. 16, 1995, Ser. No. 40,367
Term of patent 14 years
U.S. Cl. D15—70



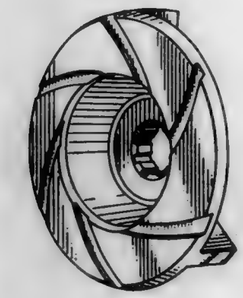
377,361
SEWING MACHINE
Don M.-C. Chung, and Robert S. Turnbull, both of Taichung, Taiwan, assignors to The Singer Company N.V., Curaco, Netherlands Antilles
Filed Jun. 16, 1995, Ser. No. 40,374
Term of patent 14 years
U.S. Cl. D15—70



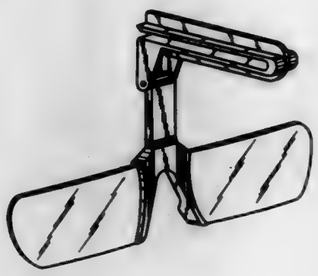
377,363
CAMERA
Makoto Inozuki, and Hiroyuki Sakai, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 4, 1995, Ser. No. 47,398
Claims priority, application Japan, Jun. 2, 1995, 7-15844
Term of patent 14 years
U.S. Cl. D16—209



377,362
DISCHARGE ROTOR FOR MEAT-EMULSIFYING MACHINE
Vladan Mihailovic, Long Grove, Ill., assignor to 2 M Tool Co., Inc., Chicago, Ill.
Filed Apr. 15, 1996, Ser. No. 53,117
Term of patent 14 years
U.S. Cl. D15—126



377,364
CLIP-ON GLASSES
Alan J. Dingee, Coral Springs, Fla., assignor to Premier Optics, L.C., Coral Springs, Fla.
Filed Jan. 11, 1996, Ser. No. 48,862
Term of patent 14 years
U.S. Cl. D16—304



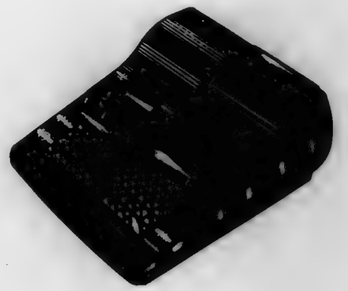
377,365
EYEWEAR FRONT
Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Oct. 20, 1995, Ser. No. 46,649
Term of patent 14 years
U.S. Cl. D16—330



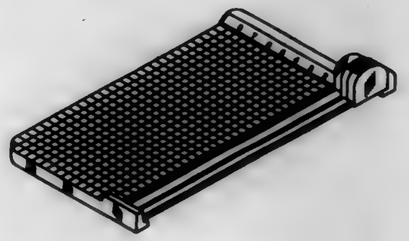
377,366
CASH REGISTER
Maki Sato, Yokohama, Japan, assignor to Kabushiki Kaisha TEC, Shizuoka, Japan
Filed Oct. 2, 1995, Ser. No. 44,866
Claims priority, application Japan, Apr. 18, 1995, 7-10730
Term of patent 14 years
U.S. Cl. D18—4



377,367
ELECTRONIC CASH REGISTER
Koichi Sato, Hachioji, and Akihiko Miyahara, Kunitachi, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 22, 1996, Ser. No. 53,427
Term of patent 14 years
U.S. Cl. D18—4



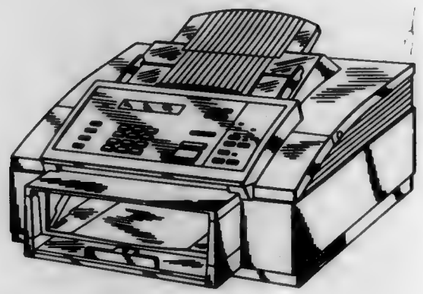
377,368
ROTARY PAPER TRIMMER
Michael Rellinger, Chicago, Ill., assignor to Quartet Manufacturing Company, Skokie, Ill.
Filed Jun. 30, 1995, Ser. No. 40,965
Term of patent 14 years
U.S. Cl. D18—34



377,369
PRINTER
Shinya Kogoh; Hideji Kobashi, both of Yokohama, Japan; William T. Clark, West Henrietta; Mark S. Penke, West Henrietta, N.Y.; Jacob W. Patin, Fairport, N.Y., and Makoto Kenmochi, Yokohama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Jul. 13, 1995, Ser. No. 41,430
Claims priority, application Japan, Jan. 17, 1995, 7-490
The portion of the term of this patent subsequent to Nov. 26, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—53



377,370
COMBINED INK-JET PRINTER, FACSIMILE AND COPIER
Victor T. Escobedo, and David W. Leong, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sep. 27, 1995, Ser. No. 44,611
Term of patent 14 years
U.S. Cl. D18—55



377,371
INK TANK FOR PRINTER
Hiroyuki Tokuda; Masanori Takenouchi, both of Yokohama; Yasuo Kotaki, Machida, and Yuji Hamanaki, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 22, 1995, Ser. No. 35,180
Claims priority, application Japan, Aug. 23, 1994, 6-25194
The portion of the term of this patent subsequent to Dec. 3, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—56



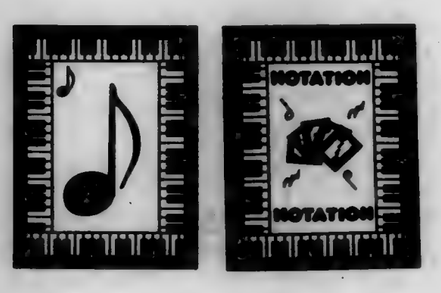
377,372
PEEL-OFF COUPON FOR ACCOUNTING AND SECURITY TRACKING SHEET
Kenneth Thompson, 2368 Eastman Ave., Suite 3, Ventura, Calif. 93003
Filed Feb. 15, 1994, Ser. No. 18,762
Term of patent 14 years
U.S. Cl. D19—1



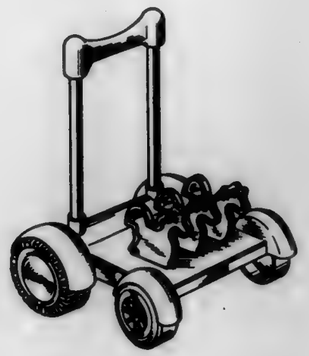
377,373
LOTTERY NUMBER SELECTOR CAPABLE OF ENCASING A BUSINESS CARD
Edward J. Rebish, 17964 Alpine Cir., Strongsville, Ohio 44136
Filed Feb. 12, 1996, Ser. No. 50,226
Term of patent 14 years
U.S. Cl. D20—40



377,374
DECK OF CARDS
Robert L. Weston, 422 Starboard Way, Columbia, S.C. 29209, assignor to Robert Lynwood Weston, Columbia, S.C.
Filed Nov. 28, 1994, Ser. No. 29,517
Term of patent 14 years
U.S. Cl. D21—42



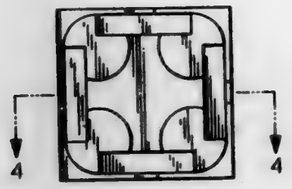
377,375
BABY CART
Pao-Yu Liu, 6F., 218, Ta-Tung Rd., Sec. 3, Shi-Chi Chen, Taipei Hsien, Taiwan
Filed Sep. 7, 1995, Ser. No. 43,584
Term of patent 14 years
U.S. Cl. D21—75



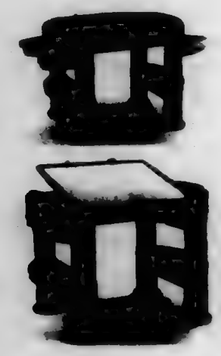
377,376
CHARACTER SPINNING TOP
George Castillo, 2521 San Terisi, Mission Viejo, Calif. 92692
Filed Nov. 27, 1995, Ser. No. 47,130
Term of patent 14 years
U.S. Cl. D21—95



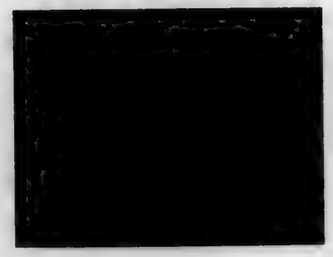
377,377
TOY CONSTRUCTION BLOCK WITH SYMMETRICALLY ARRANGED T-SLOTS
Kenneth P. Glynn, Raritan Township, Hunterdon County, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.
Filed Dec. 20, 1994, Ser. No. 32,505
Term of patent 14 years
U.S. Cl. D21—108



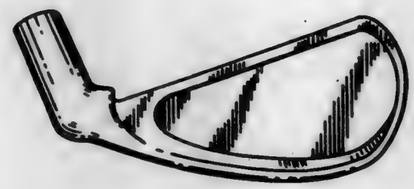
377,378
TOY DESK
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons-Le-Saunier, France
Filed Sep. 13, 1994, Ser. No. 28,355
Claims priority, application WIPO, Mar. 29, 1994, DM/029 171
Term of patent 14 years
U.S. Cl. D21—121



377,379
TOY ANIMAL
Anna Elverlund, Älmhult, Sweden, assignor to Ikea of Sweden AB, Almhult, Sweden
Filed Sep. 26, 1995, Ser. No. 44,536
Claims priority, application WIPO, Apr. 13, 1995, DMA/002869
Term of patent 14 years
U.S. Cl. D21—148



377,380
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238
Filed May 13, 1993, Ser. No. 8,195
Term of patent 14 years
U.S. Cl. D21—220



377,381
GOLF CLUB HEAD
Kunihiko Takahashi, Munakata, and Yuichi Aizawa, Higashikurume, both of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 5, 1996, Ser. No. 48,617
Claims priority, application Japan, Jul. 6, 1995, 7-19417
Term of patent 14 years
U.S. Cl. D21—220



377,382
RETRACTABLE SCUBA BUDDY LINE
Kenneth W. Saunders, Netcong Heights, Bldg. 34 #7, Netcong, N.J. 07857, and Mirael Dourado, 26 Searing Ave., #1, East Newark, N.J. 07029
Filed Feb. 22, 1996, Ser. No. 50,676
Term of patent 14 years
U.S. Cl. D21—236



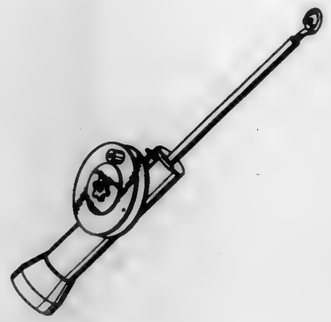
377,383
TURKEY CALL GUN MOUNTING CLIP
Steven A. Morocco, 131 Stoy Rd., Somerset, Pa. 15501
Filed May 22, 1995, Ser. No. 39,385
Term of patent 14 years
U.S. Cl. D22—108



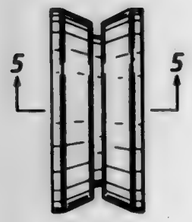
377,384
FISHING LURE
David W. Hill, 3002 W. Madison St., Springfield, Mo. 65802
Filed Aug. 11, 1995, Ser. No. 42,508
Term of patent 14 years
U.S. Cl. D22—133



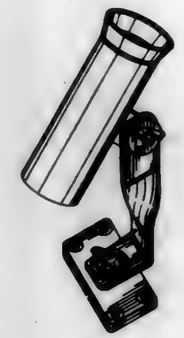
377,385
ICE FISHING ROD
Kim Jennings, 3116 Meadowview, Lot 6, Jackson, Mich. 49201
Filed Dec. 8, 1995, Ser. No. 47,614
Term of patent 14 years
U.S. Cl. D22—138



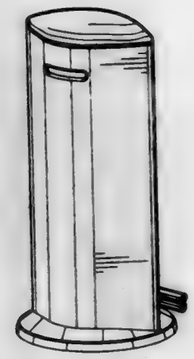
377,386
LINE ROLLER FOR A SPINNING FISHING REEL
Kazuma Yamaguchi, Higashikurume, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Oct. 5, 1995, Ser. No. 45,022
Claims priority, application Japan, Apr. 6, 1995, 7-9565
Term of patent 14 years
U.S. Cl. D22—141



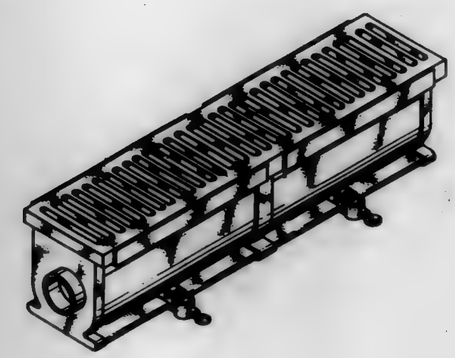
377,387
FISHING ROD SUPPORT
Christy L. Mathewson, 109 Hamlin Ct. North, Longwood, Fla. 32750
Filed Apr. 1, 1996, Ser. No. 52,496
Term of patent 14 years
U.S. Cl. D22—147



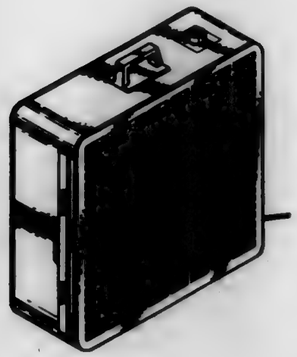
377,388
WATER PURIFIER
Jeffrey A. Weber, Minneapolis, and David J. Emmons, Plymouth, both of Minn., assignors to Recovery Engineering, Inc., Minneapolis, Minn.
Filed Jul. 5, 1995, Ser. No. 41,891
Term of patent 14 years
U.S. Cl. D23—207



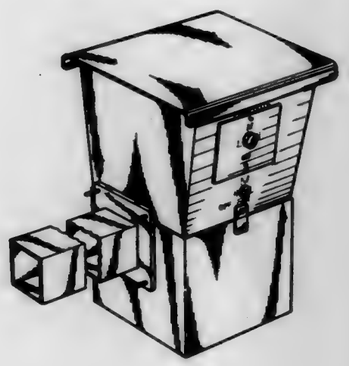
377,389
CHANNEL DRAIN AND SUPPORT BRACKET UNIT
Trevor Phillips, and Robert Babcock, both of 3001 Mission Oaks Blvd., Camarillo, Calif. 93011
Filed Feb. 25, 1994, Ser. No. 19,231
Term of patent 14 years
U.S. Cl. D23—261



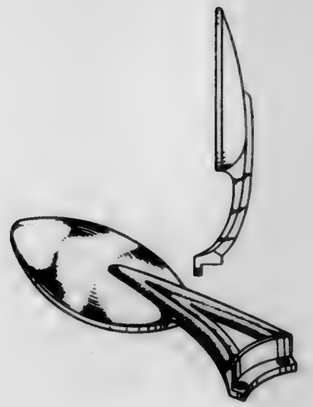
377,390
AIR FILTER HAVING FAN INCORPORATED THEREIN
James V. Ketchum, 506 4th Ave. N., Gladstone, Mich. 49837
Filed May 8, 1995, Ser. No. 38,530
Term of patent 14 years
U.S. Cl. D23—328



377,391
PELLET HOPPER FOR A PELLET-BURNING GRILL
Richard E. Whitehurst, Sr., 1677 N. Gardiner Rd., Prineville, Oreg. 97754
Filed May 30, 1995, Ser. No. 39,431
Term of patent 14 years
U.S. Cl. D23—329



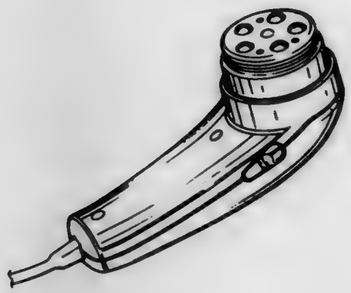
377,392
BLADE HOLDER FOR A CEILING FAN
Chen-Tze Liu, No. 465 Shuei-Yuan Road, Feng-Yuan City, Taichung County, Taiwan
Filed Apr. 2, 1996, Ser. No. 52,672
Term of patent 14 years
U.S. Cl. D23—411



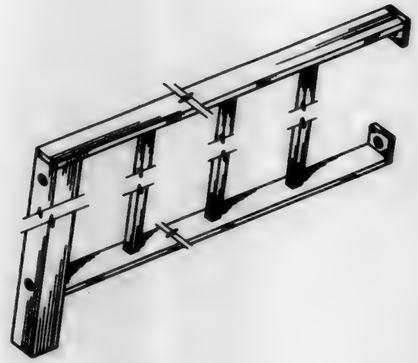
377,393
MEDICAL DIAGNOSTIC ILLUMINATING INSTRUMENT
Bernard Sams, London, United Kingdom, assignor to Gowllands Limited, Croydon, England
Filed Apr. 5, 1995, Ser. No. 37,164
Claims priority, application United Kingdom, Nov. 9, 1994, 2043134
Term of patent 14 years
U.S. Cl. D24—137



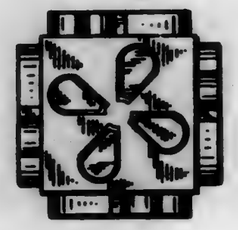
377,394
COMBINED MASSAGING APPLIANCE AND CREAM DISPENSER UNIT
Menahem Tillman, Hofit; Daphne Topaz, and Avraham Topaz, both of Even Yehuda, all of Israel, assignors to T. Top (1994) Ltd., Netanya, Israel
Filed Dec. 22, 1995, Ser. No. 51,315
Term of patent 14 years
U.S. Cl. D24—215



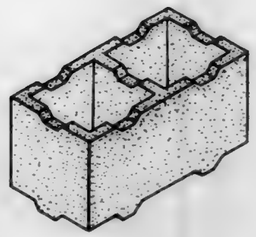
377,395
MODULAR WROUGHT IRON GRID
Frank Vyvoda, P.O. Box 23071, Honolulu, Hi. 96823-3071
Filed Aug. 21, 1995, Ser. No. 42,940
Term of patent 14 years
U.S. Cl. D25—38



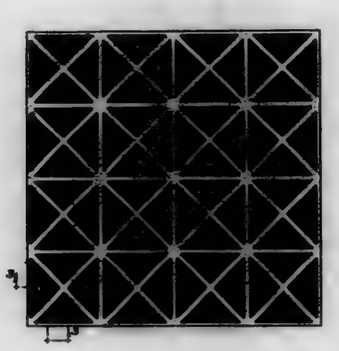
377,396
CONSTRUCTION BLOCK
Jean-Yves Maurel, Pontoise, France, assignor to Edrasco, Juniors, France
Filed Jan. 27, 1995, Ser. No. 34,139
Term of patent 14 years
U.S. Cl. D25—113



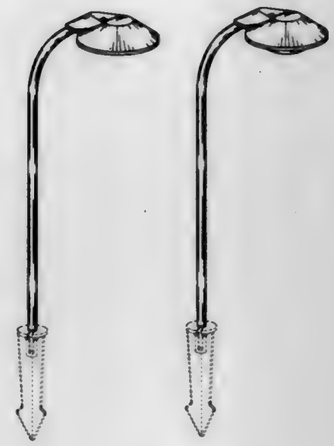
377,397
CINDER BLOCK
Carl E. Craig, 3836 Walnut Ave., Grand Junction, Colo. 81504
Filed Nov. 16, 1995, Ser. No. 46,586
Term of patent 14 years
U.S. Cl. D25—118



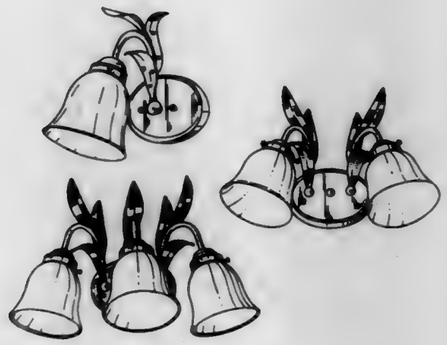
377,398
NON SLIP TILE
John M. Adam, 818 Celestone Rd., Marietta, Ga. 30060
Filed May 26, 1992, Ser. No. 888,527
Term of patent 14 years
U.S. Cl. D25—158



377,399
EXTERIOR LIGHTING FIXTURE
Melissa S. Kay, South Euclid, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio
Filed Mar. 16, 1995, Ser. No. 36,010
Term of patent 14 years
U.S. Cl. D26—68



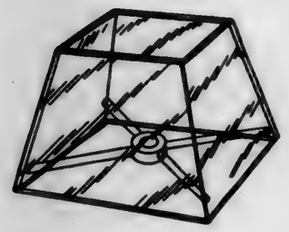
377,400
WALL LIGHT FIXTURE
Stephen E. Blackman, 248 Columbia Turnpike, Florham Park, N.J. 07932
Filed Jan. 23, 1995, Ser. No. 33,900
Term of patent 14 years
U.S. Cl. D26—87



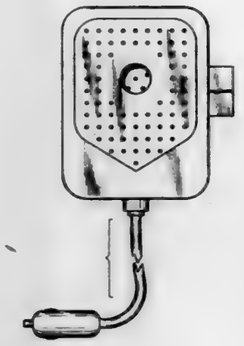
377,401
FLOOR LAMP
Daniel Chelsea, New York, N.Y., assignor to C. N. Burman Co., Paterson, N.J.
Filed Sep. 11, 1995, Ser. No. 43,687
Term of patent 14 years
U.S. Cl. D26—110



377,402
GLASS CHIMNEY FOR AN ILLUMINATION SOURCE
David R. Perkins, Manchester, Mass., assignor to Glass Dimensions, Essex, Mass.
Filed May 3, 1995, Ser. No. 38,393
Term of patent 14 years
U.S. Cl. D26—135



377,403
10-4 VEHICLE CIGARETTE LIGHTER WITH CB MICROPHONE-STYLE HANDSET
Farshad S. Tohidi, 2636 28th St., #5, Santa Monica, Calif. 90405
Filed Mar. 5, 1996, Ser. No. 51,196
Term of patent 14 years
U.S. Cl. D27—148

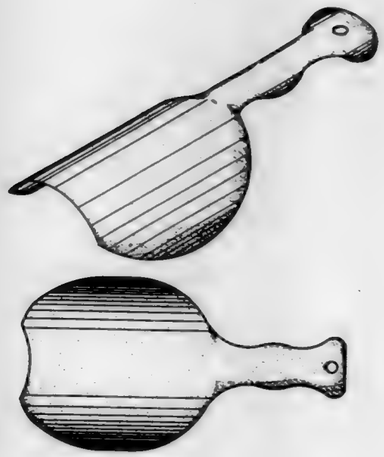


377,404
ELECTRIC SHAVER
Shunji Izumi, Matsumoto, Japan, assignor to Izumi Products Company, Nagano, Japan
Filed May 24, 1995, Ser. No. 39,468
Claims priority, application Japan, Dec. 19, 1994, 6-38821
Term of patent 14 years
U.S. Cl. D28—49

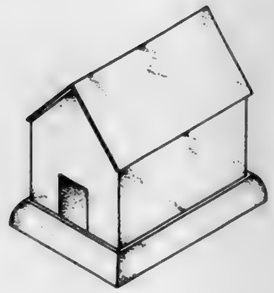


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377,405
HAIR SPRAY FACE SHIELD
Carole A. Morrill, 2884 Tennis Club Dr., Apt. 201, W. Palm Beach, Fla. 33417
Filed Mar. 24, 1995, Ser. No. 36,690
Term of patent 14 years
U.S. Cl. D29—108



377,406
COMBINED FELINE HOUSE AND REMOVABLE BASE
Mary E. McKinstray, R.R. 2, Box 156-A, Mt. Vernon, Ill. 62864
Filed Oct. 24, 1994, Ser. No. 30,203
Term of patent 14 years
U.S. Cl. D30—108



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TO WHOM

PATENTS WERE ISSUED ON THE 14th DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C. Nielsen Company: *See*—
Lu, Daozheng; and Cook, Barry P., 5,594,934, Cl. 455-2.000.
AB Volvo: *See*—
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Abbott, Jay D. Retrofitted door for open luggage rack on passenger busses. 5,593,203, Cl. 296-198.000.
Abbott Laboratories: *See*—
Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,593,896, Cl. 436-500.000.
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Abe, Shunji: *See*—
Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihito; Sato, Yoshiharu; Abe, Shunji; and Soumiya, Toshio, 5,594,717, Cl. 370-232.000.
Abe, Yasushi; and Tasuva, Teishiro, to NSK Ltd. Lubricating mechanism for a linear guide apparatus. 5,593,003, Cl. 184-5.100.
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Abileah, Adiel; VanDerploeg, John; and Xu, Gang, to OIS Optical Imaging Systems, Inc. LCD with a pair of retardation films on one side of normally white liquid crystal layer. 5,594,568, Cl. 349-120.000.
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Adachi, Kazutaka; and Sudo, Hideki, to Nissan Motor Co., Ltd. Current servo amplification/control apparatus and method for reversible DC motor. 5,594,307, Cl. 318-280.000.
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Adams, Jerry L.; and Boehm, Jeffrey C. Imidazole compounds, use and process of making. 5,593,991, Cl. 514-235.200.
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Advanced Cardiovascular Systems, Inc.: *See*—
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Lin, Jonathan; Barsan, Radu; and Sharpe-Geisler, Bradley A., 5,594,687, Cl. 365-185.100.
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Advanced Technology Materials, Inc.: *See*—
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Campbell, Alexander C., 5,593,983, Cl. 514-176.000.
Middelman, Erik; and Zuuring, Pieter H., 5,592,737, Cl. 29-848.000.
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White, Peter D.; and DuMont, Robert, 5,593,634, Cl. 266-217.000.
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Alexander, Claibourne N., III. Leaf and lawn debris collecting apparatus. 5,593,117, Cl. 248-99.000.
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Alexion, Michael. Correction fluids. 5,594,045, Cl. 523-161.000.
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Allen, Dana R.: *See*—
Fast, Bruce B.; and Allen, Dana R., 5,594,814, Cl. 382-254.000.
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Allen, Lance. Baseball tethered ball training apparatus. 5,593,154, Cl. 473-429.000.
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Robards, Timothy G.; Allen, Mark L.; and Baker, Ralph E., 5,594,610, Cl. 361-104.000.
Allergan: *See*—
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Garrison, Millard M.; and Miller, Paul L., 5,593,301, Cl. 431-350.000.
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Peters, Rex B., 5,594,170, Cl. 73-514.290.
Ramaswa, V. R. V.; Fish, Gordon E.; Liebermann, Howard H.; and Silgailis, John, 5,593,513, Cl. 148-304.000.
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Krieder, Robert D.; and Greenly, Cheryl L., 5,592,754, Cl. 34-527.000.
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Murray, Stephen G.; and Smith, Joseph C., 5,593,165, Cl. 277-22.000.
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Koizumi, Hiroyuki, 5,593,223, Cl. 362-255.000.
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Suzuki, Isao; and Amano, Taisei, 5,594,666, Cl. 364-571.010.
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Romanowski, Christopher A.; and Amatsis, Bruno, 5,592,987, Cl. 164-428.000.
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Cato, Raul J.; and Boruchi, Monica K., 5,593,883, Cl. 435-252.100.
Ambu International A/S: *See*—
Kohake, Ole B., 5,593,306, Cl. 434-267.000.
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Williams, Theodore G.; Chap, John P.; Gadberry, Mike; and Covert, William M., 5,592,886, Cl. 108-108.000.
Amdahl Corporation: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,594,899, Cl. 395-600.000.
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Spencer, Kevin C.; Boisrobert, Christine E.; Fisher, Steven A.; Rojak, Patricia A.; and Sabatini, Karen S., 5,593,868, Cl. 435-94.000.
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Epstein, Joseph W.; Birnberg, Gary H.; Walker, Gary E.; Dutia, Mina D.; and Bloom, Jonathan D., 5,594,027, Cl. 514-463.000.
Kerwar, Suresh S.; and Wick, Michael M., 5,593,671, Cl. 424-85.200.
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Rones, James M., 5,592,713, Cl. 15-210.100.
Ameritech Services, Inc.: *See*—
Engel, Joel S., 5,594,938, Cl. 455-6.200.
Amid, Parviz K.: *See*—
Lichtenstein, Irving L.; Turnquist, Carl R.; and Amid, Parviz K., 5,593,441, Cl. 623-11.000.
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Wagnon, Jean; Tonnerre, Bernard; Di Malta, Alain; Roux, Richard; Amiel, Marie-Sophie; and Serradell-Legal, Claudine, 5,594,023, Cl. 514-423.000.
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Komarek, James A.; Padgett, Clarence W.; Amoaus, Robert D.; and Tanner, Scott B., 5,594,696, Cl. 365-208.000.
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Jacoby, Philip; Bauer, Charles W.; Clingman, Scott R.; and Tapp, William T., 5,594,070, Cl. 525-88.000.
Shah, Jyotsna S.; Chen, Samuel W.; Pitman, Theodore B.; and Lane, David J., 5,593,831, Cl. 435-6.000.
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AMSC Subsidiary Corporation: *See*—
Rose, David J.; Isaacs, Blake L.; and Williams, Kevin J., 5,594,953, Cl. 455-89.000.
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Beigel, David F.; Krieger, William A.; and Feindt, Susan L., 5,594,266, Cl. 257-355.000.
Gilbert, Barrie, 5,594,326, Cl. 323-313.000.
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Wisberry, Martin W.; Velagaleti, Ranga R.; Williams, Mark D.; Daly, Donna; Swain, Lee R.; and Weber, Jerome B., 5,594,185, Cl. 73-866.000.
Anders, Gary H.: *See*—
Tollet, Leland; Anders, Gary H.; and Bell, Hilton L., Jr., 5,592,828, Cl. 62-249.000.
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Potenpa, Lawrence A.; and Anderson, Byron E., 5,593,897, Cl. 436-507.000.
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Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Anderssen, Bengt R.; and Hansson, Lars O., 5,594,024, Cl. 514-429.000.
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Thuswaldner, Hermann; and Anderssen, Sören, 5,593,534, Cl. 156-380.040.
Ando, Masahiko: *See*—
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Andoh, Mitsuru, to NEC Corporation. Control system for parallel execution of job steps in computer system. 5,594,901, Cl. 395-674.000.
Andree, Roland; Darwes, Mark-Wilhelm; Marhold, Albrecht; Santel, Hans-Joachim; and Dollinger, Markus, to Bayer Aktiengesellschaft. N-cyanoaryl-nitrogen heterocycles. 5,593,945, Cl. 504-243.000.
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Hendrickx, Freddy; Verbeeck, Ann; Meeus, Pascal; and Andriessen, Hieronymus, 5,593,817, Cl. 430-488.000.
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Sekiguchi, Atsushi; Kobayashi, Tsukasa; and Takagi, Shinji, 5,594,280, Cl. 257-771.000.
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Lee, Mun-Hyon, 5,592,873, Cl. 99-510.000.
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Sanchez, Victor R.; Ceja, Alberto; and Anguiano, Rigoberto, 5,592,870, Cl. 99-353.000.

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Bischof, Werner, 5,594,393, Cl. 333-26.000.

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Shipp, John I.; Crothall, George; Lathrop, Robert L., Jr.; and Reichel, Donald R., 5,593,414, Cl. 606-142.000.

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Kaufman, Alan; and Podlesnik, Jim, 5,593,053, Cl. 215-12.100.

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Capps, Stephen P.; Beernink, Ernest H.; Meier, John R.; and Tomkin, David, 5,594,640, Cl. 395-794.000.
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Goundol, Armand P. J., 5,594,810, Cl. 382-187.000.
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Turkowski, Kenneth E., 5,594,919, Cl. 395-800.000.

Appleman, Kenneth H.: *See*—
Filipp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allen M.; Meo, Sam; Tiemann, Deane; Abrahams, Lawrence; Silfen, Michael J.; Dalessa, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.

Applewhite, John: *See*—
Johnson, Lonnie G.; and Applewhite, John, 5,592,931, Cl. 124-69.000.

Applied Materials, Inc.: *See*—
Wang, Maureen K.; and Chew, Sandy M., 5,593,541, Cl. 156-643.100.

Applied Power Inc.: *See*—
Stelter, George R.; and Knutson, Dale A., 5,593,134, Cl. 251-129.170.

Applied Sciences, Inc.: *See*—
Alig, Robert L.; Guth, Jason R.; and Burton, David J., 5,594,060, Cl. 524-496.000.

Apte, Prabhat P.; and Perugini, Ajit P., to Texas Instruments Incorporated. Use of a capping layer to attain low titanium-silicide sheet resistance and uniform silicide thickness for sub-micron silicon and polysilicon lines. 5,593,924, Cl. 437-200.000.

APV Corporation Limited: *See*—
Nicholls, John R.; Stephenson, David J.; and Archer, Geoffrey F., 5,593,726, Cl. 427-189.000.

Arai, Atsushi: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromine; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,594,478, Cl. 347-41.000.

Arai, Hisako: *See*—
Maeda, Yoshiyuki; Kita, Ryusuke; Arai, Hisako; Ohtani, Noboru; and Kobe, Masayoshi, 5,593,495, Cl. 117-4.000.

Arai, Shunji: *See*—
Ogata, Minoru; Suzuki, Shoji; Tsuchida, Shinji; Tsutsui, Yuichiro; Arai, Shunji; and Hiroki, Shigeru, 5,594,944, Cl. 455-34.100.

Arakawa, Katsuyuki: *See*—
Tanaka, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, 5,594,930, Cl. 419-5.000.

Archer, Geoffrey F.: *See*—
Nicholls, John R.; Stephenson, David J.; and Archer, Geoffrey F., 5,593,726, Cl. 427-189.000.

Arena, Blaise J.: *See*—
Gillespie, Ralph D.; Bricker, Jeffery C.; Arena, Blaise J.; and Holmgren, Jennifer S., 5,593,932, Cl. 502-163.000.

Arena, Joseph P.; Feng, Guoping; Hall, Linda M.; Liu, Kou; Van Der Ploeg, Leonardus H. T.; Wang, Feiyi; and Warmke, Jeffrey W., to Merck & Co., Inc.; and Research Foundation of State University of New York, The. Process for functional expression of the para cation channel. 5,593,864, Cl. 435-69.100.

Arghavani, Zahra: *See*—
Akhavan-Tafti, Hashem; DeSilva, Rosuka; Arghavani, Zahra; and Schoenfelner, Barry A., 5,593,845, Cl. 435-7.900.

Arita, Masahobe: *See*—
Mizutani, Tomoni; Yokota, Katsuyuki; Arita, Masahobe; and Kojyou, Hiroshi, 5,593,703, Cl. 425-71.000.

Arita, Tatsuo; Sakurai, Ichiro; and Kosaiya, Noboru, to Sakurai Seigi Company, Ltd. Device for adjusting a position of a focal point of an intraocular implant. 5,593,437, Cl. 623-6.000.

Aritake, Hirokazu: *See*—
Ishimoto, Masabu; Kato, Masayuki; Aritake, Hirokazu; and Sato, Noriko, 5,594,564, Cl. 349-143.000.
Sato, Noriko; Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Masabu; and Nakashima, Masato, 5,594,559, Cl. 359-8.000.

Arizona Instrument Corporation: *See*—
Johnson, Glen A., 5,594,352, Cl. 324-664.000.

Arleth, Werner: *See*—
Goodowski, Gerhard; Arleth, Werner; and Ulmer, Peter, 5,593,018, Cl. 198-370.100.

Armington, Steven E.; and Ratzel, Richard O., to Rasquk Corp. Cushioning conversion machine and method. 5,593,376, Cl. 493-464.000.

Armstrong, Scott: *See*—
Schaffer, Peter; and Armstrong, Scott, 5,593,492, Cl. 106-623.000.

Arnold, Paul A. B. L. M.: *See*—
Rugowski, James S.; Retsoske, Michael J.; Lin, Philip S.; Gropp, Ronald F.; and Arnold, Paul A. B. L. M., 5,593,545, Cl. 162-207.000.

Arviste, Tudor; Cadd, Amelia; and Phillips, Judith, to Ciba-Geigy Corporation. Fibrillated calcitonin pharmaceutical compositions. 5,593,962, Cl. 514-12.000.

Asada, Masasuki: *See*—
Kosumi, Toshiya; and Asada, Masasuki, 5,593,015, Cl. 192-70.270.

Asahi Glass Company Ltd.: *See*—
Takahashi, Hideo; Tanaka, Shinji; and Maeno, Hiroshi, 5,594,178, Cl. 73-808.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Fujisaki, Yoshifumi, 5,594,523, Cl. 396-448.000.
Saito, Koichi, 5,594,553, Cl. 386-88.000.
Shimizu, Hitoshi, 5,594,519, Cl. 396-449.000.

Asahi/America, Inc.: *See*—
Lester, Leo M.; and Kuroki, Yasunori, 5,593,135, Cl. 251-209.000.

Asahina, Katsushi: *See*—
Kondoh, Harufusa; and Asahina, Katsushi, 5,594,369, Cl. 326-83.000.

Asai, Ryuo, to Meiki Co., Ltd. Mold capable of changing a set position of a stamper plate. 5,593,710, Cl. 425-552.000.

Asai, Yuichi; and Ito, Akira, to Nippondenso Co., Ltd. Drive line apparatus for automotive vehicle. 5,593,363, Cl. 477-74.000.

Asai, Kenji: *See*—
Katsuo, Kiyoshi; Obuchi, Shokichi; Shitara, Eiki; Shimizu, Masuo; Yagyuchi, Kazuo; Miura, Tomoaki; Iconura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.

Asai, Yasuhiro; and Akasaka, Masayuki. Apparatus for cooking food materials. 5,592,868, Cl. 99-348.000.

Asajima, Mikio: *See*—
Saito, Hiroshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.

Asaka, Hideo; and Yamauchi, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device having a plurality of blocks. 5,594,701, Cl. 365-230.030.

Asakura, Osamu: *See*—
Nozaki, Mineo; Asakura, Osamu; Uchikata, Yoshio; and Nagashima, Masayasu, 5,593,237, Cl. 400-208.000.

Asaoka, Masanobu: *See*—
Hanya, Yukio; Osawa, Kenji; Hota, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuo; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Asazawa, Hiroshi, to NEC Corporation. Voltage-to-current converting circuit operating with low supply voltage. 5,594,633, Cl. 363-73.000.

ASC Incorporated: *See*—
Corder, George A.; and Turney, Charles C., 5,593,202, Cl. 296-108.000.

Associated Octel Company Limited, The: *See*—
Cook, Stephen L.; Rush, Maurice W.; Richards, Paul J.; and Burr, Donald, 5,593,464, Cl. 44-362.000.

Associates of Cape Cod, Inc.: *See*—
Wainwright, Norman R.; and Novitsky, Thomas J., 5,594,113, Cl. 530-395.000.

AST Research, Inc.: *See*—
Le, Bao G., 5,594,627, Cl. 361-801.000.

Astra AB: *See*—
Wu, Edwin S.-C.; and Griffith, Ronald C., 5,594,000, Cl. 514-278.000.

Aswell, Cecil: *See*—
McBride, Ken; and Aswell, Cecil, 5,594,376, Cl. 327-236.000.

AT&T Global Information Solutions Company: *See*—
Kenneth, Alexander R.; and Mahesh, Mumtaz S., 5,594,233, Cl. 235-492.000.
Moore, Charles A.; and Kinton, Douglas J., 5,593,119, Cl. 248-185.100.

Atalla, Martin M. Microcell computer system and method using cell access switch and functionally partitioned moving memory architecture. 5,594,915, Cl. 395-800.000.

Athas, William L.: *See*—
Babaahs, William S., Jr; Athas, William L.; York, Marvin E.; and Subotsky, Leon R., 5,593,420, Cl. 606-205.000.

Athena Neurosciences: *See*—
Schenk, Dale B.; Seubert, Peter A.; and Vigo-Pelfrey, Carmen, 5,593,846, Cl. 435-7.900.

Atmel Corporation: *See*—
Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gudger, Keith H.; and Gongwer, Geoffrey S., 5,594,366, Cl. 326-41.000.

Atsuchi, Naruhiko: *See*—
Yamamoto, Hideki; and Atsuchi, Naruhiko, 5,594,591, Cl. 349-5.000.

Attanasi, Ryo, to Attanasi, Ryo. Order processing control module. 5,594,639, Cl. 364-468.140.

Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamontbe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Raj, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased (by Florette Belleau, executrix), to Biochem Pharma Inc. Heterocyclic anthracycline analogs. 5,593,970, Cl. 514-34.000.

Attler, Josef: *See*—
Shen, Jian; Yaremko, Mytrois; Chachowski, Rosemary; Attler, Josef; Dupinet, Thierry; Kittrich, Daniel; Kunz, Hansjoerg; Puchegger, Karl; and Rohlfs, Reiner, 5,594,808, Cl. 382-133.000.

Audebert, Roland; Jauca, Joseph; Meroy, Pierre; and Hendrika, Hugo, to Dowell Schlumberger Incorporated. Cement composition containing chemically crosslinked polyvinyl alcohol (PVA). 5,594,050, Cl. 524-5.000.

Audinot, Valérie: *See*—
Peglion, Jean-Louis; Vian, Joel; Goumont, Bertrand; Millan, Mark; Audinot, Valérie; Schwartz, Jean-Charles; and Sokoloff, Pierre, 5,593,989, Cl. 514-229.500.

Audisio, Filippo; Borello, Giuseppe; Ferrera, Massimo; Giacotti, Pietro; and Gozzelino, Riccardo, to Centro Ricerche Fiat Societa' Consortile Per Azioni. Internal combustion engine adapted to operate selectively with injection of gasoline or LPG. 5,592,924, Cl. 123-525.000.

Auerbach, Bernhard; and Peters, Helmut, to Behringwerke Aktiengesellschaft. Diagnostic method for the immunological determination of NCAM. 5,593,898, Cl. 436-518.000.

Auger, Armando P.; and Barnes, Roger L. Bullet molding apparatus. 5,592,986, Cl. 164-335.000.

August, Gregg D. Image display glasses having an LCD for displaying an image wherein the image provides for viewing by others. 5,594,573, Cl. 349-13.000.

Auria, Augustin: *See*—
Holzerwald, Andres; Auria, Augustin; Jiminez, Miguel; Vizquez, Miguel; Carranza, Francesc; and Coronado, Juan C., 5,592,763, Cl. 38-77.900.

Austin, Jerrold N.: *See*—
Laberge, Ernest D.; and Austin, Jerrold N., 5,592,743, Cl. 30-271.000.

Austin, Peter W., to Zeneca Limited. 2-(B-branched alkyl)-benzisothiazolin-3-ones. 5,594,018, Cl. 514-313.000.

Autoimmune, Inc.: *See*—
Weiner, Howard L.; Hafler, David A.; Carpenter, Charles B.; Sayegh, Mohamed; and Zhang, Zhengyi, 5,593,698, Cl. 424-534.000.

Automated Healthcare, Inc.: *See*—
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, 5,593,267, Cl. 414-273.000.

Autonomous Technology Corporation: *See*—
Frey, Rudolph W.; and Bolen, Philip D., 5,594,753, Cl. 372-57.000.

Avasro: *See*—
Webb, Lee F., 5,592,813, Cl. 60-226.200.

Avakian, Roger W.; Prabhu, Vaikunth S.; Enlow, William P.; and Gray, Carlous L., to General Electric Company. Aromatic cyclic bisphosphite esters and polymeric compositions thereof. 5,594,053, Cl. 524-120.000.

Aval Communications, Inc.: *See*—
Anvari, Kiomars, 5,594,385, Cl. 330-149.000.

Averill, Robert G.; Cohen, Robert C.; and Zabok, Rafail, to Implex Corp. Prosthetic device and method of implantation. 5,593,451, Cl. 623-23.000.

Avery Dennison Corporation: *See*—
Vargas, Richard R.; Phanthottam, Sebastian S.; and Landers, John O., 5,593,759, Cl. 428-200.000.

Aviles, Gladys M.: *See*—
Harrison, Richard P.; Brown, Bert W.; Rossio, Richard C.; Aviles, Gladys M.; Dentheimer, Edward M.; and Ho, David, 5,594,037, Cl. 521-99.000.

Axion Logistics Corporation: *See*—
LaDue, Christoph K., 5,594,740, Cl. 379-59.000.

Ayer, Atul D.: *See*—
Merrill, Sonya; Ayer, Atul D.; Hwang, Paul; and Kuczynski, Anthony L., 5,593,695, Cl. 424-480.000.

Azakami, Masayoshi: *See*—
Oda, Kunihiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.

Azran, Yitzhak: *See*—
Yakub, Yuri; and Azran, Yitzhak, 5,594,302, Cl. 313-642.000.

B A C O Constructions Electriques Anct. Baumgarten: *See*—
Schaeffer, Maurice; and Choukroun, Alain, 5,593,022, Cl. 200-308.000.

B & W Nuclear Technologies: *See*—
Bryan, George H.; and Pop, Milusi G. M., 5,593,578, Cl. 210-232.000.

B.F.E. Limited: *See*—
Poillac, Lionel, 5,593,712, Cl. 426-19.000.

B&F Medical Products, Inc.: *See*—
Reed, George D.; and Weaver, Robert L., 5,593,136, Cl. 251-366.000.

Baba, Noriatsu; and Yamamoto, Michiyasu, to NipponDenso Co., Ltd. Refrigerant condenser with integral receiver. 5,592,830, Cl. 62-509.000.

Babich, Edward D.; Petrillo, Karen E.; Simons, John P.; and Seeger, David E., to International Business Machines Corporation. Photoresist having increased sensitivity and use thereof. 5,593,812, Cl. 430-270.100.

Babillon, Laurent: *See*—
Boni, Bernard; Carpentier, Eric; and Babillon, Laurent, 5,593,520, Cl. 152-158.000.

Backlund, Stephen J.: *See*—
Olsen, Robert E.; Reese, Harlan F.; and Backlund, Stephen J., 5,594,058, Cl. 524-481.000.

Babout, Yvon, to SGS-Thomson Microelectronics, S.A. Integrated circuit containing a protected memory and secured system using said integrated circuit. 5,594,793, Cl. 380-4.000.

Bailey, Christian E.: *See*—
Dunbar, Edwin G.; Bailey, Christian E.; and Sasso, Robert L., 5,593,482, Cl. 96-135.000.

Bainton, Nigel J.: *See*—
Bycroft, Barrie W.; Williams, Paul; Stewart, Gordon S. A. B.; Chhabra, Siri R.; Stead, Paul; Winson, Michael K.; Hill, Philip J.; Rees, Catherine E. D.; and Bainton, Nigel J., 5,593,827, Cl. 435-6.000.

Bajda, Piotr J.: *See*—
Okrasiewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., 5,593,618, Cl. 252-512.000.

Baker, Donal E., to Sundstrand Corporation. Add-on distortion scrubber for AC power systems. 5,594,630, Cl. 363-40.000.

Baker Hughes Incorporated: *See*—
Jarrett, Michael, 5,593,952, Cl. 507-131.000.
Lembcke, Jeffrey J.; and Jordan, Henry J., Jr., 5,592,991, Cl. 166-298.000.
Scott, Danny E.; Pessier, Rudolf C. O.; Isbell, Matthew R.; Meany, Nigel; and Beaton, Alain, 5,592,995, Cl. 175-374.000.

Baker, Patricia M. Christmas tree shirt support. 5,593,743, Cl. 428-18.000.

Baker, Ralph E.: *See*—
Robards, Timothy G.; Allen, Mark L.; and Baker, Ralph E., 5,594,610, Cl. 361-104.000.

Baker, Richard W.; Santus, Giancarlo; and Vitalis-Friedman, Susan, to Pharmacia AB. Method and therapeutic system for smoking cessation. 5,593,684, Cl. 424-435.000.

Bala, Frank, Jr.: *See*—
Mondin, Myriam; Loth, Myriam; Brose, Guy; Mehrotrah, Ammanuel; Thomas, Barbara; Adamy, Steven; and Bala, Frank, Jr., 5,593,958, Cl. 510-417.000.

Balachandran, Kumar, to Pacific Communication Sciences, Inc. Method and apparatus for efficient handoffs by mobile communication entities. 5,594,943, Cl. 455-33.200.

Balaji, Vinakadi N.: *See*—
Chan, Ming F.; Raja, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkateshalapathi; and Balaji, Vinakadi N., 5,594,021, Cl. 514-378.000.

Balakrishnan, Krishna: *See*—
Wetegrove, Robert L.; Balakrishnan, Krishna; and Brushi, Richard E., 5,593,850, Cl. 435-7.920.

Baldeschwieler, John D., to NeXstar Pharmaceuticals, Inc. Liposomal targeting of ischaemic tissue. 5,593,688, Cl. 424-450.000.

Baldwin, David R.; and Bigos, Andrew, to 3Dlabs Inc. Ltd. Graphics subsystem with coarse subpixel correction. 5,594,854, Cl. 395-141.000.

Baldwin-Gegenbauer GmbH: *See*—
Weizmann, Franz, 5,592,879, Cl. 101-416.100.

Bale, Alain; and Champion, Patrick, to Framatome Connectors International. Connector including an insulative bridge. 5,593,307, Cl. 439-79.000.

Ball Corporation: *See*—
Long, Eugene; Schmidt, Jeff; and Lynch, Frank, 5,593,640, Cl. 422-111.000.

Ball, Gary A. Dual-wavelength pumped low noise fiber laser. 5,594,747, Cl. 372-31.000.

Ball, Melville D.: *See*—
Minerich, Phillip L.; Hewitt, Bryan C.; Lacroix, Cindy M.; and Ball, Melville D., 5,593,610, Cl. 219-728.000.

Ball, Richard D. Pediatric wheelchair. 5,592,997, Cl. 180-65.100.

Ball-Tech Energy Ltd.: *See*—
Ben-Dom, Chaim, 5,592,990, Cl. 165-95.000.

Bally, Nazar: *See*—

Mundy, Terry R.; Mundy, Robert R.; and Bally, Nazar, 5,593,347, Cl. 454-68.000.

Bolos, Barbara; Changeon, Nancy S.; Patterson, James V.; Rodriguez, José M.; and Fischer, Stephen A., to Henkel Corporation. Process for repulping wet strength paper. 5,593,543, Cl. 162-6.000.

Bahnz, Karen B., to Vector Equipment-Houston, Inc. Mobile stair system for gets and unloads, method of making said mobile stair system. 5,592,801, Cl. 52-741.200.

Ban, Tetsuya: *See*—
Toki, Yusuke; Hiraoka, Masahe; Yamagishi, Ichiro; Ozaki, Hiroyuki; Ban, Tetsuya; Hada, Tetsuro; Nakazawa, Takeo; Yamabana, Masao; Fujita, Masakazu; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.

Banerjee, Chandra K.: *See*—
Fernie, Ernest G.; Chiou, Joseph J.; Lehman, Richard L.; and Banerjee, Chandra K., 5,593,792, Cl. 429-8.000.

Banes, Albert J. Culture plate with splash guard. 5,593,891, Cl. 435-305.100.

Banjo, Minoru: *See*—
Koizumi, Yutaka; Banjo, Minoru; and Wakagawa, Takeshi, 5,594,350, Cl. 324-616.000.

Bara, Isabelle; and Meffre, Myriam, to L'Oreal. New cosmetic or dermopharmaceutical compositions in the form of aqueous gels modified by the addition of expanded microspheres. 5,593,680, Cl. 424-401.000.

Baranczyk, Steven V.: *See*—
Mayo, Michael A.; and Baranczyk, Steven V., 5,593,785, Cl. 428-423.100.

Barbeau, France: *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamouthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Barbier, Gérard Y. G.: *See*—
Alary, Jean-Paul D.; Barbier, Gérard Y. G.; Delahaye, Corine G.; Havard, Jacques G. W. R.; Mackovic, Paul; Masse, Bruno R. H.; Merville, Didier; Mirville, Francois J.-P.; Mocciolli, Serge R. Y.; Sandella, Denis J. M.; and Stoltz, Ralph M., 5,592,821, Cl. 60-751.000.

Barbosa, Jose J.: *See*—
Santamaria, Pedro; Boyce-Jacino, Michael T.; Barbosa, Jose J.; Rich, Stephen S.; and Perna, Anthony J., 5,593,830, Cl. 435-6.000.

Barenholz, Yechezkiel: *See*—
Gati, Shimon; Barenholz, Yechezkiel; Bercovier, Herve; and Eldar, Zvi, 5,593,508, Cl. 134-40.000.

Barkhaus, C. Rodger: *See*—
Zeppero, Anthony C.; Krawetz, Barton; Barkhaus, C. Rodger; and Seifert, Gary D., 5,593,509, Cl. 136-253.000.

Barnaose, Thomas C. Socket wrench set. 5,592,861, Cl. 81-438.000.

Barnes, Roger L.: *See*—
Anger, Armando P.; and Barnes, Roger L., 5,592,986, Cl. 164-335.000.

Barnett, Thomas R.; Elting, James J.; and Allard, William J., to Bayer Corporation. Monitoring of NC 50/90 in blood samples of breast cancer patients. 5,593,847, Cl. 435-7.230.

Barnhardt, Steve L.; Hadley, Steven L.; and Terry, Jeff M., to Volvo GM Heavy Truck Corporation. Highway vehicle. 5,593,167, Cl. 280-164.100.

Barr, Donald: *See*—
Cook, Stephen L.; Rush, Maurice W.; Richards, Paul J.; and Barr, Donald, 5,593,464, Cl. 44-362.000.

Barr, Ian G.; and Thiel, William J., to CSL Limited. Single dose vaccination system. 5,593,697, Cl. 424-490.000.

Barracuda Technologies AB: *See*—
Thuvesholmer, Hermann; and Andersson, Sören, 5,593,534, Cl. 156-380.040.

Barrett, Alfred H., to Delco Electronics Corporation. Power converter with harmonic neutralization. 5,594,632, Cl. 363-44.000.

Barrier, Jacques J.; and Grogan, R. Pat, to Calmar Inc. Pump sprayer having variable discharge. 5,593,094, Cl. 239-476.000.

Barry, John D.: *See*—
Northam, William J.; Barry, John D.; and Heberling, Richard L., 5,593,880, Cl. 435-240.100.

Barsan, Radu: *See*—
Lin, Jonathan; Barsan, Radu; and Sharpe-Geisler, Bradley A., 5,594,687, Cl. 365-185.100.

Bartal, Peter; and Kleefeldt, Frank, to Kiekert Aktiengesellschaft. Lock system for motor vehicle with sliding door. 5,594,283, Cl. 307-10.100.

Bartlett, Allan C. Portable stove top grill. 5,592,871, Cl. 99-400.000.

Bartram, Ronald D.: *See*—
Erk, Henry F.; Bartram, Ronald D.; Hollander, Eugene R.; and Chai, Jing, 5,593,505, Cl. 134-1.300.

Bartus, Stephen P., Jr.: *See*—
Parker, Anthony A.; Strickler, David A.; Bartus, Stephen P., Jr.; and Wolke, Susan M., 5,593,786, Cl. 428-426.000.

Base Ten Systems, Inc.: *See*—
Eisenberg, Alan J.; and Adelson, Alexander, 5,594,637, Cl. 395-202.000.

BASF Aktiengesellschaft: *See*—
Nuebling, Christoph; von Deyn, Wolfgang; Theobald, Hans; Westphalen, Karl-Otto; Kardorff, Uwe; Walter, Helmut; Kappe, Thomas; and Gerber, Matthias, 5,593,943, Cl. 504-221.000.
Sopher, David; Gieseler, Andreas; Hibst, Hartmut; Harth, Klaus; and Jaeger, Peter, 5,593,557, Cl. 204-290.00R.
Wingert, Horst; Hellendahl, Beate; Sauter, Hubert; and Lorenz, Gisela, 5,594,020, Cl. 514-378.000.

BASF Corporation: *See*—
Harrison, Richard P.; Brown, Bari W.; Rosario, Richard C.; Aviles, Gladys M.; Dexheimer, Edward M.; and Ho, David, 5,594,037, Cl. 521-99.000.
Karnell, Leigh Ann, 5,593,491, Cl. 106-493.000.
Lim, Rudolph E.; and Kilbride, Terence K., Jr., 5,593,948, Cl. 504-324.000.
Walsh, William C., 5,594,035, Cl. 521-47.000.

BASF Lacke+Farben Aktiengesellschaft: *See*—
Loerzer, Thomas; Wegener, Stefan; and Gosling, Friedrich, 5,593,811, Cl. 430-258.000.

Bashir, Aaniz, to Intel Corporation. Address transition detection sensing interface for flash memory having multi-bit cells. 5,594,691, Cl. 365-189.090.

Basinski, Margret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., to Eli Lilly and Company. Anti-obesity proteins. 5,594,104, Cl. 530-324.000.

Bateman, Nick. Truck tool organizer system. 5,593,201, Cl. 296-100.000.

Bates, David F.: *See*—
Nielson, Ralph B.; Rosick, Thomas A.; Bates, David F.; Hosan, James S.; and Yau, Hwei-Ling, 5,594,047, Cl. 523-315.000.

Bates, Ian R. J.; Daly, Michael; and Fowler, Paul M., to Eaton Corporation. Semi-automatic mechanical transmission with forced automatic shifting. 5,592,851, Cl. 74-336.00R.

Bates, Peter A.: *See*—
Steward, Anthony R.; and Bates, Peter A., 5,594,194, Cl. 89-46.000.

Batesville Casket Company, Inc.: *See*—
Linville, John E.; and Long, Otis L., 5,592,724, Cl. 27-12.000.

Batt, Douglas G.; Pisto, Donald J. P.; Orwat, Michael J.; Petraitis, Joseph J.; and Pitts, William J., to DuPont Merck Pharmaceutical Company, The. Prostaglandin synthase inhibitors. 5,593,994, Cl. 514-252.000.

Battist, Gerald E.: *See*—
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Foscaro, Giancarlo; and Battistella, Mirco, 5,592,722, Cl. 24-68.05K.

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Nosker, Richard W.; Michalchak, Joey J.; Bauder, Richard C.; and Ragland, Frank R., Jr., 5,594,300, Cl. 313-402.000.

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Jacoby, Philip; Bauer, Charles W.; Clingman, Scott R.; and Tapp, William T., 5,594,070, Cl. 525-88.000.

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Bauer, Jason. Apparatus for reconditioning digital recording discs. 5,593,343, Cl. 451-254.000.

Bauer, Michael: *See*—
Krause, Werner; Maier, Franz-Karl; Bauer, Michael; Schuhmann-Giampieri, Gabriele; and Press, Wolf-Rüdiger, 5,593,660, Cl. 424-9.451.

Bauer, Ralph: *See*—
Khasnd, Arup K.; Garg, Ajay K.; and Bauer, Ralph, 5,593,468, Cl. 51-309.000.

Bauer, William. Suture element delivery device and method. 5,593,421, Cl. 606-213.000.

Baughman, James R.: *See*—
Zakzrec, Matthew J.; McCune, Robert C., Jr.; Popoola, Oludele O.; Baughman, James R.; and Brevick, John E., 5,592,927, Cl. 123-568.000.

Baum, Larry R.; James, Gary L.; and Schmidt, Mark A., to Hastings Fiber Glass Products, Inc. Telescopic hot stick. 5,593,196, Cl. 294-19.100.

Bauman, Robert C.: *See*—
Brecht, David C.; Bauman, Robert C.; and Hancock, Robert L., 5,594,616, Cl. 361-622.000.

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Berwein, Heinz-Jürgen; and Baumgärtel, Gerd, 5,592,888, Cl. 110-229.000.

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Lai, Yu-Chin, 5,594,085, Cl. 526-302.000.

Baxter International Inc.: *See*—
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Carlson, Gary; and Norris, Jeffrey A., 5,594,375, Cl. 327-129.000.
Carpentier, Alexandre C.; and Carpentier, Alain F., 5,593,435, Cl. 623-2.000.

Bay Mills Limited: *See*—
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Bayer AG: *See*—
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Bayer Aktiengesellschaft: *See*—
Andree, Roland; Drewes, Mark-Wilhelm; Marhold, Albrecht; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,945, Cl. 504-243.000.

Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Staach, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.
Glock, Volker; Penzling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.
Heinemann, Torsten; Dietrich, Manfred; Jacobs, Gundolf; Kratz, Mark; Sanders, Josef; Scholz, Uwe; and Woynar, Helmut, 5,594,066, Cl. 524-761.000.
König, Klaus; Mazanek, Jan; Schwindt, Jürgen; Dietrich, Manfred; and Klein, Gerhard, 5,594,087, Cl. 528-44.000.
Ooms, Pieter; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,944, Cl. 504-240.000.
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Wroblowsky, Heinz-Jürgen; and König, Klaus, 5,594,147, Cl. 548-263.600.
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Cahill, Sally E.; Pugia, Michael J.; and Schaeper, Robert J., 5,593,895, Cl. 436-86.000.
Mason, James P.; and DiBernardo, James A., 5,594,059, Cl. 524-493.000.

Bayley, Gwain: *See*—
Weaver, Lindsay A., Jr.; Bayley, Gwain; Tiedemann, Edward G., Jr.; and Gilhousen, Klein S., 5,594,718, Cl. 370-331.000.

Beach, David L.; Carney, Michael J.; and Mora, Javier M., to Chevron Chemical Company. Cyclopentadienyl group 6b metal alpha-olefin polymerization catalysts and process for polymerizing alpha-olefins. 5,593,931, Cl. 502-117.000.

Beasley, Jeff; Kirschner, Michael B.; Charles, Robert A.; and Hall, Sacha C., to Motorola, Inc. Method of resistance welding thin elements. 5,593,604, Cl. 219-117.100.

Beaufort, Richard F.; Yergenson, Robin P.; and Hooper, Howard G., to Hewlett-Packard Company. Refillable toner cartridge. 5,594,535, Cl. 399-262.000.

Beaver, Michael L., to Fore-Mat Products, Inc. Golf practice apparatus. 5,593,355, Cl. 473-278.000.

Beben, Marius: *See*—
Dittrich, Gerhard; Beben, Marius; and Mehlert, Wolfgang, 5,593,146, Cl. 269-22.000.

Bechberger, Edward J.: *See*—
Scribner, Herbert C.; Fredette, Maurice C. J.; Bechberger, Edward J.; and Pu, Chunmin, 5,593,653, Cl. 423-477.000.

Beckenbaugh, William M.; Lytle, William H.; and Berman, Bernard, to Motorola, Inc. Method of forming contact pads for wafer level testing and burn-in of semiconductor dice. 5,593,903, Cl. 437-8.000.

Becker, Burckhard: *See*—
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, 5,593,209, Cl. 297-344.130.

Becker, Gerald W.; Hale, John E.; and MacKellar, Warren C., to Eli Lilly and Company. Anti-obesity proteins. 5,594,101, Cl. 530-317.000.

Becton Dickinson and Company: *See*—
Berndt, Klaus W., 5,593,854, Cl. 435-31.000.
Fumihiko, Hato, 5,593,587, Cl. 210-470.000.
Levine, Robert A.; Wardlaw, Stephen C.; Rodriguez, Rodolfo; Britz, Judith; and Mercolino, Thomas J., 5,593,848, Cl. 435-7.240.
Malick, Adrien; and Feindt, Hans H., 5,593,843, Cl. 435-7.100.
Reichert, Thomas A.; and Champlin, Richard, 5,593,677, Cl. 424-154.100.
Walker, G. Terrance; Nadeau, James G.; and Linn, C. Preston, 5,593,867, Cl. 435-91.200.

Bedard, Robert L.; Ozin, Geoffrey A.; Ahari, Homayoun; Bowes, Carol L.; Jiang, Tong; and Young, David, to UOP. Semiconductor device containing a semiconducting crystalline nanoporous material. 5,594,263, Cl. 257-201.000.

Beernink, Ernest H.: *See*—
Capps, Stephen P.; Beernink, Ernest H.; Meier, John R.; and Temkin, David, 5,594,640, Cl. 395-794.000.

Behfar-Rad, Abbas; Harder, Christoph S.; and Meier, Heinz P., to International Business Machines Corporation. Semiconductor laser with low vertical far-field. 5,594,749, Cl. 372-45.000.

Behnke, Mark: *See*—
Pal, Kollol; Behnke, Mark; and Adams, Julian, 5,594,008, Cl. 514-338.000.

Beluingwerke Aktiengesellschaft: *See*—
Auerbach, Bernhard; and Peters, Helmut, 5,593,898, Cl. 436-518.000.

Beigel, David F.; Krieger, William A.; and Feindt, Susan L., to Analog Devices, Incorporated. Integrated circuit (IC) with a two-terminal diode device to protect metal-oxide-metal capacitors from ESD damage. 5,594,266, Cl. 257-355.000.

Belinka, Benjamin A., Jr.; Coughlin, Daniel J.; Alvarez, Vernon L.; and Wood, Richard, to Cytogen Corporation. Metal-binding targeted polypeptide constructs. 5,593,656, Cl. 424-1.690.

Bell Atlantic: *See*—
Goodman, William, 5,594,779, Cl. 379-59.000.

Bell Atlantic Network Services, Inc.: *See*—
O'Callaghan, Daniel; and Lew, Eugene L., 5,594,492, Cl. 348-10.000.
Seazholtz, John W.; and McAllister, Alex, 5,594,789, Cl. 379-207.000.

Bell, Chris A.: *See*—
Van Vechten, James A.; Lundy, James R.; Wallace, Alan K.; and Bell, Chris A., 5,593,744, Cl. 428-34.400.

Bell Communications Research, Inc.: *See*—
Cruz, Gil C.; Hill, Ralph D.; Judd, Thomas H.; New, Darren H.; and Rosenberg, Jonathan, 5,594,911, Cl. 395-800.000.

Bell, D. Michael, to Intel Corporation. PCI split transactions utilizing dual address cycle. 5,594,882, Cl. 395-421.020.

Bell, Hilton L., Jr.: *See*—
Tollet, Leland; Anders, Gary H.; and Bell, Hilton L., Jr., 5,592,828, Cl. 62-249.000.

Bell, Robert T.; and Platt, Richard B., to Intecom, Incorporated. Bridging and signalling subsystems and methods for private and hybrid communications systems including multimedia systems. 5,594,732, Cl. 370-401.000.

Bellas, Richard F.: *See*—
Mero, Christopher J.; and Bellas, Richard F., 5,593,056, Cl. 215-382.000.

Belleau, Bernard, deceased (by Pierette Belleau, executrix): *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamouthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Belleau, Pierette, executrix: *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamouthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Bellew, Matthew: *See*—
Dalal, Ketan; and Bellew, Matthew, 5,594,898, Cl. 395-602.000.

Bellin, Nathan P., to Motorola, Inc. Method and apparatus for saving power in a radiotelephone. 5,594,951, Cl. 455-89.000.

BellSouth Corporation: *See*—
Lewis, John E.; Roach, Peter O., Jr.; and Poulos, Thomas, 5,594,945, Cl. 455-38.100.

Belmont, Brian V., to Compaq Computer Corporation. Method of and apparatus for arbitrarily disabling under processor control individual slots on a computer bus. 5,594,879, Cl. 395-309.000.

Benczits, Franz, to Benczits, Franz; and Perycut-Chemie AG. Use of first runnings coconut fatty acid as insect-repellent. 5,594,029, Cl. 514-552.000.

Bender, Albert, to Hoechst Aktiengesellschaft. Modified resinates. 5,594,099, Cl. 530-218.000.

Bender, Werner, to Pilz GmbH & Co. Low-voltage switching apparatus. 5,593,325, Cl. 439-709.000.

Ben-Dosa, Chaim, to Ball-Tech Energy Ltd. Cleaning system for cleaning fluid-conducting tubing. 5,592,990, Cl. 165-95.000.

Benefiel, David L.; Kessler, Louis R.; and Mitchell, Alan J., to Whirlpool Corporation. Subambient temperature controlled cell for infrared spectroscopic analysis and a method for the detection of paraffinic hydrocarbons. 5,594,249, Cl. 250-339.030.

Benight, Albert S.: *See*—
Lane, Michael J.; Benight, Albert S.; and Faldasz, Brian D., 5,593,834, Cl. 435-6.000.

Benker, Gerhard; Treiber, Helmut; Klüter, Ulrich; Lorenz, Bernhard; and Münch, Reimund, to AGFA Geavert. Method of printing photographs and apparatus for carrying out the method. 5,594,525, Cl. 355-29.000.

Bennett, Brian D.: *See*—
Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,593,998, Cl. 514-258.000.

Bentele, Clemens: *See*—
Heanrich, Werner; and Bentele, Clemens, 5,593,088, Cl. 237-12.30C.

Benz, Mark G.: *See*—
Johnson, Neil A.; Raber, Thomas R.; Hibbs, Louis E., Jr.; Murray, Melissa L.; and Benz, Mark G., 5,593,506, Cl. 134-9.000.

Berchin, Gregory J., to Nicolet Instrument Corporation. Method and apparatus for frequency triggering in digital oscilloscopes and the like. 5,594,655, Cl. 364-487.000.

Bercovier, Herve: *See*—
Gati, Shimon; Barenholz, Yechezkel; Bercovier, Herve; and Eldar, Zvi, 5,593,508, Cl. 134-40.000.

Bergemont, Albert; and Chi, Min-hwa, to National Semiconductor Corporation. Method for programming a single EPROM or flash memory cell to store multiple bits of data that utilizes a punchthrough current. 5,594,685, Cl. 365-185.030.

Berger, Neal: *See*—
Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gadger, Keith H.; and Gongwer, Geoffrey S., 5,594,366, Cl. 326-41.000.

Bergey, James L.: *See*—
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Berghmans, Joost; De Waegenaere, Johan; Klingeleers, Pierre; and Van Giel, Frans, to N.V. Bekaert S.A. Non-wrapped non-sleeving compact cord. 5,592,806, Cl. 57-212.000.

Berghoff, Jan S.; and Hendrick, Jeff. Sound system for use with gas fireplaces and simulating burning wood. 5,594,802, Cl. 381-61.000.

Berke, Philip A.; and Rosen, William E., to ISP Chemicals Inc. Glycine anhydride dimethylol as a biocide and preservative. 5,593,681, Cl. 424-401.000.

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Berkey, George E., to Corning Incorporated. Fiber optic couplers, preform and method of making same. 5,594,822, Cl. 385-43.000.

Berman, Arnold L.: *See—*
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Berman, Bernard: *See—*
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Berman, Phillip J.: *See—*
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Bernard, Clay, II, to Computer Aided Systems, Inc. Automated work center. 5,593,269, Cl. 414-331.000.

Bernard, David N. Lotion applicator. 5,592,714, Cl. 15-230.110.

Bernardi, Luigi: *See—*
Quadri, Luisa; Bernardi, Luigi; Ferrari, Patrizia; Gobbini, Mauro; Melloni, Piero; and Valentino, Loredana, 5,593,982, Cl. 514-172.000.

Berndt, Klaus W., to Becton Dickinson and Company. Data analysis method for use with fluorescent bacterial sensors. 5,593,854, Cl. 435-31.000.

Bernecker, Walter J.: *See—*
Chenelli, John B.; Bernecker, Walter J.; and Caprio, Craig A., 5,593,804, Cl. 430-30.000.

Bernhardt, Ralf; and Grupp, Günter, to Carl-Zeiss-Stiftung. Method for correcting coordinate measurement on workpieces based on bending characteristics. 5,594,668, Cl. 364-571.070.

Bernstein Senso-Plus GmbH: *See—*
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Bernstrom, Marvin L.; Radford, Karen J.; and Kassen, Gary R., to Eaton Corporation. Hydraulic motor and pressure relieving means for valve plate thereof. 5,593,296, Cl. 418-61.300.

Berson, Thomas: *See—*
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Bertin & Cie: *See—*
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Berwein, Heinz-Jürgen; and Baumgärtel, Gerd, to Siemens Aktiengesellschaft. Process and apparatus for disposing of waste. 5,592,888, Cl. 110-229.000.

Besson, Alain: *See—*
Scott, Danny E.; Pessier, Rudolf C. O.; Isbell, Matthew R.; Meany, Nigel; and Besson, Alain, 5,592,995, Cl. 175-374.000.

Bet Technology, Inc.: *See—*
Boylan, Eugene B.; Koerner, Robert F.; and Hebert, Russell R., 5,593,161, Cl. 273-274.000.

Better, Bernhard: *See—*
Kampfe, Michael; and Better, Bernhard, 5,592,940, Cl. 128-654.000.

Betz, Robert A.: *See—*
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BetzDearborn Inc.: *See—*
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Carey, William S.; Meyer, Ellen M.; and Peltier, Jeffrey H., 5,594,096, Cl. 528-387.000.
Hart, Paul R., 5,593,572, Cl. 208-177.000.
Wright, J. Barry; and Michalopoulos, Daniel L., 5,593,599, Cl. 210-764.000.

Beuck, Martin: *See—*
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Deazer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.

Bexten, Daniel P.: *See—*
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Beyer, Robert: *See—*
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Bhat, Neelima M.; Bieber, Marcia M.; and Teng, Nelson N. H., to Leland Stanford Junior University, The. Method of killing B cells using antibodies which bind CDIM. 5,593,676, Cl. 424-137.100.

Bhatnagar, Satish K.; George, Albert L., Jr.; and Nazarenko, Irina, to Oncor, Inc. Amplification of nucleic acid sequences. 5,593,840, Cl. 435-6.000.

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Reinhardt, Bruce A.; and Bhatt, Jayprakash C., 5,594,075, Cl. 525-426.000.

Bheda, Mukesh: *See—*
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Biasoli, Giovanni: *See—*
Mosgelli, Nicola; Biasoli, Giovanni; Paio, Alfredo; Grandi, Maria; and Ciomei, Marina, 5,593,976, Cl. 514-48.000.

Bichler, Helmut: *See—*
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Bidwell, Alexander W.: *See—*
Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalzana, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.

Bieber, Marcia M.: *See—*
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Bielak, Charles R.; and Furness, Richard J., to Ford Motor Company. Eliminating hinged drill caps. 5,593,256, Cl. 408-1.00R.

Bigos, Andrew: *See—*
Baldwin, David R.; and Bigos, Andrew, 5,594,854, Cl. 395-141.000.

Billion, Marc: *See—*
Gueguen, Michel; Billion, Marc; and Majastre, Hervé, 5,593,462, Cl. 29-623.300.

Bilson, Edward B.; Wedell, Mark T.; and Zimmerman, Thomas A., to Thomas & Betts Corporation. Electrical receptacle for photoelectric controller. 5,593,318, Cl. 439-573.000.

Bingham, David, to Maxim Integrated Products. Reverse current prevention method and apparatus and reverse current guarded low dropout circuits. 5,594,381, Cl. 327-534.000.

Bio Merieux: *See—*
Colin, Bruno, 5,594,183, Cl. 73-864.520.

Bio-Technology General Corp.: *See—*
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Biochem Pharma Inc.: *See—*
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamonthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Biondo, Barry. Car carrier rack and car mount. 5,593,076, Cl. 224-488.000.

Biosearch Medical Products Inc.: *See—*
Patrick, Algird, 5,593,402, Cl. 606-1.000.

BioSepra, Inc.: *See—*
Girot, Pierre; and Boschetti, Egisto, 5,593,576, Cl. 210-198.200.

Birbara, Philip J.: *See—*
Meixner, Richard A.; and Birbara, Philip J., 5,593,737, Cl. 427-512.000.

Birchenough, Charles W.; Dietz, Hans P.; Holloway, Dwight S.; Ryter, Noel J.; Scholl, Rolland D.; and Tweed, Lorne W., to Caterpillar Inc. Method and system for diagnosing a drivetrain during shifting operations. 5,594,643, Cl. 364-424.080.

Bird, William L., Jr.: *See—*
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Birk, Gerhard: *See—*
Wanner, Martin; Maier, Dieter; and Birk, Gerhard, 5,592,710, Cl. 15-53.200.

Birkner, John M.: *See—*
Chua, Andrew K.; Birkner, John M.; and Chua, Hua-Thye, 5,594,364, Cl. 326-39.000.

Birmingham, Joan. Cat scratching device for protecting furniture. 5,592,901, Cl. 119-706.000.

Birnberg, Gary H.: *See—*
Epstein, Joseph W.; Birnberg, Gary H.; Walker, Gary E.; Dutia, Minu D.; and Bloom, Jonathan D., 5,594,027, Cl. 514-463.000.

Bischof, Rüdolf, to Rudolf Bischof GmbH. Filtration system comprising sieving trough, helix and additional sieving apparatus. 5,593,597, Cl. 210-744.000.

Bischof, Werner, to ANT Nachrichtentechnik GmbH. Microwave line structure. 5,594,393, Cl. 333-26.000.

Bischoff, Hilmar: *See—*
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Deazer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.

Bishara, Jerries I.; Brannan, James R.; Horvath, Roland J.; Sacco, Anthony R.; and Hinden, Jean M., to Eltech Systems Corporation. Electrolytic treatment of an electrolytic solution. 5,593,627, Cl. 264-127.000.

Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, to Elmo Company, Limited. Image reproduction apparatus. 5,594,502, Cl. 348-373.000.

Bitonti, Alan J.: *See—*
Wright, Paul S.; and Bitonti, Alan J., 5,593,664, Cl. 424-78.080.

Bittikofer, Raymond P. Apparatus for producing multiple motions. 5,593,380, Cl. 601-27.000.

Bizenberger, Thomas: *See—*
Jelden, Hanno; Schultalbers, Winfried; and Bizenberger, Thomas, 5,592,815, Cl. 60-274.000.

Black, Roy A.; Fitzner, Jeffrey N.; and Sleath, Paul R., to Immunex Corporation. Inhibitors of TNF-α secretion. 5,594,106, Cl. 530-331.000.

Black, Thomas J., Jr.: *See—*
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., 5,593,164, Cl. 277-9.500.

Blain, Roy W. Servo control for hydraulic elevator. 5,593,004, Cl. 187-275.000.

Blanchard, Christian; Lauraire, Michel; and Vigouroux, Didier, to Schneider Electric SA. Protective switching device. 5,594,399, Cl. 335-132.000.

Blanchard, Randall D., to Paloma Technologies Corporation. Flat panel display with elliptical diffuser and fiber optic plate. 5,594,561, Cl. 349-59.000.

Blanco, Pamela K.: *See—*
Grohs, David D.; Schroeder, Fred G.; and Blanco, Pamela K., 5,592,974, Cl. 138-44.000.

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Herrmann, Matthias, 5,594,799, Cl. 381-13.000.

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Bleys, Gerhard J.: *See—*
Chaffanjon, Pierre G.; Stroobants, Peter F.; and Bleys, Gerhard J., 5,594,097, Cl. 528-419.000.

Bliznik, Kenneth: *See—*
Mowrey-McKee, Mary; Bliznik, Kenneth; and Stone, Ralph, 5,593,637, Cl. 422-28.000.

Block, David E.; Hermann, Theron E.; Hsieh, Jih-Han; Mehta, Nikhil S.; and Rai, Vishva R., to Hoffmann-La Roche Inc. Process for producing freonolicin B. 5,593,870, Cl. 435-119.000.

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Bolick, Martin P.; Allen, James D.; and Blonstein, Steven M., 5,594,812, Cl. 382-232.000.

Bloom, Jonathan D.: *See—*
Epstein, Joseph W.; Birnberg, Gary H.; Walker, Gary E.; Dutia, Minu D.; and Bloom, Jonathan D., 5,594,027, Cl. 514-463.000.

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D'Amico, Charles R.; and Blumberg, David, Jr., 5,594,950, Cl. 455-67.100.

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Garcia, Jose G.; and Malatka, LD, 5,592,978, Cl. 140-92.940.

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Sessler, Jonathan L.; Iverson, Brent L.; Král, Vladimir; Thomas, Richard E.; Magda, Darren; and Smith, Daniel A., 5,594,136, Cl. 540-472.000.

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Wirth, Henry G.; and Bobb, Mark A., 5,593,152, Cl. 271-241.000.

Bobry, Howard H. Hand-held sweep electronic printer with compensation for non-linear movement. 5,593,236, Cl. 400-88.000.

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Brunner, Armin; and Bock, Erich, 5,592,808, Cl. 57-408.000.

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Rödel, Günther; Radzisik, Bernhard; Zeiher, Michael; and Stenz, Herbert, 5,594,547, Cl. 356-312.000.

Bodnar, Ernest R. Method of simultaneously forming a pair of sheet metal structural members. 5,592,848, Cl. 72-379.200.

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Boehme, Michael H.: *See—*
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Hargrave, Karl D.; Cullen, Ernest; Proudfoot, John R.; Grozinger, Karl G.; Pal, Kollol; and Adams, Julian, 5,593,979, Cl. 514-81.000.
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Holmes, John S., II; and Anderson, Joe E., 5,594,906, Cl. 395-750.000.

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Rudolph, Rainer; Fischer, Stephan; and Mattes, Ralf, 5,593,865, Cl. 435-69.100.

Boeing Company, The: *See—*
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Lubowitz, Hyman R.; and Sheppard, Clyde H., 5,594,089, Cl. 528-171.000.

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David, Catherine; Teral, Gilles; Ledon, Henry; and Boiteux, Jean-Pierre, 5,594,150, Cl. 548-573.000.

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Ivanov, Eugene Y.; Grigoriva, Tatyana F.; and Boldyrev, Vladimir V., 5,593,082, Cl. 228-122.100.

Bolen, Philip D.: *See—*
Frey, Rudolph W.; and Bolen, Philip D., 5,594,753, Cl. 372-57.000.

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Bollore Technologies: *See—*
Gueguen, Michel; Billion, Marc; and Majastre, Hervé, 5,593,462, Cl. 29-623.300.

Boni, Bernard; Carpentier, Eric; and Babillon, Laurent, to Hutchinson. Ring device for running on a flat tire. 5,593,520, Cl. 152-158.000.

Bonislawski, John M., Jr.; Thayer, Bruce E.; and Gerbesi, Dennis G., to Xerox Corporation. Cleaner/waste bottle interface sealing via toner valve. 5,594,541, Cl. 399-358.000.

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Bonomo, Paul: *See—*
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Booher, Richard N.; Flaugh, Michael E.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., to Eli Lilly and Company. 6-heterocyclic-4-amino-1,3,4,5-tetrahydrobenz[CD]indoles. 5,594,019, Cl. 514-374.000.

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Audisio, Filippo; Borello, Gianpiero; Ferrera, Massimo; Gianotti, Pietro; and Gozzelino, Riccardo, 5,592,924, Cl. 123-525.000.

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Oparin, Mikhail I.; Borisov, Mikhail T.; and Alexeev, Georgy M., 5,594,831, Cl. 392-421.000.

Born, Joseph, to Machine Research Corporation of Chicago. Electromechanical variable valve actuator. 5,592,905, Cl. 123-90.110.

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Weinberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.

Borucki, Monica K.: *See—*
Cano, Raul J.; and Borucki, Monica K., 5,593,883, Cl. 435-252.100.

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Dings, Jacobus M.; Horne, Remko; Van Veen, Gerardus N. A.; and Bosman, Joseph C. M., 5,593,528, Cl. 156-154.000.

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Joachimi, Roland, 5,594,046, Cl. 523-179.000.

Both, Walter. Shirt packed in a can-like arrangement for presentation. 5,593,029, Cl. 206-278.000.

Bott, Klaus: *See—*
Schwendemann, Eckhard; and Bott, Klaus, 5,594,312, Cl. 318-799.000.

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Botvin, Arthur D. Methods and systems for conducting financial transactions via facsimile. 5,594,225, Cl. 235-379.000.

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Bourdier, Gilles: *See—*
Joulie, René; and Bourdier, Gilles, 5,594,827, Cl. 385-101.000.

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Bourgault, Gerard F. J., 5,592,889, Cl. 111-174.000.

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Foster, Mark J.; and Bovio, Michele, 5,594,617, Cl. 361-679.000.

Bowes, Carol L.: *See—*
Bedard, Robert L.; Ozin, Geoffrey A.; Ahari, Homayoun; Bowes, Carol L.; Jiang, Tong; and Young, David, 5,594,263, Cl. 257-201.000.

Bowles, Philip; Duff, Eric; and Thayer, Dale D., to ThermoSpectra Corporation. Method and apparatus for imaging obscured areas of a test object. 5,594,770, Cl. 378-58.000.

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Wood, H. Alan, 5,593,669, Cl. 424-93.600.

Boyce-Jacino, Michael T.: *See*—
Santamaria, Pedro; Boyce-Jacino, Michael T.; Barbosa, Jose J.; Rich, Stephen S.; and Paras, Anthony J., 5,593,830, Cl. 435-6.000.

Boyer, Leonard O.: *See*—
Evans, Joseph T., Jr.; and Boyer, Leonard O., 5,593,914, Cl. 437-60.000.

Boyette, Scott M.; and Golaszewski, Alan E., to BetzDearborn Inc. Alkylallylphosphonate copolymer used for boiler water treatment. 5,594,084, Cl. 526-278.000.

Boykin, David W.: *See*—
Dykstra, Christine C.; Tidwell, Richard R.; Boykin, David W.; Wilson, W. David; Spychala, Jaroslaw; Das, Bijan P.; and Kumar, Arvind, 5,594,138, Cl. 540-596.000.

Boylan, Eugene B.; Koerner, Robert F.; and Hebert, Russell R., to Bet Technology, Inc. Wagering game with a set of rounds and bets. 5,593,161, Cl. 273-274.000.

Boyle, William H., to Envirex Inc. Clarifier. 5,593,589, Cl. 210-519.000.

Bradshaw, John M.: *See*—
Gelder, Richard; and Bradshaw, John M., 5,593,602, Cl. 216-42.000.

Bradshaw, Richard L., to International Business Machines Corporation. Polymeric compositions containing inorganic fillers and use therof. 5,594,064, Cl. 524-507.000.

Brady, Thomas J.: *See*—
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Branan, M. William, Jr., to Motorola, Inc. Radio permitting information transfer between radio frequency shielded sub-systems. 5,594,579, Cl. 359-145.000.

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Wolf, Robert J.; Parrington, Scott M.; Brandner, John M.; Olson, David A.; and Reed, John F., 5,593,769, Cl. 428-286.000.

Brandolini, Jean-Louis: *See*—
Boubel, Henry; and Brandolini, Jean-Louis, 5,592,764, Cl. 38-77.830.

Brannan, James R.: *See*—
Bishara, Jeries I.; Brannan, James R.; Horvath, Roland J.; Sacco, Anthony R.; and Hinden, Jean M., 5,593,627, Cl. 264-127.000.

Brannon, Shaun: *See*—
Seiler, Douglas A., 5,593,024, Cl. 206-5.000.

Brascon Architectural Products Inc.: *See*—
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Brassfield, Steven R.: *See*—
Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,276, Cl. 415-173.100.
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Bratten, Jack R. System and method for collecting cutting fluid liquid and chips. 5,593,596, Cl. 210-741.000.

Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., to Baxter International Inc. Tissue implant systems and methods for sustaining viable high cell densities within a host. 5,593,440, Cl. 623-11.000.

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Hahnewald, Andrea; Auria, Augustin; Jiminez, Miguel; Vazquez, Miguel; Carreras, Francesc; and Coronado, Juan C., 5,592,763, Cl. 38-77.900.

Brecht, David C.; Bauman, Robert C.; and Hancock, Robert L., to Ford Motor Company. Electrical component connecting provisions for an ignition coil. 5,594,616, Cl. 361-622.000.

Brecht, William B., to Trojan Battery Company. Electrode plate construction. 5,593,797, Cl. 429-210.000.

Breese, Steven M. Crib ventilating system. 5,592,704, Cl. 5-423.000.

Breisenbuber, Josef; Bock, Erich; Lindner, Gallus; and Knabel, Manfred, to Rieter Ingolstadt Spinnereimaschinenbau AG. Bearing arrangement for an open-end spinning rotor. 5,592,807, Cl. 57-406.000.

Brenner, Michael B.; and Parker, Christina M., to Brigham and Women's Hospital, Inc. Novel integrin alpha subunit. 5,594,120, Cl. 536-23.500.

Breslin, Patrick W., to U-Haul International, Inc. Receiver hitch with anti-rattle device. 5,593,172, Cl. 280-506.000.

Brestel, Ronald R.: *See*—
Lovell, Michel K.; Jackson, Randall S.; and Brestel, Ronald R., 5,593,166, Cl. 277-59.000.

Breton, Richard E., to Heidelberger Druckmaschinen AG. Device for extracting samples from a folder. 5,592,864, Cl. 83-154.000.

Brevick, John E.: *See*—
Zabuzec, Matthew J.; McCune, Robert C., Jr.; Popoola, Oludele O.; Baughman, James R.; and Brevick, John E., 5,592,927, Cl. 123-668.000.

Brey, William W.; and Withers, Richard S., to Conductus, Inc. Nuclear magnetic resonance probe coil with enhanced current-carrying capability. 5,594,342, Cl. 324-322.000.

Brichta, Donald A.: *See*—
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Bridgestone Corporation: *See*—
Graves, Daniel F.; and Hergenrother, William L., 5,593,701, Cl. 425-52.000.

Briggs, Oliver G., Jr.; and Sund, John A., Jr., to DB Riley, Inc. Variable orifice plate for coal pipes. 5,593,131, Cl. 251-117.000.

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Brillhart, Mark V.: *See*—
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Briner, Michael S.: *See*—
Roohparvar, Fariborz F.; and Briner, Michael S., 5,594,694, Cl. 365-201.000.

Brinker, Alfred, to Karl Ruggli AG. Tampon, as well as a method and a device for manufacturing it. 5,592,725, Cl. 28-118.000.

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Brion, Francis; Bueadia, Jean; Diolez, Christian; and Vivat, Michel, to Uclaf, Roussel. Intermediates for the preparation of $\Delta^{4,9(11),17(20)}$-pregnatriene-3-ones. 5,594,127, Cl. 540-30.000.

Bristol Compressors, Inc.: *See*—
Hill, Joe T., 5,593,295, Cl. 418-55.200.

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Lim, Gary M. F.; Roubie, John M.; and Garofalo, Elizabeth A., 5,594,129, Cl. 540-222.000.
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Britt, Mike: *See*—
Sagar, Chris; and Britt, Mike, 5,592,826, Cl. 62-195.000.

Britz, Judith: *See*—
Levine, Robert A.; Wardlaw, Stephen C.; Rodriguez, Rodolfo; Britz, Judith; and Mercolino, Thomas J., 5,593,848, Cl. 435-7.240.

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Broder, Damon; Movaghar, Abdolreza; and Rhoads, W. Wistar, to Hewlett-Packard Company. Carriage support system for computer driven printer. 5,593,240, Cl. 400-352.000.

Bronstein, Irena; Edwards, Brooks; and Voyta, John, to Tropix, Inc. Membrane for chemiluminescent blotting applications. 5,593,828, Cl. 435-6.000.

Brosch, Andrea L.: *See*—
Gruber, Patrick R.; Kolstad, Jeffrey J.; Witzke, David R.; Hartmann, Mark H.; and Brosch, Andrea L., 5,594,095, Cl. 528-354.000.

Broskow, James A., to Illinois Tool Works Inc. Ring container multipack with perforated tear strip for container removal. 5,593,026, Cl. 206-150.000.

Brother Kogyo Kabushiki Kaisha: *See*—
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Muto, Yukiyoshi, 5,592,891, Cl. 112-475.190.
Ohashi, Yumiko, 5,594,482, Cl. 347-69.000.

Brown, Bari W.: *See*—
Harrison, Richard P.; Brown, Bari W.; Rossio, Richard C.; Aviles, Gladys M.; Dexheimer, Edward M.; and Ho, David, 5,594,037, Cl. 521-99.000.

Brown, Charles R.: *See*—
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Brown, David G.: *See*—
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Brown, Jeffery O.: *See*—
Louwagie, Dominic J.; Carolus, Steven L.; Field, John M.; Murphy, Daniel J.; Brown, Jeffery O.; and Dewey, James D., 5,594,347, Cl. 324-539.000.

Brown, Melissa H.: *See*—
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Brown, Sherri M.; and Santino, Colleen G., to Monsanto Company. Enhanced expression in plants. 5,593,874, Cl. 435-172.300.

Brown, Thomas A., to Ericsson Inc. Control channel timing detection and self correction for digitally trunked simulcast radio communications system. 5,594,761, Cl. 375-356.000.

Broze, Guy: *See*—
Mondin, Myriam; Loth, Myriam; Broze, Guy; Mehreteab, Ammanuel; Thomas, Barbara; Adamy, Steven; and Bala, Frank, Jr., 5,593,958, Cl. 510-417.000.

Brueckmann, Dieter; and Preuss, Walfried, to Siemens Aktiengesellschaft. Digital signal processing device with optimized ALU circuit and logic block for controlling one of two registers based on the contents of the multiplication register. 5,594,912, Cl. 395-800.000.

Bruehl, Richard E.: *See*—
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Brugel, Edward G., to Du Pont de Nemours, E. I., and Company. Stable chlorosulfonated resin latex related applications. 5,594,063, Cl. 524-504.000.

Bruner, Curt; Hutsell, Larry; Reh, Jeff; and Metz, Robert, to Maxtor Corporation. Dual internal bus system architecture for hard disk drive. 5,594,600, Cl. 360-69.000.

Bruner, Nancy J.; and Smith, Patricia L., to U. S. West Marketing Resources Group, Inc. Method for interfacing with a multi-media information system. 5,594,661, Cl. 364-514.00R.

Brüning, Paul: *See*—
Figgener, Helmut; and Brüning, Paul, 5,593,377, Cl. 494-56.000.

Brunken, Dean E., to Advanced Chemical Technologies, Inc. Water repellent composition for cellulose containing materials and method for producing same. 5,593,483, Cl. 106-2.000.

Brunner, Armin; and Bock, Erich, to Rieter Ingolstadt Spinnereimaschinenbau AG. Opener device for a spinning station of an open-end spinning machine. 5,592,808, Cl. 57-408.000.

Bryan, George H.; and Pop, Mihai G. M., to B & W Nuclear Technologies. Filter adapter and disposable filter. 5,593,578, Cl. 210-232.000.

Brzezinski, Philip: *See*—
Fishman, Neil S.; Miller, J. Mark; Dvorachek, Thomas J., III; and Brzezinski, Philip, 5,594,462, Cl. 345-2.000.

Bucci, George H.; and Johansen, Mark R., to Walbro Corporation. Control valve and system for fuel vapor recovery. 5,592,963, Cl. 137-202.000.

Buchanan, Charles M.; Gardner, Robert M.; White, Alan W.; and Wood, Matthew D., to Eastman Chemical Company. Cellulose ester blends. 5,594,068, Cl. 525-54.300.

Buck, Wolfgang. Oxadiazole carbonamide herbicidal compounds. 5,593,946, Cl. 504-265.000.

Budd, Kenton D., to Minnesota Mining and Manufacturing Company. Encapsulated electroluminescent phosphor and method for making same. 5,593,782, Cl. 428-403.000.

Bueadia, Jean: *See*—
Brion, Francis; Bueadia, Jean; Diolez, Christian; and Vivat, Michel, 5,594,127, Cl. 540-30.000.

Bueno, Clifford; Betz, Robert A.; Ellisman, Mark H.; and Fan, Gary G. Y., to Lockheed Missiles and Space Company, Inc. Hybrid luminescent device for imaging of ionizing and penetrating radiation. 5,594,253, Cl. 250-486.100.

Buettner, Michael: *See*—
Florin, Fabrice; Buettner, Michael; Corey, Glenn; Fritsche, Janey; Maresca, Peter; Miller, Peter; Purdy, Bill; Sharpe, Stuart; and West, Nick, 5,594,509, Cl. 348-731.000.

Bühler AG: *See*—
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Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; McCartor, Harold R.; Rowan, Stuart H.; Wagner, Neldon C.; and Whitney, Hartwell H., to Osteo Sciences Corporation. Apparatus and method for acoustic analysis of bone using optimized functions of spectral and temporal signal components. 5,592,943, Cl. 128-661.030.

Buhr, Mark S.: *See*—
Webler, William E.; and Buhr, Mark S., 5,592,942, Cl. 128-660.090.

Bujanowski, Valeris J.: *See*—
Glover, Shedric O.; Bujanowski, Valeris J.; Ziemelis, Maris J.; Skinner, Michael W.; Homan, Gary R.; Perz, Susan V.; and Cannady, John P., 5,594,042, Cl. 522-31.000.

Bularzik, Joseph H.: *See*—
Krause, Robert F.; Bularzik, Joseph H.; and Kokal, Harold R., 5,594,186, Cl. 75-228.000.

Bull, Brian S. Method and apparatus for rapid determination of blood sedimentation rate. 5,594,164, Cl. 73-61.660.

Bull S.A.: *See*—
Tamisier, Thomas, 5,594,656, Cl. 364-488.000.

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Williams, Theodore G.; Chap, John P.; Gadberry, Mike; and Covert, William M., 5,592,886, Cl. 108-108.000.

Chapman, Terri L.: *See*—
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Ihm, Dae W.; Kim, Jeong L.; Kim, Kwon I.; and Kim, Byeng H., 5,593,738, Cl. 427-534.000.
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Jackson, Frank W., 5,593,851, Cl. 435-12.000.
Chemelli, John B.; Bernecker, Walter J.; and Caprio, Craig A., to Eastman Kodak Company. Test pouch. 5,593,804, Cl. 430-30.000.
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Chemosal S.A.: *See*—
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Chenard, Bertrand L., to Pfizer Inc. Method for treating spinal cord trauma with phenolic 2-piperidino-1-alkanols. 5,594,007, Cl. 514-315.000.
Cheng, Yihao, to JDS Fitel Inc. Integrated optical isolator. 5,594,821, Cl. 385-24.000.
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Leng, Francis J.; and Parrott, David T., 5,593,663, Cl. 424-65.000.
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LoStracco, Gregory; Chesler, Ronald B.; and Hsu, Hui-Pin, 5,594,829, Cl. 385-134.000.
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Habib, Mohammad M.; Winslow, Philip L.; and Moore, Richard O., Jr., 5,593,570, Cl. 208-108.000.
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Chew, Sandy M.: *See*—
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Chi, Min-hwa: *See*—
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Cho, Jung S.; and Song, Je S., to Hyundai Electronics Industries Co., Ltd. Car collision prevention apparatus and method using dual processor and automatic sensor switching function. 5,594,413, Cl. 340-435.000.
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Choi, Do H.: *See*—
Kim, Jong P.; Kim, Byung H.; Ahn, Cheoul H.; Kim, Tae H.; and Choi, Do H., 5,594,427, Cl. 340-825.720.
Choi, Young R.: *See*—
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Yam, Benny S.; Jorgensen, Robert C.; and Spears, William E., Jr., 5,593,339, Cl. 451-36.000.
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Ciaccio, Michael P., to Ford Motor Company. EMI baffle for electronic control. 5,594,199, Cl. 174-35.00R.
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Cutter, Larry; Gartner, Klaus W.; Butterweck, Dieter; Vuilleumier, P.; Monnier, Jean-Luc; and Sermet, P-A, 5,594,430, Cl. 340-825.310.
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Narayanan, Puducode S.; Nguyen, Tai T.; Vaidyanathan, Arunachalam; and Garcia, Edward C., 5,594,874, Cl. 395-284.000.
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Clark, Thomas R.; Dawson, Gerald L.; and Scherer, Paul T., to Mas-Hamilton Group. Anti-attack interlocks for a combination lock mechanism. 5,592,838, Cl. 70-303.00A.
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Coates, Geoffrey W.: *See*—
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Cochran, Mark D.; and Macdonald, Richard D., to Syntro Corporation; and PruTech Research and Development Partnership. Recombinant infectious bovine rhinotracheitis virus. 5,593,873, Cl. 435-172.300.
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Cohen, Robert C.: *See*—
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Cole, Clinton: *See*—
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Mondin, Myriam; Loth, Myriam; Broze, Guy; Mehreteab, Ammanuel; Thomas, Barbara; Adamy, Steven; and Bala, Frank, Jr., 5,593,958, Cl. 510-417.000.
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Belmont, Brian V., 5,594,879, Cl. 395-309.000.
Dao, Giang H., 5,594,848, Cl. 395-134.000.

Sellers, Charles A., 5,594,618, Cl. 361-680.000.
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Concat, Ltd.: *See*—
Winchell, Harry S.; Klein, Joseph Y.; Simhon, Elliot D.; Cyjon, Rosa L.; Klein, Ofer; and Zaklad, Haim, 5,593,659, Cl. 424-9.363.
CONDEA Vista Company: *See*—
Decker, Lewis B., Jr.; and McLaughlin, Kevin J., 5,593,654, Cl. 423-625.000.
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Brey, William W.; and Withers, Richard S., 5,594,342, Cl. 324-322.000.
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Moench, Thomas R.; and Cone, Richard A., 5,592,949, Cl. 128-837.000.
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Trinsberger, Stephen M.; Duong, Khue; and Conn, Robert O., Jr., 5,594,367, Cl. 326-41.000.
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Zhu, Li-Yan, 5,594,595, Cl. 360-31.000.
Connor, Denis J.; Cummings, Gerald F.; and Star, Michael J., to Dynamotive Canada Corporation. Acoustic transformer with non-piezoelectric core. 5,594,705, Cl. 367-13.000.
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Thomson, Donald W.; and Nichols, Frank B., 5,593,709, Cl. 425-454.000.
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Continental Aktiengesellschaft: *See*—
Neddermeyer, Thomas; and Frucht, Theodor, 5,593,522, Cl. 152-458.000.
Peter, Julius, 5,593,226, Cl. 366-69.000.
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Conway, James M. Expanded area safety gate. 5,592,779, Cl. 49-73.100.
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Lu, Daozheng; and Cook, Barry P., 5,594,934, Cl. 455-2.000.
Cook, Robert E.: *See*—
Measaros, David W.; Cook, Robert E.; and Medykiewicz, Ronald A., 5,594,663, Cl. 364-550.000.
Cook, Stephen L.; Rush, Maurice W.; Richards, Paul J.; and Barr, Donald, to Associated Octel Company Limited, The. Fuel additives. 5,593,464, Cl. 44-362.000.
Cook, Thomas D.; Fairchild, Manuel R.; Mowery, Kenneth D.; and Scott, Jeffrey R., to Delco Electronics Corporation. Digitally reconfigurable engine knock detecting system. 5,594,649, Cl. 364-424.034.
Coombs, Peter M., to Gradco (Japan) Ltd. Tray configuration for sheet receiving apparatus. 5,593,153, Cl. 271-287.000.
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Cooney, Barry F.; Camden, Thomas M.; Duke, James P.; and Steffo, David J., to Westinghouse Electric Corporation. Automated video characterization of nuclear power plant components. 5,594,764, Cl. 376-248.000.
Cooper Industries: *See*—
Happ, Lawrence R.; Alfaro, Conrad F.; and Grossmann, Bruce B., 5,594,404, Cl. 337-210.000.
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Woodworth, Jonathan J.; Kester, Jeffrey J.; and Hartman, Thomas C., 5,594,613, Cl. 361-127.000.
Copeland Corporation: *See*—
Houghtby, Timothy R.; Reineke, Roger W.; and Monnier, Kenneth J., 5,593,294, Cl. 418-55.100.
Copeland, Richard L.; and Mancuso, Paul, to Sensormatic Electronics Corporation. Rotating magnet array for deactivating EAS markers. 5,594,420, Cl. 340-572.000.
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Corder, George A.; and Turney, Charles C., to ASC Incorporated. Convertible top. 5,593,202, Cl. 296-108.000.
Cordis Corporation: *See*—
Martinez, Susana; and Yoklavich, Margaret F., 5,593,412, Cl. 606-108.000.
Corey, Glenn: *See*—
Florin, Fabrice; Buettner, Michael; Corey, Glenn; Fritsche, Janey; Maresca, Peter; Miller, Peter; Purdy, Bill; Sharpe, Stuart; and West, Nick, 5,594,509, Cl. 348-731.000.
Cornell Research Foundation, Inc.: *See*—
Frechet, Jean M. J.; and Svec, Frantisek, 5,593,729, Cl. 427-337.000.
Corning Incorporated: *See*—
Berkey, George E., 5,594,822, Cl. 385-43.000.
Coronado, Juan C.: *See*—
Habsowald, Andrea; Auria, Augustin; Jiminez, Miguel; Vazquez, Miguel; Carreras, Francesc; and Coronado, Juan C., 5,592,763, Cl. 38-77.900.
Corridon, James M. Cathedral ceiling fixture mounting system. 5,592,788, Cl. 52-39.000.
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Turner, Dennis M., 5,593,207, Cl. 297-281.000.
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McDonald, Ian A.; Whitten, Jeffrey P.; and Cosford, Nicholas D., 5,594,011, Cl. 514-343.000.
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Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, to Kabushiki Kaisha Toshiba; and International Business Machines, Corp. Apparatus for processing semiconductor wafers. 5,593,537, Cl. 156-636.100.
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Jha, Brajesh K.; Chhatre, Ajay S.; Kulkarni, Bhaskar D.; and Sivasanker, Subramanian, 5,594,137, Cl. 540-535.000.
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Courian, Kenneth J.: *See*—
Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, 5,594,481, Cl. 347-65.000.
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Williams, Theodore G.; Chap, John P.; Gadberry, Mike; and Covert, William M., 5,592,886, Cl. 108-108.000.
Cowen, Steven J.; Young, Christopher M.; Dombrowski, James H.; Kono, Michael E.; and Daughtry, James H., to United States of America, Navy. Process for manufacturing a fiber reinforced optic microcable with a UV cured resin. 5,593,736, Cl. 427-492.000.
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Duffy, Gerald E.; Cowling, John J.; Crites, D. Aaron; and Mikol, Dale K., 5,594,294, Cl. 313-25.000.
Cox, David S.; and Gates, Stephen M., to Sonsub, Inc. Diverless flowline connection system. 5,593,249, Cl. 405-191.000.
Cox, Donald P. Methods and apparatus for selectively attaching and releasing multiple payloads suspended from an aircraft. 5,593,113, Cl. 244-137.100.
Cox, Donald R., to Co-Jo Sports, Inc. Vibrating footwear. 5,592,759, Cl. 36-141.000.
Cox, Richard V.; and Kaplan, Michael M., to Lucent Technologies Inc. Secure telecommunications. 5,594,798, Cl. 380-49.000.
Coyle, Laurie; Finucane, Kevin M.; King, James D.; Doncho, Harold F.; and De Los Santos, Armando, to Lever Brothers Company, Division of Conopco, Inc. Apparatus for accurately controlling moisture levels of aqueous surfactant compositions during on line processing including a cross-feed piston assembly. 5,594,340, Cl. 324-321.000.
Crafford Precision Products Co.: *See*—
Marcotrigiano, Anthony; and Pepper, James T., 5,592,809, Cl. 59-25.000.
Crane Plastics Company Limited Partnership: *See*—
Scott, Michael K., 5,592,782, Cl. 49-489.100.
Crawford, Charles K., to Kimball Physics, Inc. Vacuum system components. 5,593,123, Cl. 248-231.210.

Crawford, Steve, to MEC Systems, Inc. Exhaust gas scrubber. 5,593,469, Cl. 55-228.000.
CRC-Evans Pipeline International, Inc.: *See*—
Jones, Richard L., 5,593,605, Cl. 219-121.630.
Creative Integrated Systems, Inc.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,594,696, Cl. 365-208.000.
Creighton University: *See*—
Lovas, Sandor; Conlon, J. Michael; Vincze, Borbala; Palyi, Istvan; Gaal, Dezso; Kalnay, Adrienn; Mezo, Imre; Teplan, Istvan; Toth, Geza; and Kovacs, Magdolna, 5,593,965, Cl. 514-15.000.
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Golla, Carla; and Cremonesi, Alessandro, 5,594,677, Cl. 364-724.160.
Crepeau, Allen E.; and Jablonowski, Thomas L., to Uniroyal Chemical Company, Inc. Dialkylthiourea cured elastomeric roofing composition. 5,594,073, Cl. 525-331.800.
Cretini, Gus R. Floating cover and baffle system. 5,593,575, Cl. 210-170.000.
Crisler, Kenneth J.; and Needham, Michael L., to Motorola, Inc. Time slot allocation method. 5,594,738, Cl. 370-347.000.
Cristalli, Gloria, to Schering Corporation. Adenosine derivatives having A_2 agonist activity. 5,593,975, Cl. 514-46.000.
Crites, D. Aaron: *See*—
Duffy, Gerald E.; Cowling, John J.; Crites, D. Aaron; and Mikol, Dale K., 5,594,294, Cl. 313-25.000.
Croft, W. Jack. Nut harvester. 5,592,805, Cl. 56-16.40R.
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Khoury, Jehad; Woods, Charles L.; Cronin-Golomb, Mark; and Fu, Jack, 5,594,586, Cl. 359-559.000.
Crothall, George: *See*—
Shipp, John I.; Crothall, George; Lathrop, Robert L., Jr.; and Reichel, Donald R., 5,593,414, Cl. 606-142.000.
Croudace, Michael C.: *See*—
Jessup, Peter J.; and Croudace, Michael C., 5,593,567, Cl. 208-46.000.
Crowther, Gordon H., deceased; and Younce, by Donn, executor, to Neuroware Therapy International, Inc. Method for neurostimulation for pain alleviation. 5,593,432, Cl. 607-46.000.
CRP, Inc.: *See*—
Meriette, John, 5,593,456, Cl. 623-49.000.
Cruz, Gil C.; Hill, Ralph D.; Judd, Thomas H.; New, Darren H.; and Rosenberg, Jonathan, to Bell Communications Research, Inc. System and method for preprocessing and delivering multimedia presentations. 5,594,911, Cl. 395-800.000.
Crystal Semiconductor Corporation: *See*—
Henrion, W. S., 5,594,612, Cl. 341-120.000.
Paulos, John J.; Kamath, Gautham D.; and Krone, Andrew W., 5,594,442, Cl. 341-143.000.
Swanson, Eric J., 5,594,439, Cl. 341-118.000.
CSL Limited: *See*—
Barr, Ian G.; and Thiel, William J., 5,593,697, Cl. 424-490.000.
Cudd, Amelia: *See*—
Arvinte, Tudor; Cudd, Amelia; and Phillips, Judith, 5,593,962, Cl. 514-12.000.
Cuevas, Jess A.; and Zakula, Mitchell P., to TRW Inc. Dual chamber inflator for side impact air bag. 5,593,180, Cl. 280-741.000.
Cullen, Ernest: *See*—
Hargrave, Karl D.; Cullen, Ernest; Proudfoot, John R.; Grozinger, Karl G.; Pal, Kollol; and Adams, Julian, 5,593,979, Cl. 514-81.000.
Cullen, Thomas G.: *See*—
Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,593,998, Cl. 514-258.000.
Culler, Michael D.: *See*—
Goldstein, Gideon; and Culler, Michael D., 5,593,842, Cl. 435-7.100.
Cullinan, George J.; and Sales, James J., to Eli Lilly and Company. Methods of inhibiting breast disorders. 5,593,987, Cl. 514-212.000.
Culp, Gordon W. Axially stiff link. 5,593,351, Cl. 464-114.000.
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Cummings, Gerald F.: *See*—
Connor, Denis J.; Cummings, Gerald F.; and Star, Michael J., 5,594,705, Cl. 367-13.000.
Cunningham, David: *See*—
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,593,959, Cl. 514-8.000.
Curello, Charles C.; Shahriary, I. Mark; and Berman, Arnold L., to Hughes Aircraft Company. Synthesizer routing architecture for a switching apparatus. 5,594,939, Cl. 455-12.100.
Curreri, Anthony; Smith, B. Scott; and Jennings, G. Mark, to Davox Corporation. Method for selecting and controlling the automatic dialing of a call record campaign. 5,594,790, Cl. 379-265.000.
Curry, Robert M.: *See*—
Parsons, Harry R.; Curry, Robert M.; and Gilvar, Stephen G., 5,594,522, Cl. 396-517.000.
Curzons, Alan D.: *See*—
Greenway, Michael J.; Salt, Sarah D.; Valder, Christopher E.; and Curzons, Alan D., 5,594,026, Cl. 514-460.000.
Cutler, Victor H., Jr.: *See*—
Peterson, Kenneth M.; Cutler, Victor H., Jr.; and Davieau, Gerald J., 5,594,940, Cl. 455-12.100.
Cutter, Larry; Gartner, Klaus W.; Butterweck, Dieter; Vuilleumier, P.; Monnier, Jean-Luc; and Sermet, P-A, to La Gard; and Ciposa Microtechniques SA. Programmable electronic time lock. 5,594,430, Cl. 340-825.310.
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Garel-Jones, Philip M.; Harman, Murray R.; and Cutts, Timothy P., 5,594,820, Cl. 385-22.000.
Cyjon, Rosa L.: *See*—
Winchell, Harry S.; Klein, Joseph Y.; Simhon, Elliot D.; Cyjon, Rosa L.; Klein, Ofer; and Zaklad, Haim, 5,593,659, Cl. 424-9.363.
Cytec Technology Corp.: *See*—
Wu, Kuang-Jong; and O'Toole, Doris C., 5,593,735, Cl. 427-461.000.
Cytogen Corporation: *See*—
Belinka, Benjamin A., Jr.; Coughlin, Daniel J.; Alvarez, Vernon L.; and Wood, Richard, 5,593,656, Cl. 424-1.690.
Czech, Anna M., to OSi Specialties, Inc. Method for imparting softness with reduced yellowing to a textile using a low amine content, high molecular weight aminopolysiloxane. 5,593,611, Cl. 252-8.630.
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Storz, Andreas; Czesnikowski, Siegmund; and Frey, Wolfram, 5,593,125, Cl. 248-316.500.
DAC Vision, Inc.: *See*—
Nelson, Thomas E.; and Larsen, Erik A., 5,593,340, Cl. 451-42.000.
Daewoo Electronics Co., Ltd.: *See*—
Kim, Byung-Sun, 5,592,829, Cl. 62-428.000.
Lee, Chang-Ho, 5,594,604, Cl. 360-85.000.
Park, Yong-Gyu, 5,594,743, Cl. 371-40.100.
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Umine, Shigeki; Suzuki, Taro; and Yamamoto, Kyoichi, 5,593,940, Cl. 503-227.000.
Dai Nippon Printing Co., Ltd.: *See*—
Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Miktio, 5,593,939, Cl. 503-227.000.
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Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Hayashida, Tadashi, 5,593,510, Cl. 148-225.000.
Daiki Engineering Co., Ltd.: *See*—
Kumagai, Naokazu; Jikihara, Shuji; and Samata, Yoshimitsu, 5,593,556, Cl. 204-290.00F.
Daikin Industries, Ltd.: *See*—
Sogabe, Masaharu; and Sumida, Hisashi, 5,592,824, Cl. 62-127.000.
Dailey, Kirk W.: *See*—
Schaupp, George W., Jr.; Sheley, Laura A.; and Dailey, Kirk W., 5,594,778, Cl. 379-58.000.
Daimler-Benz Aerospace AG: *See*—
Ransom, Stephen; and Relotius, Klaus-Dieter, 5,593,110, Cl. 244-3.230.
Daiwa Seiko, Inc.: *See*—
Iwama, Shinichi; Ota, Seiki; and Tsugami, Keiji, 5,592,758, Cl. 36-117.100.
Yamaguchi, Akira, 5,593,102, Cl. 242-246.000.
Dalal, Ketan; and Bellew, Matthew, to Microsoft Corporation. Method and system for joining database tables using compact row mapping structures. 5,594,898, Cl. 395-602.000.
Dall, Cristine J.: *See*—
Treml, Suzanne B.; Dall, Cristine J.; Draveling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., 5,593,824, Cl. 435-4.000.
Dallas Semiconductor: *See*—
Ezell, Richard W., 5,594,408, Cl. 338-89.000.
Dalsass, Aldo R.: *See*—
Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalsass, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.
Daly, Donna: *See*—
Winberry, Martin W.; Velagaleti, Ranga R.; Williams, Mark D.; Daly, Donna; Swain, Len R.; and Weber, Jerome B., 5,594,185, Cl. 73-866.000.
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Bates, Ian R. J.; Daly, Michael; and Fowler, Paul M., 5,592,851, Cl. 74-336.00R.
Dam, Chuong Q.; Koshkarian, Keut A.; and Willi, Martin L., to Caterpillar Inc. Combustion catalyst wire wrapped on corrosion resistive glow plugs. 5,593,607, Cl. 219-270.000.
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Dan-Dee International Limited: *See*—
Capozzi, Lee, 5,593,041, Cl. 206-784.000.
Dana Corporation: *See*—
Tsung, Wei-Jiung; and Fisher, James, 5,592,843, Cl. 72-88.000.
Danby, Michael: *See*—
Clinch, James P.; and Danby, Michael, 5,593,263, Cl. 411-182.000.

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Hussain, Zaki D., 5,594,288, Cl. 310-62.000.

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Meroni, Umberto; Ruzza, Domenico W.; and Carboni, Andrea, 5,592,988, Cl. 164-478.000.

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Ginzburg, Vladimir B., 5,592,823, Cl. 62-64.000.

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Machino, Masaki; Ito, Sumiyoshi; Danmoto, Shojiro; Kanno, Fumio; and Komiya, Takao, 5,593,293, Cl. 414-729.000.

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Dao, Giang H., to Compaq Computer Corporation. Method and apparatus for efficiently determining line segments within a window using iterative halving. 5,594,848, Cl. 395-134.000.

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Darredeau, Bernard; Lehman, Jean-Yves; and Peyron, Jean-Marc, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process and installation for the separation of air. 5,592,834, Cl. 62-656.000.

Darsley, Michael J.: *See*—
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Das, Bijan P.: *See*—
Dykstra, Christine C.; Tidwell, Richard R.; Boykin, David W.; Wilson, W. David; Spychala, Jaroslaw; Das, Bijan P.; and Kumar, Arvind, 5,594,138, Cl. 540-596.000.

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Davis, Robert M.; and da Silva, Jorge M. P., 5,593,095, Cl. 239-584.000.

Dasse, Edward C.; Kost, Donald R.; and Day, Lawrence J., to Motorola Inc. Apparatus for performing wafer-level testing of integrated circuits where test pads lie within integrated circuit die but overly no active circuitry for improved yield. 5,594,273, Cl. 257-620.000.

Dataproducts Corporation: *See*—
Tuvesson, Eric; and Lipetsky, Efrem, 5,594,532, Cl. 399-100.000.

Date, Masahiro, to Fujitsu Limited. Character developing apparatus. 5,594,472, Cl. 345-194.000.

Dauber, Edwin G.; Bailey, Christian E.; and Sassa, Robert L., to W. L. Gore & Associates, Inc. Adsorbent assembly for removing gaseous contaminants. 5,593,482, Cl. 96-135.000.

Daughtry, James H.: *See*—
Cowen, Steven J.; Young, Christopher M.; Dombrowski, James H.; Kono, Michael E.; and Daughtry, James H., 5,593,736, Cl. 427-492.000.

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Sung, Chih-Ta; Chan, Tzoyao; Chang, Richard; Rosenau, Mark A.; Ort, Jeffrey G.; Daum, Daniel T.; and Sun, Yuanyuan, 5,594,660, Cl. 364-514.00R.

Dauth, Jochen; Herzig, Christian; Deubzer, Bernward; Hierstetter, Thomas; and Gratzl, Petra, to Wacker-Chemie GmbH. Organosilicon compounds containing (meth) acryloxy groups, their preparation and their use. 5,593,787, Cl. 428-447.000.

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David Sarnoff Research Center, Inc.: *See*—
Zanzucchi, Peter J.; Cherukuri, Satyam C.; McBride, Sterling E.; and Judd, Amrit K., 5,593,838, Cl. 435-6.000.

Davidson Textron Inc.: *See*—
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Davieau, Gerald J.: *See*—
Peterson, Kenneth M.; Cutler, Victor H., Jr.; and Davieau, Gerald J., 5,594,940, Cl. 455-12.100.

Davis, Curtis A.: *See*—
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Briggs, Oliver G., Jr.; and Sund, John A., Jr., 5,593,131, Cl. 251-117.000.

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Johnson, Allen E., 5,593,048, Cl. 211-59.200.

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Ramos, Sergio; Hall, John T.; Tanzer, Herbert J.; and Quon, William, 5,594,315, Cl. 320-2.000.
Shelton, Gary R.; and Street, Kyle R., 5,593,040, Cl. 206-706.000.
Yeow, Eddie Y.; Radys, Ray G.; Woody, George R.; and Ramos, Sergio, 5,594,317, Cl. 320-2.000.

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Register, David S., 5,594,620, Cl. 361-681.000.

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Swamy, Deepak; and Pecone, Victor, 5,593,322, Cl. 439-660.000.

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O'Neill, William J., 5,594,843, Cl. 395-127.000.

Derecktor, Thomas E., to TracRac, Inc. Portable work bench having sliding connections for releasably and adjustably attaching accessories thereto. 5,592,981, Cl. 144-286.100.

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Ansart, Denis R. H.; Commaret, Patrice A.; David, Etienne S. R.; Desaulty, Michel A. A.; Quinquenneau, Bruno M. M.; and Sandelis, Denis, 5,592,819, Cl. 60-737.000.

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Knowles, Billy J.; Collins, Clive A.; Desnoyers, Christine M.; Grice, Donald G.; and Rolfe, David B., 5,594,918, Cl. 395-800.000.

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Dewar, Kevin D.: *See*—
Jones, Anthony M.; Dewar, Kevin D.; and Sotheran, Martin W., 5,594,678, Cl. 364-725.000.

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Louwagie, Dominic J.; Carolus, Steven L.; Field, John M.; Murphy, Daniel J.; Brown, Jeffery O.; and Dewey, James D., 5,594,347, Cl. 324-539.000.

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d'Hont, Loek, to Texas Instruments Incorporated. Highly accurate RF-ID positioning system. 5,594,448, Cl. 342-44.000.

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Dinsmore, Jonathan, 5,593,673, Cl. 424-93.700.

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McMorrow, Gerald J., 5,592,941, Cl. 128-660.070.

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König, Klaus; Mazanek, Jan; Schwindt, Jürgen; Dietrich, Manfred; and Klein, Gerhard, 5,594,087, Cl. 528-44.000.

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Birchenough, Charles W.; Dietz, Hans P.; Holloway, Dwight S.; Ryter, Noel J.; Scholl, Rolland D.; and Tweed, Lorne W., 5,594,643, Cl. 364-424.080.

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Colgate, William K.; and Green, Kelly C., 5,594,889, Cl. 395-497.020.
Foster, Mark J.; and Bovio, Michele, 5,594,617, Cl. 361-679.000.
Hawe, William R.; Lampson, Butler W.; and Gupta, Amar, 5,594,869, Cl. 395-200.200.
Kinzelman, Paul M.; and Warchol, Nicholas A., 5,594,741, Cl. 371-27.000.
Lee, Ching S.; and Itkowsky, Frank A., Jr., 5,594,927, Cl. 395-886.000.
Palmer, Larry G.; and Palmer, Ricky S., 5,594,495, Cl. 348-17.000.
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Printz, Harry W.; and Stubley, Peter R., 5,594,674, Cl. 364-715.020.
Thaller, Kurt M., 5,594,875, Cl. 395-287.000.

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Peterson, John, 5,594,428, Cl. 340-825.360.

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Jaskowiak, Timothy R.; Gilmore, Daniel R., III; and DiGravio, Thomas L., 5,592,863, Cl. 82-1.110.

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Di Malta, Alain: *See*—
Wagnon, Jean; Tonnerre, Bernard; Di Malta, Alain; Roux, Richard; Amiel, Marie-Sophie; and Serradeil-Legal, Claudine, 5,594,023, Cl. 514-423.000.

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Basinski, Margret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,594,104, Cl. 530-324.000.

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Tempest, Michael C.; and Dimofte, Florin, 5,593,230, Cl. 384-100.000.

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Jay, Eric C.; Dyer, John A.; and Dinsmoor, John C., III, 5,593,211, Cl. 297-383.000.

Dinsmore, Jonathan, to Diacrin, Inc. Isolated porcine pancreatic cells for use in treatment of diseases characterized by insufficient insulin activity. 5,593,673, Cl. 424-93.700.

Diolez, Christian: *See*—
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Dion, John K.: *See*—
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Endres, James A.; DiRenzi, Francis J.; and Hecht, Gideon, 5,593,247, Cl. 405-3.000.

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Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,276, Cl. 415-173.100.
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Chambers, Joseph W., Sr.; Sabol, Robert T.; Fennessy, Craig J.; and Graham, Rodney E., 5,593,100, Cl. 241-101.200.

Di Troia, Gary W.; and Robicheau, Richard E., to Burndy Corporation. Electrical solder splice connector. 5,594,211, Cl. 174-84.00R.

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Doan, Trung T.: *See*—
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Struuban, Emil E.; Dobrinsky, Edward K.; Kuznetsov, Anatoly A.; and Harutyunyan, Avenik H., 5,593,740, Cl. 427-577.000.

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Aono, Tetsuya; Ohkawa, Shigenori; and Doi, Takayuki, 5,594,154, Cl. 549-462.000.

Doi, Yukihiro: *See*—
Akata, Masao; Miura, Takao; Ogawa, Takeshi; Doi, Yukihiro; Higashi, Isao; and Imagawa, Hitoshi, 5,594,724, Cl. 370-469.000.

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Dolan, James P.; Dolan, Patrick M.; Dolan, James T.; and Dolan, Margaret R. Valve stem gas leak detector. 5,594,162, Cl. 73-46.000.

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Andree, Roland; Drewes, Mark-Wilhelm; Marhold, Albrecht; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,945, Cl. 504-243.000.
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Kinnersley, Alan M.; Konkan, Larry P.; Strom, David J.; and Meah, Abdul R. Y., 5,593,947, Cl. 504-283.000.

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Kobayashi, Hiroaki; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shunji; and Uehara, Hirotaka, 5,594,548, Cl. 356-376.000.

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Dow Chemical Company, The: *See*—
Lopez, Leonardo C.; and Pelletier, Ronald R., 5,593,758, Cl. 428-195.000.
Shmidt, Creston D.; Imeokparia, Daniel D.; and Suh, Kyung W., 5,594,036, Cl. 521-79.000.

Dow Corning Corporation: *See*—
Glover, Shedric O.; Bujanowski, Valeris J.; Ziemelis, Maris J.; Skinner, Michael W.; Homan, Gary R.; Perz, Susan V.; and Cannady, John P., 5,594,042, Cl. 522-31.000.

Dow Deutschland Inc.: *See*—
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Audebert, Roland; Janca, Joseph; Maroy, Pierre; and Hendriks, Hugo, 5,594,050, Cl. 524-5.000.

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Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Drappel, Stephan V., 5,593,486, Cl. 106-22.00A.

Draveling, Connie A.: *See*—
Treml, Suzanne B.; Dull, Cristine J.; Draveling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., 5,593,824, Cl. 435-4.000.

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Jones, David L.; and Dresner, George L., Jr., 5,592,703, Cl. 4-667.000.

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Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Staach, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.

Dresser Industries, Inc.: *See*—
Ippolito, Rodolfo M., 5,593,231, Cl. 384-114.000.
Rakieski, Kenneth E., 5,592,965, Cl. 137-315.000.

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Maier, Martin D., 5,593,232, Cl. 384-119.000.

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Andree, Roland; Drewes, Mark-Wilhelm; Marhold, Albrecht; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,945, Cl. 504-243.000.

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Davison, Michael J.; Dryer, Paul W.; and Wilson, Wendy K., 5,593,538, Cl. 156-637.100.

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Anton, David L.; Fallon, Robert D.; Stieglitz, Barry; and Witterholt, Vincent G., 5,593,871, Cl. 435-129.000.
Brugel, Edward G., 5,594,063, Cl. 524-504.000.
Jackson, Scott C.; Resnick, Paul R.; and Swearingen, Steven H., 5,594,159, Cl. 570-142.000.

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Thompson, Leo J.; Dubberly, Gregory T.; and Ritchie, John A., Jr., 5,594,726, Cl. 370-485.000.

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Szyszko, Alexander; Fuqua, Rick L.; Lyden, Thomas B.; Smialek, Mariusz; and Dudek, Marek, 5,592,877, Cl. 101-129.000.

Duff, Eric: *See*—
Bowles, Philip; Duff, Eric; and Thayer, Dale D., 5,594,770, Cl. 378-58.000.

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Cooney, Barry F.; Camden, Thomas M.; Duke, James P.; and Stefko, David J., 5,594,764, Cl. 376-248.000.

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Duong, Khue: *See*—
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Batt, Douglas G.; Pinto, Donald J. P.; Orwat, Michael J.; Petraitis, Joseph J.; and Pitts, William J., 5,593,994, Cl. 514-252.000.
Teleha, Christopher A.; Wilkerson, Wendell W.; and Earl, Richard A., 5,594,001, Cl. 514-290.000.

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Duren, John J., to Smith & Newphew Rolyan Inc. Marine marker. 5,593,331, Cl. 441-6.000.

Durham, Dana L.: *See*—
Rahman, M. Dalil; and Durham, Dana L., 5,594,098, Cl. 528-482.000.

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Fouquet, Jean-Michel; and Duval, Benoit, 5,593,183, Cl. 280-775.000.

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Fishman, Neil S.; Miller, J. Mark; Dvorachek, Thomas J., III; and Brzezinski, Philip, 5,594,462, Cl. 345-2.000.

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Klas, Daniel E.; Gentry, John M.; Tipton, Regina L.; and Dwyer, Richard H., 5,594,206, Cl. 174-56.000.

Dyble, Richard J.; and Stirmel, Timothy M., to Panoramic, Inc. Locking package. 5,593,036, Cl. 206-464.000.

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Jay, Eric C.; Dyer, John A.; and Dinsmoor, John C., III, 5,593,211, Cl. 297-383.000.

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Connor, Denis J.; Cummings, Gerald F.; and Star, Michael J., 5,594,705, Cl. 367-13.000.

Dynic Corporation: *See*—
Kato, Hiromoto; and Fukuhara, Hiroshi, 5,593,941, Cl. 503-227.000.

E. R. Squibb & Sons, Inc.: *See*—
Steer, Peter L.; Steer, Graham E.; and Gent, John A., 5,593,396, Cl. 604-327.000.
Thottathil, John K.; Pendri, Yadagiri; Li, Wen-Sen; and Kronenthal, David R., 5,594,153, Cl. 549-374.000.
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Jordan, Robert T., III; and Mortensen, Russell G., 5,592,893, Cl. 114-255.000.

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Eash, Joseph J.: *See*—
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Peeples, Frank K.; Raith, David; and Donnelly, Charles E., 5,593,268, Cl. 414-301.000.

East, Kenneth H. Toilet lid alarm and method. 5,594,423, Cl. 340-686.000.

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Buchanan, Charles M.; Gardner, Robert M.; White, Alan W.; and Wood, Matthew D., 5,594,068, Cl. 525-54.300.
Papas, Andreas M.; and Hobbs, Howard K., 5,593,682, Cl. 424-401.000.

Eastman Kodak Company: *See*—
Chemelli, John B.; Bernecker, Walter J.; and Caprio, Craig A., 5,593,804, Cl. 430-30.000.
Corbin, Douglas D., 5,593,097, Cl. 241-21.000.
Greisch, Danny L.; and Chemelli, John B., 5,593,290, Cl. 417-478.000.
Kaplan, Martin C.; and Kwon, Heemin, 5,594,816, Cl. 382-275.000.
Klees, Kevin J., 5,594,514, Cl. 396-429.000.
Nielsen, Ralph B.; Rosiek, Thomas A.; Bates, David F.; Honan, James S.; and Yau, Hwei-Ling, 5,594,047, Cl. 523-315.000.
Pollatta, David J.; and Quinzi, Thomas N., 5,593,752, Cl. 428-114.000.
SanGregory, Jude A.; and Rydelek, James G., 5,593,104, Cl. 242-348.100.
Shi, Jianmin; and Tang, Ching, 5,593,788, Cl. 428-690.000.
Stern, Philip A.; Elich, Terry R.; and Wicks, Thomas S., 5,592,980, Cl. 141-364.000.
Wirth, Henry G.; and Bobb, Mark A., 5,593,152, Cl. 271-241.000.
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Eaton Corporation: *See*—
Bates, Ian R. J.; Daly, Michael; and Fowler, Paul M., 5,592,851, Cl. 74-336.00R.
Bernstrom, Marvin L.; Radford, Karen J.; and Kassen, Gary R., 5,593,296, Cl. 418-61.300.
Clinch, James P.; and Danby, Michael, 5,593,263, Cl. 411-182.000.
Haag, Arthur F.; and Byrd, William A., 5,592,818, Cl. 60-487.000.
Robirds, Timothy G.; Allen, Mark L.; and Baker, Ralph E., 5,594,610, Cl. 361-104.000.
Scott, George E., 5,593,283, Cl. 416-244.00R.

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Drayna, Dennis T.; and Eaton, Dan L., 5,593,674, Cl. 424-94.630.

Eavenson, Jimmy N., Sr.; and Hough, Barry M., to Deere & Company. Switchable ignition and starter control system. 5,593,367, Cl. 477-203.000.

Ebara Corporation: *See*—
Inoue, Naoyuki, 5,592,825, Cl. 62-141.000.

Ebara Research Co., Ltd.: *See*—
Itoh, Junju; and Toma, Yasushi, 5,594,166, Cl. 73-105.000.

Eberwine, James H.; and Spencer, Corinne, to University of Pennsylvania, Trustees of the. Administration of an RNA stem loop structure to modulate protein synthesis. 5,593,863, Cl. 435-69.100.

Ebina, Kouichi; Ito, Ikuo; and Kasai, Kazuaki, to Seiko Epson Corporation. Point-of-sale terminal and printing apparatus therefor. 5,594,920, Cl. 395-224.000.

Ebinuma, Ryuichi: *See*—
Fujioka, Hidehiko; Nose, Noriyuki; Ebinuma, Ryuichi; Hara, Shinichi; and Maehara, Hiroshi, 5,593,800, Cl. 430-5.000.

Ebner, Walter B.: *See*—
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Ebrahimi, Touradj, to Lucent Technologies Inc. Predictive video coding using a motion vector updating routine. 5,594,504, Cl. 348-416.000.

ECC International Inc.: *See*—
Wu, Kuan-Ting, 5,593,488, Cl. 106-464.000.
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Eck, Werner; Horadler, Georg-Michael; and Lepach, Werner, to Maschinenfabrik Niehoff GmbH & Co. KG. Bobbin for receiving elongated winding material. 5,593,108, Cl. 242-608.500.

Eckstrom, Donald J.: *See*—
Vidmar, Robert J.; Eckstrom, Donald J.; Eash, Joseph J.; and Chestnut, Walter G., 5,594,446, Cl. 342-1.000.

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Pfirrmann, Rolf W.; and Geistlich, Peter, 5,593,665, Cl. 424-85.100.

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Eddy, Colleen D. Stethoscope cover. 5,592,946, Cl. 128-715.000.

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Rosenberg, Robert D.; Simons, Michael; Edelman, Elazer; Langer, Robert S.; and DeKeyser, Jean-Luc, 5,593,974, Cl. 514-44.000.

Edgar, Jason L.: *See*—
Schotz, Matthew T.; Edgar, Jason L.; and Welygan, Dennis G., 5,593,628, Cl. 264-154.000.

Eduard Küsters Maschinenfabrik GmbH & CO KG: *See*—
Ahrweiler, Karl-Heinz, 5,593,762, Cl. 428-218.000.

Edwards, Brooks: *See*—
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EFAR Microsystems, Inc.: *See*—
Chang, Ying-Feng; and Sheu, Juei-Sheng, 5,594,926, Cl. 395-872.000.

Egan, Robert W.: *See*—
Weinberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.

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Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.

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Eichhorn, Eric E.: *See*—
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Eichhorn, Gunther: *See*—
Palusis, Mark E.; Figueroa, Carlos G.; Friedberg, Daniel C.; Jones, Gary D.; and Eichhorn, Gunther, 5,592,814, Cl. 60-271.000.

Eichten, Gerard. Portable clothing and equipment drier. 5,592,750, Cl. 34-104.000.

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Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Roberts, Mary E., 5,593,657, Cl. 424-9.410.

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van Ettinger, Rudolf G.; and Eikendal, Martinus P., 5,594,329, Cl. 324-96.000.

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Eisman, John A.: *See*—
Morrison, Nigel A.; Eisman, John A.; and Kelly, Paul J., 5,593,833, Cl. 435-6.000.

Eldar, Zvi: *See*—
Gat, Shimon; Barenholz, Yechezkel; Bercovier, Herve; and Eldar, Zvi, 5,593,508, Cl. 134-40.000.

Eldon, James B., III; Winig, Richard J.; and Winig, Alan M., to Eye Designs, Inc. Eyeglass and eyeglass frame display fixture and system. 5,593,045, Cl. 211-13.000.

Electric Power Research Institute: *See*—
Narendran, Nadarajah; and Weiss, Joseph M., 5,594,819, Cl. 385-12.000.

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Owen, Mark D.; and O'Brien, James N., 5,593,606, Cl. 219-121.710.

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Joo, Bheom S.; Lee, Bbum C.; Kim, Jung S.; and Kang, Seok Y., 5,594,762, Cl. 375-371.000.
Oh, Don-Sung; and Shin, Dong-Jin, 5,594,719, Cl. 370-286.000.

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Szyszko, Alexander; Fuqua, Rick L.; Lyden, Thomas B.; Smialek, Mariusz; and Dudek, Marek, 5,592,877, Cl. 101-129.000.

Elf Atochem North America, Inc.: *See*—
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Elf Atochem S.A.: *See*—
Commandeur, Raymond; and Sarron, Jean-Pierre, 5,593,613, Cl. 252-73.000.

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Basinski, Margret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,594,104, Cl. 530-324.000.
Becker, Gerald W.; Hale, John E.; and MacKellar, Warren C., 5,594,101, Cl. 530-317.000.
Booher, Richard N.; Flaugh, Michael E.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,594,019, Cl. 514-374.000.
Chou, Ta-Sen, 5,594,124, Cl. 536-28.400.
Cullinan, George J.; and Sales, James J., 5,593,987, Cl. 514-212.000.
Gidda, Jaswant S.; and Schaus, John M., 5,594,025, Cl. 514-453.000.
Gidda, Jaswant S.; and Schaus, John M., 5,594,034, Cl. 514-657.000.
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,594,028, Cl. 514-464.000.
Hertel, Larry W.; Jones, Charles D.; Kroin, Julian S.; and Mabry, Thomas E., 5,594,155, Cl. 549-475.000.
Schenk, Dale B.; Seubert, Peter A.; and Vigo-Pelfrey, Carmen, 5,593,846, Cl. 435-7.900.

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Stern, Philip A.; Elich, Terry R.; and Wicks, Thomas S., 5,592,980, Cl. 141-364.000.

Elliott, Laura D.: *See*—
Nuñez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., 5,594,043, Cl. 523-106.000.

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Ellisman, Mark H.: *See*—
Bueno, Clifford; Betz, Robert A.; Ellisman, Mark H.; and Fan, Gary G. Y., 5,594,253, Cl. 250-486.100.

Elmo Company, Limited: *See*—
Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,594,502, Cl. 348-373.000.

Elpatronic AG: *See*—
Baumgartner, Michael, 5,592,844, Cl. 72-133.000.

Elsag International N.V.: *See*—
Hemphill, Brian D., 5,594,353, Cl. 324-681.000.

Elson, Edward E., to Elson, Edward E. Gas and odor absorber. 5,593,477, Cl. 96-108.000.

Elstran, Gerald V.; Mattila, Robert J.; and Phillips, Jerome D., to Minnesota Mining and Manufacturing Company. Positive/negative air pressure adaptor for use with respirators. 5,592,935, Cl. 128-205.290.

Eltech Systems Corporation: *See*—
Bishara, Jeries I.; Brannan, James R.; Horvath, Roland J.; Sacco, Anthony R.; and Hinden, Jean M., 5,593,627, Cl. 264-127.000.

Elting, James J.: *See*—
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Eltner, Bruno, to Heidelberger Druckmaschinen AG. Chain conveyor of a sheet-fed printing machine. 5,592,878, Cl. 101-231.000.

Ema, Taiji; and Itabashi, Kazuo, to Fujitsu Limited. Semiconductor memory device having thin film transistor and method of producing the same. 5,594,267, Cl. 257-368.000.

Embree, Michael E.: *See*—
Penn, Steven M.; Jones, David N.; and Embree, Michael E., 5,594,652, Cl. 364-468.260.

EMC Corporation: *See*—
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Emhart Glass Machinery Investments Inc.: *See*—
Paul, Kenneth J., 5,593,472, Cl. 65-327.000.

Emmons, Robert M.: *See*—
Winston, Roland; Holman, Robert L.; Jacobson, Benjamin A.; and Emmons, Robert M., 5,594,830, Cl. 385-146.000.

Endcor Inc.: *See*—
Endres, James A.; DiRenzi, Francis J.; and Hecht, Gideon, 5,593,247, Cl. 405-3.000.

Endo, Junc: *See*—
Uchino, Hideshi; Endo, Junc; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, 5,594,081, Cl. 526-127.000.

Endoh, Toshiya: *See*—
Tsushima, Noboru; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, 5,594,488, Cl. 347-208.000.

Endorecherche Inc.: *See*—
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Endres, Dan D.: *See*—
Sosalla, Paula M.; Li, Yong; and Endres, Dan D., 5,593,401, Cl. 604-385.200.

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Otto, Johanngeorg, 5,594,449, Cl. 342-124.000.

Endriz, John, to SDL, Inc. Diode laser source with concurrently driven light emitting segments. 5,594,752, Cl. 372-50.000.

Endruschat, Albert J.; Staples, Charles W.; and Casaday, Arthur K., to Endruschat, Albert J. Touchless switch which discriminates between motion intended to toggle the switch and other forms of motion. 5,594,238, Cl. 250-221.000.

Engel, Joel S., to Ameritech Services, Inc. Universal TV interface for switch of broadcast video distribution (and related method). 5,594,938, Cl. 455-6.200.

Engelhardt, Fritz: *See*—
Funk, Rüdiger; Engelhardt, Fritz; Riegel, Ulrich; and Wessling, Michael, 5,594,083, Cl. 526-232.300.

English, Edward E. Method and device for feeding dogs. 5,592,899, Cl. 119-61.000.

Enlow, William P.: *See*—
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Entek Corporation: *See*—
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Entzeroth, Michael: *See*—
Hauel, Norbert; Narr, Berthold, deceased; Ries, Uwe; van Meel, Jacobus C. A.; Wienen, Wolfgang; and Entzeroth, Michael, 5,594,003, Cl. 514-300.000.

Envirex Inc.: *See*—
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Environmental Products Corporation: *See*—
Powell, Ken R.; and Driscoll, Rusty, 5,593,017, Cl. 194-212.000.

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Brown, Thomas A., 5,594,761, Cl. 375-356.000.
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Trigger, David, 5,594,013, Cl. 514-356.000.

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Chen, Hudong; Churchill, Peter C.; Iannucci, Robert A.; Molvig, Kim; Papadopoulos, Gregory; Remondi, Stephen A.; Teixeira, Christopher M.; and Traub, Kenneth R., 5,594,671, Cl. 364-578.000.

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Chaco, John; Hersh, Israel; Orlovsky, Dmitry; Vincens, Joe; and Ram, Yaron, 5,594,786, Cl. 379-93.000.

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Kosumi, Toshiya; and Asada, Masaaki, 5,593,015, Cl. 192-70.270.
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Tack, Robert D.; and Lewtas, Kenneth, 5,593,466, Cl. 44-398.000.

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Bauer, Heinz; and Fabian, Rainer, 5,592,831, Cl. 62-625.000.

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Goldstein, Allan L.; and Fagarasan, Mirela O., 5,593,964, Cl. 514-12.000.

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Cook, Thomas D.; Fairchild, Manuel R.; Mowery, Kenneth D.; and Scott, Jeffrey R., 5,594,649, Cl. 364-424.034.

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Lane, Michael J.; Benight, Albert S.; and Faldasz, Brian D., 5,593,834, Cl. 435-6.000.

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Anton, David L.; Fallon, Robert D.; Stieglitz, Barry; and Winterbolt, Vincent G., 5,593,871, Cl. 435-129.000.

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Murray, Brent W.; and Faludy, Thomas G., 5,592,982, Cl. 160-67.000.

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Santamaria, Pedro; Boyce-Jacino, Michael T.; Barbosa, Jose J.; Rich, Stephen S.; and Faras, Anthony J., 5,593,830, Cl. 435-6.000.

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Lucas, Michael; Klotz, James M.; Farfan, Frank; and Hall, S. Warren, 5,594,410, Cl. 340-332.000.

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Rodal, Eric B.; Farmer, Dominic G.; and Lau, Chung Y., 5,594,453, Cl. 342-357.000.

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Comoglio, Paolo; and Ponzetto, Carola, 5,594,105, Cl. 530-326.000.
Mongelli, Nicola; Biasoli, Giovanni; Paio, Alfredo; Grandi, Maria; and Ciomei, Marina, 5,593,976, Cl. 514-48.000.

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Farnworth, Warren M.: *See*—
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FATA Hunter, Inc.: *See*—
Romanowski, Christopher A.; and Amatcis, Bruno, 5,592,987, Cl. 164-428.000.

Fauble, Curtis D.; and Fauble, David L. Training device for racket sports. 5,593,155, Cl. 473-463.000.

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Feibelman, Jeffrey A., to Display Technologies, Inc. Foldable jewelry card. 5,593,025, Cl. 206-6.100.

Feindt, Hans H.: *See*—
Malick, Adrien; and Feindt, Hans H., 5,593,843, Cl. 435-7.100.

Feindt, Susan L.: *See*—
Beigel, David F.; Krieger, William A.; and Feindt, Susan L., 5,594,266, Cl. 257-355.000.

Feucl, Willi: *See*—
Day, Derek J.; Stilhelin, Rolf; Provenzale, Salvatore; Riem, Heinrich; and Feucl, Willi, 5,594,252, Cl. 250-385.100.

Feng, Guoping: *See*—
Arena, Joseph P.; Feng, Guoping; Hall, Linda M.; Liu, Ken; Van Der Ploeg, Leonardus H. T.; Wang, Peiyi; and Warmke, Jeffrey W., 5,593,864, Cl. 435-69.100.
Hall, Linda M.; and Feng, Guoping, 5,593,862, Cl. 435-69.100.

Fenical, William H.; Jacobs, Robert S.; and Jensen, Paul R., to University of California, The Regents of the. Cyclic heptapeptide anti-inflammatory agent. 5,593,960, Cl. 514-9.000.

Fennessy, Craig J.: *See*—
Chambers, Joseph W., Sr.; Sabol, Robert T.; Fennessy, Craig J.; and Graham, Rodney E., 5,593,100, Cl. 241-101.200.

Ferag AG: *See*—
Hausch, Egon, 5,593,148, Cl. 270-52.300.

Fernandez, Conrad L.: *See*—
Hester, Gary K.; Fernandez, Conrad L.; McNeill, Jon; Ray, Ted M.; and Traynor, William, 5,593,072, Cl. 223-120.000.

Ferrari, Patrizia: *See*—
Quadri, Luisa; Bernardi, Luigi; Ferrari, Patrizia; Gobbini, Mauro; Melosi, Piero; and Valentino, Loredana, 5,593,982, Cl. 514-172.000.

Ferrarin, James A. Universal fence post connector. 5,593,143, Cl. 256-68.000.

Ferrera, Massimo: *See*—
Audisio, Filippo; Borello, Gianpiero; Ferrera, Massimo; Gianotti, Pietro; and Gozzelino, Riccardo, 5,592,924, Cl. 123-525.000.

Ferrill, Jess B.; and Snead, Kevin H., to Whitaker Corporation, The. Bonding discrete wires to form unitary ribbon cable. 5,592,739, Cl. 29-872.000.

Ferrofluidics Corporation: *See*—
Li, Zhixin; and Ham, Steve, 5,594,241, Cl. 250-231.170.
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., 5,593,164, Cl. 277-9.500.

Fertala, Andrzej: *See*—
Prockop, Darwin J.; Ala-Kokko, Leena; Fertala, Andrzej; Sieron, Aleksander; Kivirikko, Kari I.; Geddis, Amy; and Pihlajaniemi, Taina, 5,593,859, Cl. 435-69.100.

Fessler, Charles B.: *See*—
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,593,214, Cl. 303-7.000.

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Sautel, Hans-Joachim; and Feucht, Dieter, 5,593,942, Cl. 504-134.000.

Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Höbsch, Walter; Müller, Ulrich; Müller-Glieemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Deuzer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, to Bayer Aktiengesellschaft. Substituted monopyridylmethyl derivatives. 5,594,010, Cl. 514-340.000.

Fiberite, Inc.: *See*—
Yap, Hugh A., 5,593,780, Cl. 428-392.000.

Fiberweb North America, Inc.: *See*—
Gessner, Scott L., 5,593,768, Cl. 428-286.000.

Fiedler, Steven P., to Hewlett-Packard Company. Real-time event charting in an electronic flowsheet. 5,592,945, Cl. 128-710.000.

Field, John; and Hoselling, Steven P., to Gyration,Inc. Optically sensed wire gyroscope apparatus and system, and methods for manufacture and cursor control. 5,594,169, Cl. 73-504.140.

Field, John M.: *See*—
Louwagie, Dominic J.; Carolus, Steven L.; Field, John M.; Murphy, Daniel J.; Brown, Jeffery O.; and Dewey, James D., 5,594,347, Cl. 324-539.000.

Fielder, Dennis A.: *See*—
Marlton, Anthony P.; Fielder, Dennis A.; Halstead, Victor G., deceased; and Stockill, Trevor R., 5,594,467, Cl. 345-115.000.

Figgener, Helmut; and Brüning, Paul, to Westfalia Separator Aktiengesellschaft. Weir and choke plate for a solid-jacket centrifuge drum. 5,593,377, Cl. 494-56.000.

Figueroa, Carlos G.: *See*—
Paluzis, Mark E.; Figueroa, Carlos G.; Friedberg, Daniel C.; Jones, Gary D.; and Eichhorn, Gunther, 5,592,814, Cl. 60-271.000.

Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalsass, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., to IBM Corp. Interactive computer network and method of operation. 5,594,910, Cl. 395-800.000.

Filice, Gary W.; and Chauvin, Dewey, to Jas D. Easton, Inc. Shock attenuating ball bat. 5,593,158, Cl. 473-520.000.

Filo, Allen L.: *See*—
Shaw, Feng-Rong; and Filo, Allen L., 5,593,215, Cl. 303-113.200.

Finch, Clara N.: *See*—
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,593,959, Cl. 514-8.000.

Findley, James K.: *See*—
Marcou, Jean-Claude; Packard, Thomas N.; Findley, James K.; and Murphy, Patrick J., 5,594,398, Cl. 335-18.000.

Finegan, Timothy: *See*—
Ainslie, Benjamin J.; Wilkinson, Iain J.; and Finegan, Timothy, 5,594,578, Cl. 359-127.000.

Finkelstein, Adam: *See*—
Salesin, David H.; and Finkelstein, Adam, 5,594,853, Cl. 395-141.000.

Finlay, Ian G.: *See*—
Carter, Kenneth B.; Finlay, Ian G.; and Richardson, William, 5,593,443, Cl. 623-14.000.

Finnegan, Danny, Workman's wrist band. 5,593,073, Cl. 224-183.000.

Finucane, Kevin M.: *See*—
Coyle, Laurie; Finucane, Kevin M.; King, James D.; Donoho, Harold F.; and De Los Santos, Armando, 5,594,340, Cl. 324-321.000.

Firma C. Rob. Hanemerstein GmbH: *See*—
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, 5,593,209, Cl. 297-344.130.

First Opinion Corporation: *See*—
Iliff, Edwin C., 5,594,638, Cl. 395-203.000.

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Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,594,133, Cl. 540-228.000.

Fischer, Meir, to Bio-Technology General Corp. Expression plasmids containing the deo promoter, and bacterial hosts containing the plasmids. 5,593,860, Cl. 435-69.100.

Fischer, Stephan: *See*—
Rudolph, Rainer; Fischer, Stephan; and Mattes, Ralf, 5,593,865, Cl. 435-69.100.

Fischer, Stephen A.: *See*—
Balos, Barbara; Clungeon, Nancy S.; Patterson, James V.; Rodriguez, José M.; and Fischer, Stephen A., 5,593,543, Cl. 162-6.000.

Fish, Gordon E.: *See*—
Ramanan, V. R. V.; Fish, Gordon E.; Liebermann, Howard H.; and Silgailis, John, 5,593,513, Cl. 148-304.000.

Fisher Controls International, Inc.: *See*—
Lovell, Michel K.; Jackson, Randall S.; and Brestel, Ronald R., 5,593,166, Cl. 277-59.000.

Fisher, James: *See*—
Tsung, Wei-Jiung; and Fisher, James, 5,592,843, Cl. 72-88.000.

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Fisher-Rosemount Systems, Inc.: *See*—
Blevins, Terrence L., 5,594,858, Cl. 395-326.000.

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Spencer, Kevin C.; Boisrobert, Christine E.; Fisher, Steven A.; Rojak, Patricia A.; and Sabatini, Karen S., 5,593,868, Cl. 435-94.000.

Fishman, Neil S.; Miller, J. Mark; Dvorachek, Thomas J., III; and Brzezinski, Philip, to Microsoft Corporation; and Timex Corporation. Calibrating data transmission line spacing on a frame-scanning display device for optically transmitting data to a portable programmable device. 5,594,462, Cl. 345-2.000.

Fiskars Inc.: *See*—
Laborre, Ernest D.; and Austin, Jerrold N., 5,592,743, Cl. 30-271.000.

Fitzner, Jeffrey N.: *See*—
Black, Roy A.; Fitzner, Jeffrey N.; and Sleath, Paul R., 5,594,106, Cl. 530-331.000.

Fiume, Luigi; Busi, Corrado; Stefano, Giuseppina D.; and Mattioli, Alessandro, to Laboratori Baldacci SpA. Process of conjugation of antiviral nucleosides with lactosaminated human albumin. 5,594,110, Cl. 530-362.000.

Flamant, Hubert F.: *See*—
Spijkerman, Johannes; and Flamant, Hubert F., 5,594,615, Cl. 361-150.000.

Flamm, Ron: *See*—
Turner, Leonard; Trobough, Mark; Kabadi, Ashok; and Flamm, Ron, 5,594,356, Cl. 324-755.000.

Flaugh, Michael E.: *See*—
Booker, Richard N.; Flaugh, Michael E.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,594,019, Cl. 514-374.000.

Fleer, Reinhard; Fournier, Alain; and Yeh, Patrice, to Rhone-Poulenc Rorer SA. Highly stable recombinant yeasts for the production of recombinant proteins. 5,593,858, Cl. 435-69.100.

Fleischer, Dietrich: *See*—
Strutz, Heinz; Fleischer, Dietrich; Kulpe, Jürgen; and Schleicher, Andreas, 5,593,594, Cl. 210-660.000.

Fletcher, David J. Mixing device for a microwave oven. 5,593,609, Cl. 219-726.000.

Fleury, Christophe J. M.; and Legue, Bertrand, to Sopha Medical. Gamma camera with rotating arm. 5,594,251, Cl. 250-363.050.

Flint, Paul W.: *See*—
Cummings, Charles W.; Flint, Paul W.; and Scranton, Peter J., 5,593,439, Cl. 623-9.000.

Flora, David B.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Schoner, Brigitte E.; Shields, James E.; and Smiley, David L., 5,594,104, Cl. 530-324.000.

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Flory, Isaac L., IV: *See*—
Nuckholls, Joe A.; and Flory, Isaac L., IV, 5,594,308, Cl. 315-290.000.

Fluid Power Industries, Inc.: *See*—
Shaw, Feng-Rong; and Filo, Allen L., 5,593,215, Cl. 303-113.200.

Fluke Corporation: *See*—
van Ettinger, Rudolf G.; and Eikendal, Martinus P., 5,594,329, Cl. 324-96.000.

FMC Corporation: *See*—
Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,593,998, Cl. 514-258.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; Gosebruch, Harald; and Häfker, Thomas, 5,593,107, Cl. 242-559.400.

Focke, Heinz; Gosebruch, Harald; and Häfker, Thomas, to Focke & Co. (GmbH & Co.). Apparatus for handling reels of webs of material. 5,593,107, Cl. 242-559.400.

Fogle, James C.: *See*—
Ross, John A.; and Fogle, James C., 5,593,087, Cl. 229-199.000.

Force, Gordon: *See*—
Taylor, Carl J.; Patterson, Michael W.; and Force, Gordon, 5,594,204, Cl. 174-52.200.

Ford, James D.: *See*—
Nunez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., 5,594,043, Cl. 523-106.000.

Ford Motor Company: *See*—
Bielak, Charles R.; and Furness, Richard J., 5,593,256, Cl. 408-1.00R.
Brecht, David C.; Bauman, Robert C.; and Hancock, Robert L., 5,594,616, Cl. 361-622.000.
Campbell, Douglas C.; Gloceri, Gary J.; McCoy, Daniel M.; Reichenbach, Thomas G.; Duchnowski, Lenard J.; Ivan, Jerome C.; and Raad, Joseph M., 5,593,176, Cl. 280-707.000.
Chattha, Mohinder S.; and Kudla, Robert J., 5,593,933, Cl. 502-317.000.
Ciaccio, Michael P., 5,594,199, Cl. 174-35.00R.
Groha, David D.; Schroeder, Fred G.; and Blanco, Pamela K., 5,592,974, Cl. 138-44.000.
Justice, Clinton F.; and Miller, William, 5,593,357, Cl. 475-204.000.
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Stockhausen, William F.; and Stein, Robert A., 5,592,916, Cl. 123-308.000.
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Forde, Lyle G.: *See*—
Meehan, Craig F.; and Forde, Lyle G., 5,592,792, Cl. 52-173.200.

Fore-Mat Products, Inc.: *See*—
Beaver, Michael L., 5,593,355, Cl. 473-278.000.

Forehand, David I.: *See*—
Dreiske, Peter D.; Turner, Arthur M.; and Forehand, David I., 5,593,902, Cl. 437-4.000.

Forma Block, Inc.: *See*—
Niveus, Kirk N., 5,592,784, Cl. 52-20.000.

Forstinger, Klaus; Volk, Heinrich; and Wykypiel, Werner, to Hoechst AG. Process for the preparation of 2(3H)-benzothiazolones. 5,594,145, Cl. 548-173.000.

Foscaro, Giancarlo; and Battistella, Mirco, to Nordica S.p.A. Closure device, particularly for sports shoes. 5,592,722, Cl. 24-68.05K.

Foster, Clark B.: *See*—
Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,593,028, Cl. 206-221.000.

Foster, Donald D.; and Nelson, Philip L., to Contico International, Inc. Low cost trigger sprayer having elastomeric pump and inlet valve. 5,593,093, Cl. 239-333.000.

Foster, Mark J.; and Bovio, Michele, to Digital Equipment Corporation. Rotating battery hinge for a notebook computer. 5,594,617, Cl. 361-679.000.

Foster, Robert F.; and Hillman, Joseph T., to Sony Corporation; and Materials Research Corporation. Method of nitridization of titanium thin films. 5,593,511, Cl. 148-238.000.

Fouchard, David T.: *See*—
Pachotek, David R.; Fouchard, David T.; and Ebner, Walter B., 5,594,320, Cl. 320-4.000.

Fouquet, Jean-Michel; and Duval, Benoit, to NACAM. Energy-absorbing device for vehicle steering column. 5,593,183, Cl. 280-775.000.

Fourer, Gary: *See*—
Primm, Charles E.; and Fourer, Gary, 5,594,305, Cl. 315-169.300.

Fournier, Alain: *See*—
Fleer, Reinhard; Fournier, Alain; and Yeh, Patrice, 5,593,858, Cl. 435-69.100.

Fowler, Paul M.: *See*—
Bates, Ian R. J.; Daly, Michael; and Fowler, Paul M., 5,592,851, Cl. 74-336.00R.

Fox, Duane M.; and Schoen, Joel, to Intermec Corporation. Method and apparatus for controlling transport of thermal transfer ribbon. 5,593,238, Cl. 400-234.000.

Fraley, Walter C., to SEMCO, Inc. Personal audio/video surveillance system. 5,594,498, Cl. 348-158.000.

Framatome Connectors International: *See*—
Bale, Alain; and Champion, Patrick, 5,593,307, Cl. 439-79.000.

France Telecom: *See*—
Devaux, Fabrice, 5,594,583, Cl. 359-184.000.

Frasci, François-Marie, to Pack'Industrie S.A. Continuous tubular box body production process, particularly for cardboard boxes. 5,593,375, Cl. 493-302.000.

Frankovich, Mark M.: *See*—
Spehr, Paul R.; Frankovich, Mark M.; and White, Mark A., 5,593,433, Cl. 607-128.000.

Frasier, William P. Archery practice device. 5,592,928, Cl. 124-1.000.

Frechet, Jean M. J.; and Svec, Frantisek, to Cornell Research Foundation, Inc. Pore-size selective modification of porous materials. 5,593,729, Cl. 427-337.000.

Frederick, Thomas P.: *See*—
Lenko, Daniel S.; and Frederick, Thomas P., 5,594,195, Cl. 102-260.000.

Fredette, Maurice C. J.: *See*—
Scribner, Herbert C.; Fredette, Maurice C. J.; Bechberger, Edward J.; and Pu, Chunmin, 5,593,653, Cl. 423-477.000.

Free-Flow Packaging Corporation: *See*—
Fuss, Gunter G., 5,593,755, Cl. 428-134.000.

Freeman, Richard D.; Linoff, Joseph D.; and Saxe, Timothy, to Zycad Corporation. Logic cell and routing architecture in a field programmable gate array. 5,594,363, Cl. 326-39.000.

Freeman, Richard D., to Zycad Corporation. Random access memory (RAM) based configurable arrays. 5,594,698, Cl. 365-222.000.

Freeman, William T.; and Weissman, Craig D., to Mitsubishi Electric Information Technology Center America Inc. Hand gesture machine control system. 5,594,469, Cl. 345-158.000.

Freund, Paul X., to Mine Safety Appliances Company. Respirator mask with stiffening elements. 5,592,937, Cl. 128-206.160.

Frey, Gerhard; Hirth, Thomas; Grohmann, Dieter; and Reichart, Willi, to Mercedes-Benz AG. Test device for vehicles having a wheel rotation speed sensor which is sensitive to magnetic fields. 5,594,173, Cl. 73-520.010.

Frey, Robert A.; and Stevenson, Philip H., to HMI Industries, Inc. Filter system. 5,593,479, Cl. 96-57.000.

Frey, Rudolph W.; and Bolen, Philip D., to Autonomous Technology Corporation. Cartridge excimer laser system. 5,594,753, Cl. 372-57.000.

Frey, Wolfram: *See*—
Storz, Andreas; Czesnikowski, Siegmund; and Frey, Wolfram, 5,593,125, Cl. 248-316.500.

Friedberg, Daniel C.: *See*—
Paluzis, Mark E.; Figueroa, Carlos G.; Friedberg, Daniel C.; Jones, Gary D.; and Eichhorn, Gunther, 5,592,814, Cl. 60-271.000.

Friesen, Albert D., to Genesys Pharma Inc. Antisense oligonucleotides targeted against human immunodeficiacy virus. 5,594,122, Cl. 536-24.500.

Friesen, Jed C.; and Cervenka, Bohumir, to Friesen, Jed C. Spacer for glass blocks. 5,592,798, Cl. 52-308.000.

Fritsche, Janey: *See*—
Florin, Fabrice; Buettner, Michael; Corey, Glenn; Fritsche, Janey; Maresca, Peter; Miller, Peter; Purdy, Bill; Sharpe, Stuart; and West, Nick, 5,594,509, Cl. 348-731.000.

Froehler, Brian; and Matteucci, Mark, to Gilead Sciences, Inc. Enhanced triple-helix and double-helix formation with oligomers containing modified purines. 5,594,121, Cl. 536-23.500.

Frohnhaus, Ernst-Reiner: *See*—
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, 5,593,209, Cl. 297-344.130.

Frost, Barry L., to New Venture Gear, Inc. Multi-speed manual transmission with two simple planetary gearsets. 5,593,358, Cl. 475-218.000.
Frost, Colin, to Davidson Textron Inc. Energy absorbent interior trim for vehicle. 5,593,182, Cl. 280-751.000.
Frucht, Theodor: *See*—
Neddermeyer, Thomas; and Frucht, Theodor, 5,593,522, Cl. 152-458.000.
Fryar, Richard D., Jr.: *See*—
Conway, Anthony J.; Conway, Philip J.; and Fryar, Richard D., Jr., 5,593,718, Cl. 427-2.300.
Fu, Jack: *See*—
Khoury, Jehad; Woods, Charles L.; Cronin-Golomb, Mark; and Fu, Jack, 5,594,586, Cl. 359-559.000.
Fu, Ya-ming; Peng, Jyi-Ching; Hwong, Chen-Une; and Fang, Liang-Jyi, to Industrial Technology Research Institute. Process and an apparatus for producing teas. 5,592,752, Cl. 34-388.000.
Fuchs, Richard W. Apparatus for removing hardened substances. 5,593,257, Cl. 409-218.000.
Fuisz, Richard C.; Bantist, Gerald E.; and Myers, Garry L., to Fuisz Technologies Ltd. Method of making crystalline sugar and products resulting therefrom. 5,593,502, Cl. 127-30.000.
Fuisz Technologies Ltd.: *See*—
Fuisz, Richard C.; Bantist, Gerald E.; and Myers, Garry L., 5,593,502, Cl. 127-30.000.
Fuji Electric Co., Ltd.: *See*—
Fukushi, Akira; and Yamaguchi, Tomio, 5,594,223, Cl. 218-120.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Morikawa, Koji, 5,592,919, Cl. 123-435.000.
Fuji Kihan Co., Ltd.: *See*—
Miyasaka, Yoshio, 5,592,840, Cl. 72-53.000.
Fuji Photo Film Co., Ltd.: *See*—
Harada, Akinori, 5,594,746, Cl. 372-22.000.
Kawamoto, Fumio, 5,593,818, Cl. 430-512.000.
Oyamada, Takayoshi, 5,593,821, Cl. 430-567.000.
Sato, Morimasa; and Shinozaki, Fumiaki, 5,593,802, Cl. 430-20.000.
Shirai, Hideyuki, 5,593,820, Cl. 430-567.000.
Takeuchi, Koh, 5,593,938, Cl. 503-206.000.
Takizawa, Hiroo; and Makuta, Toshiyuki, 5,593,816, Cl. 430-393.000.
Fuji Photo Optical Co., Ltd.: *See*—
Noguchi, Yukio, 5,594,516, Cl. 396-418.000.
Fuji Xerox Co., Ltd.: *See*—
Kawabata, Takashi; Hyakutake, Nobuo; Furusawa, Fumio; and Tokunaga, Masaaki, 5,594,536, Cl. 399-297.000.
Fujihira, Mitsuaki, to Sumitomo Electric Industries, Ltd. Method of manufacturing semiconductor device. 5,593,926, Cl. 437-209.000.
Fujii, Masashi; Uyama, Kiichiro; Tsuchiya, Takeo; Mori, Miki; Kosuge, Hideo; and Suzuki, Hirokatsu, to Kabushiki Kaisha Toshiba. Laminograph and inspection and repair device using the same. 5,594,768, Cl. 378-21.000.
Fujii, Nanaitsugu: *See*—
Sugino, Hiroshi; Hotta, Yasumichi; Fujii, Nanaitsugu; Shibata, Masahiro; and Sano, Hiromi, 5,593,558, Cl. 204-429.000.
Fujii, Syuso: *See*—
Shimizu, Mitsuru; Fujii, Syuso; Numata, Kenji; and Wada, Masaharu, 5,594,265, Cl. 257-355.000.
Fujii, Yasuhiro: *See*—
Kondo, Yoshikazu; Matsui, Masao; Yoshidome, Hideo; Osaki, Takuji; Kajiyama, Hiroshi; Ozeki, Eiichi; and Fujii, Yasuhiro, 5,593,778, Cl. 428-373.000.
Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Magneto-optical recording medium and method of manufacturing the same. 5,593,791, Cl. 428-694.0ML.
Fujikata, Junichi: *See*—
Hayashi, Kazuhiko; Yamamoto, Hidefumi; Fujikata, Junichi; and Ishihara, Kunihiko, 5,594,933, Cl. 428-546.000.
Fujimura, Hideo: *See*—
Saito, Hitoshi; Inoue, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.
Fujimami, Yasushi; and Yonemitsu, Jun, to Sony Corporation. Apparatus and method for producing downwards compatible video signals with increased vertical resolution, and apparatus for reproducing and displaying same. 5,594,552, Cl. 386-131.000.
Fujioka, Hidehiko; Nose, Noriyuki; Ebisawa, Ryuichi; Hara, Shinichi; and Machara, Hiroshi, to Canon Kabushiki Kaisha. Mask manufacturing method and apparatus and device manufacturing method using a mask manufactured by the method or apparatus. 5,593,800, Cl. 430-5.000.
Fujisaka, Takahiko: *See*—
Usui, Ryuzaburo; Iwamoto, Masafumi; Yamamoto, Kazuhito; Fujisaka, Takahiko; and Kondo, Michimasa, 5,594,447, Cl. 342-42.000.
Fujisaki, Yoshifumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens cover mechanism for a camera. 5,594,523, Cl. 396-448.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,594,132, Cl. 540-227.000.
Fujise, Masakuni: *See*—
Toki, Yusuke; Hiraoka, Masaba; Yamagishi, Ichiro; Ozaki, Hiroyuki; Ban, Tatsuya; Hada, Tetsuro; Nabetame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihito; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.
Fujitsu Limited: *See*—
Date, Masahiro, 5,594,472, Cl. 345-194.000.
Ema, Taiji; and Itabashi, Kazuo, 5,594,267, Cl. 257-368.000.
Iida, Ichiro; and Kurita, Toshihiko, 5,594,722, Cl. 370-426.000.
Ikeda, Masae; and Nakashima, Teturou, 5,594,198, Cl. 399-281.000.
Ishimoto, Masabu; Kato, Masayuki; Aritake, Hirokazu; and Sato, Noriko, 5,594,564, Cl. 349-143.000.
Iwamatsu, Takanori, 5,594,759, Cl. 375-344.000.
Kato, Susumu; Mizuno, Moriaki; Ogawa, Kazumi; and Nonaka, Kazuyuki, 5,594,382, Cl. 327-541.000.
Kawamura, Kazutoshi, 5,594,785, Cl. 379-90.000.
Kiyanagi, Hiroyuki; and Iwamatsu, Takanori, 5,594,389, Cl. 331-12.000.
Kuc, Roman B.; Szinger, James J.; Hayashi, Takehiko; Goto, Takao; Nakashima, Yoshiyasu; Shimura, Takaki; and Kawabe, Kenji, 5,594,849, Cl. 395-135.000.
Masuda, Syuzo; and Iwama, Ryouichi, 5,594,530, Cl. 399-111.000.
Mori, Kazunori; Suzuki, Nobuyuki; and Sasamoto, Taturo, 5,594,603, Cl. 360-78.040.
Nishigaya, Takashi; Hakata, Akira; Itoh, Naoto; Ide, Toshihiro; and Hirayama, Masahiro, 5,594,902, Cl. 395-672.000.
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.
Ohshima, Kenichi; Ishikawa, Jun; Kudoh, Koji; and Nakaya, Tomoki, 5,594,787, Cl. 379-114.000.
Ozawa, Takashi; and Sorimachi, Haruo, 5,592,735, Cl. 29-841.000.
Ryu, Tadanitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masaaobu; Adachi, Takeshi; and Ichikawa, Naomi, 5,594,836, Cl. 395-62.000.
Saitoh, Hiroyuki, 5,594,865, Cl. 395-185.080.
Sato, Noriko; Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; and Nakashima, Masao, 5,594,559, Cl. 359-8.000.
Shibata, Yuji; Okazaki, Makoto; Tanibira, Hisamitsu; and Okada, Katsuyuki, 5,594,878, Cl. 395-309.000.
Sotoyama, Wataru; Tatsuura, Satoshi; Yoshimura, Tetsuzo; Matsuura, Azuma; and Hayano, Tomoaki, 5,594,093, Cl. 528-353.000.
Suzuki, Yoshio; and Takeda, Naoyuki, 5,594,922, Cl. 395-837.000.
Taguchi, Masao, 5,594,681, Cl. 365-149.000.
Teshima, Yasuhiro; and Karokawa, Tetsuo, 5,593,080, Cl. 228-39.000.
Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihiro; Sato, Yoshiharu; Abe, Shunji; and Soumiya, Toshio, 5,594,717, Cl. 370-232.000.
Yabe, Toru, 5,594,662, Cl. 364-550.000.
Yokouchi, Kishio; Kamezaki, Hiroshi; Wakamura, Masato; Kamehara, Nobuo; and Niwa, Koichi, 5,593,526, Cl. 156-89.000.
Fujitsu VLSI Limited: *See*—
Kato, Susumu; Mizuno, Moriaki; Ogawa, Kazumi; and Nonaka, Kazuyuki, 5,594,382, Cl. 327-541.000.
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.
Fujiwara, Susumu; Sakata, Masahiko; and Ishizuka, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Silencing apparatus operable to reduce vehicle noise at a telephone. 5,594,803, Cl. 381-71.000.
Fujiwara, Tsutomu: *See*—
Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, 5,594,487, Cl. 347-197.000.
Fukami, Tatsuya: *See*—
Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, 5,593,791, Cl. 428-694.0ML.
Fukano, Akira: *See*—
Nishiyama, Ryuji; Fukano, Akira; Harakawa, Koji; and Miura, Makoto, 5,593,806, Cl. 430-106.600.
Fukatsu, Akira: *See*—
Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.
Fukuda, Yoshibumi: *See*—
Sakai, Toshio; Watanabe, Norito; Miyoshi, Masanori; and Fukuda, Yoshibumi, 5,594,844, Cl. 395-127.000.
Fukuhara, Hiroshi: *See*—
Kato, Hiromoto; and Fukuhara, Hiroshi, 5,593,941, Cl. 503-227.000.
Fukuoka Kagaku Ltd.: *See*—
Fukuoka, Masahiro, 5,593,206, Cl. 297-217.700.
Fukuoka, Masahiro, to Fukuoka Kagaku Ltd. Apparatus for vibrating seats. 5,593,206, Cl. 297-217.700.
Fukushi, Akira; and Yamaguchi, Tomio, to Fuji Electric Co., Ltd. Vacuum switch bulb type change over switch for on-load tap changer. 5,594,223, Cl. 218-120.000.
Fukutani, Hiroshi; Ohnishi, Hiroshi; Uebe, Shuichi; and Horita, Akihiro, to Sharp Kabushiki Kaisha. Liquid crystal display element with gap uniformity. 5,594,572, Cl. 349-155.000.
Fukuyama Gosu Kogyo Kabushiki Gaisha: *See*—
Katoh, Yusaku; and Uchiyama, Tsuyoshi, 5,593,218, Cl. 305-174.000.
Fukuyo, Kei: *See*—
Hosoya, Yukio; and Fukuyo, Kei, 5,593,216, Cl. 303-119.200.
Fumihiko, Hato, to Becton, Dickinson and Company. Cell strainer. 5,593,587, Cl. 210-470.000.
Funai Electric Co., Ltd.: *See*—
Sakakibara, Shigeto, 5,594,510, Cl. 348-731.000.

Fung, Steven; and Gryaznov, Sergei M., to Perkin-Elmer Corporation, Applied Biosystems, Inc. Enzymatic ligation of 3'amino-substituted oligonucleotides. 5,593,826, Cl. 435-6.000.
Funk, Rüdiger; Engelhardt, Fritz; Riegel, Ulrich; and Wessling, Michael, to Cassella Aktiengesellschaft. Water-swellable hydrophilic polymers. 5,594,083, Cl. 526-232.300.
Fuqua, Rick L.: *See*—
Szyszko, Alexander; Fuqua, Rick L.; Lydea, Thomas B.; Smialek, Mariusz; and Dudek, Marek, 5,592,877, Cl. 101-129.000.
Furness, Richard J.: *See*—
Bielak, Charles R.; and Furness, Richard J., 5,593,256, Cl. 408-1.00R.
Furse, David A.: *See*—
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,593,548, Cl. 203-29.000.
Furuhashi, Tsutomu: *See*—
Nakashima, Tatsushi; Furuhashi, Tsutomu; Kano, Hiroyuki; Yamamoto, Kazuo; and Inoue, Hiroshi, 5,592,968, Cl. 137-561.00A.
Furukawa, Kenichi. Method of recording images. 5,594,484, Cl. 347-95.000.
Furusawa, Fumio: *See*—
Kawabata, Takashi; Hyakutake, Nobuo; Furusawa, Fumio; and Tokunaga, Masaaki, 5,594,536, Cl. 399-297.000.
Furuta, Masakazu: *See*—
Terada, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, 5,594,930, Cl. 419-5.000.
Furuya, Eiichi: *See*—
Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, 5,594,487, Cl. 347-197.000.
Furuyama, Takaaki: *See*—
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.
Fusion Lighting, Inc.: *See*—
Simpson, James; Kamarehi, Mohammad; Ury, Michael; and Turner, Brian, 5,594,303, Cl. 315-39.000.
Fuss, Gunter G., to Free-Flow Packaging Corporation. Accordion-folded paper sheet packing material and method. 5,593,755, Cl. 428-134.000.
Futaba Denshi Kogyo K.K.: *See*—
Itoh, Shigeo; Watanabe, Teruo; and Niiyama, Takahiro, 5,594,298, Cl. 313-336.000.
Futamura, Shingo: *See*—
D'Sidocky, Richard M.; and Futamura, Shingo, 5,594,052, Cl. 524-83.000.
Futatsuki, Takashi: *See*—
Yamasaka, Koji; Imaoka, Takashi; Futatsuki, Takashi; and Yamashita, Yukinari, 5,593,554, Cl. 204-252.000.
G.O.T. Guide-On Technologies Ltd.: *See*—
Hooberman, Gideon, 5,592,962, Cl. 137-68.220.
Gan, Karl; Nowy, Günter; and Schmailzl, Georg, to Hoechst Aktiengesellschaft. Process for the preparation of polyalkyl-1-oxa-diazaspirodecane compounds. 5,594,142, Cl. 546-19.000.
Gaal, Dezso: *See*—
Lovas, Sandor; Conlon, J. Michael; Vincze, Borbala; Palyi, Istvan; Gaal, Dezso; Kalnay, Adriena; Mezo, Imre; Teplan, Istvan; Toth, Geza; and Kovacs, Magdolna, 5,593,965, Cl. 514-15.000.
Gaard Automation Inc.: *See*—
Reiersgaard, William L.; Knebel, Andrew W., Jr.; Davis, Curtis A.; Reiersgaard, John M.; and Pelton, Lloyd E., 5,592,738, Cl. 29-863.000.
Gabelman, Alan; and Luzio, Gary A., to Tastemaker. Enzymatic oxidation of alcohols to aldehydes in a continuous reaction system using *Candida boidinii*. *5,593,872, Cl. 435-147.000.*
Gadberry, Mike: *See*—
Williams, Theodore G.; Chap, John P.; Gadberry, Mike; and Covert, William M., 5,592,886, Cl. 108-108.000.
Gaddy, James L. Clostridium stain which produces acetic acid from waste gases. 5,593,886, Cl. 435-252.700.
Galas, Stephen, to Johnson & Johnson Vision Products, Inc. Apparatus and method for releasably fusing lens mold pieces. 5,593,620, Cl. 264-1.100.
Galko, Joseph: *See*—
Burkett, Eugene J.; Callender, Douglas D.; Galko, Joseph; and Sisson, Edwin A., 5,594,092, Cl. 528-272.000.
Gallagher, Russell B.: *See*—
Tobill, Henry J.; Gallagher, Russell B.; Kuharych, Kenneth G.; and Hallstrom, Nils O., 5,593,085, Cl. 228-193.000.
Gallagher, Timothy F.: *See*—
Adams, Jerry L.; Sheldrake, Peter W.; Gallagher, Timothy F.; and Garigipati, Ravishanker, 5,593,992, Cl. 514-235.800.
Gallaher, Dale M.: *See*—
Smith, Mark A.; Gallaher, Dale M.; and Sgouros, George E., 5,593,250, Cl. 405-205.000.
Gallatin, Gregg M.: *See*—
de Groot, Peter; Gallatin, Gregg M.; and Roychoudhuri, Chandra, 5,594,543, Cl. 356-5.090.
Gallus, Heinz E.: *See*—
Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., 5,594,665, Cl. 364-558.000.
Galperin, Yury: *See*—
Hlinsky, Emil J.; and Galperin, Yury, 5,593,327, Cl. 439-811.000.
Galvan, Gloria J.: *See*—
Nilsen, David N.; Galvan, Gloria J.; Hundley, Gary L.; and Wright, John B., 5,593,593, Cl. 210-638.000.
Galyon, Stanley D., to Nisus Corp. Termite activity remote monitoring and information system. 5,592,774, Cl. 43-124.000.
Gambini, Paola; and Gatti, Emilio, to Agippetroli S.p.A. Fuel composition. 5,593,463, Cl. 44-300.000.
Gamble, Eric J.: *See*—
Maier, Mark S.; Gamble, Eric J.; Wilson, Jack W.; Calzadilla, Eliott L.; and Goetz, Gerald F., 5,593,112, Cl. 244-117.00A.
Gamblin, Rodger L. Surfactant enhanced dyeing. 5,593,459, Cl. 8-539.000.
Garcia, Edward C.: *See*—
Narayanan, Puducode S.; Nguyen, Tai T.; Vaidyanathan, Arunachalam; and Garcia, Edward C., 5,594,874, Cl. 395-284.000.
Garcia, Jose G.; and Malatka, LD, to BMCI, Inc. System for controlling a chain link fence weaving machine. 5,592,978, Cl. 140-92.940.
Garcia-Salas, Sergio: *See*—
Flores-Cotera, Luis B.; and Garcia-Salas, Sergio, 5,593,890, Cl. 435-286.500.
Gardetto, William W.: *See*—
Costello, Anthony J.; Gardetto, William W.; and Everett, Royice B., 5,593,404, Cl. 606-15.000.
Gardner, Kenneth D., to Costes, Asi, Inc. Flood conveyer. 5,592,958, Cl. 134-122.00R.
Gardner, Robert M.: *See*—
Buchanan, Charles M.; Gardner, Robert M.; White, Alan W.; and Wood, Matthew D., 5,594,068, Cl. 525-54.300.
Garel-Jones, Philip M.; Harman, Murray R.; and Cutts, Timothy P., to JDS Fitel Inc. Opto-mechanical device having optical element movable by twin flexures. 5,594,820, Cl. 385-22.000.
Garg, Ajay K.: *See*—
Khaund, Arup K.; Garg, Ajay K.; and Bauer, Ralph, 5,593,468, Cl. 51-309.000.
Garigipati, Ravishanker: *See*—
Adams, Jerry L.; Sheldrake, Peter W.; Gallagher, Timothy F.; and Garigipati, Ravishanker, 5,593,992, Cl. 514-235.800.
Garn, Heinrich; Rasinger, Josef; and Multner, Wolfgang, to Oesterreichisches Forschungszentrum Seibersdorf Ges.m.b.H. Comb generator, device and process for calibrating measurement sections. 5,594,458, Cl. 343-703.000.
Garofalo, Elizabeth A.: *See*—
Lim, Gary M. F.; Roubie, John M.; and Garofalo, Elizabeth A., 5,594,129, Cl. 540-222.000.
Garrett, James E., to Dell USA, L.P. System and method for identifying expansion devices in a computer system. 5,594,873, Cl. 395-281.000.
Garrison, Millard M.; and Miller, Paul L., to Alliant Techsystems, Inc. Apparatus and method for burning energetic material. 5,593,301, Cl. 431-350.000.
Gartner, Klaus W.: *See*—
Cutter, Larry; Gartner, Klaus W.; Butterweck, Dieter; Vuilleumier, P.; Monnier, Jean-Luc; and Sermet, P-A, 5,594,430, Cl. 340-825.310.
Garvan Institute of Medical Research: *See*—
Morrison, Nigel A.; Eisman, John A.; and Kelly, Paul J., 5,593,833, Cl. 435-6.000.
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Kiefer, Karl F., 5,594,176, Cl. 73-623.000.
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Louy, Jean-François; and Gasquet, Jean-Claude, 5,594,424, Cl. 340-815.540.
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Weinberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.
Gates, Alan J., to Gates, Alan J. Back-flow preventer. 5,592,966, Cl. 137-513.500.
Gates, Stephen M.: *See*—
Cox, David S.; and Gates, Stephen M., 5,593,249, Cl. 405-191.000.
Gatt, Shimon; Bareaholz, Yechezkel; Bercovier, Herve; and Eldar, Zvi, to Hebrew University of Jerusalem, Yissum Research Development Company of the. Moist, absorbent material for cleaning articles and surfaces. 5,593,508, Cl. 134-40.000.
Gatten, Ronald A. Self contained vial for drawing, storing, sealing and identifying a fluid sample. 5,592,948, Cl. 128-763.000.
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Gambini, Paola; and Gatti, Emilio, 5,593,463, Cl. 44-300.000.
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Stucchi, Giovanni; and Gatti, Gianmarco, 5,592,970, Cl. 137-614.030.
Gaultier, Jean-Marie B.: *See*—
Roury, Olivier; and Gaultier, Jean-Marie B., 5,594,693, Cl. 365-200.000.
Gauthier, Forrest P., to Varis Corporation. Method for banding and rasterizing an image in a multiprocessor printing system. 5,594,860, Cl. 395-501.000.
Gavin, Norman W. Handle for subterranean concrete covers. 5,592,785, Cl. 52-20.000.
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Gazerro, Carmine M.; and Indiveri, Richard. Hairpiece with detachable portions having continuous fastening segments. 5,592,957, Cl. 132-53.000.
GB Electrical, Inc.: *See*—
Sorensen, Soren C.; and Sorensen, Jens O., 5,593,630, Cl. 264-219.000.
Geddis, Amy: *See*—
Prockop, Darwin J.; Ala-Kokko, Leena; Fertala, Andrzej; Sieron, Aleksander; Kivirikko, Kari I.; Geddis, Amy; and Pihlajaniemi, Taina, 5,593,859, Cl. 435-69.100.

Godeon, Dale G.; Schatz, Mark B.; Stephens, Robert J.; and Roberts, Shawn E., to Chrysler Corporation. Removable plastic box for automobile instrument panel. 5,593,262, Cl. 411-182.000.
Geels, James L.: *See*—
Liechty, Deryll L.; and Geels, James L., 5,592,740, Cl. 29-888.044.
Geerts, Rolf L.: *See*—
Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,594,078, Cl. 526-119.000.
Gegner, Joel P., to Motorola, Inc. Constant frequency, zero-voltage-switching converters with resonant switching bridge. 5,594,635, Cl. 363-124.000.
Geirhos, Josef: *See*—
Jacob, Ingolf; Paulus, Eberhard; Kreuzer, Gerhard; Schubert, Bernd; and Geirhos, Josef, 5,593,777, Cl. 428-370.000.
Geis, Philip A.: *See*—
Trinh, Toan; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark L.; Pilosof, David; Zwerdling, Susan S.; and Tordil, Helen B., 5,593,670, Cl. 424-76.100.
Geisel, Thomas: *See*—
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Geistlich, Peter: *See*—
Pfirrmann, Rolf W.; and Geistlich, Peter, 5,593,665, Cl. 424-85.100.
Geiwiz, Jürgen; Götschi, Erwin; Hebeisen, Paul; Link, Helmut; and Lübbers, Thomas, to Hoffmann-La Roche Inc. Tricyclic DNA gyrase inhibitors. 5,594,135, Cl. 540-468.000.
Gelder, Richard; and Bradshaw, John M., to Pilkington PLC. Metal substrate for a magnetic disc and manufacture thereof. 5,593,602, Cl. 216-42.000.
Geldmacher, Joachim. Filter for continuous filtration of liquids containing solids in a closed cylindrical vessel. 5,593,583, Cl. 210-331.000.
Gen-Probe Incorporated: *See*—
Hogan, James; Smith, Richard; and Kop, Joann, 5,593,841, Cl. 435-6.000.
GenCorp Inc.: *See*—
Hubbard, Michael J., 5,593,748, Cl. 428-41.300.
Koros, William J.; Hargis, I. G.; Olson, Richard A.; and Harris, Jason S., 5,593,157, Cl. 473-606.000.
Sharma, Satish C.; Kovalchin, John P.; and Weinert, Raymond J., 5,594,061, Cl. 524-503.000.
Genentech, Inc.: *See*—
Carlsson, Lena M. S.; Clark, Ross G.; and Wong, Wai L. T., 5,593,844, Cl. 435-7.100.
Drayna, Dennis T.; and Eaton, Dan L., 5,593,674, Cl. 424-94.630.
Erbe, David V.; Lasky, Laurence A.; and Presta, Leonard G., 5,593,882, Cl. 435-240.200.
Wurm, Florian M.; and Jordan, Martin, 5,593,875, Cl. 435-172.300.
General Electric Company: *See*—
Avakian, Roger W.; Prabhu, Vaikunth S.; Enlow, William P.; and Gray, Carlous L., 5,594,053, Cl. 524-120.000.
Blankenship, Charles P., Jr.; and Henry, Michael F., 5,593,519, Cl. 148-514.000.
Boehm, Manfred D., 5,594,345, Cl. 324-428.000.
Brinkman, Earl H., 5,593,273, Cl. 415-108.000.
Carreno, Diether E.; Myers, Albert; Palmer, Gene D.; Caruso, Philip M.; Wilson, Ian D.; and Hemsworth, Martin C., 5,593,274, Cl. 415-115.000.
Daiber, Paul C.; and Bird, William L., Jr., 5,593,163, Cl. 277-3.000.
DeJule, Michael C.; and Riza, Nabeel A., 5,594,565, Cl. 349-19.000.
Dorri, Bizhan; Laskaris, Evangelos T.; and Ogle, Michele D., 5,594,401, Cl. 335-216.000.
Drumbor, Rebecca C.; Calder, William H.; and Ignasiak, Martin C., 5,594,221, Cl. 200-50.270.
Duffy, Gerald E.; Cowling, John J.; Crites, D. Aaron; and Mikol, Dale K., 5,594,294, Cl. 313-25.000.
Hsieh, Jiang, 5,594,767, Cl. 378-8.000.
Johnson, Neil A.; Raber, Thomas R.; Hibbs, Louis E., Jr.; Murray, Melissa L.; and Benz, Mark G., 5,593,506, Cl. 134-9.000.
Lee, Gim F., Jr., 5,594,054, Cl. 524-141.000.
Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,276, Cl. 415-173.100.
Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,277, Cl. 415-173.100.
Steigerwald, Robert L., 5,594,629, Cl. 363-21.000.
Tam, Kwok C., 5,594,766, Cl. 378-4.000.
Venkatasubbu, Srinivasan; Eschenbach, Jeffrey J.; Waymeyer, Stephen J.; and Lampert, Bruno G., 5,593,275, Cl. 415-160.000.
Whipple, Walter, III, 5,594,333, Cl. 324-142.000.
General Filters, Inc.: *See*—
Redner, Carl R., 5,593,481, Cl. 96-132.000.
General Hospital Corporation, The: *See*—
Bogdanov, Alexei A.; and Brady, Thomas J., 5,593,658, Cl. 424-9.340.
General Instrument Corporation of Delaware: *See*—
Eyer, Mark; Shumate, Allen; and Moroney, Paul, 5,594,794, Cl. 380-20.000.
General Motors Corporation: *See*—
Kirby, Charles W., 5,593,647, Cl. 422-180.000.
Rajashekara, Kaushik; and Kurnia, Alexander, 5,594,634, Cl. 363-98.000.
Sharma, Ram A., 5,593,566, Cl. 205-363.000.
General Surgical Innovations, Inc.: *See*—
Mollenauer, Kenneth H., 5,593,418, Cl. 606-192.000.
Genesis Microchip Inc.: *See*—
Greggain, Lance; Goel, James; and Beyer, Robert, 5,594,676, Cl. 364-724.010.
Genesse, Bryan V., to Genovative Concepts International LLC. Automatic toilet lid closer. 5,592,700, Cl. 4-246.100.
Genesys Pharma Inc.: *See*—
Friesen, Albert D., 5,594,122, Cl. 536-24.500.
Genetics Institute, Inc.: *See*—
Knopf, John L.; and Clark, James, 5,593,878, Cl. 435-198.000.
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Genesse, Bryan V., 5,592,700, Cl. 4-246.100.
Genovese, Frank C., to Xerox Corporation. Electroded doner roll structure incorporating resistive network. 5,594,534, Cl. 399-285.000.
Gent, John A.: *See*—
Steer, Peter L.; Steer, Graham E.; and Gent, John A., 5,593,396, Cl. 604-327.000.
Gentry, John M.: *See*—
Klas, Daniel E.; Gentry, John M.; Tipton, Regina L.; and Dwyer, Richard H., 5,594,206, Cl. 174-56.000.
George, Albert L., Jr.: *See*—
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George Washington University Medical Center, The: *See*—
Goldstein, Allan L.; and Fagarasan, Mirela O., 5,593,964, Cl. 514-12.000.
Georgelos, Paul N., to Viskase Corporation. Puncture resistant heat shrinkable film containing narrow molecular weight ethylene alpha olefin. 5,593,747, Cl. 428-36.700.
Georgia State University Research Foundation: *See*—
Dykstra, Christine C.; Tidwell, Richard R.; Boykin, David W.; Wilson, W. David; Spychala, Jaroslaw; Das, Bijan P.; and Kumar, Arvind, 5,594,138, Cl. 540-596.000.
Gerard, Jean Louis: *See*—
Le Deit, Gerard; and Gerard, Jean Louis, 5,593,006, Cl. 188-73.450.
Gerbasi, Dennis G.: *See*—
Bonislawski, John M., Jr.; Thayer, Bruce E.; and Gerbasi, Dennis G., 5,594,541, Cl. 399-358.000.
Gerber, Dirk; Derluyn, Johan R.; and Huygens, Eric, to Imperial Chemical Industries. Process for preparing flexible foams. 5,594,039, Cl. 521-159.000.
Gerber, Dirk; Derluyn, Johan R.; and Huygens, Eric, to Imperial Chemical Industries PLC. Process for preparing flexible foams. 5,594,040, Cl. 521-159.000.
Gerber, Matthias: *See*—
Nuebling, Christoph; von Deyn, Wolfgang; Theobald, Hans; Westphalen, Karl-Otto; Kardorff, Uwe; Walter, Helmut; Kappe, Thomas; and Gerber, Matthias, 5,593,943, Cl. 504-221.000.
Gerenser, Duane; Kuffel, Reinhard F.; and Jorgensen, Donald, to Pennington Metals, Inc. Process for producing bar flats. 5,592,845, Cl. 72-161.000.
Gergely, Gerhard; Gergely, Thomas; Gergely, Irmgard; and Gergely, Stefan, to Gergely, Gerhard. Effervescent mixture with alkali metal salts or lysinates of acidic, insoluble or slightly soluble active ingredients. 5,593,693, Cl. 424-464.000.
Gergely, Irmgard: *See*—
Gergely, Gerhard; Gergely, Thomas; Gergely, Irmgard; and Gergely, Stefan, 5,593,693, Cl. 424-464.000.
Gergely, Stefan: *See*—
Gergely, Gerhard; Gergely, Thomas; Gergely, Irmgard; and Gergely, Stefan, 5,593,693, Cl. 424-464.000.
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Gerhaher, Max. Deceleration warning system. 5,594,416, Cl. 340-467.000.
Gerhart, Thomas L. Stretch thru fastener. 5,593,142, Cl. 256-54.000.
German, Johann, to Mercedes-Benz AG. Battery container for several electrochemical accumulators arranged therein. 5,593,793, Cl. 429-62.000.
Gerzon, Michael A., to Trifield Productions Limited. Sound reproduction system having a matrix converter. 5,594,800, Cl. 381-20.000.
Gessner, Scott L., to Fiberweb North America, Inc. Nonwoven fabrics and fabric laminates from multiconstituent fibers. 5,593,768, Cl. 428-286.000.
Getzlaff, Klaus J.; and Wille, Udo, to International Business Machines Corporation. Arbitration protocol for a bidirectional bus for handling access requests to a logically divided memory in a multiprocessor system. 5,594,876, Cl. 395-293.000.
Ghisler, Walter: *See*—
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GHZ Equipment Company: *See*—
Stiles, Walter J.; Richey, Milford G.; Haddon, Perry W.; and Ziegler, Malcolm I., 5,594,937, Cl. 455-5.100.
Gianantonio, Anacleto: *See*—
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Giannuzzi, Anthony C.; and Giannuzzi, Louis N. Fail-safe anchor bolt assembly for cracked masonry. 5,593,261, Cl. 411-55.000.
Giannuzzi, Louis N.: *See*—
Giannuzzi, Anthony C.; and Giannuzzi, Louis N., 5,593,261, Cl. 411-55.000.
Gianotti, Pietro: *See*—
Auditzio, Filippo; Bovello, Gianpiero; Ferrera, Massimo; Gianotti, Pietro; and Gozzelino, Riccardo, 5,592,924, Cl. 123-525.000.

Gidda, Jaswant S.; and Schaus, John M., to Eli Lilly and Company. Method of inhibiting gastric acid secretion with 5-substituted-3-aminochromane. 5,594,025, Cl. 514-453.000.
Gidda, Jaswant S.; and Schaus, John M., to Eli Lilly and Company. Method of inhibiting gastric acid secretion with 8-substituted-2-amino-1,2,3,4-tetrahydronaphthalene. 5,594,034, Cl. 514-657.000.
Gieseler, Andreas: *See*—
Sopher, David; Gieseler, Andreas; Hibst, Hartmut; Harth, Klaus; and Jaeger, Peter, 5,593,557, Cl. 204-290.00R.
Giessen, Bill C.; Gokhale, Sunil V.; and Marchev, Krassimir G., to Northeastern University. Amorphous metal alloys rich in noble metals prepared by rapid solidification processing. 5,593,514, Cl. 148-403.000.
Gilbarco Inc.: *See*—
Payne, Edward A.; and Hartsell, Hal C., Jr., 5,592,979, Cl. 141-59.000.
Gilbert, Barrie, to Analog Devices, Inc. Sub-rail voltage regulator with low stand-by current and high load current. 5,594,326, Cl. 323-313.000.
Gilead Sciences, Inc.: *See*—
Froehler, Brian; and Matteucci, Mark, 5,594,121, Cl. 536-23.500.
Gilhousen, Klein S.: *See*—
Weaver, Lindsay A., Jr.; Bayley, Gwain; Tiedemann, Edward G., Jr.; and Gilhousen, Klein S., 5,594,718, Cl. 370-331.000.
Gill, Aharon: *See*—
Farkash, Shmuel; Retter, Rafael; Adar, Ruth; and Gill, Aharon, 5,594,554, Cl. 358-426.000.
Gill, Jasbir S., to Calgon Corporation. Method for controlling scale using a synergistic phosphonate combination. 5,593,595, Cl. 210-700.000.
Gillebaard, Hendrik C., Jr. Variable size above-ground swimming pool. 5,592,702, Cl. 4-506.000.
Gillen, Gerard, to Gillen Pile Driving, Inc. Method of installing a composite timber and concrete pile. 5,593,251, Cl. 405-250.000.
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Gillen, Gerard, 5,593,251, Cl. 405-250.000.
Gillespie, Ralph D.; Bricker, Jeffery C.; Arena, Blaise J.; and Holmgren, Jeanifer S., to UOP. Process for sweetening a sour hydrocarbon fraction using a mixture of a supported metal chelate and a solid base. 5,593,932, Cl. 502-163.000.
Gillette Canada Inc.: *See*—
Meessmann, Jeffrey S., 5,593,213, Cl. 300-21.000.
Gilmore, Daniel R., III: *See*—
Jaskowiak, Timothy R.; Gilmore, Daniel R., III; and DiGravio, Thomas L., 5,592,863, Cl. 82-1.110.
Gilvar, Stephen G.: *See*—
Parsons, Harry R.; Curry, Robert M.; and Gilvar, Stephen G., 5,594,522, Cl. 396-517.000.
Ginetti, Bernard, to VLSI Technology, Inc. Pipelined analog to digital converters and interstage amplifiers for such converters. 5,594,445, Cl. 341-162.000.
Ginzburg, Vladimir B., to Danieli United; and International Rolling Mill Consultants, Inc. Variable soft cooling header. 5,592,823, Cl. 62-64.000.
Giolma, William H.: *See*—
Choi, Davy H.; Giolma, William H.; and Lee, Owen, 5,594,377, Cl. 327-278.000.
Giordano, Joseph, to Symbol Technologies, Inc. Planar arrangement for two-dimensional optical scanning. 5,594,232, Cl. 235-472.000.
Girard, Michael. Computer user interface for step-driven character animation. 5,594,856, Cl. 395-173.000.
Girot, Pierre; and Boschetti, Egisto, to BioSepra, Inc. Passivated porous polymer supports and methods for the preparation and use of same. 5,593,576, Cl. 210-198.200.
Girotti, Michael: *See*—
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,593,214, Cl. 303-7.000.
Gist-brocades, B.V.: *See*—
Van Ooijen, Albert J. J.; Rietveld, Krija; Hoekema, Andreas; Pen, Jan; Sijmons, Peter C.; and Verwoerd, Teunis C., 5,593,963, Cl. 514-12.000.
GKN Automotive AG: *See*—
Harz, Peter; Krude, Werner; and Taureg, Herbert, 5,593,084, Cl. 228-182.000.
Glaesener, Pierre, to Husky Injection Molding Systems Ltd. Uniformly compressible platen. 5,593,711, Cl. 425-595.000.
Glamkowski, Edward J.; and Chiang, Yulin, to Hoechst-Roussel Pharmaceuticals, Inc. 2-[(4-heteroaryl-1-piperazinyl)alkyl]-1,3-indandiones and related compounds and their therapeutic utility. 5,593,995, Cl. 514-254.000.
Glassberg, Jeffrey, to Lifecodes Corporation. Method for forensic analysis. 5,593,832, Cl. 435-6.000.
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Chinzi, Calogero, 5,593,784, Cl. 428-413.000.
Glaxo Group Limited: *See*—
Bye, Alan; Evans, Jill; Huckle, Paul D.; Lacey, Laurence F.; and Rue, Peter J., 5,593,685, Cl. 424-439.000.
Glaze, Bradley S.; Warner, Kenneth R.; Horn, Terry D.; and Horn, Ronald D., to H&H Eco Systems, Inc. Method for accelerated bioremediation and method of using an apparatus therefor. 5,593,888, Cl. 435-262.500.
Glick, Irving; and Miale, Peter, to Imp Designs, Inc. Molded table with storage compartment. 5,592,884, Cl. 108-25.000.
Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., to Heartstream, Inc. Electrotherapy method. 5,593,427, Cl. 607-7.000.
Glinka, Tomasz W.: *See*—
Christensen, Burton G.; Cho, In-Seop; Glinka, Tomasz W.; and Hecker, Scott J., 5,593,986, Cl. 514-204.000.
Globig, James E.: *See*—
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Gloceri, Gary J.: *See*—
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Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, to Bayer Aktiengesellschaft. Hydrated niobium oxide and hydrated tantalum oxide catalysts, their preparation and a process for preparing N-alkylated anilines using these catalysts. 5,593,936, Cl. 502-354.000.
Glover, Shedric O.; Bujanowski, Valeris J.; Ziemelis, Maris J.; Skinner, Michael W.; Homan, Gary R.; Perz, Susan V.; and Cannady, John P., to Dow Corning Corporation. Radiation curable compositions containing vinyl ether functional polyorganosiloxanes. 5,594,042, Cl. 522-31.000.
Glowa, Michael P.; Berman, Phillip J.; and Slenker, Dale, to Linvatec Corporation. Method of making arthroscopic shaver with rotatable collet and slide aspiration control valve. 5,592,727, Cl. 29-434.000.
Glynn, Kenneth P., to Ideal Ideas, Inc. Child resistant flip cap with collar. 5,593,054, Cl. 215-225.000.
Gnuco Technology Corporation: *See*—
Carroll, Gary T.; and Pauley, J. Donald, 5,594,384, Cl. 324-369.000.
Go, Shintetsu; Takai, Hideyuki; Miyazaki, Hajime; Yamazaki, Itaru; Kanemaru, Tetsuro; and Iuchi, Kazushi, to Canon Kabushiki Kaisha. Oxytitanium phthalocyanine, process for producing same and electrophotographic photosensitive member using same. 5,593,805, Cl. 430-78.000.
Gobbini, Mauro: *See*—
Quadri, Luisa; Bernardi, Luigi; Ferrari, Patrizia; Gobbini, Mauro; Melloni, Piero; and Valentino, Loredana, 5,593,982, Cl. 514-172.000.
Göbel, Frank: *See*—
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Goe, Bryan W.; and Hertlein, Robert C., to Cincinnati Incorporated. Auger conveyor assembly for heating and feeding polymer coated powder to the shuttle of a compacting press. 5,593,707, Cl. 425-257.000.
Goel, James: *See*—
Greggain, Lance; Goel, James; and Beyer, Robert, 5,594,676, Cl. 364-724.010.
Goetz, Gerald F.: *See*—
Maier, Mark S.; Gamble, Eric J.; Wilson, Jack W.; Calzadilla, Eliott L.; and Goetz, Gerald F., 5,593,112, Cl. 244-117.00A.
Goffing, Friedrich: *See*—
Loerzer, Thomas; Wegener, Stefan; and Goffing, Friedrich, 5,593,811, Cl. 430-258.000.
Goffman, William, to GWG Associates. Method for retrieving high relevance, high quality objects from an overall source. 5,594,897, Cl. 395-613.000.
Gokhale, Sunil V.: *See*—
Giessen, Bill C.; Gokhale, Sunil V.; and Marchev, Krassimir G., 5,593,514, Cl. 148-403.000.
Goldstar Co., Ltd.: *See*—
Ahn, Hyung S., 5,593,815, Cl. 430-321.000.
Goldstein, Allan L.; and Fagarasan, Mirela O., to George Washington University Medical Center, The. Method of treating septic shock by preventing actin polymerization. 5,593,964, Cl. 514-12.000.
Goldstein, Gideon; and Culler, Michael D., to Goldstein, Gideon. Method of measuring thymopoietin proteins in plasma and serum including acidification of the plasma and serum. 5,593,842, Cl. 435-7.100.
Goliaszewski, Alan E.: *See*—
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Goll, Jeffrey H.: *See*—
Buhler, Joe P.; Butt, David; Goll, Jeffrey H.; McCartor, Harold R.; Rowan, Stuart H.; Wagner, Neldon C.; and Whitney, Hartwell H., 5,592,943, Cl. 128-661.030.
Golla, Carla; and Cremonesi, Alessandro, to SGS-Thomson Microelectronics S.r.l. Method and apparatus for filtering high resolution digital signals. 5,594,677, Cl. 364-724.160.
Golunski, Stanislaw E.; and Hayes, John W., to Johnson Matthey Public Limited Company. Catalysts. 5,593,935, Cl. 502-339.000.
Gongwer, Geoffrey S.: *See*—
Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gudger, Keith H.; and Gongwer, Geoffrey S., 5,594,366, Cl. 326-41.000.
Gonnella, Norman T.; and Starcke, Steven F., to International Business Machines Corporation. Method for manufacturing a disk drive unit having magnetic disks with textured data areas and head landing zones. 5,593,341, Cl. 451-57.000.
Gonzalez-Cadavid, Nestor F.; and Rajfer, Jacob. Amelioration of human erectile dysfunction by treatment with iNOS, inducers of iNOS or iNOS cDNA. 5,594,032, Cl. 514-645.000.
Gonzalez-Hernandez, Jesus: *See*—
De La Luz-Martinez, Jose; Gonzalez-Hernandez, Jesus; Sanchez-Sinencio, Feliciano; de Dios Figueroa C., Juan; Martinez-Bustos, Fernando; and Ruiz-Torres, Maximiano, 5,593,713, Cl. 426-237.000.
Goodearl, Andrew D. J.; Stroobant, Paul; and Waterfield, Michael D., to Ludwig Institute for Cancer Research. Schwann cell mitogenic factor, its preparation and use. 5,594,114, Cl. 530-399.000.
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Gray, Carlous L.: *See*—
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Greisch, Danny L.; and Chemelli, John B., to Eastman Kodak Company. Micro dispensing positive displacement pump. 5,593,290, Cl. 417-478.000.
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Griffith, James R., to United States of America, Navy. Nontoxic antifouling systems. 5,593,732, Cl. 427-407.100.
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Ivanov, Eugene Y.; Grigoriva, Tatyana F.; and Boldyrev, Vladimir V., 5,593,082, Cl. 228-122.100.
Grijalva, Victor E.: *See*—
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Grimm, Thomas H.: *See*—
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Grossmann, Bruce B.: *See*—
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Hargrave, Karl D.; Cullen, Ernest; Proudfoot, John R.; Grozinger, Karl G.; Pal, Kollol; and Adams, Julian, 5,593,979, Cl. 514-81.000.
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Gruber, Carl: *See*—
Riebel, Michael J.; Torguson, Paul L.; Roos, Kenneth D.; Anderson, Donald E.; and Gruber, Carl, 5,593,625, Cl. 264-115.000.
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Zicker, Robert G.; and Dion, John K., 5,594,782, Cl. 379-63.000.
Gudgel, John. Shotgun mounted launching device and launching projectile. 5,592,770, Cl. 42-105.000.
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Guggemos, Adolf; and Oechs Le, Markus, to Voith Sulzer Papiermaschinen GmbH. Dryer section having combination of single and double tier dryer groups. 5,592,751, Cl. 34-117.000.
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Gullapalli, Rao P.; Liu, Haiying; and Loncar, Mark J., to Picker International, Inc. Three point technique using spin and gradient echoes for water/fat separation. 5,594,336, Cl. 324-309.000.
Gullette, James B.: *See*—
Moyer, William C.; Gullette, James B.; and Pepe, Kara B., 5,594,880, Cl. 395-595.000.
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Guth, Jason R.: *See*—
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GWG Associates: *See*—
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Field, John; and Hoelling, Steven P., 5,594,169, Cl. 73-504.140.
Gzesh, David P., to Elf Atochem North America, Inc. Dry wire drawing lubricants. 5,593,956, Cl. 508-459.000.
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Glaze, Bradley S.; Warner, Kenneth R.; Horn, Terry D.; and Horn, Ronald D., 5,593,888, Cl. 435-262.500.
Haag, Arthur F.; and Byrd, William A., to Eaton Corporation. Reversible hydrostatic transmission with dump valve. 5,592,818, Cl. 60-487.000.
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Haber, Terry M.; Smedley, William H.; and Foster, Clark B., to Habley Medical Technology Corporation. Multi-pharmaceutical storage, mixing and dispensing vial. 5,593,028, Cl. 206-221.000.
Habib, Mohammad M.; Winslow, Philip L.; and Moore, Richard O., Jr., to Chevron Research and Technology Company, A Division of Chevron U.S.A. Inc. Catalyst system for combined hydrotreating and hydrocracking and a process for upgrading hydrocarbonaceous feedstocks. 5,593,570, Cl. 208-108.000.
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Herz, Erich; and Habich, Heiko, 5,593,245, Cl. 403-403.000.
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Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,593,028, Cl. 206-221.000.
Hache, Jean: *See*—
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Hachey, Kathleen A.: *See*—
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Hackbarth, David G.; Hapke, Kenyon A.; and Schantz, Spencer C., to US Controls Corp. Rotary switch with cam operated sliding contact engaging noble metal stationary contact bar surface. 5,594,220, Cl. 200-6.00B.
Hacker, Manfred: *See*—
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Hada, Tetsuro: *See*—
Toki, Yusuke; Hiraoka, Manabu; Yamagishi, Ichiro; Onoki, Hiroyuki; Ban, Tatsuya; Hada, Tetsuro; Nabatame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.
Haddon, Perry W.: *See*—
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Hadley, Steven L.: *See*—
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Haeger, Inc.: *See*—
Wareham, Robert C., 5,592,733, Cl. 29-708.000.
Häfker, Thomas: *See*—
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Hafler, David A.: *See*—
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Hagiuda, Nobuyoshi; Matsui, Hideki; Sakamoto, Hiroshi; and Takayanagi, Ryotaro, to Nikon Corporation. Secondary battery discharge adaptor. 5,594,314, Cl. 320-2.000.
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Hajzler, Christian: *See*—
Sonnerat, Claude; Aliff, Denis; and Hajzler, Christian, 5,594,334, Cl. 324-173.000.
Hakamata, Yoshimi: *See*—
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Haldemann, Walter: *See*—
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Hale, John E.: *See*—
Becker, Gerald W.; Hale, John E.; and MacKellar, Warren C., 5,594,101, Cl. 530-317.000.
Hale, Russell S. Economical foot connected stilt assembly. 5,593,373, Cl. 482-75.000.
Halem, Stephen H. Controlled infusion administration of pharmaceuticals. 5,593,384, Cl. 604-54.000.
Hall, Cynthia F.: *See*—
Kimbel, Steven L.; Korb, Harold W.; and Hall, Cynthia F., 5,593,498, Cl. 117-201.000.
Hall, John R. Convertible barrow for ground level loading. 5,593,271, Cl. 414-490.000.
Hall, John T.: *See*—
Ramos, Sergio; Hall, John T.; Tanzer, Herbert J.; and Quon, William, 5,594,315, Cl. 320-2.000.
Hall, Linda M.; and Feng, Guoping, to Research Foundation of State University of New York. Nucleic acids encoding drosophila tipE cation channel proteins and recombinant expression of the same. 5,593,862, Cl. 435-69.100.
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Hall, Sacha C.: *See*—
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Lucas, Michael; Klotz, James M.; Farfan, Frank; and Hall, S. Warren, 5,594,410, Cl. 340-332.000.

Hallén, Jan-Ake: *See*—
Leijonbufvud, Carl B.; and Hallén, Jan-Ake, 5,592,723, Cl. 27-2.000.

Hallstrom, Nils O.: *See*—
Tohill, Henry J.; Gallagher, Russell B.; Kubarych, Kenneth G.; and Hallstrom, Nils O., 5,593,085, Cl. 228-193.000.

Halstead, Susan, administrator: *See*—
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Halstead, Victor G., deceased (by Susan Halstead, administrator): *See*—
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Ham, Steve: *See*—
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Hamada, Masaaki: and Aoi, Takahiro, to Tokai Rubber Industries, Ltd. Oscillating rod member equipped with dynamic damper. 5,593,144, Cl. 267-141.000.

Hamada, Yasunori: *See*—
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Hamaguchi, Toshihide: *See*—
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Hamamatsu Photonics K.K.: *See*—
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Hamamoto, Nobuo: *See*—
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Hamamoto, Yasuhiro: *See*—
Suzuki, Hidetoshi; Oeada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Hamerski, Michael D., to Minnesota Mining and Manufacturing Company. Quick-mounting fastening assembly. 5,593,120, Cl. 248-205.300.

Hamuro, Takehide: *See*—
Sakanaka, Tetsuo; and Hamuro, Takehide, 5,594,580, Cl. 359-172.000.

Han, Min-Koo; and Min, Byung-Hyuk, to Samsung Electronics Co., Ltd. Method for fabricating a MOS transistor having an offset resistance. 5,593,909, Cl. 437-41.000.

Hancock, Robert E. W.; Piers, Kevin L.; and Brown, Melissa H., to University of British Columbia, The. Cationic peptides and method for production. 5,593,866, Cl. 435-69.700.

Hancock, Robert L.: *See*—
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Handke, Patrick M.: *See*—
Scarberry, Eugene N.; and Handke, Patrick M., 5,592,938, Cl. 128-206.240.

Handlin, Dale L., Jr.; Willis, Carl L.; Goodwin, Daniel E.; and St. Clair, David J., to Shell Oil Company. Liquid star polymers having terminal hydroxyl groups. 5,594,072, Cl. 525-314.000.

Hangartner, Thomas N., to Wright State University. Method and apparatus for the evaluation of cortical bone by computer tomography. 5,594,775, Cl. 378-207.000.

Hanko, Rudolf: *See*—
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Hans, Helmut; and Oelsch, Jürgen, to Papst Licensing GmbH. Disk storage drive for maintaining precision during thermal variations. 5,594,606, Cl. 360-99.080.

Hansch, Egon, to Ferag AG. Process and apparatus for collecting printed products. 5,593,148, Cl. 270-52.300.

Hanse, John K. Shaker table. 5,594,177, Cl. 73-663.000.

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Hansson, Thord; and Sjölander, Stefan, to Pharmacia Biosensor AB. Valve, especially for fluid handling bodies with microflowchannels. 5,593,130, Cl. 251-61.100.

Hanyu, Yukio; Onuma, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuto; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsuga, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device and process for production thereof. 5,594,571, Cl. 349-138.000.

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Hara, Takahisa; Matsumoto, Masahiro; and Usui, Nobuhiro, to Sumitomo Chemical Company, Limited. Method for molding resin articles. 5,593,631, Cl. 264-257.000.

Harada, Akinori, to Fuji Photo Film Co., Ltd. Method and apparatus for fabricating ferroelectric domain reversals. 5,594,746, Cl. 372-22.000.

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Broder, Damon; Movaghar, Abdolreza; and Rhoads, W. Wistar, 5,593,240, Cl. 400-352.000.
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Coffin, Daniel R., 5,594,673, Cl. 364-709.150.
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Greenstein, Michael; and Yoshida, Henry, 5,592,730, Cl. 29-594.000.
Kaplinsky, George T.; and Swanson, David W., 5,594,483, Cl. 347-87.000.
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Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.

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Karin, Michael; Hibi, Masahiko; and Lin, Anning, 5,593,884, Cl. 435-252.300.

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Sopher, David; Gieseler, Andreas; Hibst, Hartmut; Harth, Klaus; and Jaeger, Peter, 5,593,557, Cl. 204-290.00R.

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Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., 5,593,440, Cl. 623-11.000.

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Foster, Robert F.; and Hillman, Joseph T., 5,593,511, Cl. 148-238.000.

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Koizumi, Yutaka; Banjo, Minoru; and Wakugawa, Takeshi, 5,594,350, Cl. 324-616.000.

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Hiramoto, Toshiro; Tamba, Nobuo; and Kasai, Motoki, 5,594,270, Cl. 257-393.000.
Horiuchi, Hideyuki; Suda, Koji; and Matsumoto, Masaetsu, 5,594,544, Cl. 356-73.000.
Itou, Yutaka; Iwai, Hidesoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, 5,594,279, Cl. 257-758.000.
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Nakagoshi, Junji; Higuchi, Tatsuo; Kato, Shinichi; Ando, Toshimitsu; and Iwasaki, Masaaki, 5,594,868, Cl. 395-200.160.
Noyama, Hideo; Kato, Makoto; Nohmi, Makoto; and Takizawa, Yuri, 5,594,850, Cl. 395-135.000.
Ohtake, Masatoshi; Tottori, Takeshi; Nakagawa, Kazunari; Hamamoto, Nobuo; Ohkawa, Takehiro; and Kinebuti, Yutaka, 5,594,680, Cl. 365-63.000.
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Sakurai, Wataru; Sawaguchi, Hideki; Satoh, Naoki; and Umemoto, Masao, 5,594,756, Cl. 375-233.000.
Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, 5,594,246, Cl. 250-310.000.
Tamba, Yuko, 5,594,383, Cl. 327-552.000.
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Todokoro, Hideo; Takamoto, Kenji; Ozaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, 5,594,245, Cl. 250-310.000.
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Ushijima, Kazuhiro; Matsumura, Hisashi; and Matsuura, Fumiaki, 5,594,426, Cl. 340-825.020.
Watanabe, Takao; Kimura, Katsutaka; Itoh, Kiyoo; and Kawajiri, Yoshiki, 5,594,916, Cl. 395-800.000.
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Ho, Chin-Lien. Document holder with an extensible-retractable bag. 5,593,086, Cl. 229-67.300.

Ho, David: *See*—
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Hobbs, Howard K.: *See*—
Papas, Andreas M.; and Hobbs, Howard K., 5,593,682, Cl. 424-401.000.

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Shea, Chi-Cheong; and Hodson, Lester L., 5,594,297, Cl. 313-309.000.

Hoeber, Matthias: *See*—
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Forstinger, Klaus; Volk, Heinrich; and Wykypiel, Werner, 5,594,145, Cl. 548-173.000.

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Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Luttrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,594,133, Cl. 540-228.000.
Bacher, Claus; Döbal, Hans-Rolf; Harada, Takamasa; Hemmerling, Wolfgang; Illian, Gerhard; Müller, Ingrid; Murakami, Mitio; Ohlendorf, Dieter; and Wingen, Rainer, 5,594,575, Cl. 349-171.000.
Gau, Karl; Nowy, Günter; and Schmailzl, Georg, 5,594,142, Cl. 546-19.000.
Jacob, Ingolf; Paulus, Eberhard; Kreuzer, Gerhard; Schubert, Bernd; and Geirhos, Josef, 5,593,777, Cl. 428-370.000.
Strutz, Heinz; Fleischer, Dietrich; Kulpe, Jürgen; and Schleicher, Andreas, 5,593,594, Cl. 210-660.000.

Hoechst Celanese Corporation: *See*—
Rahman, M. Dalil; and Durham, Dana L., 5,594,098, Cl. 528-482.000.

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Vicari, Richard, 5,594,086, Cl. 526-262.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Glamkowski, Edward J.; and Chiang, Yulin, 5,593,995, Cl. 514-254.000.

Hoekema, Andreas: *See*—
Van Ooijen, Albert J. J.; Rietveld, Krijn; Hoekema, Andreas; Pen, Jan; Sijmons, Peter C.; and Verwoerd, Teunis C., 5,593,963, Cl. 514-12.000.

Hoffman-La Roche Inc.: *See*—
Sninsky, John J.; and Kwok, Shirley Y., 5,594,123, Cl. 536-24.320.

Hoffman, Robert E.: *See*—
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Hoffmann, Hans-Rainer: *See*—
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Hoffmann, James A.: *See*—
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Hoffmann-La Roche Inc.: *See*—
Block, David E.; Hermann, Theron E.; Hsieh, Jih-Han; Mehta, Nikhil S.; and Rai, Vishva R., 5,593,870, Cl. 435-119.000.
Geiwiz, Jürgen; Götschi, Erwin; Hebeisen, Paul; Link, Helmut; and Lübbers, Thomas, 5,594,135, Cl. 540-468.000.
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 5,593,667, Cl. 424-85.200.
Young, Sai-Shek, 5,594,055, Cl. 524-291.000.

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Kelly, Stephen; and Lukác, Teodor, 5,593,617, Cl. 252-299.670.

Hofmann, Hartmut: *See*—
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Hogan, James; Smith, Richard; and Kop, Joann, to Gen-Probe Incorporated. Nucleic acid probes for detection and/or quantitation of non-viral organisms. 5,593,841, Cl. 435-6.000.

Hojo, Yasuo: *See*—
Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.

Holland, Wayland B.: *See*—
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Hollander, Eugene R.: *See*—
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Hollister Incorporated: *See*—
La Gro, Phillip A., 5,593,397, Cl. 604-355.000.

Holloway, Dwight S.: *See*—
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Holman, Robert L.: *See*—
Winston, Roland; Holman, Robert L.; Jacobson, Benjamin A.; and Emmons, Robert M., 5,594,830, Cl. 385-146.000.

Holmes, Ann: *See*—
Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.

Holmes, John S., II; and Anderson, Joe E., to Boehringer Mannheim Corporation. Zero power receive detector for serial data interface. 5,594,906, Cl. 395-750.000.

Holmgren, Jennifer S.: *See*—
Gillespie, Ralph D.; Bricker, Jeffery C.; Arena, Blaise J.; and Holmgren, Jennifer S., 5,593,932, Cl. 502-163.000.

Holotex Limited: *See*—
Sharpe, Richard A.; and Manners, Mia J., 5,593,765, Cl. 428-225.000.

Holzer, Reuven, to National Semiconductor Corporation. Reduced area, first order R-C filters using current conveyors. 5,594,390, Cl. 331-17.000.

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Nielsen, Ralph B.; Roniek, Thomas A.; Bates, David F.; Honan, James S.; and Yau, Hwei-Ling, 5,594,047, Cl. 523-315.000.

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Matsumoto, Yoshiyuki, 5,594,412, Cl. 340-435.000.
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Okada, Yuichi; and Aoyama, Toshihiko, 5,593,002, Cl. 180-421.000.
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Urakami, Fukashi, 5,592,998, Cl. 180-164.000.

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Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 5,593,667, Cl. 424-85.200.

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Hirano, Hiroshige; and Honda, Toshiyuki, 5,594,697, Cl. 365-208.000.

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Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., 5,594,665, Cl. 364-558.000.

Honeywell Inc.: *See*—
Larson, Brent D., 5,594,563, Cl. 349-74.000.

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Hoppe, Thomas W., deceased (by Curtis A. Orgill, executor): *See*—
Weinberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börasen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.

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Horie, Hiroshi: *See*—
Ishida, Hiroki; Tani, Junichi; and Horie, Hiroshi, 5,593,360, Cl. 475-331.000.

Horie, Yoshiko: *See*—
Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Kawai, Takashi; Shono, Seita; and Ohta, Eiji, 5,594,558, Cl. 358-518.000.

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Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.

Horita, Akihiro: *See*—
Fukutani, Hiroshi; Ohnishi, Hiroshi; Uebe, Shuichi; and Horita, Akihiro, 5,594,572, Cl. 349-155.000.

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Minerich, Phillip L.; Hewitt, Bryan C.; Lacroix, Cindy M.; and Ball, Melville D., 5,593,610, Cl. 219-728.000.

Horn, Jeffrey A.: *See*—
Patterson, Burton R.; and Horn, Jeffrey A., 5,594,057, Cl. 524-406.000.

Horn, Ronald D.: *See*—
Glaze, Bradley S.; Warner, Kenneth R.; Horn, Terry D.; and Horn, Ronald D., 5,593,888, Cl. 435-262.500.

Horn, Terry D.: *See*—
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Horn, Thomas: *See*—
Urdea, Michael S.; and Horn, Thomas, 5,594,117, Cl. 536-23.100.
Urdea, Michael S.; and Horn, Thomas, 5,594,118, Cl. 536-23.100.

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Eck, Werner; Horndler, Georg-Michael; and Lepach, Werner, 5,593,108, Cl. 242-608.500.

Horne, Remko: *See*—
Dings, Jacobus M.; Horne, Remko; Van Veen, Gerardus N. A.; and Bosman, Joseph C. M., 5,593,528, Cl. 156-154.000.

Horner, Gregory S.: *See*—
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Horrobin, David F. Methods and compositions for the treatment of the skin. 5,594,031, Cl. 514-553.000.

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Hernandez, Bernie; Horton, Raymond R.; Palmer, Michael J.; and Weindelmayer, Frederick G., 5,593,083, Cl. 228-180.210.

Horvath, Roland J.: *See*—
Bishara, Jeries I.; Brannan, James R.; Horvath, Roland J.; Sacco, Anthony R.; and Hindes, Jean M., 5,593,627, Cl. 264-127.000.

Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., to Warner-Lambert Company. Cholecystokinin antagonists, their preparation and therapeutic use. 5,593,967, Cl. 514-18.000.

Horwell, David C.; Howson, William; Pritchard, Martya C.; Roberts, Edward; and Rees, David C., to Warner-Lambert Company. Tachykinin antagonists. 5,594,022, Cl. 514-419.000.

Hoshino, Hidekazu; and Kurihara, Tatsuya, to NHK Spring Co., Ltd. Method and apparatus for checking the authenticity of a checking object by detecting magnetic flux reversals. 5,594,229, Cl. 235-449.000.

Hosoya, Ryo; and Kobayashi, Takaichi, to Kabushiki Kaisha Toshiba. Electronic apparatus system having an electronic apparatus unit and an expansion unit for expanding the function of the electronic apparatus unit by connection to an expansion card connector. 5,594,622, Cl. 361-686.000.

Hosoya, Yukio; and Fukuyo, Kei, to Nisshinbo Industries, Inc. Antilock brake device valve arrangement. 5,593,216, Cl. 303-119.200.

Hostikka, Sirkka L.: *See*—
Tryggvason, Karl; Hostikka, Sirkka L.; and Höyhtyä, Matti, 5,593,900, Cl. 436-547.000.

Hotea, Gheorghe, to Whitaker Corporation, The. Integral seal and strain relief member for a connector. 5,593,321, Cl. 439-589.000.

Hotelling, Steven P.: *See*—
Field, John; and Hotelling, Steven P., 5,594,169, Cl. 73-504.140.

Hotta, Yasumichi: *See*—
Sugino, Hiroshi; Hotta, Yasumichi; Fujii, Namiteugu; Shibata, Masahiro; and Sano, Hiromi, 5,593,558, Cl. 204-429.000.

Hotta, Yoshihiko: *See*—
Konda, Kazamoto; and Hotta, Yoshihiko, 5,593,320, Cl. 439-589.000.

Hotta, Yoshio: *See*—
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Hough, Barry M.: *See*—
Eavenson, Jimmy N., Sr.; and Hough, Barry M., 5,593,367, Cl. 477-203.000.

Houghtby, Timothy R.; Reineke, Roger W.; and Mosnier, Kenneth J., to Copeland Corporation. Scroll machine with reverse rotation protection. 5,593,294, Cl. 418-55.100.

Houghton, Jon C.; and Petry, Chester H., Jr., to Byers Industries, Inc. Method and apparatus for framing a film mounted integrated circuit. 5,592,734, Cl. 29-827.000.

Houghton, Richard A.: *See*—
Harder, Stanley D.; Houghton, Richard A.; and Wallace, Richard H., 5,594,925, Cl. 395-863.000.

Howbert, J. Jeffry: *See*—
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,594,028, Cl. 514-464.000.

Howmedica Inc.: *See*—
Higham, Paul A.; and Warfield, Larry T., 5,593,452, Cl. 623-23.000.

Howmet Corporation: *See*—
Schmiedelmeclit, Dean L.; Straszheim, Mark J.; Thompson, Dennis J.; and Rauguth, Brad L., 5,592,984, Cl. 164-62.000.

Howson, William: *See*—
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Höyhtyä, Matti: *See*—
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Hoyt, Earl H., Jr. Recurve bow alignment. 5,592,929, Cl. 124-23.100.

Hrytzak, Bernard J., to Siemens Electric Limited. Electromagnetic actuator arrangement for engine control valve. 5,593,132, Cl. 251-129.150.

Hsieh, Hsien-Fen; and Hsu, Ming-Teh, to Industrial Technology Research Institute. Etching recipe for the CrSi film. 5,593,601, Cl. 216-41.000.

Hsieh, Jiang, to General Electric Company. Methods and apparatus for enhancing image sharpness. 5,594,767, Cl. 378-8.000.

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Block, David E.; Hermann, Theron E.; Hsieh, Jih-Han; Mehta, Nikhil S.; and Rai, Vishva R., 5,593,870, Cl. 435-119.000.

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LoStracco, Gregory; Chesler, Ronald B.; and Hsu, Hui-Pin, 5,594,829, Cl. 385-134.000.

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Hsue, Chen-Chin, to United Microelectronics Corporation. Polysilicon programming memory cell. 5,594,684, Cl. 365-185.010.

Huang, Bing-Heng: *See*—
Lin, Stephen T.; Huang, Bing-Heng; and Chow, Steve, 5,594,788, Cl. 375-167.000.

Huang, Haitao: *See*—
Chen, Kejian; and Huang, Haitao, 5,593,795, Cl. 429-192.000.

Huang, Hao; DeBruzzi, Michael S.; and Riso, Thomas A., to Unique Mobility, Inc. Method of constructing a stator. 5,592,731, Cl. 29-596.000.

Huang, Tzuen-Hsi: *See*—
Chen, Ming-Jer; and Huang, Tzuen-Hsi, 5,594,683, Cl. 365-177.000.

Hubbard, Michael J., to GenCorp Inc. Reinforced tape strip for perimeter securement of a membrane roof and method of attaching. 5,593,748, Cl. 428-41.300.

Hubbell, Earl A.; Lipshutz, Robert J.; Morris, Macdonald S.; and Winkler, James L., to Affymetrix, Inc. Computer-aided engineering system for design of sequence arrays and lithographic masks. 5,593,839, Cl. 435-6.000.

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Klas, Daniel E.; Gentry, John M.; Tipton, Regina L.; and Dwyer, Richard H., 5,594,206, Cl. 174-56.000.
Nuckholls, Joe A.; and Flory, Isaac L., IV, 5,594,308, Cl. 315-290.000.

Huber, Catherine M.; Dolby, Debra J.; and Holland, Wayland B., to Texas Instruments Incorporated. Semiconductor device with reticle specific implant verification indicator. 5,594,258, Cl. 257-48.000.

Huber, Cynthia; and Longo, Nancy. Method of making vital wheat gluten into fibers. 5,593,717, Cl. 426-656.000.

Hübech, Walter: *See—*
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Staach, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.
Huckle, Paul D.: *See—*
Bye, Alan; Evans, Jill; Huckle, Paul D.; Lacey, Laurence F.; and Rae, Peter J., 5,593,685, Cl. 424-439.000.
Hudkins, Robert L.; and Knight, Ernest, Jr., to Cephalon, Inc. Fused pyrrolocarbazoles. 5,594,009, Cl. 514-338.000.
Huey, Richard W., Jr.; Lerner, Neil D.; Chaney, David B.; and Koncelik, Joseph A., to COMSIS Corporation. Universally accessible smoke detector. 5,594,422, Cl. 340-628.000.
Hufford, Larry A.: *See—*
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., 5,593,164, Cl. 277-9.500.
Hughes Aircraft Company: *See—*
Carello, Charles C.; Shahriary, I. Mark; and Berman, Arnold L., 5,594,939, Cl. 455-12.100.
Kritkorian, Kapriel V.; and Victor, Arnold E., 5,594,451, Cl. 342-160.000.
Zhang, Yong H.; and Chow, David H., 5,594,750, Cl. 372-45.000.
Hughes Danbury Optical Systems, Inc.: *See—*
de Groot, Peter; Gallatin, Gregg M.; and Roychoudhuri, Chandra, 5,594,543, Cl. 356-5.090.
Hughes, Huw P. A.: *See—*
Potter, Andrew; Campos, Manuel; and Hughes, Huw P. A., 5,594,107, Cl. 530-350.000.
Hulbert, Anthony P., to Roke Manor Research Limited. Apparatus for use in equipment providing a digital radio link between a fixed radio unit and a mobile radio unit. 5,594,755, Cl. 375-208.000.
Huls America Inc.: *See—*
Subramoniam, Chitoor S.; and Larson, Gerald L., 5,594,156, Cl. 556-417.000.
Humbles, Marvin L., to Whitaker Corporation, The. Modular furniture communication system. 5,593,317, Cl. 439-502.000.
Hundley, Gary L.: *See—*
Nilsen, David N.; Galvan, Gloria J.; Hundley, Gary L.; and Wright, John B., 5,593,593, Cl. 210-638.000.
Hunsicuat, Harry A., to Kelsey-Hayes Company. Variable assist steering pressure control valve. 5,593,133, Cl. 251-129.150.
Hunter, Sharron: *See—*
Deckner, George E.; Turner, Crystal; Hunter, Sharron; and Watts-McMillan, Kim, 5,593,662, Cl. 424-64.000.
Hurley, John F.; and Hartel, Edward O., to Combustion Components Associates, Inc. Pollutant reducing modification of a tangentially fired furnace. 5,593,298, Cl. 431-9.000.
Husain, Zaki D., to Daniel Industries, Inc. Laminated rotor assembly. 5,594,288, Cl. 310-62.000.
Husky Injection Molding Systems Ltd.: *See—*
Glaesener, Pierre, 5,593,711, Cl. 425-595.000.
Hustache, Gerard: *See—*
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Huston, Rima: *See—*
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Hutchinson: *See—*
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Hutsell, Larry: *See—*
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Huygens, Eric: *See—*
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Hwang, Paul: *See—*
Merrill, Sonya; Ayer, Atul D.; Hwang, Paul; and Kuczynski, Anthony L., 5,593,695, Cl. 424-480.000.
Hwo, Charles C.; Ma, Chin-Yuan G.; and McCullough, James D., Jr., to Shell Oil Company. Process for improving processability of ultra low melt viscosity polymer. 5,594,074, Cl. 525-387.000.
Hwong, Chen-Une: *See—*
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Hyakutake, Nobuo: *See—*
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Hyatt, Gilbert P. Computer system having a serial keyboard, a serial display, and a dynamic memory with memory refresh. 5,594,908, Cl. 395-800.000.
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Niethammer, Bernd, 5,592,972, Cl. 137-625.650.
Hyonaga, Takuya: *See—*
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Hyubdai Electronics Industries Co., Ltd.: *See—*
Nam, Joong G., 5,594,380, Cl. 327-390.000.
Hyun, Jae W.: *See—*
Lee, Jong W.; Chae, Jeong S.; Choi, Young R.; Lee, Yeong N.; Rho, Eun R.; Kang, Heui I.; and Hyun, Jae W., 5,593,984, Cl. 514-202.000.
Hyundai Electronics America: *See—*
Oh, Jong-Hoon, 5,594,765, Cl. 377-44.000.
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Cho, Jung S.; and Song, Je S., 5,594,413, Cl. 340-435.000.
Kim, Hyeong S., 5,593,813, Cl. 430-312.000.
Oh, Young N., 5,594,374, Cl. 327-108.000.
Hyundai Motor Company: *See—*
Kim, Yoonsuk, 5,592,917, Cl. 123-308.000.
I-Stat Corporation: *See—*
Davis, Graham, 5,593,638, Cl. 422-56.000.
Iannucci, Robert A.: *See—*
Chen, Hudong; Churchill, Peter C.; Iannucci, Robert A.; Molvig, Kim; Papadopoulos, Gregory; Remondi, Stephen A.; Teixeira, Christopher M.; and Traub, Kenneth R., 5,594,671, Cl. 364-578.000.
IBM Corporation: *See—*
Ahn, Kie Y.; Hedrick, James L., Jr.; Labadie, Jeffrey W.; Lee, Kang-Wook; Twieg, Robert J.; Viehbeck, Alfred; and Walker, George F., 5,593,720, Cl. 427-97.000.
Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalsass, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.
King, C. David; and Torres, Robert J., 5,594,857, Cl. 395-352.000.
Ichihashi, Tetsuo: *See—*
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Ichikawa, Kei: *See—*
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Ichikawa, Naomi: *See—*
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Ichikawa, Shuji: *See—*
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Ichikawa, Yoshitaka: *See—*
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Ichikawa, Yukihito: *See—*
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Ichikoh Industries, Ltd.: *See—*
Ishiyama, Yoshihiko, 5,594,590, Cl. 359-841.000.
Yoshida, Norio; and Yokota, Masayuki, 5,592,715, Cl. 15-250.003.
ICTV, Inc.: *See—*
Hourty, W. Leo, 5,594,507, Cl. 348-584.000.
Ide, Toshihiro: *See—*
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Ideal Ideas, Inc.: *See—*
Glynn, Kenneth P., 5,593,054, Cl. 215-225.000.
Igarashi, Hiroshi: *See—*
Kobayashi, Hiroaki; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shunji; and Uehara, Hirotaka, 5,594,548, Cl. 356-376.000.
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kamei, Shigeru; Oka, Masahisa; and Sano, Atsunori, to Takeda Chemical Industries, Ltd. Matrix for sustained-release preparation. 5,594,091, Cl. 528-271.000.
IGEN Incorporated: *See—*
Kamireddy, Balreddy; Dursley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,593,969, Cl. 514-25.000.
Ignasiak, Martin C.: *See—*
Drumbor, Rebecca C.; Calder, William H.; and Ignasiak, Martin C., 5,594,221, Cl. 200-50.270.
Ignon, Roger G.: *See—*
Thomas, Ron, Jr.; Ignon, Roger G.; and Cohen, William, 5,592,936, Cl. 128-206.120.
Ihm, Dae W.; Kim, Jeong L.; Kim, Kwon I.; and Kim, Byeng H., to Cheil Synthetics Inc. Process for the preparation of composite semi-permeable membrane. 5,593,738, Cl. 427-534.000.
Iida, Hiroyuki: *See—*
Katano, Kiyoaki; Ohuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.
Iida, Ichiro; and Kurita, Toshihiko, to Fujitsu Limited. Personal communication method and system. 5,594,722, Cl. 370-426.000.
Iijima, Yasuo; and Tsubokawa, Masahiro, to Matsushita Electric Industrial Co., Ltd. Surge testing method in decompressed atmosphere for a small-size electric machine and apparatus thereof. 5,594,348, Cl. 324-546.000.
Iijima, Yasushi: *See—*
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Iimuro, Shunichi: *See—*

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Iiyama, Michitomo: *See—*
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Iizuka, Masaru: *See—*
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Ikeda, Masae; and Nakashima, Teturou, to Fujitsu Limited. Developing device using one-component type developer. 5,594,198, Cl. 399-281.000.
Ikeda, Yasuo, to NEC Corporation. Method and apparatus for forming silicon oxide film by chemical vapor deposition. 5,593,741, Cl. 427-579.000.
Iketani, Akira: *See—*
Juri, Tatsuro; Iketani, Akira; and Matsumi, Chiyoko, 5,594,550, Cl. 386-40.000.
Ikeyama, Seiichi: *See—*
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Iliff, Edwin C., to First Opinion Corporation. Computerized medical diagnostic system including re-enter function and sensitivity factors. 5,594,638, Cl. 395-203.000.
Illian, Gerhard: *See—*
Escher, Claus; Dübal, Hans-Rolf; Harada, Takamasa; Hemmerling, Wolfgang; Illian, Gerhard; Müller, Ingrid; Murakami, Mikio; Ohlendorf, Dieter; and Wingen, Rainer, 5,594,575, Cl. 349-171.000.
Illinois Tool Works Inc.: *See—*
Broskow, James A., 5,593,026, Cl. 206-150.000.
Malin, Art; Van Erden, Donald; and McMahon, Michael, 5,592,802, Cl. 53-133.400.
Rice, Brian L.; and Turansky, Albert J., 5,593,753, Cl. 428-131.000.
Ilvespää, Heikki; Jaakkola, Jyrki; Linsuri, Ari; Partanen, Erkki; and Verkasalo, Lauri, to Valmet Corporation. Hybrid former with an MB unit in a paper machine. 5,593,546, Cl. 162-301.000.
Imaeda, Yasuo: *See—*
Ishida, Tatsuya; and Imaeda, Yasuo, 5,594,171, Cl. 73-514.320.
Iwata, Hitoshi; Jinkai, Koichi; and Imaeda, Yasuo, 5,594,271, Cl. 257-469.000.
Imagawa, Hitoshi: *See—*
Akata, Masao; Miura, Takao; Ogawa, Takeshi; Doi, Yukihiro; Higashi, Isao; and Imagawa, Hitoshi, 5,594,724, Cl. 370-469.000.
Imai, Hiroaki: *See—*
Suga, Seiji; Imai, Hiroaki; and Uchida, Katsuhiko, 5,592,910, Cl. 123-90.170.
Imai, Koji; Wakahoi, Toshiya; Adachi, Hiromitsu; Terada, Keiichi; Yamashita, Hiroaki; and Morikawa, Hiroshi, to Toyo Roki Seizo Kabushikikaisha; and Honda Giken Kogyo Kabushiki Kaisha. Filter having internally threaded cover non-rotatably mounted to casing of the filter. 5,593,577, Cl. 210-232.000.
Imai, Masao: *See—*
Nagata, Teruyuki; Okazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, 5,594,088, Cl. 528-77.000.
Imai, Noboru: *See—*
Hiroe, Toshikatsu; Kaneko, Kenichi; Imai, Noboru; Takasaka, Hiroyuki; and Kawamura, Toshio, 5,593,774, Cl. 428-343.000.
Imajo, Yasutaka: *See—*
Inada, Minoru; Imajo, Yasutaka; and Uchino, Masahide, 5,593,507, Cl. 134-11.000.
Imani, Yuichi: *See—*
Asai, Jirou; Imani, Yuichi; and Ito, Akira, 5,593,363, Cl. 477-74.000.
Imaoka, Takashi: *See—*
Yamanaka, Koji; Imaoka, Takashi; Futatsuki, Takashi; and Yamashita, Yukinari, 5,593,554, Cl. 204-252.000.
Imaoka, Takeshi: *See—*
Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, 5,594,006, Cl. 514-312.000.
Imation Corp.: *See—*
Dubner, Andrew D., 5,593,790, Cl. 428-694.0ML.
Kirk, Mark P.; and Mott, Andrew W., 5,594,143, Cl. 566-157.000.
Imeokparia, Daniel D.: *See—*
Shmidt, Creston D.; Imeokparia, Daniel D.; and Suh, Kyung W., 5,594,036, Cl. 521-79.000.
Immunex Corporation: *See—*
Black, Roy A.; Fitzner, Jeffrey N.; and Sleath, Paul R., 5,594,106, Cl. 530-331.000.
Immuno Aktiengesellschaft: *See—*
Turecek, Peter; Johann, Eibl; and Schwarz, Hans-Peter, 5,593,968, Cl. 514-21.000.
Imoto, Kazunobu: *See—*
Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.
Imp Designs, Inc.: *See—*
Glick, Irving; and Miale, Peter, 5,592,884, Cl. 108-25.000.
Imperial Chemical Industries: *See—*
Gerber, Dirk; Derluyn, Johan R.; and Huygens, Eric, 5,594,039, Cl. 521-159.000.
Imperial Chemical Industries PLC: *See—*
Chaffanjon, Pierre G.; Stroobants, Peter F.; and Bleys, Gerhard J., 5,594,097, Cl. 528-419.000.
Gerber, Dirk; Derluyn, Johan R.; and Huygens, Eric, 5,594,040, Cl. 521-159.000.
Woolhouse, Robin A.; and Revill, Brian K., 5,593,553, Cl. 204-252.000.
Implex Corp.: *See—*
Averill, Robert G.; Cohen, Robert C.; and Zubok, Rafail, 5,593,451, Cl. 623-23.000.
Inaba, Michihiko: *See—*
Saito, Akiko; Sahashi, Masashi; Tokai, Yoichi; Tsutai, Akihiko; Okamura, Masami; Nishiyama, Yukiko; and Inaba, Michihiko, 5,593,517, Cl. 148-301.000.
Inada, Minoru; Imajo, Yasutaka; and Uchino, Masahide, to Kabushiki Kaisha Toshiba; and Japan Field Company, Ltd. Cleaning method and cleaning apparatus. 5,593,507, Cl. 134-11.000.
Inada, Takahiro: *See—*
Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, 5,594,645, Cl. 364-426.044.
Inagaki, Hiroshi: *See—*
Miyata, Shigeru; Kondo, Noriaki; and Inagaki, Hiroshi, 5,592,926, Cl. 123-630.000.
Inamori, Masayuki: *See—*
Ueno, Takuya; Inamori, Masayuki; and Kyutoku, Hirofumi, 5,593,776, Cl. 428-367.000.
Indiveri, Richard: *See—*
Gazerro, Carmine M.; and Indiveri, Richard, 5,592,957, Cl. 132-53.000.
Industrial Technology Research Institute: *See—*
Chen, Jim, 5,594,589, Cl. 359-826.000.
Fu, Ya-ming; Perng, Jyi-Ching; Hwong, Chen-Une; and Fang, Liang-Jyi, 5,592,752, Cl. 34-388.000.
Hsieh, Hsien-Fen; and Hsu, Ming-Teh, 5,593,601, Cl. 216-41.000.
Lu, Chih-Yuan; and Tseng, Horng H., 5,594,682, Cl. 365-149.000.
Peng, Yung-Chow, 5,594,675, Cl. 364-724.100.
Ingersoll-Rand Company: *See—*
Sajasovic, James N., 5,593,603, Cl. 219-69.100.
Inorganic Coating, Inc.: *See—*
Schaffer, Peter; and Armstrong, Scott, 5,593,492, Cl. 106-623.000.
Inoue, Akihisa: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.
Inoue, by Tsuneo, heir: *See—*
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Sueoka, Manabu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, 5,594,479, Cl. 347-45.000.
Inoue, Hiroshi: *See—*
Nakashima, Tatsushi; Furuhashi, Tsutomu; Kano, Hiroyuki; Yamamoto, Kazuo; and Inoue, Hiroshi, 5,592,968, Cl. 137-561.00A.
Inoue, Hiroto: *See—*
Kaizaki, Keiji; Yamamoto, Tamotsu; Yokoji, Shigeru; Inoue, Hiroto; and Matsui, Hiroshi, 5,593,023, Cl. 200-570.000.
Inoue, Hiroyasu: *See—*
Utsunomiya, Hajime; Uchiyama, Kenji; Kosuda, Masanori; and Inoue, Hiroyasu, 5,593,789, Cl. 428-694.0ML.
Inoue, Hiroyumi, to NEC Corporation. File I/O control device writing blocks to faster device first and canceling exclusive lock as each block is written. 5,594,909, Cl. 395-872.000.
Inoue, Kazuhiko: *See—*
Matsuda, Takehisa; Inoue, Kazuhiko; and Tani, Nobutaka, 5,593,814, Cl. 430-320.000.
Inoue, Kazuo, to Matsushita Electric Industrial Co., Ltd. Optical disk substrate and optical disk employing said optical disk substrate. 5,594,716, Cl. 369-275.400.
Inoue, Koichi: *See—*
Okuda, Nobuyuki; Inoue, Koichi; Tokutake, Toshinori; and Ito, Shinji, 5,593,187, Cl. 285-305.000.
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Sueoka, Manabu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, to Canon Kabushiki Kaisha. Method for manufacturing ink jet recording head having water-repellent material. 5,594,479, Cl. 347-45.000.
Inoue, Masahiko: *See—*
Takekoshi, Nobuhiko; and Inoue, Masahiko, 5,594,538, Cl. 399-310.000.
Inoue, Naoyuki, to Ebara Corporation. Absorption refrigeration machine. 5,592,825, Cl. 62-141.000.
Inoue, Noboru. Fluid-filtering device for filtering out particulates in fluid. 5,593,560, Cl. 204-671.000.
Inoue, Satoshi; and Miyamori, Takashi, to Kabushiki Kaisha Toshiba. Direct memory access controller comprising a multi-word data register for high speed continuous data transfer. 5,594,923, Cl. 395-842.000.
Instance, David J. Labels and manufacture thereof. 5,593,749, Cl. 428-40.100.
Institut Fue Neue Materialien Gemeinnützige GMBH: *See—*
Nass, Rüdiger; Schmidt, Helmut; and Schmitt, Peter, 5,593,781, Cl. 428-403.000.
Institut für Mikrotechnik Mainz GmbH: *See—*
Kerndlmaier, Walter, 5,594,824, Cl. 385-49.000.
Instytut Wlokiennictwa: *See—*
Otoniewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., 5,593,618, Cl. 252-512.000.

Intecom, Incorporated: *See*—
Bell, Robert T.; and Platt, Richard B., 5,594,732, Cl. 370-401.000.
Integrated Controls: *See*—
Caldwell, David W., 5,594,222, Cl. 200-600.000.
Integrated Device Technology, Inc.: *See*—
Campbell, David L., 5,594,361, Cl. 326-24.000.
Integrated Information Technology, Inc.: *See*—
Pendrianto, Jan; Wang, Chi S.; Rainnie, Hedley K. J.; Sutardja, Sehat; and Martin, Bryan R., 5,594,813, Cl. 382-236.000.
Intel Corporation: *See*—
Bashir, Amir, 5,594,691, Cl. 365-189.090.
Bell, D. Michael, 5,594,882, Cl. 395-421.020.
Hazen, Peter K.; and Castillo, Michael J., 5,594,686, Cl. 365-185.040.
Nugent, Steven F., 5,594,866, Cl. 395-200.130.
Turner, Leonard; Trobough, Mark; Kabedi, Ashok; and Flamm, Ron, 5,594,356, Cl. 324-755.000.
Wojciechowski, Kenneth E., 5,594,360, Cl. 324-771.000.
Interferometrics, Inc.: *See*—
Webber, John C.; and Knight, Curtis A., 5,594,452, Cl. 342-353.000.
Internec Corporation: *See*—
Fox, Duane M.; and Schoen, Joel, 5,593,238, Cl. 400-234.000.
Internedics, Inc.: *See*—
Spehr, Paul R.; Frankovich, Mark M.; and White, Mark A., 5,593,433, Cl. 607-128.000.
International Business Machines Corporation: *See*—
Babich, Edward D.; Petrillo, Karen E.; Simons, John P.; and Seeger, David E., 5,593,812, Cl. 430-270.100.
Behfar-Rad, Abbas; Harder, Christoph S.; and Meier, Heinz P., 5,594,749, Cl. 372-45.000.
Bonne, Francois; Grillet, Jean-Marie; Mansel, Guy; and Rouah, Paul, 5,594,892, Cl. 395-500.000.
Bradshaw, Richard L., 5,594,064, Cl. 524-507.000.
Cohn, Oded; Nagin, Kenneth; Novick, Yoram; and Winokur, Alex, 5,594,900, Cl. 395-600.000.
Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, 5,593,537, Cl. 156-636.100.
Erpelding, A. David; and Ruiz, Oscar J., 5,594,607, Cl. 360-104.000.
Fecteau, Jean G.; Kligerman, Eugene; and Kollar, Lubor, 5,594,881, Cl. 395-419.000.
Getzlaff, Klaus J.; and Wille, Udo, 5,594,876, Cl. 395-293.000.
Gonzella, Norman T.; and Starcke, Steven F., 5,593,341, Cl. 451-57.000.
Hassner, Martin A.; Schwiegelshohn, Uwe; and Winograd, Shmuel, 5,594,436, Cl. 341-59.000.
Hernandez, Bernie; Horton, Raymond R.; Palmer, Michael J.; and Weindelmayer, Frederick G., 5,593,083, Cl. 228-180.210.
Hershey, Paul C.; and Waclawsky, John G., 5,594,728, Cl. 370-471.000.
Himpsel, Franz J., 5,593,951, Cl. 505-235.000.
Kaowlea, Billy J.; Collins, Clive A.; Dezaoyers, Christine M.; Grice, Donald G.; and Rolfe, David B., 5,594,918, Cl. 395-800.000.
Lemaire, Charles A.; and Stricmer, Bryan L., 5,594,658, Cl. 364-514.008.
Ottesen, Hal H.; Smith, Gordon J.; and Van Leeuwen, George W., 5,594,924, Cl. 395-851.000.
Price, Wilbur D., 5,594,883, Cl. 395-440.000.
Rajeevakumar, Thekkemadathil V., 5,593,912, Cl. 437-52.000.
Raymond, Jon H.; and Ventrone, Sebastian T., 5,594,895, Cl. 395-556.000.
Reissner, Peter E., 5,594,731, Cl. 370-338.000.
Virtuoso, Salvatore; and Parolo, Alberto, 5,594,952, Cl. 455-89.000.
International Power Group, Inc.: *See*—
Krichtafovitch, Igor A.; and Sinitsyna, Irina Z., 5,594,402, Cl. 336-65.000.
International Rectifier Corporation: *See*—
Kiraly, Laszlo, 5,594,379, Cl. 327-381.000.
International Rolling Mill Consultants, Inc.: *See*—
Ginzburg, Vladimir B., 5,592,823, Cl. 62-64.000.
Inuzuka, Masayuki: *See*—
Sawai, Toshihiko; Inuzuka, Masayuki; and Terada, Toyohiko, 5,594,301, Cl. 313-523.000.
Investions, Inc.: *See*—
Szlam, Aleksander; and Owen, James E., 5,594,791, Cl. 379-265.000.
Investive Technology: *See*—
Roberts, Kent S.; and Roberts, Brent J., 5,592,930, Cl. 124-44.500.
Iomega Corporation: *See*—
Padden, Robin, 5,594,597, Cl. 360-46.000.
Ionic Fuel Technology, Inc.: *See*—
Westworth, Fred A., Jr., 5,592,903, Cl. 123-25.00A.
Iowa State University Research Foundation, Inc.: *See*—
McConnell, Kenneth G.; and Jang, Wan-Shik, 5,594,309, Cl. 318-568.220.
Ippotico, Rodolfo M., to Dresser Industries, Inc. Hydrodynamic bearing. 5,593,231, Cl. 384-114.000.
Ireco, Inc.: *See*—
Rooney, Daniel; Schalleukamp, Glen C.; Seeger, Margaret R.; and Steedman, David, 5,594,196, Cl. 102-275.110.
Irie, Reiko F.: *See*—
Zeng, Qing S.; and Irie, Reiko F., 5,593,822, Cl. 435-2.000.
Iris Electronics Corporation: *See*—
Herman, R. Keith; Wong, C. Brian; Reshetnikov, Gennady; and McLaughlin, Brian, 5,594,332, Cl. 324-127.000.
Isaacs, Blake L.: *See*—
Ross, David J.; Isaacs, Blake L.; and Williams, Kevin J., 5,594,953, Cl. 455-89.000.
Isaacs, Stephen T.: *See*—
Wollowitz, Susan; Isaacs, Stephen T.; Rapoport, Henry; Spielmann, Hans P.; and Nerio, Aileen, 5,593,823, Cl. 435-2.000.
Isaka, Haruo; Maruoka, Toshihiko; Ichikawa, Kei; Honjo, Kenichi; and Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Tracking error detecting circuit. 5,594,602, Cl. 360-77.140.
Isbell, Matthew R.: *See*—
Scott, Danny E.; Pessier, Rudolf C. O.; Isbell, Matthew R.; Meany, Nigel; and Besson, Alain, 5,592,995, Cl. 175-374.000.
Iscar Ltd.: *See*—
Satran, Amir; and Margulis, Rafael, 5,593,255, Cl. 407-113.000.
Iseki, Tsutomu, to Sumtiomo Rubber Industries, Ltd. Pneumatic tire including cord layers. 5,593,521, Cl. 152-209.00R.
Isert, Dieter: *See*—
Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,594,133, Cl. 540-228.000.
Ishida, Hiroki; Tani, Junichi; and Horie, Hiroshi, to Tsubakimoto Chain Co. Planetary gear system. 5,593,360, Cl. 475-331.000.
Ishida, Shinichi, to Canon Kabushiki Kaisha. Image processing method and apparatus empolying the same. 5,594,555, Cl. 358-448.000.
Ishida, Tatsuya; and Imaeda, Yasuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Capacitance type acceleration sensor. 5,594,171, Cl. 73-514.320.
Ishigami, Takashi: *See*—
Horiuchi, Tadahiko; Ishigami, Takashi; Nakamura, Hiroyuki; Mogami, Tohru; Wakabayashi, Hitoshi; Kunio, Takemitsu; and Okumura, Koichiro, 5,593,923, Cl. 437-200.000.
Ishihara, Kunihiko: *See*—
Hayashi, Kazuhiko; Yamamoto, Hidefumi; Fujikata, Junichi; and Ishihara, Kunihiko, 5,594,933, Cl. 428-546.000.
Ishii, Hirokazu: *See*—
Sato, Morio; Abe, Yutaka; Takano, Jun; Ishii, Hirokazu; and Murata, Yasuzo, 5,594,562, Cl. 349-12.000.
Ishii, Shigeru; Shinso, Yoshihide; Murata, Kosei; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, to Nissan Motor Co., Ltd. Shift control apparatus for automatic transmission. 5,593,364, Cl. 477-98.000.
Ishii, Yutaka: *See*—
Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.
Ishikawa, Jun: *See*—
Ohshima, Kenichi; Ishikawa, Jun; Kudoh, Koji; and Nakaya, Tomoki, 5,594,787, Cl. 379-114.000.
Ishikawa, Masaki; and Yamada, Masao, to Tamapack Co., Ltd. Display device for a vehicle. 5,594,415, Cl. 340-467.000.
Ishikawa, Masakuni: *See*—
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.
Ishikawa, Midori: *See*—
Katano, Kiyoaki; Obuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.
Ishikawa, Osamu; and Takehara, Hiroyasu, to Matsushita Electric Industrial Co., Ltd. Radio frequency probe and probe card including a signal needle and grounding needle coupled to a microstrip transmission line. 5,594,358, Cl. 324-762.000.
Ishimoto, Manabu; Kato, Masayuki; Aritake, Hirokazu; and Sato, Noriko, to Fujitsu Limited. Space light modulating apparatus having a length to width ratio of 30:1 and staggered drivers. 5,594,564, Cl. 349-143.000.
Ishimoto, Manabu: *See*—
Sato, Noriko; Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; and Nakashima, Masato, 5,594,559, Cl. 359-8.000.
Ishiura, Ryoichi: *See*—
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,594,619, Cl. 361-681.000.
Ishiwa, Tadashi: *See*—
Kinoshita, Hiroaki; and Ishiwa, Tadashi, 5,593,315, Cl. 439-459.000.
Ishiwata, Hiroshi; Ohishi, Takashi; and Kitahara, Nobuhiro, to Zexel Corporation. Pilot injection controller in fuel injection system and method of controlling pilot injection quantity. 5,592,915, Cl. 123-300.000.
Ishiyama, Yoshihiko, to Ichikoh Industries, Ltd. Mirror-housing positioning device for car rearview mirror. 5,594,590, Cl. 359-841.000.
Ishizaki, Toshio: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakatsubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.
Ishizuka, Mikio: *See*—
Fujiwara, Susumu; Sakata, Masahiko; and Ishizuka, Mikio, 5,594,803, Cl. 381-71.000.
Isobe, Kunio: *See*—
Watanabe, Yuichiro; Isobe, Kunio; Yarita, Ikuo; and Nikaido, Hideyuki, 5,592,846, Cl. 72-206.000.

Isoda, Hideo; Hamaguchi, Tadaaki; Sakuda, Mitsuhiro; and Yamada, Yasushi, to Toyo Boseki Kabushiki Kaisha. Process of making structured fiber material. 5,593,525, Cl. 156-622.000.
Isomura, Yasuko: *See*—
Katano, Kiyoaki; Obuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.
Isono, Aoji: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Falk, Johann; and Plessing, Albert K., 5,593,532, Cl. 156-285.000.
ISP Chemicals Inc.: *See*—
Berke, Philip A.; and Rosen, William E., 5,593,681, Cl. 424-401.000.
Itabashi, Kazuo: *See*—
Ema, Taiji; and Itabashi, Kazuo, 5,594,267, Cl. 257-368.000.
Itkowsky, Frank A., Jr.: *See*—
Lee, Ching S.; and Itkowsky, Frank A., Jr., 5,594,927, Cl. 395-886.000.
Ito, Akira: *See*—
Asai, Jirou; Imani, Yuichi; and Ito, Akira, 5,593,363, Cl. 477-74.000.
Ito, Chris: *See*—
Lee, Hyong Y.; Johnson, Belinda; Reston, Rocky; Ito, Chris; Trombley, Gerald; and Havasy, Charles, 5,594,262, Cl. 257-192.000.
Ito, Fumihiko, to Canon Kabushiki Kaisha. Telephone apparatus for recording a predetermined message in place of a CNG tone. 5,594,783, Cl. 379-68.000.
Ito, Hiroyuki: *See*—
Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.
Ito, Ikuo: *See*—
Ebina, Kouichi; Ito, Ikuo; and Kasai, Kazuaki, 5,594,920, Cl. 395-224.000.
Ito, Katsuya, to Sumitomo Wiring Systems, Ltd. Electric bulb socket. 5,593,324, Cl. 439-672.000.
Ito, Keizo: *See*—
Sugimoto, Yuji; Nakayama, Fujikazu; and Ito, Keizo, 5,594,542, Cl. 399-402.000.
Ito, Kengo: *See*—
Sato, Shuji; Ogata, Masanori; Ito, Kengo; and Shiota, Hiroyuki, 5,594,480, Cl. 347-51.000.
Ito, Shinji: *See*—
Okuda, Nobuyuki; Inoue, Koichi; Tokutake, Toshinori; and Ito, Shinji, 5,593,187, Cl. 285-305.000.
Ito, Sumiyoshi: *See*—
Machino, Masaki; Ito, Sumiyoshi; Danmoto, Shojiro; Kanno, Fumio; and Komiya, Takao, 5,593,293, Cl. 414-729.000.
Ito, Takashi: *See*—
Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, 5,594,397, Cl. 333-202.000.
Ito, Tomonari: *See*—
Okada, Hajime; Aoyama, Masahiko; and Ito, Tomonari, 5,593,328, Cl. 439-851.000.
Ito, Yoshikaza: *See*—
Tomita, Kazushi; Ito, Yoshikazu; Hirano, Motohiro; Nozawa, Akira; Matsuo, Hiromitsu; Iimuro, Shunichi; Tozawa, Shigeki; and Miura, Yutaka, 5,593,540, Cl. 156-643.100.
Itoh, Junju; and Toma, Yasushi, to Ebara Research Co., Ltd.; and Agency of Industrial Science and Technology. Cantilever for use with atomic force microscope and process for the production thereof. 5,594,166, Cl. 73-105.000.
Itoh, Katsuyuki; and Yamashita, Hiroshi, to NEC Corporation. Electron beam shaping mask for an electron beam system with pattern writing capability. 5,593,761, Cl. 428-210.000.
Itoh, Keisuke; and Sawada, Minoru, to Kabushiki Kaisha Bandai. Spinner and adapter for toy tops and combination of spinner and toy top. 5,593,338, Cl. 446-259.000.
Itoh, Kiyoo: *See*—
Watanabe, Takao; Kimura, Katsutaka; Itoh, Kiyoo; and Kawajiri, Yoshiki, 5,594,916, Cl. 395-800.000.
Itoh, Naoto: *See*—
Nishigaya, Takashi; Hakata, Akira; Itoh, Naoto; Ide, Toshihiro; and Hirayama, Masahiro, 5,594,902, Cl. 395-672.000.
Itoh, Noriie; Kunihara, Mineo; Kushida, Hiroshi; McWhorter, William W.; Nomura, Syunji; Ozawa, Kazunori; Taniguchi, Mikio; and Tsuzuki, Kazuo, to Upjohn Company, The. Tropolone derivatives and pharmaceutical composition thereof for preventing and treating ischemic diseases. 5,594,144, Cl. 548-166.000.
Itoh, Shigeo; Watanabe, Teruo; and Niiyama, Takahiro, to Futaba Denshi Kogyo K.K. Field emission cathode device. 5,594,298, Cl. 313-336.000.
Itoh, Yasunobu; and Katoh, Kiyohide, to Aisin AW Co., Ltd. Method and apparatus for self-diagnosis for an electronic control system for vehicles. 5,594,646, Cl. 364-424.040.
Itou, Yutaka; Iwai, Hidetoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, to Texas Instruments Incorporated; and Hitachi Ltd. Semiconductor device having shield wiring for noise suppression. 5,594,279, Cl. 257-758.000.
ITT Automotive, Inc.: *See*—
Kullmann, Bernhard; Scheibel, Joerg; Masserant, Larry; Keck, Daniel; and Gottschalk, Werner, 5,593,005, Cl. 188-72.400.
ITT Corporation: *See*—
Palmer, Gary L., 5,594,254, Cl. 250-504.00R.
Iuchi, Kazushi: *See*—
Go, Shinetsu; Takai, Hideyuki; Miyazaki, Hajime; Yamazaki, Itaru; Kanemaru, Tetsuro; and Iuchi, Kazushi, 5,593,805, Cl. 430-78.000.
Ivan, Jerome C.: *See*—
Campbell, Douglas C.; Gloceri, Gary J.; McCoy, Daniel M.; Reichenbach, Thomas G.; Duchnowski, Lenard J.; Ivan, Jerome C.; and Raad, Joseph M., 5,593,176, Cl. 280-707.000.
Ivanov, Eugene Y.; Grigoriva, Tatyana F.; and Boldyrev, Vladimir V., to Tosoh SMD, Inc. Methods of bonding targets to backing plate members using solder pastes and target/backing plate assemblies bonded thereby. 5,593,082, Cl. 228-122.100.
Iverson, Brent L.: *See*—
Sessler, Jonathan L.; Iverson, Brent L.; Král, Vladimir; Thomas, Richard E.; Magda, Darren; and Smith, Daniel A., 5,594,136, Cl. 540-472.000.
Ivey, Ray K. Valve cage for a rod drawn positive displacement pump. 5,593,292, Cl. 417-554.000.
Iwagoe, Hiroko: *See*—
Hirata, Mitsuaki; Nammatsu, Akihiro; Watanabe, Noriko; Mizushima, Shigeaki; Makino, Seiji; Iwagoe, Hiroko; and Oyobe, Kei, 5,594,570, Cl. 349-129.000.
Iwai, Hidetoshi: *See*—
Itou, Yutaka; Iwai, Hidetoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, 5,594,279, Cl. 257-758.000.
Iwai, Ichiro: *See*—
Terada, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, 5,594,930, Cl. 419-5.000.
Iwai, Shoji: *See*—
Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.
Iwaki, Takashi: *See*—
Nakamura, Shinichi; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; and Kosaka, Yoko, 5,593,616, Cl. 252-299.610.
Iwakura, Shiro: *See*—
Sakamoto, Yoshio; Iwakura, Shiro; Tanase, Akio; and Yamazaki, Kaoru, 5,594,805, Cl. 381-199.000.
Iwama, Naoshi: *See*—
Uchino, Hideshi; Endo, June; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, 5,594,081, Cl. 526-127.000.
Iwama, Ryouichi: *See*—
Masuda, Syuzo; and Iwama, Ryouichi, 5,594,530, Cl. 399-111.000.
Iwama, Shinichi; Ota, Seiki; and Tsugami, Keiji, to Daiwa Seiko, Inc. Ski boot with overlapping instep portions. 5,592,758, Cl. 36-117.100.
Iwamatsu, Takanori, to Fujitsu Limited. Quasi-synchronous detection and demodulation circuit and frequency discriminator used for the same. 5,594,759, Cl. 375-344.000.
Iwamatsu, Takanori: *See*—
Kiyanagi, Hiroyuki; and Iwamatsu, Takanori, 5,594,389, Cl. 331-12.000.
Iwamoto, Fumio: *See*—
Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.
Iwamoto, Hideyuki: *See*—
Sadakata, Nobuyasu; Honma, Bunji; Iwamoto, Hideyuki; Shindo, Yoichi; and Yomoda, Akira, 5,593,287, Cl. 417-366.000.
Iwamoto, Hisashi: *See*—
Konishi, Yasuhiro; Miyamoto, Takayuki; Kajimoto, Takeshi; and Iwamoto, Hisashi, 5,594,704, Cl. 365-233.000.
Iwamoto, Masafumi: *See*—
Usui, Ryuzaburo; Iwamoto, Masafumi; Yamamoto, Kazuhiko; Fujisaka, Takahiko; and Kondo, Michimasa, 5,594,447, Cl. 342-42.000.
Iwano, Tsuneaki: *See*—
Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.
Iwasaki, Keiji: *See*—
Kitazawa, Manabu; and Iwasaki, Keiji, 5,594,012, Cl. 514-345.000.
Iwasaki, Masaaki: *See*—
Nakagoshi, Junji; Higuchi, Tatsuo; Kato, Shinichi; Ando, Toshimitsu; and Iwasaki, Masaaki, 5,594,868, Cl. 395-200.160.
Iwasaki, Tatsuya: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.
Iwata, Eiji, to Sony Corporation. Adaptive video signal processing apparatus. 5,594,679, Cl. 364-736.000.
Iwata, Hitoshi; Jinkai, Koichi; and Imaeda, Yasuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Load current detecting device including a multi-emitter bipolar transistor. 5,594,271, Cl. 257-469.000.
Izumi, Hiroyuki: *See*—

Ryu, Tadamitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masatoshi; Adachi, Takeshi; and Ichikawa, Naomi, 5,594,836, Cl. 395-62.000.

Izumi, Tomoji: *See*—
Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, 5,594,645, Cl. 364-426.044.

Izzo Systems, Inc.: *See*—
Izzo, Theodore-James, 5,593,077, Cl. 224-627.000.

Izzo, Theodore-James, to Izzo Systems, Inc. Shoulder-borne carrying strap assembly for articles, such as, golf bags. 5,593,077, Cl. 224-627.000.

Jaakkola, Jyrki: *See*—
Ilvespää, Heikki; Jaakkola, Jyrki; Linsuri, Ari; Partanen, Erkki; and Verkasalo, Lauri, 5,593,546, Cl. 162-301.000.

Jablonowski, Thomas L.: *See*—
Crepeau, Allen E.; and Jablonowski, Thomas L., 5,594,073, Cl. 525-331.800.

Jabr, Salim N., to Telephone Information Systems, Inc. Method and apparatus for predicting semiconductor laser failure. 5,594,748, Cl. 372-38.000.

Jackinsky, Carmen U. Shoe with walking sole. 5,592,757, Cl. 36-114.000.

Jackson, Frank W., to Chek-Med Systems, Inc. Test kid for the rapid detection of helicobacter pylori in gastric biopsy tissue. 5,593,851, Cl. 435-12.000.

Jackson Laboratory, The: *See*—
Naggert, Jürgen K.; and Leiter, Edward H., 5,593,837, Cl. 435-6.000.

Jackson, Randall S.: *See*—
Lovell, Michel K.; Jackson, Randall S.; and Brestel, Ronald R., 5,593,166, Cl. 277-59.000.

Jackson, Scott C.; Resnick, Paul R.; and Swearingen, Steven H., to Du Pont de Nemours, E. I., and Company. Producing $CF_3CH_2CF_3$ and/or $CF_3CH{=}CF_2$ by the conversion of alpha-hydroperfluoroisobutyric acid compounds. 5,594,159, Cl. 570-142.000.

Jackson, Troy; and Leak, Joseph S., Sr. Safety system for removing a rider from a vehicle by deploying a parachute. 5,593,111, Cl. 244-110.00D.

Jacob, Ingolf; Paulus, Eberhard; Kreuzer, Gerhard; Schubert, Bernd; and Geirhos, Joaef, to Hoechst Aktiengesellschaft. Two-component loop yarns, production thereof and use thereof as sewing and embroidery yarns. 5,593,777, Cl. 428-370.000.

Jacob, James J.: *See*—
Harlamoff, Brian L.; and Jacob, James J., 5,594,592, Cl. 359-330.000.

Jacobs, Gundolf: *See*—
Heinemann, Torsten; Dietrich, Manfred; Jacobs, Gundolf; Kratz, Mark; Sanders, Josef; Scholz, Uwe; and Woynar, Helmut, 5,594,066, Cl. 524-761.000.

Jacobs, Martin J.; and Hart, Fred J., to Mallinckrodt Veterinary, Inc. Growth promoting composition for fish and method of using the same. 5,593,978, Cl. 514-58.000.

Jacobs, Robert S.: *See*—
Fenical, William H.; Jacobs, Robert S.; and Jensen, Paul R., 5,593,960, Cl. 514-9.000.

Jacobsen, Eric J.; and TenBrink, Ruth E., to Upjohn Company, The. Imidazo(1,5-A)quinolines for treatment of anxiety and sleep disorders. 5,594,140, Cl. 544-126.000.

Jacobsen, Stephen C., to Sarcos Group. Movement actuator/sensor systems. 5,594,330, Cl. 324-106.000.

Jacobson, Benjamin A.: *See*—
Winston, Roland; Holman, Robert L.; Jacobson, Benjamin A.; and Emmons, Robert M., 5,594,830, Cl. 385-146.000.

Jacobson, John O.: *See*—
Farnworth, Warren M.; Wood, Alan G.; Doan, Trung T.; and Jacobson, John O., 5,593,927, Cl. 437-209.000.

Jacoby, Philip; Bauer, Charles W.; Clingman, Scott R.; and Tapp, William T., to Amoco Corporation. Oriented polymeric microporous films. 5,594,070, Cl. 525-88.000.

Jaeger, Peter: *See*—
Sopher, David; Giesecler, Andreas; Hibst, Hartmut; Harth, Klaus; and Jaeger, Peter, 5,593,557, Cl. 204-290.00R.

Jambor, Charles E., to Karoly-J Ltd. Ground marker and methods of using same to mark distances and/or advertise on a golf course. 5,593,156, Cl. 40-584.000.

James, Gary L.: *See*—
Baum, Larry R.; James, Gary L.; and Schmidt, Mark A., 5,593,196, Cl. 294-19.100.

Jamshidi, Khosrow, to Jamshidi, Khosrow. Emergency external cardiac defibrillator and pacing method and apparatus. 5,593,428, Cl. 607-10.000.

Janca, Joseph: *See*—
Audebert, Roland; Janca, Joseph; Maroy, Pierre; and Hendriks, Hugo, 5,594,050, Cl. 524-5.000.

Jang, Eun S.: *See*—
Kim, Joong H.; Kim, Sung H.; Nam, Ghil S.; Kim, Ha Y.; Son, Hyen J.; and Jang, Eun S., 5,593,985, Cl. 514-203.000.

Jang, Wan-Shik: *See*—
McConnell, Kenneth G.; and Jang, Wan-Shik, 5,594,309, Cl. 318-568.220.

Jansen, Adolf E., to Dobart Holding B.V. Apparatus for taking a sample of a fluid and part for such an apparatus. 5,594,182, Cl. 73-863.710.

Jansson, Kerstin: *See*—
Svensson, Thomas; Rangert, Bo; Jansson, Kerstin; and Jörgensen, Einar, 5,593,444, Cl. 623-16.000.

Japan Aviation Electronics Industry, Limited: *See*—
Kinoshita, Hiroaki; and Ishiwa, Tadashi, 5,593,315, Cl. 439-459.000.
Ohno, Akira, 5,593,319, Cl. 439-587.000.

Japan Exlan Company Limited: *See*—
Kohara, Noriyuki; and Shigita, Shozo, 5,593,763, Cl. 428-219.000.

Japan Field Company, Ltd.: *See*—
Inada, Minoru; Imajo, Yasutaka; and Uchino, Masahide, 5,593,507, Cl. 134-11.000.

Japan Immuno Research Lab. Co., Ltd. of Gunma, Japan: *See*—
Yamazaki, Kazutoshi; Shinmura, Kazuo; and Abe, Yoshiko, 5,593,586, Cl. 210-435.000.

Japan Radio Co., Ltd.: *See*—
Eguchi, Kouichi, 5,594,460, Cl. 343-765.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Makino, Kenya; Yamakawa, Yoshitaka; Murata, Mitsuhiro; and Hayashi, Toshio, 5,593,639, Cl. 422-102.000.

Japan Tobacco, Inc.: *See*—
Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Masabe, Shunichi; Shindo, Masanori; Nakagawa, Takashi; and Nakamura, Takeshi, 5,593,988, Cl. 514-219.000.

Jarrett, Michael, to Baker Hughes Incorporated. Amphoteric acetates and glycinates as shale stabilizing surfactants for aqueous well fluids. 5,593,952, Cl. 507-131.000.

Jas D. Easton, Inc.: *See*—
Filice, Gary W.; and Chauvin, Dewey, 5,593,158, Cl. 473-520.000.

Jaskowiak, Timothy R.; Gilmore, Daniel R., III; and DiGravio, Thomas L., to Xerox Corporation. Cryogenic machining of soft/ductile materials. 5,592,863, Cl. 82-1.110.

Jaso-Friedmann, Liliana: *See*—
Evans, Donald L.; and Jaso-Friedmann, Liliana, 5,593,678, Cl. 424-184.100.

Jatco Corporation: *See*—
Mizuta, Muneo, 5,593,362, Cl. 475-348.000.

Jay, Eric C.; Dyer, John A.; and Dinsmoor, John C., III, to Jay Medical Ltd. Deformity back system. 5,593,211, Cl. 297-383.000.

Jay Medical Ltd.: *See*—
Dinsmoor, John C., III; and VanEveren, Barry, 5,592,707, Cl. 5-654.000.
Jay, Eric C.; Dyer, John A.; and Dinsmoor, John C., III, 5,593,211, Cl. 297-383.000.

JDS Fitel Inc.: *See*—
Cheng, Yuan, 5,594,821, Cl. 385-24.000.
Garel-Jones, Philip M.; Harman, Murray R.; and Cutts, Timothy P., 5,594,820, Cl. 385-22.000.
Kawasaki, Brian S.; and Parker, Richard R., 5,594,825, Cl. 385-60.000.

Jego, Gérard: *See*—
Nourry, Daniel; Jego, Gérard; and Thierry, Jean-Pierre, 5,594,212, Cl. 174-88.00R.

Jelden, Hanno; Schultalbers, Winfried; and Bizenberger, Thomas, to Volkswagen AG. Process for monitoring the conversion rate of an exhaust catalyst. 5,592,815, Cl. 60-274.000.

Jelley, Kevin W.; Vallath, George T.; and Chen, Alan G., to Motorola, Inc. Display device comprising fluorescent enhanced reflective holographic illumination. 5,594,560, Cl. 359-15.000.

Jendralla, Joachim-Heiner: *See*—
Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,594,133, Cl. 540-228.000.

Jeng, James H. Wireless digitizer and stylus pen unit. 5,594,215, Cl. 178-19.000.

Jennings, Carol A.: *See*—
Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Drappel, Stephan V., 5,593,486, Cl. 106-22.00A.

Jennings, G. Mark: *See*—
Curreri, Anthony; Smith, B. Scott; and Jennings, G. Mark, 5,594,790, Cl. 379-265.000.

Jensen, Darwin A.; and Jensen, Gwen R. Amputee stump protector clothing. 5,592,693, Cl. 2-115.000.

Jensen, Gwen R.: *See*—
Jensen, Darwin A.; and Jensen, Gwen R., 5,592,693, Cl. 2-115.000.

Jensen, Niels. Device for a urinal used by bedridden patients. 5,592,699, Cl. 4-144.300.

Jensen, Paul R.: *See*—
Fenical, William H.; Jacobs, Robert S.; and Jensen, Paul R., 5,593,960, Cl. 514-9.000.

Jentsch, Joerg-Dietrich: *See*—
Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.

Jeong, Seong-wook; Kim, Jae-in; and Kang, Yun-seog, to Samsung Electronics Co. Ltd. Temperature controlling method of refrigerator using microprocessor. 5,592,827, Cl. 62-229.000.

Jessup, Peter J.; and Croudace, Michael C. Gasoline fuel. 5,593,567, Cl. 208-46.000.

Jha, Brajesh K.; Chhatre, Ajay S.; Kulkarni, Bhaskar D.; and Sivasanker, Subramanian, to Council of Scientific and Industrial Research. Process for the preparation of caprolactam. 5,594,137, Cl. 540-535.000.

Jiang, Tong: *See*—
Bedard, Robert L.; Ozin, Geoffrey A.; Ahari, Homayoun; Bowes, Carol L.; Jiang, Tong; and Young, David, 5,594,263, Cl. 257-201.000.

Jibiki, Ubao: *See*—
Kay, Ira M.; and Jibiki, Ubao, 5,594,584, Cl. 359-433.000.

Jikihara, Shuji: *See*—
Kumagai, Naokazu; Jikihara, Shuji; and Samata, Yoshimitsu, 5,593,556, Cl. 204-290.00F.

Jiminez, Miguel: *See*—
Hahnewald, Andrea; Auria, Augustin; Jiminez, Miguel; Vazquez, Miguel; Carreras, Francesc; and Coronado, Juan C., 5,592,763, Cl. 38-77.900.

Jinkai, Koichi: *See*—
Iwata, Hitoshi; Jinkai, Koichi; and Imaeda, Yasuo, 5,594,271, Cl. 257-469.000.

Jinks, Philip A., to Minnesota Mining and Manufacturing Company. Aerosol valves with movable agitator. 5,593,069, Cl. 222-246.000.

JKS Boyles International Inc.: *See*—
Laporte, Irvin J.; and Watkins, Amos J., 5,592,994, Cl. 175-247.000.

Joachimi, Roland, to Bostik, Inc. Intumescent one-component sealant. 5,594,046, Cl. 523-179.000.

Joentgen, Winfried: *See*—
Groth, Torsten; Joentgen, Winfried; Wagner, Paul; Traenckner, Hans-Joachim; and Jovcic, Dorde, 5,594,077, Cl. 525-451.000.

Johann, Eibl: *See*—
Turecek, Peter; Johann, Eibl; and Schwarz, Hans-Peter, 5,593,968, Cl. 514-21.000.

Johansen, Mark R.: *See*—
Bucci, George H.; and Johansen, Mark R., 5,592,963, Cl. 137-202.000.

Johansson, Ewa W.: *See*—
Fahlgren, Christer; Gustavsson, Sören; Tibbling, Petter; and Johansson, Ewa W., 5,593,544, Cl. 162-65.000.

John Wayne Cancer Institute: *See*—
Zeng, Qing S.; and Irie, Reiko F., 5,593,822, Cl. 435-2.000.

Johns Hopkins University: *See*—
Cummings, Charles W.; Flint, Paul W.; and Scranton, Peter J., 5,593,439, Cl. 623-9.000.
Devereux, William S.; Boehme, Michael H.; Linstrom, Lloyd; McKnight, Thomas R., Jr.; Moore, Robert C.; Meyer, John R.; Snow, Paul R.; and Grimm, Paul D., 5,594,454, Cl. 342-357.000.

Johns, Rolf M.: *See*—
Mumford, Neal A.; Chin, Cheng-Chi; Johns, Rolf M.; and Lloyd, Ben A., 5,593,770, Cl. 428-290.000.

Johnson, Alan W., to Sauer Inc. Hydrostatic transaxle. 5,593,000, Cl. 180-305.000.

Johnson, Allen E., to DCI Marketing. Product dispensing unit. 5,593,048, Cl. 211-59.200.

Johnson & Johnson Professional, Inc.: *See*—
Scott, Richard D.; Thornhill, Thomas S.; and Slamin, John, 5,593,450, Cl. 623-20.000.

Johnson & Johnson Vision Products, Inc.: *See*—
Galas, Stephen, 5,593,620, Cl. 264-1.100.
Nunez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., 5,594,043, Cl. 523-106.000.

Johnson, Belinda: *See*—
Lee, Hyong Y.; Johnson, Belinda; Reston, Rocky; Ito, Chris; Trombley, Gerald; and Havasy, Charles, 5,594,262, Cl. 257-192.000.

Johnson, Carroll L. Fin assembly for float tube users. 5,593,333, Cl. 441-62.000.

Johnson, Charles L. Bi-directional elevating and rack-attached support device for positioning modules during installation and removal from racks. 5,593,137, Cl. 254-122.000.

Johnson, Donald D.: *See*—
Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,593,896, Cl. 436-500.000.

Johnson, Eric G.: *See*—
Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Drappel, Stephan V., 5,593,486, Cl. 106-22.00A.

Johnson, F. Scott; and Taylor, Kelly, to Texas Instruments Incorporated. Method of forming stacked barrier-diffusion source and etch stop for double polysilicon BJT with patterned base link. 5,593,905, Cl. 437-31.000.

Johnson, Glen A., to Arizona Instrument Corporation. Fuel tank transducer module circuit. 5,594,352, Cl. 324-664.000.

Johnson, Herrick J. Spidercraft. 5,592,894, Cl. 114-270.000.

Johnson, James N. Abrasive-belt conversion wheel for cylindrical grinders. 5,593,345, Cl. 451-296.000.

Johnson, Kenneth R.; Johnson, Robert L.; and Johnson, Ronald L. Tool handle for holding multiple tools of different sizes during use. 5,592,859, Cl. 81-177.400.

Johnson, Lonnie G.; and Applewhite, John, to Johnson Research & Development Co, Inc. Compressed air gun with magazine indexer. 5,592,931, Cl. 124-69.000.

Johnson Matthey Public Limited Company: *See*—
Golunski, Stanislaw E.; and Hayes, John W., 5,593,935, Cl. 502-339.000.

Johnson, Neil A.; Raber, Thomas R.; Hibbs, Louis E., Jr.; Murray, Melissa L.; and Benz, Mark G., to General Electric Company. Cleaning method for foil. 5,593,506, Cl. 134-9.000.

Johnson Research & Development Co, Inc.: *See*—
Johnson, Lonnie G.; and Applewhite, John, 5,592,931, Cl. 124-69.000.

Johnson, Robert C.: *See*—
Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., 5,593,440, Cl. 623-11.000.

Johnson, Robert L.: *See*—
Johnson, Kenneth R.; Johnson, Robert L.; and Johnson, Ronald L., 5,592,859, Cl. 81-177.400.

Johnson, Ronald L.: *See*—
Johnson, Kenneth R.; Johnson, Robert L.; and Johnson, Ronald L., 5,592,859, Cl. 81-177.400.

Johnson, Roy A., to Upjohn Company, The. Arylmethylphosphonates and phosphonic acids useful as anti-inflammatory agents. 5,593,980, Cl. 514-107.000.

Johnson, Steven R.: *See*—
Von Ehr, James R., II; Johnson, Steven R.; and Seals-Mason, Samantha, 5,594,855, Cl. 395-142.000.

Jokura, Jun, to NEC Corporation. TDMA mobile unit frequency synthesizer having power saving mode during transmit and receive slots. 5,594,735, Cl. 370-337.000.

Jolly, James F.: *See*—
Treml, Suzanne B.; Dall, Cristine J.; Drayeling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., 5,593,824, Cl. 435-4.000.

Jones, Anthony M.; Dewar, Kevin D.; and Sotheran, Martin W., to Discovision Associates. Method and arrangement for transformation of signals from a frequency to a time domain. 5,594,678, Cl. 364-725.000.

Jones, Charles D.: *See*—
Hertel, Larry W.; Jones, Charles D.; Kroin, Julian S.; and Mabry, Thomas E., 5,594,155, Cl. 549-475.000.

Jones, David L.; and Drenner, George L., Jr., to Mobility Plus, Inc. Powered toilet seat lift. 5,592,703, Cl. 4-667.000.

Jones, David N.: *See*—
Penn, Steven M.; Jones, David N.; and Embree, Michael E., 5,594,652, Cl. 364-468.260.

Jones, Gary D.: *See*—
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Kamm, Christian P., to Wilkinson Company. Wall protector. 5,592,786, Cl. 52-28.000.
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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kang, Heui I.: *See*—
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Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, to Westinghouse Air Brake Company. Railway parking braking apparatus. 5,593,214, Cl. 303-7.000.
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Akagi, Yuu; Kawaguchi, Yuichi; and Yu, Donghai, 5,593,731, Cl. 427-386.000.
KAO Corporation: *See*—
Kitaori, Noriyuki; Yoshida, Osamu; and Mizunoya, Hirohide, 5,593,723, Cl. 427-127.000.
Mori, Kazuo; Nishizawa, Kazunori; and Niki, Yoshifumi, 5,593,779, Cl. 428-375.000.
Kaplan, Martin C.; and Kwon, Heemin, to Eastman Kodak Company. Computer based digital image noise reduction method based on overlapping planar approximation. 5,594,816, Cl. 382-275.000.
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Cox, Richard V.; and Kaplan, Michael M., 5,594,798, Cl. 380-49.000.
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Karl Ruggli AG: *See*—
Brinker, Alfred, 5,592,725, Cl. 28-118.000.
Karnell, Leigh Ann, to BASF Corporation. Method of preparing triarylmethane dyes and pigments. 5,593,491, Cl. 106-493.000.
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Jambor, Charles B., 5,593,156, Cl. 40-584.000.
Karttunen, Lauri: *See*—
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Kasai, Kazuaki: *See*—
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Kasai, Motoki: *See*—
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Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, to Canon Kabushiki Kaisha. Production process of color filter and color filter produced thereby. 5,593,757, Cl. 428-195.000.
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Kastinger Stapa-Schuhfabrik Hans Huemer Gesellschaft m.b.H.: *See*—
Ehrlich, Johann, 5,592,755, Cl. 36-33.000.
Kasuga, Shinji: *See*—
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Katano, Kiyoaki; Ohuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsurusoka, Takashi, to Meiji Seika Kabushiki Kaisha. Compound with platelet aggregation inhibitor activity. 5,594,004, Cl. 514-301.000.
Kataoka, Naoki: *See*—
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Katayama, Takao: *See*—
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Katayanagi, Jun; and Niikura, Takeji, to Canon Kabushiki Kaisha. Sheet feeding apparatus for a recording apparatus. 5,593,150, Cl. 271-121.000.
Kato, Hiromoto; and Fukuhara, Hiroshi, to Dynic Corporation. Process for production of thermally transferred image-receptive sheet. 5,593,941, Cl. 503-227.000.
Kato, Koji: *See*—
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Kato, Makoto: *See*—
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Noyama, Hideo; Kato, Makoto; Nohmi, Makoto; and Takizawa, Yuri, 5,594,850, Cl. 395-135.000.
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Kato, Naoki, to Sanshin Kogyo Kabeshiki Kaisha. Water injection propulsion device. 5,593,329, Cl. 440-42.000.
Kato, Shinichi: *See*—
Nakagoshi, Junji; Higuchi, Tatuo; Kato, Shinichi; Ando, Toshimitsu; and Iwasaki, Masaaki, 5,594,868, Cl. 395-200.160.
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Katoh, Yusaku; and Uchiyama, Tsuyoshi, to Fukuyama Gomu Kogyo Kabushiki Gaisha. Highly elastic rubber crawler. 5,593,218, Cl. 305-174.000.
Katoozi, Mehdi; and La Rue, George S., to Boeing Company, The. Digital pulse width modulator for power supply control. 5,594,631, Cl. 363-41.000.
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Koyama, Kazushige; Mutoh, Naoki; and Katsumata, Masaaki, 5,594,406, Cl. 338-21.000.
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Kattwinkel, Hans-Harald; and Kattwinkel, Marcus, 5,592,897, Cl. 114-363.000.
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Kaufman, Arie E.; and Pfister, Hanspeter, to Research Foundation of State University of New York, The. Apparatus and method for real-time volume visualization. 5,594,842, Cl. 395-124.000.
Kawabata, Kohji: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,594,132, Cl. 540-227.000.
Kawabata, Takashi; Hyakutake, Nobuo; Furusawa, Fumio; and Tokunaga, Masaaki, to Fuji Xerox Co., Ltd. Reliable transfer film attachment structure. 5,594,536, Cl. 399-297.000.

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Kuc, Roman B.; Szinger, James J.; Hayashi, Takehiko; Goto, Takao; Nakashima, Yoshiyasu; Shimura, Takaki; and Kawabe, Kenji, 5,594,849, Cl. 395-135.000.

Kawada, Hiroshi: *See—*
Nishimura, Koichi; Kawada, Hiroshi; and Kanamimoto, Takanori, 5,593,668, Cl. 424-93.400.

Kawade, Hisaki: *See—*
Suzuki, Hidetoshi; Otada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hasamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Otsuka, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Kawaguchi, Mami: *See—*
Katano, Kiyoaki; Ohuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yagashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.

Kawaguchi, Takashi, to Brother Kogyo Kabushiki Kaisha. Releasing sheet. 5,593,241, Cl. 400-613.000.

Kawaguchi, Yuichi: *See—*
Akagi, Yuu; Kawaguchi, Yuichi; and Yu, Donghai, 5,593,731, Cl. 427-386.000.

Kawai, Masumi, to Shimadzu Corporation. Digital angiographic apparatus. 5,594,771, Cl. 378-98.200.

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Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Kawai, Takashi; Shono, Seita; and Ohta, Eiji, 5,594,558, Cl. 358-518.000.

Kawajiri, Yoshiki: *See—*
Watanabe, Takao; Kimura, Katsutaka; Itoh, Kiyoo; and Kawajiri, Yoshiki, 5,594,916, Cl. 395-800.000.

Kawakami, Kouichi; Hamaguchi, Toshihide; Kuge, Satoru; and Maida, Yoshiaki, to Sanyo Electric Co., Ltd. Video tape recorder carrying out field extraction recording and/or reproduction of a video signal. 5,594,596, Cl. 386-80.000.

Kawamata, Motoo: *See—*
Gotoh, Yoshihisa; Kawamata, Motoo; and Takahashi, Toshiaki, 5,593,916, Cl. 437-83.000.

Kawamoto, Akio; and Kaneko, Kazuhiro, to Nihon Plast Co., Ltd. Cable type electric connector. 5,593,310, Cl. 439-164.000.

Kawamoto, Fumio, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 5,593,818, Cl. 430-512.000.

Kawamura, Eiichi: *See—*
Saito, Tadashi; Tanikawa, Kiyoshi; Kawamura, Eiichi; and Kawanishi, Toshiyuki, 5,593,937, Cl. 503-201.000.

Kawamura, Kazutoshi, to Fujitsu Limited. Method of producing ring-back tone in order wire. 5,594,785, Cl. 379-90.000.

Kawamura, Kiyoshi; Moramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, to Yamaha Corporation. Keyboard musical instrument having key action mechanisms movable to and from strings. 5,594,188, Cl. 84-171.000.

Kawamura, Toshio: *See—*
Hiroe, Toshikatsu; Kaneko, Kenichi; Imai, Noboru; Takasaka, Hiroyuki; and Kawamura, Toshio, 5,593,774, Cl. 428-343.000.

Kawanishi, Toshiyuki: *See—*
Saito, Tadashi; Tanikawa, Kiyoshi; Kawamura, Eiichi; and Kawanishi, Toshiyuki, 5,593,937, Cl. 503-201.000.

Kawano, James C.: *See—*
Tscholtar, Werner; Yonce, Cary S.; Bergey, James L.; and Kawano, James C., 5,593,971, Cl. 514-39.000.

Kawano, Katsumi: *See—*
Kawano, Shigeki; Mori, Kinji; Kawano, Katsumi; Orimo, Masayuki; and Hirasawa, Shigeki, 5,594,872, Cl. 395-200.150.

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Kawano, Yuji: *See—*
Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, 5,593,791, Cl. 428-694.0ML.

Kawasaki, Brian S.; and Parker, Richard R., to JDS Fitel Inc. Optical connector coupling for reducing unwanted effects associated with high power density. 5,594,825, Cl. 385-60.000.

Kawasaki, Hisao: *See—*
Lee, Chii-Chang; and Kawasaki, Hisao, 5,593,919, Cl. 437-190.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Hiroaki; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shunji; and Uehara, Hirotaka, 5,594,548, Cl. 356-376.000.

Kawasaki Steel Corporation: *See—*
Takemura, Kazuya; Kajioka, Masahiko; Sashi, Kazumichi; Takano, Shigeru; and Sumita, Eiichi, 5,594,062, Cl. 524-504.000.
Watanabe, Yuichiro; Isobe, Kunio; Yarita, Ikuo; and Nikaido, Hideyuki, 5,592,846, Cl. 72-206.000.

Kawneer Company, Inc.: *See—*
Rinehart, David M.; Whitmyer, Wayne E.; and McKenna, Gregory B., 5,592,795, Cl. 52-235.000.

Kay, Ira M.; and Jibiki, Ubao. Dot sighting device. 5,594,584, Cl. 359-433.000.

Kayaba Industry Co., Ltd.: *See—*
Hayashi, Tetsuji, 5,593,279, Cl. 415-213.100.

Kazahaya, Yukio: *See—*
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.

Kazda, Stanislav: *See—*
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Höbech, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.

Keck, Daniel: *See—*
Kullmann, Berahard; Scheibel, Joerg; Masserant, Larry; Keck, Daniel; and Gottschalk, Werner, 5,593,005, Cl. 188-72.400.

Kee, David R.: *See—*
Carter, Buford H., Jr.; Davis, Dennis D.; Kee, David R.; Clark, Jesse; Laverde, Steven P.; and Tran, Hai, 5,594,234, Cl. 257-676.000.

Keech, Robert L.: *See—*
Hedblom, Thomas P.; Hachey, Kathleen A.; and Keech, Robert L., 5,593,246, Cl. 404-9.000.

Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, to Hewlett-Packard Company. Ink channel structure for inkjet printhead. 5,594,481, Cl. 347-65.000.

Keefe, Douglas H., to University of Washington. System and method for measuring acoustic reflectance. 5,594,174, Cl. 73-585.000.

Keely, Leroy B.: *See—*
Evancicky, Daniel E.; Keely, Leroy B.; and Siefert, Steven, 5,593,221, Cl. 353-122.000.

Keeney, Kenneth W.: *See—*
Stewart, Mark T.; Morris, Mary M.; Di Domenico, Edward; and Keeney, Kenneth W., 5,593,550, Cl. 204-165.000.

Keith, Carl W.; and Mensa-Wilmot, Graham, to Smith International, Inc. Drill bit having improved cutting structure with varying diamond density. 5,592,996, Cl. 175-431.000.

Keithley Instruments, Inc.: *See—*
Verkuil, Roger L.; Horner, Gregory S.; and Miller, Thomas G., 5,594,247, Cl. 250-326.000.

Kellenberger, Stanley R.: *See—*
Tauzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.

Keller, Alois, to Bühler AG. Quality-control sieve and method of using it. 5,593,042, Cl. 209-261.000.

Keller, Jakob J.: *See—*
Althaus, Rolf; Chyou, Yau-Pin; Joos, Franz; and Keller, Jakob J., 5,593,302, Cl. 431-353.000.

Kelly, Paul J.: *See—*
Morrison, Nigel A.; Eisman, John A.; and Kelly, Paul J., 5,593,833, Cl. 435-6.000.

Kelly, Stephen; and Lukic, Teodor, to Hoffmann-LaRoche Inc. Photochemically polymerizable liquid crystals. 5,593,617, Cl. 252-299.670.

Kelsey-Hayes Company: *See—*
Hunnicutt, Harry A., 5,593,133, Cl. 251-129.150.

Kemtek SA: *See—*
Mathias, Claudia B., 5,593,242, Cl. 402-7.000.

Kenan, Boaz: *See—*
Vronsky, Eliyahu; and Kenan, Boaz, 5,594,556, Cl. 358-482.000.

Kennedy, Michael E.: *See—*
Hendron, Scott S.; and Kennedy, Michael E., 5,592,762, Cl. 37-443.000.

Kenneth, Alexander R.; and Mahsoub, Munther S., to AT&T Global Information Solutions Company. Multiple standard smart card reader. 5,594,233, Cl. 235-492.000.

Kenney Manufacturing Company: *See—*
Sartini, Eugene; and McMichael, Dannie L., 5,592,983, Cl. 160-178.100.

Kerckhoff, Brian. Multihull windsurfer. 5,592,892, Cl. 114-39.200.

Keritsis, Gus D., to Philip Morris Incorporated. Cigarette with insulating shell and method for making same. 5,592,955, Cl. 131-175.000.

Kernallmaier, Walter, to Institut für Mikrotechnik Mainz GmbH. Coupling device between a glass fiber and a dielectric waveguide. 5,594,824, Cl. 385-49.000.

Kerr-McGee: *See—*
Sherman, Larry G., 5,593,569, Cl. 208-108.000.

Kerwar, Suresh S.; and Wick, Michael M., to American Cyanamid Company. Method of attenuating lung capillary leak in a mammal. 5,593,671, Cl. 424-85.200.

Keshavan, Madapusi K.; and Rey, Proserfina C., to Smith International, Inc. Composite cemented carbide. 5,593,474, Cl. 75-240.000.

Kessler, Dennis B. Portable precision indicator gage. 5,592,747, Cl. 33-783.000.

Kessler, Louis R.: *See—*
Benefiel, David L.; Kessler, Louis R.; and Mitchell, Alan J., 5,594,249, Cl. 250-339.030.

Kester, Jeffrey J.: *See—*
Woodworth, Jonathan J.; Kester, Jeffrey J.; and Hartman, Thomas C., 5,594,613, Cl. 361-127.000.

Ketcham, Mark G.: *See—*
McNaughton, James; Liimatta, Walfred J.; and Ketcham, Mark G., 5,593,188, Cl. 285-319.000.

Khan, Emdadur R.: *See—*
Rahman, Sayeedur C.; and Khan, Emdadur R., 5,594,835, Cl. 395-51.000.

Khaund, Arup K.; Garg, Ajay K.; and Bauer, Ralph, to Saint-Gobain/Norton Industrial Ceramics Corporation. Sol-gel alumina abrasives. 5,593,468, Cl. 51-309.000.

Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gudger, Keith H.; and Gongwer, Geoffrey S., to Atmel Corporation. Programmable logic device with regional and universal signal routing. 5,594,366, Cl. 326-41.000.

Khoury, Jehad; Woods, Charles L.; Cronin-Golomb, Mark; and Fu, Jack, to United States of America, Air Force. Photorefractive limiting quadratic processor. 5,594,586, Cl. 359-559.000.

Kickelhain, Joerg, to LPKF CAD/CAM Systeme GmbH. Method of patterned metallization of substrate surfaces. 5,593,739, Cl. 427-555.000.

Kiefer, Karl F., to Gas Research Institute. Scan assembly and method for transferring power and data across a rotary interface. 5,594,176, Cl. 73-623.000.

Kiekert Aktiengesellschaft: *See—*
Bartel, Peter; and Kleefeldt, Frank, 5,594,283, Cl. 307-10.100.

Kiely, John S.: *See—*
DeWitt, Sheila H. H.; Kiely, John S.; Pavia, Michael R.; Schroeder, Mel C.; and Stankovic, Charles J., 5,593,642, Cl. 422-131.000.

Kientz, Paul: *See—*
Wissmann, Friedbert; Kientz, Paul; and Skerra, Bernd, 5,592,975, Cl. 138-112.000.

Kienzle, Armin: *See—*
Schlaffke, Hans-Juergen; and Kienzle, Armin, 5,593,200, Cl. 296-37.160.

Kiilunen, J. Peter. Welding apparatus. 5,593,081, Cl. 228-45.000.

Kikuchi, Koichi; and Watanabe, Masao, to Kikuchi Web Tech Co., Ltd. Multi-layered woven belt with rope shaped portion. 5,592,977, Cl. 139-387.00R.

Kikuchi, Tetsuo: *See—*
Komatsuda, Hideki; Hirose, Hideo; and Kikuchi, Tetsuo, 5,594,587, Cl. 359-619.000.

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Kikumaru, Kadoya: *See—*
Hayashida, Tomohiro; Kikumaru, Kadoya; and Tomoyuki, Omura, 5,593,694, Cl. 424-468.000.

Kikutani, Isao, to Nabco Limited. Liquefied gas pump. 5,593,288, Cl. 417-435.000.

Kilbride, Terence K., Jr.: *See—*
Lisa, Rudolph E.; and Kilbride, Terence K., Jr., 5,593,948, Cl. 504-324.000.

Kim, Byeng H.: *See—*
Ihm, Dae W.; Kim, Jeong L.; Kim, Kwon I.; and Kim, Byeng H., 5,593,738, Cl. 427-534.000.

Kim, Byung H.: *See—*
Kim, Jong P.; Kim, Byung H.; Ahn, Cheoul H.; Kim, Tae H.; and Choi, Do H., 5,594,427, Cl. 340-825.720.

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Kim, Chang-Keun: *See—*
Kim, Jae-Jin; Kim, Chang-Keun; and Kwak, Seung-Yeop, 5,593,588, Cl. 210-490.000.

Kim, Choon-Woo; and Chou, Hsin-hsin, to Minnesota Mining and Manufacturing Company. Process for applying images to non-adhesive surfaces in thermal dye transfer imaging. 5,593,803, Cl. 430-22.000.

Kim, Dong-myung: *See—*
Choi, Cha-yong; Kim, Dong-myung; and Jung, Gyoo-yeol, 5,593,856, Cl. 435-68.100.

Kim, Gia Y.; Taylor, Lloyd D.; and Waterman, Kenneth C., to Polaroid Corporation. Peel apart diffusion transfer compound film unit with crosslinkable layer and borate. 5,593,809, Cl. 430-213.000.

Kim, Ha Y.: *See—*
Kim, Joong H.; Kim, Sung H.; Nam, Ghil S.; Kim, Ha Y.; Son, Hyen J.; and Jang, Eun S., 5,593,985, Cl. 514-203.000.

Kim, Hyeong S., to Hyundai Electronics Industries Co. Ltd. Method for forming submicroscopic patterns. 5,593,813, Cl. 430-312.000.

Kim, Jae-in: *See—*
Jeong, Seong-wook; Kim, Jae-in; and Kang, Yun-seog, 5,592,827, Cl. 62-229.000.

Kim, Jae-Jin; Kim, Chang-Keun; and Kwak, Seung-Yeop, to Korea Institute of Science and Technology. Composite reverse osmosis membrane having active layer of aromatic polyester or copolymer of aromatic polyester and aromatic polyamide. 5,593,588, Cl. 210-490.000.

Kim, Jeong L.: *See—*
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Joo, Bheom S.; Lee, Bhum C.; Kim, Jung S.; and Kang, Seok Y., 5,594,762, Cl. 375-371.000.

Kim, Kwon I.: *See—*
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Kim, Kyung W. Multiple cone type loudspeaker. 5,594,804, Cl. 381-186.000.

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Kim, Tae H.: *See—*
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Kim, Yoonsuk, to Hyundai Motor Company. Intake air control device for an internal combustion engine. 5,592,917, Cl. 123-308.000.

Kim, Young-Mook, to Wonder Co., Ltd. Tubular fishing rod and its method of manufacture. 5,592,771, Cl. 43-18.100.

Kim, Young-Mook, to Wonder Co., Ltd. Fishing rod and its method of manufacture. 5,592,772, Cl. 43-18.100.

Kimachi, Kazuhiko: *See—*
Maeda, Hiroaki; Eda, Yasuyuki; Kimachi, Kazuhiko; Ono, Yoichi; and Tokiyoshi, Sachio, 5,593,861, Cl. 435-69.100.

Kimball Physics, Inc.: *See—*
Crawford, Charles K., 5,593,123, Cl. 248-231.210.

Kimbel, Steven L.; Korb, Harold W.; and Hall, Cynthia F., to MEMC Electronic Maserials, Inc. Apparatus for rotating a crucible of a crystal pulling machine. 5,593,498, Cl. 117-201.000.

Kimberly-Clark Corporation: *See—*
Rugowski, James S.; Rekoske, Michael J.; Lin, Philip S.; Gropp, Ronald F.; and Arnold, Paul A. B. L. M., 5,593,545, Cl. 162-207.000.
Sosalla, Paula M.; Li, Yong; and Endres, Dan D., 5,593,401, Cl. 604-385.200.
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.

Kimura, Haruo; Miyake, Isao; Nakano, Toshihiro; and Nemoto, Yukihiro, to Oki Electric Industry Co., Ltd. Automatic teller machine managing system. 5,593,149, Cl. 271-3.010.

Kimura, Hisamichi: *See—*
Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.

Kimura, Katsutaka: *See—*
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Kimura, Manabu; Kurihara, Hideshi; Ichihashi, Tetsuo; and Kitazawa, Sasoshi, to Teijin Limited. Base film for photographic film. 5,593,819, Cl. 430-533.000.

Kimura, Mikihiro, to Mitsubishi Denki Kabushiki Kaisha. Dielectric breakdown prediction apparatus and method, and dielectric breakdown life-time prediction apparatus and method. 5,594,349, Cl. 324-551.000.

Kineboti, Yutaka: *See—*
Ohtake, Masatoshi; Tottori, Takeshi; Nakagawa, Kazunari; Hamamoto, Nobuo; Ohkawa, Takehiro; and Kineboti, Yutaka, 5,594,680, Cl. 365-63.000.

King, C. David; and Torres, Robert J., to IBM Corporation. Conceptual map showing the windows of a complex task. 5,594,857, Cl. 395-352.000.

King, George, to Siemens Stromberg-Carlson. Reed relay. 5,594,400, Cl. 335-151.000.

King, James D.: *See—*
Coyle, Laurie; Finucane, Kevin M.; King, James D.; Donoho, Harold F.; and De Los Santos, Armando, 5,594,340, Cl. 324-321.000.

King, Neal J.: *See—*
Kozdon, Peter J.; and King, Neal J., 5,594,781, Cl. 379-60.000.

King, Te P., to Rockefeller University, The. Nucleic acid and recombinant production of vespid venom hyaluronidase. 5,593,877, Cl. 435-197.000.

King, William L., to Samsonite Corporation. Retractable auxiliary luggage attachment mechanism and method. 5,593,009, Cl. 190-102.000.

Kinion, James A.: *See—*
Reppert, David A.; and Kinion, James A., 5,593,461, Cl. 29-11.000.

Kinnersley, Alan M.; Koskan, Larry P.; Strom, David J.; and Meah, Abdul R. Y., to Donlar Corporation. Method for more efficient uptake of plant growth nutrients. 5,593,947, Cl. 504-283.000.

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Kinton, Douglas J.: *See—*
Moore, Charles A.; and Kinton, Douglas J., 5,593,119, Cl. 248-185.100.

Kinugasa, Masayoshi: *See—*
Doi, Yukio; Zhang, Wei-Zhong; and Kinugasa, Masayoshi, 5,594,067, Cl. 524-806.000.

Kinzelman, Paul M.; and Warchol, Nicholas A., to Digital Equipment Corporation. Method for control of random test vector generation. 5,594,741, Cl. 371-27.000.

Kiraly, Laszlo, to International Rectifier Corporation. Method and Circuit to eliminate false triggering of power devices in optically coupled drive circuits caused by dv/dt sensitivity of optocouplers. 5,594,379, Cl. 327-381.000.

Kirby, Charles W., to General Motors Corporation. Catalytic converter having tri precious metal catalysts. 5,593,647, Cl. 422-180.000.

Kirch, Johannes, to Siemens Aktiengesellschaft. Surge arrester. 5,594,614, Cl. 361-127.000.

Kirjk, Michael, Jr.: *See*—
Schomaker, Joeef B.; Kirjk, Michael, Jr.; and Ruffcorn, Donald A., 5,593,527, Cl. 156-149.000.

Kirk, Mark P.; and Mott, Andrew W., to Imation Corp. Photothermographic materials. 5,594,143, Cl. 566-157.000.

Kirschner, Michael B.: *See*—
Beasley, Jeff; Kirschner, Michael B.; Charles, Robert A.; and Hall, Sacha C., 5,593,604, Cl. 219-117.100.

Kiso, Norikazu: *See*—
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikazu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.

Kissel, Charles L., to Exxon Corporation. Method for reducing the pour point of an oil and compositions for use therein. 5,593,955, Cl. 507-239.000.

Kissel, Thomas; Schrank, Henriette; and Hoffmann, Hans-Rainer, to Sandoz Ltd. Pharmaceutical compositions. 5,593,686, Cl. 424-448.000.

Kita, Kazuhiko: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.

Kita, Ryusuke: *See*—
Masuda, Yoshiyuki; Kita, Ryusuke; Arai, Hisako; Ohtani, Noboru; and Koba, Masayoshi, 5,593,495, Cl. 117-4.000.

Kitahara, Nobuhiro: *See*—
Ishiwata, Hiroshi; Ohishi, Takashi; and Kitahara, Nobuhiro, 5,592,915, Cl. 123-300.000.

Kitahata, Sumio; Nakano, Hirofumi; Washino, Tsutomu; and Moriwaki, Masamitsu, to San-Ei Gen F.F.I; and Osaka. Method of manufacturing sugars by trehalase. 5,593,869, Cl. 435-100.000.

Kitano, Kenzo: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; and Hayashida, Tadashi, 5,593,510, Cl. 148-225.000.

Kitaori, Noriyuki; Yoshida, Osamu; and Mizusoya, Hirohide, to KAO Corporation. Magnetic recording medium manufacturing method and manufacturing apparatus and magnetic recording medium. 5,593,723, Cl. 427-127.000.

Kitayama, Kunihiko; Nagashima, Toshiaki; and Oyama, Kiyoshi, to Canon Kabushiki Kaisha. Toner supply apparatus and toner cartridge therefor. 5,593,068, Cl. 222-167.000.

Kitazawa, Masaabu; and Iwasaki, Keiji, to Ajinomoto Co., Inc. Amino acid derivatives and anti-active oxygen agents. 5,594,012, Cl. 514-345.000.

Kitazawa, Satoshi: *See*—
Kimura, Masaabu; Kurihara, Hideshi; Ichihashi, Tetsuo; and Kitazawa, Satoshi, 5,593,819, Cl. 430-533.000.

Kittrich, Daniel: *See*—
Shen, Jian; Yarenko, Mykola; Chachowski, Rosemary; Atzler, Josef; Dupinet, Thierry; Kittrich, Daniel; Kunz, Hansjoerg; Puchegger, Karl; and Rohlfs, Reiner, 5,594,808, Cl. 382-133.000.

Kivirikko, Kari I.: *See*—
Prockop, Darwin J.; Ala-Kokko, Leena; Fertala, Andrzej; Sieron, Aleksander; Kivirikko, Kari I.; Geddis, Amy; and Pihlajaniemi, Taina, 5,593,859, Cl. 435-69.100.

Kiyanagi, Hiroyuki; and Iwamatsu, Takanori, to Fujitsu Limited. Carrier regeneration circuit including area judging device. 5,594,389, Cl. 331-12.000.

Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Sheet convey apparatus. 5,594,486, Cl. 347-104.000.

Kizer, Thomas L., to Chrysler Corporation. Quick-connect stored energy torsional fastener. 5,593,265, Cl. 411-552.000.

Klaenhammer, Todd R.; Sing, Wesley D.; and Hill, Colin J., to North Carolina State University. Phage defense rotation strategy. 5,593,885, Cl. 435-252.300.

Klare, Manfred: *See*—
Lindstädt, Klaus; and Klare, Manfred, 5,594,197, Cl. 102-499.000.

Klas, Daniel B.; Gentry, John M.; Tipton, Regina L.; and Dwyer, Richard H., to Hubbell Incorporated. Label cover construction and arrangement thereof on switch faceplate. 5,594,206, Cl. 174-56.000.

Klast, Bruno; Kreutzberger, Günter; and Suchi, Manfred, to Heraeus Electrochemie Bitterfeld GmbH. Electrode structure for a monopolar electrolysis cell operating by the diaphragm or membrane process. 5,593,555, Cl. 204-286.000.

Kleefeldt, Frank: *See*—
Bartel, Peter; and Kleefeldt, Frank, 5,594,283, Cl. 307-10.100.

Klees, Kevin J., to Eastman Kodak Company. Image capture system. 5,594,514, Cl. 396-429.000.

Klein, Enrique J., to Localmed, Inc. Radially expansible and articulated vessel scaffold. 5,593,442, Cl. 623-12.000.

Klein, Gerhard: *See*—
König, Klaus; Mazanek, Jan; Schwindt, Jürgen; Dietrich, Manfred; and Klein, Gerhard, 5,594,087, Cl. 528-44.000.

Klein, Joseph Y.: *See*—
Winchell, Harry S.; Klein, Joseph Y.; Simhon, Elliot D.; Cyjon, Rosa L.; Klein, Ofer; and Zaklad, Haim, 5,593,659, Cl. 424-9.363.

Klein, Larry L.: *See*—
Gunawardana, Geewaganda P.; Klein, Larry L.; and McAlpine, James B., 5,594,157, Cl. 549-510.000.

Klein, Ofer: *See*—
Winchell, Harry S.; Klein, Joseph Y.; Simhon, Elliot D.; Cyjon, Rosa L.; Klein, Ofer; and Zaklad, Haim, 5,593,659, Cl. 424-9.363.

Kleinhans, Matthias: *See*—
König, Axel; Kleinhans, Matthias; and Michelic, Janéz, 5,593,500, Cl. 118-303.000.
König, Axel; Kleinhans, Matthias; and Michelic, Janéz, 5,593,501, Cl. 118-410.000.

Kleinschroth, Jurgen: *See*—
Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.

Kligerman, Eugene: *See*—
Fecteau, Jean G.; Kligerman, Eugene; and Kollar, Lubor, 5,594,881, Cl. 395-419.000.

Kline, Raymond K.: *See*—
Reuter, John R.; and Kline, Raymond K., 5,594,628, Cl. 362-249.000.

Klingeleers, Pierre: *See*—
Berghmans, Joost; De Waegenaere, Johan; Klingeleers, Pierre; and Van Giel, Frans, 5,592,806, Cl. 57-212.000.

Klotz, James M.: *See*—
Lucas, Michael; Klotz, James M.; Farfan, Frank; and Hall, S. Warren, 5,594,410, Cl. 340-332.000.

Klüter, Ulrich: *See*—
Benker, Gerhard; Treiber, Helmut; Klüter, Ulrich; Lorenz, Bernhard; and Münch, Reimund, 5,594,525, Cl. 355-29.000.

Knabel, Manfred: *See*—
Breitenhuber, Josef; Bock, Erich; Lindner, Gallus; and Knabel, Manfred, 5,592,807, Cl. 57-406.000.

Knapp, Alfons, to Masco Corporation. Single handle mixing valve with flow control device for preventing hammer knock. 5,592,971, Cl. 137-625.410.

Knebel, Andrew W., Jr.: *See*—
Reiersgaard, William L.; Knebel, Andrew W., Jr.; Davis, Curtis A.; Reiersgaard, John M.; and Pelton, Lloyd E., 5,592,738, Cl. 29-863.000.

Kneile, Karl, to Robert Krause GmbH & Co. KG Zweigniederlassung Weilheim/Teck. Furniture frame. 5,593,118, Cl. 248-150.000.

Knight, Curtis A.: *See*—
Webber, John C.; and Knight, Curtis A., 5,594,452, Cl. 342-353.000.

Knight, Ernest, Jr.: *See*—
Hudkins, Robert L.; and Knight, Ernest, Jr., 5,594,009, Cl. 514-338.000.

Knight Industries, Inc.: *See*—
Zaguroli, James, Jr., 5,593,138, Cl. 254-314.000.

Knight, William R.: *See*—
Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, 5,594,481, Cl. 347-65.000.

Knopf, John L.; and Clark, James, to Genetics Institute, Inc. Recombinant phospholipase A_2 enzyme. 5,593,878, Cl. 435-198.000.

Knorr, Andreas: *See*—
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübach, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Staech, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.

Knorr, Raymond S.: *See*—
Yu, Jing-peir; Bheda, Mukesh; and Knorr, Raymond S., 5,593,751, Cl. 428-97.000.

Knowles, Billy J.; Collins, Clive A.; Desnoyers, Christine M.; Grice, Donald G.; and Rolfe, David B., to International Business Machines Corporation. Parallel computer system providing multi-ported intelligent memory. 5,594,918, Cl. 395-800.000.

Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Piazak, Zbigniew, to Amdahl Corporation. Operating system and data base having an access structure formed by a plurality of tables. 5,594,899, Cl. 395-600.000.

Knutson, Dale A.: *See*—
Steber, George R.; and Knutson, Dale A., 5,593,134, Cl. 251-129.170.

Koakutsu, Naohiko: *See*—
Akiyama, Takaaki; Koakutsu, Naohiko; Teradaira, Mitsuaki; Miyasaka, Masayo; and Hyonaga, Takuya, 5,594,653, Cl. 364-468.240.

Koba, Masayoshi: *See*—
Masuda, Yoshiyuki; Kita, Ryusuke; Arai, Hisako; Ohtani, Noboru; and Koba, Masayoshi, 5,593,495, Cl. 117-4.000.

Kobashi, Masayuki; Koeda, Noriaki; Mizuno, Yoshiteru; and Okada, Satoru, to TOA Medical Electronics Co., Ltd. Dispensing device with syringe driving compensator for flexible tube. 5,593,893, Cl. 436-50.000.

Kobata, Yasaku: *See*—
Yamada, Mitsuo; and Kobata, Yasaku, 5,594,049, Cl. 523-415.000.

Kobayashi, Hiroaki; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shuuji; and Uehara, Hirotaka, to Kawasaki Jukogyo Kabushiki Kaisha; and Doryokuro Kakunenryo Kaihatsu Jigyodan. In-furnace inspection machine utilizing a double-walled structure. 5,594,548, Cl. 356-376.000.

Kobayashi, Junya: *See*—
Mukaida, Masashi; Miyazawa, Shintaro; and Kobayashi, Junya, 5,593,950, Cl. 505-234.000.

Kobayashi, Koichi: *See*—
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,594,619, Cl. 361-681.000.

Kobayashi, Makoto: *See*—
Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, 5,594,397, Cl. 333-202.000.

Kobayashi, Masato: *See*—
Tanimizu, Toru; Hakamata, Yoshimi; Kobayashi, Masato; Osaka, Akira; and Komuro, Katsuhiro, 5,594,224, Cl. 218-134.000.

Kobayashi, Noboru, to Yamaha Hatsudoki Kabushiki Kaisha. Lock system for a watercraft. 5,593,330, Cl. 440-84.000.

Kobayashi, Takaichi: *See*—
Hosoya, Ryo; and Kobayashi, Takaichi, 5,594,622, Cl. 361-686.000.

Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, to Sekisui Chemical Co., Ltd. Plastic foam material composed of thermoplastic resin and silane-modified thermoplastic resin and method for making same. 5,594,038, Cl. 521-154.000.

Kobayashi, Tsukasa: *See*—
Sekiguchi, Atsushi; Kobayashi, Tsukasa; and Takagi, Shinji, 5,594,280, Cl. 257-771.000.

Kobayashi, Yoshinao, to Sumitomo Wiring Systems, Ltd. Connecting assembly for ignition plug in gasoline engine and method for producing same. 5,593,308, Cl. 439-125.000.

Köbele, Klaus: *See*—
Prinz, Horst; Hofmann, Hartmut; Köbele, Klaus; and Wegner, Marion, 5,593,650, Cl. 423-203.000.

Kobus, Jerzy Z.: *See*—
Okoniewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., 5,593,618, Cl. 252-512.000.

Koch Engineering Company, Inc.: *See*—
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,593,548, Cl. 203-29.000.

Koch, Kevin: *See*—
Dow, Robert L.; Koch, Kevin; and Schulte, Gary R., 5,593,997, Cl. 514-258.000.

Kodera, Yasuto: *See*—
Hanyu, Yukio; Onuma, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuto; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Koeda, Noriaki: *See*—
Kobashi, Masayuki; Koeda, Noriaki; Mizuno, Yoshiteru; and Okada, Satoru, 5,593,893, Cl. 436-50.000.

Koenig, Christopher H.: *See*—
Kanani, Sanjay; Williams, Daniel S.; and Koenig, Christopher H., 5,594,219, Cl. 187-394.000.

Koerner, Robert F.: *See*—
Boylan, Eugene B.; Koerner, Robert F.; and Hebert, Russell R., 5,593,161, Cl. 273-274.000.

Kohara, Noriyuki; and Shigita, Shozo, to Japan Exlan Company Limited. Acrylic fibrous material and humidity controller provided therewith. 5,593,763, Cl. 428-219.000.

Kohjin Co., Ltd.: *See*—
Mizutani, Tomozi; Yokota, Katsuyuki; Arita, Masahobu; and Kojyou, Hisashi, 5,593,703, Cl. 425-71.000.

Kohl, Walter; Mittag, Rainer; and Hoeber, Matthias, to Robert Bosch GmbH. Battery charging apparatus with fault detection. 5,594,321, Cl. 320-48.000.

Kohm, Thomas S.: *See*—
Stans, Louis J.; Tullo, James; and Kohm, Thomas S., 5,593,499, Cl. 118-63.000.

Kohnke, Ole B., to Ambu International A/S. Manikin unit. 5,593,306, Cl. 434-267.000.

Kohout, Darryl A. Labor-saving materials dispenser. 5,592,760, Cl. 37-403.000.

Koike, Shoji; and Yamamoto, Tomoya, to Canon Kabushiki Kaisha. Ink-jet textile printing method. 5,594,485, Cl. 347-101.000.

Koike, Yasuhiro; and Nihei, Ryo. Method of manufacturing plastic optical transmission medium. 5,593,621, Cl. 264-1.290.

Koinuma, Yasumi: *See*—
Miyazaki, Tsuyoshi; Nakajima, Hironitsu; Ichikawa, Shuji; Koinuma, Yasumi; Matsuyama, Kazuo; Kamenosono, Koji; and Minoshima, Yoshihiro, 5,594,090, Cl. 528-265.000.

Kois, Adam: *See*—
Chan, Ming F.; Raju, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vitukudi N., 5,594,021, Cl. 514-378.000.

Koizumi, Hiroyuki, to Alpine Electronics, Inc. Illumination device. 5,593,223, Cl. 362-255.000.

Koizumi, Noritaka: *See*—
Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.

Koizumi, Yutaka; Banjo, Minoru; and Wakugawa, Takeshi, to Hitachi, Ltd.; and Hitachi Electric System Company, Ltd. Signal detecting circuit for digital controller. 5,594,350, Cl. 324-616.000.

Kojima, Makoto: *See*—
Hanyu, Yukio; Onuma, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuto; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Kojima, Masahiro: *See*—
Terada, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, 5,594,930, Cl. 419-5.000.

Kojyou, Hisashi: *See*—
Mizutani, Tomozi; Yokota, Katsuyuki; Arita, Masahobu; and Kojyou, Hisashi, 5,593,703, Cl. 425-71.000.

Kokal, Harold R.: *See*—
Krause, Robert F.; Bularzik, Joseph H.; and Kokal, Harold R., 5,594,186, Cl. 75-228.000.

Kolacz, David J.: *See*—
McMillan, Stewart G.; and Kolacz, David J., 5,593,092, Cl. 239-285.000.

Kolbenson, Chuck; Nelson, Paul; St. Hilaire, Kenneth; Tingley, Alan; Tenuta, Gerry; and Sandstrom, Peter, to Summa Four, Inc. Telephone switch providing dynamic allocation of time division multiplex resources. 5,594,727, Cl. 370-442.000.

Kollar, Lubor: *See*—
Fecteau, Jean G.; Kligerman, Eugene; and Kollar, Lubor, 5,594,881, Cl. 395-419.000.

Köller, Horst: *See*—
Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.

Kolstad, Jeffrey J.: *See*—
Gruber, Patrick R.; Kolstad, Jeffrey J.; Witzke, David R.; Hartmann, Mark H.; and Brosch, Andrea L., 5,594,095, Cl. 528-354.000.

Komakine, Shigeo; Ochiai, Kuniaki; and Mine, Kazunori, to Kabushiki Kaisha TEC. Ink jet printer head and a method of driving the same. 5,594,475, Cl. 347-9.000.

Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., to Creative Integrated Systems, Inc. Improvements in a detection circuit with a level shifting circuit. 5,594,696, Cl. 365-208.000.

Komatsu, Toru, to Murakami Kaimeido Co., Ltd. Vehicle mirror. 5,594,585, Cl. 359-512.000.

Komatsu, Toshihiko, to Sumitomo Wiring Systems, Ltd. Water-tight cap with vent. 5,592,911, Cl. 123-143.00C.

Komatsuda, Hideki; Hirose, Hideo; and Kikuchi, Tetsuo, to Nikon Corporation. Illumination device with allowable error amount of telecentricity on the surface of the object to be illuminated and exposure apparatus using the same. 5,594,587, Cl. 359-619.000.

Komatsuda, Hideki: *See*—
Mori, Takashi; and Komatsuda, Hideki, 5,594,526, Cl. 355-67.000.

Komiya, Noboru: *See*—
Arita, Tatsuo; Sakurai, Ichiro; and Komiya, Noboru, 5,593,437, Cl. 623-6.000.

Komiya, Takao: *See*—
Machino, Masaki; Ito, Sumiyoshi; Danmoto, Shojiro; Kanno, Fumio; and Komiya, Takao, 5,593,293, Cl. 414-729.000.

Komma, Yoshiaki; Nishino, Seiji; Kato, Makoto; and Matsuda, Kaoru, to Matsushita Electric Industrial Co., Ltd. Optical pickup head apparatus. 5,594,713, Cl. 369-112.000.

Komori Corporation: *See*—
Toyoda, Hideaki, 5,592,882, Cl. 101-487.000.

Komuro, Ichiro: *See*—
Murano, Jun'ichi; Muraishi, Takaya; Tanabe, Hiroshi; Karasawa, Kazumori; Nishido, Kazuhiro; and Komuro, Ichiro, 5,594,539, Cl. 399-316.000.

Komuro, Katsuhiro: *See*—
Tanimizu, Toru; Hakamata, Yoshimi; Kobayashi, Masao; Osaka, Akira; and Komuro, Katsuhiro, 5,594,224, Cl. 218-134.000.

Koncelik, Joseph A.: *See*—
Huey, Richard W., Jr.; Lerner, Neil D.; Chaney, David B.; and Koncelik, Joseph A., 5,594,422, Cl. 340-628.000.

Konda, Kazumoto; and Hotta, Yoshihito, to Sumitomo Wiring Systems, Ltd. Waterproof connector. 5,593,320, Cl. 439-589.000.

Kondo, Michimasa: *See*—
Usui, Ryuzaburo; Iwamoto, Masafumi; Yamamoto, Kazuhiko; Fujisaka, Takahiko; and Kondo, Michimasa, 5,594,447, Cl. 342-42.000.

Kondo, Noriaki: *See*—
Miyata, Shigeru; Kondo, Noriaki; and Inagaki, Hiroshi, 5,592,926, Cl. 123-630.000.

Kondo, Yoshikazu; Matsui, Masao; Yoshidome, Hideo; Osaki, Takuji; Kajiyama, Hiroshi; Ozeki, Eiichi; and Fujii, Yasuhiro, to Kanebo, Ltd.; and Shimadzu Corporation. Biodegradable copolyester, molded article produced therefrom and process for producing the molded article. 5,593,778, Cl. 428-373.000.

Kondoh, Harufusa; and Asahina, Katsushi, to Mitsubishi Denki Kabushiki Kaisha. Open-drain fet output circuit. 5,594,369, Cl. 326-83.000.

Kondoh, Harufusa; and Notani, Hiromi, to Mitsubishi Denki Kabushi Kaisha. Ring oscillator having large load driving capability for use as VCO in phase locked loops. 5,594,392, Cl. 331-57.000.

König, Axel; Kleinhans, Matthias; and Michelic, Janéz, to Sanirade Ltd. Device for coating solid particles. 5,593,500, Cl. 118-303.000.

König, Axel; Kleinhans, Matthias; and Michelic, Janéz, to Sanirade Ltd. Device for coating small solid bodies. 5,593,501, Cl. 118-410.000.

König, Klaus; Mazanek, Jan; Schwindt, Jürgen; Dietrich, Manfred; and Klein, Gerhard, to Bayer Aktiengesellschaft. Polyurethane thickeners and their use for thickening aqueous systems. 5,594,087, Cl. 528-44.000.
König, Klaus: *See*—
Wroblowsky, Heinz-Jürgen; and König, Klaus, 5,594,147, Cl. 548-263.600.
Wroblowsky, Heinz-Jürgen; and König, Klaus, 5,594,148, Cl. 548-263.600.
Konishi, Shuji: *See*—
Goto, Minoru; Watanabe, Satoru; Aoki, Minoru; Konishi, Shuji; and Kato, Koji, 5,594,707, Cl. 367-111.000.
Konishi, Yasuhiro; Miyamoto, Takayuki; Kajimoto, Takeshi; and Iwamoto, Hitashi, to Mitsubishi Denki Kabushiki Kaisha. Synchronous semiconductor memory device. 5,594,704, Cl. 365-233.000.
Konishi, Yoshikazu; and Akimoto, Shigeyuki, to Kabushiki Kaisha Topcon. Position detecting apparatus which uses a continuously moving light spot. 5,594,242, Cl. 250-234.000.
Kono, Michael E.: *See*—
Cowen, Steven J.; Young, Christopher M.; Dombrowski, James H.; Kono, Michael E.; and Daughtry, James H., 5,593,736, Cl. 427-492.000.
Kosuma, Ritaro; and Tanaka, Yoji, to Kabushiki Kaisha Hosokawa Yoko; and Kabushiki Kaisha Polymer Systems. Container, method of manufacturing the same, and installation jig for cartridge container for discharge gun. 5,593,066, Cl. 222-94.000.
Kousuke, Toshimitsu; Nishi, Takeshi; Shimizu, Michio; Mori, Harumi; Moriya, Kouji; and Murakami, Satoshi, to Semiconductor Energy Laboratory Co., Ltd. Liquid-crystal electro-optical apparatus and method of manufacturing the same. 5,594,569, Cl. 349-122.000.
Koo, Kenneth G.; and Tully, Bill M., to Truswal Systems Corporation. Truss with adjustable ends and metal web connectors. 5,592,800, Cl. 52-692.000.
Koo, Stephen: *See*—
Ahern, John M.; and Koo, Stephen, 5,594,497, Cl. 348-71.000.
Koop, Klaus H.: *See*—
Anjum, Mohammed; Koop, Klaus H.; and Kyaw, Maung H., 5,593,907, Cl. 437-35.000.
Kooyker, Klaus; Weiss, Adam; and Van Der Vinne, Frans, to U.S. Philips Corporation. Kitchen machine with elastic frame suspension. 5,592,872, Cl. 99-510.000.
Kop, Joann: *See*—
Hogan, James; Smith, Richard; and Kop, Joann, 5,593,841, Cl. 435-6.000.
Kopec, Gary E.; Chou, Philip A.; and Niles, Leslie T., to Xerox Corporation. Automatic training of character templates using a text line image, a text line transcription and a line image source model. 5,594,809, Cl. 382-161.000.
Kopelowicz, Alberto. Latex prophylactics. 5,592,950, Cl. 128-842.000.
Kopf, Henry B. Filtration cassette article, and filter comprising same. 5,593,580, Cl. 210-321.750.
Koprowska, Joanna: *See*—
Okoniewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., 5,593,618, Cl. 252-512.000.
Kor-One, Ltd.: *See*—
Gvoich, Ned, 5,593,374, Cl. 482-123.000.
Korb, Harold W.: *See*—
Kimbel, Steven L.; Korb, Harold W.; and Hall, Cynthia F., 5,593,498, Cl. 117-201.000.
Korea Construction Financial Cooperative: *See*—
Kim, Jong P.; Kim, Byung H.; Ahn, Cheoul H.; Kim, Tae H.; and Choi, Do H., 5,594,427, Cl. 340-825.720.
Korea Institute of Construction Technology: *See*—
Kim, Jong P.; Kim, Byung H.; Ahn, Cheoul H.; Kim, Tae H.; and Choi, Do H., 5,594,427, Cl. 340-825.720.
Korea Institute of Science and Technology: *See*—
Kim, Jae-Jin; Kim, Chang-Keun; and Kwak, Seung-Yeop, 5,593,588, Cl. 210-490.000.
Kim, Joong H.; Kim, Sung H.; Nam, Ghil S.; Kim, Ha Y.; Son, Hyen J.; and Jang, Eun S., 5,593,985, Cl. 514-203.000.
Koros, William J.; Hargis, I. G.; Olson, Richard A.; and Harris, Jason S., to GenCorp Inc. Long life, low air permeable pressurized articles such as play balls. 5,593,157, Cl. 473-606.000.
Korpi, John G., to United States of America, Army. Lane marker. 5,592,898, Cl. 116-209.000.
Kosaka, Yoko: *See*—
Nakamura, Shinichi; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; and Kosaka, Yoko, 5,593,616, Cl. 252-299.610.
Koseki, Shinya: *See*—
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Tohill, Henry J.; Gallagher, Russell B.; Kubarych, Kenneth G.; and Hallstrom, Nils O., 5,593,085, Cl. 228-193.000.
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Dittrich, Gerhard; Bebea, Marius; and Mehlert, Wolfgang, 5,593,146, Cl. 269-22.000.
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Son, Jung N., 5,592,876, Cl. 100-272.000.
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Kunreuther, Steven. Clip of attachments. 5,593,033, Cl. 206-346.000.
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Post, Lothar A.; and Kunze, Jörg, 5,593,309, Cl. 439-157.000.
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Fahlgren, Christer; Gustavsson, Sören; Tibbling, Petter; and Johansson, Ewa W., 5,593,544, Cl. 162-65.000.

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Anjum, Mohammed; Koop, Klaus H.; and Kyaw, Maung H., 5,593,907, Cl. 437-35.000.

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Cutler, Larry; Gartner, Klaus W.; Butterweck, Dieter; Vuilleumier, P.; Monsier, Jean-Luc; and Sermet, P-A, 5,594,430, Cl. 340-825.310.

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Ahn, Kie Y.; Hedrick, James L., Jr.; Labadie, Jeffrey W.; Lee, Kang-Wook; Twieg, Robert J.; Viehbeck, Alfred; and Walker, George F., 5,593,720, Cl. 427-97.000.

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Fiume, Luigi; Busi, Corrado; Stefano, Giuseppina D.; and Mattioli, Alessandro, 5,594,110, Cl. 530-362.000.

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Conte, Ubaldo; La Manna, Aldo; and Tessitore, Giuseppe, 5,594,030, Cl. 514-553.000.

Labrie, Fernand, to Endorecherche Inc. Method and treatment of androgen-related diseases. 5,593,981, Cl. 514-170.000.

Lacey, Laurence F.: *See*—
Bye, Alan; Evans, Jill; Hackle, Paul D.; Lacey, Laurence F.; and Rue, Peter J., 5,593,685, Cl. 424-439.000.

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LaDue, Christoph K., to Axion Logistics Corporation. Wireless communications application specific enabling method and apparatus. 5,594,740, Cl. 379-59.000.

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Jourdain, Gerard E. A.; Lagrange, Jean-Paul; Maudet, Gerard M. F.; Mouchel, Jacques H.; Richard, Jean-Philippe E.; and Soligny, Marcel R., 5,593,278, Cl. 415-173.200.

La Gro, Phillip A., to Hollister Incorporated. Fecal collector with elastic attachment patch. 5,593,397, Cl. 604-355.000.

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Grosheau, Pierre, 5,593,533, Cl. 156-305.000.

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Darredeau, Bernard; Lehman, Jean-Yves; and Peyron, Jean-Marc, 5,592,834, Cl. 62-656.000.

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Lajeunesse, Alan L. Facial insulator. 5,592,687, Cl. 2-9.000.

Laloux, Bernard: *See*—
Lefevre, Hervé; Martin, Philippe; Laloux, Bernard; Graindorge, Philippe; and Disdier, Laurent, 5,594,744, Cl. 372-20.000.

Lam, Peter A. D/A converter noise reduction system. 5,594,443, Cl. 341-144.000.

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Lamonthe, Serge: *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamonthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Lamprecht, Dale E., Jr.: *See*—
Christopher, Amy S.; Morrison, Donald A.; Roth, Mark W.; Watkins, Rex D.; Lamprecht, Dale E., Jr.; and Globig, James E., 5,594,838, Cl. 395-117.000.

Lampsat, Bruno G.: *See*—
Venkatasubbu, Srinivasan; Eschenbach, Jeffrey J.; Waymeyer, Stephen J.; and Lampsat, Bruno G., 5,593,275, Cl. 415-160.000.

Lampson, Butler W.: *See*—
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Lamptech Ltd.: *See*—
Yakub, Yuri; and Azran, Yitzhak, 5,594,302, Cl. 313-642.000.

Landers, John O.: *See*—
Vargas, Richard R.; Plamthottam, Sebastian S.; and Landers, John O., 5,593,759, Cl. 428-200.000.

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Lynn, Michael; Morris, Alan; Perry, Richard A.; and Carper, June R., 5,592,989, Cl. 165-259.000.

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Schwendemann, Eckhard; and Bott, Klaus, 5,594,312, Cl. 318-799.000.

Lane, David J.: *See*—
Shah, Jyotsna S.; Chan, Samuel W.; Pitman, Theodore B.; and Lane, David J., 5,593,831, Cl. 435-6.000.

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Bugster, Carl; Bugster, Conrad H.; Haldemann, Walter; and Rivara, Giorgio, 5,593,691, Cl. 424-461.000.
Mario, Caplrusso: *See*—
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Grube, Gary W.; Markison, Timothy W.; and Rybicki, Mathew A., 5,594,796, Cl. 380-25.000.
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Marlton, Anthony P.; Fielder, Dennis A.; Halstead, Victor G., deceased (by Susan Halstead, administrator); and Stoctill, Trevor R., to Video Logic Ltd. Computer based display system allowing mixing and windowing of graphics and video. 5,594,467, Cl. 345-115.000.
Marney, Gary L.: *See*—
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Chen, Hao; and Radmer, Richard, 5,593,853, Cl. 435-29.000.
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Martin, Lyle B. Self-contained dual panel window screen alarm. 5,594,418, Cl. 340-546.000.
Martin Marietta Corporation: *See*—
Rodriguez, Derek A., 5,594,192, Cl. 89-33.160.
Steward, Anthony R.; and Bates, Peter A., 5,594,194, Cl. 89-46.000.
Martin, Melvin E. Social serving plate. 5,593,062, Cl. 220-574.100.
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Martin, Trevor I.: *See*—
Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Druppel, Stephan V., 5,593,486, Cl. 106-22.00A.
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Guillaud, Jean-Michel; and Martinez, Georges, 5,594,760, Cl. 375-345.000.
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Brauker, James H.; Hill, Ronald S.; Martinson, Laura A.; Boggs, Daniel R.; and Johnson, Robert C., 5,593,440, Cl. 623-11.000.
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Martz, Joel D. Vapor permeable dressing. 5,593,395, Cl. 604-304.000.
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Maruyama, Shigenori, to Takata Corporation. Air bag device for vehicle. 5,593,179, Cl. 280-740.000.
Maruyama, Yutaka: *See*—
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Willing, Bernd; and Göbel, Frank, 5,593,010, Cl. 191-12.00R.
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Knapp, Alfons, 5,592,971, Cl. 137-625.410.
Mashtare, Dale R.; and Snelling, Christopher, to Xerox Corporation. Self biasing electrostatic paper transport. 5,593,151, Cl. 271-193.000.
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Rosenberg, Robert D.; Simons, Michael; Edelman, Elazer; Langer, Robert S.; and DeKeyser, Jean-Luc, 5,593,974, Cl. 514-44.000.
Steller, Hermann; Abrams, John M.; Grether, Megan E.; and White, Kristin, 5,593,879, Cl. 435-240.100.
Masse, Bruno R. H.: *See*—
Alary, Jean-Paul D.; Barbier, Gérard Y. G.; Delahaye, Corine G.; Havard, Jacques G. W. R.; Mactovic, Paul; Masse, Bruno R. H.; Merville, Didier; Mirville, Francois J.-P.; Muccioli, Serge R. Y.; Sandelis, Denis J. M.; and Stelter, Ralph M., 5,592,821, Cl. 60-751.000.
Masserant, Larry: *See*—
Kallmann, Bernhard; Scheibel, Joerg; Masserant, Larry; Keck, Daniel; and Gottschalk, Werner, 5,593,005, Cl. 188-72.400.
Massey, Richard J.: *See*—
Kamireddy, Balreddy; Dursley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,593,969, Cl. 514-25.000.
Masuda, Kazuaki: *See*—
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Masuda, Masami, to Kabushiki Kaisha Toshiba. Semiconductor apparatus having wiring structure of an integrated circuit in which a plurality of logic circuits of the same structure are arranged in the same direction. 5,594,281, Cl. 257-773.000.
Masuda, Syuzo; and Iwama, Ryouichi, to Fujitsu Limited. Serial printer having carriage with independently movable image bearing member and fixing unit. 5,594,530, Cl. 399-111.000.
Masuda, Yoshiyuki; Kita, Ryusuke; Arai, Hisako; Ohtani, Noboru; and Koba, Masayoshi, to Sharp Kabushiki Kaisha. Method for manufacturing thin film of composite metal-oxide dielectric. 5,593,495, Cl. 117-4.000.
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Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, to Masumoto, Tsuyoshi; Inoue, Akihisa; Teikoku Piston Ring Co., Ltd.; Yamaha Corporation; and YKK Corporation. High strength aluminum-based alloy. 5,593,515, Cl. 148-415.000.
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Foster, Robert F.; and Hillman, Joseph T., 5,593,511, Cl. 148-238.000.
Mathias, Claudia B., to Kemtek SA. Filing of sheets of paper. 5,593,242, Cl. 402-7.000.
Mathieu, Raymond J.; Mellott, James F.; and Myers, Dean E., to MAC Tools, Inc. Spark plug wire puller. 5,593,197, Cl. 294-19.100.
Mathre, David J.: *See*—
Ho, Guo-Jie; and Mathre, David J., 5,594,134, Cl. 540-362.000.
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Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, to Canon Kabushiki Kaisha. Ink jet recording apparatus for divisionally driving a recording head with a plurality of ink jet orifices grouped into blocks. 5,594,478, Cl. 347-41.000.
Matsubara, Takashi: *See*—
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Matsuda, Kaoru: *See*—
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Matsuda, Takehisa; Inoue, Kazuhiko; and Tani, Nobutaka, to Kanegafuchi kagaku kogyo Kabushiki Kaisha. Control of cell arrangement. 5,593,814, Cl. 430-320.000.
Matsui, Hideki: *See*—
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Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.
Matsui, Masao: *See*—
Kosdo, Yoshikazu; Matsui, Masao; Yoshidome, Hideo; Osaki, Takuji; Kajiyama, Hiroshi; Ozeki, Eiichi; and Fujii, Yasuhiro, 5,593,778, Cl. 428-373.000.
Matsuki, Junichi, to NEC Corporation. Bipolar transistor with base and emitter contact holes having shorter central portions. 5,594,272, Cl. 257-579.000.
Matsumi, Chiyoko: *See*—
Juri, Tatsuro; Iketani, Akira; and Matsumi, Chiyoko, 5,594,550, Cl. 386-40.000.
Matsumoto, Masaetsu: *See*—
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Matsumoto, Masahito: *See*—
Hara, Takahisa; Matsumoto, Masahito; and Usui, Nobuhiro, 5,593,631, Cl. 264-257.000.
Matsumoto, Masakazu; Taguchi, Masahiro; and Yamamoto, Yusaku, to Nikken Kosakusho Works Ltd. Tool holder. 5,593,258, Cl. 409-234.000.
Matsumoto, Noritsune; and Kamitani, Kazuo, to F. Cube Co. Ltd. Method for perfuming conveyances and perfuming article therefor. 5,593,635, Cl. 422-5.000.
Matsumoto, Yoshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Warning system for vehicles. 5,594,412, Cl. 340-435.000.
Matsumura, Hisashi: *See*—
Ushijima, Kazuhiro; Matsumura, Hisashi; and Matsuura, Fumiaki, 5,594,426, Cl. 340-825.020.
Matsumura, Paul M.: *See*—
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Matsumura, Tsutomu: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.
Matsunaga, Shinya: *See*—
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Matsuo, Hiromitsu: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Akiyama, Koji; Takimoto, Akio; and Ogawa, Hisahito, 5,594,567, Cl. 349-28.000.
Asaka, Hideo; and Yamauchi, Hiroyuki, 5,594,701, Cl. 365-230.030.
Hirano, Hiroshige; and Honda, Toshiyuki, 5,594,697, Cl. 365-208.000.
Iijima, Yasuo; and Tsubokawa, Masahiro, 5,594,348, Cl. 324-546.000.
Inoue, Kazuo, 5,594,716, Cl. 369-275.400.
Isaka, Haruo; Maruoka, Toshihiko; Ichikawa, Kei; Honjo, Kenichi; and Gotou, Makoto, 5,594,602, Cl. 360-77.140.
Ishikawa, Osamu; and Takehara, Hiroyasu, 5,594,358, Cl. 324-762.000.
Juri, Tatsuro; Iketani, Akira; and Matsumi, Chiyoko, 5,594,550, Cl. 386-40.000.
Kaizaki, Keiji; Yamamoto, Tamotsu; Yokoji, Shigeru; Inoue, Hiroso; and Matsui, Hiroshi, 5,593,023, Cl. 200-570.000.
Komma, Yoshiaki; Nishino, Seiji; Kato, Makoto; and Matsuda, Kaoru, 5,594,713, Cl. 369-112.000.
Koyama, Kazushige; Mutoh, Naoki; and Katsumata, Masaaki, 5,594,406, Cl. 338-21.000.
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Monta, Hiroki, 5,594,551, Cl. 386-92.000.
Nishiyama, Ryuji; Fukaso, Akira; Harakawa, Koji; and Miura, Makoto, 5,593,806, Cl. 430-106.600.
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.
Matsuura, Azuma: *See*—
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Matsuura, Masaaki; Hikichi, Toichiro; Saito, Mitsuru; and Tagami, Takuya, to Honda Giken Kogyo Kabushiki Kaisha. Actuated shock absorber link mechanism with variable link ratio and link form. 5,592,999, Cl. 180-227.000.
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, to Canon Kabushiki Kaisha. Method for forming a deposited film. 5,593,497, Cl. 117-90.000.
Matsuyama, Kazuo: *See*—
Miyazaki, Tsuyoshi; Nakajima, Hiromitsu; Ichikawa, Shuji; Koinuma, Yasumi; Matsuyama, Kazuo; Kamenosono, Koji; and Minoshima, Yoshihiro, 5,594,090, Cl. 528-265.000.
Mattes, Ralf: *See*—
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Matteucci, Mark: *See*—
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Matthews, Jacqueline R. Sound-emitting knee apparatus. 5,592,689, Cl. 2-23.000.
Matthews, John W., to Laser Products Ltd. Bidirectional holsters. 5,593,074, Cl. 224-251.000.
Matthews, William F., to Caterpillar Inc. Exhaust valve with a tapered stem portion. 5,592,913, Cl. 123-188.300.
Mattila, Robert J.: *See*—
Elstran, Gerald V.; Mattila, Robert J.; and Phillips, Jerome D., 5,592,935, Cl. 128-205.290.
Mattingly, Phillip G.: *See*—
Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,593,896, Cl. 436-500.000.

Mattioli, Alessandro: *See*—
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Mattox, John R., to Rohm and Haas Company. Stabilization of aqueous 3-isothiazolone solutions. 5,594,017, Cl. 514-372.000.
Mauro, Gerald D. Rotating tilt latch. 5,592,781, Cl. 49-394.000.
Mauser-Werke GmbH: *See*—
Przytulla, Dietmar, 5,593,060, Cl. 220-319.000.
Maxim Integrated Products: *See*—
Bingham, David, 5,594,381, Cl. 327-534.000.
Maxtor Corporation: *See*—
Bruner, Curt; Hutsell, Larry; Reh, Jeff; and Metz, Robert, 5,594,600, Cl. 360-69.000.
Mayo, Michael A., to PPG Industries, Inc. Coating composition containing polyester polymers with terminal carbamate groups and polymeric polyol derived from ethylenically unsaturated monomers. 5,593,733, Cl. 427-407.200.
Mayo, Michael A.; and Barancyk, Steven V., to PPG Industries, Inc. Coating compositions containing acrylic polymers with pendant carbamate groups exhibiting improved intercoat adhesion. 5,593,785, Cl. 428-423.100.
Mazanek, Jan: *See*—
König, Klaus; Mazanek, Jan; Schwindt, Jürgen; Dietrich, Manfred; and Klein, Gerhard, 5,594,087, Cl. 528-44.000.
Mazda Motor Corporation: *See*—
Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, 5,594,645, Cl. 364-426.044.
McAllister, Alex: *See*—
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McAlpine, James B.: *See*—
Gunawardana, Geewananda P.; Klein, Larry L.; and McAlpine, James B., 5,594,157, Cl. 549-510.000.
McBride, Darryl G., to Universal Lock. Pick resistant lock. 5,592,837, Cl. 70-38.00A.
McBride, Ken; and Aswell, Cecil, to Micro Linear Corporation. Clock deskewing apparatus including three-input phase detector. 5,594,376, Cl. 327-236.000.
McBride, Sterling E.: *See*—
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McCabé, Mead M., to University of Miami. Method for labeling DNA by ring-opening of purine bases. 5,593,829, Cl. 435-6.000.
McCabe, Thomas: *See*—
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McCamley, John A.: *See*—
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McCarrick, Daniel W.: *See*—
Justice, Clinton F.; and McCarrick, Daniel W., 5,593,359, Cl. 475-280.000.
McCartor, Harold R.: *See*—
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McCarty, Mark L.: *See*—
Trinh, Toan; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark L.; Pilosof, David; Zwerdling, Susan S.; and Tordil, Helen B., 5,593,670, Cl. 424-76.100.
McCarty, Robert S.: *See*—
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McClure, David C., to SGS-Thomson Microelectronics, Inc. Output driver circuitry with selective limited output high voltage. 5,594,373, Cl. 327-108.000.
McConnell, Kenneth G.; and Jang, Wan-Shik, to Iowa State University Research Foundation, Inc. Robot control scheme. 5,594,309, Cl. 318-568.220.
McCoy, Daniel M.: *See*—
Campbell, Douglas C.; Glocceri, Gary J.; McCoy, Daniel M.; Reichenbach, Thomas G.; Duchnowski, Lenard J.; Ivan, Jerome C.; and Raad, Joseph M., 5,593,176, Cl. 280-707.000.
McCracken, Robert E., to Waxing Corporation of America, Inc. Electrical cord lock. 5,593,312, Cl. 439-369.000.
McCullough, Edward D., to Rockwell International Corporation. Angular sensing system. 5,594,434, Cl. 341-13.000.
McCullough, James D., Jr.: *See*—
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McCune, Robert C., Jr.: *See*—
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McDonald, Ian A.; Whitten, Jeffrey P.; and Cosford, Nicholas D., to SIBIA Neurosciences, Inc. Modulators of acetylcholine receptors. 5,594,011, Cl. 514-343.000.
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, to Automated Healthcare, Inc. Automated system for selecting and delivering packages from a storage area. 5,593,267, Cl. 414-273.000.
McDonald, Ted P., to University of Tennessee Research Corp., The. Methods and compositions for treating thrombocytopenia. 5,593,666, Cl. 424-85.100.
McDonnell Douglas Corporation: *See*—
Ruhl, Louis F., 5,593,114, Cl. 244-183.000.
McGee, Michael. Baby bottle with two separate fluid chambers. 5,593,052, Cl. 215-11.100.
McGinness, Michael P.; and Short, Warren. Method and apparatus for closed loop recycling of contaminated cleaning solution. 5,593,598, Cl. 210-748.000.
McGuire, John D., to Brascon Architectural Products Inc. Safety turnstile. 5,592,778, Cl. 49-42.000.
McGurran, Kelly T.: *See*—
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McKay, Angela: *See*—
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McKay, Colin F.; McKay, Angela; and Ringan, Eric S., to Silberline Limited. Metal powder pigment. 5,593,773, Cl. 428-328.000.
McKenna, Gregory B.: *See*—
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McKnight, Thomas R., Jr.: *See*—
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McLaughlin, Brian: *See*—
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McLaughlin, Kevin J.: *See*—
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McLaury, Loren L., to Micron Technology, Inc. VRAM having isolated array sections for providing write functions that will not affect other array sections. 5,594,474, Cl. 345-203.000.
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McMahon, Michael: *See*—
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McMahon, Neil D.: *See*—
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Viegas, Tacey X.; Reeve, Lorraine E.; and Henry, Raymond L., 5,593,683, Cl. 424-427.000.
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MEC Systems, Inc.: *See*—
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Alexander, Gary E., 5,593,413, Cl. 606-122.000.

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Palster, Robert, 5,593,494, Cl. 117-2.000.
Kimbel, Steven L.; Korb, Harold W.; and Hall, Cynthia F., 5,593,498, Cl. 117-201.000.

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Alary, Jean-Paul D.; Barbier, Gérard Y. G.; Delahaye, Corine G.; Havard, Jacques G. W. R.; Mackovic, Paul; Masse, Bruno R. H.; Merville, Didier; Mirville, Francois J.-P.; Muccioli, Serge R. Y.; Sandelis, Denis J. M.; and Stelter, Ralph M., 5,592,821, Cl. 60-751.000.

Meshberg, Philip. Promotional dispenser and method for its use. 5,593,064, Cl. 222-39.000.

Messaros, David W.; Cook, Robert E.; and Medytkiewicz, Ronald A., to Hewlett-Packard Company. Remote diagnostic tool. 5,594,663, Cl. 364-550.000.

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Methfessel, Harley A. J.; and Langston, Terry L. Mobile ground level skydiving apparatus. 5,593,352, Cl. 472-50.000.

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Metz, Robert: *See—*
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Meyer, Daniel G.: *See—*
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Carey, William S.; Meyer, Ellen M.; and Peltier, Jeffrey H., 5,594,096, Cl. 528-387.000.

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Meyer, Michael: *See—*
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Meyerson, Robert F.; and Chang, Yung-Fu, to Teletransaction, Inc. Highly integrated portable electronic work slate unit. 5,594,470, Cl. 345-169.000.

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Michaud, Alain: *See—*
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Michaud, Serge: *See—*
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Michelic, Janéz: *See—*
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Michigan State University: *See—*
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Mickeler, Reinhold: *See—*
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Micro Energetics Corporation: *See—*
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Micro Linear Corporation: *See—*
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Micro Motion, Inc.: *See—*
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Micro Precision Operations, Inc.: *See—*
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Microchip Technology Incorporated: *See—*
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Microsoft Corporation: *See—*
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Mika, Helmut: *See—*
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Mikol, Dale K.: *See—*
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MileMarker, Inc.: *See—*
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Millan, Mark: *See—*
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Miller, Paul L.: *See—*
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Miller, Terry Q. Hold-down cover for cables and the like. 5,593,756, Cl. 428-194.000.

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Milner, Peter J. Rear view system for a vehicle. 5,594,593, Cl. 359-726.000.

Milo, Robert J.: *See—*
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Milstein, Anatole: *See—*
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Mimick, Frank P.; and Staudacher, Daniel W., to Tandy Corporation. Method of programming audio tracks in a sequential medium. 5,594,601, Cl. 360-72.200.

Mimms, Larry T.: *See—*
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Minakata, Tsuyoshi: *See—*
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Minami, Shigenobu: *See—*
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Minato, Kohei. Magnetic rotating apparatus. 5,594,289, Cl. 310-152.000.

Mine, Kazunori: *See—*
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Mine Safety Appliances Company: *See—*
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Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, to Escom AG. Personal computer apparatus for holding and modifying video output signals. 5,594,473, Cl. 345-199.000.

Minerich, Phillip L.; Hewitt, Bryan C.; Lacroix, Cindy M.; and Ball, Melville D., to Hormel Foods Corporation. Container for active microwave heating. 5,593,610, Cl. 219-728.000.

Minh, Pham H., to Liquid Air Engineering Corporation. Mixed bed adsorber. 5,593,475, Cl. 95-123.000.

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Jinks, Philip A., 5,593,069, Cl. 222-246.000.
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Nerad, Bruce A.; and Vesley, George F., 5,593,615, Cl. 252-299.010.
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Minoshima, Yoshihiro: *See—*
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Minuskin, Steven E. Target Device. 5,593,162, Cl. 273-403.000.

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Mist, Inc.: *See—*
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Mital, Amit, to Microsoft Corporation. Exception handler and method for handling interrupts. 5,594,905, Cl. 395-733.000.

Mitchell, Alan J.: *See—*
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Mitra, Sumit K., to Microchip Technology Incorporated. Microcontroller with programmable postscaler for pulse width modulation interrupt. 5,594,894, Cl. 395-556.000.

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Mitsuba Electric Manufacturing Co., Ltd.: *See—*

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Mitsubishi Chemical Corporation: *See*—
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Mitsubishi Denki Kabushi Kaisha: *See*—
Kondoh, Harufusa; and Notani, Hiromi, 5,594,392, Cl. 331-57.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, 5,593,791, Cl. 428-694.0ML.
Fujiwara, Susumu; Sakata, Masahiko; and Ishizuka, Mikio, 5,594,803, Cl. 381-71.000.
Kimura, Mikihiro, 5,594,349, Cl. 324-551.000.
Kondoh, Harufusa; and Asahina, Katsushi, 5,594,369, Cl. 326-83.000.
Konishi, Yasuhiro; Miyamoto, Takayuki; Kajimoto, Takeshi; and Iwamoto, Hisashi, 5,594,704, Cl. 365-233.000.
Koseko, Yasushi, 5,594,891, Cl. 395-500.000.
Shirahata, Masayoshi; and Okumura, Yoshinori, 5,594,264, Cl. 257-335.000.
Suzuki, Hiroyoshi, 5,594,163, Cl. 73-61.440.
Usui, Ryuzaburo; Iwamoto, Masafumi; Yamamoto, Kazuhiko; Fujisaka, Takahiko; and Kondo, Michimasa, 5,594,447, Cl. 342-42.000.
Yamaguchi, Atsuo, 5,594,692, Cl. 365-189.090.
Yoshioka, Nobuyuki; and Miyazaki, Junji, 5,593,801, Cl. 430-5.000.
Mitsubishi Electric Information Technology Center America Inc.: *See*—
Freeman, William T.; and Weissman, Craig D., 5,594,469, Cl. 345-158.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Takabashi, Mamoru; Todo, Akira; Ikeyama, Seiichi; Tsutsui, Toshiyuki; Matsunaga, Shinya; and Kaneshige, Norio, 5,594,071, Cl. 525-240.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Gotoh, Yoshihisa; Kawamata, Motoo; and Takahashi, Toshiaki, 5,593,916, Cl. 437-83.000.
Nagata, Teruyuki; Otazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, 5,594,088, Cl. 528-77.000.
Naruse, Hiroshi; Mizuta, Hideki; Umeda, Shinichi; and Nagata, Teruyuki, 5,594,149, Cl. 548-316.400.
Mitsui, Yasuhiro: *See*—
Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, 5,594,246, Cl. 250-310.000.
Mitsutake, Hideaki; Nakamura, Naoto; and Sano, Yoshihisa, to Canon Kabushiki Kaisha. Electron source and electron beam apparatus. 5,594,296, Cl. 313-309.000.
Mittag, Rainer: *See*—
Kohl, Walter; Mittag, Rainer; and Hoeber, Matthias, 5,594,321, Cl. 320-48.000.
Mitzkat, Martin; Dufresne, Pierre; and Ackermann, François, to Eurecat. Heat treatment of solid catalyst or adsorbent particles in the presence of fluid in a vibrating helical coil. 5,592,748, Cl. 34-61.000.
Miura, Koji: *See*—
Shishido, Kazuo; Sasaki, Shinichi; and Miura, Koji, 5,594,531, Cl. 399-159.000.
Miura, Makoto: *See*—
Nishiyama, Ryuji; Fukuso, Akira; Harakawa, Koji; and Miura, Makoto, 5,593,806, Cl. 430-106.600.
Miura, Takao: *See*—
Akata, Masao; Miura, Takao; Ogawa, Takeshi; Doi, Yukihiro; Higashi, Isao; and Imagawa, Hitoshi, 5,594,724, Cl. 370-469.000.
Miura, Taro: *See*—
Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, 5,594,397, Cl. 333-202.000.
Miura, Tohru: *See*—
Nagata, Teruyuki; Otazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, 5,594,088, Cl. 528-77.000.
Miura, Tomoaki: *See*—
Katano, Kiyoaki; Ohuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yagashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.
Miura, Yutaka: *See*—
Tomita, Kazushi; Ito, Yoshikazu; Hirano, Motohiro; Nozawa, Akira; Matsuo, Hiromitsu; Iimuro, Shunichi; Tozawa, Shigeki; and Miura, Yutaka, 5,593,540, Cl. 156-643.100.
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, to Kabushiki Kaisha Toshiba. Portable computer comprising keyboard and coordinate input tablet hingedly connected to a main body case through a junction base having a cylindrical element defining a linear groove therethrough. 5,594,619, Cl. 361-681.000.
Miyake, Isao: *See*—
Kimura, Haruo; Miyake, Isao; Nakano, Toshihiro; and Nemoto, Yukihiro, 5,593,149, Cl. 271-3.010.
Miyamori, Takashi: *See*—
Inoue, Satoshi; and Miyamori, Takashi, 5,594,923, Cl. 395-842.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,594,515, Cl. 396-315.000.
Miyamoto, Takayuki: *See*—
Konishi, Yasuhiro; Miyamoto, Takayuki; Kajimoto, Takeshi; and Iwamoto, Hisashi, 5,594,704, Cl. 365-233.000.
Miyasaka, Masayo: *See*—
Akiyama, Takaaki; Koakutsu, Naohiko; Teradaira, Mitsuaki; Miyasaka, Masayo; and Hyonaga, Takuya, 5,594,653, Cl. 364-468.240.
Miyasaka, Yoshio, to Fuji Kihan Co., Ltd. Method of preventing abrasion at sliding portion of metal-product. 5,592,840, Cl. 72-53.000.
Miyata, Shigeru; Kondo, Noriaki; and Inagaki, Hiroshi, to NGK Spark Plug Co., Ltd. Method of detecting misfire of engine ignition system and device for carrying out the same. 5,592,926, Cl. 123-630.000.
Miyazaki, Hajime: *See*—
Go, Shintetsu; Takai, Hideyuki; Miyazaki, Hajime; Yamazaki, Itaru; Kanemaru, Tetsuro; and Iuchi, Kazushi, 5,593,805, Cl. 430-78.000.
Miyazaki, Junji: *See*—
Yoshioka, Nobuyuki; and Miyazaki, Junji, 5,593,801, Cl. 430-5.000.
Miyazaki, Kenji: *See*—
Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, 5,594,038, Cl. 521-154.000.
Miyazaki, Tsuyoshi; Nakajima, Hiromitsu; Ichikawa, Shuji; Koinuma, Yasumi; Matsuyama, Kazuo; Kamenosono, Koji; and Minoshima, Yoshihiro, to NOF Corporation. Alkylene sulfide group-containing prepolymer, polymerizable composition and optical material. 5,594,090, Cl. 528-265.000.
Miyazawa, Shintaro: *See*—
Mukaida, Masashi; Miyazawa, Shintaro; and Kobayashi, Junya, 5,593,950, Cl. 505-234.000.
Miyazawa, Takeo, to Studio Gen Inc. Image information compressing method, compressed image information recording medium and compressed image information reproducing apparatus. 5,594,503, Cl. 348-414.000.
Miyazawa, Takeo. Rapid sound data compression in code book creation. 5,594,833, Cl. 395-2.300.
Miyoshi, Masanori: *See*—
Sakai, Toshio; Watanabe, Norito; Miyoshi, Masanori; and Fukuda, Yoshiburni, 5,594,844, Cl. 395-127.000.
Mizrahi-Shalom, Ori K.: *See*—
Ostler, Farrell L.; Goodhue, Gregory K.; and Mizrahi-Shalom, Ori K., 5,594,913, Cl. 395-800.000.
Mizuno, Akio: *See*—
Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,594,502, Cl. 348-373.000.
Mizuno, Fumio: *See*—
Todokoro, Hideo; Takamoto, Kenji; Otaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, 5,594,245, Cl. 250-310.000.
Mizuno, Koki: *See*—
Suzuki, Yasutoshi; Yokoyama, Kenichi; Mizuno, Koki; Toyoda, Inao; and Tsuzuki, Yukio, 5,594,236, Cl. 250-214.100.
Mizuno, Moriaki: *See*—
Kaso, Susumu; Mizuno, Moriaki; Ogawa, Kazumi; and Nonaka, Kazuyuki, 5,594,382, Cl. 327-541.000.
Mizuno, Yoshiteru: *See*—
Kobashi, Masayuki; Koeda, Noriaki; Mizuno, Yoshiteru; and Okada, Sasoru, 5,593,893, Cl. 436-50.000.
Mizunoya, Hirohide: *See*—
Kitaori, Noriyuki; Yoshida, Osamu; and Mizunoya, Hirohide, 5,593,723, Cl. 427-127.000.
Mizushima, Shigeaki: *See*—
Hirata, Mitsuaki; Nammatsu, Akihiro; Watanabe, Noriko; Mizushima, Shigeaki; Makino, Seiji; Iwagoe, Hiroko; and Oyobe, Kei, 5,594,570, Cl. 349-129.000.
Mizuta, Hideki: *See*—
Naruse, Hiroshi; Mizuta, Hideki; Umeda, Shinichi; and Nagata, Teruyuki, 5,594,149, Cl. 548-316.400.
Mizuta, Muneo, to Jatco Corporation. Carrier structure for planetary gear system. 5,593,362, Cl. 475-348.000.
Mizutani, Tomozi; Yokota, Katsuyuki; Arita, Masahobu; and Kojyou, Hisashi, to Kobjin Co., Ltd. Mandrel for cooling. 5,593,703, Cl. 425-71.000.
MKS Japan, Inc.: *See*—
Suzuki, Isao; and Amano, Taisei, 5,594,666, Cl. 364-571.010.
Mobile Information Systems, Inc.: *See*—
Shah, Mukesh C.; and Prabhakaran, Sanjiv, 5,594,650, Cl. 364-449.100.
Mobility Plus, Inc.: *See*—
Jones, David L.; and Dresner, George L., Jr., 5,592,703, Cl. 4-667.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, 5,594,112, Cl. 530-391.300.
Mochizuki, Hiroshi: *See*—
Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, 5,594,112, Cl. 530-391.300.
Moesch, Jerry D.: *See*—
Agrawal, Om P.; and Moench, Jerry D., 5,594,365, Cl. 326-40.000.
Moench, Thomas R.; and Cone, Richard A. Device for acidic buffering and method for inactivation of pathogens. 5,592,949, Cl. 128-837.000.
Mogami, Tohru: *See*—

Horiuchi, Tadahiko; Ishigami, Takashi; Nakamura, Hiroyuki; Mogami, Tohru; Wakabayashi, Hitoshi; Kunio, Takemitsu; and Okumura, Koichiro, 5,593,923, Cl. 437-200.000.
Mogen International: *See*—
Van Ooijen, Albert J. J.; Rietveld, Krijn; Hoekema, Andreas; Pen, Jan; Sijmons, Peter C.; and Verwoerd, Teunis C., 5,593,963, Cl. 514-12.000.
Mohr, Donald C. Belt buckle alignment device. 5,592,718, Cl. 24-265.0BC.
Mohss, Anders. Casting mould. 5,593,623, Cl. 264-32.000.
Moll, Anton, to Linde Aktiengesellschaft. Process and apparatus for the recovery of pure argon. 5,592,833, Cl. 62-648.000.
Mollenauer, Kenneth H., to General Surgical Innovations, Inc. Methods and devices for harvesting blood vessels with balloons. 5,593,418, Cl. 606-192.000.
Molock, Frank F.: *See*—
Nuñez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., 5,594,043, Cl. 523-106.000.
Moloney, Simon F.: *See*—
Chouraki, Philippe J.; Moloney, Simon F.; Russell, Mark A.; and Preston, David R., 5,594,792, Cl. 379-269.000.
Molvig, Kim: *See*—
Chen, Hudong; Churchill, Peter C.; Iannucci, Robert A.; Molvig, Kim; Papadopoulos, Gregory; Remondi, Stephen A.; Teixeira, Christopher M.; and Traub, Kenneth R., 5,594,671, Cl. 364-578.000.
Molyneaux, David A.: *See*—
Henderson, Robert G.; Kristoff, James W.; and Molyneaux, David A., 5,594,339, Cl. 324-318.000.
Monarch Marking Systems, Inc.: *See*—
Christopher, Amy S.; Morrison, Donald A.; Roth, Mark W.; Watkins, Rex D.; Lamprecht, Dale E., Jr.; and Globig, James E., 5,594,838, Cl. 395-117.000.
Mondin, Myriam; Loth, Myriam; Broze, Guy; Mehreteab, Ammanuel; Thomas, Barbara; Adamy, Steven; and Bala, Frank, Jr., to Colgate-Palmolive Co. Cleaning composition in microemulsion, crystal or aqueous solution form based on ethoxylated polyhydric alcohols and option esters's thereof. 5,593,958, Cl. 510-417.000.
Mongelli, Nicola; Biasoli, Giovanni; Paio, Alfredo; Grandi, Maria; and Ciomei, Marina, to Farmitalia Carlo Erba S r l. New ureido derivatives of poly-4-amino-2-carboxy-1-methyl compounds. 5,593,976, Cl. 514-48.000.
Mongon, John: *See*—
Oswald, Robert; Mongon, John; and Weiss, Peggy, 5,593,901, Cl. 437-2.000.
Monnier, Jean-Luc: *See*—
Cutter, Larry; Gartner, Klaus W.; Butterweck, Dieter; Vuilleumier, P.; Monnier, Jean-Luc; and Sernet, P-A, 5,594,430, Cl. 340-825.310.
Monnier, Kenneth J.: *See*—
Houghtby, Timothy R.; Reineke, Roger W.; and Monnier, Kenneth J., 5,593,294, Cl. 418-55.100.
Monroe, Larry D., to Minnesota Mining and Manufacturing Company. Abrasive grain. 5,593,467, Cl. 51-309.000.
Monsanto Company: *See*—
Brown, Sherri M.; and Santino, Colleen G., 5,593,874, Cl. 435-172.300.
David, Donald J.; and Rotstein, Nestor A., 5,594,069, Cl. 525-61.000.
Yu, Jing-peir; Bheda, Mukesh; and Knorr, Raymond S., 5,593,751, Cl. 428-97.000.
Monta, Hiroki, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for selectively recording multiple television signals. 5,594,551, Cl. 386-92.000.
Monte, Paul A.: *See*—
Wiedeman, Robert A.; and Monte, Paul A., 5,594,780, Cl. 379-59.000.
Moon, Daniel F.: *See*—
Palermo, Robert J.; McNutt, Alan D.; and Moon, Daniel F., 5,594,917, Cl. 395-800.000.
Mooney, David T.: *See*—
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., 5,593,164, Cl. 277-9.500.
Moore, Arthur W.; and Dowell, Michael, to Advanced Ceramics Corporation. Interface coating for ceramic fibers. 5,593,728, Cl. 427-255.200.
Moore, Charles A.; and Kinton, Douglas J., to AT&T Global Information Solutions Company. Apparatus and method for mounting a terminal. 5,593,119, Cl. 248-185.100.
Moore, Richard O., Jr.: *See*—
Habib, Mohammad M.; Winslow, Philip L.; and Moore, Richard O., Jr., 5,593,570, Cl. 208-108.000.
Moore, Robert C.: *See*—
Devereux, William S.; Boehme, Michael H.; Linstrom, Lloyd; McKnight, Thomas R., Jr.; Moore, Robert C.; Meyer, John R.; Snow, Paul R.; and Grimm, Paul D., 5,594,454, Cl. 342-357.000.
Mora, Javier M.: *See*—
Beach, David L.; Carney, Michael J.; and Mora, Javier M., 5,593,931, Cl. 502-117.000.
Mordecai, Mark A.: *See*—
Blauer, Stephen J.; Blauer, Charles; and Mordecai, Mark A., 5,593,754, Cl. 428-131.000.
Morén, Lars G.; Wiss, Christer C. I.; and Lindmark, Magnus C. W., to Aktiebolaget Electrolux. Device for a vacuum cleaner and a method for cooling a motor. 5,592,716, Cl. 15-412.000.
Morgan, Carlton B.; Powers, Daniel; Cole, Clinton; Mydynski, Steven T.; and Leventhal, Michael J., to Heartstream, Inc. Defibrillator system using multiple external defibrillators and a communications network. 5,593,426, Cl. 607-5.000.
Morgan, Carlton B.: *See*—
Gliner, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,593,427, Cl. 607-7.000.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Binder. 5,593,243, Cl. 402-52.000.
Mori, Harumi: *See*—
Konuma, Toshimitsu; Nishi, Takeshi; Shimizu, Michio; Mori, Harumi; Moriya, Kouji; and Murakami, Satoshi, 5,594,569, Cl. 349-122.000.
Mori, Kazunori; Suzuki, Nobuyuki; and Sasamoto, Taturo, to Fujitsu Limited. Seek control system based upon a detected temperature of a positioning mechanism in a disk device. 5,594,603, Cl. 360-78.040.
Mori, Kazuo; Nishizawa, Kazunori; and Niki, Yoshifumi, to Kao Corporation. Fiber for clothing and production method therefor. 5,593,779, Cl. 428-375.000.
Mori, Kinji: *See*—
Kawano, Shigeki; Mori, Kinji; Kawano, Katsumi; Orimo, Masayuki; and Hirasawa, Shigeki, 5,594,872, Cl. 395-200.150.
Mori, Miki: *See*—
Fujii, Masashi; Uyama, Kiichiro; Tsuchiya, Takeo; Mori, Miki; Kouge, Hideo; and Suzuki, Hirokatsu, 5,594,768, Cl. 378-21.000.
Mori, Mitsuhiro: *See*—
Hara, Daiji; Adachi, Masahiro; and Mori, Mitsuhiro, 5,594,079, Cl. 526-119.000.
Mori, Takashi; and Komatsuda, Hideki, to Nikon Corporation. Optical integrator and projection exposure apparatus using the same. 5,594,526, Cl. 355-67.000.
Mori, Tetsuya; Murakami, Eiichi; and Shinonaga, Hirohiko, to Canon Kabushiki Kaisha. Position detecting method and projection exposure apparatus using the same. 5,594,549, Cl. 356-401.000.
Morikawa, Hiroshi: *See*—
Imai, Koji; Wakahoi, Toshiya; Adachi, Hiromitsu; Terada, Keiichi; Yamashita, Hiroaki; and Morikawa, Hiroshi, 5,593,577, Cl. 210-232.000.
Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Electronic control system for an engine and the method thereof. 5,592,919, Cl. 123-435.000.
Morin, John M., Jr.; Ternansky, Robert J.; Noreen, Rolf; and Lind, Tomas, to Medivir AB. Method for inhibition of HIV related viruses. 5,593,993, Cl. 514-247.000.
Morinaga, Youichi: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.
Morita, Taizo: *See*—
Terada, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, 5,594,930, Cl. 419-5.000.
Morita, Toshikazu, to Nohmi Bosai, Ltd. Fire alarm system. 5,594,417, Cl. 340-506.000.
Moritz, Jules G., III: *See*—
Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, 5,594,481, Cl. 347-65.000.
Moriwaki, Masamitsu: *See*—
Kitahata, Sumio; Nakano, Hirofumi; Washino, Tsutomu; and Moriwaki, Masamitsu, 5,593,869, Cl. 435-100.000.
Moriwaki, Minoru: *See*—
Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Manabe, Shunichi; Shindo, Masanori; Nakagawa, Takashi; and Nakamura, Takeshi, 5,593,988, Cl. 514-219.000.
Moriya, Kouji: *See*—
Konuma, Toshimitsu; Nishi, Takeshi; Shimizu, Michio; Mori, Harumi; Moriya, Kouji; and Murakami, Satoshi, 5,594,569, Cl. 349-122.000.
Moriyama, Jiro: *See*—
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Moroney, Paul: *See*—
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Morris, Alan: *See*—
Lynn, Michael; Morris, Alan; Perry, Richard A.; and Carper, June R., 5,592,989, Cl. 165-259.000.
Morris, John S.: *See*—
Westerfield, Curtis L.; Morris, John S.; and Agnew, Stephen F., 5,594,546, Cl. 356-246.000.
Morris, Macdonald S.: *See*—
Hubbell, Earl A.; Lipshutz, Robert J.; Morris, Macdonald S.; and Winkler, James L., 5,593,839, Cl. 435-6.000.
Morris, Mary M.: *See*—
Stewart, Mark T.; Morris, Mary M.; Di Domenico, Edward; and Keeney, Kenneth W., 5,593,550, Cl. 204-165.000.
Morrison, Donald A.: *See*—
Christopher, Amy S.; Morrison, Donald A.; Roth, Mark W.; Watkins, Rex D.; Lamprecht, Dale E., Jr.; and Globig, James E., 5,594,838, Cl. 395-117.000.
Morrison, Nigel A.; Eisman, John A.; and Kelly, Paul J., to Garvan Institute of Medical Research. Assessment of allelic variation in vitamin D receptor correlated to bone density or turnover. 5,593,833, Cl. 435-6.000.

Mortensen, Russell G.: *See*—
Jordan, Robert T., III; and Mortensen, Russell G., 5,592,893, Cl. 114-255.000.
Morton International, Inc.: *See*—
Dyer, David J.; and Rose, Larry D., 5,592,729, Cl. 29-464.000.
Ricks, Merle, 5,593,177, Cl. 280-731.000.
Walker, Kerry C.; and Parkinson, David W., 5,593,181, Cl. 280-741.000.
Morton, Michael D.: *See*—
Schlegel, Daniel K.; and Morton, Michael D., 5,593,264, Cl. 411-522.000.
Moschel, Charles, to Stowe Woodward Licensco, Inc. Roll having means for determining pressure distribution. 5,592,875, Cl. 100-99.000.
Motooka, Eiji: *See*—
Oku, Hiroshi; and Motooka, Eiji, 5,594,527, Cl. 355-75.000.
Motorola, Inc.: *See*—
Beasley, Jeff; Kirschner, Michael B.; Charles, Robert A.; and Hall, Sacha C., 5,593,604, Cl. 219-117.100.
Beckenbaugh, William M.; Lytle, William H.; and Berman, Bernard, 5,593,903, Cl. 437-8.000.
Bellin, Nathan P., 5,594,951, Cl. 455-89.000.
Branan, M. William, Jr., 5,594,579, Cl. 359-145.000.
Crisler, Kenneth J.; and Needham, Michael L., 5,594,738, Cl. 370-347.000.
Dasue, Edward C.; Kost, Donald R.; and Day, Lawrence J., 5,594,273, Cl. 257-620.000.
Davison, Michael J.; Dryer, Paul W.; and Wilson, Wendy K., 5,593,538, Cl. 156-637.100.
Gegner, Joel P., 5,594,635, Cl. 363-124.000.
Grube, Gary W.; Markison, Timothy W.; and Rybicki, Mathew A., 5,594,796, Cl. 380-25.000.
Grube, Gary W.; Naddell, Marc C.; and Shaughnessy, Mark L., 5,594,947, Cl. 455-54.200.
Jelley, Kevin W.; Valliath, George T.; and Chen, Alan G., 5,594,560, Cl. 359-15.000.
Lee, Chii-Chang; and Kawasaki, Hisao, 5,593,919, Cl. 437-190.000.
Mesich, Barry J.; and Akinniyi, Akingbade R., 5,594,946, Cl. 455-54.100.
Moyer, William C.; Gullette, James B.; and Pepe, Kara B., 5,594,880, Cl. 395-595.000.
O'Malley, Patrick J., 5,594,437, Cl. 341-67.000.
Peterson, Kenneth M.; Cutler, Victor H., Jr.; and Daviess, Gerald J., 5,594,940, Cl. 455-12.100.
Reber, William L.; and Perttunen, Cary D., 5,594,935, Cl. 455-2.000.
Rohani, Kamyar, 5,594,757, Cl. 375-344.000.
Schaupp, George W., Jr.; Sheley, Laura A.; and Dailey, Kirk W., 5,594,778, Cl. 379-58.000.
Thandiwe, Ilonga P., 5,594,319, Cl. 320-2.000.
Wang, Shay-Ping T., 5,594,834, Cl. 395-2.620.
Motoyama, Masaaki: *See*—
Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, 5,594,006, Cl. 514-312.000.
Mott, Andrew W.: *See*—
Kirk, Mark P.; and Mott, Andrew W., 5,594,143, Cl. 566-157.000.
Mouchel, Jacques H.: *See*—
Jourdain, Gerard E. A.; Lagrange, Jean-Paul; Mandet, Gerard M. F.; Mouchel, Jacques H.; Richard, Jean-Philippe E.; and Soligny, Marcel R., 5,593,278, Cl. 415-173.200.
Moulin, Jacques: *See*—
Denoncourt, Jeffrey P.; and Moulin, Jacques, 5,593,563, Cl. 204-524.000.
Moulton, Kern A.: *See*—
Fisher, Jim; Campbell, Bryant A., deceased; and Moulton, Kern A., 5,593,649, Cl. 422-305.000.
Moursund, Elizabeth A., to Microsoft Corporation. System and method for selecting free form objects associated with a selection region displayed by a computer. 5,594,847, Cl. 395-133.000.
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Mowery, Kenneth D.: *See*—
Cook, Thomas D.; Fairchild, Manuel R.; Mowery, Kenneth D.; and Scott, Jeffrey R., 5,594,649, Cl. 364-424.034.
Mowrey-McKee, Mary; Blizaik, Kenneth; and Stone, Ralph, to Allergan. Method and composition for disinfecting contact lenses. 5,593,637, Cl. 422-28.000.
Moyer, William C.; Gullette, James B.; and Pepe, Kara B., to Motorola Inc. System for executing a plurality of tasks within an instruction in different orders depending upon a conditional value. 5,594,880, Cl. 395-595.000.
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., to Ferrofluidics Corporation. Ferrofluidic seal centering ring. 5,593,164, Cl. 277-9.500.
MTD Products Inc.: *See*—
Weirich, Mike; and Vogt, Kurt E., 5,592,855, Cl. 74-371.000.
MTI, Inc.: *See*—
Spijkerman, Johannes; and Flamant, Hubert F., 5,594,615, Cl. 361-150.000.
MTU Motoren- und Turbinen-Union Muenchen GmbH: *See*—
Krueger, Wolfgang, 5,593,282, Cl. 416-219.00R.
Muccioli, Serge R. Y.: *See*—
Alary, Jean-Paul D.; Barbier, Gérard Y. G.; Delahaye, Corine G.; Havard, Jacques G. W. R.; Mackovic, Paul; Masse, Bruno R. H.; Merville, Didier; Mirville, Francois J.-P.; Muccioli, Serge R. Y.; Sandelis, Denis J. M.; and Stelter, Ralph M., 5,592,821, Cl. 60-751.000.
Muderlak, Kenneth J., to Trek Bicycle, Corp. Seat post bag clip. 5,593,126, Cl. 248-316.700.
Mueller, Wendey E.: *See*—
Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gudger, Keith H.; and Goegwer, Geoffrey S., 5,594,366, Cl. 326-41.000.
Muhammed, Mamoun; Wahlberg, Sverker; and Grenthe, Ingmar, to Sandvik AB. Method of preparing powders for hard materials. 5,594,929, Cl. 419-1.000.
Muijs Van de Moer, Wouter M.; and Rienks, Rieak. Occlusion assembly for sealing openings in blood vessels and a method for sealing openings in blood vessels. 5,593,422, Cl. 606-213.000.
Mukaida, Masashi; Miyazawa, Shintaro; and Kobayashi, Junya, to Nippon Telegraph & Telephone Corporation. Lattice matching super conducting device with a- and c- axes. 5,593,950, Cl. 505-234.000.
Mukoyama, Kenji; and Hayashi, Noriaki, to Makita Corporation. Nailing machine. 5,593,079, Cl. 227-8.000.
Mulaskey, Bernard F.: *See*—
Heyse, John V.; and Mulaskey, Bernard F., 5,593,571, Cl. 208-134.000.
Müller, Ingrid: *See*—
Escher, Claus; Dübal, Hans-Rolf; Harada, Takamasa; Hemmerling, Wolfgang; Illian, Gerhard; Müller, Ingrid; Murakami, Mikio; Ohlendorf, Dieter; and Wingen, Rainer, 5,594,575, Cl. 349-171.000.
Muller, Rolf H.: and Zhang, Shengtao, to University of California, The Regents of the. Ion implantation of highly corrosive electrolyte battery components. 5,593,798, Cl. 429-245.000.
Müller, Ulrich: *See*—
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.
Müller-Gliemann, Matthias: *See*—
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.
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Garn, Heinrich; Rasinger, Josef; and Mullner, Wolfgang, 5,594,458, Cl. 343-703.000.
Mumford, Neal A.; Chin, Cheng-Chi; Johns, Rolf M.; and Lloyd, Ben A., to Thiokol Corporation. Chemorheologically tailored matrix resin formulations containing anhydride curing agents. 5,593,770, Cl. 428-290.000.
Münch, Reimund: *See*—
Beaker, Gerhard; Treiber, Helmut; Klüter, Ulrich; Lorenz, Bernhard; and Münch, Reimund, 5,594,525, Cl. 355-29.000.
Mura, Hajime: *See*—
Murotani, Masahiro; Mura, Hajime; Takeda, Makoto; and Shibafuchi, Hiroshi, 5,594,146, Cl. 548-251.000.
Murai, Keiichi: *See*—
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Sueoka, Masabu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, 5,594,479, Cl. 347-45.000.
Muraishi, Takaya: *See*—
Murano, Jun'ichi; Muraishi, Takaya; Tanabe, Hiroshi; Karasawa, Kazunori; Nishido, Kazuhiro; and Komuro, Ichiro, 5,594,539, Cl. 399-316.000.
Murakami, Eiichi: *See*—
Mori, Tetsuya; Murakami, Eiichi; and Shinonaga, Hirohiko, 5,594,549, Cl. 356-401.000.
Murakami, Hiroaki: *See*—
Nishimura, Ryuhei; Murakami, Hiroaki; and Yamamura, Shinya, 5,592,817, Cl. 60-431.000.
Murakami Kaimeido Co., Ltd.: *See*—
Komatsu, Toru, 5,594,585, Cl. 359-512.000.
Murakami, Mikio: *See*—
Escher, Claus; Dübal, Hans-Rolf; Harada, Takamasa; Hemmerling, Wolfgang; Illian, Gerhard; Müller, Ingrid; Murakami, Mikio; Ohlendorf, Dieter; and Wingen, Rainer, 5,594,575, Cl. 349-171.000.
Murakami, Satoshi: *See*—
Konuma, Toshimitsu; Nishi, Takeshi; Shimizu, Michio; Mori, Harumi; Moriya, Kouji; and Murakami, Satoshi, 5,594,569, Cl. 349-122.000.
Murakawa, Masahiko: *See*—
Ryu, Tadamitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masasobu; Adachi, Takeshi; and Ichikawa, Naomi, 5,594,836, Cl. 395-62.000.
Muramatsu, Taroh: *See*—
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,594,188, Cl. 84-171.000.
Murano, Jun'ichi; Muraishi, Takaya; Tanabe, Hiroshi; Karasawa, Kazunori; Nishido, Kazuhiro; and Komuro, Ichiro, to Ricoh Company, Ltd. Paper guide device for image forming apparatus. 5,594,539, Cl. 399-316.000.
Murari, Bruno; and Libretti, Giuseppe, to SGS-Thomson Microelectronics, S.A. Semiconductor device package with shaped parts for direct coupling to standard connectors. 5,594,276, Cl. 257-693.000.
Murata Kikai Kabushiki Kaisha: *See*—

Nakade, Kazuhiko; Suzuki, Shujiro; and Hasegawa, Masakatsu, 5,592,849, Cl. 73-160.000.
Murata, Kiyohito; and Shindo, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Clutch device for an automatic transmission. 5,593,016, Cl. 192-85.0AA.
Murata, Kosei: *See*—
Ishii, Shigeru; Shinso, Yoshihide; Murata, Kosei; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, 5,593,364, Cl. 477-98.000.
Murata Manufacturing Co., Ltd.: *See*—
Daidai, Muneyuki; and Sumita, Manabu, 5,593,721, Cl. 427-100.000.
Hino, Taketoshi, 5,594,396, Cl. 333-189.000.
Murata, Mitsuhiro: *See*—
Makino, Kenya; Yamakawa, Yoshitaka; Murata, Mitsuhiro; and Hayashi, Toshio, 5,593,639, Cl. 422-102.000.
Murata, Takayuki: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,594,478, Cl. 347-41.000.
Murata, Yasuzo: *See*—
Sato, Morio; Abe, Yutaka; Takano, Jun; Ishii, Hirokazu; and Murata, Yasuzo, 5,594,562, Cl. 349-12.000.
Murotani, Masahiro; Mura, Hajime; Takeda, Makoto; and Shibafuchi, Hiroshi, to Nippon Carbide Kogyo Kabushiki Kaisha. Process for producing 5-aminotetrazole. 5,594,146, Cl. 548-251.000.
Murphy, Daniel J.: *See*—
Louwagie, Dominic J.; Carolus, Steven L.; Field, John M.; Murphy, Daniel J.; Brown, Jeffery O.; and Dewey, James D., 5,594,347, Cl. 324-539.000.
Murphy, Edmond J., to Lucent Technologies Inc. Digital optical switch and modulator and a method for digital optical switching and modulation. 5,594,818, Cl. 385-8.000.
Murphy, Patrick J.: *See*—
Marcou, Jean-Claude; Packard, Thomas N.; Findley, James K.; and Murphy, Patrick J., 5,594,398, Cl. 335-18.000.
Murray, Brent W.; and Faludy, Thomas G., to Carefree/Scott Fetzer Company. Stabilizing clamp for canopy of a retractable awning. 5,592,982, Cl. 160-67.000.
Murray, Melissa L.: *See*—
Johnson, Neil A.; Raber, Thomas R.; Hibbs, Louis E., Jr.; Murray, Melissa L.; and Benz, Mark G., 5,593,506, Cl. 134-9.000.
Murray, Stephen G.; and Smith, Joseph C., to Allison Engine Company, Inc. Circumferential flow channel for carbon seal runner cooling. 5,593,165, Cl. 277-22.000.
Muto, Yukiyoshi, to Brother Kogyo Kabushiki Kaisha. Embroidery data processing apparatus and process of producing an embroidery product. 5,592,891, Cl. 112-475.190.
Mutoh, Naoki: *See*—
Koyama, Kazushige; Mutoh, Naoki; and Katsumata, Masaaki, 5,594,406, Cl. 338-21.000.
Mycogen Corporation: *See*—
Thompson, Mark; Schwab, George E.; Schaepf, H. Ernest; and Stockhoff, Brian, 5,593,881, Cl. 435-240.100.
Mydynski, Steven T.: *See*—
Morgan, Carlton B.; Powers, Daniel; Cole, Clinton; Mydynski, Steven T.; and Leventhal, Michael J., 5,593,426, Cl. 607-5.000.
Myers, Albert: *See*—
Carreno, Diether E.; Myers, Albert; Palmer, Gene D.; Caruso, Philip M.; Wilson, Ian D.; and Hemsworth, Martin C., 5,593,274, Cl. 415-115.000.
Myers, Allen. Method and apparatus for baseline drift correction for a sensor. 5,594,667, Cl. 364-571.010.
Myers, Dean E.: *See*—
Mathieu, Raymond J.; Mellott, James F.; and Myers, Dean E., 5,593,197, Cl. 294-19.100.
Myers, Garry L.: *See*—
Fuisz, Richard C.; Battist, Gerald E.; and Myers, Garry L., 5,593,502, Cl. 127-30.000.
Myers, Roy T., Jr.: *See*—
Wakeman, Larry N.; Myers, Roy T., Jr.; and Lee, Wesley C., 5,594,702, Cl. 365-230.050.
Mygatt, Leonard T. Container lid/closure with printed closure insert. 5,592,766, Cl. 40-307.000.
MyriadLase, Inc.: *See*—
Costello, Anthony J.; Gardetto, William W.; and Everett, Royice B., 5,593,404, Cl. 606-15.000.
N.J. Phillips Pty. Limited: *See*—
Phillips, Ian R., 5,593,388, Cl. 604-135.000.
N.V. Bekaert S.A.: *See*—
Berghmans, Joost; De Waegenaere, Johan; Klingeleers, Pierre; and Van Giel, Frans, 5,592,806, Cl. 57-212.000.
Nabetame, Takeo: *See*—
Toki, Yusuke; Hiraoka, Masabu; Yamagishi, Ichiro; Osuki, Hiroyuki; Ban, Tatsuya; Hada, Tetsuro; Nabetame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.
Nabco Limited: *See*—
Kikutani, Isao, 5,593,288, Cl. 417-435.000.
NACAM: *See*—
Fouquet, Jean-Michel; and Duval, Benoit, 5,593,183, Cl. 280-775.000.
Nace, Timothy P.: *See*—
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,593,548, Cl. 203-29.000.
Naddell, Marc C.: *See*—
Grube, Gary W.; Naddell, Marc C.; and Shaughnessy, Mark L., 5,594,947, Cl. 455-54.200.
Nadeau, James G.: *See*—
Walker, G. Terrance; Nadeau, James G.; and Liaw, C. Preston, 5,593,867, Cl. 435-91.200.
Nagai, Takaaki, to TOA Medical Electronics Co., Ltd. Pipet washing apparatus. 5,592,959, Cl. 134-169.00R.
Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Thermal recording apparatus with a thermal head including energizing time controlling. 5,594,489, Cl. 347-211.000.
Nagano, Shuichi; and Tomizawa, Kenji, to Sony Corporation. Reproducing device having index search function and access method therefor. 5,594,709, Cl. 369-32.000.
Nagao, Mitsuhiro: *See*—
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.
Nagasaka, Takashi: *See*—
Otani, Yuji; Nagasaka, Takashi; and Saitou, Mitsuhiro, 5,593,722, Cl. 427-101.000.
Nagashima, Masasumi: *See*—
Nozaki, Mineo; Asakura, Osamu; Uchikata, Yoshio; and Nagashima, Masasumi, 5,593,237, Cl. 400-208.000.
Nagashima, Toshiaki: *See*—
Kitayama, Kunihiko; Nagashima, Toshiaki; and Oyama, Kiyoshi, 5,593,068, Cl. 222-167.000.
Nagata, Atsushi: *See*—
Shiga, Ichizou; Nagata, Atsushi; Koyama, Tooru; and Sakane, Katsunobu, 5,593,178, Cl. 280-731.000.
Nagata, Teruyuki; Okazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, to Mitsui Toatsu Chemicals, Inc. Plastic lenses having a high-refractive index, process for the preparation thereof and casting polymerization process for preparing sulfur containing urethane resin lens and lens prepared thereby. 5,594,088, Cl. 528-77.000.
Nagata, Teruyuki: *See*—
Naruse, Hiroshi; Mizuta, Hideki; Umeda, Shinichi; and Nagata, Teruyuki, 5,594,149, Cl. 548-316.400.
Naggert, Jürgen K.; and Leiter, Edward H., to Jackson Laboratory, The. Clinical disorders associated with carboxypeptidase E mutation. 5,593,837, Cl. 435-6.000.
Nagin, Kenneth: *See*—
Cohn, Oded; Nagin, Kenneth; Novick, Yoram; and Winokur, Alex, 5,594,900, Cl. 395-600.000.
Nagira, Jiro: *See*—
Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Aizawa, Fumio, 5,594,529, Cl. 399-8.000.
Nagorski, Boguslaw A.: *See*—
Weldon, David E.; Nagorski, Boguslaw A.; and Talich, Homayoun, 5,593,344, Cl. 451-296.000.
Nagoshi, Shigeyasu: *See*—
Matsubara, Miyuki; Hirabayashi, Hiromitsu; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,594,478, Cl. 347-41.000.
Nair, Madhavan G.; and Liu, Li. Non-classical folate analogue inhibitors of glycinamide ribonucleotide formyltransferase (GARFT). 5,593,999, Cl. 514-260.000.
Naito, Sadaaki: *See*—
Suzuki, Shigehiko; Yasui, Itsuo; and Naito, Sadaaki, 5,593,523, Cl. 152-527.000.
Nakade, Kazuhiko; Suzuki, Shujiro; and Hasegawa, Masakatsu, to Murata Kikai Kabushiki Kaisha. Yarn uneveness information analyzing apparatus. 5,592,849, Cl. 73-160.000.
Nakagawa, Kazunari: *See*—
Ohtake, Masatoshi; Totori, Takeshi; Nakagawa, Kazunari; Hamamoto, Nobuo; Ohkawa, Takehiro; and Kinebuti, Yutaka, 5,594,680, Cl. 365-63.000.
Nakagawa, Takashi: *See*—
Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Manabe, Shunichi; Shindo, Masasori; Nakagawa, Takashi; and Nakamura, Takeshi, 5,593,988, Cl. 514-219.000.
Nakagoshi, Juaji; Higuchi, Tatsuo; Kato, Shinichi; Ando, Toshimitsu; and Iwasaki, Masaaki, to Hitachi, Ltd. Processor unit for a parallel processor system discards a received packet when a reception buffer has insufficient space for storing the packet. 5,594,868, Cl. 395-200.160.
Nakahara, Ichirou, to Alps Electric Co., Ltd. Transmission and reception system and signal generation method for same. 5,594,429, Cl. 340-825.310.
Nakajima, Hiromitsu: *See*—
Miyazaki, Tsuyoshi; Nakajima, Hiromitsu; Ichikawa, Shuji; Koisuma, Yasumi; Matsuyama, Kazuo; Kameonono, Koji; and Minorikima, Yoshihiro, 5,594,090, Cl. 528-265.000.
Nakajima, Hisashi, to Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. Testing apparatus and connection method for the testing apparatus. 5,594,357, Cl. 324-758.000.

Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, to Zexel Corporation; and Tama Manufacturing Co., Ltd. Scroll type compressor. 5,593,297, Cl. 418-88.000.

Nakajima, Shigeyuki: *See*—
Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, 5,594,397, Cl. 333-202.000.

Nakaki, Yoshiyuki: *See*—
Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, 5,593,791, Cl. 428-694.0ML.

Nakakubo, Hideaki: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.

Nakamichi Corporation: *See*—
Nakamichi, Niro, 5,594,710, Cl. 369-36.000.

Nakamichi, Niro, to Nakamichi Corporation. Disc player with a disc-securing mechanism. 5,594,710, Cl. 369-36.000.

Nakamura, Fumiko: *See*—
Ueno, Hiroaki; Oe, Takayuki; Suehiro, Ichiro; and Nakamura, Fumiko, 5,594,016. Cl. 514-369.000.

Nakamura, Hiroyuki: *See*—
Horiuchi, Tadahiko; Ishigami, Takashi; Nakamura, Hiroyuki; Mogami, Tohru; Wakabayashi, Hitoshi; Kunio, Takemitsu; and Okumura, Koichiro, 5,593,923, Cl. 437-200.000.

Nakamura, Katsutoshi: *See*—
Hanyu, Yukio; Onuma, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuto; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Nakamura, Masanori: *See*—
Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, 5,594,038, Cl. 521-154.000.

Nakamura, Naoto: *See*—
Mitsutake, Hideaki; Nakamura, Naoto; and Sano, Yoshihisa, 5,594,296, Cl. 313-309.000.

Nakamura, Osamu: *See*—
Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.

Nakamura, Shinichi; Taki guchi, Takao; Iwaki, Takashi; Togano, Takeshi; and Kosaka, Yoko, to Canon Kabushiki Kaisha. Optically inactive, mesomorphic compound, liquid crystal composition containing the compound, liquid crystal device using the composition, liquid crystal apparatus and display method. 5,593,616, Cl. 252-299.610.

Nakamura, Takao; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Superconducting device having a superconducting channel formed of oxide superconductor material and method for manufacturing the same. 5,594,257, Cl. 257-39.000.

Nakamura, Takeshi: *See*—
Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Manabe, Shunichi; Shindo, Masanori; Nakagawa, Takashi; and Nakamura, Takeshi, 5,593,988, Cl. 514-219.000.

Nakamura, Toshihiro: *See*—
Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.

Nakano, Hirofumi: *See*—
Kitahara, Sumio; Nakano, Hirofumi; Washino, Tsutomu; and Moriwaki, Masamitsu, 5,593,869, Cl. 435-100.000.

Nakano, Hirotaka: *See*—
Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, 5,594,736, Cl. 370-474.000.

Nakano, Toshihiro: *See*—
Kimura, Haruo; Miyake, Isao; Nakano, Toshihiro; and Nemoto, Yukihiro, 5,593,149, Cl. 271-3.010.

Nakashima, Masato: *See*—
Sato, Noriko; Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; and Nakashima, Masato, 5,594,559, Cl. 359-8.000.

Nakashima, Tatsushi; Furuhashi, Tsutomu; Kano, Hiroyuki; Yamamoto, Kazuo; and Inoue, Hiroshi, to Nippondenso Co., Ltd. Pressure supply device. 5,592,968, Cl. 137-561.00A.

Nakashima, Teturoo: *See*—
Ikeda, Masao; and Nakashima, Teturoo, 5,594,198, Cl. 399-281.000.

Nakashima, Yoshiyasu: *See*—
Kuc, Roman B.; Szinger, James J.; Hayashi, Takehiko; Goto, Takao; Nakashima, Yoshiyasu; Shimura, Takaki; and Kawabe, Kenji, 5,594,849, Cl. 395-135.000.

Nakatani, Toshifumi: *See*—
Tsushima, Noboru; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, 5,594,488, Cl. 347-208.000.

Nakaura, Tohru, to Sumitomo Electric Industries, Ltd. Antiskid control apparatus. 5,594,648, Cl. 364-426.010.

Nakaya, Tomoki: *See*—
Otashima, Kenichi; Ishikawa, Jun; Kudoh, Koji; and Nakaya, Tomoki, 5,594,787, Cl. 379-114.000.

Nakayama, Eiichiro: *See*—
Kagawa, Haruo; Nakayama, Eiichiro; and Yoshimura, Fumihiko, 5,593,592, Cl. 210-611.000.

Nakayama, Fujikazu: *See*—
Sugimoto, Yuji; Nakayama, Fujikazu; and Ito, Keizo, 5,594,542, Cl. 399-402.000.

Nakazato, Ikuo: *See*—
Takada, Hideaki; Aihara, Takao; and Nakazato, Ikuo, 5,593,280, Cl. 416-44.000.

Nalco Chemical Company: *See*—
Lemke, Harald K., 5,593,568, Cl. 208-48.0AA.
Weisgrove, Robert L.; Balakrishnan, Krishna; and Bruehl, Richard E., 5,593,850, Cl. 435-7.920.

Nam, Ghil S.: *See*—
Kim, Joong H.; Kim, Sung H.; Nam, Ghil S.; Kim, Ha Y.; Son, Hyen J.; and Jang, Eun S., 5,593,985, Cl. 514-203.000.

Nam, Jong G., to Hyubdai Electronics Industries Co., Ltd. Bootstrap circuit and data output buffer having the bootstrap circuit. 5,594,380, Cl. 327-390.000.

Nammatsu, Akihiro: *See*—
Hirata, Mitsuaki; Nammatsu, Akihiro; Watanabe, Noriko; Mizushima, Shigeaki; Makino, Seiji; Iwagoe, Hiroko; and Oyobe, Kei, 5,594,570, Cl. 349-129.000.

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Openchowski, Richard A., 5,593,051, Cl. 213-47.000.

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Young, Robson T., Jr.; and Thomas, Roger L., 5,592,885, Cl. 108-51.300.

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Darmawan, Johan A., 5,594,268, Cl. 257-370.000.
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Taylor, Carl J.; Patterson, Michael W.; and Force, Gordon, 5,594,204, Cl. 174-52.200.
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Oparin, Mikhail I.; Borisov, Mikhail T.; and Alexeev, Georgy M., 5,594,831, Cl. 392-421.000.

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Andoh, Mitsuru, 5,594,901, Cl. 395-674.000.
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Hayashi, Kazuhiko; Yamamoto, Hidefumi; Fujikata, Junichi; and Ishihara, Kunihiko, 5,594,933, Cl. 428-546.000.
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Ikeda, Yasuo, 5,593,741, Cl. 427-579.000.
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Kagawa, Shigeru, 5,594,387, Cl. 330-259.000.
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Matsuki, Junichi, 5,594,272, Cl. 257-579.000.
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Ohoka, Tsukasa, 5,593,915, Cl. 437-62.000.
Shibuya, Norio; and Oura, Norihiro, 5,593,313, Cl. 439-373.000.
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Suetaki, Kenji, 5,594,274, Cl. 257-667.000.
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Foster, Donald D.; and Nelson, Philip L., 5,593,093, Cl. 239-333.000.

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Tannenbaum, Joseph; and Pasternak, Eli S., 5,593,381, Cl. 601-93.000.

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Crowther, Gordon H., deceased; and Younce, by Donn, executor, 5,593,432, Cl. 607-46.000.

New Brunswick Scientific Co., Inc.: *See*—
Tannenbaum, Myron, 5,593,228, Cl. 366-209.000.

New, Darren H.: *See*—
Cruz, Gil C.; Hill, Ralph D.; Judd, Thomas H.; New, Darren H.; and Rosenberg, Jonathan, 5,594,911, Cl. 395-800.000.

New Venture Gear, Inc.: *See*—
Frost, Barry L., 5,593,358, Cl. 475-218.000.
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Krall, Jack; and Plyler, Rodger, 5,594,931, Cl. 419-5.000.

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Baldeschwieler, John D., 5,593,688, Cl. 424-450.000.

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Hori, Yoshiaki; and Akitsu, Yasuo, 5,593,471, Cl. 55-302.000.

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Machida, Minoru; Yamada, Toshio; Ichikawa, Yukihito; and Kasai, Yoshiyuki, 5,592,925, Cl. 123-568.000.
Sato, Ritsu, 5,593,930, Cl. 501-141.000.
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Miyata, Shigeru; Kondo, Noriaki; and Inagaki, Hiroshi, 5,592,926, Cl. 123-630.000.

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Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamouche, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Bellefeuille, Bernard, deceased, 5,593,970, Cl. 514-34.000.

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Hoshino, Hidekazu; and Kurihara, Tatsuya, 5,594,229, Cl. 235-449.000.

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Thomson, Donald W.; and Nichols, Frank B., 5,593,709, Cl. 425-454.000.

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Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 5,594,473, Cl. 345-199.000.

Nicolet Instrument Corporation: *See*—
Berchin, Gregory J., 5,594,655, Cl. 364-487.000.

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Nielsen, Larry E.; and Sgrignoli, Gary J., to Zenith Electronics Corporation. Detection of co-channel interference in digital television signals. 5,594,496, Cl. 348-21.000.

Nielsen, Ralph B.; Rosiek, Thomas A.; Bates, David F.; Honan, James S.; and Yau, Hwei-Ling, to Eastman Kodak Company. Method for forming photographic dispersions comprising loaded latex polymers. 5,594,047, Cl. 523-315.000.

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Nihei, Ryo: *See*—
Koike, Yasuhiro; and Nihei, Ryo, 5,593,621, Cl. 264-1.290.

Nihon Bunko Kabushiki Kaisha: *See*—
Saito, Muneo; Kurosu, Yasuyuki; and Sasaki, Toru, 5,594,545, Cl. 356-246.000.

Nihon Plast Co., Ltd.: *See*—
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Niikura, Takeji: *See*—
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Nike, Inc.: *See*—
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Nike International, Ltd.: *See*—
Pearce, Tony M., 5,592,706, Cl. 5-654.000.

Niki, Yoshifumi: *See*—
Mori, Kazuo; Nishizawa, Kazunori; and Niki, Yoshifumi, 5,593,779, Cl. 428-375.000.

Nikken Kosakusho Works Ltd.: *See*—
Matsumoto, Masakazu; Taguchi, Masahiro; and Yamamoto, Yusaku, 5,593,258, Cl. 409-234.000.

Nikko Kogyo Kabushiki Kaisha: *See*—
Katsuura, Nobuo; and Dei, Takashi, 5,593,046, Cl. 211-41.000.

Nikon Corporation: *See*—
Hagiuda, Nobuyoshi; Matsui, Hideki; Sakamoto, Hiroshi; and Takayanagi, Ryotaro, 5,594,314, Cl. 320-2.000.
Hasuda, Masanori; and Matsubara, Takashi, 5,594,521, Cl. 396-453.000.
Komatsuda, Hideki; Hirose, Hideo; and Kikuchi, Tetsuo, 5,594,587, Cl. 359-619.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,594,515, Cl. 396-315.000.
Mori, Takashi; and Komatsuda, Hideki, 5,594,526, Cl. 355-67.000.
Ogasawara, Akira, 5,594,715, Cl. 369-212.000.
Ohshita, Koichi, 5,594,518, Cl. 396-133.000.
Sasagaki, Nobuaki; and Saegusa, Takashi, 5,594,524, Cl. 396-287.000.
Yamano, Shozo, 5,594,928, Cl. 396-95.000.

Niles, Andrew L.; and Hauk-Freadacho, Mary, to Promega Corporation. Tryptase polyclonal antibody and purification method for use in human tryptase immunoassay. 5,594,116, Cl. 530-413.000.

Niles, Leslie T.: *See*—
Kopec, Gary E.; Chou, Philip A.; and Niles, Leslie T., 5,594,809, Cl. 382-161.000.

Nilsen, David N.; Galvan, Gloria J.; Hundley, Gary L.; and Wright, John B., to United States of America, America. Process for removing sulfate anions from waste water. 5,593,593, Cl. 210-638.000.

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Ninomiya, Ken: *See*—
Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, 5,594,246, Cl. 250-310.000.
Todokoro, Hideo; Takamoto, Kenji; Otaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, 5,594,245, Cl. 250-310.000.

Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Murotani, Masahiro; Mura, Hajime; Takeda, Makoto; and Shibafuchi, Hiroshi, 5,594,146, Cl. 548-251.000.

Nippon Oil Co., Ltd.: *See*—
Tajima, Yoshio; Katsuka, Naoki; Numao, Yosuke; Seki, Takashi; and Matsuura, Kazuo, 5,594,082, Cl. 526-160.000.

Nippon Paint Co., Ltd.: *See*—
Yamada, Mitsuo; and Kobata, Yusaku, 5,594,049, Cl. 523-415.000.

Nippon Steel Corporation: *See*—
Sato, Yasuo, 5,594,688, Cl. 365-185.100.
Uchiyama, Tomoyuki, 5,594,278, Cl. 257-751.000.

Nippon Telegraph and Telephone Corporation: *See*—
Akata, Masao; Miura, Takao; Ogawa, Takeshi; Doi, Yukihiro; Higashi, Isao; and Imagawa, Hitoshi, 5,594,724, Cl. 370-469.000.
Douseki, Takakuni, 5,594,371, Cl. 326-119.000.
Hori, Toshikazu; and Cho, Keizo, 5,594,455, Cl. 343-700.0MS.
Mukaida, Masashi; Miyazawa, Shintaro; and Kobayashi, Junya, 5,593,950, Cl. 505-234.000.

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Koshiba, Yoshikazu; Kuroda, Yasuhide; Aoki, Yukio; Minakata, Tsuyoshi; and Iizuka, Masaru, 5,593,646, Cl. 422-177.000.

Nippondenso Co., Ltd.: *See*—
Asai, Jirou; Imani, Yuichi; and Ito, Akira, 5,593,363, Cl. 477-74.000.
Baba, Norimasa; and Yamamoto, Michiyasu, 5,592,830, Cl. 62-509.000.
Nakashima, Tatsushi; Furuhashi, Tsutomu; Kano, Hiroyuki; Yamamoto, Kazuo; and Inoue, Hiroshi, 5,592,968, Cl. 137-561.00A.
Otani, Yuji; Nagasaka, Takashi; and Saitou, Mitsuhiro, 5,593,722, Cl. 427-101.000.
Sugino, Hiroshi; Hotta, Yasumichi; Fujii, Namitsugu; Shibata, Masahiro; and Sano, Hiromi, 5,593,558, Cl. 204-429.000.
Suzuki, Yasutoshi; Yokoyama, Kenichi; Mizuno, Koki; Toyoda, Inao; and Tsuzuki, Yukio, 5,594,236, Cl. 250-214.100.
Urya, Nobuhiko; and Hayashi, Nobuyuki, 5,592,912, Cl. 123-179.250.

Niro Holding A/S: *See*—
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Nishi, Takeshi: *See*—
Kosuma, Toshimitsu; Nishi, Takeshi; Shimizu, Michio; Mori, Harumi; Moriya, Kouji; and Murakami, Satoshi, 5,594,569, Cl. 349-122.000.

Nishida, Takashi: *See*—
Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, 5,594,246, Cl. 250-310.000.

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Murano, Jun'ichi; Muraishi, Takaya; Tanabe, Hiroshi; Karasawa, Kazsaori; Nishido, Kazuhiro; and Komuro, Ichiro, 5,594,539, Cl. 399-316.000.

Nishigaya, Takashi; Hakata, Akira; Itoh, Naoto; Ide, Toshihiro; and Hirayama, Masahiro, to Fujitsu Limited. Custom service control system. 5,594,902, Cl. 395-672.000.

Nishimoto, Norihito: *See*—
Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihito; Sato, Yoshiharu; Abe, Shuuji; and Soumiya, Toshio, 5,594,717, Cl. 370-232.000.

Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, to Mazda Motor Corporation. Cruise controller for vehicles. 5,594,645, Cl. 364-426.044.

Nishiumra, Ryuhei; Murakami, Hiroaki; and Yamamura, Shinya, to Shimadzu Corporation. Forklift controller. 5,592,817, Cl. 60-431.000.

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Komma, Yoshiaki; Nishino, Seiji; Kato, Makoto; and Matsuda, Kaoru, 5,594,713, Cl. 369-112.000.

Nishiyama, Ryuji; Fukuzo, Akira; Harakawa, Koji; and Miura, Makoto, to Matsushita Electric Industrial Co., Ltd.; and Tomoegawa Paper Co., Ltd. Two-component developer and image-forming method for which the developer is adapted. 5,593,806, Cl. 430-106.600.

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Mori, Kazuo; Nishizawa, Kazunori; and Niki, Yoshifumi, 5,593,779, Cl. 428-375.000.

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Ishii, Shigeru; Shinso, Yoshihide; Murata, Kosei; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, 5,593,364, Cl. 477-98.000.
Shinohara, Toshiro, 5,594,172, Cl. 73-514.330.

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Nisus Corp.: *See*—
Galyon, Stanley D., 5,592,774, Cl. 43-124.000.

NIT Mobile Communications Network Inc.: *See*—
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Nivens, Kirk N., to Forma Block, Inc. Trench structure. 5,592,784, Cl. 52-20.000.

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Yokouchi, Kisbio; Kamezaki, Hiroshi; Wakamura, Masato; Kamehara, Nobuo; and Niwa, Koichi, 5,593,526, Cl. 156-89.000.

Nobelpharma AB: *See*—
Svensson, Thomas; Rangert, Bo; Jansson, Kerstin; and Jörgensen, Einar, 5,593,444, Cl. 623-16.000.

Nobutake Enterprises, Inc.: *See*—
Otake, Ben, 5,593,159, Cl. 463-47.200.

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NOF Corporation: *See*—
Miyazaki, Tsuyoshi; Nakajima, Hiromitsu; Ichikawa, Shuji; Koinuma, Yasumi; Matsuyama, Kazuo; Kamenosono, Koji; and Minoshima, Yoshihiro, 5,594,090, Cl. 528-265.000.
Obara, Nobutoshi; Shizuka, Nobuhiko; and Takahashi, Fujio, 5,593,957, Cl. 508-501.000.

Noguchi, Yukio, to Fuji Photo Optical Co., Ltd. Photographic camera. 5,594,516, Cl. 396-418.000.

Nohmi Bosai, Ltd.: *See*—
Morita, Toshikazu, 5,594,417, Cl. 340-506.000.

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Noyama, Hideo; Kato, Makoto; Nohmi, Makoto; and Takizawa, Yuri, 5,594,850, Cl. 395-135.000.

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Alanärä, Seppo; and Berson, Thomas, 5,594,797, Cl. 380-28.000.

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Kuszmann, Martin; and Rommel, Erwin, 5,593,057, Cl. 220-2.30A.

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Talarmo, Reino; and Brockman, Pertti, 5,594,948, Cl. 455-54.200.

Nolan, Shari J.: *See*—
Harris, George W., Jr.; and Nolan, Shari J., 5,594,870, Cl. 395-200.200.

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Tanaka, Takaaki; Sato, Yuzuru; and Nomura, Hiroaki, 5,594,464, Cl. 345-94.000.

Nomura, Ichiro: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Nomura, Noboru: *See*—
Kubota, Masafumi; Nomura, Noboru; and Tamaki, Tokuhiko, 5,593,539, Cl. 156-643.100.

Nomura, Syuaji: *See*—
Itoh, Noriie; Kunihara, Mineo; Kushida, Hiroshi; McWhorter, William W.; Nomura, Syuaji; Ozawa, Kazunori; Taniguchi, Mikio; and Tsuzuki, Kazuo, 5,594,144, Cl. 548-166.000.

Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, to Fujitsu Limited; and Fujitsu VLSI Limited. DRAM with reduced electric power consumption. 5,594,699, Cl. 365-226.000.

Nonaka, Kazuyuki: *See*—
Kato, Susumu; Mizuno, Moriaki; Ogawa, Kazumi; and Nonaka, Kazuyuki, 5,594,382, Cl. 327-541.000.

Nor, Jiri K.; and Soltys, Josef V., to Norvik Traction Inc. Traction battery charging with inductive coupling. 5,594,318, Cl. 320-2.000.

Norand Corporation: *See*—
Waite, James E.; and Wolf, Roger L., 5,594,230, Cl. 235-462.000.

Norco, Inc.: *See*—
Parsons, John D., 5,592,852, Cl. 74-57.000.

Nordica S.p.A.: *See*—
Foscaro, Giancarlo; and Battistella, Mirco, 5,592,722, Cl. 24-68.0SK.

Noreen, Rolf: *See*—
Morin, John M., Jr.; Ternansky, Robert J.; Noreen, Rolf; and Lind, Tomas, 5,593,993, Cl. 514-247.000.

Noritsu Koki Co., Ltd.: *See*—

Otu, Hiroshi; and Motooka, Eiji, 5,594,527, Cl. 355-75.000.

Norm A.M.C. AG: *See*—
Rickert, Hubert, 5,593,348, Cl. 454-365.000.

Norman, Don T.; and Marney, Gary L. Apparatus for producing improved carbon blacks. 5,593,644, Cl. 422-156.000.

Norris, Elwood G.; and O'Bryant, David W., to Patriot Scientific Corporation. Gas tube RF antenna. 5,594,456, Cl. 343-701.000.

Norris, Jeffrey A.: *See*—
Carlson, Gary; and Norris, Jeffrey A., 5,594,375, Cl. 327-129.000.

North Carolina State University: *See*—
Klasenhammer, Todd R.; Sing, Wesley D.; and Hill, Colin J., 5,593,885, Cl. 435-252.300.

Northam, William J.; Barry, John D.; and Heberling, Richard L., to Viratest International, Inc. Dual-state nutritional medium for the transport and maintenance of cells. 5,593,880, Cl. 435-240.100.

Northeastern University: *See*—
Giessen, Bill C.; Gokhale, Sunil V.; and Marchev, Krassimir G., 5,593,514, Cl. 148-403.000.

Northern Telecom Limited: *See*—
Byers, Russell F.; Duchaine, Joseph M. G.; Schuett, Michael L.; and Grootenboer, Cornelius J., 5,594,893, Cl. 395-557.000.

Northrop Grumman Corporation: *See*—
Diaz, Rodolfo E.; Squires, Mark C.; and Miller, Michael C., 5,594,218, Cl. 181-295.000.
Schauder, Colin D., 5,594,636, Cl. 363-160.000.

Northrup III, William F., to Segmed, Inc. Apparatus and method for reducing and stabilizing the circumference of a vascular structure. 5,593,424, Cl. 606-232.000.

Northwestern University: *See*—
Potempa, Lawrence A.; and Anderson, Byron E., 5,593,897, Cl. 436-507.000.

Nortman, Brian K.: *See*—
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wea Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.

Norton, Ian T.: *See*—
Appelqvist, Ingrid A.; Brown, Charles R.; and Norton, Ian T., 5,593,716, Cl. 426-589.000.

Norvik Traction Inc.: *See*—
Nor, Jiri K.; and Soltys, Josef V., 5,594,318, Cl. 320-2.000.

Nosco, Jacques: *See*—
Stone, Neil T.; and Nosco, Jacques, 5,594,513, Cl. 352-6.000.

Nose, Noriyuki: *See*—
Fujioka, Hidehiko; Nose, Noriyuki; Ebisuma, Ryuichi; Hara, Shinichi; and Maehara, Hiroshi, 5,593,800, Cl. 430-5.000.

Noskier, Richard W.; Michalchuk, Joey J.; Bauder, Richard C.; and Ragland, Frank R., Jr., to Thomson Consumer Electronics, Inc. Color picture tube having a tensioned mask and compliant support frame assembly. 5,594,300, Cl. 313-402.000.

Notani, Hiromi: *See*—
Kondoh, Harufusa; and Notani, Hiromi, 5,594,392, Cl. 331-57.000.

Nourry, Daniel; Jego, Gérard; and Thierry, Jean-Pierre, to Schneider Electric SA. Coupling device for electrical trunking. 5,594,212, Cl. 174-88.00R.

Novell, Inc.: *See*—
Stiles, Ian J., 5,594,863, Cl. 395-182.130.

Novick, Yoram: *See*—
Cohn, Oded; Nagin, Kenneth; Novick, Yoram; and Winokur, Alex, 5,594,900, Cl. 395-600.000.

Novitsky, Thomas J.: *See*—
Wainwright, Norman R.; and Novitsky, Thomas J., 5,594,113, Cl. 530-395.000.

Novo Nordisk A/S: *See*—
Yaver, Debbie S.; and Thompson, Sheryl A., 5,594,119, Cl. 536-23.200.

Nowacki, Max C.: *See*—
Sahay, Bharat B.; Nowacki, Max C.; Meteyer, Gregory J.; and Cardinale, Louis J., 5,594,840, Cl. 395-113.000.

Nowakowski, Jolanta T.: *See*—
Macor, John E.; and Nowakowski, Jolanta T., 5,594,014, Cl. 514-364.000.

Nowy, Günter: *See*—
Gaa, Karl; Nowy, Günter; and Schmailzl, Georg, 5,594,142, Cl. 546-19.000.

Noyama, Hideo; Kato, Makoto; Nohmi, Makoto; and Takizawa, Yuri, to Hitachi, Ltd. Image simulation method. 5,594,850, Cl. 395-135.000.

Noyes, Dallas B. Method for representation of knowledge in a computer as a network database system. 5,594,837, Cl. 395-63.000.

Nozaki, Mineo; Asakura, Osamu; Uchikata, Yoshio; and Nagashima, Masasumi, to Canon Kabushiki Kaisha. Printing apparatus and ink ribbon cassette therefor. 5,593,237, Cl. 400-208.000.

Nozawa, Akira: *See*—
Tomita, Kazushi; Ito, Yoshikazu; Hirano, Motohiro; Nozawa, Akira; Matsuo, Hiromitsu; Iimuro, Shunichi; Tozawa, Shigeki; and Miura, Yutaka, 5,593,540, Cl. 156-643.100.

NPH Ltd.: *See*—
Carter, Kenneth B.; Finlay, Ian G.; and Richardson, William, 5,593,443, Cl. 623-14.000.

NSK Ltd.: *See*—
Abe, Yasushi; and Tamura, Teishiro, 5,593,003, Cl. 184-5.100.

NTN Corporation: *See*—
Liston, Mary-Jo A., 5,593,234, Cl. 384-492.000.

Nu-Tech GmbH: *See*—
Stange, Gerd, 5,594,181, Cl. 73-861.280.

Nuckholls, Joe A.; and Flory, Isaac L., IV, to Hubbell Incorporated. High intensity discharge lamp starting circuit with automatic disablement of starting pulses. 5,594,308, Cl. 315-290.000.

Nuebling, Christoph; von Deyn, Wolfgang; Theobald, Hans; Westphalen, Karl-Otto; Kardorff, Uwe; Walter, Helmut; Kappe, Thomas; and Gerber, Matthias, to BASF Aktiengesellschaft. Heteroaromatically condensed hydroxypyridonecarboxamides, their preparation and use as herbicides. 5,593,943, Cl. 504-221.000.

Nuechterlein, Paul E.: *See*—
Rozman, Gregory I.; Markunas, Albert L.; and Nuechterlein, Paul E., 5,594,322, Cl. 322-10.000.

Nugent, Steven F., to Intel Corporation. Message routing in a multi-processor computer system with alternate edge strobe regeneration. 5,594,866, Cl. 395-200.130.

Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, to Kabushiki Kaisha TBC. Thermal head supporting device. 5,594,487, Cl. 347-197.000.

Numao, Yosuke: *See*—
Tajima, Yoshio; Katsuka, Naoki; Numao, Yosuke; Seki, Takashi; and Matsuura, Kazuo, 5,594,082, Cl. 526-160.000.

Numata, Kenji: *See*—
Shimizu, Mitsuru; Fujii, Syuso; Numata, Kenji; and Wada, Masaharu, 5,594,265, Cl. 257-355.000.

Nuñez, Ivan M.; Molock, Frank F.; Elliott, Laura D.; and Ford, James D., to Johnson & Johnson Vision Products, Inc. Method of forming shaped hydrogel articles including contact lenses using inert, displaceable diluents. 5,594,043, Cl. 523-106.000.

Nurse, Harry L., Jr. Septic tank filter. 5,593,584, Cl. 210-346.000.

Nuyen, Linh T., to Picogiga Societe Anonyme. Method of making semiconductor components with electrochemical recovery of the substrate. 5,593,917, Cl. 437-86.000.

Nyrhilä, Olli J., to Aktiebolaget Electrolux. Method and device for shaping details by means of superplastic forming. 5,592,842, Cl. 72-60.000.

Obara, Nobutoshi; Shizuka, Nobuhiko; and Takahashi, Fujio, to NOF Corporation. Synthetic lubricating oil containing an ester and working fluid composition for refrigerating machine containing same. 5,593,957, Cl. 508-501.000.

Obermeier, Peter, to Deutsche Forschungsanstalt für Luft- und Raumfahrt e.V. Black body radiator with reflector. 5,594,832, Cl. 392-435.000.

Object Technology Licensing Corp.: *See*—
Collins, Leland D.; and Lin, Judy, 5,594,642, Cl. 395-797.000.
Pettus, Christopher E., 5,594,921, Cl. 395-831.000.

O'Brien, James N.: *See*—
Owen, Mark D.; and O'Brien, James N., 5,593,606, Cl. 219-121.710.

O'Bryant, David W.: *See*—
Norris, Elwood G.; and O'Bryant, David W., 5,594,456, Cl. 343-701.000.

O'Callaghan, Daniel; and Lew, Eugene L., to Bell Atlantic Network Services, Inc. Method and apparatus for rapid channel selection. 5,594,492, Cl. 348-10.000.

Ocean Wash, Inc.: *See*—
Dickson, Glen A.; and Gray, Donnie R., 5,593,458, Cl. 8-102.000.

Ochiai, Kuniaki: *See*—
Komakine, Shigeo; Ochiai, Kuniaki; and Mine, Kazunori, 5,594,475, Cl. 347-9.000.

Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, to Railway Technical Research Institute; and Sumitomo Precision Products Company Limited. Leg apparatus for the magnetically levitated vehicle. 5,593,175, Cl. 280-704.000.

Oda, Nobuyuki: *See*—
Biro, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,594,502, Cl. 348-373.000.

OddzOn Products, Inc.: *See*—
LaRonge, Ron; Grimm, Thomas H.; Wooldridge, Diana L.; and Stillinger, Scott H., 5,592,688, Cl. 2-19.000.

Odom, Harold A., Jr.: *See*—
Odom, Patricia B.; and Odom, Harold A., Jr., 5,593,128, Cl. 248-346.010.

Odom, Patricia B.; and Odom, Harold A., Jr. Lap supported computer mouse surface. 5,593,128, Cl. 248-346.010.

Oe, Takayuki: *See*—
Ueno, Hiroaki; Oe, Takayuki; Suehiro, Ichiro; and Nakamura, Fumiko, 5,594,016, Cl. 514-369.000.

Oechs Le, Markus: *See*—
Guggenos, Adolf; and Oechs Le, Markus, 5,592,751, Cl. 34-117.000.

Oelsch, Jürgen: *See*—
Hans, Helmut; and Oelsch, Jürgen, 5,594,606, Cl. 360-99.080.

Oesterreichisches Forschungszentrum Seibersdorf Ges.m.b.H.: *See*—
Garn, Heinrich; Rasinger, Josef; and Mullner, Wolfgang, 5,594,458, Cl. 343-703.000.

Off Data GmbH: *See*—
Dengler, Wolfgang, 5,593,184, Cl. 281-43.000.

Ogasawara, Akira, to Nikon Corporation. Exposure control device of a camera and method. 5,594,715, Cl. 369-212.000.

Ogata, Masanori: *See*—
Sato, Shuji; Ogata, Masanori; Ito, Kengo; and Shiota, Hiroyuki, 5,594,480, Cl. 347-51.000.

Ogata, Minoru; Suzuki, Shoji; Tsuchida, Shinji; Tsutsui, Yuichiro; Arai, Shunji; and Hiroki, Shigeru, to Canon Kabushiki Kaisha. Communication channel selection method. 5,594,944, Cl. 455-34.100.

Ogawa, Hisahito: *See*—
Akiyama, Koji; Takimoto, Akio; and Ogawa, Hisahito, 5,594,567, Cl. 349-28.000.

Ogawa, Kazumi: *See*—
Kato, Susumu; Mizuno, Moriaki; Ogawa, Kazumi; and Nonaka, Kazuyuki, 5,594,382, Cl. 327-541.000.

Ogawa, Takeshi: *See*—
Akata, Masao; Miura, Takao; Ogawa, Takeshi; Doi, Yukihiro; Higashi, Isao; and Imagawa, Hitoshi, 5,594,724, Cl. 370-469.000.

Ogle, Michele D.: *See*—
Dorri, Bizhan; Laskaris, Evangelos T.; and Ogle, Michele D., 5,594,401, Cl. 335-216.000.

Oh, Don-Sung; and Shin, Dong-Jin, to Electronics and Telecommunications Research Institute. Method for controlling echo canceller circuit. 5,594,719, Cl. 370-286.000.

Oh, Jong-Hoon, to Hyundai Electronics America. Interleaved and sequential counter. 5,594,765, Cl. 377-44.000.

Oh, Young N., to Hyundai Electronics Industries Co. Ltd. Data output buffer. 5,594,374, Cl. 327-108.000.

Ohashi, Yumiko, to Brother Kogyo Kabushiki Kaisha. Ink jet printer head with ink channel protective film. 5,594,482, Cl. 347-69.000.

Ohayon, Abraham. Stackable bins. 5,593,037, Cl. 206-509.000.

Ohishi, Takashi: *See*—
Ishiwata, Hiroshi; Ohishi, Takashi; and Kitahara, Nobuhiro, 5,592,915, Cl. 123-300.000.

Ohkawa, Shigenori: *See*—
Aoso, Tetsuya; Ohkawa, Shigenori; and Doi, Takayuki, 5,594,154, Cl. 549-462.000.

Ohkawa, Takehiro: *See*—
Ohtake, Masatoshi; Tottori, Takeshi; Nakagawa, Kazunari; Hamamoto, Nobuo; Ohkawa, Takehiro; and Kinebuti, Yutaka, 5,594,680, Cl. 365-63.000.

Ohlendorf, Dieter: *See*—
Eacher, Claus; Dübal, Hans-Rolf; Harada, Takamasa; Hemmerling, Wolfgang; Illian, Gerhard; Müller, Ingrid; Murakami, Mikio; Ohlendorf, Dieter; and Wingen, Rainer, 5,594,575, Cl. 349-171.000.

Ohmi, Tadahiro: *See*—
Shibata, Tadashi; and Ohmi, Tadahiro, 5,594,372, Cl. 326-121.000.

Ohnishi, Hiroshi: *See*—
Fukutani, Hiroshi; Ohnishi, Hiroshi; Uebe, Shuichi; and Horita, Akihiro, 5,594,572, Cl. 349-155.000.

Ohno, Akira, to Japan Aviation Electronics Industry, Limited. Connector member comprising a casing having a counterpart member receiving space lined with a water-tight sealing member. 5,593,319, Cl. 439-587.000.

Ohoka, Tsukasa, to NEC Corporation. Method of manufacturing semiconductor device. 5,593,915, Cl. 437-62.000.

Ohshima, Kenichi; Ishikawa, Jun; Kudoh, Koji; and Nakaya, Tomoki, to Fujitsu Limited. Call toll processing method and call toll processing apparatus. 5,594,787, Cl. 379-114.000.

Ohshita, Koichi, to Nikon Corporation. Camera. 5,594,518, Cl. 396-133.000.

Ohsiro, Tetsuo: *See*—
Hong, Zi Quan; Kumagai, Ryohei; and Ohsiro, Tetsuo, 5,594,811, Cl. 382-216.000.

Ohsol, Ernest O.; and Callery, Thomas G., to Unipure Corporation. Production of dry, free flowing solids from bio-waste sludge. 5,593,591, Cl. 210-609.000.

Ohta, Eiji: *See*—
Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Kawai, Takashi; Shono, Seita; and Ohta, Eiji, 5,594,558, Cl. 358-518.000.

Ohta, Ikuo: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.

Ohta, Ken-ichi: *See*—
Usami, Akihiro; Ohta, Ken-ichi; Horie, Yoshiko; Kawai, Takashi; Shono, Seita; and Ohta, Eiji, 5,594,558, Cl. 358-518.000.

Ohta, Takashi: *See*—
Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.

Ohtake, Masatoshi; Tottori, Takeshi; Nakagawa, Kazunari; Hamamoto, Nobuo; Ohkawa, Takehiro; and Kinebuti, Yutaka, to Hitachi, Ltd.; and Hitachi Maxell, Ltd. Noise reduced contactless parallel data transfer device and method thereof. 5,594,680, Cl. 365-63.000.

Ohtani, Noboru: *See*—
Masuda, Yoshiyuki; Kita, Ryusuke; Arai, Hisako; Ohtani, Noboru; and Kobe, Masayoshi, 5,593,495, Cl. 117-4.000.

Ohtsuka, Hiroyuki: *See*—
Yoneda, Yutaka; and Ohtsuka, Hiroyuki, 5,594,512, Cl. 351-206.000.

Ohuchi, Shokichi: *See*—
Kataso, Kiyoaki; Ohuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Mami; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.

OIS Optical Imaging Systems, Inc.: *See*—
Abileah, Adiel; VanDerploeg, John; and Xu, Gang, 5,594,568, Cl. 349-120.000.

Oka, Masahisa: *See*—
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kamei, Shigeru; Oka, Masahisa; and Sano, Atsunori, 5,594,091, Cl. 528-271.000.

Oka, Michio, to Sony Corporation. Laser light generating apparatus. 5,594,745, Cl. 372-21.000.

Okada, Hajime; Aoyama, Masahiko; and Ito, Tomonari, to Sumitomo Wiring Systems, Ltd. Female terminal fitting for connector. 5,593,328, Cl. 439-851.000.

Okada, Hirofumi: *See*—
Yasuda, Shigekazu; and Okada, Hirofumi, 5,594,647, Cl. 364-424.055.

Okada, Katsuyuki: *See*—
Shibata, Yuji; Okazaki, Makoto; Tanihira, Hisamitsu; and Okada, Katsuyuki, 5,594,878, Cl. 395-309.000.

Okada, Osamu; Minami, Shigenobu; and Yamasaki, Shoichiro, to Kabushiki Kaisha Toshiba. Moving picture coding apparatus. 5,594,494, Cl. 348-15.000.

Okada, Satoru: *See*—
Kobashi, Masayuki; Koeda, Noriaki; Mizuno, Yoshiteru; and Okada, Satoru, 5,593,893, Cl. 436-50.000.

Okada, Yuichi; and Aoyama, Toshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Power steering system equipped with means for varying an assist torque thereof. 5,593,002, Cl. 180-421.000.

Okamoto, Kayoko: *See*—
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kamei, Shigeru; Oka, Masahisa; and Sano, Atsunori, 5,594,091, Cl. 528-271.000.

Okamura, Masami: *See*—
Saito, Akiko; Sahashi, Masashi; Tokai, Yoichi; Tsutai, Akihiko; Okamura, Masami; Nishiyama, Yukiko; and Inaba, Michihiko, 5,593,517, Cl. 148-301.000.

Okamura, Masatoshi; and Kaneda, Hiroshi, to TDK Corporation. Reel spring for tape cassette and method for preparing it. 5,593,103, Cl. 242-345.200.

Okamura, Toshio. Cutting edge arrangement. 5,592,742, Cl. 30-254.000.

Okazaki, Koju: *See*—
Nagata, Teruyuki; Okazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, 5,594,088, Cl. 528-77.000.

Okazaki, Makoto: *See*—
Shibata, Yuji; Okazaki, Makoto; Tanihira, Hisamitsu; and Okada, Katsuyuki, 5,594,878, Cl. 395-309.000.

Oki Electric Industry Co., Ltd.: *See*—
Kimura, Haruo; Miyake, Isao; Nakano, Toshihiro; and Nemoto, Yukihiro, 5,593,149, Cl. 271-3.010.

Okoniewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., to Instytut Wlokiennictwa. Conductive fibers. 5,593,618, Cl. 252-512.000.

Otu, Hiroshi; and Motooka, Eiji, to Noritsu Koki Co., Ltd. Negative film masking apparatus. 5,594,527, Cl. 355-75.000.

Okuda, Kazuyoshi: *See*—
Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, 5,594,645, Cl. 364-426.044.

Okuda, Masahiro: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Okuda, Nobuyuki; Inoue, Koichi; Tokutake, Toshinori; and Ito, Shinji, to Showa Aluminum Corporation. Pipe joint. 5,593,187, Cl. 285-305.000.

Okuda, Tsunehisa: *See*—
Nishimura, Eiji; Hirasawa, Tamio; Okuda, Kazuyoshi; Ando, Satoru; Inada, Takahiro; Okuda, Tsunehisa; Izumi, Tomoji; and Shimizu, Kenji, 5,594,645, Cl. 364-426.044.

Okumura, Katsuya: *See*—
Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, 5,593,537, Cl. 156-636.100.

Okumura, Koichiro: *See*—
Horiuchi, Tadahiko; Ishigami, Takashi; Nakamura, Hiroyuki; Mogami, Tohru; Wakabayashi, Hitoshi; Kunio, Takemitsu; and Okumura, Koichiro, 5,593,923, Cl. 437-200.000.

Okumura, Yoshinori: *See*—
Shirahata, Masayoshi; and Okumura, Yoshinori, 5,594,264, Cl. 257-335.000.

O'Leary, Audrey A., to Paragon Trade Brands. Disposable absorbent article with suspended absorbent structure. 5,593,400, Cl. 604-385.200.

Oliva, David C.; and Rogers, Max W., to Cobra Electronics Corp. Traffic information warning system. 5,594,432, Cl. 340-905.000.

Oliver, Doreen A. Ornamental hat-brim slip cover and method of manufacture. 5,592,696, Cl. 2-175.300.

Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Drappel, Stephan V., to Xerox Corporation. Photochromic hot melt ink compositions. 5,593,486, Cl. 106-22.00A.

Olivo, Marco; and Maccarrone, Marco, to SGS-Thomson Microelectronics S.r.l. End-of-count detecting device for nonvolatile memories. 5,594,703, Cl. 365-230.060.

Olsen, Robert E.; Reese, Harlan F.; and Backlund, Stephen J., to Aerojet-General Corporation. Polyphenylene resins from vinylethynylbenzene, diethynylbenzene and phenylacetylene. 5,594,058, Cl. 524-481.000.

Olson, Craig W. System for machine reading/index marking publications. 5,593,185, Cl. 283-70.000.

Olson, David A.: *See*—
Wolf, Robert J.; Purrington, Scott M.; Brandner, John M.; Olson, David A.; and Reed, John F., 5,593,769, Cl. 428-286.000.

Olson, Richard A.: *See*—
Koros, William J.; Hargis, I. G.; Olson, Richard A.; and Harris, Jason S., 5,593,157, Cl. 473-606.000.

Olympus Optical Co., Ltd.: *See*—
Togino, Takayoshi, 5,594,588, Cl. 359-631.000.
Tsunefuji, Katsuhiko, 5,594,517, Cl. 396-87.000.

O'Malley, Patrick J., to Motorola, Inc. Circuit and method of unpacking a serial bitstream. 5,594,437, Cl. 341-67.000.

Onaya, Masato, to Sanyo Electric Co., Ltd. A/D converter having a variable integrator whose time constant can be changed. 5,594,440, Cl. 341-131.000.

Oncor, Inc.: *See*—
Bhatnagar, Satish K.; George, Albert L., Jr.; and Nazarenko, Irina, 5,593,840, Cl. 435-6.000.

O'Neill, Gregory A., Jr., to Rockwell International Corp. Low loss quadrature matching network for quadrifilar helix antenna. 5,594,461, Cl. 343-895.000.

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Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Ono, Yoichi: *See*—
Maeda, Hiroaki; Eda, Yasuyuki; Kimachi, Kazuhiko; Ono, Yoichi; and Tokiyoshi, Sachio, 5,593,861, Cl. 435-69.100.

Ontrak Systems, Inc.: *See*—
Weldon, David E.; Nagorski, Bogusław A.; and Talich, Homayoun, 5,593,344, Cl. 451-296.000.

Onuki, Hiroyuki: *See*—
Toki, Yusuke; Hiraoka, Masabu; Yamagishi, Ichiro; Onuki, Hiroyuki; Bae, Tatsuya; Hada, Tetsuro; Nabatame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.

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Oomen, Emmanuel W. J. L.; and De Beurs, Hans, to U.S. Philips Corporation. Iron having an anti-friction layer. 5,592,765, Cl. 38-93.000.

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Dernehl, James U., 5,593,323, Cl. 439-668.000.

Ophardt, Heiner. Modular partition system. 5,592,787, Cl. 52-34.000.

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Scott, Jeffrey W., 5,594,751, Cl. 372-46.000.

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Davis, Robert M.; and da Silva, Jorge M. P., 5,593,095, Cl. 239-584.000.

Oregon Health Sciences University, State of Oregon, Acting by and Through the Oregon State Board of Higher Education on Behalf of the: *See*—
Civelli, Olivier; and Van Tol, Hubert H., 5,594,108, Cl. 530-350.000.

Oregon Reinforcement Engineering, Ltd.: *See*—
Van Vechten, James A.; Lundy, James R.; Wallace, Alan K.; and Bell, Chris A., 5,593,744, Cl. 428-34.400.

Organo Corporation: *See*—
Yamanaka, Koji; Imaoka, Takashi; Futatsuki, Takashi; and Yamashita, Yukinari, 5,593,554, Cl. 204-252.000.

Orgill, Curtis A., executor: *See*—
Weisberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.

Orimo, Masayuki: *See*—
Kawano, Shigeki; Mori, Kinji; Kawano, Katsumi; Orimo, Masayuki; and Hirasawa, Shigeki, 5,594,872, Cl. 395-200.150.

Orlovsky, Dmitry: *See*—
Chaco, John; Hersh, Israel; Orlovsky, Dmitry; Vincens, Joe; and Ram, Yaron, 5,594,786, Cl. 379-93.000.

Ort, Jeffrey G.: *See*—
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Ortho Diagnostic Systems Inc.: *See*—
Shen, Jian; Yaremko, Mykola; Chachowski, Rosemary; Atzler, Josef; Dupinet, Thierry; Kittrich, Daniel; Kunz, Hansjoerg; Puchegger, Karl; and Rohlfs, Reiner, 5,594,808, Cl. 382-133.000.

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Stern, Elliot L., 5,593,369, Cl. 482-47.000.

Ortlieb, Orlen J., to Sonoco Products Company. Corner post for packaging system. 5,593,039, Cl. 206-586.000.

Orwat, Michael J.: *See*—
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Osada, Yoshiyuki: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

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Osaka, Akira: *See*—
Tanimizu, Toru; Hakamata, Yoshimi; Kobayashi, Masato; Osaka, Akira; and Komuro, Katsuhiro, 5,594,224, Cl. 218-134.000.

Osaka Gas Company, Limited: *See*—
Ueno, Takuya; Inamori, Masayuki; and Kyutoku, Hirofumi, 5,593,776, Cl. 428-367.000.

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Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,593,044, Cl. 209-584.000.

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Schuster, Thomas F.; and Osborne, Harold G., 5,592,836, Cl. 66-176.000.

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Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.

OSi Specialties, Inc.: *See*—
Czech, Anna M., 5,593,611, Cl. 252-8.630.

Osram Sylvania Inc.: *See*—
Skopic, Albert D., 5,594,213, Cl. 174-91.000.

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Buhler, Joe P.; Batt, David; Goll, Jeffrey H.; McCartor, Harold R.; Rowan, Stuart H.; Wagner, Neldon C.; and Whitney, Hartwell H., 5,592,943, Cl. 128-661.030.

Osteonics Corp.: *See*—
Doag, Nicholas N. G., 5,593,448, Cl. 623-19.000.

Ostler, Farrell L.; Goodhue, Gregory K.; and Mizrahi-Shalom, Ori K., to Philips Electronics North America Corporation. High speed memory access system for a microcontroller with directly driven low order address bits. 5,594,913, Cl. 395-800.000.

Oswald, Robert; Mongon, John; and Weiss, Peggy, to Amoco/Enron Solar. Monolithic series and parallel connected photovoltaic module. 5,593,901, Cl. 437-2.000.

Osypka, Peter. Fiber optic endoscope. 5,593,405, Cl. 606-15.000.

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Otake, Ben, to Nobutake Enterprises, Inc. Restraining baton and strap. 5,593,159, Cl. 463-47.200.

Otani, Yuji; Nagasaka, Takashi; and Saitou, Mitsuhiro, to Nippondenso Co., Ltd. Method of producing thick multi-layer substrates. 5,593,722, Cl. 427-101.000.

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Kamani, Sanjay; Williams, Daniel S.; and Koenig, Christopher H., 5,594,219, Cl. 187-394.000.

O'Toole, Doris C.: *See*—
Wu, Kuang-Jong; and O'Toole, Doris C., 5,593,735, Cl. 427-461.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, 5,594,006, Cl. 514-312.000.

Otsuki, Kazutaka: *See*—
Nishizaka, Teiichiro; and Otsuki, Kazutaka, 5,593,904, Cl. 437-29.000.

Otsuki, Tetsuya, to Seiko Epson Corporation. Resin sealing type semiconductor device and method of making the same. 5,594,282, Cl. 257-796.000.

Otteson, Hal H.; Smith, Gordon J.; and Van Leeuwen, George W., to International Business Machines Corporation. Multiple user multimedia data server with switch to load time interval interleaved data to plurality of time interval assigned buffers. 5,594,924, Cl. 395-851.000.

Otto, Johanngeorg, to Badreas + Hauser GmbH + Co. Tank-contents level measuring assembly. 5,594,449, Cl. 342-124.000.
Ouchi, Toshihiko: *See*—
Majima, Masao; Ouchi, Toshihiko; and Ono, Takeo, 5,594,577, Cl. 359-124.000.
Oura, Norihiro: *See*—
Shibuya, Norio; and Oura, Norihiro, 5,593,313, Cl. 439-373.000.
Owen, James E.: *See*—
Szlam, Aleksander; and Owen, James E., 5,594,791, Cl. 379-265.000.
Owen, Jeffrey R., to Seiko Communications Systems, Inc. Gatable level-pulling circuit. 5,594,362, Cl. 326-38.000.
Owen, Mark D.; and O'Brien, James N., to Electro Scientific Industries, Inc. Ultraviolet laser system and method for forming vias in multi-layered targets. 5,593,606, Cl. 219-121.710.
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Kitayama, Kenshiko; Nagashima, Toshiaki; and Oyama, Kiyoshi, 5,593,068, Cl. 222-167.000.
Oyamada, Takayoshi, to Fuji Photo Film Co., Ltd. Silver halide emulsion and photographic material having the same. 5,593,821, Cl. 430-567.000.
Oyobe, Kei: *See*—
Hirata, Mitsuaki; Nammatsu, Akihiro; Watanabe, Noriko; Mizushima, Shigeaki; Makino, Seiji; Iwagoe, Hiroko; and Oyobe, Kei, 5,594,570, Cl. 349-129.000.
Ozaki, Masahiro: *See*—
Toki, Yusuke; Hiraoka, Masabe; Yamagishi, Ichiro; Osaki, Hiroyuki; Ban, Tatsuya; Hada, Tetsuro; Nabatame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, 5,594,772, Cl. 378-114.000.
Ozawa, Kazunori: *See*—
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Ozawa, Takashi; and Sorimachi, Haruo, to Fujitsu Limited. Method of making a multi-chip module having an improved heat dissipation efficiency. 5,592,735, Cl. 29-841.000.
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Ozin, Geoffrey A.: *See*—
Bedard, Robert L.; Ozin, Geoffrey A.; Ahari, Homayoun; Bowes, Carol L.; Jiang, Tong; and Young, David, 5,594,263, Cl. 257-201.000.
Özmerih, Levent, to Sinvent A/S. Rotor for mechanical air classifiers. 5,593,043, Cl. 209-303.000.
Pacesetter, Inc.: *See*—
Renger, Herman L., 5,593,430, Cl. 607-18.000.
Pacholok, David R.; Fouchard, David T.; and Ebner, Walter B., to Rayovac Corporation. Charge equalization of series connected cells or batteries. 5,594,320, Cl. 320-4.000.
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Balachandran, Kumar, 5,594,943, Cl. 455-33.200.
Petrunovich, James E., 5,594,758, Cl. 375-344.000.
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Marcou, Jean-Claude; Packard, Thomas N.; Findley, James K.; and Murphy, Patrick J., 5,594,398, Cl. 335-18.000.
Pack'Industrie S.A.: *See*—
Franci, François-Marie, 5,593,375, Cl. 493-302.000.
Paddon, Robin, to Iomega Corporation. Neural network disk drive read channel pattern detector. 5,594,597, Cl. 360-46.000.
Padget, John C.: *See*—
Satgurunathan, Rajasingham; Hinde, David C.; Padget, John C.; and Yeates, Stephen G., 5,593,730, Cl. 427-386.000.
Padgett, Clarence W.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,594,696, Cl. 365-208.000.
Padia, Janak K.: *See*—
Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.
Paget, Charles J., Jr.: *See*—
Booher, Richard N.; Flaugh, Michael E.; Lawhorn, David E.; Paget, Charles J., Jr.; and Schaus, John M., 5,594,019, Cl. 514-374.000.
Paio, Alfredo: *See*—
Mongelli, Nicola; Biasoli, Giovanni; Paio, Alfredo; Grandi, Maria; and Ciomei, Marina, 5,593,976, Cl. 514-48.000.
Palmaz, Inc.: *See*—
Harrold, John E., 5,593,065, Cl. 222-94.000.
Pal, Kollol; Behnke, Mark; and Adams, Julian, to Boehringer Ingelheim Pharmaceuticals, Inc. Pyrrolidine derivatives inhibitors of leukotriene biosynthesis. 5,594,008, Cl. 514-338.000.
Pal, Kollol: *See*—
Hargrave, Karl D.; Cullen, Ernest; Proudfoot, John R.; Grozinger, Karl G.; Pal, Kollol; and Adams, Julian, 5,593,979, Cl. 514-81.000.
Palaikal, Syriac J.: *See*—
Welch, M. Bruce; Geerts, Rolf L.; Palaikal, Syriac J.; and Pettijohn, Ted M., 5,594,078, Cl. 526-119.000.
Palermo, Robert J.; McNutt, Alan D.; and Moon, Daniel F., to Siemens Energy & Automation, Inc. High speed programmable logic controller. 5,594,917, Cl. 395-800.000.
Palitsch, John R.: *See*—
Sarkisian, John M.; Palitsch, John R.; and Zecco, Joseph J., Jr., 5,592,847, Cl. 72-356.000.
Pall Corporation: *See*—
Grimes, Michael, 5,593,529, Cl. 156-218.000.
Randhahn, Horst; and Vogelman, Hartmut, 5,594,161, Cl. 73-38.000.
Palmer, Cynthia L.: *See*—
Varney, Michael D.; Romines, William H.; and Palmer, Cynthia L., 5,594,139, Cl. 544-48.000.
Palmer, Gary L., to ITT Corporation. Illuminator device for use with night vision devices. 5,594,254, Cl. 250-504.00R.
Palmer, Gene D.: *See*—
Carreno, Diether E.; Myers, Albert; Palmer, Gene D.; Carnao, Philip M.; Wilson, Ian D.; and Hemsworth, Martin C., 5,593,274, Cl. 415-115.000.
Palmer, Larry G.; and Palmer, Ricky S., to Digital Equipment Corporation. Video data scaling for video teleconfereneing workstations communicating by digital data network. 5,594,495, Cl. 348-17.000.
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Palmer, Michael J.: *See*—
Hernandez, Bernie; Horton, Raymond R.; Palmer, Michael J.; and Weindelmayer, Frederick G., 5,593,083, Cl. 228-180.210.
Palmer, Ricky S.: *See*—
Palmer, Larry G.; and Palmer, Ricky S., 5,594,495, Cl. 348-17.000.
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Blanchard, Randall D., 5,594,561, Cl. 349-59.000.
Paluzis, Mark E.; Figueroa, Carlos G.; Friedberg, Daniel C.; Jones, Gary D.; and Eichhorn, Gunther, to United Technologies Corporation. Attaching brittle composite structures in gas turbine engines for resiliently accommodating thermal expansion. 5,592,814, Cl. 60-271.000.
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Lovas, Sandor; Coulon, J. Michael; Vincze, Borbala; Palyi, Istvan; Gaal, Dezso; Kalnay, Adrienn; Mezo, Imre; Teplan, Istvan; Toth, Geza; and Kovacs, Magdolna, 5,593,965, Cl. 514-15.000.
Pan, Lyadon M., to Lucent Technologies Inc. Method and system for implementing an application protocol in a communication network. 5,594,721, Cl. 370-392.000.
Panagossis, Spyros, to Cennoid Technologies Inc. Analog-to-digital converter. 5,594,438, Cl. 341-108.000.
Panoramic, Inc.: *See*—
Dyble, Richard J.; and Stirnael, Timothy M., 5,593,036, Cl. 206-464.000.
Panzone, Giambattista; and Giannantonio, Anacleto, to Gruppo Lepetit S.p.A. Chemical process for preparing antibiotic L 17932 (deglucoteicoplanin) and its salt. 5,594,102, Cl. 530-317.000.
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Papas, Andreas M.; and Hobbs, Howard K., to Eastman Chemical Company. Skin treating composition. 5,593,682, Cl. 424-401.000.
Papst Licensing GmbH: *See*—
Hans, Helmut; and Oelsch, Jürgen, 5,594,606, Cl. 360-99.080.
Paragon Trade Brands: *See*—
O'Leary, Audrey A., 5,593,400, Cl. 604-385.200.
Paranjpe, Ajit P.: *See*—
Apte, Pushkar P.; and Paranjpe, Ajit P., 5,593,924, Cl. 437-200.000.
Parish, Robert O., II; and Reber, Cleve C., to TTI Trenchless Technologies, Inc. Directional auger attachment. 5,592,993, Cl. 175-162.000.
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Lee, Youl-Lark; and Park, Sang-Jae, 5,593,855, Cl. 435-41.000.
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Parker, Anthony A.; Strickler, David A.; Bartus, Stephen P., Jr.; and Wolfe, Susan M., to Libbey-Owens-Ford Company. Self-edhering polyvinyl chloride safety glass interlayer. 5,593,786, Cl. 428-426.000.
Parker, Christina M.: *See*—
Brenner, Michael B.; and Parker, Christina M., 5,594,120, Cl. 536-23.500.
Parker, Richard R.: *See*—
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Parkinson, David W.: *See*—
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Parkinson Machinery and Manufacturing Corp.: *See*—
Cavanagh, Kenneth M., 5,593,106, Cl. 242-527.000.
Parolo, Alberto: *See*—
Virtuoso, Salvatore; and Parolo, Alberto, 5,594,952, Cl. 455-89.000.
Parrott, David T.: *See*—
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Parsons, George A., to New Venture Gear, Inc. Self-centering shifter assembly. 5,592,856, Cl. 74-473.00P.
Parsons, Harry R.; Curry, Robert M.; and Gilvar, Stephen G., to Polaroid Corporation. Cassette for enclosing a plurality of negative film units. 5,594,522, Cl. 396-517.000.
Parsons, John D., to Norco, Inc. Mechanical oscillator. 5,592,852, Cl. 74-57.000.
Partanen, Erkki: *See*—
Ilvespää, Heikki; Jankkola, Jyrki; Linsuri, Ari; Partanen, Erkki; and Verkasalo, Lauri, 5,593,546, Cl. 162-301.000.
Pasch, Nicholas F.: *See*—
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Pass & Seymour, Inc.: *See*—
Marcou, Jean-Claude; Packard, Thomas N.; Findley, James K.; and Murphy, Patrick J., 5,594,398, Cl. 335-18.000.
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Tannenbaum, Joseph; and Pasternak, Eli S., 5,593,381, Cl. 601-93.000.
Patel, Raj D.: *See*—
Sacripante, Guerino G.; and Patel, Raj D., 5,593,807, Cl. 430-137.000.
Patrick, Algird, to Bioseareh Medical Products Inc. Laparoscopic device having a detachable distal tip. 5,593,402, Cl. 606-1.000.
Patriot Scientific Corporation: *See*—
Norris, Elwood G.; and O'Bryant, David W., 5,594,456, Cl. 343-701.000.
Patterson, Burton R.; and Horn, Jeffrey A., to University of Alabama Research Foundation. Reversibly heat stiffening suspension. 5,594,057, Cl. 524-406.000.
Patterson, James V.: *See*—
Balos, Barbara; Clungeon, Nancy S.; Patterson, James V.; Rodriguez, José M.; and Fischer, Stephen A., 5,593,543, Cl. 162-6.000.
Patterson, Michael W.: *See*—
Taylor, Carl J.; Patterson, Michael W.; and Force, Gordon, 5,594,204, Cl. 174-52.200.
Paul, Kenneth J., to Emhart Glass Machinery Investments Inc. Glass feeder heat baffle. 5,593,472, Cl. 65-327.000.
Pauley, J. Donald: *See*—
Carroll, Gary T.; and Pauley, J. Donald, 5,594,384, Cl. 324-369.000.
Paulos, John J.; Kamath, Gautham D.; and Krone, Andrew W., to Crystal Semiconductor Corporation. Configuration programming of a digital audio serial port using no additional pins. 5,594,442, Cl. 341-143.000.
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Pavia, Michael R.: *See*—
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Pawlowski, Marek: *See*—
Wilson, David F.; and Pawlowski, Marek, 5,593,899, Cl. 436-127.000.
Payne, Edward A.; and Hartsell, Hal C., Jr., to Gilbarco Inc. Vapor recovery system for a fuel delivery system. 5,592,979, Cl. 141-59.000.
PCD Polymere Gesellschaft m.b.H.: *See*—
Blauhut, Wilfried, 5,592,874, Cl. 100-93.0RP.
Peake, Clinton J.: *See*—
Henrie, Robert N., II; Peake, Clinton J.; Cullen, Thomas G.; Chaguturu, Munirathnam K.; Ray, Partha S.; and Bennett, Brian D., 5,593,998, Cl. 514-258.000.
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Pecone, Victor: *See*—
Swamy, Deepak; and Pecone, Victor, 5,593,322, Cl. 439-660.000.
Peeples, Frank K.; Raith, David; and Donnelly, Charles E., to East Coast Terminal Assoc. Ltd. Cargo loading system. 5,593,268, Cl. 414-301.000.
Pees, Klaus-Jurgen; and Albert, Guido, to American Cyanamid Company. Triazolopyrimidine derivatives. 5,593,996, Cl. 514-258.000.
Peglion, Jean-Louis; Vian, Joel; Goument, Bertrand; Millan, Mark; Audinot, Valérie; Schwartz, Jean-Charles; and Sokoloff, Pierre, to Adir et Compagnie. Tetracyclic 1,4-oxazine compounds. 5,593,989, Cl. 514-229.500.
Pellegrino, Anthony J.; and DeFreitas, Kenneth F., to Thermotrex Corporation. Method and apparatus for obtaining stereotactic mammographic guided needle breast biopsies. 5,594,769, Cl. 378-37.000.
Pelletier, Ronald R.: *See*—
Lopez, Leonardo C.; and Pelletier, Ronald R., 5,593,758, Cl. 428-195.000.
Pellicori, Samuel F.; Sullivan, Sean; and Ahten, Michael J., to Spectra-Physics Scanning Systems, Inc. Scanner window. 5,594,231, Cl. 235-462.000.
Peltier, Jeffrey H.: *See*—
Carey, William S.; Meyer, Ellen M.; and Peltier, Jeffrey H., 5,594,096, Cl. 528-387.000.
Pelton, Lloyd E.: *See*—
Reiersgaard, William L.; Knebel, Andrew W., Jr.; Davis, Curtis A.; Reiersgaard, John M.; and Pelton, Lloyd E., 5,592,738, Cl. 29-863.000.
Pen, Jan: *See*—
Van Ooijen, Albert J. J.; Rierveld, Krijn; Hoekema, Andreas; Pen, Jan; Sijmons, Peter C.; and Verwoerd, Teunis C., 5,593,963, Cl. 514-12.000.
Pendri, Yadagiri: *See*—
Thottathil, John K.; Pendri, Yadagiri; Li, Wen-Sen; and Kronenthal, David R., 5,594,153, Cl. 549-374.000.
Peng, Chien-Hsiung: *See*—
Desu, Seshu B.; Peng, Chien-Hsiung; Shi, Tian; and Agashar, Pradyot A., 5,593,727, Cl. 427-248.100.
Peng, Peter H., to Vulcan Materials Company. Method for increasing the production capacity of sulfuric acid plants and processes. 5,593,652, Cl. 423-522.000.
Peng, Yung-Chow, to Industrial Technology Research Institute. Reduced signal processing requirement sample and hold linear phase interpolative fir filter. 5,594,675, Cl. 364-724.100.
Penn, Steven M., to Texas Instruments Incorporated. System, method and process for fabrication of 3-dimensional objects by a static electrostatic imaging and lamination device. 5,593,531, Cl. 156-272.600.
Penn, Steven M.; Jones, David N.; and Embree, Michael E., to Texas Instruments Incorporated. Method and apparatus for the computer-controlled manufacture of three-dimensional objects from computer data. 5,594,652, Cl. 364-468.260.
Pennemann, Bernd: *See*—
Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.
Penney, Bruce J., to Tektronix, Inc. Decoder using adaptive non-separable digital filter. 5,594,508, Cl. 348-665.000.
Pennington Metals, Inc.: *See*—
Gerenser, Duane; Kuffel, Reinhard F.; and Jorgensen, Donald, 5,592,845, Cl. 72-161.000.
Pennsylvania Research Foundation, The: *See*—
Gordon, Bernard, III; and Sharma, Prabodh P., 5,594,076, Cl. 525-444.000.
Pentling, Ursula: *See*—
Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.
Peoplenet, Inc.: *See*—
Ladner, David L.; and Grazzini, Andrea J., 5,594,425, Cl. 340-825.060.
Pepe, Kara B.: *See*—
Moyer, William C.; Gullette, James B.; and Pepe, Kara B., 5,594,880, Cl. 395-595.000.
Pepper, James T.: *See*—
Marcotrigiano, Anthony; and Pepper, James T., 5,592,809, Cl. 59-25.000.
PepsiCo., Inc.: *See*—
Mero, Christopher J.; and Bellas, Richard F., 5,593,056, Cl. 215-382.000.
Pereira, Kenneth J.: *See*—
Adams, Daniel S.; Butler, Gene R.; and Pereira, Kenneth J., 5,593,129, Cl. 248-405.000.
Perkin-Elmer Corporation, The: *See*—
Wiktorowicz, John, 5,593,559, Cl. 204-453.000.
Perkin-Elmer Corporation, Applied Biosystems, Inc.: *See*—
Fung, Steven; and Gryaznov, Sergei M., 5,593,826, Cl. 435-6.000.
Perkowitz, Mary M.: *See*—
Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,593,896, Cl. 436-500.000.
Perng, Jyi-Ching: *See*—
Fu, Ya-ming; Perng, Jyi-Ching; Hwong, Chen-Une; and Fang, Liang-Jyi, 5,592,752, Cl. 34-388.000.
Perry, Mickey J. Fishing rod flotation device. 5,592,773, Cl. 43-25.000.
Perry, Richard A.: *See*—
Lynn, Michael; Morris, Alan; Perry, Richard A.; and Carper, June R., 5,592,989, Cl. 165-259.000.
Pershadsingh, Harrihar A.: *See*—
Kurtz, Theodore W.; and Pershadsingh, Harrihar A., 5,594,015, Cl. 514-369.000.
Person, Wayne C.; Theroux, Marc J.; and Lopez-Isa, Maria E., to United States Surgical Corporation. Skin fastener. 5,593,423, Cl. 606-219.000.
Personnel Identification & Entry Access Control, Inc.: *See*—
Colbert, Charles, 5,594,806, Cl. 382-115.000.
Persson, Bengt Y.: *See*—
Andersson, Claes H.; Eriksson, Hakan O.; Madfors, Magnus E.; and Persson, Bengt Y., 5,594,949, Cl. 455-62.000.
Perttunen, Cary D.: *See*—
Reber, William L.; and Perttunen, Cary D., 5,594,935, Cl. 455-2.000.
Perycut-Chemie AG: *See*—
Beaesits, Franz, 5,594,029, Cl. 514-552.000.
Perz, Susan V.: *See*—
Glover, Shedric O.; Bujanowski, Valeris J.; Ziemelis, Maris J.; Skinner, Michael W.; Homan, Gary R.; Perz, Susan V.; and Cannady, John P., 5,594,042, Cl. 522-31.000.
Peschke, Wolfgang: *See*—
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Scott, Danny E.; Pessier, Rudolf C. O.; Isbell, Matthew R.; Meany, Nigel; and Besson, Alain, 5,592,995, Cl. 175-374.000.
Peter, Julius, to Peter, Julius; and Continental Aktiengesellschaft. Apparatus for receiving and transporting material mixed in internal mixers used for processing rubber mixtures. 5,593,226, Cl. 366-69.000.
Peter Wahl GmbH & Co.: *See*—
Wahl, Peter; and Ackermann, Rudolf, 5,593,204, Cl. 296-223.000.
Peters, Helmut: *See*—
Auerbach, Bernhard; and Peters, Helmut, 5,593,898, Cl. 436-518.000.

Peters, Rex B., to AlliedSignal Inc. K_{xy} cancellation in a pendulous silicon accelerometer. 5,594,170, Cl. 73-514.290.

Peters, Walter, to Wilhelm Fette GmbH. Generating milling cutter. 5,593,254, Cl. 407-48.000.

Peterson, John, to Digital Security Controls Ltd. Combination security unit. 5,594,428, Cl. 340-825.360.

Peterson, Kenneth M.; Cutler, Victor H., Jr.; and Davieau, Gerald J., to Motorola, Inc. Statistically robust traffic modeling method and apparatus. 5,594,940, Cl. 455-12.100.

Petitjean, Frédéric P. D. F.: *See*—
Steenackers, Pieter D.; and Petitjean, Frédéric P. D. F., 5,593,645, Cl. 422-176.000.

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Shuman, Dennis; Litzkow, Carl A.; Kruss, Sergey; Coffelt, James A.; Petitt, Frederick L.; and Wietlisbach, David O., 5,594,654, Cl. 364-478.010.

Petraitis, Joseph J.: *See*—
Batt, Douglas G.; Pinto, Donald J. P.; Orwat, Michael J.; Petraitis, Joseph J.; and Pitts, William J., 5,593,994, Cl. 514-252.000.

Petranovich, James E., to Pacific Communication Sciences, Inc. Frequency controller and method of correcting phase estimates in a PSK demodulator using frequency control. 5,594,758, Cl. 375-344.000.

Petri, Volker; Mickeler, Reinhold; and Meyer, Michael, to Mercedes-Benz AG. Apparatus for interrupting operation of a motor driven movable member upon contacting an obstacle. 5,592,777, Cl. 49-28.000.

Petrillo, Karen E.: *See*—
Babich, Edward D.; Petrillo, Karen E.; Simons, John P.; and Seeger, David E., 5,593,812, Cl. 430-270.100.

Petry, Chester H., Jr.: *See*—
Houghton, Jon C.; and Petry, Chester H., Jr., 5,592,734, Cl. 29-827.000.

Petsch, Martin C.; Main, Douglas T., Jr.; and Milo, Robert J., to Universal Valve Co., Inc. Hose retractor. 5,593,116, Cl. 248-75.000.

Pettijohn, Ted M.: *See*—
Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,594,078, Cl. 526-119.000.

Pettus, Christopher E., to Object Technology Licensing Corp. Authentication of users with dynamically configurable protocol stack. 5,594,921, Cl. 395-831.000.

Peyron, Jean-Marc: *See*—
Darredeau, Bernard; Lehman, Jean-Yves; and Peyron, Jean-Marc, 5,592,834, Cl. 62-656.000.

Pfefferle, William C. Catalytic method. 5,593,299, Cl. 431-170.000.

Pfirrmann, Rolf W.; and Geistlich, Peter, to Ed Geistlich Söhne AG für Chemische Industrie. Pharmaceutical compositions. 5,593,665, Cl. 424-85.100.

Pfister, Hanspeter: *See*—
Kaufman, Arie E.; and Pfister, Hanspeter, 5,594,842, Cl. 395-124.000.

Pfizer Inc: *See*—
Chen, Yuhpyng L., 5,594,002, Cl. 514-295.000.
Macor, John E.; and Nowakowski, Jolanta T., 5,594,014, Cl. 514-364.000.

Pfizer Inc.: *See*—
Chenard, Bertrand L., 5,594,007, Cl. 514-315.000.
Dow, Robert L.; Koch, Kevin; and Schulte, Gary R., 5,593,997, Cl. 514-258.000.

Pharmacia AB: *See*—
Baker, Richard W.; Santus, Giancarlo; and Vistilla-Friedman, Susan, 5,593,684, Cl. 424-435.000.
Slavin, Shimon; Weiss, Lola; and Grost, David, 5,594,005, Cl. 514-311.000.

Pharmacia & Upjohn Company: *See*—
Sharma, Satish K., 5,594,115, Cl. 530-413.000.

Pharmacia Biosensor AB: *See*—
Hansson, Thord; and Sjölander, Stefan, 5,593,130, Cl. 251-61.100.

Pharmacia Biotech, Inc.: *See*—
Trenil, Suzanne B.; Dall, Cristine J.; Draveling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., 5,593,824, Cl. 435-4.000.

Pharmacyclics, Inc.: *See*—
Sessler, Jonathan L.; Iverson, Brent L.; Král, Vladimir; Thomas, Richard E.; Magda, Darren; and Smith, Daniel A., 5,594,136, Cl. 540-472.000.

Phenix Biocomposites, Inc.: *See*—
Riebel, Michael J.; Torgusen, Paul L.; Roos, Kenneth D.; Anderson, Donald E.; and Gruber, Carl, 5,593,625, Cl. 264-115.000.

Philip Morris Incorporated: *See*—
Keritsis, Gus D., 5,592,955, Cl. 131-175.000.

Philips Electronics North America Corporation: *See*—
Ostler, Farrell L.; Goodhue, Gregory K.; and Mizrahi-Shalom, Ori K., 5,594,913, Cl. 395-800.000.

Philips, Peter A. Electrical cable reinforced with a longitudinally applied tape. 5,593,524, Cl. 156-51.000.

Phillips, Ian R., to N.J. Phillips Pty. Limited. Injector with retractable shroud. 5,593,388, Cl. 604-135.000.

Phillips, Jerome D.: *See*—
Elstran, Gerald V.; Mattila, Robert J.; and Phillips, Jerome D., 5,592,935, Cl. 128-205.290.

Phillips, Judith: *See*—
Arvinte, Tudor; Cudd, Amelia; and Phillips, Judith, 5,593,962, Cl. 514-12.000.

Phillips Petroleum Company: *See*—
Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., 5,594,078, Cl. 526-119.000.

Phillips, Van L. Plug mounted prosthesis. 5,593,455, Cl. 623-47.000.

Phillips, Van L. Foot prosthesis having auxiliary ankle construction. 5,593,457, Cl. 623-52.000.

Philmac Pty Ltd: *See*—
Harris, Wayne A., 5,593,186, Cl. 285-23.000.

Philosophers' Stone LLC: *See*—
Remillard, John F., 5,594,435, Cl. 341-51.000.

Photocircuits Corporation: *See*—
Staas, Louis J.; Tullo, James; and Kohm, Thomas S., 5,593,499, Cl. 118-63.000.

Photometrics, Ltd: *See*—
Meyer, Hans-Jurgen, 5,594,520, Cl. 396-463.000.

Photonetics S.A.: *See*—
Lefevre, Hervé; Martin, Philippe; Laloux, Bernard; Graindorge, Philippe; and Diadier, Laurent, 5,594,744, Cl. 372-20.000.

Picker International, Inc.: *See*—
Gullapalli, Rao P.; Liu, Haiying; and Loncar, Mark J., 5,594,336, Cl. 324-309.000.
Henderson, Robert G.; Kristoff, James W.; and Molyneaux, David A., 5,594,339, Cl. 324-318.000.

Picogiga Societe Anonyme: *See*—
Nuyen, Linh T., 5,593,917, Cl. 437-86.000.

Pien, Gene: *See*—
Nielsen, Kenneth R.; Bonomo, Paul; and Pien, Gene, 5,594,828, Cl. 385-121.000.

Piers, Kevin L.: *See*—
Hancock, Robert E. W.; Piers, Kevin L.; and Brown, Melissa H., 5,593,866, Cl. 435-69.700.

Pihlajaniemi, Taina: *See*—
Prockop, Darwin J.; Ala-Kokko, Leena; Fertala, Andrzej; Sieron, Aleksander; Kivirikko, Kari I.; Geddis, Amy; and Pihlajaniemi, Taina, 5,593,859, Cl. 435-69.100.

Pileski, Michael J.: *See*—
Wood, Robert J.; Salisbury, Terrence L.; Walts, Connie R.; and Pileski, Michael J., 5,594,826, Cl. 385-88.000.

Pilkington PLC: *See*—
Gelder, Richard; and Bradshaw, John M., 5,593,602, Cl. 216-42.000.

Pillekamp, Klaus-Dieter, to Siemens Aktiengesellschaft. Arrangement for controlling a transmitting/receiving device of base stations and/or mobile units, in particular of a cordless telephone system. 5,594,737, Cl. 370-278.000.

Pilosof, David: *See*—
Trinh, Toan; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark L.; Pilosof, David; Zwerdling, Susan S.; and Tordil, Helen B., 5,593,670, Cl. 424-76.100.

Pilz GmbH & Co.: *See*—
Beader, Werner, 5,593,325, Cl. 439-709.000.

Pinaire, Ronald: *See*—
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,593,548, Cl. 203-29.000.

Pincus, Matthew R.: *See*—
Miller, Jonathan L.; Cunningham, David; Lyle, Vicki A.; Finch, Clara N.; and Pincus, Matthew R., 5,593,959, Cl. 514-8.000.

Pinkus, Robert: *See*—
Spencer, Richard; and Pinkus, Robert, 5,593,058, Cl. 220-4.310.

Pinto, Donald J. P.: *See*—
Batt, Douglas G.; Pinto, Donald J. P.; Orwat, Michael J.; Petraitis, Joseph J.; and Pitts, William J., 5,593,994, Cl. 514-252.000.

Pioneer Electronic Corporation: *See*—
Sakamoto, Mitsunao, 5,594,463, Cl. 345-76.000.
Yamamoto, Hideki; and Atsuchi, Naruhiko, 5,594,591, Cl. 349-5.000.

Pishko, Michael V.: *See*—
Heller, Adam; and Pishko, Michael V., 5,593,852, Cl. 435-14.000.

Pisinger, Franz, to Voith Sulzer Papiermaschinen GmbH. Press section of a paper machine. 5,593,547, Cl. 162-360.300.

Pitman, Theodore B.: *See*—
Shah, Jyotsna S.; Chan, Samuel W.; Pitman, Theodore B.; and Lane, David J., 5,593,831, Cl. 435-6.000.

Pitts, William J.: *See*—
Batt, Douglas G.; Pinto, Donald J. P.; Orwat, Michael J.; Petraitis, Joseph J.; and Pitts, William J., 5,593,994, Cl. 514-252.000.

Plamthottam, Sebastian S.: *See*—
Vargas, Richard R.; Plamthottam, Sebastian S.; and Landers, John O., 5,593,759, Cl. 428-200.000.

Plantinga, Ronald A.: *See*—
Van Gennip, Nicasius G. T.; Van Heeswijk, Johannes A. A. M.; and Plantinga, Ronald A., 5,594,295, Cl. 313-25.000.

Platt, Richard B.: *See*—
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Plazak, Zbigniew: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,594,899, Cl. 395-600.000.

Plemmons, Larry W.: *See*—
Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,276, Cl. 415-173.100.
Proctor, Robert; Linger, David R.; Di Salle, David A.; Brassfield, Steven R.; and Plemmons, Larry W., 5,593,277, Cl. 415-173.100.

Plessing, Albert K.: *See*—
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Plyler, Rodger: *See*—
Krall, Jack; and Plyler, Rodger, 5,594,931, Cl. 419-5.000.

Podhajsky, Jim: *See*—
Kaufman, Alan; and Podhajsky, Jim, 5,593,053, Cl. 215-12.100.

Poertner, Roland G.: *See*—
Bottelberghe, Scott A.; Thomas, Dustin H.; Shurtleff, Terry M.; and Poertner, Roland G., 5,593,619, Cl. 252-609.000.

Poilâne, Lionel, to B.F.E. Limited. Process for making bread. 5,593,712, Cl. 426-19.000.

Pökkä , Tapani: *See*—
Makkonen, Matti; Pökkä , Tapani; and Leisto, Markku, 5,594,777, Cl. 379-58.000.

Polaroid Corporation: *See*—
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Lindholm, Edward P.; and Manning, James J., 5,593,810, Cl. 430-213.000.
Parsons, Harry R.; Curry, Robert M.; and Gilvar, Stephen G., 5,594,522, Cl. 396-517.000.

Pollatta, David J.; and Quinzi, Thomas N., to Eastman Kodak Company. Low CTE/CME boron/carbon fiber laminates and method of making them. 5,593,752, Cl. 428-114.000.

Pompilun, William S.: *See*—
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pompilun, William S.; Rippl, Carl O.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.

Ponzetto, Carola: *See*—
Comoglio, Paolo; and Ponzetto, Carola, 5,594,105, Cl. 530-326.000.

Poore, Gerald A.: *See*—
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,594,028, Cl. 514-464.000.

Pop, Mihai G. M.: *See*—
Bryan, George H.; and Pop, Mihai G. M., 5,593,578, Cl. 210-232.000.

Pope, Kenneth E. Pressure capture valve. 5,592,973, Cl. 137-625.210.

Popoola, Oludele O.: *See*—
Zaluzec, Matthew J.; McCune, Robert C., Jr.; Popoola, Oludele O.; Baughman, James R.; and Brevick, John E., 5,592,927, Cl. 123-668.000.

Portola Packaging, Inc.: *See*—
Repp, Richard E.; West, William R.; and Luch, Daniel, 5,593,055, Cl. 215-256.000.

Pöschl, Günter, to PPV Verwaltungs AG. Apparatus for the oxygen enrichment of air. 5,593,480, Cl. 96-124.000.

Post, Lothar A.; and Kunze, Jörg, to Whitaker Corporation, The. Electrical connector having improved latching/unlatching feature. 5,593,309, Cl. 439-157.000.

Poston, Mendel L., Jr.: *See*—
Traveluse, Frederick L.; Hoffman, Robert E.; and Poston, Mendel L., Jr., 5,593,629, Cl. 264-209.300.

Potempa, Lawrence A.; and Anderson, Byron E., to Northwestern University. Binding of immune complexes by modified forms of C-reactive protein. 5,593,897, Cl. 436-507.000.

Potter, Andrew; Campos, Manuel; and Hughes, Huw P. A., to University of Saskatchewan; and Ciba-Geigy Canada Ltd. Chimeric protein comprising an RTX-family cytotoxin and interferon-2 or interferon. 5,594,107, Cl. 530-350.000.

Poulachon, Daniel, to Sextant Avionique. Device for dynamic display of information relating to an electronic system of variable configuration and/or composition. 5,594,465, Cl. 345-98.000.

Poulos, Thomas: *See*—
Lewis, John E.; Roach, Peter O., Jr.; and Poulos, Thomas, 5,594,945, Cl. 455-38.100.

Powell, Ken R.; and Driscoll, Rusty, to Environmental Products Corporation. Method and apparatus for identifying information contained in surface deviations. 5,593,017, Cl. 194-212.000.

Powers, Daniel: *See*—
Morgan, Carlton B.; Powers, Daniel; Cole, Clinton; Mydynski, Steven T.; and Leventhal, Michael J., 5,593,426, Cl. 607-5.000.

Powers, Daniel J.: *See*—
Ginzer, Bradford E.; Lyster, Thomas D.; Cole, Clinton S.; Powers, Daniel J.; and Morgan, Carlton B., 5,593,427, Cl. 607-7.000.

Pozzo, Gianfranco. Router bit with interchangeable knives. 5,593,253, Cl. 407-36.000.

PPG Industries, Inc.: *See*—
Krumwiede, John F.; Galotta, Joseph A.; and Shelestak, Larry J., 5,593,929, Cl. 501-70.000.
Mayo, Michael A., 5,593,733, Cl. 427-407.200.
Mayo, Michael A.; and Barancyk, Steven V., 5,593,785, Cl. 428-423.100.

PPV Verwaltungs AG: *See*—
Pöschl, Günter, 5,593,480, Cl. 96-124.000.

Prabhakaran, Sanjiv: *See*—
Shah, Mukesh C.; and Prabhakaran, Sanjiv, 5,594,650, Cl. 364-449.100.

Prabhu, Vaikunth S.: *See*—
Avakian, Roger W.; Prabhu, Vaikunth S.; Enlow, William P.; and Gray, Carlos L., 5,594,053, Cl. 524-120.000.

Praria, Guy B.: *See*—
Praria, Helen T.; and Praria, Guy B., 5,593,212, Cl. 297-423.440.

Praria, Helen T.; and Praria, Guy B. Footstool extension providing leg support. 5,593,212, Cl. 297-423.440.

Precision Camera Inc.: *See*—
Putora, Ivan, 5,593,078, Cl. 226-81.000.

President and Fellows of Harvard College: *See*—
Rando, Robert R.; and Wang, Yong, 5,593,835, Cl. 435-6.000.

Press, Wolf-Rüdiger: *See*—
Krause, Werner; Maier, Franz-Karl; Bauer, Michael; Schuhmann-Giampieri, Gabriele; and Press, Wolf-Rüdiger, 5,593,660, Cl. 424-9.451.

Presta, Leonard G.: *See*—
Erbe, David V.; Lasky, Lawrence A.; and Presta, Leonard G., 5,593,882, Cl. 435-240.200.

Preston, David R.: *See*—
Chouraki, Philippe J.; Moloney, Simon F.; Russell, Mark A.; and Preston, David R., 5,594,792, Cl. 379-269.000.

Preuss, Walfried: *See*—
Brueckmann, Dieter; and Preuss, Walfried, 5,594,912, Cl. 395-800.000.

Pribnow, Scott R.: *See*—
Lawless, Joseph D.; Heil, Robert H.; Pribnow, Scott R.; and Russell, Duncan R., 5,593,771, Cl. 428-317.300.

Pricer, Wilbur D., to International Business Machines Corporation. Hierarchical data storage system employing contemporaneous transfer of designated data pages to long write and short read cycle memory. 5,594,883, Cl. 395-440.000.

Primm, Charles E.; and Fourer, Gary, to Texas Instruments Incorporated. Power supply for use with switched anode field emission display including energy recovery apparatus. 5,594,305, Cl. 315-169.300.

Printz, Harry W.; and Stubley, Peter R., to Digital Equipment Corporation. Code point update device in the arithmetic coding method. 5,594,674, Cl. 364-715.020.

Prinz, Horst; Hofmann, Hartmut; Köbele, Klaus; and Wegner, Marion, to Metallgesellschaft Aktiengesellschaft. Method for producing a high-density saline cesium and rubidium solution. 5,593,650, Cl. 423-203.000.

Pritchard, Martyn C.: *See*—
Horwell, David C.; Howson, William; Pritchard, Martyn C.; Roberts, Edward; and Rees, David C., 5,594,022, Cl. 514-419.000.

Prochnow, Neal. Fishing tackle storage and carrying apparatus. 5,593,061, Cl. 220-507.000.

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Christie, Julie A.; and Talkes, Brian E., 5,593,648, Cl. 422-266.000.
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Stolowitz, Mark L., 5,594,111, Cl. 530-391.100.
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Niles, Andrew L.; and Hsak-Prendacho, Mary, 5,594,116, Cl. 530-413.000.

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Macor, Richard J., 5,592,862, Cl. 81-439.000.

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Hargrave, Karl D.; Cullen, Ernest; Proudfoot, John R.; Grozinger, Karl G.; Pal, Kollol; and Adams, Julian, 5,593,979, Cl. 514-81.000.

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Trudell, Roger J.; and Prouty, Robert E., 5,593,393, Cl. 604-264.000.

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Day, Derek J.; Stihelin, Rolf; Provenzale, Salvatore; Riess, Heinrich; and Feucl, Willi, 5,594,252, Cl. 250-385.100.

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Marshall, Roger N.; Lizon, Richard M.; Busch, Jeffrey W.; and Haack, Lane T., 5,594,468, Cl. 345-158.000.

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Cochran, Mark D.; and Macdonald, Richard D., 5,593,873, Cl. 435-172.300.

Prutton, Martin, to University of York. Electron energy spectrometer. 5,594,244, Cl. 250-305.000.

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PSC, Inc.: *See*—
Coleman, Edward P., Jr., 5,594,441, Cl. 341-136.000.

Pu, Chunmin: *See*—
Scribner, Herbert C.; Frederic, Maurice C. J.; Bechberger, Edward J.; and Pu, Chunmin, 5,593,653, Cl. 423-477.000.

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Cahill, Sally E.; Pugia, Michael J.; and Schaeper, Robert J., 5,593,895, Cl. 436-86.000.

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Chwieralski, Alfred; and Wecke, Rolf, 5,593,021, Cl. 200-303.000.

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Florin, Fabrice; Buettner, Michael; Corey, Glenn; Fritsche, Janey; Maresca, Peter; Miller, Peter; Purdy, Bill; Sharpe, Stuart; and West, Nick, 5,594,509, Cl. 348-731.000.

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Putora, Ivan, to Precision Camera Inc. Motion picture film advancement apparatus with vibration reduction. 5,593,078, Cl. 226-81.000.

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Wanner, Martin; Maier, Dieter; and Birk, Gerhard, 5,592,710, Cl. 15-53.200.

Puzik, Alois, to Volkswagen AG. Beaded guide roller. 5,593,366, Cl. 474-177.000.

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Weaver, Lindsay A., Jr.; Bayley, Gwnin; Tiedemann, Edward G., Jr.; and Gilhousen, Klein S., 5,594,718, Cl. 370-331.000.

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Magnuson, Erik E., 5,594,338, Cl. 324-318.000.

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Quickie Designs Inc.: *See*—
Williamson, Daniel E., 5,593,173, Cl. 280-642.000.

QuickLogic Corporation: *See*—
Chan, Andrew K.; Birkner, John M.; and Chan, Hua-Thye, 5,594,364, Cl. 326-39.000.

Quicksilver Manufacturing Ltd.: *See*—
Steadman, Gary E., 5,593,070, Cl. 222-608.000.

Quinquenceaux, Bruno M. M.: *See*—
Assart, Denis R. H.; Consmaret, Patrice A.; David, Etienne S. R.; Dennaby, Michel A. A.; Quinquenceaux, Bruno M. M.; and Sandelis, Denis, 5,592,819, Cl. 60-737.000.

Quinzi, Thomas N.: *See*—
Pollatta, David J.; and Quinzi, Thomas N., 5,593,752, Cl. 428-114.000.

Quon, William: *See*—
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Raber, Thomas R.: *See*—
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Zmyslowski, Mark; and Larson, Erik W., 5,592,810, Cl. 59-78.000.

Radford, Karen J.: *See*—
Bernstrom, Marvin L.; Radford, Karen J.; and Kassen, Gary R., 5,593,296, Cl. 418-61.300.

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Evans, Joseph T., Jr.; and Boyer, Leonard O., 5,593,914, Cl. 437-60.000.

Radix Sytems, Inc.: *See*—
D'Annunzio, Camille M.; and Channing, Charles E., 5,592,791, Cl. 52-167.200.

Radmer, Richard: *See*—
Chen, Hao; and Radmer, Richard, 5,593,853, Cl. 435-29.000.

Radys, Ray G.: *See*—
Yeow, Eddie Y.; Radys, Ray G.; Woody, George R.; and Ramos, Sergio, 5,594,317, Cl. 320-2.000.

Radziuk, Bernhard: *See*—
Rädel, Günther; Radziuk, Bernhard; Zeiher, Michael; and Streuz, Herbert, 5,594,547, Cl. 356-312.000.

Ragland, Frank R., Jr.: *See*—
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Rahman, M. Dalil; and Durham, Dana L., to Hoechst Celanese Corporation. Metal ion reduction in novolak resins and photoresists. 5,594,098, Cl. 528-482.000.

Rahman, Motiur: *See*—
Weder, Donald E.; and Rahman, Motiur, 5,594,048, Cl. 523-335.000.

Rahman, Sayeedur C.; and Khan, Emadadur R., to National Semiconductor Corporation. Neural-fuzzy logic control system with adjustable fuzzy logic membership functions. 5,594,835, Cl. 395-51.000.

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Block, David E.; Herrmann, Theron E.; Hsieh, Jih-Han; Mehta, Nikhil S.; and Rai, Vishva R., 5,593,870, Cl. 435-119.000.

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Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.

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Fandrianto, Jan; Wang, Chi S.; Rainnie, Hedley K. J.; Sutardja, Sehat; and Martin, Bryan R., 5,594,813, Cl. 382-236.000.

Raith, Alex K.: *See*—
Dent, Paul W.; and Raith, Alex K., 5,594,795, Cl. 380-23.000.

Raith, David: *See*—
Peeples, Frank K.; Raith, David; and Donnelly, Charles E., 5,593,268, Cl. 414-301.000.

Rajasekaran, Kaushik; and Kurnia, Alexander, to General Motors Corporation. DC link inverter having soft-switched auxiliary devices. 5,594,634, Cl. 363-98.000.

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Rajfer, Jacob: *See*—
Gonzalez-Cadavid, Nestor F.; and Rajfer, Jacob, 5,594,032, Cl. 514-645.000.

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Chen, Ming F.; Raju, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vitukudi N., 5,594,021, Cl. 514-378.000.

Rakieski, Kenneth E., to Dresser Industries, Inc. Valve stop changer. 5,592,965, Cl. 137-315.000.

Ram, Yaron: *See*—
Chaco, John; Hersh, Israel; Orlovsky, Dmitry; Vincens, Joe; and Ram, Yaron, 5,594,786, Cl. 379-93.000.

Ram, Zeev. Dental apparatus including multiple-use electrically-oscillated headpiece. 5,593,304, Cl. 433-82.000.

Ramanan, V. R. V.; Fish, Gordon E.; Liebermann, Howard H.; and Silgailis, John, to AlliedSignal Inc. Amorphous Fe-B-Si-C alloys having soft magnetic characteristics useful in low frequency applications. 5,593,513, Cl. 148-304.000.

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Tresal, Suzanne B.; Dall, Cristine J.; Draveling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., 5,593,824, Cl. 435-4.000.

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Ramos, Sergio: *See*—
Yeow, Eddie Y.; Radys, Ray G.; Woody, George R.; and Ramos, Sergio, 5,594,317, Cl. 320-2.000.

Ramsey Electronics, Inc.: *See*—
Ramsey, John G., 5,594,200, Cl. 174-35.00R.

Ramsey, John G., to Ramsey Electronics, Inc. Electromagnetic isolation chamber. 5,594,200, Cl. 174-35.00R.

Randall, John N.: *See*—
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Randhahn, Horst; and Vogelman, Hartmut, to Pall Corporation. Method and apparatus for rapidly testing the integrity of filter elements. 5,594,161, Cl. 73-38.000.

Rando, Robert R.; and Wang, Yong, to President and Fellows of Harvard College. Methods and kits for RNA binding compounds. 5,593,835, Cl. 435-6.000.

Rangert, Bo: *See*—
Svensson, Thomas; Rangert, Bo; Jansson, Kerstin; and Jörgensen, Einar, 5,593,444, Cl. 623-16.000.

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Ransom, Stephen; and Relotius, Klaus-Dieter, to Daimler-Benz Aerospace AG. Apparatus for controlling the structural dynamic response of a rocket. 5,593,110, Cl. 244-3.230.

Rapoport, Henry: *See*—
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Rasinger, Josef: *See*—
Garn, Heinrich; Rasinger, Josef; and Mullner, Wolfgang, 5,594,458, Cl. 343-703.000.

Ratajczyk, Barbara E.: *See*—
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Ratzel, Richard O.: *See*—
Armington, Steven E.; and Ratzel, Richard O., 5,593,376, Cl. 493-464.000.

Rauguth, Brad L.: *See*—
Schmiedeknecht, Dean L.; Straszheim, Mark J.; Thompson, Dennis J.; and Rauguth, Brad L., 5,592,984, Cl. 164-62.000.

Ray, Partha S.: *See*—
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Ray, Ted M.: *See*—
Hester, Gary K.; Fernandez, Conrad L.; McNeill, Jon; Ray, Ted M.; and Traynor, William, 5,593,072, Cl. 223-120.000.

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Bouton, Frank M.; Church, Robert L.; and Rayhawk, Joseph C., 5,593,350, Cl. 463-36.000.

Rayman, Reiza, to Surgery Futures Research, Inc. Magnetic operating table. 5,593,379, Cl. 600-9.000.

Raymond, Jon H.; and Ventrone, Sebastian T., to International Business Machines Corporation. Method and apparatus for switching between clock generators only when activity on a bus can be stopped. 5,594,895, Cl. 395-556.000.

Rayovac Corporation: *See*—
Pacholok, David R.; Pouchard, David T.; and Ebner, Walter B., 5,594,320, Cl. 320-4.000.

Read, Kenric W. Free-standing two-way bar clamp. 5,593,147, Cl. 269-170.000.

Rebec, Mihailo V.: *See*—
Rebec, Mohammed S.; and Rebec, Mihailo V., 5,594,936, Cl. 455-3.200.

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Parish, Robert O., II; and Reber, Cleve C., 5,592,993, Cl. 175-162.000.

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Redner, Carl R., to General Filters, Inc. Activated carbon air purifier. 5,593,481, Cl. 96-132.000.

Reed, George D.; and Weaver, Robert L., to B&F Medical Products, Inc. Gas flow rate regulator. 5,593,136, Cl. 251-366.000.

Reed, John F.: *See*—
Wolf, Robert J.; Purrington, Scott M.; Brandner, John M.; Olson, David A.; and Reed, John F., 5,593,769, Cl. 428-286.000.

Rees, Catherine E. D.: *See*—
Bycroft, Barrie W.; Williams, Paul; Stewart, Gordon S. A. B.; Chhabra, Siri R.; Stead, Paul; Winson, Michael K.; Hill, Philip J.; Rees, Catherine E. D.; and Bainton, Nigel J., 5,593,827, Cl. 435-6.000.

Rees, David C.: *See*—
Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.
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Reese, Harlan F.: *See*—
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Register, David S., to Dell U.S.A., L.P. Secondary display system having a plurality of clamping devices for mounting on a computer monitor. 5,594,620, Cl. 361-681.000.

Reh, Jeff: *See*—
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Rehbichler, Gerhard, to Robert Bosch GmbH. Method and device for actuating an electromagnetic load. 5,592,921, Cl. 123-490.000.

Reichart, Willi: *See*—
Frey, Gerhard; Hirth, Thomas; Grohmann, Dieter; and Reichart, Willi, 5,594,173, Cl. 73-520.010.

Reichel, Donald R.: *See*—
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Reichenbach, Thomas G.: *See*—
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Reichenzer, Werner: *See*—
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Reichert, Russell L. Turbulence arrester. 5,592,969, Cl. 137-592.000.

Reichert, Thomas A.; and Champlin, Richard, to Becton Dickinson and Company. Method for prevention of graft versus host disease. 5,593,677, Cl. 424-154.100.

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Reiersgaard, William L.; Knebel, Andrew W., Jr.; Davis, Curtis A.; Reiersgaard, John M.; and Pelton, Lloyd E., 5,592,738, Cl. 29-863.000.

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Reineke, Roger W.: *See*—
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Hargarter, Nicole; Schultze, Dirk; and Reiners, Ulrich, 5,593,775, Cl. 428-349.000.

Reinert, Gary L., Sr. Adjustable container set apparatus and method. 5,594,201, Cl. 174-37.000.

Reinhardt, Bruce A.; and Bhatt, Jayprakash C., to United States of America, Air Force. Acetylenic heterocyclic nonlinear optical thermoset monomers. 5,594,075, Cl. 525-426.000.

Reinicke-Murmann, Joachim: *See*—
Kreuter, Peter; Reinicke-Murmann, Joachim; and Heuser, Peter, 5,592,906, Cl. 123-90.160.

Reinke, Richard F. Roof shingle tab cover system. 5,592,799, Cl. 52-529.000.

Reis, Nicolas D. Internal ilio-lumbar fixator. 5,593,407, Cl. 606-61.000.

Reissner, Peter E., to International Business Machines Corporation. Access point tracking for mobile wireless network node. 5,594,731, Cl. 370-338.000.

Rej, Rabindra: *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamonthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Rekoske, Michael J.: *See*—
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Relin, Arkadi; and Milstein, Anatole. Method of and device for suction transporting. 5,593,252, Cl. 406-85.000.

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Remillard, John F., to Philosophers' Stone LLC. Permutation-based data compression. 5,594,435, Cl. 341-51.000.

Remondi, Stephen A.: *See*—
Chen, Hudong; Churchill, Peter C.; Iannacci, Robert A.; Molvig, Kim; Papadopoulos, Gregory; Remondi, Stephen A.; Teixeira, Christopher M.; and Traub, Kenneth R., 5,594,671, Cl. 364-578.000.

Renger, Herman L., to Pacesetter, Inc. Bus system for interconnecting an implantable medical device with a plurality of sensors. 5,593,430, Cl. 607-18.000.

Repp, Richard E.; West, William R.; and Luch, Daniel, to Portola Packaging, Inc. Snap-on, screw-off cap with tamper-evident skirt and container neck. 5,593,055, Cl. 215-256.000.

Reppert, David A.; and Kinion, James A., to Metro Industries, Inc. Method of manufacturing a caster with a fouling-resistant bearing cup feature. 5,593,461, Cl. 29-11.000.

Requejo, Antonio. Reinforced awning. 5,592,790, Cl. 52-77.000.

Research Corporation Technologies, Inc.: *See*—
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Hall, Linda M.; and Feng, Guoping, 5,593,862, Cl. 435-69.100.
Kaufman, Arie E.; and Pfister, Hanspeter, 5,594,842, Cl. 395-124.000.
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Reshetnikov, Gennady: *See*—
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Respironics Inc.: *See*—
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Reston, Rocky: *See*—
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Retter, Rafael: *See*—
Farkash, Shmuel; Retter, Rafael; Adar, Ruth; and Gill, Aharon, 5,594,554, Cl. 358-426.000.

Reuteler, Urs, to Riverwood International Corporation. Method and apparatus for positioning carton flaps. 5,592,804, Cl. 53-398.000.

Reuter, John R.; and Kline, Raymond K. Decorative exterior lighting system for use on a building. 5,594,628, Cl. 362-249.000.

Revill, Brian K.: *See*—
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Rexham Graphics Inc.: *See*—
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Rey, Proserfina C.: *See*—

Keshavan, Madapusi K.; and Rey, Prosenfina C., 5,593,474, Cl. 75-240.000.

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Reynolds, Michael L. Mechanically assisted hydraulic filter. 5,593,579, Cl. 210-242.100.

Reynolds, Richard A.: *See*—
Cala, Francis R.; Reynolds, Richard A.; and Eichhorn, Eric E., 5,593,504, Cl. 134-1.000.

Rho, Eun R.: *See*—
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Wissmann, Friedbert; Kientz, Paul; and Sierra, Bernd, 5,592,975, Cl. 138-112.000.

Saarela, Olli J.: *See*—
Lyon, Richard H.; Choi, Jangboon; Lang, Jeffrey H.; Hagman, Wayne H.; Umans, Stephen D.; and Saarela, Olli J., 5,594,175, Cl. 73-593.000.

Sabatini, Karen S.: *See*—
Spencer, Kevin C.; Boisrobert, Christine E.; Fisher, Steven A.; Rojak, Patricia A.; and Sabatini, Karen S., 5,593,868, Cl. 435-94.000.

Sabin, Robert. Method of preparing and maintaining the immune system for lymphokine, cytokine and biological response modifier administration. 5,593,672, Cl. 424-85.200.

Sabol, Robert T.: *See*—
Chambers, Joseph W., Sr.; Sabol, Robert T.; Fennessy, Craig J.; and Graham, Rodney E., 5,593,100, Cl. 241-101.200.

Sabot, Jean-Louis: *See*—
Chane-Ching, Jean-Yves; Hustache, Gerard; and Sabot, Jean-Louis, 5,593,651, Cl. 423-242.100.

Sacco, Anthony R.: *See*—
Bishara, Jeries I.; Brannan, James R.; Horvath, Roland J.; Sacco, Anthony R.; and Hinden, Jean M., 5,593,627, Cl. 264-127.000.

Sacher, Dirk: *See*—
Schröder, Dierk; Sacher, Dirk; and Straube, Peter, 5,594,184, Cl. 73-865.000.

Sachse, Andreas: *See*—
Rössling, Georg; and Sachse, Andreas, 5,593,687, Cl. 424-450.000.

Sacripante, Guerino G.; and Patel, Raj D., to Xerox Corporation. Toner processes using sodium sulfonated polyester resins. 5,593,807, Cl. 430-137.000.

Sadakata, Nobuyasu; Honma, Bunji; Iwamoto, Hideyuki; Shindo, Yoichi; and Yomoda, Akira, to Mitsuba Electric Manufacturing Co., Ltd. Fuel feed pump. 5,593,287, Cl. 417-366.000.

Saegusa, Takashi: *See*—
Sasagaki, Nobuaki; and Saegusa, Takashi, 5,594,524, Cl. 396-287.000.

Safyan, Bernard, to CCC Industries, LLC. Wall washer light with internal swivel connector and support arm. 5,593,225, Cl. 362-427.000.

Sagar, Chris; and Britt, Mike. Air conditioning systems with purge. 5,592,826, Cl. 62-195.000.

Sagredos, Angelos N.; and Neumeister, Ilmar, to Wamsler Grosskuechentechnik GmbH. Method for determining the degree of deterioration of oils or fats used for frying foods. 5,594,327, Cl. 324-71.100.

Sahashi, Masashi: *See*—
Saito, Akiko; Sahashi, Masashi; Tokai, Yoichi; Tsutai, Akihiko; Okamura, Masami; Nishiyama, Yukiko; and Inaba, Michihiko, 5,593,517, Cl. 148-301.000.

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Sahebjam, Steve S.: *See*—
Hill, George H.; and Sahebjam, Steve S., 5,594,284, Cl. 307-10.500.

Saikawa, Akira: *See*—
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kamei, Shigeru; Oka, Masahisa; and Sano, Atsunori, 5,594,091, Cl. 528-271.000.

Saint-Gobain/Norton Industrial Ceramics Corporation: *See*—
Khasnd, Arup K.; Garg, Ajay K.; and Bauer, Ralph, 5,593,468, Cl. 51-309.000.

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Shimada, Yasunori; Goto, Masahito; Saito, Hisashi; and Taniguchi, Koji, 5,594,259, Cl. 257-66.000.

Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, to Dai Nippon Printing Co., Ltd. Thermal transfer image receiving sheet, production process therefor and thermal transfer sheet. 5,593,939, Cl. 503-227.000.

Saito, Mitsuru: *See*—
Matsuura, Masaaki; Hikichi, Toichiro; Saito, Mitsuru; and Tagami, Takuya, 5,592,999, Cl. 180-227.000.

Saito, Muneo; Kurosu, Yasuyuki; and Sasaki, Toru, to Nihon Bunko Kabushiki Kaisha. Microflow cell. 5,594,545, Cl. 356-246.000.

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Saitoh, Hiroyuki, to Fujitsu Limited. Watchdog timer that can detect processor runaway while processor is accessing storage unit using data comparing unit to reset timer. 5,594,865, Cl. 395-185.080.

Saitou, Mitsuhiro: *See*—
Otani, Yuji; Nagasaka, Takashi; and Saitou, Mitsuhiro, 5,593,722, Cl. 427-101.000.

Sajnovic, James N., to Ingersoll-Rand Company. Method for producing hardened flutes in a kelly bar. 5,593,603, Cl. 219-69.100.

Sakai, Akira: *See*—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 5,593,497, Cl. 117-90.000.

Sakai, Toshio; Watanabe, Norito; Miyoshi, Masanori; and Fukuda, Yoshibumi, to Hitachi, Ltd. Three dimensional view using ray tracing through voxels subdivided numerically using object based parameters. 5,594,844, Cl. 395-127.000.

Sakakibara, Shigeto, to Funai Electric Co., Ltd. Method for tuning the channel of broadcasting waves and identifying channel plan by applying memorized frequency data. 5,594,510, Cl. 348-731.000.

Sakamoto, Hiroshi: *See*—
Hagiuda, Nobuyoshi; Matsui, Hideki; Sakamoto, Hiroshi; and Takayanagi, Ryotaro, 5,594,314, Cl. 320-2.000.

Sakamoto, Hiroyuki: *See*—
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sano, Fumitaka; and Ishiura, Ryoichi, 5,594,619, Cl. 361-681.000.

Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives as matrix metalloproteinases inhibitors. 5,594,006, Cl. 514-312.000.

Sakamoto, Mitsuno, to Pioneer Electronic Corporation. Driving circuit for display apparatus, and method of driving display apparatus. 5,594,463, Cl. 345-76.000.

Sakamoto, Yoshio; Iwakura, Shiro; Tanase, Akio; and Yamazaki, Kaoru, to Kabushiki Kaisha Kenwood. Loudspeaker. 5,594,805, Cl. 381-199.000.

Sakanaka, Tetsuo; and Hamuro, Takehide, to Canon Kabushiki Kaisha. Optical space communication apparatus. 5,594,580, Cl. 359-172.000.

Sakane, Katsunobu: *See*—
Shiga, Ichizou; Nagata, Atsushi; Koyama, Tooru; and Sakane, Katsunobu, 5,593,178, Cl. 280-731.000.

Sakata, Masahiko: *See*—
Fujiwara, Susumu; Sakata, Masahiko; and Ishizuka, Mikio, 5,594,803, Cl. 381-71.000.

Sakuda, Mitsuhiro: *See*—
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Sakuragawa, Tooru: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakatsubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.

Sakurai, Ichiro: *See*—
Arita, Tatsuo; Sakurai, Ichiro; and Komiya, Noboru, 5,593,437, Cl. 623-6.000.

Sakurai Seigi Company, Ltd.: *See*—
Arita, Tatsuo; Sakurai, Ichiro; and Komiya, Noboru, 5,593,437, Cl. 623-6.000.

Sakurai, Wataru; Sawaguchi, Hideki; Satoh, Naoki; and Umemoto, Masuo, to Hitachi, Ltd. Decision feedback equalization circuit. 5,594,756, Cl. 375-233.000.

Sakuta, Toshiyuki: *See*—
Ikou, Yutaka; Iwai, Hidetoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, 5,594,279, Cl. 257-758.000.

Sales, James J.: *See*—
Cullinan, George J.; and Sales, James J., 5,593,987, Cl. 514-212.000.

Salesin, David H.; and Finkelstein, Adam, to University of Washington. Method and system for editing the general sweep and detail of a figure with a curve. 5,594,853, Cl. 395-141.000.

Salisbury, Terrence L.: *See*—
Wood, Robert J.; Salisbury, Terrence L.; Walts, Connie R.; and Pileski, Michael J., 5,594,826, Cl. 385-88.000.

Sallee, Bradley T., to Tracor, Inc. Extendable support pole. 5,593,239, Cl. 403-109.000.

Sallee, Lorry F.: *See*—
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laus, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.

Salt, Sarah D.: *See*—
Greenway, Michael J.; Salt, Sarah D.; Valder, Christopher E.; and Curzons, Alan D., 5,594,026, Cl. 514-460.000.

Samata, Yoshimitsu: *See*—
Kumagai, Naokazu; Jikihara, Shuji; and Samata, Yoshimitsu, 5,593,556, Cl. 204-290.00F.

Samsonite Corporation: *See*—
King, William L., 5,593,009, Cl. 190-102.000.

Samsung Electronics Co., Ltd.: *See*—
Han, Min-Koo; and Min, Byung-Hyuk, 5,593,909, Cl. 437-41.000.
Jeong, Seong-wook; Kim, Jae-in; and Kang, Yun-seog, 5,592,827, Cl. 62-229.000.
Kim, Kyung-su, 5,594,310, Cl. 318-578.000.
Kwon, Young S.; and Ahn, Seung H., 5,594,275, Cl. 257-686.000.
Lee, Chul-woo; Rim, Kyung-hwa; Seong, Pyong-yong; and Chung, Chong-sam, 5,594,714, Cl. 369-118.000.
Lee, Jin-Soo, 5,594,605, Cl. 360-96.500.
Park, Chun-geun; Yeo, Gi-sung; and Park, Jung-chul, 5,593,725, Cl. 427-160.000.
Yang, Jian, 5,594,506, Cl. 348-531.000.
Yim, Sung-Min; and Lee, Jung-Hyuck, 5,594,695, Cl. 365-205.000.

Samsung Heavy Industries Co., Ltd.: *See*—
Cho, Hyung J., 5,592,967, Cl. 137-522.000.

San-Ei Gen F.F.I: *See*—
Kitahata, Sumio; Nakano, Hirofumi; Washino, Tsutomu; and Moriwaki, Masamitsu, 5,593,869, Cl. 435-100.000.

Sanchez, Victor R.; Ceja, Alberto; and Anguiano, Rigoberto, to Machine Masters, Inc. Mass handling apparatus and method for handling mass. 5,592,870, Cl. 99-353.000.

Sanchez-Sinencio, Feliciano: *See*—
De La Luz-Martinez, Jose; Gonzalez-Hernandez, Jesus; Sanchez-Sinencio, Feliciano; de Dios Figueroa C., Juan; Martinez-Bustos, Fernando; and Ruiz-Torres, Maximiano, 5,593,713, Cl. 426-237.000.

Sandelis, Denis: *See*—
Ansart, Denis R. H.; Commaret, Patrice A.; David, Etienne S. R.; Desaulty, Michel A. A.; Quinquennean, Bruno M. M.; and Sandelis, Denis, 5,592,819, Cl. 60-737.000.

Sandelis, Denis J. M.: *See*—
Alary, Jean-Paul D.; Desaulty, Michel; Sandelis, Denis J. M.; and Schroer, Pierre, 5,592,820, Cl. 60-751.000.
Alary, Jean-Paul D.; Barbier, Gérard Y. G.; Delahaye, Corine G.; Havard, Jacques G. W. R.; Mackovic, Paul; Masse, Bruno R. H.; Merville, Didier; Mirville, Francois J.-P.; Muccioli, Serge R. Y.; Sandelis, Denis J. M.; and Stelter, Ralph M., 5,592,821, Cl. 60-751.000.

Sanders, Josef: *See*—
Heinemann, Torsten; Dietrich, Manfred; Jacobs, Gundolf; Kratz, Mark; Sanders, Josef; Scholz, Uwe; and Woynar, Helmut, 5,594,066, Cl. 524-761.000.

Sandoz Ltd.: *See*—
Kissel, Thomas; Schrank, Henriette; and Hoffmann, Hans-Rainer, 5,593,686, Cl. 424-448.000.

Sandstrom, Peter: *See*—
Kolbenson, Chuck; Nelson, Paul; St. Hilaire, Kenneth; Tingley, Alan; Tenuta, Gerry; and Sandstrom, Peter, 5,594,727, Cl. 370-442.000.

Sandvik AB: *See*—
Muhammed, Mamoun; Wahlberg, Sverker; and Grenthe, Ingmar, 5,594,929, Cl. 419-1.000.

SanGregory, Jude A.; and Rydelek, James G., to Eastman Kodak Company. Film spool. 5,593,104, Cl. 242-348.100.

Sano, Atsunori: *See*—
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kamei, Shigeru; Oka, Masahisa; and Sano, Atsunori, 5,594,091, Cl. 528-271.000.

Sano, Hiromi: *See*—
Sugino, Hiroshi; Hotta, Yasumichi; Fujii, Namitsugu; Shibata, Masahiro; and Sano, Hiromi, 5,593,558, Cl. 204-429.000.

Sano, Yoshihisa: *See*—
Mitsutake, Hideaki; Nakamura, Naoto; and Sano, Yoshihisa, 5,594,296, Cl. 313-309.000.

Sanofi: *See*—
Wagnon, Jean; Tomerre, Bernard; Di Malta, Alain; Roux, Richard; Amiel, Marie-Sophie; and Serradeil-Le Gal, Claudine, 5,594,023, Cl. 514-423.000.

Sanpei, Kazuo; and Yamauchi, Tatsuo, to Hitachi Telecom Technologies Ltd. Electric appliance, its assembling method, and its housing structure. 5,594,625, Cl. 361-755.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Kato, Naoki, 5,593,329, Cl. 440-42.000.

Santamaria, Pedro; Boyce-Jacino, Michael T.; Barbosa, Jose J.; Rich, Stephen S.; and Faras, Anthony J., to University of Minnesota, Regents of the. DNA sequence-based HLA class I typing method. 5,593,830, Cl. 435-6.000.

Santel, Hans-Joachim; and Feucht, Dieter, to Bayer Aktiengesellschaft. Herbicidal agents based on heteroaryloxyacetamides and metriburzin. 5,593,942, Cl. 504-134.000.

Santel, Hans-Joachim: *See*—
Andree, Roland; Drewes, Mark-Wilhelm; Marhold, Albrecht; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,945, Cl. 504-243.000.
Ooms, Pieter; Santel, Hans-Joachim; and Dollinger, Markus, 5,593,944, Cl. 504-240.000.

Santino, Colleen G.: *See*—
Brown, Sherri M.; and Santino, Colleen G., 5,593,874, Cl. 435-172.300.

Santosusso, Thomas M.: *See*—
Tien, Chao-Fong; Hegedus, Charles R.; Santosusso, Thomas M.; Snyder, Jeanine M.; and Mercando, Lisa A., 5,594,065, Cl. 524-507.000.

Santrade Ltd.: *See*—
König, Axel; Kleinhans, Matthias; and Michelic, Janéz, 5,593,500, Cl. 118-303.000.
König, Axel; Kleinhans, Matthias; and Michelic, Janéz, 5,593,501, Cl. 118-410.000.

Santus, Giancarlo: *See*—
Baker, Richard W.; Santus, Giancarlo; and Vintilla-Friedman, Susan, 5,593,684, Cl. 424-435.000.

Sanyo Electric Co., Ltd.: *See*—
Kawakami, Kouichi; Hamaguchi, Toshihide; Kuge, Satoru; and Maida, Yoshiaki, 5,594,596, Cl. 386-80.000.
Onaya, Masato, 5,594,440, Cl. 341-131.000.
Yamada, Susumu, 5,594,888, Cl. 395-495.000.

Sarcos Group: *See*—
Jacobsen, Stephen C., 5,594,330, Cl. 324-106.000.

Sarkisian, John M.; Palitsch, John R.; and Zecco, Joseph J., Jr., to Wyman-Gordon Company. Stepped segmented, closed-die forging. 5,592,847, Cl. 72-356.000.

Sarron, Jean-Pierre: *See*—
Commandeur, Raymond; and Sarron, Jean-Pierre, 5,593,613, Cl. 252-73.000.

Sartini, Eugene; and McMichael, Dannie L., to Kenney Manufacturing Company. Pull cord safety device. 5,592,983, Cl. 160-178.100.

Sasagaki, Nobuaki; and Saegusa, Takashi, to Nikon Corporation. Camera for selectively inputting operating parameters and method. 5,594,524, Cl. 396-287.000.

Sasagawa, Katsuyoshi: *See*—
Nagata, Teruyuki; Okazaki, Koju; Miura, Tohru; Kajimoto, Nobuyuki; Kanemura, Yoshinobu; Sasagawa, Katsuyoshi; and Imai, Masao, 5,594,088, Cl. 528-77.000.

Sasakawa, Hidetoshi; and Ushiyama, Keiji, to Yazaki Corporation. Mounting clip. 5,592,720, Cl. 24-453.000.

Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Oka, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, to Matsushita Electric Industrial Co., Ltd. Antenna diversity switching device with switching circuits between the receiver terminal and each antenna. 5,594,394, Cl. 333-103.000.
Sasaki, Satoru: *See*—
Tsushima, Nobuo; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, 5,594,488, Cl. 347-208.000.
Sasaki, Shinichi: *See*—
Shishido, Kazuo; Sasaki, Shinichi; and Miura, Koji, 5,594,531, Cl. 399-159.000.
Sasaki, Toru: *See*—
Saito, Muneo; Kurosu, Yasuyuki; and Sasaki, Toru, 5,594,545, Cl. 356-246.000.
Sasamoto, Taturo: *See*—
Mori, Kazunori; Suzuki, Nobuyuki; and Sasamoto, Taturo, 5,594,603, Cl. 360-78.040.
Sashi, Kazumichi: *See*—
Takemura, Kazuya; Kajioka, Masahiko; Sashi, Kazumichi; Takano, Shigeru; and Sumita, Eiichi, 5,594,062, Cl. 524-504.000.
Sassa, Robert L.: *See*—
Dauber, Edwin G.; Bailey, Christian E.; and Sassa, Robert L., 5,593,482, Cl. 96-135.000.
Satgurunathan, Rajasingham; Hinde, David C.; Padget, John C.; and Yeates, Stephen G., to Zeneca Limited. Powder coating composition. 5,593,730, Cl. 427-386.000.
Sato, Fumitaka: *See*—
Miyagawa, Shigenori; Kobayashi, Koichi; Kunii, Shimpei; Kamio, Shizuo; Sakamoto, Hiroyuki; Sato, Fumitaka; and Ishiura, Ryoichi, 5,594,619, Cl. 361-681.000.
Sato, Hideaki: *See*—
Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.
Sato, Hiroshi: *See*—
Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, 5,593,757, Cl. 428-195.000.
Sato, Koichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Video signal recording and reproducing apparatus using signal modification to remove jitter. 5,594,553, Cl. 386-88.000.
Sato, Morimasa; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Method of forming a spacer for use in a liquid crystal panel. 5,593,802, Cl. 430-20.000.
Sato, Morio; Abe, Yutaka; Takano, Jun; Ishii, Hirokazu; and Murata, Yasuzo, to Kabushiki Kaisha Pilot. Hand-writable polymer dispersed liquid crystal board set with high resistance layer adjacent conductive layer. 5,594,562, Cl. 349-12.000.
Sato, Motoaki: *See*—
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Suzuka, Manabu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, 5,594,479, Cl. 347-45.000.
Sato, Naofumi; Mochizuki, Hiroshi; and Kanamori, Toshinori, to Mochida Pharmaceutical Co., Ltd. Acridinium compounds and conjugates thereof. 5,594,112, Cl. 530-391.300.
Sato, Noriko; Aritake, Hirokazu; Kato, Masayuki; Ishimoto, Manabu; and Nakashima, Masato, to Fujitsu Limited. Stereoscopic display apparatus. 5,594,559, Cl. 359-8.000.
Sato, Noriko: *See*—
Ishimoto, Manabu; Kato, Masayuki; Aritake, Hirokazu; and Sato, Noriko, 5,594,564, Cl. 349-143.000.
Sato, Ritsu, to NGK Insulators, Ltd. Composition for high pressure casting slip, high pressure casting slip and method for preparing the composition and slip. 5,593,930, Cl. 501-141.000.
Sato, Shuji; Ogata, Masanori; Ito, Keago; and Shiota, Hiroyuki, to Sony Corporation. Printing device and photographic paper. 5,594,480, Cl. 347-51.000.
Sato, Yasuo, to Nippon Steel Corporation. Nonvolatile semiconductor memory device and method of producing the same. 5,594,688, Cl. 365-185.100.
Sato, Yoshiharu: *See*—
Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihito; Sato, Yoshiharu; Abe, Shunji; and Soumiya, Toshio, 5,594,717, Cl. 370-232.000.
Sato, Yuzuru: *See*—
Tanaka, Takaaki; Sato, Yuzuru; and Nomura, Hiroaki, 5,594,464, Cl. 345-94.000.
Satoh, Naoki: *See*—
Sakurai, Wataru; Sawaguchi, Hideki; Satoh, Naoki; and Umemoto, Masuo, 5,594,756, Cl. 375-233.000.
Satoh, Yasuharu: *See*—
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.
Satou, Hiroyuki: *See*—
Matoba, Tsukasa; and Satou, Hiroyuki, 5,594,884, Cl. 395-452.000.
Satran, Amir; and Margulis, Rafael, to Iscar Ltd. Cutting insert for a rotary milling cutter. 5,593,255, Cl. 407-113.000.
Sauer Inc.: *See*—
Johnson, Alan W., 5,593,000, Cl. 180-305.000.
Saurer Sticksysteme AG: *See*—
Zwiener, Rudolf, 5,592,976, Cl. 139-194.000.
Sauter, Hubert: *See*—
Wingert, Horst; Hellendahl, Beate; Sauter, Hubert; and Lorenz, Gisela, 5,594,020, Cl. 514-378.000.
Sawada, Minoru: *See*—
Itoh, Keisuke; and Sawada, Minoru, 5,593,338, Cl. 446-259.000.
Sawaguchi, Hideki: *See*—
Sakurai, Wataru; Sawaguchi, Hideki; Satoh, Naoki; and Umemoto, Masuo, 5,594,756, Cl. 375-233.000.
Sawahashi, Mamoru: *See*—
Dohi, Tomohiro; Sawahashi, Mamoru; and Adachi, Fumiyuki, 5,594,754, Cl. 375-200.000.
Sawai, Toshihiko; Inuzuka, Masayuki; and Terada, Toyohiko, to Hamamatsu Photonics K.K. Electron tube including aluminum seal ring. 5,594,301, Cl. 313-523.000.
Saxe, Timothy: *See*—
Freeman, Richard D.; Linoff, Joseph D.; and Saxe, Timothy, 5,594,363, Cl. 326-39.000.
Sayegh, Mohamed: *See*—
Weiner, Howard L.; Hafler, David A.; Carpenter, Charles B.; Sayegh, Mohamed; and Zhang, Zhengyi, 5,593,698, Cl. 424-534.000.
Scambia Industrial Developments Aktiengesellschaft: *See*—
Steenackers, Pieter D.; and Petitjean, Frédéric P. D. F., 5,593,645, Cl. 422-176.000.
Scarberry, Eugene N.; and Handke, Patrick M., to Respironics Inc. Mask apparatus. 5,592,938, Cl. 128-206.240.
Schaeffer, Maurice; and Choukroun, Alain, to B A C O Constructions Electriques Anct. Baumgarten. Push-and-turn latching control button, in particular for operating an electrical component. 5,593,022, Cl. 200-308.000.
Schaeper, Robert J.: *See*—
Cahill, Sally E.; Pugia, Michael J.; and Schaeper, Robert J., 5,593,895, Cl. 436-86.000.
Schaffer, Peter; and Armstrong, Scott, to Inorganic Coating, Inc. Weld through primer. 5,593,492, Cl. 106-623.000.
Schallenkamp, Glen C.: *See*—
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Schantz, Spencer C.: *See*—
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Shu, Joseph S., 5,594,839, Cl. 395-109.000.
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Olivo, Marco; and Maccarrone, Marco, 5,594,703, Cl. 365-230.060.

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Duren, John J., 5,593,331, Cl. 441-6.000.

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Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,593,214, Cl. 303-7.000.

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Keshavan, Madapusi K.; and Rey, Proserfina C., 5,593,474, Cl. 75-240.000.

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Greenway, Michael J.; Salt, Sarah D.; Valder, Christopher E.; and Curzons, Alan D., 5,594,026, Cl. 514-460.000.

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Snead, Kevin H.: *See*—
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Devereux, William S.; Boehme, Michael H.; Linstrom, Lloyd; McKnight, Thomas R., Jr.; Moore, Robert C.; Meyer, John R.; Snow, Paul R.; and Grimm, Paul D., 5,594,454, Cl. 342-357.000.

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Alary, Jean-Paul D.; Desaulty, Michel; Sandelis, Denis J. M.; and Schroer, Pierre, 5,592,820, Cl. 60-751.000.

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Nor, Jiri K.; and Soltys, Josef V., 5,594,318, Cl. 320-2.000.

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Sonsub, Inc.: *See*—
Cox, David S.; and Gates, Stephen M., 5,593,249, Cl. 405-191.000.
Sony Corporation: *See*—
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Fujinami, Yasuhi; and Yonemitsu, Jun, 5,594,552, Cl. 386-131.000.
Hirota, Katsumi, 5,594,459, Cl. 343-749.000.
Iwata, Eiji, 5,594,679, Cl. 364-736.000.
Nagano, Shuichi; and Tomizawa, Kenji, 5,594,709, Cl. 369-32.000.
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Sopher, David; Gieseler, Andreas; Hibst, Hartmut; Harth, Klaus; and Jaeger, Peter, to BASF Aktiengesellschaft. Electrode consisting of an iron-containing core and a lead-containing coating. 5,593,557, Cl. 204-290.00R.
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Sotheran, Martin W.: *See*—
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Sourdillon: *See*—
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Southpac Trust International, Inc.: *See*—
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Weder, Donald E., 5,592,803, Cl. 53-397.000.
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Dearnaley, Geoffrey; and Lankford, James, Jr., 5,593,719, Cl. 427-2.260.
Dearnaley, Geoffrey; and Herk, Leonard F., Jr., 5,594,041, Cl. 522-2.000.
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Velius, George A., 5,594,784, Cl. 379-88.000.
Space Systems/Loral, Inc.: *See*—
Caster, Stanley; and Leak, Ronald, 5,594,324, Cl. 323-282.000.
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Spehr, Paul R.; Frankovich, Mark M.; and White, Mark A., to Intermedics, Inc. Implantable endocardial lead with self-healing retractable fixation apparatus. 5,593,433, Cl. 607-128.000.
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Spivak, Victor, to Gorlitsky, Igor. Electroacoustic energy converter for transformation between thermal and electrical energy. 5,594,293, Cl. 310-339.000.
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Stackhouse, Inc.: *See*—
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Stalcup, Gregory C.; and Harris, James C., to Zimmer, Inc. Orthopaedic milling guide for milling intersecting planes. 5,593,411, Cl. 606-88.000.
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Star, Michael J.: *See*—
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Stephenson, David J.: *See*—
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Stern, Elliot L., to Orthotic Rehabilitation Products, Inc. Inflatable hand orthosis. 5,593,369, Cl. 482-47.000.
Stern, Philip A.; Elich, Terry R.; and Wicks, Thomas S., to Eastman Kodak Company. Toner container. 5,592,980, Cl. 141-364.000.
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Stockill, Trevor R.: *See*—
Marlton, Anthony P.; Fielder, Dennis A.; Halstead, Victor G., deceased; and Stockill, Trevor R., 5,594,467, Cl. 345-115.000.
Stolowitz, Mark L., to Protinx, Inc. Phenylboronic acid complexes for bioconjugate preparation. 5,594,111, Cl. 530-391.100.
Stolowitz, Mark L., to Protinx, Inc. Phenylboronic acid complexing reagents derived from aminosalicylic acid. 5,594,151, Cl. 548-542.000.
Stone, Neil T.; and Nosco, Jacques. System for motion picture film previewing. 5,594,513, Cl. 352-6.000.
Stone, Ralph: *See*—
Mowrey-McKee, Mary; Blizzik, Kenneth; and Stone, Ralph, 5,593,637, Cl. 422-28.000.
Stone, William J.: *See*—
Case, Paul D.; and Stone, William J., 5,592,954, Cl. 131-84.100.
Stonehart Associates Inc.: *See*—
Stonehart, Paul, 5,593,934, Cl. 502-326.000.
Stonehart, Paul, to Tanaka Kikinzoku Kogyo K.K.; and Stonehart Associates Inc. Platinum alloy catalyst. 5,593,934, Cl. 502-326.000.
Storage Technology Corporation: *See*—
Dee, Richard H., 5,594,608, Cl. 360-126.000.
Stork, Willem H. J.: *See*—
Jongkind, Hermanus; Van Koten, Martijn A.; Seive, Alain; and Stork, Willem H. J., 5,593,655, Cl. 423-702.000.
Storz, Andreas; Czesnikowski, Siegmund; and Frey, Wolfram, to Mercedes-Benz AG. Windshield wiper assembly fastening arrangement. 5,593,125, Cl. 248-316.500.
Stowe Woodward Licensco, Inc.: *See*—
Moachel, Charles, 5,592,875, Cl. 100-99.000.
Straszheim, Mark J.: *See*—
Schmiedeknecht, Dean L.; Straszheim, Mark J.; Thompson, Dennis J.; and Ranguth, Brad L., 5,592,984, Cl. 164-62.000.
Straube, Peter: *See*—
Schröder, Dierk; Sacher, Dirk; and Straube, Peter, 5,594,184, Cl. 73-865.000.
Street, Kyle R.: *See*—
Shelton, Gary R.; and Street, Kyle R., 5,593,040, Cl. 206-706.000.
Strickler, David A.: *See*—
Parker, Anthony A.; Strickler, David A.; Barton, Stephen P., Jr.; and Wolke, Susan M., 5,593,786, Cl. 428-426.000.
Striemer, Bryan L.: *See*—
Lemaire, Charles A.; and Striemer, Bryan L., 5,594,658, Cl. 364-514.00B.
Strom, David J.: *See*—
Kinnersley, Alan M.; Koskas, Larry P.; Strom, David J.; and Meah, Abdul R. Y., 5,593,947, Cl. 504-283.000.
Stroobant, Paul: *See*—
Goodearl, Andrew D. J.; Stroobant, Paul; and Waterfield, Michael D., 5,594,114, Cl. 530-399.000.
Stroobants, Peter F.: *See*—
Chaffanjon, Pierre G.; Stroobants, Peter F.; and Bleys, Gerhard J., 5,594,097, Cl. 528-419.000.
Strumban, Emil E.; Dobrinsky, Edward K.; Kazmetsov, Anatoly A.; and Harutyunyan, Avetik H., to Synamtix Corporation. Method and apparatus for making carbon-encapsulated ultrafine metal particles. 5,593,740, Cl. 427-577.000.
Strutz, Heinz; Fleischer, Dietrich; Kulpe, Jürgen; and Schleicher, Andreas, to Hoechst Aktiengesellschaft. Ter material and process for removing ozone from gases and liquids. 5,593,594, Cl. 210-660.000.
Stubbs, David M., to Lockheed Martin Corporation. Fluid deflection skirt apparatus. 5,592,822, Cl. 62-51.200.
Stubley, Peter R.: *See*—
Printz, Harry W.; and Stubley, Peter R., 5,594,674, Cl. 364-715.020.
Stucchi, Giovanni; and Gatti, Gianmarco, to Stucchi s.r.l. Quick-coupling fitting for pipes provided with a safety valve. 5,592,970, Cl. 137-614.030.
Stucchi s.r.l.: *See*—
Stucchi, Giovanni; and Gatti, Gianmarco, 5,592,970, Cl. 137-614.030.
Stuchinsky, Yoram. Cabinet door latch. 5,593,192, Cl. 292-207.000.
Stucki, Martin: *See*—
Hodler, Gerhard; Lerch, Peter; and Stucki, Martin, 5,593,675, Cl. 424-130.100.
Studio Gen Inc.: *See*—
Miyazawa, Takeo, 5,594,503, Cl. 348-414.000.
St. Ville, James A. Method and apparatus for manufacturing objects having optimized response characteristics. 5,594,651, Cl. 364-468.040.
Su, Ming-Jai; Teng, Cho-Ming; and Lee, Shoei-Sheng, to National Science Council. Secoporphine compound on arrhythmia. 5,594,033, Cl. 514-654.000.
Subramanian, Chitoor S.; and Larson, Gerald L., to Huls America Inc. Synthesis of silyl cyanohydrins. 5,594,156, Cl. 556-417.000.

Subotelny, Leon R.: *See—*
Eubanks, William S., Jr; Athas, William L.; York, Marvin E.; and Subotelny, Leon R., 5,593,420, Cl. 606-205.000.

Suchi, Manfred: *See—*
Klatt, Bruno; Kreutzberger, Günter; and Suchi, Manfred, 5,593,555, Cl. 204-286.000.

Suda, Koji: *See—*
Horiuchi, Hideyuki; Suda, Koji; and Matsumoto, Masactsu, 5,594,544, Cl. 356-73.000.

Sudo, Hideki: *See—*
Adachi, Kazutaka; and Sudo, Hideki, 5,594,307, Cl. 318-280.000.

Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, to Hitachi, Ltd. Method and apparatus for x-ray analyses. 5,594,246, Cl. 250-310.000.

Suehiro, Ichiro: *See—*
Ueno, Hiroshi; Ota, Takayuki; Suehiro, Ichiro; and Nakamura, Fumiko, 5,594,016, Cl. 514-369.000.

Sueoka, Masahu: *See—*
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Sueoka, Masahu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, 5,594,479, Cl. 347-45.000.

Suetaki, Kenji, to NEC Corporation. Lead frame for use in a semiconductor device and method of manufacturing the semiconductor device using the same. 5,594,274, Cl. 257-667.000.

Suga, Seiji; Imai, Hiroaki; and Uchida, Katsuhiko, to Unisia Jecs Corporation. Camshaft phase changing device. 5,592,910, Cl. 123-90.170.

Sugano, Toshihiko: *See—*
Uchino, Hideshi; Endo, June; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, 5,594,081, Cl. 526-127.000.

Sugimoto, Hitoshi: *See—*
Matsubara, Miyuki; Hirabayashi, Hironitsu; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,594,478, Cl. 347-41.000.

Sugimoto, Yuji; Nakayama, Fujikazu; and Ito, Keizo, to Sharp Kabushiki Kaisha. Image forming apparatus having double-sided image forming and post processing capability. 5,594,542, Cl. 399-402.000.

Sugino, Hiromu: *See—*
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Susumu, 5,593,667, Cl. 424-85.200.

Sugino, Hiroshi; Hotta, Yasumichi; Fujii, Namitsugu; Shibata, Masahiro; and Sano, Hiromi, to Nippondenso Co., Ltd. Oxygen concentration detector. 5,593,558, Cl. 204-429.000.

Sugiyama, Nobuo: *See—*
Kawamura, Kiyoshi; Muramatsu, Taroh; Wada, Masahiro; Sugiyama, Nobuo; and Koseki, Shinya, 5,594,188, Cl. 84-171.000.

Suh, Kyung W.: *See—*
Shmidt, Creston D.; Imeokparia, Daniel D.; and Suh, Kyung W., 5,594,036, Cl. 521-79.000.

Sullivan, Greg T.: *See—*
Rothenberger, Roland D.; Sullivan, Greg T.; and Tung, Kenny Y., 5,594,690, Cl. 365-189.010.

Sullivan, Sean: *See—*
Pellicori, Samuel F.; Sullivan, Sean; and Alston, Michael J., 5,594,231, Cl. 235-462.000.

Sumida, Hisashi: *See—*
Sogabe, Masaharu; and Sumida, Hisashi, 5,592,824, Cl. 62-127.000.

Sumita, Eiichi: *See—*
Takemura, Kazuya; Kajioka, Masahiko; Sashi, Kazumichi; Takano, Shigeru; and Sumita, Eiichi, 5,594,062, Cl. 524-504.000.

Sumita, Masahu: *See—*
Daidai, Masayuki; and Sumita, Masahu, 5,593,721, Cl. 427-100.000.

Sumitomo Chemical Company, Limited: *See—*
Hara, Takahisa; Matsumoto, Masahito; and Usui, Nobuhiro, 5,593,631, Cl. 264-257.000.

Sumitomo Electric Industries, Ltd.: *See—*
Fujihira, Mitsuaki, 5,593,926, Cl. 437-209.000.
Nakamura, Takao; and Iiyama, Michitomo, 5,594,257, Cl. 257-39.000.
Nakura, Tohru, 5,594,648, Cl. 364-426.010.

Sumitomo Precision Products Company Limited: *See—*
Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Suzuki, Shigehiko; Yasui, Itsuo; and Naito, Sadaaki, 5,593,523, Cl. 152-527.000.

Sumitomo Wiring Systems, Ltd.: *See—*
Ito, Katsuya, 5,593,324, Cl. 439-672.000.
Kobayashi, Yoshimo, 5,593,308, Cl. 439-125.000.
Komatsu, Toshihiko, 5,592,911, Cl. 123-143.00C.
Kondo, Kazumoto; and Hotta, Yoshihiko, 5,593,320, Cl. 439-589.000.
Okada, Hajime; Aoyama, Masahiko; and Ito, Tomonori, 5,593,328, Cl. 439-851.000.
Taga, Shunji; and Yomura, Takeshi, 5,594,403, Cl. 337-186.000.

Summa Four, Inc.: *See—*
Kolbenson, Chuck; Nelson, Paul; St. Hilaire, Kenneth; Tingley, Alan; Tanuta, Gerry; and Sanderson, Peter, 5,594,727, Cl. 370-442.000.

Sumitomo Rubber Industries, Ltd.: *See—*
Iseki, Tsutomu, 5,593,521, Cl. 152-209.00R.

Sun Microsystems, Inc.: *See—*
Donovan, Walter E., 5,594,846, Cl. 395-130.000.
Traubee, Richard D., 5,594,864, Cl. 395-183.150.

Sun, Yuanyuan: *See—*
Sung, Chih-Ta; Chan, Tzoyao; Chang, Richard; Rosenau, Mark A.; Ort, Jeffrey G.; Daum, Daniel T.; and Sun, Yuanyuan, 5,594,660, Cl. 364-514.00R.

Sund, John A., Jr.: *See—*
Briggs, Oliver G., Jr.; and Sund, John A., Jr., 5,593,131, Cl. 251-117.000.

Sundberg, Carl-Erik W.: *See—*
Papadopoulos, Haralabos C.; and Sundberg, Carl-Erik W., 5,594,720, Cl. 370-330.000.

Sundstrand Corporation: *See—*
Baker, Donal E., 5,594,630, Cl. 363-40.000.
Green, Jeffry H., 5,593,332, Cl. 441-7.000.
Rozman, Gregory I.; Martunas, Albert L.; and Nuechterlein, Paul E., 5,594,322, Cl. 322-10.000.
Wisbey, Peter J.; and Rateike, Lee R., 5,594,285, Cl. 307-18.000.

Sung, Chih-Ta; Chan, Tzoyao; Chang, Richard; Rosenau, Mark A.; Ort, Jeffrey G.; Daum, Daniel T.; and Sun, Yuanyuan, to Cirrus Logic, Inc. Programmable audio-video synchronization method and apparatus for multimedia systems. 5,594,660, Cl. 364-514.00R.

Suresh, Srinivas B., to Deutsch Company, The. Axial swage tool having a stabilizing pin. 5,592,726, Cl. 29-237.000.

Surgery Futures Research, Inc.: *See—*
Rayman, Reiza, 5,593,379, Cl. 600-9.000.

Susnjara, Kenneth J., to Thermwood Corporation. Slide assembly for machine tools and method of making same. 5,592,728, Cl. 29-434.000.

Sutardja, Sehat: *See—*
Fandrianto, Jan; Wang, Chi S.; Rainnie, Hedley K. J.; Sutardja, Sehat; and Martin, Bryan R., 5,594,813, Cl. 382-236.000.

Sutherland, Daniel N.: *See—*
Shagott, David M.; Kruse, Gary E.; Harber, Blair L., Jr.; Sutherland, Daniel N.; and Travis, Terrell F., 5,593,470, Cl. 55-274.000.

Sutherland, Joseph E.; and Matsumura, Paul M., to Alcatel Network Systems, Inc. Optical serial bus interface. 5,594,576, Cl. 359-118.000.

Sutherland, Robert L., to Riverwood International Corporation. Carrier with preformed end panels. 5,593,027, Cl. 206-170.000.

Suzuki, Akira: *See—*
Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, 5,594,487, Cl. 347-197.000.

Suzuki, Fujio, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Temperature control method and apparatus for use in thermal processing equipment. 5,593,608, Cl. 219-492.000.

Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, to Canon Kabushiki Kaisha. Method of manufacturing an electron source. 5,593,335, Cl. 445-50.000.

Suzuki, Hirokatsu: *See—*
Fujii, Masashi; Uyama, Kiichiro; Tsuchiya, Takeo; Mori, Miki; Kosuge, Hideo; and Suzuki, Hirokatsu, 5,594,768, Cl. 378-21.000.

Suzuki, Hiroyoshi, to Mitsubishi Denki Kabushiki Kaisha. Fuel mixing ratio detecting device. 5,594,163, Cl. 73-61.440.

Suzuki, Hisao: *See—*
Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, 5,594,487, Cl. 347-197.000.

Suzuki, Isao; and Amano, Taisei, to MKS Japan, Inc. Mass flow control system. 5,594,666, Cl. 364-571.010.

Suzuki, Kenji, to Canon Kabushiki Kaisha. Accumulation time control apparatus. 5,594,501, Cl. 348-362.000.

Suzuki, Nobuyuki: *See—*
Mori, Kazunori; Suzuki, Nobuyuki; and Sasamoto, Taturo, 5,594,603, Cl. 360-78.040.

Suzuki, Norio; and Tachibana, Yousuke, to Honda Giken Kogyo Kabushiki Kaisha. Intake air volume control device for internal combustion engine. 5,592,918, Cl. 123-339.180.

Suzuki, Noritake: *See—*
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroaki; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Suzuki, Shigehiko; Yasui, Itsuo; and Naito, Sadaaki, to Sumitomo Rubber Industries, Ltd. Radial tire for motorcycle including spiral cord belt. 5,593,523, Cl. 152-527.000.

Suzuki, Shoji: *See—*
Ogata, Minoru; Suzuki, Shoji; Tsuchida, Shinji; Tsutsui, Yuichiro; Arai, Shunji; and Hiroki, Shigeru, 5,594,944, Cl. 455-34.100.

Suzuki, Shujiro: *See—*
Nakade, Kazuhiko; Suzuki, Shujiro; and Hasegawa, Masakatsu, 5,592,849, Cl. 73-160.000.

Suzuki, Taro: *See—*
Umise, Shigeki; Suzuki, Taro; and Yamamoto, Kyoichi, 5,593,940, Cl. 503-227.000.

Suzuki, Tomohiro: *See—*
Itou, Yutaka; Iwai, Hideyoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, 5,594,279, Cl. 257-758.000.

Suzuki, Yasutoshi; Yokoyama, Kenichi; Mizuno, Koki; Toyoda, Inao; and Tsuzuki, Yukio, to Nippondenso Co., Ltd. Sunlight sensor. 5,594,236, Cl. 250-214.100.

Suzuki, Yoshio; and Takeda, Naoyuki, to Fujitsu Limited. System for monitoring a library unit shared as input/output with higher level unit wherein abnormal occupation of library by a higher level unit is reset. 5,594,922, Cl. 395-837.000.

Svec, Frantisek: *See—*
Frechet, Jean M. J.; and Svec, Frantisek, 5,593,729, Cl. 427-337.000.

Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Stjernlof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., to Upjohn Company, The. Centrally actig substituted phenylazacycloalkanes. 5,594,024, Cl. 514-429.000.

Svensson, Thomas; Rangert, Bo; Jansson, Kerstin; and Jörgensen, Einar, to Nobelpharma AB. Spacing member for attaching cranial facial prosthesis. 5,593,444, Cl. 623-16.000.

Swain, Len R.: *See—*
Winberry, Martin W.; Velagaleti, Ranga R.; Williams, Mark D.; Daly, Donna; Swain, Len R.; and Weber, Jerome B., 5,594,185, Cl. 73-866.000.

Swamy, Deepak; and Pecone, Victor, to Dell USA, L.P. Leadless high density connector. 5,593,322, Cl. 439-660.000.

Swanson, David W.: *See—*
Kaplinsky, George T.; and Swanson, David W., 5,594,483, Cl. 347-87.000.

Swanson, Eric J., to Crystal Semiconductor Corporation. Diagnosing problems in an electrical system by monitoring changes in nonlinear characteristics. 5,594,439, Cl. 341-118.000.

Swartz, Jerome; and Tracy, William, to Symbol Technologies, Inc. Self-checkout, point-of-transaction system including deactivatable electro-optically coded surveillance tags. 5,594,228, Cl. 235-383.000.

Swearingen, Steven H.: *See—*
Jackson, Scott C.; Resnick, Paul R.; and Swearingen, Steven H., 5,594,159, Cl. 570-142.000.

Swenson Process Equipment, Inc.: *See—*
Schranz, Martin B., 5,593,496, Cl. 117-36.000.

Symbol Technologies, Inc.: *See—*
Giordano, Joseph, 5,594,232, Cl. 235-472.000.
Swartz, Jerome; and Tracy, William, 5,594,228, Cl. 235-383.000.

Syamatix Corporation: *See—*
Strumban, Emil E.; Dobrinsky, Edward K.; Kuznetsov, Anatoly A.; and Harutyunyan, Avetik H., 5,593,740, Cl. 427-577.000.

Syntro Corporation: *See—*
Cochran, Mark D.; and Macdonald, Richard D., 5,593,873, Cl. 435-172.300.

Szadowski, Jerzy S.: *See—*
Okoniewski, Marian K.; Szadowski, Jerzy S.; Bajda, Piotr J.; Kobus, Jerzy Z.; Koprowska, Joanna; and Ratajczyk, Barbara E., 5,593,618, Cl. 252-512.000.

Szinger, James J.: *See—*
Kuc, Roman B.; Szinger, James J.; Hayashi, Takehiko; Goto, Takao; Nakashima, Yoshiyasu; Shimura, Takaki; and Kawabe, Kenji, 5,594,849, Cl. 395-135.000.

Szlam, Aleksander; and Owen, James E., to Inventions, Inc. Method and apparatus for providing result-oriented customer service. 5,594,791, Cl. 379-265.000.

Szyszko, Alexander; Fuqua, Rick L.; Lyden, Thomas B.; Smialek, Mariusz; and Dudek, Marek, to Elexon Ltd. Screen printing apparatus with data storage. 5,592,877, Cl. 101-129.000.

Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, to Toyota Jidosha Kabushiki Kaisha; and Aishin A.W. Co., Ltd. Control system for automatic transmission. 5,593,365, Cl. 477-119.000.

Tachibana, Yousuke: *See—*
Suzuki, Norio; and Tachibana, Yousuke, 5,592,918, Cl. 123-339.180.

Tachikawa, Hiroshi, to NEC Corporation. Power control system for electrical power supply modules. 5,594,286, Cl. 307-43.000.

Tack, Robert D.; and Lewtas, Kenneth, to Exxon Chemical Patents Inc. Oil and fuel oil compositions. 5,593,466, Cl. 44-398.000.

Tacken, Roy E. Detachable tree mount for arrow quivers. 5,593,121, Cl. 248-218.400.

Taga, Shunji; and Yomura, Takeshi, to Sumitomo Wiring Systems, Ltd. High-voltage fuse box. 5,594,403, Cl. 337-186.000.

Tagami, Takuya: *See—*
Matsuura, Masaaki; Hikichi, Toichiro; Saito, Mitsuru; and Tagami, Takuya, 5,592,999, Cl. 180-227.000.

Tago, Mamoru: *See—*
Nuita, Akira; Fujiwara, Tsutomu; Suzuki, Hisao; Narushima, Tsugio; Suzuki, Akira; Tago, Mamoru; and Furuya, Eiichi, 5,594,487, Cl. 347-197.000.

Taguchi, Masahiro: *See—*
Matsumoto, Masakazu; Taguchi, Masahiro; and Yamamoto, Yusaku, 5,593,258, Cl. 409-234.000.

Taguchi, Masao, to Fujitsu Limited. Dynamic random access memory wherein timing of completion of data reading is advanced. 5,594,681, Cl. 365-149.000.

Tahara, Masaaki; Seabokuya, Haruo; Kitano, Kenzo; and Hayashida, Tadashi, to Daido Hoxan, Inc. Method of carburizing austenitic metal. 5,593,510, Cl. 148-225.000.

Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Manabe, Shunichi; Shindo, Masanori; Nakagawa, Takashi; and Nakamura, Takeshi, to Yoshitomi Pharmaceutical Industries, Ltd.; and Japan Tobacco, Inc. Therapeutic agent for osteoporosis and diazepine compound. 5,593,988, Cl. 514-219.000.

Tai, Avon: *See—*
Tai, Jen-Lung D., 5,593,281, Cl. 416-145.000.

Tai, Jen-Lung D., to Tai, Jen-Lung D.; Tai, Sandy H.; Tai, Avon; and Tai, Rose. Dynamic balancing apparatus for ceiling fans. 5,593,281, Cl. 416-145.000.

Tai, Rose: *See—*
Tai, Jen-Lung D., 5,593,281, Cl. 416-145.000.

Tai, Sandy H.: *See—*
Tai, Jen-Lung D., 5,593,281, Cl. 416-145.000.

Taiwan Semiconductor Manufacturing Company Ltd.: *See—*
Lee, Jin-Yuan; and Liang, Mong-Song, 5,593,911, Cl. 437-51.000.
Liaw, Jhon-Jhy; and Chin, Hsien W., 5,593,922, Cl. 437-195.000.

Tajima, Yoshio; Kataoka, Naoki; Numao, Yosuke; Seki, Takashi; and Matsuura, Kazuo, to Nippon Oil Co., Ltd. Process for polymerization of olefinic hydrocarbon. 5,594,082, Cl. 526-160.000.

Takada, Hideaki; Aihara, Takao; and Nakazato, Ikuo, to Honda Giken Kogyo Kabushiki Kaisha. Propeller for boat. 5,593,280, Cl. 416-44.000.

Takagi, Nobukazu: *See—*
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.

Takagi, Shinji: *See—*
Sekiguchi, Atsushi; Kobayashi, Tsukasa; and Takagi, Shinji, 5,594,280, Cl. 257-771.000.

Takahama, Tomohiko: *See—*
Uchino, Hideshi; Endo, June; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, 5,594,081, Cl. 526-127.000.

Takahashi, Akinori: *See—*
Tsushima, Noboru; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, 5,594,488, Cl. 347-208.000.

Takahashi, Fujio: *See—*
Obara, Nobutoshi; Shizuka, Nobuhiko; and Takahashi, Fujio, 5,593,957, Cl. 508-501.000.

Takahashi, Hideo; Tanaka, Shinji; and Maeno, Hiroshi, to Asahi Glass Company Ltd. Strength evaluation method for brittle material pieces. 5,594,178, Cl. 73-808.000.

Takahashi, Hiroshi: *See—*
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakalubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hironki; Yuda, Naoki; and Morinaga, Yoaichi, 5,594,394, Cl. 333-103.000.

Takahashi, Kiichiro: *See—*
Matsubara, Miyuki; Hirabayashi, Hironitsu; Nagoshi, Shigeyasu; Arai, Atsushi; Akiyama, Yuji; Murata, Takayuki; Sugimoto, Hitoshi; and Takahashi, Kiichiro, 5,594,478, Cl. 347-41.000.

Takahashi, Mamoru; Todo, Akira; Ikeyama, Seiichi; Tsutsui, Toshiyuki; Matsunaga, Shinya; and Kaneshige, Norio, to Mitsui Petrochemical Industries, Ltd. Ethylene copolymer composition. 5,594,071, Cl. 525-240.000.

Takahashi, Nobuyuki: *See—*
Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.

Takahashi, Toshiaki: *See—*
Gotoh, Yoshihisa; Kawamata, Motoo; and Takahashi, Toshiaki, 5,593,916, Cl. 437-83.000.

Takai, Hideyuki: *See—*
Go, Shintetsu; Takai, Hideyuki; Miyazaki, Hajime; Yamazaki, Itaru; Kanemaru, Tetsuro; and Iuchi, Kazushi, 5,593,805, Cl. 430-78.000.

Takamoto, Kenji: *See—*
Todokoro, Hideo; Takamoto, Kenji; Otaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, 5,594,245, Cl. 250-310.000.

Takano, Jun: *See—*
Sato, Morio; Abe, Yutaka; Takano, Jun; Ishii, Hirokazu; and Murata, Yasuzo, 5,594,562, Cl. 349-12.000.

Takano, Masamitsu; and Maejima, Takahide, to Yamakawa Industrial Co., Ltd. Mount supporting member and manufacturing method therefor. 5,593,001, Cl. 180-312.000.

Takano, Shigeru: *See—*
Takemura, Kazuya; Kajioka, Masahiko; Sashi, Kazumichi; Takano, Shigeru; and Sumita, Eiichi, 5,594,062, Cl. 524-504.000.

Takao, Hideaki: *See—*
Hanya, Yukio; Onuma, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuo; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Takasaka, Hiroyuki: *See—*
Hiroe, Toshikatsu; Kaneko, Kenichi; Imai, Noboru; Takasaka, Hiroyuki; and Kawamura, Toshio, 5,593,774, Cl. 428-343.000.

Takasu, Hideki: *See—*
Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, 5,594,006, Cl. 514-312.000.

Takasugi, Hisashi: *See—*

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,594,132, Cl. 540-227.000.

Takata Corporation: *See*—
Maruyama, Shigenori, 5,593,179, Cl. 280-740.000.

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-acylamino-3-substituted cephalosporanic acid derivatives. 5,594,132, Cl. 540-227.000.

Takayanagi, Ryotaro: *See*—
Hagiuda, Nobuyoshi; Matsui, Hideki; Sakamoto, Hiroshi; and Takayanagi, Ryotaro, 5,594,314, Cl. 320-2.000.

Takeda Chemical Ind. Ltd.: *See*—
Kung, Hsiang-Fu; Sugino, Hiromu; and Honda, Sunumu, 5,593,667, Cl. 424-85.200.

Takeda Chemical Industries, Ltd.: *See*—
Akiyama, Yohko; Horibe, Hidetoshi; and Yoshioka, Minoru, 5,593,690, Cl. 424-457.000.
Aono, Tetsuya; Ohkawa, Shigenori; and Doi, Takayuki, 5,594,154, Cl. 549-462.000.
Igari, Yasutaka; Saikawa, Akira; Okamoto, Kayoko; Kanei, Shigeru; Oka, Masahisa; and Sano, Atsunori, 5,594,091, Cl. 528-271.000.

Takeda, Harumi, to Ueda Co., Ltd. Solar cell system. 5,594,313, Cl. 320-1.000.

Takeda, Hitoshi, to K.K. Endo Seisakusho. Golf club head with peripheral weights. 5,593,356, Cl. 473-335.000.

Takeda, Makoto: *See*—
Marotani, Masahiro; Mura, Hajime; Takeda, Makoto; and Shibafuchi, Hiroshi, 5,594,146, Cl. 548-251.000.

Takeda, Naoyuki: *See*—
Suzuki, Yoshio; and Takeda, Naoyuki, 5,594,922, Cl. 395-837.000.

Takeda, Toshihiko: *See*—
Suzuki, Hidetoshi; Osada, Yoshiyuki; Nomura, Ichiro; Ono, Takeo; Kawade, Hisaki; Yamaguchi, Eiji; Takeda, Toshihiko; Toshima, Hiroshi; Hamamoto, Yasuhiro; Iwasaki, Tatsuya; Isono, Aoji; Suzuki, Noritake; Todokoro, Yasuyuki; Okuda, Masahiro; and Shinjo, Katsuhiko, 5,593,335, Cl. 445-50.000.

Takehara, Hiroyasu: *See*—
Ishikawa, Osamu; and Takehara, Hiroyasu, 5,594,358, Cl. 324-762.000.

Takekoshi, Nobuhiko; and Inoue, Masahiko, to Canon Kabushiki Kaisha. Image forming apparatus having multi-layer transfer material bearing member with different coefficient of kinetic frictions between layers. 5,594,538, Cl. 399-310.000.

Takemae, Yoshihiro: *See*—
Nomura, Yukihiro; Satoh, Yasuharu; Takemae, Yoshihiro; Furuyama, Takaaki; Nagao, Mitsuhiro; and Niimi, Masahiro, 5,594,699, Cl. 365-226.000.

Takemura, Kazuya: Kajioka, Masahiko; Sashi, Kazuwichi; Takano, Shigeru; and Sumita, Eiichi, to Kawasaki Steel Corporation. Polycarbonate/polyolefin based resin compositions and their production processes and uses. 5,594,062, Cl. 524-504.000.

Takenaka, Toru: *See*—
Hasegawa, Tadaaki; and Takenaka, Toru, 5,594,644, Cl. 364-424.027.

Takeuchi, Koh, to Fuji Photo Film Co., Ltd. Thermal-sensitive recording material. 5,593,938, Cl. 503-206.000.

Takeuchi, Yukihisa; Kimura, Koji; and Kurashina, Mitsuru, to NGK Insulators, Ltd. Piezoelectric device. 5,594,292, Cl. 310-324.000.

Taniguchi, Takao: *See*—
Nakamura, Shinichi; Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; and Kosaka, Yoko, 5,593,616, Cl. 252-299.610.

Takimoto, Akio: *See*—
Akiyama, Koji; Takimoto, Akio; and Ogawa, Hisahito, 5,594,567, Cl. 349-28.000.

Takizawa, Hideyuki: *See*—
Oda, Kazuhiro; Azakami, Masayoshi; Takizawa, Hideyuki; Iwamoto, Fumio; and Iwai, Shoji, 5,593,175, Cl. 280-704.000.

Takizawa, Hiroo; and Makuta, Toshiyuki, to Fuji Photo Film Co., Ltd. Silver halide color photographic material and color image forming method. 5,593,816, Cl. 430-393.000.

Takizawa, Yuri: *See*—
Noyama, Hideo; Kato, Makoto; Nohmi, Makoto; and Takizawa, Yuri, 5,594,850, Cl. 395-135.000.

Talarmo, Reino; and Brockman, Pertti, to Nokia Telecommunications Oy. Method for realising a group call in a digital radio network. 5,594,948, Cl. 455-54.200.

Talich, Homayoun: *See*—
Weldon, David E.; Nagorski, Boguslaw A.; and Talich, Homayoun, 5,593,344, Cl. 451-296.000.

Talkes, Brian E.: *See*—
Christie, Julie A.; and Talkes, Brian E., 5,593,648, Cl. 422-266.000.

Tam, Kwok C., to General Electric Company. Method and apparatus for improving efficiency in computing radon derivatives for CT imaging. 5,594,766, Cl. 378-4.000.

Tama Manufacturing Co., Ltd.: *See*—
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.

Tamai, Jun; Maruyama, Yutaka; and Chiba, Ichiro, to Canon Kabushiki Kaisha. Vibration device for vibration driven motor. 5,594,291, Cl. 310-323.000.

Tamaki, Tokuhiko: *See*—
Kubota, Masafumi; Nomura, Noboru; and Tamaki, Tokuhiko, 5,593,539, Cl. 156-643.100.

Tamamoto, Junichi: *See*—
Yamashita, Tuichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, 5,593,044, Cl. 209-584.000.

Tamapack Co., Ltd.: *See*—
Ishikawa, Masaaki; and Yamada, Masao, 5,594,415, Cl. 340-467.000.

Tamba, Nobuo: *See*—
Hiramoto, Toshiro; Tamba, Nobuo; and Kasai, Motoki, 5,594,270, Cl. 257-393.000.

Tamba, Yuko, to Hitachi, Ltd. Analog filter circuit and semiconductor integrated circuit device using the same. 5,594,383, Cl. 327-552.000.

Tamisier, Thomas, to Bull S.A. Method of verification of a finite state sequential machine and resulting information support and verification tool. 5,594,656, Cl. 364-488.000.

Tamura, Teishiro: *See*—
Abe, Yasushi; and Tamura, Teishiro, 5,593,003, Cl. 184-5.100.

Tanabe, Hiroshi: *See*—
Murano, Jun'ichi; Murashi, Takaya; Tanabe, Hiroshi; Karasawa, Kazunori; Nishido, Kazuhiro; and Komuro, Ichiro, 5,594,539, Cl. 399-316.000.

Tanaka, Akio, to NEC Corporation. Infrared imaging device and infrared imaging system using same. 5,594,248, Cl. 250-332.000.

Tanaka, Akio: *See*—
Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 5,594,473, Cl. 345-199.000.

Tanaka Kikinzoku Kogyo K.K.: *See*—
Stoschart, Paul, 5,593,934, Cl. 502-326.000.

Tanaka, Shigeo, to Sony Corporation. Apparatus for locking/unlocking a number of units connected to a master unit. 5,594,907, Cl. 395-750.000.

Tanaka, Shinji: *See*—
Takahashi, Hideo; Tanaka, Shinji; and Maeno, Hiroshi, 5,594,178, Cl. 73-808.000.

Tanaka, Taeko; and Kaneda, Kitahiro, to Canon Kabushiki Kaisha. Image pickup apparatus. 5,594,500, Cl. 348-345.000.

Tanaka, Takaaki; Sato, Yuzuru; and Nomura, Hiroaki, to Seiko Epson Corporation. Liquid crystal display device having two metastable states and driving method therefor. 5,594,464, Cl. 345-94.000.

Tanaka, Yoji: *See*—
Konuma, Ritaro; and Tanaka, Yoji, 5,593,066, Cl. 222-94.000.

Tanase, Akio: *See*—
Sakamoto, Yoshio; Iwakura, Shiro; Tanase, Akio; and Yamazaki, Kaoru, 5,594,805, Cl. 381-199.000.

Tandy Corporation: *See*—
Minnick, Frank P.; and Staudacher, Daniel W., 5,594,601, Cl. 360-72.200.

Tang, Cheng-Long: *See*—
Lentz, Derek J.; and Tang, Cheng-Long, 5,594,877, Cl. 395-306.000.

Tang, Ching: *See*—
Shi, Jiannin; and Tang, Ching, 5,593,788, Cl. 428-690.000.

Tani, Junichi: *See*—
Ishida, Hiroki; Tani, Junichi; and Horie, Hiroshi, 5,593,360, Cl. 475-331.000.

Tani, Nobutaka: *See*—
Matsuda, Takehisa; Inoue, Kazuhiko; and Tani, Nobutaka, 5,593,814, Cl. 430-320.000.

Taniguchi, Koji: *See*—
Shimada, Yasunori; Goto, Masahito; Saito, Hisashi; and Taniguchi, Koji, 5,594,259, Cl. 257-66.000.

Taniguchi, Koki: *See*—
Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.

Taniguchi, Mikio: *See*—
Itoh, Noriie; Kunihara, Mineo; Kushida, Hiroshi; McWhorter, William W.; Nomura, Syunji; Ozawa, Kazunori; Taniguchi, Mikio; and Tsuzaki, Kazuo, 5,594,144, Cl. 548-166.000.

Taniguchi, Osamu: *See*—
Hanyu, Yukio; Osuna, Kenji; Hotta, Yoshio; Taniguchi, Osamu; Takao, Hideaki; Asaoka, Masanobu; Mihara, Tadashi; Kodera, Yasuto; Kojima, Makoto; Nakamura, Katsutoshi; and Wada, Takatsugu, 5,594,571, Cl. 349-138.000.

Tanihira, Hisamitsu: *See*—
Shibata, Yuji; Okazaki, Makoto; Tanihira, Hisamitsu; and Okada, Katsuyuki, 5,594,878, Cl. 395-309.000.

Tanikawa, Kiyoshi: *See*—
Saito, Tadashi; Tanikawa, Kiyoshi; Kawamura, Eiichi; and Kawanishi, Toshiyuki, 5,593,937, Cl. 503-201.000.

Tanimizu, Toru; Hakamata, Yoshimi; Kobayashi, Masato; Osaka, Akira; and Komuro, Katsuhiro, to Hitachi, Ltd. Vacuum circuit interrupter. 5,594,224, Cl. 218-134.000.

Taniyama, Eiji: *See*—
Uchino, Hideshi; Endo, June; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, 5,594,081, Cl. 526-127.000.

Tankelevich, Roman L., to Laser Products, Inc. Method for operating a curve forming device. 5,594,852, Cl. 395-141.000.

Tannenbaum, Joseph; and Pasternak, Eli S., to Neptune Pundak & Ayalon Ltd. Skin and tissue treatment and stimulation device and method. 5,593,381, Cl. 601-93.000.

Tannenbaum, Myron, to New Brunswick Scientific Co., Inc. Rotary shaker with flexible strap suspension. 5,593,228, Cl. 366-209.000.

Tanner, Scott B.: *See*—

Komarek, James A.; Padgett, Clarence W.; Ameeus, Robert D.; and Tanner, Scott B., 5,594,696, Cl. 365-208.000.

Tanzer, Herbert J.: *See*—
Ramos, Sergio; Hall, John T.; Tanzer, Herbert J.; and Quon, William, 5,594,315, Cl. 320-2.000.

Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Norman, Brian K.; Pompian, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., to Kimberly-Clark Corporation. Absorbent article which includes superabsorbent material located in discrete, elongate pockets placed in selected patterns. 5,593,399, Cl. 604-368.000.

Tao, Eddie V. P.: *See*—
Harper, Richard W.; Howbert, J. Jeffry; Poore, Gerald A.; Rieder, Brent J.; Tao, Eddie V. P.; and Aikins, James A., 5,594,028, Cl. 514-464.000.

Tapp, William T.: *See*—
Jacoby, Philip; Bauer, Charles W.; Clingman, Scott R.; and Tapp, William T., 5,594,070, Cl. 525-88.000.

Tappon, Ellen R.: *See*—
Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, 5,594,481, Cl. 347-65.000.

Tarantino, E. Rocco: *See*—
Weinberger, Scot R.; Egan, Robert W.; Hoppe, Thomas W., deceased; Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, 5,594,243, Cl. 250-288.000.

Tardy, André; and Dumas, Jean-Pierre, to Alcatel Cable. Method of manufacturing a multi-fiber optical cross-coupler, and an optical cross-coupler obtained by performing the method. 5,594,823, Cl. 385-46.000.

Tarpley, Leon. Standing valve assembly for sucker rod operated subsurface pumps. 5,593,289, Cl. 417-454.000.

Tashji, George A.: *See*—
Kanesaka, Nozomu; and Tashji, George A., 5,593,394, Cl. 604-282.000.

Task Force Tips, Inc.: *See*—
McMillan, Stewart G.; and Kolacz, David J., 5,593,092, Cl. 239-285.000.

Tastemaker: *See*—
Gebelman, Alan; and Lazio, Gary A., 5,593,872, Cl. 435-147.000.

Tatsumi, Masahiro; Koizumi, Noritaka; Hibi, Keiichi; Iwano, Tsuneaki; Ito, Hiroyuki; Nakamura, Osamu; and Nakano, Hirotaka, to Sharp Kabushiki Kaisha. Image-information storage regenerating device. 5,594,736, Cl. 370-474.000.

Tatsuura, Satoshi: *See*—
Sotoyama, Wataru; Tatsuura, Satoshi; Yoshimura, Tetsuzo; Matsuura, Azuma; and Hayano, Tomoaki, 5,594,093, Cl. 528-353.000.

Tauber, Arthur: *See*—
Lux, Robert A.; Harvey, James A.; Tauber, Arthur; and Tidrow, Steven C., 5,593,742, Cl. 427-586.000.

Taugher, James E.: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,594,899, Cl. 395-600.000.

Taureg, Herbert: *See*—
Harz, Peter; Krude, Werner; and Taureg, Herbert, 5,593,084, Cl. 228-182.000.

Taylor, Carl J.; Patterson, Michael W.; and Force, Gordon, to National Semiconductor Corporation. Overmolded PC board with ESD protection and EMI suppression. 5,594,204, Cl. 174-52.200.

Taylor, Gary R., to ETI Technologies Inc. Weight compensating method and apparatus. 5,592,858, Cl. 74-573.00R.

Taylor Group, Inc., The: *See*—
Horton, Herbert D., 5,592,902, Cl. 119-846.000.

Taylor, Kelly: *See*—
Johnson, F. Scott; and Taylor, Kelly, 5,593,905, Cl. 437-31.000.

Taylor, Lawrence E.: *See*—
Hodge, Winston W.; and Taylor, Lawrence E., 5,594,491, Cl. 378-7.000.

Taylor, Lloyd D.: *See*—
Kim, Gia Y.; Taylor, Lloyd D.; and Waterman, Kenneth C., 5,593,809, Cl. 430-213.000.

Taylor, Peter M.; and Roylance, David G. Protective case for rolls of sheet material. 5,593,035, Cl. 206-397.000.

TDK Corporation: *See*—
Okamura, Masatoshi; and Kaneda, Hiroshi, 5,593,103, Cl. 242-345.200.
Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, 5,594,397, Cl. 333-202.000.
Utsunomiya, Hajime; Uchiyama, Kenji; Kosuda, Masanori; and Inoue, Hiroyasu, 5,593,789, Cl. 428-694.0ML.

Technogear Consulting AG: *See*—
Steyskal, Felix, 5,593,590, Cl. 210-603.000.

Teijin Limited: *See*—
Kimura, Masabu; Kurihara, Hideshi; Ichihashi, Tetsuo; and Kitazawa, Satoshi, 5,593,819, Cl. 430-533.000.

Teikoku Piston Ring Co., Ltd.: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.

Teixeira, Christopher M.: *See*—
Chen, Hudong; Churchill, Peter C.; Iannucci, Robert A.; Molvig, Kim; Papadopoulos, Gregory; Remondi, Stephen A.; Teixeira, Christopher M.; and Traub, Kenneth R., 5,594,671, Cl. 364-578.000.

TekSource, LC: *See*—
Pearce, Tony M., 5,592,706, Cl. 5-654.000.

Tektronix, Inc.: *See*—
Penney, Bruce J., 5,594,508, Cl. 348-665.000.

Telecom Finland Oy: *See*—
Makkonen, Matti; Pökkä , Tapani; and Lehto, Markku, 5,594,777, Cl. 379-58.000.

Telefonaktiebolaget L M Ericsson: *See*—
Jönsson, Anders; Winberg, Ulfe; Lignell, Charles G. E.; Lee, Chung M.; and Larsen, Peter, 5,594,861, Cl. 395-181.000.
Linnermark, Nils O. A.; and Carlsson, Karl U., 5,594,904, Cl. 395-704.000.

Telefonaktiebolaget LM Ericsson: *See*—
Andersson, Claes H.; Eriksson, Hakan O.; Madfors, Magnus E.; and Persson, Bengt Y., 5,594,949, Cl. 455-62.000.
Antic, Nenad; and Ghisler, Walter, 5,594,942, Cl. 455-33.100.
Lemieux, Yves, 5,594,739, Cl. 570-350.000.
Lindberg, Torsten G., 5,593,127, Cl. 248-345.100.

Teleha, Christopher A.; Wilkerson, Wendell W.; and Earl, Richard A., to DuPont Merck Pharmaceutical Company, The. Polycyclic systems, and derivatives thereof, as neurotransmitter release enhancers useful in the treatment of cognitive disorders. 5,594,001, Cl. 514-290.000.

Telephone Information Systems, Inc.: *See*—
Jabr, Salim N., 5,594,748, Cl. 372-38.000.

Telescope Casual Furniture Co.: *See*—
Vandermindeu, Robert D., Sr.; and Butler, Nathan, 5,593,205, Cl. 297-184.150.

Teletransaction, Inc.: *See*—
Meyerson, Robert F.; and Chang, Yung-Fu, 5,594,470, Cl. 345-169.000.

Tell, Richard B. Compact disc holder. 5,593,030, Cl. 206-308.100.

Temkin, David: *See*—
Cappe, Stephen P.; Beernink, Ernest H.; Meier, John R.; and Temkin, David, 5,594,640, Cl. 395-794.000.

Tempest, Michael C.; and Dimofte, Floria, to Westwind Air Bearings Limited. Air bearing. 5,593,230, Cl. 384-100.000.

Temple, Victor A. K., to Harris Corporation. Device for isolating parallel sub-elements with reverse conducting diode regions. 5,594,261, Cl. 257-140.000.

Templin, Catherine K.; and McManigill, Douglass, to Hewlett-Packard Company. Microcolumn-microcolumn flow interface and method. 5,593,564, Cl. 204-451.000.

Tenbokum, Léo: *See*—
Lavigne, Gilles; and Tenbokum, Léo, 5,592,947, Cl. 128-744.000.

TenBrink, Ruth E.: *See*—
Jacobsen, Eric J.; and TenBrink, Ruth E., 5,594,140, Cl. 544-126.000.

Teng, Che-Ming: *See*—
Su, Ming-Jai; Teng, Che-Ming; and Lee, Shoei-Sheng, 5,594,033, Cl. 514-654.000.

Teng, Nelson N. H.: *See*—
Bhat, Neelima M.; Bieber, Marcia M.; and Teng, Nelson N. H., 5,593,676, Cl. 424-137.100.

Teng, Shih-Chin. Article organizing shelf frame. 5,592,887, Cl. 108-134.000.

Tensar Corporation, The: *See*—
Specht, Paul, 5,593,706, Cl. 425-127.000.

Tenuta, Gerry: *See*—
Kolbenson, Chuck; Nelson, Paul; St. Hilaire, Kenneth; Tingley, Alan; Tenuta, Gerry; and Sandstrom, Peter, 5,594,727, Cl. 370-442.000.

Teplan, Istvan: *See*—
Lovas, Sandor; Conlon, J. Michael; Vincze, Borbala; Palyi, Istvan; Gaal, Dezso; Kalnay, Adriena; Mezo, Imre; Teplan, Istvan; Toth, Geza; and Kovacs, Magdolna, 5,593,965, Cl. 514-15.000.

Terada, Keiichi: *See*—
Imai, Koji; Wakahoi, Toshiya; Adachi, Hiromitsu; Terada, Keiichi; Yamashita, Hiroaki; and Morikawa, Hiroshi, 5,593,577, Cl. 210-232.000.

Terada, Takashi; Kojima, Masahiro; Morita, Taizo; Arakawa, Katsuyuki; Iwai, Ichiro; and Furuta, Masakazu, to Showa Aluminum Corporation. Brazeable aluminum material and a method of producing same. 5,594,930, Cl. 419-5.000.

Terada, Toyohiko: *See*—
Sawai, Toshihiko; Inuzuka, Masayuki; and Terada, Toyohiko, 5,594,301, Cl. 313-523.000.

Teradaira, Mitsuaki: *See*—
Akiyama, Takaaki; Koakutsu, Naohiko; Teradaira, Mitsuaki; Miyasaka, Masayo; and Hyonaga, Takuya, 5,594,653, Cl. 364-468.240.

Terajima, Koiichi, to Akai Electric Co. Vibration control apparatus having oscillation frequency regulation. 5,594,168, Cl. 73-496.000.

Terakado, Sadao: *See*—
Todokoro, Hideo; Takamoto, Kenji; Otaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, 5,594,245, Cl. 250-310.000.

Teral, Gilles: *See*—
David, Catherine; Teral, Gilles; Ledon, Henry; and Boiteux, Jean-Pierre, 5,594,150, Cl. 548-573.000.

Terlep, Stephen K. Omni-directional LED lamp. 5,594,433, Cl. 340-908.100.

Ternansky, Robert J.: *See*—
Morin, John M., Jr.; Ternansky, Robert J.; Noreen, Rolf; and Lind, Tomas, 5,593,993, Cl. 514-247.000.

Ternes-Burton Company: *See*—
Ternes, Gretchen, 5,592,746, Cl. 33-623.000.

Ternes, Gretchen, to Ternes-Burton Company. Image registration board and compressible spacer assembly. 5,592,746, Cl. 33-623.000.
Terry, Jeff M.: *See—*
Barnhardt, Steve L.; Hadley, Steven L.; and Terry, Jeff M., 5,593,167, Cl. 280-164.100.
Terumo Kabushiki Kaisha: *See—*
Yoshioka, Hiroshi; and Goto, Hiroshi, 5,593,622, Cl. 264-4.320.
Teshima, Yasuhiro; and Kurokawa, Tetsuo, to Fujitsu Limited. Mask for printing solder paste. 5,593,080, Cl. 228-39.000.
Tessitore, Giuseppe: *See—*
Conte, Ubaldo; La Manna, Aldo; and Tessitore, Giuseppe, 5,594,030, Cl. 514-553.000.
Testa, Richard J. Photograph display device. 5,592,768, Cl. 40-786.000.
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Chan, Ming F.; Raju, Bore G.; Kois, Adam; Verner, Erik J.; Wu, Chengde; Castillo, Rosario S.; Yalamoori, Venkatachalapathi; and Balaji, Vinakudi N., 5,594,021, Cl. 514-378.000.
Texas Instruments Incorporated: *See—*
Apte, Pushkar P.; and Paranjpe, Ajit P., 5,593,924, Cl. 437-200.000.
Carter, Buford H., Jr.; Davis, Dennis D.; Kee, David R.; Clark, Jesse; Laverde, Steven P.; and Tran, Hai, 5,594,234, Cl. 257-676.000.
Choi, Davy H.; Giolma, William H.; and Lee, Owen, 5,594,377, Cl. 327-278.000.
Coomes, Joseph A.; Marshall, Steve P.; and Simar, Laurence R., 5,594,914, Cl. 395-800.000.
Dreiske, Peter D.; Turner, Arthur M.; and Forehand, David L, 5,593,902, Cl. 437-4.000.
Harder, Stanley D.; Houghton, Richard A.; and Wallace, Richard H., 5,594,925, Cl. 395-863.000.
Huber, Catherine M.; Dolby, Debra J.; and Holland, Wayland B., 5,594,258, Cl. 257-48.000.
Itou, Yutaka; Iwai, Hidetoshi; Sakuta, Toshiyuki; Nasu, Takumi; and Suzuki, Tomohiro, 5,594,279, Cl. 257-758.000.
Johnson, F. Scott; and Taylor, Kelly, 5,593,905, Cl. 437-31.000.
Jovanovic, Dejan; and Randall, John N., 5,593,908, Cl. 437-40.000.
Pena, Steven M., 5,593,531, Cl. 156-272.600.
Pena, Steven M.; Jones, David N.; and Embree, Michael E., 5,594,652, Cl. 364-468.260.
Prinsm, Charles E.; and Fourer, Gary, 5,594,305, Cl. 315-169.300.
Shea, Chi-Cheong; and Hodson, Lester L., 5,594,297, Cl. 313-309.000.
Vickers, Kenneth G., 5,593,562, Cl. 204-486.000.
Ward, Morris D.; and Williams, Kenneth L., 5,594,700, Cl. 365-230.030.
d'Hont, Loek, 5,594,448, Cl. 342-44.000.
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Worsley, Debra J.; Werstlein, Michael T.; and Thaik, Richard W., 5,594,734, Cl. 370-395.000.
Thaller, Kurt M., to Digital Equipment Corporation. Method and apparatus to provide pended transaction on a non-pended system bus. 5,594,875, Cl. 395-287.000.
Thandiwe, Iilonga P., to Motorola, Inc. Battery pack having theft deterrent circuit. 5,594,319, Cl. 320-2.000.
Thayer, Bruce E.: *See—*
Bonislawski, John M., Jr.; Thayer, Bruce E.; and Gerbasi, Dennis G., 5,594,541, Cl. 399-358.000.
Thayer, Dale D.: *See—*
Bowles, Philip; Duff, Eric; and Thayer, Dale D., 5,594,770, Cl. 378-58.000.
Thayer, Thomas E. Water walkers. 5,593,334, Cl. 441-77.000.
Theobald, Hans: *See—*
Nuebling, Christoph; von Deyn, Wolfgang; Theobald, Hans; Westphalen, Karl-Otto; Kardorff, Uwe; Walter, Helmut; Kappe, Thomas; and Gerber, Matthias, 5,593,943, Cl. 504-221.000.
Thermalloy, Inc.: *See—*
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ThermoSpectra Corporation: *See—*
Bowles, Philip; Duff, Eric; and Thayer, Dale D., 5,594,770, Cl. 378-58.000.
Thermotrex Corporation: *See—*
Pellegrino, Anthony J.; and DeFreitas, Kenneth F., 5,594,769, Cl. 378-37.000.
Thermwood Corporation: *See—*
Susnjara, Kenneth J., 5,592,728, Cl. 29-434.000.
Theroux, Marc J.: *See—*
Person, Wayne C.; Theroux, Marc J.; and Lopez-Isa, Maria E., 5,593,423, Cl. 606-219.000.
Thibaut, Bernard, to Thibaut S.A. Device for smoothing and polishing stone. 5,593,342, Cl. 451-159.000.
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Thibaut, Bernard, 5,593,342, Cl. 451-159.000.
Thiel, William J.: *See—*
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Thiele Kaolin Company: *See—*
Etheridge, Owen E., Jr.; Yordan, Jorge L.; and Lowe, Robert A., 5,593,490, Cl. 106-484.000.
Thierry, Jean-Pierre: *See—*
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Thiokol Corporation: *See—*
Hinshaw, Jerald C.; Doll, Daniel W.; Blau, Reed J.; and Laud, Gary K., 5,592,812, Cl. 60-205.000.
Mumford, Neal A.; Chin, Cheng-Chi; Johns, Rolf M.; and Lloyd, Ben A., 5,593,770, Cl. 428-290.000.
Thomas & Betts Corporation: *See—*
Bilson, Edward B.; Wedell, Mark T.; and Zimmerman, Thomas A., 5,593,318, Cl. 439-573.000.
Fabian, Mark E.; and Michaud, Serge, 5,594,207, Cl. 174-58.000.
Lybrand, Brent B., 5,593,311, Cl. 439-295.000.
Nattel, William; and Michaud, Alain, 5,594,209, Cl. 174-65.00G.
Thomas, Barbara: *See—*
Mondin, Myriam; Loth, Myriam; Broze, Guy; Mehreteab, Ammanuel; Thomas, Barbara; Adamy, Steven; and Bala, Frank, Jr., 5,593,958, Cl. 510-417.000.
Thomas, Dustin H.: *See—*
Bottelberghe, Scott A.; Thomas, Dustin H.; Shurtleff, Terry M.; and Poertner, Roland G., 5,593,619, Cl. 252-609.000.
Thomas Industries: *See—*
Knukel, Michael D.; and Kusmer, Raymond J., 5,593,224, Cl. 362-287.000.
Thomas Industries Inc.: *See—*
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Thomas Jefferson University: *See—*
Prockop, Darwin J.; Ala-Kokko, Leena; Fertala, Andrzej; Sieron, Aleksander; Kivirikko, Kari I.; Geddis, Amy; and Pihlajaniemi, Taina, 5,593,859, Cl. 435-69.100.
Thomas, Kristina M. Pacifier holder. 5,593,336, Cl. 446-81.000.
Thomas, Paul: *See—*
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Thomas, Richard E.: *See—*
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Thomas, Roger L.: *See—*
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Thomas, Ron, Jr.; Ignon, Roger G.; and Cohen, William, to Stackhouse, Inc. Surgical helmet. 5,592,936, Cl. 128-206.120.
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Schmiedeknecht, Dean L.; Straszheim, Mark J.; Thompson, Dennis J.; and Rauguth, Brad L., 5,592,984, Cl. 164-62.000.
Thompson, Leo J.; Dubberly, Gregory T.; and Ritchie, John A., Jr., to Scientific-Atlanta, Inc. Frequency agile broadband communications system. 5,594,726, Cl. 370-485.000.
Thompson, Mark; Schwab, George E.; Schnepf, H. Ernest; and Stockhoff, Brian, to Mycogen Corporation. *Bacillus thuringiensis* delta-endotoxin. 5,593,881, Cl. 435-240.100.
Thompson, Sheryl A.: *See—*
Yaver, Debbie S.; and Thompson, Sheryl A., 5,594,119, Cl. 536-23.200.
Thompson, Stewart A.: *See—*
Higaki, Jeffrey N.; Tischer, Edmund G.; Cordell, Barbara; and Thompson, Stewart A., 5,593,857, Cl. 435-69.100.
Thompson, Timothy J. Lawn edger blade assembly. 5,592,992, Cl. 172-15.000.
Thomson Consumer Electronics, Inc.: *See—*
Nosker, Richard W.; Michalchuk, Joey J.; Bauder, Richard C.; and Ragland, Frank R., Jr., 5,594,300, Cl. 313-402.000.
Thomson, Donald W.; and Nichols, Frank B., to Consorcio Can-Tico, S.A. Mold for forming panels for prefabricated construction. 5,593,709, Cl. 425-454.000.
Thornhill, Thomas S.: *See—*
Scott, Richard D.; Thornhill, Thomas S.; and Slamin, John, 5,593,450, Cl. 623-20.000.
Thottathil, John K.; Pendri, Yadagiri; Li, Wen-Sen; and Kronenthal, David R., to E. R. Squibb & Sons, Inc. Process for the preparation of 1,3-dioxane derivatives useful in the preparation of HMG-COA reductase inhibitors. 5,594,153, Cl. 549-374.000.
Thrustmaster, Inc.: *See—*
Bouton, Frank M.; Church, Robert L.; and Rayhawk, Joseph C., 5,593,350, Cl. 463-36.000.
Thuillard, Marc P., to Cerberus AG. Method and detector for detecting a flame. 5,594,421, Cl. 340-578.000.
Thurkauf, Andrew: *See—*
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Thuswaldner, Hermann; and Andersson, Sören, to Barracuda Technologies AB. Apparatus for manufacturing camouflage netting. 5,593,534, Cl. 156-380.040.
Thwaites, David J., to BOC Group plc, The. Anaesthetic vaporizer. 5,592,934, Cl. 128-203.120.
Tibbling, Petter: *See—*
Fahlgren, Christer; Gustavsson, Sören; Tibbling, Petter; and Johansson, Ewa W., 5,593,544, Cl. 162-65.000.
Tibi, Georges, to U.S. Philips Corporation. ATM information system and multiplexer for assigning and controlling access time. 5,594,723, Cl. 370-396.000.
Tidrow, Steven C.: *See—*
Lux, Robert A.; Harvey, James A.; Tauber, Arthur; and Tidrow, Steven C., 5,593,742, Cl. 427-586.000.
Tidwell, Richard R.: *See—*
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Weaver, Lindsay A., Jr.; Bayley, Gwain; Tiedemann, Edward G., Jr.; and Gilhousen, Klein S., 5,594,718, Cl. 370-331.000.
Tiemann, Duane: *See—*
Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalsass, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.
Tien, Chao-Fong; Hegedus, Charles R.; Santoianni, Thomas M.; Snyder, Jeanine M.; and Mercando, Lisa A., to Air Products and Chemicals, Inc. Two component waterborne crosslinkable polyurethane/acrylate-hybrid systems. 5,594,065, Cl. 524-507.000.
Timex Corporation: *See—*
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Tischer, Edmund G.: *See—*
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Tischler, Paul V.; and Clemeats, Bill, to Vtel Corporation. Process and system for video rate control in a multipoint video conference. 5,594,725, Cl. 370-260.000.
Titzler, David H.: *See—*
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TOA Medical Electronics Co., Ltd: *See—*
Kobashi, Masayuki; Koeda, Noriaki; Mizuno, Yoshiteru; and Okada, Satoru, 5,593,893, Cl. 436-50.000.
Nagai, Takaaki, 5,592,959, Cl. 134-169.00R.
Tobias, Michael A. Split sleeve system. 5,594,202, Cl. 174-48.000.
Todo, Akira: *See—*
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Todokoro, Hideo; Takamoto, Kenji; Otaka, Tadashi; Mizuno, Fumio; Yamada, Satoru; Terakado, Sadao; Kuroda, Katsuhiro; Ninomiya, Ken; and Kure, Tokuo, to Hitachi, Ltd. Scanning electron microscope and method for dimension measuring by using the same. 5,594,245, Cl. 250-310.000.
Todokoro, Hideo: *See—*
Sudo, Yoshimi; Kure, Tokuo; Ninomiya, Ken; Kuroda, Katsuhiro; Nishida, Takashi; Todokoro, Hideo; Mitsui, Yasuhiro; and Shichi, Hiroyasu, 5,594,246, Cl. 250-310.000.
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Togino, Takayoshi, to Olympus Optical Co., Ltd. Visual display. 5,594,588, Cl. 359-631.000.
Tohill, Henry J.; Gallagher, Russell B.; Kubarych, Kenneth G.; and Hallstrom, Nils O., to Solar Turbines Incorporated. Method of manufacturing an impeller assembly. 5,593,085, Cl. 228-193.000.
Tokai Rubber Industries, Ltd.: *See—*
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Toki, Yusuke; Hiraoka, Masabu; Yamagishi, Ichiro; Onuki, Hiroyuki; Ban, Tatsuya; Hada, Tetsuro; Nabatame, Takeo; Yamahana, Masao; Fujise, Masakuni; Aochi, Yoshihiko; Hayashibara, Makoto; and Ozaki, Masahiro, to Kabushiki Kaisha Toshiba. Computer tomography apparatus. 5,594,772, Cl. 378-114.000.
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Tokyo Electron Limited: *See—*
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Tokyo R&D Co., Ltd.: *See—*
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Tollet, Leland; Anders, Gary H.; and Bell, Hilton L., Jr., to Tyson Holding Company. Carcass processing method. 5,592,828, Cl. 62-249.000.
Toma, Yasushi: *See—*
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Tomie, Toshihisa, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. X-ray lens. 5,594,773, Cl. 378-145.000.
Tomita, Kazushi; Ito, Yoshikazu; Hirano, Motohiro; Nozawa, Akira; Matsuo, Hiromitsu; Iimuro, Shunichi; Tozawa, Shigeki; and Miura, Yutaka, to Hitachi, Ltd.; Hitachi Tokyo Electronics Co., Ltd.; Tokyo Electron Limited; and Tokyo Electron Yamanashi Limited. Plasma etching system and plasma etching method. 5,593,540, Cl. 156-643.100.
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Tosoh SMD, Inc.: *See—*
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Toth, Geza: *See—*
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Tottori, Takeshi: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Chemical Co., Ltd.: *See—*
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Toyo Roki Seizo Kabushikikaisha: *See—*
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Toyoda Gosei Co., Ltd.: *See—*
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Toyoda, Hideaki, to Komori Corporation. Printing press bearing and method of controlling temperature of bearings of a printing press. 5,592,882, Cl. 101-487.000.

Toyoda, Inao: *See—*
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Toyota Jidosha Kabushiki Kaisha: *See—*
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Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.

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Tracy, William: *See—*
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Travelstead, Frederick L.; Hoffman, Robert E.; and Poston, Mendel L., Jr., to Wellman, Inc. Method for increased productivity of industrial fiber. 5,593,629, Cl. 264-209.300.

Travis, Terrell F.: *See—*
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Traylor, Paul L. Air gap anti-siphon System. 5,592,964, Cl. 137-216.000.

Traynor, William: *See—*
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Treiber, Helmut: *See—*
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Trek Bicycle, Corp.: *See—*
Mudertak, Kenneth J., 5,593,126, Cl. 248-316.700.

Trenl, Suzanne B.; Dall, Cristine J.; Draveling, Connie A.; Jolly, James F.; and Ramanujam, Rama P., to Pharmacia Biotech, Inc. Biological reagent spheres. 5,593,824, Cl. 435-4.000.

Tresidder, Michael J.: *See—*
Smith, Michael B.; and Tresidder, Michael J., 5,594,886, Cl. 395-463.000.

Trezise, Dieter. Holder for identification cards. 5,592,767, Cl. 40-649.000.

Tri-Ex Tower Corporation: *See—*
Adams, Daniel S.; Butler, Gene R.; and Pereira, Kenneth J., 5,593,129, Cl. 248-405.000.

Trifield Productions Limited: *See—*
Gerzon, Michael A., 5,594,800, Cl. 381-20.000.

Trigger, David, to Ethical Pharmaceuticals Limited. Pharmaceutical compositions containing nifedipine and process for the preparation thereof. 5,594,013, Cl. 514-356.000.

Trimberger, Stephen M.; Duong, Khue; and Cosa, Robert O., Jr., to Xilinx, Inc. Output multiplexer within input/output circuit for time multiplexing and high speed logic. 5,594,367, Cl. 326-41.000.

Trimble Navigation, Ltd: *See—*
Rodal, Eric B.; Farmer, Dominic G.; and Lau, Chung Y., 5,594,453, Cl. 342-357.000.

Trimmer, Karen. Hands-free hair dryer. 5,592,749, Cl. 34-97.000.

Trinh, Toan; Cappel, Jerome P.; Gess, Philip A.; McCarty, Mark L.; Piloseof, David; Zwerdling, Susan S.; and Tordil, Helen B., to Proctor & Gamble Company, The. Uncomplexed cyclodextrin solutions for odor control on inanimate surfaces. 5,593,670, Cl. 424-76.100.

Trivedi, Bharat K.: *See—*
Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Jasak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.

Trobough, Mark: *See—*
Turner, Leonard; Trobough, Mark; Kabadi, Ashok; and Flamm, Ron, 5,594,356, Cl. 324-755.000.

Trojan Battery Company: *See—*
Brecht, William B., 5,593,797, Cl. 429-210.000.

Trombley, Gerald: *See—*
Lee, Hyong Y.; Johnson, Belinda; Reston, Rocky; Ito, Chris; Trombley, Gerald; and Havasy, Charles, 5,594,262, Cl. 257-192.000.

Tropix, Inc.: *See—*
Bronstein, Irena; Edwards, Brooks; and Voyta, John, 5,593,828, Cl. 435-6.000.

Trudell, Roger J.; and Prouty, Robert E. Lacrimal irrigating cannula. 5,593,393, Cl. 604-264.000.

Trueba, Kenneth E.: *See—*
Keefe, Brian J.; Ho, May F.; Courian, Kenneth J.; Steinfield, Steven W.; Childers, Winthrop D.; Tappon, Ellen R.; Trueba, Kenneth E.; Chapman, Terri I.; Knight, William R.; and Moritz, Jules G., III, 5,594,481, Cl. 347-65.000.

Trustees of Boston: *See—*
Madanshetty, Sameer I., 5,594,165, Cl. 73-61.750.

Truswal Systems Corporation: *See—*
Koo, Kenneth G.; and Tully, Bill M., 5,592,800, Cl. 52-692.000.

TRW Inc.: *See—*
Cuevas, Jess A.; and Zakula, Mitchell P., 5,593,180, Cl. 280-741.000.

TRW Repa GmbH: *See—*
Schmid, Johannes; and Mika, Helmut, 5,593,105, Cl. 242-383.400.

Tryggvason, Karl; Hostikka, Sirkka L.; and Höyhtyä, Matti. Immunological methods for the detection of the human type IV collagen α5 chain. 5,593,900, Cl. 436-547.000.

Trzasko, Peter T.: *See—*
Shi, Yong-Cheng; and Trzasko, Peter T., 5,593,503, Cl. 127-71.000.

Tscholler, Werner; Yonce, Cary S.; Bergey, James L.; and Kawano, James C., to E. R. Squibb & Sons, Inc. Method for preventing onset of hypertension employing a cholesterol lowering drug. 5,593,971, Cl. 514-39.000.

Tseng, Horng H.: *See—*
Lu, Chih-Yuan; and Tseng, Horng H., 5,594,682, Cl. 365-149.000.

Tsubakimoto Chain Co.: *See—*
Ishida, Hiroki; Tani, Junichi; and Horie, Hiroshi, 5,593,360, Cl. 475-331.000.

Tsubokawa, Masahiro: *See—*
Iijima, Yasuo; and Tsubokawa, Masahiro, 5,594,348, Cl. 324-546.000.

Tsuchida, Shinji: *See—*
Oguza, Minoru; Suzuki, Shoji; Tsuchida, Shinji; Tsutsui, Yuichiro; Arai, Shunji; and Hiroki, Shigeru, 5,594,944, Cl. 455-34.100.

Tsuchiya, Takeo: *See—*
Fujii, Masashi; Uyama, Kiichiro; Tsuchiya, Takeo; Mori, Miki; Kosuge, Hideo; and Suzuki, Hirokatsu, 5,594,768, Cl. 378-21.000.

Tsuden Kabushiki Kaisha: *See—*
Hayashida, Tatekazu, 5,594,316, Cl. 320-2.000.

Tsugami, Keiji: *See—*
Iwama, Shinichi; Ota, Seiki; and Tsugami, Keiji, 5,592,758, Cl. 36-117.100.

Tsujikawa, Munekazu: *See—*
Tsutsui, Tsuyoshi; and Tsujikawa, Munekazu, 5,594,260, Cl. 257-80.000.

Tsukamoto, Kazumasa: *See—*
Tabata, Atsushi; Takahashi, Nobuyuki; Ohta, Takashi; Hojo, Yasuo; Kasuga, Shinji; Hayabuchi, Masahiro; Ando, Masahiko; Tsukamoto, Kazumasa; and Fukatsu, Akira, 5,593,365, Cl. 477-119.000.

Tsumori, Toshiro; and Shimizu, Hideo, to Sony Corporation. Exposure mask. 5,593,799, Cl. 430-5.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Enlargement photographing apparatus. 5,594,517, Cl. 396-87.000.

Tsung, Wei-Jiung; and Fisher, James, to Dana Corporation. Spline rack. 5,592,843, Cl. 72-88.000.

Tsuruoka, Takashi: *See—*
Katano, Kiyoaki; Obuchi, Shokichi; Shitara, Eiki; Shimizu, Masaro; Yaegashi, Kazue; Miura, Tomoaki; Isomura, Yasuko; Iida, Hiroyuki; Ishikawa, Midori; Asai, Kenji; Hatsushiba, Emiko; Kawaguchi, Masni; and Tsuruoka, Takashi, 5,594,004, Cl. 514-301.000.

Tsuruta, Seiji, to Unisia Jecs Corporation. Camshaft phase changing device. 5,592,909, Cl. 123-90.170.

Tsushima, Noboru; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, to Alps Electric Co., Ltd. Thermal head. 5,594,488, Cl. 347-208.000.

Tsutai, Akihiko: *See—*
Saito, Akiko; Sahashi, Masashi; Tokai, Yoichi; Tsutai, Akihiko; Okamura, Masumi; Nishiyama, Yukiko; and Inaba, Michihiko, 5,593,517, Cl. 148-301.000.

Tsutsui, Toshiyuki: *See—*
Takahashi, Mamoru; Todo, Akira; Ikeyama, Seiichi; Tsutsui, Toshiyuki; Matsunaga, Shinya; and Kaneshige, Norio, 5,594,071, Cl. 525-240.000.

Tsutsui, Tsuyoshi; and Tsujikawa, Munekazu, to Rohm Co., Ltd. Photoelectric converter with photoelectric conversion devices mounted separately from wiring boards. 5,594,260, Cl. 257-80.000.

Tsutsui, Yuichiro: *See—*
Ogata, Minoru; Suzuki, Shoji; Tsuchida, Shinji; Tsutsui, Yuichiro; Arai, Shunji; and Hiroki, Shigeru, 5,594,944, Cl. 455-34.100.

Tsutsumi, Kazuhiko: *See—*

Fujii, Yoshio; Tokunaga, Takashi; Nakaki, Yoshiyuki; Tsutsumi, Kazuhiko; Hashima, Kazuo; Fukami, Tatsuya; and Kawano, Yuji, 5,593,791, Cl. 428-694.0ML.

Tsuzuki, Kazuo: *See—*
Itoh, Noriie; Kunihara, Mineo; Kashida, Hiroshi; McWhorter, William W.; Nomura, Syunji; Ozawa, Kazunori; Taniguchi, Mikio; and Tsuzuki, Kazuo, 5,594,144, Cl. 548-166.000.

Tsuzuki, Yukio: *See—*
Suzuki, Yasutoshi; Yokoyama, Kenichi; Mizuno, Koki; Toyoda, Inao; and Tsuzuki, Yukio, 5,594,236, Cl. 250-214.100.

TTI Treachless Technologies, Inc.: *See—*
Parish, Robert O., II; and Reber, Cleve C., 5,592,993, Cl. 175-162.000.

Tulip Computers International B.V.: *See—*
van Rumpt, Herman W., 5,594,621, Cl. 361-686.000.

Tullo, James: *See—*
Stass, Louis J.; Tullo, James; and Kohm, Thomas S., 5,593,499, Cl. 118-63.000.

Tully, Bill M.: *See—*
Koo, Kenneth G.; and Tully, Bill M., 5,592,800, Cl. 52-692.000.

Tundaun, Apisit. Interlocking office panel device. 5,592,794, Cl. 52-220.700.

Tung, Kenny Y.: *See—*
Rothenberger, Roland D.; Sullivan, Greg T.; and Tung, Kenny Y., 5,594,690, Cl. 365-189.010.

Turansky, Albert J.: *See—*
Rice, Brian L.; and Turansky, Albert J., 5,593,753, Cl. 428-131.000.

Turecek, Peter; Johann, Eibl; and Schwarz, Hans-Peter, to Immuno Aktiengesellschaft. Virus-inactivated factor Xa preparation. 5,593,968, Cl. 514-21.000.

Turkowski, Kenneth E., to Apple Computer, Inc. Method and system for reordering bytes in a data stream. 5,594,919, Cl. 395-800.000.

Turner, Arthur M.: *See—*
Dreiske, Peter D.; Turner, Arthur M.; and Forehand, David L., 5,593,902, Cl. 437-4.000.

Turner, Brian: *See—*
Simpson, James; Kamarchi, Mohammad; Ury, Michael; and Turner, Brian, 5,594,303, Cl. 315-39.000.

Turner, Crystal: *See—*
Deckner, George E.; Turner, Crystal; Hunter, Sharron; and Watts-McMillan, Kim, 5,593,662, Cl. 424-64.000.

Turner, Dennis M., to Coleco, Inc. Seat for child swing. 5,593,207, Cl. 297-281.000.

Turner, Leonard; Trobough, Mark; Kabadi, Ashok; and Flamm, Ron, to Intel Corporation. Interconnection device for connecting test equipment with a circuit board designed for fine pitch solder lead integrated circuit components. 5,594,356, Cl. 324-755.000.

Turney, Charles C.: *See—*
Corder, George A.; and Turney, Charles C., 5,593,202, Cl. 296-108.000.

Turnquist, Carl R.: *See—*
Lichtenstein, Irving L.; Turnquist, Carl R.; and Amid, Parviz K., 5,593,441, Cl. 623-11.000.

Tuvesson, Eric; and Lipetsky, Efrem, to Dataproducts Corporation. Cartridge, cartridge cleaning apparatus and method for cleaning a corona wire. 5,594,532, Cl. 399-100.000.

Tuzuki, Tomio: *See—*
Bito, Nobutsune; Tuzuki, Tomio; Oda, Nobuyuki; and Mizuno, Akio, 5,594,502, Cl. 348-373.000.

Tweed, Lorne W.: *See—*
Birchenough, Charles W.; Dietz, Hans P.; Holloway, Dwight S.; Rytter, Noel J.; Scholl, Rolland D.; and Tweed, Lorne W., 5,594,643, Cl. 364-424.080.

Twieg, Robert J.: *See—*
Ahn, Kie Y.; Hedrick, James L., Jr.; Labadie, Jeffrey W.; Lee, Kang-Wook; Twieg, Robert J.; Viehbeck, Alfred; and Walker, George F., 5,593,720, Cl. 427-97.000.

Tyner, Joan D.: *See—*
Adamczyk, Maciej; Johnson, Donald D.; Mattingly, Phillip G.; Clarisse, Diana E.; Tyner, Joan D.; and Perkowitz, Mary M., 5,593,896, Cl. 436-500.000.

Tyson Holding Company: *See—*
Tollet, Leland; Anders, Gary H.; and Bell, Hilton L., Jr., 5,592,828, Cl. 62-249.000.

U-Haul International, Inc.: *See—*
Breslin, Patrick W., 5,593,172, Cl. 280-506.000.

U. S. West Marketing Resources Group, Inc.: *See—*
Bruner, Nancy J.; and Smith, Patricia L., 5,594,661, Cl. 364-514.00R.

Uchida, Hironichi, to Toyo Chemical Co., Ltd. Disc accommodation device including movable disc holder. 5,593,031, Cl. 206-308.100.

Uchida, Katsuhiko: *See—*
Suga, Seiji; Imai, Hiroshi; and Uchida, Katsuhiko, 5,592,910, Cl. 123-90.170.

Uchikata, Yoshio: *See—*
Nozaki, Mineo; Asakura, Osamu; Uchikata, Yoshio; and Nagashima, Masayasu, 5,593,237, Cl. 400-208.000.

Uchikoba, Fumio; Nakajima, Shigeyuki; Ito, Takashi; Miura, Taro; Kobayashi, Makoto; Kurahashi, Takahide; and Iijima, Yasushi, to TDK Corporation. Electronic filtering part using a material with microwave absorbing properties. 5,594,397, Cl. 333-202.000.

Uchino, Hideshi; Endo, Jun; Sugano, Toshihiko; Takahama, Tomohiko; Kato, Taku; Taniyama, Eiji; and Iwama, Naoshi, to Mitsubishi Chemical Corporation. Catalyst component for the polymerization of α-olefins and a process for preparing α-olefin polymers with use of same. 5,594,081, Cl. 526-127.000.

Uchino, Masahide: *See—*
Inada, Minoru; Imajo, Yasutaka; and Uchino, Masahide, 5,593,507, Cl. 134-11.000.

Uchiyama, Kenji: *See—*
Utsunomiya, Hajime; Uchiyama, Kenji; Kosuda, Masanori; and Inoue, Hiroyasu, 5,593,789, Cl. 428-694.0ML.

Uchiyama, Tomoyuki, to Nippon Steel Corporation. Semiconductor device having a via hole with an aspect ratio of not less than four, and interconnections therein. 5,594,278, Cl. 257-751.000.

Uchiyama, Tsuyoshi: *See—*
Katoh, Yusuke; and Uchiyama, Tsuyoshi, 5,593,218, Cl. 305-174.000.

Uclaf, Roussel: *See—*
Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, 5,594,127, Cl. 540-30.000.

Uebe, Shuichi: *See—*
Fukutani, Hiroshi; Ohnishi, Hiroshi; Uebe, Shuichi; and Horita, Akihiro, 5,594,572, Cl. 349-155.000.

Ueda Co., Ltd.: *See—*
Takeda, Harumi, 5,594,313, Cl. 320-1.000.

Ueda, Mamoru, to Sony Corporation. Apparatus for verifying operation of a recording and reproducing apparatus. 5,594,599, Cl. 360-53.000.

Uehara, Hirotaka: *See—*
Kobayashi, Hiroshi; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shunji; and Uehara, Hirotaka, 5,594,548, Cl. 356-376.000.

Ueki, Masao: *See—*
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 5,593,497, Cl. 117-90.000.

Ueno, Hiroaki; Oe, Takayuki; Suehiro, Ichiro; and Nakamura, Fumiko, to Mitsubishi Chemical Corporation. Naphthalene derivatives. 5,594,016, Cl. 514-369.000.

Ueno, Takeshi: *See—*
Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oshima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sano, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.

Ueno, Takuya; Inamori, Masayuki; and Kyutoku, Hirofumi, to Osaka Gas Company, Limited. Fluororesin composites. 5,593,776, Cl. 428-367.000.

Ulmer, Peter: *See—*
Goodowski, Gerhard; Arleth, Werner; and Ulmer, Peter, 5,593,018, Cl. 198-370.100.

Ulowetz, Michael A.: *See—*
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., 5,593,548, Cl. 203-29.000.

Ultrapointe Corporation: *See—*
Lee, Ken K., 5,594,235, Cl. 250-201.300.

Umans, Stephen D.: *See—*
Lyon, Richard H.; Chai, Jangbom; Lang, Jeffrey H.; Hagman, Wayne H.; Umans, Stephen D.; and Saarela, Olli J., 5,594,175, Cl. 73-593.000.

Umeda, Shinichi: *See—*
Naruse, Hiroshi; Mizuta, Hideki; Umeda, Shinichi; and Nagata, Teruyuki, 5,594,149, Cl. 548-316.400.

Umemoto, Masuo: *See—*
Sakurai, Wataru; Sawaguchi, Hideki; Satoh, Naoki; and Umemoto, Masuo, 5,594,756, Cl. 375-233.000.

Umise, Shigeki; Suzuki, Taro; and Yamamoto, Kyoichi, to Dai Nippon Insatsu Kabushiki Kaisha. Thermal transfer sheet. 5,593,940, Cl. 503-227.000.

Umwelt-Technics-Nord GmbH: *See—*
Grosholz, Claus, 5,592,753, Cl. 34-410.000.

Ung, Ly W. Non-distorted blind spot mirror using a triangular prism for all types of vehicles. 5,594,594, Cl. 359-855.000.

Uniden Corporation: *See—*
Goto, Minoru; Watanabe, Satoru; Aoki, Minoru; Konishi, Shuji; and Kato, Koji, 5,594,707, Cl. 367-111.000.

Unipure Corporation: *See—*
Ohsol, Ernest O.; and Callery, Thomas G., 5,593,591, Cl. 210-609.000.

Unique Mobility, Inc.: *See—*
Huang, Hao; DeBruzzi, Michael S.; and Riso, Thomas A., 5,592,731, Cl. 29-596.000.

Uniroyal Chemical Company, Inc.: *See—*
Crepeau, Allen E.; and Jablonowski, Thomas L., 5,594,073, Cl. 525-331.800.

Unisia Jecs Corporation: *See—*
Hara, Seinosuke, 5,592,857, Cl. 74-568.00R.
Hara, Seinosuke; and Hidaka, Akira, 5,592,908, Cl. 123-90.170.
Machida, Kenichi, 5,592,923, Cl. 123-520.000.
Suga, Seiji; Imai, Hiroshi; and Uchida, Katsuhiko, 5,592,910, Cl. 123-90.170.
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Unisys Corporation: *See—*
Carlson, Robert H., 5,594,896, Cl. 395-556.000.
Harris, George W., Jr.; and Nolan, Shari J., 5,594,870, Cl. 395-200.200.
Rothenberger, Roland D.; Sullivan, Greg T.; and Tung, Kenny Y., 5,594,690, Cl. 365-189.010.

United Microelectronics Corporation: *See—*
Hsue, Chen-Chiu, 5,594,684, Cl. 365-185.010.

United States of America

Agriculture: *See*—
Shuman, Dennis; Litzkow, Carl A.; Kruss, Sergey; Coffelt, James A.; Potin, Frederick L.; and Wietlisbach, David O., 5,594,654, Cl. 364-478.010.
Air Force: *See*—
Khoury, Jehad; Woods, Charles L.; Cronin-Golomb, Mark; and Fu, Jack, 5,594,586, Cl. 359-559.000.
Lee, Hyong Y.; Johnson, Belinda; Reston, Rocky; Ito, Chris; Trombley, Gerald; and Havasy, Charles, 5,594,262, Cl. 257-192.000.
Reinhardt, Bruce A.; and Bhat, Jayprakash C., 5,594,075, Cl. 525-426.000.
Rowan, Herman K., 5,592,850, Cl. 73-167.000.
Americe: *See*—
Nilsen, David N.; Galvan, Gloria J.; Hundley, Gary L.; and Wright, John B., 5,593,593, Cl. 210-638.000.
Army: *See*—
Korpi, John G., 5,592,898, Cl. 116-209.000.
Lux, Robert A.; Harvey, James A.; Tauber, Arthur; and Tidrow, Steven C., 5,593,742, Cl. 427-586.000.
Shepard, James E., 5,593,190, Cl. 292-98.000.
Energy: *See*—
Weiss, Jonathan D., 5,594,240, Cl. 250-227.230.
Health and Human Services: *See*—
Malech, Harry L.; and Rotrosen, Daniel, 5,593,966, Cl. 514-16.000.
National Aeronautics and Space Administration: *See*—
Hearn, Chase P., 5,594,351, Cl. 324-637.000.
Navy: *See*—
Cowen, Steven J.; Young, Christopher M.; Dombrowski, James H.; Kono, Michael E.; and Daughtry, James H., 5,593,736, Cl. 427-492.000.
Griffith, James R., 5,593,732, Cl. 427-407.100.
Lenko, Daniel S.; and Frederick, Thomas P., 5,594,195, Cl. 102-260.000.
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U.S. Philips Corporation: *See*—
Dings, Jacobus M.; Horne, Remko; Van Veen, Gerardus N. A.; and Bosman, Joseph C. M., 5,593,528, Cl. 156-154.000.
Florent, Raoul; and Lelong, Pierre, 5,594,845, Cl. 395-127.000.
Guillaud, Jean-Michel; and Martinez, Georges, 5,594,760, Cl. 375-345.000.
Kamoen, Joost-Pieter; and Vlot, Marnix C., 5,594,733, Cl. 370-449.000.
Kooyker, Klaas; Weits, Adam; and Van Der Vinne, Frans, 5,592,872, Cl. 99-510.000.
Oomen, Emmanuel W. J. L.; and De Bont, Hans, 5,592,765, Cl. 38-93.000.
Tibi, Georges, 5,594,723, Cl. 370-396.000.
Van Gennip, Nicasius G. T.; Van Heeswijk, Johannes A. A. M.; and Plantinga, Ronald A., 5,594,295, Cl. 313-25.000.
United States Surgical Corporation: *See*—
Person, Wayne C.; Theroux, Marc J.; and Lopez-Isa, Maria E., 5,593,423, Cl. 606-219.000.
United Technologies Corporation: *See*—
Maier, Mark S.; Gamble, Eric J.; Wilson, Jack W.; Calzadilla, Eliot L.; and Goetz, Gerald F., 5,593,112, Cl. 244-117.00A.
Meixner, Richard A.; and Birbara, Philip J., 5,593,737, Cl. 427-512.000.
Palmisa, Mark E.; Figueroa, Carlos G.; Friedberg, Daniel C.; Jones, Gary D.; and Eichhorn, Gunther, 5,592,814, Cl. 60-271.000.
United Technologies Motor Systems, Inc.: *See*—
Shannon, Larry S.; Welch, David W.; and Boxten, Daniel P., 5,594,290, Cl. 310-251.000.
Universal Lock: *See*—
McBride, Darryl G., 5,592,837, Cl. 70-38.00A.
Universal Valve Co., Inc.: *See*—
Petzsch, Martin C.; Main, Douglas T., Jr.; and Milo, Robert J., 5,593,116, Cl. 248-75.000.
Universite de Montreal: *See*—
Lavigne, Gilles; and Touloukian, Léo, 5,592,947, Cl. 128-744.000.
University of Alabama Research Foundation: *See*—
Patterson, Burton R.; and Horn, Jeffrey A., 5,594,057, Cl. 524-406.000.
University of British Columbia, The: *See*—
Hancock, Robert E. W.; Piers, Kevin L.; and Brown, Melissa H., 5,593,866, Cl. 435-69.700.
University of California, The Regents of the: *See*—
Feaical, William H.; Jacobs, Robert S.; and Jensen, Paul R., 5,593,960, Cl. 514-9.000.
Kamm, Edward J.; Wijesinghe, Ananda M.; and Viani, Brian E., 5,593,248, Cl. 405-128.000.
Kurtz, Theodore W.; and Pershadsingh, Harriher A., 5,594,015, Cl. 514-369.000.
Muller, Rolf H.; and Zhang, Shengtao, 5,593,798, Cl. 429-245.000.
Westerfield, Curtis L.; Morris, John S.; and Agnew, Stephen F., 5,594,546, Cl. 356-246.000.
White, Richard M.; and Campbell, Gregory A., 5,594,331, Cl. 324-117.00R.
University of Colorado, Regents of the: *See*—
Wegmann, Dale R., 5,594,100, Cl. 530-303.000.
University of Georgia Research Foundation: *See*—
Evans, Donald L.; and Jaso-Friedmann, Liliana, 5,593,678, Cl. 424-184.100.
University of Miami: *See*—
McCabe, Mead M., 5,593,829, Cl. 435-6.000.
University of Minnesota, Regents of the: *See*—
Santamaria, Pedro; Boyce-Jacino, Michael T.; Barbosa, Jose J.; Rich, Stephen S.; and Faras, Anthony J., 5,593,830, Cl. 435-6.000.
University of Nebraska, The Board of Regents of the: *See*—
Wheeler, Desmond M. S., 5,594,158, Cl. 552-201.000.
University of North Carolina at Chapel Hill, The: *See*—
Dykstra, Christine C.; Tidwell, Richard R.; Boykin, David W.; Wilson, W. David; Spychala, Jaroslaw; Das, Bijan P.; and Kumar, Arvind, 5,594,138, Cl. 540-596.000.
University of Nottingham, The: *See*—
Bycroft, Barrie W.; Williams, Paul; Stewart, Gordon S. A. B.; Chhabra, Siri R.; Stead, Paul; Winson, Michael K.; Hill, Philip J.; Rees, Catherine E. D.; and Bainton, Nigel J., 5,593,827, Cl. 435-6.000.
University of Pennsylvania, Trustees of the: *See*—
Eberwine, James H.; and Spencer, Corinne, 5,593,863, Cl. 435-69.100.
Weiner, David B.; Williams, William V.; and Wang, Bin, 5,593,972, Cl. 514-44.000.
Wilson, David F.; and Pawlowski, Marek, 5,593,899, Cl. 436-127.000.
University of Saskatchewan: *See*—
Potter, Andrew; Campos, Manuel; and Hughes, Huw P. A., 5,594,107, Cl. 530-350.000.
University of Tennessee Research Corp., The: *See*—
McDonald, Ted P., 5,593,666, Cl. 424-85.100.
University of Washington: *See*—
Keefe, Douglas H., 5,594,174, Cl. 73-585.000.
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Viola, Paolo; and Sevennec, Michelle, 5,593,014, Cl. 192-70.180.
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Louy, Jean-François; and Gasquet, Jean-Claude, 5,594,424, Cl. 340-815.540.
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Jelley, Kevin W.; Valliath, George T.; and Chen, Alan G., 5,594,560, Cl. 359-15.000.
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Appelqvist, Ingrid A.; Brown, Charles R.; and Norton, Ian T., 5,593,716, Cl. 426-589.000.
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Day, Derek J.; Stilhelin, Rolf; Provenzale, Salvatore; Riem, Heinrich; and Fencl, Willi, 5,594,252, Cl. 250-385.100.
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Majidi-Ahy, Reza; and Hill, Howard, 5,594,341, Cl. 324-322.000.
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Varney, Michael D.; Romines, William H.; and Palmer, Cynthia L., to Agouron Pharmaceuticals, Inc. Processes for preparing antiproliferative garft-inhibiting compounds. 5,594,139, Cl. 544-48.000.
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Balzer, Karen B., 5,592,801, Cl. 52-741.200.
Veermeer, Christian J. Electrical fitting. 5,594,203, Cl. 174-48.000.
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Verner, Erik J.: *See*—
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Viani, Brian E.: *See*—
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Vicari, Richard, to Hoechst Colanese Corp. Preparation and use of poly(3,5 disubstituted-4-hydroxystyrene/n-substituted maleimide). 5,594,086, Cl. 526-262.000.
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Wurzinger, Vinzenz, 5,593,266, Cl. 414-228.000.

Viola, Paolo; and Sevennec, Michelle, to Valeo. Clutch module with a peripherally thickened pressure plate. 5,593,014, Cl. 192-70.180.

Viovy, Jean-Louis: *See*—
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Virtest International, Inc.: *See*—
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Virginia Tech Intellectual Properties, Inc.: *See*—
Desu, Seshu B.; Peng, Chien-Hsiung; Shi, Tian; and Agashar, Pradyot A., 5,593,727, Cl. 427-248.100.

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Castellano, Thomas P.; and Schumacher, Robert, 5,593,390, Cl. 604-187.000.

Viskase Corporation: *See*—
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Vivat, Michel: *See*—
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Vlot, Marnix C.: *See*—
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Vogelman, Hartmut: *See*—
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Vollmer Werke Maschinenfabrik GmbH: *See*—
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Vrespa, Giuseppe. Screw device for fixing prostheses to bones. 5,593,410, Cl. 606-73.000.

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Vulcan Materials Company: *See*—
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VXL/HCR Technology Corporation: *See*—
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W. L. Gore & Associates, Inc.: *See*—
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Wacker-Chemie GmbH: *See*—
Dauth, Jochen; Herzig, Christian; Deubzer, Bernward; Hierstetter, Thomas; and Gratzl, Petra, 5,593,787, Cl. 428-447.000.
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Waclawsky, John G.: *See*—
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Wada, Masaharu: *See*—
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Wada, Takatsugu: *See*—
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Wagner, Neldon C.: *See*—
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Wagner, Paul: *See*—
Groth, Torsten; Joentgen, Winfried; Wagner, Paul; Traenckner, Hans-Joachim; and Jovcic, Dorde, 5,594,077, Cl. 525-451.000.

Wagnon, Jean; Tonnerre, Bernard; Di Malta, Alain; Roux, Richard; Amiel, Marie-Sophie; and Serradeil-Legal, Claudine, to Sanofi. 1,3-dihydroindol-2-one derivatives substituted in the 3-position by a nitrogen-containing group, their preparation and the pharmaceutical compositions in which they are present. 5,594,023, Cl. 514-423.000.

Wahl, Peter; and Ackermann, Rudolf, to Peter Wahl GmbH & Co. Guide rocker (or crank) for a sliding cover of a sun roof for a motor vehicle. 5,593,204, Cl. 296-223.000.

Wahlberg, Sverker: *See*—
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Wainwright, Norman R.; and Novitsky, Thomas J., to Associates of Cape Cod, Inc. Endotoxin binding and neutralizing protein and uses thereof. 5,594,113, Cl. 530-395.000.

Waite, James E.; and Wolf, Roger L., to Norand Corporation. Analyzer for bar code readers and decoders. 5,594,230, Cl. 235-462.000.

Waite, Peter D.; and DuMont, Robert, to Alcan International Limited. Gas treatment of molten metals. 5,593,634, Cl. 266-217.000.

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Waizmann, Franz, to Baldwin-Gegenheimer GmbH. Method and apparatus for the contact-free removal of dirt from the cylinders of printing machines. 5,592,879, Cl. 101-416.100.

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Wakai, Ronald T.: *See*—
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Walbro Corporation: *See*—
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Walker, Gary E.: *See*—
Epstein, Joseph W.; Birnberg, Gary H.; Walker, Gary E.; Dutia, Minu D.; and Bloom, Jonathan D., 5,594,027, Cl. 514-463.000.

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Wallace, Alan K.: *See*—
Van Vechten, James A.; Lundy, James R.; Wallace, Alan K.; and Bell, Chris A., 5,593,744, Cl. 428-34.400.

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Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,593,825, Cl. 435-5.000.

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Harder, Stanley D.; Houghton, Richard A.; and Wallace, Richard H., 5,594,925, Cl. 395-863.000.

Walsh, John J.; and Carter, Leigh D., to Guiness Brewing Worldwide Limited. Beverage dispensing system. 5,592,867, Cl. 99-323.200.

Walsh, William C., to BASF Corporation. Reclamation of polymers, that contain styrene in the polymeric backbone, using a water soluble solvent based reclamation process. 5,594,035, Cl. 521-47.000.

Walter, Helmut: *See*—
Nuebling, Christoph; von Deyn, Wolfgang; Theobald, Hans; Westphalen, Karl-Otto; Kardorff, Uwe; Walter, Helmut; Kappe, Thomas; and Gerber, Matthias, 5,593,943, Cl. 504-221.000.

Walter, Hilger A.; Hönen, Herwart; and Gallus, Heinz E., to Dow Deutschland Inc. Process and device for monitoring and for controlling of a compressor. 5,594,665, Cl. 364-558.000.

Walts, Connie R.: *See*—
Wood, Robert J.; Salisbury, Terrence L.; Walts, Connie R.; and Pileski, Michael J., 5,594,826, Cl. 385-88.000.

Wamsler Grosskuechentechnik GmbH: *See*—
Sagredos, Angelos N.; and Neumeister, Ilmar, 5,594,327, Cl. 324-71.100.

Wang, Bin: *See*—
Weiner, David B.; Williams, William V.; and Wang, Bin, 5,593,972, Cl. 514-44.000.

Wang, Chi S.: *See*—
Fandrianto, Jan; Wang, Chi S.; Rainnie, Hedley K. J.; Sutardja, Sehat; and Martin, Bryan R., 5,594,813, Cl. 382-236.000.

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Wang, Chin-Yang. Article hanger. 5,593,124, Cl. 248-231.810.

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Wang, Shay-Ping T., to Motorola, Inc. Method and system for recognizing a boundary between sounds in continuous speech. 5,594,834, Cl. 395-2.620.

Wang, Wuyi: *See*—
Attardo, Giorgio; Kraus, Jean-Louis; Courchesne, Marc; Lamouthe, Serge; Lavallée, Jean-François; Lebeau, Elaine; Nguyen, Dieu; Rej, Rabindra; St-Denis, Yves; Wang, Wuyi; Xu, Yao-Chang; Barbeau, France; Belleau, Bernard, deceased, 5,593,970, Cl. 514-34.000.

Wang, Yong: *See*—
Rando, Robert R.; and Wang, Yong, 5,593,835, Cl. 435-6.000.

Wanner, Martin; Maier, Dieter; and Birk, Gerhard, to Putzmeister-Werk Maschinenfabrik GmbH. Brush head for cleaning surfaces. 5,592,710, Cl. 15-53.200.

Warchol, Nicholas A.: *See*—
Kinzelman, Paul M.; and Warchol, Nicholas A., 5,594,741, Cl. 371-27.000.

Ward, Arthur A. Backhoe scarifying apparatus. 5,592,761, Cl. 37-403.000.

Ward, Edward R., to Schlumberger Industries, Inc. Gas meter having cam for reciprocating valve covers and related methods. 5,594,167, Cl. 73-274.000.

Ward, Morris D.; and Williams, Kenneth L., to Texas Instruments Incorporated. Sequential memory. 5,594,700, Cl. 365-230.030.

Wardlaw, Stephen C.: *See*—
Levine, Robert A.; Wardlaw, Stephen C.; Rodriguez, Rodolfo; Britz, Judith; and Mercolino, Thomas J., 5,593,848, Cl. 435-7.240.

Wareham, Robert C., to Haeger, Inc. High production hardware insertion press incorporating operator and tool protection systems and apparatus. 5,592,733, Cl. 29-708.000.

Warfield, Larry T.: *See*—
Higham, Paul A.; and Warfield, Larry T., 5,593,452, Cl. 623-23.000.

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Warner, Kenneth R.: *See*—
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Warner-Lambert Company: *See*—
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Horwell, David C.; Roberts, Edward; Holmes, Ann; Padia, Janak K.; Roark, William H.; Roth, Bruce D.; Trivedi, Bharat K.; Kleinschroth, Jurgen; Rees, David C.; and Richardson, Reginald S., 5,593,967, Cl. 514-18.000.
Horwell, David C.; Howson, William; Pritchard, Martyn C.; Roberts, Edward; and Rees, David C., 5,594,022, Cl. 514-419.000.

Warr, Charles J., to Rex-Roseulew International Corporation. Heavy duty bag with easily-removable corner for pouring. 5,593,229, Cl. 383-209.000.

Washington, Dyral. Meat tenderizing mallet. 5,593,346, Cl. 452-146.000.

Washino, Tsutomu: *See*—
Kitahata, Sumio; Nakano, Hirofumi; Washino, Tsutomu; and Moriwaki, Masamitsu, 5,593,869, Cl. 435-100.000.

Washio, Hajime: *See*—
Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.

Watanabe, Kenji; and Yasui, Hiroyuki, to Sony Corporation. Apparatus for producing a video signal in the common intermediate format (CIF). 5,594,499, Cl. 348-222.000.

Watanabe, Masao: *See*—
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Watanabe, Noriko: *See*—
Hirata, Mitsuaki; Nammatsu, Akihiro; Watanabe, Noriko; Mizushima, Shigeaki; Makino, Seiji; Iwagoe, Hiroko; and Oyobe, Kei, 5,594,570, Cl. 349-129.000.

Watanabe, Norito: *See*—
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Watanabe, Satoru: *See*—
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Watanabe, Takao; Kimura, Katsutaka; Itoh, Kiyoo; and Kawajiri, Yoshiki, to Hitachi, Ltd. Neural network processing system using semiconductor memories and processing paired data in parallel. 5,594,916, Cl. 395-800.000.

Watanabe, Takashi, to Sharp Kabushiki Kaisha. Charge detection device, a method for producing the same, and a charge transfer and detection apparatus including such a charge detection device. 5,593,910, Cl. 437-41.000.

Watanabe, Takashi: *See*—
Inoue, Makoto, deceased; Inoue, by Tsuneo, heir; Masuda, Kazuaki; Toganoh, Shigeo; Sueoka, Manabu; Murai, Keiichi; Watanabe, Takashi; Goto, Akira; and Sato, Motoaki, 5,594,479, Cl. 347-45.000.

Watanabe, Teruo: *See*—
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Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihito; Sato, Yoshiharu; Abe, Shuji; and Soumiya, Toshio, to Fujitsu Limited. Call admission control in ATM network. 5,594,717, Cl. 370-232.000.

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Waterfield, Michael D.: *See*—
Goodeurl, Andrew D. J.; Stroobant, Paul; and Waterfield, Michael D., 5,594,114, Cl. 530-399.000.

Waterman, Kenneth C.: *See*—
Kim, Gia Y.; Taylor, Lloyd D.; and Waterman, Kenneth C., 5,593,809, Cl. 430-213.000.

Waters, R. Nicholas: *See*—
Svensson, Kjell A. I.; Wikstrom, Hakan V.; Carlsson, Per A. E.; Boije, Anna M. P.; Waters, R. Nicholas; Sonesson, Clas A.; Sjoerulof, Nils P.; Andersson, Bengt R.; and Hansson, Lars O., 5,594,024, Cl. 514-429.000.

Watkins, Amos J.: *See*—
Laporte, Irvin J.; and Watkins, Amos J., 5,592,994, Cl. 175-247.000.

Watkins, John A., deceased; and Watkins, Margaret C., administrator. Apparatus for adjusting the attitude of a mattress. 5,592,709, Cl. 5-660.000.

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Watkins, John A., deceased; and Watkins, Margaret C., administrator, 5,592,709, Cl. 5-660.000.

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Watkins, Robert C.: *See*—
Mraz, William B.; Black, Thomas J., Jr.; McMahan, Paul E.; Hufford, Larry A.; Mooney, David T.; and Watkins, Robert C., 5,593,164, Cl. 277-9.500.

Watts, Thomas A., to Caterpillar Inc. Hydraulic axial piston unit with multiple valve plates. 5,593,285, Cl. 417-269.000.

Watts-McMillan, Kim: *See*—
Deckner, George E.; Turner, Crystal; Hunter, Sharron; and Watts-McMillan, Kim, 5,593,662, Cl. 424-64.000.

Waxing Corporation of America, Inc.: *See*—
McCracken, Robert E., 5,593,312, Cl. 439-369.000.

Waymeyer, Stephen J.: *See*—
Venkatasubbu, Srinivasan; Eschenbach, Jeffrey J.; Waymeyer, Stephen J.; and Lampert, Bruno G., 5,593,275, Cl. 415-160.000.

Waymouth, Robert M.; Coates, Geoffrey W.; and Hauptman, Elisabeth M., to Leland Stanford, Jr. University. Thermoplastic elastomeric olefin polymers, method of production and catalysts therefor. 5,594,080, Cl. 526-126.000.

Weaver, Lindsay A., Jr.; Bayley, Gwain; Tiedemann, Edward G., Jr.; and Gilhousen, Klein S., to Qualcomm Incorporated. Method and apparatus for providing mobile unit assisted hard handoff from a CDMA communication system to an alternative access communication system. 5,594,718, Cl. 370-331.000.

Weaver, Robert L.: *See*—
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Webb, Lee F., to Avaero. Hush kit for jet engine. 5,592,813, Cl. 60-226.200.
Webber, John C.; and Knight, Curtis A., to Interferometrics, Inc. Method and system for locating an unknown transmitter using calibrated oscillator phases. 5,594,452, Cl. 342-353.000.
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Winberry, Martin W.; Velagaleti, Ranga R.; Williams, Mark D.; Daly, Donna; Swain, Len R.; and Weber, Jerome B., 5,594,185, Cl. 73-866.000.
Webler, William E.; and Buhr, Mark S., to Cardiovascular Imaging Systems, Inc. Automated longitudinal position translator for ultrasonic imaging probes, and methods of using same. 5,592,942, Cl. 128-660.090.
Wecke, Rolf: *See*—
Chwieralski, Alfred; and Wecke, Rolf, 5,593,021, Cl. 200-303.000.
Wedell, Mark T.: *See*—
Bilson, Edward B.; Wedell, Mark T.; and Zimmerman, Thomas A., 5,593,318, Cl. 439-573.000.
Weder, Donald E., to Southpac Trust International, Inc. Scalable floral sleeve having a detachable portion. 5,592,776, Cl. 47-72.000.
Weder, Donald E., to Southpac Trust International, Inc. Floral grouping wrapper and methods. 5,592,803, Cl. 53-397.000.
Weder, Donald E.; and Rahman, Motiur, to Southpac Trust International, Inc. Water-based ink composition free of volatile organic compounds for deposition on a substrate. 5,594,048, Cl. 523-335.000.
Wegener, Stefan: *See*—
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Wegner, Marion: *See*—
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Wei, Guang; Lagos, Bryan C.; and Treger, Jack, to Duracell Inc. Moisture barrier composite film of silicon nitride and fluorocarbon polymer and its use with an oa-cell tester for an electrochemical cell. 5,593,794, Cl. 429-91.000.
Weimer, Chester L. Protective underwear with malodorous flatus filter. 5,593,398, Cl. 604-359.000.
Weinberger, Scott R.; Egan, Robert W.; Hoppe, Thomas W., deceased (by Curtis A. Orgill, executor); Gassmann, Ernst; Schär, Martin M.; Börnsen, Klaus O.; and Tarantino, E. Rocco, to Hewlett Packard Company. Laser desorption ionization mass monitor (LDIM). 5,594,243, Cl. 250-288.000.
Weindelmayer, Frederick G.: *See*—
Hernandez, Bernie; Horton, Raymond R.; Palmer, Michael J.; and Weindelmayer, Frederick G., 5,593,083, Cl. 228-180.210.
Weiner, David B.; Williams, William V.; and Wang, Bin, to Wistar Institute, The; and University of Pennsylvania, The Trustees of the. Genetic immunization. 5,593,972, Cl. 514-44.000.
Weiner, Howard L.; Hafler, David A.; Carpenter, Charles B.; Sayegh, Mohamed; and Zhang, Zhengyi, to Autoimmune, Inc. Suppression of proliferative response and induction of tolerance with polymorphic class II MHC allopeptides. 5,593,698, Cl. 424-534.000.
Weinert, Raymond J.: *See*—
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Weinstein, Alex H. Eating utensil. 5,592,744, Cl. 30-324.000.
Weirich, Mike; and Vogt, Kurt E., to MTD Products Inc. Transmission shift key. 5,592,855, Cl. 74-371.000.
Weiss, Jonathan D., to United States of America, Energy. Strain-optic voltage monitor wherein strain causes a change in the optical absorption of a crystalline material. 5,594,240, Cl. 250-227.230.
Weiss, Joseph M.: *See*—
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Weiss, Lola: *See*—
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Weits, Adam: *See*—
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Weitzmann, Jürgen: *See*—
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Welch Allyn, Inc.: *See*—
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Welch, David W.: *See*—
Shannon, Larry S.; Welch, David W.; and Bexten, Daniel P., 5,594,290, Cl. 310-251.000.
Welch, M. Bruce; Geerts, Rolf L.; Palackal, Syriac J.; and Pettijohn, Ted M., to Phillips Petroleum Company. Process for producing broad molecular weight polyolefin. 5,594,078, Cl. 526-119.000.
Weldon, David E.; Nagorski, Bogusław A.; and Talieh, Homayoun, to Ontrak Systems, Inc. Wafer polishing machine with fluid bearings and drive systems. 5,593,344, Cl. 451-296.000.
Wellman, Inc.: *See*—
Travelute, Frederick L.; Hoffman, Robert E.; and Poston, Mendel L., Jr., 5,593,629, Cl. 264-209.300.
Welygan, Dennis G.: *See*—
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Wendeberg, Hans: *See*—
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Wentworth, Fred A., Jr., to Ionic Fuel Technology, Inc. Vapor catalyst system for combustion. 5,592,903, Cl. 123-25.00A.
Wentworth, Wayne E.: *See*—
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Werner & Pfleiderer, GmbH: *See*—
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Werner, Richard. Snow gun. 5,593,090, Cl. 239-2.200.
Werstlein, Michael T.: *See*—
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Wessling, Michael: *See*—
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West, Nick: *See*—
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West, Raymond O. Impact cushioning device to prevent fall related injuries. 5,592,705, Cl. 5-424.000.
West, William R.: *See*—
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Westerfield, Curtis L.; Morris, John S.; and Agnew, Stephen F., to University of California, The Regents of the. Diamond anvil cell for spectroscopic investigation of materials at high temperature, high pressure and shear. 5,594,546, Cl. 356-246.000.
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Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,593,214, Cl. 303-7.000.
Westinghouse Electric Corporation: *See*—
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Westphalen, Karl-Otto: *See*—
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Westwind Air Bearings Limited: *See*—
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Wetegrove, Robert L.; Balakrishnan, Krishna; and Bruehl, Richard E., to Nalco Chemical Company. Monitoring of industrial water quality using monoclonal antibodies to polymers. 5,593,850, Cl. 435-7.920.
Wheeler, Desmond M. S., to University of Nebraska, The Board of Regents of the. Processes for producing doxorubicin, daunomycinone, and derivatives of doxorubicin. 5,594,158, Cl. 552-201.000.
Whipple, Walter, III, to General Electric Company. Zero current sensor. 5,594,333, Cl. 324-142.000.
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Whirlpool Corporation: *See*—
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Whitaker Corporation, The: *See*—
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Hotea, Gheorghe, 5,593,321, Cl. 439-589.000.
Humbles, Marvin L., 5,593,317, Cl. 439-502.000.
Kulick, John D.; and Mak, Eric S-F., 5,594,237, Cl. 250-214.100.
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Listing, Martin, 5,593,326, Cl. 439-752.000.
Post, Lothar A.; and Kunze, Jörg, 5,593,309, Cl. 439-157.000.
White, Alan W.: *See*—
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White, Kristin: *See*—
Steller, Hermann; Abrams, John M.; Grether, Megan E.; and White, Kristin, 5,593,879, Cl. 435-240.100.
White, Mark A.: *See*—
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White, Richard M.; and Campbell, Gregory A., to University of California, Regents of the. Microelectromechanical powerline monitoring apparatus. 5,594,331, Cl. 324-117.00R.
Whiteman, Aharon E.: *See*—
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Whitney, Hartwell H.: *See*—
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Wicks, Thomas S.: *See*—
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Wiedeman, Robert A.; and Monte, Paul A., to Space Systems/Loral, Inc. Satellite communication system that is coupled to a terrestrial communication network and method. 5,594,780, Cl. 379-59.000.
Wienen, Wolfgang: *See*—
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Wilk, Peter J.: *See*—
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Wilkinson Company: *See*—
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Williams, Andrew S., to Lucas Western, Inc. Actuator system and method. 5,593,109, Cl. 244-3.210.
Williams, Christopher R. Hunting blind. 5,592,960, Cl. 135-87.000.
Williams, Daniel S.: *See*—
Kamani, Sanjay; Williams, Daniel S.; and Koenig, Christopher H., 5,594,219, Cl. 187-394.000.
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Usui, Ryuzaburo; Iwamoto, Masafumi; Yamamoto, Kazuhiko; Fujisaka, Takahito; and Kondo, Michimasa, 5,594,447, Cl. 342-42.000.

Yamamoto, Kazuo: *See*—
Nakashima, Tatsushi; Paruhashi, Tsutomu; Kano, Hiroyuki; Yamamoto, Kazuo; and Inoue, Hiroshi, 5,592,968, Cl. 137-561.00A.

Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, to Sharp Kabushiki Kaisha. Driving device for a display panel and a driving method of the same. 5,594,466, Cl. 345-100.000.

Yamamoto, Kyoichi: *See*—
Umise, Shigeki; Suzuki, Taro; and Yamamoto, Kyoichi, 5,593,940, Cl. 503-227.000.

Yamamoto, Michiyasu: *See*—
Baba, Norimasa; and Yamamoto, Michiyasu, 5,592,830, Cl. 62-509.000.

Yamamoto, Tomotsu: *See*—
Kaizaki, Keiji; Yamamoto, Tamotsu; Yokoji, Shigeru; Inoue, Hiroto; and Matsui, Hiroshi, 5,593,023, Cl. 200-570.000.

Yamamoto, Tomoya: *See*—
Koike, Shoji; and Yamamoto, Tomoya, 5,594,485, Cl. 347-101.000.

Yamamoto, Yasuhiro, to Kabushiki Kaisha Meidensha. Apparatus for measuring circuit constant of induction motor with vector control system and method therefor. 5,594,670, Cl. 364-571.010.

Yamamoto, Yoshihito: *See*—
Sakamoto, Makoto; Imaoka, Takeshi; Motoyama, Masaaki; Yamamoto, Yoshihito; and Takasu, Hideki, 5,594,006, Cl. 514-312.000.

Yamamoto, Yusaku: *See*—
Matsumoto, Masakazu; Taguchi, Masahiro; and Yamamoto, Yusaku, 5,593,258, Cl. 409-234.000.

Yamamura, Ken: *See*—
Tsushima, Noboru; Endoh, Toshiya; Sasaki, Satoru; Yamamura, Ken; Shirakawa, Takashi; Nakatani, Toshifumi; and Takahashi, Akinori, 5,594,488, Cl. 347-208.000.

Yamamura, Shinya: *See*—
Nishimura, Ryuhei; Murakami, Hiroaki; and Yamamura, Shinya, 5,592,817, Cl. 60-431.000.

Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 5,594,132, Cl. 540-227.000.

Yamanaka, Hiroyuki: *See*—
Noda, Masayuki; Yonekura, Minoru; and Yamanaka, Hiroyuki, 5,593,767, Cl. 428-251.000.

Yamanaka, Koji; Imaoka, Takashi; Futatsuki, Takashi; and Yamashita, Yukinari, to Organo Corporation. Electrolytic ionized water producing apparatus. 5,593,554, Cl. 204-252.000.

Yamano, Shozo, to Nikon Corporation. Autofocus camera and method. 5,594,928, Cl. 396-95.000.

Yamasaki, Shoichiro: *See*—
Okada, Osamu; Minami, Shigenobu; and Yamasaki, Shoichiro, 5,594,494, Cl. 348-15.000.

Yamashita, Hiroaki: *See*—
Imai, Koji; Wakahoi, Toshiya; Adachi, Hiromitsu; Terada, Keiichi; Yamashita, Hiroaki; and Morikawa, Hiroshi, 5,593,577, Cl. 210-232.000.

Yamashita, Hiroshi: *See*—
Itoh, Katsuyuki; and Yamashita, Hiroshi, 5,593,761, Cl. 428-210.000.

Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Osaka, Tadashi; and Tamamoto, Junichi, to Hitachi, Ltd. Apparatus for sorting sheets or the like. 5,593,044, Cl. 209-584.000.

Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Aizawa, Fumio, to Etxdy Corporation. Imaging device with stock supervision means. 5,594,529, Cl. 399-8.000.
Yamashita, Yukinari: *See*—
Yamanaka, Koji; Imaoka, Takashi; Futatsuki, Takashi; and Yamashita, Yukinari, 5,593,554, Cl. 204-252.000.
Yamauchi, Hiroyuki: *See*—
Asaka, Hideo; and Yamauchi, Hiroyuki, 5,594,701, Cl. 365-230.030.
Yamauchi, Mineo: *See*—
Saito, Hitoshi; Imoto, Kazunobu; Ueno, Takeshi; Oukima, Katsuyuki; Yamauchi, Mineo; Eguchi, Hiroshi; Sato, Hideaki; Fujimura, Hideo; and Asajima, Mikio, 5,593,939, Cl. 503-227.000.
Yamauchi, Tatsuo: *See*—
Sanpei, Kazuo; and Yamauchi, Tatsuo, 5,594,625, Cl. 361-755.000.
Yamauchi, Tsunekazu, to Aisin Seiki Kabushiki Kaisha. Fluid coupling for an engine. 5,593,013, Cl. 192-58.682.
Yamaura, Shinichi; Yoshioka, Keiichi; Hara, Kazuhiko; and Katayama, Takao, to Ricoh Company, Ltd. Emulation system for emulating CPU core, CPU core with provision for emulation and ASIC having the CPU core. 5,594,890, Cl. 395-500.000.
Yamazaki, Itaru: *See*—
Go, Shintetsu; Takai, Hideyuki; Miyazaki, Hajime; Yamazaki, Itaru; Kaneharu, Tetsuro; and Iuchi, Kazushi, 5,593,805, Cl. 430-78.000.
Yamazaki, Junichi: *See*—
Watanabe, Yoshihiro; Yamazaki, Junichi; Nishimoto, Norihito; Sato, Yoshiharu; Abe, Shunji; and Soumiya, Toshio, 5,594,717, Cl. 370-232.000.
Yamazaki, Kaoru: *See*—
Sakamoto, Yoshio; Iwakura, Shiro; Tanase, Akio; and Yamazaki, Kaoru, 5,594,805, Cl. 381-199.000.
Yamazaki, Kazunobu; Shimamura, Kazuo; and Abe, Yoshiko, to Sekisui Kagaku Kogyo Kabushiki Kaisha of Osaka, Japan; and Japan Immuno Research Lab. Co., Ltd. of Gunma, Japan. Granulocyte adsorbing carrier and granulocyte remover. 5,593,586, Cl. 210-435.000.
Yanagisawa, Ken, to Yugen Kaisha Sozoan. Speed changer. 5,593,361, Cl. 475-342.000.
Yang, Edward, to Videojet Systems International, Inc. Ink jet ink which is rub resistant to alcohol. 5,594,044, Cl. 523-160.000.
Yang, Jian, to Samsung Electronics Co., Ltd. Line sync detector for digital television receiver. 5,594,506, Cl. 348-531.000.
Yang, Koun Y., to LG Electronics, Inc. Optical pickup system with five longitudinal splitted detection areas to prevent information reproducing error by wavelength variations. 5,594,712, Cl. 369-112.000.
Yano, Hiroyuki: *See*—
Cote, William J.; Ryan, James G.; Okumura, Katsuya; and Yano, Hiroyuki, 5,593,537, Cl. 156-636.100.
Yap, Hugh A., to Fiberite, Inc. Impact resistant phenolics. 5,593,780, Cl. 428-392.000.
Yarbrough, Sandra M.: *See*—
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.
Yaremko, Mykola: *See*—
Shea, Jian; Yaremko, Mykola; Chachowski, Rosemary; Atzler, Josef; Dupinet, Thierry; Kittrich, Daniel; Kusz, Hansjoerg; Puchegger, Karl; Rohlfs, Reiner, 5,594,808, Cl. 382-133.000.
Yarita, Ikuo: *See*—
Watanabe, Yuichiro; Isobe, Kunio; Yarita, Ikuo; and Nikaido, Hideyuki, 5,592,846, Cl. 72-206.000.
Yasuda, Hitoshi; and Hirasawa, Masahide, to Canon Kabushiki Kaisha. Lens controlling apparatus. 5,594,311, Cl. 318-685.000.
Yasuda, Shigekazu; and Okada, Hirofumi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Apparatus for determining emergency conditions of a vehicle. 5,594,647, Cl. 364-424.055.
Yasui, Hiroyuki: *See*—
Watanabe, Kenji; and Yasui, Hiroyuki, 5,594,499, Cl. 348-222.000.
Yasui, Itsuo: *See*—
Suzuki, Shigehiko; Yasui, Itsuo; and Naito, Sadaaki, 5,593,523, Cl. 152-527.000.
Yasukawa, Robert D.; Woolley, James P.; and Grobelny, Venecia M., to Lockheed Missiles & Space Co., Inc. Jet engine sound-insulation structure. 5,594,216, Cl. 181-213.000.
Yasunishi, Norio: *See*—
Yamamoto, Kunihiko; Matsui, Kiyohisa; Ishii, Yutaka; Yasunishi, Norio; Nakamura, Toshihiro; Washio, Hajime; and Taniguchi, Koki, 5,594,466, Cl. 345-100.000.
Yau, Hwei-Ling: *See*—
Nielsen, Ralph B.; Rosiek, Thomas A.; Bates, David F.; Honas, James S.; and Yau, Hwei-Ling, 5,594,047, Cl. 523-315.000.
Yavor, Debbie S.; and Thompson, Sheryl A., to Novo Nordisk A/S. Gene encoding carboxypeptidase of *aspergillus niger*. *5,594,119, Cl. 536-23.200.*
Yazaki Corporation: *See*—
Sasakawa, Hidetoshi; and Ushiyama, Keiji, 5,592,720, Cl. 24-453.000.
Yabe, Kazuyoshi, 5,594,210, Cl. 174-76.000.
Yeates, Stephen G.: *See*—
Satgurunathan, Rajasingham; Hinde, David C.; Padget, John C.; and Yeates, Stephen G., 5,593,730, Cl. 427-386.000.
Yee, Abraham: *See*—
Rostoker, Michael D.; Schneider, Mark; Pasch, Nicholas F.; Yee, Abraham; and Schneider, William C., 5,593,918, Cl. 437-187.000.
Yeh, Patrice: *See*—
Fleer, Reinhard; Fournier, Alain; and Yeh, Patrice, 5,593,858, Cl. 435-69.100.
Yeo, Gi-sung: *See*—
Park, Chun-geun; Yeo, Gi-sung; and Park, Jung-chul, 5,593,725, Cl. 427-160.000.
Yeoman, Neil; Pinaire, Ronald; Ulowetz, Michael A.; Nace, Timothy P.; and Furse, David A., to Koch Engineering Company, Inc. Method for concurrent reaction with distillation. 5,593,548, Cl. 203-29.000.
Yeomans, Allan J. Radiant energy collecting apparatus. 5,592,932, Cl. 126-686.000.
Yeow, Eddie Y.; Radys, Ray G.; Woody, George R.; and Ramos, Sergio, to Delco Electronics Corp. Inductive charger field shaping using nonmagnetic metallic conductors. 5,594,317, Cl. 320-2.000.
Yergenson, Robin P.: *See*—
Beaufort, Richard F.; Yergenson, Robin P.; and Hooper, Howard G., 5,594,535, Cl. 399-262.000.
Yewer, Edward H., Jr. Wrap type hand glove. 5,592,694, Cl. 2-161.100.
Yim, Seng-Min; and Lee, Jung-Hyuck, to Samsung Electronics Co., Ltd. Sense amplifier control circuit of semiconductor memory device. 5,594,695, Cl. 365-205.000.
YKK Corporation: *See*—
Masumoto, Tsuyoshi; Inoue, Akihisa; Kimura, Hisamichi; Shinohara, Yoshiyuki; Horio, Yuma; and Kita, Kazuhiko, 5,593,515, Cl. 148-415.000.
Yoklavich, Margaret F.: *See*—
Martinez, Susana; and Yoklavich, Margaret F., 5,593,412, Cl. 606-108.000.
Yokoi, Hideto: *See*—
Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, 5,593,757, Cl. 428-195.000.
Yokoji, Shigeru: *See*—
Kaizaki, Keiji; Yamamoto, Tamotsu; Yokoji, Shigeru; Inoue, Hiroto; and Matsui, Hiroshi, 5,593,023, Cl. 200-570.000.
Yokota, Katsuyuki: *See*—
Mizutani, Tomozi; Yokota, Katsuyuki; Arita, Masahobu; and Kojyou, Hisashi, 5,593,703, Cl. 425-71.000.
Yokota, Masayuki: *See*—
Yoshida, Norio; and Yokota, Masayuki, 5,592,715, Cl. 15-250.003.
Yokouchi, Kishio; Kamezaki, Hiroshi; Wakamura, Masato; Kamehara, Noboo; and Niwa, Koichi, to Fujitsu Limited. Process for preparing a multi-layer wiring board. 5,593,526, Cl. 156-89.000.
Yokoyama, Kenichi: *See*—
Suzuki, Yasutoshi; Yokoyama, Kenichi; Mizuno, Koki; Toyoda, Ineo; and Tsuzuki, Yukio, 5,594,236, Cl. 250-214.100.
Yomoda, Akira: *See*—
Sadakata, Nobuyasu; Honma, Bunji; Iwamoto, Hideyuki; Shindo, Yoichi; and Yomoda, Akira, 5,593,287, Cl. 417-366.000.
Yomura, Takeshi: *See*—
Taga, Shunji; and Yomura, Takeshi, 5,594,403, Cl. 337-186.000.
Yonce, Cary S.: *See*—
Tscholtar, Werner; Yonce, Cary S.; Bergey, James L.; and Kawano, James C., 5,593,971, Cl. 514-39.000.
Yoneda, Yutaka; and Ohtsuka, Hiroyuki, to Kabushiki Kaisha Topcon. Ophthalmological photographing instrument. 5,594,512, Cl. 351-206.000.
Yonekura, Minoru: *See*—
Noda, Masayuki; Yonekura, Minoru; and Yamanaka, Hiroyuki, 5,593,767, Cl. 428-251.000.
Yonemitsu, Jun: *See*—
Fujinami, Yasushi; and Yonemitsu, Jun, 5,594,552, Cl. 386-131.000.
Yordan, Jorge L.: *See*—
Etheridge, Owen E., Jr.; Yordan, Jorge L.; and Lowe, Robert A., 5,593,490, Cl. 106-484.000.
York, Marvin E.: *See*—
Eubanks, William S., Jr; Athas, William L.; York, Marvin E.; and Subsetny, Leon R., 5,593,420, Cl. 606-205.000.
Yoshida, Henry: *See*—
Greenstein, Michael; and Yoshida, Henry, 5,592,730, Cl. 29-594.000.
Yoshida, Kazushi: *See*—
Yamashita, Taichiro; Hamada, Yasunori; Yoshida, Kazushi; Onuka, Tadashi; and Tamamoto, Junichi, 5,593,044, Cl. 209-584.000.
Yoshida, Norio; and Yokota, Masayuki, to Ichikoh Industries, Ltd. Wiper blade for automotive outside mirror wiper and automotive outside mirror wiper using same. 5,592,715, Cl. 15-250.003.
Yoshida, Osamu: *See*—
Kitaori, Noriyuki; Yoshida, Osamu; and Mizunoya, Hirohide, 5,593,723, Cl. 427-127.000.
Yoshida, Takehiro, to Canon Kabushiki Kaisha. Data communication apparatus which transmits in accordance with a reception time zone or a terminal from which data has been received. 5,594,867, Cl. 395-200.150.
Yoshidome, Hideo: *See*—
Kondo, Yoshikazu; Matsui, Masao; Yoshidome, Hideo; Osaki, Takuji; Kajiyama, Hiroshi; Ozeki, Eiichi; and Fujii, Yasuhiro, 5,593,778, Cl. 428-373.000.
Yoshimura, Fumihiko: *See*—
Kagawa, Hanao; Nakayama, Eiichiro; and Yoshimura, Fumihiko, 5,593,592, Cl. 210-611.000.
Yoshimura, Tetsuzo: *See*—
Sotoyama, Wataru; Tatsuura, Satoshi; Yoshimura, Tetsuzo; Matsuura, Azuma; and Hayano, Tomoaki, 5,594,093, Cl. 528-353.000.

Yoshioka, Hiroshi; and Goto, Hiroshi, to Terumo Kabushiki Kaisha. Preparation of liposomes with peg-bound phospholipid on surface. 5,593,622, Cl. 264-4.320.
Yoshioka, Keiichi: *See*—
Yamaura, Shinichi; Yoshioka, Keiichi; Hara, Kazuhiko; and Katayama, Takao, 5,594,890, Cl. 395-500.000.
Yoshioka, Minoru: *See*—
Akiyama, Yohko; Horibe, Hidesoshi; and Yoshioka, Minoru, 5,593,690, Cl. 424-457.000.
Yoshioka, Nobuyuki; and Miyazaki, Junji, to Mitsubishi Denki Kabushiki Kaisha. Attenuating type phase shifting mask, method of manufacturing thereof and semiconductor device manufactured by using the mask. 5,593,801, Cl. 430-5.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Hayashida, Tomohiro; Kikumaru, Kadoya; and Tomoyuki, Omura, 5,593,694, Cl. 424-468.000.
Tahara, Tetsuya; Moriwaki, Minoru; Chiba, Kenji; Manabe, Shunichi; Shindo, Masanori; Nakagawa, Takashi; and Nakamura, Takeshi, 5,593,988, Cl. 514-219.000.
Yoshizawa, Akihiko, to Kabushiki Kaisha Toshiba. N-stage ring connected voltage controlled oscillator. 5,594,391, Cl. 331-57.000.
Yoshizawa, Shunji: *See*—
Kobayashi, Hiroaki; Igarashi, Hiroshi; Adachi, Junichi; Usui, Shinichi; Yoshizawa, Shunji; and Uehara, Hirotaka, 5,594,548, Cl. 356-376.000.
Younce, by Donn, executor: *See*—
Crowther, Gordon H., deceased; and Younce, by Donn, executor, 5,593,432, Cl. 607-46.000.
Young, Christopher M.: *See*—
Cowen, Steven J.; Young, Christopher M.; Dombrowski, James H.; Kono, Michael E.; and Daughtry, James H., 5,593,736, Cl. 427-492.000.
Young, David: *See*—
Bedard, Robert L.; Ozin, Geoffrey A.; Ahari, Homayoun; Bowes, Carol L.; Jiang, Tong; and Young, David, 5,594,263, Cl. 257-201.000.
Young, Francis C.: *See*—
Filepp, Robert; Gordon, Michael L.; Bidwell, Alexander W.; Young, Francis C.; Wolf, Allan M.; Meo, Sam; Tiemann, Duane; Abrahams, Lawrence; Silfen, Michael J.; Dalsass, Aldo R.; Lee, Florence M.; and Appleman, Kenneth H., 5,594,910, Cl. 395-800.000.
Young, Karen K. Y.: *See*—
Nieniec, John T.; and Young, Karen K. Y., 5,593,836, Cl. 435-6.000.
Young, Robson T., Jr.; and Thomas, Roger L., to National Pallet LLC. Collapsible pallet. 5,592,885, Cl. 108-51.300.
Young, Russell. Waterproof pocket. 5,592,697, Cl. 2-247.000.
Young, Sai-Shek, to Hoffmann-La Roche Inc. Antioxidant system for polyolefins. 5,594,055. Cl. 524-291.000.
Yozan, Inc.: *See*—
Hong, Zi Quan; Kumagai, Ryohei; and Ohsiro, Tetsuo, 5,594,811, Cl. 382-216.000.
Yu, Donghai: *See*—
Akagi, Yuu; Kawaguchi, Yuichi; and Yu, Donghai, 5,593,731, Cl. 427-386.000.
Yu, Jing-peir; Bheda, Mukesh; and Knorr, Raymond S., to Monsanto Company. Nylon fiber blends for saxony carpets. 5,593,751, Cl. 428-97.000.
Yu, Joe: *See*—
Khong, James C. K.; Mueller, Wendey E.; Yu, Joe; Berger, Neal; Gudger, Keith H.; and Gongwer, Geoffrey S., 5,594,366, Cl. 326-41.000.
Yuan, Jun; and Thurkauf, Andrew, to Neurogen Corporation. Certain aminomethyl biphenyl, aminomethyl phenyl pyridine and aminomethyl phenyl pyrimidine derivatives; novel dopamine receptor subtype selective ligands. 5,594,141, Cl. 544-242.000.
Yuan, Sinh-Lah; and Gruszczynski, David W., II, to Eastman Kodak Company. Multiple inlet flow distributor for liquids. 5,593,734, Cl. 427-420.000.
Yuda, Naoki: *See*—
Sasaki, Atsushi; Ishizaki, Toshio; Takahashi, Hiroshi; Sakuragawa, Tooru; Nakakubo, Hideaki; Ohta, Ikuo; Matsumura, Tsutomu; Kosugi, Hiroaki; Yuda, Naoki; and Morinaga, Youichi, 5,594,394, Cl. 333-103.000.
Yugen Kaisha Sozoan: *See*—
Yanagisawa, Ken, 5,593,361, Cl. 475-342.000.
Yuhan Corporation: *See*—
Lee, Jong W.; Chae, Jeong S.; Choi, Young R.; Lee, Yeong N.; Rho, Eun R.; Kang, Heui I.; and Hyun, Jae W., 5,593,984, Cl. 514-202.000.
Zaguroli, James, Jr., to Knight Industries, Inc. Air balancing hoist combination. 5,593.138, Cl. 254-314.000.
Zaiss, Siegfried: *See*—
Fey, Peter; Krämer, Thomas; Dressel, Jürgen; Hanko, Rudolf; Hübsch, Walter; Müller, Ulrich; Müller-Gliemann, Matthias; Beuck, Martin; Bischoff, Hilmar; Wohlfeil, Stefan; Denzer, Dirk; Kazda, Stanislav; Stasch, Johannes-Peter; Knorr, Andreas; and Zaiss, Siegfried, 5,594,010, Cl. 514-340.000.
Zaklad, Haim: *See*—
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Zakula, Mitchell P.: *See*—
Cuevas, Jess A.; and Zakula, Mitchell P., 5,593,180, Cl. 280-741.000.
Zaluzec, Matthew J.; McCune, Robert C., Jr.; Popoola, Oladele O.; Baughman, James R.; and Brevick, John E., to Ford Motor Company. Method of depositing and using a composite coating on light metal substrates. 5,592,927, Cl. 123-668.000.
Zamot, Daniel. Wall constructed to reduce the impact of visual imperfections. 5,593,772, Cl. 428-323.000.
Zanzucchi, Peter J.; Cherukuri, Satyam C.; McBride, Sterling E.; and Judd, Amrit K., to David Sarnoff Research Center, Inc. Partitioned microelectronic device array. 5,593,838, Cl. 435-6.000.
Zastera, Stephen R.: *See*—
Miguel, Edward K.; Bohn, Martin G.; Zastera, Stephen R.; and Lilly, Eugene B., 5,593,349, Cl. 463-30.000.
Zecco, Joseph J., Jr.: *See*—
Sarkisian, John M.; Palitsch, John R.; and Zecco, Joseph J., Jr., 5,592,847, Cl. 72-356.000.
Zeid, Neal R. Pre-recorded media package and display. 5,593,034, Cl. 206-387.110.
Zeiher, Michael: *See*—
Rödel, Günther; Radziuk, Bernhard; Zeiher, Michael; and Steuz, Herbert, 5,594,547, Cl. 356-312.000.
Zeller, Hal M. Holder to secure sheet material. 5,592,721, Cl. 24-460.000.
Zeneca Limited: *See*—
Austin, Peter W., 5,594,018, Cl. 514-313.000.
Satgurunathan, Rajasingham; Hinde, David C.; Padget, John C.; and Yeates, Stephen G., 5,593,730, Cl. 427-386.000.
Zeng, Qing S.; and Irie, Reiko F., to John Wayne Cancer Institute. IgG depleted serum preparations and methods for antibody production. 5,593,822, Cl. 435-2.000.
Zenith Electronics Corporation: *See*—
Nielsen, Larry E.; and Sgrignoli, Gary J., 5,594,496, Cl. 348-21.000.
Zenker, David L.: *See*—
Tanzer, Richard W.; Abuto, Frank P.; Kellenberger, Stanley R.; Laux, Daniel R.; Nortman, Brian K.; Pomplun, William S.; Rippl, Carl G.; Robinson, Mark L.; Sallee, Lorry F.; Schroeder, Wen Z.; Yarbrough, Sandra M.; and Zenker, David L., 5,593,399, Cl. 604-368.000.
Zexel Corporation: *See*—
Ishiwata, Hiroshi; Ohishi, Takashi; and Kitahara, Nobuhiro, 5,592,915, Cl. 123-300.000.
Nakajima, Nobuyuki; Ishikawa, Masakuni; Kiso, Norikatsu; Takagi, Nobukazu; Kazahaya, Yukio; and Kuchiki, Seiji, 5,593,297, Cl. 418-88.000.
ZF Friedrichshafen AG: *See*—
Rebholz, Wolfgang; and Leber, Fritz, 5,592,853, Cl. 74-325.000.
Zhang, Shengtao: *See*—
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Zhang, Wei-Zhong: *See*—
Doi, Yukio; Zhang, Wei-Zhong; and Kinugasa, Masayoshi, 5,594,067, Cl. 524-806.000.
Zhang, Yong H.; and Chow, David H., to Hughes Aircraft Company. Selectively Si-doped InAs/AlAsSb short-period-superlattices as N-type cladding layers for mid-IR laser structures grown on InAs substrates. 5,594,750, Cl. 372-45.000.
Zhang, Zhengyi: *See*—
Weiner, Howard L.; Hafler, David A.; Carpenter, Charles B.; Sayegh, Mohamed; and Zhang, Zhengyi, 5,593,698, Cl. 424-534.000.
Zhu, Li-Yan, to Conner Peripherals, Inc. FM detection of slider-disk interface. 5,594,595, Cl. 360-31.000.
Zicker, Robert G.; and Dion, John K., to GTE Mobile Communications Service Corporation. Multiple mode personal wireless communications system. 5,594,782, Cl. 379-63.000.
Ziegler, Malcolm I.: *See*—
Stiles, Walter J.; Richey, Milford G.; Haddon, Perry W.; and Ziegler, Malcolm I., 5,594,937, Cl. 455-5.100.
Ziemelis, Maris J.: *See*—
Glover, Shedric O.; Bujanowski, Valeris J.; Ziemelis, Maris J.; Skinner, Michael W.; Homan, Gary R.; Perz, Susan V.; and Cannady, John P., 5,594,042, Cl. 522-31.000.
Zigmond, Daniel J.: *See*—
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Zimmer, Inc.: *See*—
Stalcup, Gregory C.; and Harris, James C., 5,593,411, Cl. 606-88.000.
Zimmerman, Casey. Apparatus for securing a vehicle to a trailer. 5,593,260, Cl. 410-20.000.
Zimmerman, Thomas A.: *See*—
Bilson, Edward B.; Wedell, Mark T.; and Zimmerman, Thomas A., 5,593,318, Cl. 439-573.000.
Zircon Corporation: *See*—
Heger, Charles E.; and Schultheis, Gary R., 5,592,745, Cl. 33-366.000.
Heger, Charles E., 5,594,669, Cl. 364-559.000.
Zirngiebl, Eberhard: *See*—
Glock, Volker; Pentling, Ursula; Pennemann, Bernd; Jentsch, Joerg-Dietrich; Zirngiebl, Eberhard; and Köller, Horst, 5,593,936, Cl. 502-354.000.
Zitel Corporation: *See*—
Lautzenheiser, Marvin, 5,594,885, Cl. 395-460.000.
Zittel, David R., to Lyco Manufacturing Inc. Open throat blancher with support braces. 5,592,869, Cl. 99-348.000.
Zmyslowski, Mark; and Larson, Erik W., to Radar Industries, Inc. Clevis link. 5,592,810, Cl. 59-78.000.
Zoran Corporation: *See*—

Farkash, Shmuel; Retter, Rafael; Adar, Ruth; and Gill, Aharon, 5,594,554, Cl. 358-426.000.

Zubok, Rafail: *See*—
Averill, Robert G.; Cohen, Robert C.; and Zubok, Rafail, 5,593,451, Cl. 623-23.000.

Zucchi, Giuseppe, to Mallinckrodt Medical, Inc. Hygroscopic cartridge particularly for filters for medical use. 5,592,933, Cl. 128-201.130.

Zuppero, Anthony C.; Krawetz, Barton; Barklund, C. Rodger; and Seifert, Gary D., to Lockheed Idaho Technologies Company. Portable thermo-photovoltaic power source. 5,593,509, Cl. 136-253.000.

Zuuring, Pieter H.: *See*—
Middelman, Erik; and Zuuring, Pieter H., 5,592,737, Cl. 29-848.000.

Zwerdling, Susan S.: *See*—
Trinh, Toan; Cappel, Jerome P.; Geis, Philip A.; McCarty, Mark L.; Pilosof, David; Zwerdling, Susan S.; and Tordil, Helen B., 5,593,670, Cl. 424-76.100.

Zwiener, Rudolf, to Saurer Sticksysteme AG. Thread breaking device for a power loom. 5,592,976, Cl. 139-194.000.

Zycad Corporation: *See*—
Freeman, Richard D.; Linoff, Joseph D.; and Saxe, Timothy, 5,594,363, Cl. 326-39.000.
Freeman, Richard D., 5,594,698, Cl. 365-222.000.

3Dlabs Inc. Ltd.: *See*—
Baldwin, David R.; and Bigos, Andrew, 5,594,854, Cl. 395-141.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14th DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, to ThermoSpectra Corporation. Method and apparatus for performing automated circuit board solder quality inspections. Re. 35,423, Cl. 378-58.000.

Amoroso, Juan, Jr.: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Axford, Paul: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Bowles, Phil: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Juha, Mike: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Leopold Kostal GmbH & Co. KG: *See*—
Levers, Juergen, Re. 35,422, Cl. 318-444.000.

Levers, Juergen, to Leopold Kostal GmbH & Co. KG. Apparatus and method for controlling a windshield wiping system. Re. 35,422, Cl. 318-444.000.

Nguyen, Van: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Preskitt, Charles: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Ross, Ed: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

ThermoSpectra Corporation: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Thompson, Doug: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

Turner, Paul: *See*—
Adams, John; Amoroso, Juan, Jr.; Axford, Paul; Bowles, Phil; Juha, Mike; Nguyen, Van; Preskitt, Charles; Ross, Ed; Thompson, Doug; and Turner, Paul, Re. 35,423, Cl. 378-58.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American Telphone and Telegraph Company: *See*—
Sheu, Jim J., B1 5,163,115, Cl. 385-100.000.

Dickhudt, Eugene A.: *See*—
Ray, Charles D.; and Dickhudt, Eugene A., B1 4,961,740, Cl. 606-61.000.

Dietz, Wesley P.: *See*—
Huffstutler, Alan D.; and Dietz, Wesley P., B1 5,439,068, Cl. 175-356.000.

Dresser Industries, Inc.: *See*—
Huffstutler, Alan D.; and Dietz, Wesley P., B1 5,439,068, Cl. 175-356.000.

Huffstutler, Alan D.; and Dietz, Wesley P., to Dresser Industries, Inc. Modular rotary drill bit. B1 5,439,068, Cl. 175-356.000.

JLG Industries, Inc.: *See*—
MacDonald, Wayne P.; and Ritz, Jeffery J., B1 4,754,840, Cl. 182-2.000.

Latzke, Arno W., to Magnesystems, Inc. Magnetic plaster. B1 4,489,711, Cl. 600-15.000.

Lyall, Gordon M.: *See*—
McCarron, Philip F.; Stewart, James W.; and Lyall, Gordon M., B1 5,138,967, Cl. 114-301.000.

MacDonald, Wayne P.; and Ritz, Jeffery J., to JLG Industries, Inc. Leveling assembly for work platforms on articulating booms. B1 4,754,840, Cl. 182-2.000.

Magnesystems, Inc.: *See*—
Latzke, Arno W., B1 4,489,711, Cl. 600-15.000.

McCarron, Philip F.; Stewart, James W.; and Lyall, Gordon M., to Simpson-Lawrence Ltd. Marine anchor. B1 5,138,967, Cl. 114-301.000.

Pizzacar, Anthony. Advertising cap nameplate. B1 5,003,640, Cl. 2-209.130.

Ray, Charles D.; and Dickhudt, Eugene A., to Surgical Dynamics, Incorporated. V-thread fusion cage and method of fusing a bone joint. B1 4,961,740, Cl. 606-61.000.

Recreative Technologies Corporation: *See*—
Zeltner, Barry, B1 4,912,800, Cl. 15-114.000.

Ritz, Jeffery J.: *See*—
MacDonald, Wayne P.; and Ritz, Jeffery J., B1 4,754,840, Cl. 182-2.000.

Sheu, Jim J., to American Telphone and Telegraph Company. Cables such as optical fiber cables including superabsorbent polymeric materials which are temperature and salt tolerant. B1 5,163,115, Cl. 385-100.000.

Simpson-Lawrence Ltd.: *See*—
McCarron, Philip F.; Stewart, James W.; and Lyall, Gordon M., B1 5,138,967, Cl. 114-301.000.

Stewart, James W.: *See*—
McCarron, Philip F.; Stewart, James W.; and Lyall, Gordon M., B1 5,138,967, Cl. 114-301.000.

Surgical Dynamics, Incorporated: *See*—
Ray, Charles D.; and Dickhudt, Eugene A., B1 4,961,740, Cl. 606-61.000.

Surko, Walter E., Jr., to Yale Security Inc. Door lock having disengaged outer lever handle when in the locked condition and means to bias the handle toward horizontal position. B1 4,920,773, Cl. 70-224.000.

Yale Security Inc.: *See*—
Surko, Walter E., Jr., B1 4,920,773, Cl. 70-224.000.

Zeltner, Barry, to Recreative Technologies Corporation. Cleaning device for golfers and construction method therefor. B1 4,912,800, Cl. 15-114.000.

LIST OF DESIGN PATENTEES

Adam, John M. Non slip tile. 377,398, Cl. D25-158.000.

Advantest Corporation: *See*—
Amano, Hiroaki; and Arai, Chizuru, 377,319, Cl. D10-75.000.

Ahern, Richard B., Jr., to Rubbermaid Incorporated. Pitcher. 377,291, Cl. D7-319.000.

Aizawa, Yuichi: *See*—
Takahashi, Kunihiko; and Aizawa, Yuichi, 377,381, Cl. D21-220.000.

Amano, Hiroaki; and Arai, Chizuru, to Advantest Corporation. Network analyzer. 377,319, Cl. D10-75.000.

Amos, Michael. Article support tray. 377,273, Cl. D6-406.000.

Antonious, Anthony J. Iron type golf club head. 377,380, Cl. D21-220.000.

Arai, Chizuru: *See*—
Amano, Hiroaki; and Arai, Chizuru, 377,319, Cl. D10-75.000.

Arai, Toru: *See*—
Katooka, Masao; Arai, Toru; Okamoto, Shigeru; Danjo, Kenzo; and Tanaka, Masaharu, 377,335, Cl. D13-110.000.

Asdurian, Haig: *See*—

Liu, Yu-Ping; Asdurian, Haig; and Smith, Stephen R., 377,333, Cl. D12-319.000.
AT&T Global Information Solutions Company: *See*—
Lin, Horng-Jaan, 377,342, Cl. D14-107.000.
Avar, Eric P., to Nike, Inc. Side element of a shoe upper. 377,261, Cl. D2-972.000.
Azrak-Hamway International, Inc.: *See*—
Nagel, Dietmar, 377,303, Cl. D8-68.000.
Babcock, Robert: *See*—
Phillips, Trevor; and Babcock, Robert, 377,389, Cl. D23-261.000.
Baco Constructions Electriques - Anct. Baumgarten S.A.: *See*—
Schaeffer, Maurice, 377,337, Cl. D13-171.000.
Bausch & Lomb Incorporated: *See*—
Conway, Simon M., 377,365, Cl. D16-330.000.
Belka, Allen B.: *See*—
Jacobs, Ronna L.; and Belka, Allen B., 377,277, Cl. D6-425.000.
Beruscha, Michael S.; and Lenz, Michael R., to Motorola, Inc. Electronics enclosure. 377,339, Cl. D13-184.000.
Biba, Scott L., to Springs Window Fashions Division, Inc. Window blind pull. 377,287, Cl. D6-581.000.
Bird, James W.; and Bird, Michael E. Universal electronic remote control. 377,352, Cl. D14-218.000.
Bird, Michael E.: *See*—
Bird, James W.; and Bird, Michael E., 377,352, Cl. D14-218.000.
Blackman, Stephen E. Wall light fixture. 377,400, Cl. D26-87.000.
Bliss, Jeffrey. Combination sanding block and squeegee. 377,305, Cl. D8-90.000.
Brady, Beth A., to Package Products, Inc. Elongated ovenable food tray. 377,294, Cl. D7-554.000.
Brasani, Marco, to Vibram S.p.A. Shoe sole. 377,260, Cl. D2-954.000.
Braun Aktiengesellschaft: *See*—
Hartwein, Peter, 377,317, Cl. D10-57.000.
Brenner, Richard K.; Kimbrough, Mark S.; Leung, Philip; Garrett, Robert H.; and Jones, Pearce, to Brother International Corporation. Computer with printer. 377,340, Cl. D14-100.000.
Bridgestone/Firestone, Inc.: *See*—
Kakegawa, Hiroki; Guspodin, James G.; and Byrne, Francis J., 377,330, Cl. D12-147.000.
Brokelmann, Jaeger & Busse, GmbH & Co.: *See*—
Henrici, Dieter, 377,292, Cl. D7-348.000.
Brother International Corporation: *See*—
Brenner, Richard K.; Kimbrough, Mark S.; Leung, Philip; Garrett, Robert H.; and Jones, Pearce, 377,340, Cl. D14-100.000.
Brown, Fred C.; and Marquardt, Maniel D., to Electric Mobility Corporation. Golfing vehicle. 377,325, Cl. D12-16.000.
Bruns, Mark W., to May-Wes Manufacturing, Inc. Planter closing wheel. 377,356, Cl. D15-28.000.
Bulgari S.p.A.: *See*—
Burgari, Paolo, 377,323, Cl. D11-6.000.
Burgari, Paolo, to Bulgari S.p.A. Bracelet. 377,323, Cl. D11-6.000.
Burkholder, Sharon L. Garment. 377,258, Cl. D2-828.000.
Byrne, Francis J.: *See*—
Kakegawa, Hiroki; Guspodin, James G.; and Byrne, Francis J., 377,330, Cl. D12-147.000.
C. N. Burman Co.: *See*—
Chelsea, Daniel, 377,401, Cl. D26-110.000.
Calvin, Charles A. Vertical, free-standing hot dog bun. 377,257, Cl. D1-101.000.
Campbell, D. Bruce. Bottle rack. 377,298, Cl. D7-708.000.
Canon Kabushiki Kaisha: *See*—
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 377,371, Cl. D18-56.000.
Casio Computer Co., Ltd.: *See*—
Moriai, Ryusuke; and Sugisawa, Akihiro, 377,314, Cl. D10-38.000.
Moriai, Ryusuke; Sugisawa, Akihiro; and Nikaido, Takashi, 377,315, Cl. D10-38.000.
Sato, Koichi; and Miyahara, Akihiko, 377,367, Cl. D18-4.000.
Castillo, George. Character spinning top. 377,376, Cl. D21-95.000.
Chelsea, Daniel, to C. N. Burman Co. Floor lamp. 377,401, Cl. D26-110.000.
Chen, Chin-Ting, to Chih Feng Industrial Co., Ltd. Office chair leg. 377,282, Cl. D6-498.000.
Chicago Pneumatic Tool Company: *See*—
Kazamaki, Yutaka; Groshans, Joseph; and Sienkiewycz, Robert, 377,302, Cl. D8-61.000.
Chih Feng Industrial Co., Ltd.: *See*—
Chen, Chin-Ting, 377,282, Cl. D6-498.000.
Chung, Don M.-C.; and Turnbull, Robert S., to Singer Company N.V., The. Sewing machine. 377,359, Cl. D15-70.000.
Chung, Don M.-C.; and Turnbull, Robert S., to Singer Company N.V., The. Sewing machine. 377,360, Cl. D15-70.000.
Chung, Don M.-C.; and Turnbull, Robert S., to Singer Company N.V., The. Sewing machine. 377,361, Cl. D15-70.000.
Claber S.p.A.: *See*—
Romaa, Gianfranco; and Paust, Claudio, 377,316, Cl. D10-40.000.
Clark, William T.: *See*—
Kogoh, Shinya; Kobashi, Hideji; Clark, William T.; Penke, Mark S.; Patla, Jacob W.; and Kenmochi, Makoto, 377,369, Cl. D18-53.000.
Cleary, Grace C.: *See*—
Farrow, Kathryn C.; Cleary, Grace C.; and Stoffer, Sarah C., 377,284, Cl. D6-519.000.
Coca-Cola Company, The: *See*—
Credle, William S., Jr., 377,289, Cl. D7-301.000.
Columbia Footwear Corporation: *See*—
Davidowitz, Ivan; Sproul, Michael; and Wright, Rosemary, 377,259, Cl. D2-952.000.
Composite Manufacturing & Research, Inc.: *See*—
Foster, Thomas M., 377,327, Cl. D12-43.000.
Conway, Simon M., to Bausch & Lomb Incorporated. Eyewear front. 377,365, Cl. D16-330.000.
Craig, Carl E. Cinder block. 377,397, Cl. D25-118.000.
Credle, William S., Jr., to Coca-Cola Company, The. Housing for a beverage dispenser. 377,289, Cl. D7-301.000.
Crump, Jim C., Jr. Tool holder. 377,310, Cl. D8-373.000.
Cruz, Raymond, III. Vehicle wheel rim protector. 377,332, Cl. D12-213.000.
Daiwa Seiko, Inc.: *See*—
Takahashi, Kunihito; and Aizawa, Yuichi, 377,381, Cl. D21-220.000.
Yamaguchi, Kaname, 377,386, Cl. D22-141.000.
Danjo, Kenzo: *See*—
Katooka, Masao; Arai, Toru; Okamoto, Shigeru; Danjo, Kenzo; and Tanaka, Masaharu, 377,335, Cl. D13-110.000.
Davidowitz, Ivan; Sproul, Michael; and Wright, Rosemary, to Columbia Footwear Corporation. Footwear sole and periphery. 377,259, Cl. D2-952.000.
Decker, Dennis. Quick-release hinge for toilet seat. 377,306, Cl. D8-326.000.
Dewitt, Wayne, to Lond King Manufacturing Co., Inc. Check stand counter. 377,272, Cl. D6-402.000.
DiBiagio, Anthony J., to Holiday Rambler, L.L.C. Power cord port. 377,307, Cl. D8-356.000.
Dilesto, Mario. Tray attachment for a chair. 377,275, Cl. D6-418.000.
Dinges, Alan J., to Premier Optics, L.C. Clip-on glasses. 377,364, Cl. D16-304.000.
Dion, Jean-Paul. Nailing tool. 377,301, Cl. D8-51.000.
Dionisio, Louis. Insulating container. 377,295, Cl. D7-606.000.
DiPietro, Stephen B. Pocket for eyeglasses and sunglasses. 377,267, Cl. D3-265.000.
Dourado, Mizael: *See*—
Saunders, Kenneth W.; and Dourado, Mizael, 377,382, Cl. D21-236.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Murkett, Stephen, 377,331, Cl. D12-181.000.
Edrasco: *See*—
Maurel, Jean-Yves, 377,396, Cl. D25-113.000.
Efverlund, Anna, to Ikea of Sweden AB. Toy animal. 377,379, Cl. D21-148.000.
Electric Mobility Corporation: *See*—
Brown, Fred C.; and Marquardt, Maniel D., 377,325, Cl. D12-16.000.
Emmons, David J.: *See*—
Weber, Jeffrey A.; and Emmons, David J., 377,388, Cl. D23-207.000.
Escobedo, Victor T.; and Leong, David W., to Hewlett-Packard Company. Combined ink-jet printer, facsimile and copier. 377,370, Cl. D18-55.000.
Farrow, Kathryn C.; Cleary, Grace C.; and Stoffer, Sarah C. Combined toilet paper and moist towelette dispenser. 377,284, Cl. D6-519.000.
Foster, Thomas M., to Composite Manufacturing & Research, Inc. Railcar door. 377,327, Cl. D12-43.000.
Fredrick von Essen, Hans P. Two-handled shovel. 377,300, Cl. D8-10.000.
Fuji Photo Film Co., Ltd.: *See*—
Isozaki, Makoto; and Sakai, Hiroyuki, 377,363, Cl. D16-209.000.
Fuji Xerox Co., Ltd.: *See*—
Kogoh, Shinya; Kobashi, Hideji; Clark, William T.; Penke, Mark S.; Patla, Jacob W.; and Kenmochi, Makoto, 377,369, Cl. D18-53.000.
Garrett, Robert H.: *See*—
Brenner, Richard K.; Kimbrough, Mark S.; Leung, Philip; Garrett, Robert H.; and Jones, Pearce, 377,340, Cl. D14-100.000.
George, Scott; and Goddard, Dennis. Luggage bag. 377,268, Cl. D3-287.000.
Gibson, Joseph A.: *See*—
McNamara, James E.; and Gibson, Joseph A., 377,308, Cl. D8-370.000.
Glass Dimensions: *See*—
Perkins, David R., 377,402, Cl. D26-135.000.
Glynn, Kenneth P., to Ideal Ideas, Inc. Toy construction block with symmetrically arranged T-slots. 377,377, Cl. D21-108.000.
Goddard, Dennis: *See*—
George, Scott; and Goddard, Dennis, 377,268, Cl. D3-287.000.
Gowllands Limited: *See*—
Sams, Bernard, 377,393, Cl. D24-137.000.
Groshans, Joseph: *See*—
Kazamaki, Yutaka; Groshans, Joseph; and Sienkiewycz, Robert, 377,302, Cl. D8-61.000.
Grossman, Stephen P.; Ranes, Richard L.; Petersen, Perry B.; and Wainfan, Barnaby S., to Northrop Grumman Corporation. Tactical aircraft decoy (TAD). 377,326, Cl. D12-16.100.
Guspodin, James G.: *See*—
Kakegawa, Hiroki; Guspodin, James G.; and Byrne, Francis J., 377,330, Cl. D12-147.000.
Hamamoto, Koya; Tokizaki, Hiroshi; and Kuramochi, Izumi, to Yokohama Rubber Co., Ltd., The. Automobile tire. 377,329, Cl. D12-147.000.
Hamasaki, Yuji: *See*—
Tokuda, Hiroyuki; Takenouchi, Masanori; Kotaki, Yasuo; and Hamasaki, Yuji, 377,371, Cl. D18-56.000.
Hartwein, Peter, to Braun Aktiengesellschaft. Thermometer. 377,317, Cl. D10-57.000.
Haworth, Inc.: *See*—
Jacobs, Ronna L.; and Belka, Allen B., 377,277, Cl. D6-425.000.
Henredon Furniture Industries, Inc.: *See*—

Keller, H. Thomas, 377,280, Cl. D6-446.000.
Henrici, Dieter, to Brokelmann, Jaeger & Busse, GmbH & Co. Oven lamp. 377,292, Cl. D7-348.000.
Hewlett-Packard Company: *See*—
Escobedo, Victor T.; and Leong, David W., 377,370, Cl. D18-55.000.
Hill, David W. Fishing lure. 377,384, Cl. D22-133.000.
Hirsch, Steven; and Yedvab, Joseph. Reading stand. 377,276, Cl. D6-419.000.
Hochiki Kabushiki Kaisha: *See*—
Tomizawa, Toshikazu, 377,321, Cl. D10-106.000.
Hofman, James A., to Selfix, Inc. Over door hook. 377,309, Cl. D8-372.000.
Hogue, Aaron G.; and Hogue, Patrick L., to Hogue Grips. Resilient grip sleeve for an air tool. 377,304, Cl. D8-70.000.
Hogue Grips: *See*—
Hogue, Aaron G.; and Hogue, Patrick L., 377,304, Cl. D8-70.000.
Hogue, Patrick L.: *See*—
Hogue, Aaron G.; and Hogue, Patrick L., 377,304, Cl. D8-70.000.
Holiday Rambler, L.L.C.: *See*—
DiBiagio, Anthony J., 377,307, Cl. D8-356.000.
Hon Hai Precision Ind. Co., Ltd.: *See*—
Tan, Haw-Chan; and Ma, Frank C., 377,336, Cl. D13-147.000.
Hon Industries Inc.: *See*—
McFarlane, Sean B., 377,281, Cl. D6-446.000.
Huntin Buddy Industries, L.L.C.: *See*—
Rhodes, Roy A., 377,322, Cl. D10-119.000.
Husted, Wayne D. Combined tumbler with lid. 377,293, Cl. D7-510.000.
Ideal Ideas, Inc.: *See*—
Glynn, Kenneth P., 377,377, Cl. D21-108.000.
Ikea of Sweden AB: *See*—
Efverlund, Anna, 377,379, Cl. D21-148.000.
Imahori, Yoshio: *See*—
Tajima, Kazushige; and Imahori, Yoshio, 377,353, Cl. D14-222.000.
Imai, Fumihito; Nagai, Michio; and Kawasaki, Keigo, to NEC Corporation. Portable communication terminal. 377,341, Cl. D14-100.000.
Interlink Electronics, Inc.: *See*—
Tickle, James D., 377,343, Cl. D14-114.000.
Ishii, Mitsuo, to Kabushiki Kaisha Topcon. Surveying apparatus that receives a laser beam. 377,318, Cl. D10-66.000.
Ishii, Yoji: *See*—
Toki, Yuiko; Kodama, Ryo; Ishii, Yoji; and Ozaki, Hiroshi, 377,351, Cl. D14-138.000.
Isozaki, Makoto; and Sakai, Hiroyuki, to Fuji Photo Film Co., Ltd. Camera. 377,363, Cl. D16-209.000.
Izumi Products Company: *See*—
Izumi, Shunji, 377,404, Cl. D28-49.000.
Izumi, Shunji, to Izumi Products Company. Electric shaver. 377,404, Cl. D28-49.000.
Jackson, Craig. Video cartridge/CD container. 377,288, Cl. D6-632.000.
Jacobs, Ronna L.; and Belka, Allen B., to Haworth, Inc. Foldable mobile office. 377,277, Cl. D6-425.000.
Jennings, Kim. Ice fishing rod. 377,385, Cl. D22-138.000.
Jones, Pearce: *See*—
Brenner, Richard K.; Kimbrough, Mark S.; Leung, Philip; Garrett, Robert H.; and Jones, Pearce, 377,340, Cl. D14-100.000.
Jong Well Industrial Co., Ltd.: *See*—
Su, Tung-Hua, 377,283, Cl. D6-500.000.
Jouets, Monneret: *See*—
Monneret, Alain, 377,378, Cl. D21-121.000.
Kabushiki Kaisha TBC: *See*—
Sato, Maki, 377,366, Cl. D18-4.000.
Kabushiki Kaisha Topcon: *See*—
Ishii, Mitsuo, 377,318, Cl. D10-66.000.
Kabushiki Kaisha Toshiba: *See*—
Yamamoto, Tokuzo; and Yamane, Nobuhiro, 377,344, Cl. D14-114.000.
Kakegawa, Hiroki; Guspodin, James G.; and Byrne, Francis J., to Bridgestone/Firestone, Inc. Tire tread. 377,330, Cl. D12-147.000.
Karlin, James H., to PSC Inc. Optical scanner. 377,345, Cl. D14-116.000.
Karlin, James H., to PSC Inc. Optical scanner. 377,346, Cl. D14-116.000.
Karlin, James H., to PSC Inc. Optical scanner. 377,347, Cl. D14-116.000.
Karlin, James H., to PSC Inc. Optical scanner. 377,348, Cl. D14-116.000.
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250.003 5,592,715
412 5,592,716

CLASS 16
367 5,592,717

CLASS 24
68 SK 5,592,722
265 BC 5,592,718
453 5,592,719
5,592,720
460 5,592,721

CLASS 27
2 5,592,723
12 5,592,724

CLASS 28
118 5,592,725

CLASS 29
11 5,593,461
25.01 5,593,465
237 5,592,726
434 5,592,727
5,592,728
464 5,592,729
594 5,592,730
596 5,592,731
599 5,592,732
623.3 5,593,462
708 5,592,733
827 5,592,734
841 5,592,735
842 5,592,736
848 5,592,737
863 5,592,738
872 5,592,739
888.044 5,592,740

CLASS 30
101 5,592,741
254 5,592,742
271 5,592,743
324 5,592,744

CLASS 33
366 5,592,745
623 5,592,746
783 5,592,747

CLASS 34
61 5,592,748
97 5,592,749
104 5,592,750
117 5,592,751
388 5,592,752
410 5,592,753
527 5,592,754

CLASS 36
33 5,592,755
89 5,592,756
114 5,592,757
117.1 5,592,758
141 5,592,759

CLASS 37
403 5,592,760
5,592,761
443 5,592,762

CLASS 38
77.83 5,592,764
77.9 5,592,763
93 5,592,765

CLASS 40
307 5,592,766
584 5,593,156
649 5,592,767
786 5,592,768

CLASS 42
1.02 5,592,769
105 5,592,770

CLASS 43
18.1 5,592,771
5,592,772
25 5,592,773
124 5,592,774

CLASS 44
300 5,593,463
362 5,593,464
398 5,593,466

CLASS 47
61 5,592,775
72 5,592,776

CLASS 49
28 5,592,777
42 5,592,778
73.1 5,592,779
386 5,592,780
394 5,592,781
489.1 5,592,782

CLASS 51
309 5,593,467
5,593,468

CLASS 52
12 5,592,783
20 5,592,784
5,592,785
88 5,592,786
34 5,592,787
39 5,592,788
63 5,592,789
77 5,592,790
167.2 5,592,791
173.2 5,592,792
182 5,592,793
220.7 5,592,794
235 5,592,795
241 5,592,796
288.1 5,592,797
308 5,592,798
529 5,592,799
692 5,592,800
741.2 5,592,801

CLASS 53
133.4 5,592,802
397 5,592,803
398 5,592,804

CLASS 55
228 5,593,469
274 5,593,470
302 5,593,471

CLASS 56
16.4 R 5,592,805

CLASS 57
212 5,592,806
406 5,592,807
408 5,592,808

CLASS 59
25 5,592,809
78 5,592,810

CLASS 60
39.02 5,592,811
205 5,592,812
226.2 5,592,813
271 5,592,814
274 5,592,815
398 5,592,816
431 5,592,817
487 5,592,818
737 5,592,819
751 5,592,820
5,592,821

CLASS 62
51.2 5,592,822
64 5,592,823
127 5,592,824
141 5,592,825
195 5,592,826
229 5,592,827
249 5,592,828
428 5,592,829
509 5,592,830
625 5,592,831
646 5,592,832
648 5,592,833
656 5,592,834

CLASS 63
4 5,592,835

CLASS 65
327 5,593,472

CLASS 66
176 5,592,836

CLASS 70
38 A 5,592,837
224 B1 4,920,773
303 A 5,592,838
456 R 5,592,839

CLASS 71
15 5,593,473

CLASS 72
53 5,592,840
5,592,841
60 5,592,842
88 5,592,843
133 5,592,844
161 5,592,845
206 5,592,846
356 5,592,847
379.2 5,592,848

CLASS 73
38 5,594,161
46 5,594,162
61.44 5,594,163
61.66 5,594,164
61.75 5,594,165
105 5,594,166
160 5,592,849
167 5,592,850
274 5,594,167
496 5,594,168
504.14 5,594,169
514.29 5,594,170
514.32 5,594,171
514.33 5,594,172
520.01 5,594,173
585 5,594,174
593 5,594,175
623 5,594,176
663 5,594,177
808 5,594,178
861.07 5,594,179
861.28 5,594,181
861.356 5,594,180
863.71 5,594,182
864.52 5,594,183
865 5,594,184
866 5,594,185

CLASS 74
57 5,592,852
325 5,592,853
331 5,592,854
336 R 5,592,851
371 5,592,855
473 P 5,592,856
568 R 5,592,857
573 R 5,592,858

CLASS 75
228 5,594,186
240 5,593,474
246 5,594,187

CLASS 81
177.4 5,592,859
180.1 5,592,860
438 5,592,861
439 5,592,862

CLASS 82
1.11 5,592,863

CLASS 83
154 5,592,864
872 5,592,865

CLASS 84
171 5,594,188
322 5,594,189
453 5,594,190
485 R 5,594,191

CLASS 89
33.16 5,594,192
36.08 5,594,193
46 5,594,194

CLASS 92
31 5,592,866

CLASS 95
78 5,593,476
123 5,593,475

CLASS 96
57 5,593,479
108 5,593,477
111 5,593,478
124 5,593,480
132 5,593,481
135 5,593,482

CLASS 99
323.2 5,592,867
348 5,592,868
5,592,869
353 5,592,870
400 5,592,871
510 5,592,872
5,592,873

CLASS 100
93 RP 5,592,874
99 5,592,875
272 5,592,876

CLASS 101
129 5,592,877
231 5,592,878
416.1 5,592,879
450.1 5,592,880
483 5,592,881
487 5,592,882

CLASS 102
260 5,594,195
275.11 5,594,196
499 5,594,197

CLASS 104
88.03 5,592,883

CLASS 106
2 5,593,483
18.13 5,593,485
22 A 5,593,486
170.1 5,593,487
464 5,593,488
5,593,489
484 5,593,490
493 5,593,491
623 5,593,492
714 5,593,493

CLASS 108
25 5,592,884
51.3 5,592,885
108 5,592,886
134 5,592,887

CLASS 110
229 5,592,888

CLASS 111
174 5,592,889

CLASS 112
470.07 5,592,890
475.19 5,592,891

CLASS 114
39.2 5,592,892
255 5,592,893
270 5,592,894
274 5,592,895
301 B1 5,138,967
303 5,592,896
363 5,592,897

CLASS 116
209 5,592,898

CLASS 117
2 5,593,494
4 5,593,495
36 5,593,496
90 5,593,497
201 5,593,498

CLASS 118
63 5,593,499
303 5,593,500
410 5,593,501

CLASS 119
61 5,592,899
164 5,592,900
706 5,592,901
846 5,592,902

CLASS 123
25 A 5,592,903
52.3 5,592,904
90.11 5,592,905
90.16 5,592,906
5,592,907
90.17 5,592,908
5,592,909
5,592,910
143 C 5,592,911
179.25 5,592,912
188.3 5,592,913
300 5,592,915
308 5,592,916
5,592,917
339.18 5,592,918
435 5,592,919
450 5,592,920
490 5,592,921
520 5,592,922
5,592,923
525 5,592,924
568 5,592,925
630 5,592,926
668 5,592,927

CLASS 124
1 5,592,928
23.1 5,592,929
44.5 5,592,930
69 5,592,931

CLASS 126
686 5,592,932

CLASS 127
30 5,593,502
71 5,593,503

CLASS 128
201.13 5,592,933
203.12 5,592,934
205.29 5,592,935
206.12 5,592,936
206.16 5,592,937
206.24 5,592,938
653.1 5,592,939
654 5,592,940
660.07 5,592,941
660.09 5,592,942
661.03 5,592,943
710 5,592,945
715 5,592,946
744 5,592,947
763 5,592,948
837 5,592,949
842 5,592,950
848 5,592,951
849 5,592,952
882 5,592,953

CLASS 131
84.1 5,592,954
175 5,592,955
270 5,592,956

CLASS 132
53 5,592,957

CLASS 134
1 5,593,504
1.3 5,593,505
9 5,593,506
11 5,593,507
40 5,593,508
122 R 5,592,958
169 R 5,592,959

CLASS 135
87 5,592,960
125 5,592,961

CLASS 136
253 5,593,509

CLASS 137
68.22 5,592,962
202 5,592,963
216 5,592,964
315 5,592,965
513.5 5,592,966
522 5,592,967
561 A 5,592,968
592 5,592,969
614.03 5,592,970
625.21 5,592,973
625.41 5,592,971
625.65 5,592,972

CLASS 138
44 5,592,974
112 5,592,975

CLASS 139
194 5,592,976
387 R 5,592,977

CLASS 140
92.94 5,592,978

CLASS 141
59 5,592,979
364 5,592,980

CLASS 144
286.1 5,592,981

CLASS 148
225 5,593,510
238 5,593,511
301 5,593,517
304 5,593,513
5,593,518
403 5,593,514
415 5,593,515
418 5,593,516
514 5,593,519

CLASS 152
158 5,593,520
209 R 5,593,521
458 5,593,522

527 5,593,523

CLASS 156

51 5,593,524
89 5,593,526
149 5,593,527
156 5,593,528
218 5,593,529
260 5,593,530
272.6 5,593,531
285 5,593,532
305 5,593,533
380.04 5,593,534
428 5,593,535
433 5,593,536
622 5,593,525
636.1 5,593,537
637.1 5,593,538
643.1 5,593,539
5,593,540
5,593,541

CLASS 160

67 5,592,982
178.1 5,592,983

CLASS 162

4 5,593,542
6 5,593,543
65 5,593,544
207 5,593,545
301 5,593,546
360.3 5,593,547

CLASS 164

62 5,592,984
98 5,592,985
335 5,592,986
428 5,592,987
478 5,592,988

CLASS 165

95 5,592,990
259 5,592,989

CLASS 166

298 5,592,991

CLASS 172

15 5,592,992

CLASS 174

35 R 5,594,199
5,594,200
37 5,594,201
48 5,594,202
5,594,203
52.2 5,594,204
53 5,594,205
56 5,594,206
58 5,594,207
5,594,208
65 G 5,594,209
76 5,594,210
84 R 5,594,211
88 R 5,594,212
91 5,594,213
117 P 5,594,214

CLASS 175

162 5,592,993
247 5,592,994
356 B1 5,439,068
374 5,592,995
431 5,592,996

CLASS 178

19 5,594,215

CLASS 180

65.1 5,592,997
164 5,592,998
227 5,592,999
305 5,593,000
312 5,593,001
421 5,593,002

CLASS 181

213 5,594,216
235 5,594,217
295 5,594,218

CLASS 182

2 B1 4,754,840

CLASS 184

5.1 5,593,003

CLASS 187

275 5,593,004
394 5,594,219

CLASS 188

72.4 5,593,005
73.45 5,593,006
269 5,593,007

CLASS 190

8 5,593,008
102 5,593,009

CLASS 191

12 R 5,593,010

CLASS 192

4 A 5,593,011
56.1 5,593,012
58.682 5,593,013
70.18 5,593,014
70.27 5,593,015
85 AA 5,593,016

CLASS 194

212 5,593,017

CLASS 198

370.1 5,593,018
721 5,593,019

CLASS 200

6 B 5,594,220
43.14 5,593,020
50.27 5,594,221
303 5,593,021
308 5,593,022
570 5,593,023
600 5,594,222

CLASS 203

10 5,593,549
29 5,593,548

CLASS 204

165 5,593,550
192.12 5,593,551
228 5,593,552
252 5,593,553
5,593,554
286 5,593,555
290 F 5,593,556
290 R 5,593,557
429 5,593,558
451 5,593,564
453 5,593,559
456 5,593,561
486 5,593,562
524 5,593,563
643 5,593,565
671 5,593,560

CLASS 205

363 5,593,566

CLASS 206

5 5,593,024
6.1 5,593,025
150 5,593,026
170 5,593,027
221 5,593,028
278 5,593,029
308.1 5,593,030
5,593,031
309 5,593,032
346 5,593,033
387.11 5,593,034
397 5,593,035
464 5,593,036
500 5,593,037
527 5,593,038
586 5,593,039
706 5,593,040
784 5,593,041

CLASS 208

46 5,593,567
48 AA 5,593,568
108 5,593,569
5,593,570
134 5,593,571
177 5,593,572
252 5,593,573

CLASS 209

261 5,593,042
303 5,593,043
384 5,593,044

CLASS 210

150 5,593,574
170 5,593,575
198.2 5,593,576
232 5,593,577
5,593,578
242.1 5,593,579
321.75 5,593,580
321.84 5,593,581
325 5,593,582
331 5,593,583
346 5,593,584
409 5,593,585
435 5,593,586
470 5,593,587
490 5,593,588
519 5,593,589
603 5,593,590
609 5,593,591
611 5,593,592
638 5,593,593
660 5,593,594
700 5,593,595
741 5,593,596
744 5,593,597
748 5,593,598
764 5,593,599
787 5,593,600

CLASS 211

13 5,593,045
41 5,593,046
58 5,593,047
59.2 5,593,048
193 5,593,049

CLASS 212

325 5,593,050

CLASS 213

47 5,593,051

CLASS 215

11.1 5,593,052
12.1 5,593,053
225 5,593,054
256 5,593,055
382 5,593,056

CLASS 216

41 5,593,601
42 5,593,602

CLASS 218

120 5,594,223
134 5,594,224

CLASS 219

69.1 5,593,603
117.1 5,593,604
121.63 5,593,605
121.71 5,593,606
270 5,593,607
492 5,593,608
726 5,593,609
728 5,593,610

CLASS 220

2.3 A 5,593,057
4.31 5,593,058
229 5,593,059
319 5,593,060
507 5,593,061
574.1 5,593,062
608 5,593,063

CLASS 222

39 5,593,064
94 5,593,065
5,593,066
108 5,593,067
167 5,593,068
246 5,593,069
608 5,593,070

CLASS 223

112 5,593,071
120 5,593,072

CLASS 224

183 5,593,073
251 5,593,074
483 5,593,075
488 5,593,076
627 5,593,077

CLASS 226

81 5,593,078

CLASS 227

8 5,593,079

CLASS 228

39 5,593,080
45 5,593,081
122.1 5,593,082
180.21 5,593,083
182 5,593,084
193 5,593,085

CLASS 229

67.3 5,593,086
199 5,593,087

CLASS 235

379 5,594,225
5,594,226
380 5,594,227
383 5,594,228
449 5,594,229
462 5,594,230
5,594,231
472 5,594,232
492 5,594,233

CLASS 237

12.3 C 5,593,088

CLASS 238

370 5,593,089

CLASS 239

2.2 5,593,090
127 5,593,091
285 5,593,092
333 5,593,093
476 5,593,094
584 5,593,095

CLASS 241

14 5,593,096
21 5,593,097
46.01 5,593,098
46.02 5,593,099
101.2 5,593,100

CLASS 242

25 A 5,593,101
246 5,593,102
345.2 5,593,103
348.1 5,593,104
383.4 5,593,105
527 5,593,106
559.4 5,593,107
608.5 5,593,108

CLASS 244

3.21 5,593,109
3.23 5,593,110
110 D 5,593,111
117 A 5,593,112
137.1 5,593,113
183 5,593,114

CLASS 248

68.1 5,593,115
75 5,593,116
99 5,593,117
150 5,593,118
185.1 5,593,119
205.3 5,593,120
218.4 5,593,121
222.12 5,593,122
231.21 5,593,123
231.81 5,593,124
316.5 5,593,125
316.7 5,593,126
345.1 5,593,127
346.01 5,593,128
405 5,593,129

CLASS 250

201.3 5,594,235
214.1 5,594,236
5,594,237
221 5,594,238
227.16 5,594,239
227.23 5,594,240
231.17 5,594,241
234 5,594,242
288 5,594,243
305 5,594,244
310 5,594,245
5,594,246
326 5,594,247
332 5,594,248
339.03 5,594,249
361 R 5,594,250
363.05 5,594,251
385.1 5,594,252
486.1 5,594,253
504 R 5,594,254
551 5,594,256

CLASS 251

61.1 5,593,130
117 5,593,131
129.15 5,593,132
5,593,133
129.17 5,593,134
209 5,593,135
366 5,593,136

CLASS 252

8.63 5,593,611
62.56 5,593,612
73 5,593,613
299.01 5,593,615
299.61 5,593,616
299.67 5,593,617
512 5,593,618
609 5,593,619

CLASS 254

122 5,593,137
314 5,593,138
325 5,593,139
374 5,593,140

CLASS 256

26 5,593,141
54 5,593,142
68 5,593,143

CLASS 257

39 5,594,257
48 5,594,258
66 5,594,259
80 5,594,260
140 5,594,261
192 5,594,262
201 5,594,263
335 5,594,264
355 5,594,265
5,594,266
368 5,594,267
370 5,594,268
380 5,594,269
393 5,594,270
469 5,594,271
579 5,594,272
620 5,594,273
667 5,594,274
676 5,594,234
686 5,594,275
693 5,594,276
751 5,594,278
758 5,594,279
771 5,594,280
773 5,594,281
796 5,594,282

CLASS 264

1.1 5,593,620
1.29 5,593,621
4.32 5,593,622
32 5,593,623
48 5,593,624
115 5,593,625
122 5,593,626
127 5,593,627
154 5,593,628
209.3 5,593,629
219 5,593,630
257 5,593,631
284 5,593,632
510 5,593,633

CLASS 266

217 5,593,634

CLASS 267

141 5,593,144

CLASS 269

3 5,593,145
22 5,593,146
170 5,593,147

CLASS 270

52.3 5,593,148

CLASS 271

3.01 5,593,149
121 5,593,150
193 5,593,151
241 5,593,152
287 5,593,153

CLASS 273

139 5,593,160
274 5,593,161
403 5,593,162

CLASS 277

3 5,593,163
9.5 5,593,164
22 5,593,165
59 5,593,166

CLASS 280

164.1 5,593,167
275 5,593,168
422 5,593,170
479.2 5,593,171
506 5,593,172
642 5,593,173
647 5,593,174
704 5,593,175
707 5,593,176
731 5,593,177
5,593,178
740 5,593,179
741 5,593,180
5,593,181
751 5,593,182
775 5,593,183

CLASS 281

43 5,593,184

CLASS 283

70 5,593,185

CLASS 285

23 5,593,186
305 5,593,187
319 5,593,188

CLASS 289

17 5,593,189

CLASS 292

98 5,593,190
144 5,593,191
207 5,593,192
336.3 5,593,193
340 5,593,194

CLASS 293

134 5,593,195

CLASS 294

19.1 5,593,196
5,593,197
54.5 5,593,198
88 5,593,199

CLASS 296

37.16 5,593,200
100 5,593,201
108 5,593,202
198 5,593,203
223 5,593,204

CLASS 297

184.15 5,593,205
217.7 5,593,206
281 5,593,207
336 5,593,208
344.13 5,593,209
361.1 5,593,210
383 5,593,211
423.44 5,593,212

CLASS 300

21 5,593,213

CLASS 303

7 5,593,214
113.2 5,593,215
119.2 5,593,216
139 5,593,217

CLASS 305

174 5,593,218

CLASS 307

10.1 5,594,283
10.5 5,594,284
18 5,594,285
43 5,594,286
132 E 5,594,287

CLASS 310

62 5,594,288
152 5,594,289
251 5,594,290
323 5,594,291
324 5,594,292
339 5,594,293

CLASS 312

263 5,593,219
265.6 5,593,220

CLASS 313

25 5,594,294
5,594,295
309 5,594,296
5,594,297
336 5,594,298
346 DC 5,594,299
402 5,594,300
523 5,594,301
642 5,594,302

CLASS 315

39 5,594,303

85 5,594,304
169.3 5,594,305
290 5,594,308

CLASS 318

245 5,594,306
280 5,594,307
444 Re.35,422
568.22 5,594,309
578 5,594,310
685 5,594,311
799 5,594,312

CLASS 320

1 5,594,313
2 5,594,314
5,594,315
5,594,316
5,594,317
5,594,318
5,594,319
4 5,594,320
48 5,594,321

CLASS 322

10 5,594,322

CLASS 323

222 5,594,323
282 5,594,324
5,594,325
313 5,594,326

CLASS 324

71.1 5,594,327
72 5,594,328
96 5,594,329
106 5,594,330
117 R 5,594,331
127 5,594,332
142 5,594,333
173 5,594,334
207.2 5,594,335
309 5,594,336
318 5,594,337
5,594,338
5,594,339
321 5,594,340
322 5,594,341
5,594,342
338 5,594,343
5,594,344
369 5,594,384
428 5,594,345
464 5,594,346
539 5,594,347
546 5,594,348
551 5,594,349
616 5,594,350
637 5,594,351
664 5,594,352
681 5,591,353
727 5,594,354
755 5,594,355
5,594,356
758 5,594,357
762 5,594,358
765 5,594,359
771 5,594,360

CLASS 326

24 5,594,361
38 5,594,362
39 5,594,363
5,594,364
40 5,594,365
41 5,594,366
5,594,367
80 5,594,368
83 5,594,369
86 5,594,370
119 5,594,371
121 5,594,372

CLASS 327

108 5,594,373
5,594,374
129 5,594,375
236 5,594,376
278 5,594,377
304 5,594,378
381 5,594,379
390 5,594,380
534 5,594,381
541 5,594,382
552 5,594,383

CLASS 330

149 5,594,385
251 5,594,386
259 5,594,387

CLASS 331

1 R 5,594,388
12 5,594,389
17 5,594,390
57 5,594,391
5,594,392

CLASS 333

26 5,594,393
103 5,594,394
178 5,594,395
189 5,594,396
202 5,594,397

CLASS 335

18 5,594,398
132 5,594,399
151 5,594,400
216 5,594,401

CLASS 336

65 5,594,402

CLASS 337

186 5,594,403
210 5,594,404

CLASS 338

4 5,594,405
21 5,594,406
24 5,594,407
89 5,594,408

CLASS 340

326 5,594,409
332 5,594,410
425.5 5,594,411
435 5,594,412
5,594,413
436 5,594,414
467 5,594,415
5,594,416
506 5,594,417
546 5,594,418
568 5,594,419
572 5,594,420
578 5,594,421
628 5,594,422
686 5,594,423
815.54 5,594,424
825.02 5,594,426
825.06 5,594,425
825.31 5,594,429
825.36 5,594,428
825.72 5,594,427
870.02 5,594,431
905 5,594,432
908.1 5,594,433

CLASS 341

13 5,594,434
51 5,594,435
59 5,594,436
67 5,594,437
108 5,594,438
118 5,594,439
120 5,594,612
131 5,594,440
136 5,594,441
143 5,594,442
144 5,594,443
159 5,594,444
162 5,594,445

CLASS 342

1 5,594,446
42 5,594,447
44 5,594,448
124 5,594,449
159 5,594,450
160 5,594,451
353 5,594,452
357 5,594,453
5,594,454

CLASS 343

700 MS 5,594,455
701 5,594,456
702 5,594,457
703 5,594,458
749 5,594,459
765 5,594,460
895 5,594,461

CLASS 345

2 5,594,462
76 5,594,463
94 5,594,464
98 5,594,465
100 5,594,466
115 5,594,467
158 5,594,468
169 5,594,469
5,594,470
173 5,594,471
194 5,594,472
199 5,594,473
203 5,594,474

CLASS 347

9 5,594,475
10 5,594,476
30 5,594,477
41 5,594,478
45 5,594,479
51 5,594,480
65 5,594,481
69 5,594,482
87 5,594,483
95 5,594,484
101 5,594,485
104 5,594,486
197 5,594,487
208 5,594,488
211 5,594,489

CLASS 348

6 5,594,490
10 5,594,492
13 5,594,493
15 5,594,494
17 5,594,495
21 5,594,496
71 5,594,497
158 5,594,498
222 5,594,499
345 5,594,500
362 5,594,501
373 5,594,502
414 5,594,503
416 5,594,504
531 5,594,506
584 5,594,507
665 5,594,508
731 5,594,509
5,594,510

CLASS 349

5 5,594,591
12 5,594,562
13 5,594,573
19 5,594,565
28 5,594,567
58 5,594,574
59 5,594,561
74 5,594,563
120 5,594,568
122 5,594,569
129 5,594,570
138 5,594,571
143 5,594,564
155 5,594,572
171 5,594,575

CLASS 351

116 5,594,511
206 5,594,512

CLASS 352

6 5,594,513

CLASS 353

122 5,593,221

CLASS 355

29 5,594,525
67 5,594,526
75 5,594,527
84 5,594,528

CLASS 356

5.09 5,594,543
73 5,594,544
246 5,594,545
5,594,546
312 5,594,547
376 5,594,548
401 5,594,549

CLASS 358

426 5,594,554
448 5,594,555
482 5,594,556
518 5,594,557
5,594,558

CLASS 359

8 5,594,559
15 5,594,560
118 5,594,576
124 5,594,577
127 5,594,578
145 5,594,579
172 5,594,580
177 5,594,581
184 5,594,583
330 5,594,592
433 5,594,584
512 5,594,585
559 5,594,586
619 5,594,587
631 5,594,588
726 5,594,593
826 5,594,589
841 5,594,590
855 5,594,594

CLASS 360

31 5,594,595
46 5,594,597
49 5,594,598
53 5,594,599
69 5,594,600
72.2 5,594,601
77.14 5,594,602
78.04 5,594,603
85 5,594,604
96.5 5,594,605
99.08 5,594,606
104 5,594,607
126 5,594,608

CLASS 361

104 5,594,609
5,594,610
118 5,594,611
127 5,594,613
5,594,614
150 5,594,615
622 5,594,616
679 5,594,617
680 5,594,618
681 5,594,619
5,594,620
686 5,594,621
5,594,622
697 5,594,623
704 5,594,624
755 5,594,625
784 5,594,626
801 5,594,627

CLASS 362

157 5,593,222
249 5,594,628
255 5,593,223
287 5,593,224
427 5,593,225

CLASS 363

21 5,594,629
40 5,594,630
41 5,594,631
44 5,594,632
73 5,594,633
98 5,594,634
124 5,594,635
160 5,594,636

CLASS 364

424.027 5,594,644
424.034 5,594,649
424.04 5,594,646
424.055 5,594,647
424.08 5,594,643
426.01 5,594,648
426.044 5,594,645
449.1 5,594,650
468.04 5,594,651
468.14 5,594,639
468.24 5,594,653
468.26 5,594,652
478.III 5,594,654
487 5,594,655
488 5,594,656
490 5,594,657
492 5,594,659
514 B 5,594,658
514 R 5,594,660
5,594,661
550 5,594,662
5,594,663
558 5,594,665
559 5,594,669
571.01 5,594,666
5,594,667
571.07 5,594,668
578 5,594,671
707 5,594,672
709.15 5,594,673
715.02 5,594,674
724.01 5,594,676
724.1 5,594,675
724.16 5,594,677
725 5,594,678
736 5,594,679

CLASS 365

63 5,594,680
149 5,594,681
5,594,682
177 5,594,683
185.01 5,594,684
185.03 5,594,685
185.04 5,594,686
185.1 5,594,687
5,594,688
185.22 5,594,689
189.01 5,594,690
189.09 5,594,691
5,594,692
200 5,594,693
201 5,594,694
205 5,594,695
208 5,594,696
5,594,697
222 5,594,698
226 5,594,699
230.03 5,594,700
5,594,701
230.05 5,594,702
230.06 5,594,703
233 5,594,704

CLASS 366

69 5,593,226
82 5,593,227
209 5,593,228

CLASS 367

13 5,594,705
76 5,594,706
111 5,594,707

CLASS 369

13 5,594,708
32 5,594,709
36 5,594,710
44.37 5,594,711
112 5,594,712
5,594,713
5,594,714
118 5,594,715
212 5,594,716
275.4 5,594,716

CLASS 370

232 5,594,717
260 5,594,725
278 5,594,737
286 5,594,719
330 5,594,720
331 5,594,718
337 5,594,735
338 5,594,731
347 5,594,738
391 5,594,729
392 5,594,721
395 5,594,734
396 5,594,723
401 5,594,732
426 5,594,722
442 5,594,727
449 5,594,733
469 5,594,724
471 5,594,728
474 5,594,736
485 5,594,726
488 5,594,730

CLASS 371

27 5,594,741
37.1 5,594,742
40.1 5,594,743

CLASS 372

20 5,594,744
21 5,594,745
22 5,594,746
31 5,594,747
38 5,594,748
45 5,594,749
5,594,750
46 5,594,751
50 5,594,752
57 5,594,753

CLASS 375

167 5,594,788
200 5,594,754
208 5,594,755
233 5,594,756
344 5,594,757
5,594,758
5,594,759
345 5,594,760
356 5,594,761
371 5,594,762
376 5,594,763

CLASS 376

248 5,594,764

CLASS 377

44 5,594,765

CLASS 378

4 5,594,766
7 5,594,491
8 5,594,767
21 5,594,768
37 5,594,769
58 Re.35,423
5,594,770
98.2 5,594,771
114 5,594,772
145 5,594,773
177 5,594,774
207 5,594,775

CLASS 379

58 5,594,776
5,594,777
5,594,778
59 5,594,740
5,594,779
5,594,780
60 5,594,781
63 5,594,782
68 5,594,783
88 5,594,784
90 5,594,785
93 5,594,786
114 5,594,787
207 5,594,789
265 5,594,790
5,594,791
269 5,594,792

CLASS 380

4 5,594,793
20 5,594,794
23 5,594,795
25 5,594,796
28 5,594,797
49 5,594,798

CLASS 381

13 5,594,799
20 5,594,800
24 5,594,801
61 5,594,802
71 5,594,803
186 5,594,804
199 5,594,805

CLASS 382

115 5,594,806
128 5,594,807
133 5,594,808
161 5,594,809
187 5,594,810
216 5,594,811
232 5,594,812
236 5,594,813
254 5,594,814
5,594,815
275 5,594,816
290 5,594,817

CLASS 383

209 5,593,229

CLASS 384

100 5,593,230
114 5,593,231
119 5,593,232
222 5,593,233
492 5,593,234
542 5,593,235

CLASS 385

8 5,594,818
12 5,594,819
22 5,594,820
24 5,594,821
43 5,594,822
46 5,594,823
49 5,594,824
60 5,594,825
88 5,594,826
100 B1 5,163,115
101 5,594,827
121 5,594,828
134 5,594,829
146 5,594,830

CLASS 386

40 5,594,550
80 5,594,596
88 5,594,553
92 5,594,551
131 5,594,552

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CLASS 392

421 5,594,831
435 5,594,832

CLASS 395

2.3 5,594,833
2.62 5,594,834
51 5,594,835
62 5,594,836
63 5,594,837
109 5,594,839
113 5,594,840
117 5,594,838
119 5,594,841
124 5,594,842
127 5,594,843
5,594,844
5,594,845
130 5,594,846
133 5,594,847
134 5,594,848
135 5,594,849
5,594,850
140 5,594,851
141 5,594,852
5,594,853
5,594,854
142 5,594,855
173 5,594,856
181 5,594,861
182.03 5,594,862
182.13 5,594,863
183.15 5,594,864
185.08 5,594,865
200.09 5,594,871
200.13 5,594,866
200.15 5,594,867
5,594,872
200.16 5,594,868
200.2 5,594,869
5,594,870
202 5,594,637
203 5,594,638
224 5,594,920
281 5,594,873
284 5,594,874
287 5,594,875
293 5,594,876
306 5,594,877
309 5,594,878
5,594,879
326 5,594,858
330 5,594,859
352 5,594,857
419 5,594,881
421.02 5,594,882
440 5,594,883
452 5,594,884
460 5,594,885
463 5,594,886
471 5,594,887
495 5,594,888
497.02 5,594,889
500 5,594,890
5,594,891
5,594,892
501 5,594,860
556 5,594,894
5,594,895
5,594,896
557 5,594,893
595 5,594,880
600 5,594,899
5,594,900
601 5,594,641
602 5,594,898
613 5,594,897
672 5,594,902
674 5,594,901
704 5,594,904
712 5,594,903
733 5,594,905
750 5,594,906
5,594,907
794 5,594,640
797 5,594,642
800 5,594,908
5,594,910
5,594,911
5,594,912
5,594,913
5,594,914
5,594,915
5,594,916
5,594,917
5,594,918
5,594,919
831 5,594,921
837 5,594,922
842 5,594,923
851 5,594,924
863 5,594,925
872 5,594,909
886 5,594,926
5,594,927

CLASS 396

87 5,594,517
95 5,594,928
133 5,594,518
287 5,594,524
315 5,594,515
418 5,594,516
429 5,594,514
448 5,594,523
449 5,594,519
453 5,594,521
463 5,594,520
517 5,594,522

CLASS 399

8 5,594,529
61 5,594,533
100 5,594,532
111 5,594,530
159 5,594,531
262 5,594,535
281 5,594,198
285 5,594,534
297 5,594,536
310 5,594,538
316 5,594,539
318 5,594,537
326 5,594,540
358 5,594,541
402 5,594,542

CLASS 400

88 5,593,236
208 5,593,237
234 5,593,238
352 5,593,240
613 5,593,241

CLASS 402

7 5,593,242
52 5,593,243

CLASS 403

109 5,593,239
322 5,593,244
403 5,593,245

CLASS 404

9 5,593,246

CLASS 405

3 5,593,247
128 5,593,248
191 5,593,249
205 5,593,250
250 5,593,251

CLASS 406

85 5,593,252

CLASS 407

36 5,593,253
48 5,593,254
113 5,593,255

CLASS 408

1 R 5,593,256

CLASS 409

218 5,593,257
234 5,593,258

CLASS 410

3 5,593,259
20 5,593,260

CLASS 411

55 5,593,261
182 5,593,262
5,593,263
522 5,593,264
552 5,593,265

CLASS 414

228 5,593,266
273 5,593,267
301 5,593,268
331 5,593,269
458 5,593,270
490 5,593,271
498 5,593,272
729 5,593,293

CLASS 415

108 5,593,273
115 5,593,274
160 5,593,275
173.1 5,593,276
5,593,277
173.2 5,593,278
213.1 5,593,279

CLASS 416

44 5,593,280
145 5,593,281
219 R 5,593,282
244 R 5,593,283

CLASS 417

174 5,593,284
269 5,593,285
366 5,593,287
435 5,593,288
454 5,593,289
478 5,593,290
539 5,593,291
554 5,593,292

CLASS 418

55.1 5,593,294
55.2 5,593,295
61.3 5,593,296
88 5,593,297

CLASS 419

1 5,594,929
5 5,594,930
5,594,931
29 5,594,932

CLASS 422

5 5,593,635
6 5,593,636
28 5,593,637
56 5,593,638
102 5,593,639
111 5,593,640
123 5,593,641
131 5,593,642
144 5,593,643
156 5,593,644
176 5,593,645
177 5,593,646
180 5,593,647
266 5,593,648
305 5,593,649

CLASS 423

203 5,593,650
242.1 5,593,651
477 5,593,653
522 5,593,652
625 5,593,654
702 5,593,655

CLASS 424

1.69 5,593,656
9.34 5,593,658
9.363 5,593,659
9.41 5,593,657
9.451 5,593,660
45 5,593,661
64 5,593,662
65 5,593,663
76.1 5,593,670
78.08 5,593,664
85.1 5,593,665
5,593,666
85.2 5,593,667
5,593,671
5,593,672
93.4 5,593,668
93.6 5,593,669
93.7 5,593,673
94.63 5,593,674
130.1 5,593,675
137.1 5,593,676
154.1 5,593,677
184.1 5,593,678
242.1 5,593,679
401 5,593,680
5,593,681
5,593,682
427 5,593,683
435 5,593,684
439 5,593,685
448 5,593,686
450 5,593,687
5,593,688
457 5,593,690
461 5,593,691
464 5,593,693
468 5,593,694
472 5,593,696
480 5,593,695
490 5,593,697
534 5,593,698

CLASS 425

2 5,593,699
3 5,593,700
52 5,593,701
67 5,593,702
71 5,593,703
72.1 5,593,704
72.2 5,593,705
127 5,593,706
257 5,593,707
392 5,593,708
454 5,593,709
552 5,593,710
595 5,593,711

CLASS 426

19 5,593,712
237 5,593,713
268 5,593,714
467 5,593,715
589 5,593,716
656 5,593,717

CLASS 427

2.26 5,593,719
2.3 5,593,718
97 5,593,720
100 5,593,721
101 5,593,722
127 5,593,723
135 5,593,724
160 5,593,725
189 5,593,726
248.1 5,593,727
255.2 5,593,728
337 5,593,729
386 5,593,730
5,593,731
407.1 5,593,732
407.2 5,593,733
420 5,593,734
461 5,593,735
492 5,593,736
512 5,593,737
534 5,593,738
555 5,593,739
577 5,593,740
579 5,593,741
586 5,593,742

CLASS 428

18 5,593,743
34.4 5,593,744
34.5 5,593,745
36.1 5,593,746
36.7 5,593,747
40.1 5,593,749
5,593,750
41.3 5,593,748
97 5,593,751
114 5,593,752
131 5,593,753
5,593,754
134 5,593,755
194 5,593,756
195 5,593,757
5,593,758
200 5,593,759
210 5,593,761
218 5,593,762
219 5,593,763
220 5,593,764
225 5,593,765
236 5,593,766
251 5,593,767
286 5,593,768
5,593,769
290 5,593,770
317.3 5,593,771
323 5,593,772
328 5,593,773
343 5,593,774
349 5,593,775
367 5,593,776
370 5,593,777
373 5,593,778
375 5,593,779
392 5,593,780
403 5,593,781
5,593,782
408 5,593,783
413 5,593,784
423.1 5,593,785
426 5,593,786
447 5,593,787
546 5,594,933
690 5,593,788
694 ML 5,593,789
5,593,790
5,593,791

CLASS 429

8 5,593,792
62 5,593,793
91 5,593,794
192 5,593,795
204 5,593,796
210 5,593,797
245 5,593,798

CLASS 430

5 5,593,799
5,593,800
5,593,801
20 5,593,802
22 5,593,803
30 5,593,804
78 5,593,805
106.6 5,593,806
137 5,593,807
213 5,593,809
5,593,810
258 5,593,811
261 5,593,808
270.1 5,593,812
312 5,593,813
320 5,593,814
321 5,593,815
393 5,593,816
488 5,593,817
512 5,593,818
533 5,593,819
567 5,593,820
5,593,821

CLASS 431

9 5,593,298
170 5,593,299
328 5,593,300
350 5,593,301
353 5,593,302

CLASS 433

9 5,593,303
82 5,593,304
218 5,593,305

CLASS 434

267 5,593,306

CLASS 435

2 5,593,822
5,593,823
4 5,593,824
5 5,593,825
6 5,593,826
5,593,827
5,593,828
5,593,829
5,593,830
5,593,831
5,593,832
5,593,833
5,593,834
5,593,835
5,593,836
5,593,837
5,593,838
5,593,839
5,593,840
5,593,841
7.1 5,593,842
5,593,843
5,593,844
7.23 5,593,847
7.24 5,593,848
7.33 5,593,849
7.9 5,593,845
5,593,846
7.92 5,593,850
12 5,593,851
14 5,593,852
29 5,593,853
31 5,593,854
41 5,593,855
68.1 5,593,856
69.1 5,593,857
5,593,858
5,593,859
5,593,860
5,593,861
5,593,862
5,593,863
5,593,864
5,593,865
69.7 5,593,866
91.2 5,593,867
94 5,593,868
100 5,593,869
119 5,593,870
129 5,593,871
147 5,593,872
172.3 5,593,873
5,593,874
5,593,875
188 5,593,876
197 5,593,877
198 5,593,878
240.1 5,593,879
5,593,880
5,593,881
240.2 5,593,882
252.1 5,593,883
252.3 5,593,884
5,593,885
252.33 5,593,887
252.7 5,593,886
262.5 5,593,888
282 5,593,889
286.5 5,593,890
305.1 5,593,891

CLASS 436

34 5,593,892
50 5,593,893
71 5,593,894
86 5,593,895
127 5,593,899
500 5,593,896
507 5,593,897
518 5,593,898
547 5,593,900

CLASS 437

2 5,593,901
4 5,593,902
8 5,593,903
29 5,593,904
31 5,593,905
5,593,906
35 5,593,907
40 5,593,908
41 5,593,909
5,593,910
5,593,928
51 5,593,911
52 5,593,912
53 5,593,913
60 5,593,914
62 5,593,915
83 5,593,916
86 5,593,917
187 5,593,918
190 5,593,919
195 5,593,920
5,593,921
5,593,922
200 5,593,923
5,593,924
209 5,593,925
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125 5,593,308
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369 5,593,312
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459 5,593,315
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CLASS 441

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7 5,593,332
62 5,593,333
77 5,593,334

CLASS 445

50 5,593,335

CLASS 446

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125 5,593,337
259 5,593,338

CLASS 451

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42 5,593,340
57 5,593,341
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296 5,593,344
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CLASS 454

68 5,593,347
365 5,593,348

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5.1 5,594,937
6.2 5,594,938
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34.1 5,594,944
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429 5,593,154
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606 5,593,157

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CLASS 475

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218 5,593,358
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342 5,593,361
348 5,593,362

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74 5,593,363
98 5,593,364
119 5,593,365
203 5,593,367

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47 5,593,369
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75 5,593,373
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141 5,593,930

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5,593,940
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239 5,593,955

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9 5,593,960
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107 5,593,980
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378 5,594,020
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429 5,594,024
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141 5,594,054
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354 5,594,095
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482 5,594,098

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	28	377,356	D18—	4	377,366		95	377,376		141	377,386		113	377,396	D30—	108	377,406
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		377,358		34	377,368		121	377,378	D23—	207	377,388		158	377,398			
	70	377,359		53	377,369		148	377,379		261	377,389	D26—	68	377,399			
		377,360		55	377,370		220	377,380		328	377,390		87	377,400			
		377,361		56	377,371			377,381		329	377,391		110	377,401			
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		5,593,369		5,592,942		5,593,442		5,593,955		5,594,430		5,594,758					
		5,593,999		5,592,948		5,593,455		5,593,960		5,594,434		5,594,763					
		5,594,057		5,592,961		5,593,457		5,594,011		5,594,436		5,594,780					
		5,594,202		5,592,964		5,593,474		5,594,015		5,594,443		5,594,781					
04	:	5,592,696		5,592,978		5,593,477		5,594,021		5,594,446		5,594,788					
		5,592,811		5,592,987		5,593,478		5,594,032		5,594,451		5,594,792					
		5,592,958		5,593,024		5,593,541		5,594,058		5,594,453		5,594,794					
		5,593,172		5,593,028		5,593,551		5,594,080		5,594,456		5,594,797					
		5,593,180		5,593,030		5,593,559		5,594,089		5,594,468		5,594,809					
		5,593,281		5,593,038		5,593,564		5,594,111		5,594,473		5,594,810					
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		5,593,343		5,593,055		5,593,570		5,594,118		5,594,483		5,594,813					
		5,593,511		5,593,058		5,593,571		5,594,119		5,594,491		5,594,814					
		5,593,538		5,593,073		5,593,573		5,594,121		5,594,493		5,594,815					
		5,593,903		5,593,074		5,593,630		5,594,123		5,594,498		5,594,817					
		5,594,064		5,593,085		5,593,659		5,594,139		5,594,507		5,594,835					
		5,594,218		5,593,094		5,593,674		5,594,151		5,594,509		5,594,839					
		5,594,324		5,593,100		5,593,676		5,594,164		5,594,513		5,594,841					
		5,594,352		5,593,109		5,593,677		5,594,169		5,594,532		5,594,846					
		5,594,437		5,593,114		5,593,684		5,594,204		5,594,561		5,594,856					
		5,594,450		5,593,129		5,593,688		5,594,216		5,594,592		5,594,864					
		5,594,520		5,593,153		5,593,695		5,594,231		5,594,595		5,594,870					
		5,594,563		5,593,158		5,593,709		5,594,235		5,594,607		5,594,874					
		5,594,651		5,593,159		5,593,736		5,594,250		5,594,611		5,594,877					
		5,594,829		5,593,173		5,593,755		5,594,252		5,594,626		5,594,896					
		5,594,894		5,593,192		5,593,759		5,594,253		5,594,627		5,594,903					
		5,594,937		5,593,193		5,593,768		5,594,268		5,594,638		5,594,908					
		5,594,940		5,593,201		5,593,772		5,594,315		5,594,640		5,594,915					
05	:	5,592,749		5,593,220		5,593,797		5,594,317		5,594,641		5,594,919					
		5,592,828		5,593,221		5,593,798		5,594,328		5,594,642		5,594,921					
		5,593,619		5,593,222		5,593,809		5,594,331		5,594,650		5,594,926					
		5,593,743		5,593,224		5,593,822		5,594,338		5,594,669		5,594,939					
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		5,592,688		5,593,248		5,593,836		5,594,355		5,594,687			5,592,731				
		5,592,700		5,593,269		5,593,839		5,594,360		5,594,690			5,592,741				
		5,592,702		5,593,340		5,593,841		5,594,361		5,594,691			5,592,960				
		5,592,726		5,593,344		5,593,844		5,594,363		5,594,694			5,592,982				
		5,592,730		5,593,351		5,593,846		5,594,364		5,594,696			5,593,009				
		5,592,745		5,593,370		5,593,857		5,594,365		5,594,698			5,593,077				
		5,592,761		5,593,389		5,593,873		5,594,366		5,594,702			5,593,211				
		5,592,766		5,593,390		5,593,875		5,594,367		5,594,710			5,593,333				
		5,592,822		5,593,409		5,593,881		5,594,370		5,594,730			5,593,373				
		5,592,859		5,593,418		5,593,882		5,594,375		5,594,734			5,593,393				
		5,592,870		5,593,430		5,593,883		5,594,376		5,594,740			5,593,398				
		5,592,873		5,593,432		5,593,884		5,594,379		5,594,748			5,593,476				
		5,592,895		5,593,434		5,593,887		5,594,381		5,594,750			5,593,680				
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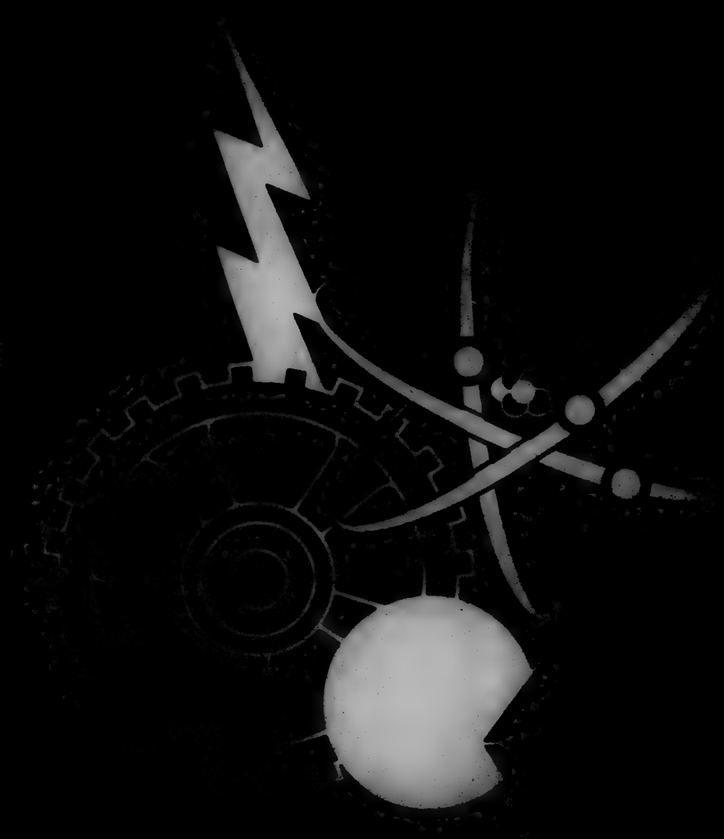
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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1996, and were announced in the *Official Gazette* at 1189 O.G. 62, on August 20, 1996.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 10, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Patent Cooperation Treaty Update

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, the dollar amount of the international fees for international applications filed in the United States Receiving Office will increase, effective February 1, 1997.

Effective February 1, 1997, the amount of the international fees for international applications filed in the United States Receiving Office will be:

Basic fee (first 30 pages)	$590.00

Basic supplemental fee (for each page over 30)	$12.00
Designation fee (per country or region up to 11)	$143.00
Handling fee	$180.00

December 26, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Patent Cooperation Treaty Update

Accession by Ghana

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Ghana deposited its instrument of accession of the PCT on November 26, 1996. Ghana will become a Contracting State of the PCT on February 26, 1997. Consequently, nationals and residents of Ghana are entitled to file international applications under the PCT on and after February 26, 1997, and from the same date it is possible to file international applications designating and electing Ghana (country code: GH).

Since Ghana is a member of the Harare Protocol with the framework of ARIPO, Ghana will be able to be designated for a patent granted by ARIPO. As of February 26, 1997, any designation in an international application for an ARIPO patent will automatically include the designation of Ghana for that purpose.

Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(1) Central African Republic[2]	Accession	15 September 1971	24 January 1978
(2) Senegal[2]	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi[5]	Accession	16 May 1972	24 January 1978
(5) Cameroon[2]	Accession	15 March 1973	24 January 1978
(6) Chad[2]	Accession	12 February 1974	24 January 1978
(7) Togo[2]	Ratification	28 January 1975	24 January 1978
(8) Gabon[2]	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany[3]	Ratification	19 July 1976	24 January 1978
(11) Congo[2]	Accession	08 August 1977	24 January 1978
(12) Switzerland[3]	Ratification	14 September 1977	24 January 1978
(13) United Kingdom[3]	Ratification	24 October 1977	24 January 1978
(14) France[3]	Ratification	25 November 1977	25 February 1978
(15) Russian Federation	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg[3]	Ratification	31 January 1978	30 April 1978
(18) Sweden[3]	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark[3]	Ratification	01 September 1978	01 December 1978
(21) Austria[3]	Ratification	23 January 1979	23 April 1979
(22) Monaco[3]	Ratification	22 March 1979	22 June 1979
(23) Netherlands[3]	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein[3]	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium[3]	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania[2]	Accession	13 January 1983	13 April 1983
(34) Sudan[2]	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali[2]	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy[3]	Ratification	28 December 1984	28 March 1985
(40) Benin[2]	Accession	26 November 1986	26 February 1987
(41) Burkina Faso[2]	Accession	21 December 1988	21 March 1989
(42) Spain[3]	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece[3]	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Côte d'Ivoire[2]	Ratification	31 January 1991	30 April 1991
(47) Guinea[2]	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(49) Czech Republic	Declaration[4]	18 December 1992	01 January 1993
(50) Ireland[3]	Ratification	01 May 1992	01 August 1992
(51) Portugal[3]	Accession	24 August 1992	24 November 1992
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration[4]	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration[4]	30 December 1992	01 January 1993
(56) Niger[2]	Accession	21 December 1992	21 March 1993
(57) Kazakstan	Declaration[4]	16 February 1993	25 December 1991
(58) Belarus	Declaration[4]	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991
(61) China	Accession	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991
(61) China	Accession	18 January 1994	25 December 1991
(65) Kyrgyzstan	Declaration[4]	14 February 1994	25 December 1991
(66) Republic of Moldova	Declaration[4]	14 February 1994	25 December 1991
(67) Tajikistan	Declaration[4]	14 February 1994	25 December 1991
(68) Kenya[5]	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia	Declaration[4]	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland[5]	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda[5]	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan	Declaration[4]	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho[5]	Accession	21 July 1995	21 October 1995
(82) Azerbaijan	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996
(84) Israel	Ratification	01 March 1996	01 June 1996
(85) Cuba	Accession	16 April 1996	16 July 1996
(86) Saint Lucia	Accession	30 May 1996	30 August 1996
(87) Bosnia and Herzegovina	Accession	7 June 1996	7 September 1996
( ) Ghana[5]	Accession	26 November 1996	26 February 1997

[1]Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2]Member of African Intellectual Property Organization (OAPI) regional patent system.

[3]Member of European Patent Convention (EPC) regional patent system.

[4]Declaration of continued application.

[5]Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

December 26, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 18, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,276,922 through 5,278,997
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 16, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,893,355 through 4,894,864
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 14, 1996 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,563,776 through 4,564,955
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:
(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED November 13, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,142	06/736,662	05/13/86
(4,481,986)	(06/417,225)	(11/13/84)
Re. 32,530	06/712,251	10/27/87
(4,482,051)	(06/382,151)	(11/13/84)
Re. 33,066	06/899,058	09/26/89
(4,481,727)	(06/390,380)	(11/13/84)
Re. 34,304	07/610,412	07/06/93
(4,783,645)	(06/719,060)	(11/08/88)
4,481,679	06/434,543	11/13/84
4,481,681	06/367,102	11/13/84
4,481,696	06/354,670	11/13/84
4,481,699	06/413,649	11/13/84
4,481,701	06/534,976	11/13/84
4,481,718	06/496,820	11/13/84
4,481,723	06/324,862	11/13/84
4,481,731	06/482,634	11/13/84
4,481,735	06/414,597	11/13/84
4,481,742	06/473,511	11/13/84
4,481,747	06/437,201	11/13/84
4,481,748	06/298,474	11/13/84
4,481,762	06/429,796	11/13/84
4,481,767	06/511,883	11/13/84
4,481,774	06/330,238	11/13/84
4,481,777	06/505,152	11/13/84
4,481,778	06/477,477	11/13/84
4,481,780	06/568,909	11/13/84
4,481,783	06/440,529	11/13/84
4,481,785	06/402,469	11/13/84
4,481,788	06/448,045	11/13/84
4,481,789	06/358,297	11/13/84
4,481,793	06/414,516	11/13/84
4,481,802	06/297,901	11/13/84
4,481,806	06/439,939	11/13/84
4,481,814	06/392,844	11/13/84
4,481,819	06/465,183	11/13/84
4,481,820	06/449,616	11/13/84
4,481,821	06/521,114	11/13/84
4,481,822	06/434,879	11/13/84
4,481,824	06/411,880	11/13/84
4,481,826	06/463,358	11/13/84
4,481,830	06/455,612	11/13/84
4,481,833	06/453,038	11/13/84
4,481,834	06/416,220	11/13/84
4,481,838	06/369,495	11/13/84
4,481,839	06/367,789	11/13/84
4,481,848	06/386,085	11/13/84
4,481,851	06/275,723	11/13/84
4,481,852	06/281,291	11/13/84
4,481,854	06/451,009	11/13/84
4,481,856	06/415,589	11/13/84
4,481,863	06/401,310	11/13/84
4,481,864	06/400,159	11/13/84
4,481,869	06/378,094	11/13/84
4,481,871	06/402,958	11/13/84
4,481,884	06/334,889	11/13/84
4,481,886	06/458,100	11/13/84
4,481,889	06/498,012	11/13/84
4,481,891	06/518,134	11/13/84
4,481,903	06/462,384	11/13/84
4,481,904	06/508,600	11/13/84
4,481,905	06/509,944	11/13/84
4,481,906	06/516,757	11/13/84
4,481,909	06/466,783	11/13/84
4,481,912	06/396,265	11/13/84
4,481,915	06/490,321	11/13/84
4,481,919	06/447,158	11/13/84
4,481,920	06/427,745	11/13/84
4,481,926	06/406,143	11/13/84
4,481,927	06/486,284	11/13/84
4,481,930	06/468,310	11/13/84
4,481,935	06/449,879	11/13/84
4,481,956	06/417,271	11/13/84
4,481,957	06/421,922	11/13/84

Patent Number	Serial Number	Issue Date
4,481,958	06/296,233	11/13/84
4,481,959	06/394,780	11/13/84
4,481,960	06/402,252	11/13/84
4,481,963	06/502,215	11/13/84
4,481,979	06/418,788	11/13/84
4,481,982	06/518,916	11/13/84
4,481,983	06/491,562	11/13/84
4,481,985	06/469,426	11/13/84
4,481,992	06/466,385	11/13/84
4,481,993	06/512,654	11/13/84
4,481,994	06/473,129	11/13/84
4,482,010	06/450,996	11/13/84
4,482,014	06/397,680	11/13/84
4,482,016	06/552,938	11/13/84
4,482,026	06/446,422	11/13/84
4,482,032	06/488,340	11/13/84
4,482,033	06/299,206	11/13/84
4,482,034	06/434,751	11/13/84
4,482,037	06/397,139	11/13/84
4,482,047	06/499,461	11/13/84
4,482,050	06/524,124	11/13/84
4,482,052	06/491,556	11/13/84
4,482,059	06/349,689	11/13/84
4,482,070	06/510,222	11/13/84
4,482,071	06/434,107	11/13/84
4,482,076	06/349,565	11/13/84
4,482,083	06/431,728	11/13/84
4,482,086	06/520,267	11/13/84
4,482,087	06/326,953	11/13/84
4,482,088	06/375,185	11/13/84
4,482,102	06/445,454	11/13/84
4,482,103	06/445,455	11/13/84
4,482,114	06/510,739	11/13/84
4,482,117	06/329,343	11/13/84
4,482,122	06/472,195	11/13/84
4,482,127	06/264,338	11/13/84
4,482,140	06/440,872	11/13/84
4,482,141	06/421,157	11/13/84
4,482,142	06/454,724	11/13/84
4,482,148	06/371,533	11/13/84
4,482,150	06/346,892	11/13/84
4,482,155	06/431,579	11/13/84
4,482,160	06/594,109	11/13/84
4,482,168	06/355,290	11/13/84
4,482,170	06/279,617	11/13/84
4,482,171	06/345,063	11/13/84
4,482,185	06/462,536	11/13/84
4,482,202	06/419,764	11/13/84
4,482,205	06/432,215	11/13/84
4,482,210	06/468,132	11/13/84
4,482,211	06/449,100	11/13/84
4,482,213	06/444,263	11/13/84
4,482,216	06/318,332	11/13/84
4,482,217	06/467,877	11/13/84
4,482,221	06/385,734	11/13/84
4,482,244	06/438,799	11/13/84
4,482,247	06/512,311	11/13/84
4,482,253	06/479,290	11/13/84
4,482,254	06/464,560	11/13/84
4,482,258	06/490,480	11/13/84
4,482,261	06/398,491	11/13/84
4,482,263	06/494,030	11/13/84
4,482,268	06/541,715	11/13/84
4,482,279	06/354,759	11/13/84
4,482,281	06/445,913	11/13/84
4,482,284	06/313,389	11/13/84
4,482,288	06/413,793	11/13/84
4,482,293	06/348,001	11/13/84
4,482,304	06/303,098	11/13/84
4,482,305	06/565,848	11/13/84
4,482,306	06/446,526	11/13/84
4,482,321	06/413,742	11/13/84
4,482,324	06/480,320	11/13/84
4,482,326	06/343,017	11/13/84
4,482,336	06/344,934	11/13/84
4,482,348	06/457,686	11/13/84
4,482,352	06/586,408	11/13/84
4,482,353	06/520,156	11/13/84
4,482,355	06/567,071	11/13/84
4,482,360	06/498,174	11/13/84
4,482,361	06/457,915	11/13/84
4,482,367	06/398,684	11/13/84
4,482,369	06/493,180	11/13/84
4,482,370	06/485,357	11/13/84
4,482,371	06/485,004	11/13/84
4,482,372	06/452,497	11/13/84
4,482,373	06/529,923	11/13/84
4,482,380	06/408,029	11/13/84
4,482,383	06/502,821	11/13/84
4,482,384	06/470,244	11/13/84
4,482,385	06/509,677	11/13/84
4,482,387	06/557,705	11/13/84
4,482,390	06/415,813	11/13/84
4,482,392	06/377,788	11/13/84
4,482,402	06/519,279	11/13/84
4,482,415	06/599,967	11/13/84
4,482,417	06/490,382	11/13/84
4,482,419	06/576,143	11/13/84
4,482,428	06/603,057	11/13/84
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4,783,774	07/001,332	11/08/88
4,783,781	06/883,756	11/08/88
4,783,787	06/871,038	11/08/88
4,783,789	06/751,503	11/08/88
4,783,807	06/644,769	11/08/88
4,783,818	06/788,411	11/08/88
4,783,819	07/015,453	11/08/88
4,783,820	07/029,677	11/08/88
4,783,827	06/867,471	11/08/88
4,783,841	07/045,493	11/08/88
4,783,847	06/913,010	11/08/88
4,783,848	06/789,424	11/08/88
4,783,852	06/894,662	11/08/88
5,161,258	07/623,779	11/10/92
5,161,260	07/746,407	11/10/92
5,161,261	07/745,666	11/10/92
5,161,262	07/748,522	11/10/92
5,161,263	07/696,509	11/10/92
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5,161,282	07/740,494	11/10/92
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5,161,289	07/706,654	11/10/92
5,161,298	07/730,168	11/10/92
5,161,308	07/733,991	11/10/92
5,161,309	07/873,784	11/10/92
5,161,310	07/810,212	11/10/92
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5,161,346	07/772,075	11/10/92
5,161,359	07/612,504	11/10/92
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5,161,594	07/288,431	11/10/92
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5,161,802	07/660,785	11/10/92
5,161,810	07/680,844	11/10/92
5,161,812	07/740,938	11/10/92
5,161,814	07/659,541	11/10/92
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5,161,834	07/589,033	11/10/92
5,161,835	07/651,259	11/10/92
5,161,837	07/787,261	11/10/92
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5,162,351	07/431,643	11/10/92
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5,162,359	07/753,751	11/10/92
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5,162,368	07/563,188	11/10/92
5,162,373	07/399,778	11/10/92
5,162,376	07/706,421	11/10/92
5,162,382	07/734,373	11/10/92
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5,162,387	07/833,863	11/10/92
5,162,390	07/741,695	11/10/92
5,162,392	07/612,312	11/10/92

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5,162,398	07/089,951	11/10/92
5,162,403	07/474,826	11/10/92
5,162,405	07/675,357	11/10/92
5,162,406	07/134,393	11/10/92
5,162,410	07/809,236	11/10/92
5,162,417	07/677,904	11/10/92
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5,162,434	07/565,191	11/10/92
5,162,448	07/810,609	11/10/92
5,162,449	07/802,802	11/10/92
5,162,452	07/530,388	11/10/92
5,162,454	07/789,382	11/10/92
5,162,459	07/578,373	11/10/92
5,162,461	07/644,476	11/10/92
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5,162,463	07/624,635	11/10/92
5,162,466	07/814,810	11/10/92
5,162,469	07/740,591	11/10/92
5,162,475	07/722,423	11/10/92
5,162,476	07/807,955	11/10/92
5,162,483	07/602,544	11/10/92
5,162,484	07/551,401	11/10/92
5,162,489	07/532,401	11/10/92
5,162,495	07/435,146	11/10/92
5,162,499	07/794,800	11/10/92
5,162,500	07/613,759	11/10/92
5,162,502	07/714,870	11/10/92
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5,162,527	07/676,047	11/10/92
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5,162,553	07/717,813	11/10/92
5,162,557	07/688,244	11/10/92
5,162,559	07/332,031	11/10/92
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5,162,572	07/810,650	11/10/92
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5,162,606	07/789,621	11/10/92
5,162,610	07/496,989	11/10/92
5,162,612	07/528,192	11/10/92
5,162,617	07/597,530	11/10/92
5,162,650	07/645,649	11/10/92
5,162,657	07/788,630	11/10/92
5,162,660	07/722,435	11/10/92
5,162,665	07/496,966	11/10/92
5,162,683	07/758,361	11/10/92
5,162,693	07/423,904	11/10/92
5,162,713	07/599,020	11/10/92
5,162,752	07/796,699	11/10/92
5,162,763	07/793,517	11/10/92
5,162,775	07/488,133	11/10/92
5,162,777	07/630,979	11/10/92
5,162,778	07/684,971	11/10/92
5,162,781	07/735,106	11/10/92
5,162,783	07/627,229	11/10/92
5,162,789	07/345,849	11/10/92
5,162,802	07/693,469	11/10/92
5,162,806	07/475,472	11/10/92
5,162,810	07/740,007	11/10/92
5,162,824	07/760,378	11/10/92
5,162,826	07/716,223	11/10/92
5,162,843	07/753,716	11/10/92
5,162,851	07/614,928	11/10/92
5,162,862	07/637,643	11/10/92
5,162,864	07/703,866	11/10/92
5,162,865	07/692,133	11/10/92
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5,162,911	07/727,625	11/10/92
5,162,926	07/537,956	11/10/92
5,162,948	07/806,057	11/10/92
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5,162,994	07/540,255	11/10/92
5,163,015	07/546,387	11/10/92
5,163,026	07/741,516	11/10/92
5,163,029	07/652,887	11/10/92
5,163,032	07/717,871	11/10/92
5,163,048	07/500,611	11/10/92
5,163,056	07/474,091	11/10/92
5,163,057	07/510,206	11/10/92
5,163,058	07/706,985	11/10/92
5,163,060	07/760,862	11/10/92
5,163,061	07/781,036	11/10/92
5,163,062	07/782,008	11/10/92
5,163,068	07/660,420	11/10/92
5,163,076	07/784,716	11/10/92
5,163,088	07/666,524	11/10/92
5,163,099	07/334,557	11/10/92
5,163,101	07/412,619	11/10/92
5,163,104	07/159,665	11/10/92
5,163,105	07/775,934	11/10/92
5,163,109	07/499,549	11/10/92
5,163,117	07/611,818	11/10/92
5,163,139	07/575,140	11/10/92
5,163,147	07/575,439	11/10/92
5,163,161	07/432,957	11/10/92
5,163,166	07/596,010	11/10/92

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Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 32,580	06/909,319	09/18/86	01/19/88	11/25/96
4,721,121	06/829,503	02/14/86	01/26/88	11/27/96
4,749,109	06/911,398	09/25/86	06/07/88	11/22/96
4,768,021	07/099,334	09/18/87	08/30/88	11/27/96
4,799,277	07/175,680	03/21/88	01/24/89	11/27/96
4,937,556	07/252,982	10/04/88	06/26/90	11/29/96
4,960,720	07/088,948	08/24/87	10/02/90	11/29/96
4,996,006	07/313,241	02/21/89	02/26/91	11/26/96
5,000,955	07/559,513	07/23/90	03/19/91	11/25/96
5,002,311	07/464,240	01/12/90	03/26/91	11/26/96
5,061,692	07/382,623	11/23/89	10/29/91	11/26/96
5,110,584	07/601,296	10/22/90	05/05/92	11/22/96
5,119,988	07/545,399	06/28/90	06/09/92	11/22/96
5,125,649	07/622,934	12/06/90	06/30/92	11/27/96
5,127,318	07/519,630	05/07/90	07/07/92	11/27/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
5,138,891	07/481,961	02/20/90	08/18/92	11/25/96
5,148,017	07/708,980	05/31/91	09/15/92	11/29/96

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 11/29/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
Re. 33,453	07/417,795	10/05/89	11/20/90	12/03/96
Re. 34,045	07/585,887	09/20/90	08/25/92	12/06/96
4,619,986	06/749,705	06/28/85	10/28/86	12/02/96
4,640,293	06/692,704	01/18/85	02/03/87	12/02/96
4,681,440	06/799,068	11/18/85	07/21/87	11/29/96
4,702,200	06/852,647	04/16/86	10/27/87	12/02/96
4,743,238	07/070,206	07/14/87	05/10/88	12/02/96
4,754,894	07/048,050	05/11/87	07/05/88	12/02/96
5,009,700	07/558,279	07/26/90	04/23/91	12/02/96
5,019,710	07/331,404	03/30/89	05/28/91	12/02/96
5,038,719	07/498,606	03/26/90	08/13/91	12/02/96
5,040,377	07/439,852	11/21/89	08/20/91	12/02/96
5,079,174	07/281,410	12/08/88	01/07/92	12/02/96
5,085,678	07/644,899	01/22/91	02/04/92	11/29/96
5,104,793	07/156,168	02/16/88	04/14/92	12/02/96
5,106,965	07/507,421	04/09/90	04/21/92	12/03/96
5,108,215	07/406,827	09/12/89	04/28/92	12/02/96
5,146,984	07/682,811	04/09/91	09/15/92	12/29/96
5,147,039	07/706,293	05/28/91	09/15/92	11/29/96
5,152,424	07/642,811	01/18/91	10/06/92	12/02/96

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 12/06/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,618,907	06/695,965	01/29/85	10/21/86	12/10/96
4,710,725	06/643,408	08/23/84	12/01/87	12/10/96
4,743,673	06/944,667	12/19/86	05/10/88	12/10/96
4,971,366	07/389,251	08/02/89	11/20/90	12/11/96
4,979,198	07/375,124	07/03/89	12/18/90	12/09/96
5,077,853	07/639,905	01/10/91	01/07/92	12/10/96
5,081,911	07/473,763	02/02/90	01/21/92	12/10/96
5,088,147	07/588,055	09/24/90	02/18/92	12/10/96
5,123,206	07/668,747	03/13/91	06/23/92	12/10/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

Re. 33,380, Re. S.N. 08/614,127, Mar. 12, 1996, Cl. 379/98, VOICEHAND DATA SET, Enrique Cheng-Quispe, et. al., Owner of Record: *Lucent Technologies, Inc., Murray Hill, N.J.*, Attorney or Agent: Joseph J. Opalach, Ex. Gp.: 2608

5,005,554, Re. S.N. 08/286,791, Aug. 5, 1996, Cl. 124/24.1, BOW HANDLE WITH OFFSET IN WINDOW, Paul E. Shepley, Owner of Record: *Precision Shooting Equipment Co., Tucson, Ariz.*, Attorney or Agent: Paul F. Willie, Ex. Gp.: 3509

5,014,267, Re. S.N. 08/540,921, Oct. 11, 1995, Cl. 370/62, VIDEO CONFERENCING NETWORK, E. Neal Tompkins, et. al., Owner of Record: *Datapoint Corp., San Antonio, Tex.*, Attorney or Agent: Peter T. Cobrin, Ex. Gp.: 2603

5,134,322, Re. S.N. 08/717,135, Sep. 20, 1996, Cl. 327, CONTROL AND MONITORING DEVICE FOR A POWER SWITCH, Jean-Marie Bourgeois, et. al., Owner of Record: *SGS-Thomson Microelectronics SA, Gentilly, France*, Attorney or Agent: Bryan A. Santarelli, Ex. Gp.: 2511

5,211,317, Re. S.N. 08/679,689, Sep. 5, 1996, Cl. 222/394, LOW PRESSURE, NON-BARRIER TYPE, VALVED DISPENSING CAN, George B. Diamond, et. al., Owner of Record: *Inventor*, Attorney or Agent: Robert C. Faber, Ex. Gp.: 3104

5,263,154, Re. S.N. 08/559,509, Nov. 15, 1995, Cl. 395/575, METHOD AND SYSTEM FOR INCREMENTAL TIME ZERO BACKUP COPYING OF DATA, Lawrence E. Eastridge, et. al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Keith Hargrove, Ex. Gp.: 2413

5,280,089, Re. S.N. 08/721,296, Sep. 26, 1996, Cl. 525/445, POLYESTER-ACRYLIC GRAFT POLYMERS FOR USE IN POWDER COATINGS, Henry J. DeGraaf, et. al., Owner of Record: *Ferro Corp., Cleveland, Ohio*, Attorney or Agent: Kenneth A. Clark, Ex. Gp.: 1207

5,315,989, Re. S.N. 08/655,747, May 30, 1996, Cl. 12/74, MEDICAL VENTILATOR, Ronald L. Tobia, Owner of Record: *BOC Healthcare, Inc., Liberty Corner, N.J.*, Attorney or Agent: John F. Rollins, Ex. Gp.: 3307

5,316,039, Re. S.N. 08/656,391, May 31, 1996, Cl. CARTRIDGE-TYPE FAUCET VALVE WITH IMPROVED SEAL, William D. Hoag, et. al., Owner of Record: *The Chicago Faucet Co., Des Plaines, Ill.*, Attorney or Agent: Steven P. Petersen, Ex. Gp.: 3407

5,328,238, Re. S.N. 08/678,132, Jul. 11, 1996, Cl. 297/332, LAYABLE SEAT, Ryokichi Yamazaki, Owner of Record: *Kotobuki Corp., Tokyo, Japan*, Attorney or Agent: Sharon Wong, Ex. Gp.: 3507

5,329,237, Re. S.N. 08/680,569, Jul. 12, 1996, Cl. 324/501, METHOD AND SYSTEM FOR DECOUPLING INOPERATIVE PASSIVE ELEMENTS ON A SEMICONDUCTOR CHIP, Andrew Horch, Owner of Record: *Micron Semiconductor Inc., Boise, Id.*, Attorney or Agent: Patrick McBride, Ex. Gp.: 2607

5,330,879, Re. S.N. 08/687,785, Jul. 19, 1996, Cl. 430/313, METHOD FOR FABRICATION OF CLOSE-TOLERANCE LINES AND SHARP EMISSION TIPS ON A SEMICONDUCTOR WAFER, Charles H. Dennison, Owner of Record: *Micron Technology Inc., Boise, Ida.*, Attorney or Agent: Robert G. Winkle, Ex. Gp.: 1113

5,331,593, Re. S.N. 08/284,338, Nov. 19, 1996, Cl. 365/189.11, READ CIRCUIT FOR ACCESSING DYNAMIC RANDOM ACCESS MEMORIES (DRAMS), Todd A. Merritt, et. al., Owner of Record: *Micron Semiconductor Inc., Boise, Id.*, Attorney or Agent: Patrick McBride, Ex. Gp.: 2511

5,332,420, Re. S.N. 08/687,632, Jul. 26, 1996, Cl. 428/24, CHEMICAL PROCESS OF SEPARATING METALS FROM AN ORGANIC COMPLEX, Domenico C. Cupertino, et. al., Owner of Record: *Zeneca LTD, London, England*, Attorney or Agent: Donald J. Bird, Ex. Gp.: 1103

5,346,461, Re. S.N. 08/604,381, Feb. 21, 1996, Cl. 602/19, ELECTROMECHANICAL BACK BRACE APPARATUS, Thomas J. Heinz, Owner of Record: *Commercial Bank California, Industry, Calif.*, Attorney or Agent: George E. Oran, Jr., Ex. Gp.: 3302

5,347,179, Re. S.N. 08/713,757, Sep. 13, 1996, Cl. 307/451, INVERTING OUTPUT DRIVER CIRCUIT FOR REDUCING ELECTRON INJECTION INTO THE SUBSTRATE, Stephen L. Casper, et. al., Owner of Record: *Micron Technology, Inc., Boise, Id.*, Attorney or Agent: Patrick McBride, Ex. Gp.: 2607

5,350,621, Re. S.N. 08/727,094, Sep. 27, 1996, Cl. 428/209, SYSTEM OF ELECTRONIC LAMINATES WITH IMPROVED REGISTRATION PROPERTIES, Donald E. Yuhas, et. al., Owner of Record: *Allied-signal Inc., Morristown, N.J.*, Attorney or Agent: Douglas W. Robinson, Ex. Gp.: 1317

5,358,407, Re. S.N. 08/743,462, Oct. 24, 1996, Cl. 434/094, APPEARANCE MODIFICATION DISPLAY/SELECTION SYSTEM AND METHOD, Lisa M. Lainer, Owner of Record: *Inventor*, Attorney or Agent: Donald W. Meeker, Ex. Gp.: 3303

5,361,355, Re. S.N. 08/736,585, Oct. 24, 1996, Cl. 395, SOFTWARE ASSET SYSTEMIZER, Syuji Kondo, et. al., Owner of Record: *Fujitsu Limited, Kawasaki-Shi, Japan*, Attorney or Agent: Ilene D. Altman, Ex. Gp.: 2316

5,364,452, Re. S.N. 08/ 686,953, Jul. 26, 1996, Cl. 75, CHEMICAL PROCESS FOR THE RECOVERY OF METAL FROM AN ORGANIC COMPLEX, Domenico C. Cupertino, et. al., Owner of Record: *Zeneca Limited, London, England*, Attorney or Agent: Donald J. Bird, Ex. Gp.: 1304

5,375,948, Re. S.N. 08/747,407, Nov. 12, 1996, Cl. 407/116, CUTTING INSERT FOR CUTTING AND GROOVING TOOLS, Lars Lindstedt, Owner of Record: *Sandvik AB, Sandviken, Sweden*, Attorney or Agent: Harold R. Brown, III, Ex. Gp.: 3203

5,483,190, Re. S.N. 08/746,076, Nov. 6, 1996, Cl. 210/241, REINFORCED NET FOR RECOVERING DEBRIS ALONG A WATER BOTTOM, Jimmie Martin, Sr., Owner of Record: *B and J Martin, Cut Off, La.*, Attorney or Agent: Gregory C. Smith, Ex. Gp.: 1308

5,476,259, Re. S.N. 08/743,672, Nov. 6, 1996, Cl. 273/085.0CP, PARI MUTUEL ELECTRONIC AND LIVE TABLE GAMING, Gary Weingardt, Owner of Record: *Gamin Weingardt Trust, Henderson, Nev.*, Attorney or Agent: John Edward Ruethel, Ex. Gp.: 3304

5,589,751, Re. S.N. 08/700,179, Aug. 20, 1996, Cl. 403/235, SEAT ATTACHMENT APPARATUS, Jeff Keller, Owner of Record: *Inventor*, Attorney or Agent: Randall B. Bateman, Ex. Gp.: 3503

5,537,874, Re. S.N. 08/743,656, Nov. 5, 1996, Cl. 327/564, POWER SEMICONDUCTOR PACKAGING, Arthur H. Iverson, et. al., Owner of Record: *Inventor*, Attorney or Agent: James H. Phillips, Ex. Gp.: 2511

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,692,781, Reexam. No. 90/004,484, Dec. 13, 1996, Cl. 257/360, SEMICONDUCTOR DEVICE WITH ELECTROSTATIC DISCHARGE PROTECTION, Robert N. Rountree, et. al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.*, Attorney or Agent: Ira S. Matsil, Texas Instruments, Inc., Dallas, Tex., Ex. Gp.: 2503, Requester: Owner

4,867,938, Reexam. No. 90/004,482, Dec. 13, 1996, Cl. 264/297.2, SEQUENTIAL INJECTION MOLDING PROCESS, Robert D. Schad, et. al., Owner of Record: *Husky Injection Molding Systems, Ltd., Bolton, Canada*, Attorney or Agent: Robert H. Bachman, Bachman & La Pointe, New Haven, Conn., Ex. Gp.: 1307, Requester: Jens Ole Sorensen, c/o Edward W. Callan, San Diego, Calif.

4,870,105, Reexam. No. 90/004,483, Dec. 13, 1996, Cl. 514/557, PHOSPHORUS BINDER, John S. Fordtran, Owner of Record: *Braintree Laboratories, Inc., Braintree, Mass.*, Attorney or Agent: Lorusso & Loud, Boston, Mass., Ex. Gp.: 1205, Requester: Nephro Tech, Inc., c/o Mark E. Brown & Marcia J. Rodgers, Litman McMahon & Brown, Kansas City, Mo.

5,443,650, Reexam. No. 90/004,485, Dec. 13, 1996, Cl. 127/046.2, PROCESS FOR SOFTENING A SUGAR-CONTAINING AQUEOUS SOLUTION, SUCH AS SUGAR JUICE OR MOLASSES, Michael Saska, et. al., Owner of Record: *Board of Supervisors of Louisiana State Univ. and Agricultural And Mechanical College, Baton Rouge, La. & Societe Nouvelle De Recherches Et D'Applications Industrielles D'Echangeurs D'Ions Applexion, Epone, France*, Attorney or Agent: John H. Runnels, Taylor, Porter, Brooks & Phillips, Baton Rouge, La., Ex. Gp.: 1105, Requester: Amalgamated Research, Inc., c/o Robert G. Winkle, Trask Britt & Rossa, Salt Lake City, Utah

5,477,299, Reexam. No. 90/004,481, Dec. 13, 1996, Cl. 347/238, MULTIPLE BEAM SCANNING APPARATUS, LIGHT SOURCE UNIT, AND METHOD OF MANUFACTURING THE SAME, Hiroshi Iwasa, Owner of Record: *Dainippon Screen Mfg. Co. Ltd., Kyoto, Japan*, Attorney or Agent: Ostrolenk Faber Gerb & Soffen, New York, N.Y., Ex. Gp.: 2108, Requester: Anonymous

5,499,108, Reexam. No. 90/004,486, Dec. 13, 1996, Cl. 358/400, DOCUMENT-DRIVEN SCANNING INPUT DEVICE COMMUNICATING WITH A COMPUTER, Pierre Cotte, et. al., Owner of Record: *Visioneer Communications, Inc., Menlo Park, Calif.*, Attorney or Agent: Thomas A. Gallagher, San Francisco, Calif., Ex. Gp.: 2612, Requester: Winston Hsu, c/o Keith Kline, San Jose, Calif.

5,525,428, Reexam. No. 90/004,487, Dec. 18, 1996, Cl. 428/546, SUBSTRATE FOR SEMICONDUCTOR APPARATUS, Mitsuo Osada, et. al., Owner of Record: *Sumitomo Electric Industries Ltd., Osaka, Japan*, Attorney or Agent: David A. Blumenthal, Foley & Lardner, Washington, D.C., Ex. Gp.: 2204, Requester: Perry Palon, Barnes & Thornburg, Washington, D.C.,

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Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 23, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
12,857	70/012,857	12/15/1885
107,680	71/087,462	12/21/1915
330,747	71/367,505	12/17/1935
330,771	71/368,573	12/17/1935
330,772	71/368,563	12/17/1935
330,779	71/368,375	12/17/1935
330,815	71/364,580	12/17/1935
330,825	71/367,570	12/17/1935
330,829	71/345,155	12/17/1935
330,834	71/362,400	12/17/1935
330,844	71/366,062	12/17/1935
330,845	71/366,218	12/17/1935
330,849	71/360,210	12/17/1935
330,873	71/366,376	12/17/1935
330,880	71/366,771	12/17/1935
330,896	71/365,212	12/17/1935
330,913	71/367,796	12/17/1935
330,918	71/367,709	12/17/1935
330,920	71/367,708	12/17/1935
330,921	71/367,707	12/17/1935
330,922	71/367,706	12/17/1935
330,931	71/365,708	12/17/1935
617,668	71/657,616	12/20/1955
617,670	71/658,778	12/20/1955
617,671	71/658,779	12/20/1955
617,678	71/668,809	12/20/1955
617,686	71/670,440	12/20/1955
617,688	71/674,323	12/20/1955
617,694	71/680,394	12/20/1955
617,699	71/657,568	12/20/1955
617,702	71/684,930	12/20/1955
617,717	71/681,897	12/20/1955
617,719	71/682,071	12/20/1955
617,721	71/682,177	12/20/1955
617,723	71/678,967	12/20/1955
617,724	71/686,889	12/20/1955
617,726	71/687,367	12/20/1955
617,727	71/687,368	12/20/1955
617,730	71/662,878	12/20/1955
617,731	71/663,039	12/20/1955
617,732	71/669,790	12/20/1955
617,739	71/675,464	12/20/1955
617,744	71/681,528	12/20/1955
617,747	71/681,629	12/20/1955
617,748	71/681,630	12/20/1955
617,749	71/681,631	12/20/1955
617,775	71/664,301	12/20/1955
617,784	71/675,768	12/20/1955
617,796	71/680,493	12/20/1955
617,807	71/676,741	12/20/1955
617,808	71/677,667	12/20/1955
617,811	71/678,786	12/20/1955
617,831	71/666,348	12/20/1955
617,832	71/669,267	12/20/1955
617,833	71/679,070	12/20/1955
617,858	71/664,270	12/20/1955
617,860	71/670,324	12/20/1955
617,861	71/687,969	12/20/1955
617,868	71/666,279	12/20/1955
617,871	71/674,622	12/20/1955
617,878	71/681,582	12/20/1955
617,881	71/681,625	12/20/1955
617,882	71/622,667	12/20/1955
617,892	71/680,561	12/20/1955
617,898	71/680,724	12/20/1955
617,899	71/681,442	12/20/1955
617,905	71/680,565	12/20/1955
617,911	71/681,707	12/20/1955
617,921	71/683,506	12/20/1955
617,927	71/668,704	12/20/1955
617,928	71/675,830	12/20/1955
617,929	71/680,513	12/20/1955
617,933	71/652,540	12/20/1955
617,938	71/658,771	12/20/1955
617,947	71/666,565	12/20/1955
617,950	71/669,967	12/20/1955
617,951	71/670,265	12/20/1955
617,954	71/671,531	12/20/1955
617,963	71/676,590	12/20/1955
617,964	71/676,631	12/20/1955
617,967	71/677,754	12/20/1955
617,977	71/672,411	12/20/1955
617,987	71/683,420	12/20/1955
617,992	71/666,086	12/20/1955
618,001	71/680,139	12/20/1955
618,016	71/645,309	12/20/1955
618,017	71/664,767	12/20/1955
772,002	72/180,193	06/23/1964
1,027,080	73/004,616	12/16/1975
1,027,081	73/005,402	12/16/1975
1,027,082	73/005,426	12/16/1975
1,027,084	73/015,833	12/16/1975
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1,027,090	73/025,536	12/16/1975
1,027,091	73/030,901	12/16/1975
1,027,093	73/031,500	12/16/1975
1,027,094	73/032,374	12/16/1975
1,027,097	73/036,529	12/16/1975
1,027,098	73/037,275	12/16/1975
1,027,102	73/048,035	12/16/1975
1,027,110	73/050,258	12/16/1975
1,027,115	73/014,404	12/16/1975
1,027,118	73/019,302	12/16/1975
1,027,119	73/020,882	12/16/1975
1,027,120	73/021,313	12/16/1975
1,027,124	73/032,857	12/16/1975
1,027,126	73/038,269	12/16/1975
1,027,133	73/042,286	12/16/1975
1,027,135	73/044,936	12/16/1975
1,027,137	73/047,596	12/16/1975
1,027,143	73/051,940	12/16/1975
1,027,146	73/022,667	12/16/1975
1,027,148	73/027,534	12/16/1975
1,027,149	73/028,353	12/16/1975
1,027,151	73/035,352	12/16/1975
1,027,152	73/036,775	12/16/1975
1,027,156	73/038,682	12/16/1975
1,027,158	73/039,288	12/16/1975
1,027,159	73/041,372	12/16/1975
1,027,160	73/042,376	12/16/1975
1,027,162	73/043,923	12/16/1975
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1,027,179	73/052,027	12/16/1975
1,027,180	73/006,403	12/16/1975
1,027,181	73/012,850	12/16/1975
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1,027,188	73/011,908	12/16/1975
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1,027,194	73/026,717	12/16/1975
1,027,197	73/030,048	12/16/1975
1,027,199	73/031,816	12/16/1975
1,027,201	73/034,056	12/16/1975
1,027,204	73/038,573	12/16/1975
1,027,206	73/044,136	12/16/1975
1,027,209	73/049,337	12/16/1975
1,027,210	73/049,652	12/16/1975
1,027,211	73/049,726	12/16/1975
1,027,215	73/048,617	12/16/1975
1,027,216	73/048,619	12/16/1975
1,027,226	73/018,429	12/16/1975
1,027,228	73/019,675	12/16/1975
1,027,229	73/019,715	12/16/1975
1,027,236	73/026,395	12/16/1975
1,027,238	73/027,360	12/16/1975
1,027,239	73/027,455	12/16/1975
1,027,241	73/030,029	12/16/1975
1,027,242	73/030,982	12/16/1975
1,027,244	73/034,024	12/16/1975
1,027,250	73/038,172	12/16/1975
1,027,251	73/040,586	12/16/1975
1,027,257	73/045,445	12/16/1975
1,027,258	73/045,446	12/16/1975
1,027,261	73/045,825	12/16/1975
1,027,262	73/046,604	12/16/1975
1,027,263	73/046,622	12/16/1975
1,027,264	73/046,773	12/16/1975
1,027,267	73/048,716	12/16/1975
1,027,269	73/050,095	12/16/1975
1,027,274	73/001,382	12/16/1975
1,027,282	73/043,872	12/16/1975
1,027,284	73/045,439	12/16/1975
1,027,288	73/049,503	12/16/1975
1,027,290	73/049,734	12/16/1975
1,027,292	73/049,966	12/16/1975
1,027,297	73/011,211	12/16/1975
1,027,298	73/017,249	12/16/1975
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1,027,303	73/037,260	12/16/1975
1,027,304	73/037,457	12/16/1975
1,027,307	73/043,840	12/16/1975
1,027,308	73/045,382	12/16/1975
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1,027,346	73/012,100	12/16/1975
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1,027,355	73/027,109	12/16/1975
1,027,360	73/030,501	12/16/1975
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1,027,362	73/037,357	12/16/1975
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1,027,381	73/039,499	12/16/1975
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1,027,384	73/037,129	12/16/1975
1,027,385	73/042,368	12/16/1975
1,027,386	73/043,836	12/16/1975
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1,027,398	73/019,138	12/16/1975
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1,027,407	73/035,990	12/16/1975
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1,027,422	73/016,929	12/16/1975
1,027,430	73/033,716	12/16/1975
1,027,434	73/039,132	12/16/1975
1,027,437	73/043,569	12/16/1975
1,027,438	73/043,570	12/16/1975
1,027,443	73/049,767	12/16/1975
1,027,446	73/049,989	12/16/1975
1,027,452	73/008,499	12/16/1975
1,027,454	73/011,941	12/16/1975
1,027,455	73/023,714	12/16/1975
1,027,456	73/025,542	12/16/1975
1,027,459	73/030,384	12/16/1975
1,027,468	73/043,156	12/16/1975
1,027,470	73/048,500	12/16/1975
1,027,472	73/050,976	12/16/1975
1,027,475	73/017,601	12/16/1975
1,027,476	73/020,166	12/16/1975
1,027,478	73/026,021	12/16/1975
1,027,495	73/043,814	12/16/1975
1,027,496	73/043,815	12/16/1975
1,027,497	73/044,485	12/16/1975
1,027,500	73/049,449	12/16/1975
1,027,505	73/050,873	12/16/1975
1,027,507	73/051,500	12/16/1975
1,027,509	73/007,089	12/16/1975
1,027,515	73/028,179	12/16/1975
1,027,518	73/052,698	12/16/1975
1,027,520	73/040,452	12/16/1975
1,027,522	73/043,441	12/16/1975
1,027,535	73/039,246	12/16/1975
1,027,537	73/046,225	12/16/1975
1,027,538	73/046,228	12/16/1975
1,027,539	73/012,847	12/16/1975
1,027,542	73/039,906	12/16/1975
1,027,545	73/048,371	12/16/1975
1,027,550	73/021,282	12/16/1975
1,027,554	73/029,501	12/16/1975
1,027,555	73/039,095	12/16/1975
1,027,556	73/040,243	12/16/1975
1,027,558	73/049,996	12/16/1975
1,027,562	73/035,837	12/16/1975
1,027,564	73/003,126	12/16/1975
1,027,566	73/029,990	12/16/1975
1,027,568	73/035,656	12/16/1975
1,027,570	73/036,796	12/16/1975
1,027,573	73/041,136	12/16/1975
1,027,574	73/046,422	12/16/1975
1,027,579	73/018,604	12/16/1975
1,027,584	73/029,576	12/16/1975
1,027,586	73/030,432	12/16/1975
1,027,589	73/033,061	12/16/1975
1,027,592	73/035,925	12/16/1975
1,027,593	73/036,589	12/16/1975
1,027,595	73/037,416	12/16/1975
1,027,596	73/038,230	12/16/1975
1,027,598	73/038,576	12/16/1975
1,027,600	73/038,867	12/16/1975
1,027,604	73/043,607	12/16/1975
1,027,605	73/045,477	12/16/1975
1,027,609	73/051,499	12/16/1975
1,027,612	72/435,912	12/16/1975
1,027,615	72/460,393	12/16/1975
1,027,616	72/407,364	12/16/1975
1,027,619	72/440,791	12/16/1975
1,027,622	72/416,892	12/16/1975
1,027,623	72/439,278	12/16/1975
1,027,632	72/444,194	12/16/1975
1,027,635	72/462,615	12/16/1975
1,027,637	72/459,713	12/16/1975
1,027,640	72/440,758	12/16/1975
1,027,647	72/447,507	12/16/1975
1,027,649	72/446,638	12/16/1975
1,027,650	72/449,631	12/16/1975
1,027,652	72/446,580	12/16/1975
1,027,655	72/443,017	12/16/1975
1,027,656	72/407,471	12/16/1975
1,027,657	72/444,704	12/16/1975

Reg. Number	Serial Number	Reg. Date
1,027,659	72/457,083	12/16/1975
1,027,662	72/434,288	12/16/1975
1,027,663	72/456,371	12/16/1975
1,027,665	72/466,739	12/16/1975
1,027,666	72/466,740	12/16/1975
1,027,667	72/448,183	12/16/1975
1,027,671	73/030,033	12/16/1975
1,027,672	73/035,190	12/16/1975
1,027,675	73/040,293	12/16/1975
1,027,677	73/012,674	12/16/1975
1,027,678	73/021,255	12/16/1975
1,027,681	73/012,455	12/16/1975
1,027,683	73/044,064	12/16/1975
1,027,685	73/001,482	12/16/1975
1,027,689	73/050,215	12/16/1975
1,027,701	72/453,133	12/16/1975

Erratum

Patrick John Span (Reg. No. 18,530) was listed in the *Official Gazette* dated September 3, 1996, as being removed from the register. His name was published in error. We regret any inconvenience the publication may have caused.

December 19, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment & Discipline

Certificates of Correction
For the Week of January 21, 1997

B1 5,264,619	5,471,414	5,526,245	5,543,900
P. 09,340	5,474,994	5,526,405	5,544,015
P. 09,392	5,485,985	5,526,992	5,544,234
Re. 35,279	5,488,120	5,527,478	5,544,462
D. 368,590	5,492,753	5,527,581	5,544,603
D. 370,797	5,493,430	5,528,221	5,544,718
D. 372,511	5,495,088	5,530,424	5,544,820
4,346,035	5,495,769	5,530,425	5,545,716
4,617,039	5,496,345	5,530,886	5,545,957
5,073,424	5,497,568	5,531,326	5,546,072
5,112,590	5,500,415	5,531,737	5,546,167
5,142,242	5,500,827	5,532,075	5,546,170
5,150,439	5,501,564	5,532,136	5,546,674
5,171,666	5,502,865	5,532,456	5,546,808
5,175,343	5,506,118	5,532,545	5,546,947
5,219,893	5,507,492	5,533,870	5,547,659
5,229,990	5,508,014	5,533,881	5,548,330
5,239,292	5,509,620	5,534,161	5,548,568
5,252,920	5,510,807	5,534,674	5,548,701
5,276,879	5,511,199	5,534,706	5,549,437
5,289,257	5,512,091	5,535,809	5,549,711
5,293,626	5,512,430	5,535,889	5,550,686
5,344,641	5,512,648	5,536,155	5,550,711
5,350,054	5,512,702	5,536,163	5,551,758
5,364,706	5,512,793	5,536,778	5,551,964
5,377,806	5,514,638	5,537,760	5,552,218
5,387,194	5,514,748	5,538,115	5,552,433
5,397,848	5,515,107	5,538,139	5,552,616
5,402,651	5,517,229	5,538,423	5,552,963
5,410,730	5,517,399	5,538,677	5,553,384
5,414,450	5,517,783	5,538,687	5,553,392
5,417,013	5,517,828	5,538,991	5,553,459
5,422,676	5,518,138	5,540,120	5,553,874
5,436,282	5,518,549	5,540,292	5,554,190
5,436,831	5,520,009	5,540,414	5,554,630
5,452,326	5,520,092	5,540,890	5,555,311
5,454,455	5,520,392	5,542,278	5,555,423
5,462,934	5,520,625	5,542,620	5,556,343
5,463,106	5,523,126	5,543,182	5,556,642
5,467,851	5,523,948	5,543,353	5,556,689
5,468,079	5,524,871	5,543,371	5,556,718
5,470,692	5,525,336	5,543,399	5,557,025
5,471,006	5,525,634	5,543,588	5,557,255
5,557,468	5,561,126	5,564,865	5,570,428
5,557,980	5,562,336	5,565,274	5,570,605
5,558,000	5,562,488	5,565,276	5,571,305
5,558,046	5,562,712	5,566,125	5,571,437
5,558,241	5,562,828	5,566,575	5,572,393
5,558,729	5,563,225	5,566,736	5,572,850
5,558,859	5,563,776	5,566,772	5,576,786
5,559,416	5,564,063	5,567,797	5,578,257
5,559,589	5,564,293	5,568,396	5,578,532
5,559,746	5,564,385	5,569,200	5,578,834
5,560,129	5,564,481	5,570,109	
5,560,209	5,564,739	5,570,117	

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
November 25-29, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TT/AB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-25	EX	74439,739	Steiner Co., Inc.	2(d)	Refusal Affirmed		"SOFT TOUCH" [liquid soap for hands, face, and body, sold exclusively to commercial and industrial accounts; liquid soap dispensers]	"SOFT TOUCH" (and design) (shampoo); "SOFT TOUCH" (and design) (scalp conditioner and hair dress)	No
11-25	EX	74/530,908	Home Tutor, Inc.	2(d)	Refusal Affirmed		"HOME TUTOR" [computer software in the field of information designed to teach students, such as those in elementary school, how to take standardized tests]	"HOME TUTOR VIDEO" [prerecorded videocassettes to teach children reading skills]	No
11-26	EX	74/544,094	Hobart Brothers of Canada Ltd.	2(e)(1)	Refusal Affirmed		"GREEN SPOOL" [spool for feeding welding wire]		No
11-26	EX	74/557,073	On Technology Corp.	2(e)(1)	Refusal Reversed		"AUDITRACK" [computer software for monitoring activity on a computer network]		No
11-26	EX	74/457,135	Pillowtex Corp.	2(d)	Refusal Affirmed		"LIFESTYLE THROWS" [blankets]	"LIFESTYLE" [mattress mattress pad]	No
11-27	EX	74/414,612	Watkins Mfg. Corp.	2(e)(1)	Refusal Affirmed		"SPLIT-TOP" [fitted bed sets covers]		No
11-27	EX EX	74/634,307 74/634,527	ITT Sheraton Corp.	2(e)(1); requirement for disclaimer of all wording	Refusal Affirmed (in both cases)		"CUISINE OF THE AMERICAS" and "CUISINE OF THE AMERICAS" (and design) [restaurant services]		No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TT/AB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
11-27	EX	74/421,904	Federal Mortgage Insurance Corp.	2(e)(1)	Refusal Affirmed		"MULTIPLE DISTRIBUTIONS ANALYSIS" [computer software used in evaluating loss underwriting decisions based on the establishment of several probability distributions containing both dependent and independent probabilities of existing asset prices and remaining power of existing casters]		No
11-27	EX	74/415,864	Newspaper Associates of America	2(e)(1)	Refusal Affirmed		"NEWSPAPER NATIONAL NETWORK" [providing a single source advertising network from which newspaper space in all markets in which they are interested]		No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

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Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

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Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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2900 Crystal Drive
Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
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Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

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In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

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Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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Ohio	Akron - Summit County Public Library	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaguez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN R. KITTLE, Director	308-0661	06/16/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	08/23/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/31/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY	308-2351	09/29/95
STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-0196	02/13/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director		
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	02/13/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	06/22/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	03/15/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/24/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	05/29/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/31/95
DESIGN, GROUP 2900—JOHN R. KITTLE, Director	308-0661	04/18/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Director	308-1113	07/31/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	07/13/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	09/12/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/28/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/02/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of December 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/22/96	10/01/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/13/96	07/08/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/05/96	11/12/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/03/96	08/20/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/03/96	06/19/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/11/96	08/23/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/27/96	10/09/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/26/96	07/24/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/96	08/15/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	10/04/96	—0—
Renewals (All Classes)	10/11/96	—0—
Section 12(c) Publications (All Classes)	06/10/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

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REEXAMINATIONS

JANUARY 21, 1997

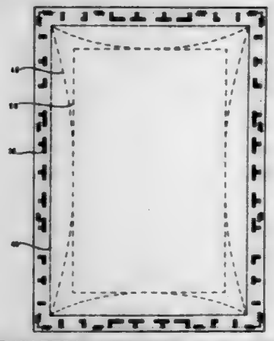
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,661,655 (3109th)

ELECTROGRAPHIC TOUCH SENSOR AND METHOD OF REDUCING BOWED EQUIPOTENTIAL FIELDS THEREIN

William A. Gibson, Knox County, and John E. Talmage, Jr., Anderson County, both of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Reexamination Request No. 90/003,924, Aug. 25, 1995.
Reexamination Certificate for Patent 4,661,655, issued Apr. 28, 1987, Ser. No. 685,348, Dec. 24, 1984.
Int. Cl.[6] G08C *21/00*; G06K *9/28*
U.S. Cl. 178—18



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

1. A position touch sensor having resistive electrodes which provides a substantially linear response over the total area of said sensor by substantially reducing the bow of equipotential lines along the edges of said sensor, said equipotential lines produced when electric fields are introduced into said sensor, which comprises:

a substrate having an upper and a lower face, said substrate defining a perimeter of a selected configuration;

a uniform resistive coating applied to said upper face of said substrate, said coating covering a substantial portion of said upper face and defining perimeter edges of said coating;

resistance elements positioned proximate each of said perimeter edges of said coating, each of said resistance elements having opposite ends joined to proximate ends of adjoining resistance elements, said resistance elements being insulated from said coating;

a plurality of electrodes positioned along a preselected symmetrical path along each perimeter edge of said coating and electrically attached to said coating, said electrodes each being electrically connected to selected positions along said resistance elements to introduce orthogonal electric fields into said coating, said electrodes having a selected spacing and an effective length along said path;

said spacing and effective length of said electrodes selected to produce a selected voltage gradient at each of said electrodes to compensate for any cummulative voltage drop along said resistance elements perpendicular to current flow through said coating during operation of said sensor when said orthogonal fields are applied to said coating whereby said bow of said equipotential lines is substantially reduced.

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REISSUES

JANUARY 21, 1997

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,424

MULTIPURPOSE BICYCLE TOOL KIT

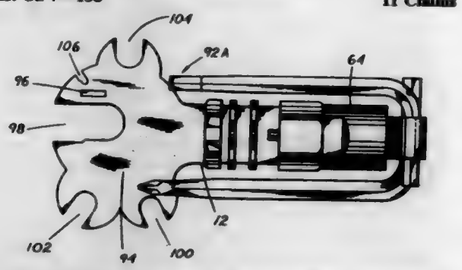
Robert L. Seals, Chico, Calif., assignor to Fiskars Inc., Madison, Wis.

Original No. 5,383,439, dated Apr. 19, 1994, Ser. No. 88,139, Jul. 8, 1993. Application for reissue Apr. 8, 1996, Ser. No. 629,989

Int. Cl.[6] B25F *1/02*

U.S. Cl. 7—138

11 Claims



6. A multipurpose bicycle tool kit comprising in combination:
an elongated handle;
a plate-like web attached to and extending from a first end of said handle, said web having a plurality of sockets therein to provide means for grasping a variety of sizes of nuts and bolt heads;
a bicycle chain link remover means attached to said handle;
at least two different allen wrenches; *and*
means for retaining said at least two different allen wrenches adjacent said chain link remover means[; at least one of said at least two different allen wrenches having a screwdriver tip.
an armature gear held to the external end of the armature shaft;
an idler gear driven by said armature gear and supported on an idler gear bearing pin;
a clutch assembly including a clutch assembly drive gear which is turned by said idler gear, said clutch assembly including [an] *a* clutch assembly outer bearing;
a pinion gear shaft, having an end, passing in an axial manner through said clutch assembly drive gear and being supported by said clutch assembly outer bearing and by an inner bearing wherein said starter motor may be affixed to many different types of engines by an adapter assembly comprising:
a face plate having:
an opening which surrounds thee clutch assembly drive gear;
an outer face [which is inboard of the clutch assembly outer bearing]; and
means for the attachment of a mounting adapter to said face plate;
a plurality of different mounting adapters, each mounting adapter including:
an adapter inner face configured to mate with the outer face of said face plate;
an adapter outer face;
a pinion gear access opening;
a clutch assembly outer bearing support recess accessible from said inner face;
means for attachment of the assembly to an engine, the configuration of said means for attachment of the assembly being dictated by the configuration of the engine to which it will be attached; and
means for affixing the mounting adapter to said face plate, said means for affixing the mounting adapter to said face plate being accessible from the exterior of the starter motor assembly.

Re. 35,425

UNIVERSAL STARTER MOTOR ASSEMBLY

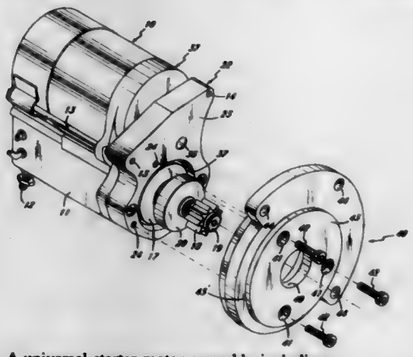
Patrick D. Isom, 19036 Sundown La., Yorba Linda, Calif. 92686; Frank T. Montgomery, and Jack F. Isom, both of La Habra, Calif., assignors to Patrick D. Isom, Yorba Linda, Calif.

Original No. 5,163,335, dated Nov. 17, 1992, Ser. No. 729,594, Jul. 15, 1991. Application for reissue Nov. 17, 1994, Ser. No. 341,673

Int. Cl.[6] F02N *15/02*; F16H *57/02*

U.S. Cl. 74—6

10 Claims



1. A universal starter motor assembly including:
a starter motor with an armature supported by an armature shaft having an external end;

Re. 35,426

FORMING CASINGLESS SAUSAGE AND THE LIKE

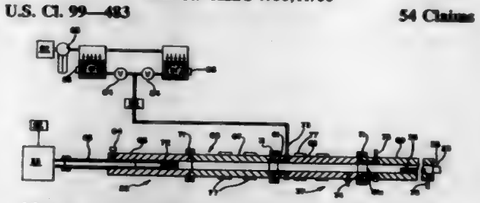
Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Original No. 5,056,425, dated Oct. 15, 1991, Ser. No. 587,839, Sep. 25, 1990. Continuation-in-part of Ser. No. 400,000, Aug. 29, 1989, Pat. No. 4,989,505, and Ser. No. 575,044, Aug. 30, 1990, Pat. No. 5,115,732. Application for reissue Oct. 13, 1993, Ser. No. 135,819

Int. Cl.[6] A22C *7/00; 11/00*

U.S. Cl. 99—483

54 Claims



27. An apparatus for forming a casingless sausage comprising:
means for stuffing and shaping flowable batter material;
treating means associated with said stuffing and shaping means, said treating means being for contacting the flowable batter material with a treatment fluid and for thus forming a proteinaceous skin of batter material from the batter material of the stuffing and shaping means;
ejecting means for removing a blank from the stuffing and shaping means, the blank having a shape determined by said stuffing and shaping means, the blank further having an external surface including the proteinaceous skin and a core portion including batter material which has not been formed into the proteinaceous skin; and

conveyor means for receiving and conveying the blank, said conveyor means including an end forming assembly for engaging batter material at at least one end of the blank and for shaping the end batter material into a generally rounded configuration to thereby form a shaped product having an end portion with a generally rounded configuration.

Re. 35,427

STERILIZABLE REFLECTIVE SURGICAL DRAPE

Robert J. Poettgen, Arlington, Tex., assignor to O.R. Concepts, Inc., Roanoke, Tex.

Original No. 4,945,924, dated Aug. 7, 1990, Ser. No. 234,314, Aug. 19, 1988. Continuation-in-part of Ser. No. 890,402, Jul. 25, 1986, Pat. No. 4,765,323. Application for reissue Feb. 20, 1991, Ser. No. 658,486

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—849 **45 Claims**



1. A sterilizable reflective surgical drape for covering at least a portion of and reducing heat loss from a surgical patient's body, comprising:

(a) **[**a**]** *an electrically* non-conductive core layer of aluminum:

(b) a first thermoplastic material layer superposed on said core layer;

(c) a second thermoplastic material layer superposed on said core layer; and

(d) a layer of flexible non-woven sterilizable material superposed on said first thermoplastic material layer.

Re. 35,428

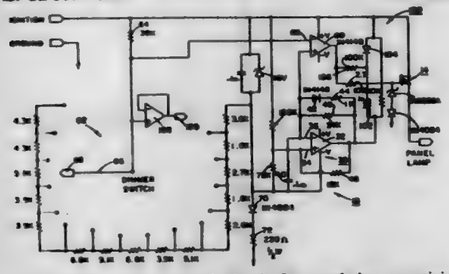
ELECTRONIC RHEOSTAT METHOD AND APPARATUS

Daniel D. Wilhelm, Columbus, Ind., assignor to Nartron Corporation, Reed City, Mich.

Original No. 4,935,641, dated Jun. 19, 1990, Ser. No. 227,151, Aug. 2, 1988. Application for reissue Jun. 19, 1992, Ser. No. 901,525

Int. Cl.[6] H02J *1/00*

U.S. Cl. 307—10.8 **28 Claims**



1. A *vehicle* power control circuit for regulating energizing power coupled to a device in a motor vehicle comprising:

(a) a **[**d.c.**]** *vehicle* voltage source for supplying energizing **[**the device**]**power;

(b) oscillator means for generating an oscillating voltage waveform that varies between a maximum and a minimum voltage;

(c) comparator means for comparing the oscillating voltage waveform from the oscillator means with a reference voltage to produce a pulse width modulated output whose duty cycle varies as a function of the reference voltage; and

(d) drive means coupled to the pulse width modulated output of the comparator means for coupling the device to the d.c. voltage source in synchronism with the pulse width modulated output;

(e) said comparator means including a reference voltage divider circuit connected to the d.c. voltage source including adjustment means to allow a user to adjust the reference voltage and **[**control**]** *to vary* the average voltage applied to the device by the drive means.

Re. 35,429

SPARK PLUG AND THE METHOD OF MANUFACTURING THE SAME

Ryoji Kondo, Okazaki, Japan, assignor to Nippendenso Co., Ltd., Kariya, Japan

Original No. 4,893,051, dated Jan. 9, 1990, Ser. No. 712,917, Mar. 18, 1985. Continuation of Ser. No. 372,148, Apr. 27, 1982, abandoned. Application for reissue Jun. 9, 1993, Ser. No. 73,706

Claims priority, application Japan, May 7, 1981, 56-66725; May 7, 1981, 56-68758

Int. Cl.[6] H01J *13/20*

U.S. Cl. 313—141 **15 Claims**



12. A spark plug according to claim 1, wherein a diameter of the top end surface of the center electrode is larger than the diameter of the noble metal tip so that after the welding step, the noble metal tip is buried inside the flat top end surface of the center electrode.

Re. 35,430

SEMICONDUCTOR MEMORY DEVICE

Toshio Yamada, Osaka, and Michihiro Inoue, Nara-ken, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

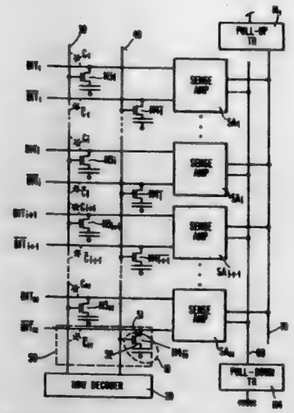
Original No. 5,151,878, dated Sep. 29, 1992, Ser. No. 787,859, Nov. 5, 1991. Continuation of Ser. No. 463,877, Jan. 10, 1990, Pat. No. 5,128,896. Application for reissue Sep. 27, 1994, Ser. No. 312,589

Claims priority, application Japan, Jan. 12, 1989, 1-5239

Int. Cl.[6] G11C *7/00;13/00*

U.S. Cl. 365—189.01 **4 Claims**

1. A semiconductor device comprising:



a plurality of memory cells capable of being selected for use or remaining unselected, at least one unselected memory cell **[**having a logical value of "0" and**]** having a first signal voltage potential *corresponding to a first logical value*;

at least one selected memory cell **[**having a logical value of "1" and**]** having a second signal voltage potential *corresponding to a second logical value*;

a first **[**set of reading and restoring**]** word **[**lines**]** *line* connected to selected memory cells, said first **[**set of**]** word **[**lines**]** *line* having a signal voltage potential which is higher than said second signal voltage potential by a first predetermined value; and

a second **[**set of**]** word **[**lines**]** *line* connected to unselected memory cells, said second **[**set of**]** word **[**lines**]** *line* having a signal voltage potential which is **[**higher**]** *lower* than said first signal voltage potential by a second and different predetermined value.

Re. 35,431

Patent Not Issued For This Number

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PLANT PATENTS

GRANTED JANUARY 21, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,783

CHERRY TREE 'EARLISWEET'

Chris F. Zaiger, 929 Grimes Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 4005 California Ave., all of Modesto, Calif. 95358

Filed Oct. 31, 1995, Ser. No. 550,600
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—37 1 Claim

1. A new and distinct variety of cherry tree, substantially as illustrated and described, characterized by its large size; vigorous, upright growth and being a regular and productive bearer of medium size, early maturing fruit with an attractive red skin color; the fruit is further characterized by being relatively uniform in ripening, having good flavor and eating quality, and ripening approximately 23 days before its parent Stella Cherry (non-patented).

9,784

"AUGUST WHITE" PEACH TREE

Richard J. Marshall, 6321 Ave. 376, Dinuba, Calif. 93618

Filed Jan. 23, 1995, Ser. No. 399,994
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—42.1 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described which is somewhat remotely similar to the "Champagne" peach tree (U.S. Pat. No. P.P. 4,865) of which it is a sport, but from which it is distinguished by producing white flesh fruit which are late ripening for commercial harvesting and shipment approximately August 20 to August 31, or about eight (8) days to two (2) weeks after the "Champagne" peach tree, in the San Joaquin Valley of central California and which have a sweeter flavor and a greater flesh coloration when compared therewith.

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PATENTS

GRANTED January 21, 1997

ERRATA

For CLASS	See PATENT NO.
228–001	5,595,328
228–009	5,595,329
228–102	5,595,330
473–453	5,595,384
473–295	5,595,385
463–047	5,595,386
473–465	5,595,388
463–031	5,595,389
030–169	5,595,424
473–350	5,595,552
152–209	5,595,619
510–299	5,595,681
530–350	5,596,071
530–351	5,596,072
424–001	5,596,077
396–207	5,596,381
396–429	5,596,382
396–315	5,596,383
396–413	5,596,384
396–006	5,596,385
396–110	5,596,386
396–050	5,596,387
399–111	5,596,388
399–016	5,596,389
399–008	5,596,390
399–045	5,596,391
399–098	5,596,392
399–174	5,596,393
399–186	5,596,394
399–168	5,596,395
399–237	5,596,396
399–335	5,596,397
399–346	5,596,398
399–045	5,596,399
399–045	5,596,400
386–017	5,596,417

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ERRATA–CONTINUED

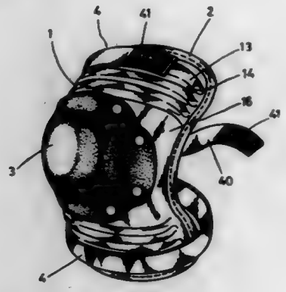
For CLASS	See PATENT NO.
386–009	5,596,418
386–009	5,596,418
386–052	5,596,419
386–110	5,596,420
386–126	5,596,421
386–126	5,596,422
349–067	5,596,429
349–074	5,596,430
349–032	5,596,431
349–051	5,596,432
349–123	5,596,435
349–132	5,596,435
320–005	5,596,567
395–678	5,596,579

PATENTS

GRANTED JANUARY 21, 1997

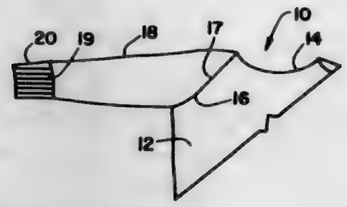
GENERAL AND MECHANICAL

5,594,954
KNEE-PAD AND ELBOW-PAD
Cheng-Yen Huang, P.O. Box 90, Tainan 704, Taiwan
Filed Mar. 11, 1996, Ser. No. 612,794
Int. Cl.[6] A41D *13/00;13/08*
U.S. Cl. 2—24 **6 Claims**



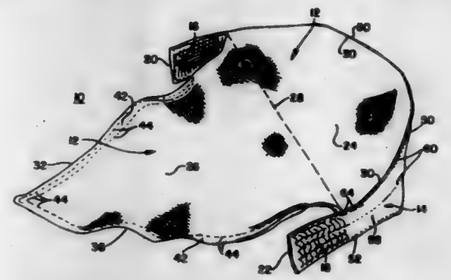
1. A knee-pad or an elbow-pad comprising:
a body with its periphery sewn with a protective rim;
a protective plate provided in an intermediate portion of said body between an upper portion and a lower portion thereof, covering the knee of a user;
a plurality of binding means sewn on an upper end and a lower end of said body; and
characterized by said body made integral of a layer of lining, a lay of buffer, and a surface cloth by means of thermal pressing process, said body curving from the middle to the upper portion, the lower portion, to the right side and to the left side, by a plurality of lateral ribs spaced apart equidistantly in the upper and the lower portion, by grooves formed between every two of said lateral ribs in the upper portion and the lower portion of said body, by each said rib having an elastic means wrapped inside, by said body having a bowl-shaped protective portion formed in the intermediate portion, and by said body easily being bent for a large angle.

5,594,955
SURGICAL GOWN SLEEVE
Jay R. Sommers, Marietta, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 12, 1994, Ser. No. 353,856
Int. Cl.[6] A41B *7/00;* **A41D** *13/12*
U.S. Cl. 2—114 **28 Claims**



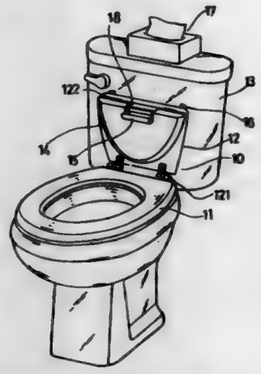
10. A surgical gown, comprising:
a sleeve and a cuff secured to the sleeve;
wherein the sleeve is formed from a fibrous web secured to a liquid impervious film; and
wherein the cuff is formed from a sheetlike laminate material including an elastic layer captured between a liquid retentive layer and a liquid impervious layer.

5,594,956
HEAD BANDANNA HAVING A HEADBAND WITH CLOSURE TABS
Heriberto M. Barrientos, Elizabeth, N.J., assignor to Rags N' Things Inc., Linden, N.J.
Filed Apr. 26, 1995, Ser. No. 429,333
Int. Cl.[6] A42B *1/06*
U.S. Cl. 2—207 **25 Claims**



1. A head bandanna to be worn on the head area of a wearer for protecting and covering the head area, which is used in sporting, recreational and work activities, comprising:
a) a head covering made of fabric having a front and a rear portion, wherein said front portion has a front curved edge substantially in the shape of a semicircle;
b) a curved headband made of absorbent material and having the shape of a longitudinal strip of substantially uniform width and being integrally connected to said front curved edge of said front portion of said head covering at a 90° angle and facing downwardly relative to said head covering; and
c) closure means connected to opposite ends of said headband at the rear of said headband for adjusting said head bandanna on a wearer's head area in a conforming and secure fit.

5,594,957
FOLDABLE TOILET SEAT COVER
Shiu F. Shih, 7F-1, No. 303, Chung Ming South Road, Taichung, Taiwan
Filed Jun. 20, 1996, Ser. No. 665,676
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—242.1 **2 Claims**



1. A foldable toilet seat cover comprising:

a first section rotatable between a horizontal position above and parallel to a toilet seat, and a vertical position proximate a toilet tank, said first section, when in said vertical position, having a lower portion adapted to be pivotally coupled to a toilet seat seat hinge axis, an upper portion, and a rear portion which faces said toilet tank, said rear portion having a flange connected thereto and extending rearwardly therefrom along peripheral edges of said first section, said flange being curved so as to hold newspaper and books therein and against said rear portion when said first section is in said vertical position; and,

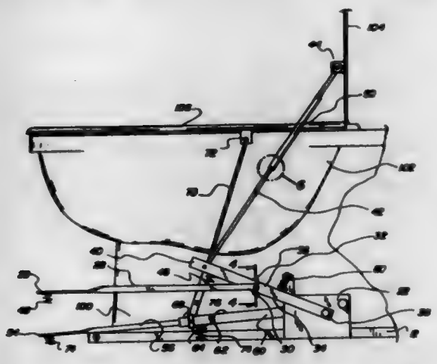
a second section, rotatable between a horizontal position which is coextensive with said first section and a vertical position which is parallel to and adjacent said first section, said second section, when in said vertical position, having an upper portion connected to said upper portion of said first section by a pivot pin, said second section further having a handle therein for folding and unfolding said toilet seat cover.

5,594,958

HANDS-OFF TOILET SEAT LIFTING APPARATUS

Lanh N. Nguyen, 14001 Peltier Dr. #101, New Orleans, La. 70129

Filed Jul. 14, 1995, Ser. No. 502,478
Int. Cl.[6] A47K *13/10*
U.S. Cl. 4—246.5 **3 Claims**



1. A hands-free toilet seat lifting apparatus for raising and lowering a toilet cover of an existing toilet without using hands comprising, in combination:

a mounting bracket adapted for removable securement around a base of the existing toilet, the mounting bracket having a securement block secured to an outer surface thereof;

a first foot pedal having a rod extending outwardly therefrom, the rod having an end portion pivotally coupled to an intermediate portion of an arm, a stop mechanism coupled around the pivotally coupled rod and arm, the arm having a first end and a second end, the first end pivotally coupled to an outer surface of the securement block of the mounting bracket, the second end of the arm having an adjustable shaft extending upwardly therefrom, the adjustable shaft having an end portion securable to the toilet cover of the existing toilet, the first foot pedal having a spring secured to a bottom surface thereof, the first end of the arm having a spring secured to a bottom surface thereof;

a second foot pedal having a rod extending outwardly therefrom, the rod having an end portion pivotally coupled to an intermediate portion of an arm, a stop mechanism coupled around the pivotally coupled rod and arm, the arm having a first end and a second end, the first end pivotally coupled to an outer surface of the securement block of the mounting bracket, the second end of the arm having an adjustable shaft extending upwardly therefrom, the adjustable shaft having an end portion securable to a toilet seat of the existing toilet, the second foot pedal having a spring secured to a bottom surface thereof, the first end of the arm having a spring secured to a bottom surface thereof;

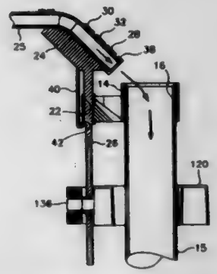
a spring stop mechanism secured to an upper surface of the securement block, the spring stop mechanism preventing the first foot pedal and the second foot pedal from extending too far.

5,594,959

DUAL-FLUSH REFILL APPARATUS

David Nichols-Roy, and Dennis D. Woods, both of Escondido, Calif., assignors to Hunter Plumbing Products, San Marcos, Calif.

Continuation-in-part of Ser. No. 230,088, Apr. 20, 1994, Pat. No. 5,452,482. This application Jun. 7, 1995, Ser. No. 476,422
Int. Cl.[6] F16K *31/18*
U.S. Cl. 4—415 **12 Claims**



1. An apparatus for diverting a flow from a refill tube in a flush tank, comprising:

an annular float for mounting on an overflow tube for vertical reciprocable movement with water level in the flush tank, said annular float being formed with a central throughbore for receiving said overflow tube, and said float including a plurality of standoff ribs extending inward from an inner wall of said throughbore for engagement with said overflow tube;

means for mounting on an upper end of the overflow tube for limiting upward movement of said float; and

attachment means on said float for directly connecting to and supporting the outlet end of the refill tube so that vertical movement of said float responsive to water level in the flush tank moves said outlet end of said refill tube vertically for diverting water from the outlet end of the overflow tube into the flush tank during a first portion of a refill cycle and moves said outlet end of said refill tube vertically for directing water into the upper end of the overflow tube during a second portion of a refill cycle.

5,594,960

SWIMMING POOL COVER WITH DRAINAGE AND FILTER

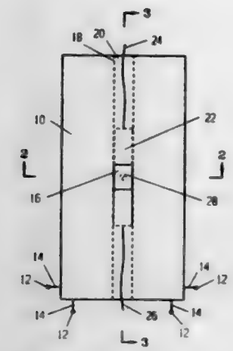
Robert Stern, 1746 Lakewood Rd., Toms River, N.J. 08755

Filed Dec. 18, 1995, Ser. No. 575,736
Int. Cl.[6] E04H *4/10*
U.S. Cl. 4—498 **18 Claims**

1. A cover for a water pool comprising:

a sheet of flexible, waterproof material having a drainage opening positioned therein, said sheet of flexible, waterproof material adapted to be secured about the periphery of said water pool;

a sleeve defining a passageway secured on said sheet of flexible, waterproof material, said sleeve defining a passageway in alignment with and intersecting said drainage opening;



a filter means slidably positionable in said sleeve defining said passageway, said filter means having a planar area dimension greater than the planar area dimension of said drainage opening, said filter means permitting the passage of water therethrough, said filter means preventing the passage of particulate matter therethrough by accumulation of said particulate matter in said filter means;

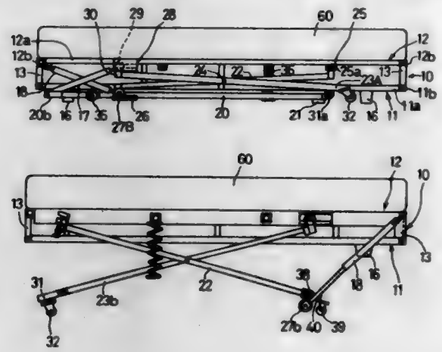
a means for slidably positioning said filter means within said sleeve in registration with said drainage opening; said means for slidably positioning comprising a pair of opposing tether lines secured to opposing sides of said filter means and extending outwardly in said sleeve defining said passageway to a periphery of said sheet.

5,594,961

ADJUSTABLE HEIGHT BED

Shinji Yokoi; Shinji Michida, both of Okazaki; Yoshinori Mori, Chiryu, and Tsuyoshi Nishidera, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 18, 1994, Ser. No. 276,802
Claims priority, application Japan, Jul. 16, 1993, 5-177079; Oct. 5, 1993, 5-249514; Jan. 28, 1994, 6-008767
Int. Cl.[6] A47C *31/00*; A61G *13/06*
U.S. Cl. 5—11 **5 Claims**



1. A bed comprising:

a bed body including a frame and a main leg member fixed to one of longitudinal opposite sides of said frame;

a pair of rotary members having opposite ends, one of said rotary members held rotatably to one of longitudinal opposite sides of said bed body at one of the opposite ends, the other one of said rotary members held slidably and rotatably to the other longitudinal opposite sides of said bed body at one of opposite ends;

a fulcrum member supporting said rotary members relatively rotatably at a middle of said rotary members; and

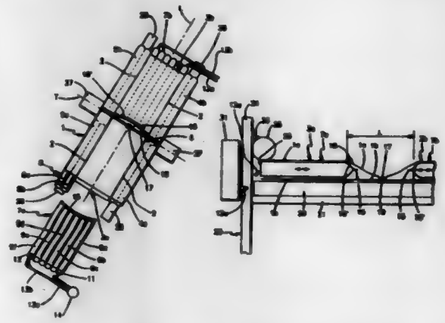
a pair of casters held to said other ends of said rotary members.

5,594,962

FLUID FILLED MEDICAL MATTRESS

Joseph Bogdanoff, 22 boulevard Meynial, 47200 Marmande, France

PCT No. PCT/FR93/00927, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO95/08285, PCT Pub. Date Mar. 30, 1995
PCT Filed Sep. 23, 1993, Ser. No. 446,604
Int. Cl.[6] A47C *27/10*; A61G *7/057*; *7/02*
U.S. Cl. 5—422 **7 Claims**



1. Medical mattress comprising:

a flexible rectangular tubular envelope having two open ends, and divided into a central compartment extending along a longitudinal axis of the envelope, said central compartment being open at both ends and being flanked, on either side, by a relatively narrow lateral compartment forming a border also open at both ends;

two sets of foam elements adapted to be inserted in the lateral compartments;

two small water mattresses having edges and adapted to be inserted into said central compartment, said foam elements and said water mattresses being disposed in the envelope in a substantially symmetrical manner with respect to a central transverse axis of said envelope, and said edges having a concavity which forms in a central zone, and transversely to, said medical mattress, a basin;

an opening formed in an upper wall of the envelope in a central part of said basin, connected to at least one flexible conduit disposed within the envelope and emerging outside the mattress for discharging body waste and soiled fluids; and

a supply device for supplying water to at least one of the two water mattresses at a regulated temperature and pressure.

5,594,963

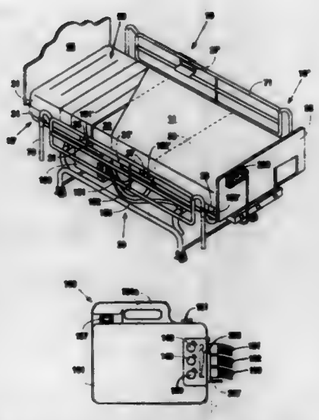
PRESSURE RELIEF AIR MATTRESS AND RELATED SYSTEM

Steven A. Berkowitz, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 309,557, Sep. 28, 1994, abandoned, which is a continuation of Ser. No. 932,873, Aug. 20, 1992, abandoned. This application Mar. 11, 1996, Ser. No. 608,996
Int. Cl.[6] A61G *7/04*
U.S. Cl. 5—713 **5 Claims**

1. An inflatable mattress system comprising:

a first inflatable air cushion positioned to support the seat portion of a patient;



a second inflatable air cushion positioned to support another portion of the patient; and

a source of pressurized gas in fluid communication with an inlet opening in the first air cushion and an inlet opening in the second air cushion for inflating the same;

said source being in unrestricted fluid communication with the inlet opening in the first air cushion;

said source comprising at least a first and a second control for controlling the flow of air to the first and second air cushions;

said first control being operable to adjust the output of a blower integral with said source, the outlet of which is in fluid communication with each of the said first and second cushions for inflating the same; and

said second control being an adjustable flow restricting device for controlling the flow from the blower unit to the second inflatable air cushion.

5,594,964

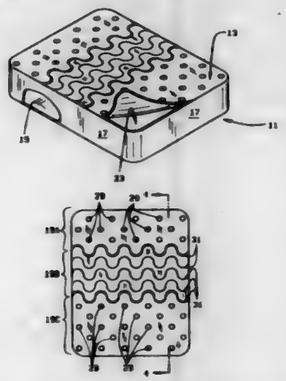
WATERBED MATTRESS COVER AND METHOD OF MAKING SAME

Dennis Boyd, Chesterfield, Mo.; Jeffrey J. Lachonok, Rancho Cucamonga, and Alfredo D. Mayen, Torrance, both of Calif., assignors to Boyd Flotation, Inc., Maryland Heights, Mo.

Filed Dec. 28, 1994, Ser. No. 365,015

Int. Cl.[6] A47C 27/08

U.S. Cl. 5—502 **12 Claims**



1. A cover for a waterbed mattress comprising:

a top layer suitably sized to cover a waterbed mattress, said top layer having a longitudinal axis;

an inner backing layer of substantially the same overall outline as the top layer and being disposed thereunder so that the top layer lies over the backing layer;

a bottom spaced away from the top layer and the inner backing layer so as to provide a cavity for a water mattress, said bottom being disposed below said cavity and said inner backing layer being disposed above said cavity;

said top layer being divided into at least three sections, each section extending substantially across the top layer transverse to the longitudinal axis, at least a first of said sections being fixedly secured to the inner backing layer by stitches disposed in a first stitching pattern, and at least a second of said sections being fixedly secured to the inner backing layer by stitches disposed in a second stitching pattern;

said bottom being substantially free of any stitching in either the first stitching pattern or the second stitching pattern;

wherein the second stitching pattern is a tack and jump stitching pattern.

5,594,965

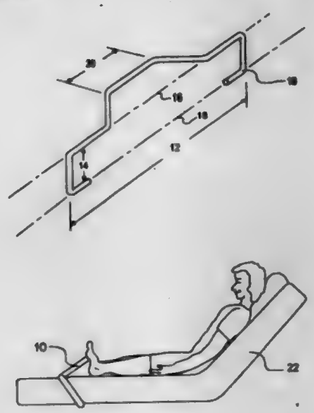
HOSPITAL BED ADJUSTABLE FOOT STOP

Teddy L. Vanzant, 2291 Indian Horse Dr., Norco, Calif. 91760

Filed Oct. 16, 1995, Ser. No. 543,294

Int. Cl.[6] A47C 20/02

U.S. Cl. 5—651 **3 Claims**



1. A foot stop for a user resting on a mattress, the foot stop adapted to be removably attachable to said mattress, comprising a unitary, generally rigid structural member incorporating opposing U shaped sections at each end that have inner dimensions essentially equal to the thickness of the mattress, with the upper arms of the U shaped sections adapted to overlie and contact the top portion of the mattress, the lower arms of the U shaped section adapted to underlie and contact at least a portion of the bottom of the mattress, the upper arms of the U shaped sections that are adapted to overlie the top portion of the mattress having an offset foot rest area generally overlying a central area of the mattress, and adapted to provide a support for the soles of the feet of a user.

5,594,966

KNIFE WITH BLADE SHARPENER STORED IN KNIFE HANDLE

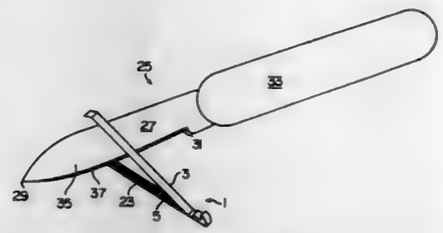
Paul D. Goldman, Marlboro, Mass., assignor to Saint-Gobain/Norton Industrial Ceramics Corporation, Worcester, Mass.

Filed Nov. 10, 1993, Ser. No. 150,630

Int. Cl.[6] B26B 11/00

U.S. Cl. 7—120 **14 Claims**

1. A knife blade sharpener, comprising



an elongated appendage adapted to be removably secured to a knife handle, said removable appendage comprising a V-shaped tweezers having a pair of pivotally attached resilient arms with working surfaces at the non-attached end of the arms, at least one of said arms carrying an abrasive layer on its surface.

5,594,967

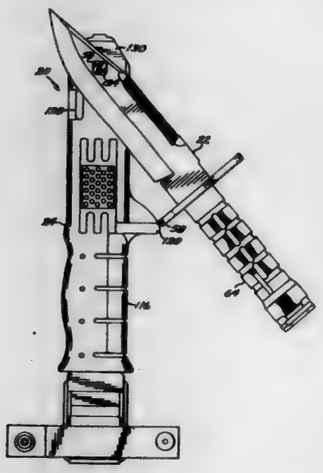
BAYONET SYSTEM INCLUDING BAYONET WITH INTEGRAL TANG AND SCABBARD WITH HAND PROTECTION

Randolph J. Morton, Coronado; Brett Seber; Curtis English, both of Escondido, and Mark DeFelice, Santee, all of Calif., assignors to Buck Knives, Inc., El Cajon, Calif.

Filed Jan. 12, 1995, Ser. No. 372,179

Int. Cl.[6] B25B 1/22

U.S. Cl. 7—134 **14 Claims**



1. A bayonet system comprising

a bayonet including:

a one-piece, integral blade-and-tang unit having a blade, an elongated tang having a tang axis, and a blade shoulder between the blade and the tang,

a guard having a guard opening therein sized to fit over that portion of the tang adjacent to the blade shoulder,

a plastic handle joined to a portion of the tang, the tang and the handle together comprising a handle assembly, the plastic handle having a length less than that of the tang such that a butt end of the tang protrudes from a butt end of the plastic handle,

a latch plate assembly sized to register with the butt end of the handle assembly, the latch plate assembly including a latch plate having a latch-plate tang bore sized to fit over the butt end of the tang, and

means for attaching the latch plate to the butt end of the handle assembly, wherein the means for attaching includes

a handle pin bore extending into the handle from the butt end of the handle and lying parallel to the tang axis,

a latch-plate pin bore extending through the latch plate assembly parallel to the tang axis and aligned with the handle pin bore, and

a latch-plate attachment pin sized to extend through the aligned pair of latch-plate pin bore and handle pin bore with a press fit; and

a scabbard in which the bayonet is received for storage.

5,594,968

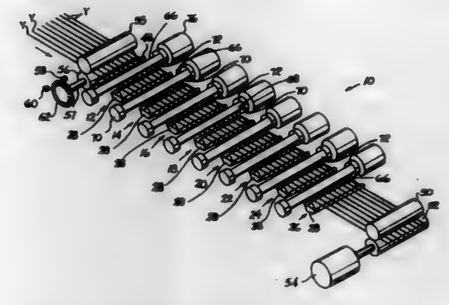
METHOD AND APPARATUS FOR SPACE DYEING YARN

Jack G. Haselwander, Chattanooga, Tenn., and Kurt W. Niederer, Charlotte, N.C., assignors to Belmont Textile Machinery Company, Mt. Holly, N.C.

Filed Jul. 24, 1995, Ser. No. 506,077

Int. Cl.[6] D06B 1/14; 11/00

U.S. Cl. 8—149 **12 Claims**



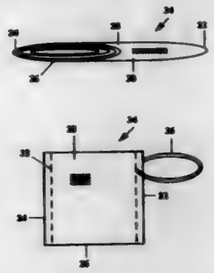
1. Apparatus for space dyeing yarn comprising, a plurality of spaced apart dyeing stations, means for feeding said yarn through said stations in seriatim in one direction, each dyeing station having dye applying means for applying dye of a selected color onto said yarn, a rotatable pattern member disposed at each dyeing station for selectively permitting and preventing dye to be applied to said yarn by the respective dye applying means, a motor for rotating each pattern member selectively, and control means for selectively starting and stopping rotation of each motor in timed relationship with the movement of the yarn in accordance with a pattern to move the pattern member associated therewith to positions which permit and prevent dyeing at each station, whereby dye of the selected colors may be applied to selective lengths of said yarn at each station.

7. In the method of space dyeing moving yarn by apparatus having a plurality of rotatable pattern members, each pattern member permitting a dye to be applied to the yarn in seriatim only when disposed in a selected angular disposition relative to said yarn, each pattern member being associated with a different color dye, the improvement comprising varying the speed of each member to control the angle through which each of the members rotates during repetitive time periods so that the disposition required to permit dyeing of yarn by each color may be obtained at selected times, and coordinating the location along the yarn at which each member permits dye to be applied, whereby each different color dye may be applied along different amounts of the yarn and at selected locations.

5,594,969

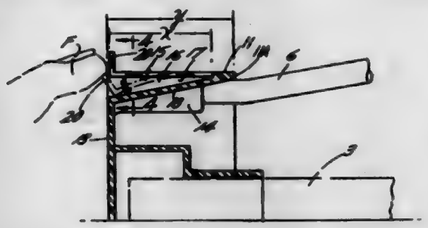
Patent Not Issued For This Number

5,594,970
PERSONAL CLEANSING IMPLEMENT USING KNITTED TUBING
W. Dennis Benge, Covington, Ky., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 31, 1995, Ser. No. 381,263
Int. Cl.[6] A47L *17/08*; D04B *21/16*
U.S. Cl. 15—208 9 Claims



1. A personal cleansing implement comprising a substantially rectangular hydrophobic batt, said batt being a piece of knitted tubing made from extruded plastic monofilaments, said monofilaments having circular cross-sections in the range of 0.003 inches to 0.015 inches diameter, said piece of knitted tubing having a longitudinal axis, said piece of knitted tubing being inverted upon itself along said longitudinal axis to form a plurality of concentric layers of tubing, each of said layers having a similar length and substantially overlapping all other layers, said batt having a top surface, a bottom surface and two ends perpendicular to said longitudinal axis, said batt being substantially flattened perpendicular to said longitudinal axis, and said top surface and said bottom surface being bonded together at said two ends by a bonding means to maintain said bait substantially flattened.

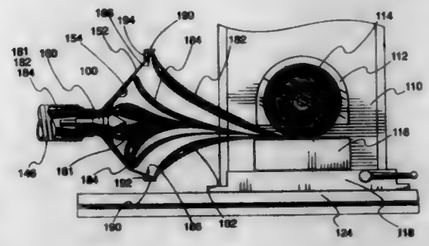
5,594,971
PAINT ROLLER FRAME ASSEMBLY WITH LOCK EQUIPPED END MEMBER
James A. Nelson, 415 Highway 101 South, Crescent City, Calif. 95931
Filed Aug. 4, 1995, Ser. No. 511,106
Int. Cl.[6] B05C *17/02*
U.S. Cl. 15—230.11 2 Claims



1. In a paint roller assembly having a spindle and inner and outer bearing members on said spindle for lengthwise reception of a tubular paint roller, said outer bearing member having an outer end wall and an annular side wall terminating at an inner edge, the improvement comprising a flexible arm having a proximal end integral with said side wall adjacent said inner edge and having a distal end adjacent said outer end wall including a stop normally disposed in a radially projecting position relative said annular side wall to confine a tubular roller against lengthwise movement, said flexible arm permitting radial displacement of the stop away from the roller to permit roller passage past said stop,

a paint barrier proximate said arm and including sidewalls and an interconnecting wall both integral with said end wall and said annular side wall, said barrier defining a channel to receive said flexible arm when displaced radially inward of the annular side wall during positioning of the paint roller.

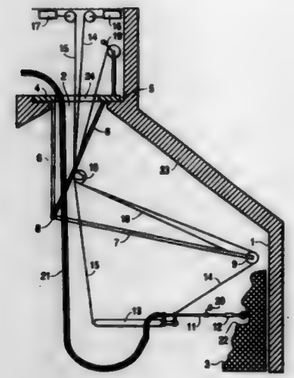
5,594,972
DUST COLLECTOR
Edward P. Iversen, 14 Woodview La., Algonquin, Ill. 60102
Filed Aug. 15, 1995, Ser. No. 515,511
Int. Cl.[6] B24B *55/06*; A47L *5/38*
U.S. Cl. 15—301 20 Claims



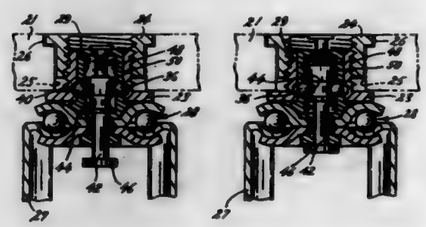
1. A dust collector for controlling a flow of residue from a machining process including a funnel assembly mounted on a flexible arm, the dust collector further comprising:
a) a vacuum assisting means directing the flow of residue into the funnel assembly;
b) the funnel assembly including a wide mouth and a narrow base;
c) the vacuum assisting means being connected to the narrow base;
d) the flexible arm positioning the dust collector to receive the flow of residue;
e) the wide mouth being formed by a funnel housing;
f) a channel means on the wide mouth forming a channel around the funnel assembly;
g) a slidably mounted guide means being mounted within the funnel assembly;
h) the slidably mounted guide means directing the flow of residue within the funnel assembly; and
i) the narrow base further including an exhaust channel for the flow of residue, thereby permitting the flow of residue therethrough to the vacuum assisting means.

5,594,973
DEVICE FOR CLEANING THE WALL OF A SILO
Joseph Brunsteers, St.-Job-In't-Goor, and Jan Claes, Duffel, both of Belgium, assignors to Solvay (Société Anonyme), Brussels, Belgium
PCT No. PCT/EP94/00862, § 371 Date Aug. 22, 1995, § 102(e) Date Aug. 22, 1995, PCT Pub. No. WO94/15728, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 7, 1994, Ser. No. 481,485
Claims priority, application Belgium, Jan. 12, 1993, 09300025
Int. Cl.[6] B08B *9/08*; *5/02*
U.S. Cl. 15—304 9 Claims

1. A device for cleaning the wall (1, 23) of a silo, comprising a compressed-air gun (12) which can move inside the silo, characterized in that the gun (12) is suspended from two cables (14, 15) which are fixed respectively on either side of its centre of gravity and which are connected respectively to two separate winches (16, 17), bearing respectively on two pulleys (9, 10) fastened to a frame (6) which is arranged inside the silo and which is fixed to a rotary plate (4) which can move on a circular track (5) above an opening (2) in the silo.

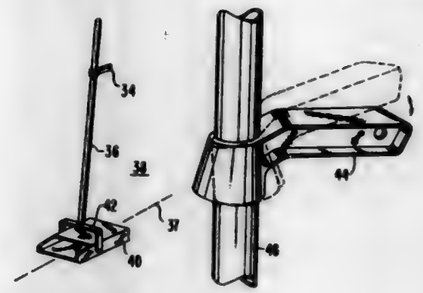


5,594,974
RELEASABLE CASTER
James Wattron, Gurnee, and Walter E. Lisowski, Chicago, both of Ill., assignors to James P. Wattron, Gurnee, Ill.
Continuation-in-part of Ser. No. 12,728, Feb. 3, 1993, Pat. No. 5,347,681. This application Aug. 19, 1994, Ser. No. 292,860
Int. Cl.[6] A63C *17/01*; B60B *33/00*
U.S. Cl. 16—30 9 Claims



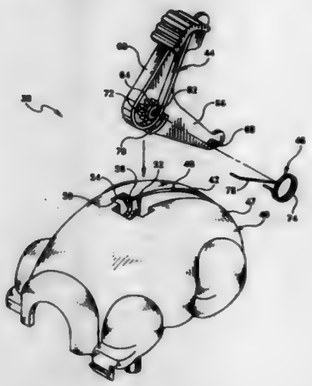
1. A releasable caster for use with a structure having a bottom wall portion, the bottom wall portion having a hole therein, the releasable caster comprising:
caster means including a wheel, a support yoke, a swivel, and a mounting stem, the mounting stem having a generally axial orifice formed therein and a plurality of radial openings formed therethrough;
a mounting shell adapted to be mounted in the hole of the bottom wall portion of the structure, the mounting shell having an axial opening which releasibly receives the mounting stem, the axial opening having an inner wall, the inner wall having an annular abutment formed therein;
radially moveable balls carried by the radial openings of the mounting stem and positioned opposite the abutment of the inner wall, the balls movable between a first radial position wherein the balls engage the abutment of the inner wall and prevent the mounting stem from being withdrawn from the axial opening of the mounting shell and a second radial position wherein the balls are spaced apart from the abutment of the inner wall and permit the mounting stem to be withdrawn from the axial opening of the mounting shell; and
manually operable means arranged in the axial orifice of the mounting stem for moving the balls between the first and second radial positions.

5,594,975
ADJUSTABLE TOOL HANDLE
Jack P. Christen, Wesley Chapel, Fla., assignor to White Mop Wringer Company, Tampa, Fla.
Filed Feb. 13, 1995, Ser. No. 388,192
Int. Cl.[6] A47L *13/52*; B25G *1/00*; *3/00*
U.S. Cl. 16—114 R 20 Claims



1. A handle for a cleaning implement having a shaft with a longitudinal axis, comprising:
an elongated handle body having portions at one end forming a cavity with first and second surface openings for receiving said shaft, said cavity being defined by first and second overlapping bores with respective first and second longitudinal axes which are inclined toward one another, said first bore defining a first cavity surface and said second bore defining a second cavity surface, said handle being movable between:
a locked position in which said longitudinal axis of said shaft is aligned with said first longitudinal axis and said first cavity surface frictionally holds said handle in place relative to said shaft; and
an unlocked position in which said longitudinal axis of said shaft is aligned with said second longitudinal axis and said second cavity surface is spaced from said shaft so that said handle moves freely relative to said shaft.

5,594,976
PIVOT ASSEMBLY
Nikolay Shkolnik; Baruch Kantor, both of West Hartford, Conn., and Domingos Joaquim, Springfield, Mass., assignors to Hasbro, Inc., Pawtucket, R.I.
Filed Oct. 24, 1994, Ser. No. 327,722
Int. Cl.[6] E05D *5/12*; *7/10*
U.S. Cl. 16—380 19 Claims



1. A pivot assembly comprising:

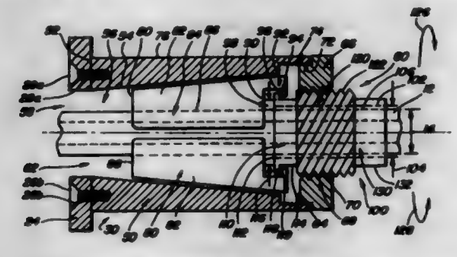
a. a housing including an outer wall having a pivot opening therein;
b. a pair of spaced substantially parallel mounting walls extending inwardly in said housing adjacent spaced opposite side extremities of said pivot opening, said mounting walls having substantially parallel notches therein which open outwardly through said pivot opening;
c. a pivot arm including an elongated main arm portion and a substantially transverse pivot shaft portion on said main arm portion, said pivot shaft portion being received in said notches for pivotably mounting said pivot arm for movement between first and second oppositely pivoted positions;
d. first retaining means on at least one of said mounting walls spaced inwardly in said housing on the opposite side of the notches in the mounting walls thereof from said pivot opening; and
e. second retaining means on said pivot member spaced from said shaft portion and engaging said first retaining means to prevent removal of said shaft portion from said notches through said pivot opening when said pivot arm is in an intermediate pivoted position between said first and second pivoted positions.

5,594,977

SMOOTH ROD-GRIPPING APPARATUS

James P. McCallion, 23352 Saint Elena, Mission Viejo, Calif. 92691

Filed Dec. 30, 1993, Ser. No. 175,731
Int. Cl.[6] F16G 11/04
U.S. Cl. 24—136 B 19 Claims



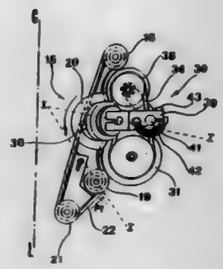
1. An apparatus for gripping a smooth rod characterized by a rod diameter, the apparatus, when secured to the rod, preventing formwork, fitting about the rod and contacting the apparatus, from sliding along the rod toward the apparatus, the apparatus comprising:
a housing with a tapered inner wall defining a chamber within the housing, the chamber being accessible on opposing ends of the housing through a front aperture and a rear aperture, the tapered inner wall defining the chamber such that the chamber increasingly narrows toward a front portion of the chamber adjoining the front aperture and increasingly widens toward a back portion of the chamber adjoining the rear aperture, the rear aperture being a cylindrical bore with a helical groove, the front aperture, the chamber, and the rear aperture being sized to permit passage of the rod through the housing;
a jaw cluster comprising a plurality of elongated jaw members for securing the rod within the apparatus, the jaw cluster being positioned within the chamber and sized such that the rod may freely enter the chamber through the front aperture and exit the chamber through the rear aperture or likewise enter the rear aperture and exit the front aperture, each of the jaw members including a tapered outer surface facing the tapered inner wall, a clasping inner surface facing the rod, a front end near the front aperture, and a rear end near the rear aperture, the rear end of each jaw member including an arcuate shoulder formed thereon by extending the tapered outer surface and elongating the jaw member, the arcuate shoulder including an inwardly-opening groove, the arcuate shoulder and inwardly-opening groove of each jaw member collectively defining an internal circumferential engagement recess within the jaw cluster; and
a force tube with an outer tube surface having an outer tube diameter and a cylindrical conduit therethrough having a conduit diameter larger than the rod diameter, the force tube including:
a rear portion having a mechanical interface for being torqued by a tool;
a front portion including an annular extension cantilevered outwardly beyond the outer tube diameter to define a pushing surface and a pulling surface, the annular extension fitting within the jaw cluster's internal circumferential engagement recess with the pushing surface facing the front end of the jaw cluster and the pulling surface facing the rear end of the jaw cluster; and
an intermediate threaded portion having a helical thread carried circumferentially thereabout to permit threading of the force tube into the helical groove of the housing's rear aperture;
wherein the force robe advances into the housing in response to a twisting force applied to the rear portion, the twisting force initiating a pushing contact between the pushing surface of the force robe and the jaw cluster's internal circumferential engagement recess, the pushing contact advancing the jaw cluster toward the front portion of the housing, thereby securing the smooth rod within the apparatus when the tapered outer surfaces of the jaw cluster contact the tapered inner wall of the housing;
wherein the force tube withdraws from the housing in response to a countertwisting force applied to the rear portion, the countertwisting force and initiating a pulling contact between the pulling surface of the force robe and the jaw cluster's internal circumferential engagement recess, the pulling contact pulling the jaw cluster toward the rear portion of the housing, thereby releasing the rod within the apparatus by separating the tapered outer surfaces of the jaw cluster from the tapered inner wall of the housing.

5,594,978

EXPANDER FOR TUBULAR FABRICS

Gian F. Ferraro, Olgiate Olona, Italy, assignor to Albrecht Equipamentos Industriais Ltda., Joinville, Brazil

Filed Jun. 2, 1995, Ser. No. 459,115
Claims priority, application Italy, Jun. 3, 1994, MI94A1164
Int. Cl.[6] D06C 5/00
U.S. Cl. 26—84 4 Claims



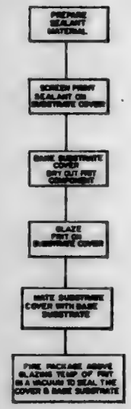
1. An expander for tubular fabrics, said fabric expander having at least one pair of first internal wheel and belt assembly groups (15) contacting an internal portion of the fabric tube (16), each said wheel and belt assembly group having one plate (17) over which the wheels and belts are assembled to transport the fabric tube, said fabric expander further having at least one pair of second external wheel and belt assembly groups (30) contacting an external portion of the fabric tube (16), wherein each said external wheel and belt assembly group includes motor wheels placed in a V-shaped configuration against one of the internal wheels to set said internal wheels into movement, comprising each plate of said aforesaid plates (17, 17A) having
a) in a medial position, along the longitudinal extension of said plate (17) at least one first conducted wheel (20), said wheel having a perimeter edge in the shape of two open wings (X1) which said open wings form a first concave opening in the bottom of which said concave opening there is provided a second opening having a V shaped configuration, and a first conveyor belt received in said second opening and having a V shape section when viewed in cross-section to transport the fabric tube;
b) said first conducted wheel (20), communicating rotationally with and transmits movement to at least one second driven wheel (18), (19), (21), said at least one second driven wheel having an opening in V shape configuration in which said opening is received said first conveyor belt (22), which said conveyor belt (22), is linked to said V-shaped openings in said first conducted wheel (20) and said at least one second driven wheel (18), (19), (21), said conveyor belt being closed and engageable over said at least one second driven wheel to spin around with said at least one second driven wheel when said first conducted wheel (20) is set into movement, said conveyor belt contacting with the fabric tube (16), said fabric fastened against said belt through said wheels (36) of the second external group of wheels (30), said belt transporting said fabric in a desired direction (F2).

5,594,979

METHOD FOR PACKAGING A SURFACE ACOUSTIC WAVE DEVICE

Earl F. Borchelt, Cambridge, and Thomas E. Parker, Framington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 13, 1984, Ser. No. 650,017
Int. Cl.[6] H01L 41/22
U.S. Cl. 29—25.35 29 Claims



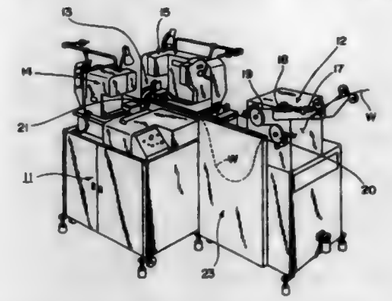
1. A method for providing a packaged SAW device comprising the steps of:
providing a pair of substrates, a first one having disposed thereon at least one transducer;
depositing a sealant material comprising a glass frit and binder vehicle enclosing a surface portion of a second one of said pair of substrates;
heating the sealant material on a second one of said pair of substrates for a first predetermined time interval at a temperature substantially below the softening temperature of the glass frit until the binder vehicle is driven off;
heating the sealant material for a second predetermined time interval at a temperature just above the softening point of the frit to glaze the glass frit;
mating the substrate having the glazed glass frit with the other remaining substrate;
heating the mated substrates for a third predetermined time interval at a temperature in a range substantially above the glazing temperature of the glass frit, but below the crystallographic transformation temperature of said substrate to seal the mated substrates.

5,594,980

ELECTRIC WIRE PRODUCING CONTROL DEVICE AND ELECTRIC WIRE MEASURING AND CUTTING APPARATUS INCLUDING THE CONTROL DEVICE

Yoshikazu Tamura; Kengo Ooue, and Toshikatsu Yamashiro, all of Kanazawa, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Nov. 8, 1994, Ser. No. 337,382
Claims priority, application Japan, Nov. 12, 1993, 5-283667
Int. Cl.[6] H01R 43/00; G06F 15/46
U.S. Cl. 29—33 M 18 Claims



1. An electric wire producing control device comprising:
a wire producing data file in which a plurality of wire producing data and a plurality of index codes attached to the respective wire producing data for identifying the wire producing data are registered;
first reading means for reading, from a record medium on which any one of the index codes attached to said respective wire producing data is recorded, the index code;
second reading means for accessing said wire producing data file when the index code read by said first reading means is applied and reading out the wire producing data to which the same index code as the read index code is attached;
storing means capable of storing a plurality of wire producing data for assigning the wire producing data read out by said second reading means priorities and storing the wire producing data, and outputting the wire producing data in the order of descending priorities; and
control means for sequentially reading out the wire producing data from said storing means and carrying out control of production processing of electric wires on the basis of the wire producing data read out.

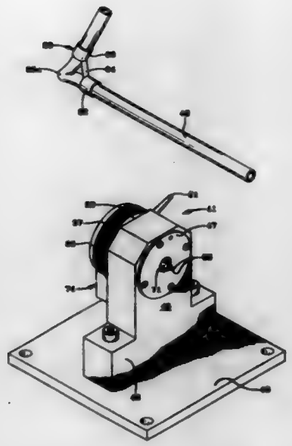
5,594,981

APPARATUS FOR TELESCOPICALLY ASSEMBLING A TUBING SEGMENT ON A LENGTH OF TUBING

Carl J. Plontek, Powell, and Bradford L. Buck, Gahanna, both of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 21, 1995, Ser. No. 531,541
Int. Cl.[6] B23P 19/02
U.S. Cl. 29—235 19 Claims

1. An apparatus for assembling a flexible tubular segment telescopically upon an end portion of a length of tubing, the tubing having an outer diameter substantially the same or greater than the inner diameter of the tubular segment, said apparatus comprising:

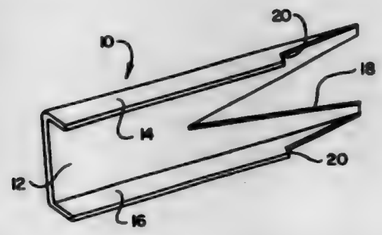


(a) means for controllably stretching the flexible tubular segment sufficiently to facilitate passage therethrough of an end portion of a length of said tubing; (b) means for positioning the end portion of the length of tubing inside the stretched flexible tubular segment such that the stretched tubular segment is located a preselected distance from the free end of the end portion of the length of tubing while the tubular segment is allowed to contract around the said end portion; and (c) means for ejecting the assembled tubular segment and end portion of the length of tubing from the apparatus while maintaining the preselected distance of the tubular segment from the free end of the end portion of the length of tubing.

5,594,982
DUCTWORK ALIGNMENT TOOL

Mark E. Dobbeck, 3407 Dahlgreen Dr., Westerville, Ohio 43081

Filed Feb. 16, 1995, Ser. No. 389,794
Int. Cl.[6] B23P *11/00*
U.S. Cl. 29—243.5 **2 Claims**

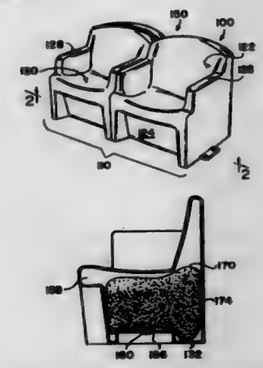


1. A hand tool for use in aligning misaligned adjacent ductwork sections having return flange terminations, and comprising:
- a relatively thin flat sheet metal base area of substantially uniform thickness having two sides and two ends;
- a pair of spaced-apart upstanding flanges integrally formed with said sheet metal base area at opposite sides of said base area; and
- a V-shaped notch provided in said sheet metal base area intermediate said pair of upstanding flanges having an open end portion which opens into one end of said base area and an apex spaced intermediate said ends of said base area.

5,594,983
METHOD OF FORMING A CHAIR AND GROUPING THEREOF

Richard B. Karl, St. Charles, and Harvey Haaig, North Aurora, both of Ill., assignors to Norix Group, Inc., West Chicago, Ill.

Division of Ser. No. 213,161, Mar. 14, 1994, Pat. No. 5,496,851. This application Dec. 11, 1995, Ser. No. 570,096
Int. Cl.[6] B23P *21/00*
U.S. Cl. 29—469 **7 Claims**



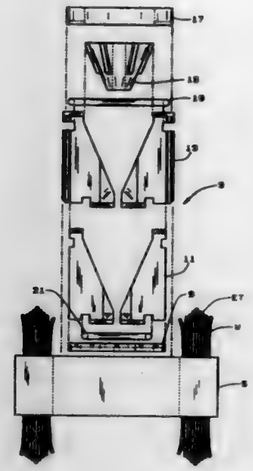
1. A method of assembling at least two shaped, one-piece chairs in an assembly difficult to move, each comprising:
a) providing at least two shaped, one-piece chairs having a pair of oppositely disposed arms; a chair seat therebetween and a chair back support ergonomically related to the chair seat and being hollow;
b) filling each chair with a flowable material through a base thereof in order to provide weight to the chair;
c) securing the flowable material therein;
d) joining a first chair of the one-piece chair to a second chair of the one-piece chair to provide an assembly, the assembly being at least one assembly selected from the group consisting of a side by side structure and a back to back structure to provide a stable, interconnected assembly of at least two chairs positioned to receive a person in each chair seat; and
e) positioning the assembly for use.

5,594,984
GAPLESS INNER DIAMETER STATOR WINDING BLOCKING MECHANISM

Vernon E. Kieffer, St. Louis, and Andrew J. Klethermes, Franklin County, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 106,399, Aug. 12, 1993, Pat. No. 5,491,886. This application Jun. 6, 1995, Ser. No. 485,233
Int. Cl.[6] H02K *15/06*
U.S. Cl. 29—736 **11 Claims**

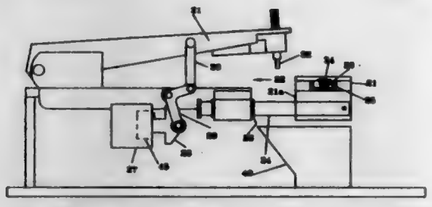
1. A blocking mechanism for blocking windings of a dynamoelectric machine, the windings having an inner diameter, an outer diameter, and a height; the blocking mechanism including an outer diameter block for blocking the outer diameter of the windings, an inner diameter block for blocking the inner diameter of the windings, and a compression ring for blocking the height of the windings; the inner diameter block including a plurality of radially movable segments forming an expandable cylinder which is movable between a compressed position and an expanded, blocking position, the segments of said expandable cylinder defining cylindrical a blocking surface, said blocking surface establishing an effectively continuous and gap-free surface throughout a transition between the compressed position and the expanded position, said cylindrical blocking surface moving essentially horizontally as said segments are moved between said compressed and expanded positions.



5,594,985
END PIN EXTRACTOR FOR SEMICONDUCTOR STORAGE TUBE

Jerry M. Varley, Whitesboro, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 8, 1995, Ser. No. 436,776
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—823 **10 Claims**



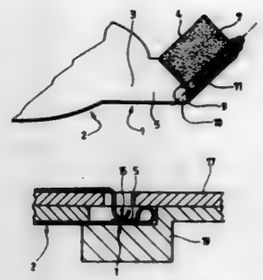
1. An extractor for automatically removing pins from storage tubes, comprising:
- a movable arm having first and second ends;
- an extractor pin on a first end of said movable arm;
- a head assembly for receiving a storage tube with a pin therein;
- at least one track on which the head assembly travels when moved under the extractor pin; and
- a solenoid, with a solenoid arm therein for causing said movable arm to rotate about said second end to remove a pin from a storage tube in said head assembly.

5,594,986
METHOD FOR OBTAINING AN ELECTRICAL CONNECTION WITH A THIN MONOFACE CONDUCTIVE STRIP AND CONNECTION THUS OBTAINED

Erik J. Frenkel, Neuchâtel, and Jean-Jacques Born, Morges, both of France, assignors to Asulab S.A., Bienne, Switzerland

Filed Sep. 13, 1994, Ser. No. 305,863
Claims priority, application France, Sep. 21, 1993, 93 11315
Int. Cl.[6] H01R *43/04*
U.S. Cl. 29—861 **7 Claims**

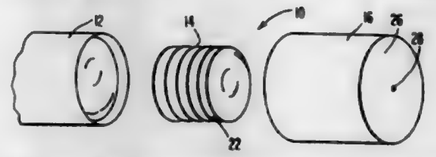
1. A method of manufacturing an electrical connection for connecting a conductive coating disposed on a single face only of a thin strip of material to a second conductor disposed opposite a non-conductive face of said thin strip of material, said method comprising:
- providing a thin strip of thermoformable plastic material including an end portion, said thin strip, including said end portion, having a conductive coating on a single face only whereby said thin strip and end portion have a conductive face and a non-conductive face;
- placing said end portion between first and second parallel cylinders with the non-conductive face facing toward the second cylinder;
- heating at least one of said cylinders; and
- rolling up a lug by folding said end portion, said folding being carried out by driving said cylinders in rotation until the non-conductive face of said end portion is pressed against the non-conductive face of said thin strip.



5,594,987
METHOD OF MAKING A SUB-MINIATURE AEROSOLIZER

Theodore J. Century, 702 W. Carpenter La., Philadelphia, Pa. 19119

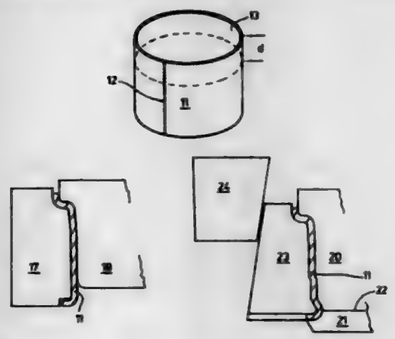
Division of Ser. No. 274,234, Jul. 13, 1994. This application Aug. 28, 1995, Ser. No. 519,692
Int. Cl.[6] B21D *53/00*
U.S. Cl. 29—890.143 **4 Claims**



1. A method for making a liquid sprayer aerosolizer adapted for being placed in connection with a liquid pressure driver apparatus for delivery of liquid material, said method including the steps of:
- providing an appropriate length of a first hollow tube member having a specified outer diameter defined by an outer surface and a specified inner diameter defined by an inner surface;
- tapping a threaded area in a portion of said inner surface of said first hollow tube member a predetermined distance from a first end thereof;
- providing a screw member of an appropriate diameter and length;
- grinding substantially flat a first end of said screw member;
- forming a substantially elongated slot within said substantially flat first end of said screw member;
- inserting said substantially flat first end of said screw member into said first end of said first hollow tube member;
- providing a driver in a second end of said first hollow tube member for engaging said substantially elongated slot within said substantially flat first end of said screw member;
- rotating said driver for backing said screw member into said first hollow tube member through engagement of the threaded portions thereof;

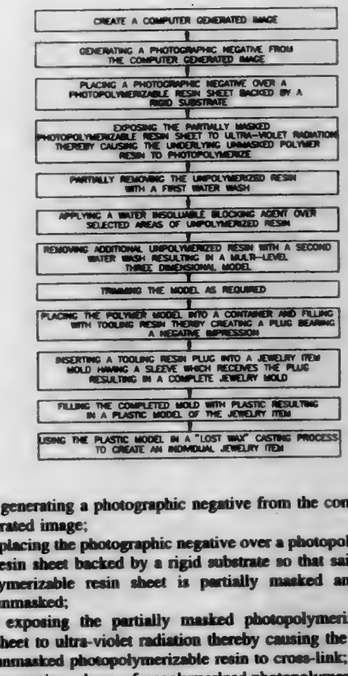
providing an appropriate length of a second hollow tube member having a specified outer diameter defined by an outer surface and a specified inner diameter defined by an inner surface;
providing a foil disc of specified diameter and thickness defined by first and second sides;
coupling said foil disc to a first end of said second hollow tube member;
drilling a hole through said foil disc from the first side through to the second side thereof;
deburring an appropriate amount of said first and second sides of said foil disc proximate said hole therethrough; and
coupling said first and second hollow tube members.

5,594,988
METHOD OF MAKING A WHEEL RIM
Jordan S. Fishman, 4015 Flamingo Ave., Sarasota, Fla. 34242
PCT No. PCT/GB94/00573, § 371 Date Sep. 26, 1995, § 102(e) Date Sep. 26, 1995, PCT Pub. No. WO94/22615, PCT Pub. Date Oct. 13, 1994
PCT Filed Mar. 21, 1994, Ser. No. 532,702
Claims priority, application United Kingdom, Mar. 30, 1993, 9306550
Int. Cl.[6] B21K *1/38*; B21D *37/16*
U.S. Cl. 29—894.353 **14 Claims**



1. A method of manufacturing a wheel rim comprising the steps of:
forming a flat steel section into an annulus;
welding the ends of the section together;
heating to about 700° C. one end of the annulus to an axially extending depth of about 7.5 cm;
pressing said one end to shape by bending the end without any flow of metal which would change the thickness of the section;
heating to about 700° C. the other end of the annulus to an axially extending depth of about 7.5 cm;
pressing said other end to shape by bending the end without any flow of metal which would change the thickness of the section.

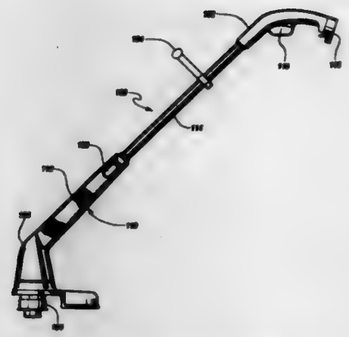
5,594,989
PROCESS FOR MAKING JEWELRY UTILIZING A HARD PHOTOPOLYMER
Donald W. Greve, Sunrise, Fla., assignor to Aurafin Corporation, Sunrise, Fla.
Filed Apr. 4, 1995, Ser. No. 416,049
Int. Cl.[6] B21F *43/00*; B22C *9/02*; C08J *7/04*
U.S. Cl. 29—896.4 **9 Claims**



1. A process for producing customized, three dimensional articles, including the following steps:
(a) creating a computer generated image;
(b) generating a photographic negative from the computer generated image;
(c) placing the photographic negative over a photopolymerizable resin sheet backed by a rigid substrate so that said photopolymerizable resin sheet is partially masked and partially unmasked;
(d) exposing the partially masked photopolymerizable resin sheet to ultra-violet radiation thereby causing the underlying unmasked photopolymerizable resin to cross-link;
(e) removing a layer of unpolymerized photopolymerizable resin with a liquid wash, followed by selectively blocking remaining areas of unpolymerized resin with a water insoluble agent, and removing additional polymer resin with a water wash, resulting in a multi-level relief polymer resin model;
(f) trimming the model as required;
(g) placing the polymer resin model into a container and pouring tooling resin into the container thereby creating a tooling resin plug bearing the negative impression of the item to be created;
(h) inserting the tooling resin plug into a mold having an empty sleeve which receives the plug resulting in a completed mold;
(i) filling the completed mold with plastic resulting in a plastic model;
(j) using the plastic model in a lost wax type casting process resulting in a solid three dimensional article.

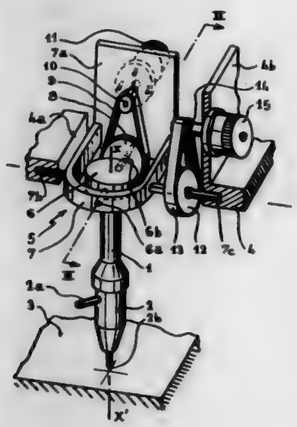
5,594,990
LAWN TRIMMING AND EDGING APPARATUS HAVING MOTOR HOUSING ROTATABLE ON EXTENDABLE HANDLE
Ronald G. Brant, Haughton, and Michael S. Houge, Shreveport, both of La., assignors to WCI Outdoor Products, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 96,483, Jul. 22, 1993, Pat. No. 5,446,964. This application Feb. 21, 1995, Ser. No. 391,145
Int. Cl.[6] A01D *50/00*
U.S. Cl. 30—122 **15 Claims**

1. A Lawn trimming and edging apparatus comprising:
an electric motor coupled to a vegetation cutter;
a housing for supporting the motor and the cutter in a fixed spatial relationship with the housing;
a handle;
an elongated tube having a lower end to which is mounted the housing for rotation on the tube and an upper end to which the handle is attached for gripping by an operator to hold the cutter near the ground while standing; and



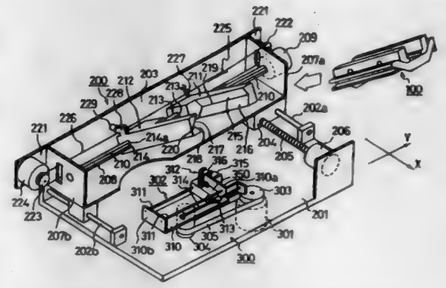
a power cord extending between the handle and the electric motor within the tube;
wherein the housing includes:
means for discretely locking relative rotation of the housing and the tube in one of a plurality of positions, including a first position in which the cutting element is in a trimming orientation or a second position in which the cutting element is in an edging orientation;
a button located on an outside portion of the housing for manually releasing the means for discretely locking to thereby enable relative rotation of the housing and tube between the plurality of positions; and
means for limiting relative rotation of the housing and the tube to a fixed angle between the first and second rotational positions.

5,594,991
MARKING DEVICE
Marcel Theroud, 114 Quai du Rhône, Miribel, France
Filed Aug. 2, 1995, Ser. No. 510,467
Claims priority, application France, Aug. 8, 1994, 94 09970
Int. Cl.[6] B43L *9/00*; *13/00*
U.S. Cl. 33—18.1 **1 Claim**



1. Marking device for making two-dimensional identification signs on a surface of an object, of the type in which a micro-percussion tool is borne axially by a slewable rod which is retained angularly along its axis and which penetrates in a fixed housing through a Universal joint allowing free orientation thereof in all directions along an axis of symmetry, wherein orientation of the rod is controlled with the aid of two independent motors which act on one and another, respectively, of two orthogonal pivot pins of the joint.

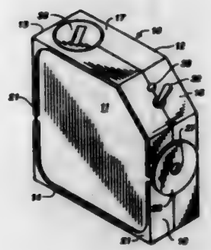
5,594,992
APPARATUS FOR MEASURING A LENS FRAME CONFIGURATION
Yasuo Suzuki; Takashi Sato, and Jun Akiyama, all of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan
Filed Apr. 20, 1995, Ser. No. 425,202
Claims priority, application Japan, Apr. 20, 1994, 6-081235; Apr. 22, 1994, 6-084304
Int. Cl.[6] G01B *5/20*
U.S. Cl. 33—200 **4 Claims**



1. An apparatus for measuring a lens frame configuration, comprising:
an apparatus body provided with a measuring reference surface;
frame holding means movably retained by said apparatus body and adapted to hold right and left lens frames of an eyeglass frame so as to rotate and incline a holding plane of said lens frame with respect to said reference surface;
rotating means for rotating and inclining said frame holding means;
measuring means for measuring coordinates of each point in a circumferential direction of a V-shaped groove of said lens frame with respect to said measuring reference surface; and
an arithmetic circuit for calculating an inclination of said lens frame in said V-shaped groove with respect to said reference surface from a result obtained by said measuring means.

5,594,993
HAND-HELD BUILDER'S SQUARE AND STRING LINE DEVICE INCORPORATING A LASER
Robert C. Tager; Herbert P. Radding, both of Saratoga, and Roger D. Ludlow, Sunnyvale, all of Calif., assignors to Builders Tools, Inc., Saratoga, Calif.
Filed Jun. 22, 1995, Ser. No. 493,482
Int. Cl.[6] G01C *15/00*; *15/12*; *15/14*
U.S. Cl. 33—227 **32 Claims**

1. A compact builder's tool for defining a reference line over an extended range, comprising:
a housing sized to be hand-held having first and second broad spaced-apart parallel faces and a plurality of narrow faces joining said broad faces and extending substantially perpendicular thereto, said plurality of narrow faces including first and second narrow faces defining first and second reference planes that are substantially perpendicular to one another;
wherein at least one of said broad faces has a raised surface proximal to at least three edges of said at least one broad face, said raised surface being of small area relative to said at least one broad face and defining a third reference plane;
wherein said first, second and third reference planes are mutually perpendicular to one another;



a laser beam exit window in said housing positioned opposite said first narrow face;

a battery-powered laser mounted within said housing for projecting a visible laser beam through said exit window over said extended range; and

alignment means within said housing for setting the alignment of said laser beam perpendicular to said first reference plane and parallel to said second and third reference planes;

whereby said tool defines a line of laser light perpendicular to a working surface in contact with said first narrow face and parallel to a working surface in contact with said second narrow face or in contact with said at least one broad face.

5,594,994

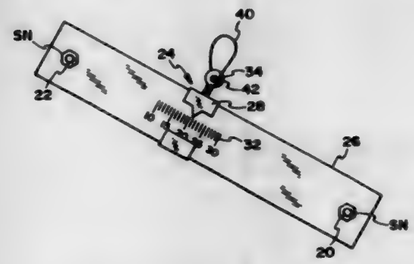
TREE STAND RANGEFINDER AND METHOD OF USING THE SAME

John M. David, 2059 Huntington Ave., No. 311, Alexandria, Va. 22303

Continuation of Ser. No. 277,577, Jul. 20, 1994, Pat. No. 5,467,531. This application Nov. 20, 1995, Ser. No. 560,623

Int. Cl.[6] G01C *3/12;3/10*

U.S. Cl. 33—284 **9 Claims**



1. A self-contained hand-held device for measuring distance from an above-ground position, comprising:

a) a support member;

b) first and second projection members on said support member for measuring a preselected distance;

c) said first projection member including a sight pin;

d) means associated with said support member for indicating an above-ground height; and

e) means for suspending the device freely in a vertical plane;

f) whereby when the device suspends freely in a vertical plane, said first and second projection members cooperate spatially to point a location corresponding to said preselected distance.

5,594,995

TOUCH SENSOR

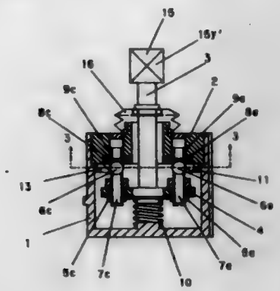
Akira Matsuhashi, Tokyo, Japan, assignor to Metrol Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1995, Ser. No. 542,301

Claims priority, application Japan, Apr. 6, 1995, 7-117595

Int. Cl.[6] G01B *5/012*

U.S. Cl. 33—558 **8 Claims**



1. A touch sensor for obtaining directional and positional data, comprising:

a movable plate;

at least four movable contacts provided on said movable plate, said movable contacts being arranged in a rectangular shape;

a measuring shaft attached to the movable plate to extend perpendicularly thereto, said measuring shaft having a contact portion at one end thereof;

a base plate situated at a side opposite to said movable contacts and having at least four fixed contacts formed at positions corresponding to said respective movable contacts so that the fixed contacts contact the corresponding movable contacts;

means for urging the movable plate to the base plate so that the movable contacts and the fixed contacts contact together; and

insulating guides provided on one of said base plate and said movable plate to surround the movable and fixed contacts, said guides contacting and guiding one of the movable and fixed contacts so that when an object to be measured touches said contact portion, a first two of said movable contacts which are adjacent to each other become rotational supporting points, and a second two of said movable contacts which are adjacent to each other provided at an opposite side of said first two adjacent movable contacts are separated from two of said fixed contacts corresponding thereto.

5,594,996

APPARATUS FOR DRYING A FIBRE WEB

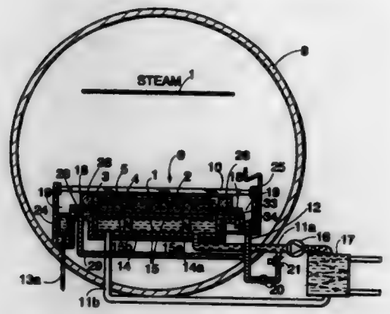
Seppo Haavisto, Hämeenkyrö , Finland, assignor to Valmet-Tampella Oy, Tampere, Finland

Filed Aug. 1, 1994, Ser. No. 283,256

Int. Cl.[6] F26B *13/10*

U.S. Cl. 34—66 **15 Claims**

1. Drying apparatus for drying a fibre web, comprising two endless bands impermeable to air and having a good thermal conductivity, said bands being arranged to move in parallel with each other over a distance so that they form therebetween a drying zone where one band is heated by pressurized steam contacting a surface of the one, heated band opposite the drying zone from a steam chamber and the other band is cooled by a pressurized fluid heat transfer medium contacting an opposite surface of the other, cooled band from a heat-transfer-medium chamber the fibre web and at least one felt or wire are passed between the bands through the drying zone so that the fibre web is in contact with the heated band while the felt or wire is positioned between the fibre web and the cooled band, the steam pressure prevailing in the steam chamber and the heat transfer medium pressure prevailing in the heat-



transfer-medium chamber being arranged to be substantially equal by a connection extending from the heat-transfer-medium chamber to the steam chamber.

5,594,997

APPARATUS FOR DRYING A FIBRE WEB, AND A DRYING SECTION OF A PAPER MACHINE

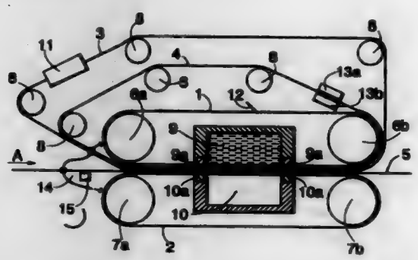
Jukka Lehtinen, Tampere, Finland, assignor to Valmet Corporation, Helsinki, Finland

Filed Jan. 19, 1996, Ser. No. 588,834

Claims priority, application Finland, Feb. 14, 1995, 950652

Int. Cl.[6] F26B *13/26*

U.S. Cl. 34—95 **6 Claims**



6. A drying section of a paper machine, comprising first and second endless bands that are impermeable to air; first turning rolls, around which the first band turns; and second turning rolls, around which the second band turns; the first and second bands having respective paths that are in part parallel such that they define between them a drying zone where at least the first band is cooled; a fibre web and at least a first auxiliary wire being disposed in the drying zone such that the first auxiliary wire is in contact with the first band and the fibre web is heated to evaporate water therefrom, both the first and second bands being cooled; the drying section also comprising a second auxiliary wire, the first and second auxiliary wires being disposed between the first and second bands with each of the first and second bands in contact with a respective one of the first and second auxiliary wires; the drying section being provided with two steam-permeable bands between the first and second auxiliary wires that are permeable to steam, form an endless loop, have good thermal conductivity and pass through the drying zone, said steam-permeable bands being heated, the fibre web being in contact with said steam-permeable bands and being disposed between them in the drying zone, whereby the steam-permeable bands heat the water present in the fibre web, turning it into steam, and steam evaporating from the fibre web passes through said steam-permeable bands and further through the first and second auxiliary wires toward the first and second bands and condenses onto a surface of the first and second bands.

5,594,998

HEATABLE SHIELD FOR HEAT TREATMENT OF PAPER-MAKING MACHINE TEXTILES

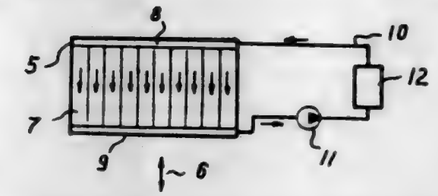
Gunnar Eriksen, Borgen, and Sissel W. Olsen, Tranby, both of Norway, assignors to Kvaerner Eureka a.s, Tranby, Norway

Filed Feb. 22, 1996, Ser. No. 605,621

Claims priority, application Norway, Mar. 8, 1995, 950888

Int. Cl.[6] D21F *1/00;* D06C *3/00;* F26B *13/10*

U.S. Cl. 34—111 **3 Claims**



1. A device for the heat treatment of paper-making machine textiles, which travel in a longitudinal direction in the form of a band over a heatable roller, said device comprising: a heatable shield for applying heat to the band traveling over the roller from the outside of the band, said shield extending along a part of the periphery of the roller and adapted to the curvature of the roller, said shield having internal channels for the through-flow of a heating medium, said channels being oriented in said longitudinal direction and including means for emitting different amounts of heat individually or by section, so as to obtain a temperature gradient transverse to said band.

5,594,999

RADIANT WALL OVEN AND PROCESS FOR GENERATING INFRARED RADIATION HAVING A NONUNIFORM EMISSION DISTRIBUTION

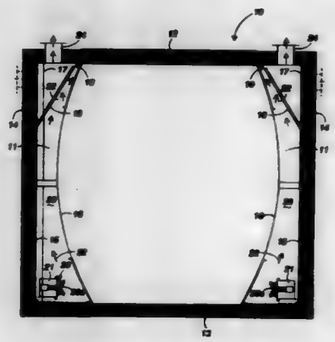
Willie H. Best, Columbia, S.C., assignor to Haden Schweitzer Corporation, Madison Heights, Mich.

Continuation-in-part of Ser. No. 702,109, May 15, 1991, Pat. No. 5,230,161. This application Mar. 29, 1993, Ser. No. 39,928

The portion of the term of this patent subsequent to Jul. 27, 2010, has been disclaimed.

Int. Cl.[6] F26B *3/30*

U.S. Cl. 34—270 **57 Claims**



45. A radiant wall structure for radiating substantially infrared energy for drying or curing coatings on the surfaces of objects comprising:

(a) a first radiant emitting wall having a radiant emitting outer surface and a radiant absorbing inner surface, said first radiant emitting wall having a length in a longitudinal direction;

(b) a second wall spaced from said radiant absorbing inner surface of said first radiant emitting wall for defining therebetween a chamber, said second wall having an interior radiant

emitting surface, said inner radiant absorbing surface of said first wall and said inner radiant emitting surface of said second wall being in opposed relationship to each other;

(c) a gaseous burner for delivering heated gases into said chamber for heating by convection said inner emitting surface of said second wall and said radiant absorbing surface of said first wall, said burner being located within the lower portion of said chamber and extending substantially the length of said first radiant emitting wall; said burner, when lighted, emitting infrared radiant energy to said absorbing surface of said first wall and to said inner radiant absorbing surface of said second wall;

(d) insulation for said second wall for restricting the loss of heat to the exterior of said second wall sufficiently for the average temperature of said radiant emitting surface of said second wall to appreciably exceed the average temperature of said first radiant emitting wall thereby transfering radiant energy from inner emitting surface to said radiant absorbing surface of said first radiant emitting wall;

(e) the average fixed emission intensity, for a specific energy input between the lower and upper segments of the wall being dependent on the distance from the combustion surface of the burner and said first emitting wall;

(f) the energy input to said gaseous burner, at an equilibrium temperature of the first radiant emitting wall averaging between about 3,000 BTUH and about 35,000 BTUH per foot of said first emitting radiant wall in its longitudinal direction;

(g) means for supporting an object sufficiently located with respect to said first radiant emitting wall, that surfaces of said object absorb radiant emission from said first radiant emitting wall;

(h) the heat delivered from said second wall to said first wall by radiation being between about 30% and 70% of the total heat delivered to said first wall; and

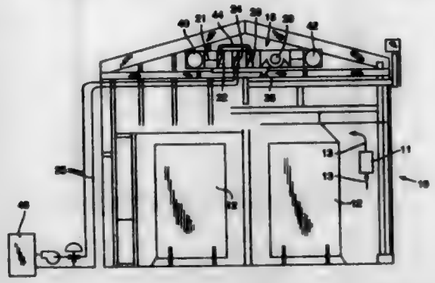
(i) said gaseous burner heating said radiant emitter of said second wall for generating infrared heat, said second wall being so positioned with respect to said first wall and said gaseous burner being so located that said infrared heat is directly by the emitting surface of said second wall toward said infrared absorbing surface of said first wall, said first wall and said burner being so positioned that increments of said first wall are heated to radiate at different temperatures.

5,595,000

NO-VENT DRY KILN

Tom E. Goodwin, III, Green Cove Springs, Fla., assignor to U.S. Natural Resources, Inc., Vancouver, Wash.

Filed Jan. 17, 1995, Ser. No. 338,393
Int. Cl.[6] F26B *3/00*
U.S. Cl. 34—471 **7 Claims**



5. A method of drying lumber under controlled conditions in a dry kiln which comprises:

placing a quantity of stacked wet lumber in an enclosed structure;

circulating heated air within the structure and through the stacked wet lumber;

monitoring the humidity level indicating moisture content of the circulating heated air;

in response to the presence of a pre-determined humidity level of the air, dehumidifying the air using a heat exchanger extending from a dehumidifying chamber to exterior of the dry kiln whereat a media flowing through the heat exchanger is cooled and circulated to the chamber and thereby condensing moisture from the air passing through the chamber to liquid form and lowering the humidity level of the circulating air without venting to the atmosphere; and

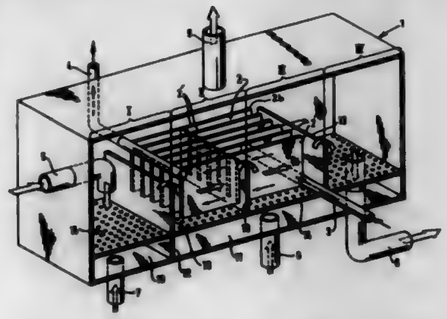
draining off the liquid from the dehumidifying chamber to be removed from the structure while continuing the circulation of the heated air confined in the structure.

5,595,001

APPARATUS FOR PRODUCING SODIUM PERBORATE MONOHYDRATE AND PRODUCT PRODUCED THEREBY

Rüdiger Schütte, Alzenau-Hörstein; Alexander Ruhe, Rheinfelden; Claus-Jürgen Klasen, Rodenbach, and Hans-Christian Alt, Gelnhausen, all of Germany, assignors to DeGussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 10, 1994, Ser. No. 337,405
Claims priority, application Germany, May 15, 1993, 43 16 320.3
Int. Cl.[6] F26B *17/00*
U.S. Cl. 34—579 **31 Claims**



1. A flow-bed dryer for converting sodium perborate tetrahydrate to sodium perborate monohydrate, comprising:

a main housing having an inlet end with a peripheral edge, an outlet end with a peripheral edge and at least one exterior wall extending about the peripheral edge of said end walls;

a weir spaced between said first and second ends so as to define a first and a second zone;

a heat exchanger positioned in said second zone above said fluidizing plate for contact with the perborate and to one side of said weir such that said first zone is free of a heat exchanger;

a fluidizing plate positioned at a bottom region of said flow-bed dryer;

an inlet conduit for directing sodium perborate tetrahydrate into said first zone;

fluidizing gas introduction means for directing fluidizing air through said fluidizing plate and into said first and second zones;

heat exchanger heating means for heating said heat exchanger;

a product exhaust conduit provided at said outlet end;

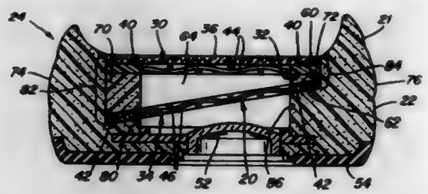
and said fluidizing air introduction means including a first air receiver area positioned below a first portion of said fluidizing plate positioned in said first zone and a second air receiver area positioned below a second portion of said fluidizing plate positioned below said second zone, and said fluidizing air introduction means including a first air supply conduit opening into said first receiver, a second air supply conduit opening into said second receiver, and means for directing air at a first temperature through said first conduit and air at a second, different temperature to said second receiver.

5,595,002

STABILIZING GRID WEDGE SYSTEM FOR PROVIDING MOTION CONTROL AND CUSHIONING

Neil R. Stephan, Durham, N.H.; Michael P. Kirk, Salem, and Joseph Hamill, Florence, both of Mass., assignors to Hyde Athletic Industries, Inc., Peabody, Mass.

Filed Dec. 5, 1994, Ser. No. 349,405
Int. Cl.[6] A43B *13/28;21/26;5/00*
U.S. Cl. 36—27 **19 Claims**



1. In a shoe construction with a heel region having a lateral and medial side, a stabilizing system, comprising:

at least one component extending laterally over at least a portion of the shoe construction from the medial side to the lateral side thereof in the heel region;

a cushioning wedge supporting said at least one component, said cushioning wedge having a lateral portion, medial portion, and center portion therebetween, said lateral portion being thicker than the medial portion and having greater compressibility than said medial portion;

and said center portion having a compressibility greater than both said lateral portion and said medial portion of said cushioning wedge thereby resisting pronation.

5,595,003

ATHLETIC SHOE WITH A FORCE RESPONSIVE SOLE

A. Ray Snow, 11810 S. Hidden Valley Rd., Sandy, Utah 84092

PCT No. PCT/US92/01354, § 371 Date Feb. 18, 1994, § 102(e) Date Feb. 18, 1994, PCT Pub. No. WO93/03639, PCT Pub. Date Mar. 4, 1993
Continuation-in-part of Ser. No. 969,243, Feb. 19, 1993, abandoned, which is a continuation of Ser. No. 570,906, Aug. 21, 1990, abandoned. This PCT application Feb. 20, 1992, Ser. No. 199,166
Int. Cl.[6] A43B *13/18*
U.S. Cl. 36—28 **20 Claims**



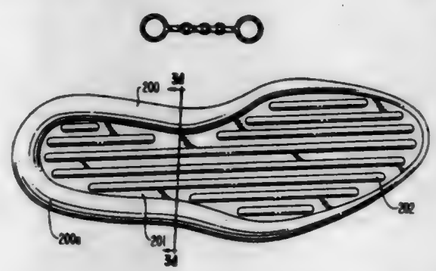
1. An athletic shoe having a force responsive sole, comprising a first sole portion having spaced cleats extending therefrom; a second sole portion having correspondingly spaced apertures for receiving said cleats and having margins about the circumference of each of said apertures; force responsive, resilient means held between said first and second sole portions at least partially covering said apertures and cooperable with said cleats for normally maintaining said first and second sole portions spaced apart, with the cleats of the first sole portion aligned with the receiving apertures of the second sole portion; cleat guide means in which the cleats of the first sole portion are positioned so that said guide means restricts lateral relative movement of said first and second sole portions; a correspondingly apertured support plate covering the second sole portion to protect the margins of said second sole portion surrounding the apertures thereof against damage by movement of the resilient means thereagainst when being stretched; means interconnecting said first sole portion and said second sole portion; a shoe upper for receiving a wearer's foot; and ground-contacting wearing surface for said sole.

5,595,004

SHOE SOLE INCLUDING A PERIPHERALLY-DISPOSED CUSHIONING BLADDER

Robert M. Lyden, Beaverton, and Michael A. Aveni, Lake Oswego, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Mar. 30, 1994, Ser. No. 220,032
Int. Cl.[6] A43B *13/20;21/26;7/14*
U.S. Cl. 36—29 **8 Claims**



1. A shoe comprising a sole having heel and forefoot areas, said sole having a perimeter and a central region, and comprising a bladder including a sealed, fluid-filled tube with resilient elastomeric walls disposed about the perimeter of said sole, said tube including medial and lateral portions and extending generally about the heel area of said sole and forward along the medial and lateral sides of the sole and generally about the forefoot area to define said central region between the medial and lateral portions, said central region occupying a substantial portion of the heel and forefoot areas, said bladder including upper and lower portions extending between the medial and lateral portions of said tube, said upper and lower portions and said medial and lateral portions defining therebetween a sealed, fluid-filled chamber having a thickness less than the thickness of the heel area of said tube, said sealed chamber isolated out of fluid communication from said tube.

5,595,005

FOOTWEAR SYSTEM

James L. Throneburg, 625 W. Bell St., Statesville, N.C. 28687; James G. McLelland, Statesville, N.C.; Victor J. Gallenstein, Maysville, Ky.; Leon E. Kelley, Needham, Mass., and Douglas H. Richie, Long Beach, Calif., assignors to James L. Throneburg, Statesville, N.C.

Continuation-in-part of Ser. No. 96,708, Jul. 23, 1993, Pat. No. 5,335,517. This application Mar. 21, 1994, Ser. No. 216,264
Int. Cl.[6] A43B *13/12;13/14*
U.S. Cl. 36—91 **25 Claims**

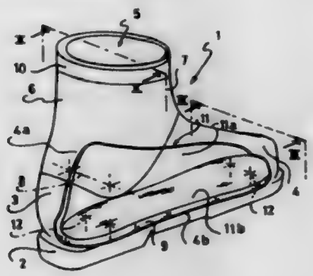
14. A footwear system for providing enhanced protection and comfort to the foot of a wearer by reducing impact and shearing forces normally received by the foot, said footwear system com-



prising a knit sock and a shoe, said knit sock overlying and contacting said shoe and comprising a ball portion, a heel portion, and an arch portion disposed between said ball and heel portions, each of said ball and heel portions being formed of thicker knit fabric than said arch portion thereby providing a greater amount of protection and cushioning to the ball and heel of the foot of the wearer than to said arch portion, said shoe comprising a multiple layer innersole having a ball portion, a heel portion, and a raised arch portion for interfacing with said respective overlying portions of said sock, said raised arch portion having a hump for comfortably supporting the arch of the foot of the wearer, said hump including medial and lateral peripheries thereof, a substantial flat plateau portion extending outwardly from around said lateral periphery of said hump, and oppositely inclined fore and aft portions adjacent said plateau portion for providing a smooth transition with said ball portion and major areas of said heel portions, said raised arch portion of said sole corresponding substantially to the lengthwise extent of said arch portion of said knit sock when positioned on the foot of a wearer so as to provide a substantially mating interfacing relationship with said knit sock for added protection and comfort to the wearer.

5,595,086
REINFORCED SKI BOOT
Claude Perrinaud, Saint-Jorioz, and René Borel, Annecy, both of France, assignors to Salomon S.A., Metz-Tessy, France
Continuation of Ser. No. 368,635, Jan. 4, 1995, abandoned. This application Mar. 13, 1996, Ser. No. 614,986
Claims priority, application France, Jan. 12, 1994, 94 00401
Int. Cl.[6] A43B *5/04*
U.S. Cl. 36—117.5 **22 Claims**

1. A ski boot comprising:



an external sole;

a rigid shell having a shell base mounted upon said external sole, said shell base having an internally facing side and an externally facing side;

an upper mounted for movement upon said shell base about a transverse journal axis, said upper including a front portion and a rear portion;

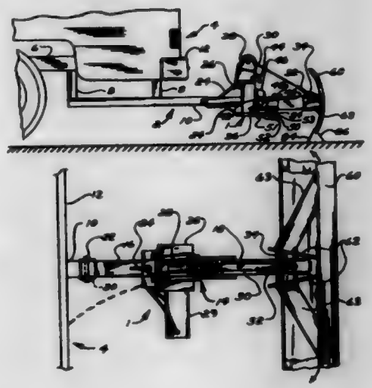
internal cushioning in the form of a flexible liner positioned between said rigid shell and at least in the area between the foot and a lower portion of the leg of a skier of the boot;

a rigid internal reinforcement having an asymmetrical transverse cross section and a generally squared shape, said rigid internal reinforcement being interposed between said flexible liner and said shell base; and

said rigid internal reinforcement including a generally horizontal bottom area and a substantially vertical area at said internally facing side of said shell base, said horizontal area and said vertical area being rigidly affixed together laterally and longitudinally;

whereby said horizontal bottom area and said vertical area comprise means for rendering said shell base non-deformable exclusively in said horizontal bottom area and said vertical internally facing side for providing firm support during vertical pressure on said internal sole and/or lateral pressure on said internally facing side of said shell base exerted by the skier during skiing without changing flexibility characteristics of areas of said shell base other than said horizontal bottom area and said vertical area.

5,595,087
TRAILER-TYPE SNOWPLOW
Michael P. Biance, 4 Ritzmic Ct., Latham, N.Y. 12110
Filed Nov. 29, 1994, Ser. No. 346,093
Int. Cl.[6] E01H *5/06*
U.S. Cl. 37—268 **14 Claims**



1. A snowplow assembly adapted for removable securement to a vehicle, said assembly comprising;

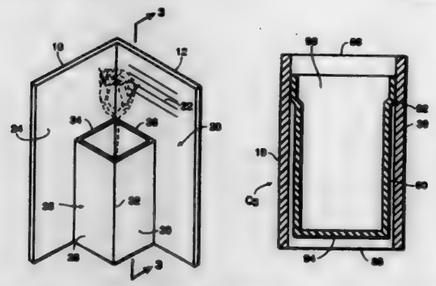
a support fixture;

a plow blade adapted for plowing snow when moved in a predetermined direction;

a first attachment means connected to the support fixture and adapted for attachment to an end of a vehicle; and

a second attachment means connected to the support fixture, and wherein said second attachment means is also connected to the plow blade and includes a pivot assembly that allows the plow blade to freely pivot in a horizontal plane at all times and wherein the pivot assembly of the second attachment means is in the form of at least one elongated member that may freely slide within a complementary slot.

5,595,008
GREETNG CARD DEVICE
Keith D. Johnson, Inglewood, Calif., assignor to United Pacific Development, Los Angeles, Calif.
Continuation-in-part of Ser. No. 235,451, Apr. 29, 1994, Pat. No. 5,435,085. This application Dec. 27, 1994, Ser. No. 364,122
Int. Cl.[6] G09F *1/00*
U.S. Cl. 40—124.1 **17 Claims**



15. A method of presenting a greeting on a greeting card and retaining a plant in relation to the greeting card, said method comprising:

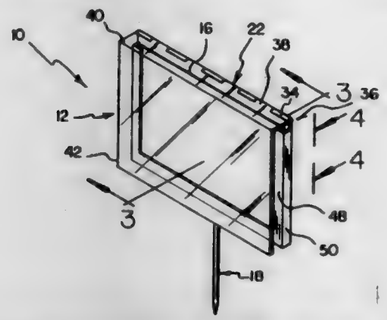
a) hingedly moving a pair of panels forming part of the greeting card relative to one another so that the panels are angularly disposed with respect to one another in an opened position and facewise disposed against one another in a closed position;

b) causing the opening of a pair of walls located between the panels when the panels are moved to the opened position and thereby forming a pocket between the walls;

c) presenting a message on a surface of at least one of the panels; and

d) forming a pocket between the walls and inserting a plant in the pocket when the panels have been shifted to the opened position.

5,595,009
GROUND-PENETRATING MARKER APPARATUS
Charles W. Rummer, 4025 Old Wheeling Rd., Zanesville, Ohio 43701
Filed Aug. 29, 1994, Ser. No. 297,166
Int. Cl.[6] G09F *15/00*
U.S. Cl. 40—606 **2 Claims**



1. A ground-penetrating marker apparatus, comprising:

a sign-supporting assembly which includes a receptacle portion adapted to receive an information-bearing card,

a spike assembly connected to a bottom portion of said sign-supporting assembly, said spike assembly adapted for penetration into a ground surface, and

a cover assembly, connected to a top portion of said sign-supporting assembly, for weather protecting said receptacle portion of said sign-supporting assembly, wherein said sign-supporting assembly includes a top edge, an opposed bottom edge, and first and second opposed side edges extending between said top edge and said bottom edge, said cover assembly further including a first portion of a hinge assembly connected to said top edge,

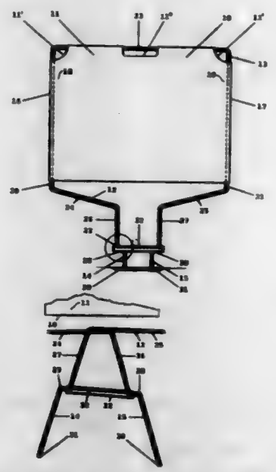
wherein said cover assembly includes an L-shaped cover member oriented with its short side at the top thereof and with its long side extending orthogonally and downwardly with respect to said short side, said short side of said L-shaped cover member being connected to said second portion of said hinge assembly,

wherein said receptacle portion comprises a frame member extending along said opposed first and second sides and along said bottom edge of said sign-supporting assembly,

wherein said long side of said L-shaped cover member terminates in a bottom edge portion at least partially coextensive with the said frame member extending along said bottom edge of said receptacle portion and includes a transparent panel portion which extends co-extensively with at least a portion of said sign, supporting assembly to permit viewing an information-bearing card maintained in position in said receptacle portion of said sign-supporting assembly by said frame member,

wherein said bottom portion of said sign-supporting assembly includes a well extending rearwardly and oppositely with respect to said frame member bottom edge and said L-shaped cover member bottom edge portion at least partially co-extensive therewith, and wherein said spike assembly includes an upper end adapted to be engaged within said well of said sign-supporting assembly and includes a lower pointed end adapted to penetrate the ground surface.

5,595,010
SIGN CONSTRUCTION
Lionel C. Fuller, 22 Alton Tce, The Gap 4061, Brisbane, Australia, and Berin J. Burnett, 72 Ocean Beach Rd., Mt. Maunganui, New Zealand
Filed Jun. 7, 1995, Ser. No. 477,199
Claims priority, application Australia, Aug. 24, 1994, PM7683
Int. Cl.[6] G09F *15/00*
U.S. Cl. 40—606 **10 Claims**



1. A frame assembly for removably supporting a display sheet to form a sign adapted to be secured to a foundation during use

thereof, said frame assembly having a width and comprising resilient rod means including sign supporting side elements extending to lower support elements spaced apart in the direction of the width of said sign, clamping means including a rigid member having a length and apertures at spaced locations along its length for receiving said lower support elements, said rigid member being operable to move said lower support elements between release and clamping positions for respectively mounting and dismounting the display sheet between said side elements and for retaining the display sheet in a substantially planar orientation between said side elements during use of the sign, said rigid member being operable to dispose at least a portion of said lower elements in overlying relationship in said release position to resiliently bias said side elements toward each other a sufficient amount to facilitate the mounting and dismounting of said display sheet, said rigid member being adapted to cooperate with the frame assembly in said clamping position to retain said side elements in spaced apart relationship with said display sheet extending therebetween in a tensioned condition and to inhibit relative movement of said side elements.

5,595,011

TELESCOPIC-SIGHT SYSTEM FOR AK47-TYPE RIFLES

Richard A. Gorslin, 707 E. Pinto Ave., Phoenix, Ariz. 85024

Filed Nov. 3, 1995, Ser. No. 552,939

Int. Cl.[6] F41G *1/38*

U.S. Cl. 42—101 **20 Claims**



1. An improvement in telescopic sights for rifle means of the type comprising barrel means portions located at about arm's length from the eyes of an aiming user, comprising, in combination:

a. pistol-type telescopic sight means for enlarged focused viewing of a target when said pistol-type telescopic sight means is located about an arm's length from said eyes of a said aiming user; and

b. mounting means for mounting said pistol-type telescopic sight means along and above said barrel means portions.

5,595,012

BIRD DECOY

Allen D. Coleman, 712 3rd St., League City, Tex. 77573

Filed Apr. 18, 1995, Ser. No. 424,792

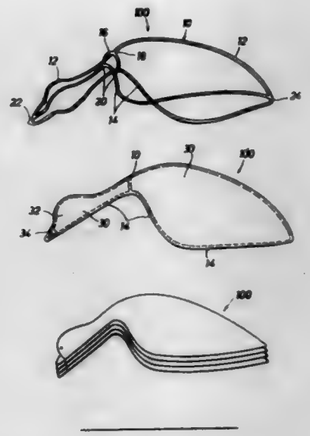
Int. Cl.[6] A01M *31/06*

U.S. Cl. 43—3 **20 Claims**

1. A fowl decoy comprising:

a frame foraged of rod members, said frame forming a body portion, a neck portion and a head portion;

a flexible covering disposed substantially around said frame and forming a lower opening in said body, neck and head portions of said frame to allow the fowl decoy to be stacked upon one another.



5,595,013

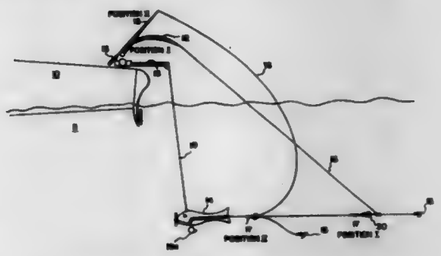
WATERPOWERED FISH DECOY AND JIGGING DEVICE

Paul C. Dubrinke, Keene, N.H., assignor to Strikeline, Inc., Keene, N.H.

Continuation of Ser. No. 123,753, Sep. 17, 1993, Pat. No. 5,428,916. This application Oct. 5, 1994, Ser. No. 318,278

Int. Cl.[6] A01K *91/00*

U.S. Cl. 43—19.2 **13 Claims**



1. An apparatus for the attraction of and catching of fish including a jigging device connected by a line to lure, said jigging device being actuated by the motion of water relative to said jigging device and cyclically reeling said line and lure toward said jigging device and releasing said line and lure, said improvement comprising

a drag increasing device spaced from said jigging device on said line, said drag increasing device being actuated when said line is released by said jigging device and increasing a dragging force on said line and said lure, said drag increasing device pulling said line and lure away from said jigging device and causing said lure to have a motion relative to said jigging device essentially the same as said motion of the water relative to said jigging device whereupon said lure resembles a stunned fish substantially motionless in the water.

5,595,014

FISHING ROD TIE

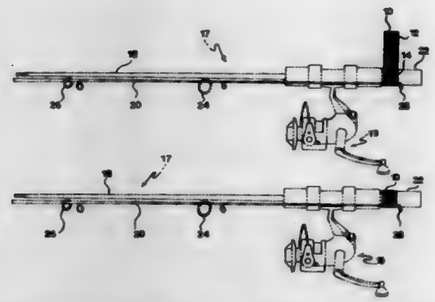
Clifton H. Moore, 4901 49th Ave., Hyattsville, Md. 20781

Filed Feb. 21, 1995, Ser. No. 391,512

Int. Cl.[6] A01K *87/00*

U.S. Cl. 43—25 **8 Claims**

1. A fastener strip for holding together pieces of a multi-piece fishing rod comprising:



an elongated hook portion having a first end, a second end and a first length, said hook portion having a plurality of hooks on a first surface thereof and an adhesive provided on a second surface thereof;

an elongated loop portion having a first end, a second end and a second length, said loop portion having a plurality of loops of yarn on a first surface thereof and a smooth backside provided on a second surface thereof, said second end of said hook portion being attached to said first end of said loop portion to form a continuous strip which is substantially the sum of the first and second lengths; and

wherein said first length of said hook portion is relatively shorter than said second length of said loop portion, and said plurality of hooks are on an opposite side from said plurality of loops;

whereby said loop portion can be adhered to a fishing rod handle forming part of a first piece of multi-piece fishing rod, and said hook portion can be drawn around at least a second piece of the multi-piece fishing rod, thereby holding at least the first piece and the second piece of the multi-piece fishing rod together.

5,595,015

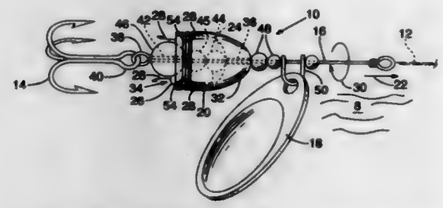
FISHING LURE

Roger P. Jensen, Hood River, Oreg., assignor to Miracle Tackle Co., Inc., Stevenson, Wash.

Filed May 26, 1994, Ser. No. 249,747

Int. Cl.[6] A01K *85/00*

U.S. Cl. 43—42.06 **3 Claims**



1. An artificial fishing lure comprising;

a spindle having opposed top and bottom ends adapted for attachment to a fishing line at the top end and a fishing hook at the bottom end;

a bell shaped housing having an upper end and a lower end and provided with a cavity that opens to the lower end and forming a cavity mouth, and an orifice provided in the housing extending from the upper end down into the cavity, said housing slidably mounted on said spindle which extends down through the orifice and into the cavity and out through the cavity mouth;

a first restriction provided on said spindle within said cavity to restrict downward movement of the housing on the spindle, and a second restriction provided on said spindle and positioned at said cavity mouth with the first restriction engaging the housing and restricting further downward movement, said second restriction sized to provide limited spacing at the cavity mouth for limiting water flow through said cavity; and

scented bait having a consistency that allows shaping of the bait to enable insertion into the cavity with the housing retracted upwardly relative to said second restriction to thereby open the cavity mouth, and said scented bait retained in said housing with the housing slid to its lower position whereat the second restriction is positioned in the cavity mouth.

5,595,016

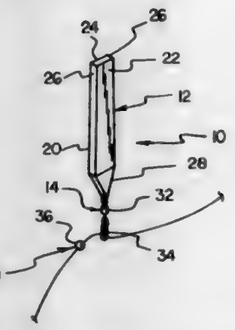
MOTION RESISTANT FREELINE BOBBER

John Feher, R.D. #1, Box 222A, Adena, Ohio 43901

Filed Feb. 9, 1995, Ser. No. 385,891

Int. Cl.[6] A01K *93/00*

U.S. Cl. 43—44.87 **4 Claims**



1. A fishing line bobber comprising:

a spherical floatation member shaped so as to define a truncated cylindrical bore extending into the spherical floatation member which is of a first diameter, the truncated cylindrical bore being in contiguous communication with the through-extending cylindrical bore, with the first diameter being substantially greater than the second diameter;

a securing boss received within truncated cylindrical bore;

a hollow hemi-spherical weight secured to a portion of the spherical floatation member so as to coextensively cover approximately one-half of the spherical floatation member;

a center wire projecting through the securing boss and through the through the through-extending cylindrical bore, the center wire being shaped so as to define an upper J-shaped end which engages a portion of the securing boss so as to preclude a passage of a first upper end of the center wire through the cylindrical bores of the spherical floatation member, the center wire continuing through the through-extending cylindrical bore of the spherical floatation member, and projecting through a center of the hemi-spherical weight, the center wire terminating in a lower J-shaped end which engages an exterior portion of the hemi-spherical weight so as to secure the weight relative to the spherical floatation member; and

a line clasp secured to the swivel and adapted for engaging a fishing line.

5,595,017

FISHLINE SINKER

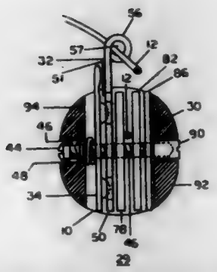
Andrew Gaydos, 193 Upper Heckman Rd., North Versailles, Pa. 15137

Filed May 22, 1995, Ser. No. 447,262

Int. Cl.[6] A01K *95/00*

U.S. Cl. 43—44.88 **5 Claims**

1. A deep troller weight apparatus for receiving a fishline comprising:

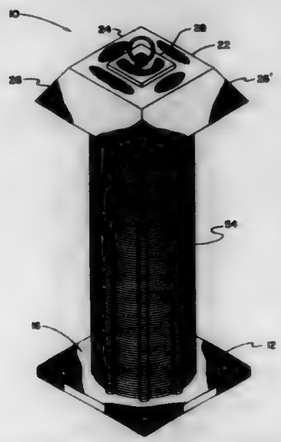


a deep troller weight body for attachment to said fishline;

a fishline locking means housed within said weight body allowing said fishline to be engaged to said deep troller weight body at a fixed point prior to lowering said deep troller weight apparatus with a hook and lure at an end of said fishline into a body of water wherein said locking means acts in a second capacity to release said deep troller weight apparatus from said locking means of said fishline when activated by a moderate pull on said fishline freeing said deep troller weight apparatus to glide by gravitational forces along said fishline to a lower level on said fishline where said hook and lure are located, wherein said locking means consists of a plurality of pressure disks housed in a cavity of said deep troller weight body and affixed about a shaft, a spring means located about said shaft which functions to create a lateral pressure on said plurality of pressure disks, wherein said fishline is secured between two of said pressure disks being two opposing disks until said fishline is released from said two opposing pressure disks when said locking means is activated by said moderate pull on said fishline;

a fishline guiding means for holding said fishline at a fixed position about said deep troller weight body and preventing said locking means from releasing said fishline under relatively small forces exerted on said fishline.

5,595,018
MOSQUITO KILLING SYSTEM
Alvin D. Wilbanks, 3519 W. County Rd., Osceola, Ark. 72370
Filed Feb. 28, 1995, Ser. No. 395,910
Int. Cl.[6] A01M 1/22
U.S. Cl. 43—112 **5 Claims**



1. A new and improved portable mosquito killing system for use indoors and out of doors comprising, in combination:

a base member having a floor having a plurality of apertures and a roof, and further having a fan therebelow the floor for urging gaseous flow communication therethrough the plurality of apertures;

a canopy member having a flat top section and a plurality of outwardly sloped downwardly disposed sides, the flat top section having an outer surface having means for suspension communication with a chain and an inner surface having means for electrical communication with a heat emitting quartz tube;

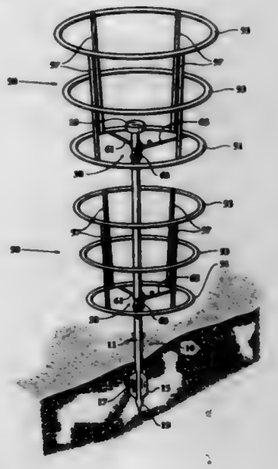
a cylindrical tower therebetween having an inner shell and an outer network of electrified low voltage wires in a spaced apart relationship for forming an annular zone therein, and a plurality of upstanding non-conducting rods therein the annular zone, the inner shell further having a heating zone therein in an upper portion thereof and a second plurality of apertures on a periphery of the inner shell for such that said fan urges gas flow communication from the heating zone through the second plurality of apertures to the outer network of wires for attracting the insects to a warmed aromatic air;

transformer means for converting current from 120 volts to a variable lower voltage for delivery to the low voltage wired network;

thermostatic means for maintaining the heat emitting tube in an operating temperature range of about between 100 to 120 degrees fahrenheit; and

status means for indicating the electrical operating status of the transformer means and the heat emitting tube.

5,595,019
PLANT SUPPORT
Howard R. Foreman, 63366 E. 111 Rd., Miami, Okla. 74354
Filed Oct. 6, 1995, Ser. No. 539,974
Int. Cl.[6] A01G 17/06;17/14
U.S. Cl. 47—47 **15 Claims**



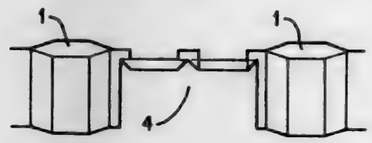
1. A support for a plant comprising:

a rod;

at least two brackets fixed in spaced apart relationship on said rod, an uppermost of said brackets being proximate an upper end of said rod; and

at least one cage having means thereon cooperable with one of said brackets for connecting said cage to said rod, said cage having a depth from a top thereof to said means greater than a distance from said uppermost bracket to said upper end of said rod whereby said top of said cage is higher than said upper end of said rod.

5,595,020
CONTINUOUS ASSEMBLY OF POTS FOR RAISING AND TRANSPLANTING SEEDLINGS
Sumio Ito; Hidekazu Terasawa, and Yukio Sasaki, all of Obihiro, Japan, assignors to Nihon Tensaisaito Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 25, 1995, Ser. No. 428,675
Claims priority, application Japan, Nov. 4, 1992, 5-297585
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—66 **6 Claims**

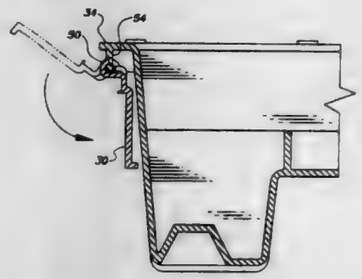


1. An assembly of pots for raising and transplanting seedlings, comprising:

a plurality of cylindrical pots made of paper, each pot connected by a connection member to at least one adjacent pot to form the assembly, the connection member including slits for allowing a spacing between each adjacent pot to be elongated to a length corresponding to one intrarow spacing,

wherein the slits on the connection member are vertically and alternately provided from upper and lower edges of the connection member, each slit having a length shorter than a vertical length of the connection member.

5,595,021
TURFING SYSTEMS FOR STADIA
Thomas L. Ripley, Sr., and Stephen A. Cataldo, both of Chalfont, Pa., assignors to Greentech L.L.C., Richmond, Va.
Filed Jun. 6, 1995, Ser. No. 470,924
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—66 **8 Claims**



1. A turf unit for a transportable, natural turf activity surface, comprising:

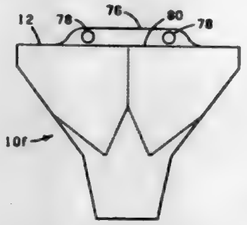
a growing pan containing plant growing medium together with growing, substantially entire, turf plants, said growing pan comprising:

a bottom surface;

a plurality of sidewalls connected to said bottom surface and having a top edge;

a fence section hingeably connected to the top edge of each one of said sidewalls, said fence section being adapted for containing said plant growing medium together with growing, substantially entire, turf plants when said fence section is in a closed position above the top edge, said fence section being rotatable about the hingeable connection to an open position below the top edge.

5,595,022
DECORATIVE COVERING FOR A FLOWER POT
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International Inc., Oklahoma City, Okla.
Continuation of Ser. No. 237,078, May 3, 1994, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, and a continuation-in-part of Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482. This application Jun. 2, 1995, Ser. No. 459,683
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—72 **15 Claims**



1. A plant cover for covering a pot means having an upper rim, a lower end and an outer peripheral surface, comprising:

a sleeve comprising:

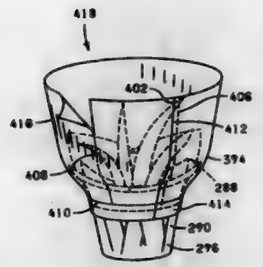
a base portion having a lower end, an upper end, an inner peripheral surface and an outer peripheral surface, the base having a flattened state from which the base is openable to an opened position wherein the inner surface of the base defines and encompasses an inner retaining space, an opening being formed through the upper end of the base in communication with the inner retaining space, the base defined as that portion of the sleeve which is substantially adjacent to and surrounds the outer peripheral surface of the pot means and having a portion in the lower end inwardly folded to form a gusset which is unfoldable for forming a closed bottom of the base in the opened position of the base,

a skirt portion extending from the upper end of the base, and an upper portion connected to an upper end of the skirt portion along a non-linear line of perforations and having means in the upper portion for supporting the sleeve from wicket means; and

wherein the base and skirt portion are separable from the upper portion by tearing along the line of perforations forming a non-linear upper edge in the skirt portion and wherein when the base is positioned in the opened position, the pot means is disposable in the inner retaining space of the base with the lower end of the pot means positioned upon the closed bottom of the base and with the base substantially covering only the outer peripheral surface of the pot means to provide the decorative cover for the pot means and wherein the skirt portion is shaped and dimensioned to extend a distance from the base without substantially encompassing a floral grouping disposed within the pot means.

5,595,023
DECORATIVE PLANT COVER WITH ATTACHED SLEEVE
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.
Continuation of Ser. No. 237,078, May 3, 1994, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, and Ser. No. 940,930, Sep. 4, 1992. This application Jun. 5, 1995, Ser. No. 465,510
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—72 **31 Claims**

1. A plant cover for covering a pot means having an outer peripheral surface, comprising:

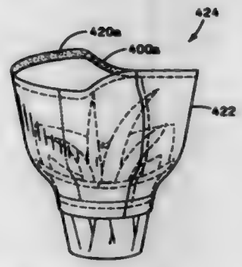


a base portion preformed to fit about a pot means having a specific size and shape and having a lower end, an upper end, an outer peripheral surface, an inner peripheral surface, and having an opening extending from the upper end to the lower end;

a skirt portion attached to the base portion and extending a distance beyond the upper end of the base portion; and

a sleeve portion bondingly connected by an adhesive or cohesive to a surface of the base portion and extending from the upper end of the base portion and detachable therefrom and wherein when the sleeve portion is detached from the upper end of the base portion, the skirt portion is exposed allowing the skirt portion to extend angularly from the base portion.

5,595,024
PLANT COVER AND SLEEVE FORMED FROM TWO MATERIALS
Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.
Continuation of Ser. No. 237,078, May 3, 1994, which is a continuation-in-part of Ser. No. 220,852, Mar. 31, 1994, and Ser. No. 940,930, Sep. 4, 1992, Pat. No. 5,361,482. This application Jun. 5, 1995, Ser. No. 463,646
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—79 **22 Claims**



1. A tubular sleeve, comprising:

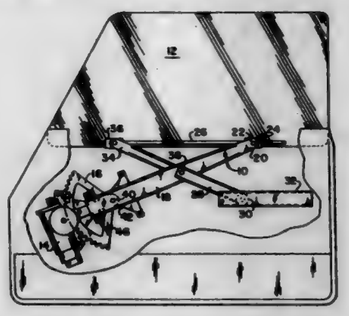
a base portion preformed to fit about a pot means having a specific size and shape and having a lower end, an upper end, an outer surface and a retaining space for enclosing the pot means, and sized to substantially cover the pot means;

a skirt portion extending beyond the upper end of the base portion and having an upper peripheral edge; and

a sleeve portion having an upper peripheral edge and a lower peripheral portion, the lower peripheral portion bondingly connected to one of the skirt portion and the outer surface of the base portion and detachable therefrom and extending a distance therefrom, and sized to substantially surround and encompass a floral grouping,

wherein the base portion and the skirt portion are constructed from a first material and the sleeve portion is constructed from a second material different from the first material and wherein when the sleeve portion is detached from the skirt portion, the skirt portion extends angularly from the base portion.

5,595,025
WINDOW REGULATOR ASSEMBLY
Bryan D. MacPhail-Fausey, Pontiac, Mich., assignor to Excel Industries, Inc., Elkhart, Ind.
Filed May 1, 1995, Ser. No. 432,954
Int. Cl.[6] E05F 11/44
U.S. Cl. 49—351 **10 Claims**



1. A regulator assembly having a window panel movable between open and closed positions, comprising:

drive means for delivering drive force for reversibly operating the regulator assembly to move window panel between the open and closed positions;

gear means comprising a sector gear operatively engaging the drive means, and pivotally mounted to the lifting arm at a pivot point;

linkage means comprising a lifting arm operatively interconnecting the sector gear to the window panel, for transmitting drive force from the drive means to the window panel; and

load absorber means mounted to one of said gear means and said linkage means, for releasably absorbing drive force upon operation of the regulator assembly between any two points of travel of the window panel between the open and closed positions, comprising an elastomeric bushing surrounding a bushing post remote from the pivot point, a rigid bearing surface of one of the sector gear and the lifting arm engaging the elastomeric bushing to limit pivotal movement of the sector gear and lifting arm relative one another.

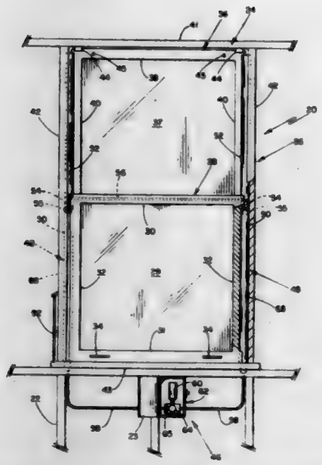
5,595,026
WINDOW ASSEMBLY WITH AN INTERNALLY PROPELLED WINDOW UNIT
Michael A. Licking, 1129 Blvd., Sturgis, S. Dak. 57785, and Gerald E. Bergum, R.R. 1 Box 133, Whitewood, S. Dak. 57793
Filed Sep. 9, 1994, Ser. No. 303,408
Int. Cl.[6] E05F 11/00
U.S. Cl. 49—360 **5 Claims**

1. A window assembly containing an internal propelling system, the assembly comprising:

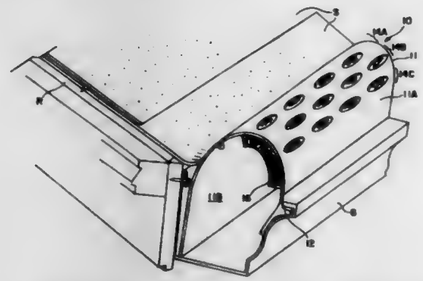
a frame to define a window opening;

a movable window unit mounted in the frame within the window opening; and

an internal propelling system comprising at least one piston and cylinder assembly mounted at least partially within the frame for propelling the movable window unit to a relatively open position upon activation, the internal propelling system including an extension member attached to the movable window unit and at least one rod connected to the at least one piston and cylinder assembly, wherein, upon activation of the system, the rod abuts and propels the extension member, thereby moving the attached movable window unit to an open position, the extension member defined by a cross bar extending from one end to an opposite end of the movable window unit.



5,595,027
GUTTER PROTECTOR
R. Lane Vail, 1000 Reverdy La., Matthews, N.C. 28105
Filed Nov. 17, 1994, Ser. No. 341,638
Int. Cl.[6] E04D 13/00
U.S. Cl. 52—12 **14 Claims**



1. A gutter protector mounted in an open top of a gutter attached to an edge of a roof, said gutter protector comprising:

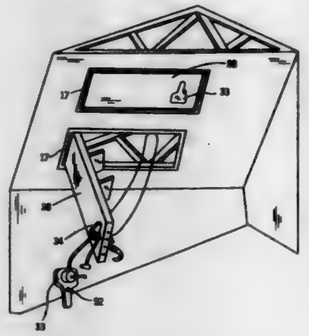
(a) an elongate sheet of flexible material for being flexed into a curved shape under tension and for being placed into the open top of the gutter while in the flexed condition, for retaining the gutter protector in the flexed position in the gutter, the gutter protector having a curved, convex outer surface extending upwardly above the opening of the gutter to define a debris-diverting surface;

(b) first flange means positioned on the sheet material and extending outwardly from an outer edge of the sheet material for being trapped and retained in a lip proximate a top outer edge of the gutter for providing positive retention of the outer edge of the sheet material in the gutter;

(c) second flange means positioned on the sheet material and extending from an inner edge of the sheet material for being trapped and retained by an inner edge of the gutter adjacent the open top of the gutter and adjacent the edge of the roof to which the gutter is attached for providing positive retention of the inner edge of the sheet material in the gutter adjacent its open top; and

(d) aperture means in the sheet of flexible material for permitting water to pass through the protector into the gutter.

5,595,028
TRUSS ROOF AND FLOOR JOIST STORAGE DEVICE
Walter A. Handzlik, 4808 May Field Rd., West Bend, Wis. 53095
Filed Jan. 31, 1995, Ser. No. 382,248
Int. Cl.[6] A47F 5/08
U.S. Cl. 52—32 **12 Claims**



10. An overhead storage device suspendable from building support members for storing items, said device comprising:

a generally rectangular planar surface;

a pair of end walls joined to said planar surface;

a pair of side walls joined to said planar surface such that said planar surface, said end walls, and said side walls combine to form a storage unit;

a pair of support members each securely attached between a pair of building support members;

a hinge means securely connected at a first side to one of said support members and securely connected at a second side to one of said end walls, such that said hinge means permits said storage unit to pivot between a substantially horizontal position and a substantially vertical position;

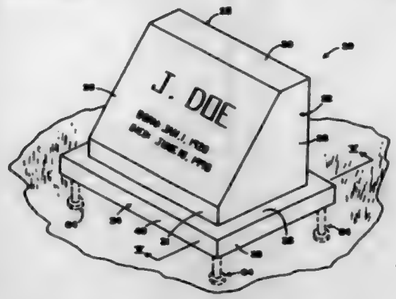
a latch mounted on said storage unit and engageable with the other of said support members to releasably hold said planar surface in the substantially horizontal position;

a spring loaded safety catch mounted on said storage unit, said safety catch engageable with the other of said support members for preventing the unexpected free-fall movement of said planar surface from the substantially horizontal position to the substantially vertical position;

a release cord having a first end connected to said safety catch and a second end extending through said planar surface; and

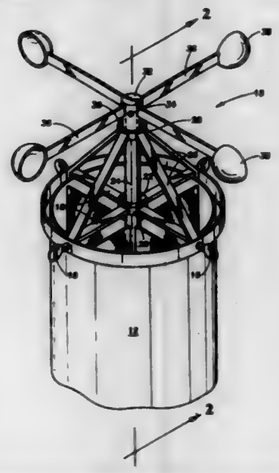
a pulley supported above said planar surface, said pulley engaging said release cord between said first and second ends, such that the combination of said cord and said pulley control the upward and downward pivotal movement of said storage unit.

5,595,829
MOLDED TOMBSTONE/MONUMENT
Melvin H. Revoir, 835 Haynor Dr., Petoskey, Mich. 49770, and Gregory L. Revoir, 10346 Burnett, Charlevoix, Mich. 49720
Continuation-in-part of Ser. No. 88,437, Jul. 7, 1993, abandoned. This application Jan. 6, 1994, Ser. No. 254,191
Int. Cl.[6] E01F 9/011
U.S. Cl. 52—103 29 Claims



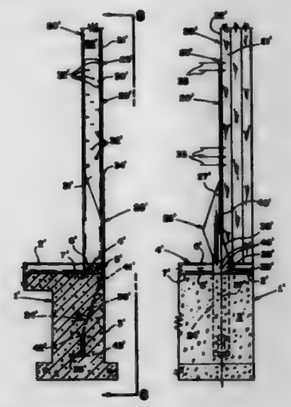
1. A tombstone/monument assembly comprising:
a one-piece molded, solid body formed from a moldable polymeric material and having an outer inscription area on an exterior surface, a base defining an outer perimeter, and a bottom surface, said body also including a plurality of apertures in said bottom surface, said apertures being concealed from view from said exterior surface; and
a plurality of anchors for attachment to said body at said apertures and thereafter to be anchored to the ground, each of said anchors including an enlarged member and a connector projecting from said enlarged member, whereby said enlarged member is anchored in the ground and said body is secured to said connector to prevent removal of the body when the outer inscription area is readily visible.

5,595,830
VENT STACK FROST BUILD UP INHIBITOR
Calvin L. Pulscher, R.R. 1, Box 27, Aurora, S. Dak. 57002
Filed Aug. 5, 1994, Ser. No. 286,334
Int. Cl.[6] E04H 12/28; F23L 17/02
U.S. Cl. 52—218 4 Claims

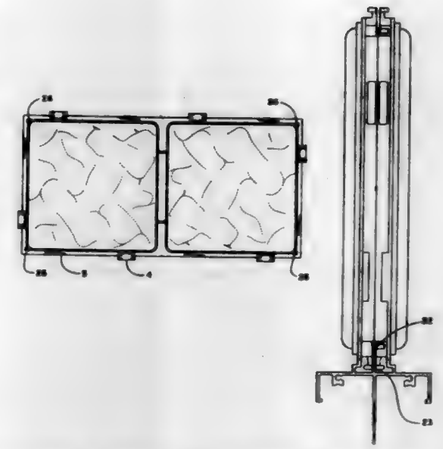


1. A vent stack frost buildup inhibitor comprising:
a vent stack;
a ring for attaching the inhibitor to a vent stack;
means for adjustably securing the ring to the stack;
first beam means attached to the ring, in a plane transverse to the longitudinal axis of a vent stack, comprising four individual beams joining at the centerpoint of the said ring and engaging a bearing receiving and holding cup;
second beam means connected to the ring in a conical plane, having its apex along the longitudinal axis of the vent stack, comprising four individual beams extending at an acute angle to said transverse plane of the first beam means and joining at the apex of the conical plane and engaging a bearing receiving and holding cup;
a shaft extending along the longitudinal axis of the vent stack from a point distal to the apex of the conical plane to a point distal to the transverse plane;
a first bearing means connected to the first beam means;
a second bearing means connected to the second beam means whereby, the shaft extends through and is supported by the first and second bearing means;
a wind turbine means, attached to the shaft adjacent the second bearing means, comprising a plurality of air capturing cup shape means mounted at the ends of arms extending from a shaft adapter fitting;
the said first and second bearing means comprise sealed bearings;
means for removably securing the wind turbine to said shaft; and
a plurality of rectangular vane means attached to the shaft adjacent the first bearing means and extending into the vent stack whereby, rotation of the wind turbine means will cause rotation of the vane means within the vent stack.

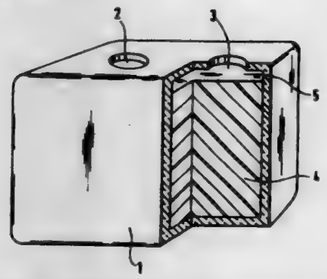
5,595,831
ONE-PIECE, IN-LINE SHEET METAL HOLDOWN STRAP CONNECTOR
Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., Pleasanton, Calif.
Filed Aug. 29, 1994, Ser. No. 297,585
Int. Cl.[6] E02D 27/02; E04B 1/38
U.S. Cl. 52—264 6 Claims



4. A holdown strap connection comprising:
a. a concrete foundation having an upper surface and a side surface;
b. a generally horizontally extending mudsill member having an outside edge and an upper side and a lower side resting on said concrete foundation;
c. a generally vertical frame member having an outside edge and a side face and mounted on said upper side of said mudsill member;
d. an elongated sheet metal holdown strap connector including,
1. a foot section embedded in said concrete foundation,
2. a transition section having an upper portion and a lower portion connected to said foot section and extending from said concrete foundation past said outside edge of said mudsill member and along a portion of said outside edge of said vertical frame member, and
3. an elongated strap section with an upper portion and a lower portion integrally connected to said upper portion of said transition section, extending and in registration with said side face of said vertical frame member and arranged so that the plane of said elongated strap section generally bisects the plane of said foot section and formed with a plurality of fastener indicia means; and
h. fastener means dimensioned for insertion at said fastener indicia means through said elongated strap section of said elongated sheet metal holdown strap connector and into said vertical frame member.



5,595,832
BUILDING BLOCKS
Jeffrey Richards, West Molesey, and Martin C. Harvey, Camberley, both of Great Britain, assignors to Dow Corning Hanull Limited, Byfleet, United Kingdom
Filed Jan. 19, 1995, Ser. No. 386,994
Claims priority, application United Kingdom, Jan. 28, 1994, 9401687
Int. Cl.[6] E04C 1/42
U.S. Cl. 52—306 4 Claims

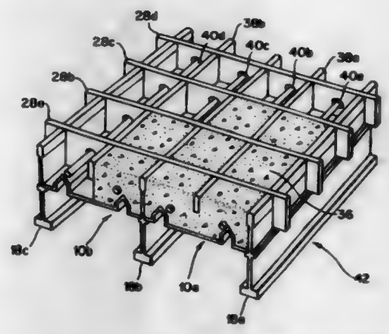


1. A hollow, glass, building block which contains the elastomeric or gel-like product of curing a polydiorganosiloxane composition, said cured product being optically at least translucent and present in an amount insufficient to fill completely the available interior volume of the bulding block whereby there is provided a space adjacent to the cured product which permits expansion of the cured product relative to the block during changes in temperature thereof.

5,595,833
PLASTIC BLOCK
John R. Frey, 6863 Karen La., Riverside, Calif. 92509, assignor to John R. Frey, Monterey Park, Calif.
Filed May 26, 1995, Ser. No. 450,866
Int. Cl.[6] E04C 1/42
U.S. Cl. 52—306 4 Claims

1. A generally rectangular hollow block:
said rectangular block comprised of two like halves joined together to comprise one complete rectangular hollow block, said halves each comprising two square faces and a flange parallel to the two square faces extending throughout the full perimeter of the halves forming edges of which;
each square face having three sides comprised of the edges; each side having one male locking member at one end and one female locking member at an opposite end;
said halves joined such that the male locking members of each half align to form male locking devices and the female locking members of each half align to form female locking devices;
each female locking device recessed below the edges forming a channel to receive a male locking device;
each male locking device extending beyond the edges and comprised of two legs normal to the edges defining a void therebetween;
the legs of the male locking devices being adapted to engage a lead in on a female locking device to secure said block to an adjacent like block.

5,595,834
GRID ASSEMBLY WITH IMPROVED FORM PAN FOR USE IN GRID REINFORCED CONCRETE DECKS AND METHOD OF MANUFACTURING SAME
William Krysalka, Zelienople, and Jack Lindermann, Tarentum, both of Pa., assignors to Harsco Corporation, Wormleysburg, Pa.
Filed Feb. 22, 1995, Ser. No. 392,125
Int. Cl.[6] E04F 15/14
U.S. Cl. 52—318 25 Claims



1. A grid assembly, comprising a plurality of longitudinally extending main beams in parallel spaced relation, each of said main beams having a plurality of longitudinally spaced slots therein and a central flange thereon, said beams being positioned such that said slots are aligned between said beams, a plurality of cross bars constructed to be inserted through said aligned slots and rotated into an upright position, and a form pan extending between two adjacent main beams of said plurality of main beams and having a first and a second side portion disposed on said central flange of said two adjacent main beams, respectively, said form

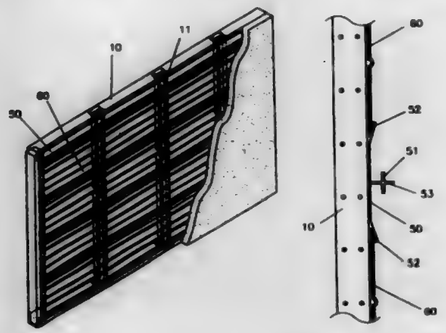
pan including at least a first ridge extending upwardly thereon, said first ridge having a height which enables a lower edge of said cross bars to come into contact therewith when in said upright position, said contact causing a downward force on said first ridge which mechanically locks said form pan between said cross bars and said central flange on said adjacent main beams and places said first and second side portions in sealing engagement with the associated central flange of the main beams.

5,595,035

LIGHT WEIGHT WALL STRUCTURE FOR USE IN BUILDINGS

Fu-Chuan Chang, 4D-11, Taipei World Trade Centre No. 5, Hsin Yi Road, Sec. 5, Taipei, Taiwan

Filed May 20, 1994, Ser. No. 246,696
Int. Cl.[6] E04B *9/00*
U.S. Cl. 52—348 **12 Claims**



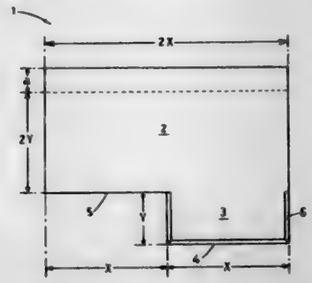
1. A light weight wall structure for a building including:
a skeletal frame having a plurality of posts for quick assembly;
a plurality of gusset sub-panels and base board sub-panels disposed in overlapping and alternate relationship fastened to the skeletal frame;
connection means provided in each junction between adjacent sub-panels for securely adjoining the sub-panels together;
a slurry retention device disposed on at least one major surface of a selected number of sub-panels; and
a wall facing layer applied to the sub-panels in the form of a setable slurry, so as to increase the strength of the wall structure;
further wherein each of said posts comprises:
an upper post resembling a long column, said upper post having a first end fixably connected to an upper girder or upper floor of a building and a second end with a longitudinal hole, said longitudinal hole having an inner wall with an internal thread;
a lower post resembling a long column, said lower post having a first end fixably connected to a lower girder or lower floor of a building and a second end with a longitudinal hole, said longitudinal hole having an inner wall with an internal thread; and
an intermediate post resembling a long column, said intermediate post having first and second end each having a long thread for screwing into said longitudinal holes of said upper and lower posts, respectively; and
said long thread is a right-handed thread on one end of said intermediate post, and is a left-handed thread on the other end, such that turning said intermediate post enables said upper and lower posts to produce longitudinal movement relative to each other.

5,595,036

ROOF SHINGLES

Hiroki Nakamura, Arida, Japan, assignor to Globe Japan Corporation, Osaka, Japan

Filed Jul. 6, 1995, Ser. No. 498,892
Claims priority, application Japan, Aug. 23, 1994, 6-198323
Int. Cl.[6] E04D *1/12*
U.S. Cl. 52—554 **15 Claims**



1. A roof shingle comprising:
a shingle body portion having substantially a rectangular shape with a widthwise dimension and a depthwise dimension, said body portion having a lower eave side to be directed downwardly toward an eave of a roof when said shingle is installed on the roof;
a tab portion extending from an end portion of said eave side of said body portion, said tab portion having substantially a rectangular shape with a widthwise dimension and a depthwise dimension, said tab portion having opposite side edges extending in said depthwise direction and an eave side edge extending between said opposite side edges, said opposite side edges and said eave side edge of said tab portion being beveled; and
said body portion and said tab portion being relatively configured such that said widthwise dimension of said tab portion is X, said widthwise dimension of said body portion is 2X, said depthwise dimension of said tab portion is Y, and said depthwise dimension of said body portion is 2Y+a, wherein a>0.

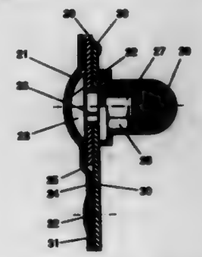
5,595,037

METHOD OF BUILDING UP A SILO OR TANK WITH A LINING, AND A WALL SHEET FOR BUILDING UP A SILO OR TANK AND METHOD OF MANUFACTURING SUCH WALL SHEET

Gerardus H. F. Paques, Balk, Netherlands, assignor to Industrial Tankbuilders B.V., Joure, Netherlands

Filed Aug. 4, 1994, Ser. No. 283,902
Claims priority, application Netherlands, Aug. 6, 1993, 9301376
Int. Cl.[6] E04B *2/18*
U.S. Cl. 52—591.5 **25 Claims**

1. A method of building up a silo or tank with a lining by means



of pre-formed, substantially rectangular, wall sheets, connected to each other by means of screw connections for forming a complete silo wall, characterized in that wall sheets are used provided, along the edges thereof, with bolt holes, the bolt holes in zones located along at least two connecting edges being provided with fastening members secured against rotation, and the zones comprising said fastening members and the rest of each wall sheet being covered, on the inside thereof, by a layer of lining material bonded to the wall sheet, leaving free two other free edge zones provided with bolt holes, said layer of lining material extending by edge strips beyond the edges of the zones having bolt holes provided with fastening members, and that the wall sheets are fastened to each other by means of the fastening members and the bolt holes in a manner such that said edge strips of the layer of lining material of a wall sheet cover the free edge zones of two adjacent wall sheets, and that the adjacent edges of the layers of lining material of different wall sheets are sealingly bonded to each other.

5,595,038

CONSTRUCTION MODULES

Alfred Prestenback, 122 Sharlene St., Houma, La. 70364

Filed Mar. 21, 1995, Ser. No. 408,046
Int. Cl.[6] F04B *2/08*
U.S. Cl. 52—592.1 **11 Claims**



1. A construction module, comprising:
an elongated sheet of moldable material, said sheet being configured to comprise a first, open-end portion formed by a pair of substantially parallel elements which define a first passageway therebetween, said first portion further comprising a nose portion formed by integral extensions of said elements, said nose portion defining a reduced sized second passageway;
a second, closed end portion which is formed by integral extensions of said elements opposite said nose portion, said closed-end portion adapted to be fitted in a first passageway of a similar adjacent construction module when adjacent construction modules are interconnected; and
a connecting portion formed by integral extensions of said elements between said first portion and said second portion, said connecting portion adapted to be fitted into a second passageway of said similar adjacent module when adjacent modules are interconnected, said connecting portion comprising means for allowing securing of the construction module to an independent structure, said means for allowing securing of the construction module comprising a plurality of openings spaced along said connecting portion, said openings being adapted to receive a securing member therethrough.

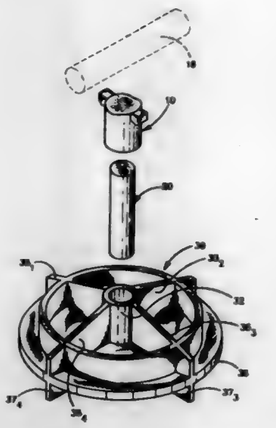
5,595,039

CHAIRS OF ADJUSTABLE HEIGHT FOR USE IN CONCRETE CONSTRUCTIONS

John L. Lowery, 7940 Jefferson Hwy., Apt. 107, Baton Rouge, La. 70809

Filed Dec. 18, 1995, Ser. No. 574,073
Int. Cl.[6] E04C *5/16*
U.S. Cl. 52—677 **18 Claims**

1. Apparatus characterized as a chair said apparatus supporting, positioning and retaining a concrete reinforcing bar in place at predetermined height in the pouring and construction of concrete slabs beams at a jobsite wherein the concrete reinforcing bar remains as an integral element of the slab beam construction, which comprises



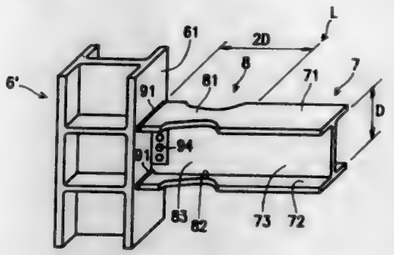
a cap constituted of a tubular member having an upper face and a downwardly faced lower opening, the upper face of which is provided with a slot retaining and supporting the concrete reinforcing bar, the downwardly faced lower opening being formed by an enclosing side wall and upper wall forming a downwardly faced receptacle,
a base containing an upwardly faced receptacle opening, and
a stem having an upper terminal end and a lower terminal end, the upper terminal end of which can be fitted into the downwardly faced receptacle provided in the cap, the lower terminal end which can be fitted into the receptacle in the base, said stem being readily cut into desired lengths to provide a chair of adjustable height as predetermined by slab and beam thickness,
whereby, said cap and said base can be shipped to a jobsite and a chair of needed height can be assembled therefrom by simply cutting the stem to a required length, and using said stem to complete formation of the chair based on requirements of slab and beam thickness.

5,595,040

BEAM-TO-COLUMN CONNECTION

Sheng-Jin Chen, Taipei, Taiwan, assignor to National Science Council, Taipei, Taiwan

Filed Jul. 20, 1994, Ser. No. 278,034
Int. Cl.[6] E04H *9/02*; E04C *3/00*
U.S. Cl. 52—729.1 **8 Claims**



1. An apparatus for connecting an H-beam, to a column surface, said apparatus comprising:
the H-beam having a pair of flange plates and a web plate positioned between the flange plates, a plastic moment capacity and a demand moment capacity;
a web plate member disposed at an end of the H-beam integrally formed with said web plate of said H-beam; and

a pair of flange plate members also disposed at an end of the H-beam respectively integrally formed with said flange plates, each of the flange plate members including means for reducing the plastic moment capacity of said H-beam to an amount of 90%–95% of the demand moment capacity of said H-beam, said reducing means comprising a tapered zone that is non-uniform.

5,595,041

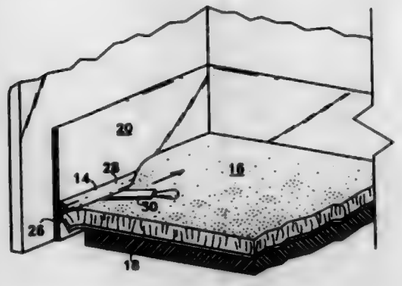
CARPET INSTALLATION METHOD USING FLEXIBLE CARPET BASE

Merle R. Hoopengardner, Lafayette, Calif., assignor to Step Loc Corporation, Lafayette, Calif.

Division of Ser. No. 223,827, Apr. 6, 1994, Pat. No. 5,450,698, which is a continuation of Ser. No. 627, Jan. 5, 1993, abandoned, which is a division of Ser. No. 628,443, Dec. 17, 1990, Pat. No. 5,184,445. This application Sep. 12, 1995, Ser. No. 527,155

Int. Cl.[6] E04F *13/00;19/04*

U.S. Cl. 52—746.1 **5 Claims**



1. A method for installing a wall-to-wall carpet on a floor, such that the edge of the carpet is engaged by and covered by a pre-installed carpet wall base secured to the wall, comprising,

adhering to the wall at the floor a carpet wall base, said carpet wall base comprising an integral extrusion of a generally rubbery plastic material and having a generally vertical flat back surface lying flatly against and adhering to the wall, and the wall base having a shape defining a generally flat tail extension at its lower end with a bottom edge of the tail extension substantially engaged against the floor and the shape further defining a protruding edge extending outwardly, away from the wall, with a generally flat bottom surface just above the tail extension, said generally flat bottom surface projecting outwardly and substantially rigid in a direction away from the wall and terminating at said protruding edge, so that upon adhering the carpet wall base to the wall the generally flat bottom surface and protruding edge are spaced above the floor and form a substantially rigid extension of the carpet wall base,

after a carpet has been installed on the floor, trimming the carpet such that the edge of the carpet extends up onto the carpet wall base over the protruding edge, and

tucking the carpet edge under the protruding edge using a blade type tool engaged between the top surface of the carpet and the protruding edge, and sliding the tool longitudinally with the tool engaged against the substantially rigid protruding edge, to thereby progressively draw the carpet edge down under the protruding edge and under the generally flat bottom surface along the length of a wall, whereby the carpet is engaged by the carpet wall base and the carpet's edge is covered.

5,595,042

PROCESS AND MACHINE FOR WRAPPING PRODUCTS WITH STRETCHABLE FILM, AND WRAPPING FORMED BY THIS PROCESS

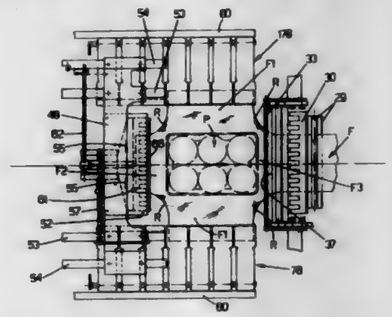
Angelo Cappi, Vignola, and Renato Rimondi, Bazzano, both of Italy, assignors to A.W.A.X. Progettazione E Ricerca S.r.l., Vignola, Italy

Division of Ser. No. 215,646, Mar. 22, 1994, Pat. No. 5,528,881. This application May 8, 1996, Ser. No. 646,641

Claims priority, application Italy, Mar. 24, 1993, GE93A0028

Int. Cl.[6] B65B *11/00;53/00*

U.S. Cl. 53—66 **30 Claims**



14. A machine for wrapping products with stretchable film comprising:

means for ascertaining length, width, and height dimensions of an article to be wrapped;

means for feeding a longitudinal segment of the stretchable film to a wrapping station, including at least one reel for feeding the film and means for determining a length dimension of the longitudinal segment to be fed to the wrapping station which is proportionate to at least the length dimension of the article determined by said ascertaining means;

means for holding, at a product wrapping point, a longitudinal segment of the film, which is extended but not substantially stretched, said holding means comprising

a fixed front dispenser disposed next to a front fixed folder capable of allowing the film to slide through said front fixed folder only when a specified longitudinal teasile force is exceeded so that the film remains longitudinally extended,

a rear clamp parallel, complementary and opposite to said dispenser and mounted against a carriage which carries a movable rear folder, and

a computer which controls a movement of said rear clamp towards and away from said front dispenser wherein a travel distance of said rear clamp is proportionate to at least one of length, width, height dimensions of the product to be wrapped;

means for transversely pre-stretching a selected intermediate portion of a longitudinal segment of the stretchable film, said pre-stretching means including

means for selecting a desired length dimension of the intermediate portion to be pre-stretched which is proportionate to the length dimension of the longitudinal segment determined by said determining means such that the desired length dimension of the intermediate portion is also proportionate to the length dimension of the product,

on each lateral side of the longitudinal segment, a respective variable length clamping means for clamping different lengths of intermediate portions in order to clamp at each lateral side the desired length dimension of the intermediate portion,

means for actuating the variable length clamping means at each lateral side so that a length of the clamping means substantially equals the selected length dimension of the intermediate portion, and

means for moving the respective actuated clamping means transversely away from one another to pre-stretch the intermediate portion;

said variable length clamping means comprising

opposing clamps disposed to grip the lateral sides of film extended at the wrapping point, each said clamp being disposed next to at least one adjacent said clamp,

means for rectilinear and self-centering movement of said clamps;

elastic means for closing said clamps and a centralized operating system for opening said clamps, and

means for causing said clamps not used for gripping the film by the variable length clamping means to be disposed at a lower height than an assembly comprising said rear folder and said rear clamp;

means for reducing longitudinal tension in the film, during the pre-stretching phase, with a proportional approach of the rear clamp which holds a rear flap of the film and with a proportional drawing of film from said fixed front dispenser;

a lifter located at the wrapping point and capable of lifting the product to be wrapped against the film which is held by said holding means and which bears a front of said film on a rear face of the front fixed folder and a rear of said film on a support which allows the film to slide freely, wherein said opposing clamps are able to approach each other to a distance proportionate to the dimensions of the product as the product is lifted, while the longitudinal tension of the film is reduced with a suitable approach of said rear clamp and with a proportionate drawing of film from the feed dispenser;

movable folding means for executing folding of side flaps onto the bottom of the product, said side flaps being formed by transverse pre-stretching of the film and held by the respective variable length clamping means, the rear folder being made to operate and extend a portion of a rear flap of the film under the product and under a portion of said side flaps, while the film remains fixed to said rear clamp;

a pusher, mounted on a carriage which also carries the rear folder immediately after the rear folder which pushes the product onto the front fixed folder while a front flap of film is drawn under tension from said fixed front dispenser and extended onto an entire bottom length of the product; and

cutting means for separating the front flap of the wrapping film transversely from a new leading end of the film held by said dispenser.

5,595,043

CARTONER WITH SELECTIVELY INTERCHANGEABLE TUCKING AND GLUING MODULES

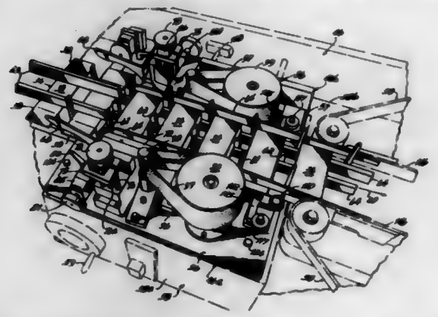
Richard E. Radigan, Cincinnati, Ohio, assignor to R.A. Jones & Co., Inc., Covington, Ky.

Filed Nov. 14, 1994, Ser. No. 338,871

Int. Cl.[6] B65B *7/20;7/24;51/02*

U.S. Cl. 53—201 **38 Claims**

1. A cartoner for loading products into cartons and for sealing



the ends of product cartons as the cartons move along a carton path therein, said cartoner further comprising:

a support structure positioned proximate the cartoon path;

a tuck module mounted predominantly on a module mount, the module mount configured to be received by the support structure at a position along the carton path for the tuck module to engage an end flap of the product carton and tuck a tucking portion of the end flap into the carton end to seal the end as the carton moves along said path; and

a glue module mounted predominantly on a second module mount, the second module mount selectively interchangeable with the tuck module mount at said position along the carton path for the tuck module to engage an end flap of a product carton and glue the end flap to a portion of the carton to seal the carton end as the carton moves along said path;

whereby a single cartoner may be used to seal cartons by selectively tucking or gluing the end flaps.

5,595,044

METHOD AND DEVICE FOR DETECTING SHORTAGE/EXCESS OF ARTICLE ENCLOSED IN AUTOMATIC MAIL ENCLOSING AND SEALING MACHINE

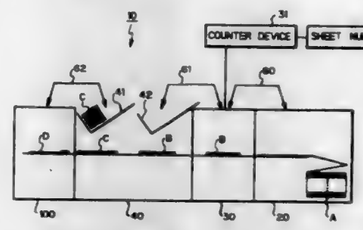
Tutomu Katagi, Tokyo, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Jan. 30, 1995, Ser. No. 380,356

Claims priority, application Japan, Feb. 1, 1994, 6-010681

Int. Cl.[6] B65B *57/16;57/18*

U.S. Cl. 53—396 **4 Claims**



1. A method of detecting a shortage or excess of an article including at least one sheet enclosed in respective envelopes in an automatic mail enclosing and sealing machine, said method comprising the steps of;

detecting a unit value of the sheet to be enclosed and setting the allowable range according to the detected value,

receiving information regarding the number of sheets to be enclosed in respective envelope,

detecting a variable corresponding to the number of sheets being enclosed, by measuring the thickness of respective envelopes,

discriminating whether the detected variable is within an allowable range corresponding to the sheet number information, and

determining whether a shortage or excess of articles is enclosed.

5,595,045

METHOD OF WRAPPING A FLORAL GROUPING WITH A SLEEVE

Donald E. Weder, Highland, and William F. Straeter, Breese, both of Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

Division of Ser. No. 218,952, Mar. 25, 1994, which is a continuation-in-part of Ser. No. 95,331, Jul. 21, 1993, Pat. No. 5,428,939, which is a continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,803, which is a continuation-in-part of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 30, 1995, Ser. No. 453,936

Int. Cl.[6] B65B *9/13;13/02;51/04*

U.S. Cl. 53—397 **35 Claims**

1. A method for wrapping a floral grouping, comprising:

providing a floral grouping having an upper end and a stem portion;

providing a wrapper having an upper end and a lower end and having:

an inner surface surrounding an interior space and having an outer surface,

a crimp connecting means comprising an adhesive or cohesive bonding material disposed upon a portion of at least one of the inner surface and the outer surface, the crimp connecting means for holding overlapping portions of the wrapper in a crimped position adjacent a stem portion of the floral grouping,

closure means extending from the wrapper for enclosing the upper end, the lower end or both the upper end and lower end of the wrapper, and

detaching means for detaching a portion of the wrapper after the wrapper has been bound about the floral grouping;

placing the floral grouping into the interior space of the wrapper; and

binding the wrapper about the floral grouping by crimping portions of the wrapper together causing at least one portion of the wrapper to overlap another portion of the wrapper, the crimp connecting means engaging the overlapping portions of the wrapper together in a position surrounding and adjacent a portion of the floral grouping forming a crimped portion of the wrapper and wherein at least a portion of the stem portion is disposed within the crimped portion thereby binding the wrapper in a position about the floral grouping.

5,595,846

WRAPPING A FLORAL GROUPING WITH SHEETS HAVING ADHESIVE OR COHESIVE MATERIAL APPLIED THERETO

Donald E. Weder, Highland, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 264,866, Jun. 23, 1994, Pat. No. 5,448,875, which is a continuation of Ser. No. 965,595, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, said Ser. No. 502,358and a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 467,443

Int. Cl.[6] B65B *51/02;61/06*

U.S. Cl. 53—397 **33 Claims**

1. A method for wrapping an item, comprising:

providing a pad comprising a plurality of sheets of material;

each sheet of material having an upper surface and a lower surface, and each sheet of material having adhesive means thereon;

providing a floral grouping with the floral grouping comprising the item;

placing the floral grouping on one of the sheets of material in the pad; and

placing a portion of the sheet of material over a portion of the floral grouping causing portions of the sheet of material to overlap other portions of the sheet of material forming overlapping portions and bonding the overlapping portions of the sheet of material by contacting the adhesive means on the sheet of material with adjacent overlapping portions of the sheet of material forming bonded overlapping portions wherein the sheet of material is held about the floral grouping by the bonded overlapping portions of the sheet of material.

5,595,847

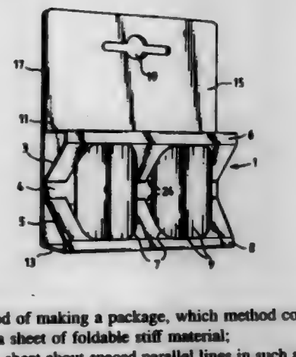
PACKAGING

Jacky M. G. N. Paumen, Begijnendijk; Rowland Hemming, Brussels, both of Belgium; Kai Hartmann, Weltmo-Wengen, Germany, and Marc Beckers, Garivate, Italy, assignors to Duracell Inc., Bethel, Conn.

Division of Ser. No. 373,345, Jan. 17, 1995, Pat. No. 5,544,755, which is a division of Ser. No. 802,018, Dec. 3, 1991, Pat. No. 5,428,940. This application Apr. 17, 1995, Ser. No. 423,065

Int. Cl.[6] B65B *21/00*

U.S. Cl. 53—398 **14 Claims**



1. A method of making a package, which method comprises:

providing a sheet of foldable stiff material;

folding the sheet about spaced parallel lines in such a manner as to form a channel region of substantially V-shaped channel cross section;

providing opposed openings in the sheet, positioned so as to be in opposite integral limbs of said channel region;

inserting one or more articles longitudinally through the opposed openings in the respective limbs, while said limbs are in a substantially V-configuration;

further folding the sheet to form end locating regions adjacent the ends of the inserted article(s) for retaining the article(s) longitudinally in the openings; and

further folding and securing the sheet so as to form a rigid structure comprising said oblique limbs of the substantially V-shaped channel region and said end locating regions, with said limbs taut and thereby frictionally gripping and preventing rotation of the article(s).

5,595,848

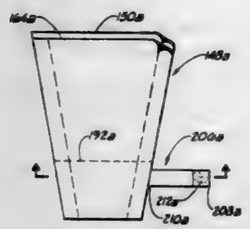
FLORAL GROUPING WRAPPER HAVING A DETACHABLE PORTION

Donald E. Weder, Highland, and William F. Stracter, Breese, both of Ill., assignors to Southpac Trust International, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 95,331, Jul. 21, 1993, Pat. No. 5,428,939, which is a continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, Pat. No. 5,408,803, which is a continuation-in-part of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Mar. 25, 1994, Ser. No. 218,952

Int. Cl.[6] B65B *9/00;13/02;51/06*

U.S. Cl. 53—399 **36 Claims**



1. A method for wrapping a floral grouping, comprising:

providing a floral grouping having an upper end and a stem portion;

providing a wrapper having an upper end and a lower end and having:

an inner surface surrounding an interior space and having an outer surface,

a crimp connecting means comprising an adhesive or cohesive bonding material disposed upon a portion of at least one of the inner surface and the outer surface, the crimp connecting means for holding overlapping portions of the wrapper in a crimped position adjacent a stem portion of the floral grouping, and

detaching means for detaching a portion of the wrapper after the wrapper has been bound about the floral grouping;

placing the floral grouping into the interior space of the wrapper; and

binding the wrapper about the floral grouping by crimping portions of the wrapper together causing at least one portion of the wrapper to overlap another portion of the wrapper, the crimp connecting means engaging the overlapping portions of the wrapper together in a position surrounding and adjacent a portion of the floral grouping forming a crimped portion of the wrapper and wherein at least a portion of the stem portion is disposed within the crimped portion thereby binding the wrapper in a position about the floral grouping.

5,595,849

METHOD AND APPARATUS FOR DEPOSITING SLIVER FROM A SLIVER-PRODUCING MACHINE INTO A COILER CAN

Ferdinand Leifeld, Kempen, Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Germany

Filed Jun. 2, 1995, Ser. No. 458,469

Claims priority, application Germany, Aug. 11, 1994, 44 28 474.8

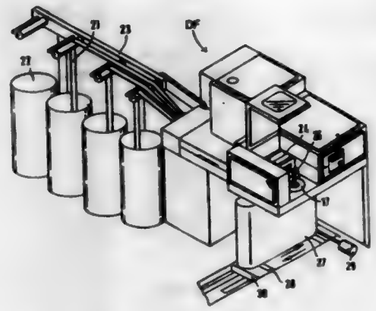
Int. Cl.[6] B65B *63/04*

U.S. Cl. 53—430 **10 Claims**

1. In a method of depositing sliver from a sliver-producing machine into a coiler can, including the steps of

outputting the sliver by the sliver-producing machine with a delivery speed;

advancing the sliver to a sliver depositing device with an advancing speed;



positioning an upwardly open coiler can on a platform below the sliver depositing device;

moving the platform with the coiler can with a platform speed; and

rotating the sliver depositing device with a rotary speed and discharging the sliver by the sliver depositing device for depositing the sliver into the moving coiler can in an annular pattern;

the improvement comprising the step of automatically varying a lag between said advancing speed, said rotary speed and said platform speed upon a change of said delivery speed.

5,595,850

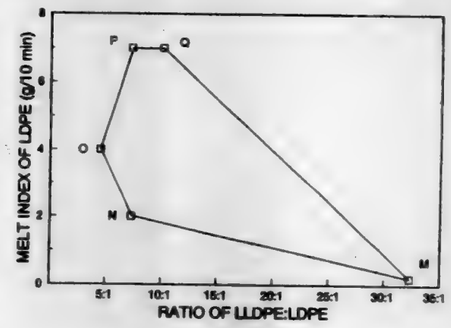
METHOD OF MAKING POLYETHYLENE STRETCH FILMS AND UNITIZED PALLETS

Kaelyn C. Koch, Lake Jackson, Tex., and Lisa M. Belek, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 962,772, Oct. 19, 1992, Pat. No. 5,399,426. This application Mar. 17, 1995, Ser. No. 405,666

Int. Cl.[6] B65B *53/00*

U.S. Cl. 53—441 **12 Claims**



1. A method of making a unitized pallet of goods, comprising the steps of:

(A) providing a polymer blend which comprises

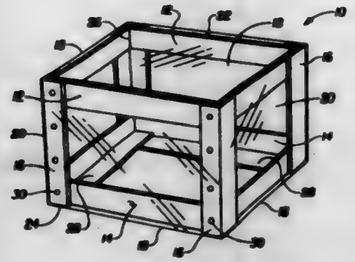
(i) at least one linear polyethylene, and

(ii) at least one branched polymer selected from the group consisting of ethylene homopolymers and ethylene/vinyl acetate copolymers, wherein the linear polyethylene and branched polymer are in a ratio from about 5:1 to about 33:1,

(B) extruding the polymer blend to foun a film structure,

(C) stretch wrapping the pallet of goods with the film structure of (B).

5,595,851
MINIMAL SHIPPING CONTAINER AND METHOD OF CONSTRUCTION
Stephen S. Applegate, 5563 Hoffman Rd., Milford, Ohio 45150
Division of Ser. No. 310,605, Sep. 22, 1994. This application Nov. 21, 1995, Ser. No. 561,341
Int. Cl.[6] B65B 53/02; 11/58
U.S. Cl. 53—442 10 Claims



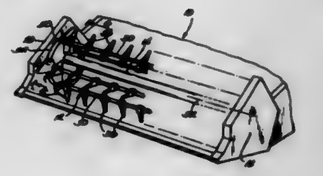
1. A method of constructing a minimal container for shipping consumer disposable goods, said method comprising the steps of:
a) pre-cutting strips of corrugated cardboard and arranging them with face-to-face overlapping surfaces;
b) fastening together at said overlapping surfaces said strips of corrugated cardboard to form a unitary, substantially flat ladder-shaped structure having two ends;
c) scoring said unitary, substantially flat ladder-shaped structure for folding; and
d) folding said unitary, substantially flat ladder-shaped structure and fastening together said unitary, substantially flat structure at said two ends to form a three-dimensional frame.

5,595,852
BAT FOR A REEL HAVING AN ANTI-WRAP EXTENSION
Edward P. Jasper, Mendota, and Roderick J. Jensen, Moline, both of Ill., assignors to Deere & Company, Moline, and HCC, Inc., Mendota, both of Ill.
Filed Aug. 4, 1995, Ser. No. 511,572
Int. Cl.[6] A01D 57/03
U.S. Cl. 56—220 6 Claims



1. A bat for a reel of an agricultural harvesting platform; the bat comprising:
an elongated tube has a circular cross section;
a downwardly projecting tine mounted to the tube by a connector assembly, the connector assembly is provided with an upstanding projection having a mounting screw for mounting the elongated anti-wrap extension to the elongated tube, a rotation preventing means prevents the downwardly projecting tine from rotating relative to the elongated tube;
an elongated anti-wrap bat extension is mounted to the connector assembly for preventing crop material from wrapping around the elongated tube.

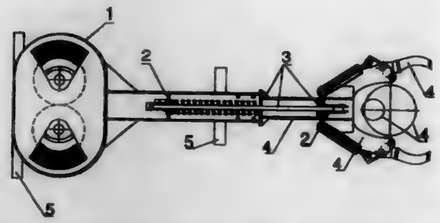
5,595,853
HARVESTING MACHINE REEL
Edward P. Jasper; James M. Frederick, and Joshua U. Echelberger, all of Mendota, Ill., assignors to HCC Inc., Mendota, Ill.
Filed Mar. 1, 1995, Ser. No. 396,920
Int. Cl.[6] A01D 65/04
U.S. Cl. 56—226 17 Claims





1. A reel for a harvesting machine comprising
an elongated shaft having opposed ends, mounted for rotation about a transverse axis during operation and carrying a plurality of sets of circumferentially spaced, radially extending support arms mounted at axially spaced locations along said shaft, said support arms having outer end portions;
a plurality of axially extending bat tubes equal in number to said support arms in each set, each of said bat tubes mounted on the outer end portions of said support arms for rotation about an axis relative to said support arms and having opposed ends;
a plurality of tines mounted at axially spaced locations along each of said bat tubes for common rotation therewith; and
bias means operably connected to each of said bat tubes which applies a biasing force on said bat tube to hold it in an operating position wherein said tines are at a predetermined angular orientation relative to the rotational axis of said reel and which, in response to one or more of said tines engaging an obstruction, permits the respective bat tube to rotate relative to said support arms against said biasing force, in a direction opposite to the rotational direction of said reel, to a deflected position where said tines can ride over the obstruction.

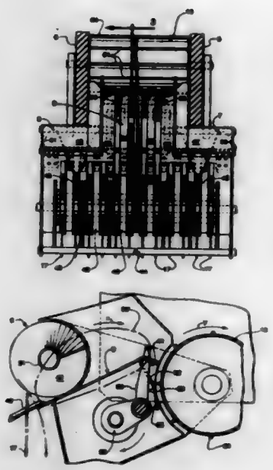
5,595,854
MECHANICAL TREE SHAKER FOR FRUIT HARVESTING
Domingos P. Reynolds de Sousa, Rua Heliodoro Salgado, and Pedro J. Vieira Correia de Oliveira, Caxias, both of Portugal, assignors to Reynolds & Oliveira-Empresa de Projectos e Comercializacao de Maquinas, R&O, LDA, Estremos, Portugal
Continuation-in-part of Ser. No. 35,470, Mar. 23, 1993. This application Sep. 7, 1994, Ser. No. 302,103
Claims priority, application European Pat. Off., Apr. 24, 1992, 92870083
Int. Cl.[6] A01D 46/00
U.S. Cl. 56—340.1 10 Claims



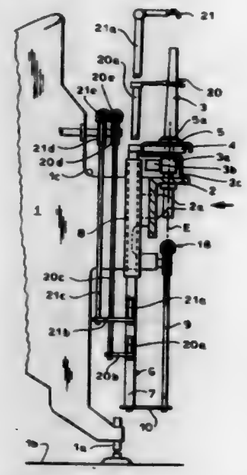
1. An agricultural mechanical shaker for harvesting fruit by providing phase-controlled linear impact vibrations to a tree, said shaker comprising:
a linear vibrator set including a plurality of rotating eccentric masses for initiating said vibrations, the vibrator set having an end and including a first metallic bumper at said end;
a clamp set for linking said shaker to a trunk or limb of said tree, said clamp set including a second metallic bumper receiving direct impacts from said first metallic bumper;
a spring set interconnecting said linear vibrator set with said clamp set, said spring set including a guiding long screw and a helical spring mounted around said guiding long screw such that, when said first metallic bumper and said second metallic bumper become separated, said spring set biases said second metallic bumper toward said first metallic bumper.

5,595,855
PICKUP APPARATUS FOR A ROUND BALER
Fred M. Horchler, Jr., Lancaster, and H. Nevin Lausch, Denver, both of Pa., assignors to New Holland North America, Inc., New Holland, Pa.
Filed Jul. 17, 1995, Ser. No. 503,361
Int. Cl.[6] A01F 15/07
U.S. Cl. 56—341 16 Claims

1. In a round baler for traversing a field to form cylindrical bales of crop material, said baler comprising
a main frame,
means for supporting said frame above the surface of said field,
a bale forming chamber defined by means mounted on said frame, said chamber having a generally transverse opening for permitting the ingress of crop material,
a pickup for picking up crop material from said field and feeding it rearwardly along a path in the direction of said transverse opening,
stuffer means including crop engaging elements for engaging said crop material as it is being fed rearwardly, said elements urge said crop material along said path and into said transverse opening,
said stuffer means includes stationary stripping means for engaging said crop material and stripping some or all of said crop material from said crop engaging elements in the vicinity of said transverse opening, the improvement comprising
supplemental stripping means for subsequently engaging any of said crop material not stripped from said crop engaging elements by said stripping means.



5,595,856
RING-SPINNING MACHINE OR RING-TWISTING MACHINE WITH RING-RAIL LIFTER BRACKETS EXTENDING TOWARD VERTICAL CENTER OF GRAVITY PLANE
Mathias Scheufler, Eislingen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany
Filed Dec. 7, 1995, Ser. No. 568,536
Claims priority, application Germany, Dec. 14, 1994, 44 44 619.5
Int. Cl.[6] D01H 7/40; 7/52
U.S. Cl. 57—75 9 Claims



1. A textile machine comprising:
a machine frame;
a spindle rail on said machine frame having a multiplicity of spindle stations each provided with a respective spindle;
a horizontal ring rail displaceable vertically on said machine frame and having respective rings surrounding said spindles and adapted to receive respective travelers traversed by respective yarns to be wound on bobbins of the respective spindles, said ring rail having a longitudinal axis containing

the center of gravity of the ring rail and lying in a plane of said center of gravity;

vertical guides on said machine frame below said ring rail;

rigid vertically displaceable drive elements guided in said vertical guides and connected to said ring rail for lifting and lowering said ring rail, said drive elements extending downwardly from said ring rail;

a bracket extending transversely from one of said drive elements toward said plane and affixed to said one of said drive elements below said ring rail; and

at least one flexible traction member upon which a pull is exerted to lift said ring rail, said traction member extending vertically parallel to said plane.

5,595,857

STEEL CORDS FOR THE REINFORCEMENT OF RUBBER ARTICLES

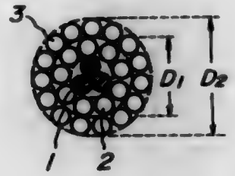
Yoshinori Kuriya, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 393,893

Claims priority, application Japan, Feb. 24, 1994, 6-026446

Int. Cl.[6] D02G *3/07;3/06*

U.S. Cl. 57—213 **3 Claims**



1. A steel cord for the reinforcement of rubber articles comprising: a core comprised of three steel filaments, a first sheath formed by twisting nine wave-formed steel filaments around the core, and a second sheath formed by twisting fifteen wave-formed steel filaments around the first sheath in a twisting direction opposite to the twisting direction of the first sheath, wherein a forming ratio F_1 of each filament in the first sheath is defined by a ratio of amplitude H_1 of a wave formed in the filament to a first diameter D_1 of the first sheath, and a forming ratio F_2 of each filament in the second sheath is defined by a ratio of amplitude H_2 of wave formed in the filament to a second diameter D_2 of the second sheath such that F_1 and F_2 are within a range of 0.75–0.95, respectively, and satisfy $F_1<F_2$.

5,595,858

OPEN-END SPINNING DEVICE

Werner Billner, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Division of Ser. No. 183,599, Jan. 21, 1994, Pat. No. 5,471,829. This application Jun. 6, 1995, Ser. No. 468,376

Claims priority, application Germany, Mar. 25, 1993, 43 09 704.9

Int. Cl.[6] D01H *4/38*

U.S. Cl. 57—413 **3 Claims**

1. An open-end spinning device, comprising:

a replaceable spinning rotor of a given diameter provided with an inside wall, a fiber collection groove, and an open side;

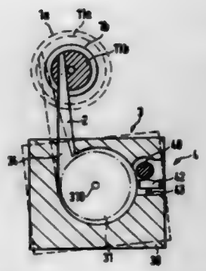
an opener device for supplying fibers to said spinning rotor, said opener device comprising an opener roller rotatable about a longitudinal axis;

a machine frame, said opener device being rotatably mounted relative said spinning rotor about a rotational axis on said machine frame, said opener device being variably positionable about said rotational axis in a plane perpendicular to said opener roller longitudinal axis between a plurality of operating positions;

a stationary replaceable rotor cover configured for said given diameter of said spinning rotor and disposed so as to cover said open side of said spinning rotor, said rotor cover stationary relative to said rotatable opener device;

a fiber feeding channel beginning in said opener device and ending in said rotor cover across from said inside wall of said spinning rotor so as to deposit fibers conveyed from said opener device to said inside wall at any of said operating positions of said opener device, at least a portion of said fiber feeding channel being defined through said rotor cover and having dimensions and orientation dependent at least in part upon said given diameter of said spinning rotor; and

wherein said opener device is rotatably displaceably mounted relative to said spinning rotor and rotor cover to accommodate different dimensions and orientation of said fiber feeding channel as a result of replacing said spinning rotor and said rotor cover with different sized spinning rotors and rotor covers.



5,595,859

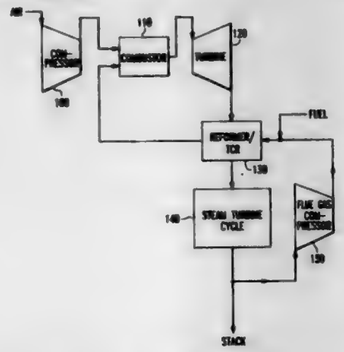
COMBINED CYCLE POWER PLANT WITH THERMOCHEMICAL RECUPERATION AND FLUE GAS RECIRCULATION

David J. Huber, Orlando; Ronald L. Bannister, Winter Springs, both of Fla.; Mark J. Khinkis, Morton Grove, and Josif K. Rabovitser, Chicago, both of Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1995, Ser. No. 397,610

Int. Cl.[6] F02C *6/00*; F02B *43/00*

U.S. Cl. 60—39.02 **14 Claims**



9. A reformer having a first inlet connected to a gas turbine exhaust, a first outlet connected to a steam turbine cycle inlet, a second inlet connected to a flue gas compressor exhaust and a source of fuel, and a second outlet connected to a combustor of the gas turbine wherein the second outlet is mixed with an air compressor exhaust prior to combustion.

13. A method of increasing the efficiency of a combined cycle power plant comprising the steps of passing the exhaust of a gas turbine through a reformer before entering a steam turbine cycle; compressing at least a portion of the flue gas from the steam turbine cycle and mixing it with natural gas to form a mixed stream; passing the mixed stream through the reformer; and entering it with compressed air into a combustor of the gas turbine.

5,595,860

APPARATUS AND METHOD FOR INTERNAL-COMBUSTION ENGINE CONTROL

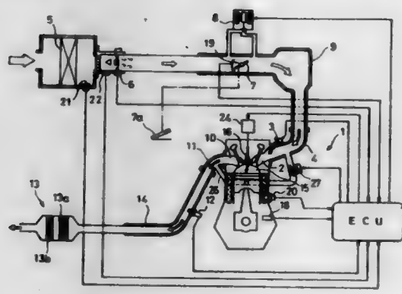
Kazuhide Togai, Takatsuki, and Kazuo Koga, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1995, Ser. No. 438,553

Claims priority, application Japan, May 10, 1994, 6-096270; May 20, 1994, 6-106628; Oct. 20, 1994, 6-255879

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **80 Claims**



1. A control apparatus for an internal combustion engine having an exhaust purifying catalytic device disposed in an exhaust passage for reducing emission of nitrogen oxide to atmosphere, the exhaust purifying catalytic device being operable to adsorb nitrogen oxide contained in exhaust gases discharged from the internal combustion engine when the engine is in a lean-combustion mode where an air-fuel ratio of an air-fuel mixture supplied to the engine is leaner than a theoretical air-fuel ratio, and to deoxidize adsorbed nitrogen oxide when the internal combustion engine is in a rich-combustion mode where the air-fuel ratio is equal to or richer than the theoretical air-fuel ratio, comprising:

adsorption state estimating means including first nitrogen oxide discharge amount estimating means for estimating a discharge amount of nitrogen oxide from the exhaust purifying catalytic device, and said adsorption state estimating means estimating an adsorption state of nitrogen oxide adsorbed by the exhaust purifying catalytic device based on said estimated discharge amount of nitrogen oxide from the exhaust purifying catalytic device; and

combustion-state deteriorating means for deteriorating a combustion state of the internal combustion engine according to the adsorption state of nitrogen oxide estimated by said adsorption state estimating means when the engine is in the lean-combustion mode.

5,595,861

CATALYST DETERIORATION-DETECTING DEVICE FOR INTERNAL COMBUSTION ENGINE

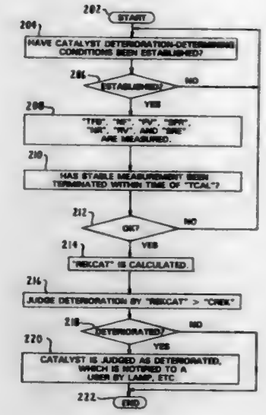
Katsuhiko Toyoda, Shizuoka-ken, Japan, assignor to Suzuki Motor Corporation, Hamamatsu, Japan

Filed Jul. 17, 1995, Ser. No. 503,379

Claims priority, application Japan, Jul. 30, 1994, 6-197499

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **2 Claims**



1. In a catalyst deterioration-detecting device for an internal combustion engine, having first and second exhaust sensors disposed in an exhaust passage of said internal combustion engine respectively on upstream and downstream sides of a catalyst body, said catalyst body being provided generally midway along said exhaust passage, which catalyst deterioration-detecting device provides first feedback control of an air-fuel ratio toward a target value in accordance with the first voltage signal which is output by said first exhaust sensor, while executing a second feedback control of said air-fuel ratio so as to correct said first feedback control in accordance with a second voltage signal which is output by said second exhaust sensor, whereby the deterioration of said catalyst body is determined when predetermined catalyst deterioration-determining conditions are fulfilled, the improvement comprising:

a control means having a catalyst deterioration-determining section which determines a degraded state of said catalyst body, when said predetermined catalyst deterioration-determining conditions are established, by taking successive steps of: respectively measuring first and second voltage signal-inverted states within a predetermined arithmetic operating time in accordance with inverted states of first and second voltage signals, thereby calculating an inverted state ratio; respectively measuring first and second voltage signal-surrounding areas within said predetermined arithmetic operating time in accordance with respective areas which are surrounded by loci of periods of time during which said first and second voltage signals are inverted, thereby calculating an area ratio; respectively measuring first and second voltage signal states within said predetermined arithmetic operating time in accordance with said first and second voltage signals, thereby calculating a voltage ratio; calculating a catalyst deterioration-measured value on the basis of said inverted state ratio, said area ratio, and said voltage ratio; and, comparing said catalyst deterioration-measured value and a catalyst deterioration-determining value, the latter value being set for each engine load.

5,595,062

INTERNAL COMBUSTION ENGINE INTAKE AND EXHAUST SYSTEMS

Alexander Chabry, 2/64 Market Street, Randwick, New South Wales 2031, Australia

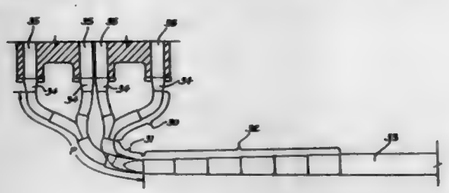
PCT No. PCT/AU93/00066, § 371 Date Aug. 11, 1994, § 102(e) Date Aug. 11, 1994, PCT Pub. No. WO93/16272, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 17, 1993, Ser. No. 284,626

Claims priority, application Australia, Feb. 17, 1992, PL0916

Int. Cl.[6] F02B *27/00;27/04;* **F02M** *35/10;* **F01N** *7/08*

U.S. Cl. 60—313 **18 Claims**



1. A reciprocating piston internal combustion engine comprising:

at least one cylinder having a cylinder wall, at least one intake port and at least one exhaust port, the ports being disposed on the cylinder wall;

at least one intake valve disposed at a corresponding intake port for regulating a flow of intake gas into the cylinder;

at least one exhaust valve disposed at a corresponding exhaust port for regulating a flow of exhaust gas out of the cylinder;

a piston mounted in the cylinder, the piston having a diameter D and being mounted for reciprocal motion of a predetermined stroke length S within the cylinder, the piston further being adapted to assume a bottom dead center position and a top dead center position; and

a plurality of manifold tubes comprising:

at least one intake manifold tube connected to a corresponding intake port;

at least one exhaust manifold tube connected to a corresponding exhaust port;

wherein each of the manifold tubes comprises a plurality of pipes connected end to end and including an end pipe disposed closest to a corresponding port, each of the pipes having a constant cross-section, the cross section of the pipes increasing incrementally in a direction away from the end pipe, the end pipe further having a diameter MW given by:

$$MW = \sqrt{D^2 \cdot \frac{S \cdot RPM}{360 \cdot FR}} \text{ inches}$$

where RPM is engine revolutions per minute, and FR is, for an intake port, an intake gas velocity through the intake port in a range between 500 and 870 ft/sec, and, for an exhaust port, an exhaust gas velocity through the exhaust port in a range between 550 and 950 ft/sec.

5,595,063

DEVICE AND METHOD FOR DEGASSING MAKE-UP WATER FOR A STEAM TURBINE PROCESS

Burkhard Trage, Ratingen, and Richard Leitz, Hilden, both of Germany, assignors to BDAG Balcke-Dürr Aktiengesellschaft, Ratingen, Germany

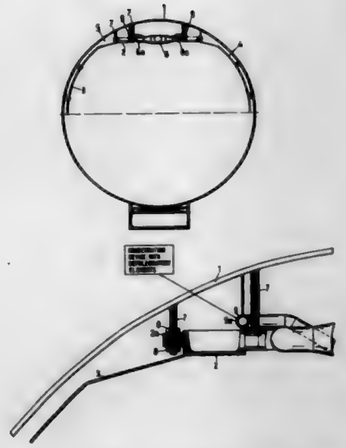
Filed Jul. 28, 1994, Ser. No. 282,835

Claims priority, application Germany, Mar. 9, 1994, 44 07 843.9

Int. Cl.[6] B01D *19/00;* **F01K** *7/00;19/00*

U.S. Cl. 60—688 **9 Claims**

1. A method for degassing make-up water for a water-steam circuit of a steam turbine process of a power plant, said method comprising the steps of:



introducing, at a location of introduction, make-up water into an exhaust steam pipe so as to form a water film;

connecting a suction line to the exhaust steam pipe in the vicinity of the location of introduction; and

removing gases released from the make-up water via the suction line.

5,595,064

CONTROL SYSTEM FOR AIR-CONDITIONER ON ELECTRIC VEHICLE

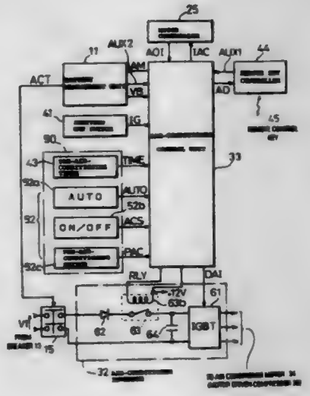
Susumu Ikeda; Toshimi Isobe, both of Isesaki; Akihiro Tajiri, Wako; Masahiro Takagi, Wako; Mitsuru Ishikawa, Wako; Choji Sakuma, Wako, and Nobuyuki Yuri, Wako, all of Japan, assignors to Sanden Corporation, Gunma-ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Jun. 7, 1995, Ser. No. 479,331

Claims priority, application Japan, Jul. 6, 1994, 6-155044

Int. Cl.[6] F25B *1/00;* **B60K** *1/00*

U.S. Cl. 62—126 **20 Claims**



1. A control system for controlling an air-conditioner on an electric vehicle, comprising:

a high-voltage battery;

a motor-driven compressor;

an air-conditioner control unit for controlling the air-conditioner;

an inverter for energizing said motor-driven compressor with electric energy supplied from said high-voltage battery in response to a drive signal from said air-conditioner control unit;

a battery management unit connected to said air-conditioner control unit and said high-voltage battery, for managing the high-voltage battery by checking power supply conditions of the high-voltage battery;

said air-conditioner control unit having means for outputting a confirmation signal to said battery management unit before said drive signal is outputted;

said battery management unit having means for checking the power supply conditions of the high-voltage battery and outputting a permission signal representative of a permission to start said motor-driven compressor to said air-conditioner control unit based on the checked power supply conditions, said air-conditioner control unit having means for activating said drive signal to operate said inverter after having received said permission signal; and

contacts controllable by said battery management unit for supplying and cutting off electric energy from said high-voltage battery, said contacts being connected between said high-voltage battery and said motor-driven compressor, said battery management unit having means for checking the power supply conditions of the high-voltage battery, closing said contacts to supply electric energy from said high-voltage battery to said inverter when the checked power supply conditions are affirmative, further checking the power supply conditions of the high-voltage battery after the contacts are closed, and outputting said permission signal to said air-conditioner control unit when the further checked power supply conditions are affirmative.

5,595,065

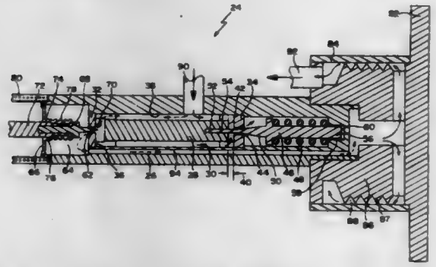
CLOSED CYCLE CRYOGENIC REFRIGERATION SYSTEM WITH AUTOMATIC VARIABLE FLOW AREA THROTTLING DEVICE

Michael Bolarski, Moscow, Russian Federation; Ralph C. Longsworth, Allentown, Pa.; Boris Yudin, Moscow, Russian Federation; Dennis H. Hill, Pottstown, Pa.; Lawrence A. Klusmier, Germansville, Pa.; Ajay N. Khatri, Bethlehem, Pa., and Anthony L. Owoc, Harleysville, Pa., assignors to APD Cryogenics, Allentown, Pa.

Filed Jul. 7, 1995, Ser. No. 499,259

Int. Cl.[6] F25B *41/00*

U.S. Cl. 62—222 **40 Claims**



1. In a closed cycle cryogenic refrigeration system using a mixed refrigerant, said system including an evaporator operating in a range from 70 K to 150 K for absorbing heat from a load, a refrigerant compressor receiving low pressure refrigerant and compressing said refrigerant to a high pressure, and first heat exchanger means for rejecting heat including compressor heat from said system, and second heat exchanger means for exchanging heat between a flow of low pressure refrigerant leaving said evaporator and entering said compressor, and a flow of high pressure refrigerant leaving said first heat exchanger means, the improvement therein comprising:

an automatic restrictor valve for receiving said high pressure refrigerant from said second heat exchanger, means for throttling said refrigerant to reduce pressure and temperature of said refrigerant, and delivering said reduced temperature refrigerant to an inlet of said evaporator, said valve including:

a first orifice for refrigerant flow therethrough to throttle said refrigerant and reduce said pressure and temperature;

first needle means for obstructing a flow area of said first orifice;

an actuator connected to said first needle means, said actuator being responsive to changes in temperature and moving said first needle means to reduce said first orifice flow area when said actuator temperature drops, said first orifice flow area in operation diminishing from a start of cool-down toward a steady-state operating temperature, said first orifice flow area no longer decreasing and remaining substantially constant in a predetermined range of temperature above said steady-state operating temperature.

5,595,066

METHOD AND DEVICE FOR PRESERVING THE MEAT OF A SLAUGHTERED BIRD

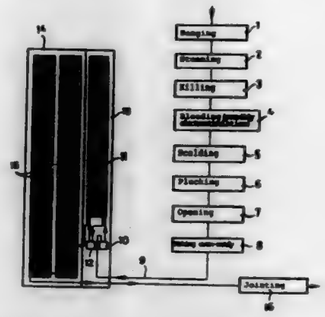
Radboud H. G. Zwanikken, Boxmeer; Jenneke A. C. Lankhaar, Bokhoven, and Adrianus J. van den Nieuwelaar, Gemert, all of Netherlands, assignors to Stork PMT B.V., Netherlands

Filed Jan. 12, 1995, Ser. No. 371,825

Claims priority, application Netherlands, Jan. 13, 1994, 9400060

Int. Cl.[6] F25D *17/02*

U.S. Cl. 62—374 **17 Claims**



1. A device for preserving the meat of a slaughtered bird or a part thereof, comprising:

conveyor means for conveying the slaughtered bird or a part thereof along a path into, through and out of one or more cooling rooms, the one or more cooling rooms comprising a first cooling zone with a spraying device for spraying cold water on the bird or the part thereof, and means for producing a cold air stream directed at the bird or part thereof, the device further comprising a second cooling zone containing cold air of sufficiently low relative humidity that the surface of the bird or the part thereof is essentially dry after passing therethough.

5,595,067

ENERGY PUMP

James E. Maness, 8918 S. Union, Tulsa, Okla. 74132

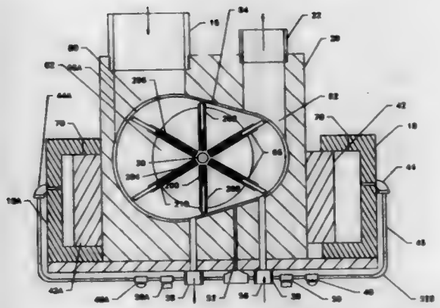
Filed Dec. 9, 1994, Ser. No. 353,096

Int. Cl.[6] F25D *9/00*

U.S. Cl. 62—401 **39 Claims**

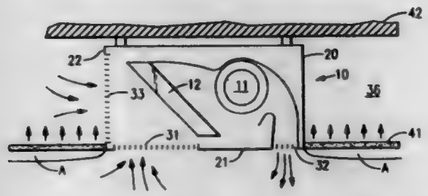
1. A rotary vane compression/expansion device comprising:

a rotor having a shaft with an axis;



a housing having an inner wall, an air inlet, and an air outlet, the shape of the cross-section of the inner wall of said housing in a plane perpendicular to said axis is an ovoid shape;
a plurality of vanes extending radially outwardly from said axis to rotationally contact the inner wall;
means to move said housing with respect to said rotor.

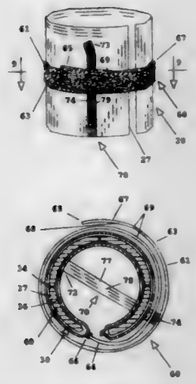
5,595,068
CEILING MOUNTED INDOOR UNIT FOR AN AIR CONDITIONING SYSTEM
Yehia M. Amr, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 15, 1995, Ser. No. 572,806
Int. Cl.[6] F25D 17/04;23/12; F24F 13/068
U.S. Cl. 62—418 **5 Claims**



1. In a room air conditioning unit of the type having an air inlet opening and an air discharge opening in the bottom surface thereof, and a heat exchanger coil and a fan disposed within the unit in serial flow relationship between the inlet and discharge openings, the unit being adaptable for mounting in a space between a true and false ceiling, wherein the improvement comprises:
an auxiliary air inlet opening formed in one side of the unit for providing fluid flow communication between the space and the fan, such that the fan simultaneously draws air from both the room and the space by way of the heat exchanger coil.

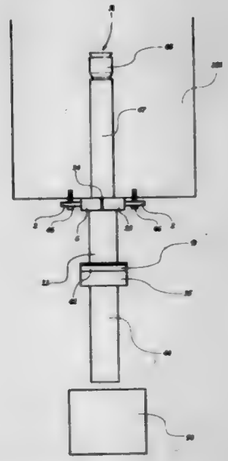
5,595,069
ADJUSTABLE REFREEZABLE UTILITY COOLER
Ronald A. Gies, N. 7217 Fotheringham, Spokane, Wash. 99208
Filed Aug. 25, 1995, Ser. No. 519,415
Int. Cl.[6] F25D 3/08
U.S. Cl. 62—530 **10 Claims**

1. An adjustable refreezable utility cooler, comprising:
(a) a cover comprising an inside sheet attached to an outside sheet, the inside sheet and outside sheet having a long side and a narrow side;
(b) a refrigerant bag, carried in the cover, comprising a plurality of refrigerant pouches;
(c) refrigerant means, carried by the refrigerant pouches, for absorbing heat energy;



(d) insulation means, carried in the cover, for reducing the rate of heat energy flow between the refrigerant and the outside sheet of the cover;
(e) lengthwise adjustable fastening means, attached to the narrow side of the cover, for adjusting the circumference of the cooler; and
(f) a perpendicular adjustable fastening structure, attached to the long side of the cover and releasably attachable to the lengthwise adjustable fastening means.

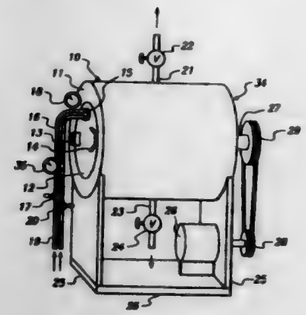
5,595,070
PRODUCT FABRICATING ATTACHMENT AND METHODS OF CONSTRUCTING
Gerald M. Gray, Sr., 968 S. Union St., Concord, N.C. 28025, and Randy L. Gray, Box 429, Rte. 1, Denton, N.C. 27239
Filed Mar. 5, 1990, Ser. No. 489,260
Int. Cl.[6] D04B 35/00
U.S. Cl. 66—147 **9 Claims**



1. An attachment for an apparatus performing an end closure in a substantially tubular fusible article, comprising, in combination:
a knitting machine for producing said substantially tubular fusible article;
first substantially tubular means for releasably receiving said substantially tubular fusible article from said knitting machine;

a collar assembly for releasably retaining said first substantially tubular means proximate a first end portion of said first substantially tubular means;
first mounting means for releasably connecting said collar assembly to said knitting machine in a predetermined position relative to said knitting machine;
means for fusing and cutting said substantially tubular fusible article;
second mounting means for releasably connecting said first substantially tubular means to said fusing and cutting means in a predetermined position relative to said fusing and cutting means;
said knitting machine and said first substantially tubular means collectively having an interior length which is sufficient to accommodate a finished product;
whereby two separated finished products each having a fused end closure therein are produced.

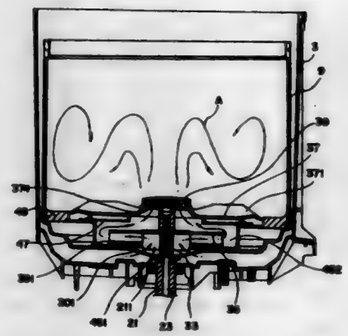
5,595,071
MIST TREATMENT OF GARMENTS
Dilip Prasad, and Frank Garcia, both of El Paso, Tex., assignors to Levi Strauss & Co., San Francisco, Calif.
Division of Ser. No. 198,195, Feb. 16, 1994, Pat. No. 5,461,742. This application Jun. 7, 1995, Ser. No. 487,464
Int. Cl.[6] D06B 3/30
U.S. Cl. 68—5 C **19 Claims**



1. An apparatus for finishing garments comprising:
a substantially liquid impermeable housing having a front and a rear end;
a means for tumbling garments placed in the housing;
a high velocity low pressure nozzle means mounted in said housing for generating a textile treatment agent fog;
a gas conduit for communicating a propellant gas from a gas source under pressure to said nozzle means;
a reservoir; and
a liquid conduit for communicating a liquid treatment agent from said reservoir under pressure to said nozzle means.

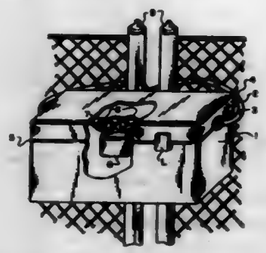
5,595,072
WATER CURRENT FORMING APPARATUS OF WASHING MACHINE
Sang-Chul Bal, Suwon, and Joon-Sang Park, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Mar. 8, 1995, Ser. No. 400,956
Claims priority, application Rep. of Korea, Mar. 8, 1994, 94-4476
Int. Cl.[6] D06F 39/08
U.S. Cl. 68—133 **8 Claims**

1. A clothes washing machine comprising:
an outer tub;



an inner tub disposed within said outer tub and being rotatable relative thereto about a vertical axis for centrifugally spin-drying laundry;
a pulsator disposed at a bottom of said inner tub, said pulsator including generally radially outwardly projecting agitating blades, and an upwardly directed opening disposed between radially inner ends of said blades and intersected by said vertical axis;
a motor-driven spin drying shaft connected to said inner tub to rotate said inner tub about a vertical axis for centrifugally spin-drying laundry;
a motor-driven washing shaft connected to said pulsator for oscillating said pulsator about said vertical axis to agitate water and laundry in said inner tub;
said inner tub defining a space beneath said opening, said space including a wash water inlet for receiving washing water, and a wash water outlet defined by said opening for ejecting wash water upwardly into a central region of said tub; and
a pumping member disposed in said space between said wash water inlet and wash water outlet and operably connected to said washing shaft to be oscillating thereby for drawing wash water into said space and ejecting wash water through said opening for generating an upward water current in said central region of said inner tub, said upward water current cooperating with a water current established by said agitator blades to urge clothes outwardly toward a wall of said inner tub.

5,595,073
WEATHERPROOF MULTIPLE PADLOCK CASE, COVER AND METHOD
John J. Sullivan, 270 Morgan St., South Hadley, Mass. 01075
Filed Nov. 13, 1995, Ser. No. 555,897
Int. Cl.[6] E05B 67/38
U.S. Cl. 70—18 **2 Claims**



1. An improved apparatus to more efficiently provide a weatherproof enclosure for padlocks, used to secure a fence gate, said padlocks each having a hasp, said apparatus comprising:
a) a case body in the shape of a topless container with a bottom surface, a front surface, a rear surface and two side surfaces

having a case body lip at the point where a top would appear, said case body lip forming a continuous rectangular case body opening having a case body channel appearing along the complete circumference of said rectangular case body opening, in addition said case body lip has two semicircular case body notches one at each side surface of said case body,

b) a case cover in the shape of an inverted bottomless container with a top surface, a front surface, a rear surface and two side surfaces, having a case cover lip at the point where a bottom would appear, said case cover lip forming a continuous rectangular case cover opening and having a case cover channel appearing along the complete circumference of said rectangular case cover opening, in addition said case cover lip has two semicircular case cover notches one at each side surface of said case cover, said case cover lip sized and shaped to conform to the dimensions of said case body lip when the said case cover is placed on top of said case body,

c) a cable having two looped ends being a first looped end and a second looped end, said looped ends being sized and shaped to receive at least one of said padlock hasps,

d) two donut shaped resilient gaskets each having two outer diameter areas, two inner diameter areas and a middle diameter area, each donut shaped resilient gasket appearing to be three donut shaped gaskets, the outer diameter areas having a greater diameter than the diameter of the inner diameter areas and the middle diameter area, the middle diameter area having a greater diameter than the diameter of the inner diameter areas, said donut shaped resilient gaskets having an opening sized and shaped to cause the cable to fit securely within the opening, further the two inner diameter areas being sized and shaped to fit securely against the semicircular case body notches and semicircular case cover notches, further said middle diameter area being sized and shaped to compressibly fit within the channel of both the care body and case cover when said case cover is placed on top of said case body,

c) a first section and second section of a resilient gasket sized and shaped to fit frictionally within said case body channel extending between the two semicircular case body notches, and further being sized and shaped in order that the first section and second section of said resilient gasket protrude sufficiently to make compressed contact with the case cover channel and against the two donut shaped resilient gaskets when the case cover is placed on top of said case body, and

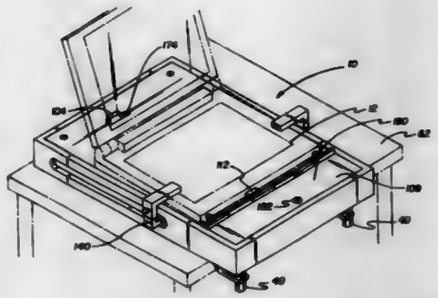
f) a hinged means for securing the rear surface of the case cover lip of said case cover with the rear surface of the case body lip of said case body, said hinged means being a hinge mechanism affording the case cover to be in a first open position and a second closed position together with an interacting latch to hold the case cover in the second closed position, the securing means when securing the case cover in the second closed position causes the case cover to compress the two section resilient gasket and the two donut shaped resilient gaskets causing a weatherproof seal.

5,595,874

DESKTOP SECURITY LOCKING STATION FOR A LAPTOP COMPUTER OR SIMILARLY SIZED COMPUTER PERIPHERAL

Robert G. Munro, 5 George Crescent, Caledon, East Ontario Louise, Canada

Filed Jan. 29, 1996, Ser. No. 593,863
Int. Cl.[6] E05B *69/00*
U.S. Cl. 70—58 **4 Claims**



1. A desktop security locking station for a laptop computer comprising, in combination:

a rectangular box-shaped platform having a pair of front corners, a pair of rear corners, and a bottom wall with a pair of long side walls, a short front wall, and a short back wall extending upwards therefrom to define a hollow interior and a top opening, and with each side wall having an elongated slot formed thereon, the platform further having an intermediate wall extended between the long walls to divide the interior into an open forward compartment and an open rearward compartment;

a pair of adjustable clamps extended downwards from each front corner of the platform, each clamp having a downwardly extended tubular seat portion integral with the bottom wall of the platform, a bolt having a lower threaded portion extended downwards through the bottom wall and the seat portion and an upper head portion extended upwards into the forward compartment, a sleeve portion telescopically disposed within the seat portion and threadably engaged with the threaded portion of the bolt, and a clamping arm integral with and extending outwards from the sleeve portion, and with the head portion of each bolt tightenable for allowing the associated clamping arm to move upwards for clamping an object positioned between the clamping arm and the bottom wall of the platform;

a ratcheting grip assembly disposed within the interior of the platform and comprising:

a pair of opposed, spaced, interconnected, and toothed rails,

a bracket coupled between the rails and slidable therealong, the bracket having an upper portion with a recess formed thereon and an upper pair of spring-loaded pins extended oppositely inwards to the recess, a lower portion with a lateral primary bore disposed therethrough, a pair of lateral opposed secondary bores disposed therethrough on each side Of the primary bore, and a lower pair of spring-loaded pins extended oppositely outwards therefrom, and an intermediate portion with a channel formed therein that is extended downwards from the recess to the primary bore,

an elongated and axially rotatable beam extended between the rails and through the primary bore of the bracket, the beam having a rear end with a finger formed thereon that is located within the rearward compartment, a front end with a handle formed thereon that is located within the forward compartment, an intermediate portion therebetween that is extended through the intermediate wall of the platform, and another finger formed thereon that is located within the rearward compartment near the intermediate wall, and with reciprocation of the beam by the handle allowing the fingers to project upwards through the top opening of the platform in one position and sideways in another position,

a pair of elongated and axially rotatable levers positioned on opposite sides of the beam, each lever having a rear end disposed within one of the secondary bores of the bracket and positioned in juxtaposition with one of the lower pair of pins, a front end with a handle formed thereon that is located within the forward compartment, and an intermediate portion therebetween that is extended through the intermediate wall of the platform, and with the reciprocation of the levers by the handles allowing the lower pair of pins to project outwards to hold the bracket in a fixed position relative to the rails,

a rotatable gear disposed within the recess of the bracket and secured thereto with a downwardly extended spring-loaded pin that is removably seated within the channel,

a pair of J-shaped gripper arms, each gripper arm having an inboard elongated toothed portion positioned in mesh with the gear and an outboard portion with a lower extent disposed through one of the slots of the platform and terminated at an upper abutment portion that is located above the top opening, and

a peg disposed within the channel of the bracket, the peg having a lower end in contact with the beam and an upper end positionable against the pin of the gear and with the upper end of the peg engagable with the gear to thereby preclude movement of the gear and thus prevent movement of the gripper arms when the handle of the beam is positioned such that the fingers of the beam face upward;

a planar rectangular base plate disposed over the rearward compartment and coupled to the platform to cover the ratcheting grip assembly and yet allow projection of the fingers therethrough, and with the Upper abutment portions of the arms positionable in contact against a laptop computer placed upon the base plate and the fingers positionable upward against the laptop computer through reciprocation of the beam by the handle of the beam to hold the laptop computer in a fixed position; and

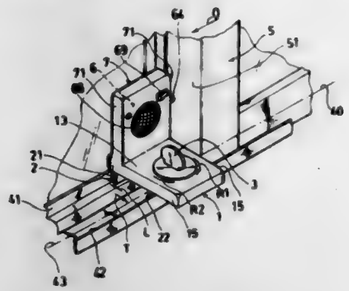
a lockable door hingably coupled to the platform and closable over the forward compartment to preclude access to the handles of the beam and the levers as well as the head portions of the clamps, thereby precluding the laptop computer which is fixed in place from being released by disengaging the clamps and the gripper arms.

5,595,075

LOCK AND ALARM MEANS LOCKABLE ON WINDOW AND DOOR RAIL

Mike Chen, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan

Filed Jan. 31, 1995, Ser. No. 381,345
Int. Cl.[6] E05B *65/08*
U.S. Cl. 70—95 **1 Claim**



1. A lock and alarm means lockable on a window or door rail comprising:

a lock body having at least a side wall formed on a side portion of said lock body;

a vise means having two jaw members telescopically mounted on a bottom of said lock body to be movably held in a rail means of a window or door slidably held on the rail means along a rail axis of said rail means;

a driving means rotatably mounted on the lock body and operatively driving one of said two jaw members of said vise means for tightly retaining said two jaw members in said rail means to allow said side wall of said lock body to retard a side frame of the window or door for locking said window or door for preventing a sliding opening on said rail means; and

an alarm means mounted on said lock body for actuating an alarm sounding when said alarm means and said lock body are impacted by said window or door when intentionally opened by an intruder;

the improvement which comprises:

said lock body including: a bottom having a sliding slot longitudinally formed in the bottom, an upper portion having a shaft hole formed in a central portion of the upper portion;

said vise means including: a fixed jaw member protruding downwardly from a rear portion of the lock body to be contacted with a first rail wall of said rail means adjacent to an exterior of the window or door, a movable jaw member protruding downwardly from a sliding plate slidably reciprocatively held in the lock body to be extendibly retained on a second rail wall of the rail means adjacent to an interior and opposite to the fixed jaw member, and a plurality of rack teeth equally spaced and longitudinally formed on an upper surface of the sliding plate, with the movable jaw member having a neck portion formed under a bottom surface of the sliding plate to be slidably engaged with the sliding slot formed in the bottom of the lock body; and

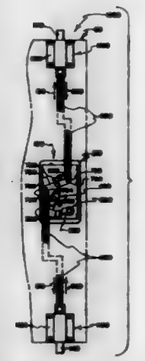
said driving means operatively driving said movable jaw member in relation to said fixed jaw member to be locked in said rail means, said driving means including: a knob secured to a shaft rotatably engageable with the shaft hole formed in the upper portion of the lock body and protruding upwardly from the upper portion of the lock body, a driving disk secured to the shaft and positioned below the upper portion of the lock body, and a spiral thread spirally formed on a bottom surface of the driving disk to be engageable with the rack teeth formed on the sliding plate of the movable jaw member, whereby upon rotation of the knob of the driving means, the sliding plate of the movable jaw member will be driven in a direction generally perpendicular to said rail axis of said rail means for firmly retaining the jaw members in said rail means.

5,595,076

HANDLE OPERABLE TWO-POINT LATCH AND LOCK

Lee S. Weinerman, Medina, and Scott A. Arthurs, Brunswick, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 510,470, Aug. 2, 1995, which is a continuation of Ser. No. 145,691, Oct. 29, 1993, Pat. No. 5,439,260. This application Dec. 22, 1995, Ser. No. 577,718
Int. Cl.[6] E05C *3/26; 1/12*
U.S. Cl. 70—208 **52 Claims**



1. A flush-mountable, handle-operable latch operating mechanism for mounting on a closure and for being connected by a first linkage to a first remotely located closure-mounted latch assembly that is engageable with a first strike, and by a second linkage to a second remotely located latch assembly that is engageable with a second strike for releasably retaining the closure in a closed position, comprising:

a) flush-mountable front assembly means for mounting as a first modular assembly on a closure adjacent a mounting opening that is formed through a front wall of the closure, including:

i) first housing means including a pan-shaped housing for mounting on the closure adjacent the mounting opening, including a one-piece housing that defines:

A) mounting flange means for defining a front wall of the pan-shaped housing, including a mounting flange that is configured 1) to extend perimetrically about the closure's mounting opening, 2) to closely overlie portions of a front surface of the closure's front wall that extend perimetrically about the mounting opening, and 3) to be clamped toward engagement with said portions of the closure's front surface to substantially flush-mount the pan-shaped housing on the closure;

B) side walls and a back wall that cooperate to define a forwardly-facing recess, 1) with the side walls being configured to extend forwardly and rearwardly through the closure's mounting opening when the mounting flange closely overlies said portions of the closure's front surface, 2) the side walls having front portions that join smoothly with and are perimetrically surrounded by the mounting flange, 3) the side walls having rear portions that join smoothly with portions of the back wall, 4) with said portions of the back wall being configured to extend substantially parallel to the front wall of the pan-shaped housing, 5) with said portions of the back wall having a front surface that faces forwardly into the recess and a rearwardly-facing back surface on the opposite side thereof, and 6) with a main back wall opening formed through said portions of the back wall;

ii) handle means including an operating handle that is at least partially nested within the recess, and that is connected to the first housing means for movement relative to the pan-shaped housing between a non-operated position and an operated position;

iii) projection means connected to the handle and extending rearwardly through the opening formed in the back wall for being moved by movement of the handle 1) such that, when the handle is in the non-operated position, the projection means is caused by its connection to the handle to be in a first position, such that, 2) when the handle is moved from the non-operated position to the operated position, the projection means is caused by such movement to move from the first position to a second position, and such that, 3) when the handle is moved from the operated position to the non-operated position, the projection means is caused by such movement to move from the second position to the first position;

b) rear assembly means for mounting as a second modular assembly on the closure, for being connected to the front assembly means to clampingly draw the mounting flange toward engagement with said portions of the closure's front surface to securely mount the rotary latch on the closure, including:

i) mounting bracket means including a mounting bracket having a rear wall for overlying at least a portion of the back surface of the back wall of the pan-shaped housing, for bridging at least a portion of the closure's mounting opening at a location behind the back surface of the closure's front wall, for being fastener-connected to the front assembly means, and for defining back-surface engaging means for being clamped toward engagement with the back surface of the closure's front wall when the mounting flange of the first housing means is being clamped toward engagement with said portions of the closure's front surface;

ii) said mounting bracket means having a projection receiving opening formed therethrough, through which said projection means extends when said back-surface engaging means is fastener-connected to the front assembly means, with said projection receiving opening having a first end and an opposed second end, and with said projection receiving opening further being configured such that, 1) when said projection means is in said first position, a rearwardly projecting part of said projection means is located near said first end, and such that, 2) when said projection means is in said second position, the rearwardly projecting part of said projection means is located near said second end;

iii) a lever-type link pivotally connected to the mounting bracket, and having opposed first and second end formation means for being connected to first and second linkages to concurrently move the first and second linkages to concurrently operate first and second latch mechanisms, respectively; and,

iv) an operating arm pivotally connected to the mounting bracket and to the elongate lever-type link for pivoting the lever-type link relative to the mounting bracket, with a designated part of the operating arm extending into engagement with said rearwardly projecting part of the projection means for being moved by the rearwardly projecting part of the projection means for transmitting motion from the projection means through the operating arm to the lever-type link to move the first and second linkages to concurrently operate the first and second latch mechanisms in response to the rearwardly projecting means being moved due to movement of the operating handle from the non-operated position to the operated position; and,

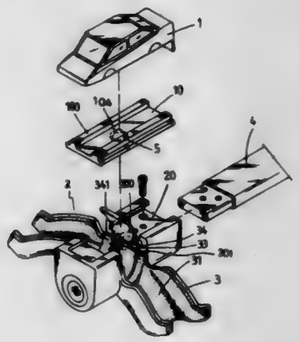
c) fastener means for connecting and clamping toward each other the housing means and the mounting bracket means to thereby clamp the back-surface engaging means of the mounting bracket toward a position of engagement with the back surface of the closure's front wall, and to clamp the mounting flange of the pan-shaped housing toward a position of engagement with said portions of the closure's front surface.

5,595,877

STEERING LOCK

Tian-Tsair Weng, No.49-1, Chung-Lung Chun, An-Ting Hsiang, and Yang-Hui Cheng, No. 94, Kang Chih Wei, Kang-Wei Chun, An-Ting Hsiang, both of Tainan Hsien, Taiwan

Filed May 5, 1995, Ser. No. 435,225
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **1 Claim**



1. A steering lock comprising:

a lock body having a middle and a half-round recess transversely disposed in the middle for attaching to a steering wheel of a motor vehicle, two locating holes in said half-round recess, a longitudinal top sliding track, and a hole in said longitudinal top sliding track;

a protective cushion mounted on said half-round recess for receiving a periphery of the steering wheel, said protective cushion comprising two bottom pins respectively fitted into the locating holes on said lock body, a top chamber, which receives the periphery of the steering wheel, a rectangular slot longitudinally disposed in a middle of said top chamber, a back groove disposed at a back side thereof and transversely extended from said rectangular slot;

an adjustment cushion fitting said back groove of said protective cushion, having a coupling portion at one end fastened to said rectangular slot and a flanged portion at an opposite end capable of covering the periphery of the steering wheel;

a slide inserted into said longitudinal top sliding track of said lock body to hold down the flange portion of said adjustment cushion on the periphery of the steering wheel, said slide comprising two parallel rails longitudinally disposed at a top side thereof, pairs of countersunk holes at a bottom side thereof respectively penetrated through said parallel rails and terminating in a respective screw hole, and a center through hole;

a hollow top cover covered on said slide and fixed to said countersunk holes by screws;

an audio alarm circuit mounted within said hollow top cover and supported on said slide, said audio alarm circuit comprising a speaker mounted within the center through hole on said slide and facing the hole on the longitudinal top sliding track of said lock body;

a stop bar having one end fixed to said lock body to hold said slide in position and an opposite end stoppable at an instrument board of the motor vehicle; and

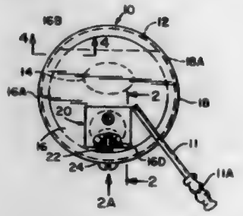
a lock mechanism mounted within the lock body for engaging the slide to lockably secure the steering lock to the steering wheel.

5,595,878

STEERING WHEEL DISABLING MOTOR VEHICLE ANTI-THEFT DEVICE

Washington Harrell, 143-18 182 Pl., Springfield Garden, N.Y. 11413

Filed Jun. 9, 1995, Ser. No. 489,146
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **5 Claims**



1. A vehicle anti-theft steering wheel disabling device replaceably attachable to a steering wheel of a vehicle having a windshield and preventing the unauthorized access to an air bag contained in the steering wheel of the vehicle while preventing the unrestricted rotation of the steering wheel of the vehicle, the steering wheel of the vehicle having a front, a circumference, a lower portion with a back, a cross section, and an upper portion, said device comprising:

a) a circular-shaped upper plate positioned over, and concealing, the front of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle, so that unauthorized access to the air bag contained in the steering wheel of the vehicle is prevented; said circular-shaped upper plate having a circular-shaped outer surface, a circular-shaped inner surface disposed below, and parallel to, said circular-shaped outer surface of said circular-shaped upper plate, a circular-shaped perimeter, and a square-shaped throughbore extending therethrough from said circular-shaped outer surface of said circular-shaped upper plate to said circular-shaped inner surface of said circular-shaped upper plate and being disposed in close proximity to said circular-shaped perimeter of said circular-shaped upper plate; said square-shaped throughbore in said circular-shaped upper plate being positioned in close proximity to the upper portion of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle, so that said square-shaped throughbore in said circular-shaped upper plate is easily accessible when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle;

b) a hollow and cylindrically-shaped rim positioned around, and concealing, the circumference of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle; said hollow and cylindrically-shaped rim having a circular-shaped upper edge, a circular-shaped lower edge, a cylindrically-shaped outer surface, and a cylindrically-shaped inner surface disposed inward of, and parallel to, said cylindrically-shaped outer surface of said hollow and cylindrically-shaped rim; said hollow and cylindrically-shaped rim extending perpendicularly downwardly from said circular-shaped upper plate, with said circular-shaped upper edge of said hollow and cylindrically-shaped rim being coiacident with, and welded to, said circular-shaped perimeter of said circular-shaped upper plate, so that manufacturing thereof is simplified; said hollow and cylindrically-shaped rim further having a rectangular-shaped throughslot extending therethrough from said cylindrically-shaped outer surface of said hollow and cylindrically-shaped rim to said cylindrically-shaped inner surface of said hollow and cylindrically-shaped rim; said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim further extending perpendicularly upwardly from, and opening into said, circular-shaped lower edge of said hollow and cylindrically-shaped rim; said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim being in alignment with, and in close proximity to, said square-shaped throughbore in said circular-shaped upper plate and thereby also being positioned in close proximity to the upper portion of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle, so that said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim is easily accessible when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle;

c) a semi-circular-shaped lower plate positioned over, and concealing, the back of the lower portion of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle; said semi-circular-shaped lower plate having a semi-circular-shaped perimeter portion being coincident with, and welded to, said circular-shaped lower edge of said hollow and cylindrically-shaped rim, so that manufacturing thereof is simplified; said semi-circular-shaped lower plate being disposed opposite to said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim; said circular-shaped upper plate, said hollow and cylindrically-shaped rim, and said semi-circular-shaped lower plate forming a receptacle for receiving the lower portion of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle;

d) a pair of vertically-oriented shrouds extending radially perpendicularly outwardly from said cylindrically-shaped outer surface of said hollow and cylindrically-shaped rim and straddling said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim; each shroud of said pair of vertically-oriented shrouds having a laterally-oriented throughbore extending laterally therethrough that are in lateral alignment with each other;

e) a slender, elongated, cylindrically-shaped handle having a free end; said slender, elongated, cylindrically-shaped handle being fixedly attached by welding to, and extending radially outwardly from, said circular-shaped outer surface of said circular-shaped upper plate, so that manufacturing thereof is simplified and carrying of said vehicle anti-theft steering wheel disabling device is facilitated; said slender, elongated, cylindrically-shaped handle disposed in close proximity to said square-shaped throughbore in said circular-shaped upper plate and thereby also positioned in close proximity to the

upper portion of the steering wheel of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle; said slender, elongated, cylindrically-shaped handle extending generally upwardly and approaching, if not abutting against, the windshield of the vehicle when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle, so that unrestricted rotation of the steering wheel of the vehicle is prevented;

f) a substantially L-shaped hasp having a first leg with a free end having a lateral throughbore extending laterally therethrough, a second leg perpendicular to said first leg of said substantially L-shaped hasp and having a free end with a lateral throughbore extending laterally therethrough, a closed position, and an open position; said free end of said first leg of said substantially L-shaped hasp disposed between said pair of vertically-oriented shrouds and being pivotally mounted thereto by a pin extending through said laterally-oriented throughbore in each shroud of said pair of vertically-oriented shrouds and through said lateral throughbore in said free end of said first leg of said substantially L-shaped hasp, so that said substantially L-shaped hasp is pivotally mounted to said cylindrically-shaped outer surface of said hollow and cylindrically-shaped rim; said substantially L-shaped hasp being in close proximity to the upper portion of the steering wheel when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle, so that said substantially L-shaped hasp is easily accessible when said vehicle anti-theft steering wheel disabling device is installed on the steering wheel of the vehicle; said first leg of said substantially L-shaped hasp extending radially inwardly through, without extending below, said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim with the upper portion of the steering wheel of the vehicle resting thereon and said second leg of said substantially L-shaped hasp extending vertically upwardly through said square-shaped throughbore in said circular-shaped upper plate with said lateral throughbore in said free end of said second leg of said substantially L-shaped hasp disposed thereabove when said substantially L-shaped hasp is in said closed position; said first leg of said substantially L-shaped hasp leaving said rectangular-shaped throughslot in said hollow and cylindrically-shaped rim and said second leg of said substantially L-shaped hasp leaving said square-shaped throughbore in said circular-shaped upper plate when said substantially L-shaped hasp is in said open position; and

g) a padlock having a tumbler part and a hasp part; said hasp part of said padlock passing through said lateral throughbore in said free end of said second leg of said substantially L-shaped hasp when said substantially L-shaped hasp is in said closed position and thereby maintaining said substantially L-shaped hasp in said closed position, so that said substantially L-shaped hasp can not unauthorizably achieve said open position and thereby preventing unauthorized removal of said vehicle anti-theft steering wheel disabling device from the steering wheel of the vehicle and thereby preventing unauthorized access to the air bag in the steering wheel, while said slender, elongated, cylindrically-shaped handle approaches, if not abutting against, the windshield of the vehicle so as to prevent unrestricted rotation of the steering wheel of the vehicle.

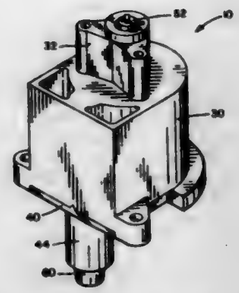
5,595,079

MOTORCYCLE STEERING LOCK

Gary L. Myers, Monee, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Continuation-in-part of Ser. No. 20,989, Apr. 6, 1994, Pat. No. Des. 369,536. This application Dec. 19, 1994, Ser. No. 358,833
Int. Cl.[6] B62H *5/00*
U.S. Cl. 70—233 28 Claims

1. An improved key operated steering lock assembly comprising, in combination:



a housing having a shell portion at one side and a base portion at the opposite side, said base portion including a generally cylindrical drum insert arranged within said shell portion and a hollow projecting sleeve offset from said drum insert;

a lock plug assembly rotatably disposed in said shell portion of said housing, said lock plug assembly having a spindle which rotates when said lock plug assembly is turned by a key;

a locking bolt slidably disposed in said hollow projection sleeve of said base portion;

a movable bolt means for selectively moving said locking bolt between an engaged position wherein said locking bolt extends beyond said hollow projecting sleeve of said base portion and a disengaged position wherein said locking bolt is fully retracted within said hollow projecting sleeve of said base portion; and

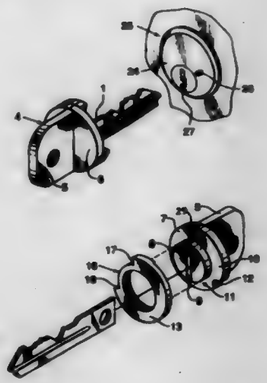
a drum coupled to said spindle of said lock plug assembly and rotatably mounted on said drum insert such that said drum insert is received within said drum, said drum linearly actuating said movable bolt means when said lock plug assembly is turned by said key.

5,595,080

LOCK CONDITION INDICATOR DEVICE

Mark J. Whinton, R.R. #22, Cambridge, Ontario, Canada

Filed Sep. 5, 1995, Ser. No. 523,645
Int. Cl.[6] E05B *41/00*
U.S. Cl. 70—432 7 Claims



1. A lock condition indicator device for use with a corresponding cylinder lock, said lock having a pin projecting therefrom, said device comprising:

a key head and a shank extending from said head, said head having an outer disc with a flat surface perpendicular to said shank and an inner disc extending outwardly from said flat surface;

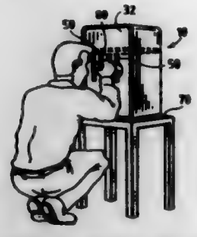
a disc rotatably mounted around said inner disc, said rotatable disc having engaging means on its circumference for engaging said pin extending from said lock, such that said rotatable disc is rotated into one of a plurality of indicator positions as said key head is turned in said lock permitting the status of the lock to be ascertained from said key.

5,595,081

LOCKABLE CONTAINER, SUCH AS TOY SAFE

Joseph V. Nuzzo, Willowbrook, and John F. Miroballi, Schaumburg, both of Ill., assignors to Penn Products, Inc., Villa Park, Ill.

Filed Jun. 20, 1995, Ser. No. 492,624
Int. Cl.[6] E05B *17/00*
U.S. Cl. 70—446 7 Claims



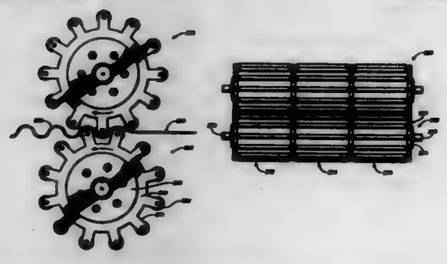
1. A lockable container comprising a box having an upper wall, a lower wall, a back wall, and two side walls and having a front opening, a front door hinged to the box so as to be movable between a closing position, in which the front door closes the front opening, and other positions, in which the front door does not close the front opening, a shelf disposed within the box so as to extend from the back wall, between the side walls, and means including a combination lock mounted on the front door for locking the front door in the closing position and for unlocking the front door in accordance with a combination of alphanumeric characters, the front door having an inner surface, on which the combination is displayed below the shelf, the displayed combination being visible from outside the lockable container when the front opening is closed by the front door, through one of a series of open vents provided in one of the upper, lower, back, and side walls, at least if and when the displayed combination is not obscured by contents of the lockable container and is illuminated, as through another of the series of open vents.

5,595,082

SHEET METAL CORRUGATOR

Enrique P. Gandara, Garland, Tex., assignor to Gandara Systems, Garland, Tex.

Continuation-in-part of Ser. No. 374,832, Jan. 19, 1995, Pat. No. 5,494,261. This application Aug. 2, 1995, Ser. No. 510,587
Int. Cl.[6] B21D *13/04*
U.S. Cl. 72—196 20 Claims



1. A corrugating machine, comprising:

a first reel having a plurality of ganged sections rotated together about a common first axis, each said reel section having a different plurality of roller bars supported peripherally thereabout, each said different plurality of roller bars being mounted to a respective section so as to be independently rotatable with respect to the roller bars of the other ganged section;

said first reel ganged sections having a common wheel support for rotatably mounting thereto the different plurality of roller bars of two said sections;

a second reel having a plurality of ganged sections rotated together about a common second axis, each said second reel section having a different plurality of roller bars supported peripherally thereabout, each said second different plurality of roller bars being mounted to a respective section of said second reel so as to be independently rotatable with respect to the roller bars of the other ganged section; and

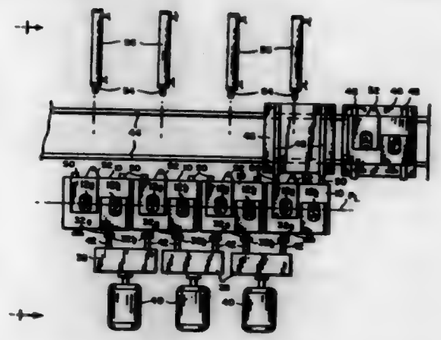
said second reel ganged sections having a common wheel support for rotatably mounting thereto the different plurality roller bars of two sections of said second reel, whereby when sheet metal stock is passed between said first and second reels, said sheet metal stock is deformed so as to form corrugations therein.

5,595,083

MODULAR ROLLING MILL

Terrence M. Shore, Princeton, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 1, 1994, Ser. No. 284,090
Int. Cl.[6] B21B *31/07*
U.S. Cl. 72—249 8 Claims



1. A modular rolling mill comprising:

a plurality of rolling units arranged in succession on a mill pass line, each rolling unit having multiple pairs of mechanically interconnected work rolls;

a plurality of gear reduction units arranged in succession alongside said mill pass line, each gear reduction unit being driven by a drive motor; and

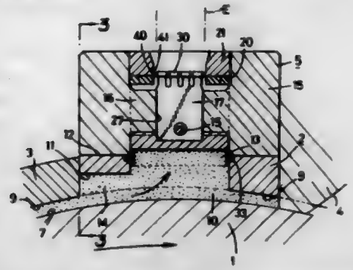
coupling means for detachably connecting at least some of said rolling units to two successive gear reduction units and for connecting other of said rolling units to single gear reduction units.

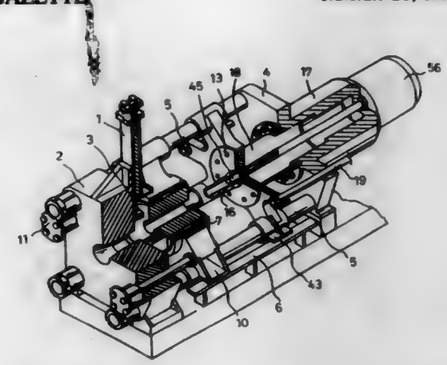
5,595,084

HOLLOW DIE AND AN APPARATUS FOR CONTINUOUS EXTRUSION FORMING OF HOLLOW ARTICLES

Sadahide Yano, Osaka, Japan, assignor to Yugen Kaisha Yano Engineering, Osaka, Japan

Filed Mar. 24, 1995, Ser. No. 410,513
Claims priority, application Japan, Apr. 12, 1994, 6-073501
Int. Cl.[6] B21C 23/00
U.S. Cl. 72—262 6 Claims





3. An apparatus for continuous extrusion forming of hollow articles, the apparatus comprising:

a rotatable extrusion wheel having an outer periphery;

a main guide groove formed about the periphery;

an inner feed plate having an arcuate inner surface and a flat outer surface;

the inner surface being in a sliding contact with the outer periphery of the extrusion wheel;

an auxiliary guide groove formed about the inner surface of said feed plate and disposed in registry with the main guide groove; and

a hollow die fixedly supported by the flat outer surface of the inner feed plate, the hollow die comprising:

an axially extending cylindrical body;

a cavity extending coaxially through the body;

a bridge formed integral with the body and extending across an upstream region of the cavity, said bridge containing a slot therein;

a core fixedly mounted in said slot of the bridge, said core having bearing tip means operative to form at least one hollow longitudinal space in said extrudate;

the bearing tip means including at least one bearing tip extending from said bridge into a middle region of the cavity; and

a female member secured in a downstream region of the cavity and having a forming hole surrounding the bearing tip means and being cooperable therewith to define a forming slit for producing the extrudate.

5,595,085

ALUMINUM EXTRUDING MACHINE

Wu-Hsiung Chen, P.O. Box 82-144, Taipei, Taiwan

Filed Feb. 14, 1996, Ser. No. 601,685
Int. Cl.[6] B21C 23/20
U.S. Cl. 72—265 1 Claim

1. An aluminum extruding machine of the type comprising a machine base, an upright front block and an upright rear block raised from said machine base at two opposite ends, four guide rods symmetrically connected between said upright front block and said upright rear block, a die holder fixedly secured to said upright front block at an inner side, a material carrying barrel moved along said guide rods relative to said die holder to carry molten aluminum, a push member moved along said guide rods relative to said material carrying barrel and having a tubular plunger forced through said material carrying barrel into said die holder to extrude molten aluminum out of said die holder, first reciprocating means controlled to move said material carrying barrel along said guide rods, second reciprocating means controlled to move said push member along said guide rods, a center rod moved into said die holder to define an annular cavity within said die holder for permitting molten aluminum to be extruded out of said die holder by said plunger, third reciprocating means controlled to move said center rod into said die holder, and a cutter assembly controlled to cut off extruded aluminum tube from said die holder, wherein:

said cutter assembly comprises a cylinder block having a mounting frame at a back side thereof fixedly secured to said upright front block, a longitudinal front opening at a front side thereof, two longitudinal rails bilaterally disposed within said longitudinal front opening, and a circular top opening, a sliding block moved along the longitudinal rails of said cylindrical block, a cylinder having a piston rod inserted through the circular top opening of said cylindrical block and fixedly connected to said sliding block at the top, and a cutter fixedly secured to said sliding block at the bottom;

two sliding tables are longitudinally located on said machine base at two opposite sides between said upright front block and said upright rear block to guide the movement of said material carrying barrel and said push member;

said material carrying barrel comprises four projecting blocks equiangularly spaced around the periphery of said barrel, four bearing blocks respectively and fixedly mounted in the projecting blocks of said material carrying barrel and respectively sleeved onto said guide rods, two sliding legs downwardly outwardly extending from two of the bearing blocks of said material carrying barrel and slidably supported on said sliding tables;

said push member comprises four projecting blocks equiangularly spaced around the periphery of said push member, four bearing blocks respectively and fixedly mounted in the projecting blocks of said push member and respectively sleeved onto said guide rods, two sliding legs downwardly outwardly extending from two of the bearing blocks of said push member and slidably supported on said sliding tables, and two projecting portions at two opposite sides respectively fastened to said second reciprocating means;

said tubular plunger has a copper tube mounted on the inside;

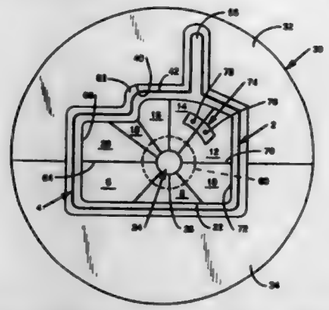
said center rod is inserted through said copper tube and connected to said third reciprocating means through a connecting rod and moved out of said tubular plunger into said die holder by said third reciprocating means, said center rod comprising a cylindrical front rod section terminating in a conical tip, a cylindrical rear rod section of smaller cross section relative to said cylindrical front rod section, a tapered intermediate rod section connected between said cylindrical front rod section and said cylindrical rear rod section, a collar disposed between said cylindrical front rod section and said tapered intermediate rod section, and a toothed portion around the periphery of said cylindrical rear rod section adjacent to said tapered intermediate rod section, and a longitudinal slot through said cylindrical rear rod section, said connecting rod comprising a longitudinal coupling hole, which receives the cylindrical rear rod section and tapered intermediate rod section of said center rod, and a longitudinal slot connected to the longitudinal slot of said center rod by a pin, the periphery of the longitudinal coupling hole of said connecting rod being meshed with the toothed portion of said tubular plunger.

5,595,086

APPARATUS FOR CALIBRATING HOLLOW NONSYMMETRICAL MULTIPLANE EXTRUSIONS AND ASSOCIATED METHOD

Thomas W. Scherf, Vandergrift, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 2, 1994, Ser. No. 285,173
Int. Cl.[6] B21D 39/20
U.S. Cl. 72—353.4 21 Claims



1. Apparatus for calibrating a hollow article comprising

a plurality of internal die elements for insertion into said hollow article mounted for generally radial inward and outward movement,

said internal die elements having an external contour corresponding to the desired calibrated configuration of the interior surface of the hollow article,

a passageway defined by inner portions of said internal die elements,

tapered plunger means mounted for reciprocating movement within said passageway such that moving said plunger means into said passageway will urge said die elements radially outwardly into an open position and moving said plunger means outwardly with respect to said passageway will permit said die elements to move inwardly into a closed position,

external die means for contacting the exterior of said hollow article, and

said passageway being axially nonlinear.

5,595,087

APPARATUS FOR THE TRANSPORT OF PARTS IN A MULTIPLE-DIE PRESS

Erich Harsch, Weingarten, Germany, assignor to Maschinenfabrik Mueller-Weingarten AG, Weingarten, Germany

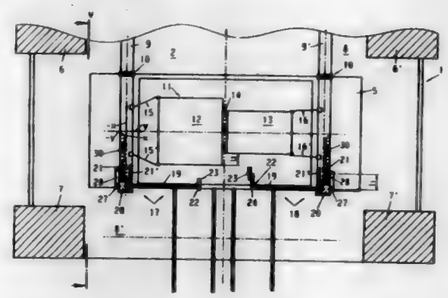
Continuation of Ser. No. 207,713, Mar. 9, 1994, abandoned.
This application Sep. 26, 1995, Ser. No. 533,673
Claims priority, application Germany, Apr. 23, 1993, 43 13 416.5
Int. Cl.[6] B21D 43/05
U.S. Cl. 72—405.16 14 Claims

1. An apparatus for the transport of workpieces in a die press comprising a plurality of die stages, comprising:

at least first and second spaced apart gripper rails extending respectively in a longitudinal direction through said die stages and movable in three directions so as to grip, lift and feed the workpieces in the longitudinal direction between the die stage;

at least one tong fastened to the first gripper rail and projecting in a direction essentially perpendicular to the longitudinal direction of such rail and toward the second gripper rail, said at least one tong having an end for supporting a portion of a workpiece and for moving the workpiece from one die stage to another die stage; and

at least one arm fastened to the first gripper rail, said arm projecting transversely from said gripper rail and having an end offset relative to the end of said at least one tong in a direction of the second gripper rail, said arm being so mounted that its end is movable in the longitudinal direction towards and away from the workpiece held by said tong so that the end of said arm can be placed in a position where it supports the workpiece at a position distal from the portion supported by the tong in the direction toward the second gripper rail.

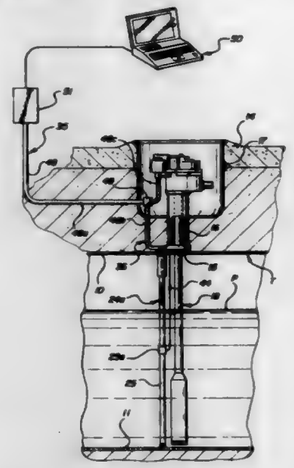


5,595,088

LIQUID LEVEL MONITORING SYSTEM FOR UNDERGROUND STORAGE TANKS AND METHOD FOR ITS INSTALLATION

Jack R. Horner, Bay City, Mich., assignor to Horner Creative Products, Inc., Bay City, Mich.

Filed May 11, 1994, Ser. No. 241,350
Int. Cl.[6] G01F 23/28
U.S. Cl. 73—290 V 30 Claims



14. In a product level monitoring system in combination with an underground storage tank for use in continuously registering the level of liquid in said underground storage tank, the tank having upper and lower walls and a vertically axially extending riser with an access riser opening in the upper wall of the tank, surrounded by an upper wall marginal interior surface, for gaining access to the tank from an above ground elevation;

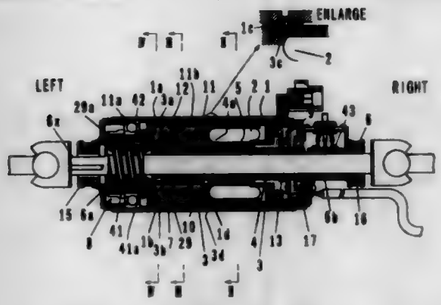
a) a removable, longitudinally extending pipe assembly carrying a liquid level sensor disposed within said tank vertically between said upper marginal interior surface and lower wall laterally adjacent to but laterally offset from said riser and riser opening;
b) wherein said pipe assembly includes telescoping members, and a biasing device urges said members to an expanded position to maintain the pipe assembly in captured position between the upper and lower walls of said tank;
c) a connector wire system including sensor conductors leading from said sensor and pipe assembly up through said pump riser opening; and
d) an electronic control system above ground to which said connector wire system is coupled to enable the determination of the liquid level in the tank.

5,595,089

ACTUATOR FOR STEERING REAR WHEELS

Tsukasa Watanabe, Toyota; Mutsumi Miyashiro, Nishikamo-gun; Shunetsu Suzuki, Anjou; Takeshi Goto, Toyota, and Kozo Fujita, Nishikamo-gun, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 27, 1995, Ser. No. 379,966
Claims priority, application Japan, Jan. 31, 1994, 6-009554
Int. Cl.[6] B62D 6/00
U.S. Cl. 74—89.15 **10 Claims**



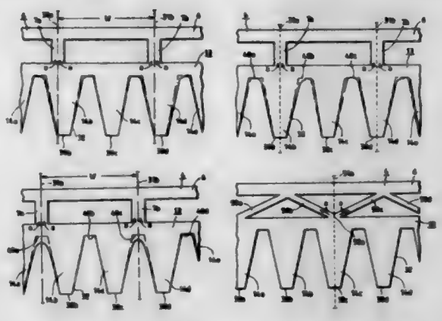
1. An actuator for steering rear wheels comprising:
a hollow, cylindrical housing member having an inner wall housing member;
a cylindrical coil member disposed coaxially within an inner space of the housing member;
a molded support member of resin material disposed completely within the housing member and integrally molded to the inner wall of the housing member and the coil member for supporting the coil member in an integral manner with the housing member;
a cylindrical rotor member disposed in an internal space of the coil member in coaxial relationship with the housing member and rotatably supported by the molded support member through a bearing;
a permanent magnet member mounted on the rotor member;
a drive shaft member extending through a central space within the rotor member;
an epicyclic gearing disposed coaxially within the housing member and the support member and including a first sun gear connected to the rotor member;
a motion conversion mechanism disposed in an internal space of the housing member in coaxial relationship therewith and interposed between the epicyclic gearing and the drive shaft member for converting a rotary motion of the gearing into a linear motion in the axial direction of the drive shaft member; and
magnetic pole detecting means disposed in an internal space of the housing member for detecting the position of a magnetic pole on the permanent magnet member.

5,595,090

PLANET GEAR TYPE TORQUE TRANSMISSION DEVICE

Satoshi Moribayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 273,162
Claims priority, application Japan, Oct. 18, 1993, 5-259703
Int. Cl.[6] F16H 1/28
U.S. Cl. 74—462 **17 Claims**



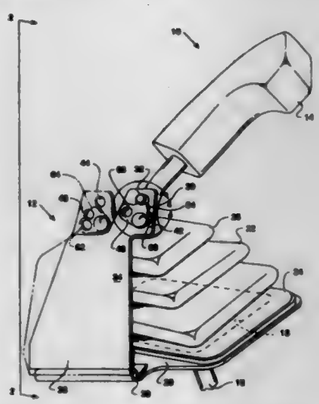
1. A planet gear type torque transmission device comprising:
a planet gear driven by a rotary shaft; and
an internal gear having an inner periphery portion, an outer periphery portion, and coupling portions,
wherein said inner periphery portion comprises internal teeth engaged with said planet gear,
wherein said coupling portions couple said inner periphery portion and said outer periphery portion,
wherein said internal teeth are arranged at predetermined regular intervals with respect to positions of said coupling portions, and
wherein said internal gear is integrally formed by resin molding.

5,595,091

RESTRAINT MECHANISM FOR A CONTROL LEVER

Ronald H. Garman, Pekin; Stephen C. Garnett, Princeville, and Steven L. Groth, Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 28, 1995, Ser. No. 430,973
Int. Cl.[6] G05G 1/00
U.S. Cl. 74—523 **8 Claims**



1. A control lever restraint mechanism, comprising:
a control lever;

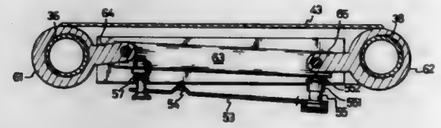
a protrusion having a notch defined therein and being mounted on the control lever to extend outwardly therefrom;
a first plate having a first aperture defined therein, said first plate being pivotally mounted adjacent the control lever for movement between a first position in which the protrusion is received within the first aperture and relative movement of the control lever is restrained and a second position in which the protrusion is disengaged from the first aperture and relative movement of the control lever is unrestrained; and
a second plate having an engagement portion defined thereon and being rotatably mounted to the first plate for movement between a third position in which the engagement portion is engaged with the notch to maintain the first plate in its first position and a fourth position in which the engagement portion is disengaged from the notch to allow the first plate to be moved to its second position.

5,595,092

POSITIONING DEVICE OF RETRACTABLE BARS OF A TROLLEY

Chin-chang Cheng, No. 20, Lane 327, Sec. 2, Chung Shan Rd., Chung Ho City, Taipei Hsien, Taiwan

Filed Mar. 24, 1995, Ser. No. 410,341
Int. Cl.[6] B62B 1/12; G05G 5/22
U.S. Cl. 74—531 **5 Claims**



1. A positioning device of a pair of telescopically retractable vertical bars of a trolley, wherein each of said retractable bars has an outer tube and an inner tube telescopically received in the outer tube, the positioning device comprising:
a sleeve member comprising a pair of sleeves coaxially rigidly mounted on one end of the outer tubes, the sleeves being connected by a horizontally extending plate tangentially in contact with an outer periphery of the sleeves and each of the sleeves having a gap radially defined therein; and
a pair of eccentric rings having an inner diameter equal to an outer diameter of the inner tubes with the inner tubes passing therethrough and coaxially rivetally retained in the gaps with a thinner ring wall thereof in contact with the plate, each of the rings having a protrusion laterally extending from an outer periphery of a thicker ring wall thereof for rotating the ring to cause the thicker ring wall to contact the plate and thereby laterally displacing the ring and tightening the inner tube to the outer tube.

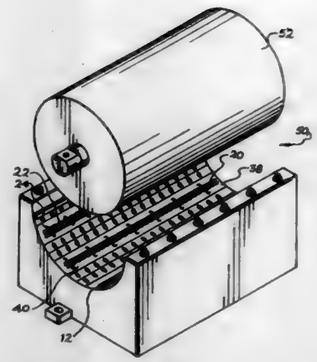
5,595,093

METHOD OF FORMING A ROTARY CUTTING DIE

Paul G. Kapolnek, Chicago, Ill., assignor to Western Printing Machinery Company, Schiller Park, Ill.

Filed May 12, 1994, Ser. No. 241,618
Int. Cl.[6] B26F 1/44
U.S. Cl. 76—107.8 **12 Claims**

1. A method of forming a rotary cutting die, comprising the following steps:
providing a curved cutting rule transfer plate comprising an inner surface and an outer surface;
forming a cutting rule channel in the transfer plate, the cutting rule channel defining a predetermined design;
placing a cutting rule having a cutting edge and a support edge in the cutting rule channel, the support edge of the cutting rule extending from the inner surface of the transfer plate;



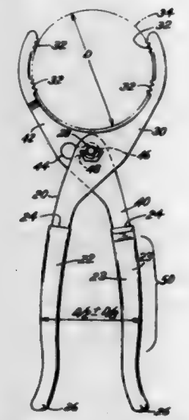
forming a translucent rotary die plate on the inner surface of the transfer plate wherein the support edge of the cutting rule extends into and is supported in the rotary die plate; and
removing the transfer plate from the rotary die plate.

5,595,094

OIL FILTER WRENCH

Joel A. Negus, Clarinda, Iowa, assignor to The Lisle Corporation, Clarinda, Iowa

Filed Jan. 6, 1995, Ser. No. 369,380
Int. Cl.[6] B25B 7/04
U.S. Cl. 81—3.44 **1 Claim**



1. An oil filter wrench having opposed jaws for turning generally cylindrical oil filters about their cylindrical axis by gripping the cylindrical surface thereof, said wrench of the type which comprises a pliers construction convertible between a first reduced diameter jaw opening size and a second increased diameter jaw opening size to thereby accommodate a broad range of sizes of cylindrical oil filters, said jaws being arcuate and having a diameter, D, of a circle defined by the arcuate shape of the jaw, said wrench comprising, in combination:
a first, fixed pivot arm having a manual handle for movement in a plane, said handle having an outside end and a run extending from the end for a distance in the range of 2D± D/2 to a fixed pivot pin, said fixed pivot pin defining a pivot axis perpendicular to the plane;
a first integral jaw exteading from the handle away from the pivot pin, said first jaw defining a concave arcuate gripping member having a radius of curvature in the range D/2 and a

circumferential extent greater than πD D/4, said member including a plurality of teeth projecting radially inward for engaging a cylindrical surface;

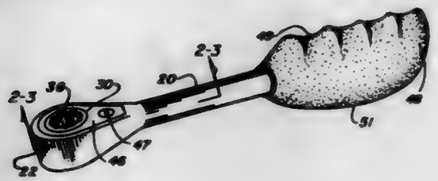
a second pivot arm with a movable pivot and attached integral jaw, said second arm and jaw substantially identical to the fixed pivot arm and integral jaw, said second jaw including first and second connected, spaced openings for the pivot pin whereby the pivot pin may be slidably moved between the openings, said first and second pivot arms and integral jaws pivotally joined by the pivot pin through an opening to provide a pliers construction with the concave integral jaws opposed to define means for encircling and gripping a cylindrical filter, said openings having pivot centers spaced apart in the range of D/6±D/18; whereby the pivot pin engages the first opening and the jaws are spaced to define a gripping diameter D/1.5 as the handles are spaced a distance of D/2±D/8 in the plane of movement defined by the handles and whereby the pivot pin engages the second opening and the jaws are spaced to define gripping a diameter D as the handles are spaced a distance D/2±D/8 in the plane of movement defined by the handles.

5,595,895

RATCHETING SOCKET WRENCH WITH INTERMESHING GEARS

George Hillinger, 129 N. LeDoux Rd., Beverly Hills, Calif. 90211

Continuation-in-part of Ser. No. 322,594, Oct. 13, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 517,842
Int. Cl.[6] B25B *13/00*
U.S. Cl. 81—58.3 10 Claims



1. A ratcheting socket wrench with intermeshing gears, comprising:

a) a shank having a front end and a back handle end with the front end further having a housing with a recessed round bore therethrough and a set of upwardly directed female gear teeth within the recessed round bore,

b) a hollow sleeve disposed rotatably within said recessed round bore having a set of integral male gear teeth positioned to mate with said upwardly directed female gear teeth such that the teeth mesh in one rotational direction and slide apart and rotate freely when rotated in an opposite direction,

c) spring means positioned between the shank recessed round bore and the hollow sleeve to urge the mating gear teeth together,

d) a cover plate joined to the shank front end to cover and retain the spring means, and

e) an ergonomically shaped handle positionably disposed on a back end of said handle for gripping thereupon, the wrench therefore locking the gear teeth securely when rotating a workpiece within the hollow sleeve in one direction and ratcheting freely when rotating in an opposite direction also when removed from a workpiece and turned over, the wrench rotates a workpiece oppositely, said handle further comprises:

(1) a grip having external finger grooves on one side and a palm shaped curve on the other and a straight hollow grip sleeve within, disposed over the shank.

(2) said shank further having a reduced diameter shoulder and a slot on the handle end,

(3) a handle compression spring positioned between the shank shoulder and the grip sleeve to urge the grip toward the handle end of the shank,

(4) spring retaining means within the grip sleeve to hold the spring in compression and,

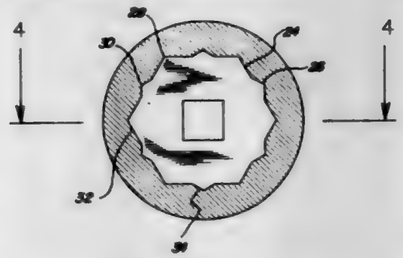
(5) a plug cap attached to the grip, blocking the hollow sleeve, the cap further having a flat blade projecting inwardly toward the shank with the blade interlocking into the slot in the shank such that when the handle is urged outwardly toward the shank handle end and rotated 180 degrees, the grip is repositioned, when released, for operation of the wrench in the opposite rotational mode.

5,595,896

ENGLISH-METRIC WRENCH SOCKET OR DRIVE

George L. Coffman, 563 S. Burgess Ave., Columbus, Ohio 43204

Filed Jan. 4, 1996, Ser. No. 582,953
Int. Cl.[6] B25B *13/06*
U.S. Cl. 81—121.1 10 Claims



1. An English-Metric wrench socket for accommodating similarly sized English and Metric nut-type fasteners for effecting sustained nut-turning loads on such fasteners without slippage comprising, in combination:

a generally cylindrical rigid body including a first free end having a bore with a square cross section extended axially therethrough, a second free end with a polygonal shaped bore extended axially therethrough and with the polygonal shaped bore bounded by a first hexagonal arrangement of twelve planar primary facets axially aligned with and offset by about thirty degrees from a second hexagonal arrangement of twelve planar secondary facets to thereby create a set of six primary points and a set of six secondary points with each primary point formed of a pair of primary facets joined at an apex to create an angle of about sixty degrees therebetween and with each secondary point formed of a pair of secondary facets joined at an apex to create an angle of about sixty degrees therebetween and wherein a first distance as measured between one of the primary facets of one of the primary points of the first arrangement and the parallel primary facet positioned directly opposite thereto is between about ½ to 3½% different than a second distance as measured between one of the secondary facets of one of the secondary points of the second arrangement and the parallel secondary facet positioned directly opposite thereto.

5,595,897

TWO-SIDED, MULTI-ANGLED WRENCH

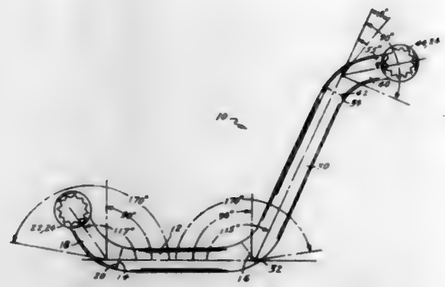
Steven P. Anderson, 6660 Reseda Blvd., #112, Reseda, Calif. 91335

Filed Jan. 31, 1995, Ser. No. 381,221
Int. Cl.[6] B25B *13/04*
U.S. Cl. 81—125.1 17 Claims

1. A double-ended, multi-angled end wrench comprising:

a) a horizontal section having a first end and a second end,

b) a first outward angled section having a first end and a first bolt or nut gripping end, where the first end is integral with the first end of said horizontal section, and angles outwardly substantially one-hundred seventeen degrees (117°) as measured counter-clockwise from said horizontal section,



c) a second outward angled section having a first end and a second end, where the first end is integral with the second end of said horizontal section, and angles outward substantially one-hundred fifteen degrees (115°) as measured clockwise from said horizontal section, and

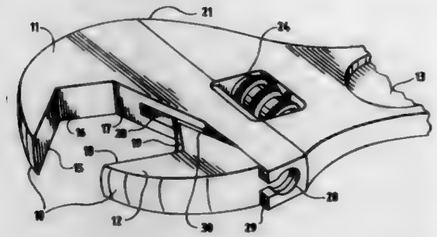
d) a third outward angled section having a first end and a second bolt or nut gripping end, where the first end is integral with the second end of said second outwardly angled section and angles outward substantially fifty-five degrees (55°) as measured clockwise from said second outward angled section.

5,595,898

TOOL HAVING JAWS FOR GRIPPING HEXAGONALLY SHAPED OBJECTS

Rodney Malkin, 3448 Willoughby, Holt, Mich. 48842, and Gary Burgess, 3854 New Salem, Okemos, Mich. 48864

Filed Dec. 21, 1994, Ser. No. 361,103
Int. Cl.[6] B25B *13/16*
U.S. Cl. 81—165 5 Claims



1. A tool having positionable jaws for engaging various sized hexagonally shaped objects within the operating range of said tool, comprising:

a first jaw and an opposingly positioned second jaw, said second jaw being positionable relative to said first jaw on a linear axis;

said first jaw having three angularly disposed jaw surfaces comprising a base surface, an intermediate surface and an extended surface;

said second jaw having two angularly disposed jaw surfaces comprising a base surface and extended surface;

said base jaw surface of said first jaw forms an angle of about 19 degrees with said linear axis; and

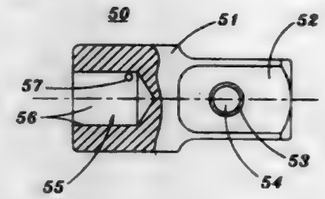
said first and second jaw surfaces having a configuration and being positioned relative to one another and said linear axis such that said jaw surfaces have the ability to operatively engage five full sides of an object when in a closed position and at least four full sides of a hexagonally shaped object, when in an open position, by specifically engaging three adjacent sides and one opposing side of said hexagonally shaped objects within said operating range of said tool.

5,595,899

STRESS REDUCED PINNED ANVIL AND SOCKET TOOL

Daniel S. Puusteri, Grayslake, Ill., assignor to Snap-on Technologies, Inc., Crystal Lake, Ill.

Filed Jun. 5, 1995, Ser. No. 460,916
Int. Cl.[6] B25B *23/16*
U.S. Cl. 81—177.85 19 Claims



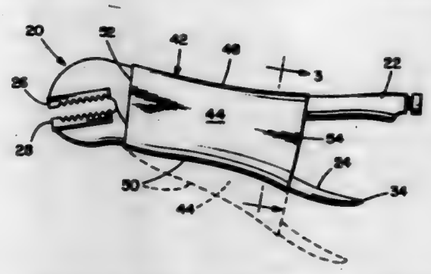
1. A socket tool comprising: a body having a socket receptacle formed therein, said receptacle being polygonal in transverse cross section and defining a plurality of flat planar surfaces equidistantly spaced from a central axis, and a cylindrical bore having a circumference and extending transversely through said body, the bore being spaced from the axis and communicating with the receptacle at two of said planar surfaces along the entire circumference of the bore.

5,595,100

HAND GUARD FOR LOCKING PLIERS

Robert E. Sollo, 1132 Ocean Ave., New London, Conn. 06320

Filed Dec. 12, 1995, Ser. No. 571,127
Int. Cl.[6] B25B *7/02*
U.S. Cl. 81—427 18 Claims



1. A hand guard for locking pliers having mutually hinged main and operating handles movable between opened and closed positions, said hand guard comprising:

a protective sleeve for conformable reception onto and over the main and operating handles of the locking pliers, said protective sleeve including:

first and second opposed spaced apart panels for receiving the locking pliers therebetween; and

upper and lower opposed spaced apart panels for receiving the main and operating handles therebetween;

said protective sleeve being of resiliently stretchable material such that when operatively positioned on the locking pliers in the closed position, said upper panel conformingly engages the main handle thereof, said lower panel conformingly engages the operating handle thereof, and said first and second panels are substantially planar, extending,

respectively, between said upper and lower panels, and such that when operatively positioned on the locking pliers in the opened position, said first and second panels are drawn into a reformed configuration while biasing the operating handle toward the closed position;

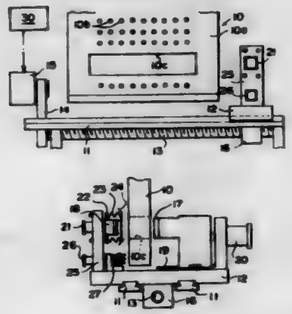
said protective sleeve thereby preventing any portion of the hand of a user from entering a zone of the locking pliers between the main and operating handles.

5,595,101

METHOD AND APPARATUS FOR MAKING SPLICE INDICATING HOLES THROUGH PHOTOGRAPHIC PAPER

Eiji Yoshimatsu; Shinichi Fujii, and Shigeru Okitsu, all of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 804,734, Dec. 11, 1991, abandoned. This application Sep. 1, 1993, Ser. No. 121,036
Claims priority, application Japan, Dec. 12, 1990, 2-401488
Int. Cl.[6] B26D 7/01;9/00; B26F 1/02
U.S. Cl. 83—40 8 Claims



1. A method for making a plurality of splice indicating holes through a photographic paper web, comprising the steps of:

i) providing a control means, a movable member, and a punching means supported on said movable member;

ii) using said control means to designate a plurality of strips of respective determined widths as areas into which the photographic paper web is to be slit, each designated strip having a longitudinal axis extending parallel to the longitudinal axis of the web;

iii) using said control means to control said movable member to stop at predetermined intervals with respect to a width direction of said photographic paper web and to activate said punching means to form said plurality of splice indicating holes through said photographic paper web one after another, at the predetermined intervals with respect to the width direction of said photographic paper web, said predetermined intervals being adjusted in accordance with the width of the strips into which said photographic paper web is to be slit, thereby disposing at least one of said splice indicating holes in each of said strips into which said photographic paper web is to be slit;

iv) cutting said photographic paper web in the width direction a predetermined distance from said splice indicating holes, said cutting step forming an end of the photographic paper web,

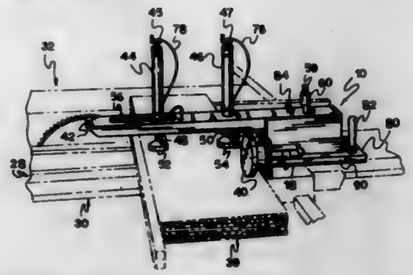
wherein all of said plurality of splice indicating holes made through the photographic paper web are thereby equally spaced a predetermined longitudinal distance from the end of the photographic paper web.

5,595,102

APPARATUS FOR CLAMPING STACKED ITEMS FOR CUTTING

Paul J. O'Grady, 1010 6th St., Pentwater, Mich. 49449

Filed Jan. 6, 1995, Ser. No. 369,393
Int. Cl.[6] B23Q 3/06
U.S. Cl. 83—435.17 13 Claims



1. A clamp device for securing stacked items on a sliding table of a table saw comprising:

a base unit for securing and orienting components of the device, said base unit comprised by a bottom wall, two side walls, a front wall, and a back wall;

a plurality of horizontally projecting clamp members mounted to said base unit;

a cross arm projecting horizontally from said base unit in the same direction as said horizontally projecting clamp members;

a plurality of vertically projecting clamp members mounted on said cross arm;

at least one guide shoe for mounting the clamp device to a sliding table of a table saw; and

a switch for controlling the application of pressure on said horizontally and vertically projecting clamp members and said at least one guide shoe.

5,595,103

HYDRAULIC DRIVE ASSEMBLY FOR ELECTRICAL DISCHARGE MACHINE

William B. Ecoff, 29439 Sierra Rojo La., Valley Center, Calif. 92082, and William H. Bradbury, 2124 View Crest Glen, Escondido, Calif. 92026

Filed Mar. 18, 1993, Ser. No. 32,388
Int. Cl.[6] F15B 13/02
U.S. Cl. 91—51 10 Claims

7. A hydraulic system for positioning a part, comprising:

a hydraulic cylinder having opposite first and second ends;

a piston slidably mounted in the cylinder to separate the cylinder into first and second chambers on opposite sides of the piston;

at least one piston rod extending from the piston through the second end of the cylinder for connection to a part to be positioned;

a reservoir for hydraulic fluid, the reservoir having a base wall secured across the first end of the cylinder;

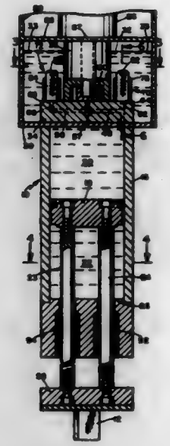
a pump mounted in said reservoir having an inlet opening into said reservoir and an outlet;

a first connecting passageway connecting the pump outlet to the first chamber;

a second connecting passageway connecting the pump outlet to the second chamber;

first and second return passageways for returning fluid from the first and second chambers, respectively, to the reservoir;

valve means for selectively controlling the supply of fluid from the pump outlet to the chambers and from the chambers back to the reservoir, whereby in a first valve condition fluid flows into the first chamber and from the second chamber to the reservoir in order to move the piston in a first direction, and in a second valve condition fluid flows into the second chamber



and is vented from the first chamber to the reservoir in order to move the piston in a second, opposite direction; and

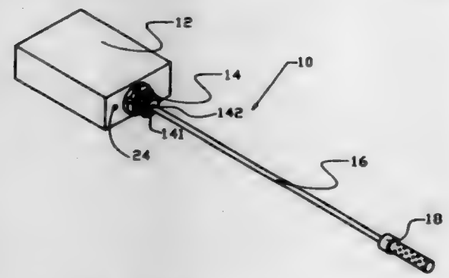
a connecting manifold mounted within said reservoir on said base wall, the connecting manifold having an outer surface and at least five openings on said outer surface, the pump being mounted on said manifold with the pump inlet aligned with a first of said openings and the pump outlet aligned with a second of said openings, the valve means comprising a first vent valve mounted on said manifold over a third of said openings and a second vent valve mounted on said manifold over a fourth of said openings each vent valve having an outlet directly exposed to fluid in said reservoir, the manifold having an inlet passageway for supplying fluid to the pump extending from a fifth of said openings to said first opening, said first and second connecting passageways extending at least partially within said manifold to said second opening, and said first and second return passageways extending at least partially within said manifold to said third and fourth openings, respectively.

5,595,104

WINE BOTTLE AERATOR

Robert W. Delaplaine, 3585 Tripp Rd., Woodside, Calif. 94062

Filed Jul. 23, 1996, Ser. No. 685,324
Int. Cl.[6] B01F 3/04; C12H 1/00
U.S. Cl. 99—323.1 6 Claims



1. An aerator for a bottle comprising:

a power control box,

a stopper means comprising venting means,

a submersion rod, and

an aeration element; wherein

said power control box includes a power supply means that drives an air pump to draw air in through an air inlet and pump air out through an air outlet into said submersion rod then out through said aeration element, and

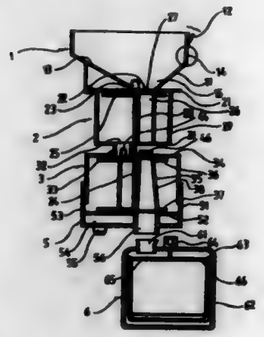
said stopper means is seated securely in a mouth of said bottle, thereby stably anchoring said aerator, said venting means of said stopper means allows air to vent from an interior of said bottle such that air pressure in said interior does not exceed a safe level.

5,595,105

APPARATUS FOR AUTOMATICALLY COOKING RICE

Sung-Phil Kang, 420 Ji-dong, Paldal-gu, Suwon-city, Kyunggi-do, 442-060, Rep. of Korea

Filed Aug. 31, 1995, Ser. No. 522,153
Claims priority, application Rep. of Korea, Dec. 30, 1994, 94-39758
Int. Cl.[6] A47J 27/00
U.S. Cl. 99—327 2 Claims



1. An apparatus for automatically cooking rice, comprising:

a rice receiving section having a rice box provided at a front wall thereof with a rice inlet port and a window for checking the interior of the rice box;

a measuring section disposed beneath the rice receiving section, the measuring section having an upper plate attached to a lower end of the rice receiving section and provided with a throughout hole communicated with an outlet of the rice box, a rotating plate disposed beneath the upper plate and provided with a throughout hole, the rotating plate being rotated by a motor such that the throughout hole thereof is selectively aligned with the throughout hole of the upper plate, the measuring section further having a measuring cup attached to a lower end of the rotating plate;

a rice washing section disposed beneath the measuring section, the rice washing section having a measuring cup support plate provided with a throughout hole communicated with an opened lower end of the measuring cup and a washing bath attached to a lower end of the measuring cup support plate and provided with a plurality of water drain ports, the washing bath being coupled to the rotating plate by a rotating shaft such that they rotate together;

a water supply section having a water supply pipe adapted to receive a water from an external water supply source, a water supply motor connected to the water supply pipe, a water injection port connected to the water supply motor and opened to the washing bath, a pressure reducing valve connected to the water supply pipe, a water supply port connected to the pressure reducing valve and opened to the washing bath, and a water pressure sensor adapted to sense a water pressure in the water supply pipe and thereby check a water cut-off state;

to a water drain section disposed beneath the rice washing section, the water drain section having a rice discharge pipe

selectively aligned with an opened lower end of the washing bath and a water collecting chamber for collecting a water drained from the washing bath, and water drain ports for draining the water collected in the water collecting chamber; and

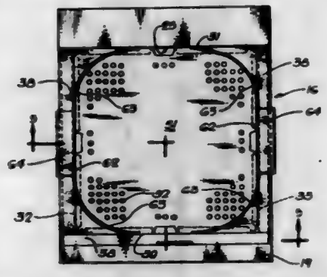
a rice cooking section disposed beneath the water drain section, the rice cooking section having a rice receiving hopper disposed beneath the rice discharge pipe and adapted to receive a washed rice from the rice washing section, a rice cooker laid on a slidable shelf, and a rotating opening/closing plate provided with a rice receiving hole and adapted to rotate by a motor such that it allows selectively the rice cooker to receive the rice from the rice receiving hopper through the rice receiving hole.

5,595,106

BAGEL COOKER

Richard J. Anetsberger, Northbrook, Ill., assignor to Anetsberger Brothers, Inc., Northbrook, Ill.

Filed Dec. 15, 1995, Ser. No. 573,153
Int. Cl.[6] A47J 37/12
U.S. Cl. 99—483 8 Claims



1. Cooking apparatus for proofing raw bagels, comprising:

an open top bagel proofing kettle comprising a horizontally oriented rectangular bottom having it's periphery integrally joined with four planar vertical walls that are intersectingly integrated at right angles to form corresponding right angular interior corners for said kettle;

a grid plate having a planar body formed with plural openings therethrough mounted over said bottom; and

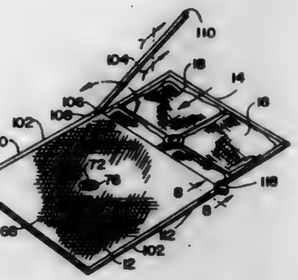
plural baffle means mounted in the interior of said kettle to extend vertically between said grid plate and the kettle's open top comprising semi-cylindrical portions extending over said interior corners whereby to render said corners curvelinear.

5,595,107

FILTERING AND TREATING DEVICE

Thomas H. Bivens, P.O. Box 1250, Magnolia, Tex. 77355-1250

Filed May 2, 1994, Ser. No. 236,890
Int. Cl.[6] A47J 37/00
U.S. Cl. 99—408 16 Claims



1. A filtering and treating device for filtering and treating liquid in a container comprising:

a shell constructed at least in part of rigid, perforate material;

at least one wire mesh screen exterior of said shell;

said at one wire mesh screen comprising a wire mesh screen envelope surrounding said shell;

at least one pouch having a treating material therein;

said at least one pouch constructed to allow fluid flow therethrough;

at least one interior compartment of said shell constructed for receiving said at least one pouch;

said at least one pouch removably positioned in said at least one interior compartment;

suction means in fluid communication with an interior of said shell;

so that upon engagement of said suction means, liquid is drawn through said at least one wire mesh screen, said shell, said at least one interior compartment, and said at least one pouch; and

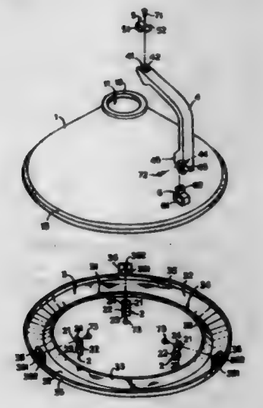
thereby the liquid is both filtered and treated by the device.

5,595,108

FAST ASSEMBLED OIL-COLLECTING THROUGH AND CLIP RING STRUCTURE

Jin-Yuh Shen, 2nd Fl. No. 25, Sec. 3, Jen-Ai Rd., Taipei, Taiwan

Filed Mar. 14, 1996, Ser. No. 616,123
Int. Cl.[6] A47J 27/00;27/58; B65D 51/00;51/16
U.S. Cl. 99—425 4 Claims



1. A fast assembled oil-collecting trough and clip ring structure, comprising a conic glass-made fry pan cover, a circular clip ring disposed on an edge of the fry pan cover, at least three resilient plates for associating the fry pan cover with the clip ring, an arch handle disposed on the fry pan cover, an upper latch plate secured on upper end of the handle and a lower latch plates secured on lower end of the handle, said structure being characterized in that:

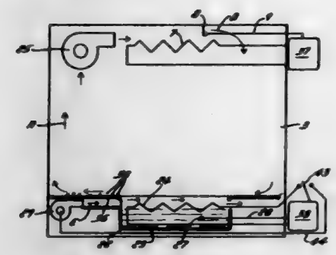
the clip ring has a vertical flange formed along the periphery of the clip ring, the flange being formed with at least three integrally made vertical tabs each having an insertion hole, the dimension of the insertion hole being determined by the profile and size of the resilient plate, the tab being formed with an orifice for a rivet to pass through an orifice of upper end of the resilient plate into the orifice so as to rivet the resilient plate with the tab, the resilient plate being a flexible metal plate having an arch projection at middle section, the projection being faced toward the center of the clip ring.

5,595,109

FOOD STORAGE DEVICE WITH DEHUMIDIFICATION MEANS

Winston L. Shelton, Louisville, Ky., assignor to Carton Drive Enterprises, Louisville, Ky.

Continuation of Ser. No. 251,208, May 31, 1994. This application Apr. 13, 1995, Ser. No. 421,832
Int. Cl.[6] A21B 1/00;1/22; F27D 11/00
U.S. Cl. 99—476 3 Claims



1. An apparatus, comprising:

a food receiving chamber including a heat source;

a water reservoir including a heat source;

an air flow path between said food receiving chamber and said water reservoir, wherein the air flowing along said air flow path contains moisture;

a circulating fan for circulating air along said air flow path; and

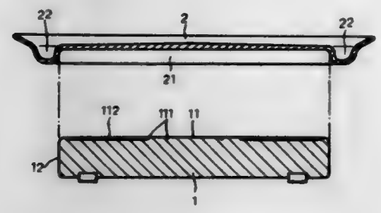
an ambient air fan for blowing ambient air onto said water reservoir in order to reduce the temperature of said water reservoir and cause some of the moisture in said air flow path to condense.

5,595,110

SANITARY CHOPPING PLATE STRUCTURE

Cheng-Tzu Tzeng, No. 172, Wu-Chi Road, Wu-Chi Town, Taichung Hsien, Taiwan

Filed Sep. 29, 1995, Ser. No. 606,026
Int. Cl.[6] B23Q 3/00
U.S. Cl. 99—483 3 Claims



1. A sanitary chopping plate structure, comprising:

a bottom disk with a substantially planar upper surface, and

a chopping plate wherein;

said upper surface of said bottom disk includes a plurality of annular grooves and a plurality of radiant grooves,

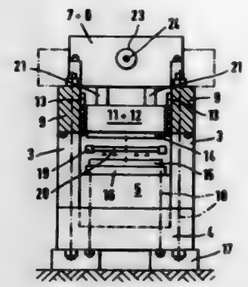
a lower surface of said chopping plate includes a recess which conforms in shape to an upper end of said bottom disk so that said recess receives said upper end of said bottom disk.

5,595,111

PRESS INSTALLATION COMPRISING LONGITUDINAL TRAVERSES

Wolfgang Michael, Göppingen; Kurt Strommer, Kuchen, and Hans Hofele, Göppingen, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Jun. 24, 1993, Ser. No. 80,784
Claims priority, application Germany, Jun. 27, 1992, 42 21 143.3
Int. Cl.[6] B30B 15/30;15/04
U.S. Cl. 100—207 1 Claim



1. A press installation having a drawing stage and working stages, comprising:

a press frame having press supports, a press bed, headpieces and turnbuckles that rigidly connect the press supports, the press bed and the headpieces with one another;

slides for forming;

a transfer device providing a transfer movement of workpieces between the working stages;

driving devices that provide a moving drive of the slides and the transfer device;

a longitudinal traverse respectively extending in front of and behind the slides in the longitudinal dimension of the press installation, the longitudinal traverses each extending along the length of at least the working stages;

wherein one pair of the press supports is arranged behind the drawing stage and in front of the working stages, and another pair of the press supports is arranged behind the working stages, with one of the press supports being situated locally in front of the slides and another of the press supports being situated locally behind the slides the longitudinal traverses being supported on the press supports and braced by the turnbuckles; and

vertically extending guides arranged on the longitudinal traverses, in which guides at least the slides, of the working stages are disposed with complementary guides so that the slides are vertically moveable, further comprising:

a press cross traverse in front of the working stage which follows the drawing stage and another press cross traverse behind a last one of the working stages, the press cross traverses extend transversely with respect to a longitudinal dimension of the press installation;

a press bed which extends from one of the press cross traverses to the other press cross traverse and is placed on the press cross traverses;

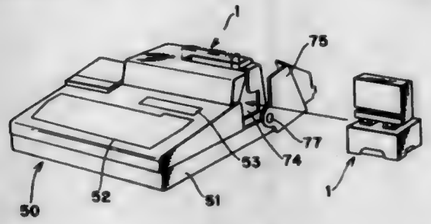
wherein the press supports are supported directly on the press cross traverses with the press bed therebetween, the longitudinal traverses rest on the press supports, and at least two of the headpieces receive the driving devices for the slides, the headpieces resting on the longitudinal traverses.

5,595,112

STAMP ASSEMBLY AND STAMP UNIT INCLUDING THE STAMP ASSEMBLY AND A PERFORATION DEVICE

Keiji Seo, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 22, 1995, Ser. No. 561,753
Claims priority, application Japan, Dec. 22, 1994, 6-319704
Int. Cl.[6] B41F *1/04*
U.S. Cl. 101—26 14 Claims



1. A stamp assembly mountable to a thermal perforation unit for forming perforations in heat-sensitive stencil sheet, the thermal perforation unit having a mounting member for mounting the stamp assembly to the thermal perforation unit, the stamp assembly comprising:

a mounting member reception portion formed with a guide hole through which the mounting member is inserted to mount the stamp assembly to the thermal perforation unit;

a stencil plate fixed to said mounting member reception portion, said stencil plate including an ink-impregnated member and a heat-sensitive stencil sheet; and

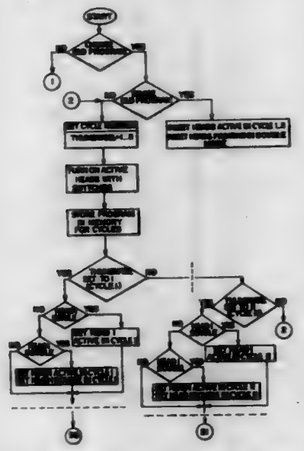
an opening-closing means for opening and closing the guide hole.

5,595,113

SEQUENCING SYSTEM FOR PRINTING MACHINE

Robert P. Daniel, and Bogusław S. Biel, both of Carol Stream, Ill., assignors to M & R Printing Equipment, Inc., Glen Ellyn, Ill.

Filed Oct. 25, 1994, Ser. No. 328,666
Int. Cl.[6] B41F *15/04*
U.S. Cl. 101—115 37 Claims



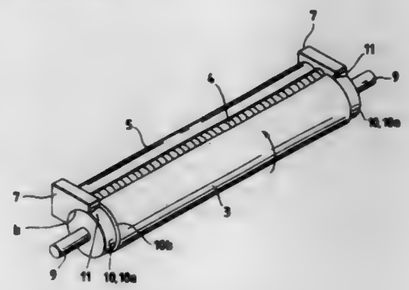
1. In a printing press comprising a plurality of stations, each of the stations being capable of working as a print station for printing ink into an item, the stations also being capable of operating as curing stations for curing the ink printed on the item, a sequencing system comprising means for controlling the operation of the sequencing system including means for manually controlling the operation of each station and means for automatically controlling the operation of each station, the automatic control means being adapted to receive a set of instructions from an operator for automatically sequencing the sequencing system, the manual control means including means for preventing one of the stations from operating during automatic sequencing without erasing the set of instructions for automatic sequencing when the one of the stations is set to operate during automatic sequencing.

5,595,114

STENCIL PRINTING DRUM HAVING SQUEEGEE AND DOCTOR ROLLER END INK BANKS

Hideo Negishi, and Yoshiharu Ohinata, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Mar. 20, 1995, Ser. No. 407,379
Claims priority, application Japan, Mar. 22, 1994, 6-050593
Int. Cl.[6] B41L *13/18*; B41F *15/46*
U.S. Cl. 101—120 5 Claims



1. A stencil printing machine comprises:

a rotary cylindrical drum having an ink passage part and being rotatable about a central axis;

an ink supplying roller rotatable around an ink supplying roller axis in parallel with the central axis of said rotary cylindrical drum, said ink supplying roller being moveable such that an outer surface thereof contacts an inner cylindrical surface of said rotary cylindrical drum;

an ink coating roller arranged in parallel with said ink supplying roller, said ink coating roller applying ink onto the surface of said ink supplying roller in accordance with said ink supplying roller rotating, an ink pool forming between said ink coating roller and said ink supplying roller;

a pair of cylindrical members respectively provided on opposite ends of said ink supplying roller, said cylindrical members having a smaller outside diameter than an outside diameter of said ink supplying roller and being coaxial with said ink supplying roller such that outer surfaces of said cylindrical members are displaced radially inwardly with respect to said outer surface of said ink supply roller; and

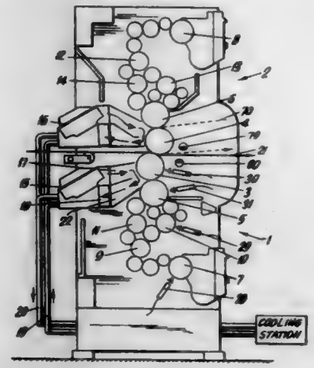
a pair of ink banks provided at opposite ends of said ink pool, respectively, said ink banks including first surfaces which respectively contact said outer surfaces of said cylindrical members and second surfaces which intersect said first surfaces at respective leading edges along said outer surfaces of said cylindrical members, said second surfaces being angled with respect to said ink supplying roller axis such that ink which has leaked onto said outer surfaces of said cylindrical members is scraped by said leading edges and flows along said second surfaces back to said ink pool.

5,595,115

PRINTING MECHANISM INCLUDING MEANS FOR COOLING AND MEANS FOR MOUNTING SLEEVE SHAPED FORMS ON TRANSFER AND FORM CYLINDERS

Gunnar Rau, Königsbrunn, and Karl H. Müller, Gersthofen, both of Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Nov. 7, 1994, Ser. No. 335,127
Claims priority, application Germany, Nov. 5, 1993, 9316932 U; Sep. 1, 1994, 44 31 188.5
Int. Cl.[6] B41L *29/00;35/14*
U.S. Cl. 101—142 28 Claims



1. A printing mechanism for waterless offset printing, comprising: a frame having side walls, one of the side walls having an opening therein; a form cylinder; a transfer cylinder, the form cylinder and the transfer cylinder being rotatably mounted to the side walls of the frame; inking means for inking the form cylinder; means for cooling at least one of the transfer cylinder and the form cylinder; and a sleeve-shaped form removably mounted on at least one of the form cylinder and the transfer cylinder, the sleeve-shaped form being movable onto and off of the respective cylinder through the opening in the one of the side walls of the frame, a first of the side walls is at a drive side of the cylinders and a second of the side walls is on an operating side of the cylinders, and further comprising a gear case arranged at the side wall on the drive side, a heat exchanger in operative connection with the gear case, means for supplying coolant to the heat exchanger, a regulating valve and regulator for regulating coolant supply to the heat exchanger, and a separate thermal sensor arranged at each of the side walls and being connected to the regulator.

5,595,116

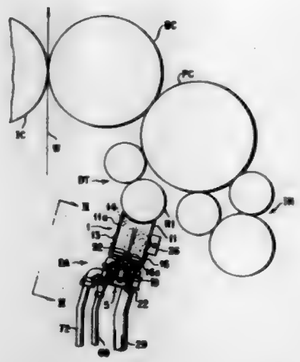
DAMPENING APPARATUS OF LITHOGRAPHIC PRINTING MACHINE

Tsuaki Ohkawara, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Japan

Filed Apr. 24, 1995, Ser. No. 427,175
Claims priority, application Japan, Sep. 30, 1994, 6-236261
Int. Cl.[6] B41L *23/00*
U.S. Cl. 101—147 14 Claims

1. A dampening apparatus of a lithographic printing machine in which a dampening train includes at least one roller and which is arranged so that a dampening liquid is supplied to a printing plate through the dampening train, the dampening apparatus comprising:

a spraying mechanism facing a peripheral surface of the roller of the dampening train, said spraying mechanism being spaced from the roller and parallel with an axis of the roller, said spraying mechanism being provided with a plurality of nozzles each directed toward the peripheral surface of the roller;



a cover unit enclosing a space between the spraying mechanism and the roller for preventing dampening liquid sprayed from the spraying mechanism from scattering away from the roller, said cover unit having at least a roller side cover positioned fixedly with respect to the roller, and a spraying mechanism side cover fitted to the roller side cover;

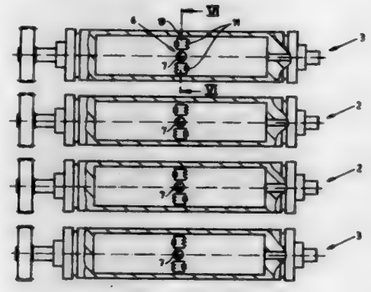
movement adjusting means connected with the spraying mechanism and the spraying mechanism side cover for moving the spraying mechanism and the spraying mechanism side cover toward and away from the peripheral surface of the roller so as to adjust a distance between the spraying mechanism and the roller.

5,595,117

METHOD AND APPARATUS FOR DAMPING BENDING VIBRATIONS OF CYLINDERS IN A PRINTING PRESS

Jilani Chrigui, Creil, France, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, S.A., Montataire, France

Filed Aug. 4, 1995, Ser. No. 511,176
Claims priority, application France, Aug. 9, 1994, 94 09853
Int. Cl.[6] B41F *5/00*
U.S. Cl. 101—216 15 Claims



1. A method for damping bending vibrations in a group of cylinders situated in a print assembly of a printing press, the method comprising the steps of:

determining a frequency of at least one fundamental vibration mode; and

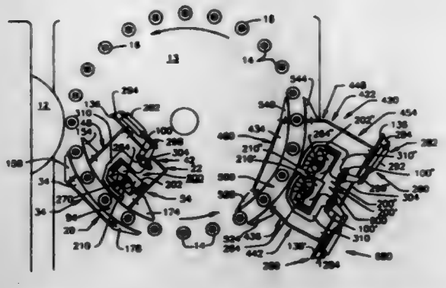
disposing at least one dynamic damper such that said dynamic damper damps said frequency of the fundamental mode of said group of cylinders.

5,595,118

DRYING APPARATUS FOR A DRY OFF-SET PRINTING PRESS HAVING AN ULTRA-VIOLET LAMP ASSEMBLY

Fernando Villaverde, Sr., and Fernando Villaverde, Jr., both of Piscataway, N.J., assignors to F & L Machinery Design, Inc., Edison, N.J.

Filed Oct. 16, 1995, Ser. No. 543,452
Int. Cl.[6] B41F 35/06
U.S. Cl. 101—424.1 24 Claims



1. A dryer apparatus in combination with a printing press for drying printed matter and coatings on containers as they are received from the printing press, comprising:

a) a UV lamp assembly for drying printed matter and coatings on the containers; a shroud assembly for housing said UV lamp assembly;

b) said UV lamp assembly including a housing, a UV lamp mounted in said housing, and a UV reflector mounted in said housing for directing UV light in a light path toward the containers, and means for moving said UV lamp assembly between an operational position in said shroud assembly and a non-operational position outside said shroud assembly to allow said UV lamp to be serviced or changed;

c) a shutter assembly including a shutter and means for pivotally mounting said shutter located inside said shroud assembly for pivotally moving said shutter between a light-blocking position between said UV lamp and the containers, and a light-drying position wherein said shutter is moved out of the light path of said UV lamp to dry the containers, said means for pivotally mounting said shutter are mounted out of the light path of said UV reflector to avoid exposure to direct UV light; and

d) said means for moving said UV lamp assembly including guide rails on said UV lamp assembly and guide tracks mounted within said shroud assembly, said guide rails for engaging said guide tracks for moving said UV lamp assembly between said operational and non-operational positions.

5,595,119

METHOD FOR AUTOMATIC MACHINE-PLATE CHANGE IN ROTARY PRINTING PRESS AND APPARATUS THE SAME

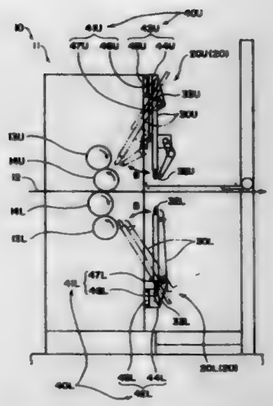
Narutoshi Hada; Shingo Nakamura, both of Zama, and Takeshi Horiguchi, Ebina, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1995, Ser. No. 540,983
Claims priority, application Japan, Oct. 12, 1994, 6-245949
Int. Cl.[6] B41F 27/12
U.S. Cl. 101—477 16 Claims

1. A method for an automatic machine-plate change in a rotation printing press, the improvement comprising the steps of:

accommodating a new-plate for winding around a plate cylinder into a new-plate cassette provided in a printing press having the plate cylinder;

delivering the new-plate to a position next to the plate cylinder by moving the new-plate cassette to cause the edge of the new-plate cassette to approach the plate cylinder;



removing a used-plate previously wound around the plate cylinder by rotating the plate cylinder in an unwinding direction after delivering the new-plate into a position next to the plate cylinder in the new-plate cassette and driving a belt conveyor fixed to the new-plate cassette;

winding the new-plate around the plate cylinder after the new-plate, accommodated into the new-plate cassette, is moved toward the plate cylinder; and

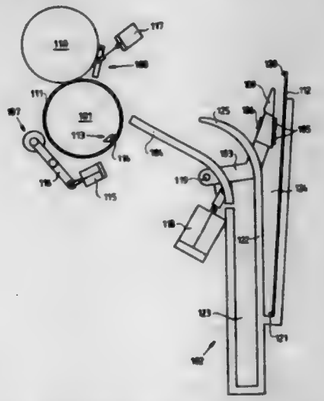
moving the new-plate cassette to cause the edge of the new-plate cassette to move away from the plate cylinder.

5,595,120

DEVICE FOR FEEDING PRINTING FORMS TO AND CHANGING THEM ON A PRINTING FORM CYLINDER

Jacques Métrope, Laigneville, France, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Apr. 1, 1996, Ser. No. 627,776
Claims priority, application France, Mar. 31, 1995, 95/03829
Int. Cl.[6] B41F 1/28
U.S. Cl. 101—477 15 Claims



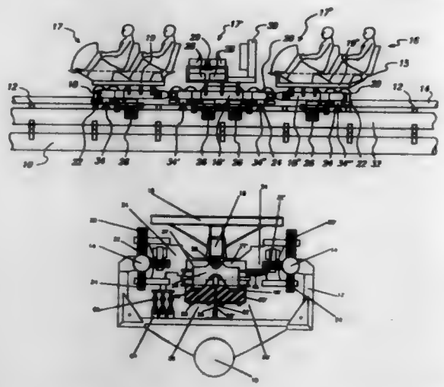
1. Device for changing printing forms on a printing-press form cylinder having a gap formed therein containing a holding device associated with a printing start, the holding device having a gripping region openable so as to form a gap extending over a printing-form format width for taking-up a leading edge of a printing form therein, comprising a swivelable holding element for selectively removing a first printing form from the form cylinder and applying a second printing form onto the form cylinder.

5,595,121

AMUSEMENT RIDE AND SELF-PROPELLED VEHICLE THEREFOR

Steven A. Elliott, Glendale; Ronald W. Froelich, Covina, both of Calif., and John W. Sogge, Orlando, Fla., assignors to The Walt Disney Company, Burbank, Calif.

Filed Apr. 15, 1994, Ser. No. 228,106
Int. Cl.[6] A63G 25/00
U.S. Cl. 104—53 54 Claims



1. A high performance amusement ride having a self-propelled ride vehicle capable of maximum acceleration of between about 0.3 G and about 1.0 G in either a forward or reverse direction, said amusement ride comprising:

a track having two substantially parallel, spaced apart load bearing rails and a substantially continuous drive fin mounted along said load bearing rails, said drive fin having a first and a second vertical tractive surface, said first and second tractive surfaces being substantially flat and substantially parallel to each other, said track being provided with at least one vertical, horizontal, or compound curve;

an electric power source disposed along said track; and,

at least one vehicle mounted for movement-along said track, said vehicle including

a frame,

at least one passenger compartment attached to said frame,

a plurality of load bearing wheels for engaging said load bearing rails of said track,

an electric pinch wheel drive for engaging and accelerating the vehicle above 0.3 G along the drive fin, said electric pinch wheel drive including

a first electric drive motor package pivotally mounted to said vehicle to engage said first tractive surface of said drive fin, a second electric drive motor package pivotally mounted to said vehicle to engage said second tractive surface of said drive fin, each said drive motor package having an electric motor with a motor output shaft which can rotate with substantially equal performance in either a clockwise or a counterclockwise direction, a transmission means for reducing the speed of the motor output shaft, a wheel attached for rotation to a transmission output shaft, said wheel including a tire for engaging said tractive surface,

a compressive coupler for simultaneously compressing the tire of the first electric drive motor package against the first tractive surface and the tire of the second electric drive motor package against the second tractive surface with sufficient force to enable the electric drive motor packages to move the vehicle along the fin, whereby the amount of compressive force generated by said compressive coupler is substantially independent of vehicle weight; and,

a motor controller electrically connected to each said motor for controlling the direction and speed of each motor output shaft;

a vehicle controller for determining the position of the vehicle on the track and for communicating with and controlling the motor controllers; and,

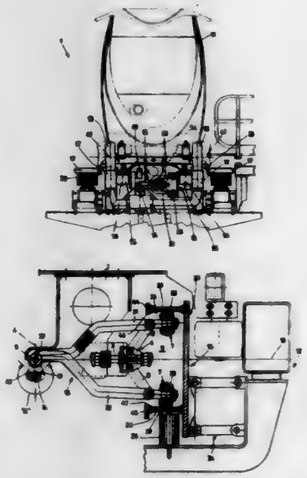
a conductor for drawing electrical power from the electric power source and delivering said electrical power to said electric drive motor packages, said motor controllers, and said vehicle controller.

5,595,122

FUNICULAR SYSTEM OF RAIL AND RUNNING CABLE TYPE

Ferruccio Levi, Cologno Monzese, and Giuseppe Conte, Bolzano, both of Italy, assignors to Leitner S.p.A., Bolzano, Italy

Filed Jun. 16, 1995, Ser. No. 491,453
Claims priority, application Italy, Jun. 16, 1994, MI94A1256
Int. Cl.[6] B61B 12/00
U.S. Cl. 104—173.1 17 Claims



1. A funicular system which utilizes a rail and running cable in which the movement of a vehicle is controlled, during stopping and starting, thereof by motorized rollers positioned on at least one side of the system, which comprises:

a cable;

at least one clamp comprising two operating arms having movable jaws, said jaws being selectively coupleable to and releasable from said cable;

a pair of guides respectively acting on the free ends of the operating arms of said movable jaws, said arms being movable to cause said movable jaws to be movable apart to open said movable jaws and to be moveable to close said movable jaws wherein said guides (29) are rigidly connected together and form a single guide carrier element supported in such a manner as to be movable vertically parallel to itself wherein said guide carrier element is vertically movable by said free ends of the operating arms only in operation of said operating arms such that said guide carrier is instantaneously and automatically self-centered about said operating arms.

5,595,123

ROLLING STOCK AND METHOD FOR EQUIPPING THE INTERIOR THE SAME

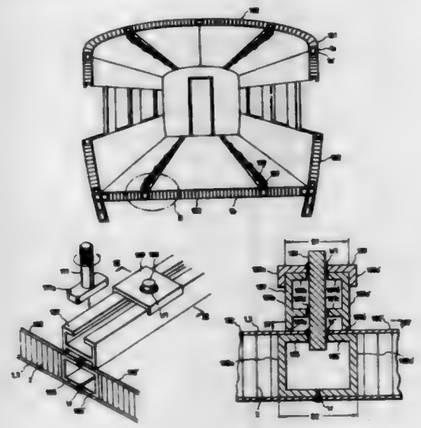
Takashi Tao; Yasuo Ishinaru, both of Kudamatsu; Morishige Hattori, Kudamatsu; Keiji Ohmura, and Hideshi Ohba, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 309,417, Sep. 20, 1994. This application Jun. 7, 1995, Ser. No. 487,901

Claims priority, application Japan, Sep. 20, 1993, 5-232807

Int. Cl.[6] B61D *17/00*

U.S. Cl. 105—396 5 Claims



1. A rolling stock having a body structure comprising:

a plurality of laminated panels, each of said laminated panels comprising a pair of face panels, a core disposed between a pair of said face panels, and framing shapes disposed between a pair of said face panels along both longitudinal edges of said face panels, wherein said face panels, said core, and said framing shapes are joined to each other, and wherein adjacent ones of a plurality of said laminated panels are joined to each other by welding of said framing shapes to each other;

a rod fixed to said framing shapes joining said adjacent laminated panels to each other;

a support shape for supporting equipment, said support shape being mounted on said rod and extending in a longitudinal direction of said body structure in such a manner that said rod passes through said support shape, wherein said support shape comprises a pair of side walls having respective first ends in contact with respective ones of said adjacent laminated panels; a pair of flanges integrated with second ends of said side walls in such a manner as to face and be spaced from each other; and a bottom wall connecting said side walls to each other, said bottom wall being disposed at a position between said pair of flanges and said adjacent laminated panels, wherein a width between said pair of side walls is smaller than a width of said two framing shapes joined to each other by welding;

a holding plate disposed outside said two flanges and fixed on said rod in such a manner as to hold said two side walls;

wherein said rod passes through said bottom wall, a space between said two flanges, and said holding plate.

5,595,124

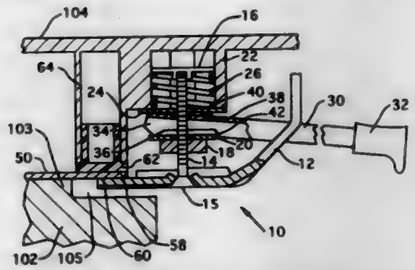
RESTRAINING MECHANISM

Barry D. Wixey, Pittsburgh, and Jeffrey L. Haffely, Gibsonia, both of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jun. 8, 1994, Ser. No. 255,420

Int. Cl.[6] A47B *35/00*

U.S. Cl. 108—50 25 Claims



1. A restraining mechanism for use with an adjustable work table for releasably restraining movement of a movable member of the table relative to a stationary member of the table, the restraining mechanism comprising:

clamping means connected to one of the movable and stationary members;

spring means, connected to said clamping means, for forcing said clamping means against the other of the movable and stationary members and thereby restraining movement of the movable member relative to the stationary member;

pivot means attached to one of the movable and stationary members; and

lever arm means, pivotably cooperating with said pivot means, for contacting said clamping means during pivotal motion of said lever arm means and thereby operating against the bias of said spring means to reduce the force applied through said clamping means to the other of the movable and stationary members, to allow movement of the movable member relative to the stationary member, said lever arm means including a handle portion, a pivot portion and a contact portion, said lever arm means pivotally cooperating with said pivot means at said pivot portion and contacting said clamping means at said contact portion, said pivot portion being intermediate said contact portion and said handle portion.

5,595,125

CORRUGATED PAPER PALLET

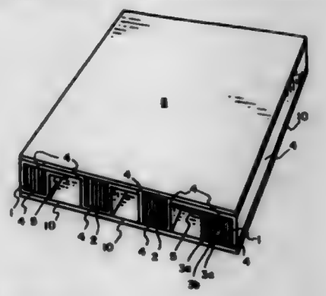
Robert L. Bridges, Jr., 158 Kenan Dr. NW., Milledgeville, Ga. 31061

Filed Mar. 6, 1995, Ser. No. 398,675

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.3 4 Claims

1. A corrugated paper pallet for supporting containers and bulk material comprising:



a left and a right side runner and a first and a second center runner, each having a top, a bottom, a left side and a right side, and each fabricated of a plurality of corrugated paper runner elements aligned vertically, and laminated and fixably attached together;

a corrugated paper inner sheet having an upper and lower surface, said sheet wrapping completely around and being fixably attached to the right side, bottom, left side and top of the left side runner, extending from the top of said left side runner a distance of the width of a fork-lift tine to the left side of the first center runner, wrapping around and being fixably attached to the left side, bottom and right side of said center runner, extending therefrom the distance of the width of a forklift line to the left side of the second center runner and wrapping around and being fixably attached to the left side, bottom and right side of said second center runner, and finally extending therefrom the distance of the width of a fork-lift tine to the top of, wrapping completely around and being fixably attached to the top, right side, bottom and left side of the right side runner, where overlaps of said inner sheet are available on the right side of the left side runner and on the left side of the right side runner and said overlaps are themselves fixably attached to the lower side of said inner sheet near the top of the side runners;

a double-walled, sesame-tape-reinforced corrugated paper top deck fixably attached to the upper side said inner sheet and the top of said center runners;

a corrugated paper bottom deck fixably attached to the inner sheet at the points adjacent to the bottom of the said side and center runners;

a means of fixably attaching said runner elements together, of fixably attaching said inner sheet to said runners, of fixably attaching said overlaps to the lower side of said inner sheet, of fixably attaching said top deck to said inner sheet and center runners, and of fixably attaching said bottom deck to said inner sheet, said means being capable of bonding said respective parts into one laminated unit.

5,595,126

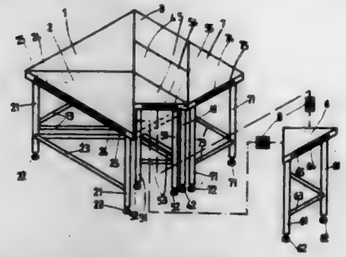
SHAPE-CHANGEABLE TABLE

Hsin-Ho Yeh, 2F, No. 1, Lane 3, Chen Der Road, Section 4, Shih Lin, Taipei, Taiwan

Filed Aug. 10, 1995, Ser. No. 513,585

Int. Cl.[6] A47B *1/00*

U.S. Cl. 108—64 3 Claims



1. A shape-changeable table comprising:

a) a plurality of individual table units, each table unit being of a planar polygonal configuration defined in part by a top surface and a plurality of peripheral side faces;

b) at least one peripheral side face of each table unit being provided with a longitudinal recess formed therein and at least one mortise disposed in the longitudinal recess; and

c) a plurality of tenons engageable with the recesses and mortises of adjacent table units for securing the units together and disposing the side faces of adjacent units in abutting relationship with each other, whereby the top surfaces of the units are disposed in a coplanar relationship with each other for collectively defining a table top.

5,595,127

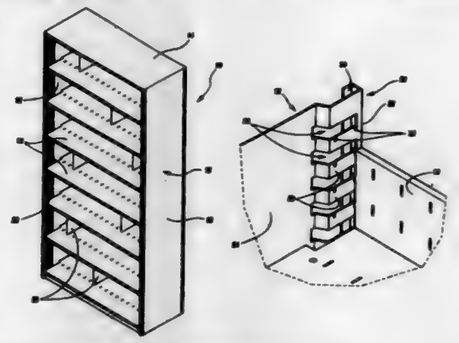
SHELVING SYSTEM

Brian Eustace, Sierra Madre, and Robert Zarate, Studio City, both of Calif., assignors to Hon Industries Inc., Muscatine, Iowa

Filed Dec. 6, 1994, Ser. No. 349,825

Int. Cl.[6] A47B *9/00*

U.S. Cl. 108—109 26 Claims



1. A side panel for a shelving unit comprising:

a generally rectangular panel formed from a unitary piece of sheet metal having a planar body portion and vertically disposed front and rear marginal portions in parallel spaced relationship with each other, said marginal portions being formed into generally C-shaped channels defining a pair of vertical parallel spaced uprights;

a plurality of vertically spaced horizontally extending slots formed in said uprights, said slots each having a generally L-shaped configuration formed through a face of each channel and an adjacent edge thereof defining a plurality of generally L-shaped horizontally extending rails with upper and lower edges; and

at least one vertical notch formed in the upper edge of each rail, each notch being dimensioned and configured to receive and retain a hook formed on an associated shelf.

5,595,128

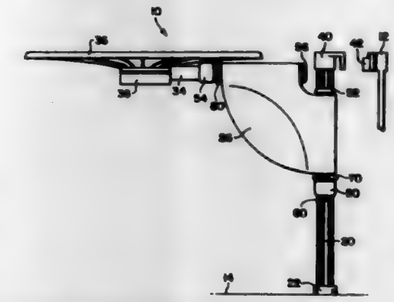
TABLE ASSEMBLY

Yvon De Ladurantaye, Ste-Madeleine, and Koen De Winter, Beaconsfield, both of Canada, assignors to Dycaf Pro-Vision International, Quebec, Canada

Filed Aug. 28, 1995, Ser. No. 518,115

Int. Cl.[6] A47B *11/00;9/14*

U.S. Cl. 108—140 11 Claims



1. A table assembly comprising:

a first longitudinally grooved and elongated supporting member disposed substantially vertically, the first supporting member having a generally circular cross section;

a second longitudinally grooved and elongated supporting member disposed substantially horizontally, the second supporting member having a generally circular cross section;

a brace member for operatively connecting together the first and second supporting members, the brace member having a first sleeve portion slidably connected to the first supporting member and a second sleeve portion slidably connected to the second supporting member, the brace member comprising a first and a second tubular section, the first tubular section being coaxial with the first supporting member and downwardly projecting from the first sleeve portion of the brace member, the second tubular section being coaxial with the second supporting member and laterally projecting from the second sleeve portion of the brace member towards the distal end of the second supporting member;

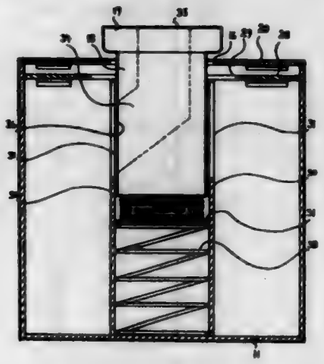
a first locking means provided between the brace member and the first supporting member for removably locking the brace member with the first supporting member, the first locking means comprising at least one first outwardly biased radial stopper movable through a corresponding hole of the first tubular section upon rotation of a first eccentric ring mounted around the first tubular section in front of the first stopper, the first stopper having a first position away from the first supporting member for allowing free rotation and translation of the brace member with reference to the first supporting member, a second position where the first stopper is set into one longitudinal groove of the first supporting member for only preventing the brace member from rotating around the first supporting member, and a third position where the first stopper is extending inside one of a plurality of first adjustment holes provided at different heights on the first supporting member for further preventing translation of the brace member along the first supporting member;

a second locking means provided between the second supporting member and the brace member for removably locking the second supporting member with the brace member;

a table plate connected to a distal end of the second supporting member; and

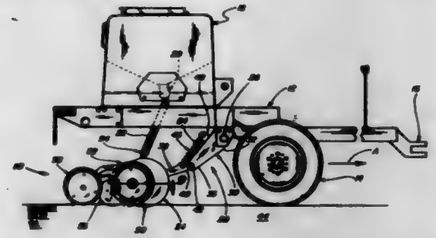
mounting means for removably connecting the first supporting member to a fixed structure.

5,595,129
REMOVABLE SECURITY BOX
Philip R. Grobe, 5 Tane Court, Gosnells, Australia
Filed Nov. 16, 1993, Ser. No. 153,316
Claims priority, application Australia, Nov. 17, 1992, PL5899
Int. Cl.[6] E05G *1/00*; B65D *91/00*
U.S. Cl. 109—22 **19 Claims**



1. A security box comprising a box which defines an enclosed chamber wherein the chamber comprises a first sub-chamber and a second sub-chamber located to one side of the first sub-chamber and separated from the first sub-chamber by a partition, a closure in a wall of the box to provide selective access to the chamber, a lock provided on the closure, a first slot formed in a wall of the box opening into the first sub-chamber, a moveable platen supported within the first sub-chamber in substantially opposed relation to the first slot and being moveable within the first sub-chamber towards and away from the first slot, biasing means to bias the platen into face-to-face engagement with an internal face of the wall accommodating the first slot, an elongate insert receivable in the first slot, said insert having a cross-sectional configuration substantially corresponding to the shape of the first slot and having one end which is outermost when the insert is in engagement with the first slot and another end which is within the chamber when the insert is in engagement with the first slot, said insert having a passageway extending between a first opening at the one end and a second opening in a side of the insert, said second opening communicating with the second sub-chamber when the insert is fully received in the first slot, said passageway being intended to receive coins or tokens.

5,595,130
PLANTING UNIT
Roger D. Baugher, and Garreth D. Baugher, both of P.O. Box 79-A, McClure, Ill. 62957
Filed Feb. 6, 1995, Ser. No. 384,660
Int. Cl.[6] A01C *5/06*
U.S. Cl. 111—52 **18 Claims**



1. A single disk opener assembly adapted for attachment to a rotatable frame and movable forwardly over the ground for opening a furrow therein comprising;

a draw bar assembly including an elongated first arm member having a first end adapted for attachment to the frame for rotation therewith and a second end located downwardly and rearwardly of said first end, an elongated second arm member adapted to be positioned at an angular orientation with respect to the ground having a forward end pivotally connected to the first arm member adjacent the second end thereof and an opposite rearward end located rearwardly of the forward end, and a spring member attached between the first and second arm members, the spring member being compressible by the rotation of the first arm member with the frame when attached thereto through a limited range of angular positions to apply a variable downward force against the second arm member,

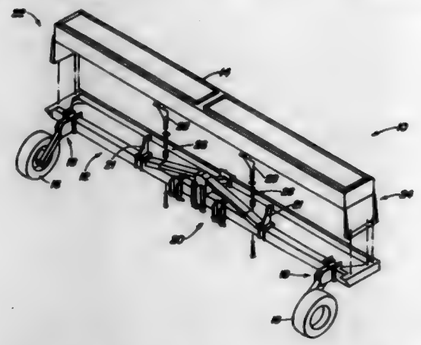
a single disk connected to the second arm member adjacent the rearward end thereof for rotation about an axis offset at an angle to the direction transverse to the forward direction, the angled disk thus defining forwardly and rearwardly directed disk surfaces, the disk being positionable for penetrating the ground for opening the furrow therein, the disk when positioned for opening the furrow having an angular orientation with respect to the ground which is variable corresponding to the angular orientation of the second arm member,

a seed tube located closely adjacent the rearwardly directed disk surface for discharging material in the furrow, and

a gauge wheel, and means connecting the gauge wheel to the second arm member for rotation adjacent the forwardly directed surface of the disk about an axis generally parallel to the disk axis to limit the penetration of the disk into the ground,

wherein said elongated first arm member has a length as measured between the first end thereof and the pivotal connection to said second arm member sufficient such that said second arm member is oriented at between about a 0° and about a 20° angle with respect to the ground when said disk is in position for opening the furrow therein and the angular orientation of said second arm member with respect to the ground and the corresponding angular orientation of the disk with respect to the ground remain substantially constant when said first arm member is rotated with the frame to the angular positions for varying the downward force applied against said second arm member.

5,595,131
FLEXIBLE AND RESILIENT SUPPORTS FOR A GRAIN BOX
Glenn D. Head, Jr., Des Moines, Iowa, and Mark Johnston, Lockport, Ill., assignors to Deere & Company, Moline, Ill.
Filed Oct. 10, 1995, Ser. No. 540,380
Int. Cl.[6] A01B *59/043*
U.S. Cl. 111—200 **10 Claims**



1. A grain drill for sowing seeds in a field, the grain drill comprising:

a transverse support frame;

an elongated grain box for holding seed of a rigid unitary structure being provided with a first end and a second end opposite the first end, the first and second ends of the grain box are rigidly mounted to the transverse support frame;

an intermediate support being mounted to the transverse support frame and vertically supporting the grain box between the first and second ends of the grain box, the intermediate support being vertically resilient and flexible.

5,595,132
SUPERSTRUCTURE FOR MULTIHULL VESSELS
Stig Bystedt, Uddevalla; Orvar Torsking, Alingsås, and Henrik Nordhammar, Göteborg, all of Sweden, assignors to Stena Rederi, AB, Göteborg, Sweden
Filed May 30, 1995, Ser. No. 360,832
Claims priority, application Sweden, Jul. 9, 1992, 9202131
Int. Cl.[6] B63B *1/00*
U.S. Cl. 114—61 **5 Claims**

1. A multi-hull catamaran comprising:

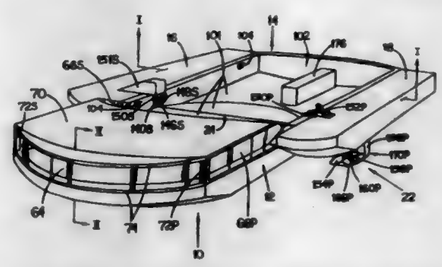
at least two hulls which extend in a mutually parallel and horizontally spaced relationship,

at least one deck joining said at least two hulls together,

a superstructure, supported on said at least two hulls by at least one wall structure extending from said hulls and defining an overlying space, and

latticework beams forming walls of the superstructure and having longitudinal profiles which extend horizontally and struts which extend between said profiles in alternating directions, said profiles and said struts lying in planes which are oriented generally vertically, the latticework beams being connected firmly to said at least one wall structure supporting the superstructure on the at least two hulls, free spaces defined by the longitudinal profiles and the struts in the latticework beams forming window openings for said overlying space.

5,595,133
UNDERWATER VIEWING SURFACE WATERCRAFT
Marc D. Bullard, P.O. Box 720322, Orlando, Fla. 32872
Continuation of Ser. No. 385,766, Feb. 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 134,975, Oct. 13, 1993, abandoned. This application Dec. 15, 1995, Ser. No. 573,581
Int. Cl.[6] B63B *35/00*
U.S. Cl. 114—66 **11 Claims**



1. An underwater viewing surface watercraft providing complete human vision for viewing underwater comprising:

an elongated buoyant body for supporting at least one viewer in a prone position;

a transparent viewing window mounted in the bow portion and incorporated within a bottom surface of said buoyant body, said window being crowed laterally forming a concave shape with respect to said prone viewers' face for full contact with water, and

extending symmetrically in opposite directions toward starboard and port from its longitudinal centerline to two separate and correspanding points on a line drawn through said prone viewers' eyes at an angle of 95° with respect to said prone viewer's straight ahead line of vision, and

the bow side edge of said window extending forward to a point on a line drawn from said prone viewer's eyes at an angle of approximately 60° with respect to said prone viewer's straight ahead line of vision, and

the stern side edge of said window extends backward to a point on a line drawn from said prone viewer's eyes at an angle of approximately 75° with respect to said prone viewer's straight ahead line of vision;

a headrest member for providing vertical support for said viewer's head and vertical separation between said viewer's eye level and an inside surface of said window and establishing a

vertical and horizontal reference point thereby enabling the field of view provided by said buoyant body to exceed man's visual capabilities.

5,595,134
TOWING SYSTEM FOR DREDGES AND METHOD FOR USING SAME

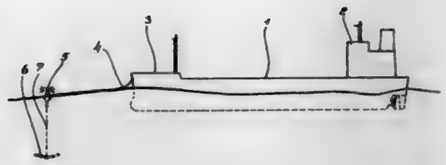
Ira J. Pete, 4411 Bayouside Dr., Chauvin, La. 70344
Filed Mar. 2, 1995, Ser. No. 396,672
Int. Cl.[6] B63B *21/66*
U.S. Cl. 114—244 1 Claim



1. A towing arm assembly, comprising:
(a) two towing arm supports, each support affixed to an opposite side of a towing vessel, each of the supports having a horizontal channel adapted to receive in sliding engagement a pin connected to a proximal end of a towing arm, and each of the supports adapted for receiving a locking member to lock the pin within the channel, thereby preventing any fore and aft motion of the proximal end of the towing arm;
(b) two towing arms, each having a proximal end and a second, oppositely disposed, distal end, each comprising a tube having a pin rigidly connected thereto at the proximal end for sliding engagement within the channel of a towing arm support, each of the towing arms being connected at its distal end to a dredging apparatus;
(c) two locking members, each adapted for locking a pin to one of the towing arm supports thereby allowing locking of the pin within the channel to prevent fore and aft movement of the proximal end of the towing arms;
(d) means for sliding each of the towing arms aft to allow a dredging apparatus connected thereto to be placed at a distance sufficiently behind the stern of the towing vessel to allow any substantial amount of forced air from the dredging apparatus to remain substantially clear of any stern propeller of the towing vessel;
(e) means for sliding each of the towing arms forward to allowing the dredging apparatus to be positioned near the stern of the vessel; and
(f) means for raising and lowering the dredging apparatus.

5,595,135
ARRANGEMENT FOR TOWING OF A DISABLED SHIP

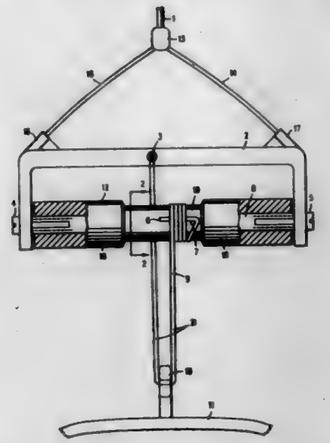
Jan B. Jensen, 240 Vibergvej, DK-7840 Hojslev, Denmark
PCT No. PCT/DK94/00179, § 371 Date Dec. 29, 1995, § 102(e) Date Dec. 29, 1995, PCT Pub. No. WO94/25336, PCT Pub. Date Nov. 10, 1994
PCT Filed May 4, 1994, Ser. No. 535,075
Claims priority, application Denmark, May 5, 1993, 0513/93
Int. Cl.[6] B63B *21/04*
U.S. Cl. 114—253 8 Claims



1. An arrangement in combination with and for towing of a disabled ship by means of a wire prepared for that purpose, said wire being connected with a buoy adapted to be released from, in connection with a disabling of, the ship,
wherein the wire is placed on a wire drum having an axis extending in the longitudinal direction of the ship at the stern, stem or stern and stem of the ship, the wire being permanently connected with the ship at one end behind the drum and at the other end with a painter;
wherein the painter is a buoyant line stored in a magazine, in which it is coiled without being twisted, the magazine being placed between the wire drum and a launching pipe for the buoy, with which the other end of the painter is connected; and
wherein the buoy is inflatable and connected with and encapsuled in a box comprising a floating anchor, said box being launchably mounted in the launching pipe.

5,595,136
HARNESS RELEASE DEVICE FOR WATER SKIING

Michael Shinsky, 743 15th Ave., Menlo Park, Calif. 94025
Filed Nov. 7, 1995, Ser. No. 554,766
Int. Cl.[6] B63B *21/04;35/85*
U.S. Cl. 114—253 14 Claims



6. A water skiing harness release device for removably attaching a water ski harness worn by a water skier to a tow line being pulled by a towing means, comprising:
a frame having means for attaching to the tow line;
a cylindrical handle having a longitudinal axis and two ends thereof that are rotatably attached to and supported by said frame such that said handle is freely rotatable about said longitudinal axis, said handle being graspable by at least one hand of the skier; and
a harness line having a first end and a second end, said first end being fixedly attached to said frame, said second end being releasably connected to said handle, wherein said releasable connection being formed by wrapping said second end around said handle and rotating said handle in a first direction to wind said harness line around said handle, said connection being releasable by rotation of said handle in a second direction opposite to said first direction.

5,595,137
WIND INDICATOR

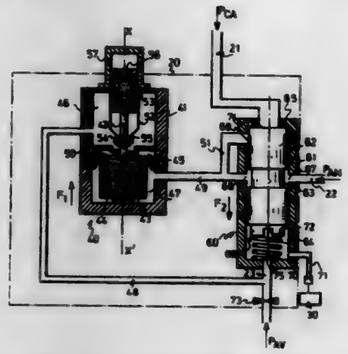
Anthony W. Delmonte, 1173 Lovejoy St., Buffalo, N.Y. 14206
Filed Dec. 30, 1994, Ser. No. 366,966
Int. Cl.[6] G01P *13/02*
U.S. Cl. 116—264 15 Claims



2. A dual function wind detector comprising a main section, a suspension means for rotatably suspending said main section, a scent container means or a scent compartment, and an attachment means for connecting said wind detector to a supportive structure, said main section comprising a substantially triangular portion having a centrally-disposed fold which defines wing sections on either side thereof, said main section folded inwardly so as to form a scoop section, said scoop section being sensitive to wind current, said scent compartment located above said main section and connected thereto by said suspension means, said scent compartment having means to retain and emit a scent from a composition dispensed therein, said suspension means terminating at an upper end with said scent compartment and said attachment means connecting said scent compartment to the supporting structure, said suspension means having means to allow said main section to easily turn upon wind contact with said main section.

5,595,138
APPARATUS FOR DETECTING OPERATIONAL ANOMALIES IN PRESSURIZED FLUID CIRCUITS

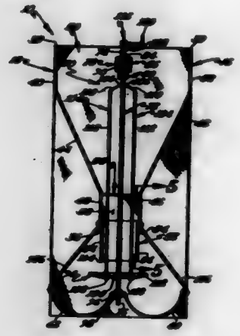
Pierre J. E. Claret, Nandy, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A., Paris Cedex, France
Filed Jun. 7, 1995, Ser. No. 472,848
Claims priority, application France, Jun. 8, 1994, 94 06986
Int. Cl.[6] G01L *19/12*
U.S. Cl. 116—268 8 Claims



1. An apparatus for detecting operational anomalies in a pressurized fluid circuit having a main pump, a fluid filter and a booster pump connected in series comprising:
a) an indicating detector comprising a case having first and second internal chambers separated by a flexible membrane and an alarm indicator extending externally of the case when the pressure differential between the first and second chambers reaches a predetermined threshold value;
b) a switching device comprising a case having opposite first and second ends, a slider movable within the switching device case between the opposite ends thereof, the slider having a middle portion with a reduced cross-sectional dimension, the switching device case having a first inlet in the first end, a second inlet in the second end and a third inlet in a middle portion;
c) first means supplying fluid pressure upstream of the booster pump (P_{CA}) to the first inlet;
d) second means supplying fluid pressure between the fluid filter and the main pump (P_{AM}) to the second inlet and to the first chamber of the indicating detector;
e) third means supplying fluid pressure between the booster pump and the fluid filter (P_{AB}) to the third inlet; and,
f) fourth means connecting the second chamber of the indicating detector to the switching device whereby fluid pressure P_{AM} is applied to the second chamber when the slider is in a first position and fluid pressure P_{CA} is applied to the first chamber when the slider is in a second position.

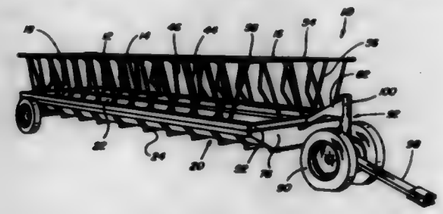
5,595,139
HOG FEEDER

Joseph M. Hofer, and Daniel J. Wipf, both of Lake Andes, S. Dak., assignors to Lakeview Hutterian Brethren, Inc., Lake Andes, S. Dak.
Filed Jul. 14, 1994, Ser. No. 275,833
Int. Cl.[6] A01K *5/01*
U.S. Cl. 119—54 32 Claims



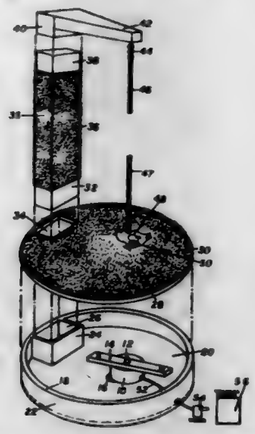
9. A feeder comprising:
a feed trough;
a feed reservoir for holding animal feed, said reservoir disposed above said trough and having an outlet for discharging feed;
a feed agitation assembly for agitation of the animal feed, said agitation assembly comprising:
a rod rotationally mounted to said feed reservoir, said rod having a first end extending through said outlet and a second, opposite end;
at least one agitator bar extending outwardly therefrom; and
a feed plate, said feed plate being attached near said second rod end and disposed above said feed trough, said feed plate being capable of being rotated through 360°;
wherein said agitation assembly includes an even number of bars, said bars being spaced equidistantly circumferentially about said rod.

5,595,140
LIVESTOCK FEEDER
Calvin A. Charbonneau, Gerald, Mo., assignor to Charbonneau Enterprises, Inc., Gerald, Mo.
Filed Mar. 6, 1996, Ser. No. 611,566
Int. Cl.[6] A01K *1/10*
U.S. Cl. 119—58 **18 Claims**



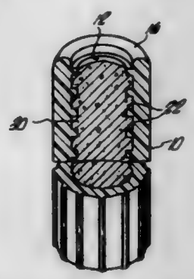
1. A livestock feeder comprising:
(a) a bottom bed frame including horizontally spaced members of substantially equal length extending from a first end to a second end and diagonally spaced members extending outwardly from each of the first and second ends to form a U-shaped configuration;
(b) a pair of side walls pivotally connected to the bottom bed frame;
(c) a pair of end walls extending upwardly from the bottom bed frame;
(d) front and rear wheels supporting the livestock feeder;
(e) a pair of guide members positioned between the side walls and the diagonally spaced members; and
(f) a flexible bed floor extending between the side walls and secured by the guide members.

5,595,141
ANIMAL SCRATCHING AND ENTERTAINMENT DEVICE
Steven D. Udelle; Laura L. Udelle, both of 13 Seasons Dr., and Jessica J. Udelle, 26414 Barranquilla, all of Punta Gordon, Fla. 33983
Filed Jun. 6, 1995, Ser. No. 469,214
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—706 **10 Claims**



1. An animal scratching and entertainment device comprising:
a) a vertical peripheral sidewall forming a base and having a lower surface and an upper surface forming a housing;
b) said upper surface supporting an elongated vertical member substantially off-center of said upper surface;
c) said vertical member having an upper end, said upper end supporting a horizontal member extending outwardly to the center of said upper surface;
d) said horizontal member employs a fastening means to its underside remote from said upper end of said vertical member; and
e) a rigid tether having an upper end is affixed to said fastening means of said horizontal member;
f) said rigid tether having an lower end supporting a suspended object; and
g) a shaft below said upper surface of said housing; and
h) means for rotating said shaft disposed within said housing; and
i) means for producing a magnetic field coupled to said shaft and disposed within said housing, wherein rotation of said shaft causes said means for producing a magnetic field to rotate within said housing, the magnetic field produced thereby influencing said suspended object to cause said suspended object to continuously move in an erratic manner above said upper surface of said housing.

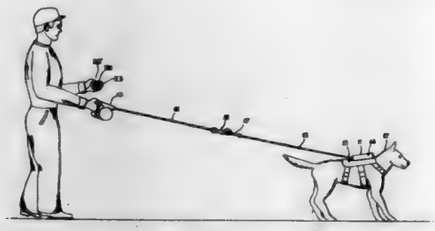
5,595,142
THERAPEUTIC ANIMAL TOY
Michael Chill, 575 Meridian Ter., Los Angeles, Calif. 90042
Filed Jul. 15, 1993, Ser. No. 92,221
Int. Cl.[6] A01K *15/00*
U.S. Cl. 119—710 **11 Claims**



1. A therapeutic animal toy containing food comprising:
a hollow elongate body open at both ends having an outer surface with ridges parallel to the longitudinal axis of said elongate body and an inner surface with circular ridges perpendicular to the longitudinal axis of said elongate body to effect a purchase on food held therein
said elongate body being made of a nylon resin material with a flexural modulus of about 410,000 psi at 73 degrees F.
said food being comprised of a paste-like canned pet food.

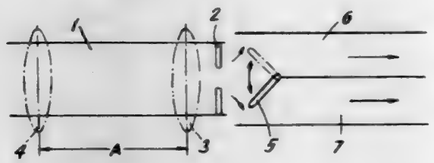
5,595,143
RETRACTABLE LEASH APPARATUS PROVIDING FOR DOUBLING THE RANGE AND RETRACTION SPEED OF SUCH APPARATUS WITHOUT TENSION INCREASE
Frank Alberti, P.O. Box 99155, Seattle, Wash. 98199
Filed Oct. 19, 1995, Ser. No. 545,566
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—794 **6 Claims**

1. A retractable leash apparatus for use by a user for restraining an animal, said leash apparatus comprising:
a pack,
first and second retractable leashes and
means for attaching said pack onto said animal,
said first retractable leash comprising a first spring powered reel, a first leash line carried on said first reel and having a first free end and a first hook attached to said first free end, said first reel creating a tension in said first leash capable of line,



said second retractable leash comprising a second spring powered reel, a second leash line carried on said second reel and having a second free end and a second hook attached to said second free end, said second reel creating a tension in said second leash line,
said first retractable leash being carried in said pack and said second retractable leash being held by said user with said first hook being connected to said second hook, whereby with said pack attached onto said animal said user can restrain said animal and the length and retraction speed of said leash apparatus are double the length and retraction speed of each of said first and second leashes with said tensions in said first and second leash lines being unchanged.

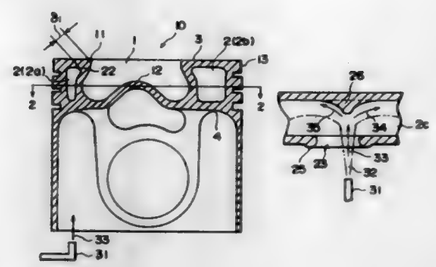
5,595,144
DEVICE FOR SORTING ANIMALS
Ulrich Löher, Oelde, Germany, assignor to Westfalia Separator Aktiengesellschaft, Oelde, Germany
PCT No. PCT/EP94/01915, § 371 Date May 11, 1995, § 102(e) Date May 11, 1995, PCT Pub. No. WO95/05735, PCT Pub. Date Mar. 2, 1995
PCT Filed Apr. 13, 1994, Ser. No. 436,259
Claims priority, application Germany, Aug. 26, 1993, 43 28 666.6
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—840 **6 Claims**



1. A device for sorting animals, comprising:
a first electronic sensor for scanning animals; at least one downstream gate swingable back and forth in accordance with indicators that identify the animals detected by the first sensor to provide alternating access to one of at least two exits, and an entrance upstream of the at least one swingable gate and opening and closing in response to animal-identification indicators detected by second sensor.

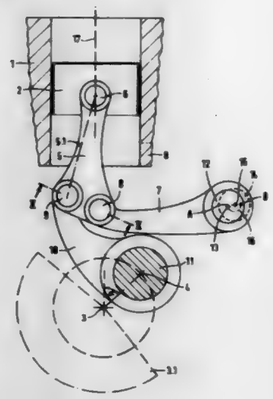
5,595,145
COOLING STRUCTURE OF DIESEL ENGINE PISTON
Godo Ozawa, Utsunomiya, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed May 31, 1995, Ser. No. 454,915
Int. Cl.[6] F01P *1/04*
U.S. Cl. 123—41.35 **20 Claims**

1. A diesel engine piston comprising:
a piston body having a longitudinal axis, a top face, and a generally cylindrical outer periphery, with a reentrant combustion chamber formed in said top face;



an annular cooling cavity formed in said piston body circumferentially around and outwardly of an outer periphery of said reentrant combustion chamber, said annular cooling cavity having a top, a bottom, and an inner annular wall surface extending between the top and the bottom of said cooling cavity;
a cooling liquid inlet passageway formed in said piston body whereby cooling liquid can be supplied through said cooling liquid inlet passageway to said annular cooling cavity; and
at least one cooling liquid outlet formed in said piston body whereby cooling liquid can be withdrawn from said annular cooling cavity through said at least one cooling liquid outlet;
wherein a top portion of said inner annular wall surface of said cooling cavity is located adjacent said top face and has a smaller diameter, in a plane perpendicular to said longitudinal axis, than a bottom portion of said inner annular wall surface.

5,595,146
COMBUSTION ENGINE HAVING A VARIABLE COMPRESSION RATIO
Christoph Bollig, Stolberg; Hans-Joerg Hermanns, Würselen; Torsten Schelhase, Herzogenrath, and Frank Widmann, Nürnberg, all of Germany, assignors to FEV Motorentechnik GmbH & Co. Kommanditgesellschaft, Aachen, Germany
Filed Jan. 24, 1995, Ser. No. 377,597
Claims priority, application Germany, Oct. 18, 1994, 44 37 132.2
Int. Cl.[6] F02B *75/04*
U.S. Cl. 123—48 B **16 Claims**



1. A combustion engine comprising:
an engine housing;
at least one cylinder disposed in the engine housing and having a cylinder axis;
a crank drive including:

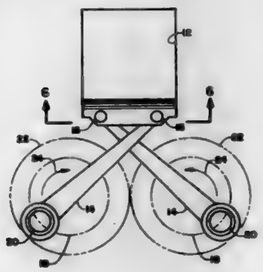
a crankshaft having a crankshaft axis and a crank and being disposed adjacent the cylinder;
a piston being axially displaceable within the cylinder;
a connecting rod including:
an upper connecting rod part hinged to the piston;
a lower connecting rod part hinged to the crank of the crankshaft, the lower connecting rod part further being hinged to the upper connecting rod part; and
a central joint for hinging the upper connecting rod part and the lower connecting rod part to one another, a longitudinal axis of the upper connecting rod part further being defined by a line connecting the central joint with a hinge joint of the upper connecting rod part to the piston;
a hinge point having a hinge point axis and being disposed on the engine housing;
a control arm hinged at one end thereof to the hinge point, and at another end thereof to the upper connecting rod part;
an additional joint for hinging the control arm and the upper connecting rod part to one another, the additional joint having an additional joint axis and being disposed adjacent the central joint at a distance from the longitudinal axis of the upper connecting rod part; and
a controllable adjusting device connected to the hinge point for changing a distance of the hinge point with respect to the cylinder axis in a direction transverse to the cylinder axis, the controllable adjusting device including:
a support element connected to the hinge point and having a changeable length for keeping the hinge point in various ones of predeterminable positions; and
an adjusting means connected to the support element and responsive to a torque resulting from inertial forces of the crank drive for changing a length of the support element for moving the hinge point into one of its predeterminable positions.

5,595,147

CONTRA-ROTATING TWIN CRANKSHAFT INTERNAL COMBUSTION ENGINE

James J. Feuling, 2521 Palma Pl., Ventura, Calif. 93003

Filed Dec. 15, 1995, Ser. No. 574,434
Int. Cl.[6] F02B *75/32*
U.S. Cl. 123—52.4 **11 Claims**



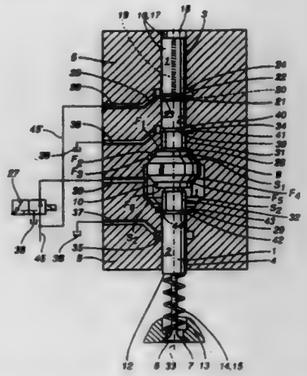
1. A contra-rotating twin crankshaft system for internal combustion engines which comprises:
two substantially parallel first and second crankshafts;
drive means for causing said crankshafts to rotate substantially identically in opposite directions;
at least one piston spaced from said crankshafts;
first and second, substantially parallel, wrist pins secured to each said piston;
first and second connecting rod means extending between said first and second crankshafts and said first and second wrist pins, respectively, with said connecting rod means in a crossed relationship.

5,595,148

HYDRAULIC VALVE CONTROL DEVICE

Ulrich Letsche, Stuttgart; Andreas Rehberger, Berglen, and Frank Iberle, Karlsruhe, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jan. 19, 1996, Ser. No. 588,768
Claims priority, application Germany, Jan. 19, 1995, 195 01 495.2
Int. Cl.[6] F01L *9/02*; **F16K** *31/363*
U.S. Cl. 123—90.12 **20 Claims**



19. Hydraulic valve assembly for internal combustion engine inlet and outlet openings, comprising:
a valve stem connected to a valve,
a first spring continuously pushing the valve stem toward a valve closing position,
a second spring periodically pushing the valve stem toward a valve opening position, and
a control piston connected to the valve stem and operable to be selectively hydraulically moved by working fluid toward respective valve opening and closing positions,
wherein the prestressing force of the second spring is controllable to assist valve opening movement of the control piston and operable such that, when the working fluid is relieved of pressure and the second spring is contracted, the first spring holds the valve stem in a valve closed position.

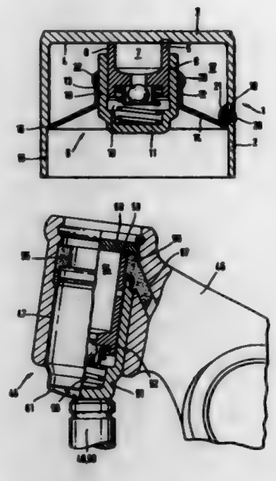
5,595,149

METHOD OF FIRST FILLING OF A HYDRAULIC VALVE ACTUATING DEVICE

Walter Speil, Ingolstadt, and Dieter Schmidt, Nürnberg, both of Germany, assignors to Ina Walzlager Schaeffler KG, Germany

Filed Jan. 22, 1996, Ser. No. 589,480
Claims priority, application Germany, Feb. 4, 1995, 195 03 699.9
Int. Cl.[6] F01L *1/245;31/00*
U.S. Cl. 123—90.55 **13 Claims**

1. A method of leakproof first filling of a hydraulic valve actuating tappet (1) with hydraulic oil, said tappet comprising a hollow cylindrical jacket (2) closed at one end by a disc-shaped bottom (3) which is contacted by a control cam, a hollow cylindrical guide sleeve (5) extending concentric with the jacket (2) from an undersurface (4) of the bottom (3) and enclosing a central oil reservoir (7) while an outer peripheral surface (8) of the guide sleeve (5) extends in a bore (9) of an axially displace-able pressure piston (10) comprising a bottom (11) oriented towards a gas exchange valve and an outer peripheral surface (12) surrounded by an axial extension (13) of an annular guiding element (14) which is affixed at an outer edge (15) to an inner peripheral surface (16) of the jacket (2) and extends radially inwards from said outer edge



(15) to delimit thereabove an annular oil reservoir (17) which can be filled with hydraulic oil through at least one supply bore (19) in the jacket (2),
a) comprising almost completely filling the central oil reservoir (7) together with a high pressure chamber (18) situated axially between the bottom (11) of the pressure piston (10) and the guide sleeve (5), and the annular oil reservoir (17), with hydraulic oil, and
b) filling at least the supply bore (19) leading to the annular oil reservoir (17), with a lubricating grease or a pasty material (20) which is flow-resistant at ambient temperature.

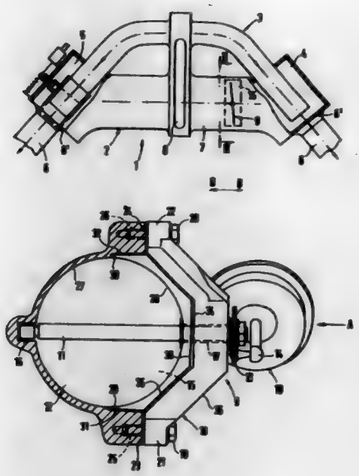
5,595,150

AIR INTAKE SYSTEM WITH A THROTTLE VALVE FOR A MULTI-CYLINDER INTERNAL-COMBUSTION ENGINE

Wolfgang Herlacher, Gerlingen, Germany, assignor to Dr. Ing h.c.F. Porsche AG, Weissach, Germany

Filed May 18, 1995, Ser. No. 444,102
Claims priority, application Germany, May 19, 1994, 44 17 472.1
Int. Cl.[6] F02B *27/02*
U.S. Cl. 123—184.36 **20 Claims**

1. An air intake system of a multi-cylinder internal-combustion engine with two opposite cylinder banks and with suction pipes connecting the cylinder banks to respective resonance containers, comprising:
at least one connection pipe communicating the respective resonance containers, said connection pipe having an insertion opening and a bearing bore;
a bearing support which is fastened to the connection pipe and which closes said insertion opening, said bearing support having a bearing bore, and
a swivellable throttle valve comprising a throttle disk and a bearing shaft;
wherein the throttle valve is inserted into the connection pipe through said insertion opening in the connection pipe;
and wherein the bearing shaft extends from said bearing bore in the connection pipe to said bearing bore in the bearing support, the bearing shaft being rotatably supported by each of said bearing bore in the connection pipe and said bearing bore in the bearing support.

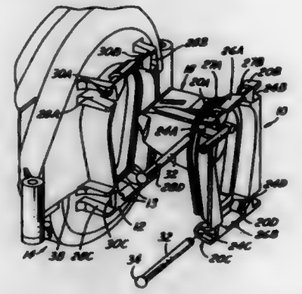


5,595,151

RELEASABLE CONNECTION FOR MOLDED PARTS

Jeffrey J. Powell, Windsor, Canada; Tony A. Price, Lake Orion, Mich., and Lisa Whaley, Wheatley, Canada, assignors to Siemens Electric Limited, Ontario, Canada

Filed Dec. 11, 1995, Ser. No. 570,225
Int. Cl.[6] F02M *35/10*
U.S. Cl. 123—184.61 **4 Claims**



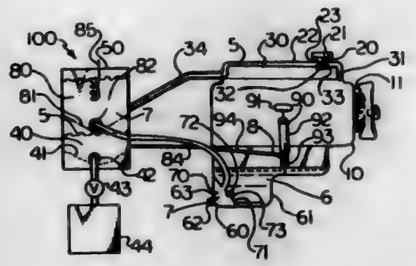
1. A releasable connection for attaching a cover over an opening in an intake manifold, said intake manifold molded from a composite plastic material, said connection including:
a flange molded into said intake manifold defining a cover mounting surface surrounding said opening;
said cover having a main wall and a series of parallel projections extending orthogonally from said main wall;
said flange cover mounting surface having a series of first open ended recesses molded thereinto spaced and configured to receive and be fit to a respective one of said projections upon advance of said cover main wall against said flange cover mounting surface;
each of said projections having a recess extending thereinto;
a series of sloping surfaces, each surface molded into said flange and located alongside a respective one of said flange recesses, each surface extending in from a side of said mounting flange and located to extend across a respective projection recess and partially overlap a projection recess at an end portion thereof to define sets of opposing but offset surfaces on said cover and said flange respectively; and,
an elongated key element inserted between and engaged by each of said aligned sets of opposing surfaces.

5,595,152

CLANDESTINE SAMPLING APPARATUS AND METHOD

Theodore W. Selby; Jerry G. Cox, both of Midland; Paul A. Bennett, St. Johns, and Rebecca S. Cox, Midland, all of Mich., assignors to The Saginaw Valley Institute of Materials, Inc., Midland, Mich.

Filed Aug. 8, 1995, Ser. No. 512,544
Int. Cl.[6] F01M 11/04
U.S. Cl. 123—196 R 15 Claims



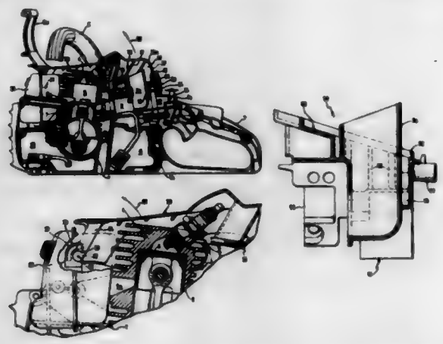
1. A clandestine engine oil sampling apparatus comprising an engine for a motor vehicle with the following components: an entry port in mimic of an oil entry port of the engine into which a sample of motor oil can be dispensed; an entry shunt in communication with the entry port in mimic of an oil entry port of the engine, through which entry shunt the sample of motor oil can travel upon entry through the entry port in mimic of an oil entry port of the engine and bypass lubricated moving parts in the engine; and an entry reservoir in communication with the entry shunt, in which the sample of motor oil can be stored upon travel through the entry shunt, and the sample of motor oil is separate from working and storage systems of the engine.

5,595,153

PORTABLE HANDHELD WORK APPARATUS HAVING A FILTER CASE

Klaus Höppner, Marbach; Karl Förderer, Schwaikheim; Georg Lohse, Waiblingen, and Klaus-Martin Uhl, Baltmannsweiler, all of Germany, assignors to Andreas Stihl, Waiblingen, Germany

Filed Feb. 13, 1995, Ser. No. 387,470
Claims priority, application Germany, Feb. 11, 1994, 44 04 465.8
Int. Cl.[6] F01P 1/02
U.S. Cl. 123—198 E 14 Claims



1. A portable handheld apparatus such as a motor-driven chain saw, cutoff machine or the like, the apparatus having a work tool and comprising:

a housing having an opening through which ambient air flows into the housing;

an internal combustion engine for driving said work tool;

said engine being mounted in said housing and having an air-intake channel;

said housing including a filter case arranged therein;

an air filter mounted in said filter case and partitioning said filter case into a first compartment communicating with said opening for receiving said ambient air and a clean compartment for receiving air for combustion through said air filter from said first compartment;

said air-intake channel being arranged in said housing so as to communicate with said clean compartment for receiving filtered air for combustion in said engine;

said housing having a hood covering said filter case; and,

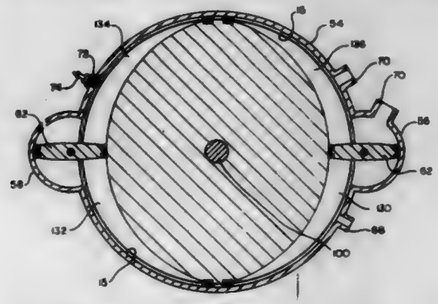
pivot bearing means for pivotally connecting said hood to said housing.

5,595,154

ROTARY ENGINE

William A. Smith, Rte. 1, Box 213, Kinston, N.C. 28501

Filed Feb. 13, 1995, Ser. No. 387,602
Int. Cl.[6] F02B 53/00
U.S. Cl. 123—222 9 Claims



1. A rotary engine comprising:

a) an outer housing;

b) a rotary piston rotatively mounted within the housing and including an outer surrounding edge having a pair of depressions formed in the surrounding edge and wherein there is formed a chamber area between the respective depressions and the housing as the rotary piston rotates within the housing;

c) the outer housing including a pair of circumferentially spaced dome-shaped valve housings integrally formed therewith, with each dome-shaped valve housing being open to the rotary piston;

d) a rotary valve rotatively mounted in each dome-shaped valve housing with the rotary valve being rotatively mounted about an axis parallel with the axis of the rotary piston;

e) wherein one rotary valve constitutes an exhaust/intake valve while the other rotary valve constitutes a compression/combustion valve;

f) at least one sealing ring extending around each depression formed in the rotary piston with the sealing ring of each depression sealing against the outer housing during a substantial portion of each revolution of the rotary piston;

g) at least one sealing ring extending around each rotary valve for sealing with a respective dome-shaped valve structure as well as the sealing rings associated with each depression of the rotary piston and

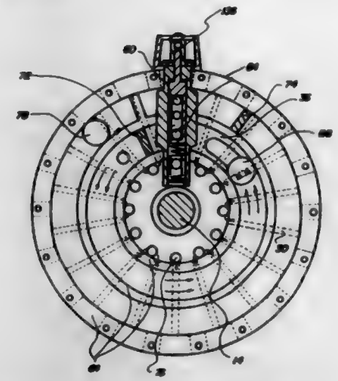
h) drive means interconnecting the rotary piston with the rotary valve for continuously driving the rotary valve in response to the rotation of the rotary piston such that the rotary valve is continuously driven as the rotary piston rotates within the outer housing.

5,595,155

ROTARY INTERNAL COMBUSTION ENGINE

Poeut Poch, 1044 Olive Ave.; Vorng Pouv, 1134 Gardenia Ave.; Tan Vannak, 1712 Gardenia Ave., all of Long Beach, Calif. 90813, and Chhim Bophan, 651 Canterbury Cir., Corona, Calif. 91719

Filed Feb. 8, 1995, Ser. No. 385,592
Int. Cl.[6] F02B 53/00
U.S. Cl. 123—240 7 Claims



1. A rotary internal combustion engine for delivering rotational torquing power for subsequent use comprising, in combination:

a rotatable blade driver mechanism including a cylindrical shaft, a dual cam coupled about the shaft, and a pair of generally annular blade drivers coupled to the shaft on each side of the dual cam, each blade driver having an inboard surface, an outboard surface, a circular inner extent, and an annular outer extent planarly outwardly offset from the inner extent and with the outer extent further including an inboard blade slot disposed therethrough, an outboard blade slot disposed therethrough and angularly offset from the inboard blade slot, and a plurality of elongated tubular circumferentially positioned air vent holes formed radially therethrough between an inner edge extent and an outer edge extent thereof, each blade driver further having an elongated compression blade slidably disposed within the outboard blade slot and an elongated combustion blade slidably disposed within the inboard blade slot, each blade driver additionally having a hollow complimentary compression balancing casing coupled to the inboard surface with an elongated compression blade balancing mass slidably disposed therein and a hollow complimentary combustion balancing casing coupled to the inboard surface with an elongated combustion blade balancing mass slidably disposed therein and with the compression blade balancing mass of one of the blade drivers positioned in general axial alignment with the compression blade of the other blade driver and with the combustion blade balancing mass of one of the blade drivers positioned in general axial alignment with the combustion blade of the other blade driver;

a generally tubular casing generally encompassing the blade driver mechanism such that the shaft is projected outwards therefrom, the casing including a pair of outer casing sections with a mid-casing section therebetween, each outer casing section including a tubular bearing housing disposed about the shaft of the driver mechanism for allowing its axial rotation, an annular face plate coupled to and extended radially outwards from the bearing housing and with the face plate having an inboard surface, an outboard surface, and three integral concentric side walls projected inwards from the inboard surface thereof to create an annular inner air chamber, an annular outer compression chamber, and an annular intermediate combustion chamber therebetween, each outer casing section further including a combustion chamber blocker extended radially across the combustion chamber and secured between the adjacent side walls, a compression chamber blocker extended radially across the compression chamber and secured between the adjacent side walls, a plurality of circularly positioned air vent holes disposed through the face plate and placed in communication with the inner air chamber, an air inlet port disposed through the face plate and placed in communication with the compression chamber on one side of the compression chamber blocker, a compressed air outlet port disposed through the face plate and placed in communication with the compression chamber on another side of the compression chamber blocker, a spark plug port disposed through the face plate and placed in communication with the combustion chamber on one side of the combustion chamber blocker, an air-fuel intake port disposed through the face plate and placed in communication with the combustion chamber between the spark plug port and the combustion chamber blocker, and an exhaust port disposed through the face plate and placed in communication with the combustion chamber on another side of the combustion chamber blocker, each outer casing section positioned in facing contact with the outer extent of the outboard surface of one of the blade drivers to thereby seal the respective inner air chamber, combustion chamber, and compression chamber and place the corresponding compression blade into the compression chamber and the corresponding combustion blade into the combustion chamber and with the positioning of the outer casing sections in association with the mid-casing section creating a central oil sump, the mid-casing section having a generally tubular outer extent and an annular blade guide assembly extended radially inwards and with the blade guide assembly having an upper portion with a pair of push rod bores disposed therethrough and an outer radial pair and an inner radial pair of annular blade guides extended therefrom and with the outer pair of blade guides slidably secured to the compression blades of the blade drivers and the compression blade balancing masses of the other blade driver for controlling extension of compression blades when being revolved within the compression chambers and with the inner pair of blade guides slidably secured to the combustion blades of the blade drivers and the combustion blade balancing masses of the other blade driver for controlling extension of the combustion blades when being revolved within the combustion chambers; and

a rocker arm mechanism secured to an upper extent of the casing, the rocker arm mechanism including a pair of hollow valve housings with each valve housing secured to the outboard surface of each face plate of the casing and further placed in communication with the corresponding compressed air output port and the corresponding air-fuel intake input port, each valve housing further including a fuel inlet disposed thereon and a spring-loaded valve slidably disposed therein and with each valve having a head portion and a body portion with a fuel atomizer tip secured thereto and with the body portion positionable for allowing selective communication between the air-fuel intake port, the compressed air output port, and the fuel inlet port and further allowing alignment of the fuel atomizer with the fuel inlet, the rocker arm mechanism further including a pair of elongated push rods separately slidably disposed within the push rod bores of the casing and positioned in contact with the dual cam, the rocker arm mechanism additionally including a pair of rockers coupled to the upper extent of the casing and with each rocker having an arm extended between and in contact with the head portion of one of the valves and an upper end of one of the push rods and with rotation of the dual cam selectively actuating the rockers for allowing the associated ports to be opened and closed by the valve.

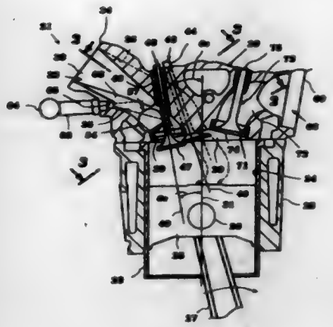
5,595,156

INDUCTION CONTROL SYSTEM FOR MULTI-VALVE ENGINE

Hiroyuki Tsuzuku, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 19, 1995, Ser. No. 504,256
Claims priority, application Japan, Jul. 20, 1994, 6-168116
Int. Cl.[6] F02B 31/00
U.S. Cl. 123—306 27 Claims

1. An internal combustion engine having a cylinder block defining a cylinder bore, a piston reciprocating in said cylinder bore, a cylinder head closing said cylinder bore and forming at least in



part a combustion chamber with said cylinder bore and said piston, a first intake passage extending through said cylinder head and terminating in a first valve seat, a second intake passage extending through said cylinder head and terminating in a second valve seat, said first intake passage being disposed to create a first flow pattern in said combustion chamber, said second intake passage and said second valve seat being disposed to provide a second flow pattern different from said first flow pattern in said combustion chamber, and means for selectively disabling the flow through one of said valve seats under certain engine running conditions for controlling the flow pattern in said combustion chamber.

5,595,157

AIR GUIDING DEVICE

Seak H. Siew, 39 Jalan Tiasah 7, Taman Sri Puteri, Johor 81300 Skudai, Malaysia, and Roger C. T. Chen, Block #12, #04-218 Teck Whye Lane, Singapore 2368, Singapore

PCT No. PCT/GB94/00236, § 371 Date Aug. 11, 1995, § 102(e) Date Aug. 11, 1995, PCT Pub. No. WO94/18448, PCT Pub. Date Aug. 18, 1994

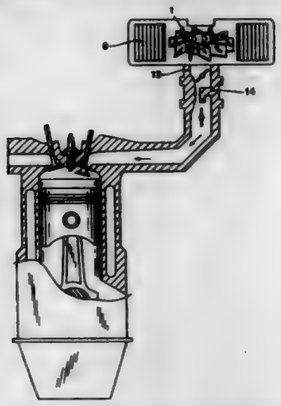
PCT Filed Feb. 8, 1994, Ser. No. 585,176

Claims priority, application Malaysia, Feb. 13, 1993, UI9300243; United Kingdom, Jul. 6, 1993, 9313949

Int. Cl.[6] F02M *29/06;29/04*

U.S. Cl. 123—306 20 Claims

1. An air guiding device for producing a vortical and turbulent



air flow in an inlet manifold, which device comprises: a hub portion having a periphery; a plurality of vanes carried by the hub portion and extending outwardly from the periphery of the hub portion; for deflecting an air flow impinging on the device in a first direction to create a first vortical and turbulent air flow; a series of openings defined between the edges of adjacent vanes at the periphery of the hub portion, and a tab associated with at least one of the vanes located on the radially innermost edge of a vane within one of the openings at an angle to the vane for deflecting the air flow in a second direction to create a second vortical and turbulent air flow at low air flow rates at which the vanes would not create a substantial first vortical and turbulent air flow, the arrangement being such that the air flow impinging on the device is deflected into a vortical and turbulent air flow by the vanes and at least one associated tab.

5,595,158

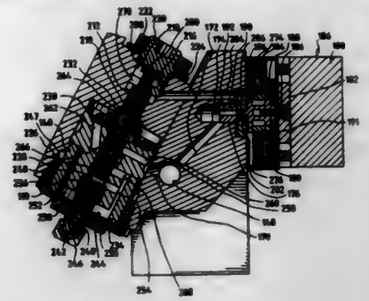
DYNAMIC POSITIONING DEVICE FOR AN ENGINE BRAKE CONTROL

James J. Faletti, Spring Valley; Dennis D. Feucht, and Scott G. Sinn, both of Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Division of Ser. No. 468,937, Jun. 6, 1995, Pat. No. 5,540,201, which is a continuation of Ser. No. 282,573, Jul. 29, 1994, abandoned. This application Oct. 30, 1995, Ser. No. 549,895

Int. Cl.[6] F02D *13/04;* F01L *13/06*

U.S. Cl. 123—321 18 Claims



1. A device for use in an engine brake control to move an exhaust valve to an open position, comprising:

an actuator engageable with the exhaust valve wherein the actuator includes a valve spool and a slave piston wherein the slave piston includes a passage and wherein the valve spool includes a high pressure annulus coupled to a source of high fluid pressure and a low pressure annulus coupled to a source of low fluid pressure and is movable relative to the slave piston to interconnect the passage with the high pressure annulus or the low pressure annulus; and

an electrically-operable control valve for selectively providing high fluid pressure to the valve spool and to the slave piston to cause the slave piston to oscillate about a point at which the exhaust valve is disposed in the open position and the passage is alternately connected to the low pressure annulus and the high pressure annulus.

5,595,159

METHOD AND ARRANGEMENT FOR CONTROLLING THE POWER OF AN INTERNAL COMBUSTION ENGINE

Werner Huber, Schwaikheim, and Martin Streib, Vaihingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

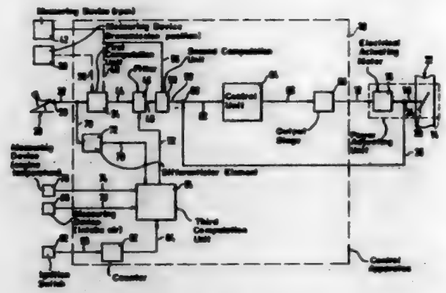
Filed Jan. 25, 1995, Ser. No. 378,820

Claims priority, application Germany, Feb. 15, 1994, 44 04 668.5

Int. Cl.[6] F02D *41/06*

U.S. Cl. 123—362 8 Claims

1. A method of controlling the power of an internal combustion engine of a vehicle equipped with an electrically adjustable power adjusting element which influences the air supplied to the engine in dependence upon a command of the driver, the method comprising the steps of:



detecting at least one operating variable in operating states in which an increased emission of toxic substances can be expected during a transient operating phase; and,

limiting the rate of change of adjusting said power adjusting element in dependence upon said at least one operating variable which includes at least one of the following: temperature of the engine, temperature of the inducted air and the time elapsed since the engine was started.

5,595,160

FUEL SUPPLY SYSTEM AND DELIVERY PIPE FOR USE IN SAME

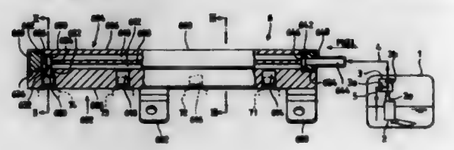
Tatsuya Matsumoto, Kariya; Kazuhiro Shimomiya, Aichi-ken; Masaaki Tanaka, Tsu, and Mikio Torii, Hekinan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

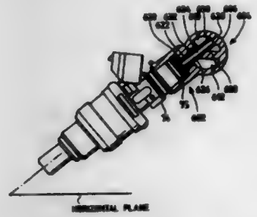
Filed Apr. 13, 1995, Ser. No. 422,523

Claims priority, application Japan, Apr. 13, 1994, 6-074736

Int. Cl.[6] F02M *55/02;37/04*

U.S. Cl. 123—456 17 Claims





1. A fuel supply system for supplying pressurized fuel to an internal combustion engine, comprising:

a chamber member defining a gas-liquid separation chamber having an first portion and a second portion, said separation chamber being constructed and arranged to accept pressurized fuel and to separate liquid components and gas components contained in the pressurized fuel;

fuel outlet means, communicating with the second portion of said gas-liquid separation chamber, for supplying the fuel to said engine; and

a passage member having a passage formed therein, said member being disposed within both the first portion and the second portion and operatively connected to said fuel outlet means such that the passage communicates with said fuel outlet means, said passage member also having a first opening establishing communication between said passage and said first portion, and a second opening establishing communication between said passage and said second portion, said passage member being constructed and arranged to supply the fuel within said first portion through the first opening, into the passage, and into said fuel outlet means, and to supply the fuel within said second portion through the second opening, into the passage, and into said fuel outlet means.

5,595,161

DEVICE FOR CONTROLLING THE FUEL INJECTION IN AN INTERNAL COMBUSTION ENGINE

Karl Ott, Markgroeningen; Klaus Walter, Bietigheim-Bissingen, both of Germany, and Joachim Straze, Seoul, Rep. of Korea, assignors to Robert Bosch GmbH, Stuttgart, Germany

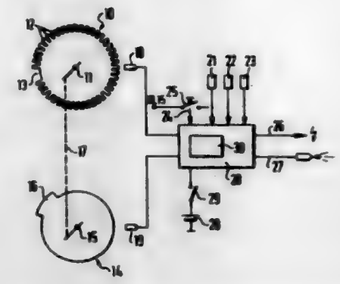
PCT No. PCT/DE94/00000, § 371 Date Jul. 28, 1995, § 102(e) Date Jul. 28, 1995, PCT Pub. No. WO94/18444, PCT Pub. Date Aug. 18, 1994

PCT Filed Jan. 29, 1994, Ser. No. 505,275

Claims priority, application Germany, Dec. 2, 1993, 43 04 163.9

Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—491 8 Claims



1. A device for controlling a fuel injection in an internal combustion engine, comprising means for determining an angle position of at least one of a crankshaft and a camshaft; and a control device including means for evaluating the determined angle position up to a stationary state during a running-on phase after an ignition of an internal combustion engine is switched off, means for storing the evaluated position in the stationary state, means using the stored position directly after the internal combustion engine is switched on so as to form control signals for a first injection into an inlet valve at least as the internal combustion engine starts to turn, said means for using triggering further injections into inlet valves of other cylinders after a start of turning, but still before synchronization has taken place, and means for providing a transition to a customary cylinder-specific injection after the synchronization.

5,595,162

START UP FUEL CONTROL DEVICE FOR AN ENGINE

Akira Iwai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 27, 1995, Ser. No. 579,491

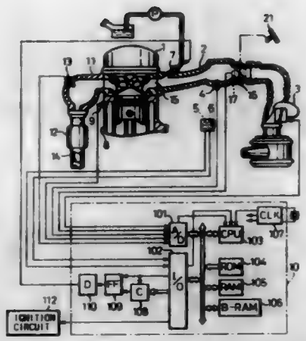
Claims priority, application Japan, Dec. 28, 1994, 6-327746

Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—491 15 Claims

1. A start up fuel control device, for an internal combustion engine having cylinders, comprising:

start up determining means for determining whether the engine has started;



residual fuel amount calculating means for calculating a residual fuel amount parameter relating to the amount of fuel remaining in the cylinders of the engine during a start up operation of the engine;

memory means for memorizing the latest value of said residual fuel amount parameter from the beginning of the start up operation of the engine until the start up determining means determines that the engine has started, regardless of whether a main switch of the engine is turned on or turned off;

scavenging means for initiating a scavenging operation of the engine in which a fuel supply amount to the engine is reduced when the value of said residual fuel amount parameter memorized in the memory means becomes larger than a predetermined first value;

a scavenged fuel amount calculating means for calculating a scavenged fuel amount parameter relating to the amount of fuel expelled from the cylinders since the scavenging operation of the engine started; and

restoring means for increasing the fuel supply amount to the engine when the value of said scavenged fuel amount parameter becomes larger than a predetermined second value until the fuel supply amount reaches a fuel supply amount before the scavenging operation started.

5,595,163

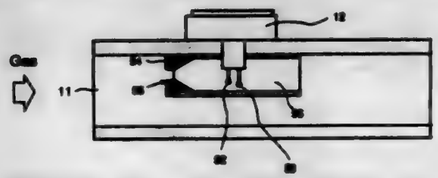
APPARATUS AND METHOD FOR CONTROLLING THE FUEL SUPPLY OF A GAS-FUELED ENGINE

Toshiharu Negi, Novi; Robert L. Bruetsch, Whitmore Lake, and George Saikalis, West Bloomfield, all of Mich., assignors to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Jun. 6, 1995, Ser. No. 467,817

Int. Cl.[6] F02M *51/00;21/04;* G01F *1/68*

U.S. Cl. 123—494 **22 Claims**



1. A premixture apparatus for operating a gaseous fuel internal combustion engine having a fuel supply means and an air intake means, said apparatus comprising:

air flow sensing means disposed in said air intake means for detecting the mass flow rate of air delivered through said air intake means;

gas flow sensing means for detecting the mass flow rate of gaseous fuel to be supplied to said internal combustion engine, wherein said gas flow sensing means is located in a longitudinal housing having a lumen defined by said housing, said housing further comprising a nozzle on one end thereof constricting said lumen;

gas valve means responsive to said gas flow sensing means and having at least one outlet disposed in said air intake means downstream of said air flow sensing means, for selectively controlling the mass flow rate of gaseous fuel supplied to said internal combustion engine;

throttle means, having a movable plate disposed in said air intake means downstream of the outlet of said gas valve means, for varying the quantity of air and fuel flow through said air intake means; and control means for controlling the operation of said gas valve, said control means being responsive to at least said air flow sensing means and said gas flow sensing means.

5,595,164

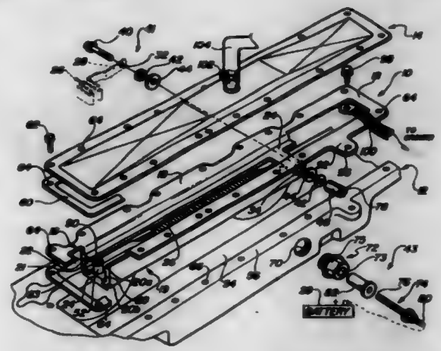
LOW PROFILE INTAKE MANIFOLD HEATER

Jan P. Thiamnesch, Eden Prairie, Minn., assignor to Phillips & Temro Industries Inc., Eden Prairie, Minn.

Filed Jun. 22, 1995, Ser. No. 493,486

Int. Cl.[6] F02M *31/00*

U.S. Cl. 123—549 **23 Claims**



1. A heating device for use in an internal combustion engine comprising:

a frame including connecting means for attaching said frame to an engine and a recessed body portion having an aperture;

an electric heating element coupled to said frame;

a terminal assembly connected to said heating element for conducting an electric current thereto, said terminal assembly passing through said aperture in said recessed body portion, said terminal assembly including a first portion connected to said heating element and a second portion removably engageable with said first portion, said second portion being disposable through an opening in the engine for engagement with the first portion of the terminal assembly; and

grounding means electrically connected to said heating element.

5,595,165

SINGLE-SHOT RUBBERBAND GUN AND SNAP-TOY

Agostino B. Conte, 2900 Wilkinson Ave., Bronx, N.Y. 10461

Filed Dec. 2, 1994, Ser. No. 349,076

Int. Cl.[6] F41B *7/02;7/08;* A63H *5/04*

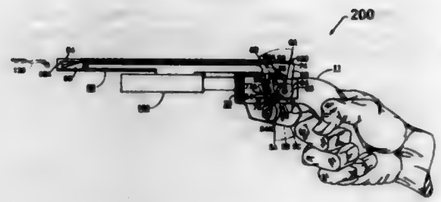
U.S. Cl. 124—18 **13 Claims**

1. A simulated hand held firearm for deployment of an elastic loop band, comprising:

(a) a frame including a body, a handle, and an elongated barrel;

(b) means at the barrel front to receive an elastic band;

(c) a sear member pivotally mounted in said body at the barrel rear for pivotal movement in a plane parallel to the barrel, said sear member comprising a central hub with a hole to



receive a pivot pin, and a notch in its periphery, and a generally upwardly extending arm to receive the elastic band thereover;

(d) a trigger member pivotally mounted in said body adjacent to said sear member for pivotal movement in the plane parallel to the barrel, said trigger member comprising a central hub with a hole to receive a pivot pin, a generally upwardly extending leg which engages a stop to limit rotation of the trigger member, a generally upwardly diagonal leg which engages the notch of the sear member to lock the sear member from rotation, and a generally downwardly extending leg for actuation by the user's finger, the trigger being biased to pivot so that the diagonal leg engages the notch until the downward leg is actuated by a user;

(e) cocking means operable to pivot the sear member rearward until the upwardly extending arm is in an elastic band holding position and the diagonal leg of the trigger is aligned with the notch of the sear member, causing them to interlock, whereby actuation of said trigger by the user causes said diagonal leg and notch to disengage, allowing the sear to pivot forward to a release position to release the elastic band.

7. A simulated hand held firearm for mimicking the mechanical operations and sounds of a conventional hand held firearm, comprising:

(a) a frame comprising a body, a handle, and an elongated barrel;

(b) a sear member pivotally mounted in said body at the barrel rear for pivotal movement in a plane parallel to the barrel, said sear member comprising a central hub with a hole to receive a pivot pin, and a notch in its periphery, and a generally upwardly extending arm;

(c) means to bias said sear member so that said upwardly extending arm pivots forward;

(d) a stop means mounted in said body to stop forward pivoting of said upwardly extending arm, said stop means being of a rigid material so as to create an audible sound when said upwardly extending arm forcefully contacts it under bias of said biasing means;

(e) a trigger member pivotally mounted in said body adjacent to said sear member for pivotal movement in the plane parallel to the barrel, said trigger member comprising a central hub with a hole to receive a pivot pin, a generally upwardly extending leg which engages a stop to limit rotation of the trigger member, a generally upwardly diagonal leg which engages the notch of the sear member to lock the sear member from rotation, and a generally downwardly extending leg for actuation by the user's finger, the trigger being biased to pivot so that the diagonal leg engages the notch until the downward leg is actuated by a user;

(f) cocking means operable to pivot the sear member rearward until the upwardly extending arm is in a rear position out of contact with said stop means and the diagonal leg of the trigger member is aligned with the notch of the sear member, causing them to interlock, whereby actuation of said trigger by the user causes said diagonal leg and notch to disengage, allowing the sear to pivot forward to contact said stop means to create a sound which simulates a real firearm.

5,595,166

DOUBLE BARREL SPEARGUN

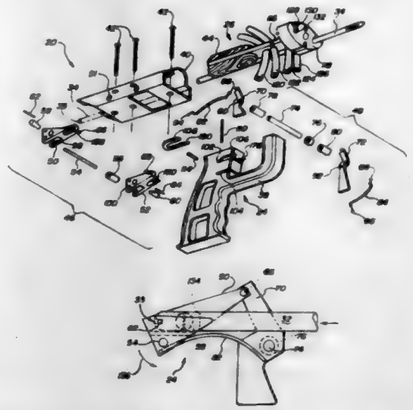
John W. Schmidt, III, Palm Harbor, and Morgan R. Grieslinger, St. Petersburg, both of Fla., assignors to E. Douglas Hougen, Flint, Mich.

Division of Ser. No. 961,741, Oct. 19, 1992, Pat. No. 5,372,118.

This application Oct. 24, 1994, Ser. No. 327,562

Int. Cl.[6] F41B *7/04*

U.S. Cl. 124—22 **19 Claims**



8. A speargun breach assembly having an opening adapted to receive a spear shaft, said breach assembly comprising:

a pivotally mounted trigger;

a pivotally mounted latch mounted adjacent said trigger; said latch being adapted to pivot between a cocked position wherein said latch retains said spear shaft within said breach and a firing position wherein said latch is disengaged from said spear shaft, said trigger and said latch being operatively connected such that said trigger controls the pivotal movement of said latch between said cocked position and said firing position;

a spear shaft cradle having a generally semi-circular cross section adapted to closely receive said spear shaft, said cradle being mounted to said latch such that said spear and said cradle interact to restrict twisting movement of said latch and facilitate the accuracy of said spear gun.

5,595,167

SECURE ARCHERY WRIST STRAP

John W. Scott, 587 Adams Ridge Rd., Clay City, Ky. 40312

Filed Jun. 7, 1995, Ser. No. 486,696

Int. Cl.[6] F41B *5/18*

U.S. Cl. 124—35.2 **15 Claims**

1. An archery release wrist strap comprising:

a strap having two branches of flexible material joined into a "V" shape at the proximal ends of said branches with an angle between said two branches of said strap, each said branch having an inner and an outer surface;

a first ring of rigid material, said first ring including an aperture for attaching said first ring to said strap;

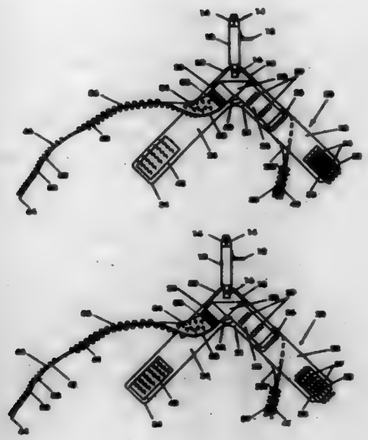
a first flexible web of material looped through said first ring and attached to said strap on a first of said branches;

a second ring attached to said strap on said first said branch;

a region on a distal end of said first said branch and on both surfaces thereof covered with a loop portion of a hook and loop fastening material;

said first ring further attached to said strap on said second of said branches;

a second elongated web having a first surface and a second surface, said first surface having a plurality of loops of a hook



and loop fastener material on a first region on said second web and a plurality of hooks of a hook and loop fastener material on a second region on said first surface of said second web, said second elongated web further supporting on said second surface a plurality of hooks of said hook and loop fastener material,

distal ends of said strap branches supporting hooks and loops of a hook and loop fastener, said distal end of said first branch further provided with loops on said inner surface;

whereby said plurality of loops disposed on said inner surface of said first branch may be engaged with said hooks disposed on said second branch,

said strap and said hooks on said second elongated web may be disposed over and engaged with said loops on said outer surface of said first branch of said strap and said second elongated web further disposed extending through said second ring and disposed over a portion of said loops on said first surface of said second elongated web and engaged therewith, thereby reinforcing the fastening forces of said hook and loop fastening material between said branches of said wrist strap.

13. An archery bowstring release assembly comprising:

a release mechanism including a release trigger and bowstring release jaws;

an attaching member coupled with said release mechanism and further attached to a wrist strap;

said wrist strap comprising a pair of branches each terminating in a distal end;

said branches and distal ends conformable to an archer's wrist and overlappable to close and attach said wrist strap to form a wrist loop;

a ring attached to said wrist strap on one of said branches;

one of said branches supporting a first region of material of a hook and loop fastener on the outer surface of the distal end thereof, wherein said first region is exposed when said branches are overlapped to form said wrist loop;

a web attached to said wrist strap on the other of said branches and extending therefrom a length to wrap around the user's wrist passing through said ring and folded back and attached to said web,

said web supporting a second region of material of a hook and loop fastener complimentary to said first region engaged with and fastened to said first region,

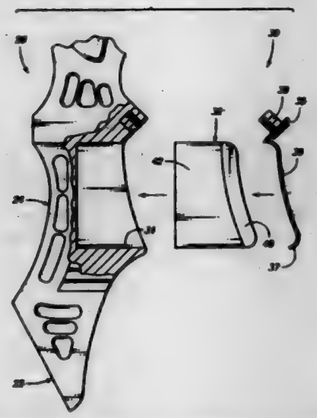
whereby the attachment of the two said distal ends is reinforced and prevented from becoming detached during use by being overlayed by said web.

5,595,168

DAMPING APPARATUS FOR AN ARCHERY BOW, HANDLE RISER FOR AN ARCHERY BOW, AND METHOD OF FABRICATING A HANDLE RISER FOR AN ARCHERY BOW

Terry G. Martin, Walla Walla, Wash., assignor to Martin Archery Inc., Walla Walla, Wash.

Filed Nov. 18, 1994, Ser. No. 337,855
Int. Cl.[6] F41B *5/20*
U.S. Cl. 124—89 13 Claims



12. A method of fabricating a handle riser for an archery bow comprising the following steps:

providing a handle riser for an archery bow having at least one slot therein;

introducing a gelling substance into the at least one slot of the handle riser;

curing the gelling substance within the at least one slot to semi-solidify and securably maintain the gelling substance within the at least one slot, the semi-solidified gelling substance damping vibrations imparted to the handle riser when launching an arrow.

13. A damping apparatus for an archery bow comprising:

a homogenous semi-solid damping mass configured to absorb vibrations imparted to the archery bow when launching an arrow; and

an attachment device configured to retain the semi-solid mass at least partially within a portion of the archery bow.

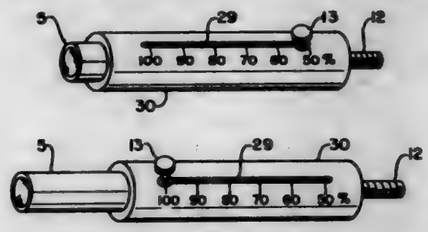
5,595,169

HYDRAULIC STABILIZER FOR BOW

Franklin C. Brown, Jr., P.O. Box 9219, Akron, Ohio 44305

Filed Dec. 23, 1994, Ser. No. 362,943
Int. Cl.[6] F41B *5/20*
U.S. Cl. 124—89 17 Claims

1. A device for stabilizing an archery bow, said bow comprising



a central body portion with opposite limbs connected by a bow string, said stabilizing device comprising:

a hollow elongated housing with a first end with means to attach said housing to the bow, and a second open end;

a sealed capsule with hydraulic motion absorbing means therein, said capsule having an elongated body with a first and a second end, said capsule being of a size to be received within said hollow elongated housing and axially slidable therein with said first end of said capsule closer to said bow than said second end; and

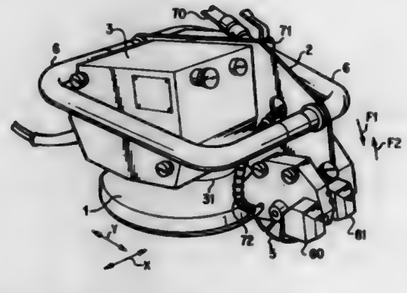
fastening means functioning to releasably secure said capsule in one of numerous fixed positions relative to said housing thereby adjusting the distance of said capsule from said archery bow.

5,595,170

PORTABLE MACHINES FOR PERFORMING CUTS IN STONE, MARBLE GRANITE AND THE LIKE

Quintilio Lupi, Via Flaminia, 138, Rignano Flaminio, Italy

PCT No. PCT/IT93/00055, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO93/24291, PCT Pub. Date Dec. 9, 1993
PCT Filed May 28, 1993, Ser. No. 343,533
Claims priority, application Italy, May 29, 1992, RM92A0405
Int. Cl.[6] B28D *1/02*
U.S. Cl. 125—12 13 Claims



1. A portable machine for cutting stone, marble and granite, comprising:

a supporting member arranged for movement over a surface of a stone to be cut;

a connecting block rotatably connected to said supporting member about a first axis of rotation which is generally perpendicular to said surface of the stone;

a plurality of rolling-ball bearings arranged on said supporting member to engage said surface of the stone;

a frame connected to the connecting block, said frame being rotatable along with said connecting block with respect to said supporting member, said frame supporting a motor and a transmission;

a cutting tool connected to the frame, said cutting tool being rotatable along with said frame and said connecting block with respect to said supporting member; and

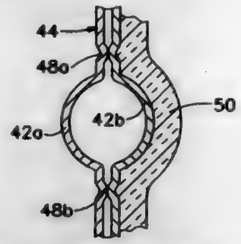
a handle operatively connected to the frame to guide the cutting tool along a rectilinear or curvilinear path on said surface of the stone, said handle being rotatable along with said frame, said connecting block, and said cutting tool with respect to said supporting member.

5,595,171

APPARATUS FOR HEATING CONCRETE

Colin Makin, 323 Woodhaven Place, S.W., Calgary, Alberta, Canada

Filed Nov. 29, 1993, Ser. No. 158,645
Int. Cl.[6] F23L *9/00*
U.S. Cl. 126—271.1 3 Claims



1. An apparatus to aid in the curing of concrete, comprising:

(a) a heat transfer apparatus;

(b) a liquid capable of transferring heat;

(c) a metal concrete form panel having a working front side against which is formed uncured concrete and a back side opposite of said working front side, said form panel also having a plurality of strengthening ribs extending from said back side;

(d) an air and liquid impermeable conduit being of a construction to receive said liquid after said liquid has been passed through said heat transfer apparatus, said conduit being placed in thermal contact with said back side of said concrete forming panel to allow transfer of heat by conduction between said liquid and said uncured concrete to aid in the curing of said concrete; and

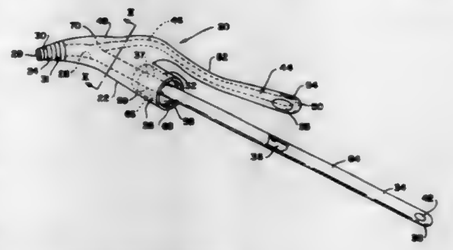
(e) insulation operably connected to said conduit, said insulation being capable of reducing heat transfer from said liquid other than between said liquid and said concrete.

5,595,172

SUCTION STYLET FOR USE WITH AN ENDOTRACHEAL TUBE

John L. Reese, 2416 W. Bayshore Rd., Gulf Breeze, Fla. 32561

Filed Aug. 12, 1994, Ser. No. 289,287
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—200.26 27 Claims



1. A suction styler, comprising:

a main body having a first end, a second end and an internal passageway extending in a direction between said first and second ends, said main body comprising a suction fitting with an opening that opens into the internal passageway and is adapted for connection with a suction source, and said main body further comprising a connector member which is adapted for connection with an endotracheal tube;

a suction stylet extension extending off of said main body and adapted for insertion into an endotracheal tube, said suction stylet extension having an internal conduit which opens out at

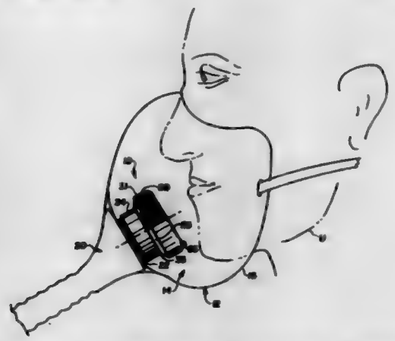
a free end of said suction styler extension and, at an opposite end of said suction stylet extension, is in fluid communication with the internal passageway in said main body;

a vent arm extending off from said main body, said vent arm having a first end connected with said main body and a second end spaced from said first end, said vent arm further including a vent passageway which extends in a direction between said first and second ends of said vent arm and opens into the internal passageway of said main body, and said vent arm further including a vent port which opens into said vent passageway.

5,595,173
REHUMIDIFICATION FILTER FOR VENTILATION MASK

Nevin W. Dodd, Jr., 122 Oaks Dr., Columbus, Miss. 39701

Filed Jun. 29, 1995, Ser. No. 496,672
Int. Cl.[6] A62B *7/14*
U.S. Cl. 128—201.13 **4 Claims**



1. A disposable rehumidification filter device for attachment to an annular projection within a flight ventilation mask, the device comprising:

a cylindrical container enclosed at one end by a screen and having an annular ridge at an opposite end thereof, said annular ridge terminating at an edge defining an opening, said container including an annular securing mechanism extending outwardly from said edge, an annular projection within the flight ventilation mask, said securing mechanism including attachment means for replaceably engaging said annular projection; and

a coil of wicking sheet material filling said cylindrical container.

5,595,174
NASAL ADAPTOR, MASK, AND METHOD

Max R. Gwaltney, 1911 NW. 119 Ave., Pembroke Pines, Fla. 33026

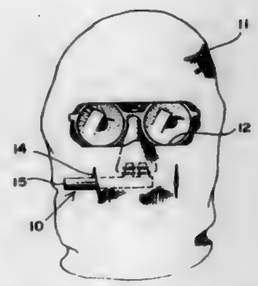
Filed Feb. 28, 1994, Ser. No. 202,586
Int. Cl.[6] A62B *18/08*
U.S. Cl. 128—201.15 **6 Claims**

1. In combination, a nasal adapter and tube assembly and a head net having an eyeglass opening to accommodate eyeglasses for a person intending to wear the head net at the forward portion of said head net and port means at one side of the head net for receiving a portion of the nasal adapter and tube assembly, said nasal adapter, head net, and tube assembly comprising, in combination,

a head net with an eyeglass opening and a port at one side thereof,

a nasal adapter body having laterally spaced nostril engaging inserts extending upwardly from a tube,

a tube mounted in the lower portion of the nasal adapter body and extending laterally therefrom a distance to permit the tube

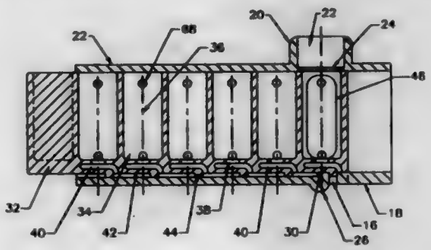


to be moved outside the head net port, whereby warm moisture laden exhaled breath is diverted outwardly of the head net to avoid fogging eyeglasses of a head net wearer.

5,595,175
INHALER FOR ADMINISTRATION OF POWDERY SUBSTANCES

Eric Maicher, St. Louis, France, and Kurt Zechner, Allschwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 930,862, Aug. 14, 1992, abandoned. This application Mar. 28, 1994, Ser. No. 218,551
Claims priority, application Germany, Aug. 16, 1991, 41 27 097.5
Int. Cl.[6] A61M *15/00;16/00*; B05D *7/14*; B65D *83/06*
U.S. Cl. 128—203.15 **11 Claims**



1. An inhaler for administering powdered medicaments comprising

an elongate body having a first end, a second end, a magazine passage extending through the elongate body from the first end to the second end, an air inlet to the magazine passage, an air outlet from the magazine passage aligned opposite the air inlet and terminating in a mouthpiece, and a capsule cutter having blades and a blade actuator;

an elongate magazine releasably and slidably held in the magazine passage, the elongate magazine having a plurality of discrete, elongate capsule chambers defined in the elongate magazine and spaced along the length of the elongate magazine with the longitudinal axis of each capsule chamber arranged transverse to the longitudinal axis of the elongate magazine, each capsule chamber having an air inlet alignable with the air inlet of the elongate body, an air outlet alignable with the air outlet of the elongate body and blade ports to provide access for the blades into the capsule chamber, the magazine being slidable in and along the magazine passage; and

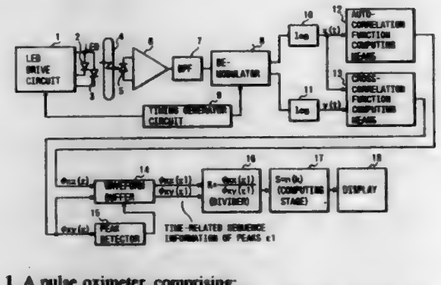
a catch means co-operating between the elongate body and the elongate magazine for releasably holding the elongate magazine in one of a plurality of aligned positions in the elongate body in which, in each aligned position, a capsule chamber is aligned with the air inlet of the elongate body, the air outlet of

the elongate body and the capsule cutter, an air flow passage being provided from the air inlet of the elongate body, through the capsule chamber and out of the mouthpiece, the elongate magazine being slidable in the magazine passage of the elongate body from one aligned position to the next; and in which the blades of the capsule cutter pierce both end of a capsule in the capsule chamber and the actuator causes the blades to enter the capsule chamber and pierce the capsule.

5,595,176
PULSE OXIMETER

Masahiko Yamaura, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Filed Dec. 7, 1994, Ser. No. 351,533
Claims priority, application Japan, Dec. 7, 1993, 5-306281
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—633 **4 Claims**



1. A pulse oximeter, comprising:

light-emitting devices for irradiating different wavelengths of light into a living tissue through which arterial blood flows, wherein any portion of said different wavelengths of light which pass through said living tissue is considered transmitted light and any portion of said different wavelengths of light which reflect off of said living tissue is considered reflected light;

a light-receiving device for detecting received light, wherein said received light comprises at least one of said transmitted light and said reflected light;

first correlation function computing means for determining a first correlation function for a first waveform of said received light having one of the different wavelengths detected by the light-receiving device;

second correlation function computing means for determining a second correlation function for a second waveform of said received light having another of the different wavelengths detected by the light-receiving device;

dividing means for determining a ratio between the first correlation function obtained by the first correlation function computing means and the second correlation function obtained by the second correlation function computing means, wherein the ratio is determined according to said first and second correlation functions; and

computing means for calculating oxygen saturation of the arterial blood on the basis of an output of the dividing means,

wherein the first correlation function computing means includes an auto-correlation function computing means and the second correlation function computing means includes a cross-correlation function computing means,

wherein said first correlation function is an auto-correlation function,

wherein said auto-correlation function is based on said first waveform and a phase shifted version of said first waveform,

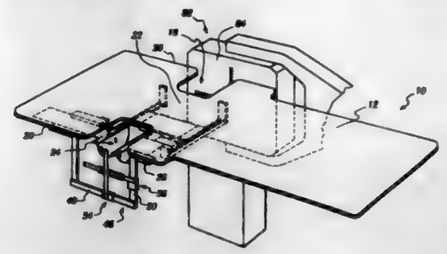
wherein said second correlation function is a cross-correlation function, and

wherein said cross-correlation function is based on said first waveform and a phase shifted version of said second waveform.

5,595,177
SCINTIGRAPHY GUIDED STEREOTAXIC LOCALIZATIONS APPARATUS FOR BREAST CARCINOMAS

Ismael Mena, Los Angeles; Linda Diggles, Torrance; Douglas M. Diggles, Sr., Bodfish; Robert E. Diggles, Torrance, and Iraj Kholkhali, Rancho Palos Verdes, all of Calif., assignors to Harbor-UCLA Research and Education Institute, Inc., Torrance, Calif.

Filed Jun. 3, 1994, Ser. No. 253,419
Int. Cl.[6] A61B *5/05*
U.S. Cl. 128—653.1 **22 Claims**



1. A scintigraphy guided system for stereotaxic localization of a breast carcinoma, adapted for use in conjunction with a scintillation detection device, of a patient who has been injected with a radioactive substance which preferentially accumulates in carcinoma, said system comprising:

a table means, with a top and bottom surface, upon which the patient lies in a prone position, said table means having at least one opening through which the patient's breast being examined will pendulously protrude therethrough;

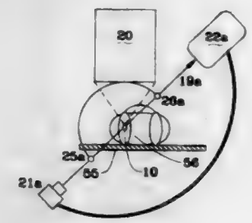
a pair of fenestrated paddles positioned under the bottom surface of the table means in a vicinity of said at least one opening, said pair of fenestrated paddles being moveable relative to each other to compress the patient's breast therebetween; and

a guide means positioned under the table means in the vicinity of the opening, said guide means having a plurality of moveable sighting guides, each moveable along one of three orthogonal axes, each sighting guide having a radioactive sighting line located thereon, wherein said moveable sighting guides will be moved to line up with the carcinoma in the breast, as detected by the scintillation detector device, to localize the carcinoma in three dimensions and in real-time in the breast.

5,595,178
SYSTEM, METHOD AND APPARATUS FOR TREATMENT OF DEGENERATIVE BONE

Joachim Voss, Munich; Werner Schwarze, Stockach-Hoppetenzell, and Reiner Schultheiss, Salem-Mimmenhausen, all of Germany, assignors to HMT High Medical Technologies GmbH, Jena, Germany

Filed Oct. 2, 1994, Ser. No. 333,372
Int. Cl.[6] A61B *6/00*
U.S. Cl. 128—653.1 **2 Claims**



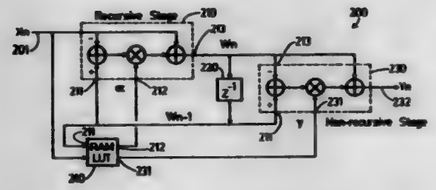
1. A process for exposing a patient with acoustic shock waves generated by a therapy head and conducted through the surface of the skin and into the body of the patient comprising the steps of
- locating a boundary surface gap between bone and an acoustically reflective body
  - by using a locating device comprising an x-ray beam imaging system and two moveable targets connected mechanically to the therapy head and
  - by causing the focal point of the shock waves to coincide with an imaginary connecting line extending between the two targets; and
- focussing the shock waves in that part of the gap small enough to cause reflections of the focussed shock waves to generate vibrations in the bone surfaces, the surfaces of the acoustically reflecting body and in the volume of the boundary surface gap.

5,595,179

ADAPTIVE PERSISTENCE PROCESSING

J. Nelson Wright, Menlo Park; Jay S. Pluggo, Sunnyvale; D. Grant Fash, III, Saratoga; Donald B. Langdon, Mountain View; David J. Finger, San Jose; Brian M. Normand, San Ramon, and Ismayil M. Guracar, Redwood City, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed May 2, 1995, Ser. No. 433,217
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—660.07 26 Claims



1. An adaptive persistence filter in an ultrasound imaging system, comprising
- a node disposed for coupling to an input pixel, said input pixel having an input pixel value X_n;
- a recursive stage filter coupled to said node, having an recursive stage output, and responsive to a first filtering coefficient α, said recursive stage output having an intermediate pixel value W_n;
- a nonrecursive stage filter coupled to said recursive stage output, and responsive to a second filtering coefficient γ; and
- a function block coupled to said node and to said recursive stage output, and generating said second filtering coefficient γ in response to said input pixel value X_n and a previous said intermediate pixel value W_{n-1}.

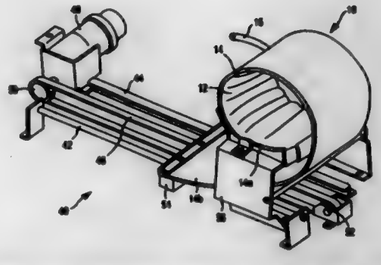
5,595,180

METHOD AND APPARATUS FOR WINDING CUFF IN BLOOD PRESSURE MEASUREMENT

Toshihiko Ogura, Izumiyama; Akihiro Yokozeki, and Chikao Harada, both of Komaki, all of Japan, assignors to Colin Corporation, Aichi-ken, Japan

Filed Aug. 16, 1994, Ser. No. 288,080
Int. Cl.[6] A61B 5/02
U.S. Cl. 128—686 9 Claims

1. A method of winding a cuff having an inflatable chamber around a body portion of a living subject, in measuring a blood pressure of the subject, comprising the steps of:
- positioning said cuff and said body portion of said subject relative to each other such that the cuff surrounds the body portion,



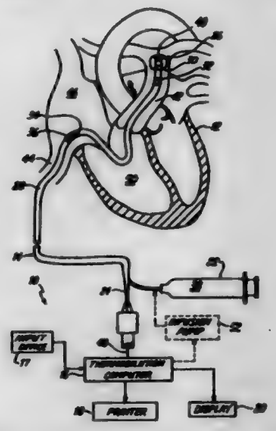
- supplying a predetermined amount of gas into said chamber of said cuff to hold said gas in said chamber, and
- fastening said cuff surrounding said body portion after increasing a tension of the cuff until a gas pressure in said chamber of the cuff in which said predetermined amount of gas is held reaches a reference value.

5,595,181

SYSTEM FOR PROVIDING CARDIAC OUTPUT AND SHUNT QUANTITATION

A. Robert Hubbard, 632 E. Center St. #37, Rochester, Minn. 55938

Filed Mar. 24, 1994, Ser. No. 217,243
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—692 19 Claims



1. A method of communicating cardiac output from a patient, comprising:
- providing a catheter having a proximal end, a distal end, a lumen between the proximal end and the distal end of the catheter, and having an injection port communicating with the lumen;
- placing a first temperature sensor in a blood vessel exiting a first heart chamber of the patient;
- placing a second temperature sensor proximate the injection port;
- performing a cardiac output test comprising:
  - injecting injectate, having an injectate temperature, through the lumen into a second heart chamber of the patient;
  - sensing the injectate temperature with the second temperature sensor;
  - sensing blood temperature with the first temperature sensor as blood carrying the injectate passes through the blood vessel;
  - storing a set of curve data representative of the sensed blood temperature as a function of time;

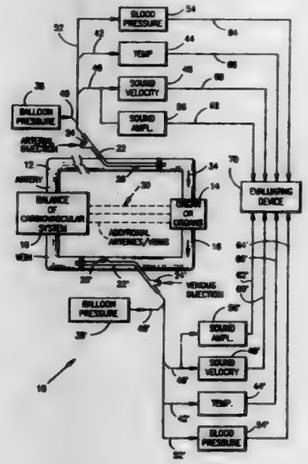
- repeating the cardiac output test until a first plurality of sets of curve data are stored;
- displaying at least one of the first plurality of sets of curve data; and
- wherein the second temperature sensor senses the injection of injectate and provides an initiation signal indicative of the injection of the injectate, and further comprising:
  - triggering the step of performing the cardiac output test based on the initiation signal.

5,595,182

CARDIOVASCULAR MEASUREMENTS BY SOUND VELOCITY DILUTION

Nikolai M. Krivitski, Ithaca, N.Y., assignor to Transonic Systems, Inc., Ithaca, N.Y.

Division of Ser. No. 327,984, Oct. 24, 1994, Pat. No. 5,453,576.
This application Jun. 7, 1995, Ser. No. 485,790
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—692 49 Claims



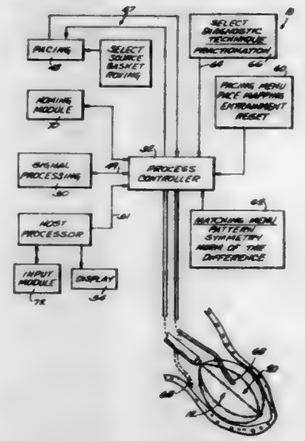
1. Apparatus for measuring selected parameters of blood, comprising:
- a blood circulating system having an arterial portion leading from an upstream blood flow and a venous portion leading to a downstream blood flow, said arterial and venous portions being connected in said circulating system to allow blood to travel from said upstream flow through the circulating system to said downstream flow;
- a sound velocity sensor coupled to at least one of said arterial and venous portions for detecting the velocity of blood traveling therein;
- an injection port in at least one of said arterial and venous portions;
- an indicator injectable through said injection port to produce a bolus in blood flowing in said blood circulating system, said bolus having sound velocity characteristics different from sound velocity characteristics of blood flowing within said system in the absence of said indicator;
- a sound velocity detector connected to each said sound velocity sensor for producing an output signal corresponding to sensed sound velocity in blood flowing in said stream to thereby produce sound velocity dilution signals representing changes in blood characteristics due to said bolus; and
- an evaluating device for determining from said dilution signals selected blood characteristics.

5,595,183

SYSTEMS AND METHODS FOR EXAMINING HEART TISSUE EMPLOYING MULTIPLE ELECTRODE STRUCTURES AND ROVING ELECTRODES

David K. Swanson, Mountain View; Dorin Panescu, Sunnyvale, and James G. Whayne, Saratoga, all of Calif., assignors to EP Technologies, Inc., Sunnyvale, Calif.

Filed Feb. 17, 1995, Ser. No. 390,383
Int. Cl.[6] A61B 5/0402; A61N 1/362
U.S. Cl. 128—697 25 Claims



1. A system for acquiring electrograms comprising
- an array of multiple electrodes supported for operative association with a region of heart tissue,
- roving second electrode means supported for movement relative to the multiple electrodes for operative association with selected, different regions of endocardial tissue within the heart, and
- a processing element coupled to the multiple electrodes and the roving second electrode means for conditioning one of the multiple electrodes and the roving second electrode means to emit a pacing signal and for conditioning the other one of the multiple electrodes and the roving second electrode means to record paced electrograms occurring as a result of the pacing signal.

5,595,184

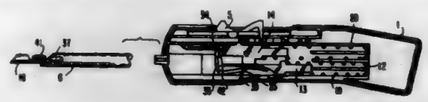
Patent Not Issued For This Number

5,595,185

SINGLE PUNCTURE MULTI-BIOPSY GUN

Nahum Erlich, Ramat Gan, Israel, assignor to N.M.B. Medical Applications Ltd., Caeseria, Israel

Filed Aug. 11, 1994, Ser. No. 289,115
Int. Cl.[6] A61B 10/00
U.S. Cl. 128—754 6 Claims



1. A multiple biopsy gun to collect tissue samples having a housing and an axially elongated cutting needle and stylet extending from the housing,

the improvement wherein the housing contains a driving mechanism which propels the stylet and the cutting needle forward in sequential fashion to capture two or more tissue samples, without the necessity to reload the biopsy gun or to remove the biopay gun from the target site between biopsies.

5,595,186

BONE MARROW BIOPSY NEEDLE

Alan Rubinstein, Los Angeles; Andrew M. Olah, and Emery Olah, both of Santa Monica, all of Calif., assignors to Alan I. Rubinstein, Los Angeles, Calif., and Daniel B. Rubinstein, Brookline, Mass.

Continuation-in-part of Ser. No. 863,457, Apr. 6, 1992, Pat. No. 5,462,062. This application Mar. 8, 1995, Ser. No. 400,857
Int. Cl.[6] A61B *10/00*
U.S. Cl. 128—754 **12 Claims**



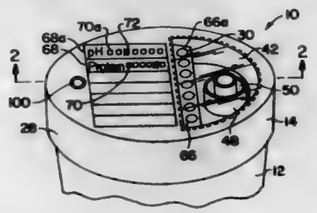
1. A bone marrow biopsy needle for removing bone marrow from a patient, comprising in combination:
an outer tube member having a lumen therein, a proximal end and a distal end and an opening at said distal end, said lumen narrows proximate to the opening; and
an inner tube member adapted to be slidable in said lumen of said outer tube member, said inner tube member having pincers at a distal end thereof, said pincers capable of being slidable in said outer tube member, said pincers capable of closing by flexing relative to said inner tube it and said inner tube slide in the direction from the proximal end to the distal end of said outer tube and engage the narrowed lumen proximate to said opening of said outer tube member, and thereby said pincers being adaptable to grasp a biopsy core when said needle is inserted into the bone marrow of a patient.

5,595,187

ANALYTICAL SPECIMEN CUP SYSTEM AND METHOD

Richard C. Davis, Palm Harbor, Fla., assignor to Urocath Corporation, Tampa, Fla.

Filed Jun. 20, 1994, Ser. No. 262,535
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—771 **14 Claims**



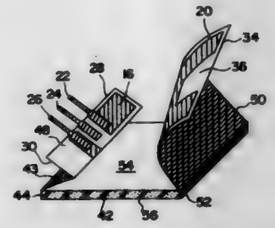
1. A method of analyzing a specimen comprising the steps of:
preparing a lid for an analytical specimen cup to have an enclosed test space with a test strip mounted therein and preparing a cup therefor separately with a temporary cover for covering the mouth of the specimen cup;
sterilizing the specimen cup with its temporary cover;
removing the temporary cover and placing a fluid specimen in the specimen cup;
attaching the lid to the mouth of the specimen cup;
inverting the specimen cup to cause the fluid specimen to flow through an opening in the lid into the test space and thereby activate said test strip.

5,595,188

ASSEMBLY PROCESS FOR POLYMER-BASED ACOUSTIC DIFFERENTIAL-OUTPUT SENSOR

James J. Kassal, East Lyme, Conn., assignor to Flowscan, Inc., Mill Valley, Calif.

Filed Jul. 26, 1995, Ser. No. 507,570
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—773 **21 Claims**



1. An acoustic sensor for detecting sounds and converting the sounds to analogous electrical signals comprising:
means for sensing flexure of a surface with which said sensor is in contact and which flexure is caused by sounds produced beneath said surface;
said sensing means including spaced apart first and second portions for sensing said flexure and for converting said sensed flexure into said electrical signals;
said first and second sensing portions being formed by a single piece of piezoelectric material having two spaced apart, opposed surfaces coated in selected areas with an electrically conductive material;
a first one of said two opposed surfaces having one elongated area of said electrically conductive material; and
a second one of said two opposed surfaces having a plurality of discrete areas of said electrically conductive material, said plurality of discrete areas being spaced along said second one of said two opposed surfaces in a longitudinal direction.

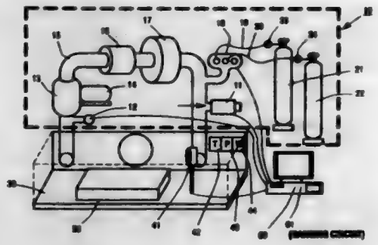
5,595,189

METHODS AND APPARATUS FOR MEASURING BODY COMPOSITION

Ari B. Naim, Philadelphia; Stephen Dubin, Springfield, and Beth A. Schrope, Philadelphia, all of Pa., assignors to Resbet, Bala Cynwyd, and Drexel University, Philadelphia, both of Pa.

Filed Jun. 7, 1995, Ser. No. 484,595
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—774 **25 Claims**

1. A method for measuring the density of a subject living, comprising the steps of:
(a) weighing the subject in a first gaseous atmosphere having a first density, said first gaseous atmosphere being safely breathable by said subject and being composed of a first mixture of gases;
(b) weighing the subject in a second gaseous atmosphere having a second density, said second gaseous atmosphere being safely breathable by said subject and being composed of a second mixture of gases different from said first mixture of gases; and
(c) estimating the subject's density on the basis of a difference in weight of the subject in said first and second atmospheres.



5,595,190

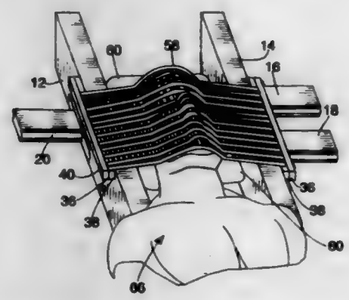
Patent Not Issued For This Number

5,595,191

ADJUSTABLE PATIENT IMMOBILIZATION SYSTEM AND METHOD FOR PATIENT IMMOBILIZATION

John R. Kirk, Ramsey, N.J., assignor to WFR/Aquaplast Corporation, Wyckoff, N.J.

Filed Oct. 12, 1995, Ser. No. 542,173
Int. Cl.[6] A61F *5/37*
U.S. Cl. 128—846 **20 Claims**



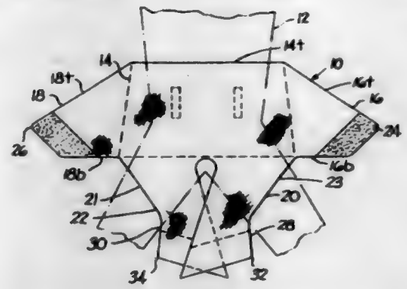
1. An adjustable anchor for securing differently sized combinations of anterior and posterior molds of a customized patient immobilizing system to patients prior to said patients receiving radiation therapy, comprising:
(a) said anchor having a left side and a right side, with a base plate connected therebetween;
(b) said left and right sides being substantially parallel to each other;
(c) said base plate defining a substantially flat area between said left side and said right side, said base plate having means for cooperating with said left side and said right side in order to enable said base plate to be expanded or contracted in a direction perpendicular to said sides so that different widths of said anterior-posterior mold combinations are accommodated; and
(d) means for securing said anterior mold to at least one side of said anchor.

5,595,192

RESTRAINING GARMENT FOR SURGICAL PATIENTS

Eugene T. Tatum, 1617 Euclid Ave., Bowling Green, Ky. 42103

Filed Jun. 6, 1996, Ser. No. 659,392
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—869 **9 Claims**



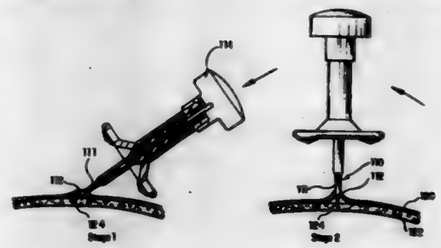
1. A garment for restraining the sliding movement of a patient's body down an inclined operating table comprising
a back member positioned between the lower back and buttocks of a patient and an operating table, said back member having fastener means attached thereto for securing said garment to said table,
left and right upper thigh wrap members connected to said back member which, when said garment is in use, are wrapped and secured about the upper thighs of said patient,
said left and right upper thigh wrap members each comprising a lateral portion and a medial portion associated with the left and right thighs of said patient,
when said garment is in use,
each of said lateral portions being wrapped about a respective associated lateral hip area and extending diagonally and inferiorly across a respective anterolateral upper thigh and
each of said medial portions being wrapped across a respective associated medial thigh adjacent the groin and extending diagonally and superiorly across a respective anteromedial upper thigh and overlapping an end of a respective lateral portion, each end of said lateral and medial portions having operatively compatible fasteners for securing each of said thigh wrap members about said respective thigh.

5,595,193

TOOL FOR IMPLANTING A FIDUCIAL MARKER

Richard L. Walus, 69 Trout Farm La., Duxbury, Mass. 02332; Jennifer J. McCrory, 9 Timberland Dr., Lincoln, R.I. 02865; John A. Santangelo, 16 Roosevelt Dr., East Freetown, Mass. 02717, and Raphael Meloul, 340 Grove St., Randolf, both of Mass. 02368

Division of Ser. No. 186,946, Jan. 27, 1994, and a continuation-in-part of Ser. No. 17,167, Feb. 12, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,451
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—898 **5 Claims**



1. A method of inserting a fiducial marker component in a bone in the human body, comprising the steps of:

a) inserting an obturator having a tip at one end in a guide tube of a guide assembly;

b) positioning the tip of said obturator at an implantation site overlying bone tissue into which the fiducial marker is to be inserted;

c) positioning said guide assembly over the implantation site so that it provides a stable orthogonal path with respect to the implantation site for the insertion of a drill;

d) removing said obturator from said guide

d) removing said obturator from said guide assembly, while leaving said guide assembly in place;

e) inserting a drill in said guide tube of the guide assembly;

f) drilling a hole at the implantation site into bone tissue;

g) removing said drill from said guide assembly; and

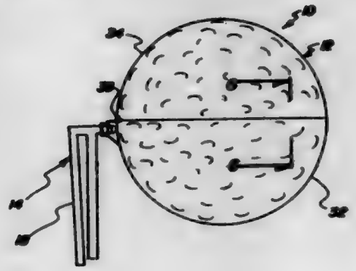
h) inserting a fiducial marker into said drilled hole.

5,595,194

PIVOTALLY MOUNTABLE ASH TRAY

Adam J. Talbot, 4107 Woodland Ave., Brookhaven, Pa. 19015

Filed Aug. 7, 1995, Ser. No. 511,635
Int. Cl.[6] A24F *15/08*
U.S. Cl. 131—241 5 Claims



1. A pivotally mountable ash tray comprising:

an ash container for receiving and supporting ashes and smoking materials;

a pivotal mounting means pivotally secured to the ash container and engagable to a support object for supporting the ash container in a substantially vertical orientation relative to the support;

wherein the pivotal mounting means comprises a substantially U-Shaped clip having a pivot pin projecting therefrom, the pivot pin being rotatably coupled to the ash container such that the U-shaped clip extends substantially in a spaced relationship relative to an outer exterior of the ash container, wherein the U-shaped clip can be fictionally engaged to a support object so as to support the ash container depending therefrom;

wherein the ash container comprises a lower hemi-spherical member to which the pivotal mounting means is pivotally coupled;

an upper hemi-spherical member pivotally mounted to the lower hemi-shperical member;

a latch coupled to the ash container for maintaining the upper hemi-spherical member in a closed configuration relative to the lower hemi-spherical member;

a weight positioned in a lower portion of the lower hemi-spherical member.

5,595,195

CIGARETTE WITH INSTALLED FIRE EXTINGUISHER

Cheng C. Chang, and Chorer Yang, both of No. 136, Ming Shen Street, Sanxia, Taiwan

Filed Feb. 28, 1996, Ser. No. 683,945
Int. Cl.[6] A24D *1/10*
U.S. Cl. 131—349 5 Claims



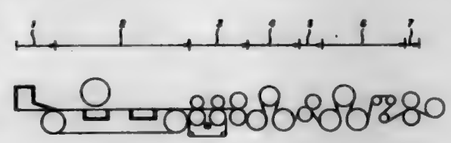
1. A cigarette of the type comprising a filter-tip, an outer paper tube connected to one end of said filter-tip in a flush manner, and a tobacco wrapped in said outer paper tube, wherein a cylindrical collapsible water reservoir is axially mounted in said filter-tip to hold water therein; an inflammable nozzle tube is axially mounted in said tobacco within said outer paper tube and longitudinally connected to said cylindrical collapsible water reservoir; a collapsible metal ring movably mounted around said outer paper tube; water is released from said cylindrical collapsible water reservoir out of said inflammable nozzle tube to quench the flame during the burning of said tobacco, when said filter-tip is squeezed to compress said cylindrical collapsible water reservoir.

5,595,196

METHOD OF PRODUCING A FILTER CIGARETTE WITH TIPPING PAPER HAVING LIP RELEASE PROPERTIES

Hannu Salomaa, and Helena Kanerva, both of Tervakoski, Finland, assignors to Enso-Gutzeit Oy, Tervakoski, Finland

Continuation-in-part of Ser. No. 79,782, Jun. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 888,487, May 27, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,290
Int. Cl.[6] A24C *5/52*
U.S. Cl. 131—362 6 Claims



1. A method of producing a filter cigarette having a filter section joined to a tobacco section by a tipping paper having improved lip release properties, comprising:

placing a tobacco section and a filter section in longitudinal axial relationship; and

joining said filter section and tobacco section together by wrapping a tipping paper around said filter section and an adjoining portion of said tobacco section, said tipping paper possessing lip release properties which were imparted thereto by applying a surface coating containing a lip release chemical to only one side of a base tipping paper during a stage of a papermaking process for manufacturing the base tipping paper.

5,595,197

PROCESS FOR DIRECTLY COLORING KERATINOUS FIBRES USING SULPHONIC DYES AND WATER VAPOR

Henri Samain, Bievres, and Jean-Michel Sturla, Saint-Cloud, both of France, assignors to L'Oreal, Paris, France

Filed Dec. 16, 1994, Ser. No. 356,955
Claims priority, application France, Dec. 22, 1993, 93 15483
Int. Cl.[6] A61K *7/13*
U.S. Cl. 132—208 22 Claims

18. A process for the direct dyeing of keratinous fibres comprising the step of:

directly dyeing said fibres by contacting said fibres with a composition containing at least one direct dye containing a sulphonic functional group and with a gas containing water vapour, for a time not exceeding two minutes, and wherein said gas has a temperature sufficient to dye said fibres without substantially staining the skin adjacent to said fibres.

5,595,198

MASCARA APPLICATOR AND METHOD OF MAKING THE SAME

Walter K. Kemmerer, Cortlandt Manor, N.Y., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Jun. 7, 1995, Ser. No. 472,955
Int. Cl.[6] A45D *40/26*
U.S. Cl. 132—218 11 Claims



1. An applicator for the application of mascara to the eyelashes, comprising: a central core formed from a twisted wire and having a brush section at one end thereof, the core having a longitudinal axis, the brush section comprising a plurality of regularly disposed and radially extending bristles, the bristles being disposed in a helical array by the twisted wire, at least some of the bristles having portions removed so as to form a substantially helical groove therethrough, the groove having a substantial depth and width, and the groove being substantially parallel to the longitudinal axis of the core.

5,595,199

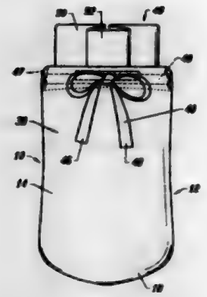
HAIR CONTAINER

Charleen Solomon, 1302 Antrim Dr., and Karin Copeland, 1303 Antrim Dr., both of Roseville, Calif. 95747

Filed Jan. 30, 1995, Ser. No. 380,130
Int. Cl.[6] A45D *8/04;8/34;8/36*
U.S. Cl. 132—273 10 Claims

1. A hair container, comprising:

a. a sheath for enclosing strands of hair extending into said sheath, said sheath including a flexible wall portion forming a chamber and an opening to said chamber to permit the strands of hair to extend into said sheath;



b. a clamp mounted to said flexible wall portion of said sheath within said chamber of said sheath, said clamp being capable of engaging and holding the strands of hair to prevent relative movement between said flexible wall portion within said chamber of said sheath and the strands of hair extending into said chamber of said sheath; and

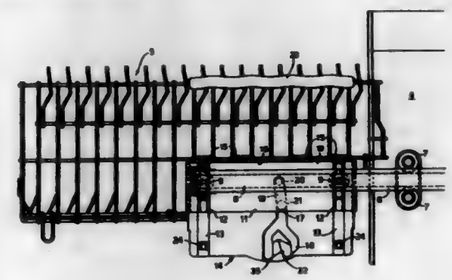
c. holding means for drawing said flexible wall portion of said sheath against the strands of hair.

5,595,200

DISHWASHER WITH VERTICALLY ADJUSTABLE BASKET

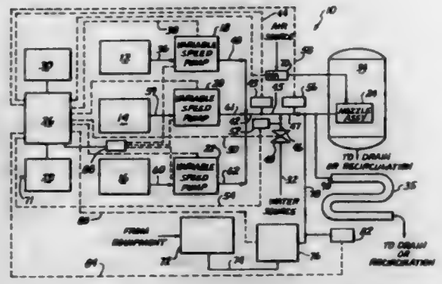
Daniele Favaro, Pramaggiore, Italy, assignor to Electrolux Zanussi Elettrodomestici S.p.A., Pordenone, Italy

Filed Jul. 10, 1995, Ser. No. 500,405
Claims priority, application Italy, Jul. 15, 1994, PN940031 U
Int. Cl.[6] A47L *15/50*
U.S. Cl. 134—201 5 Claims



1. A dishwasher comprising a washing basin accommodating at least one basket; substantially horizontal side guides along which the basket slides; and sliding devices for connecting the basket to the side guides and adapted for adjustment for selectively varying the vertical position of the basket, characterized by respective post-and-slot connecting devices (17,18) connecting the basket (5) to the sliding devices (8), said connecting devices having at least two releases such that each side of the basket (5) can be selectively positioned between an upper position and a lower position defined by the corresponding post-and-slot devices (17,18) by applying to the basket a direct upward force activating said connecting post-and-slot devices.

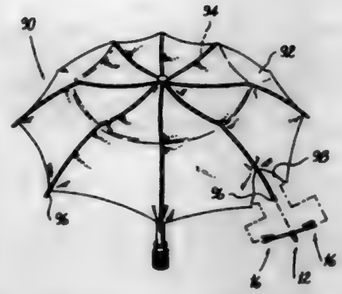
5,595,201
APPARATUS AND METHODS FOR AUTOMATICALLY CLEANING MULTIPLE PIECES OF EQUIPMENT
Daniel J. Dobrez, Homewood, Ill., and Robert J. Rybarski, Hebron, Ind., assignors to Dober Chemical Co., Midlothian, Ill.
Filed Dec. 5, 1994, Ser. No. 349,662
Int. Cl.[6] B08B *13/00*
U.S. Cl. 134—57 D 16 Claims



14. An apparatus useful for providing a chemical composition useful to treat a piece of equipment comprising:
- a reservoir for containing a concentrated form of said chemical composition, said reservoir having an outlet through which said concentrated form of said chemical composition exits said reservoir;
- a concentrate pump adapted to pump, at a controlled time rate and at a controlled time, the concentrated form of said chemical composition from said reservoir;
- a flow assembly coupled to said concentrate pump and a source of diluent and being adapted (1) for providing, at a time rate and at a controlled time, diluent from said source of diluent to a piece of equipment to be treated, and (2) for providing, at a time rate and at a controlled time, a chemical composition comprising diluent from said source of diluent and said concentrated form of said chemical composition from said reservoir to the piece of equipment to be treated;
- a control assembly associated with said concentrate pump and said flow assembly and structured to, automatically and independently of the diluent flow, control the time rate at which said concentrated form of said chemical composition is pumped by said concentrate pump from said reservoir and control the time during which said concentrated form of said chemical composition is pumped by said concentrate pump from said reservoir, and to automatically and independently control the flow of diluent in said flow assembly; and
- a recirculation tank adapted to receive at least one of diluent and said chemical composition from said piece of equipment, and a recirculation pump located and adapted to pump at least one of diluent and said chemical composition from said recirculation tank to said piece of equipment.

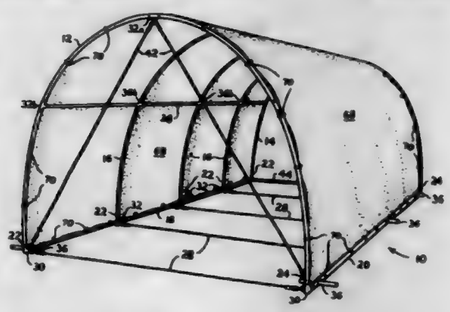
5,595,202
UMBRELLA TEAR PREVENTION AND REPAIR DEVICE
David M. Scaccia, 171 Eastwood Ave., Deer Park, N.Y. 11729
Filed Jun. 15, 1995, Ser. No. 490,940
Int. Cl.[6] A45B *25/04*
U.S. Cl. 135—33.6 16 Claims

1. A device for securing umbrella material to an umbrella rib end, which comprises:
- a) a cap member having an external wall and an internal wall, the internal wall defining an internal bore having an opening at a distal end of the internal wall;
- b) attachment means for releasably securing the device to the umbrella material;



- c) at least one cord connected to the cap member and the attachment means for securing the cap member to the attachment means;
- d) wherein the at least one cord has a minimum length at a resting position and a maximum length at an extended position, the at least one cord moveable between the resting position and the extended position, the at least one cord biased towards the resting position.

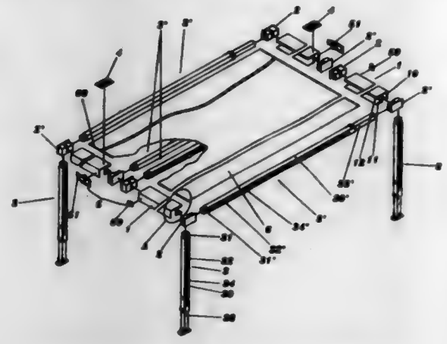
5,595,203
STRESSED ARCH STRUCTURES
Mark A. Espinosa, 1162 Phyllis Ct., Mountain View, Calif. 94040
Filed Jun. 26, 1995, Ser. No. 494,973
Int. Cl.[6] E04H *15/36*
U.S. Cl. 135—124 20 Claims



1. A stressed arch structure, comprising:
- a first end and an oppositely disposed second end rib element and a plurality of intermediate rib elements each comprising a tube of equal length and each having a first end and an opposite second end, said rib elements disposed in a parallel array;
- a first and a second straight tubular base member, each secured respectively to each said first end and each said second end of said rib elements to define a frame;
- a tubular intermediate member connected to each of said rib elements between said first and said second base member and parallel thereto;
- said rib elements, each said base member, and said intermediate member each being a straight, uncurved tube in its unstressed and unassembled state and being disposed to define a flat, planar surface when assembled together;
- a plurality of equal length tension members each having a length shorter than said length of each of said rib elements, said tension members being connected between said first base member and said second base member in a parallel array to stress and urge said frame into an arcuate structure, and;
- a frame cover secured at least to each said base member and to said first end and said second end rib element, whereby;

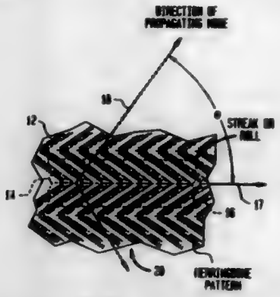
said stressed arch structure is adapted to provide temporary and semi-permanent protection for boats, automobiles, and other equipment and articles.

5,595,204
MULTI-USE COLLAPSIBLE SUN-SHADE TENT
Chyi-Ming Hwang, P.O. Box 90, Tainan City, 704, Taiwan
Filed Apr. 15, 1996, Ser. No. 632,615
Int. Cl.[6] E04H *15/42*
U.S. Cl. 135—142 3 Claims



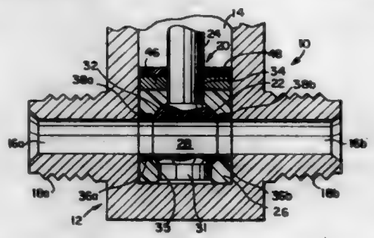
1. A multi-use collapsible sun-shade tent comprising:
- a pair of lateral beams located in two opposite horizontal sides, having one lengthwise groove opening downward and another lengthwise groove opening sidewise, and a narrow lengthwise groove on said lengthwise groove opening sidewise, each said lateral beam consisting of two half portions;
- two pairs of lengthwise beams, said one pair located in two opposite horizontal sides between said pair of lateral beams, and another pair between an intermediate portion of each of said two lateral beams;
- a plurality of connecters located diagonally and fixed in said lengthwise groove opening sidewise of each said lateral beam, respectively having two empty chambers, one of said chambers opening downward and the other opening sidewise;
- four vertical extensible posts having their upper ends respectively fitted in said downward empty chambers of said connecters;
- two hinges connecting said two half portions of each said lateral beams so as to let one half portion folded on the other half portion in collapsing said tent;
- two locking means fixed on a vertical side of each said lateral beam to hold each said lateral beam in a straight line;
- a sun-shaped cloth having its two ends respectively secured in each said narrow groove of each said lateral beam; and
- said vertical posts being able to be directly separated from said connecters in collapsing and to be stored in said lengthwise grooves opening sidewise of said lateral beams, said lengthwise beams being able to be separated from said connecters and to be stored in said lengthwise grooves opening downward of said lateral beams, said locking means being unhooked so as to fold said two half portions of each said lateral beam in half length, said sun-shaped cloth being able to be wound around said collapsed half lateral beam so as to be easily carried on a small car or the like.

5,595,205
METHOD OF AND APPARATUS FOR CONTROLLING TURBULENCE IN BOUNDARY LAYER AND OTHER WALL-BOUNDED FLUID FLOW FIELDS
Lawrence Sirovich, New York, N.Y.; Evgene Levich, Tel-Aviv, and Lucien Y. Bronicki, Yavne, both of Israel, assignors to Orlev Scientific Computing Ltd., Yavne, Israel
Continuation of Ser. No. 447,170, May 19, 1995, abandoned, which is a continuation of Ser. No. 253,134, Jun. 2, 1994, abandoned. This application Jan. 16, 1996, Ser. No. 586,423
Int. Cl.[6] F15C *1/04*
U.S. Cl. 137—13 22 Claims



1. A method for controlling turbulence in boundary layer or other wall-bounded fluid flow field having a turbulent wall region characterized by a system of roll pairs or streaks whose diameter is functionally related to the strength of the flow, and which extend in the direction of flow, and by propagating structures of coherent patterns that propagate obliquely to the direction of flow at a substantially constant group speed, said method including introducing into the turbulent wall region two separate disturbances that are effective in said region to produce a composite disturbance field that is strongly coupled to and modifies the obliquely propagating structures in a manner that increases or decreases the interaction of the propagating structures with the system of roll pairs for locally increasing or decreasing the turbulence in the flow field.

5,595,206
BALL VALVE HAVING ONE-PIECE MACHINED SEAT MEMBER
Sergio Soria Vega, Huntington Beach, Calif., assignor to Greene, Tweed of Delaware, Inc., Wilmington, Del.
Filed May 23, 1995, Ser. No. 448,153
Int. Cl.[6] F16K *5/04*
U.S. Cl. 137—15 8 Claims



1. A method of fabricating a ball valve comprising the steps of:
- providing a valve body with a generally cylindrical bore extending therein to define a valve chamber and inlet and outlet passages communicating with the valve chamber;
- forming a generally cylindrical one-piece polymeric seat member including an internal cavity for receiving and sealingly engaging a ball member, a first axial opening communicating

with the internal cavity for sealingly engaging an operating stem secured to said ball member, a first generally radial opening communicating with the internal cavity and a second generally radial opening communicating with the internal cavity;

causing the polymeric seat member to change from a substantially non-deformable state to a substantially deformable state where the seat member deforms but does not break under pressure;

inserting a ball member having an operating stem engaged therewith into the internal cavity of the deformable seat member such that the operating stem extends out of the first axial opening, the insertion of the ball member deforming the polymeric seat member;

adjusting the size and shape of the deformed seat member with the inserted ball member such that the seat member is sized and shaped for sealingly engaging the valve chamber when installed therein; and

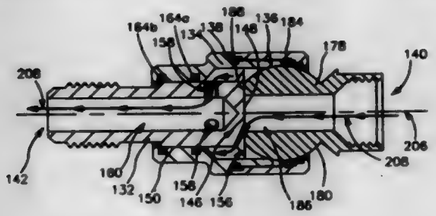
installing the seat member into the valve chamber with the first seat member opening aligned with an inlet passage of the valve chamber, the second seat member opening aligned with an outlet passage of the valve chamber, and the operating stem extending out of the valve chamber.

5,595,207

TENSION ACTUATED GAS SHUTOFF VALVE

Stephen L. Jiles, Anaheim, Calif., assignor to Southern California Gas Company, Los Angeles, Calif.

Filed Oct. 19, 1994, Ser. No. 325,663
Int. Cl.[6] F16K *17/36*
U.S. Cl. 137—38 **6 Claims**



1. A valve comprising:

a body having a body axis and an inlet formed on a ball joint at an upstream end for receiving a fluid flow along a fluid flow path from upstream to downstream;

a piston, having a piston outlet at a downstream end axially opposite the body inlet, and slidable within the body along the body axis, in response to a longitudinal force applied across the valve, to slide between a first position wherein flow through the valve is prevented and a second position wherein the flow through the valve is permitted.

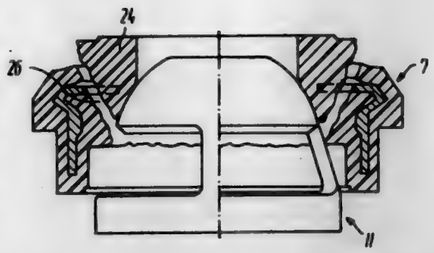
5,595,208

DOUBLE VALVE

Per K. Augustinus, Troense Strandvej 57, 5700 Svendborg, and Ken Riis, Ostergards Allé 45, 5250 Odense SV, both of Denmark

Filed Apr. 13, 1995, Ser. No. 421,531
Int. Cl.[6] F16K *17/14*
U.S. Cl. 137—68.11 **18 Claims**

16. A double valve for a container of the type used for distribution of a liquid stored in the container under pressure of a gas whereby the valve defines an axis and comprises a central liquid passage; a ring formed gas passage placed around the liquid passage; an elastomeric valve ring placed in the gas passage and axially movable serving the purpose of closing the gas passage by,



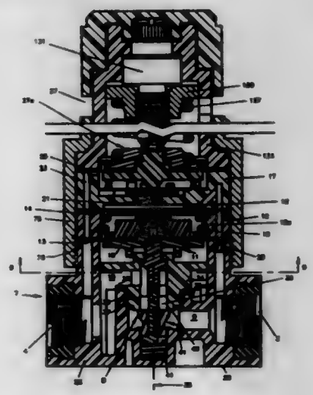
under influence of the gas pressure and the spring force from a pressure spring, being pressed into tight engagement with a seat in the valve; an opening formed in the valve ring forming the mouth of the liquid passage; and a valve plug being axially displaceable and placed in the liquid passage serving the purpose of closing the mouth by under influence of the load of the valve plug and the spring force from a pressure spring being pressed into tight engagement with a seat formed in the opening of the valve ring, characterized in that the valve ring has at least one area, which is so much weaker than the surrounding areas, that the weaker area is deformed so much in the closed condition of the valve under influence of the load of the valve plug and the gas pressure that the mouth of the liquid passage is no longer sealed when the pressure in the container exceeds a predetermined pressure larger than the normal working pressure in the container.

5,595,209

FLUID PRESSURE REGULATOR ESTABLISHING A STABLE OUTPUT FLUID PRESSURE

Louis D. Atkinson, New Berlin, and Kevin M. Rave, West Allis, both of Wis., assignors to Airtrol Components Inc., New Berlin, Wis.

Filed Mar. 29, 1995, Ser. No. 412,744
Int. Cl.[6] G05D *16/06*; F16K *39/02*
U.S. Cl. 137—116.5 **34 Claims**



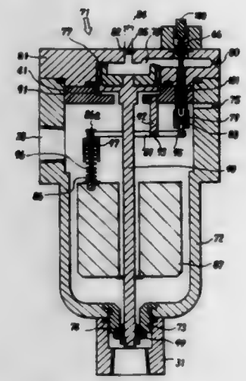
1. A multi-stage regulator for a pressurized fluid source, comprising a regulating valve having an input chamber and an output chamber, a relief valve connected to said regulating valve and having a first pressure responsive component coupled to said output chamber for pressure relief venting of fluid from said output chamber, a pilot valve, a first connection between said pilot valve and said input chamber and a second connection between said pilot valve and said relief valve, a flow control unit in said connection of said pilot valve to said input chamber establishing a single bleed flow from said input chamber to said pilot valve and from said pilot valve to said output chamber and relief valve for venting said bleed flow, said pilot valve including a second pressure responsive component connected to said relief valve and operating in opposition to said first pressure responsive component, said relief valve forming a single and only bleed from said regulator for stabilizing the regulating valve, said first and second pressure responsive components being constructed and arranged to position said relief valve and directly compensate for uptrending pressure created by said bleed flow from said relief valve to said output chamber.

5,595,210

AUTO-DRAIN UNIT

Toru Kushiya, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan

Division of Ser. No. 305,887, Sep. 14, 1994. This application May 25, 1995, Ser. No. 450,785
Claims priority, application Japan, Sep. 30, 1993, 5-268079; Jul. 13, 1994, 6-183870; Jul. 13, 1994, 6-183871; Jul. 13, 1994, 6-183872
Int. Cl.[6] F16T *1/20*
U.S. Cl. 137—181 **3 Claims**



3. An auto-drain unit comprising:

a bowl of cylindrical shape for storing liquid and provided with a drain inlet at an upper portion and a drain outlet at a bottom portion, a drain valve seat for discharging drain and mounted on the drain outlet, a drain valve disc for opening and closing the drain valve seat, a pressure receiving member for opening and closing the drain valve disc by moving up and down as pilot air is supplied to or discharged from a pilot chamber, a pilot valve seat for communicating the pilot chamber with an interior of the bowl, a pilot valve disc for opening and closing the pilot valve seat, an exhaust orifice having an effective opening area smaller than the pilot valve seat and communicating the pilot chamber to atmospheric air, a float moving up and down according to a liquid level of liquid in the bowl, and a lever tilted by upward or downward movement of the float and for opening and closing the pilot valve disc, wherein:

said pressure receiving member, said pilot valve seat, said pilot valve disc, said exhaust orifice and said lever are provided at positions higher than the liquid level of the liquid stored in the bowl; and

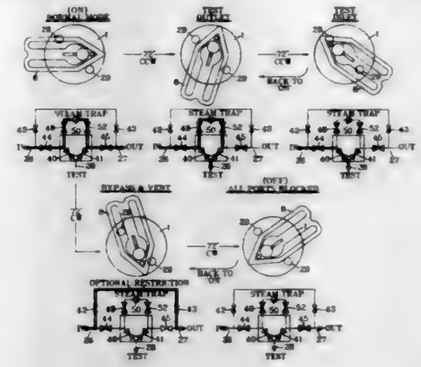
an operating member is provided for applying a pushing force on the lever when the float is moved up by a given distance between said lever and said float, and a spring means is provided for pushing the lever further up and for maintaining it at an open position after said operating member is pushed up and the pilot valve disc is opened.

5,595,211

STEAM TRAP TEST STATION

Don L. Adams, Tulia, Tex., assignor to D/A Manufacturing Co., Inc., Tulia, Tex.

Filed Aug. 31, 1995, Ser. No. 521,922
Int. Cl.[6] F16K *11/06*
U.S. Cl. 137—182 **5 Claims**



1. A steam trap test station, comprising:

a body connected to a source of steam, a steam trap and an object to be heated by steam;

a rotor fixed for rotation in the body;

the body having porting walls defining body ports;

the rotor having porting walls defining rotor ports;

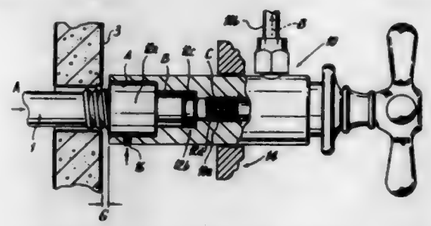
the body and rotor ports being adapted and arranged such that an "ON" mode is provided wherein steam passes through the station from the source of steam through the steam trap to the object to be heated, with a "TEST OUTLET" mode being first reached when the rotor is turned in a first direction from the "ON" mode wherein an outlet may be tested for malfunction, and with a "TEST INLET" mode being second reached when the rotor is turned in the first direction from the "ON" mode wherein inlet media may be tested.

5,595,212

WALL MOUNT INLET STOP SYSTEM

Jerome Warshawsky, Hewlett Harbor, and Frank Antoniello, Commack, both of N.Y., assignors to I. W. Industries, Inc., Melville, N.Y.

Filed Oct. 19, 1995, Ser. No. 545,243
Int. Cl.[6] F16L *5/00*
U.S. Cl. 137—360 **6 Claims**



1. An improved wall mount inlet stop comprising:

an inlet stop body engagable with a water inlet tube protruding through a vertical wall,

said inlet stop body being engagable to an intermediate water inlet tube extension, said water inlet tube extension attachable between said water inlet tube and said inlet stop body, said water inlet tube extension having at a distal end thereof a

coupling portion engagable over the water inlet tube extending through the vertical wall,

said water inlet tube extension further having an inlet coupling section at a proximal end therefore engagable within said inlet stop fixture,

said hollow bore of said inlet stop body further having a water tight seal, said seal comprising an O-ring compressible against a root of an O-ring collar of said water inlet tube extension in a sliding seal relationship.

5,595,213

QUICK CONNECTOR WITH CHECK VALVE

Lanny Brown, Lexington, Mich., assignor to Huron, Inc., Lexington, Mich.

Filed Jan. 4, 1995, Ser. No. 368,661
Int. Cl.[6] F16K *15/04*
U.S. Cl. 137—515.5 12 Claims



1. A threadless fluid connector assembly for fluidically connecting a first and a second fluid carrying device, said threadless fluid connector comprising:

a first member fluidically connected to said first fluid carrying device, said first fluid member including a head and a neck extending from said head, a stepped bore extending through said first member, said stepped bore having a first small diameter portion and a second larger diameter portion separated by a seat;

at least one peripheral groove in said neck;

at least one peripheral groove in said head

a first resilient elastomeric member adapted to be received in said groove of said neck;

a second resilient elastomeric member adapted to be received in said groove of said head;

a second member fluidically connected to said second fluid carrying device, said second member having a bore therethrough adapted to be received by said extending neck, said bore having a first portion adapted to be coupled with one of said resilient elastomeric members for sealing said second member with said first member and a second portion adapted to be coupled with said other resilient elastomeric member for retaining said second member on said first member; and

a one-way check valve disposed within said bore between said first member and said second member, a portion of said one-way check valve seating on said seat in said larger diameter portion of said stepped bore and said one-way check valve prohibiting fluid flow in one direction when said first member is coupled to said second member.

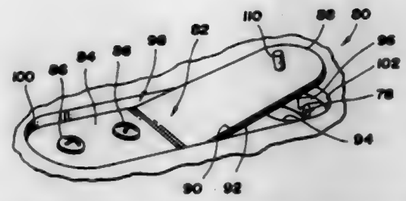
5,595,214

HYDRAULIC COUPLING FOR VEHICLE DRIVETRAIN

Theodore E. Shaffer, and Murat N. Okcuoglu, both of Santa Barbara, Calif., assignors to Ashe Corporation, Santa Barbara, Calif.

Continuation-in-part of Ser. No. 205,900, Mar. 3, 1994, Pat. No. 5,336,215, which is a continuation-in-part of Ser. No. 16,168, Feb. 10, 1993, Pat. No. 5,310,388. This application Jun. 7, 1995, Ser. No. 482,761
Int. Cl.[6] F16H *48/30*; F16K *21/00*
U.S. Cl. 137—517 26 Claims

1. In a vehicle drivetrain including a pair of rotary members, a control valve for use in controlling rotative coupling of the pair of



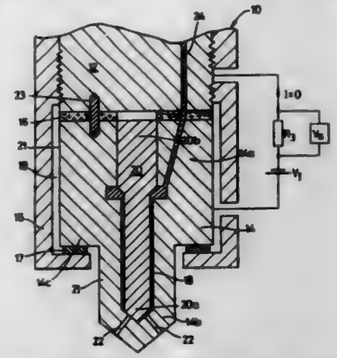
rotary members, comprising: a valve element; a port through which pressurized hydraulic fluid selectively flows to control the coupling of the pair of rotary members; the port including a main passage and a bleed passage that is communicated with the main passage; and the valve element being mounted for movement between an open position spaced from the main passage of the port and a closed position where the valve element closes the main passage of the port but permits pressurized hydraulic fluid to bleed through the bleed passage; and the bleed passage upon subsequent movement of the valve element to the open position being cleaned by fluid flow through both passages of the port.

5,595,215

IMPROVEMENTS IN OR RELATING TO FLUID-FLOW CONTROL VALVES

Ian F. Wallace, and John Stamford, both of Peterborough, United Kingdom, assignors to Perkins Limited, Cambridgeshire, United Kingdom

PCT No. PCT/GB93/02458, § 371 Date May 24, 1995, § 102(e) Date May 24, 1995, PCT Pub. No. WO94/12788, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 30, 1993, Ser. No. 448,513
Claims priority, application United Kingdom, Nov. 30, 1992, 9225085
Int. Cl.[6] F01B *7/07*; *7/00*
U.S. Cl. 137—554 16 Claims



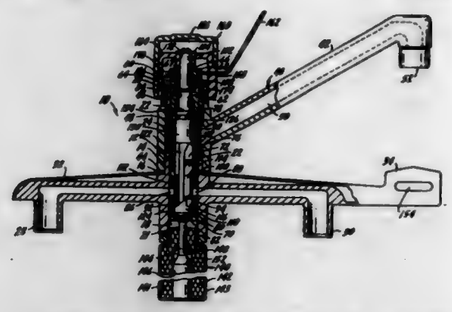
1. A fluid-flow control valve comprising juxtaposed first and second electrically conductive, stationary body members, means for separating said first and second body members, and an electrically conductive valve actuation member movably mounted to and electrically contacting said second body member, said valve actuation member being movable from a first position spaced from said first body member to a second position contacting said first body member, wherein said separating means is electrically conductive but has electrical resistance such that movement of the actuation member from its first position to its second position completes an electrical connection between said first and second body members having a lower resistance than a resistance already existing between said first and second body members through said separation means.

5,595,216

SINK ARRANGEMENT WITH FAUCET HAVING DUAL OPERATIONAL MODE

Joseph J. Pilolla, 853 Cedar Ave., Elmhurst, Ill. 60126

Continuation of Ser. No. 167,734, Dec. 15, 1993, Pat. No. 5,397,099, which is a continuation-in-part of Ser. No. 40,835, Mar. 31, 1993, Pat. No. 5,358,213. This application Feb. 9, 1995, Ser. No. 385,778
Int. Cl.[6] F16K *31/11*
U.S. Cl. 137—607 32 Claims



1. A faucet for discharging water automatically or manually comprising:

a housing for connection to a water supply and including a discharge spout;

a manual actuation mechanism;

an automatic actuation mechanism;

a single flow control valve mechanism having at least one inlet port for communication with the water supply, at least one water outlet port and operable to establish a flow path between said inlet and outlet ports, or block flow between said inlet and outlet ports;

said discharge spout in communication with said outlet port;

said manual actuation mechanism operatively associated with said valve mechanism to operate said valve mechanism independently of said automatic actuation mechanism;

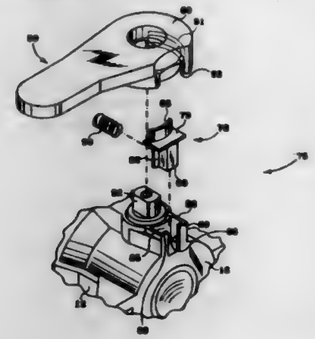
said automatic actuation mechanism operatively associated with said valve mechanism to operate said valve mechanism independently of said manual actuation mechanism.

5,595,217

DRY BREAK COUPLING ASSEMBLY WITH CAM-LOCKING CONNECTION SYSTEM

Mark E. Gillen, and Stephen L. Biggs, both of Crawfordsville, Ind., assignors to Banjo Corporation, Crawfordsville, Ind.

Filed May 5, 1995, Ser. No. 435,795
Int. Cl.[6] F16L *37/28*
U.S. Cl. 137—614.06 20 Claims



1. A dry break coupling assembly for interconnecting and controlling fluid flow between first and second components in a fluid handling system, the coupling assembly comprising:

a first valve attachable to the first fluid handling system component, said first valve including:

a body including a valve connection end, said body further comprising a fluid passageway;

a valve element rotatably supported within said body, said valve element rotatable between an open position and a closed position;

a handle operatively connected to said valve element for selectively rotating said valve element between said open position, wherein said fluid passageway is opened, and said closed position, wherein said fluid passageway is closed; and

at least one camming lever pivotally mounted to said body, said camming lever pivotable between a release position and a locking position;

a second valve attachable to the second fluid handling system component, said second valve including:

a body including a valve connection end, said body further comprising a fluid passageway;

a valve element rotatably supported within said body, said valve element rotatable between an open position and a closed position;

a handle operatively connected to said valve element for selectively rotating said valve element between said open position, wherein said fluid passageway is opened, and said closed position, wherein said fluid passageway is closed; and

at least one locking component disposed on said body for cooperating with said camming lever;

wherein said first valve and said second valve are movable relative to each other between a disconnected arrangement and a connected arrangement, wherein said valve connection ends of said first and second valves are disposed in facing relationship when said first valve and said second valve are disposed in said connected arrangement;

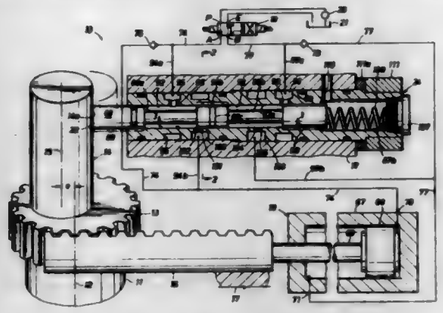
wherein said valve element of one of said first and second valves includes a recess arranged to face said valve element of the other of said first and second valves when said first and second valves are positioned in said connected arrangement and said valve element of said one of said first and second valves is disposed in said closed position, wherein rotation of said valve element of one of said first and second valves from said closed position rotates said recess out of facing relationship with said valve element of the other of said first and second valves;

wherein said valve element of said other of said first and second valves includes a portion conforming to the shape of said valve element recess that nests within said valve element recess when said first and second valves are positioned in said connected arrangement and said valve elements of said first and second valves are disposed in said closed positions;

wherein said camming lever and said locking component are complementarily structured and arranged such that said camming lever engages said locking component when said first and second valves are positioned in said connected arrangement and said camming lever pivots from said release position to said locking position, whereby said first and second valves are locked together in said connected arrangement and permit fluid flow therethrough when said valve elements of said first and second valves are disposed in their open positions; and

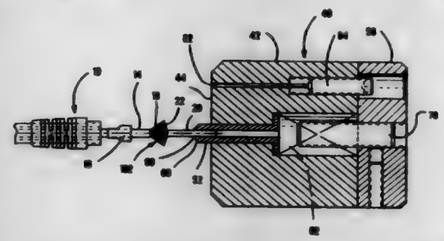
each of said first and second valves further comprising means for preventing rotation of their respective valve elements from said closed position to said open position when said first and second valves are disposed in said disconnected arrangement, said rotation preventing means of each of said first and second valves structured and arranged for deactivation by operative engagement with the other of said first and second valves when said first and second valves are locked together in said connected arrangement, whereby upon deactivation said rotation preventing means allow rotation of their respective valve elements from said closed position to said open position.

5,595,218
VALVE CONSTRUCTION
Raymond L. Hallbach, Cold Springs, Ky.; Miles E. Loretta, Jr., and Douglas W. Vallance, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Mar. 9, 1995, Ser. No. 401,576
Int. Cl.[6] F16K 11/07
U.S. Cl. 137—625.18 2 Claims



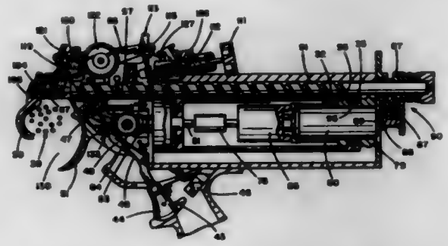
1. A method for establishing a precise land width on the spool of a fluid control valve, comprising the following steps:
providing a valve bushing with first and second orifices spaced to a known dimension along a valve bushing bore;
providing a one-piece valve spool for said bore, said spool having a land with first and second land edges for coacting with said first and second orifices to control fluid flow;
splitting said one-piece spool into two spool pieces by cutting through said land;
providing a spacer which slidably fits within said bore;
machining the length of said spacer to establish a predetermined width of said land when said spool is in two pieces;
assembling said spacer between said two spool pieces, within said valve bushing bore; and
biasing said spacer and said two spool pieces together so as to travel in unison within said valve bushing bore, and such that said spacer is caused to travel only in response to movement of said spool pieces.

5,595,219
APPARATUS AND METHOD FOR SPLAYING THE SHIELD WIRES OF A COAXIAL CABLE
Gregory F. Deuel, Lancaster, and Marlin R. Schollenberger, Myerstown, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Dec. 1, 1994, Ser. No. 347,638
Int. Cl.[6] B21F 45/00
U.S. Cl. 140—123 9 Claims



1. A tool for splaying the wire shielding of a coax cable radially about its center conductor, wherein said cable has a prepared end stripped of insulation, comprising:
(a) a block having a flat surface and a first hole formed in said flat surface perpendicular thereto;
(b) a pin in said first hole arranged to slide therein from a first position where an end of said pin extends outwardly from said flat surface to a second position where said end of said pin is substantially flush with said flat surface, said pin having a second hole formed axially therein for receiving said center conductor; and
(c) a resilient member in said first hole arranged for urging said pin into said first position,
said block and said pin arranged so that upon moving said coax cable axially toward said pin, said pin being in said first position, and insertion of said center conductor into said second hole, said wire shield engages said end of said pin and splays outwardly, then said pin retracts into said block against the urging of said resilient member under continued movement of said cable until said wire shield engages said flat surface and is thereby splayed further, said pin then being in said second position.

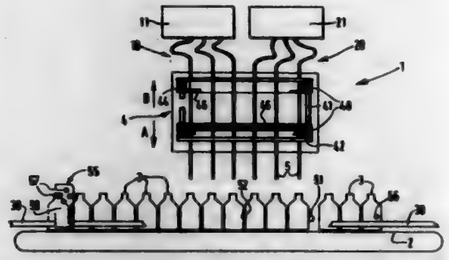
5,595,220
PORTABLE CABLE TIE INSTALLATION TOOL
Joseph F. Leban, Warrenville; Robert F. Levin, Braceville, and Mark B. Richardson, Joliet, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Jan. 18, 1995, Ser. No. 374,463
Int. Cl.[6] B21F 09/02
U.S. Cl. 140—123.6 19 Claims



1. An automatic cable tie installation tool for fastening an individual cable tie around a bundle of wires or the like, comprising:
cable tie positioning means for positioning the cable tie around a bundle;
cable tie receiver means for receiving and positioning the cable tie for advancement to the cable tie positioning means;
tensioning means for tensioning the cable tie around a bundle; and
cable tie advancing means for transporting the cable tie from the receiving means to the positioning means, wherein the advancing means includes a rotary driven rod having a helical groove that engages with a head of the cable tie.

5,595,221
METERING MACHINE SUITABLE FOR FILLING BOTTLES OF VARYING DIMENSIONS
Bernard P. Lagneau, Champforgeuil, France, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 20, 1995, Ser. No. 491,796
Claims priority, application France, Jul. 4, 1994, 94 08440
Int. Cl.[6] B65B 3/04
U.S. Cl. 141—177 5 Claims

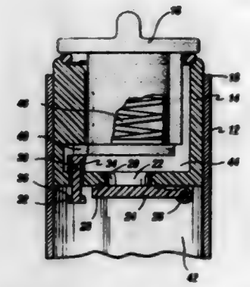
1. A metering machine for filling a plurality of bottles including a first and second series of bottles, said metering machine comprising:
a continuously operating conveyor moving the bottles along a first direction between a first position and a second position, said bottles having a first diameter;



a first series of nozzles for filling the first series of bottles with a neutral atmosphere at said first position;
a second series of nozzles for filling the second series of bottles with a liquid at said second position, said first and second series of nozzles being movable in a second direction between a filling position and a non-filling position, said second direction being substantially perpendicular to said first direction, said first series of nozzles being rigidly affixed to said second series of nozzles;
a first device for immobilizing the second series of bottles at said second position, said first immobilizing device disposed downstream of said first and second series of nozzles;
a second device for immobilizing the first series of bottles at said first position, said second immobilizing device disposed upstream of said first immobilizing device and adjustable in said first direction;
guides adjustable in a transverse position relative to said first direction to align the bottles with said first and second series of nozzles;
a first and second alignment device disposed one above the other for adjusting the distance between each nozzle, each of said first and second alignment devices being provided with a guide defining a passage slot allowing the movement of said first and second series of nozzles in a direction parallel with said first direction, each of said first and second alignment devices including a series of combs receiving and immobilizing said first and second series of nozzles, said combs being slideable in a plane substantially parallel to the conveyor and movable in said second direction;
a first cell disposed upstream of said first immobilization device to detect the presence of the first and second series of bottles on the conveyor, said first cell being adjustable in said first direction; and
a second cell disposed downstream of said first immobilization device to detect the passage the second series of bottles from said second position, said second cell being adjustable in said first direction.

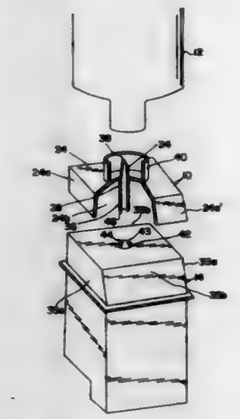
5,595,222
POSITIVE SEAL RETAINER FOR QUICK INSTALL FUEL CAP
Robert H. Thompson, Redford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 5, 1995, Ser. No. 498,160
Int. Cl.[6] B65B 1/04;3/04
U.S. Cl. 141—312 6 Claims

1. A fuel cap retainer and fuel tank cap system for a fuel tank filler tube comprising:
a baffle plate having an external side and an internal side and extending across the fuel tank filler tube near a distal end of the fuel tank filler tube, said baffle plate having a refueling opening into which a fuel filler nozzle is adapted to be received and a valve opening;
a flap valved attached to said baffle plate having a spring for biasing the flap valve into a closed position sealing the refueling opening;
a movable valve element associated with the valve opening, said movable valve element being biased to a closed position in



which the valve element seals the valve opening and shiftable to an open position in which the valve element permits fluid flow through the valve opening;
a fuel tank cap having a pressure relief valve and a structural element, said structural element holding the movable valve element in the open position only when the fuel tank cap is properly installed on the distal end of the fuel tank filler tube, wherein the movable valve element is closed whenever the fuel tank cap is not properly installed on the distal end of the fuel tank filler tube; and
said flap valve and said movable valve element sealing vapor transmission from one side of the baffle plate to the other when the fuel tank cap is not properly installed on the distal end of the fuel tank filler tube and said movable valve element permitting vapor pressure equalization on both the external and internal sides of the baffle plate when the fuel tank cap is properly installed on the distal end of the fuel tank filler tube so that the pressure relief valve in the fuel tank cap can be actuated by pressure developed below the baffle plate.

5,595,223
INK REFILLING ASSEMBLY
Sakae Hayao, Chatsworth, Calif., assignor to Mitsubishi Pencil Corporation of America, Chatsworth, Calif.
Continuation-in-part of Ser. No. 327,280, Oct. 21, 1994, abandoned. This application Mar. 23, 1995, Ser. No. 409,012
Int. Cl.[6] B65B 1/04;3/00; B67C 3/00
U.S. Cl. 141—375 11 Claims



1. An ink refilling assembly for refilling a removable ink cartridge with ink from a separate ink container through an ink inlet of said ink cartridge, said ink refilling assembly comprising:
a support plate having an upper surface and a lower surface;

side walls extending at right angles from edges of said support plate so as to surround said lower surface and define an inner space for receiving said cartridge;

a cylindrical conduit passing through said support plate at an angle transverse to said top plate, said conduit defining an upper portion and a lower portion which is opposite from said upper portion, said upper portion extending from said upper surface of said support plate for communicating ink from said ink container to said conduit and said lower portion extending from said lower surface of said support plate for communicating ink from said conduit to said ink cartridge; and

a plurality of ribs formed on inner surfaces of said side walls so as to project into said inner space and provide air passages for said cartridge while being refilled.

5,595,224

RETRACTABLE AND CONCEALABLE FUEL DELIVERY INSTALLATION

Gaetano Cutore, Sift Casella Postale 72 I-00040, Montecompatri (Rome), Italy

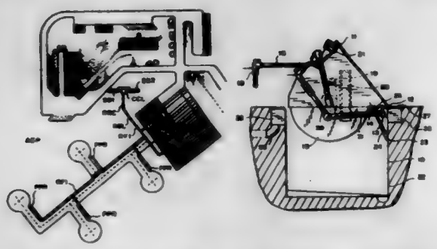
PCT No. PCT/IT93/00075, § 371 Date Mar. 2, 1995, § 102(e) Date Mar. 2, 1995, PCT Pub. No. WO94/01327, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 13, 1993, Ser. No. 373,228

Claims priority, application Italy, Jul. 14, 1992, RM92A0537

Int. Cl.[6] B65B *3/00*

U.S. Cl. 141—388 4 Claims



1. In a peripheric refuelling point (PPR) in a protected and concealed refuelling station system including

a) a fuel supply source (SS1,SS2);

b) a main remotely controlled delivering station (CCL) provided with

an electropump for delivering fuel from said fuel supplying source,

an oleodynamic control unit for delivering hydraulic fluid, and

an electric power supply;

c) a fuel delivering piping network (RRC) to be fed by said electropump;

d) a hydraulic fluid delivering piping network (RF1) to be fed by said oleodynamic control unit;

e) an electric network (REL) connected to said power supply;

said peripheric refuelling point (PPR) being connected to said main remotely controlled delivering station (CCL) through said fuel delivering piping network (RRC), said hydraulic fluid delivering piping network (RF1) and said electric network (REL) and said peripheric refuelling point (PPR), the improvement comprising:

an outer metal tank (10) of a parallelepipedic shape received into the ground;

an upper cover (11) for said tank (10) which has a hinge (12) at one side thereof;

a metal frame (14) which is hinged at said side of the tank under the hinge (12) of said cover so as to pivot between a lowered position and a raised position, said metal frame and said cover being engaged so as to drive the cover to pivot on the frame;

a take-up reel (15) pivotally supported by said metal frame and a fuel delivering hose (16) carried by said take-up reel in fluid communication with said fuel delivering piping network (RRC);

a hydraulic motor (19) for rewinding said take-up reel supported by said frame and controlled with the hydraulic fluid supplied from said main station through said fluid delivering piping network (RRC);

a cylinder and piston assembly (24) operating between said hinged frame and the wall (22) of said tank for causing the frame to raise and lower, said cylinder and piston assembly being operated by the hydraulic fluid delivered by oleodynamic control unit in said main remotely controlled delivering station through said fluid pipe network (RF1); and

control means for remotely controlling said main delivering station through said electric network (REL), said electric network consisting of low voltage electric lines.

5,595,225

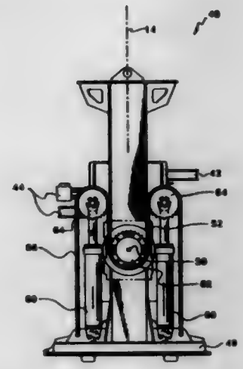
MECHANISM FOR ROTATING A TREE-FELLING IMPLEMENT AND TREE-FELLING IMPLEMENT THEREWITH

Sylvain Gilbert, 1641 boul. St-Dominique, Roberval Québec, Canada, and Michel Taillon, St-Félicien, Canada, assignors to Sylvain Gilbert, Canada

Continuation-in-part of Ser. No. 419,713, Apr. 10, 1995, Pat. No. 5,553,993. This application Dec. 12, 1995, Ser. No. 571,269

Int. Cl.[6] A01G *23/08*; E02F *3/32*

U.S. Cl. 144—34.1 4 Claims



1. A mechanism for rotating a tree-felling implement, the tree-felling implement comprising a frame rotatably connectable to a distal end of a boom of a logging vehicle by an implement pivot, the boom generally defining a boom plane, the mechanism comprising:

a pinion coaxial with the implement pivot and fixed in rotation with reference to the distal end of the boom, the pinion generally defining a pinion plane;

two longitudinally extending actuators mounted on the frame and substantially lying in the pinion plane, each actuator being adjacent to the pinion on a respective side thereof;

two sprockets substantially coplanar with the pinion plane and respectively rotatably connected to a free end of a corresponding actuator; and

a chain in mesh with the sprockets and the pinion, the chain having ends rigidly attached to the frame;

whereby, in use, the implement is rotated as the actuators are operated in opposite directions.

5,595,226

DRILLING/CUTTING MACHINE FOR MAKING JOINTS IN WOODEN MEMBERS

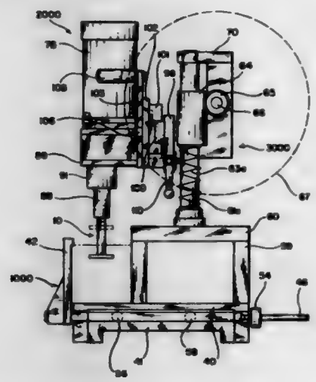
Teruo Nakanishi, Kyoto, Japan, assignor to Nakanishi Construction Company, Japan

Continuation-in-part of Ser. No. 263,338, Jun. 21, 1994, Pat. No. 5,499,667. This application Jul. 14, 1994, Ser. No. 274,825

Claims priority, application Japan, Jul. 14, 1993, 5-173933

Int. Cl.[6] B27F *5/00*

U.S. Cl. 144—69 14 Claims



1. A drilling/cutting machine for making joints in wooden members for accepting metal protrusions of a metal plate connector used to join wooden members together, said machine comprising:

a bed for holding the wooden member;

a drilling/cutting tool connected to said bed, said drilling/cutting tool having a drilling bit configured for boring a hole into a surface of the wooden member when said drilling/cutting tool is moved along a first axis towards said bed and configured for cutting at least one slot extending from the hole in the surface of the wooden member when said drilling/cutting tool is subsequently moved along another axis set substantially perpendicular relative to said first axis; and

a mechanism connected between said bed and said drilling/cutting tool, said mechanism configured for moving said drilling/cutting tool along said first axis towards and away from said bed, and configured for moving said drilling/cutting tool along said second axis along the surface of the wooden member.

5,595,227

ADJUSTABLE FENCE ASSEMBLY USED WITH JOINTER-PLANER MACHINES

David A. Varley, Pottstown, Pa., assignor to American Machine & Tool Company, Inc. of Pennsylvania, Royersford, Pa.

Filed May 25, 1995, Ser. No. 452,595

Int. Cl.[6] B27C *1/14*; *1/12*

U.S. Cl. 144—253.6 18 Claims

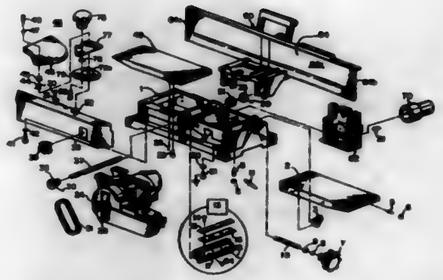
1. A fence assembly for use with a jointer-planer having a base housing a motor and supporting an infeed table, an outfeed table and a rotary knife positioned across the base and generally between and at least partially above the infeed and outfeed tables, the fence assembly comprising:

a fence having at least one generally planar side and an opposing side;

a fence traveler pivotally supporting the fence;

a fence track configured to slidably support the fence traveler with the fence for linear movement of the fence traveler on the fence track and pivotal movement of the fence on the fence trolley; and

a fence trolley simultaneously movably coupled with the fence and the fence traveler, the fence trolley being shaped and positioned to rotate at least partially into and out of at least one of the fence and the fence traveler with pivotal movement of the fence on the fence trolley.



5,595,228

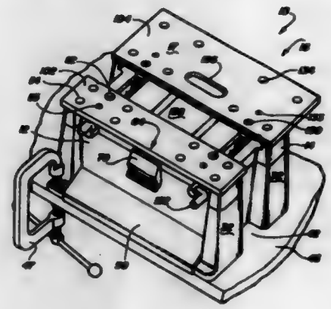
UTILITY BOX INCORPORATING AN INTEGRAL CLAMPING VISE

Edward H. Meimer, Short Hills, N.J.; Keith Kristiansen, Stratford, Conn.; Michael Bellone, New Providence, N.J.; Roberta S. Hall, Sparks; Michael A. Lefurski, Monkton, both of Md.; Michael D. Deleon, Millbrook, Canada; Christopher Bennett, Whitby, Canada; John B. Manson, Sr.; Frank Bastien, both of Brockville, Canada, and Colin Overy, North Augusta, Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 12, 1994, Ser. No. 289,676

Int. Cl.[6] B25H *1/12*; B65D *85/20*

U.S. Cl. 144—285 130 Claims



1. A utility box comprising:

a base defining an open chamber for holding at least one article; and

a clamping vise secured to said base, said clamping vise forming a cover for closing said open chamber.

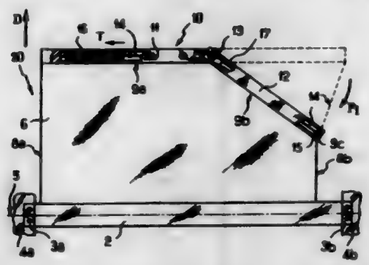
49. A utility box comprising:

a generally rectangular base defining an open chamber for holding at least one article;

a cover secured to said base; and

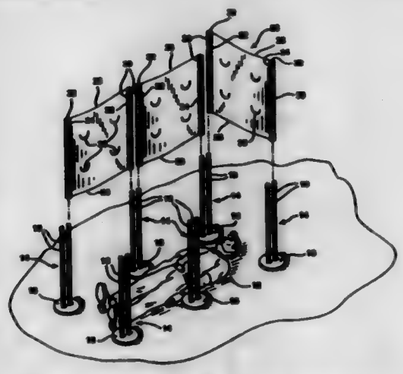
a pedestal disposed at each corner of said generally rectangular base, each adjacent pair of pedestals forming a first recessed area of said base between each said adjacent pair of pedestals, each of said first recessed areas extending the entire height of said base.

5,595,229
SELF-WINDING BLIND
Gaston Ouvrard, Brennire, France, assignor to Farnier & Penin SNC, Brennire, France
Filed Jun. 29, 1995, Ser. No. 496,530
Claims priority, application France, Jul. 29, 1994, 94 09452
Int. Cl.[6] E04F *10/06*
U.S. Cl. 160—23.1 13 Claims



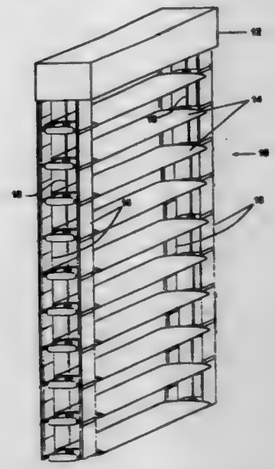
1. A self-winding blind constituted by a housing containing winding means for winding a fabric about an axis, the fabric having two side edges and a free edge fitted with a pull-bar, which free edge comprises a first segment and at least one second segment inclined relative to said first segment toward the housing and meeting a side edge at a corner forming an obtuse angle, wherein the pull-bar includes a fixed portion fixed to the first segment, and at least one portion hinged to the fixed portion about an axis substantially perpendicular to the plane containing the wound-out fabric in order to pivot between a first position in which said portion extends along the second segment and a second position in which said portion extends in line with the fixed portion, wherein the blind includes a flexible cord extending through a guide support disposed at the free end of the hinged portion, said flexible cord having a first end fixed to the pull-bar and a second end fixed to the fabric at the corner between the second segment and the side edge, and wherein the blind includes resilient tension means associated with the flexible cord and having the effect of pulling the hinged portion up against the second segment.

5,595,230
CRIME SCENE BODY SHIELD
Art Guerra, 13723 Faust Ave., Bellflower, Calif. 90706
Filed Jul. 31, 1995, Ser. No. 509,175
Int. Cl.[6] A47G *5/00*
U.S. Cl. 160—135 3 Claims



1. Apparatus for visually shielding a body from view at a scene of police action comprising a plurality of free-standing shroud support stands each having a base and at least two posts extending upright from said base, a plurality of flexible, opaque, rectangular shroud panels, fastening means for releasable fastening said shroud panels to said posts, wherein said fastening means includes at least a pair of laterally separated sleeves with closed upper ends formed in each of said panels, whereby said sleeves slide onto said posts to hold said shroud panels upright between said support stands, and wherein said support stands and said shroud panels are assembled together with said support stands disposed at laterally spaced intervals about said body with said shroud panels each releasably fastened to said posts of laterally adjacent ones of said shroud support stands so as to extend therebetween.

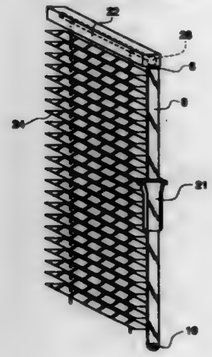
5,595,231
SUSPENDED SHUTTER
Norbert Marocco, 46 Pennycress Court, Woodbridge, Ontario, Canada
Filed Nov. 10, 1994, Ser. No. 339,172
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—168.1 15 Claims



1. A flexible, storable suspended shutter assembly having shutter blades, and, adapted to provide the general appearance of a rigid shutter door frame, the shutter blades being moveable and storable, and comprising;
- a head rail, and shutter blade raise cords extending therefrom, said head rail defining two ends, spaced apart a predetermined distance;
- a plurality of shutter blade assemblies supported from said head rail, each said blade assembly defining two ends which are coextensive with said ends of said head rail;
- two sets of blade suspension means, each said set of suspension means having upright portions defining inner and outer edges, and upper ends of said suspension means being secured to said head rail, with said outer edges coextensive with said ends of said head rail to simulate a door frame, and having transverse blade engaging means;
- capture means on respective said ends of said shutter blade assemblies, for capturing respective blade engaging means whereby each said shutter blade assembly is supported by respective said blade engaging means, in parallel spaced apart generally horizontal relation;
- blade members forming portions of said blade assemblies, said blade members having a length shorter than said blade assemblies;
- a plurality of blade recesses in each end of each of said blade member;

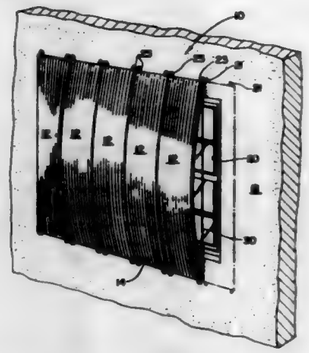
- a plurality of blade end cap members said blade members being interengaged with respective said end cap members at opposite ends of said blade members to form said blade assemblies and wherein said blade end cap members include said capture means for capturing said blade engaging means for supporting said blade assemblies therebetween;
- a plurality of end cap connector plugs extending from said end caps and adapted to interfit into respective blade recesses whereby to join said end caps end to end with said blade members; and,
- end opening means defined by said shutter blade assemblies, said raise cords extending through said end opening means, whereby raising of said raise cords will raise all of said shutter blade assemblies in sequence, towards said headrail for storage.

5,595,232
DEVICE FOR MANUALLY OPERATING A BLIND, PREFERABLY A VERTICAL BLIND
Siegfried Benthin, Bremerhaven, Germany, assignor to Benthin Aktiengesellschaft, Bremerhaven, Germany
Filed May 25, 1995, Ser. No. 450,195
Claims priority, application Germany, May 28, 1994, 44 18 735.1
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—178.1 20 Claims



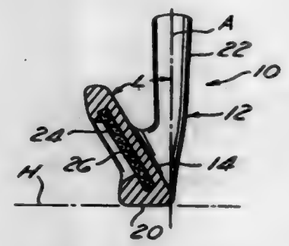
1. A device for the operation of a blind, comprising:
- a pull cord provided in the form of a loop and including a leading end portion and a return end portion;
- a grip body that can be grasped by a user of the blind, the grip body defining a leading end passage accommodating said leading end of said pull cord and defining a return end passage accommodating said return end portion of said pull cord, said grip body including leading end clamping means for clamping said leading end portion of said pull cord, said leading end clamping means being switchable from an outside of said grip body, and said grip body including return end clamping means for clamping said return end portion of said pull cord, said return end clamping means being switchable from an outside of said grip body;
- a section rail, said grip body being arranged movably along, and guided by, said section rail, said section rail accommodating said pull cord leading end portion and accommodating said pull cord return end portion, said section rail defining channels extending in a longitudinal direction and including a leading end portion channel and a return end portion channel.

5,595,233
HURRICANE SHUTTERS
Teddy A. Gower, 624 Riverside Rd., North Palm Beach, Fla. 33408
Filed Jan. 5, 1995, Ser. No. 369,861
Int. Cl.[6] E06B *9/00*
U.S. Cl. 160—232 6 Claims



1. A storm shutter having at least one double-skinned panel, said double-skinned panel having a plurality of web members extending between the double-skin of said double-skinned panels defining a plurality of side by side open ended channels, a removable rod extending through at least one of said open ended channels, said rod including means for attaching said panels to the frame of the window or door intended to be protected, said rod includes a threaded end portion and an eyelet threadably mounted on said threaded end portion, a cable attached to one end of said rod and to the other end of said rod and means for adding tension to said cable to bow said rod and said double-skinned panel.

5,595,234
METHOD OF MANUFACTURING GOLF CLUB HEAD WITH INTEGRAL INSERT
William C. Beck, Rancho Palos Verdes, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.
Division of Ser. No. 388,762, Feb. 15, 1995. This application Jun. 8, 1995, Ser. No. 488,990
Int. Cl.[6] B22D *19/00*
U.S. Cl. 164—9 12 Claims



1. A method for manufacturing a golf club head comprising the steps of:
- (a) forming a quantity of molten wax into a wax pattern which approximates the shape of the club head and defines a front face, a rear face, and an interior cavity having a peripheral sidewall, said rear face having a window formed therein which communicates with the interior cavity and includes a peripheral edge disposed inwardly relative to the sidewall, said interior cavity including an insert disposed therewithin;

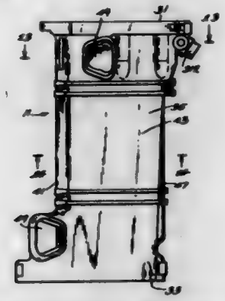
(b) applying a coating to the wax pattern and that portion of the insert exposed by the window, said coating hardening into an outer shell;
(c) melting the wax pattern and draining the wax from within the outer shell, said insert remaining within the outer shell;
(d) pouring a quantity of molten metal into the outer shell, said metal flowing about said insert and hardening into a head body which rigidly captures the insert within the interior cavity of the head body; and
(e) removing the outer shell from the club head.

5,595,235

OUTBOARD MOTOR EXHAUST HOUSING AND LOST FOAM PATTERN THEREFOR

Michael C. Anschu, Fort Myers, Fla.; Clarence E. Blanchard, Kenosha, Wis., and James S. Nerstrom, Green Oaks, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 255,696, Jun. 7, 1994, Pat. No. 5,498,182.
This application Nov. 3, 1995, Ser. No. 552,396
Int. Cl.[6] B22C 7/02
U.S. Cl. 164—235 **6 Claims**



1. A lost foam pattern assembly comprising a port outer piece including a port outer side surface, and an inner surface defining a mating face, a port inner piece including an outer surface defining a mating face in engagement with said mating face of said inner surface of said port outer piece, and an inner surface defining a mating face and partially defining an exhaust gas passage, a starboard inner piece including an inner surface including a mating face in engagement with said mating face of said inner surface of said port inner piece and partially defining said exhaust gas passage, and an outer surface including a mating face, and a starboard outer piece including an inner surface defining a mating face in engagement with said mating face of said outer surface of said starboard inner piece, and a starboard outer side surface.

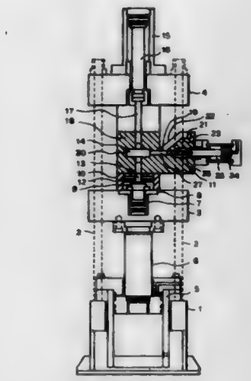
5,595,236

VERTICAL SQUEEZE CASTING APPARATUS

Ho-In Lee; Ki-Bae Kim; Ye-Sub Han, and Yong-Joon Kim, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed May 8, 1995, Ser. No. 436,484
Int. Cl.[6] B22D 17/00; 17/04
U.S. Cl. 164—319 **6 Claims**

1. A vertical squeeze casting apparatus to provide local pressing for molten metal filled in a metal mold cavity formed within a metal mold, which comprises:
- at least three means for pressing the molten metal within the metal mold cavity in upper, lower, and lateral directions, respectively, at least one of said means for pressing the molten metal ejecting the molten metal after solidification thereof; and
- a molten metal supplying means which is installed on an upper portion of at least one of the pressing means and supplies the molten metal through a hole passing through the metal mold.

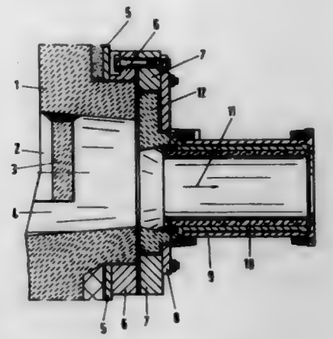


5,595,237

HORIZONTAL CONTINUOUS CASTING APPARATUS FOR METALS

Eberhard Fischer, Bitthard, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Continuation of Ser. No. 220,291, Mar. 30, 1994, abandoned.
This application Oct. 5, 1995, Ser. No. 538,770
Claims priority, application Germany, Mar. 30, 1993, 43 11 031.2
Int. Cl.[6] B22D 11/10
U.S. Cl. 164—440 **4 Claims**



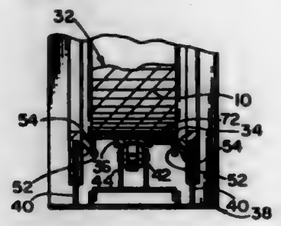
1. A horizontal continuous casting apparatus for metals, comprising:
- an inductively heated liquid metal supply vessel, said vessel including a side wall region defining a horizontally extending outlet conduit;
- a horizontal continuous casting mold defining a mold cavity having an inlet opening aligned with said outlet conduit;
- means for cooling the mold; and
- a flow restricting plate member comprised of a refractory material and having a peripheral edge surface portion secured to an interior wall surface portion of said outlet conduit at a distance from said mold inlet opening at least equal to a smallest linear dimension of a cross-sectional area of the mold cavity so as to define a melt passage in a lower half of said outlet conduit, the plate member having a cross-sectional profile smaller than a cross-sectional profile of the mold cavity and smaller than said outlet conduit so that the cross-sectional area of said melt passage is less than half the cross-sectional area of the mold cavity.

5,595,238

ROTATABLY SUPPORTED REGENERATIVE FLUID TREATMENT WHEEL ASSEMBLIES

Henry Y. Mark, Philadelphia, and James A. Heywood, Yardley, both of Pa., assignors to Engelhard/ICC, Philadelphia, Pa.

Filed Sep. 16, 1994, Ser. No. 307,134
Int. Cl.[6] F23L 15/02
U.S. Cl. 165—9 **13 Claims**



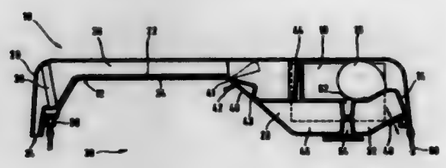
6. A rotatably supported regenerative fluid treatment wheel assembly comprising:
- a regenerative fluid treatment wheel having a core porous in an axial direction;
- a pair of seal flanges extending at least generally outwardly from the treatment wheel around the outer circumference of the treatment wheel proximal each of two major opposing axial sides of the wheel;
- a housing surrounding the treatment wheel, the housing including a pair of opposing outer walls with openings therethrough, at least generally axially aligned with the core of the treatment wheel; and
- flexible seals releasably clipped on the housing surrounding each opening, each seal positioned to contact one of the seal flanges of the treatment wheel.

5,595,239

HEATING, VENTING, AND/OR AIR CONDITIONING UNIT

Hannes Wolf, Buchen, and Alfred Kern, Schneeberg, both of Germany, assignors to Aurora Konrad G. Schulz GmbH & Co., Odenwald, Germany

Filed Aug. 1, 1994, Ser. No. 284,355
Claims priority, application Germany, Nov. 29, 1993, 43 40 587.8
Int. Cl.[6] F28F 13/00
U.S. Cl. 165—41 **23 Claims**



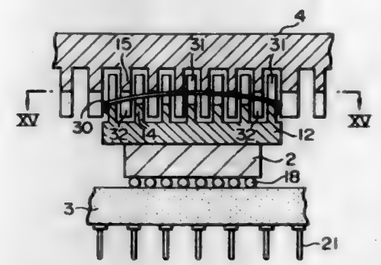
1. A heating-venting-air conditioning unit for a cabin vehicle positioned at a roof of the cabin vehicle; said unit comprising:
- at least one blower having air channels connected to a suction side and a pressure side of said blower, with at least one said air channel connected to said suction side to form a suction channel and with at least one said air channel connected to said blower side to form an air distributing channel; and
- wherein at least one of said suction channel and said air distributing channel is comprised of two half-shells manufactured by a double deep-drawing process.

5,595,240

COOLING APPARATUS OF ELECTRONIC DEVICES

Takahiro Daikoku, Uchiku; Noriyuki Ashiwake, Tsuchiura; Nobuo Kawasaki, Ibaraki, and Shizuo Zushi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 664,605, Mar. 4, 1991, Pat. No. 5,515,912.
This application Jun. 5, 1995, Ser. No. 464,581
Claims priority, application Japan, Mar. 2, 1990, 2-49269
Int. Cl.[6] H01L 23/36; 23/34
U.S. Cl. 165—80.4 **4 Claims**



1. A cooling apparatus for electronic devices, the cooling apparatus comprising:
- thermal conductive members each provided with a plurality of first fins;
- second fins engagable with said first fins so as to transmit heat from said first fins to a housing;
- setting spaces formed of grooves provided in each of said first and second fins extending transversely through each of said first and second fins in a direction substantially perpendicular to said first and second fins; and
- linear spring members accommodated in said setting spaces and extending in a direction transverse to a longitudinal axis of said first and second fins, whereby each of said thermal conductive members is urged in a direction toward the surface of each of said electronic devices mounted on a circuit substrate.

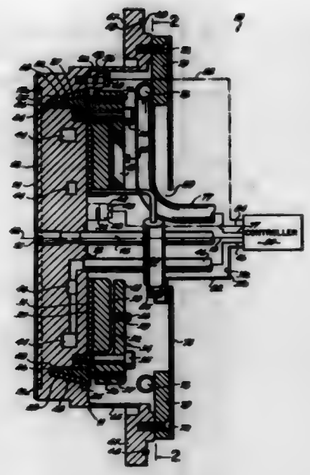
5,595,241

WAFER HEATING CHUCK WITH DUAL ZONE BACKPLANE HEATING AND SEGMENTED CLAMPING MEMBER

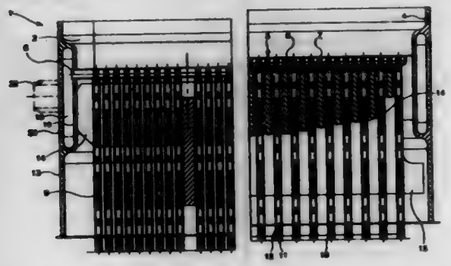
Vaclav Jelinek, River Edge, N.J., assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corp., Orangeburg, N.Y.

Filed Oct. 7, 1994, Ser. No. 319,884
Int. Cl.[6] F28F 7/00
U.S. Cl. 165—80.1 **41 Claims**

1. A wafer heating chuck comprising:
- a backplane having a first surface for mounting a wafer thereon and a second surface with an annular recess formed therein, the annular recess located adjacent an outer edge of the backplane and having an outer angled wall; and
- an outer annular backplane heater residing in the annular recess, the heater including an angled surface in engagement with the outer angled wall to promote heat transfer from the heater to the outer edge of the backplane.



5,595,242
HEAT EXCHANGER
Jiri Jekerle, Baunatal, and Bernd Schope, Kassel, both of Germany, assignors to Schmidt'sche Heissdampf GmbH, Kassel-Bettenhausen, Germany
Filed May 10, 1995, Ser. No. 438,504
Claims priority, application Germany, May 13, 1994, 44 16 932.9
Int. Cl.[6] F28D 7/10; F28F 9/02
U.S. Cl. 165—154 11 Claims



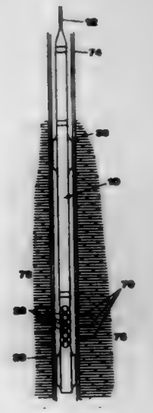
1. In a heat exchanger wherein a hot fluid and a coolant are caused to flow through double tubes having first and second ends, each of the double tubes defining an inner flow path and an annular outer flow path which is coaxial with the inner flow path, the tubes being supported adjacent their first ends by a first tube plate, the first tube plate defining a first plane and being in part comprised of a first web plate, the first web plate in part defining a first wall of a first plenum chamber to which a pressurized fluid will be delivered, first flow paths of the double tubes being in fluid communication with the first plenum chamber via apertures in the first web plate, the first tube plate further being comprised of plural fluid collectors which are in fluid communication with associated second flow paths of the double tubes the first plenum chamber being further defined by a first casing which forms a second wall Of the first plenum chamber, the first casing being disposed on a first side of the first plane, the heat exchanger further including at least first support means disposed on an opposite side of the first plane with respect to the first plenum chamber defining casing, the improvement comprising:

means defining a first annular chamber which extends about the periphery of the first tube plate, said first annular chamber defining means having inner and outer walls and a pair of opposite side edges, said first annular chamber defining means being disposed between the first plenum chamber defining casing and the first support means, said first annular chamber defining means outer wall being in alignment with the first plenum chamber defining casing and the first support means, said opposite side edges of said annular chamber defining means being respectively affixed to the first support means and the first plenum chamber defining casing;

means establishing fluid communication between the fluid collectors through said first annular chamber defining means inner wall; and

fluid connection defining means extending through said first annular chamber defining means outer wall.

5,595,243
ACOUSTIC WELL CLEANER
Voldi E. Maki, Jr., 11904 Bell Ave., Austin, Tex. 78759-2415, and Mukul M. Sharma, Dept. of Petroleum Engr. Univ. of Texas, Austin, Tex. 78712
Continuation of Ser. No. 283,399, Jul. 29, 1994, abandoned. This application Oct. 10, 1995, Ser. No. 544,409
Int. Cl.[6] E21B 28/00; 37/08
U.S. Cl. 166—177.2 3 Claims



1. An apparatus for producing high acoustic levels in a well for the purpose of stimulating fluid production from a formation into a well, said apparatus comprising:

an elongate sealed tool housing;

a plurality of acoustic transducers circumferentially mounted within said elongate sealed tool housing, each of said acoustic transducers comprising:

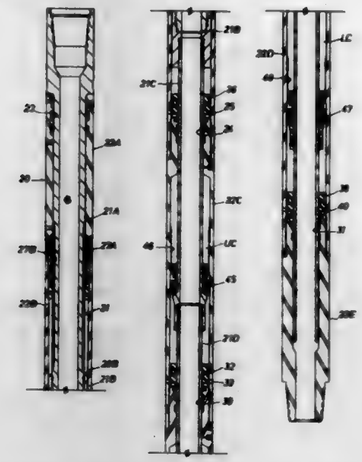
a piezoelectric ceramic source within an air chamber isolated from the well fluid;

a head mass coupled to the ceramic source and exposed to the well fluid; and

a support which isolates the well fluid from the air chamber located at the node of the resident structure formed by the ceramic source and the head mass; and

wherein said acoustic transducers are radially oriented in order to direct high energy acoustic radiation directly into the formation.

5,595,244
HYDRAULIC JAR
Billy J. Roberts, Houston, Tex., assignor to Houston Engineers, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 187,708, Jan. 27, 1994, Pat. No. 5,447,196. This application Jul. 24, 1995, Ser. No. 505,908
Int. Cl.[6] E21B 31/107; 4/14
U.S. Cl. 166—178 1 Claim



1. A hydraulic jar for use in applying a jar to an object stuck in a well bore, comprising

first and second telescopically arranged tubular members connectible, respectively, to the stuck object and a pipe string adapted to be raised and lowered within the well bore and having an annular space between them,

means sealing between upper, lower and intermediate equal diameter portions of the tubular members,

an upper piston ring sealably slidable within the annular space between the tubular members vertically intermediate the upper and intermediate sealing means to form an upper pressure chamber in the annular space on one end of said upper piston ring which is adapted to be filled with hydraulic fluid,

a lower piston ring sealably slidable with the annular space between the tubular members vertically intermediate the lower and intermediate sealing means to form a lower pressure chamber in the annular space on one end of said lower piston ring which is adapted to be filled with hydraulic fluid,

the outer of the first and second tubular members having ports connecting the exterior thereof with the annular space on the other ends of the piston rings,

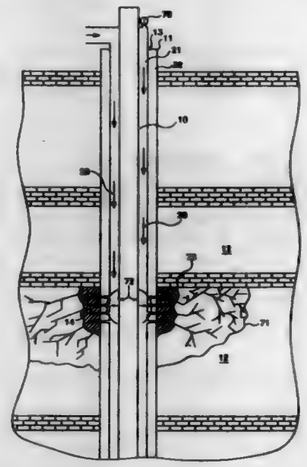
the first tubular member having an upper cylindrical restriction in the upper pressure chamber and a lower cylindrical restriction in the lower pressure chamber,

upper detent means carried by the second tubular member within the upper pressure chamber for movement through the upper restriction so as to restrict the flow of hydraulic fluid within said upper pressure chamber as the second tubular member is moved with the pipe string in one vertical direction with respect to the first tubular member and permit relatively free flow of such fluid within the upper pressure chamber as the second tubular member is moved with the pipe string in the opposite vertical direction with respect to the first tubular member,

lower detent means carried by the second tubular member within the lower chamber so as to restrict the flow of hydraulic fluid within said lower pressure chamber simultaneously with the restriction of flow in said upper chamber as the second tubular member is moved with the pipe string in said one vertical direction with respect to the first tubular member and permit relatively free flow of such fluid within the lower pressure chamber simultaneously with the relatively free flow in said upper chamber as the second tubular member is moved with the pipe string in said opposite vertical direction with respect to said first tubular member,

means on said tubular members for engaging one another to impart a jar to the object as the upper and lower detent means are moved in said one vertical direction out of the restrictions to impart a jar to the object as said upper and lower detent means are moved through the restrictions.

5,595,245
SYSTEMS OF INJECTING PHENOLIC RESIN ACTIVATOR DURING SUBSURFACE FRACTURE STIMULATION FOR ENHANCED OIL RECOVERY
George L. Scott, III, 100 N. Pennsylvania, Roswell, N.M. 88201
Filed Aug. 4, 1995, Ser. No. 511,244
Int. Cl.[6] E21B 43/267; 47/06
U.S. Cl. 166—250.1 29 Claims



1. A method of fracturing a subsurface formation adjacent to a cased well containing tubing comprising:

(a) pumping a mixture containing fluid and non-activated resin-coated proppant downhole between casing and tubing, thereby causing the mixture to pass under pressure through perforations in the casing; and

(b) after pumping of the proppant is substantially complete, breaching a tubing-conveyed container holding a quantity of activator fluid, thereby causing the activator fluid to pass from the tubing through perforations in the casing.

11. An apparatus for fracturing with resin-coated proppant a subsurface formation adjacent to a cased well containing tubing comprising:

(a) a tubing-conveyed container holding a quantity of resin activator and situated in a wellbore adjacent to perforations in casing lining the wellbore;

(b) a surface-controlled breaching device coupled to said container;

(c) a surface pump having an outlet positioned to pump fluid under preasure between casing and tubing; and

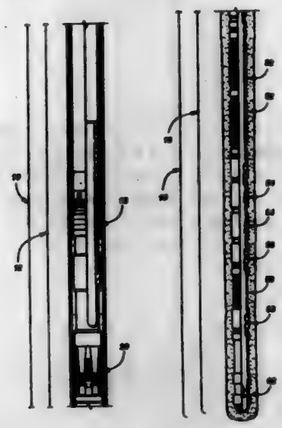
(d) a surface pressure monitor positioned to measure pressure in the casing-tubing annulus.

5,595,246

ONE TRIP CEMENT AND GRAVEL PACK SYSTEM

Benn A. Voll, Houston, Tex.; Matthew S. Kebodeaux, Abita Spring, La., and Steve Stringfellow, Spring, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 14, 1995, Ser. No. 388,371
Int. Cl.[6] E21B 33/13;43/04
U.S. Cl. 166—278 10 Claims



1. A method of well completion comprising:
drilling a well bore;
running into the well bore an assembly comprising a liner, equipment for cementing said liner, and equipment for treating, conditioning, or gravel packing the portion of the formation adjacent the lower end of said assembly, wherein said assembly further comprises an inner equipment string such that said inner equipment string initially comprises an inner circulation assembly;
isolating a zone outside said assembly into an upper and a lower region;
cementing at least a part of said upper region;
selectively disconnecting said inner circulation assembly from the remainder of said inner equipment string;
removing said inner equipment string from the well bore without removing said inner circulation assembly;
connecting a wash pipe to said inner circulation assembly; and
treating, conditioning, or gravel packing the lower region of the formation.

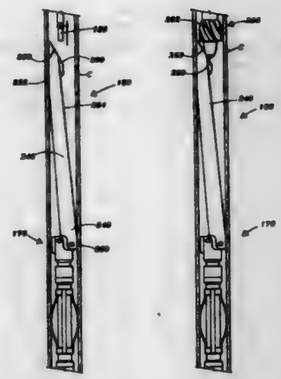
5,595,247

RETRIEVABLE THROUGH TUBING TOOL AND METHOD

Britt O. Braddick, Houston, Tex., assignor to TIW Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 223,704, Apr. 6, 1994, Pat. No. 5,566,762. This application Mar. 23, 1995, Ser. No. 409,276
Int. Cl.[6] E21B 29/06
U.S. Cl. 166—297 34 Claims

1. A method for cutting a window at a window depth in a first tubular disposed in a wellbore, a portion of said first tubular containing therein a second tubular having a diameter less than said first tubular, said second tubular terminating at a lower end, said lower end being disposed at a termination depth in said wellbore less than said window depth, said method comprising the following steps:
inserting a downhole tool into said wellbore;
moving said downhole tool through said second tubular and past said lower end of said second tubular;



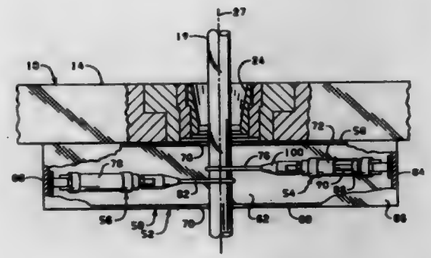
securing said downhole tool within said first tubular adjacent said window depth;
inserting a cutting member into said first tubular;
guiding said cutting member with said downhole tool to cut said window in said first tubular with said cutting member;
retrieving said cutting member from said wellbore; and
retrieving said downhole tool from said wellbore.

5,595,248

PIPE ALIGNMENT APPARATUS

Larry Denny, Oklahoma City, Okla., assignor to Den-Con Tool Co., Oklahoma City, Okla.

Filed Aug. 25, 1995, Ser. No. 519,224
Int. Cl.[6] E21B 19/00;19/10;3/04
U.S. Cl. 166—379 21 Claims



1. An apparatus for centering a pipe string within a slip bowl to facilitate the setting of a set of slips about the pipe string, the slip bowl disposed in a floor of a drilling rig and the pipe string suspended from the drilling rig so that the pipe string extends downwardly through the slip bowl and into a well bore, the apparatus comprising:
pipe engaging means for selectively engaging a portion of the pipe string from below the floor of the rig and moving the pipe string into alignment with the center of the slip bowl.

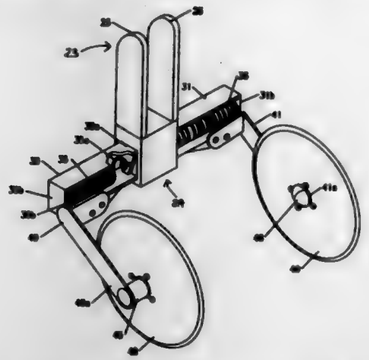
9. A method for centering a pipe string within a slip bowl to facilitate the setting of a set of slips about the pipe string, the slip bowl disposed in a floor of a drilling rig and the pipe string suspended from the drilling rig so that the pipe string extends downwardly through the slip bowl and into a well bore, the method comprising the steps of:
selectively engaging the pipe string from below the floor of the rig so as to align the pipe string with the center of the slip bowl.

5,595,249

GROUND LEVELER ATTACHMENT FOR A GROUND WORKING DEVICE

Dan P. Steinberger, 1617 E. 14th St., West Fargo, N. Dak. 58078, and Jack Oberlander, 3201 First St. North, Fargo, N. Dak. 58102

Filed Sep. 5, 1995, Ser. No. 523,152
Int. Cl.[6] A01B 49/02
U.S. Cl. 172—156 13 Claims



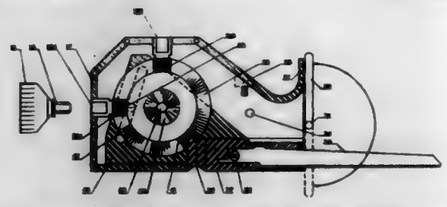
1. A ground leveler attachment for a ground working device comprising:
a mounting means for securely mounting said ground leveler attachment to said ground working device, said mounting means being securely mounted to a shank supporting a ground breaking tool of said ground working device;
a leveler support means attached to said mounting means and including a carrier arm having a distal end, a pair of leg supports being in pivotal and contactable relationship to said carrier arm which has a pair of pivot mounts attached thereto, a pair of leg members attached to said leg supports, and a pair of leveler support said leg members, said pivot mounts adapted to be received in selected ends of said leg supports and for positioning said leg supports relative to said carrier arm, each of said pivot mounts having a lateral cross-section consistent with the lateral cross-section of said leg supports for restricting movement of said leg supports;
a pair of levelers attached to said leveler support means for leveling the ground; and
bias means for biasing said levelers into a ground engagement position.

5,595,250

DRILL ACCESSORY

George C. Bourke, 8176 Spanker Ridge Dr., Bentonville, Ark. 72712

Continuation-in-part of Ser. No. 414,829, Mar. 31, 1995. This application Jan. 25, 1996, Ser. No. 591,692
Int. Cl.[6] B23D 51/10
U.S. Cl. 173—29 4 Claims



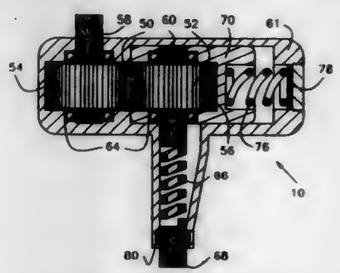
1. A power tool attachment for converting rotary motion from a power tool into reciprocating motion of a saw comprising: a housing, a first gear mounted in said housing and having a peg mounted eccentrically thereon, a blade connected to a blade drive arm, said blade drive arm reciprocable in said housing and having a slot therein, said peg received in said slot, a pair of second bevel gears mounted in said housing orthogonally with respect to each other and each being engaged with said first bevel gear, said second bevel gears each having a recess therein, said first bevel gear having a recess in a center portion thereof, and a drive pin receivable in any one of said recesses and a rotatable power tool chuck at opposite ends thereof, whereby rotation of said power tool chuck enables the reciprocation of said blade along an axis parallel to a rotation axis of said power tool chuck or along any axis orthogonal to said axis of said power tool chuck depending upon which recess the drive pin is received.

5,595,251

DISPLACEABLE GEAR TORQUE CONTROLLED DRIVER

Joseph S. Cook, Jr., Webster, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 10, 1994, Ser. No. 288,114
Int. Cl.[6] B25B 21/00; B23B 45/00
U.S. Cl. 173—178 18 Claims



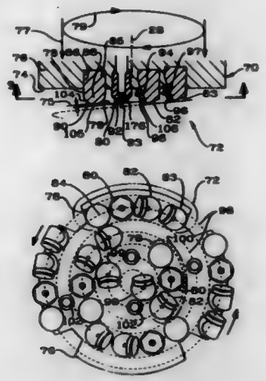
1. A driver for applying torque to a fastener, comprising:
a driver housing;
a first gear carried by said driver housing for relative rotation with respect thereto, said first gear having first gear teeth mounted around a circumferential portion thereof,
a second gear displaceable with respect to said first gear in a direction having a lateral component with respect to said first gear between an engaged and a disengaged position, said second gear having second gear teeth mounted around a circumferential portion thereof, said second gear teeth and said first gear teeth meshing in said engaged position, at least one of said first and second gear teeth defining an angled tooth profile to produce a separating force in response to torque transfer between said first and second gears for moving said second gear in a direction having a lateral component with respect to said first gear to said disengaged position to thereby limit torque transferred between said first and second gears and to said fastener;
a pressurized-chamber assembly to bias said second gear toward said engaged position, said pressurized-chamber assembly including a chamber for pressurization; and
a pressure fluid supply to maintain a pressure within said chamber to thereby produce a substantially constant bias on said second gear, opposing said separating force, during the period in which said second gear is displaced with respect to said first gear from said engaged to said disengaged position.

5,595,252

FIXED-CUTTER DRILL BIT ASSEMBLY AND METHOD

Thomas A. O'Hanlon, Tacoma, Wash., assignor to Flowdril Corporation, Kent, Wash.

Filed Jul. 28, 1994, Ser. No. 282,075
Int. Cl.[6] E21B *10/46*
U.S. Cl. 175—57 57 Claims



1. A rotary drill bit assembly having a longitudinal axis of rotation, said drill bit assembly being adapted to drill into an earth formation to form a drill hole having a hole side wall and a hole end wall, said assembly comprising:

a. a drill bit housing having an upper end adapted to be connected to a drill string means and a lower end at which the housing has an operating surface, said housing being configured and arranged for rotation about said longitudinal axis;

b. at least one cutter unit mounted at said operating surface along a circumferential cutting path having a circumferential axis at a pre-determined radial distance from the longitudinal axis, in a manner that as said drill bit assembly rotates about said longitudinal axis, said cutter unit travels along said circumferential cutting path in a forward direction around said longitudinal axis; said cutter unit comprising:

i. a forwardly located lead positioning cutter having at a lower end thereof a lower relatively hard positioning portion having a downwardly facing relatively blunt contact surface, which contact surface is located axially at a lower positioning location at the lower end of said positioning cutter to engage material at the drill hole end wall at said circumferential path said positioning cutter has a relatively hard material removal surface portion of said contact surface extending forwardly and upwardly from a lowermost positioning surface portion of said contact surface in a manner to be able to engage and remove at least some material from said drill hole end wall;

ii. a trailing cutter having a relatively sharp cutting edge portion which is positioned at said circumferential axis rearwardly of said lead positioning cutter at an axial location operationally lower than the contact surface of the positioning cutter, in a manner to be positioned and configured to cut into said drill hole end wall as said drill assembly advances into the drill hole,

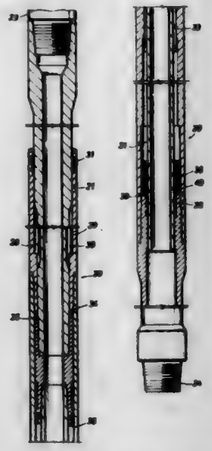
whereby, in operation, said lead positioning cutter engages the drill hole end wall to locate the drill bit assembly axially relative to the end wall of the drill hole, and thus locate the cutting depth of the trailing cutter axially relative to the circumferential path.

5,595,253

HYDRAULIC JAR WITH IMPROVED DETENT RING

Glenn J. Martin, Houma, La., and Chuan C. Teng, Houston, Tex., assignors to Houston Engineers, Inc., Houston, Tex.

Filed Jul. 24, 1995, Ser. No. 506,105
Int. Cl.[6] E21B *4/14*
U.S. Cl. 175—297 6 Claims



1. A hydraulic jar for use in applying up and down jars to an object stuck in a well bore, comprising,

first and second telescopically arranged, tubular members connectible, respectively, to the stuck object and a pipe string adapted to be raised and lowered within the well bore, and being circumferentially spaced apart and sealed with respect to one another along equal diameter portions to form an annular space therebetween,

the outer of the first and second members having a port therein to connect one end of the space with the well bore,

a piston ring being sealably slidable within the space to separate the port from a chamber within the space which contains hydraulic fluid,

one of the tubular members having a cylindrical restriction within the chamber and the other tubular member having longitudinal grooves formed about its circumference, and longitudinally spaced upper and lower shoulders above and below the rings, and

detent ring means carried by the other member within the annular space vertically intermediate the upper and lower shoulders with one side closely surrounding the grooves and having upper and lower annular positions on its outer sides, said detent ring means being vertically reciprocable with respect to said other member between a first position in which its lower end is seated on the lower shoulder of the other member to prevent flow therepast, as a lower annular portion of its other side is pulled upwardly through the restriction, and a second position in which its upper end is seated on the upper shoulder of said other member to prevent flow therepast, as an upper annular portion of its other side is pushed downwardly through the restriction,

said detent ring means having metering means which permit limited flow therethrough as said annular portions move through said restriction and means connecting its one side with its other side intermediate said annular portions so that the annular portion last to move out of the restriction is relatively freely movable back into the restriction until the other annular portion enters the restriction,

said tubular members having means arranged to engage one another for imparting an up jar to the stuck object as the lower annular portion of the detent ring means is pulled upwardly out of the restriction, and a down jar thereto as the upper annular portion of the detent ring means is pushed downwardly out of the restriction, and

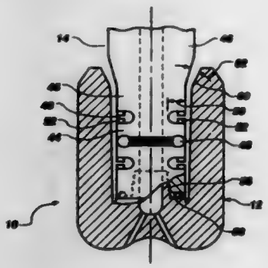
said metering means being of such construction as to permit a lesser volume of limited flow therethrough, during an upward jar, then during a downward jar.

5,595,254

TILTING BIT CROWN FOR EARTH-BORING DRILLS

Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 117,214, Sep. 3, 1993, Pat. No. 5,503,236.
This application Jun. 5, 1995, Ser. No. 462,780
Int. Cl.[6] E21B *7/08*
U.S. Cl. 175—320 20 Claims



1. A drill bit for drilling subterranean formations, comprising:

a shank defining a longitudinal axis for attaching said drill bit to a drill string;

a crown for cutting a said subterranean formation;

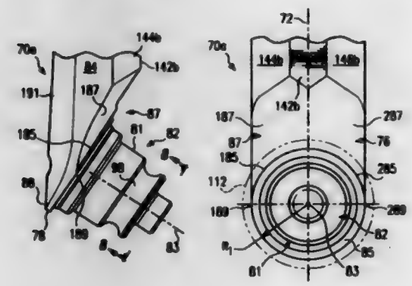
structure immediately adjacent said crown and integral with said shank for tilting said crown with respect to said longitudinal axis of said shank while transmitting torque and axial loads between said shank and said crown.

5,595,255

ROTARY CONE DRILL BIT WITH IMPROVED SUPPORT ARMS

Alan D. Huffstutler, Grand Prairie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 8, 1994, Ser. No. 287,441
Int. Cl.[6] F21B *10/08*; E21B *10/12*
U.S. Cl. 175—331 19 Claims



1. A rotary cone drill bit for forming a borehole, comprising:

a bit body having a lower exterior surface, and an upper end portion adapted for connection to a drill string for rotation of said bit body;

a number of support arms extending from said bit body, each of said support arms having a lower portion with an inside surface and a machined surface formed thereon;

a spindle connected to each of said machined surfaces with each spindle projecting generally downwardly and inwardly with respect to its associated support arm;

a number of cutter cone assemblies equaling said number of support arms and mounted respectively on one of said spindles;

said inside surface of each support arm having a throat relief area formed adjacent to said spindle and extending contiguous with adjacent portions of said machined surface whereby said throat relief area and said cutter cone assembly mounted on said spindle cooperate with each other to provide enhanced fluid flow between said cutter cone assembly and said throat relief area;

said machined surface having a generally uniform outside diameter formed on said inside surface adjacent to said spindle;

said spindle having an axis extending therethrough and said outside diameter of said machine surface having a radius R_1 extending from said spindle axis;

said lower portion of said support arm having a width equal to approximately twice the value of R_1; and

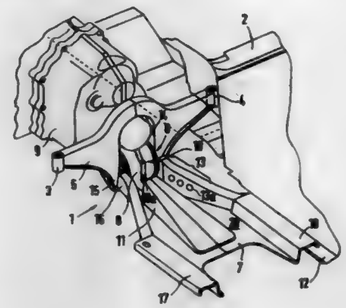
said throat relief area extending contiguous from said machined surface over approximately 180° of said outside diameter.

5,595,256

ASSEMBLY BEARING FAVORABLE IN CRASH SITUATIONS

Robert Mueller, Mönsheim, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weinsuch, Germany

Filed Feb. 24, 1995, Ser. No. 393,675
Claims priority, application Germany, Feb. 24, 1994, 44 05 904.3
Int. Cl.[6] B60K *5/00*
U.S. Cl. 180—232 13 Claims



1. Assembly bearing structure for a motor vehicle, having a transmission case with a front-side end, which is favorable in crash situations, comprising a holding arrangement disposed on a vehicle body, wherein the holding arrangement comprises a carrying member supported on the vehicle body as well as an elastically connected longitudinal support which is provided with a catch device for the front-side end of the transmission case, said longitudinal support having at least one energy-absorbing deformation area; and

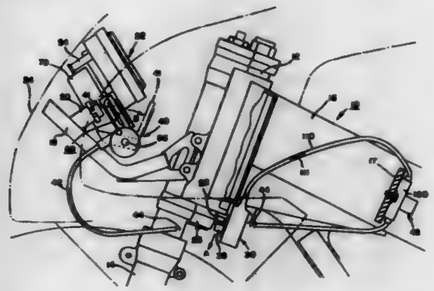
wherein the deformation area of the longitudinal support is formed by at least one stability-reducing zone which is arranged in such a manner that, when stressed by a crash, the transmission case is guided to swivel out in a downward direction of the vehicle body.

5,595,257

CONTROL APPARATUS FOR A VEHICLE

Susumu Yoshida, and Takeshi Nakazawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,086
Claims priority, application Japan, Dec. 28, 1992, 4-348256; Oct. 8, 1993, 5-253421
Int. Cl.[6] B60R 25/00
U.S. Cl. 180—287 35 Claims



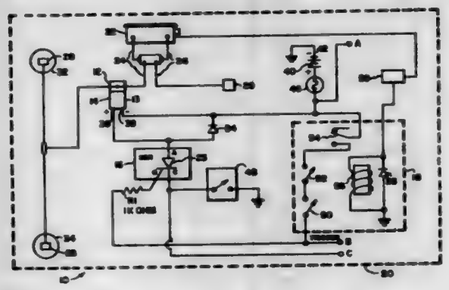
1. A control apparatus for a vehicle having a body frame, a handle and an engine, the control apparatus comprising:
an engine control unit provided on the body frame, said engine control unit including:
an electric circuit for starting and stopping the engine and a slot for permitting entry to said electric circuit;
a judgement unit electronically verifying whether or not a key inserted in said slot is correct with respect to said engine,
whereupon proper electronic verification of said key operation of said engine in cooperation with said engine control unit is controlled; and
a handle lock unit automatically unlocking the handle when said key inserted in said slot is verified by said judgement unit.

5,595,258

ANTI-CAR JACKING SYSTEM

Michael J. Georgas, 5143 W. George St., Chicago, Ill. 60641, and Kirk L. Nanz, 1717 Carnegie Cir., Tampa, Fla. 33619

Filed Apr. 12, 1995, Ser. No. 421,666
Int. Cl.[6] B60T 17/16
U.S. Cl. 180—287 28 Claims



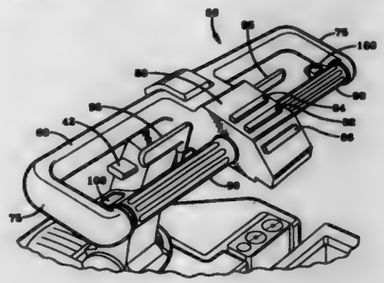
1. A system for disabling a stolen motor vehicle, the stolen motor vehicle having a master cylinder housing brake fluid and coupled to brakes by brake lines, said system comprising:
means for controlling the flow of brake fluid between the master cylinder and the brakes, said means for controlling initially allowing bidirectional flow of brake fluid; and
first means for triggering said means for controlling to restrict the flow of brake fluid to one direction, said first means being activated in response to: initiation of the system, tilting of the stolen motor vehicle forward at a first angle with respect to ground equal to or greater than a predetermined angle, and application of the brakes.

5,595,259

ROTARY GRIP WITH PADDLE FOR USE ON PALLET TRUCK

Kevin A. Gilliland, Coldwater, and Larry A. Niemeyer, New Knoxville, both of Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Filed Feb. 10, 1995, Ser. No. 386,555
Int. Cl.[6] B62D 1/14
U.S. Cl. 180—332 6 Claims



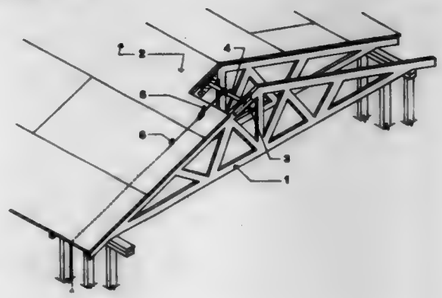
1. A control handle for controlling the direction of travel of a center controlled pallet truck including twist grips for controlling the speed of both forward and reverse movement of the truck,
said control handle including a U-shaped yoke comprising a cross member, a central housing, and a pair of arms extending rearwardly from said cross member,
a pair of twist grips, each twist grip being positioned between said housing and one of said arms,
each twist grip including a generally horizontally disposed, forward facing paddle located at outer ends thereof and extending inwardly a short distance from a corresponding arm end of the control handle.

5,595,260

CONSTRUCTING AND ANALYZING REQUIREMENTS OF REUSABLE ROOFLINE ANCHOR

Maharaj K. Jalla, 7817 Calpurnia Ct., McLean, Va. 22102

Continuation-in-part of Ser. No. 445,721, May 22, 1995, abandoned. This application Jul. 2, 1996, Ser. No. 674,425
Int. Cl.[6] A62B 35/00
U.S. Cl. 182—3 4 Claims



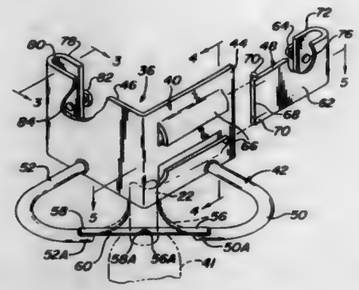
1. A reusable roofline anchor, comprising of:
a load bearing member of circular cross-section,
a steel wire cable connected to said load bearing member for anchoring a lifeline,
a U-shaped bolt fixed to said load bearing member for restricting sideways movement of said steel wire cable,
a pair of struts of unequal lengths welded to attachment structures of either L-shape or U-shape, one at each end of said load bearing member, for holding said load bearing member in the horizontal direction, and
steel bolts for connecting said load bearing member to said struts to prevent sliding of said load bearing member over said struts;
the said load bearing member and said struts welded to said attachment structures being separate components and are assembled only during installation, thereby enabling removal of said load bearing member after said installation for reuse at another location or for replacement subsequent to any damage.

5,595,261

SYSTEM AND METHOD FOR EXTENDING A SAFETY LINE OVER AN ELECTRICAL TRANSMISSION TOWER

Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976

Division of Ser. No. 33,670, Mar. 16, 1993, Pat. No. 5,417,303.
This application Dec. 27, 1994, Ser. No. 364,363
Int. Cl.[6] E04G 5/00
U.S. Cl. 182—129 5 Claims



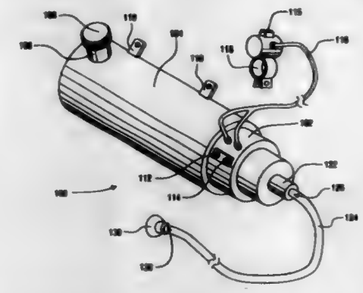
1. A device for securement to a vertically oriented leg of a tower to releasably hold a safety rope in position so that it extends along the leg between an elevated position and a lower position, said device comprising:
a. a bracket, said bracket including securement means for securing said bracket to the tower leg;
b. a gate mounted on said bracket, said gate comprising a pair of arms projecting from said bracket, said arms lying within a plane and bounding a space through which the rope extends in a direction perpendicular to said plane, each of said arms having a free end, said free ends being spaced from each other to form a gap serving as the entrance to said space and,
c. said gate further comprising at least one deflectable member located within said gap, said deflectable member being arranged to be deflected between a closed position and an open position, said deflectable member being deflectable in a direction that is perpendicular to said plane to enable a member coupled to said rode to pass through said space parallel to the direction of said rope.

5,595,262

ELECTRICALLY OPERABLE OILER FOR MOTORCYCLE DRIVE CHAIN

Christopher M. Martin, Rte. #2 Box 362, Houston, Miss. 38851

Filed Mar. 27, 1995, Ser. No. 410,970
Int. Cl.[6] F16N 7/16
U.S. Cl. 184—15.2 13 Claims



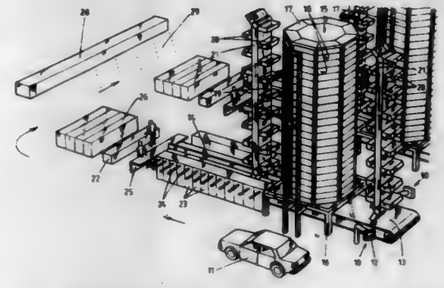
1. An electrically pumped motorcycle drive chain oiler attachable to a frame member of a motorcycle having handlebars for steering, wherein the oiler comprises:
an electric pump having an input port and an output port;
a hollow container defining a reservoir for the storage of oil and having a container port, wherein said electric pump is fittingly affixed to said hollow container in a manner thereby to permit said oil from said reservoir to pass into said input port of said electric pump, to be urged by said electric pump through said output port of said electric pump;
an electric switch mountable to the handlebars for activating said electric pump; and
a flexible conduit having a first and a second end, wherein said first end is attached to said output port of said electric pump; thereby to provide for positionable discharge of said oil from said pump through said second end when said pump is activated.

5,595,263

MERCHANDIZING MEANS AND METHOD

Anthony Pignataro, 12 Livingstone Street, Thebarton, South Australia, Australia

Filed Feb. 15, 1995, Ser. No. 388,794
Claims priority, application Australia, Feb. 15, 1994, PM3925
Int. Cl.[6] B65G 1/06; E04H 3/02
U.S. Cl. 186—53 2 Claims



1. A merchandising method comprising customer identification and supply order of required articles by viewing one of a plurality of visual display units each of which identifies saleable articles at an associated one of a plurality of order stations each having a command facility, transmission of command signals from the com-

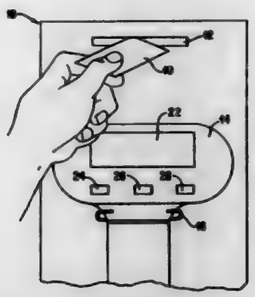
mand facility at said one station to at least one of a plurality of electronically controlled robots, withdrawal of said required articles from a storage facility by said at least one robot, transfer of said required articles to a packaging station by a transfer conveyor, command signals from each said command facility controlling each said robot independently of control from other of said command facilities, said transfer conveyor further comprising divisions which form side-by-side channels above said transfer conveyor, and respective release gates at the entry ends of said channels, and the method further comprising opening of each said gate after completion of withdrawal of required articles by a respective said robot to satisfy a said supply order.

5,595,264

SYSTEM AND METHOD FOR AUTOMATED SHOPPING

Frank P. Tretta, Jr., 53 Bote Rd., Greenwich, Conn. 06830

Filed Aug. 23, 1994, Ser. No. 294,016
Int. Cl.[6] *A47F 9/04*
U.S. Cl. 186—56 **13 Claims**



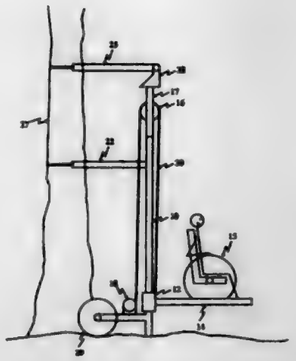
1. A method of automated shopping, comprising:
(a) accepting and retaining an authorized payment medium;
(b) releasing a portable bar code scanner means upon acceptance and retention of the authorized payment medium, the scanner means being secured in a holder for limited access;
(c) displaying a plurality of items for purchase in a store;
(d) selecting an item to be purchased from a store display;
(e) scanning bar code indicia information related to the selected item to be purchased with the bar code scanner means, the bar code indicia indicating at least a purchase price for the selected item; and
(f) returning the scanner means to the scanner holder;
(g) debiting the payment medium for the purchase price of the selected item; and
(h) thereafter, in exchange for the returned scanner means, returning the payment medium.

5,595,265

PORTABLE VERTICAL LIFT

Chester J. Lebrocquy, 90 High St., Randolph, Mass. 02368

Filed Sep. 2, 1994, Ser. No. 300,790
Int. Cl.[6] *B66D 1/00*
U.S. Cl. 187—261 **8 Claims**



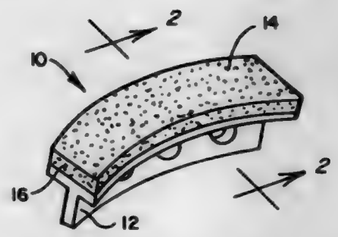
1. A portable apparatus for raising and lowering a load vertically along a substantially vertical structure comprising:
a post including
a) a first post member; and
b) a second post member, a bottom portion of which is detachably attached to a top portion of the first post member, whereby additional post sections may be disposed between the first and second post members to increase an overall height of the post;
a carriage movably attached to the post;
a winch attached to the post;
a pulley attached to a top portion of the post;
a cable, a first end of which is wound onto the winch, and a second end of which passes through the pulley and is connected to the carriage, whereby the carriage may be raised and lowered by winding and unwinding the cable onto the winch;
a platform attached to the carriage for supporting the load;
a wheel rotatingly attached to a bottom portion of the post;
a hitch attached to the top portion of the post, whereby the apparatus may be transported; and
a retainer for securing the post to the substantially vertical structure wherein the retainer comprises:
a lower binder comprising:
a) a frame having two branches adapted for fastening a variable length of chain therebetween and a base attached to the first post member; and
b) a spacer having an adjustable position located in each of the two branches of the frame, one end of each spacer adapted for contacting the substantially vertical structure; and
an upper binder comprising:
a) a frame having two branches adapted for fastening a variable length of chain therebetween and an adjustable length base swivelly attached to the hitch; and
b) a spacer having an adjustable position located in each of the two branches of the frame, one end of each spacer adapted for contacting the substantially vertical structure.

5,595,266

BONDING A FRICTION MATERIAL BRAKE LINING ELEMENT TO A METALLIC BACKING PLATE ELEMENT

James A. Cecere, Stephens City, Va., assignor to Wagner Electric Corporation, Houston, Tex.

Filed Jun. 26, 1995, Ser. No. 494,883
Int. Cl.[6] F16D *69/00*
U.S. Cl. 188—251 A **3 Claims**



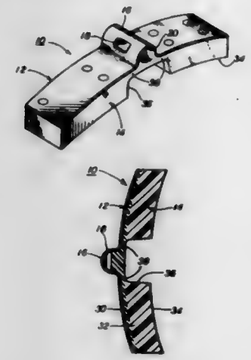
1. A resin bonded friction brake subassembly, which comprises:
a metallic backing plate element having a lining surface; and
a substantially homogeneous friction material brake lining element having a rod braking surface and a bottom surface comprised of a cured epoxy resin matrix and friction material particles embedded in the cured epoxy resin matrix, said substantially homogeneous friction material brake lining element bottom surface being directly adhered to said lining surface of said metallic backing plate element by said brake lining element cured epoxy resin matrix such that said substantially homogeneous friction material brake lining element extends from said backing plate element lining surface to said top braking surface.

5,595,267

BRAKE SHOE HAVING FATIGUE RESISTANT BACKING PLATE

Joseph C. Kahr, Southern Pines, N.C., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Continuation-in-part of Ser. No. 625,179, Mar. 29, 1996. This application Jun. 11, 1996, Ser. No. 661,820
Int. Cl.[6] B61D *69/00*
U.S. Cl. 188—261 **3 Claims**



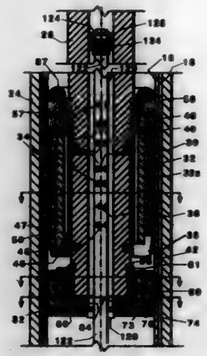
1. A brake shoe for braking engagement with the tread of railroad car wheel comprising:
a) a backing plate formed intermediate the ends thereof with a keybridge that projects from one surface of said backing plate and provides a concavity in a surface of said backing plate opposite said one surface, said concavity extending the entire width of said backing plate;
b) a brake lining comprised of a composition material bonded to said opposite surface of said backing plate and to said keybridge within the area of said concavity so as to substantially fill said concavity, said brake lining having a braking face with which said brake shoe establishes braking engagement with said railroad car wheel tread; and
c) a recess in said braking face extending across the entire width thereof, said recess being in substantially juxtaposed relationship with said concavity and having a minimum width that is greater than the maximum dimension of said concavity in the longitudinal direction of said brake shoe such that the thickness of said brake lining is least in an area thereof between said recess and said backing plate beyond the bounds of said concavity delineating said maximum width thereof.

5,595,268

FLUID ACTUATED FRICTION DAMPER

H. Neil Paton, 1460 Elliott Ave. West, Seattle, Wash. 98119-3124

Continuation of Ser. No. 235,280, Apr. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 87,867, Jul. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 25,674, Mar. 3, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 408,129
Int. Cl.[6] F16F *7/08*
U.S. Cl. 188—271 **27 Claims**



1. A fluid actuated friction damper comprising:
telescopically movable inner and outer bodies;
the outer body having an elongated, continuous friction surface;
the inner body comprising friction shoe means engageable with said continuous friction surface, fluid pressure responsive means for exerting a normal force to urge said friction shoe means against said continuous friction surface, a shuttle device supporting said friction shoe means, said shuttle device being axially movable between end stops on said inner body by frictional drag between said friction shoe means and said friction surface upon relative axial movement of said inner and outer bodies, and means for establishing fluid pressure communication between an external source of pressurized fluid and said fluid pressure responsive means when said shuttle device is at one of said stops and for isolating said fluid pressure responsive means from said external source when said shuttle device is moved from said one stop.

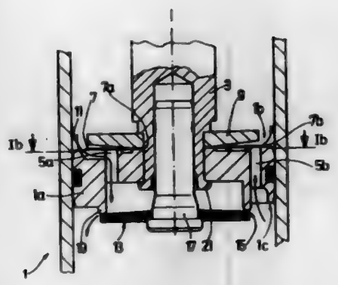
5,595,269

VIBRATION DAMPER FOR A MOTOR VEHICLE

Hubert Beck, Elsterf, Germany, assignor to Fichtel & Sachs AG, Elsterf, Germany

Continuation-in-part of Ser. No. 239,365, May 6, 1994. This application Feb. 16, 1995, Ser. No. 389,344
Claims priority, application Germany, May 10, 1993, 43 15 458.1; May 10, 1993, 43 15 457.3; Feb. 16, 1994, 44 04 835.1
Int. Cl.[6] F16F *9/50*
U.S. Cl. 188—282 **20 Claims**

1. A vibration damper for damping vibrations of a motor vehicle, said vibration damper comprising:
a first tubular member, said first tubular member comprising first means for attaching said first tubular member to one of: a wheel suspension and a support structure of the motor vehicle;
said first tubular member defining a first chamber therewithin, said first chamber comprising damping fluid therewithin, and said first tubular member defining a longitudinal dimension;
piston rod means, said piston rod means having a first end within said first tubular member and a second end external to said first tubular member, said piston rod means being movable



within said first tubular member in a direction along said longitudinal dimension of said first tubular member;

means for attaching said second end of said piston rod means to the other of: the wheel suspension and the support structure of the motor vehicle;

piston means disposed at said first end of said piston rod means, said piston means having a first side disposed adjacent said piston rod means and a second side opposite to said first side, and said piston means dividing said first chamber into a first chamber portion adjacent said first side of said piston means and a second chamber portion adjacent said second side of said piston means;

said piston means comprising:

at least one first passage for permitting fluid flow in one direction from said first chamber portion to said second chamber portion, said first side of said piston means comprising a passage opening of said at least one first passage for permitting fluid flow from said first chamber portion into said at least one first passage, said passage opening comprising a constant opening for permitting fluid flow from said first chamber portion into said at least one first passage, said passage opening having an outer periphery disposed towards said first tubular member and a radially inner edge disposed radially inwardly of said outer periphery;

at least one second passage for permitting fluid flow from said second chamber portion to said first chamber portion, said first side of said piston means comprising a valve seat for said at least one second passage;

a flexible plate disposed at said first side of said piston means, said flexible plate being configured for bending away from said valve seat to open said at least one second passage upon fluid pressure in said second chamber portion being greater than fluid pressure in said first chamber portion, and said flexible plate being configured for sealing against said valve seat to block flow of fluid through said at least one second passage from said first chamber portion to said second chamber portion, said flexible plate having a peripheral edge disposed towards said first tubular member;

said peripheral edge of said flexible plate defining said radially inner edge of said passage opening of said at least one first passage;

said piston means defining a longitudinal axis substantially parallel to said longitudinal dimension of said first tubular member;

said first side of said piston means comprising a plurality of wall portions;

at least a portion of said plurality of wall portions extending from said first side of said piston means in a direction parallel to said longitudinal axis of said piston means;

said plurality of wall portions comprising a plurality of webs;

said plurality of webs each having a thickness, a length, and a height, said thickness being substantially less than said length;

said plurality of webs defining a labyrinth of fluid passages on said first side of said piston means;

a first portion of said labyrinth of fluid passages being in fluid communication with said passage opening of said at least one first passage;

said first portion of said labyrinth of fluid passages comprising at least one passage portion extending from said passage opening of said at least one first passage to said at least one first passage;

a first portion of said plurality of webs defining at least part of said at least one passage portion, said first portion of said plurality of webs each being disposed parallel to a radius of said piston means;

a second portion of said labyrinth of fluid passages being in fluid communication with said at least one second passage; and

each of said plurality of webs comprising means for separating said at least one first passage from said at least one second passage.

5,595,270

VIBRATION DAMPER WITH MECHANICAL DECOMPRESSION STOP

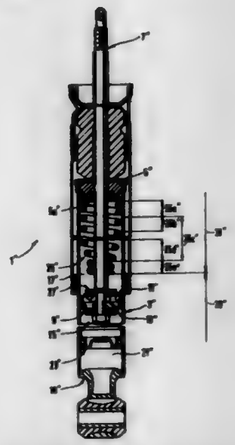
Günther Braun, Geldersheim, and Sabine Rucks, Schweinfurt, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jun. 8, 1995, Ser. No. 488,572

Claims priority, application Germany, Jun. 9, 1994, 44 20 134.6

Int. Cl.[6] F16F *9/48*

U.S. Cl. 188—284 **17 Claims**



1. A shock absorber, said shock absorber comprising:

a first end and a second end;

a cylinder defining a chamber therein, said cylinder containing a damping fluid;

a piston rod sealingly projecting into said cylinder and being axially displaceable within said cylinder, said piston rod having a longitudinal axis, a first end portion and a second end portion;

a piston being attached to said first end portion of said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into a first working chamber and a second working chamber; and

means for permitting fluid communication between said first working chamber and said second working chamber;

said cylinder being disposed between said first end and said second end;

said first end comprising first means for connecting said shock absorber to a first body; and

said second end comprising second means for connecting said shock absorber to a second body;

said cylinder comprising:

a first end and a second end, said piston rod sealingly projecting into said first end of said cylinder; and

a spring within said cylinder;

said spring being disposed within said first chamber;

said first chamber being disposed at said first end of said cylinder;

said spring comprising a first portion and a second portion;

said first portion of said spring being disposed adjacent to said first end of said cylinder;

said second portion of said spring being disposed away from said first end of said cylinder towards said piston;

said cylinder having an inner wall;

said first portion of said spring being disposed tightly against said inner wall of said cylinder; and

said second portion of said spring being disposed about and substantially adjacent said first end portion of said piston rod;

wherein said spring comprises a coil spring;

wherein said second portion of said spring is disposed immediately adjacent to said piston rod to form a guide portion and thereby prevent said second portion of said spring from moving excessively transversely within said chamber;

wherein said guide portion of said spring is disposed to prevent said second portion of said spring from moving substantially transversely within said chamber; and

wherein said second portion of said spring comprises a substantially non-compressible tightly wound portion comprising a plurality of coil turns, and wherein said plurality of coil turns of said second portion of said spring are in contact with one another upon said spring being in a relaxed, noncompressed state.

5,595,271

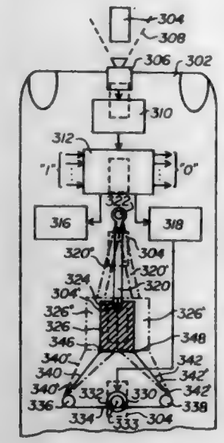
ELECTRIC VEHICLE PICK-UP POSITION CONTROL

Ling-Yuan Tseng, 13772 Calle Tacuba, Saratoga, Calif. 95070

Filed Aug. 7, 1995, Ser. No. 511,991

Int. Cl.[6] B60L *5/00*

U.S. Cl. 191—4 **21 Claims**



1. An inductive pick-up apparatus for an electrically powered vehicle comprising:

an inductive pick-up configurated for use with a series of aligned and spaced-apart charging pads associated with a road surface; and

a device for automatically controlling a relative position between the pick-up and the charging pads while the vehicle moves along the road surface, the device including an extension arm connected to the vehicle, the pick-up being pivotally attached to the extension arm, and wherein the shape of the pick-up enables the pick-up to maintain a consistent air gap between the pick-up and the charging pads solely due to the airflow acting on the pick-up, while said device is in a first mode of operation.

5,595,272

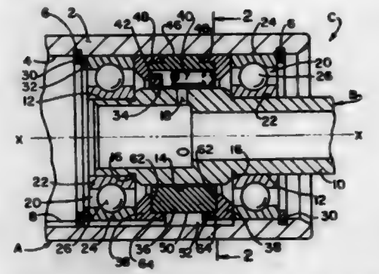
UNIDIRECTIONAL CLUTCH

Rao-Sheng Zhou, Canal Fulton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Apr. 25, 1995, Ser. No. 428,835

Int. Cl.[6] F16D *41/064*

U.S. Cl. 192—45 **16 Claims**



1. A clutch for permitting relative rotation in only one direction about an axis, said clutch comprising: a friction surface located around the axis with its center being the axis; a retainer located circumferentially along the friction surface and having pockets which open toward the friction surface, each pocket having a ramp which is located slightly oblique to the friction surface, whereby each pocket has a large region and a small region, the retainer also having channels which open into the large regions of the pockets at both sides of those pockets; a roller located in each pocket, the roller being too large to fit into the small region of its pocket and small enough to fit loosely into the large region of the pocket, whereby the roller will lodge between the ramp and the friction surface intermediate the large and small regions of the pocket, the rollers all being of substantially the same length and equal in number to the pockets; biasing elements in the channels and contacting the rollers near the ends of the rollers so that each roller is acted upon by two biasing elements, the biasing elements bearing against the rollers and urging the rollers toward the small regions of their pockets, so that the rollers remain lodged between the ramps of their respective pockets and the friction surface, whereby torque applied to the friction surface or retainer in one direction will tend to drag the rollers toward the large regions of the pockets and relative rotation will occur between the friction surface and the retainer, and torque applied in the opposite direction will cause the rollers to lodge between the ramps and the friction surface where they will provide the only coupling between the friction surface and retainer and thus transfer the torque between the friction surface and the retainer.

5,595,273

REVERSE LOCK FOR ONE-WAY CLUTCH

Robert Endey, Troy; Edward J. Debler, Jr., Sterling Heights, and Mark A. Hanke, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 9, 1995, Ser. No. 488,520

Int. Cl.[6] F16D *41/067;43/24;43/04*

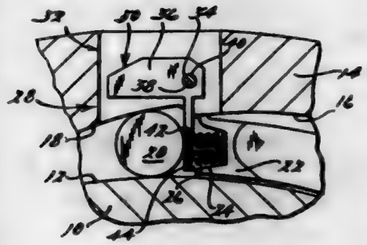
U.S. Cl. 192—45 **10 Claims**

1. A one-way roller clutch, comprising:

a first race having a first annular surface;

a second race having a second annular surface with a wedging surface adjacent said first surface;

a clutch roller interposed between said first and second annular surfaces;



a cage means having a recess for retaining said clutch roller between said first and second races; and

an inertial biasing means pivotably supported by one of the group comprising said first race, said second race and said cage means for urging said clutch roller into wedging contact with said races.

5,595,274

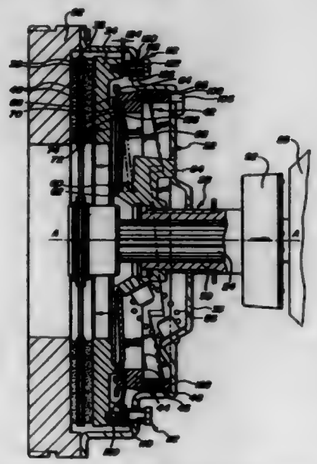
AUTOMATICALLY ADJUSTING FRICTION TORQUE DEVICE WITH RELATIVELY ROTATING CAM RINGS

Daniel V. Gochenour, Auburn; Barry T. Adams, St. Joe; Martin E. Kummer, Auburn; Christopher M. Davis, Albion; Steven D. Lepard, Angola; Michael L. Bassett, and Kevin F. Schlosser, both of Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 263,315, Jun. 21, 1994. This application Jun. 7, 1995, Ser. No. 479,860

Int. Cl.[6] F16D *13/75*

U.S. Cl. 192—70.25 **1 Claim**



1. A friction torque device disposed between a driving member and an axially extended driven shaft comprising:

a cover fixed to the driving member for unitary rotation therewith;

a first cam ring annular in shape and rotatable relative to both a pressure plate and to the cover and axially fixed relative to the cover and disposed against an end of the cover;

a second cam ring annular in shape and engaging the first cam ring on a side of the first cam ring opposite the cover and rotatably fixed relative to the cover wherein the first and second cam rings cooperatively control an axial displacement of the pressure plate relative to the cover as a function of relative rotative position;

an adjusting spring functionally disposed between the first cam ring and the second cam ring and rotatably biasing the first cam ring with respect to the second cam ring in a first rotative direction increasing the axial displacement;

the pressure plate rotatably coupled to said cover for rotation therewith;

a retainer slidably disposed over the driven shaft for axial translation therealong;

a radially extending lever pivotably engaging both the retainer and an adjustment ring and slidably engaging the pressure plate;

an apply spring functionally disposed between the cover and the retainer biasing the retainer and therefore the pressure plate toward the driving member and an engaged position;

a bias spring of much lower force than the apply spring functionally disposed between the cover and the pressure plate biasing the pressure plate toward the cover and a disengaged position; and

a driven member having a friction surface and coupled to the driven shaft for rotation therewith, the friction surface interposed between the driving member and the pressure plate, the pressure plate responsive to the apply spring operably clamping the driven member between the pressure plate and the driving member for rotation therewith.

5,595,275

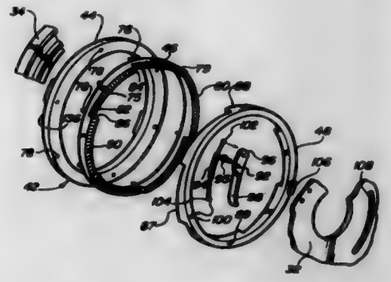
TORSION SPRING ASSEMBLY FOR AN AUTOMATICALLY ADJUSTING FRICTION TORQUE DEVICE

Daniel V. Gochenour, Auburn; Barry T. Adams, St. Joe; Martin E. Kummer, Auburn; Christopher M. Davis, Albion; Steven D. Lepard, Angola; Michael L. Bassett, and Kevin F. Schlosser, both of Auburn, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 263,315, Jun. 21, 1994. This application Jun. 7, 1995, Ser. No. 479,433

Int. Cl.[6] F16D *13/75*

U.S. Cl. 192—111 A **12 Claims**



1. A compact torsion spring assembly functionally disposed between a first member and a second member, the first member being rotatable relative to the second member about an axis of rotation with the first member having a first spring engagement notch at a first radial distance from the axis with relative rotation being limited to a predetermined arcuate range, the spring assembly comprising:

a bracket fixed relative to the second member and having a second notch;

an arcuately shaped spring support arm fixed relative to the second member and extending toward the first notch from the second notch; and

a tension spring engaging both the first member and the bracket and rotatively biasing the first notch of the first member toward the second notch and being a continuous coil of steel wire having an axially varying coil diameter forming

an active portion having a first coil diameter and engaging the support arm and received by the first notch and the second notch,

a first catch plate portion disposed at an end of the spring and having a coil diameter larger than the coil diameter at the first notch and engaging the first member at the first spring engagement notch,

a second catch plate portion disposed at an end of the spring and having a coil diameter larger than the coil diameter at the second notch and engaging the bracket at the second spring engagement notch

wherein the spring extends between the first notch and a point of tangency on the spring support arm at an angle substantially normal to a line between the axis and the first notch, thereby exerting a rotative force on the first member and biasing it toward a second position.

5,595,276

CLUTCH DISC WITH TORSIONAL VIBRATION DAMPER

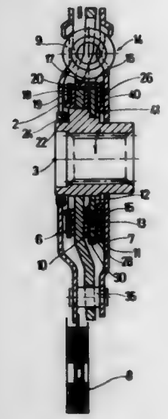
Klaus Memmel, Gädheim, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Mar. 3, 1995, Ser. No. 398,122

Claims priority, application Germany, Mar. 5, 1994, 44 07 394.1

Int. Cl.[6] F16D *13/64;3/66*

U.S. Cl. 192—213.12 **7 Claims**



1. A clutch disc for a motor vehicle clutch, said clutch disc comprising:

a first cover plate;

a second cover plate;

means for substantially fixedly connecting said first and second cover plates with respect to one another;

a hub for connecting with a transmission of a motor vehicle, said hub having a rotational axis defined therethrough;

a hub disc extending radially away from said hub;

said hub disc being disposed axially between said first and second cover plates;

a hub flange being fixedly connected to said hub and extending radially away from said hub;

a load damper arrangement for acting between said hub disc and said first and second cover plates;

an idle damper arrangement for acting on said hub flange;

said idle damper arrangement comprising third and fourth cover plates, said hub flange being disposed axially between said third and fourth cover plates;

means for providing friction between said idle damper arrangement and at least one of said first and second cover plates, said friction means being disposed between said idle damper arrangement and at least one of said first and second cover plates;

said friction means comprising a control plate for engaging with said hub flange;

means for biasing said control plate and at least one of said third and fourth cover plates into frictional engagement with one another;

said biasing means being disposed to act in a direction generally parallel to said rotational axis;

said third cover plate being disposed axially between said hub flange and said hub disc;

said fourth cover plate being disposed axially between said hub flange and said control plate;

said means for biasing said at least one of said third and fourth cover plates into frictional engagement with said control plate comprising means for biasing said fourth cover plate into frictional engagement with said control plate;

said control plate being disposed between said fourth cover plate and said second cover plate;

said biasing means further comprising means for biasing said control plate into frictional engagement with said second cover plate upon said fourth cover plate being biased into frictional engagement with said control plate;

means for permitting a limited range of rotation of said hub and said hub disc with respect to one another;

said load damper comprising a plurality of energy storing devices for acting between said hub disc and said first and second cover plates;

said hub disc, said first cover plate and second cover plate all comprising means for accommodating said energy storing devices;

said hub disc comprising a plurality of recesses disposed therein;

at least one of said third and fourth cover plates comprising axially oriented tabs being circumferentially engaged, substantially without clearance or play, in said recesses of said hub disc, to substantially fixedly connect said at least one of said third and fourth cover plates with respect to said hub disc;

said hub flange comprising circumferentially oriented apertures;

said control plate comprising axial projections being engaged in said circumferentially oriented apertures of said hub flange, each of said apertures describing a greater arc about said rotational axis than does each corresponding axial projection;

said axial projections being circumferentially offset with respect to said tabs;

an axially acting spring;

said axially acting spring having means for biasing said friction means and said hub flange into frictional engagement with one another; and

said control plate comprising at least one shoulder for facilitating frictional engagement between said control plate and said hub flange.

5,595,277

COIN PAYOUT METHOD AND CONTROL MEANS

Ronald A. Heermann, St. Charles, and Douglas M. Petty, Clayton, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Oct. 21, 1994, Ser. No. 327,272

Int. Cl.[6] G07D *1/06*

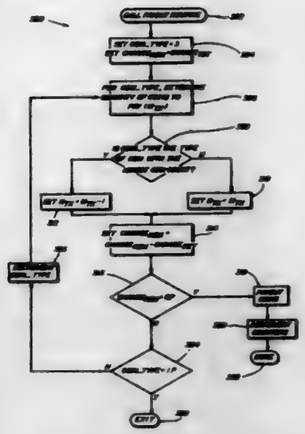
U.S. Cl. 194—217 **6 Claims**

1. A method of saving specified coin types during a change payout operation of a vending system, comprising the steps of:

(1) determining

(a) the total amount of change payout ($CHANGE_{TOT}$) required, such total amount initially being the remaining undetermined change payout required ($CHANGE_{REM}$) when no determined change payback ($CHANGE_{DET}$) has been established, and

(b) the specific coin type (TX where X corresponds to a particular coin type) desired to be saved,



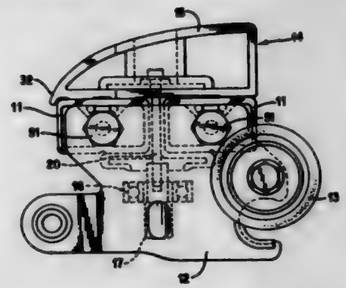
(2) identifying the remaining undetermined change payout required ($CHANGE_{REM}$=$CHANGE_{TOT}$–$CHANGE_{DET}$) and the highest ranked coin type, not yet considered, that could be used for change payback;
(3) determining the maximum number (M_{Tx}) of such identified highest ranked coin type that would be required for such payout of $CHANGE_{DET}$ and which are available for payout;
(4) determining whether such identified highest ranked coin type is the specific coin type desired to be saved and, based thereupon, establishing the number of such identified coin type to be paid back as N_{Tx}=M_{Tx} if such highest ranked coin type is not the specific coin type desired to be saved or as N_{Tx}=M_{Tx}–1 if such highest ranked coin type is the specific coin type desired to be saved, and calculating $CHANGE_{DET}$ to such point in time;
(5) effecting change payout of the established numbers N_{Tx} of the identified coin type (TX) if there is no remaining undetermined change payback or either:
(a) proceeding to step (2) if the lowest ranked coin type has not been considered; or
(b) effecting alternative change payout.

5,595,278
PALLET FOR A CONVEYOR
Jörg Ostermeier; Peter Borchers, and Berward Engelke, all of Stadthagen, Germany, assignors to Otis Elevator Company, Farmington, Conn.
Filed Apr. 28, 1995, Ser. No. 430,949
Int. Cl.[6] B65B *23/12*
U.S. Cl. 198—333 **10 Claims**



1. A pallet for a conveyor having a plurality of adjacent pallets connected to and driven by a pallet chain, the conveyor including a path having a linear section and a curved section for the plurality of pallets, the pallet including:
a first connector disposed on a first edge of the pallet;
a second connector disposed on a second edge of the pallet, the second edge being opposite to the first edge; and
means to engage the first connector with a second connector of an adjacent pallet such that the first and second connectors connected by the engagement means are permitted to move relative to each other through an arcuate path, wherein the relative motion between the first and second connectors of adjacent pallets in the curved section of the path permits the first and second connectors to move towards the adjacent pallet.

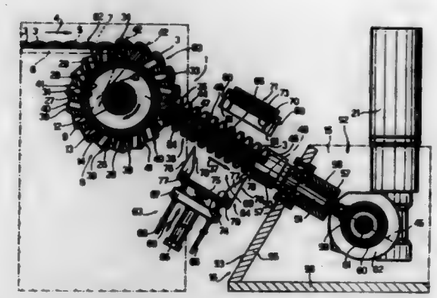
5,595,279
SORTATION CONVEYOR
John J. Wilkins; Walter L. Steffens, both of Cincinnati, Ohio; Timothy A. Koesinger, Fort Thomas, Ky., and Martin A. Helt, Cincinnati, Ohio, assignors to Western Atlas Inc., Hebron, Ky.
Filed Jun. 6, 1995, Ser. No. 467,842
Int. Cl.[6] B65G *47/46*
U.S. Cl. 198—370.02 **20 Claims**



1. A diverter adapted to be retained in operative position between adjacent pairs of slats in a sortation conveyor:
a) said diverter including a pusher comprising a hollow plastic shell (31) that slopes downwardly from its rear surface toward its front surface and terminates in a lowered front lip (32) that depends below the top surface of the slats,
b) a stem (26) depending below said pusher,
c) a retainer (27) formed on the lower end of said stem, adapted to fit below the slats,
d) a diverter pin (17) depending below said retainer, and bearings (16) secured about said pin, said pin and bearing adapted to cooperate with camming surfaces to determine the lateral position of said diverter on the conveyor, and
e) bearing surfaces (28) defined on the underside of said shell and on said stem to ride on the surface of the slats.

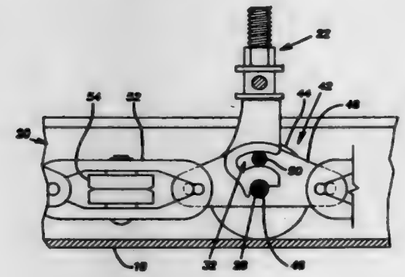
5,595,280
METHOD AND DEVICE FOR FORMING GROUPS OF FLAT ARTICLES ON EDGE
Mario Spatafora, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy
Filed Apr. 11, 1995, Ser. No. 419,825
Claims priority, application Italy, Apr. 13, 1994, BO94A0156
Int. Cl.[6] B65B *35/00*
U.S. Cl. 198—429 **24 Claims**

20. A device for forming groups (2) of flat articles (3) on edge, the device comprising: a conveyor surface (5) for a first succession (82) of said articles (3) laid flat and traveling with a first spacing in a first given direction (4); first conveyor means for successively transferring said articles (3) between a pickup station (34) on the conveyor surface (5) and a transfer station (35), the first conveyor means (8) presenting a succession of seats (39) for respectively



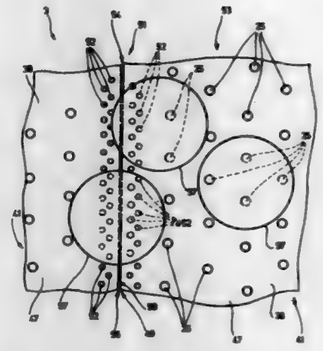
receiving said articles (3), laid flat, at the pickup station (34), and for feeding them to the transfer station (35) in a second succession (83) wherein the articles (3) are equally spaced with a second spacing and in such a manner that each article (3) lies in a given plane (84) at the transfer station (35); second conveyor means (36) for feeding said articles (3) from the transfer station (35) in a second direction (37) perpendicular to said plane (84), and forming a third succession (85) wherein the articles (3) are equally spaced with a third spacing; and extracting means (63) for withdrawing groups (2) of said articles (3) on edge from the second conveyor means (36) in a third direction (68) crosswise to said second direction (37), said extracting means (63) comprising an extracting element (64) defining a pocket (79) for a respective said group (2), actuating means (65) for moving the extracting element (64) back and forth in said third direction (68) and through the second conveyor means (36) and compacting means (77, 78) on said extracting element (64), for compacting said group (2).

5,595,281
INVERTED CONVEYOR WITH SINGLE POINT PENDANT
Gerald B. Mabrey, Sandwich, Ill., assignor to Richards-Wilcox, Inc., Aurora, Ill.
Filed Nov. 14, 1994, Ser. No. 338,030
Int. Cl.[6] B65G *47/84*
U.S. Cl. 198—687.1 **15 Claims**



1. An inverted conveyor apparatus, comprising:
an upwardly opening track;
a chain having a plurality of serially connected trolleys supported by the track, each trolley having a wheel rotatable on an axle;
a pendant pivotably mountable on one of the trolleys and having a bearing surface adapted to be supported by the axle so as to permit pivoting of the pendant with respect to the trolley; and
a support arm mounted on the pendant and adapted to suspend a load below the track.

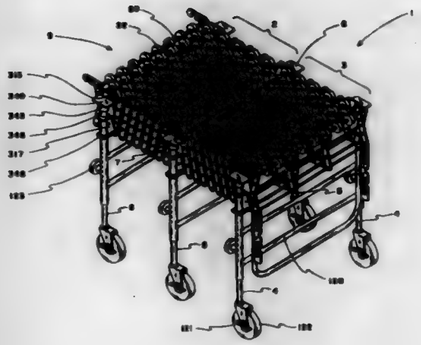
5,595,282
ARTICLE TREATMENT APPARATUS
Bernhard Mokler, Markgröningen, Germany, assignor to LTG Lufttechnische GmbH, Stuttgrat, Germany
Filed Dec. 28, 1994, Ser. No. 365,612
Claims priority, application Germany, Feb. 11, 1994, 44 04 307.4; Nov. 17, 1994, 44 40 926.5
Int. Cl.[6] B65G *15/32*
U.S. Cl. 198—689.1 **21 Claims**



1. An article treatment apparatus, comprising:
at least one treatment zone; and
a conveyor for conveying articles through the treatment zone, said conveyor comprising a support provided with a plurality of vacuum openings along a longitudinal extent of said support, and air-permeable article-conveying means displaceable along said support,
wherein said support is formed of at least two support sections abutting each other and defining together a joint region; and
wherein an operational cross-section of vacuum openings located in a support area for a single article and located at least partially in the joint region, is larger than an operational cross-section of vacuum openings in a support area for a single article and located in a region other than the joint region.

5,595,283
MODULAR FLEXIBLE CONVEYOR
Larry E. Whetsel, Stow, Ohio, assignor to Axia Incorporated, Oak Brook, Ill.
Continuation-in-part of Ser. No. 188,362, Jan. 27, 1994, Pat. No. 5,456,348, which is a continuation-in-part of Ser. No. 14,124, Feb. 5, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 386,968
Int. Cl.[6] B65G *21/14*
U.S. Cl. 198—812 **8 Claims**

1. A flexible conveyor for transporting objects, said conveyor comprising:
a plurality of conveyor modules, each having at least two spaced parallel flexible side link assemblies, each of said side link assemblies comprising a plurality of links pivotally connected to each other in an X-shaped chain configuration;
a quick connect/disconnect connector on at least one end of each of said flexible link assemblies, said connectors joining said plurality of conveyor modules into a single operative unit so that each of said flexible link assemblies may expand or contract independently of the other flexible link assemblies; and
a plurality of rods each having a plurality of freely rotating skate wheels mounted thereon, said rods interconnecting said side link assemblies.



5,595,284

CONVEYOR BELT

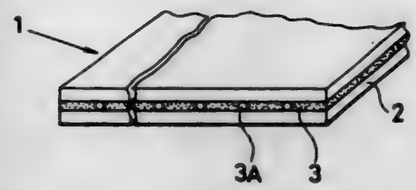
Shuji Takahashi; Kazuhito Yasuderi; Yoshiyuki Yamamoto, all of Hiratsuka; Yoichi Shyuto, and Takayuki Ifuku, both of Gamagori, all of Japan, assignors to The Yokohama Rubber Co. Ltd., and Tokyo Rope Mfg. Co., Ltd., both of Tokyo, Japan

Filed Feb. 29, 1996, Ser. No. 609,185

Claims priority, application Japan, May 26, 1995, 7-128434; May 26, 1995, 7-128436

Int. Cl.[6] B65G *15/34*

U.S. Cl. 198—847 9 Claims



1. A conveyor belt comprising an endless belt body and a plurality of reinforcing cords embedded in the endless belt body along the longitudinal direction of the belt body and in substantially parallel alignment at predetermined intervals in the widthwise direction of the belt body, the reinforcing cords each having a tenacity of not less than 10 g/d and a diameter of 2 to 15 mm and comprising twisted bundles of organic fiber filaments having a tenacity of not less than 15 g/d, the reinforcing cord has a triple twist structure using first twisting, secondary twisting, and final twisting, respectively effected by twisting a plurality of organic fiber filament bundles into a first twist yarn, twisting a plurality of the first twist yarns into a strand, and twisting a plurality of the strands, the filaments in the organic fiber filament bundle being oriented at an angle of ±10° to the cord axis of the reinforcing cord.

5,595,285

AXIALLY OPERATED SWITCH FOR ELECTRICAL CIRCUITS

Antonio F. Do Espirito Santo, Sao Paulo, Brazil, assignor to Metagal Infudtris E Comercio Ltda., Sao Paulo, Brazil

Filed Mar. 25, 1994, Ser. No. 217,674

Int. Cl.[6] H01H *3/20*

U.S. Cl. 200—330 11 Claims



1. An axial switch for electrical circuits of a review mirror of a vehicle, comprising a switch rod having an axis and arranged to move in an axial direction, said switch rod having one end to be actuated and an opposite end adopted to actuate electrical contacts upon its movement in an axial direction; a key arranged to act on said one end of said rod and to move said rod in the axial direction; and direction changing means cooperating with said key so that said key being pressed toward said rod by a user is displaced in direction of a y axis which is substantially perpendicular to said axis o said rod and also in direction of an x axis substantially parallel to said axis of said rod without turning and as a result acts on said one end of said rod so as to move said rod in the axial direction.

5,595,286

RADIUS ACTUATOR FOR A SAFETY SWITCH

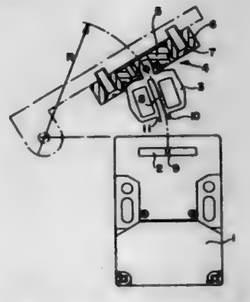
Klaus Schulze, Radevormwald, Germany, assignor to K. A. Schmersal GmbH & Co., Wuppertal, Germany

Filed Sep. 14, 1995, Ser. No. 528,142

Claims priority, application Germany, Sep. 15, 1994, 44 32 862.1

Int. Cl.[6] H01H *3/04*

U.S. Cl. 200—335 22 Claims



1. A radius actuator for a safety switch, said actuator being mountable to a pivotal support member for rotation with the support member about a first axis and adapted to be selectively disengaged from and operatively coupled to a safety switch, rotation of the support member about said first axis defining a first plane, said actuator comprising:

(a) cover means adapted to be affixed to the support member for mounting said actuator to the support member;

(b) holder means for supporting a switch engaging key, said holder means including first and second adjustable setscrews and first and second springs, said holder means being pivotally mounted within said cover means such that said holder means may pivot between a first position and a second position about a second axis, said second axis lying within a second plane which is perpendicular to said first plane, said holder means being spring-biased to said first position by said first spring, and an angular displacement between said first and second holder means positions being selected by adjustment of said first setscrew; and

(c) key means supported by said holder means, said key means including said switch engaging key and key pivot means for pivotally mounting said switch engaging key on said holder means such that said switch engaging key is pivotal between a pair of angularly displaced positions about an axis which lies in a third plane which is perpendicular to said second plane, said switch engaging key being spring-biased to a first of said angular key positions by said second spring, and an angular displacement between said pair of angularly displaced key positions being selected by adjustment of said second setscrew.

5,595,287

SPRING DRIVE FOR A SWITCHING APPARATUS

Rolf Niklaus, Unterentfelden, Switzerland, assignor to GEC Alsthom T & D AG, Oberentfelden, Switzerland

Filed Oct. 25, 1994, Ser. No. 328,650

Claims priority, application Switzerland, Nov. 3, 1993, 93117797.6

Int. Cl.[6] H01H *3/40*

U.S. Cl. 200—501 8 Claims



1. A spring drive for a switching apparatus for medium voltage and high voltage, said spring drive comprising:

a switch-on spring which is coupled eccentrically to a rotatably mounted switch-on shaft for driving the switch-on shaft in a rotation direction to switch on the switching apparatus,

a large wheel which is connected to the switch-on shaft,

a small wheel which interacts with said large wheel and can be driven by means of a drive device in order to stress the switch-on spring by rotation of the switch-on shaft in the rotation direction from an initial position in which the switch-on spring is at least partially relieved of stress, via a deadpoint position in which the switch-on spring is stressed, and

a latching device which supports the switch-on shaft in a supported position which follows the deadpoint position in the rotation direction and releases the switch-on shaft to switch on the switching apparatus,

the large wheel comprising a first tooth system having a gap at a point which is arranged adjacent to the small wheel when the switch-on shaft is supported on the latching device, the large wheel and the small wheel forming a wheel pair, the small wheel comprising a second tooth system, each tooth of said second tooth system comprising flanks converging toward one another radially on an outer side to a common edge for preventing mutual blocking of the large wheel and the small wheel after release of the switch-on shaft by the latching device,

wherein flanks of a first tooth on the large wheel, which trails behind the gap in the rotation direction, converge toward one another radially on an outer side to a common tooth edge, and

the first tooth trailing behind the gap has an involute shape on the flank which is loaded during switch on, and the flank which is unloaded during switch on has a flat flank part which converges toward the common tooth edge and is inclined with respect to a radial straight line through a center of the tooth.

5,595,288

THIN SWITCH INCLUDING DOMED CONTACT

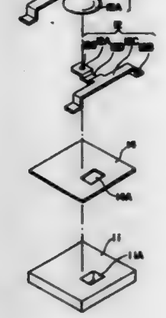
Hiroshi Matsui, Hirakata; Tsunetsu Yamamoto, Ashiya, and Yukihiro Ishihara, Kainoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 18, 1995, Ser. No. 444,152

Claims priority, application Japan, Jul. 14, 1994, 6-162010

Int. Cl.[6] H01H *1/10*

U.S. Cl. 200—513 12 Claims



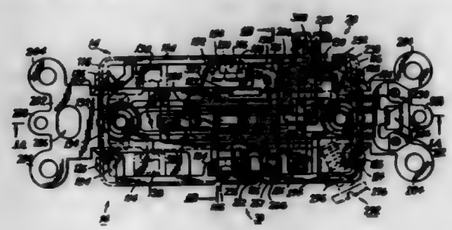
1. A thin switch comprising:

(a) a rectangular insulating substrate;

(b) a fixed contact member comprising a unitary T-shaped conductive thin metal including a fixed contact, a first terminal, and a first conductive part, wherein said fixed contact is placed at a center of a surface of said insulating substrate, and said first terminal is placed on a first edge of said insulating substrate and said fixed contact member is attached to said insulating substrate; and

(c) a movable contact member comprising a unitary T-shaped, elastic and conductive thin metal including a domed contact, a second terminal and a second conductive part, wherein said domed contact is placed over said fixed contact, said second terminal is placed on a second edge of said insulating substrate and said movable contact member is attached to said insulating substrate.

5,595,289
ROCKER-TYPE ELECTRICAL SWITCH
Stephen R. Kurek, 66-32 Alderton St., Rego Park, N.Y. 11374, and David Schroeder, 6485 Pino Real Dr., El Paso, Tex. 79912
Continuation of Ser. No. 373,687, Jan. 17, 1995, Pat. No. 5,500,498, which is a continuation of Ser. No. 976,873, Nov. 13, 1992, Pat. No. 5,382,768. This application Aug. 31, 1995, Ser. No. 521,696
Int. Cl.[6] H01H 21/82
U.S. Cl. 200—559 17 Claims



1. An electrical rocker switch comprising:
a manually movable rocker cover;
actuator means including a first and second end, wherein said first end is attached to said rocker cover such that said actuator means is movable in response to movement of said rocker cover;
slider means responsive to movement induced in said actuator means by sliding in one of two opposite directions;
a fixed terminal assembly including a first fixed contact;
a movable brush assembly including a first movable electrical contact, wherein said movable brush assembly responds to said slider means movement in a first direction by forcing said first movable contact to mate with said first fixed contact of said fixed terminal assembly to electrically close said switch and wherein said movable brush assembly responds to slider means movement in a second direction by forcing said first movable contact to disengage from said mated position with said first fixed contact of said fixed terminal assembly to electrically open said switch;
said movable brush assembly also including a second movable contact on a side thereof opposite said first movable contact in a first switch position, wherein said electrical rocker switch includes a second fixed terminal assembly having a second fixed contact thereon, and wherein said movable brush assembly is moved by said slider means such that said second movable contact is mated with said second fixed contact of said second fixed terminal assembly to close said switch in another switch position; and
a cam spring positioned adjacent to and contacting said second end of said actuator means to oppose movement thereof.

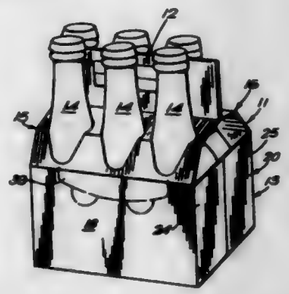
5,595,290
SWITCH STRUCTURE WITH MULTIPLE USAGES
Hsuan-Jui Hsieh, 2F., No. 196-8, Sec. 3, Dah-Tsung Rd., Shih-Jyy Jeun, Taipei Hsien, Taiwan
Filed Nov. 28, 1995, Ser. No. 563,722
Int. Cl.[6] H01H 19/20
U.S. Cl. 200—571 3 Claims

1. A switch structure with multiple usages, comprising a main body, an engaging seat, a central shaft, a rotary switch, two conductive wires, a connecting plate and a diode, the main body having a recessed face portion formed with several engaging holes, the engaging seat having several corresponding engaging hooks extending downward therefrom to pass through the engaging holes and engage with several corresponding reverse hooks of the main body so that the engaging seat is engaged with and secured to the main body, the engaging seat being formed with a central through hole, the central shaft passing through the through hole to engage



with the rotary switch, the central shaft having three arch stopper blocks at a bottom end thereof, wherein two of the three stopper blocks are disposed with conductive contacts positioned within the face portion of the main body, the face portion having a central boss for rotatably fitting into a shaft hole formed on a bottom of the central shaft, several oblique notches being formed on a top edge of the main body for inserting the two conductive wires therein, each wire having a conductive plate at a front end thereof, which is obliquely located in the face portion of the main body, each of the conductive plates and connecting plate having a bottom end passing through slits in the face portion of the main body and wherein the diode is inserted between the bottom ends of the conductive plates, between each two arch stopper blocks of the central shaft there is an arcuate driving block which contacts bent arms of the conductive plates and the connecting plate such that when the rotary switch is rotated to drive the central shaft, the contacts of the central shaft are switched into and out of electric contact with the conductive plates and the connecting plate and the contacts are revolved in either direction to change the positions of the contacts relative to the conductive plates and the driving blocks deflect the bent arms to thereby produce an audible sound.

5,595,291
CONTAINER FOR ARTICLES
Emanuel Negelen, Schweich, Germany, assignor to Riverwood International Limited, Bristol, United Kingdom
PCT No. PCT/GB93/01481, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO94/02380, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 14, 1993, Ser. No. 374,621
Claims priority, application United Kingdom, Jul. 17, 1992, 9215257
Int. Cl.[6] B65D 71/00
U.S. Cl. 206—143 17 Claims



1. A basket type paperboard container for a plurality of articles, the container comprising a handle portion, a basket portion having a bottom wall, two oppositely disposed side walls and two oppositely disposed end walls, and retaining means for retaining the articles in the basket portion, said retaining means having one or more areas which have an initial, article retaining position and which have an open position whereby the area or areas have been

removed or partially removed to allow removal of the articles, and reinforcing means for reinforcing said retaining means in a region outside said one or more areas, the handle portion and basket portion remaining substantially intact after said removal or partial removal of said one or more areas.

5,595,292
CARTON HAVING SHOCK-ABSORBING CARRYING HANDLE AND PACKAGE FORMED THEREFROM
Aaron Bates, Marietta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Jan. 4, 1995, Ser. No. 368,185
Int. Cl.[6] B65D 71/20;71/28
U.S. Cl. 206—158 20 Claims



1. A carton comprising:
a top panel having a pair of opposite side edges;
a pair of side panels foldably joined to and extending downwardly from said side edges of said top panel; and
a strap handle formed in part from said top panel and in part from said side panels, said handle extending transversely across said top panel and being joined at opposite end portions thereof respectively to said side panels for movement between a stowed position where an intermediate portion of said handle is disposed in a plane of said top panel and a raised position where said intermediate portion is bowed and disposed above said top panel whereby said end portions of said handle are moved inwardly of said carton when said handle is moved from said stowed position to said raised position, each of said end portions having foldable means adapted to be pressed against an article within said carton and to thereby be folded to allow gradual stress increase in said handle when said handle is moved from said stowed position toward said raised position, said foldable means of said each end portion comprising a tab formed from adjacent one of said side panels and joined to said each end portion along a fold line for outward folding movement about said fold line upon movement of said strap handle toward said raised position, said fold line extending transversely of adjacent one of said side edges of said top panel.

11. A package comprising:
a plurality of articles arranged into a group of at least one row, each of said articles having a top and a substantially rounded side wall defining a center axis, said axes of said articles in said group being disposed vertically and parallel to each other; and
a carton disposed around the exterior of said group of said articles and comprising a top panel, a pair of side panels and a strap handle, said side panels being disposed adjacent to said side walls of said articles in said group along opposite sides of said group, said top panel being disposed adjacent to said tops of said articles in said group, said strap handle formed in part from said top panel and in part from said side panels, said handle extending transversely across said top panel and being joined at opposite end portions thereof to said side panels respectively, at least a part of each of said end portions being located midway between two adjacent ones of said articles in said group so as to allow said each end portion to move inwardly of said carton when said handle is pulled upward from a stowed position where an intermediate portion of said handle is disposed in a plane of said top panel, said each end portion having foldable means adapted to be pressed against said side wall of at least one of said two adjacent articles and to thereby be folded to allow gradual stress increase in said handle when said handle is pulled upwards from said stowed position, said foldable means of said each end portion comprising a tab formed from adjacent one of said side panels and foldably joined to said each end portion, said tab being disposed flush with said adjacent side panel when said handle is in said stowed position, wherein said tab of said each end portion is joined to said each end portion along a fold line for outward folding movement about said fold line upon upward movement of said strap handle, said fold line extending transversely of adjacent one of said side edges of said top panel.

15. A carton comprising:
a top panel having a pair of opposite side edges;
a pair of side panels foldably joined to and extending downwardly from said side edges of said top panel; and
a strap handle formed in part from said top panel and in part from said side panels, said handle extending transversely across said top panel and being joined at opposite end portions thereof respectively to said side panels, an intermediate portion of said handle being defined between a pair of opposed first slits formed in said top panel, each of said end portions of said handle being defined between a pair of opposed second slits formed in adjacent one of said side panels, said second slits in each of said side panels being continuous respectively with said first slits and extending generally downwardly from adjacent one of said side edges of said top panel, said each side panel being provided with a pair of third slits disposed at a lateral space respectively from said second slits in said each side panel, said third slits extending to respective lower ends remoter from adjacent one of said side edges of said top panel than lower ends of said second slits in said each side panel, said lower ends of said second slits in said each side panel being curved so as to be directed respectively to said third slits in said each side panel whereby when said handle is pulled upward, each of said second slits tends to tear into adjacent one of said third slits.

18. A blank for forming a carton, comprising a top panel having a pair of opposite side edges, and a pair of side panels foldably joined to said side edges of said top panel, said top panel having a pair of opposed first slits extending across said top panel transversely of said side edges, each of said side panels having a pair of opposed second slits disposed transversely of said side edges of said top panel, said second slits in said each side panel being disposed continuously respectively with said first slits and extending from adjacent one of said side edges away from said first panel whereby a portion of said top panel between said first slits and respective portions of said side panels between said second slits comprise a continuous length of strap handle, said each side panel being provided with a pair of third slits disposed at a lateral space respectively from said second slits in said each side panel, said third slits extending to respective outward ends remoter from adjacent one of said side edges of said top panel than outward ends of said second slits in said each side panel, said outward ends of said second slits in said each side panel being curved so as to be directed respectively to said third slits in said each side panel.

5,595,293

WALLET FOR CONTAINING A COMPACT DISC, AND FABRICATION METHOD

William R. Miller, La Puente, Calif., assignor to Rembrandt Photo Services, City of Commerce, Calif.

Continuation-in-part of Ser. No. 326,540, Nov. 20, 1994, which is a continuation-in-part of Ser. No. 145,253, Oct. 29, 1993, and a continuation-in-part of Ser. No. 14,817, Oct. 29, 1993, Pat. No. Des. 353,837. This application May 31, 1995, Ser. No. 455,815

Int. Cl.[6] B65D *85/57; B31B 19/14;19/60*

U.S. Cl. 206—308.1 30 Claims



1. A wallet for containing a compact disc, comprising the combination of:

a transparent substantially rectangular first flexible plastic panel and a substantially rectangular second flexible plastic panel of substantially the same dimensions as said first panel, said first and second panels welded together along four edges thereof;

a substantially rectangular graphics sheet interposed between said first and second panels and enclosed within the welded edges of said welded together first and second panels, said graphics sheet having graphics thereon viewable through said first panel;

said welded together first and second panels and said interposed graphics sheet foldable to form a front cover and a rear cover separated by a spine; and

a third flexible plastic panel superposed on one of said covers and facing said second panel, said third panel welded along three edges thereof to three edges of said one cover forming a pocket between said one cover and said third panel having an opening along an unsealed edge of said third panel facing said spine for receiving the compact disc.

16. A wallet having a width dimension and a longitudinal dimension for containing a compact disc, comprising the combination of:

a compact disc having digital information embedded therein;

a substantially rectangular graphics sheet including graphics on one surface thereof relating to the information embodied in said compact disc, said graphics sheet having a width dimension and a longitudinal dimension respectively less than the width dimension and longitudinal dimension of the wallet, said graphics sheet including two parallel scores thereon along said sheet's width dimension and spaced from each other along said sheet's longitudinal dimension to define a spine therebetween substantially midway of said sheet's longitudinal dimension;

a transparent substantially rectangular first flexible plastic panel of greater flexibility than said graphics sheet, said first panel having a width dimension slightly greater than the diameter of said compact disc and a longitudinal dimension greater than twice the diameter of said compact disc plus the distance between said scores defining said spine;

a substantially rectangular second flexible plastic panel of substantially the same dimension as said first panel and of greater flexibility than said graphics sheet;

said first and second panels welded together along four edges thereof with said graphics sheet interposed therebetween and enclosed within said edges with said graphics viewable through said first panel, said welded together first and second panels and said interposed graphics sheet foldable along said scores with said first panel outwardly disposed to form a front cover and a rear cover separated by said spine; and

a third flexible plastic panel superposed on said rear cover and facing said second panel, said third panel having a width dimension substantially the same as the width dimension of said rear cover and a longitudinal dimension less than the longitudinal dimension of said rear cover, said third panel welded along three edges thereof to three edges of said rear cover forming a first pocket between said rear cover and said third panel having a first opening along an unsealed edge of said third panel facing said spine for receiving said compact disc.

24. A method for fabricating a wallet having a width dimension and a longitudinal dimension for containing a compact disc, comprising the combination of:

providing a longitudinally extending transparent first flexible plastic web, a longitudinally extending second flexible plastic web and a longitudinally extending third flexible plastic web;

providing a rectangular graphics sheet having a longitudinal dimension and a width dimension respectively less than the longitudinal dimension of the wallet being fabricated, said graphics sheet including two parallel scores thereon along said sheet's width dimension and spaced from each other along said sheet's longitudinal dimension to define a spine therebetween substantially midway of said sheet's longitudinal dimension;

cutting said third web to form an opening therethrough having two generally obverse edges respectively on opposite sides of a lateral line and spaced therefrom, said opening having a width dimension along said lateral line greater than the width dimension of the wallet being fabricated;

superposing said second web on said third web;

welding said second and third webs together to form a seam along an arc concavely facing said lateral line, said arc having a diameter slightly greater than the diameter of the compact disc and a center longitudinally spaced from said lateral line by a distance greater than one-half the diameter of the compact disc plus one-half the distance between said scores defining said spine;

placing said graphics sheet on said second web with said two parallel scores respectively on opposite sides of said lateral line;

superposing said first web on said graphics sheet;

welding said first, second and third webs together to form a seam defining a rectangle having a width dimension slightly greater than the diameter of the compact disc and a longitudinal dimension greater than twice the diameter of the compact disc plus the distance between said two scores on said graphics sheet, the longitudinal dimension of said rectangle being bisected by said lateral line and the width dimension of said rectangle being contained within the width dimension of said opening through said third web; and

cutting the welded together first, second and third webs along said rectangle including said rectangular seam.

5,595,294

MODULAR PACKAGING AND HOLDER FOR TOOL BITS

Archibald M. McKenzie, 9260 Oak Street, Vancouver, B.C., Canada; Paul D. McKenzie, 6781 Marlue Drive, Vancouver, B.C., Canada, and Robert Suter, #328 - 8500 Ackroyd Rd., Richmond, B.C., Canada

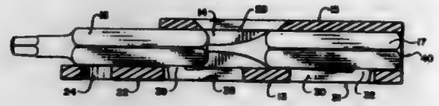
PCT No. PCT/CA93/00325, § 371 Date Apr. 12, 1995, § 102(e) Date Apr. 12, 1995, PCT Pub. No. WO94/04323, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 16, 1993, Ser. No. 381,926

Claims priority, application Canada, Aug. 14, 1992, 2076223

Int. Cl.[6] B65D *85/20;* A45C *11/26*

U.S. Cl. 206—349 12 Claims



1. A storage container for a tool bit having a length L and diameter D, comprising:

a) a hollow body having a front wall, a rear wall, first and second side walls and first and second ends, said hollow body being open at said first and second ends, said front, rear and side walls forming a central chamber extending between said first and second ends of said hollow body having a diameter greater than D and a length greater than L for receiving and enclosing a single tool bit:

b) first means positioned in said central chamber for releasably retaining a tool bit in a first position in said chamber adjacent a first end of said chamber;

c) second means for releasably retaining a tool bit in a second position in said central chamber at a distance greater than L from said first end of said chamber; and

d) means provided on each of said first and second side walls for releasably securing each of said side walls to a wall of an adjacent tool bit storage container.

5,595,295

DEVICE FOR KEEPING AND DISPLAYING A SHEARING TOOL

C. S. Lin, No. 10, Lane 188, Gung-Ye Rd., Long-Ching Hsiang, Taichung Hsien, Taiwan

Filed Sep. 18, 1995, Ser. No. 529,463

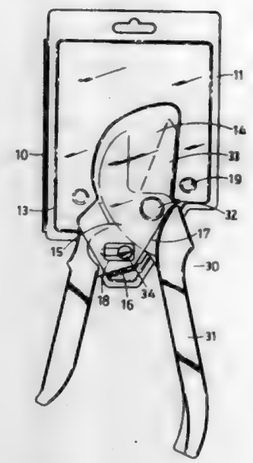
Int. Cl.[6] A45C *11/26*

U.S. Cl. 206—349 4 Claims

1. A device for keeping and displaying a shearing tool comprising:

a transparent top piece provided with a recessed receiving slot for receiving blades and a pivoting portion of a shearing tool, said receiving slot provided at an entrance end thereof with a holding portion comprising a plurality of reinforcing ribs for holding said pivoting portion of said shearing tool, two through holes for receiving therein two hand grips of said shearing tool said holding portion reinforcing ribs being located between the two through holes, and a holding hole for receiving therein a switching element of said shearing tool;

a transparent bottom piece provided with a recessed holding slot; and



a connection piece located between said top piece and said bottom piece such that said top piece and said bottom piece can be folded and unfolded where the reinforcing ribs of the holding portion permit the shearing tool to be pivotally actuated within the device.

5,595,296

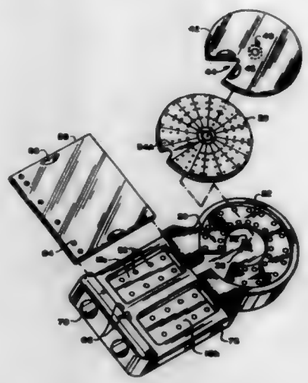
STERILIZATION AND STORAGE CONTAINER

Timothy E. Wood, Weare, N.H., assignor to Poly Vac, Incorporated, Manchester, N.H.

Filed Feb. 14, 1995, Ser. No. 388,287

Int. Cl.[6] B65D *51/16*

U.S. Cl. 206—363 4 Claims



1. A sterile container for sterilizing, transporting, and storing surgical instruments, and comprising a base having at least one well, an apertured plate covering at least part of said well, said apertured plate having apertures to accommodate selected instruments, a rotatable cover being spaced from the apertured plate, said cover having an opening for providing access to a limited area of the plate and any instruments loaded therein, said base including at least one bore for accommodating the handle portion of an extraction tool stowed therein, and a resiliently deformable strip transversing said bore at least in part for releasably engaging the handle portion of said tool.

5,595,297

PROTECTIVE CONTAINER FOR SUBSTANTIALLY CUBOIDAL OBJECTS

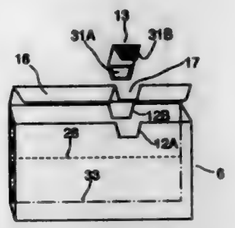
Gerald-Wolfgang Berck, Ludwigshafen; Jochen Eicher, Neustadt, both of Germany; Pierre Kuhn, Schiltigheim, France; Norbert Müller, Friedelsheim, Germany, and Antoine Salamé, Levallois Perret, France, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Nov. 22, 1993, Ser. No. 155,147

Claims priority, application Germany, Nov. 27, 1992, 9216154 U

Int. Cl.[6] B65D 85/672;43/16

U.S. Cl. 206—387.13 4 Claims



1. A protective container for a tape cassette of substantially cuboidal shape comprising a case of cuboid shape, which has an open side for pushing in and taking out the tape cassette and bottom and top walls as well as long and short side walls, the open side of the case having a length and being covered by means of a separate case part, which separate case part is made of foldable material and has an at least partially U-shaped cross-section over the full length of the open side of the case, said bottom and top walls of the case being provided with gripping cut-outs adjacent to the open side of the case, and

the protective container being provided with a closure strip which partially transverses the length of said open side of the case with said separate case part therein, so as to connect the bottom and top walls of the case and the separate case part to each other in order to further provide a positive indication of whether or not the container has been previously opened,

said separate case part having a folded-open width which approximately corresponds to the width of either the bottom or top wall of the case, said separate case part in folded-open form providing an insert-sheet between the tape cassette and the bottom and top walls of the case for documentation of the content of the tape cassette, and the closure strip being a part which can be separated by means of a perforation at either the bottom or top wall of the case.

5,595,298

METHOD AND APPARATUS FOR PROVIDING A WRAPPER FOR A FLORAL GROUPING HAVING A FLAP FOR CLOSING THE UPPER END OR THE LOWER END OF THE WRAPPER

William F. Straeter, Breese, Ill., assignor to Southpac Trust International, Inc., Oklahoma City, Okla.

Division of Ser. No. 193,822, Feb. 9, 1994, which is a continuation of Ser. No. 923,117, Jul. 30, 1992, Pat. No. 5,307,605, which is a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 18, 1995, Ser. No. 444,001

Int. Cl.[6] A01G 5/02

U.S. Cl. 206—423 30 Claims

1. A plant package comprising:



a sheet of material having an upper surface and a lower surface and having a closure bonding material disposed on a portion of the sheet of material and having a flap bonding material disposed upon another portion thereof; and

a floral grouping having a stem end and a bloom end, the floral grouping wrapped by the sheet of material and with the portion of the sheet of material having the closure bonding material disposed thereon forming a connection with an adjacent portion of the sheet of material for cooperating to secure the sheet of material about the floral grouping to provide a wrapper having an upper end and a lower end and wherein said connection may be adjustably positioned when the sheet is wrapped about the floral grouping and with a portion of the sheet of material being folded over the lower end of the wrapper and being connected thereto by the flap bonding material for forming a flap extending over the lower end of the wrapper.

5,595,299

BOTTLE CARRIER WITH RETAINING MEANS

Philippe Le Bras, Chateauroux, France, assignor to The Mead Corporation, Dayton, Ohio

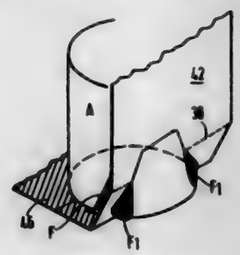
PCT No. PCT/US94/04429, § 371 Date Jun. 2, 1995, § 102(e) Date Jun. 2, 1995, PCT Pub. No. WO94/25363, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 22, 1994, Ser. No. 446,766

Claims priority, application United Kingdom, Apr. 30, 1993, 9309048

Int. Cl.[6] B65D 75/00

U.S. Cl. 206—434 19 Claims



1. An article carrier comprising a plurality of interconnected panels, including a side wall panel and a second wall panel which are foldably interconnected, article receiving and retaining means extending between said side wall panel and said second wall panel, said means comprising an aperture adapted to receive a portion of an article contained within the carrier, and a flap struck from and hingably connected to an edge of said aperture which flap is adapted to abut the article received in the aperture, and wherein the flap is pivotal into an operative position about its hinged connection to provide portions thereof which protrude both inwardly and outwardly of the carrier so that a portion of said flap engages the article internally of the carrier and another portion of said flap engages the article externally of the carrier, said flap being put into its operative position by pivoting inwardly of the carrier.

5,595,300

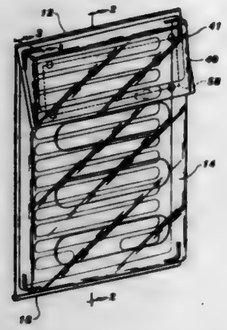
APPARATUS FOR HOLDING AND DISPENSING FLAT ARTICLES

Harry S. Falk, Sacramento, and Kotaro Shinogori, Venice, both of Calif., assignors to Infopak International, Inc., Seattle, Wash.

Filed Sep. 5, 1995, Ser. No. 523,717

Int. Cl.[6] B65D 85/62;43/16

U.S. Cl. 206—449 11 Claims



1. Apparatus for holding and dispensing flat articles, said apparatus comprising, in combination:

a receptacle back member having upper and lower ends;

a receptacle front member having upper and lower ends and defining an opening at the upper end thereof, said receptacle front member connectable to said receptacle back member and movable between an open position and a closed position relative to said receptacle back member, said receptacle back member and said receptacle front member defining a receptacle interior for accommodating a plurality of flat articles when said receptacle front member is in said closed position;

latch means for releasably latching said receptacle front member to said receptacle back member with said receptacle front member in said closed position;

a cover member hingedly secured to said receptacle back member at the upper end of the receptacle back member and movable between a first position wherein said cover member covers the opening defined by said receptacle front member and resists movement of said receptacle front member away from said receptacle back member when said receptacle front member is in said closed position and a second position wherein said cover member exposes said opening allowing manual access to flat articles in said receptacle interior and allows movement of said receptacle front member away from said receptacle back member; and

support means for supporting said apparatus said receptacle back member including a back panel and a plurality of side walls projecting from said back panel partially defining said receptacle interior, said side walls having smooth distal wall surfaces which are in partial registry with the opening defined by the receptacle front member when said receptacle front member is in said closed position, and said receptacle back member additionally including a top wall projecting from said back panel partially defining said receptacle interior, said top wall having a smooth distal wall surface in partial registry with the opening defined by the receptacle front member when said receptacle front member is in said closed position.

11. Apparatus for holding and dispensing flat articles, said apparatus comprising, in combination:

a receptacle back member having upper and lower ends;

a receptacle front member having upper and lower ends and defining an opening at the upper end thereof, said receptacle front member connectable to said receptacle back member and movable between an open position and a closed position relative to said receptacle back member, said receptacle back member and said receptacle front member defining a receptacle interior for accommodating a plurality of flat articles when said receptacle front member is in said closed position;

latch means for releasably latching said receptacle front member to said receptacle back member with said receptacle front member in said closed position;

a cover member hingedly secured to said receptacle back member at the upper end of the receptacle back member and movable between a first position wherein said cover member covers the opening defined by said receptacle front member and resists movement of said receptacle front member away from said receptacle back member when said receptacle front member is in said closed position and a second position wherein said cover member exposes said opening allowing manual access to flat articles in said receptacle interior and allows movement of said receptacle front member away from said receptacle back member; and

support means for supporting said apparatus, said receptacle back member including a back panel and two side walls, a top wall and a bottom wall projecting from said back panel, each of said walls having an inner wall partially defining said receptacle interior and an outer wall spaced from said inner wall, said receptacle front member having a peripherally extended wall in engagement with the outer walls of said receptacle back member when said receptacle front member is in said closed position.

5,595,301

TRANSPORTING HOLDING DEVICE FOR PICTURE FRAMES OR THE LIKE

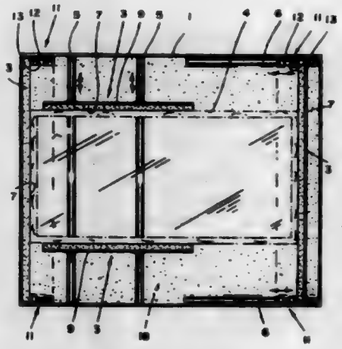
Manfred Pütz, and Mathias Szarata, both of Bornheim, Germany, assignors to Hasenkamp Internationale Transport GmbH & Co. KG, Germany

Division of Ser. No. 250,772, May 27, 1994, Pat. No. 5,518,118. This application Mar. 20, 1996, Ser. No. 619,923

Claims priority, application Germany, May 29, 1993, 43 18 045.0

Int. Cl.[6] B65D 85/48

U.S. Cl. 206—449 12 Claims



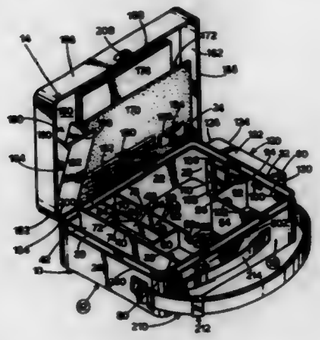
1. Transporting holding device for picture frames comprising a plurality of frame securing elements, first guide devices and second guide devices for said securing elements, said second guide devices being oriented crosswise relative to said first guide devices; wherein the first and second guide devices are located on a rear wall of a transport crate; wherein the frame securing elements are in the form of flat side brackets for supporting respective parts of the edges of a picture frame; wherein the frame securing elements are provided with means for adjusting the position thereof in a lengthwise direction of the first and second guide devices and means for immobilizing the frame securing elements in positions to which they are adjustable along the first and second guide devices.

5,595,302

LUNCHBOX

Jude D. Maydwell, and Kathleen Maydwell, both of 73 E. Franklin St., Ephrata, Pa. 17522-2446

Filed Jan. 16, 1996, Ser. No. 586,830
Int. Cl.[6] A45C 11/20
U.S. Cl. 206—541 14 Claims



1. A lunchbox comprising:

A) a bottom unit which includes

(1) a bottom plate,

(2) a front wall fixed to said bottom plate and having a top rim spaced from said bottom plate,

(3) a rear wall fixed to said bottom plate and having a top rim spaced from said bottom plate,

(4) first and second side walls, each being fixed to said bottom plate and each having a top rim spaced from said bottom plate,

(5) all of said top rims being co-planar with each other in a first plane,

(6) a longitudinal dimension extending from said front wall to said rear wall,

(7) a transverse dimension extending from said first side wall to said second side wall,

(8) a first longitudinal inner wall fixed to said bottom plate and having a top rim which is spaced from said bottom plate and which is co-planar with said first plane, and extending parallel to said longitudinal dimension adjacent to said first side wall, said first longitudinal inner wall defining with said first side wall, said bottom plate, said front wall and said rear wall a first compartment,

(9) a second longitudinal inner wall fixed to said bottom plate, said second longitudinal inner wall being spaced from said first longitudinal inner wall and extending from said rear wall to said front wall and having a top rim which is spaced from said bottom plate and which is located in a second plane spaced from said first plane,

(10) a third longitudinal inner wall fixed to said bottom plate and having a top rim spaced from said bottom plate and located in said second plane, said third longitudinal inner wall being located between said first longitudinal inner wall and said second longitudinal inner wall and extending from said rear wall,

(11) a fourth longitudinal inner wall fixed to said bottom plate and having a top rim located in said second plane and extending from said front wall,

(12) said fourth longitudinal inner wall being spaced from said second side wall a distance equal to the spacing between said third longitudinal inner wall and said first side wall,

(13) a first transverse inner wall fixed to said bottom plate and having a top rim located in said second plane and extending between said first and second longitudinal inner walls and intersecting a top edge of said third longitudinal inner wall, and a second transverse inner wall fixed to said bottom plate and having a top rim located in said second plane,

(14) a cover plate abutting said rear wall and said first and third longitudinal inner walls and having a top surface which is co-planar with said second plane, and an inner edge spaced from said rear wall and from said first transverse inner wall and from said bottom plate,

(15) a hinge means for connecting said cover plate to said third longitudinal inner wall whereby said cover plate moves between an open position extending at an angle out of said second plane and a closed position in said second plane,

(16) a closure plate fixed to said cover plate and having a lower edge, said lower edge abutting said bottom plate when said cover plate is in said closed position,

(17) a slot defined in said closure plate,

(18) said closure plate, said cover plate, said bottom plate and said first and third longitudinal inner walls forming a closed chamber when said cover plate is in said closed position,

(19) said second longitudinal inner wall, said front wall, said bottom plate and said first transverse inner wall defining a cup compartment,

(20) a first clip element in said second longitudinal inner wall and including two elements extending toward said first side wall into said cup compartment,

(21) said second and third longitudinal inner walls, said bottom plate and said first transverse inner wall and said rear wall defining a toothpaste tube compartment,

(22) a first support bracket fixed to said bottom plate in said toothpaste tube compartment and having a notch defined therein,

(23) said fourth longitudinal inner wall, said bottom plate, said front wall and said second transverse inner wall defining a juice container compartment,

(24) second clip elements on said second side wall and on said fourth longitudinal inner wall and extending into said juice container compartment,

(25) support walls fixed to said second side wall and extending toward said first side wall adjacent to said second transverse inner wall,

(26) a fifth longitudinal inner wall mounted on said support walls to be spaced from said second side wall, said fifth longitudinal inner wall having a slot defined therein, and

(27) a pencil case mounted on said second side wall and having a bottom wall fixed to said second side wall, an outer side wall, a rear end wall, a front end wall and a top wall;

B) a top unit which includes

(1) a top plate,

(2) a rear wall mounted on said top plate and having a bottom rim spaced from said top plate,

(3) a front wall mounted on said top plate and having a bottom rim spaced from said top plate,

(4) first and second side walls, each mounted on said top plate and each having a bottom rim spaced from said top plate and each connecting the front wall of said top unit to the rear wall of said top unit,

(5) the bottom rims of said top unit being co-planar with each other in a bottom plane,

(6) an inner wall connected to said second side wall of the top unit and spaced from said top plate to define a pocket,

(7) first spring clip means on said inner wall of the top unit for holding pencil-like elements,

(8) second spring clip means on said inner wall of the top unit for holding eraser-like elements, and

(9) a movable game pocket which includes

(a) an outer wall having a top edge,

(b) hinge means for connecting said outer wall of said movable game pocket to said rear wall of the top unit to move between an open position at an angle to said top plate and a closed position parallel to said top plate, and

(c) two wings each connected to said outer wall of the game pocket;

C) hinge means for movably connecting said top unit to said bottom unit to move said top unit between an open position with said front wall of the top unit spaced from said front wall of the bottom unit and a closed position with said bottom rim of the front wall of the top unit abutting the top rim of the front wall of the bottom unit;

D) a lock means for locking said top unit to said bottom unit when said top unit is in said closed position; and

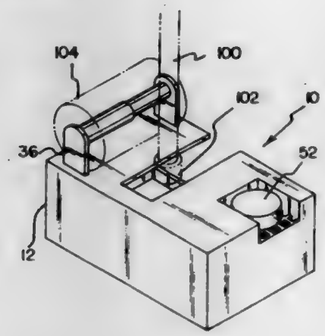
E) handle means on said bottom unit for carrying top and bottom units.

5,595,303

MULTI-FUNCTION TOILET ACCESSORY

Jane Weeks, and Tammy Searcy, both of 149 George Flowers Rd., Norman Park, Ga. 31771

Filed Mar. 14, 1996, Ser. No. 616,160
Int. Cl.[6] A45C 11/00; B65D 85/672
U.S. Cl. 206—576 6 Claims



1. A multi-function toilet accessory for holding and concealing toilet articles comprising, in combination:

a main housing having a generally rectangular configuration, the main housing having a front wall, an open rear, a top wall, a bottom wall, a pair of side walls, and a hollow interior, the top wall having an elongated recess extending inwardly from the open rear, the elongated recess extending more than three quarters of a width of the main housing, the top wall having a square recess formed therein coextensive with one of the pair of side walls, the square recess having a lower surface comprised of a perforated grid, the open rear having an upwardly extending lip integral with a rear edge of the bottom wall of the main housing;

a toilet paper dispensing portion comprised of a pair of upwardly extending walls secured to the top wall of the main housing, each of the walls having a recess formed on an inner surface downwardly of free ends thereof, the toilet paper dispensing portion further comprising a spring biased spool adapted for removable securement between the upwardly extending walls within the recesses therein;

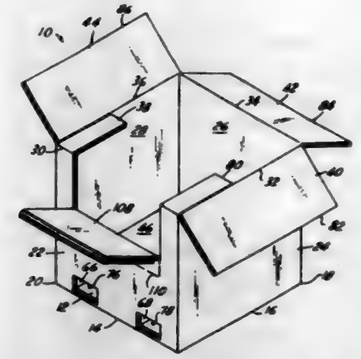
a deodorizer portion comprised of a tablet having an upper surface and a lower surface, the lower surface having an adhesive disposed thereon, the adhesive having a peel-away sheet disposed thereon, the tablet being dimensioned for securement to the perforated grid of the square recess of the main housing.

5,595,304

SHIPPING CONTAINER

Lawrence J. Timmins, Riverview, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jun. 6, 1995, Ser. No. 468,696
Int. Cl.[6] B65D 19/20
U.S. Cl. 206—598 4 Claims



1. In a shipping container comprising a generally rectangular bottom wall having four edges, a side wall extending upwardly from each edge, adjacent ones of the side walls being connected to each other, each side wall having an upper edge, a closure flap hingedly connected to the upper edge of each side wall, the flaps being foldable inwardly of the container to form a top closure therefore and foldable outwardly of the container to permit access to the container interior, the improvement comprising:

providing a pallet within the container supported by the bottom wall of the container,

the pallet including an article carrying panel having an upper surface for supporting articles received in the container and a lower surface,

the lower surface having at least three spaced apart elongated support members secured thereto and extending thereacross to thereby space the article carrying panel from the bottom wall,

the support members defining a pair of elongated slots adapted to receive the tines of a fork lift truck for lifting the pallet,

at least one of the container side walls having a pair of spaced apart openings therein adjacent the bottom wall in alignment with the elongated slots to permit insertion of said tines into the pallet slots,

the entire container and the entire pallet being fabricated of multi-ply corrugated cardboard,

each of the closure flaps having an unattached edge, at least one of the side walls and its hingedly connected flap having a pair of spaced apart discontinuous slits formed therein and extending from the unattached edge of the flap to a point substantially midway of the side wall to which the flap is connected,

the discontinuity of the slits being created by spaced apart untitted tab portions provided along the length of each slit, the corrugated cardboard portion between the slits being manually separable from the remaining portions of the respective side wall and closure flap by pulling thereon to tear the tab portions and thereby permit ready access to the articles in the lower portion of the container,

wherein the side wall having the slits is provided with scores in at least two places between the slits, one of the scores extending between the lower end points of the slits and another of the scores extending between the slits at a position spaced upwardly therefrom,

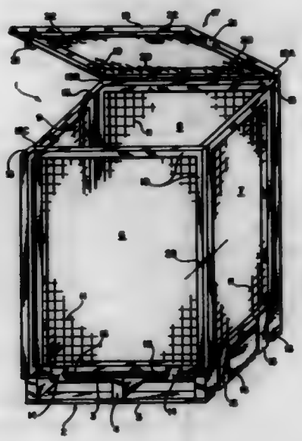
the scores facilitating manual downward bending of any corrugated cardboard portion which is separated from the remaining portions of the respective side wall and closure flap to get it out of the way and facilitate access to the container interior, at least two scores being provided to accommodate people of different heights.

5,595,305

COLLAPSIBLE STORAGE CONTAINER

Michael J. Hart, 126 The Esplanade, Sylvania Heights, New South Wales, 2224, Australia

Filed Mar. 29, 1995, Ser. No. 412,566
Claims priority, application Australia, Mar. 29, 1994, PM4755
Int. Cl.[6] B65D 1/06;88/52
U.S. Cl. 206—600 7 Claims



1. A collapsible storage container comprising at least four wall members interconnected by intermediate hinged connections, with at least two of said wall members including respective engaging means for selectively engaging a forklift pallet, said hinged connections allowing said wall members to be moved to:

a container configuration in which a pallet is captively engaged by said engaging means as a base to an enclosure formed by said wall members; and

a collapsed configuration in which at least some of said wall members are adjacent each other in a substantially parallel arrangement, said engaging means comprising generally L-shaped hooks depending from said wall members, said L-shaped hooks being of two types, one of said types being engageable with an upper deck of the pallet and the other of said types configured for spanning and engaging a joist of the pallet.

5,595,306

SCREENING SYSTEM

Ari M. Huikki, Edgewood, and Brian S. Carr, Ft. Wright, both of Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 22, 1995, Ser. No. 447,272
Int. Cl.[6] B07B 1/34
U.S. Cl. 209—325 37 Claims

1. A screening system comprising

a resiliently mounted housing;

a low frequency vibratory drive coupled to the housing;



a screen extending across and within the housing, including a peripheral screen frame and a screen element fixed to the peripheral screen frame about the periphery of the screen element;

a mounting ring flexible in beading to high frequency vibration adjacent and supporting the under surface of the peripheral screen frame;

a mounting flange extending outwardly from the mounting ring and retained by the housing;

at least one high frequency drive held rigidly to the peripheral screen frame and positioned below the mounting ring and within the housing.

5,595,307

METHOD OF MAKING A SCREEN CYLINDER, AND A SCREEN CYLINDER

Jouko Hautala, Tampere, Finland, assignor to Valmet Corporation, Tampere, Finland

Filed Sep. 11, 1995, Ser. No. 526,265
Claims priority, application Finland, Sep. 27, 1994, 944484
Int. Cl.[6] B07B 1/49
U.S. Cl. 209—395 5 Claims



1. A wire cage for purifying and sorting out a pulp mixture, the wire cage comprising mesh wires arranged in the axial direction of the wire cage at predetermined intervals to provide a cylindrical mesh surface, the mesh wires being attached to supporting rods, and at least some of the supporting rods being surrounded on the outside by a supporting ring, and the supporting ring being positioned around the corresponding supporting rod without fastening it to the supporting rod, and the supporting ring, when it is put in place, being tightened around the supporting rod so firmly that it presses the supporting rod in the radial direction of the wire cage.

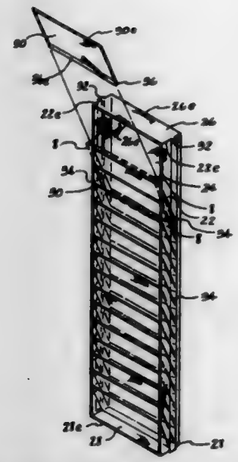
5,595,308

APPARATUS AND METHOD FOR STORING COMPACT DISC JEWEL BOXES

Douglas A. King, 1602 W. 51st N., Wichita, Kans. 67204, and Ryan Nelson, 8472 Lakeland Ct., Wichita, Kans. 67207

Continuation-in-part of Ser. No. 986,785, Dec. 8, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 306,002
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—40 7 Claims

1. A method for storing a compact disc container such that when stored a portion of the face of the compact disc container is readily seen and illuminated, comprising the steps of:



(a) providing a compact disc container having a planar face with informational indicia representing the contents of audio program on a compact disc contained therein;

(b) providing a compact disc holder assembly for holding a plurality of the compact disc containers and for displaying and viewing the informational indicia representing the contents of audio program on a compact disc contained therein; said compact disc holder assembly comprising at least one rack means for supporting the plurality of compact disc containers in a generally upright posture, so that the face of each compact disc may be readily seen to determine the artist(s) of the compact disc contained in each container without having to view the spline or edge of each container, said rack means comprising at least two longitudinal side supports having a structure defining a plurality of opposed angularly disposed channels; at least two trays slidably disposed in the opposed channels; a pair of longitudinal lugs bound to a traversing the longitudinal side supports; at least two longitudinal end cap members having a structure defining at least two longitudinal recesses for slidably receiving and engaging the longitudinal lugs, said tray members comprising a transparent plastic composition having a dyestuff agent for producing a florescence effect;

(c) slidably disposing the compact disc container between said two trays such that when contained and held a portion of the face of each compact disc may be readily seen to determine the artist(s) of the compact disc contained in each container without having to view the spline or edge of each container, and where the face of each compact disc container is viewably illuminated by the florescence effect of the tray members.

5,595,309

PEGHOOK WITH CORRUGATED DISPLAY PANEL

Jamie D. Boner, Edgewater, N.J., and John P. Krisko, Danbury, Conn., assignors to Advertising Display Company, Englewood Cliffs, N.J.

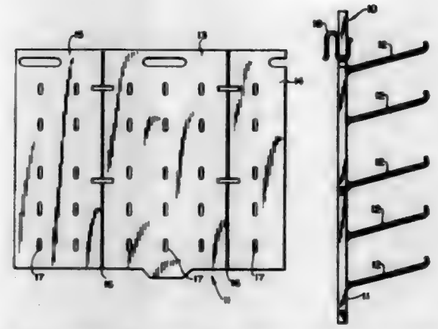
Filed Feb. 21, 1995, Ser. No. 391,450
Int. Cl.[6] B42F 15/00
U.S. Cl. 211—59.1 5 Claims

1. A merchandise display panel for displaying packaged products comprising:

(a) a center panel;

(b) a pair of spaced apart side wings operatively associated with said center panel and separated by said center panel and each connected to said center panel by means of fold scores;

(c) a plurality of peghook receiving slots formed through said center panel; and



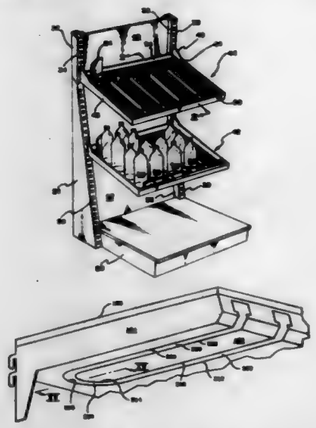
(d) a plurality of peghooks disposed through said peghook receiving slots for receiving and holding said packaged product wherein said peghooks comprise a generally horizontally extending shaft terminating at one end with a hook for receiving and holding said packaged product wherein a hook base is operatively disposed at one end of said horizontally extending shaft distant from said hook for holding said peghooks in place in said receiving slots when said side wings are folded along said fold scores backward against the rear of said center panel and said hook base such that said hook base is substantially disposed between said center panel and said side wings.

5,595,310

DISPLAY DEVICE HAVING ARTICLE GUIDE MEANS FOR ENCOURAGING STOCK ROTATION

William S. Spencer, Roswell; J. Marshall Suttles, Elberton, and Elizabeth T. Cooper, Atlanta, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 330,415, Oct. 28, 1994, abandoned. This application Mar. 3, 1995, Ser. No. 518,741
Int. Cl.[6] A47F 7/00
U.S. Cl. 211—59.2 30 Claims



1. A display device comprising an article dispenser means having a front edge and a rear edge and adapted to support articles, said dispenser means comprising:

means for defining a plurality of parallel tracks, each track extending from said front edge toward said rear edge to receive a row of articles for movement along said each track;

means for defining a diverting pathway extending substantially transversely of said tracks so that said tracks are intercommunicated at rear ends thereof through said pathway, said path-

way being dimensioned to receive articles for movement therealong and being arranged such that articles are allowed to be transferred from said pathway to said each track and vice versa; and

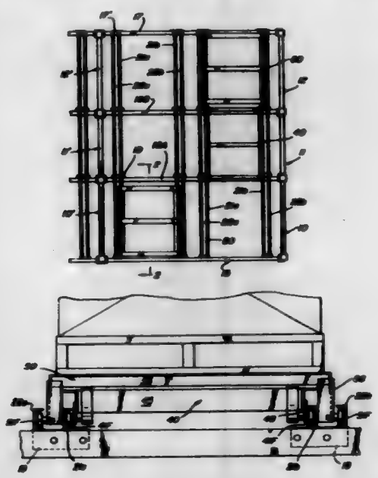
guide means disposed adjacent to said rear end of one of said tracks and having a guide surface such that when moved backwards along said one track, articles in said one track are brought into contact one after another with said guide surface and guided laterally of said one track along said guide surface into said pathway to be transferred to the other track or tracks through said pathway,

said display device further comprising support means for supporting said dispenser means in a tilted fashion such that said dispenser means is inclined downwardly toward said front edge thereof whereby articles when received in said each track are allowed to gravity feed one after another to said front edge as leading articles in said each track successively are removed from said each track and whereby articles when received in said pathway are allowed to gravity feed from said pathway into said tracks.

5,595,311
STORAGE RACK SYSTEM

Donald R. Allen, Long Valley, N.J., assignor to Frazier Industrial Company, Long Valley, N.J.

Filed Feb. 13, 1995, Ser. No. 393,221
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—151 **28 Claims**



1. A storage rack for supporting pallet loads multiple pallets deep having a framework providing a plurality of storage bays each of which is defined by a plurality of vertical uprights and horizontal shelf beams, wherein at least one of said storage bays comprises:

a plurality of carts,

track means extending along the depth of said storage bay for supporting said carts for movement along said track means from forward positions to back positions thereof, said track means comprising:

a first pair of parallel track members having cart supporting portions extending from front to back along the depth of said storage bay and being spaced apart across the width of the storage bay,

a second pair of parallel track members having cart supporting portions extending from front to back along the depth of said storage bay and being spaced apart across the width of the storage bay,

said first pair of track members being located inwardly of said second pair of track members, said first and second pairs of track members being arranged to face inwardly,

said plurality of carts including

a first cart including a frame providing support for a pallet load, front and rear wheel assemblies on each side of said first cart frame, and means for supporting each of said first cart wheel assemblies to make rolling contact with one of said tracks of said track means as said first cart moves along the depth of the storage bay between a forward position and a back position,

a second cart including a frame providing support for a loaded pallet, front and rear wheel assemblies on each side of said second cart frame, and means for supporting each of said second cart wheel assemblies to make rolling contact with one of said track means as said second cart moves along the depth of the storage bay between a forward and a back position,

the front and rear wheel assemblies of said first cart being constructed and arranged to make rolling contact with said first tracks,

the front and rear wheel assemblies of said second cart being constructed and arranged to make rolling contact with said second tracks,

said track means being mounted on the storage bay framework so as said track means are inclined toward the entry end of said storage bay, whereby said carts are supported so that they tend to roll along said track means toward the entry end of said storage bay.

5,595,312
EASILY ASSEMBLED AND ADJUSTABLE STORAGE AND DISPLAY TOWER ASSEMBLY

Shahriar Dardashti, c/o Atlantic Representations, Inc., P.O. Box 2399, Santa Fe Springs, Calif. 90670

Filed Mar. 11, 1996, Ser. No. 613,926
Int. Cl.[6] A47F 7/00
U.S. Cl. 211—188 **26 Claims**



1. A storage and display assembly, comprising:

a support base;

a first set of rods releasably mountable into upright, spaced securement on said base;

a second set of rods threadable onto tops of respective ones of said rods of said first set and extending vertically up therefrom;

a fixed shelf held in level disposition at a juncture between said first and second sets of rods;

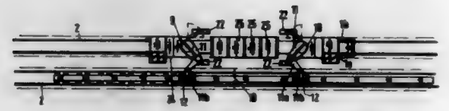
a first adjustable shelf having openings through which at least some of said rods of said second set pass such that said first shelf is slidable along said rods; and

first supporting means for supporting in generally level disposition said first shelf at a desired height on said second set.

5,595,313
CRANE, PARTICULARLY A TRACK-BOUND MOBILE CRANE

Joachim Kröll, Jöchen, and Peter Richter, Bergheim, both of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Jan. 30, 1995, Ser. No. 380,067
Claims priority, application Germany, Jan. 31, 1994, 44 02 905.5
Int. Cl.[6] E01B 29/02
U.S. Cl. 212—225 **11 Claims**

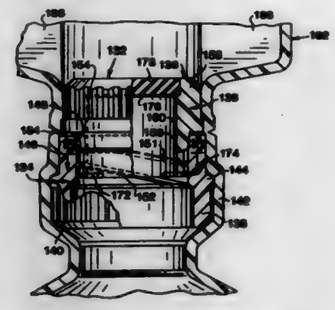


1. A crane for raising and lowering a load, comprising: a vehicle frame having end areas and a central longitudinal axis; a slewing device arranged on the vehicle frame, the slewing device including at least two basic slewing columns, slewable by 360°, one of the slewing columns being mounted on the vehicle frame in each of the vehicle frame end areas; a separate double-link articulated slewing arm having at least two elements that are connected together to be pivotable relative to one another about a vertical axis and in a horizontal plane, located on each basic slewing column; at least one guidance carrier arranged on the vehicle so as to extend in the longitudinal direction of the vehicle; trolleys arranged on both cross-sectional sides of the guidance carrier; and gripper means attached to each of the slewing arms in a rotary-adjustable manner for catching and holding the guidance carrier.

5,595,314
TORQUE-RESISTANT CLOSURE FOR A HERMETICALLY SEALED CONTAINER

Gerhard H. Weller, South Barrington, Ill., assignor to Automatic Liquid Packaging, Inc., Woodstock, Ill.

Continuation-in-part of Ser. No. 253,111, Jun. 2, 1994. This application Jan. 25, 1995, Ser. No. 377,814
Int. Cl.[6] B65D 1/02
U.S. Cl. 215—50 **12 Claims**



1. A hermetically sealed container of a thermoplastic material and comprising:

(a) a body portion having an upper end terminating in a neck portion unitary therewith;

(b) a throat portion unitary with said neck portion and exteading away from the neck portion in a direction away from the body portion;

(c) a preformed closure insert immobilized within said throat portion; said closure insert having an axially extending passageway defined therethrough; and

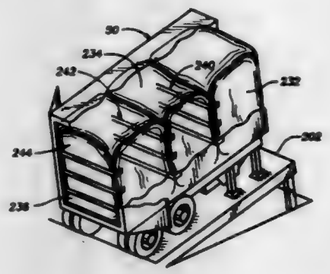
(d) a removable overcap unitary with said throat portion and delineated by a peripheral frangible web circumscribing the closure insert,

wherein said closure insert is a subassembly that includes a base member with a scabrous perimeter surface immobilized within said throat portion and a multiple entry closure member removably secured to said base member.

5,595,315
BRACING SYSTEM FOR A LINER FOR A CARGO CONTAINER

Victor T. Podd, 255 Beverly Avenue, Montreal, Quebec, Canada; Stephen D. Podd, Blockhouse Point Rd., North Hero, Vt. 05474, and Victor L. Podd, 1678 S.W. 20th Ave., Boca Raton, Fla. 33486

Division of Ser. No. 869,246, Apr. 15, 1992, Pat. No. 5,318,193, which is a division of Ser. No. 627,695, Dec. 14, 1990, Pat. No. 5,152,735, which is a continuation-in-part of Ser. No. 482,830, Feb. 15, 1990, Pat. No. 5,181,625. This application Feb. 18, 1994, Ser. No. 198,869
Int. Cl.[6] B65D 25/00
U.S. Cl. 220—1.5 **2 Claims**



1. A cargo container comprising:

a container body defining an interior cargo space;

a plurality of flexible and expandable liners secured inside the container body, each of the liner including a back panel;

plurality of bracing systems secured in the container body, each of the bracing systems engaging and supporting a respective one of the liners in the container;

the container body includes a floor;

the plurality of liners includes first and second liners;

both the first and second liners are positioned on and supported by the floor of the container;

the first liner is located forward of the second liner;

the plurality of bracing systems includes first and second bracing systems;

the first bracing system includes a plurality of straps connected to the container body and extending across the back panel of the first liner;

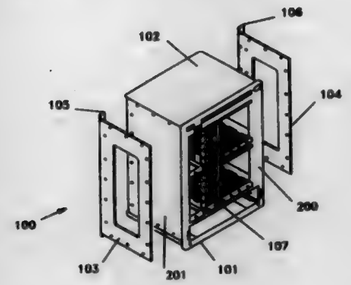
the second bracing system includes a plurality of straps connected to the container body and extending across the back panel of the second liner;

the back panels of each of the first and second liners define a respective discharge outlet for the discharge of cargo from the liner; and

the cargo container further includes a discharge conduit in communication with the discharge outlet of the first liner and

exteading forward therefrom through the second liner, to discharge cargo from the first liner and through the second liner.

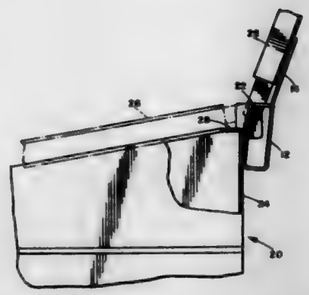
5,595,316
EQUIPMENT ENCLOSURE
Pat Gallarelli, Chapel Hill; Joel E. Walker, and Robert E. Steinbugler, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 7, 1995, Ser. No. 474,225
Int. Cl.[6] B65D *6/16*
U.S. Cl. 220—4.33 **1 Claim**



1. An enclosure comprising:
a continuous sheet metal top member;
a continuous sheet metal bottom member substantially identical to said top member;
a continuous sheet metal tube assembly;
a continuous sheet metal front panel having slots formed therein for permitting access to an inside of said enclosure;
means for attaching said front panel to said tube assembly;
means for attaching said top member to said tube assembly;
means for attaching said bottom member to said tube assembly;
first and second side plates having first and second flange portions, respectively, adaptable for coupling to an equipment rack;
means for attaching said first and second side plates to said enclosure so that said first and second flange portions project outward from a front of said enclosure for front facing mounting of said enclosure on said equipment rack;
means for attaching said first and second side plates to said enclosure so that said first and second flange portions project outward from a rear of said enclosure for rear facing mounting of said enclosure on said equipment rack; and
means for attaching said first and second side plates to said enclosure so that said first and second flange portions project inward to a rear of said enclosure for stand-alone mounting of said enclosure.

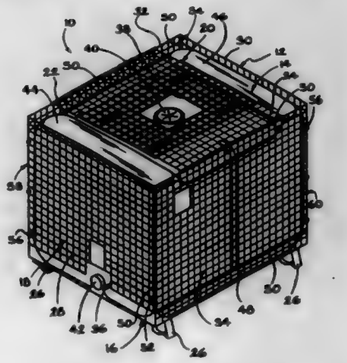
5,595,317
LID PROP FOR COMMERCIAL TRASH BIN
Tony Hodge, 6504 Eldridge St., San Diego, Calif. 92120
Filed Jun. 2, 1995, Ser. No. 459,754
Int. Cl.[6] B65D *43/24*
U.S. Cl. 220—335 **10 Claims**

1. An apparatus on a container for propping a lid of the container in a partially open position, comprising:
a first arm extending away from an axis in a first direction, said first direction having at least a first direction component perpendicular to said axis;
a frame including a second arm connected to said first arm and extending away from said axis in a second direction, said second direction having at least a second direction component perpendicular to said axis, said frame having an elongated slot



rotatably retaining a lid rod of said container parallel to said axis, said lid rod axially movable in said elongated slot, one of said first and second arms in contact with said lid and the other of said first and second arms in contact with a rear wall of said container when said lid is in said partially open position, one of said first and second arms movable out of one of said contact when said frame is moved interally with respect to said lid rod.

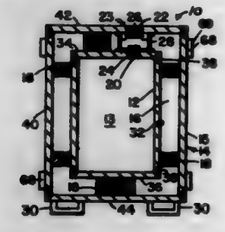
5,595,318
COMPOSITE CONTAINER WITH IMPROVED OUTER SHELL
Keith Barno, Anniston, Ala., assignor to Hoover Group, Inc., Alpharetta, Ga.
Filed Oct. 27, 1994, Ser. No. 329,870
Int. Cl.[6] B65D *19/00*
U.S. Cl. 220—401 **13 Claims**



1. A reusable one-way shipping container comprising:
a generally rectangular box shaped outer container of mesh material and including a bottom wall, side walls, and a top wall, said bottom wall having legs extending downward therefrom to support said shipping container a distance above a support surface, said top wall being defined by at least two opposing top panels, at least one of said top panels having a fill opening defined therein, one of said side walls having a portion defining a discharge opening generally adjacent to said bottom wall;
a synthetic resin inner tank adapted for the storage of fluids therein, said inner tank being positionable within said outer container and being removable therefrom, said inner tank including an inlet fitting permitting the introduction of fluids into said inner tank and located on said inner tank so to be accessible through said fill opening when said inner tank is within said outer container, said inner tank also including a discharge fitting permitting the dispensing of fluids from said

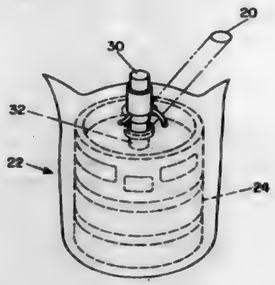
inner tank, said discharge fitting located on said inner tank to be accessible through said discharge opening;
each of said top panels being rotatably secured one of said side walls for movement between an opened position and a closed position, said open position allowing said inner tank to be withdrawn out of said outer container upwardly between said side walls, said top panels extending at least partially across the top of said inner tank and overlapping one another when in said closed position; and
securing means for releasably securing said top panels in said closed position and preventing inadvertent movement of said top panels from said closed position to said open position thereby retaining said inner tank within said outer container.

5,595,319
REUSABLE CONTAINER UNIT HAVING SPACED PROTECTIVE HOUSINGS
William R. Householder, Johnson City, Tenn.; William M. Arnold, and Charles S. Brewer, both of Bristol, Va., assignors to Nuclear Containers, Inc., A Tennessee Corporation, Elizabethton, Tenn.
Continuation-in-part of Ser. No. 64,670, May 21, 1993, Pat. No. 5,395,007, and Ser. No. 721,182, Jun. 21, 1991, abandoned. This application Mar. 6, 1995, Ser. No. 399,206
Int. Cl.[6] B65D *90/04*
U.S. Cl. 220—429 **19 Claims**



1. A reusable container unit for flowable materials, said unit having enhanced puncture resistance and leak prevention characteristics and comprising a substantially closed first wall means forming a vessel for containing said material and preveating leakage thereof, a substantially rigid protective shell formed by a substantially closed second wall means surrounding said vessel and spaced therefrom over at least a major portion of the outer surface of said first wall means to provide a protective spacing between said first and second wall means, wherein impact forces on said shell are not readily transmitted to said vessel, spacer cushion means positioned between said first and second wall means for maintaining said protective spacing therebetween, first aperture means through said first wall means and second aperture means through said second wall means forming an access port entering into said vessel for filling and emptying the same of flowable material, first closure means for said first aperture means and second closure means for said second aperture means, said first and second closure means being operable for selectively sealing or opening said apertures to allow the filling and emptying of said vessel, said first and second closure means being structurally and operably substantially independent of each other and spaced apart from each other to maintain the integrity of said protective spacing, third wall means forming a tubular shaped conduit having an inner end and an outer end and extending between said first and second wall means and having its said inner end sealingly affixed to said first wall means and its said outer end sealing affixed to said second wall means and encompassing said first and second aperture means respectively to substantially seal said third wall means between said first and second wall means and provide access to said first closure means for providing for the passage of said materials into and out of said vessel, said third wall means being readily distortionable under impact forces applied to said shell in the vicinity of said second closure means for minimizing the portion of said impact forces transmitted to said first wall means, and base means on said shell for contacting and stabilizing said container unit in at least one position on a support.

5,595,320
INSULATED BAG FOR BEER KEG
Xerxes K. Aghamiposur, 1085 Commonwealth Ave. #187, Boston, Mass. 02215-1023
Filed Dec. 1, 1994, Ser. No. 348,046
Int. Cl.[6] B65D *30/08*
U.S. Cl. 220—466 **9 Claims**



1. An insulated bag comprising:
an enclosing wall having one open end and one covered end, said covered end having a removable portion, said portion when removed providing an opening in the covered end of said insulated bag;
said enclosing wall and the covered end including, a multilayered structure having an inner layer of heat resistive material, an intermediate layer filled with air or other flexible heat insulating material disposed over said inner layer, and an outer layer of a metalized polyethylene material disposed over said intermediate layer, said inner, intermediate and outer layer sealed together around the periphery of said removable portion.

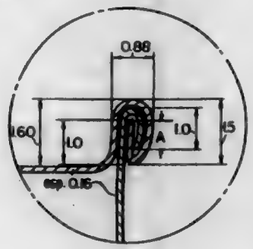
5,595,321
GLASS-FIBRE-REINFORCED PLASTIC CONTAINER
Kurt Bergland, Norrfjärden, Sweden, assignor to Composite Scandinavia AB, Piteå, Sweden
Division of Ser. No. 352,282, Dec. 8, 1994, abandoned, which is a division of Ser. No. 142,476, Nov. 22, 1993, abandoned. This application May 1, 1995, Ser. No. 432,550
Claims priority, application Sweden, May 24, 1991, 9101584
Int. Cl.[6] B65D *90/08*
U.S. Cl. 220—565 **6 Claims**



1. Plastic tank reinforced with glass-fibres or corresponding reinforcing filaments, and composed of two generally cylindrical tank halves, each having a bottom, one of said bottoms having a connecting opening, the open ends of said tank halves being conically bevelled and inserted into each other as a male part in a

female part and held together by an adhesive, said tank halves having outer and inner layers containing essentially longitudinal reinforcing strands and an intermediate layer containing essentially transverse reinforcing strands, the inner layer of the male part containing a layer of densely arranged reinforcing strands in a number of courses of flat-lying rovings, the outer layer of said female part containing a layer of densely arranged reinforcing strands in a number of courses of flat-lying rovings, and said cone angle in the conical joint being in the interval 2–10° characterized in that the outer layer (29) of the male part (20) and the inner layer (36) of the female part (22) comprise reinforcing strands in flat-lying rovings forming groups (30, 37) with a predetermined lateral spacing (F) between the groups to form channels (31, 38), in which plastic has been introduced during casting of the respective tank half (10, 12) to facilitate dispersion of the plastic between the reinforcing strands in the respective tank half.

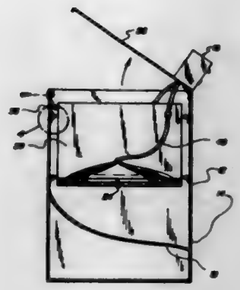
5,595,322
MICROSEAMED METALLIC CAN
Antonio H. Kramer, Sao Paulo, Brazil
Division of Ser. No. 45,436, Apr. 8, 1993, Pat. No. 5,320,468, which is a continuation-in-part of Ser. No. 729,331, Jul. 12, 1991, abandoned. This application Jan. 13, 1994, Ser. No. 180,647
Claims priority, application Brazil, Jul. 13, 1990, 9003371
Int. Cl.[6] B65D *8/20*
U.S. Cl. 220—619 **10 Claims**



1. A metallic can having a microseam formed between a can end and s can body providing reduction of cover hooks and body hooks as well as length of seam, countersink of seam and overlap of seam, comprising: a flanged body of a can having a reduced flange and at least one curled can end having a reduced curl, and said curled can end having profile and curling dimensions necessary for connecting the curled can end to the reduced flange can body;, said microseam having a reduced length of substantially 1.50 mm, a reduced body hook of substantially 1.0 mm, a reduced cover hook of substantially 1.0 mm, a reduced countersink of substantially 1.60 mm, and a reduced overlap, and wherein the microseam is substantially free from wrinkles and folds on the cover hook, and forms a hermetic seal.

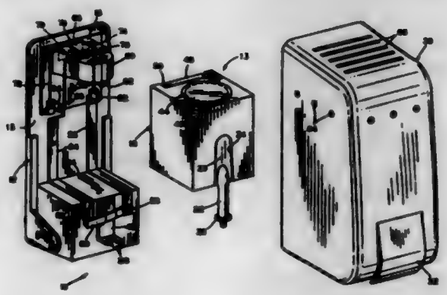
5,595,323
SECURE PERIODICAL VENDING MACHINE
James W. Day, 19431 N. 67th Dr., Glendale, Ariz. 85308
Filed Apr. 17, 1995, Ser. No. 422,985
Int. Cl.[6] B65H *3/00*
U.S. Cl. 221—194 **7 Claims**

1. A secure periodical vending machine comprising:
a housing, the housing being shaped so as to define a dispensing aperture directed through a front wall thereof;
a coin changer mounted to the housing;
a guide chute extending through the housing and into contiguous communication with the dispensing aperture thereof;
dispensing means for selectively dispensing a single periodical onto the guide chute and through the dispensing aperture in



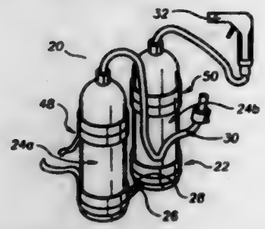
response to an operation of the coin changer including a rectangular hopper secured within the housing and positioned above the guide chute, the rectangular hopper including a plurality of separate vertical receiving bins, within which a plurality of periodicals can be individual positioned; and a latch means exteading along a lower surface of the rectangular hopper and positioned between the hopper and the guide chute, the latch means being positioned in electrical communication with the coin changer for selectively permitting communication between an individual one of the vertical receiving bins and the guide chute such that a periodical residing within the individual one of the receiving bins can be gravitationally biased from the rectangular hopper and onto the guide chute for dispensing through the aperture in the front of the housing.

5,595,324
DUAL DISPENSER, SUPPLY UNIT, AND METHOD
Douglas S. Brown; David F. Scherger, both of Toledo; George C. Hellman, Northwood, and Robert B. Brown, Toledo, all of Ohio, assignors to Fresh Products, Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 24,448, Mar. 1, 1993, Pat. No. 5,379,917. This application Oct. 6, 1994, Ser. No. 319,292
Int. Cl.[6] B67D *5/00*
U.S. Cl. 222—1 **3 Claims**



3. A method of packaging a supply unit for a dual dispenser, comprising:
providing a supply of soap;
providing a supply of air freshener;
connecting said supply of soap and said supply of air freshener in a manner such that when said supply of soap is removed from a dispenser said supply of air freshener is removed from said dispenser; and
connecting a power source to one of said supply of soap and said supply of air freshener in such a manner that when said one of said supply of soap and said supply of air freshener is removed from a dispenser said source of power is removed from said dispenser.

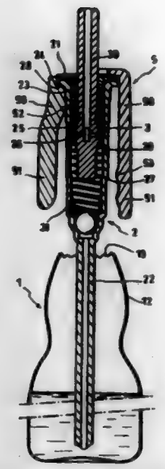
5,595,325
PORTABLE LIQUID SUPPLY
Stelios C. Lerea, 2659 Halsey Ave., New Orleans, La. 70114
Filed Aug. 22, 1995, Ser. No. 517,743
Int. Cl.[6] B67D *5/52*
U.S. Cl. 222—135 **7 Claims**



1. A portable liquid supply comprising:
a first liquid storage container including a first bottom reservoir member having a first loading mouth in connection with a first internal storage cavity, and a first loading mouth lid, securable over said first loading mouth aperture, having a first tube aperture, said first bottom reservoir member including a first loop stop in connection with a first exterior surface thereof extending outwardly from said first exterior surface;
a second liquid storage container including a second bottom reservoir member having a second loading mouth in connection with a second internal storage cavity, and a second loading mouth lid, securable over said second loading mouth aperture, having a second tube aperture, said second bottom reservoir member including a second loop stop in connection with a second exterior surface thereof extending outwardly from said second exterior surface;
a transfer conduit, having a transfer valve installed in line therein, in fluid connection between said first and said second reservoir bottom members;
a drinking tube assembly in fluid connection with one of said liquid storage containers;
a spray nozzle assembly in fluid connection with said other liquid storage container; and
a container support frame including a central support member connected between a first and second liquid storage container support, each of said first and second liquid storage container supports including a pair of spaced, coaxially aligned container support loops, a diameter of each container support loop is selected to allow a top section of said bottom reservoir member to pass therethrough but to prevent said loop stop of said bottom reservoir member from passing through said support loop, a spacing between said container support loops forming each of said pairs of support loops is selected such that, when said loop stop is in contact with one of said container support loops, said top section of said bottom reservoir member extends through and past said other coaxially oriented container support loop a distance sufficient to allow said loading mouth lid to be secured over said loading mouth of said bottom reservoir member in a manner such that said loading mouth lid prevents passage of said top section through said adjacent container support loop.

5,595,326
SYSTEM FOR PACKAGING AND DISPENSING A LIQUID PRODUCT
Jean-Louis Bougamont, Eu, and Stanislas Peronnet, Paris, both of France, assignors to Sofab, LeTreport, France
Filed Jan. 5, 1995, Ser. No. 368,996
Claims priority, application France, Jan. 7, 1994, 94 00109
Int. Cl.[6] B67D *5/54*
U.S. Cl. 222—321.7 **13 Claims**

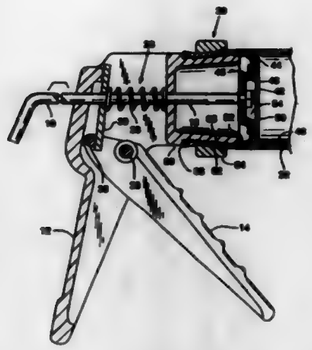
1. A system for packaging and dispensing a liquid product, the system comprising:



a glass vial defining a volume for receiving and containing the liquid product, said glass vial comprising a body portion, a neck portion, and a tip portion, said neck portion and said tip portion joined together at a line of weakness, said glass vial adapted to be opened by snap-off removal of said tip portion from said neck portion at said line of weakness;
a metering pump comprising:
a tubular pump body with a dip tube projecting axially in a first direction, and
a push-button dispensing head comprising a piston disposed for axial movement within said pump body, with a hollow rod defining an ejection duct projecting axially in a second direction opposite to said first direction of said dip tube,
said pump body defining a vent closed by said piston in a rest position; and
said pump body, in a mid-region, defining a shoulder disposed for supporting engagement upon a lip of said neck portion of said glass vial; and
an assembly element disposed for sealing engagement between said pump body and said glass vial, said assembly element comprising an elastically deformable sleeve permanently fixed in sealed engagement upon a top portion of said pump body by a top waist-band, with a skirt extending from said top waist-band and disposed for sealing engagement against an exterior wall surface of said neck portion of said glass vial.

5,595,327
CAULK GUN WITH TUBE ENGAGING RECEPTACLE
Christopher G. Dentler, and John N. Zagone, both of Portland, Oreg., assignors to Z-Pro International, Inc., Portland, Oreg.
Continuation-in-part of Ser. No. 269,863, Jun. 30, 1994, Pat. No. 5,553,754. This application Oct. 27, 1994, Ser. No. 330,536
Int. Cl.[6] B65D *88/54*
U.S. Cl. 222—327 **22 Claims**

1. A caulk gun for dispensing caulk from a cylindrical caulk tube having a rear drive plate, the gun comprising:
(a) a handle having a trigger mechanism pivotally connected to the handle;
(b) a plunger assembly including a plunger slidably connected to the handle, wherein operation of the trigger toward the handle drives a plunger in a forward direction and operation of the trigger away from the handle urges the plunger in a rearward direction;
(c) a piston connected to the plunger and having a flexible, circumferential rim for engaging the drive plate of the caulk tube, wherein the piston mechanically pushes against the drive plate when the plunger moves forwardly and the piston



creates a pressure differential against the drive plate when the plunger moves rearwardly thus urging the drive plate rearwardly; and

(d) a tube receiving receptacle coupled to the handle for receiving and fixedly engaging a portion of the elongate cylindrical tube and preventing movement of the cylindrical tube when the plunger pushes against the drive plate and the plunger urges the drive plate rearwardly.

5,595,328

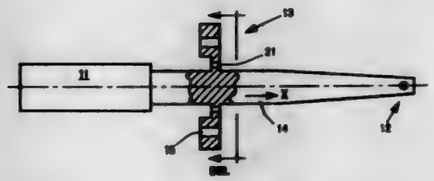
SELF ISOLATING ULTRASONIC TRANSDUCER

Ali R. Safinahkah, Yardley; Valery Khalemsky, Holland, and Charles S. Kalliche, Fort Washington, all of Pa., assignors to Kalliche and Sofia Investments, Inc., Wilmington, Del.

Filed Dec. 23, 1994, Ser. No. 361,736

Int. Cl.[6] B23K *20/10*

U.S. Cl. 228—1.1 **14 Claims**



3. A low mounting impedance ultrasonic transducer, comprising:

a transducer body,

an ultrasonic driver at one end of said transducer body,

a bonding tool mounting recess at the other end of said transducer body,

a mounting flange directly connected to over fifty percent of said transducer body and forming a rigid connection therewith at a zero mounting node intermediate the ends of said transducer body,

a plurality of mounting holes in said mounting flange for mounting said transducer body on a bonding machine, and

a pair of stress relieving slots between said transducer body and said mounting holes for relieving radial pressure waves that are directed toward said mounting holes and for providing a uniformly low mounting impedance Z_M.

5,595,329

APPARATUS FOR WELDING PROFILE BODIES ONTO PLANAR BODIES

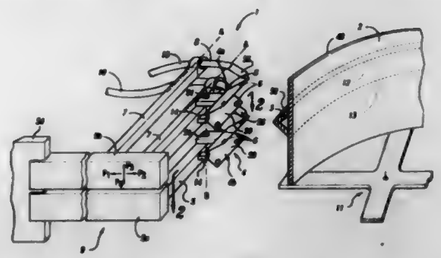
Georg Penger, Oberappendorf, Germany, assignor to Anton Steinecker Entwicklungs GmbH & Co., Germany

Filed Mar. 3, 1995, Ser. No. 398,014

Claims priority, application Germany, Mar. 4, 1994, 9403709 U

Int. Cl.[6] B23K *37/00*

U.S. Cl. 228—9 **13 Claims**



1. Apparatus for welding profile bodies onto plane or cylindrical body surfaces, comprising at least one welding torch head, a positional assignment of said welding torch head to a weld seam being defined by a profiled seam detector whose profile shape is adapted to a profile shape of said profile body, said seam detector being adapted to be activated toward said profile body and being provided with rolls through which said seam detector can be supported on said profile body.

5,595,330

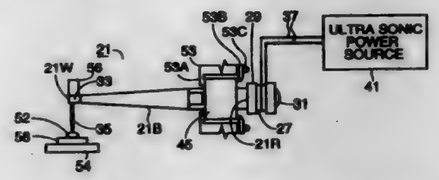
POWER SUPPLY

David Buice, Dallas; Cesar Alfaro, Carrollton, and Mike Whelan, Coppell, all of Tex., assignors to Verity Instruments, Inc., Carrollton, Tex.

Filed Aug. 24, 1994, Ser. No. 295,992

Int. Cl.[6] B23K *20/10*

U.S. Cl. 228—102 **4 Claims**



2. A method of bonding a metal member to a metal bond site with the use of an ultrasonic transducer having an electrically activated vibrating means for vibrating said transducer, comprising the steps of:

contacting said transducer with said metal member while said metal member is engaging said bond site,

applying an output voltage to said electrically activated vibrating means for vibrating said transducer at ultrasonic frequency for causing said metal member to bond to said bond site during a given cycle,

during the initial part of said cycle, applying a higher output voltage to said electrically activated vibrating means than during the remaining part of said cycle wherein bonding is carried out at least during the remaining part of said cycle,

obtaining voltage and current functions from said output voltage during the remaining part of said cycle while bonding is being carried out and deriving a power function from said voltage and current functions,

comparing said power function with a preset voltage function to obtain a correction function, and

using said correction function to maintain the level of said output voltage substantially constant while bonding is being carried out during the remaining part of said cycle.

5,595,331

CLAMPING COAT HANGER FOR GARMENTS

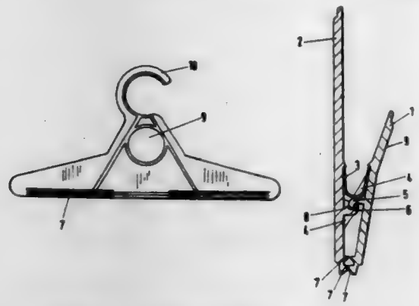
Corinna Leistner, Leipziger Strasse 16, D-06/25 Reuden, Germany

Filed Aug. 30, 1995, Ser. No. 520,900

Claims priority, application Germany, Aug. 30, 1994, 44 30 752.7

Int. Cl.[6] A47G *25/48*

U.S. Cl. 223—91 **16 Claims**



1. A clamping coat hanger comprising:

a main clamping member having an upper and a lower end, said upper end having a hook for suspending said coat hanger and said lower end comprising at least one first clamping rib;

a first clamping member having an upper and a lower end, wherein said lower end comprises at least one second clamping rib and wherein said upper end has a first pressure application location;

said main clamping member and said first clamping member pivotably connected to one another in an area between said upper and said lower ends thereof, wherein said main clamping member has a first pivot hook member and wherein said first clamping member has a second pivot hook member for cooperation with said first pivot hook member, wherein said first and second hook pivot hook members are pivotable about a pivot axis parallel to a longitudinal extension of said first and second clamping ribs, wherein said first and second pivot hook members engage and hook one behind one another by transversely intersecting said pivot axis; and

a first elastic element connected to said main clamping member and said first clamping member above said pivot axis for forcing said main clamping member and said first clamping member apart and simultaneously forcing said first and second pivot hook members into engagement such that said first and second clamping ribs clamp a garment therebetween.

5,595,332

STRAP COVER AND METHOD OF MAKING THE SAME

Francelyna Freedman, Easy Hill Farm, R.R. 2, Box 134, Verbank, N.Y. 12585

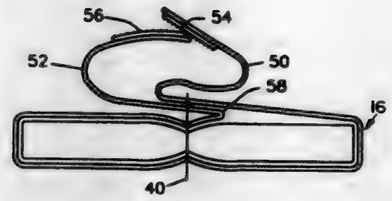
Filed Feb. 7, 1995, Ser. No. 384,852

Int. Cl.[6] B60R *22/00*

U.S. Cl. 224—264 **8 Claims**

1. A cover for securing around a strap of a strap-bearing device comprising:

a) a sleeve slidably mounted around the strap comprising a first opening for receiving an end of the strap and an opposed opening enabling the end of the strap to exit the sleeve so that the sleeve is slidably mounted around the strap when the cover is operatively engaged to the strap-bearing device;



b) a support layer including a chamber containing a padding material beneath the sleeve and positioned between the strap and a user; and

c) securing means for securing the sleeve to the support layer, said sleeve and said support layer being formed of a continuous sheet of material.

5,595,333

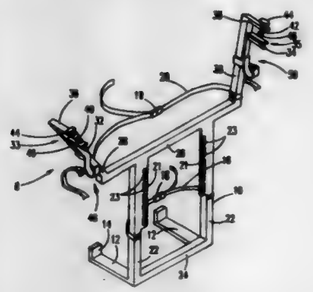
RACK FOR CARRYING A BOW OR LONG GUN ON AN ALL-TERRAIN VEHICLE

Leslie E. Boston, 2850 Tenita Rd., Owenton, Ky. 40359

Filed Jun. 6, 1995, Ser. No. 467,465

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—536 **10 Claims**



1. A rack for carrying an archery bow or a firearm comprising:

a frame, said frame forming a plane;

a first pair of arms attached to said frame and extending from said frame;

a rigid member protruding from each of said first pair of arms and projecting substantially normal to said plane, said rigid members disposed to support a hunting weapon;

said first pair of arms each having a second rigid member disposed on each of said arm substantially parallel to said first rigid member, each said second rigid member supporting a clamping member moveable relative to said second rigid member and engageable with said weapon, trapping said weapon between said clamping member and said first rigid member, thereby retaining said hunting weapon on said rack;

a second pair of arms projecting substantially normal to said plane from said frame, said second pair of arms further comprising retaining flanges, and

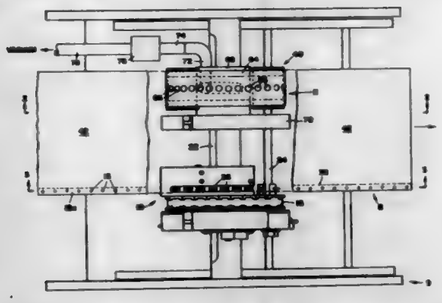
retainer straps attached to said rack and disposable around a device supported on said second pair of arms for transportation.

5,595,334

VACUUM AND TRACTOR DRIVE FOR PAPER WEB

Eric A. Belec, Southbury; Eric J. Janatka, Danbury; Shahzad H. Malick, Fairfield, all of Conn., and Rebecca J. Prittting, Pawling, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 16, 1995, Ser. No. 543,673
Int. Cl.[6] B65H *20/10;20/22*
U.S. Cl. 226—15 5 Claims



1. Apparatus for transporting a web of paper having tractor holes along only one margin thereof and a marginal portion without tractor holes, comprising:

a tractor drive having a first pair of pulleys and a first belt mounted on said first pair of pulleys, said first belt having a plurality of sprockets adapted to engage said paper tractor holes; and

an auxiliary vacuum drive system for engaging the marginal portion of said web of paper without tractor holes, said auxiliary drive system having (a) a second pair of pulleys and a second belt mounted on said second pair of pulleys, said second belt having a plurality of apertures at equally spaced intervals extending longitudinally of the length of said second belt, said second belt having an upper and lower reach, (b) means for applying a vacuum to the apertures in the upper reach of said second belt, (c) means for varying the amount of vacuum applied by said vacuum applying means, and (d) means for driving the upper rack of said second belt at about the same linear velocity as the linear velocity of the tractor drive sprockets, whereby the vacuum applying means can be turned off during constant velocity or deceleration motions of the web, to dissipate tolerance build-up due to speed differential between said tractor drive and said auxiliary vacuum drive system.

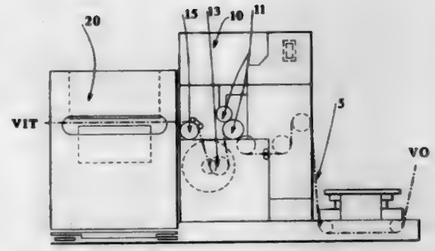
5,595,335

INFEED STATION FOR CONVERTING A CONTINUOUSLY MOVING WEB-LIKE SHEET INTO AN INTERMITTENTLY FED WEB-LIKE SHEET FOR A SUBSEQUENT PROCESSING STATION

Edouard Borel, Corcelles, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Apr. 19, 1995, Ser. No. 424,055
Claims priority, application Switzerland, Apr. 25, 1994, 01267/94
Int. Cl.[6] B65H *20/04;20/24;23/192*
U.S. Cl. 226—42 6 Claims

1. In combination, an infeed station having an eccentric roller mounted for rotation between two rotary plates around which a web-like sheet travels so that the speed of the sheet entering the station is converted from a constant inlet speed into a variable outlet speed which is desired by an operating cycle of a working station to which the sheet is being supplied, said infeed station having an infeed roller for guiding the web-like sheet from the eccentric roller into the working station, the improvement comprising means for driving the infeed roller with a variable peripheral



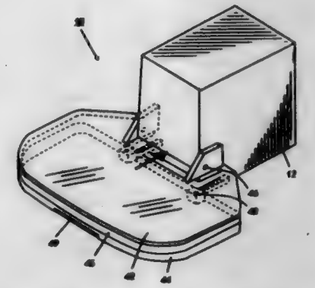
speed which is being synchronized with changes in the variable outlet speed of the web-like sheet passing through the working station although the variable peripheral speed of the feed roller remains permanently at a higher rate than the variable outlet speed of the web-like sheet.

5,595,336

SAFETY STAPLER

Wayne D. Everdyke, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1995, Ser. No. 551,600
Int. Cl.[6] B27F *7/36*
U.S. Cl. 227—7 2 Claims



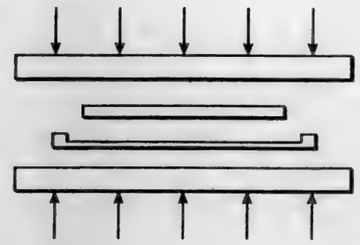
2. A safety system for a power stapler with stapling jaws with a sheet entrance, in which stapling of a set of sheets of up to a preset maximum thickness is actuated by inserting the set of sheets into the stapling jaws of the stapler, wherein said safety system comprises a large transparent upper plate mounted above the entrance to the stapling jaws of the stapler and extending away from the stapling jaws of the stapler by at least approximately 8 centimeters, and a lower plate below the entrance to the stapling jaws of the stapler extending away from the stapling jaws of the stapler, to prevent fingers from being inserted into the stapling jaws of the stapler, said upper and lower plates being spaced apart by a distance not substantially greater than the maximum thickness of the set of sheets to be inserted into the stapling jaws of the stapler to allow the set of sheets to be insertable into the stapling jaws of the stapler from between said upper and lower plates and movable for alignment between said upper and lower plates while being visible through said transparent upper plate; wherein at least said upper plate is pivotally mounted to said stapler to be pivotable into a compact vertical storage position closely adjacent to said stapler, in which position access to the stapling jaws is blocked.

5,595,337

SPUTTERING DEVICE AND TARGET WITH COVER TO HOLD COOLING FLUID

Richard E. Demaray, Portola Valley; Manuel Herrera, San Mateo, and David E. Berkstresser, Los Gatos, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 157,763, Nov. 24, 1993, Pat. No. 5,433,835. This application Jun. 5, 1995, Ser. No. 460,954
Int. Cl.[6] B23K *20/00;20/22;* C23C *14/34*
U.S. Cl. 228—193 3 Claims



1. A method of producing a sputtering target assembly comprising the steps of:

preparing the surface of a tantalum target for bonding;

preparing the surfaces of a titanium backing plate for bonding;

placing the tantalum surface to be bonded in contact with the titanium surface to be bonded;

placing the surfaces to be bonded in an inert gas or vacuum environment;

pressing the bonding surfaces against one another at approximately 2 MPa, while simultaneously heating the surfaces to be bonded to approximately 750° C.;

heating the surfaces to be bonded to approximately 885° C. for approximately one hour; and

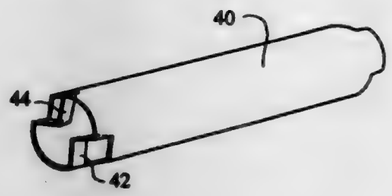
maintaining the pressure on the bonding surface during cooling.

5,595,338

REUSABLE CONTAINER FOR A STACK OF COINS

Frederick F. Abler, P.O. Box 1022, San Luis Obispo, Calif. 93406

Filed Dec. 2, 1994, Ser. No. 348,458
Int. Cl.[6] B65D *65/04*
U.S. Cl. 229—87.2 3 Claims



1. A container for a stack of coins comprising:

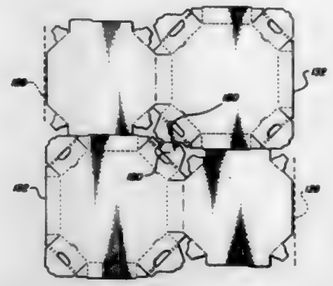
a hollow cylinder of a flexible material, open at both ends, including at each end at least two marginal portions connected together to form a toggle retainer, and sufficiently flexible that it can be flattened by an applied force less than one pound.

5,595,339

BLANK FOR ONE-PIECE OCTAGONAL BOX

John D. Correll, 8459 Holly Dr., Canton, Mich. 48187

Continuation-in-part of Ser. No. 145,248, Nov. 1, 1993, abandoned, and Ser. No. 311,396, Sep. 23, 1994, which is a continuation of Ser. No. 86,318, Jul. 6, 1993, abandoned, and Ser. No. 29,195, Sep. 30, 1994, Pat. No. Des. 371,296. This application Sep. 14, 1995, Ser. No. 527,851
Int. Cl.[6] B65D *5/22*
U.S. Cl. 229—109 15 Claims



1. A double-matable, alignable blank for a one-piece octagonal box, said blank being of foldable material cut and scored to define:

(a) a bottom panel having front and rear edges, left and right edges, and first, second, third, and fourth diagonal edges, said front and rear edges being disposed approximately parallel one to another, said left and right edges being disposed approximately parallel one to another, the first diagonal edge being disposed between said front edge and said left edge, the second diagonal edge being disposed between said front edge and said right edge, the third diagonal edge being disposed between said rear edge and said left edge, and the fourth diagonal edge being disposed between said rear edge and said right edge,

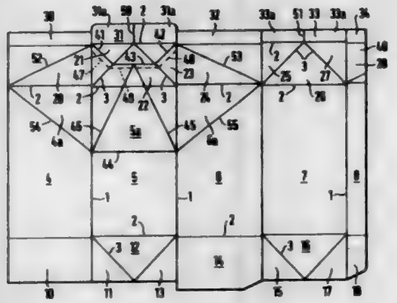
(b) a front wall, a rear wall, and left and right walls hingedly attached to said bottom panel at the front edge, rear edge, and left and right edges, respectively, each of the walls having top and bottom edges,

(c) a cover panel hingedly attached to the top edge of said rear wall at a cover fold line, said cover panel having a plurality of cover edges including non-parallel first and second diagonal cover edges and parallel left and right free cover edges, and a plurality of cover flaps comprising first and second cover flaps hingedly attached at said first and second diagonal cover edges, respectively,

(d) first, second, third, and fourth double-panel diagonal wall structures hingedly attached to said bottom panel at said first, second, third, and fourth diagonal edges, respectively, each said double-panel diagonal wall structure comprising an outer panel and an inner panel hingedly linked to said outer panel, said inner and outer panels each having top and bottom edges, the distance between said top and bottom edges of said inner panel being substantially the same as the distance between said top and bottom edges of said outer panel, whereby when said blank is folded into a box each said double-panel diagonal wall structure forms a double-panel wall, at least one of the inner panels of said third and fourth double-panel diagonal wall structures being non-rectangular.

5,595,340
PACKAGING
Edward A. Skinner, Welwyn Garden City, United Kingdom, assignor to Elopak Systems A.G., Glattbrugg, Switzerland
Filed Oct. 27, 1995, Ser. No. 549,257
Claims priority, application United Kingdom, Oct. 28, 1994, 9421722
Int. Cl.[6] B65D 5/74
U.S. Cl. 229—216 18 Claims

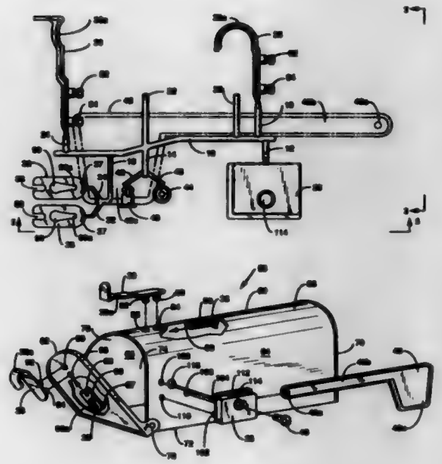
1. A packaging container including an end closure comprised of



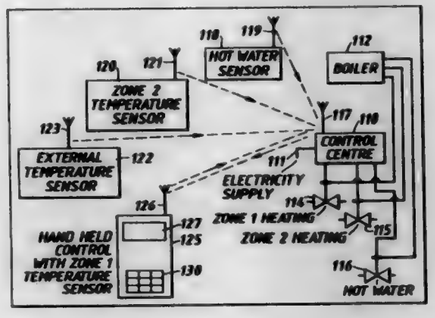
a first plurality of container wall portions forming an end wall of said container, a second plurality of container wall portions sealed together to form a sealing fin and, in the regions of the respective ends of the sealing fin, third and fourth pluralities of container wall portions flattened together to form respective triangular flaps extending from respective opposite edges of said end wall, at least said third plurality of container wall portions forming a closed, openable, pouring spout, said sealing fin extending face-to-face with said end wall, wherein the improvement comprises said sealing fin being substantially unadhered to said end wall in a first zone near said third plurality of container wall portions and being adhered to said end wall in a second zone further from said third plurality of container wall portions than is said first zone.

5,595,341
MAILBOX ASSEMBLY AND ASSOCIATED METHODS
Larry D. Robinson, Taylorsville, Miss., and James A. Riley, McKeesport, Pa., assignors to Artcraft Industries, Inc., Pittsburgh, Pa.
Filed May 16, 1995, Ser. No. 442,498
Int. Cl.[6] B65D 91/00
U.S. Cl. 232—17 32 Claims

11. A kit for constructing a mailbox, comprising
a mailbox housing defining an inner compartment,
a mailbox door pivotally connected to said housing,
runner means being integrally formed and unitary molded to at least some of said auxiliary components, which said auxiliary components are disconnected from said runner means for said assembling of said mailbox,
said auxiliary components comprise flag bracket means attachable to said mailbox housing,
indicator flag means receivable in said flag bracket means and mountable therein for pivotal movement,
cooperating lasch means attachable to said mailbox housing and to said mailbox door member for latching said door member against said mailbox housing, and
fastening means for securing said flag bracket means, said indicator flag means, and said cooperating latch means to said mailbox.

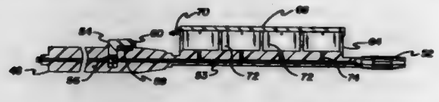


5,595,342
CONTROL SYSTEM
Henry P. McNair, New Malden, and Christos P. Bakopoulos, London, both of United Kingdom, assignors to British Gas plc, London, United Kingdom
Filed May 24, 1994, Ser. No. 248,241
Claims priority, application United Kingdom, May 24, 1993, 9310666; May 24, 1993, 9310667; May 24, 1993, 9310668
Int. Cl.[6] G05D 23/00
U.S. Cl. 236—51 43 Claims



1. A control system for a heating or cooling arrangement incorporating a heating/cooling device, said control system comprising: control means for providing operational control of the heating/cooling device; at least one temperature sensor device including radio transmission means remote from the control means for providing temperature information for transmission to the control means to allow said control means to receive said information to determine whether to operate the heating/cooling device, said radio transmission means including means for reducing the risk of loss of reception of the information by the control means, wherein the means for reducing the risk of loss of reception includes means for transmitting temperature data sequentially on each of a plurality of frequencies by means of selected frequency channels.

5,595,343
SNOW COLORING DEVICE
George Marhelko, Box 614, Nuremberg, Pa. 18241
Filed Aug. 21, 1995, Ser. No. 517,369
Int. Cl.[6] B05B 7/24
U.S. Cl. 239—154 1 Claim

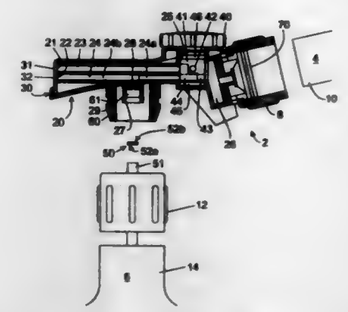


1. A snow coloring device for allowing children or adults to paint snow in a variety of colors comprising, in combination:
a harness having two shoulder straps and a waist strap, the two shoulder straps having end portions secured to the waist strap, the waist strap being adjustably coupled around a waist of a user with the shoulder straps securing over shoulders of the user;
a cylindrical pressure container having a top end, a bottom end, and a surrounding side wall therebetween, the cylindrical pressure container having an opening formed through the top end, the opening receiving a pump therein, the container having nipples extending outwardly of the top end thereof and extending outwardly of the side wall thereof;
a pair of hoses coupled with the nipples of the cylindrical pressure container;
a shield portion secured between the two shoulder straps of the harness for optional coupling with the cylindrical pressure container;
an elongated housing having a first end and a second end, the first end being adapted to be coupled with an end portion of the hose extending from the nipple in the top end of the cylindrical pressure container, the second end having a spray nozzle secured thereto, the elongated housing having a transport tube extending from the end portion of the hose to the spray nozzle, the elongated housing having a spring biased trigger mechanism secured to an upper portion thereof whereby depressing of the trigger mechanism will allow flow of air from the first end freely to the second end and release of the trigger mechanism will prevent the flow of air from the first end to the second end, the elongated housing having a latch pivotally secured thereto, the latch adapted to engage the trigger mechanism when it is depressed thereby locking it in to allow the free flow of air;
a paint container integral with the upper portion of the elongated housing adjacent to the trigger mechanism, the paint container having an open top, the open top having a lid hingedly secured thereto, the open top having a nipple secured thereto coupled with the air hose from the side wall of the cylindrical pressure container, the open top having a plurality of compartments formed therein, each of the compartments being adapted to hold coloring dye therein, each of the compartments having a vertical conduit extending downwardly therefrom to couple with the transport tube of the elongated housing, each vertical conduit having a rotary valve extending outwardly therefrom, each of the votary valves having a first position to allow coloring dye into the transport tube and a second position to prevent the coloring dye from entering into the transport tube.

5,595,344
SURGICAL INSTRUMENT CLEANING DEVICE
Gary D. Starnes, 2524 Castle, Burleson, Tex. 75028
Filed Mar. 2, 1995, Ser. No. 397,394
Int. Cl.[6] B05B 7/04
U.S. Cl. 239—307 9 Claims

1. A surgical instrument cleaning device comprising:
a pump having an inlet conduit fluidly connecting said pump to a water source, and an outlet conduit fluidly connecting said pump to a dispensing means;
a dual injection means for mixing another fluid with the water in the inlet conduit before the water enters the pump; and
an actuating means for selectively permitting the other fluid to flow into the inlet conduit for mixing with the water, wherein the actuating means includes a foot actuating bellows with a normally open air switch, wherein the air bellows supplies air pressure to close the air switch to permit the other fluid to flow into the inlet conduit.

5,595,345
DOUBLE BARREL SPRAYER FOR SELECTIVE SPRAYING OF WATER OR DILUTED PRODUCT AND USE THEREOF
William D. Chura, Ridgefield; Edward Kozlowski, Southport; Lance Liljeqvist, Wilton; Stephen Jones, Darien, all of Conn.; Mark Thompson, Charleston, and Charles Hawes, Summerville, both of S.C., assignors to Armor All Products Corporation, Charleston, S.C.
Continuation-in-part of Ser. No. 451,922, May 26, 1995, abandoned. This application Aug. 4, 1995, Ser. No. 511,142
Int. Cl.[6] B05B 9/00
U.S. Cl. 239—312 25 Claims



1. A portable sprayer for applying a diluted product to a surface to be treated, comprising:
a housing having first and second inlets, first and second outlets, a mixing chamber and a valve member;
the first inlet supplying water to the sprayer;
the second inlet supplying a concentrated liquid product to the sprayer;
the mixing chamber being in fluid communication with the first and second inlets such that water is mixed with the concentrated liquid product to form a diluted product by feeding water through the first inlet and feeding the concentrated liquid product through the second inlet the housing including a passage in fluid communication with the first and second inlets and second outlet, the passage including an upstream portion and a downstream portion, the second inlet being fluid communication with the downstream portion, and the downstream portion having a larger cross section than the upstream portion so that concentrated liquid product is siphoned into the downstream portion and mixed with water supplied

through the upstream portion to provide the diluted product, the diluted product being conveyed in the downstream portion without exposure to atmospheric air until the diluted product is sprayed through the second outlet;

the first outlet spraying rinsing water from the sprayer to allow removal of diluted product from a surface to be treated;

the second outlet spraying the diluted product from the sprayer onto a surface to be treated; and

the valve member being operable to selectively feed the diluted product to the second outlet or feed rinsing water to the first outlet or prevent rinsing water from flowing to the first and second outlets.

5,595,346

AIR ASSISTED ATOMIZING SPRAY NOZZLE

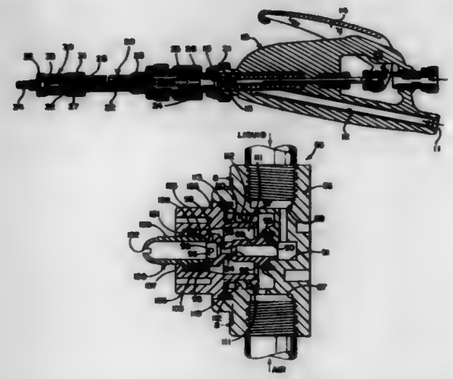
James Haruch, Naperville, and Tim Oberg, Glendale Heights, both of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Continuation-in-part of Ser. No. 119,889, Sep. 10, 1993, Pat. No. 5,385,304, which is a continuation of Ser. No. 871,833, Apr. 20, 1992, abandoned. This application Dec. 2, 1994, Ser. No. 349,402

The portion of the term of this patent subsequent to Apr. 20, 2012, has been disclaimed.

Int. Cl.[6] B05B *7/04*

U.S. Cl. 239—431 **9 Claims**



1. An air assisted atomizing nozzle assembly comprising a housing having a pressurized liquid inlet and a pressured air inlet, an atomizing member defining (i) a mixing chamber having a longitudinal axis, (ii) a liquid injection port in axial communication with said mixing chamber for injecting a liquid stream axially into said mixing chamber, and (iii) a plurality of air injection ports in radial communication with said mixing chamber for injecting a plurality of air streams radially into said mixing chamber thereby to atomize said liquid stream, a spray tip located downstream of said mixing chamber for spraying the atomized liquid into the atmosphere, and means for holding said spray tip and said atomizing member in assembled relation with said housing with said spray tip in communication with said mixing chamber and with said liquid injection port and said air injection ports in communication with said air inlet and said liquid inlet, respectively, said means comprising a cap engageable with at least one of said spray tip and said atomizing member, and co-acting means on said cap and said housing permitting a portion of said cap to be inserted linearly into said housing without turning said cap relative to said housing, said co-acting means being operable after insertion of said cap portion into said housing and after said cap has been rotated through less than one full turn relative to said housing to lock said cap to said housing and to cause said cap to hold said spray tip and said atomizing member in fixed relation with said housing.

5,595,347

PROCESS FOR SEPERATING ILMENITE

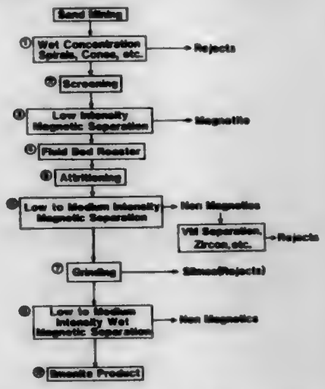
Ernest A. Walpole, Lambton, Australia, assignor to Austpac Gold N.L., Sydney, Australia

Filed Mar. 1, 1993, Ser. No. 989,003

Claims priority, application Australia, Aug. 30, 1990, PK 2031; Apr. 29, 1991, 76298/91

Int. Cl.[6] B02C *19/00;19/12*

U.S. Cl. 241—20 **31 Claims**



1. A process for the separation of ilmenite from raw sand or mineral concentrates thereof, comprising the steps of:

a specific gravity separation stage;

a low intensity magnetic separation stage;

a single stage magnetizing roast for magnetically enhancing ilmenite at a temperature in the range of 650° C.–900° C. using an excess of carbon fuel for providing an atmosphere in which the oxygen potential for oxidation or reduction dependent on mole ratio of the ilmenite is controlled; and,

a low to medium intensity magnetic separation stage.

5,595,348

MACHINE FOR TRITURATING COMPOSITE MATERIALS, PARTICULARLY FOR TRITURATING SOLID URBAN WASTE

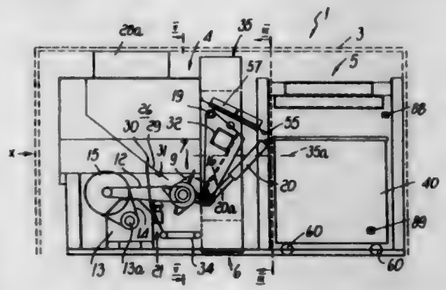
Giuseppe Barone, Termini Imerese, Italy, assignor to ALFA S.r.l., Termini Imerese, Italy

Filed Dec. 15, 1994, Ser. No. 356,485

Claims priority, application Italy, May 18, 1994, PA94A0004

Int. Cl.[6] B02C *18/16*

U.S. Cl. 241—36 **28 Claims**



1. Machine for triturating composite materials including solid urban waste, which comprises a shredding apparatus that comprises:

a cutting element provided with multiple blades arranged side by side along an axis of the cutting element;

a rotation mechanism for rotating said blades about said axis; and

a complementary cutting element which cooperates with said cutting element in shredding material conveyed between said cutting element and said complementary cutting element, said complementary cutting element being movable away from said cutting element to allow material that withstands the action of said blades to pass between said cutting element and said complementary cutting element, said complementary cutting element comprising multiple cutters supported on a supporting element which is movable towards and away from said cutting element;

and wherein the shredding apparatus further comprises a presser device mounted on said supporting element for pressing material loaded in the region that lies between said cutting element and said complementary cutting element.

5,595,349

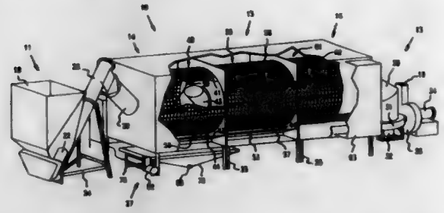
CONTINUOUS FLOW ROTARY MATERIALS PROCESSING APPARATUS

David A. Bergstrom, 811 Leeds Ct., Eau Claire, Wis. 54703, and Carl W. Loff, 707 Westhaven Rd., Chippewa Falls, Wis. 54729

Filed Feb. 27, 1992, Ser. No. 842,568

Int. Cl.[6] B02C *17/02;17/18*

U.S. Cl. 241—41 **16 Claims**



1. A continuous flow, rotary processing apparatus for horizontal transport of material at a predetermined rate, comprising:

a) a cylindrical enclosure, a central axis of which is oriented in a horizontal plane, said cylindrical enclosure being rotatable about said central axis, said cylindrical enclosure having a predetermined diameter and axial length, and further having first and second end walls, a cylindrical wall disposed between said first and second end walls, and at least one vane structure of a predetermined surface area disposed longitudinally on said enclosure cylindrical wall;

b) means to rotate said cylindrical enclosure at a constant predetermined rotational velocity;

c) means to allow ingress of material into said cylindrical enclosure, said ingress means being disposed in said first end wall;

d) an egress aperture disposed axially, with respect to said cylindrical enclosure, in said second end wall;

e) a hollow cylindrical chute disposed in said egress aperture and having a first open end extending into said cylindrical enclosure, and a second open end which is open to the exterior of said cylindrical enclosure; and

f) means to dislodge material resident in said cylindrical chute first end.

5,595,350

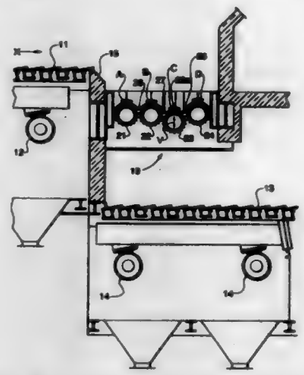
COMMINUTION DEVICE

Michael R. Massaro, Jr.; Robert H. Holland, both of Whitehall, and William J. Speas, Allentown, all of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed Jun. 21, 1993, Ser. No. 80,174

Int. Cl.[6] B02C *4/02;4/08*

U.S. Cl. 241—65 **28 Claims**



1. A device for communicating particulate material having a predetermined minimum size suitable for use in a cooling apparatus for cooling material, said device comprising an assembly of (a) at least two crushing rolls acting in combination to crush said material in a material crushing gap located between said two crushing rolls and (b) at least one transport roll located adjacent to one of said crushing rolls, with there being a gap between each transport roll and the roll located adjacent thereto said transport rolls serving to aid in delivering material of said predetermined size to said material gap, while screening out smaller material through the gap located between each transport roll and the roll located adjacent thereto wherein the position of at least one roll in the assembly is vertically adjustable relative to the roll or rolls adjacent thereto.

5,595,351

METHOD FOR CONTROLLING A WINDING STATION OF A BOBBIN WINDING MACHINE WHEN A TAKE-UP BOBBIN IS CHANGED AND WINDING STATION FOR PERFORMING THE METHOD

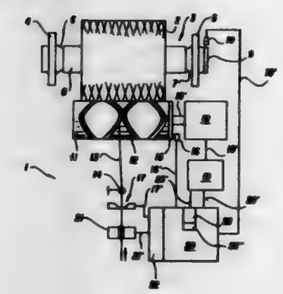
Rolf Hansen, Mönchengladbach, Germany, assignor to W. Schlafhorst AG & Co., Moenchengladbach, Germany

Filed Nov. 14, 1994, Ser. No. 338,962

Claims priority, application Germany, Nov. 18, 1993, 43 39 217.2

Int. Cl.[6] B65H *54/38;63/00*

U.S. Cl. 242—18 DD **10 Claims**



1. In a method for controlling a winding station of a bobbin winding machine when changing a take-up bobbin, the improvement which comprises: driving the take-up bobbin by contact with a driven yarn guide drum and simultaneously depositing a yarn on the take-up bobbin with the yarn guide drum;

ascertaining that a predetermined yarn quantity has been wound onto the take-up bobbin,

subsequently decelerating the take-up bobbin to a standstill by controlled deceleration of a rotary speed of the yarn guide drum and, by means of the controlled deceleration, causing a varying slip between a surface of the yarn guide drum and a surface of the take-up bobbin, the varying slip being great enough to prevent ribbon formation, yet being limited so as to avoid knocking the yarn off the bobbin and damaging the surface of the bobbin.

5,595,352

BAIL ARM INVERTING APPARATUS FOR A FISHING REEL

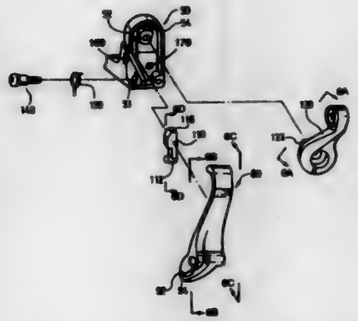
Cheol S. Oh, Kyunggi-Do, Rep. of Korea, assignor to Shin A Sports Co., Ltd., Kimpo-Kun, Rep. of Korea

Filed May 2, 1994, Ser. No. 237,005

Claims priority, application Rep. of Korea, Mar. 23, 1994, 5814

Int. Cl.[6] A01K *89/015*

U.S. Cl. 242—233 **8 Claims**



1. A bail arm inverting apparatus for a fishing reel, said fishing reel having a rotor with a longitudinal axis and being adapted to be attached to a fishing rod with the longitudinal axis aligned generally parallel to the fishing rod, said bail arm inverting apparatus comprising:

an arm-lever support arm extending from said rotor in a generally longitudinal direction and a trigger lever mounting bracket integrally molded with said arm-lever support arm;

a trigger lever pivotally mounted directly to said trigger lever mounting bracket, said trigger lever having a link-engaging portion and a distal, finger-lever portion;

a link member supported on said arm lever support arm, a first end of said link member being engaged with said link-engaging portion of said trigger lever in a manner that permits a limited range of engaged, sliding contact between said link member and said trigger lever, said link member being configured and disposed so as to reciprocate in a direction generally parallel to the longitudinal axis of the reel as said trigger lever pivots;

guide means formed integrally with said arm-lever support arm for guiding the reciprocation of the link member; and

an arm-lever pivotally mounted directly to said arm-lever support arm, said arm-lever pivoting about a second axis disposed generally perpendicular to the longitudinal axis of the reel, said arm-lever having a push member attached directly to and extending therefrom at a position radially spaced from said second axis;

said trigger lever, said link member, and said arm-lever being disposed such that a second end of said link member makes free, sliding, non-engaged pushing contact with said push member when said trigger lever is pivoted whereby pivoting movement of said trigger lever causes pivoting movement of said arm-lever.

5,595,353

FILM SPOOL FOR A FILMSTRIP

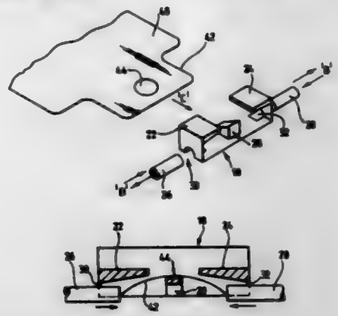
Edward C. T. S. Glover, London, and Anthony Earle, Middlesex, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1995, Ser. No. 517,013

Claims priority, application United Kingdom, Aug. 24, 1994, 9417048

Int. Cl.[6] G03B *23/02*; B65H *19/28*

U.S. Cl. 242—348.1 **6 Claims**



1. A spool for a filmstrip, the spool comprising:

a body portion having a first end and a second end;

a slot formed in the body portion intermediate the first end and the second end thereof; and

a protrusion provided in the slot for engagement with an aperture formed in the filmstrip for attaching the filmstrip to the spool, the filmstrip having a pair of side edges;

characterized in that the spool further includes actuating means positioned adjacent the protrusion and operable to push opposite side edges of the filmstrip in directions toward each other so that the aperture is moved out of engagement with the protrusion detach the filmstrip from the spool.

5,595,354

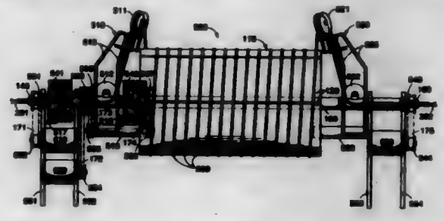
APPARATUS FOR STORING A VARIABLE QUANTITY OF MOVING STRAND MATERIAL

Peter L. Jones, Omaha, Nebr., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 29, 1995, Ser. No. 496,792

Int. Cl.[6] B65H *51/24*

U.S. Cl. 242—364 **9 Claims**



1. Apparatus for storing a variable quantity of moving strand material comprising a winder assembly for wrapping convolutions

of strand material around a storage structure, the winder assembly being positioned at one end of the storage structure and being rotatable about a common axis at a first predetermined rate, said storage structure having a central shaft which is collinear with the common axis and being rotatable about the common axis at a second predetermined rate, said storage structure

characterized by

an exterior surface having a longitudinal direction and a transverse direction which are substantially perpendicular to each other, said longitudinal direction being parallel to the common axis, the convolutions of the strand material being wrapped around the exterior surface in the transverse direction, the exterior surface including a movable segment attached to a mounting plate by a pair of electromagnets, each of the electromagnets comprising a first portion which is mounted on the mounting plate and a second portion which is mounted on the exterior surface said first and second portions being separated by an air gap, one of the electromagnets being adapted to move the segment in the longitudinal direction and the other electromagnet being adapted to move the segment in the transverse direction; and

support means for attaching the mounting plate to the central shaft.

5,595,355

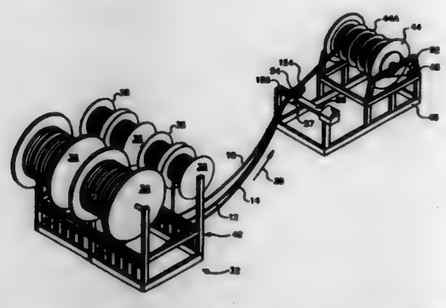
METHOD AND APPARATUS FOR CABLE DISPENSING AND PLACEMENT

Roger C. Haines, 752 S. Highway 165, Branson, Mo. 65616

Continuation of Ser. No. 642,109, Jan. 16, 1991, Pat. No. 5,421,501. This application Jan. 30, 1995, Ser. No. 380,652

Int. Cl.[6] B65H *54/00*; *51/015*

U.S. Cl. 242—470 **27 Claims**



1. Apparatus usable in forming a bundle of wires in a desired configuration, said bundle having a first end and a second end, the apparatus comprising:

a rack for holding a plurality of wires to permit a desired length of wire to be pulled from said rack;

means for measuring the length of a portion of a first of said plurality of wires removed from said rack, said means for measuring also capable of measuring the length of a second of said plurality of wires as said first and second wires are simultaneously pulled from said rack for forming into a bundle, said bundle comprising at least a length of said first wire and a length of said second wire, said length of said first wire having a first end and a second end, said length of said second wire having a first end and a second end, said first end of said first wire being longitudinally displaced a predetermined length from said first end of said second wire in said bundle.

5,595,356

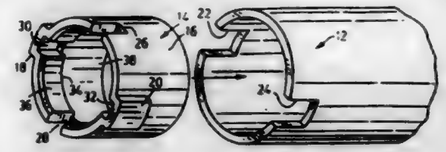
TUBULAR CORE ASSEMBLIES FOR ROLLS OF PAPER OR OTHER SHEET MATERIAL

Daniel D. Kewin, 16 Dogwood Drive, Brantford, Ontario, Canada

Filed Oct. 12, 1995, Ser. No. 541,281

Int. Cl.[6] B65H *75/50*

U.S. Cl. 242—613.5 **15 Claims**



1. A tubular core assembly for a roll of paper or other sheet material comprising:

a hollow cylindrical core member formed of paperboard material, and

an annular end member or plastic material with each opposite end portion of the core member, each end member having an outer annular surface secured to the inner annular surface of the core member and an inner annular surface shaped to receive a roll supporting chuck,

each end member having a pair of radially-projecting lugs at diametrically opposite positions at the respective end of the tubular core assembly, said core member having a pair of lug-receiving notches at diametrically opposite positions at each end receiving said lugs of the respective end member to facilitate transmission of torque and axial chuck pressure from the end member to the core member,

each end member having a pair of notches at diametrically opposite positions extending inwardly from the respective end of the tubular core assembly for receiving a projection of a roll supporting chuck, each projection-receiving notch being located circumferentially mid-way between said pair of lugs, and

each end member having a further pair of projection-receiving notches, said further pair of projection-receiving notches extending inwardly from the respective end of tubular core assembly immediately radially inwardly of a respective lug.

5,595,357

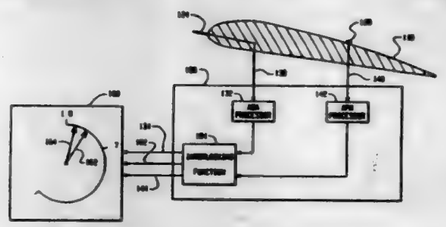
AIRCRAFT STALL WARNING SYSTEM

Paul A. Catlin, Lowell; Douglas C. Ballard, Wayland; Gary S. Watson, Ada, all of Mich., and Alfred M. Worden, Brecksville, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 5, 1994, Ser. No. 270,702

Int. Cl.[6] B64D *43/00*; G08B *23/00*

U.S. Cl. 244—1 R **17 Claims**



1. A common display for displaying indications of an aerodynamic performance and an angle of attack of an aircraft having an airfoil comprising:

first indicator indicative of the angle of attack of the aircraft;

second indicator indicative of the aerodynamic performance of the airfoil;

said first and second indicators being integrated into said common display for simultaneously displaying the angle of attack and aerodynamic performance indications from the common and

an interlocking means for interlocking the first and second indicators to display a differential therebetween only under predetermined conditions.

5,595,358

MULTIPURPOSE AIRBORNE VEHICLE

German V. Denisiev, ul.Frunze, d.9., kv.173, Kazan, Russian Federation, and Eduard S. Osipov, ul.M.Gorkogo, d.6, kv.22, Kazan, Russian Federation

Continuation of Ser. No. 204,328, Aug. 10, 1994, abandoned. This application Jan. 29, 1996, Ser. No. 593,019

Claims priority, application U.S.S.R., Jul. 8, 1992, 5051337/23; Russian Federation, Dec. 16, 1992, 92012649/23

Int. Cl.[6] B64C 27/08;27/22;15/12;29/02

U.S. Cl. 244—7 A 23 Claims



1. A multipurpose airborne vehicle, comprising a fuselage, a wing, and a power unit, the fuselage having spanwise-curved aerodynamic lifting airfoils joined together in a horizontal plane of the vehicle to form a ring, the power unit having several gas-turbine engines, each having a ramjet duct, a shortened jet nozzle, an after-burner, and a flywheel member, said vehicle also having rotor units with blades and also provided with a control actuator for the blades, the rotor units having nozzles arranged along the axis of rotation at the ends of the rotor blades and being joined together with said ring, said vehicle also including means for rotating the rotor units with respect to the lifting airfoils so as to form a movable part with respect to the vehicle lifting airfoils.

5,595,359

LANDING GEAR AXLE STEERING

Michael J. Meneghetti, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

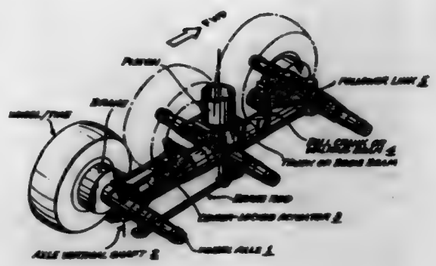
Filed Nov. 22, 1994, Ser. No. 343,812

Int. Cl.[6] B64C 25/50

U.S. Cl. 244—50 3 Claims

1. In combination in an aircraft:

a steerable axle for a six wheel three axel truck actuated by a walking beam mechanism powered by a single hydraulic actuator locked at mid-stroke for takeoff and landing of said aircraft.



5,595,360

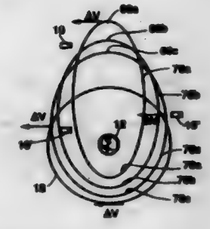
OPTIMAL TRANSFER ORBIT TRAJECTORY USING ELECTRIC PROPULSION

Arnon Spitzer, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 25, 1994, Ser. No. 217,791

Int. Cl.[6] B64G 1/10

U.S. Cl. 244—158 R 14 Claims



1. In a spacecraft launched into an injection orbit about a central body and oriented in a predetermined attitude, where the injection orbit has an apogee and a perigee, a method for translating said spacecraft from said injection orbit to a geosynchronous orbit having a semi-major axis and a predetermined orbital plane, comprising the steps of:

providing a propulsion thruster oriented on said spacecraft for generating a thrust when fired which exerts a predetermined force on said spacecraft;

firing the propulsion thruster at apogees of intermediate orbits to successively increase the perigees thereof until the semi-major axis of an intermediate orbit is substantially equal to the semi-major axis of the geosynchronous orbit to define an initial transfer orbit for the spacecraft; and

thereafter continuously firing the propulsion thruster to translate the orbit of the spacecraft from the initial transfer orbit to said geosynchronous orbit while maintaining the substantial equality of the geosynchronous semi-major axis and the transfer orbit semi-major axis.

5,595,361

WING RAIL HOLD-DOWN

James A. Remington, Superior, Wis.; Keith Young, Naperville, and Stephen R. Kuhn, Richton Park, both of Ill., assignors to ABC Rail Products Corporation, Chicago, Ill.

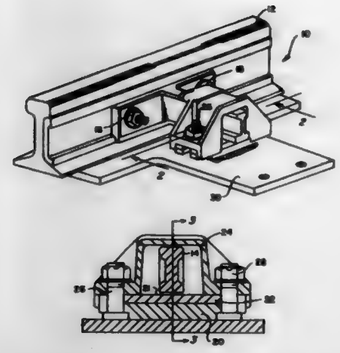
Filed Nov. 22, 1995, Ser. No. 561,568

Int. Cl.[6] B61K 13/00

U.S. Cl. 246—276 6 Claims

6. In a railroad trackwork spring frog installation having a base plate supporting a wing rail and a horn fitting attached to and projected laterally from the wing rail, in combination:

a weld block component welded to the installation base plate beneath and spaced-apart from the installation horn fitting;



a riser component positioned beneath the installation horn fitting and supported on said weld block component;

a pair of bolt fastener devices retained in position by said weld block component;

a housing component positioned above the installation horn fitting and supported by the upper surface of said riser component;

said bolt fastener devices joining said weld block component, said riser component, and said housing component into a unitary structure having bearing surfaces that restrain the installation horn fitting from vertical movement but not from lateral movement during operation of the railroad trackwork spring frog; and

wherein said weld block component and said riser component are fabricated of different steel alloys, the steel alloy of said riser component having a frictional wear resistance property significantly greater than the frictional wear resistance property of the steel alloy of said weld block component.

5,595,362

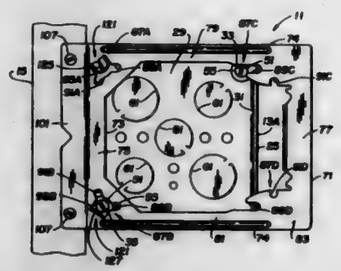
ELECTRICAL BOX MOUNTING BRACKET

Eric R. Rinderer, Highland, and Martin L. Witherbee, Edwardsville, both of Ill., assignors to B-Line Systems, Inc., Highland, Ill.

Filed Dec. 17, 1992, Ser. No. 991,731

Int. Cl.[6] G12B 9/00

U.S. Cl. 248—27.1 19 Claims



1. A bracket for mounting large and small electrical boxes on a wall stud, each electrical box being of the type having side walls, a rear wall, a front opening, and a pair of box mounting screws projecting forward from the box generally adjacent diagonally opposite corners of the front opening of the box, each screw having a screw head and a threaded shank, said bracket comprising:

a sheet metal plate having front and rear faces and a large central opening therein having first and second pairs of diagonally opposite corners,

a fastening flap extending from one side of the plate for securement to a wall stud to mount the bracket on the stud in a position wherein the plate extends laterally from the stud at one side of the stud and lies in a generally vertical plane,

a first pair of screw opening formations in the plate generally adjacent said first pair of diagonally opposite corners of the central opening in the plate,

a second pair of screw opening formations in the plate generally adjacent said second pair of diagonally opposite corners of the central opening in the plate,

each formation of said first and second pairs of screw opening formations including first and second relatively narrow screw shank clearance slots each having a width sufficient to receive the shank of a respective box mounting screw but insufficient to permit passage therethrough of said screw head, at least one screw opening formation of each of said first and second pairs of screw opening formations further having a respective screw head clearance opening communicating with open ends of said first and second screw shank clearance slots of the screw opening formation, said first and second screw shank clearance slots extending from the screw head clearance opening generally at right angles relative to one another,

the plate being so configured that a small electrical box is adapted to be moved to a first position in which the front of the box is closely adjacent the rear face of the plate and in which the heads of the box mounting screws on the box pass through respective screw head clearance openings and are disposed forward of the front face of the plate, the small box then being movable in a direction generally parallel to the plate from said first position to a second position in which the shanks of the screws are received in said first screw shank clearance slots of respective screw opening formations and in which the front opening of the box is generally in register with the central opening in the plate,

the plate being further configured so that a large electrical box is adapted to be moved to a first position in which the front of the box is closely adjacent the rear face of the plate and in which the heads of the box mounting screws on the box pass through respective screw head clearance openings and are disposed forward of the front face of the plate, the large box then being movable in a direction generally parallel to the plate from said first position to a second position in which the shanks of the screws are received in said second screw shank clearance slots of respective screw opening formations and in which the front opening of the box is generally in register with the central opening in the plate, and

at least one locking device formed as an integral part of the bracket located adjacent one of said at least one screw head clearance openings and movable relative to the bracket from a first position in which the locking device is positioned on the bracket for enabling said small or large box to be moved from its said first position to its said second position, to a second position in which the locking device is positioned on the bracket for preventing movement of the small or large box from its said second position back to its said first position thereby to lock the box in its said second position and to hold the box captive on the mounting bracket without the need to tighten the box mounting screws to bring the heads of the screws into clamping engagement with the front wall of the bracket.

5,595,363

PLASTIC PIPE BEAM SUPPORT

Marcel De Leebeeck, 101/4 SOI 8, Manecya House, Rattanatibet Road, Nonthaburi 11000 THX

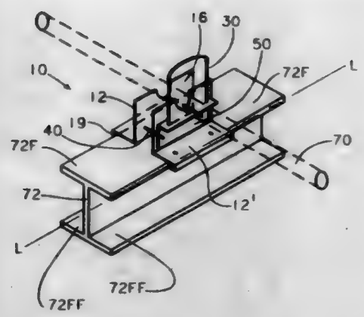
Filed Sep. 18, 1995, Ser. No. 529,333

Int. Cl.[6] F16L 3/24

U.S. Cl. 248—72 2 Claims

1. A plastic pipe beam support comprising:

a pair of substantially identical, oppositely disposed brackets for engaging laterally opposite flanges of an I-beam, each bracket including a U-shaped base portion and a flat-upstanding lug



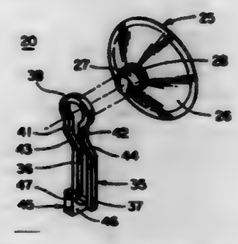
portion having a recess cut out from an upper margin thereof for receiving and supporting a pipe;

a U-bolt with threaded ends spaced apart a distance greater than the outer diameter of the pipe, capable of partially encompassing the pipe and equipped with matching threaded nuts;

an angle iron that extends longitudinally a distance greater than the distance between the threaded ends of the U-bolt and comprising a vertical support portion and a horizontal shelf portion, the vertical support portion having a first pair of longitudinally-spaced apertures for receiving threaded means, and the shelf portion having a second pair of longitudinally-spaced apertures for receiving the threaded ends of the U-bolt; and

a pair of threaded means inserted through oppositely disposed lug portions of the brackets and through the second pair of apertures of the angle iron, for clamping and unclamping the brackets to the beam.

5,595,364
SUCTION CUP AND HANGER
William F. Protz, Jr., Lake Forest, Ill., assignor to Santa's Best, Northfield, Ill.
Filed Feb. 9, 1995, Ser. No. 386,076
Int. Cl.[6] F16B *47/00*
U.S. Cl. 248—205.5 **7 Claims**

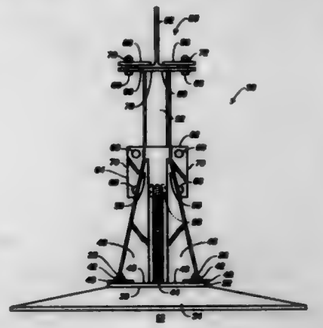


1. A suction cup and hanger combination, comprising a suction cup having a flexible cup shaped member with mounting means on one end thereof, a hanger having a hook at one end and mechanism at the other end for detachably mounting said hanger on said suction cup mounting means, said hanger hook being laterally offset to position at least a portion of said hook substantially vertically under said suction cup mounting means and having a surface urging an object supported thereon toward said suction cup.

5,595,365

Patent Not Issued For This Number

5,595,366
SEISMIC FOUNDATION PIER
Matt Casimano, Aptos, and Douglas W. Ladd, Clovis, both of Calif., assignors to Central Piers, Inc., Fresno, Calif.
Filed Feb. 6, 1995, Ser. No. 384,666
Int. Cl.[6] E02D *27/48*
U.S. Cl. 248—354.3 **11 Claims**



1. A foundation pier for supporting a movable dwelling comprising:

a base plate;

a threaded shaft affixed to said base plate and extending upwardly therefrom and perpendicular thereto;

a plurality of webs affixed to said base plate and extending upwardly therefrom, said webs spatially positioned about said shaft;

a support member threadably coupled to said shaft for adjusting the height of said pier, said support member having couple means at an end thereof for coupling said pier to a support beam of said dwelling; and

clamp means comprising a clamp member having complementary first and second portions for receiving said support member therebetween, the first portion of said clamp member affixed to adjacent ones of said plurality of webs and the second portion of said clamp member affixed to adjacent ones of said plurality of webs such that the first and second portions of said clamp member are located adjacent to and oppose one another, said clamp means including a plurality of bolt member with complementary nuts, said bolt members adapted to be disposed through opposing holes in the first and second portions with said nuts tightened onto said bolts for coupling said clamp means to said support member to prevent movement therebetween.

5,595,367
AUTOMATIC HOLDING DEVICE FOR GASOLINE PUMP HANDLES
Roy Sternes, 2117 Truscott Dr., Tallahassee, Fla. 32312, and Mark A. Rutledge, 1565 Sprucewood Trail, Tallahassee, Fla. 32301
Filed Dec. 28, 1994, Ser. No. 365,083
Int. Cl.[6] F16K *35/00*
U.S. Cl. 251—90 **7 Claims**

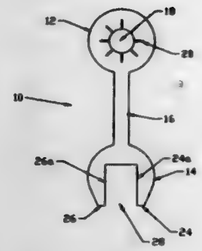
1. A holding device for holding the lever of a gasoline pump dispensing handle in an opened gasoline dispensing position comprising:

a clamp and a retaining means;

said clamp includes a back portion and a pair of identical arms extending from opposite ends of said back portion;

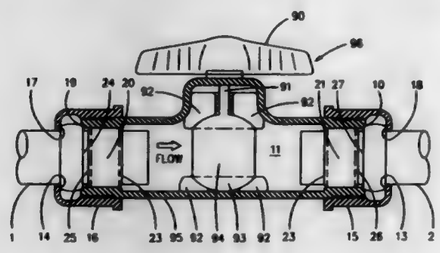
said retaining means provides for said holding device to be attached in proximity to an opening of a fuel line of a vehicle;

a cord made of a resilient and flexible material is secured to said retaining means and said clamp; and



said retaining means is a resilient member having a hollow center and said hollow center is able to engage an end of said gasoline fuel line.

5,595,368
APPARATUS FOR PREVENTING SLIPPAGE IN PIPE COUPLINGS
Arthur Bogdany, 12110 Shropshire, Austin, Travis, Tex. 78711, and Alfred G. Davey, 206 Hy Rd., Buda, Hays, Tex. 78610
Filed Aug. 12, 1994, Ser. No. 289,644
Int. Cl.[6] F16K *51/00*; F16L *27/00*
U.S. Cl. 251—148 **29 Claims**



10. An apparatus adaptable for coupling first and second ends of first and second pipes, said apparatus comprising:

first and second cylindrical washers adaptable for engaging said first and second pipes, respectively, near said first and second ends, wherein inner diameters of said first and second washers are substantially equal to outer diameters of said first and second pipes, respectively;

first and second cylindrical rings adaptable for engaging said first and second pipes, respectively, near said first and second ends and between said first and second ends and said first and second cylindrical washers, respectively, wherein inner diameters of said first and second cylindrical rings are substantially equal to outer diameters of said first and second pipes, respectively, and wherein an outer diameter of said first and second cylindrical rings are large enough to prevent passage thereover of said first and second cylindrical washers;

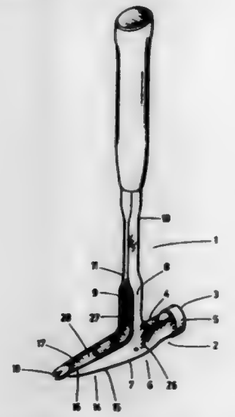
a cylindrically shaped sleeve; and

first and second means adaptable for forming seals between said first and second cylindrical washers and said cylindrically shaped sleeve.

20. The apparatus as recited in claim 10 further comprising:

a valve means coupled to said cylindrically shaped sleeve.

5,595,369
NAIL EXTRACTING DEVICE
Anthony Hull, 169 Louth Street, St. Catharines, Ontario, Canada
Filed Jul. 12, 1995, Ser. No. 501,374
Int. Cl.[6] B25C *11/00*
U.S. Cl. 254—26 R **8 Claims**



1. A nail extracting device comprising:

a) a first front body section having first and second ends wherein a vertical striking surface is provided at said first end;

b) a second body section integrally connected to the second end of said first front body section, said second body section having:

i) a bottom wall and opposite side walls projecting upwardly from the edges of said bottom wall,

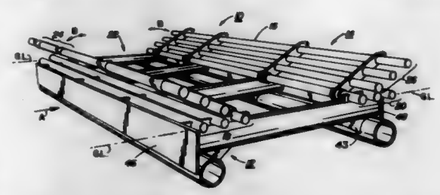
ii) upstanding handle means connected to the top of said side walls,

iii) an opening in said bottom wall centrally disposed beneath said handle means, and

iv) a horizontal V-shaped cut in said bottom wall, said cut facing into said opening; and

c) a rear body section having bottom and opposite vertical side walls integrally connected to the bottom and side walls of said second body section, wherein the bottom wall of said rear body section is curved upwardly and rearwardly and having a V-shaped cut in the distal end of said bottom wall.

5,595,370
TEXAS GATE
Eugene J. Heck, Bodo, Canada, assignor to Bodo Oilfield Maintenance Ltd., Bodo, Canada
Filed Sep. 5, 1995, Ser. No. 523,181
Int. Cl.[6] E01B *17/00*
U.S. Cl. 256—17 **9 Claims**



1. A Texas gate assembly comprising a base frame adapted to be set into a roadway and a deck assembly secured to said base frame, said deck assembly comprising a series of spaced parallel elon-

gated deck members arranged in groups, first and second groups of said deck members being fixed to said base frame in spaced apart flanking relation to a central region of the gate assembly, and at least one further group of deck members mounted for pivotal movement together in unison from a lowered position overlying said central region and supported on said base frame in co-planar relation to said first and second groups of deck members to a raised position above said first and second groups and providing access to an area beneath said central region of the gate assembly to facilitate removal of debris therefrom and/or to provide a barrier to road traffic.

5,595,371

VIBRATION ISOLATING SUPPORTER

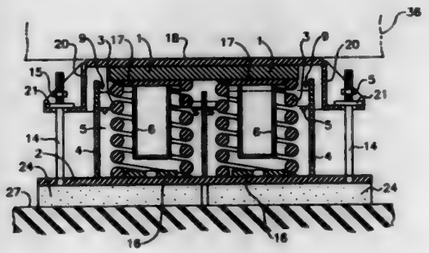
Kounei Hukuda, Tokyo; Kenji Takuma, Kisarazu; Minori Kuriyama, Kisarazu; Yoshimitsu Murahashi, Kisarazu; Hiroaki Kawakami, Kisarazu; Yuji Ida, Himeji; Kazuki Inaba, Futtsu; Hiroyuki Tanaka, Tachikawa, and Katsumi Shimizu, Hiratsuka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, and Showa Electric Wire & Cable, Kanagawa, both of Japan

PCT No. PCT/JP94/00592, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO94/24457, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 8, 1994, Ser. No. 343,417

Int. Cl.[6] F16F *15/06*

U.S. Cl. 267—34 **6 Claims**



1. An apparatus for isolating vibrations, comprising:

an upper frame;

a lower frame disposed in parallel, vertically spaced relation to said upper frame;

a coil spring disposed between said upper frame and said lower frame, said coil spring being in repose when said apparatus is not subjected to vibrations;

a plurality of imperforate, upstanding partition panels disposed in surrounding relation to said coil spring, said partition panels and said lower frame collectively forming an open-topped cavity;

each partition panel of said plurality of partition panels having a lowermost end secured to said lower frame and having an uppermost end spaced downwardly from said upper frame;

a damping material disposed in said open-topped cavity, said damping material partially immersing said coil spring;

a resisting member depending from said upper frame, said resisting member having a diameter less than a diameter of said coil spring and being ensleeved by said coil spring, said resisting member having an axis of symmetry coincident with an axis of symmetry of said coil spring so that said resisting member is disposed concentrically relative to said coil spring;

said resisting member having a length less than a length of said coil spring so that a lowermost end of said resisting member is disposed in spaced apart relation to said lower frame; and

said resisting member having a substantially constant cylindrical configuration throughout its entire axial extent including an imperforate bottom wall that provides resistance to movement of said resisting member through said damping material;

whereby vibration-induced displacement of said upper frame relative to said lower frame is resisted by movement of said resisting member through said damping material.

5,595,372

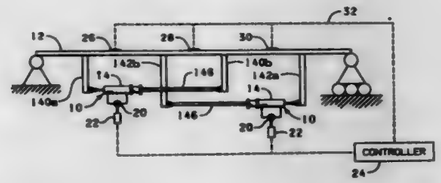
SEMI-ACTIVE VIBRATION MITIGATION ASSEMBLY

William N. Patten, Norman, Okla., assignor to The Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation-in-part of Ser. No. 376,477, Jan. 20, 1995, abandoned, which is a continuation of Ser. No. 243,724, May 17, 1994, abandoned, which is a continuation of Ser. No. 29,849, Mar. 11, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,473

Int. Cl.[6] F16F *5/00; 9/50*

U.S. Cl. 267—64.13 **26 Claims**



1. A semi-active vibration mitigation assembly for suppressing vibration of a structure, comprising:

a cylinder having a first end and a second end, the second end of the cylinder adapted to be connected to a portion of the structure;

a piston slidably disposed in the cylinder, the piston defining a first fluid chamber and a second fluid chamber in the cylinder with each of the first and second fluid chambers having a compressible fluid disposed therein;

a piston rod having one end connected to the piston and another end extending from the first end of the cylinder and adapted to be connected to another portion of the structure;

valve means for interconnecting the first fluid chamber to the second fluid chamber so as to provide fluid flow between the first fluid chamber and the second fluid chamber and for regulating the flow of the fluid between the first fluid chamber and the second fluid chamber;

structural sensor means for measuring the vibration of the structure and for generating a data signal representing the vibration of the structure;

piston sensor means for measuring the movement of the piston relative to the cylinder and for generating a data signal representing the movement of the piston relative to the cylinder;

pressure sensor means for measuring the pressure in the first fluid chamber and the second fluid chamber and for generating a data signal representing the pressure differential between the first fluid chamber and the second fluid chamber; and

control means operably connected to the valve means for generating a control signal in response to the data signals received by the control means from the structure sensor means, the piston sensor means, and the preasure sensor means, and for outputting the control signal to the valve means to regulate the flow of the fluid between the first and second fluid chambers of the cylinder such that elastic energy generated by elastic deformation of the compressible fluid in the first and second fluid chambers is selectively stored in and released from the fluid and the amount of vibration energy dissipated by the vibration mitigation assembly is selectively varied whereby both a stiffness of the vibration mitigation assembly and the amount of damping are continuously adjusted to maximize the suppression of the vibrations.

5,595,373

FLUID-FILLED DAMPING DEVICE HAVING TWO AXIALLY SPACED ANNULAR FLUID CHAMBERS COMMUNICATING WITH EACH OTHER THROUGH ORIFICE

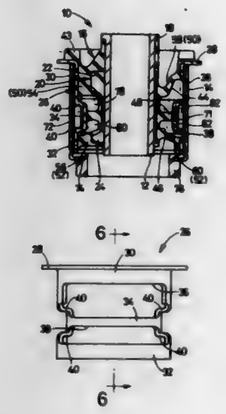
Katuhisa Ikeda, Kazugai, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Dec. 12, 1995, Ser. No. 570,937

Claims priority, application Japan, Dec. 21, 1994, 6-318163

Int. Cl.[6] F16M *1/00*

U.S. Cl. 267—140.12 **10 Claims**



1. A cylindrical fluid-filled damping device comprising:

a center shaft member;

an outer cylindrical member disposed radially outwardly of said center shaft member;

a generally annular elastic body interposed between and elastically connecting said center shaft member and said outer cylindrical member, said elastic body having a first and a second annular pocket which are spaced apart from each other in an axial direction of said elastic body;

an intermediate sleeve secured to an outer circumferential surface of said elastic body, said intermediate sleeve having an axially intermediate small-diameter portion, and a pair of first windows and a pair of second windows which pairs are formed on respective axially opposite sides of said small-diameter portion, each of said first and second windows having a circumferential length not larger than a half of an entire circumference of said intermediate sleeve, said first and second annular pockets being open in an outer circumferential surface of said intermediate sleeve through said pairs of first and second windows, respectively, said outer cylindrical member being secured to said outer circumferential surface of said intermediate sleeve; and

an orifice member interposed between said axially intermediate small-diameter portion of said intermediate sleeve and said outer cylindrical member, said orifice member and said outer cylindrical member closing said first and second windows and cooperating with said elastic body to define a first and a second annular fluid chamber, said orifice member partially defining an orifice passage for fluid communication between said first and second annular fluid chambers.

5,595,374

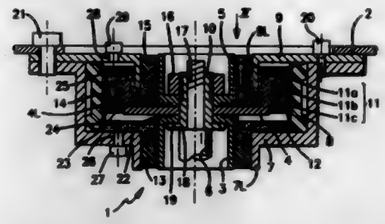
VARIABLE ELASTIC COUPLING ASSEMBLY FORMING SHOCK ABSORBER ATTACHMENT AND FILTERING BLOCK

Christian Charette, Yzeure, and Etienne De Fontenay, Decize, both of France, assignors to Caoutchouc Manufacture et Plastiques, Versailles, France

Filed Mar. 23, 1995, Ser. No. 408,983

Int. Cl.[6] F16F *9/08; B60G 13/06*

U.S. Cl. 267—220 **7 Claims**



1. A variable elastic coupling assembly interconnecting a rod of a vehicle shock absorber and a structure to be damped in order to filter vibrations, said assembly comprising two rigid annular armatures one of which is fastened to the rod and the other to the structure, said armatures being bonded together through three elastomeric annular elements including an upper elastomeric annular element, an intermediate elastomeric annular element, and a lower elastomeric annular element, which delimit between them a closed space containing a fluid, at least one of the lower, intermediate and upper elastomeric annular elements comprising at least one limit stop of elastomer, the volume of said closed space being modified by deformation under strain of said elastomeric annular elements, said closed space being totally sealed with respect to its external environment, and being constituted by two non-communicating annular chambers including an upper annular chamber, delimited by the upper elastomeric annular element and the intermediate elastomeric annular element, for filtering vibrations due to impact loads, and a lower annular chamber, delimited by the same intermediate elastomeric annular element and the lower elastomeric annular element, for filtering vibrations due to rebound loads, said closed space being connected to a management system for the fluid used to fill the closed space, making it possible to modulate the static and dynamic rigidities as a function of the road surface, by means of at least one connecting channel emptying into at least one of the annular chambers via a filling orifice provided in at least one of the armatures, and said fluid including a gas phase and at least one liquid phase.

5,595,375

SELF-TIGHTENING, EASILY RELEASABLE CLAMPING DEVICE CAPABLE OF BEING RETAINED IN AN OPEN POSITION

Hermann Benshausen, Durham, N.C., assignor to Benn Corporation

Filed May 12, 1995, Ser. No. 439,797

Int. Cl.[6] B25B *5/04*

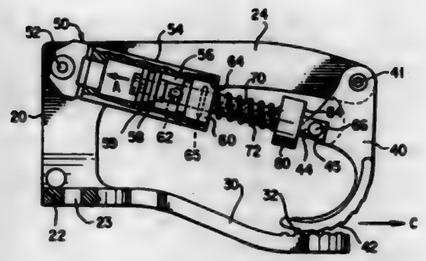
U.S. Cl. 269—32 **2 Claims**

1. A clamp for releasably gripping a workpiece, comprising:

a base member having an extended arm portion;

a first jaw portion attached to said base member and having a first gripping portion;

a second jaw member pivotally coupled to said extended arm portion at a pivot location and having a second gripping portion, said second jaw member pivotable about the pivot location between a retracted position where said first and second gripping portions are spaced apart and a gripping position where said first and second gripping portions engage the workpiece and apply a gripping force to hold the workpiece; and



an actuator having one end connected to said base member and another end connected to said second jaw member and operable to selectively move said second jaw member from the gripping position to the retracted position; wherein said actuator comprises:

a cylinder pivotally attached to said base member;

a piston mounted inside said cylinder and selectively movable within the cylinder;

a rod having one end coupled to said piston and another end coupled to said second jaw member;

a spring having one end contacting said cylinder and the other end contacting said cam member; and

a second cam surface disposed on said second jaw member,

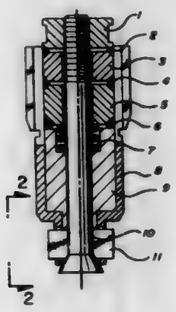
wherein said cam member is slidable along said rod and wherein said spring urges said cam member away from said cylinder and towards said second jaw member so that said first cam surface is urged into contact with said second cam surface, and wherein the contact between said cam surfaces releasably retains said second jaw member in said retracted position when said second jaw member is in the retracted position and urges the said second jaw member towards the gripping position when said second jaw member is near the gripping position.

5,595,376

MANDREL FOR PROCESSING A WORKPIECE WITH AN INTERNAL SPLINE

Xu X. Hua, Tiezi Qu, Fugang Er Jie, 6-223, Shenyang City 110024, China

Filed Feb. 7, 1994, Ser. No. 193,504
Claims priority, application China, Feb. 8, 1993, 93227250.9
Int. Cl.[6] B23Q 3/14
U.S. Cl. 269—48.1 10 Claims



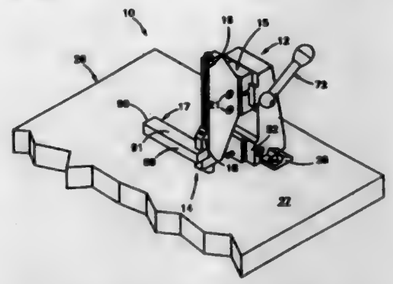
1. A mandrel for processing a workpiece with an internal spline comprising two half-keys separated by a bolt, said two half-keys being positioned in a groove formed on the lower portion of an expandable spline-shaped collet, said expandable spline-shaped collet further comprising an expanding sleeve.

5,595,377

WORKPIECE PRESETTING ASSEMBLY

Michael D. Tibbet, Oxnard, Calif., assignor to Gaiser Tool Co., Ventura, Calif.

Filed Jun. 6, 1995, Ser. No. 469,901
Int. Cl.[6] B23Q 3/02
U.S. Cl. 269—71 16 Claims



1. A workpiece presetting assembly comprising:

a support table having a top surface;

a rail attached to said top surface having a rail reference surface:

an upstanding presetting stand having a bottom surface positioned upon said top surface;

a slot in said bottom surface having a slot reference surface abutting against said rail reference surface;

said presetting stand having a front side that includes an outwardly extending lower joint part having first and second opposing surfaces with at least said first surface comprising a lower reference area having a longitudinal axis that extends perpendicular to the longitudinal axis of said slot reference surface;

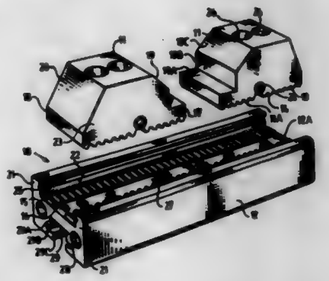
said front side including an outwardly extending upper joint part having third and fourth opposing surfaces with at least said third surface comprising an upper reference area having a longitudinal axis that extends perpendicular to the longitudinal axis of said lower reference area.

5,595,378

CLAMPING JAW

Lars M. R. Martinsson, and Jan-Olof Hemmervall, both of Robertsfors, Sweden, assignors to Cae Dee Produkter AB, Robertsfors, Sweden

PCT No. PCT/SE93/00512, § 371 Date Feb. 3, 1995, § 102(e) Date Feb. 3, 1995, PCT Pub. No. WO93/25821, PCT Pub. Date Dec. 23, 1993
PCT Filed Jun. 9, 1993, Ser. No. 347,382
Claims priority, application Sweden, Jun. 9, 1992, 9201757
Int. Cl.[6] B25B 1/02
U.S. Cl. 269—210 26 Claims



1. Clamping jaw for a clamping device, adapted to be mounted on a profile member and wherein the clamping jaw (10) is adapted

to be applied under pressure against the profile member (31) by means of two transverse clamping bolts (32), placed each on one side of the profile member, clamping jaw (10) being formed by two separate jaw members (11) and a common counter support (12) for each member of said jaw members, located behind them and arranged to transmit clamping forces produced by means of the clamping bolts (32) to the jaw members (11), the jaw members (11) and the counter support (12) being provided with cooperating engagement means (13, 15), serving to make it possible to place and hold the jaw members (11) in predetermined positions in relation to the counter support (12), wherein the engagement means (13, 15) are arranged to permit each said jaw member (11) to be placed and held in position in relation to the counter support (12) which may be freely selected among a plurality of different predetermined positions;

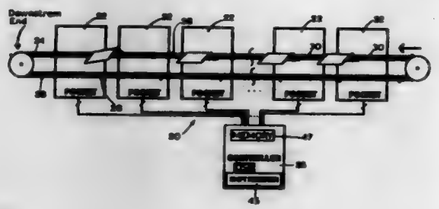
wherein the engagement means (13, 15) are arranged to permit the jaw members (11) to be placed and held in differently spaced apart positions on the counter support (12).

5,595,379

OPERATOR INTERFACE APPARATUS AND METHOD FOR ADJUSTING BINDING LINE TIMING

Thang Hoang, Valinda, Calif., assignor to R. R. Donnelley & Sons Company, Lisle, Ill.

Continuation-in-part of Ser. No. 124,307, Sep. 20, 1993, abandoned. This application Mar. 24, 1995, Ser. No. 410,060
Int. Cl.[6] B65H 39/043
U.S. Cl. 270—52.06 72 Claims



1. A timing-adjustment apparatus for a binding line including a feeding device having a sensor that develops an output during each of a plurality of operational sequences indicating that a condition has arisen and controlling means responsive to the sensor output for controlling the binding line, comprising:

storing means operable during an initial operational sequence for storing an operator-defined time period during which the condition is expected to arise in each subsequent operational sequence;

developing means responsive to the storing means and operable during an operational sequence subsequent to the initial operational sequence for developing an indication for an operator of the binding line that the operator-defined time period has been reached; and

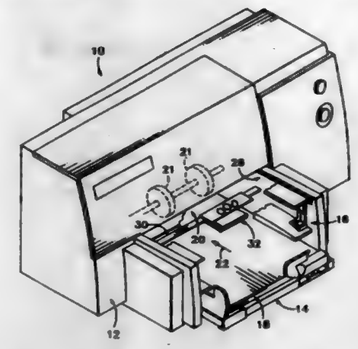
changing means coupled to the storing means for changing the operator-defined time period in an operational sequence subsequent to the initial operational sequence based on the indication.

5,595,380

SHEET MEDIA HANDLING SYSTEM FOR ALIGNED INSERTION OF SINGLE SHEET MEDIUM

Thomas E. McCue, Jr., Vancouver; Raymond C. Sherman; Shannon D. Casey, both of Camas; Steve O. Rasmussen, Vancouver, and Sandra Y. Okazaki, Redmond, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1995, Ser. No. 396,190
Int. Cl.[6] B65H 5/26
U.S. Cl. 271—9.09 16 Claims



1. A sheet media handling system for use in a printer including an input path that sheet media follows when introduced into the printer and an input port located downstream the input path, wherein the input port receives sheet media introduced into the printer, the system comprising:

an input tray for storing one or more sheet media prior to input into the input port, wherein the input tray is attached to the printer; and

a single sheet medium guide mechanism attached to the printer, wherein the medium guide mechanism including a substantially vertical orientation sidewall fixed relative to the input port for facilitating routing of the single medium toward the input port and aligning the single medium to minimize skew by contacting a first edge of the single medium and a movable skew-abatement member with a substantially vertical contact surface facing the sidewall for contacting a second edge of the single medium, wherein the skew-abatement member acts with the sidewall for further facilitating routing of the single medium toward the input port and aligning of the single medium routes the single medium toward the input port and aligns the single medium with the input path when the single medium is inserted into the guide mechanism.

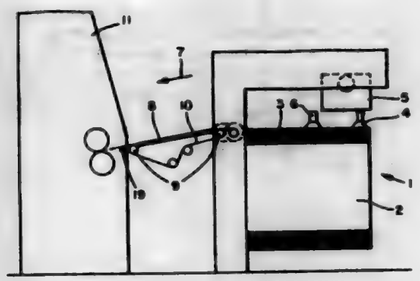
5,595,381

SHEET FEEDER UNIT

Karl-Heinz Schickedanz, Neu-Isenburg, Germany, assignor to MAN Roland Druckmaschinen AG, Germany

Filed Sep. 16, 1994, Ser. No. 307,196
Claims priority, application Germany, Sep. 17, 1993, 43 31 610.7
Int. Cl.[6] B65H 5/08
U.S. Cl. 271—12 14 Claims

1. A sheet feeder unit for controlling the movement of sheets through a printing machine comprising in combination a suction head unit with a suction head drive for removing sheets from a stack; a belt table with a belt drive for receiving sheets from the suction head unit, the suction head drive being independently changeable from the operation of the belt drive; a control system which drives the belt drive in a periodic manner and synchronizes the transfer of sheets from the suction head unit to the belt table to occur approximately at a time of slowest conveying speed of the belt drive, the control system including (1) means for providing input signals indicating time of the transfer of the sheets, and (2) a



controller for comparing values of the input signals with a reference value and in response to the comparison controlling the operation of the suction head drive independently of the belt drive to correct the deviation between the input signal and the reference value.

5,595,382

SHEET FEEDING ROLLER HOLDING MECHANISM

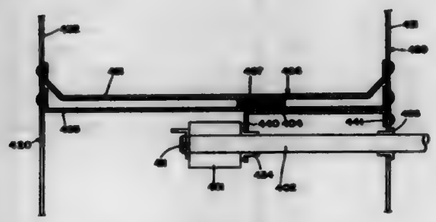
Kiyotaka Arai, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 914,560, Jun. 2, 1992, Pat. No. 5,451,043. This application Feb. 8, 1995, Ser. No. 385,684

Claims priority, application Japan, Jul. 24, 1991, 3-184549; Jul. 24, 1991, 3-184550; Jul. 24, 1991, 3-184551; Jul. 24, 1991, 3-184552; Aug. 23, 1991, 3-212109

Int. Cl.[6] B65H *3/52*

U.S. Cl. 271—122 5 Claims



1. A sheet feeding roller holding mechanism comprising:
- a sheet feeding roller for feeding sheets,
- a sheet feeding shaft, wherein said sheet feeding roller is detachably mounted at a first end of said sheet feeding shaft,
- a body frame for holding a second end of said sheet feeding shaft,
- a supporting member for supporting said sheet feeding shaft at said first end of said sheet feeding shaft,
- a plate part mounted to said body frame for supporting said supporting member, and
- a vibration preventive member which is supported by said body frame, wherein a part of said vibration preventive member abuts on a specified position of said plate part, said supporting member or said sheet feeding shaft, in a manner to prevent vibration of said sheet feeding shaft in a direction substantially perpendicular to said sheet feeding shaft.

5,595,383

TRANSPORT UNIT FOR A STACK OF LETTERS HAVING A STATIONARY HELICAL SLIDE

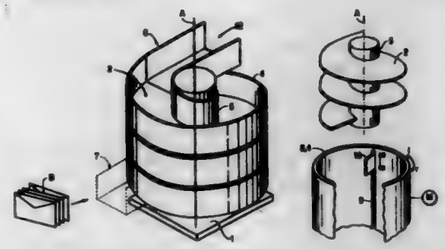
Markus Hochheuel, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Dec. 23, 1994, Ser. No. 361,725

Claims priority, application Germany, Jan. 4, 1994, 44 00 096.3

Int. Cl.[6] B65H *1/02;1/00*

U.S. Cl. 271—149 5 Claims



1. A transport unit having a shaft for receiving a stack of letters, comprising:
- a stationary helical slide forming a bottom of the shaft and being wound around an approximately vertical axis, said helical slide having an upper end and a lower end, each end defining a transfer point for selectively feeding in and feeding out the stack of letters;
- a sleeve surrounding said helical slide and being coaxial to and rotatable about the vertical axis;
- drive means operatively connected to said sleeve for rotating said sleeve; and
- conveying means operatively acting with the shaft for displacing the stack of letters on said helical slide, said conveying means comprising a sliding plate positioned on said sleeve to extend into the shaft so as to come into engagement with the stack of letters.

5,595,384

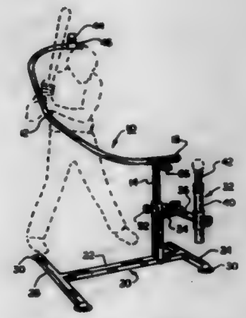
BAT SWING GUIDE

George T. Hardison, Jr., Diamond City Rd., Rte. 1, Box 402, Jamesville, N.C. 27846

Continuation of Ser. No. 3,528, Jan. 12, 1993, Pat. No. 5,322,276. This application Apr. 25, 1994, Ser. No. 232,718

Int. Cl.[6] A63B *69/40*

U.S. Cl. 473—453 6 Claims



1. A bat swing guide, said guide comprising:
(a) a vertical support member; and
(b) an arcuate guide attached at one end to said vertical support member, said arcuate guide forming a generally semi-circular arc and including sequentially:

(i) a bat load zone consisting essentially of a distinct generally linear segment of substantial length corresponding to an initial starting position of a bat head, said bat load zone adapted to restrict the position of a bat head as a batter initiates a swing,

(ii) a hook zone consisting essentially of a distinct curved segment extending from said bat load zone, said hook zone adapted to force a batter to shorten the radius of the bat swing by restricting the batter from moving the bat head out away from a batter's head, thereby preventing the bat head from looping at the top of the bat swing,

(iii) a trigger zone consisting essentially of a distinct generally linear segment of substantial length extending from said hook zone and corresponding to an initial starting position of the batter's hands, said trigger zone adapted to restrict the rearward movement of the batter's hands and to force the batter to maintain the bat head above the batter's hands, thereby preventing the bat head from looping at the lower part of the bat swing,

(iv) an A to C pathway consisting essentially of a distinct generally linear segment of substantial length extending from said trigger zone and forming a chord that connects two points of the arc defined by said arcuate guide, said A to C pathway adapted to force the batter to decrease the radius of the bat swing by restricting the path of the swing and thereby increase the angular velocity of the bat swing, and a contact zone consisting essentially of a distinct generally linear segment of substantial length extending from said A to C pathway, said contact zone adapted to force the batter to flatten the bat swing by restricting the path of the swing immediately prior to contact with a ball.

5,595,385

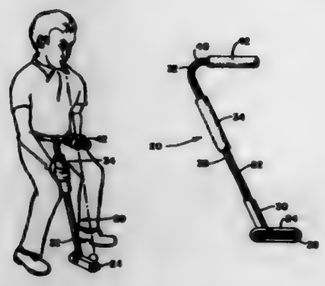
GOLF PUTTER

Thaddeus M. Jablonski, 243 Richards Dr., Palatine, Ill. 60067

Filed Aug. 8, 1995, Ser. No. 512,565

Int. Cl.[6] A63B *53/14;53/16*

U.S. Cl. 473—295 16 Claims



1. A golf putter, comprising:
- a putter head having a longitudinal dimension between a rear and a front of said putter head and a ball striking club face extending along said longitudinal dimension;
- a putter shaft including a first shaft section connected at a lower end to said putter head and extending upwardly from said putter head at an obtuse angle with respect to said putter head longitudinal dimension to a second shaft section that extends between said first shaft section and a third shaft section which extends only forwardly from said second shaft section at an acute angle with respect to said first shaft section and generally in a direction along said putter head longitudinal dimension from said rear to said front of said putter head, and
- a handle extending around, along and secured against rotation on said third shaft section, said handle being supportable and rotatable on one hand of a golfer to accommodate pendulum-like movement of said putter head.

5,595,386

ELONGATED BUTTON LOCK FOR EXPANDABLE BATONS

Kevin L. Parsons, Appleton, Wis., assignor to Armament Systems and Procedures, Inc., Appleton, Wis.

Filed Oct. 11, 1995, Ser. No. 540,952

Int. Cl.[6] F41B *15/02*

U.S. Cl. 473—47.7 9 Claims



1. An expandable baton of the type having a handle and at least one telescoping section nesting within the handle, the telescoping section moveable between a retracted position and an expanded position, said handle and telescoping section defining mating tubes for the adjacent telescoping section, the improvement comprising:
- a detent mechanism having an elongated, generally rectangular-shaped button positioned on said telescoping section, said button moveable between an extended, projecting position and a retracted position wherein said button in the extended, projecting position defines an elongated, flat abutment surface between the button and the mating tube when the telescoping section is in the expanded position for locking the section in the expanded position.

5,595,387

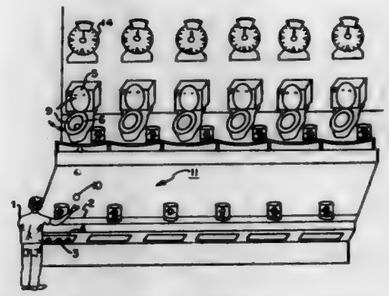
TOILET BOWL ARCADE GAME

Randall Senna, 1 Rolling Knolls Dr., Middletown, N.J. 07748

Filed May 12, 1995, Ser. No. 384,521

Int. Cl.[6] A63B *63/04*

U.S. Cl. 273—369 1 Claim



1. An arcade game played by a plurality of participants under control of an operator comprising:
- a) a front counter having a plurality of stations;
- b) a target positioned, approximately three (3) to ten (10) feet directly in front of each station, having a simulated toilet bowl seat and toilet bowl cover having a forward and an inward end, moved by push rods at the inward end of the toilet bowl cover, with means to cause said toilet bowl seat to alternatively pivot up and down; with means to cause the toilet bowl cover to fall when the game is commenced;

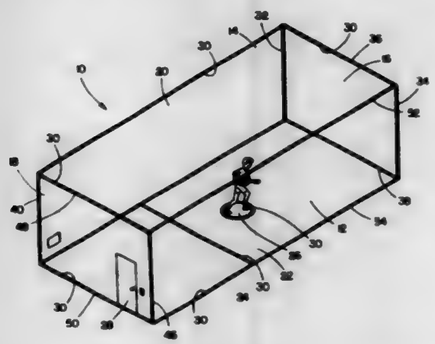
c) a plurality of balls, such that they are thrown by the participant into the toilet bowl which is in front of each station;
d) a means of returning said balls to a ball access return compartment at each station of the frost counter; each ball access compartment being open such that the participant can reach for balls;
e) a means of opening and closing the ball access return compartment for each station at the beginning and end of the game;
f) a means of detecting the balls passing through an opening in the bottom of the toilet bowl in front of each station;
g) a means of counting the number of balls each participant throws into each of their respective bowls;
h) a means of setting at what predetermined winning number of balls constitutes a winning situation by the first participant to reach that number;
i) a means of determining when the predetermined winning number of balls is thrown into a toilet bowl;
j) an accounting means counting the number of participants in each game;
k) a means of creating audio when a game is started and a winner is determined;
l) a means of resetting the game after a winner is determined which closes the toilet seats and sets each means of ball counting back to zero.

5,595,388

DARK COURT GAME APPARATUS AND METHOD

David Z. Swigart, 440 Glenhaven Dr., Lincoln, Nebr. 68505

Filed Feb. 26, 1996, Ser. No. 607,327
Int. Cl.[6] A63B 71/04
U.S. Cl. 473—465 23 Claims



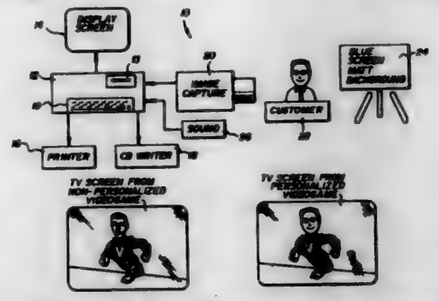
1. A method for preparing a game court for play in the dark, said court having a floor, ceiling and side walls defining an enclosure, said method comprising, providing a plurality of illumination markers to said court to identify locations thereon in the dark,
illuminating at least some of said illumination markers,
providing a game ball having means for illuminating at least a portion of the surface thereof,
illuminating at least a portion of the surface of the game ball, and
substantially eliminating light from said court other than from said illumination markers and said game ball, thereby to render the court dark.

5,595,389

METHOD AND APPARATUS FOR PRODUCING "PERSONALIZED" VIDEO GAMES USING CD DISCS

Kenneth A. Parulski, Rochester; Hans P. Baumeister, Churchville, and Richard N. Ellson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 30, 1993, Ser. No. 175,806
Int. Cl.[6] A63F 9/22
U.S. Cl. 463—31 9 Claims



1. A method of forming a personalized video game including the printing of a game character comprising the steps of:
storing a video game having at least one character on a non-volatile portable storage medium;
storing a low and a high resolution digital image of a person on the non-volatile portable storage medium;
reading and executing the stored video game;
accessing and combining said low resolution digital image with said at least one character to from a personalized character; and
displaying said personalized character as a representation of the person; and
accessing and combining said low or said high resolution digital image with said at least one character for driving a printer when a hard copy print is desired.

5,595,390

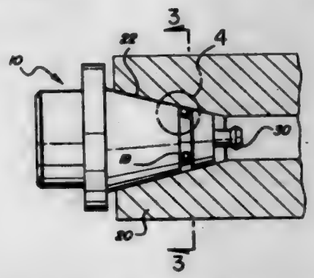
Patent Not Issued For This Number

5,595,391

RELATING TO TAPERED CONNECTIONS

Evgeny I. Rivin, Southfield, Mich., assignor to The Board of Governors of Wayne State University, Detroit, Mich.

Filed Apr. 18, 1995, Ser. No. 423,975
Int. Cl.[6] B23B 31/117
U.S. Cl. 279—103 18 Claims



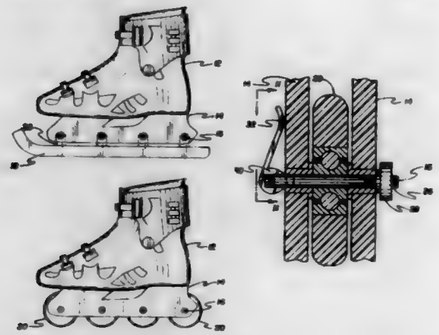
1. In a conical shank adapted to be inserted in a conical receptacle, the receptacle being formed with an angle approximating but deviating from the angle of said shank, whereby, when the shank is inserted into the receptacle, the mating surface of the shank and receptacle initially contact one another at one end of their engagement surface, the improvement comprising:
resilient extension means supported in a circumferential arrangement adjacent the surface of the end of one of the shank or receptacle opposite to the end at which the contact between the shank and receptacle initially occurs upon insertion of the shank into the receptacle, the extension means protruding from such support surface by a dimension at least equal to the maximum possible clearance between the shank and receptacle at said circumferential arrangement when such initial contact occurs, such extension means being sufficiently resilient so that, upon application of force to fully seat the shank into the receptacle, the extension means contact the opposing conical surface, whereby the extension means and contacting conical surfaces provide sufficient contact with the opposing surface to provide accurate radial positioning of the shank and high resistance to forces tending to disturb the radial position of the shank relative to the receptacle.

5,595,392

IN-LINE ROLLER ICE SKATE COMBINATION

Anthony Casillas, 3400 Roseview Ave., Los Angeles, Calif. 90065

Filed Jul. 31, 1995, Ser. No. 509,495
Int. Cl.[6] A63C 17/18;17/06
U.S. Cl. 280—7.13 1 Claim



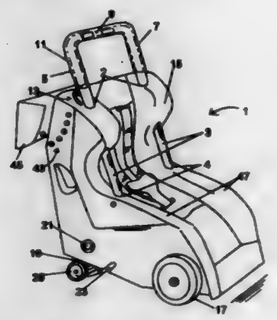
1. An alternately useable in-line roller and ice skate combination comprising:
an ice blade;
a plurality of wheels;
a boot adapted to be the secured to a human foot;
a pair of mounting plates positioned in a substantially spaced and parallel orientation relative to one another and extending longitudinally along a lower surface of the boot so as to project downwardly therefrom;
a plurality of support axles extending between the mounting plates to secure either of the ice blade and the plurality of wheels between the mounting plates
the axles are directed through the mounting plates and positioned in a substantially spaced and parallel orientation relative to one another;
the ice blade including a plurality of support stanchions projecting therefrom and extending in between the mounting plates when the ice blade is coupled thereto, each of the support stanchions being shaped so as to define an aperture directed therethrough permitting passage of an individual one of the axles through the support stanchion so as to mount the ice blade beneath the boot and the mounting plates;
the support stanchions being of a first transverse thickness, with the ice blade being of a second transverse thickness, wherein the first transverse thickness is substantially greater than the second transverse thickness such that each of the support stanchions closely engages interior surfaces of the spaced mounting plates;
the wheels each including a roller bearing centrally mounted therewithin through which a respective one of the axles projects to rotatably mount the respective wheel between the mounting plates when the wheels are coupled thereto;
a plurality of bushings being arranged in pairs of bushings extending circumferentially about a respective one of the axles, the bushings abuttingly engaging opposed sides of an interior race of the bearing of a respective one of the wheels;
the axles each projecting laterally beyond the mounting plates, with each of the axles including exterior threads formed about an exterior portion of a first end thereof, with an adjustment nut being threadably engaged to the exterior threads, and the axles being further shaped so as to define a bifurcated second end having a cam mounted between spaced furcations of the second end, the cam being rotatably mounted relative to the second end of the axle and including a lever projecting therefrom which can be manually manipulated to affect rotation of the cam into engagement within an exterior of one of the mounting plates to tension the respective axle and secure the axle relative to the mounting plates with either of the wheels and the ice blade positioned therebetween.

5,595,393

INFANT CAR SEAT STROLLER CONVERSION AND METHOD THEREFOR

James B. Batten, 9 Anderson Avenue, St. John's, Newfoundland, Canada

Filed Aug. 15, 1994, Ser. No. 291,833
Int. Cl.[6] B62B 7/12
U.S. Cl. 280—30 17 Claims



1. A child car safety seat and stroller useful for transporting a child with increased safety in an automobile and for aiding in transporting said child along a surface outside said automobile, comprising:
a seat structure having a recessed area for receiving a child;
means for securing said seat structure to a seating surface of said automobile;
first and second passages in said seat structure extending in a generally downward direction from an upper portion of said seat structure;
a handle assembly having at least two elongated projections, each of said projections extending downward through respective ones of said first and second passages;
means for securing said handle assembly to said seat structure; and,
wheel mounting means, having at least one rotatable wheel mounted thereon, attached to a lower portion of said seat structure at a forward position, whereby said at least one rotatable wheel is in a fixed position except for its rotatability, in relation to said seat structure, and whereby lifting of a rearward portion of said seat structure via said handle assem-

bly affects a shift of a majority of the weight of said seat structure to said at least one rotatable wheel so as to permit said seat structure to be rolled along said surface.

5,595,394

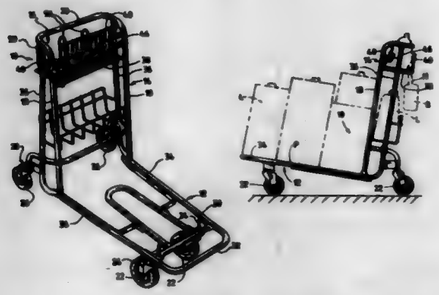
WHEELED CART WITH CHILD SEAT PROVIDING BAG-HANGING DIVIDERS

Mark Adamson, Broken Arrow, Okla., assignor to Unarco LLC, Atlanta, Ga.

Continuation-in-part of Ser. No. 33,889, Jan. 23, 1995, Pat. No. Des. 365,904. This application Mar. 6, 1995, Ser. No. 398,550

Int. Cl.[6] B62B *3/14;5/08*

U.S. Cl. 280—33.993 4 Claims



1. A wheeled cart comprising a wheeled chassis, a handle extending upwardly from a rear portion of the wheeled chassis, and a seat for a child, the handle having two upright portions spaced laterally from each other and a gripping portion extending laterally between the upright portions, the seat having a bottom portion extending rearwardly beyond the gripping portion of the handle and being mounted to the handle so as to extend between the upright portions, at least three dividers extending upwardly from the bottom portion of the seat, the dividers being spaced laterally from one another so as to define open-topped gaps open approximately to the bottom portion of the seat, the dividers defining means to accommodate the legs of a child sitting on the bottom portion of the seat and extending his or her legs through the open-topped gaps, to enable handles of bags or purses to be hung over the dividers, and to enable the handles once hung thereover to be lowered approximately to the bottom portion of the seat.

5,595,395

BIN CADDY

Carol A. Wilson, 145 Santa Lucia Dr., West Palm Beach, Fla. 33405

Filed Feb. 9, 1995, Ser. No. 386,272

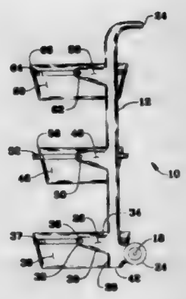
Int. Cl.[6] B62B *1/26*

U.S. Cl. 280—47.26 14 Claims

1. A caddy for use in combination with at least two rectangular recycling bins each including a bottom wall with four vertical sidewalls extending upward therefrom to an outwardly extending lip disposed along an upper portion of each said sidewall, said caddy comprising:

a frame means defined by a first and second rail member each having an upper end and a lower end, said first and second rail members spaced apart by upper and lower connectors, said first and second rail members having two sets of forwardly extending support members disposed between said upper end and said lower end;

rectangular bracket means pivotally coupled to said support members forwardly of said frame means, each bracket means operatively associated with said lip and sized to support said recycling bin in a removable position;



a pair of wheels rotatably secured to a lower portion of each said rail in transversely spaced relation for rotation about a transversely extending axis of rotation;

and means for maintaining said frame means in an upright position;

whereby said frame means supports said bin in a horizontal position when said frame means is placed in an upright position wherein tilting of said frame means allows for transporting of said bin on said wheels with said bracket means allowing said bin to be maintained in a horizontal position during transporting.

5,595,396

RETENTION APPARATUS FOR A BOOT ON A GLIDING BOARD

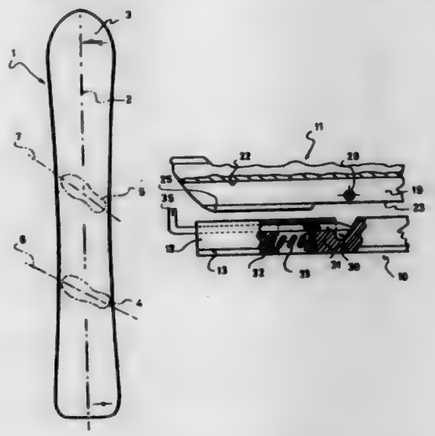
Joël Bourdeau, Saint-Jorioz, France, assignor to Salomon S.A., Metz-Tessy, France

Filed Apr. 4, 1994, Ser. No. 224,142

Claims priority, application France, May 14, 1993, 93 06006

Int. Cl.[6] A63C *9/18*

U.S. Cl. 280—607 26 Claims



1. A snowboard retention apparatus for a boot to be mounted on a snowboard, said apparatus comprising:

a first retention device adapted to be affixed to the snowboard and a second retention device adapted to be affixed to the boot, said first and second retention devices being complementary and forming a linkage assembly, during engagement between said first retention device and said second retention device, and located to ensure an opposition of relative movement between the boot and the snowboard in all directions;

one of said first retention device and said second retention device comprising means defining a groove and the other of said first retention device and said second retention device comprising means defining a rib, said rib generally complementary in shape with said groove, said rib and said groove having complementary fixed lateral surfaces for engagement to oppose relative lateral translational movement of said rib and said groove, and said rib being received in said groove in a nesting direction for said engagement against movement from said nesting direction, said rib and said groove being confined within a contour of the sole of the boot and a projection of the sole of the boot on the snowboard;

one of said first retention device and said second retention device further comprising a catch and the other of said first retention device and said second retention device further comprising a latch for retaining said catch and for retaining said first retention device and said second retention device to ensure said engagement;

means for enabling movement of said latch from an open position, for receiving said catch, to a closed position, for retaining said catch in said nesting direction against release; and

a control device for manipulation of said latch from said closed position to said open position, said manipulation being required for releasing said catch from said latch.

5,595,397

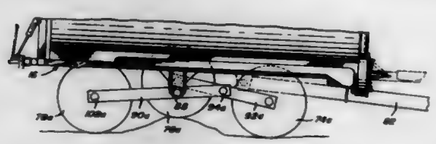
METHOD AND APPARATUS FOR SPREADING A LIQUID SLURRY

Marcel Depault, Shefford, Canada, assignor to WIC Inc., Wickham, Canada

Division of Ser. No. 983,455, Jun. 24, 1992, Pat. No. 5,357,883, which is a continuation-in-part of Ser. No. 857,426, Mar. 24, 1992, abandoned. This application Oct. 25, 1994, Ser. No. 328,422

Int. Cl.[6] B60G *5/04*

U.S. Cl. 280—677 7 Claims



1. A trailer suspension including a trailer chassis, a hitch pole extending frontwardly of the trailer chassis, the chassis including an axle extending laterally thereof, each end of the axle pivotally mounting respective first beams having front and rear ends, a vehicle supporting wheel means mounted at respective rear ends of each first beam, and the front ends of each first beam pivotally mounting second beams, and a pair of wheels, one journaled to each end of the second beam respectively, such that the trailer includes in at least three sets of wheels mounted in tandem.

5,595,398

WORK MACHINE

David J. B. Brown, Thirsk, United Kingdom, assignor to Caterpillar Inc., Peoria, Ill.

Filed May 1, 1995, Ser. No. 432,844

Claims priority, application United Kingdom, May 4, 1994, 9408790

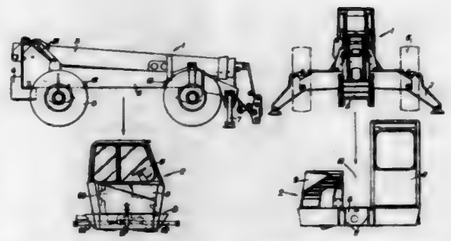
Int. Cl.[6] B62D *21/04*

U.S. Cl. 280—763.1 6 Claims

1. A work machine, comprising:

a first chassis having a longitudinally extending spine and front and rear axles and wheels;

a separate and distinct second chassis having a base, said base having first and second side portions,



an operator's cab adapted to be mounted to said first side portion of said base;

an engine adapted to be mounted to said second side portion of said base, said engine being spaced from said cab with said engine, cab, and base defining a u-shaped gap; and

said spine of said first chassis being adapted to be positioned within said u-shaped gap and in contact with said base, and said first chassis being adapted to be connected to said second chassis.

5,595,399

ENERGY-ABSORBING DEVICE WITH AXIAL HOLDING FOR AUTOMOBILE VEHICLE STEERING COLUMNS

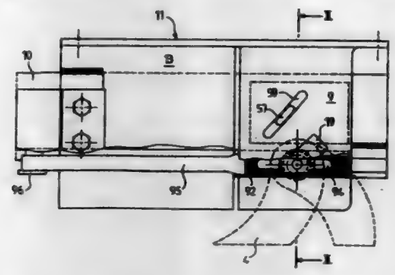
Jean-Michel Fouquet; Benoit Duval, both of Vendome, and Pascal Millet, Meslay, all of France, assignors to NACAM, Vendome, France

Filed Jan. 5, 1995, Ser. No. 368,984

Claims priority, application France, Jan. 6, 1994, 94 00084

Int. Cl.[6] B62D *1/19*

U.S. Cl. 280—777 16 Claims



1. An energy-absorbing device in an automobile steering column adjustable in depth and inclination comprising:

a support structure fixed to an automobile body for receiving a steering column body-tube and a steering shaft therein and mounting the body-tube and steering shaft to the automobile body so as to be adjustable in a selected depth and inclination;

a securing device for locking the body-tube in said support structure and having a rotatable elongate tightening element mounted on the support structure extending in a direction normal to the longitudinal axis of the steering column;

said securing device having an operator operable in a direction for rotating the tightening element in a direction to tighten and lock the body-tube in said support structure;

clamping elements mounted on said support structure coactive therewith and with said tightening element for clamping the body-tube and locking it in said support structure;

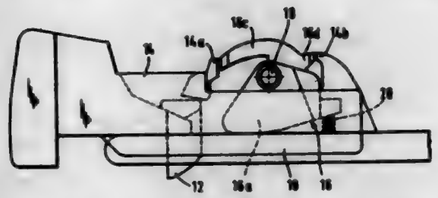
said clamping elements and support structure having slots through which said tightening element extends axially coactive to accommodate positioning of the axis of the tightening element in accordance with a selected depth and inclination of the steering column in said support structure;

an energy-absorbing element mounted and connected at an end of the body-tube facing toward a driving wheel of the automobile steering column and translating therewith in response

to an impact force applied to the body-tube at said end and in a direction parallel to the axis of the body-tube and effecting axial translation thereof and absorbing energy of the impact force during said translation;

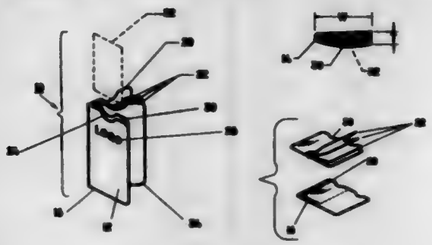
intermediate toothed elements coupling the energy-absorbing element to the securing device operator for effecting translation of the securing device operator and tightening element axis in response to axial translation of the body-tube relative to said support structure to absorb energy of the impact force when the impact force is applied and said energy absorbing element is readered effective and absorbs the energy of the impact force.

5,595,400
BUCKLE FOR SAFETY BELTS
Franz Wier, Gäggingen, Germany, assignor to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany
Filed Jan. 23, 1996, Ser. No. 589,806
Claims priority, application Germany, Jan. 26, 1995, 195 02 416.8
Int. Cl.[6] B60R *22/46*
U.S. Cl. 280—806 **3 Claims**



1. A buckle for vehicular safety belt systems, comprising a frame, a latch movably mounted in said frame for movement between a release position and a fastening position, a release button slidably mounted on said frame for movement in a longitudinal direction of said frame, actuation of said release button urging said latch from the fastening position to the release position, at least one two-armed blocking lever with an integral inertial body pivotally mounted on said frame, and a pair of abutments provided on said release button spaced from each other in the longitudinal direction of said frame, said blocking lever being arranged between said abutments with each of its arms having an end facing one of said abutments.

5,595,401
WALLET SIZE CARD BOOK
William B. Exline, Chagrin Falls, and Michael P. Exline, Novelty, both of Ohio, assignors to William Exline, Inc., Cleveland, Ohio
Filed Apr. 7, 1995, Ser. No. 418,567
Int. Cl.[6] B42D *1/00*
U.S. Cl. 281—2 **4 Claims**



1. A wallet size card book comprising:

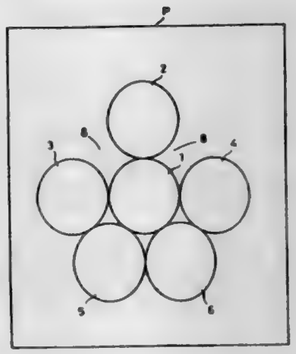
a. a cover having a fold which divides the cover into a front cover panel and a rear cover panel;

b. a plurality of leaves attached at the fold, the leaves forming pages;

c. a L-shaped glue strip extended along two edges of at least one leaf; and

d. a pocket formed by a first leaf being sealed to the inner surface of the cover and cut shorter and narrower than the cover and a second leaf being sealed along two edges to the L-shaped glue strip with a third edge attached at the fold and a fourth edge remaining open, wherein the card book is of a suitable size and configuration large enough to retain a conventional size credit card and yet small enough to fit within the conventional card compartments of a wallet.

5,595,402
PSYCHOLOGICAL TEST PAPER
Mitsuko Omori, 17-67, Mondoso, Nishinomiya-shi, Hyogo 662, Japan
Continuation of Ser. No. 151,411, Nov. 12, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 386,855
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—67 **8 Claims**



1. A method of testing a psychological condition of a subject to be tested comprising the steps of:

providing the subject with a psychological test paper which comprises a sheet having a pattern consisting essentially of first to sixth blank areas depicted thereon to be colored, each of said first to sixth blank areas being defined by respective contours, said pattern being such that the second to sixth blank areas are positioned relative to the first blank area on the top, left-hand side, right-hand side, diagonally lower left-hand and diagonally lower right-hand sides of the first blank area, respectively, the first blank area being substantially centrally positioned relative to the second through sixth blank areas, wherein the respective contours of the second to sixth blank areas adjoin the contour of the first blank area;

having the subject color some or all of the first to sixth blank areas, wherein one or more of the areas to be colored are associated with the present, past and/or future; and

evaluating the colored test paper to assess one or more of past, present or future psychological conditions of the subject wherein the evaluating step comprises one or more of the following:

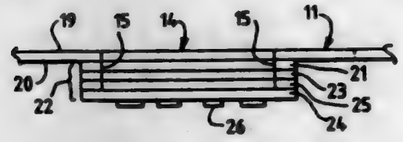
(a) evaluating the order of coloring of at least two areas;

(b) evaluating the color of at least one area;

(c) evaluating the presence or absence of coloring of at least one area; and

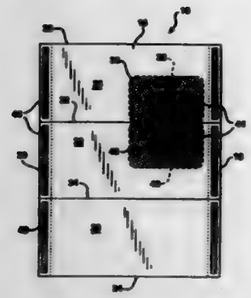
(d) evaluating the manner of coloring of at least one area.

5,595,403
CARD INTERMEDIATE AND METHOD
Ronald R. Garrison, Batavia, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.
Continuation-in-part of Ser. No. 159,294, Nov. 30, 1993, abandoned, and Ser. No. 198,612, Feb. 18, 1994, Pat. No. 5,466,013. This application Aug. 3, 1994, Ser. No. 285,410
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—74 **4 Claims**



1. A card intermediate comprising a length of paper having top and bottom surfaces and a generally rectangular diecut extending therethrough between said surfaces to define a card, a film laminate adhesively secured to said bottom surface and extending beyond the diecut on all sides thereof, said laminate including two film layers adhesively untied in superposed relation with a first of said film layers being positioned adjacent said bottom surface and a second of said film layers being positioned remote from said bottom surface, said diecut extending through said first film layer but not said second film layer, said second film layer being substantially transparent and having upper and lower surfaces, said upper surface being adjacent said paper bottom surface and said lower surface being remote from said paper bottom surface, and reverse alpha and/or numeric information printed on said surface.

5,595,404
MAILER INTERMEDIATE OR BUSINESS FORM
Hugh B. Sloss, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio
Filed Feb. 13, 1995, Ser. No. 387,554
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—116 **19 Claims**



1. A business form or mailer intermediate comprising:

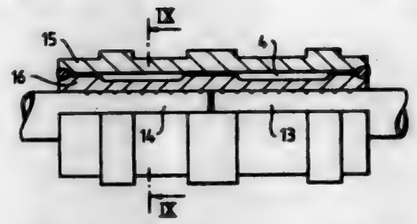
a substrate sheet having first and second surfaces, first and second opposite parallel longitudinal edges, and first and second opposite end edges;

at least first and second transverse fold lines formed in said substrate perpendicular to said parallel longitudinal edges, dividing said substrate into at least first, second, and third panels, said first fold line separating said first and second panels and said second fold line separating said second and third panels;

lines of weakness disposed in said first and second panels thereby forming first and second plies, respectively, and;

a first adhesive pattern provided on said second surface of at least one of said first and second plies so that when said substrate sheet is folded about said first fold line said second surfaces of said first and second plies lie in contact forming a two-ply card.

5,595,405
DIAPHRAGM POWER JACK
Hans Knutsen, Akrehamn, Norway, assignor to OBS Technology A/S, Haugesund, Norway
PCT No. PCT/NO93/00025, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO93/21099, PCT Pub. Date Oct. 28, 1993
PCT Filed Feb. 11, 1993, Ser. No. 318,693
Claims priority, application Norway, Apr. 10, 1992, 921431; May 21, 1992, 922010
Int. Cl.[6] F16L *17/00*
U.S. Cl. 285—96 **4 Claims**



1. A device for interconnecting in a sealing manner the end portions of two substantially aligned pipes, comprising

outer and inner cylindrical sleeves formed from a metal that are sealingly joined together at their ends to form an intermediate, closed annular space therebetween to which a pressure medium may be supplied, said inner sleeve forming a clamping sleeve that is subjected to shrinking when a pressure medium is supplied to said closed annular space, whereby when said inner sleeve is under a pressure medium influence said inner sleeve is pressed into sealing contact with the abutting end portions of two substantially aligned pipes that are positioned within said inner sleeve;

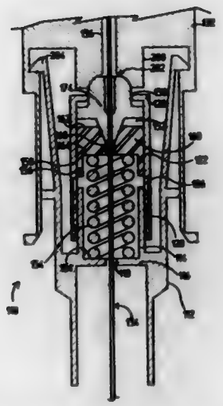
a plurality of longitudinally extending groove means that are uniformly distributed over the outer surface of said inner sleeve for receiving sleeve material that is brought to flow during shrinking of said inner sleeve under a pressure medium influence, whereby said inner sleeve maintains its circular cross-section as it shrinks; and

a plurality of inwardly projecting, peripherally extending ribs that are provided on the inner surface of said inner sleeve to penetrate the outer surface of two substantially aligned pipes positioned within said inner sleeve during the shrinking of said inner sleeve under a pressure medium influence, whereby leakage barriers are formed.

5,595,406
CAPILLARY TUBING CONNECTOR
Andrew M. E. Warchol, Wilmington, Del., assignor to Hewlett-Packard Co., Palo Alto, Calif.
Filed Nov. 30, 1995, Ser. No. 568,893
Int. Cl.[6] F16L *39/00*
U.S. Cl. 285—319 **8 Claims**

1. A connector for connecting a first fluid-bearing conduit to a second fluid-bearing conduit, thereby providing fluid communication between the first and second fluid-bearing conduits, the second fluid-bearing conduit being located in a receiver and communicating with a receiver port having a receiver port surface, comprising:

a bifernale provided with a forward end having a spherical head portion, an aft end having a tapered portion, and a bore therebetween for receiving the first fluid-bearing conduit therein;



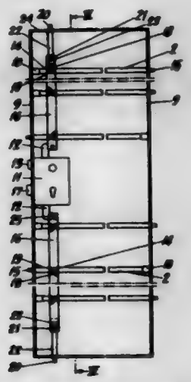
a biferrule compression assembly including a support for supporting the biferrule in the biferrule compression assembly, biasing means for compressing the aft end of the biferrule onto the first conduit, and means for attaching the combination of the biferrule, support, and biasing means to the receiver, said combination being attachable to the receiver to cause said biasing means to compress the aft end of the biferrule onto the first conduit for effecting a first fluid seal therebetween and to urge the forward end of the biferrule into sealing engagement with the receiving port for effecting a second fluid seal therebetween.

5,595,407
ROOF LATCHING DEVICE
Gerhardus E. R. ter Horst, Elbergen, Netherlands, and Donald J. Moore, Wolston, United Kingdom, assignors to Jaguar Cars Limited, Allesley, England
Filed Dec. 2, 1994, Ser. No. 348,796
Claims priority, application Netherlands, Dec. 3, 1993, 9302107
Int. Cl.[6] E05C 5/00
U.S. Cl. 292—5 8 Claims



1. A roof latching device for latching a convertible folding roof, to a header of a windscreen of a vehicle, the latching device comprising:
pull-to means located centrally in the header, which pull-to means grip the roof in a position thereof close to the header and pull the roof against the header;
drive means for driving the pull-to means;
locking means being located in the header on either side of the pull-to means, in order to lock the roof after the roof has been pulled against the header by means of the pull-to means;
wherein the locking means comprise two locking bars accommodated in the header on either side of the pull-to means, one of the locking bars being connected directly to the drive means, and the other being connected to the drive means with interposition of reversing means, so that the locking bars can be moved in opposite directions to each other by the drive means between an unlocked position and a locked position, and each locking bar in the locked position interacting with at least one coupling means disposed on the vehicle roof.

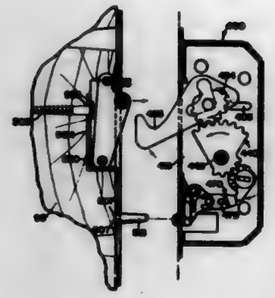
5,595,408
SAFETY DOOR AND SAFETY APPARATUS FOR INSTALLATION IN A DOOR
Peter Jeche, Hasenheckweg 49, DE 12107, Berlin, Germany
Filed Feb. 8, 1995, Ser. No. 386,352
Claims priority, application Germany, Feb. 8, 1994, 44 03 870.4; Jul. 4, 1994, 9411037 U
Int. Cl.[6] E05C 1/06
U.S. Cl. 292—37 11 Claims



1. A safety door comprising a door leaf (1); safety bolts (15) provided at two mutually opposite peripheral edges of the door leaf (1); installation holding straps (9); a locking mechanism apparatus for shifting said safety bolts in assigned guideways in such a manner that, in a locked position, said safety bolts protrude beyond the corresponding peripheral edge of the door leaf and, in an unlocked position, said safety bolts are accommodated within the door leaf, the locking mechanism apparatus comprising a slide rod (16), which can be shifted in a longitudinal direction thereof and which runs essentially transversely to the guideways and with which the safety bolts (15) are coupled mechanically, wherein precisely one safety bolt (15) is carried in each guideway and the safety bolts, allocated to the one peripheral edge and the opposite peripheral edge, are disposed offset with respect to one another, and wherein said guideways are formed as pipes (2) extending transversely through the whole of the door leaf (1) and are connected at their opposite ends to said installation holding straps (9), which extend along said peripheral edges of the door leaf (1) and connect all pipes (2) with one another.

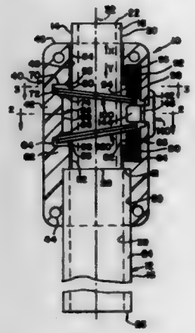
5,595,409
GLIDING DOOR LATCH ASSEMBLY
Duane T. Fier, Hudson, Wis., and Scott J. Rote, Rockford, Ill., assignors to Anderson Corporation, Bayport, Minn.
Filed Jul. 5, 1994, Ser. No. 270,496
Int. Cl.[6] E05C 5/00
U.S. Cl. 292—112 25 Claims

1. A lock for a gliding door unit of a type having at least one operating panel that is horizontally moveable relative to a vertical receiving jamb, the lock comprising:
a reach out latch portion configured for mounting to the operating panel, wherein said reach out latch portion includes:
a housing; and
a latch operatively connected to said housing and having a hook-like engaging member that is moveable between an unlatched position substantially within said housing, a keeper engaging position at a first distance outside said housing, and a latched position at a second, relatively lesser distance outside said housing;
a keeper portion configured for mounting to the receiving jamb, said keeper portion having a keeper configured to be selectively engaged by said hook-like engaging member; and



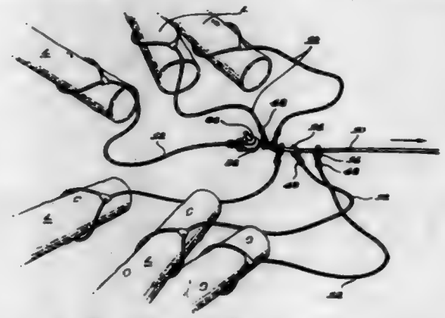
a moving means for moving said latch from said unlatched position to said keeper engaging position to said latched position, wherein in a first phase of operation, said moving means rotates said latch from said unlatched position to said keeper engaging position, and in a second phase of operation, said moving means moves said latch linearly from said keeper engaging position to said latched position and causes said latch portion to move toward said keeper portion, thereby causing the operating panel to move toward the receiving jamb, wherein said moving means includes a slot in said housing, and a peg on said latch protrudes through said slot, and said slot includes an arcuate portion through which said peg travels in said first phase of operation, and linear portion through which said peg travels in said second phase of operation.

5,595,410
QUICK-RELEASE LOCKING DEVICE FOR TELESCOPING MEMBER
Duard W. Wilson, Anderson, Calif.; Jon L. Gerber, Woodland, Ill., and Jeff G. Christianson, Oshkosh, Wis., assignors to Chicago Steel Tape Co., Wataeka, Ill.
Filed Feb. 27, 1995, Ser. No. 394,574
Int. Cl.[6] E05C 17/02
U.S. Cl. 292—306 19 Claims



1. A locking device for selectively locking a first telescoping member to a second telescoping member to prevent longitudinal movement therebetween, while selectively allowing the first telescoping member to slide in a first longitudinal direction with respect to the second telescoping member and to selectively slide in a second and opposite longitudinal direction with respect to the second telescoping member, said locking device including:
a housing including a sidewall having a first end and a second end and a bore extending though said housing between said first end and a second end of said sidewall, said housing being connectable to the second telescoping member and the first telescoping member extending through said bore;
a first locking mechanism disposed within said housing, said first locking mechanism including a first engagement portion adapted to selectively engage the first telescoping member and a second engagement portion adapted to selectively engage the first telescoping member, said locking mechanism being pivotal between a first position and a second position, wherein said first locking mechanism, when in said first position, prevents longitudinal movement of the first telescoping member in the first longitudinal direction with respect to the second telescoping member, and when in said second position, said first locking mechanism permits movement of the first telescoping member in the first longitudinal direction with respect to the second telescoping member;
a second locking mechanism disposed within said housing, said second locking mechanism including a third engagement portion adapted to engage the first telescoping member and a fourth engagement portion adapted to engage the first telescoping member, said second locking mechanism being pivotal between a first position, wherein said second locking mechanism prevents movement of the first telescoping member in the second longitudinal direction with respect to the second telescoping member, and a second position wherein said second locking mechanism permits movement of the first telescoping member in the second longitudinal direction with respect to the second telescoping member;
means for biasing said first locking mechanism toward said first position; and
an actuator member associated with said first and second locking mechanisms such that said actuator member may assume at least three positions, whereby when said actuator member is in said first position the first telescoping member is prevented from sliding longitudinally with respect to the second telescoping member in both the first and second longitudinal direction, whereby when said actuator member is moved to a second position said actuator member pivots said first locking mechanism to said second position wherein the first telescoping member is allowed to slide longitudinally with respect to the second telescoping member in the first longitudinal direction, and whereby when said actuator member is moved to the third position said actuator member pivots said second locking mechanism to said second position wherein the first telescoping member is allowed to slide longitudinally with respect to the second telescoping member in the second longitudinal direction.

5,595,411
ACCESSORIES FOR LOG HAULING APPARATUS
Real Delisle, 390 rue du Centenaire, St-Theole, Quebec, Canada
Filed Aug. 31, 1995, Ser. No. 521,917
Claims priority, application Canada, Apr. 26, 1995, 2147945
Int. Cl.[6] B66C 1/14; F16G 11/14
U.S. Cl. 294—74 5 Claims



1. A log hauling system consisting essentially of a main line, a plurality of choker lines, an interconnecting member connecting

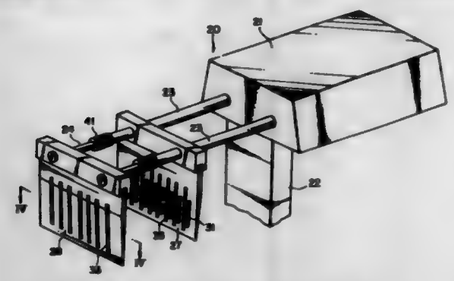
each choker line to said main line, each of said interconnecting members having a pulley at one end thereof adapted to run along said main line, an end piece located at an end of said main line, said end piece having first and second opposed surfaces, a channel formed in said end piece, said channel extending between said first and second opposed surfaces, said channel extending between a central portion of said end piece and an edge thereof, a moveable member extending across said channel adjacent said edge, said main line having a knotted portion adjacent said end piece, said channel being sized to permit passage of said main line therethrough and to prevent passage of said knotted portion, said channel also-being sized to permit passing of said main line through said channel when said moveable member is removed.

5,595,412

DEVICE FOR HANDLING WAFERS

Hideo Kudo, and Isao Uchiyama, both of Fukushima-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 352,654
Claims priority, application Japan, Dec. 10, 1993, 5-310299
Int. Cl.[6] B66C 1/42
U.S. Cl. 294—87.1 **24 Claims**



13. A device for handling wafers which comprises:
external hollow shafts supported horizontally and freely movable in an axial direction;
internal shafts inserted and freely slidable within the external hollow shafts;
a pair of handling members, one of the pair of handling members being supported by adjacent ends of the external hollow shafts and another of said pair of handling members being supported by adjacent ends of the internal shafts, said pair of handling members having respective surfaces which are opposed to each other;
a drive mechanism for moving the external hollow shafts and the internal shafts along the axial direction; and
a plurality of supporting structures provided in the respective opposed surfaces of the handling members, wherein the handling members comprise plate-shaped structures and include a plurality of supporting recesses as the supporting structures which are carved on the opposed surfaces thereof, and liquid communicating slits which are provided adjacent each of the supporting recesses.

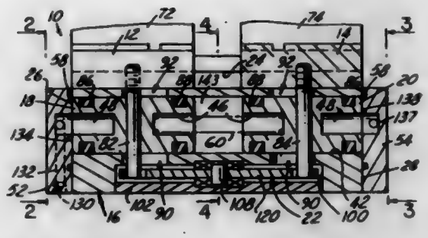
5,595,413

FLUID ACTUATED GRIPPER

Donald E. McGeachy, Commerce Township, Mich., and Jeffrey R. Schmeid, North Olmstead, Ohio, assignors to Numatics, Inc., Westlake, Ohio

Filed Dec. 12, 1994, Ser. No. 355,085
Int. Cl.[6] B25J 15/08
U.S. Cl. 294—88 **8 Claims**

1. A fluid actuated gripper mechanism of the type having opposed gripper devices mounted for sliding relation to and from a gripping position which comprises:



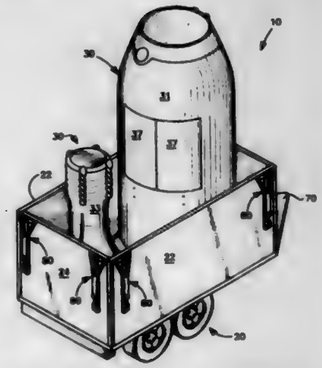
(a) a housing,
(b) opposed gripper slides mounted on said housing for lineal reciprocation,
(c) a piston bore extending axially of said housing adjacent said slides,
(d) opposed pistons in said bore,
(e) coupling pins coupling said pistons to said slides, each said coupling pin transfixed one piston and has a first end extending into a gripper slide to cause simultaneous motion of said one piston and slide, and
(f) a synchronizing lever located in said body, centrally mounted to pivot on an axis perpendicular to the axis of said piston bore, said lever having parallel cam slots, one at each end, angled to the path of lineal reciprocation of said slides, and a second end of each said transfer pin is located in a respective cam slot to provide simultaneous synchronous motion of said pistons and slides when actuated, wherein fluid directed to said pistons actuates said slides simultaneously.

5,595,414

TRAILER THAT TRANSFORMS INTO PLATFORM

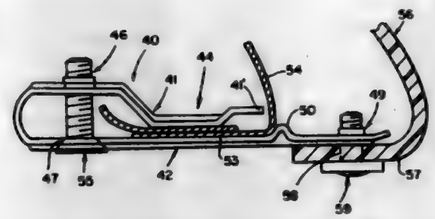
Nikolai A. Duhaig, and Gernot M. Maasner, both of Augasse 4, A-6060 Hall, Austria

Filed Feb. 7, 1995, Ser. No. 384,983
Claims priority, application Switzerland, Oct. 13, 1994, 3069/94
Int. Cl.[6] B60P 3/025
U.S. Cl. 296—26 **10 Claims**



1. A mobile apparatus, the apparatus comprising:
a platform having a leading end, a trailing end, and a pair of sides;
a wheel and axle assembly for supporting said platform and enabling transportation of said platform over public roads;
a side wall hingedly mounted to each side of said platform, each side wall having a first upstanding position and a second deployed position in a substantially horizontal plane;
an end wall hingedly mounted to said trailing end of said platform, said end wall having a first upstanding position and a second deployed position in a substantially horizontal plane;

a hollow structure secured to and supported by said platform, said hollow structure having an interior of predetermined size to permit entry thereinto of at least one person;
a door formed in said structure to provide ingress and egress into and from said hollow structure, respectively; and
at least one stairway permitting entry onto said platform from a ground surface;
said hollow structure including a base part and a top part that surmounts said base part, said top part being detachably secured to said base part.



5,595,415

TWIN-WALL COMPOSITE LINING FOR AUTOMOBILES

Bernard Bonnet, Brazay-en-Plaine, France, assignor to Plasto SA, France

Filed Jun. 5, 1995, Ser. No. 462,826
Claims priority, application France, Jun. 8, 1994, 94 06990
Int. Cl.[6] B60J 5/04
U.S. Cl. 296—39.1 **13 Claims**



1. A composite lining and automobile door, wherein the door comprises an outer door panel facing outward, an interior covering panel of the door facing inward and, at least over part of the respective opposed surface areas of the outer door panel and the interior covering panel, the interior covering panel being spaced away from the outer panel;
a composite lining disposed between the outer door panel and the interior covering panel; the composite lining comprising a first outer panel of a material adapted to perform a sealing function, and the first panel being fixed to the surface of the outer door panel;
the composite lining further comprising a second inner panel to which the interior covering panel is fixed, the second panel being shaped and profiled relative to the first panel for defining a cavity between them and for the first and second panels contacting each other away from the cavity; and means for fastening the first and second panels of the lining together.

5,595,416

RETAINING CLIPS FOR VEHICLE HOOD PROTECTORS

Rodney E. Herwill, P.O. Box 171, Salisbury Queensland 4107, Australia

Filed Aug. 3, 1995, Ser. No. 510,666
Claims priority, application Australia, Aug. 5, 1994, PM7269
Int. Cl.[6] B62D 35/00
U.S. Cl. 296—91 **17 Claims**

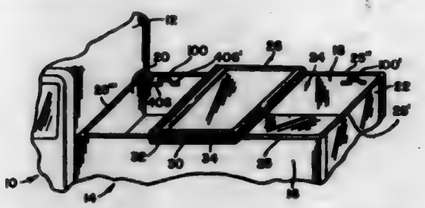
14. A hood protector or shield secured to the hood of a vehicle by at least one retaining clip, said hood having a return flange, and said at least one retaining clip having upper and lower integral spaced apart gripping arms, said upper gripping arm being located on an upper side of said return flange of said vehicle hood and said lower gripping arm being located on the lower side of said return flange of said vehicle hood, means extending between said upper and lower gripping arms and urging said gripping arms relatively towards each other to cause said arms to grip said return flange of said hood, said lower arm having a portion projecting forwardly beyond said upper arms and said hood, and attaching means attaching said hood protector or shield to said projecting portion of said one arm.

5,595,417

TONNEAU COVER FOR A PICK-UP TRUCK

David C. Thomas, and Christopher M. Thomas, both of 623 W. Mishawaka Ave., Mishawaka, Ind. 46545

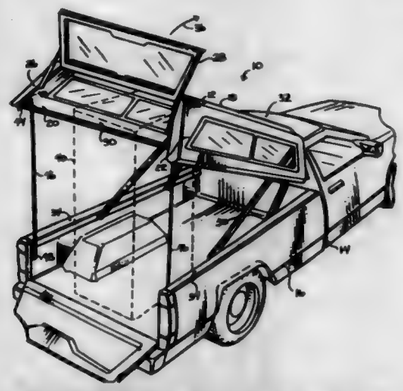
Filed Jul. 26, 1995, Ser. No. 507,115
Int. Cl.[6] B60P 7/02
U.S. Cl. 296—100 **20 Claims**



1. In combination with a pick-up truck of the type having an open bed for carrying cargo, said bed having a pair of spaced apart parallel side walls connected to a front end wall and a rear end wall, said rear end wall being rotatable with respect to said bed, said side walls, front end wall and rear end wall each having a top surface in substantially a same horizontal plane with respect to said bed, a tonneau cover for engaging each top surface to form a compartment and seal said open bed from the surrounding environment, said tonneau cover comprising: a center panel connected to a first frame formed by joining together first, second, third and fourth reinforcing members, said first and third reinforcing members of said first frame being fixed to said parallel side walls to secure and locate said center panel in a stationary position with respect to said open bed; a front panel connected to a second frame formed by joining together first, second, third and fourth reinforcing members; a first rubber hinge secured to said fourth reinforcing member of said first frame and said second reinforcing member of said second frame for joining said center panel with said front panel; a rear panel being connected to a third frame formed by joining together first, second, third and fourth reinforcing members; a spacer member; and a second rubber hinge secured to said second reinforcing member of said second frame, said spacer member and said fourth reinforcing member of said third frame for joining said center panel with said rear panel, said first hinge allowing said front panel to rotate from a first position engaging said top surface of said front end wall to a second position where said fourth reinforcing member of said second frame is parallel to and overlays said second reinforcing member of said first frame, said second hinge and said spacer member allowing said rear panel to rotate from first position engaging said top surface of said rear

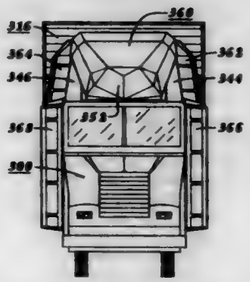
end wall to a second position where said second reinforcing member of said third frame is parallel to and overlays said fourth reinforcing member of said second frame, said center panel along with said front panel and rear panel in said second positions forming a work surface substantially parallel with said bed.

5,595,418
SELECTIVELY LIFTABLE CARGO BED ENCLOSING SYSTEM
Eric G. Medlin, 3721 S. Dennis Dr., Tempe, Ariz. 85282
Filed Sep. 6, 1995, Ser. No. 523,957
Int. Cl.[6] B60P *7/02*
U.S. Cl. 296—100 **20 Claims**



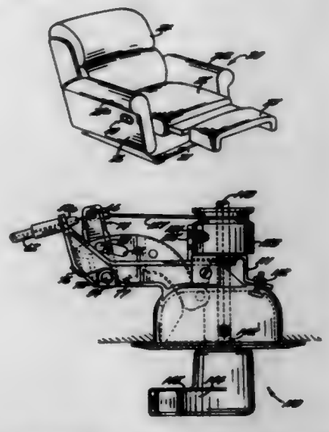
1. A selectively liftable cargo bed enclosing system which covers a vehicle cargo bed and which selectively pivots away from said cargo bed, said system comprising:
a camper shell having an interior surface;
a substantially rigid upper arm pivotally attached to said interior surface of said shell at an upper arm pivot point; and
a substantially rigid lower arm pivotally attached to said interior surface of said shell at a lower arm pivot point, said lower arm pivot point being spaced apart from said upper arm pivot point, and said lower arm being shorter than said upper arm.

5,595,419
SEGMENTED AIR DEFLECTOR ASSEMBLY
Dan E. Spears, 3515 Westfield Dr., Brandon, Fla. 33511
Filed Dec. 9, 1994, Ser. No. 352,515
Int. Cl.[6] B62D *35/00*
U.S. Cl. 296—180.2 **9 Claims**



1. A segmented air deflector for a tractor, the tractor having a roof area, a direction of forward travel from which directional orientations are derived, a left side, a right side, a left rear vertically oriented trailing edge and a right rear vertically oriented trailing edge, the tractor to tow a trailer, the tractor and the trailer forming a tractor trailer combination, the segmented air deflector attachable to the roof area of the tractor and having a directional orientation following attachment, the directional orientation including left, right, forward and rear all corresponding to the directional orientations of the tractor, the segmented air deflector comprising a continuous shell having a left lower edge, a forward transversal edge, a right lower edge all in close proximity to the tractor roof following installation, the continuous shell having an exterior surface having a left side terminating rearward with a left rear trailing edge and a right side terminating rearward with a right rear trailing edge, an intermittent section extending rearward and upward between and contacting the left side and the right side, the intermittent section having a transversal direction extending between the left side and the right side and a longitudinal direction extending rearward and upward, the transversal direction separated into a plurality of surface sections, each surface section level and planar and defined from adjacent surface sections by sharp edges, the exterior surface of the segmented air deflector forming a continuous segmented surface area to provide fairing characteristics to stream line air flow around the trailer during motion of the tractor trailer combination to reduce drag.

5,595,420
DUAL-OPERATED MECHANISM FOR REMOTE LATCH ACTUATION
W. Clark Rogers, P.O. Box 685, Denton, N.C. 27239
Filed Sep. 8, 1994, Ser. No. 302,202
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—85 **48 Claims**



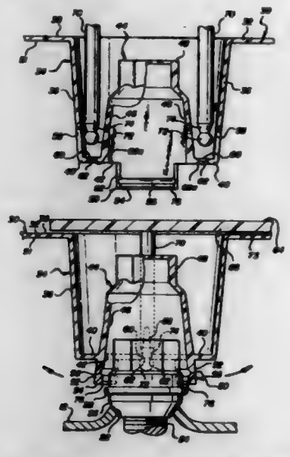
31. A chair comprising a base, a seat, a backrest, means for reclining said chair between an upright position and at least one reclined position, and a mechanism for actuating movement of said chair from the upright position to a reclined position, said mechanism comprising:
a housing attached to said chair,
a lever arm directly and pivotally connected to said housing to define a pivot axis and to be pivotable between a retracted position and an extended position, said lever arm having a free end portion,
an actuating member connected at one end to and movable with said lever arm free end portion and at a second end to said reclining means so that movement of said actuating member responsive to the movement of said lever arm from the retracted position toward the extended position actuates said reclining means to move said chair from the upright position to one of said at least one reclined position,

first actuator means for pivoting said lever arm from its retracted position to its extended position, and including operating means movable between retracted and extended positions and first interconnecting means interconnecting said lever arm and said operating means so that the lever arm will be pivoted from its retracted position toward its extended position upon a corresponding movement of said operating means, said first interconnecting means extending between and connected to said lever arm and said operating means, and said first actuator means being directly connected to said housing, and
second actuator means for pivoting said lever arm from its retracted position to its extended position independently of the operation of said first actuator means, and including take-up means rotatably mounted to said housing and second interconnecting means interconnecting said lever arm and said take-up means so that rotation of said take-up means in a first rotative direction causes said lever arm to pivot from its retracted position toward its extended position, said second interconnecting means extending between and connected to said lever arm and said take-up means, and said second actuator means being directly connected to said housing.

5,595,421

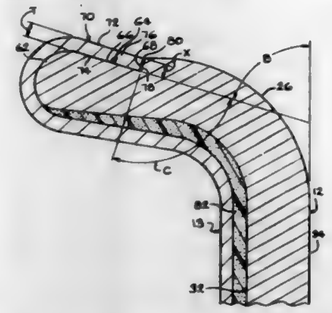
Patent Not Issued For This Number

5,595,422
WHEEL COVER ASSEMBLY HAVING ANTI-THEFT RETAINER SYSTEM
Lawrence C. Ladouceur, Windsor, Canada, assignor to Textron Automotive Company, Inc., Troy, Mich.
Filed Apr. 29, 1996, Ser. No. 638,764
Int. Cl.[6] B60B *7/16*
U.S. Cl. 301—37.21 **16 Claims**



1. A center mount wheel cover assembly for covering the wheel of an automotive vehicle, said assembly comprising:
a cover member having axially inner and outer sides and a plurality of circumferentially spaced wells extending axially inwardly from said outer side of said cover member each having a central opening to receive an associated lug nut of the wheel; and
an anti-theft retainer system provided on said inner side of said cover member having resilient lug nut-embracing locking arms extending axially from at least one of said wells and arm-expanding reaction surfaces provided between said locking arms and accessible through said cover member, said locking arms being expandable radially outwardly to receive an associated one of the lug nuts between said locking arms and biased radially inwardly to close at least partially around and embrace the lug nut to lock said cover member on the wheel, said locking arms being releasable from locked engagement with the lug nut by insertion of a force-applying anti-theft release tool between said reaction surfaces causing said reaction surfaces to deflect outwardly of one another thereby expanding said locking arms radially outwardly to permit the removal of said cover member from the wheel.

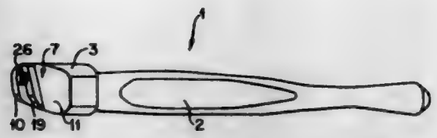
5,595,423
VEHICLE WHEEL COVER RETENTION SYSTEM AND METHOD FOR PRODUCING SAME
Thomas E. Heck, Monroe, and Michael V. Maloney, Belleville, both of Mich., assignors to Hayes Wheels International, Inc., Romulus, Mich.
Continuation-in-part of Ser. No. 389,867, Feb. 23, 1995, which is a continuation-in-part of Ser. No. 203,858, Feb. 28, 1994, Pat. No. 5,435,631. This application Dec. 7, 1995, Ser. No. 569,023
Int. Cl.[6] B60B *7/06*
U.S. Cl. 301—37.43 **10 Claims**



1. A vehicle wheel defining an axis and comprising:
a disc defining an outboard facing wheel surface and including an outboard tire bead seat retaining flange, tire bead seat retaining flange including an outer peripheral end and an inner surface having a circumferential, radially outwardly facing groove formed therein, and
a wheel cover covering at least a portion of tire facing wheel surface and the entire portion of said outer peripheral end of said outboard bead seat retaining flange, said wheel cover including an outer annular lip which extends into said groove when said wheel cover is installed on said disc.

5,595,424
MINI PLANE
Takao Nakagawa, Tokyo, Japan, assignor to S.T. Japan Inc., Tokyo, Japan
Filed Feb. 6, 1995, Ser. No. 386,525
Claims priority, application Japan, Apr. 27, 1994, 6-090110
Int. Cl.[6] B26B *1/00*
U.S. Cl. 30—169 **10 Claims**

1. A mini plane, comprising:
a bar-like handle;
a cutting blade holder fixed on said bar-like handle at a forward end thereof; and
a cutting blade detachably attached to said cutting blade holder;
wherein said cutting blade has a flat seating face, a front face opposite the seating face, a slant blade face which is slanted at a longitudinal end portion of the front face and whose tip edge



coincides with a longitudinal edge of said seating face, a positioning side face perpendicular to a cutting edge of the slant blade face, and a through hole which extends between said seating face and the front face for receiving a fixing screw;

said cutting blade holder has a mounting face to which the seating face of said cutting blade is attached, a positioning reference side face with which said positioning side face is contacted, and a fixing tapped hole provided in said mounting face with which a tip end portion of the fixing screw passing through said through hole is screw-engaged;

said cutting blade holder is provided with a surface for forming a cutting accommodating space for accommodating a cutting produced by said cutting blade;

a diameter of the through hole in said cutting blade is larger by a predetermined value than an outside diameter of said fixing screw;

said cutting blade has an adjusting tapped hole which extends from a longitudinal end opposite the cutting edge of said cutting blade to the through hole; and

wherein said mini plane further comprises a position adjusting screw which engages with said adjusting tapped hole with a tip end thereof reaching into said through hole.

5,595,425

BRAKE PRESSURE CONTROL UNIT OF VEHICLE LOAD RESPONSIVE TYPE

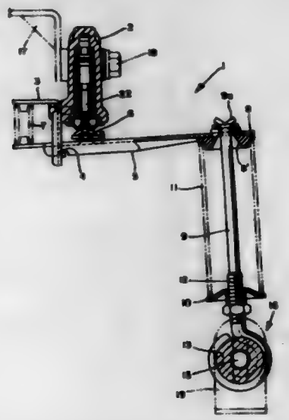
Kiyoteba Nagamori, Kariya; Sigeki Yagami, Chiryu, and Hidenki Mitubayashi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 24, 1995, Ser. No. 427,595

Claims priority, application Japan, Apr. 25, 1994, 6-107378; Apr. 14, 1995, 7-112572

Int. Cl.[6] B60T 8/18

U.S. Cl. 303—22.1 **6 Claims**



1. A brake pressure control unit of vehicle load responsive type comprising: a load-sensing proportional valve to be disposed in a hydraulic brake pressure line extending from a master cylinder to at least one rear wheel brake cylinder, a load-sensing lever swingable about a pivot point formed on a stationary member which is secured to the proportional valve and abutting on a plunger of the proportional valve, a secondary spring disposed between the stationary member and one of the free ends of the lever, a rod engaged with the other free end of the lever, and a primary spring disposed between the other free end of the lever and a lower portion of the rod, the direction of the biasing force of the secondary spring with respect to the plunger of the proportional valve being the same as that of the primary spring, said brake pressure control unit being pre-assembled as one unit and installed in the vehicle as it is in such a manner that the proportional valve is secured to a bracket on a chassis frame side of the vehicle and the end of the rod is secured to a bracket on an axia side thereof.

5,595,426

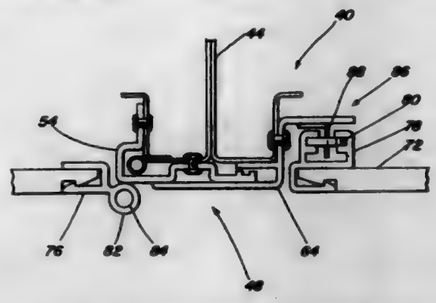
LOCKER DOOR RETROFIT ASSEMBLY

John C. Wolff, Columbus; Scott R. Gardner, Dublin, and Delbert P. Kelsling, Jr., Clarks Summit, all of Ohio, assignors to Compression Polymers Group, Pa.

Continuation-in-part of Ser. No. 196,660, Feb. 10, 1994. This application Dec. 15, 1994, Ser. No. 356,490

Int. Cl.[6] A47B 43/00;47/00; E06B 1/10

U.S. Cl. 312—109 **9 Claims**



1. A locker door retrofit assembly for an existing locker which has a first side wall with an existing hinge attached thereto, and a second side wall, the locker door retrofit assembly comprising:

a non-metallic jamb hinge adapted to be attached to the first side wall, wherein the jamb hinge is adapted to enclose the existing hinge;

a non-metallic jamb lock adapted to be attached to the second side wall, wherein said jamb lock is adapted to be slidably adjustable in relation to said jamb hinge, prior to securing said jamb lock to said side wall, thereby allowing said jamb lock and said jamb hinge to fit on adjacent lockers of variable dimensions; and

a non-metallic replacement door having a non-metallic door hinge and a latch, wherein the door hinge is hingedly attached to the jamb hinge and the latch engages the jamb lock when the door is closed.

5,595,427

MODULAR COUNTERTOP

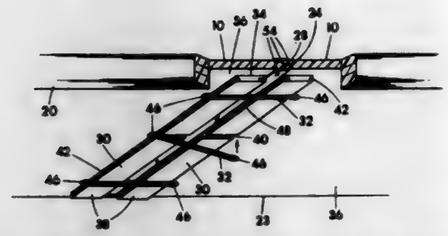
Chris R. Peters, Chico, and James W. Henderson, Paradise, both of Calif., assignors to Transfer Flow International, Inc., Chico, Calif.

Filed Feb. 13, 1996, Ser. No. 387,336

Int. Cl.[6] A47B 57/00; F16B 2/02

U.S. Cl. 312—140.4 **4 Claims**

1. A modular countertop defined at least in part by a rigid first panel section adhesively bonded to a rigid second panel section, each of the panel sections having a substantially flat work space top surface and a bottom surface oppositely disposed from the top surface, each of the panel sections further having a back edge and a front edge across from said back edge, and at least two lateral



side edges extending between the front edge and the back edge of each of the panel sections,

one side edge of said first panel section positioned in close adjacency to one side edge of said second panel section with adhesive between the closely adjacent side edges,

a pair of elongated material strips, one said material strip affixed to each of the panel sections in general parallel alignment with said closely adjacent side edges, each of the material strips including

at least one groove retaining end-fittings of

a plurality of elongated linear extendable and retractable tension springs extended and under tension spanning across said closely adjacent side edges; each of said tension springs having two oppositely disposed ends with each of the oppositely disposed ends affixed with one of said end-fittings, each of said end-fittings being larger in at least one dimension relative to a nominal diameter of the respective tension spring, and further wherein each of the end-fittings is sufficiently sized and shaped to be able to be readily grasped by fingers of a human hand and to thus serve as a handle.

5,595,428

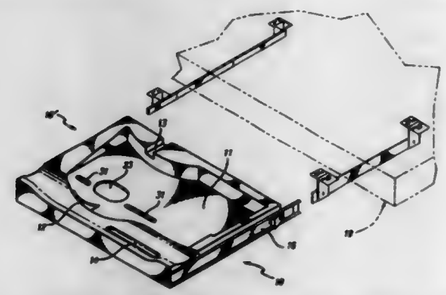
ERGONOMIC KEYBOARD DRAWER

Michael Huang, 8527 Beverly Dr., San Gabriel, Calif. 91706

Filed Jul. 28, 1995, Ser. No. 508,748

Int. Cl.[6] A47B 81/00;97/00

U.S. Cl. 312—223.3 **6 Claims**



1. A support drawer apparatus for an ergonomic computer keyboard including a shelf for supporting the keyboard, and including means for attaching said shelf to a desk or support surface, said keyboard being of the type having means for elevating a portion of the keyboard when supported on the shelf, comprising:

a recessed central surface in said shelf capable of accepting for support an ergonomically designed keyboard, the keyboard having a non-rectangular bottom surface for supporting the keyboard on the recessed surface, the recessed surface being complementary in shape to the non-rectangular bottom surface of the keyboard, a first access port for temporarily manually elevating the ergonomically designed keyboard while supported within said recessed surface, a second access port for accessing a lift-up bar assembly of the ergonomically designed keyboard while supported within said recessed surface, said elevation means and said access means being located within a close proximity of each other, and raised projections for securing a lift-up bar assembly of the ergonomically designed keyboard in a desired elevational position while the ergonomically designed keyboard is supported within said recessed surface of said shelf.

5,595,429

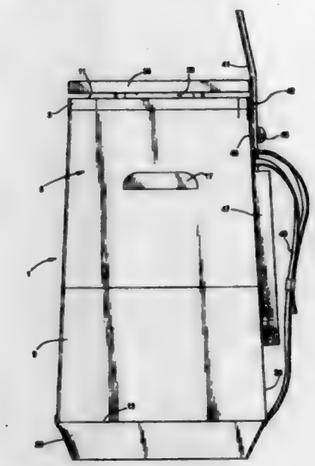
COMBINATION COOLER-SEAT-STORAGE TRANSPORTING DEVICE

Thomas A. Kennedy, Raritan Township, Hunterdon County, N.J., assignor to T.A.K. Enterprises, Inc., Flemington, N.J.

Continuation-in-part of Ser. No. 227,068, Apr. 13, 1994, Pat. No. 5,435,643, which is a continuation-in-part of Ser. No. 213,151, Mar. 14, 1994, Pat. No. 5,435,642. This application Apr. 11, 1995, Ser. No. 419,828

Int. Cl.[6] A47B 83/02;3/14

U.S. Cl. 312—235.2 **20 Claims**



1. A combination cooler-seat storage transporting device, which comprises:

a) a main housing having a top, a bottom, sidewalls, and a front, said housing having an upper section and a lower section, said upper section having inner walls and outer walls and having heat insulation therebetween, said housing further including an open top at said upper section, an open front at said lower section, said open front having a hinged door thereon, said lower section further containing a plurality of horizontal drawer supports therein;

b) a cover hingedly connected to said main housing at said open top of said upper section, said cover having an inner wall and an outer wall with heat insulation therebetween;

c) a plurality of drawers located within said housing and slidably connected to said drawer supports for horizontal opening and closing thereof, wherein at least a portion of said plurality of drawers are located inside said housing behind said door;

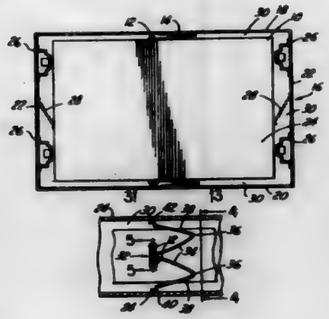
d) a seat located on said cover of said housing; and,

e) handling means on said housing for manually carrying same.

5,595,430
RESILIENT RETAINER FOR VIBRATION SENSITIVE COMPONENTS

Gregory A. Weyeneth, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 27, 1995, Ser. No. 411,197
Int. Cl.[6] A47B *88/00*; G11B *33/08*
U.S. Cl. 312—319.1 10 Claims



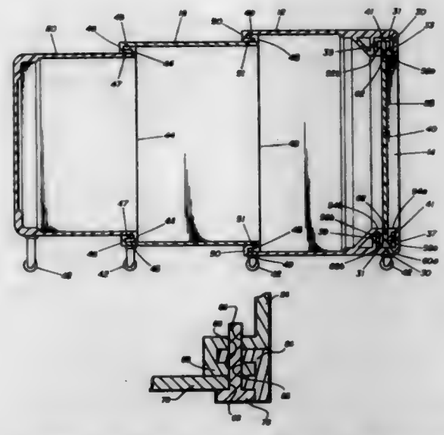
1. A vibration sensitive assembly comprising:
a housing having a top portion, a bottom portion and a pair of side walls extending therebetween;
a vibration sensitive component positioned within said housing, said vibration sensitive component having a top, a bottom and a pair of side walls extending therebetween, said vibration sensitive component having at least one mounting pin extending from said bottom;
attachment means mounting said vibration sensitive component within the housing so that a space is formed between said bottom of said vibration sensitive component and the bottom portion of the housing;
at least one resilient retainer isolating said vibration sensitive component from side wall, said resilient retainer including a connection portion for fixedly attaching to said at least one mounting pin, and a pair of biasing elements, each biasing element mounted between said connection portion and said side walls in said space between said bottom of said vibration sensitive component and the bottom portion of the housing, said biasing elements each having a pair or arms each bendable at a fulcrum and having a free end extending therefrom with a curved portion on a distal end thereof in contact with one of said pair of sidewalls, said biasing elements exerting a predetermined centering force between said side wall and said mounting pin.

5,595,431
STRENGTHENED HARDENED AIRCRAFT UNIT LOAD DEVICE

Paul F. Miskar, Vicksburg, Miss., assignor to Jaycor, San Diego, Calif.

Continuation-in-part of Ser. No. 188,376, Jan. 12, 1994, Pat. No. 5,413,410, and Ser. No. 209,561, Mar. 9, 1994, each which is a continuation-in-part of Ser. No. 816,309, Dec. 26, 1991, Pat. No. 5,312,182. This application Feb. 1, 1995, Ser. No. 382,290
Int. Cl.[6] A47B *96/00*
U.S. Cl. 312—409 20 Claims

1. A strengthened hardened unit load carrying device which comprises:
a container for holding said load, said container being formed with an opening, said opening having a perimeter;
a door for slidingly covering said opening to enclose said load in said container, said door having an edge;
a gripping means formed along said edge of said door;

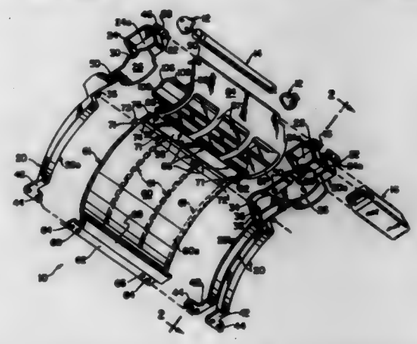


a channel means formed along said perimeter of said opening, for slidably receiving said gripping means on said door;
a first plurality of holes through said gripping means, said first plurality of holes being spaced along said edge of said door;
a second plurality of holes through said channel means, said second plurality of holes being spaced along said perimeter of said opening to align with said first plurality of holes when said door is in a closed position covering said opening;
a plurality of pins, said pins being insertable through said first plurality of holes and through said second plurality of holes when said door is in said closed position, to fasten said gripping means to said channel means;
wherein said pins maintain alignment between said gripping means and said channel means, to assist said gripping means and said channel means to interlock with increased force in response to an explosive blast within said container, to resist rupturing said device.

5,595,432
LIGHTING FIXTURE

Troy Vanderhoof, Plano, Tex., assignor to Gulton Industries, Inc., Plano, Tex.

Continuation of Ser. No. 988,251, Dec. 10, 1992, Pat. No. 5,420,763, which is a continuation-in-part of Ser. No. 961,777, Oct. 15, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 396,166
Int. Cl.[6] B60Q *3/02*
U.S. Cl. 362—74 3 Claims



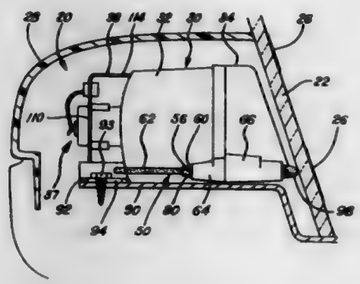
1. A lighting arrangement for the interior of a vehicle comprising:

a first and a second adjacent lighting fixtures placed end-to-end, each fixture including a fluorescent light tube
said first fixture having a first rigid unitary mounting batten at its end adjacent said second fixture,
said second fixture having a second rigid unitary mounting batten at its end adjacent said first fixture,
each batten being adapted to be secured to the structure of said vehicle in a generally vertical orientation for mounting said fixtures to said vehicle structure,
said first batten having a first electrical connector mounted thereon,
said second batten having a ballast mounted thereon, said ballast having a second electrical connector mounted thereon and mating with said first electrical connector,
said ballast being connected to both of said light tubes for initiating and maintaining light discharges therein.

5,595,433
BACK LIGHT ASSEMBLY

Gerald P. Pokriefka, Clarkston, and Paul E. Cole, Chelsea, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Aug. 28, 1995, Ser. No. 520,120
Int. Cl.[6] B60Q *1/26*
U.S. Cl. 362—80.1 12 Claims



1. A back light assembly for an automotive vehicle, comprising a housing,
said housing having separable first and second housing parts cooperating with one another to form a chamber for a light bulb, and
means for releasably securing said housing parts together comprising an elongated fastener made of flexible, compressible, stretchable material,
a first passage in said first housing part having inner and outer ends,
a second passage in said second housing part having inner and outer ends,
said passages being aligned with the inner ends thereof adjacent one another,
said fastener extending through and installed in said aligned passages,
said first housing part having a first transverse abutment associated with said first passage and facing away from the inner end thereof,
said second housing part having a second transverse abutment associated with said second passage and facing away from the inner end thereof,
said fastener having longitudinally spaced apart first and second enlargements, and
said first enlargement engaging said first abutment and said second enlargement engaging said second abutment to oppose separation of said housing parts.

5,595,434
WAND ATTACHMENT

Ricky C. Pasch, 915 W. County B2, Roseville, Minn. 55113, and David R. Thomas, 10105 152nd St. North, Hugo, Minn. 55038

Continuation of Ser. No. 124,724, Sep. 21, 1993, Pat. No. 5,383,103. This application Jan. 17, 1995, Ser. No. 373,649
Int. Cl.[6] F21L *15/00*
U.S. Cl. 362—102 2 Claims

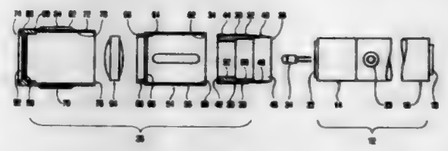


1. A wand attachment for a handle portion having a first diameter, and an axially aligned expanded portion having a second diameter larger than said first diameter, comprising:
a wand member having proximal and distal ends;
an opposing collar member receivable over said handle portion to axially engage one axial end of said expanded portion;
means for attaching said wand member to said opposing collar member when said wand member is disposed in engagement, at said proximal end thereof, with an opposite axial end of said expanded portion and said opposing collar member, having a central longitudinal axis, is disposed in engagement with said one axial end of said expanded portion so that said wand attachment is secured to said expanded portion; and
multiple length means for interchangeably attaching said wand attachment to at least two different handle portions with expanded portions having different lengths, said multiple length means being carried by said wand member proximate said proximal end thereof, and a central longitudinal axis of said expanded portion being generally coaxial with a central longitudinal axis of said handle member.

5,595,435
FLASHLIGHT ILLUMINATOR FOR A NIGHT VISION DEVICE

Gary L. Palmer, Roanoke, and William K. Forsythe, Blueridge, both of Va., assignors to ITT Corporation, New York, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,346
Int. Cl.[6] F21V *33/00*
U.S. Cl. 362—109 18 Claims



1. An illuminator device for a night vision apparatus, said illuminator device providing supplemental illumination of remotely located objects to be viewed through the night vision apparatus under a low light condition, said illuminator device comprising:
housing means having a first end and a second end;
light source means coupled to said first end of said housing means for generating a light to illuminate the remotely located objects; and

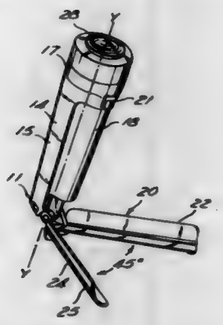
focusing means for condensing the light generated by said light source means into a concentrated light beam having a pattern of consistent brightness which enables substantially long range illumination, wherein said focusing means is located a given distance away from said light source means in a location which is remote from said first end of said housing means, and wherein said focusing means comprises a single convex aspheric lens, said aspheric lens including opposing first and second spherical surfaces, said first spherical surface having a first radius of curvature and said second spherical surface having a second radius of curvature, said first radius of curvature being substantially different from said second radius of curvature.

5,595,436

FLASHLIGHT WITH ARTICULATING STAND

Lowell B. Way, Jr., Laguna Niguel, and Martin I. Sheps, Poway, both of Calif., assignors to Diamondlight Industries, Inc., Costa Mesa, Calif.

Filed Nov. 17, 1995, Ser. No. 559,906
Int. Cl.[6] F21L *7/00*
U.S. Cl. 362—190 **13 Claims**



1. A flashlight comprising:
an elongate housing having a front end and a back end;
a cartridge slidably disposed in said housing, the cartridge holding a power source;
a light source disposed in the front end of said housing, said light source being electrically connected to said power source; and
a stand member pivotally connected to said housing and movable between a collapsed position and a deployed position, said stand member being operable to support the housing at a desired angle relative to a generally planar surface when moved to the deployed position and rested upon the surface.

5,595,437

HAIRBRUSH WITH MOTION SENSITIVE LIGHT

Carmen C. Rapisarda, 2650 Myrtle Ave. #B-7, Monrovia, Calif. 91016, and Thomas C. Rapisarda, 9334 Wampler Ave., Pico Rivera, Calif. 90660

Filed Jan. 11, 1996, Ser. No. 584,305
Int. Cl.[6] F12V *33/00*
U.S. Cl. 362—109 **4 Claims**

1. A hairbrush having a body including a back and a handle and a plurality of bristles, said body being fabricated from a light transmitting material, wherein the improvement comprises:
a battery energized light source positioned within said body, said battery energized light source including a battery, switch means and a light source, and wherein said switch means is momentarily turned on and off by movement of said hairbrush.

5,595,438

REFLECTIVE HYBRID LAMP ASSEMBLY

David M. Burd, P.O. Box 123, Bentonville, Va. 22610

Filed Mar. 16, 1995, Ser. No. 407,994
Int. Cl.[6] F21S *7/00*
U.S. Cl. 362—228 **20 Claims**



1. A fluorescent lamp device comprising a housing including a light outlet opening, at least two annular fluorescent lamp tubes disposed in concentric relation in said housing adjacent to each other in a substantially common plane so as to define a central space inwardly thereof within said housing, said lamp tubes each being of a shape, in cross section, of a substantially semicircular portion having an apex and being joined to a substantially flat base, said apex of said semicircular portion being directed toward said outlet opening and said device further comprising reflector means for directing light emitted from a region of said base through said central space and out through said outlet opening.

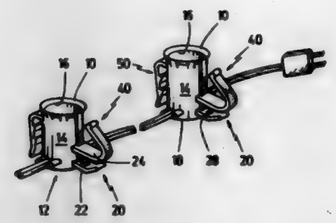
5,595,439

DECORATIVE LIGHT STRINGS AND MULTI-PURPOSE LAMPHOLDERS THEREFOR

William H. Maddock, and David A. Parahad, both of Toronto, Canada, assignors to Noma Inc., Toronto, Canada

Continuation-in-part of Ser. No. 49,335, Apr. 21, 1993, Pat. No. 5,355,288. This application Oct. 5, 1994, Ser. No. 318,397
Int. Cl.[6] F21V *1/00*
U.S. Cl. 362—238 **10 Claims**

1. A lampholder for a decorative string of lights; said lampholder comprising
a hollow insulating body having an opening thereto through which the base of a lamp is insertable for retention in said lampholder, and a bottom wall, said opening and bottom wall defining axially opposed ends of said lampholder;



first radial clip means comprising first and second jaws extending radially outwardly from said body adjacent one of said axially opposed ends in mutually opposed, axially spaced apart relationship, said jaws having a generally radially disposed entrance therebetween;
said second jaw adjacent said entrance having a jaw extension which terminates proximate the other of said axially opposed ends of said lampholder to define a first axial clip means, said first axial clip means having a generally axially disposed entrance thereto;
said first radial clip means and said first axial clip means respectively serving to grasp different types of support structure and to permit said lampholder to be oriented in different manners with respect to said support structure.

5,595,440

MEANS AND METHOD FOR HIGHLY CONTROLLABLE LIGHTING OF AREAS OR OBJECTS

Myron K. Gordin, and Joe P. Crookham, both of Oskaloosa, Iowa, assignors to Musco Corporation, Oskaloosa, Iowa

Continuation-in-part of Ser. No. 855,606, Mar. 20, 1992, Pat. No. 5,337,221, which is a continuation-in-part of Ser. No. 820,486, Jan. 14, 1992, Pat. No. 5,402,327, and Ser. No. 4,693, Jan. 14, 1993, Pat. No. 5,343,374, which is a division of Ser. No. 820,486, Jan. 14, 1992, Pat. No. 5,402,327. This application May 13, 1994, Ser. No. 242,746
Int. Cl.[6] F21V *7/00*
U.S. Cl. 362—247 **9 Claims**



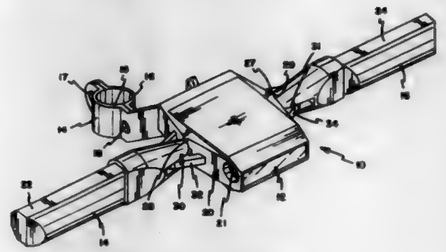
1. An apparatus for providing highly controllable lighting for a target area and a volume of space defined by a target area comprising:
a first light source elevated on an elevation device for providing light directed generally downward towards the target area, the first light source including a light producing component and a primary reflector to produce a first defined primary light beam;
a second light source positioned lower than the first light source for providing light directed generally upward to a volume of space above the target area, the second light source including a light producing component and a primary reflector to produce a second defined primary light beam; and
at least one of said first and second light sources including a secondary reflector positioned relative to one of the first and second defined primary light beams to receive and reflect at least a portion of said one of said first and second defined primary light beams, the secondary reflector having a shape, specularity, and orientation with respect to the said one of said first and second defined primary light beams to produce a desired reflected light beam having a distinct cutoff and direction.

5,595,441

PORTABLE SAFETY LIGHTING DEVICE AND METHOD FOR INCREASING VISIBILITY OF A PERSON OR VEHICLE

David I. McGee, 1729 Grand Ave., #1, St. Paul, Minn. 55105

Filed Feb. 23, 1995, Ser. No. 393,176
Int. Cl.[6] F21V *21/14*
U.S. Cl. 362—250 **10 Claims**



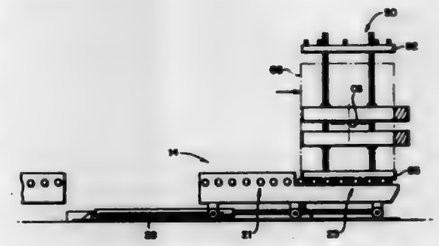
1. A safety lighting device comprising:
a base for attachment to an object;
a first elongated illuminatable section pivotably attached to said base, said elongated illuminatable section comprising a light source and an illuminatable tube, said light source being circuitly connected to an energy source to provide illumination, and said illuminatable tube comprising a cylinder of scatter refractive material to refract illumination from said illuminatable tube; and
a second elongated illuminatable section pivotably attached to said base, said second elongated illuminatable section comprising a second light source and a second illuminatable tube, said second light source being circuitly connectable to an energy source to provide illumination, said second illuminatable tube comprising a cylinder of scatter refractive material to refract illumination from said illuminatable tube, wherein said second elongated illuminatable section can pivot between an open portion and a closed position.

5,595,442

TUMBLER LOADER ASSEMBLY

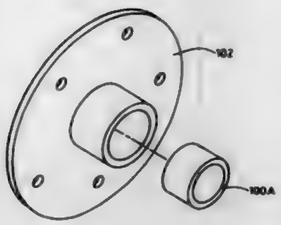
Gerald E. Glass, Springfield; Lindy L. May, Strafford, and Robert C. Norton, Jr., Nixa, all of Mo., assignors to Custom Metalcraft, Inc., Springfield, Mo.

Filed Jun. 30, 1994, Ser. No. 268,793
Int. Cl.[6] B01F *11/00*
U.S. Cl. 366—213 **5 Claims**



1. A tumbler loader assembly for tumbling a bin or other container, comprising:
a feed cart having horizontally disposed conveyor rollers for transferring said bin along said feed cart;
means for operating said rollers;
means for tumbling said bin, said tumbling means including a cradle having cross members; and
means for lateral movement of said feed cart between a first loading position exterior to said tumbling means and a second loading position interior of said tumbling means wherein at said second loading position said feed cart rollers are capable of interengaging said cradle cross members and transferring said bin into and out of said cradle.

5,595,443
ABRASIVE RESISTANT BEARING
Kenneth G. Prillwitz, P.O. Box 3107, Visalia, Calif. 93278
Filed Feb. 17, 1995, Ser. No. 390,113
Int. Cl.[6] B01F 7/04
U.S. Cl. 366—331 **5 Claims**

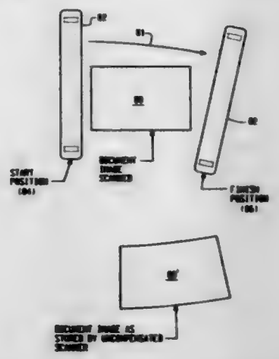


1. An abrasion resistant agitator bearing system for use in a mineral dissolution machine comprising:
a. an elongated shaft disposed inside an agitation tank, said shaft having two ends with a plurality of agitation paddles attached thereto intermediate the ends;
b. a first annular tungsten carbide bearing affixed to one end of said shaft;
c. a second annular tungsten carbide bearing affixed to the opposite end of said shaft;
d. an anchor housing in the wall of said tank having a first tungsten carbide bushing mounted therein for receiving said first bearing whereby said bearing is free to rotate inside said bushing; and
e. a second housing in an opposite wall of said tank having a second tungsten carbide bushing mounted therein for receiving said second bearing whereby said second bearing is free to rotate inside said second bushing.

5,595,444
METHOD FOR DETECTING POOR MEAT QUALITY IN GROUPS OF LIVE ANIMALS
Alan K. Tong; Stephen D. M. Jones, and Allan L. Schaefer, all of Lacombe, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Department of Agriculture and Agri-Food Canada, Lacombe, Canada
Continuation-in-part of Ser. No. 84,993, Jul. 2, 1993, Pat. No. 5,458,418. This application Oct. 16, 1995, Ser. No. 543,752
Int. Cl.[6] G01N 25/00
U.S. Cl. 374—45 **23 Claims**

1. A method for detecting those animals from a group of live domestic animals which have a high probability of producing poor meat quality, comprising:
scanning an area of each animal of the group of live domestic animals with an infrared camera to produce a thermographic image for each animal;
for each animal's thermographic image, determining a measure of central tendency for the temperature;
for the images from the group of live domestic animals, determining a measure of central tendency for the temperatures from all of the images; and
rejecting as animals having a high probability of producing poor meat quality, up to twenty percent of the animals, the rejected animals being those whose measures of central tendency differ the most from the measure of central tendency for the group.

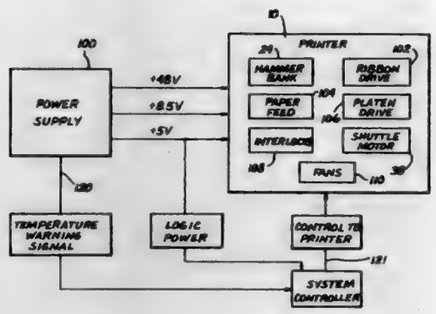
5,595,445
HAND-HELD OPTICAL SCANNER
Howard H. Bobry, 18416 Olympic View Dr., Edmonds, Wash. 98020
Filed Dec. 27, 1995, Ser. No. 579,438
Int. Cl.[6] H04N 1/047; 1/107
U.S. Cl. 400—88 **42 Claims**



1. A hand-held and self contained electronic scanning appiaratus for scanning information on a document disposed outside the apparatus, comprising: a housing that can be manually positioned adjacent a surface of the document and manually swept across a selected scanning area of the document during a scanning sequence; a scanner disposed in the housing and having a scan head with a plurality of scan elements for scanning information within the scanning area; and electronic control means disposed in the housing for controlling the scanner to scan information on the document during a scanning sequence, said control means comprising compensation means for reducing scanned image distortion caused by movement of said scan head along a non-linear path during a scanning sequence.

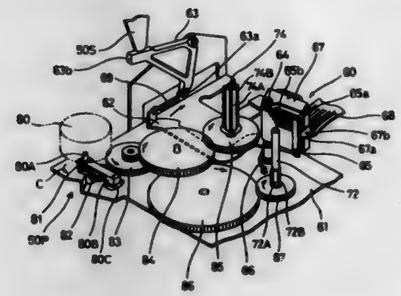
5,595,446
PRINTER POWER SUPPLY
Gordon Barrus, San Juan Capistrano, and Richard E. Schumaker, Orange, both of Calif., assignors to Printronix, Inc., Irvine, Calif.
Filed Oct. 12, 1994, Ser. No. 321,564
Int. Cl.[6] B41J 29/38; 2/30
U.S. Cl. 400—124.13 **6 Claims**

1. A printer for dot matrix printing on a media comprising:
a hammerbank having a plurality of hammers which are retained by permanent magnet means;
means for releasing said hammers;
a ribbon drive comprising first and second motors for driving a ribbon by said hammers for imprinting dots on the media by said hammers impinging the ribbon;
means for feeding media over said hammers in said hammerbank;



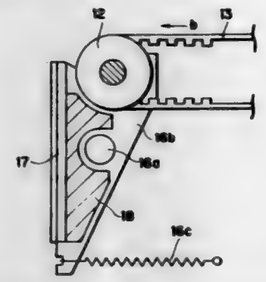
platen means for supporting said media against which said hammers can impact;
a shuttle supporting said hammerbank for reciprocating shuttle movement across said media;
fans for cooling said printer;
a controller for controlling said printer movement;
a power supply connected to said controller for providing an output o fpower to said printer for driving the ribbon and fans, an for driving the hammers of said hammerback at a different voltage from said ribbon drive and fans, and an output for providing power to the controller of said printer;
thermal sensing means connected to said power supply for sensing its temperature; and,
means to signal said controller of a pre-established temperature of said power supply sensed by said thermal sensing means.

5,595,447
TAPE CARTRIDGE AND PRINTING DEVICE HAVING PRINT MEDIUM CARTRIDGE
Masaji Takayama, Suwa; Kenji Watanabe, Tokyo, and Yoshikiyo Furuya, Suwa, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 8, 1993, Ser. No. 134,213
Claims priority, application Japan, Oct. 13, 1992, 4-300301; Oct. 13, 1992, 4-300302; Feb. 5, 1993, 5-018754
Int. Cl.[6] B41J 11/58
U.S. Cl. 400—231 **26 Claims**



1. A cartridge for use in a printing device comprising:
a cartridge case;
a printing tape and an ink ribbon accommodated in said cartridge case, said ink ribbon being used for printing on said printing tape when said cartridge is set in said printing device;
a cylindrical ink ribbon core for holding said ink ribbon wound thereon; and
a cylindrical ribbon winding core for holding said ink ribbon wound thereon after said ink ribbon has been used for printing on said printing tape,
said ink ribbon core being rotatably supported by said cartridge case and said ink ribbon core having an engaging element on a portion of said ink ribbon core that is adjacent to said cartridge case and that is exposed to said cartridge case when said ink ribbon is wound on said ink ribbon core,
said cartridge case having an engagement piece integrally formed as part of said cartridge case for engaging said engaging element of said ink ribbon core to prevent rotation of said ink ribbon core.

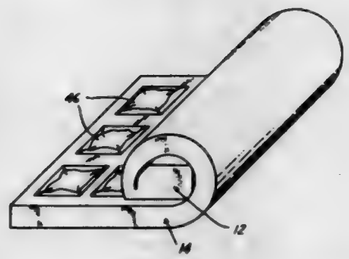
5,595,448
CARRIAGE SHIFTING APPARATUS AND SERIAL RECORDING SYSTEM
Toshiaki Harada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 331,153, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 227,697, Apr. 14, 1994, abandoned, which is a continuation of Ser. No. 78,867, Jun. 18, 1993, abandoned, which is a continuation of Ser. No. 903,927, Jun. 26, 1992, abandoned. This application Jul. 5, 1995, Ser. No. 498,138
Claims priority, application Japan, Jun. 28, 1991, 3-184834
Int. Cl.[6] B41J 25/304
U.S. Cl. 400—320 **11 Claims**



6. An apparatus having a carriage mechanism for moving a head member along a sheet member, said apparatus comprising:
control means for controlling the head member;
a carriage for holding the head member;
a belt member for moving said carriage in a moving direction;
a first pulley member for driving said belt member and being provided at one end of the carriage mechanism relative to the moving direction of said carriage;
a second pulley member for supporting said belt member at the other end of the carriage mechanism relative to the moving direction of said carriage;
a support member for supporting said second pulley member; and
a vibration absorbing member for absorbing a vibration, said vibration absorbing member having a resilient member and a weight member, with said weight member being attached to said support member via said resilient member.

5,595,449
INFLATABLE KEYBOARD
Lev M. Vitkin, Carmel, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.
Filed Dec. 21, 1995, Ser. No. 576,823
Int. Cl.[6] B41J 5/08; H03K 17/94
U.S. Cl. 400—472 **10 Claims**

1. An inflatable keyboard comprising:
a housing having a rigid portion and a flexible portion;
the flexible portion having a chamber coupled to the rigid portion and extending substantially over the area of the keyboard;



a pump in the rigid portion for inflating the chamber to afford a firm keyboard base;

a valve in the housing for releasing pressure from the chamber to deflate the flexible portion for storage;

a flexible circuit extending along the area of the keyboard and carrying a plurality of conductors; and

a flexible array of keys adjacent the flexible circuit for selectively contacting the conductors to signal key actuation.

5,595,450

LABEL PRINTING APPARATUS WITH DISPLAY

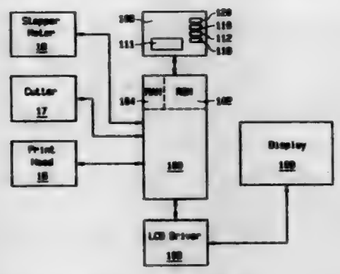
Michael A. Beadman, Steeple Morden, and Paul Martin, Great Shelford, both of United Kingdom, assignors to Esselte N.V., St. Niklaas, Belgium

Filed Jun. 2, 1993, Ser. No. 71,120

Claims priority, application Belgium, Jun. 11, 1992, 9212439.5; Jan. 15, 1993, 9300048.2

Int. Cl.[6] B41J *3/46*

U.S. Cl. 400—615.2 **27 Claims**



1. A label printing apparatus comprising:

input means for selecting characters for composing a label to be printed;

display means for displaying the characters selected at the input means;

printing means for printing said characters on an image receiving tape to define a label;

cutting means for cutting off a portion of said image receiving tape including said label;

storage means for storing common font data defining each of a plurality of characters; and

a controller for recalling said common font data for each character selected at said input means and operable to apply a first scaling factor to said common font data to produce display pixel data for driving the display means to display the character and a second scaling factor to said font data to produce print pixel data for driving said printing means to print the character whereby the characters displayed on the display means exactly resemble the characters which are printed by the printing means and differ only in their resolution.

5,595,451

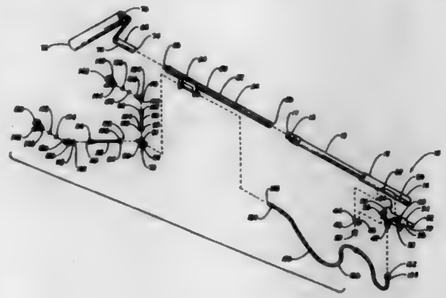
PAINTING APPARATUS AND METHODS

William E. Harrison, Jr., Norman, Okla., assignor to Dunlap & Codding, P.C., Oklahoma City, Okla.

Filed Jun. 7, 1995, Ser. No. 485,345

Int. Cl.[6] B05C *17/035*

U.S. Cl. 401—219 **4 Claims**



1. A painting apparatus adapted for use with a spray gun having a spray outlet, said painting apparatus comprising:

a handle having a handle end, an extension end and an outer periphery, an opening intersecting a portion of the handle end forming a spray gun receiving space, the spray gun being disposed in the spray gun receiving space;

an extension means which slideably lengthens and shortens having adjusting means, the extension means connected to the handle at the extension end, the extension means having both a mounting means for a spray nozzle and a connecting means for a roller assembly;

a spray nozzle comprising a base having a single inlet means and an inlet conduit formed in the base, said inlet conduit connected to a plurality of pivotally adjustable outlet means, wherein each of the plurality of pivotally adjustable outlet means has a pivotal means contained therein, said pivotally adjustable outlet means pivotally connected to the base, and wherein each of the plurality of pivotally adjustable outlet means further comprises a discharge means, wherein the connection of the base, the plurality of pivotally adjustable outlet means, and the discharge means permit a flow of a composition therethrough for discharge via the discharge means upon a selected surface when said composition is introduced into the single inlet means;

a roller assembly connected to the connecting means of the extension, the roller assembly comprising a roller;

a connecting hose which connects to the spray outlet of the spray gun and extends to and connects to the single inlet means of the base of the spray nozzle;

wherein a flow of a composition from the spray gun through the spray outlet, the connecting hose, and the discharge means of the spray nozzle permits a spray of the composition on a selected surface; and

wherein each of the plurality of pivotally adjustable outlet means of the spray nozzle is adjustable to permit the spray of the composition through the discharge means onto the selected surface selected from the group consisting of a roller, a surface, and both a roller and a surface.

5,595,452

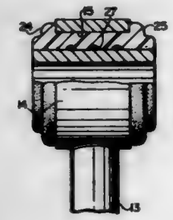
LINK ASSEMBLY AND BUSHING THEREFOR

Clinton W. Hill, Washington, and Robert M. Crandall, Capac, both of Mich., assignors to U.S. Farathane Corporation, Utica, Mich.

Filed Dec. 10, 1992, Ser. No. 988,475

Int. Cl.[6] F16D *1/00*

U.S. Cl. 403—221 **27 Claims**



1. A link assembly connectable to a member and adapted for rotary motion and conical deflection relative to said connectable member comprising:

an elongated rigid member having an opening therethrough for receiving said connectable member therein; and

a bushing disposed in said opening, said bushing being formed of a thermoplastic polyurethane material and having an opening therethrough providing a cylindrical wall therein, said cylindrical wall having a plurality of dimples.

5,595,453

CONSTRUCTION MEMBER PROTECTOR PLATE UNIT

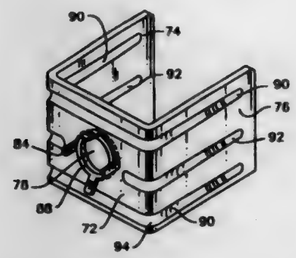
William Nattel, Montreal, and Serge Michaud, Brossard, both of Canada, assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Apr. 12, 1995, Ser. No. 420,954

Claims priority, application Canada, Apr. 15, 1994, 2121451

Int. Cl.[6] H02G *3/22*; F16L *5/00*

U.S. Cl. 403—252 **20 Claims**



20. A protector plate unit, for use with a metal construction beam comprising:

a mounting portion having a pair of opposed ends;

first and second protector plates extending from each end of the mounting portion, respectively, and being substantially perpendicular to the mounting portion; and

means for securing the protector plate unit to the metal construction beam disposed on the mounting portion.

5,595,454

PANEL ASSEMBLY

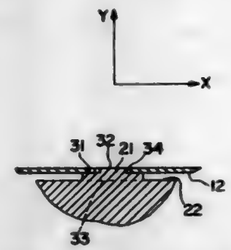
Constant Bogaerts, Schilde; Eric Van Echelpoel, Lier; Henri Geeraert; Luc Van Goethem, both of Wilrijk, and Luc Van Aken, Kuringen, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Jun. 15, 1994, Ser. No. 260,911

Claims priority, application European Pat. Off., Jul. 12, 1993, 93202055

Int. Cl.[6] F16B *5/00*; H05K *5/02*; *7/18*

U.S. Cl. 403—263 **13 Claims**



1. A panel assembly comprising a generally planar first panel having at least one insertion slot therein and a generally planar second panel arranged at a substantial angle to said first panel, said second panel having at least one projecting tab which projects outwardly from at least one edge thereof to terminate in a free end and fits into one of said insertion slots, said tab including at least one shoulder located at a point along the projecting length of said tab which is between said free end of the top and said one edge of said second panel, and said shoulder defining a generally straight shoulder edge directed generally perpendicular to the tab length which is in abutting contact with a portion of said first panel adjacent said insertion slot, whereby said one edge of the second panel is maintained out of contact with said first panel, said first panel having margins around each said insertion slot and each said tab being free of portions disposed in overlying relation to said margins of said first panel.

5,595,455

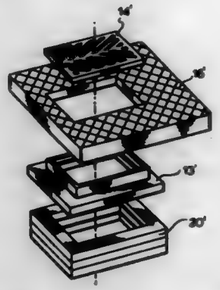
TRANSITION COLLAR

Ferdinand M. Sviridys, Rexdale, Canada, assignor to Domal Envirotech Inc., Rexdale, Canada

Filed Dec. 9, 1994, Ser. No. 352,614

Int. Cl.[6] E02D *29/14*

U.S. Cl. 404—25 **15 Claims**



15. A resiliently-flexible riser ring for use in a roadway construction comprising a self-supporting rigid frame structure and a resilient transition collar structure, said riser ring being formed from scrap rubber from automobile tires, said riser ring being one element of a set of resiliently-flexible riser rings comprising first and second risers of different uniform thickness to effect height

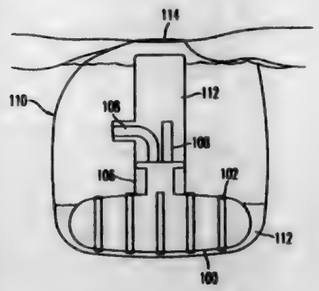
adjustment of said transition collar structure in said roadway construction and a third riser of wedge shape in elevation, varying uniformity from a minimum dimension at one side thereof to a maximum dimension at the other side thereof to effect orientation adjustment of said transition collar.

5,595,456

WATER-TIGHT RISER FOR UNDERGROUND STORAGE TANK MANWAY

Robin Berg, Hudson, Wis., and Mark Baumgartner, Farmington, Minn., assignors to Xerxes Corporation, Minneapolis, Minn.

Filed May 9, 1995, Ser. No. 437,787
Int. Cl.[6] B65G *5/00*
U.S. Cl. 405—53 **8 Claims**



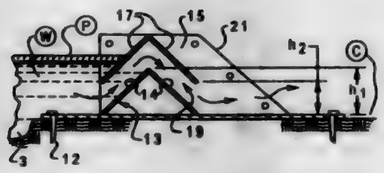
1. In an underground storage tank provided for the containment of liquid materials, said tank being provided with a manway providing access to the interior of said tank, said manway being reached through an access way provided at ground level above said storage tank, wherein the improvement comprises providing a riser about said manway extending from the exterior of said storage tank to a point proximal to and below said access way, said riser being provided with a dome-shaped cover secured in water-tight fashion to said riser.

5,595,457

STORM DRAINAGE UNDERFLOW DAM UNIT

Mark A. Stacks, 3058 Trailwood East, Burleson, Tex. 76028

Filed Mar. 14, 1995, Ser. No. 404,050
Int. Cl.[6] E02B *7/00*
U.S. Cl. 405—87 **32 Claims**



1. A portable underflow dam unit comprising
a horizontal base having a longitudinal axis extending between opposite ends of the base;
sidewalls extending upward from the base on either side of the longitudinal axis;
a dam extending upward from the base between the sidewalls and having a peak height above the base;
skimmer means spanning between the sidewalls above the dam, the skimmer means having a lower limit below the peak height of the dam, for skimming floating pollutants from the surface of water flowing over the dam;
anchor means for anchoring the base to a flow line of a stream.

5,595,458

BIOFILTER BAGS FOR EROSION CONTROL

Howard Grabhorn, Tualatin, Oreg., assignor to Grabhorn, Inc., Beaverton, Oreg.

Filed Jun. 29, 1994, Ser. No. 269,051
Int. Cl.[6] E02D *5/00*; E02B *3/12*
U.S. Cl. 405—258 **14 Claims**



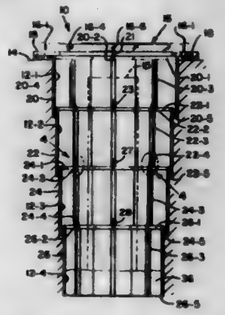
1. A water permeable erosion control bag, comprising:
a container having a flexible mesh wall with openings through which water can flow through the bag, wherein the mesh wall conforms to a surface on which the container sits; and
discrete hammer-milled wood fragments within the container, wherein the wood fragments do not have smooth surfaces that tend to stick together when wet and form a mass of fragments that prevents flow of water through the bag, such that the hammer-milled wood fragments that do not have smooth surfaces resist adherence to other wood fragments within the container without becoming clogged with sediment carried by the water, and are large enough to be retained within the mesh wall, and allow a flow of water through the bag.

5,595,459

COFFERDAM FOR 4', 8' AND 12' DIAMETER TANKS

Stenis LeMonaco, 140-28 Springfield Blvd, Queens, N.Y. 11413

Filed Oct. 2, 1995, Ser. No. 537,622
Int. Cl.[6] E02D *17/00*; E21D *1/00*
U.S. Cl. 405—272 **19 Claims**



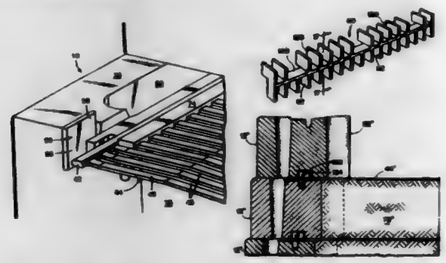
1. A hole shoring device, comprising:
a) a support frame supportable on an area around a hole;
b) a first hollow octagonal shaped sleeve disposed below said support frame and positionable in the hole;
c) a frame linkage removably connecting said first hollow octagonal shaped sleeve and said support frame;
d) a hollow second octagonal shaped sleeve removably mounted within and extending below said hollow first octagonal shaped sleeve and positionable in the hole;
e) a first linkage removably connecting said hollow second octagonal shaped sleeve and said hollow first octagonal shaped sleeve;
f) a hollow third octagonal shaped sleeve removably mounted within and extending below said hollow second octagonal shaped sleeve and positionable in the hole;
g) a second linkage removably connecting said hollow third octagonal shaped sleeve and said hollow second octagonal shaped sleeve;
h) a hollow fourth octagonal shaped sleeve removably mounted within and extendable below said hollow third octagonal shaped sleeve and positionable in the hole; and
i) a third linkage removably connecting said hollow fourth octagonal shaped sleeve and said hollow third octagonal shaped sleeve.

5,595,460

MODULAR BLOCK RETAINING WALL SYSTEM AND METHOD OF CONSTRUCTING SAME

Robert A. Miller, Marietta, and Philip M. Taylor, Atlanta, both of Ga., assignors to The Tensar Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 254,710, Jun. 6, 1994, Pat. No. 5,540,525. This application Jan. 10, 1995, Ser. No. 370,324
Int. Cl.[6] E02D *29/02*
U.S. Cl. 405—284 **41 Claims**



24. A modular wall block comprising:
a front face,
a rear face,
an upper surface,
a lower surface, and
opposed sidewalls extending between said upper and lower surfaces and said front and rear faces,
a recess defined below a level of said upper surface for receiving a grid connector for connecting a grid-like sheet of material to said modular wall block,
said recess of said upper surface and a recess of an adjacent wall block receiving said grid connector for positioning adjacent wall blocks in a course of wall blocks with respect to each other, and
a slot defined in said lower surface cooperating with said grid connector received in said recess for positioning superimposed course of wall blocks with respect to a lower course of wall blocks in one of a vertically aligned and vertically offset orientation.

29. A modular wall block system to be used for forming a retaining wall, said modular wall block system comprising:
a plurality of wall blocks each having a front face for forming a portion of an exterior surface of the retaining wall, a rear face, upper and lower surfaces, and opposed sidewalls extending between said upper and lower surfaces and said front and rear faces,
a grid-like sheet of material comprising end portions to be secured to selected wall blocks with the remainder of the grid-like sheet of material extending rearwardly into fill material behind the retaining wall to reinforce the retaining wall, said end portions of said grid-like sheet of material including a plurality of elongated strands extending generally parallel to said front face of said blocks interconnected by a multiplicity of rearwardly extending elongated strands together defining a plurality of laterally spaced openings,
a grid connector for securing said end portions of said grid-like sheet of material to said selected wall blocks, said grid connector comprising a crossbar and a plurality of finger members integrally extending therefrom, said finger members being spaced apart by a distance corresponding to the spacing between selected openings in said end portions of said grid-like sheet of material, and
an elongated recess defined in each of said wall blocks below said upper surface thereof, said recess being dimensioned to receive said fingers of said grid connector with said crossbar of said grid connector overlying a plurality of said rearwardly extending strands of said grid-like sheet of material to secure said end portions of said grid-like sheet of material to said selected wall blocks.

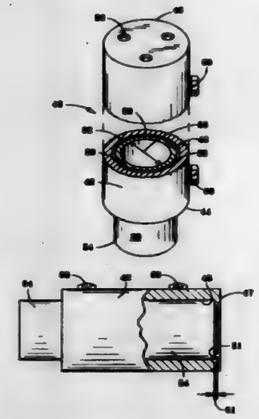
31. A locating device for positioning front faces of wall blocks in superimposed courses of wall blocks relative to each other in one of a vertically aligned and vertically staggered orientation, said locating device comprising:
a spine,
a plurality of finger members extending from said spine in one direction and collectively defining a plane,
at least one tab extending from said spine in an opposite direction and at least a portion of said tab being in said plane of said finger members, and
a central axis of said finger members being laterally spaced from a central axis of said at least one tab.

5,595,461

APPARATUS FOR CONTROLLED VACUUMING OF HIGH DENSITY ABRASIVE BLAST MEDIA

David B. Miller, Advance, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 292,988, Aug. 19, 1994, abandoned. This application Feb. 27, 1996, Ser. No. 607,620
Int. Cl.[6] B65G *53/42*
U.S. Cl. 406—152 **16 Claims**



1. In combination with a vacuum generator for vacuuming particles, the vacuum generator including a hose having an intake nozzle end having a cross-sectional area and an exhaust end, a density controller comprising:
a substantially cylindrical main body which includes a first open end, which telescopically receives the intake nozzle end, and a second substantially closed end, the substantially closed end having a laterally extending face, the body further including at least one clearance member adjacent the laterally extending face, said at least one member adapted to support the nozzle

end to maintain a fixed separation distance between the nozzle end and the laterally extending face;

an air inlet formed between an outer surface of the intake nozzle end and an inner surface of the substantially cylindrical main body;

at least one opening formed completely in the laterally extending face of the second substantially closed end of the substantially cylindrical main body, the at least one opening having a total area ranging from 10% to 20% of the cross-sectional area of the intake nozzle end, the total area of the at least one opening being non-adjustable; and

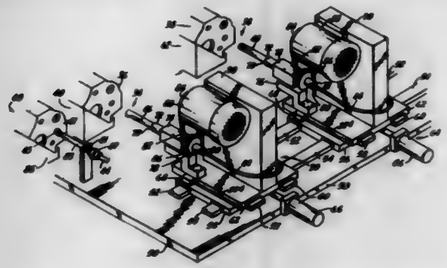
means for fixedly locating the substantially cylindrical main body in a predetermined location about the intake nozzle.

5,595,462

MACHINE TOOL COOLANT DELIVERY METHOD AND APPARATUS

Jerry C. Hensley, Macomb, Mich., assignor to Western Atlas, Inc., Hebron, Ky.

Filed Nov. 17, 1994, Ser. No. 341,672
Int. Cl.[6] B23B *35/00;51/06*
U.S. Cl. 409—132 **54 Claims**



38. A method of delivering coolant to an orifice for directing coolant onto a workpiece comprising:

(a) providing a low pressure supply of coolant and a supply of coolant at a pressure greater than the low pressure coolant supply;

(b) supplying coolant from the higher pressure coolant supply to the orifice for directing coolant onto the workpiece; and

(c) supplying coolant from the low pressure coolant supply to the higher pressure coolant supply.

5,595,463

AREA MACHINING METHOD

Takashi Takegahara, Hachioji; Shigetoshi Takagi, and Shinya Nakamura, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Japan

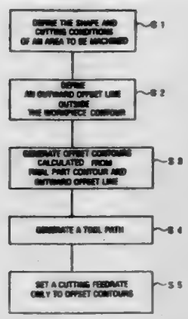
Filed Jun. 15, 1995, Ser. No. 490,592
Claims priority, application Japan, Jul. 1, 1994, 6-150848
Int. Cl.[6] B23C *3/00; G05B 19/4061*
U.S. Cl. 409—132 **4 Claims**

1. An area machining method for hollowing out an area whose boundary is partially open, comprising the steps of:

defining a shape and cutting conditions of an area to be machined, wherein the shape of the area is defined by a workpiece contour, which is a part of a workpiece outline, and a final part contour, which is a finished contour expected to be obtained as a result of the area machining;

defining an outward offset line that is set away from the workpiece contour with a predetermined offset distance;

generating a series of offset contours, being defined within a region between the final part contour and the outward offset line, each of which has a predetermined offset distance only from the final part contour;



generating a tool path by connecting the offset contours; and

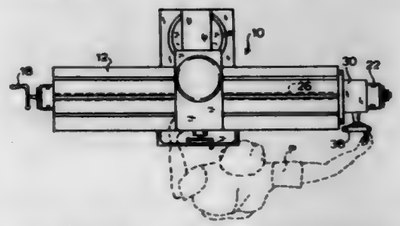
setting a tool speed to each part of the tool path so that a cutting feedrate should be set to the offset contours except for a common segment with the outward offset line and a rapid traverse speed or a predetermined speed should be set to the outward offset line.

5,595,464

CRANK ADAPTER FOR A MILLING MACHINE

Warren H. Daniels, Jr., 416 Weatherly Dr., Durham, N.C. 27703

Filed Apr. 4, 1995, Ser. No. 416,343
Int. Cl.[6] B23C *9/00; B23B 47/18*
U.S. Cl. 409—219 **6 Claims**



1. A crank adapter for retrofitting a milling machine having a worktable, a lead screw positioned below, lengthwise and outwardly of an end of the worktable, a base frame and means mounting said lead screw on said worktable, and said worktable and lead screw on said base frame in a manner enabling rotation of said lead screw to be translated into lateral motion of said worktable relative to said base frame, said crank adapter comprising:

(a) a housing having a vertical front wall and in perpendicular relation thereto at respective ends of said front wall opposed vertical rearwardly extending inner and outer end walls;

(b) a first shaft rotatably mounted in and passing through said outer end wall and adapted for being connected to said lead screw;

(c) a first gear mounted within said housing on said first shaft;

(d) a second shaft rotatably mounted in and passing through said front wall in perpendicular relation thereto;

(e) a second gear engaging said first gear and mounted within said housing on an inner portion of said second shaft;

(f) said inner end wall being formed with a lead screw receiving hole therethrough in alignment with said first shaft;

(g) means for securing said housing to an adjacent end of said worktable and enabling said first shaft to be connected to said lead screw; and

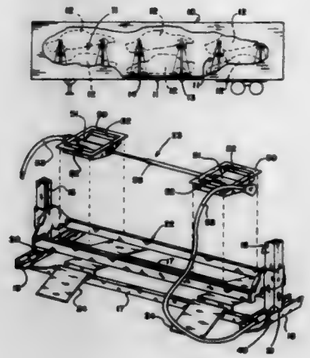
(h) operator means mounted on an outer portion of said second shaft for rotating said second shaft to thereby enable said lead screw when connected to said first shaft to laterally move said worktable in a direction dependent on the direction of rotation of said second shaft.

5,595,465

RACK FOR TRANSPORTING AUTOMOBILES IN ENCLOSED SEMITRAILERS

James M. Knott, Springdale, Ark., assignor to J.B. Hunt Corp., Wilmington, Del.

PCT No. PCT/US93/11363, § 371 Date Apr. 3, 1995, § 102(e) Date Apr. 3, 1995, PCT Pub. No. WO94/18421, PCT Pub. Date Aug. 18, 1994
PCT Filed Nov. 19, 1993, Ser. No. 411,623
Int. Cl.[6] E04H *6/06*
U.S. Cl. 410—24 **2 Claims**



1. In association with an enclosed semi-trailer having a forward end, a rearward end, and a floor and provided with a plurality of automobile-powered automobile lifts in which drive means is provided to operate each automobile lift through the rotary motion of the drive wheels of an automobile received onto the lift, a method for expedited loading of automobiles into the semi-trailer, comprising the steps of:

(a) installing toward the forward end of the semi-trailer an automobile powered lift having means to receive a first automobile at a first position lowered to the approximate level of said floor and lift means operated by said drive means for raising said lift to a second position at a sufficient elevation above said floor to allow a second automobile to be positioned beneath said first automobile;

(b) placing said lift at said first position;

(c) driving said first automobile onto said lift;

(d) disconnecting said drive means from said lift means;

(e) connecting auxiliary drive means to said lift means;

(f) operating said auxiliary drive means to raise said lift to said second position;

(g) driving said second automobile under said lift;

(h) disconnecting said auxiliary drive means from said lift means; and

(i) repeating steps (a)–(h) sequentially to said rearward end of said semi-trailer to produce a filled semi-trailer with stacks of two automobiles each.

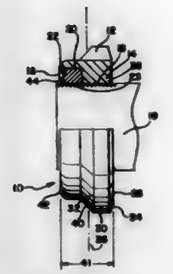
5,595,466

DOUBLE SLOT SPANNER LOCKNUT

Lon DeHaitre, Arlington Heights, Ill., assignor to Abbott-Interfast Corporation, Wheeling, Ill.

Filed May 25, 1995, Ser. No. 449,762
Int. Cl.[6] F16B *19/06;39/34*
U.S. Cl. 411—383 **3 Claims**

1. A slotted spanner locknut comprising: a substantially ring-shaped main body having a round outside edge and a hollow lower interior engagement portion for engaging a fastener including a threaded portion;



only two adjustment slots positioned on said edge, said slots being positioned about 180° apart on said outside edge;

a hollow coined lip portion containing an insert cavity; and

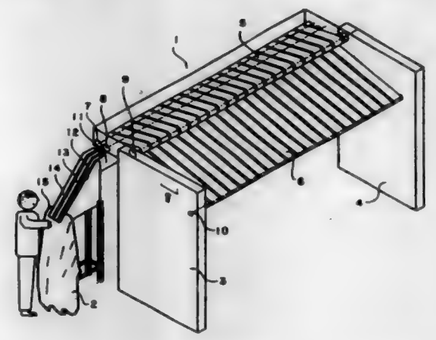
a substantially ring-shaped, impressionable, nylon self-locking insert positioned inside said insert cavity for engaging the threaded portion of the fastener and impressing a thread on said insert.

5,595,467

METHOD AND AN APPARATUS FOR FEEDING A LAUNDRY ARTICLE TO A LAUNDRY PROCESSING APPARATUS

Jørn M. Jensen, Bern, Switzerland, assignor to Ejnar Jensen & Son A/S, Rønne, Denmark

Filed Jan. 30, 1995, Ser. No. 380,186
Claims priority, application Denmark, Feb. 8, 1994, 0162/94
Int. Cl.[6] D06F *67/04*
U.S. Cl. 414—13 **11 Claims**



5. Apparatus for feeding substantially flat, rectangular laundry articles to a laundry processing apparatus comprising a bar, means for positioning a laundry article over and along the bar in a stretched and hanging state so that a greater portion of the article hangs down on one side of the bar and a minor portion forming a folded part hangs down on the other side of the bar with a fold between said portions, two opposed conveyor faces resiliently engaged with each other and located adjacent said bar, insertion means for moving the fold off the bar and inserting the fold of the laundry article between the two opposed conveyor faces, said conveyor faces pulling the laundry article off the bar with its fold foremost and onto the face of an underlying one of said two conveyor faces.

5,595,468

EMPTY BAG FEEDER FOR PACKAGING MACHINES

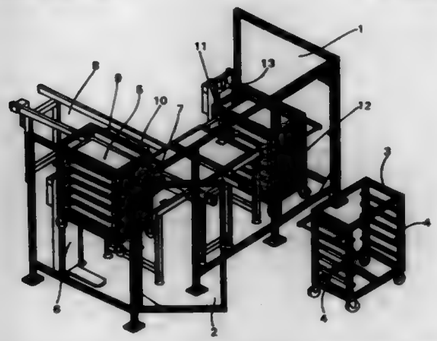
Ulrich Wald, Hamloch, Germany, assignor to Paper Converting Machine GmbH, Schifferstadt, Germany

Filed May 22, 1995, Ser. No. 446,385

Claims priority, application Germany, May 20, 1994, 44 17 689.9

Int. Cl.[6] B65B *43/12*

U.S. Cl. 414—331 10 Claims



1. A device for feeding empty bags into a packaging machine comprising a bag stack feeder which comprises a plurality of carriers (5), each equipped with a holder (16), each carrier being detachably connected to the bag stack feeder, each carrier comprising a laterally open grate having a plurality of spaced apart rods such that a machine fork can be positioned between the spaced apart rods, and the carrier can be lowered with the stack of bags remaining on the machine fork.

5,595,469

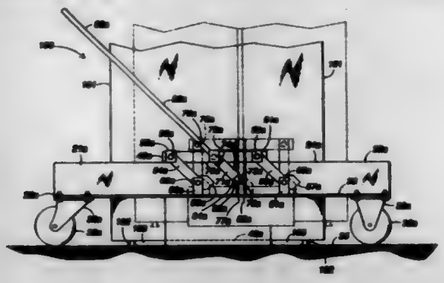
TRANSPORTER FOR HEAVY LOADS

Glen A. Evans, Garwood, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 164,071, Dec. 8, 1993, Pat. No. 5,449,266. This application Dec. 6, 1994, Ser. No. 350,301

Int. Cl.[6] B60P *3/00*

U.S. Cl. 414—458 2 Claims



1. A load lifting device comprising a lengthwise elongated beam, relatively forward and rearward lengthwise-spaced wheel means mounted on and beneath said beam for assisting in movement of the load lifting device, and hand actuated lifting means mounted on said beam between said forward and rearward wheel means for vertically displacing a load, said lifting means having a horizontally-extending lower portion with a horizontal center projecting out in a sidewise direction away from one side of said beam and engageable with said load on said one side for exerting on said load an upward lifting force, said forward wheel means comprising a single wheel swivelably mounted on said beam and said rearward wheel means comprising a pair of wheel means angularly fixedly mounted relative to said beam and spaced from each other in said sidewise direction on each side of a plane which extends parallel to said beam and intersects the horizontal center of said lower portion to thereby stabilize said beam against overturning by a moment produced by a reactive force of said load on said beam.

5,595,470

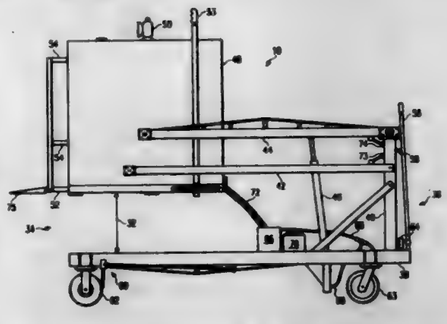
LIFT FOR PHYSICALLY-CHALLENGED PASSENGERS AND METHOD OF OPERATION

Rex A. Berkey, Rock; Daniel DeFant, Marquette, both of Mich.; Brad Hallum, Ft. Worth, Tex.; Jeffrey A. Hansen, Marquette; Edward L. Hopper, Negaunee, Mich.; Philip A. Johnson, Negaunee, Mich.; Frank C. Saari, Negaunee, Mich., and Randy P. Sundell, Negaunee, Mich., assignors to American Airlines, Incorporated, Fort Worth, Tex.

Filed Mar. 7, 1994, Ser. No. 207,961

Int. Cl.[6] B60P *1/48*

U.S. Cl. 414—495 7 Claims



1. A manual, steerable passenger lift for loading a passenger into and out of a structure, the structure having an elevated opening, the lift comprising:

a chassis having a front end and a back end;

a plurality of wheels attached to the chassis providing means for allowing the lift to be moved;

a brake assembly coupled to the chassis for securing the wheels so as to prevent the lift from moving when the brake assembly is engaged;

a rechargeable electrical energy source for providing electrical energy;

an electric motor for converting electrical energy from the electrical energy source to mechanical energy;

a reservoir of fluid;

a pump coupled to the electric motor and reservoir of fluid for converting the mechanical energy from the electric motor to pressure in the fluid;

a rear support generally perpendicular to the chassis and attached to the back end of the chassis, the rear support providing a surface for moving and steering the lift;

a basket for holding the passenger while the passenger is raised and lowered, the basket located at the front end of the chassis and having three closed sides and one open side towards the front end of the chassis, the open side providing access to the basket;

a pair of lift arms for lifting the basket, each lift arm having a front end and a back end, the front end pivotally attached to the basket and the rear end pivotally attached to the rear support;

a pair of stabilizing arms for providing stability to the basket, each stabilizing arm having a front end and a back end, the front end pivotally attached to the basket and the rear end pivotally attached to the rear support;

a plurality of bearing assemblies positioned between the basket and the lifting arms and stabilizing arms for ensuring relational movement between the basket and arms so that the basket remains level while it is raised and lowered and positioned between the rear end of each lifting arm and the rear support for ensuring relational movement between the lifting arms and the rear support;

a pair of hydraulic cylinders using the fluid pressure from the pump for displacing the lifting arms relative to the chassis so as to raise and lower the basket, each hydraulic cylinder associated with one of the lifting arms and having a first end and a second end, the first end pivotally attached to the lifting arm between the front end and back end of the lifting arm and the second end pivotally attached to the chassis between the front end and back end of the chassis;

a retractable ramp that may be extended from the basket's open side;

a recharger for recharging the rechargeable electrical energy source;

a connection means for coupling the recharger to an external electrical energy source;

a switch operable to monitor the charge on the rechargeable electrical energy source and to decouple the external electrical energy source from the recharger when the rechargeable electrical energy source is fully charged;

at least one of a lifting arm limit switch and a stabilizing arm limit switch, the lifting arm limit switch being operable to detect when a lift arm is raised above a predetermined height and further operable to suspend the conversion of electrical energy to mechanical energy to prevent further raising of the lifting arms, and the stabilizing arm limit switch being operable to detect when a stabilizing arm is raised above a predetermined height and further operable to shut down the energy converter in order to prevent further raising of the lifting arms; and

a command means located in the basket and coupled to the electric motor for controlling the lowering and raising of the lift.

5,595,471

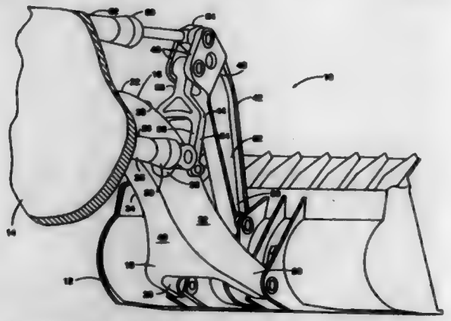
LINKAGE ARRANGEMENT

Akin O. Ajilore, Macomb, Mich., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 28, 1994, Ser. No. 345,962

Int. Cl.[6] E02F *3/36*

U.S. Cl. 414—685 16 Claims



1. A linkage arrangement for connecting a work implement to a machine, comprising:

a first link having a first end portion connectable to the work implement and a second end portion connectable to the machine and being moveable in a generally vertical plane with respect to the machine;

a second link having a first, bifurcated end portion defining a pair of plates that are spaced from one another and a second end portion that is pivotally connectable to the work implement;

a third link having a first, bifurcated end portion positioned to straddle the first link and being pivotally connected thereto and a second end portion positioned between the plates defined by the first end portion of the second link and being pivotally connected thereto at a lower portion thereof; and

means for pivoting the work implement with respect to the first link, said pivoting means having a first end portion connectable to the machine and a second end portion positioned between the plates defined by the first end portion of the second link and being pivotally mounted to an upper portion thereof at a location that is immediately above the connecting point between the second and third links.

5,595,472

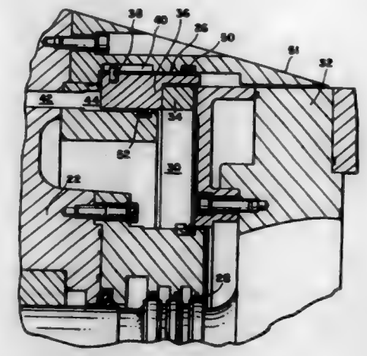
ADJUSTABLE SEAL LUBRICATION HYDRAULIC POSITIONING DEVICE

Richard A. Quattrocicchi, 6208 Cemetary Rd., Rome, N.Y. 13440

Filed Oct. 19, 1995, Ser. No. 545,117

Int. Cl.[6] F01D *11/00*

U.S. Cl. 415—110 20 Claims



1. A runner seal positioning system comprising:

an annular runner seal piston;

an annular runner seal seated against said piston and mounted for rotation with respect to said piston, said runner seal and said piston allowing a fluid leakage therebetween;

pressure supply means extending to said piston for supplying a back pressure to force said piston against said runner seal to limit the fluid leakage;

a weir box;

drain means extending from said runner seal and said piston to said weir box for draining the fluid leakage into said weir box, a fluid level in said weir box being directly related to a rate of the fluid leakage; and

pressure control means operatively connected to said pressure supply means and responsive to said fluid level for increasing said back pressure as said fluid level rises and decreasing said back pressure as said fluid level falls.

5,595,473

CENTRIFUGAL FLUID MACHINE

Yoshihiro Nagaoka, Ishioka; Sadashi Tanaka, Ibaraki-ken; Yukiji Iwase, Ushiku; Michiaki Ida, Tsuchiura; Hirotoshi Ishimaru, Ibaraki-ken; Saburo Iwasaki, Tsuchiura; Yoshiharu Ueyama, Tsukuba, and Tetuya Yoshida, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1994, Ser. No. 324,212

Claims priority, application Japan, Oct. 18, 1993, 5-259609; Dec. 17, 1993, 5-317711

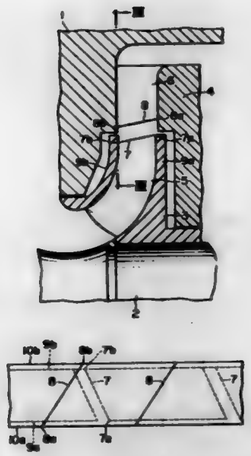
Int. Cl.[6] F04D *29/02*

U.S. Cl. 415—199.1 40 Claims

1. A centrifugal fluid machine comprising;

a casing;

a rotating shaft within said casing, said rotating shaft having a longitudinally extending axis of rotation;



a plurality of centrifugal impeller vanes fixed to said rotating shaft; and

a plurality of centrifugal diffuser vanes fixed to said casing, said plurality of centrifugal diffuser vanes cooperating with said plurality of centrifugal impeller vanes in at least one stage in each of which a trailing edge of each centrifugal impeller vane rotates about the axis of rotation and past a leading edge of each of the centrifugal diffuser vanes;

wherein, within each stage, radii of trailing edges of said centrifugal impeller vanes and leading edges of said centrifugal diffuser vanes are monotonously varied in a direction along the axis of rotation such that said trailing edges of said centrifugal impeller vanes and said leading edges of said centrifugal diffuser vanes are inclined on a meridional plane in the same orientation.

5,595,474

PITCH VARIATION CONTROL DEVICE FOR THE BLADES OF A TURBOMACHINE ROTOR AND METHOD OF OPERATING THE DEVICE

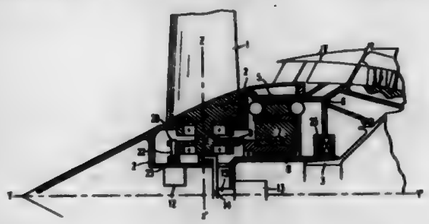
Francis Girard, Viroflay, France, assignor to Hispano-Suiza, Saint Cloud, France

Continuation of Ser. No. 338,798, Nov. 10, 1994, abandoned. This application Apr. 4, 1996, Ser. No. 627,394

Claims priority, application France, Nov. 10, 1993, 93 13409

Int. Cl.[6] B64C 11/44

U.S. Cl. 416—1 **28 Claims**



1. A pitch variation control device for blades of a turbomachine having a rotor wherein said blades are mounted on a disc rotated by a shaft of the turbomachine and each of said blades has a longitudinal axis and a root by which said blade is pivotable about its longitudinal axis, said control device comprising:

actuating means for changing the pitch of said blades and locking means for locking said roots of said blades, said actuating means including an electric motor having a stationary stator winding and a rotor which is secured to said turbomachine shaft and has no electrical connection to the stator,

a toothed wheel which is rigidly secured to said rotor of said electric motor, and pinion sectors rigidly secured to said roots of said blades and meshing with said toothed wheel, said locking means including an electromechanical actuator which is rigidly secured to said turbomachine shaft, and a rotary transformer electrically powering said actuator.

5,595,475

AGITATING ELEMENT

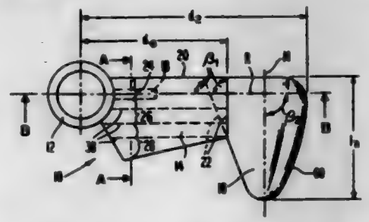
Hans J. Weiss, Kenders; Peter Forschner, Hasel; Rainer Krebs, and Reinhard Geisler, both of Schopfheim, all of Germany, assignors to EKATO Rühr- und Mischtechnik GmbH, Schopfheim, Germany

Filed Jan. 20, 1995, Ser. No. 375,956

Claims priority, application Germany, Jan. 20, 1994, 44 01 596.8

Int. Cl.[6] B64C 11/16

U.S. Cl. 416—223 R **24 Claims**



1. An agitating element fastened to an agitator shaft for agitating low-to-medium-viscosity liquids, comprising:

an inner main blade disposed at a predetermined angle (γ_0) to said agitator shaft; and

an outer side blade connected to said inner main blade, said side blade forming a predetermined angle (δ_0) with said main blade wherein a ratio of a predetermined length (l_s) of said side blade to the external diameter (d_2) of the said agitating element ranges from approximately 0.15 to approximately 0.4.

5,595,476

PUMP SHAFT DRIVEN INLET AND OUTLET RADIAL PIN ARRANGEMENT FOR REDUCING FLUID RIPPLE

Steve Abel, and Gordon Whelpley, both of Chandler, Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Feb. 23, 1996, Ser. No. 605,930

Int. Cl.[6] F04B 11/00; 1/20

U.S. Cl. 417—53 **8 Claims**

1. Apparatus for reducing ripple in the flow of a fluid through an axial piston fixed positive displacement pump, said apparatus comprising:

a. an inlet tube in fluid communication with an inlet of said pump;

b. an outlet tube in fluid communication with an outlet of said pump;

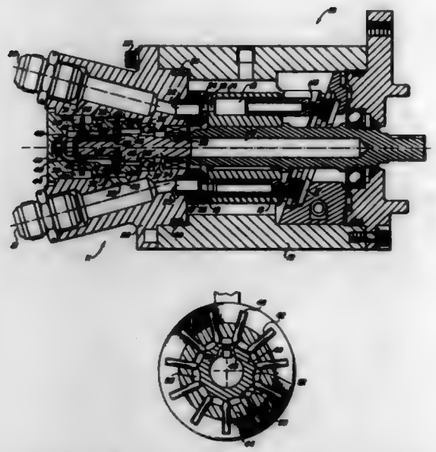
c. first annulus in fluid communication with said inlet;

d. second annulus in fluid communication with said outlet;

e. drive shaft connected to a main shaft of said pump;

f. first and second cams connected to said drive shaft, said first cam being associated with said first annulus and said second cam being associated with said second annulus; and,

g. a plurality of pins having a portion located within one of said annuluses and an end opposite said portion in contact with the cam associated with the respective annulus;



wherein, said drive shaft is rotated by said main shaft and thereby rotates said cams to cause said pins to reciprocate and create ripple within their respective annuluses and thereby within said inlet tube and said outlet tube to substantially offset ripple within fluid flow created by said pump.

5,595,477

VACUUM PUMPING STAND

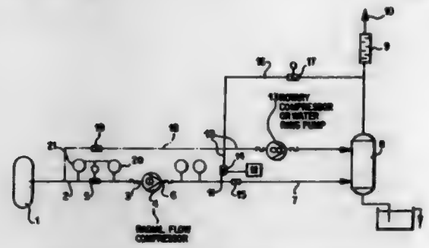
Heinrich Amlinger, Niddatal, Germany, assignor to SGI-Prozestechnik GmbH, Altenstadt, Germany

Filed Jan. 16, 1996, Ser. No. 590,853

Claims priority, application Germany, Jan. 13, 1995, 195 00 823.5

Int. Cl.[6] F04C 23/00;25/02;41/06;25/16

U.S. Cl. 417—69 **6 Claims**



1. Vacuum pumping stand for the cyclic pumping-down of a container and for maintaining an operating vacuum in the container, comprising:

(A) a first and a second vacuum pump normally arranged in series and forming a first and a second pumping stage, respectively, wherein the first vacuum pump is a radial flow compressor having a first inlet and a first outlet and the second vacuum pump is one of a rotary compressor and a water ring pump, having a second inlet and a second outlet;

(B) an intake pipe leading to said first inlet;

(C) an outlet pipe leading from said first outlet;

(D) a controllable throttle located in the intake pipe;

(E) a vacuum pipe branching off said outlet pipe and thence in parallel to said outlet pipe, said vacuum pipe leading into said second inlet of said second vacuum pump;

(F) an outlet of said vacuum pumping stand; and

(G) a control means arranged in each of said vacuum pipe and said outlet pipe downstream of the branch-off for directing displaced volume from said container:

(1) from the first vacuum pump directly at higher pressures to the outlet of the vacuum pumping stand, and

(2) from the first vacuum pump by way of the second vacuum pump at lower pressures to the outlet of the vacuum pumping stand.

5,595,478

PUMP AND CONTROL VALVE WITH ANNULAR SEALING MEMBER TO PREVENT CORROSION

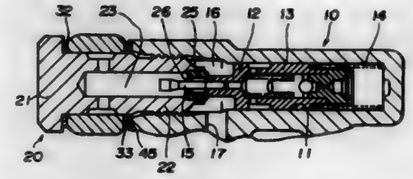
Kazuyoshi Ishizuki; Masataru Yamamoto; Atsushi Ishizuka; Shouji Oiya, and Miyako Hamao, all of Atsugi, Japan, assignors to Unisia Jecs Corporation, Japan

Division of Ser. No. 183,989, Aug. 10, 1993, Pat. No. 5,540,566. This application Apr. 20, 1995, Ser. No. 425,900

Claims priority, application Japan, Aug. 11, 1992, 4-061751

Int. Cl.[6] F04B 49/00

U.S. Cl. 417—300 **4 Claims**



1. A pump comprising a pump body having a control valve for controlling working fluid flow from the pump body to an actuator through a joint, the joint being connected mechanically to the pump body through a washer made of a material different from that of the pump body, and an annular member provided between the pump body and the washer, the annular member being made of an insulating material to prevent electrical conduction between the pump body and the washer, wherein the pump body is provided with a bore closed at one end and open at the other end, said pump body having an annular end wall adjacent the open end of the bore, including a connector having a head portion and a stem portion, with the stem portion inserted into said bore through the open end of the bore, and wherein said joint is mounted on said stem portion and disposed between said head portion and the annular end wall of the pump body.

5,595,479

HYDRAULIC MACHINE HAVING TEETH FORMED BY ROLLERS

Gunnar L. Hansen, and Hans C. Petersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

PCT No. PCT/DK94/00123, § 371 Date Nov. 27, 1995, § 102(e) Date Nov. 27, 1995, PCT Pub. No. WO94/23205, PCT Pub. Date Oct. 13, 1994

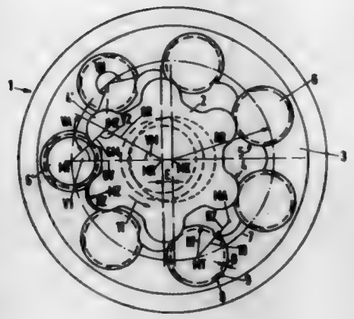
PCT Filed Mar. 24, 1994, Ser. No. 535,009

Claims priority, application Germany, Apr. 5, 1993, 43 11 166.1

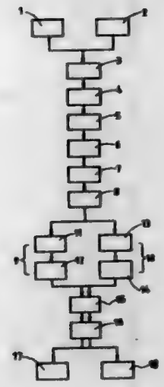
Int. Cl.[6] F03C 2/08; F04C 2/10

U.S. Cl. 418—61.3 **9 Claims**

1. A hydraulic machine having an annular gear with a set of internal teeth and a gearwheel with a set of external teeth mounted eccentrically therein, the internal teeth having one more tooth than the external teeth, and the teeth of at least one set of teeth being formed by rotatably mounted rollers, and in which each roller has at least three axially parallel recesses in a surface of the roller in which the teeth of the other set of teeth engage, each recess being bounded by a surface corresponding to a part of a cylinder and the teeth of the other set have a continuous convex surface over the major portion of each tooth.

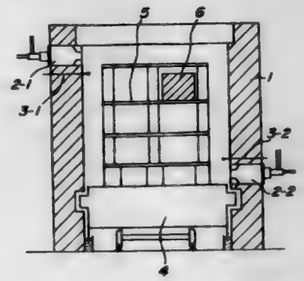


5,595,480
PROCESS FOR SINTERING INDUSTRIAL WASTE
Hsun Wang, No. 37, 114 Lane, Shi Yuan Rd., Jong Lih City, Tsur Yuan Hsien, Taiwan
Filed Oct. 31, 1994, Ser. No. 331,414
Int. Cl.[6] F27B *14/00*
U.S. Cl. 432—13 2 Claims



1. A process for sintering industrial waste into stones, comprising;
(1) uniformly mixing waste industrial earth, said mixed waste industrial earth comprising red earth, black earth, reddish yellow earth and clay
(2) uniformly mixing industrial waste, said mixed industrial waste comprising wood flour, waste paper pulp, waste mud, tea dregs, and waste oil;
(3) uniformly mixing approximately equal parts of mixed waste industrial earth and mixed industrial waste to form stone material;
(4) ball milling said stone material;
(5) press filtering said stone material;
(6) pugging said stone material so as to aggregate said stone material;
(7) treating said stone material by a vacuum ejection process to coagulate said stone material;
(8) drying said coagulated stone material at a temperature of 250° C. for 9 minutes to remove water of crystallization, thus forming said stone material into lumps;
(9) breaking said lumps into uniform grains;
(10) preheating said grains for approximately 5 minutes to 600° C.;
(11) sintering said preheated grains at 1,500° C. for approximately 15 minutes so as to form stones;
(12) cooling said sintered stones in a chilling kiln for about 2 minutes; and
(13) screening said stones to separate said stones by size.

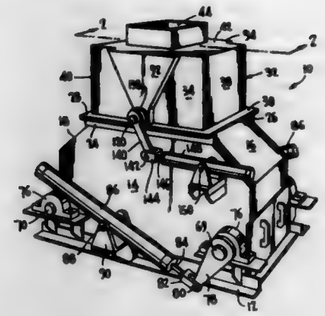
5,595,481
TEMPERATURE CONTROL METHOD FOR HEATING KILN
Kazuhiro Miyahara, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan
Continuation of Ser. No. 384,693, Feb. 6, 1995, abandoned, which is a continuation of Ser. No. 202,074, Feb. 25, 1994, abandoned. This application May 18, 1995, Ser. No. 443,560
Claims priority, application Japan, Mar. 30, 1993, 5-071832
Int. Cl.[6] F27D *7/00*
U.S. Cl. 432—24 5 Claims



1. A method for obtaining and maintaining a substantially uniform temperature throughout a heating kiln, which uniform temperature is substantially equal to a set temperature, said kiln having a firing zone, a plurality of heat sources for heating products to be fired in said firing zone, and a plurality of heat detecting means being the same in number as said plurality of heat sources in said firing zone, said plurality of heat detecting means being respectively positioned at a plurality of locations, each said heat detecting means in said firing zone being affected by heat flows from said plurality of heat sources in said firing zone, said method comprising the steps of:
detecting temperatures by said plurality of heat detecting means;
calculating a mean temperature for said heat sources from the temperatures detected by said plurality of heat detecting means; and
controlling outputs of each of said heat sources based on the temperatures detected by said plurality of heat detecting means to make said mean temperature substantially equal to the set temperature of the heating kiln.

5,595,482
AIRLOCKING SYSTEM AND METHOD FOR FEEDING BULK GRANULAR MATERIAL
Marshall F. Parsons, 4 Meadow Grass Ct., Gaithersburg, Md. 20878
Filed Oct. 27, 1994, Ser. No. 329,823
Int. Cl.[6] F27D *1/08*
U.S. Cl. 432—95 11 Claims

1. Apparatus for feeding a supply of fluent material to a process device, comprising:
housing means which includes an upper inlet for admitting fluent material to said housing means and a pair of lower outlets for selectively emptying fluent material from said housing means;
control chamber means, contained within said housing means, wherein said upper inlet of said housing means serves as an inlet to said control chamber means,

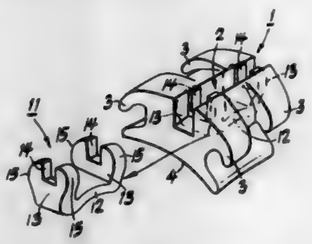


a pair of adjacent parallel supply chamber means in communication with said control chamber means, wherein each of said pair of supply chamber means includes a supply chamber inlet and a supply chamber outlet, and wherein each of said pair of supply chamber means selectively receives fluent material from said control chamber means through a respective supply chamber inlet,
pivotally-mounted, single diverter plate means contained within said control chamber means for directing continuously flowing fluent material to either one or the other of said pair of adjacent parallel supply chamber means and for sealing either one or the other of said adjacent parallel supply chamber means,
a pair of control valve plate means for respectively controlling gravity discharge of fluent material from said pair of parallel supply chamber means through said pair of lower outlets of said housing means and for sealing said lower outlets of said housing means,
power-operated, diverter plate motor means, supported by said housing means and operatively connected to said pivotally-mounted, single diverter plate means, for optionally positioning said diverter plate means in one or another of two positions for directing the fluent material to one of said parallel supply chamber means, while simultaneously preventing flow of fluent material to the other of said parallel supply chamber means, and
a pair of power-operated, control-valve-plate operating means, each of which being operatively connected to a respective one of said control valve plate means for optionally opening one of said supply chamber outlets while simultaneously closing and sealing another of said supply chamber outlets, such that one of said supply chamber means is being emptied while the other of said supply chamber means is being filled.

5,595,483
METHOD AND APPARATUS FOR THERMAL TREATMENT OF MATERIALS CONTAINING VAPORIZABLE SUBSTANCES
Albrecht Melber, Darmstadt; Erwin Wanetzky, Gross-krotzenburg, and Dieter Uechtoreit, Kassen, all of Germany, assignors to Ald Vacuum Technologies GmbH, Erlensee, Germany
Filed Mar. 20, 1995, Ser. No. 406,625
Claims priority, application Germany, Mar. 18, 1994, 44 09 401.9; Mar. 18, 1994, 44 09 402.7
Int. Cl.[6] F27B *5/04*
U.S. Cl. 432—285 43 Claims

1. Process for separating vaporizable substances from materials, said process comprising
providing at least two treatment chambers in succession, said treatment chambers comprising a first treatment chamber and a last treatment chamber,
feeding said materials through successive chambers in steps,
isolating said chambers from each other after each step,
maintaining successive said chambers at successively lower pressures and successively higher temperatures, thereby generating vaporized substances and solids in each chamber,
exhausting vaporized substances separately from each treatment chamber, and
discharging solids from the last treatment chamber.

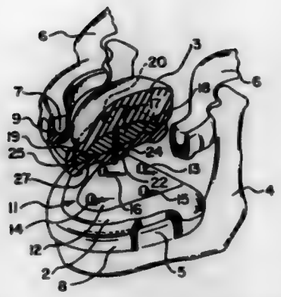
5,595,484
ORTHODONTIC BRACKET
Masaaki Orikasa, and Kozo Kawaguchi, both of Ohkuma-ken, Japan, assignors to GAC International, Inc., Central Islip, N.Y.
Filed Aug. 22, 1994, Ser. No. 293,997
Claims priority, application Japan, Apr. 13, 1994, 6-097866
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—8 46 Claims



1. An orthodoatic bracket, comprising:
a bracket body including surfaces defining a slot extending substantially along a mesial-distal axis of the bracket body for receiving an arch wire; and
a reinforcement member partly embedded in said bracket body, said reinforcement member including a portion defining a holding notch therein, wherein said portion extends through said surfaces defining said slot to locate said holding notch inside said slot to form arch wire holding means for engaging the arch wire to substantially reduce contact between the arch wire and said surfaces defining said slot.

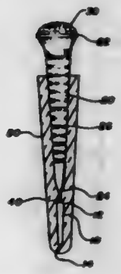
5,595,485
DENTAL RECORDING DEVICE, ARTICULATOR AND METHODS
John S. Shepard, Fort Collins, Colo., assignor to John S. Shepard, D.D.S., P.C., Fort Collins, Colo.
Filed Nov. 21, 1994, Ser. No. 342,598
Int. Cl.[6] A61C *11/00*
U.S. Cl. 433—58 7 Claims

1. In a dental articulator for substantially duplicating a temporomandibular joint of a patient, the combination comprising:



a lower frame with a pair of upstanding laterally spaced side posts, each said side post having a pin-like upper section with a top portion of generally semi-spherical shape,
a lower jaw model of a particular patient supported by said lower frame,
a lower base plate supported by said lower jaw model,
a lower marking plate mounted to said lower base plate and having four upstanding, spaced marking pins, said pins being spaced apart a sufficient distance from one another in relation to patient jaw movement to avoid a socket pattern overlap,
an upper frame supporting a pair of laterally spaced fossa holders receiving said upper sections with a pliable mold material disposed in each of said fossa holders,
an upper jaw model of a particular patent supported by said upper frame,
an upper marking plate mounted to said upper jaw model opposite said lower marking plate and having a wafer attached to a bottom face, said wafer having four spaced socket patterns in which top portions of said marking pins are disposed, said four socket patterns being representative of the movement of the lower jaw of a particular patient,
tension means extending between said lower and upper frames whereby the movement of one of said upper and lower frames relative to one another with said marking pins track in said four socket patterns form a fossa socket pattern in said mold material in each of said holders that are a substantial duplication of the temporomandibular joints of a patient, said mold material hardening after said fossa socket patterns are formed.

5,595,486
METHOD AND DEVICE FOR FILLING AN ENDODONTICALLY PREPARED TOOTH
Ashok Manocha, 34 Flowerwood Dr., Chattahoochee, Fla. 32324
Filed Apr. 14, 1995, Ser. No. 432,985
Int. Cl.[6] A61C *5/02*
U.S. Cl. 433—224 **16 Claims**

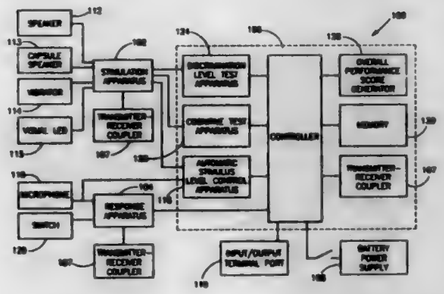


1. A obturator and post for filling an endodontically prepared root canal comprising:
a) a post dimensioned to terminate about 2 to about 5 millimeters above the tooth;
b) a carrier;
c) a connector, of a diameter less than the diameter of the post and the diameter of the carrier, connecting the end of the carrier to end of the post; and
d) a filler that is bioacceptable within the root surrounding the carrier, the connector, and the lower part of the post.

5,595,487
METHOD FOR BONDING AMALGAM TO DENTAL SURFACES
Paula D. Arlo, Minneapolis, and Steven M. Aasen, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 269,157, Jun. 30, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,950
Int. Cl.[6] A61C *5/04; 5/00*
U.S. Cl. 433—226 **20 Claims**

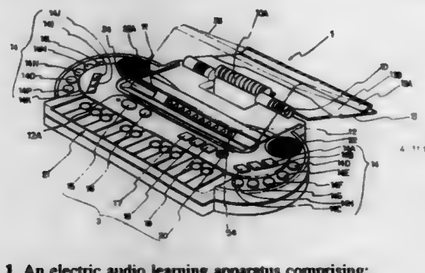
1. A method for adhering amalgam to a dental surface comprising the steps of
a) etching said dental surface with acid;
b) applying a treatment composition comprising an aromatic sulfinate salt to said etched dental surface, thereby providing a treated dental surface;
c) applying a priming solution containing a film-former to said treated dental surface, thereby providing a primed dental surface;
d) applying a chemically curable dental adhesive to said primed dental surface, thereby providing an adhesive-coated dental surface, said chemically curable adhesive comprising an oxidizing agent and a reducing agent, said oxidizing agent being present in an amount sufficient to interact with said aromatic sulfinate salt to achieve higher adhesion to the dental surface than a like method not comprising an aromatic sulfinate salt in the treatment composition; and
e) applying amalgam to said adhesive-coated dental surface.

5,595,488
APPARATUS AND METHOD FOR MONITORING AND IMPROVING THE ALERTNESS OF A SUBJECT
Eli Geslan, Kiryat Motzkin; Shlomo Breznitz, Haifa; Dan Nir, Haifa, and Sharon Erlich, Haifa, all of Israel, assignors to Vigilant Ltd., Israel
Filed Aug. 4, 1994, Ser. No. 285,688
Int. Cl.[6] G09B *19/00*
U.S. Cl. 434—236 **9 Claims**



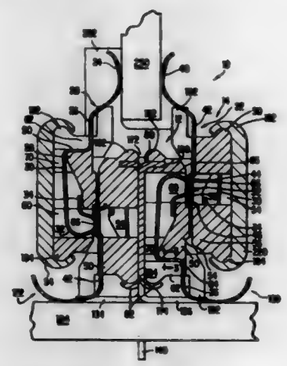
1. Apparatus for monitoring and improving the alertness of a subject while the subject is performing a primary activity, the apparatus comprising:
(a) first stimulation means for providing at least one discrimination level test stimulus of increasing intensity to the subject;
(b) first response means operable by the subject for responding to said at least one discrimination level test stimulus;
(c) second stimulation means for providing at least one cognitive test stimulus to a subject while the subject continues to perform the primary activity, said second stimulation means being responsive to an intensity level of said discrimination level test and to said first response means to set an intensity level of said cognitive test stimulus,
(d) second response means operable by the subject for responding to said at least one cognitive test stimulus; and
(e) control means for controlling the rate of activation of at least one of said stimulation means such that its rate of activation increases inversely with a deteriorating state of alertness of the subject so as to improve the alertness of the subject.

5,595,489
ELECTRONIC AUDIO LEARNING APPARATUS
Han D. Kwon, Seoul, Rep. of Korea, assignor to Kemongsa Publishing Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 2, 1994, Ser. No. 352,765
Claims priority, application Rep. of Korea, Dec. 2, 1993, 93-26228
Int. Cl.[6] G09B *3/00*
U.S. Cl. 434—319 **10 Claims**



1. An electric audio learning apparatus comprising:
a main body;
a musical keyboard on said main body;
an operation panel on said main body including a selection switch and switches for controlling said apparatus;
a sensing section in said main body for detecting book and page numbers;
a book shelf section on said main body for placing a book;
a sound effect section in said main body for selecting sound effects;
speakers for emitting sound effects attached to said main body; a ROM-Pack;
a ROM-Pack insertion section in said main body for inserting a ROM-Pack, said ROM-Pack having sound data corresponding to said indicia of said pages of said book;
a power source for supplying power to said apparatus; and
an electronic circuit section in said main body powered by said power source for generating voice or sound output based on the input data from said operation panel, wherein said sensing section, said sound effect section, said musical keyboard, and said circuit section further comprising: said electronic circuit comprises a book number sensing unit for outputting a book number to an I/O expansion section from a connection of contact switches caused by oppression of a book; photo-transistors for detecting the existence of punched holes by light projection; a page number sensing unit for detecting a page number from the existence of holes on a book sensed by said photo-transistors; an I/O expansion section for receiving outputs of said book number sensing unit, said page number sensing unit and said sound effect sensing section; an address decoder in said electronic circuit section for decoding an address; a CPU for receiving output of said I/O expansion section through a control and data port, a data and address port of said CPU is connected to an address port of a ROM-Pack through said address decoder; a low path filter for receiving a data port from said D/A converting section; a book or keyboard selection swiech unit for receiving a data port which is connected between said CPU and said address decoder through a D/A converting section and said low path filter, said book or keyboard selection swiech is receiving output of a piano IC; and a piano IC for receiving an output of said musical keyboard unit; when said selection swiech is in the book mode, said learning apparatus produces acoustic information, when a book is placed on the book shelf section and the sensing section, the sensing section producing an acoustic output from the ROM-Pack, correspooding to the indica on the page of said book, and when said selection switch is in the keyboard mode, the learning apparatus will produce a selected sound effect as the user plays the keyboard.

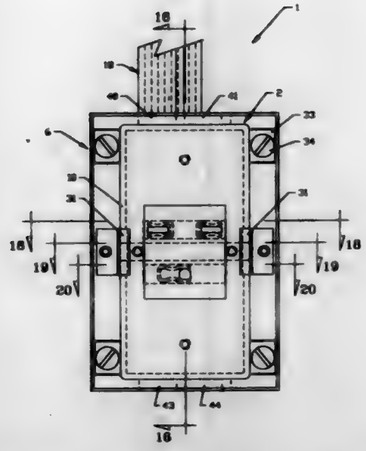
5,595,490
PRINTED CIRCUIT BOARD CONNECTORS
Thomas S. Cohen, New Boston, N.H., and Philip T. Stokoe, Attleboro, Mass., assignors to Teradyne, Inc., Boston, Mass.
Filed Jan. 13, 1995, Ser. No. 372,494
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—74 **35 Claims**



1. An electrical connector comprising:
a) an insulative housing having a face;
b) a first plurality of contacts extending through the housing, each of the first plurality of contact elements including a contact pad with the contact pads disposed in a first line across the face;
c) a second plurality of contact elements extending through the housing, each of the second plurality of contact elements including a beam extending through the face with the beams disposed in a second line across the face.

5,595,491
240 VOLT RECEPTACLE MODULE FOR MODULAR ELECTRICAL SYSTEM
Lindy L. May, P.O. Box 399, Strafford, Mo. 65757
Filed Feb. 1, 1996, Ser. No. 595,184
Int. Cl.[6] H01R *4/66*
U.S. Cl. 439—106 **5 Claims**

1. A 240 volt receptacle module adapted with four blade conductors protruding from said 240 volt receptacle module; with one blade conductor serving as a left positive blade conductor and internally connected to a left positive plug adapter, with one blade conductor serving as a right positive blade conductor and internally connected to a right positive plug adapter, with one blade conductor serving as a neutral blade conductor and internally connected to



a neutral plug adapter, and with one blade conductor serving as a ground blade conductor and internally connected to a grounding plate, said blade conductors providing an electrical interface of said 240 volt receptacle module with a wallbox; said wallbox being adapted with the means to connect conductors of a 4-conductor cable to said blade conductors of said 240 volt receptacle module; said 240 volt receptacle module being comprised of:

a.) a module base which houses said plug adapters,

b.) a module cover which retains said plug adapters in said module base and provides a receptacle face to interface with a standard 240 volt electrical plug,

c.) said left positive plug adapter providing the electrical interface to the left positive blade of a standard 240 volt electrical plug,

d.) said right positive plug adapter providing the electrical interface to the right positive blade of a standard 240 volt electrical plug,

e.) said neutral plug adapter providing the electrical interface to the neutral blade of a standard 240 volt electrical plug, and

f.) said grounding plate providing the means to ground said 240 volt receptacle module and the electrical box of said wallbox.

5,595,492

CONNECTOR HOUSING COUPLING MECHANISM

Naoto Taguchi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,995

Claims priority, application Japan, Dec. 20, 1993, 5-344592

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—157 **2 Claims**

1. A connector housing coupling mechanism, comprising:

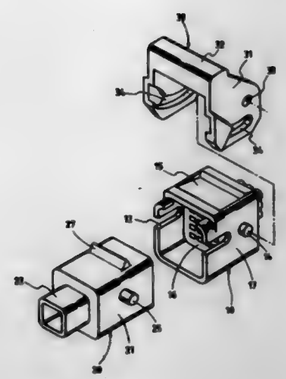
a female connector housing;

a male connector housing;

an engaging projection which is formed on a first side face of one of said male and female connector housings;

an operating lever which is rotatably supported on a side face of the other one of said male and female connector housings, said operating lever comprising a cam groove which receives and guides said engaging projection depending on a rotation position of said operating lever, an innermost portion of said cam groove being closer to a rotation center of said operating lever than an entrance of said cam groove, said male and female connector housings being coupled with and uncoupled from each other by rotating said operating lever; and

lever locking means for inhibiting said operating lever from being rotated, said lever locking means comprising: engaging means disposed on said other one of said male and female connection housings which, when said male and female connector housing are uncoupled from each other, is located at a position where said engaging means does not engage with said operating lever; and urging means disposed on said one of said male and female connector housing for, when said male and female connector housings are coupled with each other, urging said engaging means to a position where said engaging means engages with said operating lever, said operating lever being prevented by said engaging means from being rotated only when said male and female connector housings are coupled with each other.



5,595,493

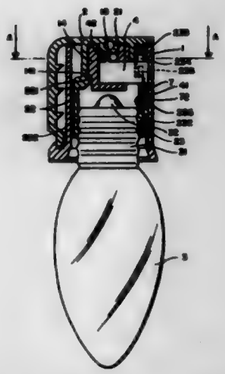
SAFETY LAMP SOCKET

Ming-Hsiung Chen, 16, Alley 3, Lane 227, Nung-An Street, Taipei, Taiwan

Filed Aug. 30, 1994, Ser. No. 298,331

Int. Cl.[6] H01R *29/00*

U.S. Cl. 439—188 **1 Claim**



1. A safety lamp socket of the type comprising a socket body having a top recess and two opposite mounting slots and two contact metal plate mounting holes, an electric wire arranged within said top recess, a socket cap having two mounting rods fastened to said mounting slots and a press block pressed on said electric wire, a center contact metal plate and a side contact metal plate respectively fastened to said contact metal plate mounting holes and disposed in contact with the positive and negative conductors of said electric wire, wherein:

said two mounting rods of said socket cap each have a hooked portion hooked on said mounting holes on the inside and a screw thread lower section for fastening a ring contact of a lamp bulb being threaded into said socket body, one mounting rod having a T-groove at an outer side and a notch on the respective screw thread lower portion; said side contact metal plate has a contact leg suspending inside said socket body; a side metal spring plate is disposed inside said socket body, having a T-shaped top mounting section fitted into said T-groove and a curved bottom section protruding over said notch, the curved bottom section of said side metal spring plate being forced by the ring contact of said lamp bulb to contact the contact leg of said side contact metal plate when said lamp bulb is threaded into said socket body; a center metal spring plate is disposed between said mounting rods of said socket cap inside said socket body, having a retaining portion fastened to a retaining hole inside said socket body and a raised portion spaced from said center contact metal plate, said raised portion being forced by the tip contact of said lamp bulb to contact said center contact metal plate when said lamp bulb is threaded into said socket body.

5,595,494

UNIVERSALLY MOUNTED POWER STRIP

Donald G. Wiebe, Hacienda Heights, Calif., assignor to Damac Products Inc, Santa Fe Springs, Calif.

Filed Oct. 5, 1994, Ser. No. 318,443

Int. Cl.[6] H01R *4/60*

U.S. Cl. 439—211 **13 Claims**

1. A power strip for distributing power from a power source to a plurality of electronic modules through a respective plurality of power cords, said power strip has an elongated length, said power strip comprising,

a plurality of angled pieces each having a bulbous end and a groove end between which is an angled corner, each of said bulbous end and said groove end and said angled corner extend said elongated length, said bulbous end is adapted to be slidably inserted into said groove end defining a respective mated corner, then forming a housing having a plurality of angled corners and a plurality of mated corners, then defining a cavity within said housing and then defining a plurality of housing sides between said angled corners and said mated corners,

corner flanges formed on each of said angled corners and each of said mated corners, said corner flanges formed in parallel to each other and extending said elongated length of said power strip, each of said corner flanges defined by an exterior surface between two opposing flange edges,

a source power cord for receiving power from said power source, and

a plurality of power outlets disposed on at least one of said housing sides and adapted to receive said respective plurality of power cords.

5,595,495

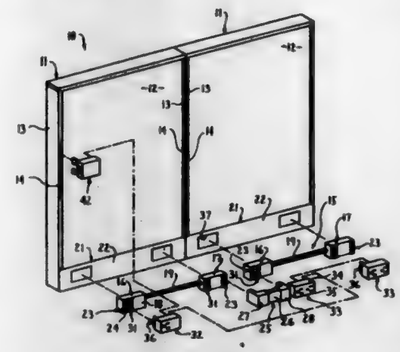
ELECTRIFIED INTERIOR SPACE-DIVIDING MEMBERS WITH LOW-VOLTAGE SWITCHING SYSTEM

Ross S. Johnson, Jenison, and Steven J. King, Park Township, Ottawa County, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed May 19, 1994, Ser. No. 246,355

Int. Cl.[6] H01R *25/00*

U.S. Cl. 439—215 **16 Claims**



1. In an upright interior wall system formed by a plurality of serially-connected interior wall panels, at least some of said panels having electrified power blocks positioned interiorly thereof, said power blocks having electrical output connectors for releasable pluglike engagement with portable power-tap units which releasably mount on the power blocks generally interiorly of the panels, each said power-tap unit having an electrical input connector which is releasably engageable with a said electrical output connector of a said power block, the improvement comprising:

a first said power-tap unit comprising a low-voltage power supply unit releasably mounted on one said electrical output connector of a said power block;

said power supply unit having first and second low-voltage terminal means, and high-to-low voltage converting means connected between said first terminal means and the respective electrical input connector for stepping down the voltage to provide a low voltage at said first terminal means;

a second said power-tap unit comprising a receptacle unit releasably mounted on a said electrical output connector of one said power block and having a three-hole electrical outlet for accommodating a conventional electrical plug;

said receptacle unit having an interior normally-open switching means connected between said outlet and the respective electrical input connector for permitting electrification of said outlet only when said interior switching means is closed, said interior switching means including low-voltage activating means for activating said interior switching means into a closed position in response to low-voltage activation, said receptacle unit having third terminal means mounted thereon and connected to said activating means;

electrical cable means connected between said second and third terminal means for transmitting a low voltage signal therebetween; and

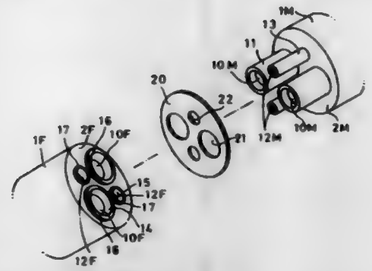
a low-voltage switch unit disposed at a location remote from said power supply and receptacle units for controlling supply of low-voltage from said converting means to the activating means of said receptacle unit.

5,595,496

WATER-PROOF CONNECTOR

Kazunoto Kondo, Mie Pref., and Yoshihito Hotta, Saitama Pref., both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie Pref., Japan

Filed Nov. 10, 1994, Ser. No. 339,253
Claims priority, application Japan, Nov. 10, 1993, 5-305779
Int. Cl.[6] H01R 13/52
U.S. Cl. 439—271 7 Claims



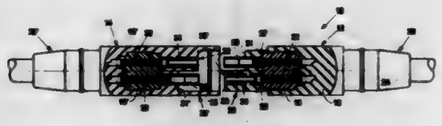
1. A water-proof connector comprising:
a first connector housing having an end surface;
a plurality of male terminals protruding from said end surface of said first connector housing;
a plurality of sleeves extending from said end surface of said first connector housing, said plurality of sleeves surrounding said plurality of male terminals, respectively;
a second connector housing having an end surface, and defining a plurality of cavities extending inwardly of said end surface thereof and which correspond in number to the number of said plurality of male terminals, said second connector housing further having a plurality of annular protrusions projecting from a peripheral edge of said plurality of cavities, respectively;
a female terminal, engageable with a corresponding said male terminal, disposed in each of said cavities; and
a resilient seal lying against said end surface of one of said first and second connector housings and having a plurality of discrete openings arranged to correspond to said plurality of sleeves so that, when said first and second connector housings are mated with each other, said plurality of sleeves extend through said openings of said seal into said corresponding cavities and are electrically connected with said female terminals, respectively, wherein each of said annular protrusions surrounds a respective one of said openings of said resilient seal and presses against said resilient seal when said first and second connector housings are mated with each other such that said resilient seal is compressed by and between said end surface of said first connector housing and the annular protrusions of said second connector housing.

5,595,497

UNDERWATER ELECTRICAL CONNECTOR

Richard G. Wood, Magnolia, Tex., assignor to Tescorp Seismic Products, Inc., Houston, Tex.

Filed Mar. 1, 1995, Ser. No. 396,960
Int. Cl.[6] H01R 13/405
U.S. Cl. 439—282 13 Claims



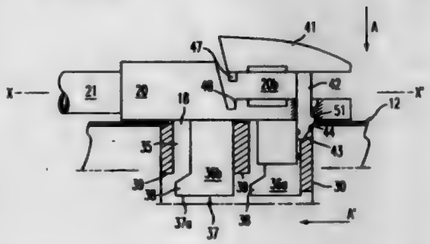
1. An electrical connector, comprising:
a housing formed of a flexible, relatively soft, electrically non-conductive material having a hardness of from about 40 to about 80 durometer as measured on the Shore A scale, and having a centrally disposed longitudinal axis, a matable end, a wire conductor encapsulating end spaced along said longitudinal axis from said matable end, a face surface disposed in proximate relationship to said matable end and having at least one bore extending inwardly from said face surface, said bore being defined by a cylindrical wall surface having a plurality of radially inwardly extending annular ridges formed on said cylindrical wall surface and adapted to form a seal between said bore and a sheath surrounding an electrically conductive contact of a mating connector when said mating connector is operably assembled with said electrical connector; and,
a core encapsulated within said housing and formed of a relatively hard, electrically nonconductive material having a hardness greater than the hardness of said housing and having a plurality of electrical conductors at least partially embedded therein, each of said electrical conductors having a first end adapted for connection with a wire conductor, a second end having a matable electrically conductive contact formed thereon, and a central body portion having an outer surface defined by a plurality of lands and grooves, said core extending around at least preselected ones of said electrically conductive contacts and forming an open-ended sheath around the respective electrical contact, said sheath having a hardness equal to the hardness of said core.

5,595,498

CONNECTOR FOR ELECTRICAL TRUNKING

Gérard Jego, Brazey en Plaine; Daniel Nourry, Dijon, and Jean-Pierre Thierry, Arc Sur Tille, all of France, assignors to Schneider Electric SA, Boulogne-Billancourt, France

Filed Mar. 2, 1995, Ser. No. 397,368
Claims priority, application France, Mar. 2, 1994, 94 02493
Int. Cl.[6] H01R 4/50
U.S. Cl. 439—342 9 Claims



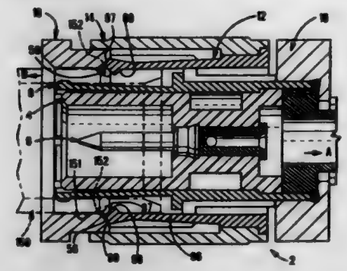
1. Branch connector for electrical trunking, the trunking containing
a plurality of parallel conductors accommodated in a rigid enclosure and
a plurality of branch contact blocks located in the enclosure and facing openings respectively formed in one wall of the enclosure, the connector including a branch cable connector and a body having connecting terminals respectively inserted in the contact blocks to be connected to the conductors in the trunking;
a latch mounted on the conductor body, said latch being movable manually from an unlocked position to a locked position;
the contact block including a component engaging said latch and operating a lock mechanism locking the connector body relative to the contact block upon inserting of the connector in the contact block wherein the connector has guide wells and the latch is guided by surfaces of the guide wells of the connector, the latch having one of a cam surface and a ramp engageable with the contact block so that displacement of the latch towards a lock position thereof generates a force displacing the connector in a longitudinal direction parallel to a longitudinal axis of the conductors and towards the connecting terminals.

5,595,499

COAXIAL CONNECTOR HAVING IMPROVED LOCKING MECHANISM

Hans-Joachim Zander, Schifferstadt; Dieter Bonzer, Mannheim, and Stefan Martin, Bensheim, all of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 534,133, Sep. 26, 1995, abandoned, which is a continuation of Ser. No. 282,380, Jul. 29, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 634,874
Claims priority, application United Kingdom, Oct. 6, 1993, 9320575
Int. Cl.[6] H01R 13/627
U.S. Cl. 439—352 12 Claims



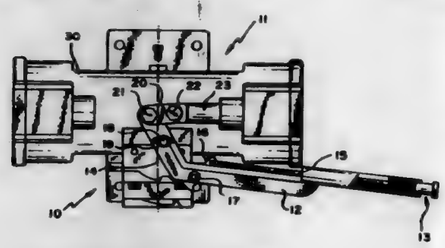
1. A coaxial connector comprising an inner terminal and an outer conductor coaxially positioned relative to the inner terminal, an insulative housing disposed between the inner terminal and outer conductor, a locking element supported by the outer conductor including a stationary member and a movable member movable relative to the outer conductor and the stationary member, spring locking arms provided by the movable member engagable in a peripheral groove of a mating connector when the mating connector is mated with the coaxial connector to latch the connectors in a prelocking condition, and cam engaging surfaces on said spring locking arms and said stationary member engagable with one another when said movable member is moved toward said stationary member thereby locking said spring locking arms within the peripheral groove of the mating connector.

5,595,500

QUICK RELEASE ELECTRICAL CONNECTOR

Michael P. Page, Kincumber, Australia, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 22, 1994, Ser. No. 310,299
Int. Cl.[6] H01R 13/62
U.S. Cl. 439—372 7 Claims



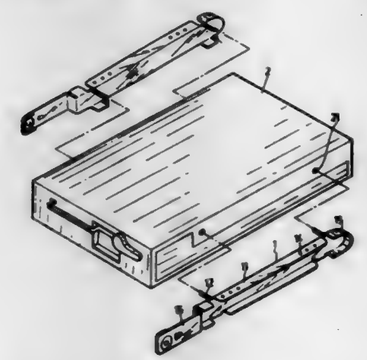
1. An electrical connector comprising:
a housing having at least one end for electrical coupling to another electrical connector,
a sliding member slidably attached to the housing and comprising a locking lug for engagement with an engagement part of said another electrical connector,
a lever pivotally attached to the housing and pivotally connected to the sliding member by pivot means to effect sliding movement of the sliding member to thereby effect movement of the lug for interaction of said lug with said engagement part of said another connector, and
locking means to lock the sliding member in a selected orientation relative to the housing, wherein the locking means includes a gear on the housing and a ratchet pin pivotally mounted on the lever.

5,595,501

SLIDING CASE MOUNTING DEVICE

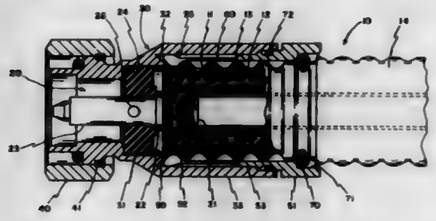
Hsin C. Ho, 20F-1, 268, Sec. 1, Wen-Hua Road, Pan Chiao, Taipei, Taiwan

Filed Sep. 29, 1995, Ser. No. 606,822
Int. Cl.[6] H01R 13/64
U.S. Cl. 439—377 1 Claim



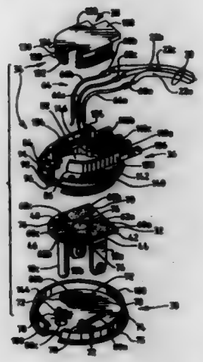
1. A sliding case mounting device comprising two sliding case mounting rails fixed to two opposite long sides of a rectangular sliding case for permitting it to be installed in two tracks inside a mainframe, each sliding case mounting rail comprising a channel-like rail body for insertion into one track of said mainframe, a plurality raised portions raised from a horizontal top side of said channel-like rail body for contact with the inside wall of the respective track, two horizontal projecting plug rods perpendicularly raised from two opposite ends of said channel-like rail body at an outer side and respectively plugged into respective mounting holes on one lateral side of said sliding case, a circularly arched tip longitudinally extended from one end of said channel-like rail body for insertion into one track of said mainframe, two outward hooks respectively raised from two opposite ends of said channel-like rail body at an outer side and hooked in respective mounting holes at a bottom side of said sliding case, a front extension strip longitudinally extended from an opposite end of said channel-like rail, an inward hook raised from said front extension strip at an inner side for hooking in a respective retaining hole inside said mainframe, and a press portion at one end of said front extension strip remote from said channel-like rail body for pressing by hand to release said inward hook from the respective retaining hole on said mainframe for permitting said sliding case to be disconnected from said mainframe.

5,595,502
CONNECTOR FOR COAXIAL CABLE HAVING HOLLOW INNER CONDUCTOR AND METHOD OF ATTACHMENT
Lee F. Allison, Mokena, Ill., assignor to Andrew Corporation, Orland Park, Ill.
Filed Aug. 4, 1995, Ser. No. 511,473
Int. Cl.[6] H01R 4/26
U.S. Cl. 439—429 24 Claims



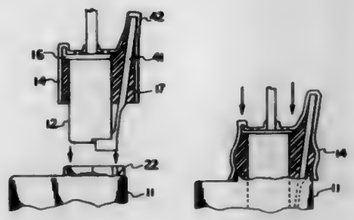
1. A connector assembly for a coaxial cable having an outer conductor and a hollow inner conductor with an interior surface, said connector assembly comprising;
means for engaging the outer conductor of the cable;
an inner connector having a threaded portion adapted to fit into the hollow inner conductor in threaded engagement with the interior surface of the inner conductor, said threaded portion comprising a plurality of interleaved concentric threads; and
a dielectric spacer between said engaging means and said inner connector.

5,595,503
ROTATABLE ELECTRICAL PLUG AND POWER CORD
Carl R. Pittman, Westfield, and Wendell Ison, Columbus, both of Ind., assignors to Woods Industries, Inc., Carmel, Ind.
Filed Jun. 7, 1995, Ser. No. 476,126
Int. Cl.[6] H01R 13/56
U.S. Cl. 439—446 21 Claims



1. A rotatable electrical plug and power cord for mating with a conventional electrical outlet, comprising:
a housing first portion;
first and second electrically conductive outlet prongs extending from the housing first portion a sufficient distance engagement into an electrical outlet;
a power cord having a proximal end and a distal end and first and second electrical conductors extending between its proximal and distal ends;
a housing second portion rigidly affixed to the proximal end of the power cord and rotatably coupled to the housing first portion such that the power cord can rotate relative to the electrical prongs; and
flexible conductor means for electrically interconnecting the first and second power cord conductors with the first and second prongs, respectively, and for permitting the housing first portion to rotate relative to the housing second portion without imparting forces on the power cord conductors.

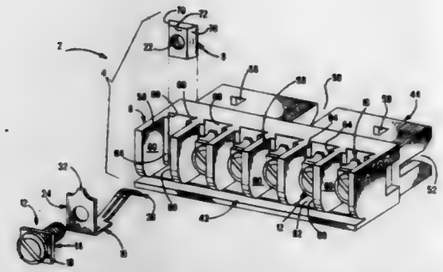
5,595,504
SEALED CONNECTOR
Mark W. Muller, Fort Worth, Tex., assignor to Siecor Corporation, Hickory, N.C.
Filed Sep. 26, 1994, Ser. No. 313,513
Int. Cl.[6] H01R 13/52
U.S. Cl. 439—521 5 Claims



1. A sealed connector, comprising:
a jack housing enclosing a dielectric member holding electrical contacts, the jack housing having a plug entrance and a conductor entrance;
an electrical plug removably insertable into the jack housing through the plug entrance and attached at a first plug end to a line cord, the plug having a second plug end opposite the first plug end, and having a latching arm that extends from the second plug end and toward the first plug end;
a resilient boot attached to the first plug end and extending out over the first plug end and the latching arm and then toward the second plug end sufficiently such that the boot abuts against the jack housing when the plug is inserted into the jack housing so as to define a closed space around the portion of the plug and the latching arm extending from the jack housing, the boot sufficiently resilient to allow manipulation of the latching arm through the boot, the boot defining a hole for passage of the line cord to the plug;
a resin having major surfaces covering the conductor entrance, the resin having a first portion and a second portion, at least the second resin portion sufficiently flexible to expand or contract responsive to air pressure within the jack housing; and
electrical conductors inserted through the first resin portion and extending to the dielectric member.

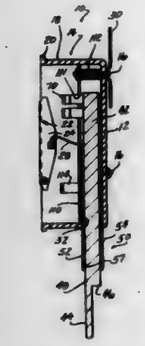
5,595,505
ELECTRICAL CONNECTOR FOR CONDUCTIVE LEADS
Christopher J. Duke, Enfield; Frank Wheeler-King, Berkhamsted, and Michael J. Whelan, Hitchin, all of Great Britain, assignors to The Whitaker Corporation, Wilmington, Del.
Filed Apr. 21, 1995, Ser. No. 426,546
Claims priority, application United Kingdom, Apr. 27, 1994, 9408326
Int. Cl.[6] H01R 23/70
U.S. Cl. 439—630 17 Claims

1. An electrical connector for connecting electrical leads to a mating component comprising:
a body having a lead side and a device side with a passageway therebetween, the lead side including a port in communication with the passageway and having a slot disposed in a wall thereof;



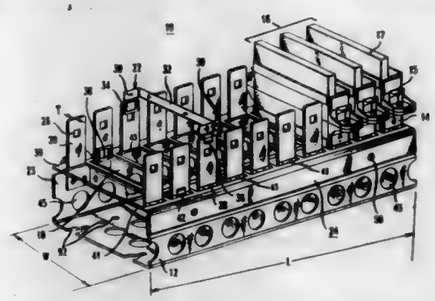
a contact disposed in the body and extending through the passageway such that a first end of the contact is disposed in the port of the lead side and the second end is exposed on the device side for mating with the component;
a retention member positioned within the slot; and,
a fastener for connecting the lead to the first end of the contact in response to tightening thereof, where the fastener is connected to the retention member and the first end of the contact is captivated therewith the fastener being tightenable relative the retention member independent of an exertion of a compressive force on the body; whereby the lead is electrically connected to the first end on the contact.

5,595,506
S TO B WATTHOUR METER SOCKET ADAPTER
Darrell Robinson, Highland Township, and Karl Loehr, Novi, both of Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.
Filed Nov. 4, 1994, Ser. No. 334,562
Int. Cl.[6] H01R 25/00
U.S. Cl. 439—638 24 Claims



1. A watthour meter socket adapter for mounting a watthour meter having a plurality of outwardly extending blade terminals in a watthour meter socket including a plurality of terminals connected to electrical power line and load conductors, the watthour meter socket adapter comprising:
a housing having a base and an annular sidewall extending from the base and terminating in a watthour meter mounting flange;
a plurality of rigid electrical conductors disposed within the housing, each electrical conductor having first and second ends;
an electrical contact mounted on the first end of each electrical conductor for receiving one blade terminal of a watthour meter therein;
an aperture formed in the sidewall of the housing; and
a portion of each electrical conductor and the second end of each electrical conductor extending through the aperture externally from the housing for direct electrical connection of the second end of each electrical conductor to one terminal in a watthour meter socket.

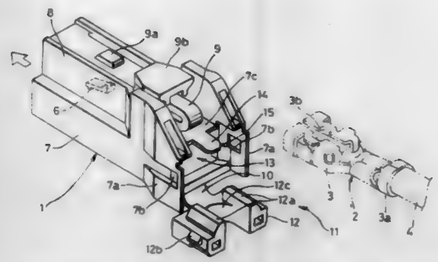
5,595,507
MOUNTING BRACKET AND GROUND BAR FOR A CONNECTOR BLOCK
Rudy R. Braun, Oakland; Antonio A. Figueiredo, Belleville; Adam S. Kane, Morristown, and Jeremia P. Starace, Nutley, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed May 17, 1995, Ser. No. 442,980
Int. Cl.[6] H01R 9/26
U.S. Cl. 439—716 22 Claims



1. In a modular connecting block system for termination of wires, wherein connector modules having a plurality of terminals facing a front and rear side thereof are insertable within a mounting bracket for mounting of said connecting block, said bracket including a plurality of support posts aligned on either side of said bracket for retaining said connector modules, a ground bar apparatus for attachment to said bracket, said ground bar apparatus comprising:
a unitary metallic strip formed into three distinct sections including,
first and third sections including fastening means for fastening to said support posts of said bracket to thereby electrically couple said ground bar to said bracket, and
a second section perpendicularly coupled between said first and third sections, said second section including a ground bus adapted to electrically couple with circuit protection modules installable in a front and rear side of said connector modules, wherein said fastening means of said first and third sections is adapted to couple to front facing and rear facing ends of said support posts of said bracket.

5,595,508
CONNECTOR HOUSING
Masanori Tsuji; Motohisa Kashiyama, and Satoki Masuda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 28, 1994, Ser. No. 365,362
Claims priority, application Japan, Dec. 28, 1993, 5-350569
Int. Cl.[6] H01R 13/514
U.S. Cl. 439—752 6 Claims

1. A connector housing comprising:
a retaining member for retaining a terminal, the retaining member being provided in a terminal receiving chamber in which the terminal is inserted,
a rear holder connected to the connector housing through a hinge at a rear end portion of the terminal receiving chamber, the rear holder having a U-shaped wire holding portion extending completely through the rear holder for holding the terminal in the terminal receiving chamber; and



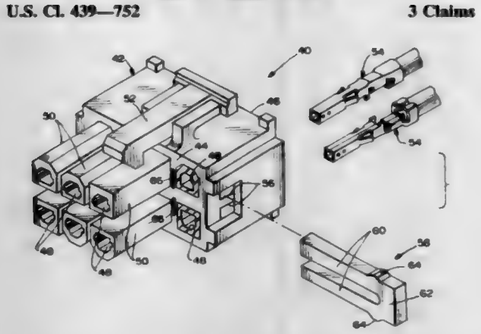
a displacement preventing member arranged in the terminal receiving chamber for restraining lateral movement of the U-shaped wire holding portion, the displacement preventing member having a width substantially equal to a width of the U-shaped wire holding portion, and the displacement preventing member being inserted into the U-shaped wire holding portion when the rear holder is locked.

5,595,509

ELECTRICAL CONNECTOR WITH TERMINAL POSITION ASSURANCE SYSTEM

Rupert J. Fry, Mt. Prospect; Adam F. Guzik, Darien, and John S. Luthy, Naperville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Aug. 14, 1995, Ser. No. 514,645
Int. Cl.[6] H01R *13/436*
U.S. Cl. 439—752 **3 Claims**



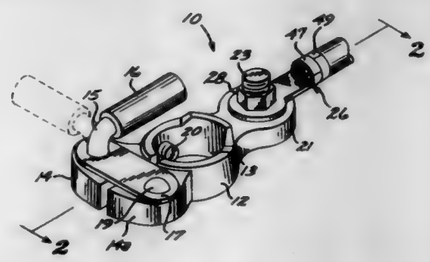
1. An electrical connector assembly which includes a terminal position assurance system, comprising:
- an elongated housing having a front mating face and a rear terminal-insertion face with a plurality of terminal-receiving cavities extending transversely of the housing between the faces, the cavities being arranged in two rows lengthwise of the housing and including two rows of terminal-protective silos projecting forwardly of the front mating face in alignment with the cavities, transverse walls between the cavities in each row extending in a direction between the faces, two generally parallel channels longitudinally of the housing intersecting the two rows of cavities, a longitudinal solid wall portion of the front mating face extending lengthwise between the two rows of forwardly projecting silos and further extending between the front mating face and the rear terminal-insertion face, and a plurality of slits in the front mating face between the adjacent silos in alignment with the transverse walls and extending rearwardly to the channels;
- a plurality of terminals adapted to be inserted into the cavities to fully inserted positions in the forwardly projecting silos, the terminals having portions adapted to block said channels if the terminals are not in their said respective fully inserted positions; and
- an elongated bifurcated terminal position assurance device including a pair of longitudinal legs insertable into the two channels each leg having a wall facing a wall of opposite leg, each facing wall located adjacent a respective opposite surface of the longitudinal solid wall portion, unless one of the channels is blocked by a portion of one of the terminals in either row thereof;
- wherein the front mating face has strength necessary to prevent the silos breaking away from the front mating face when transverse forces are exerted on the silos.

5,595,510

SNAP-ON BATTERY CABLE CONNECTOR

Rizal A. Obligar, No. 19 Mystic Rose Dr., Sanville Subdivision Project 16, Quezon City, Philippines

Filed Nov. 6, 1995, Ser. No. 554,360
Claims priority, application Philippines, Aug. 31, 1995, 14001
Int. Cl.[6] H01R *4/28*
U.S. Cl. 439—761 **4 Claims**



1. An improved snap-on battery cable connector comprising:
- an elongated electrically conductive body including a pair of semi-circular jaws projecting from a flexible central yoke and cooperating to form a circular battery terminal receiving socket having a central axis, said jaws formed with respective free ends configured with respective ears, formed with respective first and second bores having respective axes projecting parallel to said central axis;
- an eccentric cam rotatably received in said first bore;
- a connector pin received in said second bore;
- a connector link connected between said cam and said pin;
- a handle mounted on said cam for rotation thereof to draw the respective said ears together and flex said jaws inwardly toward one another;
- a cable connector ring carried from said yoke and formed with a connector bore;
- a connector stud received on one end in said connector bore and projecting therefrom to form an upstanding threaded shaft;
- a fastener for fastening said stud to said connector; and
- a connector nut for receipt of said threaded shaft.

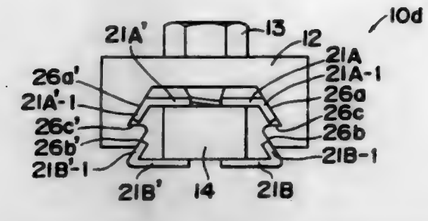
5,595,511

BATTERY TERMINAL

Hajime Okada, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Division of Ser. No. 161,574, Dec. 6, 1993, Pat. No. 5,558,544. This application Dec. 29, 1995, Ser. No. 580,583
Claims priority, application Japan, Dec. 7, 1992, 4-84121; Dec. 7, 1992, 4-84122; Dec. 7, 1992, 4-84131
Int. Cl.[6] H01R *13/631*
U.S. Cl. 439—762 **2 Claims**

1. A battery terminal comprising:
- a pair of right top and bottom tightening members and a pair of left top and bottom tightening members provided on each free end of a pair of top and bottom annular terminal fitting members of a terminal formed by folding a plate in two, each of said tightening members having sliding members, said top tightening members being separated from said bottom tightening members by a predetermined space;
- a tightening tool having a cut-out formed by top and bottom two-stage tapered surfaces; said tapered surfaces being staggered and contacting the sliding members of each of said tightening members; and
- said pairs of right and left top and bottom tightening members being substantially V-shaped, each including said sliding member sloping along and directly engaging respective said top and bottom two-stage tapered surfaces of said tightening tool, whereby when a bolt is tightened through a bolt hole formed in said tightening tool into a nut provided between said top and bottom tightening members, said nut being thicker than said predetermined space, whereby said pairs of right and left top and bottom tightening members are biased against respective top and bottom surfaces of said nut, said right and left top and bottom tightening members are moved towards each other horizontally by said sliding members moving along said tapered surfaces to close said each free end of said annular terminal fitting members.

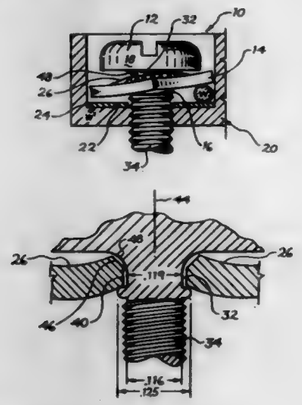


5,595,512

TILTED TERMINAL CLAMP

Howard S. Langdon, Winnetka, Ill., assignor to The Fastron Company, Franklin Park, Ill.

Filed Nov. 9, 1994, Ser. No. 336,414
Int. Cl.[6] H01R *4/36*
U.S. Cl. 439—812 **7 Claims**



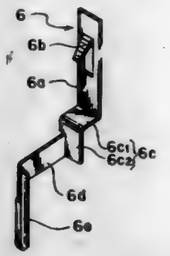
1. A tilting terminal clamp comprising:
- a threaded screw having a longitudinal axis and a threaded shank;
- a head for turning the screw at one end of the shank and a lead-in at the other end of the screw shank;
- a fillet formed on the screw joining the head to the shank;
- an annular retaining ring on the screw shank spaced at a predetermined distance from the head;
- a tiltable clamping plate having a central aperture encircling the screw shank between the annular retaining ring and the head of the screw;
- a lower serrated surface on the clamping plate to engage a wire;
- a frusto-conical annulus formed in the central portion of the clamping plate;
- a lower concave surface on the lower side of the frusto-conical annulus for abutting the retaining ring of the screw;
- a wall defining an aperture in the frusto-conical annulus including a coined straight wall portion extending parallel to the longitudinal axis of the screw and encircling the shank and having a diameter less than the diameter of the retaining ring to retain the plate on the screw; and
- an upper inclined portion on the wall defining the aperture located above the coined straight wall portion and extending outwardly therefrom at an angle and located adjacent the fillet and sized to receive therein the fillet.

5,595,513

BULB SOCKET TERMINAL

Hiroyuki Kondo, Haibara-gun, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 267,941, Jul. 6, 1994, abandoned, which is a division of Ser. No. 113,360, Aug. 30, 1993, Pat. No. 5,350,322, which is a continuation of Ser. No. 734,110, Jul. 24, 1991, abandoned, which is a continuation of Ser. No. 483,173, Feb. 22, 1990, abandoned. This application Sep. 29, 1995, Ser. No. 537,256
Int. Cl.[6] H01R *13/24*
U.S. Cl. 439—862 **2 Claims**



1. A bulb socket terminal insertable into a metal mold prior to insert-molding of a socket body of a connector bulb socket for accommodating a bulb having a filament and a ground end, said terminal comprising:
- a base;
- an elastic contact portion connected to said base and for contacting with at least one of said filament end and said ground end of said bulb on one side of said base;
- a connecting portion connectable to a connector on another side of said base;
- a resin flow blocking wall integral to said base for sealing and blocking entry of resin into an area behind said elastic contact portion during insert-molding of said socket body of said connector bulb socket, said resin flow blocking wall being formed between said elastic contact portion and said connecting portion and adapted to contact an insert-molding metal mold for said socket body during insert-molding of said socket body of said connector bulb socket, wherein said resin flow blocking wall includes a substantially L-shaped bent portion (6c) which comprises a substantially horizontal portion ($6c_1$) and a substantially vertical portion ($6c_2$), said substantially horizontal portion being connected to a lower end portion of said base; and
- a substantially horizontal tab portion (6d) which is, at one end thereof, connected to and perpendicularly extended from said

substantially vertical portion, and is, at an opposing end thereof, connected to said connecting portion,

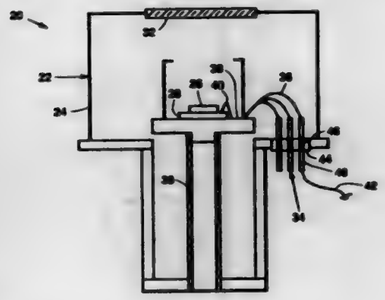
wherein a horizontally projected dimension of said elastic contact portion is smaller than a horizontally projected dimension of said substantially horizontal portion $6c_1$.

5,595,514

FEEDTHROUGH PIN AND PROCESS FOR ITS PREPARATION, AND ELECTRICAL FEEDTHROUGH MADE THEREWITH

Timothy S. Romanos; Tom K. Evans; Gary B. Hughes, all of Goleta, and Karl H. Neumann, Santa Barbara, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 19, 1994, Ser. No. 277,560
Int. Cl.[6] H01R *13/03*
U.S. Cl. 439—886 19 Claims



1. A feedthrough pin, comprising:

an elongated pin having an axis of elongation;

a recess in at least one end of the pin, the recess extending parallel to the axis of elongation; and

a coating of gold within the recess, the gold being present in an amount sufficient to fill the recess.

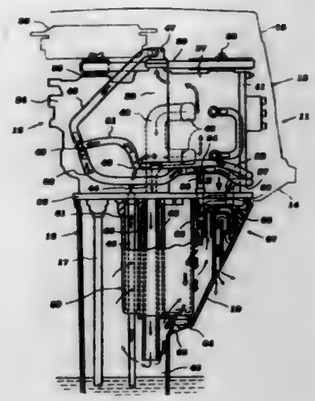
5,595,515

OUTBOARD MOTOR EXHAUST SYSTEM

Junichi Hasegawa; Yoshifumi Iwata, and Yukio Sunagawa, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki kaisha, Hamamatsu, Japan

Filed May 31, 1995, Ser. No. 455,982
Claims priority, application Japan, Jun. 3, 1994, 6-145564
Int. Cl.[6] B63H *20/24*
U.S. Cl. 440—89 8 Claims

1. An above-the-water exhaust gas discharge for an outboard motor, said outboard motor having a drive shaft housing with an outer casing forming at least one exhaust gas discharge opening therethrough positioned above the level of water in which the associated watercraft is operating at low speeds, said outer casing forming an integral cavity contiguous to and communicating with said exhaust gas discharge opening, an expansion chamber formed in said drive shaft housing outer casing, an internal combustion engine positioned above said drive shaft housing and having an exhaust gas discharge, an exhaust pipe for delivering exhaust gases from said engine exhaust gas discharge into the interior of said outer casing of said drive shaft housing, and a generally U-shaped tube contained entirely within said drive shaft housing outer casing and having one end communicating with the interior of said drive shaft housing outer casing for receiving the exhaust gases therein and another end communicating with said exhaust gas discharge opening through said integral cavity, at least one end of said tube being detachably connected to said drive shaft housing outer casing.

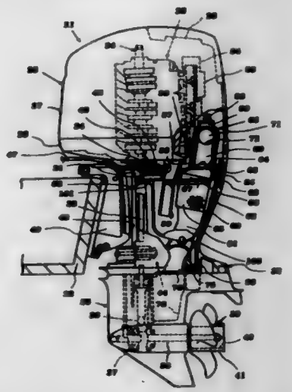


5,595,516

OUTBOARD MOTOR EXHAUST SYSTEM

Naoto Matsumoto, and Hiroaki Fujimoto, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 25, 1995, Ser. No. 506,524
Claims priority, application Japan, Jul. 28, 1994, 6-194574
Int. Cl.[6] B63H *21/32*
U.S. Cl. 440—89 21 Claims



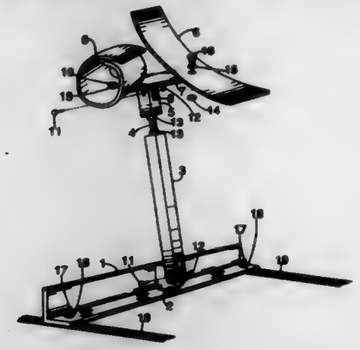
1. An outboard motor comprised of the power head containing an internal combustion engine and a surrounding protective cowling, a drive shaft housing and lower unit assembly depending from said power head and containing a propulsion device for an associated water craft, transmission means for driving said propulsion device from said engine, said engine having at least one exhaust port for discharging combustion products therefrom, an exhaust system for discharging exhaust gases from said exhaust port to the atmosphere through a body of water which the associated water craft is operating under at least some running conditions, said exhaust system including a trap device positioned at least in part in said power head, a cooling pump for pumping water from the body of water in which said watercraft is operating, and conduit means for delivering at least a portion of the water pumped by said water pump directly to a cooling jacket encircling at least a portion of said trap device before delivery to any other heated component of said outboard motor.

5,595,517

SUPPORT FOR BOAT OARS

Stephen L. Smith, 133 James St., Mount Ephraim, N.J. 08059

Filed May 29, 1996, Ser. No. 657,065
Int. Cl.[6] B63H *16/06*
U.S. Cl. 440—104 16 Claims



1. A device for supporting the oars of a boat in a fixed position comprising:

a mounting bracket connectable to the boat;

a bracket plate fixed to the mounting bracket;

a riser rod, having two forked ends, which is connected pivotally by a fastener at one forked end to the bracket plate;

a bar plate which is connected pivotally by a fastener to the forked end of the riser rod opposite the end of the riser rod connected to the bracket plate;

a strap mounting bar which is fixed to the bar plate;

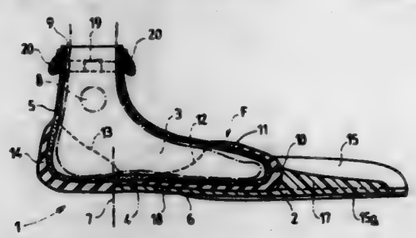
a pair of oar straps, which are connected by fasteners to the strap mounting plate, whereby the oars of the boat can be strapped and held in a fixed position.

5,595,518

FIN DEVICE, IN PARTICULAR FOR WATER SPORTS, AND METHOD OF MANUFACTURE OF SUCH A DEVICE

Roger Ours, 62, avenue Clariane, 92420 Vaucresson, France

PCT No. PCT/FR93/00383, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO93/22004, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 19, 1993, Ser. No. 325,255
Claims priority, application France, Apr. 23, 1992, 92 04990
Int. Cl.[6] A63B *31/11*
U.S. Cl. 441—64 10 Claims



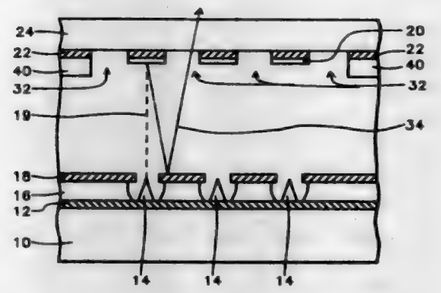
1. Fin device comprising a frontal part forming a blade, made of a relatively rigid material, and means for fastening the blade to a foot of a user, said blade being fixed in its rear region under a sole of a shoe element made of a material more flexible than that of the blade, said shoe element having a heel region and a front part provided with a covering made of a material which is more rigid than that of the shoe element, said covering being solidly attached to the blade and being capable of correctly transmitting momentum from the foot to the blade, and said covering extending under the entire sole of the shoe element and rising towards a rear part to surround the heel region.

5,595,519

PERFORATED SCREEN FOR BRIGHTNESS ENHANCEMENT

Jammy C.-M. Huang, Taipei, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 13, 1995, Ser. No. 387,082
Int. Cl.[6] H01J *9/22;1/30*
U.S. Cl. 445—24 9 Claims



1. A method of manufacturing a faceplate with a glass base for a field emission display, in which the faceplate is mounted parallel and opposite to a baseplate that has a plurality of field emission microtips extending up from a substrate through openings formed in a sandwich structure of an insulating layer and a conductive layer, comprising the steps of:

forming a transparent conductive layer over said glass base;

forming said field emission microtips into groups, or pixels;

forming black matrix elements over said transparent conductive layer, at periphery of said pixels;

forming phosphorescent elements over said transparent conductive layer; and

forming openings between said phosphorescent elements and through said transparent conductive layer.

5,595,520

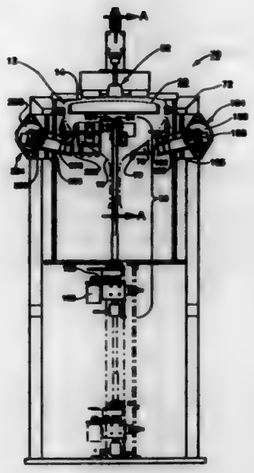
CATHODE-RAY TUBE PARTICLE REMOVAL APPARATUS AND METHOD

Joseph J. Pinciaski, Leola; Eric E. Fritz, Lititz; Morton J. Nierenberg; Leonard P. Wilbur, Jr., both of Lancaster, and Leroy W. Horn, Pottstown, all of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 19, 1995, Ser. No. 424,948
Int. Cl.[6] H01J *9/38*
U.S. Cl. 445—59 10 Claims

1. An apparatus for removing particles from an interior of a CRT envelope, said envelope including a faceplate panel sealed to a funnel with a color selection electrode assembly detachably mounted within said faceplate panel, said apparatus comprising

plurality of means for striking said funnel at similar frequencies but at different times, thereby imparting asynchronous vibrations to said funnel of said envelope, and means for flushing the interior of said funnel with a suitable fluid.

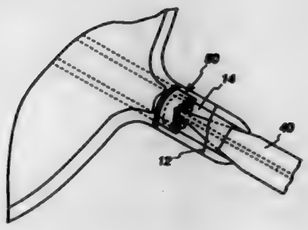


5,595,521

BALLOONS AND BALLOON VALVES

Charles R. Becker, Chicago, Ill., assignor to M & D Balloons, Inc., Manteno, Ill.

Continuation of Ser. No. 179,308, Jan. 10, 1994, Pat. No. 5,482,492. This application Jun. 7, 1995, Ser. No. 475,422
Int. Cl.[6] A63H 3/06
U.S. Cl. 446—224 27 Claims



1. A self-sealing valve effective for use in a balloon filled with a pressurized gas, comprising:

first and second layers of flexible heat sealable film valve material disposed in at least partially overlapping relationship, the valve material impermeable to pressurized gas and the first and second layers having inner surfaces which flatten and seal to the other to close the valve;

heat sealing means for heat sealing said first and said second layers together to form a double-ended hollow tube for passage of pressurized gas therethrough, with the tube having an inlet end and an outlet end;

a heat resistant material at the inlet end of the tube, located between the first and second layers, to prevent their heat sealing joinder to one another; and

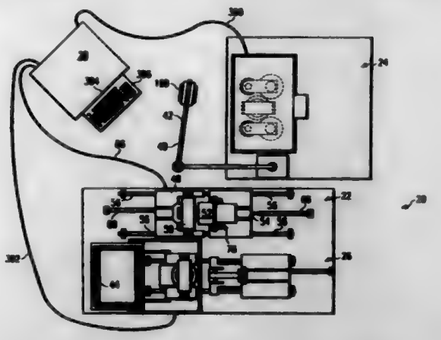
at least one of said first and said second layers having an inlet edge at the inlet end of the tube, with the inlet edge divided into at least two unconnected parts, each with a portion of the free edge, to form a layer with at least two adjacent free edge portions at the inlet end of the tube and forming a valve effective for holding a pressurized gas in a balloon.

5,595,522

SEMICONDUCTOR WAFER EDGE POLISHING SYSTEM AND METHOD

Vikki S. Simpson; Tom G. Gullett, both of Sherman; Jerry B. Medders, Van Alstyne; Arthur R. Clark, Sherman; Bobby R. Robbins, Denison; Danny R. Newton, Sherman; Lawrence D. Dyer, Richardson; Douglas W. Bilderback, Denison, and Clyde A. King, Bells, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1994, Ser. No. 178,186
Int. Cl.[6] B24B 49/00
U.S. Cl. 451—5 19 Claims



1. A system for edge polishing a plurality of semiconductor wafers, the system comprising:

a loader including an integrator for loading the plurality of wafers and a plurality of spacers into said integrator to form a stack;

a vibrator for vibrating the plurality of wafers and the plurality of spacers to facilitate alignment;

a polisher for polishing the edges of each of the plurality of wafers in the stack; and

an unloader for unloading the plurality of spacers and for unloading the wafers.

5,595,523

Patent Not Issued For This Number

5,595,524

GRINDING APPARATUS AND METHOD WHICH SUPPORTS A WORKPIECE ON THE SURFACE BEING GROUND

William P. Gundy, Milford, N.H., assignor to NPC, Inc., Milford, N.H.

Filed Feb. 17, 1995, Ser. No. 393,155
Int. Cl.[6] B24B 49/00
U.S. Cl. 451—5 31 Claims

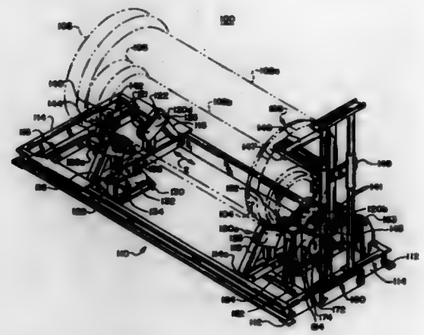
1. A method of grinding a surface on a workpiece, using a grinding apparatus having a workpiece support mechanism, a surface grinding mechanism, and a workpiece rotator mechanism, said method comprising the steps of:

rotatably supporting said workpiece on said workpiece support mechanism, including resting said workpiece on said workpiece support mechanism and supporting said workpiece on said surface being ground with at least two opposing workpiece support mechanism roller members positioned generally beneath said workpiece at a first end of said workpiece and in contact with said surface being ground

rotating said workpiece with said workpiece rotator mechanism;

grinding said surface of said workpiece with said surface grinding mechanism, to a predetermined depth wherein said surface grinding mechanism rotates about an axis parallel to a longitudinal axis of rotation of said workpiece; and

maintaining contact of said surface being ground with said workpiece support mechanism while grinding said surface.

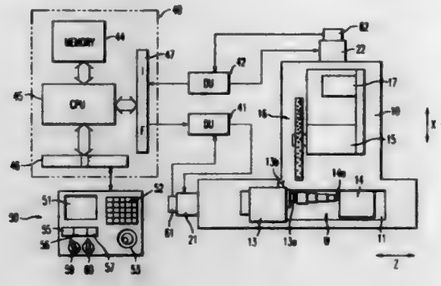


5,595,525

NUMERICALLY CONTROLLED GRINDING MACHINE

Yutaka Hayashi, Chiryu, and Makoto Nemoyama, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 10, 1995, Ser. No. 541,426
Claims priority, application Japan, Oct. 11, 1994, 6-245590
Int. Cl.[6] B24B 49/00; 51/00
U.S. Cl. 451—5 11 Claims



1. A numerically controlled grinding machine for grinding a cylindrical surface of a workpiece by a relative movement between the workpiece and a grinding wheel, said numerical controlled grinding machine comprising:

means for inputting grinding conditions;

means for automatically determining grinding data necessary for grinding the workpiece in dependence upon the grinding conditions inputted by said input means;

means for displaying the grinding data determined by said determination means; and

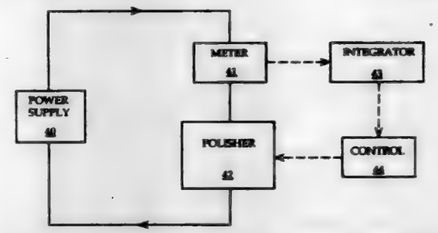
means for modifying the grinding data displayed on said display means by one of the four rules of arithmetic.

5,595,526

METHOD AND APPARATUS FOR ENDPOINT DETECTION IN A CHEMICAL/MECHANICAL PROCESS FOR POLISHING A SUBSTRATE

Leopoldo D. Yau, Portland, and Paul B. Fischer, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 30, 1994, Ser. No. 347,813
Int. Cl.[6] B24B 49/00; 19/22
U.S. Cl. 451—8 14 Claims



1. In a chemical/mechanical process for polishing a substrate, a method of endpoint detection comprising the steps of:

(a) determining a target amount of energy needed by a polishing apparatus to produce a desired polishing result on the substrate;

(b) providing an energy source to the polishing apparatus to commence the chemical/mechanical process;

(c) calculating a total energy consumption by integrating over time an electrical parameter of the polishing apparatus that is approximately proportional to an instantaneous power consumed by the polishing apparatus; and

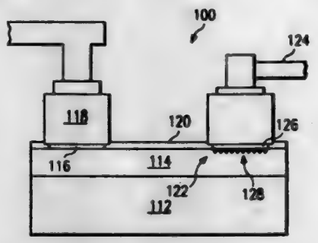
(d) stopping the chemical/mechanical process when the total energy consumption equal the target amount of energy.

5,595,527

APPLICATION OF SEMICONDUCTOR IC FABRICATION TECHNIQUES TO THE MANUFACTURING OF A CONDITIONING HEAD FOR PAD CONDITIONING DURING CHEMICAL-MECHANICAL POLISH

Andrew T. Appel, Dallas, and Michael F. Chisholm, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 281,391, Jul. 27, 1994, Pat. No. 5,536,202. This application Jun. 7, 1995, Ser. No. 474,605
Int. Cl.[6] B24B 1/00
U.S. Cl. 451—28 20 Claims



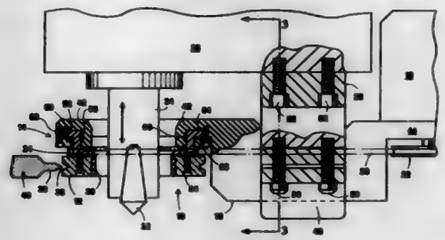
1. A method for conditioning a polishing pad having particles embedded therein, comprising the steps of

a. providing a conditioning head, wherein said conditioning head comprises a semiconductor substrate having a non-planar semiconductor surface;

b. rotating said polishing pad;

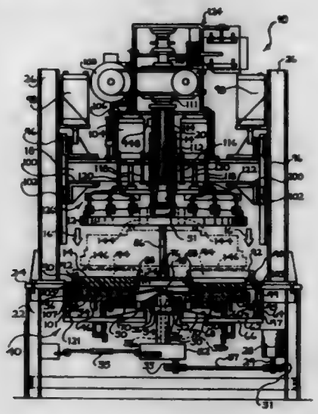
c. applying said non-planar semiconductor surface of said conditioning head to said polishing pad while said polishing pad is rotating to remove said particles from said polishing pad.

5,595,528
GRINDING WHEEL DRESSER
Edward Becker, Springfield, Vt., assignor to Vermont Rebuild, Inc., Springfield, Vt.
Filed Oct. 19, 1994, Ser. No. 326,085
Int. Cl.[6] B24B *53/07*
U.S. Cl. 451—72 15 Claims



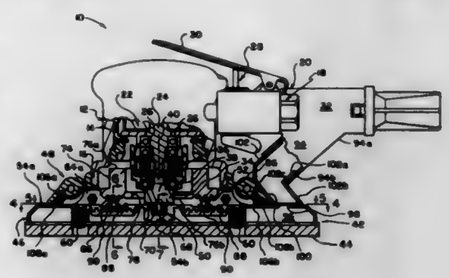
1. A dresser adapted for mounting on a grinding machine having a tailstock defining a workpiece axis, the dresser comprising:
a body;
a ring-shaped dressing wheel having a central opening with a diameter larger than the tailstock of the grinding machine;
a precision bearing rotationally mounting the dressing wheel to the body;
a drive motor connected to rotate the dressing wheel on the precision bearing about a dressing wheel axis; and
a base connected to the body and the grinding machine, mounting the body of the dresser with the tailstock of the grinding machine projecting through the central opening of the dressing wheel, the body being angularly adjustable relative to the base to rotate the dressing wheel axis to a desired angle relative to the workpiece axis.

5,595,529
DUAL COLUMN ABRADING MACHINE
Joseph V. Cesna, Niles, Ill., and Lawrence O. Day, Fremont, Calif., assignors to Speedfam Corporation, Des Plaines, Ill.
Filed Mar. 28, 1994, Ser. No. 218,611
Int. Cl.[6] B24B *7/24*
U.S. Cl. 451—291 15 Claims



1. A device for performing abrading operations on a plurality of workpieces, the device comprising:
an upper and lower lap plate, each having an annular lapping surface parallel to each other;
means for rotating each of the lap plates about its own vertical axis;
means for carrying workpieces on the lower lap plate;
carriage means for supporting the upper lap plate for vertically reciprocating movement relative thereto;
a frame means for supporting the carriage means at spaced locations for vertically reciprocating movement;
means for driving the vertically reciprocating movement of the carriage means being mounted to the frame means and connected to the carriage means to move the upper lap plate relative to the lower lap plate for performing abrading operations and to load and unload the workpieces; and
means for driving the vertically reciprocating movement of the upper lap plate relative to the carriage means for cooperating with the vertical movement of the carriage means for positioning the upper lap plate to perform abrading operations.

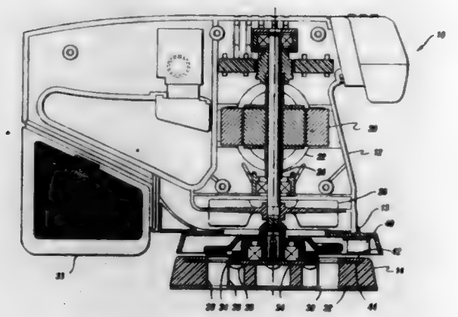
5,595,530
RECIPROCATING SANDER
Richard A. Heidelberger, Wheatfield, N.Y., assignor to Dynabrade, Inc., Clarence, N.Y.
Filed Jan. 31, 1995, Ser. No. 381,116
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—356 20 Claims



1. A portable tool comprising in combination:
a housing to be held and manipulated by a user;
a motor carried by said housing;
a motor driven drive member supported for rotation about a first axis relative to said housing;
a shoe for mounting an abrading means, said shoe being carried adjacent said housing and supported for reciprocating movement relative thereto;
first coupling means for connecting said drive member to said shoe for effecting reciprocating movement of said shoe relative to said housing in response to rotary movement of said drive member;
a counterweight carried intermediate said housing and said shoe for reciprocating movement relative to said housing parallel to and in alignment with said shoe; and
second coupling means separate from said first coupling means for connecting said shoe to said counterweight for effecting reciprocating movement of said counterweight relative to said housing in response to reciprocating movement of and oppositely directed relative to said shoe.

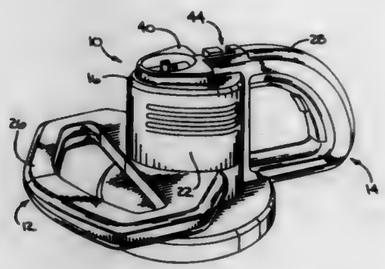
5,595,531
RANDOM ORBIT SANDER HAVING SPEED LIMITER
Paul W. Niemela, Pickens, and David G. Peot, Easley, both of S.C., assignors to Ryobi North America, Easley, S.C.
Filed Jul. 26, 1995, Ser. No. 507,109
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—357 11 Claims

11. A random orbit sander having a free speed limiting mechanism, the sander comprising:



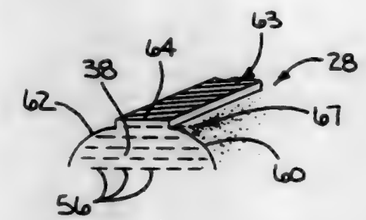
a housing for supporting a motor;
a drive spindle having a longitudinal axis and rotatably mounted to the motor;
a freely rotatable bearing disposed eccentrically with respect to the drive spindle;
a platen rotatably supported by the bearing and mounted on one end of the drive spindle, the platen having substantially flat, parallel first and second surfaces lying substantially perpendicular to the spindle axis;
a braking member formed of a non-magnetic, electrically conductive material fixed relative to the first surface of the platen;
a flux member formed of material having low permeability to the magnetic flux disposed between the braking member and the platen; and
at least one magnet supported by the housing adjacent the braking member so that a magnetic field formed by the at least one magnet intersects the braking member wherein relative movement between the at least one magnet and the braking member results in the generation of an eddy current force which inhibits rotation of the platen.

5,595,532
ELECTRICALLY-POWERED POLISHER
Robert E. McCracken, Tucson, Ariz., assignor to Waxing Corporation of America, Inc., Elmhurst, Ill.
Filed Oct. 20, 1995, Ser. No. 546,272
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—357 12 Claims



1. An electrically powered polisher comprising:
a central housing having a top and a bottom and a front and a back with a rotary pad mounted adjacent no the bottom of the housing;
a front handle extending horizontally outward from the housing front substantially parallel to the top and bottom of the housing adjacent to and above the housing bottom;
a rear handle extending outwardly from the housing rear and extending vertically between the top and the bottom of the housing;
a collar defined at the top of the central housing and a male receptacle including male prongs mounted therein with the make receptacle capable of being electrically connected to a female socket head of an electrical cord supplying power to the polisher, the collar being recessed in the top of the housing with the male prongs of the receptacle extending from the housing into the collar; and
a cord lock including a cord receiving trough formed in the top of the housing adjacent to the collar and an overhung tab for retaining a portion of an electrical cord in the trough.

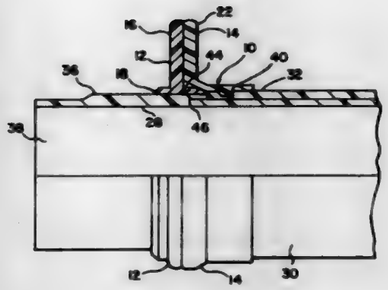
5,595,533
V-RIBBED BELT AND GRINDING WHEEL FOR FORMING THE BELT
Toshimi Kumazaki, Kobe, Japan, assignor to Mitsuboshi Belting Ltd., Nagata, Japan
Division of Ser. No. 271,351, Jul. 6, 1994, Pat. No. 5,492,587.
This application Oct. 3, 1995, Ser. No. 538,781
Claims priority, application Japan, Jul. 7, 1993, 5-193211
Int. Cl.[6] B23F *21/03*
U.S. Cl. 451—541 13 Claims



13. A grinding wheel for producing a V shape in a workpiece, said grinding wheel comprising:
a cylindrical body having a central axis;
a plurality of radially extending projections each being spaced fully from the others in an axial direction,
there being facing grinding surface portions on axially adjacent projections;
a radially faring base surface portion between the axially adjacent projections; and
an undercut extending radially inwardly from the base surface portion and continuously through 360° around the cylindrical body.

5,595,534
EASILY REMOVABLE ADJUSTABLE SIZING DEVICE FOR TUBULAR FOOD CASING
Thomas R. Stanley, Georgetown, Ill., assignor to Devro-Teepak, Inc., Westchester, Ill.
Filed Jan. 30, 1996, Ser. No. 593,982
Int. Cl.[6] A22C *11/02*
U.S. Cl. 452—38 7 Claims

1. A snap-on adjustable one piece sizing ring comprising an inner horn ring and an outer horn ring, the inner horn ring comprising an inner horn ring elliptical plate to which is attached a tubular section about an off-center hole therethrough, the outer horn ring comprising an outer horn ring elliptical plate having an off-center hole which fits over and is free to rotate about the tubular section so that overall circumference of the combined



plates can be varied, the tubular section of said inner horn ring being provided with means for pressure release attachment to an inner tube of a two-part stuffing horn comprising concentric inner and outer tubes and the outer horn ring being provided with means for releasable attachment to the outer tube of said two-part stuffing horn so that rotation of the concentric tubes relative to each other causes rotation of the elliptical plates relative to each other so that said overall circumference is varied.

5,595,535

DEVICE FOR PAYING OFF COINS FROM AT LEAST A PAIR OF COIN COLLECTING TUBES

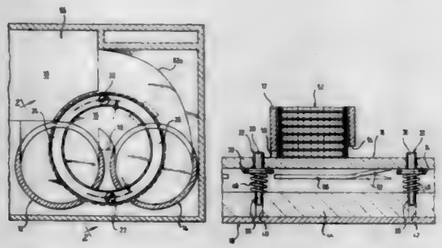
Dieter Wenskus, Dorfstrasse, Germany, assignor to National Rejectors, Inc., Buxtehude, Germany

Filed Jun. 23, 1995, Ser. No. 494,299

Claims priority, application Germany, Jun. 28, 1994, 44 26 585.9; Jul. 23, 1994, 44 26 193.4

Int. Cl.[6] G07D *1/00*

U.S. Cl. 453—40 **21 Claims**



1. A device for paying off coins from at least a pair of adjacent coin collecting tubes comprising:

a rotor located below the pair of adjacent tubes, the rotational axis of said rotor being substantially parallel to the tube axes;

an electric motor driving the rotor in either direction of rotation;

control means for the electric motor to cause the motor starting from a predetermined neutral position to rotate the rotor a first 180° turn and subsequently a second 180° turn in a reverse direction;

an ejecting element mounted to the rotor to be movable between a release position and an ejecting position; and

stationary control means co-operating with said ejecting element such that the ejecting element is moved by a first 180° turn of the rotor from the neutral position in either direction of rotation by the control means into one of its positions and by a second 180° turn in either direction of rotation into the other of its positions.

5,595,536

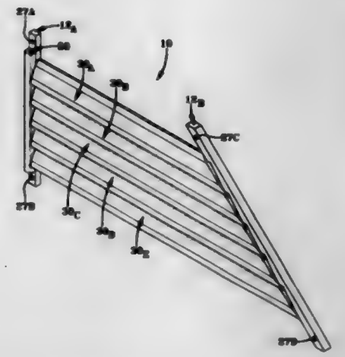
SHUTTER ASSEMBLIES PARTICULARLY ADAPTED FOR USE ON YACHTS

Robert E. Cornell, 621 Margaret St., Key West, Fla. 33040

Filed Aug. 23, 1995, Ser. No. 518,142

Int. Cl.[6] F24F *13/15*

U.S. Cl. 454—78 **7 Claims**



1. A shutter assembly for an opening adapted to admit light and/or air, the opening being surrounded by a frame having at least one oblique member, said shutter assembly comprising:

laterally spaced base members defining a base plane that extends across the opening;

one of said base members being obliquely disposed to the other of said base members;

a plurality of parallel, shutter-slats extending between said base members;

said base member being obliquely disposed with respect to said shutter-slats having a notch therein disposed adjacent to each of said shutter-slats such that said shutter-slat may pivot into said notch to avoid contact with said base member;

each shutter-slat having a longitudinal reference axis, a mounting axis and an input axis;

each said mounting axis being disposed in transversely spaced, parallel relation with respect to said longitudinal reference axis and lying within said base plane;

means securing each said shutter-slat to said base members for pivotal movement of each said shutter-slat about its said mounting axis;

said input axis of each shutter-slat being disposed in transversely spaced, parallel relation with respect to said mounting axis;

at least one actuator;

means securing said actuator to each said shutter-slat for relatively pivotal movement of each said shutter-slat with respect to said actuator about said input axis and thereby simultaneously to effect pivotal movement of each said shutter-slat about its respective mounting axis.

5,595,537

SELF-PROPELLING HARVESTER THRESHER

Ludger Jungemann, Lippstadt; Hermann Dreesbeimdieke, Guetersloh, and Lambert Sanders, Herzebrock-Clarholz, all of Germany, assignors to Claas oHG beschraenkt haftende offene Handelsgesellschaft, Harsewinkel, Germany

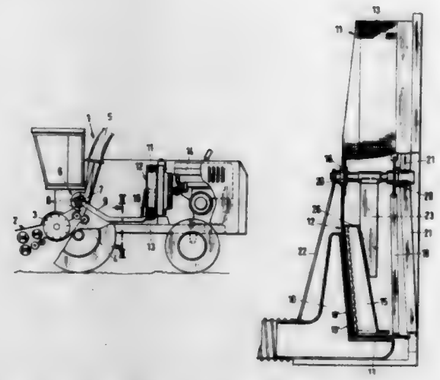
Filed Feb. 13, 1995, Ser. No. 387,254

Claims priority, application Germany, Feb. 11, 1994, 44 04 401.1

Int. Cl.[6] A01F *12/54*

U.S. Cl. 460—100 **16 Claims**

1. A self-propelling harvester thresher, comprising a blower; a cooler with a cooler fan for supplying a cooling air; a rotatable sieve device arranged between said cooler for retaining dirt particles entrained in the cooling air; a stationary outer housing having



an inner chamber communicating with said blower and having a side which faces toward said sieve device and is provided with an opening; a conduit communicating said inner chamber of said outer housing with a suction side of said blower; a screening element formed as an inner housing having an inner chamber and arranged inside said sieve device opposite to said opening of said outer housing, said screening element having a side which faces towards said end surface of said sieve device and has an opening, said opening of said screening element being greater than said opening of said outer housing.

5,595,538

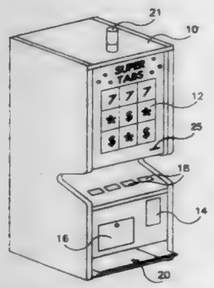
ELECTRONIC GAMING MACHINE AND METHOD

Thomas E. Haste, III, 11258 Ventura Blvd. #734, Studio City, Calif. 91604

Continuation-in-part of Ser. No. 406,024, Mar. 17, 1995. This application Nov. 2, 1995, Ser. No. 552,221

Int. Cl.[6] A63F *1/18*

U.S. Cl. 463—17 **14 Claims**



1. An electronic gaming machine, comprising:

a payment acceptance device, for accepting payment from a player;

a supply of tickets installed inside the gaming machine, wherein each ticket includes first indicia imprinted thereon, and each ticket further includes a machine-readable identifier, uniquely identifying the ticket;

a ticket dispenser for dispensing tickets one at a time from the supply of tickets;

a ticket reader, for reading the identifier on each ticket before such ticket is dispensed;

a display device;

a game controller for receiving the identifier read by the ticket reader and, in response thereto, for sending data representative of second indicia specific to each ticket to the display device, wherein said second indicia is different from said first indicia.

5,595,539

VISCOUS VIBRATION DAMPING MECHANISM WITH VARIABLE FLUID FLOW RESISTANCE

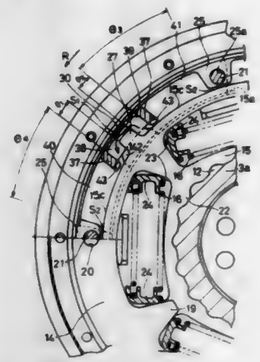
Kozo Yamamoto, Daitou, Japan, assignor to Exedy Corporation, Osaka, Japan

Filed Jun. 22, 1994, Ser. No. 263,886

Claims priority, application Japan, Jun. 24, 1993, 5-153490

Int. Cl.[6] F16D *3/80*

U.S. Cl. 464—24 **3 Claims**



1. A viscous dampening device comprising:

a first flywheel;

a second flywheel coupled to said first flywheel for limited rotary displacement, said first and second flywheels at least partially confining an annular chamber therebetween, at least one fluid chamber housing disposed within said annular chamber fixed to said first flywheel, said fluid chamber housing having opposing walls and a tapered opening formed in at least one of said walls, said fluid chamber housing defining a plurality of fluid chambers, fluid being flowable between said fluid chambers in response to relative rotary displacement between said flywheels, relative displacement between said flywheels defined by rotary movement in first and second motion ranges, the second range including rotary displacement greater than the first range;

a first rotary member coupled to said first flywheel having a plurality of projections at least partially extending into said annular chamber;

a second rotary member coupled to said second flywheel having a plurality of projections at least partially extending into said annular chamber, and a plurality of radial portions between said projections, said first and second rotary member projections at least partially defining said fluid flow chambers;

a slider having a hollow interior disposed for limited movement within said chamber housing adjacent to said second rotary member wherein at least one of said second rotary member projections extends into the hollow interior of said slider, an inner surface of said slider and said projection forming a first choke, said slider and said projection forming first and second fluid sub-chambers within the hollow interior of said slider, said slider and said projection being proximate said tapered opening in the absence of relative displacement between said flywheels, said tapered opening selectively allowing fluid communication between said first and second fluid sub-chambers, and said projection gradually inhibiting fluid flow between said first and second fluid chambers via said tapered opening as said projection moves within said slider in response to rotary displacement between said flywheels in said first motion range, said tapered opening providing said first choke assembly with a variable fluid flow resistance between said first and second fluid sub-chambers in response to displacement between said flywheels in said first motion range;

a second choke assembly disposed between a third chamber and a fourth chamber defined in said fluid chamber housing, said third and fourth chambers having a generally constant fluid

flow resistance between said third and fourth chambers greater than the variable fluid flow resistance of said first choke in response to relative displacement between said flywheels within said second motion range, wherein at least one of said first rotary member projections and at least one of said radial portions of said second rotary member defining said second choke:

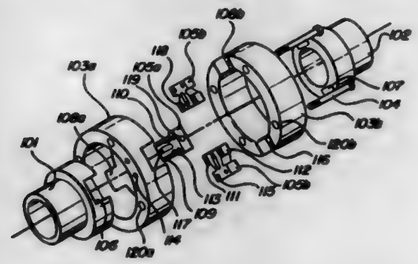
wherein said variable fluid flow resistance of said first choke gradually increases as the relative displacement between said flywheels increases within said first motion range defining a gradual transition between said variable fluid flow resistance and said constant fluid flow resistance of said second choke.

5,595,540

TORSIONALLY RIGID MISALIGNMENT COMPENSATING COUPLING

Evgeny I. Rivin, 30236 Southfield Rd., #249, Southfield, Mich. 48076

Filed Dec. 30, 1994, Ser. No. 366,462
Int. Cl.[6] F16D *3/04*
U.S. Cl. 464—85 **10 Claims**



1. Torsional connection for mechanical power transmission comprising two nominally coaxial hubs and an intermediate member nominally coaxial with said hubs, each of said hubs connected with said intermediate member via pairs of parallel preloaded in compression laminated elements comprising alternating bonded together layers of elastomeric material and rigid material, with compression load on one of said laminated elements in each pair increasing while compression load on the other laminated element in the same pair decreasing with increasing torque transmitted by said torsional connection, wherein said laminated elements comprising each pair are located on opposite sides of a fork-like holding structure including two prongs, and preloading of said elastomeric elements is effected by said prongs being elastically expanded outwardly in relation to said holding structure by means of a preload-generating element in order to develop a specified compression preload of said laminated elements, with said holding structure constituting together with said preload—generating element in its terminal position a closed frame thus providing rigidity for torque transmission via compression of said laminated elements.

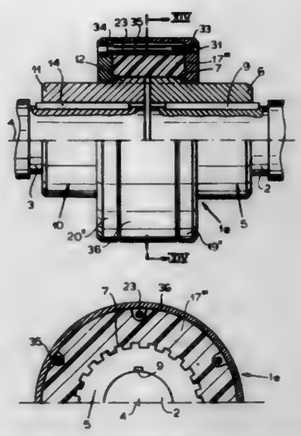
5,595,541

FLEXIBLE ADJUSTABLE SHAFT COUPLING

Jean Ducugnon, Cahuire, France, assignor to P.I.V. S.A., Villeurbanne, France

Filed Nov. 15, 1994, Ser. No. 339,962
Claims priority, application France, Nov. 19, 1993, 93 14075
Int. Cl.[6] F16D *3/44*
U.S. Cl. 464—154 **13 Claims**

1. A flexible coupling for two shafts rotatable generally about a common axis and having juxtaposed shaft ends, the coupling comprising:



respective end fittings fixed on the shaft ends and each having a radially outwardly directed outer surface formed with respective externally directed teeth;

an elastically compressible sleeve having an inner surface formed with inwardly directed teeth meshing with the teeth of both outer surfaces, a radially outwardly directed outer surface, and axially oppositely directed end surfaces;

rigid structure including a pair of axially spaced rings engaging the outer and end surfaces of the sleeve; and

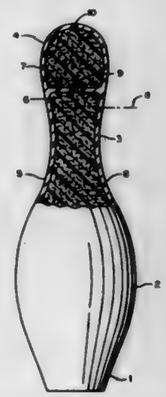
adjusting means including a plurality of axially extending and generally angularly equispaced bolts each having one end seated in one of the rings and an opposite end seated in the other ring for pressing the structure against the outer and end surfaces of the sleeve and thereby pressing the inner sleeve surface against the outer fitting surfaces with a variable force.

5,595,542

MATERIAL FILLED PLASTIC BOWLING PIN

Arnold Jäger, Gehrbergsweg 6, 31303 Burgdorf, Germany

Filed Jun. 2, 1995, Ser. No. 459,118
Claims priority, application Germany, Jul. 28, 1994, 44 26 729.0
Int. Cl.[6] A63K *9/00*
U.S. Cl. 473—118 **13 Claims**



1. A plastic bowling pin, for bowling lanes, comprising:

a hard shell having a hollow interior that contains material selected from the group consisting of cellular and porous material; and

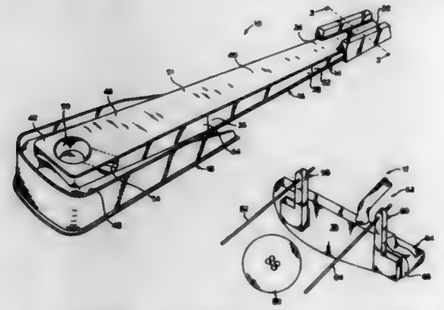
at least one partition disposed within said shell and dividing said hollow interior of said shell into at least two chambers, said at least one partition being provided with a single centrally disposed first hole extending therethrough as a venting hole.

5,595,543

GOLF PUTTING PRACTICE SYSTEM

Roger S. Wolk, 28 Malibu Colony, Malibu, Calif. 90265

Filed Oct. 27, 1995, Ser. No. 549,126
Int. Cl.[6] A63B *69/36;67/02*
U.S. Cl. 473—162 **24 Claims**



15. In combination with a putter having a head portion with a face plate, an apparatus comprising:

a. at least two L-shaped attachment members attachable to and forming a sweet spot therebetween on the face plate of the head portion of the putter, each attachment member having a horizontal leg, a vertical leg integrally connected to and upwardly extending from the horizontal leg and an aperture therethrough located at an upper portion of the vertical leg;

b. at least two guide pointers each installed to a respective one of said apertures of said at least two L-shaped attachment members and extending away from the face plate of the putter and above the head portion of the putter for providing line of sight for the golfer; and

c. means for removably attaching said at least two L-shaped attachment members to the face plate of the head portion of the putter which allow said at least two L-shaped attachment members to be repositioned on the face plate of the putter to increase or decrease a width of said sweet spot;

d. whereby said at least two L-shaped attachment members provide guiding spacers for properly hitting a golf ball, and when the golf ball is not stroked correctly on said sweet spot when it is stroked, the golf ball will be deflected by said respective one of said at least two L-shaped attachment members, and thereby causing an error on hitting the golf ball, and when the golf ball is stroked correctly on said sweet spot, and thereby the golf ball strikes said sweet spot on the putter, the golf ball will not be deflected.

5,595,544

PUTTER GRIP WITH STABILIZING MEMBERS

Harold R. Roelke, 13050 Gremoor Dr., Elm Grove, Wis. 53122-1815

Filed Dec. 27, 1995, Ser. No. 579,594
Int. Cl.[6] A63B *53/14;69/36*
U.S. Cl. 473—283 **18 Claims**

18. A putter comprising:

(A) a head having a heel, a toe, and a striking face;

(B) a putter shaft having a lower end attached to said head between said heel and said toe thereof and having an upper end located above said lower end; and

(C) a grip which includes



(1) an elongated molded body which is generally cylindrical in shape so as to have a longitudinal axis and which is mounted over said upper end of said shaft, said grip including a body, said body having

(a) an upper end which is at least partially closed,

(b) an open lower end,

(c) front and rear surfaces which are located in a common plane with said toe and said heel of said head and which extend from said lower end to said upper end, and

(d) a pair of side surfaces each extending from said lower end to said upper end; and

(2) first and second generally planar stabilizing members located between said lower and upper ends of said body in a common vertical plane with said heel of said head and said toe of said head, said first stabilizing member at least selectively extending generally radially forwardly from said front surface of said body and presenting a bottom surface which is designed to be engaged by a first finger of a golfer when gripping said grip, said second stabilizing member at least selectively extending generally radially rearwardly from said rear surface of said body and presenting a bottom surface which is designed to be engaged by another finger of said golfer when gripping said grip, said second stabilizing member being located below said first stabilizing member.

5,595,545

GOLF SWING TRAINING TRACK APPARATUS

Timothy M. O'Brien, Seatac, Wash., assignor to Track Trainer, Inc., Seattle, Wash.

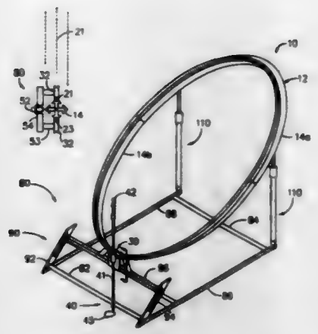
Filed Oct. 3, 1995, Ser. No. 538,435
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—259 **31 Claims**

24. A golf swing training apparatus of the circular track type for conditioning muscle memory in proper swing technique comprising the improvements of:

a circular hoop providing a club swing guide track;

a multi-wheeled cart mounted to ride on said hoop and be guided by said hoop track in a swing plane parallel to said hoop;

a golf club having a head and grippable handle at opposed ends of a club shaft;



a club-to-cart attachment having a rotatable and slidable bearing cooperating with said shaft intermediate said head and handle, and a pivot connecting said bearing to said cart so that said club rotates about its axis in said bearing, slides lengthwise along its axis in said bearing, and pivots at a moving point along said shaft in a plane orthogonal to that of said hoop; and

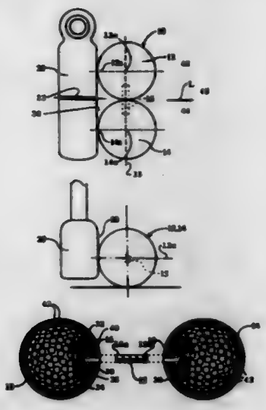
a base mounting said hoop with its plane inclined upwardly, whereby a user stands inside said hoop and swings the club in a backswing, power stroke and followthrough guided by the cart riding on the hoop.

5,595,546

GOLF PUTTING AID

Albert D. Masters, P.O. Box 132, Washington, Okla. 73093

Filed Aug. 14, 1995, Ser. No. 514,912
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—280 5 Claims



1. A golf putting aid comprising:

first and second golf balls having surfaces, each of said golf balls having a passage formed therein; and

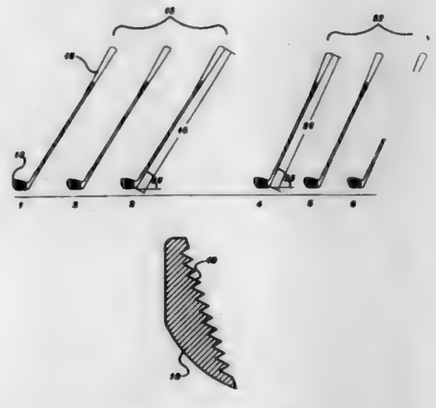
a connector having ends extending into said passages and urging said surfaces of said first and second golf balls into abutting relation forming tangent points between said first and second golf balls such that a line of sight from a golf club to a golf hole passes through the tangent points between said golf balls so that a golfer sees the same alignment that he will use when striking a conventional golf ball.

5,595,547

MATCHED GOLF CLUB SET HAVING V-SHAPED GROOVES THAT CHANGE FROM CLUB TO CLUB

Carl W. Lekavich, 21529 Mesilo Ave., Torrance, Calif. 90502

Filed Mar. 10, 1995, Ser. No. 401,905
Int. Cl.[6] A63B 53/00
U.S. Cl. 473—287 9 Claims



1. A set of golf club irons comprising:

a first, a second and a third subset of clubs, each subset containing at least one club, each club comprising:

a grip for grasping and controlling said club, said grip having a central axis;

a shaft having a first and a second end, a shaft length and a central axis coincident with said central axis of said grip, said first end of said shaft being fixed relative to said grip; and

a head having:

a face having a surface area for contacting a ball, said face further having a sweet spot, a loft angle and a plurality of horizontal, substantially parallel V-shaped grooves, each groove having an upper and a lower shelf, said lower shelf extending into its face forming an included angle of 90 to 120 degrees with respect to the face of each club within said first and said second subset of clubs, said upper shelf extending into its face forming an included angle of 90 to 115 degrees with respect to the face of each club within said third subset of clubs; and

a hosel fixing said head relative to said second end of said shaft, said hosel being dimensioned and configured to define an angle between said head and said shaft, said angle being supplementary to a lie angle;

wherein all of the clubs in said first subset of clubs have a first lie angle and a first shaft length, all of the clubs in said second subset of clubs have a second lie angle and a second shaft length, and all the clubs in said third subset of clubs have a third lie angle and a third shaft length; said third lie angle being greater than said second lie angle which is in turn greater than said first lie angle, and said third shaft length being shorter than said second shaft length which is in turn shorter than said first shaft length; and

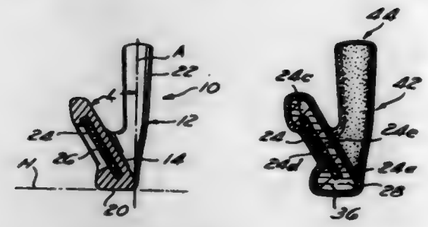
all of the clubs in each said subset of clubs having a common swing weight.

5,595,548

METHOD OF MANUFACTURING GOLF CLUB HEAD WITH INTEGRAL INSERT

William C. Beck, Rancho Palos Verdes, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Feb. 15, 1995, Ser. No. 388,762
Int. Cl.[6] A63B 53/04
U.S. Cl. 473—324 8 Claims



1. A golf club head comprising:

a head body defining a front striking face, a rear face, and an interior cavity having a peripheral sidewall, said rear face having a window formed therein which communicates with the interior cavity, said window including a peripheral edge which is disposed inwardly relative to the peripheral sidewall; and

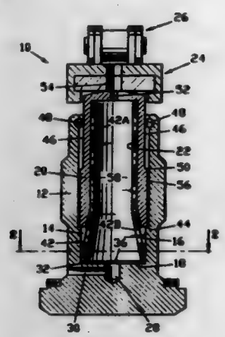
a pre-formed ceramic insert disposed within the interior cavity; said head body being formed about said ceramic insert to facilitate the rigid capture of the ceramic insert within the interior cavity of the head body in a manner preventing the non-destructive removal of the ceramic insert from within the interior cavity.

5,595,549

HYDRAULIC TENSIONER WITH LUBRICATOR FOR IC ENGINE TRANSMISSION CHAIN

Patrick Jarrand, Seyssins, France, assignor to Sacha Industries S.A. (Huret et Maillard Reunis), Chepy, France

Filed Dec. 27, 1994, Ser. No. 364,453
Claims priority, application France, Jan. 17, 1994, 94 00438
Int. Cl.[6] F16H 57/04
U.S. Cl. 474—91 9 Claims



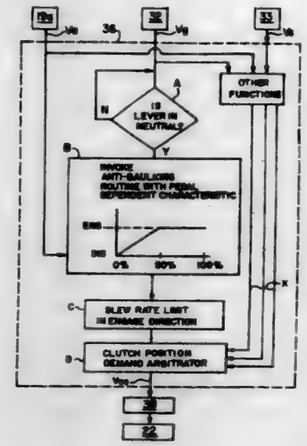
1. Hydraulic tensioner for an endless connection element, in particular for a transmission chain of an internal combustion engine, said tensioner comprising in combination: a body defining a cylindrical cavity having a blind inner end, a piston slidably mounted in said cavity, and a pressure shoe associated with said piston so as to be biased by said piston into contact with said endless connection element and thereby put said endless connection element under tension, said blind inner end of said cavity defining an orifice for connection of said cavity to a source of liquid under pressure, and a resilient blade constituting a check valve associated with said orifice whereby said orifice is closable, said resilient blade being part of a disc and is defined by a cutting line having an open contour formed in said disc, said disc being placed against said blind inner end of said cavity, and a compression helical spring provided in said cavity between said piston and said disc for holding said disc against said blind inner end of said cavity, there being an axial blind bore in said piston, said compression spring having a first end portion which is disposed in said axial blind bore and includes spring coils of constant diameter, and a second end portion in contact with a peripheral edge portion of said disc and a lateral surface of said cavity and including spring coils having diameters which increases in a direction away from said first end portion, and means for ensuring a minimum axial spacing between an inner end of said piston in said body and said second end portion of said spring of larger diameter.

5,595,550

CLUTCH CONTROL SYSTEM

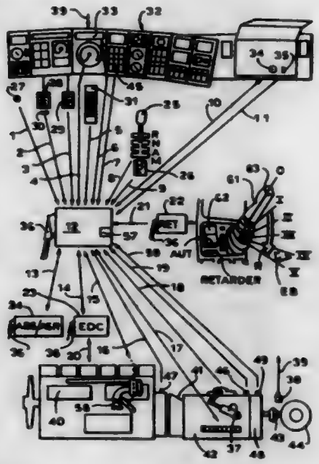
Roger P. Jarvis, Leominster, and Charles J. Jones, Coventry, both of United Kingdom, assignors to Automotive Products, plc, Leamington Spa, England

PCT No. PCT/GB95/00184, § 371 Date Feb. 7, 1995, § 102(e) Date Feb. 7, 1995, PCT Pub. No. WO95/21070, PCT Pub. Date Aug. 10, 1995
PCT Filed Jan. 30, 1995, Ser. No. 532,697
Claims priority, application United Kingdom, Feb. 1, 1994, 9401900
Int. Cl.[6] B60K 41/02; F16H 61/04
U.S. Cl. 477—84 14 Claims



1. A clutch control system for the automatic control of a motor vehicle clutch (14) which connects an engine (10) with a gearbox (12) under the control of a driver-operated gear ratio selector lever (24), the control system controlling initial clutch take-up on starting of the vehicle, clutch re-engagement following each ratio change, clutch disengagement on movement of the gear selector lever to change the operative ratio of the gearbox, and clutch disengagement on the coming to rest etc. of the vehicle, the clutch control system being characterised in that, if the gear selector lever (24) is in its neutral position, an anti-baulking routine is enabled which allows engagement of the clutch (14) by increasing the engine speed (Ve) above an idle level.

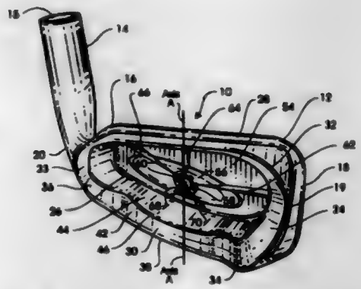
5,595,551
METHOD FOR CONTROL OF ENGINE TORQUE DURING GEAR CHANGING
Lars-Gunnar Hedström, Vagnhärad; Roger Andersson; Göran Söderman, both of Södertälje, and Torbjörn Gustavsson, Nyköping, all of Sweden, assignors to Scania CV Aktiebolag, Sweden
Filed May 8, 1995, Ser. No. 436,622
Claims priority, application Sweden, May 13, 1994, 9401653
Int. Cl.[6] B60K *41/08*
U.S. Cl. 477—109 16 Claims



1. A method in an automatic computer controlled control system for changing gears in a mechanical stepped gear box in a vehicle powered by a combustion engine for reducing the torque delivered by the engine in connection with the disengagement of a gear, which method comprises the steps of:
(a) measuring the acceleration of the engine a_m;
(b) determining an acceleration factor M_a as a function of the measured engine acceleration a_m;
(c) before disengagement of a gear reducing the torque delivered by the engine to a zero-torque level M_0 which is a function at least of the acceleration factor M_a;
(d) disengaging the gear; and
(e) after disengagement of the gear, accelerating the engine to a value corresponding to the engines instantaneous value of acceleration of the engine before disengagement of the gear.

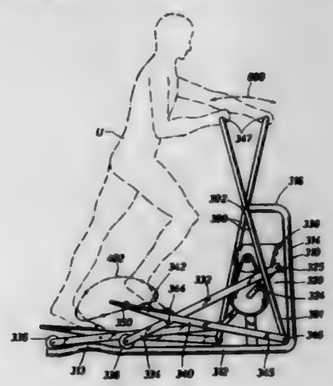
5,595,552
GOLF CLUB HEAD WITH TUNING AND VIBRATION CONTROL MEANS
David E. Wright, Glendale; John A. Solheim, and Daniel J. Kubica, both of Phoenix, all of Ariz., assignors to Karsten Manufacturing Corp., Phoenix, Ariz.
Filed Dec. 15, 1995, Ser. No. 573,525
Int. Cl.[6] A63B *53/04*
U.S. Cl. 473—332 16 Claims

1. A golf club head comprising:
a body having a heel end, a toe end, a front face arranged for impact with a golf ball, a back face disposed rearwardly of said front face, and a perimeter weighting element protruding rearwardly away from said front face defining a cavity in said back face, said cavity having a bottom surface;
said perimeter weighting element including a top rail and a sole, said top rail extending between said body heel and toe ends along an upper portion of said body, and said sole extending between said body heel and toe ends along a lower portion of said body;



a plurality of ribs disposed in said cavity for eliminating undesirable vibrations in the club head caused when said front face impacts a golf ball and for attenuating other vibrations in the club head, each of said ribs having an outer end that merges with said perimeter weighting element;
a geometric region formed in said bottom surface of said cavity for assisting said plurality of ribs in eliminating said undesirable vibrations and in attenuating said other vibrations, said body having a center of gravity located within said geometric region; and
a ring formed integrally with and rising above said geometric region, said ring encircling said center of gravity.

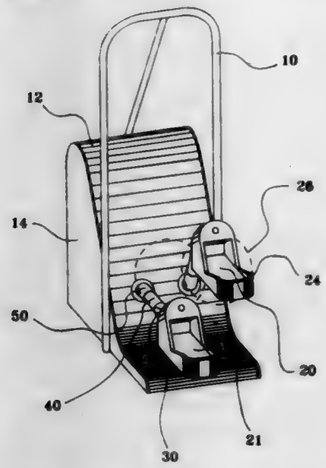
5,595,553
STATIONARY EXERCISE APPARATUS
Robert E. Rodgers, Jr., Houston, Tex., assignor to CCS, LLC, Denver, Colo.
Continuation-in-part of Ser. No. 377,846, Jan. 25, 1995, Pat. No. 5,573,488,. This application Feb. 16, 1996, Ser. No. 602,662
Int. Cl.[6] A63B *69/16;22/04*
U.S. Cl. 482—51 7 Claims



1. An exercise device comprising:
a frame having a base portion adapted to be supported by a floor, said base portion having a curved portion;
a first linkage assembly having a first reciprocating member and a first foot member, said first reciprocating member having a first end and a second end, said first end of said first reciprocating member being adapted to contact said curved portion of said base portion, said first foot member having a first and second end, said first foot member being pivotally attached proximate said first end of said first foot member between said first and second ends of said first reciprocating member proximate said first end of said first reciprocating member;

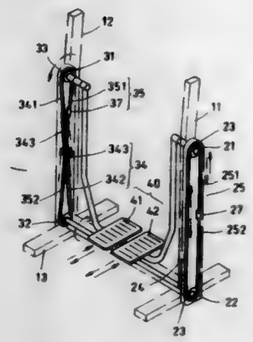
a second linkage assembly having a second reciprocating member and a second foot member, said second reciprocating member having a first end and a second end, said first end of said second reciprocating member being adapted to contact said curved portion of said base portion, said second foot member having a first and second end, said second foot member being pivotally attached proximate said first end of said second foot member between said first and second ends of said reciprocating member proximate said first end of said second reciprocating member; and
a coupling member having a pulley supported by said frame defining a pivot axis and means for attaching said second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in the rotation of the second ends of said reciprocating members in a substantially circular path about said axis and wherein each foot of the user of the device follows a predetermined closed path having a preferred anatomical pattern.

5,595,554
ROTO STEPPER EXERCISE MACHINE
Joseph D. Maresh, 19919 White Cloud Cir., West Linn, Oreg. 97068
Continuation-in-part of Ser. No. 221,529, Apr. 1, 1994, abandoned. This application Aug. 8, 1994, Ser. No. 287,526
Int. Cl.[6] A63B *22/04*
U.S. Cl. 482—52 20 Claims



1. A step type exercise machine comprising:
(a) a frame,
(b) said frame having a forward and rearward direction,
(c) said frame having a horizontal transverse direction generally perpendicular to said frame forward and rearward direction.
(d) a first foot platform support member rotatably mounted to said frame at a first foot platform support member inner end,
(e) a first foot platform support member rotational axis about which said first foot platform support member rotates,
(f) said first foot platform support member rotation axis being perpendicular to said frame transverse direction,
(g) a second foot platform support member rotatably mounted to said frame at a second foot platform support member inner end,
(h) a second foot platform support member rotational axis about which said second foot platform support member rotates,
(i) said second foot platform support member rotation axis being perpendicular to said frame transverse direction,
(j) said first foot platform support member rotational axis and said second foot platform support member rotational axis being substantially parallel and spaced apart transversely with respect to said machine frame,
(k) a first foot platform support member outer end,
(l) a second foot platform support member outer end,
(m) said first foot platform support member outer end having a first foot platform support member outer end axis being offset and parallel from said first foot platform rotational axis,
(n) said second foot platform support member outer end having a second foot platform support member outer end axis being offset and parallel from said second foot platform rotational axis,
(o) means rotatably connecting said first foot platform support member to said second foot platform support member,
(p) said means rotatably connecting said first foot platform support member to said second foot platform support member such that said first foot platform support member and said second foot platform support member are always caused to counter rotate at approximately the same angular velocity,
(q) a first foot platform rotatably connected to said first foot platform support member outer end and having a first foot platform rotational axis coaxial with said first foot platform support member outer end axis,
(r) a second foot platform rotatably connected to said second foot platform support member outer end and having a second foot platform support member rotational axis coaxial with said second foot platform support member outer end axis.

5,595,555
WALKING EXERCISE APPARATUS
David Chen, P.O. Box 63-150, Taichung, Taiwan
Filed May 14, 1996, Ser. No. 647,556
Int. Cl.[6] A63B *22/00*
U.S. Cl. 482—51 3 Claims



1. An improved walking exercise apparatus, .comprising: a main frame consisting of a left upright upright support, a right upright support and a base with its ends connected to the respective bottom ends of said left and right upright supports, said base having a transversely disposed rotary shaft provided thereon;
a positive drive means consisting of an upper drive chain wheel and a lower drive chain wheel respectively disposed at the ends of said right upright support, said lower drive chain wheel being coaxially secured with one end of said rotary shaft, said upper drive chain wheel and said lower drive chain wheel each having a section of a drive chain engaging a circumferential rim thereof, said drive chain on said upper drive chain wheel having both ends connected to the ends of said drive chain on said lower drive chain wheel by means of two lath-like rigid connecting elements, one of said connecting elements being cut into two parts at a suitable position, said two parts having fixedly provided therein respective screw rods which are joined and positioned by means of a hollow sleeve fitted thereon, said sleeve having both ends pivotally provided with respective adjusting screws which

screwably lock with said screw rods to allow axial pulling or releasing of said positive drive means;

a reverse drive means consisting of an upper drive wheel and a lower drive wheel respectively disposed at the ends of said left upright support, said lower drive wheel thereof being coaxially secured with the other end of said rotary shaft, said upper drive chain wheel and said lower drive chain wheel each having a section of a drive chain engaging a circumferential rim thereof, said drive chain on said upper drive chain wheel having both ends connected to the ends of said drive chain on said lower drive chain wheel by means of two lath-like rigid connecting elements which are arranged in a slanting position and a cross relationship, one of said connecting elements being cut into two parts at a middle section thereof, said parts being joined by two connecting strips of a pre-determined length such that a space is defined between said connecting strips for passage of the other of said connecting elements; and

two suspension bars respectively, pivotally disposed at the inner sides of said left and right upright supports near their upper ends, said suspension bars being coaxially secured with said upper drive chain wheels of said left and right upright supports respectively to allow forward and rearward pivotal swinging movement, said suspension bars respectively having a foot rest at a bottom end thereof.

5,595,556

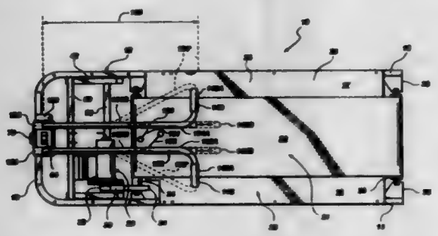
TREADMILL WITH UPPER BODY SYSTEM

William T. Dalebout, and Scott R. Watterson, both of Logan, Utah, assignors to ICON Health & Fitness, Inc., Logan, Utah

Continuation-in-part of Ser. No. 13,637, Feb. 4, 1993, Pat. No. 5,282,776, which is a continuation-in-part of Ser. No. 954,299, Sep. 30, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,582

Int. Cl.[6] A63B *22/02;21/015*

U.S. Cl. 482—54 5 Claims



1. A treadmill having structure operable for exercising the upper body of a user, said treadmill comprising:

a frame having a front end, a rear end, and laterally spaced right and left sides;

a movable endless belt rotatably mounted to said frame rearward of said front end and between said right and left sides, said endless belt being formed to support a user thereon;

first and second rigid lever arms each having an upper end and each being pivotally mounted proximate said front end for back and forth movement about a common axis, said common axis being located proximate and above said front end and below said upper end;

resistance means positioned and connected to frictionally resist back and forth pivotal movement of said first and second rigid lever arms; and

locking means for selectively locking said first and second rigid lever arms in a non-moving position.

5,595,557

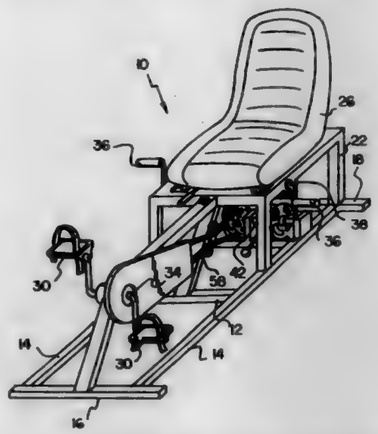
EXERCISE MACHINE WITH TWO SETS OF PEDALS

Lloyd J. Lambert, Sr., and Lloyd J. Lambert, Jr., both of 13001 Nyack, #14558, Houston, Tex. 77089

Filed Aug. 21, 1995, Ser. No. 517,219

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—57 5 Claims



1. A new and improved stationary exercise machine with two sets of pedals comprising, in combination:

a rectangular frame of a rigid configuration positionable upon a recipient surface such as a floor, the frame having long parallel side edges and short parallel forward and rearward edges therebetween;

a raised support in a box-like configuration extending upwardly from the rearward portion of the frame;

a seat portion positioned upon the support for the receipt of a user;

a forward set of foot pedals secured on a first horizontal axis with respect to the frame adjacent to the forward end thereof, the pedals adapted to be rotated by the feet of a user;

a rearward set of hand pedals secured on a second horizontal axis with respect to the support adjacent to the upper extent thereof for being held and rotated by the hands of a user;

a central drive shaft located intermediate the first axis and second axis parallel with the forward and rearward ends of the frame;

axially displaced sprockets on the first axis and second axis respectively for coupling the hand and foot pedals with the central drive shaft;

a set of axially displaced sprockets on the central drive shaft with chains coupling the foot and hand pedals with the drive shaft; and

an operator controlled adjustable transmission mechanism with a lever on the central drive shaft to vary the force required to rotate the foot and hand pedals.

5,595,558

EXERCISER

Daniel R. Moon, 148 Maplewood, Riverside, Ill. 60546

Filed Oct. 10, 1995, Ser. No. 541,302

Int. Cl.[6] A63B *21/00*

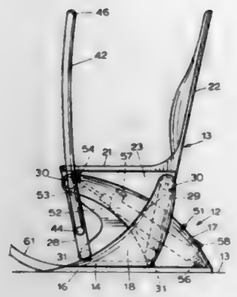
U.S. Cl. 482—72 16 Claims

1. An exerciser comprising

a) a support base;

b) a seat;

c) pivot link means including upper and lower end portions, said upper end portion being connected to said support base and said lower end portion being connected to said seat, whereby said pivot link means suspends said seat from said support base in rocking motion;



d) resistance means for restraining said rocking motion of said seat relative to said base; and

e) manually operated force arm means connected to said pivot means for moving said pivot means to produce said rocking motion.

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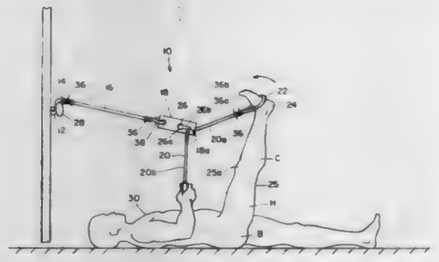
MUSCLE STRETCHING APPARATUS AND METHOD

Joseph E. Viel, 55 Portland St., Lawrence, Mass. 01843

Filed Jul. 24, 1995, Ser. No. 505,866

Int. Cl.[6] A63B *21/002*

U.S. Cl. 482—91 23 Claims



1. A stretching apparatus comprising:

a foot coupler for coupling to a foot of a user;

a first flexible connecting member having a distal end, the distal end of the first connecting member being coupled to the foot coupler;

an adjustable locking device for adjustably locking to the first connecting member, the distance between the foot coupler and the locking device being adjustable, the locking device capable of being continuously lockable;

a second flexible connecting member coupled to the locking device, the second connecting member having an anchoring end;

an anchoring device coupled to the anchoring end of the second connecting member for anchoring the stretching apparatus to a fixed element; and

a handle extending downwardly from the locking device for pulling the locking device downwardly relative to the foot coupler and the anchoring device.

5,595,560

DIE MANAGEMENT METHOD FOR PUNCH PRESS

Ikuo Kamada, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

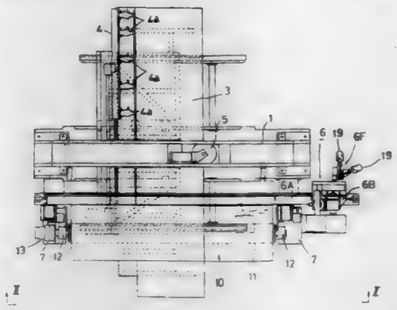
PCT No. PCT/JP94/01735, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO95/11098, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 14, 1994, Ser. No. 446,740

Claims priority, application Japan, Oct. 19, 1993, 5-260910; Dec. 24, 1993, 5-327655

Int. Cl.[6] B23Q *3/155*

U.S. Cl. 483—1 12 Claims



1. A die management method for a punch press provided with a die replacement system, the method comprising the steps of:

storing die information on an upper die and on a lower die to be used for pressing operation and storing die assembly information on a die assembly in which the upper and lower dies are combined in a pair;

storing information on the address of the die assembly stocked in the punch press in connection with the die assembly information; and

performing die replacement by fetching the die assembly according to the die assembly information to start punching operation.

5,595,561

LOW-TEMPERATURE METHOD FOR CONTAINING THERMALLY DEGRADABLE HAZARDOUS WASTES

Dennis L. Bean; Lillian D. Wakeley; Judy C. Tom; Melvin C. Sykes; William N. Brabston, and Philip G. Malone, all of Vicksburg, Miss., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 29, 1995, Ser. No. 521,302

Int. Cl.[6] B09B *3/00;* G21F *9/00*

U.S. Cl. 588—255 9 Claims



1. A hazardous waste pellet, comprising:

(a) a core formed of a mixture of hazardous waste and an organic polymer;

(b) an intermediate layer of epoxy surrounding said core; and

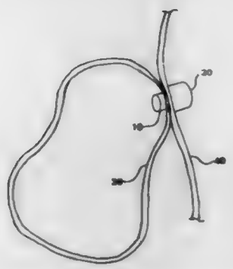
(c) an outer coating of silicate-based powder covering said intermediate layer, whereby said pellet can be used as an aggregate in a concrete mixture.

7. A method for forming a composite wasteform for storage and disposal of thermally degradable hazardous waste, comprising the steps of:

(a) processing the hazardous waste at room temperature to form a plurality of separate pellets;

(b) mixing said pellets with a solidifiable liquid to form a pellet-liquid mixture; and
(c) allowing said liquid to solidity, whereby said pellets are encased in the composite wasteform;
(d) maintaining said liquid at a density greater than the density of said pellets;
(e) pouring said pellet-liquid mixture into a rotatable mold and rotating said mold, whereby said pellets become concentrated away from the perimeter of the wasteform; and
(f) wherein said solidifiable liquid is a concrete mixture.

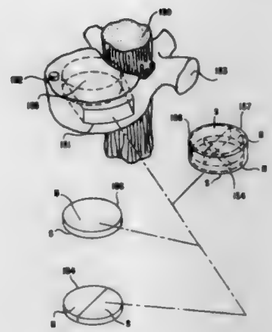
5,595,562
MAGNETIC ENTERAL GASTROSTOMY
Jonathan F. Grier, Shrevport, La., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.
Filed Nov. 10, 1994, Ser. No. 337,103
Int. Cl.[6] A61B *17/11*
U.S. Cl. 600—12 **27 Claims**



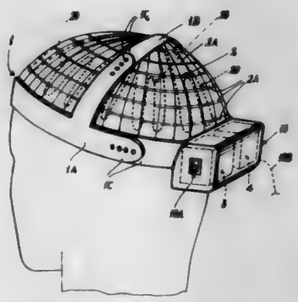
1. A method for performing a gastrostomy, said gastrostomy producing an opening from the interior of a patient's stomach through the patient's stomach wall and abdominal wall, comprising the steps of:
introducing a first magnet into the stomach;
placing said first magnet on the stomach wall adjacent to the abdominal wall;
placing a second magnet on the outside of the abdominal wall opposite, and relative to, said first magnet whereby said first magnet and said second magnet are drawn together compressing a portion of the stomach wall and a portion of the abdominal wall to produce local ischemia between said first magnet and said second magnet; and
allowing said first magnet and said second magnet to remain in place for a time sufficient to form a tract substantially through the stomach wall and the abdominal wall thereby forming a gastrostoma adherent to the abdominal wall.

5,595,563
METHOD AND APPARATUS FOR MAINTAINING THE POSITION OF BODY PARTS
Roger G. F. Meiselas, 4875 SW. 28th Ave., Fort Lauderdale, Fla. 33312
Filed Sep. 5, 1995, Ser. No. 523,265
Int. Cl.[6] A61M *13/00*
U.S. Cl. 600—12 **42 Claims**

1. A method for repositioning integral bones to a desired position, which comprises attaching a magnetic positioning device to opposite sides of the integral bones, and adjusting the positioning device for repositioning the bones to the desired position.



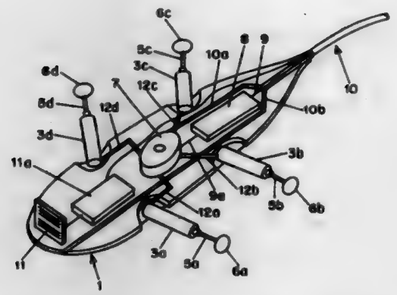
5,595,564
DEVICE FOR RETARDING HAIR LOSS AND FOR STIMULATING ITS REGROWTH
Marco Pinna, Induno Olona, Italy, assignor to Biofarm S.R.L., Milan, Italy
Filed Nov. 18, 1994, Ser. No. 344,692
Claims priority, application Italy, Nov. 26, 1993, MI932505 U
Int. Cl.[6] A61N *1/00*
U.S. Cl. 600—14 **5 Claims**



1. A device for retarding hair loss and for stimulating its regrowth, comprising:
an electrical pulse generator connected to an electrically conducting cable extending within a shaped structure to be applied to a person's skull, said cable being distributed in the form of loops, said generator providing to said cable electrical pulses for generating a pulsating electromagnetic field around said cable having an intensity of at least one gauss in proximity to the conducting cable, and wherein the intensity of said field is essentially negligible at approximately 5 mm from a surface of said conducting cable.

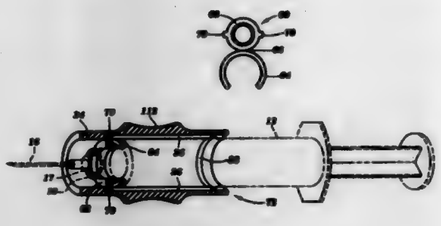
5,595,565
SELF-PROPELLED ENDOSCOPE USING PRESSURE DRIVEN LINEAR ACTUATORS
Michael R. Treat, New York, N.Y., and William S. Trimmer, Belle Meade, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.
Filed Jun. 30, 1994, Ser. No. 268,641
Int. Cl.[6] A61B *1/00*; G01D *21/00*
U.S. Cl. 600—114 **44 Claims**

1. An articulated endoscope for performing endoscopic procedures in a tubular organ of a patient comprising:
a single chassis;



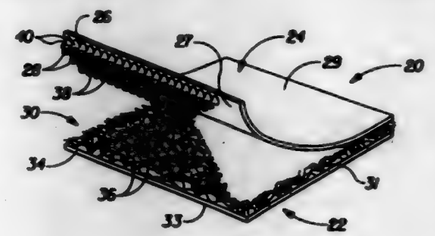
four pressure driven linear actuators mounted, by proximal ends, in two oppositely facing pairs to the chassis, whereby said proximal ends of said four pressure driven linear actuators are mounted to respective mounting points on the single chassis and the respective mounting points do not move relative to one another;
control means mounted to the chassis for storing a predetermined pressure distribution sequence therein and for outputting the predetermined sequence in response to a directional input from a user;
means for receiving and distributing pressure to the four pressure driven linear actuators in the predetermined pressure distribution sequence in response to control signals from the control means, the means for receiving and distributing being mounted to the chassis; and
a tube delivering pressure to the means for receiving and distributing pressure, whereby self propelled motive force is produced by pushing against interior surfaces of the tubular organ with distal ends of the four pressure driven linear actuators as pressure is applied to the four pressure driven linear actuators in the predetermined pressure distribution sequence.

5,595,566
APPARATUS FOR SHIELDING A SYRINGE NEEDLE
Anthony J. Valielunga, Albany, N.Y.; Thomas T. Paquin, Shaftsbury, Vt., and Brian Crawford, Valatie, N.Y., assignors to Unique Management Enterprises, Inc., Albany, N.Y.
Continuation-in-part of Ser. No. 381,193, Jan. 31, 1995, Pat. No. 5,498,243. This application Dec. 8, 1995, Ser. No. 569,800
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—197 **8 Claims**



1. A syringe assembly comprising:
a syringe housing having a main body and a restricted end;
a needle attached to the restricted end of said syringe housing;
a flexible snap ring mounted about the restricted end of said syringe housing;
a tubular collar mounted about the restricted end of said syringe housing adjacent said flexible snap ring, said tubular collar including at least one radially extending projection;
hinge means for pivotally securing said flexible snap ring to said tubular collar, said flexible snap ring, tubular collar and said hinge means forming an adapter assembly;
means for shielding said needle;
at least one longitudinally extending slot formed in an interior wall of said needle shielding means, each radially extending projection on the tubular collar of said adapter assembly slidably engaging a corresponding one of said longitudinally extending slots, the engagement between each projection and corresponding slot allowing said needle shielding means to be moved between an extended position surrounding and shielding said needle, and a retracted position in which said needle is exposed for use; and
groove means formed about an interior diameter of said needle shielding means, wherein said flexible snap ring extends into said groove means when said needle shielding means is moved to said extended position surrounding and shielding said needle, thereby permanently locking said needle shielding means in said extended position.

5,595,567
NONWOVEN FEMALE COMPONENT FOR REFASTENABLE FASTENING DEVICE
Willie F. King, and Mark J. Kline, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 9, 1994, Ser. No. 287,571
Int. Cl.[6] A61F *13/15*; A44B *1/04*
U.S. Cl. 604—391 **20 Claims**



1. A female component of a refastenable fastening device capable of engaging a complementary hook fastening component, said female component comprising:
a backing having an elongated orientation, a relaxed orientation, and a path of response along which said backing contracts from said elongated orientation to said relaxed orientation; and
a nonwoven web in contact with said backing, said nonwoven web comprising filaments having unsecured regions and fixed regions, said fixed regions comprising inter-fiber bonds joining said filaments and forming a nonwoven bonding pattern comprising a multiplicity of nonwoven bonding pattern elements; and

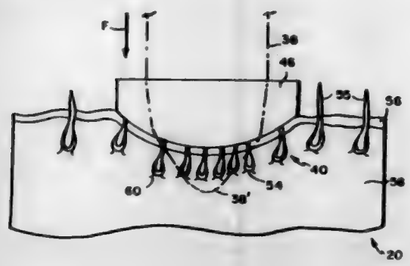
a construction bond pattern comprising at least one construction bond for joining said nonwoven web with said backing, said construction bond pattern intersecting with at least two points of each of said nonwoven bonding pattern elements, wherein said unsecured regions of said filaments are shirred when said backing is caused to return to its relaxed orientation, forming catching regions capable of entangling the male component of a refastenable fastening device.

5,595,568

PERMANENT HAIR REMOVAL USING OPTICAL PULSES

R. Rox Anderson, Lexington; Melanie Grossman, Boston, and William Farinelli, Danvers, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Feb. 1, 1995, Ser. No. 382,122
Int. Cl.[6] A61N 5/06
U.S. Cl. 606—9 22 Claims



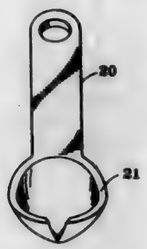
1. A method of simultaneously removing multiple hairs, each of which is in a corresponding follicle, from a skin region of a patient, said method comprising illuminating the hairs and follicles with a large-area optical radiation field delivered by a transparent device in contact with the skin region, wherein said illuminating heats the hairs and follicles so that the hairs are removed while leaving the skin region substantially free of injury.

5,595,569

SPOON SHAPED TICK REMOVER

Rick Hebbard, 97 Spruce Ln., Dover, N.H. 03820

Filed Sep. 7, 1994, Ser. No. 301,600
Int. Cl.[6] A61B 19/00
U.S. Cl. 606—131 7 Claims



1. A device for removing a blood sucking parasite such as a tick from a host comprising:

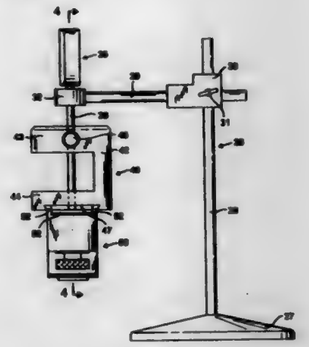
a spoon-shaped member having a handle with a scoop at one end, said scoop having a rim and an outer end opposite said handle, said rim and said handle lying in the same plane and said outer end having a single notch therein of a size and shape for permitting the scoop at said notch to be moved laterally across the surface of the skin of the host and passed between said parasite and the skin with said handle roughly perpendicular to said skin until said notch engages the parasite underneath the parasite's body; the notch being sized and configured so as to extract the parasite by further lateral movement of the notch relative to the parasite.

5,595,570

KERATOME WITH SPRING LOADED ADJUSTABLE PLATE, CUTTING LENGTH ADJUSTMENT PLATE, METHOD OF CUTTING A CORNEAL FLAP, AND GAUGE-MOUNTED BRACKET FOR ADJUSTING PLATE ON KERATOME HEAD

G. Richard Smith, Fountain Hills, Ariz., assignor to S.C.M.D., Ltd., Fountain Hills, Ariz.

Filed Dec. 6, 1994, Ser. No. 349,782
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—166 6 Claims



1. A keratome adjustment plate for measuring a desired length cut of cornea, comprising:

a plate having top and bottom surfaces and first and second side edges, said top surface with a transverse groove sized for sliding engagement with a keratome;

an aperture parallel to and within said groove for viewing a tip of a blade of said keratome; and

indicia on the bottom surface of said plate to measure the distance the tip of said blade travels within said plate from one of said side edges of said plate to said indicia.

5,595,571

BIOLOGICAL MATERIAL PRE-FIXATION TREATMENT

Norman Jaffe, Dana Point, and Warren B. Hancock, Newport Beach, both of Calif., assignors to Hancock Jaffe Laboratories, Irvine, Calif.

Filed Apr. 18, 1994, Ser. No. 229,452
Int. Cl.[6] A61L 17/00; D01C 3/00; A61F 2/02
U.S. Cl. 8—94.11 18 Claims

1. A controlled autolysis method for making a biological material substantially acellular, wherein the biological material that is to be made substantially acellular has structural integrity and comprises cells and non-cellular structural components, the controlled autolysis method comprising the step of:

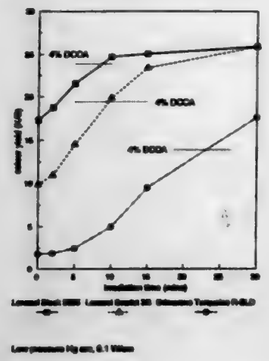
exposing the biological material, prior to any fixation thereof, to at least one buffered solution having a pH in the range from about 5.0 to about 8.0 and a temperature in the range from about 12° C. to about 30° C. for a sufficient period of time to permit autolytic enzymes within the cells to degrade said cells, whereby at least one region of the biological material is rendered substantially acellular while preserving the overall structural integrity and non-cellular structural components of the biological material.

5,595,572

WOOL AND WOOL-BLEND FABRIC TREATMENT

Keith R. Millington, Belmont, Australia, assignor to The Commonwealth of Australia Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

PCT No. PCT/AU94/00066, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO94/19526, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 15, 1994, Ser. No. 585,233
Claims priority, application Australia, Feb. 16, 1993, PL7272
Int. Cl.[6] D06M 10/04; D06L 3/02; 3/04
U.S. Cl. 8—103 14 Claims



1. A method of modifying the surface of a wool or wool blend fabric which comprises the successive steps of:

i) exposing the fabric surface to UV radiation; and

ii) oxidatively treating the fabric by exposing the fabric to an aqueous oxidative solution.

5,595,573

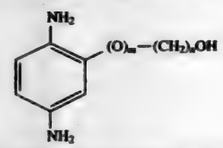
KERATIN FIBER DYEING COMPOSITIONS BASED ON A COMBINATION OF OXIDATION DYES AND CORRESPONDING DYEING PROCESSES

Marie-Pascale Audousset, Asnieres, and Mireille Maubru, Chatou, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 2, 1995, Ser. No. 552,277
Claims priority, application France, Nov. 2, 1994, 94 13081
Int. Cl.[6] A61K 7/13
U.S. Cl. 8—412 20 Claims

1. A dye composition for the oxidation dyeing of keratin fibers, said composition comprising, in a medium which is suitable for dyeing:

at least one first oxidation base or an acid addition salt thereof, said first oxidation base being 2,6-dimethyl-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, or a para-phenylenediamine of formula (I):



(I)

wherein m is an integer equal to zero or 1 and n is an integer ranging from 1 to 4, and

at least one second oxidation base, said second oxidation base being 3-methyl-6-aminophenol or an acid-addition salt thereof wherein all of said first and second oxidation bases together represent from 0.01 to 10% by weight of the total weight of the dye composition.

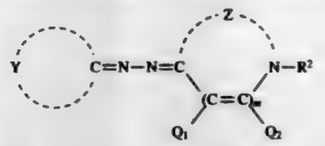
5,595,574

DYES AND DYE-DONOR ELEMENTS FOR USE IN THERMAL DYE TRANSFER

Wilhelmus Janssens, Aarschot, and Luc Vanmaele, Lochristi, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 169,335, Dec. 17, 1993, Pat. No. 5,468,258. This application May 23, 1995, Ser. No. 447,941
Claims priority, application European Pat. Off., Jan. 28, 1993, 93200138
Int. Cl.[6] D06P 5/00
U.S. Cl. 8—471 3 Claims

1. A dye donor element comprising a support having on one side thereon a dye layer comprising at least one unreacted heterocyclic hydrazono dye compound, and having on the other side thereon a slipping layer, wherein said at least one heterocyclic hydrazono dye corresponds to the following general formula (I):



(I)

wherein:

Z represents the atoms necessary to complete a heterocyclic ring system, or a substituted heterocyclic ring system, including a heterocyclic ring system carrying a fused-on aliphatic or aromatic ring system,

Y represents the atoms necessary to complete a heterocyclic coupler system or substituted heterocyclic coupler system,

R^2 represents an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an aryl group, or a substituted aryl group,

m is 0 or 1, and

each of Q_1 and Q_2 independently represents hydrogen or a substituent.

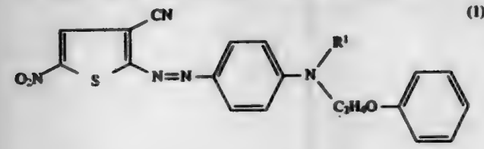
5,595,575

BLUE DISPERSE DYE MIXTURE

Kiyoshi Hinano; Toshio Hihara, and Ryoichi Sekioka, all of Kitakyushu, Japan, assignors to DyStar Japan Ltd., Osaka, Japan

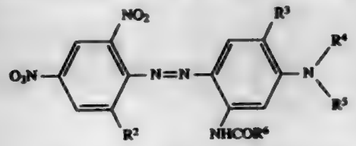
Filed Nov. 8, 1995, Ser. No. 555,171
Claims priority, application Japan, Dec. 2, 1994, 6-323965
Int. Cl.[6] C09B 67/22; D06P 3/54
U.S. Cl. 8—639 5 Claims

1. A blue disperse dye mixture comprising 1 part by weight of a monoazo dye of the following formula (1) and from 0.1 to 1.5 parts by weight of at least one azo dye selected from the group consisting of dyes of the following formulas (2), (3), (4) and (5):



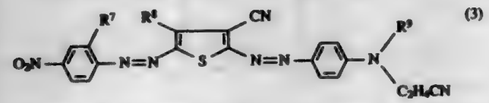
(1)

wherein R^1 is a C_1–C_5 alkyl group or an allyl group,



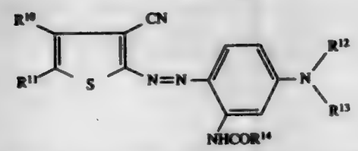
(2)

wherein R^2 is a halogen atom, R^3 is a hydrogen atom, a methoxy group, an ethoxy group or a C_1–C_3 alkoxy C_2 or C_3 alkoxy group, R^4 is a hydrogen atom, a C_1–C_5 alkyl group or an allyl group, R^5 is a C_1–C_5 alkyl group or an allyl group, and R^6 is a C_1–C_5 alkyl group,



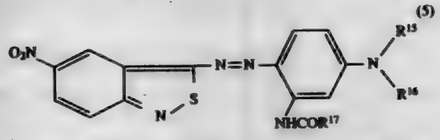
(3)

wherein R^7 is a hydrogen atom or a halogen atom, R^8 is a hydrogen atom, a methyl group, an ethyl group or a halogen atom, and R^9 is a C_1–C_5 alkyl group,



(4)

wherein R^{10} is a hydrogen atom or a halogen atom, R^{11} is a nitro group or a formyl group, each of R^{12} and R^{13} which are independent of each other, is a C_1–C_5 alkyl group, and R^{14} is a C_1–C_5 alkyl group, a C_1–C_3 alkoxymethyl group or a C_1–C_3 alkoxy C_2 or C_3 alkoxymethyl group,



(5)

wherein each of R^{15} and R^{16} which are independent of each other is a C_1–C_5 alkyl group, a C_1–C_3 alkoxy C_2 or C_3 alkyl group, and R^{17} is a C_1–C_5 alkyl group.

5,595,576

ENHANCING FUEL EFFICIENCY AND ABATING EMISSIONS OF ENGINES

Charles E. Cameron, 829 Amye St., Fayetteville, N.C. 28301

PCT No. PCT/US93/03992, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995, PCT Pub. No. WO93/21435, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 15, 1993, Ser. No. 325,283
Int. Cl.[6] C10L 1/24
U.S. Cl. 44—321 24 Claims

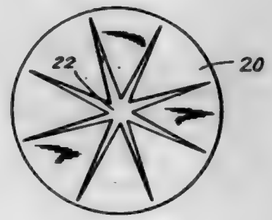
1. A method of enhancing fuel efficiency of an internal combustion engine, comprising including in the fuel upon which the engine is operating an effective amount of selenium to enhance the fuel efficiency of the engine, said effective amount being up to about 2 parts per million of selenium.

5,595,577

METHOD FOR MAKING A CARBONACEOUS HEAT SOURCE CONTAINING METAL OXIDE

Azzedine Bensalem, 134 Joralemon St., Brooklyn, N.Y. 11201; Sarojini Deevi; Seetharama C. Deevi, both of 8519 Whirlaway Dr., Midlothian, Va. 23112, and Donald M. Schleich, La Riandiere, Carquefou 44470, France

Division of Ser. No. 71,313, Jun. 2, 1993, Pat. No. 5,468,266.
This application May 19, 1995, Ser. No. 444,943
Int. Cl.[6] C10L 9/00; 11/00
U.S. Cl. 44—629 33 Claims



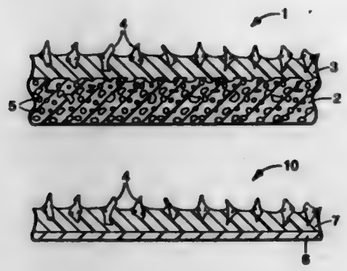
1. A smoking article comprising:
a carbonaceous heat source made according to the method comprising the steps of:
a) mixing a hydroxylated organic chemical, wherein the hydroxylated chemical compound is selected from the group consisting of diols and triols, and a metal oxide precursor to form a sol, wherein the metal oxide precursor is selected such that the formed metal oxide is an iron oxide, the metal oxide capable of reducing an amount of carbon monoxide produced upon combustion of the carbonaceous material;
b) heating the mixture from step a) to form a polymeric or oligomeric species containing the selected metal and organic species;
c) treating a carbonaceous material with the sol; and
d) heating the product of step c) to evaporate liquid from the sol and then decompose the polymeric or oligomeric species of the sol to form the metal oxide to form a heat source comprising the carbonaceous material and the metal oxide,
wherein said carbonaceous heat source is formed into a shape which fits within the smoking article and gases flow past or through it to be heated, and,
a flavor bed which is then heatable by the thus heated gases to release flavor, whereby flavor is provided to a smoker.

5,595,578

COATED ABRASIVES UTILIZING A MOISTURE CURABLE POLYURETHANE HOT MELT MAKE COATING

Roy Stubbs, Nuneaton; Michael J. Hughes, Staffordshire, and James F. Morris-Adams, Birmingham, all of Great Britain, assignors to Minnesota Mining and Manufacturing COmpany, St. Paul, Minn.

Filed Aug. 10, 1994, Ser. No. 288,404
Claims priority, application United Kingdom, Aug. 11, 1993, 93.16715
Int. Cl.[6] B24D 3/28; 3/32
U.S. Cl. 51—295 41 Claims



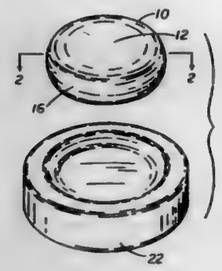
1. A coated abrasive comprising a substrate bearing a layer of a moisture-cured hot melt polyurethane adhesive having a plurality of abrasive particles at least partially embedded therein.

5,595,579

SOAP ABSORBING, SOAP DISPENSING CERAMIC STONE FOR SKIN EX-FOLIANT TREATMENT

Charles W. Atkinson, 514 N. Elmwood, Traverse City, Mich. 49684

Continuation-in-part of Ser. No. 192,121, Feb. 3, 1994, Pat. No. 5,472,459. This application Dec. 4, 1995, Ser. No. 567,093
Int. Cl.[6] B24D 11/00
U.S. Cl. 51—295 7 Claims



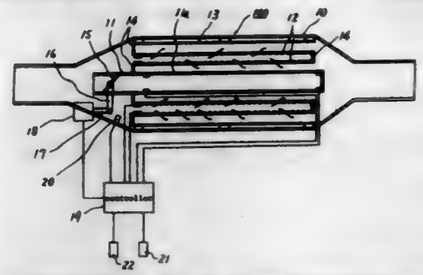
1. A porous ceramic abrasive oval body comprising 65% by weight of a mildly abrasive particulate, 35% by weight of a vitrified glass frit and clay bond and a plurality of interconnecting voids substantially uniform in size and distribution throughout the body, a convex top surface on the body, a concave bottom surface on the body and a circumferential sidewall surface on the body, the bottom and sidewall surfaces gently blending together to form generally rounded junctures between the bottom and sidewall surfaces, and the surfaces being interrupted by a multiplicity of the interconnecting voids to form a mildly abrasive surface.

5,595,580

DIESEL PARTICULATE FILTER AND CONTROL DEVICE THEREFOR

Hideo Kawamura, Sanmkawa-machi, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Kanagawa-ken, Japan

Filed May 12, 1995, Ser. No. 440,336
Claims priority, application Japan, May 12, 1994, 6-122989; May 12, 1994, 6-122990
Int. Cl.[6] B01D 29/62
U.S. Cl. 55—288 6 Claims



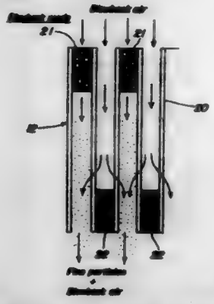
1. A diesel particulate filter for heating, burning and releasing diesel engine exhaust particulates collected therein, comprising:
a filter case,
a bypass pipe having a sub-filter, disposed within the filter case, said bypass pipe being provided with an open-close bypass valve in the vicinity of an inlet thereof,
a cylindrical main filter having laminating long fibers of ceramics, disposed between said bypass pipe and said filter case,
a wire net of electric resistance metal for heating said main filter fastened to a first surface of said main filter for receiving the exhaust, and
a reinforcing net plate of a heat resistant metal fastened to a second surface of said main filter for releasing the exhaust.

5,595,581

EXHAUST GAS FILTER AND APPARATUS FOR TREATING EXHAUST GASES

Yukihito Ichikawa; Yoshiyuki Kasai, and Yoshiro Ono, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 6, 1995, Ser. No. 466,776
Claims priority, application Japan, Jun. 10, 1994, 6-128750
Int. Cl.[6] B01D 46/00
U.S. Cl. 55—302 5 Claims



1. An apparatus for treating exhaust gas, comprising:
a honeycomb structure having a plurality of partition walls defining a plurality of throughholes extending along an axial direction, the honeycomb structure having first and second opposite axial ends, the throughholes forming two groups, a first group which is open at the first axial end and plugged via first sealing members at the second axial end, and a second group which is plugged via second sealing members at the

first axial end and open at the second axial end, wherein the first group of througholes is adapted to receive exhaust gas, the second group of througholes is adapted to receive blowback air, and the first sealing members have a three-dimensional micropore structure including interconnected pores that allow blowback air to pass therethrough such that said first sealing members have an air permeation time that is less than an air permeation time of the partition walls of the honeycomb structure; and

a device for receiving fine particles that are collected by the honeycomb structure and removed therefrom by flow of blowback air through the honeycomb structure.

5,595,582

FILTER INSERT

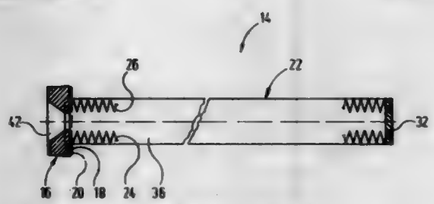
Jürgen Junker, Kurpfalzstr. 60, D-74889 Sinsheim, Germany

Filed Aug. 1, 1994, Ser. No. 298,090

Claims priority, application Germany, Sep. 1, 1993, 43 29 367.0

Int. Cl.[6] B01D *29/07*

U.S. Cl. 55—497 **13 Claims**



1. A back-flushable filter insert, comprising:

(a) a top section having means for attaching to a perforated plate of a filter casing;

(b) a pocket-shaped filter section fixed tightly against the top section, the filter section comprising (i) two lateral filter walls each folded in a zig-zag manner, (ii) an upper inherently rigid wall component, (iii) a lower inherently rigid wall component, and (iv) a rear inherently rigid wall component, wherein the filter walls and the wall components are connected to one another and to the top section in a fluid-tight and mechanically loadable structure to maintain a high degree of mechanical stability, both during application of a relatively low pressure to the filter insert during filtration and also during application of a relatively higher pressure to the filter insert during backflushing, and

at least one central internal component supporting the filter walls and positioned between the upper inherently rigid wall component and the lower inherently rigid wall component.

5,595,583

APPARATUS FOR LOCALIZED SURFACE GLAZING OF CERAMIC ARTICLES

Daniel E. Muraick, Bernardsville, N.J., assignor to Rutgers, The State University, Piscataway, N.J.

Division of Ser. No. 15,568, Feb. 9, 1993, Pat. No. 5,427,825. This application Feb. 21, 1995, Ser. No. 391,610

Int. Cl.[6] C03C *23/00*

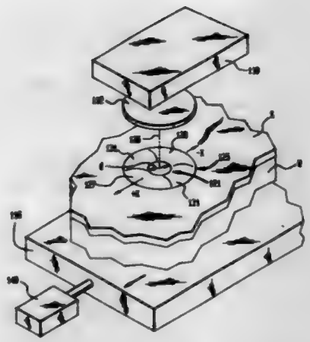
U.S. Cl. 65—350 **4 Claims**

1. Apparatus for treating a ceramic article comprising:

(a) means for holding a ceramic article and maintaining the ceramic article at a bulk temperature below the annealing temperature of the article;

(b) means for providing a beam of radiant energy and directing said beam of radiant energy onto only a portion of a surface of said article so that said beam at said surface has one or more beam dimensions and a power distribution; and

(c) means for adjusting said beam directing means so that said beam at said surface in said region has a preheating beam



dimension during a preheating period, then has a fusing beam dimension smaller than said preheating beam dimension during a fusing period later in time than said preheating period and then has an annealing beam dimension larger than said fusing beam dimension during an annealing period later in time than said fusing period, and so that said radiant energy in the beam causes melting within said portion of said surface while the article is maintained at said bulk temperature by said holding and maintaining means.

5,595,584

METHOD OF ALTERNATE COMMINGLING OF MINERAL FIBERS AND ORGANIC FIBERS

James E. Loftus, and Michael T. Pellegrin, both of Newark, Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Dec. 29, 1994, Ser. No. 367,834

Int. Cl.[6] C03C *14/00*; C03B *37/04*

U.S. Cl. 65—442 **20 Claims**

1. A method for producing mineral fibers comprising:

a. centrifuging mineral fibers from one or more rotary mineral fiber spinners to establish one or more downwardly moving veils of mineral fibers positioned above a collecting surface;

b. centrifuging organic fibers from molten organic material using one or more rotary organic fiber spinners to establish one or more downwardly moving veils of organic fibers positioned above the collecting surface, the veils of mineral fibers being generally colinear with the veils of organic fibers, where the rotary mineral fiber spinners and the rotary organic fiber spinners are arranged so that they are not coaxial and so that there is an overlapping of at least one of the veils of organic fibers with at least one of the veils of mineral fibers to integrate the organic material and the mineral fibers; and,

c. collecting the integrated organic material and mineral fibers on the collecting surface.

5,595,585

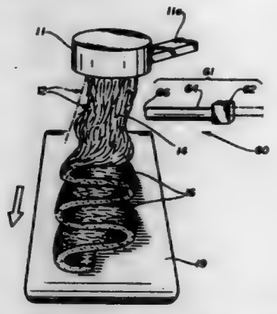
LOW FREQUENCY SOUND DISTRIBUTION OF ROTARY FIBERIZER VEILS

David P. Aschenbeck, and Michael T. Pellegrin, both of Newark, Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Filed May 2, 1994, Ser. No. 236,861

Int. Cl.[6] C03B *37/04*

U.S. Cl. 65—505 **17 Claims**



1. A fiber distribution device comprising a rotary fiberizing apparatus for generating a downwardly moving veil of glass fibers and gases traveling with the glass fibers, a collection surface, and a veil lapping device for applying sound to said veil to distribute it onto said collection surface, where said veil lapping device comprises a low frequency sound generator having a resonator tube having an open end from which sound may be emitted, wherein said resonator tube is shaped for directing low frequency sound having a frequency less than about 30 cycles per second to a portion of said veil.

5,595,586

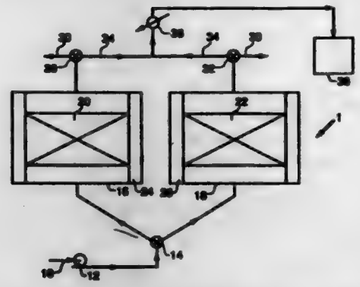
METHOD FOR RECOVERY OF VOLATILE ORGANIC COMPOUNDS

Timothy M. Sivavec, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 23,457, Feb. 26, 1993, abandoned. This application Mar. 3, 1995, Ser. No. 400,429

Int. Cl.[6] B01D *53/04*

U.S. Cl. 95—143 **2 Claims**



1. A method for separating volatile organic compounds from a gas stream containing said compounds in gaseous form which comprises the steps of passing the gas stream through a sorbent for said compounds consisting of polyester elastomer comprising soft block units and hard block units, removing the sorbent from contact with the gas stream, desorbing the volatile organic compounds from the sorbent, and reusing the sorbent to sorb volatile organic compounds.

5,595,587

APPARATUS FOR TREATING AIR WITH ELECTRICALLY CHARGED AND UNCHARGED LIQUID SPRAYS

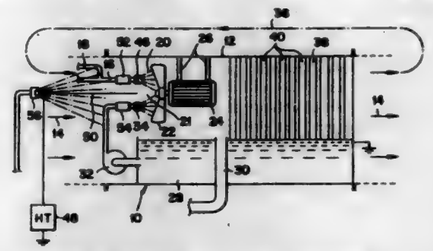
Victor O. Steed, 303 Glen Ashleigh, 237 Oxford Road, Illovo, Johannesburg, South Africa

Division of Ser. No. 274,741, Jul. 14, 1994, Pat. No. 5,518,525. This application Mar. 18, 1996, Ser. No. 616,890

Claims priority, application South Africa, Jul. 14, 1993, 93/5081

Int. Cl.[6] B03C *3/014*

U.S. Cl. 96—27 **7 Claims**



1. Apparatus for treating a gas or vapor comprising:

a conduit arranged to conduct gas or vapor therethrough;

at least one main nozzle arranged to be supplied with liquid under pressure and to emit a spray of fine droplets of the liquid into the conduit, thereby to cause dispersion of the droplets through the gas or vapor in the conduit;

a high voltage source connected to the at least one main nozzle for electrostatically charging the droplets which are emitted therefrom; and

an auxiliary nozzle arranged to direct an auxiliary spray of fine uncharged droplets over an entrance opening of the conduit, thereby to prevent ignition of explosive gas or particles outside the conduit.

5,595,588

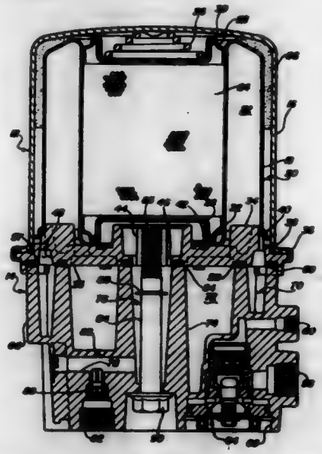
AIR DRYER CARTRIDGE MOUNTING SYSTEM

Jerry R. Blevins, Bloomfield Hills, Mich., assignor to AlliedSignal Truck Brake Systems Co., Elyria, Ohio

Filed Jul. 24, 1995, Ser. No. 506,313

Int. Cl.[6] B01D *53/04*

U.S. Cl. 96—108 **7 Claims**



1. An air dryer assembly for a motor vehicle air supply system, comprising:

a cartridge having a cup shaped outer shell, said outer shell affixed to a load plate having air flow passages therethrough, said load plate having a mounting surface with a first threaded means, said cartridge having a desiccant material therein for removing water from air passing through said air supply system,

a body assembly having a plurality of ports for connection with said air supply system and a mounting surface enabling said cartridge load plate mounting surface to be mated thereto, whereby said cartridge and said body assembly cooperate to form air flow passageways for said air passing through said body assembly ports and a through bore opening in said body mounting surface and in an exposed opposing surface of said body assembly, said through bore being aligned with said cartridge load plate first threaded means when said cartridge and said body assembly are mated together at said mounting surfaces, and

a retention bolt positioned through said body assembly bore and having second threaded means engaging said cartridge load plate first threaded means thereby fastening together said cartridge and said load plate assembly, said retention bolt having a driving head accessible at said body exposed surface.

5,595,589

BAKED COLOR PENCIL LEAD AND METHOD OF MANUFACTURING THE SAME

Masaaki Hoshiba, Fujieda, and Kazutaka Aoki, Iwata, both of Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1996, Ser. No. 617,042

Claims priority, application Japan, Mar. 27, 1995, 7-067319

Int. Cl.[6] C09D *13/00*

U.S. Cl. 106—19 B **18 Claims**

1. A baked color pencil lead manufactured by a method comprising the steps of:

kneading a blend composition comprising at least a filler and an organic forming binder, molding the composition by extrusion, and baking the molded composition in a non-oxidizing atmosphere, thereby to form a first baked lead containing a binder of a carbon produced by carbonizing said organic forming binder,

heating the first baked lead in an oxidizing atmosphere to remove the binder of the carbon by oxidation, thereby to form a second baked lead comprising at least the filler,

impregnating the pores of the second baked lead with a perhydropolysilazane-containing solution and then subjecting it to a heat treatment in an inert atmosphere or in an ammonia gas atmosphere, thereby to form a third baked lead containing silicon nitride produced by the heat treatment, and

impregnating the pores of the third baked lead with an organic pigment solution and solidifying the organic pigment in the pores to allow at least the pigment to be contained in the baked lead as a colorant.

5,595,590

METHOD AND COMPOSITIONS FOR AUTHENTICATING A PRODUCT OR DOCUMENT

Blake Q. Belding, West Chester; JoAnn Silkaitter, Pottstown; Kevin B. Stevenson, Downingtown, and Terry W. Stovold, Honey Brook, all of Pa., assignors to Necopi Technologies, Inc., Wayne, Pa.

Filed May 31, 1995, Ser. No. 455,949

Int. Cl.[6] C09D *11/02*

U.S. Cl. 106—21 A **57 Claims**

1. A composition for authenticating a document or article comprising a mixture of a carrier, a leuco dye and an activator and wherein the activator is at least one selected from the group consisting of amidophenol, asilides with hydroxyl groups and benzoamides with hydroxyl groups.

5,595,591

CELLULOSE ACETOACETATE ESTERS USED IN COATING COMPOSITIONS

Kevin J. Edgar, and Jonathan E. Lawniczak, both of Kingsport, Tenn., assignors to Eastman Chemical Comany, Kingsport, Tenn.

Division of Ser. No. 395,820, Feb. 27, 1995, Pat. No. 5,521,304, which is a division of Ser. No. 135,107, Oct. 12, 1993, Pat. No. 5,420,267, which is a continuation-in-part of Ser. No. 109,205, Aug. 19, 1993, Pat. No. 5,292,877, which is a continuation of Ser. No. 742,821, Aug. 9, 1991, abandoned. This application Mar. 1, 1996, Ser. No. 609,182

Int. Cl.[6] C08L *1/08*; C09J *4/00*; *101/00*

U.S. Cl. 106—170.27 **17 Claims**

1. A coating composition comprising:

(A) about 20 to about 80 percent, based on the weight of the total coating composition, of a cellulose acetoacetate ester having a DS/AGU of 0.1 to 2.9,

(B) about 20 to about 80 percent, based on the weight of the total coating composition, of a coating solvent.

5,595,592

DYE COMPOSITIONS AND METHODS FOR FILM COATING TABLETS AND THE LIKE

Charles A. Signorino, Norristown, Pa., and Harry Meggos, Alton, Ill., assignors to Warner-Jenkinson Company, Inc., St. Louis, Mo.

Division of Ser. No. 21,785, Feb. 24, 1993, Pat. No. 5,411,746. This application Nov. 28, 1994, Ser. No. 345,930

Int. Cl.[6] C09D *1/00*; *101/28*; *103/02*; *105/00*

U.S. Cl. 106—198.1 **12 Claims**

1. A stable, dry concentrate composition for use in preparing a stable, aqueous suspension composition comprising:

(i) a water-soluble, nontoxic dye,

(ii) an opacifying agent selected from the group consisting of titanium dioxide and iron oxide, and

(iii) a nontoxic immobilizing agent, said nontoxic immobilizing agent being constituted by a nontoxic metal salt present in an amount from approximately 0.1 to approximately 10 equivalents of metal per mole of said dye.

5,595,593

TREATMENT OF FILLERS WITH OXA-SILACYCLOALKANES

Gary T. Burns; Linda D. Keenan; Aroop K. Roy, and Arthur J. Tselepis, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 12, 1995, Ser. No. 542,153

Int. Cl.[6] C08K *5/04*

U.S. Cl. 106—499 **12 Claims**

1. A method of hydrophobing a filler comprising contacting a filler selected from the group consisting of inorganic pigments, metal oxides, metal hydroxides, and silicate minerals, with an oxa-silacycloalkane, in an amount sufficient for at least a portion of hydroxyl functionality on the filler to be replaced with carbinol functionality.

5,595,594

ANTI-EFFLORESCENCE ADMIXTURE FOR CONCRETE PRODUCTS

Jie-Yi Dong, Oakville, Canada; David F. Factor, Hiram, Ohio; Hamid Farzaneh, Chagrin Falls, Ohio, and Kenneth Sroka, Parma, Ohio, assignors to Sandoz Ltd, Basle, Switzerland

Division of Ser. No. 330,276, Oct. 27, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 471,433

Int. Cl.[6] C04B *24/08*

U.S. Cl. 106—661 **31 Claims**

1. An anti-efflorescence admixture for concrete products comprising:

a) a tall oil fatty acid, and

b) an unsaturated fatty acid having 8–28 carbon atoms, in a weight ratio of tall oil fatty acid to unsaturated fatty acid of 1:10 to 2:1; wherein 2 to 50% by weight of the acid of a) and b) being optionally in salt form with at least one salt-forming member selected from an alkanolamine or an alkylamine.

5,595,595

AQUAGEL-BASED LIGHTWEIGHT CONCRETE

Gregory M. Glenn, American Canyon, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 15, 1995, Ser. No. 515,502

Int. Cl.[6] C04B *24/10*; *38/00*

U.S. Cl. 106—672 **8 Claims**



1. A concrete composition having a solid matrix having cells or pores produced by a process comprising mixing together a mixture comprising cement, water, and aquagels to form concrete, said aquagels having sufficient firmness to withstand shear forces that occur during mixing of said mixture and wherein said aquagels maintain formation of said pores or cells in said mixture during an initial cement set stage when the concrete becomes firm.

5,595,596

CEMENT COMPOSITION AND ITS USE FOR THE PREPARATION OF LIGHTWEIGHT CONCRETES

Armando Marcotullio, S. Donato Milanese, and Massimo Santori, Varese, both of Italy, assignors to Eniricerche S.p.A., Milan, Italy

Filed Dec. 29, 1995, Ser. No. 580,660

Claims priority, application Italy, Jan. 23, 1995, MI95A0101

Int. Cl.[6] C04B *38/10*; *24/02*

U.S. Cl. 106—677 **20 Claims**

1. A cement composition comprising a hydraulic cement, water, inert products and a foaming additive, wherein the foaming additive is obtained by:

(i) contacting ethylene oxide with a residue obtained in the production of synthetic alcohols by the oxosynthesis of normal-olefins, in a weight ratio of ethylene oxide to said residue of from 0.5/1 to 2.0/1, in the presence of a basic catalyst selected from KOH or NaOH in a weight percentage based on the total amount of ethylene oxide and residue of between 0.05 and 1.0% at a temperature between 120° and 160° C. and under pressure and for a period of time so as to obtain an ethoxylated product;

(ii) reacting the ethoxylated product obtained in step (i) with liquid or gaseous sulfuric anhydride in a stoichiometric quantity to obtain a sulfation product;

(iii) neutralizing the sulfation product of step (ii) with a base of an alkaline metal or of an alkaline earth metal, or with ammonia to obtain a neutralized product; and

(iv) recovering said neutralized product as said foaming additive.

5,595,597

PROCESS FOR PRODUCING PHOSPHOMAGNESIA CEMENTS HAVING REDUCED SENSITIVITY TO WATER

William Fogel, Ales, and Eric Garcia, Lyons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Division of Ser. No. 366,892, Dec. 29, 1994, Pat. No. 5,518,541. This application Mar. 6, 1996, Ser. No. 611,683

Claims priority, application France, Dec. 31, 1993, 93 15987

Int. Cl.[6] C04B *12/02*

U.S. Cl. 106—691 **24 Claims**

1. A process for formulation of a phosphomagnesia composition of matter, comprising intimately admixing (1) a binder phase including (a) at least one phosphorus compound and (b) at least one magnesium compound reactive therewith in the presence of water, and (2) at least one hydrogenated alkyl silicone compound.

5,595,598

METHOD FOR ADJUSTING CONSISTENCY

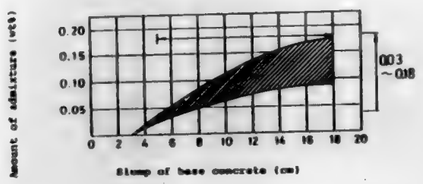
Eiichi Yooda, Tokyo, and Fumitaka Itoh, Saitama, both of Japan, assignors to Taisei Rotec Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 264,931, Jun. 24, 1994, abandoned, which is a continuation of Ser. No. 935,103, Aug. 27, 1992, Pat. No. 5,332,434. This application Mar. 22, 1996, Ser. No. 620,394

Claims priority, application Japan, Nov. 27, 1991, 3-312153; Dec. 4, 1991, 3-328436

Int. Cl.[6] C04B *26/00*

U.S. Cl. 106—724 **2 Claims**



1. A method for adjusting the consistency of previously-mixed concrete by adding water-absorbing polymeric materials comprising one of a copolymer of acrylic acid with vinyl alcohol, and a polymer of sodium acrylate to the previously mixed concrete, the method is characterized in that the previously-mixed concrete having a slump value of 5–18 cm is added with one of the water-absorbing polymeric materials selected from one of the copolymer of acrylic acid with vinyl alcohol, and the polymer of sodium acrylate in a ratio of 1.0–4.0 kg (0.03–0.18 wt%) per m^3 of said previously-mixed concrete to adjust the consistency of said previously-mixed concrete to a slump value of lower than 3 cm before hardening.

5,595,599
METHOD AND APPARATUS FOR SINTERING CEMENT CLINKER

Norio Yokota, Narashino; Nichitaka Sato, Funabashi; Katsuji Mukai, Nagareyama; Toshiyuki Ishimoshichi, Tochigi-ken; Isao Hashimoto, Akashi; Mikio Murao, Kobe; Shozo Kanamori, Miki, and Chikanori Kamegai, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, and Sumitomo Cement Co., Ltd., Tokyo, both of Japan

Division of Ser. No. 202,154, Feb. 25, 1994. This application Jun. 7, 1995, Ser. No. 476,256

Claims priority, application Japan, Feb. 26, 1993, 5-063138; Mar. 31, 1993, 5-073890; Mar. 31, 1993, 5-073909; Mar. 31, 1993, 5-098485

Int. Cl.[6] C04B *7/45*

U.S. Cl. 106—744 3 Claims

1. A method of sintering cement clinker comprising:

introducing raw material for cement to a spouted fluidized bed granulating furnace which includes a perforated distributor having a plurality of nozzle holes;

passing fluidizing gas through at least one of said plurality of nozzle holes into said spouted fluidized bed granulating furnace while simultaneously blowing classifying gas at a selected flow velocity that is different from the flow velocity of said fluidizing gas into said spouted fluidized bed granulating furnace through a dropping port arranged facing and between the fluidized bed of said spouted fluidized bed granulating furnace and in communication with a fluidized bed sintering furnace;

granulating said raw material in said spouted fluidized bed granulating furnace;

discharging granules formed in said spouted fluidized bed granulating furnace into said fluidized bed sintering furnace while classifying said granules with said classifying gas; and

sintering the granules injected into the fluidized bed sintering furnace through said dropping port.

5,595,600
LOW TEMPERATURE SELECTIVE GROWTH OF SILICON OR SILICON ALLOYS

Cyril Cabral, Jr., Ossining; Kevin K. Chan, Staten Island; Jack O. Chu, Astoria, and James M. E. Harper, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 390,132, Feb. 17, 1995, which is a division of Ser. No. 240,860, May 9, 1994, Pat. No. 5,427,630. This application Jun. 6, 1995, Ser. No. 469,650

Int. Cl.[6] H01L *21/20*

U.S. Cl. 117—83 12 Claims



1. A semiconductor device comprising:

(a) a substrate;

(b) a masking layer formed over a portion of said substrate, creating a masked portion and an unmasked portion of said device, said masking layer being an oxide of an element selected from the group consisting of scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium; and

(c) an epitaxial layer selected from the group consisting of silicon and silicon alloys grown over said unmasked portion at a temperature below 650° C.

5,595,601
COATING BAR FOR A BAR COATER

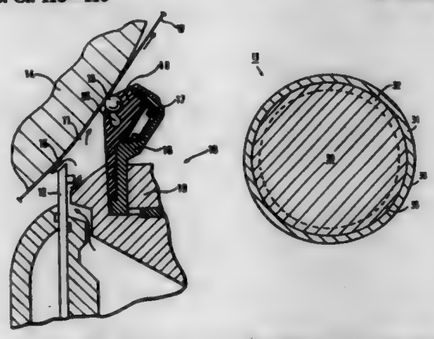
Timo Liutala, Kouvus, Finland, assignor to Valmet Corporation, Helsinki, Finland

Continuation-in-part of Ser. No. 85,964, Jun. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 697,875, May 8, 1991, Pat. No. 5,264,247. This application Mar. 7, 1995, Ser. No. 399,753

Claims priority, application Finland, Sep. 14, 1990, 904541

Int. Cl.[6] B05C *1/08;11/02*

U.S. Cl. 118—110 20 Claims



1. A coating bar for a bar coater, said coating bar being revolvingly supported substantially over its entire length in a cradle fixed to a frame of the bar coater, said coating bar comprising

a substantially cylindrical metallic core having a profiled outer core surface defining a plurality of grooves extending circumferentially around said core, said core having a core surface region bounded by and inward of said profiled outer core surface and comprising FeB and Fe_2B, and

a discrete metallic coating containing both FeB and Fe_2B situated in direct contact with said profiled outer core surface.

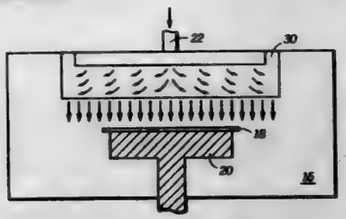
5,595,602
DIFFUSER FOR UNIFORM GAS DISTRIBUTION IN SEMICONDUCTOR PROCESSING AND METHOD FOR USING THE SAME

Kent S. Harlan, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 14, 1995, Ser. No. 514,634

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 18 Claims



1. A method of diffusing gas in a semiconductor process, comprising the steps of:

providing a chamber for a semiconductor process, the chamber having a blocking plate and a porous sintered face plate, the porous sintered face plate having an exit surface;

placing a semiconductor wafer within the chamber, wherein the porous sintered face plate lies between the semiconductor wafer and the blocking plate; and

introducing a gas into the chamber, wherein the gas introduced into the chamber flows through the porous sintered face plate, and wherein a portion of the gas flowing through the porous sintered face plate flows horizontally through the porous sintered face plate before exiting through the exit surface of the porous sintered face plate.

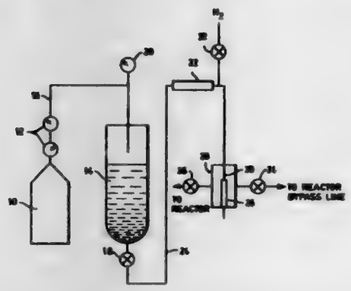
5,595,603
APPARATUS FOR THE CONTROLLED DELIVERY OF VAPORIZED CHEMICAL PRECURSOR TO AN LPCVD REACTOR

Keith A. Klinedinst, Marlborough, and Joseph E. Lester, Lincoln, both of Mass., assignors to Osram Sylvania Inc., Danvers, Mass.

Division of Ser. No. 199,914, Feb. 22, 1994, Pat. No. 5,492,724. This application Sep. 1, 1995, Ser. No. 522,686

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 6 Claims



1. An apparatus for the controlled delivery of a vaporized chemical precursor to an LPCVD reactor comprising:

a container of liquid precursor;

a first source of inert gas coupled to said container of liquid precursor for pressurizing said container of liquid precursor;

a flow restrictor element for restricting a flow of liquid precursor from said container of liquid precursor, said flow of liquid precursor containing a quantity of dissolved inert gas from said first source of inert gas;

a gas/liquid phase separator coupled to said flow restrictor element for separating said quantity of dissolved inert gas from said flow of liquid precursor and for producing a continuous flow of liquid precursor;

a liquid vaporizer having an input coupled to said gas/liquid phase separator for receiving said continuous flow of liquid precursor and for producing a quantity of vaporized precursor, and;

means for coupling said quantity of vaporized precursor within said liquid vaporizer to an LPCVD reactor.

5,595,604
WAFER SUPPORTING BOAT

Shuichi Kobayashi, Shirakawa; Masayuki Kobayashi, Fukushima-ken, both of Japan; Tsutomu Yuri, Livingston, United Kingdom; Yoichi Serizawa, Nishigo-mura, Japan; Mamoru Akimoto, Urawa, Japan, and Shinichi Okoshi, Yamagata, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan

Filed Sep. 15, 1995, Ser. No. 528,560

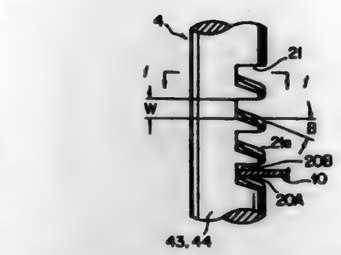
Claims priority, application Japan, Sep. 30, 1994, 6-259802

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 27 Claims

1. A wafer supporting boat with which a heat treatment is applied to surfaces to be treated of wafers which are disposed in a stacking manner by holding grooves in members disposed in an arc and parallel to an axis of said boat wherein

each holding groove is inclined relative to a tangent to said arc of the boat and



an upper or lower clearance in the holding groove facing one of the surfaces to be treated of each of the wafers increases in width in the direction of said tangent to said arc of the boat.

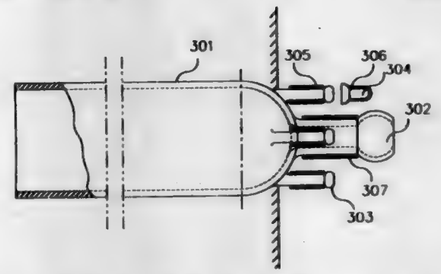
5,595,605
APPARATUS FOR PREVENTING THE UNSTABLE GROWTH RATE OF OXIDE CAUSED BY WATER VAPOR REMAINING IN THE INLET PIPES OF A HORIZONTAL DRIVEN FIELD OXIDATION TUBE

Wen-Kuang Tai, Kan-Hsiang, and Ching-Li Shih, Hsin-Chu, both of Taiwan, assignors to United Microelectronics Corp., Taipei, Taiwan

Filed Oct. 11, 1995, Ser. No. 540,775

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 12 Claims



1. An apparatus for preventing the unstable growth rate of oxide caused by water vapor remaining in the inlet pipes of a horizontal driven field oxidation tube, comprising:

a gas inlet pipe located at the center of a closed end of said horizontal driven field oxidation tube for injecting high purity gases;

a plurality of thermocouple sheaths located at an edge of the closed end of said horizontal driven field oxidation tube for locating a thermocouple therein;

a plurality of caps for covering said thermocouple sheaths; and

a plurality of insulating sleeves wrapping around said gas inlet pipe, said thermocouple sheaths, and said caps for keeping the temperature therein above 100 degrees Celsius.

5,595,606
SHOWER HEAD AND FILM FORMING APPARATUS USING THE SAME

Yuichiro Fujikawa; Tatsuo Hatano, and Seishi Murakami, all of Yamanashi-ken, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

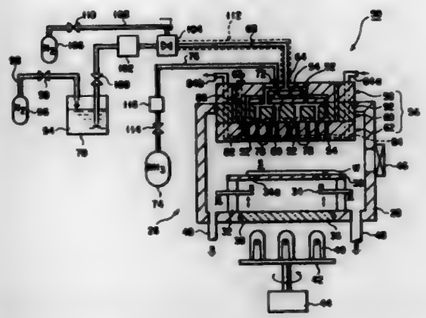
Filed Apr. 18, 1996, Ser. No. 634,372

Claims priority, application Japan, Apr. 20, 1995, 7-119403

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—725 20 Claims

11. A film forming apparatus for forming a film on an object to be processed, using first and second reaction gases, which are



capable of reacting with each other, said first reaction gas being liquefied at and below a first temperature, and said first and second reaction gases reacting with each other at and above a second temperature which is higher than said first temperature, said apparatus comprising:

(a) a process chamber;

(b) a work table for supporting said object in said process chamber;

(c) a heater for heating said objected supported by said work table up to a third temperature higher than said second temperature;

(d) an exhaust for exhausting said process chamber; and

(e) a shower head having first and second passages for independently and respectively supplying said first and second reaction gases into said process chamber, said shower head comprising,

first, second and third blocks independently formed and having holes which define said first and second passages, said second block being interposed between said first and third blocks, such that said first and second passages respectively have first and second introduction inlets arranged on said first block for respectively introducing said first and second gases, and also respectively have a plurality of first supply outlets and a plurality of second supply outlets arranged on said third block for respectively supplying said first and second reaction gases into said process chamber, and each of said first and second passages is branched from said first block to said third block,

a cooler arranged in said third block near said first and second supply outlets, for cooling said first and second supply outlets,

a heater arranged in said first and second blocks, for heating said first passage in said first and second blocks up to a temperature above said first temperature, and

a connector for connecting said first, second and third blocks.

5,595,607

BURIED CONTACT INTERCONNECTED THIN FILM AND BULK PHOTOVOLTAIC CELLS

Stewart R. Wenham, Illawong; Martin A. Green, Waverley, and Michael Y. Tsouk, Eastlakes, all of Australia, assignors to Unisearch Limited, Kensington, Australia

PCT No. PCT/AU92/00658, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/12543, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 9, 1992, Ser. No. 244,834

Claims priority, application Australia, Dec. 9, 1991, PK 9946

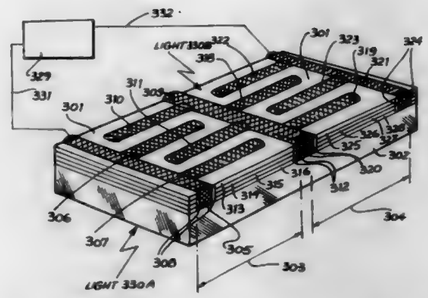
Int. Cl.[6] H01L *31/05*

U.S. Cl. 136—244 **33 Claims**

1. A solar cell having:

a plurality of alternate p-type and n-type doped semiconductor material layers defining one or more semiconductor junctions; and

two contact structures formed in a plurality of grooves having semiconductor surfaces and extending to contact the plurality of doped layers, the semiconductor surfaces of the groove of a first of the contact structures being doped with an n-type dopant, with the semiconductor surfaces of the groove of the second of the contact structures being doped with a p-type dopant and each groove containing a conducting material in conducting electrical contact with the respective doped surfaces of the groove, the first contact structure providing an electrical connection with the n-type doped layers and the second contact structure providing an electrical connection with the p-type doped layers.



11. An array of series connected solar cells, the array including m solar cells as defined in claim 1, the semiconductor material of each cell being effectively isolated from the semiconductor material of the remaining cells other than by way of direct interconnection of their respective contact structures, the first contact structure of the jth cell being connected to the second contact structure of the (j−1)th cell in the array, where $1<j\leq m$.

5,595,608

PREPARATION OF PERMANENT MAGNET

Katsuhi Takebuchi, Ibaraki; Shinya Fujito; Shinya Hashimoto, both of Chiba, and Koichi Yajima, Saitama, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 2, 1994, Ser. No. 333,982

Claims priority, application Japan, Nov. 2, 1993, 5-297300; Nov. 8, 1993, 5-302303

Int. Cl.[6] H01F *1/03*

U.S. Cl. 148—104 **38 Claims**



1. A method for preparing a permanent magnet which contains R, T and B as main ingredients wherein R is at least one element selected from yttrium or rare earth elements, T is iron or a mixture of iron and cobalt, and B is boron and has a primary phase consisting essentially of $R_2T_{14}B$,

said method comprising the steps of compacting to obtain a compact a mixture of a primary phase-forming master alloy and a grain boundary phase-forming master alloy both in powder form and sintering the compact, wherein

said primary phase-forming master alloy contains 90 to 100% by volume columnar crystal grains consisting essentially of $R_2T_{14}B$ and having a mean grain size of 3 to 50 μm produced by cooling an alloy melt from one direction or two directions., and grain boundaries composed primarily of an R rich phase having an R content higher than $R_2T_{14}B$, said primary phase-forming master alloy consisting essentially of 26 to 32% by weight of R, 0.9 to 2% by weight of B, and the balance of T,

said grain boundary phase-forming master alloy is a crystalline alloy consisting essentially of 32 to 60% by weight of R and the balance of cobalt or a mixture of cobalt and iron, and

said mixture contains 60 to 95% by weight of said primary phase-forming master alloy.

5,595,609

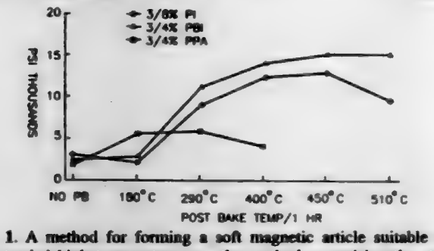
ANNEALED POLYMER-BONDED SOFT MAGNETIC BODY

David E. Gay, Noblesville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 243,851, May 13, 1994, abandoned, which is a continuation of Ser. No. 44,421, Apr. 9, 1993, abandoned. This application Nov. 24, 1995, Ser. No. 563,435

Int. Cl.[6] H01F *1/26*

U.S. Cl. 148—104 **9 Claims**



1. A method for forming a soft magnetic article suitable for extended high temperature use, the method comprising the steps of:

depositing a substantially uniform encapsulating layer of a thermoplastic polymer onto each of a plurality of soft ferromagnetic metal particles ranging in size from about 5 to about 400 microns to form a plurality of coated particles, said polymer comprising less than about one percent of the weight of said coated particles and being selected from the group consisting of polybenzimidazole and polyimides having a heat deflection temperature of at least about 400° C.;

compacting said coated particles within a mold cavity at a temperature and pressure sufficient to compact and adhere the coated particles together to form said magnetic article;

heating the magnetic article at a temperature and for a duration which are sufficient to relieve work-hardening stresses induced in said metal particles by the compacting step but insufficient to significantly degrade or pyrolyze said polymer, whereby the magnetic permeability of said article is significantly improved; and

cooling the heated magnetic article at a sufficiently slow rate as to avoid thermally inducing stresses into said metal particles.

5,595,610

METHOD OF MANUFACTURING CASE-HARDENED PARTS WITH LITTLE DISTORTION IN HEAT TREATMENT AND SUPERIOR STRENGTH IN BENDING FATIGUE

Hisao Maeda; Yoshitake Matsushima; Morifumi Nakamura; Akito Shiina, all of Kobe; Mikio Hirahara, Hiroshima; Yukio Arimi, Hiroshima, and Yoshihiko Kojima, Hiroshima, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, and Mazda Motor Corporation, Hiroshima, both of Japan

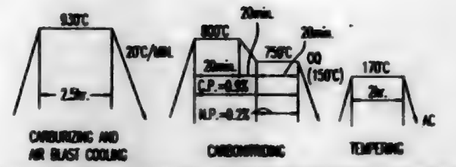
Continuation of Ser. No. 237,318, May 3, 1994, abandoned, which is a continuation of Ser. No. 894,600, Jun. 5, 1992, abandoned. This application Jan. 22, 1996, Ser. No. 589,581

Claims priority, application Japan, Jun. 7, 1991, 3-163507; Apr. 24, 1992, 4-131866

Int. Cl.[6] C22C *38/00*

U.S. Cl. 148—233 **6 Claims**

1. A manufacturing method of a case-hardened material with little distortion during heat treatment comprising an uncarburized core and a carburized surface layer, comprising the steps of carburizing, carbonitriding or carburizing followed by carbonitriding



parts made of a case-hardening steel, whose chemical composition is C:0.03–0.27 wt. %, Si: 0.05–0.35 wt. %, Mn: 0.3–2.0 wt. %, S: 0.3 wt. % and less, Ni: 0.4–3.0 wt. %, Mo: 0.1–1.0 wt. %, Al: 0.015–0.10 wt. %, V: 0.03–0.5 wt. %, and N: 0.004–0.02 wt. %, the balance Fe and inevitable impurities, wherein the C-equivalent represented by the following formula is in the range 0.5–1.2 (wt. %),

$$\text{C-equivalent}=[C]+(1/7.2)\,[Si]+(1/4.8)\,[Mn]+(1/7.5)\,[Ni]+(1/6.0)\,[Cr]+(1/5.8)\,[Mo]+(1/1.5)\,[V]$$

wherein, in the above formula, each bracketed element represents the content thereof in weight percentage,

cooling said parts at a rate of from 100° C./min. to 1° C./minute, and then reheating and quenching in a manner selected from the following heat treatment conditions (1), (2) or (3) to form a carburized surface layer having a mixed phase structure comprising martensite and retained austenite and an uncarburized core having a mixed phase structure comprising ferrite and martensite or ferrite, martensite and bainite,

(1) heating said parts at a temperature which is greater than the Ac_3 transformation point of the carburized surface layer having a C-content of at least 0.4% by weight but which is less than 850° C., retaining the parts at said temperature and then quenching,

(2) heating and retaining said parts at said temperature designated in case (1) above, cooling to a temperature not less than 600° C. and then quenching,

(3) heating and retaining said parts at said temperature designated in case (1) above, cooling to a temperature not less than 600° C., retaining said parts at said temperature not less than 600° C., and then quenching.

5,595,611

MODERATE TEMPERATURE MANGANESE PHOSPHATE CONVERSION COATING COMPOSITION AND PROCESS

Mervet S. Boulos, Troy; David C. Montrose, St. Clair Shores, and Michael Petschel, Rochester Hills, all of Mich., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Feb. 14, 1996, Ser. No. 601,481

Int. Cl.[6] C23C *22/18*

U.S. Cl. 148—259 **8 Claims**

1. A process of forming a phosphate conversion coating on a steel or galvanized substrate surface, said process comprising a step of physically contacting the substrate surface at a temperature with a range from about 35° to about 75° C. with an aqueous liquid composition of matter consisting essentially of water and:

(A) from about 0.80 to about 2.7 ppt of dissolved divalent manganese cations;

(B) from about 9 to about 30 ppt of dissolved phosphate anions;

(C) from about 2.0 to about 10 mM of a dissolved component selected from the group consisting of organic acids and anions thereof that (1) contain at least two moieties per molecule that are selected from the group consisting of (1.1) carboxyl and carboxylate moieties, (1.2) hydroxyl moieties that are not part of a carboxyl moiety, and (1.3) phosphonic acid and phosphonate moieties and (2) are not part of either component (A) or component (B);

(D) a component of nitric acid, and, optionally, other dissolved acids that are not part of any of the previously recited components; and, optionally, one of more of the following components:

(E) a component of dissolved reducing agent and/or reaction products therefrom that are not part of any of the previously recited components;

(F) a component of surfactant that is not part of any of the previously recited components;
(G) a dissolved component selected from the group consisting of simple and complex anions that contain fluorine atoms and are not part of any of the previously recited components;
(H) a component of dissolved metal cations, with a valence of at least two, that are not part of any of the previously recited components;
(J) a component of buffering agents that are not part of any of the previously recited components; and
(K) a component of biocides that are not part of any of the previously recited components,

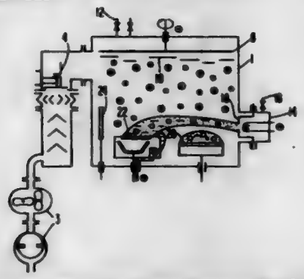
wherein, in said aqueous liquid composition: the pH is at least 3; component (A) is present in a ratio to component (B) of from about 1.0:30 to about 1.0:7.0; the Total Acid points are from about 8 to about 25; and the Free Acid points are from about −1.0 to about 1.0.

5,595,612

WORKPIECE WITH WEAR RESISTANCE COATING

Norbert M. Dingremont, Vandoevre les Nancy, France, assignor to Balzers Aktiengesellschaft, Furstentum, Germany

Filed Jul. 19, 1993, Ser. No. 93,361
Claims priority, application Switzerland, May 27, 1993, 1599/93
Int. Cl.[6] C23C *8/22;8/26;30/00*
U.S. Cl. 148—318 **3 Claims**



1. A workpiece comprising: a steel body made of a steel body material and having a surface area with a hard material coating thereon which is formed of a metal of the group IVb or of a metal alloy with at least one of said metal of the group IVb, the surface area of the steel body whereon the hard material coating resides, being enriched, with respect to the steel body material, with at least one element from the group C, N, B, O, S, and Si; and a transition zone extending from said enriched surface area of the steel body into the hard material coating having a non-diminishing content of said at least one element when considered in a direction from an interior of the steel body, toward the hard material coating which contains the metal of group IVb or alloy thereof.

5,595,613

STEEL FOR GEAR, GEAR SUPERIOR IN STRENGTH OF TOOTH SURFACE AND METHOD FOR PRODUCING SAME

Atsumi Hatano, Kamaki; Sadayuki Nakamura, Mie-gun; Makoto Yoshida, Hadano; Yoshio Okada, Atsugi, and Takashi Matsumoto, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, and Daido Steel Co., Ltd., Aichi Prefecture, both of Japan

Filed Mar. 7, 1995, Ser. No. 400,225
Claims priority, application Japan, Mar. 9, 1994, 6-038282
Int. Cl.[6] C23C *8/22;8/32*
U.S. Cl. 148—319 **9 Claims**

1. A gear made of a steel which consists essentially of C ranging from 0.1 to 0.3% by weight, Si ranging not more than 1.0 % by



weight, Mn ranging not more than 1.0% by weight, Cr ranging from 1.5 to 5.0% by weight, and balance including iron and an impurity;

said gear having a surface layer hardened by one of carburizing-hardening-tempering and carbonitriding-hardening-tempering, a zone from surface to a depth of 0.1 mm of the hardened surface layer including C ranging from 0.7 to 1.3% by weight and including C, Si and Cr so as to satisfy the following relationship: $5.5<3\times C\ (wt\ \%)+5.2\times Si(wt\ \%)+Cr(wt\ \%)$.

5,595,614

DEEP HARDENING BORON STEEL ARTICLE HAVING IMPROVED FRACTURE TOUGHNESS AND WEAR CHARACTERISTICS

Joseph E. McVicker, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jan. 24, 1995, Ser. No. 378,121
Int. Cl.[6] C22C *38/22;38/24*
U.S. Cl. 148—334 **10 Claims**



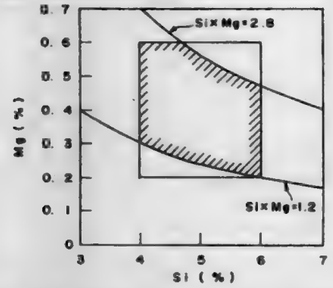
1. A deep hardening steel article having a composition comprising, by weight percent, from 0.23 to 0.37 carbon, from 0.4 to 1.2 manganese, from 0.5 to 2.0 silicon, from 0.25 to 2.0 chromium, from 0.2 to 0.8 molybdenum, from 0.05 to 0.25 vanadium, from 0.03 to 0.15 titanium. from 0.015 to 0.05 aluminum, from 0.0008 to 0.009 boron, less than 0.025 phosphorus, less than 0.025 sulfur, from 0.005 to about 0.013 nitrogen, and the balance essentially iron, said steel article being free of any detrimental aluminum nitride and having been quenched and tempered to produce a fine martensitic microstructure and a distribution of nanometer size background nitride, carbonitride, and carbide precipitates, said precipitates being spaced apart no greater than about 0.003 mm.

5,595,615

HIGH TOUGHNESS AND HIGH STRENGTH ALUMINUM ALLOY CASTING

Ryoichi Shibata, Tochigi-ken, and Rikitou Watanabe, Mooka, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 296,245
Claims priority, application Japan, Aug. 26, 1993, 5-234186
Int. Cl.[6] C22C *21/06*
U.S. Cl. 148—440 **8 Claims**



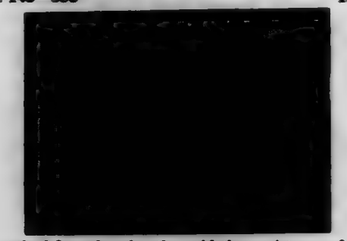
1. A high toughness and high strength casting of an aluminum alloy, said casting having comparatively thick portions with a thickness of 20 mm or more and said aluminum alloy comprising 4–5.98% Si, 0.2–0.6% Mg, less than 0.15% Fe, not more than 0.4% Mn, by weight, residual aluminum and unavoidable impurities, Si(%)×Mg(%) having a value of 1.2–2.8; said aluminum alloy being kept under an atmosphere of more than atmospheric pressure in solidification of said aluminum alloy to form said casting; and T6 heat treatment being applied subsequently to said casting.

5,595,616

METHOD FOR ENHANCING THE OXIDATION RESISTANCE OF A MOLYBDENUM ALLOY, AND A METHOD OF MAKING A MOLYBDENUM ALLOY

Douglas M. Berczik, North Palm Beach, Fla., assignor to United Technologies Corporation, East Hartford, Conn.

Division of Ser. No. 373,945, Jan. 17, 1995, which is a continuation-in-part of Ser. No. 170,933, Dec. 21, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,534
Int. Cl.[6] C22F *1/18*
U.S. Cl. 148—538 **13 Claims**



1. A method for enhancing the oxidation resistance of a molybdenum alloy comprising the step of adding silicon and boron to a molybdenum composition comprised of more than 50 weight % molybdenum; wherein said step of adding comprises: adding said silicon and boron to a melt comprising molybdenum followed by rapid solidification; and further comprising the step of consolidating the rapidly solidified alloy to form an alloy in which there is a matrix of body centered cubic molybdenum surrounding discrete particles of intermetallic phase;

and further wherein said silicon and boron are added in amounts such that the molybdenum alloy having enhanced oxidation resistance that results from said step of adding, consists essentially of a composition defined by the area described by the compositional points of the phase diagram for a ternary system: metal-1.0%Si-0.5%B, metal- 1.0%Si-4.0%B, metal-4.5%Si-0.5%B, and metal-4.5%Si-4.0%B; wherein percentages are weight % and wherein said metal consists essentially of molybdenum as the major component.

4. A method of making a molybdenum alloy comprising the steps of forming a melt of a composition defined by the area described by the compositional points of the phase diagram for a ternary system: metal-1.0%Si-0.5%B, metal-1.0%Si-4.0%B, metal-4.5%Si-0.5%B, and metal-4.5%Si-4.0%B; wherein percentages are weight % and wherein said metal consists essentially of molybdenum as the major component;

rapidly solidifying said melt to form a rapidly solidified material; and

consolidating said rapidly solidified material to form an alloy in which there is a matrix of body centered cubic molybdenum surrounding discrete particles of intermetallic phase.

5,595,617

PROCESS FOR PRODUCING PATENTED STEEL WIRE

Charles Tonteling, Bissen, Luxembourg; Kenneth J. Palmer, Wadsworth; Farrel B. Heifer, Akron, both of Ohio; Rodger Todd, Heffingen, and Josy Jean Blum, Ell, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 44,785, Apr. 12, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,734
Int. Cl.[6] C22C *38/00*
U.S. Cl. 148—595 **15 Claims**

1. A process for producing a high strength filament for use in elastomeric reinforcements, said process comprising the steps of:

(1) heating a steel wire to a temperature which is within the range of approximately 850° C. to about 1050° C. for a period of at least about 2 seconds; wherein said steel wire is comprised of a microalloyed high carbon steel which consists essentially of, about 97.03 to about 98.925 weight percent iron, from about 0.72 to about 0.92 weight percent carbon, from about 0.3 to about 0.8 weight percent manganese, from about 0.05 to about 0.4 weight percent silicon, and from about 0.005 to about 0.85 weight percent of at least one member selected from the group consisting of chromium, vanadium, nickel, and boron, with the proviso that the total amount of silicon, manganese, chromium, vanadium, nickel, and boron in the microalloyed high carbon steel is within the range of about 0.7 to 0.9 weight percent to produce a heated steel wire;

(2) continuously cooling the heated steel wire at a cooling rate of 40° C. to 60° C. per second to a temperature which is within the range of about 500° C. to about 650° C. until a transformation from austenite to pearlite begins;

(3) allowing the transformation from austenite to pearlite to proceed with an increase in the wire temperature resulting from recalescence to produce a patented steel wire, wherein the increase in wire temperature resulting from recalescence is an increase in temperature which is within the range of about 20° C. to about 70° C.;

(4) cooling the patented steel wire to ambient temperature;

(5) brass-plating the patented steel wire to produce a brass-plated steel wire; and;

(6) cold-drawing the brass-plated steel wire to a diameter which is within the range of about 0.15 mm to about 0.40 mm to produce a high strength filament.

5,595,618

ASSEMBLY PROCESS FOR A LAMINATED TAPE

Donald M. Fries, Combined Locks, and Larry F. Sallee, Pine River, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 3, 1995, Ser. No. 415,383
Int. Cl.[6] A61F 13/60;13/62; B32B 31/18
U.S. Cl. 156—164 19 Claims



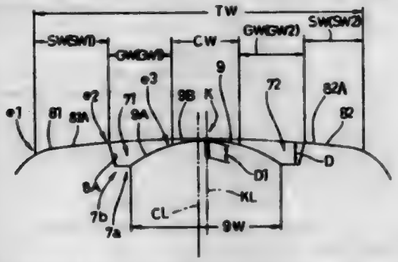
1. A method for forming a fastener system, comprising the steps of:
(a) providing along a machine-direction a first web of material having a medial portion thereof;
(b) attaching a second web of release material to said medial portion of said first web along said machine-direction to provide a web laminate;
(c) separating said web laminate into at least a first laminate section and a second laminate section, each laminate section including a portion of said first web and a portion of said second web of release material, and each laminate section having an edge region thereof;
(d) spacing apart said first and second laminate sections;
(e) locating a securement web between said first and second laminate sections, said securement web having a first side region a second side region, and a securing means on a securing surface of the securement web;
(f) affixing said edge region of said first laminate section to said first side region of said securement web, and affixing said edge region of said second laminate section to said second side region of said securement web to thereby form a composite base web which has a medial portion thereof;
(g) dividing said composite web along its medial portion to form at least a first composite securement web and a second composite securement web.

5,595,619

PNEUMATIC TIRE INCLUDING SHOULDER PARTS

Masatoshi Tanaka, Takarazuka, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Continuation-in-part of Ser. No. 135,551, Oct. 14, 1993. This application Dec. 27, 1994, Ser. No. 363,813
Claims priority, application Japan, Oct. 14, 1992, 4-302955; Aug. 5, 1993, 5-215015; Dec. 27, 1993, 5-350821
Int. Cl.[6] B60C 101/00;111/00
U.S. Cl. 152—209 A 5 Claims



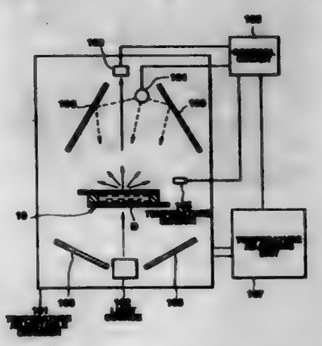
1. A pneumatic tire comprising a tread part having two circumferential grooves continuously extending in the circumferential direction, one of said circumferential grooves being disposed on one side of the tire's equator and the other of the circumferential grooves being disposed on the other side of the tire's equator so as to divide the tread part into a pair of shoulder parts, which are located outside outer bottom edges of the circumferential grooves in the axial direction of tire, and a central part, the central part being located between inner bottom edges of the circumferential grooves in the axial direction of the tire; wherein
the central part has a surface comprising successive convex curves including
a pair of inner groove walls, each of the inner groove walls being convex and extending inward in the tire's axial direction along a curve convexed outwardly in the radial direction from the inner bottom edges, and
a central ground-contacting surface smoothly connected between the pair of the inner groove walls,
the central ground-contacting surface has a width CW being in a range of 0.15 to 0.35 times a ground-contact tread width TW and is substantially in contact with a virtual tread line between outer surfaces of the shoulder parts,
a width 9W of the central part is in a range of 0.4 to 0.55 times the ground-contact tread width TW,
the circumferential grooves have a groove width GW being in a range of 35 mm or more, and
when the tire is mounted on a regular rim, inflated with regular internal pressure and applied with normal load,
a) a shoulder ground-contacting area Fs1 where one of the shoulder parts contacts with the ground has a width SW1 in the tire's axial direction which is larger than a width SW2 in the tire's axial direction of a shoulder ground-coutacting area Fs2 where the other one of the shoulder parts contacts with the ground, and
b) a groove width GW1 of the circumferential groove adjacent to said one of the shoulder parts having the larger width SW1 is smaller than a groove width GW2 of the circumferential groove adjacent to said other one of the shoulder parts having the smaller width SW2.

5,595,620

APPARATUS AND METHOD FOR MANUFACTURING POLYMER DISPERSION TYPE LIQUID CRYSTAL DISPLAY DEVICE

Jiro Takei, Tama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 217,170
Claims priority, application Japan, Mar. 31, 1993, 5-015900 U
Int. Cl.[6] B32B 31/00
U.S. Cl. 156—64 18 Claims



10. A method of manufacturing a polymer dispersion type liquid crystal display device, said method comprising:
a step of injecting into a liquid crystal cell a mixture solution of a liquid crystal and a polymer material which is subjected to a polymerization reaction by light;

a temperature adjusting step of lowering the temperature of the mixture solution in the liquid crystal cell and phase-separating the mixture solution; and
a light radiation step of radiating light on the liquid crystal cell in the state in which the temperature of the mixture solution is lowered in said temperature adjusting step.

5,595,621

METHOD OF MAKING ABSORBABLE STRUCTURES FOR LIGAMENT AND TENDON REPAIR

Nicholas D. Light, Doune; James McGregor, Bishopbriggs; Wilson Harvey, Gargunnock, and Paul W. Watt, Broomridge, all of United Kingdom, assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Division of Ser. No. 314,986, Sep. 29, 1994, Pat. No. 5,514,181. This application Jun. 7, 1995, Ser. No. 485,244
Claims priority, application United Kingdom, Sep. 29, 1993, 9320100
Int. Cl.[6] A61F 2/08
U.S. Cl. 156—80 9 Claims



1. A method of making a bioabsorbable prosthesis for use in surgical repair of a damaged ligament or tendon, the method comprising the steps of:
providing a laminate of a foraminous layer of bioabsorbable material and a bioabsorbable film; coating the laminate with a layer of an aqueous gel comprising a bioabsorbable polymer; rolling up the laminate and the gel layer into a spiral roll, followed by drying the gel to form a layer of bioabsorbable sponge.

5,595,622

METHOD OF MAKING A BORON CARBIDE CERMET WITH AN ALUMINUM OXIDE LAYER

Aleksander J. Pyzik; Sharon M. Fuller, and Donald R. Beaman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 289,967, Aug. 12, 1994, Pat. No. 5,508,120. This application Dec. 19, 1995, Ser. No. 574,871
Int. Cl.[6] B32B 9/00
U.S. Cl. 156—89 9 Claims

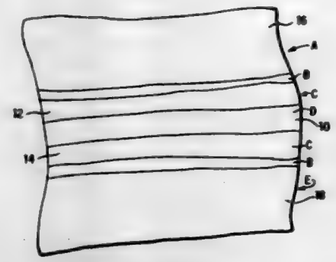
1. A method for making a boron carbide-aluminum structural composite comprising sequential steps:
a) infiltrating molten aluminum or aluminum alloy into a porous B_4C preform to form a densified B_4C-Al cermet;
b) heat treating the densified cermet in the presence of air or an oxygen-containing atmosphere at a temperature of at least about 625° C. for a period of time sufficient to yield (1) a microstructure characterized by isolated B_4C grains or clusters of B_4C grains surrounded by a multiphase matrix that comprises aluminum borides, aluminum borocarbides and free metal, and (2) a dense surface layer of aluminum oxide, the surface layer being substantially free of carbon.

5,595,623

METHOD FOR MAKING A BARRIER FILM WITH IMPROVED EXTENSIBILITY FOR CHEESE PACKAGING

Cedric M. Lulham, Gray Ct., and Gloria G. Toney, Greer, both of S.C., assignors to W. R. Grace Co.-Conn., Duncan, S.C.

Division of Ser. No. 871,595, Apr. 16, 1992, which is a continuation of Ser. No. 614,768, Nov. 16, 1990, abandoned. This application May 31, 1995, Ser. No. 455,804
Int. Cl.[6] B29C 55/28
U.S. Cl. 156—244.14 13 Claims



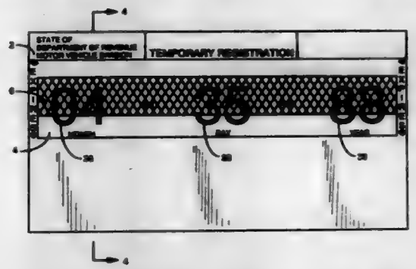
1. A method of making a film comprising:
blending from about 5% to about 95% by weight of ethylene vinyl acetate copolymer having from about 3% to about 18% by weight of vinyl acetate with from about 5% to about 95% by weight of ethylene/alpha-olefin copolymer having a density of less than about 0.915 g/cc;
extruding said blend through a circular coextrusion die;
immediately blowing the extrudate to a diameter appropriate for achieving the desired thickness for the final film;
cooling the coextruded film; and
collapsing the cooled film.

5,595,624

METHOD OF MAKING TAMPER EVIDENT AND COUNTERFEIT RESISTING INFORMATIONAL ARTICLE

Yoram Cariel, Aurora, Colo., assignor to Optical Security Group, Inc., Denver, Colo.

Division of Ser. No. 213,561, Mar. 16, 1994, Pat. No. 5,370,763, which is a continuation of Ser. No. 915,975, Jul. 17, 1992, abandoned. This application Nov. 17, 1994, Ser. No. 341,662
Int. Cl.[6] G03H 1/00
U.S. Cl. 156—277 10 Claims



1. A method of protecting an informational article comprising:
providing an article having a first zone for inserting information and a pattern disposed within said zone;
inserting information in said zone;
securing a transparent tape over said information, whereby said pattern will resist photocopy duplication of said article and said tape will resist alteration of said inserted information;
employing a refractive image as said pattern;
employing a hologram as said refractive image;

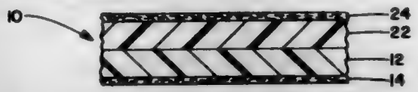
providing on said tape a coating of a silicone resin on the exposed surface thereof;
providing about 2½ to 10 percent by weight wax in said silicone resin;
employing a polytetrafluoroethylene wax as said wax;
adhesively bonding said tape over said inserted information;
adhesively bonding a portion of said tape to said article prior to inserting said information; and
inserting said information by manual or printing means.

5,595,625

METHOD OF MANUFACTURING AN ANTI-FRACTURE, WATER-RESISTANT, MASONRY-BONDABLE MEMBRANE

David L. Fiebel, Caledonia, and Terry M. Digiglia, Columbus, both of Miss., assignors to GenCorp Inc., Fairlawn, Ohio

Division of Ser. No. 177,057, Jan. 4, 1994, Pat. No. 5,481,838, which is a division of Ser. No. 969,893, Nov. 2, 1992, Pat. No. 5,318,832. This application Aug. 22, 1995, Ser. No. 517,784
Int. Cl.[6] B32B *27/30*; E02D *19/00*
U.S. Cl. 156—308.2 **8 Claims**



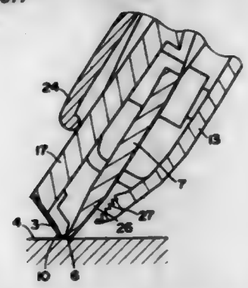
1. A method of making an anti-fracture, water-resistant, masonry-bondable membrane, comprising the steps of:
applying and physically bonding a nonwoven fiber layer to a first side of a first flexible, plasticized, polyvinyl chloride homopolymer or copolymer layer;
applying and physically bonding a second nonwoven fiber layer to a first side of a second flexible, plasticized, polyvinyl chloride homopolymer or copolymer layer;
subsequently contacting the second side of the first flexible, plasticized, polyvinyl chloride homopolymer or copolymer layer with the second side of the second flexible, plasticized, polyvinyl chloride homopolymer or copolymer layer; and
melt-fusing said first and second polyvinyl chloride homopolymer or copolymer layer to form the membrane.

5,595,626

TAPE DISPENSER

Nobuo Yokouchi, Saku, and Hiroyuki Saito, Ishioka, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

PCT No. PCT/JP94/00685, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/25385, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 11, 1994, Ser. No. 362,469
Claims priority, application Japan, Apr. 26, 1993, 5-027173; Jul. 30, 1993, 5-045869
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—577 **37 Claims**



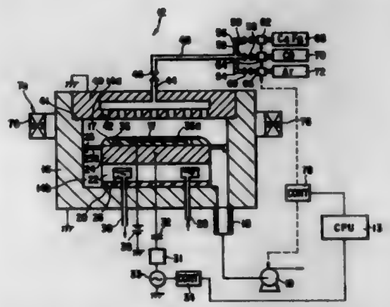
1. A tape dispenser comprising: a main body having a dispensing end for dispensing a tape upon application of a pull-out force at a leading end of the tape, the main body having a size capable of being gripped by a hand of a user; a holding member in the main body for pivotally supporting a roll of the tape for permitting the roll of tape to undergo angular displacement about a pivot axis; a pressing member having a pressing portion at the dispensing end of the main body for receiving the tape from the roll and for pressing the tape against a surface for adhering the tape to the surface; clamping means for applying a clamping force to the tape to releasably clamp the tape at the dispensing end of the main body; and a cutting unit pivotally connected to the holding member and having a blade portion for cutting the tape at the dispensing end of the main body, the blade portion being displaceable between a first position toward the dispensing end of the main body and a second position away from the dispensing end of the main body; whereby displacement of the blade portion of the cutting unit from the first position toward the second position displaces the roll of tape angularly about the pivot axis to slacken a portion of the tape between the roll of tape and the leading end of the tape even when a pull-out force is not applied to the leading end of the tape.

5,595,627

PLASMA ETCHING METHOD

Koichiro Inazawa, Tokyo; Shin Okamoto, Kofu; Hisataka Hayashi, Yokohama, and Takuya Matsuhita, Yokkaichi, all of Japan, assignors to Tokyo Electron Limited, Tokyo, and Kabushiki Kaisha Toshiba, Kawasaki, both of Japan

Filed Feb. 2, 1996, Ser. No. 597,563
Claims priority, application Japan, Feb. 7, 1995, 7-043532
Int. Cl.[6] H01L *21/00*; C09K *13/00*
U.S. Cl. 156—643.1 **18 Claims**



1. A plasma etching method in which a processing gas is introduced into a processing room housing a substrate, an RF power is applied across opposite electrodes to cause the processing gas to discharge, thereby generating a plasma, and a first layer supported by said substrate is etched by using the plasma in preference to a second layer supported by said substrate and consisting of a material different from that of said first layer,
wherein said first layer consists essentially of SiO_2 while second layer consists essentially of a material selected from a group consisting of SiN, Si, Al, and TiN, the processing gas contains C_4F_8 and CO, and progress of dissociation of C_4F_8 is controlled, using a discharge duration of each part of the processing gas as a parameter, in order to set an etching selection ratio of said first layer to said second layer.

5,595,628

PRODUCTION OF PULP BY THE SODA-ANTHRAQUINONE PROCESS (SAP) WITH RECOVERY OF THE COOKING CHEMICALS

Otto W. Gordon, Apples; Eric Plattner, Seltisberg, and Frank Doppenberg, Lausanne, all of Switzerland, assignors to Grant S.A., Lausanne, Switzerland

Filed Jan. 5, 1994, Ser. No. 170,364
Claims priority, application Switzerland, May 5, 1992, 1434/92
Int. Cl.[6] D21C *11/04*
U.S. Cl. 162—30.11 **28 Claims**

1. A process for producing pulp from wood and annual plants and recovering of digesting chemicals thereof, the process comprising:
(a) cooking wood and annual plants with a digesting white liquor comprised of water, sodium hydroxide, anthraquinone and one or more alkali salts selected from the group consisting of aromatic carboxylic acids, aliphatic carboxylic acids and organic sulfonic acids, to produce pulp and black liquor; and
(b) recovering the digesting chemicals contained in the black liquor by:
(i) partially oxidizing the black liquor in a water phase without substantially oxidizing the organic sulfonic acids, aliphatic carboxylic acids, and anthraquinone, wherein the lignin, hemicelluloses and sugars are oxidizedinto aliphatic carboxylic acids and carbon dioxide and the sodium hydroxide is converted to sodium carbonate and/or sodium bicarbonate,
(ii) removing the insoluble anthraquinone from the oxidized liquor,
(iii) heating the oxidized liquor to transform sodium bicarbonate into sodium carbonate;
(iv) converting the sodium carbonate formed in the heated oxidized liquor into sodium hydroxide in a causticizing stage, and
(v) separating the sodium salts of aliphatic carboxylic acids from the causticized liquor by one of the following steps:
(a1) crystallizing the causticized liquor to remove the sodium salts of aliphatic carboxylic acids; and
(a2) crystallizing the causticized liquor to remove the sodium salts of aliphatic carboxylic acids from the liquor, re-dissoluting the remaining liquor in water and then subjecting re-dissoluted liquor to a membrane electrolysis or electrodialysis to further separate the sodium hydroxide from residual sodium salts of aliphatic carboxylic acids.

5,595,629

PAPERMAKING PROCESS

Arthur J. Begala, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 22, 1995, Ser. No. 532,911
Int. Cl.[6] D21H *21/06*
U.S. Cl. 162—158 **11 Claims**

1. A papermaking process consisting of:
forming an aqueous cellulosic papermaking slurry;
adding a cationic polymer having a molecular weight of from 500,000 to 20,000,000 selected from the group consisting of dimethylaminoethyl acrylate methyl chloride quat, dimethylaminoethylmethacrylate, dimethylaminoethyl acrylate benzyl chloride quat, dimethylaminoethylmethacrylate methyl chloride quat, [3-methacryloylamino-propyl] trimethyl ammonium chloride, N-[3-(Dimethylamino)propyl]-methacrylamide and acrylamide copolymers thereof, in an amount of at least 0.01 weight percent based on dry weight of slurry solids;
adding an anionic polymer to the slurry, the anionic salt comprising a formaldehyde condensate of a naphthalene sulfonic acid salt, in an amount of from about 0.005 weight percent to about 0.5 weight percent based on dry weight of slurry solids;
draining the slurry to form a sheet, and
drying the sheet.

5,595,630

PROCESS FOR THE MANUFACTURE OF PAPER

Robert H. Moffett, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, D.C.

Filed Aug. 31, 1995, Ser. No. 522,452
Int. Cl.[6] D21H *21/10*
U.S. Cl. 162—164.1 **6 Claims**

1. A process for the manufacture of paper comprising the steps of:
(A) adding to an aqueous paper furnish containing cellulosic fibers
(i) cationic aluminum compound in a proportional amount X;
(ii) artionic aluminum compound in a proportional amount 1-X, wherein the combined weight of said aluminum compounds (as Al_2O_3) is 0.005–2 weight % based on the dry weight of the furnish;
(iii) cationic or amphoteric polymer in an amount of 0.05–6 weight % based on the dry weight of the furnish; and
(iv) anionic colloidal microparticles in an amount of 0.001–2 weight % (as SiO_2 or, for bentonite, as solids) based on the dry weight of the furnish; and
(B) forming and dewatering the aqueous suspension formed in step (A);
wherein as X is varied from 0 to 1, a plot of Canadian Standard Freeness versus X has a maximum at some amount X, where $0<X<1$ and a plot of turbidity versus X has a minimum at some amount X where $0<X<1$.

5,595,631

METHOD OF PAPER SIZING USING MODIFIED CATIONIC STARCH

John J. Tsai, Belle Mead, and Walter Malicayuya, Somerville, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed May 17, 1995, Ser. No. 442,731
Int. Cl.[6] D21H *17/28*
U.S. Cl. 162—175 **15 Claims**

1. A method for sizing paper products comprising the steps of:
a) providing a paper stock system;
b) forming a sizing emulsion comprising a cyclic dicarboxylic acid anhydride containing hydrophobic substitution, a cationic, non-degraded starch which is further modified to a DS of from about 0.005 to 0.4 with either:
i) an ether group, R—O— where R is an hydroxyalkyl or alkyl of 1 to 4 carbon atoms or alkenyl of 2 to 4 carbon atoms, or
ii) an ester group,

where R is an alkyl of 1 to 4 carbon atoms or alkenyl of 2 to 4 carbon atoms, wherein the non-degraded, fully modified starch has a viscosity of at least 1,000 cPs at 30° C. in an 8% aqueous solution and there is from about 0.1 to 10 parts by weight of modified cationic starch per part of substituted cyclic dicarboxylic acid anhydride, and water;
c) forming a web from the paper stock system; and
d) dispersing said emulsion within the paper stock either before or after formation of said web but prior to passing said web through the drying stage of the paper making operation in an amount sufficient to provide a concentration of the substituted

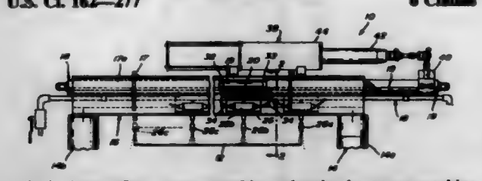
cyclic dicarboxylic acid anhydride of from about 0.01 to 2.0% by weight, based on dry fiber weight.

5,595,632

SHOWER FOR PAPER MAKING MACHINE

Jacek Maciorewicz, Brockville, Canada, assignor to James Ross Limited, Ontario, Canada

Filed Feb. 1, 1994, Ser. No. 189,650
Int. Cl.[6] D21F 1/32
U.S. Cl. 162—277 6 Claims



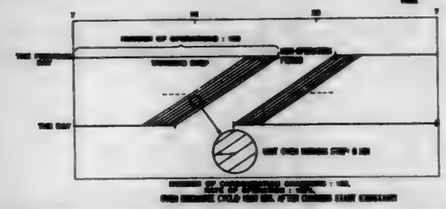
1. A shower for a paper machine wherein the paper machine includes a paper fabric conveyor means movable in a paper feed direction, the shower comprising at least a fluid conduit and an elongated conduit support means having an axis extending above and across the width of the paper fabric conveyor means, a plurality of line nozzles spaced apart in series on the conduit support means and the nozzles being directed toward the paper fabric conveyor means, said conduit support means is mounted in a fixed housing extending over the paper fabric conveyor means, and the conduit support means slides within the fixed housing in the axis of the conduit support means, and oscillating means are provided for oscillating the conduit support means in the axis so that the line nozzles will move to span the distance between adjacent line nozzles, each line nozzle is associated with a valve for controlling the supply of conditioning fluid from the at least a fluid conduit through the line nozzle, and means for individually controlling each valve to selectively operate the individual line nozzles in order to selectively spray conditioning fluid on selected longitudinal zones of the paper fabric conveyor means.

5,595,633

COKING PROCESS FOR A BATTERY OF COKE OVENS

Shingo Sogame, and Masatsugu Kimura, both of Sakaide, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 958,761, Oct. 9, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,494
Claims priority, application Japan, Oct. 11, 1991, 3-263996
Int. Cl.[6] C10B 31/00
U.S. Cl. 201—1 8 Claims



1. A coking process utilizing a battery of coke ovens comprising the steps of:

providing at least 70 coke ovens;

continuously charging said coke ovens with coal from a first oven to at least a seventieth oven without interruption until the at least seventieth oven of said ovens has been charged, and performing a coking operation in each oven of said ovens that have been charged; and

interrupting charging of ovens with coal for a period beginning after said at least seventieth oven has been charged, wherein no ovens are charged during said period, wherein said period extends at least until coking is completed in said first oven; and

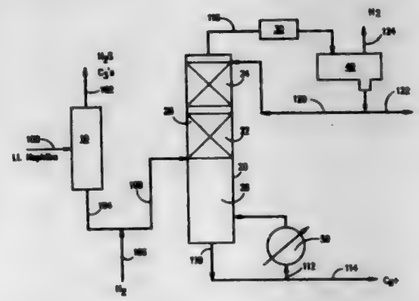
discharging each of said at least seventy ovens continuously after said period and starting with the coke oven first charged.

5,595,634

PROCESS FOR SELECTIVE HYDROGENATION OF HIGHLY UNSATURATED COMPOUNDS AND ISOMERIZATION OF OLEFINS IN HYDROCARBON STREAMS

Dennis Hearn; Gary R. Gildert, and Hugh M. Putman, all of Pasadena, Tex., assignors to Chemical Research & Licensing Company, Pasadena, Tex.

Filed Jul. 10, 1995, Ser. No. 500,101
Int. Cl.[6] B01D 3/34; C01G 7/00; C07C 5/22
U.S. Cl. 203—29 14 Claims



1. A process for the removal of mercaptans and/or hydrogen sulfide from aliphatic hydrocarbon streams, containing 3 to 12 carbon atoms comprising distilling a hydrocarbon stream comprising C_3 to C_{12} hydrocarbons including alkanes, mono-olefins, diolefins, acetylenes and sulfur compounds to remove a fraction comprising at least C_3's and a portion of the sulfur compounds and leaving a residual, concurrently

(a) feeding hydrogen and a portion of the residual to a distillation column reactor containing a first bed comprising a first hydrogenation catalyst selected from the group consisting of nickel, cobalt, iron and compounds thereof and prepared in the form of a distillation structure and a second bed positioned in said column above said first bed, said second bed comprising a second hydrogenation catalyst selected from the group consisting of platinum, palladium, rhodium and the compounds thereof and prepared as a distillation structure wherein any sulfur compounds in the residual react in said first bed with a portion of the diolefins to form sulfides in a first reaction mixture,

(b) fractionally distilling the first reaction mixture to remove the sulfides with a heavier fraction and passing a lighter fraction into the second bed,

(c) hydrogenating the diolefins and acetylenes in said lighter fraction in said second bed to form a second reaction mixture,

(d) fractionally distilling the second reaction mixture, and

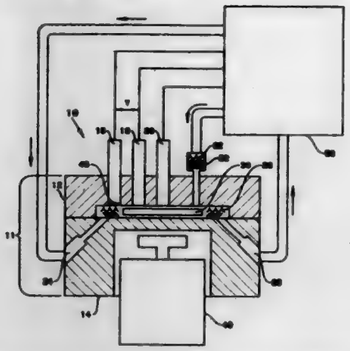
(e) removing a fraction overhead, which is substantially free of sulfur compounds, acetylenes and diolefins.

5,595,635

APPARATUS FOR MEASURING LEAD CONTENT OF WATER

Cesar Clavell, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 5, 1995, Ser. No. 525,451
Int. Cl.[6] G01N 27/26
U.S. Cl. 204—412 12 Claims



1. An electrochemical cell for measuring concentration of metal ions in a liquid sample, comprising:

a sampling enclosure for containing said liquid sample;

a working electrode operably coupled to said sampling enclosure and said liquid sample;

a counter electrode electrically insulated from said working electrode, operably coupled to said sampling enclosure and said liquid sample;

a reference electrode electrically insulated from said working electrode and said counter electrode, operably coupled to said sampling enclosure and said liquid sample;

a voltage meter operably coupled to said working electrode and said reference electrode for measuring an open circuit voltage response; and

a calculator operably coupled to said voltage meter for displaying said concentration of said metal ions in said liquid sample as a plot having a peak representative of said concentration of said metal ions calculated by mapping said open circuit voltage response into voltage bins.

5,595,636

METHOD FOR MASS SPECTROMETRIC ANALYSIS OF SAMPLES FROM ELECTROPHORESIS PLATES

Jochen Franzen, Bremen, Germany, assignor to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed Mar. 9, 1995, Ser. No. 401,404
Claims priority, application Germany, Mar. 10, 1994, 44 08 034.4
Int. Cl.[6] G01N 27/26;27/447
U.S. Cl. 204—464 15 Claims

1. A method for the mass spectrometric analysis of an analyte substance in a sample which has been separated by gel electrophoresis on a gel electrophoresis plate, which method comprises:

coating a sample support plate with a smooth adsorptive layer of a solid matrix substance, the matrix substance being a material which can be coevaporated with the sample and which interacts with the sample in a gaseous phase so as to generate ions of the sample by ion-molecular reaction;

transferring the sample to the surface of the matrix layer of the sample support plate by direct contact with at least one of the electrophoresis plate and a moist transfer membrane, contact between the sample and matrix layer being such that substantially no dissolution of the matrix substance results therefrom; and

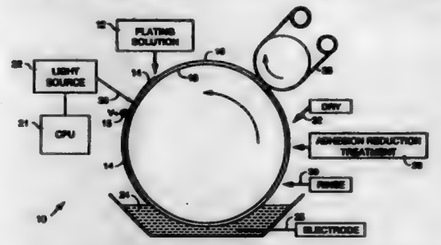
ionizing the analyte substance by matrix-assisted laser desorption.

5,595,637

PHOTOELECTROCHEMICAL FABRICATION OF ELECTRONIC CIRCUITS

D. Morgan Tench, Ventura; Leslie F. Warren, Jr., Camarillo, and Young J. Chung, Calabasas, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Nov. 17, 1995, Ser. No. 559,952
Int. Cl.[6] C25D 5/00;5/02;7/12; B05D 5/12
U.S. Cl. 205—91 19 Claims



1. A method of fabricating an electronic circuit, comprising the steps of:

providing a surface of semiconductor material;

applying a metal plating solution to cover at least a portion of said semiconductor surface;

illuminating selected areas of said solution-covered semiconductor surface corresponding to a pattern of the electronic circuit;

photoelectrochemically depositing a seed layer of metal on said illuminated areas of said solution-covered semiconductor surface;

treating said deposited seed layer of metal to reduce adhesion of subsequently deposited metal;

subsequently depositing metal on said treated seed layer without further illumination; and

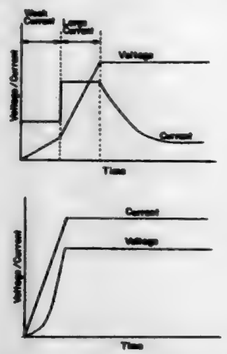
transferring said subsequently deposited metal to an alternate substrate to form the electronic circuit.

5,595,638

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING AN ANODIC OXIDATION

Toshimitsu Konuma; Akira Sugawara, and Yukiko Uehara, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Mar. 10, 1995, Ser. No. 401,698
Claims priority, application Japan, Mar. 17, 1994, 6-074024
Int. Cl.[6] C25D 5/00;5/18;11/00;5/48
U.S. Cl. 205—96 10 Claims



1. A process of anodic oxidation comprising the steps of:

applying a voltage between a thin film comprising an anodizable material and a cathode through an electrolyte therebetween, with said thin film used as an anode;

increasing monotonically a current applied between the thin film and the cathode until the voltage therebetween reaches a first value; and then

maintaining said first voltage for a first duration.

5,595,639

METHOD OF MAKING A MOLD HAVING A NICKEL AND GRAPHITE SURFACE COATING FOR MOLDING GLASS

Hiroki Sano, Yokosuka; Tateyuki Suzuki, Kashiwa, and Akira Kobayashi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 228,003, Apr. 15, 1994, Pat. No. 5,429,652, which is a continuation of Ser. No. 931,385, Aug. 18, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 377,102

Claims priority, application Japan, Aug. 19, 1991, 3-230797

Int. Cl.[6] C25D *15/00*

U.S. Cl. 205—109 **7 Claims**



1. A method of producing a mold for molding glass, said mold being coated with a film of nickel or nickel-based alloy having graphite dispersed therein comprising the steps of

immersing the mold as a cathode and nickel metal as an anode in a dispersion coating bath comprising a solution of a water-soluble nickel salt with graphite being dispersed therein, and applying an electric current between said cathode and said anode to precipitate nickel as well as graphite onto the mold to form a precipitated film,

wherein a water-soluble high molecular weight dispersing agent having a molecular weight of 1000 or greater is present in the dispersion coating bath so that granular growth of nickel or nickel-base alloy in the precipitated film in the direction perpendicular to the film surface and in the direction of the plane of the film surface is suppressed, and the nickel or nickel-base alloy is present in the form of flakes and is continuous as a whole but exists in the form of open cells in which graphite is held, graphite being outwardly exposed on the film surface.

5,595,640

METHOD AND APPARATUS FOR CONTINUOUS GALVANIC APPLICATION OF METALLIC LAYERS ON A BODY

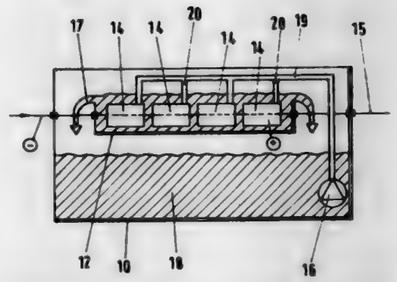
Timm von Hoffmann, Muehlacker, Germany, assignor to Metallgiesz Gesellschaft fuer Entgratung und Oberflaechentechnik mbH, Muehlacker, Germany

Filed Aug. 28, 1995, Ser. No. 520,071

Int. Cl.[6] C25D *2/04;5/08;5/34;17/00*

U.S. Cl. 205—205 **12 Claims**

1. In a galvanic process for galvanic or chemical treatment, in particular for the continuous application of metallic layers on a body which is guided in a direction opposite to the flow direction of an electrolyte which flows through a hollow body and is mixed with metal ions, said body being connected to the negative pole of a current source so as to act as a cathode, while the hollow body is connected with the positive pole of the current source and acts as an anode, wherein the flow velocity of the electrolyte, which can be influenced by a pump, and the movement velocity of the body



to be coated are selected so that a turbulent flow occurs at the surface of the body to be coated, the improvement comprising the steps of:

injecting the electrolyte to be directed on all sides of the circumference of the body so as to be inclined at angles (α, β) relative to and opposite the throughput direction of the body by partially changing the flow velocity of the injected electrolyte with respect to the body for the purpose of completely dissolving the diffusion layer on the entire surface of the body to be coated; and

regulating the current of the current source such that a current density of 10 to 400 A/dm^2 prevails on the surface of the body.

5,595,641

APPARATUS AND PROCESS FOR ELECTROCHEMICALLY DECOMPOSING SALT SOLUTIONS TO FORM THE RELEVANT BASE AND ACID

Carlo Traini, Milan, and Giuseppe Faita, Novara, both of Italy, assignors to DeNora Permelec S.p.A., Italy

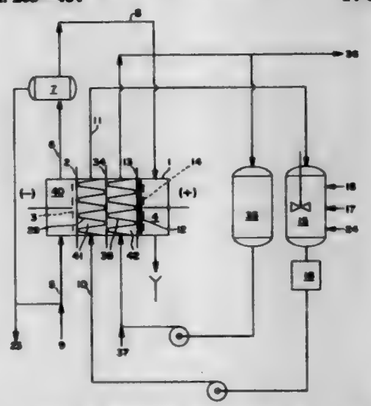
PCT No. PCT/EP92/01442, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO93/00460, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 26, 1992, Ser. No. 157,180

Claims priority, application Italy, Jun. 27, 1991, MI91A1765

Int. Cl.[6] C25B *1/00*

U.S. Cl. 205—464 **14 Claims**



14. A method of electrolysis of a solution of a salt for the production of a solution containing an acid and a solution containing a base, carried out in an electrolyzer which comprises at least one elementary cell divided into a first, a central and a third compartment by means of a first and a second cation-exchange membrane, the first of said compartments contains the first of said membranes and a cathode for the hydrogen evolution and the production of the base, the central compartment defined by said

cation-exchange membranes is further divided into two parts by an anion-exchange membrane, the third compartment contains the second of said cation-exchange membranes and an anode, said anode comprises a porous electrocatalytic sheet for hydrogen ionization and a porous rigid current collector, said method comprises:

feeding the solution of the base to an inlet of the first compartment

withdrawing a more concentrated solution of the base and hydrogen from an outlet of said first compartment

feeding the solution of the salt to an inlet of the part of the central compartment defined by said first cation-exchange membrane and the anion-exchange membrane,

withdrawing an exhausted solution of the salt from an outlet of said part of the central compartment,

withdrawing a solution of the acid from an outlet of the part of the central compartment defined by the anion-exchange membrane and said second cation-exchange membrane

feeding a hydrogen-containing gaseous stream to an inlet of said third compartment

venting rest gas from an outlet of said compartment characterized in that the hydrogen gas diffuses throughout the porous current collector and the porous electrocatalytic sheet and it is ionized at the interface between said electrocatalytic sheet and the membrane to form H^+ ions and said H^+ ions migrate through the membrane into said solution of the acid, said electrocatalytic sheet, said membrane and said current collector are held in contact by means of pressure without bonding.

5,595,642

PRESSURE LEACHING OF NICKEL AND COBALT SULPHIDES WITH CHLORINE UNDER CONTROLLED REDOX POTENTIAL CONDITIONS

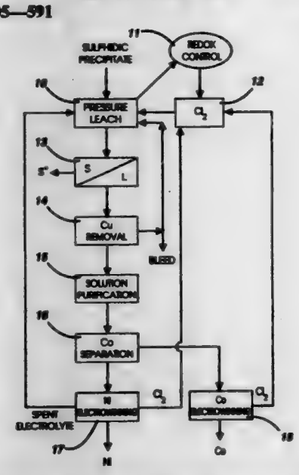
Tao Xue, 43 Rondeau, Kirkland Quebec, Canada, and Ronald R. Dunn, 1899 Cedarview Crescent, Sudbury Ontario, Canada

Filed Nov. 16, 1995, Ser. No. 558,530

Claims priority, application Canada, Dec. 1, 1994, 2137124

Int. Cl.[6] C25C *1/06*

U.S. Cl. 205—591 **14 Claims**



1. A method of pressure leaching nickel and cobalt from sulphidic precipitates which contain NiS as the main nickel compound, CoS as the main cobalt compound, have a low copper content of less than 0.5 wt % and a high sulphur content in the range of 30–40 wt %, which method comprises charging an aqueous slurry of said sulphidic precipitates into a pressure vessel and leaching the same at over-atmospheric pressure with chlorine in the presence of copper as redox catalyst at a controlled redox potential of a value selected between 400 and 550 mV with respect to Ag/AgCl reference electrode and at a temperature of between 120° and 160° C., said redox potential and said temperature being such as to dissolve at least 80 wt % of cobalt and to oxidize less than 10 wt % of sulphur to sulphate during said pressure leaching and said redox potential being controlled by continuously measuring the same within the pressure vessel using a suitable redox potential measuring probe and by continuously or intermittently injecting into the pressure vessel a required amount of chlorine to maintain said redox potential at the selected value until the leaching operation is essentially complete.

11. Method according to claim 1, wherein upon completion of the pressure leaching operation, a liquid-solid separation is carried out to separate leach solution from leach residue and sulphur is recovered from the leach residue, while the leach solution is subjected to the steps of copper removal, solution purification, cobalt separation and electrowinning of nickel and cobalt respectively.

5,595,643

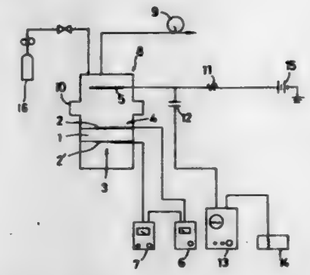
METHOD FOR GENERATING NEGATIVELY CHARGED OXYGEN ATOMS AND APPARATUS USED THEREFOR

Yoshifumi Torimoto, Wakayama, and Masayoshi Sadakata, 2-31-24, Koenji Minami, Suginami-ku, Tokyo, both of Japan, assignors to Kao Corporation, and Masayoshi Sadakata, both of Tokyo, Japan

Filed May 24, 1995, Ser. No. 449,852

Int. Cl.[6] C25B *1/02*

U.S. Cl. 205—634 **14 Claims**



1. A method for generating negatively charged oxygen atoms, comprising the following steps:

(A) supplying oxygen to a surface of a solid electrolyte, at which the surface is provided an electrode A', while supplying an electric current to the electrode A', to form oxygen ions (O^{2-});

(B) causing the oxygen ions formed in step (A) to be transmitted through said solid electrolyte;

(C) forming negatively charged oxygen atoms (O^-) from said oxygen ions at a surface of said solid electrolyte, an opposite surface on which the electrode A' is provided, the by providing the electric current to an electrode A on said opposite surface; and

(D) applying voltage to an electrode B spaced from said electrode A, and away from the solid electrolyte in an amount sufficient to generate an electric potential between the electrode A and the electrode B, causing said negatively charged oxygen atoms to migrate and diffuse from the electrode A towards the electrode B.

5,595,644

METHOD AND DEVICE FOR THE ELIMINATION OF TOXIC MATERIALS FROM, IN PARTICULAR, THE TOPSOIL

Falk R. Doring, and Nicki Doring, both of Stuttgart, Germany, assignors to P + P Geotechnik GmbH, Stuttgart, Germany

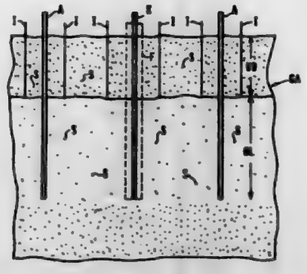
PCT No. PCT/EP93/01878, § 371 Date Mar. 14, 1995, § 102(e) Date Mar. 14, 1995, PCT Pub. No. WO94/02264, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 16, 1993, Ser. No. 374,532

Claims priority, application Germany, Jul. 17, 1992, 42 23 666.5; Jan. 19, 1993, 43 01 270.1

Int. Cl.[6] C02F *1/461*

U.S. Cl. 205—766 16 Claims



1. A method of eliminating harmful materials in a ground region, said method comprising:

applying an electrical voltage to electrodes disposed in said ground region;

causing harmful materials to decompose in situ by production of an ionization channel between said electrodes via said application of a voltage in the ground region so as to increase the conductivity of said ground region; and

regulating the electrical voltage by adjusting the current such that the energy supplied is equal to or greater than the electron affinity of the atoms of which the harmful materials are comprised in said ground region.

5,595,645

ELECTROLYTIC OXIDATION PROCESS

Neal Barr, Clayfield, Australia, assignor to Spunbon Pty Ltd, Queensland, Australia

PCT No. PCT/AU93/00436, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/04720, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 26, 1993, Ser. No. 393,011

Claims priority, application Australia, Aug. 26, 1992, PL4324

Int. Cl.[6] C25D *7/00*

U.S. Cl. 205—771 29 Claims

15. A process for removing ferrous ions from a solution comprising the steps of:

providing a closed electrolytic cell including an inlet for introducing the solution and an outlet for removing the solution, the electrolytic cell having an anode and a cathode;

introducing the solution into the electrolytic cell at a flow rate greater than 0.2 m/s;

electrolytically oxidizing ferrous ions where hydroxyl ion are present to produce ferric hydroxide; and

removing the solution from the cell, wherein

liquid turbulence is induced at, or in the proximity of, at least a portion of the surface of the anode where a mechanically



stable, non-dendritic ferric hydroxide precipitate grows on or near the anode.

5,595,646

EXTENDED USE PLANAR SENSORS

Joseph S. Foos, Needham; Peter G. Edelmann, Franklin; James E. Flaherty, Attleboro, all of Mass., and Joseph Berger, Basel, Switzerland, assignors to Ciba Corning Diagnostics Corp., Del.

Division of Ser. No. 209,881, Mar. 9, 1994, Pat. No. 5,503,719, which is a division of Ser. No. 45,847, Apr. 9, 1993, Pat. No. 5,387,329. This application Aug. 24, 1995, Ser. No. 492,465

Int. Cl.[6] G01N *27/26*

U.S. Cl. 205—783 35 Claims

1. A method of adjusting the dioxygen permeability of a semipermeable membrane comprising a copolymer of a nitrile-containing monomer and a conjugated diene, comprising:

adding a set quantity of a species selected from the group consisting of a polymeric or copolymeric vinyl halide vinylidene halide, a copolymer comprising vinyl halide and a nitrile-Containing monomer, a copolymer comprising vinylidene halide and a nitrile containing monomer, and a combination of any of the above, to said nitrile/conjugated diene copolymer, to form a mixture of copolymers, said set amount being selected to adjust the oxygen permeability to a set level.

5,595,647

METHOD FOR DETERMINING GAS COMPONENTS AND/OR GAS CONCENTRATIONS OF GAS MIXTURE

Gerhard Hoetzel, Stuttgart; Harald Neumann, Vaihingen, and Johann Riegel, Bietigheim-Bissingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/00188, § 371 Date Jan. 19, 1995, § 102(e) Date Jan. 19, 1995, PCT Pub. No. WO94/22007, PCT Pub. Date Sep. 29, 1994

PCT Filed Feb. 19, 1994, Ser. No. 290,783

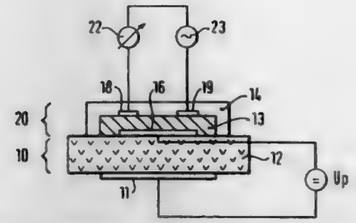
Claims priority, application Germany, Mar. 19, 1993, 43 08 767.1

Int. Cl.[6] G01N *27/12;27/41*

U.S. Cl. 205—784.5 10 Claims

1. A method of determining at least one of gas constituents and gas concentrations of a gas mixture such as exhaust gas from an internal combustion engine, comprising:

producing a change in gas concentration of the gas mixture at a semiconductor gas sensor by pumping a variable supply of oxygen to the semiconductor gas sensor by means of a solid electrolyte pumping cell;



detecting at least one reaction speed selected from the group consisting of adsorption speed and desorption speed caused by the change in gas concentration as a signal from the semiconductor gas sensor which is a reply function;

evaluating the signal from the semiconductor gas sensor over time to provide a time response of the reply function; and

comparing the time response of the reply function with a stored, standardized time response of different gas constituents whereby at least one of the gas constituents and the gas concentrations of the gas mixture are determined.

5,595,648

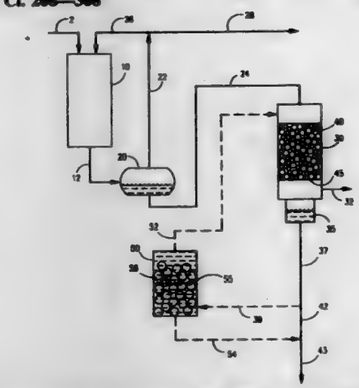
TWO PHASE REMOVAL OF HALIDES FROM LIQUID HYDROCARBONS CROSS-REFERENCE TO RELATED APPLICATIONS

Tsoung Y. Yan, Wayne, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 30, 1994, Ser. No. 367,501

Int. Cl.[6] C10G *19/00;19/073;29/12*

U.S. Cl. 208—308 18 Claims



1. A process for removing acidic halides from dry liquid hydrocarbon streams comprising:

a. charging a liquid hydrocarbon stream which is not saturated with water less than 50 wt. ppm water and from 0.1 to 100 wt. ppm acidic halogen compounds to a neutralization reactor containing particles consisting essentially of solid caustic disposed within said reactor as a bed with a void volume of at least 10%, said caustic particles having a low surface area and being essentially non-porous;

b. removing at least a majority of said acidic halides by reaction with said solid caustic to form:

salts, which are deposited on the surface of said solid caustic, and

water of neutralization, which is essentially completely dissolved in said dry liquid hydrocarbon so that no aqueous phase forms in said treating vessel or in said bed;

c. removing from said bed and from said vessel a treated liquid hydrocarbon stream having a reduced content of acidic halides and being essentially free of any aqueous phase as a product of the process.

5,595,649

PARTICLE-LOADED NONWOVEN FIBROUS ARTICLE FOR SEPARATIONS AND PURIFICATIONS

Craig G. Markell, White Bear Township, Ramsey County; Donald F. Hagen, Woodbury; Paul E. Hansen, Lake Elmo, and Nicholas R. Baumann, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 198,527, Feb. 17, 1994, Pat. No. 5,415,779, which is a division of Ser. No. 929,985, Aug. 14, 1992, Pat. No. 5,328,758, which is a continuation-in-part of Ser. No. 776,898, Oct. 11, 1991, abandoned. This application Feb. 16, 1995, Ser. No. 389,260

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 29 Claims

1. A disk comprising

a) a thermoplastic nonwoven fibrous web, and

b) sorptive or reactive particles enmeshed in said web to provide a particle-loaded fibrous disk,

wherein said particle-loaded fibrous disk has been compressed or fused by at least one of calendering, heating, and applying pressure to provide said disk with controlled porosity and a Gurley number of at least two seconds, said disk being useful in solid phase extraction.

5,595,650

DEVICE AND A METHOD FOR THE SEPARATION OF FLUID SUBSTANCES

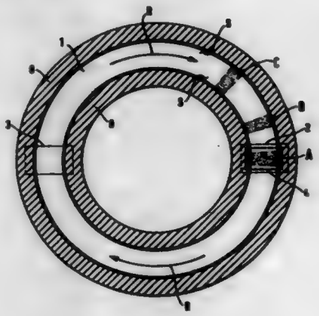
Andreas Manz, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Feb. 28, 1995, Ser. No. 396,045

Claims priority, application Switzerland, Mar. 3, 1994, 633/94

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 13 Claims



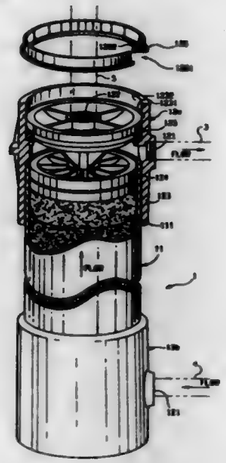
1. A device for the separation of fluid substances, especially a capillary chromatographic seperating device, which comprises a separating path in which a stationary phase is arranged and through which a mobile phase and an injected sample to be separated into its components flow, and means for transporting the mobile phase, and a detection device for detecting the seperated components, wherein the separating path is constructed in the form of an annular channel into which lead the inflow and outflow channels for the mobile phase and the fluid substance to be seperated, wherein the means for transporting the mobile phase together with the injected sample are arranged inside the annular channel.

5,595,651

ALL-PLASTIC HAND-ASSEMBLED SUPER-STRENGTH REVERSE OSMOSIS MEMBRANE HOUSING

Augustin Pavel, 301 Industrial Way Suite 2-3, Fallbrook, Calif. 92028

Filed Jan. 23, 1995, Ser. No. 390,294
Int. Cl.[6] B01D 61/08
U.S. Cl. 210—232 8 Claims



5. A housing for the membrane of a reverse osmosis system comprising:

a cylindrical central pipe having ends;

a sleeve permanently affixed to an end of the pipe and extending beyond the pipe end, the sleeve presenting in its extension a circular interior groove;

a circular plug inserted into the sleeve extension so as to have one circular surface facing outward, and one circular surface facing inward, to the pipe, the circular plug having and presenting at a circular periphery of its outward-facing circular surface a bevel surface; and

a retaining ring, having a bevel surface that is complimentary to the bevel surface of the plug, inserted in the circular interior grove of the sleeve and seating, bevel surface to bevel surface, against the plug so as to hold the plug in the sleeve., the seating teading, when any force is exerted on the plug as would tead to expel the plug outward from its held position within the sleeve, to force the retaining ring to greater circumferential distension, and tightly into the circular interior grove of the sleeve into which the retaining ring fits.

5,595,652

METHOD AND APPARATUS FOR IN-SITU REMEDIATION OF WATER CONTAINING UNDESIRABLE IONIC SPECIES

Norman B. Rainer, 2008 Fendalac Rd., Richmond, Va. 23229

Continuation-in-part of Ser. No. 561,606, Jul. 31, 1990. This application Sep. 19, 1994, Ser. No. 307,422
Int. Cl.[6] B01D 27/02; B01J 8/06;39/04
U.S. Cl. 210—282 6 Claims

1. Apparatus for the selective removal of dissolved multivalent metal ions from water comprising a compliant porous container of tubular shape having closure means associated with at least one extremity and, confined within said container, a multitude of pieces of porous sponge of cuboid configuration defined by six surfaces and containing 50% to 75% by weight of a chelation polymer, the average size of said sponge pieces being larger than the pore size of said container, the largest average dimension of said pieces of sponge being in the range of 5 to 30 millimeters when dry, said



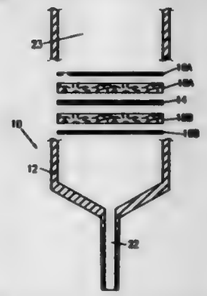
container permitting diametric expansion under the influence of said confined pieces of sponge.

5,595,653

MICROCOLUMN FOR EXTRACTION OF ANALYTES FROM LIQUIDS

Thomas J. Good, Sierra Madre, and Alan F. Redmond, Temple City, both of Calif., assignors to Cera, Inc., Baldwin Park, Calif.

Filed Jul. 15, 1994, Ser. No. 275,781
Int. Cl.[6] B01D 24/00;24/20;39/06;15/00
U.S. Cl. 210—289 19 Claims



1. Apparatus for extracting an analyte from a liquid sample comprising:

a) a container having an entrance, an exit, and a passage therebetween for passage of a liquid sample containing an analyte therethrough;

b) within the passage, a thin layer of microparticulate extraction media for extracting the analyte from the liquid sample, wherein:

(i) the extraction media layer has a top surface, a bottom surface, and a peripheral edge,

(ii) the extraction media has a particle size of less than 20 microns,

(iii) the ratio of the effective diameter of the extraction media layer to the distance between its top and bottom surfaces is at least 10, and

(iv) the extraction media layer is oriented in the passage so that liquid flows through the extraction media layer from its top surface to the bottom surface;

c) an upper compression layer at the top surface of the extraction media layer and a lower compression layer at the bottom surface of the extraction media layer, the two compression layers pressing the extraction media therebetween, the compression layers being sufficiently porous that the liquid sample flows therethrough, the compression layers being formed of a

flexible, hydrophilic, microfiber material and having a pore size less than the particle size of the extraction media;

d) an upper mesh flow distributor above the upper compression layer for distributing flow of the liquid sample uniformly to the extraction media layer top surface; and

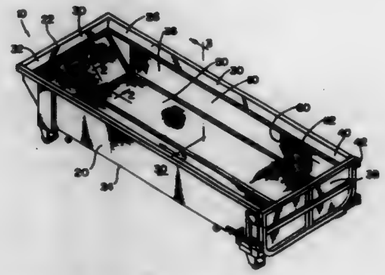
e) a lower mesh flow distributor below the lower compression layer.

5,595,654

SLUDGE FILTRATION SYSTEM AND METHOD

Carl R. Caughman, Jr., Houston, Tex., assignor to Flo Trend Systems, Inc., Houston, Tex.

Filed Jun. 7, 1995, Ser. No. 479,945
Int. Cl.[6] B01D 29/05
U.S. Cl. 210—323.1 22 Claims



1. A sludge filtration system comprising:

a container having container side walls and a bottom constructed to receive and maintain a sludge therein;

at least one first filter assembly positioned in said container;

said at least one first filter assembly defining a first filtrate cavity bounded by said first filter assembly, said container side walls, said container bottom and a lower surface of a separator plate;

said at least one first filter assembly constructed and positioned to be maintained below said sludge when said container contains said sludge therein;

thereby facilitating maintenance of a differential pressure that is lower than the atmospheric pressure in said first filtrate cavity;

a first pump means for creating a differential pressure that is lower than the atmospheric pressure in said first filtrate cavity and evacuating filtrate from said first filtrate cavity;

at least one first filtrate discharge conduit providing flow communication between said first filtrate cavity and said first pump means;

at least one second filter assembly positioned in said container;

said at least one second filter assembly defining a second filtrate cavity bounded by said at least one second filter assembly, said container side walls, and an upper surface of said separator plate, wherein said separator plate sealingly separates said first filtrate cavity from said second filtrate cavity; and

at least one second filtrate discharge conduit positioned and constructed to provide for gravitational evacuation of filtrate from said second filtrate cavity.

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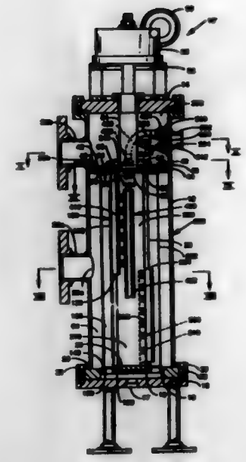
SELF-CLEANING FILTER ASSEMBLY

Carl A. Steiner, Erie, and Ricky L. Jackson, Union City, both of Pa., assignors to TM Industrial Supply, Inc., Erie, Pa.

Continuation of Ser. No. 136,953, Oct. 13, 1993, Pat. No. 5,443,726. This application Jun. 7, 1995, Ser. No. 482,822
Int. Cl.[6] B01D 29/68
U.S. Cl. 210—391 22 Claims

1. A fluid filter assembly comprising:

a filter body defining a chamber, an inlet, an outlet, and a backwash outlet;



a cylindrical filter element positioned within said chamber and supported by said body through which a fluid entering the inlet must pass to exit the outlet, said filter element having an inlet side and an outlet side, said filter body and the inlet side of said cylindrical filter element defining an inlet cavity;

means for cleaning the inlet side of the filter element comprising:

a hollow duct for collecting particulate matter dislodged from said filter element, said duct supported by said body and positioned within said inlet cavity adjacent to said inlet side of said filter element, said duct and said filter element being movable relative to each other, said duct including a slot opening so that said duct is in fluid communication with said inlet cavity; an elongated adjustable scraper attached to said duct and slidably contacting the inlet side of said filter element, said scraper substantially equal in length to said slot opening; a fluid deflector attached to said duct, said deflector substantially equal in length as said scraper, said deflector being positioned forwardly of said scraper, said slot opening in said duct being positioned between said deflector and said scraper, said deflector having a leading edge positioned in close proximity to said filter element; a cleaning chamber defined by said scraper, said deflector, and said duct, said cleaning chamber in fluid communication with said inlet cavity;

whereby when a fluid to be filtered passes from the inlet through the filter element and to the outlet and said duct and said filter element move relative to each other, fluid is directed from said inlet cavity into said cleaning chamber and said duct through which it can be exhausted to said backwash outlet.

5,595,656

DEVICE FOR FILTERING AGRICULTURAL WATER

Chang H. Yun, 138-2, Guseo-Dong, Gumjung-Gu, Pusan, Rep. of Korea

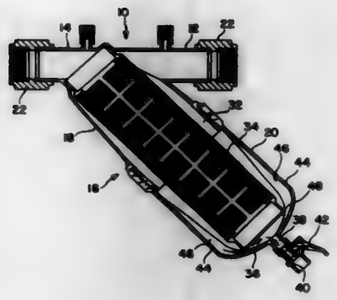
Filed Aug. 14, 1995, Ser. No. 514,790
Claims priority, application Rep. of Korea, Aug. 17, 1994, 94-20913
Int. Cl.[6] B01D 35/02
U.S. Cl. 210—416.1 5 Claims

1. A device for filtering agricultural water comprising:

an inlet tube connected to a water pump;

an outlet tube connected to a spray nozzle;

an upper shell disposed between said inlet tube and said outlet tube to connect them to each other, said upper shell being downwardly projected from a common axis of said inlet tube and said outlet tube;



a lower shell detachably fastened to a lower end of said upper shell and having at least one protruding portion formed on a circumferential surface of said lower shell, said protruding portion projecting radially and extending axially such that an inner surface of said protruding portion define, a particulate matter containment chamber; and

at least one filter received in an inner space defined by said upper shell and said lower shell to filter the agricultural water and thereby deposit any particulate matter in said containment chamber.

5,595,657

RECYCLABLE PHOTOGRAPHIC FILTERS

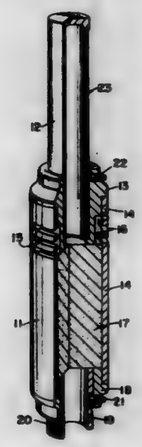
Stuart M. Coleman, 37 Bellbird Cres., Blaxland 2774 NSW., Australia, assignor to Stanley D. Sandler, and Stuart M. Coleman, both of New South Wales, Australia

Continuation of Ser. No. 276,206, Jul. 18, 1994, abandoned. This application Nov. 29, 1995, Ser. No. 563,870

Claims priority, application Australia, Mar. 7, 1994, PM4279

Int. Cl.[6] B01D *29/15*

U.S. Cl. 210—461 **10 Claims**



1. A recyclable filter cartridge for use in photographic processing, said cartridge comprising:

a housing including a substantially tubular imperforate shell having a longitudinal axis, the shell defining a cylindrical core therewithin through which processing chemicals are adapted to pass from a first end of the core to a second end of the core in the direction of the longitudinal axis of the shell;

entry port means formed through the shell solely at said first end of said core for the ingress of processing chemicals into the housing, the entry port means being in liquid flow communication to the first end of the core;

exit port means defined by an open end of the housing at said second end of said core for the egress of processing chemicals from housing, the exit port means being in liquid flow communication to the second end of the core; and,

filtering material which fills and is tightly packed within the cylindrical core extending between the said first and second ends for filtering processing chemicals, whereby the processing chemicals are subject to filtration by passage in the direction of the longitudinal axis of the shell through the filtering material, the filtering material being removable from the core.

5,595,658

MEMBRANE BASED ON GRAFT COPOLYMERS

Detlev Fritsch, Hamburg; Klaus V. Peinemann, Geesthacht; Rolf D. Behling, Hamburg, and Regine Just, Geesthacht, all of Germany, assignors to GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht, Germany

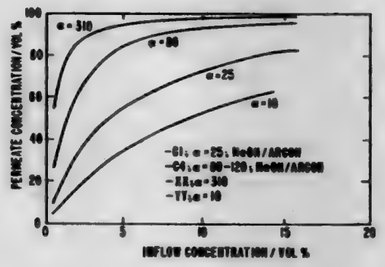
PCT No. PCT/DE93/00347, § 371 Date Dec. 28, 1994, § 102(e) Date Dec. 28, 1994, PCT Pub. No. WO93/20930, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 21, 1993, Ser. No. 325,371

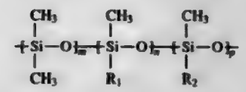
Claims priority, application Germany, Apr. 22, 1992, 42 13 217.7

Int. Cl.[6] B01D *69/02*

U.S. Cl. 210—490 **35 Claims**



1. A membrane comprised of a graft copolymer comprising a base component and a copolymer component, said base component comprising a first polymer having a repeating unit of the following general formula:



wherein m=0.1–0.9, n=0.9–0.1, p=0.03–0.04, R_1 can be a linear, branched or cyclic C_1–C_{12} non-aromatic hydrocarbon radical, R_2 can be a linear, branched or cyclic C_1–C_{12} non-aromatic hydrocarbon radical, and wherein at least one of said R_1 and R_2 is a linear or branched non-aromatic hydrocarbon radical with a terminal C=C double bond, said copolymer component comprising a siloxane copolymer having reactive sites for undergoing hydrosilylation.

5,595,659

FILTER MATERIAL FOR REMOVING CHLORINE FROM COLD WATER IN PREPARING A HUMAN-CONSUMABLE BEVERAGE

Ming-Teh Huang, Durham; David R. Lambert, Somersworth; Robert F. Gatto, Durham, and Kevin G. Lynch, Hampton, all of N.H., assignors to Lydall, Inc., Manchester, Conn.

Filed Feb. 17, 1995, Ser. No. 390,672

Int. Cl.[6] B01D *39/02*

U.S. Cl. 210—502.1 **37 Claims**



1. A filter material for removing chlorine from cold water used in preparing a human-consumable beverage, comprising:

(a) at least one layer of a mat of laid fibers selected from the group consisting of cellulosic fibers and synthetic textile fibers and mixtures thereof;

(b) a synthetic hydrophilic, food-grade latex binder deposited onto the fibers within the mat in an amount sufficient to so bind the fibers together within the mat that during a filtration of cold water through the mat no substantial amount of fibers are displaced therefrom and in an amount insufficient to substantially reduce a gravity flow rate of cold water through the mat to less than about 0.3 liter per minute per 100 square centimeters of said mat; and

(c) a water-insoluble chlorine adsorbent or absorbent solid powder disposed on said binder such that no more than 65% of the total surface area of the powder is substantially contacted by said binder.

5,595,660

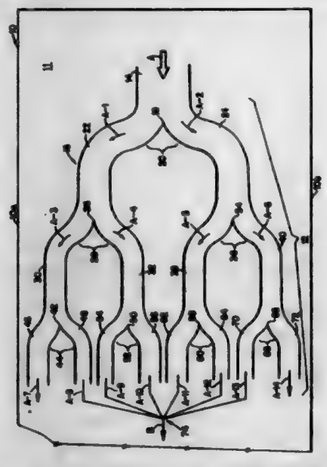
PLATE-TYPE SEPARATOR

Otto M. Ilg, and Jeffrey S. Dugan, both of Asheville, N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Jun. 23, 1995, Ser. No. 494,243

Int. Cl.[6] B01D *21/20*

U.S. Cl. 210—521 **21 Claims**



1. A plate-type separator, comprising at least one separator flow plate having formed on a common facial surface thereof at least one separation chamber comprising:

at least one inlet means formed on said common facial surface;

a channel assembly in fluid communication with said inlet means and formed on said common facial surface, said assembly comprising at least one branched-channel structure containing a main flow channel split at a downstream branch-point end thereof into at least two branching flow channels, wherein said main flow channel has a geometry sufficient to separate a multicomponent fluid stream passing therethrough into a plurality of substantially discrete fluid phases having different average density or average viscosity values, further wherein each of said branching flow channels is disposed to receive one of said discrete phases from said main flow channel so as to physically separate said discrete phases formed in said main flow channel from one another; and

a plurality of outlet means in fluid communication with said branching flow channels and formed on said common facial surface.

5,595,661

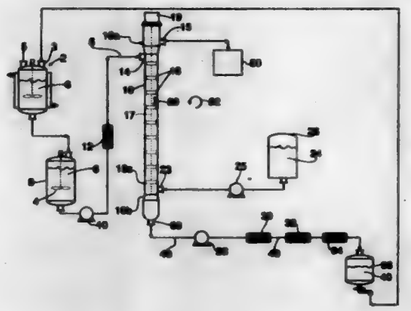
PROCESS FOR RECOVER HALOCARBONS FROM LIQUID WASTE SLURRIES

Michael Hsin-Chwen Li, Neshanic Sation; Hari K. Tikku, Edison, and Marc Steinman, Livingston, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 3, 1994, Ser. No. 285,254

Int. Cl.[6] B01D *11/04*

U.S. Cl. 210—634 **17 Claims**



1. A process for recovering a halocarbon from a liquid waste slurry containing the halocarbon admixed with one or more contaminants, comprising,

providing a countercurrent extraction column having two or more agitators and means for moving said agitators, said column also having in the following vertical order from the column top to the column bottom: an immiscible liquid outlet, a waste slurry inlet, an immiscible liquid inlet and a raffinate outlet;

introducing or feeding optionally filtered or unfiltered liquid slurry into said waste slurry inlet;

introducing or feeding a liquid which is immiscible with the halocarbon component of the waste slurry into the immiscible liquid inlet;

allowing a continuous flow of liquid waste slurry to move countercurrently to a continuous flow of the immiscible liquid through said two or more agitators that promote dispersion of the liquid waste slurry and the immiscible liquid at each agitator, thus facilitating transfer of contaminants from the waste slurry to the immiscible liquid;

removing the immiscible liquid containing waste contaminants extracted from said optionally filtered or unfiltered liquid slurry, at said immiscible liquid outlet;

allowing the halocarbon to separate from the immiscible liquid and the contaminants; and

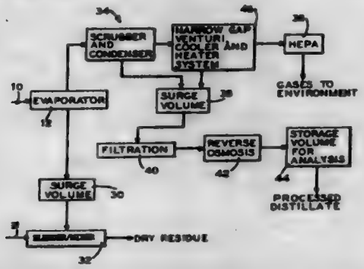
recovering the halocarbon or raffinate at said raffinate outlet.

5,595,662
WATER PURIFICATION DEVICE
Ronald D. Sanderson, Stellenbosch, South Africa, assignor to Water Research Commission, South Africa
Filed Aug. 21, 1995, Ser. No. 517,190
Claims priority, application South Africa, Aug. 19, 1994, 94/6328
Int. Cl.[6] B01D *15/00;35/18*
U.S. Cl. 210—640 **9 Claims**



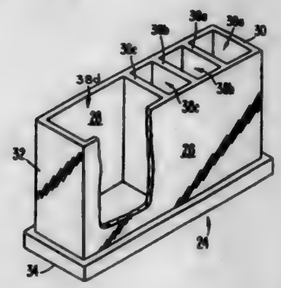
1. A water purification device, which comprises a compartment for holding a supply of impure water; a purified water collection zone; a dense hydrophilic membrane between the compartment and the purified water collection zone, the membrane being capable of functioning by membrane distillation; and a water vapor condensing surface defining the purified water collection zone, with the condensing surface spaced from the membrane; wherein the membrane is of flexible radiation-absorbent polymeric material, is laminated to a cloth support, and is in the form of a bag defining the compartment holding said impure water, the bag having front and back panels joined along their peripheries, a base and an upper end having a filler opening leading into the compartment holding said impure water.

5,595,663
METHOD FOR PROCESSING CHEMICAL CLEANING SOLVENT WASTE
Cary R. Bowles, Lynchburg; Sidney D. Jones, and Gary A. Peters, both of Forest, all of Va., assignors to Framatome Technologies, Inc., Lynchburg, Va.
Continuation-in-part of Ser. No. 512,619, Aug. 8, 1995. This application Feb. 15, 1996, Ser. No. 601,911
Int. Cl.[6] B01D *61/00*
U.S. Cl. 210—652 **6 Claims**



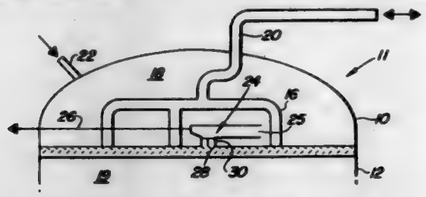
1. A method for processing chemical cleaning solvent waste, comprising:
a. separating the solvent waste stream into gaseous products and a lower volume concentrated liquid and collecting said gaseous products and said concentrated liquid for further treatment;
b. absorbing said concentrated liquid with an absorption media to produce a dry residue;
c. scrubbing said gaseous products produced in step a. above to remove particulates contained therein;
d. cooling the scrubbed gaseous products to remove excess moisture and collecting the excess moisture for further treatment;
e. reheating the cooled gaseous products to remove any residual moisture and collecting the residual moisture with the excess moisture collected in step d.;
f. directing the reheated gaseous products through HEPA filters for discharge to the surrounding environment; and
g. treating the moisture collected in steps d. and e. by filtration and reverse osmosis whereby the treated liquid may be released to the surrounding environment.

5,595,664
COLUMN ANALYZER SYSTEM AND IMPROVED CHROMATOGRAPH COLUMN FOR USE IN THE SYSTEM
James R. M. Sanford, Vidor; Patrick M. Frank, Beaumont; Joseph H. Gollas, Beaumont, and William C. Jennings, Beaumont, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.
Division of Ser. No. 285,014, Sep. 16, 1994, Pat. No. 5,441,645, which is a division of Ser. No. 58,364, May 10, 1993, Pat. No. 5,358,641, which is a division of Ser. No. 779,186, Oct. 22, 1991, Pat. No. 5,228,908, which is a continuation-in-part of Ser. No. 733,714, Jul. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 708,298, May 31, 1991, Pat. No. 5,207,918, which is a division of Ser. No. 427,346, Oct. 27, 1989, Pat. No. 5,045,208. This application Jun. 6, 1995, Ser. No. 470,992
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—656 **18 Claims**



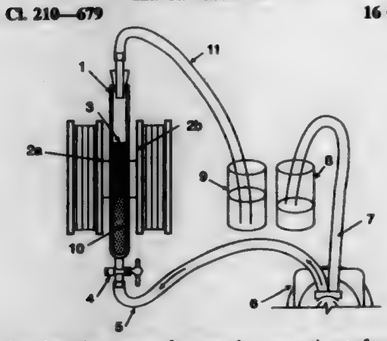
1. A method for conducting column chromatography, utilizing a cuvette, the cuvette comprising a base having a first surface; a pair of opposed, spaced apart side walls extending from the first surface of said base; a pair of opposed, spaced apart end walls extending from said first surface of said base; and at least one interior wall spaced apart from the end walls, said inter wall extending from said first surface and contacting at least two walls; said base, end walls and interior wall defining at least two discrete cells for retention of liquid therein, the method comprising the step of:
(a) mounting a chromatographic column in a support, the column having a top and a seal closing the top;
(b) opening the seal;
(c) introducing fluid into the column through the opened seal; and
(d) pressurizing the interior of the column such that an eluate enters at least one cuvette cell.

5,595,665
PROCESS VESSEL HEAD FLUSH APPARATUS
Robert J. L. Nee, Mt. Prospect, Ill., assignor to UOP, Des Plaines, Ill.
Division of Ser. No. 65,968, May 25, 1993, Pat. No. 5,415,773. This application May 12, 1995, Ser. No. 439,801
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—662 **2 Claims**



1. A simulated moving bed adsorption process, the process utilising an apparatus comprising an adsorption vessel containing an adsorbent and a distribution grid, the distribution grid separating said vessel into an equalization chamber and an adsorption chamber, the adsorbent being disposed in the adsorption chamber, a partition disposed within the equalization chamber and subdividing a portion of the equalization chamber to form a head flush chamber the process comprising:
a) collecting or distributing a process flow stream through the distribution grid in the adsorption vessel;
b) passing a head flush fluid to the equalization chamber in the adsorption vessel;
c) establishing fluid communication between the equalization chamber and the distribution grid through the head flush chamber; and,
d) withdrawing a flush chamber effluent comprising head flush fluid from the head flush chamber.

5,595,666
REMOVAL OF RADIOACTIVE MATERIALS AND HEAVY METALS FROM WATER USING MAGNETIC RESIN
Robert L. Kochen, Boulder, Colo., and James D. Navratil, Simi Valley, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 7, 1993, Ser. No. 62,512
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—679 **16 Claims**

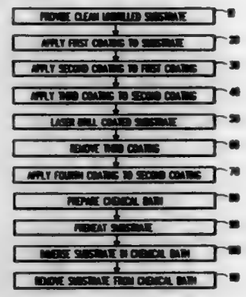


1. An adsorptive process for removing contaminants from water comprising the steps of:
placing water contaminated with cationic species including actinides in contact with a magnetic polymer composition in the presence of an external magnetic field, said magnetic polymer composition comprising an anion exchange resin combined with magnetic particles, and
permitting said cationic species to adsorb to said magnetic polymer composition.

5,595,667
LIQUID FILTRATION AND INCINERATION
Roy S. Rieber, Houston, Tex., assignor to Enviroguard, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 142,484, Nov. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 702,832, May 20, 1991, abandoned. This application Sep. 23, 1994, Ser. No. 311,565
Int. Cl.[6] B01D *37/02*
U.S. Cl. 210—769 **15 Claims**

9. A method of filtering a liquid containing solid particles comprising,
flowing the liquid through a filter aid comprised of solid rubber particles effective to filter the solid particles from the liquid on flow of the liquid therethrough forming a filter cake of rubber particles containing the solid rubber particles and the solid particles filtered from the liquid,
the rubber particles being substantially uncompactable and dimensionally stable at temperature and pressure ranges at which filtration of the solid particles occurs,
the resulting filter cake containing the solid rubber particles and the filtered solid particles having a heat value sufficient to be incinerated as a fuel for industrial boilers, furnaces, and kilns,
the liquid flowing through the filter aid being free of the rubber particles and the solid particles filtered from the liquid.

5,595,668
LASER SLAG REMOVAL
Jean D. Madden, Jr., Warwick, R.I., and Christopher H. Knapp, North Attleboro, Mass., assignors to Electro-Films Incorporated, Warwick, R.I.
Filed Apr. 5, 1995, Ser. No. 417,892
Int. Cl.[6] H05K *3/00*
U.S. Cl. 216—17 **20 Claims**



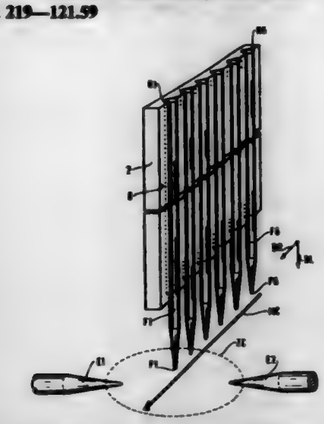
1. A process for preparing a substrate for through-hole metalization, comprising the steps of:
providing a ceramic substrate having a first side and a second side;
coating said first side and said second side with an adhesion-promoting material;
coating said adhesion-promoting material with an acid resistant material;
coating said acid resistant material with an organic coating to provide a coated ceramic substrate;
laser drilling at least one aperture through said coated ceramic substrate to provide a drilled substrate;
removing said organic coating from said acid resistant material;
immersing at least a portion of said drilled ceramic substrate in an acid bath;
removing said drilled ceramic substrate from said acid bath;
removing said acid resistant material from said drilled ceramic substrate; and
removing said adhesion-promoting material from said drilled ceramic substrate.

5,595,669

METHOD OF FORMING COUPLING DIOPTERS AT THE ENDS OF OPTICAL FIBERS

Jean Le Bris, Quincy Sous Senart, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Aug. 16, 1994, Ser. No. 288,745
Claims priority, application France, Aug. 18, 1993, 93 10077
Int. Cl.[6] B23K *10/00*; C03B *37/01*
U.S. Cl. 219—121.59 9 Claims



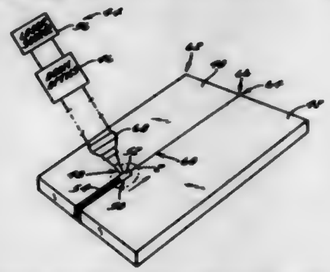
1. Method of forming coupling diopters at the ends of optical fibers in which displacement of a fiber end (P1) to be conformed causes said end to enter a heating area (ZC) so that it is partially melted, this method being characterized in that this displacement is a unidirectional sideways displacement (MC) at an angle to the axes of the optical fibers.

5,595,670

METHOD OF HIGH SPEED HIGH POWER WELDING

Jean C. Mombo-Caristan, Troy, Mich., assignor to The Twenty-first Century Corporation, Troy, Mich.

Filed Apr. 17, 1995, Ser. No. 395,488
Int. Cl.[6] B23K *26/06; 15/00*
U.S. Cl. 219—121.64 42 Claims



1. A method of welding using a high energy density radiation beam comprising the steps of:

(a) providing 1) a pair of sheets to be welded together with the sheets being constructed of a material having a $P_{dmax\ min}$ characteristic value with $P_{dmax\ min}$ being the minimum average power density of a high energy density radiation beam focused as a beam spot on at least one of the sheets necessary to achieve deep penetration keyhole welding for the type of sheet material being welded in Watts per square centimeter, 2) a high energy density radiation beam source capable of generating a high energy density radiation beam having an average power, P, of at least one kilowatt and which is great enough to achieve deep penetration keyhole mode welding for the material being welded, and 3) a beam delivery system capable of focusing the beam into an oblong shaped spot onto at least one of the sheets;

(b) positioning one sheet in close proximity to the other sheet forming a weld line;

(c) focusing the high energy density radiation beam into an oblong focused beam spot shape having a longitudinal length, L, in millimeters, and a width, w, in millimeters, such that the focused beam spot width, w, satisfies:

$$w^2 \leq (P+15)^*(10^6 + P_{dmax\ min})$$

and the length, L, of the oblong focused beam spot is within the following limits:

$$1.5\ w \leq L \leq (P+w)^*(10^5 + P_{dmax\ min})$$

(d) training the oblong focused beam spot onto at least one of the sheets for welding the one sheet to the other sheet, and wherein a longitudinal axis of the oblong focused beam spot is acutely angled within the range of +45° from a direction parallel to a direction tangent to the weld line; and

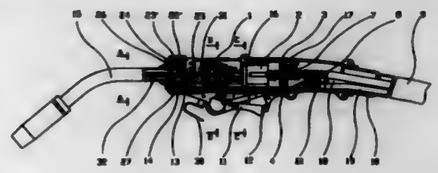
(e) moving the beam relative to at least one of the sheets in a welding direction along the weld line at a welding speed of at least two meters per minute.

5,595,671

WIRE FEEDER TORCH

David A. David, Tel Aviv, Israel, assignor to Plasmtics Welding Systems Ltd., Holon, Israel

Filed Aug. 3, 1995, Ser. No. 510,631
Int. Cl.[6] B23K *9/12*
U.S. Cl. 219—137.62 11 Claims



1. A torch wire feeder for arc welding featuring a body and provided a welding current, welding wire, water for cooling parts of the torch wire feeder, gas for fueling the torch and shielding the welding arc, the torch wire feeder comprising:

(a) a front holder and a back holder at the two remote ends of said body;

(b) an electric motor situated between said front holder and said back holder, affixed to said back holder;

(c) a planetary wire feeder situated between said front holder and said back holder and affixed to said motor;

(d) a plurality of tubes traversing from said front holder to said back holder, said tubes embodying a conduit for welding current, two conduits for water and a conduit for gas, said tubes are situated around said motor and said planetary head;

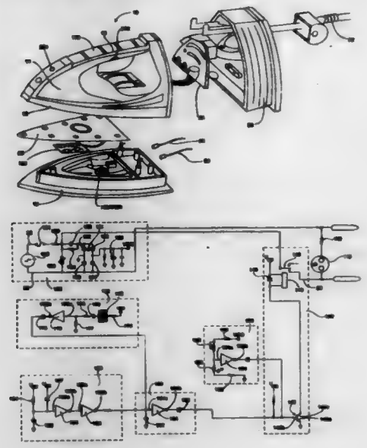
(e) a goose neck featuring a neck body made up of two cylindrical chambers for transmitting water into and out of said goose neck, said goose neck being connected to said front holder by a thread nut, said thread nut serving to transmit welding current, said goose neck affording 360° rotation, said goose neck being removable from said front holder; the torch wire feeder being ergonomic.

5,595,672

AUTOMATIC POWER INTERRUPTING APPARATUS FOR AN ELECTRIC APPLIANCE

John C. K. Sham, Hong Kong, and Fan K. Leung, Pok fu lam, both of Hong Kong, assignors to Pentalpha Enterprises Ltd., Hong Kong

Filed May 19, 1994, Ser. No. 245,964
Int. Cl.[6] H03K *17/96*; D06F *75/26*
U.S. Cl. 219—257 18 Claims



1. An automatic switching apparatus for supplying electrical power to an electric appliance, de-energizing a heating element of said appliance after detecting non-use of said appliance for a predetermined time period, and de-energizing said heating element after temperature of said heating element is equal to a predetermined temperature, said appliance including means for coupling said switching apparatus to a source of electrical power, said switching apparatus comprising:

a) a drive circuit switchable between an activated state for electrically connecting said appliance to said source of electrical power and a deactivated state for electrically disconnecting said appliance from said source of electrical power;

b) a manually actuable switch coupled to said drive circuit, said manually actuable switch switchable between a first actuated state operable to switch said drive circuit to said activated state, and a second deactuated state operable to switch said drive circuit to said deactivated state;

c) a first timing circuit operable to cause said drive circuit to switch to said deactivated state when said manually actuable switch is in said second deactuated state for said predetermined period of time, and said manually actuable switch being further operable to activate said drive circuit to reset said first timing circuit when said manually actuable switch is switched to said first actuated state; and

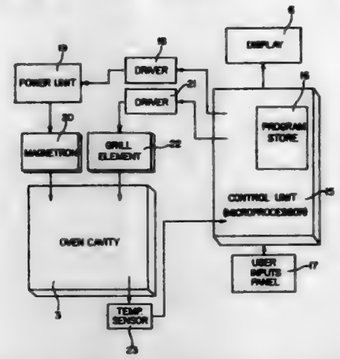
d) a temperature sensitive circuit operative to deactivate said drive circuit in response to said predetermined temperature by switching said drive circuit to said deactivated state when temperature of said heating element equals said predetermined temperature and operative to activate said drive circuit by switching said drive circuit to said activated state when temperature of said heating element is less than said predetermined temperature.

5,595,673

MICROWAVE OVEN WITH MICROWAVE-ACTUABLE BOTTOM AND TEMPERATURE SENSOR

Anders W. Ekström, Norrköping, and Bo W. Ohlsson, Kolmården, both of Sweden, assignors to Whirlpool Europe B.V., Veldhoven, Netherlands

Filed Jun. 12, 1995, Ser. No. 489,646
Claims priority, application Sweden, Jun. 13, 1994, 9402063
Int. Cl.[6] H05B *6/68*
U.S. Cl. 219—710 12 Claims



1. A microwave oven comprising a cavity, a microwave radiation source for feeding microwaves to the cavity, a microwave-activable bottom heater in the form of a receptacle and comprising a microwave-absorbing material, a carrier for receiving food for heating or cooking, and a control unit for controlling the bottom heater and the feeding of microwaves to the cavity, characterized in that a temperature sensor is disposed in the cavity out of physical contact with the bottom heater, the temperature sensor comprises microwave-absorbing material whose temperature is related to the temperature of the bottom heater, and sensed by the sensor, and the control unit is arranged to receive the sensed temperature and, depending on the value thereof, control the feeding of microwaves to the cavity during a cooking or heating procedure.

5,595,674

MICROWAVE OVEN WITH POWER SWITCHING CONTROLLER

Bae-Jin Kim, Kyungsangnam-Do, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

Filed Aug. 25, 1995, Ser. No. 519,432
Claims priority, application Rep. of Korea, Aug. 29, 1994, 21425/1994
Int. Cl.[6] H05B *6/68*
U.S. Cl. 219—715 2 Claims

1. A microwave oven with a power switching control circuit, comprising:

heating means for generating heat energy;

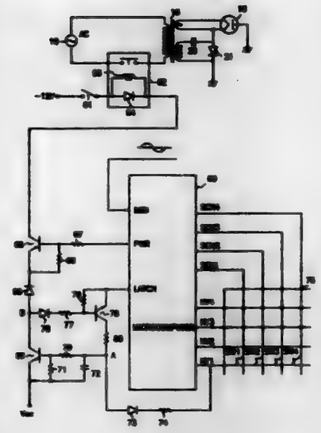
power switching means for controlling electric power supplied to said heating means;

switch module means including a plurality of switches for selecting a desired function and for outputting a key input signal;

microcomputer means for outputting scanning signals at predetermined time differences to said switch module means and for outputting predetermined control signals in accordance with the key input signal scanned from the switch module means; and

control means for controlling said power switching means in accordance with the control signals outputted from said microcomputer and the key input signal outputted from the switch module means, the control means including:

a capacitor for carrying a charge in accordance with the key input signal outputted from the switch module means;



a first transistor for switching a supply voltage in accordance with the charge of said capacitor which charge is coupled to a base and an emitter of said first transistor;

a second transistor, which is turned on by an output signal from said first transistor being coupled to a base of said second transistor, for transferring a latch signal applied to an emitter of said second transistor from said microcomputer means to the capacitor through a collector of said second transistor; and

a third transistor having an emitter coupled with the base of the second transistor and the collector of the first transistor, and operated by a power control signal from the microcomputer means applied to a base of said third transistor for controlling the operation of the power switching means by switching the supply voltage turned on by the first transistor,

wherein said latch signal maintains a predetermined state after the key input signal of said switch module means which is selected and applied to the second transistor is detected, while having the same level as a scanning signal outputted from a switch of said switch module means which is selected by an operation mode corresponding to scanning signals outputted from the switch module means, and wherein the power control signal is changed from a first state into a second state after said latch signal becomes a predetermined state and a second predetermined time is lapsed while maintaining the first state.

5,595,675

FIBER TREATMENT COMPOSITIONS

Takayuki Aoe; Isao Ona, and Masaru Ozaki, all of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 521,201

Claims priority, application Japan, Aug. 31, 1994, 6-230787

Int. Cl.[6] D06M *13/513;13/517*

U.S. Cl. 252—8.61 **18 Claims**

1. A fiber treatment composition comprising:

(A) 100 weight parts of a dimethylpolysiloxane having a viscosity at 25° C. of 2 to 100 mm^2/s;

(B) 1 to 20 weight parts of a metal salt of a fatty acid having from 10 to 20 carbon atoms; and

(C) 0.05 to 10 weight parts of at least one organopolysiloxane resin comprising $SiO_{4/2}$ units and $R_3SiO_{1/2}$ units wherein R denotes a monovalent hydrocarbon group or a haloalkyl group with the proviso that said resin is free of $RSiO_{3/2}$ units wherein R is as defined above.

5,595,676

FLUORINATED POLYMERS

David J. Barnes, Tarporley, England, and John P. Gilday, Linlithgow, Scotland, assignors to Imperial Chemical Industries PLC, United Kingdom

PCT No. PCT/GB93/01472, § 371 Date Dec. 22, 1994, § 102(e) Date Dec. 22, 1994, PCT Pub. No. WO94/03503, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 14, 1993, Ser. No. 356,306

Claims priority, application United Kingdom, Jul. 30, 1992, 9216156; Jul. 30, 1992, 9216157

Int. Cl.[6] H01G *9/022*

U.S. Cl. 252—62.2 **17 Claims**

1. A fluoroorganic polymeric material which is derived from a substantially fluorinated alkene and a perfluorocarbon vinyl ether and comprises a polymeric chain and at least one group pendent from the polymeric chain, in which the group pendent from the polymeric chain is derived from a perfluorovinyl ether and comprises at least one sulphonate group or group convertible thereto and an acyclic secondary carbon atom, and in which the sulphonate group or group convertible thereto is directly linked to the acyclic secondary carbon atom.

5,595,677

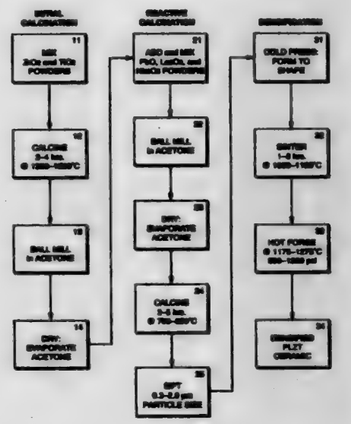
NB-DOPED PLZT PIEZOELECTRIC CERAMICS

Ratnakar R. Neurgaonkar, Thousand Oaks; John R. Oliver, Newbury Park, and Jeffrey G. Nelson, Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed May 30, 1995, Ser. No. 452,923

Int. Cl.[6] C04B *35/491*

U.S. Cl. 252—62.9 **10 Claims**



1. A piezoelectric material, comprising:

a PLZT material having the general formula $(Pb_{0.93}\ La_{0.07})(Zr_{0.6}\ Ti_{0.4})_{0.9825}O_3$;

said PLZT material doped with 0.5–1.5 mole % Nb^{5+}; and

said PLZT material having an average grain size of about 3 μm and a maximum piezoelectric strain in the range of 0.16–0.22%.

5,595,678

LUBRICANT COMPOSITION FOR AMMONIA REFRIGERANTS USED IN COMPRESSION REFRIGERATION SYSTEMS

Glenn D. Short, Midland, Mich.; Lars I. Sjöholm, Burnsville, Minn., and Thomas E. Rajewski, Bay City, Mich., assignors to CPI Engineering Services, Inc., Midland, Mich.

Filed Aug. 30, 1994, Ser. No. 298,342

Int. Cl.[6] C10M *145/26;145/34*

U.S. Cl. 252—68 **32 Claims**

1. A fluid composition for use in compression refrigeration, said fluid composition comprising:

ammonia refrigerant; and

a lubricant base fluid composition comprising:

a polyalkylene glycol of the formula

$$Z\text{—}((CH_2\text{—}CH(R_1)\text{—}O)_n\text{—}(CH_2\text{—}CH(R_1)\text{—}O\text{—})_m)_p\text{—}H$$

wherein

Z is a residue of a compound having 1–8 active hydrogens and a minimum number of carbon atoms of six (6) where Z is an aryl group and a minimum number of carbon atoms of ten (10) where Z is an alkyl group,

R_1 is hydrogen, methyl, ethyl, or a mixture thereof,

n is 0 or a positive number,

m is a positive number, and

p is an integer having a value equal to the number of active hydrogens of Z.

5,595,679

CORROSION INHIBITOR

Najib H. Zaid, Sterling, Kans., assignor to Jacam Chemical Partners Ltd., Sterling, Kans.

Filed Jun. 13, 1995, Ser. No. 489,743

Int. Cl.[6] C09K *3/18*

U.S. Cl. 252—70 **14 Claims**

1. A road deicing mixture having reduced corrosive properties and comprising a quantity of sodium chloride and at least about 1.5% by weight of a corrosion inhibitor mixed with said sodium chloride, said corrosion inhibitor comprising a mixture of at least about 0.5% by weight of a first component selected from the group consisting of citric acid, a salt of citric acid and mixtures thereof, and an amount of a second component greater than said first component and selected from the group consisting of alkali metal silicates, alkali metal metasilicates and mixtures thereof.

5,595,680

ELECTRORHEOLOGICAL FLUIDS CONTAINING POLYANILINES

Charles P. Bryant, Euclid; Kasturi Lal, Willoughby, and Joseph W. Pialet, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 167,592, Dec. 14, 1993, Pat. No. 5,437,806, which is a continuation-in-part of Ser. No. 774,398, Oct. 10, 1991, abandoned. This application Apr. 6, 1994, Ser. No. 223,802

Int. Cl.[6] C10M *171/00;169/04*

U.S. Cl. 252—77 **33 Claims**

1. A non-aqueous electrorheological fluid which comprises a hydrophobic liquid phase and a dispersed particulate phase of a polyaniline prepared by polymerizing aniline, using about 0.8 to about 2 moles of an oxidizing agent per mole of aniline to effect polymerization thereof, wherein the oxidant is added to the aniline, and from about 0.1 to about 1.2 moles of an acid per mole of aniline to form an acid salt of polyaniline, and thereafter treating the acid salt with a base in an amount and for a period of time sufficient to provide a polymer which exhibits a current density of at most about 7000 mA/m^2 when formulated in a 20% mixture in silicone oil and tested in a concentric cylinder electrorheometer at 20° C. at a direct current field of 6 kV/mm and a shear rate of 500 s^{-1}.

5,595,681

LIQUID LAUNDRY DETERGENTS CONTAINING POLYAMINO ACID AND POLYALKYLENEGLYCOL

Rajan K. Panandiker, and Yueqian Zhen, both of West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 166,748, Dec. 14, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,742

Int. Cl.[6] C11D *3/26;3/20*

U.S. Cl. 510—299 **4 Claims**

1. A liquid laundry detergent composition containing an especially effective clay soil removal/antideposition agent, which composition comprises:

i) from about 1% to about 80% of surfactant;

ii) from about 1% to about 50% of an organic or inorganic detergency builder

iii) from about 0.1% to about 20% of a clay soil removal/antideposition agent, said agent comprising a mixture of:

(a) a polyamino acid or salt thereof selected from the group consisting of polyaspartic acid, and salts thereof; and

(b) polyethylene glycol having a molecular weight of from about 3400 to about 4000;

the weight ratio of (a) to (b) being from about 1:3 to about 1:5 and;

iv) from about 10% to about 70% of a liquid medium.

5,595,682

LIQUID CRYSTAL COMPOUNDS, MIXTURES AND DEVICES

John W. Goodby; Kenneth J. Toyne, and Christopher J. Booth, all of Hull, United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain And Northern Ireland, and Defence Research Agency, both of United Kingdom

PCT No. PCT/GB93/01133, § 371 Date Apr. 18, 1995, § 102(e) Date Apr. 18, 1995, PCT Pub. No. WO93/25631, PCT Pub. Date Dec. 23, 1993

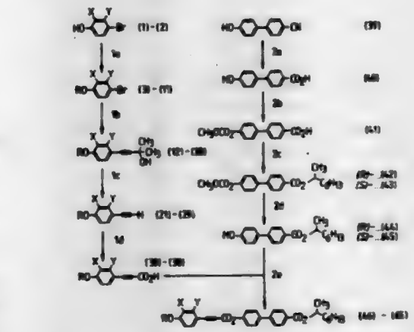
PCT Filed May 28, 1993, Ser. No. 416,897

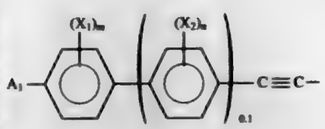
Claims priority, application United Kingdom, Jun. 10, 1992, 9212334

Int. Cl.[6] C09K *19/52;19/20;19/12;* G02F *1/13*

U.S. Cl. 252—299.01 **11 Claims**

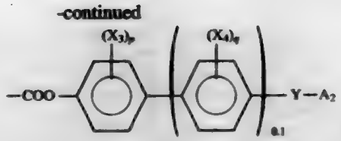
1. A compound having formula I





I

-continued



where A_1 is selected from alkyl, alkoxy or alkenyl and contains 3–20 carbon atoms, X_1, X_2, X_3 and X_4 are independently selected from the halogen group; m, n, p and q are independently 0, 1, 2, 3 or 4 such that m+n+p+q≠0; Y is selected from O and COO; A_2 is an end group of formula II



II

where Z is selected from halogen, CH_3, CN, CF_3, CHF_2; R is a linear or branched alkyl group containing 2–15 carbon atoms or H; R_1 is a linear or branched alkyl group containing 1–5 carbon atoms or H.

5,595,683

REACTION PRODUCTS OF LYOTROPIC LIQUID CRYSTAL SALT COMPLEXES

Stanley B. Elliott, 7125 Cassilly Blvd., Walton Hills, Ohio 44146

Continuation of Ser. No. 239,619, May 9, 1994, Pat. No. 5,443,753, which is a continuation-in-part of Ser. No. 821,884, Jan. 16, 1992, Pat. No. 5,354,496, which is a continuation-in-part of Ser. No. 642,089, Jan. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 562,017, Aug. 2, 1990, Pat. No. 5,082,588, which is a division of Ser. No. 444,599, Dec. 1, 1989, Pat. No. 4,975,249, which is a continuation of Ser. No. 78,186, Jul. 27, 1987, abandoned. This application May 23, 1995, Ser. No. 447,990

Int. Cl.[6] C09K *19/52;19/34;19/32*

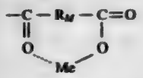
U.S. Cl. 252—299.01 **12 Claims**

1. A polymeric chemical complex that is the covalent reaction product of the polymerization of

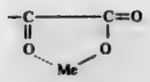
(a) a lyotropic liquid crystal precursor salt complex that is one or more metal salts of an acid having an organic ring structure portion that is hydrophobic and a ionic polar head ring complex phase portion that is hydrophilic, the acid having a main chain of carbon atoms or carbon atoms and a nitrogen atom, the polar ring complex phase having a ring formed from the keto group of the acid portion, intervening ring members, and a metal ion, the complex having the general structure:

HYDROPHOBIC ORGANIC RING	—	HYDROPHILIC POLAR RING EQUIVALENT 5 TO 13 MEMBERS

in which the 5 to 13 member ring is formed from the metal (Me) ring member that bonds to the keto group according to the following structure:



where R_M is one or more ring members when the ring is a 6 to 13 ring member; and the following structure represents the 5 member ring:



and

(b) an acid as defined in (a) , in which (a) is one or more metal salts of an aroylacrylic acid and (b) is an aroylacrylic acid, there being

(A) a lattice modifier; or

(B) a lattice stabilizer.

5,595,684

OPTICALLY ACTIVE TETRAHYDROPYRAN DERIVATIVE, LIQUID CRYSTAL COMPOSITION, AND LIQUID CRYSTAL DEVICE CONTAINING THE SAME

Masazaki Namekawa; Keizou Itoh; Shinichi Nayuki; Mitsunori Takeda, and Yoshinobu Murayama, all of Ibaraki-ken, Japan, assignors to Kashima Oil Company, Tokyo, Japan

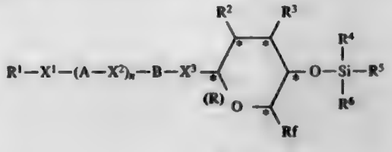
Filed Apr. 3, 1995, Ser. No. 415,676

Claims priority, application Japan, Apr. 11, 1994, 6-071913

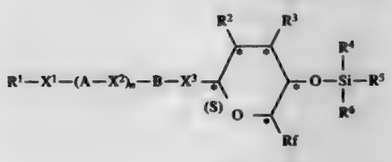
Int. Cl.[6] C09K *19/34;* G02F *1/13;* C07D *309/00;* C07F *7/04*

U.S. Cl. 252—299.61 **6 Claims**

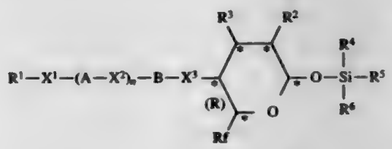
1. An optically active tetrahydropyran derivative represented by formula (I) or (I') or (I") or (I"')



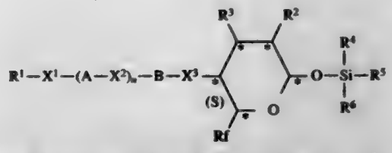
(I)



(I')



(I")



(I"')

wherein Rf represents a fluoroalkyl group having 1 or 2 carbon atoms; R^1 represents a linear or branched alkyl group having 3 to 20 carbon atoms; R^2 and R^3 each independently represent a hydrogen atom, a linear or branched alkyl group having 1 to 15 carbon atoms, an alkenyl group having 2 to 15 carbon atoms, or an aralkyl group having 7 to 10 carbon atoms; R^4, R^5, and R^6 each independently represent a hydrogen atom, a linear or branched alkyl group having 1 to 15 carbon atoms, an alkenyl group having 2 to 15 carbon atoms, an aryl group having 6 to 10 carbon atoms, or an aralkyl group having 7 to 10 carbon atoms; X^1 represents —COO—, —OCO—, —O—, or a single bond; X^2 represents —COO—, —OCO—, —CH_2O—, —OCH_2—, —C≡C—, or a single bond; X^3 represents —COO—, —CH_2O—, or —O—; Si represents a silicon atom; * denotes that the carbon atom having this mark is an asymmetric carbon atom; A and B each independently represent a substituted or unsubstituted group containing a six-membered ring; and n represents 0 or 1.

5,595,685

MESOMORPHIC COMPOUND, LIQUID CRYSTAL COMPOSITION CONTAINING SAME, LIQUID CRYSTAL DEVICE USING SAME AND DISPLAY APPARATUS

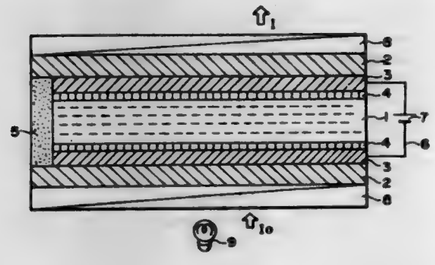
Takao Takiguchi, Tokyo; Takashi Iwaki, Machida; Takeshi Togano, Yokohama; Yoko Yamada, and Shinichi Nakamura, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 65,690, May 25, 1993, abandoned, which is a continuation of Ser. No. 645,458, Jan. 24, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,790

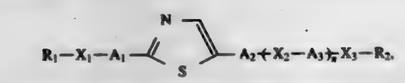
Claims priority, application Japan, Jan. 25, 1990, 2-016811; Jun. 5, 1990, 2-147034; Nov. 29, 1990, 2-332677

Int. Cl.[6] C09K *19/34;* C07D *285/12*

U.S. Cl. 252—299.61 **22 Claims**



1. A mesomorphic compound represented by the following formula (I):

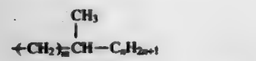


[I]

wherein R_1 and R_2 independently denote any one of the following groups (i)–(iv):

(i) an n-alkyl group having 4–14 carbon atoms;

(ii)



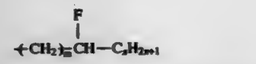
wherein m is an integer of 0–6 and n is an integer of 2–8;

(iii)

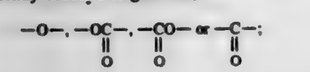


wherein r is an integer of 0–6, s is 0 or 1 and t is an integer of 1–12; and

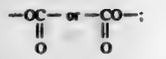
(iv)



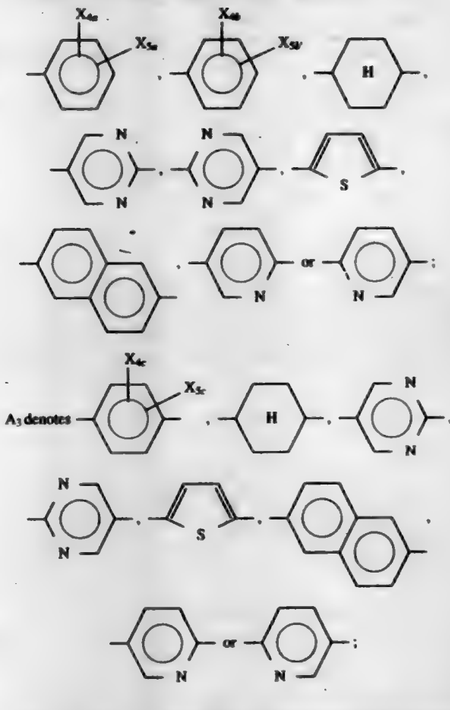
wherein m is 0 or 1 and x is an integer of 1–14; X_1 and X_3 independently denote a single bond,



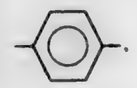
X_2 denotes a single bond,



A_1 and A_2 independently denote a single bond,



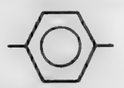
X_{4a}, X_{5a}, X_{4b}, X_{5b}, X_{4c} and X_{5c} independently denote hydrogen, fluorine, chlorine, bromine, —CH_3, —CN or —CF_3; and n is 0 or 1, with proviso that: X_1 always denotes a single bond when A_1 denotes a single bond, X_3 always denotes a single bond when A_2 denotes a single bond and n is 0; A_1 and A_2 cannot be single bonds simultaneously; X_3 cannot be —O— when X_1 denotes a single bond or —O—, A_1 denotes a single bond or



and —A_2—(X_2—A_3)$_n$— denotes



and X_1 cannot be a single bond when A_1 denotes



and A_2 denotes a single bond and n is 0.

5,595,686

SILACYCLOHEXANE COMPOUNDS, A LIQUID CRYSTAL COMPOSITION COMPRISING THE SAME AND A LIQUID CRYSTAL DEVICE COMPRISING THE COMPOSITION

Takaaki Shimizu; Takeshi Kinebo; Tsutomu Ogihara; Tatsushi Kaneko; Mutsuo Nakashima, all of Niigata-ken, and Hideshi Kurihara, Kawasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

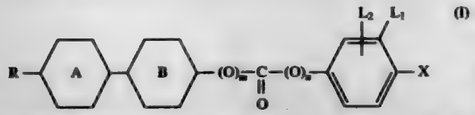
Filed Sep. 1, 1995, Ser. No. 523,895

Claims priority, application Japan, Sep. 2, 1994, 6-234243; Nov. 10, 1994, 6-301327

Int. Cl.[6] C09K *19/34;19/30;* C07F *7/08;* G02F *1/13*

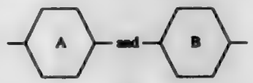
U.S. Cl. 252—299.61 15 Claims

1. A silacyclohexane compound of the following formula (I)



(I)

wherein R represents a linear alkyl group having from 1 to 10 carbon atoms, a branched alkyl group having from 3 to 8 carbon atoms, a mono or difluoroalkyl group having from 1 to 10 carbon atoms, an alkoxyalkyl group having from 2 to 7 carbon atoms or an alkenyl group having from 2 to 8 carbon atoms; at least one of



represents a trans-1-sila-1,4-cyclohexylene group or trans-4-sila-1,4-cyclohexylene group in which the silicon atom at the 1 or 4 position has a substituent of H, F, Cl or CH_3, and the other represents a trans-1,4-cyclohexylene group, L_1 and L_2 independently represent H, F, Cl or CH_3; X represents a linear alkyl group having from 1 to 10 carbon atoms, a linear alkoxy group having from 1 to 10 carbon atoms, an alkoxyalkyl group having from 2 to 7 carbon atoms, CN, F, Cl, CF_3, CF_2Cl, $CHFCl$, OCF_3, OCF_2Cl, $OCHFCl$, $OCHF_2$, $(O)_lCY{=}CX_1X_2$ wherein l is 0 or 1, Y and X_1 independently represent H, F or Cl, X_2 represents F or Cl, or $O(CH_2)_r(CF_2)_sX_3$ wherein r and s are, respectively, 0, 1 or 2 provided that r+s=2, 3 or 4, X_3 represents H, F or Cl; and m and n are, respectively, 0 or 1 provided that m+n=1.

5,595,687

EMULSION STABILITY

Stuart Reynolds, Wilmington, and Robert H. Dettre, Hockessin, both of Del., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 968,650, Oct. 30, 1992, abandoned. This application Apr. 7, 1995, Ser. No. 419,515

Int. Cl.[6] B01J *13/00*

U.S. Cl. 252—312 13 Claims

1. A method for making a stable emulsion having substantially completely no unemulsified fluorocarbon comprising the steps of:

preparing an aqueous electrolyte solution,

preparing a dispersion by introducing at least one emulsifying agent into the solution,

admixing at least one perfluorocarbon into the dispersion to form an emulsion,

applying an interior coating comprising silicone oil or lecithin to a storage container,

storing the emulsion in the container which has a non-oxidizing atmosphere, wherein said emulsion contains substantially completely no unemulsified perfluorocarbon, and;

optionally agitating the emulsion.

10. A stable emulsion comprising about 10 to about 50% volume/volume (v/v) of a liquid perfluorocarbon which has a molecular weight in the range of about 460– 520, about 1–8% weight/volume (w/v) of an emulsifying agent, and the balance comprising a physiologically acceptable saline solution; wherein said emulsion contains substantially no unemulsified fluorocarbon and is stored in a container, the interior of which has been coated with a composition comprising silicone oil or lecithin.

5,595,688

WATER SOLUBLE CAKING INHIBITORS FOR AMMONIUM PHOSPHATES

Mark A. Adams, Chesterfield; Robert V. Brill, St. Louis, both of Mo., and James R. Vass, Gibralter, Mich., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 6, 1995, Ser. No. 469,112

Int. Cl.[6] C09K *3/18*

U.S. Cl. 252—385 20 Claims

1. A composition comprising greater than 90%, by weight, monoammonium phosphate and a caking inhibiting amount of a phosphate selected from the group consisting of sodium tripolyphosphate, sodium potassium tripolyphosphate, sodium acid pyrophosphate, sodium pyrophosphate, sodium hexametaphosphate, trisodium phosphate, disodium phosphate and monosodium phosphate.

5,595,689

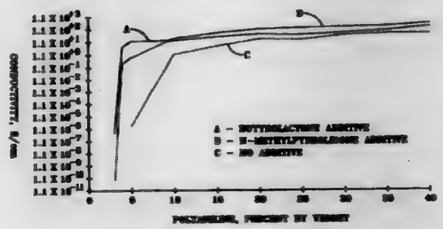
HIGHLY CONDUCTIVE POLYMER BLENDS WITH INTRINSICALLY CONDUCTIVE POLYMERS

Vaman G. Kulkarni, Charlotte, N.C., and John C. Campbell, Akron, Ohio, assignors to Americhem, Inc., Cuyahoga Falls, Ohio

Filed Jul. 21, 1994, Ser. No. 278,165

Int. Cl.[6] H01B *1/00;1/12*

U.S. Cl. 252—500 11 Claims



1. In a polymer blend of the type comprising an intrinsically electrically conductive polymer dispersed in a matrix selected from the group consisting of thermoplastic polymers, the improvement comprising;

an amount of a non-polymeric polar additive having a boiling point greater than about 100° C. at 760 mm and selected from the group consisting of pyrrolidones and lactones, having the formula R—O—C (O)R, where R is selected from the group consisting of hydrogen, aliphatic radicals having from 1 to about 10 carbon atoms and aromatic radicals, and mixtures thereof incorporated in said polymer blend in an amount sufficient to impart an electrical conductivity to the blend which is greater than that of the blend without the non-polymeric polar additive;

wherein the electrical conductivity of the blend is greater than about 10 S/cm.

5,595,690

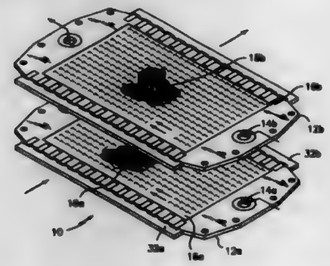
METHOD FOR IMPROVING WATER TRANSPORT AND REDUCING SHRINKAGE STRESS IN MEMBRANE HUMIDIFYING DEVICES AND MEMBRANE HUMIDIFYING DEVICES

Thomas P. Filbura, Granby; John C. Huddleston, Poquonock, and Dean A. Killelea, Winsted, all of Conn., assignors to Hamilton Standard, Windsor Locks, Conn.

Filed Dec. 11, 1995, Ser. No. 570,295

Int. Cl.[6] B01F *3/04*

U.S. Cl. 261—104 20 Claims



1. A method for improving water transport and reducing shrinkage stress in a membrane humidifying device that produces humidified air, wherein said humidifying device comprises at least one membrane cell and a means for introducing water into each said cell, wherein said method comprises:

assembling at least one membrane cell which comprises: at least one sheet of a dry and contracted hydrophilic membrane having a first surface and a second surface, that is capable of osmotically transporting water from said first surface to said second surface, and at least one rigid screen, located contiguous to at least one membrane sheet, for providing even water flow distribution to and support for said membrane sheet(s);

passing water, having a temperature of from about 45° C. to about 90° C., through said assembled cell(s), while simultaneously

applying a vacuum to said cell(s), for a period of at least about 30 minutes until at least said first surface of each said membrane sheet permanently conforms to a surface of a contiguous rigid screen.

5,595,691

AIR SUPPLY APPARATUS FOR POND FISHERIES

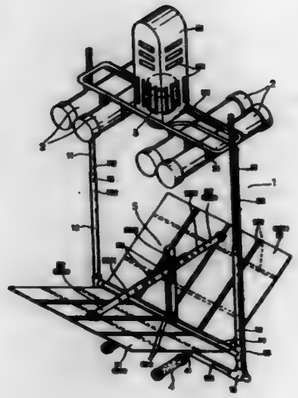
Shui-Yuan Hsu, No. 40-3, Lane 702, An Chung Road, Sec. 1, Tainan City, Taiwan

Filed Nov. 7, 1995, Ser. No. 554,686

Int. Cl.[6] B01F *3/04*

U.S. Cl. 261—120 4 Claims

1. An air supply apparatus for pond fisheries, comprising a framework, float means fastened to a top transverse rack for supporting said framework in water in a rearing pond, an air pump means mounted on said top transverse rack and having an air output port connected to a bottom cross tube by an air tube, and a plurality of air distributors respectively connected to said bottom cross tube for permitting air be forced from said air pump means into water in the rearing pond in the form of air bubbles, wherein a baffle assembly is mounted on a cross bar to detain upward movement of air bubbles released from said air distributors, said baffle assembly comprising two symmetrical baffle boards pivotably connected to said cross bar at two opposite sides, and an angle adjustment frame connected between said cross bar and said baffle boards, said angle adjustment frame comprising two parallel upright frames fixedly secured to said cross bar, and two connecting bars connected between said baffle boards and said upright frames, said upright frames having a respective longitudinal slot, said connecting bars each having a fixed end pivoted to one baffle board, and a free end made with a longitudinal series of locating holes adjustably connected to the longitudinal slots of said upright frames by a lock.



5,595,692

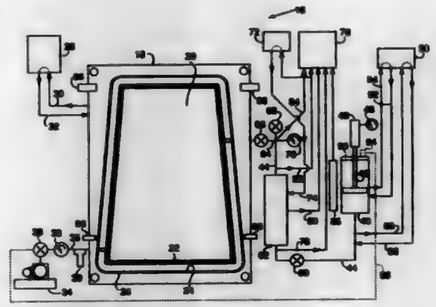
METHOD OF REPAIRING RESIN IMPREGNATED ARTICLES

Michael Folsom, and Paul DiMora, both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 13, 1994, Ser. No. 305,016

Int. Cl.[6] B32B *35/00*

U.S. Cl. 264—36 15 Claims



1. A method of repairing a defective article produced by resin transfer molding having at least one resin-depleted area, comprising the steps of:

applying an anti-adherent to an exterior surface of the article excluding the at least one resin-depleted area to substantially prevent infiltration of resin into the anti-adherent applied surface areas;

placing the article in a mold cavity defining a shape corresponding to a shape of the defective article;

creating a gap between the exterior surface of the defective article and a wall defining the mold cavity; and

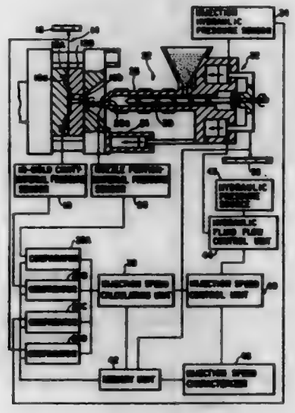
injecting resin into the gap to impregnate the at least one resin-depleted area with the injected resin.

5,595,693

METHOD FOR AUTOMATICALLY SETTING INJECTION MOLDING SPEED CONDITION IN INJECTION MOLDING MACHINE

Shigeru Fujita; Hiroshi Okuyama; Kazuhiro Tashiro; Shogo Ishibashi, all of Numazu; Atsuhiro Suzuki, Fukushima, and Motoyuki Hirata, Kawasaki, all of Japan, assignors to Toshiba machine Co., Ltd., Tokyo; Tohoku Munekata Co., Ltd., Fukushima, and Showa Denko K.K., Tokyo, all of Japan

Filed Dec. 27, 1994, Ser. No. 363,907
Claims priority, application Japan, Dec. 27, 1993, 5-332995
Int. Cl.[6] B29C *45/77*
U.S. Cl. 264—40.1 6 Claims



1. A method for automatically setting an injection molding speed condition in an injection molding machine which moves an injection plunger thereby injecting melted material into a mold cavity of a mold, said method comprising:

setting a reference pressure of the melted material injected into the mold cavity as a function of injection passing time from a start of an injecting process or a function of a distance of movement of the plunger, the movement of the plunger being started at a temporarily constant injection speed;

calculating a correction value of the injection speed for eliminating a difference between a sensed pressure of the melted material injected into the mold cavity and the reference pressure in a range of the injection passing time or the distance of movement of the plunger in which the sensed pressure of the melted material exceeds the reference pressure;

correcting the injection speed in accordance with the corrected value; and

setting an injection molding speed condition, said injection molding speed condition setting step comprising:

storing the corrected value of the injection speed, and the injection passing time or the distance of the movement of the plunger, corresponding to the range, in memorizing means;

characterizing the corrected value and the injection passing time or the distance to a desired injection speed pattern; and

reading out the pattern from the memorizing means as an injection molding speed condition.

5,595,694

PROCESS FOR PRODUCING ALKENYL AROMATIC FOAMS USING A COMBINATION OF ATMOSPHERIC AND ORGANIC GASES

Michael E. Reedy, 42 First St., Keyport, N.J. 07735, and Edward W. Rider, Jr., R.D. #1 Box 43 S. Plank Rd., Slate Hill, N.Y. 10973

Continuation of Ser. No. 995,289, Dec. 22, 1992, Pat. No. 5,269,987. This application Dec. 7, 1993, Ser. No. 163,010
Int. Cl.[6] B29C *44/20*
U.S. Cl. 264—50 35 Claims

1. A process for the production of alkenyl aromatic foams, said process comprising:

(a) heating an alkenyl aromatic resin to a temperature above its melting point to form a melted alkenyl aromatic resin;

(b) adding to the melted alkenyl aromatic resin a masterbatch mix comprised of:

(i) a styrene resin;

(ii) a rubbery block copolymer; and

(iii)a solid blowing agent to form an alkenyl aromatic/masterbatch mix blend;

(c) heating the alkenyl aromatic/masterbatch mix blend to a temperature sufficient to form a melted blend;

(d) injecting into the melted blend a non-solid blowing agent comprised of a combination of atmospheric gas and organic gas to form an injected melted blend;

(e) mixing the injected melted blend to form a mixed injected melted blend; and

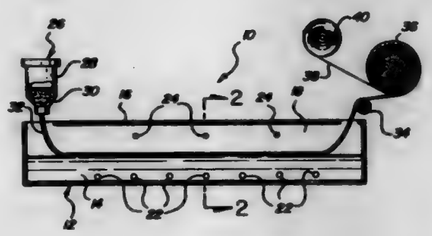
(f) cooling and extruding the mixed injected melted blend as an alkenyl aromatic foam.

5,595,695

PROCESS FOR PREPARING MATTE FINISH ELASTOMER

Peter R. Hagen, Harbor Springs, Mich., assignor to Sealex Inc., Harbor Springs, Mich.

Filed May 30, 1995, Ser. No. 454,512
Int. Cl.[6] B29C *35/06*
U.S. Cl. 264—83 22 Claims



1. A method for fabricating a cured, elastomeric article having a matte finish, from a hydrolyzable siloxane composition, said method comprising the steps of:

providing a composition including a hydrolyzable siloxane, said composition being curable to produce an elastomer;

extruding said composition so as to produce a shaped body of said composition;

maintaining said body in a humid atmosphere having a relative humidity in the range of 75–100%, so that a free surface of said body is exposed to said humid atmosphere for a period of time sufficient to permit said body to at least partially cure into a self-supporting elastomer;

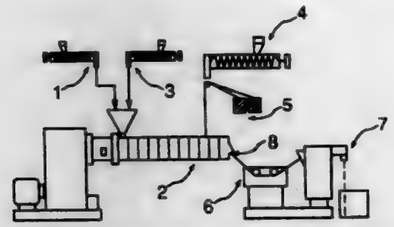
whereby said humid atmosphere promotes the formation of a matte finish on said free surface.

5,595,696

PLASTIC MATERIAL, AND PROCESS FOR THE PREPARATION THEREOF

Alois Schlarb, Frankenthal; Jürgen Hofmann, Ludwigshafen; Hilmar Ohlig, Kaiserslautern; Peter Ittemann, Lampertheim, and Karl-Peter Farwerck, Worms, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 1, 1995, Ser. No. 457,380
Claims priority, application Germany, Jun. 3, 1994, 44 19 579.6
Int. Cl.[6] B29B *9/14*
U.S. Cl. 264—118 32 Claims



1. A fiber composite plastic comprising a plastic composition and fibers, wherein the fibers have a pronounced fiber length distribution, such that more than 50% by weight of the fibers have a length outside the range from 0.8×L to 1.2×L, where L is the mean (weight average) fiber length, and the mean fiber length is greater than the critical fiber length of the plastic composition/fiber system.

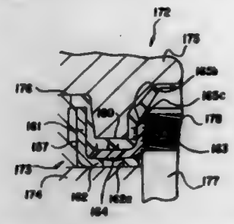
9. A process for the preparation of a fiber composite plastic comprising plastic composition and fibers which comprises subjecting a first plastic material comprising at least one first composition of fibers having an essentially uniform fiber length and a plastic composition to mechanical loading such that a second plastic material is formed which comprises the plastic composition and a second composition of fibers, where this second composition of fibers has a pronounced fiber length distribution, wherein more than 50% by weight of the fibers have a fiber length outside the range of from 0.8×L to 1.2×L, where L is the mean (weight average) fiber length, and the mean fiber length is greater than the critical fiber length of the plastic composition/fiber system.

5,595,697

METHOD OF MANUFACTURING A SEALING DEVICE

Noriyuki Wada, and Takayuki Nishigaki, both of Fukushima, Japan, assignors to NOK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 645,442, Jan. 24, 1991, Pat. No. 5,183,271. This application Jan. 6, 1993, Ser. No. 2,586
Claims priority, application Japan, Jan. 25, 1990, 15912; Feb. 7, 1990, 27386
Int. Cl.[6] D29C *43/18*; F16J *15/32*
U.S. Cl. 264—735 2 Claims



1. A method of molding a sealing device by using a mold having an inner cavity, comprising the steps of:

preparing a resin material having a cylindrical shape;

cutting the resin material to cut off a conical washer member;

chamfering an inner end portion of the cut conical washer member;

disposing the conical washer member in the cavity of the mold;

preparing an elastic material to be supplied in the cavity of the mold;

supplying the elastic material on the conical washer member in the mold;

pressuring the conical washer member and the supplied elastic material to fluidize the elastic material so that the cavity of the mold is filled up with the fluidized elastic material in a predetermined shape which includes a flanged portion; and

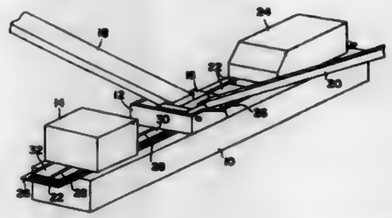
deforming the conical washer member to have an L-shaped cross section by utilizing the pressure of the fluidized elastic material, so that an outer extreme end portion of the conical washer member provides a conical outer periphery having a predetermined inclination in the cavity with respect to said flanged portion.

5,595,698

METHOD OF MAKING MULTI-COLOR CONCRETE TILES

Thomas G. Nicholas, Anaheim Hills, and Scott W. Fechner, Riverside, both of Calif., assignors to Monier Roof Tile, Inc., Irvine, Calif.

Division of Ser. No. 99,211, Jul. 29, 1993, Pat. No. 5,406,766. This application Sep. 13, 1994, Ser. No. 305,824
Int. Cl.[6] B29C *47/04*
U.S. Cl. 264—145 5 Claims



1. A method of making a concrete tile comprising the steps of:

providing a pallet defining the general shape of a tile to be formed;

dispensing wet concrete having a first color onto the pallet to form a first concrete mass of the first color on the pallet,;

substantially simultaneously with dispensing wet concrete having a first color, dispensing wet concrete having a second color different from the first color onto the pallet to form a second concrete mass of the second color on the pallet which is separate from and abuts the first concrete mass along a substantially straight line;

compressing and shaping the wet concrete on the pallet; and

curing the wet concrete to form a concrete tile in which the first and second concrete masses form separate and opposite portions of the tile of different color joining each other along the substantially straight line.

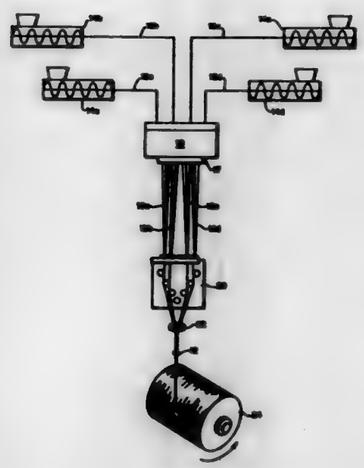
5,595,699

METHOD FOR SPINNING MULTIPLE COMPONENT FIBER YARNS

Donald E. Wright, Anderson, S.C., and William C. Flynn, III, Hendersonville, N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Jun. 7, 1995, Ser. No. 472,280
Int. Cl.[6] D01D *1/10;4/06;5/08*
U.S. Cl. 264—169 7 Claims

1. A method of spinning composite yarn having at least two different individual polymeric fibers comprising the steps of:



(i) directing at least two streams of different polymer melts to a spin pack such that one of the streams has a greater volumetric throughput as compared to the volumetric throughput of the other streams;

(ii) distributing said at least two streams within the spin pack among individual filtration chambers so that each such filtration chamber receives substantially the same volumetric throughput of the polymer melt streams;

(iii) filtering the polymer melt streams within the filtration chambers by directing the polymer melt streams therewithin through filter elements;

(iv) directing the filtered polymer melt streams through fiber-forming orifices of a spinneret plate to form the composite yarn.

5,595,700

NON-BAKED COLOR PENCIL LEADS AND METHOD FOR PREPARING SAME

Katsunori Kitazawa, Gunma, Japan, assignor to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 867,820, Apr. 13, 1992, abandoned. This application Oct. 12, 1994, Ser. No. 322,090

Claims priority, application Japan, May 2, 1991, 3-128227

Int. Cl.[6] B43K *19/02*; C09D *13/00*

U.S. Cl. 264—211 **13 Claims**

1. Non-baked color pencil leads obtained by kneading a blend composition comprising a water/oil repellent substance in an amount of 2 to 20% by weight based on the total weight of the blend composition; a binder selected from the group consisting of cellulose derivatives, polyvinyl alcohol, polyvinyl butyral, polymethyl methacrylate, tragacanth gum, gum arabic, cyamoposis gum, gum dammer, and locust bean gum; a solvent for the binder; a coloring agent and a filler; extruding the kneaded material to yield an extruded article; drying the extruded article at a temperature higher than the boiling point of the solvent for the binder but less than a temperature at which thermal deterioration of the coloring agent occurs to yield open pores in the water/oil repellent substance; and impregnating the open pores in the circumference of the water/oil repellent substance with an oil, a fat and/or a wax.

5,595,701

PROCESS FOR MAKING A POLYUREA BACKED PRODUCT WITH A POLYURETHANE SKIN

Clint J. MacGregor; Joseph L. Malone, both of Lancaster, and Monte H. York, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 12, 1995, Ser. No. 440,505

Int. Cl.[6] B29C *41/22*

U.S. Cl. 264—255 **7 Claims**

1. A process for making a polyurea-backed product with a polyurethane skin comprising:

(a) providing a mold surface;

(b) applying a polyurethane paint to the inner surface of the mold to provide a coated polyurethane surface;

(c) combining or mixing a polyisocyanate with a polyoxyalkylene polyamine, in a volume ratio of from about 30 to 70 percent to about 70 to 30 percent to form a mixture; and

(d) spraying said mixture to form at least one polyurea layer onto the polyurethane surface of the coated mold to form an integral polyurea-backed product with a polyurethane skin.

5,595,702

METHOD OF AND APPARATUS FOR MOLDING SYNTHETIC RESIN SCREWS

Toyohisa Hiroki, Chiba-ken, and Tadashi Suzuki, Saitama-ken, both of Japan, assignors to Toshu Co., Ltd., Tokyo, and Optec Co., Ltd., Saitama-ken, both of Japan

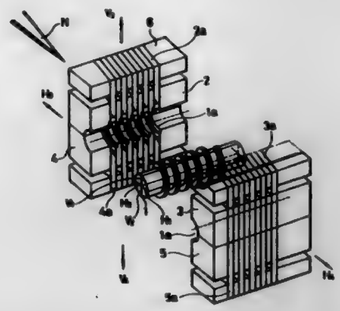
PCT No. PCT/JP93/01877, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO94/14593, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 24, 1993, Ser. No. 256,362

Claims priority, application Japan, Dec. 25, 1992, 4-347167

Int. Cl.[6] B29C *45/33*

U.S. Cl. 264—318 **12 Claims**



1. A method of molding a synthetic resin screw, wherein the synthetic resin screw is molded by using a mold assembly having non-axially extending parting planes at a crest and at a root of a screw thread comprising the steps of; providing the mold assembly having the non-axially extending parting planes at the crest and at the root of the screw thread to form a cavity for a screw by means of an upper molding block, a lower molding block, and separate slide cores engaged in and with the respective upper and lower molding blocks; charging a molten resin into the cavity; moving the slide cores after the molten resin has been solidified; and moving the upper molding block and the lower molding block by utilizing spaces from which the respective slide cores have been moved away, and taking out a molded screw.

5,595,703

METHOD FOR SUPPORTING AN OBJECT MADE BY MEANS OF STEREOLITHOGRAPHY OR ANOTHER RAPID PROTOTYPE PRODUCTION METHOD

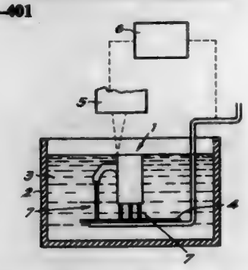
Bart Swaelens, Putte; Johan Pauwels, Berneem, and Wilfried Vancraen, Hulshamberg, all of Belgium, assignors to Materialise, Naamloze Vennootschap, Belgium

Filed Mar. 10, 1995, Ser. No. 402,525

Claims priority, application Belgium, Mar. 10, 1994, 09400267

Int. Cl.[6] B29C *35/08*; *41/02*

U.S. Cl. 264—401 **13 Claims**



1. A method of supporting an object made by sterolithography or another rapid prototype production method comprising:

creating at least one supporting structure adapted to support an object to be made with each supporting structure constituting an open framework made up of supporting elements that are interconnected at spaced locations such that each supporting structure has an outer surface provided with openings over a substantial portion thereof.

5,595,704

METHOD OF USING A SHAPING MOLD FOR MAKING ULTRA-THIN SHAPED RUBBER ARTICLES

Tomoyuki Hayashi, Tokyo; Yoshiaki Tatsumi, Kawasaki, and Kinya Miyashita, Kawasaki, all of Japan, assignors to Sohgohkagaku Co., Ltd., Kanagawa-ken, and Nishimbo Industries, Inc., Tokyo, both of Japan

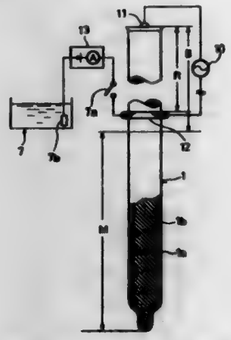
PCT No. PCT/JP93/00208, § 371 Date Oct. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO93/16857, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 22, 1993, Ser. No. 133,128

Claims priority, application Japan, Feb. 21, 1992, 4-021007 U; Oct. 14, 1992, 4-081880 U

Int. Cl.[6] B29C *41/14*; *41/40*

U.S. Cl. 264—404 **16 Claims**



1. A method of producing ultra-thin shaped rubber articles, which comprises:

(a) dipping a shaping mold, which comprises a main body having a surface for the adherence of liquid latex, said surface being made of an amorphous carbon, and a bottom part that is in contact with said main body, said bottom part having electrodes fitted thereto, said electrodes defining a heating area which is made of a material that heats upon the application of electricity to the electrodes, into a latex liquid so as to make the latex adhere to the main body of the shaping mold,

(b) heat-drying the latex coated shaping mold by applying electricity to said electrodes so as to heat said heating area by resistance heating and thereby heat and dry the latex as adhered to the surface of the shaping mold, and

(c) inspecting the shaped article by directly dipping the shaped article while on the shaping mold into an electrolytic solution, without having removed the article from the mold, and applying electricity to the mold and the solution for effecting pin hole inspection of the shaped article.

5,595,705

METHOD OF MANUFACTURING PACKAGING AND WRAPPING FILM

Kim L. Walton; Rajen M. Patel; Pak-Wing S. Cheung, all of Lake Jackson, and Todd J. Obljenski, Houston, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 55,863, Apr. 28, 1993, which is a continuation-in-part of Ser. No. 776,130, Oct. 15, 1991, Pat. No. 5,272,236, Ser. No. 961,269, Oct. 14, 1992, and Ser. No. 24,563, Mar. 1, 1993. This application Jun. 7, 1995, Ser. No. 487,271

Int. Cl.[6] B29C *35/10*

U.S. Cl. 264—456 **16 Claims**

1. In an improved method of manufacturing a monolayer heat-shrinkable, puncture-resistant biaxially oriented film having shrink in both the machine and transverse directions comprising the steps of extruding a primary tube comprising an ethylene polymer; heating the ethylene polymer primary tube; biaxially orienting the heated primary tube using a double bubble method or a simple bubble hot blown film technique set at least at a 2.5:1 blow-up ratio, the improvement comprising using as the ethylene polymer at least one substantially linear ethylene polymer which has

(A) a melt flow ratio, I_{10}/I_2, ≥5.63,

(B) a molecular weight distribution, M_w/M_n, defined by the equation:

$$M_w/M_n \leq (I_{10}/I_2) - 4.63, \text{ and}$$

(C) a gas extrusion rheology such that the critical shear rate at onset of surface melt fracture for the at least one substantially linear ethylene polymer is at least 50 percent greater than the critical shear rate at the onset of surface melt fracture for a linear ethylene polymer, wherein the substantially linear ethylene polymer and the linear ethylene polymer are comprised of the same monomer or monomers, the linear ethylene polymer has an I_2, M_w/M_n and density within nine percent of the substantially linear ethylene polymer and the respective critical shear rates of the substantially linear ethylene polymer and the linear ethylene polymer are measured at the same melt temperature using a gas extrusion rheometer.

5,595,706

ALUMINUM CONTAINING IRON-BASE ALLOYS USEFUL AS ELECTRICAL RESISTANCE HEATING ELEMENTS

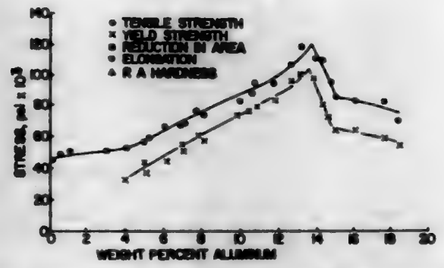
Vinod K. Sikka; Seetharama C. Deevi, both of Oak Ridge, Tenn.; Grier S. Fleischhauer, Midlothian, Va.; Mohammad R. Hajaligol, Richmond, Va., and A. Clifton Lilly, Jr., Chesterfield, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 29, 1994, Ser. No. 365,952

Int. Cl.[6] C22C *38/06*

U.S. Cl. 420—81 **28 Claims**

1. An iron-based alloy useful as an electrical resistance heating element and having a disordered body centered cubic structure, the



alloy having improved room temperature ductility, resistance to cyclic oxidation, thermal fatigue resistance, electrical resistivity and high temperature sag resistance, and comprising, in weight %, 4 to 9.5% Al, 0.5–2.0% Ti, 0.5–2% Mo, 0.1 to 0.8% Zr, 0.01–0.5% C, balance Fe.

5,595,707

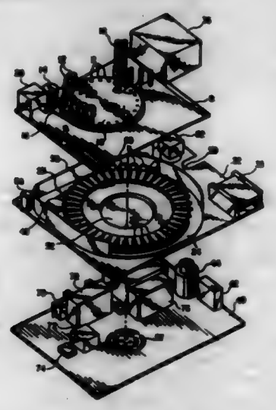
AUTOMATED BIOLOGICAL REACTION APPARATUS

Keith G. Copeland; Thomas M. Grogan; Charles Hansen; William R. Humphreys; Charles D. Lennon; Phillip C. Miller; William L. Richards, and Wayne A. Showalter, all of Tucson, Ariz., assignors to Ventana Medical Systems, Inc., Tucson, Ariz.

Continuation of Ser. No. 924,852, Aug. 31, 1992, abandoned, which is a continuation-in-part of Ser. No. 488,601, Mar. 2, 1990, abandoned. This application Dec. 9, 1994, Ser. No. 352,966

Int. Cl.[6] G01N *35/10*

U.S. Cl. 422—64 29 Claims



1. An automated biological reaction apparatus comprising:

a rotatable slide support carousel;

a plurality of slide supports mounted on the slide support carousel in a circular array for supporting a plurality of slides;

drive means engaging the slide support carousel for rotating the slide support carousel;

a reagent delivery system for applying a predetermined quantity of reagent to one of the slides on one of the slide supports positioned, by rotation of the slide support carousel, in a reagent delivery zone;

an evaporation inhibiting liquid application station comprising at least one nozzle positioned for directing a stream of evaporation inhibiting liquid onto a preselected evaporation inhibiting liquid impact zone of one of the slides on one of the slide supports;

a vortex mixing assembly positioned at a vortex agitation zone, the vortex mixing assembly having a nozzle for directing fluid at a vortex agitation zone of one of the slides on one of the slide supports and being positioned at the vortex agitation zone;

a heat zone for heating samples positioned on one of the slides on one of the slide supports;

at least one rinse station at a rinse zone, the rinse station comprising at least one nozzle positioned for directing a stream of rinse liquid onto a rinse liquid impact zone of one of the slides on one of the slide supports positioned at the rinse zone; and

a draining means for draining rinse liquid from one of the slides on one of the slide supports.

5,595,708

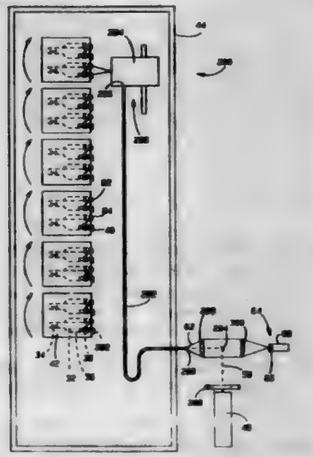
SYSTEM FOR DETECTING BACTERIAL GROWTH IN A PLURALITY OF CULTURE VIALS

Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 113,444, Aug. 27, 1993, Pat. No. 5,397,709. This application Nov. 18, 1994, Ser. No. 341,825

Int. Cl.[6] G01N *21/01*

U.S. Cl. 422—82.06 8 Claims



1. A system for detecting bacterial growth in a plurality of sample vials, said system comprising:

a housing;

a plurality of sample vials containing a sensor;

a mount structure capable of mounting said plurality of sample vials within said housing;

a frame movably mounted in said housing;

a portion of a bacterial growth detection station mounted on said frame for gathering a first and second type of information to make a determination of whether each of said plurality of sample vials is experiencing bacterial growth, wherein said second type of information is provided by said sensor in a particular sample vial and said bacterial growth detection station portion on said frame includes a first light radiation source at a first location and a detector at a second location spaced from said first location by a first distance;

said mount structure includes a pair of light stubs spaced by a distance which approximates said first distance and positioned adjacent to each of said vials, one of said pair of stubs receiving said first light radiation and the other of said pair of stubs directing a reflected radiation out of said particular sample vial and into said detector to provide said first type of information; and

a controller for moving said frame to position said bacterial growth detection station portion adjacent to said particular sample vial mounted in said mount structure.

5,595,709

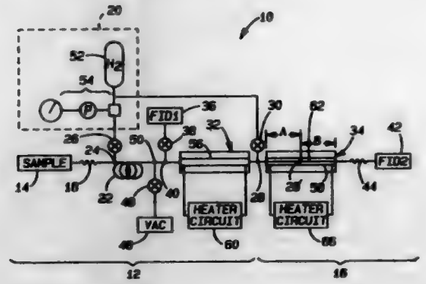
INSTRUMENT FOR MEASURING NON-METHANE ORGANIC GASES IN GAS SAMPLES

Mark A. Klemp, Swartz Creek, Mich., assignor to Chromatofast, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 938,812, Sep. 1, 1992, abandoned. This application May 3, 1994, Ser. No. 237,453

Int. Cl.[6] G01N *30/00*

U.S. Cl. 422—88 6 Claims



1. An analysis system for a gaseous sample, the system providing a measurement of the concentration of said non-methane organic gases group and the concentration of said methane gases group, said system comprising:

means for providing a source of a gaseous sample including a non-methane organic gases group which excludes methane and a methane gases group including methane;

a metal capillary tube trap for trapping a first portion of the non-methane organic gases group of the gaseous sample and passing a remainder of the gaseous sample including the methane gases group and a remainder portion of the non-methane organic gases group;

a porous layer open tubular trap arranged dowastream of said metal capillary tube trap for receiving the passed remainder of the gaseous sample, trapping the remainder portion of the non-methane organic gases group and passing the methane gases group;

temperature control means for selectively controlling the temperature of said metal capillary tube trap and said porous layer open tubular trap, said temperature control means causing said metal capillary tube trap to thermally trap said first portion of the non-methane organic gases group by adsorption at a first trapping temperature during an adsorption phase and desorbs said first portion of the non-methane organic gases group at an elevated first desorption temperature during a desorption phase, and causing said porous layer open tubular trap to thermally trap said remainder portion of the non-methane organic gases by adsorption at a second trapping temperature during said adsorption phase and desorbs said trapped remainder portion of the non-methane organic gases group at an elevated second desorption temperature during said desorption phase;

fluid circuit means for causing the gaseous sample to flow through said metal capillary tube trap and second porous layer open tubular trap in a first direction during said adsorption phase and thereafter causing the desorbed first portion of the non-methane organic gases group to flow in a second opposite direction through said metal capillary tube trap during said desorption phase and causing the desorbed remainder portion of the non-methane organic gases group to flow in the first direction through said porous layer open tubular trap during said desorption phase;

first detector means operably connected to said metal capillary tube trap for measuring a concentration of said first portion of the non-methane organic gases group flowing in the second direction after said first portion of the non-methane organic gases group is desorbed from said metal capillary tube trap; and

second detector means operably connected to said porous layer open tubular trap for measuring a concentration of the methane gases group passed through said porous layer open tubular column and a concentration of said remainder portion of the non-methane organic gases group desorbed from said porous layer open tubular trap.

5,595,710

MEDICAL SLIDE HOLDER

John M. Van Dusen, Jupiter, and Ross J. Petrie, Ft. Lauderdale, both of Fla., assignors to Intelligent Medical Imaging, Inc., Riviera Beach, Fla.

Filed May 25, 1995, Ser. No. 450,189

Int. Cl.[6] B65D *85/48*

U.S. Cl. 422—104 17 Claims

1. A medical slide holder comprising:

(a) a rectangular frame defining a rectangular opening therewithin; said rectangular frame including

(i) a pair of opposite sides each having a proximal and a distal end;

(ii) a front member bridging between distal ends of said opposite sides and rigidly interconnected therewith; and

(iii) a rear member bridging between proximal ends of said opposite sides and rigidly interconnected therewith;

said front member having a front ledge extending inwardly therefrom at a lower extremity of said front member; and said rear member having a rear ledge extending inwardly therefrom at a lower extremity of said rear member, said front and said rear ledges having slide-engaging surfaces for supporting specimen slides,

(b) a first locking cap having an upper surface and a lower surface with a first plurality of resiliest fingers protruding outwardly from said lower surface; means for fastening said first locking cap to said front member to project said first plurality of resiliest fingers toward said front ledge thereby to resiliently engage upper surfaces of slides when said slides are positioned in said slide holder; and

(c) a second locking cap having an upper surface and a lower surface with a second plurality of resiliest fingers protruding outwardly from said lower surface; said second locking cap including means for fastening said second locking cap to said rear member to project said second plurality of resiliest fingers toward said rear ledge thereby to resiliently engage upper surfaces of slides when said slides are positioned in said slide holder.

5,595,711

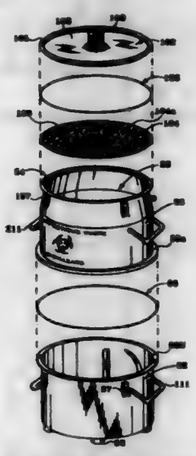
ISOLATED BIOLOGICAL AND MEDICAL WASTE PROCESSOR AND LID LINER CARRYING A CHEMICALLY SENSITIVE DECONTAMINANT

Joseph H. Wilson, Speedway; David C. Haeberle, Bloomington, both of Ind.; Raymond C. Kralovic, Willoughby, Ohio; Kenneth R. Lemaster, Indianapolis, Ind.; David B. Mennel; Jeffrey C. Rapp, both of Greenwood, Ind.; Lewis I. Schwartz, Bratenahl, and Kathleen M. Astlege, Chardon, both of Ohio, assignors to Ecomed, Inc., Indianapolis, Ind., and Steris Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 209,944, Mar. 11, 1994, abandoned. This application Jul. 20, 1995, Ser. No. 504,920

Int. Cl.[6] G01N *31/22*

U.S. Cl. 422—119 43 Claims



1. An apparatus for the treatment and decontamination of biological or medical waste, comprising:

a waste treatment chamber having an upper opening formed by an opening interface, said chamber enclosing a rotatable waste treatment assembly accessible through said upper opening;

a lid for engaging said opening interface and closing the upper opening of said chamber to define a closed waste treatment chamber;

a contiguous liner removably carried within the chamber for preventing the waste from adhering to the underside of said lid, said liner having at least one non-deformable opening provided therein sized so as to substantially prevent liquids and solids from passing therethrough while allowing aerosols and entrained particulates to pass therethrough; and

a chemical indicator carried by said liner for chemically reacting with any decontaminant present within the chamber and generating an output indicating the presence of the decontaminant within said chamber during the treatment cycle.

5,595,712

CHEMICAL MIXING AND REACTION APPARATUS

Kevin H. Harbster, Newark, Del., and Joseph A. Perrotto, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1994, Ser. No. 280,046

Int. Cl.[6] B01F *5/00*

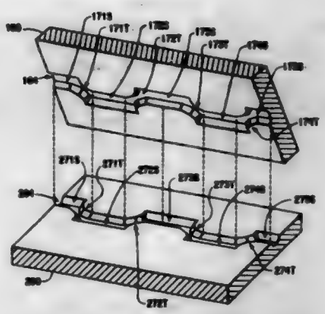
U.S. Cl. 422—129 12 Claims

1. A mixing apparatus, comprising:

a plurality of laminae, and having at least one inlet port and at least one outlet port, each lamina having a first planar surface and a second planar surface, the laminae being joined together such that respective first surfaces are joined to respective adjacent second surfaces, and having a plurality of intersecting channels formed therethrough, the channels being connected to said at least one inlet port and said at least one outlet port,

wherein the channels are generally planar, and one or more channels are formed as grooves in said first planar surface of said at least one lamina and one or more channels are formed as grooves in said adjacent second planar surface of an adjoining lamina,

and the channels are generally serpentine and are offset from each other such that the channels of said at least one lamina and said adjoining lamina repeatedly intersect in a juxtaposed manner and form predetermined angles of attack at points of intersection.



5,595,713

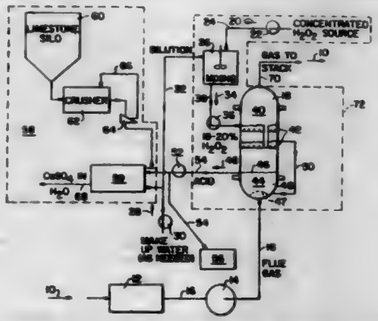
HYDROGEN PEROXIDE FOR FLUE GAS DESULFURIZATION

Wadie F. Gohara, and Dennis W. Johnson, both of Barberton, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 8, 1994, Ser. No. 303,311

Int. Cl.[6] B01D *50/00;* B01J *8/04;* C01B *17/20*

U.S. Cl. 422—170 6 Claims



1. A system for removing sulfur dioxide, nitrogen dioxide and other contaminants from a flue gas using hydrogen peroxide, comprising:

a vertical tank reaction chamber having an inlet at a lower end thereof for receiving the flue gas, distribution means located in a lower portion of the reaction chamber for bubbling the flue gas upwards through a level of liquid reaction products and unused reagent within the reaction chamber to provide an initial desulfurization and removal of contaminants from the flue gas, and a plurality of weirs located in an upper portion of the reaction chamber to effect desulfurization and removal of other contaminants from the flue gas as it is bubbled vertically upwards through the weirs;

means for providing hydrogen peroxide to the weirs located in the upper portion of the reaction chamber to produce liquid reaction products and unused reagent as the flue gas is bubbled vertically upwards through the weirs;

means for transporting liquid reaction products and unused reagent from the weirs to the lower portion of the reaction chamber below the level of the liquid to provide the level of liquid therein;

means for removing the liquid reaction products and unused reagent from the lower portion of the reaction chamber to maintain the level of liquid at a desired value;

acid collection means for collecting said liquid reaction products and unused reagent for use, further processing, or sale as a commercial product; and

means for discharging the flue gas from the upper portion of the reaction chamber.

5,595,714

RECOVERY OF GADOLINIUM AND ITS COMPLEXING AGENTS FROM AQUEOUS SOLUTIONS CONTAINING THEIR COMPLEXES

Giorgio Ripa, and Paolo Morosi, both of Milan, Italy, assignors to Dibra S.P.A., Milan, Italy

Filed May 24, 1995, Ser. No. 448,741

Claims priority, application Italy, May 16, 1995, MI95A0986

Int. Cl.[6] C01F *17/00*

U.S. Cl. 423—21.1 13 Claims

1. A process for the recovery in essentially pure form of both gadolinium and the complexing agent thereof from an aqueous solution containing the complex between gadolinium and the complexing agent or a salt of said complex, said complexing agent being a linear or macrocyclic polyaminocarboxylic acid chelating agent, wherein said chelating agent is a member selected from the group consisting of diethylenetriaminopentaacetic acid (DTPA), 1,4,7,10-tetraazacyclododecan-1,4,7,10-tetracetic acid (DOTA), 1,4,7,10-tetraazacyclododecan-1,4,7-triacetic acid (DO3A), [10-(2-hydroxypropyl)-1,4,7,10-tetraazacyclododecan-1,4,7-triacetic acid (HPDO3A), 4-carboxy-5,8,11-tris(carboxymethyl)-1-phenyl-2-oxa- 5,8,11-triazatridecan-13-oic acid (BOPTA), N-[2-[bis(carboxymethyl)-amino]-3-(4-ethoxyphenyl)propyl]-N-[2-bis(carboxymethyl)-amino]ethylglycine (EOB-DTPA), N,N-bis[2-[(carboxymethyl)[(methylcarbamoil)methyl]amino]ethyl]glycine (DTPA-BMA), 2-methyl-1,4,7,10-tetraazacyclododecan-1,4,7,10-tetracetic acid (MCTA), and (a,a',a",a"')-tetramethyl- 1,4,7,10-tetraazacyclododecan-1,4,7,10-tetracetic acid (DOTMA), which process comprises the following steps:

a) acidifying the solution containing said complex to a pH lower than the pH at which said complexing agent separates from the gadolinium;

b) adding oxalate ions to the acidified solution from step a) to precipitate gadolinium oxalate wherein said complexing agent remains in the acidified solution;

c) filtering the precipitated gadolinium oxalate from said acidified solution from step b);

d) adding a base to the filtered acidified solution from step c) to a pH between 1.4 and 4.5 to precipitate said complexing agent.

5,595,715

SYNTHESIS OF TETRAMETHYLAMMONIUM ALUMINOSILICATE AND USE THEREOF

Wieslaw J. Roth, Sewell, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 7, 1994, Ser. No. 319,915

Int. Cl.[6] C01B *33/26*

U.S. Cl. 423—328.1 10 Claims

1. A method for the synthesis of TMA aluminosilicate solution which comprises:

admixing a source of solid silica and tetramethylammonium hydroxide and heating the admixture at a temperature in the range of from about 40° C. to about 150° C. to produce a tetramethylammonium silicate solution intermediate product; and

dissolving a hydrolyzable aluminum compound in said tetramethylammonium silicate intermediate product to produce tetramethylammonium aluminosilicate solution.

5,595,716

SYNTHETIC MIXED-LAYER SILICATE AND METHOD FOR THE PREPARATION THEREOF

Kazuo Torii, Sendai; Takashi Iwasaki, Tagajo, and Yoshio Onodera, Sendai, all of Japan, assignors to Japan as directed by Director General of Agency of Industrial Science and Technology, Tokyo-to, Japan

Filed Aug. 18, 1995, Ser. No. 516,533

Claims priority, application Japan, Aug. 23, 1994, 6-222673

Int. Cl.[6] C01B *33/40*

U.S. Cl. 423—328.2 14 Claims

1. A synthetic mixed-layer silicate comprising x layers in number of serpentine and y layers in number of saponite, in which the serpentine has a chemical composition expressed by the general formula

$$Si_{2-a}Al_{2a}Mg_{3-a}O_5(OH)_{4-b}F_b,$$

in which the subscript a is 0 or a positive number not exceeding 1 and the subscript b is 0 or a positive number not exceeding 4, and the saponite has a chemical composition expressed by the general formula

$$[Si_{4-c-d}Al_{c+2d}Mg_{3-d}O_{10}(OH)_{2-e}F_e]^{c-}.M^{f+}c/f,$$

in which the subscript c is a positive number smaller than 1, the subscript d is 0 or a positive number not exceeding 1, the subscript e is 0 or a positive number not exceeding 2, the subscript f is a positive number in the range from 1 to 2 and M is a cation or a combination of cations selected from the group consisting of the ions of alkali metals and alkaline earth metals and ammonium ion, the ratio of the number of the serpentine layers to the number of the saponite layers x:y being in the range from 0.1 to 10.

5,595,717

CONTROLLED PRECIPITATION OF AMORPHOUS SILICA FROM GEOTHERMAL FLUIDS OR OTHER AQUEOUS MEDIA CONTAINING SILICIC ACID

Ross T. Harper; James H. Johnston, both of Wellington, and Nicholas Wiseman, Okere Falls, all of New Zealand, assignors to Tasman Pulp & Paper Co., Limited, Auckland, and Geochemistry Research Limited, Wellington, both of New Zealand

Continuation-in-part of Ser. No. 495,976, Feb. 28, 1990, Pat. No. 5,200,165. This application Mar. 24, 1993, Ser. No. 35,477

Claims priority, application New Zealand, Mar. 23, 1989, 228472; Jan. 19, 1990, 232170; Feb. 1, 1993, 245823

Int. Cl.[6] C01B *33/18*

U.S. Cl. 423—339 23 Claims

1. A process of producing particles of amorphous silica having a tertiary aggregate structure selected from at least one member of the group consisting of Type-I, Type-II and Type-III, which comprises:

providing a source fluid containing siliceous materials and an amount of an indigent precipitation agent for said siliceous materials which is insufficient to cause substantial quantities of said siliceous materials to independently come out of solution in said source fluid at that time and under temperature and pressure conditions prevailing in said source fluid;

adding previously produced tertiary aggregate particles of amorphous silica into admixture with said source fluid, of a size and in an amount such that dissolved siliceous materials in said source fluid accrete to said previously produced particles

and cause at least some of said previously produced particles to grow to a larger effective particle sizes, but of substantially the same structure;

maintaining the pH of said fluid at up to about 9.5 during the following steps;

forming a silica sol, by causing said source fluid to become supersaturated with respect to amorphous silica and initiating polymerization of said siliceous materials therein into polymeric material comprising primary particles of polymeric amorphous silica and accreting at least some of said primary particles of amorphous silica to said added particles of amorphous silica, without causing substantial quantities of said siliceous materials to be independently precipitated from said sol under the prevailing conditions;

aging said silica sol, by holding said silica sol for a time sufficient to continue the polymerization of said siliceous materials in said sol into said polymeric material, without causing substantial quantities of said polymeric material to be independently precipitated under the prevailing conditions;

adding to said silica sol a sufficient quantity of at least one added precipitation agent, different from said amorphous silica tertiary aggregate particles, to provide a sufficient proportion thereof, in relation to the concentration of said polymeric material, to convert said polymeric material into silica particles having a tertiary aggregate structure of said Type-I, Type-II or Type-III, of a size and in an amount sufficient to cause precipitation thereof from said silica sol;

thereby precipitating at least some of said tertiary aggregate amorphous silica particles to form a slurry of said particles; and

harvesting at least a portion of said precipitated particles.

5,595,718

PROCESS FOR PRODUCING A CRYSTALLINE SILICON NITRIDE POWDER

Tetsuo Yamada; Takashi Yamao; Yasukazu Kondo; Hideo Nakamura, and Tadayuki Mitani, all of Ube, Japan, assignors to UBE Industries Ltd., Yamaguchi, Japan

Filed Jan. 20, 1995, Ser. No. 496,852

Int. Cl.[6] C01B *21/068*

U.S. Cl. 423—344 **11 Claims**

1. A process for producing a crystalline silicon nitride powder, comprising the steps of:

calcining a silane material comprising, as a principal component, at least one nitrogen-containing silane compound in a mixed gas atmosphere comprising a nitrogen-containing inert gas and 0.1 to 5%, based on the total volume of the mixed gas, of molecular oxygen, to provide an amorphous silicon nitride powder the calcining being performed to pick up an amount of oxygen of 0.1 to 0.4% by weight;

baking the amorphous silicon nitride powder in a nitrogen-containing inert gas atmosphere, to provide a crystalline silicon nitride powder; and

milling the crystalline silicon nitride powder in a mixed gas atmosphere comprising 5 to 40% by volume of molecular oxygen gas and the balance consisting of an inert gas.

5,595,719

PROCESS FOR STEAM REFORMING OF HYDROCARBONS

Israr Ul-Haque, Bentleigh Hills, and David L. Trimm, Watsons Bay, both of Australia, assignors to Haldor Topsoe A/S, Denmark

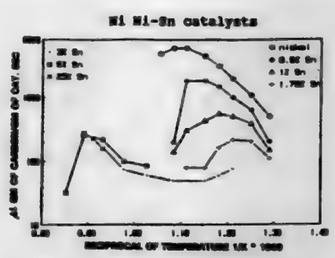
Division of Ser. No. 743,120, Aug. 9, 1991, abandoned. This application May 22, 1992, Ser. No. 887,610

Claims priority, application Denmark, Aug. 9, 1990, 1898/90

Int. Cl.[6] C01B *3/26;31/18*

U.S. Cl. 423—418.2 **6 Claims**

1. A process for the production of hydrogen and/or carbon monoxide rich gases by steam reforming of a hydrocarbon feedstock, the process comprising the step of contacting the hydrocarbon feedstock and steam with a catalyst comprising nickel as a main catalytic component, a refractory carrier material for the nickel, and at least one catalytic element for the steam reforming of the hydrocarbon feedstock, the element being selected from the group consisting of arsenic, antimony and bismuth.



5,595,720

METHOD FOR PRODUCING CARBON FIBER

Yutaka Arai, Kawasaki; Kunio Miura; Toshihiro Nishikawa, both of Hiroji, and Mitsuaki Matsumoto, Tsukuba, all of Japan, assignors to Nippon Steel Corporation, and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 117,531, Sep. 7, 1993, abandoned. This application May 9, 1995, Ser. No. 437,921

Claims priority, application Japan, Sep. 4, 1992, 4-260498; Sep. 4, 1992, 4-260499; Sep. 11, 1992, 4-267842

Int. Cl.[6] D01D *5/096*

U.S. Cl. 423—447.6 **3 Claims**

3. A method for producing carbon fiber comprising infusibilizing a pitch fiber yarn, made using mesophase pitch as a starting material, in an oxidizing gas atmosphere including nitrogen dioxide and oxygen; carbonizing the infusible fiber yarn in an inert gas atmosphere at a temperature of 350° to 390° C. for 10 minutes or more for primary carbonization; then carbonizing the yarn at a temperature of 800° to 1300° C. for 5 to 120 seconds with a tension of 50 to 2500 gf/mm^2 applied to the yarn for secondary carbonization to obtain a carbon fiber yarn having a breaking strength of at least 15 kgf/mm^2; and then continuously graphitizing the carbon fiber yarn at 1500° C. or more, while applying a tension of 1.5 to 10 kgf/mm^2 to the carbon fiber yarn.

5,595,721

RADIOIMMUNOTHERAPY OF LYMPHOMA USING ANTI-CD20

Mark S. Kaminski, Ann Arbor, Mich.; Gregory M. Butchko, Miami Lakes; Stephen D. Gleim, Davie, both of Fla., and Richard L. Wahl, Ann Arbor, Mich., assignors to Coulter Pharmaceutical, Inc., Palo Alto, Calif.

Filed Sep. 16, 1993, Ser. No. 121,582

Int. Cl.[6] A61K *51/10*

U.S. Cl. 424—1.49 **25 Claims**

1. A method for immunotherapy of B-cell lymphoma, which comprises:

(i) administering to a patient an imaging effective amount of an antibody, or a Fab, Fab' or F(ab')$_2$ portion thereof, trace labelled with a first radiolabel, which binds to CD20 antigen present on the surface of cells of said B-cell lymphoma;

(ii) imaging the distribution of said labelled antibody, or a Fab, Fab' or F(ab')$_2$ portion thereof of step (i), within the body of the patient;

(iii) administering to the patient an amount of the antibody or a Fab, Fab' or F(ab')$_2$ portion thereof of step (i) in unlabelled form, which binds to CD20 antigen present on the surface of cells of said B-cell lymphoma, said amount effective for blocking non-tumor binding sites for an antibody, or Fab, Fab' or F(ab')$_2$ portion thereof effective for treating B-cell lymphoma, within the body of the patient; and

(iv) administering to the patient a radioimmunotherapeutically effective amount for treating B-cell lymphoma of said antibody, or a Fab, Fab' or F(ab')$_2$ portion thereof of step (i), this is labelled with said first radiolabel or with a different radiolabel wherein the amount of radioactivity is less than the amount that provides irradiation at a dose which causes myelosuppression severe enough to require the reintroduction of hematopoietic stem cell into the patient in order for the to recover hematopoietic function after administration of said antibody or Fab, Fab' or F(ab')$_2$ portion thereof which is administered in said radioimmunotherapeutically effective amount.

5,595,722

METHOD FOR IDENTIFYING AN AGENT WHICH INCREASES TGF-BETA LEVELS

David J. Grainger, and James C. Metcalfe, both of Cambridge, England, assignors to NeoRx Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 242,161, May 12, 1994, which is a continuation-in-part of Ser. No. 61,714, May 13, 1993, abandoned, and Ser. No. 241,844, May 12, 1994, which is a continuation-in-part of Ser. No. 62,451, May 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 11,669, Jan. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,735

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.2 **7 Claims**

1. A method for identifying an agent which increases the level of TGF-beta in a human comprising:

(a) contacting cultured explant human aortic smooth muscle cells (hVSMC) with said agent in an amount effective to reduce or inhibit the rate of proliferation of said cells;

(b) contacting said hVSMC resulting from step (a) with a moiety which specifically binds to TGF-beta in an amount effective to block the binding of TGF-beta to the TGF-beta receptors of said hVSMC and determining the rate of proliferation; and

(c) determining whether the rate of proliferation of said hVSMC resulting from step (b) is increased relative to the rate of proliferation of the hVSMC which are contacted with said agent in step (a).

5,595,723

METHOD FOR PREPARING STORAGE STABLE COLLOIDS

Steven C. Quay, Pacific Palisades, Calif., assignor to Sonus Pharmaceuticals, Bothell, Wash.

Continuation-in-part of Ser. No. 8,172, Jan. 25, 1993. This application Nov. 8, 1993, Ser. No. 148,284

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.5 **31 Claims**

1. A method of preparing a storage stable ultrasound contrast agent comprising the steps of:

(a) mixing at least one amphiphilic material with water to form an aqueous continuous phase;

(b) adding an amount of a fluorine-containing compound in gas form which has a boiling point less than 37° C. to said continuous phase; and

(c) condensing said gas to form a liquid in liquid colloidal dispersion having dispersed phase particles with an average diameter of less than 5000 nm.

5,595,724

TREATED CALCIUM/OXYANION-CONTAINING PARTICLES FOR MEDICAL DIAGNOSTIC IMAGING

Edward A. Deutsch; Karen F. Deutsch, both of 12805 Maryland Estates Ct., Maryland Heights, Mo. 63043; Dennis L. Nosco, 1026 Driftwood Trails Dr., Florissant, Mo. 63031; William H. Ralston, 22 Rathenlugh Ct., St. Charles, Mo. 63304; David H. White, 877 Gardenway Dr., Ballwin, Mo. 63011; Janet B. Wilking, 819 Moondale Dr., Ferguson, Mo. 63135; Robert G. Wolfangel, 1104 Grenadier La., Ballwin, Mo. 63021; Steven R. Woulfe, 1719 Woodmore Oaks Dr., Ballwin, Mo. 63021; William P. Cacheris, 16726 Edisto Ct., Florissant, Mo. 63034, and Linda Meeh, 6028 Odell, St. Louis, Mo. 63139

Division of Ser. No. 47,129, Apr. 13, 1993, Pat. No. 5,487,659, which is a continuation-in-part of Ser. No. 948,540, Sep. 22, 1992, Pat. No. 5,344,640, which is a continuation-in-part of Ser. No. 784,325, Oct. 22, 1991, abandoned. This application Jan. 13, 1995, Ser. No. 373,152

Int. Cl.[6] A61B *8/00*

U.S. Cl. 424—9.5 **21 Claims**

1. A method for enhancing medical diagnostic imaging of body organs and tissues which comprises:

(a) administering to a patient, a diagnostically effective amount of calcium/oxyanion- containing particles which are treated to be echogenic, in a pharmaceutically acceptable carrier, said calcium/oxyanion-containing particles having a general formula:

$$Ca_sM_mX_nY_r$$

wherein M is a stoichiometric mixture of metal ions, X is a simple anion, Y is an oxyanion, tetrahedral oxyanion, protonated or unprotonated, carbonate, or mixtures thereof, m is from 0 to 10, n is from 1 to 10, s is ≥ 1, and r is adjusted as needed to provide charge neutrality; and

(b) imaging the organs and tissues using an ultrasound medical diagnostic imaging technique.

5,595,725

DIAGNOSTIC MEDIA

Heinz Gries; Douwe Rosenberg; Hanno-Joachim Weinmann; Ulrich Speck; Wolfgang Mätzel; Georg-Alexander Heyer, all of Berlin; Henrich Pfeiffer, deceased, late of Berlin, and Franz-Josef Remmeke, Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 911,800, Jul. 10, 1992, Pat. No. 5,362,475, which is a continuation of Ser. No. 596,932, Oct. 15, 1990, abandoned, which is a division of Ser. No. 370,139, Jun. 23, 1989, Pat. No. 4,963,344, which is a continuation of Ser. No. 20,993, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 573,184, Jan. 23, 1984, Pat. No. 4,647,447, which is a continuation-in-part of Ser. No. 401,594, Jul. 26, 1982, abandoned, said Ser. No. 911,800is a continuation of Ser. No. 20,992, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 573,184, which is a continuation-in-part of Ser. No. 401,594, said Ser. No. 911,800is a continuation of Ser. No. 20,300, Mar. 2, 1987, Pat. No. 5,021,236, which is a division of Ser. No. 573,184, which is a continuation-in-part of Ser. No. 401,594, said Ser. No. 911,800is a continuation of Ser. No. 423,594, Oct. 17, 1989, abandoned, which is a continuation of Ser. No. 20,301, Mar. 2, 1987, abandoned, which is a division of Ser. No. 573,184, which is a continuation-in-part of Ser. No. 401,594. This application Oct. 28, 1994, Ser. No. 330,954

Claims priority, application Germany, Jul. 24, 1981, 31 29 906.7; Jan. 21, 1983, 33 02 410.3; Jan. 11, 1984, 34 01 052.1

Int. Cl.[6] A61B *5/055*

U.S. Cl. 424—9.34 **38 Claims**

1. A method of imaging body tissue in a patient, comprising subjecting the patient to NMR tomography and prior to performing

the NMR tomography administering to the patient an effective amount of a pharmaceutical agent for affecting the relaxation times of atoms in body tissue undergoing NMR diagnosis, whereby image contrast is enhanced, said agent comprising an amount, effective to affect such relaxation times, of a paramagnetic, physiologically compatible chelate complex of an ion of a lanthanide element of atomic numbers 58–70 or of a transition metal of atomic numbers 21–29, 42, or 44, wherein said chelate complex is coupled by a chemical reaction to a biomolecule, said biomolecule being effective to transport said chelate complex to a specific site in said patient; and a pharmaceutically acceptable carrier.

5,595,726

CHROMOPHORE PROBE FOR DETECTION OF NUCLEIC ACID

Darren Magda, Cupertino, Calif.; Jonathan L. Sessler, and Brent Iverson, both of Austin, Tex., assignors to Pharmacyclics, Inc., Sunnyvale, Calif., and Board of Trustees, Univ. of TX Sys., Austin, Tex.

Continuation-in-part of Ser. No. 310,501, Sep. 21, 1994, which is a continuation-in-part of Ser. No. 112,872, Aug. 25, 1993, Pat. No. 5,451,576, and a continuation-in-part of Ser. No. 227,370, Apr. 14, 1994, which is a continuation-in-part of Ser. No. 75,123, Jun. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 822,964, Jan. 21, 1992, Pat. No. 5,252,720, said Ser. No. 112,872is a division of Ser. No. 822,964. This application Jun. 7, 1995, Ser. No. 486,311

Int. Cl.[6] C07D 487/22

U.S. Cl. 424—9.61 20 Claims

1. A probe for the detection of a target nucleic acid sequence, which probe comprises a texaphyrin chromophore conjugated to an oligonucleotide having complementary binding affinity for said targeted nucleic acid sequence.

5,595,727

AQUEOUS COSMETIC COMPOSITION FOR SETTING THE HAIR BASED ON THE COMBINATION OF HYDRODISPERSIBLE POLYCONDENSATE AND A HYDROSOLUBLE COPOLYMER

Jean-Michel Sturla, Saint-Cloud, France, assignor to L'Oreal, Paris, France

Filed May 19, 1995, Ser. No. 447,171

Claims priority, application France, May 19, 1994, 94-06119

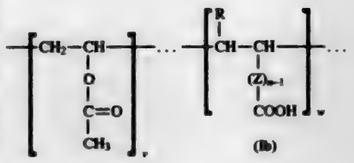
Int. Cl.[6] A61K 7/08

U.S. Cl. 424—47 17 Claims

1. An aqueous cosmetic composition for setting the hair, comprising in an aqueous or weakly hydroalcoholic medium.

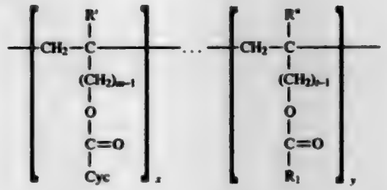
(a) 0.5 to 40 percent by weight, relative to the total weight of said composition, of a hydrodispersible polycondensate having sulfonate functions, and

(b) 0.5 to 15 percent by weight, relative to the total weight of said composition, of a hydrosoluble copolymer having the formula



(I)

(Ia) (Ib)



(Ic) (Id)

wherein

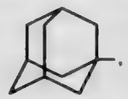
R, R' and R", each independently, represent hydrogen or methyl,

m, n and t are 1 or 2,

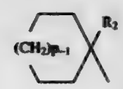
R_1 represents linear or branched, saturated or unsaturated alkyl having 2 to 21 carbon atoms,

Z represents a divalent radical selected from the group consisting of $—CH_2—$, $—CH_2—O—CH_2$ and $—CH_2O—(CH_2)_t—$ and

Cyc represents a member selected from the group consisting of



(i)

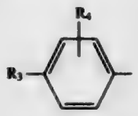


(ii)

wherein

R_2 represents hydrogen or methyl and

p is 1 or 2

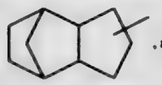


(iii)

wherein

R_3 represents hydrogen, methyl, ethyl, tert-butyl, ethoxy, butoxy or dodecyloxy and

R_4 represents hydrogen, alkyl having 1–4 carbon atoms or alkoxy having 1–4 carbon atoms, and



(iv)

, and

v represents 10 to 91 weight percent,

w represents 3 to 20 weight percent,

x represents 4 to 60 weight percent, and

y represents 0 to 40 weight percent,

v+w+x+y being equal to 100 percent,

the said carboxylic acid functions of said copolymer being neutralized by a basic agent in an amount greater than 80 percent.

5,595,728

AMINO ACID β-LYASE ENZYME INHIBITORS AS DEODORANTS

Sue Brockett, Bethesda; Clifford O'Neal, Gaithersburg; Hermes van der Lee, Olney, all of Md., and Brian Rogers, South Boston, Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 824,886, Jan. 22, 1992, Pat. No. 5,213,791, which is a continuation of Ser. No. 418,876, Oct. 10, 1989, abandoned. This application Dec. 4, 1992, Ser. No. 985,851

Int. Cl.[6] A61K 7/32;7/34;7/38;9/12

U.S. Cl. 424—65 12 Claims

1. A deodorant composition comprising a body odor suppressing effective amount of an inhibitor of an amino acid β-lyase enzyme containing the cofactor pyridoxal phosphate and which cleaves amino acids with the structure $COOH—CH(NH_2)—CH_2—S—R$ where R is alkyl, in a dermatologically acceptable vehicle.

5,595,729

BASIC ALUMINUM ANTIPERSPIRANT ACTIVE MATERIALS HAVING ENHANCED ACTIVITY, ANTIPERSPIRANT ACTIVE COMPOSITIONS CONTAINING SUCH MATERIALS, AND METHODS FOR PREPARATION OF SUCH MATERIALS AND COMPOSITIONS

Morton L. Barr, Rockaway; Paul J. Vincenti, Jefferson, and Elaine L. Vanderhoof, Long Valley, all of N.J., assignors to The Mennen Company, Morristown, N.J.

Continuation of Ser. No. 558,683, Jul. 18, 1990, abandoned. This application Jul. 27, 1993, Ser. No. 97,620

Int. Cl.[6] A61K 7/38

U.S. Cl. 424—68 49 Claims

1. An antiperspirant active composition, comprising:

(1) at least one basic aluminum material having the empirical formula:

$$Al_2(OH)_{6-a}X_a$$

where $0.5 \leq a \leq 5.0$; and X is a univalent complex oxoanion of nitrogen or a univalent complex oxoanion of a halogen, which forms salts with Al^{3+} in aqueous solution, so that these salts are essentially completely dissociated, which is readily soluble in water with metallic ions in the solution, and which forms conjugate acids that are strong acids, the at least one basic aluminum material being further characterized by:

(a) size exclusion high performance liquid chromatography peaks corresponding to peak 3 and peak 4 of the size exclusion chromatogram produced from a high performance liquid chromatography technique;

(b) a peak 4 relative area of at least 25%, and a peak 3 relative area of less than 60%, the sum of the relative peak 3 and peak 4 areas being at least 50%;

(c) less than 10% chromatographic peaks eluting at shorter retention times than peak 3, corresponding to peaks 1 and 2;

(d) less than 25% of the aluminum being in the form of Al^b Polyhydroxyaquoaluminum;

(e) an ^{27}Al NMR spectrum wherein 5% to 30% of the total area under the spectrum from 140 ppm to −80 ppm is contained in a resonance line at 71.5–73.5 ppm; and

(f) an ^{27}Al NMR spectrum in which the area of the 71.5–73.5 ppm resonance line includes more than 50% of the combined areas of the 62.5–63.5 ppm and 71.5–73.5 ppm resonance lines, and

(2) at least one other antiperspirant active material, which is selected from the group consisting of antiperspirant active Zr salts, antiperspirant active Hf salts, antiperspirant active Ti salts and antiperspirant active Sn salts.

5,595,730

LACTATE DEHYDROGENASE INHIBITORS IN COSMETIC COMPOSITIONS

John B. Bartolone, Bridgeport, Conn.; Christine M. Penkas, Westwood, N.J.; Uma Santhanam, Tenafly, N.J., and Brian D. Lang, North Bergen, N.J., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Continuation of Ser. No. 359,759, Dec. 20, 1994, abandoned. This application Jan. 5, 1996, Ser. No. 583,243

Int. Cl.[6] A61K 7/06;31/19

U.S. Cl. 424—70.1 5 Claims

1. A composition for topical applications to human skin, hair or nails, the composition consisting essentially of

(i) from about 0.01% to about 20% of an inhibitor of lactate dehydrogenase selected from the group consisting of pyruvic acid, an alkyl ester of pyruvic acid, 2-ketomalonic acid and mixtures thereof;

(ii) from about 0.01% to about 20% of a co-active ingredient selected from the group consisting of acetic acid, acetoacetic acid, succinic acid, fumaric acid, cis-aconitic acid, β-hydroxybutyric acid, and mixtures thereof; and

(iii) a cosmetically acceptable vehicle.

5,595,731

ORGANIC FLUID GELIFYING COMPOUNDS

Lucien Vallieres, 3001 ouest, rue Sherbrooke bureau 603, Westmount, Canada

Continuation-in-part of Ser. No. 216,015, Mar. 21, 1994, abandoned. This application Sep. 21, 1995, Ser. No. 531,677

Int. Cl.[6] A01N 25/12

U.S. Cl. 424—76.4 12 Claims

1. A gelifying compound for use in solidifying liquid water-based organic material, and comprising a thoroughly mixed combination of the four following ingredients:

a) a granular superabsorbent polymer, for gelifying the water-based organic waste material into a gel;

b) a non-metallic deodorizer having inherent means for cooperating with said polymer in stabilizing said gel, said inherent stabilizing means consisting of herbal extracts from the roots, stems, buds or flower of the following group of members of the plant kingdom: peach tree, maple tree, cucumber, azalea, angelica, cherry tree, chestnut, rose, pine, cedar, cypress, white birch, strawberry, and butterbur, said herbal extracts substantially enhancing the water absorbing capability of said polymer wherein stabilization of the gelified waste material is improved together with ease of handling thereof;

c) a granular chemical disinfectant, having microbicidal properties against all biological material; and

(d) a chelating agent, for neutralizing calcium ions contained in the organic material so as to enhance gelification of the polymer;

wherein said compound promotes easy and timely handling of the liquid organic material during its collection, capture, transportation, and refuse discharge, while substantially precluding cross-contamination and combating foul odours, thanks to the dual deodorizing/stabilizing nature of said deodorizer.

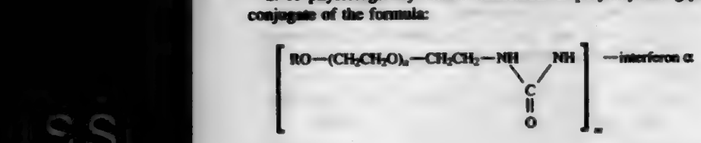
5,595,732

POLYETHYLENE-PROTEIN CONJUGATES

John Halstal, Scarsdale, N.Y.; Patricia Kilian, Upper Montclair, and Perry Rosen, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 674,001, Mar. 25, 1991, abandoned. This application Sep. 27, 1991, Ser. No. 767,000
The portion of the term of this patent subsequent to Aug. 26, 2012, has been disclaimed.
Int. Cl.[6] A61K *38/21*; C07K *14/56*
U.S. Cl. 424—85.7 4 Claims

1. A physiologically active interferon α polyethylene glycol conjugate of the formula:



wherein R is lower alkyl; and m and n are selected from any combination of numbers which provide a molecular weight for the conjugate, excluding the interferon α, of from 300 to 30,000 daltons.

5,595,733

METHODS FOR PROTECTING ∗I ZEA MAYS PLANTS AGAINST PEST DAMAGE

Gloria Carswell, Cary; Christian Harms, Chapel Hill, both of N.C.; Yin-Fu Chang, Hayward, Calif., and Mary-Dell Chilton, Raleigh, N.C., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 269,677, Jul. 1, 1994, which is a continuation of Ser. No. 24,875, Mar. 1, 1993, Pat. No. 5,350,689, which is a continuation of Ser. No. 276,210, Nov. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 178,178, Apr. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 56,552, May 29, 1987, abandoned, and Ser. No. 56,586, May 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 53,241, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 52,440, May 20, 1987, abandoned. This application May 22, 1995, Ser. No. 445,526
Int. Cl.[6] A01N *65/00*; C12N *5/04*; *5/14*
U.S. Cl. 424—93.21 4 Claims

1. A method of controlling insect larvae comprising:

(a) feeding the larvae an insecticidal amount of transgenic *Zea mays* cells containing an isolated or synthetic DNA which encodes a polypeptide having the insect toxicity properties of a *Bacillus thuringiensis* crystal protein, wherein the cells have been grown or cultured in a manner to permit expression of the toxin in the cells.

5,595,734

COMPOSITIONS COMPRISING ONCONASE (TM) AND LOVASTATIN

Stanislaw M. Mikulski, Essex Fells, N.J., and Wojciech J. Ardelt, New City, N.Y., assignors to Alfacell Corporation, Bloomfield, N.J.

Continuation-in-part of Ser. No. 436,141, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 178,118, Apr. 6, 1988, Pat. No. 4,882,421. This application Jul. 28, 1992, Ser. No. 921,619
Int. Cl.[6] A61K *37/54*; C07K *14/00*
U.S. Cl. 424—94.6 1 Claim

1. A bioactive pharmaceutical comprising a protein having the following amino acid sequence:

1 2 3 4 5 6 7 8 9 10
<Glu—Asp—Trp—Leu—Thr—Phe—Gln—Lys—Lys—His—

11 20
Ile—Thr—Asn—Thr—Arg—Asp—Val—Asp—Cys—Asp—

21 30
Asn—Ile—Met—Ser—Thr—Asn—Leu—Phe—His—Cys—

31 40
Lys—Asp—Lys—Asn—Thr—Phe—Ile—Tyr—Ser—Arg—

41 50
Pro—Glu—Pro—Val—Lys—Ala—Ile—Cys—Lys—Gly—

51 60
Ile—Ile—Ala—Ser—Lys—Asn—Val—Leu—Thr—Thr—

61 70
Ser—Glu—Phe—Tyr—Leu—Ser—Asp—Cys—Asn—Val—

71 80
Thr—Ser—Arg—Pro—Cys—Lys—Tyr—Lys—Leu—Lys—

81 90
Lys—Ser—Thr—Asn—Lys—Phe—Cys—Val—Thr—Cys—

91 100
Glu—Asn—Gln—Ala—Pro—Val—His—Phe—Val—Gly—

101 104
Val—Gly—Ser—Cys

and

[1S-[1α(R*), 3α, 7β, 8β(2S*, 4S*), 8aβ]]-1, 2, 3, 7, 8, 8a-hexahydro -3,7-dimethyl-8-[2-(tetrahydro-4-hydroxy-6-oxo-2H-pyran-2-yl)ethyl]-1-napthalenyl 2-methylbutanoate.

5,595,735

HEMOSTATIC THROMBIN PASTE COMPOSITION

Lowell Saferstein, Edison, and Stephen J. Wolf, Neshanic Station, both of N.J., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed May 23, 1990, Ser. No. 528,002
Int. Cl.[6] A61K *38/48*; *35/16*; C12N *9/74*
U.S. Cl. 424—94.64 20 Claims

1. An anhydrous hemostatic paste composition comprising a hemostatically effective amount of thrombin uniformly dispersed in a polyethylene glycol base and wherein the paste composition is freeze-dried.

5,595,736

COMPOUNDS AND METHODS FOR TREATMENT OF THROMBOEMBOLIC DISORDERS

David T. Berg, Beech Grove, and Brian W. Grinnell, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 689,410, Apr. 22, 1991, abandoned. This application Mar. 27, 1995, Ser. No. 411,260
Int. Cl.[6] A61K *38/46*; *38/49*; C12N *9/48*; *9/64*
U.S. Cl. 424—94.64 8 Claims

1. A human tissue-plasminogen activator (t-PA) derivative lacking Finger, Growth Factor, and Kringle 1 domains which comprises a Kringle 2 domain that is monoglycosylated at an amino acid residue equivalent to amino acid residue number 218 of native human t-PA.

5,595,737

METHODS FOR USING MONOCLONAL ANTIBODIES SPECIFIC FOR CELL-SURFACE BOUND LAM-1

Thomas F. Tedder, South Natick; Boris Schlossman, Brookline, both of Mass., and Olivier Spertini, Aarau, Switzerland, assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Division of Ser. No. 334,191, Nov. 4, 1994, which is a division of Ser. No. 862,483, Apr. 2, 1992, Pat. No. 5,389,528, which is a continuation-in-part of Ser. No. 730,383, Jul. 8, 1991, abandoned, which is a continuation of Ser. No. 313,109, Feb. 21, 1989, abandoned, and a continuation-in-part of Ser. No. 708,773, May 15, 1991, abandoned, Ser. No. 737,892, Jul. 29, 1991, abandoned, and Ser. No. 770,608, Oct. 3, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,394
Int. Cl.[6] A61K *39/395*; C07K *16/28*; C12N *5/20*
U.S. Cl. 424—130.1 2 Claims

1. A method for blocking LAM-1 dependent cellular adhesion in the presence of shed LAM-1, comprising the step of contacting a population of cells expressing said LAM-1 with an effective amount of a monoclonal antibody that is reactive with cell-surface bound LAM-1 but not reactive with shed LAM-1.

5,595,738

CTAA 81AV78, THE ANTIGEN RECOGNIZED BY HUMAN MONOCLONAL ANTIBODY 81AV78

Nicholas Ponazio, Frederick, Md., and Janet H. Ransom, Shepardstown, W. Va., assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/US92/04108, § 371 Date Dec. 6, 1993, § 102(e) Date Dec. 6, 1993, PCT Pub. No. WO92/20374, PCT Pub. Date Nov. 26, 1992
Continuation-in-part of Ser. No. 701,252, May 16, 1991, abandoned. This PCT application May 15, 1992, Ser. No. 150,836
Int. Cl.[6] A61K *31/20*; *34/38*
U.S. Cl. 424—184.1 5 Claims

1. An essentially purified and isolated human tumor cell, phosphorylated, nonglycosylated lipid antigen immunoreactive with human monoclonal antibody 81AV78 and found on tumor cell lines SKCO-1, HCT-8, EP, CaLu-1, Ovcar3 and Panc-1.

5,595,739

HEPATITIS B VIRUS MUTANTS, REAGENTS AND METHODS FOR DETECTION

William F. Carman, Glasgow, United Kingdom; Richard H. Decker, Deerfield, Ill.; Lesley Wallace, Glasgow, United Kingdom; Larry T. Mimms, Lake Villa, and Larry R. Solomon, Mundelein, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed May 7, 1993, Ser. No. 59,031
Int. Cl.[6] A61K *39/29*; G01N *33/543*; C07K *14/02*; C12Q *1/70*
U.S. Cl. 424—189.1 11 Claims

1. A purified polypeptide comprising the sequence of a mutant hepatitis B virus surface antigen (HBsAG) "a" determinant, in which the mutation is insertion of the amino acids Asn and Thr between positions 122 and 123 of the HBsAG sequence.

5,595,740

CLONING OF NON-IGA FC BINDING FORMS OF THE GROUP B STREPTOCOCCAL BETA ANTIGENS

L. Jeannine Brady, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed May 16, 1994, Ser. No. 242,932
Int. Cl.[6] A61K *39/09*; C07K *14/315*; C12N *15/31*; *1/21*
U.S. Cl. 424—190.1 8 Claims

1. A purified deletion mutant beta antigen polypeptide from group B streptococci, wherein said polypeptide is immunoreactive with anti-beta antigen antiserum and comprises the amino terminus and carboxy terminus region of the wild type beta antigen an amino acid sequence of the beta antigen that lacks a human IgA immunoglobulin binding wherein said polypeptide does not bind to the Fc region of human IgA immunoglobulin.

5,595,741

AMINOALKYLMALEIMIDES AND HAPTEN AND ANTIGEN DERIVATIVES DERIVED THEREFROM AS WELL AS CONJUGATES WITH PEPTIDES OR PROTEINS

Erasmus Huber, Unterflauting; Christian Klein, Wellheim; Hans-Georg Batz, Tutzing, and Bruno Zink, Uffing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Division of Ser. No. 656,851, Feb. 14, 1991, abandoned. This application Jul. 21, 1994, Ser. No. 278,621
Claims priority, application Germany, Jun. 19, 1989, 39 19 915.0
Int. Cl.[6] C08L *77/04*; A61K *37/02*; *39/385*
U.S. Cl. 424—194.1 10 Claims

3. A peptide or protein conjugate compound as produced by reaction of an amidoalkylmaleimide of formula II



(II)

with a peptide or protein carrying at least one sulfhydryl group wherein

in Formula II Hap is a hapten, R_1 and R_2 are the same or different and are C_1–C_4-alkyl or hydrogen and A is a straight-chain or branched, saturated or unsaturated C_2–C_6-alkylene, which alkylene is uninterrupted or is interrupted by an oxygen or a sulphur atom or a carbonyl.

5,595,742

ANTIMICROBIAL AGENT FOR STAPHYLOCOCCUS

Hiroshi Fujiwara, Kakuhouji, and Ken Sawai, Osaka, both of Japan, assignors to Toyo Seiyaku Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 9,689, Jan. 27, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 351,571
Claims priority, application Japan, Oct. 6, 1992, 4-267556
Int. Cl.[6] A61K *35/84*
U.S. Cl. 424—195.1 19 Claims

1. A method for treating Staphylococcus infections in human and non-human animals comprising administering an effective amount of a composition consisting essentially of a soluble extract of *Ganoderma lucidum* prepared from the ripe pileus containing many spores.

5,595,743

PREPARATION OF HERBAL MEDICINES BY USING A MULTI-ENZYME SYSTEM, HERBAL MEDICINES PREPARED AND THEIR USES

Wencai Wu, 11 Gangguo, Haidian District, Beijing 100080, China

Filed Dec. 20, 1994, Ser. No. 359,693

Claims priority, application China, Dec. 21, 1993, 93 1 20926.9

Int. Cl.[6] A61K *35/78;38/46;38/47;38/48*

U.S. Cl. 424—195.1 17 Claims

1. A process for preparing a herbal medicine comprising the steps of:

forming a mash from raw material,

grinding finely the mash to make the size of average suspended particles less than 50 μm,

hydrolyzing the ground material by using a multi-enzyme system, the enzyme system comprising cellulases, proteases, amylases, lipases, and lysozymes and having an activity unit of from about 20,000 to about 10,000,000 IU/g, wherein the hydrolyzing takes place at a temperature of from about 20° C. to about 80° C., and

sterilizing the hydrolyzed material.

5,595,744

RESPIRATORY DISEASE VACCINE FOR CATS

William S. K. Chalmers, St. Ives Cambs., United Kingdom, and Antonius A. C. Jacobs, PS Kessel, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 948,196, Sep. 21, 1992, abandoned.

This application Apr. 3, 1995, Ser. No. 415,783

Claims priority, application European Pat. Off., Sep. 30, 1991, 91308931

Int. Cl.[6] A61K *39/10;39/00;39/255;39/02*

U.S. Cl. 424—253.1 6 Claims

1. A method for the prevention of upper respiratory disease in cats caused by Bordetella bronchiseptica acting as a sole pathogen comprising administering a vaccine for developing immunity in the upper respiratory tract comprising an effective amount of Bordetella bronchiseptica antigens to cats.

5,595,745

PETROLEUM BUTTER

Alexander P. Zanikos, Trumbull; Walter Rose, Haven, and Michael C. Chaney, Fairfield, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jun. 7, 1995, Ser. No. 484,227

Int. Cl.[6] A61K *7/00;7/48*

U.S. Cl. 424—401 4 Claims

1. A cosmetic composition comprising:

(i) from 50% to 98% by weight of petroleum jelly; and

(ii) from 10 to 40% by weight of a behenoyl lactylate salt.

5,595,746

INSECT PEST CONTROL

Richard J. Milner, Hall; Judith A. Staples, Bungendore; Michael Lenz, Aitutaki; George G. Lutton, Fraser; Cheryl F. McRae, Campbell, and John A. L. Watson, deceased, late of O'Connor, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australian Capital Territory, Australia

PCT No. PCT/AU92/00629, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO93/09672, PCT Pub. Date May 27, 1993

PCT Filed Nov. 23, 1992, Ser. No. 244,271

Claims priority, application Australia, Nov. 22, 1991, PK9664

Int. Cl.[6] A01N *25/02*

U.S. Cl. 424—405 22 Claims

1. A method of controlling termites in field applications comprising applying to an uninfested, termite-infestable structure, a prophylactic effective dose of conidia of a strain of *Metarhizium anisopliae* or formulations thereof, such that said structure will not suffer damage from termites.

5,595,747

SLOW-RELEASING COMPOSITIONS CONTAINING HYDROTALCITES WHICH HAVE BEEN INTERCALATED WITH AN ORGANIC ANION AND METHOD OF CONTROLLING INSECTS AND PROTECTING FABRIC FROM INSECTS

Kazuyuki Kuroda, Tokyo; Yasuyori Tanaka, Toyonaka, and Tadahiro Matsunaga, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 26, 1994, Ser. No. 280,462

Claims priority, application Japan, Jul. 30, 1993, 5-189899

Int. Cl.[6] A01N *25/08*

U.S. Cl. 424—405 12 Claims

1. A composition comprising an active agent supported on a compound intercalated with organic anions, wherein the compound can be obtained by exchange of inorganic anions A^{n-} of an inorganic compound represented by the formula (I)

$$[M_{1-x}^{2+}M_x^{3+}(OH)_2]^{x+}[A_{x/n}^{n-}\cdot mH_2O]^{x-} \quad (I)$$

wherein M^{2+} is a divalent metal cation, M^{3+} is a trivalent metal cation, A^{n-} is a n-valent inorganic anion, and x is in the range of $0<x\leqq 0.33$, with the organic anions.

5,595,748

COMPOSITIONS AND METHODS FOR CONTROLLING NEMATODES

Eric M. Hewlett, and Thomas E. Hewlett, both of 5401 NW. 23rd Pl., Gainesville, Fla. 32606

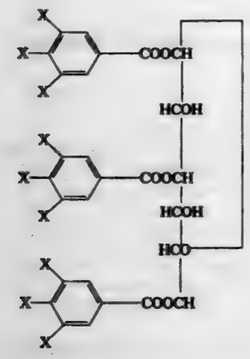
Filed Feb. 24, 1995, Ser. No. 394,090

Int. Cl.[6] A01N *25/12*

U.S. Cl. 424—405 9 Claims

1. A method for controlling migrating nematodes, said method comprising the steps of:

(a) applying a nematode-attracting amount of a tannin to a plant growth medium; and



(b) attracting the nematode away from a desired plant, thereby preventing damage to the plant.

5,595,749

INSECTICIDE COMPOSITION AND PROCESS FOR MAKING SAME

Lawrence Rascher, Wayne; Samir Bishai, Iselin, and William Periberg, Franklin Lakes, all of N.J., assignors to The Hartz Mountain Corporation, Secaucus, N.J.

Filed Apr. 6, 1995, Ser. No. 417,899

Int. Cl.[6] A01N *25/06*

U.S. Cl. 424—405 10 Claims

1. An insecticide composition suitable for dispensing by spraying, comprising an effective amount of tetrachlorvinphos, a water insoluble, hydrolysis prone organophosphate ester insecticide dissolved in an emulsifiable hydrophobic micelle formed by esters of carboxylic acids, said insecticide component being emulsified in an aqueous carrier.

5,595,750

ANTIMICROBIAL PARTICLES OF SILVER AND BARIUM SULFATE OR ZINC OXIDE

Howard W. Jacobson; Michael H. Schoilla, and Annie W. Wigfall, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 6,022, Jan. 15, 1993, abandoned, which is a continuation of Ser. No. 742,963, Aug. 9, 1991, Pat. No. 5,180,585. This application Dec. 21, 1994, Ser. No. 361,083

Int. Cl.[6] A01N *25/26;59/16*

U.S. Cl. 424—421 12 Claims

1. An antimicrobial composition consisting essentially of barium sulfate particles having successive coatings of

1) about 0.05 to 3 weight percent, based upon said particles, silver with about 0.05 to 3 weight percent optional copper (II) oxide,

2) about 0.10 to 6 weight percent silica, and

3) an amount of hydrous alumina sufficient to provide an isoelectric point for the particle with its coatings of about 5.5 to 9.5; wherein the average diameter of said particles is about 0.01 to 100 microns.

5,595,751

ABSORBABLE POLYOXAESTERS CONTAINING AMINES AND/OR AMIDO GROUPS

Rao S. Bezwada, Whitehouse Station, and Dennis D. Jamiolkowski, Long Valley, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 554,011, Nov. 19, 1995, abandoned, which is a continuation-in-part of Ser. No. 399,308, Mar. 6, 1995, Pat. No. 5,464,929. This application Feb. 8, 1996, Ser. No. 598,721

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—422 33 Claims

1. An aliphatic polyoxaesters comprising a first divalent repeating unit of formula I:

$$-[O-C(O)-C(R_1)(R_2)-O-(R_3)-O-C(R_1)(R_2)-C(O)-] \quad I$$

and a second repeating unit selected from the group of formulas consisting of:

$$-[-O-R_{12}-]_U- \quad XIV$$

wherein R_1 and R_2 are independently hydrogen or an alkyl group containing 1 to 8 carbon atoms; R_3 is an alkylene unit or is an oxyalkylene group of the following formula:

$$-[(CH_2)_C-O-]_D-(CH_2)_E- \quad IV$$

wherein C is an integer in the range of from 2 to about 5, D is an integer in the range of from about 0 to about 12, and E is an integer in the range of from about 2 to about 5, except when D is zero in which case E will be an integer from 2 to 12; R_{12} is an alkylene unit containing from 2 to 8 carbon atoms and containing an internal amine (—$N(R_{10})$—) or amide (—$N(R_{11})$—); R_{10} and R_{11} are independently hydrogen or an alkyl group containing 1 to 8 carbon atoms; and U is an integer in the range of from 1 to 1,000.

5,595,752

INCREASING DRESSING PERCENTAGE AND CARCASS WEIGHT IN FINISHING BEEF CATTLE

Thomas R. Kaeser, Chesterfield, and Jeffrey W. Day, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 1, 1994, Ser. No. 269,986

Int. Cl.[6] A61F *2/00*

U.S. Cl. 424—423 14 Claims

1. A method of preparing beef cattle for slaughter comprising:

inserting into the intraperitoneal cavity of a bovine in the finishing stage of growth a source of bovine somatotropin effective for prolonged release;

the bovine being adminstered an estrogenic agent at a rate effective for increasing one of the parameters selected from the group consisting of average daily gain and carcass weight and body weight of cattle;

the source of somatotropin being effective for approximately zero order delivery and releasing intraperitoneally in the bovine a dose of bovine somatotropin sustained in a range effective for increasing average daily gain of cattle;

continuing the somatotropin release in the bovine for a period of time greater than about 9 weeks and continuing substantially until slaughter of the bovine;

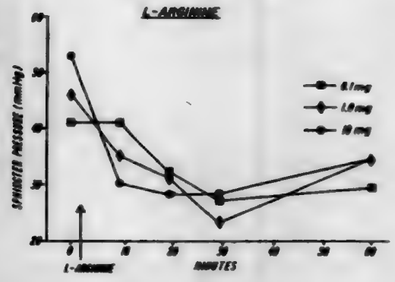
the bovine maintaining an average daily gain greater than 1 kilogram per day during said period.

5,595,753

TOPICAL FORMULATIONS AND METHODS FOR TREATING HEMORRHOIDAL PAIN AND SPHINCTER AND SMOOTH MUSCLE SPASM IN THE GASTROINTESTINAL TRACT

Herbert B. Heckman, Chestnut Hill, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 14, 1995, Ser. No. 422,390
Int. Cl.[6] A61F 9/02; A61K 9/68; A01N 37/12;37/18
U.S. Cl. 424—436 29 Claims



1. A method of treating hemorrhoidal pain or other medical condition arising from a spasm in the smooth muscle of the gastrointestinal tract of a patient, said method comprising:

applying a topical preparation of L-arginine in an pharmaceutically acceptable carrier to an area of the gastrointestinal tract of said patient exhibiting said hemorrhoidal pain or other medical condition in an amount effective to treat said condition.

5,595,754

SHEETS FOR ANIMALS, SHEET, BAGS, DAILY GOODS, INK AND PACKAGING MATERIALS

Hiroshi Ito, Tokyo; Kaoru Shinpo, Saitama, and Yasuharu Kirimal, Tokyo, all of Japan, assignors to Daiki Co., Ltd., Japan

Continuation of Ser. No. 271,124, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 752,466, Aug. 23, 1991, abandoned. This application Feb. 28, 1996, Ser. No. 608,283
Int. Cl.[6] A61F 13/42; A61L 15/56
U.S. Cl. 424—443 2 Claims



1. A sheet for a pet animal to be used for checking urine of said pet animal for physical examination of said pet animal after excreting on said sheet comprising:

a first fluid permeable sheet (1, 111);

a second fluid impermeable sheet (4, 141); and

a third sheet composed of paper sheets (2, 121), sandwiched between said first sheet and second sheet and printed with patterns or letters with ink containing bromothymol blue and a sterilizing agent dispersed in an organic solvent, said sterilizing agent is selected from the group consisting of ethanol, isopropyl alcohol, and DL-pyrrolidone carboxylate.

5,595,755

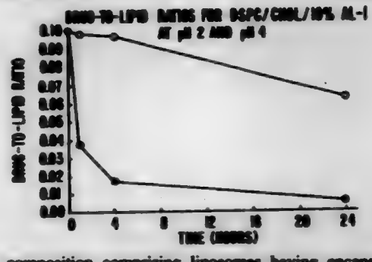
Patent Not Issued For This Number

5,595,756

LIPOSOMAL COMPOSITIONS FOR ENHANCED RETENTION OF BIOACTIVE AGENTS

Marcel B. Bally, Bowen Island; Nancy L. Boman, Richmond; Pieter R. Cullis, Vancouver, and Lawrence D. Mayer, North Vancouver, all of Canada, assignors to Inex Pharmaceuticals Corporation, and University of British of Columbia, both of Vancouver, Canada

Filed Dec. 22, 1993, Ser. No. 172,140
Int. Cl.[6] A61K 9/127
U.S. Cl. 424—450 10 Claims



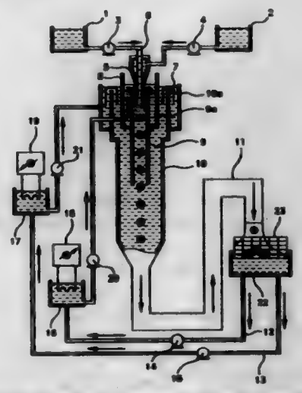
1. A composition comprising liposomes having encapsulated therein both a bioactive agent and a buffered solution having a pH of 2 to 3, said liposomes containing a sugar-modified lipid which is a ganglioside and cerebroside in an amount of about 10 mol percent.

5,595,757

SEAMLESS CAPSULES

Jesse J. Kiefer, Belvidere, and Blake H. Glenn, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 29, 1995, Ser. No. 412,672
Int. Cl.[6] A61K 9/48
U.S. Cl. 424—451 9 Claims



1. A method for making a seamless capsule comprising a shell material encapsulating a center-filled core material comprising the steps of:

providing a concentrically aligned multiple nozzle system having at least an outer nozzle and an inner nozzle;

supplying a shell material to the outer nozzle and a core material to the inner nozzle;

simultaneously extruding the shell material through the outer nozzle and the core material through the inner nozzle, thereby forming a coaxial jet of the shell material surrounding the core material;

introducing the coaxial jet into a flow of a heated carrier liquid or air, thereby allowing the shell material to encapsulate the core material to form capsules in the heated carrier liquid; and

introducing the capsules into a flow of a cooled carrier liquid, thereby allowing the capsules to solidify.

5,595,758

SOFT-SHELLED GELATIN ENCAPSULATED PARTICLES

Prasad S. Adusumilli, Edison, and Kenneth W. James, Randolph, both of N.J., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jun. 7, 1995, Ser. No. 483,487
Int. Cl.[6] A61K 9/48
U.S. Cl. 424—456 19 Claims

1. A soft translucent gelatin capsule having contained therein a mixture comprising a translucent liquid and a plurality of particles comprising a beneficial agent wherein said particles are insoluble in the liquid, the particles filling less than the total internal volume of the capsule and being capable of movement within said liquid, the liquid and particle mixture filling the total internal volume of the capsule; said particles being visible to the naked eye inside said capsule whereby said capsule is tamper-evident upon visual inspection.

5,595,759

PROCESS FOR PROVIDING THERAPEUTIC COMPOSITION

Jeri D. Wright, Dublin; Brian L. Barclay, Sunnyvale, and Linda E. Atkinson, Portola Valley, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Nov. 10, 1994, Ser. No. 337,701
Int. Cl.[6] A61K 9/20
U.S. Cl. 424—464 7 Claims

1. A process for preparing a therapeutic composition for administering to a human, wherein the process comprises the steps of:

a) blending an estrogen with ethanol to produce a wet granulation;

b) blending separately a hydroxyalkylcellulose of 7,500 to 175,000 molecular weight with a poly(alkylene oxide) of 100,000 to 650,000 molecular weight to produce a dry granulation;

c) mixing the wet granulation and the dry granulation to produce a homogenous wet mixture;

d) evaporating the solvent from the mixture to produce dry granules; and,

e) compressing the dry mixture into a shape and size adopted for oral administration to the human for delivering the therapeutic composition to the human.

5,595,760

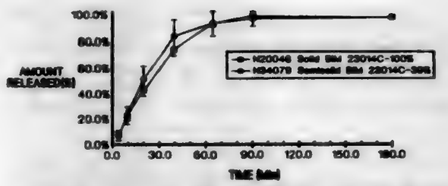
SUSTAINED RELEASE OF PEPTIDES FROM PHARMACEUTICAL COMPOSITIONS

Roland Cherif-Cheikh, Issy-les-Moulineaux, France, assignor to Delab, Paris, France

Filed Mar. 8, 1995, Ser. No. 400,610
Int. Cl.[6] A61K 9/20
U.S. Cl. 424—464 22 Claims

1. A method of administering a peptide to a patient and delivering the peptide continuously over an extended period of time of at least three days, said method comprising

obtaining a solid pharmaceutical composition consisting essentially of a soluble, gelable peptide salt of said peptide and up to 30 percent, by weight, of a pharmaceutically acceptable, soluble, monomeric carrier, wherein said peptide salt and carrier are soluble in aqueous liquids, and



parenterally administering said solid composition to the patient in one injection; wherein said solid composition automatically forms a gel after interaction with the patient's bodily fluids, said gel releasing said peptide continuously within the patient over an extended period of at least three days.

5,595,761

PARTICULATE SUPPORT MATRIX FOR MAKING A RAPIDLY DISSOLVING TABLET

Loyd V. Allen, Jr., Edmond, and Bingnan Wang, Oklahoma City, both of Okla., assignors to The Board of Regents of the University of Oklahoma, Norman, Okla.

Filed Jan. 27, 1994, Ser. No. 187,670
Int. Cl.[6] A61K 9/10;9/14;47/42
U.S. Cl. 424—484 28 Claims

1. A particulate support matrix for use in making a rapidly dissolving tablet, comprising:

a first polypeptide component having a net charge when in solution;

a second polypeptide component having a net charge of the same sign as the net charge of the first polypeptide component when in solution; and

a bulking agent, and wherein the first polypeptide component and the second polypeptide component together comprise about 2% to 20% by weight of the particulate support matrix and wherein the bulking agent comprises about 60% to 96% by weight of the particulate support matrix; and

wherein the second polypeptide component has a solubility in aqueous solution greater than that of the first polypeptide component and wherein the mass:mass ratio of the first polypeptide component to the second polypeptide component is from about 1:½ to about 1:14; and

wherein when the support matrix is introduced into an aqueous environment the support matrix is disintegrable within less than about 20 seconds.

5,595,762

STABILIZED PULVERULENT ACTIVE AGENTS, COMPOSITIONS CONTAINING THEM, PROCESS FOR OBTAINING THEM AND THEIR APPLICATIONS

Guy Derrien, Cagnes sur Mer, and Bernard Raynier, Nice, both of France, assignors to Laboratoires Virbac, Carros, France

Filed Nov. 30, 1993, Ser. No. 159,120
Claims priority, application France, Nov. 30, 1992, 92/14365
Int. Cl.[6] A61K 9/16
U.S. Cl. 424—490 7 Claims

1. Microparticles of pulverulent active agent adapted for formulation manufacturing process physical treatments, wherein said pulverulent active agent comprises for its stabilization, an immediate release coating consisting essentially of (a) at least one film-forming agent, in proportions of between 2 and 25% by weight of the final mass, selected from the group consisting of polyvinylpyrrolidones (povidone), polyvinyl alcohols, vinylpyrrolidone/vinyl acetate copolymer, vinylpyrrolidone/polyvinyl alcohol copolymer, cellulose acetate, cellulose acetate phthalate, cellulose butyrate, ethylcellulose, methylcellulose, acrylic and methacrylic polymers and copolymers and vegetable,

animal or synthetic waxes, and (b) at least one pore-forming agent, in proportions of between 0.5 and 5% by weight of the final mass, selected from the group consisting of microcrystalline lactose, low molecular weight polyethylene glycols, calcium carbonate, calcium phosphate, sucrose, sodium chloride and potassium chloride, and leading to microparticles having a particle size of between 50 and 100 μm.

5,595,763

TUNGSTEN (VI) COMPOSITIONS FOR THE ORAL TREATMENT OF DIABETES MELLITUS

Joan J. Guinovart, Esplugues de Llobregat; Albert Barberà, Barcelona, and Joan E. Rodríguez-Gil, Aviny6, all of Spain, assignors to Quimica Farmaceutica Bayer S.A., Barcelona, Spain

Filed Jul. 19, 1995, Ser. No. 504,820
Int. Cl.[6] A61K *33/24;31/28*
U.S. Cl. 424—617 **17 Claims**

1. A method of lowering blood sugar in a mammal comprising administering orally to said mammal an effective amount of a pharmaceutical composition, said pharmaceutical composition comprising an effective amount of a compound formed by tungsten (VI) and a pharmaceutically acceptable chemical moiety, or of a hydrate of said compound, in combination with a pharmaceutically acceptable excipient.

5,595,764

OPHTHALMIC COMPOSITION FOR TREATING DRY EYE

Donald L. Mackeen, Bethesda, Md., assignor to DEO Corporation, Bethesda, Md.

Continuation of Ser. No. 926,244, Aug. 6, 1992, Pat. No. 5,290,572. This application Oct. 28, 1993, Ser. No. 144,643
Int. Cl.[6] A61K *47/00;9/14*
U.S. Cl. 424—687 **2 Claims**

1. A calcium-based ophthalmic composition for treatment of dry eye syndrome consisting essentially of:

a) an ophthalmologically acceptable carrier suitable for application to the inferior eyelid or inferior eyelid margin having a sufficient viscosity to prevent running or dripping of the carrier when the carrier is applied to the lateral eyelid margin or inferior eyelid margin; and

b) dispersed within said ophthalmologically acceptable carrier, a minimally water-soluble, ophthalmologically acceptable salt of calcium selected from the group consisting of calcium carbonate and calcium sulfate, said calcium salt finely divided into particles having a mean diameter of less than about 60 microns;

wherein the ophthalmologically acceptable carrier is selected from the group consisting of petrolatum and a combination of petrolatum and white wax; and

wherein the calcium salt is present in an amount of between about 2% and 25% by weight.

5,595,765

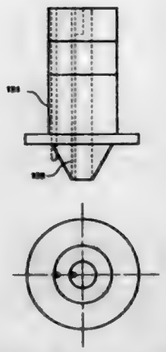
APPARATUS AND METHOD FOR CONVERTING AXISYMMETRIC GAS FLOW PLENUMS INTO NON-AXISYMMETRIC GAS FLOW PLENUMS

Roy W. Christensen, Stockton, Calif.; Steven A. Miller, Amsterdam, N.Y., and David P. Meaver, Beverly, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,642
Int. Cl.[6] B22F *9/08*; C21C *7/00*
U.S. Cl. 425—7 **8 Claims**

1. A close-coupled axisymmetric atomization system for atomizing molten metal comprising:

a close coupled nozzle including a plenum having a channel therein for delivering gas;



a melt guide tube extending axially through the plenum to an exit orifice, the plenum means including means for supporting the melt delivery tube; and

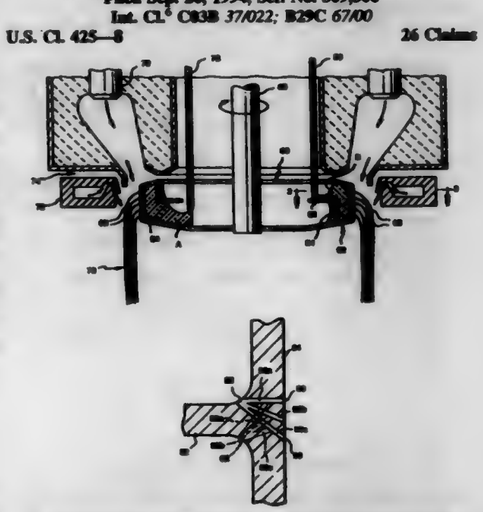
constrictor means, operatively positioned in the plenum, for facilitating the interaction of the delivered gas with the molten melt at a point proximate the melt guide tube exit orifice such that the yield of fine powder was increased by about five (5) to about fifteen (15) percent over the yield achieved without the constrictor means.

5,595,766

SPINNER FOR DUAL COMPONENT FIBERS HAVING MULTIPLE EXITS FOR EACH INLET

Ronald A. Houpt, Newark, and Dennis C. Somers, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Sep. 20, 1994, Ser. No. 309,306
Int. Cl.[6] C03B *37/022*; B29C *67/00*
U.S. Cl. 425—8 **26 Claims**



1. Apparatus for making dual component fibers comprising:

a) a spinner having a peripheral wall, and further including orifices located on the exterior of said peripheral wall for centrifuging dual component fibers, said spinner being divided into at least two compartments;

b) equipment for supplying first and second molten thermoplastic materials to said spinner;

c) a divider for directing said first molten thermoplastic material into alternate ones of said compartments and for directing said second molten thermoplastic material into the remaining ones of said compartments so that adjacent compartments contain different thermoplastic materials; and

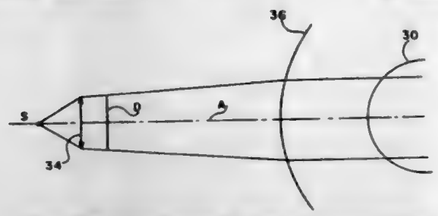
d) passages in each of said compartments through which said molten thermoplastic materials flow to said orifices on said peripheral wall of said spinner, at least some of said passages having branches which form a common inlet adjacent to the interior of said peripheral wall and which communicate with at least two different orifices on said peripheral wall of said spinner.

5,595,767

THREE-DIMENSIONAL ENERGY DISTRIBUTION DEVICE

Philippe Cinquin, and Laurent Desbat, both of Grenoble, France, assignors to Universite Joseph Fourier, Grenoble Cedex, France

PCT No. PCT/FR93/00286, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO93/20528, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 23, 1993, Ser. No. 313,862
Claims priority, application France, Mar. 27, 1992, 92 04132
Int. Cl.[6] B29C *35/08*
U.S. Cl. 425—174.4 **11 Claims**



1. A three-dimensional energy distribution device including:

a volume (30) reacting to the energy of a predetermined radiation;

a plurality of sources of said radiation illuminating said volume according to respective angles (A_1, A_2, A_3 . . .); and,

placed between each source and the volume, a support (D_1, D_2, D_3 . . .) that is transparent to said radiation and that includes an image corresponding to a density projection of a real or virtual object examined at the angle the respective source illuminates the volume, said projection having been subjected to an image correction process.

5,595,768

LASER DISK TEXTURING APPARATUS

David Treves, Palo Alto; Hong Fu, and Thomas O'Dell, both of Milpitas, all of Calif., assignors to Komag, Incorporated, Milpitas, Calif.

Filed Nov. 2, 1995, Ser. No. 552,185
Int. Cl.[6] G11B *5/84*
U.S. Cl. 425—174.4 **4 Claims**



1. An apparatus for forming a texture feature on a generally planar disk substrate of a magnetic disk recording, such feature formed by the incidence of a beam of radiation upon the substrate, comprising:

a focusing lens having a radially central axis;

a disk substrate receiving apparatus disposed on a first side of the focusing lens, for receiving and retaining a generally planar disk substrate such that the plane of the disk substrate is approximately perpendicular to the central axis of the focusing lens;

a radiation beam source for generating a radiation beam directed at said focusing lens, disposed on a second side of the focusing lens opposite the first side, and positioned such that, prior to incidence upon the focusing lens, a radiation beam generated thereby is in a beam axis approximately parallel to, but radially offset from the central axis of the focusing lens, the radiation beam being focusable by the focusing lens to a spot upon a disk substrate retained by the disk substrate receiving apparatus; and

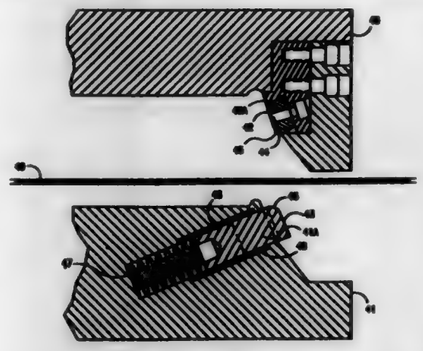
a blocking apparatus disposed such that a reflected beam, comprising any part of the radiation beam reflected by a disk substrate retained by the disk substrate receiving apparatus, is blocked from entering the radiation beam source thereby.

5,595,769

HINGED LID LATCHING MECHANISM

Glenn C. Castner, Victor; Keith A. Messinger, Canandaigua, and Donald E. Rowe, Newark, all of N.Y., assignors to Tenneco Packaging, Evanston, Ill.

Division of Ser. No. 273,246, Jul. 11, 1994, Pat. No. 5,474,728. This application Jun. 7, 1995, Ser. No. 471,879
Int. Cl.[6] B29C *51/32*
U.S. Cl. 425—183 **7 Claims**



1. A mold apparatus for making thermoformed articles comprising:

a first mold member;

a second mold member;

closing means for bringing the first and the second mold members into contact with a preheated thermoplastic sheet between the mold members to form a thermoplastic article;

a fixed shear key mounted in the first mold member, the key having at least one cutting edge defined by the intersection of a first horizontal key surface coplanar with the first mold member and a first inclined key surface, said first inclined surface angled to the direction of closure of the first and second mold members at an acute angle;

a movable shear key mounted in the second mold member, the key having a trapezoidally-shaped, flat cutting surface and a beveled guide surface adjacent to said cutting surface, wherein the second key is movable along an inclined path in the second mold member, the path being inclined at an acute angle relative to the second mold member;

bias means for urging the movable shear key cutting surface against the fixed shear key cutting edge;

wherein during the forming of a thermoplastic article, the fixed shear key cutting edge contacts the movable shear key on the beveled guide surface and slides downwardly across the trapezoidally-shaped, flat cutting surface so as to push the

movable shear key along the inclined path in the second mold member and cut a large, trapezoidally-shaped opening in the thermoplastic article, the opening having two angled sides,

the opening being substantially free of tearing along each angled side;

wherein the fixed first key inclined surface is nonparallel to the trapezoidally-shaped cutting surface of the movable second shear key.

5,595,770

GRANULATING DEVICE FOR STRAND MATERIALS

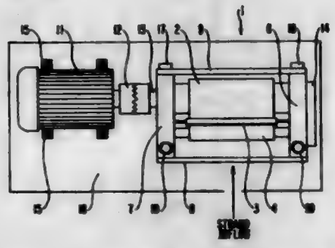
Walter Firrung, Grossostheim; Berthold Glabb, Hösbach; Laurenz Hohm, Grossostheim; Helmuth Meidhof, Grossostheim, and Günther Wolf, Grossostheim, all of Germany, assignors to Rieter Automatik GmbH, Germany

Filed Apr. 17, 1995, Ser. No. 422,852

Claims priority, application Germany, Apr. 20, 1994, 44 13 716.8

Int. Cl.[6] B29B 9/00; B29C 47/00

U.S. Cl. 425—188 3 Claims



1. Granulation apparatus (1) for strand material (21) having pull-in means (4,5) for gripping said strand material (21) and transporting it to a counter knife (3), a knife roll (2) cooperating with said counter knife (3) for cutting said strand material (21) into granulate, and a housing (6,7,8,9,10) accomodating said pull-in means (4,5), said counter knife (3) and said knife roll (2), wherein a motor (11) driving said knife roll (2) and said pull-in means (4,5) is arranged beside said housing (6,7,8,9,10) and is connected by means of a drive axle (13) to said knife roll and pull-in means contained in said housing (6,7,8,9,10) and wherein said motor and said housing are mounted on a common support (16), the improvement comprising a mounting assembly including a tension mounting means (17,18) and a pressure mounting means (19,20) which project from said support and are arranged in the region of the two side portions (8,9) of said housing which are so located beside said drive axle that, due to the torque acting on said housing, the tension mounting means receives a teasile force directed away from said support and the pressure mounting means receives a pressure force directed toward said support, said tension mounting means having a hook-shaped portion releasably holding said housing (6,7,8,9,10) onto said support (16), and said pressure holding means (19,20) having a catch which prevents movement of said housing away from said tension mounting means.

5,595,771

MODULAR MOLD FOR INJECTION MOLDING AND METHOD OF USE THEREOF

Eugene L. Feltzz, and Norman H. Cohen, both of 14427 NW. 60th Ave., Miami Lakes, Fla. 33014

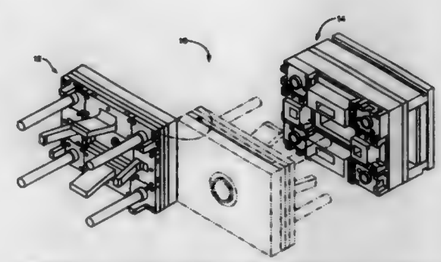
Filed Nov. 4, 1994, Ser. No. 334,060

Int. Cl.[6] B29C 45/04

U.S. Cl. 425—443 12 Claims

1. A modular mold for use in injection molding comprising:

a mold assembly for an injection molding press comprising a plurality of sections which when pressed together form a mold cavity; and



a plurality of interchangeable modules attached to said mold assembly for shaping a plurality of sides of a component.

5,595,772

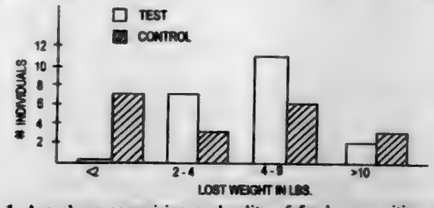
COMPOSITION AND METHODS FOR LOSING WEIGHT

Judith J. Wurtman, and Richard J. Wurtman, both of Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 481,624

Int. Cl.[5] A23L 1/29

U.S. Cl. 426—2 33 Claims



1. A package comprising a plurality of food compositions for consumption in connection with a weight loss diet plan, including at least one breakfast composition, at least one lunch or dinner composition, and at least one snack composition, said breakfast composition comprising (a) at least one form of carbohydrate, and (b) at least one form of protein, the weight ratio in said breakfast composition of the total amount of carbohydrate to the total amount of protein ranging from about 1:10 to about 1:1; said lunch or dinner composition comprising (a) at least one form of carbohydrate, and (b) at least one form of protein, the weight ratio in the composition of the total amount of carbohydrate to the total amount of protein ranging from about 4:1 to about 10:1; and said snack composition comprising at least one form of carbohydrate and being substantially free of protein.

5,595,773

METHOD FOR PREPARING FROZEN BAKER'S DOUGH

Kimihito Wada, Amagasaki, and Koji Tsukuda, Kishiwada, both of Japan, assignors to Matsutani Chemical Industry Co., Ltd., Kyogo-Ken, Japan

Filed Sep. 12, 1995, Ser. No. 527,213

Claims priority, application Japan, Sep. 12, 1994, 6-244773

Int. Cl.[6] A21D 2/36; 8/02; 8/04

U.S. Cl. 426—20 9 Claims

1. A method for preparing frozen baker's dough which comprises the steps of

blending ingredients for preparing bread including raw grain flour comprising 10 to 40% by weight of wheat flour having a protein content of not less than 14% by weight,

1 to 7 parts by weight of a processed starch per 100 parts by weight of the raw grain flour and 300 to 1000 units of a starch decomposition enzyme per 1 kg of the raw grain flour, the processed starch having a hot water solubility of not more than 8% by weight, a ratio of cold water swelling power to hot water swelling power ranging from 1.2 to 0.8 and a cold water swelling power ranging from 4 to 15, to thereby form a mixture;

kneading the mixture while adding water to form a dough; and then

freezing the dough.

5,595,774

REDUCED FAT SHREDDED WAFERS AND PROCESS

Kevin J. Leibfred, Towaco, N.J.; Diane L. Hunt, Danbury, Conn.; Angel D. Ferrer, Patterson, and Henry M. Andreoli, Whippany, both of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Filed Dec. 14, 1994, Ser. No. 355,582

Int. Cl.[6] A23L 1/168

U.S. Cl. 426—93 20 Claims

1. A reduced-, low- or no-fat wafer comprising a plurality of laminated net-like sheets comprising filamentous, shredded whole grain and from about 0.15% by weight to about 1.5% by weight of at least one hydrocolloid gum incorporated into and onto each of said sheets by coating said whole grain with said at least one hydrocolloid prior to shredding, wherein at least substantially all of the strands or shreds of the wafers contain said at least one hydrocolloid gum to provide a smooth or slippery mouthfeel and enhanced lubricity to the wafer throughout the mastication and swallowing of the wafer.

5,595,775

METHOD FOR PRESERVING FRESH FRUIT AND VEGETABLE

Moshe Tishel, Kfar Bilu, Israel, assignor to Analyst Ltd., Israel

Filed Oct. 11, 1995, Ser. No. 540,944

Claims priority, application Israel, Nov. 10, 1994, 111234

Int. Cl.[6] A23B 7/00; A23L 3/00

U.S. Cl. 426—241 10 Claims

1. A method for the preservation of fresh fruit and vegetable comprising treating whole or cut pieces of said fruit or vegetable with microwaves at a temperature not exceeding 45° C. and subsequently freezing the treated fruit or vegetable for a desired period of time.

5,595,776

PROCESS FOR PREPARING EDGE-TO-EDGE ASSEMBLED BACON SLICES

Mark E. Selz, Sun Prairie, Wis., assignor to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 296,781, Aug. 26, 1994, abandoned.

This application Mar. 19, 1996, Ser. No. 618,661

Int. Cl.[6] A23L 1/31

U.S. Cl. 426—272 14 Claims



1. A method for forming assembled bacon slices, comprising the steps of:

providing a bacon belly having generally parallel oppositely directed faces, one on a top side of the belly and the other on a bottom side of the belly;

forming at least one cut partially through the bacon belly to define an integral web portion along the belly and to form at least two bacon belly portions from each belly, each of said belly portions including a part of the top face and a part of the bottom face of said belly;

assembling one of said bacon belly portions onto another of said bacon belly portions by folding one of said bacon belly portions upon another of said bacon belly portions at said integral web portion such that the bacon belly portions engage one another along their respective face portions to provide a belly portion stack;

heating said belly portion stack until said bacon belly portions thereof adhere to one another to form an initially adhered stack;

chilling said initially adhered belly portion stack to less than or equal to about 32° F. to provide an adhered belly log; and

thereafter slicing said adhered belly log into a plurality of assembled bacon slices in which a slice from one of said bacon belly portions is adhered in edge-to-edge relationship to a slice of another of said bacon belly portions.

5,595,777

PROCESS FOR MAKING GEL-COATED FOODS

William F. Chaloupa, Aurora, Ill., and George R. Sanderson, Carlsbad, Calif., assignors to Monsanto Company, St. Louis, Mo.

PCT No. PCT/US93/05611, § 371 Date May 12, 1995, § 102(e) Date May 12, 1995, PCT Pub. No. WO94/00024, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 11, 1993, Ser. No. 351,340

Int. Cl.[6] A23L 1/05; A23B 7/16; A21D 15/08; 10/04

U.S. Cl. 426—305 12 Claims

1. A process for preparing a gel coated food substrate comprising:

a) applying an aqueous batter dispersion having sodium ion sources, calcium ion sources or a combination of sodium ion sources and calcium ion sources, to the surface of a food substrate to form a batter-food substrate complex;

b) contacting the batter-food substrate complex with a dry bread material to form a breaded complex;

c) applying an aqueous gel-forming solution to the breaded batter-food substrate complex to form a thermally irreversible gel film around the complex.

5,595,778

PIE DOUGH WITH REDUCED DEGREE OF CRACKING

Victor T. Huang, Mounds view, and Karen V. Sandiller, St. Paul, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Jun. 7, 1995, Ser. No. 473,672

Int. Cl.[6] A21D 8/00; 8/02

U.S. Cl. 426—556 11 Claims

1. A method for making a pie dough having a deformability at ambient temperatures effective to prevent cracking and having a deformability at baking temperatures effective to prevent slumping, comprising:

providing a quantity of fat of a concentration effective to make a pie dough;

preparing a slurry comprising water;

emulsifying the slurry and fat to make an emulsified mixture;

adding the emulsified mixture to a blend comprising flour; and

mixing the emulsified mixture and the blend.

5,595,779

EUCALYPTUS TEA

Kenji Shimabukuro, Nago, Japan, assignor to Yugen Kaisha Okinawa Yukali Farm, Okinawa, Japan

Continuation of Ser. No. 104,826, Aug. 10, 1993, abandoned.

This application Mar. 1, 1995, Ser. No. 396,690

Int. Cl.[6] A23F 3/00

U.S. Cl. 426—597 2 Claims

1. Finely ground Eucalyptus tea in dried form, constituting a tea product made solely of Eucalyptus leaves and produced by a process which comprises the sequential steps of:

(1) steaming raw Eucalyptus tea leaves alone by contact thereof with water vapor sufficiently to cause loss of activity of

attendant oxidizing enzymes in the raw tea leaves and also cause an increase in the attendant softness of the tea leaves, whereby to bring out the aromatic components of the Eucalyptus tea leaves and make it easy to rumple-twist and dry the tea leaves, the steaming being effected at about 100° C. for about 30 seconds,

(2) cooling the steamed tea leaves sufficiently rapidly to prevent color and gloss degradation of the tea leaves,

(3) drying the cooled tea leaves sufficiently for effecting more procise rumple-twisting,

(4) rumple-twisting the dried tea leaves,

(5) further drying the rumple-twisted tea leaves to a moisture content of at most about 5% for increasing long term storage stability, and

(6) finely grinding the further dried tea leaves sufficiently to provide a finely ground tea in dried form for enhancing elution of the attendant components therein and for giving out an aroma therefrom,

said finely ground tea in dried form having a specific flavor derived from the attendant essential oil components therein and being rich in fats, soluble polysaccharides and tannins, and in potassium, sodium and calcium, and comprising about the following detected component content:

1. crude proteins	7.6%
2. crude fats	7.4%
3. ash content	5.0%
4. crude fibers	16.8%
5. glucides	49.8%
6. tannins	13.6%
7. potassium	1731.3 mg %
8. sodium	837.4 mg %
9. calcium	592.5 mg %
10. magnesium	59.0 mg %
11. phosphorus	186.7 mg %
12. iron	9.5 mg %
13. copper	0.5 mg %
14. zinc	2.7 mg %
15. selenium	0.9 mg %.

5,595,780

PROCESS FOR THE PREPARATION OF PARTIALLY-DEFATTED NUTS AND PRODUCT THEREOF

Denise E. Zook, Little Falls, N.J., assignor to Nabisco, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 209,854, Mar. 11, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 470,384

Int. Cl.[6] A23L *1/38*

U.S. Cl. 426—632 **15 Claims**

1. A process for producing low calorie nuts with the organoleptic character of full fat nuts comprising:

a) providing raw nuts which have had at least some of the oil removed therefrom so that they are partially defatted;

b) applying a vacuum of at least about 20 inches of mercury to the partially defatted nuts;

c) contacting the partially defatted nuts with an infusant at a level of at least about 2% to about 15% by weight of the nuts, wherein the infusant comprises about 25% to about 60% of a first component comprising an edible oil and about 40% to about 75% of a second component which facilitates the formation of a desired nut color after roasting and whereby the infusant is absorbed into the nuts;

d) releasing the vacuum applied to the nuts;

e) applying a pressure of at least 10 psi to the nuts;

f) releasing the pressure applied to the nuts;

g) holding the nuts for at least about one hour; and

h) thereafter roasting the partially defatted nuts.

5,595,781

VAPOR DEPOSITED FILM, AND A GEOMETRY MEASURING METHOD, PRODUCTION PROCESS CONTROL METHOD, PRODUCTION METHOD, GEOMETRY MEASURING APPARATUS AND PRODUCTION PROCESS CONTROL APPARATUS THEREFOR

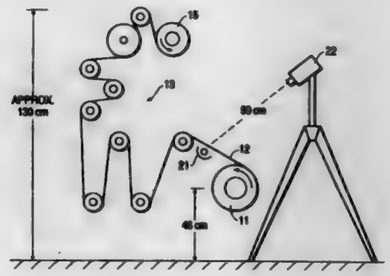
Tsugio Yatsushiro, and Jun Torikai, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 28, 1995, Ser. No. 395,852

Claims priority, application Japan, Jun. 29, 1993, 5-158582

Int. Cl.[6] G23C *14/00*

U.S. Cl. 427—10 **13 Claims**



1. A method for measuring the geometry of a vapor deposited film, comprising the steps of allowing a vapor deposited strip film comprising vapor deposited zones and vapor nondeposited zones formed in stripes in the longitudinal direction and alternately in the transversal direction to travel, while illuminating the vapor deposited film with light; receiving the light transmitted through said vapor deposited film; detecting the light transmittance distribution in the transversal direction of the vapor deposited film from the transmitted light; and determining the edge positions of said vapor deposited film, and the positions and widths of said vapor deposited zones and said vapor nondeposited zones based on the detected light transmittance distribution.

9. An apparatus for measuring the geometry of a vapor deposited film, comprising a light source for emitting light to a traveling vapor deposited strip film with vapor deposited zones and vapor nondeposited zones formed in stripes in the longitudinal direction and alternately in the transversal direction; a means for receiving the light transmitted through the vapor deposited film; a means for detecting the light transmittance distribution of the vapor deposited film in the transversal direction from the transmitted light; and a means for calculating the edge positions and the positions and widths of the vapor deposited zones and the vapor nondeposited zones based on the detected light transmittance distribution.

5,595,782

OIL-BASED DUST SUPPRESSION SUSPENSION, EMULSION FOR DUST SUPPRESSION, AND METHOD FOR SUPPRESSING DUST

Robert Cole, 117 Briarcliff Dr., Moneta, Va. 24121

Continuation-in-part of Ser. No. 135,856, Oct. 12, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,384

Int. Cl.[6] B05D *1/00*; C09K *3/32*

U.S. Cl. 427—212 **27 Claims**

1. A dust suppression suspension comprising:

(a) an oil base;

(b) sugar particles suspended in the oil base;

(c) a thickening agent for suspending the sugar particles in the oil base;

(d) a thickening agent activator; and

(d) an emulsifier.

5,595,783

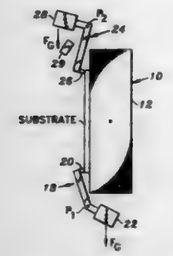
SPIN COATING FIXTURE

Richard S. Cook, Chino, Calif., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Feb. 22, 1995, Ser. No. 393,215

Int. Cl.[6] B05D *3/12*; B05C *13/00*

U.S. Cl. 427—240 **30 Claims**



1. A fixture for spin coating a planar substrate about an axis approximately parallel to the plane of the substrate, the fixture comprising:

a base against which the substrate bears;

a gravity-operated tooling pin movably connected to the base, to hold the substrate against the base in response to operation of gravity force as a result of rotation of the base about the axis; and

a centrifugal-operated tooling pin movably connected to the base, to hold the substrate against the base in response to operation of centrifugal force as a result of rotation of the base about the axis.

24. A method of holding a planar substrate for spin coating about an axis approximately parallel to the plane of the substrate, the method comprising the steps of:

placing the substrate against a base in a substantially upright orientation;

rotating the base about the axis;

holding the substrate against the base, in response to operation of gravity force as a result of the rotating of the base; and

holding the substrate against the base, in response to operation of centrifugal force as a result of the rotating of the base.

5,595,784

TITANIUM NITRIDE AND MULTILAYERS FORMED BY CHEMICAL VAPOR DEPOSITION OF TITANIUM HALIDES

Robert Kaim, 762 Washington St., Brookline, Mass. 02146, and John W. Vanderpot, 29 Pearl Rd., Boxford, Mass. 01921

Filed Aug. 18, 1995, Ser. No. 516,790

Int. Cl.[6] C23C *16/00*; B05D *3/06*

U.S. Cl. 427—255.2 **14 Claims**

1. A chemical vapor deposition process of depositing a titanium nitride film onto a semiconductor device, comprising the steps of forming a gaseous mixture including titanium halide, silane, a halogen, and ammonia, and transforming the mixture within a chemical vapor deposition reactor to deposit the titanium nitride film onto the semiconductor device, the titanium halide being selected from the group consisting of titanium iodide, titanium bromide and titanium chloride, the halogen being selected from the group consisting of chlorine, iodine and bromine.

5,595,785

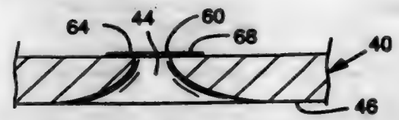
ORIFICE PLATE FOR AN INK-JET PEN

Suraj L. Hindagolla, Corvallis; Glen A. Hopkins, Philomath, both of Oreg.; Howard H. Taub, San Jose; Si-Ty Lam, Pleasanton, both of Calif.; Paul H. McClelland, Monmouth, and James S. Aden, Corvallis, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 724,648, Jul. 2, 1991, Pat. No. 5,434,606. This application Apr. 18, 1995, Ser. No. 424,971

Int. Cl.[6] B05D *1/02;1/32*

U.S. Cl. 427—271 **8 Claims**



1. A method of making an orifice plate having an orifice extending therethrough, the method comprising the steps of:

selecting an essentially planar substrate for an orifice plate, said essentially planar substrate having a first surface and a second surface, said first surface including a first portion having a wetting characteristic with respect to ink;

forming an orifice extending from said first surface of the orifice plate to said second surface in said orifice plate, said orifice and said first portion of said first surface joining to define an edge, said first portion of said first surface being adjacent to said edge, surrounding said orifice, and separated from said orifice by said edge;

surrounding said first portion of said first surface with a second portion of said first surface, said second portion given a non-wetting characteristic with respect to ink; and

surrounding said second portion of said first surface with a third portion of said first surface said third portion of said first surface having a wetting characteristic with respect to ink.

5,595,786

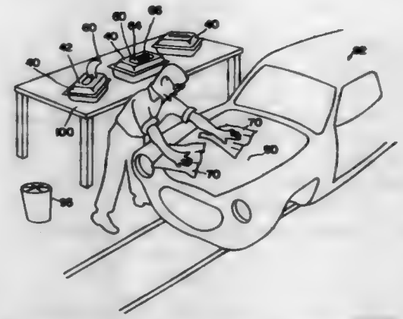
METHOD OF PREPARING SURFACE FOR RECEIVING A COATING AND APPARATUS THEREFOR

John S. McBride, Jr., and Kenneth J. O'Connor, both of Spartanburg, S.C., assignors to Contec, Inc. of Spartanburg, Spartanburg, S.C.

Filed Jun. 7, 1995, Ser. No. 484,872

Int. Cl.[6] B05D *3/00;3/12*

U.S. Cl. 427—299 **6 Claims**



1. A method of preparing a surface of a motor vehicle for painting, the method comprising the steps of:

providing a resealable package containing a solvent together with a plurality of solvent carriers in the form of sheet members composed of material carrying said solvent;

removing at least one said carriers of said solvent from said package;

using said removed carrier to apply said solvent to the motor vehicle surface to prepare the motor vehicle surface for application of paint; and

applying paint to the motor vehicle surface as part of a systematic painting of a plurality of motor vehicles.

5,595,787

CHEMICAL METALLIZATION OF ELECTRICALLY NON-CONDUCTING POROUS SUBSTRATES

Holger Klotzup, Esslingen, and Otwin Imhof, Nürtingen, both of Germany, assignors to Deutsche Automobilgesellschaft mbH, Germany

Continuation of Ser. No. 553,622, Jul. 18, 1990, abandoned. This application Aug. 26, 1991, Ser. No. 751,641

Claims priority, application Germany, Jul. 29, 1989, 39 25 232.9

Int. Cl.[6] B05P 3/04

U.S. Cl. 427—304 **9 Claims**

1. A process for chemical metallization of electrically non-conducting porous needle felt substrates having a porosity of from 40 to 97%, comprising the steps of activating fiber surfaces of the substrates with a noble metal-containing solution, placing the activated substrates in at least four layers, one above the other, in a metallizing tank whereby the lower layers are immediately brought into contact with a chemical metallizing solution and the remaining layers are initially not filled with the chemical metallizing solution and chemically metallizing the activated substrates by adding an initial volume of the chemical metallizing solution which is from 10 to 30% less than the free pore volume of the substrates and thereafter increasing the initial volume by evolution of gas to fill the remaining layers.

5,595,788

METHOD OF APPLYING AN ANTIFREEZE PRODUCT

James A. Lott, 910 W. 3rd., Maryville, Mo. 64468, and David V. Kiser, 4112 N. 31st., St. Joseph, Mo. 64506

Division of Ser. No. 312,569, Sep. 26, 1994, which is a division of Ser. No. 958,934, Sep. 24, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,159

Int. Cl.[6] B05D 7/00

U.S. Cl. 427—421 **8 Claims**

1. A method of applying an antifreeze composition to form a protective film, the antifreeze composition being comprised of:

a part A component comprised of a water containing solution of an alginic acid composition containing acid functional groups, the alginic acid composition being selected from the group consisting of sodium, potassium and ammonium salts of alginic acid, and a separate

part B component comprised of a water containing solution of a polyvalent cation salt selected from the group consisting of soluble calcium, aluminum and iron salts,

the alginic acid composition being present in part A in an amount between about 0.01 to 20 percent by weight, and the polyvalent cation salt being present in part B in an amount between about 0.001 and 30 percent by weight,

and wherein part A and part B are sprayed through pressurized sprayers, at flow rates over about 0.1 gallon per minute, mixing said components together and allowing the composition to react and form a cross linked antifreeze gel layer.

5,595,789

COATED POLYCARBONATE MOULDED PARTS

Peter Bier, Krefeld, Germany, assignor to Bayer AG, Leverkusen, Germany

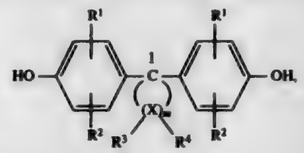
Filed Aug. 18, 1995, Ser. No. 516,820

Claims priority, application Germany, Sep. 2, 1994, 44 31 217.2

Int. Cl.[6] B05D 3/06

U.S. Cl. 427—493 **8 Claims**

1. Method for coating polycarbonate moulded parts, characterised in that to the surface of a moulded body of a polycarbonate (A) formed from (1) one or more diphenols of formula (Ia)



(Ia)

wherein

R^1 and R^2 independently of one another denote hydrogen, halogen, C_1–C_8 alkyl, C_5–C_6 cycloalkyl,

C_6–C_{10} aryl, or C_7–C_{12} aralkyl, m is 4 or 5,

R^3 and R^4 are selected individually for each X and independently of one another denote hydrogen or C_1–C_6 alkyl and

X denotes carbon,

with the proviso that, on at least one atom X, R^3 and R^4 both denote C_1–C_6 alkyl, and

2) one or more diphenols selected from the group consisting of 2,2-bis(4-hydroxyphenyl)propane;

2,2-bis(3,5-dimethyl-4-hydroxyphenyl)propane;

2,2-bis(3,5-dichloro-4-hydroxy-phenyl)propane;

2,2-bis(3,5-dibromo-4-hydroxyphenyl)propane and

1,1-bis(4-hydroxyphenyl)-cyclohexane, at a molar ratio of (1):(2) of from 100 mol %:0 mol % to 10 mol %:90 mol %,

a coating material (B), which possesses as cross-linkable components agents having acrylate, allyl, epoxide, silanol, isocyanate, anhydride or melamine functional groups or combinations thereof, is applied in a thickness of from 0.5 to 200 μm and is subsequently cured thermally and/or by irradiation.

5,595,790

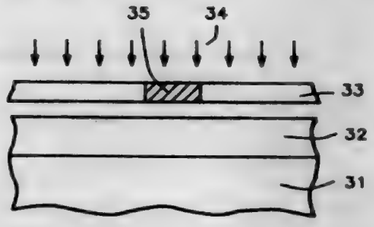
METHOD FOR FORMING A REFLECTIVE SURFACE FOR A LCD

Cheng-Kuang Wei, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 21, 1996, Ser. No. 668,987

Int. Cl.[6] C08J 7/04

U.S. Cl. 427—510 **14 Claims**



1. A method for forming a non-specular reflecting surface for use in a liquid crystal display comprising:

providing a solution consisting of a first component, that is subject to hardening when exposed to ultraviolet light, and a second component that is not subject to hardening when exposed to ultraviolet light;

providing a substrate;

coating said substrate with a layer of the solution;

exposing the solution to ultraviolet light thereby transforming the solution to a solid layer, having an upper surface, wherein are dispersed liquid regions;

removing said liquid regions wherever they are part of said upper surface, thereby deplanarizing said surface;

heating the layer to solidify said liquid regions; and

depositing a layer of a reflective material on said deplanarized upper surface.

5,595,791

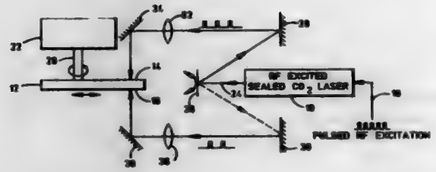
PROCESS FOR TEXTURING BRITTLE GLASS DISKS

Peter M. Baumgart, San Jose; Wing P. Leung, Arcadia; Hung V. Nguyen; Thao A. Nguyen, both of San Jose; Andrew C. Tan, Saratoga, and Anthony Wu, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 149,851, Nov. 10, 1993, abandoned. This application May 31, 1995, Ser. No. 455,171

Int. Cl.[6] B05D 1/36

U.S. Cl. 427—554 **28 Claims**



1. A method for manufacturing a data recording disk comprising the steps of:

providing a glass base plate which has a surface, the glass base plate having a thermal shock threshold fluence level above which the glass base plate is fractured;

polishing said surface;

concentrating laser energy pulses upon a plurality of spaced-apart locations over a treatment area of said surface to produce a bump with a maximum diametral dimension D_d on said surface at each said spaced-apart location, wherein each laser energy pulse has a laser energy fluence f_p at said each spaced-apart location which is limited to said thermal shock threshold fluence level; and

depositing over said surface a film of magnetic data recording material to create a data recording layer.

5,595,792

METHOD AND APPARATUS FOR PRODUCING MAGNETIC RECORDING MEDIUM

Makoto Kashiwaya, and Junji Nakada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

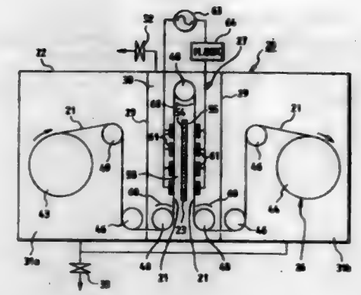
Filed Aug. 23, 1995, Ser. No. 518,177

Claims priority, application Japan, Aug. 24, 1994, 6-220857

Int. Cl.[6] H05H 1/02

U.S. Cl. 427—570 **23 Claims**

1. A method for producing a magnetic recording medium in which, while a reactive gas is supplied to a sheet-shaped plasma stream formed in a vacuum chamber, a web-like substrate is made to run in the vicinity of said plasma stream so that a thin film is formed on a plasma stream side surface of said substrate by gas-phase reaction of said reactive gas on the plasma stream, the method comprising the steps of: running a substrate in a vacuum chamber while providing therein a vacuum atmosphere for a film-forming process with a substrate arranged opposite to a sheet-shaped plasma stream; and forming a thin film while generating an electric field in a direction crossing said plasma stream and said substrate, which are arranged opposite to each other.



5,595,793

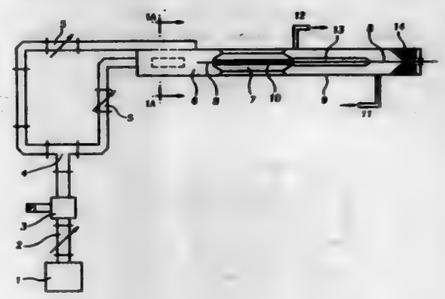
SURFACE-PLASMA-WAVE COATING TECHNIQUE FOR DIELECTRIC FILAMENTS

Leonid Blinov, Moscow, Russian Federation, and Wolfgang Neuberger, Monchengladbach, Germany, assignors to Ceram Optec Industries, Inc., East Longmeadow, Mass.

Filed Apr. 24, 1995, Ser. No. 428,770

Int. Cl.[6] B05D 1/04

U.S. Cl. 427—575 **5 Claims**



1. A method for coating dielectric filaments by a plasma enhanced CVD deposition process with a dielectric layer, using a microwave generated plasma, comprising the steps of:

a. introducing a dielectric filament with an outer surface to be coated into a deposition chamber;

b. supplying said deposition chamber with a reactive gas containing a coating material precursor;

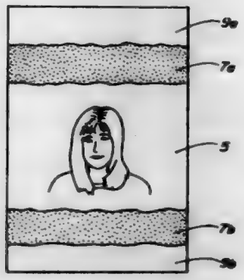
c. generating a plasma in said deposition chamber as a surface plasma wave on said dielectric filament's surface with said surface plasma generated as a hybrid azimuthal HE_{11} wave, excited on said dielectric filament and wherein a microwave generator uses a microwave whose wavelength, λ, is no greater than

$$\lambda_{cr}=1.3d(\epsilon_1-\epsilon_2)^{1/2},$$

in which d is said dielectric filament's diameter, ϵ_1 is said filament's dielectric constant and ϵ_2 is said plasma's dielectric constant; and

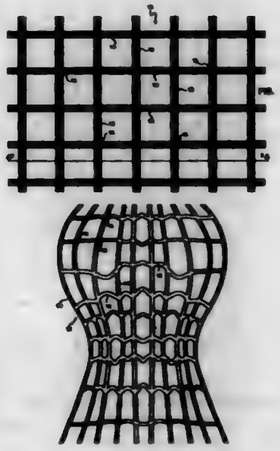
d. having said reactive gas react with said surface plasma wave depositing at least one layer of a desired coating onto said dielectric filament.

5,595,794
ARCHIVAL PHOTOPRINT LAMINATE
Claudio Cossu, 45 Crystal Springs Rd., San Mateo, Calif. 94402
Filed May 11, 1995, Ser. No. 439,460
Int. Cl.[6] G09F 7/12
U.S. Cl. 428—13 4 Claims



1. An archival photoprint laminate, comprising:
a photographic print;
a polyurethane bonding material applied to opposing sides of said print; and
two glass plates fused to said polyurethane bonding material, one on each of said opposing sides, thus creating a 5-piece bonded laminate structure.

5,595,795
COMPOSITE, PREFORM THEREFORE, METHOD OF MAKING, AND APPARATUS
Henry I. Alfred, Amherst, Mass., assignor to Netcom Technologies Corp., Amherst, Mass.
Filed Apr. 25, 1994, Ser. No. 232,992
Int. Cl.[6] B28B 21/00
U.S. Cl. 428—34.5 5 Claims

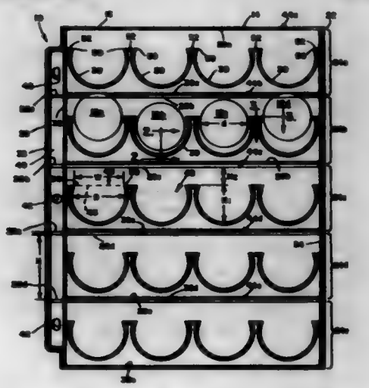


1. A composite comprising at least one preform, said at least one preform comprising a plurality of inter-crossed roving arranged to form a plurality of junction points, at least one junction point of said plurality of junction points being configured to include a thermoset binding material for connecting the inter-crossed roving of said at least one junction point, said thermoset binding material essentially being confined to the area of said at least one junction point.

5,595,796
FOODSTUFF CASING BASED ON CELLULOSE HYDRATE WITH IMPROVED PEELABILITY
Klaus-Dieter Hammer, Mainz; Manfred Siebrecht, and Theo Krauss, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed May 25, 1994, Ser. No. 248,875
Claims priority, application Germany, Mar. 4, 1994, 44 07 288.0
Int. Cl.[5] F16L 11/08; A22C 13/00
U.S. Cl. 428—34.8 12 Claims

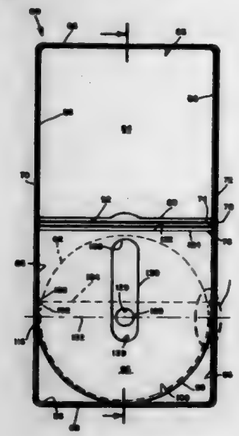
1. A foodstuff casing, comprising a cellulose hydrate substrate, and a coating or impregnation composition present on the side of the substrate which forms the interior of said casing, wherein said coating or impregnation composition comprises a mixture of an adhesive component and a non-stick component wherein the ratio of said adhesive to said non-stick component is between about 4:1 and 1:4, by weight, wherein said adhesive component is present on said interior in an amount of about 40 to 200 mg/m^2 of said casing and said non-stick component is present on said interior in an amount of about 20 to 2,000 mg/m^2 of said casing, and wherein the non-stick composition is selected from the group consisting of a chromium/fatty acid complex, a diketene with (C_4–C_{20})alkyl, (C_4–C_{20})cycloalkyl, (C_6–C_{20})aryl or (C_7–C_{20})aralalkyl substituents, perfluoroethylene, polyethylene and lecithin.

5,595,797
PROTECTIVE HOLDERS FOR DISKS
William R. Miller, Walnut, Calif., assignor to Rembrandt Photo Services, City of Commerce, Calif.
Filed Oct. 29, 1993, Ser. No. 145,253
Int. Cl.[6] B65D 73/00; 85/57
U.S. Cl. 428—35.2 28 Claims



1. A device for protecting a disk, comprising in combination:
a disk;
two flexible plastic panels in superposed relation; and
securing means securing said panels in said superposed relation with a first opening for receiving said disk between said panels, said securing means including an arcuate seam sealing said superposed panels along a circular arc for containing at least one-half but not the entirety of said disk between said panels within said arc of said seam, said arc of said seam exceeding 180° and terminating at a second opening between said superposed panels of sufficient width for permitting passage therethrough and into said arc of at least one-half of said disk when said disk is received by said first opening for containing the entirety of said disk between said panels, the width of said second opening and the inside diameter of said arcuate seam being related to the diameter and the thickness of said disk such that said disk resists withdrawal from within said arc of said seam through said second opening when at least one-half of said disk is contained within said arc.

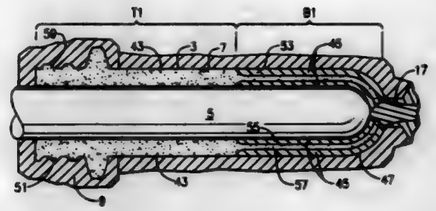
5,595,798
PROTECTIVE HOLDERS FOR DISKS
William R. Miller, Walnut, Calif., assignor to Rembrandt Photo Services, City of Commerce, Calif.
Continuation-in-part of Ser. No. 145,253, Oct. 29, 1993, and Ser. No. 14,817, Oct. 29, 1993, Pat. No. Des. 353,837. This application Oct. 28, 1994, Ser. No. 326,540
Int. Cl.[6] B65D 85/57
U.S. Cl. 428—35.2 23 Claims



1. A wallet for containing a disk, comprising:
a disk;
a substantially rectangular first flexible plastic sheet foldable to form a front cover and a rear cover separated by a spine;
a second flexible plastic sheet in superposed relation with said front cover and welded to said front cover along three edges thereof forming a first pocket between said front cover and said second sheet having an opening; and
a third flexible plastic sheet and a fourth flexible plastic sheet in superposed relation with one another and with said rear cover and welded to said rear cover along three edges thereof forming a second pocket between said rear cover and said third sheet having an opening, said third and fourth sheets further welded together by an arcuate seam along a circular arc exceeding 180° including welds at the termini of said arc forming a third pocket between said third and fourth sheets having a first opening for receiving said disk, said welds at said termini defining a second opening of said third pocket for permitting passage therethrough and into said arc of at least one-half but not the entirety of said disk when said disk is received by said first opening, the width of said second opening of said third pocket and the diameter of said arc being related to the diameter and the thickness of said disk such that said disk resists withdrawal from within said arc through said second opening when at least one-half of said disk is contained within said arc.

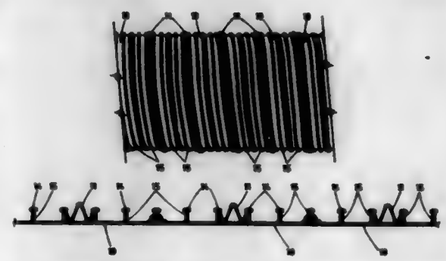
5,595,799
COINJECTION MOLDING OF DECORATIVE PREFORMS AND CONTAINERS PRODUCED FROM SUCH PREFORMS
Martin H. Bock, Amherst; Robert Caldicott, Nashua, and John H. Muszynski, Auburn, all of N.H., assignors to DTL Technology Limited Partnership, Amherst, N.H.
Filed Dec. 14, 1995, Ser. No. 572,596
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—35.7 24 Claims

1. A process for coinjection molding a multi-colored decorative article comprising the steps of:



a) metering an initial quantity of a molten first-colored material;
b) supplying the initial molten first-colored material through a supply gate in an injection mold cavity and into the cavity;
c) metering a quantity of molten second-colored material;
d) supplying the molten second-colored material through the supply gate and into the cavity, contiguously with the initial first-colored material;
e) controlling the locations of the first and second-colored materials in the cavity, such that the initial first-colored material is supplied to at least a desired first portion of the cavity and the second-colored material is supplied to at least a desired second portion of the cavity, by providing the first and second-colored materials with desired melt viscosities, and controlling the melt temperatures and rates of supply of the first and second-colored materials.

5,595,800
HELICALLY WOUND REINFORCED RIBBED COMPOSITE STRUCTURE
Stanley W. O. Mensel, Dry Creek, Australia, assignor to Rib Loc Australia Pty Ltd., South Australia, Australia
PCT No. PCT/AU92/00522, § 371 Date Mar. 29, 1994, § 102(e) Date Mar. 29, 1994, PCT Pub. No. WO93/07412, PCT Pub. Date Apr. 15, 1993
PCT Filed Sep. 30, 1992, Ser. No. 211,286
Claims priority, application Australia, Oct. 2, 1991, PK8668
Int. Cl.[6] B31C 3/00; 3/04; B29D 23/22
U.S. Cl. 428—363 14 Claims



1. A helically wound composite tube or pipe produced by helically winding a strip of plastics material and interengaging the adjacent convolutions of the strip, wherein the strip comprises an array of lengthwise extending ribs spaced apart across the width of the strip so as to form therebetween a series of open longitudinally extending side-by-side channels, each of at least some of said ribs having flange formations at or near its free end to strengthen such said ribs, each of the flange formations being separated from the flange formation on any adjacent rib, characterized by at least one helical elongate reinforcing member located between a pair of said ribs within the array, the marginal edges of the reinforcing member interlocking respectively with the flange formations of the ribs of said pair, said reinforcing member having a central body portion which has a radial height greater than the height of said ribs whereby the effective external diameter of the composite tube or pipe is substantially greater than the inner diameter of the tube or pipe.

5,595,801

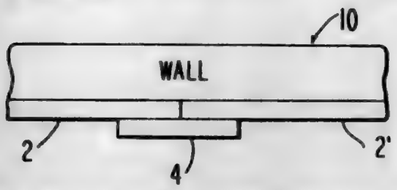
LAMINATED SHIELDING MATERIAL AND METHOD FOR SHIELDING AN ENCLOSURE THEREWITH

Lawrence J. Fahy, Warwick; Peter J. Angelini, Central Valley; David A. Diermeier, Warwick, and John Marcoux, Middletown, all of N.Y., assignors to International Paper Company, Purchase, N.Y.

Continuation-in-part of Ser. No. 737,626, Jul. 30, 1991, abandoned. This application Sep. 3, 1993, Ser. No. 116,455

Int. Cl.[6] B32B 7/12;31/12

U.S. Cl. 428—40.1 20 Claims



1. A system for shielding an enclosure, comprising first and second metal substrates having a seam therebetween, and means for sealing said seam to prevent leakage of electromagnetic radiation into said enclosure, said sealing means comprising a first electrically conductive nonwoven mat comprising randomly oriented and randomly packed fibers and a layer of nonconductive adhesive which penetrates said first nonwoven mat when not yet dried and which bonds said first nonwoven mat to said first metal substrate when dried, said penetration of said nonconductive adhesive allowing at least some of said fibers to contact the surface of said first and second metal substrates in said bonded state.

5,595,802

SELF ADHERING WRAPPING MATERIAL FOR WRAPPING FLOWER POTS AND METHOD OF USING SAME

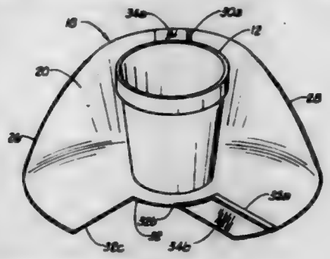
Donald E. Weder, Highland; William F. Stracter, Breese; Joseph G. Stracter, Highland, all of Ill.; Franklin J. Craig, Valley Park, Mo.; Wilma M. Donnelly, Highland, Ill., and Jack W. Redditt, Nashville, Tenn., assignors to Southpac Trust International, Inc., Okla. City, Okla.

Continuation of Ser. No. 889,654, May 27, 1992, Pat. No. 5,388,672, which is a continuation of Ser. No. 677,225, Mar. 29, 1991, Pat. No. 5,199,242, which is a continuation-in-part of Ser. No. 368,597, Jun. 20, 1989, Pat. No. 5,007,229, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,883, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned, said Ser. No. 677,225is a continuation-in-part of Ser. No. 232,541, Aug. 11, 1988, Pat. No. 4,835,834, which is a continuation of Ser. No. 876,405, Jun. 20, 1986, abandoned.

This application Mar. 3, 1994, Ser. No. 205,920

Int. Cl.[6] A01G 9/02

U.S. Cl. 428—40.1 12 Claims



1. A wrapping, comprising:

a flower pot having an outer periphery;

a sheet of material having an upper surface and a lower surface, the sheet of material sized to wrap at least a portion of the flower pot; and

a single cling material having both an insubstantial portion and a substantial portion, the insubstantial portion of the cling material overlapping and connected to a small portion of the sheet of material, the substantial portion of the cling material extending away from the sheet of material, both the cling material and sheet of material forming a wrapping material,

wherein the wrapping material is wrapped about at least a portion of the flower pot thereby forming the wrapping,

wherein the sheet of material substantially wraps about at least a portion of the outer peripbery of the flower pot, and

wherein the substantial portion of the cling material both overlaps and connects to the sheet of material when the sheet of material is wrapped about the flower pot, the substantial portion of the cling material overlapping only a limited portion of the sheet of material to secure the sheet of material about the flower pot.

5,595,803

FILMIC PACKAGING MATERIAL AND A TEAR ADHERENT THERETO

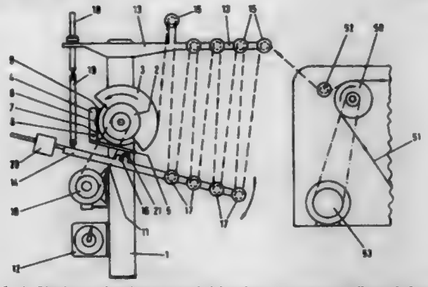
Geoffrey B. May, Beeston; Brian F. Davis, Carlton, and Wladyslaw L. Nowak, Arnold, all of United Kingdom, assignors to P. P. Payne Limited, United Kingdom

Division of Ser. No. 18,068, Feb. 16, 1993, abandoned, which is a division of Ser. No. 733,365, Jul. 19, 1991, Pat. No. 5,203,935, which is a continuation of Ser. No. 294,749, Jan. 9, 1989, abandoned, which is a division of Ser. No. 595,311, Mar. 30, 1984, Pat. No. 4,844,962. This application Mar. 4, 1994, Ser. No. 206,871

Claims priority, application United Kingdom, Mar. 31, 1983, 8308932

Int. Cl.[6] B31B 1/90

U.S. Cl. 428—43 4 Claims



1. A filmic packaging material having a teartape adhered thereto wherein the teartape is molecularly oriented in a longitudinal direction and comprises a base film formed from an oriented thermoplastic plastic material coated with a pressure sensitive adhesive composition by which the teartape is adhered to the packaging material.

5,595,804

SPLICE MEANS, A METHOD OF SPLICING AN ABRASIVE ARTICLE WITH SAME AND THE SPLICED ABRASIVE ARTICLE FORMED THEREBY

Gerald E. Korbel, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

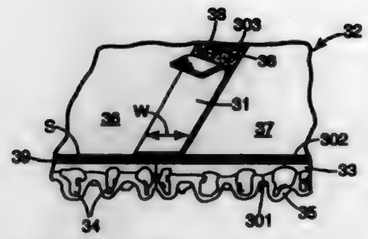
Filed Aug. 22, 1994, Ser. No. 293,655

Int. Cl.[6] B24D 11/06; B32B 27/12

U.S. Cl. 428—57 20 Claims

11. A splice comprising:

(a) two free sheet ends of abrasive sheet material juxtaposely abutted together to form a juncture line, wherein said abrasive sheet material has a central axis and opposed major surfaces



with a coating of abrasive grains bonded to one of said major surfaces and a backing side constituting the other of said major surfaces; and

(b) a splice means overlapping said juncture line on said backing side and bonded thereto by a splice adheseive means disposed adjacent to said juncture line on surfaces of said two free sheet ends which are overlapped by said splice means, wherein said splice means comprises a support means comprising a polymeric film having a major surface, and a fiber reinforcement means comprising a plurality of monofilaments, said monofilaments being bonded to said major surface of said support means by a fiber adhesive, said fiber adhesive being hot melted, cooled to a solid state and cured by exposure to water and in the absence of nonaqueous liquid solvent, and said plurality of monofilaments being arranged on said major surface of said support means so as to span said juncture line and are oriented in a substantially parallel direction to said central axis of said abrasive sheet material, wherein said fiber adhesive comprises a mixture of isocyanate-terminated polyurethane prepolymers comprising: (a) a first prepolymer comprising the reaction product of an at least essentially semicrystalline hydroxy-functional material and a polyisocyanate: (b) a second prepolymer which comprises the reaction product of a poly (tetramethylene glycol) ether and a polyisocyanate; and (c) a third prepolymer which comprises the reaction product of an essentially amorphous hydroxy functional material and a polyisocyanate, and optionally (d) a fourth prepolymer which comprises the reaction product of a slightly branched hydroxy-functional material and a polyisocyanate.

5,595,805

MAGNETO-OPTICAL RECORDING MEDIUM

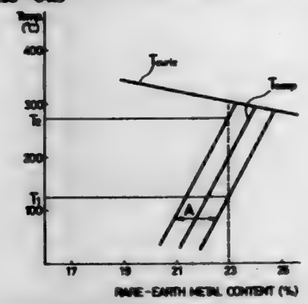
Junichiro Nakayama, Shiki-gun; Junsaku Nakajima, Yamatokoriyama; Akira Takahashi, Nara, and Kenji Ohta, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 910,678, Jul. 8, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 318,536

Claims priority, application Japan, Jul. 8, 1991, 3-167201

Int. Cl.[6] G11B 5/66

U.S. Cl. 428—64.3 8 Claims



1. A magneto-optical recording medium comprising:

a substrate;

a dielectric layer directly over said substrate;

a magnetic layer directly over said dielectric layer, recording bits of information as localized areas having magnetization direction components differing from surrounding portions of said magnetic layer, said magnetic layer being the only magnetic layer included in said medium, and said magnetic layer consisting of a rare-earth/transition metal alloy having a composition containing a higher percentage of rare-earth metal, as compared to the percentage of rare-earth metal in a compensating composition in which magnetic moments of the rare-earth metal and the transition metal balance each other at room temperature, which exhibits, at room temperature, an in-plane magnetization, for magnetization components not corresponding to recorded information, and perpendicular magnetization, for magnetization components corresponding to recorded information, and which exhibits, at temperatures above a transition temperature exceeding room temperature, perpendicular magnetization corresponding to the recorded information for all magnetization components;

and a second dielectric layer directly over said magnetic layer.

5,595,806

MAT FOR BEARING AND SUPPORTING OBJECTS, ESPECIALLY FOR PACKAGING

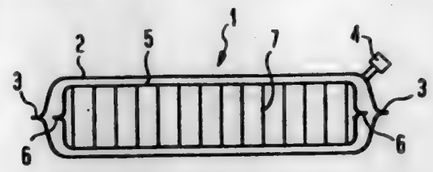
Georg Korfmacher, Munich, Germany, assignor to Korfmacher Trading GmbH, Munich, Germany

Continuation of Ser. No. 603,468, Oct. 25, 1990, abandoned. This application Jul. 27, 1992, Ser. No. 918,785

Claims priority, application Germany, Apr. 30, 1988, 8805735 U; May 18, 1988, 8806523 U; Dec. 29, 1988, 8816163 U; Hague Agreement, Feb. 11, 1989, WO89/10315

Int. Cl.[6] B32B 3/06

U.S. Cl. 428—69 17 Claims



1. A mat for bearing and supporting an object comprising:

(a) a container defining at least one airtight and flexible compartment having at least one valve means connected to a source of vacuum for creating an evacuated condition within said compartment;

(b) at least one air-permeable bag disposed within said compartment, said bag comprising an upper wall and a lower wall joined in a manner to define an enclosed region, said upper wall and said lower wall being connected within said enclosed region by a plurality of spacer threads such that said bag has a thickness that is maintained substantially uniform; and

(c) a granular material disposed within said enclosed region,

said mat having a first, unevacuated condition and a second, evacuated condition, said granular material being of a granule size to permit said granular material to circulate freely within said region when said mat is in said first unevacuated condition, and said mat in said second, evacuated condition being adapted to secure said granular material in fixed positions within said enclosed region.

5,595,807

COMBINATION WET DRY WIPE

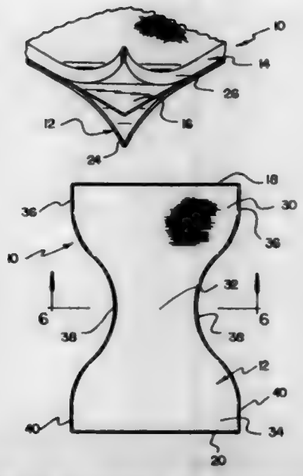
Robert B. Gooding, Jr., and Kimberly Minor, both of 124 Federal St., St. Albans, Vt. 05478

Filed Jun. 1, 1995, Ser. No. 457,126

Int. Cl.[6] A61F 13/00;13/15; A61K 9/70; A61M 35/00

U.S. Cl. 428—80 6 Claims

1. A combination wet dry wipe comprising:



a wetting means for retaining a topical cleansing solution and permitting manual application of the topical cleansing solution to an object, the wetting means being comprised of a saturated layer of fabric material saturated with a topical cleansing solution, the saturated layer is of a first thickness;

an absorbing means coupled to the wetting means for drying an object, the absorbing means being comprised of an absorbent layer of flexible fabric material, the absorbent layer being of a second thickness, wherein the second thickness is substantially greater than the first thickness of the saturated layer;

an impermeable separating layer interposed between the absorbing means and the wetting means, the separating layer being formed of thermoplastic material and having the saturated layer secured thereto by an adhesive interposed therebetween, the separating layer having the absorbent layer coextensively covering and being adhesively fastened thereto so as to project in a direction opposite that of the saturated layer; and

whereby the wetting means, the separating layer and the absorbing means are coextensive, the wetting means and the coextensive absorbing means cooperate with the coextensive impermeable separating layer so as to define a linear top edge, a linear lower edge spaced from and oriented substantially parallel to the linear top edge, and linear lateral edges extending substantially orthogonally between the top and bottom edges so as to define a substantially rectangular shape of the combination wet dry wipe.

5,595,808

Patent Not Issued For This Number

5,595,809

METHOD FOR IMPROVING THE ENERGY ABSORPTION OF A HIGH TENACITY FABRIC DURING A BALLISTIC EVENT

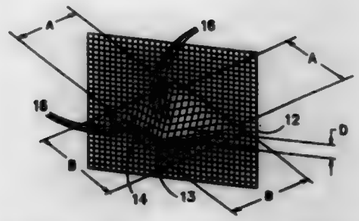
Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 880,045, May 7, 1992, Pat. No. 5,466,503. This application May 15, 1995, Ser. No. 443,491

Int. Cl.[6] B32B *5/12*; F41H *1/02*

U.S. Cl. 428—113 **4 Claims**

1. A ballistic-resistant fabric comprising of at least one layer of woven fabric having yarns in both the warp direction and weft direction, made from fibers having a tenacity of at least ten grams/denier, said strip of fabric having a ballistic failure ratio less than one for an impact with a projectile having a velocity of about at least five hundred feet per second, and a ratio of said length of said strip of fabric to said width of said strip of fabric greater then a reciprocal squared of said ballistic failure ratio, said layer of woven fabric having been stretched under tension in a substantially bias direction.



5,595,810

DECORATIVE LABELS AND METHOD OF THEIR PRODUCTION

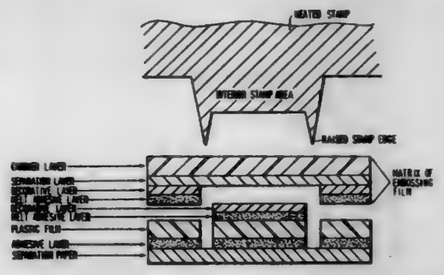
Norbert Beinert, Hofheim-Lorsbach; Manfred Kaste, Bad Tölz; Gottfried Philipp, Heinkirchen, and Christian von Tluck und Tuschenowitz, Schaftlach, all of Germany, assignors to Zweckform Büro-Produkte GmbH, Oberlaindern, Germany

Filed Apr. 1, 1994, Ser. No. 222,741

Claims priority, application Germany, Apr. 5, 1993, 43 11 200.5

Int. Cl.[6] B32B *31/20*

U.S. Cl. 428—156 **31 Claims**



1. Method for the production of decorative labels, comprising the steps of:

a) applying (i) an embossing film capable of transferring heat and comprising a carrier layer, a separation layer, at least one decorative layer and a melt adhesive layer that can be heat-activated in the range of 110° to 230° C. on (ii) a substrate comprising a separation paper, an adhesive layer and a plastic film comprising homopolymers or copolymers of ethylene having a crystallite melting point of 110° to 120° C., a heat of fusion of 125 to 180 J/g and a melt index of 2.0 to 3.5 g/10 min., in a manner such that the melt adhesive layer of embossing film (i) and the plastic film of the substrate (ii) face one another;

b) embossing the aforementioned combination of the embossing film (i) and substrate (ii) at a temperature of 100° to 230° C., under a pressure of 1.0 to 7.0 bar and for a period of 3 to 0.3 sec. with a heated stamp having an area bearing a certain motif and raised edges in comparison to an interior of the stamp area, the stamp acting upon the carrier layer of the embossing film (i) so that

within the stamp area, the embossing film (i) and substrate (ii) are bonded to one another via the melt adhesive layer, and the separation layer, at least one decorative layer and melt adhesive layer of the embossing film (i) and the plastic film and adhesive layer of the substrate (ii) are fused and punched through in the area of the raised edges of the stamp;

c) removing the carrier layer of the embossing film (i) and parts of the embossing film (i) that are not bonded to the substrate (ii); and

d) removing parts of the plastic film and the adhesive layer of the substrate (ii) that lie outside confines of the stamp motif (stamp area);

whereby a label having an unimpaired decorative motif is produced without warping of the film or blurring of the pattern.

5,595,811

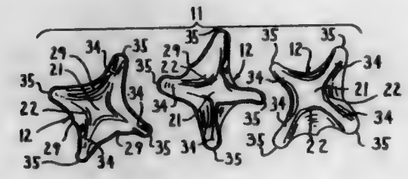
PACKAGING MATERIAL

William A. Stout, Jr., 11410 E. Shore Dr., Delton, Mich. 49046

Continuation-in-part of Ser. No. 829,726, Jan. 31, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 299,562

Int. Cl.[6] B65D *81/16*

U.S. Cl. 428—181 **23 Claims**



1. Improvements in a free-flowing dunnage packaging material usable for filling an open region between an article and a surrounding container so that the dunnage packaging material provides for cushioned support of the article within the container, said dunnage packaging material consisting of a large plurality of separate and discrete dunnage packaging elements capable of adopting a haphazard and random orientation when said material is disposed within and substantially fills said open region, the improvement wherein said dunnage element comprises a monolithic one-piece blank consisting of thin paper physically deformed into a cup-shaped element having a generally flat base wall and a substantially annular skirt fixedly joined to said base wall around the periphery thereof and projecting transversely away from said base wall so that said skirt defines therein an open, interior region which is closed at a first end of said skirt by said base wall and which opens outwardly through a second end thereof, said second end of said skirt being defined by a free edge which creates a substantially endless path, said skirt being defined by a plurality of side panels which are individually joined to said base wall and which are serially joined to one another to define a substantially annular configuration, each side panel having a channeled cross section when viewed in a plane substantially parallel to said base wall, said channeled cross section opening in a direction outwardly away from the interior region of the skirt, and sidewardly adjacent pairs of said side panels having adjacent sidewall portions which are integrally joined together by edge portions which are elongated and project outwardly away from the base wall and terminate at said free edge.

5,595,812

Patent Not Issued For This Number

5,595,813

ARCHITECTURAL MATERIAL USING METAL OXIDE EXHIBITING PHOTOCATALYTIC ACTIVITY

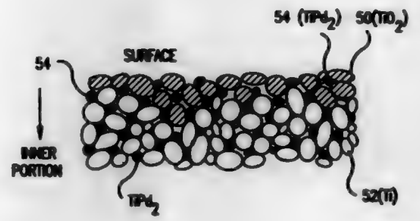
Takatoshi Ogawa; Yasuhiko Yoshioka; Nobuo Tsubouchi; Toshio Saito; Tamotsu Hasegawa, all of Koto-ku; Akira Fujishima, Kawasaki, and Kazuhito Hashimoto, Yokohama, all of Japan, assignors to Takenaka Corporation, Osaka, Japan

Filed Sep. 15, 1993, Ser. No. 120,929

Claims priority, application Japan, Sep. 22, 1992, 4-252931; Nov. 6, 1992, 4-297395

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—212 **4 Claims**



1. An architectural material for use as an external wall material, a roofing material, an internal wall material, a flooring material, or a ceiling material, comprising:

a substrate; and

a thin film formed on said substrate, said coating capable of decomposing mold, bacteria and odorous compounds, wherein an outer surface region of said thin film for receiving light includes an outer portion substantially formed of a metal mixture including a metal oxide which exhibits photocatalytic activity upon irradiation by ultraviolet light and a second metal for improving the photocatalytic activity of said metal oxide, with the concentration of the metal oxide decreasing with increasing depth from the outer surface, and further includes an inner portion contiguous to the outer portion and substantially formed of a metal mixture including a metal of the same kind as that which constitutes said metal oxide and said second metal for improving the photocatalytic activity of said metal oxide, with the concentration of said metal of the same kind increasing with increasing depth from the outer surface, and wherein said outer portion is substantially formed of a metal mixture which is expressed by the following general formula (I):

$$[TiO_2]_x[Ti\ M_y]_{1-x} \text{ or } [TiO_2]_xM_{1-x} \quad (I)$$

(where M represents a metal selected from the group consisting of Pt, Au, Pd, Ag, Cu, Ni, and Co; x is such that $0.3 \leqq x < 1$; and y is an integer peculiar to said metal M combining with Ti and is any one of 1, 2, and 3),

and said inner portion is a metal mixture which is expressed by the following general formula (II):

$$[Ti]_x[Ti\ M_y]_{1-x} \text{ or } [Ti]_xM_{1-x} \quad (II)$$

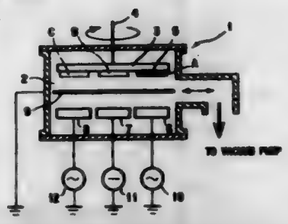
(where M represents a metal selected from the group consisting of Pt, Au, Pd, Ag, Cu, Ni, and Co; x is such that $0.3 \leqq x < 1$; and y is an integer peculiar to said metal M combining with Ti and is any one of 1, 2, and 3).

5,595,814

WEAR RESISTANT FILM

Hiroshi Yamagata, Toyama-ken, and Shinichiro Maruyama, Toyama, both of Japan, assignors to YKK Corporation, Tokyo, Japan

Filed May 9, 1995, Ser. No. 437,383
Claims priority, application Japan, Jun. 1, 1994, 6-148749
Int. Cl.[6] C23C *14/08*
U.S. Cl. 428—216 9 Claims



1. A wear-resistant film formed on a substrate of aluminum or an aluminum alloy, consisting essentially of:
a SiO_2 film deposited on a surface of said substrate, and
an aluminum oxide film deposited on said SiO_2 film.

5,595,815

WATER DISPERSIBLE MULTI-LAYER MICROFIBERS

Gregg A. Patnode, Woodbury; Denise R. Rutherford, Oakdale, both of Minn., and Dietmar Schiel, Hudson Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 367,826, Dec. 30, 1994, Pat. No. 5,472,518. This application May 30, 1995, Ser. No. 452,922
Int. Cl.[6] B32B *7/02*
U.S. Cl. 428—219 8 Claims

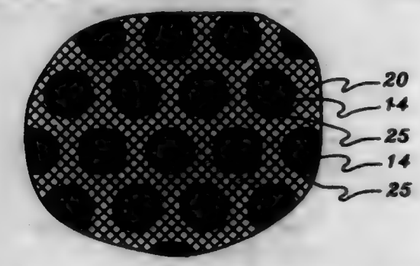
1. A multilayered microfiber, comprising at least one layer of a water soluble polymer and at least one layer of at least one hydrolytically degradable polymer.

5,595,816

UNSINTERED PERFORATED CERAMIC FIBER PLATES USEFUL AS BURNER FACES

Martin G. Carswell, San Jose, Calif., assignor to Alzeta Corporation, Santa Clara, Calif.

Filed Jun. 6, 1995, Ser. No. 466,453
Int. Cl.[6] F34D *14/14*
U.S. Cl. 428—131 20 Claims



1. An unsintered, perforated ceramic fiber plate comprising an unsupported compact layer of chopped ceramic fibers having a thickness not exceeding about 0.5 inch and containing uniformly spaced perforations that have a diameter not exceeding 0.08 inch and that are spaced from one another not exceeding 0.13 inch from center to center, and a binding agent uniformly distributed throughout said compact layer of chopped ceramic fibers and resulting from an inorganic sol selected from the group consisting of colloidal alumina and colloidal silica dried at a temperature not exceeding about 650° F.

5,595,817

FLAME PENETRATION BLOCKER FOR FUSELAGES

Werner Schiller, Birkenau, and Gerhard Schaut, Hemsbach, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Jun. 2, 1995, Ser. No. 459,879
Claims priority, application Germany, Jun. 13, 1994, 44 20 613.5
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—283 16 Claims

1. A flame penetration blocker for fuselages comprising a composite of a 100 to 600 g/m^2 phlogopite or muscovite mica paper having laminated on at least one side thereof a 30 to 300 g/m^2 needled fabric layer composed of flame retardant fibers which have an LOI value of 20 to 55, the mica paper being bonded to the needled fabric layer with a partially cross-linked, latently adhesive binding agent that is a component of the mica paper itself, the binding agent having a lasting service temperature in accordance with DIN 53 446 of more than 100° C. wherein the binding agent is incorporated into the mica paper in an amount from 20 to 30% by weight of the mica paper.

5,595,818

ROUGH-SURFACED POLYVINYL BUTYRAL SHEET AND METHOD OF FORMING SAME

Harold H. Hopfe, Longmeadow, and Aristotelis Karagiannis, Northampton, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

PCT No. PCT/US93/08859, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO95/07940, PCT Pub. Date Mar. 23, 1995
PCT Filed Sep. 17, 1993, Ser. No. 387,855
Int. Cl.[6] B32B *5/16;27/30;* C08F *8/28*
U.S. Cl. 428—327 13 Claims



1. Plasticized sheet comprising a polyvinyl butyral matrix containing discrete particles of crosslinked polyvinyl butyral which are integrally randomly dispersed in the matrix and microscopically protrude from the surface of the sheet forming a rough surface thereon.

5,595,819

THIN POLYESTER FILM CONTAINING CUBIC CALCIUM CARBONATE PARTICLES SUITABLE FOR CAPACITOR, DIGITAL STENCIL AND THERMAL TRANSFER MEDIA

Virgil L. Andersen, Circleville, Ohio; Gusty Feyder, Dalheim; Cathy Vanderdonckt, Niederanven, both of Luxembourg; Albert W. Forrest, Jr., Chillicothe, and Patrick H. Young, Amanda, both of Ohio, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 21, 1995, Ser. No. 426,535
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—330 4 Claims

1. A roll of film consisting of polyester selected from polyethylene terephthalate and polyethylene naphthalate, said film having a thickness in a range from two to six microns having incorporated therein cubic calcium carbonate having an average diameter in a range of 0.2 to 3.0 microns and a concentration of 0.1 to 2.0 weight % with a proviso that the film has a $Kt^{-0.5}$ of at least 21 wherein K is stack coefficient constant and t is film thickness in microns.

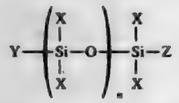
5,595,820

COATING SYSTEM FOR GLASS STRENGTH RETENTION

David M. Szum, Elmhurst, Ill., assignor to DSM Desotech, Inc., Elgin, Ill.

Division of Ser. No. 284,993, Mar. 2, 1994, Pat. No. 5,502,145. This application Jun. 7, 1995, Ser. No. 484,650
Int. Cl.[6] D02G *3/00;* B32B *9/04*
U.S. Cl. 428—378 9 Claims

1. A glass substrate coated with at least one composition, said composition comprising; an oligomer that is the reaction product of a hydroxy functional monomer containing ethylenic unsaturation, a polyisocyanate and a hydroxyfunctional polyether; and a poly(siloxane) having the formula:



wherein Y and Z are independently selected from the group consisting of halogen, alkyl and alkoxy; n is one or more; and each X is independently a hydrolyzable group or a siloxane group.

5,595,821

REPULPABLE PLASTIC FILMS

Patrick J. Hager, and Richard J. Goetz, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 238,226, May 4, 1994, Pat. No. 5,534,589. This application May 15, 1995, Ser. No. 440,650
Int. Cl.[6] B32B *5/16;15/02;27/32*
U.S. Cl. 428—402 14 Claims

1. Suspension polymerized, film-forming, non-tacky, solvent and water insoluble, plastic, polymeric microspheres having a diameter of at least 1 micron, formed from free radically polymerizable monomers.

5,595,822

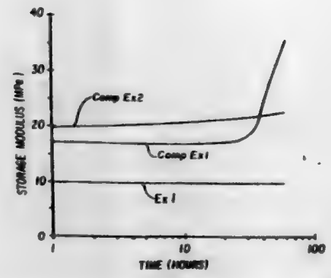
Patent Not Issued For This Number

5,595,823

FUSER MEMBERS OVERCOATED WITH FLUOROCARBON ELASTOMER CONTAINING ALUMINUM OXIDE

Jiann H. Chen, Fairport; John J. Fitzgerald; William B. Vreeland, II, both of Webster; Wayne T. Ferrar, Fairport; Gary F. Roberts, Macedon, and William J. Staudenmayer, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1994, Ser. No. 268,139
Int. Cl.[6] B05C *11/02*
U.S. Cl. 428—421 13 Claims



1. A fuser member comprising a core and a layer overlying said core, said layer comprising: a cured fluorocarbon random copolymer comprising subunits having the general structures:



wherein
x is from 30 to 90 mole percent,
y is from 10 to 70 mole percent, and
z is from 0 to 34 mole percent;
said layer further comprising particulate filler, said particulate filler including aluminum oxide and a material selected from the group consisting of alkali metal oxides, alkali metal hydroxides, and combinations thereof; said particulate filler having a total concentration in said layer of from about 25 to 50 percent of the total volume of said layer, said aluminum oxide having a concentration of from 20 to 40 percent of the total volume of said layer.

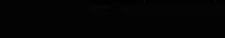
5,595,824

MAGNETIC RECORDING MEDIA INCORPORATING A POLYISOCYANATE CROSSLINKING AGENT SYSTEM COMPRISING TWO DIFUNCTIONAL AND ONE TRIFUNCTIONAL DIISOCYANATE ADDUCTS

Norman E. Rustad, Shoreview, Minn., assignor to Imation Corp., St. Paul, Minn.

Continuation of Ser. No. 85,189, Jun. 30, 1993, abandoned. This application Jul. 20, 1995, Ser. No. 504,463
Int. Cl.[6] G11B *5/702*
U.S. Cl. 428—425.9 41 Claims

1. A magnetic recording medium, comprising a magnetic coating provided on a nonmagnetizable substrate, wherein the magnetic coating comprises a magnetic pigment dispersed in a polymeric binder, said binder being a matrix of cured components which comprise a film-forming, unhindered, aromatic polyisocyanate crosslinking agent and a polymer component, wherein:
(a) the polyisocyanate crosslinking agent comprises
(i) a diisocyanate of the formula



(ii) a first diisocyanate adduct of the formula



and

(ii) a second diisocyanate adduct of the formula



wherein:

each A moiety is independently a divalent, organic linking group having a chemical structure such that each NCO group pendant from each A moiety is aromatic and unhindered;

X is a divalent, organic linking group;

Y is a trivalent, organic linking group;

the crosslinking agent comprises less than about 25 weight percent of the diisocyanate; and

the weight ratio of the difunctional diisocyanate adduct to the trifunctional diisocyanate adduct is in the range from about 1:20 to 20:1; and

(b) the polymer component comprises at least one polymer having pendant hydroxyl groups.

5,595,825

TRANSPARENT SUBSTRATE PROVIDED WITH A STACK OF THIN FILMS ACTING ON SOLAR AND/OR INFRARED RADIATION

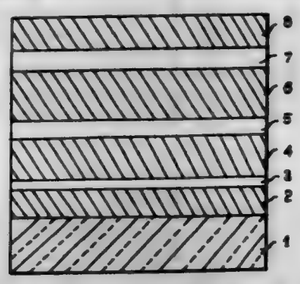
Olivier Guiselin, Paris, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Sep. 21, 1994, Ser. No. 309,652

Claims priority, application France, Sep. 23, 1993, 93 11339

Int. Cl.[6] B32B *17/06*

U.S. Cl. 428—428 **24 Claims**



1. A laminate having an external light reflection of blue or blue-green with a dominant wavelength in the range of from about 470 to 500 nm, said external light reflection remaining substantially constant in said range irrespective of viewing angle, which comprises a first transparent substrate and a plurality of thin films deposited thereon, said plurality of thin films comprising successively from the substrate:

i) a first dielectric material film;

ii) a first film having infrared reflection properties;

iii) a second dielectric material film;

iv) a second film having infrared reflection properties;

v) a third dielectric material film;

vi) a third film having infrared reflection properties; and

vii) a fourth dielectric material film, wherein the thickness of said third film having infrared reflection properties (vi) is greater than the thickness of said second film having infrared reflection properties (iv), and wherein the thickness of said second film having infrared reflection properties (iv) is greater than the thickness of said first film having infrared reflection properties (ii).

5,595,826

CURABLE ORGANOPOLYSILOXANE COMPOSITIONS WITH IMPROVED ADHESION

Thomas E. Gray, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 11, 1995, Ser. No. 540,815

Int. Cl.[6] B32B *9/06*

U.S. Cl. 428—450 **27 Claims**

1. A curable organopolysiloxane composition having improved adhesion to a substrate, the composition comprising

(A) 100 parts by weight of an organopolysiloxane containing at least two silicon-bonded lower alkenyl groups in each molecule and having a viscosity within a range of about 0.03 Pa·s to 100 Pa·s at 25° C.,

(B) from 0.3 to 40 parts by weight of an organohydrogenpolysiloxane crosslinker containing at least two silicon-bonded hydrogens per molecule,

(C) a catalytically effective amount of a platinum group metal catalyst,

(D) from 0.01 to 30 parts by weight of an epoxy functional compound,

(E) from 0.01 to 30 parts by weight of a compound comprising at least one hydroxy group and in the same molecule at least one substituent selected from a group consisting of silicon hydride, alkenyl, and acryl, and

(F) from 0.0005 to 1 part by weight of a catalyst selected from a group consisting of compounds of aluminum and compounds of zirconium, effective in promoting adhesion of the curable organopolysiloxane to a substrate.

5,595,827

POLYPROPYLENE RESIN COMPOSITION AND THE USE OF THE SAME

Masaya Yamada; Michio Turiumi, both of Ichihara; Tetsunori Shinozaki, and Mamoru Kioka, both of Waki-cho, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 274,751, Jul. 14, 1994, Pat. No. 5,536,773. This application Jun. 5, 1995, Ser. No. 463,674

Claims priority, application Japan, Jul. 16, 1993, 5-177828; Jul. 16, 1993, 5-177024

Int. Cl.[6] B32B *27/08; 7/00*

U.S. Cl. 428—516 **8 Claims**

1. A polypropylene multi-layer streched film comprising:

[I] a base layer formed from a polypropylene resin composition comprising:

(A) 80 to 95% by weight of a propylene polymer having such properties that:

a melt flow rate (MFR) of said polymer at 230° C. under a load of 2.16 kg is in the range of 0.1 to 500 g/10 min,

a pentad isotacticity [M_s] obtained from the following formula (1) using absorption intensity [Pmmmm] and [Pw] in a ^{13}C-NMR spectrum of a boiled heptane-insoluble component contained in said polymer is in the range of 0.970 to 0.995,

a pentad tacticity [M_3] obtained from the following formula (2) using absorption intensity [Pmmrm], [Pmmrr], [Pmrrr], [Prmrr], [Prmmr], [Prrrr] and [Pw] in a ^{13}C-NMR spectrum of a boiled heptane-insoluble component contained in said polymer is in the range of 0.0020 to 0.0050, and

a crystallinity of a boiled heptane-insoluble component contained in said polymer is not less than 60%; and

(B) 20 to 5% by weight of a terpene resin having no polar group and/or a petroleum resin having no polar group,

wherein said base layer has a glass transition temperature (Tg) of 0° to 10° C., and

[II] a surface layer formed from a propylene polymer

(C) having such properties that:

a pentad isotacticity [M_s] obtained from the following formula (3) using absorption intensity [Pmmmm], [Pw], [Sαγ], [Sαδ$^+$] and [Tδ$^+$δ$^+$] in a ^{13}C-NMR spectrum of a boiled heptane-insoluble component contained in said polymer is in the range of 0.925 to 0.975,

a pentad tacticity [M_3] obtained from the following formula (4) using absorption intensity [Pmmrm], [Pmrmr], [Pmrrr], [Prmrr], [Prmmr], [Prrrr], [Pw], [Sαγ], [Sαδ$^+$] and [Tδ$^+$δ$^+$] in a ^{13}C-NMR spectrum of a boiled heptane-insoluble component contained in said polymer is in the range of 0.0020 to 0.0050,

wherein said base layer has a thickness of 80% or more based on the total thickness of said film;

$$[M_5] = \frac{[Pmmmm]}{[Pw]} \quad (1)$$

wherein

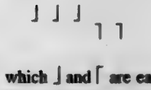
[Pmmmm] is absorption intensity of methyl groups present in the third unit among continuous five propylene units which are bonded to each other with meso form, and

[Pw] is absorption intensity of all methyl groups in a propylene unit;

$$[M_3] = \frac{[Pmmrm] + [Pmrmr] + [Pmrrr] + [Prmrr] + [Prmmr] + [Prrrr]}{[Pw]} \quad (2)$$

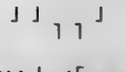
wherein

[Pmmrm] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



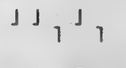
in which ⌋ and ⌈ are each a propylene unit,

[Pmrmr] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



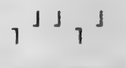
in which ⌋ and ⌈ are each a propylene unit,

[Pmrrr] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



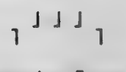
in which ⌋ and ⌈ are each a propylene unit,

[Prmrr] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



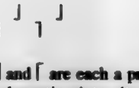
in which ⌋ and ⌈ are each a propylene unit,

[Prmmr] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



in which ⌋ and ⌈ are each a propylene unit,

[Prrrr] is absorption intensity of methyl groups present in the third unit among continuous five propylene units represented by



in which ⌋ and ⌈ are each a propylene unit, and

[Pw] is absorption intensity of all methyl groups in a propylene unit;

$$[M_5] = \frac{[Pmmmm]}{[Pw] - 2([S\alpha\gamma] + [S\alpha\delta^+]) + 3[T\delta^+\delta^+]} \quad (3)$$

wherein

[Pmmmm] and [Pw] have the same meanings as defined in the above formula (2),

[Sαγ] is absorption intensity of such secondary carbons that are present in a main chain and out of two kinds of tertiary carbons positioned nearest to said secondary carbons one is situated at the α position and the other is situated at the γ position,

[Sαδ$^+$] is absorption intensity of such secondary carbons that are present in a main chain and out of two kinds of tertiary carbons positioned nearest to said secondary carbons one is situated at the α position and the other is situated at the δ position or farther than the δ position, and

[Tδ$^+$δ$^+$] is absorption intensity of such tertiary carbons that are present in a main chain and out of two kinds of tertiary carbons positioned nearest to said tertiary carbons one is situated at the δ position or farther than the δ position and the other is also situated at the δ position or farther than the δ position;

$$[M_3] = \frac{[Pmmrm] + [Pmrmr] + [Pmrrr] + [Prmrr] + [Prmmr] + [Prrrr]}{[Pw] - 2([S\alpha\gamma] + [S\alpha\delta^+]) + 3[T\delta^+\delta^+]} \quad (4)$$

wherein

[Pmmrm], [Pmrmr], [Pmrrr], [Prmrr], [Prmmr], [Prrrr] and [Pw] have the same meanings as defined in the above formula (2), and [Sαγ], [Sαδ$^+$] and [Tδ$^+$δ$^+$] have the same meanings as defined in the above formula (3).

5,595,828

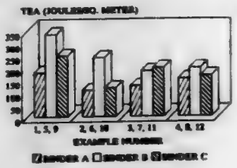
POLYMER-REINFORCED, EUCALYPTUS FIBER-CONTAINING PAPER

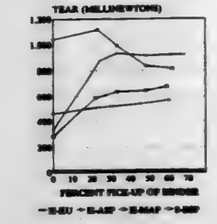
Robert E. Weber, Marietta; Linda G. Harris, Lawrenceville, and Amy B. Reed, Marietta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 346,665, Nov. 30, 1994. This application May 26, 1995, Ser. No. 451,590

Int. Cl.[6] D21H *21/22; 11/00*; B32B *29/00*; D21F *11/00*

U.S. Cl. 428—537.5 **11 Claims**





1. An improved-strength, polymer-reinforced paper comprising:

fibers, of which from about 60 to about 80 percent on a dry weight basis are eucalyptus fibers and from about 5 to about 25 percent on a dry weight basis are synthetic fibers; and

from about 15 to about 60 percent on a dry weight basis, based on the dry weight of the fibers, of a latex binder.

5,595,829

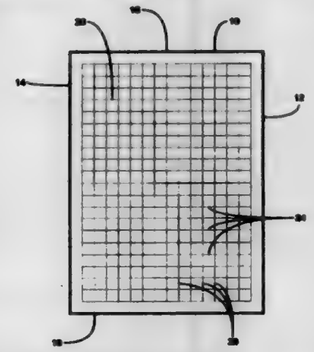
POSTERBOARD

Barbara R. Pitts, 3100 Bullock, Plano, Tex. 75023, and Mary R. Sarno, 11342 Straight Ln., Dallas, Tex. 75229

Filed Jul. 12, 1995, Ser. No. 501,385

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—537.5 **19 Claims**



1. An improved posterboard, comprising:

a rectangular posterboard having vertical side edges and horizontal top and bottom edges;

guide markings printed on the posterboard;

the guide markings being visually perceptible at a writing distance away from the posterboard, and substantially imperceptible at a viewing distance away from the posterboard.

5,595,830

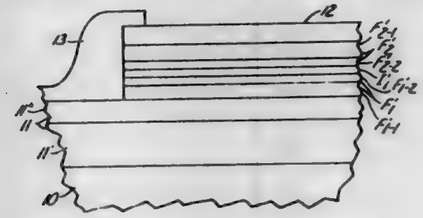
MAGNETORESISTIVE STRUCTURE WITH ALLOY LAYER HAVING TWO SUBSTANTIALLY IMMISCIBLE COMPONENTS

James M. Daughton, Edina, Minn., assignor to Nonvolatile Electronics, Incorporated, Eden Prairie, Minn.

Continuation of Ser. No. 976,985, Nov. 6, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 232,324

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—611 **50 Claims**



1. A magnetoresistive thin-film layer structure, said structure comprising:

a substrate having a major surface portion;

a magnetoresistive, anisotropic first ferromagnetic thin-film provided on said substrate major surface portion;

an intermediate layer provided on said first ferromagnetic thin-film with a thickness of less than 30 Å, said intermediate layer being formed of a substantially nonmagnetic, conductive alloy having two substantially immiscible components therein; and

a magnetoresistive, anisotropic second ferromagnetic thin-film provided on said intermediate layer.

5,595,831

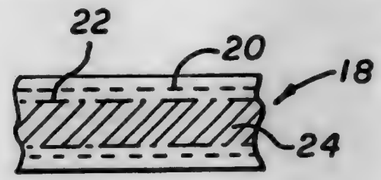
CADIUM-FREE CORROSION PROTECTION FOR TURBINES

Eugene V. Clark, 7327 Elmo St., Tujunga, Calif. 91042

Continuation-in-part of Ser. No. 190,678, Jan. 31, 1994, abandoned, and Ser. No. 188,968, Jan. 28, 1994, abandoned. This application May 15, 1995, Ser. No. 440,849

Int. Cl.[6] B32B *15/18*; F01D *5/28*

U.S. Cl. 428—679 **15 Claims**



1. Method of protecting from environmental corrosion fluid directing surfaces of steam or gas turbine components comprising chromium steel having a 5 to 12% by weight chromium content, including depositing onto the component surfaces to be protected a nickel-zinc coating layer in a weight ratio of 65–80% nickel and 20–35% zinc, and in advance thereof plating said component surfaces with nickel having low diffusivity to zinc to limit the penetration of zinc into said component surface from said coating layer.

5,595,832

MOLTEN CARBONATE FUEL CELL

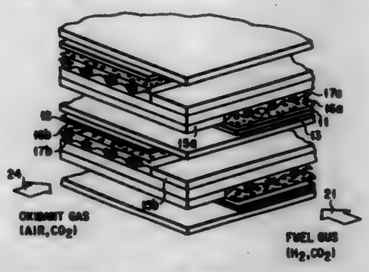
Norihiro Tsunisatsu, Kawasaki; Hideyuki Ohzu; Yoshihiro Akasaka, both of Yokohama; Kazuaki Nakagawa, Urayasu, and Hiroshi Tateishi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 2, 1994, Ser. No. 299,652

Claims priority, application Japan, Sep. 3, 1993, 5-219305

Int. Cl.[6] H01M *8/14*

U.S. Cl. 429—16 **22 Claims**



1. A molten carbonate fuel cell, comprising:

a pair of conductive electrodes;

an electrolyte body sandwiched between the pair of electrodes and including a porous body containing a retaining material and a reinforcing material and an electrolyte impregnated in said porous body and containing an alkali carbonate mixture, said retaining material containing fine particles having an average particle diameter of 0.2 to 0.6 μm and said reinforcing material containing short fibers having an average diameter of 0.5 to 5 μm and an average length of at most 50 μm;

fuel gas supplying means for supplying a fuel gas to one of the pair of electrodes; and

oxidant gas supplying means for supplying an oxidant gas to the other of the pair of electrodes.

5,595,833

SOLID OXIDE FUEL CELL STACK

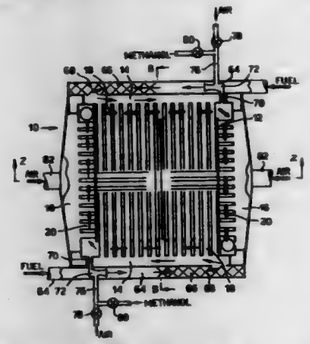
Frederick J. Gardner; Michael J. Day, both of Derby; Nigel P. Brandon, Leicestershire, and John B. Brownell, Derbyshire, all of England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 392,544, Feb. 16, 1995, Pat. No. 5,486,428. This application Sep. 7, 1995, Ser. No. 525,372

Claims priority, application United Kingdom, Feb. 19, 1994, 9403198

Int. Cl.[6] H01M *8/10*

U.S. Cl. 429—19 **24 Claims**



1. A solid oxide fuel cell stack comprising

a plurality of solid oxide electrolyte members, each solid oxide electrolyte member having a first surface and a second oppositely facing surface, an anode electrode on the first surface of each solid oxide electrolyte member and a cathode electrode on the second opposite surface of each solid oxide electrolyte member to form a fuel cell, each anode electrode partially defining an anode chamber, each cathode electrode partially defining a cathode chamber,

means to define passages internally of the solid oxide fuel cell stack, the passages supplying hydrogen to the anode chambers, the passages containing a catalyst suitable for steam reforming hydrocarbon fuel to hydrogen and other product gases, the means to define the passages being in intimate thermal contact with the solid oxide fuel cells such that waste heat from the solid oxide fuel cells provides the endothermic heat requirements for the steam reforming reaction,

an adiabatic prereformer to convert heavier hydrocarbon fuels to methane, hydrogen and oxides of carbon and supplies the methane, hydrogen and oxides of carbon to the passages,

means to supply oxidant to the cathode chambers,

means to supply hydrocarbon fuel to the prereformer.

5,595,834

ANNULAR FEED AIR BREATHING FUEL CELL STACK

Mahlon S. Wilson, Los Alamos, N.M., and Jay K. Neutzler, Peoria, Ariz., assignors to The Regents of the University of Calif., Alameda, Calif.

Continuation-in-part of Ser. No. 522,885, Sep. 1, 1995, Pat. No. 5,514,486. This application Jan. 17, 1996, Ser. No. 587,430

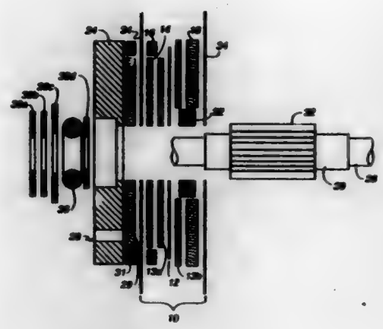
Int. Cl.[6] H01M *8/10*

U.S. Cl. 429—30 **16 Claims**

1. A polymer electrolyte fuel cell comprising:

fuel cell components defining a periphery and distributed along a common axis, said fuel cell components comprising a polymer electrolyte membrane, an anode and a cathode contacting opposite sides of said membrane, and fuel and oxygen flow fields contacting said anode and said cathode, respectively, wherein said components define an annular region therethrough along said axis; and

a fuel distribution manifold within said annular region connected to deliver fuel to said fuel flow field, wherein said fuel distribution manifold is a hydrophilic material for redistributing water produced by fuel and oxygen reacting at said cathode.



5,595,835

SEALED TYPE BATTERY

Kenichi Miyamoto; Hisashi Tsukamoto; Tetsuo Kojima; Takao Maki, and Masanori Kogure, all of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

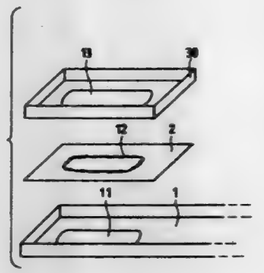
PCT No. PCT/JP94/01210, § 371 Date May 22, 1995, § 102(e) Date May 22, 1995

PCT Filed Jul. 22, 1994, Ser. No. 406,847

Claims priority, application Japan, Jul. 22, 1993, 5-282734; Jun. 30, 1994, 6-171882

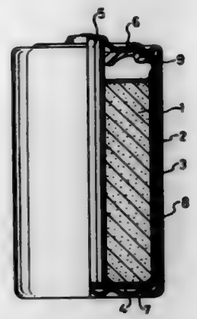
Int. Cl.[6] H01M *2/00*

U.S. Cl. 429—56 **19 Claims**



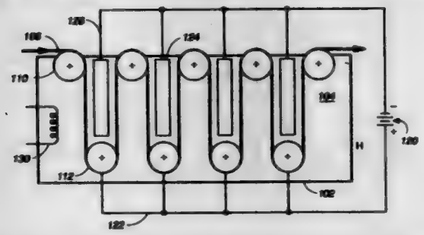
1. A sealed battery including a safety valve device in which metal plates in a laminate are integrally fixed by laser welding, said laminate being comprised of a cover plate having a hole, a metal thin plate, and a holding plate having a hole defined by a perimeter, characterized in that the hole of the holding plate extends throughout an entire area between the perimeter, and the metal thin plate is arranged between the cover plate and the holding plate so as to contact a bottom surface of the cover plate and a top surface of the holding plate and interrupt a gas discharging hole formed by the holes of the metal thin plate and cover plate.

5,595,836
MANGANESE DRY BATTERY
Eiji Tano, Osaka; Shohei Nozaki, Mino; Ryohei Ashihara, Neyagawa; Hajime Murakami, Kishiwada; Kohei Kubota, Okegawa; Akira Kato, Tsuzuno, and Koichi Sato, Akishima, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, and Mitsui Mining & Smelting Co., Ltd., Tokyo, both of Japan
Filed Jun. 7, 1995, Ser. No. 482,701
Claims priority, application Japan, Jun. 14, 1994, 6-131596; Aug. 3, 1994, 6-182376
Int. Cl.[6] H01M 2/02
U.S. Cl. 429—166 8 Claims



1. A manganese dry battery comprising an anode zinc can of a bottomed cylindrical shape, a cathode mixture including an active material of manganese dioxide and contained in said anode zinc can, a cathode collector inserted in said cathode mixture, and a separator interposed between said anode zinc can and said cathode mixture; wherein said anode zinc can is made of a zinc alloy containing 0.01–0.4 wt. % of lead, 0.001–0.5 wt. % of titanium, and at least one member selected from the group consisting of 0.001–0.05 wt. % of indium and 0.001– 0.05 wt. % of bismuth.

5,595,837
PROCESS FOR PRELITHIATION OF CARBON BASED ANODES FOR LITHIUM BATTERIES
Ib I. Olsen, and Rene Kokkeng, both of Henderson, Nev., assignors to Valence Technology, Inc., Henderson, Nev.
Filed Apr. 12, 1995, Ser. No. 422,185
Int. Cl.[6] H01M 10/40
U.S. Cl. 429—194 42 Claims

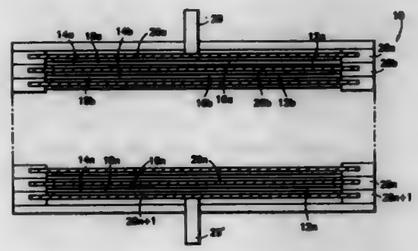


10. An electrochemical cell fabricated by a process comprising the steps of:
(a) preparing a carbon anode in a process compriaing of:
(i) providing a carbon material that is capable of intercalating lithium metal; and
(ii) prelithiating said carbon material with lithium metal;
(b) providing a cathode that comprises a lithiated compound; and
(c) forming a solvent-containing electrolyte that is interposed between said anode and said cathode.

5,595,838
METHOD FOR MANUFACTURING CARBON COMPOSITE ELECTRODE MATERIAL
Kazuo Yamada, Nara-ken; Hideaki Tanaka, Nara; Takehito Mitate, and Masaharu Yoshikawa, both of Nara-ken, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 13,029, Feb. 3, 1993, abandoned.
This application Oct. 17, 1994, Ser. No. 323,572
Claims priority, application Japan, Feb. 4, 1992, 4-017969
Int. Cl.[6] C25B 11/04
U.S. Cl. 429—209 21 Claims

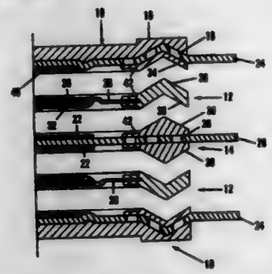
1. A method for manufacturing a carbon composite electrode comprising a plurality of carbon particles, each particle having a crystalline carbon core wherein the crystalline carbon particle core is natural graphite, kish graphite, or graphitizing carbons obtained by heat treating at a temperature above about 2000° C., wherein a plurality of carbon particles are formed into a carbon composite electrode, the method comprising:
coating the surface of each crystalline carbon particle core with a film containing an element of Group VIII metal or an alloy thereof to obtain metal coated carbon particles,
depositing a carbon material on the surface of the resulting metal coated carbon particles by pyrolyzing a hydrocarbon, the carbon material having a degree of crystallinity lower than that of the crystalline carbon core, thereby providing a composite carbon particle, and
forming the carbon composite electrode from a plurality of the composite carbon particles.

5,595,839
BIPOLAR LITHIUM-ION RECHARGEABLE BATTERY
Sohrab Hossain, Niantic, Conn., assignor to Yardney Technical Products, Inc., Pawcatuck, Conn.
Continuation-in-part of Ser. No. 322,587, Oct. 13, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 456,391
Int. Cl.[6] H01M 10/40;4/96;4/36
U.S. Cl. 429—210 20 Claims



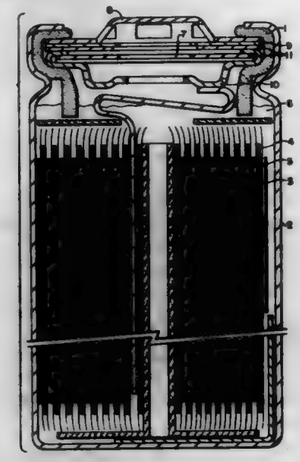
1. A bipolar rechargeable lithium-ion battery comprising: a plurality of individual electrochemical cells having positive and negative electrodes disposed in opposite face-to-face arrangement with a porous separator containing electrolyte therebetween, wherein the positive and negative electrodes of adjacent cells are disposed in electrical connection respectively with opposite sides of a common current-collecting element forming a unitary bipolar structure, said negative electrode comprising a layer of carbon adhered to one of said opposite sides of said current-collecting element and said positive electrode comprising a layer containing a lithium transition metal oxide compound adhered to the other opposite side of said element, and wherein said electrolyte comprises a lithium salt dissolved in a non-aqueous, organic solvent, and means for joining said unitary bipolar structure of adjacent cells together in a sealed stacked array.

5,595,840
METHOD OF MANUFACTURING MODULAR MOLDED COMPONENTS FOR A BIPOLAR BATTERY AND THE RESULTING BIPOLAR BATTERY
Jeffrey M. Henning, Eagan, and David L. Lund, Minneapolis, both of Minn., assignors to GNB Technologies, Inc., Mendota Heights, Minn.
Filed Nov. 27, 1995, Ser. No. 563,193
Int. Cl.[6] H01M 4/72
U.S. Cl. 429—210 14 Claims



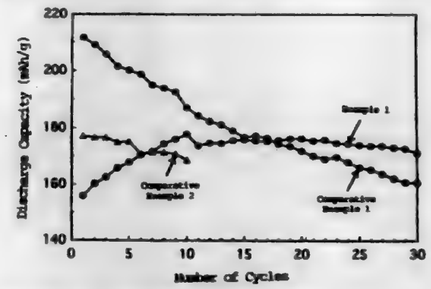
1. A method for making a modular molded plastic component for a bipolar battery, said component comprising an electrically conductive substrate having its periphery embedded in a molded plastic frame and the remainder of the surface exposed to accept an active material paste which method comprises providing a molded plastic component wherein the substrate has warpage and thereafter subjecting the substrate surface available to accept an active material paste to surface reformation in a configuration to eliminate the warpage in other than the area of the surface reformation.

5,595,841
NONAQUEOUS SECONDARY BATTERY
Ryuta Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 16, 1996, Ser. No. 633,011
Claims priority, application Japan, Apr. 19, 1995, 7-093768
Int. Cl.[6] H01M 4/62
U.S. Cl. 429—217 5 Claims



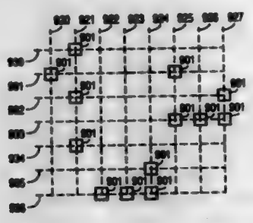
1. A nonaqueous electrolyte secondary battery which comprises a battery case enclosing therein a positive electrode and a negative electrode capable of intercalating and deintercalating lithium and a nonaqueous electrolytic solution containing a lithium salt, wherein one or both of said positive electrode and said negative electrode contain a copolymer comprising an acrylic or methacrylic ester, acrylonitrile and a vinyl monomer having an acid moiety.

5,595,842
LITHIUM SECONDARY BATTERY HAVING A CATHODE CONTAINING GALLIAM
Kenji Nakane; Yasunori Nishida, both of Ibaraki-ken; Chikashi Akamatsu, Ehime-ken; Tomoari Satoh, Ibaraki-ken; Kazuyuki Tanino, Ibaraki-ken, and Taketsugu Yamamoto, Ibaraki-ken, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan
Filed May 9, 1995, Ser. No. 438,654
Claims priority, application Japan, May 10, 1994, 6-096294; Aug. 4, 1994, 6-183462
Int. Cl.[6] H01M 4/52
U.S. Cl. 429—223 12 Claims



1. A lithium secondary battery comprising:
a cathode including, as an active material, a material that can be doped/undoped with lithium ions;
an anode including, as an active material, a lithium metal, a lithium alloy or a material that can be doped/undoped with lithium ions; and
a liquid or solid electrolyte,
wherein said active material in said cathode is lithiated nickel dioxide containing gallium.

5,595,843
LAYOUT METHODOLOGY, MASK SET, AND PATTERNING METHOD FOR PHASE-SHIFTING LITHOGRAPHY
Giang T. Dao, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.
Filed Mar. 30, 1995, Ser. No. 413,405
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 8 Claims



1. A method of producing a device layer layout comprising the steps of:
defining a plurality of lines;
defining a plurality of device features, wherein at least some of said features comprise segments extending in a first and a second direction; and

placing each of said plurality of device features in a known relationship with respect to one of said lines.

5,595,844

METHOD OF EXPOSING LIGHT IN A METHOD OF FABRICATING A RETICLE

Yoko Tamedaji; Makoto Nakase, both of Tokyo, Japan; Takashi Sato, Fishkill, N.Y.; Hiroshi Hazama, Yokohama, Japan; Haruki Komano, Yokohama, Japan, and Shinichi Ito, Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 192,891, Feb. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 798,721, Nov. 29, 1991. This application May 30, 1995, Ser. No. 453,667

Claims priority, application Japan, Nov. 29, 1990, 331308; Jul. 3, 1991, 163131; Nov. 11, 1991, 294540; Nov. 13, 1991, 297461

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 **10 Claims**

1. A method of exposing light comprising the steps of:

forming a mask pattern made of a mask film pattern formed on a light-transmissible substrate, the mask pattern being a semi-transparent film which causes a length of an optical path for a light beam passing therethrough to be different from a length of an optical path for a light beam passing through the substrate by a predetermined amount, the step of forming a mask pattern comprising the steps of:

determining ranges of refractive index n and extinction coefficient k of the semi-transparent film within which an amplitude transmissivity ratio T and a phase difference ϕ between the semi-transparent film and air that has the same thickness of the semi-transparent film fall within ranges necessary to obtain desired resolution and depth of focus,

obtaining relationship in the form of a curved line between the refractive index n and the extinction coefficient k by changing conditions for formation of the mask pattern,

selecting values of the refractive index and the extinction coefficient k from the ranges thus determined, and determining the conditions for formation of the mask pattern such that the refractive index n and the extinction coefficient k become the selected values, and

forming a mask film pattern based on the conditions for formation of the mask pattern; and

irradiating an exposure beam onto a resist through a reticle using the mask pattern.

5,595,845

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, ELECTROPHOTOGRAPHIC APPARATUS INCLUDING SAME AND ELECTROPHOTOGRAPHIC APPARATUS UNIT

Tatsuo Maeda, Toride; Hideki Amayama, Yokohama; Yoichi Kawamoto, Chigasaki; Hiroyuki Ohmori, Tokyo, and Mayumi Kimura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1995, Ser. No. 489,133

Claims priority, application Japan, Jun. 10, 1994, 6-128774

Int. Cl.[6] G03G 5/047;15/22

U.S. Cl. 430—58 **11 Claims**

1. An electrophotographic photosensitive member, comprising: a support, a charge generation layer disposed on the support and a charge transport layer disposed on the charge generation layer, wherein said charge generation layer comprises oxytitanium phthalocyanine, a bisazo pigment and a hindered phenol.

5,595,846

PHTHALOCYANINE MIXED CRYSTAL, PRODUCTION METHOD THEREOF,AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Yasuyuki Shigematsu, Ushiku; Toyoshi Ohashi, Yokohama; Mariko Hayashi, Inashiki-gun, and Shinichi Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Jun. 20, 1995, Ser. No. 492,493

Claims priority, application Japan, Jun. 22, 1994, 6-140019; Aug. 18, 1994, 6-194190; Aug. 18, 1994, 6-194191

Int. Cl.[6] G03G 5/06

U.S. Cl. 430—58 **7 Claims**

1. An electrophotographic photoreceptor comprising an electrically conductive substrate having formed thereon a photosensitive layer containing a phthalocyanine mixed crystal, wherein the phthalocyanine mixed crystal is composed of titanyl phthalocyanine and hydrogen phthalocyanine, has peaks at 6.8°, 7.4°, 15.0°, 24.7°, 26.2°, and 27.2° of the Bragg angle (2θ±0.2°) in the X-ray diffraction spectrum and having a ratio of the peak intensity at 27.2° to the peak intensity at 6.8° of 1 or more.

5,595,847

PHOTOCONDUCTOR HAVING A CURED LAYER OF AN AMINO RESIN-PHENOL RESIN COPOLYCONDENSATE

Sumitaka Nogami; Michihiro Kitazawa, and Katsuhiro Sato, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Dec. 21, 1994, Ser. No. 361,331

Claims priority, application Japan, Dec. 27, 1993, 5-329192

Int. Cl.[6] G03G 5/14

U.S. Cl. 430—64 **20 Claims**

1. A photoconductor for electrophotography, comprising:

an electroconductive substrate; and

a photosensitive layer provided on the electroconductive substrate and comprised of an intermediate layer, a charge generation layer, and a charge transfer layer laminated in this order,

wherein the intermediate layer is a doped layer and is comprised of a cured layer of a copolycondensate between an amino resin and a phenolic resin that has been subjected to doping with at least one dopant.

5,595,848

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER PRODUCED FROM ALUMINUM PIPE

Mutsuo Ohtaka, Ryugasaki; Hisami Tanaka, Yokohama; Shinichi Shibuyama, Toride; Yosuke Okubo, Ushiku, and Toru Nakajima, Tsukuba, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 9,734, Jan. 27, 1993, abandoned. This application Feb. 15, 1995, Ser. No. 389,626

Claims priority, application Japan, Jan. 31, 1992, 4-041954; Jan. 22, 1993, 5-025986

Int. Cl.[6] G03G 5/10

U.S. Cl. 430—69 **6 Claims**

1. An electrophotographic photosensitive member having a photosensitive layer on the surface of an aluminum pipe prepared by a process comprising the steps of cutting the aluminum pipe on its periphery, and thereafter carrying out rotary pressure rolling.

5,595,849

RESIN COMPOSITIONS FOR ELECTROPHOTOGRAPHIC TONER

Takashi Nihase, Kyoto, Japan, assignor to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Feb. 17, 1995, Ser. No. 390,572

Claims priority, application Japan, Feb. 17, 1994, 6-044871

Int. Cl.[6] G03G 9/087;9/083

U.S. Cl. 430—106.6 **13 Claims**

13. An electrophotographic toner comprising:

i) 45–95% by weight of a resin composition comprising:

(A) a styrenic polymer or a copolymer of a styrenic monomer with (meth)acrylic monomer or maleic monomer, wherein said (meth)acrylic monomer is selected from the group consisting of (meth)acrylic acid and C_{1-50} alkyl(meth)acrylates, and mixtures thereof, and wherein said polymer or copolymer has a weight average molecular weight of less than 500,000,

(B) a non-crosslinked non-crystallizable polymer having a polar group selected from the group consisting of hydroxyl group, carboxyl group, amino group, amide group, epoxy group and nitrile group, wherein:

(1) the weight ratio of (B)/(A) is in the range of (0.01–0.5)/1;

(2) said resin composition has at least one glass transition temperature in the range of 50°–70° C.;

(3) (B) has a glass transition temperature in the range of 15°–55° C., and (A) has a glass transition temperature higher than that of (B);

(4) a ratio of a weight average molecular weight of said resin composition, to a weight average molecular weight of (B) (Mwd/Mwb), is in the range of 20–1,000;

(5) (B) has a number average molecular weight (Mnb) in the range of 500–2,500; and

(6) (A) and (B) have solubility parameters, satisfying the following equation (1);

$$-5.5\times10^{-4}\,Mnb+0.74\leqq SPb-SPa\leqq-5.5\times10^{-4}\,Mnb+1.39 \quad (1)$$

wherein SPa is the solubility parameter of (A), and SPb is the solubility parameter of (B);

ii) 1–10% by weight of a colorant; and

iii) 0–50% by weight of a magnetic powder.

5,595,850

FERRITE CARRIER FOR ELECTROPHOTOGRAPHIC DEVELOPER AND DEVELOPER CONTAINING THE CARRIER

Toshio Honjo; Yuji Sato; Kanao Kayamoto; Masahiro Ogata, and Hiromichi Kobayashi, all of Kashiwa, Japan, assignors to Powdertech Co., Ltd., Chiba-ken, Japan

Filed Jun. 28, 1995, Ser. No. 496,823

Claims priority, application Japan, Jul. 5, 1994, 6-174909

Int. Cl.[6] G03G 9/107

U.S. Cl. 430—106.6 **14 Claims**

1. A ferrite carrier for electrophotographic developers which comprises a Mn-Mg ferrite having the general formula

$$(MnO)_x(MgO)_y(Fe_2O_3)_z$$

wherein x+y+z=100 mol % and SrO is substituted for a part of the MnO, MgO and/or Fe_2O_3; and

said Mn-Mg ferrite is formed by the method comprising a first step mixing MnO, MgO, and Fe_2O_3 with a predetermined amount of SrO or $SrCO_3$ to form a mixture, a second step of grinding and mixing said mixture with water to form a slurry, a third step of drying said slurry to form a dried slurry product, a fourth step of grinding and incorporating said dried slurry product with a dispersing agent and a binder to form an incorporated product, a fifth step of granulating said incorporated product to form a multitude of particles, and a sixth step of maintaining said multitude of particles at a temperature of from about 1000° C. to about 1500° C. for about 1 hour to about 24 hours.

5,595,851

CONDUCTIVE DEVELOPER COMPOSITIONS WITH COATED CARRIER PARTICLES

John A. Creatura, Ontario; Catherine A. McKnight, Penfield; Michael J. Duggan, Webster; Arun J. Cogswell, Penfield, all of N.Y.; Michael F. Cunningham, Georgetown, Canada, and Thomas C. Dombroski, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 21, 1995, Ser. No. 493,063

Int. Cl.[6] G03G 9/113

U.S. Cl. 430—108 **32 Claims**

1. A conductive carrier composition comprised of a core with a coating thereover consisting essentially of a mixture of first and second polymers, and wherein the first polymer contains a conductive component, and the second polymer contains a metal oxide, and wherein said carrier composition possesses a substantially constant conductivity of from about 10^{-9} (ohm-cm)$^{-1}$ to 10^{-7} (ohm-cm)$^{-1}$ and a positive triboelectric charging value of from about 5 microcoulombs per grams to about 40 microcoulombs per gram, and wherein the conductive component and the metal oxide are tribocontrast pigments that are not in close proximity in the triboelectric series, and wherein said conductive component and said metal oxide are dispersed in said polymers.

5,595,852

ORGANOSILICON COMPOUND, PRODUCING METHOD THEREOF AND TONER AND DRY-TYPE DEVELOPER USING THE SAME

Masakatsu Shimoda, Higashikurume; Haruo Iimura, Yamato; Hiroyuki Takahashi, Yokohama, and Fuyuhiko Matsumoto, Yamato, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1995, Ser. No. 534,640

Claims priority, application Japan, Sep. 29, 1994, 6-234571; Jan. 26, 1995, 7-030018; Mar. 31, 1995, 7-076641; Mar. 31, 1995, 7-076826; Sep. 11, 1995, 7-233135; Sep. 12, 1995, 7-234526; Sep. 27, 1995, 7-273683

Int. Cl.[6] G03G 9/097

U.S. Cl. 430—110 **18 Claims**

1. A toner for developing latent electrostatic images comprising toner particles which comprise a resin, a coloring agent, and an organosilicon compound of formula (I):

$$[R^2\text{—}SiCH_2CH_2CH_2NMe_2R^4]^+X^- \quad (I)$$

(with R^1, R^3 attached to the Si)

wherein R^1, R^2 and R^3 each is an alkyl group having 1 to 6 carbon atoms, or a phenyl group which may have a substituent; R^4 is an alkyl group which may have a substituent, an alicyclic alkyl group,

a phenyl group which may have a substituent, or a benzyl group which may have a substituent; and X is a halogen atom, a benzenesulfonate radical, a hydroxynaphthalenesulfonate radical, BPh_4, BF_4, ClO_4, or $SbCl_5$.

5,595,853

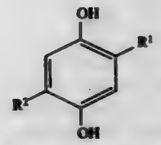
OPTICAL IMAGE FORMING MATERIAL

Makoto Ono, and Naoto Yanagihara, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1995, Ser. No. 528,010
Claims priority, application Japan, Oct. 14, 1994, 6-249112
Int. Cl.[6] G03C 1/675
U.S. Cl. 430—138 8 Claims

1. An optical image forming material comprising a support having thereon at least a coating layer containing (1) microcapsules containing a leuco dye which forms color when it is oxidized and a photooxidizing agent, and (2) a reducing agent and a fixing accelerator present outside of said microcapsules, wherein said reducing agent comprises a hydroquinone compound substituted by an alkyl group at each of 2- and 5-positions thereon, and said fixing accelerator comprises 2,2-bis(4-hydroxy-phenyl)propane;

wherein said hydroquinone compound is represented by general formula (1):



(1)

wherein R^1 and R^2 each represents an alkyl group.

5,595,854

METHOD FOR THE FORMATION OF HEAT MODE IMAGE

Luc Leenders, Herentals; Herman Uytterhoeven, Bonheiden; Rita Tarik, Herentbout; Leo Oulbrandt, Kruibeke; Carlo Uyttendaele, Borchem, and Jan Van den Bogaert, Schilde, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 8, 1995, Ser. No. 400,345
Claims priority, application European Pat. Off., Mar. 25, 1994, 94200794
Int. Cl.[6] G03C 8/08
U.S. Cl. 430—200 16 Claims

1. Method for the formation of a heat mode image comprising the steps of:

(1) preparing a donor element by coating on a support one or more donor layers containing, distributed over said one or more layers, a reducing agent, a radiation to heat converting compound, and optionally a polymeric binder;

(2) preparing an acceptor element by coating on a support an acceptor layer containing a reducible organic silver salt and a polymeric binder;

(3) bringing said donor element and said acceptor element in close contact with each other;

(4) information-wise exposing the contracting elements with laser radiation, thus inducing the partial or complete transfer of said donor layer(s) to the acceptor element and/or diffusion of said reducing agent into the acceptor element;

(5) peeling apart the donor and acceptor elements; and

(6) subjecting the separated acceptor element to an overall heat treatment.

5,595,855

RADIATION SENSITIVE COMPOSITION

Manirathan Padmanaban; Yoshiaki Kinoshita; Natsumi Suehiro; Takanori Kudo; Seiya Masuda; Yuko Nozaki; Hiroshi Okazaki, and Georg Pawlowski, all of Saitama, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Filed Feb. 17, 1995, Ser. No. 390,045
Claims priority, application Japan, Feb. 25, 1994, 6-028322
Int. Cl.[6] G03C 1/72
U.S. Cl. 430—270.1 18 Claims

1. A radiation sensitive composition comprising

a) a copolymer represented by the formula:

$$-(CH_2-CHR)_m-(CH_2-CR_1R_2)_n-$$

where R is a hydroxy-substituted aryl, wherein R is or is not further substituted with alkyl, where the hydroxyl group is or is not partially protected by an acid cleavable group, R_1 is hydrogen or a methyl group, R_2 is a phenyl, alkyl-substituted phenyl, halogenated phenyl, or acrylate group, and m and n are integers of 1 or more,

b) a polyacetal represented by the general formula:

$$-(CHR_3-O-R_4-X-NR_5)_p-$$

R_3 is an alkyl, aryl, or substituted aryl group, R_4 is an alkylene, cycloalkylene, alkene, or alkyne group, R_5 is an alkyl, alkene, alkyne, or cycloalkyl group, X is —OCO—, —CO—, or —NHCO—, and p is an integer of 1 or more,

c) a radiation sensitive compound capable of generating an acid upon exposure to actinic radiation,

d) a base capable of degrading into a neutral compound upon exposure to actinic radiation, and

e) a solvent for dissolving the components a), b), c), and d).

5,595,856

HEAT-RESISTANT PHOTORESIST COMPOSITION AND NEGATIVE-TYPE PATTERN FORMATION METHOD

Amane Mochizuki; Michio Ishii; Mamiko Maeda, and Kazumi Higuchi, all of Osaka, Japan, assignors to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 31, 1996, Ser. No. 594,720
Claims priority, application Japan, Feb. 14, 1995, 7-025132
Int. Cl.[6] G03F 7/038
U.S. Cl. 430—270.1 7 Claims

1. A heat-resistant photoresist composition comprising a resin component having a carbodiimide unit represented by the following formula (I), and a compound capable of inducing a basic compound by irradiation with actinic rays,

$$-(R-N=C=N)- \quad (I)$$

wherein R represents a divalent organic group.

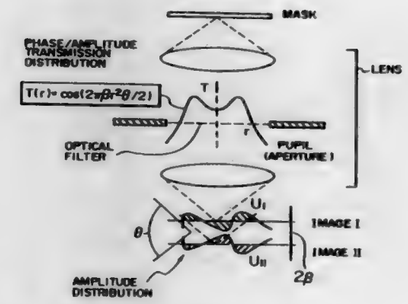
5,595,857

METHOD OF FORMING A PATTERN AND PROJECTION EXPOSURE APPARATUS

Hiroshi Fukuda, Kokubunji, and Tsuneo Terasawa, Ome, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 445,949, May 22, 1995, abandoned, which is a division of Ser. No. 225,821, Apr. 11, 1994, Pat. No. 5,418,598, which is a division of Ser. No. 765,860, Sep. 24, 1991, Pat. No. 5,316,896. This application Oct. 18, 1995, Ser. No. 543,254
Claims priority, application Japan, Oct. 24, 1990, 2-284229; Feb. 7, 1991, 3-016346; May 15, 1991, 3-110127
Int. Cl.[6] G03C 5/00
U.S. Cl. 430—311 12 Claims

1. A method of manufacturing a semiconductor device having a principal surface to be processed, comprising the steps of:



preparing a mask having a predetermined pattern;

preparing a projection lens structure having a filter;

forming first and second projected images of said predetermined pattern at a first image plane and a second image plane, respectively;

setting said principal surface between said first and second image planes; and

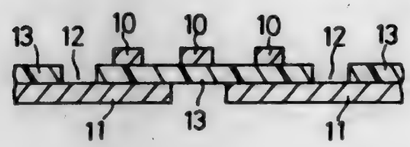
exposing said mask with light to project said predetermined pattern onto said principal surface through said projection lens structure.

5,595,858

MANUFACTURING METHOD FOR DOUBLE-SIDED WIRING BOARD

Fumio Akama, Ushiku, and Yasuyuki Tanaka, Tsuchiura, both of Japan, assignors to Nippon Mektron, Ltd., Tokyo, Japan

Filed Feb. 10, 1995, Ser. No. 387,291
Claims priority, application Japan, Mar. 25, 1994, 6-079878
Int. Cl.[6] G03C 5/00
U.S. Cl. 430—314 5 Claims



1. A manufacturing method for producing a double-sided wiring board comprising the sequential performance of the steps of

forming a photosensitive insulation bonding layer on one surface of a first conducting layer;

subjecting said photosensitive insulation bonding layer to exposure treatment so as to product an exposed area and at least a first unexposed area thereof;

forming a second conducting layer on the other surface of said photosensitive insulation bonding layer;

photoetching at least one of said first and second conducting layers to produce wiring patterns on at least one surface of said photosensitive insulation bonding layer;

removing the unexposed area of said photosensitive insulation bonding layer by development so as to form an access opening therethrough; and

forming the exposed area of said photosensitive insulation bonding layer into an insulating layer by curing.

5,595,859

PROCESS FOR PREPARING AN ARTICLE HAVING DEPOSITED THEREON A PHOTOIMAGEABLE ELECTRODEPOSITABLE PHOTORESIST COMPOSITION

Kurt G. Olson, Gibsonia; Michael G. Sandala, Allison Park; Steven R. Zawacky, Pittsburgh; Charles F. Kahle, II, Allison Park, all of Pa., and Masayuki Nakajima, Olmsted Township, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 268,778, Jun. 30, 1994, which is a continuation of Ser. No. 697,355, Jan. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 562,857, Aug. 19, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 478,151
Int. Cl.[6] G03C 5/00
U.S. Cl. 430—325 10 Claims

1. A process for preparing an article having a photoresist coating layer thereon comprising:

(a) electrodepositing a film of an electrodepositable photoresist composition onto an electrocoductive substrate by immersing the electroconductive substrate into an electrodeposition bath containing the electrodepositable composition and an anode in contact with the electrodepositable composition and passing an electric current between the anode and a cathode, wherein the electroconductive substrate serves as the cathode, and wherein the electrodepositable photoresist composition comprises an aqueous dispersion of:

(i) a water dispersible at least partially ionized unsaturated cationic polymeric material which is a reaction product of a first monomer having at least one epoxy group per molecule and a second monomer selected from the group consisting of amines, sulfides, phosphines, and mixtures thereof, further reacted with a partially blocked isocyanate which is a reaction product of a polyisocyanate and an active hydrogen-containing ethylenically unsaturated compound,

(ii) a nonionic ethylenically unsaturated material, and

(iii) a photoinitiator,

(b) dehydrating the film of the electrodepositable composition electrodeposited onto the electroconductive substrate to produce a non-tacky photoresist layer,

(c) exposing the non-tacky photoresist layer to radiation in a predetermined pattern so as to effect a difference in solubility between those parts of the dehydrated film which were exposed to radiation and those parts of the dehydrated film which were not exposed to radiation, and

(d) removing the soluble parts of the dehydrated film with a composition which comprises a dilute aqueous acidic solution.

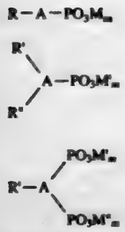
5,595,860

PROCESS FOR THE PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takatoshi Ishikawa, and Masakazu Yoneyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 5,160, Jan. 15, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,470
Claims priority, application Japan, Jan. 16, 1992, 4-024315
Int. Cl.[6] G03C 11/00; 5/18; 5/26; 7/46
U.S. Cl. 430—372 20 Claims

1. A process for processing an imagewise exposed silver halide color photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, comprising the step of developing in a color developer having a sulfite ion concentration of 1×10^{-3} mol/l or less, the color developer containing an aromatic primary amine color developing agent and at least one phosphorus compound selected from the group consisting of compounds represented by formula (I), formula (I-a) and formula (I-b) and internal salts derived from these compounds:

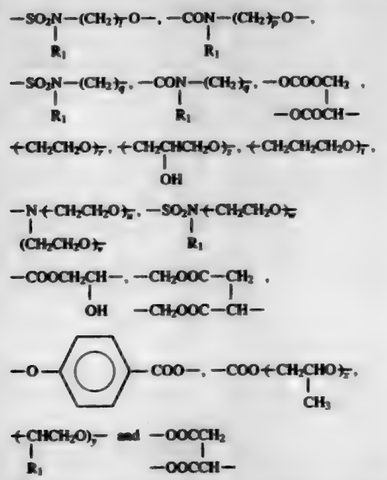


(I)

(I-a)

(I-b)

wherein R, R' and R" each represents an aliphatic hydrocarbon group having from 6 to 30 carbon atoms or an aryl group having from 10 to 24 carbon atoms; M, M' and M" each represents a hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium or a quaternary ammonium; m represents 2 when M, M' or M" is monovalent and m is 1 when M, M' or M" is divalent; and A represents a divalent or trivalent linking group comprising at least one group selected from the group consisting of



and combinations thereof; wherein R_1 represents a hydrogen atom or a substituted or unsubstituted C_{1-6} alkyl group, and l, p, q, r, s, t, u, v, w, x and y each represents an integer of from 1 to 30 except that r, s, t and y each is 2 to 30 when A comprises a single type of the above exemplified linking groups, and when A comprises a combination of the above exemplified linking groups the sum of l to y is from 2 to 60.

5,595,861

METHOD OF SELECTING AND APPLYING A TOP ANTIREFLECTIVE COATING OF A PARTIALLY FLUORINATED COMPOUND

Mario Garza, Sunnyvale, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 189,574, Jan. 31, 1994, which is a division of Ser. No. 907,757, Jun. 29, 1992, Pat. No. 5,330,883. This application Jun. 5, 1995, Ser. No. 461,119

Int. Cl.[6] G03C *1/825*

U.S. Cl. 430—510 **3 Claims**

1. A method of selecting and applying a top antireflective coating over a film of photoresist during semiconductor fabrication, comprising:

a) selecting a coating of a partially fluorinated compound capable of adhering well to photoresist, said partially fluorinated compound selected from the group consisting of:

(1) $R_fCH_2CH_2SCH_2CH_2CO_2Li$;
(2) $(R_fCH_2CH_2O)P(O)(ONH_4)_2$;
(3) $(R_fCH_2CH_2O)_2P(O)(ONH_4)$;
(4) $(R_fCH_2CH_2O)P(O)(OH)_2$;
(5) $(R_fCH_2CH_2O)_2P(O)(OH)$;
(6) $R_fCH_2CH_2SCH_2CH_2N^+(CH_3)_3CH_3SO_4^-$;
(7) $R_fCH_2CH(OCOCH_3)CH_2N^{+(CH_3)_2}CH_2CO_2^-$; and
(8) $R_fCH_2CH_2SO_3X$ (X=H or NH_4);
wherein R_f=$F(CF_2CF_2)_m$ and m=3–8; and

b) applying the coating over the photoresist to a thickness of L/4, where "L" is the wavelength of incident photolithographic light in the photoresist.

5,595,862

PHOTOGRAPHIC ELEMENTS CONTAINING MATTE PARTICLES OF BIMODAL SIZE DISTRIBUTION

Alfred B. Fant, Rochester; Yongcai Wang, Penfield; Dennis E. Smith, Rochester; Melvin M. Kestner, Hilton, and Rudolf D. Steinmetz, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 381,803, Feb. 1, 1995, Pat. No. 5,550,011. This application Sep. 25, 1995, Ser. No. 533,625

Int. Cl.[6] G03C *1/76;1/00;3/00*

U.S. Cl. 430—537 **15 Claims**

1. A photographic element comprises a support, at least one silver halide light-sensitive layer, and a protective overcoat comprising a hydrophilic binder and permanent matte particles, the permanent matte particles comprising a polymer of methyl methacrylate and having a size distribution of a first and a second mode, with the first mode being composed of particles having a mean particle size of from 0.2 to 1.2 micrometers in a coating weight of from 10 to 200 mg/m^2 and the second mode having a mean particle size of from 1.5 to 10 micrometers in a coating weight of from 5 to 150 mg/m^2, the total coating weight of the particles of the first and the second modes being greater than 100 mg/m^2.

5,595,863

SILVER HALIDE EMULSION PREPARED IN THE PRESENCE OF POLYMERS AND A PHOTOGRAPHIC MATERIAL USING THE SAME

Junichi Yamanouchi, and Yoichi Hosoya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 312,657, Sep. 27, 1994. This application Sep. 29, 1995, Ser. No. 537,225

Claims priority, application Japan, Sep. 28, 1993, 5-263128

Int. Cl.[6] G03C *1/035;1/04*

U.S. Cl. 430—567 **6 Claims**

1. A silver halide photographic emulsion which is prepared in the presence of:

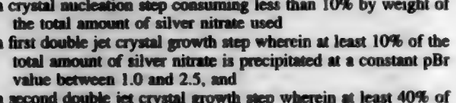
(A) at least one polymer comprising a recurring unit represented by Formula (1):



(1)

wherein the polymer having the recurring unit represented by Formula (1) is at least one polymer selected from:

(i) a vinyl polymer having a monomer represented by Formula (3) as a constitutional component:



(3)

and

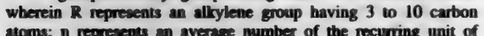
(ii) a polyurethane represented by Formula (4):



(4)

and

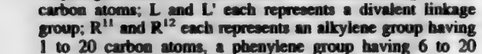
(B) at least one polymer comprising a recurring unit represented by Formula (2):



(2)

wherein the polymer having the recurring unit represented by Formula (2) is at least one polymer selected from:

(i) a vinyl polymer having a monomer represented by Formula (5) as a constitutional component:



(5)

(ii) a polyurethane represented by Formula (6):

(6)

and

(iii) polyethylene glycol which may be substituted by an alkyl group or an aryl group having from 1 to 30 carbon atoms;

wherein R represents an alkylene group having 3 to 10 carbon atoms; n represents an average number of the recurring unit of from 4 to 200; m represents an average number of the recurring unit of from 6 to 50;

R^1 and R^4 each represents a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; R^2 and R^5 each represents a hydrogen atom or a monovalent substituent having 1 to 20 carbon atoms; L and L' each represents a divalent linkage group; R^{11} and R^{12} each represents an alkylene group having 1 to 20 carbon atoms, a phenylene group having 6 to 20 carbon atoms or an aralkylene group having 7 to 20 carbon atoms; x, y, z, x', y' and z' each represents weight percentages of the recurring components; x and x' each represents 1 to 70; y and y' each represents 1 to 70; and z and z' each represents 20 to 70, wherein x+y+z=100 and x'+y'+z'=100.

5,595,864

METHOD FOR MAKING TABULAR SILVER HALIDE GRAINS

Marc Van den Zegel, Boortmeerbeek, and Marcel Mestdagh, Rymenam, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Continuation of Ser. No. 48,429, Apr. 20, 1993, abandoned. This application Jul. 13, 1994, Ser. No. 274,363

Claims priority, application European Pat. Off., May 5, 1992, 92201259

Int. Cl.[6] G03C *1/015*

U.S. Cl. 430—569 **11 Claims**

1. Method for the preparation of an emulsion with silver halide grains, wherein at least 70% of the total projected area of all the grains is provided by tabular grains, and wherein said tabular grains exhibit

an average aspect ratio of at least 2:1

an average thickness between 0.15 and 0.30 μm,

a coefficient of variation of the tabular grains between 0.15 and 0.45, said method compriaing the following steps:

preparing a dispersion medium containing a gelatino-peptizer and being adjusted to a pBr value between 1.0 and 2.0 by means of a bromide ions providing salt

a crystal nucleation step consuming less than 10% by weight of the total amount of silver nitrate used

a first double jet crystal growth step wherein at least 10% of the total amount of silver nitrate is precipitated at a constant pBr value between 1.0 and 2.5, and

a second double jet crystal growth step wherein at least 40% of the total amount of the silver nitrate used is added at a constant pBr value higher than 2.7.

5,595,865

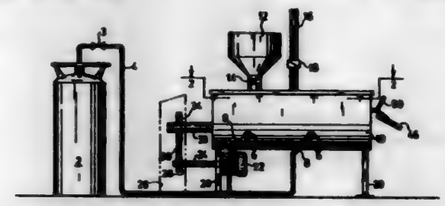
METHOD OF CHILLING A PHOTOGRAPHIC EMULSION

Steven D. Pomeroy, Penfield; Daniel J. Wooster, Ontario, both of N.Y., and David R. Bendle, Hemel Hempstead, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1990, Ser. No. 635,011

Int. Cl.[6] G03C *1/005; B01J 13/00; B01F 13/02*

U.S. Cl. 430—642 **17 Claims**



1. A method of chilling and gelling a liquid, photographic emulsion comprising:

feeding said liquid, photographic emulsion into a chamber and injecting coolant into said liquid emulsion within the chamber under conditions to convert the liquid to a gelled, photographic emulsion, wherein said coolant is gaseous at ambient room temperature and atmospheric pressure.

5,595,866

STEP-WISE METHOD TO REMOVE CRYOPROTECTANT FROM SPERM

John K. Critser, Carmel, and Dayong Gao, Indianapolis, both of Ind., assignors to Methodist Hospital of Indiana, Inc., Indianapolis, Ind.

Filed May 27, 1994, Ser. No. 250,675

Int. Cl.[6] A01N *1/02*

U.S. Cl. 435—2 **1 Claim**

1. A method to remove cryoprotectant from sperm cells of an animal species, comprising:

contacting sperm cells containing cryoprotectant with four or more stepwise additions of aliquots containing said cryoprotectant, wherein each aliquot has a concentration of cryoprotectant lower than that within the sperm cells with which it is contacted, and said concentration of each aliquot swelling the sperm cells to at least 90% of the upper cellular volume limit of the sperm cells but not substantially exceeding the upper cellular volume limit.

5,595,867

METHOD AND KIT FOR ENZYMATICALLY DETERMINING THE PH OF A SPECIMEN

Cheng-I Lin, Cupertino, and Yuh-Geng Tsay, Los Altos Hills, both of Calif., assignors to Diagnostic Reagents, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 398,693, Mar. 6, 1995, abandoned. This application May 26, 1995, Ser. No. 452,171

Int. Cl.[6] C12Q *1/00*

U.S. Cl. 435—4 **27 Claims**

1. A method of enzymatically determining the pH of a specimen, comprising

(a) mixing in a buffered solution (i) a sample of said specimen with (ii) an enzyme having an activity and (iii) a one or more substrates for said enzyme, said buffered solution having a pH effective to provide a direct proportional relationship between said activity of said enzyme and the pH of said specimen, wherein each of said sample, said enzyme, said substrate and said buffered solution is present in an amount effective to provide said direct proportional relationship between said activity of said enzyme and the pH of said specimen,

(b) determining said activity of said enzyme, and

(c) correlating said activity of said enzyme to the pH of the specimen.

5,595,868

MONOCLONAL ANTIBODIES TO HEPATITIS C VIRUS

Wimand J. A. Habets, Den Bosch; Miriam F. H. M. Klein-Rot, Wychen; Theodorus A. M. Oosterhiken, Boxtel, all of Netherlands, and Sing H. Yap, Nieuwrode, Belgium, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 237,958, May 3, 1994, abandoned, which is a continuation of Ser. No. 961,239, Oct. 15, 1992, abandoned. This application Aug. 14, 1995, Ser. No. 514,982

Claims priority, application European Pat. Off., Oct. 15, 1991, 91202659

Int. Cl.[6] G01N *33/569;33/576;* A61K *39/29;* C07K *16/08*

U.S. Cl. 435—5 5 Claims

1. A hybridoma cell line obtainable from the European Collection of Animal Cell Cultures (ECACC) under accession number 91101711.

2. A monoclonal antibody produced by the hybridoma cell line of claim 1.

5,595,869

DIAGNOSTIC METHODS FOR DETECTING LYMPHOMAS IN HUMANS

Yoshihide Tsujimoto, Londodowne, and Carlo M. Croce, Philadelphia, both of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Continuation of Ser. No. 633,010, Mar. 19, 1991, Pat. No. 5,202,429, which is a continuation of Ser. No. 883,687, Jul. 9, 1986, Pat. No. 5,015,568. This application Dec. 23, 1992, Ser. No. 994,941

Int. Cl.[6] C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—6 2 Claims



1. A diagnostic method for detecting B-cell neoplasms in a human, comprising the steps of:

determining the amount of bcl-2 mRNA in a test sample comprising B-cells isolated from a human;

comparing the amount of bcl-2 mRNA in the test sample to the amount of bcl-2 mRNA in a normal cell sample control, a ratio of test sample bcl-2 mRNA to control bcl-2 mRNA of greater than about ten indicating B-cell neoplasm, said normal cell sample being selected from the group consisting of: B-cells from a normal human, cells from a normal B-cell or pre-B-cell line, and non-B-cells from said human.

5,595,870

IDENTIFYING NUCLEIC ACIDS BY RESTRICTION DIGESTION AND HYBRIDIZATION WITH RANDOM OR PSEUDORANDOM OLIGONUCLEOTIDES

Michael R. Knapp, and Philip Goelet, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation of Ser. No. 982,416, Nov. 27, 1992, abandoned, which is a continuation of Ser. No. 857,675, Mar. 25, 1992, abandoned, which is a continuation of Ser. No. 312,596, Feb. 17, 1989, abandoned. This application Aug. 13, 1993, Ser. No. 106,143

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 19 Claims



1. A method of determining whether a nucleic acid molecule having a sequence of interest is present within a nucleic acid-containing sample without having to sequence the nucleic acid in the sample which method comprises the steps:

(A) subjecting said nucleic acid of said sample to a treatment sufficient to fragment said nucleic acid and to produce a plurality of fragments from said nucleic acid;

(B) fractionating said plurality of fragments;

(C) contacting said fractionated plurality of fragments, under hybridizing conditions, with a reagent comprising a mixture of random or pseudorandom oligonucleotides, said oligonucleotides having a length ≧3 and ≦1000 nucleotides;

(D) detecting the pattern of hybrids that form from said contacting of said fractionated nucleic acid molecules and said oligonucleotides of the mixture of random or pseudorandom oligonucleotides;

(E) determining whether said nucleic acid molecule having said sequence of interest is present in said sample by determining whether said pattern is indicative of the presence of said molecule.

5,595,871

DETECTION AND PREVENTION OF MYCOPLASMA HOMINIS INFECTION

Vito G. DelVecchio, Scranton; Gary L. Gallia, Philadelphia, both of Pa., and Ferne K. McCleskey, San Antonio, Tex., assignors to University of Scranton, Scranton, Pa., and Research Corporation Technologies, Inc., Tucson, Ariz.

Filed Aug. 25, 1993, Ser. No. 112,816

Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *21/04*

U.S. Cl. 435—6 76 Claims

1. A method of detecting Mycoplasma hominis comprising:

a) amplifying a *Mycoplasma hominis* target nucleic acid by contacting a sample to be tested for the presence of *Mycoplasma hominis* with at least one oligonucleotide for a time and under conditions sufficient to produce copies of said target nucleic acid, wherein said oligonucleotide consists of at least 14 contiguous nucleotides of Mycoplasma hominis DNA of pMhom120 having ATCC Accession Number 97512, or wherein said oligonucleotide has at least about 70% complementarity to at least 14 contiguous nucleotides of SEQ ID NO:1 or SEQ ID NO:3, such that said complementarity is sufficient to permit said amplification, and wherein said oligonucleotide does not hybridize to genomic DNA of *Ureaplasma urealyticum, Mycoplasma genitalium, Mycoplasma hyorhinis, Mycoplasma orale, Mycoplasma pneumoniae* or *Mycoplasma salivarium;* and

b) detecting said nucleic acid copies, thereby detecting *Mycoplasma hominis.*



5,595,872

NUCLEIC ACIDS ENCODING MICROSOMAL TRIGYCERIDE TRANSFER PROTEIN

John R. Wetterau, II, Langhorne, Pa.; Daru Y. Sharp, Perrineville, N.J.; Richard E. Gregg, Pennington, N.J.; Scott A. Biller, Ewing, N.J.; John K. Dickson, Mount Holly, N.J.; R. Michael Lawrence, Yardley, Pa.; John E. Lawson, Wallingford, Conn.; Henry M. Holava, Meriden, Conn., and Richard A. Partyka, Neshanic, N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation-in-part of Ser. No. 15,449, Feb. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 847,503, Mar. 6, 1992, abandoned. This application Sep. 3, 1993, Ser. No. 117,362

Int. Cl.[6] C12Q *1/70;* C07H *21/02;* C12N *15/79;5/10*

U.S. Cl. 435—6 14 Claims

1. An isolated nucleic acid molecule consisting of an MTP nucleotide sequence, wherein the MTP nucleotide sequence encodes the high molecular weight subunit of microsomal triglyceride transfer protein.

5,595,873

***T. THERMOPHILA* GROUP I INTRONS THAT CLEAVE AMIDE BONDS**

Gerald F. Joyce, Encinitas, Calif., assignor to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 242,402, May 13, 1994. This application Jul. 1, 1994, Ser. No. 270,180

Int. Cl.[6] C12Q *1/68;* C12H *15/10*

U.S. Cl. 435—6 20 Claims

1. An enzymatic RNA molecule comprising a ribonucleotide polymer having a nucleotide sequence from the group I intron of *T. thermophila,* wherein said polymer catalyzes the hydrolysis of amide bonds in a substrate, and wherein said substrate comprises an oligonucleotide containing an amide, bond.

20. A method of engineering enzymatic RNA molecules that cleave amide bonds, comprising the following steps:

a. introducing genetic variation into a population of *T. thermophila* group I introns (ribozymes) to produce a variant population;

b. selecting individuals from said variant population that meet predetermined selection criteria;

c. separating said selected individuals from the remainder of said variant population; and

d. amplifying said selected individuals.

5,595,874

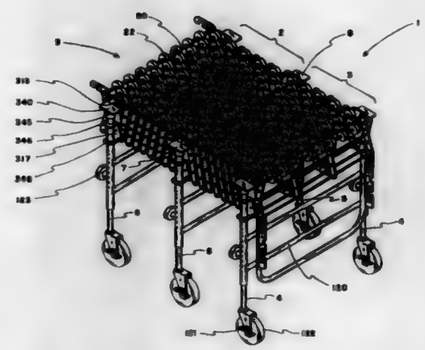
NUCLEIC ACID PROBES FOR DETECTION AND/OR QUANTITATION OF NON-VIRAL ORGANISMS

James Hogan, and Richard Smith, both of San Diego, Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 171,267, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 906,195, Jun. 26, 1992, abandoned, which is a division of Ser. No. 806,929, Dec. 11, 1991, abandoned, which is a continuation of Ser. No. 295,208, Dec. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 83,542, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 934,244, Nov. 24, 1986, abandoned. This application Aug. 22, 1994, Ser. No. 293,567

Int. Cl.[6] C12Q *1/68;* C07H *21/04*

U.S. Cl. 435—6 22 Claims



1. A probe comprising an oligonucleotide 10 to 100 nucleotides in length able to hybridize to a *Mycobacterium intracellulare* nucleic acid target region to form a detectable target:probe duplex under selective hybridization assay conditions, said target region corresponding to, or perfectly complementary to a nucleic acid corresponding to, bases 185–225 of *E. coli* 16S rRNA; wherein said oligonucleotide comprises a sequence which is at least 75% complementary to a target sequence of 10 contiguous nucleotides present in said target region and said oligonucleotide does not hybridize to nucleic acid from either *Mycobacterium avium, Mycobacterium kansasii, Mycobacterium asiaticum,* or *Mycobacterium tuberculosis* to form a detectable non-target:probe duplex under said hybridization conditions.

5,595,875

METHOD FOR DETECTION OF AN ANALYTE USING ACRIDINIUM ESTER AND LIPOSOMES

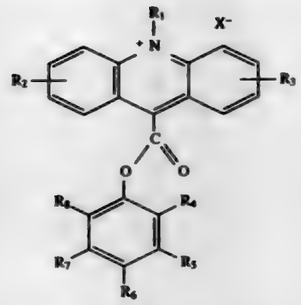
Say-Jong Law, Westwood, and Uri Piran, Sharon, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Division of Ser. No. 32,231, Mar. 17, 1993, Pat. No. 5,449,556, which is a division of Ser. No. 826,186, Jan. 22, 1992, Pat. No. 5,227,489, which is a continuation of Ser. No. 226,639, Aug. 1, 1988, abandoned. This application Oct. 19, 1994, Ser. No. 325,845

Int. Cl.[6] C12Q *1/68*

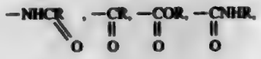
U.S. Cl. 435—6 13 Claims

1. In an assay for the determination of an analyte wherein the assay comprises combining a sample fluid suspected of containing the analyte, with liposomes comprising a label and a ligand, ligand analog or anti-ligand, and then determining the amount of the label associated with the analyte, the improvement comprising employing lumisomes as the liposomes, said lumisomes containing acridinium esters of the formula



wherein R_1 is alkyl, alkenyl, alkynyl, aryl, or aralkyl, containing from 0 to 20 heteroatoms;

R_2, R_3, R_5 and R_7 are hydrogen, amino, alkoxyl, hydroxyl, halide, nitro, —CN, —SO_3H,



or —SCN, wherein R is alkyl, alkenyl, alkynyl, aryl, or aralkyl, costaining from 0–20 heteratoms;

R_4 and R_6 are alkyl, alkenyl, alkynyl, aralkyl, or alkoxyl;

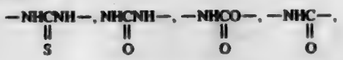
X is an anion;

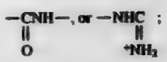
R_8 is -R-$I_{(n)}$ or Q-R-$I_{(n)}$,

wherein R is as defined above; Q is —O—, —S—, —NH—,



—SO_3—, diazo,





I is an ionizable group; and n is at least 1.

5,595,876

IN SITU EXTRACTION OF MICROBIAL DNA

Scott L. Rakestraw, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 107,440, Aug. 13, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 409,611

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **9 Claims**

1. An in situ method to extract nucleic acids from gram negative or gram positive bacterial cells, comprising the steps of:

(a) heating the cells in the presence of a hypotonic EDTA solution at a temperature of 80°±2° C. for about 10 minutes to deactivate endogenous cellular nuclease activity, EDTA being present at concentrations between about 5 mM and 30 mM;

(b) lysing the cells by addition of achromopeptidase in hypotonic solution and incubating said lysed cells for a time sufficient to inactivate internal cellular degradative factors; and

(c) heating said lysed cells at a temperature of 70°±1° C. for about 30 minutes to inactivate remaining protease and nuclease activity; to yield extracted bacterial double-stranded nucleic acids which are suitable for in situ restriction digestion, steps (a), (b), and (c) taking place in a single reaction vessel.

5,595,877

METHODS OF PRODUCING NUCLEIC ACID LIGANDS

Larry Gold, and Craig Tuerk, both of Boulder, Colo., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Division of Ser. No. 964,624, Oct. 21, 1992, Pat. No. 5,496,938, which is a continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, which is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application May 16, 1995, Ser. No. 442,862

Int. Cl.[6] C12Q *1/68; C12P 19/34*

U.S. Cl. 435—6 **28 Claims**

1. A method for preparing an improved nucleic acid ligand; wherein said improvement is produced by modifying a nucleic acid ligand to have at least one of the following improved properties: decreased size, enhanced stability, or enhanced binding affinity, said nucleic acid ligand being a ligand of a given target comprising:

a) contacting a candidate mixture of of nucleic acids with the target, wherein nucleic acids having an increased affinity to the target relative to the candidate mixture may be partitioned from the remainder of the candidate mixture;

b) partitioning the increased affinity nucleic acids from the remainder of the candidate mixture;

c) amplifying the increased affinity nucleic acids to yield a ligand-enriched mixture of nucleic acids;

d) repeating steps a)-c), as necessary, to identify a nucleic acid ligand;

e) modifying the nucleic acid ligand of step d), wherein said modifying comprises adding, deleting, or substituting nucleotide said residues, wherein said residues may may be chemically modified, and/or chemically modifying said nucleic acid ligand; and

f) determining whether the modified nucleic acid ligand of step e) has at least one of said improved properties relative to the nucleic acid ligand of step d) whereby said improved nucleic acid ligand may be prepared.

5,595,878

DETECTION OF BIOPOLYMERS AND BIOOLIGOMERS WITH BORON HYDRIDE LABELS

Anup Sood, Durham, and Bernard F. Spielvogel, Cary, both of N.C., assignors to Boron Biologicals, Inc., Raleigh, N.C.

Filed Jun. 2, 1995, Ser. No. 460,855

Int. Cl.[6] C12Q *1/68; A01N 55/08*

U.S. Cl. 435—6 **45 Claims**

1. A method for detecting a target molecule, wherein said method comprises the steps of:

(a) contacting a target molecule with an unassociated boron-marker, thereby forming an associated boron-marker;

(b) eliminating remaining unassociated boron-marker;

(c) adding to said associated boron-marker, a detection agent capable of being chemically reduced by said associated boron-marker, thereby forming a detectable product which produces a signal;

(d) incubating said associated boron-marker and said detection agent so as to chemically reduce said detection agent and form a detectable product; and

(e) detecting the detectable product, wherein the signal is detected by visual detection or with the aid of analytical equipment, whereby the target molecule is detected; and

wherein,

"target molecule" is the generic term for molecules that are selected to be detected;

a "ligand" is an organic or inorganic molecule that binds, with selective affinity, to a ligand receptor;

a "ligand receptor" is an organic or inorganic molecule or polymer which binds with selective affinity to a ligand;

a "boron-label" is a borane or boron hydride moiety capable of reducing a detection agent, resulting in the formation of one or more detectable products;

a "boron-building-block" is a small organic molecule that comprises one or more boron-labels, and can sere as the repeat unit of a biopolymer or a biooligomer;

a "labeled probe" is a biopolymer, biooligomer, ligand receptor, or ligand, that comprises at least one boron-label and has a selective affinity to associate with a target molecule such that, when associated with the appropriate target molecule, the target molecule can be detected;

a "boron-marker" is a boron-label, a boron-building-block, and/or a labeled probe that is capable of being associated with a target molecule;

an "associated boron-marker" is a boron-marker bound to a target molecule by means including but not limited to covalent bonds, and/or hydrogen bonds, and/or ionic interactions, and/or hydrophobic interactions, and/or charge-transfer complexation, and/or metal to ligand coordination bonds;

an "unassociated boron-marker" is a boron-marker that is not associated with a target molecule;

a "bioorganic polymer" is a polymer comprising nucleotides, amino acids, sugars, or combinations thereof;

a "biooligomer" is a bioorganic polymer comprising at least two but not more than 50 nucleotides, amino acids, sugars, or combinations thereof;

a "biopolymer" is an bioorganic polymer comprising 51 or more nucleotides, amino acids, sugars, or combinations thereof;

a "detection agent" is either an organic or inorganic electron acceptor that is capable of being reduced by a boron-label to form a detectable product;

a "detectable product" is a product of the reaction of a boron-marker, defined below, with a detection agent, said product alone or through an additional chemical development step produces (and/or augments) a signal that can be detected by one or more means; and

a "signal" is that property produced by the detectable product that is detectable.

5,595,879

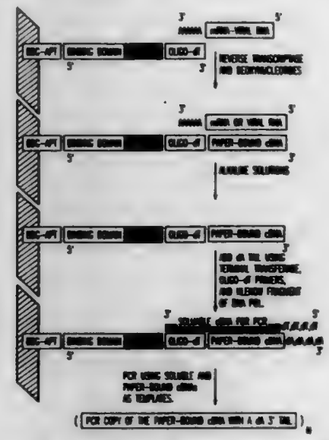
MULTI-DOMAIN DNA LIGANDS FOR PROTEIN AND NUCLEIC ACID AFFINITY CHROMATOGRAPHY AND PROCESSING OF SOLID-PHASE DNA

Joseph G. Utermohlen, Tucson, Ariz., assignor to Arizona Board of Regents for and on behalf of the University of Arizona, Tucson, Ariz.

Division of Ser. No. 742,856, Aug. 8, 1991, Pat. No. 5,437,976. This application Jun. 7, 1995, Ser. No. 479,446

Int. Cl.[6] C12Q *1/68; C12P 19/34; C07H 21/02*

U.S. Cl. 435—6 **8 Claims**



1. A method for detecting, amplifying and/or cloning a nucleic acid sequence in a sample, comprising:

(a) providing an arylamine-substituted solid phase binding matrix activated to covalently bind an oligonucleotide ligand;

(b) constructing a multi-functional oligonucleotide ligand having a 3' terminal domain comprising polydeoxythymidine and a 5' terminal domain comprising at least one of polydeoxyguanosine, polydeoxyuracil, or poly-N-6-aminohexyldeoxyadenosine;

(c) covalently binding said multi-functional oligonucleotide ligand to said solid phase binding matrix such that said 5' terminal domain is bound to said solid phase binding matrix, to obtain a bound oligonucleotide;

(d) contacting said bound oligonucleotide with a sample containing RNA to bind said RNA in said sample to said 3' terminal domain of said oligonucleotide ligand bound to said solid phase binding matrix;

(e) forming cDNA complements to said RNA bound to said oligonucleotide and removing said bound RNA template; and

(f) hybridizing said cDNA complements with an oligonucleotide primer to form complementary templates.

7. The method of claim 1, further comprising:

(g) amplifying said cDNA complement hybridized to said oligonucleotide primer to obtain an amplified cDNA;

(h) inserting said amplified cDNA into an expression vector.

5,595,880

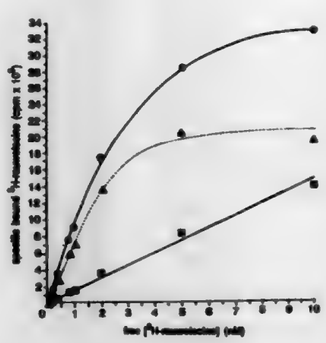
DNA ENCODING AN α_{2b} ADRENERGIC RECEPTOR AND USES THEREOF

Richard L. Weinshank, New York, N.Y., and Paul R. Hartig, Mahwah, N.J., assignors to Synaptic Pharmaceutical Corporation, Paramus, N.J.

Continuation of Ser. No. 707,604, May 30, 1991, abandoned, which is a division of Ser. No. 428,856, Oct. 30, 1989, Pat. No. 5,053,337. This application Oct. 22, 1992, Ser. No. 965,040

Int. Cl.[6] C12Q *1/00; 1/68*

U.S. Cl. 435—7.21 **5 Claims**



1. A method for determining whether a compound specifically binds to a human α_{2b} adrenergic receptor which comprises:

a) obtaining a membrane preparation from mammalian cells, said cells 1) comprising an isolated nucleic acid molecule encoding the human α_{2b} adrenergic receptor, and 2) expressing on their cell surface the human α_{2b} adrenergic receptor encoded by the isolated nucleic acid molecule;

b) contacting the compound with the membrane preparation under conditions permitting the binding of the compound to the human α_{2b} adrenergic receptor; and

c) detecting the presence of such compound specifically bound to the human α_{2b} adrenergic receptor in the membrane preparation, the presence of such compound specifically bound to the human α_{2b} adrenergic receptor indicating that the compound specifically binds to a human α_{2b} adrenergic receptor.

5,595,881

METHOD FOR THE DETECTION OF ANTIGEN PRESENTING CELLS

Teresa Kendrick, San Mateo; Bishwajit Nag; Prabha V. Mukku, both of Fremont, and Somesh D. Sharma, Los Altos, all of Calif., assignors to Anergen, Inc., Redwood City, Calif.

Filed Aug. 9, 1994, Ser. No. 288,143
Int. Cl.[6] G01N 1/02; C12Q 1/68;1/02
U.S. Cl. 435—7.21 7 Claims

1. A method of detecting the presence of antigen presenting cells bearing a pre-selected MHC:antigen complex in a biological sample suspected of comprising said antigen presenting cells, said method comprising the steps of:

(a) providing T cells specific for the MHC:antigen complex;

(b) contacting said biological sample with the T cells; and

(c) detecting changes in the proliferation rate of said T cells

(d) relating the changes in proliferation rate of said to T cells to the presence in said biological sample of antigen presenting cells bearing the pre-selected MHC:antigen complex.

5,595,882

ANGIOTENSIN II TYPE-1 RECEPTOR PROTEINS AND SCREENING ASSAYS USING SUCH PROTEINS OR TRANSFORMANTS EXPRESSING THEM

Yukio Fujisawa; Shun'ichi Kuroda, both of Hyogo, and Hiroaki Kaneko, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 41,219, Mar. 31, 1993, Pat. No. 5,427,922. This application Apr. 5, 1995, Ser. No. 417,122
Claims priority, application Japan, Apr. 7, 1992, 4-85445; Apr. 21, 1992, 4-101393; Feb. 17, 1993, 5-27835
Int. Cl.[6] C07K 14/72; G01N 33/566; C12Q 1/02
U.S. Cl. 435—7.21 13 Claims

1. An isolated angiotensin II type 1 receptor polypeptide comprising the amino acid sequence shown in SEQ ID NO: 6.

2. A method of screening a substance for angiotensin II receptor-modulatory activity, comprising the steps of

contacting an angiotensin II type 1 receptor polypeptide according to claim 1 with a candidate modulatory substance in the presence of angiotensin II; and

determining whether said substance inhibits the binding of angiotensin II to said receptor polypeptide relative to a control performed in the absence of said substance.

7. A method of screening a substance for angiotensin II receptor-modulatory activity, comprising the steps of

providing a transformed host cell expressing heterologous DNA which encodes an angiotensin II type 1 receptor polypeptide according to claim 1, wherein said host cell comprises one or more detectable species, the concentration(s) of which are responsive to the binding of angiotensin II to said receptor;

contacting said host cell with a candidate modulatory substance in the presence of angiotensin II; and

determining whether said substance induces a change in the concentration(s) of said species relative to their concentration(s) in a control cell incubated in the absence of said substance.

5,595,883

METHOD OF DIAGNOSING ALZHEIMER'S DISEASE BY MEASURING ACETYLCHOLINESTERASE ACTIVITY IN OCULAR FLUID

Margaret E. Appleyard, Egham, and Brendan McDonald, Cowley, both of England, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 1, 1990, Ser. No. 531,613
Int. Cl.[6] C12Q 1/46;1/44
U.S. Cl. 435—20 6 Claims

1. A method for detecting Alzheimer's disease, which comprises measuring the level of acetylcholinesterase activity in ocular fluids of a patient, and determining if such level of acetylcholinesterase (AChE) activity is above the average level of acetylcholinesterase activity found in ocular fluids in normal controls.

5,595,884

PAPILLOMAVIRUS E2 TRANSACTIVATION REPRESSOR PROTEINS AND DNA

Elliot J. Androphy, Natick, and James G. Barsoum, Lexington, both of Mass., assignors to Biogen Inc., Cambridge, and New England Medical Center Hospitals, Inc., Boston, both of Mass.

PCT No. PCT/US92/00652, § 371 Date Sep. 24, 1993, § 102(e) Date Sep. 24, 1993, PCT Pub. No. WO92/12728, PCT Pub. Date Aug. 6, 1992
Continuation-in-part of Ser. No. 646,998, Jan. 28, 1991, Pat. No. 5,219,990. This PCT application Jan. 28, 1992, Ser. No. 94,128
Int. Cl.[6] C12N 15/37;1/15;1/21; C07K 14/025
U.S. Cl. 435—69.1 17 Claims

3. A DNA sequence encoding an E2 trans-activation repressor comprising a polypeptide fragment of the native E2 DNA binding domain, wherein said repressor forms inactive heterodimers with native E2 protein, and wherein said inactive heterodimers are incapable of binding to E2 DNA binding sites.

6. A recombinant DNA molecule comprising a DNA sequence according to claims 2, 3 or 5.

7. The recombinant DNA molecule according to claim 6, further comprising an expression control sequence, wherein said DNA sequence is operatively linked to said expression control sequence.

10. A unicellular host transformed with a recombinant DNA molecule according to any one of claims 7 to 9, wherein said expression control sequence in said recombinant DNA molecule is capable of functioning in said host.

13. A process for producing an E2 trans-activation repressor, said process comprising the steps of:

a) culturing a transformed host according to claim 10; and

b) recovering the E2 trans-activation repressor from said culture.

5,595,885

MATRIX METALLOPROTEINASE INHIBITOR PEPTIDES

William G. Stetler-Stevenson, Gaithersburg; Lance A. Liotta, Potomac, and Henry C. Krutzsch, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 494,796, Mar. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,453, Aug. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 380,431, Jul. 17, 1989, which is a continuation-in-part of Ser. No. 326,334, Mar. 21, 1989, abandoned. This application Mar. 29, 1993, Ser. No. 39,525
Int. Cl.[6] C12N 15/00
U.S. Cl. 435—69.2 7 Claims

1. An isolated nucleic acid having a sequence which encodes the 194 amino acid polypeptide of FIG. 8.

5,595,886

PROTEIN COMPLEXES HAVING FACTOR VIII:C ACTIVITY AND PRODUCTION THEREOF

Barbara Chapman, Berkeley, and Rae L. Burke, San Francisco, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 652,099, Feb. 7, 1991, abandoned, which is a continuation-in-part of Ser. No. 51,916, May 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 822,989, Jan. 27, 1986, abandoned. This application Dec. 3, 1993, Ser. No. 161,770
Int. Cl.[6] C07K 14/755; C12N 5/10;15/12;15/79
U.S. Cl. 435—69.6 14 Claims

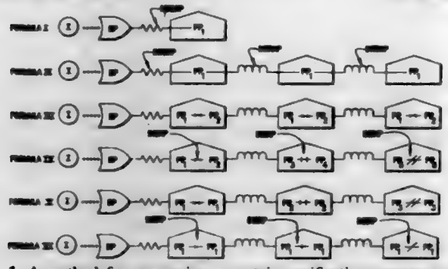
1. A DNA construct which comprises a nucleotide sequence that encodes a protein complex having human Factor VIII:C activity, said complex comprising a first polypeptide homologous to the A domain of human Factor VIII:C linked to a second polypeptide homologous to the C domain of human Factor VIII:C by a polypeptide spacer, wherein the polypeptide spacer comprises a first amino acid sequence homologous to a human Ig heavy chain hinge region.

5,595,887

PURIFICATION DIRECTED CLONING OF PEPTIDES USING CARBONIC ANHYDRASE AS THE AFFINITY BINDING SEGMENT

Thomas R. Coolidge, Falls Village, Conn.; Fred Wagner, Walton, Nebr.; Gino van Heeke; Sheldon M. Schuster, both of Gainesville, Fla.; Jay Stout, and Dwane E. Wylie, both of Lincoln, Nebr., assignors to BioNebraska, Inc., Lincoln, Nebr.

Filed Jul. 16, 1990, Ser. No. 552,810
Int. Cl.[6] C12P 21/04;21/06
U.S. Cl. 435—69.7 25 Claims



1. A method for expressing a protein purification construct of three, tandem, coupled segments, the first segment being a binding protein, the second segment being an interconnecting linker, and the third segment being a variable fused polypeptide, comprising:

inserting an expression vector carrying a recombinant gene for the protein purification construct into a compatible host cell to produce a transformed host cell; and

causing the transformed host cells to express the protein purification construct;

wherein;

the recombinant gene comprises base segments coding for the segments of the protein purification construct;

the base segment for the binding protein codes for mammalian or human carbonic anhydrase or a modified version of the mammalian or human carbonic anhydrase;

the modified version of the carbonic anhydrase a) has an amino acid sequence that is free at least of the amino acid segment for the interconnecting linker, b) has a dissociation constant for a mammalian or human carbonic anhydrase inhibitor that is no greater than about 10^{-7}M, and c) the amino acid sequence of the modified version of carbonic anhydrase is the amino acid sequence of human or mammalian carbonic anhydrase that has been modified by a change selected from the group consisting of: elimination of methionine residues, replacement of one or more glutamate residues with another amino acid residue, replacement of one or more arginine residues with another amino acid residue, replacement of one or more asparagine residues with another amino acid residue, replacement of one or more methionine residues with another amino acid residue, replacement of one or more cysteine residues with another amino acid residue, and any combination thereof; and,

the base segment for the variable fused polypeptide codes for a single polypeptide unit or multiple copies of the polypeptide units with adjacent polypeptide units being linked by an intraconnecting linker, the polypeptide unit being one copy of a product peptide or multiple copies of the product peptide with adjacent product peptide copies being linked by an interconnecting linker.

5,595,888

RECOMBINANT METHODS OF MAKING GAMMA INTERFERON COMPOSITIONS

Patrick W. Gray, San Francisco, and Ernst H. Rinderknecht, San Carlos, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 837,642, Feb. 14, 1992, abandoned, which is a division of Ser. No. 93,455, Sep. 4, 1987, abandoned, which is a division of Ser. No. 584,217, Feb. 27, 1984, Pat. No. 4,855,238, which is a continuation-in-part of Ser. No. 562,809, Dec. 16, 1983, abandoned. This application Mar. 24, 1994, Ser. No. 221,542
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[6] C12N 15/23;1/21
U.S. Cl. 435—69.51 5 Claims

1. A process of preparing a composition of matter comprising interferon polypeptides, wherein said interferon polypeptides consist essentially of:

a first polypeptide having an amino acid sequence consisting of an N-terminal group X-Y- joined to residues Asp^2 through Arg^{139} of the interferon-γ amino acid sequence shown in FIGS. 1A–1B, and

a second interferon polypeptide having an amino acid sequence consisting of an N-terminal group X-Y- joined to residues Asp^2 through Ser^{142} or Gln^{143} of the interferon-γ amino acid sequence shown in FIGS. 1A–1B,

wherein the N-terminal group X-Y is selected from the group consisting of Met-Gln, H-Gln, and H-pyroglutamate; said method consisting essentially of:

providing transformed host cells comprising a single species of heterologous interferon DNA, wherein said DNA is present in an operative expression vector and comprises codons for Met-Gln joined to codons for residues Asp^2 through Gln^{143} of the interferon-γ amino acid sequence shown in FIGS. 1A–1B,

culturing said host cells under conditions suitable for the expression of said DNA and the production of said interferon polypeptides, and

recovering said interferon polypeptides.

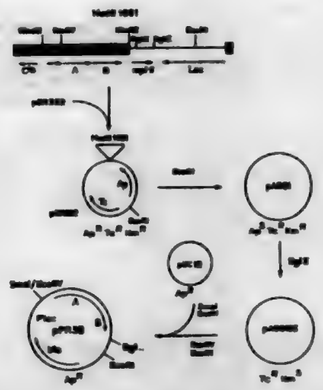
5,595,889

PROCESS FOR INTEGRATION OF A CHOSEN GENE ON THE CHROMOSOME OF A BACTERIUM USING MU TRANSPOSONS

François Richaud; Bruno Jarry, both of Paris; Koichi Takinami, Chatenay Malabry; Osamu Kurahashi, and Anne Beyou, both of Paris, all of France, assignors to Eurolysine, Paris, France

Continuation of Ser. No. 859,610, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 313,625, Feb. 21, 1989, abandoned. This application Nov. 17, 1994, Ser. No. 341,460
Claims priority, application France, Feb. 22, 1988, 88 02078
Int. Cl.[6] C12N 1/00;15/00; C12P 21/02;1/00
U.S. Cl. 435—71.2 16 Claims

1. A process for preparing an *Escherichia coli* or *Erwinia chrysanthemi* bacterial strain in which a specific number of copies



of a chosen gene or of a chosen DNA molecule is integrated into a chromosome or episome of an *Escherichia coli* or *Erwinia chrysanthemi* bacterium wherein said process comprises:

a) cloning said chosen gene or said chosen DNA molecule into a transposon, wherein said transposon is incapable of expressing a functional transposase, said transposon is from a Mu phage and at least one marker gene is situated within said transposon;

b) integrating said transposon containing said chosen gene or said chosen DNA molecule into the chromosome or episome of said bacterium;

c) complementing said transposon with a functional transposase gene;

d) expressing said functional transposase gene, whereby transposition of said transposon occurs;

e) selecting said bacterial strain on a medium that is selectable for said marker gene in a manner such that a bacterial strain containing a specific number of copies of said chosen gene or chosen DNA molecule is obtained; and

f) recovering the bacterial strain thereby selected.

5,595,890

METHOD OF DETECTING NUCLEOTIDE SEQUENCES

Clive R. Newton, nr Northwich, and Alexander F. Markham, Crewe, both of United Kingdom, assignors to Zeneca Limited, London, England

Continuation of Ser. No. 13,991, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 320,558, Mar. 8, 1989, abandoned. This application Feb. 17, 1995, Ser. No. 390,939

Claims priority, application United Kingdom, Mar. 10, 1988, 8805692; Jun. 15, 1988, 8814170

Int. Cl.[6] C12P *19/34*; C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—91.2 **11 Claims**

1. A method for detecting the presence or absence of at least one variant nucleotide in one or more nucleic acids contained in a test sample from an individual, with reference to a control or controls, which method comprises the following steps:

treating the sample, together or sequentially, with appropriate nucleoside triphosphates, an agent for polymerization of the nucleoside triphosphates, a diagnostic primer for each diagnostic portion of a target base sequence and a corresponding amplification primer under hybridizing conditions,

the nucleotide sequence of said diagnostic primer being such that it is substantially complementary to said diagnostic portion, a 3' terminal nucleotide of the diagnostic primer being either complementary to a suspected variant nucleotide or to the corresponding normal nucleotide, whereby an extension product of the diagnostic primer is synthesized when said terminal nucleotide of the diagnostic primer is complementary to the corresponding nucleotide in the target base sequence, no extension product being synthesized when the said terminal nucleotide of the diagnostic primer is not complementary to the corresponding nucleotide in the target base sequence;

any extension product of the diagnostic primer formed being capable of serving as a template for synthesis of an extension product of said amplification primer after separation from its complement;

amplifying any extension product; and

detecting the presence or absence of the suspected variant nucleotide from the presence or absence of amplification product obtained as above, with reference to the control or controls.

3. The method as claimed in claim 1 which comprises treating the sample, together or sequentially with either

(a) a first diagnostic primer having a sequence substantially complementary to a diagnostic portion of a first nucleic acid sequence, the first diagnostic primer having a terminal nucleotide complementary to said suspected variant nucleotide, and a second diagnostic primer having a sequence substantially complementary to a second diagnostic portion of a second nucleic acid sequence, the second diagnostic primer having a terminal nucleotide complementary to the complementary suspected variant nucleotide; or

(b) a first diagnostic primer having a sequence substantially complementary to a diagnostic portion of a first nucleic acid sequence, the first diagnostic primer having a terminal nucleotide complementary to the normal nucleotide which corresponds to said suspected variant nucleotide, and a second diagnostic primer having a sequence substantially complementary to a diagnostic portion of a second nucleic acid sequence, the second diagnostic primer having a terminal nucleotide complementary to the normal nucleotide which corresponds to said suspected variant nucleotide; said terminal nucleotide of the first diagnostic primer and said terminal nucleotide of the second diagnostic primer being at the 3' end of the respective primers and the first nucleic acid sequence being in the opposite sense to the second nucleic acid sequence.

5,595,891

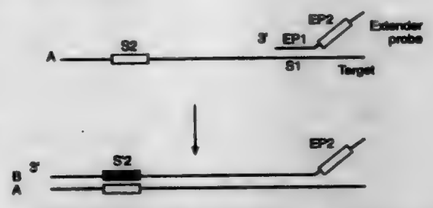
METHOD FOR PRODUCING A POLYNUCLEOTIDE FOR USE IN SINGLE PRIMER AMPLIFICATION

Samuel Rose; Linda M. Western, both of Mountain View; Martin Becker, Palo Alto, and Edwin F. Ullman, Atherton, all of Calif., assignors to Behringwerke AG, Marburg, Germany

Filed Jul. 19, 1990, Ser. No. 555,323

Int. Cl.[6] C12P *19/34*; C12Q *1/68*

U.S. Cl. 435—91.5 **49 Claims**



1. A method for producing a single stranded polydeoxynucleotide having two segments that are non-contiguous and complementary with each other, said method comprising the steps of:

providing in combination a polynucleotide having two non-contiguous, non-complementary nucleotide sequences S1 and S2 wherein S2 is 5' of S1 and is at least ten nucleotides long and an extender probe comprised of two deoxynucleotide sequences, wherein the sequence at the 3' end of said extender probe is hybridizable with S1 and the other of said deoxynucleotide sequences is homologous to S2 DNA polymerase and deoxynucleoside triphosphates, and

extending said extender probe along said polynucleotide, thereby producing said single stranded polydeoxynucleotide.

5,595,892

PROCESS FOR PREPARATION OF PURIFIED XANTHAN GUM

Kanji Murofushi; Taira Homma, both of Jeetsu; Shigehiro Nagura, Niigata-ken, all of Japan, and Richard W. Armentrout, La Jolla, Calif., assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan, and Shin-Etsu Bio, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 998,758, Dec. 15, 1992. This application Nov. 28, 1994, Ser. No. 345,076

Claims priority, application Japan, Dec. 20, 1991, 3-338244; Mar. 13, 1992, 4-054898

Int. Cl.[6] A01N *63/00*; C12P *19/06;19/12*

U.S. Cl. 435—104 **8 Claims**

1. A process for the preparation of purified xanthan gum, comprising:

a) subjecting strain ATCC 55429 or ATCC 55298 to submerged fermentation conditions to produce a fermentation broth containing xanthan gum and cellular debris;

b) heating the fermentation broth obtained from step a) at a temperature from 45° to 80° C. for a period of at least 30 minutes at an initial pH of 7 to 12.5;

c) contacting the heated broth from step b) with an alkaline protease for a period of from 20 minutes to five hours;

d) contacting the broth from step b) with lysozyme for a period of from 20 minutes to five hours; and

e) recovering the xanthan gum from the broth from step d).

5,595,893

IMMOBILIZATION OF MICROORGANISMS ON A SUPPORT MADE OF SYNTHETIC POLYMER AND PLANT MATERIAL

Anthony L. Pometto, III, Boone; Ali Demirci, and Kenneth E. Johnson, both of Ames, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 901,528, Jun. 19, 1992, abandoned. This application Jun. 6, 1994, Ser. No. 254,476

Int. Cl.[6] C12P *7/40*; C02F *3/00*; C12N *11/12;11/08*

U.S. Cl. 435—136 **20 Claims**

1. A biofilm reactor, comprising:

(a) a solid support for immobilizing cells of a film-forming microorganism, the support being comprised of about 50–95 wt-% of a polyolefin synthetic polymer in admixture with about 5–50 wt-% of an organic polymeric plant material, which solid support is capable of remaining essentially intact for about 1–3 years in aqueous media; and

(b) a film of a population of cells of the microorganism attached to a substantial proportion of the surface of the solid cell support.

5,595,894

PROCESS FOR STABLY MAINTAINING RECOMBINANT PLASMIDS IN SERINE AUXOTROPHIC MICROORGANISMS BELONGING TO THE GENUS CORYNEBACTERIUM OR BREVIBACTERIUM

Ryoichi Katsumata, Machida; Masato Ikeda, Sagamihara; Keiko Nakanishi, Machida, and Yuko Sano, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co. Ltd., Japan

Division of Ser. No. 354,314, Dec. 12, 1994, which is a continuation of Ser. No. 795,917, Nov. 20, 1991, abandoned. This application May 12, 1995, Ser. No. 439,883

Claims priority, application Japan, Nov. 22, 1990, 2-320440

Int. Cl.[6] C12N *15/09;1/20*; C12P *13/04*

U.S. Cl. 435—172.1 **3 Claims**

1. A process for maintaining a recombinant DNA stably in a microorganism host belonging to the genus Corynebacterium or Brevibacterium, which comprises transforming a serine auxotrophic microorganism host belonging to the genus Corynebacterium or Brevibacterium by introducing into said host a recombinant plasmid containing a gene which complements the serine auxotrophy of the host.

5,595,895

EFFICIENT DIRECTIONAL GENETIC CLONING SYSTEM

Toru Mikl, Rockville, Md., and Stuart A. Aaronson, Great Falls, Va., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 386,053, Jul. 28, 1989, abandoned. This application Jun. 24, 1992, Ser. No. 902,786

Int. Cl.[6] C12N *15/66;15/63;15/11*

U.S. Cl. 435—172.3 **12 Claims**

9. A method for directionally cloning a cDNA copy of a messenger RNA, comprising the steps of:

(i) annealing a linker-primer DNA segment with poly(A) mRNA, wherein said linker-primer DNA segment comprises a single-stranded oligonucleotide which compriaes oligo(dt) at the 3' end, and a single-stranded extension at the 5' end with a sequence corresponding to a first non-symmetrical restriction enzyme recognition sequence;

(ii) enzymatically synthesizing the first strand of said cDNA from the linker-primer that is annealed with said poly(A) mRNA;

(iii) enzymatically synthesizing the second strand of said cDNA using said first strand as a template under conditions such that single-stranded extensions on the synthesized cDNA molecule are made double-stranded, whereby the cDNA is made blunt-ended;

(iv) ligating onto said blunt-ended cDNA an adaptor DNA segment comprising a second non-symmetrical restriction enzyme recognition sequence that is not identical to said first non-symmetrical restriction enzyme recognition sequence but that can be cleaved by the same restriction enzyme, such that the single stranded ends formed by cleaving both said restriction enzyme recognition sequences with said same restriction enzyme are neither complementary to each other nor self-complementary, thereby preventing the formation of dimer and self-circularized by-products during ligation;

(v) exposing said cDNA resulting from ligation with said adaptor said same restriction enzyme under conditions such that both of said restriction enzyme recognition sequences are cleaved, resulting in said cDNA having two single-stranded ends that are not complementary;

(vi) ligating said cDNA resulting from cleavage with said same restriction enzyme to a directional cloning vector to form a recombinant DNA structure, said vector comprising at least one replicon and a site for inserting DNA segments to be cloned, wherein said site for inserting is flanked by non-symmetrical restriction enzyme recognition sequences that are not identical to each other but that have been cleaved by said same restriction enzyme, such that the single-stranded ends formed by cleaving both said restriction enzyme recognition sequences with said same restriction enzyme are neither complementary to each other nor self-complementary, thereby preventing the formation of dimer and self-circularized by-products during ligation and wherein during said ligating said cDNA is inserted into said site for inserting;

(vii) transforming a suitable host cell with said recombinant DNA structure; and

(viii) identifying a clone of host cells that contains a recombinant DNA structure including said cDNA.

5,595,896

EXPRESSION OF HETEROLOGOUS GENES IN TRANSGENIC PLANTS AND PLANT CELLS USING PLANT ASPARAGINE SYNTHETASE PROMOTERS

Gloria M. Coruzzi, and Feng-Ying Tsai, both of New York, N.Y., assignors to New York University, New York, N.Y.

Division of Ser. No. 514,816, Apr. 26, 1990, Pat. No. 5,256,558, which is a continuation-in-part of Ser. No. 347,382, May 3, 1989, abandoned. This application May 3, 1993, Ser. No. 58,700

Int. Cl.[6] C12N *15/00;5/14*; A01H *1/04*

U.S. Cl. 435—172.3 **7 Claims**

1. A transgenic plant containing a gene construct, which gene construct comprises a plant asparagine synthetase promoter oper-

ably associated with the coding sequence of a heterologous gene, wherein the plant asparagine synthetase promoter comprises the nucleotide sequence as depicted in FIGS. 10A–10C from nucleotide residue numbers −558 to +11 and controls the transcription of said coding sequence.

5,595,897

POLYLYSINE CONJUGATES

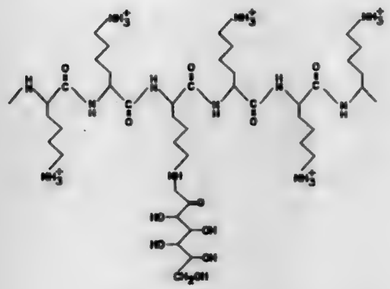
Patrick Midoux; Patrick Erbacher, both of Orleans; Annie-Claude Roche-Degremont, Sandillon, and Michel Monsigny, Saint-Cyr-En-Val, all of France, assignors to I.D.M. Immuno-Designed Molecules, France

Filed Aug. 18, 1994, Ser. No. 288,681

Claims priority, application France, Apr. 28, 1994, 94 05174

Int. Cl.[6] C07K *1/00;1/107;* C12N *15/00;15/88*

U.S. Cl. 435—172.3 **9 Claims**



1. A compound consisting of polylysine conjugated to non-charged residues wherein the free amino functions of said polylysine are substituted with said non-charged residues, which non-charged residues comprise gluconolactone, and said conjugated polylysine contains at least 30% unsubstituted free amino functions.

5,595,898

MODULAR ASSEMBLY OF ANTIBODY GENES, ANTIBODIES PREPARED THEREBY AND USE

Randy R. Robinson, Los Angeles; Alvin Y. Liu, Oceanside; Arnold H. Horwitz; Marc Better, both of Los Angeles; Randolph Wall, Sherman Oaks; Shau-Ping Lei, Los Angeles, and Gary L. Wilcox, Malibu, all of Calif., assignors to Xoma Corporation, Berkeley, Calif.

Continuation of Ser. No. 987,555, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 501,092, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 142,039, Jan. 11, 1988, abandoned, and Ser. No. 77,528, Jul. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 793,980, Nov. 1, 1985, abandoned. This application Aug. 18, 1994, Ser. No. 299,805

Int. Cl.[6] C12N *15/00;* C07H *21/04;* C12P *21/06;21/04*

U.S. Cl. 435—172.3 **4 Claims**

1. A polynucleotide molecule encoding an immunoglobulin fragment, said immunoglobulin fragment comprising a first DNA sequence encoding a first pectate lyase secretion signal sequence operably linked to a DNA sequence encoding an immunoglobulin Fd molecule or a fragment thereof comprising the variable region and a second DNA sequence encoding a second pectate lyase secretion signal sequence operably linked to a DNA sequence encoding an immunoglobulin light chain or a fragment thereof comprising the variable region, wherein said first and second DNA sequences are operably linked to a single prokaryotic promoter so as to form a dicistronic transcription unit, wherein said immunoglobulin fragment is capable of binding to an antigen and said immunoglobulin fragment is produced and secreted by an *E. coli* host cell when said polynucleotide molecule is expressed in said host cell.

5,595,899

METHODS OF INTRODUCING FOREIGN DNA INTO CELLS

Masahiro Sato, and Nobuhiro Tada, both of Kawagoe, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Continuation of Ser. No. 30,085, Mar. 23, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 364,876

Claims priority, application Japan, Sep. 25, 1990, 2-251843

Int. Cl.[6] C12N *15/90;15/79;15/87;* C07H *21/04*

U.S. Cl. 435—172.3 **6 Claims**



1. A method of introducing a foreign DNA into a chromosome of a mammalian cell comprising exposing said cell, in a suspension or a solution, to a complex comprising foreign DNA and a carrier, wherein said carrier is selected from the group consisting of 2-[2-(4-hydroxyphenyl)benzimidazolyl-5]-5-(4-methylpiperazinyl-1)-benzimidazole and 2-[2-(4-ethoxyphenyl)benzimidazolyl-5]-5-(4-methylpiperazinyl)-benzimidazole.

5,595,900

METHODS AND PRODUCTS FOR THE SYNTHESIS OF OLIGOSACCHARIDE STRUCTURES ON GLYCOPROTEINS, GLYCOLIPIDS, OR AS FREE MOLECULES, AND FOR THE ISOLATION OF CLONED GENETIC SEQUENCES THAT DETERMINE THESE STRUCTURES

John B. Lowe, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 220,433, Mar. 30, 1994, abandoned, which is a division of Ser. No. 914,281, Jul. 20, 1992, Pat. No. 5,324,663, which is a continuation-in-part of Ser. No. 715,900, Jun. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 627,621, Dec. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 479,858, Feb. 14, 1990, abandoned. This application Feb. 23, 1995, Ser. No. 393,246

Int. Cl.[6] C12N *9/10;15/54*

U.S. Cl. 435—193 **2 Claims**

2. An isolated and purified polypeptide, comprising an amino acid sequence corresponding to positions 43 to 374 of SEQ ID NO: 11.

5,595,901

METHOD FOR OBTAINING PROTECTIVE ACTIVE AND INACTIVE ADENYLATE CYCLASE FROM +1 BORDETELLA PARAPERTUSSIS

Murielle Rocancourt, Clamart; Colette Brezin, Paris; Jean L. Boucaud, Cours-La-Ville; Marek Szatanik, Saint Cyr L'Ecole, and Jean M. Alonso, Montigny Le Bretonneux, all of France, assignors to Institut Pasteur, and Institut National de la Sante et de la Recherche Medicale, both of France

Continuation of Ser. No. 844,487, Mar. 4, 1992, abandoned, which is a continuation of Ser. No. 340,551, Apr. 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,882

Claims priority, application United Kingdom, Apr. 19, 1988, 88408949

Int. Cl.[6] C12N *9/88;9/00;* C07K *1/14*

U.S. Cl. 435—232 **7 Claims**

1. A method of obtaining an active and an inactive adenylate cyclase which are free from pertussis toxin and have specific reactivity with polyclonal or monoclonal antibodies to *Bordetella pertussis* adenylate cyclase, comprising culturing a hemolytic clone of *Bordetella parapertussis*, homogenizing the cultured *Bordetella parapertussis* to produce a homogenate and isolating active and inactive adenylate cyclase from the homogenate,

wherein said inactive adenylate cyclase is devoid of calmodulin-activatable adenylate cyclase activity and of affinity for calmodulin.

5,595,902

DNA ENCODING HUMAN PROTEIN KINASE C (IOTA)

Trevor J. Biden, Neutral Bay, and Lisa Selbie, McMahons Point, both of Australia, assignors to Garvan Institute of Medical Research, Darlinghurst, Australia

PCT No. PCT/AU94/00052, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO94/18328, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 4, 1994, Ser. No. 313,274

Claims priority, application United Kingdom, Feb. 6, 1993, 9302342; Feb. 6, 1993, 9302343; Feb. 6, 1993, 9302360; Feb. 6, 1993, 9302361; Sep. 16, 1993, 9319147; Sep. 16, 1993, 9319148; Sep. 16, 1993, 9319149; Sep. 16, 1993, 9319150

Int. Cl.[6] C12N *5/10;9/12;15/54*

U.S. Cl. 435—240.1 **6 Claims**

1. An isolated DNA molecule which encodes human protein kinase C (iota), said DNA molecule encoding the amino acid sequence as shown in SEQ ID NO: 2.

5,595,903

GENETICALLY ENGINEERED HUMAN ACETYLCHOLINESTERASE

Hermona Soreq, Rishon Le Zion, and Zakut Haim, Savion, both of Israel, assignors to Yissum Research Development Co. of the Hebrew University of Jerusalem, Jerusalem, Israel

Continuation of Ser. No. 496,554, Mar. 20, 1990, abandoned. This application Aug. 2, 1993, Ser. No. 111,314

Claims priority, application Israel, Mar. 21, 1989, 89703

Int. Cl.[6] C12N *5/00;15/00;9/18*

U.S. Cl. 435—240.2 **19 Claims**

7. A host cell containing a non-naturally occurring recombinant nucleotide construct, wherein said construct comprises a sequence (A) encoding human acetylcholinesterase operably linked to a control sequence (B) such that (B) regulates (A) expression to cause the host cell to produce active human acetylcholinesterase.

5,595,904

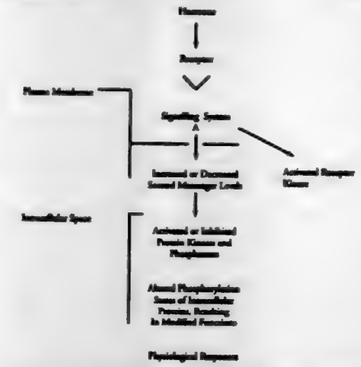
FAMILY OF MAP2 PROTEIN KINASES

Teri G. Boulton, Irving; Melanie H. Cobb, Dallas, both of Tex.; George D. Yancopoulos, Elmhurst, N.Y.; Steven Nye, New York, N.Y., and Nikos Panayotatos, Orangeburg, N.Y., assignors to Board of Regents, Univ. of Texas, Dallas, Tex., and Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Division of Ser. No. 701,544, May 16, 1991, abandoned, Continuation-in-part of Ser. No. 532,004, Jun. 1, 1990, abandoned. This application Jan. 3, 1994, Ser. No. 176,620

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.2 **20 Claims**



1. An isolated nucleic acid molecule encoding a MAP2 protein kinase known as ERK2, wherein the sequence of said nucleic acid is selected from the group consisting of:

(a) a nucleic acid sequence comprising the coding region of ERK2 as set forth in FIG. 3A (SEQ ID NO: 3);

(b) a nucleic acid sequence comprising a sequence that hybridizes at high stringency to SEQ ID NO: 3 and which encodes a polypeptide having the functional activity of ERK2; and

(c) a nucleic acid sequence differing from the sequences of (a) and (b), which encodes a polypeptide encoded by the sequence of (a) or (b).

5,595,905

PROCESS CONTROL SYSTEM FOR FED-BATCH FERMENTATION USING A COMPUTER TO PREDICT NUTRIENT CONSUMPTION

Bruce F. Bishop, Wentzville; Rodney G. Combs, Manchester, and Saied Bananikhah, Chesterfield, all of Mo., assignors to G.D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 849,847, Mar. 12, 1992, abandoned. This application Aug. 12, 1994, Ser. No. 289,610

Int. Cl.[6] C12N *1/00;5/00;* G05B *21/02;23/02*

U.S. Cl. 435—243 **12 Claims**

1. A method for controlling nutrient concentration levels in a broth, comprising the steps of:

a. fermenting a broth containing a bacteria or a yeast and a nutrient;

b. withdrawing a series of samples of said broth at periodic intervals, said series of samples comprising a first sample, a second sample, a third sample, and a fourth sample;

c. measuring the nutrient concentrations of said samples;

d. transferring said nutrient concentration measurements to a computer which can calculate the nutrient consumption rate of said broth for the interval of time between said first sample and said second sample, and between said second sample and said third sample, in real time, by comparing the nutrient concentration of a sample to the nutrient concentration of a preceding sample;

e. using said computer to predict an estimated rate at which the nutrient concentration of said broth is expected to decrease during an interval of time between said third sample and said

fourth sample by comparing said nutrient consumption rate at which the nutrient concentration of said broth decreased between said second sample and said third sample to the rate at which the nutrient concentration of said broth decreased between said first sample and said second sample; and

f. adding fresh nutrient to the broth at a rate and quantity based on said estimated rate.

5,595,906

CORYNEBACTERIUM STRAIN FOR PRODUCING L-TRYPTOPHAN DECREASED IN PHOSPHOENOLPYRUVATE CARBOXYLASE ACTIVITY

Ryuichi Katsumata, Machida, and Kuniki Kino, Hofu, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 130,995, Oct. 4, 1993, Pat. No. 5,484,716, which is a continuation of Ser. No. 625,699, Dec. 12, 1990, abandoned, which is a continuation of Ser. No. 317,589, Mar. 1, 1989, abandoned. This application Apr. 27, 1995, Ser. No. 429,472

Claims priority, application Japan, Mar. 4, 1988, 63-51358; Sep. 27, 1988, 63-241688

Int. Cl.[6] C12N *1/20*

U.S. Cl. 435—252.1 1 Claim

1. A biologically pure culture of *Corynebacterium glutamicum* BPS-13 (FERM BP-1777).

5,595,907

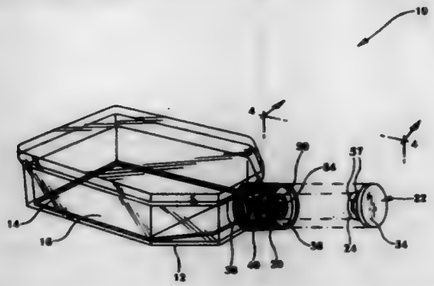
REUSABLE VENTED FLASK CAP COVER

John J. Kayal, Wayne; Susan L. Barker, Tenafly, and John M. Janson, Piscataway, all of N.J., assignors to Becton, Dickinson and Company

Filed Sep. 8, 1995, Ser. No. 525,900

Int. Cl.[6] C12M *3/00*

U.S. Cl. 435—288.1 8 Claims



1. A culture vessel assembly constructed to grow cell cultures in incubators comprising:

a vessel comprising a chamber and a neck connected to said chamber having an opening for introducing cells and culture fluids into said chamber;

a cap comprising a top portion, a bottom portion, an annular skirt extending from said top portion to said bottom portion and having an inner surface and outer surface, an inner inverted skirt portion surrounded by said inner surface of said annular skirt and extending from said top portion toward said bottom portion, an annular space between said inner surface of said annular skirt and said inverted skirt portion, a compartment area in said top portion as defined by said inverted skirt portion and an orifice in said top portion as defined by said inverted skirt portion surrounded by said compartment area, whereby said means for allowing gas diffusion into and out of said vessel is attached to said orifice; and

a plug removably attached to said cap for occluding gas diffusion into and out of said vessel comprising a top flange integrally formed to a cylindrical base with lugs extending underneath said top flange.

5,595,908

PIEZOELECTRIC DEVICE FOR DETECTION OF POLYNUCLEOTIDE HYBRIDIZATION

Newton C. Fawcett, and Jeffrey A. Evans, both of Hattiesburg, Miss., assignors to University of Southern Mississipi, Hattiesburg, Miss.

Continuation-in-part of Ser. No. 253,906, Oct. 6, 1988, abandoned, which is a continuation of Ser. No. 780,615, Sep. 26, 1985, abandoned. This application Aug. 11, 1989, Ser. No. 392,734

Int. Cl.[6] C12M *1/34;* G21D *7/02;* H02K *41/00;* C12N *15/00*

U.S. Cl. 435—287.2 9 Claims

1. A device for detecting polynucleotide hybridization comprising:

(a) a piezoelectric crystal;

(b) a polynucleotide attached to a surface of said crystal by a linker; and

(c) a means for determining the resonance frequency of said crystal.

5,595,909

FILTER DEVICE

Wei-Shou Hu, Falcon Heights, and Frank B. Cerra, Edina, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 609,371, Oct. 29, 1990, abandoned, and Ser. No. 376,095, Jun. 20, 1995, which is a continuation of Ser. No. 864,893, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 355,115, May 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 197,700, May 23, 1988, abandoned. This application Mar. 31, 1995, Ser. No. 414,499

Int. Cl.[6] C12M *3/06*

U.S. Cl. 435—297.4 20 Claims

1. A filter device comprising:

a housing having first inlet and outlet ports defining a fluid flow cavity therebetween for flowing through said housing blood, serum or plasma;

said cavity also enclosing a plurality of hollow fibers having porous walls and a partially occluded lumen;

said porous walls comprising pores smaller than a hepatocyte;

said lumen of said hollow fibers are in fluid flow communication with second inlet and outlet ports in said housing for flowing through said lumen a medium to support hepatocyte function and viability; and

said lumen of said hollow fibers are partially occluded with an aqueous matrix comprising viable hepatocytes, wherein said hepatocytes are a mixture of unaggregated cells and aggregated cell masses;

such that communication between said cavity and inside said hollow fibers is exclusively though the porous fiber walls.

5,595,910

BIOFILTER WITH MODULAR TRAYS

Wayne D. Kent, Albany, and Bruce Singleton, Selkirk, both of N.Y., assignors to Retron Incorporated, Woodstock, N.Y.

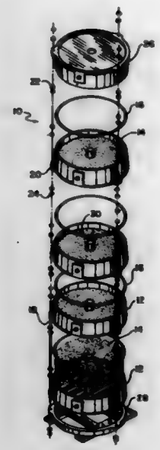
Continuation of Ser. No. 945,959, Sep. 16, 1992, abandoned. This application Dec. 10, 1993, Ser. No. 165,517

Int. Cl.[6] C12M *1/00*

U.S. Cl. 435—289.1 24 Claims

1. A filter for the removal of contaminants from a gas stream, the filter comprising:

a plurality of stackable trays each constructed and arranged to define a region for containing a gas-contacting medium, and



each tray sealingly engaging the immediately adjacent trays, each of said trays comprising a bottom portion with a peripheral side wall extending therefrom, the bottom portion and side wall defining the region for containing the gas contacting medium, the peripheral side wall having upper and lower edges each constructed and arranged to allow a seal between adjacent trays when such trays are stacked, and a plenum formed in the bottom and side wall of the tray;

at least one of said trays being a gas inlet tray, each gas inlet tray having a gas inlet incorporated therein, said inlet communicating with the plenum of the gas inlet tray and the plenum of the gas inlet tray communicating with said region containing the medium;

at least one of said trays being a gas outlet tray, each gas outlet tray having a gas outlet incorporated therein, said outlet communicating with the plenum of the gas outlet tray and the plenum of the gas outlet tray communicating with said region containing the medium, a single tray being capable of functioning as both a gas inlet tray and a gas outlet tray; and

wherein at least one of said trays contains a gas-contacting medium in said region for purifying a gas stream, and further wherein for each tray, each of the bottom portion, peripheral side wall, and plenum is an integral portion of a molded one-piece structure.

5,595,911

ISOLATION OF A CDNA ENCODING A PROTEIN TYROSINE PHOSPHATASE WHICH LOCALIZES TO FOCAL ADHESIONS

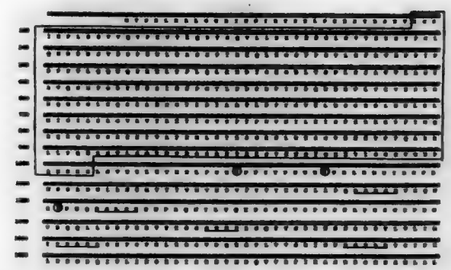
Nicholas K. Tonks, Cold Spring Harbor, N.Y., assignor to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

Continuation of Ser. No. 663,579, Mar. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 494,036, Mar. 14, 1990, abandoned. This application Aug. 16, 1993, Ser. No. 107,420

Int. Cl.[6] C12N *15/54;9/12*

U.S. Cl. 435—320.1 7 Claims

6. A retroviral vector comprising DNA encoding the protein tyrosine phosphatase whose amino acid sequence is shown in FIGS. 1A–1B.



5,595,912

SPECIFIC DNA AND RNA SEQUENCES ASSOCIATED WITH US IBDV VARIANTS, VECTOR CARRYING DNA SEQUENCES, HOST CARRYING CLONED VECTOR, DEDUCED AMINO ACID SEQUENCES, VACCINE AND METHOD OF VACCINATION

Vikram Vakharia, Bowie, and David Snyder, deceased, late of Bowie, both of Md., assignors to University of Maryland College Park, College Park, Md.

Continuation-in-part of Ser. No. 83,784, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 519,282, May 4, 1990, abandoned. This application Mar. 23, 1994, Ser. No. 216,276

Int. Cl.[6] C12N *15/85;15/40*

U.S. Cl. 435—320.1 16 Claims

1. A biologically pure RNA encoding SEQ ID NO: 19 or a fragment thereof of from 30 to 1012 amino acids long, said fragment containing SEQ ID NO: 25; or a biologically pure DNA encoding to said biologically pure RNA.

5,595,913

LIPID FRACTIONATION

Joseph F. Lawler, Arlington, and Joseph D. Mauro, Dover, both of Mass., assignors to Reference Diagnostics, Inc., Arlington, Mass.

Division of Ser. No. 73,532, Jun. 8, 1993, Pat. No. 5,422,279, which is a division of Ser. No. 677,734, Mar. 28, 1991, Pat. No. 5,242,833. This application Feb. 23, 1995, Ser. No. 392,499

Int. Cl.[6] G01N *31/02*

U.S. Cl. 436—17 37 Claims

1. A method of separating a first class of lipoprotein in a sample from a second class of lipoprotein in said sample comprising,

providing a sample containing a first and a second class of lipoprotein,

precipitating said second class of lipoprotein with a precipitating reagent,

contacting said sample with a plurality of magnetically responsive particles,

and placing said sample in a magnetic field until said plurality of magnetically responsive particles has sedimented forming a supernatant, causing said precipitated second class of lipoproteins to sediment, leaving said first class of lipoproteins in the supernatant of said sample, said plurality of magnetically responsive particles not being bound to said precipitating reagent.

5,595,914

GYPSUM DETERMINATION IN SOILS BY CONVERSION TO WATER-SOLUBLE SODIUM SULFATE

Mohammad S. Berigari, 10520 Oak Bluff Ct., Burke, Va. 22015

Filed Oct. 23, 1995, Ser. No. 547,013
Int. Cl.[6] G01N *1/00*
U.S. Cl. 436—177 2 Claims

2. A method for complete conversion of gypsum in 2-gram soil samples to water-soluble sodium sulfate comprising the steps of:

a) adding each soil sample to a centrifuge tube;

b) adding a 50% ethanol solution to each of said soil samples contained in said centrifuge tube;

c) sonificating each of said soil samples;

d) centrifuging each of said soil samples to remove nongypsic sulfates;

e) adding a 25 milliliter aliquot of 0.5M Na_2CO_3 solution to each of said soil samples to form a water-soluble sodium sulfate solution;

f) sonificating each of said soil samples to form a water-soluble sodium sulfate solution;

g) centrifuging each of said soil samples; and

h) separating the supernatant solution of each of said soil samples for sulfate analysis by $BaSO_4$.

5,595,915

METHOD OF DETERMINING ANTIGENICALLY ACTIVE AMINO ACID SEQUENCES

Hendrik M. Geysen, Victoria, Australia, assignor to Chiron Mimotopes Pty. Ltd, Victoria, Australia, and Stichting Centraal Diergeneeskundig Instituut, Lelystad, Netherlands

Continuation of Ser. No. 869,833, Apr. 15, 1992, abandoned, which is a continuation of Ser. No. 355,095, May 16, 1989, abandoned, which is a continuation of Ser. No. 680,338, Nov. 8, 1984, abandoned. This application Jun. 1, 1994, Ser. No. 252,399
Claims priority, application Australia, Mar. 8, 1983, PF8348/83
Int. Cl.[6] G01N *33/53*
U.S. Cl. 436—518 11 Claims

1. A method of detecting or determining a peptide comprising a sequence of amino acids which is antigenically active within a known amino acid sequence of an antigenic protein or portion thereof, the method comprising the steps of:

(A). synthesizing a plurality of peptides, wherein each of said peptides is coupled to a solid phase and said plurality of peptides is arranged in an array, each of said peptides comprising a sequence of five to nine amino acids which corresponds to a sequence within the known amino acid sequence, and the peptides having overlapping amino acid sequences, said overlapping amino acid sequences comprising an overlap of one to four amino acids;

(B). contacting said array of said peptides with antibody against the protein or portion thereof; and

(C). detecting or determining the presence or absence of an antigen-antibody reaction between each of said peptides and said antibody to indicate whether said peptide has antigenic activity.

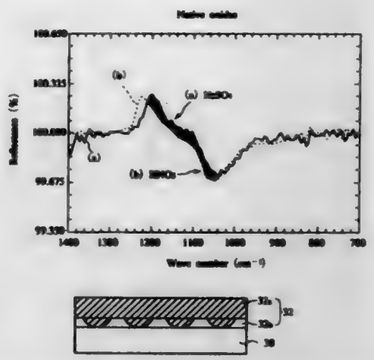
5,595,916

SILICON OXIDE FILM EVALUATION METHOD

Shuzo Fujimura; Hiroki Ogawa; Kenji Ishikawa, and Carlos R. Inomata, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 29, 1994, Ser. No. 219,550
Claims priority, application Japan, Mar. 29, 1993, 5-070527; Mar. 29, 1993, 5-070528
Int. Cl.[6] H01L *21/66*
U.S. Cl. 437—8 17 Claims

1. A silicon oxide film evaluation method comprising the steps of:



measuring reflectance or absorption spectra of a silicon oxide film, said silicon oxide film having a bulk region and an interface region formed on a silicon substrate by IR-RAS; and

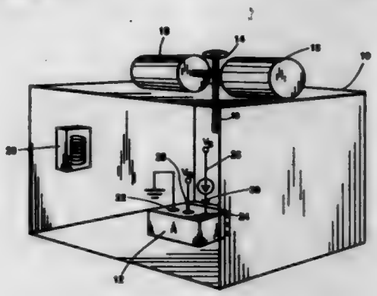
evaluating a structure of the interface region between the silicon substrate and the silicon oxide film based on the reflectance or absorption spectra in a range between a peak of the spectra by TO phonons around 1100 cm^{-1} and a peak of the spectra by LO phonons around 1230 cm^{-1}, said range excluding the peaks of the spectra by the TO phonons and the LO phonons.

5,595,917

METHOD FOR HYDROGEN TREATMENT OF FIELD EFFECT TRANSISTORS FOR USE IN HERMETICALLY SEALED PACKAGES

Michael J. Delaney; Loi D. Nguyen, both of Thousand Oaks; Minh V. Le, Simi Valley; Jorge L. Tinoi, Los Angeles, and James C. Loh, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 31, 1995, Ser. No. 381,042
Int. Cl.[6] H01L *21/66*
U.S. Cl. 437—8 19 Claims



1. A method for pretreating a Field Effect Transistor (FET), comprising:

heating said FET in the presence of hydrogen to degrade its performance; and

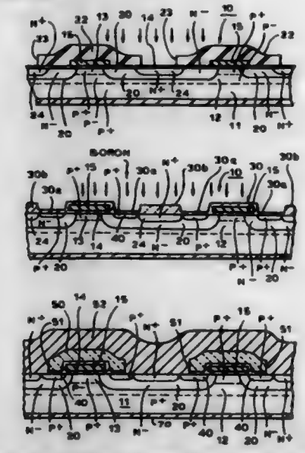
continuing to heat said FET in the presence of hydrogen for a period of time sufficient to permanently restore its performance so that the FET is substantially unaffected by a subsequent re-exposure to hydrogen.

5,595,918

PROCESS FOR MANUFACTURE OF P CHANNEL MOS-GATED DEVICE

Daniel M. Kinzer, El Segundo, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Filed Mar. 23, 1995, Ser. No. 409,181
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—29 14 Claims



1. A process for forming a P channel MOS-gated device comprising the steps of: forming a gate dielectric layer atop a P-type silicon wafer; forming a polysilicon layer atop said gate dielectric layer; patterning and etching away respective regions of said polysilicon layer in a first masking step to form a gate electrode layer; introducing N-type dopants into said silicon wafer using said gate electrode layer as a mask to form N^- bases which underlie edges of said etched polysilicon layer into said silicon wafer through said respective regions etched away from said polysilicon layer; forming respective N^+ regions centrally within the surface of each of said N^- bases; growing, in the same growth step, an oxide on said gate electrode layer, said N^- bases and said N^+ regions that has a first portion located atop said N^+ regions and has a second portion located atop said N^- bases that is thinner than said first portion; and implanting P-type carriers at an energy at which said P-type carriers penetrate through said second portion of said oxide but do not penetrate through said first portion of said oxide to form a respective self-aligned P^+ source region in each of said N^- bases.

5,595,919

METHOD OF MAKING SELF-ALIGNED HALO PROCESS FOR REDUCING JUNCTION CAPACITANCE

Yang Pan, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Pte Ltd., Singapore, Singapore

Filed Feb. 20, 1996, Ser. No. 603,117
Int. Cl.[6] H01L *21/8234*
U.S. Cl. 437—29 28 Claims

1. A method of fabricating an integrated circuit device comprising:

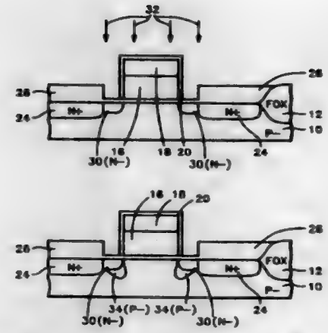
providing a layer of gate silicon oxide over the surface of a semiconductor substrate;

forming a gate electrode overlying said gate silicon oxide layer;

forming a silicon oxide layer having sidewalls on the top surface and sidewalls of said gate electrode;

forming silicon nitride spacers on the sidewalls of said silicon oxide sidewall layer;

implanting first ions into said semiconductor substrate and annealing said substrate whereby heavily doped source and drain regions are formed within said semiconductor substrate not covered by said gate electrode and said silicon oxide sidewall layer and said silicon nitride spacers;



growing a protective oxide layer over said heavily doped source and drain regions;

thereafter removing said silicon nitride spacers;

implanting second ions with a first dosage at a first energy to form lightly doped regions in said semiconductor substrate not covered by said protective oxide layer;

thereafter implanting third ions with a second dosage at a second energy wherein said third ions are of opposite polarity to said second ions and wherein said second energy is higher than said first energy whereby a halo is formed deeper than said lightly doped regions in said semiconductor substrate not covered by said protective oxide layer;

depositing an insulating layer over the surface of said substrate;

providing an opening through said insulating layer to one of said source and drain regions;

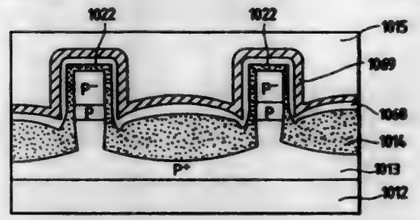
depositing a conducting layer overlying said insulating layer and within said opening and patterning said conducting layer completing the fabrication of said integrated circuit device.

5,595,920

METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE FOR USE WITH IMAGE PICKUP

Mamoru Miyawaki, Tokyo; Akira Ishizaki, Atsugi; Genno Momma, Hiratsuka; Hiroshi Yamarkura, Isehara, and Tetsunobu Kochi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 263,147, Jun. 21, 1994, which is a division of Ser. No. 870,258, Apr. 17, 1992, Pat. No. 5,331,197. This application Apr. 6, 1995, Ser. No. 417,831
Claims priority, application Japan, Apr. 23, 1991, 3-92294; Apr. 23, 1991, 3-92295; Apr. 26, 1991, 3-97256
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—40 7 Claims



1. A method for producing a semiconductor device comprising the steps of:

a) forming, on a surface of a substrate having a semiconductor region of a first conductivity type, a semiconductor layer of the first conductivity type and of an impurity concentration lower than that of the semiconductor region;

b) etching to form a plurality of convex sections including a part of the semiconductor region and a part of the semiconductor layer;

c) oxidizing a surface of one of the convex sections to form a first oxide film on the surface thereof;
d) providing an oxidizing resist layer on the first oxide film surface;
e) oxidizing a bottom exposed from the oxidizing resist layer between the plurality of the convex sections, to form, at the bottom, a second oxide film with a thickness greater than that of the first oxide film;
f) forming a gate electrode on a pair of side surfaces and a top surface of the one convex section; and
g) forming, at both lateral sides of the gate electrode, a source and a drain of a second conductivity type different from the first conductivity type.

5,595,921

METHOD FOR FABRICATING A FULLY DEPLETED LATERAL TRANSISTOR

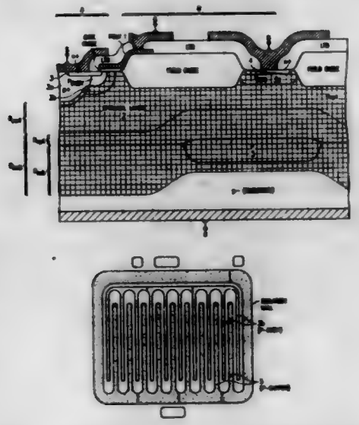
Flavio Villa, Milan, and Enrico M. A. Ravanelli, Monza, both of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Division of Ser. No. 200,396, Feb. 23, 1994. This application Jun. 2, 1995, Ser. No. 459,052

Claims priority, application European Pat. Off., Feb. 24, 1993, 93830073

Int. Cl.[6] H01L *21/8234*

U.S. Cl. 437—40 **7 Claims**



1. Method for fabricating a transistor, comprising the steps of:
(a) providing a substrate which includes at least one substantially monolithic body of semiconductor material of a first conductivity type;
(b) performing a patterned implantation step, to introduce additional dopants of said first conductivity type into said substrate;
(c) growing an epitaxial semiconductor layer of a second opposite conductivity type atop said substrate;
(d) forming source, gate, and drain regions at a surface of said epitaxial layer, with said gate region being laterally interposed between said source and drain regions to control current flow therebetween, in locations such that said drain region, but NOT said source region, lies above said additional dopants introduced in said step (b).

5,595,922

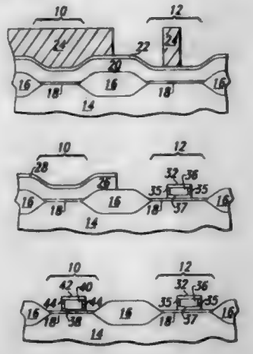
PROCESS FOR THICKENING SELECTIVE GATE OXIDE REGIONS

Howard L. Tigelaar, Allen; Bert R. Riemenschneider, Plano; Richard A. Chapman, and Andrew T. Appel, both of Dallas, all of Tex., assignors to Texas Instruments, Dallas, Tex.

Filed Oct. 28, 1994, Ser. No. 330,655

Int. Cl.[6] H01L *21/265;21/70;27/00*

U.S. Cl. 437—40 **14 Claims**



1. A method of simultaneously forming a first transistor and a second transistor on a single substrate for an electrical device structure, said method comprising:
providing a substrate, said substrate having a first region for said first transistor and a second region for said second transistor;
forming an oxide layer on said substrate, said oxide layer having a first thickness;
forming a conductive layer on said oxide layer, said conductive layer covering said oxide layer and said substrate in said first region and said second region;
removing portions of said conductive layer in said first region to form a gate structure for said first transistor and so as to leave said conductive layer remaining in said second region;
after forming said gate structure for said first transistor, thickening said oxide layer under the entire width of said gate structure for said first transistor to a second thickness while leaving said oxide layer in said second region at said first thickness; and removing portions of said conductive layer in said second region so as to form a gate structure for said second transistor, said oxide layer having a thickness of said first thickness is disposed between said gate structure for said second transistor and said substrate.

5,595,923

METHOD OF FORMING A THIN FILM TRANSISTOR

Hongyong Zhang; Hideki Uochi; Toru Takayama; Yasuhiko Takemura, and Mutsuo Yamamoto, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

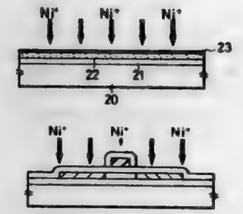
Division of Ser. No. 207,124, Mar. 8, 1994. This application Jun. 6, 1995, Ser. No. 467,986

Claims priority, application Japan, Mar. 12, 1993, 5-78999; Mar. 12, 1993, 5-79000

Int. Cl.[6] H01L *21/84*

U.S. Cl. 437—41 **16 Claims**

1. A method of forming a transistor comprising:
forming on a substrate a semiconductor film comprising silicon;
adding a catalyst element for promoting crystallization, to said semiconductor film;
annealing the semiconductor film at a first temperature to crystallize it using the catalyst element;
forming a gate electrode on said semiconductor film;
introducing a doping impurity into a portion of said semiconductor film with said gate electrode as a mask;



forming a substance containing a catalyst element in contact with the portion of said semiconductor film; and
annealing said semiconductor film at a second temperature lower than the first temperature to crystallize the portion of the semiconductor film and to activate said introduced impurity.

5,595,924

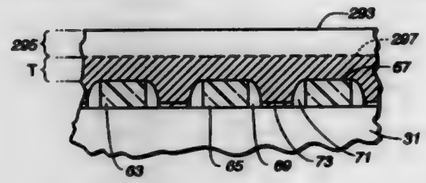
TECHNIQUE OF FORMING OVER AN IRREGULAR SURFACE A POLYSILICON LAYER WITH A SMOOTH SURFACE

Jack H. Yuan, Cupertino, and Gheorghe Samachisa, San Jose, both of Calif., assignors to SanDisk Corporation, Sunnyvale, Calif.

Division of Ser. No. 248,735, May 25, 1994. This application Dec. 19, 1994, Ser. No. 358,801

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **8 Claims**



6. A method of forming a structure on an integrated circuit substrate, comprising:
depositing a layer of dielectric material supported by said substrate,
forming channels in the dielectric layer by removing portions thereof according to a pattern,
forming a layer of polysilicon material over the dielectric layer and extending into the channels, said polysilicon layer having a thickness T over the dielectric layer such that, if the polysilicon layer was deposited only to said thickness T, the polysilicon layer would have depressions in a top surface thereof over the channels, the polysilicon layer forming step including:
depositing said layer of polysilicon to a thickness in excess of T over the dielectric layer until the top surface of the polysilicon no longer contains said depressions, and
removing a portion of the polysilicon layer until its thickness over the dielectric layer is equal to T.

5,595,925

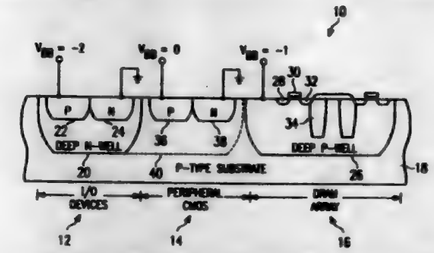
METHOD FOR FABRICATING A MULTIPLE WELL STRUCTURE FOR PROVIDING MULTIPLE SUBSTRATE BIAS FOR DRAM DEVICE FORMED THEREIN

Ih-Chin Chen, Richardson; Hisashi Shichijo, and Clarence W. Teng, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1994, Ser. No. 236,745

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **4 Claims**



1. A method for fabricating a multiple well structure in which transistors for a dynamic random access memory can be formed, the fabrication method comprising the steps of:
forming a first well structure in a p substrate in which an input/output section can be formed, the first well structure having a deep n well with a shallow p well and a shallow n well formed therein, the shallow p well of said first well structure operating from a first substrate bias voltage;
forming a second well structure in the p substrate in which peripheral transistors can be formed, the second well structure having a shallow p well and a shallow n well formed in the substrate, the shallow p well of said second well structure operating from a second substrate bias voltage;
forming a third well structure in the p substrate in which memory array transistors can be formed, the third well structure having a deep p well formed in the substrate, the p well of said third well structure operating from a third substrate bias voltage; and
forming trench regions within the p-type well region to isolate memory cells of the memory array section.

5,595,926

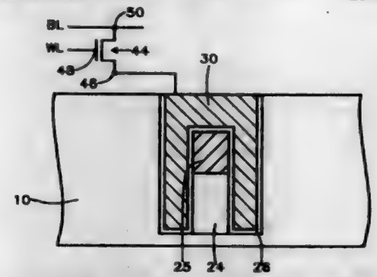
METHOD FOR FABRICATING A DRAM TRENCH CAPACITOR WITH RECESSED PILLAR

Horng-Huei Tseng, Hsin-chu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 29, 1994, Ser. No. 267,405

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **26 Claims**



1. A method for fabricating a capacitor with a single pillar recessed in a treach, comprising the steps of:
providing a silicon substrate;
forming a first insulating layer over said silicon substrate;
forming a nitride layer over said first insulating layer;

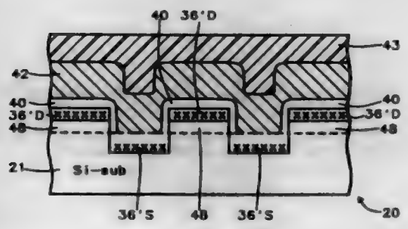
patterning said first insulating layer and said nitride layer to form an opening to said silicon substrate;
removing a portion of said silicon substrate in a region defined by said opening, whereby a first trench is formed;
forming a oxide insulating layer, in said first trench and over said nitride layer;
forming sidewall spacers along the sidewalls of said first trench by removing said oxide insulating layer except along the sidewalls of said first trench;
forming a first conductive layer between said sidewall spacers and over said first trench and said nitride layer;
removing said first conductive layer except within said first trench between said sidewall spacers, whereby a first pillar is formed;
removing said sidewall spacers;
removing a portion of said silicon substrate in said first trench that is not vertically masked by said first pillar, and simultaneously removing a portion of said first pillar, whereby a second trench and second pillar are formed at a greater depth in said silicon substrate than said first trench and said first pillar;
removing a remaining portion of said nitride layer;
forming a dielectric layer in said second trench, over said second pillar, and over said first insulating layer;
forming a second conducting layer over said dielectric layer; and
removing said second conducting layer in region outside of said second trench.

5,595,927

METHOD FOR MAKING SELF-ALIGNED SOURCE/DRAIN MASK ROM MEMORY CELL USING TRENCH ETCHED CHANNEL

Ling Chen, Sunnyvale, Calif.; Horng-Cheng Sung, Kaohsiung, and Chi-Shiung Lo, Hsinchu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Mar. 17, 1995, Ser. No. 405,722
Int. Cl.[6] H01L 21/70
U.S. Cl. 437—52 **31 Claims**



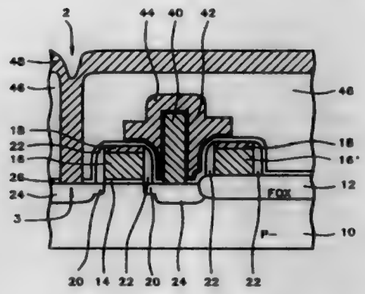
1. A method of manufacture of a semiconductor memory device including a silicon semiconductor substrate with a vertical channel comprising the sequence of steps as follows:
forming a first dielectric masking layer patterned with pattern of trench openings therethrough on said substrate,
etching of trenches in the surface of the semiconductor substrate through said first dielectric masking layer,
said trenches having bases and sidewalls, said substrate having upper surfaces between and/or aside from said trenches,
removing said masking layer,
forming a sub-spacer layer on the surface of said device,
forming a spacer layer over said sub-spacer dielectric layer,
shaping said spacer layer to form spacers over said sub-spacer dielectric layer in said trenches along said sidewalls,
ion implanting source/drain ions to deposit dopant in said substrate,
removing said spacer layer and said sub-spacer layer from said device,
forming a silicon dioxide layer over said device,
source/drain annealing said device to form source/drain regions in said silicon semiconductor substrate, and
forming and patterning a conductive word-line over said dielectric layer.

5,595,928

HIGH DENSITY DYNAMIC RANDOM ACCESS MEMORY CELL STRUCTURE HAVING A POLYSILICON PILLAR CAPACITOR

Chih-Yuan Lu, and Horng-Huei Tseng, both of Hsin Chu, Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Sep. 18, 1995, Ser. No. 529,637
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 **19 Claims**



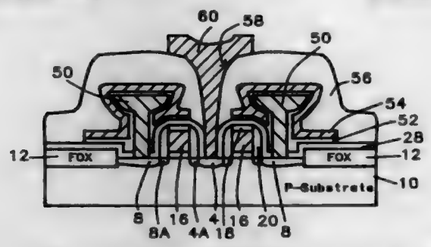
1. A method for fabricating stacked storage capacitors on a semiconductor substrate, comprising the steps of:
providing a semiconductor substrate having field oxide areas surrounded and electrically isolated device areas, said device areas having semiconductor devices formed, in part, from a patterned first polysilicon layer, and said devices areas having device contact areas;
depositing a first insulating layer on said substrate and over said patterned first polysilicon layer,
depositing a second insulating layer on said first insulating layer;
anisotropically etching node contact openings in said second and first insulating layers to said device contact areas, thereby forming node contact openings having essentially vertical sidewalls for stacked storage capacitor bottom electrodes;
depositing a conformal second polysilicon layer, and thereby filling said node contact openings, and also forming a uniformly thick second polysilicon layer elsewhere on said second insulating layer;
oxidizing by thermal oxidation said second poly-silicon layer to said second insulating layer, and thereby leaving unoxidized polysilicon pillars in said node contact openings having essentially vertical sidewalls;
isotropically etching said oxidized portion of said second poly-silicon layer, and by said same isotropic etch, etching selectively said second insulating layer to said first insulating layer leaving free standing polysilicon pillars and thereby forming pillar-shaped bottom electrodes;
forming a capacitor interelectrode dielectric layer on said bottom electrodes, and
depositing and patterning a third polysilicon layer, and completing said stacked storage capacitors.

5,595,929

METHOD FOR FABRICATING A DRAM CELL WITH A CUP SHAPED STORAGE NODE

Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Jan. 16, 1996, Ser. No. 585,615
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 **19 Claims**



1. A method of fabricating a DRAM (dynamic random access memory) device having a cup shaped capacitor, comprising the steps of:
a) providing a MOS (metal oxide semiconductor) device having a gate centered between spaced source and drain regions;
b) forming an interlayer insulating film over said MOS device and a substrate surface;
c) forming a first photoresist layer over said interlayer insulating film, said first photoresist layer having a first opening centered over said source;
d) isotropically etching said interlayer insulating film through said first opening forming a cup shaped cavity having sidewalls of said first interlayer insulation film;
e) anisotropically etching said interlayer insulating film through said first opening forming a contact hole which exposes said source region;
f) removing said first photoresist layer;
g) forming a first conductive layer over said interlayer insulating film and in said cup shaped cavity and in said node contact hole to form an electrical contact with said source region;
h) removing a top portion of said first conductive layer so that the top surface of said first conductive layer is exposed;
i) selectively removing all of said interlayer insulating film thereby forming a cup shaped storage node; and
j) sequentially forming a capacitor dielectric layer and top plate electrode, over said cup shaped storage node.

5,595,930

METHOD OF MANUFACTURING CCD IMAGE SENSOR BY USE OF RECESSES

Euy H. Baek, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Rep. of Korea

Filed Jul. 26, 1995, Ser. No. 507,202
Claims priority, application Rep. of Korea, Jun. 22, 1995, 16931/1995
Int. Cl.[6] H01L 21/339
U.S. Cl. 437—53 **20 Claims**



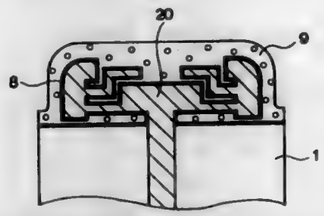
1. A method of manufacturing a CCD image sensor comprising the steps of:
a) forming a plurality of photoelectric conversion devices on a substrate spaced from one another by a predetermined distance;
b) forming a plurality of vertical charge coupled devices between said photoelectric conversion devices;
c) coating a lower planarizing layer on the surface of the exposed substrate, said photoelectric conversion devices and said vertical charge coupled devices;
d) thermally hardening said lower planarizing layer;
e) performing an etching mask operation by coating a photoresist layer onto said thermally-hardened lower planarizing layer;
f) performing an isotropic etching upon the resultant structure subjected to said etching mask operation;
g) forming a plurality of hemispheric recesses by said isotropic etching;
h) removing said photoresist layer after finishing said isotropic etching;
i) forming a dye layer by dyeing said plurality of hemispheric recesses in said lower planarizing layer by means of a plurality of colors;
j) forming an upper planarizing layer on said dye layer; and
k) forming micro-lenses having a proper refractivity on said upper planarizing layer respectively corresponding to said photoelectric conversion devices.

5,595,931

METHOD FOR FABRICATING CAPACITOR OF A SEMICONDUCTOR DEVICE

Suk S. Kim, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jun. 19, 1995, Ser. No. 491,702
Claims priority, application Rep. of Korea, Jun. 30, 1994, 94-15429
Int. Cl.[6] H01L 21/70
U.S. Cl. 437—60 **2 Claims**



1. A method for fabricating a capacitor of a semiconductor device, comprising the steps of:
forming a contact hole in a stack structure consisting of a first insulating layer and a second insulating layer, which are sequentially formed on a substrate;
depositing a first polysilicon layer to fill the contact hole and forming a first photosensitive film pattern for a storage electrode mask on the first polysilicon layer;
etching the material from the first polysilicon layer away to an appropriate depth, to form a protrusion, with the first photosensitive film serving as a mask;
removing the first photosensitive film pattern and sequentially depositing a third insulating film on the entire structure of said first polysilicon layer formed after said removing process, depositing a fourth insulating film on said third insulating film, and depositing a fifth insulating film on said fourth insulating film;
forming a second photosensitive film pattern for a storage electrode mask, wider than the first photosensitive film pattern, on the fifth insulating layer;
sequentially subjecting the fifth, the fourth and the third insulating films and the first polysilicon layer to dry etch to form a third insulating layer pattern, a fourth insulating layer pattern, a fifth insulating layer pattern, and a first polysilicon layer pattern, respectively, with said second photosensitive film pattern serving as a mask;

removing the second photosensitive film pattern and excavating the fourth insulating layer pattern to some extent to form a cavity between the third and the fifth insulating layer patterns;
depositing a second polysilicon layer over the resulting structure to fill the cavity and subjecting the second polysilicon layer to etch back to form a spacer at the side wall of the third and the fifth insulating layer patterns, said spacer being in electrical connection with the first polysilicon layer pattern and the second polysilicon layer remaining in the cavity;
removing the materials form the fifth, the fourth and the third insulating film patterns and the second insulating layer by wet etch, to expose a storage electrode consisting of the first polysilicon layer pattern and the second polysilicon spacer, a part of which extends over the first polysilicon layer pattern; and
coating a dielectric film on the surfaces of the storage electrode and forming a plate electrode along the surfaces.

5,595,932

Patent Not Issued For This Number

5,595,933

METHOD FOR MANUFACTURING A CATHODE

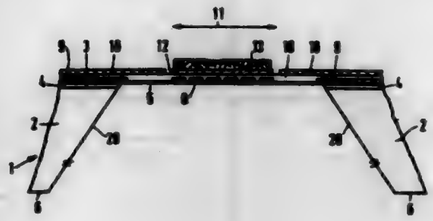
Willem L. C. M. Heijboer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 415,625, Mar. 30, 1995, Pat. No. 5,475,281, which is a continuation of Ser. No. 193,624, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 832,141, Feb. 6, 1992, abandoned. This application Aug. 29, 1995, Ser. No. 520,444

Claims priority, application Netherlands, Feb. 25, 1991, 9100327

Int. Cl.[6] H01L *21/70*

U.S. Cl. 437—60 **3 Claims**



1. A method of manufacturing an electron source comprising:
a) providing a semiconductor substrate having opposing front and rear main surfaces with etch-barrier layers at said front and rear surfaces, said etch-barrier layers being thin relative to the thickness of said substrate,
b) removing preselected portions of the etch-barrier layer present at said rear surface,
c) anisotrophically etching said substrate starting from the rear surface until the etch-barrier provided at the front surface is reached thereby removing portions of said substrate corresponding to said preselected portions of the etch-barrier present at said rear surface,
d) and before or after said etching, providing a heating element and a layer of an electron-emissive material on said front surface at the location of the etch-barrier layer provided at said front surface corresponding to said preselected portions.

5,595,934

METHOD FOR FORMING OXIDE PROTECTIVE FILM ON BONDING PADS OF SEMICONDUCTOR CHIPS BY UV/O_3 TREATMENT

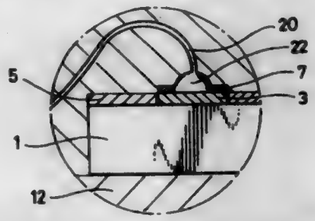
Yoon S. Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 24, 1995, Ser. No. 505,910

Claims priority, application Rep. of Korea, May 17, 1995, 1995-12286

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—180 **10 Claims**



1. A method for manufacturing a semiconductor chip, comprising:
(a) providing a chip having a circuit pattern and metal bonding pads thereon;
(b) covering the chip with a passivation film, except on said bonding pads;
(c) simultaneously,
(i) exposing the chip to an O_3 atmosphere, and
(ii) irradiating the chip using ultraviolet (UV) radiation, thereby generating excited oxygen, which reacts with metal atoms of said metal bonding pads, to form a fine metal oxide film on the bonding pads, thereby providing a protective film on said bonding pads.

5,595,935

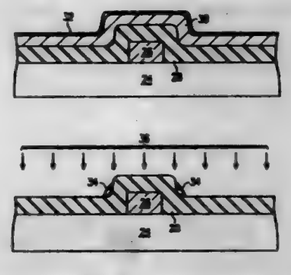
METHOD FOR FORMING INTERCONNECT IN INTEGRATED CIRCUITS

Tsiu C. Chan, Carrollton; Frank R. Bryant, Denton; Lun-Tseng Lu, Grand Prairie, and Che-Chia Wei, Plano County, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 126,673, Sep. 24, 1993, Pat. No. 5,500,557, which is a continuation of Ser. No. 876,405, Apr. 30, 1992, abandoned. This application Apr. 7, 1995, Ser. No. 418,191

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—187 **28 Claims**



1. A method for fabricating integrated circuits, comprising the steps of:
depositing a first conductive layer over an integrated circuit;
patterning the first conductive layer to define a first interconnect layer, the first interconnect layer having vertical sidewalls;
forming an insulating layer over the integrated circuit and the first interconnect layer;
depositing a second conductive layer over the insulating layer;

patterning the second conductive layer to define a second interconnect layer having a selected pattern, wherein portions of the second conductive layer outside of the selected pattern remain adjacent to the vertical sidewalls of the first interconnect layer forming residual conductive material; and
modifying the material properties of the residual conductive material to increase its conductivity.

5,595,936

METHOD FOR FORMING CONTACTS IN SEMICONDUCTOR DEVICE

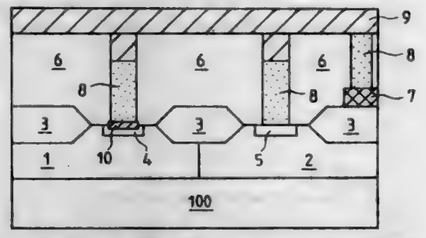
Kyeong K. Choi, and Choon H. Kim, both of Kyungki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Continuation-in-part of Ser. No. 285,972, Aug. 4, 1994, abandoned. This application Aug. 7, 1995, Ser. No. 512,141

Claims priority, application Rep. of Korea, Aug. 4, 1993, 1993-15113

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—192 **4 Claims**



1. A method for forming contacts in a semiconductor device, comprising the steps of:
preparing a silicon substrate having a P^+ impurity-diffused region and an N^+ impurity-diffused region;
forming an insulating layer over the silicon substrate;
selectively removing the insulating film, thereby forming contact holes exposing respective portions of the P^+ and N^+ impurity diffused regions;
a first step of forming a metal pad on the exposed portion of the N^+ impurity diffused region under a first temperature condition of 200° C. to 300° C. and using a reacting gas consisting of WF_6 so that tungsten is deposited to form the metal pad only on said N^+ impurity diffused region and is not deposited on said P^+ impurity-diffused region;
a second step of forming tungsten metal plugs having a uniform thickness in the contact holes, under a second temperature condition that tungsten is grown on the tungsten metal pad formed on said N^+ impurity-diffused region and is grown on said P^+ impurity-diffused region in one of said contact holes exposing said P^+ impurity-diffused region by supplying reacting gases consisting of WF_6 and SiH_4; and
forming a metal material layer over the insulating layer, the metal material layer being electrically connected with the tungsten metal plugs.

5,595,937

METHOD FOR FABRICATING SEMICONDUCTOR DEVICE WITH INTERCONNECTIONS BURIED IN TRENCHES

Kaoru Mikagi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

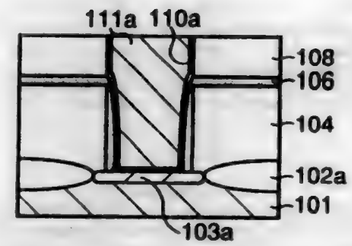
Filed Apr. 12, 1996, Ser. No. 635,230

Claims priority, application Japan, Apr. 13, 1995, 7-111053

Int. Cl.[6] H01L *21/283;21/311*

U.S. Cl. 437—192 **7 Claims**

1. A method for fabricating a semiconductor device comprising the steps of:



a) forming a first insulating film covering one of a diffusion layer formed in a surface region of a semiconductor substrate and a lower level interconnection layer formed over the semiconductor substrate;
b) forming an opening in said first insulating film, one of said opening exposing a surface of said diffusion layer and said lower level interconnection layer;
c) forming a protective film covering an inside of said opening and a surface of said first insulating film;
d) forming a planar film by burying a material in said opening, said material capable of being selectively removed relative to said protective film;
e) forming a second insulating film covering said planar film and said first insulating film;
f) forming an interconnection trench by selectively etching said second insulating film, said interconnection trench exposing a surface of said planar film;
g) removing said planar film;
h) exposing the surface of one of said diffusion layer and said lower level interconnection by removing said protective film at least at a bottom area of said opening; and
i) forming a conductive film burying said opening and said interconnection trench.

5,595,938

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

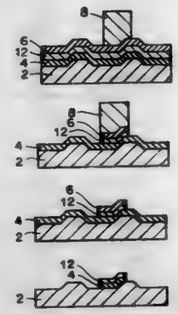
Junji Miyazaki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 345,734

Claims priority, application Japan, Dec. 28, 1993, 5-337105

Int. Cl.[6] H01L *21/469*

U.S. Cl. 437—195 **1 Claim**



1. A method of manufacturing a semiconductor device, comprising the steps of:
forming an interconnection layer consisting of a metal material on a substrate;
thereafter forming an insulating layer on said interconnection layer; and
forming an anti-reflection film on said insulating layer, said anti-reflection film including a compound having metal-

silicon-oxygen, using the same metal material as the material used for said interconnection layer;

forming a resist film having a pattern of a shape on said anti-reflection film by photolithography; and

patterning said interconnection layer and said anti-reflection film according to the pattern of said resist film.

5,595,939

LIQUID-SEALED SEMICONDUCTOR PRESSURE SENSOR AND MANUFACTURING METHOD THEREOF

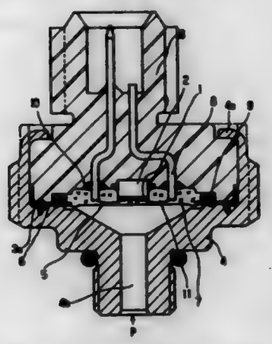
Seiichiro Otake, Hase-gun; Yoshifumi Watanabe, Nukata-gun, and Yukihiro Kato, Toyoake, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 24, 1995, Ser. No. 394,300

Claims priority, application Japan, Mar. 4, 1994, 6-034359

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 12 Claims



1. A method of manufacturing a semiconductor pressure sensor having a pressure transmitting medium held in a chamber which is formed in a recess of a connecting member and sealed by a metal diaphragm member secured to a housing having a pressure intake conduit, said method comprising the sequential steps of:

orienting the connecting member so that the recess opens upwardly;

filling a volume of transmitting medium approximately equal to a volume of said chamber into said recess of said connecting member;

press-fitting and securing said housing, with said diaphragm member interposed between said housing and said connecting member, to said connecting member to form said chamber; and

applying to said diaphragm member a prescribed pressure through said pressure intake conduit for a prescribed period to dissolve air trapped in said chamber into said transmitting medium.

5,595,940

METHOD OF PRODUCING MICROMECHANICAL STRUCTURES

Hans-Peter Trah, Reutlingen; Franz Laermer, Stuttgart, and Andrea Schilp, Gomaringen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 22, 1995, Ser. No. 446,271

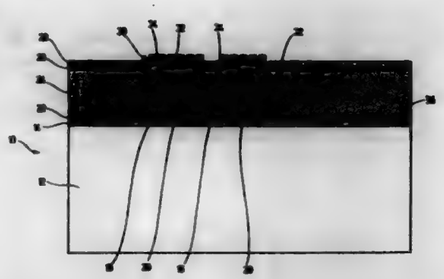
Claims priority, application Germany, May 25, 1994, 44 18 163.9

Int. Cl.[6] H01L *21/302*

U.S. Cl. 437—225 9 Claims

1. A method of producing a micromechanical structure, comprising the steps of:

providing at least one semiconductor component containing integrated circuits and having at least one surface;



subsequently and independently producing the micromechanical structure on the surface of the semiconductor component;

providing a first resist layer on the semiconductor component;

patterning, in the first resist layer, of at least one sacrificial area using at least one protective mask area;

providing a metal layer on the semiconductor component and on the at least one sacrificial area;

providing a second resist layer on the metal layer, the second resist layer having a thickness at least as large as a height of the micromechanical structure and removing the at least one sacrificial area.

5,595,941

METHOD OF FORMING FINE PATTERNS

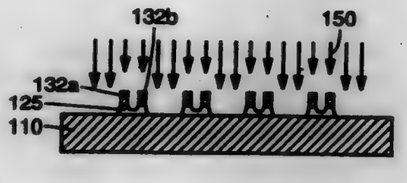
Chikayuki Okamoto; Tadashi Nishioka, and Satoru Kawazu, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Hyogo, both of Japan

Filed Feb. 27, 1995, Ser. No. 395,025

Claims priority, application Japan, Jun. 1, 1994, 6-120854

Int. Cl.[6] H01L *21/30*

U.S. Cl. 437—228 2 Claims



1. A method of forming a fine pattern, comprising the steps of:

forming an object layer on a support member;

forming on said object layer patterned resist having opposing side surfaces;

converting a portion of the patterned resist on each opposing side surface to form first and second opposing sidewalls leaving unconverted resist therebetween, wherein said first and second sidewalls exhibit etch characteristics different from said unconverted resist;

etching away the portion of said object layer excluding the portion immediately below said patterned resist, using as mask said patterned resist including said first and second sidewalls, thereby forming a pattern of the object;

removing the unconverted part of said patterned resist, thereby leaving said first and second sidewalls on said pattern of the object;

etching away the portion of said pattern of the object, excluding the portion immediately below said first and second sidewalls, using said first and said second sidewalls as a mask, thereby forming a finer pattern of said object; and

removing said first and second sidewalls.

5,595,942

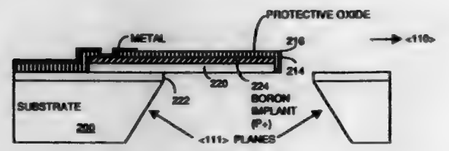
METHOD OF FABRICATING CANTILEVER FOR ATOMIC FORCE MICROSCOPE HAVING PIEZORESISTIVE DEFLECTION DETECTOR

Thomas Albrecht, San Jose; Marco Tortonese, Stanford, and Robert Barrett, Mountain View, all of Calif., assignors to The Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 239,088, May 5, 1994, abandoned, which is a division of Ser. No. 954,695, Sep. 30, 1992, Pat. No. 5,345,815, and a continuation of Ser. No. 638,163, Jan. 4, 1991, abandoned. This application Apr. 5, 1995, Ser. No. 417,485

Int. Cl.[6] H01L *21/34*

U.S. Cl. 437—228 7 Claims



1. A method of fabricating a cantilever for an atomic force microscope, said method comprising the following steps:

forming a cantilever arm on a semiconductor substrate, the cantilever arm having a free end and a fixed end;

doping a portion of the cantilever arm so as to form a piezoresistive element; and

fabricating a projecting tip near the free end of the cantilever, said tip terminating in a sharp point and having a size and shape which render said tip suitable for interacting with a surface of a sample to perform atomic force microscopy.

5,595,943

METHOD FOR FORMATION OF CONDUCTOR USING ELECTROLESS PLATING

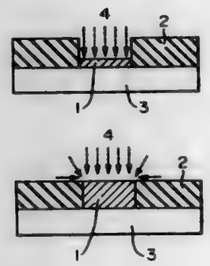
Takeyuki Itabashi; Haruo Akahoshi, both of Hitachi, and Akio Takahashi, Hitachiota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1995, Ser. No. 495,021

Claims priority, application Japan, Jun. 30, 1994, 6-194060

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—230 3 Claims



1. A method for forming a conductor circuit by depositing and filling a conductor metal in recessions of insulator in the form of grooves or holes using an electroless plating solution, the conductor metal being deposited and filled in the recession at the same level as the surface of the insulator, wherein said electroless plating solution contains an inhibitor which inhibits the cathodic partial reaction which is a metal deposition reaction and the electroless plating is carried out with stirring the plating solution.

5,595,944

TRANSISTOR AND PROCESS FOR FABRICATING THE SAME

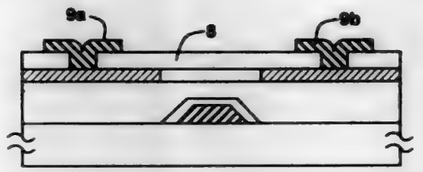
Hongyong Zhang; Toru Takayama, and Yasuhiko Takemura, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Inc., Kanagawa-ken, Japan

Division of Ser. No. 207,182, Mar. 8, 1994, abandoned. This application Dec. 21, 1994, Ser. No. 360,600

Claims priority, application Japan, Mar. 12, 1993, 5-78997; Mar. 12, 1993, 5-78998

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—41 45 Claims



1. A method of manufacturing an insulated gate field effect transistor comprising the steps of:

forming a gate electrode on a substrate;

forming a gate insulating layer on said gate electrode;

forming a semiconductor layer over said gate electrode, said gate electrode insulated from said semiconductor layer by said gate insulating layer interposed therebetween;

forming a mask over said semiconductor layer, wherein said mask is formed in a self-alignment manner with respect to said gate electrode;

introducing metal ions into a first region of said semiconductor layer in a self-alignment manner with respect to said mask;

introducing impurity ions into a second region of said semiconductor layer in a self-alignment manner with respect to said mask to form source and drain regions.

5,595,945

CERAMIC COMPOSITE COATING

George G. Wicks, Aiken, S.C., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Division of Ser. No. 668,364, Mar. 14, 1991, abandoned, which is a continuation of Ser. No. 293,846, Jan. 5, 1989, abandoned. This application Nov. 25, 1991, Ser. No. 796,974

Int. Cl.[6] C04C *35/14*

U.S. Cl. 501—12 12 Claims

1. An opaque ceramic composite suitable for curing, bonding to and thereby repairing substrates, said ceramic composite being obtained by:

mixing ethanol and water to form a first pre-mix;

adjusting the pH of said first pre-mix into the acid range;

mixing ethanol and tetraethyl orthosilicate to form a second pre-mix;

adding said first pre-mix to said second pre-mix to form a third mixture and thoroughly mixing same;

aging said third mixture at room temperature; while maintaining sufficient alcohol-water solvent present from said pre-mixes to avoid premature curing of said third mixture;

mixing a fine crystalline particulate with said third mixture to form a slurry.

5,595,946

SUBSTRATE MATERIALS FOR MAGNETIC HEADS WITH LOW FLYING HEIGHT

Shinji Tsujimoto, Osaka; Shin Mishima, Takarazuka; Shigeru Kawahara, Kasuya; Shigeki Mohri, Fukuoka; Toyohige Sozaki, Fukuoka; Michito Miyahara, Fukuoka, and Osamu Nakano, Fukuoka, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, and Nippon Tungsten Co., Ltd., Fukuoka, both of Japan

Filed May 4, 1995, Ser. No. 434,832
Claims priority, application Japan, May 14, 1994, 6-124161; Mar. 10, 1995, 7-051622
Int. Cl.[6] C04B 35/56;35/58
U.S. Cl. 501—87 7 Claims

1. Substrate materials for magnetic heads consisting of 24–75 mol % of α-Al_2O_3 and the remaining 76–25 mol % of a phase having an NaCl structure with an average composition $TiC_XO_YN_Z$, where $0.5 \leq X \leq 0.995$, $0.005 \leq Y \leq 0.30$, $0 \leq Z \leq 0.20$, and $0.505 \leq X+Y+Z \leq 1$.

5,595,947

SUBSTRATE MATERIALS FOR MAGNETIC HEAD

Shinji Tsujimoto, Osaka; Shin Mishima, Takarazuka; Shigeru Kawahara, Kasuya; Toshiaki Wada, Takatsuki; Michito Miyahara, Fukuoka; Toyohige Sozaki, Fukuoka; Shigeki Mohri, Fukuoka, and Osamu Nakano, Fukuoka, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, and Nippon Tungsten Co. Ltd., Fukuoka-ken, both of Japan

Filed May 4, 1995, Ser. No. 434,833
Claims priority, application Japan, May 14, 1994, 6-124160; Mar. 10, 1995, 7-051623
Int. Cl.[6] C04B 35/56;35/58
U.S. Cl. 501—87 6 Claims

1. Substrate materials for magnetic heads comprising a basic composition consisting of 24–75 mol % of α-Al_2O_3 and the remaining 76–25 mol % of a phase having an NaCl structure with an average composition $TiC_XO_YN_Z$, where $0.5 \leq X \leq 0.995$, $0.005 \leq Y \leq 0.30$, $0 \leq Z \leq 0.20$, and $0.505 \leq X+Y+Z \leq 1$, a compound containing 0.8–7.0 mol % with respect to 100 mol % of said basic composition of a metal selected from Mg, Ca, Zr and Cr, and a compound containing 0.03–0.8 mol % with respect to 100 mol % of said basic composition of at least one rare earth metal, the total concentration of said metal and rare earth elements being in a range of 0.83–7.03 mol %.

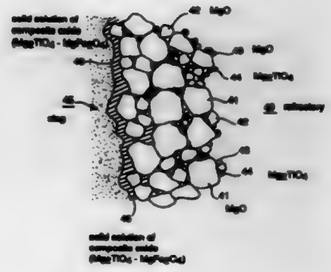
5,595,948

MAGNESIA-TITANIA REFRACTORY AND METHOD FOR MANUFACTURING THE SAME

Etsuji Kimura, Saitama-ken; Kenichi Yamaguchi, Fukushima-ken; Fumihiko Ogino, and Susumu Okabe, both of Saitama-ken, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jun. 16, 1995, Ser. No. 491,173
Claims priority, application Japan, Jun. 22, 1994, 6-163142
Int. Cl.[6] C04B 35/03;35/04;35/043
U.S. Cl. 501—108 14 Claims

1. A refractory having a spalling time number of at least 20 and an apparent porosity of 12% to 20%, said refractory consisting essentially of integrally sintered magnesium oxide particles and a mineral phase of magnesium orthotitanate (Mg_2TiO_4) intervening between said magnesium oxide particles, wherein the magnesium oxide content of said refractory is 50 to 95 wt. % and the magnesium orthotitanate content is 4 to 50 wt. % and wherein said



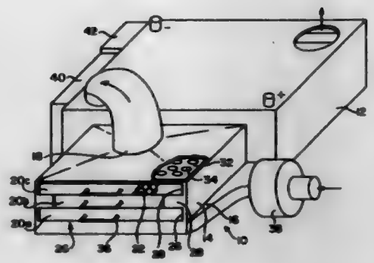
magnesium oxide particle content of said refractory comprises 10 to 50 wt. % coarse particles having an average particle diameter of at least 1 mm, and 10 to 50 wt. % medium particles having an average particle diameter of less than 1 mm.

5,595,949

SCRUBBER SYSTEM FOR REMOVING CARBON DIOXIDE FROM A METAL-AIR OR FUEL CELL BATTERY

Jonathan R. Goldstein; Yehuda Harats; Yuval Sharon, and Neal Naimer, all of Jerusalem, Israel, assignors to Electric Fuel (E.F.L.) Ltd., Jerusalem, Israel

Filed Mar. 18, 1994, Ser. No. 210,333
Int. Cl.[6] B01J 20/34
U.S. Cl. 502—20 11 Claims



1. A method for maximizing the effective life and utilization of CO_2-absorbent material in a scrubber system for removing carbon dioxide from an air inflow to a metal-air battery or fuel cell, the method comprising the steps of:

providing, in such a battery, a housing including a gas inlet, a gas outlet, and a plurality of gas-permeable containers supported in series across the flow path of gas entering said inlet and exiting said outlet;

each of said containers containing a CO_2-absorbent material and being individually independently removable from said series; and

flowing gas containing CO_2 into said gas inlet, through said CO_2-absorbent material in each of said plurality of containers, and out of said outlet,

wherein, after a utilization of the system, a first container closest to said gas inlet is removed from said series and a second container from said series is repositioned in the place of said first container and spent CO_2-absorbent material from said first container is regenerated for reuse in said scrubber system, said regeneration including at least periodically removing accumulated Group 1a metal carbonate deposits.

5,595,950

POLYMERIZATION CATALYST SYSTEMS, THEIR PRODUCTION AND USE

Virgil R. Sagar, League City, and Moses O. Jejelowo, Kingwood, both of Tex., assignors to Exxon Chemical Patents, Inc., Wilmington, Del.

Continuation of Ser. No. 433,768, May 3, 1995, abandoned, which is a continuation of Ser. No. 170,108, Dec. 20, 1993, abandoned. This application Nov. 8, 1995, Ser. No. 555,349
Int. Cl.[6] C08F 4/02
U.S. Cl. 502—104 4 Claims

1. A method for producing a supported catalyst system, said method comprising the steps of:

(1) contacting a porous carrier with at least one metallocene; and

(2) adding alumoxane that, after its initial formation, has been hydrolyzed with a hydrolyzing agent without the prior addition of alkylaluminum.

5,595,951

PROCESS FOR PREPARING A MULTILITHIO INITIATOR FOR IMPROVED TIRE RUBBERS

Adel F. Halasa, Bath, and George Jalics, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 16, 1995, Ser. No. 405,125
Int. Cl.[6] C08F 4/48
U.S. Cl. 502—154 6 Claims

1. A process for preparing an initiator which contains a plurality of lithium atoms and which is particularly useful for initiating the polymerization of diolefin monomers into rubbery polymers; said process being comprised of reacting an alkyl lithium compound with squalene, wherein said process is conducted in the presence of a substituted alkali metal phenoxide containing from 7 to about 20 carbon atoms.

5,595,952

CRYSTALLINE ALUMINUM ORGANOPHOSPHATE

Kazuyuki Maeda; Yoshimichi Kiyozumi, and Fujio Mizukami, all of Tsukuba, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,914
Claims priority, application Japan, Mar. 11, 1994, 6-068026
Int. Cl.[6] B01J 27/14
U.S. Cl. 502—162 8 Claims

1. A crystalline aluminum organophosphate stable against heating, comprising a skeleton structure having micropores having a diameter in the range of about 0.26 to about 1.2 nm therein and represented by formula (I) in chemical composition and having a specific surface area of 40 to 600 m^2/g:

formula (I):

$$[(Al_2O_3)\cdot(RPO_2)_x]$$

wherein R represents a lower alkyl group linked to a phosphorus atom, and x is such a number that $2.0 \leq x \leq 3.6$ wherein the alkyl groups constituting part of the skeleton are arranged in the pore spaces formed by an inorganic skeleton to make a wall of micropores hydrophobic and flexible.

5,595,953

CHROMIUM CATALYST COMPOSITIONS

Max P. McDaniel; Elizabeth A. Benham, both of Bartlesville, and Rickey D. Bodley, Dewey, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 958,668, Oct. 8, 1992, Pat. No. 5,486,584. This application Jun. 7, 1995, Ser. No. 486,872
Int. Cl.[6] B01J 21/08
U.S. Cl. 502—237 24 Claims

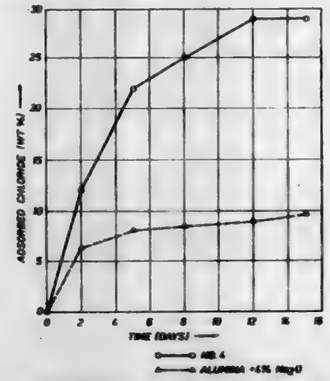
1. A chromium catalyst composition, which is useful for producing a copolymer by copolymerizing ethylene and at least one non-ethylene comonomer, wherein said copolymer has a high molecular weight portion that has a molecular weight greater than the weight average molecular weight of said copolymer, said chromium catalyst composition comprises at least two chromium catalyst systems, wherein each said chromium catalyst system comprises chromium and a support, and wherein each support comprises silica, and wherein at least two of said chromium catalyst systems have supports that have an average pore radius difference sufficient to preferentially introduce said non-ethylene comonomer into said higher molecular weight portion wherein said average pore radius difference is from about 25 to about 400 angstroms.

5,595,954

METHOD FOR MAKING AN HCL ADSORBENT

John S. Lee, Baton Rouge, La., and Michael J. Pearson, Castro Valley, Calif., assignors to Discovery Chemicals, Inc., Port Allen, La.

Division of Ser. No. 176,415, Dec. 30, 1993, Pat. No. 5,505,926, which is a division of Ser. No. 878,857, May 5, 1992, Pat. No. 5,316,998. This application Dec. 8, 1995, Ser. No. 569,970
Int. Cl.[6] B01J 20/00
U.S. Cl. 502—415 12 Claims



1. A method for making an HCl scavenger composition comprising:

impregnating an alumina containing material with a water soluble, alkali metal salt of an organic compound which decomposes at a temperature below about 500° C. to form a promoted alumina; and

heat treating said promoted alumina at a temperature of from about 300° to about 550° C. for a time sufficient to remove a major portion of hydrated water and provide an alumina adsorbent containing an alkali metal present in an amount such that, if calculated as alkali metal oxide, said alumina adsorbent contains at least about 5% by weight alkali metal oxide based on the weight of alumina present in said adsorbent, said adsorbent having a pore volume distribution of at least, 0.10 cc/g at a pore diameter of 750 Angstroms and greater, of at least 0.35 cc/g at a pore diameter of 40 Angstroms and greater, and at least 0.16 cc/g at pore diameters in

the range of from about 10,000 Angstroms to about 100 Angstroms, said adsorbent having a crush strength of at least 15 lbs.

5,595,955

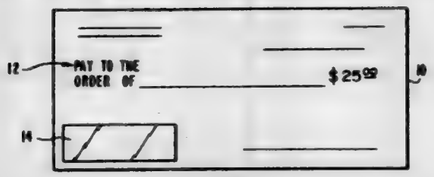
VERIFICATION METHOD USING PRESSURE AND HEAT-SENSITIVE CHROMOGENIC SYSTEM

John C. H. Chang, Naperville, and Richard H. Johnson, Lemont, both of Ill., assignors to Wallace Computer Services, Inc., Hillside, Ill.

Division of Ser. No. 75,419, Jun. 14, 1993, Pat. No. 5,401,860. This application Nov. 16, 1994, Ser. No. 341,159

Int. Cl.[6] B41M *5/165;5/30*

U.S. Cl. 503—201 **35 Claims**



1. A method of verifying the authenticity of a document, said document comprising a support bearing an information area and verification area, said information area comprising a visible principal image;

said verification area comprising a localized coating of a pressure and heat activatable chromogenic composition comprising

(a) chromogen-containing microscopic pressure-rupturable capsules, and

(b) a solid heat-sensitive color developing material having a softening point of at least about 40° C. and being capable of forming a visible colored image, said chromogen and said color developing material reacting only under application of both external pressure and external heat, said external pressure causing said capsules to rupture and release said chromogen and said external heat causing said heat-sensitive color developing material to soften and react with said chromogen to produce a visible colored image,

said method comprising applying external pressure and external heat to said localized coating of said chromogenic composition to form a visible colored image and thereby signifying that said document is authentic.

5,595,956

THERMAL TRANSFER PRINTING DYE SHEET

Andrew T. Slark, 48 Dryden Road, Ipswich, Suffolk, IP1 6QP; David W. Jarvis, 74 Wickham Road, Colchester, Essex, CO3 3EE, both of England, and Akihiro Kawamura, 1-15-1 Hanabatake, Tsukuba-city, Ibaraki-ken 305, Japan

PCT No. PCT/GB93/01820, § 371 Date May 3, 1995, § 102(e) Date May 3, 1995, PCT Pub. No. WO94/04373, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 26, 1993, Ser. No. 387,825

Claims priority, application United Kingdom, Aug. 26, 1992, 9218183

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **9 Claims**

1. A thermal transfer printing dye-sheet which comprises a substrate having on one side, a dye coat comprising a binder and a thermally transferable dye wherein the binder comprises a mixture of a polyvinyl butyral polymer and a second polymer, at least 10% of the monomeric units of the second polymer being derived from parahydroxystyrene, the phenyl group of which may or may not be further substituted.

5,595,957

TURF AND SOIL DROUGHT STRESS TREATMENT COMPRISING A SILOXANE AND A POLYALKALENE OXIDE SURFACTANT

Kenneth G. Bowey, Leders, and Neil A. Baldwin, Wilsden, both of England, assignors to Service Chemicals plc, Northants, England

Filed Feb. 23, 1995, Ser. No. 392,495

Int. Cl.[6] A01N *55/10;* C09K *17/38*

U.S. Cl. 504—118 **17 Claims**

1. A method of treating turf or soil to alleviate drought stress and soil capping and to improve soil water conservation, which comprises applying directly to the turf or soil an aqueous solution of a composition consisting essentially of

a) from 1 to 99% by weight of an organosilicone compound of the general formula

$$Md_yDx'M'$$

where M is $(CH_3)_3SiO$ and M' is Si $(CH_3)_3$

D is $(CH_3)_2SiO$ and D' is $(CH_3)(R)SiO$

where $R=(CH_2)_nO(C_2H_4O)_a(C_3H_6O)_bR_1$,

R_1 is H, an alkyl group having 1 to 4 carbon atoms, an alkyl ester group wherein the alkyl group of the ester has 1 to 4 carbon atoms;

n is from 2 to 4;

a is from 3 to 25;

b is from 0 to 25;

wherein Y is from 0 to 5; and

X is from 1 to 5; and

b) from 99 to 1% by weight of at least one surfactant selected from polyalkylene oxide compounds with the general formula

$$R_3—O—(C_2H_4O)_c(C_3H_6O)_dR_3$$

where

c is 0 to 300;

d is 0 to 300, and

R_3 is H, or an alkyl group with 1 to 4 carbon atoms;

wherein the polyalkylene oxide has a molecular weight in the range of 300 to 1500; and

c) a second optional different surfactant.

5,595,958

3-SUBSTITUTED PYRIDINE COMPOUNDS AND DERIVATIVES THEREOF

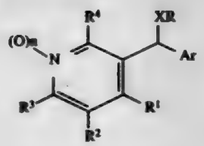
Hsiao-Ling M. Chin, Moraga; Nhan H. Nguyen, Richmond; David B. Kanne, Madera, and David L. Lee, Pleasant Hill, all of Calif., assignors to Zeneca Limited, London, England

Filed May 2, 1994, Ser. No. 236,831

Int. Cl.[6] A01N *43/40;* C07D *401/06*

U.S. Cl. 504—250 **16 Claims**

1. A compound of the formula



wherein:

Ar is a substituted or unsubstituted pyridyl gorup;

R^1, R^2, R^3 and R^4 are each independently hydrogen, halogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, nitro, cyano, hydroxy, thiocyano,—$N(R^{11})$ (R^{12}), C_1–C_6 haloalkyl, C_1–C_6 alkoxy, C_1–C_6 haloalkoxy, $(C_1$–$C_6)$alkoxy-$(C_1$–$C_6)$alkyl, halo$(C_1$–$C_6)$alkoxy$(C_1$–$C_6)$alkyl, —C(X)—R^{10} or —$S(O)_k$—R^{10};

X is oxygen or sulfur;

R is —C(Q)—R^6, —C(O)—C(O)—R^6, —$S(O)_2$—R^6, —P(Q)(R^{11}) (R^{12}) or —$Si(R^{13})$ (R^{14}) (R^{15}); wherein:

Q is oxygen or sulfur;

R^6 is hydrocarbyl, substituted hydrocarbyl, hydrocarbyloxy, substituted hydrocarbyloxy, hydrocarbyl-S—, substituted hydrocarbyl-S— or is of the formula —$N(R^7)$ (R^8);

wherein R^7 and R^8 are each independently hydrogen, hydrocarbyl, substituted hydrocarbyl, hydrocarbyloxy, substituted hydrocarbyloxy, pyridyl, furyl, thienyl, $(C_1$–$C_6)$alkoxycarbonyl$(C_1$–$C_6)$alkyl, hydroxycarbonyl$(C_1$–$C_6)$alkyl, or $N(R^9)$ (R^{10}) wherein R^9 and R 10 are each independently hydrogen, C_1–C_6 alkyl or phenyl;

or R^7 and R^8 together with the nitrogen to which they are bound form an aziridine, piperazine, morpholine, thiomorpholine, thiomorpholine 1-oxide, thiomorpholine 1,1-dioxide, hexamethyleneimine, piperidine or pyrrolidine ring, any of which may be optionally substituted with C_1–C_6 alkyl;

R^{11} and R^{12} are each independently C_1–C_6 alkyl, C_1–C_6 alkylthio or C_1–C_6 alkoxy;

R^{13}, R^{14} and R^{15} are each independently C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 haloalkyl, aryl or arylalkyl;

k is 0, 1 or 2; and

n is 0 or 1;

or an agriculturally acceptable salt thereof.

5,595,959

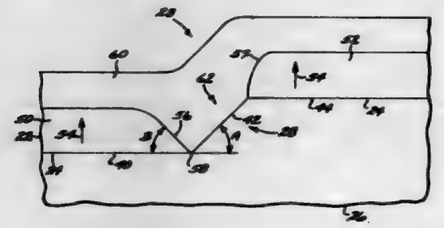
METHOD OF FORMING A HIGH-TC MICROBRIDGE SUPERCONDUCTOR DEVICE

Mark S. DiIorio; Shoco Yoshizumi, and Kai-Yuen Yang, all of San Diego, Calif., assignors to Biomagnetic Technologies, Inc., San Diego, Calif.

Continuation of Ser. No. 894,079, Jun. 5, 1992, Pat. No. 5,367,178, which is a continuation of Ser. No. 644,905, Jan. 22, 1991, Pat. No. 5,134,117. This application Nov. 22, 1994, Ser. No. 344,273

Int. Cl.[6] H01L *39/24*

U.S. Cl. 505—329 **5 Claims**



1. A method for preparing a microbridge superconductor device, comprising the steps of:

furnishing a substrate;

forming an inclined step on the surface of the substrate, the inclined step having an angle of inclination of from about 20 to about 80 degrees;

depositing a layer of a c-axis oriented superconductor material overlying the substrate such that there is a break in the layer of superconductor material at the inclined step; and

depositing a layer of normal material overlying the layer of c-axis oriented superconductor material.

5,595,960

METHOD OF DEPOSITING A SUPERCONDUCTOR LAYER ON A SUBSTRATE THROUGH AN INTERMEDIATE LAYER OF DOPED CEO_2

Christian Belouet, Sceaux, and Didier Chambonnet, Chatillon, both of France, assignors to Alcatel Alsthom Compagnie Generale d'Electricite, Paris Cedex, France

Filed Oct. 13, 1995, Ser. No. 542,881

Claims priority, application France, Oct. 27, 1994, 94 12882

Int. Cl.[6] B05D *5/12*

U.S. Cl. 505—473 **5 Claims**

1. A method of preparing a substrate for depositing a thin layer of a superconductor material thereon, wherein an operation is performed of depositing on the substrate an intermediate material having a crystal lattice constant that is a function of the percentage of a doping element, the depositing operation being initiated with a concentration of the doping element such that the lattice constant of the intermediate material is equal to or as close as possible to the lattice constant of the substrate, the proportion of the doping element being continuously varied during the depositing operation to a proportion of the doping element such that the lattice constant of the intermediate material is equal to or as close as possible to the lattice constant of the superconductor material.

5,595,961

GREASE COMPOSITION

John P. Doner, Sewell; Andrew G. Horodysky, Cherry Hill, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 270,809, Jul. 5, 1994, abandoned, which is a continuation of Ser. No. 127,709, Sep. 28, 1993, abandoned, which is a continuation of Ser. No. 1,937, Jan. 8, 1993, abandoned, which is a continuation of Ser. No. 875,924, Apr. 29, 1992, abandoned, which is a continuation of Ser. No. 365,873, Jun. 14, 1989, abandoned, which is a continuation of Ser. No. 144,752, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 54,107, May 20, 1987, abandoned, which is a continuation of Ser. No. 892,877, Jul. 28, 1986, abandoned, which is a continuation of Ser. No. 641,878, Aug. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 577,454, Feb. 6, 1984, abandoned. This application Jun. 7, 1995, Ser. No. 479,891

Int. Cl.[6] C10M *141/10;141/12*

U.S. Cl. 508—186 **24 Claims**

1. An improved grease composition comprising

a) a major proportion of a grease including a thickener;

b) from about 0.01% to about 10% by weight of an additive capable of elevating the dropping pint of a grease containing a hydroxy-bearing thickener and made by reacting an ester of the formula

$$R(COOR^1)_n$$

wherein n is 1 to about 5 and R and R^1 are hydrocarbyl or hydroxyhydrocarbyl groups containing 1 to about 40 carbon atoms, at least one of R and R^1 being a hydroxyhydrocarbyl group, with a boron compound selected from the group consisting of a metaborate, a boric acid, a boric oxide and an alkyl borate of the formula

$$(R^1O)_xB(OH)_y$$

wherein x is 1 to 3 and y is 0 to 2, their sum being 3, and R^2 is an alkyl group having 1 to about 6 carbon atoms;

c) from about 0.01% by weight of a phosphorus and sulfur compound or a mixture of phosphorus-containing and sulfur-containing compounds to supply an equivalent amount of phosphorus and sulfur; and

d) the thickener for said grease containing at least about 15% by weight of a hydroxy-containing soap thickener where the compounds in step c) provide for a grease composition having a substantially improved dropping point over a grease composition lacking said compounds.

5,595,962

FLUOROSILICONE LUBRICANT COMPOSITIONS

Gerardo Capuccio, Milan, Italy, and Hugh A. Spikes, London, England, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 16, 1996, Ser. No. 585,674
Claims priority, application Italy, Jan. 29, 1995, MI95A1395
Int. Cl.[6] C10M *107/50*
U.S. Cl. 508—206 30 Claims

1. A method for reducing the frictional wear of metal surfaces, said method comprising applying to the metal surfaces a blend comprising:

(A) a fluorosilicone oil;

(B) at least one compound selected from the group consisting of ferrocene, 1,1'-bis(diphenylphosphino) ferrocene and an N,N-disalicylidene-diaminoalkane in which the alkane portion has 3–6 carbon atoms; and

(C) at least one phosphorous compound selected from the group consisting of triphenylphosphine, tri-o-tolylphosphine, 1,5-bis-diphenylphosphinopentane and zinc dialkyldithiophosphate in which the alkyl groups have 1–14 carbon atoms, wherein said components (B) and said component (C) is each present at a level of 0.01 to 0.3 percent based on the total weight of (A), (B) and (C).

5,595,963

SYNERGISTIC ANTIOXIDANT COMBINATIONS FOR LUBRICATING OILS

James S. Pacheco, Perrineville, and David J. Martella, Princeton, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 5, 1994, Ser. No. 349,335
Int. Cl.[6] C10M *135/22*
U.S. Cl. 508—421 10 Claims

1. A lubricating oil additive combination comprising:

(A) a dithiobutal represented by structure (I)



(I)

where:

R_1, R_2, R_3, and R_4 are the same or different, and are hydrogen or a C_1–C_{20} hydrocarbyl group; and

(B) a hindered phenol, phosphite ester, or mixtures thereof;

wherein the molar ratio of (A) to (B) is in the synergistic effective range of from about 1:4 to 4:1.

5,595,964

ASHLESS, LOW PHOSPHORUS LUBRICANT

Ewa A. Bardasz, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 217,406, Mar. 24, 1994, abandoned. This application Sep. 1, 1995, Ser. No. 522,804
Int. Cl.[6] C10M *137/08*
U.S. Cl. 508—423 12 Claims

1. A method for lubricating a natural gas-fueled internal combustion engine, comprising supplying to the engine a composition comprising:

(a) an oil of lubricating viscosity;

(b) at least about 1.8% by weight of an antioxidant; and

(c) a hydrocarbylamine phosphate salt anti-nitration agent,

wherein the composition is substantially free from metals, and wherein the amount of the antioxidant and the amount of the anti-nitration agent are sufficient to reduce the amount of varnish formation in a natural gas-fueled internal-combustion engine.

5,595,965

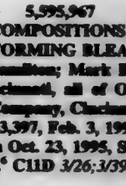
BIODEGRADABLE VEGETABLE OIL GREASE

Gary W. Wiggins, Willowick, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 8, 1996, Ser. No. 646,662
Int. Cl.[6] C10M *117/00;105/38*
U.S. Cl. 508—491 44 Claims

1. An environmentally friendly lubricating grease, comprising;

(A) a base oil wherein the base oil is a natural oil or synthetic triglyceride of the formula



wherein R^1, R^2 and R^3 are aliphatic groups that contain from about 7 to about 23 carbon atoms and

(B) a thickener wherein the thickener (B) is a reaction product of (B1) a metal based material and (B2) a carboxylic acid or its ester, wherein the metal based material (B1) comprises a metal oxide, metal hydroxide, metal carbonate or metal bicarbonate, wherein the metal is an alkali or alkaline earth metal and wherein the carboxylic acid (B2) is of the formula $R^4(COR^5)_n$ wherein R^4 is an aliphatic group that contains from 4 to about 29 carbon atoms, R^5 is hydrogen or an aliphatic group containing from 1 to 4 carbon atoms and n is an integer of from 1 to 4.

5,595,966

BIODEGRADABLE LUBRICANTS AND FUNCTIONAL FLUIDS

Mark Ross, Reading, and Ian MacPherson, Maidenhead, both of England, assignors to Ethyl Petroleum Additives Limited, Bracknell, England

Filed Jul. 18, 1991, Ser. No. 732,581
Claims priority, application European Pat. Off., Jul. 24, 1990, 90308076
Int. Cl.[6] C10M *105/04*
U.S. Cl. 508—591 26 Claims

1. In an operation wherein lubricating oil or functional fluid is released or likely to be released into the environment, the improvement which comprises providing for use as the lubricating oil or functional fluid a substantially biodegradable lubricating oil or functional fluid at least 10 percent by volume of which is composed of at least one substantially biodegradable liquid hydrocarbon of lubricating viscosity formed by oligomerization of 1-alkene hydrocarbon having 6 to 20 carbon atoms in the molecule and hydrogenation of the resultant oligomer, and wherein said lubricating oil or functional fluid contains a small visually-perceptile chromophoric quantity of at least one oil-soluble chromophoric substance.

5,595,967

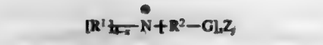
DETERGENT COMPOSITIONS COMPRISING MULTIPERACID-FORMING BLEACH ACTIVATORS

Gregory S. Miracle, Hamilton; Mark R. Sivik, Fairfield, and Patti J. Kellett, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 383,397, Feb. 3, 1995, Pat. No. 5,534,179. This application Oct. 23, 1995, Ser. No. 547,089
Int. Cl.[6] C11D *3/26;3/39;3/395*
U.S. Cl. 510—372 11 Claims

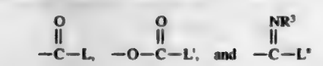
1. A detergent composition comprising:

i) from about 0.1% to about 30% by weight of a bleach activator having the formula:

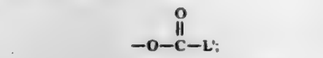


(I)

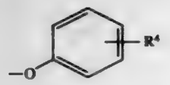
wherein x is an integer from 2 to 4; each G is independently selected from the group consisting of



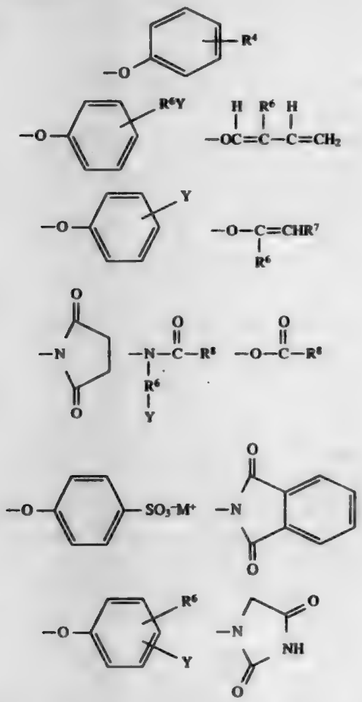
provided that at least one G is



and wherein R^3, when present, is selected from C_1–C_{12} alkyl and C_6–C_{12} aryl and wherein L, L' and L" are leaving groups; L' being selected from the group consisting of



wherein R^4 is selected from $—CO_2R_5$ and $—OR^5$ wherein R^5 is selected from C_1–C_{12} alkyl; L and L" being selected from the group consisting of



wherein R4 is selected from $—CO_2R^5$ and $—OR^5$ wherein R^5 is selected from C_1–C_{12} alkyl; Y is selected from $—(SO_3^-)M$, $—(C(O)O)^-M$, $—(C(O)OR^6)$, $—(SO_4^{2-})M$, $—(NR6)3)^+X$, $—NO_2$, —OH, O $N(R^6)_2$ and mixtures thereof; X^- is an oxidation compatible anion; M is selected from sodium, potassium and ammonium; R^6 and R^7 are selected from C_1–C_{12} alkyl and hydrogen; R^8 is selected from C_1–C_{12} alkyl; each R^1 is independently selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, phenyl, hydroxyalkyl, and polyoxyalkylene; each R^2 is independently selected from alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, alkoxyalkylene, polyalkoxy-alkylene, and hydroxyalkylene, any R^2 being substituted with a moiety selected from H, C_1–C_{20} alkyl, alkenyl, aryl, aralkyl, and alkaryl; Z is an oxidation compatible ion; and j is selected such that said bleach activator is electrically neutral; and

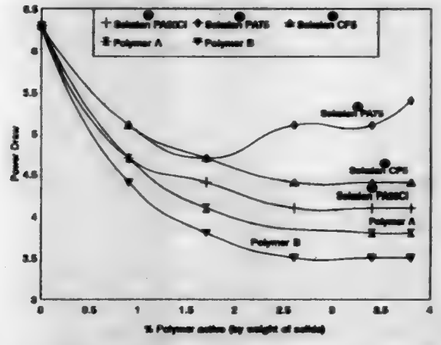
ii) from about 0.1% to about 70% by weight of a source of hydrogen peroxide.

5,595,968

POLYMERIC DISPERSANTS FOR SODA ASH BASED DETERGENT SLURRIES

Sridhar Gopalkrishnan, Woodhaven, and Kathleen M. Guiney, Wyandotte, both of Mich., assignors to BASF Corporation, Mount Olive, N.J.

Filed May 23, 1995, Ser. No. 448,281
Int. Cl.[6] C11D *17/00;7/12;7/60;11/02*
U.S. Cl. 510—418 12 Claims



1. An aqueous soda ash based detergent slurry composition comprising by weight:

(A) about 5–65% of inorganic builder salt comprising soda ash, and

(B) about 0.01–20% of a hydrophilic copolymer comprising an unsaturated hydrophilic monomer copolymerized with an oxyalkylated monomer wherein said composition is free of surfactants.

7. A method of reducing the viscosity of a surfactant free aqueous soda ash based detergent slurry composition comprising the step of adding thereto about 0.01–10% by weight of a hydrophilic copolymer comprising an unsaturated hydrophilic monomer copolymerized with an oxyalkylated monomer.

5,595,969

VARIANTS OF HUMAN CORTICOSTEROID BINDING GLOBULIN

Geoffrey L. Hammond, Lambeth, and George V. Avvakumov, London, both of Canada, assignors to Allelix Biopharmaceutical Inc., Ontario, Canada

Division of Ser. No. 994,423, Dec. 16, 1992, Pat. No. 5,432,080. This application Apr. 14, 1995, Ser. No. 421,891
Int. Cl.[6] A61K *37/04*
U.S. Cl. 514—8 13 Claims

10. A method for treating inflammation in a mammal comprising the step of administering to said mammal a therapeutically effective amount of a pharmaceutical composition comprising a steroid-binding variant of human corticosteroid binding globulin in which at least one glycosylation site other than the glycosylation site at amino acid position 238 is functionally disrupted by amino acid replacement, an anti-inflammatory agent which binds with said variant, and at least one pharmaceutically acceptable adjuvant.

5,595,970

TREATMENT OF CLIMACTERIC DISORDERS WITH NITRIC OXIDE SYNTHASE SUBSTRATES AND/OR DONORS

Robert E. Garfield, Friendswood, Tex.; Krzysztof Chwalisz; Radoslaw Bukowski, both of Berlin, Germany, and Chandra Yallampalli, Houston, Tex., assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation-in-part of Ser. No. 92,426, Jul. 16, 1993, abandoned. This application Nov. 16, 1993, Ser. No. 153,345
Int. Cl.[6] A61K *31/04;31/56;31/155*
U.S. Cl. 514—12 14 Claims

1. A method of treating climacterium (climacteric symptoms) in a non-pregnant female mammal suffering from menopausal symptoms of climacterium, exhibiting climacteric symptoms, or who is a candidate for hormone replacement therapy, comprising

administering to said female mammal

an amount of nitric oxide synthase substrate, a nitric oxide donor, or both, effective to raise the blood level of circulating L-arginine to at least about 10–50 umolar above the normally 50–100 umolar circulating levels and,

optionally, also a progestin or both of an estrogen and a progestin, in amounts effective to ameliorate the symptoms thereof.

5,595,971

PROLONGED RELEASE OF BIOLOGICALLY ACTIVE POLYPEPTIDES

James W. Mitchell, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 900,410, Jun. 18, 1992, Pat. No. 5,474,988, which is a division of Ser. No. 568,284, Aug. 16, 1990, abandoned, which is a division of Ser. No. 414,583, Sep. 29, 1989, Pat. No. 5,013,713, which is a continuation of Ser. No. 787,873, Oct. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 657,713, Oct. 4, 1984, abandoned. This application May 30, 1995, Ser. No. 452,928
Int. Cl.[6] A61K *38/18;38/27*
U.S. Cl. 514—12 16 Claims

1. An injectable prolonged-release substantially nonaqueous suspension composition comprising:

a biocompatible oil forming a continuous phase and having therein (a) an antihydration agent retarding penetration of the oil by aqueous bodily fluids following administration by parenteral injection and (b) suspended biologically active bovine somatotropin constituting from at least 10 to about 50 percent of the composition by weight.

5,595,972

CONOTOXIN PEPTIDES

Baldomero M. Olivera; Lourdes J. Cruz; David R. Hillyard; J. Michael McIntosh, all of Salt Lake City, Utah, and Amaurfino D. Santos, Quezon City, Philippines, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 137,800, Oct. 19, 1993, Pat. No. 5,514,774, which is a continuation-in-part of Ser. No. 84,848, Jun. 29, 1993, Pat. No. 5,432,155. This application Jun. 7, 1995, Ser. No. 487,174
Int. Cl.[6] A61K *38/10*
U.S. Cl. 514—13 4 Claims

1. A method for treating a patient having SCLC by administration of an α-conotoxin selected from the group consisting of MII (SEQ ID NO: 54) and U002(SEQ ID NO: 10).

5,595,973

PROTECTION OF HEMOPOIETIC CELLS DURING CHEMOTHERAPY OR RADIOTHERAPY

Arthur E. Bogden, Hopedale, Mass., assignor to Biomeasure Incorporated, Milford, Mass.

Filed Sep. 12, 1994, Ser. No. 304,724
Int. Cl.[6] A61K *38/07;38/00*
U.S. Cl. 514—18 18 Claims

1. A method of promoting regeneration of hemopoietic cells in a subject undergoing chemotherapy or radiotherapy, said method comprising:

administering to the subject a first amount of a hemopoiesis inhibitory factor, where said hemopoiesis inhibitory factor is AcSDKP or an agonist thereof and said first amount being effective to reduce the proliferation of hemopoietic cells during said chemotherapy or radiotherapy; and

after said chemotherapy or radiotherapy, administering to the subject a second amount of a hemopoiesis growth factor, wherein said hemopoiesis growth factor is an interleukin, G-CSF, GM-CSF, or an agonist thereof and said second amount being effective to stimulate the proliferation of hemopoietic cells.

5,595,974

MEDICAMENTS FOR THE TREATMENT OF RESTENOSIS AND ARTERIAL SCLEROSIS

Takanobu Tamaru, Tokyo, Japan, assignor to Tobishi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 555,451
Claims priority, application Japan, Dec. 26, 1994, 6-322011
Int. Cl.[6] A61K *38/00*
U.S. Cl. 514—21 6 Claims

1. A method for the treatment or prophylaxis of restenosis and arterial sclerosis after percutaneous transluminal angioplasty, which comprises administering an effective amount of batroxobin to a patient in need thereof.

5,595,975

Patent Not Issued For This Number

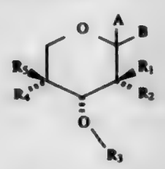
5,595,976

TETRAHYDROPYRAN COMPOUNDS

David Billington, West Midlands, United Kingdom; Gilbert Dorey, Chaville, France; Pascale Leon, Guyancourt, France; Ghanem Atassi, Saint Cloud, France; Alain Pierre, Les Allastes-le-Roi, France; Michael Barbridge, Courbevoie, France, and Nicolas Guilhaud, Paris, France, assignors to Adir et Compagnie, Courbevoie, France

Filed Aug. 30, 1995, Ser. No. 521,189
Claims priority, application France, Aug. 30, 1994, 94 10462
Int. Cl.[6] A61K *37/00;* C07H *3/00*
U.S. Cl. 514—25 15 Claims

1. A compound of formula (I):



(I)

in which:

A - represents —OR_6 and B represents —CH_2—X,

- or, together with B and the carbon atom carrying them, A forms an oxygen-containing heterocycle selected from the group consisting of oxirane, 2,2-dimethyl[1,3]dioxolane, and [1,3]dioxolan-2-one,

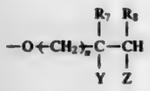
R_1 represents



in which Y and Z each represent hydrogen or together form a double bond or together form, with the carbon atoms carrying them, an oxirane ring,

and R_2 is selected from the group consisting of hydrogen, hydroxy, and —OR_9,

or R_1 represents



in which n is an integer of 1 to 4 inclusive and Y and Z each represent hydrogen or together form a double bond or together form, with the carbon atoms carrying them, an oxirane ring,

and R_2 represents hydrogen,

- or R_1 represents hydrogen

and R_2 represents



as defined above,

R_3 is selected the group consisting of hydrogen, linear or branched optionally substituted alkyl having from 1 to 6 carbon atoms inclusive, optionally substituted benzyl, optionally substituted benzoyl, optionally substituted formyl, linear or branched optionally unsaturated and optionally substituted acyl having from 1 to 6 carbon atoms inclusive, allyl, and optionally mono- or di-substituted carbamoyl,

R_4 - either is selected from the group consisting of hydroxy, linear or branched, optionally substituted alkoxy having 1 to 6 carbon atoms inclusive, optionally mono- or di-substituted carbamoyloxy, piperazinylcarbonyloxy substituted in the 4-position by R_9, and imidazol-1-ylcarbonyloxy,

and R_5 represents hydrogen,

- or, together with R_3 and the carbon atom carrying them, forms a carbonyl group,

R_6, R_7 and R_8 are selected, each independently of the others, from the group consisting of hydrogen, linear or branched optionally substituted alkyl having 1 to 6 carbon atoms inclusive, and phenylalkyl in which the phenyl group is optionally substituted and the alkyl group, which is linear or branched and is optionally substituted, has 1 to 6 carbon atoms inclusive,

R_9 is selected from the group consisting of hydrogen, linear or branched optionally substituted alkyl having 1 to 6 carbon atoms inclusive, optionally substituted formyl, linear or branched optionally unsaturated and optionally substituted acyl having 1 to 6 carbon atoms inclusive, linear or branched optionally substituted alkoxycarbonyl having 1 to 6 carbon atoms inclusive, optionally substituted benzyl, and optionally mono- or di-substituted carbamoyl, and

X is selected from the group consisting of hydroxy, halogen, optionally substituted phenylsulfonyloxy, and optionally substituted linear or branched alkylsulfonyloxy having 1 to 6 carbon atoms inclusive,

its optical or geometrical isomers, in pure form or in the form of a mixture, or its pharmaceutically-acceptable addition salts with an acid,

wherein:

- the term "optionally mono- or di-substituted" associated with the above-defined carbamoyl and carbamoyloxy radicals indicates that one or both of the hydrogen atoms carried by the nitrogen atom may be substituted (independently of each other when both hydrogen atoms are substituted) by:
  - linear or branched optionally substituted radical having from 1 to 6 carbon atoms inclusive,
  - optionally substituted formyl,
  - linear or branched, optionally unsaturated and optionally substituted acyl having 1 to 6 carbon atoms inclusive,
  - optionally substituted benzoyl,
  - optionally substituted phenyl,
  - optionally substituted naphthyl, and
  - amino optionally substituted by one or two alkyl having 1 to 6 carbon atoms inclusive in a straight or branched chain, each alkyl being optionally substituted,
- the term "optionally subetituted" associated with alkyl, alkoxy, alkoxycarbonyl, formyl, acyl, benzyl, benzoyl, phenyl and naphthyl indicates that those radicals may be substituted by one or more chemical entities selected from hydroxy, halogen, trihalomethyl, amino, alkylamino, dialkylamino, linear or branched alkoxy having 1 to 6 carbon atoms inclusive, linear or branched alkoxycarbonyl having 1 to 6 carbon atoms inclusive, and linear or branched acyl having 1 to 6 carbon atoms inclusive,
- the term "optionally substituted" associated with alkylsulfonyloxy and phenylsulfonyloxy indicates that those radicals may be substituted by one or more linear or branched alkyl having 1 to 6 carbon atoms inclusive, and
- the term "unsaturated acyl" is to be understood as meaning acryloyl or methacryloyl.

14. A method for treating a mammal afflicted with a disease requiring an angiogeneesis inhibitor compising the step of administering to said mammal an amount of a compound of claim 1 which is effective for alleviation of said disease.

5,595,977

SALTS OF AMINO GLYCOSIDES

Hjarne Dyrsting, Virum, and Torben Koch, Kobenhavn, both of Denmark, assignors to Dumex-Alpharma A/S, Copenhagen S, Denmark

Filed Oct. 27, 1993, Ser. No. 141,625
Claims priority, application Denmark, Sep. 14, 1993, 1034/93
Int. Cl.[6] A61K *31/70;* C07H *5/00*
U.S. Cl. 514—39 6 Claims

5. A method of treating gastritis and ulcerations caused by *H. pylori* in at least one location selected from the stomach and the duodenum in a warm-blooded animal, comprising administering to said warm-blooded animal a gastritis treating or ulceration treating effective amount of a compound of formula I:

$$([\text{sucrose-octa-O-sulfonic acid}^{8-}]\text{-}[R\text{-}(NH_3^+)_z]_y\text{-}M_x^{n+}) \quad \text{(I)}$$

wherein

$(x \cdot y)+(z \cdot n)=8$

$x \cdot y \epsilon N\{4 \leq x \cdot y \leq 8\}$, wherein N is the set of natural numbers,

$x \epsilon Z\{4 \leq x \leq 6\}$, wherein Z is the set of integers

$z \epsilon N\{0 \leq z \leq 4\}$,

$n \epsilon Z\{1 \leq n \leq 3\}$,

wherein R is a sugar moiety of an amino glycoside and M is selected from the group consisting of alkali metal ions, alkaline earth metal ions, an aluminum ion and an ammonium ion, or a pharmaceutically acceptable salt thereof.

5,595,978

COMPOSITION AND METHOD FOR TREATMENT OF CMV RETINITES

Kenneth G. Draper, Boulder, Colo.; Sharon K. Chapman, Carlsbad, and Daniel L. Klauer, Cardiff, both of Calif., assignors to Isis Pharmaceuticals, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 568,366, Aug. 16, 1990, abandoned, Ser. No. 927,986, Nov. 19, 1992, and Ser. No. 9,263, Jan. 25, 1993, Pat. No. 5,442,049. This application Apr. 26, 1994, Ser. No. 233,711

Claims priority, application WIPO, Aug. 14, 1991, PCT/US91/05815

Int. Cl.[6] A61K *48/00*; C12Q *1/68*; C07H *21/04*

U.S. Cl. 514—44 **9 Claims**

1. A method for treating CMV retinitis comprising administering by intravitreal injection an effective amount of a composition comprising SEQ ID NO: 1 and a pharmaceutically acceptable carrier to an animal having CMV retinitis.

5,595,979

METHOD OF TREATING A NEOPLASTIC DISEASE STATE BY CONJUNCTIVE THERAPY WITH 2'-FLUOROMETHYLIDENE DERIVATIVES AND RADIATION OR CHEMOTHERAPY

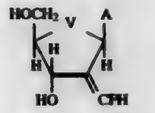
Ronald D. Snyder, Loveland, Ohio, assignor to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 273,242, Jul. 11, 1994, abandoned. This application Jun. 27, 1995, Ser. No. 495,720

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—49 **8 Claims**

1. A method of treating a patient afflicted with a neoplastic disease state comprising the administration thereto of an effective antineoplastic amount of ionizing or nonionizing radiation in conjunctive therapy with an effective sensitizing amount of a compound of the formula

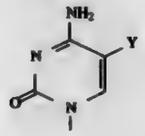


(I)

wherein

V is oxy or methylene and

A is a radical of the formula



wherein Y is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy; or a pharmaceutically acceptable salt thereof.

5,595,980

CONTRACEPTIVE COMPOSITIONS

George L. Brode, Bridgewater, N.J.; Gustavo F. Doncel, Norfolk, Va.; Henry L. Gabelnick, N. Bethesda, Md.; Russell L. Kreeger, Flemington, and George A. Solecsky, White House Station, both of N.J., assignors to Medical College of Hampton Roads, Arlington, Va., and Biomaterials Corporation, Plainsboro, N.J.

Continuation of Ser. No. 129,253, Sep. 29, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,884

Int. Cl.[6] A61K *31/72*

U.S. Cl. 514—57 **8 Claims**

1. In a contraceptive composition for use in mammals comprising:

(a) from about 0.1 to 50.0 wt % of a spermicide selected from the group consisting of benzylalkonium chloride, octoxynol-9, ricinoleic acid, phenol mercuric acetates and nonoxynol-9; a virucide selected from the group consisting of acyclovir, idoxyumidine, ribavirin, nonoxynol-9, vidarabine and rimantadine; or mixtures thereof;

(b) from about 0.1 to 99.9 wt % of a polymeric delivery vehicle component comprising a cellulosic selected from the group consisting of hydroxyethyl cellulose, hydroxypropyl cellulose, methyl cellulose, hydroxypropylmethyl cellulose and hydroxyethyl methyl cellulose, and mixtures thereof; and

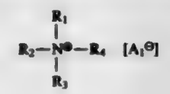
(c) from about 0.1 to 99.8 wt % of a cosmetic ingredient selected from the group consisting of water, ethyl alcohol, isopropyl alcohol, glycerin, glycerol, propylene glycol, and sorbitol;

the improvement wherein said cellulosic:

(i) has a molecular weight of from about 10,000 to 500,000 grams per gram mole;

(ii) is water-soluble; and

(iii) contains a hydrophobic substituent which is a cationic, quaternary, nitrogen-containing radical having the formula:



wherein

each R_1 and R_2 are CH_3 or C_2H_5;

R_3 is $CH_2CHOHCH_2$ or CH_2CH_2;

R_4 is an alkyl or arylalkyl group having about 8 to 18 carbon atoms; and

A_1 is a halide ion;

said hydrophobic substituent being present in an amount of from about 0.005 to 0.50 moles of the hydrophobic substituent per mole of the cellulosic and said hydrophobic substituent is present in an amount effective to provide a MOET value of less than 65 % at a polymer concentration of 0.007 w/v %.

5,595,981

2-CHLORO AND 2-BROMO DERIVATIVES OF 1,5-IMINOSUGARS

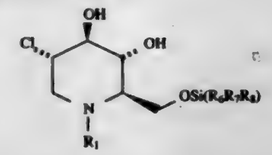
Thomas E. Barta, Evanston, and Richard A. Mueller, Glencoe, both of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Division of Ser. No. 207,340, Mar. 8, 1994, Pat. No. 5,451,679. This application Mar. 6, 1995, Ser. No. 399,022

Int. Cl.[6] A61K *31/445*; C07D *211/94*

U.S. Cl. 514—63 **2 Claims**

1. A compound of the formula



wherein R_1 is H or a C_1–C_{12} branched or unbranched alkyl group, alkoxyalkyl, alkenyl, alkynyl, arylalkyl, substituted arylalkyl, arylalkenyl or substituted arylalkenyl; and R_6, R_7 and R_8 are independently C_1–C_6 branched or unbranched alkyl, or C_6–C_{12} aryl or alkylaryl.

5,595,982

EQUINE NUTRITIONAL SUPPLEMENT

Stanley J. Harlen, Omaha, Nebr., assignor to Harlmen Inc., Omaha, Nebr.

Filed Mar. 31, 1994, Ser. No. 220,512

Int. Cl.[6] A61K *31/685;31/44;31/195;31/355*

U.S. Cl. 514—78 **7 Claims**

1. A method for alleviating chronic or acute conditions associated with hormonal imbalances in an equine, the method comprising administering a nutritional supplement to said equine, the nutritional supplement comprising lecithin, B vitamins, antioxidants selected from the group consisting of vitamin E and selenium, and lipotropic agents selected from the group consisting of inositol and methionine.

5,595,983

SUBSTITUTED PIPERAZINE 2-CARBOXYLIC ACIDS USEFUL IN THE TREATMENT OF CENTRAL NERVOUS SYSTEM DISORDERS

Jeffrey C. Watkins, Bristol, and Arwel W. Jones, Chipping Sodbury, both of England, assignors to British Technology Group Limited, London, England

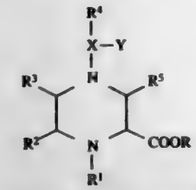
Division of Ser. No. 469,819, Jan. 23, 1990, Pat. No. 5,399,693, which is a continuation of Ser. No. 274,677, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 721,656, Apr. 10, 1985, abandoned. This application Jan. 10, 1995, Ser. No. 370,330

Claims priority, application United Kingdom, Apr. 17, 1984, 8409988; Apr. 27, 1984, 8410865

Int. Cl.[6] A61K *31/675;31/495*

U.S. Cl. 514—85 **21 Claims**

1. A method for treating disorders of the central nervous system in a patient, which comprises administering to said patient in need thereof a therapeutically effective amount of a compound of the formula (I):



(I)

wherein X is C_1–C_6 straight chain saturated or mono-unsaturated hydrocarbyl, R^4 and Y are situated in any position in X and wherein at least one of the hydrogen atoms in X can be a heavy isotope of hydrogen;

R^4 is hydrogen or alkyl, alkoxy, hydroxy, aryl, aryloxy, aralkyl, aralkoxy, aralkylamino or morpholino wherein the aryl moieties are phenyl or naphthyl, the alkyl moieties have from 1 to 6 carbon atoms, and the alkyl and aryl moieties are optionally substituted by one or more halogeno selected from fluoro, chloro and bromo; and Y is selected from:



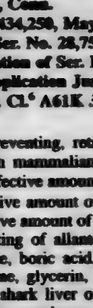
IIa

or

IIb

or

-continued



IIc

or

IId

or

IIe

where R^6 and R^7, which may be the same or different, is each hydrogen or alkyl, aryl or aralkyl wherein the aryl moieties are phenyl or naphthyl, the alkyl moieties have 1 to 6 carbon atoms, and the alkyl and aryl moieties are optionally substituted by one or more halogeno selected from fluoro, chloro and bromo, or Y is a 6-uracil residue; or R^4—X—Y represents —CO—R^8 wherein R^8 is saturated or unsaturated C_1–C_6 aliphatic hydrocarbyl, phenyl or naphthyl, optionally substituted by one or more halogeno selected from fluoro, chloro and bromo, carboxy, hydroxy or C_1–C_6 alkoxy;

R is hydrogen or alkyl, aryl or aralkyl wherein the aryl moieties are phenyl or naphthyl, the alkyl moieties have 1 to 6 carbon atoms, and the alkyl and aryl moieties are optionally substituted by one or more halogeno selected from fluoro, chloro and bromo;

R^1 is hydrogen or alkyl, aryl or aralkyl wherein the aryl moieties are phenyl or naphthyl, the alkyl moieties have from 1 to 6 carbon atoms, and the alkyl and aryl moieties are optionally substituted by one or more halogeno selected from fluoro, chloro and bromo;

R^2, R^3 and R^5, which may be the same or different, is each hydrogen or alkyl, hydroxy, alkoxy, carboxy, alkyloxycarbonyl, halogeno selected from fluoro, chloro, bromo, aryl or aryloxycarbonyl wherein the aryl moieties are phenyl or naphthyl, the alkyl moieties have 1 to 6 carbon atoms, and the aryl moieties are optionally substituted by one or more halogeno selected from fluoro, chloro and bromo, or R^2 and R^3 together with the carbon atoms to which they are attached form a benzene ring;

or a physiologically acceptable salt thereof.

5,595,984

USE OF SALICYLIC ACID FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy L. Blank, Spring Valley, N.Y., assignor to Richardson-Vicks Inc., Shelton, Conn.

Division of Ser. No. 434,250, May 3, 1995, abandoned, which is a continuation of Ser. No. 28,756, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 756,750, Nov. 25, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 464,425

Int. Cl.[6] A61K *31/60;31/19*

U.S. Cl. 514—159 **1 Claim**

1. A method for preventing, retarding, arresting, or reversing wrinkles or atrophy in mammalian skin comprising treating the skin with a safe and effective amount of a composition comprising:

(a) a safe and effective amount of salicylic acid;

(b) a safe and effective amount of a skin protectant selected from the group consisting of allantoin, aluminum hydroxide gel, bismuth subnitrate, boric acid, calamine, cocoa butter, corn starch, dimethicone, glycerin, kaolin, live yeast cell derivative, petrolatum, shark liver oil, sodium bicarbonate, sulfur, tannic acid, white petrolatum, zinc acetate, zinc carbonate, and zinc oxide, alpha-hydroxybutyric acid, alpha-hydroxyisobutyric acid, alpha-hydroxyisocapric acid, alpha-hydroxyisovaleric acid, atrolactic acid, beta-hydroxybutryic acid, beta-phenyl-lactic acid, beta-phenylpyruvic acid, citric acid, ethyl pyruvate, galacturonaic acid, glucopeptonic acid, glucoheptono 1,4-lactone, gluconic nicd, gluconolactone, glucuronic acid, glucuronolactone, glycolic acid, isopropyl

pyruvate, lactic acid, malic acid, mandelic aicd, methyl pyruvate, mucic acid, pyruvic acid, saccharic acid, saccharic acid 1,4-lactone, tartaric acid, tartronic acid, and mixtures thereof, and

(c) a pharmaceutically-acceptable carrier.

5,595,985

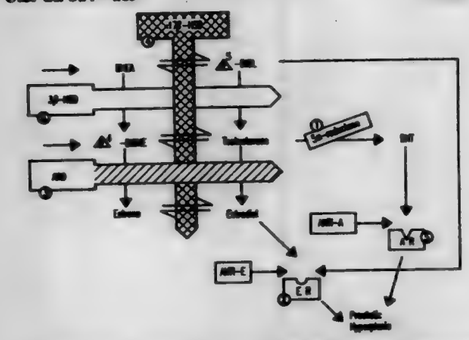
COMBINATION THERAPY FOR PROPHYLAXIS AND/OR TREATMENT OF BENIGN PROSTATIC HYPERPLASIA

Fernand Labrie, Ste-Foy, Canada, assignor to Endorecherche Inc., Quebec, Canada

Continuation of Ser. No. 925,883, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 376,700, Jul. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 322,154, Mar. 10, 1989, abandoned. This application Dec. 15, 1993, Ser. No. 167,450

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—169 **7 Claims**



1. A method of treating benign prostatic hyperplasia in a human or other warm-blooded animal said treatment comprising systemic administration to a patient in need of such treatment of both an amount of a 5α-reductase inhibitor and of a compound that binds and blocks access to androgen receptors effective to decrease prostate size, said administration being in combination with a pharmaceutically acceptable diluent or carrier.

5,595,986

STABLY STORABLE AND READILY WATER SOLUBLE COMPOSITION OF CEPHALOSPORIN FOR INJECTIONS

Makoto Okada; Masaki Takahashi; Kaoru Hosoi, and Shoichi Nakajima, all of Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

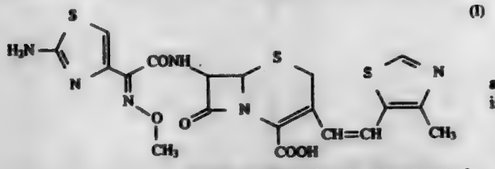
Filed Aug. 2, 1995, Ser. No. 510,342

Claims priority, application Japan, Aug. 3, 1994, 6-182378

Int. Cl.[6] A61K *31/545*

U.S. Cl. 514—202 **6 Claims**

1. A stably storable and readily water soluble composition for use in preparing injections and comprising as active ingredient sodium or potassium salt of a cephaloeporin having the formula



(I)

and the name, (6R,7R)-7-[(Z)-2-(2-aminothiazol-4-yl)-2-methoxyiminoacetamido] -3-[(Z)-2-(4-methylthiazol-5-yl)ethenyl] -8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, and capable of being stored at ambient temperatures without bringing about a substantial discoloration and without involving a substantial decomposition of the cephalosporin of the formula (I), which composition comprises a dry physical mixture of the sodium or potassium salt of the cephalosporin of formula (I) with at least one of arginine, lysine or a pharmaceutically acceptable salt thereof, and in which the weight ratio of said cephalosporin of formula (I) to arginine is in a ratio of 1.0:0.1 to 1.0:2.0 or the weight ratio of said cephalosporin of formula (I) to lysine is in a range of 1.0:0.2 to 1.0:2.0 and in which the amount of arginine, lysine or a pharmaceutically acceptable salt thereof present in the mixture is effective to prevent the salt of the compound of the formula (I) from being discolored and decomposed to a substantial extent during a storage of the composition at ambient temperatures and also allow the composition to be completely dissolved in water at ambient temperatures before and even after the storage of the composition at ambient temperatures.

5,595,987

METHOD OF SLOWING VENTRICULAR ARRHYTHMIAS USING ZATEBRADINE

Steven Lasker, New York, and Richard Klein, Bronx, both of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Jul. 22, 1994, Ser. No. 231,480

Int. Cl.[6] A61K *31/55*

U.S. Cl. 514—213 **7 Claims**

1. A method of reducing the rate of a ventricular ectopic rhythm occurring in a subject during the delayed phase following a myocardial infarction which comprises administering an amount of zatebradine to the subject during the delayed phase effective to reduce the rate of the ventricular ectopic rhythm.

5,595,988

TRIAZOLO(PYRROLO, THIENO OR FURANO)AZEPINE DERIVATIVES

Frans E. Janssens, Bonheiden, Belgium; Jean F. A. Lacrampe, Le Mesnil-Esnard, and Isabelle N. C. Pilatte, Louviers, both of France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

PCT No. PCT/EP93/03322, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO94/13681, PCT Pub. Date Jun. 23, 1994

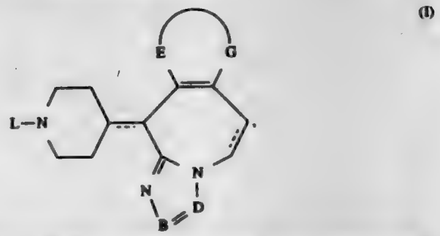
PCT Filed Nov. 25, 1993, Ser. No. 433,387

Claims priority, application European Pat. Off., Dec. 4, 1992, 92203777

Int. Cl.[6] A61K *31/55*; C07D *487/14;491/147;495/14*

U.S. Cl. 514—214 **12 Claims**

1. A compound having the formula



(I)

a pharmaceutically acceptable addition salt or a stereochemically isomeric form thereof, wherein

each of the dotted lines independently represents an optional bond;

-E-G- is a bivalent radical of formula

—X—C(R[1])═CH— (a-1); or

—CH═C(R[2])—X— (a-2);

X represents O, S or NR[3];

R[3] represents hydrogen, C_{1-6}alkyl or C_{1-4}alkylcarbonyl;

R[1] and R[2] each independently represent hydrogen, C_{1-4}alkyl, halo, ethenyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, hydroxyC_{1-4}alkyl, formyl, hydroxycarbonyl or hydroxycarbonylC_{1-4}alkyl;

-B═D- is a bivalent radical of formula

—C(R[4])═N— (b-1); or

—N═C(R[5])— (b-2);

R[4] represents hydrogen, C_{1-4}alkyl, ethenyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, C_{1-4}alkyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, hydroxyC_{1-4}alkyl, formyl or hydroxycarbonyl;

R[5] represents hydrogen, C_{1-4}alkyl, ethenyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, C_{1-4}alkyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, hydroxyC_{1-4}alkyl, formyl, hydroxycarbonyl, phenyl or pyridinyl;

L represents hydrogen; C_{1-6}alkyl; C_{1-6}alkyl substituted with one substituent selected from the group consisting of hydroxy, C_{1-4}alkyloxy, hydroxycarbonyl, C_{1-4}alkyloxycarbonyl, C_{1-4}alkyloxycarbonylC_{1-4}alkyloxy, hydroxycarbonylC_{1-4}alkyloxy, C_{1-4}alkylaminocarbonylamino, C_{1-4}alkylaminothiocarbonylamino, aryl and aryloxy; C_{1-6}alkyl substituted with both hydroxy and aryloxy; C_{2-6}alkenyl; C_{3-6}alkenyl substituted with aryl; wherein each aryl is phenyl or phenyl substituted with halo, cyano, hydroxy, C_{1-4}alkyl, C_{1-4}alkyloxy or aminocarbonyl; or,

L represents a radical of formula

-Alk-Y-Het[1] (c-1),

-Alk-NH—CO-Het[2] (c-2) or

-Alk-Het[3] (c-3); wherein

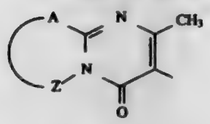
Alk represents C_{1-4}alkanediyl;

Y represents O, S or NH;

Het[1], Het[2] and Het[3] each represent furanyl, thienyl, oxazolyl, thiazolyl or imidazolyl each optionally substituted with one or two C_{1-4}alkyl substituents; pyrrolyl or pyrazolyl optionally substituted with formyl, hydroxyC_{1-4}alkyl, hydroxycarbonyl, C_{1-4}alkyloxycarbonyl or with one or two C_{1-4}alkyl substituents; thiadiazolyl or oxadiazolyl optionally substituted with amino or C_{1-4}alkyl; pyridinyl, pyrimidinyl, pyrazinyl or pyridazinyl each optionally substituted with C_{1-4}alkyl, C_{1-4}alkyloxy, amino, hydroxy or halo; and

Het[3] may also represent 4,5-dihydro-5-oxo-1H-tetrazolyl substituted with C_{1-4}alkyl;

2-oxo-3-oxazolidinyl, 2,3-dihydro-2-oxo-1H-benzimidazol-1-yl or a radical of formula



wherein

A-Z represents S—CH═CH, S—CH_2—CH_2, S—CH_2—CH_2—CH_2, CH═CH—CH═CH, or CH_2—CH_2—CH_2—CH_2.

6. A method for the treatment of allergic disease which comprises administering to a warm blooded animal suffering from allergic disease a therapeutically effective amount of a compound as defined in claim 1.

5,595,989

N-SUBSTITUTED AZAHETEROCYCLIC CARBOXYLIC ACIDS AND ESTERS THEREOF

Knud E. Andersen, Smørum; Ulle B. Olsen, Vallensbæk; Hans Petersen, Vanløse; Frederik Grunvald, Vedbæk, all of Denmark; Ursula Sonnewald, Trondheim, Norway; Tine K. Jørgensen, Herlev, and Henrik S. Andersen, København Ø, both of Denmark, assignors to Novo Nordisk A/S, Bagsværd, Denmark

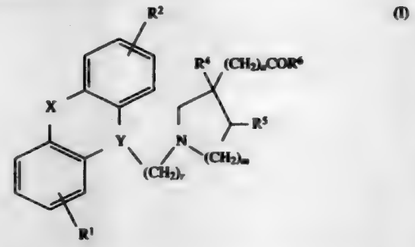
Filed Jan. 3, 1995, Ser. No. 367,648

Claims priority, application Denmark, Jan. 4, 1994, 0019/94; Nov. 9, 1994, 1290/94

Int. Cl.[6] C07D *401/06*; A61K *31/55*

U.S. Cl. 514—217 **19 Claims**

1. A compound of formula I



(I)

wherein

R[1] and R[2] independently are hydrogen, halogen, trifluoromethyl, C_{1-6}-alkyl or C_{1-6}-alkoxy;

Y is >N—CH_2—, wherein only the underscored atom participates in the ring system;

X is —CH_2CH_2— or —CH═CH—;

r is 1, 2, or 3;

m is 1 or 2;

n is 1 when m is 1 and n is 0 when m is 2;

R[4] and R[5] are hydrogen when m is 1;

R[4] and R[5] are hydrogen or form a bond when m is 2; and

R[6] is OH or C_{1-8}-alkoxy; or

a pharmaceutically acceptable salt thereof.

5,595,990

ANTIARRHYTHMIC BENZODIAZEPINES

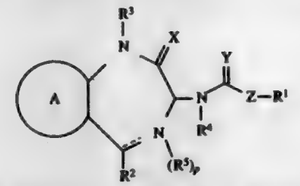
John J. Baldwin, Gwynedd Valley; David A. Claremon, Maple Glen; Jason M. Elliott, Blue Bell; Nigel Liverton, Harleysville; David C. Remy, North Wales, and Harold G. Selnick, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 156,331, Nov. 22, 1993, Pat. No. 5,426,185. This application Mar. 27, 1995, Ser. No. 411,240

Int. Cl.[6] A61K *31/55;31/38*

U.S. Cl. 514—221 **10 Claims**

1. A method of treating arrhythmia which comprises the administration to a patient in need of such treatment of an effective amount of a compound of structural formula:



I

individual diastereomers, enantiomers and mixtures thereof, or a pharmaceutically acceptable salt thereof, wherein

A is

1) thieno,

2) pyrido, or

3) benzo either unsubstituted or substituted with —NH_2, —$NHSO_2(C_{1-3}$ alkyl), C_{1-3} alkyl or C_{1-3} alkoxy;

X is
1) =O,
2) =S,
3) =N—NH_2,
4) =N—OH or
5) =H_2;

Y is
1) =O,
2) =N—CN or
3) =H_2;

Z is
1) C_{1-6} alkylene, either straight or branch chain and either unsubstituted or substituted with phenyl or spiropiperidine,
2) C_{2-4} alkenylene, either straight or branch chain,
3) —$(CH_2)_m$-W-$(CH_2)_n$— wherein m and n are independently 0, 1, 2, 3 or 4 and W is —O—, —S— or —NH,
4) 4-(5-methylisoxazole-3-yl),
5) C_{3-6} cycloalkylene, or
6) single bond;

p is 0 or 1;

R^1 is
1) phenyl, either unsubstituted or substituted with one or two substituents selected from
a) —NO_2,
b) —Cl, Br, F, or I,
c) —CF_3,
d) —C_{1-3} alkyl,
e) —C_{1-3} alkoxy,
f) —CN,
g) —methylenedioxy,
2) C_{5-7} cycloalkyl,
3)

4) mono- or bicyclic heterocyclyl of 5 to 10 members one or two of which are sulfur, nitrogen or oxygen, the remaining being carbon, such as 2-thienyl, 2-furanyl, 2-indolyl, 2-quinoxolinyl, or 2-(2,3-dihydro benzofuranyl)
5) methyl, or
6) indan-5-yl;

R^2 is
1) phenyl, either unsubstituted or substituted with C_{1-3} alkoxy or 4,4-dimethyloxazolin-2-yl,
2) C_{1-4} alkyl, either straight or branched chain and either unsubstituted or substituted with C_{1-3} alkoxy or C_{1-3} alkoxy-C_{1-3} alkoxy,
3) C_{3-7} cycloalkyl,
4) 2- or 3-furyl,
5) 1-methylpiperidin-2-yl, or
6) if R^2 is phenyl, the 2-position of the phenyl can be joined to the 4-position nitrogen of the diazepine ring through a carbonyl group and the double bond between the 4-nitrogen and the 5-carbon becomes a single bond;

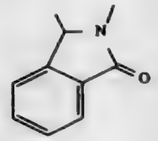
R^3 is
1) hydrogen or
2) C_{1-3} alkyl either unsubstituted or substituted with —$N(CH_3)_2$, —OH, —CF_3, or
3) —CF_3;

R^4 is
1) hydrogen,
2) C_{1-6} alkyl, the chain of carbon atoms of which can be interrupted by one or two non-adjacent oxygen atoms and which is either unsubstituted or substituted with C_{1-3} alkoxycarbonyl, —OH or

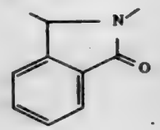


3) tetrazol-5-yl; and

R^5 is hydrogen or oxygen or is joined to R^2 to form the partial structure:



and the bond represented by ⎯ is:
1) a double bond when p is zero or when p is 1 and R^5 is oxygen, or
2) a single bond when R^5 is hydrogen or R^5 is joined to R^2 to form the partial structure:



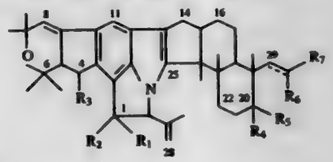
5,595,991

ANTHELMINTIC USE OF NODULISPORIC ACID AND ANALOGS THEREOF

Wesley Shoop, Somerville; Dan A. Ostlind, Watchung, and Bruce F. Michael, Whitehouse Station, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 20, 1995, Ser. No. 406,447
Int. Cl.[6] A61K *31/40;31/44;31/445;31/535*
U.S. Cl. 514—233.2 3 Claims

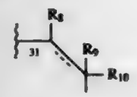
1. A method for the treatment of helminthiasis in animals which comprises administering to an animal in need of such treatment an effective amount of a compound of formula I:



I

wherein
R_1 is
(1) hydrogen,
(2) optionally substituted C_1–C_{10} alkyl,
(3) optionally substituted C_2–C_{10} alkenyl,
(4) optionally substituted C_2–C_{10} alkynyl,
(5) optionally substituted C_3–C_8 cycloalkyl,
(6) optionally substituted C_5–C_8 cycloalkenyl
where the substitutents on the alkyl, alkenyl, alkynyl, cycloalkyl and cycloalkenyl are 1 to 3 groups independently selected from C_1–C_5 alkyl, C_1–C_{10} alkoxy, C_1–C_{10} alkylthio, C_1–C_{10} alkylsulfonyl, C_3–C_8 cycloalkyl, hydroxy, halogen, cyano, carboxy, amino, C_1–C_{10} monoalkylamino, C_1–C_{10} dialkylamino, C_1–C_{10} alkanoyl amino and benzoyl amino wherein said benzoyl is optionally substituted with 1 to 3 groups independently selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_3-perfluoroalkyl, amino, hydroxy, halogen, C_1–C_5 monoalkylamino, C_1–C_5 dialkylamino and C_1–C_5 alkanoyl amino,
(7) phenyl C_0–C_5 alkyl wherein said phenyl is optionally substituted with 1 to 3 groups independently selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_3-perfluoroalkyl, amino, hydroxy, carboxy, halogen, C_1–C_5 monoalkylamino, C_1–C_5 dialkylamino and C_1–C_5 alkanoyl amino,
(8) C_1–C_5 perfluoroalkyl,

(9) a 5- or 6-membered ring selected from morpholino, pyridyl and piperazino, optionally substituted by 1 to 3 groups independently selected from hydroxy, oxo, C_1–C_{10} alkyl and halogen,
R_2, R_3, and R_4 are independently OR^a, OCO_2R^b, $OC(O)NR^cR^d$; or
R_1+R_2 represent =O, =NOR^a or =N—NR^cR^d;
R_5 and R_6 are H; or
R_5 and R_6 together represent —O—;
R_7 is
(1) CHO, or
(2) the fragment



R_8 is independently
(1) H, or
(2) OR^a;
(3) NR^cR^d
R_9 is independently
(1) H, or
(2) OR^a;
R_{10} is
(1) CN,
(2) $C(O)OR^b$,
(3) $C(O)N(OR^b)R^c$,
(4) $C(O)NR^cR^d$,
(5) $NHC(O)OR^b$,
(6) $NHC(O)NR^cR^d$,
(7) CH_2OR^a,
(8) $CH_2OCO_2R^b$, or
(9) $CH_2OC(O)NR^cR^d$;
——— represents a single or a double bond;
R^a is
(1) hydrogen,
(2) optionally substituted C_1–C_{10} alkyl,
(3) optionally substituted C_3–C_{10} alkenyl,
(4) optionally substituted C_3–C_{10} alkynyl,
(5) optionally substituted C_1–C_{10} alkanoyl,
(6) optionally substituted C_3–C_{10} alkenoyl,
(7) optionally substituted C_3–C_{10} alkynoyl,
(8) optionally substituted benzoyl,
(9) optionally substituted phenyl,
(10) optionally substituted C_3–C_7 cycloalkanoyl,
(11) optionally substituted C_4–C_7 cycloalkenoyl,
(12) optionally substituted C_1–C_{10} alkylsulfonyl
(13) optionally substituted C_3–C_8 cycloalkyl
(14) optionally substituted C_5–C_8 cycloalkenyl
where the substitutents on the alkyl, alkenyl, alkynyl, alkanoyl, alkenoyl, alkynoyl, benzoyl, phenyl, cycloalkanoyl, cycloalkenoyl, alkylsulfonyl, cycloalkyl and cycloalkenyl are from 1 to 5 groups independently selected from hydroxy, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, aryl C_1–C_3 alkoxy, NR^cR^d, CO_2R^d, $CONR^cR^d$ and halogen,
(15) C_1–C_5 perfluoroalkyl,
(16) phenylsulfonyl optionally substituted with 1 to 3 groups independently selected from C_1–C_5 alkyl, C_1–C_5 perfluoroalkyl, nitro, halogen or cyano,
(17) a 5- or 6-membered ring selected from piperidino, morpholino, pyridyl and piperazino optionally substituted by 1 to 4 groups independently selected from C_1–C_5 alkyl, C_1–C_5 alkenyl, C_1–C_5 perfluoroalkyl, amino, $C(O)R^cR^d$, cyano, CO_2R^b or halogen;
R^b is
(1) H,
(2) optionally substituted phenyl,
(3) optionally substituted C_1–C_{10} alkyl,
(4) optionally substituted C_3–C_{10} alkenyl, or
(5) optionally substituted C_3–C_{10} alkynyl,
where the substituents on the phenyl, alkyl, alkenyl or alkynyl are from 1 to 5 groups independently selected from hydroxy, C_1–C_6 alkoxy, C_3–C_7 cycloalkyl, halogen, C_1–C_5 alkanoyloxy, $C(O)NR^cR^d$, CO_2R^d, formyl, —NR^cR^d, optionally substituted phenyl, and optionally substituted phenyl C_1–C_3 alkoxy, wherein the phenyl substituents are 1 to 3 groups independently selected from R^c;
R^c and R^d are independently R^b; or
R^c and R^d together with the N to which they are attached form a piperidino, morpholino or piperazino optionally substituted with 1 to 3 groups indepeadently selected from R^g and oxo;
R^e is
(1) halogen,
(2) C_1–C_7 alkyl,
(3) C_1–C_3 perfluoroalkyl,
(4) —$S(O)_mR^f$,
(5) cyano,
(6) nitro,
(7) $R^fO(CH_2)_v$—,
(8) $R^fCO_2(CH_2)_v$—,
(9) $R^fOCO(CH_2)_v$,
(10) optionally substituted phenyl where the substituents are from 1 to 3 of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy;
v is 0 to 3;
R^g and R^h are independently
(1) hydrogen,
(2) C_1–C_6alkyl,
(3) aryl,
(4) aryl C_1–C_6 alkyl,
(5) C_1–C_5 alkoxycarbonyl,
(6) C_1–C_5 alkylcarbonyl, or
(7) C_1–C_5 alkanoyl C_1–C_6 alkyl; or
R^g and R^h together with the N to which they are attached form a piperidino, morpholino or piperazino optionally substituted with 1 to 3 groups independently selected from R^g and oxo;
R^f and R^f are independently
(1) hydrogen,
(2) C_1–C_3 perfluoroalkyl,
(3) optionally substituted C_1–C_6 alkyl, where the substituents are aryl or substituted phenyl;
(4) phenyl or substituted phenyl where the substituents are from 1 to 3 groups independently selected from halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or hydroxy;
m is 0 to 2; or
a pharmaceutically acceptable salt thereof.

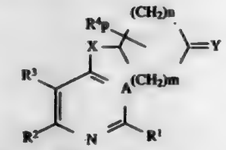
5,595,992

SUBSTITUTED PYRIDINES AND PYRIMIDINES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS PESTICIDES AND FUNGICIDES

Rainer Preuss, Hofheim; Wolfgang Schaper, Diedorf; Martin Märkl; Harald Jakobi, both of Frankfurt; Peter Braun, Nieder-Olm; Werner Kunz, Eppstein; Burkhard Sachse, Kelkheim; Anna Waltersdorfer, Frankfurt; Manfred Kern, Lörzweiler; Peter Lümmen, Niederhausen, and Werner Bonin, Kelkheim, all of Germany, assignors to Hoechst Schering AgrEvo GmbH, Germany

Filed Sep. 12, 1994, Ser. No. 304,390
Claims priority, application Germany, Sep. 14, 1993, 43 31 178.4
Int. Cl.[6] C07D *403/12;239/32;239/46;239/70;239/72;* A61K *31/505;31/52;31/50*
U.S. Cl. 514—254 8 Claims

1. A compound of the formula I



(I)

or acid addition salt thereof, in which
A is N

R^1 is hydrogen, halogen, $(C_1–C_4)$-alkyl or $(C_3–C_6)$-cycloalkyl,
R^2 is hydrogen, halogen, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkoxy, $(C_1–C_4)$-alkoxy-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-haloalkoxy-$(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-alkylthio, $(C_1–C_4)$-alkylthio-$(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkylamino or di-$(C_1–C_4)$-alkylamino,
R^3 is hydrogen, halogen, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$ haloalkoxy, $(C_1–C_4)$-alkylthio, amino, $(C_1–C_4)$-alkylamino or di- $(C_1–C_4)$ alkylamino, or
R^2 and R^3 together with the carbon atoms to which they are bonded form an unsaturated 5- or 6-membered carbocyclic ring in which one or two CH groups are optionally replaced by nitrogen atoms and in which, in the event that it is a 5-membered ring, one CH_2 group is optionally replaced by an oxygen or sulfur atom and which is optionally substituted by 1, 2 or 3 identical or different radicals, these radicals being (Cl-C4)-alkyl or $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-haloalkoxy and/or halogen,
or
R^2 and R^3 together with the carbon atoms to which they are bonded form a saturated 5-, 6- or 7-membered carbocyclic ring in which one or two CH_2 groups are optionally replaced by oxygen or sulfur atoms and which is optionally substituted by one to four identical or different radicals selected from the group consisting of $(C_1–C_4)$alkyl and halogen,
X is oxygen, NH and $S(O)_q$, wherein q is 0, 1 or 2,
R^4 is halogen, $(C_1–C_4)$-alkyl, $(C_3–C_7)$-cycloalkyl, $(C_1–C_4)$haloalkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkoxy or optionally substituted phenyl,
p is an integer from 0 to 4,
n is an integer from 0 to 2 and
m is an integer from 1 to 3,
y is



R^5 is hydrogen, halogen, $(C_1–C_{12})$-alkyl, $(C_3–C_8)$-cycloalkyl, $(C_3–C_8)$ -cycloalkyl-$(C_1–C_4)$ -alkyl, $_r$-$(C_1–C_4)$-alkyl, wherein t is an integer from 1 to 3, $(C_1–C_{12})$-haloalkyl, 2-(tetra-hydro-2H-pyran-2-yloxy)-$(C_1–C_4)$-alkyl, $_r$-$(C_1–C_4)$-haloalkyl, $(C_1–C_4)$ -alkenyl, $(C_1–C_8)$-alkylcarbonyl, $(C_1–C_8$-alkoxycarboxyl, $(C_1–C_8)$ -alkylcarbonyl-$(C_1–C_4)$-alkyl, $(C_1–C_8)$-haloalkylcarbonyl, $(C_1–C_8)$-haloalkoxycarbonyl, $(C_3–C_8)$-cycloalkylcarbonyl, $(C_3–C_8)$ -cycloalkoxycarbonyl, $(C_3–C_8)$-optionally substituted benzoyl, the term "optionally substituted benzoyl" meaning a radical in which the phenyl moiety is substituted as in "optionally substituted phenyl"; and the term "optionally substituted pheayl" meaning a phenyl radical which has one, two or three identical or different substituents selected from the series consisting of halogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkyl, and $(C_1–C_4)$-haloalkoxy; benzyloxy-carbonyl, $(C_2–C_8)$-alkenyl, $(C_2–C_8)$-alkynyl, tri-$(C_3–C_8)$-alkylsilyl, di-$(C_1–C_8)$-alkyl-$(C_{3–C_8})$-cycloalkylsilyl, di-$(C_1–C_8)$-alkyl-(phenyl-$(C_1–C_4)$-alkyl)-silyl, di$(C_1–C_8)$-alkyl-$(C_1–C_4)$-haloalkylsilyl, dimethylphenylsilyl, heteroaryl selected from the group consisting of thieayl, benzothieayl, furyl, benzo-furyl, pyrrolyl, imidazolyl, pyrazolyl, pyridyl, pyrazinyl, pyrim-idinyl, pyridazinyl, indolizinyl, isoindolyl, indolyl, indazolyl, purinyl, quinolyl, isoquinolyl, phthalazinyl, naphthydrinyl, qui-noxalinyl, quinazolinyl, cinnolinyl, pteridinyl, oxazolyl, isox-azolyl, thiazolyl, isothiazolyl, tetrazolyl; phenyl, phenyl-$(C_2–C_4)$-alkyl, beazyl, benzyloxy-$(C_{1–C_4})$-alkyl, it being possible for phenyl or heteroaryl in the last-mentioned six radi-cals to be unsubstituted or mono- or polysubstituted, and these substituents, which are identical or different, are in each case halogen, $(C_1–C_4)$-alkyl, $(C_3–C_8)$-cycloalkyl, $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-dialkylamino, $(C_1–C_4)$-alkylthio, $(C_1–C_8)$-alkoxy, $(C_1–C_8)$-alkoxycarbonyl, $(C_1–C_8)$-alkanoyloxy, $(C_1–C_4)$-haloalkoxy, $(C_1–C_4)$-alkoxy-$(C_1–C_4)$-alkoxy, $_r$-$(C_2–C_4)$-alkyl, 2-(tetrahydro-2H-pyran-2-yloxy)-ethoxy, $(C_2–C_8)$ alkenyl, $(C_2–C_8)$-alkynyl, phenoxy or benzyloxy which has optionally one more, identical or different substituents selected from the group consisting of $(C_1–C_4)$-alkyl or $(C_1–C_{4})$-haloalkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkoxy and halogen in the phenyl radical,
R^6 is hydrogen, halogen, $(C_1–C_8)$-alkyl, $(C_3–C_8)$-cycloalkyl, $(C_1–C_8)$ haloalkyl, phenyl and benzyl, wherein the phenyl rings are optionally substituted as described above under R^5, or
R^5 and R^6 together can form a 3- to 7-membered ring which can optionally be substituted by one, two or three identical or different radicals selected from the group consisting of halogen, $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-haloalkyl, $(C_1–C_4)$-haloalkyl and $(C_1–C_4)$-haloalkoxy and in which one CH_2 group is optionally replaced by O, S, NR^7 wherein R^7 is as defined for R^4 but must not be halogen.

5,595,993

ANTISCHEMIC PIPERAZINYL- AND PIPERIDINYL-CYCLOHEXANES

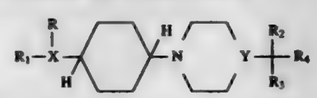
Ronald J. Mattson, Meriden, and John D. Catt, Southington, both of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 82,587, Jun. 25, 1993, Pat. No. 5,352,678, which is a continuation-in-part of Ser. No. 848,767, Mar. 11, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 306,881

Int. Cl.[6] A61K *31/495;31/445;* **C07D** *211/08;411/00*

U.S. Cl. 514—255 **12 Claims**

1. A dopaminergic compound of Formula I or a pharmaceutically acceptable salt or hydrate thereof:



(I)

wherein
R=R_1 and is independently H or halogen; or R and R_1 may be taken together to form an —$O(CH_2)_mO$— (m=1 or 2);
X=phenyl;
Y=N or CH;
R_2=R_3 and is independently H or $C_{1–4}$ alkyl; and
R_4=phenyl or substituted phenyl wherein the phenyl group is mono-, or di-substituted with groups selected from: F, Cl, I and $C_{1–4}$ alkoxy.

5,595,994

1-HALOPYRAZIN- AND 1-HALOPYRIMIDIN-4-AMINO-4-ALKYLPIPERIDINES

Marco Baroni, Vanzago; Tiziano Croci, Milan; Marco Landi, Busnero; Umberto Guzzi, Milan, all of Italy, and Dino Nisato, Saint Georges D'Orques, France, assignors to Sanofi, Paris, France

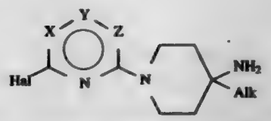
Division of Ser. No. 319,595, Oct. 7, 1994, Pat. No. 5,502,063. This application Jun. 6, 1995, Ser. No. 469,511

Claims priority, application European Pat. Off., Oct. 11, 1993, 93402498

Int. Cl.[6] A61K *31/505;* **C07D** *401/04;239/42*

U.S. Cl. 514—275 **16 Claims**

1. A compound of formula (I):



(I)

in which Hal is a halogen atom, Alk is a $(C_1–C_4)$alkyl group and one of X, and Z is a nitrogen atom and the others are —CH=, and its pharmaceutically acceptable or unacceptable salts.

5,595,995

PYRIDYL-PROPAN-2-YL ESTERS OF 1-ADAMANTANE CARBOXYLATES

Ferdinand Claus, Sutton; Michael Jarman, Tooting, and Gerard A. Potter, Widnes, all of England, assignors to British Technology Group Limited, England

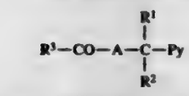
Filed Jan. 18, 1995, Ser. No. 335,743

Claims priority, application United Kingdom, May 15, 1992, 9210489; Nov. 12, 1992, 9223738

Int. Cl.[6] A61K *31/44;* **C07D** *213/55*

U.S. Cl. 514—277 **10 Claims**

1. A compound having the following formula:



(3)

wherein each of R^1 and R^2 independently represents hydrogen or alkyl of 1 to 4 carbon atoms;
A represents —O—, or CR^4R^5 where R^4 and R^5 are defined as for R^1 or R^2;
R^3 represents an adamantyl group; and
Py represents a 3- or 4-pyridyl group, as a free base or a pharmaceutically acceptable salts thereof.

5,595,996

7-SUBSTITUTED 4-AZA CHOLANIC ACID DERIVATIVES AND THEIR USE

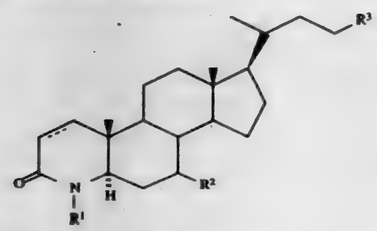
Donald W. Graham, Mountainside; Josephine R. Carlin, New Brunswick; Shuet-Hing L. Chiu, Westfield, and Richard L. Tolman, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 25, 1994, Ser. No. 328,622

Int. Cl.[6] A61K *31/44;* **C07D** *221/18;221/04*

U.S. Cl. 514—284 **9 Claims**

1. A compound of the Formula I



I

wherein:
the dotted line indicates that a double bond may be present or absent;
R^1 is H, methyl or ethyl;
R^2 is α- or β-C_{1-10} straight or branched alkyl;
R^3 is CO_2H or CO_2R^4;
R^4 is H, C_{1-10} straight or branched alkyl, aryl, or aralkyl;
Aryl is phenyl, substituted phenyl, naphthyl, or biphenyl; and
Aralkyl is C_{1-10}alkyl substituted with one to three phenyl or substituted phenyl moieties;
or a pharmaceutically acceptable salt thereof.

5,595,997

METHODS AND COMPOSITIONS FOR TREATING ALLERGIC RHINITIS AND OTHER DISORDERS USING DESCARBOETHOXYLORATADINE

A. K. Gunnar Aberg, Westborough; John R. McCullough, Worcester, and Emil R. Smith, Shrewsbury, all of Mass., assignors to Sepracor Inc., Marlborough, Mass.

Filed Dec. 30, 1994, Ser. No. 366,651

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—290 **7 Claims**

1. A method of treating allergic rhinitis in a human while avoiding the concomitant liability of adverse side-effects associated with the administration of non-sedating antihistamines, comprising administering to said human a therapeutically effective amount of descarboethoxyloratadine or a pharmaceutically acceptable salt thereof.

5,595,998

PYRAZOLOQUINOLINES

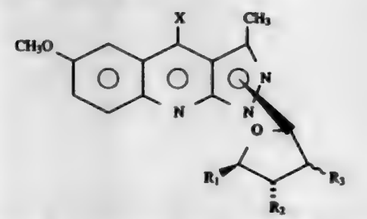
Ronald L. Wolin, 406 Mountain Ave., Westfield, N.J. 07090; Adriano Afonso, 10 Woodmere Rd., West Caldwell, N.J. 07006; Joseph M. Kelly, 112 Princeton Rd., Parlin, N.J. 08859, and F. George Njoroge, 2597 Juliet Pl., Union, N.J. 07083

Filed Dec. 15, 1994, Ser. No. 357,624

Int. Cl.[6] C07D *471/14;487/14;* **A61K** *31/44*

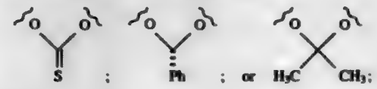
U.S. Cl. 514—293 **17 Claims**

1. A compound of the formula:



I

wherein R_1 is HO—CH_2; $(C_1–C_6)$-alkyl-O—CH_2; NH_2CH_2; $PhCH_2COOCH_2$; $PhCH_2OCH_2$; $PhCOCH_2CH(OH)$; $PhCOCH_2CH_2$; $PhCONHCH_2$; $(C_1–C_4)$-alkyl—$COOCH_2$; PhCOCH=CH; $PhCOOCH_2$; or substituted-$PhCOOCH_2$, wherein the substituents are selected from the group consisting of $(C_1–C_6)$ alkyl, $(C_1–C_6)$ alkoxy, and nitro;
R_2 and R_3 are each independently HO; $(C_1–C_6)$-alkyl—COO; $PhCH_2COO$; $PhCH_2O$—; PhCOO—; substituted-PhCOO— wherein the substituents are selected from the group consisting of $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, and nitro; or R_2 and R_3 taken together can be a chemical bond;
and with the proviso that when the bond attached to the R_2 and the bond attached to the R_3 both extend below the plane of the page that R_2 and R_3 taken together can be



and
X is Cl or H;
or a stereoisomer thereof, or a pharmaceutically acceptable salt thereof.

5,595,999

GUANIDINE DERIVATIVES

Jean Ackermann; David Bonner, both of Basel, Switzerland; Klaus Gubernator, Freiburg, Germany; Paul Hadvary, Biel-Benken, Switzerland; Kurt Hilpert, Hofstetten, Switzerland; Klaus Müller, Münchenstein, Switzerland; Ludvik Lohler, Bottmingen, Switzerland; Gérard Schmid, Kleinberg, Switzerland; Thomas B. Tschopp, Ettingen, Switzerland; Hans P. Wessel, Heitersheim, Germany, and Beat Wirz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

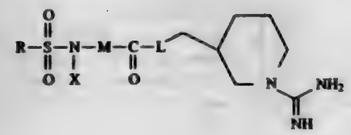
Division of Ser. No. 343,168, Nov. 22, 1994, which is a division of Ser. No. 77,476, Jun. 15, 1993, Pat. No. 5,393,768, which is a division of Ser. No. 719,429, Jun. 24, 1991, Pat. No. 5,260,307. This application Jun. 7, 1995, Ser. No. 473,060

Claims priority, application Switzerland, Jul. 5, 1990, 2250/90; May 2, 1991, 1315/91

Int. Cl.[6] A61K *31/47*; C07D *401/12*

U.S. Cl. 514—369 **19 Claims**

1. A compound of the formula:



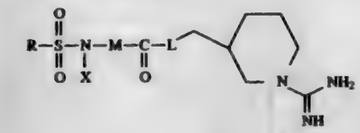
wherein

R is aryl, heteroaryl or heterocyclyl,

L is NH or O; and

—N(X)—M— is an isoquinolylene group optionally substituted in the phenyl ring; a hydrate or solvate, or physiologically usable salt thereof.

13. A method of inhibiting thrombin induced platelet aggregation and clotting of fibrinogen in plasma which comprises administering to a host requiring such treatment an effective amount of a compound of the formula:



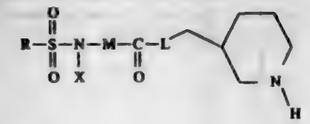
wherein

R is aryl, heteroaryl or heterocyclyl,

L is NH or O; and

—N(X)—M— is an isoquinolylene group optionally substituted in the phenyl ring; a hydrate or solvate, or physiologically usable salt thereof.

19. A compound of the formula:



wherein

R is aryl, heteroaryl or heterocyclyl,

L is NH or O; and

—N(X)—M— is an isoquinolylene group optionally substituted in the phenyl ring.

5,596,000

AMINO ACID DERIVATIVES, PROCESSES FOR THE MANUFACTURE THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Franz Ester; Gerd Schnorrenberg; Horst Dellinger, all of Ingelheim am Rhein; Birgit Jung, and Erich Burger, both of Bingen/Rhein, all of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

Filed Sep. 2, 1993, Ser. No. 116,090

Claims priority, application Germany, Sep. 3, 1992, 42 29 447.9; Dec. 22, 1992, 42 43 496.3; May 8, 1993, 43 15 437.9

Int. Cl.[6] A61K *31/47;31/415*

U.S. Cl. 514—312 **16 Claims**

1. A pharmaceutical composition of matter comprising a neurokinin (tachykinin) antagonizing amount of a compound of formula I



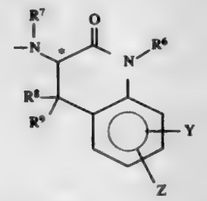
(I)

wherein

R^1 is vinyl, aryl, heteroaryl, aralkyl, heteroaralkyl, arylvinyl, heteroarylvinyl, aryloxyalkyl, arylalkyloxy, (C_{3-8})cycloalkyl, (C_{3-8})cycloalkylalkyl, bicycloheptyl or bicycloheptylalkyl (either unsubstituted or substituted by 1–3 methyl groups), adamantyl, adamantylalkyl, dekaline, dekalinalkyl, tetraline, tetralinalkyl, diphenylalkyl, di(arylalkyl)aminoalkyl or arylalkylaminoalkyl (wherein aryl is phenyl, mono-, di- or trisubstituted phenyl or naphthyl; the substituents of the phenyl group are, independently of each other, halogen, trihalomethyl, alkoxy, alkyl, hydroxy, nitro, alkylcarbonyl or cyano; heteroaryl is indolyl, indolyl substituted in position 1 by alkyl or benzyl, pyridyl, pyrrolyl, imidazolyl or thienyl; and the alkyl and alkoxy group contain 1 to 3 carbon atoms);

A^1 is D- or L-alanine (Ala), (D- or L-valine (Val), D- or L-leucine (Leu), D- or L-isoleucine (Ile), D- or L-serine (Ser), D- or L-threonine (Thr), D- or L-allothreonine, D- or L-cysteine (Cys), D- or L-methionine (met), D- or L-phenylalanine (Phe), D- or L-tryptophan (Trp), N-formyl protected Trp, D- or L-tyrosine (Tyr), D- or L-proline (Pro), D- or L-didehydroproline (ΔPro) such as 3,4-didehydroproline (Δ(3,4)-Pro), D- or L-hydroxyproline (Pro(OH)) such as 3-hydroxyproline (Pro(3OH)) and 4-hydroxyproline (Pro(4OH), D- or L-azetidin-2-carboxylic acid (Azt), D- or L-thioproline (Tpr), D- or L-aminoproline ($Pro(NH_2)$) such as 3-aminoproline ($Pro(3NH_2)$) and 4-aminoproline ($Pro(4NH_2)$), D- or L-pyroglutamic acid (pGlu), D- or L-2-aminoisobutyric acid (Aib), D- or L-2,3-diaminopropionic acid, D- or L-2,4-diaminobutyric acid, D- or L-glutamic acid (Glu), D- or L-aspartic acid (Asp), D- or L-glutamine (Gln), D- or L-asparagine (Ash), D- or L-lysine (Lys), D- or L-arginine (Arg), D- or L-histidine (His), D- or L-ornithine Orn), D-or L-hydroxy piperdine carbocylic acid such as 5-hydroxypiperidine- 2-carboxylic acid, D- or L-mercaptoproline (Pro(SH)) such as 3-mercaptoproline (Pro(3SH)) and 4-mercaptroproline (Pro(4SH)), Tpr(O), Met(O), $Tpr(O_2)$ or $Met(O_2)$, and the geometric isomers thereof, whereby the hydroxy and amino groups containing therein may be protected;

B is the group



wherein

R^6 is aralkyl, diarylalkyl (in these groups aryl is phenyl or naphthyl and alkyl is (C_{1-5})alkyl), heteroaryl-(C_{1-5})alkyl

(wherein heteroaryl is 2-, 3- or 4-pyridyl or 2- or 3-thienyl), phenylamino-(C_{1-5})alkyl, naphthylamino-(C_{1-5})alkyl or N-phenylalkylpiperidinyl (wherein the pheayl groups listed are not substituted or contain 1, 2 or 3 substituents which are, independent of each other, (C_{1-5})alkyl, (C_{1-5})alkoxy, dimethylamine, halogen, trifluoromethyl, —CN or OCF_3);

R^7 is hydrogen or (C_{1-5})alkyl; Y and Z independently of each other are hydrogen, (C_{1-5})alkyl; (C_{1-5})alkyloxy, benzyloxy (wherein the phenyl group is not substituted or contains 1,2 or 3 substituents which are independently of each other (C_{1-5})alkyl, (C_{1-5})alkoxy, dimethylamine, halogen, trifluoromethyl, —CN or OCF_3), OCF_3, halogen, CF_3, CN, CH_2NH_2, $CONH_2$, N-$(C_{1-5}$-alkyl$)_2$, NH-(C_{1-4})alkylcarbonyl, N-(C_{1-5})alkyl-N-(C_{1-4})alkylcarbonyl, NH_2 or NH-(C_{1-5})alkyl or if Y and Z are in a vicinal position to one another, both together represent —OCH_2O—, OCH_2CH_2O— or $(CH_2)_4$

R^8 is hydrogen and R^9 is hydroxy, (C_{1-5})alkoxy, phenyl-(C_{1-5})alkyloxy, naphthyl(C_{1-5})alkyloxy or (C_{1-4})alkylcarbonyl, or wherein

R^8 and R^9 are both oxygen or —OCH_2CH_2O—;

and the chirality to C* may be R or S, or the pharmaceutically acceptable salts thereof, and an inert carrier or excipient.

5,596,001

4-ARYL-3-(HETEROARYLUREIDO)QUINOLINE DERIVATVES

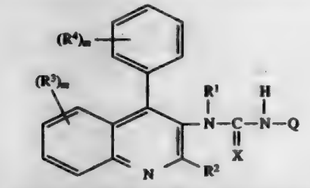
Ernest S. Hamanaka, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 25, 1993, Ser. No. 133,206

Int. Cl.[6] A61K *31/47;31/505*; C07D *401/12;403/12*

U.S. Cl. 514—313 **11 Claims**

1. The present invention relates to a compound of the formula



(I)

wherein each m is indepeandently selected from 0 to 4;

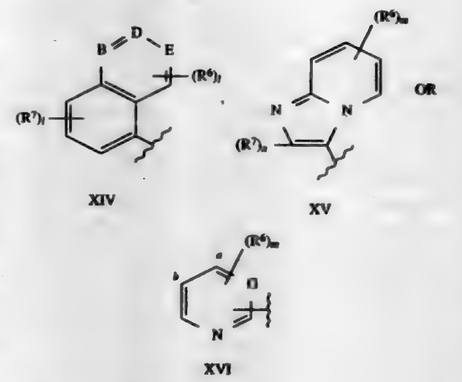
R^1 is selected from hydrogen, $(C_1–C_6)$ alkyl, $(C_6–C_{12})$ aralkyl wherein the aryl moiety is selected from phenyl, thienyl, furyl, and pyridinyl;

R^2 is selected from hydrogen, $(C_1–C_6)$ alkyl and $(C_1–C_6)$ alkoxy;

Each R^3 and R^4 is independently selected from hydrogen, halogen, $(C_1–C_6)$ alkyl optionally substituted with one or more halogen atoms, $(C_1–C_6)$ alkoxy optionally substituted with one or more halogen atoms, $(C_1–C_6)$ alkylthio optionally substituted with one or more halogen atoms, nitro, carboxyl optionally esterified with a $(C_1–C_6)$ alkyl group, hydroxyl, $(C_1–C_6)$ acyloxy and $NR^{12}R^{13}$ wherein R^{12} and R^{13} are the same or different and are selected from the group consisting of hydrogen, $(C_1–C_6)$alkyl, optionally halogenated $(C_1–C_6)$acyl, optionally halogenated $(C_1–C_6)$alkylsulfonyl, $(C_1–C_6)$alkylaminocarbonyl and $(C_1–C_6)$alkoxycarbonyl, or R^{12} and R^{13}, together with the nitrogen to which they are attached, form a piperidine, pyrrolidine or morpholine ring;

X is sulfur or oxygen; and

Q is a group of the formula



XIV XV

XVI

wherein m is as defined above;

n is 0 or 1;

Each l is independently selected from 0 to 3;

Each R^6 and R^7 is independently selected from the group consisting of halogen, $(C_1–C_6)$alkyl, $(C_1–C_6)$ haloalkyl, optionally halogenated $(C_1–C_6)$ alkoxy, optionally halogenated $(C_1–C_6)$ alkylthio, $(C_5–C_7)$ cycloalkylthio, phenyl $(C_1–C_6)$alkylthio, substituted phenylthio, heteroarylthio, heteroaryloxy, $(C_1–C_6)$ alkylsulfinyl, $(C_1–C_6)$ alkylsulfonyl, $(C_5–C_7)$ cycloalkylsulfinyl, $(C_5–C_7)$ cycloalkylsulfonyl, phenyl $(C_1–C_6)$ alkylsulfinyl, pheayl $(C_1–C_6)$ alkylsulfonyl, substituted phenylsulfinyl, substituted phenylsulfonyl, heteroarylsulfinyl, heteroarylsulfoayl, and $NR^{10}R^{11}$, wherein R^{10} and R^{11} are the same or different and are selected from the group consisting of hydrogen, $(C_1–C_6)$ alkyl, phenyl, substituted phenyl, $(C_1–C_6)$ acyl, aroyl, and substituted aroyl, wherein said substituted phenyl and substituted aroyl groups are substituted with one or more substituents independently selected from the group consisting of $(C_1–C_6)$ alkyl, $(C_1–C_6)$ alkoxy, $(C_1–C_6)$ alkylthio, halogen and trifluoromethyl, or R^{10} and R^{11}, together with the nitrogen to which they are attached, form a piperidine, pyrrolidine or morpholine ring; and

B, D, E and G are selected from the group consisting of nitrogen and carbon, with the proviso that only one of B, D and E is nitrogen, and with the proviso that when G is nitrogen, the group XVI is attached to the nitrogen of formula I at the 4 or 5 position of the pyrimidine ring (designated by a and b) wherein any of said nitrogens may be oxidized;

or a pharmaceutically acceptable salt of such compound.

5,596,002

METHOD OF TREATING CHLOROQUINE–RESISTANT MALARIA WITH AMINOQUINOLINE DERIVATIVES

Werner Hofheinz, Bottmingen; Catherine Jaquet, Basel, and Synèe Jolidon, Blauen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 26, 1994, Ser. No. 329,596

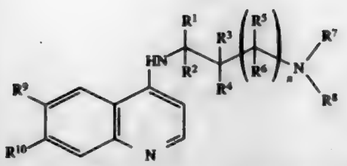
Claims priority, application Switzerland, Oct. 28, 1993, 3255/93

Int. Cl.[6] A61K *31/47*; C07D *215/44;215/46*

U.S. Cl. 514—313 **10 Claims**

1. A method for the treatment of chloroquine-resistant malaria comprising administering to a patient a composition containing a therapeutically effective amount of a an aminoquinoline derivative of general formula

I



wherein R^1 to R^6 are hydrogen or in which one or two of R^1 to R^6 are independently selected from alkyl and the other substituents are hydrogen; R^7 and R^8 are independently selected from alkyl, alkenyl or aralkyl, or together with the N atom signify pyrrolidine or piperidine, either or both of which may be substituted by alkyl; and n=0 or 1; or

wherein R^1 and R^3 are tri- or tetramethylene; R^2 and R^4 to R^6 are hydrogen; n=0; and R^7 and R^8 are defined as above; or

wherein R^1 and R^7 are methylene or dimethylene and n=1, or

R^3 and R^7 are di- or trimethylene and n=0, or

R^3 and R^7 are di- or trimethylene and n=1, or

R^3 and R^7 are tri- or tetramethylene and n=0, or

R^5 and R^7 are tri- or tetramethylene and n=1, or

R^1 and R^5 are di- or tri-methylene and n=1, and the remaining substituents are hydrogen, except R^8 which is selected from alkyl, alkenyl or alkynyl; or

wherein R^3 and R^5 are tri-or tetramethylene and n=1; R^1, R^2, R^4 and R^6 are hydrogen; and R^7 and R^8 are selected from alkyl, alkenyl or aralkyl or together with the N atom are pyrrolidine or piperidine, either or both of which may be substituted by alkyl;

R^9 is hydrogen or halogen; and R^{10} is halogen or trifluoromethyl,

or the pharmaceutically acceptable salts of the above compounds, provided that the aminoquinoline derivatives or formula I do not include:

(7-chloro-quinolin-4-yl)-(2-piperidin-1-yl-ethyl)-amine,

(7-chloro-quinolin-4-yl)-[(1-ethyl-pyrrolidin-2-yl)-methyl]-amine, or

(RS)(7-chloro-quinolin-4-yl)-(1-methyl-piperidin-2-yl-methyl)-amine.

5,596,003

PIPERIDINYL THIACYCLIC DERIVATIVES

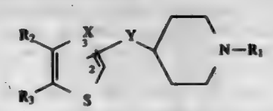
Albert A. Carr; John M. Kane; George D. Maynard; Helen C. Cheng, all of Cincinnati, and Mark W. Dudley, Somerville, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 281,943, Jul. 28, 1994, Pat. No. 5,476,861, which is a division of Ser. No. 201,149, Feb. 24, 1994, Pat. No. 5,371,093, which is a continuation of Ser. No. 76,268, Jun. 11, 1993, abandoned, which is a continuation of Ser. No. 835,658, Feb. 13, 1992. This application Jun. 1, 1995, Ser. No. 457,901

Int. Cl.[6] A61K *31/445*; C07D *417/02*

U.S. Cl. 514—321 **7 Claims**

1. A compound of the formula

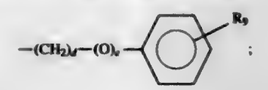


an optical isomer or a pharmaceutically acceptable salt thereof, wherein

Y is —C(=CH_2)—, wherein Y is attached at the heterocycle position 2 or 3;

X is carbon, CH or nitrogen, provided that when Y is attached at the 3 position X is carbon, and when Y is attached at the 2 position X is CH or nitrogen;

R_1 is —$(CH_2)_n$—Z—$(CH_2)_m$$COR_5$, —C(O)$R_6$ or



;

R_2 and R_3 are the same or different and are hydrogen or C_{1-4} alkyl;

Z is a bond, O, or S;

R_5 is OH, C_{1-4} alkoxy or —NR_8R_7;

R_6 and R_7 are the same or different and are H or C_{1-4} alkyl;

R_8 is C_{1-4} alkyl, C_{1-4} alkoxy;

R_9 is H, C_{1-4} alkyl, C_{1-4} alkoxy, OH, chloro, bromo, fluoro, —CF_3, —$NHC(O)R_{10}$, or CO_2R_{11};

R_{10} is C_{1-4} alkyl or C_{1-4} alkoxy;

R_{11} is hydrogen or C_{1-4} alkyl;

n is an integer from 0–3 provided that when Z is not a bond, n is an integer from 2–3;

m is an integer from 1 to 3;

d is an integer from 1–5; and

e is zero or 1, provided that when e is 1:

d is an integer from 2 to 5; and X is N;

further provided that when X is CH, R_1 is —$(CH_2)_n$—Z—$(CH_2)_m$$COR_5$ or



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5,596,004

METHODS OF INHIBITING MALE INFERTILITY

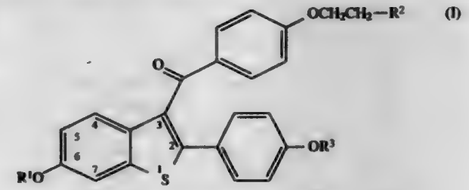
Jeffrey A. Dodge, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 168,482

Int. Cl.[6] A61K *31/445*

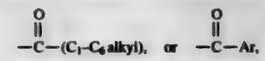
U.S. Cl. 514—324 **4 Claims**

1. A method of inhibiting male infertility comprising administering to a human in need thereof an effective amount of a compound having the formula



(I)

wherein R^1 and R^3 are independently hydrogen, —CH^3,



wherein Ar is optionally substituted phenyl;

R^2 is piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,596,005

OMEGA-DEOXY-AZASUGARS

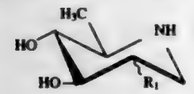
Chi-Huey Wong, Rancho Santa Fe, Calif.; Tetsuya Kajimoto, Kumamoto, Japan; Kuo-Chin Liu, and Lihren Chen, both of San Diego, Calif., assignors to The Scripps Research Institute, LaJolla, Calif.

Division of Ser. No. 835,237, Feb. 13, 1992, Pat. No. 5,276,120, which is a continuation-in-part of Ser. No. 707,600, May 30, 1991, abandoned. This application Dec. 23, 1993, Ser. No. 172,880

Int. Cl.[6] A61K *31/44*; C07D *211/40*

U.S. Cl. 514—335 **7 Claims**

1. A 1,6-dideoxy-azapyranose of the formula



wherein R_1 is selected from the group consisting of hydroxyl, N-acetyl, fluoro and ethoxy.

5,596,006

TRISUBSTITUTED BIPHENYLS

Jürgen Dressel; Peter Fey, both of Wuppertal; Rudolf Hanko, Düsseldorf; Walter Hubsch, Wuppertal; Thomas Kramer, Wuppertal; Ulrich E. Müller, Wuppertal; Matthias Müller-Gliemann, Solingen-Ohligs; Martin Beuck, Erkrath; Stanislav Kanda, Wuppertal; Stefan Wohlfeil, Hilden; Andreas Knorr, Erkrath; Johannes-Peter Stasch, Solingen, and Siegfried Zaiss, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

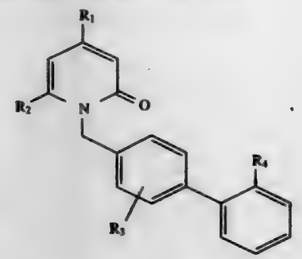
Continuation of Ser. No. 137,661, Oct. 15, 1993, abandoned. This application Jan. 3, 1995, Ser. No. 368,252

Claims priority, application Germany, Oct. 23, 1992, 42 35 933.3; Jun. 8, 1993, 43 19 041.3

Int. Cl.[6] A61K *31/44*; C07D *401/10*

U.S. Cl. 514—340 **10 Claims**

1. A trisubstituted biphenyl of the formula



(I)

in which

R_1 represents a carboxyl radical or represents a C_1–C_6-alkoxycarbonyl radical,

R_2 represents straight-chain or branched C_1–C_6-alkyl,

R_3 represents halogen

and

R_4 represents a carboxyl radical or represents tetrazolyl,

or a salt thereof.

5,596,007

THERAPEUTIC METHOD TO ALLEVIATE THE CRAVING ASSOCIATED WITH CESSATION OF TOBACCO WITH COTININE

Robert M. Keenan, Baltimore, Md., and Dorothy K. Hatsukami, Golden Valley, Minn., assignors to Pharmaco Behavioral Associates, Inc., Minneapolis, Minn.

Filed May 18, 1992, Ser. No. 885,314

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—343 **26 Claims**

1. A therapeutic method to alleviate the craving associated with cessation of tobacco smoking comprising administering an amount of cotinine or a pharmaceutically acceptable salt thereof, to a human in need of such treatment, which amount is effective to alleviate craving for at least one of cigarettes, tobacco or nicotine.

5,596,008

3,4-DIARYL SUBSTITUTED PYRIDINES FOR THE TREATMENT OF INFLAMMATION

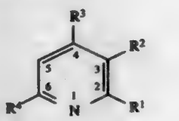
Len F. Lee, St. Charles, Mo., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 10, 1995, Ser. No. 386,843

Int. Cl.[6] C07D *213/34*; A61K *31/44*

U.S. Cl. 514—347 **21 Claims**

1. A compound of Formula I



(I)

wherein R^1 is haloalkyl;

wherein R^2 is aryl optionally substituted at a substitutable position with one or more radicals independently selected from alkylsulfinyl, alkyl, cyano, carboxyl, alkoxycarbonyl, haloalkyl, hydroxyl, hydroxyalkyl, haloalkoxy, amino, alkylamino, arylamino, nitro, halo, alkoxy and alkylthio;

wherein R^3 is aryl substituted at a substitutable position with a radical selected from alkylsulfonyl and sulfamyl; and

wherein R^4 is selected from halo, alkoxy and alkynyloxy;

or a pharmaceutically-acceptable salt thereof.

5,596,009

FUSED BENZENEOXYACETIC ACID DERIVATIVES

Nobuyuki Hamanaka; Kanji Takahashi, and Hidekado Tokumoto, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

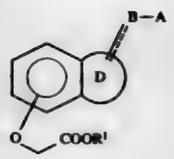
Division of Ser. No. 971,581, Nov. 5, 1992, Pat. No. 5,344,836. This application May 19, 1994, Ser. No. 246,297

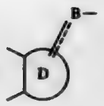
Claims priority, application Japan, Nov. 11, 1991, 3-322612; Jul. 3, 1992, 4-228246

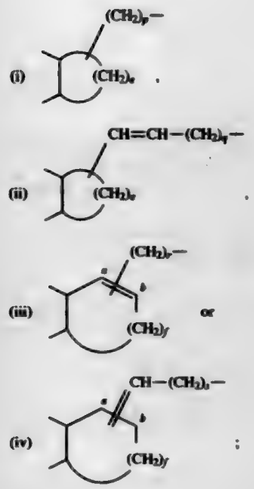
Int. Cl.[6] C07D *213/02*; A61K *31/44*

U.S. Cl. 514—357 **15 Claims**

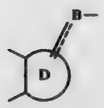
1. A fused benzeneoxyacetic acid compound of the formula (1):



wherein  is



A is
(i) —NR^4—Y, or
(ii) —Z—NR^4—$CONR^2R^3$;
Y is
(i) —CO—R^5,
(ii) —CO—U—NR^2R^3 or
(iii) —CS—U—NR^2R^3;
Z is
(i) —CH=N— or
(ii) —CH_2—NR^6—;
R^1 is a hydrogen atom or a C_{1-4} alkyl group;
R^2 and R^3 each, independently, is
(i) a hydrogen atom
(ii) a phenyl group,
(iii) a benzoylphenyl group,
(iv) a 4–7 membered, unsaturated monocyclic hetero ring containing one nitrogen atom as a hetero atom or
(v) a C_{1-4} alkyl group substituted by (1) 1 to 3 phenyl groups or (2) one phenyl group and one 4–7 membered, unsaturated monocyclic hetero ring containing one nitrogen atom as a hetero atom;
R^4 is a hydrogen atom, a C_{1-6} alkyl group or a phenyl group;
R^5 is
(i) a phenyl group,
(ii) a 4–7 membered, unsaturated monocyclic hetero ring containing one nitrogen atom as a hetero atom or
(iii) a C_{1-4} alkyl group substituted by (1) 1 to 3 phenyl groups or (2) one phenyl group and one 4–7 membered, unsaturated monocyclic hetero ring containing one nitrogen atom as a hetero atom;
R^6 is a hydrogen atom, a C_{1-6} alkyl group or a phenyl group;
U is a single bond or a C_{1-4} alkylene group;
the said phenyl group and hetero rings may also be substituted by a C_{1-4} alkyl group, a C_{1-4} alkoxy group, a halogen atom, a nitro group or a trihalomethyl group, when R^2, R^3, R^4, R^5 or R^6 is a phenyl group or the group containing a phenyl group, or when R^2, R^3 or R^5 is the said hetero ring or the group containing the hetero ring;
e is 3–5;
f is 1–3;
is 0–4;
q is 0–2;
r is 0–4;
s is 0–3;
with the proviso that, when A is (ii) —N—R^4—Y, in which R^4 and Y have the same meaning as hereinbefore defined, q, r, or s is not zero;
and that when



is the formula (iii) or (iv), —$(CH_2)_r$ or =CH—$(CH_2)_s$ in the side chain is bonded to the carbon atom at the position a or b in the ring;
or a non-toxic salt thereof or non-toxic acid addition salt thereof.

5,596,010

Patent Not Issued For This Number

5,596,011

METHOD FOR THE TREATMENT OF MACULAR DEGENERATION

Karen M. Repine, and John E. Repine, both of 2275 Cherry Hills Farm Dr., Englewood, Colo. 80110

Filed Apr. 6, 1995, Ser. No. 418,645
Int. Cl.[6] A61K *31/425;31/195;31/13*
U.S. Cl. 514—369 **14 Claims**

1. A method for the treatment of macular degeneration in a patient in need of such treatment which comprises administering to said patient an effective amount of a glutathione enhancing agent to increase intracellular levels of glutathione in the patient.

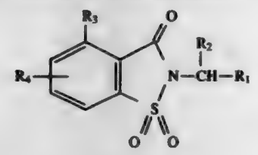
5,596,012

SACCHARIN DERIVATIVES USEFUL AS PROTEOLYTIC ENZYME INHIBITORS AND COMPOSITIONS AND METHOD OF USE THEREOF

Richard P. Dunlap, Penfield; Neil W. Boaz, Waterloo; Albert J. Mura, Rochester, all of N.Y.; Dennis J. Hlasta, Lower Salford; Ranjit C. Desai; Chakrapani Subramanyam, both of Towamencin Township, Montgomery County, Pa.; Lee H. Latimer, Brighton, N.Y., and Eric P. Lodge, Upper Pottsgrove Township, Montgomery County, Pa., assignors to Sterling winthrop Inc., New York, N.Y.

Division of Ser. No. 270,964, Jul. 5, 1994, abandoned, which is a division of Ser. No. 67,637, May 24, 1993, Pat. No. 5,371,074, which is a division of Ser. No. 793,033, Nov. 15, 1991, Pat. No. 5,236,917, which is a continuation-in-part of Ser. No. 514,920, Apr. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 347,125, May 4, 1989, abandoned, and a continuation-in-part of Ser. No. 347,126, May 4, 1989, abandoned. This application May 24, 1995, Ser. No. 449,152
Int. Cl.[6] C07D *417/06;* **A61K** *31/425;31/50;31/505*
U.S. Cl. 514—373 **6 Claims**

1. A compound having the formula



wherein:
heterocyclyl selected from 1H-(5-tetrazolyl), 5-oxo-1-tetrazolinyl, 5-thioxo-1-tetrazolinyl when R_2 as defined hereinbelow is other than phenylthio; pyimidinyl, 2-benzoxazolyl, 2-benzothiazolyl, 2-phthalimidyl, 2-(1,3,4-thiadiazolyl), 5-(1,2,4-thiadiazolyl), 5-thioxo-3-(1,2,4-thiadiazolinyl), 4-(5-oxo-1,3,4-thiadiazolinyl), 4-(5-thioxo-1,3,4-thiadiazolinyl), 3-(1,2,4-triazolyl), 4-(1,2,4-triazolyl), 1,2,3-triazol-1-yl, 2-imidazolyl, 3-(1,2,4-triazolo[4,3-a]pyridinyl), pyridazin-3-yl, 4-pyron-3-yl, quinolin-8-yl, 1,3,4-oxadiazol-2-yl, coumarin-7-yl, saccharin-6-yl, imidazol-2-yl, 1,3,4-triazol-2-yl, thiazol-2-yl, 2-thioxo-2,3-dihydro- 1,3,4-oxadiazol-3-yl, 1,2,5-thiadiazol-3-yl, 2-thioxo-2,3-dihydro-1,3,4-thiadiazol-3-yl, 2-thioxo- 2,3-dihydro-1,3,4-thiadiazol-5-yl, 1,2,3-triazol-2-yl, 1,2,4-triazin-5-yl, 5-oxo-6-hydroxy-4,5-dihydro-1,2,4-triazin-3-yl, isoxazol-5-yl, isoxazol-3-yl, 5-oxo-1,2,4-oxadiazol-4-yl, 1,1,3-trioxo-tetrahydro-1,2,5-thiadiazol-2-yl, 6,7-dihydro-1H-1,2,4-triazolo[3,4-b][1,3]thiazin-3-yl, 4,5-dihydro-5-oxo-1,2,4-oxadiazol-4-yl, 2,5-dioxopyrrolidin-1-yl, 3-indolyl, oxazol-2-yl, thiazol-4-yl, 2,3-dihydro-2-oxo-5-phenyl-1,3,4-thiadiazol-3-yl and 2,3-dihydro-2-oxo-5-phenyl-1,3,4-oxadiazol-3-yl,
or said heterocyclyl substituted on any available nitrogen atom by lower-alkyl, hydroxy-lower-alkyl, cycloalkyl, 2-, 3- or 4-pyridinyl, carboxy-lower-alkyl, lower-alkoxycarbonyl-lower-alkyl, aminocarbonyl-lower-alkyl, lower-alkylaminocarbonyl-lower-alkyl, di-lower-alkylaminocarbonyl-lower-alkyl, amino-lower-alkyl, lower-alkylamino-lower-alkyl, di-lower-alkyl-amino-lower-alkyl, 4-morpholinyl-lower-alkyl, 1-piperidinyl-lower-alkyl, 1-pyrrolidinyl-lower-alkyl or phenyi or phenyl substituted by amino, lower-alkyl-amino, di-lower-alkylamino, lower-alkanamido, N-lower-alkyl-lower-alkanamido, carboxy-lower-alkanamido, carboxy, lower-alkoxycarbonyl, lower-alkoxy, halo or carboxy-lower-alkanoylamino,
or said heterocyclyl substituted on any available carbon atom by nitro, lower-alkyl, amino, lower-alkylamino, di-lower-alkylamino, cycloalkylamino, mercapto, lower-alkylthio, amino-lower-alkylthio, lower-alkylamino-lower-alkylthio, di-lower-alkyl-amino-lower-alkylthio, 4-morpholinyl-lower-alkylthio, 1-piperidinyl-lower-alkylthio, 1-pyrrolidinyl-lower-alkylthio, lower- alkoxycarbonyl, di-lower-alkylamino-lower-alkyl, 4-morpholinyl-lower-alkylamino, cyano, 1-piperidinyl-lower-alkyl, hydroxy-lower-alkyl, phenylsulfonyl, toluenesulfonyl, halo, tri-lower-alkylsilyl, carboxy or alkali metal salt thereof, furyl, trifluoromethyl, 2-benzothiazolyl, lower-alkylsulfonyl, aminocarbonyl, benzyl, 4-morpholinyl, pyridinyl, lower-alkoxy, pyrazinyl, lower-alkoxycarbonyl-lower-alkyl, di-lower-alkylaminosulfonyl, 4-morpholinylcarboayl, lower alkanoyl, benzyloxy, hydroxy, benzoyl or benzoyl substituted by lower-alkoxy or halo, or phenyl or phenyl substituted by amino, lower-alkylamino, di-lower-alkylamino, lower-alkanamido, N-lower-alkyl-lower-alkanamido, lower-alkyl, lower-alkoxy, halo, trifluoromethyl, lower-alkoxy-poly-lower-alkoxy, methylenedioxy or lower alkoxycarbonyl;
R_2 is hydrogen, lower-alkoxycarbonyl, phenyl or phenylthio;
R_3 is hydrogen, halo, primary or secondary lower-alkyl, lower-alkoxy, lower-alkoxycarbonyl, phenyl, fluoro-lower-alkyl, lower-alkenyl, cyano or di-lower-alkylamino; and
R_4 is hydrogen or from one to three substituents selected from halo, cyano, nitro, amino, lower-alkanamido, phenyl-lower-alkanamido, diphenyl-lower-alkanamido, lower-alkylsulfonylamino, polyfluoro-lower-alkylsulfonylamino, aminosulfonyl, lower-alkyl, polyhalo-lower-alkyl, cycloalkyl, polyhalo-lower-alkoxy, hydroxy, lower-alkoxy, carboxy, hydroxymethyl, formyl, aminomethyl, lower-alkylsulfonyl, polyhalo-lower-alkylsulfonyl, lower-alkylsulfonyl-aminosulfonyl, lower-alkoxy-lower-alkoxy, lower-alkoxy-poly-lower-alkyleneoxy, carboxy-lower-alkoxy, lower-alkoxycarbonyl-lower-alkoxy or di-lower-alkylaminocarbonyloxy.

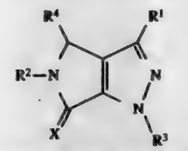
5,596,013

DIHYDRO PYRAZOLOPYRROLES

Allen J. Duplantier, New York, N.Y., assignor to Pfizer Inc, New York, N.Y.

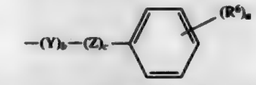
Continuation of Ser. No. 181,698, Jan. 14, 1994, Pat. No. 5,508,300. This application Apr. 15, 1996, Ser. No. 632,301
Int. Cl.[6] A61K *31/415;* **C07D** *487/04*
U.S. Cl. 514—403 **9 Claims**

1. A compound of the formula



I

and pharmaceutically acceptable salts thereof;
wherein X is two hydrogens;
R^1 is hydrogen, C_1–C_7 alkyl, C_2–C_3 alkenyl, phenyl, C_3–C_5 cycloakyl or methylene(C_3–C_5 cycloalkyl) wherein each alkyl, phenyl or alkenyl group may be substituted with one or two methyl, ethyl or trifluoromethyl, or up to three halogens;
R^2 and R^3 are each independently selected from the group consisting of hydrogen; C_1–C_{14} alkyl; (C_1–C_7 alkoxy)(C_1–C_7 alkyl)—; C_2–C_{14} alkenyl; —$(CH_2)_n$(C_3–C_5 cycloakyl) wherein n is 0, 1 or 2; a $(CH_2)_n$ (C_4–C_7 heterocyclic group) wherein n is 0, 1 or 2, containing as the heteroatom one of oxygen, sulphur, sulphonyl or NR^5 wherein R^5 is hydrogen, or C_1–C_4 alkyl; or a group of the formula



II

wherein a is an integer from 1 to 4; b and c are 0 or 1; R^6 is hydrogen, hydroxy, C_1–C_5 alkyl, C_2–C_5 alkenyl, C_1–C_5 alkoxy, C_3–C_6 cycloalkoxy, halogen, trifluoromethyl, nitro, CO_2R^7, $CONR^7R^8$, NR^7R^8, or $SO_2NR^7R^8$ wherein R^7 and R^8 are each independently hydrogen or C_1–C_4 alkyl; Z is oxygen, sulphur,

sulphonyl or NR^9 wherein R^9 is hydrogen or C_1–C_4 alkyl; and Y is C_1–C_3 alkylene or C_2–C_6 alkenylene which may be substituted with one or two C_1–C_7 alkyl or C_3–C_7 cycloakyl; wherein each said alkyl, alkenyl, cycloalkyl, alkoxyalkyl or heterocyclic group may be substituted with one to fourteen substituents R_{10} selected from the group consisting of methyl, ethyl, trifluoromethyl and halogen; and

R^4 is hydrogen, C_1–C_7 alkyl, phenyl, C_3–C_5 cycloalkyl, or methylene (C_3–C_5 cycloalkyl) wherein each alkyl or phenyl group may be substituted with one or two methyl, ethyl or trifluoromethyl, or up to three halogens.

5,596,014

HYDROXYMETHYL-POLYTHIOPHENE DERIVATIVES

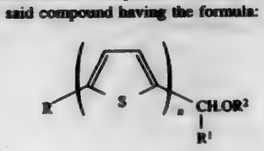
Chiang-Te Chang, and Rong-Tsun Wu, both of Taipei, Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Continuation-in-part of Ser. No. 123,432, Sep. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 71,695, Jun. 4, 1993, Pat. No. 5,508,440. This application Jun. 5, 1995, Ser. No. 461,176

Int. Cl.[6] A61K *31/38*; C07D *409/14*

U.S. Cl. 514—444 **22 Claims**

1. A method of stimulating the proliferation of T lymphocytes or phagocytes in a subject suffering from an immunodeficiency disease, which method comprises the step of administering to the subject a pharmaceutical composition including a compound and an excipient, said compound having the formula:



in which n is 2, 3 or 4; R is H, $—CH(R^1)—OR^2$, $—CH(O—Z)_2$, or $—COR^3$; R^1 is H, C_{1-6} alkyl, C_{2-6} alkenyl, OH, C_{1-6} hydroxyalkyl, or COOH; R^2 is H, C_{1-6} alkenyl, C_{2-6} alkenyl, tetrahydropyranyl, phenyl, benzoyl, C_{1-6} acyl, tosyl, or —CO—Y—COOH; and R^3 is H, C_{1-6} alkyl, C_{2-6} alkenyl, OH, C_{1-6} hydroxyalkyl, or COOH; wherein Z is C_{1-6} alkyl, C_{2-6} alkenyl, or c_{1-6} acyl; and Y is C_{1-6} alkylidene, C_{2-6} alkenylidene, phenylene, or deleted; or an ester or a salt thereof; said composition being administered in an amount effective to stimulate the proliferation of said immune system cells.

5,596,015

FUNGICIDALLY ACTIVE COMPOUNDS

Jens Brehmelt, Bagsvaerd, and Lone Lange, Valby, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Dec. 2, 1994, Ser. No. 347,336

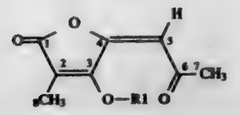
Claims priority, application Denmark, Jun. 24, 1993, 836/93

Int. Cl.[6] C12P *17/04*; C07D *307/46*

U.S. Cl. 514—473 **23 Claims**

1. A compound having the formula 3

Formula 3



wherein R^1 is hydrogen, straight or branched alkyl with 1–10 carbon atoms, straight or branched alkenyl with 2–10 carbon atoms, straight or branched alkynyl with 2–10 carbon atoms, benzyl or aryl, optionally mono- or plurisubstituted with straight or branched alkyl with 1–10 carbon atoms, hydroxy, alkoxy, halogen, an amino or a nitro group; and when R^1 is H salts thereof,

or R^1 is acyl (R^1=—COR^2) wherein R^2 is straight or branched alkyl with 1–10 carbon atoms, alkenyl with 2–10 carbon atoms, alkynyl with 2–10 carbon atoms, or aryl, optionally mono- or plurisubstituted with alkyl with 1–10 carbon atoms, hydroxy, alkoxy, halogen, an amino or a nitro group.

5,596,016

1,2-DISUBSTITUTED AROMATIC CHELATES

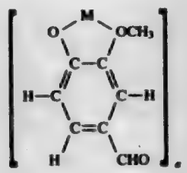
Stephen Ashmead, Clinton, and Harvey H. Ashmead, Kaysville, both of Utah, assignors to Albion International, Inc., Clearfield, Utah

Filed Aug. 19, 1994, Ser. No. 293,516

Int. Cl.[6] A61K *31/28*; C07F *15/00;3/00;11/00*

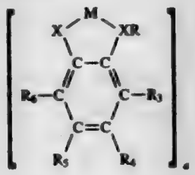
U.S. Cl. 514—492 **28 Claims**

1. A 1,2-disubstituted aromatic mineral chelate having the formula:



where a is an integer of 1 or 2 and M is a metal ion selected from the group consisting of Mg, Ca, Cr, Mn, Fe, Co, Cu, Zn, Mo and Se.

12. A method of promoting mineral uptake in a warm-blooded animal which comprises administering to said warm-blooded animal an effective amount of a 1,2-disubstituted aromatic mineral chelate having the formula:



wherein a is an integer of 1, 2, or 3; M is a metal ion selected from the group consisting of Mg, Ca, Cr, Mn, Fe, Co, Cu, Zn, Mo, and Se; X is an electron donor member selected from the group consisting of O, S, or NH; R is a member selected from the group consisting of alkyl and alkenyl containing from 1 to 10 carbon atoms; R_3 and R_6 are independently members selected from the group consisting of H and R; R_4 and R_5 are independently members selected from the group consisting of H, R, R', NH_2, NHR, NHR', OH, SH, COOR, COOR', and CHO; and R' is an R group which had been additionally substituted by one or more members selected from the group consisting of COOH, NH_2, NHR, OH, SH, and COOR.

5,596,017

SULFAMIDE DERIVATIVES

Yuichi Otsu; Yoshinori Kitagawa, both of Tochigi; Yumi Hattori, Ibaraki; Katsuaki Wada, Tochigi, and Toru Obinata, Tochigi, all of Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

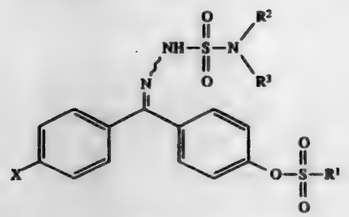
Filed May 19, 1995, Ser. No. 445,156

Claims priority, application Japan, May 27, 1994, 6-136599; Mar. 13, 1995, 7-079301

Int. Cl.[6] A01N *41/04*; C07C *309/65;309/66*

U.S. Cl. 514—517 **12 Claims**

1. A compound of the formhla



(I)

in which

X is halogen or C_1–C_4-halogenoalkyl,

R^1 is C_1–C_4-alkyl or C_1–C_4-halogenoalkyl,

R^2 is hydrogen or C_1–C_4-alkyl, and

R^3 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxycarbonylmethyl.

10. A composition for combating animal pests which comprises an animal-pest pesticidally effective amount of a compound according to claim 1 and a diluent.

5,596,018

ANTIVIRAL AGENTS AGAINST AIDS-CAUSING VIRUS

Masanori Baba, Fukushima, Japan; Dominique Schols, Hercnt, Belgium; Rudi Pauwels, Weerde, Belgium; Jan Balzarini, Heverlee, Belgium, and Erik De Clercq, Lovenjoel, Belgium, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 566,458, Dec. 18, 1991, abandoned. This application Aug. 20, 1993, Ser. No. 110,322

Claims priority, application Japan, Dec. 28, 1988, 63-332327

Int. Cl.[6] A61K *31/185*

U.S. Cl. 514—576 **4 Claims**

1. A method of inhibiting HIV comprising contacting HIV infected cells with an effective amount of fuchsinic acid.

5,596,019

N-ACYL-CYCLOALKYLAMINE DERIVATIVES AS MELATONERGICS

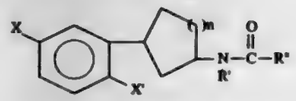
Ronald J. Mattson, Meriden; Daniel J. Keavy, Middletown; Michael F. Parker, Somers, and Graham Johnson, Madison, all of Conn., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Filed Jun. 7, 1995, Ser. No. 487,306

Int. Cl.[6] A61K *31/16*; C07C *233/06*

U.S. Cl. 514—629 **12 Claims**

1. A melatonergic compound of Formula I



(I)

wherein:

X is halogen or OR_5 wherein R_5 is C_{1-20} alkyl, C_{3-20} alkenyl, C_{3-20} alkynyl, C_{9-20} aralkyl, C_{9-20} aralkenyl or C_{9-20} aralkynyl;

X' is hydrogen or halogen;

n is an integer from 0 to 3;

R' is hydrogen, C_{1-4} alkyl or benzyl; and

R" is C_{1-6} alkyl, C_{2-6} alkenyl, C_{3-6} cycloalkyl, C_{2-4} alkoxyalkyl or C_{2-4} alkylthioalkyl.

5,596,020

AMINO BI- AND TRI-CARBOCYCLIC ALKANE BIS-ARYL SQUALENE SYNTHASE INHIBITORS

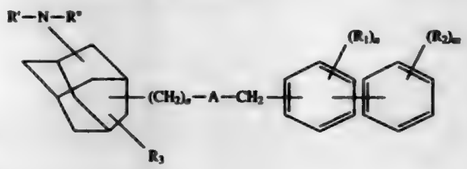
Robert L. Morris, Wayne; Kent W. Nenemschwander, Schwenksville; Keith S. Learn, Perkiomenville, and Anthony C. Scotese, King of Prussia, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Division of Ser. No. 83,117, Jun. 25, 1993, Pat. No. 5,395,846. This application Dec. 7, 1994, Ser. No. 350,593

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—646 **12 Claims**

1. A compound of the formula:



where:

A is O or NH;

R' is hydrogen or lower alkyl;

R" is hydrogen or lower alkyl;

R_1 and R_2 are hydrogen or lower alkyl;

R_3 is hydrogen or loweralkyl;

a is 0–3;

m and n are independently 0–2 or

a pharmaceutically acceptable salt thereof.

5,596,021

CROSSLINKABLE POLYESTER/ISOCYANATE COMPOSITIONS SUITABLE FOR PREPARING COMPOSITE MANUFACTURED ARTICLES, IN PARTICULAR BY MEANS OF INJECTION PROCESSES, PROCESS FOR PREPARING THEM AND THEIR USE

Andrea Adembri, Florence; Lino Credali, Bologna, and Giovanni Di Drusco, Ferrara, all of Italy, assignors to Sir Industriale S.p.A., Italy

Continuation of Ser. No. 63,929, May 18, 1993, abandoned. This application Sep. 15, 1994, Ser. No. 306,526

Claims priority, application Italy, May 20, 1992, MI92A1223

Int. Cl.[6] C08G *18/02;18/67*; C08F *283/00*; C08L *79/04*

U.S. Cl. 521—99 **17 Claims**

1. Crosslinkable polymeric composition comprising the following components:

(A) an isocyanate having a functionality of at least 2 and not higher than 5, and a viscosity at 25° C. between 20 and 10,000 cP;

(B) an unsaturated polyester resin terminated with hydroxy groups and/or a vinyl ester resin terminated with hydroxy groups, containing vinylic or vinylidenic unsaturations, in a mixture with 10–60% by weight of a vinylic or divinylic monomer, wherein the (B) component is present in an amount of from 10 to 80% of the total weight of (A)+(B), and the resin contains hydroxy groups in an amount such that the resin has a terminal hydroxy number that is higher than 0 and up to 100 mg of KOH per gram of resin;

(C) a free-radical polymerization initiator stable at temperature lower than 70° C., in amounts between 0.1 and 4% by weight, based on the total weight of (A)+(B);

(D) a promoter for the decomposition of the (C) initiator at temperatures lower than 70° C., comprising: (i) a salt of a transition metal, soluble in the mixture constituted by (A) and (B), in an amount between 0.005 and 0.5% by weight, calculated on the metal, relative to the total weight of (A)+ (B), or (ii) an N,N-dialkyl substituted aromatic amine in an amount of from 0.05 to 1% by weight, or (iii) a mixture of (i) and (ii); and

(E) a catalyst for the trimerization of (A) isocyanate in an amount between 0.01 and 4% by weight, relative to the total weight of (A)+(B);

wherein the (B) component optionally comprises a polyol, said polyol being present in an amount of from 0 to 3% by weight of said unsaturated polyester resin and/or vinyl ester resin, said polyol having a minimum functionality of 2 and a maximum functionality of 7, and a minimum molecular weight of 200 and a maximum molecular weight of 10,000; wherein the total amount of polyol in said composition does not exceed 3% by weight of said unsaturated polyester resin and/or vinyl ester resin;

and wherein the molar ratio of the isocyanic groups of the (A) component to the total hydroxy groups in the crosslinkable polymeric composition is higher than 1.5.

5,596,822

BLOWING AGENTS FOR PHENOLIC RESINS

John E. Jones, Glamorgan, England, assignor to BP Chemicals Limited, London, England

Filed Jun. 11, 1996, Ser. No. 584,930

Claims priority, application United Kingdom, Jan. 17, 1995, 9500814

Int. Cl.[6] C08J 9/14

U.S. Cl. 521—131 17 Claims

1. A process for producing phenolic foams from phenolic resins, the improvement which comprises foaming said resin using 1,1,1,4,4,4-hexafluorobutane as a blowing agent 1,1,1,4,4,4-hexafluorobutane.

5,596,823

SEALING MATERIAL FOR LIQUID CRYSTAL DISPLAY PANEL, AND LIQUID CRYSTAL DISPLAY PANEL USING IT

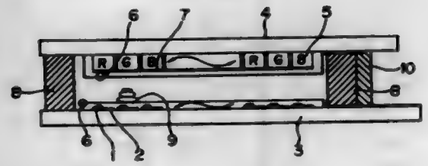
Kojiro Tsubota, Nara; Kazuyoshi Fujioka, Kashihara; Yutaka Takahiji, Nara; Tsuyoshi Kurokawa, and Fumio Tanaka, both of Niigata, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 151,745, Nov. 15, 1993, abandoned. This application Feb. 22, 1995, Ser. No. 392,400

Claims priority, application Japan, Nov. 18, 1992, 4-308515

Int. Cl.[6] C08F 2/46

U.S. Cl. 522—100 8 Claims



1. A sealing material for a liquid crystal display panel comprising the following components (a), (b) and (c):

(a) a partially esterified epoxy(meth)acrylate resin in which 10–90% of an equivalent of the epoxy group of a bisphenol A type epoxy resin is (meth)acrylated,

(b) a photopolymerization initiator, and

(c) a thermosetting agent comprising one or more imidazole and one or more organic acid hydrazide.

5,596,824

SEALING COMPOSITION FOR LIQUID CRYSTAL

Ken'ichi Horie; Hidefumi Miura, both of Hachioji, and Eiichi Tomioka, Tokyo, all of Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 263,670, Jun. 22, 1994, abandoned. This application Apr. 18, 1995, Ser. No. 441,376

Claims priority, application Japan, Jun. 22, 1993, 5-173673; Jun. 22, 1993, 5-173674; Jun. 22, 1993, 5-173675

Int. Cl.[6] C08F 2/50; C09J 163/10;163/00

U.S. Cl. 522—103 8 Claims

1. A composition comprising

(A) isobornyl(meth) acrylate,

(B) epoxy acrylate,

(C) a photopolymerization initiator,

(D) an epoxy resin having one or more polymerizable glycidyl groups, and

(E) a latent thermosetting agent obtained by treating an imidazole compound, an adduct of an imidazole compound and a carboxylic acid, and/or an adduct of an imidazole compound and an epoxy sin with an isocyanate compound.

5,596,825

DENTAL IMPRESSION MATERIAL WITH CURE-INDICATING DYE

Joel D. Oxman; Mark S. Koulage, both of Minneapolis; George V. D. Tiers, St. Paul; Kim M. Vogel, and Dennis E. Vogel, both of Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 269,195, Jun. 30, 1994, abandoned. This application Jun. 29, 1995, Ser. No. 496,772

Int. Cl.[6] C08L 83/05

U.S. Cl. 523—109 53 Claims

1. A dental impression material, comprising:

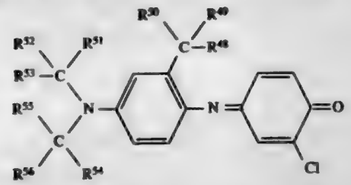
a curable silicone polymer containing at least two functional groups capable of reacting with a SiH group in the presence of a hydrosilation catalyst;

a crosslinker compound containing at least two SiH groups;

a catalyst capable of catalyzing a hydrosilation reaction; and

one or more cure-indicating dyes, wherein, in a dye evaluation test, said dye exhibits a color change within about 10 minutes at 25° C. when 500 μg of said dye, 500 μl of dichloromethane, 100 μl of pentamethyldisiloxane and 10 μl of a hydrosilation catalyst solution having between about 2 and 3 weight percent platinum are mixed together,

wherein said dye is represented by the formula



wherein each of R^{48}, R^{49}, and R^{50}, is independently selected from the group consisting of: hydrogen, halogen and an acyclic, alicyclic or aromatic hydrocarbyl group optionally interrupted with one or more heteroatoms,

each of R^{51}, R^{52}, R^{53}, R^{54}, R^{55}, and R^{56} is independently selected from the group consisting of hydrogen and an acyclic, alicyclic or aromatic hydrocarbyl group optionally interrupted with one or more heteroatoms, and optionally, any two of R^{51}, R^{52}, R^{53}, R^{54}, R^{55}, and R^{56} may together form an alicyclic or aromatic ring.

5,596,826

Patent Not Issued For This Number

5,596,827

CONDENSATION AND WATER RESISTANT JET INK

Sharon B. Mead, Hanover Park; Susan J. Brennan, Downers Grove; Arsenio Morelos, Glendale Heights, and Josephine Aguilar, Elk Grove Village, all of Ill., assignors to Videojet Systems International, Inc., Wood Dale, Ill.

Filed Jul. 13, 1995, Ser. No. 502,330

Int. Cl.[6] C09D 5/00;11/00; C08K 3/18

U.S. Cl. 523—161 47 Claims

1. An ink jet ink composition comprising a carrier, a colorant, a polyamine, and an acidic resin, said composition having a viscosity of about 5 centipoises or less at 25° C.

5,596,828

ANAEROBIC ADHESIVE AND SHEET

Masato Yanagi; Satoru Kagao; Makoto Dohi, and Sanae Nakakuzuni, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 194,156, Feb. 9, 1994, abandoned. This application Apr. 7, 1995, Ser. No. 418,874

Claims priority, application Japan, Feb. 10, 1993, 5-023061

Int. Cl.[6] C09J 4/06;163/00; C08C 19/04

U.S. Cl. 523—176 3 Claims

1.An anaerobic adhesive comprising;

(A) a rubber-based resin having adhesion properties,

(B) a compound which has both the capability of absorbing oxygen and the capability of forming peroxide, and which shows an oxygen absorption amount of 0.1 to 3.0% (weight of absorbed oxygen/weight) and an active oxygen amount of 0.01 to 1.0% (weight of active oxygen/weight), said compound being at least one compound selected from the group consisting of a rosin polyhydric alcohol ester, a polymerized rosin, a polymerized rosin polyhydric alcohol ester, a rosin phenolic resin, a terpene resin, a terpene phenolic resin, an aromatic compound modified terpene resin, a hydrogenated terpene resin, an aliphatic petroleum resin and a copolymer petroleum resin,

(C) an ethylenically unsaturated monomer or oligomer,

(D) an organic peroxide, and

(E) a polyepoxy compound in an amount of 0.05 to 2.0 parts by weight per 100 parts by weight of the adhesive,

wherein:

the amount of the compound (B) is 30 to 150 parts by weight per 100 parts by weight of the adhesive rubber-based resin (A),

the amount of the organic peroxide (D) is 0. 1 to 15 parts by weight per 100 parts by weight of the adhesive rubber-based resin (A), and

the ethylenically unsaturated monomer or oligomer (C) is contained in such an amount that the amount of ethylenically unsaturated groups of the ethyleaically unsaturated monomer or oligomer (C) per mole of the active oxygen contained in the compound (B) is 2 to 140 mol.

5,596,829

INTUMESCENT COMPOSITION OF THE TWO-COMPONENT TYPE

Siegbard Goebelbecker, Bodenheim; Hans-Dieter Naegerl, Dudenhofen, both of Germany; George J. Dunker, Olathe, Kans., and Donald Kirk, Kansas City, Mo., assignors to Akzo-Fireguard Products, Inc., Lenexa, Kans., and Chemische Fabrik Budenheim Rudolf A. Oetker, Budenheim, Germany

Filed Mar. 8, 1994, Ser. No. 207,050

Claims priority, application Germany, Mar. 9, 1993, 43 07 406.5

Int. Cl.[6] C09K 21/14; C08K 5/521

U.S. Cl. 523—179 4 Claims

1. An intumescent composition of the two-component type, obtained by combining

(A) an amino-formaldehyde resin; and

(B) an ester of phosphoric acid in admixture with an additive selected from the group consisting of a water scavenger, a filler, a pigment, a surfactant and a mixture thereof, wherein said ester of phosphoric acid is a partial ester of phosphoric acid with one or more polyols.

5,596,830

AMIDE-CONTAINING SELF-EMULSIFYING EPOXY CURING AGENT

Frederick H. Walker, Doylestown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 355,149, Dec. 13, 1994. This application Oct. 3, 1995, Ser. No. 538,671

Int. Cl.[6] C08K 3/20; C08L 63/02

U.S. Cl. 523—404 26 Claims

1. A coating composition comprising a polyepoxide resin and an epoxy hardener composition comprising the reaction product of (A) a poly(alkylene oxide) mono- or diamine having a number average molecular weight (Mn) of 500 to 3000 and (B) a polycarboxylic acid in a ratio of moles of polycarboxylic acid to equivalents of amine of about 1:1 to 6:1 to yield an intermediate (C) which is reacted with (D) a polyamine which is selected from the group consisting of aliphatic diamines and polyamines, araliphatic diamines and polyamines, aromatic diamines and polyamines, cycloaliphatic diamines and polyamines, heterocyclic diamines and polyamines, and mixtures thereof, the amount of the poly(alkylene oxide) monoamine or diamine used to produce intermediate (C) being sufficient to provide a stable solution or emulsion of the epoxy hardener composition in an aqueous medium.

5,596,831

ABSORPTIVE FIBROUS SHEETS AND PROCESSES FOR THEIR MANUFACTURE

Peter M. Lock, 2209 Glenaiden East, Germantown, Memphis, Tenn. 38139

Division of Ser. No. 903,904, Jun. 25, 1992, Pat. No. 5,382,609. This application Oct. 3, 1994, Ser. No. 316,941

Claims priority, application United Kingdom, Jun. 26, 1991, 9113861

Int. Cl.[6] C08L 1/00; B32B 3/26;31/00; B05D 1/12

U.S. Cl. 524—35 19 Claims

1. An absorbent material comprising a compact pad of fibers, compressed with a suitable absorbent heat activatable compound, and wherein said heat activatable compound is associated with substantially the entire surface of each fiber, the pad absorbing amounts of water much greater than its weight.

5,596,832

SLOW-SETTING BITUMINOUS EMULSIONS

Peter Schilling, Charleston, and Fredricke S. Starr, Johns Island, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed May 27, 1994, Ser. No. 249,366

Int. Cl.[6] C08L 95/00; B01J 13/00

U.S. Cl. 524—60 9 Claims

1. A slow-set aqueous bituminous emulsion comprising bitumen, water, and from about 3.5% to about 10.0%, based on the weight of the emulsion, of an alkaline solution of an anionic emulsifier, wherein said anionic emulsifier is the reaction product of:

(A) 2.5% to 10.0% by weight of a base, and

(B) 90.0% to 97.5% by weight of polycarboxylic acid or anhydride reaction product of

(1) a blend of from 10.0% to 60.0% by weight of a member selected from the group consisting of unsaturated fatty acids, rosin-derived resin acids, and mixtures thereof, blended in a solvent with from 25.0% to 45.0% by weight of kraft lignin, and

(2) 15.0% to 45.0% by weight of maleic anhydride.

7. An industrial emulsion formulation comprising the slow-set aqueous bituminous emulsion of claim 1 mixed with a member

selected from the group consisting of: clay, natural rubber latices, styrene-butadiene rubber latices, and combinations thereof.

5,596,033

GAS FADE RESISTANT STABILIZER SYSTEM FOR POLYPROPYLENE FIBER

Douglas W. Horsey, Briarcliff Manor, and Ramanathan Ravichandran, Nanuet, both of N.Y., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 207,909, Mar. 8, 1994, which is a continuation-in-part of Ser. No. 158,841, Nov. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 48,086, Apr. 15, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,519

Int. Cl.[6] C08K *5/3432;5/3492*

U.S. Cl. 524—100 **9 Claims**

1. A stabilized polypropylene fiber, having enhanced light stability, enhanced long term heat stability and enhanced gas fade resistance, which fiber is stabilized by an effective stabilizing amount of a mixture of

(I) a hindered amine selected from the group consisting of

the polycondensation product of 1-(2-hydroxyethyl)-2,2,6,6-tetramethyl-4-hydroxypiperidine and succinic acid;

the polycondensation product of 4,4'-hexamethylene-bis(amino-2,2,6,6-tetramethylpiperidine) and 2,4-dichloro-6-tert-octylamino-s-triazine;

the polycondensation product of 4,4'-hexamethylene-bis(amino-2,2,6,6-tetramethylpiperidine) and 2,4-dichloro-6-cyclohexylamino-s-triazine;

the polycondensation product of 4,4'-hexamethylene-bis(amino-2,2,6,6-tetramethylpiperidine) and 2,4-dichloro-6-morpholino-s-triazine;

poly[methyl 3-(2,2,6,6-tetramethylpiperidin-4-yloxy)propyl]siloxane;

bis(2,2,6,6-tetramethylpiperidin-4-yl) cyclohexylenedioxydimethylmalonate;

1,3,5-tris{N-cyclohexyl-N-[2-(2,2,6,6-tetramethylpiperazin-3-on- 4-yl)ethyl]amino-s-triazine;

N,N',N'',N'''-tetrakis[4,6-bis(butyl-(2,2,6,6-tetramethylpiperidin-4-yl)amino)-s-triazin- 2-yl]-1,10-diamino-4,7-diazadecane; and

the polycondensation product of 2,4-dichloro-6-(2,2,6,6-tetramethylpiperidin- 4-yl)butylamino-s-triazine and 2,2'-ethylene-bis{[2,4-(2,2,6,6-tetramethylpiperidin-4-yl)butylamino-s-triazin-6-yl]aminotrimethyleneamino}; and

(II) the N,N-dialkylhydroxylamine product made by the direct oxidation of N,N-di(hydrogenated tallow)amine;

wherein the weight ratio of components (I):(II)is from 100:1 to 1:2.

5,596,034

POLYCARBONATE COMPOSITIONS HAVING MOLD-RELEASE PROPERTIES

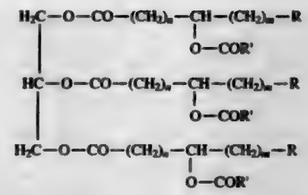
Sivaram Krishnan, Pittsburgh; James B. Johnson, Washington, both of Pa., and Rebeen Mufeti, Temple, Tex., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Sep. 7, 1995, Ser. No. 524,820

Int. Cl.[6] C08K *5/10*; C07C *67/00*

U.S. Cl. 524—308 **9 Claims**

1. A thermoplastic molding composition comprising carbonate polymer and an effective amount of a mold releasing compound conforming to



where n is 10 and m is an integer of about 2 to 10, R denotes a C_{1-4}-alkyl group or a C_{6-10}-aryl group and where R' denotes the esterification residue of at least one member selected from stearic acid and oleic acid.

5,596,035

AQUEOUS POLYMER DISPERSIONS AS BINDERS FOR NON-BLOCKING SCRATCH-RESISTANT AND CHEMICAL-RESISTANT COATINGS

Ulrich Dönc, Idstein; Stephan Krieger, Hofheim; Rolf Karopka, Bad Soden, and Bernhard Mempel, Idstein, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 10, 1994, Ser. No. 339,273

Claims priority, application Germany, Nov. 30, 1993, 43 40 648.3

Int. Cl.[6] C08L *19/02*

U.S. Cl. 524—460 **15 Claims**

1. An aqueous dispersion having an MFT of from about 0° to 50° C., comprising at least one carbonyl-containing, soft latex polymers A having an MFT of below about 20° C.; at least one hard latex polymer B having an MFT of above about 25° C.; and at least one poly-functional carboxylic hydrazide C; said dispersion being prepared by a process comprising:

i) synthesizing beforehand at least one dispersion comprising the latex polymer A;

ii) synthesizing beforehand and separately from polymer A, at least one dispersion comprising the latex polymer B; and subsequently;

iii) mixing the at least one dispersion comprising the latex polymer A and the at least one dispersion comprising the latex polymer B; and

iv) adding the polyfunctional carboxylic hydrazide C in any sequence.

5,596,036

HARDENABLE ACRYLIC MONOMER COMPOSITIONS

Karoly Dischö, Effretikon, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 309,276, Sep. 20, 1994, abandoned, which is a continuation of Ser. No. 135,040, Oct. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 897,209, Jun. 11, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 479,854

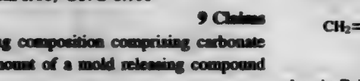
Claims priority, application Germany, Jun. 14, 1991, 41 19 646.5; Jun. 14, 1991, 41 19 647.3; Jun. 14, 1991, 41 19 648.1

Int. Cl.[6] C08K *3/04*; C08L *67/00;33/06*; C08F *26/02*

U.S. Cl. 524—496 **15 Claims**

1. A hardenable monomer composition suitable for use in flooring and concrete surface coating compositions, comprising

(a) an acrylic monomer binder which comprises a (meth)acrylic ester of Formula 1



(1)

wherein R is hydrogen or methyl; R_1 is C_{2-6}alkylene;

n is an integer of from 0–3; and R_2 is a radical of an aromatic or alicyclic dicarboxylic acid ester or a dicyclopentenyl radical, n being 0 only when R_2 is a dicyclopentenyl radical;

(b) carbon black having a BET surface area of from 20–460 M^2/g, and being present to the extent of from 0.01–7 weight % of the acrylic monomer binder; and optionally,

(c) at least one aliphatic or aromatic polyester- or polyetherurethane oligomer of molecular weight 500–5000 and a viscosity of 2,000–100,000 mPa s at 25° C., having at least two ethylenically unsaturated double bonds, said oligomer being present in an amount of 7–60% by weight said weight based on the total weight of the acrylic binder and oligomer.

5,596,037

CARBOXYL-TERMINATED POLYESTERS FOR THE PREPARATION OF POWDER COATING COMPOSITIONS

Luc Moens, Sint-Genesius-Rode; Daniel Maetens; Jean-Marie Lentz, both of Brussels, and Michel Boudour, Angreau, all of Belgium, assignors to U C B S.A., Brussels, Belgium

Division of Ser. No. 28,159, Mar. 9, 1993, Pat. No. 5,439,988. This application Apr. 20, 1995, Ser. No. 425,441

Claims priority, application European Pat. Off., Mar. 16, 1992, 92870044

Int. Cl.[6] C08L *67/02*

U.S. Cl. 524—539 **17 Claims**

1. A thermosetting powder composition comprising

(A) a carboxyl-terminated polyester consisting essentially of the reaction product of

(a) an all aliphatic hydroxyl-terminated polyester prepared from 1,4-cyclohexanedicarboxylic acid as the sole acid component and as the alcohol component

(1) from 10 to 100 equivalent % of a cycloaliphatic diol, and

(2) from 90 to 0 equivalent % of at least one straight or branched chain aliphatic polyol having 2 to 12 carbon atoms, with

(b) an aliphatic and/or aromatic dicarboxylic acid or the corresponding anhydride, the amount of 1,4-cyclohexanedicarboxylic acid of the carboxyl-terminated polyester being of from 50 to 90 mole % with respect to the total amount of carboxylic acids, and

(B) a polyepoxy compound.

5,596,038

HYDROGEL HAVING A SILICON-BASED CROSSLINKER FOR BIOSENSORS AND ELECTRODES

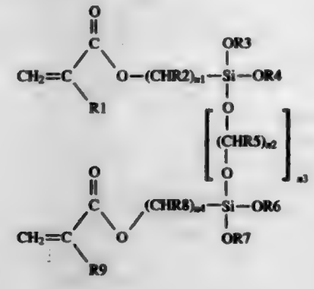
Raj Subramaniam, Fremont, Calif., assignor to Physiometrix, Inc., Sunnyvale, Calif.

Filed May 16, 1994, Ser. No. 243,230

Int. Cl.[6] C08F *222/02;220/56*; C08K *5/05*

U.S. Cl. 524—547 **12 Claims**

1. An organic polymer comprising a crosslinker comprising the general formula:



wherein each of R1–R9 comprises a one to four carbon alkyl group or hydrogen and each of n1–n4 is an integer from one to five, inclusive, wherein at least one R1–R9 alkyl group comprises an amine, hydroxyl, or carboxyl group.

5,596,039

DIGUANAMINES AND PREPARATION PROCESS, DERIVATIVES AND USE THEREOF

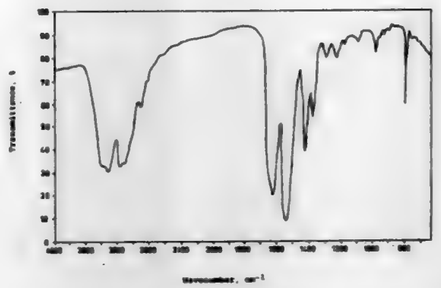
Tetsuya Oishi; Hiroshi Ozawa, both of Kanagawa-ken; Minoto Karasawa, Chiba-ken; Masamitsu Inomata, Chiba-ken; Izumi Mega, Chiba-ken, and Atsuyoshi Yamauchi, Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 186,550, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 983,855, Mar. 2, 1993, abandoned. This application Feb. 24, 1994, Ser. No. 201,391

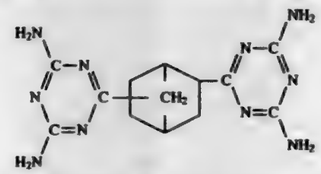
Claims priority, application Japan, Feb. 24, 1993, 5-035198; Feb. 24, 1993, 5-035199; Feb. 24, 1993, 5-035200; Mar. 3, 1993, 5-043048; Mar. 12, 1993, 5-051775; Apr. 14, 1993, 5-087499

Int. Cl.[6] C08K *5/16*

U.S. Cl. 524—714 **5 Claims**

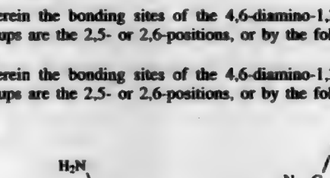


1. A diguanamine represented by the following formula (1):



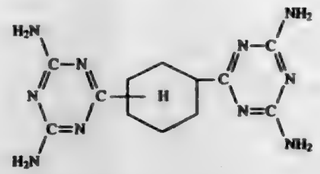
(1)

wherein the bonding sites of the 4,6-diamino-1,3,5-triazin- 2-yl groups are the 2,5- or 2,6-positions, or by the following formula (2)



(2)

wherein the bonding sites of the 4,6-diamino-1,3,5-triazin- 2-yl groups are the 2,5- or 2,6-positions, or by the following formula (2)



(2)

wherein the bonding sites of the 4,6-diamino-1,3,5-triazin- 2-yl groups are the 1,2-, 1,3- or 1,4-positions.

5,596,040

POLYPHENYLENE ETHER RESIN COMPOSITION CONTAINING MODIFIED AROMATIC HYDROCARBON-FORMALDEHYDE RESIN, RUBBER POLYMER AND POLYAMIDE RESIN

Shinya Miya, Kanagawa; Yuichi Kano, Osaka; Hisayuki Kuwahara; Takehige Kasuya, both of Kanagawa, and Yoshio Fukuya, Chiba, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 194,221, Feb. 9, 1994, abandoned. This application Oct. 4, 1995, Ser. No. 539,103

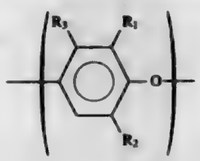
Claims priority, application Japan, Feb. 9, 1993, 5-021333; Sep. 9, 1993, 5-224591

Int. Cl.[6] C08L *51/04;71/12*

U.S. Cl. 525—92 B **5 Claims**

1. A thermoplastic resin composition comprising:

(a) about 20 to 80% by weight based on total composition weight of polyphenylene ether resin comprising at least one structural unit in its backbone represented by the formula:



wherein R_1 represents a lower alkyl group having 1 to 3 carbon atoms; R_2 represents a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms; and R_3 represents a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms;

(b) about 0.01 to 10% by weight based on total composition weight of a saturated or unsaturated aliphatic or aliphatic cyclic carboxylic acid modified aromatic hydrocarbon-formaldehyde resin;

(c) about 2 to 30% by weight based on total composition weight of a styrene-diene block copolymer; and

(d) about 20 to 80% by weight based on total composition weight of a polyamide resin.

5,596,041

HYDROGENATED BLOCK COPOLYMER AND HYDROGENATED BLOCK COPOLYMER COMPOSITON

Yoshiharu Hashiguchi, Yokkaichi; Minoru Hasegawa, Suzuka; Kunio Goshima, Yokkaichi; Yasuhiko Takemura, Yokkaichi; Yoshiyuki Higuchi, Yokkaichi, and Motokazu Takeuchi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1995, Ser. No. 414,230

Claims priority, application Japan, Apr. 4, 1994, 6-087278; Apr. 4, 1994, 6-087279

Int. Cl.[6] C08F *297/02;* **C08L** *53/00*

U.S. Cl. 525—98 **16 Claims**

1. A hydrogenated block copolymer composition comprising as main components,

(I) 1 to 99 parts by weight of a hydrogenated block copolymer or hydrogenated block copolymer mixture which consists essentially of:

(a) a hydrogenation product of a star-branched block copolymer represented by the structural formula $(A–B)_nX$ wherein A is a polybutadiene block having a 1,2-vinyl content of less than 25% by weight; B is a conjugated diene polymer block comprising at least 50% by weight of a conjugated diene compound whose vinyl content is at least 25% by weight; X is a polyfunctional coupling agent residue and n is an integer of 3 or more, the content of the block A being 5 to 60% by weight and the content of the block B being 95 to 40% by weight, provided that A+B=100% by weight, at least 80% or more of the double bonds of the conjugated diene portion of the star-branched block copolymer having been hydrogenated, and

(b) a hydrogenation product of a straight chain block copolymer represented by the structural formula A–B wherein A and B are as defined above, the content of the block A being 5 to 60% by weight and the content of the block B being 95 to 40% by weight, provided that A+B=100% by weight, at least 80% or more of the double bonds of the conjugated diene portion of the straight chain block copolymer having been hydrogenated, the weight ratio of the hydrogenated block copolymer (a) to the hydrogenated block copolymer (b) being 100/0 to 5/95, and the weight average molecular weight of the total of the hydrogenated block copolymer (a) and the hydrogenated block copolymer (b) being 50,000 to 700,000, and

(II) 99 to 1 part by weight of a thermoplastic resin and/or a rubbery polymer, provided that (I)+(II)=100 parts by weight.

5,596,042

OLEFIN THERMOPLASTIC ELASTOMER AND LAMINATE THEREOF

Yuichi Itoh; Kyoko Kobayashi; Akira Uchiyama, and Toru Takehara, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 268,564, Jul. 6, 1994, abandoned. This application Apr. 4, 1996, Ser. No. 626,980

Claims priority, application Japan, Jul. 8, 1993, 5-168866; Jul. 8, 1993, 5-168867; Aug. 26, 1993, 5-211851; Sep. 29, 1993, 5-242535; Apr. 27, 1994, 6-090078

Int. Cl.[6] C08L *23/10;25/08;53/02*

U.S. Cl. 525—98 **20 Claims**

1. An olefin thermoplastic elastomer which comprises a partially crosslinked thermoplastic elastomer comprising:

(I) a crystalline polyolefin resin (A) in an amount of 20 to 80 parts by weight;

(II) a block copolymer or a hydrogenated block copolymer (B) in an amount of 15 to 75 parts by weight, said block copolymers each comprises:

(a) a polymer block of a styrene selected from the group consisting of styrene, α-methylstyrene, 3-methylstyrene, 4-propylstyrene, 4-cyclohexylstyrene, 4-dodecylstyrene, 2-ethyl-4-benzylstyrene and 4-(phenylbutyl)styrene, and

(b) a polymer or copolymer block which is an isoprene polymer block or an isoprene/butadiene copolymer block and contains at least 40% of isoprene units bonding at 1,2- or 3,4-positions relative to the total isoprene units; and

(III) an ethylene/α-olefin copolymer rubber or ethylene/α-olefin/non-conjugated diene copolymer rubber (C) in an amount of 5 to 65 parts by weight; and

the total amount of said components (A), (B) and (C) being 100 parts by weight.

5,596,043

COATING CONTAINING URETHANE AND ACRYLIC RESIN MIXTURE FOR IMPROVED RESISTANCE TO CHIPPING

Paul J. Harris, West Bloomfield, and Richard J. Foulkes, Sterling Heights, both of Mich., assignors to BASF Corporation, Southfield, Mich.

Filed Mar. 9, 1995, Ser. No. 401,320

Int. Cl.[6] C08F *8/30*

U.S. Cl. 525—127 **11 Claims**

1. A powder coating composition comprising

a) a resin mixture of

i) a polyurethane resin having a functional group selected from the group consisting of hydroxy, amino and epoxy functionalities and having a number average molecular weight of between 300 and 5,000

ii) an acrylic resin having a functional group selected from the group consisting of hydroxy, amino and epoxy functionalities and having a Tg of between 30° and 60° C.

b) a crosslinking agent, reactable with the functional groups on the polyurethane and acrylic resins.

5,596,044

HYDROXY-FUNCTIONAL PREPOLYMERS CONTAINING HYDANTOIN GROUP PRECURSORS AND THEIR USE IN COATING COMPOSITIONS

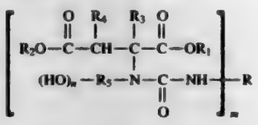
Lyuba K. Gindin, Pittsburgh; Douglas A. Wicks, Mt. Lebanon; Philip E. Yeske, Pittsburgh, and E. Haakan Jonsson, Corsopolis, all of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed May 18, 1995, Ser. No. 443,502

Int. Cl.[6] C08G *33/02;18/32;18/38;* **C07D** *233/54*

U.S. Cl. 525—131 **22 Claims**

1. A hydroxy-functional prepolymer containing urea groups and corresponding to the formula



(I)

wherein

R represents the radical obtained by removing the isocyanate groups from an organic monomeric diisocyanate, a polyisocyanate adduct or an NCO prepolymer containing hydantoin groups or hydantoin group precursors,

R_1 and R_2 are identical or different and represent organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less,

R_3 and R_4 are identical or different and represent hydrogen or organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less,

R_5 represents the hydrocarbon radical obtained by removing the amino and hydroxyl groups from an amino alcohol,

n has a value of 1 to 3 and

m has a value of 2 to 6.

5,596,045

EXPANDABLE STYRENE POLYMERS CONTAINING RECYCLED MATERIAL

Dietrich Scherzer; Wolfram Hussmann, both of Neustadt; Michael Witt, Ludwigshafen; Klaus Hahn, Kirchheim; Knut Kaempfer, Ludwigshafen, and Gerhard Alicke, Worms, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 26, 1995, Ser. No. 548,725

Claims priority, application Germany, Oct. 27, 1994, 44 38 376.2

Int. Cl.[6] C08J *9/18;* **B29B** *17/00;* **C08F** *12/08*

U.S. Cl. 525—241 **6 Claims**

1. An expandable styrene polymer which contains from 10 to 40% by weight, based on the total weight of the polystyrene, of recycled polystyrene, wherein said styrene polymer is prepared by dissolving the recycled polystyrene in monomeric styrene and polymerizing this solution in aqueous suspension, and wherein from 0.05 to 1% by weight of a finely divided polyethylene wax and/or from 10 to 500 ppm of a molecular weight regulator is added to said aqueous suspension in the course of the polymerization.

5,596,046

CROSSLINKED RESINS CONTAINING THERMALLY STABLE SULFONIC ACID GROUPS

Dirk M. Brouwer, and Elizabeth M. van de Voordervoort, both of 3, Badhuisweg, 1031 CM Amsterdam, Netherlands

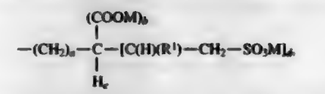
Division of Ser. No. 831,398, Feb. 20, 1986, Pat. No. 4,728,695. This application Sep. 18, 1987, Ser. No. 98,154

Claims priority, application United Kingdom, Mar. 21, 1985, 8507328

Int. Cl.[6] C08F *8/34*

U.S. Cl. 525—353 **20 Claims**

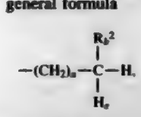
1. A process for the preparation of a catalyst comprising an aryl group having a functional substituent group of general formula



(I)

wherein a is 0 or 1, b is 1 or 2, d is 1 or 2, e is 0 or 1, b+d+e=3, R^1 represents H or a C1 to C4 alkyl group and M is a proton or another cation; which process comprises the steps of

a) reacting (1) a crosslinked resin comprising at least one substituted aryl group having a functional substituent group of general formula

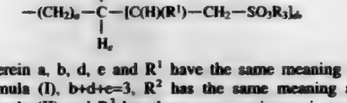


(II)

wherein a, b and e have the same meaning as in general formula (I), b+e=2, R^2 is a —CN or a carboxyester group and if b is 2, each R^2 represents a —CN or a carboxyester group, and (2) an ester of an alkenesulfonic acid of general formula

$$C(H)(R^1)=C(H)—SO_3R^3 \quad \text{(III)},$$

wherein R^1 has the same meaning as in general formula (I), and R^3 is a hydrocarbyl group, under conditions suitable for the formation of an addition product of general formula



(IV)

wherein a, b, d, e and R^1 have the same meaning as in general formula (I), b+d+e=3, R^2 has the same meaning as in general formula (II) and R^3 has the same meaning as in general formula (III), and then

b) hydrolyzing the addition product of general formula (IV) to produce a compound having a functional group of general formula (I).

5,596,047

WATER-DISPERSIBLE AND CURABLE WATERBORNE COMPOSITIONS CONTAINING 1,3,5-TRIAZINE CARBAMATES

Kuang J. Wu, Easton, and Richard Quinn, Bethel, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Filed Nov. 16, 1994, Ser. No. 340,950

Int. Cl.[6] C08F *8/32*

U.S. Cl. 525—375 **48 Claims**

1. A waterborne coating composition comprising an aqueous medium having substantially homogeneously dispersed therein:

(1) a reactive resin component comprising an active hydrogen-containing surface active resin which possesses sufficient anionic hydrophilizing functionality to render the active hydrogen-containing surface active resin water dispersible;

(2) a crosslinker component comprising a 1,3,5-triazine carbamate crosslinker; and

(3) an aqueous dispersion promoting material which is non-polymeric, has a hydrophilic portion, but which in and of itself is substantially hydrophobic.

5,596,048

METHOD FOR MAKING COPOLYMERS OF POLYARYLENE ETHERS AND SILOXANES

Margaret L. Bishm, Schenectady; Timothy E. Banach, Scotia, both of N.Y., and Christian M. E. Bailly, Antwerp, Belgium, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 16, 1995, Ser. No. 543,746
Int. Cl.[6] C08L 71/12;83/04
U.S. Cl. 525—393 **11 Claims**

1. A method for making polyarylene ether copolymers comprising the step of contacting:

(a) a polyarylene ether;

(b) a hydroxyaromatic terminated siloxane reagent; and

(c) an oxidant, whereby the polyarylene ether portion of said copolymer has a lower molecular weight than the initial polyarylene ether.

5,596,049

STABILIZATION OF POLYESTERS USING EPOXY COMPOUNDS IN COMBINATION WITH A CATALYST

Robert R. Gallucci, Mt. Vernon; Linda H. Nelson, and Thomas G. Shannon, both of Evansville, all of Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 160,993, Dec. 2, 1993, abandoned, which is a continuation of Ser. No. 987,588, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 732,188, Jul. 18, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,232
Int. Cl.[6] C08F 20/00
U.S. Cl. 525—438 **39 Claims**

1. A thermoplastic resin composition, comprising:

(a) a linear polyester resin;

(b) an effective amount of at least one difunctional epoxy compound, said at least one difunctional epoxy compound having at least one cyclohexane ring moiety and having two terminal epoxy functional groups, wherein at least one of the two terminal epoxy functional groups is a substituent on the at least one cyclohexane ring moiety; and

(c) an effective amount of a catalyst compound;

wherein the amounts of components (b) and (c) are effective to provide improved melt viscosity stability.

5,596,050

HIGH MODULUS EPOXY RESIN SYSTEMS

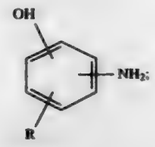
Hugh C. Gardner, Somerville; Michael J. Michno, Jr., Bridgewater, and Robert J. Cotter, Bernardsville, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 1, 1984, Ser. No. 583,358
Int. Cl.[6] C08L 63/00
U.S. Cl. 525—524 **10 Claims**

1. A resinous composition comprising:

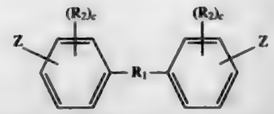
(a) a cycloaliphatic epoxy resin selected from bis(2,3-epoxycyclopentyl)ether, 4-(1,2-epoxyethyl)-1,2-epoxycyclohexane, 3,4-epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate, 2-(3,4-epoxycyclohexyl-5,5-spiro 3,4-epoxy)cyclohexane meta-dioxane, bis(3,4-epoxycyclohexyl) ether, 1,4-cyclohexadiene diepoxide, a diepoxide of vinyl cyclopenteayl ether, a diepoxide of allyl cyclopenteayl ether, or mixtures thereof, and

(b) an adduct of an epoxy resin of (a) with an aromatic active hydrogen containing compound selected from:



(i)

wherein R is H or lower alkyl, p is an integer of 2 or 3; and/or



(ii)

wherein R_1 is a direct bond, O, SO_2, S, SO, alkylidene of 1 to 6 carbon atoms, R_2 is independently hydrogen, halogen, lower alkyl of 1 to 4 carbon atoms, c is an integer of 0 to 4, Z is OH or NHR_3 and R_3 is hydrogen or lower alkyl of 1 to 4 carbon, atoms and wherein the total epoxy equivalent weight of the composition is between about 60 and about 250 grams/mole.

5,596,051

MICROCAPSULES, THE PRODUCTION AND USE THEREOF

Ekkehard Jahns, Hirschberg, and Burkhardt Dumes, Neuwied, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 24, 1994, Ser. No. 265,211
Claims priority, application Germany, Jun. 25, 1993, 43 21 205.9
Int. Cl.[6] C08F 2/00; B32B 5/16;9/02;9/04
U.S. Cl. 526—73 **12 Claims**

1. A microcapsule comprising a core and a shell of a polymer, the core containing at least one oil which can be emulsified in water, said capsule prepared by polymerizing:

(a) 1–100% by weight, based on the total weight of monomers (a) to (d), of acrylic anhydride, methacrylate anhydride, itaconic anhydride, citraconic anhydride, dimethylmaleic anhydride, 4-vinylbenzoic anhydride mixed carboxylic anhydrides, or mixtures thereof.

(b) 0–99% by weight, based on the total weight of monomers (a) to (d), of at least one monoethylenically unsaturated monomer which is oil-soluble and which is different from the monomers of group (a),

(c) 0–80% by weight, based on the total weight of monomers (a) to (d), of crosslinking monomers which are oil soluble and different from (a) which have at least two monoethylenically unsaturated non-conjugated double bonds in the molecule, and

(d) 0–20% by weight, based on the total weight of monomers (a) to (d), of water-soluble monoethylenically unsaturated monomers,

in the oil phase of a stable oil-in-water emulsion in the presence of polymerization initiators which form free radicals, where

the temperature of the polymerizing reaction mixture may be continuously or periodically increased during the polymerization.

5,596,052

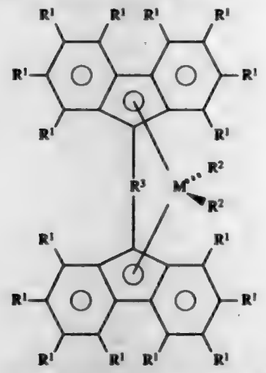
ATACTIC POLYPROPYLENE

Luigi Resconi, Ferrara, and Enrico Albizzati, Arona, both of Italy, assignors to Montell Technology Company bv, Netherlands

Division of Ser. No. 456,291, May 31, 1995, abandoned, which is a continuation of Ser. No. 175,134, Dec. 29, 1993, abandoned. This application Mar. 25, 1996, Ser. No. 622,566
Claims priority, application Italy, Dec. 30, 1992, MI92A2989
Int. Cl.[6] C08F 4/64
U.S. Cl. 526—127 **5 Claims**

1. A process for the preparation of an amorphous polypropylene, comprising the polymerization reaction of propylene in the presence of a catalyst comprising the product of the reaction between:

(A) a compound of formula (I)



(I)

wherein substituents R^1, the same or different from each other, are hydrogen atoms, C_1–C_{20} alkyl radicals, C_3–C_{20} cycloalkyl radicals, C_2–C_{20} alkenyl radicals, C_6–C_{20} aryl radicals, C_7–C_{20} alkylaryl radicals, or C_7–C_{20} arylalkyl radicals, optionally two adjacent substituents R^1 can form a cycle comprising from 5 to 8 carbon atoms and, furthermore, substituents R^1 can contain Si or Ge atoms;

M is Ti, Zr or Hf;

substituents R^2, the same or different from each other, are halogen atoms, —OH, —SH, R^1, —OR^1, —SR^1, —NR_2^1 or —PR_2^1, wherein R^1 is defined as above;

the group R^3 is selected from $>CR_2^1$, $>SiR_2^1$, $>GeR_2^1$, $>NR^1$ or $>PR^1$, wherein R^1 is defined as above and optionally, when R^3 is $>CR_2^1$, $>SiR_2^1$ or $>GeR_2^1$, both substituents R^1 can form a cycle comprising from 3 to 8 atoms;

(B) an alumoxane, or one or more compounds able to give a metallocene alkyl cation.

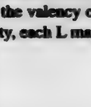
5,596,053

HIGH TRANS-1,4-POLYBUTADIENE AND CATALYST AND PROCESS FOR PREPARING CRYSTALLINE HIGH TRANS-1,4-POLY-BUTADIENE

Jung W. Kang, Clinton, and Jason T. Poulton, Canton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed May 31, 1995, Ser. No. 455,772
Int. Cl.[6] C08F 136/06;4/70
U.S. Cl. 526—132 **21 Claims**

1. A process for the synthesis of high trans-1,4-polybutadiene comprising contacting a polymerization medium containing 1,3-butadiene monomer and an organic solvent with a catalyst system comprising components: (a) a carboxylated nickel oxy borate compound selected from the group consisting of compounds represented by the formulae $(RCOOMO)_3B$ and $(RCOOMO)_2BOR'$, wherein R and R' are alkyl radicals containing from 1 to 17 carbon atoms and M is nickel; (b) an organoaluminum compound of the formula:



wherein R_1 is selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, alkoxy, fluorine, and hydrogen, R_2 and R_3 being selected from the group of alkyl, cycloalkyl, aryl, alkaryl and arylalkyl; (c) an organophosphorus compound of the formula $(ArO)_3P$ wherein Ar is a substituted or unsubstituted aryl group; and (d) a carboxylic acid or a fluorinated carboxylic acid, and allowing the 1,3-butadiene monomer to polymerize at a temperature in a range of about 0° C. to about 150° C. to produce high trans-1,4-polybutadiene.

20. A trans-1,4-polybutadiene thermoplastic polymer having a first melting point ranging between 30° C. to 60° C. and a second melting point ranging between 70° C. to 130° C. produced according to the process of claim 1.

5,596,054

TRANSITION METAL COMPOUND, POLYMERIZATION CATALYST USING SAME AND PROCESS FOR PRODUCING STYRENIC POLYMER USING SAID POLYMERIZATION CATALYST

Mizutomo Takeuchi, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1995, Ser. No. 401,982
Claims priority, application Japan, Mar. 11, 1994, 6-041315
Int. Cl.[6] C08F 4/69;4/643;12/08
U.S. Cl. 526—134 **18 Claims**

1. A polymerization catalyst for a compound containing an ethylenically unsaturated double bond or an acetyleaic bond, which catalyst comprises:

(A) a transition metal compound represented by formula (I)

$$RMX_{a-1}L_b \quad \text{(I)}$$

wherein R is, as a π ligand, a fused bicyclic or tricyclic cyclopentadieayl group in which at least one of many-membered rings to which a cyclopentadieayl group is fusedly bonded is a saturated ring; M is a transition metal, X is a σ ligand, a plurality of moieties X may be the same or different, L is a Lewis base, a is the valency of moiety M, b is 0, 1 or 2 and when L is a plurality, each L may be the same or different; and

(B) an aluminoxane.

5,596,055

PROCESS FOR PRODUCING STYRENIC POLYMER

Yoshiaki Aoyama, and Norio Tomotsu, both of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1995, Ser. No. 413,224
Claims priority, application Japan, Mar. 31, 1994, 6-062491
Int. Cl.[6] C08F 12/08
U.S. Cl. 526—153 **4 Claims**

1. A process for producing a styrenic polymer having a high degree of syndiotactic configuration which comprises polymerizing a styrenic monomer by the use of a (a) transition metal compound,

a (b) coordination complex compound comprising an anion in which a plurality of radicals are bonded to a metal and a cation, a (c) alkylating agent and a (d) reaction product between a straight-chain alkylaluminum having at least two carbon atoms in the alkyl group as represented by the formula (XVIII) and water:

$$R^0_3 Al \qquad \text{(XVIII)}$$

wherein R^0 is a straight-chain alkyl group having 2 to 10 carbon atoms, with the proviso that component (b) is different from component (c).

5,596,856

PROCESS FOR PRODUCING POLYMER PARTICLES WITH IRREGULAR SHAPE BY POLYMERIZING A WATER-SOLUBLE POLYMERIZABLE MONOMER

Hiromi Nambu; Tohshihide Mitsumi; Takayuki Amiya, and Akihiro Kondo, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 7, 1993, Ser. No. 132,971

Claims priority, application Japan, Oct. 23, 1992, 4-286439; Jan. 14, 1993, 5-142281

Int. Cl.[6] C08F 2/32

U.S. Cl. 526—207 **5 Claims**

1. A process for producing polymer particles with a nonspherical shape by polymerizing a water-soluble polymerizable monomer in a system comprising (1) a hydrophobic organic solvent inert to the polymerization, (2) an aqueous solution of the water-soluble polymerizable monomer, and (3) a dispersant comprising:

(a) a glycoside compound wherein the hydrogen atom of the hemiacetal hydroxy group in the compound has been replaced with a hydrophobic group, and having the following formula (1)

$$R^1(OR^2)_yG_x \qquad (1)$$

wherein R^1 represents a linear or branched alkyl, alkenyl group, or an alkylphenyl group having 6 to 22 carbon atoms, or a hydroxyacyloxyalkyl group having at least 9 carbon atoms, R^2 represents an alkylene group having 2 to 4 carbon atoms, G represents a reducing sugar residue having 5 or 6 carbon atoms, x represents a number of 0 to 10 on average and y represents a number of 1 to 10 on average, with the proviso that when x is 2 or above, then each R^2 may be the same or different from each other, and the hydrogen atom of a hydroxyl group in G may be substituted by a methyl group, an ethyl group, or a group having 12 or fewer carbon atoms and at least one hydrophilic group such as an ether oxygen, ester group, amido group, ionic group, hydroxyl group or ammonium group; or

(b) a glucoamide compound having the following formula (11):



(11)

wherein R and R_1 each represent a hydrogen atom a linear or branched alkyl or alkenyl group having 5 to 25 carbon atoms, a phenyl group or an alkylaryl group having 7 to 25 carbon atoms, with the proviso that not both of R and R_1 are hydrogen atoms at the same time, and R and R_1 may contain a functional group such as a hydroxyl, ether, oxyalkilene or acetyl group.

5,596,857

COPOLYMERS, THEIR PREPARATION, AND THEIR USE IN HIGH-SOLIDS COATING COMPOSITIONS

Ulrich Epple; Uwe Kubillus, and Holger Schmidt, all of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 278,065, Jul. 20, 1994, abandoned. This application Mar. 6, 1996, Ser. No. 611,550

Claims priority, application Germany, Aug. 9, 1993, 43 26 656.8

Int. Cl.[6] C08F 224/00;220/10;220/04

U.S. Cl. 526—273 **19 Claims**

1. A copolymer having a low solution viscosity of less than 2000 mPa·s in 50% strength solution which is prepared by a bulk copolymerization process wherein a first component (A) is charged initially, and at least three olefinically unsaturated copolymerizable monomers (B) are added and polymerized, at least one of which (B1) contains at least one functional group which remains after the polymerization, at least one of which (B2) is a sterically hindered monomer selected from the group consisting of (i) aliphatic, branched, noncyclic esters of methacrylic acid or acrylic acid with one or more branched, noncyclic, saturated or unsaturated alcohols having 3 to 30 carbon atoms which are selected from the group consisting of

saturated alcohols selected from the group consisting of tert.-butyl alcohol, tert.-amyl alcohol, 2-methylbutanol, 3-methylbutanol, neopentyl alcohol, 3-methyl-2-butanol, 2-pentanol, 3-pentanol, 2,3-dimethyl-2-butanol, 3,3-dimethylbutanol, 3,3 -dimethyl-2-butanol, 2-ethyl-2-butanol, 2-hexanol, 3-hexanol, 2 -methylpentanol, 2-methyl-2-pentanol, 2-methyl-3-pentanol, 3-methylpentanol, 3-methyl-2-pentanol, 3-methyl-3-pentanol, 4-methylpentanol, 4-methyl-2-pentanol, 2-(2'-hexyloxyethoxy)ethanol, 2,2-dimethyl-3-pentanol, 2,3-dimethyl-3-pentanol, 2,4 -dimethyl-3-pentanol, 4,4-dimethyl-3-pentanol, 3-ethyl-3-pentanol, 2-heptanol, 3-heptanol, 2-methyl-2-hexanol, 2-methyl-3-hexanol, 5-methyl-2-hexanol, 2-ethylhexanol, 4-methyl-3-heptanol, 6-methyl-2-heptanol, 2-octanol, 3-octanol, 2-propylpentanol, 2,4,4-trimethylpentanol, 2,6-dimethyl-4-heptanol, 3-ethyl-2,2-dimethyl- 3-pentanol, 2-nonanol, 3,5,5-trimethylpentanol, 3,5,5-trimethylhexanol, 2-decanol, 4-decanol, 3,7-dimethyloctanol, 3,7-dimethyl- 3-octanol, 2-dodecanol and 2-tetradecanol;

unsaturated alcohols selected from the group consisting of 1-hexen-3-ol, phytol (= 3,7,11,15-tetramethyl-2-hexadecen-1-ol), 3-methyl-1-penten-3-ol, 4-methyl-3-pentenol, 2-methyl-3-butenol, 3-methyl-3-buten-2-ol, 3-methyl-2-butenol, 3-methyl-3-butenol, 1-penten-3-ol, 3-penten-2-ol, 4-penten-2-ol, 6-methyl-5-hepten-2-ol, 1-octen-3-ol, nopol (= dimethyl-2-[2-hydroxyethyl]bicyclo(3.1.1)hepten-2-ol) and oleyl alcohol.

cyclic aliphatic alcohols having 5 to 30 carbon atoms selected from the group consisting of cyclohexanol, 4-tert-butylcyclohexanol, 3,3,5-trimethylcyclohexanol, isoborneol, (8/9)-hydroxytricyclo-(5.2.1.$0^{2,6}$)dec-3-ene(dihydrodicyclopentadienyl alcohol), 8-hydroxy-tricyclo(5.2.1.$0^{2,6}$)decane, 8-hydroxy-ethyl-tricyclo-(5.2.1.$0^{2,6}$)decane and citronellol;

aliphatic alcohols selected from the group consisting of trans-2-phenylcyclohexanol, 6-phenylhexanol, 3,5-bis(trifluoromethyl)benzyl alcohol, cyclopropyldiphenyl-methanol, 1,1,1,3.3.3 -hexafluoro-2-phenylpropan-2-ol, 2-bromo-1-indanol, 1-indanol, 2-indanol, 5-indanol, 3-chloro-1-phenylpropan-1-ol, 3,5-dimethylbenzyl alcohol, 1-phenylpropan-2-ol, 2,3-dihydro-2,2-dimethylbenzofuran-7-ol and 2-methoxyphenylethyl alcohol;

aromatic hydroxy compounds selected from the group consisting of phenol and naphthol, the substituted phenols and naphthols which are substituted by one or more alkyl/alkoxy groups of one to eight carbon atoms; and

(ii) cyclic vinyl monomers selected from the group consisting of styrene, 4-phenylstyrene, vinylcyclohexane, vinylcyclooctane, vinylcyclopentane, vinyl 2-ethylhexanoate, norbornene, 1,4,6,8-dimethanooctahydronaphthalene, 5-vinyl-2-norbornene, limonene, tert-butylstyrene, α-methylstyrene,

4-methylstyrene, one or more of the isomeric vinyltoluenes, ethylidenenorbornene and alkyl- or alkoxystyrenes having 1 to 8 carbon atoms in the alkyl or alkoxy group,

and at least one of which (B4) is selected from the group consisting of esters of alpha, beta-unsaturated monocarboxylic acids with aliphatic monohydric unbranched alcohols of 1 to 20 carbon atoms,

wherein the compound (A) contains a functional group that reacts with the functional group in (B) to form a chemical bond.

5,596,858

PROCESS FOR MAKING AN ACRYLOINITRILE/METHACRYLONITRILE COPOLYMER

Richard C. Smiercink, Aurora; Eddie Wardlow, Jr., Shaker Hts., and Lawrence E. Ball, Akron, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 331,297, Oct. 28, 1994, abandoned, which is a continuation of Ser. No. 149,880, Nov. 10, 1993, abandoned. This application Oct. 5, 1995, Ser. No. 539,664

Int. Cl.[6] C08F 220/44

U.S. Cl. 526—342 **21 Claims**

1. A process for polymerizing monomers of acrylonitrile and methacrylonitrile to produce an acrylonitrile/methacrylonitrile copolymer, said process comprising the steps of:

heating an initial comonomer mixture comprising acrylonitrile monomer and methacrylonitrile monomer under an inert atmosphere in the range of about 40° C. to about 120° C.;

adding an initiator to the initial comonomer mixture to start a polymerization reaction;

adding a comonomer feed mixture comprising acrylonitrile monomer and methacrylonitrile monomer to a polymerization mixture wherein the comonomer feed mixture is added at a fixed and constant molar ratio of acrylonitrile monomer to methacrylonitrile monomer and at a constant rate which is less than the rate at which the monomers are converted into copolymer and wherein the monomers of unreacted acrylonitrile and unreacted methacrylonitrile in the polymerization mixture are not greater than 15% of the total weight of the polymerization mixture; resulting in a homogeneous acrylonitrile/methacrylonitrile copolymer product wherein the copolymer product ratio is similar to the comonomer feed ratio and wherein the copolymer is melt processable without the use of solvents.

5,596,859

POLYETHER POLYOLS SUITABLE FOR MFLEXIBLE POLYURETHANE FOAM PREPARED BY CO-INITIATION OF AQUEOUS SOLUTIONS OF SOLID POLYHYDROXYL INITIATORS

Stanley L. Hager, Crosslanes, W. Va.; James E. Knight; Gregory F. Helma, both of Exton, Pa., and Ben J. Argento, South Charleston, W. Va., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Jul. 26, 1995, Ser. No. 507,102

Int. Cl.[6] C08G 18/48

U.S. Cl. 527—300 **17 Claims**

1. A polyoxyalkylene polyether polyol suitable for use in preparing polyurethane flexible foams compriaing the oxyalkylation product of an aqueous solution of one or more polyhydric, hydroxyl-functional solid initiators comprising a saccharide, polysaccharide, or derivative thereof, wherein the water content of said aqueous solution is between 12 weight percent and 90 weight percent relative to the weight of said aqueous solution, and wherein said polyoxyalkylene polyether polyol has a calculated functionality of between about 2.2 and 4.0 and a hydroxyl number between about 10 and about 180.

5,596,860

CURABLE POLYTITANOSILOXANE COMPOSITIONS AND METHOD FOR PREPARING CURED POLYTITANOSILOXANES USING SAID COMPOSITIONS

Nobuo Kushibiki; Yoko Sugata, both of Kanagawa, Japan, and Toshio Suzuki, Midland, Mich., assignors to Dow Corning Asia, Ltd., Tokyo, Japan

Filed Mar. 31, 1995, Ser. No. 414,683

Claims priority, application Japan, Apr. 1, 1994, 6-065170

Int. Cl.[6] C08G 77/08

U.S. Cl. 528—15 **6 Claims**

1. A curable polytitanosiloxane composition comprising

A. a polytitanosiloxane comprising a first unit represented by the formula $R^1_aR^2_{(3-a)}SiO_{1/2}$, a second unit represented by the formula $SiO_{4/2}$, and a third unit represented by the formula $TiO_{4/2}$, wherein the total number of said first, second and third units constitutes at least 80 mol percent of the repeating units present in said polytitanosiloxane,

B. an amount sufficient to crosslink said polytitanosiloxane of a curing agent selected from the group consisting of 1) organohydrogensiloxanes containing an average of more than two silicon-bonded hydrogen atoms per molecule in combination with an amount of a platinum-containing catalyst sufficient to promote crosslinking of said polytitanosiloxane; and 2) an amount sufficient to promote crosslinking of said composition of an organic peroxide;

wherein R^1 represents an alkenyl radical, R^2 represents a monovalent organic group, a is an integer from 0 to 3, and an average of at least two alkenyl radicals are present in each molecule of the polytitanosiloxane.

5,596,861

ORGANOSILICONE HAVING A CARBOXYL FUNCTIONAL GROUP THEREON

Abe Berger, Summit, and Dennis L. Fost, Ridgewood, both of N.J., assignors to Mona Industries, Inc., Paterson, N.J.

Continuation-in-part of Ser. No. 298,565, Aug. 31, 1994, abandoned, and Ser. No. 174,660, Dec. 28, 1993, abandoned. This application Apr. 12, 1995, Ser. No. 420,746

Int. Cl.[6] C08G 77/04

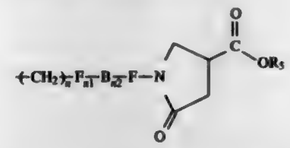
U.S. Cl. 528—26 **15 Claims**

1. A polysiloxane composition having the formula



wherein:

R_1, which can be the same or different, is selected from R_2, H, a primary amine containing group or a pyrrolidone containing group of the general formula:



wherein at least one R_1 is a pyrrolidone containing carboxyl functional group or ester derivative thereof as shown; R_2 is as defined below; R_5 is hydrogen, lower alkyl (C_{1-6}) or alkali metal; F, which can be the same or different, is linear or branched alkylene of 1–12 carbon atoms; n is 0 or 2; n^1 is 0 or 1; n^2 is 0 or 1; and B is —NR_6, sulfur or oxygen, wherein R_6 is hydrogen or lower alkyl (C_{1-6}); with the proviso that when n is 0 and n^2 is 1, n^1 is 1, when n is 2 and n^2 is 1, n^1 is 0 or 1 and when n is 2 and n^2 is 0, n^1 is 0;

R_2 can be the same or different and is selected from alkyl, aryl or olefinic;

R_3 and R_4, which may be the same or different are selected from alkyl, aryl, capped or uncapped polyoxyalkylene, alkaryl, aralkylene or alkenyl;

a is an integer from 0 to 50,000; and

b is an integer from 0 to 100.

5,596,862

SILICON-CONTAINING COPOLYMER AND METHOD OF PRODUCING SAME

Yuji Tashiro, Saitama-ken; Kazuo Inoue, Abiko, and Tadashi Suzuki, Saitama-ken, all of Japan, assignors to Tonen Corporation, Japan

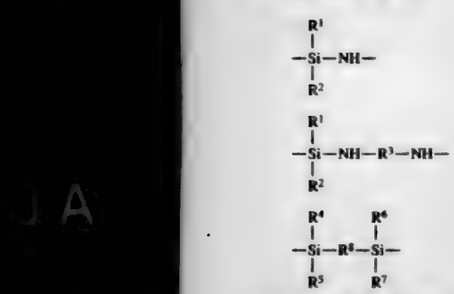
Filed Aug. 18, 1995, Ser. No. 516,562

Claims priority, application Japan, Aug. 24, 1994, 6-220811; Dec. 27, 1994, 6-338588

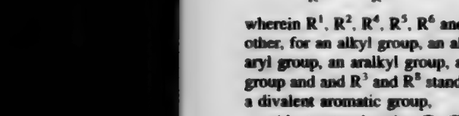
Int. Cl.[6] C08G 77/04

U.S. Cl. 528—28 **9 Claims**

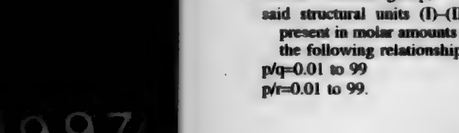
1. A silicon-containing copolymer having a number average molecular weight of 500–100,000 and containing the following structural units (I)–(III):



(I)



(II)



(III)

wherein R^1, R^2, R^4, R^5, R^6 and R^7 stand, independently from each other, for an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, an aralkyl group, an alkylamino group or an alkylsilyl group and and R^3 and R^8 stand, independently from each other, for a divalent aromatic group,

said structural units (I)–(III) being arranged at random and present in molar amounts of p, q and r, respectively, providing the following relationship:

p/q=0.01 to 99

p/r=0.01 to 99.

5,596,863

PREPARATION OF CHLOROFLUOROCARBON-FREE FLEXIBLE POLYURETHANE FOAMS USING DIPHENYLMETHANE DIISOCYANATE-BASED POLYISOCYANATE MIXTURES CONTAINING URETHANE GROUPS, AND MODIFIED POLYISOCYANATE MIXTURES OF THIS TYPE

Heinz-Dieter Lutter, Neckargemuend; Bernd Bruchmann, Ludwigshafen; Claudia Spang, Eisenberg-Steinborn; Roland Minges, Gruenstadt; Dietrich Scherzer, Neustadt; Michael Lagnayz, Groebenzell, and Ruth Zechlesche, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Germany

Division of Ser. No. 15,746, Feb. 10, 1993, Pat. No. 5,494,941. This application Jun. 8, 1995, Ser. No. 430,924

Int. Cl.[6] C08G 18/10

U.S. Cl. 528—44 **7 Claims**

1. A liquid, CFC-free diphenylmethane diisocyanate-based polyisocyanate mixture containing bonded urethane groups and containing from 20 to 30% by weight of NCO groups, obtained by reacting, based on 100 parts by weight,

a) X parts by weight of 4,4'-diphenylmethane diisocyanate, where X is a value in the range from 34 to 68 parts by weight, or

a mixture of

X parts by weight of 4,4'-diphenylmethane diisocyanate and

Y parts by weight of 2,4'-diphenylmethane diisocyanate, where X is as defined above and Y is a value in the range from 1 to 25 parts by weight, with

b) a polyether-polyol mixture (b) which contains

b1) at least one polyoxypropylene glycol having a hydroxyl number of from 120 to 25, and

b2) at least one trifunctional polyoxypropylene-polyoxyethylene-polyol having a hydroxyl number of from 120 to 25 and containing from 10 to 90% by weight, based on the weight of polymerized alkylene oxide units, of polymerized ethylene oxide units,

to give a quasi-prepolymer containing urethane groups and having an NCO content of from 10 to 19% by weight, and subsequently diluting the quasi-prepolymer with a mixture

(I) of diphenylmethane diisocyanates and polyphenylpolymethylene polyisocyanates which contains

Ia1) (34 to 68)—X parts by weight of 4,4'-diphenylmethane diisocyanate,

Ia2) (1 to 25)—Y parts by weight of 2,4'-diphenylmethane diisocyanate,

Ia3) from 0 to 4 parts by weight of 2,2-diphenylmethane diisocyanate and

Ia4) from 65 to 3 parts by weight of at least trifunctional polyphenyl-polymethylene polyisocyanates,

with the proviso that X+Y+Ia1+Ia2+Ia3+Ia4 adds up to 100 parts by weight, said mixture yielding CFC-free, flexible polyurethane foams and elastic polyurethane molded foams.

5,596,864

POLYISOCYANATES BLOCKED WITH A MIXTURE OF BLOCKING AGENTS

Eberhard Konig, Leverkusen, and Theodor Engbert, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 27, 1995, Ser. No. 430,775

Claims priority, application Germany, May 13, 1994, 44 16 750.4

Int. Cl.[6] C08G 18/80

U.S. Cl. 528—45 **3 Claims**

1. A blocked polyisocyanate which contains aliphatically and/or cycloaliphatically bound isocyanate groups, wherein at least 95% of the isocyanate groups are blocked by a mixture of blocking agents containing

A) 30 to 70 equivalent % of 1,2,4-triazole,

B) 30 to 70 equivalent % of 3,5-dimethylpyrazole, and

C) 0 to 30 equivalent % of one or more blocking agents which are different from A) and B),

wherein the preceding percentages are based on the total equivalents of blocking agents and add up to 100, and

which has a total content of blocked and non-blocked isocyanate groups (calculated as NCO) of 5 to 25 weight %, based on the solids content of the blocked polyisocyanate.

5,596,865

WATER-DILUTABLE URETHANE RESINS, PROCESS FOR THE PREPARATION, AND THE USE THEREOF

Martin Gerlitz; Rami-Raimund Awad, and Thomas Fraydl, all of Graz, Austria, assignors to Vianova Resins AG, Graz, Austria

Filed Jul. 26, 1995, Ser. No. 506,761

Claims priority, application Austria, Jul. 27, 1994, A-1481/94

Int. Cl.[6] C08G 18/10

U.S. Cl. 528—71 **20 Claims**

1. A process for the preparation of water-dilutable urethane resins comprising:

reacting (A) hexamethylene diisocyanate, a total of 50 mol % of whose NCO groups are in the form of urethane groups due to

reaction of the hexamethylene diisocyanate with (i) one or more alcohols containing (meth)acryloyl groups and optionally with (ii) one or more aliphatic monoalcohols,

with (B) from 0.25 to 0.45 mol per mol of (A) of 2,2-bis(hydroxymethyl)propionic acid at from 70° to 90° C. until complete reaction of the hydroxyl groups has taken place, to obtain intermediate (AB), and

then reacting the intermediate (AB) with (C) from 0.2 to 0.45 mol per mol of (A) of one or more of an aliphatic or cycloaliphatic diisocyanate, a total of 50 mol % of whose NCO groups are in the form of urethane groups due to reaction with (i) one or more alcohols containing (meth)acryloyl groups and optionally with (ii) one or more aliphatic monoalcohols, at from 100° to 110° C. until complete reaction of the remaining free isocyanate groups to give allophanate groups has taken place thereby giving a reaction product (ABC),

wherein the molar ratios of components (A), (B), and (C) is such that the ratio of equivalents of the isocyanate groups and hydroxyl groups present in the original raw materials for components (A), (B), and (C) is from 1.1:1 to 1.45:1; and

wherein the reaction product (ABC) contains carboxyl groups corresponding to an acid number of from 25 to 50 mg of KOH/g, and

wherein at least 45% of the carboxyl group of (ABC) are then neutralized with (D) an alkali metal hydroxide, optionally as a mixture with (E) an aliphatic or cycloaliphatic diisocyanate whose NCO groups are reacted to the extent of 50 mol % each with one or more alcohols containing (meth)acryloyl groups and with one or more N,N-dialkylalkanolamines, to form urethane groups,

wherein the end product has a double bond equivalent (number of moles of ethylenic double bond per 1000 g of resin as solid) of from 1.5 to 3.5 mmol/g.

5,596,866

DIMERIC DIOL-MODIFIED POWDER COATING CROSS-LINKING AGENTS CONTAINING URETDIONE GROUPS

Hans-Josef Laas, Köln; Reinhard Halpaap, Odenthal; Hans-Ulrich Meier-Westhues, Leverkusen, and Wolfgang Schultz, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 4, 1996, Ser. No. 582,715

Claims priority, application Germany, Jan. 9, 1995, 19500403.5

Int. Cl.[6] C08G 18/10

U.S. Cl. 528—73 **9 Claims**

1. A polyaddition compound which is solid below 40° C. and liquid above 125° C. and contains

a) 0 to 2 wt. % of free isocyanate groups (calculated as NCO; molecular weight 42),

b) 3 to 16 wt. % of uretdione groups (calculated as $C_2N_2O_2$; molecular weight 84) and

c) 10 to 22 wt. % of urethane groups (calculated as —NH—CO—O—, molecular weight 59) of which at least 1 wt. % is obtained by reaction of dimeric diols with isocyanate groups.

5,596,867

FREE FALL POLYMERIZATION PROCESS FOR THE PRODUCTION OF POLYCARBONATES

Kyosuke Komiya; Yoshifumi Kawakami, both of Kurashiki, and Hirotaka Okamoto, Okayama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP94/01282, § 371 Date Sep. 1, 1995, § 102(e) Date Sep. 1, 1995, PCT Pub. No. WO95/03351, PCT Pub. Date Feb. 2, 1995

PCT Filed Jul. 21, 1994, Ser. No. 530,274

Claims priority, application Japan, Jul. 23, 1993, 5-182896

Int. Cl.[6] C08G 64/00

U.S. Cl. 528—196 **11 Claims**

1. A method for producing an aromatic polycarbonate, which comprises:

introducing to an introduction zone having a perforated plate at least one polymerizing material selected from the group consisting of:

a molten monomer mixture of an aromatic dihydroxy compound and a diaryl carbonate, and

a molten prepolymer obtained by a process comprising reacting an aromatic dihydroxy compound with a diaryl carbonate, and

allowing said polymerizing material to pass downwardly through said perforated plate and fall freely through a free-fall polymerization reaction zone, thereby effecting a free-fall polymerization of said polymerizing material during the free-fall thereof to obtain a polymer at a bottom of said free-fall polymerization reaction zone.

5,596,868

POLYESTER RESIN FOR PRODUCING ARTICLES HAVING HIGH TRANSPARENCY AND A NEUTRAL COLOUR

Wolfgang Kramer, Herdecke; Wilhelm Wällscheidt, Bottrop; Theodor Jürgens, Castrop; Klaus Kleinecke, Kamen, and Rudolf Geier, Essen, all of Germany, assignors to John Brown Deutsche Engineering GmbH, Essen, Germany

PCT No. PCT/DE93/00565, § 371 Date Feb. 14, 1995, § 102(e) Date Feb. 14, 1995, PCT Pub. No. WO94/01482, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 25, 1993, Ser. No. 373,233

Claims priority, application Germany, Jul. 7, 1992, 42 22 244.3; Jun. 8, 1993, 43 19 008.1

Int. Cl.[6] C08G 63/78

U.S. Cl. 528—280 **4 Claims**

1. A batch formulation for esterification to produce a polyester resin in a fabrication of a container of high transparency and a neutral color, said formulation consisting essentially of a dicarboxylic acid esterifiable with a mixture of ethylene glycol and cyclohexandimethanol in the presence of an antimony compound and a phosphorous compound as catalysts and in the presence of a germanium compound, and wherein said formulation, said cyclohexandimethanol is present in an amount of 0.5 to 15 percent by weight, said antimony compound is present in an amount of 50 to 350 ppm in terms of antimony, said germanium compound is present in an amount of 1 to 100 ppm in terms of germanium, and said phosphorous compound is present in an amount of 1 to 125 ppm in terms of phosphorous.

5,596,869

CATALYST AND PROCESS FOR PRODUCING CATALYST

George R. Goodley, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 487,767, Jun. 8, 1995, Pat. No. 5,512,340, and Ser. No. 569,044, Dec. 7, 1995, abandoned. This application Mar. 25, 1996, Ser. No. 620,821

Int. Cl.[6] B01G 63/82

U.S. Cl. 528—280 **5 Claims**

1. A process for the production of poly(ethylene terephthalate) polymer which comprises combining a polymerization catalyst formed by combining a cobalt salt that is soluble in ethylene glycol and aluminum compound selected from the group consisting of aluminum chloride, aluminum hydroxide, aluminum acetate, and aluminum hydroxychloride in ethylene glycol, where the mole ratio of aluminum to cobalt is 0.25 to 1 to 16 to 1, with terephthalic acid and ethylene glycol, or low molecular weight poly(ethylene terephthalate) polymer or oligomer, where the concentration of cobalt in the thus formed mixture is in the range of about 10 to 100 parts per million parts of the mixture and polymerizing the mixture.

5,596,070

HIGH MOLECULAR WEIGHT POLYAMIDES OBTAINED FROM NITRILES

Walter Götz, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 24, 1995, Ser. No. 518,717

Claims priority, application Germany, Aug. 27, 1994, 44 30 408.3

Int. Cl.[6] C08G 69/00;69/48

U.S. Cl. 528—310 4 Claims

1. A process for the preparation of high molecular weight polyamides from cyano- or amino-containing monomers which comprises:

(a) polymerizing monomers selected from the group consisting of aminonitriles of the formula I

$$H_2N-(CH_2)_m-CN \qquad I$$

and mixtures of diamines of the formula II

$$H_2N-(CH_2)_n-NH_2 \qquad II$$

with dinitriles of the formula III

$$NC-(CH_2)_p-CN \qquad III$$

where m, n and p are integers from two to twelve, in a molar diamine/dinitrile ratio of from 0.98:1 to 1.02:1 a relative viscosity from 1.4 to 2.0 (measured at a concentration of 1 g of prepolymer per 100 ml in 96% strength by weight sulfuric acid at 23° C.) being chosen for the resulting prepolymers, to give a product capable of being granulated,

(b) granulating the prepolymer obtained under (a) and

(c) subjecting the granules obtained under (b) to solid-phase postcondensation at from 5° to 100° C. below the melting point of the prepolymer in the presence of an inert gas which contains at least 50% by volume of superheated steam to give a high molecular weight polyamide having a relative viscosity of from 2.3 to 5.0 (measured at a concentration of 1 g of polymer per 100 ml in 96% strength by weight sulfuric acid at 23° C.), the difference between the relative viscosity of the resulting prepolymer from stage (a) and that of the high molecular weight polyamide from stage (c) being at least 0.4.

5,596,071

BACILLUS THURINGIENSIS TOXINS ACTIVE AGAINST HYMENOPTERAN PESTS

Jewel M. Payne, Davis, Calif.; M. Keith Kennedy, Racine, Wis.; John B. Randall, Racine, Wis.; Henry Meier, Racine, Wis.; Heidi J. Ulek, Racine, Wis.; Luis Fencerrada; H. Ernest Schnepf, both of San Diego, Calif.; George E. Schwab, Encinitas, Calif., and Jenny Fu, San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 797,645, Nov. 25, 1991, Pat. No. 5,268,297, and Ser. No. 887,900, May 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 703,977, May 22, 1991, Pat. No. 5,260,058. This application Nov. 24, 1993, Ser. No. 158,232

Int. Cl.[6] C07K 14/325; C12N 1/20

U.S. Cl. 530—350 1 Claim

1. A *Bacillus thuringiensis* toxin from isolate PS86Q3 which has activity against hymenopteran pests.

5,596,072

METHOD OF REFOLDING HUMAN IL-13

Janice Culpepper, Mountain View; Andrew McKenzie, Redwood City; Warren Dang, San Jose, and Gerard Zurawski, Redwood City, all of Calif., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 933,416, Aug. 21, 1992, abandoned. This application Feb. 1, 1993, Ser. No. 12,543

Int. Cl.[6] C07K 1/00;14/54

U.S. Cl. 530—351 10 Claims

1. A method of refolding a denatured human IL-13 protein comprising the steps of:

a) solubilizing said protein in 6M guanidine at a concentration of about 2.5 mg/ml;

b) diluting said guanidine to about 60 mM over a period of hours in the presence of both reduced and oxidized glutathione; and

c) incubating said diluted guanidine solution for at least about 12 hrs.

5,596,073

POLYIMIDE SOLUTIONS AND METHOD OF OBTAINING THEM

Philippe Michaud, Mobile, Ala., and Jean Russo, Lyon, France, assignors to S.N.C. Kermel, Cedex, France

PCT No. PCT/FR93/00648, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO94/02535, PCT Pub. Date Feb. 3, 1994

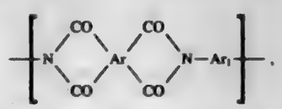
PCT Filed Jun. 29, 1993, Ser. No. 367,323

Claims priority, application France, Jul. 23, 1992, 92 09327

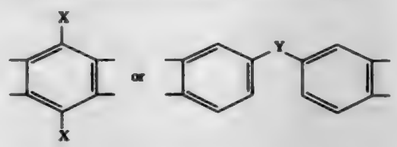
Int. Cl.[6] C08G 73/10;69/08

U.S. Cl. 528—353 16 Claims

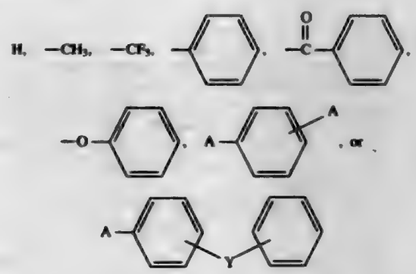
1. A clear solution which is directly shapable and spinnable, which contains 5 to 35% of a polyimide comprising repeating units of formula:



wherein Ar represents a tetravalent group of formula:



X representing an identical or different monovalent radical selected from



Y and A are identical or different divalent radicals, Y is selected from the group of bond, CO, O, SO_2, S, $C(CH_3)_2$, CH_2 or $C(CF_3)_2$; A is selected from the group of CO, O, SO_2, S, $C(CH_3)_2$, CH_2 or $C(CF_3)_2$; and

Ar_1 is a divalent aromatic group;

in anhydrous dimethylalkyleneurea (DMAU), with a pH≦7, and containing less than 1000 ppm of water, and wherein the solution does not contain carbonate, hydrocarbonate, alkali hydroxyl, or alkali salts of polycarboxilic acids.

5,596,074

METHOD FOR CONTROLLING COLOR FORMATION DURING POLYTETRAMETHYLENE ETHER GLYCOL PRODUCTION

Peter A. Bloxham, Houston, Tex.; Anne I. Breikss, Hockessin, Del.; Richard E. Ernst, Kennett Square, Pa.; Leon S. Scott; John D. Super, both of Wilmington, Del., and James D. Verbsky, Seabrook, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 495,958, Jun. 28, 1995, abandoned, which is a continuation of Ser. No. 336,356, Nov. 8, 1994, abandoned. This application Dec. 22, 1995, Ser. No. 577,943

Int. Cl.[6] C08G 59/00;65/34

U.S. Cl. 528—417 4 Claims

1. A method of producing polytetramethylene ether glycol polymer or copolymer of improved color comprising the steps of:

(a) subjecting 1,4-butanediol liquid distillate optionally containing one or more 2-alkyl-1,4-butanediol, wherein said distillate is characterized by the presence of lower alkyl glycol impurities at a concentration range of up to about 1,000 ppm, to continuous distillation while simultaneously removing overhead a stream containing undesirable lower alkyl glycol impurities and recovering there below a stream of 1,4-butanediol optionally containing one or more 2-alkyl-1,4-butanediol substantially free of said impurities;

(b) subjecting the topped 1,4-butanediol stream produced in step (a) to catalytic cyclization thus producing tetrahydrofuran optionally containing one or more 3-alkyl-substituted tetrahydrofuran, wherein said cyclic product stream is characterized as substantially free of 1,3-dioxolane and 4-alkyl- 1,3-dioxolane impurities; and

(c) polymerizing the tetrahydrofuran optionally containing one or more 3-alkyl-substituted tetrahydrofuran produced in step (b) thus producing polytetramethylene ether glycol polymer of improved color index.

5,596,075

POLYURETHANE FOAM-SUPPORTED DOUBLE METAL CYANIDE CATALYSTS FOR POLYOL SYNTHESIS

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 453,654, May 30, 1995, Pat. No. 5,527,880, which is a division of Ser. No. 345,644, Dec. 1, 1994, Pat. No. 5,498,583, which is a continuation-in-part of Ser. No. 173,290, Dec. 23, 1993, Pat. No. 5,426,081. This application Mar. 19, 1996, Ser. No. 618,486

Int. Cl.[6] C08G 65/12;65/28;65/48

U.S. Cl. 528—425 1 Claim

1. A process for preparing an epoxide polymer, said process comprising polymerizing an epoxide in the presence of a polyurethane foam-supported double metalcyanide catalyst, wherein the double metal cyanide catalyst comprises at least about 70 wt. % of a substantially amorphous double metal cyanide complex.

5,596,076

PROCESS FOR THE PREPARATION OF ELASTOMERIC POLYPROPYLENES

Norbert Hafner, Linz; Friedrich Mitter, Pasching; Hans Ledwinka, St. Ulrich; Elisabeth Bruckmüller, Weibern, and Josef Kurz, Traun, all of Austria, assignors to PCD Polymere Gesellschaft m.b.H., Schwechat-Mannsworth, Austria

Filed May 19, 1994, Ser. No. 246,291

Claims priority, application Austria, May 21, 1993, 994/93

Int. Cl.[6] C08F 6/24

U.S. Cl. 528—483 6 Claims

1. Process for the preparation of elastomeric, non-agglomerated, particulate polypropylenes with a stereoregular block arrangement in the chain structure by polymerization of propylene, with or without other olefins as comonomers, wherein liquid propylene is employed as the polymerization medium, and, in the next step after the polymerization, a polar solvent of which the polar term "delta p" of the solubility parameter according to Hansen is greater than 5 and the total solubility parameter "delta" is less than 30, or CO_2 is added to the polymerization mixture in an amount which is at least as high as the amount of the polypropylenes formed, whereupon the polypropylenes formed are precipitated and then isolated.

5,596,077

Patent Not Issued For This Number

5,596,078

SYNTHESIS OF CYCLIC PEPTIDES

Lars H. H. Andersson, Lund, and Jan-Ake Skoldback, Malmo, both of Sweden, assignors to Ferring AB, Malmo, Sweden

Continuation of Ser. No. 84,849, Jun. 29, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 423,415

Int. Cl.[6] C07K 1/02;1/18;7/16

U.S. Cl. 530—315 5 Claims

1. A method for preparing and purifying cyclic peptide compounds containing a disulfide moiety, comprising the steps of:

a) forming a first solution by adding to a protic solvent at neutral or acidic pH, a non-cyclic peptide containing the following sequence:

β-mercapto-propionyl-Tyr-Phe-Gln-Asn-Cys-Pro-D-Arg-Gly-NH_2 (SEQ ID NO: 1) said non-cyclic peptide having at least two reactive, protected or non-protected sulfhydryl groups;

b) forming a second solution of iodine dissolved in a protic solvent;

c) introducing said second solution containing iodine to said first solution containing said non-cyclic peptide such that the amount of iodine present in the resulting mixture is at least about stoichiometric with respect to the sulfhydryl groups;

d) allowing the mixture resulting from step (c) sufficient time for disulfide moiety formation and conversion of said non-cyclic peptide to said cyclic peptide compound;

e) adding the mixture of (d) containing said cyclic peptide compound directly to a separation column containing cation exchange resin;

f) eluting said cyclic peptide compound; and

g) isolating said cyclic peptide compound.

5,596,079

MIMETICS OF SENESCENT CELL DERIVED INHIBITORS OF DNA SYNTHESIS

James R. Smith, 18311 Cliffwood, Houston, Tex. 77035, and Brian K. Kay, 18 Wyntoin Way, Chapel Hill, N.C. 27514

Continuation-in-part of Ser. No. 229,420, Apr. 15, 1994, which is a continuation-in-part of Ser. No. 203,535, Feb. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 153,564, Nov. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 113,372, Aug. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 970,462, Nov. 2, 1992, Pat. No. 5,302,706, , which is a continuation-in-part of Ser. No. 808,523, Dec. 16, 1991, abandoned. This application May 24, 1994, Ser. No. 249,371

Int. Cl.[6] C07K *7/00*

U.S. Cl. 530—328 1 Claim

1. The peptide selected from the group consisting of SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12 and SEQ ID NO:13.

5,596,080

CROSSLINKING PROCESSES/AGENTS FOR ZEIN

Lorenzo F. Peloni, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 3, 1994, Ser. No. 316,445

Int. Cl.[6] C07K *14/425*

U.S. Cl. 530—373 6 Claims

1. A process for making crosslinked zein, said process comprising crosslinking zein by means of heating zein in the presence of water, which is the sole crosslinking agent, to a temperature of at least about 130° C., the initial amount of water being about 5–67 weight percent of the composition, thereby avoiding the need for toxic chemical crosslinking agents.

5,596,081

NUCLEOTIDE OR NUCLEOSIDE PHOTOAFFINITY COMPOUND MODIFIED ANTIBODIES, METHODS FOR THEIR MANUFACTURE AND USE THEREOF AS DIAGNOSTICS AND THERAPEUTICS

Boyd E. Haley, Nicholasville; Heinz Kohler; Krishnan Rajagopalan, both of Lexington, and Gabriela Pavlinkova, Lexington, all of Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Mar. 11, 1994, Ser. No. 208,822

Int. Cl.[6] C07K *16/00;* C12P *21/00*

U.S. Cl. 530—391.1 16 Claims

1. A method for site specific photoattachment of a nucleotide photoaffinity compound to antibody molecules comprising reacting an antibody containing sample with an effective amount of a nucleotide photoaffinity compound under ultraviolet light conditions which provide for the site-specific photoinsertion of said nucleotide photoaffinity compound at one or more nucleotide binding sites in the antibody molecules which are contained in the sample.

5,596,082

PROCESS FOR ISOLATING LACTOFERRIN AND LACTOPEROXIDASE FROM MILK AND MILK PRODUCTS, AND PRODUCTS OBTAINED BY SUCH PROCESS

Klaas D. Kussendrager, Veghel; Marinus G. C. Kivits, Schijndel, and Albert B. Verver, Uden, all of Netherlands, assignors to Campina Melkunie BV, Netherlands

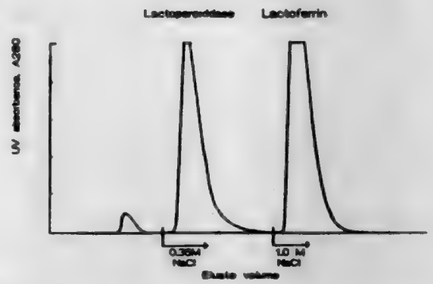
PCT No. PCT/NL93/00014, § 371 Date Sep. 20, 1994, § 102(e) Date Sep. 20, 1994, PCT Pub. No. WO93/13676, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 256,473

Claims priority, application Netherlands, Jan. 15, 1992, 9200064

Int. Cl.[6] A23J *1/20*

U.S. Cl. 530—416 15 Claims



1. A process for isolating lactoperoxidase and lactoferrin from milk or milk derivatives, comprising the following steps:

a) adsorbing the lactoperoxidase and lactoferrin to a cation exchanger having a mean particle diameter of from 100 μm to 300 μm by passing the milk or milk derivatives over the cation exchanger at a superficial velocity of at least about 600 cm per hour and a liquid load between about 100 and 600 bed volumes per hour; and

b) eluting the lactoperoxidase and lactoferrin with at least one salt solution to form at least one eluate.

5,596,083

MONOAZO COMPOUNDS AND METHOD FOR DYEING OR PRINTING FIBER MATERIALS USING THE SAME

Nobutaka Kusumi, Toyonaka; Yasuyoshi Ueda, Hirakata, and Takashi Omura, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

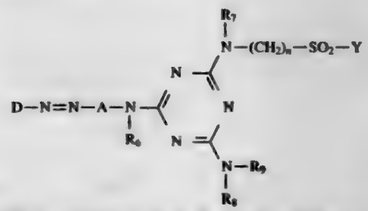
Filed Dec. 26, 1995, Ser. No. 579,683

Claims priority, application Japan, Sep. 29, 1994, 7-253004; Dec. 26, 1994, 6-322835

Int. Cl.[6] C09B *62/51;* D06P *1/384*

U.S. Cl. 534—642 10 Claims

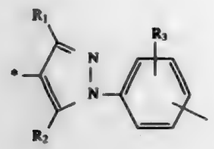
1. A monoazo compound represented by the following general formula (I):



(I)

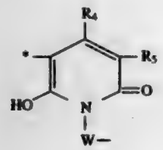
wherein D represents a phenyl or naphthyl group which may be optionally substituted;

A represents a group represented by the following formula:



in which R_1 represents a methyl group, a carboxyl group or an alkoxycarboxyl group, R_2 represents a hydroxyl group or an amino group, R_3 represents a hydrogen atom, a methyl group or a sulfo group and * represents the portion connecting to the azo group;

or A represents a group represented by the following formula:



in which W represents an alkylene group, R_4 represents a lower alkyl group, R_5 represents a hydrogen atom, a halogen atom, a cyano group, a carbamoyl group, a sulfo group or a sulfoalkyl group and * represents the portion connecting to the azo group;

R_6 and R_7 are the same or different and represent a hydrogen atom or a straight chain or branched chain alkyl group which may be optionally substituted,

R_8 and R_9 are the same or different and represent a hydrogen atom, a straight chain or branched chain alkyl group which may be optionally substituted, a cycloalkyl group which may be optionally substituted, an allyl group, a phenyl group which may be optionally substituted or a naphthyl group which may be optionally substituted;

n is 2, 3 or 4;

Y represents —CH=CH_2 or —CH_2CH_2Z in which Z represents a group removable by the action of an alkali;

provided that the substituents on D, R_8 and R_9 do not include a fiber reactive group, and at least one of the phenyl or naphthyl groups represented by D, R_8 or R_9 is substituted by a sulfo group or a carboxyl group;

or a salt thereof.

5,596,084

ALGINATE GELS

George R. Sanderson, Carlsbad; Dave Ortega, San Diego, and Tom Silberman, El Cajon, all of Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1994, Ser. No. 318,307

Int. Cl.[6] C08B *37/04*

U.S. Cl. 536—3 4 Claims

1. A gel comprising water, sodium ions, calcium ions, a sequestrant, gellan gum and alginate, wherein the ratio of sodium ions to calcium ions is between about 15:1 to about 45:1, the amount of alginate is between about 0.3 and 4%, the amount of gellan gum is between about 0.05 and 4%, and the amount of sequestrant is between about 0.01 and 1.5%.

5,596,085

METHOD FOR PREPARING POLYOL FATTY ACID POLYESTERS BY TRANSESTERIFICATION

Richard S. Silver, Wilmette, and Gerard L. Hasenhuettl, Deerfield, both of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Apr. 11, 1995, Ser. No. 420,065

Int. Cl.[6] C07H *15/00;15/06*

U.S. Cl. 536—18.6 21 Claims

1. A method for making a polyol fatty acid polyester comprising:

(1) mixing a polyol-type reagent, a fatty acid-containing reagent, and an esterification catalyst under essentially anhydrous conditions to form a reaction mixture; and

(2) heating the reaction mixture to about 95° to 200° C. for a time sufficient to form the polyol fatty acid polyester while removing non-fatty acid-containing lower alkyl ester by-product or alcohol by-product from the reaction mixture wherein the reaction mixture is maintained in a thin film to facilitate removal of the by-product.

5,596,086

MODIFIED INTERNUCLEOSIDE LINKAGES HAVING ONE NITROGEN AND TWO CARBON ATOMS

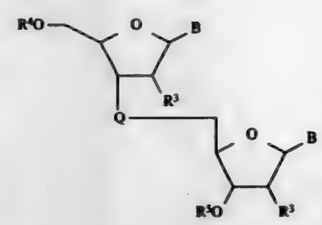
Mark Matteucci, Burlingame; Robert J. Jones, Daly City, and John Munger, San Francisco, all of Calif., assignors to Gilead Sciences, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 585,780, Sep. 28, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 763,130

Int. Cl.[6] C07H *21/00;21/02;21/04;* A61K *31/70*

U.S. Cl. 536—22.1 12 Claims

1. A dimer of the formula



wherein R^3 is independently H, OH, OCH_3, SCH_3, OC_3H_5, OC_3H_7, SC_3H_7, or F;

R^4 is hydrogen or a hydroxyl protecting group;

R^5 is hydrogen, a solid support or a hydroxyl protecting group;

B is independently a purine or pyrimidine residue or an analogous protected residue, and

wherein Q is —N(R)—CH_2—CH—, —CH_2—N(R)—CH_2— or —CH_2—CH_2— N(R)— wherein the left bond of each Q group is bonded to the 3' position of the structure (1) nucleotide and the right bond of each Q group is bonded to the 5' position of the adjacent structure (1.) nucleoside, wherein R is hydrogen, methyl, ethyl, FMOC, methoxymethyl or —C(O)—O—CH_2—CH_3.

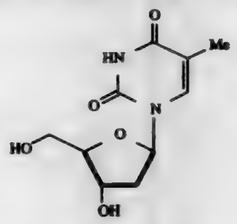
5,596,087

PROCESS FOR THE PREPARATION OF BETA THYMIDINE

Venkata R. R. Alla; K. Gurjar Mukund, and V. S. Lalitha Sista, all of Hyderabad, Ind., assignors to Council of Scientific & Industrial Research, New Delhi, Ind.

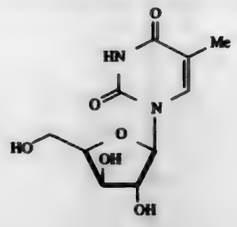
Filed May 20, 1994, Ser. No. 246,789
Int. Cl.[6] C07H *19/00;21/00*
U.S. Cl. 536—22.1 **22 Claims**

1. A process for the preparation of beta-thymidine of formula 2

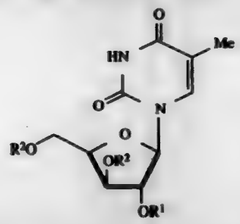


wherein, Me represents methyl, said process comprises:

(a) preparing deprotected xylothymidine of formula 9.

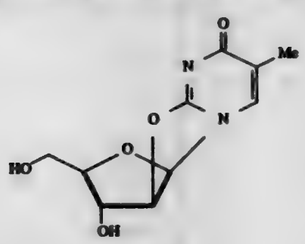


by removing by conventional methods, the acyl group from 1,2,3-tri-O-acyl-xylothymidine of formula 8



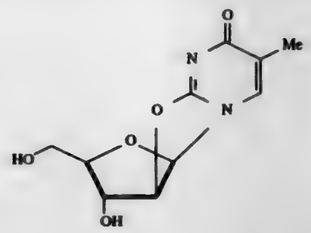
wherein R^1 represents acetyl, R^2 represents benzoyl or acetyl and Me represents methyl;

(b) condensing the deprotected xylothymidine of formula 9 with dialkyl or diaryl carbonate in the presence of a base and an organic solvent to yield 2,2'-anhydrothymidine of formula 10

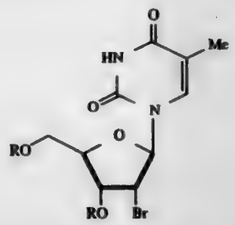


wherein Me represents methyl;

(c) brominating the 2,2'-anhydrothymidine of formula 10

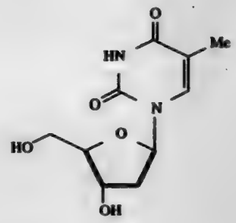


as defined above by conventional methods to form 2'-bromo compound of formula 14

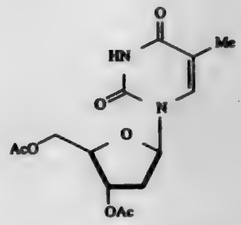


wherein R represents hydrogen or acetyl, Br represents bromine and Me represents methyl,

(d) reducing the 2'-bromo compound of the formula 14 by conventional methods to yield beta-thymidine of formula 2

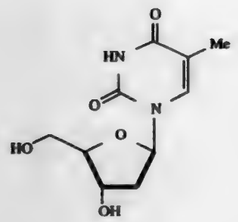


or its diacetyl compound, 15



wherein Ac represents acetyl; and

(e) if desired, deacylating the acetyl groups of the formula 15 by conventional methods to yield beta-thymidine of the formula 2



5,596,088

DNA ENCODING THE HUMAN P_{2U} RECEPTOR AND NULL CELLS EXPRESSING P_{2U} RECEPTORS

Richard C. Boucher, Chapel Hill, N.C.; Gary A. Weisman, Columbia; John T. Turner, Ashland, both of Mo.; Thomas K. Harden; Claude E. Parr, both of Chapel Hill, N.C.; Daniel M. Sullivan; Laura J. Erb, both of Columbia, Mo., and Kevin D. Lustig, Cambridge, Mass., assignors to The University of North Carolina At Chapel Hill, Chapel Hill, N.C., and The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 138,137, Oct. 15, 1993, abandoned. This application May 16, 1995, Ser. No. 442,134
Int. Cl.[6] C12N *15/12*
U.S. Cl. 536—23.5 **15 Claims**

1. Isolated DNA encoding DNA human P_{2U} receptor, selected from the group consisting of:

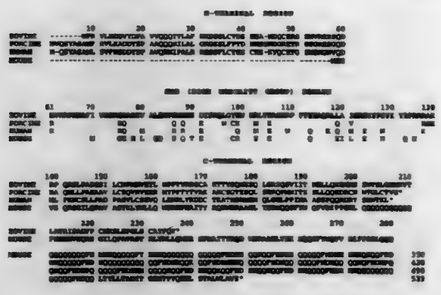
(a) isolated DNA having SEQ ID NO:1; and (b) isolated DNA differing from the isolated DNA of (a) above in nucleotide sequence due to the degeneracy of the genetic code.

5,596,089

OLIGONUCLEOTIDE PROBE AND PRIMERS SPECIFIC TO BOVINE OR PORCINE MALE GENOMIC DNA

David W. Silversides, St-Hyacinthe; Isabelle M. Daneau, Drummondville, and Alain Houde, Sherbrooke, all of Canada, assignors to Universite De Montreal, Quebec, Canada

Filed Feb. 14, 1994, Ser. No. 196,016
Int. Cl.[6] C07H *21/04;* C12Q *1/68*
U.S. Cl. 536—24.3 **2 Claims**



1. An oligonucleotide probe for detection of bovine or porcine male genomic DNA, which comprises the nucleotide sequences selected from the group consisting of SEQ ID NO:1 and SEQ ID NO:2, or fragments thereof which comprise sequences outside of the HMG box, wherein no notable homology is seen between species and whereby, the oligonucleotide probe either exclusively or predominantly hybridizes to sequences outside of said HMG box.

5,596,090

ANTISENSE OLIGONUCLEOTIDES DIRECTED AGAINST HUMAN VCAM-1 RNA

Glenn D. Hoke, Mt. Airy; Matthews O. Bradley, Laytonsville, both of Md.; Tully J. Williams, Lansdale, Pa., and Che-Hung Lee, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 918,256, Jul. 24, 1992, abandoned. This application Oct. 12, 1993, Ser. No. 137,701
Int. Cl.[6] C07H *21/04;* A61K *31/70*
U.S. Cl. 536—24.5 **3 Claims**

1. An oligonucleotide having a nucleotide sequence complementary to a sequence contained in the pre-mRNA or mature mRNA transcript of human VCAM-1, said oligonucleotide selected from the group consisting of:

GCC TGG GAG GGT ATT CAG CTC (Seq I.D. No. 1):
AAC CCT TAT TTG TGT CCC ACC (Seq I.D. No. 2):
CCC AGG CAT TTT AAG TTG CTG (Seq I.D. No. 3):
CAC GAG GCC ACC ACT CAT CTC (Seq I.D. No. 4):
CTT TGA CTT CTT GCT CAC AGC (Seq I.D. No. 5):
AAC TCC TCC AGT TCT CTC ATC (Seq I.D. No. 6):
ACC TGT GTG TGC CTG GGA GGG (Seq I.D. No. 9):
CGT GAT GAG AAA ATA GTG GTT (Seq I.D. No. 10):
CGA CCA TCT TCC CAG GCA TTT (Seq I.D. No. 11):
CCA CCA CTC ATC TCG (Seq I.D. No. 12):
CCC ATT CAC GAG GCC ACC (Seq I.D. No. 13):
CGA GGC CAC CAC TC (Seq I.D. No. 14):
CCT CCA GTT CTC TC (Seq I.D. No. 15):
GCC AGT GAG GCC CG (Seq I.D. No. 17):
CCT GGG AGG GTA TTC (Seq I.D. No. 18):
CCC TTA TTT GTG TCC C (Seq I.D. No. 19):
GGT TCC AAA ACC CTT (Seq I.D. No. 20):
TTT GTG TCC CAC CTG (Seq I.D. No. 21), and
CAT CTT CCC AGG CAT (Seq I.D. No. 22).

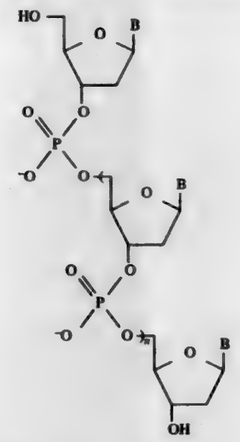
5,596,091

ANTISENSE OLIGONUCLEOTIDES COMPRISING 5-AMINOALKYL PYRIMIDINE NUCLEOTIDES

Christopher Switzer, Moreno Valley, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Mar. 18, 1994, Ser. No. 214,683
Int. Cl.[6] C07H *21/04;* C12Q *1/68;* C12P *19/34*
U.S. Cl. 536—24.5 **3 Claims**

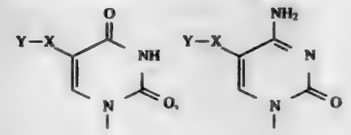
1. A modified oligonucleotide having the formula:



wherein

n is an integer of from 4 to 30; and

each B is a radical independently selected from the group consisting of,



adenine, guanine, thymine and cytosine,

wherein

each X is a linking group independently selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} unsaturated alkyl, dialkyl ether and dialkylthioether;

each Y is a cationic moiety independently selected from the group consisting of $—(NH_3)^+$, $—(NH_2R^1)^+$, $—(NHR^1R^2)^+$, and $—(NR^1R^2R^3)^+$; and

R^1, R^2, and R^3 are each independently lower alkyl having from one to ten carbon atoms,

with the proviso that when n is from 4 to 8, no more than 30% Bs are adenine, guanine, cytosine or thymine, and when n is from 9 to 30, no more than 50% Bs are adenine, guanine, cytosine or thymine, wherein said modified oligonucleotide forms chimetic duplexes when subjected to a complementary natural oligonucleotide in H_2O at pH 7 in the presence of 10 mM sodium phosphate, 0.1 mM EDTA and 50 mM sodium chloride.

5,596,092

EXTRACTION OF GENOMIC DNA FROM BLOOD USING CATIONIC DETERGENTS

Claudio Schneider, Udine, Italy, assignor to Talent S.r.l., Trieste, Italy

Continuation of Ser. No. 783,755, Oct. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 544,250, Jun. 26, 1990, abandoned. This application Jul. 6, 1994, Ser. No. 268,577

Int. Cl.[6] C07H *21/00*

U.S. Cl. 536—25.4 **13 Claims**

1. A process for the extraction of genomic DNA from whole blood comprising the steps of:

adding to a whole blood sample a lysis solution comprising a first cationic detergent selected from the group consisting of dodecyltrimethylammonium and tetradecyltrimethylammonium salts, and a salt at a concentration higher than 0.5M, under heating to a temperature of from 40° to 80° C., whereby solubilizing and lysing the nucleic acids and protein contaminants present in the sample of whole blood;

contacting the solution resulting from the previous step with an organic solvent so as to extract therefrom said first cationic detergent and any complex thereof with proteins contained in said sample, while precipitating any protein remaining in the aqueous phase;

centrifuging the mixture resulting from the previous step, whereby separating an organic phase, a solid phase containing the precipitated proteins, and an aqueous phase containing the desired DNA, and separating said aqueous phase from said organic phase and said solid phase;

diluting said aqueous phase with water to a concentration of said salt lower than 0.5M and adding a second detergent whereby precipitating the DNA; and

recovering the precipitated DNA.

5,596,093

PROCESS FOR PREPARING HALOGENATED 2,3-O-CYCLOCYTIDINE DERIVATIVES

Bruno K. Radatus; Khashayar Karimian, both of Brantford; Anand Daljeet, Mississauga, and Keshava Murthy, Brantford, all of Canada, assignors to ACIC (Canada) Inc., Brantford, Canada

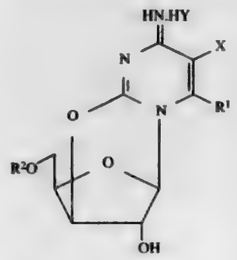
Division of Ser. No. 191,192, Feb. 2, 1994, Pat. No. 5,527,782, which is a continuation-in-part of Ser. No. 930,605, Oct. 5, 1992, Pat. No. 5,399,682. This application Jun. 6, 1995, Ser. No. 469,506

Claims priority, application Canada, Mar. 13, 1990, 2012095; Mar. 13, 1990, 2012096

Int. Cl.[6] C07H *1/00;19/09*

U.S. Cl. 536—55.3 **15 Claims**

1. A process for producing a compound of Formula I:



I

wherein:

X is a halide;

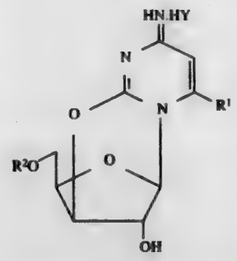
Y is selected from the group consisting of halide, sulfate and acetate;

R^1 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, substituted C_1–C_{10} alkyl, C_6–C_{10} aryl and substituted C_6–C_{10} aryl;

R^2 is selected from the group consisting of hydrogen, trityl, acetyl, benzyl, benzoyl, dimethoxytrityl, tosyl, mesyl and an acyl radical of an organic carboxylic acid



in which R is selected from the group consisting of C_1–C_{20} alkyl, substituted C_1–C_{20} alkyl, C_6–C_{10} aryl, substituted C_6–C_{10} aryl, C_4–C_{10} cycloalkyl, substituted C_4–C_{10} cycloalkyl, C_7–C_{12} aralkyl, substituted C_7–C_{12} aralkyl, a C_7–C_{20} cage-type hydrocarbon group and a C_7–C_{20} cage-type hydrocarbon group, the process comprising the step of reacting a compound of Formula II:



II

with a halogenating compound containing X.

5,596,094

PROCESS FOR PREPARING 2' -Θ- ALKYL ADENOSINE DERIVATIVES

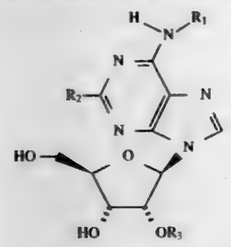
Mahavir Prashad, Hopatcong, and Prasad K. Kapa, Parsippany, both of N.J., assignors to Sandoz Ltd., Basle, Switzerland

Continuation-in-part of Ser. No. 249,914, May 26, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 485,595

Int. Cl.[6] C07H *1/00;19/167*

U.S. Cl. 536—55.3 **8 Claims**

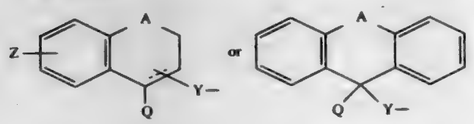
1. A process for the preparation of a compound of the formula



I

wherein

R_1 is hydrogen; (C_{1-4})alkyl; allyl; methallyl; straight-chain or branched (C_{3-7})alkynyl; (C_{3-8})cycloalkyl; phenyl mono- or independently disubstituted by halogen having an atomic number of 9 to 35, (C_{1-4})alkyl, (C_{1-4})alkoxy or CF_3; or phenyl(C_{1-4})alkyl wherein the phenyl ring is unsubstituted or mono- or independently di-substituted by halogen having an atomic number of 9 to 35, (C_{1-4})alkyl, (C_{1-4})alkoxy or CF_3; (C_{1-4}) alkyl substituted by at least two phenyl groups, naphthyl (C_{1-4})alkyl, acenaphthylenyl (C_{1-4}))alkyl or a group of the formula



wherein

Z=hydrogen or (C_{1-4})alkoxy,

Q=hydrogen,

A=$—CH_2—$, —O—, —S— or a direct bond,

Y=$—(CH_2)_n—$ or a direct bond,

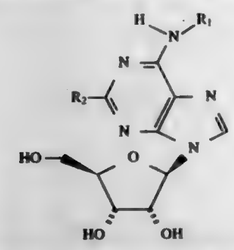
n=1–3,

and the broken line represents an optional bond,

R_2 is hydrogen, (C_{1-4})alkyl, amino, (C_{3-5})cycloalkyl or halogen with an atomic number of 9 to 35 and

R_3 is (C_{1-4}) alkyl,

which comprises reacting a compound of the formula



II

with a basic solution of a compound of the formula

$(R_3)_2SO_4$

in the presence of tetrabutylammonium hydrogen sulfate and a water-immiscible or essentially water-immiscible solvent in which the compound of formula (I) is soluble, isolating the product, and purifying the product by recrystallization.

5,596,095

FORMATION AND UTILITY OF SULFONIC ACID PROTECTING GROUPS

John C. Roberts, Newton, and Raymond J. Patch, Framingham, both of Mass., assignors to Precept, Inc., Cambridge, Mass.

Division of Ser. No. 353,832, Dec. 12, 1994. This application May 12, 1995, Ser. No. 440,547

Int. Cl.[6] C07D *501/60;* **A61K** *31/545*

U.S. Cl. 540—226 **11 Claims**

1. A method of increasing the bioavailability in an individual or animal of a drug having one or more sulfonic acid functional groups, comprising administering to the individual a therapeutically effective amount of the corresponding pro-drug having one or more substituted-neopentyl sulfonate esters wherein the substituent is a protected nucleophilic group that is capable of being deprotected in vivo; and

wherein the nucleophilic group is suitably situated so that after being deprotected it is capable of displacing the sulfonate group by internal nucleophilic attack at the ester carbon to which the sulfonate group is bonded.

5,596,096

AZETIDINONE DERIVATIVES AND METHOD FOR PRODUCING AZETIDINONE AND CEPHALOSOPORIN DERIVATIVES

Osamu Sakanaka; Shoubei Yasuda, both of Yokohama; Shinjiro Sumi, Odawara; Katsufumi Sebata, Yokohama; Katsuharu Iinuma, Yokohama, and Ken Nishihata, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

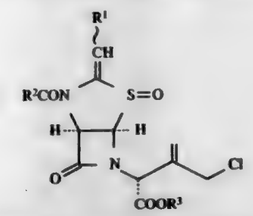
Continuation of Ser. No. 836,527, Feb. 18, 1992, abandoned, , which is a division of Ser. No. 836,527. This application Jul. 29, 1994, Ser. No. 282,005

Claims priority, application Japan, Feb. 20, 1991, 3-109904; Feb. 20, 1991, 3-109906

Int. Cl.[6] C07D *513/04*

U.S. Cl. 540—352 **5 Claims**

1. A thiazolidine azetidinone represented by the formula (1):



(1)

wherein R^1 is a member selected from the group consisting of a

substituted aryl group, an unsubstituted aryl group, a substituted aryloxy group and an unsubstituted aryloxy group; R^2CO is a carboxyl residue, and R^3 is member selected from the group consisting of hydrogen atom and carboxylic protective group.

5,596,097

HETERO-ANNULATED INDAZOLES

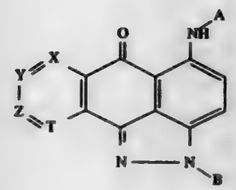
A. Paul Krapcho, Shelburne, Vt.; Ernesto Menta, Milan, Italy; Ambrogio Oliva, Varese, Italy, and Silvano Spinelli, Monza, Italy, assignors to The University of Vermont, Burlington, Vt., and Boehringer Mannheim Italia, S.p.A., Monza, Italy

Filed Mar. 8, 1994, Ser. No. 207,130

Int. Cl.[6] A61K 31/47; C07D 471/06

U.S. Cl. 544—125 **6 Claims**

1. A compound according to formula (I)



wherein:

Z is NO, X is C, Y is C and T is C;

P is selected from the group consisting of hydrogen, methyl, benzyl, 4-methoxybenzyl;

A and B are the same or different and are selected from the group consisting of C_1–C_{10} alkyl; C_2–C_{10} alkyl having one or two substituents selected from the group consisting of OR_1 and $—NR_2R_3$; C_2–C_{10} alkyl interrupted by one or two oxygen atoms or by one $—NR_4—$ group, and said C_2–C_{10} alkyl is optionally substituted by one or two hydroxy (OH) or $—NR_2R_3$ groups;

R_1 is selected from the group consisting of hydrogen, C_1–C_6 alkyl, $—S(O_2)R_5$, C_2–C_6 alkyl optionally substituted by $—NR_2R_3$;

R_2 and R_3 may be the same or different and are selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_2–C_{10} alkyl substituted with one or two hydroxy (OH) groups, or R_2 and R_3 taken together with the nitrogen atom to which they are bound form an N-morpholinyl group;

R_4 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_2–C_{10} hydroxyalkyl, C_2–C_{10} alkyl substituted with $—NR_2R_3$;

R_5 is selected from the group consisting of C_1–C_{10} alkyl, phenyl, phenylalkyl, as free bases and their salts with pharmaceutically acceptable acids.

5,596,098

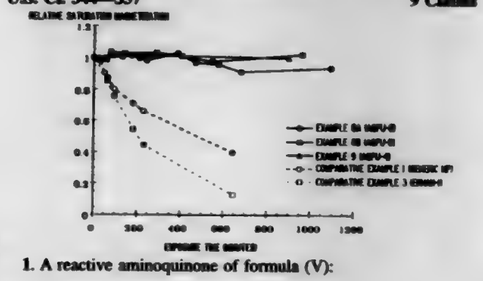
AMINO-QUINONES, AND THEIR USE IN PROVIDING CORROSION RESISTANCE TO METALS

David E. Nikles, and Jeng-Li Liang, both of Tuscaloosa, Ala., assignors to University of Alabama, Tuscaloosa, Ala.

Continuation-in-part of Ser. No. 19,917, Feb. 19, 1993, abandoned. This application Jul. 30, 1993, Ser. No. 101,535

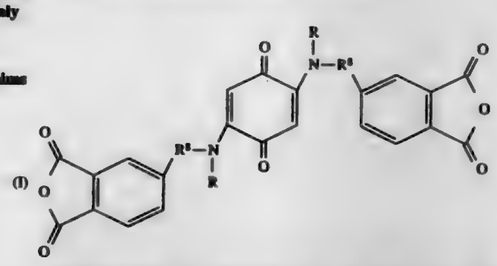
Int. Cl.[6] C07D 241/02

U.S. Cl. 544—357 **9 Claims**



1. A reactive aminoquinone of formula (V):

(V)



wherein R is hydrogen, branched, linear or cyclic C_1–C_6 alkyl, aralkyl, or phenyl which may be substituted by linear, branched or cyclic C_1–C_4 alkyl, $—NO_2$, F, OR^2 or NR^3_2 wherein R^2 and R^3 are linear, branched or cyclic C_1–C_6 alkyl, aralkyl or phenyl; and

R^8 is $—O—(CH_2)_n—$, phenoxy, phenylsulfonyl or a single bond, wherein n is an integer from 2 to 12.

5,596,099

PROCESS FOR THE PREPARATION OF N-(2-SULFATOETHYL)-PIPERAZINE IN HIGH PURITY

Michael Melzer, Frankfurt am Main, and Heinz-Georg Kantz, Bürstein, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 154,267, Nov. 18, 1993, abandoned. This application Mar. 15, 1995, Ser. No. 405,381

Claims priority, application Germany, Nov. 21, 1992, 42 39 183.0

The portion of the term of this patent subsequent to Mar. 15, 2015, has been disclaimed.

Int. Cl.[6] C07D 295/088

U.S. Cl. 544—398 **24 Claims**

1. A process for the preparation of N-(2-sulfato-ethyl)piperazine in high purity, which comprises reacting N-(2-hydroxyethyl)piperazine in a mixture of about 0.8 to about 3 parts by weight of about 95 to 100% strength sulfuric acid per part by weight of N-(2-hydroxyethyl)piperazine and oleum or chlorosulfonic acid at temperatures of from about 80° to about 250° C., transferring the resulting sulfonation mixture to a water-miscible aliphatic alcohol at a temperature not to exceed 45° C., isolating the N-(2-sulfatoethyl)piperazine sulfate formed, treating the N-(2-sulfatoethyl)piperazine sulfate, still moist with alcohol, at temperatures of from about 35° to about 90° C. with a basic compound in a mixture of a $(C_1$–$C_2)$-alkanol and water, separating off the precipitated sulfate of the basic compound employed, and isolating the N-(2-sulfatoethyl)piperazine formed by the addition of methanol and/or ethanol wherein the resulting sulfonation mixture is from about 2.0 to about 6.0 parts by weight of methanol or ethanol per part by weight of N-(2-hydroxyethyl)piperazine.

5,596,100

PALLADIUM CATALYZED ANNULATION OF INTERNAL ALKYNES

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

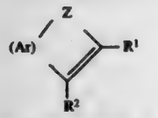
Filed Apr. 4, 1995, Ser. No. 416,461

Int. Cl.[6] C07D 217/00;307/77;311/02

U.S. Cl. 546—146 **20 Claims**

1. A process of preparing a compound of formula (2):

(2)



wherein R^1 and R^2 are individually $(C_1$–$C_6)$alkyl, $(C_6$–$C_{10})$aryl, CO_2R^5, CHO, $Si(R^3)_3$, 1-methyl(vinyl) or hydroxy$(C_1$–$C_6)$alkyl; Z is O, $—C(R^3)(R^4)O—$, $—C(R^3)(R^4)N(C(O)R^5)—$, $—CH(CO_2R^5)—$, $—C(R^3)(R^4)NH—$ or $—CH(NO_2)—$; wherein R^3 and R^4 are individually H, phenyl or $(C_1$–$C_4)$alkyl and R^5 is $(C_6$–$C_{10})$aryl or $(C_1$–$C_4)$alkyl; comprising reacting (a) an iodoaryl compound of formula (1):

(1)



wherein Y is OH or $C(R^3)(R^4)X$, and X is OH, NO_2, CO_2R^5, NH_2 or $NHC(O)R^5$, wherein R^5 is $(C_6$–$C_{10})$aryl or $(C_1$–$C_4)$alkyl; Ar is a substituted aryl or unsubstituted aryl moiety, and Y and I are positioned adjacent to each other on Ar; with (b) an internal alkyne of the formula $R^1C{\equiv}CR^2$, in the presence of an effective amount of a Pd catalyst, a base and a chloride ion source, in an organic solvent, to yield said compound of the formula (2).

5,596,101

N-SUBSTITUTED TRIFLUOROMETHYLPHENYLTETRAHYDROPYRIDINES, PROCESS FOR THE PREPARATION THEREOF, INTERMEDIATES IN SAID PROCESS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Umberto Gozzi; Costantino Palmieri, and Tiziano Croci, all of Milan, Italy, assignors to Sanofi, France

Division of Ser. No. 141,066, Oct. 26, 1993, Pat. No. 5,462,945, which is a continuation of Ser. No. 705,704, May 23, 1991, Pat. No. 5,281,606. This application May 31, 1995, Ser. No. 455,210

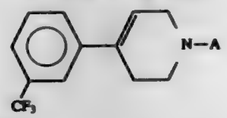
Claims priority, application France, May 23, 1990, 90 06474

Int. Cl.[6] C07D 211/74

U.S. Cl. 546—346 **2 Claims**

1. A process for the preparation of a compound of formula (I)

(I)



wherein

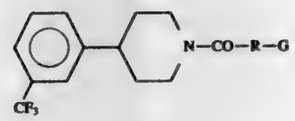
A represents a group —E—G, where

E is a group $—CH_2—R—$,

R is a straight or branched alkylene radical of from 1 to 3 carbon atoms,

G represents a radical selected from the group consisting of naphthyl mono-substituted with hydroxy or $(C_1$–$C_4)$ alkoxy; naphthyl di-substituted with hydroxy, $(C_1$–$C_4)$ alkoxy or $(C_1$–$C_4)$ alkyl; or naphthyl substituted with methylenedioxy, or one of its addition salts with mineral or organic acids, which comprises reducing the corresponding compound of formula (V)

(V)



wherein —R— and —G are as defined above; said process being further characterized in that

when a compound of formula (I) is obtained as the free base, it may be converted into an addition salt thereof,

when a compound of formula (I) is obtained as addition salt, it may be converted into the corresponding free base or into another addition salt,

when the compound of formula (I) is obtained wherein A represents a group —E—G wherein

G represents naphthyl substituted with one or two methoxy groups it may be converted into the corresponding compound wherein —G represents naphthyl substituted with one or two hydroxy groups by demethylation.

5,596,102

BIOCIDES

Peter W. Austin, Lancashire, England, assignor to Zeneca Limited, London, England

Continuation of Ser. No. 976,187, Nov. 13, 1992, abandoned, which is a division of Ser. No. 837,109, Feb. 18, 1992, Pat. No. 5,187,172, which is a continuation of Ser. No. 443,029, Dec. 1, 1989, abandoned, which is a continuation of Ser. No. 48,648, May 11, 1987, abandoned. This application Dec. 15, 1994, Ser. No. 357,140

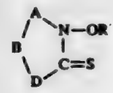
Claims priority, application United Kingdom, May 23, 1986, 8612630

Int. Cl.[6] C07F 3/06

U.S. Cl. 548—101 **7 Claims**

1. A metal complex of a compound of formula I

I



wherein the metal is copper or a metal of Group VIII or IIB of the Periodic Table,

A and B are independently selected from $—C(R^2)_2—$, $—CR^2=$ or $>C{=}NR^2$;

D is $—NR^2—$ or sulphur

R is hydrogen; and

R^2 is hydrogen, C_{1-6} hydrocarbyl, C_{1-6} hydrocarbyl substituted by halogen or two groups R^2

together with the carbon atom or carbon atoms to which they are attached form a 5- or 6-membered hydrocarbon ring system.

5,596,103

PROCESS FOR PREPARING BENZOPYRAN COMPOUNDS

Graham Johnson, Worthing; Neil Smith, Shoreham-by-Sea; Graham R. Geen, Stansted Mountfitchet; Inderjit S. Mann, Welling, all of England, and Vince Novack, Devon, Pa., assignors to SmithKline Beecham Plc, England

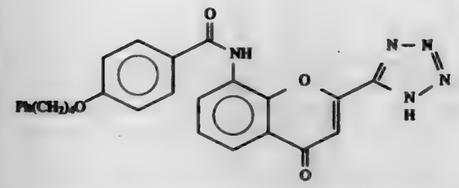
Filed May 26, 1995, Ser. No. 451,843

Claims priority, application United Kingdom, Nov. 27, 1992, 9224922

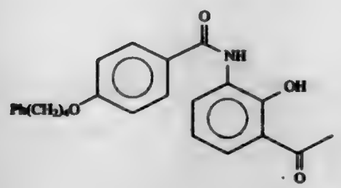
Int. Cl.[6] C07D *257/04;407/04*

U.S. Cl. 548—253 2 Claims

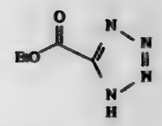
1. A process for preparing a compound of structure (IA):



or a salt, hydrate or solvate thereof, which comprises reacting a compound of structure (IIIA) with a compound of structure (IVA) or a salt thereof in an organic solvent in the presence of a base:

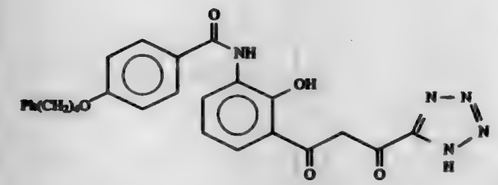


(IIIA)



(IVA)

followed by cyclisation of the intermediate compound of structure (IIA) in the presence of an acid or a Lewis acid in a compatible solvent



or a salt, hydrate or solvate thereof, so formed.

5,596,104

PREPARATION OF 3,4,6-TRIFLUOROPHTHALIC ACID

Neil J. O'Reilly, Grand Island; William S. Derwin, Buffalo; Henry C. Lin, Grand Island, and Deanne M. Nowak, Schenectady, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 653,554, Feb. 11, 1991, abandoned, and Ser. No. 847,620, Mar. 4, 1992, abandoned, which is a continuation of Ser. No. 589,929, Apr. 16, 1990, abandoned, said Ser. No. 653,554is a division of Ser. No. 315,746, Feb. 27, 1989, Pat. No. 5,047,553. This application Jun. 18, 1993, Ser. No. 77,750

Int. Cl.[6] C07D *209/48*

U.S. Cl. 548—480 21 Claims

1. A process for the preparation of 3,4,6-trifluorophthalic acid (IA) which comprises

A) reacting potassium fluoride with 3,4,6-trichloro-N-R-phthalimide at a temperature of about 200° to 270° Celsius under anhydrous conditions and in the absence of a catalyst to form 3,4,6-trifluoro-N-R-phthalimide wherein R is the same in each instance and is selected from the group consisting of C_{1-12} alkyl, phenyl, C_{1-12} monoalkyl phenyl, naphthyl and C_{1-12} monoalkyl naphthyl, and

B) hydrolyzing the 3,4,6-trifluoro-N-R-phthalimide to form 3,4,6-trifluorophthalic acid.

5,596,105

THERAPEUTICALLY ACTIVE NAPHTHALENESULFONIC PYRROLECARBOXAMIDO DERIVATIVES

Nicola Mongelli, Milan; Giovanni Bianoli, Gavirate; Maria Grandi, Reggio Emilia; Marina Clemasi, Terre d'Isola, and Maria C. Gerosi, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.r.L., Milan, Italy

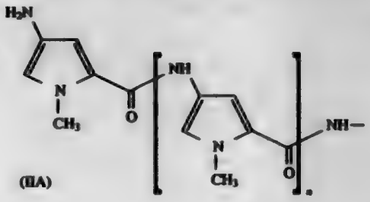
Continuation of Ser. No. 97,015, Jul. 27, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,872

Claims priority, application United Kingdom, Aug. 11, 1992, 9216962

Int. Cl.[6] C07D *207/36*

U.S. Cl. 548—518 2 Claims

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier or diluent and, as an active principle, a naphthalenesulfonic-pyrrolecarboxamide derivative of formula (I)



(I)



(IIA)

wherein n is zero or an integer of 1 to 3, R is a sulfonic acid residue and m is an integer of 1 to 3; or a pharmaceutically acceptable salt thereof.

5,596,106

CANNABINOID RECEPTOR ANTAGONISTS

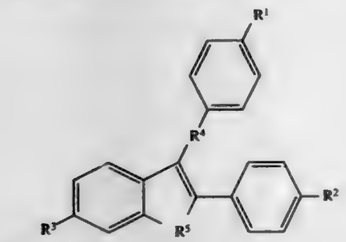
George J. Cullinan, Trafalgar; Keenan J. Fahey, and Gary A. Koppel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 275,895, Jul. 15, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 477,964

Int. Cl.[6] C07D *333/56;307/80;333/62*

U.S. Cl. 549—57 5 Claims

1. A compound of the formula:



Wherein
R^1 is cyano;
R^2 and R^3 are each individually, C_1–C_4 alkyl or C_1–C_4 alkoxy;
R^4 is carbonyl; and
R^5 is oxygen or sulfur.

5,596,107

HYDROXYMETHYPOLYTHIOPHENE DERIVATIVES

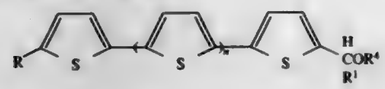
Ching-Te Chang; Chen-Tao Lee, both of Taipei, and Fuang-Lan Lin, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Division of Ser. No. 71,695, Jun. 4, 1993, Pat. No. 5,508,440. This application Jun. 2, 1995, Ser. No. 460,075

Int. Cl.[6] C07D *409/14;* A61K *31/38*

U.S. Cl. 549—59 13 Claims

1. A compound of the formula:



in which
n is 1 or 2;
R is $-CH(O-Z)_2$, or $-COR^3$;
R^1 is H, C_{1-6} alkyl, C_{2-6} alkenyl, C_{1-6} alkoxy, or C_{1-6} acyloxy;
each R^2 and R^4, independently, is H, C_{1-6} alkyl, C_{2-6} alkenyl, C_{1-6} hydroxyalkyl, C_{2-6} alkoxyalkyl, tetrahydropyranyl, C_{1-6} acyl, or -CO-Y-COOH; and
R^3 is H,
wherein Z is C_{1-6} alkyl, C_{2-6} alkenyl, or C_{1-6} acyl; and Y is C_{1-6} alkylidene, C_{2-6} alkenylidene, or phenylene; or a salt or an ester thereof.

5,596,108

PROCESS FOR THE PREPARATION OF 16β-METHYLSTEROIDS

Catherine Geurts, Betz, and Michel Vivat, Lagny sur Marne, both of France, assignors to Roussel Uclaf, France

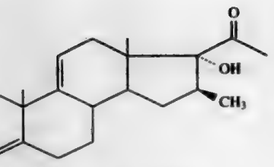
Filed May 18, 1995, Ser. No. 444,229

Claims priority, application France, Jun. 2, 1994, 94 06743

Int. Cl.[6] C07J *75/00*

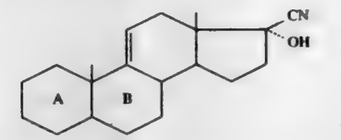
U.S. Cl. 552—596 8 Claims

1. A process for the preparation of a 16β-methyl-steroid of the formula



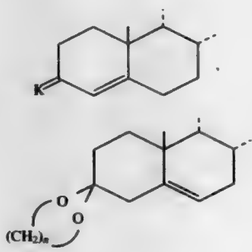
I

comprises reacting a compound of the formula

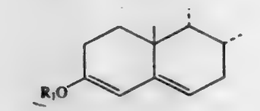


II

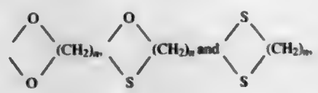
in which rings A and B are a remainder selected from the group consisting of



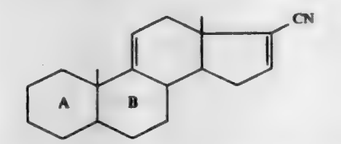
and



wherein K is oxo or a protector group of an oxo selected from the group consisting of



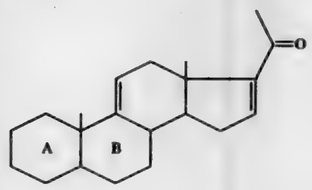
n is 2 or 3 and R_1 is an ether or ester residue with a dehydration agent to obtain a compound of the formula



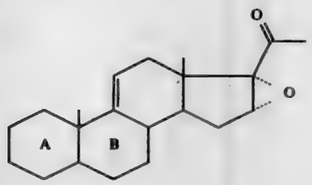
III

in which A and B have the above meaning, which, when K is oxo, is reacted with a suitable blocking agent of oxo to obtain the

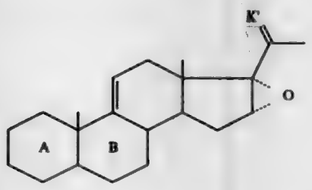
corresponding compound of formula III, in which K has values other than oxo as defined above, reacting the compound of formula III with an organometallic methylation agent to obtain after hydrolysis of the intermediate imine, a methyl ketone of the formula



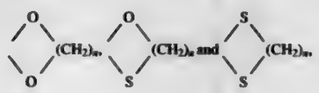
reacting the latter in a basic medium with an epoxidation agent to obtain a compound of the formula



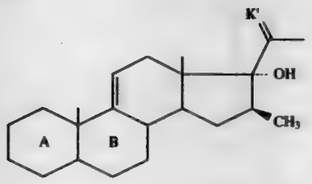
protecting the 20-keto function to obtain a compound of the formula



in which K' is a protector group of the ketone selected from the group consisting of



n being defined as previously, reacting the latter with an organometallic methylation agent to obtain the 16β-methyl derivative of the formula



unblocking the ketone functions in the 3- and 20- positions to obtain the product of formula I.

5,596,109

N-T-BUTYL-ANDROST-3,5-DIENE-17β-CARBOXAMIDE-3-CARBOXYLIC ACID POLYMORPH A

Neil H. Baine, Merion, Pa.; Neville L. Holder, Cherry Hill, N.J.; Donald N. Klein, Phoenixville, Pa.; Robert L. Webb, West Chester, Pa., and Gary E. Zuber, Audubon, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

PCT No. PCT/US93/02974, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO93/19081, PCT Pub. Date Sep. 30, 1993

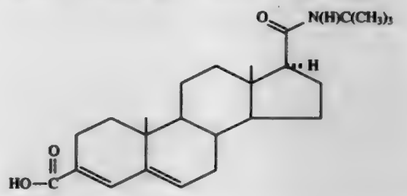
PCT Filed Mar. 24, 1993, Ser. No. 307,680

Claims priority, application United Kingdom, Mar. 24, 1992, 9206413

Int. Cl.[6] C07J *75/00*

U.S. Cl. 552—610 **5 Claims**

1. A process for preparing a compound of the structure



substantially in the polymorph A form, which comprises triturating, crystallizing or precipitating crude N-t-butyl-androst- 3,5-diene-17β-carboxamide-3-carboxylic acid from a solvent consisting of or primarily consisting of ethyl acetate or from a solvent consisting of or primarily consisting of t-butyl methyl ether with subsequent isolation of said polymorph.

5,596,110

PROCESS FOR THE PREPARATION OF 3 β, 14 β-DIHYDROXYETHIANALDEHYDE

Mauro Gobbini, Mercallo, and Marco Torri, Rho, both of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

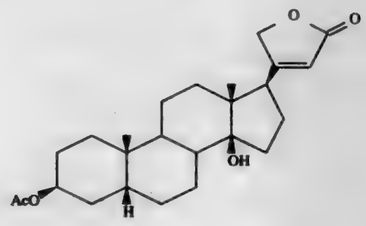
Filed Mar. 16, 1995, Ser. No. 405,354

Claims priority, application Italy, May 26, 1994, RM94A0330

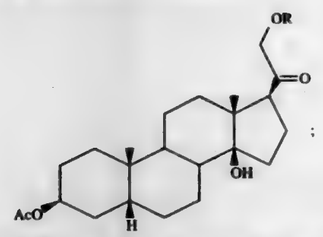
Int. Cl.[6] C07J *75/00;3/00*

U.S. Cl. 552—610 **2 Claims**

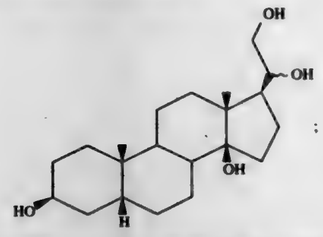
1. In a process for the production of 13β,14β-dihydroxyethianaldehyde comprising the steps of (a) oxidizing the α,β-unsaturated lactone ring of digitoxigenin 3-acetate of formula A



to obtain the keto derivative of formula B



(b) reducing the keto derivative of formula B with sodium borohydride and then hydrolyzing the 3 position and 21 position ester groups to obtain a tetrol of formula C



and (c) oxidizing the tetrol of formula C with an alkaline periodate to obtain said 13β,14β-dihydroxyethianaldehyde, the improvement comprising carrying out the oxidation of step (a) by reaction at room temperature with an alkaline periodate in the presence of a catalytic amount of ruthenium tetroxide which is formed in situ from RuO_2 hydrate or $RuCl_3$ hydrate.

5,596,111

METHOD FOR PREPARATION OF CARBOXYLIC ACIDS

Mukund P. Sibi; Philip Boudjouk, and Jiangao Ji, all of Fargo, N. Dak., assignors to North Dakota State University, Fargo, N. Dak.

Filed Jun. 5, 1995, Ser. No. 465,400

Int. Cl.[6] C07C *51/16*

U.S. Cl. 554—138 **20 Claims**

1. A method for preparing a carboxylic acid comprising:

contacting an olefinic compound with oxygen in the presence of a protic organic solvent, an inorganic oxide catalyst and a peroxidant;

the inorganic oxide catalyst including an oxide of tungsten, molybdenum, niobium, vanadium, tantalum, titanium, or yttrium;

the peroxidant including hydrogen peroxide or a peralkanoic acid;

and wherein the molar ratio of the peroxidant to the olefinic compound is from about 1:1 to about 2:1.

5,596,112

Patent Not Issued For This Number

5,596,113

RUTHENIUM-PHOSPHINE COMPLEX CATALYSTS FOR ASYMMETRIC HYDROGENATIONS

Alan W. Douglas, Monmouth Junction; Lisa DiMichele, Plainfield; Steven A. King, Summit, and Thomas R. Verhoeven, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 177,481, Jan. 5, 1994, Pat. No. 5,508,435, which is a continuation-in-part of Ser. No. 922,355, Jul. 13, 1992, abandoned. This application May 18, 1995, Ser. No. 443,614

Int. Cl.[6] C07F *15/00*

U.S. Cl. 556—14 **3 Claims**

1. A compound of structural formula:



wherein:



represents 2,2'-bis(diphenylphosphino)-1,1'-binaphthyl or 2,2'-bis(di-p-tolylphosphino)-1,1'-binaphthyl.

5,596,114

CHIRAL PHOSPHOLANES VIA CHIRAL 1 4-DIOL CYCLIC SULFATES

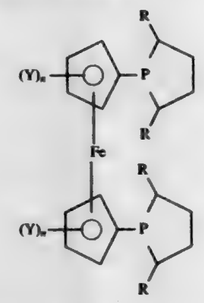
Mark J. Burk, Heckesia, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 324,329, Oct. 17, 1994, abandoned, which is a division of Ser. No. 222,758, Apr. 4, 1994, Pat. No. 5,386,061, which is a division of Ser. No. 978,215, Jul. 27, 1992, Pat. No. 5,329,015, which is a division of Ser. No. 725,121, Jul. 2, 1991, Pat. No. 5,171,892. This application May 24, 1995, Ser. No. 449,439

Int. Cl.[6] C07F *9/50*

U.S. Cl. 556—22 **5 Claims**

1. A chiral ligand of formula Vc:



wherein:

R is a radical selected from the group consisting of alkyl, fluoroalkyl or perfluoroalkyl, each containing up to about 8 carbon atoms; aryl; aralkyl; or $—CR'_2(CR'_2)_qX(CR'_2)_pR'$;

q and p are each integers, the same or different, ranging from 1 to about 8;

R' is H; F; aryl; or alkyl, fluoroalkyl or perfluoroalkyl, each containing up to about 8 carbon atoms;

X is O, S, NR", PR", divalent aryl, or divalent fused aryl;

R" is hydrogen; alkyl, fluoroalkyl or perfluoroalkyl, each containing up to about 8 carbon atoms; aryl; aralkyl; or $—CR'_2(CR'_2)_qZ(CR'_2)_pR'$;

Z is O, S, NR', or PR'; and

each Y is independently hydrogen, halogen, alkyl, alkoxy, aryl, aryloxy, nitro, amino, vinyl, substituted vinyl, alkynyl or sulfonic acid, and n is an integer from 1 to 6 equal to the number of unsubstituted aromatic ring carbons.

5,596,115

COMPOUNDS OF RHENIUM AND ALUMINIUM, PREPARATION THEREOF AND USE THEREOF AS CATALYSTS

Dominique Commereuc, Meudon, France, assignor to Institut Francais Du Petrole, France

Filed Nov. 6, 1995, Ser. No. 554,352

Claims priority, application France, Nov. 4, 1994, 94 13348

Int. Cl.[6] C07F *13/00;5/06*

U.S. Cl. 556—27 **20 Claims**

1. A compound of rhenium and aluminium of the general formula:

$$O_3Re—O—[Al(OR)(L)_x—O]_n—ReO_3$$

wherein R is a hydrocarbyl residue containing from 1 to 40 carbon atoms, n is an integer of from 1 to 10, x is equal to 0 or 1 and L represents the synthesis solvent.

18. A stable compound of rhenium and aluminium of the general formula:

$$O_3Re(L')—O—[Al(OR)(L)_x—O]_n—ReO_3(L')$$

wherein R is a hydrocarbyl residue containing from 1 to 40 carbon atoms, n is an integer of from 1 to 10, x is equal to 0 or 1, L representing the synthesis solvent, and L' is a stabilising ligand selected from the group formed by the compounds comprising at least atom of oxygen, sulphur, nitrogen, phosphorous or arsenic.

5,596,116

PROCESS FOR THE PREPARATION OF SILANE POLYSULFIDES

Thomas E. Childress, Newport, and Mark P. Bowman, Marietta, both of Ohio, assignors to OSi Specialties, Inc., Tarrytown, N.Y.

Filed Sep. 11, 1995, Ser. No. 526,272

Int. Cl.[6] C08F *7/08*

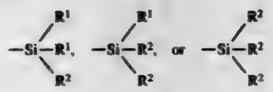
U.S. Cl. 556—427 **16 Claims**

1. A process for the preparation of silane polysulfides without the use of hydrogen sulfide comprising:

(a) obtaining an intermediate product by reacting a metal alkoxide in alcohol with elemental sulfur, or by reacting sodium metal with elemental sulfur and an alcohol, and

(b) reacting the intermediate product of step (a) with a halohydrocarbylalkoxysilane of the formula Q—R—X

in which Q is



and in which

R^1 is an alkyl group of 1 to 4 carbon atoms or phenyl, and

R^2 is an alkoxy group with 1 to 8, preferably 1 to 4, carbon atoms,

a cycloalkoxy group including 5 to 8 carbon atoms, or a straight or branched chain alkylmercapto group with 1 to 8 carbon atoms,

wherein the various R^1 and R^2 groups can be the same or different,

R is a divalent hydrocarbyl group including 1 to 18 carbon atoms, and

X is a halogen,

to produce a compound of of the formula Q—R—S_n—R—Q in which Q and R are as defined above, and n is an integer of from 1 to 9.

5,596,117

PREPARATION PROCESS OF ORGANO SILICON COMPOUNDS AND PRODUCTION PROCESS OF SILICON

Masayoshi Itoh, Yokohama; Ryo Takeuchi, Kamakura; Kenji Iwata, and Mineo Kobayashi, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

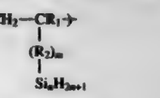
Division of Ser. No. 147,425, Nov. 19, 1993, abandoned, which is a continuation of Ser. No. 585,275, Sep. 19, 1990, abandoned, which is a continuation of Ser. No. 254,940, Aug. 22, 1988, abandoned. This application Feb. 3, 1995, Ser. No. 383,712

Claims priority, application Japan, Jan. 28, 1987, 62-015929; Feb. 16, 1987, 62-031514; Feb. 20, 1987, 62-035696; Apr. 13, 1987, 62-088871; Apr. 14, 1987, 62-089888; Apr. 22, 1987, 62-097417; Apr. 23, 1987, 62-098698; Dec. 7, 1987, 62-307491; Dec. 7, 1987, 62-307492; Dec. 7, 1987, 62-307493

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—430 **2 Claims**

1. A high molecular weight compound containing recurring structural units represented by the following formula:



wherein m is 0 or a positive integer of 1 to 20, n stands for 2 or 3, R_1 means hydrogen, an alkyl group, an aryl group or a halogen, R_2 denotes an alkylene or phenylene group, and R_1 and R_2 may contain one or more functional groups selected from the group consisting of COOH, NH_2, Cl and OH.

5,596,118

METHOD FOR THE PREPARATION OF ORGANOXY-FUNCTIONAL SILANES

Taka Koyama, and Yasushi Segiura, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1995, Ser. No. 564,767

Claims priority, application Japan, Nov. 29, 1994, 6-319104; Nov. 29, 1994, 6-319105

Int. Cl.[6] C07F *7/08;7/18*

U.S. Cl. 556—471 **11 Claims**

1. A method for the preparation of organoxy-functional silanes having the following general formula

$$R_aSi(OR^2)_{(4-a)}$$

wherein each R is a monovalent hydrocarbon radical, which R groups may be the same or different, R^2 is a substituted or unsubstituted monovalent hydrocarbon radical, and a is an integer with a value from 0 to 3, said method comprising the step of reacting:

(A) a halosilane having the general formula $R_1SiX_{(4-a)}$ wherein R and a are defined as above and X is a halogen atom; and

(B) a hydroxy compound having the general formula R^2OH wherein R^2 is defined as above; said reacting step being carried out in the presence of

(C) a polymer which includes carbon-bonded fluorine.

5,596,119

METHOD FOR CONTROLLING THE DIRECT PROCESS PRODUCT DISTRIBUTION

Roland L. Halm, Midland, Mich.; Charles S. Kuivila, Crestwood, and Oliver K. Wilding, Lagrange, both of Ky., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 5, 1995, Ser. No. 567,652

Int. Cl.[6] C07F *7/16*

U.S. Cl. 556—472 **17 Claims**

1. A process for making alkylhalosilanes, the process comprising:

contacting an alkyl halide with silicon metalloid in the presence of a catalyst comprising 0.5 to 10 weight percent copper, 5 to 200 ppm tin, 25 to 2,500 ppm phosphorous, and greater than zero to less than 50 ppm zinc, were the concentration of each of the catalyst components is based on the weight of the silicon, at a temperature within a range of about 250° C. to 400° C.

5,596,120

PROCESS FOR PREPARATION OF ORGANOSILANES

Howard M. Bank, Freeland, and Binh T. Nguyen, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 23, 1995, Ser. No. 546,883

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—480 **20 Claims**

1. A one-step process for preparation of organosilanes, the process comprising contacting magnesium metal with a mixture comprising an organic halide described by formula

R^1X,

a halosilane described by formula

$R^2_aH_bSiX_{4-a-b}$,

and a co-solvent comprising one to 15 moles of a dialkyl ether comprising less than seven carbon atoms, per mole of the organic halide, and about 0.05 to two moles of a liquid aromatic hydrocarbon solvent per mole of the dialkyl ether; at a temperature within a range of about 5° C. to 200° C.; where each R^1 and R^2 is an independently selected hydrocarbon group comprising one to about 12 carbon atoms, a=0 to 3, b=0 to 3, a+b=0 to 3, and X is selected from a group consisting of chlorine and bromine atoms.

5,596,121

Patent Not Issued For This Number

5,596,122

USE OF DISULFONYL METHANES FOR THE CONTROL OF PARASITES

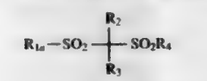
David L. Wickiser, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 156,123, Nov. 22, 1993, Pat. No. 5,449,681, which is a continuation-in-part of Ser. No. 998,426, Dec. 30, 1992, abandoned. This application Apr. 25, 1995, Ser. No. 429,270

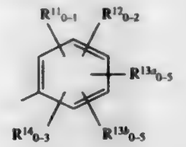
Int. Cl.[6] C07C *309/29;309/31*

U.S. Cl. 558—56 **5 Claims**

1. A compound of the formula:



wherein R_{1a} is a moiety of the formula:



wherein R^{11} is cyano;

R^{12} is nitro, isocyano, C_2 to C_4 alkanoyl, C_2 to C_4 perfluoroalkanoyl, 2,2,3,3-tetrafluoropropionyl, —N(hydrogen or C_1 to C_3 alkyl)SO_2CF_3, or —N=C(alkyl of C_1 to C_2, perfluoroalkyl of C_1 to C_2, or 1,1,2,2-tetrafluoroethyl, each independently selected)$_2$;

R^{13a} is chloro;

R^{13b} is bromo or fluoro;

R^{14} is iodo or a group of the formula

$$—R^{15}{}_n—R^{16}$$

wherein n represents 0 or 1, and wherein

R^{15} represents

—O—

—S—

—SO—

—SO_2—,

—OSO_2—, or, only when R^{16} represents —CH_3, —SO_2O—, and

R^{16} represents

—CF_3,

—CF_2CF_2H,

—CH_2CF_3,

—C_2F_5, or, —CH_3, provided that when R^{16} represents —CH_3, n is 1 and R^{15} is —SO—, —SO_2—, —OSO_2—, or —SO_2O—;

R_2 is hydrogen, halogen, C_1 to C_3 alkyl, benzyl, or C_2 to C_3 alkenyl;

R_3 is hydrogen or halogen; and

R_4 is a C_1–C_4 perfluoroalkyl or 1,1,2,2-tetrafluoroalkyl;

with the following limitations:

a) R_{1a} contains at least one substituent,

b) When R_{1a} contains one or more R^{11}, R^{12}, or R^{14} substituents, the total number of substituents on R_{1a} is not more than 3, and

c) If R_{1a} contains only one R^{12} substituent, R_{1a} is either polysubstituted or is substituted at either the ortho- or meta-position, and

d) If R_{1a} contains only one R^{13a} substituent, R_{1a} is either polysubstituted or substituted at either the ortho- or meta-position;

or a physiologically acceptable salt thereof.

5,596,123

BORIC ESTER SYNTHESIS

Said M. A. Elgendy, London; John J. Dondoni, Sutton; Geeta Patel, London; Donovan S. Green, London; Jehan A. Baban, London; Vijay V. Kakkar, Bickley, all of Great Britain, and Goran K. Clarson, Pelham, Mass., assignors to Thrombosis Research Institute, London, United Kingdom

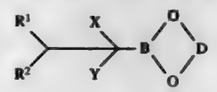
Continuation of Ser. No. 157,947, Nov. 23, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,551

Claims priority, application United Kingdom, Nov. 25, 1992, 9224702

Int. Cl.[6] C07F 5/02

U.S. Cl. 558—288 20 Claims

1. A process for preparing a compound of the formula:



wherein:

(i) R^1 and R^2 are the same or different and are each independently selected from any of the following groups:

(a) $-(CH_2)_nG^1$ where G^1 is H or halogen and n is an integer from 1 to 5;

(b) $-(CH_2)_nAvg^1$, where G^1 is H or halogen and n is an integer from 0 to 5 and Ar is phenyl, thienyl, pyridyl, naphthyl, thionaphthyl, quinoiyl, chromenyl, indolyl or wholly saturated groups corresponding to any of these, any of the aforegoing groups optionally being substituted with up to 3 groups selected from C_1–C_3 alkyl and C_1–C_3 alkoxy and optionally being bonded to G^1 through a sulpbonyl group;

(c) C_3–C_9 alkyl;

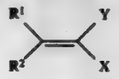
(d) C_5–C_{10} aryl or alkylaryl —where any of said alkyl, aryl or alkylaryl groups are optionally substituted with up to 3 groups selected from —OH and C_1–C_6 alkoxy; or

R^1 and R^2 are as defined above but are linked together to form a cyclic structure;

(ii) X is halogen or other leaving group;

(iii) Y is H or an alkyl group; and

(iv) —O—D—O— is the residue of a diol or dithiol, the process comprising reacting a substituted alkene of the formula



where R^1, R^2, X and Y are as defined above, with a disubstituted borane of the formula



wherein Q^1 and Q^2 together form the residue of a diol or dithiol, the substituted alkene and disubstituted borane being reacted at a temperature of at least 60° C. or in the presence of a catalyst which is a complex of any of the following formulae:

(i) $RhCl(CO)_x[E(C_6H_5)_3]_{3-x}$,

wherein E is arsenic or phosphorus and x is 0 or 1,

(ii) $[RhCl(alkene)_2]_2$

(iii) $[(C_6H_5)_3P]_3Ru(CO)ClH$ or

(iv) $[(C_6H_5)_3P]_3RuCl_2$.

5,596,124

METHOD FOR SAFENING HERBICIDES IN CEREAL CROPS USING 5-ARYLOXY-1,2-(DISUBSTITUTED)BENZENE COMPOUNDS

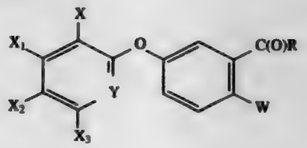
Gail E. Cary, Lawrenceville; Peter J. Wepple, Princeton, both of N.J., and Barbara A. Bench, Providence, R.I., assignors to American Cyanamid Company, Madison, N.J.

Filed Dec. 9, 1994, Ser. No. 353,829

Int. Cl.[6] C07L 9/76

U.S. Cl. 560—61 20 Claims

1. A method for protecting cereal crops from injury caused by a herbicidally effective amount of a herbicide which comprises applying to the cereal crop plant, the seed of the cereal crop, or the soil or water surrounding the cereal crop or cereal crop seed an effective antidotal amount of a safener compound having the structural formula

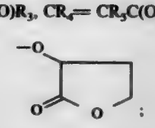


wherein

Y is N or CX_4;

X, X_1, X_2, X_3 and X_4 are each independently hydrogen, halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy or C_1–C_4haloalkoxy;

W is $O(CR_1R_2)_nC(O)R_3$, $CR_4{=}CR_5C(O)R_6$ or



R_2, R_4 and R_5 are each independently hydrogen, halogen or C_1–C_4alkyl;

n is an integer of 1, 2, 3 or 4; or

when R_1 and R_2 are not the same, the optical isomers thereof.

R, R_3 and R_6 are each independently OR_7 or R_8;

R_7 is hydrogen, C_1–C_4alkyl, C_2– C_6alkenyl, C_2–C_6alkynyl, furfuryl,

benzyl optionally substituted with one or more halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_6alkoxy or C_1–C_4 haloalkoxy groups, or

an alkali metal, alkaline earth metal, manganese, copper, zinc, cobalt, silver, nickel, ammonium or organic ammonium cation;

R_8 is hydrogen, C_1–C_4alkyl, C_2– C_6alkenyl, C_2–C_6alkynyl,

phenyl optionally substituted with one or more halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_6alkoxy or C_1–C_4 haloalkoxy groups, or

benzyl optionally substituted with one or more halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_6alkoxy or C_1–C_4 haloalkoxy groups;

R_1 is hydrogen, halogen,

phenyl optionally substituted with one or more halogen, nitro, cyano, C_1–C_6alkyl, C_1– C_6haloalkyl, C_1–C_6alkoxy or C_1–C_4haloalkoxy groups, or

C_1–C_{12}alkyl optionally substituted with phenyl optionally substituted with one or more halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy or C_1–C_4 haloalkoxy groups;

5,596,125

PROCESS FOR THE PREPARATION OF QUATERNARY DIESTERS

Burkhard Wenzke, Gummersbach; Hans J. Weinsen, Kreuzau, and Andreas G. Fischer, Jülich, all of Germany, assignors to Akzo Nobel nv, Arnhem, Netherlands

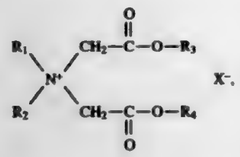
Filed Aug. 25, 1995, Ser. No. 519,558

Claims priority, application European Pat. Off., Aug. 29, 1994, 94202451

Int. Cl.[6] C07C 229/00

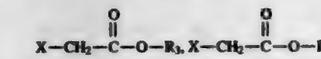
U.S. Cl. 560—171 12 Claims

1. A process for the preparation of quaternary diesters of the formula:



wherein X^- is a halogen, R_1 and R_2 are the same or different and are selected from an alkyl group having 1 to 3 carbon atoms, a hydroxyethyl group, or may be linked together to form an alkylene group having 4 to 6 carbon atoms which may be interrupted by an N atom or O atom, and R_3 and R_4 are the same or different and are selected from an alkyl group or alkenyl group having 8 to 22 carbon atoms, or be linked together to form an alk(en)ylene group having 8 to 22 carbon atoms, wherein said process comprises

a) gradually adding a secondary amine of the formula R_1—NH—R_2 to one or more liquid compounds of the formula



or mixtures thereof at a molar ratio of from about 1.0:1.0 to 1.0:1.2, in order to form solid amine hydrohalide,

b) separating the formed solid amine hydrohalide from the reaction mixture,

c) and further subjecting said solid amine hydrohalide to an aftertreatment, at elevated temperature, until the conversion is substantially complete, and the quaternary diester product is obtained.

5,596,126

CATALYTIC PREPARATION OF SEC-BUTYL ACRYLATE

Alain Riondel, Forbach, France, assignor to Elf Atochem S.A., France

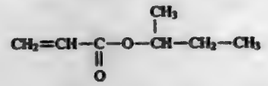
Filed Apr. 17, 1995, Ser. No. 422,957

Claims priority, application France, Apr. 15, 1994, 94 04525

Int. Cl.[6] C07C 69/52

U.S. Cl. 560—205 8 Claims

1. In a process for preparing sec-butyl acrylate of the formula



comprising reacting acrylic acid of the formula

with 1-butene of the formula

CH_2=CH–CH_2–CH_3

2-butene of the formula

CH_3–CH=CH–CH_3 or a mixture thereof

in the presence of a catalytic amount of an acid catalyst, the improvement wherein said catalyst consists essentially of a zirconium-based solid superacid.

5,596,127

PROCESS FOR THE CONTINUOUS PREPARATION OF TERPENE ESTERS

Manfred Gerheidmeier, Geblingen; Rudolf Gutmann, Gerstheim; Jakob Wiemüller, Stettenhofen, and Alfred Riedel, Stadtbergen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jun. 5, 1995, Ser. No. 462,701

Claims priority, application Germany, Jun. 6, 1994, 44 19 686.5

Int. Cl.[6] C07C 9/52;7/02

U.S. Cl. 560—220 9 Claims

1. A process for preparing terpene esters by reaction of $C_{10}H_{16}$-terpenes and a low molecular weight carboxylic acid over an acid ion exchanger as catalyst, which comprises carrying out the reaction at a molar ratio of terpene to carboxylic acid of from 0.2:1 to 2:1 and a temperature of from 25° to 60° C., with the reactants being passed from below through the acid ion exchanger located in a column-shaped reactor at such a velocity that the ion exchanger is suspended essentially to uniformly fill the reactor.

5,596,128

SULFONATING AGENT AND SULFONATION PROCESS

Eiji Ogata; Norio Yamane, both of Wakayama, and Takayuki Kitahara, Naga-gun, all of Japan, assignors to Konishi Chemical Ind. Co., Ltd., Wakayama, Japan

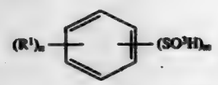
Continuation of Ser. No. 852,199, Jun. 3, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,844

Claims priority, application Japan, Oct. 12, 1990, 2-273725

Int. Cl.[6] C07C 303/02

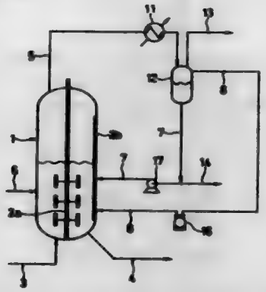
U.S. Cl. 562—95 12 Claims

1. A process for sulfonating an aromatic compound characterized in that the aromatic compound is sulfonated with an anhydrous sulfonating agent in the absence of a catalyst and in an organic solvent selected from the group consisting of halogenated aliphatic hydrocarbons, halogenated aromatic hydrocarbons, nitro compounds, straight-chain aliphatic saturated hydrocarbons, branched-chain aliphatic saturated hydrocarbons and cyclic aliphatic saturated hydrocarbons; said sulfonating agent represented by the general formula



wherein the groups R^1 are the same or different and are each a lower alkyl group having 1 to 3 carbon atoms, n is an integer of 3, 4 or 5, m is an integer of 1 or 2 and n+m≦6.

5,596,129
PROCESS AND APPARATUS FOR PRODUCING AROMATIC CARBOXYLIC ACID
Norio Murashige; Etsuro Okamoto, and Shizu Suzuki, all of Kaga-Gun, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Mar. 22, 1995, Ser. No. 409,085
Claims priority, application Japan, Mar. 22, 1994, 6-050396; Apr. 1, 1994, 6-065302
Int. Cl.[6] C07C *51/215*
U.S. Cl. 562—414 **8 Claims**



1. A process for producing an aromatic carboxylic acid by a liquid phase oxidation of an alkylbenzene with a molecular oxygen-containing gas in a solvent containing a lower aliphatic carboxylic acid, comprising
supplying the alkylbenzene and the solvent to a reactor,
supplying, as the molecular oxygen-containing gas, a high oxygen content gas containing molecular oxygen at a concentration of 23–100 volume % to the reactor,
circulating a part of the reactor exhaust gas to the liquid layer in the reactor and
thereby oxidizing the alkylbenzene to the aromatic carboxylic acid.

5,596,130
METHODS AND COMPOSITIONS FOR REDUCING FOULING DEPOSIT FORMATION IN JET ENGINES
Bruce E. Wright, The Woodlands; William L. Wittig, Montgomery; Alan E. Gollnerowski, The Woodlands, all of Tex.; William S. Carey, Ridley Park, and Jeffrey H. Pabley; King of Prussia, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Continuation-in-part of Ser. No. 368,076, Jan. 3, 1995, which is a continuation-in-part of Ser. No. 230,031, Apr. 19, 1994, abandoned. This application Oct. 25, 1995, Ser. No. 548,110
Int. Cl.[6] C10L *1/10;10/00*
U.S. Cl. 585—3 **27 Claims**

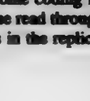
1. A method for cleaning and inhibiting fouling deposit formation on jet engine component surfaces during the combustion of turbine combustion fuel oils comprising adding to said combustion fuel oils an effective inhibiting amount of a derivative of (thio-)phosphonic acid having the formula:

$$R_1-\overset{\overset{X}{\|}}{P}-R_2$$

wherein R_1 is C_1 to C_{200} alkyl or alkenyl radical; X is the same or different and is S or O or mixtures thereof; and R_2 has the structure:

$$\begin{matrix} OR_3 \\ \diagup \\ \\ \diagdown \\ OR_4 \end{matrix}$$

wherein R_3 and R_4 are the same or different and are H, substituted or non-substituted C_1 to C_{50} alkyl or alkenyl radical; or R_2 has the structure



wherein R_5 is a substituted or non-substituted C_1 to C_{50} alkenyl radical.

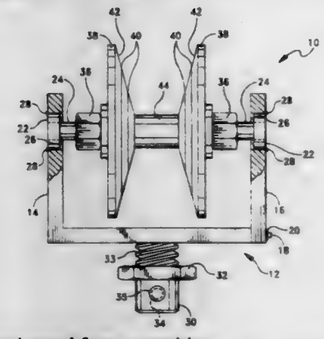
5,596,131
REGENERATION OF GRAMINACEOUS PLANTS OF THE SUBFAMILY POOIDEAE FROM PROTOPLASTS
Michael E. Horn, Woodland, Calif.; Christian T. Harms, and Raymond D. Shillito, both of Chapel Hill, N.C., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.
Continuation of Ser. No. 271,226, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 56,965, May 3, 1993, abandoned, which is a continuation of Ser. No. 611,371, Nov. 13, 1990, abandoned, which is a continuation of Ser. No. 165,665, Mar. 8, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 486,059
Int. Cl.[6] A01H *4/00;* C12N *5/14*
U.S. Cl. 800—205 **13 Claims**

9. Graminaceous plants selected from the group consisting of *Dactylis glomerata* and wheat and propagules thereof comprising plant cells containing stably incorporated exogenous DNA, wherein said exogenous DNA does not naturally occur in said graminaceous plants.

5,596,132
INDUCTION OF RESISTANCE TO VIRUS DISEASES BY TRANSFORMATION OF PLANTS WITH A PORTION OF A PLANT VIRUS GENOME INVOLVING A READ-THROUGH REPLICASE GENE
Milton Zaitlin; Daniel Golemboski, both of Ithaca, N.Y., and George Lomonossoff, Norwich, England, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Continuation of Ser. No. 198,182, Feb. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 894,864, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 491,473, Mar. 12, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 488,672
Int. Cl.[6] A01H *4/00;* C12N *5/14;15/82;15/40*
U.S. Cl. 800—205 **28 Claims**

1. An isolated DNA molecule encoding a protein or polypeptide segment of a replicase for a plant pathogenic virus, wherein the plant pathogenic virus genome coding for the replicase includes a coding region for a replicase read through portion and, wherein the segment of the replicase is in the replicase read through portion.

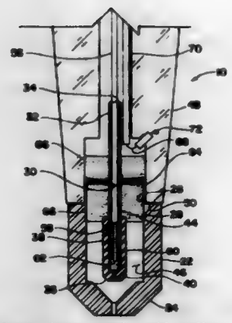
5,596,133
ROTATING PEEL FIXTURE
Wendell C. Maciejewski, Salem, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 23, 1995, Ser. No. 521,387
Int. Cl.[6] G01N *19/00*
U.S. Cl. 73—7 **2 Claims**



1. A rotating peel fixture comprising:
a U-shaped bracket comprising an L-leg, a rectangular leg affixed to said L-leg, and a pair of bearings, with each of said legs holding one of said pair of bearings;
a shaft held by said pair of bearings in such a manner so that said shaft can be rotated with respect to said U-shaped bracket;
a pair of conically shaped disks slidably mounted on said shaft and having their conical surfaces facing each other;
adjusting means for positioning said pair of conically shaped disks on said shaft, said adjusting means further comprises a pair of shoulder nuts located on said shaft adjacent and outward of said conically shaped disks for positioning said conically shaped disks;
a cylinder having a predetermined axial length mounted on said shaft between said conical surfaces and having sufficient strength to place a stop on said conically shaped disks, thereby preventing said adjusting means from positioning said conical surfaces from each other at less than a distance determined by the axial length of said cylinder; an adapter shaft affixed to said L-leg at the middle bottom of said U-shaped bracket; and
a lock-nut placed on said adapter shaft.

5,596,134
CONTINUOUS OXYGEN CONTENT MONITOR
R. Michael Phillippi, Highland; Tadeusz M. Drzewiecki, Rockville, and Stephen A. Freimanis, Germantown, all of Md., assignors to Defense Research Technologies, Inc., Rockville, Md.
Filed Apr. 10, 1995, Ser. No. 419,577
Int. Cl.[6] G01N *27/46;27/26*
U.S. Cl. 73—19.07 **27 Claims**

1. An oxygen sensor having an electrochemical galvanic cell for continuous measurement of oxygen contaminant content in molten metal comprising:
an elongated electrically conductive composite sleeve having an axial through passage defined therein, an open upper end where said composite sleeve is capable of withstanding sustained thermal contact with said molten metal upon partial immersion and an open lower end;
a first hollow shell having an open upper end attached to said lower end of said sleeve, and a dome shaped closed lower end designed for immersion into and that establishes direct thermal and temporary contact with molten metal by said sensor;
a lower castable refractory collar having an upper surface and a lower surface, said collar extending in tight adjacent fit downwardly into said first shell and upwardly in tight adjacent fit into said sleeve lower end, said collar having an axial through-passage defined therein;



a second hollow shell having an open upper end axially attached to said lower surface of said collar and a closed lower end sized to extend downwardly into said first hollow shell dome-shaped lower end in spaced relationship therewith to form an air-gap spacing between said first and second hollow shells, said second hollow shell closed lower end being packed with a reference material of known oxygen content;
a hollow tube made of a material which enables oxygen ion migration through the walls thereof, said hollow tube having an open upper end and a closed lower end, said tube extending downward in tight adjacent fit through said collar axial through-passage and in tight adjacent fit within said second shell lower end;
a flange assembly attached across said upper open end of said sleeve, said flange assembly having an electrical connector plug attached thereto;
a first elongate insulator extending downward from said flange assembly through said sleeve, into tight adjacent fit through said hollow tube to a point slightly below said second shell upper end, said first insulator having a longitudinal borehole;
a first conductive wire extending from said plug through said flange assembly, downward through said borehole in said first insulator, into said hollow tube closed lower end, said first wire forming a first electrode loop within said closed lower end of said second hollow shell, which said first electrode loop is embedded in said reference material;
a second elongate insulator extending downward from said flange assembly through said sleeve to a point between said tube open upper end and said collar upper end, said second insulator having a longitudinal borehole; and
a second conductive wire extending from said plug through said flange assembly, downward through said borehole in said second insulator, said second wire forming a second electrode loop embedded within said sleeve.

5,596,135
APPARATUS FOR AND METHOD OF DETERMINING PURITY OF A PEAK OF A PEAK OF A CHROMATOGRAM
Yasuhiro Mito, and Hideki Minegishi, both of Kyoto, Japan, assignors to Shimadzu Corporation, Nakagyo-ku, Japan
Filed Jan. 13, 1995, Ser. No. 373,573
Claims priority, application Japan, Jan. 31, 1994, 6-029043
Int. Cl.[6] G01N *30/02*
U.S. Cl. 73—23.35 **18 Claims**

1. A detector for a chromatograph comprising:
a) means for obtaining a series of absorbance spectra of a sample effluent from a column of the chromatograph repeatedly obtained at a plurality of time points separated by short intervals during a retention time of the sample effluent, each absorbance spectrum of the series of absorbance spectra being composed of a set of absorbance data with respect to wavelengths of light passing through the sample effluent;



b) means for constructing a chromatogram of the sample using the series of absorbance spectra;

c) means for detecting a peak section including an object component of the sample effluent in the chromatogram in real time;

d) means for calculating a similarity value between an absorbance spectrum of each of the plurality of time points and a standard absorbance spectrum of the object component, wherein the similarity calculating means calculates the similarity value based on an angle between an absorbance spectrum vector corresponding to the absorbance spectrum and a standard spectrum vector corresponding to the standard absorbance spectrum in real time;

e) means for calculsting a threshold value using the absorbance spectrum of said each of the plurality of time points, the standard absorbance spectrum and a noise level value of the chromatograph in real time; and

f) means for determining whether the absorbance spectrum is similar to the standard absorbance spectrum by comparing the similarity value to the threshold value in real time.

5,596,136

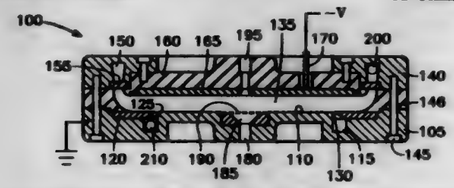
RADIAL DIFFERENTIAL MOBILITY ANALYZER

Richard C. Flagan, and Shou-Hua Zhang, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jul. 27, 1995, Ser. No. 508,311

Int. Cl.[6] G01N *27/60*

U.S. Cl. 73—28.04 **32 Claims**



1. A differential mobility analyzer for the classification of aerosols, comprising:

a chamber having two generally parallel faces and means to confine gases in said chamber;

one of said faces having a generally arcuate, annular sheath air channel, having an axis of symmetry;

other of said faces having a generally arcuate, annular aerosol channel having an axis of symmetry generally coincident with said axis of symmetry of said sheath air channel;

a first one of said faces having a sample flow aperture generally aligned with said axis of symmetry of said sheath air channel;

a second one of said faces having an excess flow aperture generally aligned with said axis of symmetry of said sheath air channel; and

means for maintaining an electric potential difference between said faces.

5,596,137

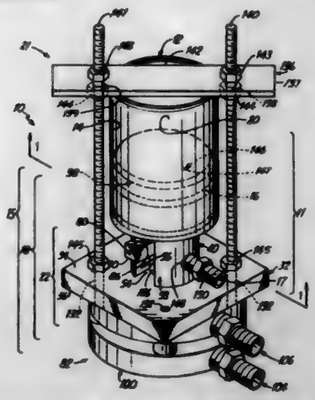
CAN VENT TESTING DEVICE

Michael R. Perry, Plymouth; James W. Finkowski, Andover, and James A. Kivi, Brooklyn Center, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 118,058, Sep. 8, 1993, abandoned. This application Jul. 14, 1995, Ser. No. 502,433

Int. Cl.[6] G01M *3/26*

U.S. Cl. 73—49.2 **20 Claims**



1. A device for testing cans of any height for leakage and for leakage rates using direct measurements, the device comprising:

a main body for receiving a can, the main body having a single test fluid bore in fluid communication with an internal volume of the can;

means for sealing against an internal surface of the can to effect a sealed chamber between the can and the main body, comprising a deformable seal ring mounted on the main body, wherein the deformable seal ring rests on a sleeve member;

means for moving the sleeve member into an operating relationship with the seal ring to effect the sealed chamber between the can and the main body, comprising a drive block which engages the sleeve member;

means for effecting an increase of pressure in the sealed chamber through the test bore; and

means for measuring volumetric fluid flow rates needed for sustaining the increase of pressure within the can to directly measure the leakage and leakage rate of the can.

5,596,138

AIR-TIGHTNESS TESTING ARRANGEMENT FOR ELECTRIC DEVICES

Tsuguo Onodera, and Shigeru Takei, both of Gunma-ken, Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gunma-ken, Japan

Filed Nov. 3, 1995, Ser. No. 552,837

Claims priority, application Japan, Nov. 14, 1994, 6-304291

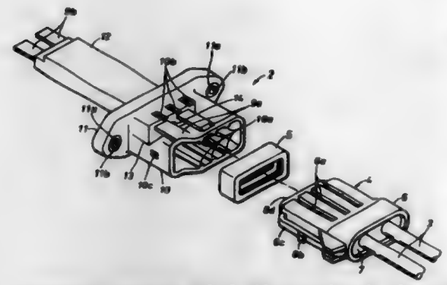
Int. Cl.[6] G01M *3/28*; H01R *9/16*

U.S. Cl. 73—49.2 **4 Claims**

1. An arrangement for testing air-tightness of an electric device having an enclosed housing, and an electric connector fitted into an opening provided in said housing, said connector comprising:

a housing-end connector half having a casing which is fitted into said opening provided in said housing of said electric device in an air-tight fashion, a connecting pin extending between inner and outer ends of said housing-end connector half casing, and a communication passage passed through between inner and outer ends of said housing-end connector half casing;

a cable-end connector half having a casing which is adapted to be coupled with said housing-end connector half casing in an air tight fashion, a cooperating terminal retained in said cable-end connector half casing and adapted to be electrically



connected to an outer end of said connecting pin when said two housing halves are coupled with each other, and lead means for establishing external electric connection to said cooperating terminal; and

seal means for closing said communication passage when said two casings of said connector halves are coupled with each other.

5,596,139

RESONANT LIQUID DETECTING DEVICE

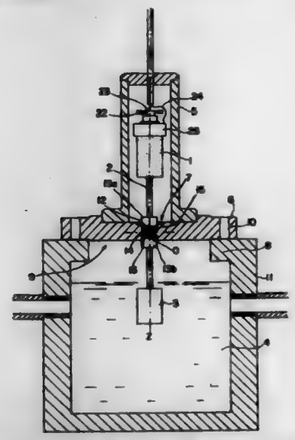
Shinsuke Miura, Tokyo, and Tsutomu Odagiri, Chiba-ken, both of Japan, assignors to Yamaichi Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,806

Claims priority, application Japan, Sep. 6, 1993, 5-245912

Int. Cl.[6] G01N *11/10*

U.S. Cl. 73—54.24 **14 Claims**



1. A detection device for detecting properties of liquid, said detection device comprising:

a vibration unit including:

a vibration transmission shaft having a first end and a second end,

a circular direction vibrator formed of piezoelectric ceramic connected at said first end of said vibration transmission shaft, and

a liquid detector connected at said second end of said vibration transmission shaft, wherein said liquid detector and said circular direction vibrator are coaxially connected at said first and second ends of said shaft, and said first and second ends of said shaft are not directly supported; and

mounting means, elastically connected to an intermediate portion of said transmission shaft at a location which includes a node of resonance, for suspending said vibration unit so that said first and second ends of said unit freely vibrate in opposite directions at a resonant frequency.

5,596,140

METHOD OF MONITORING VIBRATIONS IN VEHICLES

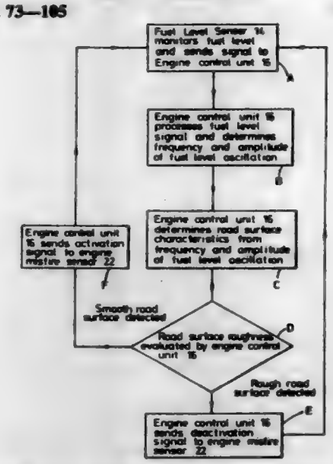
Christopher R. Boyce, Solihull, and Martin R. Haggett, Rugby, both of England, assignors to Rover Group Limited, Birmingham, England

Filed Jun. 19, 1995, Ser. No. 492,434

Claims priority, application United Kingdom, Jun. 30, 1994, 9413162

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—105 **22 Claims**



1. A method of controlling a functioning of a vehicle, the vehicle having a liquid reservoir containing liquid, and a liquid level monitor for monitoring the level of the liquid in the reservoir, the method comprising the steps of monitoring movement of the liquid in the liquid reservoir, determining from said movement when the vehicle is being vibrated in a predetermined manner and adapting the functioning of the vehicle when such vibration is detected.

5,596,141

TIRE RESONANCE FREQUENCY DETECTING SYSTEM HAVING INTER-WHEEL NOISE ELIMINATION AND METHOD FOR THE SAME

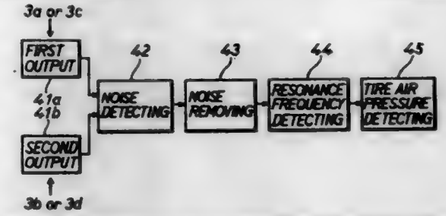
Yoshihiro Nishikawa; Ikuo Hayashi, both of Okazaki, and Takeyasu Taguti, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 3, 1995, Ser. No. 510,677

Claims priority, application Japan, Aug. 4, 1994, 6-183430

Int. Cl.[6] B60C *23/00*; *23/02*

U.S. Cl. 73—146.2 **20 Claims**



1. A tire resonance frequency detecting apparatus for a vehicle having a left-hand tire and a right-hand tire, said apparatus comprising:

first output means for outputting a vibration frequency component of said left-hand tire during vehicle travelling;

second output means for outputting a vibration frequency component of said right-hand tire during vehicle travelling;

noise detecting means for detecting a noise frequency component, other than a resonance frequency caused by a tire air pressure, from said vibration frequency components of said left-hand tire and said right-hand tire based on a correlation between said vibration frequency components of each tire output by said first output means and said second output means;

noise removing means for removing said noise frequency component detected by said noise detecting means from the vibration frequency components of each tire; and

tire resonance frequency detecting means for detecting a tire resonance frequency from said vibration frequency component of each tire from which said noise frequency component is removed by said noise removing means.

5,596,142

WELL LOGGING APPARATUS COMPRISING A MEASURING PAD AND A COMBINATON DEVICE INCLUDING SUCH APPARATUS

Alain G. M. Delpuech, Le Plessis Robinson; David C. Hoyle, Saint-Cloud; Alan J. Sallwasser, Chatenay Malabry, and Bruislew Seeman, Paris, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 316,267, Sep. 30, 1994. This application Jan. 29, 1996, Ser. No. 593,190

Claims priority, application France, Oct. 6, 1993, 93 11895

Int. Cl.[6] G01V *3/20*; E21B *47/00;49/00*

U.S. Cl. 73—152.17 **20 Claims**



9. A combination well logging device comprising first, second and third sections mounted end to end in an initial substantially vertical manner, the second section being connected to the first and third sections by respective hinges allowing the second section to assume an angle of inclination relative to the initial substantially vertical orientation of the first and second sections, the second section comprising apparatus having an elongate body, a measuring pad adapted to contact the wall of the borehole, a support device for the pad mounted pivotally on one side of the body comprising an arm which carries the weight of the pad and is connected to the pad substantially in a central part thereof, and means for applying the pad against the wall of the borehole while the tool is moved inside the borehole to permit reliable real time, continuous measurements of borehole properties during movement of the device through the borehole.

5,596,143

INSTRUMENT

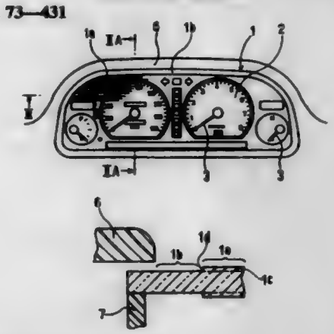
Shinichi Hashimoto, Takahama, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1995, Ser. No. 558,193

Claims priority, application Japan, Dec. 9, 1994, 6-306129

Int. Cl.[6] B44F *1/00*

U.S. Cl. 73—431 **9 Claims**



1. An instrument comprising:

a dial plate, and

a transparent front cover covering the dial plate,

wherein said front cover comprises:

a toothed central portion having a plurality of continuous ditches extending horizontally for reducing reflection of light; and

a smoothed fringe portion having a width wider than one of said ditches and being disposed generally perpendicularly to said ditches

said smoothed fringe portion being connected to said toothed central portion in such a manner so that dust or dirt accumulated in said ditches can be wiped off by a piece of cloth toward said smoothed fringe portion.

5,596,144

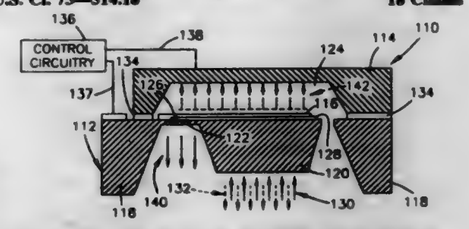
PIEZORESISTIVE FORCE REBALANCE ACCELEROMETER

Gregory D. Swanson, Indianapolis, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 4, 1995, Ser. No. 511,215

Int. Cl.[6] G01P *15/12;15/125*

U.S. Cl. 73—514.18 **18 Claims**



1. A piezoresistive force rebalance motion sensor comprising:

a cantilevered proof mass having a first electrode;

a second electrode disposed adjacent the proof mass so as to form a gap between the second electrode and the first electrode, the second electrode being adapted to generate an electrostatic force that electrostatically attracts the proof mass in a direction toward the second electrode in an energized state of the second electrode;

means associated with the proof mass for deflecting the proof mass in a direction away from the second electrode such that the proof mass is deflected away from the second electrode in absence of an electrostatic force on the proof mass;

means for sensing strain induced by a deflection of the proof mass relative to the second electrode and for producing an output signal therefrom; and

means for controlling the electrostatic force generated by the second electrode based on the output signal of the strain sensing means, the controlling means serving to return the proof mass to a null position relative to the second electrode when the proof mass is deflected from the null position;

wherein the deflecting means counteracts the electrostatic force between the proof mass and the second electrode in the energized state, such that the proof mass to be maintained at the null position in the energized state.

5,596,145

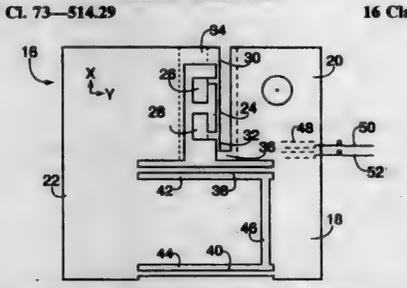
MONOLITHIC RESONATOR FOR VIBRATING BEAM FORCE SENSORS

William C. Albert, Boouton, and Herbert T. Califano, Bloomingdale, both of N.J., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Sep. 29, 1994, Ser. No. 315,045

Int. Cl.[6] G01P *15/09*

U.S. Cl. 73—514.29 **16 Claims**



1. A monolithic resonator for a force sensor, wherein said force sensor includes a vibrating beam, said resonator comprising:

an outer structure including a mounting structure, a force transfer structure, and at least one flexure beam extending between said mounting and force transfer structures; and,

an inner structure connected to said outer structure including isolator masses, isolator beams and said vibrating beam extending between said force transfer structure and said mounting structure;

wherein said outer structure has a thickness greater than the thickness of said isolator masses and the thickness of said isolator masses is greater than the thickness of said isolator beams and said vibrating beam.

5,596,146

PHOTOACOUSTIC MEASUREMENT OF UNBURNED CARBON IN FLY-ASH

David Waller, Ankeny, and Robert C. Brown, Ames, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jun. 6, 1994, Ser. No. 254,153

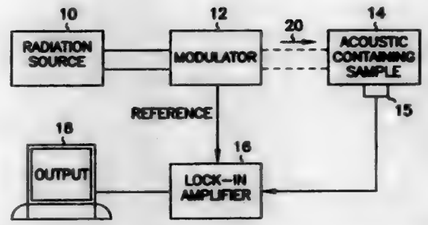
Int. Cl.[6] G01N *29/00*

U.S. Cl. 73—590 **16 Claims**

2. A method of measuring the concentration of unburned carbon in a bulk sample of fly ash comprising the steps of:

a) holding the bulk sample stationary and directing modulated infrared radiation at the bulk sample; and

b) detecting an acoustic signal produced by absorption of the infrared radiation by the unburned carbon in the bulk sample, the acoustic signal being indicative of the concentration of unburned carbon in the bulk sample, further wherein the modulated infrared radiation causes energy to be released from the sample within a certain depth from a surface of the sample called the thermal sampling depth and further comprising the step of controlling the modulated infrared radiation so that the product of an optical absorption coefficient for the sample and the thermal sampling depth is less than 1 to cause the acoustic signal to be substantially proportional to the concentration of unburned carbon in the sample.



5,596,147

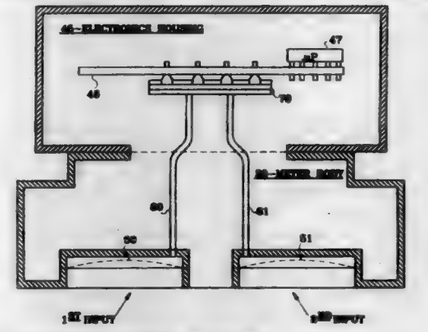
COPLANAR PRESSURE SENSOR MOUNTING FOR REMOTE SENSOR

Douglas W. Wilda, 2100 Grant Mews, Ambler, Pa. 19002; Charles E. Lane, III, 766 Moredon Rd., Meadowbrook, Pa. 19046, and Milton W. Mathias, 5410 N. Norwood La., Plymouth, Minn. 55442

Filed Nov. 17, 1995, Ser. No. 559,810

Int. Cl.[6] G01L *9/00*

U.S. Cl. 73—717 **10 Claims**



1. A pressure transmitter, comprising:

a) a first housing having a first and second diaphragm for receiving a first and second process fluid under a first and second pressure, respectively, the first and second diaphragm being deflected in response to the first and second pressure of the process fluid;

b) a second housing having a printed wire board housed therein for mounting electrical circuit components thereon;

c) a first and second capillary tube, the first capillary tube coupled to a first chamber formed by the first diaphragm and the second capillary tube coupled to a second chamber formed by the second diaphragm, each chamber and corresponding capillary tube having an internal fluid therein;

d) a sensor package, having a sensor element, the sensor package mounted internal to the second housing, the sensor package being coupled to the first and second capillary tubes such that the sensor element provides a first signal representative of the difference in pressure of the internal fluid of the capillary tubes, the first signal being coupled to electrical circuit components mounted on the printed wire board to output a second signal

indicating a difference between the first and second pressure of the process fluid.

5,596,148

PRESSURE DIFFERENCE MEASUREMENT TRANSDUCER WITH ELECTRIC LEAD-THROUGH IN BORE PARALLEL TO HOUSING LONGITUDINAL AXIS

Werner Thies, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

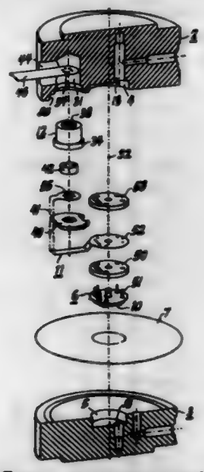
PCT No. PCT/DE94/00262, § 371 Date Nov. 28, 1995, § 102(e) Date Nov. 28, 1995, PCT Pub. No. WO94/21992, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 9, 1994, Ser. No. 525,635

Claims priority, application Germany, Mar. 15, 1993, 43 08 718.3

Int. Cl.[6] G01L *9/04; 7/08*

U.S. Cl. 73—720 **2 Claims**



1. A pressure difference measurement transducer comprising:

a. an inner housing divided into two housing sections transversely to its longitudinal axis;

b. a central diaphragm bearing a pressure sensor, the central diaphragm being clamped between the two housing sections;

c. a first bore running parallel to said longitudinal axis in one housing section having an enlarged section at the end of said bore toward the other housing section;

d. an electric lead-through having an external extension disposed in said bore with said external extension in said enlarged section of said bore;

e. an outwardly directed transverse second bore at the end of said first bore away from the other housing section; and

f. a ribbon-like conductor foil running between said pressure sensor and said electric lead-through, said ribbon-like conductor foil led through an angular bend next to said pressure sensor close to said central diaphragm, and said ribbon-like conductor foil forming a loop in the area of said electric lead-through.

5,596,149

PRESSURE MEASUREMENT TAP FOR A PRESSURIZED FLUIDIZED BED

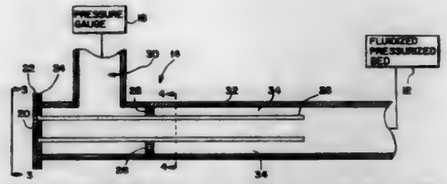
Douglas J. DeVault, Routstown, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 23, 1995, Ser. No. 547,007

Int. Cl.[6] G01L *7/00*

U.S. Cl. 73—756 **5 Claims**

1. A pressure measurement tap for a fluidized bed, the tap comprising:



an elongated pipe having a first end connected to the fluidized bed, a second end, a longitudinal axis, and an outlet adjacent the second end;

a conduit connected to the elongated pipe at the outlet;

pressure measuring means connected to the conduit; and

an inner pipe, within the elongated pipe and extending parallel to the longitudinal axis, for conveying a purge air into the elongated pipe from the second end of the elongated pipe, past the outlet without coming in contact with the outlet, to a location between the outlet and the first end of the pipe.

5,596,150

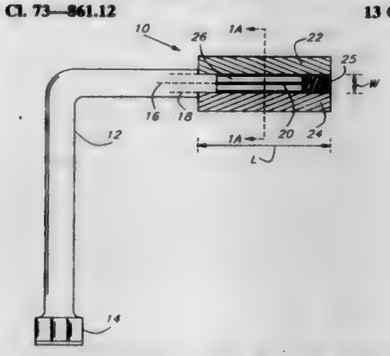
CAPACITANCE PROBE FOR FLUID FLOW AND VOLUME MEASUREMENTS

G. Dickey Arndt, Friendswood; Thanh X. Nguyen, and James R. Carl, both of Houston, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 8, 1995, Ser. No. 400,703

Int. Cl.[6] G01F *1/58*

U.S. Cl. 73—861.12 **13 Claims**



1. An electromagnetic flow monitor for monitoring flow of a material within a flow stream, comprising:

first probe, said first probe having first and second elongate electrodes substantially parallel with respect to each other, said first and second elongate electrodes having a spacing therebetween that is functionally related to said fluid to be monitored, said first and second elongate electrodes defining a flow aperture;

a signal generator operative to produce a reference signal for said probe;

a cable for applying said reference signal to said probe and for receiving a reflected signal therefrom;

flow rate means for providing said flow stream at a known flow rate through said flow aperture;

a flow director for directing said flow stream between said first and second elongate electrodes; and

detection circuits responsive to a permittivity of said material within said flow stream between said first and second elongate electrodes.

5,596,151

PRESSURE COMPENSATING DEVICE FOR INSULATING GLASS FRAMES

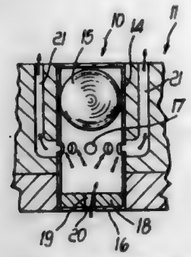
Mauro Romial, Este, Italy, assignor to Finvetro S.r.l., Este, Italy

Filed Dec. 16, 1994, Ser. No. 357,680

Claims priority, application Italy, Dec. 20, 1993, PD93A0246

Int. Cl.[6] A47G *1/00*; E04C *2/38; 2/54*; E06B *7/14*

U.S. Cl. 73—861.55 **13 Claims**



1. Device for automatically compensating pressure differences between the inside and the outside of an insulating glass frame caused by changes in environmental parameters, comprising a closed cylindrical hollow body which is arranged, so that its axis is not horizontal, between the inside and the outside of an insulating glass frame, a ball being movable within said body, said ball having such a diameter as to be in contact with the wall of the body so as to fully separate the inside of the body into two regions, at least one first hole for communication between the inside of said body and one of the inside and outside of the insulating glass frame being located in a suitable wall portion affected by the passage of said ball, at least one second hole for communication between the inside of said body and the other of said inside and outside of the insulating glass frame being located on the bottom of the body, and wherein the top of the body above said at least one first hole is completely sealed such that air is only able to pass through said at least one first hole through said body and through said at least one second hole.

5,596,152

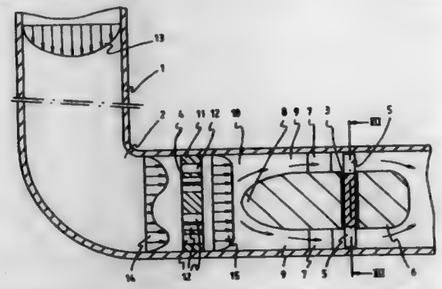
FLOW STRAIGHTENER FOR A TURBINE-WHEEL GASMETER

Josephus T. M. Bergervoet, Terborg, and Franciscus J. G. M. Oostendorp, Ulft, both of Netherlands, assignors to Instromet B.V., Silvolde, Netherlands

Filed Apr. 14, 1995, Ser. No. 421,979

Int. Cl.[6] G01F *1/10*; F15D *1/02*

U.S. Cl. 73—861.83 **5 Claims**



1. A flow straightener device for eliminating vortices in a gas stream which flows through a flow tube having a wall to a turbine-wheel gas meter disposed centrally within the flow tube to define an annular gap between the wall of the flow tube and the turbine-wheel gas meter, said turbine-wheel gas meter having a blade wheel disposed in said annular gap, said device comprising a plate having a certain thickness and further having a plurality of holes there through distributed regularly over the plate and defining a circular symmetrical hole pattern, said plate disposed upstream of the blade wheel of the turbine-wheel gas meter and the distance between the gas meter and the plate is between 0.1 and 10 times the diameter of the transverse cross-section of the flow tube, the diameter of said holes being smaller than 0.1 times the diameter of the flow tube, the total area of the sum of the cross-sections of the holes being between 0.4 and 0.8 times the area of the cross-section of the flow tube, the diameter of the largest hole is smaller than 1.3 times the diameter of the smallest hole and the thickness of the plate is smaller than the diameter of the largest hole and is between 1 and 0.6 times the diameter of the largest hole such that a uniform flow distribution in said annular gap is obtained.

5,596,153

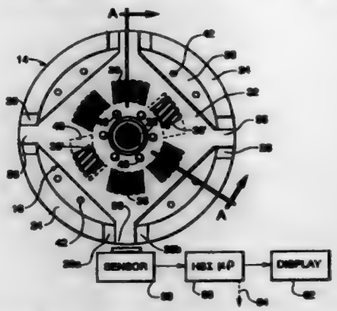
MEASUREMENT OF ROTATIONAL VELOCITY AND TORQUE

Garth H. Bulgrien, Ephrata, Pa.; Enrico Sedoni, Modena, Italy; Carlo Sedoni, Modena, Italy, and Andrea Genasso, Modena, Italy, assignors to New Holland North America, Inc., New Holland, Pa.

Filed May 2, 1995, Ser. No. 433,539

Int. Cl.[6] G01L *3/00*

U.S. Cl. 73—862.326 **22 Claims**



1. Apparatus for measuring the torque transmitted from a rotating input shaft to a rotating output shaft, said apparatus comprising:

a first element affixed to said input shaft and having a peripheral surface portion comprising a plurality of arcuate segments spaced from each other to form a plurality of windows;

a damper comprising a drive element affixed to said first element, a driven element affixed to said output shaft, and a resilient means disposed between said drive element and said driven element for driving said driven element in response to rotation of said drive element;

said driven element having a plurality of fingers extending into said windows; and,

a sensor disposed adjacent said first element for sensing passage of said arcuate segments and said fingers and producing an output signal indicative of the torque transmitted through said damper,

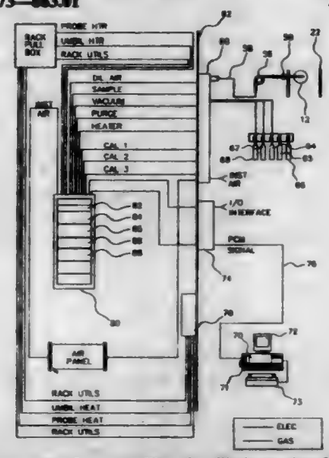
wherein said output shaft drives a transmission and said input shaft is driven by an engine, said first element being a flywheel for said engine.

5,596,154

DILUTION CONTROL METHOD AND APPARATUS

Leonard Bonghanon, Indianapolis, Ind., assignor to Enviroplan, Inc., Indianapolis, Ind.

Filed Sep. 21, 1995, Ser. No. 531,765
Int. Cl.[6] G01N *1/22*
U.S. Cl. 73—863.01 **12 Claims**



1. An apparatus for controlling the dilution ratio of a dilution probe connected to a source of emission gas and a source of dilution gas, the probe having a means for receiving sample emission gas, a means for receiving the dilution gas, and a means for emitting a diluted sample gas comprising a mixture of the sample emission gas and the dilution gas, the dilution ratio defined as the ratio of the flow of diluted sample gas from the probe to the flow of sample emission gas to the probe, the control apparatus comprising:

a regulator for regulating the flow of dilution gas to the probe, the regulator disposed between the dilution gas source and the probe;

means for measuring changes in gas density of the sample emission gas; and

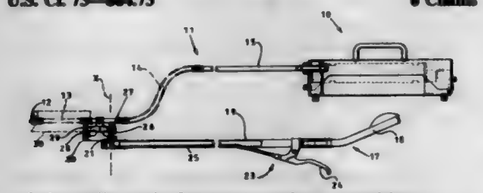
means for determining an adjusted flow value for the dilution gas provided to the probe, the adjusted flow value based on the measured changes in gas density and determined to control the dilution control ratio, the determining means connected to the regulator and the measuring means.

5,596,155

GAS SAMPLING PROBE

Ernest Holland, Daventry, England, assignor to V.L. Churchill Ltd., England

PCT No. PCT/GB93/01449, § 371 Date Jan. 17, 1995, § 102(e) Date Jan. 17, 1995, PCT Pub. No. WO94/02824, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 12, 1993, Ser. No. 373,185
Claims priority, application United Kingdom, Jul. 17, 1992, 9215295
Int. Cl.[6] G01N *1/22*
U.S. Cl. 73—864.73 **6 Claims**



1. A sampling probe for gaseous products, comprising:

a sampling tube having an inlet for gaseous products at one end;

an arm for supporting the tube and having an inner and an outer end;

pivot means between the tube and the arm and located towards the outer end of the arm so that the tube is pivotable relative to the arm to manipulate the position of the sampling tube inlet by relative movement between the arm and the tube;

the inlet being located outwardly of the pivot means; and

the sampling tube including a flexible portion located inwardly of the pivot means and a rigid portion associated with the pivot means whereby the inlet end of the tube is moveable relative to the arm.

5,596,156

SINTERED BODY FOR HIGH-HARDNESS TOOLS

Tomohiro Fukaya, and Tetsuo Nakai, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 18, 1995, Ser. No. 529,639
Claims priority, application Japan, Oct. 14, 1994, 6-275733
Int. Cl.[6] C22C *29/04*
U.S. Cl. 75—238 **2 Claims**

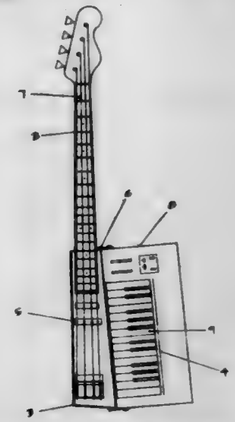
1. A sintered body for high-hardness tools, which is obtained by sintering 60 to 75% by volume of cubic boron nitride powder and remaining part of a binder powder under a superhigh pressure, the binder comprising 5 to 15% by weight of Al, and the remaining part comprising a compound represented by $(Hf_xTi_yM_{1-x-y})(C_zN_{1-z})_\alpha$ (where M denotes an element belonging to IVa, Va or VIa group in the periodic table except Ti and Hf, and where $0.1 \leq x \leq 0.5$, $0.5 \leq y \leq 0.9$, $0.7 \leq z \leq 0.9$, and $0.6 \leq \alpha \leq 0.8$) or a mixture of a plurality of compounds that totally results in the aforementioned composition.

5,596,157

STRINGED MUSICAL INSTRUMENT WITH KEYBOARD

Maechon Williams, 4522 Van Ness, Los Angeles, Calif. 90062

Filed Dec. 12, 1994, Ser. No. 385,600
Int. Cl.[6] G10D *3/00; 1/08;* G10C *3/12*
U.S. Cl. 84—170 **1 Claim**



1. A stringed musical instrument comprising:

a solid body;

a neck extending from the body;

a plurality of strings extending across the neck and body;

said body including a portion extending outward from said strings;

a keyboard comprising a plurality of keys;

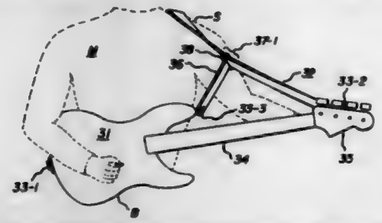
said keyboard attached to an upper surface of said extending portion.

5,596,158

THREE-PAINT SUSPENSION OF MUSICAL INSTRUMENTS

Thomas S. Tonon, 35 Birch Ave., Princeton, N.J. 08542

Continuation-in-part of Ser. No. 754,588, Sep. 4, 1991, abandoned. This application May 30, 1995, Ser. No. 454,017
Int. Cl.[6] G10D *3/00;* G10G *5/00*
U.S. Cl. 84—327 **18 Claims**



1. Apparatus for the suspension of a musical instrument, which includes a main body and a head connected to said main body, comprising

a strap having opposite ends;

first means for attaching one of said opposite ends of said strap to the main body;

second means for attaching another of said opposite ends of said strap to the head connected to said main body; and

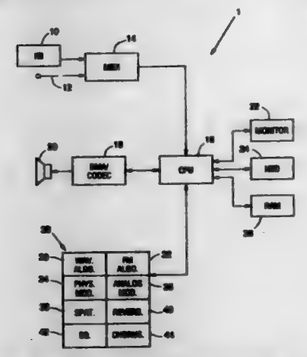
means intermediate said first means and said second means attached to said strap between said opposite ends at a position displaced from said first means for limiting the extent to which said strap can be displaced from the body of the instrument.

5,596,159

SOFTWARE SOUND SYNTHESIS SYSTEM

Steven S. O'Connell, Scotts Valley, Calif., assignor to Invision Interactive, Inc., Palo Alto, Calif.

Filed Nov. 22, 1995, Ser. No. 561,889
Int. Cl.[6] G10H *1/06*
U.S. Cl. 84—622 **13 Claims**



1. An audio signal processing system comprising:

input means for inputting musical instrument digital interface (MIDI) commands in real time over a plurality of channels;

personal computer means including a central processing unit (CPU) supplied with the MIDI commands for simultaneously synthesizing one or more voices for each of the channels in response to the MIDI commands, each of the voices being generated by one or more audio synthesis algorithms executed in software by the CPU;

random access memory means (RAM) for storing digital voice data representative of each of the voices generated by the CPU;

output means for audibly reproducing the voices from the digital voice data stored in the RAM; and

wherein the CPU, in generating the voices selects the one or more of the audio synthesis algorithms based on one or more of the following criteria:

the external processing demands placed upon the CPU by other operations being performed by the personal computer,

a best match, according to predetermined criteria, between the type of voice required and audio synthesis algorithms available to the CPU, and

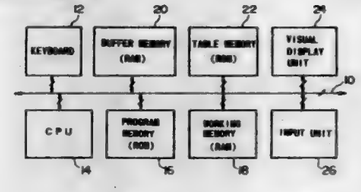
the availability of wavetable voice data to be buffered into the RAM.

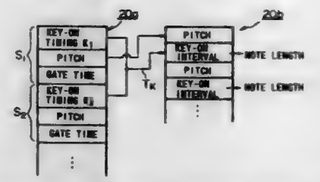
5,596,160

PERFORMANCE-INFORMATION APPARATUS FOR ANALYZING PITCH AND KEY-ON TIMING

Eiichiro Aoki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 4, 1994, Ser. No. 334,737
Claims priority, application Japan, Nov. 5, 1993, 5-300965
Int. Cl.[6] G10H *5/00;* H04Q *1/18*
U.S. Cl. 84—653 **5 Claims**





1. A performance-information analyzing apparatus comprising:

supply means for supplying pitch information and note-length information with respect to each sound to be produced, the note-length information representing a time interval to be measured between a key-on timing of a current sound and a key-on timing of a next sound; and

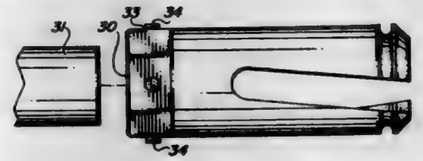
selection means for selecting a pair of time and location of bar-line, which is suited to a predetermined condition, from among multiple pairs of time and location of bar-line, which are different from each other, on the basis of the note-length information.

5,596,161

MUZZLE FLASH SUPPRESSOR

Sonja Sommers, P.O. Box 671, Tempe, Ariz. 85280-0671

Filed Jul. 12, 1995, Ser. No. 501,370
Int. Cl.[6] F41A *21/34*
U.S. Cl. 89—14.2 **10 Claims**



1. A firearm muzzle flash suppressor comprising a generally cylindrical body member with a proximal end for attachment to a firearm barrel having a rifled bore and a distal end for exit of a projectile from the body member, a recessed portion at the proximal end adapted to receive the firearm barrel, an axial passageway having a diameter slightly greater than the firearm bore connecting the recessed portion to an exit chamber of diameter substantially greater than the firearm bore, said exit chamber including a plurality of helical angled flutes angled in the direction of rifling of the firearm bore and being open at the distal end of the body member, and a means for attaching the body member to the firearm barrel.

5,596,162

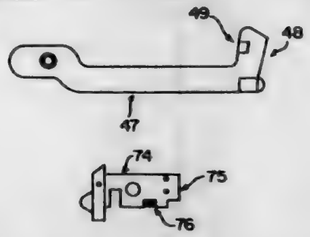
FIREARM SELECTABLE BETWEEN SEMI-AUTOMATIC AND AUTOMATIC MODE

Robert L. Burus, 117 Lake Shore Dr., Pasadena, Md. 21122

Continuation-in-part of Ser. No. 911,983, Jul. 10, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 333,786

Int. Cl.[6] F41A *19/46*

U.S. Cl. 89—128 **9 Claims**



1. A pistol having semi-automatic and fully automatic modes of operation, comprising:

a frame;

a slide removably mounted to said frame;

a trigger carried by said frame;

a trigger bar operated by said trigger and engaged to a firing mechanism, said trigger bar having a disconnector arm;

said firing mechanism having a hammer for striking a firing pin and a firing pin catch having a hook disposed so that it contacts said disconnector arm, after firing of said pistol,

said disconnector arm presenting an essentially straight surface to said firing pin catch hook thereby preventing engagement with said firing pin catch;

a decocking lever for lowering said hammer; and

a selector lever mounted to said slide, said selector lever having a first position in which said selector lever engages said decocking lever so as to lower said hammer, allowing the pistol to fire repeatedly as fast the recoil causes the slide to cock the hammer for as long as said trigger is held pulled.

5,596,163

GAS GENERATOR IGNITING CAPSULE

Erwin Callisch, Tamins, and Jurgen Bonnevie, Falera, both of Switzerland, assignors to Ems-Patvag AG, Domat/Ems, Switzerland

Filed Aug. 16, 1994, Ser. No. 291,164

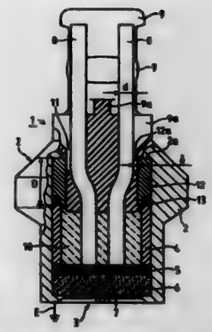
Claims priority, application Switzerland, Aug. 25, 1993, 02543/93; Aug. 25, 1993, 02544/93

Int. Cl.[6] F42B *3/18*

U.S. Cl. 102—202.2 **12 Claims**

1. A gas generator igniting capsule for use in an igniting apparatus, comprising an electrical igniter and a detonator, the electrical igniter having a contact bridge of a defined electrical resistance and two elongated contact pins of constant diameter being attached to the contact bridge;

said contact pins being directed towards an igniting element within a housing with a portion of each of said pins extending



axially through a concentric bore of a galvanically conductive cylindrical ring mounted in said housing, a lower portion of said pins being surrounded and supported by an insulator, said insulator being mounted in a lower end of said housing by a fitting ring;

said cylindrical ring being located above said fitting ring and having a height of at least twice the diameter of the contact pins and being connected to an earth line of the igniting apparatus;

said contact pin portions being separated by a distance from said cylindrical ring matched to a disruptive field strength, whereby a voltage surge occurring at the contact pin is diverted across said distance to said earth line;

an insulating plug socket mountable upon said housing and surrounding said portions of said pins within the bore of said cylindrical ring, said plug socket having a cut-out portion between said pins and said cylindrical ring defining an air gap of said disruptive field strength distance between said pins and said cylindrical ring;

said detonator comprising at least two detonator portions provided in the igniting capsule, a second portion being less highly explosive than a first portion;

said first portion being in contact with said igniting means and being an organometallic detonator;

said second portion comprising an inorganic detonator mixture;

said first and second portions each being pressed into layer form and encapsulated within said capsule in a pressure-tight manner.

5,596,164

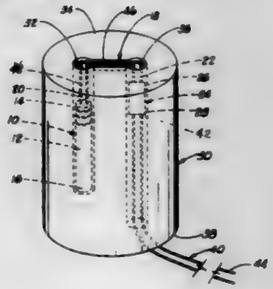
ELECTRIC DETONATOR AND LEAD CONNECTOR ASSEMBLY

Kevin H. Waldock, Runaway Bay, Australia, assignor to Clipmate Corp., Oklahoma City, Okla.

Division of Ser. No. 316,702, Sep. 30, 1994, abandoned, which is a division of Ser. No. 17,541, Feb. 16, 1993, Pat. No. 5,392,712. This application Jun. 30, 1995, Ser. No. 497,678

Int. Cl.[6] C06C *5/06*

U.S. Cl. 102—202.9 **1 Claim**



1. A method for assembling an electronic detonator and a booster charge comprising the steps of:

selecting a booster charge having a body with a first end and a second end, a blind bore in the first end, and a throughbore spaced a distance from the blind bore and extending from the first end to the second end;

selecting a detonator assembly comprising an electronic detonator having a first end and a second end and sized to be received in the blind bore in the first end of the body or the booster charge, an electrical connector having a first end and a second end, and a pair of electrical leads connecting the first end of the detonator and the first end of the connector, the leads having a length slightly greater than the distance between the blind bore and the throughbore in the booster charge;

selecting a length of leg wire comprising a pair of electrical leads and having a first end and a second end;

threading the selected length of leg wire through the throughbore in the body of the booster charge so that the first end of the selected length of leg wire extends out of the throughbore at the first end of body of the booster charge;

connecting the second end of the electrical connector of the detonator assembly to the first end of the selected length of leg wire;

inserting the detonator, second end first, into the blind bore in the first end of the booster charge; and

pulling the leg wire tautly through the throughbore.

5,596,165

BLASTING METHOD AND COMPOSITION

Patrick Carney, 1000 Nowata, Dubuque, Iowa 52001

Continuation of Ser. No. 827,413, Jan. 29, 1992, Pat. No. 5,261,327. This application Sep. 7, 1993, Ser. No. 117,427

Int. Cl.[6] F42B *3/00*; A45C *13/10*

U.S. Cl. 102—312 **10 Claims**

1. A blasting composition used within a borehole comprising: a quantity of a high velocity explosive agent, and a quantity of a low velocity, 1.3 rocket propellant, wherein said high velocity explosive agent includes a chemical composition different than said propellant and wherein said blasting composition is used as at least a non-booster explosive within said borehole.

5,596,166

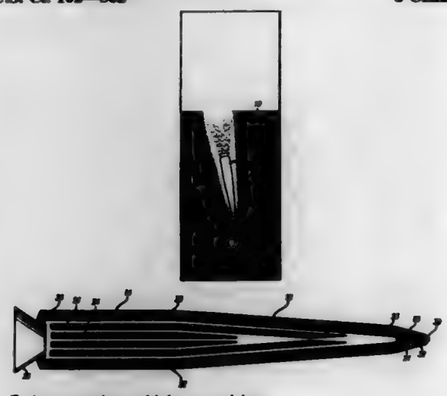
PENETRATING VEHICLE WITH ROCKET MOTOR

Robert L. Gould, Westlake Village, Calif., assignor to Logicon RDA, Los Angeles, Calif.

Filed Dec. 28, 1994, Ser. No. 365,028

Int. Cl.[6] F42B *15/00*

U.S. Cl. 102—362 **8 Claims**



7. A penetrating vehicle comprising:

an elongated projectile body having a forward section and a rearward section;

a rocket motor for causing said projectile body to penetrate and traverse a surface barrier following initial contact of said projectile body with said surface barrier;

said rocket motor including a high energy propellent positioned within said rocket motor for rapid combustion so that said rocket motor provides high thrust to said projectile body that counteracts deceleration forces caused by said initial contact and that promotes a penetration distance of said projectile body into said surface barrier;

wherein said propellent extends substantially the length of said elongated body from said forward section to said rearward section; and

a rocket motor case venting charge disposed at a position along the inside wall of said elongated projectile body, said charge being connected to a fuse for detonation at a desired period as sensed by said fuse.

5,596,167

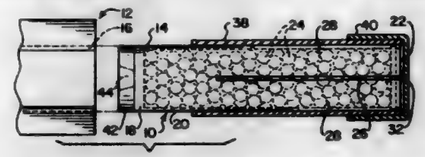
SHOT CARTRIDGE FOR A MUZZLE LOADING FIREARM AND PROCESS FOR LOADING A MUZZLE LOADING FIREARM

Richard V. Davis, 120 Jay St. #4, Lakewood, Colo. 80226

Filed Oct. 3, 1995, Ser. No. 536,245

Int. Cl.[6] F42B *7/00*

U.S. Cl. 102—532 **21 Claims**



1. A multiple projectile cartridge for a muzzle loading firearm comprising:

a plurality of projectiles;

a plastic cup sized to fit into a bore of a muzzle loading firearm and containing said plurality of projectiles, said cup having a base portion and a cylindrical tubular portion extending from said base portion around said projectiles to an open end, said tubular portion having a plurality of spaced slots extending from said open end toward said base defining petals therebetween;

a disc shaped top wad in said tubular portion spaced from said open end over said plurality of projectiles; and

a retaining means in said tubular portion of said cup spaced from said open end for retaining said top wad in said tubular portion when said cartridge is inserted into said bore of said muzzle loading firearm, said retaining means being selected from the group consisting essentially of 1) said tubular portion having a circumferential groove spaced from said open end engaging a peripheral portion of said wad and 2) said tubular portion having an inwardly projecting circumferential ridge engaging a complementary shaped groove in a peripheral rim portion of said wad.

5,596,168

SOLID PROPELLANT BASED ON PHASE-STABILIZED AMMONIUM NITRATE

Klaus Menke, Bruchsal; Jutta Bläsius-Mauss, Speyer; Helmut Schmid; Klaus M. Bucerius, both of Karlsruhe, and Walther Engel, Wiesbaden, all of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Germany

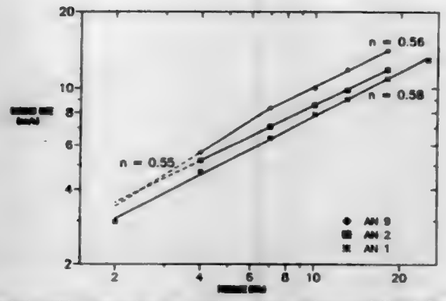
Filed Sep. 29, 1995, Ser. No. 536,140

Claims priority, application Germany, Oct. 5, 1994, 44 35 524.6

Int. Cl.[6] C06B *45/10*

U.S. Cl. 149—19.4 **25 Claims**

1. Solid propellant for rocket propulsion systems or gas generators, comprising 35 to 80 wt. % ammonium nitrate (AN) in pure or



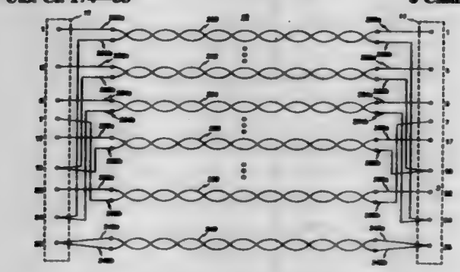
nickel oxide, potassium or cesium nitrate phase-stabilized form (PSAN) with an average particle size of 5 to 200 μm, 15 to 50 wt. % of a binder system of a binder polymer and an energy-rich plasticizer, as well as 0.2 to 5 wt. % of a burning moderator of vanadium oxide/molybdenum oxide as an oxide mixture or mixed oxide.

5,596,169

COMBINED SCSI/PARALLEL PORT CABLE

William P. Baker, Salt Lake City, and Charles Hamilton, Bountiful, both of Utah, assignors to Iomega Corporation, Roy, Utah

Filed May 12, 1995, Ser. No. 439,776
Int. Cl.[6] H01B *11/02*
U.S. Cl. 174—33 **6 Claims**



1. A cable for connecting a peripheral device to an input/output port configured in accordance with one of a SCSI protocol and a parallel port protocol, said cable comprising:

a first connector having a plurality of contact pins for connecting said cable to said peripheral device;

a second connector having a plurality of contact pins for connecting said cable to said input/output port; and

a plurality of twisted pairs, each twisted pair comprising a first conductor and a second conductor, the first conductor of each of said plurality of twisted pairs defining a data/control line and the second conductor of that twisted pair defining a return for the respective data/control line in accordance with said SCSI protocol,

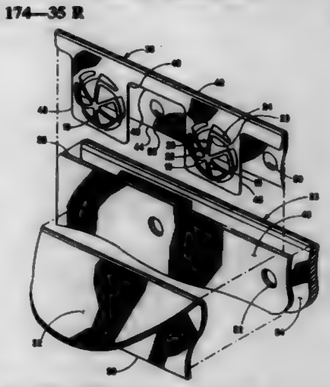
the first and second conductors of each of said twisted pairs being connected between selected pins of the first and second connectors such that none of said twisted pairs carries a data/control signal on both its first and second conductors when the cable is connected to said input/output port that is configured in accordance with said parallel port protocol.

5,596,170

FLEXIBLE DOME ELECTRICAL CONTACT

Richard M. Barina, Boca Raton; James W. Deise, III, Boynton Beach, both of Fla.; Arthur A. Kurz, New Vernon; Jeffrey McFadden, Cranford, both of N.J.; Fred L. Murray, Cary, N.C., and William D. Owsley, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1993, Ser. No. 149,571
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 R **28 Claims**



1. Electrical contact apparatus comprising:

a central contact portion;

a surrounding structure extending around said central contact portion and away from said central contact portion; and

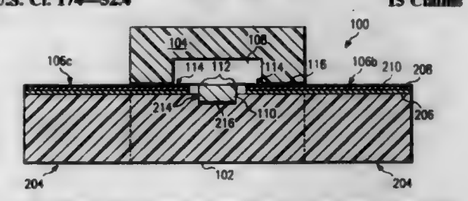
a plurality of legs, angularly spaced apart around said central contact portion, extending between said central contact portion and said surrounding structure, each of said legs of said plurality of legs extending radially outward from said central contact portion and circumferentially partially around said central contact portion, said plurality of legs forming an integral metallic structure with said surrounding structure and with said central contact portion, said plurality of legs and said central contact portion extending in a convex shape from one side of said surrounding structure.

5,596,171

PACKAGE FOR A HIGH FREQUENCY SEMICONDUCTOR DEVICE AND METHODS FOR FABRICATING AND CONNECTING THE SAME TO AN EXTERNAL CIRCUIT

James M. Harris, Rte. 4, Box 240, Terrell, Tex. 75160; Brigitte U. Kiba, 3801 E. 14th St. #401, Plano, Tex. 75074, and Porter B. Click, Jr., 612 Mt. Vernon Pl., Garland, Tex. 75043

Division of Ser. No. 65,579, May 21, 1993, abandoned. This application Jun. 7, 1994, Ser. No. 254,977
Int. Cl.[6] H01L *23/02*
U.S. Cl. 174—52.4 **15 Claims**



1. A package for semiconductor device operating at very high frequencies, the package comprising:

(a) a base having a surface for receiving a semiconductor die and a supporting metal conductor, the base being integrally formed from plastic;

(b) a low-resistance planar metal conductor on the top surface of the base for electrically connecting the package to a printed circuit board plated to the lead support, the metal conductor formed by plating metal to the base;

(c) a semiconductor die attached to the top surface of the base substantially adjacent and electrically bonded with wire to the metal conductor, wherein the bond wires have substantially minimum length to minimize parasitic losses, the bond wires and the conductors lie substantially in the same plane to reduce abrupt changes in physical path of a high frequency signal travelling between the metal conductor and the die; and

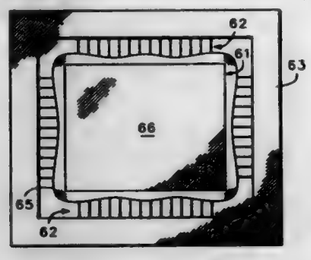
(d) a lid for covering the semiconductor die.

5,596,172

PLANAR ENCAPSULATION PROCESS

Glenn D. Raskin; Setsuko J. Cole, both of Phoenix, and Mark C. Hoggatt, Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 57,930, May 7, 1993, abandoned. This application Nov. 17, 1995, Ser. No. 560,505
Int. Cl.[6] H01L *23/02;23/28;23/14;23/10*
U.S. Cl. 174—52.4 **10 Claims**



1. An integrated circuit package comprising:

a frame;

an integrated circuit within and planar to said frame, said integrated circuit having a surface wherein semiconductor devices are formed thereon, said surface including an outer peripheral area and an inner area;

a plurality of leads coupled between said frame and said outer peripheral area of said integrated circuit;

an epoxy encapsulate covering said outer peripheral area of said integrated circuit and a portion of said plurality of leads; and

a thermoplastic film contiguous with and planar to said inner area of said surface of said integrated circuit wherein said thermoplastic film protects against mechanical damage to said surface of said integrated circuit having semiconductor devices when an object is pressed against said thermoplastic film.

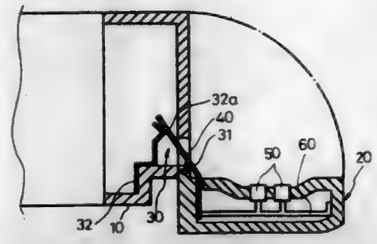
5,596,173

GROUNDING STRUCTURE FOR USE IN ELECTRIC APPLIANCES

Deog-Seo Yi, Kyunggi-do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 28, 1994, Ser. No. 365,730
Claims priority, application Rep. of Korea, Dec. 30, 1993, 93-31311
Int. Cl.[6] H05K *5/02*
U.S. Cl. 174—5 SG **2 Claims**

1. A grounding device for use in an electric appliance, which includes a door pivotably attached to a main body of the electric appliance, the door having a plurality of knobs and a conductive bracket adapted to couple said knobs with the door, comprising:



a first plate grounded to the main body of the electric appliance at one end of the first plate and freely extending upward at another end of the first plate; and

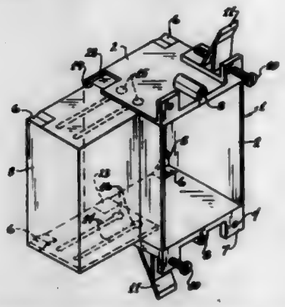
a second plate electrically coupled to the bracket at one end of the second plate, another free end of the second plate being adapted to resiliently depress said freely extending upward end of the first plate to thereby provide a continuous electrical coupling between the door and the main body, regardless of whether the door is closed or not.

5,596,174

EXPANDABLE ELECTRICAL OUTLET BOX

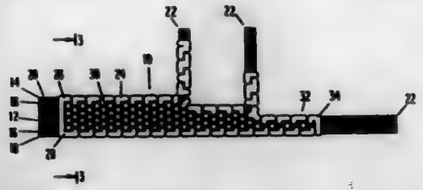
Joseph Sapienza, 188 Siegfreid, Williamsville, N.Y. 14221

Filed Oct. 4, 1994, Ser. No. 323,440
Int. Cl.[6] H01R *13/502*
U.S. Cl. 174—57 **7 Claims**



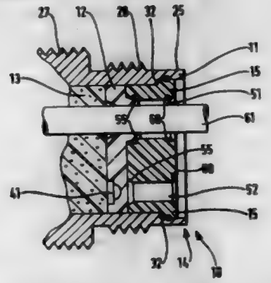
1. An expandable electrical outlet box comprising a main compartment, a movable expandable compartment, wall connecting means and wire insertion means, said wire insertion means in each of said main and expandable compartments, said expandable compartment movably fitting into said main compartment and when in a closed mode providing a space between said main and said expandable compartments for a user to easily move said expandable compartment into and out from said main compartment, said main compartment comprising a top section and a bottom section, said movable expandable compartment also comprising a top section and a bottom section, said wire insertion means comprising tab openings in outer corners of both said top and bottom sections of said main compartment and said movable expandable compartment, and said tab openings being in alignment when said expandable electrical outlet box is in said closed mode.

5,596,175
MOLDED CABLING, PREFORM FOR MAKING AND METHOD OF MAKING
Floyd Ysbrand, Joplin, Mo., assignor to Esterline, Joplin, Mo.
Filed Feb. 1, 1995, Ser. No. 382,111
Int. Cl.[6] H01B 7/08
U.S. Cl. 174—117 M 13 Claims



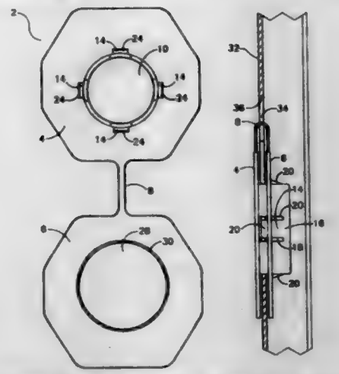
1. A molded cable comprising
a plurality of conductors forming said cable, said conductors being positioned in spaced relationship with each other; and
a plastic like molding compound molded into a web around said conductors.

5,596,176
CABLE SEALING ARRANGEMENTS
Christopher H. Everitt, Bedfordshire, England, assignor to Framatome Connectors International, Paris, France
Filed Nov. 3, 1994, Ser. No. 335,339
Claims priority, application United Kingdom, Nov. 3, 1993, 9322662
Int. Cl.[6] H02G 3/22;3/08
U.S. Cl. 174—151 17 Claims



1. A cable sealing gland for use in sealing the passage of one or more electrical cables/conductors through a bulkhead, said cable sealing gland comprising:
(a) a tubular housing having an interior;
(b) means for securing said housing sealingly relative to an opening in a bulkhead such that an interior of the housing is in registry with the bulkhead opening, whereby at least one electrical cable/conductor passed through said tubular housing will pass through the bulkhead;
(c) said housing interior defining a receptacle for receiving a fluid cable sealing compound, said receptacle when filled with said compound and with said at least one electrical cable/conductor passing through said tubular housing ensuring that the passage of said at least one electrical cable/conductor through the bulkhead is sealed; and
(d) retaining means for said fluid cable sealing compound, said retaining means comprising at least one wall of resilient elastomeric material extending across the interior of said tubular housing so as substantially to seal the same against leakage of said fluid cable sealing compound, said wall enabling electrical cables/conductors of different sizes to be pierced therethrough and elastically engaging said cables/conductors in a manner substantially to seal said cables/conductors against leakage of said fluid cable sealing compound substantially irrespective of the sizes of said cables/conductors.

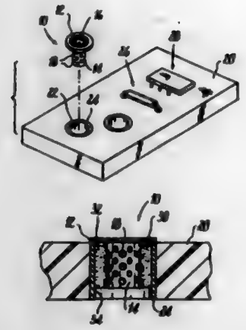
5,596,177
BUSHING FOR MULTIPLE SIZED AND SHAPED HOLES IN STRUCTURAL MEMBERS
Thomas S. Stark, Coral Springs, Fla., and Thomas J. Gretz, Clarks Summit, Pa., assignors to Arlington Industries, Inc, Scranton, Pa.
Continuation of Ser. No. 135,804, Oct. 13, 1993, abandoned.
This application Jul. 31, 1995, Ser. No. 501,951
Int. Cl.[6] H01B 17/26; F16L 5/00
U.S. Cl. 174—153 R 6 Claims



1. A bushing for multiple sized and shaped holes in a structural member combination comprising:
a structural member having a hole with edges therein;
a face flange larger than said hole in said structural member;
a tubular projection extending from said face flange and adapted to project through said hole in said structural member;
a passageway extending through said tubular projection through which electrical wires may be passed and be protected from said edges of said hole in said structural member;
a backing flange larger than said hole in said structural member for attachment to said tubular projection and resist the withdrawal of said tubular projection from said hole in said structural member said backing flange being sufficiently flexible that it can be elastically deformed to permit said backing flange to pass through said hole in said structural member;
a hole in said backing flange adapted to couple to said tubular projection;
a locking mechanism to lock said backing flange and said tubular projection together; and
a hinge connecting said face flange and said backing flange together with said hinge being folded and at least partially passing through said hole in said structural member.

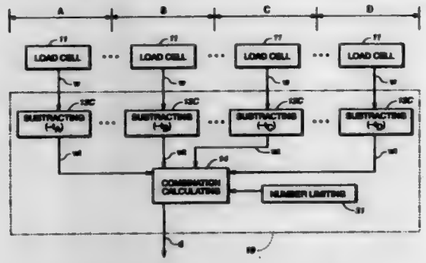
5,596,178
SINGLE REPLACEMENT PAD WITH PERFORATED SHAFT FOR THE REPAIR OF PRINTED CIRCUIT BOARDS
Suzanne Christian, 23 Indian Head Rd., Kings Park, N.Y. 11754
Filed Oct. 12, 1995, Ser. No. 542,308
Int. Cl.[6] H05K 1/02
U.S. Cl. 174—265 11 Claims

1. An apparatus adapted to be secured in a substrate having at least one conductive path and at least one aperture therein, the apparatus comprising:



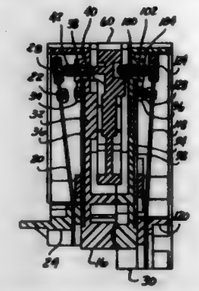
a cap; and
a tubular shaft, connected to the cap and positioned in a first aperture of the substrate, the tubular shaft having a longitudinal length of about one-half of a longitudinal length associated with the first aperture of the substrate, and having an electrically conductive wall portion and perforations therethrough, the electrically conductive wall portion operatively connected electrically to a first conductive path of the substrate, the perforations adapted to permit flowthrough of material, wherein the material facilitates the securing of at least the tubular shaft to the substrate.

5,596,179
WEIGHING MACHINE WHICH SUBTRACTS TARE WEIGHTS
Keiko Sakaeda, Shiga, Japan, assignor to Ishida Co., Ltd., Japan
PCT No. PCT/JP93/00628, § 371 Date Dec. 10, 1993, § 102(e) Date Dec. 10, 1993, PCT Pub. No. WO93/23724, PCT Pub. Date Nov. 25, 1993
PCT Filed May 12, 1993, Ser. No. 162,107
Claims priority, application Japan, May 15, 1992, 4-148813
Int. Cl.[6] G01G 13/00;19/32
U.S. Cl. 177—25.18 10 Claims



1. A combinational weighing machine comprising:
a large plural number of weight detecting means each for weighing and thereby detecting the gross weight of one or more packaged products;
subtracting means each functionally associated with one of said weight detecting means for subtracting a tare weight from the gross weight detected by the associated weight detecting means and thereby obtaining the net weight of said one or more packaged products; and
combination calculating means for combining a small plural number of said weight detecting means to calculate the total net weight of the packaged products weighed thereby and selecting a combination of said weight detecting means according to a predefined criterion including totals of the net weights obtained by said subtracting means and a given target weight value, said small plural number being smaller than said large plural number, said tare weight being variable according to the gross weight from which said tare weight is subtracted.

5,596,180
IGNITION SWITCH WITH ELECTRICALLY CONDUCTIVE LEAF SPRING MEMBERS AND ROTARY CAM OPERATOR
Georg Hofmann; Jürgen Suchanek, both of Auburn Hills, and Larry W. Burr, Saginaw, all of Mich., assignors to ITT Automotive, Inc., Auburn Hills, and General Motors Corp., Detroit, both of Mich.
Filed Apr. 3, 1995, Ser. No. 415,656
Int. Cl.[6] H01H 11/00;19/60;21/84
U.S. Cl. 200—6 B 20 Claims



1. An electrical switch for selectively controlling an ignition circuit of a motor vehicle comprising:
housing means having a first wall for supporting at least one electrical contact and at least one aperture extending through said first wall;
rotatable means connected to said housing means for at least limited angular rotating movement about a pivot axis extending generally normal to said first wall, said rotatable means including a radially extending wall opposing said first wall of said housing, said radially extending wall having at least one concentric cam surface extending arcuately along at least a sector of said rotatable means and opposing said at least one aperture in said first wall;
free floating, plunger means engageable through said at least one aperture in said first wall for slidably engaging said at least one cam surface with a first end and for moving a second end corresponding to a contour of said at least one cam surface as said cam surface moves with respect to said first end when said rotatable means is rotated between angular positions; and
electrically conductive, insert molded, leaf spring means connected to said housing means for biasing said plunger means toward said at least one cam surface and for selectively opening and closing an electrical circuit by allowing selective electrical engagement of the leaf spring means with said at least one contact in response to rotational movement of said rotatable means, said leaf spring means defining at least one high current switch operable between an open position and a closed position, and at least one low current switch operable between an open position and a closed position, both high and low current switches responsive independently of one another to movement of said plunger means as said rotatable means is rotated about said pivot axis.

5,596,181

ELECTRIC SWITCH

Erik Bach, Billund, and Morten Rydder, Vejle, both of Denmark, assignors to INTERLEGO AG, Baar, Switzerland

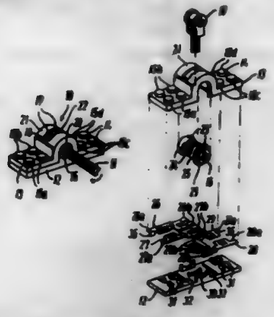
PCT No. PCT/DK93/00381, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO94/13001, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 23, 1993, Ser. No. 433,418

Claims priority, application Denmark, Nov. 24, 1992, 1408/92

Int. Cl.[6] H01H *21/00;19/00;* A63H *33/00*

U.S. Cl. 200—6 R 9 Claims



1. An electric switch comprising:

a housing containing a plurality of electric switch elements;

a substantially cylindrical member mounted for rotation within said housing, said cylindrical member including actuating means for opening and closing the switch elements upon rotation of the cylindrical member;

an axial through passage extending through said cylindrical member for receiving a drive shaft, whereby rotation of said drive shaft causes said cylindrical member to rotate;

a coupling bushing extending radially within said cylindrical member for detachably receiving an end of a lever;

a slot within said housing aligned with said bushing and through which said lever extends, when said lever is attached to said bushing, whereby movement of said lever is constrained to thereby limit rotation of said cylindrical member through a plurality of angular positions.

4. A switch according to claim 1, characterized in that terminal parts (26*b*–29*b*; 152–155) on the switching elements (26–29) of the housing (12, 13) are in the form of mutually overlapping, but spaced leaf springs, which, when the rotating member (16) is rotated, are pressed against each other by radially protruding bosses (23, 24) provided on said rotating member (16), such that said bosses (23, 24) establish electric connection between the terminal parts (26*b*–29*b*; 152–155).

5,596,182

ICEMAKER

James D. Edwards, Brentwood, Tenn.; Paul R. Staples, Cub Run, Ky., and David R. Whited, Brentwood, Tenn., assignors to France/Scott Fetzer Company, Fairview, Tenn.

Filed Jan. 28, 1994, Ser. No. 188,195

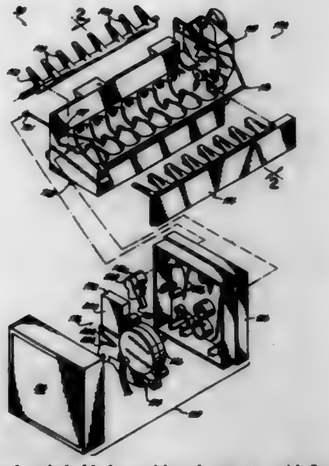
Int. Cl.[6] F25C *5/18;* H01H *43/00*

U.S. Cl. 200—61.2 19 Claims

1. An icemaker timing apparatus of the type having one or more switches and a moving timer for actuating said switches to operate electrical components of the icemaker, said icemaker timing apparatus comprising

a first switch comprising:

a first switch blade;



a second switch blade positioned near to said first switch blade; and

a connector mounted on said moving timer and configured, at a predetermined position of said moving timer, to simultaneously electrically contact said first and second switch blades and create an electrical connection therebetween for a predetermined duration of time; and

said icemaker timing apparatus further comprising a first cam for actuating said first switch blade toward and away from said second switch blade.

5,596,183

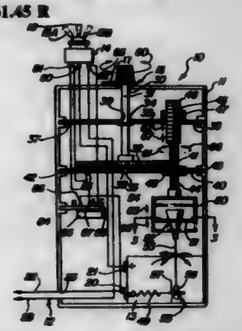
SEISMICALLY ACTIVATED APPLIANCE SWITCH

Chester M. Haley, 34892 Rancho Vista, Cathedral City, Calif. 92234

Filed Oct. 18, 1995, Ser. No. 544,732

Int. Cl.[6] H01H *35/14*

U.S. Cl. 200—61.45 R 15 Claims



1. For use in controlling an electrically powered device, a seismically activated switch apparatus comprising:

an electronic switch having a controlled power coupling path and a trigger input;

an input power coupler and output power coupler interconnected through said controlled power coupling path;

an annular ring defining a ring plane and an aperture;

a contact weight defining a varying cross-section;

a spring rod having a fixed end and a free end, said free end being secured to said contact weight and said spring rod resiliently supporting said contact weight; and

adjustable ring support means for supporting said ring such that said contact weight extends through said aperture of said ring and for raising and lowering said ring to move said ring plane with respect to said contact weight,

said trigger input being coupled to said input power coupler through contact of said annular ring and said contact weight.

5,596,184

SWITCH INCLUDING A MOVING ELEMENT, A REPELLING ELEMENT AND A CONDUCTOR

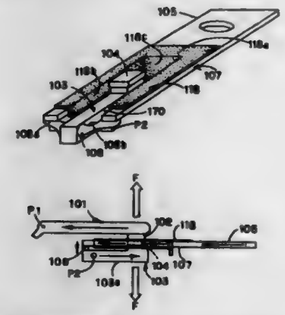
Takao Mitsuhashi; Mitsugu Takahashi; Kazunori Fukuya; Kenichi Nishina, and Shinji Yamagata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 76,741, Jun. 15, 1993. This application May 4, 1995, Ser. No. 434,529

Claims priority, application Japan, Jul. 2, 1992, 4-197444; Jul. 2, 1992, 4-197445; Jul. 2, 1992, 4-197446; Aug. 21, 1992, 4-243998; Oct. 9, 1992, 4-296640; Oct. 23, 1992, 4-307859; Oct. 23, 1992, 4-307860; Oct. 23, 1992, 4-309683

Int. Cl.[6] H01H *9/30;77/00;3/00*

U.S. Cl. 218—32 17 Claims



1. A switch comprising:

a moving element having a traveling contact at one end thereof;

a repelling element having a repelling contact at a first end thereof and extending substantially parallel to said moving element, and said repelling element pivotally mounted so that said repelling contact is capable of making and breaking contact with said traveling contact, said repelling element comprising a repelling element conductor portion;

biassing means connected to a second end of said repelling element for biasing said repelling element so that said repelling contact touches said traveling contact in a closed condition;

a terminal connected to a power source system;

a conductor connecting said repelling element to the terminal, and said conductor including

a first conductor portion positioned between said traveling contact and said repelling contact when said moving element and said repelling element are opened so as to be connected to said terminal, said first conductor portion being straight and coplanar with said terminal, and

a second conductor portion connecting said first conductor portion to said repelling element at an end on the side opposed to said repelling contact, and

wherein said repelling element conductor portion is positioned below said first conductor portion such that when a large current flows through said switch, current in said repelling element conductor portion has a direction opposed to that of current in said first conductor portion, and an electromagnetic repulsion is applied between said repelling element and said first conductor portion to rotate said repelling element in the opening direction.

5,596,185

DEVICE FOR GENERATING PICTURE INFORMATION IN REAL TIME FOR TESTING PICTURE RESOLVING SENSORS

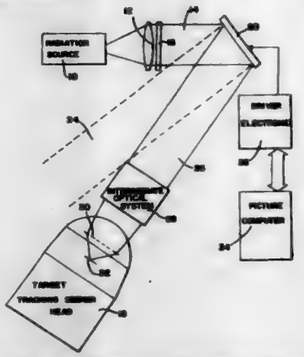
Walter Brose, Überlingen, and Bernd Uwira, Konstanz, both of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Germany

Filed Nov. 10, 1994, Ser. No. 337,171

Claims priority, application Germany, Nov. 10, 1993, 43 38 390.4

Int. Cl.[6] H04N *5/33;* G01D *9/42*

U.S. Cl. 250—208.1 4 Claims



1. A device for generating picture information in real time for testing picture resolving sensors, comprising:

(a) a micro-mechanical mirror array (20) comprising a two-dimensional array of mirror elements (22), means for moving said mirror elements individually between first and second operative positions in response to actuating signals, a plurality of submatrices, each of which, in turn, consists of a plurality of matrix elements, said mirror array (20) and said illuminating means being arranged such that light incident from said illuminating means and reflected by elements of each particular one of said sub-matrices, if said reflecting elements are in their second operating positions, falls on a particular detector element associated with said particular sub-matrix, and the number of mirror elements (22) associated with each particular detector element which are moved by the actuating means into their second operative positions, being variable, in order to vary the simulated object intensity,

(b) illuminating means

which are arranged to illuminate said mirror array (20) and

the light of which, in the first operative position of each particular mirror element (22), being reflected to pass by a sensor (32) to be tested and, in the second operative position of the mirror element (22A) being reflected into the path of rays (26) of the sensor (32),

(c) actuating means (34, 36) for actuating said moving means to move said mirror elements (22) into said first or second operative positions such that the sensor to be tested observes a simulated object scene and

(d) a detector array of detector elements, the detector elements summing up the radiation energy impinging thereon through an integration time and being read out at the end of each such integration time, said integration time thereby defining a read-out frequency, wherein said mirror elements (22) are arranged to be actuated with the clock intervals, which are substantially shorter than, the integration time of the detector elements of the sensor, and the number of clock intervals, during which mirror elements (22) are moved by the actuation means into the second operative positions during each integration time being variable in order to vary the simulated object intensity.

5,596,186

HIGH SENSITIVITY SILICON AVALANCHE PHOTODIODE

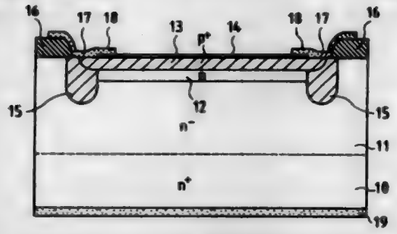
Koji Kobayashi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,731

Claims priority, application Japan, Dec. 8, 1993, 5-308227; Dec. 16, 1993, 5-316280; Nov. 8, 1994, 6-273709; Nov. 21, 1994, 6-286712

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—214.1 **9 Claims**



1. A silicon avalanche photodiode for detecting ultraviolet light, the silicon avalanche photodiode comprising a p^+-layer, an n-layer, an n^--layer and an n^+-silicon substrate in order from an entrance side of the ultraviolet light, wherein said p^+-layer has a thickness at least equal to $0.7/\alpha$ in which α is the absorption coefficient of silicon to the ultraviolet light.

5,596,187

OPTICAL METHOD FOR EXAMINING THE OPEN END OF A CIGARETTE TO DETERMINE ITS UNIFORMITY OF FILLING WITH TOBACCO

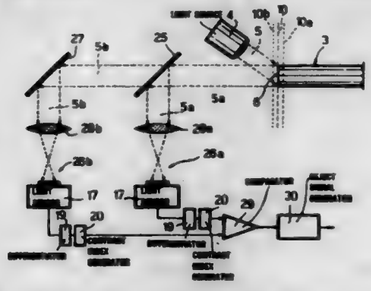
Giuseppe Di Stefano, Ferrara; Marco Ghini, Lazzaro Di Saverna; Armando Neri, and Antonio Gamberini, both of Bologna, all of Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy

Filed Jun. 27, 1994, Ser. No. 266,176

Claims priority, application Italy, Jun. 28, 1993, B093A0297

Int. Cl.[6] G01V *9/04*

U.S. Cl. 250—222.1 **13 Claims**



1. An optical method for evaluating uniformity of tobacco filling a cigarette, said method comprising:

directing a beam of light against an open end of a cigarette to illuminate tobacco in said cigarette at said open end,

reflecting said beam of light from the tobacco at said open end of the cigarette through a fixed focus lens, having zero depth of field, onto an image plane at which an image is formed of the tobacco illuminated by reflecting of said beam,

producing a curve representative of variation of brightness in said image plane, of said image along said open end of the cigarette as a function of proximity of the tobacco at said open end with respect to a reference plane,

processing said brightness curve to obtain an index value representative of said brightness and thereby of uniformity of filling of said cigarette with tobacco at said open end, and

comparing said index value with a reference index value to determine acceptance or not of the uniformity of filling of said cigarette with tobacco at said open end.

5,596,188

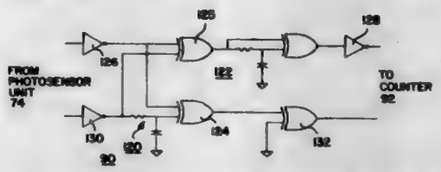
CLOCK RECOVERY SYSTEM AND ROTATIONAL DETECTION CIRCUIT

Patrick McElroy, Garden Grove, Calif., assignor to Whemoe Varec, Inc., Cypress, Calif.

Division of Ser. No. 906,295, Jul. 1, 1992. This application May 17, 1995, Ser. No. 442,875

Int. Cl.[6] H03K *5/22*; G01D *5/34*

U.S. Cl. 250—231.16 **3 Claims**



1. A clock recovery system receiving two signals separated by a phase difference and producing clock and direction signals to characterize rotation of a shaft, comprising:

a bi-directionally rotatable shaft;

a rotation detection pattern rotating with the shaft;

a first detector positioned to sense the detection pattern and to produce a first time-varying signal representing incremental shaft rotation;

a second detector positioned to sense the detection pattern and to produce a second time-varying signal representing incremental shaft rotation, the second signal offset in phase with the first signal;

a delay receiving the second signal and producing a third signal delayed from the second signal

a first exclusive-or gate directly receiving the first and third signals and generating a direction signal representing shaft rotation direction.

5,596,189

MEASURING SYSTEM FOR DETERMINING TRANSVERSE DEFLECTION OF A ROTARY SHAFT

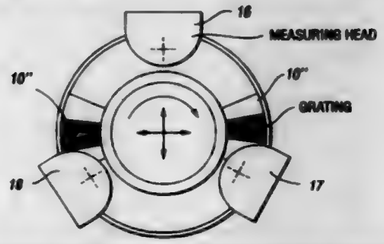
Paul A. Orton, 58 Moor Lane, Bramcote, Nottingham NG9 3FH, England

Continuation-in-part of Ser. No. 146,847, Jan. 14, 1994, Pat. No. 5,448,060. This application Jun. 5, 1995, Ser. No. 462,220

Claims priority, application United Kingdom, May 2, 1991, 9109301.8

Int. Cl.[6] G01D *5/34*

U.S. Cl. 250—231.16 **5 Claims**



1. A displaceanest measuring system for indicating relative displacement of a shaft transverse to its axis, comprising:

a) a first detector at a first station for producing electrical signals in a first channel representative of angular displacement of the shaft as measured at the first station;

b) a second detector at a second station angularly spaced from the first station for producing electrical signals in a second channel representative of angular displacement of the shaft as measured at the second station;

c) means for processing information from the first and second channels to generate an indication of relative displacement between the detectors and the shaft in a direction transverse to the axis of the shaft.

5,596,190

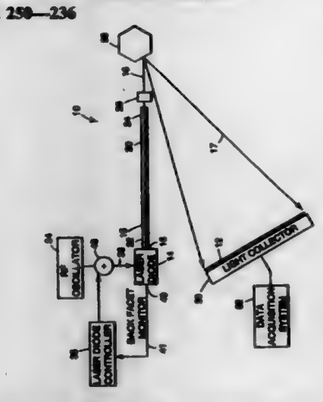
LIGHT COLLECTION DEVICE FOR A FILM IMAGE DIGITIZER

Yun Z. Li, Woodbury; Richard B. Lemberger, Forest Lake; Paul C. Schubert, Marine on St. Croix; Terrence H. Joyce, Lakeville, and Jack K. Warren, Marine on St. Croix, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1995, Ser. No. 459,328

Int. Cl.[6] H01J *3/14*

U.S. Cl. 250—236 **19 Claims**



1. An apparatus for digitizing an image formed on a sheet of film, the apparatus comprising:

a light source for emitting a beam of light;

a mechanism for scanning said beam of light in a scan line across said sheet of film to illuminate a plurality of pixels on said sheet of film;

a light collection device including:

a housing having an elongated aperture extending along said scan line, said aperture receiving light transmitted through said sheet of film from said light source;

a diffusing member, disposed within said aperture and extending along said scan line, for optically diffusing the light received by said aperture,

a linear array of photodiodes, disposed within said housing and extending along said scan line, for detecting the light diffused by said diffusing member, said linear array of photodiodes being displaced a distance from said diffusing member, and each of said photodiodes generating an analog signal representing an intensity of the detected light for each of said pixels, and

a summing circuit, coupled to each of said photodiodes, for summing the analog signals generated by said photodiodes for each of said pixels to produce an output analog signal representing an overall intensity of said light transmitted through said sheet of film from said light source for each of said pixels; and an analog-to-digital converter, electrically coupled to said summing circuit, for converting said output analog signal for each of said pixels to a digital value.

5,596,191

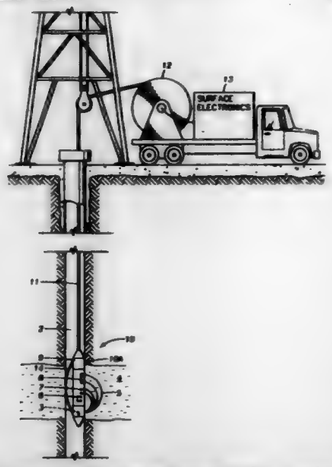
METHOD AND APPARATUS FOR EPITHERMAL NEUTRON POROSITY MEASUREMENT CORRECTED FOR TOOL STANDOFF AND FORMATION LITHOLOGY

Medhat W. Mickael, Sugar Land, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed May 22, 1995, Ser. No. 445,823

Int. Cl.[6] G01V *5/10*

U.S. Cl. 250—269.4 **11 Claims**



1. A method of determining porosity of an earth formation penetrated by a wellbore comprising the steps of:

irradiating said earth formation with bursts of fast neutrons emanating from a source inserted into said wellbore;

counting epithermal neutrons at a first detector axially spaced apart from said source so as to be primarily responsive to a neutron output rate of said source, said step of counting epithermal neutrons time-divided into buildup periods each contemporaneous with one of said bursts and decay periods each occurring between cessation of one of said bursts and initiation of a successive one of said bursts;

counting epithermal neutrons at a second detector during said buildup periods and during said decay periods, said second detector axially spaced apart from said source and radially displaced towards a wall of said wellbore so as to be responsive to epithermal neutrons entering said second detector from said formation, said second detector axially spaced so as to have response relatively insensitive to a lithology of said earth formation;

counting epithermal neutrons at a third detector during said buildup periods and during said decay periods, said third detector axially spaced apart from said source and radially displaced towards said wall so as to be primarily responsive to epithermal neutrons entering said third detector from said earth formation, said third detector axially spaced apart from said source so as to have response partially sensitive to said lithology;

calculating a first ratio of counts of said first detector to counts of said second detector counted during said buildup periods;

calculating a second ratio of counts of said first detector to counts of said second detector counted during said decay periods;

calculating a third ratio of counts of said first detector to counts of said third detector counted during said buildup periods;

calculating said porosity from said third ratio;

calculating a tool standoff from said first ratio and said second ratio;

adjusting said first ratio and said third ratio for a diameter of said wellbore and salinity of a fluid in pore spaces of said formation by a predetermined relationship; and

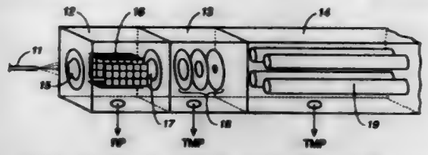
determining said lithology by comparison of said adjusted first ratio and said adjusted third ratio.

5,596,192

MASS SPECTROMETRIC APPARATUS FOR USE WITH A LIQUID CHROMATOGRAPH

Hiroaki Waki, Kyoto, Japan, assignor to Shimadzu Corporation, Japan

Filed Apr. 15, 1996, Ser. No. 631,948
Claims priority, application Japan, Apr. 28, 1995, 7-129480
Int. Cl.[6] H01J 49/04
U.S. Cl. 250—288 **18 Claims**



1. A mass spectrometric apparatus for receiving a liquid sample from a liquid chromatograph, ionizing said liquid sample under an atmospheric condition and guiding ions from said liquid sample along a specified trajectory to a mass analyzer inside a high vacuum chamber in a high vacuum condition, said mass spectrometric apparatus comprising:

one or more intermediate vacuum chambers between said liquid chromatograph and said high vacuum chamber, at least one of said intermediate vacuum chambers being an electrode-containing chamber with degree of vacuum in viscous flow region, said electrode-containing chamber having two nozzles on mutually opposite partition walls thereof corresponding to said trajectory and containing therein a pair of mutually separated planar electrodes, said trajectory being sandwiched between said pair of electrodes; and

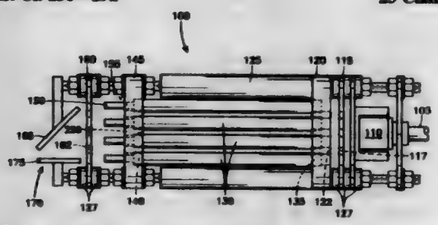
voltage means for individually and adjustably applying to said electrodes voltages of same polarity as that of said ions which enter said electrode-containing chamber through one of said nozzles.

5,596,193

MINIATURE QUADRUPOLE MASS SPECTROMETER ARRAY

Ara Chutjian, La Crescenta; Michael H. Hecht, Los Angeles, and Otto J. Orient, Glendale, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 11, 1995, Ser. No. 540,817
Int. Cl.[6] H01J 49/42
U.S. Cl. 250—292 **23 Claims**



1. A quadrupole mass analyzer for the separation of ions, comprising:

a first pair of parallel, planar, nonmagnetic conducting rods, each having an axis of symmetry;

a second pair of planar, nonmagnetic conducting rods each having an axis of symmetry parallel to said first pair of rods and disposed such that a line perpendicular to each of said first axes of symmetry and a line perpendicular to each of said second axes of symmetry bisect each other and from a generally 90 degree angle;

a nonconductive top positioning plate generally perpendicular to said first and second pairs of rods and having an aperture for ion entrance along an axis equidistant from each of said axes of symmetry;

a nonconductive bottom positioning plate generally parallel to said top positioning plate and having an aperture for ion exit centered on an axis equidistant from each of said axes of symmetry;

rigid and non-deforming means for maintaining a direct current voltage between said first and second pairs of rods; and

rigid and non-deforming means for applying a radio frequency voltage to said first and second pairs of rods;

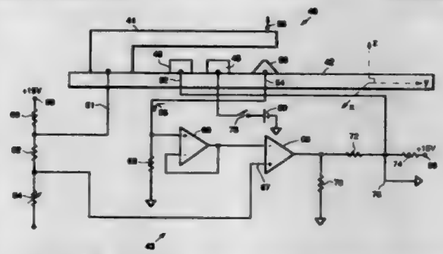
wherein said positioning plates further comprise means for preventing charging of exterior and interior surfaces of said plates.

5,596,194

SINGLE-WAFER TUNNELING SENSOR AND LOW-COST IC MANUFACTURING METHOD

Randall L. Kubena, Agoura, and Gary M. Atkinson, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 19, 1994, Ser. No. 292,897
Int. Cl.[6] H01J 37/244
U.S. Cl. 250—306 **15 Claims**



1. A tunneling tip sensor having a unitary structure, comprising:

a semiconductor substrate;

a tunneling electrode on said substrate,

a cantilever pad on said substrate, both of said tunneling electrode and said cantilever pad formed from a layer of conductive material on said substrate; and

a cantilever electrode formed from a conductive material and extending from said cantilever pad with one end suspended above said substrate at a distance from said tunneling electrode so that a tunneling current flows between said cantilever and tunneling electrodes when a bias voltage is applied across said electrodes, said cantilever and tunneling electrodes forming part of a circuit that produces an output signal such that an applied force which urges said cantilever electrode to deflect relative to said tunneling electrode modulates said output signal.

5,596,195

METHOD AND APPARATUS FOR MEASURING THE DISTRIBUTION OF ELEMENTS CONTAINED IN SAMPLE

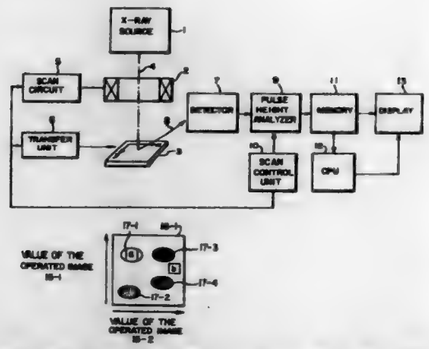
Kenichi Oborl; Atsushi Bando, and Toshikazu Yurugi, all of Miyanohigashi-machi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Sep. 15, 1995, Ser. No. 529,288
Claims priority, application Japan, Sep. 16, 1994, 6-248845
Int. Cl.[6] H01J 37/00
U.S. Cl. 250—310 **8 Claims**

1. A method of identifying substances contained in a sample wherein an intensity of resultant characteristic X-rays which are generated when radiation such as electron beams or X-rays are incident on a known element are prestored, comprising the steps of:

scanning the sample with radiation;

detecting the resultant intensity of X-rays after an impact of said X-rays with the sample;



determining a characteristic X-ray image from the detected resultant intensity of X-rays and the prestored characteristic X-rays for each element;

obtaining two or more images by multiplying the characteristic X-rays by a predetermined coefficient; and

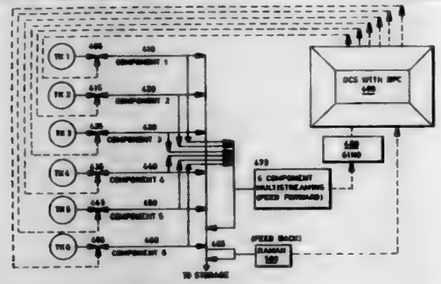
forming, from the images, a composite scattering diagram image to disclose a correlation of the composition of material in the sample.

5,596,196

OXYGENATE ANALYSIS AND CONTROL BY RAMAN SPECTROSCOPY

John B. Cooper, Virginia Beach; Kent L. Wise, Portsmouth, both of Va.; William T. Welch, Ashland, Ky., and Michael B. Sumner, Huntington, W. Va., assignors to Ashland Inc., Ashland, Ky.

Filed May 24, 1995, Ser. No. 449,326
Int. Cl.[6] G01J 3/44
U.S. Cl. 250—339.12 **39 Claims**



1. A process comprising:

a) irradiating a sample of a liquid mixture consisting essentially of liquid hydrocarbons and comprising one or more oxygenated component to produce Raman scattered radiation emitted from the sample;

b) collecting Raman scattered radiation emitted from the sample;

c) dispersing or transforming the collected Raman scattered radiation from the sample into spectra with intensities corresponding to the concentration of components of the mixture;

d) processing said spectra according to a regression model derived by multivariate analysis of Raman spectra, or a mathematical function of Raman spectra, of liquid mixtures containing known concentrations of one or more oxygenated hydrocarbons, to produce a control signal representative of the concentration of an oxygenated component in said mixture;

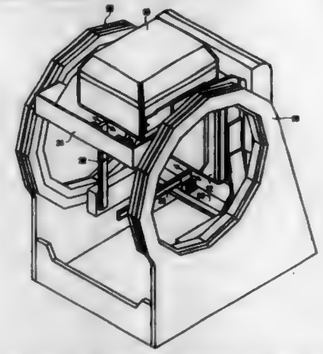
e) controlling a process in response to said control signal.

5,596,197

DUAL SYNCHRONIZED SLIDING TRANSMISSION DETECTION WINDOWS FOR DUAL TRANSMISSION LINE SOURCES

Steven M. Jones, Pleasanton; Thomas F. Lang, Fremont; John R. Liebig, San Jose, and Xiaohan Wang, Alameda, all of Calif., assignors to ADAC Laboratories, Milpitas, Calif.

Filed May 11, 1995, Ser. No. 439,222
Int. Cl.[6] G01T 1/161
U.S. Cl. 250—363.04 **36 Claims**



1. An apparatus for collecting transmission data of an object, said apparatus comprising:

a first collimated detector and a second collimated detector mounted on a gantry structure, said first detector and said second detector oriented at right angles, said first detector and second detector for simultaneously detecting emission radiation and transmission radiation;

a first line source attached to said gantry for scanning across a field of view of said first detector;

a second line source attached to said gantry structure for scanning across a field of view of said second detector;

a first transmission detection window defined within a portion of said field of view of said first detector, said first transmission detection window for receiving transmission radiation originating from said first line source;

a second transmission detection window defined within a portion of said field of view of said second detector, said second transmission detection window for receiving transmission radiation originating from said second line source; and

wherein said first line source, said second line source, said first transmission detection window, and said second transmission detection window have individual long axes and wherein all of said individual long axes are maintained within a single spatial plane.

5,596,198

GAMMA RAY CAMERA

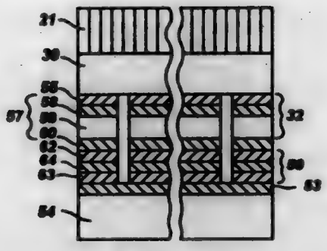
Victor Perez-Mendez, Berkeley, Calif., assignor to The Regents, University of California, Oakland, Calif.

Filed Apr. 22, 1994, Ser. No. 231,149
Int. Cl.[6] G01T 1/164; 1/202
U.S. Cl. 250—370.11 **23 Claims**

1. A gamma ray camera for detecting rays emanating from a radiation source, the gamma ray camera comprising in combination:

(a) a scintillator crystal for converting incident gamma rays to a plurality of corresponding scintillation photons, and including a scintillation layer; and

(b) a photosensor array disposed in direct contact with one side of said scintillator crystal, and responsive to the scintillation photons in order to form an electronic pattern of the incident gamma rays by recording an integrated amount of charge proportional to the incident gamma rays, without counting individual gamma rays, said photosensor array including:



(i) a transparent metallic layer; and
(ii) a p-i-n structure formed on one side of said transparent metallic layer, having a sandwich-type configuration, and comprising an upper p-type layer, an intermediate intrinsic layer and a lower n-type layer;
(c) a collimator interposed between the radiation source and said scintillation crystal; and
(d) a readout circuit formed on one side of said lower n-type layer.

5,596,199
PASSIVE SOLID STATE MICRODOSIMETER WITH ELECTRONIC READOUT
Peter J. McNulty, Seneca; W. Joseph Beauvais, Central; David R. Roth, Pendleton, all of S.C.; Wanda K. Moran, Phoenix, Ariz., and Robert A. Reed, Clemson, S.C., assignors to Clemson University, Clemson, S.C.
Filed Feb. 6, 1995, Ser. No. 383,959
Int. Cl.[6] G01T *1/24; 1/02*
U.S. Cl. 250—370.07 **66 Claims**

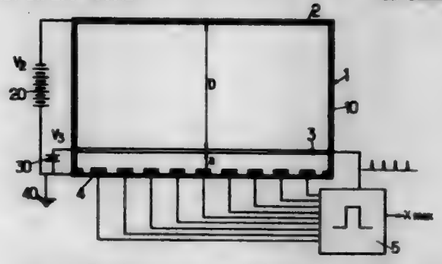


1. A passive microdosimetry detector device for recording the energy deposition of radiation incident thereto and enabling qualitative analysis of a complex radiation field, comprising an array of microstructure non-volatile memory devices, a plurality of said microstructure non-volatile memory devices each defining a corresponding microstructure sensitive volume within which charge is generated responsive to incident radiation and wherein at least one of said non-volatile memory devices is configured to store a predetermined initial charge such that said generated charge measurably alters said predetermined initial charge stored by said at least one microstructure non-volatile memory device.

5,596,200
LOW DOSE MAMMOGRAPHY SYSTEM
Sukhdev R. Sharma, Carlsbad; George E. Wasbey, Del Mar, both of Calif.; Stephen Goodman, Colorado Springs, Colo., and John A. Minteer, Vista, Calif., assignors to PrimeX, Carlsbad, Calif.
Continuation of Ser. No. 961,279, Oct. 14, 1992, abandoned. This application Apr. 6, 1995, Ser. No. 418,925
Int. Cl.[6] G01T *1/24*
U.S. Cl. 250—370.14 **23 Claims**

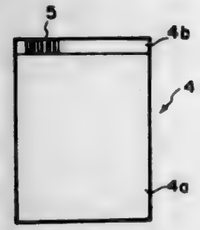
1. An x-ray mammography system comprising:
an x-ray source generating x-rays along an emission axis;
a breast holder, to hold a breast in position to be exposed to x-rays from said x-ray source;
a semiconductor detector to directly detect x-rays from said x-ray source, wherein said semiconductor detector comprises:
a layer comprising a sensor to directly detect said x-rays from said breast;
a readout chip interconnected with said layer;
wherein said sensor comprises:
a PiN detector having a first terminal surface positioned so as to be exposed to x-rays with said emission axis orthogonal to said first terminal surface.

5,596,201
DEVICE FOR FORMING IMAGES OF IONIZING PARTICLES BY MEANS OF A MULTI-WIRE PROPORTIONAL CHAMBER
Georges Charpak, Paris, France, assignor to Biospace Instruments, Paris, France
Filed Mar. 10, 1994, Ser. No. 208,148
Claims priority, application France, Mar. 11, 1993, 93 02817
Int. Cl.[6] G01T *1/18; H01J 47/00*
U.S. Cl. 250—385.1 **13 Claims**



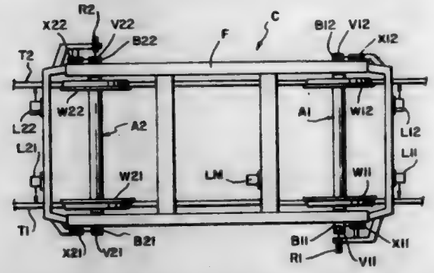
1. A device for forming images of ionizing particles, by means of a multi-wire proportional chamber, wherein said chamber, filled with a gas, exhibits an asymmetric structure formed successively by:
an entry window for the ionizing particles, taken to a first electrical potential which is negative with respect to a reference potential,
a multi-wire anode electrode taken to a second potential which is positive with respect to said reference potential in order to create an electric field between said entry window and said anode electrode,
a cathode electrode placed in the vicinity of the said multi-wire anode electrode, said cathode electrode, which is taken to the reference potential, being formed by a plurality of parallel electrically conducting strips forming a network, which makes it possible, by induction of an electric pulse caused by ionization electrons issuing from the ionizing particle in the region of one of the strips, by means of an avalanche situated in line with the impact by said particle, to detect the position of impact of this particle in the direction of the pitch of the network with a corresponding resolution.

5,596,202
RADIATION IMAGE STORAGE PANEL AND METHOD FOR USING THE SAME
Satoshi Arakawa, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 19, 1995, Ser. No. 504,260
Claims priority, application Japan, Sep. 20, 1994, 6-225067
Int. Cl.[6] G03B *42/02; G01N 23/04*
U.S. Cl. 250—484.4 **9 Claims**



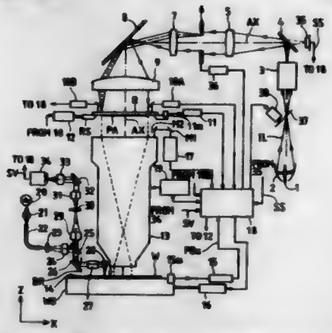
1. A radiation image storage panel for use in a radiation image read-out method
using a stimulable sheet, wherein a radiation image stored on said stimulable sheet is subjected to stimulating rays, and the radiation image is detected by a photoelectric read-out means, said storage panel comprising:
an identification code portion recorded using a fluorescent substance, said fluorescent substance producing fluorescence which has wavelengths falling within the wavelength distribution range capable of being detected by the photoelectric read-out means when said fluorescent substance is exposed to the stimulating rays, said identification code portion being used to associate descriptive information with the radiation image.

5,596,203
SYSTEM AND METHOD FOR DETECTING THE RELATIVE POSITION AND MOTIONS BETWEEN A RAIL VEHICLE AND TRACK
Angelo Zingarelli, Chieri, and Cesare Santanera, Turin, both of Italy, assignors to Fiat Ferroviaria S.p.A., Turin, Italy
Filed Apr. 20, 1995, Ser. No. 425,807
Claims priority, application Italy, Oct. 13, 1994, T094A000817
Int. Cl.[6] G01N *21/86; G01V 8/00*
U.S. Cl. 250—559.29 **10 Claims**



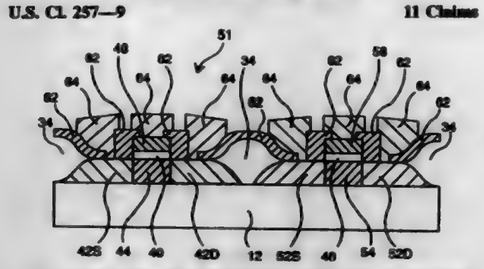
1. A detecting system for a railway vehicle running along a track formed by two parallel rails, said railway vehicle having at least two axles and a structure which is sprung over and movable relative to said axles, comprising:
photosensor position-detecting means applied to said structure and adapted to detect geometrical characteristics of the track and the relative position between said structure and said rails and to provide electrical signals indicative of said geometrical characteristics and said relative position,
displacement detecting means also applied to said structure for detectinq relative displacements between said structure and each of said axles, and to provide electrical signals indicative of said displacements,
electronic acquisition and processing means for acquiring and processing said electrical signals, to monitor track configuration and dynamic attitude of said structure relative to said axles.

5,596,204
METHOD FOR ALIGNING PROCESSING AREAS ON A SUBSTRATE WITH A PREDETERMINED POSITION IN A STATIC COORDINATE SYSTEM
Nobuyuki Irie, Kawasaki; Shigeru Hirukawa, Kashiwa, and Hiroki Tatesu, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Apr. 5, 1994, Ser. No. 222,868
Claims priority, application Japan, Apr. 6, 1993, 5-079414; Apr. 27, 1993, 5-100622; Jun. 7, 1993, 5-135968
Int. Cl.[6] G01N *21/86*
U.S. Cl. 250—548 **24 Claims**



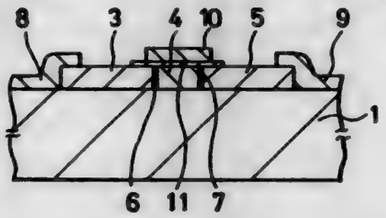
1. A method of aligning each of a plurality of processing areas on each of a plurality of substrates with a predetermined position in a static coordinate system for defining movement of the substrates, comprising:
obtaining a state of distortion of a K-th substrate, where K is an integer;
weighting respective coordinate positions of a group of specified areas selected from a plurality of processing areas on said K-th substrate in accordance with the state of distortion of the K-th substrate;
aligning each of the plurality of processing areas on said K-th substrate with said predetermined position;
obtaining a state of distortion of a (K+N)-th substrate, where N is an integer;
examining a correlation between the state of distortion of said K-th substrate and the state of distortion of said (K+N)-th substrate;
weighting, if the correlation is high, each of respective coordinate positions of a group of specified areas selected from a plurality of processing areas on said (K+N)-th substrate the same as corresponding coordinate positions of the group of specified areas of the K-th substrate; and
aligning each of the plurality of processing areas on said (K+N)-th substrate with said predetermined position.

5,596,205
HIGH-FREQUENCY WIRELESS COMMUNICATION SYSTEM ON A SINGLE ULTRATHIN SILICON ON SAPPHIRE CHIP
Ronald E. Reedy, and Mark L. Burgener, both of San Diego, Calif., assignors to Peregrine Semiconductor Corporation, San Diego, Calif.
Division of Ser. No. 218,561, Mar. 25, 1994, which is a continuation-in-part of Ser. No. 98,400, Jul. 12, 1993, Pat. No. 5,416,043. This application May 19, 1995, Ser. No. 445,144
Int. Cl.[6] H01L 29/06; 21/265
U.S. Cl. 257—9 11 Claims



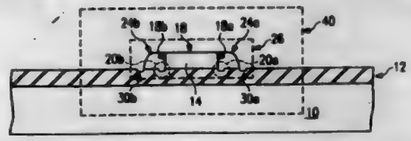
1. An analog electrosic circuit having a substantially monotonic gain characteristic and negligible kink effect comprising:
an electrically insulating substrate;
a semiconductive silicon layer that is formed on the substrate and has a thickness of less than approximately 110 nanometers and an areal density of electrically active states less than approximately 5×10^{11} cm^{-2} in regions which are not intentionally doped; and
an analog field effect transistor element that is formed in the silicon layer and has a gate length of less than approximately 0.8 micrometers.

5,596,206
SUPERCONDUCTING DEVICE
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan
Continuation of Ser. No. 151,775, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 819,633, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 512,513, Apr. 19, 1990, abandoned, which is a continuation of Ser. No. 167,987, Mar. 14, 1988, abandoned. This application Apr. 4, 1995, Ser. No. 416,474
Claims priority, application Japan, Mar. 13, 1987, 62-58141; Mar. 17, 1987, 62-63475; Mar. 23, 1987, 62-69450
Int. Cl.[6] H01L 29/06
U.S. Cl. 257—30 13 Claims



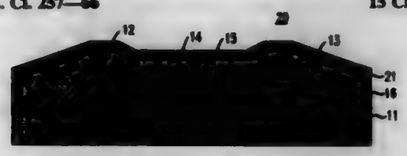
1. A superconducting device comprising:
a superconducting film formed on a substrate, the superconducting film including at least two regions having a different Tc from one another; and
a control electrode formed adjacent a portion of the superconducting film in order to control a current passing across the at least two regions in the superconducting film.

5,596,207
APPARATUS AND METHOD FOR DETECTING DEFECTS IN INSULATIVE LAYERS OF MOS ACTIVE DEVICES
Srikanth Krishnan, Richardson, and Jeffrey A. McKee, Grapevine, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 8, 1994, Ser. No. 224,947
Int. Cl.[6] H01L 23/58
U.S. Cl. 257—48 9 Claims



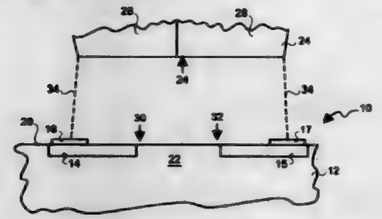
1. An MMOS capacitor formed similarly to an MOS transistor, the transistor being of the type having a substrate, a gate dielectric and a gate, the MMOS capacitor comprising:
a second substrate;
a dielectric on the second substrate, said dielectric being similar to the gate dielectric;
a conductive plate on the dielectric, a portion of the dielectric immediately surrounding the plate being partially etched due to the formation of the plate;
a conductive sidewall which is electrically continuous with the conductive plate and which overlies the partially etched portion of the dielectric, such that the conductive plate and the conductive sidewall overly a portion of the second substrate which has a uniform impurity concentration; and
whereby the electrical characteristics of the MMOS capacitor provides an indication of the electrical characteristics of the transistor.

5,596,208
ARTICLE COMPRISING AN ORGANIC THIN FILM TRANSISTOR
Ananth Dodabalapur, Millington; Howard E. Katz, Summit, and Lalan Torsi, Murray Hill, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Continuation of Ser. No. 353,824, Dec. 9, 1994, abandoned.
This application May 10, 1996, Ser. No. 644,596
Int. Cl.[6] H01L 29/76; 31/036; 31/112
U.S. Cl. 257—66 15 Claims



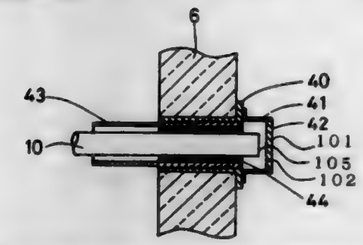
1. An article comprising a thin film transistor comprising
a) a layer of organic material;
b) spaced apart first and second contact means in contact with said layer of organic material;
c) third contact means that are spaced from each of said first and second contact means and that are adapted for controlling, by means of a voltage applied to the third contact means, a current between the first and the second contact means;
CHARACTERIZED IN THAT
d) the layer of organic material comprises a layer of first organic material of a first conductivity type and a layer of a second organic material of a second conductivity type that is in contact with said layer of the first organic material at least in a region between said first and second contact means and forms a p-n junction therewith, the layer of the first organic material being in contact with each of the first and second contact means and being not in contact with the third contact means, wherein said first and second organic materials respectively have a first and a second energy gap between a highest occupied orbital and a lowest unoccupied orbital, and wherein said first and second organic materials are selected such that said first energy gap differs from said second energy gap.

5,596,209
PHOTOCONDUCTIVE SEMICONDUCTOR CONTROL DEVICE
Peter L. D. Chang, Nashua, and Marcel T. Bergeron, Manchester, both of N.H., assignors to Lockheed Sanders, Inc., Nashua, N.H.
Filed May 9, 1994, Ser. No. 239,482
Int. Cl.[6] H01L 31/00
U.S. Cl. 257—80 7 Claims



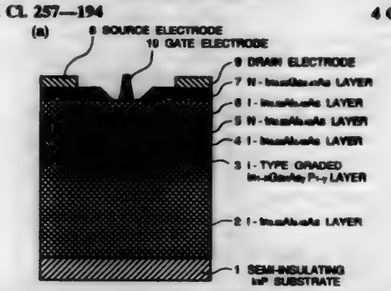
1. A semiconductor control device for alternating current signals, comprising:
a substantially undoped semiconductor having a surface thereof exposed for irradiation and a plurality of exposed, similarly doped regions formed at the exposed surface and separated by an exposed undoped portion;
a separate electrical contact formed on the substrate surface over each doped region which contacts only partially cover their respective doped region leaving substantial portions of each doped region exposed at the substrate surface between the electrical contacts; and
means for directing radiant energy onto the doped regions and undoped semiconductor for controlling current flow through the substrate in response to an alternating electrical potential thereacross.

5,596,210
LIGHT TRIGGER TYPE SEMICONDUCTOR DEVICE WITH REFLECTION PREVENTION FILM
Yasuru Kouishi; Kyotaro Hirasawa, and Kazunori Taguchi, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1995, Ser. No. 407,648
Claims priority, application Japan, Apr. 12, 1994, 6-073129
Int. Cl.[6] H01L 31/0232
U.S. Cl. 257—98 8 Claims



1. A light trigger type semiconductor device comprising:
a semiconductor substrate;
a light introducing path for transmitting a light signal to the semiconductor substrate, said light introducing path having an interface through which the light signal passes, the interface having a reflection prevention film formed thereon; and
an optical coupling agent for transmitting the light signal, said coupling agent positioned between the semiconductor substrate and said reflection prevention film.

5,596,211
FIELD EFFECT TRANSISTOR HAVING A GRADED BANDGAP INGAASP CHANNEL FORMED OF A TWO-DIMENSIONAL ELECTRON GAS
Kazuhiko Onda, and Masaaki Kuzuhara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 181,029, Jan. 14, 1994, abandoned.
This application Oct. 18, 1995, Ser. No. 544,724
Claims priority, application Japan, Jan. 14, 1993, 5-004473
Int. Cl.[6] H01L 35/26
U.S. Cl. 257—194 4 Claims



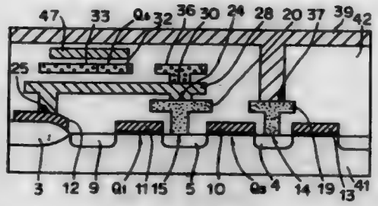
1. A two-dimensional electron gas field effect transistor comprising a buffer layer, a channel layer, an N-type electron supply layer and a Schottky layer formed on a semi-insulating InP substrate in the named order, a gate electrode being formed in Schottky contact with said Schottky layer, a source electrode and a drain electrode being formed in ohmic contact with cap layers which are formed on said Schottky layer so as to put said gate electrode therebetween and apart therefrom, the channel layer being formed of an $In_{1-x}Ga_xAs_yP_{1-y}$ layer, wherein the values of "x" and "y" change in a depth direction of said channel layer so as to cause predetermined variation of energy gap value relative to channel depth, and wherein the values of x and y are selected to satisfy the relation

$$x=(0.453y)(1+0.031y)$$

whereby lattice matching of said channel layer to said InP substrate is maintained throughout the thickness of said channel layer.

5,596,212
SEMICONDUCTOR MEMORY DEVICE AND A MANUFACTURING METHOD OF THE SAME
Hirotada Kuriyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 317,424, Oct. 4, 1994, abandoned, which is a continuation of Ser. No. 98,923, Jul. 29, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,804
Claims priority, application Japan, Sep. 4, 1992, 4-237249; Mar. 18, 1993, 5-058764
Int. Cl.[6] H01L 27/108; 29/76; 29/94; 31/119
U.S. Cl. 257—298 7 Claims

1. A semiconductor memory device including a memory cell provided with a pair of first and second driver transistors of a first conductivity type and a pair of first and second load transistors of a second conductivity type forming a flip-flop circuit, and a pair of first and second access transistors,
said memory cell comprising:
a gate electrode of said first driver transistor extending in a predetermined direction;



a gate electrode of said second driver transistor, extending substantially in the same direction as said gate electrode of said first driver transistor with a predetermined space therebetween; and

a word line extending substantially in the same direction as said gate electrode of said first driver transistor with a predetermined space therebetween, and forming gate electrodes of said first and second access transistors; wherein

source regions of said first and second driver transistors are formed to be electrically connected together between said gate electrodes of said first and second driver transistors, wherein said first and second load transistors include first and second thin-film transistors formed on an interlayer insulating film located over the semiconductor substrate,

said first and second access transistors are electrically connected to first and second bit lines extending above said first and second thin-film transistors, and

said source regions of said first and second driver transistors are electrically connected to a ground interconnection layer having an upper portion extending at least in part directly under said first and second bit lines and at least in part directly above said first and second thin-film transistors.

5,596,213

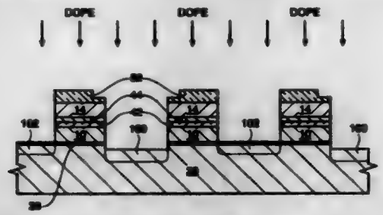
SHALLOW TRENCH SOURCE EPROM CELL

Roger Lee, Boise, Id., assignor to Micron technology, Inc., Boise, Id.

Continuation of Ser. No. 208,753, Mar. 8, 1994, Pat. No. 5,445,981, which is a division of Ser. No. 976,226, Nov. 12, 1992, Pat. No. 5,297,082. This application Mar. 14, 1995, Ser. No. 403,328

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **20 Claims**



1. A semiconductor device comprising:

a substrate having a first type conductivity and further having a trench therein, said trench having a sidewall and a bottom;

a floating gate having a sidewall;

a control gate having a sidewall,

wherein said trench sidewall, said floating gate sidewall, and said control gate sidewall are generally aligned vertically,

a channel region in said substrate having a portion along said trench sidewall and a portion under said floating gate;

a substrate region under said bottom of said trench having a second type conductivity, different from said first type conductivity,

wherein said trench sidewall has a substantially first type conductivity.

5,596,214

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING A METAL-INSULATOR-SEMICONDUCTOR GATE STRUCTURE AND METHOD FOR FABRICATING THE SAME

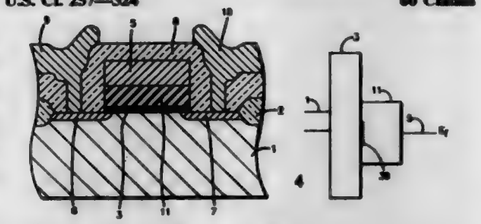
Nobuhiro Ende, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 30, 1995, Ser. No. 453,890

Claims priority, application Japan, May 30, 1994, 6-116394

Int. Cl.[6] H01L *29/792;29/76;29/94*

U.S. Cl. 257—324 **60 Claims**



1. A multi-layer structure comprising:

a semiconductor layer;

a first insulating layer formed on said semiconductor layer, said first insulating layer having a first dielectric constant ϵ_1 and having a first thickness of t_1;

a second insulating layer formed on said first insulating layer, said second insulating layer having a second dielectric constant ϵ_2 and having a second thickness of t_2; and

a highly conductive layer formed on said second insulating layer so that when an electric field is applied between said semiconductor and highly conductive layers, electrons exhibit a direct tunneling across said first insulating layer, and that electrons having exhibited said direct tunneling from said semiconductor layer are trapped into interfacial trap centers at interface states on an interface between said first and second insulating layers:

wherein said first and second dielectric constants ϵ_1 and ϵ_2 and said first and second thicknesses t_1 and t_2 satisfy the conditions of $20 \leq \epsilon_2/\epsilon_1$, and $t_2/t_1 \leq \epsilon_2/\epsilon_1$.

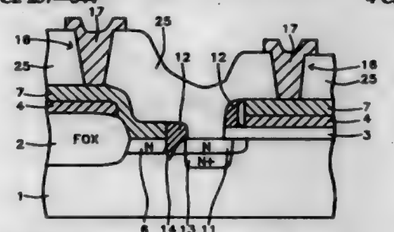
5,596,215

METHOD TO IMPROVE BURIED CONTACT RESISTANCE

Jenn M. Huang, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan Division of Ser. No. 408,764, Jan. 8, 1995, Pat. No. 5,525,552. This application Mar. 22, 1996, Ser. No. 620,183

Int. Cl.[6] H01L *29/76;29/94;27/088*

U.S. Cl. 257—344 **4 Claims**



1. A MOSFET device structure, comprising:

a field oxide region on the surface of a semiconductor substrate;

a device area in an area of said semiconductor substrate, not covered by said field oxide region;

a polysilicon gate structure having a sidewall overlying a first region, of said device area:

a polysilicon contact structure having a sidewall overlying said field oxide region, and extending to overlay a second region of, said device area:

a doped region, used for buried contact, in said second region, of said device area, underlying said polysilicon contact structure;

a creviced, third region in said device area, adjacent to the sidewall of said polysilicon contact structure:

a slightly doped source and drain region in a fourth region, of said device area, with said fourth region of said device area including said creviced, third region, of said device area, and located between said polysilicon gate structure, and said polysilicon contact structure;

a spacer located on the sidewall of said polysilicon gate structure, and on the sidewall of said polysilicon contact structure, with said spacer completely overlying said creviced, third region, of said device area:

a heavily doped source and drain region located in a fifth region, of said device area, located between said spacer on sidewall of said polysilicon contact structure, and said spacer on sidewall of said polysilicon gate structure; and

metal contact structures to said polysilicon contact structure, and to said polysilicon gate structure.

5,596,216

SEMICONDUCTOR DEVICE WITH DIODE AND CAPABLE OF DEVICE PROTECTION

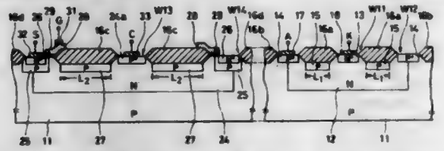
Hiroshi Yanagigawa, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 550,810

Claims priority, application Japan, Oct. 31, 1994, 6-266481

Int. Cl.[6] H01L *23/62*

U.S. Cl. 257—355 **11 Claims**



1. A semiconductor device with a diode, said device comprising:

a semiconductor substrate;

a first impurity doped region of a first conductivity type formed in said semiconductor substrate, said first impurity doped region forming one of an anode region and a cathode region of said diode;

a second impurity doped region of a second conductivity type opposite to said first conductivity type formed in said semiconductor substrate, said second impurity doped region forming the other of said anode region and said cathode region of said diode;

said first impurity doped region and said second impurity doped region producing a first p-n junction at an interface of said first impurity doped region and said second impurity doped region;

a third impurity doped region of said first conductivity type formed in said second impurity doped region, said third impurity doped region being electrically connected to said first impurity doped region; and

said third impurity doped region and said second impurity doped region producing a second p-n junction at an interface of said third impurity doped region and said second impurity doped region;

wherein when a reverse voltage is applied across said first impurity doped region and said second impurity doped region, a first depletion region is created near said first p-n junction and a second depletion region is created near said second p-n junction;

and wherein said first depletion region and said second depletion region merge together due to said reverse voltage over a breakdown voltage of said diode;

and wherein when said reverse voltage is greater than a given breakdown voltage of said diode, a breakdown phenomenon occurs in said diode so that a reverse, operating current flows between said first impurity doped region and said second impurity doped region.

5,596,217

SEMICONDUCTOR DEVICE INCLUDING OVERVOLTAGE PROTECTION DIODE

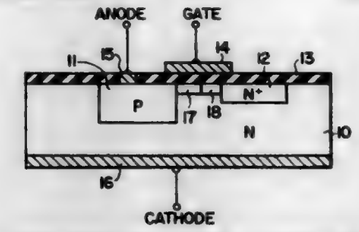
Masami Yamaoka, Anjo, and Shoji Toyoshima, Konan, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-pref., Japan

Continuation of Ser. No. 148,085, Jan. 25, 1988, abandoned, which is a continuation of Ser. No. 859,215, May 2, 1986, abandoned, which is a continuation of Ser. No. 452,404, Dec. 22, 1982, abandoned. This application Sep. 14, 1989, Ser. No. 407,157

Claims priority, application Japan, Dec. 24, 1981, 56-215649; Feb. 5, 1982, 57-17085

Int. Cl.[6] H01L *29/866*

U.S. Cl. 257—367 **34 Claims**



1. A semiconductor device having an overvoltage protection function comprising:

a substrate having N-type conductivity with impurity concentration of approximately 1.0×10^{14} to 2.0×10^{14} atoms/cm^3;

a cathode conductive layer formed on a first major surface of said substrate;

a P-type diffusion region formed in the substrate and occupying a first predetermined diffusion depth from a second major surface of said substrate;

an N-type diffusion region formed in the substrate, spaced apart from said P-type diffusion region, and occupying a second predetermined diffusion depth from said second major surface, said N-type diffusion region having an impurity concentration higher than the impurity concentration of said substrate;

an anode conductive layer overlapping at least a portion of said P-type diffusion region for receiving a reverse-bias voltage, said reverse-bias voltage being set not less than 200 v and applied across said cathode conductive layer with respect to said anode conductive layer (V_{AC});

an insulating layer overlapping at least a portion of the second major surface of said substrate between the P-type diffusion region and the N-type diffusion region; and

a gate electrode conductive layer overlapping at least a portion of said insulating layer which includes at least said portion of the second major surface of said substrate between the P-type diffusion region and the N-type diffusion region, said gate electrode conductive layer for inputting a constant potential difference set in the range of −200 to 200 v and applied across said gate electrode conductive layer with respect to said anode conductive layer (V_{GA}), the reverse-bias voltage (V_{AC}) applied across the cathode conductive layer and the anode conductive layer being set greater than the constant potential difference set across the gate electrode conductive layer and the anode conductive layer (V_{GA});

wherein $V_{GA} \neq 0$; and

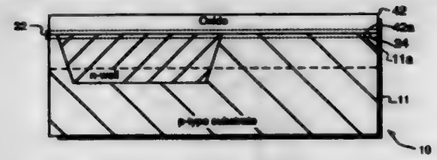
whereby said semiconductor device provides a controlled breakdown voltage in response to a high reverse-bias voltage applied across the cathode conductive layer and the anode conductive layer (V_{AC}).

5,596,218

HOT CARRIER-HARD GATE OXIDES BY NITROGEN IMPLANTATION BEFORE GATE OXIDATION

Hamid R. Soleimani, Westborough; Brian Doyle, Framingham, both of Mass., and Ara Philipossian, Redwood Shores, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 18, 1993, Ser. No. 138,986
Int. Cl.[6] H01L 29/76
U.S. Cl. 257—369 **8 Claims**



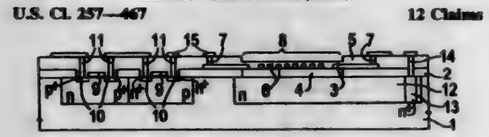
1. An article comprising:
a silicon substrate having a surface layer portion including nitrogen atoms;
an oxide layer disposed on the surface layer portion of said silicon substrate and consisting essentially of silicon dioxide and nitrogen atoms and being substantially free of a formation of Si_3N_4, with said silicon substrate surface layer portion and said oxide layer in a region having a concentration of nitrogen atoms in a range of at least $5\times10^{11}/cm^2$ to $1\times10^{12}/cm^2$ and occurring about an interface between said silicon substrate surface layer portion and said oxide layer, said region extending substantially from a depth of 1000 angstroms in said silicon substrate to a level in said oxide layer which is ten to twenty percent of the thickness of said oxide layer.

5,596,219

THERMAL SENSOR/ACTUATOR IN SEMICONDUCTOR MATERIAL

Christofer Hierold, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 16, 1995, Ser. No. 442,511
Claims priority, application Germany, May 25, 1994, 44 18 207.4
Int. Cl.[6] H01L 31/058;29/82
U.S. Cl. 257—467 **12 Claims**



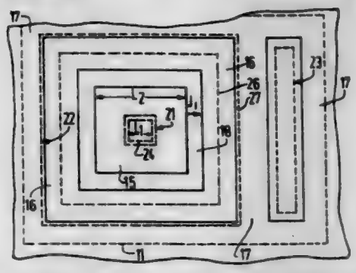
1. A thermal sensor/actuator, comprising:
a semiconductor material;
a structured layer that forms a sensor/actuator on a surface of the semiconductor material;
a dielectric layer in the semiconductor material that is separate from the structured layer;
a cavity located in a recess of the dielectric layer that thermally insulates the structured layer from remaining semiconductor material; and
a closure layer that seals said cavity from the external environment.

5,596,220

INTEGRATED LATERAL TRANSISTOR WITH IMPROVED CURRENT AMPLIFICATION

Pierre Leduc, Colleville-Montgomery, and Bertrand Jacques, Thaon, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 172,997, Mar. 23, 1988, abandoned, which is a continuation of Ser. No. 940,477, Dec. 10, 1986, abandoned. This application Jul. 20, 1989, Ser. No. 334,611
Claims priority, application France, Dec. 31, 1985, 85 19479
Int. Cl.[6] H01L 27/082;27/102;29/70;31/11
U.S. Cl. 257—587 **5 Claims**



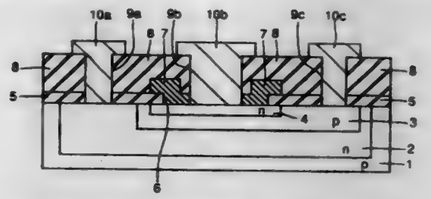
1. A semiconductor device comprising a lateral transistor having a surface-adjoining region of a second conductivity type, emitter and collector regions of a first conductivity type opposite to that of the second and at least partly covered by an insulating layer, said emitter and collector regions being laterally spaced apart and extending from the surface of said region of the second type between the emitter and collector regions forming the base of the transistor, said device comprising electrical emitter and collector connections, each of said emitter and collector connections having a zone in electrical contact, through windows in said insulating layer, with said emitter region and with said collector region, respectively, characterized in that the emitter region has a thickness and a doping level such that a diffusion length of minority carriers vertically injected into the emitter region is larger than or equal to the thickness of said emitter region and in that the ratio between the surface area of said emitter region and the surface area of said electrical emitter connection zone lies between 20 and 200.

5,596,221

BIPOLAR TRANSISTOR WITH EMITTER DOUBLE CONTACT STRUCTURE

Hiroki Honda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 463,799
Claims priority, application Japan, Sep. 29, 1994, 6-234875
Int. Cl.[6] H01L 29/45;29/73
U.S. Cl. 257—588 **18 Claims**



1. A bipolar transistor comprising:
a semiconductor substrate of a first conductivity type having a main surface,
a collector region of a second conductivity type formed at the main surface of said semiconductor substrate,
a base region of the first conductivity type formed at a surface of said collector region,

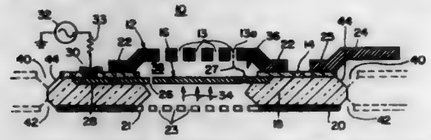
an emitter region of the second conductivity type formed at a surface of said base region,
an insulation layer formed on the main surface of said semiconductor substrate and having a contact hole reaching a surface of said emitter region,
a polycrystalline silicon layer formed in contact with a surface of said emitter region within said insulation layer and having a hole defining a portion of said contact hole, and
a metal electrode formed in said contact hole so as to provide contact with a surface of said emitter region.

5,596,222

WAFER OF TRANSDUCER CHIPS

Jonathan J. Bernstein, Medfield, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 12, 1994, Ser. No. 289,688
Int. Cl.[6] H01L 23/544
U.S. Cl. 257—620 **3 Claims**



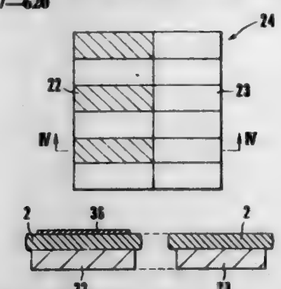
1. A wafer containing a plurality of severable transducer chips comprising:
a wafer;
a plurality of transducer chips formed on a surface of said wafer; and
a grid of longitudinal grooves in said wafer separating said chips from each other and enabling them to be easily, individually severed from said wafer; said grooves being "V" shaped and wider at the surface of the wafer and narrowing as they penetrate inwardly.

5,596,223

SEMICONDUCTOR DEVICE AND METHOD OF SELECTING THE SAME

Kazunori Asano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 357,758, Dec. 16, 1994, abandoned. This application May 21, 1996, Ser. No. 651,128
Claims priority, application Japan, Dec. 16, 1993, 5-317006
Int. Cl.[6] H01L 23/12;21/66;23/52
U.S. Cl. 257—620 **5 Claims**



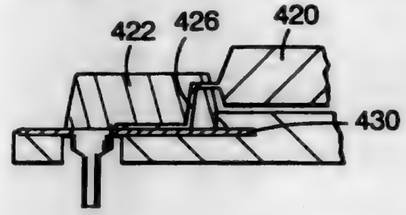
1. A plurality of semiconductor chips formed on a semiconductor substrate, said plurality of semiconductor chips comprising:
at least one group of first semiconductor chips,
at least one group of second semiconductor chips, and
a plurality of plated heat sink structures formed at respective rear surfaces of said semiconductor chips, each of said plated heat sink structures formed at respective rear surfaces of said at least one group of first semiconductor chips comprising a nickel-plating layer for allowing said at least one group of first semiconductor chips to be selected from among said at least one group of second semiconductor chips without damaging said semiconductor chips and adversely affecting characteristics thereof and, each of said plated heat sink structures formed at respective rear surfaces of said at least one group of second semiconductor chips not comprising any nickel-plating layer.

5,596,224

MOLDED-IN LEAD FRAMES

James V. Murphy, Warwick, and Michael J. Murphy, East Greenwich, both of R.I., assignors to Advanced Interconnections Corporation, West Warwick, R.I.

Division of Ser. No. 64,841, May 20, 1993, Pat. No. 5,438,481, which is a continuation-in-part of Ser. No. 991,978, Dec. 17, 1992, abandoned, which is a continuation of Ser. No. 121,568, Nov. 17, 1987, Pat. No. 5,184,285. This application May 1, 1995, Ser. No. 431,792
Int. Cl.[6] H01L 23/495
U.S. Cl. 257—666 **10 Claims**



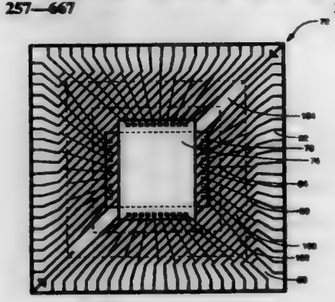
1. A device, suitable for aiding in fastening an integrated circuit package having connector leads to an intercoupling component, said device comprising a plurality of elements, each said element corresponding to a said connector lead; wherein each said element can be positioned over a different said connector lead, and wherein said elements are suitable for conveying a downward force on each said connector lead to allow contact of each said connector lead with said intercoupling component.

5,596,225

LEADFRAME FOR AN INTEGRATED CIRCUIT PACKAGE WHICH ELECTRICALLY INTERCONNECTS MULTIPLE INTEGRATED CIRCUIT DIE

Ranjan J. Mathew, San Jose, and Hem P. Takiar, Fremont, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 329,997, Oct. 27, 1994, abandoned. This application Mar. 27, 1996, Ser. No. 624,759
Int. Cl.[6] H01L 23/495;23/34; H05K 7/20
U.S. Cl. 257—667 **21 Claims**



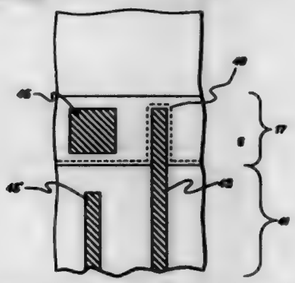
1. A leadframe for use in an integrated circuit package, said leadframe comprising a central portion having a top and a bottom surface and a peripheral portion at least partially surrounding said central portion, said peripheral portion including an array of electrically conductive leads for electrically connecting said integrated circuit package to external elements, said central portion including at least one die attach pad segment for receiving a first integrated circuit die, and said central portion having a plurality of perforations through said central portion of said leadframe for allowing the flow of said encapsulant material through said perforations during the molding process of the manufacture of said integrated circuit package, said perforations including a first perforation running diagonally and continuously through said central portion of said leadframe and including additional perforations running parallel with said first perforation forming therebetween diagonal electrically conductive strips each of which is integrally formed as part of and continuous with at least one of said electrically conductive leads in the peripheral portion of the leadframe.

5,596,226

SEMICONDUCTOR CHIP HAVING A CHIP METAL LAYER AND A TRANSFER METAL AND CORRESPONDING ELECTRONIC MODULE

Kenneth E. Bellstein, Jr., Essex Junction; Claude L. Bertin, Burlington; Timothy H. Daubenspeck, Colchester, and Wayne J. Howell, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 6, 1994, Ser. No. 301,290
Int. Cl.[6] H01L *23/48*
U.S. Cl. 257—690 **2 Claims**



1. A bare integrated circuit (IC) chip comprising:
a support layer;
a chip metal layer composed of a first type of metal, said chip metal layer being mechanically coupled to said support layer, and
a transfer metal layer integral to said bare IC chip and composed of said first type of metal, said transfer metal layer being mechanically coupled to said support layer wherein said transfer metal layer extends from above circuitry of said bare IC chip to an edge surface of said IC chip for facilitating electrical contact to said circuitry from said edge surface; and
wherein at said edge surface the chip metal layer is coplanar with and spaced from the transfer metal layer.

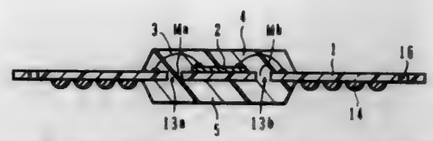
5,596,227

BALL GRID ARRAY TYPE SEMICONDUCTOR DEVICE

Hiroshi Saito, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Sep. 1, 1995, Ser. No. 522,550
Claims priority, application Japan, Sep. 1, 1994, 6-232414
Int. Cl.[6] H01L *23/12*
U.S. Cl. 257—701 **16 Claims**

1. A semiconductor device comprising:
a board with a plurality of wiring patterns:



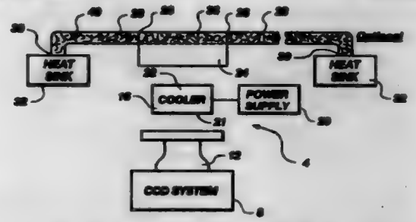
an LSI chip mounted on a front surface of the board at a mounting area thereof;
a front surface sealing resin layer for sealing the LSI chip mounted on the front surface of the board; and
a rear surface sealing resin layer for sealing a rear surface of the board at a position registered to the front surface sealing resin layer, the rear surface sealing resin layer having substantially the same size and thickness as those of the front surface sealing resin layer;
through holes formed in the board at a peripheral area thereof, the plurality of wiring patters extending from the front surface to the rear surface via the through holes; and
solder balls formed on the wiring patterns formed on the rear surface of the board, the solder balls being formed at an outside area of the rear surface sealing resin layer.

5,596,228

APPARATUS FOR COOLING CHARGE COUPLED DEVICE IMAGING SYSTEMS

Richard L. Anderton, West Jordan, and Steven E. Curtis, Salt Lake City, both of Utah, assignors to OEC Medical Systems, Inc., Salt Lake City, Utah

Continuation of Ser. No. 209,001, Mar. 10, 1994, abandoned. This application Jul. 28, 1995, Ser. No. 508,576
Int. Cl.[6] H01L *23/34;* **H05K** *7/20*
U.S. Cl. 257—714 **15 Claims**



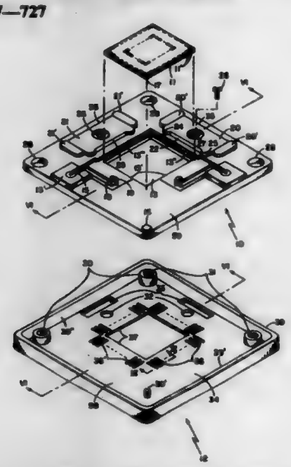
1. Apparatus for cooling a charge-coupled device imaging system, containing an imaging sensor, and the like comprising
a thermoelectric cooler thermally coupled to said system for transferring heat therefrom to cool the imaging sensor to approximately an ambient temperature, said thermoelectric cooler having a cold side and an opposing hot side, said cold side being thermally coupled to said imaging sensor to thereby cool the sensor in response to a supply of power;
a power supply coupled to the cooler for supplying power thereto;
a heat pipe means thermally coupled to said hot side for transferring heat therefrom, the heat pipe means comprising a tubular heat-conducting wall circumscribing a hollow portion, and a wicking material and a working fluid disposed in the hollow, and
a heat sink thermally coupled to the heat pipe means for transferring heat therefrom, and wherein the heat sink comprises a mass of thermally conductive material disposed so that it tracks ambient temperature.

5,596,229

CHIP CARRIER STRUCTURE

James F. Simon, Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 11, 1989, Ser. No. 392,249
Int. Cl.[6] H01L *23/32;23/50*
U.S. Cl. 257—727 **12 Claims**



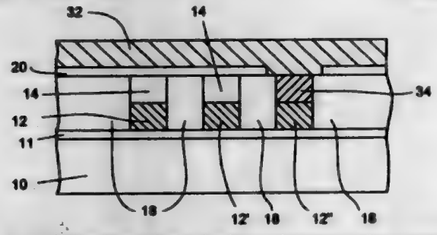
1. A chip carrier structure for containing a chip carrier having electrical contact pads comprising:
a first mounting and positioning structure for said chip carrier;
a second slotted structure;
said first and second structures being detachably mated to form a third structure containing said chip carrier; and
said slots of said second structure being in alignment with the pads of said chip carrier to provide electrical and mechanical access to said pads, said access being from exterior to interior of said third structure.

5,596,230

INTERCONNECTION WITH SELF-ALIGNED VIA PLUG

Gary Hong, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsin-chu, Taiwan

Continuation of Ser. No. 351,491, Dec. 7, 1994, abandoned, Division of Ser. No. 158,385, Nov. 29, 1993, Pat. No. 5,382,545. This application Jan. 4, 1996, Ser. No. 583,197
Int. Cl.[6] H01L *23/485;23/532*
U.S. Cl. 257—758 **6 Claims**



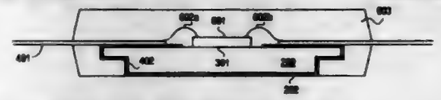
1. A semiconductor device having an interconnection structure comprising:
a first layer of a first dielectric material above a semiconductor substrate;
first metal lines on the first layer of the first dielectric material;
a second layer of a second dielectric material on the first layer of the first dielectric material between the first metal lines and covering at least portions of the first metal lines, the second layer of the second dielectric material having a surface above the first metal lines, the second dielectric material being different from the first dielectric material;
a first plurality of vias in the second layer of the second dielectric material extending from the surface of the second layer of the second dielectric material to surfaces of a first corresponding plurality of the first metal lines, the first plurality of vias filled with plugs formed from the first dielectric material;
a second plurality of vias in the second layer of the second dielectric material extending from the surface of the second layer of the second dielectric material to surfaces of a second corresponding plurality of the first metal lines, the second plurality of vias filled with metal plugs;
a third layer of the first dielectric material on the second layer of the second dielectric material and on the first plurality of vias; and
second metal lines on the second layer of the second dielectric material and in contact with the metal plugs within the second plurality of vias.

5,596,231

HIGH POWER DISSIPATION PLASTIC ENCAPSULATED PACKAGE FOR INTEGRATED CIRCUIT DIE

Edward G. Combs, Foster City, Calif., assignor to Anst, Limited, Hong Kong, Hong Kong

Continuation of Ser. No. 981,927, Nov. 24, 1994, abandoned, which is a continuation of Ser. No. 740,555, Aug. 5, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 348,288
Int. Cl.[6] H01L *23/34;* **H05K** *7/20*
U.S. Cl. 257—776 **18 Claims**



4. An integrated circuit assembly, comprising:
a block of thermally conductive material having a thin surface layer of an electrically insulative material of a predetermined thickness, said block including a stepped structure having a base and a protrusion from said base;
a lead frame attached to a surface of said base of said stepped structure; and
a resinous encapsulation for said block and said lead frame, said resinous encapsulation interlocking the stepped structure of said block, thereby minimizing displacement of said block within said resinous encapsulation, said resinous encapsulation positioning a surface of said protrusion of said stepped structure on an opposite side of said surface of said base of said stepped structure, so as to transfer heat generated at said lead frame out of said integrated circuit assembly through said surface of said protrusion of said stepped structure.

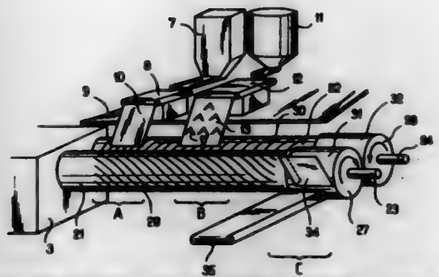
5,596,232

CONTINUOUS PROCESS FOR THE SOLVENTLESS MANUFACTURE OF COMPOSITE PYROTECHNIC PRODUCTS

Alain Lefumeux, Orsay, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jul. 28, 1995, Ser. No. 508,701
Claims priority, application France, Jul. 29, 1994, 94 09087
Int. Cl.[6] C06B *21/00*
U.S. Cl. 264—3.2 **19 Claims**

1. Continuous process for the manufacture of thermoformable composite pyrotechnic products comprising at least one thermoplastic or quasi-thermoplastic binder and an organic or inorganic crystalline oxidizing charge, which are mixed and homogenized on a roll mill consisting of two cylindrical rollers (1, 2) of identical length, with parallel axes situated in the same horizontal plane, the said rollers turning in opposite directions to each other with differ-



ent speeds of rotation, their axes being separated from each other so as to allow a minimum separation to exist between the external surfaces of the two rollers in the plane containing the two axes, the said process being characterized in that:

(i) the said binder is introduced continuously into a feed zone (A) situated at one of the ends of the said rollers in a pre-formulated solid form containing all the constituents of the binder and being free from solvent, the said binder thus forming a continuous sheet which covers the faster turning roller (1),

(ii) the said pyrotechnic product is withdrawn continuously into a recovery zone (C) situated at the end of the rollers opposite to that where introduction of the binder takes place,

(iii) the said oxidizing charge is introduced continuously in the form of crystals in a zone (B) situated between the binder feed zone (A) and the recovery zone (C) of the pyrotechnic product and arranged above the roller (1) covered with the binder,

(iv) the size of the crystals constituting the oxidizing charge is at most equal to the minimum separation existing between the external surfaces of the two rollers.

5,596,233

LIGHT SWITCHING DEVICE FOR A MOTOR VEHICLE

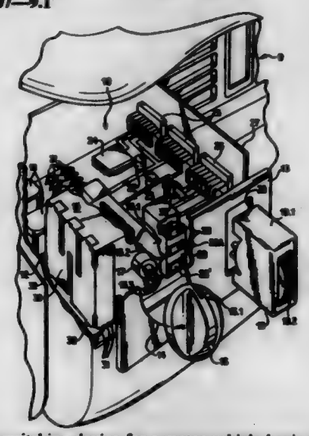
Heinz Leiber, Oberriexingen; Heinz G. Burghoff, Reichenbach; Karlheinz Mangold, Waldstetten; Michael Geber, Bad Urach, and Hartmut Fitz, Urbach, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed Jul. 25, 1994, Ser. No. 279,660

Claims priority, application Germany, Jul. 23, 1993, 43 24 690.7

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 307—9.1 **22 Claims**



1. Light switching device for a motor vehicle having a plurality of lamps which provide operating illumination, at least one exchangeable fuse, and at least one of a dashboard and an instrument panel, the light switching device comprising:

at least one switching component, capable of more than one switching position and coupled to the plurality of lamps, for switching on and off the plurality of lamps;

indicating means for indicating an operating state of the lamps which provide operating illumination;

an electrical plug-in connection integrated with the switching component and the indicating means, into a single piece that is insertable into the dashboard or the instrument panel of the motor vehicle;

an integrated semi-conductor circuit that monitors current flows to said lamps, to provide at least one of a checking and a warning function concerning operational status of the lamps which provide operating illumination;

a patchboard for the at least one fuse integrated into the light switching device in a location accessible from an interior of the vehicle, at a vertical level which is the same as a vertical level of the at least one switching component; and

a housing which is closed on all sides, and contains at least one of a circuit board on which at least some of said integrated semiconductor circuit and said lamps are mounted, and a flexible conductor foil element, said at least one of a circuit board and a foil element having thereon at least one current path for conducting lamp current monitored by said integrated circuit.

5,596,234

METHOD OF DISPOSING ANTENNA OF REMOTE CONTROL DEVICE FOR VEHICLE

Fumio Umeda; Takahisa Noda; Yuji Shibagaki; Yukio Iwasaki, and Yoshio Nakano, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa-gun, Japan

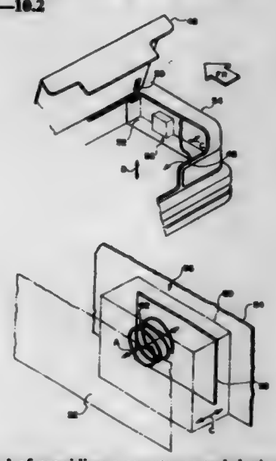
PCT No. PCT/JP93/01692, § 371 Date Jun. 9, 1995, § 102(e) Date Jun. 9, 1995, PCT Pub. No. WO94/11602, PCT Pub. Date May 26, 1994

PCT Filed Nov. 18, 1993, Ser. No. 433,511

Claims priority, application Japan, Nov. 19, 1992, 4-130487

Int. Cl.[6] B60R *25/00*; H01Q *1/32*

U.S. Cl. 307—10.2 **7 Claims**



1. A method of providing a remote control device for a vehicle that includes a transmitter for transmitting a predetermined radio wave and a receiving unit for receiving the transmitted predetermined radio wave, comprising the steps of:

positioning an electrical field type antenna having a free end within an interior of the vehicle and between a pair of parallel conductors such that an axis of the antenna is substantially perpendicular to the pair of parallel conductors, the antenna extending a distance that is smaller than a distance separating other conductors in a vicinity of the pair of parallel conductors, said pair of parallel conductors are separated by a distance that is smaller than a distance separated iD ih pteK conductors in the vicinity of the pair of conductors;

positioning the receiving unit within the interior of the vehicle at the antenna;

transmitting the predetermined radio wave with the transmitter;

receiving the predetermined radio wave with the receiving unit such that an orientation of an electrical field generated between the pair of parallel conductors by the transmitted predetermined radio wave substantially corresponds to the axis of the antenna, and the antenna receives an electrical field which is generated secondarily by current flowing within a body of the vehicle, whereby the receiving unit receives the predetermined radio wave reliably from a position within the interior of the vehicle.

5,596,235

SPINDLE MOTOR WITH SEAL STRUCTURE

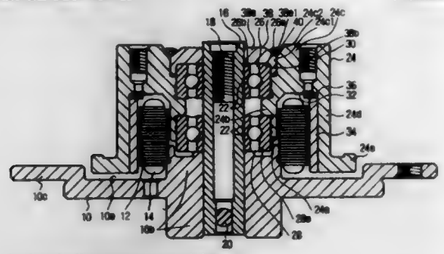
Asao Yazaki, Iida; Masanobu Chuto, Shiga-ken; Hiroshi Matsumoto, Hikone; Junko Satake, Meri-machi; Hiromi Iida, Kameoka, and Koji Tomita, Takatsuki, all of Japan, assignors to Nidec Corporation, Kyoto, Japan

Filed Feb. 17, 1994, Ser. No. 198,116

Claims priority, application Japan, Feb. 22, 1993, 5-057768; Mar. 3, 1993, 5-042343; Mar. 4, 1993, 5-069341; Mar. 23, 1993, 5-089191

Int. Cl.[6] H02K *7/00*

U.S. Cl. 310—67 R **6 Claims**



1. A spindle motor comprising;

a stationary shaft;

a rotor hub rotatably mounted to the stationary shaft;

an upper ball bearing and a lower ball bearing provided between the stationary shaft and the rotor hub and rotatably supporting the rotor hub to the stationary shaft;

an annular rotor magnet mounted to the rotor hub;

a stator mounted in radial opposition to the rotor magnet;

each ball bearing having an inner race and an outer race,

an inner surface of the inner race of the upper ball bearing being fixedly mounted to an outer surface of the stationary shaft,

an outer surface of the outer race of the upper ball bearing, at least a lower portion of being fixedly mounted to an inner surface of the rotor hub,

an annular sealing member forming a labyrinth seal with the stationary shaft disposed outwardly and above the upper ball bearing,

the sealing member comprising a disk-shaped horizontal portion having a cylindrical inner surface confronting the outer surface of the stationary shaft, and an annular extending portion extending downwardly from the outer surface of the horizontal portion, the sealing member being loosely mounted to the rotor hub but the inner surface of the extending portion being in direct and tight radial mounting contact with the radially outwardly disposed surface of the outer race of the upper ball bearing,

and the rotor hub has integral adjoining parts, one being directly fitted unto and about a lower part of the outer race of the upper ball bearing and the other being formed with a greater inner diameter than the former part, the extending portion of the sealing member being inserted into the annular opening defined by the latter part, and the outer surface of the horizontal portion and the outer surface of the extending portion of the sealing member being in contact with the inner surface of the latter part.

5,596,236

MOTOR CAPABLE OF USING HIGH OR LOW VOLTAGE

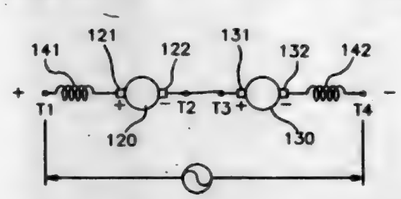
Jin-Bang Lee; Byung-Cheol Choi, both of Incheon; Nam-Ho Lee, and Seon-Kyu Kim, both of Seoul, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 6, 1994, Ser. No. 254,878

Claims priority, application Rep. of Korea, Jan. 7, 1993, 93-10258; Jul. 12, 1993, 93-13076; Jul. 28, 1993, 93-13724; Aug. 11, 1993, 93-15531; Sep. 28, 1993, 93-20179; Dec. 14, 1993, 93-27706

Int. Cl.[6] H02K *11/00*; H02P *7/74*; H01H *9/00*

U.S. Cl. 310—68 A **9 Claims**



1. A motor capable of using various voltages comprising:

a cylindrical armature having a plurality of slots formed at an outer surface thereof;

a rotation shaft passing through the center of the armature for rotating the armature;

a first and a second commutator disposed at the opposite ends of the rotation shaft in the opposite sides of the armature, and respectively including a first and a second plurality of commutator pieces, the numbers of which are respectively corresponding to that of the slots of the armature;

first and second armature coils wound in the armature slots respectively through the first and the second commutator pieces in a double-winding-back-alpha type;

first and second brushes disposed at the opposite sides of the first commutator and being in contact with the first commutator pieces, and third and fourth brushes disposed at the opposite sides of the second commutator and being in contact with the second commutator pieces;

first and second stator coil groups wound on stators fixed at the housing of the motor, and respectively interconnected to the first and second brushes, the first stator coil group, the first commutator, and the first armature coil being connected in series to form a first circuit;

the second armature coil, the second commutator, and the second stator coil group being connected in series to form a second circuit,

the first circuit being connected to the second circuit in series corresponding to a first voltage applied to the motor, and in parallel corresponding to a second voltage applied to the motor, which is lower than the first voltage; and

switching means for connecting the first circuit and the second circuit in series corresponding to the first voltage, and in parallel corresponding to the second voltage, applied to the motor,

wherein said switching means comprises:

a switch housing including a body section having a guiding protrusion formed at the center of the inner side thereof, and a receiving section formed incorporate with the body section to receive a plug of a cord for supplying high voltage power;

a switching member including a base plate having first and second conductors extending vertically and attached to

opposite sides of the front surface thereof, and a third conductor extending horizontally and attached to a lower part of the rear surface thereof, a forward protrusion formed incorporated with the base plate and protruding forward from the base plate to be inserted into the receiving section to travel between a front position and a rear position in the receiving section, and a recess formed at the rear surface of the base plate into the forward protrusion, in which the guiding protrusion is inserted;

two plug terminals fixed by a holder disposed at the rear surface of the body section, and extending from the holder through the guiding protrusion, the recess, and the forward protrusion, in order, into the receiving section;

a spring disposed between the guiding protrusion and the bottom of the recess;

first, third, sixth terminals disposed at one side of the base plate, and respectively interconnected to the first stator coil group and one of the plug terminals, the third brush, and one electrode of power source of low voltage, the first and sixth terminals respectively having a front contact plate, and the third terminal having a front and a rear contact plate, whereby the rear contact plate of the third terminal is in contact with the third conductor of the switching member at the rear position thereof, and the front contact plates of the first, the third, and the sixth terminals are in contact with the first conductor of the switching member at the front position thereof to be electrically interconnected with each other; and

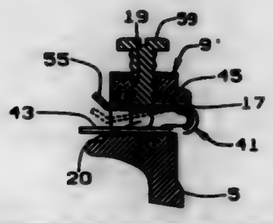
second, fourth, and fifth terminals disposed at the other side of the base plate, and respectively interconnected to the second brush, the second stator coil group and the other of plug terminals, and the other electrode of power source of low voltage, the fourth and the fifth terminal respectively having a front contact plate, and the second terminal having a front and a rear contact plates, whereby the rear contact plate of the second terminal is in contact with the third conductor of the switching member at the rear position thereof to be electrically interconnected to the third terminal, and the front conduct plates of the second, fourth, and fifth terminals are in contact with the second conductor of the switching member at the front position thereof to be electrically interconnected each other.

5,596,237

GROUND WIRE ATTACHMENT FOR A MOTOR END-SHIELD

Nicholas R. Daniels, Dellwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 31, 1994, Ser. No. 221,046
Int. Cl.[6] H02K 11/00
U.S. Cl. 310—71 25 Claims



1. A dynamoelectric machine comprising a shell, a stator, and a rotor housed in said shell, at least one end-shield covering one end of said shell, a rotor shaft extending axially from said rotor and being rotatably journaled in said at least one end-shield, the improvement comprising:

a first bore and a second bore formed in one of said shell and end-shield so as to intersect and communicate with each other; and

a ground wire retaining clip sized for reception in and received in said first bore, said clip including a front leg and a back leg joined by a web, said web having a hole formed in it, said front and back legs defining a space between them which receives said ground wire, said space being accessible through said first bore from a bottom of said first bore or through said top of said first bore through said web hole and being accessible through two openings of said second bore;

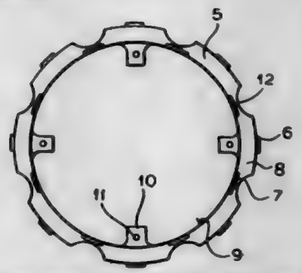
wherein said ground wire can be inserted into said space between said front and back legs from four directions.

5,596,238

MAGNET ATTACHMENT ASSEMBLY FOR A MAGNETIC CLUTCH

Siegfried Mikulkel, Krefeld, Germany, assignor to ITT Richter Chemie-Technik GmbH, Kempen, Germany

Filed Jan. 18, 1995, Ser. No. 374,497
Claims priority, application Germany, Jan. 18, 1994, 44 01 241.1
Int. Cl.[6] H02K 49/00;15/00;21/22;21/12
U.S. Cl. 310—103 12 Claims



1. A magnetic clutch assembly for a pump comprising:

an inner rotor having a first plurality of rectangularly shaped magnets spaced uniformly in a circular first array about an outer periphery of said inner rotor and having respective bearing faces resting against the outer periphery of the inner rotor;

an outer rotor surrounding said inner rotor and having a second plurality of magnets in another circular array spaced around an inner periphery thereof in juxtaposition with the magnets of said inner rotor, whereby, upon rotation of said outer rotor said inner rotor is magnetically entrained in rotation about a common axis of said rotors; and

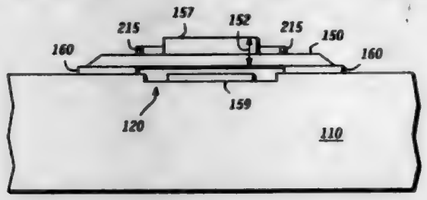
retaining means for retaining said magnets at said rotors and including, for at least said inner rotor, a respective first thin annular disk on one axial side of said first array of said rectangularly shaped magnets and formed with a respective plurality of radially extending lugs having axial fingers engaging axially partially over the rectangularly shaped magnets of the first array along sides thereof remote from the inner rotor, and a respective second thin annular disk separate from the first annular disk on the opposite axial side of said first array and formed with a respective plurality of radially extending lugs having axial fingers engaging axially partially over the rectangularly shaded magnets of the first array along a side thereof remote from the inner rotor, said lugs of the annular disks of said inner rotor being dimensioned so that corners of the magnets thereof are at a greater radial distance from said axis than the corners of the lugs.

5,596,239

ENHANCED QUALITY FACTOR RESONATOR

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 29, 1995, Ser. No. 496,780
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—311 11 Claims



1. A high quality factor resonator comprising:

a substrate having a surface;

a resonator layer having first and second surfaces and including a first electrode, said resonator layer disposed on said surface, said first electrode disposed on said first surface of said resonator layer, said first surface being more remote from said substrate than said second surface;

a cavity disposed between said substrate and said resonator layer; and

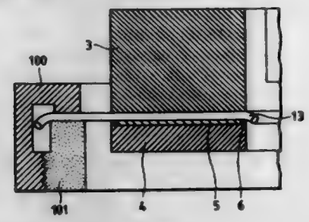
a second electrode disposed on said substrate and on a surface of said cavity remote from said resonator layer, wherein said second electrode is separated from said resonator layer by a thin gap.

5,596,240

ULTRASONIC MOTOR

Ryoichi Suganuma, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 380,191, Jan. 30, 1995, which is a continuation of Ser. No. 99,122, Jul. 29, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,859
Claims priority, application Japan, Aug. 4, 1982, 4-228028
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—323 7 Claims



1. An ultrasonic motor comprising:

a vibration member having an electro-mechanical energy converting element and an elastic member which is excited by said electro-mechanical energy converting element to generate a travelling oscillator wave;

a relative moving member to be driven by said travelling oscillatory wave; and

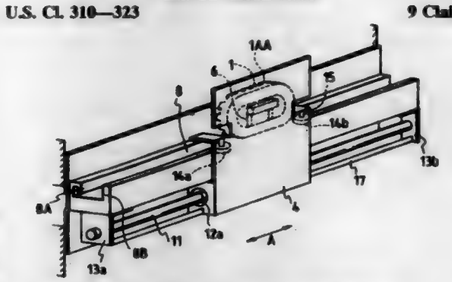
a wire member disposed between said electro-mechanical energy converting element and said elastic member together with another material and extended outwardly.

5,596,241

VIBRATION WAVE DRIVEN LINEAR-MOTOR OR PRINTER

Hiroyuki Seki, Urawa; Yoshifumi Nishimoto; Hideki Tanaka, both of Yokohama; Toshiaki Harada, Kawasaki; Atsushi Kimura, Yokohama; Yoshitaka Okumura, Machida, and Shinji Yamamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 182,395, Jan. 18, 1994, abandoned. This application Sep. 27, 1995, Ser. No. 534,887
Claims priority, application Japan, Jan. 18, 1993, 5-005689; Mar. 16, 1993, 5-055822
Int. Cl.[6] H01L 41/08
U.S. Cl. 310—323 9 Claims



1. A vibration driven motor or actuator, comprising:

a vibration member for generating a vibration thereon, said vibration member having a contact portion;

a contact member having a contact portion in frictional contact with the contact portion of said vibration member and having a first guide portion;

a guide member having a second guide portion;

a pressing member for applying a pressure between said vibration member and said contact member;

a rotating member for contacting the first guide portion, said rotating member being rotated by a relative movement between said vibration member and said contact member and for receiving a counterforce of said pressure applied by said pressing member; and

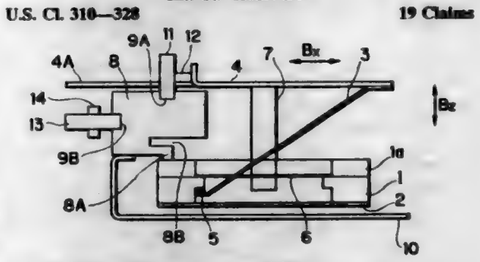
a sliding member for sliding on the second guide portion.

5,596,242

GUIDE DEVICE FOR VIBRATION DRIVEN MOTOR

Hiroyuki Seki, Urawa, and Atsushi Kimura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 936,777, Aug. 28, 1992, abandoned. This application Jun. 17, 1994, Ser. No. 261,887
Claims priority, application Japan, Sep. 5, 1991, 3-226047
Int. Cl.[6] H02N 2/04
U.S. Cl. 310—328 19 Claims



1. A vibration driven motor comprising:

a vibration member comprising a contact portion, and responsive to an applied electrical signal for generating a vibration therein;

a contact member having a contact portion which is in contact with the contact portion of said vibration member, the vibra-

tion generated in said vibration member effecting relative movement between said vibration member and said contact member, said contact member including a first guide surface and a second guide surface, said contact portion, said first guide surface and said second guide surface being integrally formed on a single body;

first and second guide followers functionally engaged to said vibration member, said first guide follower engaging said first guide surface, for preventing the contact member from shifting in a horizontal direction, and said second guide follower engaging said second guide surface, for preventing the contact member from shifting in a vertical direction; and

first and second urging members, said first urging member engaging said first guide follower, to urge said first guide follower to follow the first guide surface, and said second urging member engaging said second guide follower, to urge said second guide follower to follow the second guide surface;

wherein each of said first and second guide surfaces of said contact member includes a recess engageable with a corresponding one of said first and second guide followers.

5,596,243

CRYSTAL OSCILLATOR

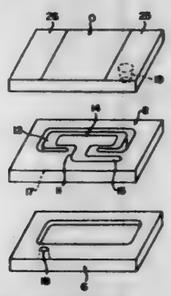
Yoshikazu Ibaru, Nishinomiya; Shuji Itamochi, Osaka; Junji Oishi, Sennan; Tetsuro Shimamura, Kyoto, and Hiroshi Tahara, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 5, 1994, Ser. No. 318,336

Claims priority, application Japan, Oct. 6, 1993, 5-250457

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—348 **16 Claims**



1. A crystal oscillator comprising:

a first quartz crystal plate having a central portion, a peripheral portion forming a rim that surrounds the central portion at a distance therefrom, and a relatively narrow connecting portion connecting said central portion to said peripheral portion;

an electrode formed on a first surface of said central portion and on a portion of a first surface of said connecting portion;

another electrode formed on a second surface of said central portion opposite to said first surface and on a portion of a second surface of said connecting portion opposite to said first surface of said rim;

a second quartz crystal plate having a central portion and a peripheral portion disposed over said first surface of said first plate, said first and second plates being firmly integrated at the peripheral portions by atomic bonding; and

a third quartz crystal plate having a central portion and a peripheral portion disposed over said second surface of said first plate, said first and third plates being firmly integrated at the peripheral portions by atomic bonding,

wherein said electrodes are for receiving an electrical signal to vibrate said central portion at a specific frequency.

5,596,244

COMPOSITE ELECTRONIC COMPONENT AND METHOD OF MANUFACTURING THE SAME

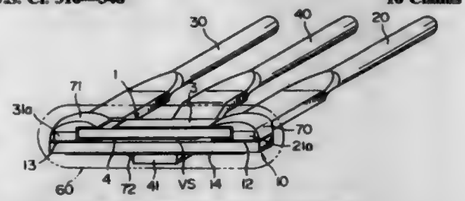
Daisaku Kugou; Hiroki Kikuchi; Nobuaki Kadono, and Kunikazu Nakahara, all of Toyama, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jul. 13, 1995, Ser. No. 502,316

Claims priority, application Japan, Sep. 13, 1994, 6-247138

Int. Cl.[6] H01L *41/22*; H01G *4/40*; H03H *9/15*

U.S. Cl. 310—348 **10 Claims**



1. A composite electronic component comprising:

a) a resonator element (1) including:

1) a thin piezoelectric substrate (2) having from and rear major surfaces and first and second side surfaces opposing each other;

2) a first resonator electrode (3) having a first vibrating part (3*a*) located on said from major surface and a first terminal part (3*b*) extending from said first vibrating part (3*a*) to cover said first side surface; and

3) a second resonator electrode (4) having a second vibrating part (4*a*) located on said rear major surface opposed to said first vibrating part (3*a*) and a second terminal part (4*b*) extending from said second vibrating part (4*a*) to cover said second side surface;

b) a capacitor element (10) including:

1) a dielectric plate (11) having from and rear major surfaces;

2) a first capacitor electrode (12) located on one end portion of said front major surface of said dielectric plate (11);

3) a second capacitor electrode (13) located on the other end portion of said front major surface of said dielectric plate (11); and

4) a third capacitor electrode (14) located on said rear major surface of said dielectric plate (11) to be opposed to said first and second capacitor electrodes (12, 13); wherein

5) a length (L2) of said dielectric plate (11) in a first direction extending from an outer edge of said first capacitor electrode (12) to an outer edge of said second capacitor electrode (13) is greater than a length (L1) of said piezoelectric substrate (2) in said first direction extending from said first side surface to said second side surface;

c) adhesive material (15,16) for fixing said rear major surface of said resonator element (1) on said front major surface of said capacitor element (1) with a vibration space (VS) therebetween to define first and second side steps (17,18) by said end portions of said capacitor element and said first and second side surfaces of said resonator element (1), respectively;

d) a first lead terminal (20) having a connecting end (21*a*) arranged on said first side step (17);

e) a second lead terminal (30) having a connecting end (31*a*) arranged on said second side step (18);

f) a third lead terminal (40) having a connecting end (41) arranged on said third capacitor electrode (14); and

g) conductive material (70,71,72) for connecting said connecting end (21*a*) of said first lead terminal (20) to said first capacitor electrode (12) and said first terminal part (3*b*) of said first resonator electrode (3), for connecting said connecting end (31*a*) of said second lead terminal (30) to said second capacitor electrode (13) and said second terminal part (4*b*) of said second resonator electrode (4), and for connecting said connecting end (41) of said third lead terminal (40) to said third capacitor electrode (14).

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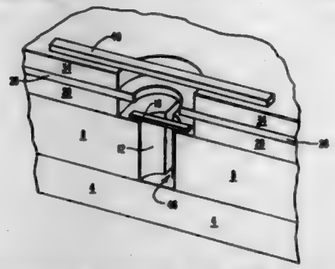
MICROMINIATURE THERMIONIC VACUUM TUBE

Laurence P. Sadwick; R. Jennifer Hwu, both of Salt Lake City; J. Mark Baird, Sandy, and Sherman Holmes, Bountiful, all of Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation of Ser. No. 126,875, Sep. 22, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 547,670

Int. Cl.[6] H01J *1/46*

U.S. Cl. 313—293 **14 Claims**



1. A microminiature thermionic vacuum tube device comprising

a substrate made of electrically resistive material, electrically conductive material disposed on the substrate to define and surround a first void extending from the substrate upwardly through the electrically conductive material,

cathode means disposed on the material to bridge over the first void, for emitting electrons when heated,

first electrically resistive material disposed on said electrically conductive material to surround the cathode means and define a second void thereabove,

electrically conductive grid means disposed on the electrically resistive material to project partially into the second void to define an opening in the grid means above the cathode means, for allowing the passage of electrons therethrough,

second electrically resistive material disposed on the grid means to define a third void above the opening in the grid means,

electrically conductive anode means disposed on the second electrically resistive material over the third void to receive electrons emitted by the cathode means and passing through the opening in the grid means, and thereby produce an electrical current,

means for heating the electrically conductive material to thereby heat the cathode means, and

means for selectively supplying a voltage to the grid means to control the magnitude of the flow of electrons through the opening therein, and thereby control the electrical current produced in the anode means.

5,596,246

HIGH CONTRAST TFEL DISPLAY IN WHICH LIGHT FROM THE TRANSPARENT PHOSPHOR LAYER IS REFLECTED BY AN ELECTRODE LAYER AND THE TFEL DIFFUSE REFLECTANCE <ABOUT 2

Russell A. Budzilek, Bridgeport; Dominick L. Monarchie, Norwalk; Myroslaw Podoba, Wallingford, and Richard R. Swatson, Trumbull, all of Conn., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

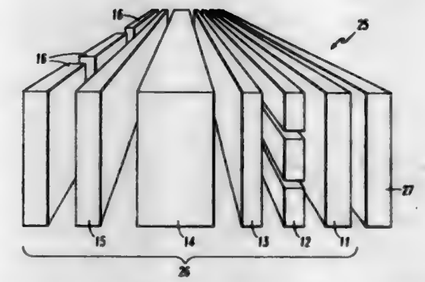
Continuation of Ser. No. 997,271, Dec. 23, 1992, abandoned. This application Jun. 12, 1995, Ser. No. 490,436

Int. Cl.[6] H01J *1/62;63/04*

U.S. Cl. 313—502 **5 Claims**

1. An electroluminescent display having a circular polarizing filter for accepting ambient light and an electroluminescent panel adjacent said filter for reflecting light passed by said filter, said electroluminescent panel comprising:

a transparent phosphor layer for passing light passed by said filter; and



an electrode layer for reflecting light passed by said transparent phosphor layer,

whereby the reflected light passes through said transparent phosphor layer towards said filter such that said electroluminescent panel has a diffuse reflectance less than about 2%.

5,596,247

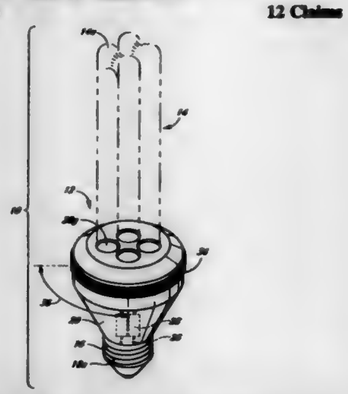
COMPACT DIMMABLE FLUORESCENT LAMPS WITH CENTRAL DIMMING RING

Mark E. Martich, Hanover; Thomas E. Beling, Framingham; John M. Ouennoucher, Scituate, and Stephen C. McLeod, Randolph, all of Mass., assignors to Pacific Scientific Company, Newport Beach, Calif.

Filed Oct. 3, 1994, Ser. No. 316,777

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—56 **12 Claims**



1. A compact dimmable fluorescent lamp fixture having a screw-in socket compatible with the socket of an incandescent lamp so that the fixture can be substituted for an incandescent lamp comprising

a generally hollow shell attached to said screw-in socket, said shell having a width which varies from about the width of an incandescent lamp socket at the screw-in socket end of the shell to a significantly larger width near an opposite end of the shell;

a ballast circuit having an input and output, said input connecting to the power line, said ballast circuit including a dimmer control element enclosed within said shell;

a fluorescent lamp tube socket attached to said hollow shell and connected to the output of said ballast circuit; and

a rotatable member extending substantially around the outer periphery of said hollow shell at a location on the shell where the width of the shell is as wide or wider than the width of substantially all the remaining portions of the shell, said rotatable member coupled to said dimmer control element of said ballast circuit for adjusting the illumination intensity of a fluorescent lamp tube placed in said lamp tube socket in

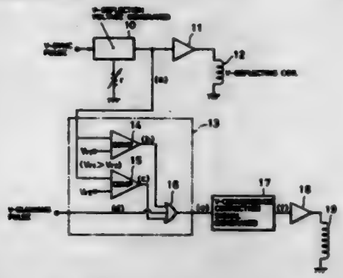
response to rotation of said rotatable member, wherein rotation of said rotatable member does not change the position of the fluorescent lamp tube.

5,596,248

CONVERGENCE CORRECTING DEVICE

Kenichiro Hasui, and Takashi Iwami, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 23, 1996, Ser. No. 604,780
Claims priority, application Japan, Feb. 23, 1995, 7-035678
Int. Cl.[6] H01J 29/51
U.S. Cl. 315—368.18 5 Claims



1. A convergence correcting device in an image display apparatus which generates V- and H-deflection voltages and V- and H-blanking pulses on the basis of a composite video signal and drives a CRT by said V- and H-deflection voltages and V- and H-blanking pulses so as to display the video information carried by said composite video signal as a two-dimensional image, which comprises:

modified V-blanking generating means for generating a modified V-blanking pulse having a pulse width which becomes larger as an amplitude of said V-deflection voltage becomes higher,

modified H-blanking pulse generating means for generating a modified H-blanking pulse having a pulse width which becomes larger as an amplitude of the H-deflection voltage becomes higher, and

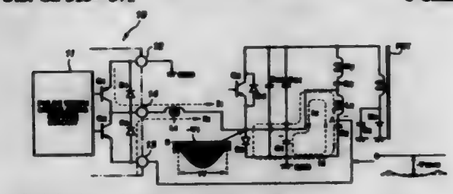
convergence signal generating and correcting means for generating V- and H-convergence signals in accordance with to respective modified V- and H-blanking pulses and executing convergence correction for the CRT.

5,596,249

HORIZONTAL OUTPUT CIRCUIT

Masashi Ochiai, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 28, 1995, Ser. No. 508,700
Claims priority, application Japan, Aug. 1, 1994, 6-180195
Int. Cl.[6] H01Q 3/22;3/24;3/26
U.S. Cl. 315—371 6 Claims



1. A horizontal output circuit comprising:

a horizontal output transistor having a base, an emitter and a collector, said base receiving a driving signal of a horizontal period;

a first parallel circuit including a damper diode, a first resonant capacitor and a series circuit connected in parallel between said collector and said emitter of said horizontal output transistor, said series circuit including a horizontal deflecting coil and a S correcting capacitor;

a second resonant capacitor connected between said collector of said horizontal output transistor and a reference potential point;

a second parallel circuit including a diode and a third capacitor arranged in parallel between said emitter of said horizontal output transistor and reference potential point, a polarity of said diode being reverse of a polarity of said damper diode;

a smooth circuit comprising a first coil connected at a first end to said emitter of said horizontal output transistor and a fourth capacitor connected between a second end of said first coil and said reference potential point;

a modulating signal source having at least one power source terminal and a signal output terminal, a pulse signal varying in vertical period being output from said signal output terminal;

means for supplying said pulse signal from said modulating signal source to said third capacitor through a second coil; and

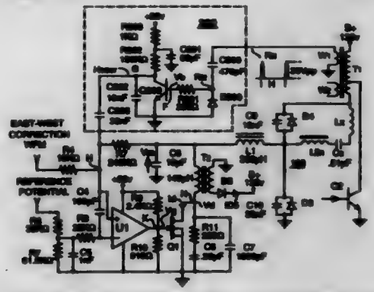
power source feeding means for supplying the voltage produced in said fourth capacitor to said power source terminal of said modulating signal source.

5,596,250

TIMING OF DEFLECTION WAVEFORM CORRECTION CIRCUIT

Walter Trunkle, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation of Ser. No. 165,202, Dec. 13, 1993, abandoned.
This application Apr. 24, 1996, Ser. No. 637,830
Int. Cl.[6] H01J 29/56
U.S. Cl. 315—371 25 Claims



1. A video display apparatus with a synchronized switched inductance, comprising:

an inductance;

a controllable switch coupled to said inductance to control current conduction therein;

a modulator for switching conductive states of said controllable switch, responsive to a switching signal;

a source of a modulation signal;

a source of horizontal deflection retrace pulses;

a signal generator coupled to said source of retrace pulses for generating a horizontal rate ramp signal having a first polarity ramp of duration less than a duration of the first half of said retrace pulse; and

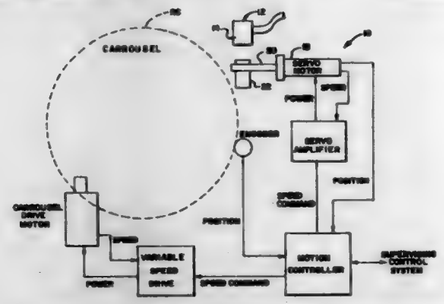
means responsive to said modulation and horizontal rate ramp signals for generating said switching signal having a first polarity, which inhibits conduction in said switch and a second polarity which enables conduction in said switch, said first polarity commencing in accordance with said modulation signal and said horizontal rate ramp signal only during said first half of said retrace pulse.

5,596,251

SERVO MOTOR-DRIVEN PLASTIC CUTTER SYSTEM FOR COMPRESSION MOLDING

Peter S. Miller, Crawfordsville, Ind., assignor to Alcoa Closure Systems International, Inc., Crawfordsville, Ind.

Filed Jun. 7, 1995, Ser. No. 482,971
Int. Cl.[6] H02P 3/08; B26D 5/38
U.S. Cl. 318—366 7 Claims



1. A method of delivering discrete quantities of plastic material to a series of associated cavities, comprising the steps of:

providing a source of molten plastic material;

providing a servo motor-driven rotary cutter including a cutting blade, and rotatably driving said blade with respect to said source of plastic material so that each rotation of said blade cuts a discrete quantity of molten plastic material; and

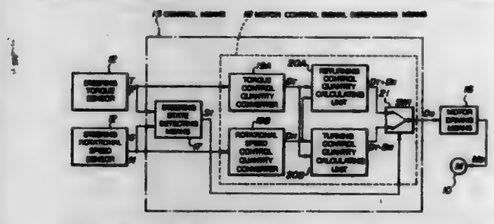
providing electronic control means for operating the servo motor, and operating said servo motor to subject said servo motor and said cutting blade to a sufficiently high rate of deceleration during each rotation thereof so as to cause each discrete quantity of plastic material to be separated from said cutting blade and thereby delivered into a respective one of said series of cavities.

5,596,252

ELECTRICALLY OPERATED POWER STEERING APPARATUS FOR ASSISTING MANUAL STEERING OPERATION IN A MOTOR VEHICLE

Yasuo Shimizu; Shinzi Hironaka; Yoshinobu Mukai, and Shigiera Yamawaki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 353,300
Claims priority, application Japan, Dec. 6, 1993, 5-305625; Dec. 6, 1993, 5-305626; Oct. 24, 1994, 6-258479
Int. Cl.[6] H02P 7/00
U.S. Cl. 318—432 10 Claims



1. An electrically operated power steering apparatus for applying power of an electric motor to a steering system to reduce manual steering forces in a motor vehicle, comprising:

steering torque detecting means for detecting a steering torque of the steering system;

steering rotational speed detecting means for detecting a steering rotational speed of the steering system;

steering state detecting means for detecting a turned state and a returned state of the steering system;

motor control signal determining means for determining a motor control signal which is produced by subtracting a value corresponding to an output signal from said steering rotational speed detecting means from a value corresponding to an output signal from said steering torque detecting means if said steering state detecting means detects the turned state of the steering system, and adding the value corresponding to the output signal from said steering rotational speed detecting means to the value corresponding to the output signal from said steering torque detecting means if said steering state detecting means detects the returned state of the steering system; and

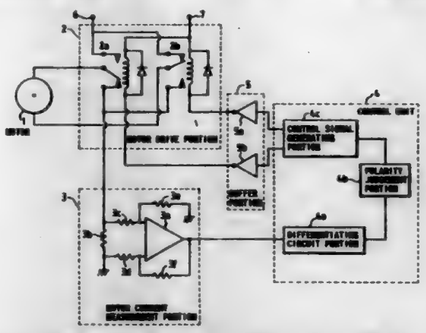
motor driving means for energizing the electric motor based on the motor control signal outputted from said motor control signal determining means.

5,596,253

VEHICLE-MOUNTED MOTOR DRIVE APPARATUS

Ken Mizuta, Miyagi-ken; Ken Shibazaki, Furukawa; Yukio Miura, Furukawa; Kazunori Fujioka, Furukawa; Toshimichi Saito, Furukawa, and Isao Takagi, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 16, 1995, Ser. No. 441,907
Claims priority, application Japan, May 17, 1994, 6-102847; Jun. 23, 1994, 6-141857
Int. Cl.[6] H02P 3/08
U.S. Cl. 318—469 10 Claims



1. A vehicle-mounted motor drive apparatus comprising:

a motor for opening and closing a movable part which is openable and closable;

a motor drive means for selectively driving and stopping the motor;

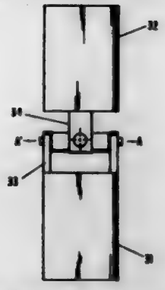
an electric current measuring means for measuring a current value representing an electric current flowing through the motor;

a change-in-current-value detecting means for generating a plurality of successive incremental current values, which are determined from the current value measured by the electric current measuring means, every constant period of time; and

a motor control means for supplying one of a first control signal and a second control signal to the motor drive means, the first control signal being generated when a polarity of detected incremental current value changes from positive to negative during a starting compensation time, and the second control signal being generated when the polarity of detected incremental current value either remains positive or changes from positive to zero during the starting compensation time;

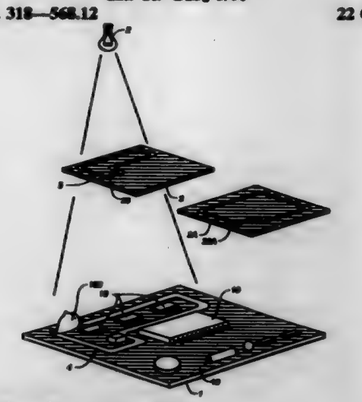
wherein the motor drive means continues driving the motor in response to the first control signal and immediately stops the driving of the motor in response to the second control signal.

5,596,254
TWO-AXIS ANGULAR EFFECTOR
Mark R. Vaughn, Albuquerque; Rush D. Robinett, III, Tijeras; John R. Phelan, and Don M. Van Zelden, both of Albuquerque, all of N.M., assignors to Sandia Corporation, Albuquerque, N.M.
Filed Aug. 12, 1994, Ser. No. 289,979
Int. Cl.[6] G05G *11/00*
U.S. Cl. 318—568.11 17 Claims



1. A two-axis angular effector, comprising:
i) a first link, comprising a first link near mounting locus and a first link far mounting locus;
ii) a second link, comprising a second link near mounting locus and a second link far mounting locus;
iii) a two-axis Cardan-type joint, comprising a yoke, a first set of arms connecting to the first link near mounting locus, a second set of arms connecting to the second link near mounting locus, and a first and second set of rotational shafts, said first and second rotational shafts respectively defining a first and a second rotational axis, said rotational axes defining in turn a first and second set of leverage points located such that a force applied parallel to the first (second) link produces a rotational torque about the first and second rotational axes, respectively;
iv) a set of at least one first link linear actuator assembly, each comprising a linear activator, a first joint connected to a member of the first set of leverage points of the two-axis Cardan-type joint and a second joint connected to the first link far mounting locus, said joints contrived so that the action of each said linear activator varies the distance between the corresponding first and second joints, and so that said joints allow free relative rotation of the first and second links about the first rotational axis;
v) a set of at least one second link linear actuator assembly, each comprising a linear activator, a third joint connected to a member of the second set of leverage points of the two-axis Cardan-type joint and a fourth joint connected to the second link far mounting locus, said joints contrived so that the action of each said linear activator varies the distance between the corresponding third and fourth joints, and so that said joints allow free relative rotation of the first and second links about the second rotational axis;
vi) a power source, and;
vii) a control system to control the relative orientation of the first and second links.

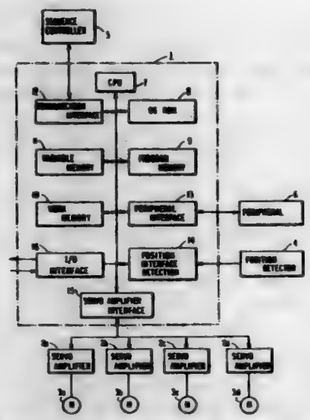
5,596,255
METHOD OF AND APPARATUS FOR GUIDING MICROROBOT
Osamu Miyazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo-to, Japan
Continuation-in-part of Ser. No. 70,399, Jun. 7, 1993. This application Oct. 18, 1994, Ser. No. 324,935
Claims priority, application Japan, Oct. 19, 1993, 5-260830; Aug. 26, 1994, 6-202358
Int. Cl.[6] B25J *5/00*
U.S. Cl. 318—568.12 22 Claims



1. A microrobot system, comprising:
a base plate having a surface;
means for forming a predetermined light pattern on said surface of said base plate; and
a microcomputer-controlled microrobot disposed on said light pattern of said base plate and including left and right detection means mounted thereon for detecting light, said left and right detection means having left and right detection fields, respectively, said left and right detection fields partially overlapping each other to form a central detection field of said microrobot;
wherein said microrobot turns to left in response to detection of light in said left detection field and turns right in response to detection of light in said right detection field, and said microrobot moves straight ahead in response to detection of light in said central detection field.

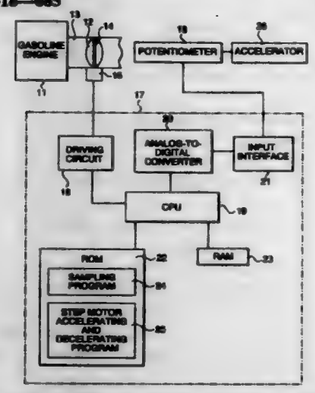
5,596,256
POSITIONING AND CONTROL APPARATUS THAT IS INTERACTIVELY PROGRAMMABLE USING A DISPLAY
Yoshichika Takizawa; Yasuyuki Sasaki; Mineko Okada; Makoto Nishizawa; Hidehiko Matsumoto; Yasuharu Kudo, and Tohru Tsujimoto, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 268,109, Jul. 6, 1994, which is a division of Ser. No. 936,841, Aug. 27, 1992, Pat. No. 5,355,062. This application Dec. 29, 1994, Ser. No. 366,100
Claims priority, application Japan, Sep. 13, 1991, 3-234635
Int. Cl.[6] G05D *3/18*
U.S. Cl. 318—600 13 Claims

1. A method of operating a transmission software module representing a differential gear in a virtual positioning apparatus for a motor, comprising the steps of:
inputting primary and auxiliary position information;
setting a primary transmission constant corresponding to a ratio of a change in said primary position information to a change in output position information and an auxiliary transmission constant corresponding to a ratio of a change in said auxiliary position information to a change in said output position information, said primary transmission constant and said auxiliary transmission constant being employed to increment or decrement said inputted primary and auxiliary position information, respectively;



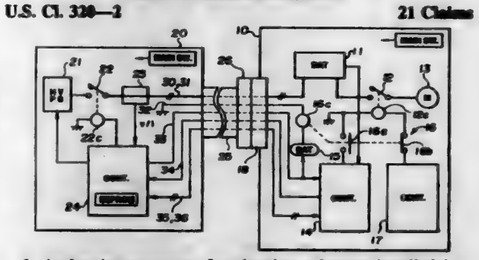
operating on said auxiliary position information on the basis of said auxiliary transmission constant to produce a first result and operating on said primary position information on the basis of said primary transmission constant to produce a second result;
subtracting said first result from said second result; and
outputting said subtraction result as said output position information.

5,596,257
STEP MOTOR CONTROLLER
Hiroshi Miyata, Toyota, and Katsumi Ishida, Toyoake, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Aisan Kogyo Kabushiki Kaisha, both of Japan
Filed May 17, 1994, Ser. No. 243,708
Claims priority, application Japan, May 20, 1993, 5-142622
Int. Cl.[6] G05B *21/02*
U.S. Cl. 318—685 15 Claims



1. A step motor controller for use in a step motor drive system, comprising:
means for inputting a target value, said target value representing a value of the rotational position at which the step motor is to be stopped;
sampling means for periodically sampling said input target value after a predetermined time interval, said interval lying in a range of 16.6 msec–20.0 msec corresponding to a fractional multiple of the natural frequency of the driving system, the fractional multiple of the natural frequency lying in a range of 50 Hz–60 Hz;
means for determining a difference between said sampled target value and a rotational position of said step motor; and
step motor accelerating and decelerating means for accelerating the step motor when said difference is greater than a set value and for decelerating said step motor when said difference is less than the set value.

5,596,258
APPARATUS AND METHOD FOR CHARGING AN ELECTRIC VEHICLE BATTERY
Takashi Kimura, Zushi, and Shinichi Takasuchi, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 23, 1994, Ser. No. 247,429
Claims priority, application Japan, Jun. 1, 1993, 5-130882
Int. Cl.[6] H01M *10/44;10/46*
U.S. Cl. 320—2 21 Claims

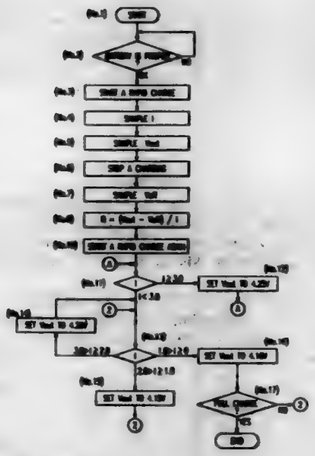


1. A charging apparatus for charging a battery installed in a battery driven electric vehicle, comprising:
a) a charger having a power supply;
b) communication means, installed in both of the charger and electric vehicle, for transmitting and receiving information on a charging operation from and to the charger and electric vehicle;
c) abnormality detecting means for detecting whether an abnormality in the communication between the charger and electric vehicle occurs; and
d) controlling means for carrying out the charge to the battery of the electric vehicle in accordance with a special charge protocol previously set when the abnormality detecting means detects the abnormality in the communication therebetween.

21. A method for charging a battery installed in a battery driven electric vehicle, comprising the steps of:
a) transmitting and receiving information on a charging operation from and to a charger having a high voltage power supply and electric vehicle;
b) detecting whether an abnormality in the communication between the charger and electric vehicle occurs; and
d) carrying out the charge to the battery of the electric vehicle in accordance with a special charge protocol previously set when detecting that the abnormality in the communication therebetween occurs.

5,596,259
METHOD OF CHARGING A SECONDARY BATTERY
Takayuki Mino, and Toshiharu Keinzo, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Feb. 28, 1995, Ser. No. 396,308
Claims priority, application Japan, Feb. 28, 1994, 6-029999
Int. Cl.[6] H01M *10/44*
U.S. Cl. 320—21 13 Claims

9. A method of charging a secondary battery, the method comprising the steps of:
charging the battery with an output voltage (V_{out}) and a charging current (I), the secondary battery having a loss resistance value (R_{out}) so that it is actually charged with an effective voltage (V_{ef}) described by the following expression:



$V_{op}=V_{min}-(R_{min}\times I)$;

sampling a value (I_{min}) of the charging current (I);

comparing the value (I_{min}) to a plurality of ranges, each range being defined by a maximum and minimum current value and identifying the range which includes the sampled value (I_{min});

charging the secondary battery by setting the output voltage (V_{min}) to a value of the following expression, within the identified respective range of the charging current (I); and

$V_{min}=V_{oplimit}+(R_{min}\times I_{min})$,

where I_{min} is the minimum current value of the identified respective range and $V_{oplimit}$ is a predetermined voltage value.

5,596,260

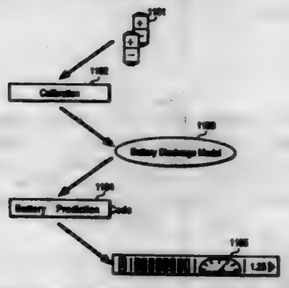
APPARATUS AND METHOD FOR DETERMINING A CHARGE OF A BATTERY

Hans P. Moravec, Pittsburgh, Pa.; James R. Beninghaus, Cupertino, Calif.; Michael K. Blackwell; Kevin J. Dowling, both of Pittsburgh, Pa., and J. Rhonda Hollowell, II, Sunnyvale, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 13, 1994, Ser. No. 242,541

Int. Cl.[6] H01M *10/48*

U.S. Cl. 320—30 **14 Claims**



9. In an electronic device having a charge storage device, a method of analyzing a voltage signal to determine a charge of said charge storing device for display on a display device, said method comprising the steps of:

defining a plurality of discrete intervals of charge ranging from no charge to full charge of said charge storing device;

establishing a probabilistic model of said charge storing device by establishing a probability for each of said discrete intervals of an actual charge corresponding to that particular discrete interval;

establishing a discharge curve specifying voltage of said charge storage device as a function of a state of charge of said charge storing device;

periodically obtaining the voltage signal by measuring a voltage of said charge storage device;

determining a probabilistic distribution of said charge storage device based on said voltage;

updating said probabilistic model by applying Bayes theorem to said probabilistic distribution;

displaying on said display device a representation of said charge of said charge storing device based on a mean of said probabilities.

5,596,261

CHARGE-STATUS DISPLAY SYSTEM FOR AN ELECTRIC VEHICLE

Kouichi Suyama, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 9,642, Jan. 27, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,558

Claims priority, application Japan, Jan. 29, 1992, 4-014366

Int. Cl.[6] H02J *7/00*; G01N *27/416*; G08B *21/00*

U.S. Cl. 320—48 **18 Claims**

1. A charge-status display system for use with an electric vehicle for transmitting via wireless transmission from the electrical vehicle information indicative of a status of charge of a main battery used as a running drive source of the electric vehicle and receiving and displaying the information at a location remote from the electric vehicle, said system comprising:

an external AC power supply source for recharging said main battery;

a charge-status detection unit disposed in the electric vehicle, said detection unit comprising,

means for detachably connecting said main battery to said power supply source, said main battery being connected to said power supply source during charging of said main battery and disconnected from said power supply source while said main battery is under use as said running drive source of the electric vehicle,

a plurality of detecting means for detecting a plurality of operating conditions of said main battery during charging,

determining means for repeatedly determining a present status of charging of said main battery based on the plurality of operating conditions detected by said plurality of detecting means and outputting signals representing said present status of charging, and

wireless transmitting means disposed in the electric vehicle for digitally coding said signals and for transmitting said signals via wireless transmission during battery charging from said detection unit; and

a portable display unit removable from the electric vehicle to a location remote from the electric vehicle, said display unit comprising,

power supply means independent of said main battery for supplying power to said display unit,

receiving means for receiving therein said signals transmitting by said wireless transmitting means, and

display means for displaying thereon said present status of charging of said main battery based on the plurality of operating conditions detected by said plurality of detecting means and said signals received by said receiving means.

5,596,262

PROCESS FOR MONITORING THE CHARGE LEVEL OF A BATTERY, AND FOR INFORMING THE USER OF THE BATTERY WHEN THE MONITORED CHARGE LEVEL IS NO LONGER RELIABLE

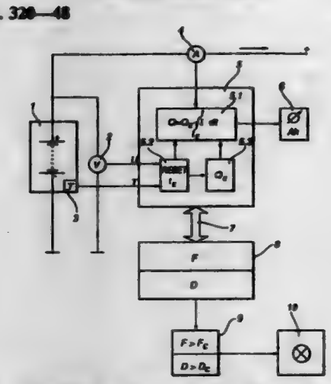
Wolf Boll, Weinstadt, Germany, assignor to Mercedes-Benz AG, Germany

Filed Oct. 31, 1994, Ser. No. 332,329

Claims priority, application Germany, Oct. 29, 1993, 43 37 020.9

Int. Cl.[6] H01M *10/48*

U.S. Cl. 320—48 **14 Claims**



1. In a method of monitoring state of charge of a battery comprising the steps of:

detecting charging and discharging current of said battery;

integrating said charging and discharging current over time to determine a net charge quantity extracted from and supplied to said battery;

determining a charge level limit of said battery as a function of physical battery values, including at least one of battery voltage and battery temperature;

comparing said net charge quantity with said charge limit value to determine a charge level of said battery; and

resetting said determination of a net charge quantity to zero whenever said charge level of said battery reaches said charge level limit;

a process for informing a user of said battery that a determined charge level is no longer reliable, said method comprising the steps of:

calculating at least one error variable indicative of a range of error of said charge level of said battery determined in said comparing step; and

activating an alarm signal when said error variable exceeds a predetermined maximum value.

5,596,263

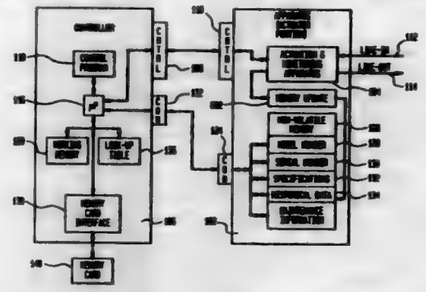
ELECTRICAL POWER DISTRIBUTION SYSTEM APPARATUS-RESIDENT PERSONALITY MEMORY MODULE

Wayne M. Zavis, Cary; Jeffery C. Misener, Raleigh, both of N.C.; James J. Honschick, Ridgeland; Michael A. Bollin, Brandon, both of Miss., and Carl J. Lapiece, Raleigh, N.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Dec. 1, 1993, Ser. No. 160,696

Int. Cl.[6] G05F *1/14*

U.S. Cl. 323—255 **15 Claims**



1. In combination,

(a) an actuator device for an electrical power distribution system line control apparatus, said actuator device comprising:

(1) a housing;

(2) actuation means, mounted in the housing, for changing a line voltage on an electrical line;

(3) an electronically reconfigurable memory device mounted in the housing; and

(4) means for storing operational information relating to the actuator device in the memory device, and

(b) a controller for being mounted external to said housing, said controller comprising:

(1) means for being coupled to the actuation means by a first control connection for controlling the actuation means,

(2) means for being coupled to the memory device by a second communication connection,

(3) means for reading said operational information stored in the memory device, and

(4) means for subsequently adapting at least a part of its operational interaction with the actuator means responsive to said stored operational information.

5,596,264

CIRCUIT CONFIGURATION FOR LIMITING THE OUTPUT VOLTAGE OF A CLOCKED VOLTAGE REGULATOR

Helmut Bichler, Graefelfing; Michael Herfurth, Gilching; Martin Feldtkeller, München, and Michael Lenz, Zorneding, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 22, 1995, Ser. No. 493,809

Claims priority, application Germany, Jun. 23, 1994, 44 22 066.9

Int. Cl.[6] G05F *1/56*

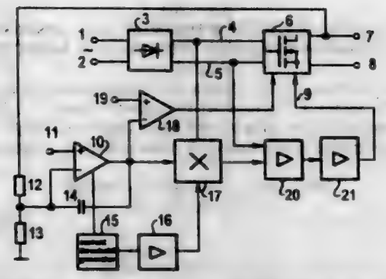
U.S. Cl. 323—284 **3 Claims**

1. A circuit configuration for limiting an output voltage of a clocked voltage regulator, comprising:

a control unit receiving a direct voltage to be regulated, and having an output for supplying an output voltage;

a voltage regulating amplifier being constructed as an integrator, receiving the output voltage and a reference voltage, and supplying an output signal;

a current threshold generator detecting a current intensity of said integrator, and supplying an output signal;



a multiplier multiplying the output signal of said current threshold generator by the output signal of said voltage regulating amplifier and a signal obtained from the direct voltage to be regulated, and supplying an output signal;

a current regulating amplifier receiving the output signal of said multiplier and a signal obtained from the direct voltage to be regulated, and supplying an output signal;

a driver stage converting the output signal of said current regulating amplifier into a trigger signal for said control unit; and

a comperator detecting an output voltage of said voltage regulating amplifier, and furnishing a dominant shutoff signal to said control unit if a reference voltage is exceeded.

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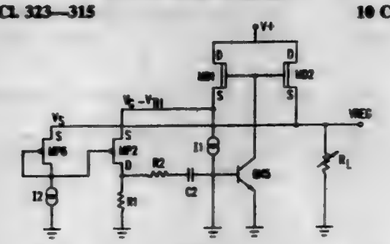
BAND GAP VOLTAGE COMPENSATION CIRCUIT

Robert S. Wrathall, Scotts Valley, and Steven J. Franck, Felton, both of Calif., assignors to Silicon Incorporated, Santa Clara, Calif.

Division of Ser. No. 326,408, Oct. 20, 1994, Pat. No. 5,559,424. This application Feb. 14, 1995, Ser. No. 388,535

Int. Cl.[6] G05F 3/16;3/20

U.S. Cl. 323—315 **10 Claims**



1. A voltage generator comprising a band gap voltage generator and a compensation circuit for introducing a correction factor into said band gap voltage generator,

said band gap voltage generator comprising:

a first bipolar transistor and a second bipolar transistor, said second bipolar transistor having a larger emitter area than the emitter area of said first bipolar transistor so that a base-emitter voltage drop (V_{BE}) of said second bipolar transistor will be smaller than the V_{BE} of said first bipolar transistor given similar currents through said first bipolar transistor and said second bipolar transistor,

a base of said first bipolar transistor being connected to a base of said second bipolar transistor, an emitter of said second bipolar transistor being connected to an emitter of said first bipolar transistor through a first resistance (R1), said emitter of said first bipolar transistor being connected to a first node, collectors of said first bipolar transistor and said second bipolar transistor being connected to a source of current,

a current (I) through said first resistance R1 being equal to

$$I=\Delta V_{BE}/R1,$$

where ΔV_{BE} equals the difference between said V_{BE} of said first bipolar transistor and the V_{BE} of said second bipolar transistor, said a V_{BE} having a positive temperature coefficient being used to set off a V_{BE} with a negative temperature coefficient when generating a band gap output voltage at an output terminal of said band gap voltage generator, so that said band gap output voltage will remain substantially constant over temperature,

said band gap output voltage being affected by non-linear variations in the characteristics of said first bipolar transistor and said second bipolar transistor;

said compensation circuit connected to said first node for coupling a first voltage generated by said compensation circuit to said first node related to

$$(KT/q)\ ln\ (beta),$$

where K is Boltzmas's constant, T is temperature, q is electronic charge, and beta is the current amplification factor of said first bipolar transistor, said first voltage offsetting said non linear variations in said first bipolar transistor and said second bipolar transistor so as to improve predictability of said band gap output voltage.

5,596,266

METAL PARTICLE DETECTING SENSOR, METAL PARTICLE DETECTING METHOD AND METAL PARTICLE DETECTING APPARATUS

Akira Mori; Ikuo Uchino; Atsuhiko Hirosawa, and Kunihiro Yamazaki, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

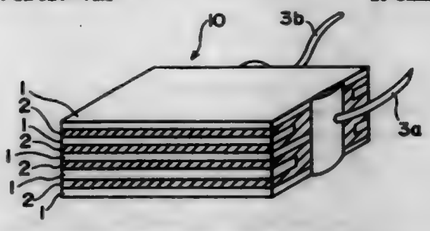
PCT No. PCT/JP92/01436, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO93/09425, PCT Pub. Date May 13, 1993

PCT Filed Nov. 6, 1992, Ser. No. 232,235

Claims priority, application Japan, Nov. 6, 1991, 3-318412

Int. Cl.[6] G01N 27/06

U.S. Cl. 324—71.1 **20 Claims**



1. A metal particle detecting sensor comprising:

a plurality of metal films alternately laminated with a plurality of insulating films to form a laminate wherein adjacent metal films are separated from each other by an insulating film, said laminate having an end face;

a first lead connected to every other one of said metal films in said laminate to form a first comb electrode; and

a second lead connected to the remaining metal films in said laminate to form a second comb electrode; and

an insulator position so as to surround said laminate except for said end face of said laminate whereby in use said end face of said laminate can be immersed in a fluid containing metal particles in order for the sensor to detect the metal particles in the fluid and produce pulse voltages responsive to the thus detected metal particles.

5,596,267

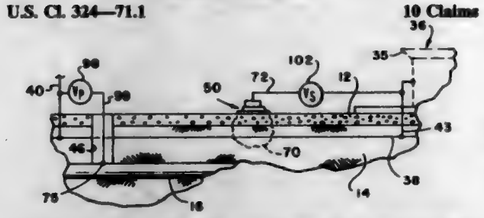
APPARATUS AND METHOD FOR MEASURING POTENTIALS THROUGH PAVEMENTS FOR BURIED PIPELINE CATHODIC PROTECTION SYSTEMS

Pedro F. Lara, Dallas, and Mark W. Mateer, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1994, Ser. No. 361,758

Int. Cl.[6] G01R 27/26

U.S. Cl. 324—71.1 **10 Claims**



1. A method for making pipe-to-soil potential measurements for verifying the operability of a cathodic protection system for a fluid transmission pipeline disposed in soil under a layer of pavement, comprising the steps of:

saturating at a first location a layer of pavement above said soil which is to be placed in electrically conductive engagement with a first reference electrode with a first quantity of an electrolyte which penetrates said pavement and into said soil to establish an ion transport path between said soil and said first reference electrode;

placing said first reference electrode in electrically conductive engagement with said soil through said electrolyte; and

measuring a potential signal between said first reference electrode and a second reference electrode connected to said pipe.

5,596,268

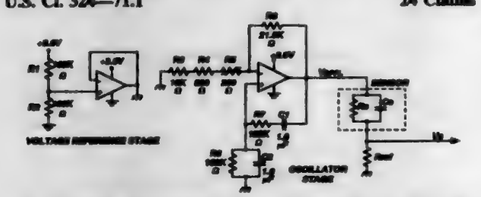
METHOD AND APPARATUS FOR DETERMINING EXTENT OF CURE IN POLYMERS

A. Brent Strong, Sandy; R. Scott Merrell, and Barry M. Lunt, both of Provo, all of Utah, assignors to Brigham Young University, Provo, Utah

Continuation of Ser. No. 948,088, Sep. 22, 1992, Pat. No. 5,432,435. This application Jun. 22, 1995, Ser. No. 493,796

Int. Cl.[6] G01N 27/02; G01R 27/16

U.S. Cl. 324—71.1 **24 Claims**



1. A method for detecting extent of cross-linking of a high impedance polymer material during a pre-cure stage, said method comprising the steps of:

a) applying a test signal through a sensor to the polymer material in the pre-cure stage to determine a level of impedance and corresponding sample voltage representative of a degree of cross-linking within the material;

b) applying the same test signal through the sensor to a reference resistance having a fixed resistance to determine a reference voltage;

c) determining a voltage difference between the test signal applied to the polymer at pre-cure stage and the test signal applied to the reference resistance as the reference voltage;

d) correlating the voltage difference as a relative indicator of the extent of cross-linking which has occurred within the polymer material, based on comparison of magnitude of the voltage difference with respect to a comparable potential range of impedance for the polymer material from its lower impedance stage at minimal cross-linking to its high impedance stage at maximum impedance for total cross-linking.

5,596,269

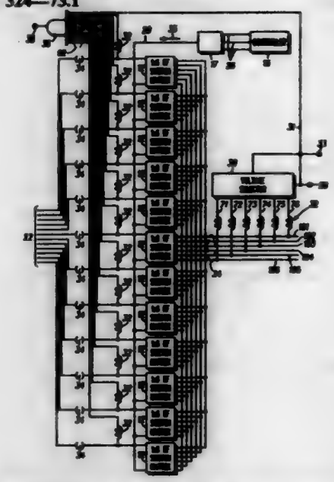
APPARATUS AND METHOD FOR TESTING ELECTRICAL SWITCH MATRICES

Philip Miller, Palatine; Joseph Tobin, Wauconda, and Edward Dudkonov, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1995, Ser. No. 577,078

Int. Cl.[6] G01R 31/02

U.S. Cl. 324—73.1 **20 Claims**



20. An apparatus for testing a plurality of electrical switches, each of the plurality of electrical switches comprising a plurality of electrical paths and having a plurality of switch inputs and a switch output, the apparatus comprising:

a potential selector having a first control line, a selector input and a plurality of selector outputs, wherein a voltage being received by the selector input is applied to a predetermined switch input of each of the plurality of electrical switches by the potential selector via one of the plurality of selector outputs of the potential selector;

a controller having a second control line in communication with each of the plurality of electrical switches, a signal being received by the second control line, the signal being applied to each of the plurality of electrical switches via the second control line, the controller thereby selecting an electrical path associated with each of the plurality of electrical switches, each selected electrical path being in communication with the predetermined switch inputs of each of the plurality of electrical switches; and

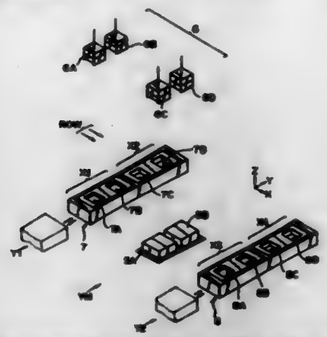
a combiner responsive to the switch outputs of each of the plurality of electrical switches, the combiner measuring the switch outputs of each of the plurality of electrical switches, wherein the combiner determines whether at least one of the selected electrical paths failed.

5,596,270

IC TRANSPORTATION MECHANISM PROVIDED WITH A PLURALITY OF SUCTION

Osamu Mitsui, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,857
Claims priority, application Japan, Feb. 28, 1994, 6-054583
Int. Cl.[6] G01R 31/02; B65G 1/02
U.S. Cl. 324—158.1 2 Claims



1. An IC transportation mechanism provided with a plurality of suction units, said IC transportation mechanism comprising:

a first moving stage which shifts in a direction of the y-axis and is provided with recesses disposed in a first row group for receiving ICs therein and recesses disposed in a second row group for storing ICs therein, said first and second recesses being arranged on a first column;

a second moving stage which shifts in the direction of the y-axis and is provided with recesses disposed in a third row group for receiving ICs therein and recesses disposed in a fourth row group for storing ICs therein, said third and fourth recesses being arranged on a second column; and

a measuring portion having IC sockets disposed in a column and on a column equidistant from said first and second columns; wherein

a transportation mechanism moves a first group of suction units disposed in a column and a second group of suction units disposed in a column together as one body in a direction of the x-axis;

said second group of suction units press ICs on said IC sockets concurrently when said first group of suction units retain ICs on said recesses disposed in said first row group on said first moving stage by suction;

said second group of suction units press ICs on said IC sockets concurrently when said first group of suction units release ICs that have been measured onto said recesses disposed in said second row group on said first moving stage by suction;

said first group of suction units press ICs on said IC sockets concurrently when said second group of suction units retain ICs on said recesses disposed in said third row group on said second moving stage;

said first group of suction units press ICs on said IC sockets concurrently when said second group of suction units release ICs that have been measured onto said recesses disposed in said fourth row group on said second moving stage;

said first moving stage shifts to a side opposite to said measuring portion when ICs are supplied to said first moving stage or those stored in said first moving stage after measurement are transported to next process; and

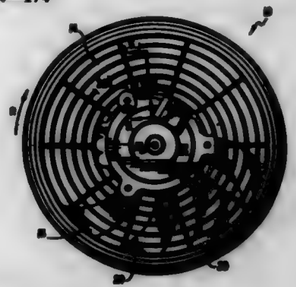
said second moving stage shifts to a side opposite to said measuring portion when ICs are supplied to said second moving stage or those stored in said second moving stage after measurement are transported to next process.

5,596,271

METHOD OF AND APPARATUS FOR DETECTING THE ROTATION RATE OF AN AIR MOVING FAN

Vernon Lowery, Brandon, Miss., assignor to Multicraft International, Brandon, Miss.

Filed May 3, 1994, Ser. No. 237,201
Int. Cl.[6] G01B 7/14; G01P 3/44;3/487; G01R 33/06
U.S. Cl. 324—174 21 Claims



1. A rotation rate sensor comprising:

a member rotatable about an axis;

an interrupter fixed to the rotatable member so as to rotate therewith and define a circular path of travel upon rotation of the member;

a Hall-effect device fixedly mounted relative to and adjacent the circular path of travel of said interrupter, said Hall-effect device having a given electrical output under ambient magnetic field conditions;

a magnet having a magnetic field and being fixedly mounted in circumferentially spaced apart relation from the Hall-effect device about the axis and adjacent the circular path of travel of the interrupter such that the magnetic field of the magnet is insufficiently magnetically coupled to said Hall-effect device to cause any substantial change in the given electrical output of said Hall-effect device; and

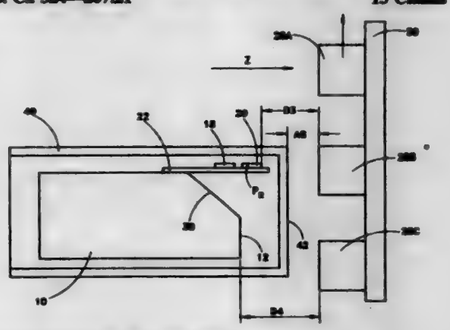
wherein said interrupter couples the magnetic field of said magnet to the Hall-effect device as it rotates on its path of travel past said magnet and Hall-effect device and causes a detectable difference in the electrical output of said Hall-effect device from the given electrical output thereof.

5,596,272

MAGNETIC SENSOR WITH A BEVELED PERMANENT MAGNET

Nicholas F. Busch, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1995, Ser. No. 531,806
Int. Cl.[6] G01B 7/30; G01P 3/488
U.S. Cl. 324—207.21 13 Claims



1. A magnetic sensor, comprising:

a magnetically sensitive component having a sensing plane;

a permanent magnet having a first magnetic pole face, a second magnetic pole face and a magnetic axis extending perpendicularly through the planes of said first and second magnetic pole faces, said magnetically sensitive component being displaced from said magnetic axis with said sensing plane being disposed in parallel association with said magnetic axis and being rigidly attached to said permanent magnet, said permanent magnet having a beveled surface formed in a first end of said permanent magnet, said beveled surface intersecting said first pole face at a preselected angle, said beveled surface being disposed proximate said magnetically sensitive component; and

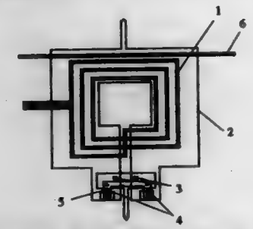
a movable ferromagnetic object disposed for movement through detection zone proximate said magnetically sensitive component.

5,596,273

HIGHLY SENSITIVE MAGNETIC FIELD DETECTOR USING LOW-NOISE DC SQUID

Satoru Yabe; Norio Chiba, and Satoshi Nakayama, all of Chiba, Japan, assignors to Seiko Instruments Inc., Japan

Filed Sep. 15, 1994, Ser. No. 306,411
Claims priority, application Japan, Sep. 17, 1993, 5-231764
Int. Cl.[6] G01R 33/035; H01L 39/22
U.S. Cl. 324—248 15 Claims



1. A highly sensitive DC SQUID comprising: an input coil for inputting a signal current converted from a detected magnetic field by a detection coil which is superconductively coupled to the input coil; a feedback modulation coil for transmitting a control signal from an external control system; a washer coil which is magnetically coupled to the input coil and the feedback modulation coil and constitutes a superconductive ring; a Josephson junction device having a barrier layer sandwiched between a lower electrode and an upper electrode, for converting the signal current to a voltage, and being connected to the washer coil; and a shunt resistor which is connected to the Josephson junction device in parallel; wherein the feedback modulation coil is arranged such that the mutual inductance between the washer coil and the feedback modulation coil is equal to or less than the self inductance of the washer coil.

5,596,274

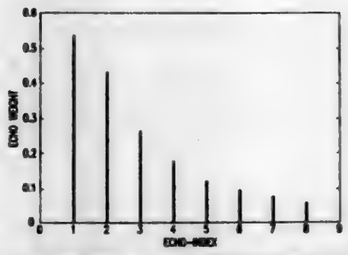
DETERMINING BOUND AND UNBOUND FLUID VOLUMES USING NUCLEAR MAGNETIC RESONANCE PULSE SEQUENCES

Abdurrahman Sezginer, Brookfield, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.

Continuation-in-part of Ser. No. 999,248, Dec. 31, 1992, Pat. No. 5,363,041. This application Oct. 31, 1994, Ser. No. 332,297
Int. Cl.[6] G01R 33/
U.S. Cl. 324—303 20 Claims

1. A method for indicating an attribute of an earth formation with a borehole tool having a magnetic device for producing static magnetic fields in a volume of a formation, a an antenna for producing oscillating magnetic fields in a volume of a formation and for detecting echo signals, the method comprising:

a) producing a static magnetic field in a volume of formation;



b) producing oscillating magnetic fields according to a selected pulse sequence in order to excite nuclei of fluids in the volume wherein some nuclei relax slowly and some nuclei relax rapidly relative to each other;

i) producing at least one pulse of the pulse sequence such that the rapidly relaxing nuclei produce an echo signal in the volume of formation; and

ii) producing a subsequent pulse of the pulse sequence substantially after the rapidly relaxing nuclei produce an echo signal in the volume of formation and before the slowly relaxing nuclei produce an echo signal in the formation;

c) receiving the echo signals from the formation due to the rapidly relaxing nuclei, the slowly relaxing nuclei substantially not contributing to the received signals; and

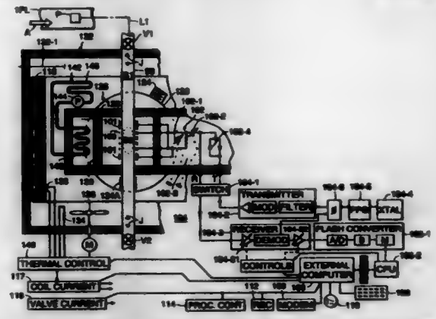
d) determining from the measured signals corresponding to the rapidly relaxing nuclei an indication of bound fluid volume (BFV) of the volume of earth formation.

5,596,275

NMR ANALYSIS OF POLYPROPYLENE IN REAL TIME

Ronald L. Dechene, Boxford, Mass.; Thomas B. Smith, Atkinson, N.H.; Scott A. Marino, Haverhill, Mass.; Ronald J. Tache, Malden, Mass., and Ajoy K. Roy, Danvers, Mass., assignors to Auburn International, Inc., Danvers, Mass.

Continuation of Ser. No. 371,891, Jan. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 226,024, Apr. 11, 1994, abandoned, which is a continuation of Ser. No. 885,633, May 19, 1992, Pat. No. 5,302,897. This application Apr. 1, 1996, Ser. No. 625,973
Int. Cl.[6] G01R 33/20
U.S. Cl. 324—307 14 Claims



1. A magnetic resonance system for industrial process monitoring of polypropylene materials with unknown proportions of NMR-active structures of varying mobilities, relaxation, or mobilities and relaxation resulting from precession, the system comprising:

a sample measuring region for receiving successive samples of polypropylene material which have been accessed and removed from an industrial process;

a field applicator for applying a base magnetic field to said sample measuring region to effect precession of nuclei of the sample therein;

a pulse applicator for applying a local excitation pulse to said sample measuring region to modify the precession;

a transmit/receive antenna coil for interacting with the sample in said sample measuring region to detect a free induction decay of the nuclei;

a signal translator for generating an electronic signal over time which is based on, and representative of, the detected free induction decay;

a digitizer for generating a digitized version of the time signal; and

an analyzer for identifying a plurality of components of the digitized version of the time signal, wherein the plurality of components include a fast Gaussian, a slower unmodified Gaussian, and an exponential, and for measuring the number of components corresponding to structures of varying mobilities, relaxation, or mobilities and relaxation of the sample in said sample measuring region by determining a time equation for the digitized version of the time signal and establishing zero intercepts and time constants from the time equation by utilizing an iterative technique.

5,596,276

CAVITY RESONATOR FOR AN ELECTRON SPIN RESONATOR

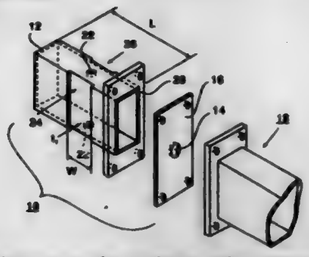
Kazuo Nakagawa; Makoto Tsuzuki; Atsushi Nakanobu, all of Tokyo; Akio Nakanishi, and Akira Furuse, both of Osaka, all of Japan, assignors to Nikkiso Co., Ltd., Tokyo, and Sumitomo Special Metals Co., Osaka, both of Japan

Continuation of Ser. No. 73,594, Jun. 8, 1993, abandoned. This application May 23, 1995, Ser. No. 447,928

Claims priority, application Japan, Jun. 9, 1992, 4-147857

Int. Cl.[6] G01R *33/20*

U.S. Cl. 324—316 **14 Claims**



1. A cavity resonator for an electron spin resonance device in which the modulation coils for generating a modulation magnetic field to be applied to a sample in said cavity resonator are arranged at an exterior of the cavity resonator, said cavity resonator comprising:

a body being rectangular-defined by predetermined length, width and height, said body having a pair of side walls being vertical to a polarizing magnetic field, said side walls each respectively being a unitary material having a single recessed area portion of a uniform thickness being less than a skin depth of a skin effect appearing at said side wall, said modulation coils being arranged on said single recessed area portions so as to have said modulation magnetic field be irradiated through said recessed area portions into the interior of said cavity resonator.

5,596,277

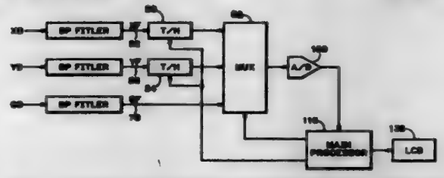
METHOD AND APPARATUS FOR DISPLAYING SIGNAL INFORMATION FROM A METAL DETECTOR

Mark D. Rowan, Lebanon, Oreg., assignor to White's Electronics, Inc.

Division of Ser. No. 918,075, Jul. 24, 1992, Pat. No. 5,523,690. This application Jun. 7, 1995, Ser. No. 485,810

Int. Cl.[6] G01N *27/72*; G01V *3/11*; *3/165*; G01R *27/26*

U.S. Cl. 324—329 **10 Claims**



4. In a metal detector having a transmit coil and a receive coil, said transmit coil transmitting a transmit signal which is acted upon by perturbations and said receive coil receiving the acted-upon transmit signal as a receive signal, the improvement comprising:

(a) said receive signal having a phase angle value which is a measurement of a phase angle between said transmit signal and said receive signal, and further having a signal amplitude value associated with the strength of said receive signal, said amplitude value being time-correlated with said phase angle value; and

(b) a visual display having a plurality of display unit addresses wherein each address corresponds to a range of phase angle values for instantaneously displaying said signal amplitude value at one of said plurality of display unit addresses corresponding to said phase angle values.

5,596,278

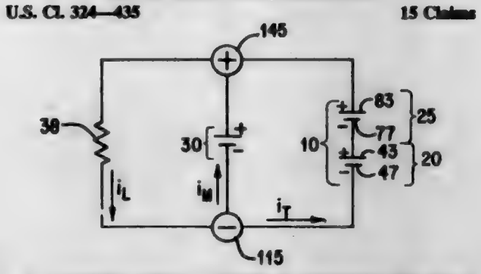
CONDITION TESTER FOR A BATTERY

Lifun Lin, Lincoln, Mass., assignor to Duracell Inc., Bethel, Conn.

Filed Sep. 8, 1995, Ser. No. 524,960

Int. Cl.[6] G01N *27/416*; H01M *10/48*

U.S. Cl. 324—435 **15 Claims**



1. A condition indicator assembly for determining the state of charge of an electrochemical power source to be tested, said condition indicator assembly comprising an indicator cell and a label attached to the electrochemical power source, said indicator cell being integrated into said label, said indicator cell comprising an anode, a cathode and an electrolyte, said electrolyte electrically contacting at least a portion of both said anode and cathode, wherein said indicator cell has an electromotive force (e.m.f.) of its own and wherein at least a portion of one of said electrodes of the indicator cell is visible, said condition indicator assembly further comprising an auxiliary cell being a power generating electrochemical cell comprising an anode, a cathode, and an electrolyte contacting at least a portion of said auxiliary cell anode and cathode, wherein one of the anode and cathode of the auxiliary cell is electrically connected to one of the anode and cathode of the indicator cell and wherein the remaining electrode of the auxiliary cell and the remaining electrode of the indicator cell are adapted to be electrically connected in parallel to the electrochemical power source.

5,596,279

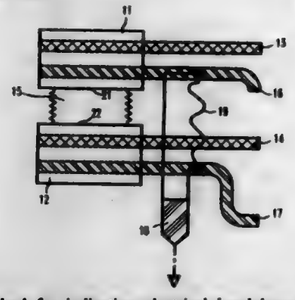
APPARATUS AND METHOD FOR INDICATING ELECTRICAL BREAKDOWN IN WATER COOLING SYSTEMS

Thomas F. Podlesak, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 17, 1994, Ser. No. 292,139

Int. Cl.[6] G01N *27/06*

U.S. Cl. 324—439 **10 Claims**



1. A method for indicating electrical breakdown in a water cooling system for high power electrical equipment, comprising the steps of:

selecting a plurality of portions of said water cooling system, said plurality of portions having a large electrical potential difference between them, being connected by a column of water, said water having a given resistance value that is nonconductive, connecting a resistor between at least two of said plurality of portions, said resistor having an ohmic value that is small compared to said given resistance value of the water and large enough to produce a recognizable voltage signal when the given resistance value of the water degrades to a conductive state;

coupling a detector circuit to said resistor, said detector circuit being capable of indicating when said recognizable voltage is present across said resistor; and

shutting down said high power electrical equipment when said detector circuit indicates said recognizable voltage signal is present across said resistor.

5,596,280

APPARATUS AND METHOD FOR TESTING CIRCUITS BY THE RESPONSE OF A PHASE-LOCKED LOOP

Salvatore R. Riggio, Jr., Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 15, 1995, Ser. No. 491,820

Int. Cl.[6] G01R *27/02*; H01H *31/02*

U.S. Cl. 324—606 **9 Claims**

1. Apparatus for determining electrical characteristics of a circuit under test, wherein said apparatus comprises:

a computing system;

an input oscillator providing an output at an input frequency of oscillation;

a phase-locked loop including a phase comparator, a loop filter, and a voltage controlled oscillator, wherein said phase comparator has first and second inputs, with said first input being connected to an output of said voltage controlled oscillator, wherein said voltage controlled oscillator has a freerunning frequency of oscillation at which said phase-locked loop operates when said input oscillator is not connected to said phase comparator, wherein said phase-locked loop oscillates at said input frequency when said input oscillator is connected to said phase comparator, wherein said voltage controlled oscillator includes a frequency control node at which said freerunning frequency of oscillation is varied by attaching an electrical impedance extending to electrical ground;

first connection means connecting said input oscillator with said second input of said phase comparator;

second connection means connecting a node of said circuit under test with said frequency control node;

detection means measuring an output signal of said loop filter;

switching means, operable by said computing system, for closing an electrical connection to said phase-locked loop to begin generating data relative to said circuit under test; and

an analog to digital converter responding to an output signal from said detection means, wherein said analog to digital converter produces coded signals indicating levels of said output signal of said loop filter at sampling times synchronized with operation of said switching means, so that said sampling times occur when said electrical connection to said phase lock loop is closed and at a plurality of equal time intervals thereafter.

5,596,281

METHOD AND AN APPARATUS FOR MEASURING THE OUTPUT VOLTAGE ON AN ELECTRIC FENCE AND FOR PRODUCING ELECTRIC PULSES IN SAID FENCE

Lars-Arne Eriksson, Sundsvall, Sweden, assignor to Alfa Laval Agriculture International AB, Tumba, Sweden

PCT No. PCT/SE92/00669, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO93/08671, PCT Pub. Date Apr. 29, 1993

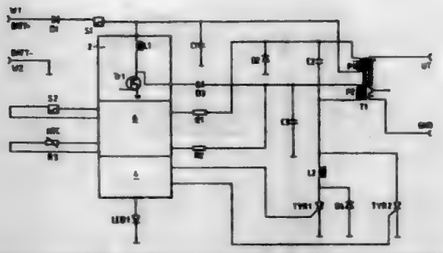
PCT Filed Sep. 25, 1992, Ser. No. 211,471

Claims priority, application Sweden, Oct. 3, 1991, 9102869

Int. Cl.[6] G01R *27/26*; G08B *21/00*

U.S. Cl. 324—713 **6 Claims**

1. A method for measuring that the output voltage provided to an electric fence from an electric fence apparatus is above a predetermined level, where high voltage pulses are provided to the fence



from a secondary winding of a step-up transformer, a chargeable discharge capacitor being connected over a first primary winding of the transformer, the capacitor being charged to a high voltage and being discharged to the first primary winding to generate the high voltage delivered from the secondary winding, the method including the steps:

measuring the time period for discharge of the capacitor through the first primary winding; and

calculating the voltage of the correasponding high voltage pulse induced in the secondary winding and provided to the electric fence from the measured time period for discharge of the capacitor.

5,596,282

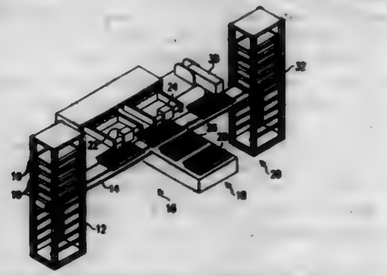
TESTER FOR INTEGRATED CIRCUITS

James N. Giddings, Mesquite, Tex., and Robert P. Howell, San Jose, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 165,226, Dec. 10, 1993, abandoned. This application Jul. 14, 1995, Ser. No. 502,590

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—754 **19 Claims**



1. A device for providing temporary interconnection of a connected device to an integrated circuit, said integrated circuit having a plurality of signal leads extending from an encapsulating package, the plurality of signal leads having a shoulder adjacent said encapsulating package, comprising:

a socketless tray for holding said integrated circuit;

a gantry positioned above said tray for lowering a jig onto said integrated circuit in said tray, said jig having a plurality of conductive contacts positioned to come in contact with said signal leads at the shoulder of said signal leads when said gantry lowers said jig onto said integrated circuit; and

a plurality of leads to move in a direction substantially perpendicular to a plane defined by said shoulder of said signal leads, one for each of said contacts, having a first end and a second end, the first end of each of said leads being connected to one of said contacts and the second end of said leads being connected to said connected device to be temporarily interconnected to said integrated circuit.

5,596,283

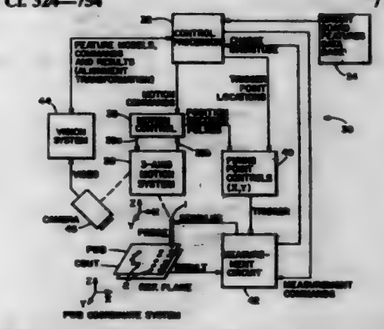
CONTINUOUS MOTION ELECTRICAL CIRCUIT INTERCONNECT TEST METHOD AND APPARATUS

Richard I. Mellitz, Pepperell, and Michael V. Dowd, Boston, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 324,293, Oct. 17, 1994, abandoned, which is a continuation of Ser. No. 103,725, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 721,043, Jun. 26, 1991, abandoned. This application Dec. 19, 1995, Ser. No. 579,838

Int. Cl.[6] G01R *1/06;27/26*

U.S. Cl. 324—754 **7 Claims**



1. Test apparatus for determining an electrical characteristic of a node disposed upon a surface of a printed wiring board (PWB) substrate comprising:

contact probe means;

means for providing continuous contact and relative omnidirectional motion between the probe means and the surface of the PWB substrate having a plurality of individual nodes disposed upon its surface;

position synchronization means for determining when the probe means is contacting an individual node of said plurality of nodes while there is continuous relative motion between the probe means and the surface of the substrate;

means, coupled to the probe means and responsive to the position synchronization means, for measuring an electrical characteristic of an individual node of the plurality of individual nodes, said electrical characteristic being measured for said individual node of the plurality of nodes when the position synchronization means indicates that said individual node is being contacted by the probe.

5,596,284

SYSTEM FOR, AND METHOD OF, MINIMIZING NOISE IN AN INTEGRATED CIRCUIT CHIP

Michael D. Wyken, Spring Valley, and Michael J. Brunelli, Escondido, both of Calif., assignors to Brooktree Corporation, San Diego, Calif.

Filed Nov. 10, 1994, Ser. No. 338,012

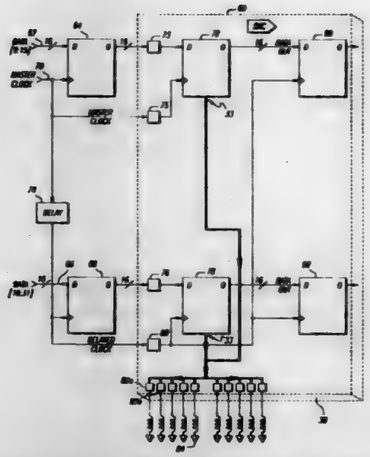
Int. Cl.[6] H03K *17/16*

U.S. Cl. 326—27 **28 Claims**

1. In combination,

an integrated circuit chip having a substrate and a plurality of integrated circuits on the substrate and having distributed capacitances between the integrated circuitry and the substrate and having pads on the periphery of the integrated circuit chip,

first means for providing successive words of digital information, each word having a plurality of bits,



second means for providing a clock signal having a plurality of successive cycles at a particular frequency,

third means for delaying each of the successive cycles of the clock signal from the second means by a particular time delay related to the time for each of the successive cycles,

fourth means for latching first bits in each word in accordance with the clock signal from the second means,

fifth means for latching second bits, different from the first bits, in each word in accordance with the delayed clock signal from the third means,

sixth means responsive to the latched bits from the fourth means and the clock signal from the second means for providing an additional latching of the first bits in each word,

seventh means responsive to the latched bits from the fifth means and the clock signal delayed by a delay corresponding to the delay provided by the third means for providing an additional latching of the second bits in each word,

eighth means for connecting the sixth means and the seventh means to at least one of the pads on the integrated circuit chip,

ninth means for providing a reference potential, and

tenth means for connecting the at least one of the pads on the integrated circuit chip to the reference potential.

5,596,285

IMPEDANCE ADAPTATION PROCESS AND DEVICE FOR A TRANSMITTER AND/OR RECEIVER, INTEGRATED CIRCUIT AND TRANSMISSION SYSTEM

Roland Marbot, Versailles; Jean-Claude Le Bihan, Montrouge; Andrew Cellez, Paris, and Reza Nezamzadeh-Mosavi, Bois d'Arcy, all of France, assignors to Bull S.A., Louveciennes, France

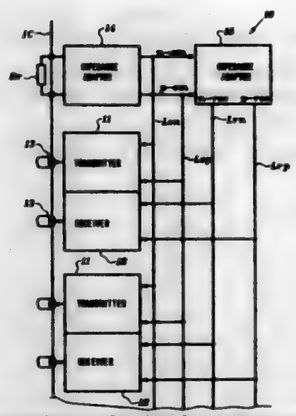
Filed Aug. 19, 1994, Ser. No. 293,190

Claims priority, application France, Aug. 19, 1993, 93 10106

Int. Cl.[6] H03K *17/16;19/0175*

U.S. Cl. 326—30 **22 Claims**

9. Input impedance adaptation device (10) to adapt an impedance to the characteristic impedance of a transmission line that connects a transmitter (11) to a receiver (12) the transmitter having a structure (16) and generating a signal having a low level and a high level and the receiver having a structure (17) responsive to the signal, the device comprising an adaptation structure (16', 17') which reproduces the structure of the transmitter and/or receiver and is connected to a reference impedance (Rr), means for adapting said adaptation structure to said reference impedance, and



closed loop control means (Len, Lep, Lrn, Lrp) connected to bring the structure of the transmitter and/or the receiver under the control of said adaptation structure.

5,596,286

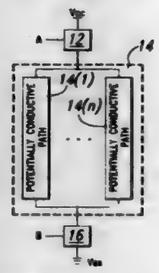
CURRENT LIMITING DEVICES TO REDUCE LEAKAGE, PHOTO, OR STAND-BY CURRENT IN AN INTEGRATED CIRCUIT

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 431,394, Apr. 28, 1995, which is a continuation of Ser. No. 150,927, Nov. 12, 1993. This application Dec. 11, 1995, Ser. No. 570,368

Int. Cl.[6] H03K *17/16*

U.S. Cl. 326—33 **27 Claims**



1. An integrated circuit comprising:

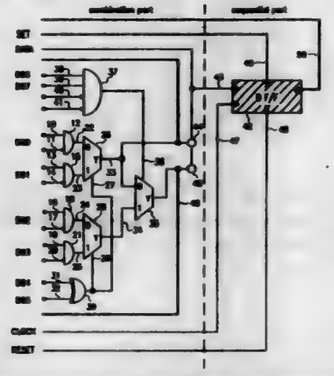
a. a functional circuit comprising a plurality of circuit elements, each of said circuit elements operable to provide a conductive path, wherein less than all of said plurality of circuit elements are active at any one time; and

b. a current limiting circuit in addition to said functional circuit connected between said plurality of circuit elements and a first voltage, wherein said current limiting circuit comprises at least one transistor and is operable to supply less than a selected current level to said plurality of elements, said current level being less than a current level required to operate all of said plurality of circuit elements, and wherein a plurality of said plurality of circuit elements are each connected between said current limiting transistor and an output node of the functional circuit.

5,596,287
PROGRAMMABLE LOGIC MODULE FOR DATA PATH APPLICATIONS

Han-Jin Cho, Daejeon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

Filed Nov. 16, 1994, Ser. No. 343,890
Claims priority, application Rep. of Korea, Dec. 23, 1993, 9329352
Int. Cl.[6] H03K 19/177
U.S. Cl. 326—40 7 Claims



1. A logic integrated circuit module including a sequential circuit part, and

a combination circuit part including

first to fourth AND logic means for respectively inputting a first data signal to a fourth data signal and for ANDing the input data signals, each AND logic means having two input terminals, said input terminals having at least one non-inverted terminal and one inverted input terminal;

XOR logic means for inputting a fifth and sixth data signals and for XORing the inputted data signals, said XOR logic means having at least two non-inverted input terminals;

fifth AND logic means for inputting a seventh data signal to an eighth data signal and ANDing the input data signals, AND logic means having four input terminals, said input terminals having at least two non-inverted terminals and two inverted input terminals;

first data select means having a select control input terminal and for selecting one of outputs from said first and second AND logic means in response to the output from said XOR logic means which is applied to the select control input terminal thereof; and

second data select means having a select control input terminal and for selecting one of outputs from said third and fourth AND logic means in response to the output from said XOR logic means which is applied to the select control input terminal thereof.

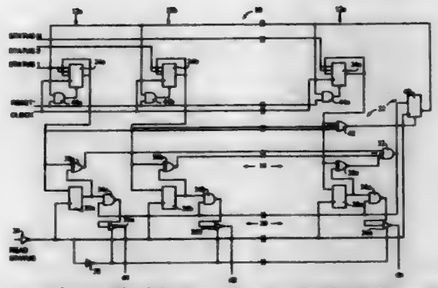
5,596,288
STATUS REGISTER WITH ASYNCHRONOUS READ AND RESET AND METHOD FOR PROVIDING SAME

Laura E. Simmons, Tempe, and Joseph A. Thomsen, Chandler, both of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 86,339, Jun. 30, 1993, Pat. No. 5,493,242. This application Sep. 7, 1995, Ser. No. 526,119
Int. Cl.[6] H03K 5/22
U.S. Cl. 327—12 52 Claims

1. A status register compriaing:

an input flip-flop having an input coupled to a status input and having an output, said input flip-flop being clocked by a clocking signal derived from a system clock;



an asynchronous latch having an input coupled to said output of said input flip-flop and having an output, where said asynchronous latch is enabled asynchronously with respect to said system clock;

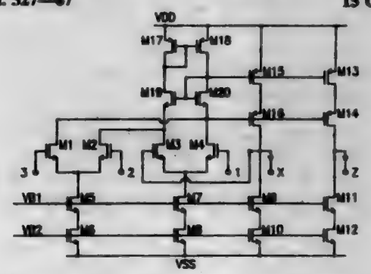
a comparator coupled to said output of said input flip-flop and said output of said asynchronous latch and operative to produce a comparison output; and

an output stage coupled to said comparison output to provide an error output when said output of said input flip-flop and said output of said asynchronous latch are different.

5,596,289
DIFFERENTIAL-DIFFERENCE CURRENT CONVEYOR AND APPLICATIONS THEREFOR

Shen-Iuan Liu, Keelung, Taiwan, assignor to National Science Council, Taipei, Taiwan

Filed May 15, 1995, Ser. No. 440,931
Int. Cl.[6] H03K 5/22; H03F 3/45
U.S. Cl. 327—67 15 Claims



1. A differential-difference current conveyor, wherein a voltage sum of a first input signal and a third input signal is substantially equal to a voltage sum of a second input signal and a fourth input signal, and a value of current of said fourth input signal is substantially equal to a value of current of an output signal, and values of current of said first, second, and third input signals are substantially zero, said differential-difference current conveyor comprising:

a high voltage source;

a low voltage source;

a first differential pair, wherein a non-inverting input terminal and an inverting input terminal of said first differential pair are coupled to said third input signal and to said second input signal, respectively;

a second differential pair, wherein a non-inverting input terminal and an inverting input terminal of said second differential pair are coupled to said fourth input signal and said first input signal, respectively, and a non-inverting output terminal and an inverting output terminal of said second differential pair are connected to an inverting output terminal and a non-inverting output terminal of said first differential pair, respectively;

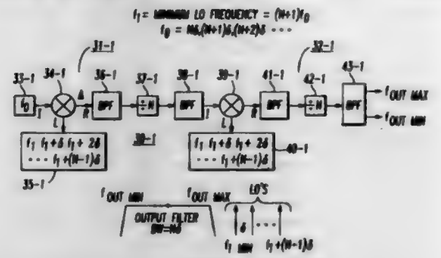
a load connected between said high voltage source and the output terminals of said first differential pair and second differential pair;

means for negative feedback, connected to the non-inverting output terminal of said second differential pair and the non-inverting input terminal of said second differential pair; and a tracking means for tracking a current value of said fourth input signal and said output signal.

5,596,290
DIRECT FREQUENCY SYNTHESIZER HAVING MODERATE BANDWIDTH

Grant H. Watkins, Dunkirk; Norman G. Matthews, Sparks; Alden C. Hazzard, Jessup, and John P. Muhlbaier, Joppa, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation of Ser. No. 460,513, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 133,429, Oct. 8, 1993, abandoned. This application Feb. 28, 1996, Ser. No. 607,924
Int. Cl.[6] H03B 21/00;19/00; H03K 21/00
U.S. Cl. 327—105 8 Claims



1. A direct frequency synthesizer comprising:

a source for at least one starter frequency signal f_o;

a source for a set of LO frequency signals f_1 through f_n spaced from each other by a frequency increment δ;

a mixer circuit for generating a product of the starter frequency signal and the LO frequency signals said product having a difference portion;

a divider having a divider ratio equal to N;

the number of LO frequency signals being equal to an integer or less than N;

the starter frequency f_o having a value equal to δ times (N+x) where x is equal to 0 or a positive integer;

the LO frequency f_1 having a value equal to $(N+1)f_o$;

an intermediate nonswitchable band pass filter for passing only the difference portion of the mixer product to the divider; and

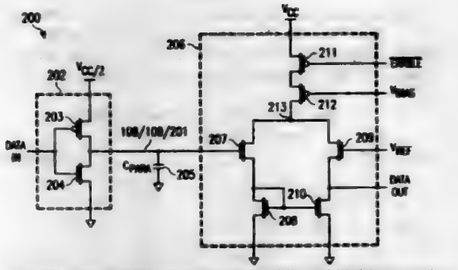
a nonswitchable output band pass filter receiving an output from the divider to generate a moderate bandwidth output.

5,596,291
CIRCUITS, SYSTEMS AND METHODS FOR THE HIGH SPEED TRANSFER OF DATA ACROSS A CONDUCTIVE LINE

Michael E. Runas, McKinney, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation of Ser. No. 418,649, Apr. 10, 1995, abandoned. This application May 2, 1996, Ser. No. 641,708
Int. Cl.[6] H03K 5/153
U.S. Cl. 327—108 20 Claims

1. Circuitry for transferring data across a conductive line comprising:



a driver for transmitting data across said line, said driver receiving data at a first high voltage level and a low voltage level and driving said line at said low voltage level and a second high voltage level generated from a first voltage source, said second high voltage level less than said first high voltage level;

a receiver for receiving data transmitted on said line by said driver, said receiver comprising:

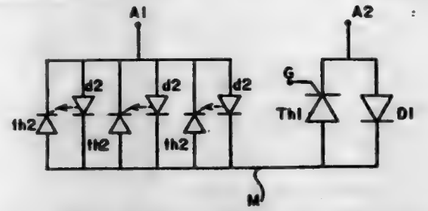
a differential amplifier having a first input coupled to said line and a second input coupled to a voltage source providing a reference voltage; and

a current source transistor coupling a common node of said differential amplifier to a second voltage source providing a voltage approximating said first high voltage level, said differential amplifier outputting data at said low voltage level and said first high voltage level.

5,596,292
A.C. SWITCH TRIGGERED AT A PREDETERMINED HALF-PERIOD

Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis Pouilly, France

Continuation of Ser. No. 448,899, May 24, 1995, which is a division of Ser. No. 32,680, Mar. 17, 1993, Pat. No. 5,471,074. This application Jun. 7, 1995, Ser. No. 470,286
Claims priority, application France, Mar. 20, 1992, 92 03763
Int. Cl.[6] H01L 29/74
U.S. Cl. 327—124 2 Claims

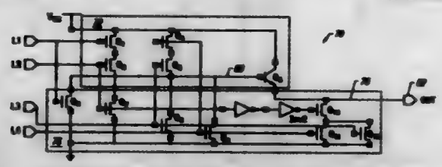


2. A method for enabling/disabling alternating current flow across first and second terminals comprising the steps of:

receiving a triggering pulse by a circuit element coupled to the first terminal; and

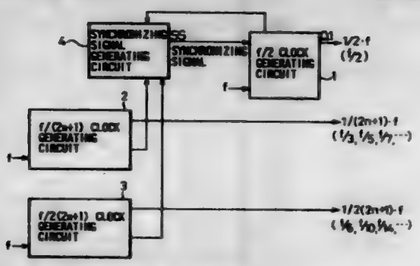
upon receipt of the triggering pulse, enabling alternating current to flow across the first and second terminals for a remaining half-cycle of a present alternating current period and a half-cycle of a subsequent alternating current period.

5,596,293
NOISE RESISTANT RESET CIRCUIT FOR A PHASE DETECTOR IN A PHASE-LOCKED LOOP
Alan C. Rogers, Palo Alto, and Gaurang A. Shah, Sunnyvale, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.
Filed Jun. 6, 1995, Ser. No. 466,887
Int. Cl.[6] H03K 19/20;5/00
U.S. Cl. 327—142 13 Claims



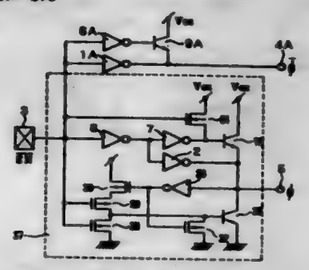
1. A reset circuit for a phase detector in a phase-locked loop, comprising:
a first set of input lines to receive a first set of latched signals corresponding to a cycle of a reference signal applied to said phase detector of said phase-locked loop;
an output node;
reset assertion logic connected to said first set of input lines and said output node, said reset assertion logic executing a predetermined logic function on said first set of latched signals to generate a reset signal on said output node with a cycle duration corresponding to said reference signal cycle; and
reset de-assertion logic connected to said first set of input lines and said output node, said reset de-assertion logic executing a predetermined logic function on said first set of latched signals to de-assert said reset signal on said output node after a period of time corresponding to said reference signal cycle.

5,596,294
SYNCHRONIZING CIRCUIT FOR DIVIDING A FREQUENCY OF A CLOCK SIGNAL SUPPLIED FROM AN EXTERNAL DEVICE INTO A PLURALITY OF INTERNAL CLOCK SIGNALS
Noriko Kadomaru, and Fumihiko Asanai, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 19, 1995, Ser. No. 492,311
Claims priority, application Japan, Sep. 20, 1994, 6-224677
Int. Cl.[6] H03K 1/04
U.S. Cl. 327—145 18 Claims



1. A synchrosizing circuit comprising:
a first signal generating means for dividing a control signal to obtain a first signal having a first frequency;
a second signal generating means for dividing the control signal to obtain a second signal having a second frequency;
a third signal generating means for dividing the control signal to obtain a third signal having a third frequency and synchronized with the second signal; and
a synchronizing signal generating means for generating a synchronizing signal synchronizing the first signal with the second and third signals in accordance with a logical result of the first, second and third signals wherein the first, second and third signals are internal clock signals having different frequencies.

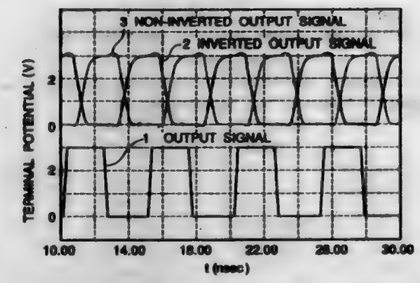
5,596,295
IN-PHASE SIGNAL OUTPUT CIRCUIT, OPPOSITE-PHASE SIGNAL OUTPUT CIRCUIT, AND TWO-PHASE SIGNAL OUTPUT CIRCUIT
Masaji Uno, Sagamihara, and Yasukazu Noine, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 16, 1995, Ser. No. 405,009
Claims priority, application Japan, Mar. 16, 1994, 6-045778
Int. Cl.[6] H03K 5/12
U.S. Cl. 327—170 12 Claims



1. A signal output circuit comprising:
an input terminal for receiving an input signal (/EN);
a primary signal output circuit comprising:
first and second inverters connected in series,
an output-side terminal for outputting a corresponding primary signal being one of in phase with and opposite in phase to the input signal (/EN),
a first switching means connected between a high voltage supply terminal and said at least one output-side terminal,
a second switching means connected between the high voltage supply terminal and a control terminal of said first switching means, a control terminal of said second switching means being connected to said input terminal, and
a third inverter connected between a junction point between said first and second inverters and said control terminal of said first switching means;
an output terminal connected to the output-side terminal; and
a low-level signal output circuit comprising a grounding switching means connected between said output terminal and a ground terminal, for, under a condition when said at least one primary signal of said primary signal output circuit is transitioning to output a primary low-level signal in response to the input signal (/EN), outputting a secondary low-level signal and further applying the outputted secondary low-level signal to said output terminal, before the primary low-level signal is outputted from said primary signal output circuit.

5,596,296
CLOCK DRIVER CIRCUIT
Hiroshi Aozasa, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Mar. 30, 1995, Ser. No. 413,416
Claims priority, application Japan, Mar. 30, 1994, 6-061740
Int. Cl.[6] G06F 1/04
U.S. Cl. 327—291 6 Claims

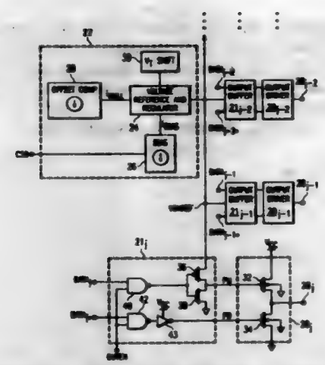
1. A clock driver circuit comprising:
an input terminal for receiving a clock signal;
an inverted signal output terminal for outputting an inverted output clock;



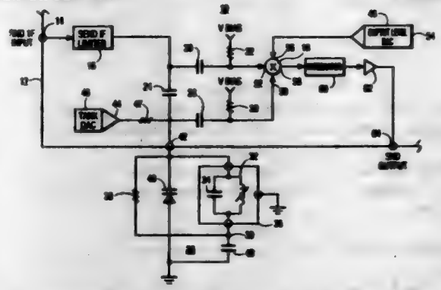
a non-inverted signal output terminal for outputting a non-inverted output clock;
a first driver having an input connected to said input terminal and an output for outputting an inverted output signal to said inverted signal output terminal;
a second driver having an input connected to said input terminal and an output for outputting a non-inverted output signal to said non-inverted signal output terminal;
a selected one of said first driver and said second driver including a first number of inverters cascaded between said input terminal and said output terminal of said selected driver so as to output at said output terminal of said selected driver a first signal delayed from said clock signal applied to said input terminal by a first delay amount corresponding to said first number of inverters, and a second number of inverter or inverters cascaded between said input terminal and said output terminal of said selected driver so as to output at said output terminal of said selected driver a second signal delayed from said clock signal applied to said input terminal by a second delay amount corresponding to said second number of inverter or inverters, so that said first and second signals are combined at said output terminal of said selected driver so as to generate a synthesized signal delayed from said clock signal applied to said input terminal by an intermediate value of said first and second delay amounts, said first number being larger than said second number by an even number and said second number including one,
the other of said first driver and said second driver having a delay time substantially equal to said intermediate value of said first and second delay amounts,
whereby said non-inverted output signal and said inverted output signal are generated by said first driver and said second driver, respectively, and have the same phase and are complementary to each other.

5,596,297
OUTPUT DRIVER CIRCUITRY WITH LIMITED OUTPUT HIGH VOLTAGE
David C. McClure, Denton, and Thomas A. Teel, Carrollton, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Filed Dec. 20, 1994, Ser. No. 360,228
Int. Cl.[6] G05F 1/10
U.S. Cl. 327—538 25 Claims

1. An output driver circuit for an integrated circuit, comprising:
a pull-up drive transistor, having a conduction path coupled between a power supply voltage and an output terminal, and having a control electrode;
circuitry for limiting the drive of the pull-up drive transistor responsive to a bias voltage; and
a voltage reference and regulator circuit for producing the bias voltage, comprising:
a voltage divider for generating a divided voltage based upon the power supply voltage;
a current mirror having a reference leg and a mirror leg, said reference leg receiving the divided voltage from the voltage divider and conducting a reference current responsive thereto, said mirror leg conducting a mirrored current responsive to the reference current and deriving the bias voltage based upon said mirrored current; and
a bias current source, coupled to the reference leg and the mirror leg of the current mirror, for controlling the reference current and the mirror current conducted thereby.



5,596,298
BUS ALIGNED QUADRATURE FM DETECTOR
Rick W. Miller, and Daniel M. Hutchinson, both of Carmel, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Apr. 5, 1995, Ser. No. 418,140
Int. Cl.[6] H03D 3/06
U.S. Cl. 329—337 7 Claims



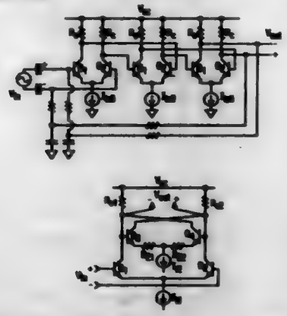
1. A demodulator circuit disposed on an integrated circuit, comprising:
first signal means for providing a first signal modulated with information;
control means disposed on the integrated circuit for generating a control voltage;
second signal means for providing a second signal which is phase adjustable with respect to the first signal by an LC circuit, the LC circuit being disposed external of the integrated circuit and coupled to a terminal of the integrated circuit, the LC circuit being tunable by a variable impedance disposed external of the integrated circuit and coupled to the terminal, the variable impedance being responsive to the control voltage present at the terminal to change the phase of the second signal to a predetermined phase relationship with respect to the first signal;
product detector means for providing an output signal responsive to the phase relationship of the first signal with respect to the second signal, the product detector means being disposed on the integrated circuit, the output signal including demodulated information.

5,596,299

IF AMPLIFIER/LIMITER WITH POSITIVE FEEDBACK

Charles J. Persico, San Diego; Nasrollah S. Navid, Saratoga, both of Calif., and Ali Petrovat-Ahmady, Tehran, Islamic Rep. of Iran, assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed May 30, 1995, Ser. No. 453,408
Int. Cl.[6] H03F 3/45
U.S. Cl. 330—260 10 Claims



8. A method of increasing the sensitivity and reducing the power consumption of a IF amplifier/limiter circuit having a string of differential amplifier pairs and a low-frequency negative feedback coupling from an output of a last of said differential amplifier pairs back to an input of a first of said differential amplifier pairs, said first differential amplifier having a first differential pair of transistors, the method comprising:

introducing a positive localized feedback into the output of the first differential amplifier pair; and

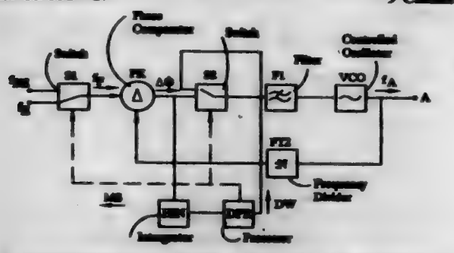
adjusting the amount of positive localized feedback introduced into the output of the first differential amplifier pair to obtain a desired output signal.

5,596,300

METHOD AND ARRANGEMENT FOR DETERMINING PHASE CHANGES OF A REFERENCE INPUT SIGNAL OF A PHASE-LOCKED LOOP

Werner Dietrich, and Christian Jenkner, both of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 3, 1995, Ser. No. 553,066
Claims priority, application Germany, Nov. 28, 1994, 44 42 306.3
Int. Cl.[6] H03L 7/06;7/08; G01R 23/00; G06F 17/00
U.S. Cl. 331—17 9 Claims



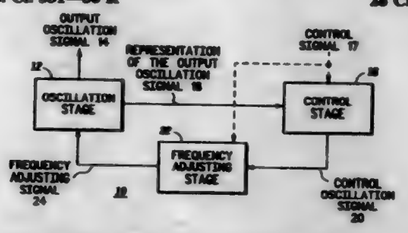
1. A method for determining a phase shift in a phase of a reference input signal of a phase-locked loop that has at least one phase comparator, a filter and a controlled oscillator, comprising the steps of: providing a reference input signal to the comparator; calculating a phase shift of the input signal within an observation time span in a processor from a phase difference at an output of the phase comparator and parameters of the phase comparator, the filter and the controlled oscillator of the phase-locked loop.

5,596,301

APPARATUS FOR A SYNTHESIZED REACTANCE CONTROLLED OSCILLATOR USABLE IN A PHASE LOCKED LOOP

Mathew A. Rybicki, and Michael D. Cave, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 4, 1995, Ser. No. 435,104
Int. Cl.[6] H03B 5/32; H03L 7/099
U.S. Cl. 331—36 R 28 Claims



1. A controlled oscillator circuit that produces an output oscillation signal comprising:

an oscillation stage that generates the output oscillation signal based, at least in part, upon a frequency adjusting signal; and

a reactive element synthesizer for synthesizing a reactive device, the reactive element synthesizer operably coupled to the oscillation stage to receive a representation of the output oscillation signal, and to provide a frequency adjusting signal, wherein the oscillation stage receives the frequency adjusting signal and adjusts the frequency of the output oscillation signal based on the frequency adjusting signal, the reactive element synthesizer comprising:

a control stage operably coupled to receive the representation of the output oscillation signal, wherein the control stage modifies the representation of the output oscillation signal to produce a control oscillation signal; and

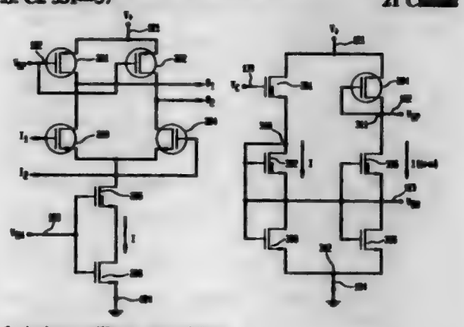
a frequency adjusting stage operably coupled to the control stage, wherein the frequency adjusting stage receives the control oscillation signal and produces therefrom the frequency adjusting signal.

5,596,302

RING OSCILLATOR USING EVEN NUMBERS OF DIFFERENTIAL STAGES WITH CURRENT MIRRORS

Angelo E. Mastrocola, West Lawn, and Jeffrey L. Sonntag, Rockland Township, Berks County, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 17, 1996, Ser. No. 588,156
Int. Cl.[6] H03B 5/24
U.S. Cl. 331—57 21 Claims



1. A ring oscillator comprising:

an even number of differential stages connected in tandem with inputs connected to outputs in order to form a ring configuration, each of said stages including a pair of semiconductor devices connected in a differential amplifier configuration with two inputs, two outputs and a common connection,

a common current device in each one of said stages connected to said common connection,

a first current mirror having each of said common current devices connected as a secondary leg for establishing a current of I in said common current device,

two load current devices in each of said stages each one of which is connected to a different one of said outputs,

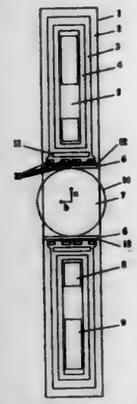
characterized in that said ring oscillator further includes a second current mirror having each of said load current devices connected as a secondary leg, said second current mirror being constructed for establishing a current of (1+∝)I/2 in each of said load current devices, and resulting in a current of I/2 in each of said load current devices, where ∝ is a number greater than zero.

5,596,303

SUPERCONDUCTIVE MAGNET SYSTEM WITH LOW AND HIGH TEMPERATURE SUPERCONDUCTORS

Ali Akgun, 43 Royal Crest Dr., #5, North Andover, Mass. 01845, and Michael M. Kerber, 6 Gristone Rd., Chelmsford, Mass. 01824

Filed Feb. 22, 1993, Ser. No. 20,788
Int. Cl.[6] H01F 1/00;5/00;6/00; G01V 3/00
U.S. Cl. 335—216 19 Claims



1. A system for producing a homogenous magnetic field within an imaging volume of a magnetic resonance imaging apparatus, comprising:

a primary coil situated about the imaging volume, said primary coil for exhibiting a primary magnetic field which contributes to the homogenous magnetic field within the imaging volume; and

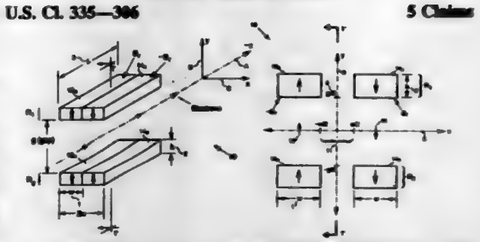
a correction coil situated about the imaging volume and coaxial with said primary coil, said correction coil being disposed closer to the imaging volume than said primary coil, said correction coil comprising a high temperature superconducting material, said correction coil being smaller in size than said primary coil so that said correction coil exhibits a correction magnetic field which is lesser in strength than said primary magnetic field within the imaging volume, said correction magnetic field and said primary magnetic field in combination for generating the homogenous magnetic field within the imaging volume.

5,596,304

PERMANENT MAGNET EDGE-FIELD QUADRUPOLE

Roman O. Tatchyn, Mountain View, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 29, 1994, Ser. No. 219,769
Int. Cl.[6] H01F 7/00;7/02
U.S. Cl. 335—306 5 Claims



1. A planar permanent magnet edge-field quadrupole for modifying the trajectory of an electrically or magnetically charged particle traveling along in a substantially linear trajectory that is in close proximity to the quadrupole symmetry axis, the planar permanent magnet edge-field quadrupole comprising:

four substantially rectangular magnetized pieces of permanent magnet material with substantially similar geometrical and dimensional parameters, each piece magnetized to a substantially similar level of magnetic field strength in a direction perpendicular to two of its opposed surfaces and substantially perpendicular to the axis of particle motion; and

the four pieces configured into two planar arrays of two pieces each, with the arrays located at an equal distance above and below the axis of particle motion, with one planar array parallel to and directly above the other; and

the two adjacent pieces in each planar array magnetized in a direction perpendicular to the plane of the array, with the sense of magnetization of the piece on the left opposite to the sense of magnetization of the other piece; and

the sense of magnetization of each piece in the top array being the same as the sense of magnetization of the piece directly below it; and

the two adjacent pieces in each planar array separated by a horizontal gap of the same size, the size of the gaps being adjustable from arbitrary positive values down to zero; and

in combination, each piece on the left hand side of the planar permanent magnet quadrupole provided with a means for adjusting the horizontal gap relative to the right hand piece in the same planar array: and

the dimensions, positions, and magnetizations of the pieces producing a field distribution that is substantially quadrupolar out to a distance away from the symmetry axis that is intermediate between zero and approximately one half of the full vertical gap size.

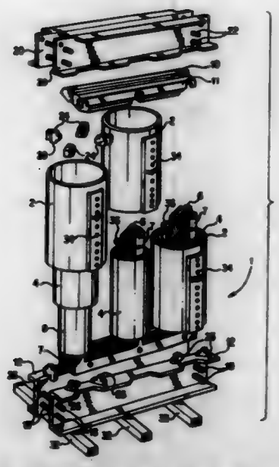
5,596,305

STRIP WOUND COIL WITH REINFORCED EDGE LAYER INSULATION

Jeewan Puri, 6700 Tree Hill Rd., Matthews, N.C. 28105

Division of Ser. No. 32,225, Mar. 17, 1993, Pat. No. 5,461,772.
This application Oct. 26, 1994, Ser. No. 329,370
Int. Cl.[6] H01F 27/14
U.S. Cl. 336—205 7 Claims

1. A strip wound coil for use in a transformer, said coil including a sheet insulator material coincident with a sheet conductor material wound on a cylindrical mandril a predetermined number of turns and further including formed air channels, said strip wound coil comprising:



A. a pocket, said pocket formed by extending top and bottom edges of said sheet insulator material above and below said sheet conductor material, said pocket to provide electrical isolation means for said sheet conductor material;

B. stiffening means for reinforcing said extended top and bottom edges of said sheet conductor to prevent collapse of said sheet conductor;

C. a porous dielectric material for packing said pocket to provide said isolation means;

D. resin for vacuum and pressure impregnating said coil to form a high strength bond between adjacent windings of said conductor sheet material; and

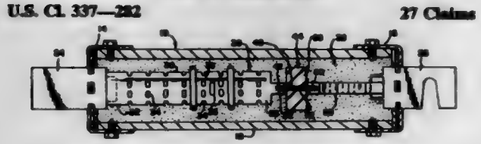
further insulating means added to said formed pocket to prevent contamination of said sheet conductor material and provide electrical insulation for withstanding high voltage gradients.

5,596,306

FORM FITTING ARC BARRIER FOR FUSE LINKS

Joseph W. Kowalik, Skokie, and Heraclio R. Gomez, Northbrook, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed Jun. 7, 1995, Ser. No. 472,406
Int. Cl.[6] H01H *85/38*
U.S. Cl. 337—282 **27 Claims**



1. A fast acting fuse comprising:

a housing with first and second conductive terminals at opposite axial ends of said housing;

a short-circuit fusible element located within said housing, said short-circuit fusible element having at least one elongated slot forming a zone of increased resistance between first and second opposite ends, said first and second opposite ends connected to said first and second conductive terminals; and,

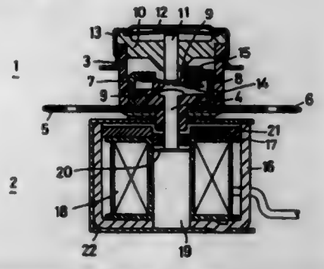
an arc barrier-forming body fitted around and intimately surrounding a portion of said short-circuit fusible element adjacent said zone and intermediate said first end and said elongated slot, said arc barrier-forming body being formed from a silicone rubber sealant which is initially free flowing at room temperature but upon exposure to air increases in viscosity until it essentially becomes a solid.

5,596,307

THERMOSTAT

Toshiharu Hayashi, and Akira Imoto, both of Osaka, Japan, assignors to Wako Electronics Company Limited, Osaka, Japan

Filed Feb. 27, 1995, Ser. No. 395,079
Claims priority, application Japan, Jun. 16, 1994, 6-159239
Int. Cl.[6] H01H *37/00*
U.S. Cl. 337—298 **7 Claims**



1. A thermostat consecutively comprising a temperature switch unit (1) for varying the opening state of switching contacts (14, 15) by physical dislocation of a heat sensing element (12), and a forced reset unit (2) for resetting the switching contacts (14, 15) by force to the initial state, wherein one of the switching contacts (14, 15) is formed in part of a spring member (9), and

between the heat sensing element (12) and spring member (9) is provided a transmission member (11) for transmitting displacement to the spring member, when the heat sensing element is displaced from the initial state, to vary the opening state of the switching contacts,

a reset shaft (4) of a proper length for abutting against the spring member is inserted into the temperature switch unit (1) so as to be free to move in back and forth from the opposite side of the heat sensing element, the forced reset unit (2) is provided at least with a bobbin (17) having a central penetration hole, a coil (18) wound on this bobbin, and a magnetic movable member (19) to be inserted into the central penetration hole, and the coil is energized to move the movable member, thereby resetting the switching contacts by force to the initial state.

5,596,308

OVERVOLTAGE SURGE ARRESTER WITH QUICK-ACTING PRESSURE RELIEF MEANS

Larry E. Beck, South Glens Falls, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Aug. 11, 1994, Ser. No. 289,480
Int. Cl.[6] H01C *7/10*; H02H *9/04*
U.S. Cl. 338—20 **11 Claims**

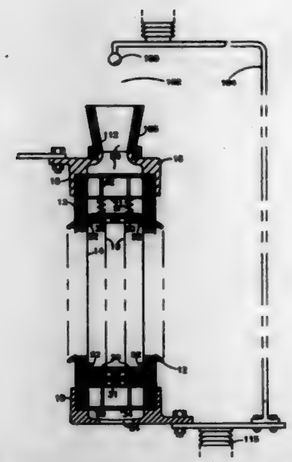
1. An arrester comprising:

(a) a cylindrical insulating housing having a bore,

(b) a first metal terminal at one end of the housing and a second metal terminal at the other end of the housing,

(c) a stack of varistor elements connected in series between said first and second terminals within said bore,

(d) said first terminal having a vent extending therethrough for venting an arc generated gas from said bore, and



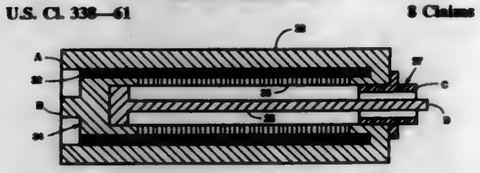
(e) an electrode connected to said second terminal and spaced from said first terminal by a gap located so that an arc forms in the gap when the gas is vented from said bore.

5,596,309

REDUCED INDUCTANCE COAXIAL RESISTOR

Takashige Nakashima, Tokyo; Katsuhisa Kato, Koshigaya, and Toshiaki Hidaka, Tokyo, all of Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 279,319
Claims priority, application Japan, Jul. 30, 1993, 5-208267
Int. Cl.[6] H01C *3/02*
U.S. Cl. 338—61 **8 Claims**



1. An electrical resistor comprising:

a first cylindrical conductor having an inner surface and a central axis and having a first end spaced apart from a second end thereof in a first direction along said central axis;

a cylindrical insulator provided on the inner surface of said first cylindrical conductor in coaxial relationship therewith, said cylindrical insulator having an inner surface and having a radial thickness in the range from several tens of micrometers to hundreds of micrometers;

a cylindrical resistor provided on the inner surface of said cylindrical insulator in coaxial relationship therewith and having a first end spaced apart from a second thereof in said first direction, said first end of said cylindrical resistor being coupled to said first end of said first cylindrical conductor so that when said second end of said first cylindrical conductor and said second end of said cylindrical resistor are connected to a current source, an electrical current flows through said first cylindrical conductor and said cylindrical resistor in opposite respective directions;

a second cylindrical conductor coupled to said first end of said first cylindrical conductor, said second cylindrical conductor defining an opening; and

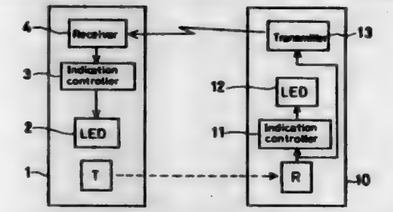
a center conductor inserted into an opening of said cylindrical resistor and having a first end spaced apart from a second end thereof in said first direction, said second end of said center conductor being coupled to said second end of said cylindrical resistor and said second end of said center conductor extending through the opening of said second cylindrical conductor so that a voltage across said cylindrical resistor is derived from said second end of said center conductor and said second cylindrical conductor in response to electrical current flowing through said cylindrical resistor.

5,596,310

RECEIVED LIGHT LEVEL INDICATING SYSTEM FOR BEAM SENSOR

Yuji Itoh, Hamamatsu, Japan, assignor to Atsumi Electric Co., Ltd., Hamamatsu, Japan

Continuation of Ser. No. 105,944, Aug. 13, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 425,218
Claims priority, application Japan, Aug. 14, 1992, 4-216850
Int. Cl.[6] G08B *5/00*
U.S. Cl. 340—331 **2 Claims**



1. A received light level indicating system for a beam sensor, comprising:

a light receiver including a light receiving means for receiving light, a first light-emitting element and a first indication controlling means for controlling said first light-emitting element, wherein the flashing period of said first light-emitting element is stepwisely changed by said first indication controlling means in accordance with a level of light received by said light receiving means,

wherein said light receiver further comprises a signal transmitting means for transmitting a signal representing the level of light received by said light receiving means, wherein said received light level indicating system further comprises a light projector including a signal receiving means for receiving the signal transmitted from said signal transmitting means, a light projecting means for projecting light to said light receiving means, a second light-emitting element, and a second indication controlling means for controlling said second light-emitting element, wherein the flashing period of said second light-emitting element is stepwisely changed by said second indication controlling means in accordance with a level of light received by said light receiving means in said light receiver.

5,596,311

METHOD AND APPARATUS FOR DRIVING A SELF-RESONANT ACOUSTIC TRANSDUCER

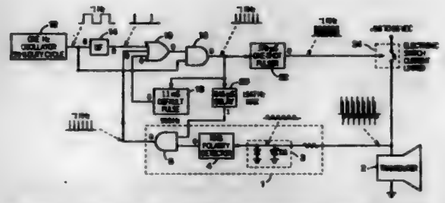
Emery L. Benz, Nampa, and Harry S. Erskine, Boise, both of Id., assignors to Preco, Inc., Boise, Id.

Filed May 23, 1995, Ser. No. 447,715
Int. Cl.[6] G08B *3/10*
U.S. Cl. 340—384.7 **18 Claims**

1. An acoustic transducer system, including:

an electro-mechanical acoustic transducer, having a movable portion, wherein the transducer is a voice coil loudspeaker, and the movable portion of the transducer includes a voice coil;

driving means for driving the transducer at any selected frequency within a range of frequencies including a nominal natural resonance frequency of said transducer;



detector means, coupled to the transducer, for generating a feedback signal indicative of actual natural resonance frequency of the movable portion of the transducer; and

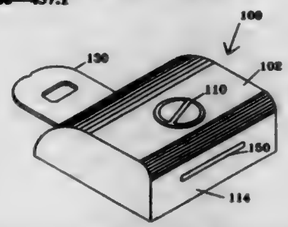
control means for receiving the feedback signal, and controlling the driving means in response to the feedback signal to cause said driving means to drive the transducer at said actual natural resonance frequency, wherein the driving means includes means for applying a sequence of voltage pulses across the transducer, wherein the detector means is a high-impedance detector circuit connected across the voice coil, and wherein the feedback signal is indicative of a zero crossing of voltage across the voice coil following application of each of said pulses.

5,596,312

SEAT BUCKLE ALARM

David C. Fowler, 210 Oak St., Surgoinsville, Tenn. 37873, and Dale D. Cummings, Star Rte. 206-B, Hwy. 52, Dawsonville, Ga. 30534

Filed Feb. 1, 1995, Ser. No. 382,490
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 340—457.1 18 Claims



1. An alarm for a vehicle seat belt system including a tongue plate at an end of one belt releasably engageable with a buckle on an end of another belt to form a restraint to secure a vehicle occupant, said alarm comprising:

a housing;

a first aperture in said housing for receiving the tongue plate of the vehicle seat belt system therein;

a tongue extending from said housing, said tongue releasably engageable with the buckle of the vehicle seat belt system;

an alarm positioned within a normally open circuit in said housing;

latch means in said housing for releasably engaging the vehicle tongue plate within said housing;

means for moving said latch means to a position out of engagement with the vehicle tongue plate, said moving means including structure for closing said normally open circuit, whereby to energize said alarm, said moving means comprising:

a second aperture in said housing;

a dial rotatably mounted within said housing aperture, said dial closing said circuit upon movement to a first position;

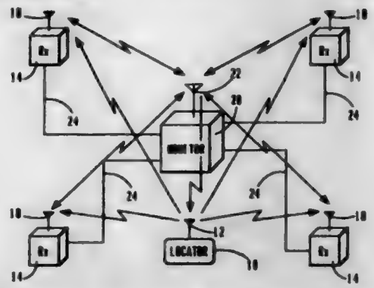
means in said housing for linking said dial with said latch means, said linking means moving said latch means out of engagement with the vehicle tongue plate upon rotation of said dial to said first position and movement of said dial away from said second housing aperture.

5,596,313

DUAL POWER SECURITY LOCATION SYSTEM

Victor P. Berglund, McKinney, and Richard R. Jaffe, Dallas, both of Tex., assignors to Personal Security & Safety Systems, Inc., Dallas, Tex.

Filed May 16, 1995, Ser. No. 442,469
Int. Cl.[6] G08B *25/12*
U.S. Cl. 340—574 13 Claims



1. A personal security system for locating a person within a predetermined locale, comprising:

a plurality of receivers disposed about the predetermined locale for receiving an alarm transmission;

one or more portable transmitters for being carried on a person, each said portable transmitter having:

an alarm switch for being activated by the person,

a battery for supplying power,

a processor for generating an alarm signal and encoding said alarm signal onto a carrier as an encoded alarm signal, and

a transmitter for transmitting said encoded alarm signal as said alarm transmission at first and second power levels, at said first power level, said alarm transmission reaching the closest ones of said plurality of receivers and, at said second power level, to an area proximate to said portable transmitter, said transmitter powered by said battery;

a control system for controlling said transmitter to operate at said first power level for a predetermined duration of time and, thereafter, at said second power level until the power in said battery is drained;

a central control system for interfacing with each of said receivers and receiving the information received thereby, each of said plurality of receivers operable to determine the time that said alarm transmission is received by said receiver, said central control system operable to determine a location of said locator by a time-of-arrival method; and

a portable monitoring system having associated therewith a directional receiver for receiving said alarm transmission when said control system for said portable transceiver forces said transmitter to operate at said second power level, said portable monitoring system operable to determine a relative position when said portable monitoring system is in the RF field of each said transmitter at said second power level to more specifically locate each said portable transmitter.

5,596,314

ENCLOSURE FOR A GAS DETECTOR SYSTEM

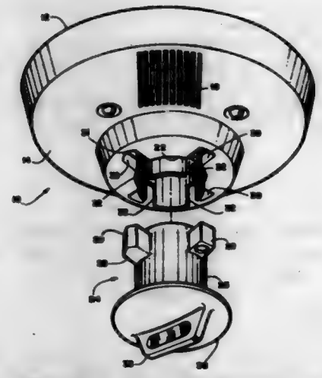
Mark K. Goldstein, San Diego, Calif., assignor to Quantum Group, Inc., San Diego, Calif.

Filed Aug. 1, 1994, Ser. No. 283,550
Int. Cl.[6] G08B *17/10*
U.S. Cl. 340—632 16 Claims

1. A gas detection system comprising:

a first flat panel for mounting said enclosure on a flat surface in an outwardly extending direction;

a second panel connected to said first panel by a sidewall thereby forming an enclosed space between said first and said second panels;



a light emitting means and a light detecting means fixedly mounted within said enclosed space;

a generally cylindrical battery/sensor holder;

an opening in said second panel wherein said battery/sensor holder is configured to be insertable into said opening;

means for releasably securing said batter/sensor holder in said opening;

means for making electrical contact between said battery/sensor holder and said light emitting means and said light detecting means upon insertion and securing of said battery/sensor holder within said opening;

a gas sensor cell carried by said holder; and,

means for aligning said gas sensor cell between said light emitting means and said light detecting means upon insertion and securing of said battery/sensor holder within said opening.

5,596,315

MESSAGE UNIT FOR USE WITH MULTI-BEAM SATELLITE-BASED MESSAGING SYSTEM AND METHOD OF OPERATION THEREOF

Keith A. Olds; Gregory B. Vatt, both of Mesa, Ariz., and Christopher N. Kurby, Elmhurst, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1994, Ser. No. 317,084
Int. Cl.[6] H01H *67/00*
U.S. Cl. 340—825.03 22 Claims



1. A method executed by an addressable call receiver receiver, said receiver having a sleep cycle and a wake cycle, said receiver being subjected to transmitted information in which a plurality of messages are grouped into a frame, a plurality of frames being grouped into a group, and a plurality of groups being grouped into a block, each of said frames having a frame header comprising frame, group, and block identification, predetermined frames each comprising a block header, said predetermined frames constituting an acquisition group, and said receiver storing an identification value identifying a block to which said receiver is assigned said method comprising the following steps:

(a) exiting said sleep cycle and examining one of said transmitted frame headers;

(b) if said block identification of said frame header matches said identification value, proceeding to step (c), otherwise proceeding to step (d);

(c) determining from said group identification whether said frame is part of an acquisition group;

(i) if so, said receiver monitors said acquisition group and proceeds to step (e);

(ii) if not, said receiver proceeds to step (d);

(d) using said frame identification to determine when it should awake from said sleep cycle;

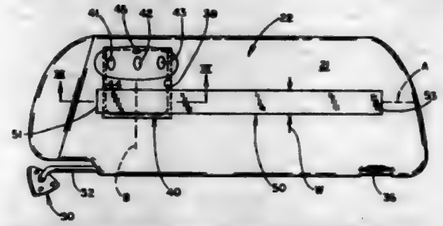
(e) entering said sleep cycle.

5,596,316

PASSIVE VISOR ANTENNA

Brian S. Henoch, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Mar. 29, 1995, Ser. No. 412,970
Int. Cl.[6] H04Q *7/00*
U.S. Cl. 340—825.69 23 Claims



12. A vehicle visor and a passive antenna comprising:

a visor body having an exterior surface, said body including a bracket for mounting said visor body to a vehicle;

an RF transmitter mounted to said visor body and including a built-in antenna;

a passive radiating antenna mounted to said exterior surface of said visor body and RF coupled to said built-in antenna of said transmitter; and

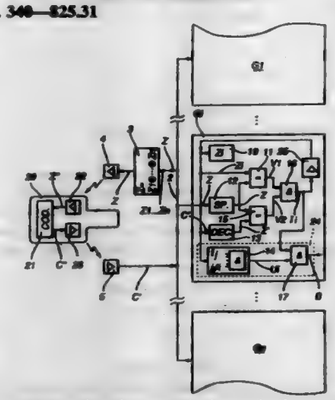
an upholstery covering said visor body and strip of conductive material.

5,596,317

VEHICLE SAFETY DEVICE WITH ELECTRONICALLY CODED ACCESS AUTHORIZATION

Horst Brinkmeyer, Waiblingen; Bernd Hense, Plochingen; Michael Dain, Filderstadt, and Günter Schwegler, Weinstadt, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed May 24, 1995, Ser. No. 449,888
Claims priority, application Germany, May 24, 1994, 44 18 069.1
Int. Cl.[6] B60R *25/00*
U.S. Cl. 340—825.31 6 Claims



1. In a vehicle safety device with electronically encoded access authorization, having a vehicle transmitter for transmitting random code information generated by the vehicle, a user unit for receiving

said transmitted random code information, generating specific user code information based on the received random code information, and transmitting the user code information, and a vehicle user code evaluating unit for receiving user code information, extracting random code information contained therein, comparing the latter with corresponding random code information generated by the vehicle, and generating vehicle operation authorizing information only when the comparison result is positive, the combination comprising:

a plurality of control devices, each having a random number generator for generating random code partial information, one such control device being arranged in and controlling operability of each of a plurality of vehicle systems whose function is required for operation of the vehicle; and

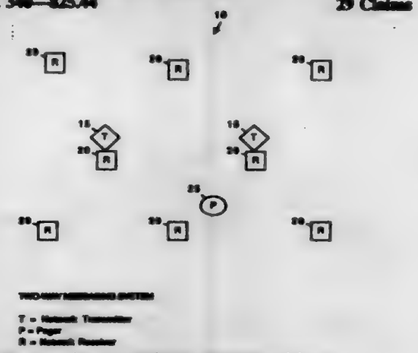
a random code partial information linking device having an input coupled to receive random code partial information from each of said control devices and an output coupled to the vehicle transmitter, which linking device links said random code partial information received from each of said control devices in a predetermined manner to form said random code information transmitted by said vehicle transmitter.

5,596,318

METHOD FOR OPERATING A TWO-WAY MESSAGING SYSTEM TO EXTEND BATTERY LIFE

Edward E. Mitchell, Issaquah, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jan. 12, 1995, Ser. No. 372,187
Int. Cl.[6] H04Q 7/18
U.S. Cl. 340—825.44 29 Claims



14. A two-way data messaging system, comprising:

a message distribution network; and

a message receiver;

said message distribution network being configured to:

transmit a plurality of messages to said message receiver, each of said messages including a corresponding message sequence number corresponding to the order in which said messages are transmitted by said message distribution network;

transmit a ping packet to said message receiver, said ping packet indicating the message number of the last of said plurality of messages, said ping packet being transmitted after a predetermined amount of time has elapsed since the transmission of the last of the plurality of messages;

receive from said message receiver a response requesting retransmission of one of said plurality of messages corresponding to a missing message sequence number;

retransmit said one of said plurality of messages corresponding to said missing message sequence number; and

said message receiver being configured to:

receive said plurality of messages from said message distribution network;

receive said ping packet from said message distribution network;

determine whether at least one of said plurality of messages was not received;

transmit said response requesting retransmission of said one of said plurality of messages corresponding to said missing message sequence number;

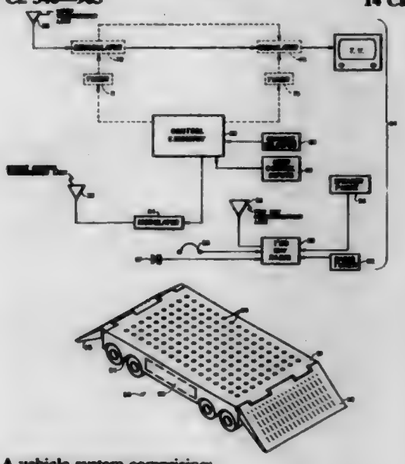
receive said one of said plurality of messages corresponding to said missing message sequence number.

5,596,319

VEHICLE REMOTE CONTROL SYSTEM

Willie L. Spry, 802 N. Carnew Dr., Placentia, Calif. 92870

Filed Oct. 31, 1994, Ser. No. 332,147
Int. Cl.[6] G08G 1/16
U.S. Cl. 340—903 14 Claims



1. A vehicle system comprising:

at least one remote control unit;

at least one remote controlled vehicle including:

a remote control receiver for receiving a selective remote control signal sent by a user from one remote control unit,

a drive mechanism for propelling said vehicle in a direction and speed in accordance with said received selective remote control signal,

a camera for producing a video signal in accordance with a video image viewed by a lens of said camera, said lens having a field of view in a direction toward a forward path of travel of said remote controlled vehicle,

a video signal transmitter for modulating said video signal and transmitting said modulated video signal to said one remote control unit,

a vehicle monitoring system for monitoring various parameters of said vehicle, and

an instrumentation display for displaying information indicative of said various monitored parameters, said instrumentation display being within the field of view of said lens;

wherein said at least one remote control unit including:

a video transmission link for receiving said transmitted modulated video signal,

user control inputs for producing user control signals in response to user inputs,

controller means for converting said user control signals into said selective remote control signal,

a remote control modulator for modulating said selective remote control signal, and

a remote control transmission link connected to said remote control modulator for transmitting said modulated selective remote control signal to said remote controlled vehicle; and

a vehicle conditioning platform including,

a flat bed for receiving said remote controlled vehicle,

a back gate pivotally attached to a back portion of said conditioning platform for allowing said vehicle to roll up onto said flat bed when said back gate is lowered,

a front gate pivotally attached to a front portion of said conditioning platform for allowing said vehicle to roll of said flat bed when said front gate is lowered,

an enclosed bottom portion located below said flat bed

an air generating unit within said enclosed bottom portion, and

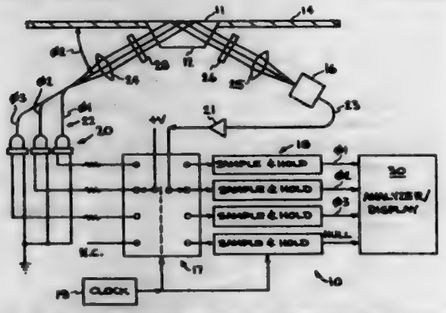
a plurality of air outlet holes located on said flat bed for allowing air generated from said air generating unit within said bottom portion to exit through said holes so as to condition said remote controlled vehicle located on said flat bed.

5,596,320

SYSTEM FOR DETECTION OF ICE, WATER, GLYCOL SOLUTION, AND OTHER CHEMICAL SPECIES

Clarence W. Barnes, San Francisco, Calif., assignor to Optical Sensor Consultants Inc., Lexington, Mass.

Filed Apr. 28, 1995, Ser. No. 431,487
Int. Cl.[6] G08B 19/02
U.S. Cl. 340—962 23 Claims



12. Apparatus for detecting the presence of chemical species in an environment, comprising:

an optical element having a surface which forms a reflective/refractive interface with an environment to be monitored;

a multiplexer for directing a plurality of beams in sequence onto said surface, each beam having a different angle of incidence on said surface;

a detector for detecting each of said plurality of beams which have been internally reflected at said surface;

means for computing the refractive index of the chemical species from the detected internally reflected beams;

wherein the presence of the chemical species is determined from the computed refractive index.

5,596,321

SYSTEM COMPRISING A FIRST ENCODER FOR CODING A FIRST DIGITAL SIGNAL, A SECOND ENCODER FOR CODING A SECOND DIGITAL SIGNAL AND AT LEAST ONE DECODER FOR DECODING CODED DIGITAL SIGNALS, AND CODER AND DECODER FOR USE IN THE SYSTEM

Andries P. Hekstra, Woubrugge, and Arian Koster, Mydrecht, both of Netherlands, assignors to Koninklijke PTT Nederland N.V., Groningen, Netherlands

Filed Sep. 10, 1993, Ser. No. 119,736
Claims priority, application Netherlands, Sep. 14, 1992, 9201593
Int. Cl.[6] H04N 11/02
U.S. Cl. 341—76 17 Claims

15. A system for communicating a digital signal comprising a first encoder for coding a first digital signal, a second encoder for coding a second digital signal and at least one decoder for decoding coded digital signals

wherein said first encoder comprises:

an encoder-input for receiving the first digital signal;

first data processing means for generating a first coded digital signal at a first output of the first data processing means data processing and having an input coupled to the encoder-input; and

first encoder feedback means, having a first encoder memory means, for feeding-back at least a portion of the first coded digital signal such that an output of the first encoder memory means is coupled to the input of the first data processing means and an input to the first encoder memory means is coupled to a second output of the first data processing means; and

wherein said second encoder comprises:

an encoder-input for receiving the second digital signal;

second data processing means for generating a second coded digital signal at a first output of the second data processing means and having an input coupled to the encoder-input;

second encoder feedback means, having a second encoder memory means, for feeding-back at least a portion of the second coded digital signal such that an output of the second encoder memory means is coupled to the input of the second data processing means and an input to the second encoder memory means is coupled to a second output of the second data processing means; and

wherein said decoder comprises:

first data reprocessing means for processing the first coded digital signal;

first decoder memory means coupled to the first data reprocessing means;

second data reprocessing means for processing the second coded digital signal; and

second decoder memory means coupled to the second data reprocessing means;

wherein the first encoder further comprises:

encoder switching means, positioned between the output of the first encoder memory means and the input of the first data processing means, for selecting memory means, such that an output of the encoder switching means is coupled to the input of the first data processing means, a first input to the encoder switching means is coupled to the output of the first encoder memory means, and a second input to the encoder switching means is coupled to the second output of the second data processing means; and

wherein the decoder further comprises:

decoder switching means for selecting memory means, such that an output of the decoder switching means is coupled to the first data reprocessing means, a first input to the

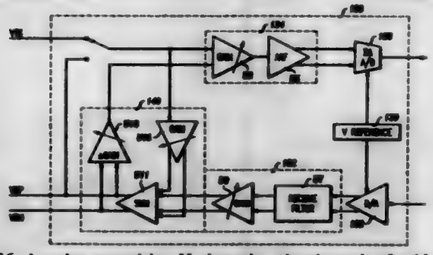
decoder switching means is coupled to an output of the first decoder memory means, and a second input to the decoder switching means is coupled to the second data reprocessing means.

5,596,322

REDUCING THE NUMBER OF TRIM LINKS NEEDED ON MULTI-CHANNEL ANALOG INTEGRATED CIRCUITS

Douglas G. Marsh, Bethlehem, and Robert H. Valden, Allentown, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 26, 1994, Ser. No. 329,590
Int. Cl.[6] H03M 1/10; H03G 3/00
U.S. Cl. 341—120 17 Claims



16. A codec comprising N channels, wherein each of said N channels includes an analog to digital (A/D) conversion path having a first analog amplifier in series with an A/D converter, and a digital to analog (D/A) conversion path having a D/A converter in series with a second analog amplifier, and wherein a gain of one of said A/D paths has been calibrated by trimming during codec fabrication, said codec further comprising:

a) analog means for providing an analog calibration signal to each said N A/D paths;

b) first comparing means for comparing (N−1) A/D path output signals generated within (N−1) corresponding ones of said non-calibrated A/D paths in response to said analog calibration signal with an output signal generated by said calibrated A/D path in response to said analog calibration signal, wherein A/D gain correction coefficients are determined;

c) digital means for providing a digital calibration signal to each said N D/A paths;

d) loopback means for providing analog D/A path output signals generated in each said N D/A paths in response to said digital calibration signal, respectively, to at least one of said N A/D paths; and

e) second comparing means for comparing N digital signals generated within said at least one A/D path, responsive to said D/A path output signals, wherein N D/A calibration coefficients are determined.

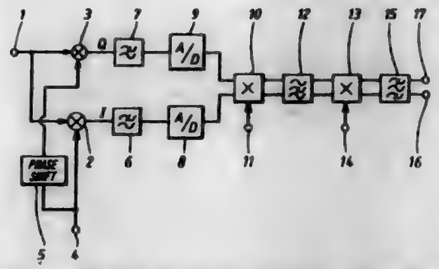
5,596,323

METHOD AND ARRANGEMENT FOR ANALOGUE-DIGITAL CONVERTERS

Lars Eriksson, Göteborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 4, 1995, Ser. No. 434,536
Claims priority, application Sweden, May 4, 1994, 9401537
Int. Cl.[6] H03M 1/12; H04L 27/38
U.S. Cl. 341—155 10 Claims

1. A method for reducing the influence of distortion which is produced when an electrical signal, which is divided into two components by phase detection against two reference signals phase shifted with respect to each other by 90°, is converted from analogue to digital form, said method comprising:



frequency-coding of the two components by providing the reference signals with a periodic frequency sweep,

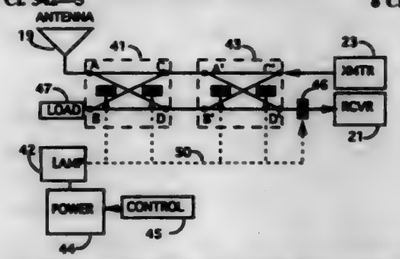
frequency-decoding each of the two components individually after the conversion to digital form so that they appear as, with regard to frequency, narrow band signals, whilst possible harmonics which are part of the distortion are distributed over a frequency range defined by the size of the periodic frequency sweep.

5,596,324

ELECTRONIC BAFFLE AND BAFFLE CONTROLLED MICROWAVE DEVICES

Jesse C. James, Huntsville, Ala., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation-in-part of Ser. No. 273,576, Jul. 11, 1994. This application Dec. 9, 1994, Ser. No. 353,189
Int. Cl.[6] H01Q 13/28; 13/22
U.S. Cl. 342—5 8 Claims



1. A transmit receive switch for a radar system, comprising:

waveguide junction means having at least a first coupling for connection to an output of a radar transmitter, a second coupling for connection to a radar receiver, and a third coupling for connection to a radar antenna;

gating means for preventing RF from said transmitter from propagating from said first coupling to said second coupling, thereby allowing said RF to propagate only to said third coupling, whereby RF produced by said radar transmitter propagates to said radar antenna, and for preventing low power RF received at said antenna from propagating through said third coupling to said transmitter, and allowing said low power RF to propagate only to said second coupling, said gating means comprising:

light source means, said light source means having a first state for producing illumination and a second state in which no illumination is produced; and

photosensor means;

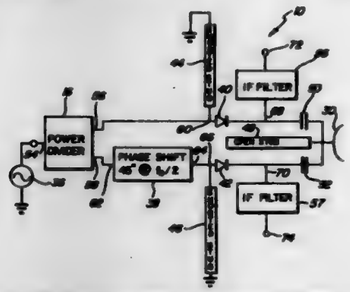
said photosensor means having a first conductivity state when not exposed to illumination from said light source means and a second conductivity state when exposed to illumination from said light source means and said photosensor means being disposed in said waveguide junction means for exposure to RF within said waveguide junction means.

5,596,325

FM-CW RADAR TRANSCEIVER

Stephen A. Maas, Long Beach, Calif., assignor to Nonlinear Technologies, Inc., Long Beach, Calif.

Filed Jul. 7, 1995, Ser. No. 499,727
Int. Cl.[6] G01S 13/58; 13/62
U.S. Cl. 342—28 20 Claims



1. An FM-CW radar transceiver for use in motion-detector applications comprising:

an oscillator;

said oscillator electrically connected to an input of a power divider, said power divider having first and second terminal outputs;

said first terminal output of said power divider electrically connected to an input of a first diode and a first shorted stub, and said second terminal output of said power divider electrically connected to an input of a phase shifter with an output of said phase shifter electrically connected to an input of a second diode and a second shorted stub;

said first and second diodes having outputs, said first diode output electrically connected to an input of a first frequency filter and to an input of a first IF blocking structure, and said second diode output electrically connected to an input of a second frequency filter and to an input of a second IF blocking structure, said first and second IF blocking structures having outputs terminating at a common antenna port;

an open stub electrically connected to said common antenna port and, said first and second frequency filters having outputs each said frequency filter output connected to an IF channel, wherein said FM-CW transceiver operates as a frequency multiplier for transmitting, and simultaneously as a subharmonically pumped in-phase, quadrature-phase mixer for reception.

5,596,326

SECONDARY SURVEILLANCE RADAR INTERROGATION SYSTEM USING DUAL FREQUENCIES

Richard A. Fitts, Monroe, Conn., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

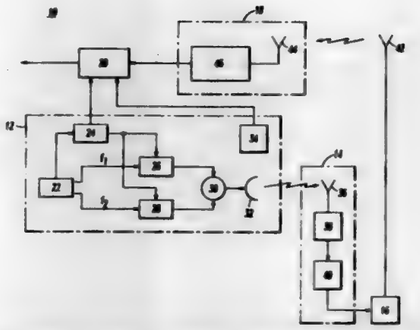
Filed Jul. 17, 1995, Ser. No. 503,442
Int. Cl.[6] G01S 13/87; 13/76
U.S. Cl. 342—30 8 Claims

1. A communication system for identifying the position of aircraft in a surveillance area comprising:

a. a dual-frequency interrogator having a narrow beam, scanning antenna, said antenna being located within said surveillance area, said interrogator producing and transmitting two signals at different frequencies;

b. a processor located on said aircraft to receive said two signals and produce a signal having a frequency equivalent to the difference between said dual frequencies;

c. a transponder provided on said aircraft, said transponder tuned to a frequency equivalent to the difference between said dual frequencies, said transponder receiving said processor signal and producing a signal containing aircraft identification information;



d. stationary antenna and receiver for receiving said transponder response; and

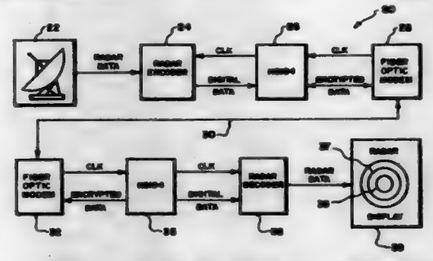
e. an estimator for estimating the position of said aircraft.

5,596,327

RADAR ENCODER

George T. Mills, and Albert T. Gabaldon, Jr., both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1995, Ser. No. 554,620
Int. Cl.[6] G01S 7/295
U.S. Cl. 342—195 20 Claims



1. A radar data encoder for generating a serial digital data stream, said radar data encoder comprising:

modulation means having a video input for receiving analog radar video data from a remote site radar, said delta modulation circuit converting said analog radar video data to digital radar video data;

optical coupling means having an input for receiving a radar trigger pulse signal from said remote site radar, said optical coupling means converting said radar trigger pulse signal to a digital pulse signal;

control signal generating means connected to said optical coupling means for receiving said digital pulse signal from said optical coupling means, said control signal generating means, in response to said trigger pulse circuit generating at least six control signals;

converter means having a plurality of data inputs for receiving analog synchro data signals from said remote site radar, a latch data input connected to said control signal generating means for receiving a first of said six control signals, said converter means converting said analog synchro data signals to digital synchro data, said converter means, responsive to said first of said six control signals latching therein said digital synchro data;

shift register means connected to said converter means for receiving said digital synchro data in a parallel format from said converter means;

said shift register means being connected to said control signal generating means for receiving a second of six control signals,

said shift register means, responsive to said second of said six control signals loading said digital synchro data therein;

said shift register means converting said digital synchro data from said parallel format to a serial format; and

multiplexer means connected to said shift register for receiving said digital synchro data, said modulation means for receiving said digital radar video data and said control signal generating means for receiving a third, a fourth, a fifth and a sixth control signal of said six control signals, said multiplexer means, responsive to said third, said fourth, said fifth and said sixth of said six control signals forming said serial digital data stream.

5,596,328

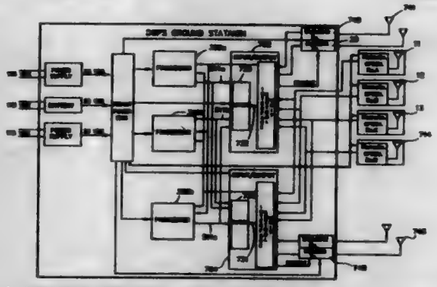
FAIL-SAFE/FAIL-OPERATIONAL DIFFERENTIAL GPS GROUND STATION SYSTEM

Rodney L. Stangeland, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 23, 1994, Ser. No. 294,283

Int. Cl.[6] G01S *5/02*

U.S. Cl. 342—357 **1 Claim**



1. A FAIL-SAFE differential satellite positioning system ground station operative for determining a satellite-specific pseudo range error associated with each received satellite signal transmitted from a plurality of satellites, the ground station comprising:

a plurality of GPS receivers operative for receiving selected satellite signals and deriving from the satellite data associated with each of said received satellite signals at least i) a satellite-receiver-specific pseudo range value at a corresponding receiver-specific measurement time, where said satellite-receiver-specific pseudo range value is an estimate of the true range value between a corresponding one of said plurality of receivers and one of said plurality of satellites derived from said satellite signal and related to the corresponding satellite signal travel time from the specific satellite of said plurality of satellites to the specific receiver of said plurality of receivers, and ii) the corresponding satellite-receiver-specific position of said one satellite at said satellite-receiver-specific measurement time; and

a plurality of differential correction processor, each including,

means for determining a receiver-satellite-specific calculated range for each receiver and each of said selected satellites, where said calculated range is the range between corresponding ones of the geocentric position of each of said plurality of receivers and the satellite-receiver-specific geocentric position of each of said satellites,

means for calculating a receiver-satellite-specific difference between corresponding ones of said receiver-satellite-specific calculated ranges and said satellite-receiver-specific pseudo range values, and

means for deriving said satellite-specific pseudo range error associated with said satellite signal transmitted from each of said selected plurality of satellites as a function of a plurality of said satellite receiver-specific pseudo range values from said plurality of GPS receivers and associated with a specific one satellite;

at least a pair of input/output control devices each including at least one voter operative to validate the identical data received from each of said plurality of processors, said input/output control devices operative for eliminating data from a faulty one of said plurality of processors, said pair of input/output control devices further including means for monitoring transmitted and received data from a pair of data-link transmitters.

5,596,329

BASE STATION ANTENNA ARRANGEMENT

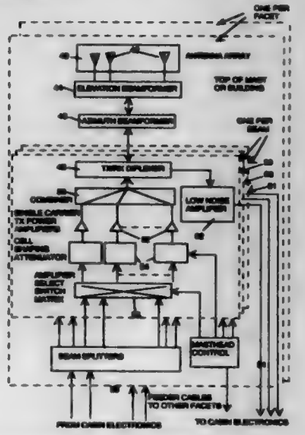
Jeffrey G. Searle, Galmpton, Nr Brixham; Stuart J. Dean, Paignton; Peter J. Chrystie, Brixham; Keith R. Broome, Torquay; Christopher R. Cox, Salcombe, and Stephen J. Westlake, Brixham, all of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 12, 1994, Ser. No. 289,920

Claims priority, application United Kingdom, Aug. 12, 1993, 9316816; Aug. 12, 1993, 9316817; Aug. 12, 1993, 9316827; Aug. 12, 1993, 9316828; Aug. 12, 1993, 9316829; Aug. 12, 1993, 9316830; Aug. 12, 1993, 9316831; Aug. 12, 1993, 9316832

Int. Cl.[6] H01Q *3/02*

U.S. Cl. 342—374 **2 Claims**



1. A base station control interface for a cellular radio system comprising:

a plurality of antenna arrays each capable of forming a multiplicity of separate overlapping narrow beams in azimuth, the arrays being positioned such that the totality of beams formed by the arrays provides a substantially omni-directional coverage in azimuth,

azimuth and elevation beam forming means for each array,

a plurality of r.f. transceivers each for transmitting and receiving r.f. signals for one or more calls,

switching matrix means for connecting each transceiver with one or other of the arrays via the beam forming means,

control means for controlling the switching matrix means whereby a particular transceiver is connected to a particular array via the beam forming means to exchange r.f. signals with a remote station located in the area covered by one of the narrow beams, and separate amplifying means for each beam, characterized in that the control interface includes means for exchanging with the network information relating to the position and movement of a remote station located within the area of coverage of the antenna.

5,596,330

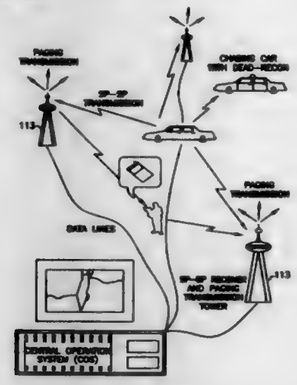
DIFFERENTIAL RANGING FOR A FREQUENCY-HOPPED REMOTE POSITION DETERMINATION SYSTEM

Hanoch Yekev, Ramat-Gan; Shlomo Peleg, Hod Hasharon; Yehouda Meiman, Rishon Letsion, and Beni Porat, Haifa, all of Israel, assignors to Nexus Telecommunication Systems Ltd., Givatayim, Israel

Continuation-in-part of Ser. No. 329,549, Oct. 26, 1994, Pat. No. 5,592,180, which is a continuation-in-part of Ser. No. 329,523, Oct. 26, 1994, Pat. No. 5,583,517, each which is a continuation-in-part of Ser. No. 158,441, Nov. 24, 1993, Pat. No. 5,430,759, which is a continuation-in-part of Ser. No. 961,776, Oct. 15, 1992, Pat. No. 5,335,246, which is a continuation-in-part of Ser. No. 140,716, Oct. 21, 1993, Pat. No. 5,379,047. This application Feb. 16, 1995, Ser. No. 389,263

Int. Cl.[6] G01S *1/24*

U.S. Cl. 342—387 **7 Claims**



1. A differential ranging mobile transmitter location system, comprising:

a mobile transmitter having a unique identifier, and having a transmitter for simultaneously sending a first frequency-hopped spread spectrum carrier signal and a second frequency-hopped spread spectrum carrier signal, at least one of which containing the unique identifier, the first frequency-hopped spread spectrum carrier having a different frequency than the second frequency-hopped spread spectrum carrier signal;

a first base station having an antenna operable for receiving the first and second frequency-hopped spread spectrum carrier signals and capable of determining a first time of arrival of the frequency-hopped spread spectrum carrier signals;

a second base station also having an antenna operable for receiving the first and second frequency-hopped spread spectrum carrier signals and capable of determining a second time of arrival of the frequency-hopped spread spectrum carrier signals; and

a central station connected to the first base station and the second base station, and operable for:

1.) receiving the first time of arrival of the first and second frequency-hopped spread spectrum carrier signals from the first base station;

2.) receiving the second time of arrival of the first and second frequency-hopped spread spectrum carrier signals from the second base station;

3.) generating a first hyperbolic plot based on the differential time of arrival of the first and second frequency-hopped spread spectrum carrier signals at the first and second base stations; and

4.) using a third information source to determine the location of the transmitter along the first hyperboplic plot.

5,596,331

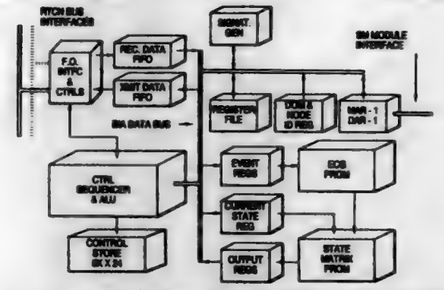
REAL-TIME CONTROL SEQUENCER WITH STATE MATRIX LOGIC

Andrew M. Benedict; Kathleen F. Benedict, both of Warrenton; Michael J. Buehler; Hubert A. Miller, both of Manassas; Galen Plunkett, Jr., Burke; Sidney F. Rudolph, Warrenton; Michael A. Sweeney, Manassas, all of Va., and Donald E. Wallis, Marblehead, Mass., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed May 13, 1988, Ser. No. 193,720

Int. Cl.[6] G01S *3/02*; G05B *15/00*

U.S. Cl. 342—455 **20 Claims**



1. A real-time, event-driven data processor having an input connected to a source of event signals and a control output connected to elements to be controlled, comprising:

a state matrix memory having a first input connected to said event input and a second input connected to receive a next state indication and having an output, for storing a plurality of state matrices, each said state matrix selected by a value of the next state indication on said second input corresponding to a control state, and organized into rows and columns with each row corresponding to an event to be detected and each row being divided into members of a first column for the next state, and a second column for the action;

a control sequencer having an input connected to the output of said state matrix memory, for receiving row data from a selected matrix in said matrix memory, in response to said state matrix memory, having received event and next state information on the first and second inputs thereof, said control sequencer in response thereto accessing a sequence of executable instructions;

an arithmetic/logic unit having an input connected to an output of said control sequencer, for receiving said sequence of executable instructions for execution therein, said instructions including a new value for the next state of the system which is output to said second input of said state matrix memory, thereby enabling said state matrix memory to respond to the occurrence of a next event.

5,596,332

AIRCRAFT LOCATION AND IDENTIFICATION SYSTEM

Robert J. Coles, Bloomingdale; Ronald J. Langlotti, Roselle, and Dennis D. Vaccaro, Glenview, all of Ill., assignors to Northrop Corporation, Los Angeles, Calif.

Continuation of Ser. No. 229,701, Apr. 19, 1994, abandoned. This application May 22, 1996, Ser. No. 651,447

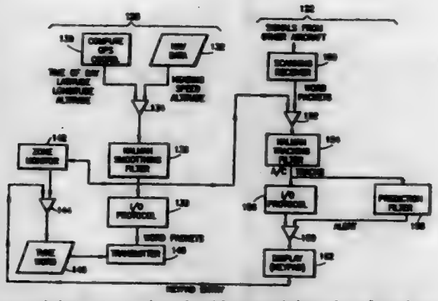
Int. Cl.[6] G01S *3/02*

U.S. Cl. 342—455 **15 Claims**

1. An aircraft location and identification system, for determining probabilistic future tracking information for aircraft comprising:

A transmitting aircraft,

a receiving aircraft, first position determining means employing earth coordinate position data located aboard said transmitting aircraft for determining a first set of present positional and tracking information described in electronic format, relating to the position of said transmitting aircraft relative to earth coordinates;



transmitting means aboard said transmitting aircraft and connected to said first position determining means aboard said transmitting aircraft for the non-interrogating, non-redundant differential, phase-shift keyed transmission of said first set of present positional and tracking information by frequency division multiplexing on a unique assigned carrier frequency channel to said receiving aircraft;

second position determining means located aboard said receiving aircraft for determining a second set of present positional and tracking information described in electronic format, relating to said receiving aircraft; and

computing means located aboard said receiving aircraft including storage means for storing present values and past values of said first set of positional and tracking information transmitted from said transmitting aircraft, and for storing present values and past values of said second set of positional and tracking information relating to said receiving aircraft, said computing means further including processing means for utilizing said past and present values of said first set of positional and tracking information from said storage means to compute corresponding first probabilistic future tracking path information for said transmitting aircraft and for utilizing said past and present values of said second set of positional and tracking information to compute corresponding second probabilistic future tracking path information for said receiving aircraft, said computing means further including intersection means for determining whether the first probabilistic future tracking configuration will intersect the second probabilistic future tracking configuration in the future,

prediction means for determining a maximum probability of intersection between the first probabilistic future tracking configuration and the second probabilistic future tracking configuration,

threshold means for determining whether said maximum probability of intersection exceeds a predetermined threshold,

warning means for providing a warning if said maximum probability of intersection exceeds a predetermined threshold, and

wherein said transmitting means transmits said positional and tracking information in a non-redundant, unique selected one of CDMA and PDMA transmission coding.

5,596,333

METHOD AND APPARATUS FOR CONVEYING A COMMUNICATION SIGNAL BETWEEN A COMMUNICATION UNIT AND A BASE SITE

Eugene J. Bruckert, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1994, Ser. No. 298,918
Int. Cl.[6] G01S 3/02
U.S. Cl. 342—457 **32 Claims**

1. A method for transmitting a downlink communication signal from a base site that services a sectorized coverage area to a communication unit residing in the sectorized coverage area, the method comprising the steps of:

a) determining an approximate location of the communication unit within a first sector of the sectorized coverage area; and

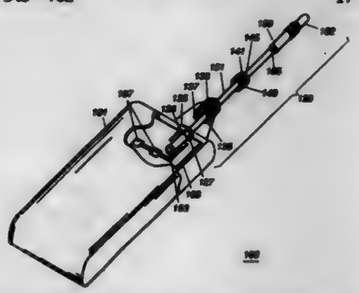
b) transmitting the downlink communication signal to the approximate location of the communication unit using an antenna structure that produces a beamwidth narrower than an angular width of the first sector.

5,596,334

ANTENNA ASSEMBLY WITH INTEGRATED INSTALLATION SUPPORT

Michael A. Boyce, Margate, and Orville T. Meyer, Jr., Palm Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1995, Ser. No. 523,579
Int. Cl.[6] H01Q 1/24
U.S. Cl. 343—702 **17 Claims**



1. An antenna assembly with integrated installation support, comprising:

an antenna element having a first catch integrally formed thereon;

a threaded casing movably mounted around the antenna element, the threaded casing having a second catch that mates with the first catch; and

a support structure having a threaded retainer;

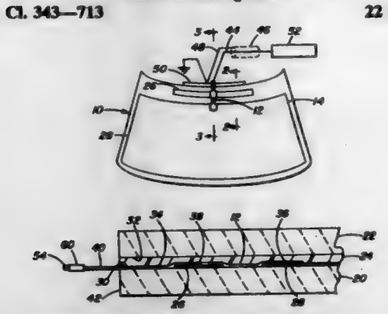
wherein the antenna element is slidably mounted through the threaded retainer and is extendible and retractable with respect to the support structure, and the antenna element, including the first catch, forms a torque driver tool that engages the second catch, temporarily during installation of the antenna element, to cause the threaded casing to be secured to the threaded retainer when the antenna element is rotated.

5,596,335

ELECTRICAL CONNECTOR

Peter T. Diehart, Pittsburgh, and Frank J. Pazul, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1994, Ser. No. 364,371
Int. Cl.[6] H01Q 1/32
U.S. Cl. 343—713 **22 Claims**



1. A connector for interconnecting multiple electroconductive antenna elements within a laminate, comprising:

a flat, electroconductive member having a first portion which overlays a first electroconductive transparent antenna element within a laminate, a second portion which overlays a second electroconductive transparent antenna element within said laminate, a third portion electrically interconnecting said first and second portions, and a fourth portion extending from said second portion; and

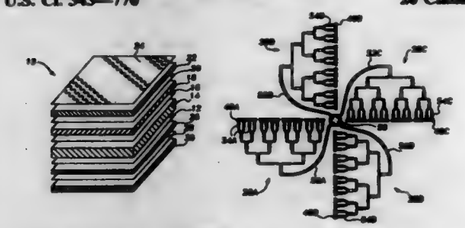
an integral connection terminal at one end of said fourth portion, wherein said terminal is formed from multiple plies of said fourth portion of said member.

5,596,336

LOW PROFILE TEM MODE SLOT ARRAY ANTENNA

Chung C. Liu, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 7, 1995, Ser. No. 488,345
Int. Cl.[6] H01Q 13/10
U.S. Cl. 343—770 **20 Claims**



1. A slot antenna comprising:

first and second oppositely disposed metallic plates spaced separate from one another via a dielectric medium, said first and second plates being adapted to allow transverse-magnetic energy to propagate therebetween;

an array of radiating elements formed in said first metallic plate;

an array of horizontal coupling slots and an array of vertical coupling slots formed in said second metallic plate, said array of horizontal coupling slots including a first array of horizontal coupling slots positioned relative to a common conductor and a second array of horizontal coupling slots positioned relative to the common conductor, said array of vertical coupling slots including a first array of vertical coupling slots positioned relative to the common conductor and a second array of vertical coupling slots positioned relative to the common conductor;

a feed network having an array of non-overlapping feed lines configured in a single plane and electrically coupled to said horizontal and vertical coupling slots, wherein a first array of feed lines electrically couple the first array of horizontal coupling slots to the common conductor, a second array of feed lines electrically couple the second array of horizontal coupling slots to the common conductor, a third array of feed lines electrically couple the first array of vertical coupling slots to the common conductor, and a fourth array of feed lines electrically couple the second vertical coupling slots to the common conductor; and

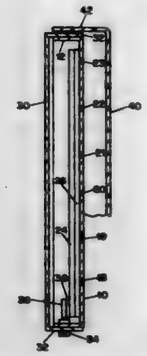
radio-wave connecting means coupled to the feed network.

5,596,337

SLOT ARRAY ANTENNAS

Joseph T. Mercuna, Northport, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Continuation of Ser. No. 283,186, Feb. 28, 1994, abandoned. This application Aug. 16, 1995, Ser. No. 515,796
Int. Cl.[6] H01Q 13/10
U.S. Cl. 343—770 **6 Claims**



1. A slot array antenna, with lightning resistant qualities, comprising:

a first conductive sheet section including a vertically-extending linear array of open slot radiating elements each having a principal dimension transverse to vertical;

a conductive excitation rod, positioned behind said first conductive sheet section and extending vertically, for coupling slot excitation signals successively to said slot radiating elements in a series feed configuration;

dielectric support means, extending along said excitation rod between said rod and said slot radiating elements, for supporting said excitation rod behind said slot radiating elements;

a second conductive sheet section positioned behind said first conductive sheet section and said excitation rod and conductively fastened to said first conductive sheet section; and

coupling means for enabling signals to be capacitively coupled to and from said excitation rod, said coupling means including:

an end portion of said excitation rod;

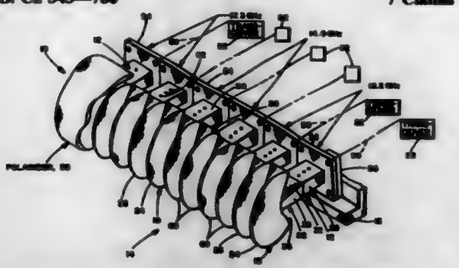
a conductive signal coupling rod coextensive with and aligned in spaced parallel non-contact relation to said end portion of said excitation rod;

second dielectric means positioned between said end portion of said excitation rod and said signal coupling rod; and

an input/output connector connected to said signal coupling rod;

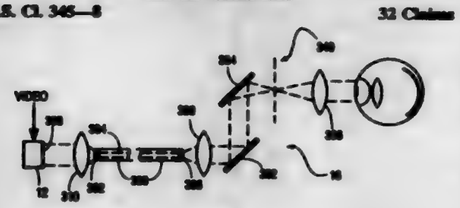
said first and second sheet sections forming a groundable conductive shell with said excitation rod and signal coupling rod positioned in non-contact relationship within said shell.

5,596,338
MULTIFUNCTION ANTENNA ASSEMBLY
Terry M. Smith, La Honda, Calif., assignor to Space Systems/Loral, Inc., Palo Alto, Calif.
Filed Jun. 27, 1995, Ser. No. 495,201
Int. Cl.[6] H01Q 13/02
U.S. Cl. 343—786 7 Claims



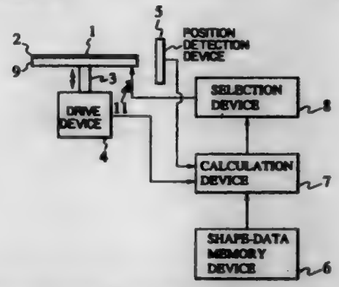
1. An antenna assembly comprising a plurality of antenna elements operative with radiation in different frequency portions of the spectrum, and means for holding said antenna elements in a side-by-side arrangement;
wherein each of said antenna elements comprises:
a radiating horn having two opposed planar parallel sidewalls and two transverse walls interconnecting the sidewalls;
a rectangular waveguide feed having cross-sectional dimensions of width and height;
a transition interconnecting said feed to a throat of said horn, said throat having cross-sectional dimensions of width and height, wherein the cross-sectional dimensions of width and height of said throat are smaller than the corresponding cross-sectional dimensions of said feed;
wherein the cross-sectional dimensions in the horn throats of a plurality of said antenna elements differ in size from the horn throat of another of said antenna elements;
the cross-sectional dimensions in the horn throats of respective ones of said antenna elements have sizes commensurate with the wavelengths of the radiation, which radiation is to be transmitted and/or received by respective ones of said antenna elements;
the relationship of commensurate throat sizes and wavelengths provides for a larger throat size for a radiation of longer wavelength and a smaller throat size for a radiation of shorter wavelength; and
wherein the horns of respective ones of said antenna elements are spaced apart from each other with the sidewalls of said respective horns being parallel to each other to provide for a compact configuration to the antenna assembly.

5,596,339
VIRTUAL RETINAL DISPLAY WITH FIBER OPTIC POINT SOURCE
Thomas A. Furness, III, Seattle; Charles D. Melville, Issaquah, and Michael R. Tidwell, Seattle, all of Wash., assignors to University of Washington, Seattle, Wash.
Continuation-in-part of Ser. No. 965,870, Oct. 22, 1992, Pat. No. 5,467,104. This application May 9, 1995, Ser. No. 437,818
Int. Cl.[6] G09G 3/02
U.S. Cl. 345—8 32 Claims



1. A virtual image display system comprising:
a source of light, said light being modulated video information;
a scanning system for scanning said light onto a retina of a user's eye; and
a single, monofilament optical fiber having an entrance aperture and an exit aperture, said optical fiber coupling light from said source to said scanning system to provide a point source of light at the exit aperture of said optical fiber.

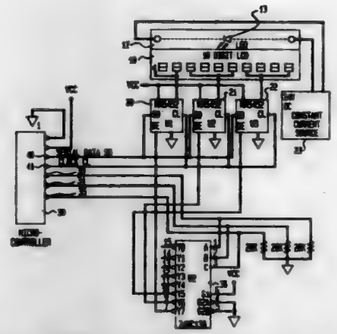
5,596,340
THREE-DIMENSIONAL IMAGE DISPLAY DEVICE
Koichi Otomi, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 30, 1992, Ser. No. 983,150
Claims priority, application Japan, Nov. 29, 1991, 3-315639
Int. Cl.[6] G09G 3/00
U.S. Cl. 345—31 21 Claims



1. A three-dimensional image display device comprising:
display means comprising a display member, said display member comprising a plurality of display elements arranged in a desired arrangement, each of said plurality of display elements producing light-emission or optical variations by means of an external electrical, magnetic, or optical operation;
drive means for moving the display means in a reciprocating motion toward specified directions with respect to the display surface of the display means;
shape data memory means for storing two-dimensional sectional images for displaying on the display means;
position detection means for detecting a start position in each of a back direction and a forth direction in the reciprocating motion of the display means while the display means is moving in the reciprocating motion; and
control means for controlling so that a specified part of the display member emits light or produces an optical variation for a specified time only, utilizing positional data from the position detection means in order to display the two-dimensional sectional images on the display means in sequence while the display means is moving in the reciprocating motion,
wherein the control means causes the two-dimensional sectional images to be displayed in sequence in an advancing path and a retreating path of the display means while the display means is vibrating.

5,596,341
DISPLAY ARRANGEMENT
Roland G. Miller, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Continuation of Ser. No. 695,171, May 3, 1991, abandoned. This application Jan. 27, 1993, Ser. No. 9,430
Int. Cl.[6] G09G 3/18; 5/00
U.S. Cl. 345—52 2 Claims

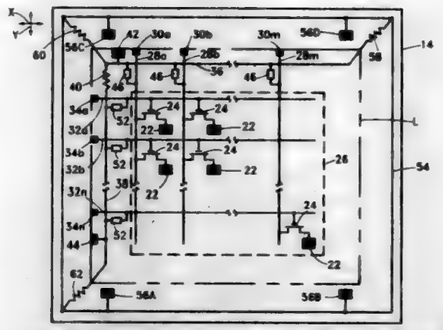
1. A display system comprising:
a multi-character segmented liquid crystal display (LCD) panel;



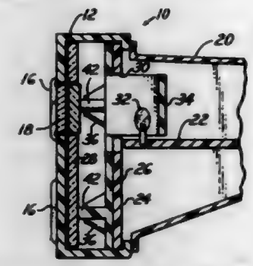
a smoke screen diffuser fixably mounted to the rear of the LCD panel;
a plurality of electrically interconnected yellow light emitting diodes (LED);
a first constant current power source in direct series communication with light emitting diodes;
a circuit board having said light LEDs mounted to one side of said circuit board, said circuit board being fixably mounted to said rear of the LCD panel such that said LEDs are in spaced relation to said smoke screen diffuser to define an enclosed cavity;
control means in electrical communication with each of said character segments of said liquid crystal display for selectively actuating a character segment to cause said character segment to illuminate representative of a character, wherein said control mean includes:
a plurality of display drivers, each of said drivers being in electrical communication with one or more of said respective character segments of said LCD;
a second power supply in electrical communication with each of said display drivers;
decoder/multiplexer having a plurality of output pins, respective ones of said output pins in electrical communication with a respective one of said display drivers; and, a microcontroller having;
a serial data output pin in electrical communication with each of said display drivers;
a clock pulse output pin in electrical communication with each of said display drivers; and,
a plurality of output terminals in electrical communication with respective input terminals of said decoder/multiplexer.

5,596,342
DISPLAY DEVICE HAVING SEPARATE SHORT CIRCUIT WIRES FOR DATA AND GATE LINES FOR PROTECTION AGAINST STATIC DISCHARGES
Mitsuru Ikezaki, Fujisawa; Shinichi Kimura, and Tatsuhi Koike, both of Sagamihara, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 10, 1994, Ser. No. 338,858
Claims priority, application Japan, Nov. 10, 1993, 5-281476
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—87 9 Claims

1. A display device equipped with a plurality of gate lines and data lines for driving said display device, said display device having protection against static discharges comprising:
first and second short circuit wires;
a first impedance element connecting said first short circuit wire to said second short circuit wire through said first impedance;
first switching elements, each connected between a data line and said first short circuit wire, said first switching elements each turning on and off in accordance with an electric potential difference between said data line connected thereto and said first short circuit wire;
second switching elements, each connected between a gate line and said second short circuit wire, said second switching elements each turning on and off in accordance with an electric potential difference between said gate line connected thereto and said second short circuit wire; and
voltage applying means for applying voltage to said first and second short circuit wires for turning said first and second switching elements off.



5,596,343
PUSHBUTTON CONTROLLER WITH BACKLIT DISPLAY AND SWITCH MEANS
Chris R. Snider, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.
Filed Sep. 12, 1994, Ser. No. 303,797
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—102 4 Claims

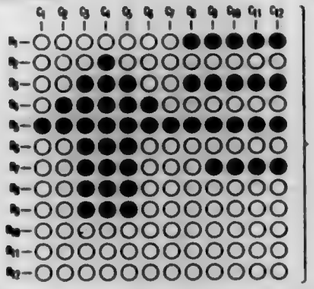


1. An electrical control having a backlit display and switch means adapted for manual operation, the electrical control comprising:
a panel;
a button associated with the panel;
a circuit board disposed adjacent the panel and having a pair of switch terminals;
an elastomeric switch pad disposed between the panel and the circuit board, the switch pad having a conductive pushbutton switch element aligned with the pair of switch terminals for selective closure against the switch terminals, the switch pad including an integrally-formed recess having a reflective surface facing the panel;
a light source mounted within the recess to illuminate the reflective surface thereof; and
a display associated with the panel and mounted so as to be illuminated by the light source and light reflected by the reflective surface of the recess.

5,596,344
DRIVING METHOD OF DRIVING A LIQUID CRYSTAL DISPLAY ELEMENT

Takeshi Kawata; Temkar Ruckmongathan; Yutaka Nakagawa; Hidemasa Kok; Hiroshi Hasebe; Takeshi Yamashita; Hideyuki Nagase, and Takaneri Okuishi, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 83,521, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 918,513, Jul. 8, 1992, Pat. No. 5,262,881. This application Jun. 7, 1995, Ser. No. 477,713
Claims priority, application Japan, Jul. 8, 1991, 3-193582; Aug. 16, 1991, 3-229606; Apr. 22, 1992, 4-129714; May 15, 1992, 4-148844; May 15, 1992, 4-148845
Int. Cl.[6] G09G 3/18
U.S. Cl. 345—103 11 Claims



1. A driving method of a liquid crystal display element comprising a plurality of row electrodes and a plurality of column electrodes wherein two kinds of data of first data corresponding to a logic "0" and second data corresponding to a logic "1" are used to display gray shades, provided that the following conditions are satisfied:

(1) said plurality of row electrodes are divided into a plurality of row electrodes subgroups each comprising at least four row electrodes so that said row electrode subgroups are selected as each batch,

(2) when said row electrode subgroups are selected, they have a positive voltage level with respect to a selection voltage, which corresponds to the logic "1", and a negative voltage level with respect to the selection voltage, which corresponds to the logic "0", wherein the absolute values of the positive and negative voltage levels are equal,

(3) a selection matrix of column vector components for generating row voltages which are time-sequentially arranged to form a display cycle in each of said row electrode subgroups, has orthogonality,

(4) the row voltage are dispersively applied in a display cycle in each of the row electrode subgroups,

(5) a voltage to be applied to the column electrodes is selected from previously determined voltage levels so that the voltage corresponds to the sums obtained by adding the outputs of exclusive OR gates which compare the logic level corresponding to the data and the logic level corresponding to the row voltages generated by said selection matrix,

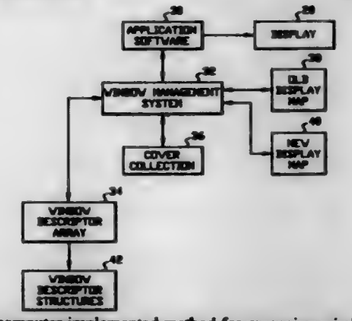
(6) a number of the vector columns K, each vector component in the K columns taking on a value of either +1 or −1, of the matrix is related to a number of the row electrodes L in a row electrode subgroup such that K is a minimum value satisfying the orthogonality and $L \leq 2^P = K$, the number of column vector components, for L rows forming one row electrode subgroup, where K, L, and P are integers;

(7) a gray shade is effected by displaying a plural number of ON and OFF sign at a specified ratio.

5,596,345
METHOD FOR MANAGING NON-RECTANGULAR WINDOWS IN A RASTER DISPLAY

Michael J. Goodfellow, Sunnyvale, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 178,639, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 870,538, Apr. 17, 1992, abandoned. This application Aug. 22, 1995, Ser. No. 518,085
Int. Cl.[6] G09G 5/14
U.S. Cl. 345—120 22 Claims



1. A computer-implemented method for managing windows in a raster display, comprising the steps of:

generating in a first portion of a storage device a first display map of scanline run values identifying, for selected scanlines of the raster display, a sequence of picture element runs spanning each selected scanline, each sequential picture element run representing a linear array of picture elements sharing a common set of windows containing the picture elements of the run, an associated window stacking order, and a topmost window to be drawn in the raster display;

in response to a window operation in the display, generating in a second portion of a storage device a second display map of scanline run values identifying, for selected scanlines of the raster display, a sequence of picture element runs spanning each selected scanline, each sequential picture element run sharing a common set of windows containing the picture elements of the run, an associated window stacking order, and a topmost window to be drawn in the raster display;

said first and second display maps both being in existence simultaneously for some period of time and each including plural storage locations containing numerical values corresponding to a scanline value representing an identifiable scanline, a scanline value representing the number of picture element runs in a scanline, and a run value representing a picture element count value and a cover index value for a picture element run;

comparing said first display map with said second display map to identify picture elements whose topmost window has changed; and

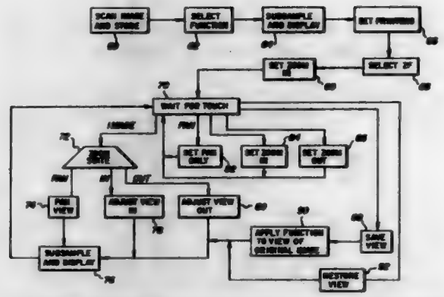
repairing the raster display by writing only said changed picture elements with data from the topmost window of the identified picture elements.

5,596,346
METHOD AND APPARATUS FOR APPLYING A FUNCTION TO A LOCALIZED AREA OF A DIGITAL IMAGE USING A WINDOW

Anthony J. Leone, Pittsford; Jeffrey R. Sacrapanski, Rochester, and Steven M. Smith, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 278,790, Jul. 22, 1994, abandoned. This application Feb. 6, 1996, Ser. No. 597,687
Int. Cl.[6] G09G 5/00
U.S. Cl. 345—127 4 Claims

1. A method of applying an artifact removal function to a source image, comprising:



a. scanning a photograph to capture the source image thereon at a first resolution;

b. subsampling the captured source image based on a variable size view port positioned on the source image to produce a first subsampled image at a second lower resolution and displaying the first subsampled image as defined by the view port with the subsampled image filling a fixed size display window on and smaller than a touch screen display;

c. allowing an operator to touch the window to indicate a location of an artifact in the image;

d. automatically adjusting a size of the view port by a predetermined amount and adjusting a position of the view port responsive to the touch indication;

e. sampling the image within the adjusted size and position view port to produce a second subsampled image and displaying the second subsampled image filling the window;

f. repeatedly performing steps c–e as initiated by the operator;

g. allowing the operator to touch an area adjacent to the window to indicate the subsampled image is ready to have the correcting function applied;

h. determining coordinates of the window within the source image;

i. detecting the artifact within the source image in a region defined by the coordinates and automatically applying the artifact removal function to remove the artifact in the image and only to a portion of the source image designated by the coordinates;

j. allowing the operator to initiate performance of steps a–e to view an effect of the function relative to the image; and

k. printing the image.

5,596,347
SYSTEM AND METHOD FOR COMPUTER CURSOR CONTROL

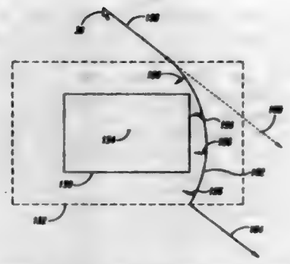
Kenneth R. Robertson, Redmond; Paul E. Henderson, Jr., Bellevue, both of Wash.; Samuel H. Smith, Stanford, Calif.; Carl T. Hellings, Redmond, Wash.; James A. Andrews, Issaquah, Wash.; Eric W. Hansen, Bellevue, Wash.; Timothy T. Brewer; Teresa L. Kelsey, both of Seattle, Wash.; Anthony R. Claflin, Bellevue, Wash.; Daniel S. Hoeger, Woodinville, Wash., and Lora K. McCambridge, Bellevue, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Division of Ser. No. 188,639, Jan. 27, 1994, abandoned. This application Mar. 31, 1995, Ser. No. 414,210
Int. Cl.[6] G09G 5/08
U.S. Cl. 345—145 14 Claims

1. A system for controlling the position of a cursor on a computer display, comprising:

a cursor control device under control of a user to generate electrical signals corresponding to the desired movement of the cursor on the computer display;

cursor position means responsive to said electrical signals for generating first and second orthogonal control signals to control the movement of the cursor in first and second corresponding orthogonal directions on the computer display;



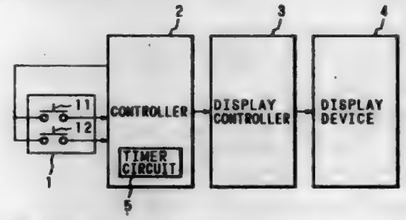
a control storage area storing position data corresponding to a control position on the computer display; and

alteration means for altering said control signals in response to said current position of the cursor being in proximity with said control position, said alteration means adding first and second orthogonal correction vectors to said first and second control signals, respectively, to cause the cursor to move incrementally closer to said control position than would result from the unaltered control signals.

5,596,348
INPUT APPARATUS

Masaharu Hayakawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 21,983, Feb. 24, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,941
Claims priority, application Japan, Feb. 26, 1992, 4-039747
Int. Cl.[6] G09G 1/06
U.S. Cl. 345—146 43 Claims



1. An input apparatus comprising:

first input means for inputting a signal on the basis of an operation;

second input means for inputting a signal on the basis of an operation;

a timer which is reset by an input of a signal produced on the basis of an operation of said first input means and which outputs a control signal upon measuring a predetermined time period; and

control means for controlling menu screen operations based on operation of said first input means, said second input means and said control signal of said timer, said control means displaying, on a display, one menu screen of a plurality of menu screens for selection based on operation of said second input means, said control means changing which of said plurality of menu screens are available for display based on operation of said first input means, and said control means selecting a currently displayed menu screen upon receipt of said control signal.

5,596,349

IMAGE INFORMATION PROCESSOR

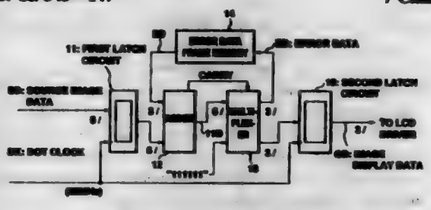
Mitsuyo Kobayashi, Nagoya; Makoto Fujioka, Ogaki; Atsuyoshi Tanioka, Gifu; Kazuhiko Moriwaki, Gifu; Makoto Shimizu, Gifu, and Hisao Ushiro, Gifu, all of Japan, assignors to Sanyo Electric Co., Inc., Osaka, Japan

Filed Sep. 28, 1993, Ser. No. 128,476

Claims priority, application Japan, Sep. 30, 1992, 4-262174; Sep. 30, 1992, 4-262175; Oct. 2, 1992, 4-264873; Oct. 23, 1992, 4-286854; Oct. 23, 1992, 4-286855; Nov. 17, 1992, 4-307210; Nov. 17, 1992, 4-307211; Nov. 18, 1992, 4-308856; Nov. 26, 1992, 4-316751; Feb. 17, 1993, 5-028155

Int. Cl.[6] G09G 5/10

U.S. Cl. 345—147 7 Claims



1. An image information processor for generating display data which is applied to a display to produce an image composed of a succession of frames, each frame containing an array of picture elements, or pixels, the display data for each pixel being composed of L image display bits, where L is a natural number equal to or greater than 2, and for causing the image to present pseudo representations of gradations represented by P image data bits, where P is a natural number greater than L, said image information processor comprising:

(a) addition means, when it is assumed that N is a natural number of 2 or greater, for adding error data of a picture element of an (N−1)st frame to the corresponding picture element data of an Nth frame;

(b) information selection means for outputting high-order L bits of P-bit data provided by said addition means as image display data of the Nth frame and at least one bit of the remaining (P−L) bits as error data of the picture element of the Nth frame;

(c) means for storing said error data;

(d) means for calculating a difference between source image data of the (N−1)st frame and the corresponding source image data of the Nth frame; and

(e) comparison means for determining whether or not the difference exceeds a predetermined value, wherein when the difference exceeds the predetermined value, said information selection means does not output the image display data and outputs the high-order L bits of the source image data of the Nth frame as the image display data of the Nth frame.

5,596,350

SYSTEM AND METHOD OF REFLOWING INK OBJECTS

Stephen P. Capps, San Carlos, and Giulio Pagallo, Cupertino, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

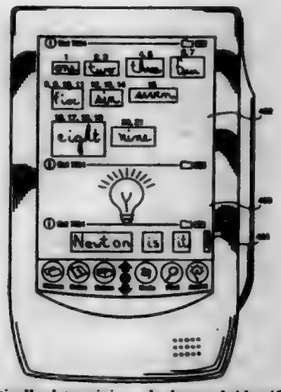
Continuation of Ser. No. 101,585, Aug. 2, 1993, abandoned. This application Mar. 1, 1995, Ser. No. 397,549

Int. Cl.[6] G09G 5/00

U.S. Cl. 345—173 35 Claims

1. A method of formatting ink objects written with a pointer on an input tablet of a computer system, an ink object being handwritten information displayed as handwriting, the method comprising the following computer implemented steps:

(a) partitioning the ink objects entered on the input tablet coupled to the computer system into paragraphs by identifying groups of ink objects separated from other groups by at least a predefined vertical distance, each such group constituting a paragraph;



(b) automatically determining whether each identified paragraph is a text paragraph or a non-text paragraph, a text paragraph being a group of words separated from other paragraphs on the input tablet by at least said predefined vertical distance;

(c) formatting text paragraphs according to a text formatting protocol and formatting non-text paragraphs according to a non-text formatting protocol, said text and non-text formatting protocols employing different rules; and

(d) outputting the formatted non-text paragraphs and text paragraphs over an output device coupled to said computer system wherein the outputted paragraphs include said ink objects displayed as handwriting.

5,596,351

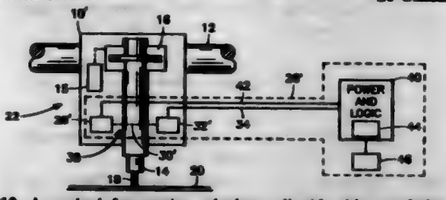
INK LEVEL SENSING ON A PEN CARRIAGE IN A PEN PLOTTER

Jeffrey Stapleton, Huntington Beach, Calif., assignor to Calcomp Inc., Anaheim, Calif.

Filed Dec. 8, 1993, Ser. No. 164,085

Int. Cl.[6] G01D 18/00; G01F 23/00; B41J 2/01

U.S. Cl. 347—7 20 Claims



10. A method for sensing whether a liquid with a turbulent surface and contained within a vessel has fallen to a level in the vessel where the liquid is substantially expended, the method comprising the steps of:

(a) emitting light from a light source towards the vessel;

(b) outputting a signal from a light sensor which senses a portion of said emitted light being reflected from the turbulence surface to the light emitted by the light source, a portion of said emitted light being reflected from the turbulence surface, the signal being proportionate with an amount of light sensed; and,

(c) determining from fluctuations in the signal output by the light sensor when the liquid has fallen to the level in the vessel where the liquid is substantially expended, wherein the fluctuations in the signal are caused by randomness in the reflections of the emitted light due to the turbulence of the surface of the liquid, and wherein,

(d) the apparatus includes only one said light source and only one said light sensor.

5,596,352

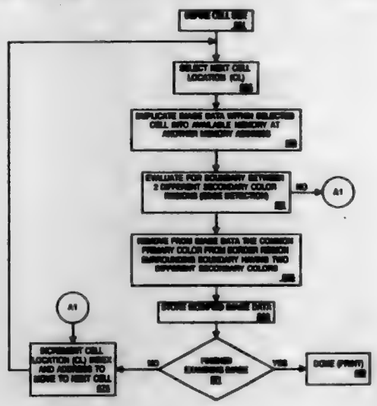
PRINTING APPARATUS AND METHOD FOR PRINTING COLOR BOUNDARY REGIONS HAVING REDUCED COLOR BLEED

Anitta L. Bliss, San Jose, and Stuart L. Claassen, Santa Clara, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 23, 1993, Ser. No. 126,072

Int. Cl.[6] B41J 2/205

U.S. Cl. 347—15 17 Claims



1. A printer for printing an image having primary colors and secondary colors onto a media comprising:

a housing;

a plurality of rollers, said plurality of rollers being disposed within said housing such that each of said rollers may rotate;

a drive motor, said drive motor disposed within said housing and coupled to said plurality of rollers such that the engagement of said drive motor causes said rollers to rotate;

a plurality of ink reservoirs each of said ink reservoirs containing ink having a color;

a print head, said print head located within said housing such that said print head may move across said media, said print head having a plurality of nozzles and coupled to said plurality of ink reservoirs such that said ink may be disposed onto said media;

a drive mechanism, said drive mechanism disposed within said housing and coupled to said print head so as to move said print head across said media; and

a plurality of processing circuits, said plurality of processing circuits coupled to said drive motor so as to control the engagement of said drive motor for controlling the movement of said rollers during printing, said processing circuits altering said image so as to provide an altered image, said altered image having a border strip disposed between adjoining regions of different secondary colors, said adjoining regions of different secondary colors comprising borders, wherein said border strip has a color and wherein said color of said border strip is a primary color which is common to the secondary color of each of said adjoining regions of different secondary colors, said print head processing circuits coupled to said drive mechanism and to said print head, said print head processing circuits controlling said drive mechanism and said print head so as to allow for said altered image to be printed onto said media.

5,596,353

IMAGE READING APPARATUS WITH A FUNCTION FOR CORRECTING NONUNIFORMITY IN RECORDING DENSITY

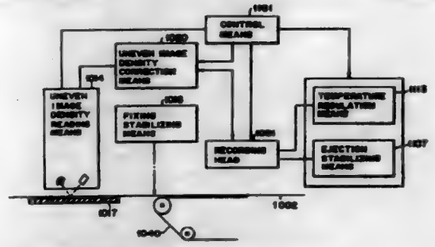
Yoshihiro Takada, Kawasaki; Akio Suzuki, Yokohama; Toshimitsu Daizaka, Tokyo; Haruhiko Moriguchi, Yokohama; Hisashi Fukushima, Yokohama; Masami Izumisaki, Yokohama, and Yasushi Miura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 104,591, Aug. 10, 1993, abandoned, which is a continuation of Ser. No. 684,339, Apr. 12, 1991, abandoned. This application Jan. 11, 1995, Ser. No. 371,492

Claims priority, application Japan, Apr. 13, 1990, 2-096574; May 30, 1990, 2-142897; May 11, 1990, 2-119952; May 11, 1990, 2-119953; May 11, 1990, 2-119958; May 31, 1990, 2-143727

Int. Cl.[6] B41J 2/01

U.S. Cl. 347—19 56 Claims



1. An image recording apparatus comprising:

a recording head having a plurality of recording elements, for recording an image on a recording medium by ejecting ink from outlets using energy generated from said recording elements;

means for causing said recording head to print a predetermined test pattern on the recording medium;

image density reading means for reading a density of the test pattern formed by said recording head;

uneven image density correction means for correcting conditions for driving said plurality of recording elements in accordance with a result of reading by said image density reading means so as to make even a density of the image;

recording stabilizing means operable on said recording head for stabilizing an ink ejection operation by said recording head by means of discharge of the ink from the outlets; and

control means for operating said recording stabilizing means before said test pattern printing means causes the test pattern to be printed and operating said test pattern printing means after said recording head has been stabilized by said recording stabilizing means.

5,596,354

INK PRIMING DEVICE FOR INK JET PRINTER

Charles F. Murphy, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 3, 1994, Ser. No. 317,150

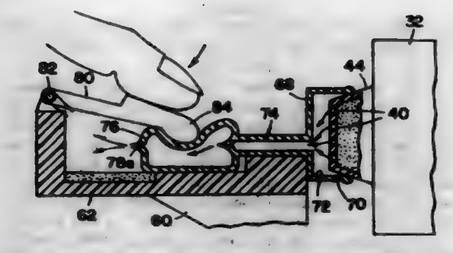
Int. Cl.[6] B41J 2/165

U.S. Cl. 347—30 8 Claims

1. In an ink jet printing apparatus having a print head which includes a nozzle plate having an array of ink nozzles formed thereon, an ink reservoir, conduits communicating between the reservoir and the nozzles, an ink priming device for applying a vacuum to the nozzles and the conduits for pulling ink through the nozzles and conduits from the reservoir at times when air is present in the nozzles or the conduits, said ink priming device comprising:

A. a housing adapted to substantially surround the nozzle plate of the print head, said housing engaging said nozzle plate in a substantially air tight manner, said housing also having an outlet aperture;

B. a vacuum generating pump having a deformable shape retaining container defining a chamber therein, and actuating means



for deforming said deformable shape retaining container from a normal shape to a deformed shape thereby reducing a volume of said chamber;

C. a conduit connected between said outlet aperture and said vacuum generating pump;

D. means for permitting air to be expelled from said chamber to ambient atmosphere but not into said housing at times when said actuating means deforms said deformable shape retaining container to said deformed shape to reduce the volume of said chamber and for withdrawing air into said chamber from within said housing but not from ambient atmosphere at times when said actuating means is released from deforming said deformable shape retaining container allowing said deformable shape retaining container to return to said normal shape to increase the volume of said chamber thereby drawing ink from the reservoir through the conduits and out of the nozzles.

5,596,355

COLOR INK JET RECORDING APPARATUS CAPABLE OF HIGH-QUALITY PRINTING OF BLACK PORTIONS

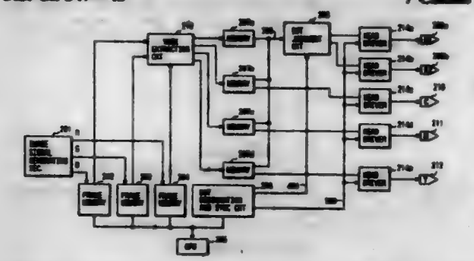
Toshio Koyama; Masumi Furuya, and Toyohiro Takahashi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 28, 1993, Ser. No. 68,177

Claims priority, application Japan, Jun. 1, 1992, 4-140587

Int. Cl.[6] B41J 2/21; G06F 3/12; G06K 15/00; H04N 1/46

U.S. Cl. 347—43 **7 Claims**



5. A color ink jet recording apparatus comprising: first ink jetting means for jetting a slow drying black ink;

second ink jetting means for jetting quick drying yellow, magenta, cyan and black inks;

means for judging existence of color information in pixels adjacent to a black pixel, and for generating a judgment signal indicating a result of the judgment;

means based on the judgment signal for selectively driving the first ink jetting means and the second ink jetting means, wherein the driving means drives the second ink jetting means to jet the quick drying black ink at times when the judgment signal indicates the existence of color information.

5,596,356

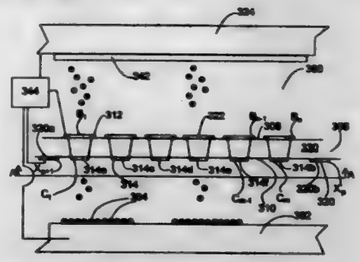
TONER EJECTION PRINTER WITH DUMMY ELECTRODE FOR IMPROVING PRINT QUALITY

Michael H. Lee, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1995, Ser. No. 548,839

Int. Cl.[6] G03G 15/00

U.S. Cl. 347—55 **3 Claims**



1. An image recording apparatus comprised of:

a developer supply for providing electrostatically charged toner particles;

a printhead structure, the printhead structure having a first major surface and a second opposite major surface, wherein a plurality of gate electrodes $B_1, \ldots B_{n-1}, B_n$ are formed on the first major surface of the printhead structure, a plurality of shield electrodes $C_1, \ldots C_{m-1}, C_m$ are formed on the second major surface of the printhead structure, and at least a first dummy electrode X_p is formed on the second major surface adjacent to electrode C_m, the printhead structure including a plurality of apertures extending from the gate electrodes $B_1, \ldots B_{n-1}, B_n$ to corresponding shield electrodes $C_1, \ldots C_{m-1}, C_m$;

a back electrode disposed in opposed relation with a surface of the printhead structure; and

a control circuit for applying controlled electrical signals to the printhead structure, the electrical signals causing the electrostatically charged toner particles to flow through selected apertures towards the back electrode.

5,596,357

LIQUID JET RECORDING SUBSTRATE, THE METHOD OF MANUFACTURE THEREFOR, A LIQUID JET RECORDING HEAD USING SUCH A SUBSTRATE, AND A RECORDING APPARATUS PROVIDED WITH SUCH A RECORDING HEAD

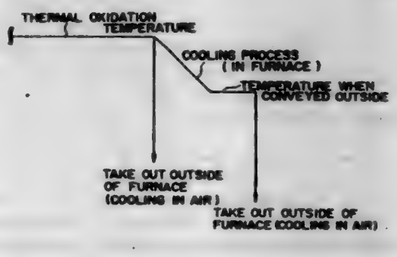
Haruhiko Terui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1992, Ser. No. 984,838

Claims priority, application Japan, Dec. 4, 1991, 3-320601

Int. Cl.[6] B41J 2/05

U.S. Cl. 347—64 **11 Claims**



1. A substrate for liquid jet recording head comprising a supporting member cut out from an ingot and having an oxidized film on a surface of said supporting member, exothermic resistive members arranged on said supporting member, and wirings electrically connected to said exothermic resistive members, wherein

a dislocation density in an area beneath the oxidized film on said supporting member is less than 5×10^4 pieces/cm^2.

5,596,358

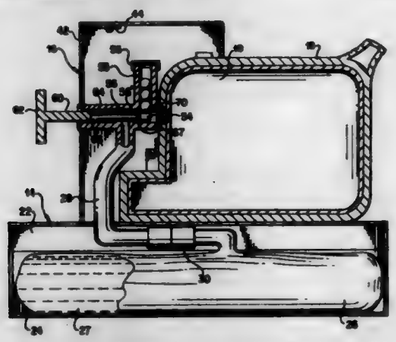
METHOD AND APPARATUS FOR REFILLING A PRINT CARTRIDGE HAVING A RESERVOIR PRESSURE OF LESS THAN AMBIENT PRESSURE

David S. Hunt; Jon J. Fong; Joseph E. Scheffelin, all of San Diego, and Alfred U. N. Zepeda, San Marcos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1994, Ser. No. 332,010

Int. Cl.[6] B41J 2/175

U.S. Cl. 347—85 **9 Claims**



1. An apparatus for refilling a print cartridge with ink, said print cartridge having an ink reservoir at a pressure of less than ambient pressure prior to refilling, comprising:

a) a refill ink reservoir containing ink for refilling, said refill ink reservoir having a pressure therein in excess of the pressure in the ink reservoir of the print cartridge;

b) an ink conduit connected to the refill ink reservoir and connectable to the ink reservoir in the print cartridge;

c) means, connected to the apparatus, for dislocating a first closure for the ink reservoir of the print cartridge by pushing the first closure into the print cartridge and for establishing airtight fluid communication with said ink conduit between the refill ink reservoir and the ink reservoir of the print cartridge so that the print cartridge is automatically refilled by the excess pressure in the refill ink reservoir; and

d) means, connected to the apparatus, for closing the ink reservoir of the print cartridge with a second closure, said means for closing the ink reservoir preventing ambient air from entering said ink reservoir after refilling the print cartridge with ink and after the apparatus is removed from the print cartridge.

5,596,359

PRINTER APPARATUS WITH ADJUSTABLE PRINTING SPEED

Alain Frederic, Cergy, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM, France

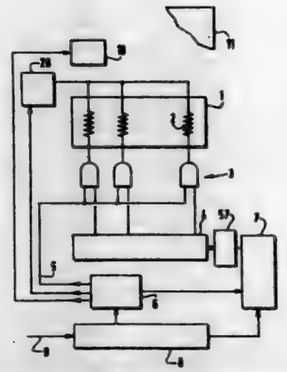
Filed Aug. 3, 1994, Ser. No. 285,418

Claims priority, application France, Aug. 3, 1993, 93 09541

Int. Cl.[6] B41J 2/36;2/37;2/365

U.S. Cl. 347—188 **5 Claims**

1. A printing apparatus including a printing head (1), characterized in that the printing apparatus comprises a buffer memory (7) adapted to be filled, at a defined speed, by data representing lines to be printed on a printing medium (11) and to be emptied line by line for each printing of a line by the head, and computation means (6) adapted to determine, prior to printing of each line, volume of buffer memory (7) available (L−xi), to determine therefrom a printing speed (Xj) of the line in question and accordingly to permit control of means (3) for adjusting printing speed (Xj) of the head (1).



5,596,360

IMAGE READING APPARATUS WITH A HALF MIRROR

Shuuichi Ichinose, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo-To, Japan

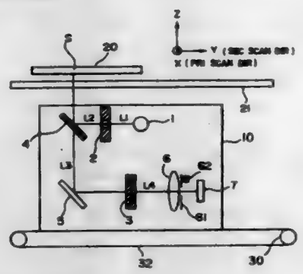
PCT No. PCT/JP92/01227, § 371 Date May 26, 1993, § 102(e) Date May 26, 1993, PCT Pub. No. WO93/06687, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 25, 1992, Ser. No. 66,871

Claims priority, application Japan, Sep. 26, 1991, 3-247312; Jun. 15, 1992, 4-155082

Int. Cl.[6] B41J 2/47

U.S. Cl. 347—256 **5 Claims**



1. An image reading apparatus comprising:

light illuminating means for illuminating an object to be image read substantially perpendicularly to the object with linearly polarized light having an illumination width determined by a width to be image read and obtaining reflected light substantially perpendicularly from the object, the reflected light having a first, regular reflection light component and a second reflection light component;

shutting means for shutting out the first, regular reflection light component and passing the second reflection light component; and

light-electricity transducing means for transducing the passed second reflection light component into electric signals.

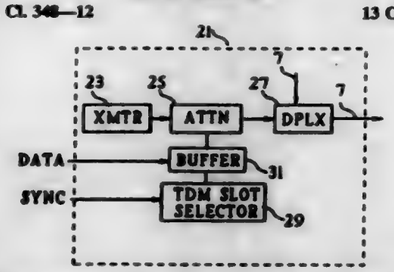
5,596,361
TWO-WAY CABLE TV CONVERSION SYSTEM FOR DATA TRANSMISSION OVER A DEDICATED FREQUENCY BAND

Louis Martinez, Perris, Calif., assignor to Radio Telecom & Technology, Inc., Riverside, Calif.

Division of Ser. No. 287,306, Mar. 7, 1994, which is a continuation-in-part of Ser. No. 941,187, Sep. 4, 1992, Pat. No. 5,321,514, which is a division of Ser. No. 282,206, Jun. 3, 1988, Pat. No. 5,177,604, which is a division of Ser. No. 863,101, May 14, 1986, Pat. No. 4,758,836. This application Sep. 11, 1995, Ser. No. 526,767

Int. Cl.[6] H04N 7/14

U.S. Cl. 348—12 13 Claims



1. In an interactive television system, a method for communicating information to at least one central receiver from at least one remote receiver location, each remote receiver location connected to a cable television system, the cable television system for transmitting at least one video signal in a downlink direction over at least one cable, the at least one cable having at least one amplifier along the at least one cable, each amplifier serving at least one remote location, the method comprising the steps of:

(i) at at least one remote location:

(a) modulating the information to be communicated from the at least one remote location onto a first carrier;

(b) transmitting the modulated first carrier of step (i)(a) onto the at least one cable only during at least some of the blanking intervals of a first cable channel;

(ii) after at least one cable amplifier in the downlink direction from the at least one remote location:

(a) detecting and retransmitting the modulated information received on the at least one cable and retransmitting the modulated information over a telephone line to at least one central receiver.

5,596,362
LOW BIT RATE AUDIO-VISUAL COMMUNICATION HAVING IMPROVED FACE AND LIP REGION DETECTION

Yang Zhou, Washington Township, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 223,903, Apr. 6, 1994. This application May 31, 1995, Ser. No. 458,095

Int. Cl.[6] H04N 7/14; G06K 9/00

U.S. Cl. 348—14 25 Claims

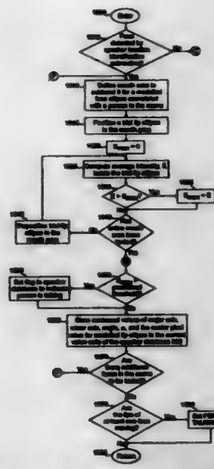
1. A method for detecting lip motion in a video signal having a plurality of image frames which include a representation of a person's face, said video signal including motion information, said method comprising the steps of:

performing a face location detection subroutine on said video signal in order to determine the location of said face in said video image frame;

isolating said motion information found in said video signal;

positioning a trial lip region in a plurality of locations in said detected face region;

analyzing said isolated motion information to identify the trial lip region within said face region having the highest measured average intensity;



concluding that said lips are moving if said highest measured average intensity exceeds a predefined threshold value; and utilizing the conclusion that said lips are moving to control subsequent processing of the video signal.

5,596,363
APPARATUS FOR STEREOSCOPICALLY VIEWING SCREENED IMAGES

John A. Christian, 5 Towers Way, Corfe Mullen, Wimborne, Dorset, United Kingdom

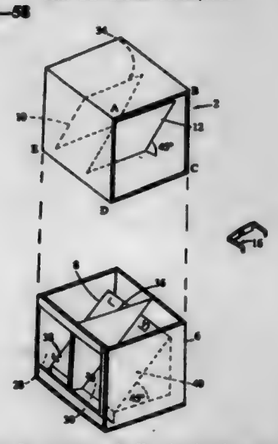
PCT No. PCT/GB93/01642, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO94/04002, PCT Pub. Date Feb. 17, 1994

PCT Filed Aug. 4, 1993, Ser. No. 382,838

Claims priority, application United Kingdom, Aug. 4, 1992, 9216556

Int. Cl.[6] H04N 13/04; 7/18

U.S. Cl. 348—58 7 Claims



1. Apparatus for stereoscopically viewing images from a single screen, which apparatus comprises a housing, at least one mirror which just reflects light, a mirror which both reflects and transmits light, and polarizing means, the said mirrors being mounted at an angle and being optically in communication with each other whereby a pair of landscape stereoscopic images are optically manipulated between an orientation required for human viewing and an alternative orientation suitable for visual image recording or reproduction, the alternative orientation being such that there is no vertical inversion or lateral inversion of one of the landscape stereoscopic images with respect to the other of the landscape stereoscopic images, and the alternative orientation also being such that the landscape stereoscopic images are each rotated about their geometric centers relative to a human viewing eye line and located for display in each of two halves of the screen, such that their longest sides are parallel with shortest edges of the screen, thereby maintaining a good aspect ratio without the need for compression or stretching of the two landscape stereoscopic images.

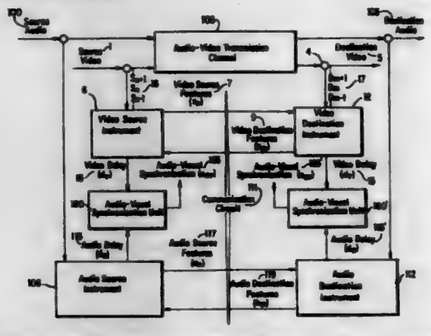
5,596,364
PERCEPTION-BASED AUDIO VISUAL SYNCHRONIZATION MEASUREMENT SYSTEM

Stephen Wolf, Nederland; Coleen T. Jones, Louisville; Arthur A. Webster, III, Longmont; Stephen Voran; Margaret H. Pinson, both of Boulder, all of Colo., and Robert F. Kubichek, Laramie, Wyo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 153,561, Oct. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 6,000, Jan. 19, 1993, Pat. No. 5,446,492. This application Mar. 30, 1995, Ser. No. 413,362

Int. Cl.[6] H04N 17/00

U.S. Cl. 348—192 12 Claims



11. A quality measurement system for measuring an audio-visual quality of a destination audio-visual signal, comprising:

source audio feature extraction means for extracting source audio features from a source electromagnetic audio-visual signal corresponding to the destination electromagnetic audio-visual signal;

destination audio feature extraction means for extracting destination audio features from the destination electromagnetic audio-visual signal;

source time referencing means for providing a source time reference for each one of the source audio features;

destination time referencing means for providing a destination time reference for each one of the destination audio features;

communication circuit means for communicating the source audio features, the source time references, the destination audio features, and the destination time references; and

audio quality parameter generation means for generating audio quality parameters, indicative of the audio quality of the destination electromagnetic audio-visual signal based on the source electromagnetic audio-visual signal, from at least one source and at least one destination audio feature.

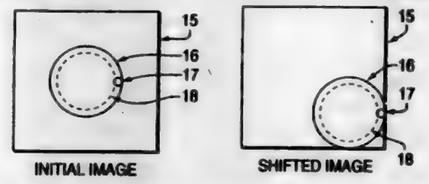
5,596,365
IMAGE STABILIZATION APPARATUS FOR TELESCOPIC DEVICES

John M. Erickson, Ocean, and Philip B. Crichton, Freehold, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1995, Ser. No. 372,548

Int. Cl.[6] H04N 5/232

U.S. Cl. 348—208 6 Claims



1. An image stabilization apparatus for telescopic devices to stabilize an entire image occupying a field of view seen through the telescopic devices, comprising:

means for selecting a portion of said entire image, said means comprising a translucent image control frame imposed on an outer edge of said entire image; means to automatically move the translucent image control frame around said outer edge; and means to select a stationary reference image which is outlined within the translucent image control frame; and

means for stabilizing said entire image, wherein said means for stabilizing said entire image comprises a miniaturized microcomputer, said microcomputer identifying and locating said reference image as an initial reference image, said microcomputer then searching for and capturing matching reference control frame images and image coordinates of the initial reference image in shifted locations, and realigaing said entire image based on shifting the initial reference image in order to redisplay said entire image as a stabilized image at a motioned-compensated location.

5,596,366
CAMERA APPARATUS HAVING CAMERA MOVEMENT DETECTION

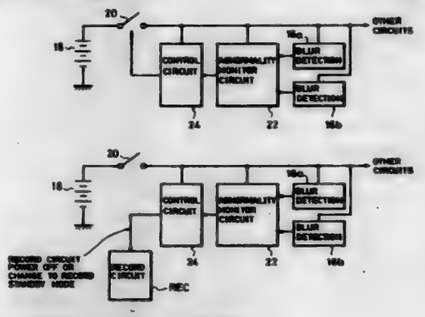
Tsuneo Takashima, Kawasaki, and Shigeru Ogino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 176,512, Jan. 3, 1994, abandoned, which is a continuation of Ser. No. 698,143, May 10, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 457,751

Claims priority, application Japan, May 14, 1990, 2-123564; May 16, 1990, 2-124100

Int. Cl.[6] H04N 5/228

U.S. Cl. 348—208 35 Claims



1. A camera apparatus, comprising:

a camera body;

movement detection means, disposed in the camera body, for detecting a relative movement between said camera body and an object, and for outputting an output signal according to the movement detected by said movement detection means;

compensating means for compensating a movement of an object image caused by the relative movement of the object and the camera body based on the output signal output by said movement detection means; and

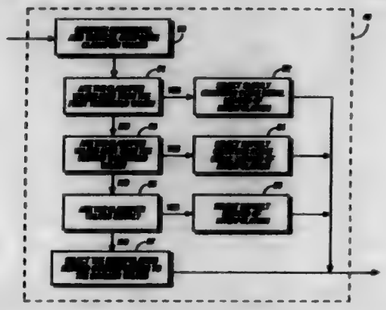
control means for controlling a camera power supply state of said camera body on the basis of the output signal of said movement detection means to shift the power supply state of said camera body to a low power supplying state when a period of time in which the output signal of said movement detection means is outside of a predetermined range exceeds a predetermined period of time.

5,596,367

AVERAGING GREEN VALUES FOR GREEN PHOTOSITES IN ELECTRONIC CAMERAS

John F. Hamilton, Jr., and James E. Adams, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 23, 1996, Ser. No. 606,178
Int. Cl.[6] H04N 9/07
U.S. Cl. 348—272 6 Claims



1. In apparatus for processing a digitized image signal obtained from an image sensor having red, green, and blue color photosites aligned in rows and columns that generate at least three separate color values but only one color value for each photosite location, means for averaging existing green pixel values for green photosite locations comprising:

means for storing the digitized image signal;

means responsive to the stored digital image signal for producing Laplacian second-order values and gradient values;

means for defining green classifier values based upon adding the Laplacian second-order values, and the gradient values to define a classifier;

means for modifying a measured green pixel value based upon adjacent pixel classifier values including:

(i) means for determining which classifier values represent a pixel neighborhood of slowly changing scene detail; and

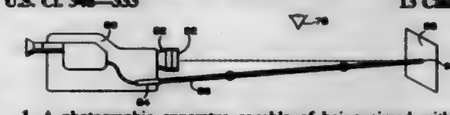
(ii) means for replacing the measured green pixel values for a green photosite location with an average of surrounding predicted green pixel values as a function of the number of classifiers which are below a predetermined value.

5,596,368

CAMERA AIMING MECHANISM AND METHOD

David G. Capper, Sausalito, Calif., and Stanley H. Axelrod, Port Orchard, Wash., assignors to Capper Technologies, Inc., Novato, Calif.

PCT No. PCT/US92/10265, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO93/16411, PCT Pub. Date Aug. 19, 1993
PCT Filed Nov. 25, 1992, Ser. No. 313,148
Int. Cl.[6] H04N 5/225
U.S. Cl. 348—333 13 Claims



1. A photographic apparatus capable of being aimed without looking through a viewfinder, the apparatus comprising:

a camera for producing a photographic image, the camera defining a field of view;

an electronic light-sensitive sensor within the camera, wherein the photographic image is produced by light from the field of view impinging on the sensor, and wherein such impinging light is capable of being read for producing an image;

a radiant energy source operatively associated with the camera and configured to produce a beam of radiant energy and to project the beam of radiant energy irrespective of whether light impinges on the sensor to identify at least a part of the field of view by producing an energy pattern on an object having a known position relative to the field of view; and

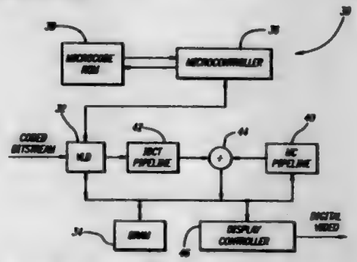
a filter operatively associated with the camera and the radiant energy source and configured to substantially suppress the energy pattern before light from the field of view impinges on the light-sensitive sensor so that a photographic image is produced by the camera irrespective of whether the radiant energy source is producing the beam of radiant energy.

5,596,369

STATISTICALLY DERIVED METHOD AND SYSTEM FOR DECODING MPEG MOTION COMPENSATION AND TRANSFORM CODED VIDEO DATA

Kwok K. Chau, Los Altos, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Jan. 24, 1995, Ser. No. 377,160
Int. Cl.[6] H04N 7/50
U.S. Cl. 348—402 18 Claims



1. A decoding system for decoding a video data bitstream including macroblocks of data which can each include input Motion Compensation (M) data and input Transform Coded (I) data, comprising:

a motion pipeline for processing said input M data to produce processed M data;

a transform pipeline for processing said input I data to produce processed I data; and

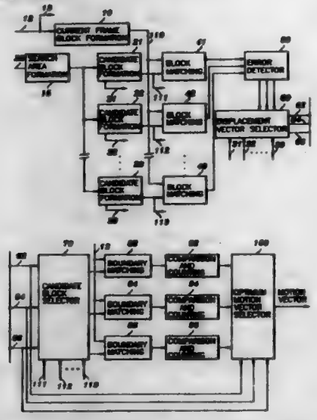
a controller for controlling the motion pipeline and the transform pipeline to concurrently process said input M data and said input I data respectively such that a length of time required for processing each macroblock is variable and is determined by the largest of a length of time required for the motion pipeline to process said input M data and a length of time required for the transform pipeline to process said input I data of said macroblock.

5,596,370

BOUNDARY MATCHING MOTION ESTIMATION APPARATUS

Hae-Mook Jung, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 1, 1995, Ser. No. 381,797
Int. Cl.[6] H04N 7/32
U.S. Cl. 348—416 1 Claim



1. An apparatus for determining a motion vector representing a displacement between a current frame and a previous frame of video signals, wherein the current frame is divided into a plurality of search blocks of an equal size and the previous frame has a plurality of search regions of a size larger than said equal size of a search block, each search region including a multiplicity of candidate blocks of said equal size, which comprises:

means for detecting displacement vectors and error functions between a search block in the current frame and said multiplicity of candidate blocks included in a search region corresponding to the search block;

means for comparing the error functions to each other and selecting M number of error functions in the order of their magnitude beginning from the smallest error function, M being an integer larger than 1;

means for selecting M number of respective displacement vectors from said detected displacement vectors, said M number of displacement vectors corresponding to said M number of error functions;

means for selecting M number of respective candidate blocks from said multiplicity of candidate blocks, said M number of candidate blocks being derived from said selected M number of displacement vectors;

means for generating M sets of boundary differences, wherein each of said M sets of boundary differences represents the differences between the boundary pixels, in each of the M candidate blocks, and pixels neighboring said boundary pixels, said neighboring pixels being included in the current frame;

means having M number of comparison and counting sections, wherein each of the comparison and counting sections compares each boundary difference in one of said M sets of boundary differences with a predetermined value, to count the number of the boundary differences having a value larger than the predetermined value; and

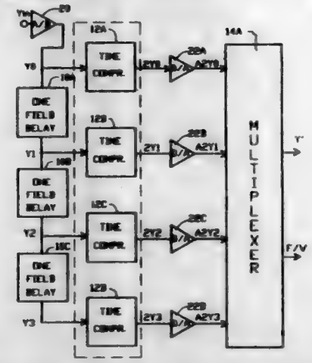
means for selecting a counted number having a minimum value to thereby determine one of said M number of displacement vectors which corresponds to the selected counted number, as the motion vector for said search block.

5,596,371

FILM-MODE VIDEO LINE-DOUBLER MOTION DETECTORS

Eduard Pakhchyan, Glendale, and Yoelf Sumakhovich, Santa Monica, both of Calif., assignors to DWIN Electronics Inc., Glendale, Calif.

Filed Feb. 2, 1995, Ser. No. 382,448
Int. Cl.[6] H04N 7/01
U.S. Cl. 348—452 14 Claims



12. A film-mode line-doubling process based on field-averaging in a video processing system receiving as input an 2:1 interlaced video luminance signal having at least some time portions that are originated from a film pull-down ratio process, comprising the steps of:

(a) directing the luminance signal through three tandem-connected one-field delays so as to produce an undelayed signal, a one-field delayed signal, a two-field delayed signal and a three-field delayed signal;

(b) separately time-compressing the luminance signal and the three delayed signals by 2:1 so as to produce four time-compressed signals: undelayed, one-field-delayed, two-field-delayed and three-field-delayed;

(c) analyzing the luminance signal and accordingly providing a binary field-averaging control signal having a binary level D during a subsequent field period following a determination that two successive fields originate from two different film frames and a binary level S during the subsequent field period following a determination that the successive fields originate from the same film frame;

(d) during fields demarked by binary level D, providing, as a complementary pair of time-compressed signals to be combined, a first averaged signal comprising the undelayed time-compressed signal averaged with the two-field-delayed time-compressed signal and a second averaged signal comprising the one-field-delayed time-compressed signal averaged with the three-field-delayed time-compressed signal; and during fields demarked by binary level S, providing, as the complementary pair of time-compressed signals, the one-field-delayed time-compressed signal and the two-field-delayed time-compressed signal;

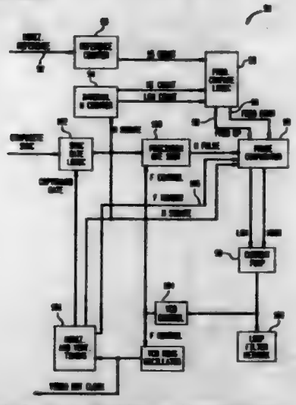
(e) combining the complementary pair of time-compressed signals in a combining circuit in a line-interleaved manner so as to provide a film-mode-optimized line-doubled non-interlaced video signal wherein anomalous field-to-field motion has been smoothed by field-averaging for driving a video display optimally with regard to film-source-related motion effects.

5,596,372

VIDEO SIGNAL DATA AND COMPOSITE SYNCHRONIZATION EXTRACTION CIRCUIT FOR ON-SCREEN DISPLAY

Eric B. Berman, Comack, and Philip T. McLaughlin, Huntington, both of N.Y., assignors to EEG Enterprises, Inc., Farmingdale, N.Y.

Division of Ser. No. 845,734, Mar. 2, 1992, Pat. No. 5,404,172. This application Feb. 3, 1995, Ser. No. 383,249
Int. Cl.[6] H04N 7/08
U.S. Cl. 348—537 8 Claims



1. A circuit for phase locking an internal timing signal to an external signal, comprising:

a phase-locked loop including a phase comparator circuit and a voltage controlled oscillator, said phase comparator circuit receiving as inputs a signal derived from said voltage controlled oscillator and a signal derived from said external signal;

means for comparing the frequency of a reference signal to the frequency of a signal derived from said internal signal, and for generating a steering signal that depends on said comparison;

means for applying said steering signal to said phase-locked loop;

said means for comparing frequency comprising a frequency comparison logic circuit that compares counts derived from said reference signal and counts derived from said phase locked loop, and produces said steering signal in response to said count comparison, said steering signal being coupled with said phase comparator to influence operation of said phase locked loop;

said phase locked loop including a current pump that is coupled to the output of said phase comparator circuit, said steering signal being operative to control the current generated by said current pump; and

means for deriving an output signal from said phase locked loop.

5,596,373

METHOD AND APPARATUS FOR PROVIDING PROGRAM ORIENTED INFORMATION IN A MULTIPLE STATION BROADCAST SYSTEM

Gail K. White, Hackensack; Fujio Nagaoki, Ridgewood, both of N.J.; Kazuhiko Akaike, Tokyo, Japan, and Mark Schaffer, Hackensack, N.J., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 4, 1995, Ser. No. 369,673
Int. Cl.[6] H04N 5/50
U.S. Cl. 348—569 26 Claims



1. In a multiple channel broadcasting system in which programs are broadcast for display on a screen, a method for generating an on-screen program list to inform the user of programs available through the broadcasting system, said method comprising the steps of:

selecting a category of programs;

searching for selected programs occurring during a predetermined timeframe that are categorized as the selected category;

extracting program information comprising a program title and start time of selected programs; and

generating an electronic program list on a display of the broadcasting system comprising the steps of;

identifying each selected program of the selected category by the program title;

identifying each start time of each selected program;

displaying the program title, and

displaying each start time of the program adjacent to the program title;

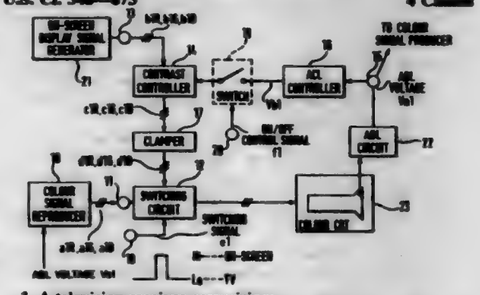
wherein a user can easily view by program category and start times such that multiple occurrences of the same program during the predetermined timeframe are viewable in one program list.

5,596,374

TELEVISION RECEIVER THAT CONTROLS DISPLAY CONTRAST BASED ON THE TYPE OF VIDEOS BEING DISPLAYED

Hajime Sasaiyoshi, and Takashi Nasukawa, both of Saitama-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1995, Ser. No. 520,247
Claims priority, application Japan, Aug. 29, 1994, 6-203711
Int. Cl.[6] H04N 7/22;7/14
U.S. Cl. 348—673 4 Claims



1. A television receiver comprising:

first signal processing means receiving television signals and generating contrast controlled first R, G and B signals;

second signal processing means for generating second on-screen R, G and B signals, the second signal processing means controlling the contrast of the second on-screen R, G and B signals if a contrast control signal is provided to the second signal processing means;

switching means receiving the contrast controlled first R, G and B signals and the second R, G and B signals from the first and the second signal processing means, respectively, and selectively outputting one of the first and the second R, G and B signals as an output signal;

a color CRT receiving the output signal from the switching means for displaying a video image corresponding to the output signal;

means for generating an ABL voltage that changes in response to a level of video displayed on the color CRT, the ABL voltage being provided to the first signal processing means for controlling the contrast of the first R, G and B signals and selectively provided to the second signal processing means as the contrast control signal; and

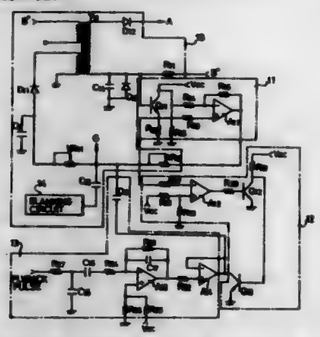
control means for selectively providing the contrast control signal to the second signal processing means for controlling the contrast of the second R, G and B signals such that the contrast control is executed if a ratio of video corresponding to the second R, G and B signals with respect to the total amount of video displayed on the color CRT exceeds a prescribed level and such that the contrast control is prohibited if the ratio is below the prescribed level.

5,596,375

AUTOMATIC BRIGHTNESS CONTROL APPARATUS FOR A MONITOR

Gi J. Kwon, Kyungsangbuk-Do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Sep. 15, 1995, Ser. No. 528,548
Claims priority, application Rep. of Korea, Sep. 16, 1994, 94-23713
Int. Cl.[6] H04N 5/228;5/68
U.S. Cl. 348—687 4 Claims



1. An automatic brightness control apparatus for a monitor having an anode and a grid terminal, the apparatus comprising:

means for controlling brightness of said monitor;

means for detecting a beam current flowing to said anode;

control means for controlling a brightness control voltage being supplied to said grid terminal in accordance with said beam current detected by said beam current detecting means, said control means comprising

a comparator which compares said beam current detected by a first transistor in said beam current detecting means with a predetermined reference value and providing a high or low level signal according to the result of the comparison;

a second transistor which performs a switching operation in accordance with an output of said comparator; and

a third transistor having an on or off state controlled by the switching operation of said second transistor; and

means for providing said brightness control voltage to said brightness control means under the control of said control means, said brightness control voltage providing means coupled to said third transistor of said control means, so that in one of the on or off states of said third transistor, the brightness control voltage is transmitted to said brightness control means while in the other of the on or off states, the brightness control voltage is not transmitted to said brightness control means.

5,596,376

STRUCTURE AND METHOD FOR A MULTISTANDARD VIDEO ENCODER INCLUDING AN ADDRESSING SCHEME SUPPORTING TWO BANKS OF MEMORY

Bradley Howe, San Jose, Calif., assignor to C-Cube Microsystems, Inc., Milpitas, Calif.

Filed Feb. 16, 1995, Ser. No. 389,661
Int. Cl.[6] H04N 9/64
U.S. Cl. 348—718 12 Claims

1. A video signal processing system for processing a video image, said video image including one or more frames of pixel data, each frame including a first field and a second field, said video signal processing system comprising:

an address bus including a first memory address and an additional address bit;

a data bus including a first portion and a second portion;

a memory system, receiving said first memory address and said additional address bit, said memory system organized to include a first bank of storage locations and a second bank of storage locations, said first bank of storage locations being accessed by said first memory address to provide data output on said first portion of said data bus, and said second bank of storage locations being accessed by a second memory address formed by replacing a corresponding bit in said first memory address by said additional bit, said second bank of storage locations providing data output on said second portion of said data bus; and

a memory controller for generating on said address bus said first memory address and said additional bit.

5,596,377

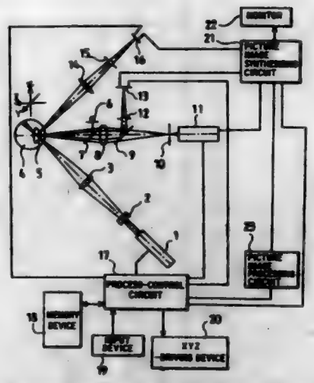
OPHTHALMIC APPARATUS HAVING THREE DIMENSIONAL CALCULATING MEANS

Nobuyuki Yano, Okazaki, Japan, assignor to Nidek Co., Ltd., Japan

Filed Aug. 30, 1994, Ser. No. 297,892
Claims priority, application Japan, Aug. 31, 1993, 5-240336
Int. Cl.[6] A61B 3/10
U.S. Cl. 351—211 6 Claims

1. An ophthalmic apparatus for aligning optical systems thereof with an expected portion in the inside of an examinee's eye to examine the eye by examining means, the apparatus comprising:

an observing optical system for observing an anterior portion of the eye;



a light projecting optical system for projecting alignment light to a cornea of the eye;

a detecting optical system for detecting in two directions the light which is projected from the light projecting optical system and then reflected by the cornea;

position calculating means for calculating a three-dimensional position of the apparatus with respect to the eye, based on the detected data at said detecting optical system;

signal generating means for generating signals to carry out examination of the eye; and

memory means for storing the three-dimensional position of the apparatus with respect to the eye at the time of signal generated at said signal generating means, as well as examination data.

5,596,378

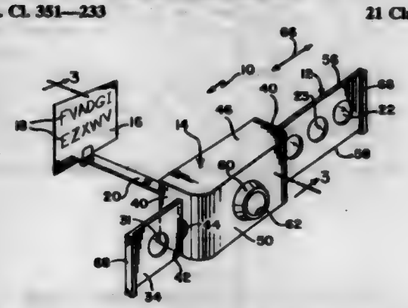
LENS SELECTION SYSTEM

Charles D. Kelman, 721 Fifth Ave., New York, N.Y. 10022

Continuation of Ser. No. 180,561, Jan. 12, 1994, abandoned. This application Nov. 29, 1995, Ser. No. 563,744

Int. Cl.[6] A61B *3/02;3/00*

U.S. Cl. 351—233 **21 Claims**



1. An eyeglass lens selection system for permitting a consumer to separately select desired individual lenses for a pair of eyeglasses without assistance, said system comprising:

at least one carrier for holding a plurality of lenses in a substantially coplanar and fixed relationship relative to each other, at least one of said lenses being of a different optical power from another of said lenses, wherein:

said carrier has a front face and a rear face; individual single lenses of said plurality of lenses are generally in a plane of said carrier defined by said faces;

said lenses permit light to pass through said carrier;

said carrier includes individual identifying indicia associated with each said individual single lens; and

said individual indicia associated with each individual single lens corresponds to individual identifying indicia associated with an individual eyeglass lens for placing into eyeglass frames to form a pair of eyeglasses such that reference to only a single carrier is necessary for selecting an eyeglass lens;

said system further comprising a viewer having a track for guiding

a single carrier, said viewer accommodating only one carrier at a time so that a consumer slides only a single carrier to position a single lens in front of one eye at a time to select an appropriate eyeglass lens for each eye as determined without referring to any information other than said individual indicia associated with a single lens on said single carrier that provides the clearest vision for the consumer.

5,596,379

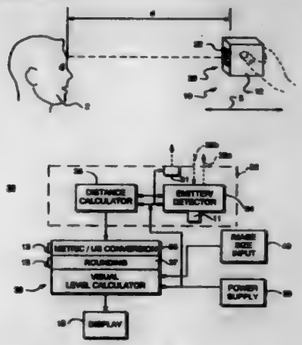
PORTABLE VISUAL ACUITY TESTING SYSTEM AND METHOD

Gary M. Kaweesh, 4585 Stevens Creek Blvd., Santa Clara, Calif. 95051

Filed Oct. 24, 1995, Ser. No. 547,649

Int. Cl.[6] A61B *3/02;3/00*

U.S. Cl. 351—244 **20 Claims**



1. A portable visual acuity testing device, for testing visual acuity of a person being tested at various distances from said person being tested, said portable visual acuity testing device comprising:

a portable visual acuity testing structure including at least one image display portion having an image of a predetermined size; and

a visual acuity level measurer and reporter disposed within said portable visual acuity testing structure, for automatically measuring and reporting a visual acuity level of the person being tested, said visual acuity level measurer and reporter including:

a distance measurer, for measuring a distance from the person being tested to said portable visual acuity testing structure;

a visual acuity level calculator, electrically coupled to said distance measurer and responsive to said predetermined size of said image, for calculating a visual acuity level based on said predetermined size of said image and said distance; and

a visual acuity level display portion, electrically coupled to said visual acuity level calculator, for displaying said visual acuity level.

5,596,380

DIGITAL SOUND SIGNAL REPRODUCING APPARATUS FOR PROJECTOR

Yoshio Ozaki, Tokyo; Toshiyuki Shirasu, and Etsuro Saito, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan, and Sony Cinema Products Corporation, Culver City, Calif.

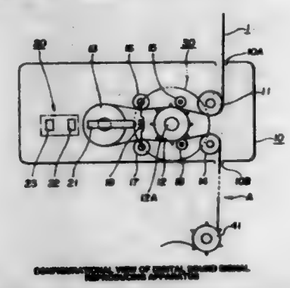
PCT No. PCT/JP94/01568, § 371 Date May 22, 1995, § 102(e) Date May 22, 1995, PCT Pub. No. WO95/08789, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 22, 1994, Ser. No. 436,380

Claims priority, application Japan, Sep. 24, 1993, 5-238516; Jun. 24, 1994, 6-166031

Int. Cl.[6] G03B *31/02;21/50*

U.S. Cl. 352—30 **4 Claims**



1. A digital sound signal reproducing apparatus for a projector comprising:

a sound drum constituting a portion of an image film traveling path along with traveling guide means, and adapted so that an image film delivered from an image film supply unit travels circumferentially around said sound drum;

digital sound signal reading means provided in association with the sound drum, and adapted for reading and reproducing a digital sound signal recorded on a digital sound signal recording portion of the image film; and

an image film traveling adjustment unit including traveling load means disposed in a manner at least positioned at a preceding stage of the image film traveling path with respect to the sound drum, and adapted for applying traveling load to the image film delivered to the digital sound signal reading means thus to stabilize traveling state; wherein the traveling load means of the image film traveling adjustment unit comprises electromagnetic brake means provided in association with the traveling guide means constituting the image film traveling path.

5,596,381

CAMERA FOR USE WITH PHOTOGRAPHIC FILM IN A CARTRIDGE

Koichiro Murakami; Takemi Miyazaki; Kazuhiro Nakanishi, and Noriyuki Kaedeoka, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 17, 1995, Ser. No. 373,448

Claims priority, application Japan, Jan. 19, 1994, 6-004185; Mar. 29, 1994, 6-059285

Int. Cl.[6] G03B *7/24;1/02;17/26*

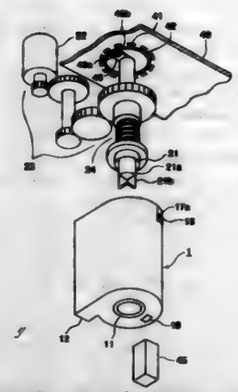
U.S. Cl. 396—287 **9 Claims**

1. A camera for use with a photographic film in a cartridge, comprising:

a cartridge chamber for accommodating said cartridge, wherein said cartridge includes a spool rotatable on an axis for holding said photographic film wound thereon;

a bar code disk including a bar code thereon, having unit blocks, and being rotatable on said axis with said spool;

a regulation member for regulating a location of said spool at a predetermined position in said cartridge chamber in relation to a rotational angle on said axis;



a regulation member release for releasing a regulation of said location of said spool by said regulation member;

a driving shaft arranged to be coupled with said spool and for rotating said spool;

a generator for generating reference pulse signals corresponding to a rotation cycle of said spool;

a bar code reader for reading the bar code on said bar code disk so as to obtain film information respectively from each unit block of said bar code; and

a controller for controlling said bar code reader in synchronism with said reference pulse signals so as to obtain said film information when said driving shaft is coupled with said spool.

5,596,382

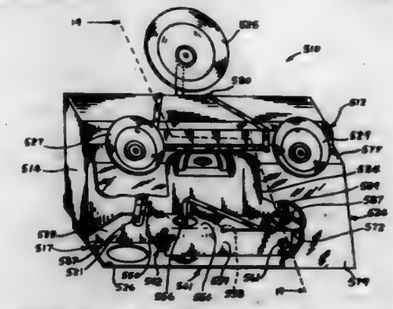
IMPACT ACTIVATED TRIGGERING MECHANISM FOR A CAMERA MOUNTED ANYWHERE IN A VEHICLE

Robert M. Bamford, Glendale, Calif., assignor to Terry D. Scharton, Santa Monica, Calif.

Continuation-in-part of Ser. No. 419,092, Apr. 10, 1995. This application Oct. 16, 1995, Ser. No. 541,203

Int. Cl.[6] G03B *17/38;29/00*

U.S. Cl. 396—429 **40 Claims**



1. In combination with a vehicle having at least one window surface and a camera having a lens and a shutter release button lever for taking a photographic picture, an impact activated camera triggering apparatus comprising:

a. a mounting element having a partial rear panel, a base panel and a front panel, the partial rear panel integrally formed with and upwardly extending from the base panel and having a top end terminating into a slanted flange protruding outwardly away from the mounting element, the base panel having a step-down section with a forward region and a rear region, the forward region having at least two apertures and a detent region with a cavity therethrough between the at least two apertures, the front panel having an opening therethrough for

accommodating the field of view of said lens of said camera, where the front panel forms an upper flange section, a middle slanted section and a lower slanted section;

b. a divider including a forward extension section, a rearward extension section and a vertical extension section;

c. said forward extension section forming a top surface with an opening therethrough, a front surface with a pivot hole and two end surfaces which enclose said detent region of said mounting element with the opening on the top surface above said cavity of said detent region;

d. said rearward extension section covering said rear region of said step-down section of said base panel of said mounting element and having a cutout end opening;

e. said vertical extension section having an aperture and a dimpled pivot hole;

f. a trigger spring mounted within said rear region of said step-down section and having a tapering distal section with a narrow distal end, a wide middle section, and a tapering proximal section with a narrow proximal end, the proximal end located relative to said rearward extension section such that the middle section abuts against said base panel, and the distal end protruding out from said cutout end opening on said rearward extension section;

g. a rolling ball retained by said forward extension section and being able to roll on said detent region, where the rolling ball is limited to a horizontal plane movement and responsive to inertial forces;

h. a trigger lever arm pivotally mounted between said pivot hole of said front surface of said forward extension section and said dimpled pivot hole of said vertical extension section at a location remote from said rolling ball and having a distal end and a proximal end, the distal end forming a trigger lever pin extending down through said opening of said top surface of said forward extension section and resting on said rolling ball when said rolling ball is seated above said cavity of said detent region, the proximal end forming a reset trigger lever and resting above a respective one of said at least two apertures on said forward region of said base panel and a latching pin extending through said aperture of said vertical extension section for latching said distal end of said trigger spring;

i. said reset trigger lever of said trigger lever arm facilitating the cocking of said tapering distal section of said trigger spring by latching said latching pin of said trigger lever arm over said narrow distal end of said trigger spring to prevent said tapering distal section of said trigger spring from pressing up on said shutter release button lever of said camera prematurely;

j. an elongated rod having one end attached to said slanted flange of said rear panel and the other end extending upwardly above said camera;

k. an upper central suction cup attached to the other end of said elongated rod such that it adheres to said at least one window surface of the vehicle;

l. two seperated lower suction cups attached to said middle slanted section of said front panel and opposite each other such that the two seperated lower suction cups adhere to said at least one window surface of the vehicle; and

m. means for retaining said camera when said camera is inverted-ly installed within said rear region of said mounting element;

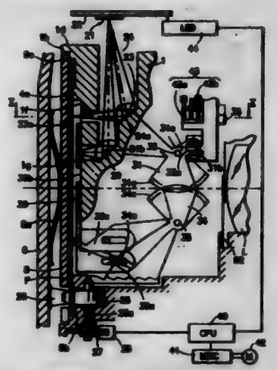
n. whereby said rolling ball can be moved off from said cavity of said detent region in response to said inertial forces in the horizontal plane upon sudden impact on the vehicle from any lateral direction, which drops said trigger lever pin of said trigger lever arm off from said rolling ball, causing said latching pin of said trigger lever arm to release said tapering distal section of said trigger spring which in turn presses on said shutter release button lever of said camera, to thereby automatically take said photographic picture at the moment of sudden impact.

5,596,383

CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

Hidemori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397.
This application Jun. 7, 1995, Ser. No. 483,689
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.[6] G03B 17/24
U.S. Cl. 396—315 1 Claim



1. A data imprinting device for use in a camera, comprising:
a light source;
said light source being effective for emitting imprinting light;
a first part of said device;
said first part being effective for focusing said imprinting light upon a photosensitive surface at at least two positions;
a second part of said device;
said second part being effective for selectively occluding said imprinting light from focusing upon at least one position of said at least two positions;
said first part including a first reflecting unit;
said first reflecting unit being effective for reflecting incident light of said imprinting light upon a first position of said at least two positions;
said first part including a second reflecting unit;
said second reflecting unit being effective for reflecting incident light of said imprinting light upon a second position of said at least two positions;
said first position being further from a center of said photosensitive surface than said second position; and
said first reflecting unit being set back further from said photosensitive surface than said second reflecting unit.

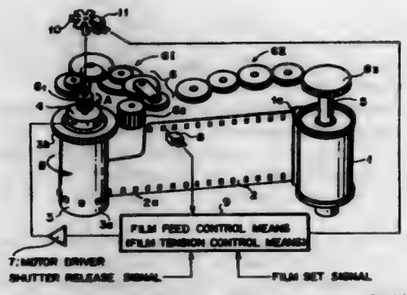
5,596,384

FILM FEEDER THAT REDUCES FILM TENSION

Yasuhiko Tanaka, and Minoru Takahashi, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama-Ken, Japan

Filed Mar. 28, 1995, Ser. No. 411,543
Claims priority, application Japan, Jul. 15, 1994, 6-163746
Int. Cl.[6] G03B 1/18
U.S. Cl. 396—413 5 Claims

1. A film feeder for taking up a film from a film container one frame at a time by rotation of a takeup spool driven by a film feed motor comprising:
first detector means for detecting linear motion of the film with respect to an exposure station;
second detector means for detecting angular motion of the film feed motor; and
a film tension control means responsive to the first and second detector means for actuating said film feed motor in the opposite direction to the direction in which said film is fed only by an amount sufficient to relieve the tension of said film while said film is maintained at a predetermined position every time said film is fed for one frame.

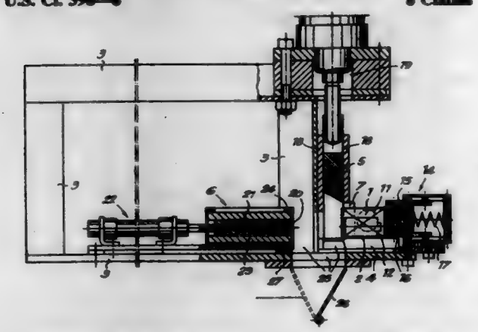


5,596,385

DEVICE FOR OPENING DISPOSABLE CAMERAS AND REMOVING THE FILM ROLL

Jan Cranshoff, Stijn Streuvelslaan 22, 2630 Aartselaar, Belgium

Filed Sep. 22, 1995, Ser. No. 532,458
Claims priority, application Belgium, Sep. 27, 1994, 9400873
Int. Cl.[6] G03B 13/00; 13/10
U.S. Cl. 396—6 8 Claims



1. Device for opening disposable cameras having a housing and for removing film rolls from them, comprising a cutting table, positioning means, a movable knife with respect to the cutting table having a cutting edge in order to cut away part of the housing of the disposable camera and to form an opening in it, means for moving this knife, and a mechanism for gripping the film roll through said opening and removing it from the housing of the disposable camera.

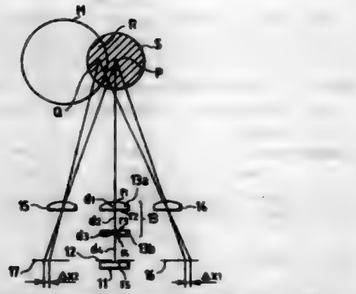
5,596,386

PROJECTION AND RECEPTION TYPE FOCUS DETECTING APPARATUS

Masashi Hankawa, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 527,939
Claims priority, application Japan, Sep. 16, 1994, 6-221589
Int. Cl.[6] G03B 3/00
U.S. Cl. 396—110 14 Claims

1. A projection and reception type focus detecting apparatus for making a range measurement in a plurality of regions, comprising:
a light source for emitting a beam of light;



a projection optical system for illuminating an object with the beam of light from said light source as a projected beam;
a reception optical system for receiving reflected light from the object to fall on a light-detecting element; and
scanning means for scanning a surface of the object with the projected beam or emitting pulses in a scanning mode when the object is illuminated with the projected beam, satisfying the condition:

$$0.09<l/f<0.23$$

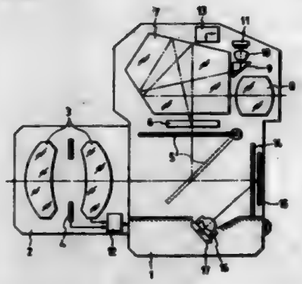
where l is a maximum distance from an intersection of an exit surface of said light source with an optical axis of said projection optical system to an end of the exit surface of said light source and f is a focal length of said projection optical system.

5,596,387

AUTO-EXPOSURE DEVICE OF A CAMERA

Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 272,999, Jul. 14, 1994, abandoned, which is a continuation of Ser. No. 65,262, May 21, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 352,419
Claims priority, application Japan, Jun. 9, 1992, 4-174092
Int. Cl.[6] G03B 7/08
U.S. Cl. 396—50 25 Claims



1. A camera having an auto-exposure device, said auto-exposure device comprising:
a divided brightness measuring circuit to divide an object field into a plurality of areas and to measure brightnesses of said areas, respectively;
a color temperature measuring circuit to measure color temperatures of said areas, respectively; and
an exposure calculation circuit to calculate an exposure value based on the brightnesses and color temperatures of said areas.

5,596,388

PROCESS CARTRIDGE WITH AN INFORMATION FEATURE AND IMAGE FORMING APPARATUS FOR USE WITH THE SAME

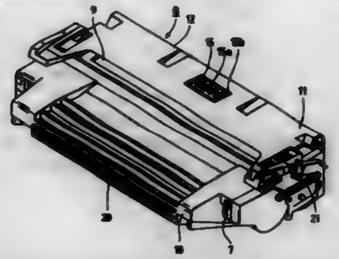
Masaharu Obikabe, Yokohama, and Mitsuru Honda, Kamagaya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 155,862, Nov. 23, 1993. This application Sep. 29, 1995, Ser. No. 536,360

Claims priority, application Japan, Nov. 26, 1992, 4-337871; Sep. 14, 1993, 5-228584; Nov. 8, 1993, 5-278434

Int. Cl.[6] G03G 15/00

U.S. Cl. 399—111 34 Claims



1. A process cartridge mountable on a main body of an image forming apparatus, said process cartridge comprising:

a frame having a gripping portion;

an image bearing member;

process means for acting on said image bearing member; and

a bar code provided on an outer surface of said frame at a position away from the gripping portion and facing upward when said process cartridge is mounted on the main body.

5,596,389

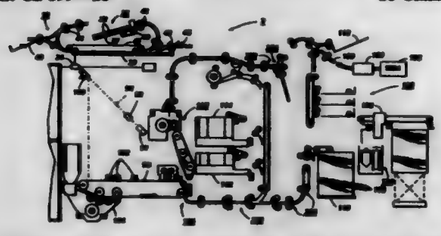
APPARATUS AND METHOD FOR SCHEDULING AN IMAGABLE SUBSTRATE AND A SPECIAL SHEET TO BE FED IN THE SAME PITCH

Glen A. Dumas, Henrietta, and Michael E. Farrell, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1994, Ser. No. 353,970

Int. Cl.[6] G03G 21/00

U.S. Cl. 399—16 16 Claims



1. In a printing system for producing a print job, the printing system including a print engine for imaging regular substrates, fed to the print engine from a regular substrate feeding apparatus, and delivering the imaged regular substrates as output, the print engine being operatively coupled with a special sheet insertion apparatus, a special sheet insertion path passing by the special sheet insertion apparatus, the special sheet insertion apparatus including one or more special sheets being feedable to the special sheet insertion path and addable to the delivered output of imaged regular substrates, a scheduling apparatus comprising:

a) a memory for storing a set of two or more feed signals, the set of feed signals including a first feed signal and a second feed signal with the first feed signal and the second feed signal corresponding respectively with a special sheet and an imagable regular substrate having opposing sides;

b) a controller for generating the first and second feed signals;

c) said controller communicating with each of the print engine and the special sheet insertion apparatus, each of the special sheet insertion apparatus and the print engine being respectively responsive to the first feed signal and the second feed signal;

d) said controller determining whether the imagable regular substrate is to be imaged on both of the opposing sides; and

e) said controller scheduling the first and second feed signals to be transmitted respectively to the special sheet insert apparatus and the print engine during a single pitch, for feeding the imagable regular substrate and the special sheet during the single pitch, when it is determined that the imagable regular substrate is to be imaged on both the opposing sides.

5,596,390

IMAGE FORMING APPARATUS AND SYSTEM FOR ADMINISTERING THE SAME

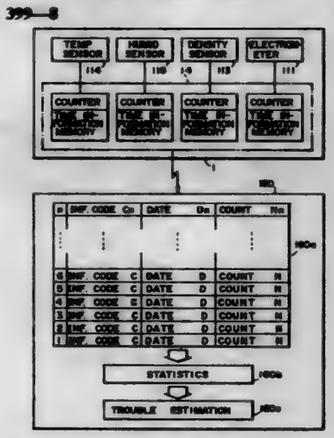
Masahiki Sawada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 26, 1995, Ser. No. 533,758

Claims priority, application Japan, Sep. 26, 1994, 6-229459; Apr. 14, 1995, 7-089688

Int. Cl.[6] G03G 15/00

U.S. Cl. 399—8 42 Claims



1. An image forming apparatus comprising:

second limit value setting means for setting second limit values which outputs of sensors disposed in said apparatus respectively reach before reaching respective first limit values each being representative of an operation limit of said apparatus;

counting means for counting occurrences that any one of the outputs of the sensors exceeds the respective second limit value;

time information storing means for storing a date or similar time information representative of a time when said counting means counted said occurrences; and

transmitting means for transmitting a count of said counting means and said time information stored in said time information storing means.

5,596,391

IMAGE FORMING APPARATUS HAVING TRANSFER CONSTANT CURRENT SOURCE ADJUSTABLE IN RESPONSE TO THE THICKNESS OF DIELECTRIC LAYER

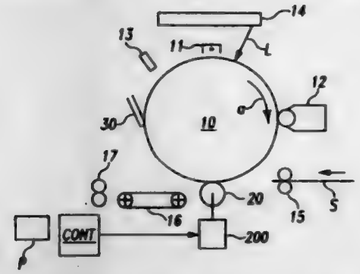
Kenji Matsushita; Yasuhiro Nakagami, and Noboru Yonekawa, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 15, 1995, Ser. No. 529,098

Claims priority, application Japan, Sep. 21, 1994, 6-227110

Int. Cl.[6] G03G 21/00

U.S. Cl. 399—45 28 Claims



1. A charging device for use in an apparatus in which a charged toner image is formed on a surface of an image carrier and then the toner image is transported from the carrier to a medium, said charging device comprising:

means for charging the medium while the medium is in contact with the charged toner image on the image carrier;

a constant-current source capable of applying a plurality of constant-current values to the charging means;

means for determining thickness of the surface of the image carrier; and

means for varying the constant-current value of the constant-current source in response to the determined thickness of the surface of the image carrier.

5,596,392

MAGNETIC SEAL PROVIDED AT AN END PORTION OF THE DEVELOPER CARRYING MEMBER

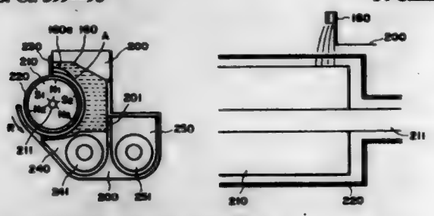
Toshinatsu Tsuzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 408,991

Claims priority, application Japan, Mar. 25, 1994, 6-055910

Int. Cl.[6] G03G 15/06

U.S. Cl. 399—98 14 Claims



1. A developing apparatus comprising:

a developer container for accommodating a developer having magnetic particles;

a rotatable developer carrying member, provided in an opening of said developer container, for carrying the developer;

a magnet in said developer carrying member;

a magnetic member, provided at an end portion of said developer carrying member, being subjected to magnetic force of said magnet;

wherein said magnetic member is disposed with a gap relative to said developer carrying member, along a circumference of said developer carrying member;

a regulating member for regulating the developer on said developer carrying member;

wherein magnetic confining force for the developer by said magnetic member is weaker toward a regulation portion of said regulating member in a circumferential direction of said developer carrying member.

5,596,393

IMAGE FORMING APPARATUS HAVING CHARGING MEMBER SUPPLIED WITH OSCILLATING VOLTAGE

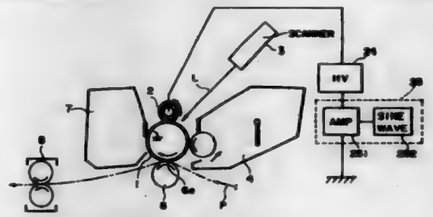
Tatsuya Kobayashi, Sobku; Hiroshi Sasame, Yokohama; Tetsuya Kobayashi, Kawasaki, and Toshiaki Miyashiro, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1993, Ser. No. 172,711

Claims priority, application Japan, Dec. 26, 1992, 4-359588

Int. Cl.[6] G03G 15/02

U.S. Cl. 399—174 22 Claims



1. An image forming apparatus comprising:

image bearing means for bearing an image;

charging member for sequentially charging a surface of said image bearing means to form an image thereon; and

voltage application means for applying an oscillating voltage to said charging member, the oscillating voltage including a first frequency and a second frequency which is different from the first frequency, the first frequency and said second frequency are repeated for each period of the oscillating voltage.

5,596,394

CHARGING APPARATUS FOR CHARGING A PHOTO-SENSITIVE MEMBER BY MAGNETICALLY HOLDING MAGNETIC PARTICLES IN A CHARGING ZONE

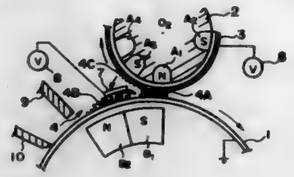
Yasuo Nishigaichi; Susumu Kikuchi; Ryuhi Inoue; Sigeki Tsukahara, and Shinji Yamane, all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed May 18, 1994, Ser. No. 245,281

Claims priority, application Japan, May 20, 1993, 5-139831; Aug. 25, 1993, 5-232308; Aug. 31, 1993, 5-238839; Aug. 31, 1993, 5-238840; Aug. 31, 1993, 5-239040; Dec. 28, 1993, 5-353326

Int. Cl.[6] G03G 15/01

U.S. Cl. 399—175 44 Claims



1. A charging apparatus for charging a photo-sensitive member by magnetically holding magnetic particles in a charging zone and impressing a charging bias on the magnetic particles, the photo-sensitive member having a front side, a back side, and defining a direction of movement, the charging zone defining an upstream

side and a downstream side relative to the direction of movement of the photo-sensitive member, the charging apparatus comprising:

magnetic field generation means for generating a magnetic field in the charging zone, the magnetic field generation means comprising:

at least a first magnetic element disposed on the front side of the photo-sensitive member,

at least a second magnetic element disposed on the back side of the photo-sensitive member,

the first and second magnetic elements being disposed in a substantially mutually opposed relationship and forming a magnetic field in a direction substantially normal to the photo-sensitive member,

the photo-sensitive member being charged by the magnetic particles while the magnetic particles are held in the charging zone by the magnetic field.

5,596,395

IMAGE FORMING APPARATUS AND ITS CONTROL SYSTEM HAVING A SINGLE DEVICE FOR MOVING A CHARGING MEMBER AND A TRANSFER MEMBER

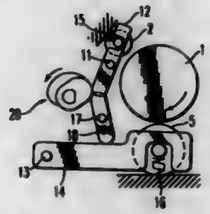
Tadahide Sawamura, Machida; Takashi Tawada, Yokohama, and Fumihito Itoh, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 531,650

Claims priority, application Japan, Sep. 21, 1994, 6-227004

Int. Cl.[6] G03G *15/02*

U.S. Cl. 399—168 9 Claims



1. An image forming system, comprising:

a photoreceptor;

a charging member which charges the photoreceptor;

a transfer member which transfers images from the photoreceptor;

a single driving source which drives the charging member and the transfer member both towards and away from the photoreceptor to positions including:

1) both the charging member and the transfer member being in contact with the photoreceptor,

2) both the charging member and the transfer member being separated from the photoreceptor, and

3) one of the charging member and the transfer member being in contact with the photoreceptor while the other of the charging member and the transfer member is separated from the photoreceptor.

5,596,396

LATENT IMAGE DEVELOPMENT APPARATUS

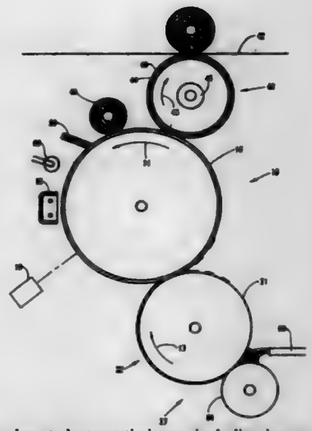
Benzion Landa, Edmonton, Canada; Ishaiau Lior, Nes Ziona, and Eliad Chatow, Petach Tikva, both of Israel, assignors to Indigo N.V., Veldhoven, Netherlands

Continuation of Ser. No. 170,367, Feb. 3, 1994, Pat. No. 5,436,706, which is a continuation-in-part of Ser. No. 727,599, Jul. 9, 1991, abandoned. This application May 4, 1995, Ser. No. 434,236

Int. Cl.[6] G03G *15/10*

U.S. Cl. 399—237 34 Claims

1. An imaging method comprising the steps of:



forming a latent electrostatic image including image regions at a first voltage and background regions at a second voltage on a first surface of a first member;

charging a second member having a second surface adapted for operative engagement with the first surface at a first, development, region to a third voltage intermediate the first and second voltages;

resiliently urging a third member against the second surface at a second region;

supplying liquid toner comprising charged toner particles and carrier liquid to the second region and forming a thin layer of liquid toner containing a concentration of charged toner particles greater than 15% on the second surface, said thin layer being of sufficient thickness to substantially fill the space between the first and second members;

developing the latent image by the selective transfer of portions of the layer of liquid toner from the second surface to the first surface at the first region to form a developed image on the first member; and

transferring the developed image from the first member to a final substrate.

5,596,397

IMAGE FORMING APPARATUS PROVIDED WITH A HEAT PIPE WHICH HAS A CENTER LOCATED ON THE SHEET PASSAGE REFERENCE SIDE WITH RESPECT TO THE CENTER OF THE HEAT ROLLER

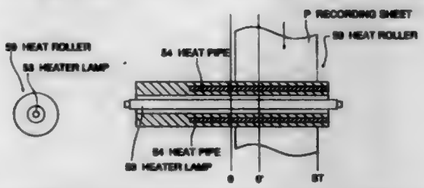
Takeichi Shimada, and Takahiko Ushiroji, both of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Dec. 15, 1995, Ser. No. 573,499

Claims priority, application Japan, Dec. 20, 1994, 6-316435

Int. Cl.[6] G03G *15/20*

U.S. Cl. 399—335 4 Claims



1. A fixing apparatus for fixing an image on a recording sheet, comprising:

a heat roller, including:

a pair of side ends wherein a rotation axis of said heat roller passes through said pair of side ends; and

a heat pipe, having a length shorter than a length of said heat roller, for regulating a temperature of said heat roller; and

a conveyance path, having a reference position side in a vicinity of one of said pair of side ends, for conveying said recording sheet in said fixing apparatus wherein said recording sheet is conveyed along said reference position side;

wherein a center of said heat pipe in a direction of said rotation axis is positioned on the reference position side of said one of said pair of side ends with respect to a center of said heat roller.

5,596,398

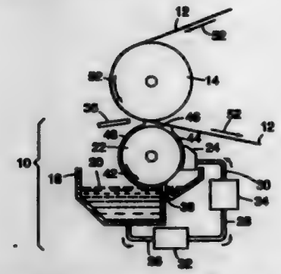
APPARATUS AND METHOD FOR CLEANING DEVELOPER FROM AN IMAGING SUBSTRATE

Edward J. Wen, Woodbury, Minn., and Thomas W. Reeder, Asheville, N.C., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Sep. 29, 1995, Ser. No. 536,685

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—346 22 Claims



1. A method for cleaning developer particles from an imaging substrate, the method comprising the steps of:

moving the imaging substrate in a first direction;

delivering a cleaning liquid to the imaging substrate;

contacting the imaging substrate with a cleaning blade, the cleaning blade cleaning at least some of the developer particles from the imaging substrate, wherein at least some of the developer particles cleaned from the imaging substrate collect on the cleaning blade;

moving the imaging substrate in a second direction, wherein the imaging substrate removes from the cleaning blade at least some of the developer particles collected on the cleaning blade;

discontinuing contact of the cleaning blade with the imaging substrate;

continuing to move the imaging substrate in the second direction; and

continuing to deliver the cleaning liquid to the imaging substrate, wherein the cleaning liquid cleans from the imaging substrate at least some of the developer particles removed from the cleaning blade.

5,596,399

COMPACT DOCUMENT MEASURING SYSTEM FOR ELECTRONIC DOCUMENT IMAGING

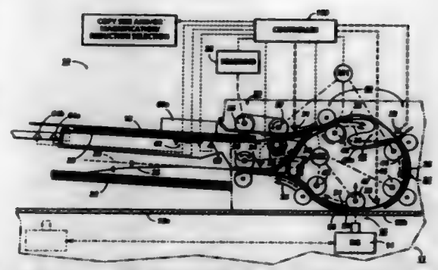
Neil J. Dempsey, Victor, and Mark H. Buddendock, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 12, 1994, Ser. No. 304,293

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—45 12 Claims

1. In a document handling system with a document feeding path for sequentially feeding document sheets of varying different standard dimensions, with leading and trailing ends, to be imaged at an imaging station in a feeding direction through said document feeding path from a document input troy sheet output to said



imaging station, with a document feeding system of known document sheet feeding velocities, the improvement for automatically determining the dimension of a document sheet being fed in its feeding direction from its leading end to its trailing end before it is imaged, yet providing a compact document handling system with a short said imaged, yet providing a compact document handling system with a short said document feeding path, wherein first and second document sheet edge sensors are provided in the document feeding path, respectively located adjacent the sheet output of said document input tray and upstream of said imaging station, and actuatable by movement therepast of said leading and trailing ends of said document sheet; and wherein:

said document handling system document feeding path from said document input tray to said imaging station is shorter than the longest said standard dimensions document sheets to be fed therethrough,

said document feeding path has a sheet buckling system including a sheet buckling chamber intermediate of said document input tray and said imaging station,

said sheet buckling chamber substantially extending normally from said document feeding path,

said sheet buckling system providing for said feeding of said trailing end of a document sheet faster than said leading end to substantially buckle the intermediate portion of said document sheet out of said document feeding path into said sheet buckling chamber so that said dimension between said trailing and leading ends of the buckled document sheet along the document feeding path is substantially reduced, and so that said trailing end of said buckled document sheet along said document feeding path normally passes and actuates said first document sheet edge sensor in said document feeding path adjacent said sheet output of said document input tray before said leading end of said buckled document sheet in the document feeding path reaches and actuates said second document sheet edge sensor upstream of said imaging station, to provide a timing signal usable for calculating the dimension of the document sheet being fed from said known document sheet feeding velocity of said document handling system, even for document sheets longer than said document feeding path.

5,596,400

IMAGE FORMING APPARATUS INCLUDING DEVICE FOR SETTING ORIGINAL DOCUMENTS ON A DOCUMENT PLATEN

Toru Kasumoto; Shigio Ogino, both of Toyokawa, and Masaaki Goto, Toyohashi, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

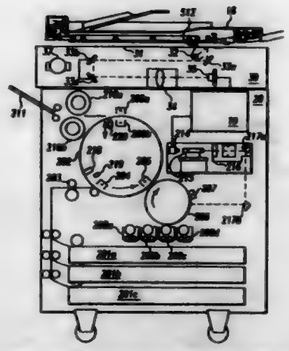
Filed Apr. 3, 1995, Ser. No. 415,787

Claims priority, application Japan, Apr. 5, 1994, 6-092989

Int. Cl.[6] G03G *15/01*

U.S. Cl. 399—45 21 Claims

1. An image forming apparatus which scans an original document by a scanner and transfers a scanned image onto a copy sheet, said image forming apparatus comprising:



means for setting on a document platen a maximum number of document sheets placeable on said document platen;

a transfer member for supporting a number of copy sheets equal to said maximum number of document sheets placed on said document platen so as to form scanned images of the document sheets onto the supported copy sheets; and

detection means for detecting said maximum number of document sheets placeable on said document platen by comparing the size of the document sheets and the document platen size.

5,596,401

PARTICLE ANALYZING APPARATUS USING A COHERENCE LOWERING DEVICE

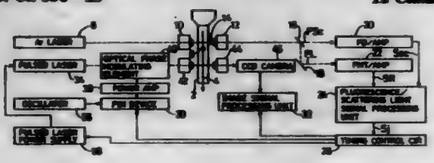
Hideo Kanamori, Kobe, Japan, assignor to TOA Medical Electronics Co., Ltd., Hyogo-ken, Japan

Filed Sep. 14, 1994, Ser. No. 305,657

Claims priority, application Japan, Sep. 16, 1993, 5-230235

Int. Cl.[6] G01N *15/14*; G06K *9/20*

U.S. Cl. 356—23 **12 Claims**



1. A particle analyzing apparatus comprising:

flow means, having a light-transmissive flow cell, for allowing subject particles in a sample liquid to flow in a separated state;

laser beam illuminating means for illuminating at least one of the subject particles flowing in the flow cell with a laser beam;

coherence lowering means for lowering coherence of the laser beam by nonlinear optical effect;

capturing means receiving light from the at least one subject particle, for capturing an image of the at least one subject particle; and

image processing means for processing and analyzing the captured image of the at least one subject particle.

5,596,402

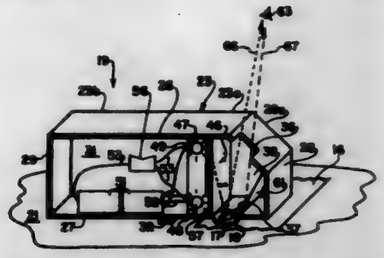
VIEWING DEVICE AND METHOD FOR ASCERTAINING SIMULTANEOUSLY OPTICAL COLOR SHIFT CHARACTERISTICS OF AN OPTICALLY VARIABLE DEVICE

Charles T. Markantes, and Roger W. Phillips, both of Santa Rosa, Calif., assignors to Flex Products, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 330,982, Oct. 27, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 607,919

Int. Cl.[6] G06K *9/74*; B42D *15/00*; G02B *27/22*; G01N *21/25*

U.S. Cl. 356—71 **28 Claims**



1. A viewing device for use by an observer to view a local area of a pattern of an instrument of value, the pattern formed from a generally planar optically variable device using optical interference technology and having optical color shift characteristics so as to reflect a first color when viewed at a first viewing angle and a second color when viewed at a second viewing angle relative to a light source, comprising a viewing structure adapted for ascertaining that the instrument of value is authentic, the viewing structure permitting the observer to view the local area of the pattern formed from the optically variable device in a fixed spatial orientation, and means carried by the viewing structure for permitting the observer to see the local area of the pattern formed from the optically variable device simultaneously in juxtaposed first and second colors without movement of the observer, the viewing device or the pattern, said means including a reflector carried by the viewing structure and disposed at an angle relative to the pattern for reflecting the second color from the local area of the pattern to the observer.

5,596,403

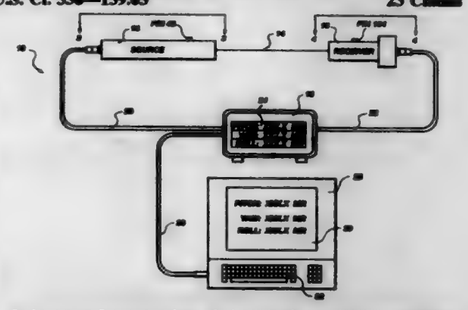
SYSTEM AND METHOD FOR MEASURING ANGULAR POSITION

Tod F. Schiff; Daniel R. Cheever, and Daniel J. Wilson, all of Bozeman, Mont., assignors to TMA Technologies, Inc., Bozeman, Mont.

Filed Dec. 2, 1994, Ser. No. 349,598

Int. Cl.[6] G01B *11/26*

U.S. Cl. 356—139.03 **23 Claims**



1. A system for measuring relative angular position, comprising:

a source assembly capable of producing modulated light by imposing a modulation on light produced by a light source,

said source assembly also capable of producing a phase reference signal corresponding to said modulation, said source assembly located along a roll-axis;

a polarizer capable of producing polarized light by polarizing modulated light produced by said source assembly, said polarizer located along the roll-axis at a distance from said source assembly;

a receiver assembly capable of detecting the power of polarized light produced by said polarizer and capable of producing in response a corresponding power signal; and

an analyzer capable of analyzing said phase reference signal and said power signal and using a time difference between said phase reference signal and said power signal to produce a roll position signal corresponding to the angular position of said source assembly relative to said polarizer about the roll-axis.

5,596,404

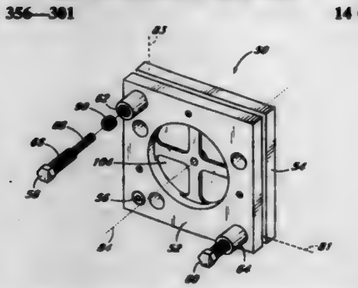
RAMAN GAS ANALYSIS SYSTEM WITH FLEXIBLE WEB AND DIFFERENTIAL THREAD FOR PRECISION OPTICAL ALIGNMENT

Kent F. Beck, West Valley City, and Charles V. Owen, Highland, both of Utah, assignors to Albion Instruments, Inc., Salt Lake City, Utah

Filed Dec. 30, 1994, Ser. No. 366,840

Int. Cl.[6] G01D *3/44*; H01S *3/086*

U.S. Cl. 356—301 **14 Claims**



1. An apparatus for making fine adjustments in an optical system comprising:

a first structural component having a first threaded hole therein, said first threaded hole having a first thread pitch, said first structural component further defining a first aperture therein;

a second structural component having a second threaded hole therein, said second threaded hole having a second thread pitch, said second structural component further defining a second aperture therein;

a flexible web component which defines a third aperture wherein said flexible web component connects said first structural component to said second structural component configured such that said first, second and third apertures are aligned which each other; and

a first lead screw having a longitudinal axis and a first set of threads extending from a first end of said first lead screw toward a midpoint along said first lead screw longitudinal axis and a second set of threads extending from a second end of said first lead screw toward said midpoint, wherein said first set of first lead screw threads has a pitch substantially equal to said first thread pitch and said second set of threads has a pitch substantially equal to said second thread pitch, said first threaded lead screw engaging said first and second threaded holes in said first and second structural components thereby joining said first and second structural components, said first lead screw and threaded holes forming a differential thread having an equivalent pitch which is substantially less than both of said first and second thread pitches to finely adjust the position of said first and second structural components relative to each other about said flexible web component.

5,596,405

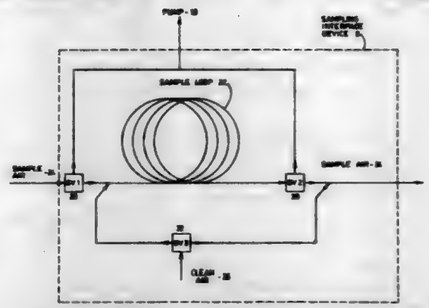
METHOD OF AND APPARATUS FOR THE CONTINUOUS EMISSIONS MONITORING OF TOXIC AIRBORNE METALS

Michael D. Seltzer, Ridgecrest, Calif., and Robert B. Green, Richland, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1995, Ser. No. 540,602

Int. Cl.[6] G01J *3/443*; G01N *21/73*

U.S. Cl. 356—316 **10 Claims**



1. A portable continuous emissions monitor for analyzing an air sample from an incinerator by an ICP-AES apparatus, comprising:

(a) a sampling interface device having:

(i) a first elongated conduit having an inlet end and an outlet end, first solenoid valve being disposed at the inlet end and second solenoid valve being disposed at the outlet end, a sample loop being disposed between the first solenoid valve and the second solenoid valve;

(ii) a second elongated conduit having a first end and a second end, the first end being connected to the first elongated conduit between the inlet end and the sample loop to form a junction, and the second end being connected to the first elongated conduit between the outlet end and the sample loop to form a junction, third solenoid valve being disposed between the first end and the second end;

(b) means for transporting said air sample to said sampling interface device at the inlet end of the first elongated conduit;

(c) an ICP-AES apparatus coupled to said sampling interface device at the outlet end of the first elongated conduit;

(d) means for propelling said air sample from said incinerator through said sampling interface device connected at the first solenoid valve and the second solenoid valve; and

(e) an analyzer coupled to the ICP-AES apparatus, the analyzer being operable to quantify metal concentration of the air sample based on an emissions signal from the ICP-AES apparatus.

5,596,406

SAMPLE CHARACTERISTIC ANALYSIS UTILIZING MULTI WAVELENGTH AND MULTI ANGLE POLARIZATION AND MAGNITUDE CHANGE DETECTION

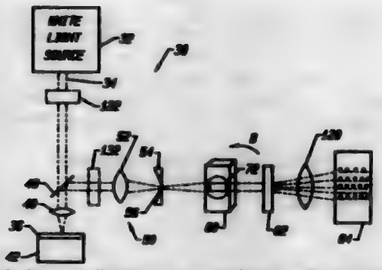
Allan Rosencwaig, Danville, and David L. Willenborg, Dublin, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Continuation of Ser. No. 368,420, Jan. 4, 1995, abandoned, which is a division of Ser. No. 93,178, Jul. 16, 1993, Pat. No. 5,412,473. This application Aug. 15, 1995, Ser. No. 532,871

Int. Cl.[6] G01J *4/00*; *3/28*

U.S. Cl. 356—327 **9 Claims**

1. An apparatus for evaluating a characteristic of a sample comprising:



a polychromatic light source means for generating at least one probe beam directed to reflect off and interact with the sample surface;

a first detector for measuring changes in a magnitude of the reflected probe beam resulting from the interaction with the sample and generating first output signals corresponding to a plurality of different wavelengths;

second detector for analyzing a change in polarization state of the reflected probe beam resulting from the interaction with the sample and generating second output signals corresponding to a plurality of different wavelengths, with said second output signals being separate and independent from the first output signals; and

processor for deriving information about a characteristic of the sample based on a combination of the first output signals representing the change in magnitude measurement as a function of wavelength and the second, independent output signals representing the polarization state analysis as a function of wavelength such that ambiguities in the result are minimized.

5,596,407

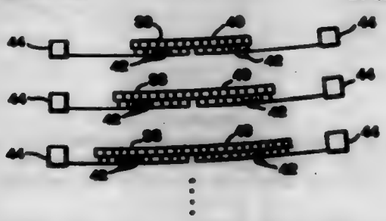
OPTICAL DETECTOR FOR ECHELLE SPECTROMETER

Andrew T. Zander, Cupertino; Charles B. Cooper, III, Redwood City, and Ring-Ling Chien, San Jose, all of Calif., assignors to Varian Associates, Inc, Palo Alto, Calif.

Filed Jun. 7, 1995, Ser. No. 477,169

Int. Cl.[6] G01J *3/18;3/36*

U.S. Cl. 356—328 **14 Claims**



1. A solid-state detector for an echelle spectrometer, comprising:

a plurality of sensing elements on a surface of the detector arranged to form a plurality of sensing element arrays,

the plurality of sensing element arrays forming a corresponding plurality of skewed lines on the detector surface, each skewed line positioned to lie along a projection of an echelle diffraction order so as to continuously track the order over the free spectral range.

5,596,408

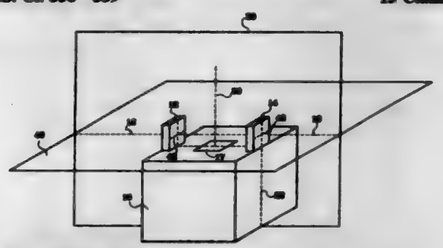
TURBIDITY SENSOR WITH REPLACEABLE COVERS

Brad L. Cummins, Freeport; Timothy K. Erickson, Lena; Gary R. O'Brien, Freeport; Alan V. Sheriff, Freeport, and Duane J. Sias, Freeport, all of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 7, 1996, Ser. No. 646,217

Int. Cl.[6] G01N *21/00*

U.S. Cl. 356—339 **15 Claims**



8. A turbidity sensor, comprising:

a support structure;

a light source attached to said support structure;

a first photosensitive device attached to said support structure, said light source being aligned with said first photosensitive device to transmit a beam of light to said first photosensitive device in a direction along a first path line, said first path line being disposed within a first plane which intersects said support structure, said first path line being disposed within a second plane which is in nonintersecting relation with said support structure, said first plane being perpendicular to said second plane;

a second photosensitive device attached to said support structure and aligned to receive light from said light source which is scattered in a direction along a second path line by a fluid within a detection zone, said second path line being disposed within said first plane and being perpendicular to said second plane, said detection zone being intersected by said first and second path lines; and

a cover attached to said support structure, said cover having light transmissive portions to permit light to pass through said cover along said first and second path lines, said cover being shaped to conduct said fluid through said detection zone.

5,596,409

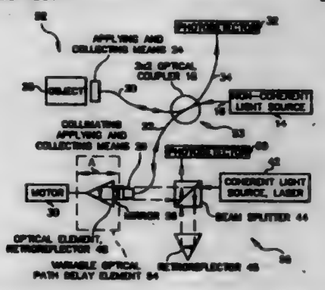
ASSOCIATED DUAL INTERFEROMETRIC MEASUREMENT METHOD FOR DETERMINING A PHYSICAL PROPERTY OF AN OBJECT

Michael A. Marcus, Honeoye Falls; Stanley Green, Rochester, and David C. Wideman, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1995, Ser. No. 408,770

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—357 **19 Claims**



1. A method for determining a physical property of an object having at least one surface which reflects light, said method comprising the steps of:

providing a first and second interferometer in association by means of sharing a common variable optical path delay element, said first interferometer having a coherent light source having a wavelength λ, and forming a coherent light interference signal, said second interferometer having a non-coherent light source;

positioning the object such that said non-coherent light source is incident the object;

forming a non-coherent light interference signal indicative of the physical property of the object;

displacing said variable optical path delay element with a periodic, continuously-varying velocity profile and measuring said coherent light interference signal as a function of displacement of said variable optical path delay element, the displacement of said variable optical path delay element being over a distance sufficient to determine the physical property of the object;

utilizing said coherent light interference signal to generate data acquisition trigger signals at constant displacement intervals of said variable optical path delay element;

utilizing said generated data acquisition trigger signals to sample the amplitude of said non-coherent light interference signal; and

determining the physical property of the object from said non-coherent light interference signal.

5,596,410

INTERFEROMETER SYSTEM AND METHOD FOR CONTROLLING THE ACTIVATION OF A REGULATING INTERFEROMETER IN RESPONSE TO AN OUTPUT SIGNAL

Peter Hantel, Am Glasemarkt 6, D-37276 Meinhard, and Jürgen Thiel, Siemensstrasse 11, D-52074 Aachen, both of Germany

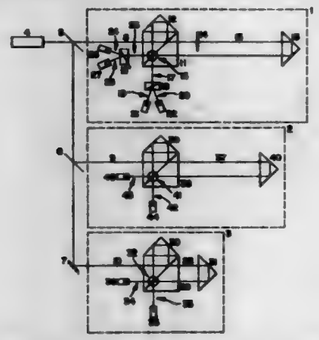
PCT No. PCT/DE93/00843, § 371 Date Apr. 24, 1995, § 102(e) Date Apr. 24, 1995, PCT Pub. No. WO94/07109, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 13, 1993, Ser. No. 483,824

Claims priority, application Germany, Sep. 14, 1992, 42 30 748.1

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—358 **29 Claims**



1. A method of using a laser interferometer comprising a measuring interferometer and at least a first regulating interferometer and a second regulating interferometer having regulating sections of differing lengths, said method comprising the steps of:

employing a laser in said measuring interferometer to produce a beam of light in said measuring interferometer;

directing a portion of said beam of light to said first regulating interferometer;

producing a first output signal from said first regulating interferometer;

setting a first maximum signal threshold value;

setting a second maximum signal threshold value;

setting a first minimum signal threshold value;

setting a second minimum signal threshold value;

switching on said first regulating interferometer;

wherein when the output signal of the first regulating interferometer has a value which rises above said second maximum signal threshold value or falls below said second minimum signal threshold value said second regulating interferometer is switched on if it has the next smallest regulating section length relative to the length of said regulating section of said first regulating interferometer;

wherein when the output signal of the first regulating interferometer has a value which falls below said first maximum signal threshold value or rises above said first minimum signal threshold value, said second regulating interferometer is switched on if it has the next largest regulating section length relative to the length of said regulating section of said first regulating interferometer;

controlling, at any given time, the wavelength of said beam of light in response to the output control signal corresponding to the regulating interferometer switched on at that given time.

5,596,411

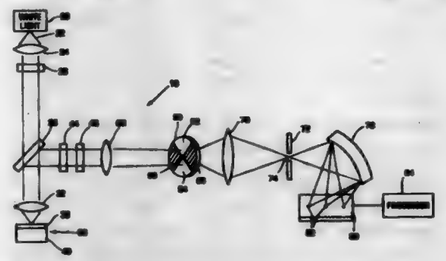
INTEGRATED SPECTROSCOPIC ELLIPSOMETER

Jeffrey T. Fanton, Los Altos, and Jon Opsal, Livermore, both of Calif., assignors to Therma-Wave, Inc., Fremont, Calif.

Continuation of Ser. No. 327,315, Oct. 21, 1994, abandoned. This application Mar. 18, 1996, Ser. No. 614,522

Int. Cl.[6] G01J *4/00*

U.S. Cl. 356—369 **22 Claims**



1. An apparatus for evaluating a sample comprising:

a source for generating a beam of polychromatic light;

means for polarizing the light beam;

lens means for focusing the light beam onto the surface of the sample in a manner so that various rays within the beam create a spread of angles of incidence;

means for retarding the phase of one polarization state of the light beam;

means for creating interference effects between the two polarization states of the beam after it has interacted with the sample;

filter means located in an image plane of the lens means for filtering the light beam, said filter means for transmitting at least a portion of the light passing through a first radial quadrant and blocking light from the two radial quadrants disposed orthogonally thereto;

optical means for focusing the transmitted light and angularly dispersing the focused light as a function of wavelength;

means for measuring the intensity of the focused light as a function of position;

means for obtaining a second independent intensity measurement of light having the characteristics of the light which was blocked by said filter means during the first intensity measurement; and

processor means for evaluating the sample based on the independent measurements, wherein said measurements represent an integration of rays at various angles of incidence.

5,596,412

PROCESS AND DEVICE FOR THE QUANTIFIED ASSESSMENT OF THE PHYSIOLOGICAL IMPRESSION OF REFLECTIVE SURFACES

Konrad Lex, Kleingedorf, Germany, assignor to BYK-Gardner, Geretsried, Germany

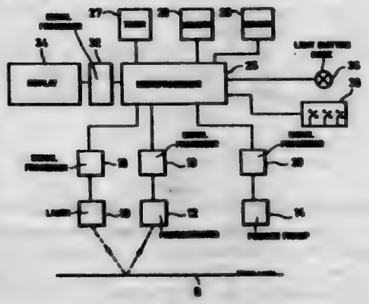
PCT No. PCT/EP92/01635, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO93/04338, PCT Pub. Date Mar. 4, 1993

PCT Filed Jul. 17, 1992, Ser. No. 193,289

Claims priority, application Germany, Aug. 16, 1991, 41 27 215.3

Int. Cl.[6] G01B 11/30

U.S. Cl. 356—371 10 Claims



1. A process for quantitative measurement of the appearance of a reflective surface comprising:

measuring light reflected from each of X_i locations on a reflective surface, where i ranges from 1 to n, the locations being uniformly spaced along a path on the reflective surface, thereby determining a brightness value for each of the locations X_i;

storing the brightness values for each of the locations X_i;

for a location X_K on the path, retrieving the brightness values for N_1 locations on the path immediately before the location X_K, retrieving the brightness values for N_2 locations on the path immediately after the location X_K, and retrieving the brightness value for the location X_K, where N_1 and N_2 are integers;

determining a surface value for the location X_K by statistically analyzing the brightness values of the N_1 locations, the X_K location, and the N_2 locations; and

repeating the steps of retrieving brightness values and determining surface values for each of a plurality of points X_i and plotting the surface values to produce a quality characteristic of the reflective surface.

5,596,413

SUB-MICRON THROUGH-THE-LENS POSITIONING UTILIZING OUT OF PHASE SEGMENTED GRATINGS

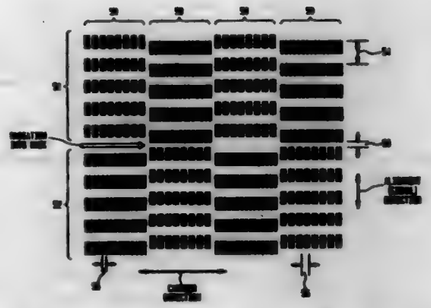
Stuart Stanton, Bridgewater; Donald L. White, Morris Plains, and George G. Zipfel, Jr., Summit, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 17, 1995, Ser. No. 516,368

Int. Cl.[6] G01B 11/00

U.S. Cl. 356—401 34 Claims

1. Process comprising image projection whereby a pattern image of a pattern on an object body is focused on a target body by projection imaging with an object beam, in which the pattern image is aligned on the target body by an alignment process including position-sensing, position-sensing comprising illuminating a first mark on one body to produce a signal beam for projecting a mark image of the first mark on the second body, in



which the position of the mark image is determined relative to a conjugate mark on the second body, and aligning the pattern image based on position-sensing characterized in that

both marks include a grating, here designated "signal grating", in that at least one of the signal gratings is segmented so that segments are out of phase with each other, in that the grating periods of the mark image and the conjugate mark are harmonically related, in that at least one signal grating is combined with a carrier grating to produce a combined grating so that lines of one grating are constituted of lines forming the other grating, in that the signal beam is diffracted by the carrier grating so that the mark image is superimposed on the conjugate mark with signal gratings parallel, in that position-sensing includes detection of the relative degree of overlap for the two segments, and in that alignment corresponds with relative degree of overlap.

5,596,414

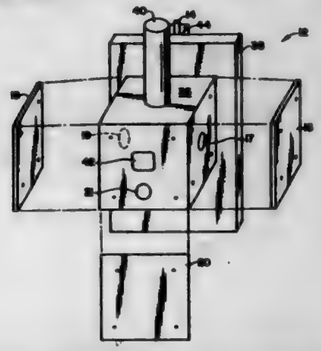
SOLID STATE SPECTROFLOURIMETER AND METHOD OF USING THE SAME

Jonathan M. Tyler, 8306 Davies Road, Edmonton, Alberta, Canada

Continuation of Ser. No. 25,362, Feb. 16, 1993, Pat. No. 5,422,726. This application Jun. 5, 1995, Ser. No. 461,552

Int. Cl.[6] G01N 21/64

U.S. Cl. 356—417 30 Claims



1. A detector arrangement for use in a spectrofluorimeter that detects the presence of light emitted from a specimen in solution with a fluorophore comprising:

a light source which produces a pulse of light;

a detector which detects light emitted from said specimen in solution with said fluorophore, said detector including:

a first photodiode which produces a first emitted light signal proportional to said emitted light;

an optical cell made of a light absorbing medium, said optical cell containing, in hollowed out portions of said optical cell, a specimen holding area, a light receiving pathway disposed between said light source and said specimen holding area, and an emitted light pathway disposed between said specimen holding area and said first photodiode; and

an amplifier which amplifies said first emitted light signal produced by said first photodiode, said amplifier being disposed on a circuit board attached to said optical cell.

5,596,415

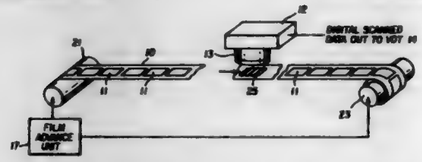
ITERATIVE PREDICTOR-BASED DETECTION OF IMAGE FRAME LOCATIONS

Patrick A. Cosgrove, Honeoye Falls; John Mitch, Webster, and Mark Niedzielski, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1993, Ser. No. 76,523

Int. Cl.[6] B41J 2/47; G03B 27/52; H04N 1/21;1/23

U.S. Cl. 358—296 73 Claims



1. A method of processing an image recording medium that contains a plurality of image frames, each of said image frames having respective location on said image recording medium, comprising the steps of:

(a) scanning said image recording medium so as to produce data representative of contents of successive scan lines of said image recording medium;

(b) processing data produced in step (a) in accordance with a first image frame identification operator for locating a well formed image frame, said first image frame identification operator, in response to identifying a location of a well formed image frame on said image recording medium, generating a first output representative of a first portion of said image recording medium containing said location of a well formed image frame, wherein a well formed image frame is defined as having prescribed image frame attributes including a first spatial region of image modulance that is bounded by leading and trailing edges, said leading and trailing edges of said well formed image frame demarcating respective leading and trailing image frame boundaries between said first spatial region of image modulance and respective second and third regions adjacent to said first spatial region of image modulance, said second and third regions being associated with an image level that is less than a prescribed threshold representative of an absence of image information;

and wherein said first image frame identification operator is operative to locate a well formed image frame, and to generate said first output associated therewith, irrespective of whether or not either a leading or a trailing image frame boundary of another image frame is adjacent to said location of a well formed image frame; and

(c) in response to step (b) locating a well formed image frame, processing data produced in step (a) associated with second portions of said image recording medium other than said first portion containing the location of the well formed image frame located in step (b), in accordance with a second image frame identification operator, said second image frame identification operator locating additional image frames on said image recording medium in accordance with at least one, but less than all, of said prescribed image frame attributes of a well formed image frame, and generating second outputs representative of locations of said additional image frames.

5,596,416

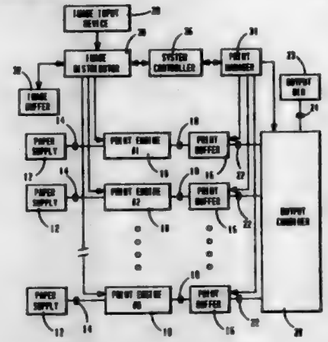
MULTIPLE PRINTER MODULE ELECTROPHOTOGRAPHIC PRINTING DEVICE

Michael W. Berry; Francis A. Rowe, both of Duluth, and E. Neal Tompkins, Atlanta, all of Ga., assignors to T/R Systems, Norcross, Ga.

Filed Jan. 13, 1994, Ser. No. 180,636

Int. Cl.[6] H04N 1/21;1/46; G03G 21/00

U.S. Cl. 358—296 32 Claims



1. A multiple print engine, comprising:

a plurality of electrophotographic print engine modules, each of said print engine modules operable to receive an image file corresponding to an input sheet image and for printing the input sheet image on an image carrier for output therefrom;

a plurality of print buffers, each associated with the output of at least one of said print engine modules, and each of said print buffers operable to receive the output of the associated one of said print engine modules as a completed print job; and

an output collator for selectively retrieving the output of each of said plurality of print buffers in accordance with a predetermined output sequence.

5,596,417

COLOR SIGNAL PROCESSOR FOR INVERTING R-Y AXIS OF CHROMINANCE SIGNAL

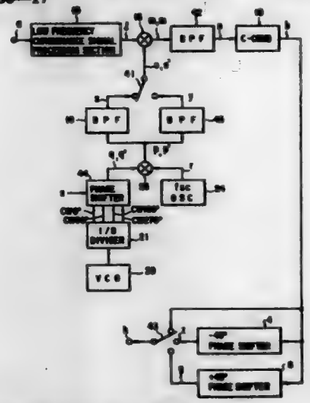
Ichiro Kisuru, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1994, Ser. No. 352,831

Claims priority, application Japan, Nov. 30, 1993, 5-299628

Int. Cl.[6] H04N 9/79;5/21

U.S. Cl. 386—17 11 Claims



1. A color signal processor comprising:

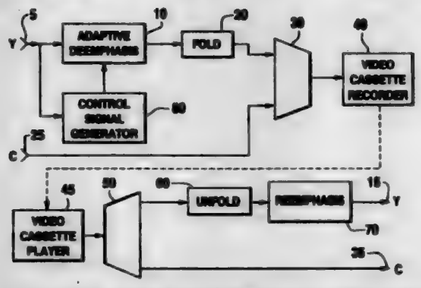
first oscillating means for generating a signal having a frequency which is an integral multiple of a chrominance signal whose frequency is converted to a low frequency;
dividing means for dividing the signal generated by said first oscillating means into a plurality of signals having phases different from each other by 90°;
a control circuit for generating control signals based on a horizontal sync signal;
selecting means for selecting one of the signals divided by said dividing means in accordance with a control signal generated by said control circuit for controlling whether or not an R-Y axis of said chrominance signal is inverted, and outputting a selected signal;
second oscillating means for generating a color subcarrier;
first multiplying means for multiplying said color subcarrier generated by said second oscillating means with the selected signal outputted from said selecting means to generate a first arithmetic carrier signal when said R-Y axis is not inverted, and for multiplying said color subcarrier by a 180° phase shifted signal output from said selecting means to generate a second arithmetic carrier signal when said R-Y axis is inverted;
extracting means for extracting a first arithmetic carrier signal from a signal outputted from said first multiplying means when said R-Y axis is not inverted, and extracting a second arithmetic carrier signal from a signal outputted from said first multiplying means when said R-Y axis is inverted;
second multiplying means for multiplying one of the first and second arithmetic carrier signals extracted from said extracting means and said chrominance signal; and
filter means for removing from the output signal of said second multiplying means an upper side band component, formed of a sum of said color subcarrier and said chrominance signal, and a lower side band component, formed of a difference between said color subcarrier and said chrominance signal.

5,596,418

DEEMPHASIS AND SUBSEQUENT REEMPHASIS OF HIGH-ENERGY REVERSED-SPECTRUM COMPONENTS OF A FOLDED VIDEO SIGNAL

Christopher H. Strolle, Glenside, Pa.; Allen L. Limberg, Ringoes, N.J.; Werner F. Wedam, Lawrenceville, N.J.; Raymond Schnitzler, Highland Park, N.J.; Hermann J. Wecksenbrock, Bordentown, N.J.; Jung W. Ko, Lawrenceville, N.J., and Jong K. Yun, Suwon, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 87,362, Jul. 8, 1993, which is a continuation-in-part of Ser. No. 604,493, Oct. 26, 1990, abandoned, and a continuation-in-part of Ser. No. 635,197, Jan. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 569,829, Aug. 17, 1990, Pat. No. 5,113,262. This application Jun. 7, 1995, Ser. No. 478,766
Int. Cl.[6] H04N 9/79
U.S. Cl. 386—9 19 Claims



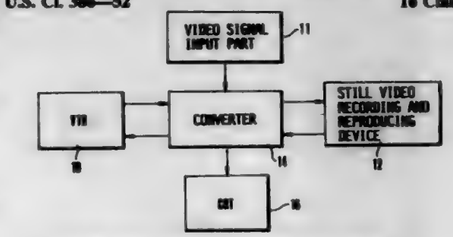
1. A recording system for recording on a recording medium a representation of a luminance signal received for recording, said recording system comprising:
means, responding to said luminance signal received for recording, for producing a control signal indicative of a desired amount of reduction of a high-frequency portion of said luminance signal vis-a-vis a low-frequency portion of said luminance signal during recording;
means for reducing the level of the high-frequency portion of said luminance signal by said desired amount in response to said control signal, thereby to generate a luminance signal with deemphasized high frequencies; and
means for recording on said medium said luminance signal with deemphasized high frequencies, wherein said means for producing a control signal comprises:
means for seperating from said luminance signal received for recording a high-frequency portion thereof;
a rectifier connected for generating a rectified response to said high-frequency portion separated from said luminance signal;
a threshold circuit connected for responding only to those portions of said rectified reaponse exceeding said threshold level; and
a lowpass filter connected for producing said control signal in response to the response of said threshold circuit, for reducing the level of the high-frequency portion of said luminance signal only if the level of said separated high-frequency portion exceeds a predetermined threshold level.

5,596,419

VIDEO SYSTEM USING TWO DIFFERENT KINDS OF RECORDING MEDIA

Katsuji Yoshimura; Koji Takahashi, and Yasutomo Suzuki, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 853,539, Mar. 18, 1992, abandoned, which is a continuation of Ser. No. 630,486, Dec. 19, 1990, Pat. No. 5,126,851, which is a continuation of Ser. No. 202,217, Jun. 3, 1988, abandoned. This application Nov. 15, 1993, Ser. No. 152,965
Claims priority, application Japan, Jun. 16, 1987, 62-150028; Jun. 16, 1987, 62-150029
Int. Cl.[6] H04N 5/76;9/79; G11B 5/00
U.S. Cl. 386—52 16 Claims



1. A video signal processing system, comprising:
(a) input means for inputting moving image signals which have programs, image plane portions of the moving image signals defining representative still picture signals;
(b) first storing means for storing moving image signals, said first storing means further storing control information;
(c) second storing means for storing still picture signals;
(d) extracting means for extracting still picture signals from the moving image signals input by said input means and the moving image signals read out from said first storing means;
(e) generating means for generating control information according to the moving image signals input by said input means; and
(f) mode setting means for setting a mode of said system among a plurality of modes,

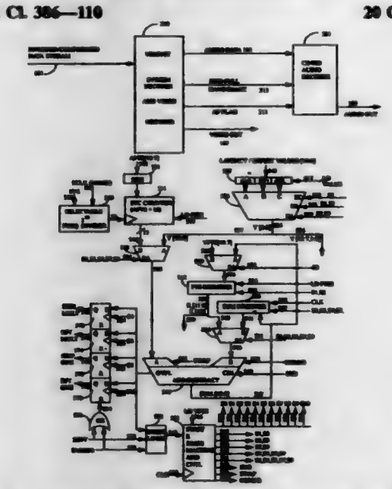
said plurality of modes including a first mode in which said first storing means stores the moving image signals input from said input means, said second storing means stores the still picture signals extracted from the moving image signals input by said input means and the control information generated by said generating means is also stored and second mode in which said second storing means stores the still picture signals extracted from the moving image signals read out from said first storing means and control information read out from said first storing means is also stored.

5,596,420

AUTO LATENCY CORRECTION METHOD AND APPARATUS FOR MPEG PLAYBACK SYSTEM

Daniel Duran, San Jose, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 358,610, Dec. 12, 1994. This application Jun. 7, 1995, Ser. No. 483,580
Int. Cl.[6] H04N 5/76;5/91;9/475
U.S. Cl. 386—110 20 Claims



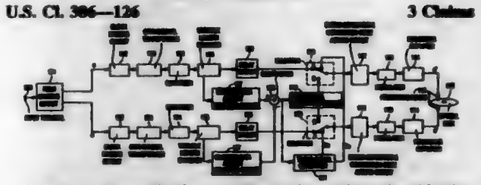
16. A method for controlling playback of audio and video signals from an encoded data stream comprising at least audio data packets, video data packets, audio presentation time stamps and video presentation time stamps, said apparatus comprising:
separating the encoded data stream into an encoded audio data stream comprising at least the audio data packets and audio presentation time stamps and an encoded video data stream comprising at least the video data packets and video presentation time stamps;
combining a decoder latency value to one of the video and audio presentation time stamp values to produce a normalized presentation time stamp value;
subtracting the normalized presentation time stamp value from the other of the audio and video presentation time stamp values to produce a difference value;
comparing the difference value with a predetermined time drift threshold and outputting a frame skip/repeat signal if the difference value exceeds the pre-determined time drift threshold; and
modifying the latency value if the frame skip/repeat signal is generated in the comparing step.

5,596,421

OPTICAL DISK RECORDER FOR VIDEO SIGNALS AND AN OPTICAL DISK FOR USE THEREIN

Hideaki Shibata, Osaka, and Masahiro Honjo, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 3, 1994, Ser. No. 253,883
Claims priority, application Japan, Jun. 3, 1993, 5-133138; Jun. 25, 1993, 5-154770
Int. Cl.[6] H04N 5/85
U.S. Cl. 386—126 3 Claims



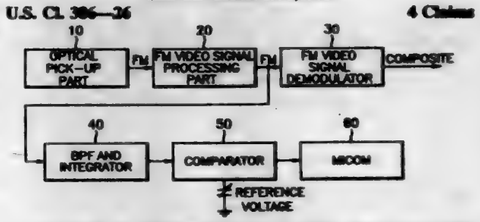
1. An optical recorder for recording an input video signal having video data in at least one frame period, said input video signal having a first resolution, said optical recorder comprising:
dividing means for dividing the video data contained in one frame period of the input video signal into two data groups;
means for independently encoding each of said two data groups to produce a first video signal and a second video signal respectively, each of said first video signal and said second video signal having a second resolution, said second resolution is lower than said first resolution, said
means for recording said first video signal and said second video signal on an optical disk in a first channel and a second channel respectively;
counting means tier counting the amount of variable length data in the first video signal and the second video signal for a designated period of time; and
means tier adding pseudo data to the variable length data of one of the first video signal and the second video signal which has a smaller amount of the variable length data so that a substantially equal amount of variable length data is in the first video signal and the second video signal.

5,596,422

NTSC OR PAL SIGNAL DETECTING CIRCUIT OF A LASER DISK PLAYER SYSTEM

Chun-Sup Kim, Suwon, Rep. of Korea, assignor to Sagsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 28, 1994, Ser. No. 330,791
Claims priority, application Rep. of Korea, Oct. 30, 1993, 1993-22933
Int. Cl.[6] H04N 5/76;5/46
U.S. Cl. 386—26 4 Claims



1. A circuit for detecting one of an NTSC signal and a PAL signal in a laser disk player system, comprising:
video signal processing means for shaping a waveform of a frequency modulation video signal and for outputting a resulting shaped waveform;
filtering means for filtering the shaped waveform;
integrating means for integrating the filtered signal and for outputting a resulting integral value in the form of an electrical signal; and
comparing means for comparing the integral value outputted from said integrating means with a predetermined reference

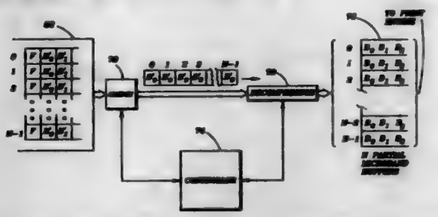
voltage, and for outputting the NTSC detecting signal or the PAL detecting signal in accordance with the comparison.

5,596,423

METHOD AND APPARATUS FOR COMPRESSION AND DECOMPRESSION OF DATA USED BY A SERIAL PRINTER

Thomas B. Pritchard, Brush Prairie, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 2, 1995, Ser. No. 399,243
Int. Cl.[6] H04N 1/00
U.S. Cl. 358—433 9 Claims



1. A data compression and decompression method for a printer having at least one printhead means which produces a swath of Y rows of pixel data in a single pass across a sheet, said method comprising the steps of:

a. storing a microband of pixel data, a swath including N microbands, each microband including y rows of pixel data, where N>=2 and y×N>=Y;

b. compressing said microband of pixel data into compressed microblocks, a microblock comprising a block of pixel data that is m bits wide by y rows high, where m is a small fraction of M bits of pixel data that are printable by said printhead means across said sheet;

c. repeating steps (a) and (b) for all remaining microbands of said swath, to thereby create compressed, positionally corresponding sets of microblocks for all said N microbands;

d. decompressing all said N microbands of pixel data compressed in steps (b) and (c), said decompressing acting on each said compressed, positionally corresponding set of microblocks to recreate said N microbands of decompressed pixel data; and

e. feeding said decompressed pixel data from said set of N microbands, in parallel, to said printhead means.

5,596,424

SCANNING OPTICAL SYSTEM HAVING IMAGE FORMING OPTICAL SYSTEM AND READING OPTICAL SYSTEM WITH AT LEAST ONE COMMON OPTICAL COMPONENT

Takashi Ezaka, and Yoshihiro Yamazaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 183,810
Claims priority, application Japan, Jan. 20, 1993, 5-026074; Jan. 19, 1994, 6-18922
Int. Cl.[6] H04N 1/04; 1/207
U.S. Cl. 358—474 78 Claims

39. A scanning optical system, comprising:

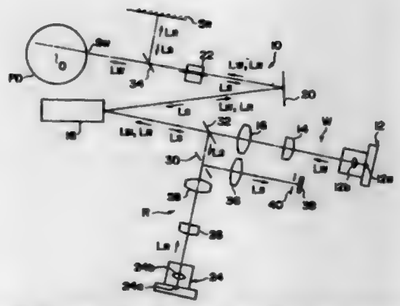
image forming optical system for emitting a writing beam modulated in accordance with an image information onto a destination surface;

means for deflecting said writing beam to scan a destination surface, said deflecting means rotating to scan the destination surface;

means for emitting a reading beam to scan an object surface; and

a reading optical system including means for receiving light reflected from said object surface to obtain an image information of said object surface, said means for deflecting said writing beam also deflecting said reflected light from said object surface, and said light receiving means disposed along an optical path of said reflected light after said deflecting means,

wherein a predetermined optical path is used by both the writing beam and the reflected light.



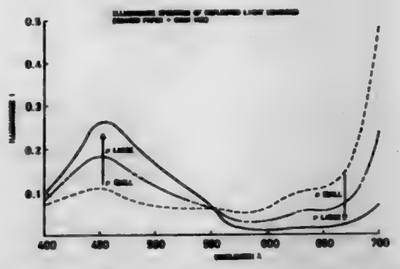
5,596,425

METHOD AND APPARATUS FOR SIMULATING COLOR PRINT

Nobuaki Umi, Tokyo; Hiroki Fujimoto, Tenjinkitamachi; Kazutaka Taniguchi, Tenjinkitamachi, and Atsushi Imamura, Tenjinkitamachi, all of Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Japan

Filed Feb. 23, 1995, Ser. No. 393,331
Claims priority, application Japan, Feb. 23, 1994, 6-051227
Int. Cl.[6] H04N 1/46; G03B 3/10
U.S. Cl. 358—500 22 Claims





1. A method of simulating a color of each reflection point in a color print observed by an observer with an output device, the color print being disposed in a three-dimensional space and irradiated by a light source, the light source emitting a light beam having a luminance spectrum $\phi(\lambda)$ where λ denotes a wavelength of the light beam, the method comprising the steps of:

determining an illuminance spectrum $I(\theta,\rho,\lambda)$ of reflected light reflected at the reflection point according to an equation:

$$I(\theta,\rho,\lambda)=\{S_s(\lambda)\cdot\cos^n\rho+S_d(\lambda)\cdot\cos\theta\}\phi(\lambda)+I_a(\lambda)$$

wherein $S_s(\lambda)$ and $S_d(\lambda)$ denote first and second reflection coefficients, respectively, ρ denotes an angle between a first direction of the reflected light and a second direction from the reflection point to the observer, n is a constant, θ denotes an angle of reflection of the reflected light, and $I_a(\lambda)$ denotes an illuminance spectrum of environmental light observed by the observer;

integrating the illuminance spectrum $I(\theta,\rho,\lambda)$ over a wavelength range of visible light with respective three color matching functions of a device-independent colorimetric system, to thereby obtain tristimulus values in the device-independent colorimetric system representing the color of the reflection point; and

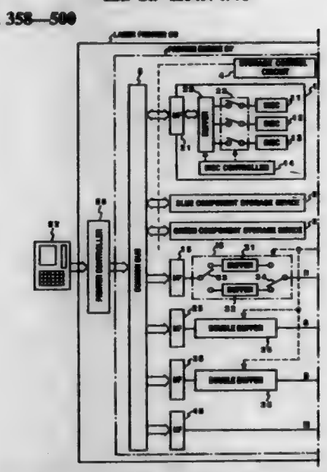
producing an image of the color print with the output device as a function of the tristimulus values.

5,596,426

IMAGE PROCESSING METHOD AND APPARATUS

Fumihiro Ueno, Yokohama; Akira Torisawa, Machida; Yasuo Ito, Inagi; Eihiro Sakaki, Chofu; Masaki Ohtake, Kawasaki; Hiromi Katsuka, Yokohama; Atsushi Kashihara, Hachioji, and Kaoru Seto, Chigasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 263,408, Jun. 21, 1994, abandoned, which is a continuation of Ser. No. 139,850, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 675,278, Mar. 26, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,466
Claims priority, application Japan, Mar. 30, 1990, 2-086164; Jul. 26, 1990, 2-199480
Int. Cl.[6] H04N 1/46
U.S. Cl. 358—500 31 Claims



1. A color image processing apparatus for receiving code data supplied from an external apparatus, generating dotted image data based on the code data, and outputting the dotted image data, comprising:

image data generating means for generating dotted image data for each color component based on the code data;

storage means for storing the dotted image data for one page;

buffering means capable of buffering one scan line of the dotted image data read from said storage means;

write means for writing the dotted image data to said buffering means;

read means for reading the dotted image data from said buffering means in synchronization with a synchronizing signal sent from an image forming unit; and

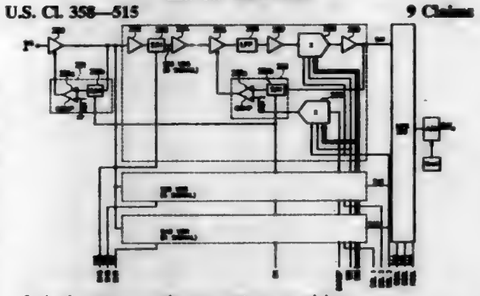
output means for transmitting the dotted image data to the image forming unit synchronously with said synchronizing signal.

5,596,427

IMAGE READING APPARATUS WITH A/D CONVERSION AND ADJUSTMENT THEREOF

Toshio Houma, Kawasaki; Nobuo Matsuoka, Yokohama; Shizuo Hasegawa, Tokyo; Yasunichi Suzuki, Harumachi; Hiroshi Itagaki, Yokohama, and Kenji Sanbara, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 636,441, Dec. 31, 1990, abandoned, which is a division of Ser. No. 144,049, Jan. 14, 1988, Pat. No. 5,121,230. This application Jul. 13, 1994, Ser. No. 274,351
Claims priority, application Japan, Jan. 19, 1987, 62-009471; Jan. 19, 1987, 62-009472; Jan. 19, 1987, 62-009473
Int. Cl.[6] H04N 1/03
U.S. Cl. 358—515 9 Claims



1. An image processing apparatus comprising:

color component signal providing means for converting an original image into a first set of color component electrical signals including at least first and second color component electrical signals, said providing means including image pick up means having a plurality of sensing elements;

processing means for processing said first set of color component electrical signals to produce signals representing a second set of color components;

first adjusting means for adjusting the first color component electrical signal of said first set in accordance with first adjusting information;

second adjusting means for adjusting the second color component electrical signal of said first set in accordance with second adjusting information, arranged independently of said first adjusting means; and

display means for displaying adjusting conditions of said first and second adjusting means in terms of said second set of color components.

5,596,428

COLOR MATCHING BY SYSTEMS CALIBRATION, LINEAR AND NON-LINEAR GAMUT MAPPING

Bart Tytgat, Grimbergen, and Paul Dierckx, Brussels, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Apr. 21, 1995, Ser. No. 426,985
Claims priority, application European Pat. Off., May 26, 1994, 94201495
Int. Cl.[6] H04N 1/60
U.S. Cl. 358—518 18 Claims

1. A method for reproducing a colour image represented by input colour signals i in a system comprising:

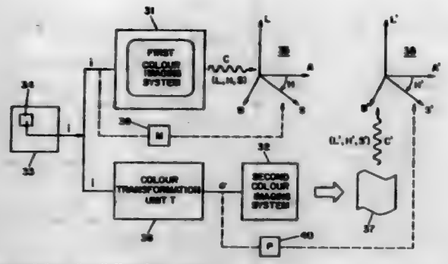
a first colour imaging system driven by said input colour signals i for imaging said colour image, each colour of said colour image having colour coordinates c in a pre-defined colour coordinate system and

a second colour imaging system driven by output colour signals o for imaging the reproduction of said colour image, each colour of said reproduction having colour coordinates c' in said pre-defined colour coordinate system;

and for obtaining a colour appearance match between:

said colour image on said first colour imaging system and

said reproduction on said second colour imaging system;



comprising the following steps:

determining, by calibrating the first imaging system, a first transformation M: c=M(i) that transforms the input colour signals i to the colour coordinates c;

determining, by calibrating the second imaging system, a second transformation P: c'=P(o) that transforms the output colour signals o to the colour coordinates c' including the steps of:

imaging a restricted set of output colour signals o on said second colour imaging system;

measuring the colour value c' corresponding to said output colour signals o; and

establishing a function, defined over all possible output colour signal values o, that approximates said measured colour values c' when it is evaluated in said restricted set of output colour signals;

deriving from said first and second transformation a colour transformation T: o=T(i) for transforming said input colour signals i to said output colour signals o;

producing an output colour signal o from each said input colour signal i from the image, according to said colour transformation T; and

driving said second imaging system by said output signals o to reproduce said colour image.

5,596,430

DISTRIBUTED INDEX LIGHT DEFLECTOR AND METHOD OF LIGHT DEFLECTION

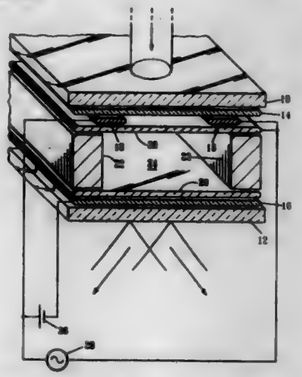
Masaki Hasegawa, Kamakura, and Fumiaki Yamada, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1994, Ser. No. 293,261

Claims priority, application Japan, Aug. 20, 1993, 5-206241

Int. Cl.[6] G02F 1/133;1/134

U.S. Cl. 349—74 **10 Claims**



1. A distributed index light deflector comprising:

a first transparent substrate in which a first high-resistance transparent electrode is disposed on one side surface thereof;

a second transparent substrate in which a second low-resistance transparent electrode is disposed on one side surface thereof, said second transparent substrate being disposed such that its surface, on which the second transparent electrode is disposed, is opposite to the surface on which the first transparent electrode of the first transparent substrate is disposed;

a liquid crystal interposed between said first transparent electrode and said second transparent electrode;

means for applying a first voltage along one end of said first high-resistance transparent electrode and a second voltage different from said first voltage along an opposite end of said first high-resistance transparent electrode to produce a voltage that gradually changes monotonically with position across said first high-resistance transparent electrode from said one end to said opposite end; and

means for applying a bias voltage to said second low-resistance transparent electrode, said first, second and bias voltages, when applied together, producing an electric field through said liquid crystal and a resulting index of refraction in said liquid crystal that both monotonically vary gradually and continuously across said liquid crystal to deflect linearly polarized light passing through said liquid crystal at a deflection angle that is determined by the difference between said first and second voltages.

5,596,429

LIQUID CRYSTAL DISPLAY

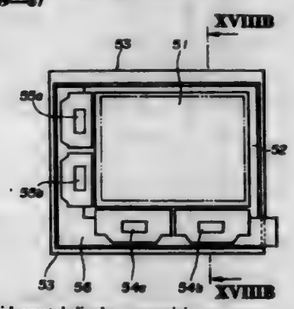
Shozo Kokawa; Michiharu Nishihara, and Yukikazu Sato, all of Yaita, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 69,392, Jun. 1, 1993, Pat. No. 5,467,208. This application Jul. 14, 1995, Ser. No. 502,847

Claims priority, application Japan, Jun. 1, 1992, 4-165298; Sep. 2, 1992, 4-234556; Dec. 25, 1992, 4-345012; Jan. 21, 1993, 5-27457

Int. Cl.[6] G02F 1/1335

U.S. Cl. 349—67 **6 Claims**



1. A liquid crystal display comprising:

a display means for displaying characters and graphics, said means including a display portion comprising at least a liquid crystal panel;

an illuminating means for illuminating the display portion of the liquid crystal panel; and

a converging means for converging light rays from the illuminating means at the display portion of the liquid crystal panel;

and said display characterized in that the illuminating means comprises a lamp, a light-guiding plate for receiving therein light rays of the lamp through a lateral surface thereof and for uniformly propagating and diffusing the light rays therein, a reflecting plate disposed on the rear surface of the light-guiding plate to reflect light rays from the rear surface of the light-guiding plate, and a diffusing plate disposed on the front surface of the light-guiding plate to diffuse light rays from the front surface of the light-guiding plate and in that the converging means, the light-guiding plate, the reflecting plate, and the diffusing plate are integrally welded to each other at least one peripheral position not affecting the display portion of the liquid crystal panel.

5,596,431

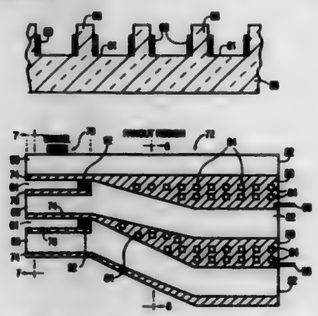
PLASMA ADDRESSED LIQUID CRYSTAL DISPLAY WITH ETCHED ELECTRODES

Petrus F. G. Bongaerts, Waalre; Jacob Bruinink, Eindhoven; Adrianus L. J. Burgmans, Eindhoven; Henri R. J. R. Van Helleputte, Eindhoven, all of Netherlands; Babar A. Khan, Ossining, N.Y., and Karel E. Kuijk, Dommelen, Netherlands, assignors to Philips Electronics North America Corp., New York, N.Y.

Filed Mar. 29, 1995, Ser. No. 413,052

Int. Cl.[6] G02F 1/133;1/1345;1/13; G09G 3/22

U.S. Cl. 349—32 **28 Claims**



1. In a method for making an electrical device comprising plural electrodes separately electrically connected to plural widened channel connecting regions, the connecting regions, separated by mesa regions, said method comprising the steps of:

(a) providing the plurality of widened channel connecting regions separated by mesa regions,

(b) providing a layer of electrode material over the channel bottoms, over the channel walls and the mesa tops and in contact with the plural electrodes, and

(c) subjecting the electrode material to anisotropic plasma etching to remove electrode material from the tops of the mesas to electrically separate the widened channel connecting regions.

5,596,432

LIQUID CRYSTAL DISPLAY HAVING ILLUMINATED NONLINEAR RESISTANCE ELEMENTS

Kanetaka Sekiguchi, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 84,793, Jun. 29, 1993, abandoned. This application Feb. 29, 1996, Ser. No. 609,054

Claims priority, application Japan, Jul. 3, 1992, 4-198934; Nov. 27, 1992, 4-341341; Dec. 8, 1992, 4-351421

Int. Cl.[6] G02F 1/136;1/1335;1/1333

U.S. Cl. 349—51 **18 Claims**

8. A liquid crystal display comprising:

a first substrate and a second substrate between which liquid crystal is held;

a first electrode and a second electrode formed separately on said first substrate, said first electrode being conductively connected to a bus;

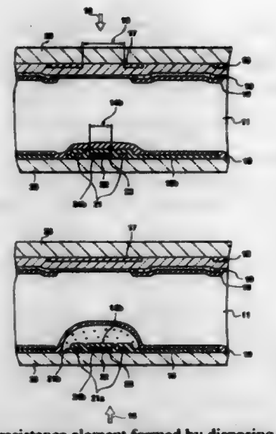
a nonlinear resistance element formed by disposing said first and second electrodes opposite to each other, the first and second electrodes sandwiching an insulating film, at least one of the first and second electrodes contacting the insulating film at an interface; and

light emission means being disposed on the side of said first substrate for emitting light to said nonlinear resistance element, wherein light is emitted to said interface from the side of said first electrode.

17. A liquid crystal display comprising:

a first substrate and a second substrate between which liquid crystal is held;

a first electrode and a second electrode formed separately on said first substrate;



a nonlinear resistance element formed by disposing said first and second electrodes opposite to each other through an insulating film, at least one of the first and second electrodes contacting the insulating film at an interface; and

light emission means being disposed on the side of said first substrate for emitting light to said nonlinear resistance element, wherein light is emitted to said interface from the side of said first substrate, wherein light reflection parts and a dome-like member for focusing light on said nonlinear resistance element are disposed in the periphery of said nonlinear resistance element.

5,596,433

HEAD-MOUNTED IMAGE DISPLAY APPARATUS HAVING A PRISM WITH AN ASPHERICAL SURFACE

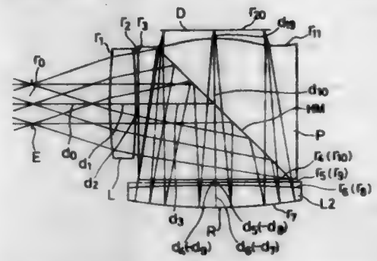
Osamu Konuma, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,763

Claims priority, application Japan, Apr. 27, 1993, 5-101371

Int. Cl.[6] G02B 27/14

U.S. Cl. 359—631 **14 Claims**



1. A head-mounted image display apparatus comprising:

an image display device for displaying an image, and

an ocular optical system for forming an exit pupil to lead said image into an observer's eyeball,

wherein said ocular optical system includes a prism having a predetermined surface having both reflecting and transmitting functions and being provided at a tilt with respect to an optical axis of light emitted from said image display device,

said prism having an aspherical surface on the side thereof which faces said image display device.

5,596,434
SELF-ASSEMBLED MONOLAYERS FOR LIQUID CRYSTAL ALIGNMENT

David M. Walba, and Charles A. Liberko, both of Boulder, Colo., assignors to University Research Corporation, Boulder, Colo.

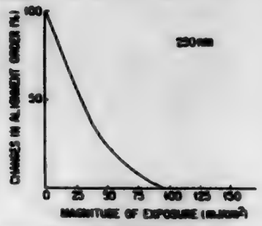
Filed Sep. 24, 1993, Ser. No. 125,909
Int. Cl.[6] G02F 1/1337;1/1333
U.S. Cl. 349—123 20 Claims

7. A liquid crystal cell comprising an aligned liquid crystal wherein said liquid crystal is aligned employing a self-assembled monolayer.

5,596,435
LIQUID CRYSTAL DISPLAY DEVICE

Kazuyuki Sunohara; Rei Hasegawa; Hiroyuki Nagata; Takeshi Yamamoto; Yasuhiro Yamamoto, and Masumi Okamoto, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 231,839, Apr. 22, 1994, Pat. No. 5,477,360. This application Oct. 2, 1995, Ser. No. 537,440
Claims priority, application Japan, Apr. 23, 1993, 5-098828; May 13, 1993, 5-111893
Int. Cl.[6] G02F 1/1337; C09K 19/00; B32B 27/00;27/06
U.S. Cl. 349—132 2 Claims



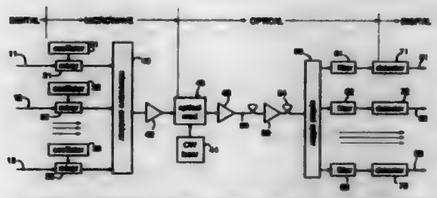
1. A liquid crystal display device comprising:
a pair of substrates arranged face to face with each other, each having an alignment film, the alignment films facing each other; and
a liquid crystal composition filled in the space between the substrates, wherein each alignment film has a plurality of alignment regions within a display region, one of said alignment regions imparting a first alignment or rise direction to liquid crystal molecules, another one of said alignment regions imparting a second alignment or rise direction to liquid crystal molecules, said first alignment or rise direction being different from said second alignment or rise direction, and a difference in viewing angle within a planar direction being mutually compensated, and at least one of the alignment films comprises a polyimide having an imidization degree of not less than 90%.

5,596,436
SUBCARRIER MULTIPLEXING WITH DISPERSION REDUCTION AND DIRECT DETECTION

Paul D. Sargis, Modesto; Ronald E. Haigh, Tracy, and Kent G. McCammon, Livermore, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jul. 14, 1995, Ser. No. 502,732
Int. Cl.[6] H04J 14/02
U.S. Cl. 359—132 11 Claims

1. A subcarrier multiplexing (SCM) system, comprising:
a plurality of digital bit stream inputs;
a plurality of microwave oscillators equal in number to the plurality of digital bit stream inputs and having independent and separate operating frequencies;
a plurality of microwave mixers equal in number to the plurality of digital bit stream inputs and respectively connected to

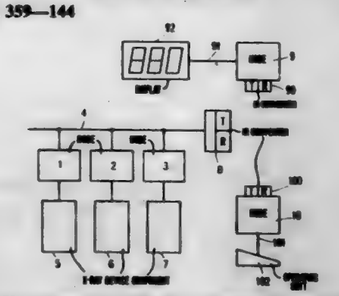


provide modulated outputs from input connections from the plurality of digital bit stream inputs and plurality of microwave oscillators;
a microwave combiner connected to receive all said modulated outputs from the plurality of microwave mixers and to provide a combined microwave output;
a continuous wave (CW) laser with a laser light carrier output;
an optical modulator connected to modulate said CW laser light carrier output with a signal representing said combined microwave output;
an erbium-doped fiber amplifier (EDFA) connected to amplify said modulated CW laser light and to drive a conventional single-mode fiber optics cable; and
receiver means for connection to said conventional single-mode fiber optics cable and for recovering digital data input applied to each of the digital bit stream inputs.

5,596,437
X-RAY DEVICE

Erich-Jürgen Heinz, Uetersen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1994, Ser. No. 194,300
Claims priority, application Germany, Feb. 9, 1993, 43 03 643.0
Int. Cl.[6] H04B 10/10
U.S. Cl. 359—144 8 Claims



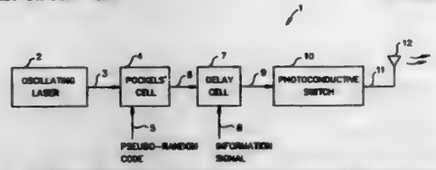
1. An X-ray device comprising a multiplicity of operative components which communicate automatically with each other and cooperate to form said X-ray device, a plurality of said operative components being controlled in response to control commands transmitted from other ones of said components and each of said operative components being assigned a data transmission node working by the Controller Area Network protocol, the data transmission nodes being in mutual communication with each other via a data transmission system for transmission of data between said components including transmission of said control commands to said plurality of controllable components, the data transmission nodes being connected to the relevant associated components through connection lines, wherein said data transmission system comprises a first wireless transmitter and a first wireless receiver serving a first group of one or more data transmission nodes, a second wireless transmitter and a second wireless receiver serving a second group of one or more data transmission nodes and a third wireless transmitter and a third wireless receiver serving a third group of one or more data transmission nodes, each of said wireless transmitters serving any particular group of nodes being

positioned for simultaneous broadcast mode wireless communication with each of said wireless receivers serving any other group of nodes.

5,596,438
PHOTOCONDUCTIVE SPREAD-SPECTRUM COMMUNICATIONS SYSTEM

Stephen E. Saddow, Laurel; Eric Funk, Silver Spring; Louis J. Jasper, Fulton, and Chi H. Lee, Potomac, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 21, 1995, Ser. No. 530,398
Int. Cl.[6] H04B 10/00;15/00; H04K 1/00
U.S. Cl. 359—154 11 Claims

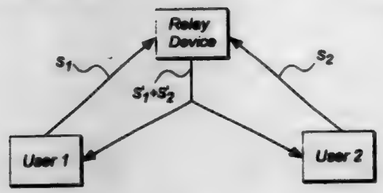


1. A photoconductive spread-spectrum communications system transmitter, comprising:
a) an oscillating laser for generating an oscillating optical signal, having an output at which appears the oscillating optical signal;
b) a Pockels' cell for selecting pulses from the oscillating optical signal, having a first input connected to the output of said oscillating laser, having a second input for receiving a pseudo-random code, and having an output at which appears a pulse train consisting of pulses selected from the output of said oscillating laser;
c) a delay cell for adding an information signal to the output of said Pockels' Cell, having a first input connected to the output of said Pockels' Cell, having a second input for receiving the information signal, and having an output at which appears the output of said Pockels' Cell combined with the information signal;
d) a photoconductive switch for converting optical signals to electromagnetic signals, having an input connected to the output of said delay cell, and an output; and
e) an antenna for transmitting electromagnetic signals, having an input connected to the output of said photoconductive switch.

5,596,439
SELF-INTERFERENCE CANCELLATION FOR TWO-PARTY RELAYED COMMUNICATION

Mark D. Dankberg, Encinitas; Mark J. Miller, Vista, both of Calif., and Michael G. Mulligan, Westford, Mass., assignors to ViaSat, Inc., Carlsbad, Calif.

Filed Aug. 1, 1995, Ser. No. 520,868
Int. Cl.[6] H04B 10/00
U.S. Cl. 359—161 8 Claims

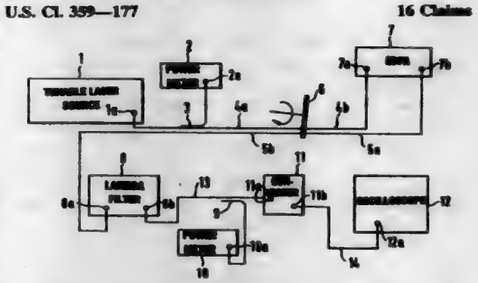


8. In a system for two-way relayed electromagnetic communication between a first device and a second device through a relay station, wherein each said first device and said second device includes a modulator, a transmitter, a receiver and a demodulator, an apparatus at each said first device and said second device for permitting said system to share common communication channels, said apparatus comprising:
means for capturing either a source signal directed to said transmitter from said modulator or a source information signal directed to said modulator;
means for storing a representation of said source signal at said device at which said source signal originates;
means for estimating channel characteristics of a roundtrip path to said relay station to obtain compensation parameters;
means for extracting a composite signal from said receiver, said composite signal containing a copy of said source signal;
means coupled to said estimating means for modifying said stored signal using said compensation parameters to obtain a cancellation signal; and
means coupled to said modifying means and to said extracting means for subtracting said cancellation signal from said composite signal to recover a desired signal, said desired signal being the source signal from the other device.

5,596,440
METHOD AND APPARATUS FOR ANALYZING THE CHARACTERISTICS OF AN OPTICAL CIRCUIT

Dietmar Patz, VS-Wielersbach; Emmerich Mueller, Aidlingen, and Christian Hentschel, Gaufelden, all of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 7, 1995, Ser. No. 511,741
Claims priority, application European Pat. Off., Aug. 16, 1994, 94112758; Sep. 8, 1994, 94114090
Int. Cl.[6] H04B 10/08
U.S. Cl. 359—177 16 Claims

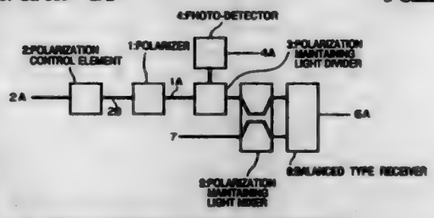


6. Apparatus for determining amplified spontaneous emission (ASE) noise of an optical amplifier in the presence of an optical signal, comprising:
a first optical path with first optical input means and first optical output means for said first optical signal;
a second optical path with second optical input means and second optical output means for said second optical signal;
a rotating means arranged in said first optical path and in said second optical path; and
one or more pairs of optical lenses arranged in one or more of said optical paths, the lenses of each pair focused on said rotating means from opposite sides and said rotating means tilted relative to an axis of rotation thereof.

5,596,441
OPTICAL POLARIZATION CONTROLLER

Nobuhiro Sakakibara, Tokyo; Kazuo Aida, Yokohama, and Kiyoshi Nakagawa, Miura-gun, all of Japan, assignors to Ando Electric Co., Ltd., and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Apr. 6, 1995, Ser. No. 417,679
Claims priority, application Japan, Apr. 13, 1994, 6-075189
Int. Cl.[6] H04B 10/06
U.S. Cl. 359—192 5 Claims



1. An optical polarization controller comprising:

a polarization control element for rotating a plane of polarization of an input signal light by a rotation angle in a predetermined rotational direction and for outputting the result as a rotated signal light;

a polarizer for extracting a component of the rotated signal light having a predetermined plane of polarization and for outputting the component as a polarized signal light;

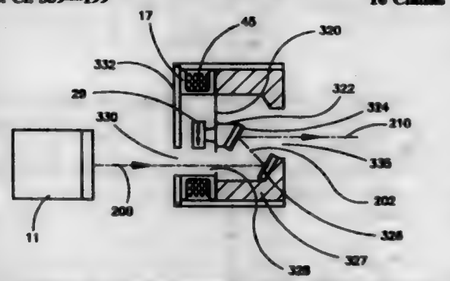
a light divider for dividing the polarized signal light into a plurality of polarized signal lights which have the same planes of polarization as the plane of the polarized light outputted by the polarizer; and

a photo-detector for detecting a level of one of the plurality of polarized signal lights, for generating, based on the detected level of the one polarized signal light, a control signal indicating which of the planes of polarization of the rotated signal light outputted by the polarization control element is in agreement with the predetermined plane of polarization of the polarizer, and for supplying the control signal to the polarization control element to control the rotation angle.

5,596,442
GYRATING AXIAL SCANNER

George A. Pfeiffer, Media, Pa., assignor to GAP Technologies, Inc., Media, Pa.

Division of Ser. No. 6,754, Jan. 21, 1993, Pat. No. 5,469,291, which is a continuation-in-part of Ser. No. 612,983, Nov. 15, 1990, Pat. No. 5,187,612. This application Jul. 8, 1994, Ser. No. 273,101
Int. Cl.[6] G02B 26/08
U.S. Cl. 359—199 16 Claims



1. A device for providing limited angular oscillatory movement of a light beam in a direction selected from at least one of the X and Y directions with respect to the beam direction, comprising:

optical means for receiving an input light beam traveling in an input beam direction and for redirecting said input light beam to provide an output light beam traveling in an output beam direction which is generally the same as said input beam direction;

means for imparting an angular oscillatory movement to said optical means, said means for imparting including a force-responsive displacement element coupled to said optical means;

a distortion means proximate said displacement element for introducing a distortion force in said displacement element;

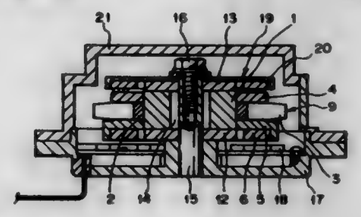
a mounting means for suspending said displacement element with respect to said distortion means to permit relative movement therebetween in response to said distortion force; and

said angular oscillatory movement of said optical means imparting to said output light beam a limited angular oscillatory movement in at least one of the X and Y directions with respect to said output beam direction.

5,596,443
POLYGON MIRROR ROTOR AND POLYGON MIRROR SCANNER MOTOR HAVING SUCH ROTOR

Daisuke Kouno, Kanagawa-ken; Hideo Furukawa, Tokyo; Isami Nitto, Niigata-ken, and Kimio Komata, Urawa, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Apr. 25, 1995, Ser. No. 428,681
Claims priority, application Japan, Apr. 27, 1994, 6-112011
Int. Cl.[6] G02B 26/08
U.S. Cl. 359—200 10 Claims



1. A polygon mirror rotor, comprising:

a ceramic ring of a generally hollow cylindrical shape having a cylindrical inner surface serving as a sliding surface of a radial hydrodynamic bearing and a pair of end surfaces each serving as a sliding surface of a thrust hydrodynamic bearing;

a plastic ring fixedly fitted over said ceramic ring;

a polygon mirror made of aluminum and fixedly fitted over said plastic ring by shrink fitting;

said plastic ring having a thermal expansion coefficient greater than that of said ceramic ring as well as greater than that of said polygon mirror; and

said plastic ring having a plurality of voids of the same shape formed therein, the number of said voids being equal to the number of mirror surfaces of said polygon mirror, said voids being arranged at uniform intervals in a circular array concentric with said plastic ring, and said voids comprising through holes or recesses.

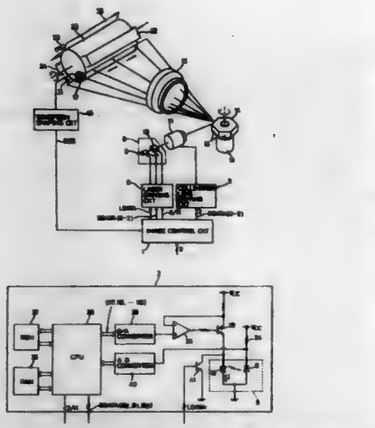
5,596,444
OPTICAL APPARATUS HAVING LASER BEAM DIAMETER VARIABLE ACCORDING TO IMAGE DATA

Tatsuya Eguchi, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1994, Ser. No. 203,008
Claims priority, application Japan, Mar. 2, 1993, 5-041278; Mar. 8, 1993, 5-046340
Int. Cl.[6] G02B 26/08
U.S. Cl. 359—210 13 Claims

1. An optical apparatus, comprising:

laser beam generation means;



beam diameter changing means for changing the beam diameter of a laser beam generated by said laser beam generation means;

intensity changing means for changing the intensity of said laser beam; and

first control means for controlling said intensity changing means to change the intensity of said laser beam in response to change of a beam diameter by said beam diameter changing means.

5,596,445
LIGHT SCANNING SYSTEM

Hiromi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1996, Ser. No. 624,931
Claims priority, application Japan, Mar. 30, 1995, 7-073431
Int. Cl.[6] G02B 26/08
U.S. Cl. 359—210 3 Claims



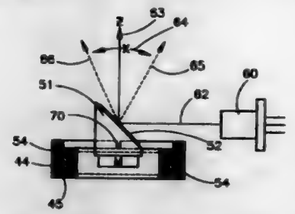
1. A light scanning system comprising a semiconductor laser which outputs a laser beam which diverges with a beam divergence angle, a condensing/scanning optical system which condenses the laser beam and causes the laser beam to scan a predetermined surface-to-be-scanned and a surface tilt compensating optical system which compensates for fluctuation in the scanning position of the laser beam due to a surface tilt in the condensing/scanning optical system, wherein the improvement comprises that

the distance between the beam waist of the laser beam and the surface-to-be-scanned as measured in the direction of the optical axis of the condensing/scanning optical system is set larger as the beam divergence angle of the laser beam as emitted from the semiconductor laser increases so that the beam diameter of the laser beam on the surface-to-be-scanned is constant irrespective of the beam divergence angle of the laser beam as emitted from the semiconductor laser.

5,596,446
ULTRA COMPACT SCANNING SYSTEM FOR A WIDE RANGE OF SPEEDS, ANGLES AND FIELD DEPTH

George A. Pfeiffer, Media, Pa., assignor to Gap Technologies, Inc., Media, Pa.

Continuation of Ser. No. 776,663, Oct. 15, 1991, Pat. No. 5,371,347, and a continuation of Ser. No. 745,985, Aug. 16, 1991, Pat. No. 5,422,471, and a continuation of Ser. No. 114,646, Oct. 28, 1993, abandoned, and a continuation-in-part of Ser. No. 6,754, Jan. 21, 1993, Pat. No. 5,469,291, which is a continuation-in-part of Ser. No. 612,983, Nov. 15, 1990, Pat. No. 5,187,612. This application Oct. 31, 1994, Ser. No. 332,629
Int. Cl.[6] G02B 26/08
U.S. Cl. 359—214 61 Claims



1. A light beam scanning system for scanning a target to read information therefrom, said system comprising a scan element for receiving a light beam and directing it toward a target as a scanning beam with an angular oscillatory movement of said beam about a neutral axis, said scan element comprising:

a coil for carrying electric current, said coil having a coil axis and an opening along said coil axis;

a shaft having a shaft axis disposed substantially perpendicular to said coil axis;

a magnetic element mounted for rotation about said shaft axis in response to current in said coil and producing a magnetic field oriented generally perpendicular to said shaft axis;

a first beam-directing optical element which is coupled to said magnetic element for rotation therewith about said shaft axis; and

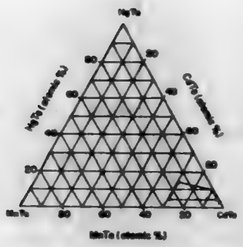
a ferromagnetic circuit including at least one ferromagnetic element disposed with respect to said magnetic element so as to establish a minimum energy rotational orientation of said magnetic element in which said magnetic field of said magnetic element is oriented generally perpendicular to said coil axis.

5,596,447
MAGNETOOPTICAL ELEMENT

Koichi Onodera, Miyagi, Japan, assignor to Tohin Corporation, Miyagi, Japan

PCT No. PCT/JP94/00095, § 371 Date Sep. 19, 1994, § 102(e) Date Sep. 19, 1994, PCT Pub. No. WO94/17437, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 25, 1994, Ser. No. 307,658
Claims priority, application Japan, Jan. 25, 1993, 5-009984; Jan. 25, 1993, 5-010000; Nov. 11, 1993, 5-282217
Int. Cl.[6] G02F 1/00
U.S. Cl. 359—324 12 Claims

1. A magnetooptical element comprising a single crystal of $Cd_{1-x-y}Mn_xHg_yTe$ including Mn and Hg, characterized in that, so as to be operable in a wavelength range between 0.8 micrometer and 1.1 micrometers, said single crystal has a composition in an area defined in a quasi three-element phase diagram of MnTe—HgTe—CdTe by four points of:



$Mn_{0.01}Hg_{0.04}Cd_{0.95}Te$, $Mn_{0.01}Hg_{0.1}Cd_{0.89}Te$, $Mn_{0.12}Hg_{0.17}Cd_{0.71}Te$, and $Mn_{0.25}Hg_{0.04}Cd_{0.71}Te$.

5,596,448

DISPERSION COMPENSATOR AND OPTICAL AMPLIFIER

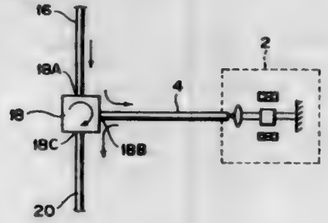
Hiroshi Onaka, and Motoyoshi Sekiya, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 20, 1995, Ser. No. 492,899

Claims priority, application Japan, Sep. 27, 1994, 6-231481

Int. Cl.[6] H01S 3/00; G02B 6/26

U.S. Cl. 359—341 **13 Claims**



1. A dispersion compensator for compensating for color dispersion of an optical fiber transmission line, comprising:

a dispersion compensation fiber having color dispersion of a sign opposite to a sign of color dispersion of said optical fiber transmission line and having a length set so as to conform to a value of the color dispersion of said optical fiber transmission line;

optical coupling means having first to third ports, said first port being connected to an output end of said optical fiber transmission line, said second port being connected to a first end of said dispersion compensation fiber, said optical coupling means outputting light supplied to said first port from said second port, said optical coupling means outputting light supplied to said second port from said third port; and

a polarization conversion mirror for converting light outputted from a second end of said dispersion compensation fiber into light having a polarization condition orthogonal and time-reversed to a polarization condition of the light outputted from said second end of said dispersion compensation fiber and supplying the light obtained by the conversion back to said second end of said dispersion compensation fiber.

5,596,449

LIGHT PULSE GENERATOR

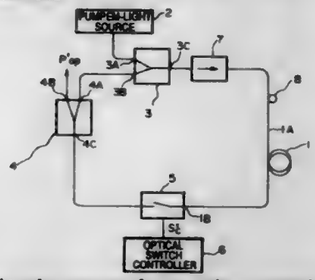
Masaaki Furuhashi; Ryouji Handa, both of Tokyo; Nobuo Tomita, Higashihiroshi-gun, and Yoshitaka Enomoto, Mito, all of Japan, assignors to Ando Electric Co., Ltd., and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Feb. 12, 1996, Ser. No. 600,260

Claims priority, application Japan, Feb. 24, 1995, 7-037415

Int. Cl.[6] H01S 3/00; H04B 10/04; G02F 1/01

U.S. Cl. 359—341 **3 Claims**



1. A light pulse generator for generating a stepped light pulse and for converting the stepped light pulse into a broader non-stepped light pulse, the generator comprising:

a pumped-light source for generating a pumped-light;

an optical loop for circulating light and for forming a stepped light pulse, the optical loop comprising:

a light mixer for mixing the pumped-light and another light,

a light isolator for transmitting the mixed pumped-light and another light in one direction,

an erbium-doped optical fiber for accumulating the mixed light transmitted through the light isolator,

light valve means for allowing the accumulated light to pass through as circulating light, and

a light divider for dividing the circulating light into a plurality of circulating lights and for introducing one of the divided plurality of circulating lights into the light mixer as said another light; and

control means for progressively opening the light valve means, which responds to a control signal having a gentle slope so that an amount of light outputted through the light valve means is gently increased in accordance with the gentle slope of the control signal;

wherein the stepped light pulse formed by the optical loop is converted into a non-stepped light pulse having a width broader than that of the stepped light pulse.

5,596,450

LIGHT REFLECTANT SURFACE AND METHOD FOR MAKING AND USING SAME

Gregory E. Hannon, Newark, Del.; Gordon L. McGregor, Landenberg, Pa., and Raymond B. Minor, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jan. 6, 1995, Ser. No. 369,850

Int. Cl.[6] F21V 7/00

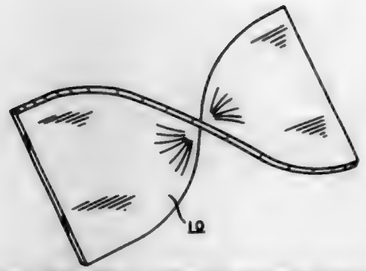
U.S. Cl. 359—599 **31 Claims**

8. A method of providing improved diffuse reflectivity of light comprising

providing a reflectant material comprising an expanded polytetrafluoroethylene having polymeric nodes interconnected by fibrils defining microporous voids therein;

mounting the reflectant material to cause light energy to reflect off it;

whereby the reflectant material provides diffuse reflectivity with greater than 90% of visible light with a wavelength between at least 400 to 700 nm striking the reflectant material reflecting from the material.



5,596,451

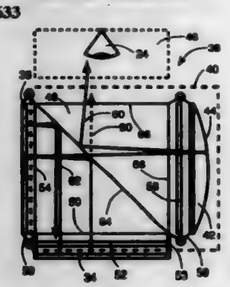
MINIATURE IMAGE GENERATOR INCLUDING OPTICS ARRANGEMENT

Mark A. Handschy, Boulder; Michael R. Meadows, Nederland, both of Colo.; Martin Shenker, Pomona, and Paul E. Weissman, Brewster, both of N.Y., assignors to Displaytech, Inc., Boulder, Colo., and Martin Shenker Optical Design, Inc., White Plains, N.Y.

Filed Jan. 30, 1995, Ser. No. 380,081

Int. Cl.[6] G02B 27/14

U.S. Cl. 359—633 **43 Claims**



1. An assembly for producing a visual display said assembly comprising:

(a) a light reflecting type spatial light modulator including a light reflecting surface cooperating with a light modulating medium switchable between different states so as to act on light in ways which form an overall pattern of reflected, modulated light, and means for switching said modulating medium between said different states in a controlled way so as to form said overall pattern;

(b) illumination means for providing a particular source of light; and

(c) optics means including a first member defining a light reflecting surface configured to direct reflected light into a predetermined area and a second member defining a first external face located in proximity to said illumination means, a second external face located in proximity to said spatial light modulator, a third external face located in proximity to the light reflecting surface of said first member, and a fourth external face, said optics means cooperating with said illumination means and said spatial light modulator such that said spatial light modulator forms said overall pattern of light from light provided by said particular source of light and such that the light reflecting surface of said first member directs light provided by the particular source of light from said spatial light modulator into said predetermined area extending outwardly from the fourth face of said second member in a way which allows a magnified image of the overall pattern of light formed at and by said spatial light modulator to be viewed from within said predetermined area, said overall pattern of light serving as said visual display.

5,596,452

COLLIMATOR LENS SYSTEM

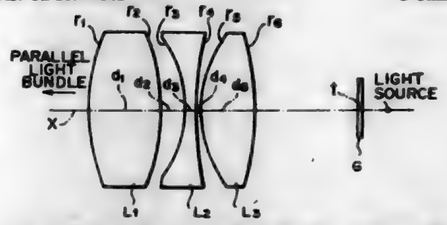
Hiromitsu Yamakawa, Saitama-ken, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Oct. 4, 1995, Ser. No. 538,650

Claims priority, application Japan, Oct. 17, 1994, 6-249897

Int. Cl.[6] G02B 27/30; 9/14

U.S. Cl. 359—641 **1 Claim**



1. A collimator lens system for collimating diverging light bundle emitted from a light source into a parallel light bundle comprising first to third lens elements arranged in this order from the side of the parallel light bundle, the first lens element being a positive double-convex lens, the second lens element being a negative lens concave to the side of the parallel light bundle, the third lens element being a positive lens convex to the side of the parallel light bundle, and the following formulae (1) to (5) being satisfied

$$0.8<f_1/f_3<2.0 \quad (1)$$

$$1.5<(r_2(n_2-1))/(r_3(n_1-1))2.7 \quad (2)$$

$$0.8<r_5/(f(n_3-1))<1.4 \quad (3)$$

$$0.8<-r_1/r_2<2.4 \quad (4)$$

$$0.5<-f_2/f<6.0 \quad (5)$$

wherein f represents the overall focal length of the collimator lens system, f_i represents the focal length of i-th lens element, i standing for 1, 2 or 3, r_i represents the radius of curvature of i-th refracting surface as numbered from the side of the parallel light bundle, i standing for 1, 2, 3, 4, 5 or 6 (being a positive value when the refracting surface is convex to the side of the parallel light bundle and a negative value when the refracting surface is concave to the side of the parallel light bundle) and n_i represents the refractive index of i-th lens, i standing for 1, 2 or 3.

5,596,453

WIDE-ANGLE ZOOM LENS

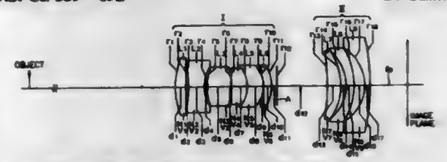
Moon-kyeon Kim, Changwon, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

Filed Nov. 10, 1994, Ser. No. 338,754

Claims priority, application Rep. of Korea, Nov. 11, 1993, 93-23913

Int. Cl.[6] G02B 15/14

U.S. Cl. 359—692 **14 Claims**



1. A wide-angle zoom lens system, comprising:

a first lens group having a positive refractive power; and

a second lens group having a negative refractive power and spaced from said first lens group at a first distance, said first distance being variable during zooming.

wherein said first lens group includes:
- a first lens having a positive refractive power and a convex surface toward an object;
- a second lens having a negative refractive power, the second lens being a bi-concave lens;
- a third lens having a positive refractive power, the third lens being a bi-convex lens;
- a fourth lens having a positive refractive power, the fourth lens being a bi-convex lens;
- a fifth lens having a negative refractive power and a concave surface toward the object; and
- a sixth lens having a positive refractive power and meniscus surfaces;

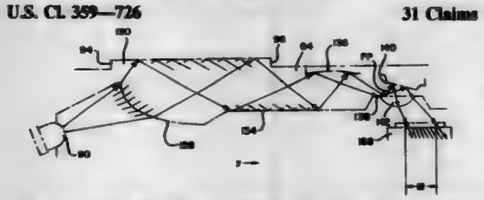
wherein said second lens group includes:
- a lens having a positive refractive power and a concave surface toward the object; and
- at least one element of a negative refractive power lens.

5,596,454

UNEVEN SURFACE IMAGE TRANSFER APPARATUS

Ray Hebert, Lee Gates, Calif., assignor to The National Registry, Inc., St. Petersburg, Fla.

Filed Oct. 28, 1994, Ser. No. 332,548
Int. Cl.[6] G02B *17/00*
U.S. Cl. 359—726 **31 Claims**



1. An optical plate for transferring an image from a platen thereon to an external image sensing device, the platen comprising a totally internally reflecting object contact surface for creating evanescent wave image rays, the optical plate comprising:
- an aspheric illuminating lens for illuminating the platen with light from a radiation source, the aspheric illuminating lens having a nominal focus point;
- a first reflecting surface positioned on one side of the nominal focus point;
- a second reflecting surface positioned on another side of the nominal focus point; and
- an imaging lens having a nominal aperture stop, the imaging lens being positioned so that the nominal aperture stop is located at the nominal focus point of the illuminating lens, the imaging lens receiving the evanescent wave image rays from the platen as reflected from the first and second reflecting surfaces and transferring same to a location external to the optical plate.

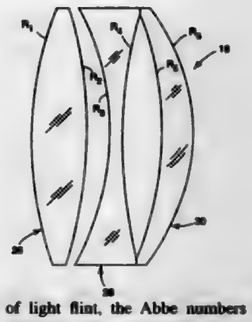
5,596,455

FIXED-FOCUS TRIPLET PROJECTION LENS FOR OVERHEAD PROJECTORS

Stephen K. Eckhardt, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1995, Ser. No. 496,773
Int. Cl.[6] G02B *9/14*
U.S. Cl. 359—789 **20 Claims**

1. A multi-element lens comprising:
- first and second lens elements, each being a positive lens and constructed of ophthalmic crown glass having an index of refraction in the range of 1.518 to 1.528; and
- a third lens element interposed between said first and second lens elements, said third lens element being a negative lens



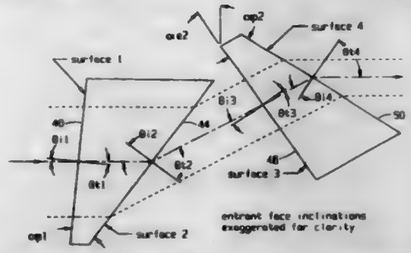
constructed of light flint, the Abbe numbers for said first, second and third lens elements conforming to the equation $5.5<[(v_1+v_3)/2-v_2]<15.5$, where v_1, v_2 and v_3 are the Abbe numbers of said first, third and second lens elements, respectively.

5,596,456

ACHROMATIC ANAMORPHIC PRISM PAIR

Francis C. Luecke, San Jose, Calif., assignor to New Focus, Inc., Santa Clara, Calif.

Filed Feb. 25, 1994, Ser. No. 201,662
Int. Cl.[6] G02B *5/04;7/18;13/10*
U.S. Cl. 359—831 **8 Claims**



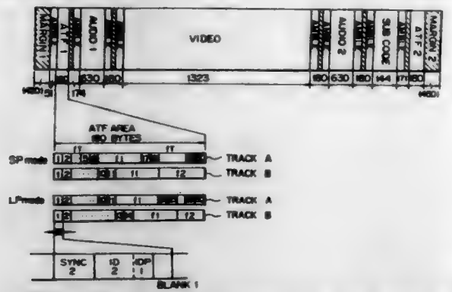
1. An achromatic anamorphic prism pair for the conversion of an input beam having an elliptical cross-section to an output beam having a circular cross section comprising;
- a. A first prism, having an index of refraction of 1.51612 at 800 nanometers, a first dispersion, an apex angle of 35.93°, and a first entrant prism face positioned to receive the incident elliptical input beam at an angle greater than 1 degree with respect to the perpendicular of said first entrant prism face and a first emergent prism face from which emerges a first refracted output beam;
- b. a second prism, having an index of refraction of 1.76476 at 800 nanometers, a second dispersion, an apex angle of 27.38°, and a second entrant prism face positioned to receive said first refracted output beam at an angle greater than 1 degree with respect to the perpendicular of said second entrant prism face and a second emergent prism face from which emerges a circular output beam having a first, lateral, displacement from said incident elliptical input beam;
- c. said respective indices of refraction, dispersion, apex angles and relative angular positions of said emergent prism faces selected to provide an anamorphic reduction in the cross section of the incident elliptical beam while maintaining the emergent angle of said circular output beam parallel to the incident elliptical input beam over a change in wavelength of said incident elliptical beam.

5,596,457

RECORDING APPARATUS WITH MEANS FOR RECORDING A PILOT SIGNAL AND TIMING SYNC DATA IN A TRACK FOLLOWING AREA OF A TRACK

Keiji Kanota; Yukio Kubota, and Takahashi Seki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 26,735, Mar. 5, 1993, Pat. No. 5,426,538.
This application Aug. 26, 1994, Ser. No. 297,229
Claims priority, application Japan, Mar. 13, 1992, 4-089434; Jul. 24, 1992, 4-217472
Int. Cl.[6] G11B *5/09;5/584*
U.S. Cl. 360—48 **6 Claims**



1. The rotary head recording apparatus of the type having first and second head means for recording respective oblique tracks on a record medium, each track including an information signal area in which information data is recorded preceded by a track following area in which a tracking control pilot signal is recorded, said apparatus comprising:
- pilot signal generating means for generating a tracking control pilot signal;
- timing data generating means for generating timing sync data comprised of plural timing sync data blocks, each of said timing sync data blocks being of predetermined data length and including a synchronizing data pattern, identification data and error correcting data associated with said identification data, said identification data in each timing sync data block identifying the relative position of the information signal area; and
- control means coupled to said pilot signal and timing data generating means for recording said pilot signal in a portion of said track following area and for recording said timing sync data in substantially the remainder of said track following area.

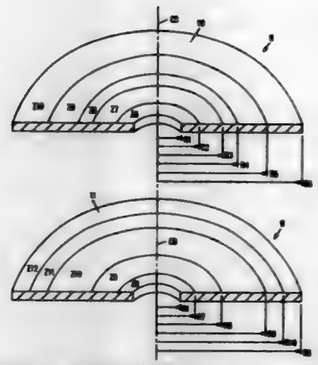
5,596,458

VARIABLE ZONE LAYOUT FOR INFORMATION STORAGE DISK DRIVE

Bruce D. Emo, Niwot, and Brian D. Wilson, Louisville, both of Colo., assignors to Intégral Peripherals, Inc., Boulder, Colo.

Filed Dec. 19, 1994, Ser. No. 359,111
Int. Cl.[6] G11B *5/09*
U.S. Cl. 360—48 **12 Claims**

1. A series of disk drives, said series comprising a plurality of disk drives, each drive in the series being assembled from a predetermined set of components for a head disk assembly and for drive electronics, said head disk assembly having a disk with a first magnetic surface and a first read/write transducer associated with said first surface, wherein in a first drive of said series said first recording surface includes a plurality of tracks and a plurality of recording zones, said recording zones having radial boundaries defined according to a first boundary pattern; and
- wherein in a second drive of said series said first recording surface includes a plurality of tracks and a plurality of recording zones, said recording zones having radial boundaries



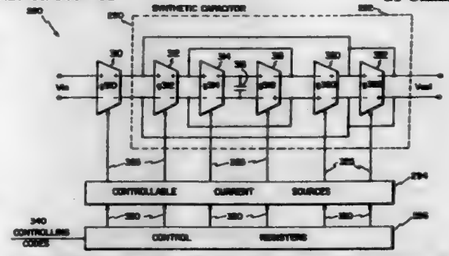
defined according to another boundary pattern which is different than said first boundary pattern.

5,596,459

FULLY INTEGRATED PROGRAMMABLE FILTERS FOR DISC DRIVE SUBSYSTEMS

Vladimir Kovner; Vadim B. Mitushin, both of Oklahoma City, and Srinivasan Surendran, Norman, all of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 166,235, Dec. 10, 1993, abandoned, which is a continuation of Ser. No. 1,346, Jan. 7, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 424,235
Int. Cl.[6] G11B *20/10*
U.S. Cl. 360—51 **21 Claims**



1. An integrated circuit filter for a data retrieval system, the integrated circuit filter comprising a plurality of synthetic components, each synthetic component having first and second terminal means between which the synthetic component behaves as a passive circuit component, each synthetic component having an impedance selectable independently of signals communicated to either the first or second terminal means, the plurality of synthetic components including a synthetic inductor, one of the plurality of components comprising:
- a passive circuit component of a selected impedance value:
- amplification means comprising a plurality of amplifiers, each amplifier having respective input means for receiving input signals, respective control means for receiving control signals determinative of a respective multiplicative factor, and respective output means for outputting signals representative of the input signals scaled by the respective multiplicative factor, each amplifier having either its input or output means coupled to either the input or output means of another amplifier of the plurality, one amplifier of the plurality having either its input or output means coupled to either of the first or second terminal means and one amplifier of the plurality coupled to the passive circuit component; and
- selection means coupled to each control means, for selecting each multiplicative factor independent of signals communicated to either of the first and second terminal means, the impedance of the synthetic component based on each multi-

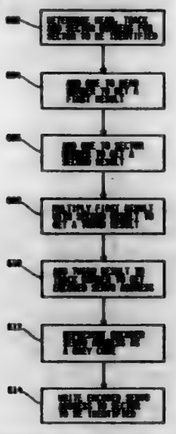
plicative factor and the selected impedance value of the passive circuit component.

5,596,460

SYSTEM AND METHOD FOR ENCODING A SERVO ADDRESS

Richard Greenberg, and John C. Purkett, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,561
Int. Cl.[6] G11B *5/596;5/09*
U.S. Cl. 360—78.14 6 Claims



1. A method for locating a desired track on a disk surface having a plurality of concentric tracks, each track having at least one sector, each sector having a servo address stored therein, the method comprising the steps of:

a) determining a sector number of a sector within a track;

b) reading an encoded servo address from said sector; and

c) using said encoded servo address together with said sector number to locate the desired track, wherein said step c) comprises:

1) adding a first integer to said sector number to obtain a first result;

2) subtracting said first result from said encoded servo address to obtain a track number; and

3) using said track number to determine if the desired track is located.

5,596,461

SPACE EFFICIENT HOUSING CONFIGURATION FOR A DISK DRIVE *#7*

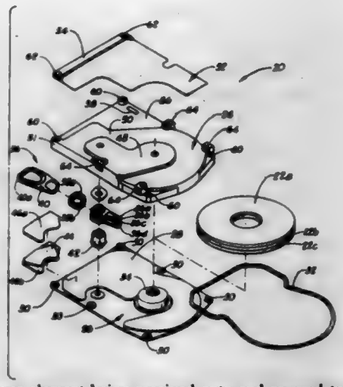
F. Mark Stefanesky, Longmont, Colo., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed May 25, 1995, Ser. No. 450,213
Int. Cl.[6] G11B *17/02;33/00*
U.S. Cl. 360—97.01 8 Claims

6. A disk drive housing, comprising:

a base member having a top, a bottom, and an outer perimeter having length and end portions of preselected dimensions; and

a cover element comprising a top surface and side walls depending downwardly from the top surface, the cover element having length and width dimensions corresponding to the dimensions of the length and end portions of the base member;



the cover element being received onto and secured to the base member to form the housing;

the top surface of the cover element including a first raised portion having a preselected shape to provide a height dimension within the housing sufficient for topmost portions of a spindle motor and head stack assembly of a disk stack assembly, the shape of the first raised portion being just sufficient to provide adequate height for the spindle motor and head stack assembly of the disk stack assembly, remaining portions of the top surface of the cover element being generally parallel to said first raised portion and providing a continuous, single PCB support surface.

5,596,462

DATA STORAGE DISK CLAMP APPARATUS FOR MINIMIZING DISK CLAMPING FORCE AND SURFACE AREA

Gordon J. Smith, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1994, Ser. No. 346,541
Int. Cl.[6] G11B *17/02*
U.S. Cl. 360—99.12 16 Claims



1. A clamp apparatus for clamping a data storage disk around a circular hub, comprising:

a data storage disk disposed on the circular hub and having a substantially rigid mating surface;

a clamp disposed on the circular hub and having a substantially rigid mating surface the data storage disk being disposed between the clamp and the circular hub, and

engagement protrusions integrally formed on one of the disk and clamp mating surfaces, the engagement protrusions penetrating the other one of the disk and clamp mating surfaces to form corresponding engagement recesses;

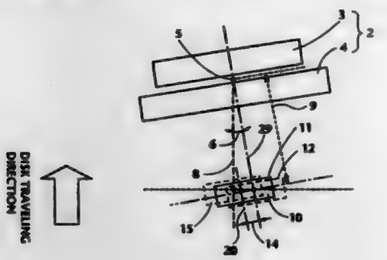
wherein engagement of the engagement protrusions and the corresponding engagement recesses under a clamping force provided by the clamp prevents movement between the clamp and disk mating surfaces during rotation of the data storage disk and circular hub.

5,596,463

RECORDING/REPRODUCTION APPARATUS WITH AN INTEGRATED INDUCTIVE WRITE, MAGNETORRESISTIVE READ HEAD

Masanobu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,531
Claims priority, application Japan, Sep. 8, 1993, 5-223000; Sep. 27, 1993, 5-240877
Int. Cl.[6] G11B *5/596*
U.S. Cl. 360—104 2 Claims



1. An integrated head mounted on a head slider which is arranged to be rotatable about a point so as to be accessible to tracks of a disk serving as a recording medium to make yaw angles with respect to tangents of said tracks, said integrated head comprising:

write element means having a magnetic gap for writing data on said tracks of said disk; and

read element means for reading data from said tracks of said disk, said read element means being located so that a center of said read element means, as determined in a direction substantially parallel to track crossing directions, is separated by a first predetermined distance from said gap of said write element means, and a line passing through a magnetic center of said read element means and which extends in a direction substantially perpendicular to said track crossing directions, is separated by a second distance from a line passing through a geometric center of said write element means and which extends in a direction substantially perpendicular to said track crossing directions,

wherein said second distance between said write element means and said read element means is determined according to the following equation:

$$OFFSET=½×\{\sin(P1)+\sin(p2)\}×S$$

where:

OFFSET=said second distance between said write element means and said read element means;

P1=the slider yaw angle with respect to the tangent of the innermost track;

P2=the slider yaw angle with respect to the tangent of the outermost track;

sin(P1)=the sine of the slider yaw angle P1;

sin(P2)=the sine of the slider yaw angle P2; and

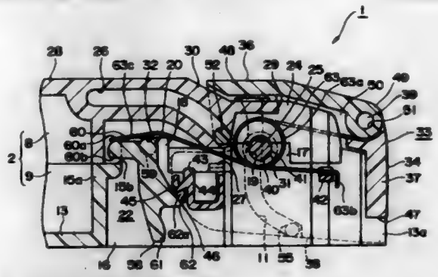
S=said first distance between said write element means and said read element means.

5,596,464

LOCKING ASSEMBLY FOR A LID MEMBER OF A TAPE CASSETTE

Takashi Sawada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,562
Claims priority, application Japan, Oct. 12, 1993, 5-277382; Feb. 1, 1994, 6-027561
Int. Cl.[6] G11B *23/02*
U.S. Cl. 360—132 3 Claims



1. A tape cassette, comprising:

a cassette case having a flattened box-like profile;

a recording medium tape accommodated in said cassette case with a portion thereof led out to a front face portion of said cassette case;

a lid member supported for pivotal motion on said cassette case between a closed position in which said lid member covers the portion of said recording medium tape positioned outside said cassette case to protect said recording medium tape when said tape cassette is not used and an open position in which said lid member allows use of said recording medium tape-when said tape cassette is used;

said cassette case being formed from an upper half and a lower half coupled in a vertical aligned relationship to each other;

a locking member supported for pivotal motion on said cassette case between a locking position at which said locking member locks said lid member at the closed position when said tape cassette is not used and an unlocking position at which said locking member-unlocks said lid member;

a resilient member for biasing said lid member toward the closed position and biasing said locking member toward the locking position; and

stopper means formed on an upstanding side wall of said lower half of said cassette case, said stopper means including a ledge which projects forwardly away from said upstanding wall and toward the front face portion of the cassette, said ledge further having an upper surface for abutting with an abutting portion provided on said locking member when said locking member is pivoted toward the locking position to prevent further pivotal movement of said locking member, said stopper means thereby allows unimpeded rotation of said abutting portion of said locking member by positioning said ledge upper surface away from any side walls.

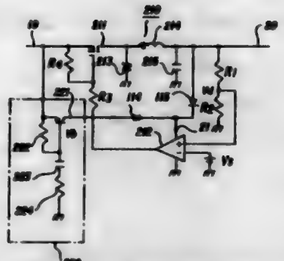
5,596,465

OVERCURRENT PROTECTION CIRCUIT FOR A DC-TO-DC CONVERTER

Shigeru Honda, and Manabu Suzuki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 22, 1994, Ser. No. 345,759
Claims priority, application Japan, Mar. 11, 1994, 6-041226
Int. Cl.[6] H02H *7/00*
U.S. Cl. 361—18 15 Claims

1. An overcurrent protection circuit for a dc-to-dc converter which converts a voltage which has been input onto a power input line into another voltage to output as an output voltage to a load through a power output line, said overcurrent protection circuit comprising:



a timer circuit connected to the power input line for outputting a first connection signal for a predetermined period from the time the input voltage is turned on;

an overcurrent detector circuit, connected to the power output line, for detecting an overcurrent caused in the load and for outputting a second connection signal from the time the input voltage is turned on until the overcurrent is detected; and

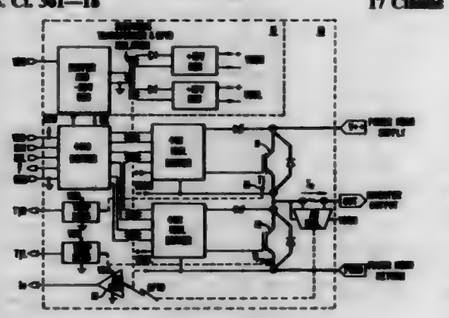
a switcher circuit, inserted in the power input line between said timer circuit and the dc-to-dc converter, for closing the power input line while receiving at least one of the first and second connection signals.

5,596,466

INTELLIGENT, ISOLATED HALF-BRIDGE POWER MODULE

Sam. S. Ochi, Cupertino, Calif., assignor to IXYS Corporation, Santa Clara, Calif.

Filed Jan. 13, 1995, Ser. No. 372,525
Int. Cl.[6] H02H 5/04
U.S. Cl. 361—18 17 Claims



1. A power module, comprising:

at least one power transistor coupled to a power module output, each power transistor having a gate drive terminal;

at least one overvoltage clamp and desaturation detection circuit, one overvoltage clamp and desaturation detection circuit being coupled to each power transistor;

an output current measurement system coupled to the power module output;

at least one junction temperature sensor, one junction temperature sensor being coupled to each power transistor;

at least one isolation transformer having a primary winding and at least one secondary winding;

an isolated driver communications interface coupled to the primary winding of each isolation transformer, the isolated driver communications interface being for converting logic signals to primary winding drive signals; and

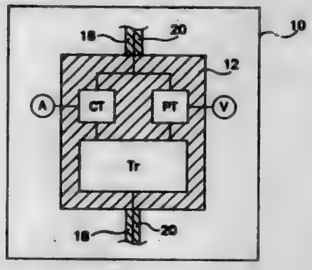
at least one isolated gate driver, one isolated gate driver being coupled to the at least one secondary winding of each isolation transformer and the gate terminal of each power transistor.

5,596,467

ELECTRICAL ENERGY-TRANSFORMING EQUIPMENT

Makoto Yamamoto, 2525-1, Nishiharuchika, Ina, Nagano, Japan

Filed Apr. 4, 1994, Ser. No. 223,092
Claims priority, application Japan, Apr. 5, 1993, 5-103621
Int. Cl.[6] H02H 7/04
U.S. Cl. 361—38 1 Claim



1. A transformer wherein:

an insulating molding material selected from the group consisting of synthetic resin and synthetic rubber is molded entirely around a coil of a transformer for distributing electric power so as to form a solid molded block;

an insulating molding material selected from the group consisting of synthetic resin and synthetic rubber is molded entirely around a coil of each of a current transformer and a potential transformer so as to form solid molded blocks of each of said respective current transformer and potential transformer; and

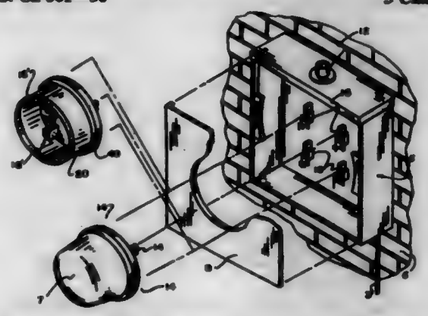
a plurality of recesses formed in a surface of said solid molded block around said coil of said transformer for distributing electric power and said solid molded blocks of said current transformer and said potential transformer are removably fitted into said recesses such that said coil of each of said current transformer and potential transformer is electrically connected to said coil of said transformer for distributing electric power via electromagnetic induction.

5,596,468

TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

Edward F. Allina, 605 Capri Blvd., Treasure Island, Fla. 33706

Continuation of Ser. No. 532,397, Jun. 1, 1990, which is a continuation-in-part of Ser. No. 923,524, Oct. 28, 1986, Pat. No. 4,931,895. This application Feb. 5, 1993, Ser. No. 14,377
Int. Cl.[6] H02H 9/00
U.S. Cl. 361—56 3 Claims



1. Plug-and-jack TVSS adapter means having a plurality of power input terminals and a plurality of power output terminals, removably insertable operably between a conventional watt-hour meter and its socket means in a grounded utility box or panel, comprising

a non-conductive housing member with terminals mating a pair of the power input and a pair of the power output terminals; and

plurality of varistor means supported by the housing member,

each varistor means including at least one two-faced varistor,

electrically connected from one of its faces to the power input terminals via a first path, and

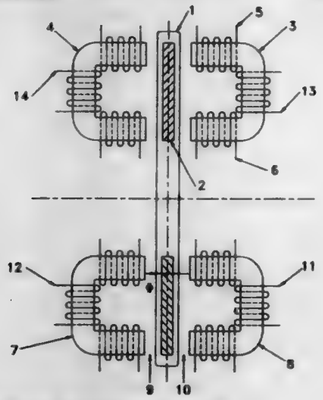
electrically connected at its opposite face to the grounded utility box or panel via a second path including conductive laminar ground plane means with an area (both sides) of at least about one-third the housing transverse cross-sectional area.

5,596,469

APPARATUS FOR LIMITING HIGH CURRENT ELECTRICAL FAULTS IN DISTRIBUTION NETWORKS BY USE OF SUPERCONDUCTING EXCITATION IN TRANSVERSE FLUX MAGNETIC CIRCUIT

Stephen B. Kuznetsov, Washington, D.C., assignor to Power Superconductor Applications Co., Pittsburgh, Pa.

Continuation of Ser. No. 163,434, Dec. 8, 1993, abandoned. This application Feb. 13, 1996, Ser. No. 599,863
Int. Cl.[6] H02H 9/02
U.S. Cl. 361—58 20 Claims



1. An electrical fault limiter comprising:

a first magnetic core;

a second magnetic core opposing said first magnetic core;

a third magnetic core adjacent the first magnetic core;

a fourth magnetic core opposing said third magnetic core and adjacent said second magnetic core;

a rotor disposed between the first and second magnetic cores, and the third and fourth magnetic cores, said rotor rotatable about a rotor axis, said first and second magnetic cores disposed on a first side of the rotor axis and said third and fourth magnetic cores disposed on a second side of said rotor axis;

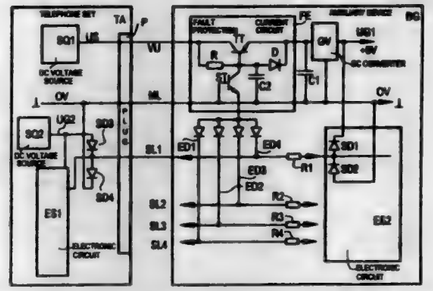
each core having a first axis, a second axis and a body to which the first and second axis are connected, each body having a superconduction bias coil disposed about it, each axis having a conduction load coil disposed about it, said rotor having a high magnetic reluctance sector and a return flux sector such that when the magnetomotive force from each superconduction bias coil balances with the magnetomotive force from associated load coils on an associated core there is no force on the rotor, but when the magnetomotive force from the superconduction bias coil is less than the magnetomotive force from associated load coils on the associated core then a force is produced on the rotor causing it to accelerate.

5,596,470

FAULT CURRENT PROTECTION CIRCUIT FOR AN AUXILIARY DEVICE IN A DIGITAL TELEPHONE SYSTEM

Frank Urbigkeit, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 21, 1995, Ser. No. 505,660
Claims priority, application Germany, Aug. 1, 1994, 44 27 207.3
Int. Cl.[6] H02H 3/20
U.S. Cl. 361—91 7 Claims



1. A fault current protection circuit apparatus for an auxiliary device connectable to a terminal device in a digital telephone system having a plurality of signal lines for connecting electronic circuits in both devices, wherein the signal lines in the auxiliary device are connected via protective diodes to at least one ground line that carries a reference potential, the apparatus comprising:

a fault current protection circuit in the auxiliary device; and

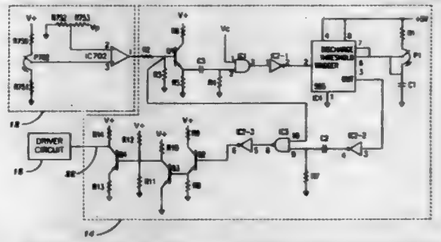
a dc voltage source in the terminal device connectable to said auxiliary device via said fault current protection circuit, such that when a fault of an inadmissible dc voltage potential on the ground line with reference to the plurality of signal lines occurs, said dc voltage source is shut off by said fault current protection circuit.

5,596,471

ADJUSTABLE UNDERVOLTAGE TRIP FAULT INTERRUPT CIRCUIT

Charles E. Hanlin, Fremont, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 5, 1995, Ser. No. 435,299
Int. Cl.[6] H02H 3/24; 7/09
U.S. Cl. 361—92 5 Claims



1. An undervoltage trip fault interrupt circuit used in a variable frequency drive (VFD) controller for preventing activation of an undervoltage fault trip signal caused by instantaneous line sags of less than a selectable time, said interrupt circuit comprising in combination:

undervoltage detection circuit means (12) responsive to the instantaneous line sags for generating a detected signal;

first differentiator means formed of a series-connected first capacitor (C3) and a first resistor (R4) and being responsive to said detected signal for generating a first positive spike;

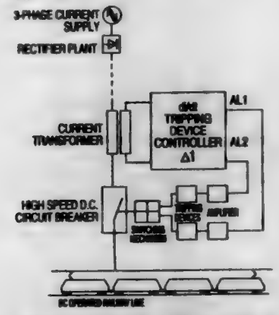
an AND logic gate (IC1) having a first input connected to receive a supply potential (V_c), a second input connected to receive said first positive spike, and an output;
an inverter (IC2-1) having its input connected to the output of said AND logic gate and its output generating a trigger signal;
an integrated time delay circuit (IC4) having its input connected to receive said trigger signal for generating a pulse signal on its output having a selectable duration;
said selectable duration of said pulse signal on the output of said time delay circuit being adjustable by a potentiometer (P1);
second differential means formed of a series-connected second capacitor (C2) and a second resistor (R7) and being responsive to said pulse signal for generating a second positive spike at the end of a selected duration of said pulse signal;
a NAND logic gate (IC3) having a first input connected to said second positive spike and a second input coupled to receive said detected signal for generating an undervoltage fault trip signal on its output only when said detected signal is longer than the selected duration of said pulse signal; and
driver circuit means (16) having its input coupled to receive said undervoltage fault trip signal for preventing the shutting down of an AC motor in the VFD controller when the instantaneous line sags are shorter than the selected duration of said pulse signal so as to eliminate "nuisance" interruptions of the operation of the AC motor.

5,596,472

PROCESS FOR CONTROLLING AN OVERCURRENT TRIPPING DEVICE OF A HIGH-SPEED D.C. CIRCUIT-BREAKER

Wolfgang Rechl, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 936,967, Aug. 28, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 299,688
Claims priority, application Germany, Aug. 30, 1991, 41 29 258.8
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—93 **2 Claims**



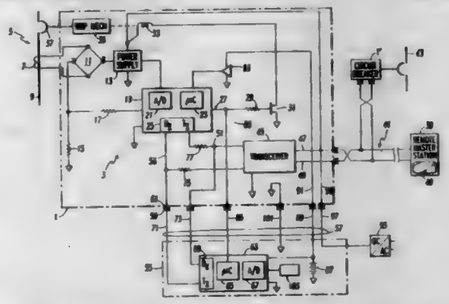
1. In a d.c. circuit including a high-speed d.c. circuit-breaker coupled in series with a transformer, the transformer generating an output signal as a function of a current through the d.c. circuit, an apparatus for controlling an overcurrent tripping device of the high-speed d.c. circuit-breaker comprising:
a current rate of rise controller for generating a first signal from the output signal of the transformer, the first signal being representative of a rate of rise of the current through the d.c. circuit;
a filtering device coupled to the current rate of rise controller for generating a filtered signal from the first signal, wherein the filtering device filters noise signals having a frequency greater than or equal to 300 Hz;
a first signal evaluation circuit coupled to the rate of rise controller and to the filtering device, the first signal evaluation circuit generating a first disconnect signal for controlling the high-speed d.c. circuit-breaker in accordance with one of the first and filtered signals;
a current step change controller for generating a second signal from the output signal of the transformer, the second signal being representative of a magnitude of change of the current through the d.c. circuit; and
a second signal evaluation circuit for generating a second disconnect signal for controlling the high-speed d.c. circuit-breaker in accordance with the second signal.

5,596,473

ELECTRICAL SWITCHES WITH CURRENT PROTECTION INTERFACED WITH A REMOTE STATION AND A PORTABLE LOCAL UNIT

Richard A. Johnson, Aliquippa; Joseph C. Engel, Monroeville; Michael F. Beccabella, North Huntingdon; David M. Oravetz, Cornapolis, and James I. Wise, Zelienople, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 6, 1995, Ser. No. 384,728
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—97 **4 Claims**



1. In combination:
an electrical switch having separable contacts, means generating a digital actual current signal from actual current flowing through said separable contacts, trip signal generating means generating a trip signal in response to values of said digital actual current signal which persist for a time sufficient that a predetermined current/time characteristic is exceeded, and trip means tripping said separable contacts open in response to said trip signal;
a master station separate from said electrical switch; and
communications means for sending digital messages back and forth between said electrical switch and said master station, said master station having means generating a digital test message containing a selected digital test current which digital test message is transmitted by said communications means to said electrical switch, and said trip signal generating means having means substituting said digital test current contained in said digital test message for said digital actual current signal for generating a trip signal in response to said digital test current which persists for said time sufficient to exceed said predetermined current/time characteristic.

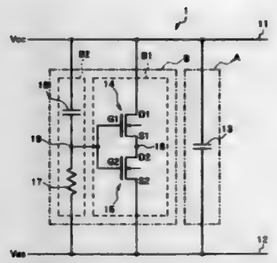
5,596,474

POWER PROTECTION CIRCUITRY FOR A SEMICONDUCTOR INTEGRATED CIRCUIT

Toshio Wada, and Eiichi Iwanami, both of Tateyama, Japan, assignors to Nittetsu Semiconductor Co., Ltd., Tateyama, Japan

Filed Sep. 27, 1995, Ser. No. 534,541
Claims priority, application Japan, Sep. 28, 1994, 6-258692
Int. Cl.[6] H02H *3/20*
U.S. Cl. 361—111 **5 Claims**

1. Power protection circuitry for a semiconductor integrated circuit comprising:



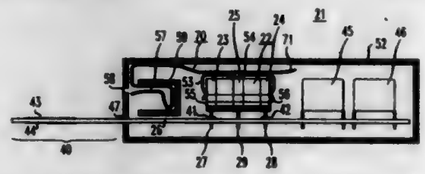
a first discharge circuit connected between a voltage supply line and a reference voltage line of the semiconductor integrated circuit, which discharges part of abnormal, high frequency voltage applied to said supply voltage line into said reference voltage line; and
a second discharge circuit, separate from said first discharge circuit, having a switching circuit including a pair of MOS transistors of the same conductivity type, and a turn-on voltage supply circuit supplying a turn-on voltage to each gate of said pair of MOS transistors at the application of the abnormal, high frequency voltage to said supply voltage line, which simultaneously turns on said pair of MOS transistors to discharge the rest of the abnormal, high frequency voltage into said reference voltage line via said pair of MOS transistors.

5,596,475

PROTECTOR DEVICE

Antonio A. Figueiredo, Belleville, and Adam S. Kane, Morristown, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 30, 1995, Ser. No. 497,489
Int. Cl.[6] H02H *1/04*
U.S. Cl. 361—119 **15 Claims**



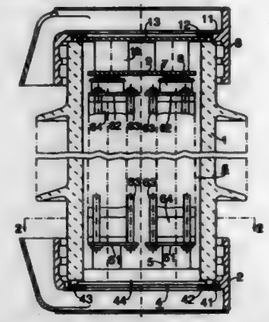
1. A protector device adapted for insertion in a connecting block comprising:
a housing;
a voltage surge protector element mounted within the housing and having a pair of biasing electrodes and a ground electrode;
a ground connector comprising an elongated conductive member electrically contacting the ground electrode and having an end portion formed into a detent which is aligned with an opening in the housing so that the end portion is adapted to receive and retain a ground bar on the connecting block, the said connector being insulated from the biasing electrodes; and
a fusible element formed on the protector element and being mounted with respect to the ground connector such that the ground connector will also contact the biasing electrodes when the fusible element melts due to the temperature of the protector element reaching a predetermined value.

5,596,476

SURGE ARRESTER WITH A MTAL OXIDE RESISTOR

Johannes Kirch, and Hans Leuchner, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE93/01159, § 371 Date Aug. 14, 1995, § 102(e) Date Aug. 14, 1995, PCT Pub. No. WO94/14171, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 2, 1993, Ser. No. 446,698
Claims priority, application Germany, Dec. 8, 1992, 9217133 U
Int. Cl.[6] H02H *1/04*
U.S. Cl. 361—127 **3 Claims**



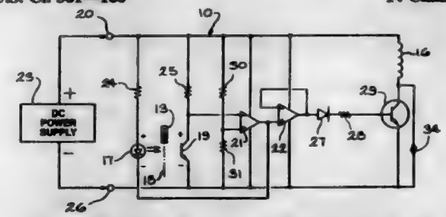
1. A surge arrester with an insulating housing having a metal oxide resistor arranged inside the insulating housing, such that the metal oxide resistor consists of two or more electrically parallel connected columns, which are made up of a larger number of resistance elements, of which each column has two separate holding plates between which the resistance elements of the column are arranged, and which in turn are joined by means of insulating holding rods which laterally immobilize the resistance elements,
wherein the columns are arranged on a plate at the lower end of the insulating housing, and centered with respect to the axis of the insulating housing, wherein a separate compression spring is associated with each of the columns for contact purposes.

5,596,477

CONTACTLESS SIGNALING DEVICE

Norman B. Horton, Tecumseh, Mich., assignor to Faraday, Inc., Tecumseh, Mich.

Filed May 3, 1993, Ser. No. 57,271
Int. Cl.[6] G10K *1/063*; H04M *11/04*; G08B *3/00*
U.S. Cl. 361—160 **14 Claims**



1. A signaling device comprising, in combination, a coil, an armature driven by said coil, a means for signaling adjacent said armature, said armature engaging said means for signaling, said armature including a shutter portion reciprocately movable along a predetermined path, a light source member and a light sensing member positioned on opposed sides of said predetermined path, a D.C. power source in communication with said light source, said light sensing member and said coil, whereby when the current to said coil is interrupted or resumed by the reciprocal movement of said shutter portion between said light source and said light sensing member said means for signaling is actuated.

5,596,478

APPARATUS FOR NEUTRALIZING CHARGED BODY

Tadahiro Ohmi, 1-17-301, Komegabukuro 2 chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, and Hitoshi Inaba, Tokyo, both of Japan, assignors to Tadahiro Ohmi, Miyagi-ken, and Takasago Netsugaku Kogyo Kabushiki-Kaisha, Tokyo, both of Japan

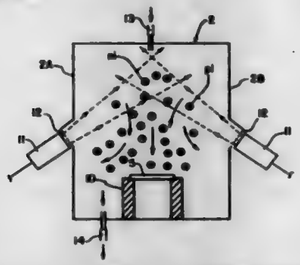
PCT No. PCT/JP92/00948, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO93/02467, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 24, 1992, Ser. No. 185,829

Claims priority, application Japan, Jul. 25, 1991, 3-208562

Int. Cl.[6] H05F 3/06

U.S. Cl. 361—212 14 Claims



1. An apparatus for neutralizing charged bodies which have been subjected to a charge, comprising:

a chamber having an interior for storing said charged bodies;

a gas input means for introducing a gas into the interior of said chamber, said gas being non-reactive with respect to said charged bodies when said charged bodies are stored in said chamber;

a neutralization charge generating means for generating ions and electrons capable of selectively neutralizing said charged bodies when said charged bodies are stored in said chamber, said neutralization charge generating means comprising a light source for projecting, into said chamber, ultraviolet rays capable of exciting the non-reactive gas within said chamber; and

a pressure reduction means for reducing pressure in the interior of the chamber to a level lower than atmospheric pressure.

5,596,479

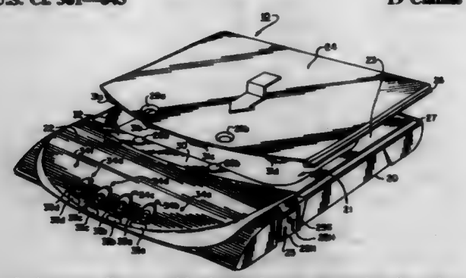
POWER SURGE PROTECTOR

Colin D. Campbell, Groton, and James H. Bleck, Chelmsford, both of Mass., assignors to American Power Conversion Corporation, N. Billerica, Mass.

Continuation of Ser. No. 278,544, Jul. 20, 1994, Pat. No. 5,457,600. This application Jul. 20, 1995, Ser. No. 504,477

Int. Cl.[6] H02B 1/04

U.S. Cl. 361—643 19 Claims



1. A power director with electrical surge protection for selectively connecting an electrical power source to multiple electrical apparatus including computers and computer peripherals comprising in combination

a housing having front and rear walls, left and right walls and top and bottom surfaces,

a plurality of electrical receptacles, each for mating with a power plug of the power cord of an electrical apparatus, located within the housing across the bottom surface between the left and right walls for defining a component bay within the housing between the receptacles and the front wall,

a component printed circuit board located in the component bay having electrical components mounted thereon including multiple electrical switches electrically coupled to certain of the receptacles for switching on and off electrical power to electrical apparatus having a power plug mated with a receptacle and a power surge protection circuit for protecting said electrical apparatus from excessive power variations and

first and second communication line jacks located in the housing for coupling to the first jack a computer or computer peripheral and for coupling to the second jack a communication line.

5,596,480

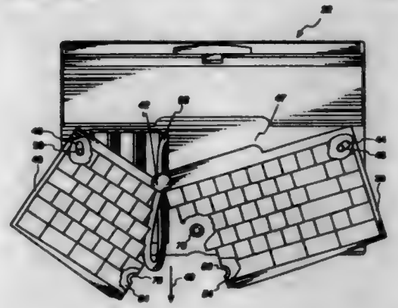
SPLIT ROTATABLE KEYBOARD

Brian E. Manser, Salem, Wis.; Peter A. Ojeda, IV; Anton R. Poole, both of St. Joseph, Mich., and Frank W. Gunsning, Arlington Heights, Ill., assignors to Zenith Data Systems Corporation, Buffalo Grove, Ill.

Filed Mar. 28, 1994, Ser. No. 218,625

Int. Cl.[6] G06F 1/16

U.S. Cl. 361—680 4 Claims



1. A keyboard assembly for a portable personal computer comprising:

a keyboard, split at a predetermined breakline, defining two keyboard sections;

means for rotatably coupling said keyboard sections together about a predetermined pivot axis, adjacent one end of said breakline, to enable said keyboard sections to be rotated relative to one another from a first position, wherein said keyboard sections are adjacent one another to a second position wherein said keyboard sections are split apart; and

means for preventing movement of said keyboard sections in a direction generally parallel to said pivot axis, wherein said preventing means includes a pair of predetermined notches formed adjacent opposing ends of said breakline in said keyboard sections, said predetermined notches adapted to receive a pin with an enlarged head in a predetermined position to prevent movement of said keyboard sections in a direction generally parallel to said pivot axis.

5,596,481

INTEGRATED ERGONOMIC PALM REST FOR NOTEBOOK COMPUTER

Peter M. Liu, Austin, and Robert L. McMahan, Cedar Park, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Aug. 7, 1995, Ser. No. 511,948

Int. Cl.[6] G06F 1/16; H05K 7/16

U.S. Cl. 361—683 39 Claims



1. A portable computer having a palm rest integrated therein, comprising:

a computer chassis having a side wall adjoining a bottom that forms a footprint of said chassis, a keyboard positioned toward a rear end of said chassis, and a cover member covering a portion of an interior of said chassis;

a palm support having front and rear ends and pivotable with respect to said chassis between a covering position and an elevated first palm support position;

a hinge pivotally coupling said palm support to said chassis; and

an adjustable extension structure having a first end coupled to said palm support and a second end couplable to a wall of said chassis.

5,596,482

STOWABLE, PIVOTALLY ATTACHED PALM REST AND HANDLE FOR A NOTEBOOK COMPUTER

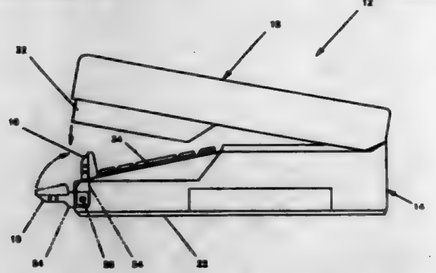
Seita Horikoshi, Zama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1995, Ser. No. 532,345

Claims priority, application Japan, Sep. 22, 1994, 6-228295

Int. Cl.[6] G06F 1/16; H05K 7/16

U.S. Cl. 361—683 8 Claims



1. A palm rest, which is installed into a data processing apparatus having a case assembly with a keyboard and a lid, said palm rest being rotatably hinged on said case assembly, being capable of holding an operator's palms when rotated outward, being covered with said lid when said lid is closed, and forming a handle when said palm rest is rotated outward and said lid is closed.

5,596,483

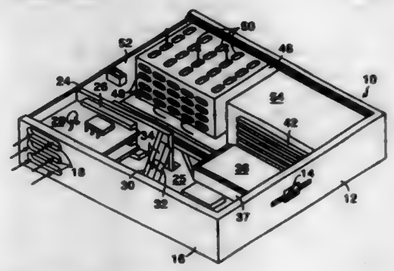
SILENT AIR COOLED COMPUTER HAVING A HARD DISK DRIVE WITH AN ACOUSTIC SHIELD AND A HEAT SINK ARRANGED EXTERIOR TO THE DRIVE

Gregory T. Wyler, Winchester, Mass., assignor to Silent Systems, Inc., Burlington, Mass.

Division of Ser. No. 246,866, May 20, 1994, Pat. No. 5,510,954. This application Apr. 18, 1996, Ser. No. 634,216

Int. Cl.[6] H05K 5/00; 7/20

U.S. Cl. 361—683 28 Claims



1. A computer comprising:

a housing;

a hard disk drive mounted within said housing for storing and retrieving data;

computer circuit boards mounted within said housing in communication with said hard disk drive;

a heat generating power supply arranged within said housing for providing a regulated voltage to said computer circuit boards;

a fan mounted in said housing for moving air past said computer circuit boards;

an acoustic shield arranged about said hard disk drive such that said computer produces no more than 25 decibels of sound substantially throughout active operation;

a heat sink arranged exterior of said acoustic shield so that air moving through said housing passes over said heat sink; and

a heat conductive path from said heat sink through said acoustic shield to said hard disk drive.

5,596,484

MOUNTING DEVICE FOR MOUNTING A SMALL ELECTRONIC DEVICE IN A SPACE FOR A LARGER ELECTRONIC DEVICE

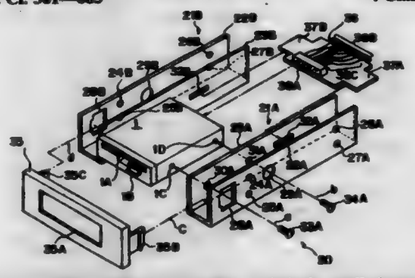
Yuji Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 19, 1992, Ser. No. 836,807

Claims priority, application Japan, Feb. 22, 1991, 3-050515

Int. Cl.[6] H05K 5/00; G06F 1/16

U.S. Cl. 361—685 4 Claims



2. A mounting device for mounting a relatively small electronic device in a space for a larger electronic device, comprising;

a pair of elongated chassis members extending from front to rear on either side of said small electronic device;

a relay substrate mounted to a rear portion of said chassis members for electrically coupling said small electronic device; and

wherein said chassis members each have a generally U-shaped cross-section with a pair of vertical side-wall portions and a horizontal portion connecting said vertical side-wall portions, and mounting hole means provided in each of said vertical side-wall portions for mounting said small electronic device to said chassis members and for mounting said chassis members within said space for said larger electronic device;

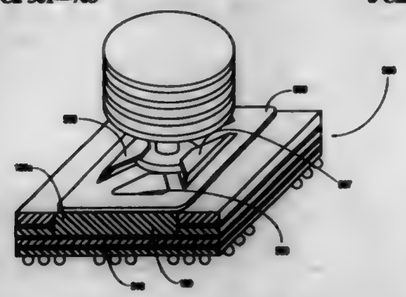
wherein each of said chassis members further include a slot located on an inner one of said vertical side-wall portions for receiving mounting protrusions extending outwardly from said relay substrate.

5,596,485

PLASTIC PACKAGED INTEGRATED CIRCUIT WITH HEAT SPREADER

Thomas P. Glenn, Gilbert, Ariz., and Roy D. Holloway, Sucat, Philippines, assignors to Amkor Electronics, Inc., Chandler, Ariz.

Filed Mar. 16, 1995, Ser. No. 405,462
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—703 **8 Claims**



1. A heat spreader and an encapsulated integrated package comprising:

a thermally conductive plate, said thermally conductive plate being of a predetermined shape and having a first surface and a second surface, opposite said first surface, said thermally conductive plate having a predetermined thickness;

at least one open region formed in said thermally conductive plate;

at least one tab extending above said at least one open region, said at least one tab being at least one integral bent tab extending from a respective side edge of said at least one open region; a supplementary heat spreader, at least part of said supplementary heat spreader being inserted under said at least one integral bent tab to create a press-fitted connection therebetween; and;

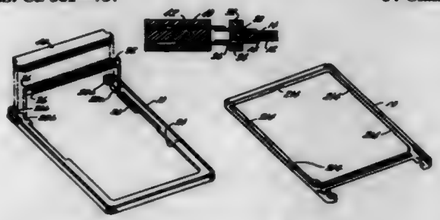
wherein said first surface of said thermally conductive plate is attached directly to an encapsulant surface of an encapsulated integrated circuit package.

5,596,486

HERMETICALLY SEALED MEMORY OR PC CARD UNIT HAVING A FRAME, HEADER AND COVERS IN BONDED ENGAGEMENT

Paul R. Young, Cromwell; David W. Richard, Southington, and Leonard Bazar, Middletown, all of Conn., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.

Continuation-in-part of Ser. No. 150,497, Nov. 10, 1993, abandoned, and Ser. No. 178,385, Dec. 23, 1993, Pat. No. 5,457,606. This application Oct. 5, 1994, Ser. No. 318,507
Int. Cl.[6] H05K *1/18;5/06;* H01R *13/58;23/70*
U.S. Cl. 361—737 **84 Claims**



1. A hermetically sealed memory unit, including:

a frame;

a memory unit retained in said frame, said memory unit including circuit elements;

a header bonded to said frame, said header including a plurality of conductive pins passing through and being encapsulated in the header, said pins extending forward and rearward from said header, said rearwardly extending pins being bonded to said circuit elements;

a connector retained in said frame adjacent to and forward of said header, said connector having rearwardly facing pins which are bonded to the forwardly extending pins of said header; and

first and second covers bonded to said frame and said header in sealing engagement therewith,

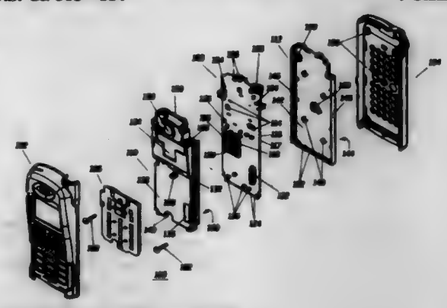
said frame, said header, and said first and second covers cooperating to form a hermetically sealed space in which said memory unit is located.

5,596,487

APPARATUS FOR RF SHIELDING RADIO CIRCUITRY

Julio C. Castaneda, Coral Springs; David H. Minard, Plantation; Kok H. Chong, Sunrise, and Roger D. Gamble, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1995, Ser. No. 509,147
Int. Cl.[6] H04B *1/03*
U.S. Cl. 361—814 **4 Claims**



1. A radio assembly, comprising:

a front housing;

a back housing;

an electronic circuit board having front and back surfaces;

at least one compressible ground clip member electrically coupled to the electronic circuit board;

a first electroless plated plastic shield having inner and outer surfaces and side walls extending from said inner surface, said inner surface including at least one protruding boss;

said first electroless plated plastic shield disposed about said electronic circuit board such that the side walls of the first electroless plated plastic shield enclose a predetermined portion of the front surface of the electronic circuit board, said at least one protruding boss aligning with said at least one compressible ground clip member;

a second electroless plated plastic shield having inner and outer surfaces and side walls extending from said inner surface, said second electroless plated plastic shield disposed about said electronic circuit board such that the sides walls of the second electroless plated plastic shield and the side walls of the first electroless plated plastic shield overlap and capacitively couple;

at least one screw for mechanically coupling the first electroless plated plastic shield, the electronic circuit board, the second electroless plated plastic shield, and the back housing; and

wherein the printed circuit board further comprises:

an aluminum-based fence soldered about a predetermined electrical circuit of the electronic circuit board; and

a perforated aluminum-based cover snap fitted onto the fence covering the predetermined electrical circuit.

5,596,488

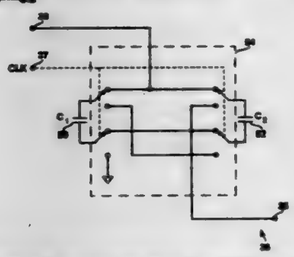
Patent Not Issued For This Number

5,596,489

CAPACITIVE TRANSFORMER HAVING A SWITCH RESPONSIVE TO CLOCK SIGNALS

Mel Bazes, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 14, 1994, Ser. No. 181,590
Int. Cl.[6] H02M *3/06*
U.S. Cl. 363—62 **64 Claims**



1. A transformer for transforming an input voltage at a first node into an output voltage at a second node, the transformer comprising:

a) a first capacitor;

b) a second capacitor; and

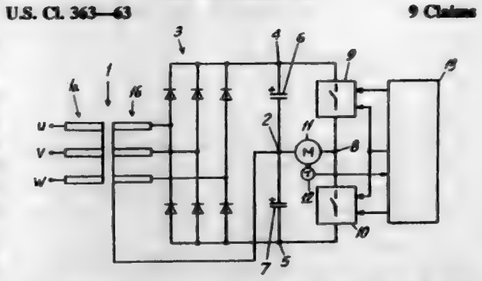
c) a first switching means responsive to a clock signal, the clock signal having a first phase and a second phase, the first switching means coupling the first capacitor and the second capacitor in parallel between the first node and the second node in the first phase of the clock signal, the first switching means coupling the first capacitor and the second capacitor in series between the second node and a third node in the second phase of the clock signal.

5,596,490

CONVERTER CIRCUIT FOR GENERATING DIRECT CURRENT WITH SELECTABLE POLARITY

Heiko Kaufmann, Schongau, Germany, assignee to Antelec Engineering GmbH, Schongau, Germany

Filed Jun. 6, 1995, Ser. No. 489,874
Claims priority, application Germany, Sep. 12, 1992, 42 41 486.5
Int. Cl.[6] H02M *7/02*
U.S. Cl. 363—63 **9 Claims**



1. A converter circuit for producing direct current with selectable polarity from a three-phase alternating voltage, with the following characteristics:

on the input side, there is a rectifier circuit arrangement with a bridge rectifier(3);

the output (4, 5) of the rectifier circuit arrangement is brought together, via two semiconductor switching elements, to one center point (8);

the output side of the converter circuit takes the form of an artificial star point (2) on the one hand and the center point (8) on the other hand,

and characterized by the following features:

the rectifier circuit arrangement is connected to the secondary side (*1b*) of a transformer (1), which is formed as a star circuit and defines the artificial star point (2);

the converter circuit is suitable for producing a direct current with a continuously variable voltage, by using switching elements consisting of series regulators (9, 10) operating in linear operation;

the series regulators (9, 10) are designed as modified driven MOSFET transistors (14, 15), the positive potential of the direct voltage furnished by the rectifier circuit arrangement being present at the drain of the first MOSFET transistor (14) and the negative potential being present at the source of the second MOSFET transistor (15) and, furthermore, the source of the first MOSFET transistor (14) and the drain of the second MOSFET transistor (15) being connected to the center point (8).

5,596,491

HIGH VOLTAGE POWER SUPPLY FOR A HELMET MOUNTED DISPLAY DEVICE

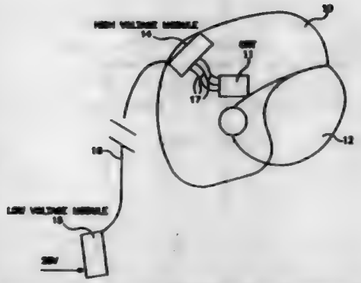
Andrew L. Gold, 108 Burdon Lane, Cheam, Surrey, United Kingdom

Continuation of Ser. No. 350,730, Dec. 7, 1994, Pat. No. 5,473,527. This application Nov. 29, 1995, Ser. No. 563,968
Claims priority, application United Kingdom, Oct. 3, 1991, 9120975; Oct. 31, 1991, 9123145
Int. Cl.[6] H02M *7/00;* G09G *3/02*
U.S. Cl. 363—65 **7 Claims**

1. A helmet mounted display system comprising:

a helmet including an electrically powered display device for providing information to the wearer of the helmet, the display device being supplied by a high voltage generated by a power supply from a low voltage source;

the power supply comprising first and second physically separate modules and an electrical conductor therebetween, wherein



the first module is connectable to said low voltage source and contains circuitry operating at low voltage;

the second module provides said high voltage supply and contains circuitry operating at high voltage and the second module is electrically connected to the display device to provide a high voltage to the display device; and

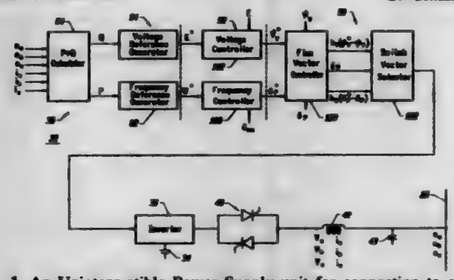
said electrical conductor extends between the two modules and carries current only at low voltage.

5,596,492

METHOD AND APPARATUS FOR DE-CENTRALIZED SIGNAL FREQUENCY RESTORATION IN A DISTRIBUTED UPS SYSTEM

Deepakraj M. Divan, and Mukul Chandorikar, both of Madison, Wis., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 14, 1994, Ser. No. 259,881
Int. Cl.[6] H02M 7/44
U.S. Cl. 363—95 **27 Claims**



1. An Uninterruptible Power Supply unit for connection to an Uninterruptible Power Supply system that includes a plurality of similarly controlled Uninterruptible Power Supply units that do not have communication links therebetween, said Uninterruptible Power Supply unit comprising:

a power bus node for connection to a power bus that has a plurality of loads and said plurality of Uninterruptible Power Supply units connected thereto, said power bus carrying a power signal with an operating frequency distinct from a nominal power signal frequency;

an inverter connected to said power bus node; and

a controller to generate a frequency restoration reference signal (ω_r^*) used to produce gate drive signals for said inverter, wherein said controller

receives a nominal power signal frequency signal (ω_o), an actual Dower signal frequeacy signal(ω_r), and an actual power level loading signal (P_l) measured locally at said Uninterruptible Power Supply unit,

subtracts said actual power signal frequency signal from said nominal power signal frequency signal to produce a delta power signal frequeacy signal($\Delta\omega_r$), and

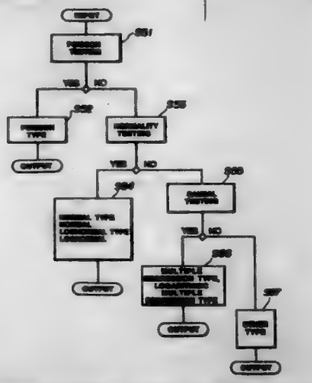
multiplies said delta power signal frequeacy signal ($\Delta\omega_r$) by the product of a frequency restoration constant (k) and a nominal power rating value (P_{ur}) to yield a first intermediate frequency restoration signal.

5,596,493

METHOD FOR CLASSIFYING SALE AMOUNT CHARACTERISTICS, METHOD FOR PREDICTING SALE VOLUME, METHOD FOR ORDERING FOR RESTOCKING, SYSTEM FOR CLASSIFYING SALE AMOUNT CHARACTERISTICS AND SYSTEM FOR ORDERING FOR RESTOCKING

Kaoru Tone, 23-4, Nakamachi 4-chome, Machida-city, Tokyo; Michiko Tone, Machida; Hiroyuki Tanaka, Kanagaya, and Toshikazu Ohzeki, Tokyo, all of Japan, assignors to Meiji Milk Products Co., Ltd., and Kaoru Tone, Tokyo, Japan

PCT No. PCT/JP92/00495, § 371 Date Dec. 17, 1992, § 102(e) Date Dec. 17, 1992, PCT Pub. No. WO92/18939, PCT Pub. Date Oct. 29, 1992
PCT Filed Apr. 17, 1992, Ser. No. 956,779
Claims priority, application Japan, Apr. 19, 1991, 3-115662
Int. Cl.[6] G06F 153/00
U.S. Cl. 395—210 **16 Claims**



1. A sale amount prediction method comprising the steps of:

entering POS data into a point-of-sale terminal;

calculating, within a computer and based upon the entered POS data, sale amount data of the individual goods for a predetermined time period;

calculating, within the computer and based upon the calculated sale amount data, a plurality of basic statistic parameters of daily sale amounts of said individual goods;

classifying, within the computer and based on said calculated basic statistic values, said individual goods by determining into which of a Poisson type, a normal type, a causal type, and another type not belonging to one of these types, the daily sale amount of the individual goods belongs; and

predicting the sale amount of the individual goods based upon a characteristic value of the type into which the daily sale amount of the individual goods is classified.

5,596,494

METHOD AND APPARATUS FOR ACQUIRING DIGITAL MAPS

Shihjong Kuo, 1433 NW. 189th Way #2, Beaverton, Oreg. 97006

Filed Nov. 14, 1994, Ser. No. 338,423
Int. Cl.[6] G06F 17/40
U.S. Cl. 364—420 **23 Claims**

1. A method of acquiring at least one instantaneous image of a terrestrial scene from a vehicle moving at a substantial distance above the ground and an associated set of absolute geophysical coordinates of terrestrial objects in said instantaneous picture, comprising the steps of:

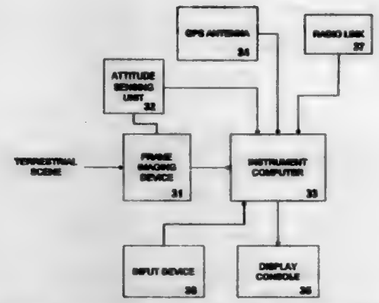
a. using a set of devices associated with a frame imaging device to measure at least one set of angles relating an "x" axis, a "y" axis, a "z" axis of an image coordinate system with respect to a set of three world axes that include a forward flight axis, a cross-track axis, and a vertical axis, and tagging them with a first time mark for each set of angles;

b. using a positioning device associated with the moving vehicle to obtain at least one set of absolute geophysical coordinates and velocity of said frame imaging device, and tagging them with a second time mark or each set of coordinates;

c initiating an exposure of said frame imaging device, producing an instantaneous image, and tagging said exposure with a third time mark;

d. collecting said instantaneous image from said frame imaging device, said sets of angles, said sets of absolute geophysical coordinates and velocity, and a set of said time marks; and

e. calculating a set of absolute geophysical coordinates of terrestrial objects by means of formulas relating a spatial orientation relationship between said frame imaging device and said terrestrial objects.

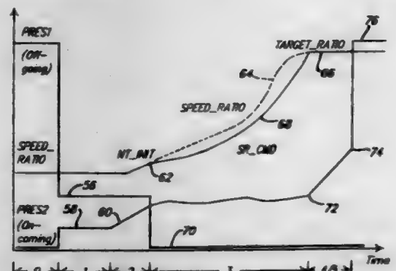


5,596,495

GEARSHIFT CONTROLLER FOR AUTOMATIC TRANSMISSION

Larry T. Brown, and Marvin P. Kraska, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 6, 1995, Ser. No. 468,851
Int. Cl.[6] B60K 41/22; F16H 61/06
U.S. Cl. 364—424.08 **9 Claims**



1. A method for controlling a change from a first gear to a second gear in an automatic transmission having an input shaft, output shaft, gearing driveably connecting the input shaft and output shaft, an oncoming friction element and offgoing friction element, comprising the steps of:

repetitively determining current input shaft speed and output shaft speed;

determining an initial speed ratio from the input shaft to the output shaft while operating in the first gear;

repetitively determining a speed ratio from the input shaft to the output shaft during the change in gears;

increasing speed ratio by decreasing pressure in the offgoing friction element and increasing pressure in the oncoming friction element;

determining the magnitude of initial input shaft speed when speed ratio has reached a predetermined magnitude above the initial speed ratio;

reducing pressure in the offgoing friction element substantially to zero pressure;

repetitively producing a commanded speed ratio determined from said initial input shaft speed and current output shaft speed; and

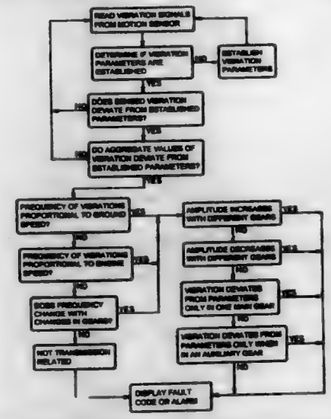
increasing speed ratio continually by controlling the magnitude of pressure in the oncoming friction element under control of a closed-loop controller until speed ratio reaches a target speed ratio.

5,596,496

VIBRATION SENSING AND DIAGNOSTIC SYSTEM FOR TRANSMISSION ASSEMBLY

John M. Loeffler, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 366,859, Dec. 29, 1994, abandoned. This application Apr. 23, 1996, Ser. No. 636,726
Int. Cl.[6] G06F 7/70; G06G 7/70
U.S. Cl. 364—424.034 **17 Claims**



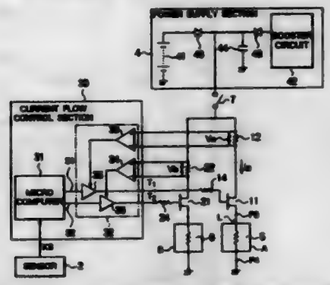
11. A combined transmission and monitoring system for indicating an operating condition of the transmission comprising:

a transmission including a case, an input shaft extending within said case, an output shaft extending within said case, a plurality of gears supported on said case for connecting said output shaft for rotation at a plurality of predetermined speed relative to said input shaft, a shift lever for selecting a desired one of said plurality of gear ratios, and a shift tower assembly mounted on said case for supporting said shift lever;

a sensor mounted on said shift tower assembly and responsive to frequency and magnitude of mechanical vibration of said transmission for generating a signal which is representative thereof; and

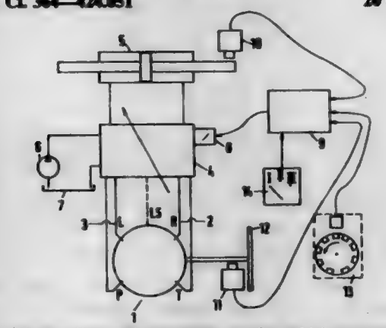
a controller responsive to said signal from said sensor for comparing said signal from said sensor with a predetermined signal characteristic and for generating an indication of the operating condition of said transmission when said signal from said sensor deviates from said predetermined signal characteristic by more than a predetermined mount.

5,596,497
CONTROL CIRCUIT FOR VEHICLE SAFETY DEVICE
Ziro Honda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 16, 1995, Ser. No. 389,788
Claims priority, application Japan, Feb. 17, 1994, 6-020229
Int. Cl.[6] B60R 21/32
U.S. Cl. 364—424.855 4 Claims



1. A control circuit for a vehicle safety device comprising:
starting means for starting the vehicle safety device by electrical energy supplied from a power supply means;
starting signal generating means which detects vehicle impact and generates a starting signal; and
starting control means, connected between power supply means and said starting means, for supplying current from the power supply means to said starting means when the starting signal has been generated by said starting signal generating means, and for blocking supply of current from the power supply means to said starting means when the current value has exceeded a predetermined value.

5,596,498
HYDRAULIC STEERING ARRANGEMENT FOR VEHICLES
Svend E. Thomsen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 182,132, Jan. 14, 1994, abandoned. This application Nov. 22, 1995, Ser. No. 563,894
Int. Cl.[6] B62D 5/093
U.S. Cl. 364—424.051 20 Claims



1. A hydraulic steering arrangement for vehicles comprising a fluid-activated steering motor, a flow amplifier in fluid connection therewith, and a steering measuring device for measuring fluid flow, said steering measuring device being in fluid connection with said flow amplifier, said amplifier including means to amplify the fluid flow measured by said steering measuring device, at least one sensor, said sensor including means to determine a performance characteristic of the vehicle, and a control device, said sensor being connected to said control device and said control device including means to change the amount of fluid supplied by the flow amplifier to the steering motor in dependence on an output signal of the sensor, said flow amplifier having a variable amplification factor, and said control device including means to change said amplification factor of the flow amplifier.

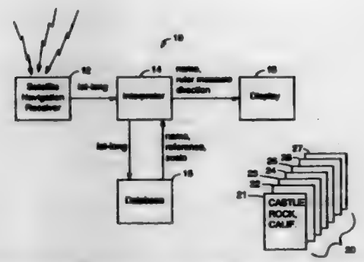
5,596,499
CONTROL LAW MODE SWITCHING BETWEEN RATE COMMAND AND ATTITUDE COMMAND CONTROL SYSTEMS
Steven I. Glusman, West Chester, Pa., and Terry M. Black, New Castle, Del., assignors to The Boeing Company, Seattle, Wash.
Filed Feb. 21, 1995, Ser. No. 391,556
Int. Cl.[6] B64C 13/08
U.S. Cl. 364—424.06 18 Claims



1. A method for switching between command/response modes in a flight control system that controls the magnitude of an aircraft parameter, the method comprising the steps of:
producing a command representing a desired change in magnitude of the parameter;
determining whether the desired response to the command is to be provided by a control system characterized by a second order transfer function or by a control system characterized by a first order transfer function;
developing a first transfer function for a dynamic system of second order having poles at a natural frequency of the desired response and a zero at a trim follow-up frequency;
developing a second transfer function from the first transfer function by equating the trim follow-up frequency to the natural frequency of the desired response;
producing a response from the first transfer function and said command if the response is to be provided by a control system characterized by a second order transfer function, and from the second transfer function and said command if the response is to be provided by a control system characterized by a first order transfer function; and
applying the response to a control surface of the aircraft to change the current magnitude of the parameter to the desired magnitude of the parameter.

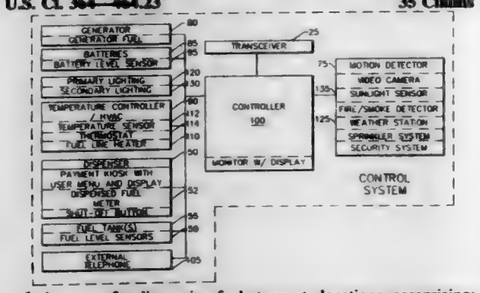
5,596,500
MAP READING SYSTEM FOR INDICATING A USER'S POSITION ON A PUBLISHED MAP WITH A GLOBAL POSITION SYSTEM RECEIVER AND A DATABASE
David S. Sprague, Portola Valley, and Arthur N. Woo, Cupertino, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 143281, Oct. 25, 1993, Pat. No. 5,422,814. This application Dec. 23, 1994, Ser. No. 363,680
Int. Cl.[6] G01S 5/02
U.S. Cl. 364—449.7 7 Claims

1. A satellite navigation map reading system, comprising:
a navigation satellite receiver for receiving microwave radio transmission signals from orbiting global positioning system (GPS) satellites and for converting a plurality of said signals into a determination of an earth position of the receiver and including means for computing said earth coordinate positions in terms of latitude and longitude;
a database of unique map names and each map's relation to a map coordinate earth position which is represented on a published, printed map and that is identified by one of said map names, and a scale of said published, printed map, wherein, the database includes the names, scales and included latitude and longitude reference points for the 7.5 minute



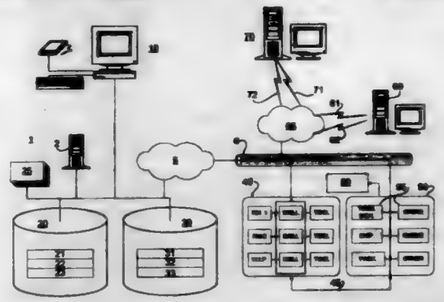
series topographical maps published by the United States Geological Survey (USGS);
interpretation means connected to the navigation satellite receiver and the database for converting said determination of an earth position of the receiver into one of said map names by indexing the database to find which of said published, printed maps includes a coordinate of said determined earth position of the receiver;
a display connected to the interpretation means for visually communicating the unique identity of said one said published, printed map; and
ruler measurement means connected to the interpretation means and the display for indicating to a user a ruler distance on a sheet of said published, printed map that said earth position of the receiver is represented up or down, then left or right from a reference point on said published, printed map.

5,596,501
SYSTEM FOR DISPENSING FUEL AT REMOTE LOCATIONS, AND METHOD OF OPERATING SAME
Timothy J. Comer; Tommy J. Embley, both of Anchorage; Eugene Mastej, Eagle River, and Dorothy S. D. Wilson, Anchorage, all of Ak., assignors to Powerplant Fuel Modules, LLC, Anchorage, Ak.
Filed Jul. 19, 1995, Ser. No. 504,250
Int. Cl.[6] G07G 01/14; G06F 17/60
U.S. Cl. 364—464.23 35 Claims



1. A system for dispensing fuel at remote locations, comprising:
a housing having a plurality of compartments therein;
a fuel tank in one of said compartments;
motion detection means for generating a motion-detect signal upon detection of motion external to said housing;
temperature controlling means for controlling temperature in at least one of said compartments;
fuel quantity determining means, operatively connected to said fuel tank, for determining a quantity of fuel in said fuel tank and generating fuel information based on the determined quantity of fuel;
means responsive to user actuation for receiving payment information relating to fuel to be dispensed from said fuel tank;
transceiving means, responsive to said fuel quantity determining means and said payment information receiving means, for providing wireless transmission of the payment information and the fuel information to an external site and wireless reception of approval information from the external site;
dispensing means, responsive to said payment information receiving means, for dispensing fuel from said fuel tank; and
electrical energy generating means, operatively connected to said dispensing means, for generating electrical energy in response to at least one of the motion-detect signal, the payment information and the approval information.

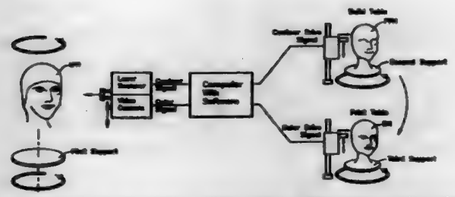
5,596,502
COMPUTER SYSTEM INCLUDING MEANS FOR DECISION SUPPORT SCHEDULING
Robert E. Koski; Kenneth R. Henderson, and Christopher R. Barlow, all of Sarasota, Fla., assignors to SunOptech, Ltd., Sarasota, Fla.
Filed Nov. 14, 1994, Ser. No. 339,520
Int. Cl.[6] G06F 19/00
U.S. Cl. 364—468.01 11 Claims



1. Method of computerized real time scheduling of production of products or delivery of services by a future time certain employing a computer system having one or more central processing units containing logic circuits configured by software contained in memory and one or more display menus, said computer system being controlled by user manipulation to perform, in any sequence, the steps of:
a) describing products to be produced or services to be performed in terms of features;
b) determining capabilities of available, callable, resources, including at least one physical workspace;
c) deriving and cataloging doability of features from the determination of said physical workspace and resource capabilities;
d) upon order entry, making one or more production or delivery time appointments at one or more physical workspaces when all said resources may be made simultaneously available to at least one of said physical workspaces to produce one or more of said features by a time certain.

5,596,503
PROCESS FOR MAKING A DOLL'S HEAD LOOKING LIKE THE HEAD OF A LIVING PERSON
Mary L. Flint, 217 Artillery Rd., Middlebury, Conn. 06762
Filed May 12, 1995, Ser. No. 439,881
Int. Cl.[6] G06F 17/50; 19/00
U.S. Cl. 364—468.25 5 Claims

1. A process for making a doll's head looking like the head of a living person comprising the steps of:
a. supporting the person on a first rotatable support and immobilizing the person's head relative to the support,
b. rotating the support and person at a given rate of rotation,
c. from a fixed position vertically scanning the rotating person's head with a laser scanner with respect to the topography of



areas of the head and a video camera with respect to the color of areas of the head and recording the results on computer software,

d. providing a second and a third rotatable support, the second support having an upstanding core,

e. using a computer to drive means to form a partly finished doll's head on the second rotatable support by applying plastic to the core as it rotates based on the topographic input from the laser scanner,

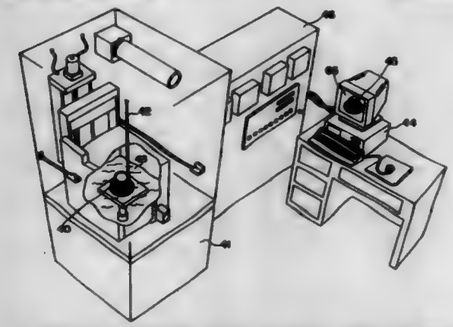
f. supporting the partly finished head on the third support and, as it rotates, using the software to drive means to color the doll's head correspondingly to the person's head based on the color input from the video camera.

5,596,504

APPARATUS AND METHOD FOR LAYERED MODELING OF INTENDED OBJECTS REPRESENTED IN STL FORMAT AND ADAPTIVE SLICING THEREOF

Kamesh Tata, Schaumburg, Ill.; Amit Bagchi, Seneca, and Nadim M. Aziz, Clemson, both of S.C., assignors to Clemson University, Clemson, S.C.

Filed Apr. 10, 1995, Ser. No. 419,711
Int. Cl.[6] G06F *19/00;17/50*; G06T *17/10*
U.S. Cl. 364—468.27 **22 Claims**



1. A device for effecting automatic operation of a stereolithography apparatus (SLA) with respect to a part to be built by the SLA, the part having a desired profile characterized by at least one key characteristic and at least two local complexity levels, wherein the operation of the SLA is controlled based on a two-dimensional sliced model of the local profile of the cross-section of the part to be built with each slice plane disposed transversely with respect to and along a slice axis of the part, which is represented by a tesselated model of the part and provided as an input to the device in the form of an STL file specifying triangular facets obeying the vertex-to-vertex rule, the device comprising:

a programmable computer;

a facet processor means for operating on the STL file input to produce a processed facet file, said facet processor means being programmed on said computer, said facet processor means including a facet sorting means, said facet sorting means being configured to sort the facets of the STL file according to the slice axis to produce a sorted facet file;

said facet processor means including a facet grouping means for operating on said sorted facet file to produce a grouped facet file, said facet grouping means being configured to group the facets of said sorted facet file according to facets having common minimum vertex values with respect to the slice axis and to produce a grouped facet file;

said facet processor means including a facet subgrouping means for operating on said grouped facet file to produce a subgrouped facet file, said facet subgrouping means being configured to subgroup the facets of said grouped facet file according to facets having common maximum vertex values with respect to the slice axis and to produce a subgrouped facet file;

a key characteristic identifier means for operating on said sorted facet file, said grouped facet file and said subgrouped facet file, said key characteristic identifier means being programmed on said computer, said key characteristic identifier means being configured to identify key characteristics of the profile represented by the STL file and to produce a key characteristic data file from said key characteristics of the profile represented by the STL file;

a thickness calculator means for operating on said sorted facet file, said grouped facet file, said subgrouped facet file and said key characteristic data file, said thickness calculator means being programmed on said computer, said thickness calculator means being configured to calculate a thickness for each layer of the model of the desired profile represented by the STL file of the part such that the geometrical error between the desired profile of the part and said model profile of each said layer having said layer thickness, remains no greater than a preselected geometrical error and to produce a layer thickness data file containing the results of such calculations;

a slicer means for operating on said sorted facet file, said grouped facet file, said subgrouped facet file and said layer thickness data file, said slicer means being programmed on said computer, said slicer means being configured to calculate the intersection of each slice plane disposed at a height above the previous slice plane by said thickness calculated by said thickness calculator means for each layer of the model of the intended profile represented by the STL file and to produce a slice plane intersection data file;

a directional ordering means for finding the direction of each contour defining each intersection of each slice plane and ensuring uniformity of such direction with the direction of each other contour defining each other intersection of each other slice plane;

a model generating means for using said layer thickness data file and said slice plane intersection data file to generate at least a portion of a model of the part wherein said portion of said model of the part includes a plurality of successive layers wherein the cross-section of each layer in a plane of view is defined by the intersection with said plane of view, of a pair of parallel planes and a model profile connecting said parallel planes, and wherein for each layer the minimum distance separating its pair of parallel planes defines the thickness of said layer; and

an interface means for controlling the operation of the machine based on said portion of a model of the part.

5,596,505

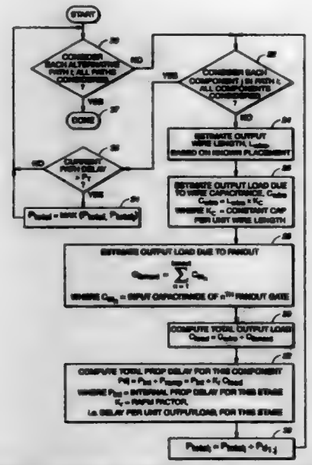
ESTIMATION OF PIN-TO-PIN TIMING FOR COMPILED BLOCKS

Russell L. Steinweg, Santa Clara; Michael A. Zampaglione, and Pei H. Lin, both of San Jose, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 23, 1993, Ser. No. 96,130
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—490 **20 Claims**

1. A process for producing an electrical circuit comprising the steps of:

determining a signal delay of a component due to physical characteristics of the component, said physical characteristics including at least a capacitance based upon a predetermined relative placement of the component during compilation of a circuit block;



determining an input-to-output speed for a circuit block by determining delays due to physical characteristics through alternate paths of the circuit block; and

producing a compiled circuit block having said predetermined relative placement.

5,596,506

METHOD OF FABRICATING IC CHIPS WITH EQUATION ESTIMATED PEAK CROSSTALK VOLTAGES BEING LESS THAN NOISE MARGIN

Richard J. Petschauer, Edina, Minn.; Roland D. Rothenberger, Poway, Calif., and Paul G. Tuinenga, Fridley, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 9, 1995, Ser. No. 385,850
Int. Cl.[6] H04B *3/32*
U.S. Cl. 364—491 **27 Claims**

$$61 \rightarrow V_p = K(e^{-X} - e^{-Y})$$

$$63 \rightarrow \begin{cases} X = \dfrac{a\log(a/b)}{a-b}, \; Y = \dfrac{b\log(a/b)}{a-b}, \; K = \dfrac{abC_C V_S (R_0 + R_L/2)}{b-a} \\ \text{where } a = \dfrac{2.197}{\Delta T}, \; b = \dfrac{1}{(R_0 + R_L/2)C_u} \end{cases}$$

$$62 \rightarrow \begin{cases} V_S = \text{MAGNITUDE OF AGGRESSOR VOLTAGE TRANSITION} \\ \Delta T = \text{TIME FOR AGGRESSOR VOLTAGE TRANSITION TO OCCUR FROM 10\% } V_S \text{ TO 90\% } V_S \\ R_0 = \text{VICTIM NET DRIVER OUTPUT RESISTANCE} \\ R_L = \text{VICTIM LINE RESISTANCE} \\ C_u = \text{VICTIM LINE CAPACITANCE} \\ C_C = \text{COUPLING CAPACITANCE} \end{cases}$$

1. A method of fabricating an integrated circuit chip, which contains a victim net and a set of aggressor nets with each aggressor net having a line segment that lies next to said victim net, such that crosstalk voltages coupled to said victim net are within an acceptable level; said method including the steps of:

providing a trial layout for said victim net and said aggressor nets;

assigning to said trial layout of said victim net, the parameters of—a line capacitance, a line resistance, and a driver output resistance; and assigning to said trial layout of each aggressor net, the parameters of—a coupling capacitance to said victim net, and a voltage transition;

estimating, for each aggressor net, a respective peak crosstalk voltage V_p which the aggressor net couples into said victim net as a function $V_p = K(e^{-X} - e^{-Y})$ where K, X, and Y are products of said parameters;

modifying said trial layout and repeating said assigning and estimating steps until a summation of the estimated peak crosstalk voltages in said victim net is within said acceptable level; and,

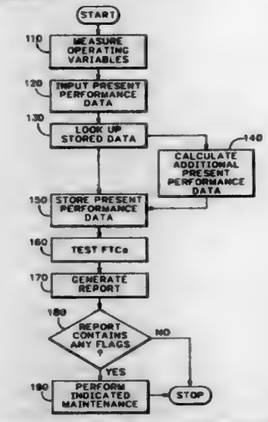
building said chip with the modified layout for which said summation is within said acceptable level.

5,596,507

METHOD AND APPARATUS FOR PREDICTIVE MAINTENANCE OF HVACR SYSTEMS

Jeffrey K. Jones, 1861 SE. 148th Ave., Portland, Oreg. 97233, and James White, 2233 SE. 53, Portland, Oreg. 97215

Filed Aug. 15, 1994, Ser. No. 290,358
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—585 **26 Claims**



1. A computer-assisted method of performing predictive maintenance on a heating, ventilation, air-conditioning and/or refrigeration (HVACR) system, the method comprising the steps of:

storing a plurality of defined HVACR system parameters— in a memory location in the computer, such defined parameters including system temperature and system pressure parameters;

defining at least one preventive maintenance instruction;

storing said instruction(s) in a computer-accessible memory;

measuring a HVACR system variable which corresponds to at least one stored system parameter;

comparing the defined parameter with the system variable to assess whether the variable is sufficiently highly correlated with the system parameter;

responsive to said comparing, accessing at least one of said stored instructions if the system parameter and the measured variable are not sufficiently highly correlated; and

displaying said accessed instruction(s) so that a user will understand the type of maintenance required.

5,596,508

HIGH RESOLUTION MEASUREMENT OF A THICKNESS USING ULTRASOUND

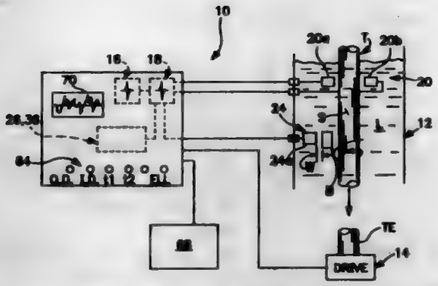
John M. Cuffe, County of Centre, United Kingdom, assignor to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Dec. 7, 1994, Ser. No. 350,956
Int. Cl.[6] G01H *11/00*
U.S. Cl. 364—508 **37 Claims**

1. Apparatus for measuring the physical properties of an object using ultrasonics comprising:

means for generating an electrical pulse having a predetermined set of characteristics;

transmission means for converting said pulse to an ultrasonic waveform, simultaneously propagating the waveform at the object from at least two different directions, and for detecting respective reflected response waveforms from the object;



means for storing each response waveform and including a first converting means and a second converting means for respectively converting each response waveform from an analog signal to a digital signal, and memory means for storing the resultant digital contents of each converted waveform; and,

processing means for simultaneously, separately reconstructing each response waveform and determining from each separate reconstruction a value representing a first physical characteristic of the object, said processing means including means for mathematically combining the respective values derived from the separate reconstructions to produce another value representating a second physical characteristic of the object, and said processing means further including means for comparing the values for each of the physical characteristics with a predetermined set of limits for each characteristic to determine if the characteristic values fall within said limits, a first processing channel for processing one of the converted waveforms, and a second and separate processing channel for processing the other converted waveform, each processing channel having as a data input the converted waveform digital contents stored in one of the respective converting means each channel including gate means for performing a real time comparison of the response waveform with predetermined threshold criteria for the response waveform to determine if the converted response waveform is to be processed by the processing means and a processor to which an output from the gate means is supplied, the output from the gate means providing the processor the location in the memory means of data to be used in reconstructing the converted waveform to measure times of flight, each said processor employing a linear interpolation technique and a finite impulse response technique on converted waveform data to reconstruct the waveform and determine accurate time of flight values, and said processing means further including a third processor to which the results of the operations of each channel processor are supplied, said results including each of the two respective characteristic values represented.

5,596,509

PASSIVE INFRARED BULLET DETECTION AND TRACKING

Thomas J. Kerr, Alamo, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed May 12, 1994, Ser. No. 241,907

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—516 **65 Claims**

1. A method for passively detecting and determining the path of a projectile comprising the steps of:

observing and recording a plurality of first successive images of infrared radiation present in a region in which a projectile is expected to be located using at least one passive infrared detector,

suppressing in each of said plurality of first successive images of said region background infrared radiation present in said region such that second successive images containing substantially only infrared radiation generated by said projectile as said projectile passes through said region are produced, and

calculating the path of said projectile by using said second successive images of infrared radiation generated by said projectile.

5,596,510

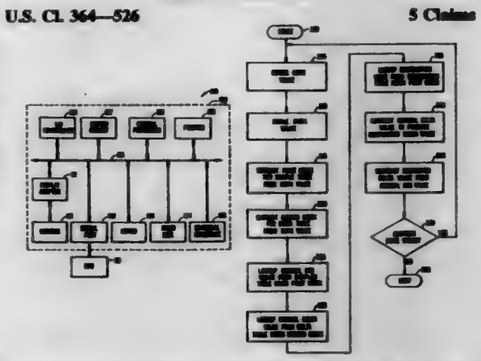
TABLE-BASED LINEAR INTERPOLATION FOR COLOR CORRECTION SYSTEM AND METHOD

Mark Beenke, Santa Rosa, Calif., assignor to Island Graphics, Larkspur, Calif.

Filed Mar. 23, 1994, Ser. No. 217,048

Int. Cl.[6] G03F *3/08*

U.S. Cl. 364—526 **5 Claims**



1. A computer-implemented method for transforming a first color in a first color space to a second color in a second color space different from the first color space, comprising the steps of:

producing a nominal transform color from a sampled lookup table storing a plurality of transforms of a subset of preselected colors in the first color space to corresponding colors in the second color space;

producing a delta value from a delta lookup table storing a plurality of interpolation values of a subset of possible colors in the second color space; and

combining said nominal transform color and said delta value to create the second color.

5,596,511

COMPUTING METHOD AND APPARATUS FOR A MANY-BODY PROBLEM

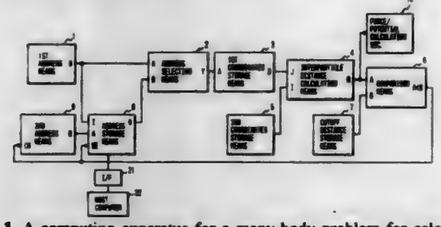
Shinjiro Toyoda; Hitoshi Ikoda; Eiri Hashimoto, and Nobuaki Miyakawa, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1994, Ser. No. 186,829

Claims priority, application Japan, Jan. 27, 1993, 5-012032; Jan. 28, 1993, 5-012908; Jan. 28, 1993, 5-012909

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—527 **9 Claims**



1. A computing apparatus for a many-body problem for calculating a force acting on a particular particle or a potential of the particular particle in a system including a plurality of particles as a sum of interactions between the particular particle and the other particles, comprising:

first coordinates storage means for storing coordinates of all the particles included in the system;

first address means for sequentially supplying an address corresponding to a particle number to the first coordinates storage means;

second coordinates storage means for storing coordinates of the particular particle;

means for calculating an interparticle distance based on coordinates output from the first coordinates storage means upon reception of the address and coordinates of the particular particle read from the second coordinates storage means;

means for storing a cutoff distance;

means for comparing the calculated interparticle distance with the cutoff distance, and for generating a write signal if the calculated interparticle distance is shorter than the cutoff distance;

particle number storage means for storing the particle number upon reception of the write signal; and

second address means for supplying an address to the particle number storage means;

wherein a proximal particle list including numbers of particles located within the cutoff distance from the particular particle is generated in the particle number storage means when a Coulomb force or potential is calculated, and a van der Waals force or potential is thereafter calculated based on only the particles included in the proximal particle list.

5,596,512

METHOD OF DETERMINING THE CONDITION OF A BACK-UP BATTERY FOR A REAL TIME CLOCK

Albert C. K. Wong, Golden Valley; Romuald M. Jurewicz, St. Louis Park, and Michael D. McCormack, Robbinsdale, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

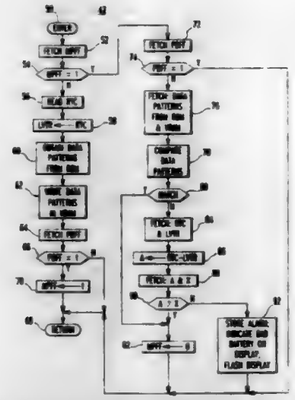
Continuation of Ser. No. 290,165, Aug. 15, 1994, abandoned. This application Apr. 17, 1996, Ser. No. 633,328

Int. Cl.[6] G01R *31/00*

U.S. Cl. 364—550 **14 Claims**

1. A method of determining the condition of a battery which backs up a real-time clock (RTC) when a main power supply for the RTC fails or is disconnected, comprising the steps of:

storing a time value of the RTC in non-volatile memory means while powered by the main power supply, just prior to a loss of the main power supply,



detecting return of the main power supply,

comparing the time value of the RTC upon return of the main power supply with said stored time value of the RTC,

and indicating that the back-up battery is bad when the comparison step finds a predetermined relationship between the compared time values.

5,596,513

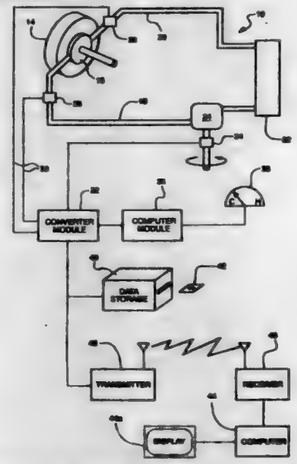
METHOD AND APPARATUS FOR ESTIMATING INTERNAL BRAKE ENERGY

David R. Schricker, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jan. 5, 1995, Ser. No. 369,030

Int. Cl.[6] G01K *13/02*

U.S. Cl. 364—557 **27 Claims**



1. A method for determining internal brake energy for a fluid cooled brake system on a work machine from easily sensed actual machine operating parameters, comprising the following steps:

providing a thermal model of the brake;

sensing actual machine operating parameters related to brake operation externally of the brake and inputting the sensed parameters to the model; and

determining an estimated internal brake temperature (TEIB) from the model based on the sensed parameters, and generating signals of TEIB useful for indicating brake operation and/or health;

wherein the sensed parameters comprise the temperature of coolant into the brake (TB_{in}), the temperature of coolant out

of the brake (TB_{out}), and one or more additional actual parameters from which the coolant flow rate through the brake (BOF) can be determined.

5,596,514

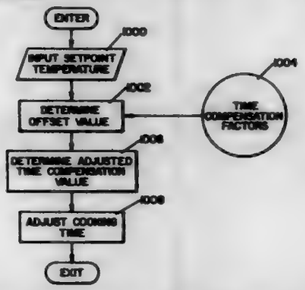
ELECTRONIC CONTROL SYSTEM FOR A HEATING APPARATUS

Charles A. Maher, Jr., Stratford, Conn., and Raymond Larrick, Kent, Ohio, assignors to Tridelta Industries, Inc., Mentor, Ohio

Division of Ser. No. 210,127, Mar. 17, 1994. This application Mar. 23, 1995, Ser. No. 409,166

Int. Cl.[6] G06F 17/00; A47J 27/00

U.S. Cl. 364—569 **22 Claims**



1. A system for adjusting an interval of time for a heating operation comprising:

means for establishing an interval of time;

means for storing a plurality of time compensation factors for a plurality of corresponding temperatures;

means for inputting a setpoint temperature;

means for determining an offset value from said plurality of stored time compensation factors, in accordance with said setpoint temperature;

means for determining an adjusted time compensation factor for a measured temperature based on the time compensation factor corresponding to the measured temperature and the offset value; and

means for utilizing the adjusted time compensation factor to adjust the interval of time.

5,596,515

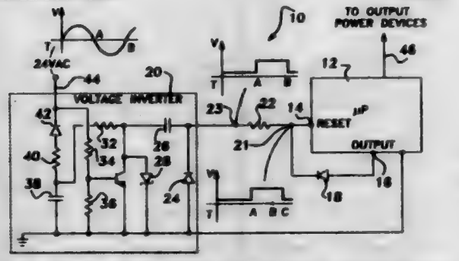
MICROPROCESSOR CONTROL CIRCUIT WITH INVERTED RESET AND EXTENDABLE RUNTIME

J. Scott Jamieson, Waukesha, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Sep. 30, 1994, Ser. No. 315,375

Int. Cl.[6] G06F 17/00

U.S. Cl. 364—570 **9 Claims**



1. An apparatus for increasing control over the outputs of a gas burner ignition control system having a periodic input power supply signal to prevent incorrect ignition signals, comprising:

processing means for processing information and executing an operating program,

said processing means having a reset terminal for receiving an activating signal and an output terminal,

wherein said output terminal is connected to said reset terminal;

said output terminal supplying an output signal which combines with said activating signal to form an override signal at said reset terminal,

said override signal having first and second levels; and

inverting means for supplying said activating signal,

said inverting means receiving the periodic input supply signal and inverting the supply signal to generate said activating signal;

said inverting means connected to said reset terminal to supply said activating signal to said reset terminal,

said activating signal having succeeding and repetitive first and second signal levels 180° out of phase from the input supply signal,

said activating signal being a square wave limited in magnitude to a logic high and a logic low;

wherein said processing means is responsive to said activating signal to enter an active state when said activating signal is at the first level, and

said processing means enters an inactive state when said activating signal is at the second level; and

said processing means remains in the active state to extend the processing time when said override signal is at the first level and said activating signal is at the second level; and

said processing means remains in the active state to extend the processing time only after said processing means has successfully completed a series of tests; and

said processing means connected to the output circuits, the output circuits being operational only during the time said processing means remains active due to said override signal being at the first level and said activating signal being at the second level.

5,596,516

CODE SEQUENCE GENERATOR

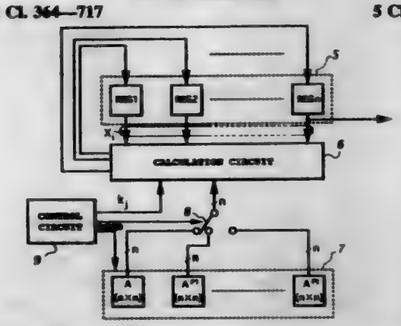
Akihiro Higashi, Yokosuka; Koji Ohno, and Narumi Umeda, both of Yokohama, all of Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

Filed Apr. 25, 1995, Ser. No. 428,389

Claims priority, application Japan, Apr. 27, 1994, 6-090353; Apr. 12, 1995, 7-087191

Int. Cl.[6] G06F 1/02

U.S. Cl. 364—717 **5 Claims**



1. A code sequence generator for generating a code sequence $Y=A^mX$ by repeating a linear transformation defined by an n×n matrix A to n-bit data X by m times (m is a positive integer), said code sequence generator comprising:

storing means for storing in advance p_j-th power of said matrix A, that is, A^{p_j}, for each of predetermined t+1 positive integers p_j (j=0, 1, 2, . . . , t);

means for resolving said integer m to a linear combination of said integers p_j, that is, $m=k_0+k_1p_1+k_2p_2+\ldots+k_tp_t$ (k_0, k_1, k_2, . . . , k_t are integers equal to or greater than zero);

selecting means for sequentially selecting matrices A^{p0}, A^{p1}, A^{p2}, . . . , A^{pt} associated with nonzero ones of said k_0, k_1, k_2, . . . , k_t from said storing means; and

means for performing the following matrix calculation for nonzero ones of said k_0, k_1, k_2, . . . , k_t,

$$Y=(A^{p0})^{k0}(A^{p1})^{k1}(A^{p2})^{k2}\ldots(A^{pt})^{kt}X.$$

5,596,517

METHOD AND ARRANGEMENT FOR TRANSFORMATION OF SIGNALS FROM A FREQUENCY TO A TIME DOMAIN

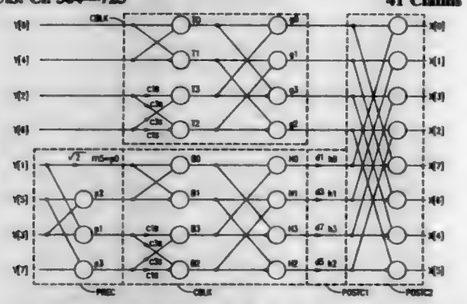
Anthony M. Jones; Kevin D. Dewar, both of Bristol, and Martin W. Sotheran, Dursley, all of Great Britain, assignors to Discovision Associates, Irvine, Calif.

Division of Ser. No. 82,087, Jun. 24, 1993, Pat. No. 5,479,364. This application Mar. 7, 1995, Ser. No. 400,722

Claims priority, application European Pat. Off., Jun. 26, 1992, 92305927

Int. Cl.[6] G06F 7/38

U.S. Cl. 364—725 **41 Claims**



1. A system for transforming digital signals from a frequency to a time representation, in which the digital signals are arranged in groups of N data input words, comprising:

means for multiplying data input words by the square root of two to generate scaled input words;

pre-common processing means (PREC) arranged to perform predetermined pairing operations on odd-numbered ones of the scaled input words and to transmit even-numbered ones of the scaled input words to pre-common outputs; and

post-common processing means (POSTC) arranged to perform predetermined output scaling operations on the odd common processing means output values to form post-processed odd values and to arithmetically combine the post-processed odd values with the even common processing means output values to generate high- and low-order output words, the system being arranged such that the output words contain inverse discrete cosine transformation values corresponding to the input data words.

5,596,518

ORTHOGONAL TRANSFORM PROCESSOR

Masaki Toyokura, Hyogo; Kiyoshi Okamoto, and Yoshifumi Matsumoto, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

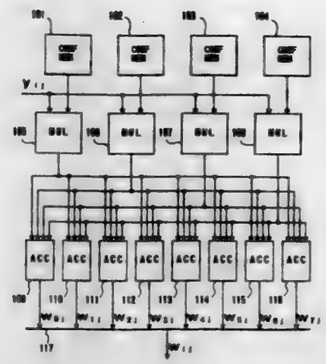
Filed May 3, 1995, Ser. No. 434,298

Claims priority, application Japan, May 10, 1994, 6-096196; Nov. 1, 1994, 6-268701

Int. Cl.[6] G06F 17/14

U.S. Cl. 364—725 **20 Claims**

1. An orthogonal transform processor for executing an orthogonal transform processing on an input data consisting of 2^{n+1} (n is an integer of 2 or more) elements, comprising;



first to 2^nth coefficient memories each for storing 2^{n+1} absolute values of $2^n\times2^{n+1}$ coefficients out of $2^{n+1}\times2^{n+1}$ coefficients forming an orthogonal transform matrix;

first to 2^nth multipliers each for executing multiplication of one element of said input data by one of the 2^{n+1} absolute values of coefficients stored in the corresponding coefficient memory out of said first to 2^nth coefficient memories;

first to 2^{n+1}th accumulators for executing accumulation using results of said first to 2^nth multipliers while restoring signs of the coefficients of said orthogonal transform matrix, thereby to obtain, in parallel, 2^{n+1} inner products corresponding to said orthogonal transform matrix; and

a 2^{n+1}-input selector for successively selectively supplying results of said first to 2^{n+1}th accumulators as elements of an output data of said orthogonal transform processor.

5,596,519

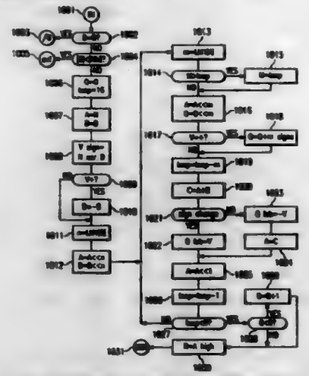
ITERATIVE DIVISION APPARATUS, SYSTEM AND METHOD EMPLOYING LEFT MOST ONE'S DETECTION AND LEFT MOST ONE'S DETECTION WITH EXCLUSIVE OR

Jerry R. Van Aken, Sugar Land; Karl M. Guttag, Missouri City, and Sydney W. Poland, Katy, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 160,120, Nov. 30, 1993. This application Jun. 7, 1995, Ser. No. 484,113

Int. Cl.[6] G06F 7/52

U.S. Cl. 364—766 **60 Claims**



24. In a data processing apparatus including first, second and third data registers, an arithmetic logic unit including a status register indicating if a result of an operation of said arithmetic logic unit is less than zero, a left most one's circuit generating an output equal to a number of bits from a most significant bit of said

input to the location of a left most one bit at an input, and a loop counter register storing a number of completed iterations, an iterative method for dividing a numerator by a denominator to form a plurality of quotient bits, the divisor having N bits an stored in said first data register and the numerator having more than N bits including most significant bits initially stored in said second data register and least significant bits initially stored in said third data register, said method comprising the steps of:

initially

storing a most significant "1" bit of said divisor in a most significant bit position of said second data register by shifting said divisor in said second data register; and

storing a most significant "1" bit of said numerator in a most significant bit position of said first data register by shifting said numerator in said first data register;

for each iteration

supplying contents of said second data register to said input of said left most one's circuit thereby detecting the position L of a left most one bit of said most significant bits of the numerator,

if L is not equal to zero, then

left shifting the numerator stored in said second and third data registers by L places,

setting L quotient bits equal to zero,

storing said L zero quotient bits in L least significant bits of said third data register vacated by said left shifting,

incrementing the number of completed iterations stored in said loop counter register by L, if L equals zero, then

supplying contents of said first and second data registers to said arithmetic logic unit and controlling said arithmetic logic unit to subtract the contents of said first data register from the contents of said second data register thereby calculating the difference between N most significant bits of the numerator and the divisor,

setting a next quotient bit to "1" if the difference was greater than or equal to zero,

setting a next quotient bit to "0" if said difference was less than zero,

storing said difference in said second data register thereby replacing said N most significant bits of the numerator if said difference was greater than or equal to zero,

left shifting the numerator stored in said second and third data registers by one place,

storing said next quotient bits in a least significant bit of said third data register vacated by said left shifting, and

incrementing the number of completed iterations

stored in said loop counter register by one, said iteration repeating until the number of completed iterations stored in said loop counter register exceeds N.

5,596,520

CMOS FULL ADDER CIRCUIT WITH PAIR OF CARRY SIGNAL LINES

Hiroyuki Hara, Fujisawa, and Takayasu Sakurai, Setagaya-ku, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Oct. 4, 1994, Ser. No. 317,435

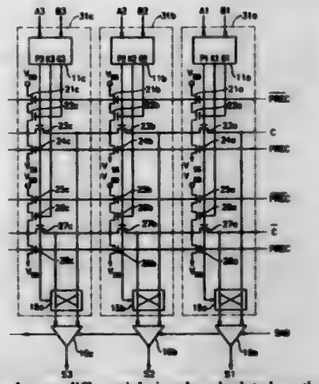
Claims priority, application Japan, Oct. 4, 1993, 5-248237

Int. Cl.[6] G06F 7/50

U.S. Cl. 364—786 **11 Claims**

1. A full adder circuit having a plurality of full adders each provided for each bit, the full adder circuit comprising:

a calculation block for receiving a carry-in signal and an inverted carry-in signal from a preceding stage bit as differential signals and two external input data to be added at a present stage bit, for outputting addition data and inverted



addition data as differential signals calculated on the basis of the carry-in signal, the inverted carry-in signal and the external input data, and further outputting a carry-out signal and an inverted carry-out signal as differential signals to a succeeding stage bit, the calculation block including,

an input block coupled to the external input data, which generates first and second control signals,

a pair of carry signal lines provided between respective full adders, for receiving the carry-in signal and the inverted carry-in signal from the preceding stage bit to apply the carry-in signal from the preceding stage bit to the present stage bit and for transferring the carry-out signal and the inverted carry-out signal generated at the present stage bit to the succeeding stage bit,

precharging means, responsive to external precharge signals, for precharging the pair of carry signal lines to a predetermined potential,

carry-out and inverted carry-out signals generating means, responsive to the first control signal, for generating the carry-out signal and the inverted carry-out signal after the pair of carry signal lines have been precharged,

transfer gate means, responsive to the second control signal, for transferring the carry-in signal and the inverted carry-in signal to the succeeding stage bit as the carry-out signal and the inverted carry-out signal, and

a switching circuit, responsive to the second control signal, the carry-in signal and the inverted carry-in signal, to switch the outputs of the carry-in signal and the inverted carry-in signal on the basis of the second control signal, to produce the addition data and the inverted addition data; and

a latch type sense amplifier for receiving the addition data and the inverted addition data from the switching circuit, differentially amplifying and latching the addition data and the inverted addition data, and for outputting an addition result of the present stage bit.

5,596,521

SEMICONDUCTOR MEMORY WITH BUILT-IN CACHE

Yasuhiro Tanaka; Tetsuya Tanabe, and Satoru Tanei, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

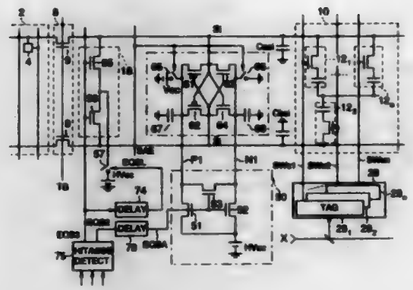
Filed Dec. 29, 1994, Ser. No. 365,970

Claims priority, application Japan, Jan. 6, 1994, 6-000210; Jan. 11, 1994, 6-001298

Int. Cl.[6] G11C 15/00

U.S. Cl. 365—49 **31 Claims**

5. A semiconductor memory device, comprising:



a rectangular array of memory cells disposed in intersecting rows and columns, for storing data;

a plurality of bit lines extending parallel to said columns and coupled to the memory cells in respective columns, for transporting data to and from said memory cells, said bit lines being grouped into complementary pairs, with one complementary pair of bit lines per column;

a plurality of word lines extending parallel to said rows and coupled to the memory cells in respective rows, for controlling transfer of data between said memory cells and said bit lines;

a row of first switching elements coupled to respective bit lines;

a plurality of sense lines coupled to respective first switching elements, for transferring data via said first switching elements to and from said bit lines, said sense lines being grouped into corresponding complementary pairs;

a row of sense amplifiers coupled to said sense lines, for amplifying data on said sense lines, each of said sense amplifiers being supplied with two different fixed potentials for use in amplifying data on said complementary pairs of sense lines;

sense-line equalizing circuits coupled to respective complementary pairs of sense lines, for equalizing said sense lines to a third potential intermediate between said two different fixed potentials;

a sense-amplifier equalizing circuit coupled to said row of sense amplifiers, for supplying said sense amplifiers with said third potential in place of said two different fixed potentials;

a delay circuit coupled to said sense-amplifier equalizing circuit, for delaying supply of said third potential to said sense amplifiers until a certain time after equalization of said sense lines has begun;

a row of second switching elements coupled to respective sense lines;

a data bus for input and output of data;

a plurality of column data lines coupled to respective second switching elements, for interfacing said sense lines to said data bus, said column data lines being grouped into corresponding complementary pairs;

a cache having at least one row of cache cells coupled to said column data lines for storing data transferred from an arbitrary row of said memory cells; and

a tag circuit coupled to said cache, for storing, for each said row of cache cells, a row address indicating which row of said memory cells has data stored in said row of cache cells, and controlling transfer of data between said row of cache cells and said column data lines responsive to said row address.

5,596,522

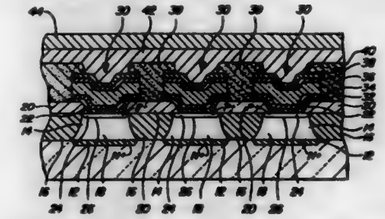
HOMOGENEOUS COMPOSITIONS OF MICROCRYSTALLINE SEMICONDUCTOR MATERIAL, SEMICONDUCTOR DEVICES AND DIRECTLY OVERWRITABLE MEMORY ELEMENTS FABRICATED THEREFROM, AND ARRAYS FABRICATED FROM THE MEMORY ELEMENTS

Stanford R. Ovshinsky, Bloomfield Hills; Stephen J. Hudgens, Southfield; David Strand, Bloomfield Township; Wolodymyr Czubatyj, Warren, all of Mich.; Jesus Gonzalez-Hernandez, Coahuila, Mexico; Helmut Fritzsche, Chicago, Ill.; Qiuyi Ye, Mesa, Ariz.; Sergey A. Kostylev, Bloomfield Hills, and Benjamin S. Chao, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 423,484, Apr. 19, 1995, Pat. No. 5,534,711, which is a continuation-in-part of Ser. No. 789,234, Nov. 7, 1991, Pat. No. 5,414,271, which is a continuation-in-part of Ser. No. 768,139, Sep. 30, 1991, Pat. No. 5,335,219, and a continuation-in-part of Ser. No. 747,853, Aug. 19, 1991, Pat. No. 5,296,716, each which is a continuation-in-part of Ser. No. 642,984, Jan. 18, 1991, Pat. No. 5,166,758. This application Aug. 2, 1995, Ser. No. 510,400

Int. Cl.[6] H01L 45/00

U.S. Cl. 365—113 **20 Claims**



1. A method of modulating the position of the Fermi level relative to a band edge in a microcrystalline semiconductor material into any one of a plurality of metastable detectable positions; said material characterized by a large dynamic range of substantially different electrical conductivities with a substantially constant optical band gap over said entire range; said method including the steps of:

providing a homogeneous body of chalcogenide alloy material;

applying a pulse to said material to modulate the position of the Fermi level thereof to a selected position relative to a band edge of the semiconductor material so as to obtain a given conductivity value within the large dynamic range of electrical conductivities; and

terminating the application of the programming pulse to said memory material while maintaining the position of the Fermi level thereof at substantially the selected position to which it was modulated.

5,596,523

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH AN ARRAY OF ONE-TRANSISTOR MEMORY CELLS

Tetsuo Endoh, Yokohama, and Riichiro Shirota, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 245,557, May 18, 1994, Pat. No. 5,483,484, which is a continuation of Ser. No. 780,933, Oct. 23, 1991, Pat. No. 5,355,332. This application Aug. 9, 1995, Ser. No. 513,000

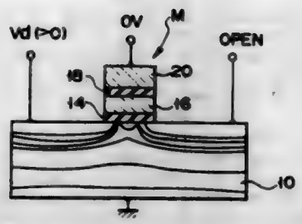
Claims priority, application Japan, Oct. 23, 1990, 2-283296

Int. Cl.[6] G11C 7/00

U.S. Cl. 365—182 **15 Claims**

1. An electrically erasable and programmable memory device, comprising:

a semiconductive substrate;



an array of memory cells arranged in rows and columns on said substrate, said array having a plurality of blocks each of which includes a preselected number of subarrays of a plurality of memory cells;

data transfer lines associated with the columns of memory cells;

control lines associated with the row of memory cells;

addressing means for designating a memory address by selecting one from among said data transfer lines and one from among said control lines, respectively; and

each of said memory cells essentially consisting of a metal oxide semiconductor transistor having:

a source and a drain spaced apart in said substrate,

an insulated floating carrier-storage layer located above said substrate,

a control gate insulatively disposed above said carrier-storage layer, and

means for causing the withstanding voltage of said drain to range from a first voltage adapted to be applied to said drain during a read operation to a second voltage applied to said drain for forcing said conductive layer to discharge.

5,596,524

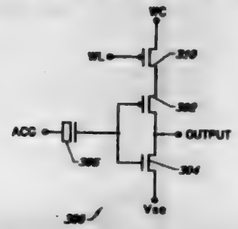
CMOS MEMORY CELL WITH GATE OXIDE OF BOTH NMOS AND PMOS TRANSISTORS AS TUNNELING WINDOW FOR PROGRAM AND ERASE

Jonathan Lin, Milpitas, and Bradley A. Sharpe-Geisler, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 21, 1995, Ser. No. 427,117

Int. Cl.[6] G11C *16/04*; H01L *29/788*

U.S. Cl. 365—185.1 **8 Claims**



1. A memory cell comprising:

a common floating gate;

a capacitor having a first terminal forming a control gate and a second terminal coupled to the common floating gate;

an NMOS transistor having a source coupled to Vss, a drain, a channel formed between its source and drain, and a tunneling oxide region overlying its channel, wherein the common floating gate overlies its tunneling oxide region; and

a PMOS transistor having a source, a drain coupled to the drain of the NMOS transistor, a channel formed between its source and drain, and a tunneling oxide region overlying its channel, wherein the common floating gate overlies its tunneling oxide region; and

a PMOS pass transistor having a drain coupled to the source of the PMOS transistor, a source, and a gate.

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MEMORY CELL OF NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

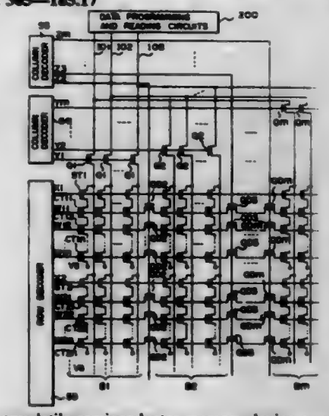
Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 288,219, Aug. 9, 1994, Pat. No. 5,448,517, which is a continuation of Ser. No. 115,100, Sep. 2, 1993, abandoned, which is a continuation of Ser. No. 913,451, Jul. 15, 1992, Pat. No. 5,270,969, which is a continuation of Ser. No. 685,650, Apr. 16, 1991, Pat. No. 5,148,394, which is a continuation of Ser. No. 212,649, Jun. 28, 1988, Pat. No. 5,008,856. This application May 3, 1995, Ser. No. 433,071

Claims priority, application Japan, Jun. 29, 1987, 62-161625; Jun. 30, 1987, 62-163023; Dec. 23, 1987, 62-325686

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—185.17 **28 Claims**



1. A nonvolatile semiconductor memory device comprising:

a memory cell array comprising memory cells for storing data arranged in matrix form having row lines and column lines, the memory cells in the same row being commonly connected to one of the row lines, the memory cells in the same column being commonly connected to one of the column lines;

row selection means for selecting one of the row lines; and

voltage boosting means, connected to the row selection means, for boosting a power source voltage externally applied, the voltage boosting means generating a boosted voltage in a read mode for reading out data stored in the memory cells and a programming voltage in a program mode, the boosted voltage and the programming voltage being applied to the row selection means.

5,596,526

NON-VOLATILE MEMORY SYSTEM OF MULTI-LEVEL TRANSISTOR CELLS AND METHODS USING SAME

Mahmud Assar, Morgan Hill, and Parviz Keshtbod, Los Altos Hills, both of Calif., assignors to Lexar Microsystems, Inc., Fremont, Calif.

Filed Aug. 15, 1995, Ser. No. 515,188

Int. Cl.[6] G11C *11/34*

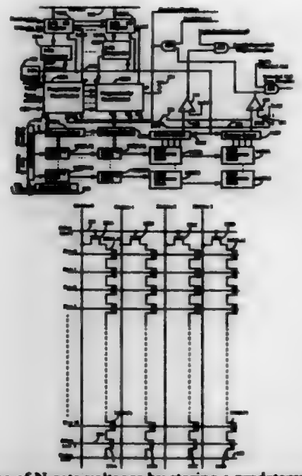
U.S. Cl. 365—185.17 **28 Claims**

1. A memory array of multi-level non-volatile single transistor cells, wherein each cell is configured to store more that a single data bit, the array comprising:

a plurality of groups, each group comprising a plurality of memory cells, each memory cell having a control gate, a floating gate and a channel formed between a source and a drain, wherein the memory cells for each of the groups are coupled with their respective channels in series;

a plurality of select transistors, wherein two of the select transistors are coupled for selecting each group;

a programming circuit for selectively programming each of the memory cells to a predetermined current level in accordance



with one of N gate voltages by storing a predetermined charge onto each of the respective floating gates wherein each of the N threshold voltages is representative of a predetermined collection of data bits:

a plurality of N write reference cells, N write reference cells for each memory cell in a group, each of the N write reference cells corresponding to the N predetermined reference voltages; and

a circuit for sequentially comparing a current through one of the memory cells to a current through each of the appropriate N write reference cells for storing a collection of data bits.

5,596,527

ELECTRICALLY ALTERABLE N-BIT PER CELL NON-VOLATILE MEMORY WITH REFERENCE CELLS

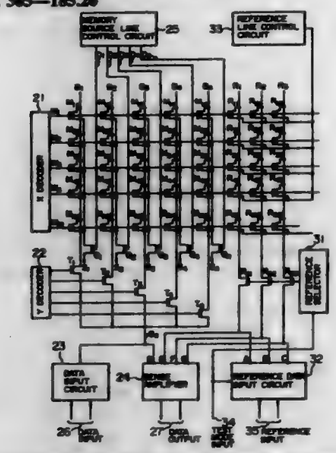
Yugo Tomioka; Shoichi Iwasa; Yasuo Sato; Toshio Wada, and Kenji Anzai, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 161,508, Dec. 6, 1993, Pat. No. 5,418,743. This application Feb. 13, 1995, Ser. No. 387,562

Claims priority, application Japan, Dec. 7, 1992, 4-351216; Mar. 15, 1993, 5-080069

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.20 **5 Claims**



1. An electrically alterable non-volatile memory comprising:

a memory cell array including a plurality of memory cells arranged in a matrix of rows and columns, each memory cell including a transistor having a selected one of a plurality of different threshold voltages;

a reference cell array including a plurality of reference cells, each reference cell having the same characteristic as that of the transistor of each of said memory cell, said plurality of reference cells being arranged in a plurality of rows corresponding to the respective rows in which said plurality of memory cells are arranged such that each row of reference cells includes one reference cell set to each of the different threshold voltages;

first selecting means for selecting one of said memory cells;

second selecting means for selecting the reference cells arranged in one of said rows corresponding to said one of said memory cells selected by said first selecting means;

comparing means for comparing a memory current read out of the selected memory cell with a refereace current read out of each of the selected reference cells, sequentially in an order of levels of the threshold voltages set for the selected reference cells, respectively, thereby outputting data according to such comparison;

source and bit lines connected to sources and drains, respectively, of the transistors provided to the respective memory cells arranged in each of the columns; a word line connected to gates of the transistors of the memory cells arranged in each of the rows;

circuit means for writing data into said memory, said circuit means comprising means for applying to the word line connected to the gate of the transistor of the selected memory cell a pulse signal having a predetermined voltage value under a condition that the source line connected to the source of the transistor provided to the selected memory cell is at an open state, while applying to the bit line connected to the drain of the transistor provided to the selected memory cell a voltage corresponding to one of said different threshold voltages selected depending on the data to be written into said memory; and

switching means connected to the source line associated with the memory cells arranged in each of said columns for selectively switching said source line between the open state and a ground potential.

5,596,528

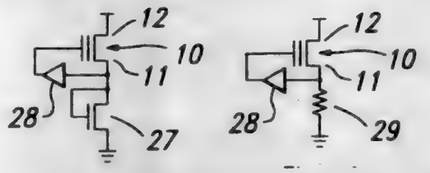
METHOD OF USING SOURCE BIAS TO RAISE THRESHOLD VOLTAGES AND/OR TO COMPACT THRESHOLD VOLTAGES

Cetin Kaya, Dallas; Wayland B. Holland, Garland, and Rabah Mezzenner, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 85,427, Oct. 4, 1993, Pat. No. 5,467,306. This application Sep. 22, 1995, Ser. No. 532,313

Int. Cl.[6] G11C *16/00*

U.S. Cl. 365—185.24 **5 Claims**



1. A method for increasing the threshold voltage of at least one of a plurality of floating-gate memory cells in a nonvolatile integrated-circuit memory having a substrate connected to a reference voltage, each said memory cell being of the single-transistor, non-slit-gate type, said method comprising:

connecting the sources of said plurality of memory cells to a high impedance;

causing currents to flow into the drains of said plurality memory cells; and

placing a voltage on the control gates of said plurality of memory cells, said voltage being positive with respect to said reference voltage.

5,596,529

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

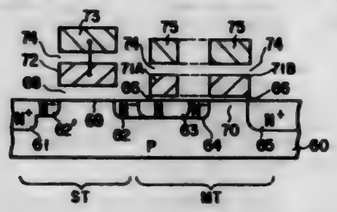
Junichiro Noda, Tokyo, and Daisuke Tokuyama, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1994, Ser. No. 351,185

Claims priority, application Japan, Nov. 30, 1993, 5-299951

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.28 **23 Claims**



1. A nonvolatile semiconductor memory device comprising:

a semiconductor substrate with an element region and a field region;

a select MOS transistor formed in said element region; and

a data storage MOS transistor which is formed in said element region and which includes a source region, a drain region, a floating-gate electrode, and a control gate electrode, said floating-gate electrode having a first portion above said drain region and a second portion above said semiconductor substrate between said source region and said drain region, an insulating film thinner than a gate insulating film of said select MOS transistor being arranged between said drain region and said first portion of said floating-gate electrode and between said semiconductor substrate and said second portion of said floating-gate electrode, and said first and second portions of said floating-gate electrode being spaced apart above said element region, and connected to each other on said field region.

5,596,530

FLASH EPROM WITH BLOCK ERASE FLAGS FOR OVER-ERASE PROTECTION

Tien-Ler Lin, Cupertino; Ray L. Wan, Milpitas, both of Calif.; Ling-Wen Haiao, Taipei, and Gilbert Sung, Ping-Chan, both of Taiwan, assignors to Macronix International Co., Ltd., Hsinchu, Taiwan

Continuation of Ser. No. 108,662, Aug. 31, 1993, Pat. No. 5,414,664. This application Feb. 2, 1995, Ser. No. 383,726

Int. Cl.[6] G11C *7/00;16/00*

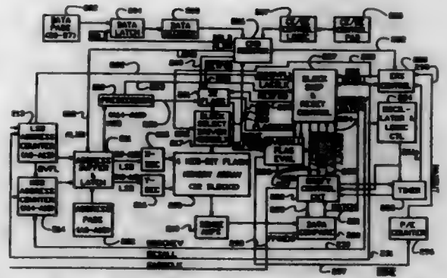
U.S. Cl. 365—185.29 **46 Claims**

1. An apparatus for storing data, comprising:

a memory array, the memory array including a plurality of blocks of FLASH EPROM memory cells;

energizing power supply circuits, coupled with the memory array, to apply energizing voltages to the plurality of blocks of memory cells to read and program addressed memory cells in the memory array and to erase the memory array;

erase verify logic, coupled with the memory array, to separately verify erasure of blocks in the plurality of blocks of memory cells; and



control circuits, coupled to the energizing power supply circuits and the erase verify logic, to control the energizing power supply circuits to re-erase blocks which fail erase verify.

5,596,531

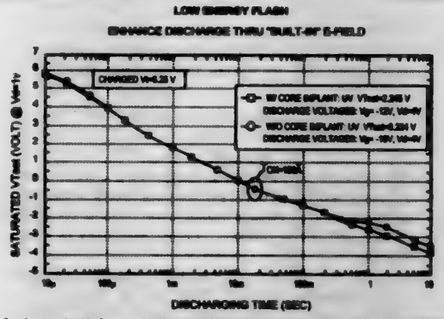
METHOD FOR DECREASING THE DISCHARGE TIME OF A FLASH EPROM CELL

David K. Y. Liu, Cupertino; Ming S. Kwan, San Leandro; Chi Chang, Redwood City; Sameer Haddad, and Yuan Tang, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed May 25, 1995, Ser. No. 450,167

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.31 **14 Claims**



1. A method for reducing a discharge time of a Flash EPROM cell, the cell having an ultraviolet voltage threshold, UVV_t, and an operational discharge threshold voltage, V_t, the method comprising:

setting the UVV_t below the operational discharge V_t of the cell; and

providing a charge pump supply voltage to the cell.

5,596,532

FLASH EEPROM SELF-ADAPTIVE VOLTAGE GENERATION CIRCUIT OPERATIVE WITHIN A CONTINUOUS VOLTAGE SOURCE RANGE

Raul-Adrian Cernea, Santa Clara; Douglas J. Lee, San Jose; Mehrdad Mofidi, Fremont, and Sanjay Mehrotra, Milpitas, all of Calif., assignors to SanDisk Corporation, Sunnyvale, Calif.

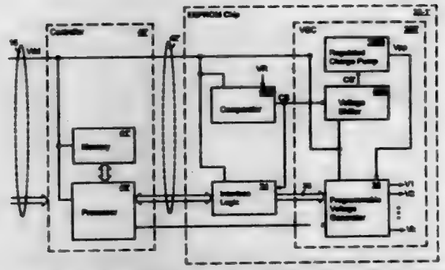
Filed Oct. 18, 1995, Ser. No. 544,456

Int. Cl.[6] G11C *16/00*

U.S. Cl. 365—185.18 **34 Claims**

8. A self-adaptive voltage generation circuit operative within a continuous voltage source range for generating a plurality of voltages for programming, reading, and erasing a flash EEPROM, comprising:

means for receiving an arbitrary source voltage within said continuous voltage source range, and generating a control



signal indicative of a subrange, including the voltage of said received arbitrary source voltage, of said continuous voltage source range; and

means responsive to said control signal, for generating from said arbitrary source voltage, said plurality of voltages for programming, reading, and erasing a flash EEPROM such that the respective magnitudes of said plurality of voltages for programming, reading, and erasing said flash EEPROM are substantially same values for any received arbitrary source voltage within said continuous voltage source range.

5,596,533

METHOD AND APPARATUS FOR READING/WRITING DATA FROM/INTO SEMICONDUCTOR MEMORY DEVICE

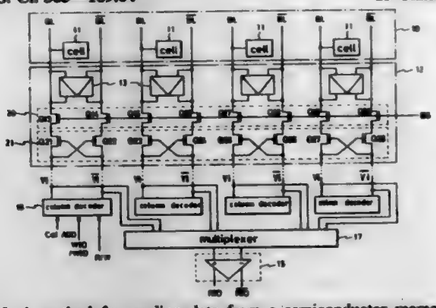
Kee W. Park, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Apr. 2, 1996, Ser. No. 626,549

Claims priority, application Rep. of Korea, Apr. 7, 1995, 95-8131

Int. Cl.[6] G11C *7/00;8/00*

U.S. Cl. 365—189.04 **13 Claims**



1. A method for reading data from a semiconductor memory device, comprising the steps of:

selecting a memory cell array block from which data is to be read, in response to a row address signal;

selecting a column of the selected memory cell array block in response to a column address signal;

sense-amplifying data which are transferred from a memory cell of the selected column to a pair of bit lines of the selected column;

decoding a read signal and allowing a pair of column decoding lines of the selected column to become a desired logic state in accordance with the decoded result;

forming a current path between one of said column decoding lines and a ground terminal in response to the sense-amplified data on said bit lines;

selecting data on said column decoding lines; and

sense-amplifying the selected data and outputting the sense-amplified data externally.

5,596,534

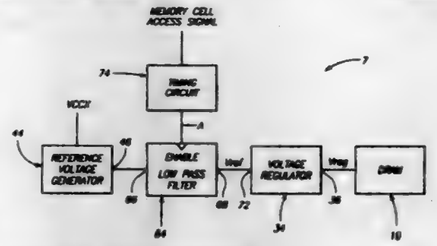
CIRCUIT INCLUDING DRAM AND VOLTAGE REGULATOR, AND METHOD OF INCREASING SPEED OF OPERATION OF A DRAM

Troy A. Manning, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 27, 1995, Ser. No. 495,338

Int. Cl.[6] G11C *11/403*

U.S. Cl. 365—189.09 **30 Claims**



1. An integrated circuit comprising:

a reference voltage generator having an output providing a reference voltage;

a selectively engageable filter having an input connected to the output of the reference voltage generator, and having an output;

a voltage regulator having an input connected to the output of the filter, and having an output;

a dynamic random access memory receiving power from the output of the voltage regulator, the dynamic random access memory having memory cells that are accessed or refreshed in response to a first signal; and

a timing circuit which engages the filter in response to the first signal, and causes the filter to filter the reference voltage.

5,596,535

SEMICONDUCTOR STORAGE DEVICE

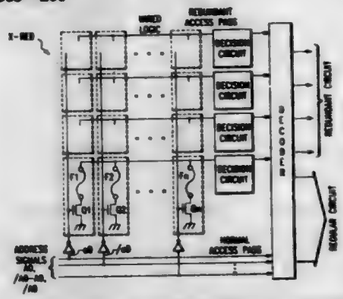
Tathunori Mushya, Fuchu; Masayasu Kawamura, Kodaira, and Shunichi Sakagawa, Tsukuba, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1994, Ser. No. 267,267

Claims priority, application Japan, Jun. 28, 1993, 5-181957

Int. Cl.[6] G11C *7/00;8/00*

U.S. Cl. 365—200 **1 Claim**

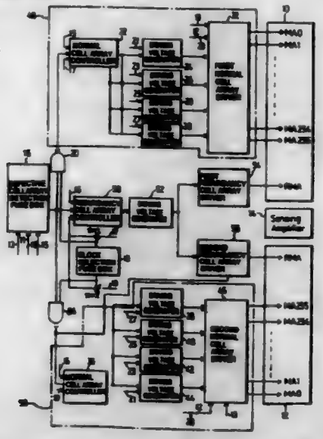


1. A semiconductor storage device comprising a pair of fuses for each bit of an address signal, a MOSFET transistor connected to one end of each fuse for supplying each fuse with electric current, an inverter connecting each MOSFET transistor with the respective true and complement address signal for each fuse, the other end of each fuse for one set of address signals being connected together to form a wired OR configuration, and a decoder circuit for selecting between a normal storage circuit and a redundant circuit depending upon the condition of the signal on the wired OR configuration, the fuses being arranged in a linear matrix.

5,596,536
REDUNDANCY CIRCUIT

Hwa S. Koh, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-Do, Rep. of Korea

Continuation of Ser. No. 174,048, Dec. 28, 1993, abandoned.
This application Jul. 24, 1995, Ser. No. 506,370
Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26727
Int. Cl.[6] G11C 29/00;7/00
U.S. Cl. 365—200 6 Claims



1. In a semiconductor memory device having at least two memory blocks, each memory block having a plurality of normal memory cell arrays and a redundancy memory cell array for replacing a defective memory cell array, a redundancy circuit comprising:

at least two redundancy cell array driving means respectively connected to at least two said redundancy memory cell arrays for driving at least two said redundancy memory cell arrays of respective blocks;

a defective cell array detection fuse box for detecting address corresponding to said defective memory cell array;

a block selection fuse box for selecting one of said plurality of memory blocks; and

driving control means for driving one of at least two said redundancy cell array driving means associated with said redundancy memory cell arrays of respective blocks by outputs of said defective cell array detection fuse box and said block selection fuse box.

5,596,537
SEMICONDUCTOR DEVICE TEST CIRCUIT HAVING TEST ENABLE CIRCUITRY AND TEST MODE-ENTRY CIRCUITRY

Shunichi Sukegawa; Shiyuzo Shiozaki, both of Tsukuba; Hiroaki Matsuura, Tokorozawa, and Masaya Muranaka, Akishima, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi Ltd., Tokyo, Japan

Filed Jul. 14, 1994, Ser. No. 275,700
Claims priority, application Japan, Jul. 14, 1993, 5-196823
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—201 7 Claims

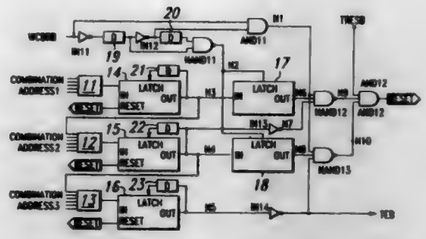
1. A semiconductor device comprising:

a semiconductor substrate;

an electronic circuit provided in and/or on said semiconductor substrate and having at least one electronic function to be performed when the electronic circuit is activated;

a test circuit provided in and/or on said semiconductor substrate in proximity to said electronic circuit, said test circuit being operably connected to said electronic circuit and having at least one test procedure to be performed with respect to said at least one electronic function of the electronic circuit for establishing proper execution thereof during activation of said electronic circuit, said test circuit including a test enable circuit for receiving a plurality of address signals as inputs thereto in a predetermined operating cycle; and

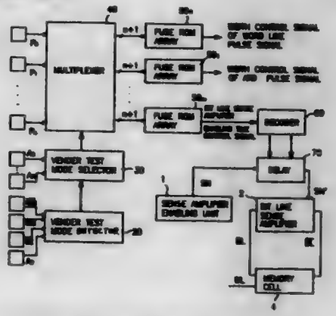
said test enable circuit being responsive to the receipt thereof of a predetermined combination of the plurality of address signals within the predetermined operating cycle for providing a test enable signal as an output enabling the performance of said at least one test procedure on said electronic circuit.



5,596,538
SEMICONDUCTOR MEMORY DEVICE

Yang S. Joo, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Choongchungbook-do, Rep. of Korea

Filed Dec. 4, 1995, Ser. No. 566,668
Claims priority, application Rep. of Korea, Dec. 8, 1994, 3224/1994
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—201 5 Claims



1. A semiconductor memory device comprising:

a vendor test mode detector for detecting a vendor test mode in response to a row address strobe signal, a column address strobe signal, a write enable signal and a specific address signal, each of which are applied from an external source and outputting a detect signal in accordance therewith;

a vendor test mode selector for selecting a vendor test mode corresponding to an address signal applied from an external source according to the detect signal provided from the vendor test mode detector and outputting a select signal in accordance therewith;

a multiplexer for controlling outputs of pad signals applied from an external source according to the select signal provided from the vendor test mode selector;

a plurality of fuse ROM arrays being programmed by the signals provided from the multiplexer and outputting programmed data, the plurality of fuse ROM arrays being respectively corresponding in number to the vendor test modes;

a decoder for decoding a signal provided from a one of the plurality of fuse ROM arrays in which data of an operational point of a bit line sense amplifier are stored, said bit line sense amplifier being operated in response to a delayed sense amplifier enable signal;

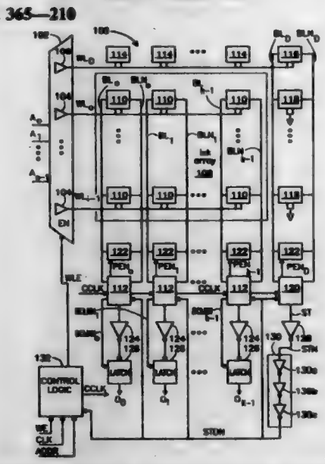
a delay means for delaying a sense amplifier enable signal provided from a sense amplifier enabling unit for a predetermined time according to an output signal of the decoder; and

a memory cell array for outputting a stored data to the bit line sense amplifier.

5,596,539
METHOD AND APPARATUS FOR A LOW POWER SELF-TIMED MEMORY CONTROL SYSTEM

Robin H. Pannow, Maple Plain; Gordon W. Priebe, Champlin; Ronald D. Isliefson, Lakeville; L. Ross Mactaggart, Eden Prairie, and Kevin R. LeClair, Prior Lake, all of Minn., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 28, 1995, Ser. No. 579,792
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—210 31 Claims



1. A self-timed memory control system for accessing data in a memory system in response to the assertion of a clock signal, the memory system including a core memory array with rows and columns of core memory cells, a corresponding array of sense amplifiers receiving a sense enable signal for enabling the sense amplifiers to sense output data in the core memory cells and for disabling the sense amplifiers, and a corresponding array of latches for latching the sensed output data, said control system comprising:

control logic for asserting a word line enable signal and the sense enable signal in response to the assertion of the clock signal, and for deasserting the sense enable signal and asserting a latch signal to latch the sensed output data in response to subsequent assertion of a timing signal;

a dummy word line driver for asserting a dummy word line select signal on a dummy select line in response to each assertion of said word line enable signal;

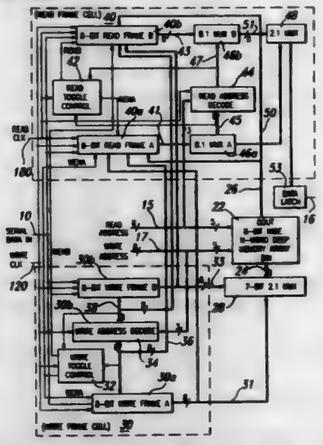
a dummy row and dummy column of memory cells located on two adjacent outer edges of the core memory array for mirroring the rows and columns of the core memory cells, wherein each memory cell of said dummy row is coupled to load said dummy select line and wherein each memory cell of said dummy column is coupled to load a pair of complementary dummy bit lines, said dummy row and dummy column further including a fixed memory cell located at the intersection of said dummy row and dummy column on an opposite end of said dummy row as said dummy word line driver, wherein said fixed cell is coupled to said dummy select line to receive said dummy word line select signal and to respondingly assert a predetermined logic level on said pair of complementary dummy bit lines; and

a dummy sense amplifier coupled to said pair of complementary dummy bit lines at an opposite end of said dummy column as said fixed dummy memory cell for sensing said predetermined logic level and for respondingly asserting said timing signal, said dummy sense amplifier being biased to favor an opposite logic level of said predetermined logic level for adding timing margin.

5,596,540
SERIAL TO PARALLEL AND PARALLEL TO SERIAL ARCHITECTURE FOR A RAM BASED FIFO MEMORY

Benjamin C. Diem, Sherman, and M. Dwayne Ward, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 139,348, Oct. 20, 1993, abandoned.
This application Mar. 31, 1995, Ser. No. 414,252
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—221 5 Claims



1. A first-in, first-out memory device, comprising:

a memory array;

a read frame buffer connected to the memory array;

a write frame buffer coupled to the memory array;

a write toggle control circuit connected to the first set of data latches and connected to the second set of data latches; and

a write address decoder connected to the first set of data latches and connected to the second set of data latches.

5,596,541
SYNCHRONOUS DYNAMIC RANDOM ACCESS MEMORY

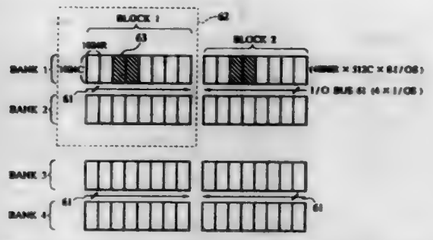
Haruki Toda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Sep. 23, 1994, Ser. No. 310,945
Claims priority, application Japan, Sep. 29, 1993, 5-242932
Int. Cl.[6] G11C 8/00
U.S. Cl. 365—230.03 20 Claims

1. A synchronous Dynamic Random Access Memory (DRAM) comprising:

a plurality of cell arrays, each of said cell arrays containing cells arranged in rows and columns, wherein said plurality of cell arrays is divided into a plurality of banks; and

a plurality of n bit (n is a positive integer) I/O buses for the input and output of n bit data among said plurality of cell arrays.



wherein each bank is divided into m blocks (m is a positive integer) consisting of a plurality of said cell arrays,

wherein the n bit I/O buses are located between adjacent banks and the n bit I/O buses are time shared by adjacent banks,

wherein said n bit I/O buses are grouped into n/m bit I/O buses every n/m bits for each block,

wherein each group of n/m bit I/O buses is arranged in a bus area adjacent to one end of its corresponding block such that for any two groups of n/m bit I/O buses for one bank, the buses of the first group do not extend in parallel beside the buses of the second group in the second group's bus area, and

wherein in each block in each bank, data input and output operations are carded out between said n/m bit I/O buses and data bus (DB) lines in each block.

5,596,542

SEMICONDUCTOR MEMORY DEVICE HAVING DUAL WORD LINE CONFIGURATION

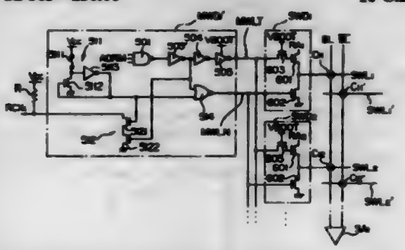
Tadahiko Sugibayashi; Satoshi Utsugi, and Isao Naritake, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1995, Ser. No. 536,189

Claims priority, application Japan, Sep. 30, 1994, 6-259590

Int. Cl.[6] G11C 8/00

U.S. Cl. 365—230.06 **10 Claims**



1. A semiconductor memory device comprising:

a plurality of sub word lines;

a plurality of sub word decoders, each connected to one of said sub word lines;

a plurality of pairs of main word lines, each pair connected to a number of said sub word decoders; and

a plurality of main word decoders, each comprising a fuse circuit including a fuse, each of said main word decoders connected to one of said pairs of main word lines, and each of said main word decoders including means for setting voltages between a respective pair of lines of said pairs of main word lines different from each other in a selection mode and for setting the voltages between a respective pair of lines of said pairs of main word lines the same as each other in a non-selection mode and only when said fuse is melted.

5,596,543

SEMICONDUCTOR MEMORY DEVICE INCLUDING CIRCUITRY FOR ACTIVATING AND DEACTIVATING A WORD LINE WITHIN A SINGLE RAS CYCLE

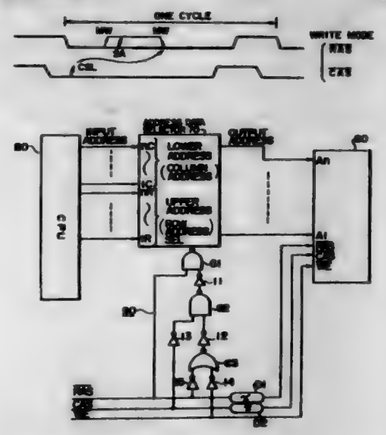
Koji Sakui, Tokyo; Kazunori Ohuchi, Yokohama, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 671,137, Mar. 18, 1991, Pat. No. 5,173,878, which is a continuation of Ser. No. 274,483, Nov. 22, 1988, abandoned. This application Oct. 30, 1992, Ser. No. 969,363

Claims priority, application Japan, Nov. 25, 1987, 62-296817

Int. Cl.[6] G11C 11/407

U.S. Cl. 365—233 **4 Claims**



1. A semiconductor memory device comprising:

a memory chip which includes

a plurality of memory cells for storing data;

a plurality of bit lines connected to said memory cells and connected to latch circuits through a plurality of switching transistors;

a plurality of word lines connected to said memory cells, respectively; and

means for making one of said word lines active and then inactive during an active period of a row address strobe signal.

5,596,544

VERY LARGE SCALE INTEGRATED PLANAR READ ONLY MEMORY

James A. Komarek, Newport Beach; Clarence W. Padgett, Westminster; Scott B. Thaner, and Jack L. Mimery, both of Irvine, all of Calif., assignors to Creative Integrated Systems, Inc., Santa Ana, Calif.

Division of Ser. No. 16,811, Feb. 11, 1993, Pat. No. 5,459,693, which is a continuation-in-part of Ser. No. 538,185, Jun. 14, 1990, abandoned. This application Apr. 21, 1995, Ser. No. 426,037

Int. Cl.[6] G11C 8/00

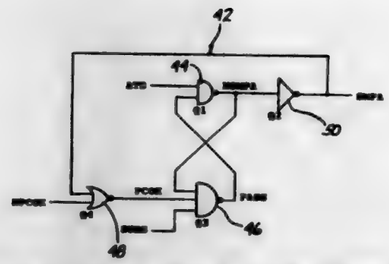
U.S. Cl. 365—233.5 **20 Claims**

1. An improvement in a digital dynamic circuit comprising:

first means for receiving an address transition detection (ATD) signal;

second means for selectively generating an sample address signal (SMPA) in response to receipt of said address transition detection signal (ATD);

third means for disabling said second means in response to a ground surge control signal (SURG) so that said sample address signal (SMPA) is held logically false regardless of the logic value of said address transition detection signal (ATD),



otherwise said third means for selectively disabling said sample address signal thereby permitting said second means to be operative according to said address transition detection signal (ATD) received by said first means,

whereby noise generated during output driver transitions within said dynamic digital circuit does not affect addressing within said circuit.

5,596,545

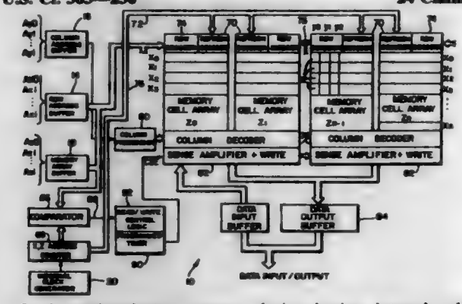
SEMICONDUCTOR MEMORY DEVICE WITH INTERNAL SELF-REFRESHING

Ya-Chi Lin, Fremont, Calif., assignor to Ramax, Inc., San Jose, Calif.

Filed Dec. 4, 1995, Ser. No. 566,887

Int. Cl.[6] G11G 7/00

U.S. Cl. 365—236 **24 Claims**



1. A semiconductor memory device having internal self-refreshing comprising:

an internal oscillator for generating and adjusting a self-refreshing time period;

a plurality of memory cell arrays, each array comprising a matrix of rows and columns, a row of memory cells comprising a word line;

an address counter receiving output pulses from the oscillator for incrementing the counter, the counter generating an internal refreshing address and activating a memory word line corresponding to the refreshing address for refreshing data in the word line, the counter being incremented, such that upon refreshing a first word line in a first one of the memory cell arrays, the internal refreshing address is incremented to a first word line in a second memory cell array, each word line being refreshed during one self refreshing time period;

a timer for counting down a write delay time period;

control logic coupled to the timer; and

a comparator for comparing an external address to be written and the internal refreshing address generated by the counter, whereby if the comparator detects that the external address to be written matches the internal address being refreshed, the comparator transmits a signal to the control logic which signals the timer to begin counting down the write delay time period, the control logic enabling the writing of data to the refreshed address after the write delay has expired, such that a maximum write delay time period is equal to one self-refreshing time period, the device enabling data stored in the internal refreshing address to be read while being refreshed.

5,596,546

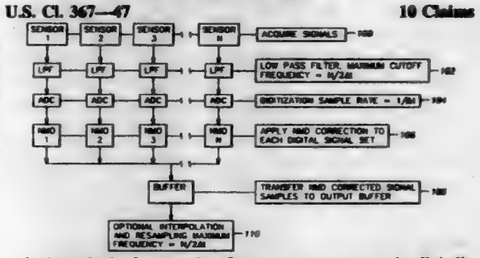
SPATIALLY DISTRIBUTED SIGNAL SAMPLING METHOD

R. Daniel Wisecup, Katy, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Dec. 21, 1994, Ser. No. 360,572

Int. Cl.[6] G01V 1/32; 1/36

U.S. Cl. 367—47 **10 Claims**



1. A method of preserving frequency components in digitally sampled signals exceeding a maximum frequency related to a predetermined digital sample interval, said signals corresponding to a plurality of sensors positioned at spaced apart locations, said method comprising the steps of:

generating time adjusted digital samples corresponding to each of said plurality of sensors, said time adjusted digital samples generated to provide amplitude correspondence between each of said signals generated by each of said plurality of sensors in response to different propagation times of energy from an energy source to each of said plurality of sensors; and

combining all of said time adjusted digital samples into a combined output signal having a sampling time interval smaller than said predetermined digital sample interval.

5,596,547

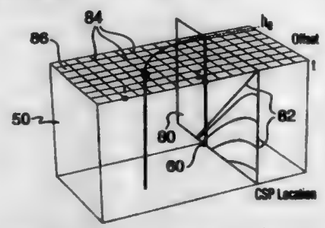
PRESTACK SEISMIC MIGRATION

John C. Bancroft, 6928 Silversprings Road NW, Calgary, Alberta, Canada, and Hugh D. Geiger, 1906 46th Avenue SW, Calgary, AB, Canada

Filed Oct. 20, 1995, Ser. No. 546,320

Int. Cl.[6] G01V 1/36; 1/28

U.S. Cl. 367—51 **17 Claims**



1. A method of obtaining a common scatter point gather for determining properties of an interior portion of a body having a plurality of scatter points, comprising the steps of:

(a) retrieving a plurality of input races where each input trace is a sequential record of energy originating from a source and reflecting from the scatter points to a receiver, each one of said input traces having a plurality of data samples representing energy amplitudes;

(b) defining a common scatter point location a point within an area of interest, said common scatter point location represents a subset of the scatter points proximate to the common scatter point location;

(c) defining a common scatter point gather for said common scatter point location based on geometry of the source and the receiver for he input traces relative to the scatter point location, said common scatter point gather being defined by at least one of a plurality of time positions and a plurality of depth positions;

(d) calculating a plurality of equivalent offset locations for said common scatter point gather based on: (i) geometry of the source and the receiver for each one of the input traces relative to said common scatter point location, (ii) position of the data samples in each input trace, and (iii) physical characteristics of the body, each one of said equivalent offset locations defining a distance between said common scatter point location and a location of a generally collocated model source and model receiver where travel time from said source to a selected one of said scatter points to said receiver is approximately equal to the travel time from the model source to said selected scatter point to the model receiver; and

(e) mapping each one of the data samples of the input traces to the equivalent offset locations in said common scatter point gather for said common scatter point location, wherein said common scatter point gather defines properties of the interior of the body.

5,596,548

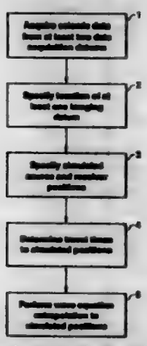
SEISMIC IMAGING USING WAVE EQUATION EXTRAPOLATION

Jerome R. Krebs, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 12, 1994, Ser. No. 241,889

Int. Cl.[6] G01V *1/28*

U.S. Cl. 367—56 **7 Claims**



1. A method of imaging a geological feature, comprising the steps of:

(a) specifying two data acquisition datums, a first data acquisition datum coincident with the surface of the earth and a second data acquisition datum coincident with a borehole;

(b) obtaining two sets of seismic data, surface seismic data deriving from a first set of sources and a first set of receivers placed along said first data acquisition datum, and VSP seismic data deriving from a second set of sources placed along said first data acquisition datum and a second set of receivers placed along said second data acquisition datum;

(c) specifying an imaging datum coincident with said borehole;

(d) using said VSP seismic data to determine traveltimes from said first data acquisition datum to said second data acquisition datum;

(e) using said traveltimes to wave equation extrapolate said surface seismic data from said first data acquisition datum to said imaging datum; and

(f) imaging said feature using said extrapolated data.

5,596,549

SIDE LOOK SONAR APPARATUS AND METHOD

Robert W. Sheriff, Davidsonville, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jul. 6, 1995, Ser. No. 498,829

Int. Cl.[6] G01S *15/89*

U.S. Cl. 367—88 **30 Claims**



1. A side look sonar apparatus, comprising:

a linear array of receiving elements, mounted on an underwater platform, receiving reflected acoustic waves, wherein said linear array of elements has a length in a cross track direction of the underwater platform which is greater than a length in an along track direction of the underwater platform; and

processing means for processing the reflected acoustic waves received by said linear array of receiving elements to produce a plurality of cross track beams, whose patch width decreases with decreasing range from the underwater platform.

5,596,550

LOW COST SHADING FOR WIDE SONAR BEAMS

Linwood M. Rowe, Jr., Severna Park; Thomas C. Montgomery, Easton; Frederick G. Geil, Annapolis, and Brad M. Fye, Crownsville, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 20, 1995, Ser. No. 492,649

Int. Cl.[6] G01S *15/00*

U.S. Cl. 367—103 **22 Claims**



1. An apparatus comprising:

at most two array elements for receiving acoustic energy from a plurality of directions; and

beamforming means for processing the acoustic energy to produce a beamformed output which enhances detectivity in at least one of the plurality of directions,

wherein said beamformer means asymmetrically amplitude shades the acoustic energy received from said at most two array elements.

5,596,551

WATCH COMPRISING AN ARRANGEMENT FOR DETECTING THE DIRECTION OF THE TERRESTRIAL MAGNETIC NORTH

Jean-Jacques Born, Morges; Etienne Bernard, Boudry, and Rudolf Dinger, St-Aubin, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Nov. 7, 1995, Ser. No. 554,842

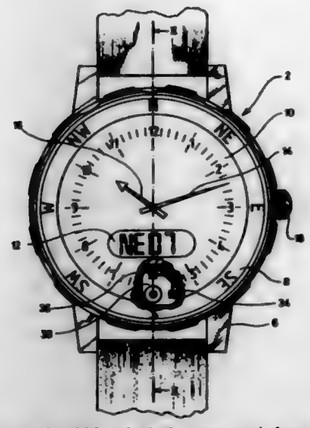
Claims priority, application Switzerland, Nov. 21, 1994, 03495/94

Int. Cl.[6] G04B *47/00*; G01C *9/00*

U.S. Cl. 368—10 **15 Claims**

1. A watch comprising:

an horological movement;



a case in which said horological movement is housed;

detecting means sensitive to the terrestrial magnetic field and including a bipolar permanent magnet rotatably mounted on a shaft arranged in said case so as to rotate freely around a predetermined rotation axis, said magnet having a magnetic axis substantially perpendicular to said rotation axis, and at least a first sensor and a second sensor arranged within said case and sensitive to the magnetic field of said magnet, said first and second sensors respectively furnishing first and second detection signals;

means for indicating a geographic direction;

electronic means for controlling said indicating means as a function of said first and second detection signals which are processed by said electronic means in a manner to determine the angular position of said magnetic axis of said bipolar magnet;

magnetic masses; and

a first information storing unit in which a correspondence table is memorized, defining for a first plurality of angular positions of the magnetic axis of said magnet a second plurality of respective angular positions, each angular position of the second plurality determining the direction of the terrestrial magnetic north whenever the magnetic axis of said magnet is oriented according to the respective angular position of the first plurality of angular positions, the angular spread between the position of said magnetic axis and the corresponding direction of the terrestrial magnetic north having a value the magnitude of which is a function of the perturbation generated by said magnetic masses of said watch on the terrestrial magnetic flux in the region in which said permanent magnet is arranged and on said magnet itself.

5,596,552

CIRCUIT FOR RESETTING TIME OF TIMER

Sang-Il Lim, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 5, 1991, Ser. No. 802,569

Claims priority, application Rep. of Korea, Dec. 31, 1990, 90-23083

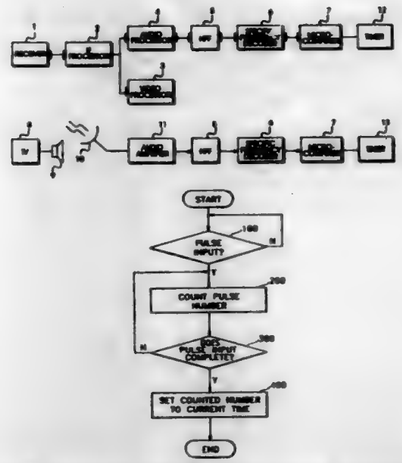
Int. Cl.[6] G04C *11/02*

U.S. Cl. 368—47 **28 Claims**

1. A circuit for resetting a timer installed in an electrical appliance, comprising:

receiving means for receiving a signal mixed with a specific frequency time signal having pulses, said signal mixed with said specific frequency time signal being transmitted on an hourly basis;

specific frequency detecting means for receiving and detecting said pulses of said specific frequency time signal from said receiving means; and



counting means for making a count of a number of said pulses detected by said specific frequency detecting means, and for resetting a timer every hour on the hour on the basis of said count, said timer being reset to a current hour of a day as determined by said count.

5,596,553

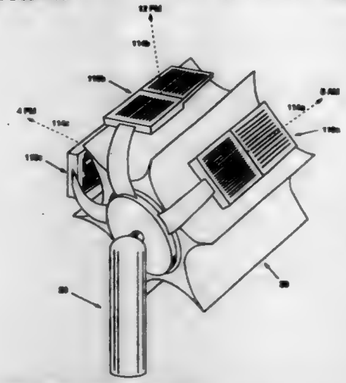
DIGITAL SUNDIAL

Robert L. Kellogg, 7509 Dew Wood Dr., Rockville, Md. 20855

Filed Nov. 21, 1995, Ser. No. 561,454

Int. Cl.[6] G04B *49/00*; G04C *19/00*; G01C *17/34*

U.S. Cl. 368—79 **21 Claims**



1. A sundial gnomon comprising:

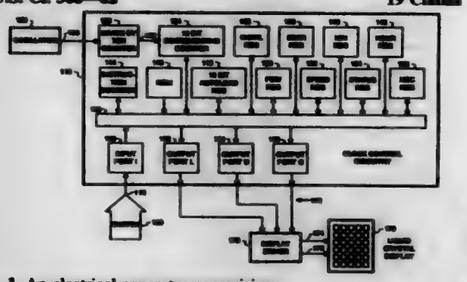
a first surface having a plurality of parallel first surface apertures transmissive to light and through which a plurality of sunbeams pass; and

a second surface having a plurality of second surface segment apertures for regulating the passage of sunbeams passing through said plurality of first surface apertures, said plurality of second surface segment apertures being arranged in a plurality of patterns, each said pattern including a plurality of second surface segment apertures, the plurality of second surface segment apertures being configured to cause sunbeams passing through said plurality of first surface apertures to be incident upon said second surface segment apertures of only one said pattern at a given time.

5,596,554
SET OPERATION IN A TIMEPIECE HAVING AN ELECTROOPTICAL DISPLAY

Hubert W. Hagadorn, 9 Light Way, Menlo Park, Calif. 94025

Filed Jun. 4, 1993, Ser. No. 72,136
Int. Cl.[6] G04C 19/00;9/00; G09G 3/04
U.S. Cl. 368—82 19 Claims



1. An electrical apparatus comprising:
an electrooptical display;
digital timekeeping circuit means for maintaining horological information;
user input means for setting said apparatus; and
display circuit means coupled to said digital timekeeping circuit means and having outputs coupled to said electrooptical display for displaying timekeeping information, said display circuit means including a setting means for displaying menus having a plurality of items that are sequentially indicated and selectable by said user input means, wherein said menus comprise first and second items, said first items facilitating selection of said second items, said second items modifying said digital timekeeping circuit means, wherein said setting means enables the automatic sequential indication of items of at least one menu having a plurality of said first items, wherein said second items are automatically sequentially indicated upon said display, wherein said user input means is in a first state when said timekeeping information is normally displayed, wherein said user input means is manually transferrable to a second state and an item being indicated is selected whereupon sequential indication ceases, and wherein said user input means is manually transferrable from said second state to said first state and said sequential indication resumes, whereby horological and other quantities are readily set.

5,596,555
MAGNETOOPTICAL RECORDING MEDIUM HAVING MAGNETIC LAYERS THAT SATISFY PREDETERMINED COERCIVE FORCE RELATIONSHIPS, AND RECORDING/REPRODUCTION METHOD FOR THE MEDIUM

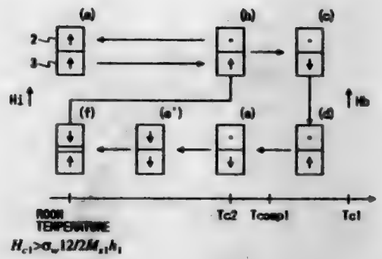
Yoichi Ouste, Yokohama, and Katsumi Miyata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,182
Claims priority, application Japan, Jul. 29, 1993, 5-188386; Aug. 6, 1993, 5-196277; Mar. 25, 1994, 6-055348; Jun. 24, 1994, 6-143199
Int. Cl.[6] G11B 11/00
U.S. Cl. 369—13 23 Claims

1. A method of recording information on a magnetooptical recording medium, which is constituted by laminating at least a first magnetic layer and a second magnetic layer in an order named on a substrate which has transparency and on which receiving a laser beam is incident, and which satisfies the following relations (1) to (4):

$$H_{c2}>H_{c1} \quad (1)$$

$$H_{c2}>\sigma_w 12/2M_{s2}h_2 \quad (2)$$



$$H_{c1}>\sigma_w 12/2M_{s1}h_1 \quad (3)$$

$$T_{comp1}<T_{c1} \quad (4)$$

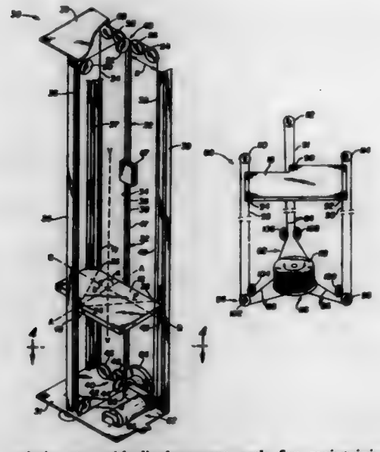
(where H_{c1} and H_{c2} are respectively the coercive forces of the first and second magnetic layers; T_{c1} and T_{c2} are respectively the Curie temperatures of the first and second magnetic layers; M_{s1} and M_{s2} are respectively saturation magnetizations of the first and second magnetic layers; h_1 and h_2 are respectively the film thicknesses of the first and second magnetic layers; T_{comp1} is the compensation temperature of the first magnetic layer; and $\sigma_w 12$ is the interface magnetic wall energy between the first and second magnetic layers, said method comprising:
the step of aligning a direction of a magnetic moment of the first magnetic layer in one direction by an external magnetic field;
the step of irradiating a laser spot of low power while applying a recording bias magnetic field in the same direction as the direction of the external magnetic field so as to form a first recording bit only in a high-temperature region in the laser spot;
the step of irradiating a laser spot of high power while applying the recording bias magnetic field so as to form a second recording bit, in which a magnetic wall is present between the first and second magnetic layers, only in the high-temperature region in the laser spot; and
the step of selecting one of the first recording bit forming step and the second recording bit forming step in correspondence with information.

5,596,556
LINEAR DISPLACEMENT AND SUPPORT APPARATUS FOR USE IN A CARTRIDGE HANDLING SYSTEM

Robert Luffel, Greeley, and Paul Collin, Fort Collins, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 18, 1993, Ser. No. 20,160
Int. Cl.[6] G11B 17/22;17/08
U.S. Cl. 369—36 13 Claims

1. A cartridge handling system, comprising:
a) a cartridge storage system for storing a plurality of cartridges at a plurality of corresponding storage locations;
b) a cartridge engaging assembly for retrieving one of said cartridges from one of said corresponding storage locations, moving said cartridge to a drive, and inserting said cartridge into said drive;
c) first displacement means for linearly displacing said cartridge engaging assembly and said cartridge engaged thereby; and
d) second displacement means for linearly displacing said cartridge engaging assembly and cartridge engaged thereby, said second displacement means comprising an apparatus for linearly displacing a cartridge engaging assembly along a predetermined displacement path and for supporting said cartridge engaging assembly at a fixed orientation relative to said displacement path, said apparatus comprising:
i) elongate flexible member means fixedly secured to said cartridge engaging assembly at at least three laterally spaced apart linear strand portions thereof for supporting and displacing said cartridge engaging assembly;
ii) flexible member engagement means located remotely from said cartridge engaging assembly and fixedly positioned

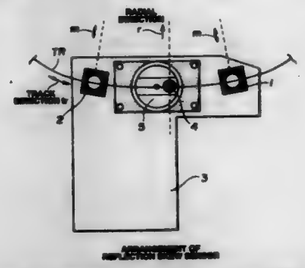


relative to said displacement path for maintaining said plurality of elongate flexible member means linear strand portions in parallel relationship with said displacement path and for tensioning said elongate flexible member means; and
iii) drive means operatively connected to said elongate flexible member means for simultaneously driving said plurality of linear strand portions in the same direction at the same rate.

5,596,557
DISC SKEW DETECTING APPARATUS USING TWO SKEW DETECTORS ARRANGED ALONG THE REPRODUCED TRACK

Yoshinori Matsumoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 17, 1995, Ser. No. 390,618
Claims priority, application Japan, Mar. 31, 1994, 6-063662
Int. Cl.[6] G11B 7/095
U.S. Cl. 369—44.32 26 Claims



1. A skew detecting apparatus for detecting skew between an optical disc having a plurality of adjacent tracks and an optical axis of a reproducing light beam for reproducing information recorded on the disc, comprising:
an objective lens for converging the reproducing light beam on a track of the disc;
an actuator for tilting the objective lens in response to a control signal so as to maintain the perpendicularity between the optical axis of the reproducing light beam and the disc;
a first skew detector for directing a first light beam onto the disc, detecting the first light beam reflected back from a first point of the disc, and providing a first output signal indicative of skew at the first point;
a second skew detector for directing a second light beam onto the disc, detecting the second light beam reflected back from a second point of the disc, and providing a second output signal indicative of skew at the second point, the first and second points being located upstream and downstream, respectively, of the objective lens along the track upon which the reproducing light beam is incident; and
a controller for generating the control signal in response to the first and second output signals.

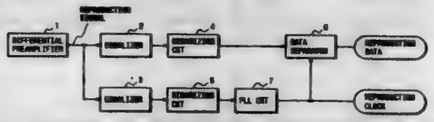
5,596,558
DATA REPRODUCING APPARATUS WITH CONTROLLED COMPARATOR FOR REDUCING CONNECTION ERROR OF MAIN DATA WITH CORRESPONDING ERROR CORRECTION DECODED DATA

Yuji Arataki; Shozo Masuda, both of Tokyo; Kenichi Kabasawa, and Tohru Kadono, both of Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 11,192, Jan. 29, 1993, abandoned.
This application May 16, 1995, Ser. No. 441,950
Claims priority, application Japan, Jan. 31, 1992, 4-040660
Int. Cl.[6] G11B 20/18
U.S. Cl. 369—53 14 Claims

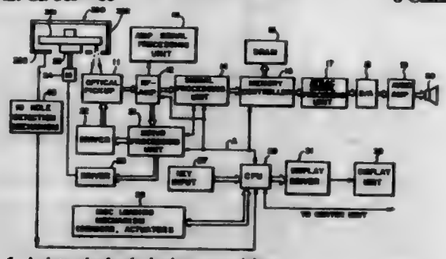
1. A data reproducing apparatus for reproducing recording data from a recording medium, the recording data having auxiliary data appended to main data, the main data having been previously subjected to an error correction coding process, said apparatus comprising:
signal processing means for separating the main data from the recording data, reproduced from the recording medium, for implementing an error correction decoding process on the separated main data to generate decoded main data, the decoded main data characterized by a reliability;
memory means for storing the decoded main data;
data reliability determining means for determining the reliability of the decoded main data;
comparing means for comparing a first data pattern, of the last decoded main data previously stored in the memory means, with a second data pattern, of decoded main data to be next stored into the memory means; and
first control means for controlling write operations into the memory means and read operations from said memory means; and
second control means for controlling a comparison condition of the comparing means according to the determined reliability of the decoded main data.

5,596,559
INFORMATION REPRODUCING APPARATUS FOR REPRODUCING DIGITAL INFORMATION BY SELF-CLOCK SCHEME
Makoto Hiramatsu, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 14, 1995, Ser. No. 421,868
Claims priority, application Japan, Apr. 20, 1994, 6-081638
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—59 4 Claims



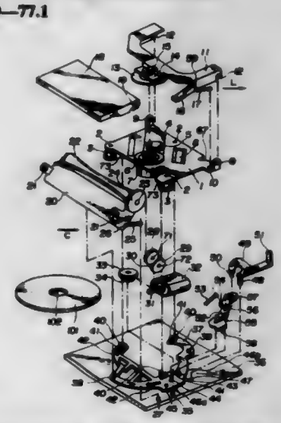
1. An information reproducing apparatus including reproduction clock generating means for generating a reproduction clock on the basis of a multivalue signal of a reproduction signal reproduced from an information recording medium, and reproduction data detecting means for detecting the multivalue signal by using the reproduction clock, and generating reproduction data synchronized with the reproduction clock, comprising:
first waveform equalizing means for performing waveform equalization of the reproduction signal, which is suitable for generation of the reproduction clock; and
second waveform equalizing means which is provided independently of said first waveform equalizing means and has a waveform equalization characteristic different from that of said first waveform equalizing means, said second waveform equalizing means performing waveform equalization of the reproduction signal, which is suitable for detection of the reproduction data.

5,596,560
DATA PLAYBACK DEVICE WITH VERIFICATION OF DATA OUTPUT BY CALCULATING DEVICE
Hiroshi Ishii, Tokyo, Japan, assignor to Clarion Co., Ltd., Saitama-ken, Japan
Filed Jan. 7, 1995, Ser. No. 477,325
Claims priority, application Japan, Jan. 16, 1994, 6-156396
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—60 6 Claims



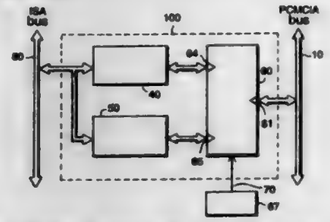
1. A data playback device comprising:
a recording medium;
a reading means that is provided with an optical pick-up for reading data recorded on said recording medium;
a temporary storing means for temporarily storing data read by said reading means;
a calculating means for calculating a value representing a sum of an amount of data (n2) stored in said temporary storing means and an amount of data (n1) on said recording medium remaining to be read;
a first check means for checking whether or not the sum calculated by said calculating means is equal to or greater than a predetermined specified value; and
a first control means for controlling said temporary storing means to output only when the calculated sum from said calculating means is equal to or greater than the predetermined specified value that is proportional to the time required for the optical pickup to move between the innermost edge to the outermost edge on said recording medium.

5,596,561
SHIFTING DEVICE AND LOADING DEVICE FOR DISC-SHAPED RECORDING MEDIUM
Tsutomu Toyoguchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 24, 1995, Ser. No. 377,400
Claims priority, application Japan, Jan. 27, 1994, 6-007595
Int. Cl.[6] G11B 17/04
U.S. Cl. 369—77.1 10 Claims



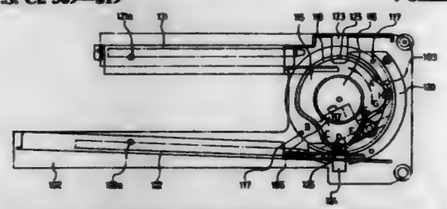
1. A loading device for a disc-shaped recording medium, comprising:
a recording/reproducing unit for recording and reproducing information signals on and from the disc-shaped recording medium;
a base plate:
a ring-shaped loading member mounted on the base plate beneath said recording reproducing unit and facing the disc-shaped recording medium for performing a rotary shifting movement along a surface of the base plate during loading unloading of the disc-shaped recording medium;
a transport mechanism for transporting the disc-shaped recording medium to said recording/reproducing unit and for rotating said ring-shaped loading member;
a control mechanism for terminating the disc transport operation by said transport mechanism upon said ring-shaped loading member being rotated a predetermined amount by said transport mechanism;
a loading mechanism for loading the disc-shaped recording medium onto said recording/reproducing unit after termination by said control mechanism of the transporting operation of the disc-shaped recording medium by said transport mechanism;
a chassis arranged on said base plate and having said recording/reproducing unit mounted thereon; and
a holding mechanism for holding said chassis having said recording/reproducing unit mounted thereon in a locked position on said base plate when said loading member is at an initial position, said holding mechanism holding said chassis with respect to said base plate by the rotary movement of said ring-shaped loading member, said holding mechanism releasing the holding of said chassis with respect to said base plate by the rotary movement of said ring-shaped loading member after the disc-shaped recording medium is loaded on said recording/reproducing unit by said loading mechanism.

5,596,562
CONTROLLING METHOD AND APPARATUS FOR SUPPORTING HARD DISK AND/OR CD-ROM DRIVES THROUGH THE PCMCIA INTERFACE
Chih-Hsien Chen, Hsinchu Hsien, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan
Filed Jan. 19, 1995, Ser. No. 374,880
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—124 13 Claims



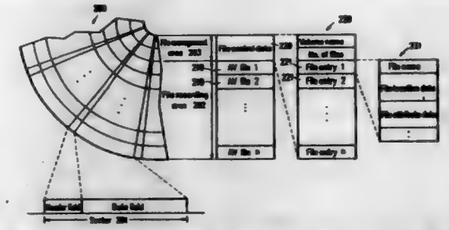
8. An apparatus for controlling a hard disk and/or CD-ROM drives through a PCMCIA interface of a computer system comprising:
a PCMCIA controller connected to an Industry Standard Architecture (ISA) bus of said computer system for implementing PCMCIA interface functions;
an Advanced Technology Attachment (ATA) controller connected to the ISA bus of said computer system for implementing ATA interface functions; and
a multiplexer means connected both to said PCMCIA controller and to said ATA controller, said multiplexer means being responsive to a selection signal provided from a selection means, whereby said apparatus performs either the PCMCIA or the ATA interface functions under control of said selection signal.

5,596,563
BOTH-SIDES PLAYING OPTICAL DISC PLAYER
Hyun J. Maeng, Anyang-city, Rep. of Korea, assignor to Goldstar C., Ltd., Kyung Sangnam-Do, Rep. of Korea
Filed May 12, 1993, Ser. No. 60,859
Claims priority, application Rep. of Korea, May 12, 1992, 92-7994; Dec. 7, 1992, 92-23504
Int. Cl.[6] G11B 7/08
U.S. Cl. 369—219 4 Claims



1. A both-sides playing optical disc player comprising:
a pair of upper and lower supporting means;
a pickup carriage comprising a single sliding motor, at least a single power transfer gear for transferring a power of said sliding motor, pickup means, and first guide means;
at least a pair of upper and lower rack elements respectively mounted in said upper and lower supporting means, for moving said pickup carriage at least within a disc reproducing position by being in gear with said power transfer gear of said pickup carriage;
second guide means mounted in said upper and lower supporting means, for guiding movement of said pickup carriage within the disc reproducing position by cooperating with said first guide means of said pickup carriage;
turning means for rotating said pickup carriage at a reproduction completed position along a semicircle near an end of a disc around an axis perpendicular to a moving direction of said pickup carriage and parallel to a side of the disc; and
means guiding said pickup carriage during rotation thereof,
said first guide means comprising a guide hole formed in a moving direction of said pickup carriage, and at least a pair of front and rear guide rollers provided in an outside of said power transfer gear;
said second guide means comprising at least a pair of upper and lower guide elements being in sliding-contact with said guide hole, for guiding said pickup carriage along a moving direction within the reproducing position of the both sides of the disc, and at least a single upper roller guide being in rolling-contact with one of said guide rollers, for guiding and supporting said pickup carriage; and
said turning means comprising a turning plate having a pickup synchronizing hole for inserting said guide roller thereinto when said pickup carriage is moved to a turning position after completion of reproduction, and means for rotating said turning plate, and a guide plate for preventing deviation of said pickup carriage during turning,
wherein said upper and lower supporting means comprise a pair of upper and lower frames respectively fixed with said upper and lower rack elements and said second guide means, a pair of left and right brackets for connecting one-sided ends of said upper and lower frames with a hinge to rotate said upper and lower frames within said upper and lower supporting means, and a guide shaft fixed in other ends of said upper and lower frames; and
said turning plate further comprises a guide shaft receiving cam curve constituted by a variable curve portion for compensating a slope according to deflection of the disc by rotating said upper and lower frames, and a concentric circle portion excluding said variable curve portion, with said turning plate being rotated by said means for rotating said turning plate and said power transfer gear to position said guide shaft on said cam curve at a position corresponding to deflection of said disc.

5,596,564
INFORMATION RECORDING MEDIUM AND APPARATUS AND METHOD FOR RECORDING AND REPRODUCING INFORMATION
Yoshihisa Fukushima; Masahiro Inagaki, both of Osaka; Yasushi Azumatani, Takatsuki, and Hiroshi Hamasaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Oct. 7, 1994, Ser. No. 319,680
Claims priority, application Japan, Oct. 8, 1993, 5-252854
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—275.3 11 Claims



1. A data recording medium having a plurality of units with a fixed length for recording AV files each including the video data that is compressed in units of a picture on the variable-bitrate condition,
wherein each of the AV files recorded on the data recording medium includes a plurality of chapter data including a plurality of GOP data, a plurality of first pointer data each having a plurality of first pointers, and at least one second pointer data having a plurality of second pointers;

each of the GOP data includes one independent picture data that is intra-picture compressed and a plurality of dependent picture data that are inter-picture compressed;

each of the first pointers is provided in a one-to-one correspondence to each of the independent picture data, and stores a location data of the corresponding independent picture data;

each of the second pointers is provided in a one-to-one correspondence to each of the first pointer data and stores a location data of the corresponding first pointer data; and

a hierarchical location data for retrieving the independent picture data is formed by the first pointers and the second pointers.

5,596,565

METHOD AND APPARATUS FOR RECORDING MPEG-COMPRESSED VIDEO DATA AND COMPRESSED AUDIO DATA ON A DISK

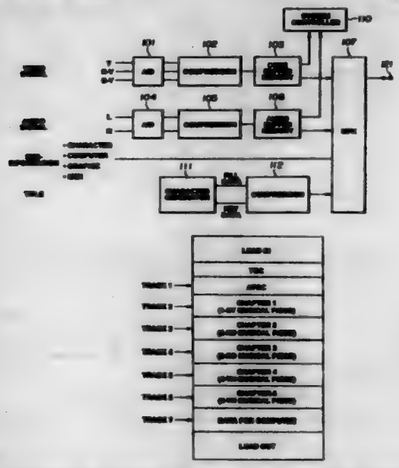
Jun Yonemitsu, Kanagawa; Ryuichi Iwamura; Shunji Yoshimura, both of Tokyo, and Makoto Kawamura, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo

Division of Ser. No. 405,890, Mar. 17, 1995. This application Jun. 7, 1995, Ser. No. 478,496

Claims priority, application Japan, Mar. 19, 1994, 6-074445

Int. Cl.[6] G11B *7/24*; H04N *5/76*

U.S. Cl. 369—275.3 **74 Claims**



1. A method of recording data on an optical disk having a diameter less than 140 mm, a thickness of 1.2 mm±0.1 mm and a recording area divided into a lead-in area, a program area and a lead-out area, said method comprising the steps of: providing user information including MPEG-compressed video data and compressed audio data for recording in a plurality of sectors in user tracks; providing table of contents (TOC) information for recording in a plurality of sectors in at least one TOC track, said TOC information including addresses of respective start sectors, each identifying a start sector of a respective user track; encoding both said user information including MPEG-compressed video data and compressed audio data and said TOC information in a long distance error correction code having at least eight parity symbols; modulating the encoded user and TOC information; recording the modulated, encoded TOC information as embossed pits in said at least one TOC track in said lead-in area; and recording the modulated, encoded user information as embossed pits in said user tracks in said program area with a track pitch in the range between 0.646 μm and 1.05 μm.

5,596,566

OPTICAL DISK CARTRIDGE HAVING DISK THICKNESS SAMPLE PLATE

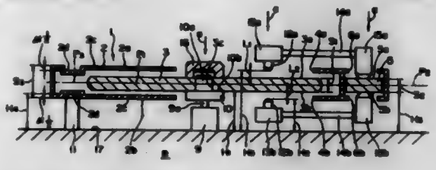
Yoshitsugu Taki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 848,512, Feb. 24, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,336

Claims priority, application Japan, Feb. 25, 1991, 3-050205

Int. Cl.[6] G11B *23/03*; *7/08*

U.S. Cl. 369—291 **7 Claims**



1. An optical disk cartridge, comprising:

an optical disk having a pair of recording faces formed on opposite surfaces thereof,

a cartridge including a pair of halves between which said optical disk is accommodated for rotation, and

a sample plate having a thickness representative of a thickness of said optical disk and disposed parallel to said optical disk at a position in said cartridge in which said sample plate does not interfere with said optical disk,

wherein one cartridge half has a first hole and the other cartridge half has a second hole, each of the first hole and the second hole exposing an upper face and a lower face, respectively, of said sample plate, whereby the thickness of the sample plate can be gaged through the first hole and the second hole from outside of the cartridge.

5,596,567

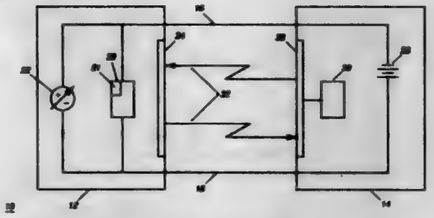
WIRELESS BATTERY CHARGING SYSTEM

David M. deMaro, Snellville, and Vernon Meadows, Lilburn, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1995, Ser. No. 414,452

Int. Cl.[6] H01M *10/48*

U.S. Cl. 320—5 **15 Claims**



1. A rechargeable battery pack, comprising:

at least one battery cell;

a wireless communication means for communicating with a battery charging device wherein said wireless communication means is a magnetically coupled (BPSK) bit phase shift keying protocol signal; and

a memory device coupled to said wireless communication means, said memory device containing information relating to recharging said at least one battery cell.

5,596,568

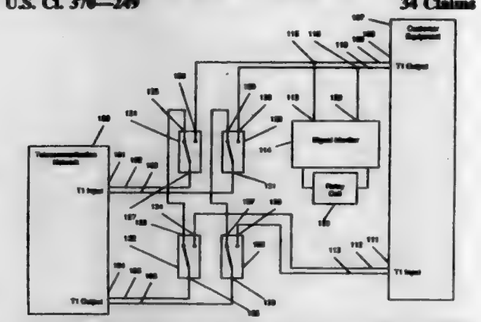
APPARATUS FOR PROTECTING A TELECOMMUNICATIONS NETWORK FROM FALSE ALARM CONDITIONS DUE TO T1 LINE SIGNAL INTERRUPTION

Donald F. Fleshren, Richardson, Tex., assignor to MCI Communications Corporation, Washington, D.C.

Filed Jun. 2, 1995, Ser. No. 459,668

Int. Cl.[6] H04J *3/14*; H04M *3/22*

U.S. Cl. 370—249 **34 Claims**



1. In a telecommunications network, an apparatus for providing a substitute T1 signal from a customer equipment to the network whenever a T1 output signal from the customer equipment is interrupted, comprising:

a) means for detecting the presence or absence of a T1 output signal from a customer equipment, coupled to the customer equipment; and

b) switching means for providing a substitute T1 signal to a network whenever the T1 output signal from the customer equipment is interrupted, coupled to the signal detecting means.

5,596,569

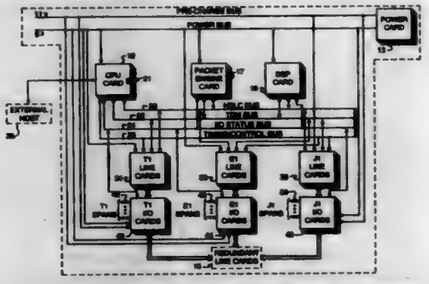
TELECOMMUNICATIONS SWITCH WITH IMPROVED REDUNDANCY

Robert P. Madonna, West Barnstable; Siegmar K. Eschholz, Monument Beach, and John T. Lynch, Buzzards Bay, all of Mass., assignors to Excel, Inc., Hyannis, Mass.

Continuation of Ser. No. 207,921, Mar. 8, 1994, abandoned. This application Oct. 10, 1995, Ser. No. 590,688

Int. Cl.[6] H04Q *11/00*; G06F *11/00*

U.S. Cl. 370—217 **26 Claims**



1. A programmable telecommunications switch comprising:

a switching matrix for dynamically connecting and disconnecting communications paths between a plurality of communication channels:

a first line module configured to receive at least one telecommunications signal of a certain protocol type and transmit the telecommunications signal to a first communication channel of the plurality of communications channels of the switching matrix, wherein the first line module is independently instructable to transmit to any one of the plurality of communication channels:

a second line module configured to receive at least one telecommunications signal of said certain protocol, wherein the second line module is independently instructable to transmit a received telecommunications signal to any one of the plurality of communication channels;

an active input device configured to terminate an external span having at least one conductor carrying at least one telecommunications signal of said certain protocol type, the active input device having a plurality of connection modes, a first mode being such that the span is connected in a communicating relationship to the first line module and a second mode being such that the span is connected in a communicating relationship to the second line module, the active input device changing from the first mode to the second mode in response to a changeover signal; and

a data processor configured to respond to a malfunction of the first line module by instructing the second line module to transmit received telecommunications signals to the first communication channel and generating the changeover signal, thereby causing the first line module to be functionally replaced by the second line module.

5,596,570

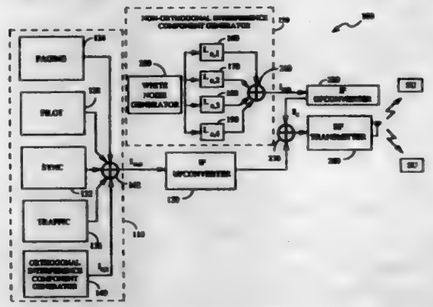
SYSTEM AND METHOD FOR SIMULATING INTERFERENCE RECEIVED BY SUBSCRIBER UNITS IN A SPREAD SPECTRUM COMMUNICATION NETWORK

Samir S. Soliman, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 274,609, Jul. 13, 1994, abandoned. This application May 22, 1996, Ser. No. 651,310

Int. Cl.[6] H04J *13/02*

U.S. Cl. 370—252 **45 Claims**



1. A method for simulating signal interference in a communication system in which information is communicated over at least one communication channel, comprising the steps of:

determining a first composite signal energy for signal transmission within said communication system over a first set of simulated communication channels;

determining a first average data rate for said first composite signal energy; and

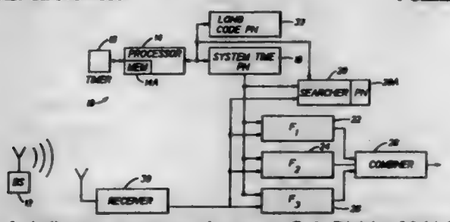
adjusting a level of signal energy transmitted over said at least one communication channel in response to a first interference signal which is based on said first composite signal energy and average data rate.

5,596,571

CDMA RADIOTELEPHONE HAVING OPTIMIZED SLOTTED MODE AND LONG CODE OPERATION

Adam F. Gould; James R. Robertson, both of San Diego; John W. Newman, Valley Center; and John R. Goss, San Diego, all of Calif., assignors to Nokia Mobile Phones Ltd., Finland

Continuation of Ser. No. 178,401, Jan. 5, 1994, Pat. No. 5,491,718. This application Oct. 30, 1995, Ser. No. 549,975
Int. Cl.[6] H04B 1/69; H04J 13/02
U.S. Cl. 370—335 4 Claims



1. A direct sequence, spread spectrum Code Division Multiple Access (CDMA) radiotelephone system, comprising:

a plurality of base stations each having a base station coverage area, each of said plurality of base stations transmitting a paging channel having a plurality of repeating paging channel slots each of which is comprised X frames, each of said plurality of base stations including means for assigning at least one paging channel slot to radiotelephones located within the coverage area of the base station; and

individual ones of said radiotelephones comprising control means for operating said radiotelephone within the CDMA radiotelephone system, an individual one of said radiotelephones comprising,

a receiver for receiving the paging channel transmission from at least one of said plurality of base stations;

a system time pseudonoise (PN) generator means;

a multi-finger correlator, having an input coupled to said receiver, for despreading a paging channel transmission received during at least a portion of an assigned paging channel slot, wherein the assigned paging channel slot is predetermined to have a duration that is Y times the duration of a rollover period of said system time pseudonoise (PN) generator; and

means for periodically activating at least portions of said radiotelephone to receive and despread a paging channel transmission received during at least the portion of the assigned paging channel slot.

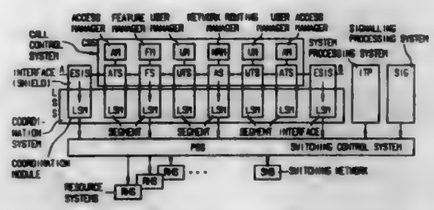
5,596,572

SYSTEM FOR COORDINATING CONNECTION REQUESTS

Regina Wille-Fier, Deisenhofen, Germany, and John W. Cutler, Coventry, Great Britain, assignors to Siemens Aktiengesellschaft, Munich, Germany, and GPT Ltd., Coventry, United Kingdom

PCT No. PCT/EP93/02288, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO94/05122, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 25, 1993, Ser. No. 392,755
Claims priority, application Germany, Aug. 25, 1992, 92 114 474.7
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—360 7 Claims

1. A coordination system for coordinating connection requests of a modular connection system to a switching control system, the connection system controlling connections at a logic level, and the switching control system controlling connections at a physical level, the coordination system comprising: coordination modules having:



a) means for receiving and buffer-storing connection requests produced from the connection system for an active connection end point involved with a connection,

b) means for passing on a connection requests, which is buffer-stored by the coordination modules, to the switching control system when the coordination modules have received control over an active connection end point, and

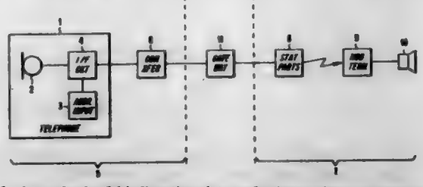
c) means for surrendering control over a specific active connection end point to one another such that only one coordination module has control over this specific active connection end point at a specific point in time.

5,596,573

TRANSFER OF VOICE MESSAGES

Staffan Bertland, Täby, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 22, 1994, Ser. No. 361,490
Claims priority, application Sweden, Dec. 22, 1993, 9304245
Int. Cl.[6] H04L 12/56
U.S. Cl. 370—474 14 Claims



1. A method of bi-directional transferring voice messages in a communication network having a public telephone network and a batch type packet-switched narrow-band radio data network for transferring voice messages in both directions between the public telephone network and terminals of the packet-switched narrow-band radio data network and for transferring voice messages in both directions between terminals of the packet-switched narrow-band radio data network, the method comprising the steps of:

converting an entire voice message from analog form to digital form to create a digitized voice message;

compressing the digitized voice message to create a compressed message;

placing the compressed message in at least one data packet;

supplementing a data packet with an address of an intended receiver of the voice message and an identification that indicates that the data packet contains a compressed voice message;

placing the data packet in a queue for transfer by the packet-switched narrow band radio data network in a batch;

transferring the data packet via the packet-swiched narrow-band radio data network in a batch;

combining data packets after transfer to the receiver so that the compressed message is reassembled;

expanding and storing the reassembled message; and

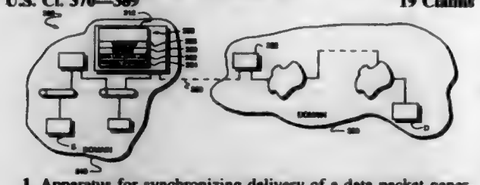
converting the expanded and reassembled message from digital form to analog form, whereby the voice message is reproduced.

5,596,574

METHOD AND APPARATUS FOR SYNCHRONIZING DATA TRANSMISSION WITH ON-DEMAND LINKS OF A NETWORK

Radia J. Perlman, Acton, Mass., and Neal D. Castagnoli, Morgan Hill, Calif., assignors to Novell, Inc., Orem, Utah

Filed Jul. 6, 1995, Ser. No. 498,640
Int. Cl.[6] H04L 12/56
U.S. Cl. 370—389 19 Claims



1. Apparatus for synchronizing delivery of a data packet generated by a source node and transmitted over an on-demand link of a computer network to a destination node in a manner that efficiently utilizes that link, the apparatus comprising:

a router coupled to the on-demand link, the router configured to activate the link to establish a connection to another node of the network for delivery of the packet to the destination node; and

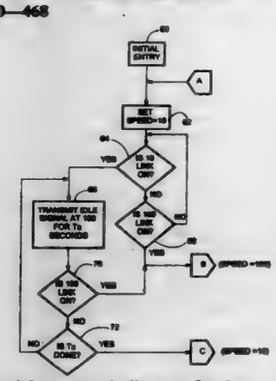
means for instructing the router whether to immediately activate the link to establish the connection, the instructing means comprising control information stored in the data packet.

5,596,575

AUTOMATIC NETWORK SPEED ADAPTER

Henry S. Yang, Andover; Donald L. Post, Leominster, both of Mass., and Wen-Yi Huang, Thoyuan, Taiwan, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 5, 1995, Ser. No. 435,923
Int. Cl.[6] H04J 3/22
U.S. Cl. 370—468 5 Claims



1. A method for automatically reconfiguring a network adapter to match its operating speed to that of a network to which the adapter is connected, the method comprising the steps of:

providing the adapter with a connection to a device driver;

initially setting the adapter to operate at a lower speed by the device driver;

determining whether the network is operating at the lower speed;

if the network is determined to be not operating at the lower speed, determining whether the network is operating at a higher speed;

if the network is determined to operating at the higher speed, setting the adapter to operate at the higher speed by the device driver; and

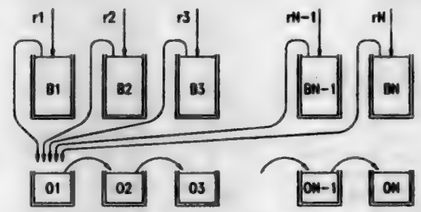
if the network is determined by the device driver to be operating at the lower speed, having the device driver instruct the adapter to deliver a burst of signals at the higher speed, then determining by the device driver whether the network has switched to the higher speed, and setting the adapter to operate at the higher speed by the device driver if the network has switched to the higher speed, or at the lower speed if the network has not switched to the higher speed.

5,596,576

SYSTEMS AND METHODS FOR SHARING OF RESOURCES

Rodolfo A. Milito, Piscataway, N.J., assignor to AT&T, Holmdel, N.J.

Filed Nov. 3, 1995, Ser. No. 552,899
Int. Cl.[6] H04J 3/22;3/16
U.S. Cl. 370—450 16 Claims



1. A method for allocating access to a shared limited resource among a plurality of users who require access to said resource, said allocation being made such that each user is granted access to said resource at a minimum guaranteed rate associated with each user and such that said resource is available for use by any user exceeding its minimum guaranteed rate only if said resource is available, said method comprising the steps of:

assigning tokens to each user at a rate determined by the minimum guaranteed rate associated with each user;

storing tokens assigned to each user in a bank associated with each user, each said bank having a finite capacity associated with each user;

storing tokens assigned to a user whose associated bank has reached its capacity in a bank assigned to another user whose bank is below its capacity; and

allowing a user requesting access to said resource to have access to said resource if said user has a predetermined number of tokens in its associated bank and otherwise denying access to said resource.

5,596,577

METHOD AND SYSTEM FOR PROVIDING ACCESS BY SECONDARY STATIONS TO A SHARED TRANSMISSION MEDIUM

John A. Perreault, Hopkinton; Abhay Joshi; Mete Kabatepe, both of Norwood; Lawrence W. Lloyd, Wrentham, and Stephen Schroeder, Stoughton, all of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

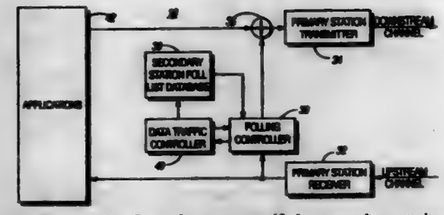
Filed May 2, 1995, Ser. No. 433,985
Int. Cl.[6] H04Q 9/00
U.S. Cl. 370—449 8 Claims

1. A method for providing access by a secondary station, the secondary station being one of a plurality of secondary stations, to a shared transmission medium, the secondary station transmitting a quantity of data on the shared transmission medium, the access to the shared transmission medium being governed by a primary station, comprising the steps of:

(a) maintaining a list of the plurality of secondary stations, each of the plurality of secondary stations having a transmission allocation and a polling priority;

(b) transmitting a poll to the secondary station;

(c) waiting for a response from the secondary station;



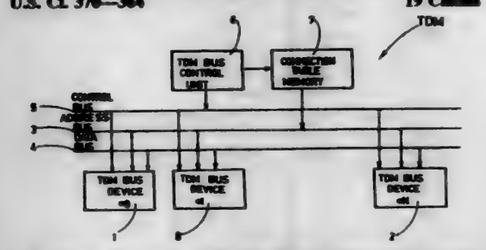
(d) determining from the response if the secondary station is congested;
(e) if the secondary station is congested
(e)(1) increasing the transmission allocation for the secondary station;
(e)(2) changing the polling priority of the secondary station;
(f) if the secondary station is not congested
(f)(1) optimizing a future transmission by the secondary station based upon the quantity of data sent by the secondary station;
(g) waiting for said poll;
(h) examining the transmission allocation;
(i) determining if there is congestion at the secondary station;
(j) if there is congestion at the secondary station, transmitting to the primary station said response indicating that there is congestion; and
(k) transmitting data in response to the poll.

5,596,578

TIME DIVISION MULTIPLEXING DATA TRANSFER SYSTEM FOR DIGITAL AUDIO DATA DISTRIBUTION

Jeffrey Cunningham, Hanover, N.H., assignor to Fostex Corporation of America, Norwalk, Calif.

Filed Oct. 4, 1993, Ser. No. 131,997
Int. Cl.[6] H04J *3/26*; H04L *12/40*
U.S. Cl. 370—364 **19 Claims**



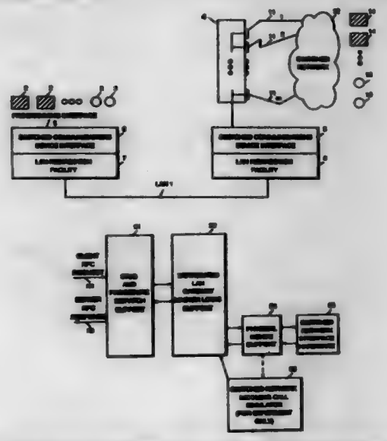
1. A time division multiplexing digital audio patch bay data transfer system for transferring data during a series of time slots, the system comprising:
(a) a digital audio data bus interconnection structure including a data bus;
(b) a plurality of digital audio processing devices, each digital audio processing device having connections plugged into the bus structure for allowing input and output data communication with the bus structure, the bus structure providing data transfer from a source digital audio processing device to a destination digital audio processing device during a single time slot; and
(c) a bus control means for providing control signals to the bus structure, the control signals controlling which of the digital audio processing devices are the source digital audio processing device and the destination digital audio processing device during the single time slot; and
wherein each of the digital audio processing devices further comprises (1) a group address means for controlling access to the data bus when a group address control signal is provided by the bus control means to address a plurality of destination devices, and (2) a single address means for controlling access to the data bus when a single address control signal is provided by the bus control means to address a single destination device such that each digital audio processing device will receive data if it sees its own unique address or the address of any group to which it belongs, and wherein there are a plurality of destination digital audio processing devices receiving data during the single time slot.

5,596,579

HIGH PERFORMANCE MACHINE FOR SWITCHED COMMUNICATIONS IN A HETEROGENEOUS DATA PROCESSING NETWORK GATEWAY

Mehrad Yasrebi, Scarborough, Canada, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 131,859, Oct. 1, 1993, Pat. No. 5,463,625. This application Jun. 5, 1995, Ser. No. 463,610
Int. Cl.[6] H04L *12/46*
U.S. Cl. 395—678 **7 Claims**



1. An interface mechanism for a switched communications gateway in a distributed computing network comprising:
means for issuing multiple remote procedures calls between at least one computer and the gateway across the distributed network;
means for concurrently processing the multiple remote procedure calls between said at least one computer and the gateway across the distributed network;
means for identifying remote procedure calls for related functions for effectuating switch communication link; and,
scheduling means for sequentially processing remote procedure calls for the related functions at the gateway.

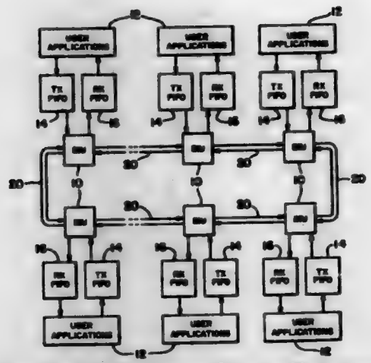
5,596,580

ACCESS TO TRANSMIT ON A MESSAGE PRIORITY BASIS

Robert A. Walser, West Point, Calif., and Earl E. Rydell, Swisher, Iowa, assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 72,664, Jun. 4, 1993. This application Jun. 2, 1995, Ser. No. 460,330
Int. Cl.[6] H04L *12/417*
U.S. Cl. 370—455 **10 Claims**

1. A method for granting to a station access to transmit on a ring bus based on a priority accorded to a data message frame awaiting transmission comprising:
assigning a priority number to each data message frame adapted for transmission on the ring bus;
circulating on the ring bus a token having a priority field adapted to receive said priority number;



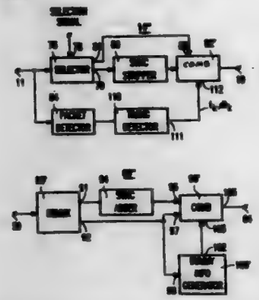
at a station having a data message frame awaiting transmission, entering the priority number of said data message frame into the priority field of the token;
granting access to transmit only after processing the token to assure that no other station has a data message frame having a higher priority; and
transmitting a "busy" condition that prevents any other station from gaining access to transmit.

5,596,581

RECORDING AND REPRODUCING AN MPEG INFORMATION SIGNAL USING TAGGED TIMING INFORMATION

Ronald W. J. J. Saeijs, Eindhoven, Netherlands; Imran A. Shah, Ossining, N.Y., and Takashi Sato, Tokyo, Japan, assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 225,193, Apr. 8, 1994. This application Jun. 3, 1994, Ser. No. 253,535
Int. Cl.[6] H04J *3/00*; H04N *5/76*
U.S. Cl. 370—394 **22 Claims**



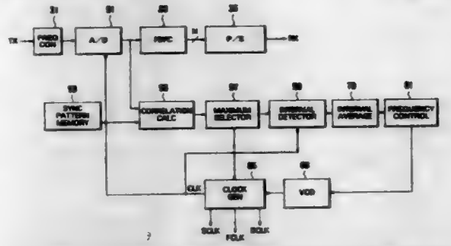
1. A method of transmitting timing-critical data of unknown transmission rate via an asynchronous channel, comprising the steps:
(i) providing the timing-critical data subdivided into a stream of successive critically-timed transmission units,
(ii) determining from the timing-critical data at least two items of timing information from which the timing-critical data can be recreated,
(iii) tagging the transmission units with the items of timing information,
(iv) transmitting the transmission units tagged with the items of timing information over the asynchronous channel,
(v) receiving from the channel the transmission units tagged with the items of timing information,
(vi) recreating from the transmission units and the items of timing information received in step (v) the timing-critical data.

5,596,582

AFC IN OFDM MODULATION BY SHIFT OF A WINDOW ALONG A RECEPTION SAMPLE SEQUENCE

Toru Sato, and Masafumi Saito, both of Tokyo, Japan, assignors to NEC Corporation, and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed May 25, 1995, Ser. No. 450,540
Claims priority, application Japan, May 26, 1994, 6-138386
Int. Cl.[6] H04J *3/06*
U.S. Cl. 370—509 **7 Claims**



1. A method of transmitting a sequence of data as a transmission signal and of receiving said transmission signal as a reproduction of said sequence of data, said method comprising the steps of:
converting said sequence of data to data symbols by orthogonal frequency division multiplex modulation;
composing said data symbols into successive frames by adding synchronizing patterns to said frames;
transmitting said successive frames as said transmission signal;
receiving said transmission signal as a received signal;
sampling reception samples from said received signal in response to a clock sequence of a clock frequency to produce a reception sample sequence;
detecting synchronization patterns in said reception sample sequence;
generating said clock sequence in response to said synchronization patterns; and
reproducing said reproduction by orthogonal frequency division multiplex demodulation of said reception sample sequence, wherein
said composing step comprises the steps of:
storing at least one synchronizing symbol to produce a stored synchronizing symbol sequence, and
using a synchronizing symbol from said stored synchronizing symbol sequence as one of said synchronizing patterns in each frame, and wherein
said detecting step comprises the steps of:
storing a pattern comprising a synchronization pattern identical with said synchronizing symbol to produce a stored pattern sequence,
calculating, responsive to said stored pattern sequence, a cross-correlation value between said synchronization pattern and each of candidate patterns derived from said reception sample sequence with a window of a predetermined time duration stepwise shifted relative to said reception sample sequence to produce successive cross-correlation values for said reception sample sequence,
selecting from said candidate patterns, as reproductions of synchronizing symbols, ones of said candidate patterns that gives two successive maxima among said cross-correlation values at a time interval substantially coincident in a standstill pattern of said reception sample sequence with a frame period of said frames, said ones of candidate patterns being selected to decide said time interval successively as time intervals each of which substantially coincides with said frame period,

averaging a prescribed number of said time intervals into a mean, interval, and

controlling said clock frequency in response to said time interval using said mean interval as said time interval.

5,596,583

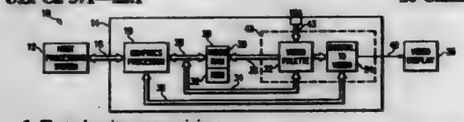
TEST CIRCUITRY, SYSTEMS AND METHODS

William R. Krenik, Garland; Louis J. Izal, Plano, and Chenwei J. Yin, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1991, Ser. No. 734,344

Int. Cl.[6] G01R 31/28

U.S. Cl. 371—22.1 20 Claims



1. Test circuitry comprising:

a multiplexer for selectively receiving multiple bit control words defining test functions to be executed by said test circuitry and for outputting data from said test circuitry;

a plurality of digital data inputs for receiving multiple bit words of digital data;

a register coupled to said multiplexer for storing a one of said multiple bit control words received by said multiplexer;

control circuitry coupled to said register for controlling execution of said test function defined by said one of said control words being held in said register;

first test circuitry coupled to said digital data inputs, said multiplexer and said control circuitry for passing said digital data words received at said digital data inputs to said multiplexer for output in response to a first control word of said control words being stored in said register.

5,596,584

SINGLE CLOCK SCAN LATCH

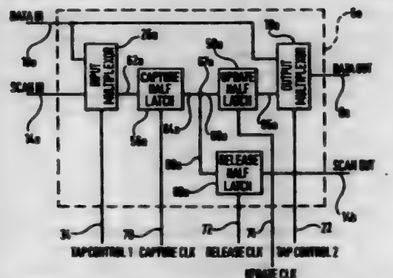
Robert Warren, Bristol, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Bristol, United Kingdom

Filed Aug. 24, 1995, Ser. No. 519,058

Claims priority, application United Kingdom, Sep. 1, 1994, 9417592

Int. Cl.[6] G01R 31/28

U.S. Cl. 371—22.3 6 Claims



1. A half-latch having an input terminal connected to receive an input signal, a first control terminal connected to receive a clock signal, and an output terminal, the half-latch being operable, when enabled, to adopt a data transfer state to transmit a signal from its input terminal to its output terminal or a data holding state to store the signal on the output terminal in dependence on the state of said clock signal, the half-latch comprising a second control terminal connected to receive a control signal to selectively disable the half-latch.

5,596,585

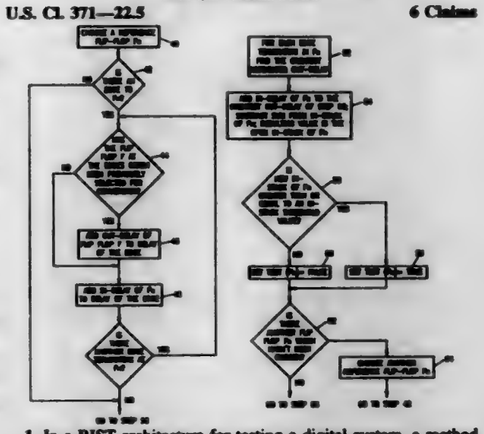
PERFORMANCE DRIVEN BIST TECHNIQUE

Charles A. Njinda, San Jose, and Neeraj Kaul, Milpitas, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 482,223

Int. Cl.[6] G01R 31/28

U.S. Cl. 371—22.5 6 Claims



1. In a BIST architecture for testing a digital system, a method for selecting ones of a plurality of storage elements contained in said digital system which are suitable to be converted into respective BIST elements so as to minimize the effect of said conversion upon the performance of said digital system, each of said storage elements having associated therewith an in-slack, an out-slack, an in-delay, and an out-delay, said method comprising the steps of:

(a) choosing as a reference element one of said plurality of storage elements;

(b) identifying those ones of said plurality of storage elements which have an edge to said reference element as origin elements;

(c) determining, based upon said out-delays of said origin elements and said in-delay and in-slack of said reference element, a new in-slack of said reference element;

(d) comparing said new in-slack of said reference element with a predetermined in-slack threshold value;

(e) identifying those ones of said plurality of storage elements which have an edge originating at said reference element as termination elements;

(f) determining, based upon said in-delays of said termination elements and said out-delay and out-slack of said reference element, a new out-slack of said reference element;

(g) comparing said new out-slack of said reference element with a predetermined out-slack threshold value;

(h) identifying, in response to said steps of comparing, said reference element as being suitable for conversion to one of said respective BIST elements; and

(i) repeating steps (a) through (h) for each of said plurality of storage elements.

5,596,586

FAILURE SIMULATION METHOD

Hiroaki Sakai, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

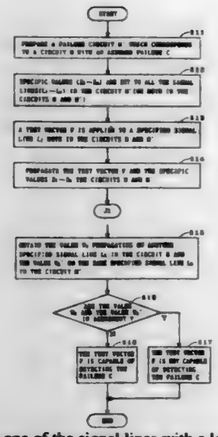
Filed May 24, 1995, Ser. No. 448,663

Claims priority, application Japan, Jul. 14, 1994, 6-162204

Int. Cl.[6] G06F 11/00

U.S. Cl. 371—25.1 11 Claims

1. A failure simulation method for determining whether a test vector is capable of detecting at least one type of failure occurring in a circuit to be tested, the circuit to be tested including a plurality of signal lines and at least one logical element, the test vector



providing at least one of the signal lines with a logical value "1" or "0", the method comprising the steps of:

(a) preparing a failure circuit which corresponds to the circuit to be tested for the at least one type of failure, the failure circuit including a plurality of signal lines and at least one logical element;

(b) setting at least one specific value uniquely to the plurality of signal lines of the failure circuit, the at least one specific value representing either a logical value "1" or "0";

(c) applying the test vector to one of the plurality of signal lines of the circuit to be tested and to one of the plurality of signal lines of the failure circuit;

(d) propagating the test vector in the circuit to be tested and in the failure circuit and propagating the at least one specific value in the failure circuit;

(e) obtaining a normal result representing a value output from the logical element of the circuit to be tested which propagates on a specific one of the plurality of signal lines of the circuit to be tested and a failure result representing a value output from the logical element of the failure circuit which propagates on a specific one of the plurality of signal lines of the failure circuit; and

(f) comparing the normal result with the failure result to determine whether the test vector is capable of detecting the failure.

5,596,587

METHOD AND APPARATUS FOR PREPARING IN-CIRCUIT TEST VECTORS

Raymond W. Douglas, Orinda, Calif.; Philip J. Stinger, Otter Shaw, England; Harold W. Ng, Concord, and Terence N. Lee, Oakland, both of Calif., assignors to Teradyne, Inc., Boston, Mass.

Filed Mar. 29, 1993, Ser. No. 39,947

Int. Cl.[6] G01R 31/28

U.S. Cl. 371—27 16 Claims

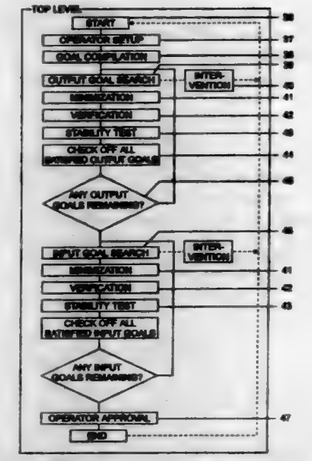
1. A method for preparing in-circuit test vectors for an electrical component, comprising:

establishing test goals for each pin of said electrical component;

automatically generating at least one pseudorandom test vector;

applying each of said at least one test vector to said electrical component; and

after application of each of said at least one test vector, testing whether any of said test goals have been satisfied, and if so, storing said at least one test vector as a set of learned test



vectors, and if not, repeating said generating, applying and testing steps.

5,596,588

MULTIPLEX TRANSMISSION METHOD

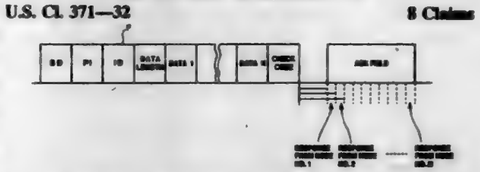
Yoshikazu Nobutoki, Higashihiroshima; Masao Hidenhima, Hiroshima; Shigeyuki Satomura, Kure, and Akira Sone, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 27, 1992, Ser. No. 858,538

Claims priority, application Japan, Mar. 28, 1991, 3-064282

Int. Cl.[6] G08C 25/02; H04L 1/18

U.S. Cl. 371—32 8 Claims



1. A multiplex transmission method for performing time-divisional distributed multiplex transmission operations among a plurality of communication nodes, comprising the steps of:

adding a check bit at a transmission node to a signal transmitted from said transmission node, said transmission node being one of said plurality of communication nodes and said check bit indicating a status of said signal;

causing said check bit to have a predetermined change every time a new signal is transmitted from said transmission node to a reception node which is one of said plurality of communication nodes, said predetermined change giving rise to a change of a value of said check bit which is different from a value of a check bit added to a previously transmitted signal;

detecting at said transmission node presence or absence of a communication node which has not normally received the signal transmitted from said transmission node, in said plurality of communication nodes;

re-transmitting the signal from said transmission node, without changing the status of said check bit, in accordance with a detection result obtained at said detecting step; and

determining, at said reception node which has received said signal, whether said signal is a re-transmitted signal on a basis of a comparison result between a first status of a check bit associated with a previously received signal and a second status of a check bit associated with a currently received signal;

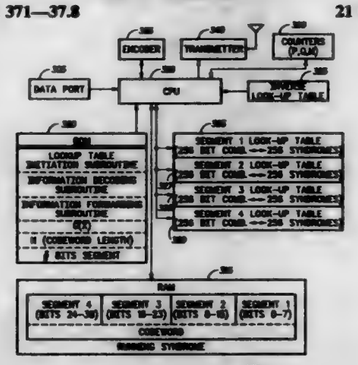
wherein if the first status and the second status agree, it is determined at said determining step that the received signal is the re-transmitted signal.

5,596,589

METHOD AND APPARATUS FOR ENCODING AND DECODING ERROR CORRECTION CODES IN A RADIO COMMUNICATION SYSTEM

Soeren H. Thomsen, Aarre, Denmark; Charles A. Sherwood, II, Naperville, and Casimir Karczewski, Lake Villa, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1993, Ser. No. 143,229
Int. Cl.[6] G06F *11/10*
U.S. Cl. 371—37.8 **21 Claims**



1. A method, in a communication device for receiving data, for decoding a codeword of predetermined length which has been previously encoded with parity bits and information bits, the method comprising the steps of:

(a) dividing the codeword into segments, wherein the segments comprise multiple bits forming bit combinations;

(b) using the bit combinations as indices to locate parity vectors corresponding to the bit combinations;

(c) adding the parity vectors using modulo 2 arithmetic to form a resulting syndrome; and

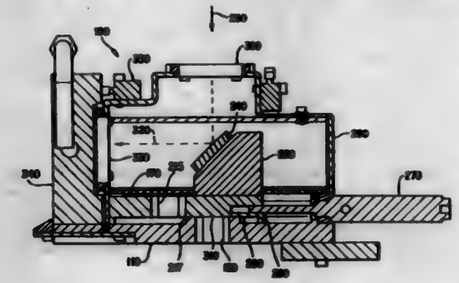
(d) using the resulting syndrome as an index to locate a corresponding value indicative of an erroneous bit included in the codeword.

5,596,590

BEAM DIVERTING SHUTTER FOR A LASER BEAM

Anthony J. de Ruyter, San Diego, and David W. Means, Carlsbad, both of Calif., assignors to Cymer Laser Technologies, San Diego, Calif.

Filed Jan. 25, 1996, Ser. No. 591,754
Int. Cl.[6] H01S *3/121*
U.S. Cl. 372—14 **13 Claims**



1. A shutter apparatus for use in a laser system comprising:

a shutter support base having a diagnostic instrument mount and a first beam aperture disposed therein;

a shutter slide operably coupled to the shutter support base by a rod-roller bearing support to allow the shutter slide to articulate in a direction parallel to a horizontal axis of the shutter support base, said shutter slide having a second beam aperture disposed therein;

a light reflection means angularly mounted on said shutter slide along an edge of said second beam aperture;

an actuating means coupled to said shutter slide;

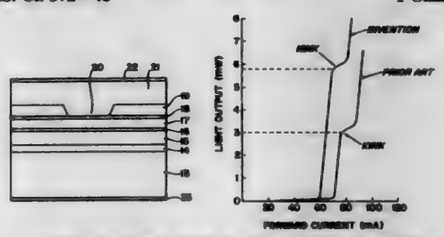
a housing mounted to said shutter support base to light seal the shutter slide and light reflection means located therein, said housing having a beam port disposed therein, said beam port being constructed to restrict light transmission to an incoming beam, wherein when said shutter apparatus is in an open mode said first and second apertures are aligned to allow said beam to pass therethrough unimpeded, and when said shutter apparatus is activated to a closed mode, said actuator means slides said shutter slide along said rod-roller bearing supports to reposition said first aperture out of alignment with said second aperture and simultaneously move said light reflection means into engagement with said transmitted beam to deflect said beam to a diagnostic instrument coupled to said diagnostic instrument mount.

5,596,591

GAIN-GUIDED TYPE LASER DIODE

Hideo Kawano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1994, Ser. No. 205,170
Claims priority, application Japan, Mar. 3, 1993, 5-041618
Int. Cl.[6] H01S *3/18*
U.S. Cl. 372—46 **1 Claim**



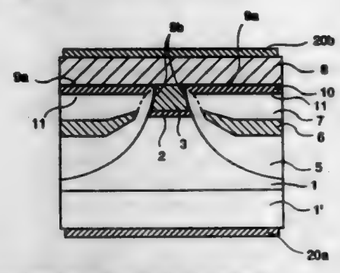
1. A gain-guided type visible light laser diode comprising: a substrate of GaAs having a first conductivity type; a buffer layer of GaAs formed on said substrate and having said first conductivity type; a first cladding layer of AlGaInP formed on said buffer layer and having said first conductivity type; an active layer formed on said first cladding layer, a second cladding layer of AlGaInP formed on said active layer and having a second conductivity type; an etching stopper layer of GaInP formed on said second cladding layer and being doped with zinc to have said second conductivity type and having an impurity concentration selected to be approximately 2×10^{18} cm^{-3}; a pair of current blocking layers so as to expose a stripe region of etching stopper layer, each of said current blocking layers being doped with silicon to have said first conductivity type, impurity concentration of said current blocking layers being selected to be at least 5×10^{18} cm^{-3}; a contact layer and said stripe region of said etching stopper layer; a first electrode layer formed on said contact layer; and a second electrode layer formed on the bottom surface of said substrate, and thereby attaining a kink level of at least 5.8 mW with a threshold current level of not more than 60 mA.

5,596,592

SEMICONDUCTOR LASER DEVICE

Yoriko Tsuiguni; Tomoko Kadowaki, and Akira Takemoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 515,000
Claims priority, application Japan, Aug. 23, 1994, 6-198346
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **6 Claims**



1. A semiconductor laser device including:

a ridge waveguide having two side surfaces;

a burying crystalline layer disposed at both side surfaces of the ridge waveguide; and

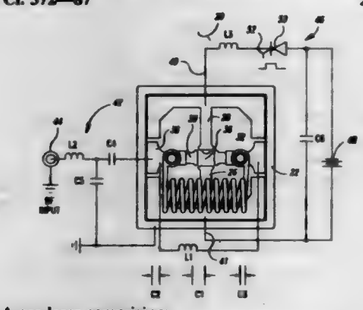
a contact layer disposed on the burying crystalline layer and the ridge waveguide, the burying crystalline layer comprising a first current blocking layer in contact with the side surfaces of the ridge waveguide and comprising a first conductivity type semiconductor, a second current blocking layer disposed on a portion of the first current blocking layer and separated from the ridge waveguide by a portion of the first current blocking layer proximate the ridge waveguide, and comprising a second conductivity type semiconductor, opposite the first conductivity type, a third current blocking layer disposed on the portion of the first current blocking layer proximate the ridge waveguide and on the second current blocking layer and comprising a first conductivity type semiconductor, and a final burying layer disposed on the third current blocking layer and comprising a second conductivity type semiconductor, the contact layer having the second conductivity type semiconductor.

5,596,593

ORTHOGONAL RFDC TRANSVERSE EXCITED GAS LASER

Katherine D. Crothall, Gladwyne, Pa.; Edward S. Schieferstein, Everett, and Steven E. Wojcik, Lynnwood, both of Wash., assignors to Luxar Corporation, Bothell, Wash.

Filed Feb. 9, 1996, Ser. No. 598,899
Int. Cl.[6] H01S *3/097*
U.S. Cl. 372—87 **28 Claims**



1. A gas laser comprising:

a housing including a discharge region fixat contains a lasing gas medium;

a pair of DC electrodes having primary surfaces facing toward the discharge region, the primary surfaces being arranged in substantially parallel planes;

a pair of RF electrodes having secondary surfaces facing toward the discharge region, the secondary surfaces being in substantially parallel planes with the secondary surfaces being arranged substantially orthogonal to the primary surfaces;

an RF power source connected between said pair of RF electrodes and selectively generating an RF discharge in the discharge region; and

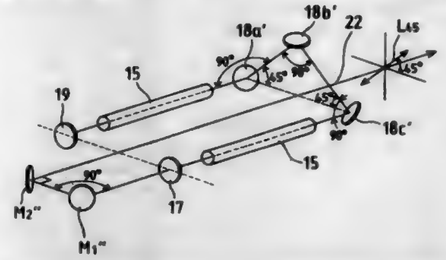
a DC power source connected between said pair of DC electrodes and selectively generating a DC discharge in the discharge region, wherein at least one of the primary surfaces of the DC electrodes is shaped differently than the secondary surfaces of the RF electrodes to maximize the DC discharge without affecting the RF discharge.

5,596,594

LASER OSCILLATOR

Akira Egawa, Oshino-mura, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP95/00050, § 371 Date Aug. 30, 1995, § 102(e) Date Aug. 30, 1995, PCT Pub. No. WO95/20255, PCT Pub. Date Jul. 27, 1995
PCT Filed Jan. 18, 1995, Ser. No. 505,361
Claims priority, application Japan, Jan. 20, 1994, 6-19927
Int. Cl.[6] H01S *3/081*
U.S. Cl. 372—93 **4 Claims**



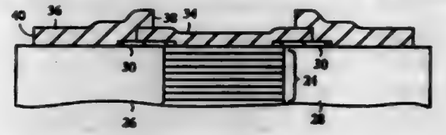
1. A laser oscillator comprising a laser resonator, and at least one set of additional reflecting mirrors for reflecting and bending a laser beam output from the laser resonator, the laser beam emitted from an output mirror of the laser resonator being outputted from the laser oscillator after being propagated for a predetermined light path length, wherein said at least one set of additional reflecting mirrors is arranged inclining at 22.5 degrees with respect to a horizontal plane.

5,596,595

CURRENT AND HEAT SPREADING TRANSPARENT LAYERS FOR SURFACE-EMITTING LASERS

Michael R. T. Tan, Menlo Park; Yu-Min Houng, Cupertino, and Shih-Yuan Wang, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 8, 1995, Ser. No. 486,008
Int. Cl.[6] H01S *3/08;3/04;3/18*
U.S. Cl. 372—96 **19 Claims**



1. A surface-emitting laser comprising:

an optical cavity having an active layer in which light energy is generated at a substantially fixed wavelength in response to electrical current flow;

a first plurality of layers having alternating indices of refraction, said first plurality of layers being on a first side of said optical cavity;

a second plurality of layers having alternating indices of refraction, said second plurality of layer being on a second side of said optical cavity opposite to said first side;

a first electrode on a side of said first plurality of layers opposite to said optical cavity, said first electrode having an opening for passage of said light energy;

a second electrode on a side of said second plurality of layers opposite to said optical cavity;

a heat-conducting layer formed in said opening of said first electrode, said heat-conducting layer having a lateral extent that is greater than a lateral extent of said opening in said first electrode, said heat-conducting layer extending over said first electrode and contacting at most a portion of a surface of said first electrode, thereby leaving a portion of said surface exposed; and

an electrically conductive heat-spreading layer having a lateral extent that exceeds a lateral extent of said first electrode, said heat-spreading layer overlapping both said exposed surface of said first electrode and a portion of a surface of said heat-conducting layer, thereby being in electrical contact with said first electrode and in thermal contact with said heat-conducting layer;

wherein said first plurality of layers and said heat-conducting layer have optical properties to permit transmission of said light energy through said opening of said first electrode.

5,596,596

NARROW BAND EXCIMER LASER

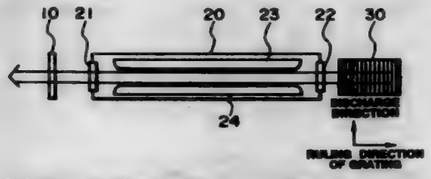
Osamu Wakabayashi; Masahiko Kowaka, and Yukio Kobayashi, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Continuation of Ser. No. 164,613, Dec. 8, 1993, abandoned, which is a continuation of Ser. No. 775,998, Nov. 14, 1991, abandoned. This application Dec. 15, 1995, Ser. No. 573,593

Claims priority, application Japan, May 18, 1989, 1-124898

Int. Cl.[6] H01S 3/08

U.S. Cl. 372—102 **7 Claims**



1. A narrow-band excimer laser comprising:

a laser chamber within which a laser gas is filled and a pair of elongated first and second electrodes for discharging and exciting the laser gas are disposed in parallel with each other and along a longitudinal direction of the laser chamber,

a front mirror disposed in front of the laser chamber, for reflecting a part of a laser beam output from the laser chamber in a forward direction and transmitting the rest of the laser beam; and

a grating disposed behind the laser chamber in a direction having a predetermined angle with respect to a laser beam output from the laser chamber in backward direction and having a plurality of grooves formed on a surface thereof in a predetermined direction, for selectively reflecting in a direction toward the laser chamber a laser beam having a desired wavelength of the laser beam output from the laser chamber in a backward direction,

wherein the grating is disposed so that the grooves thereof are directed in a direction substantially parallel with a plane containing the discharge direction by the first and second electrodes and said longitudinal direction.

5,596,597

LASER OSCILLATOR WITH STABILIZED POINTING

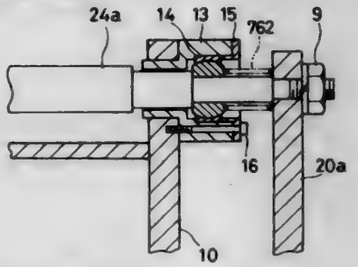
Satoshi Nishida, and Akihiro Otani, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1995, Ser. No. 432,946

Claims priority, application Japan, May 16, 1994, 6-101372

Int. Cl.[6] H01S 3/08

U.S. Cl. 372—107 **7 Claims**



1. A laser oscillator comprising:

a casing sealingly containing a laser medium gas;

a plurality of supporting rods disposed in a longitudinal direction of the casing;

a plurality of supporting members respectively fitted around longitudinal ends of the supporting rods, each supporting member including a pair of spherical bearings respectively fitted around the longitudinal ends of the supporting member and a means for mechanically determining positional relationship of one the bearings and the supporting rod, the mechanically determining means having an elastic member pressing the spherical bearing to a shoulder of the supporting rod;

a pair of base plates supported on the casing via the supporting members in a facing manner to each other; and

laser beam reflecting means including a plurality of laser reflector disposed on the base plates.

5,596,598

ELECTRIC MELTING DEVICE

Gerard Delahalle, Conflans Sainte-Honorine; Stephane Maugendre, St.-Leu D'Esserent; Thierry Caillaud, Margny-les-Compiegnes; Pierre Peigne, Franconville, and Francois Szalata, Rantigny, all of France, assignors to Isover Saint Gobain, Courbevoie, France

PCT No. PCT/FR94/01124, § 371 Date Jul. 26, 1995, § 102(e) Date Jul. 26, 1995, PCT Pub. No. WO95/09518, PCT Pub. Date Apr. 6, 1995

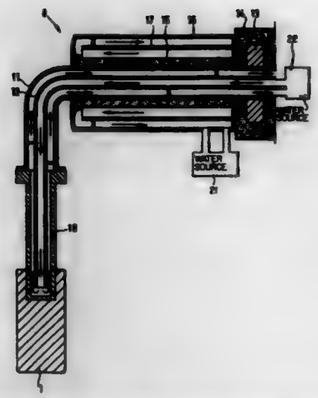
PCT Filed Sep. 27, 1994, Ser. No. 424,526

Claims priority, application France, Sep. 30, 1993, 93 11679

Int. Cl.[6] H05B 7/06

U.S. Cl. 373—93 **11 Claims**

1. A support for a melting electrode, said support comprising a power lead system for providing a current to said electrode and a cooling device, wherein a surface of said support is provided with thermal protection and said surface is electrically insulated from said power lead system.



5,596,599

SPREAD SPECTRUM RECEIVING APPARATUS

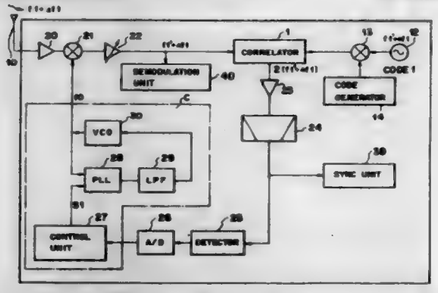
Katsuo Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1993, Ser. No. 156,019

Claims priority, application Japan, Dec. 4, 1992, 4-350834; Jan. 29, 1993, 5-32443

Int. Cl.[6] H04B 1/69

U.S. Cl. 375—200 **21 Claims**



1. A receiving apparatus for receiving a spread spectrum signal, comprising:

converting means for converting a frequency of the spread spectrum signal from a transmission frequency;

first generating means for generating a synchronization signal based on the spread spectrum signal and a reference code for synchronization;

second generating means for generating a de-spreading signal synchronously with the synchronization signal; and

de-spreading means for de-spreading the spread spectrum signal whose frequency is converted by said converting means based on the de-spreading signal,

wherein said converting means converts the frequency of the spread spectrum signal in accordance with an output of said de-spreading means.

5,596,600

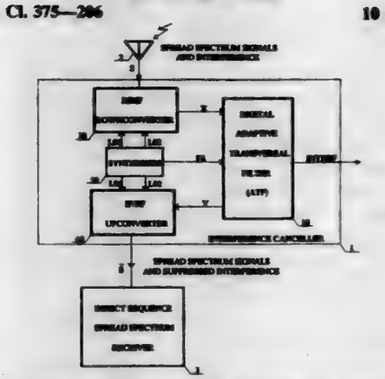
STANDALONE CANCELLER OF NARROW BAND INTERFERENCE FOR SPREAD SPECTRUM RECEIVERS

George Dimos, Cambridge, and Triveni N. Upadhyay, Concord, both of Mass., assignors to Mayflower Communications Company, Inc., Billerica, Mass.

Filed Apr. 6, 1995, Ser. No. 417,619

Int. Cl.[6] H04B 15/00

U.S. Cl. 375—206 **10 Claims**



1. A spread spectrum interference canceller for receiving from an antenna an RF analog input signal comprising (i) multiple direct-sequence spread spectrum signals, and (ii) additive multiple narrowband interferers, and for providing to a spread spectrum receiver an RF analog output signal comprising (i) multiple direct-sequence spread spectrum signals, and (ii) a reduced amount of narrowband interference compared to the interference in the RF analog input signal, said interference canceller comprising

a downconverter, responsive to said RF analog input signal, for translating the carrier frequency of said RF analog input signal from RF to a baseband intermediate frequency, and for amplifying and regulating the amplitude of said RF analog input signal and thereby generating a baseband analog input signal,

a digital adaptive transversal filter, responsive to said baseband analog input signal, for digitizing said baseband analog input signal and thereby generating a baseband digital input signal, for generating a set of digital weight coefficients, for processing said baseband digital input signal through a transversal filter employing said digital weight coefficients to reduce the amount of narrowband interference and thereby generating a baseband digital output signal, and for converting to analog form said baseband digital output signal and thereby generating a baseband analog output signal, and

an upconverter, responsive to said baseband analog output signal, for translating the carrier frequency of said baseband analog output signal from a baseband intermediate frequency to the RF frequency of said RF analog input signal, and thereby generating said RF analog output signal.

5,596,601

METHOD AND APPARATUS FOR SPREAD SPECTRUM CODE PULSE POSITION MODULATION

Israel Bar-David, Haifa, Israel, assignor to Lucent Technologies Inc., Murray Hill, N.J.

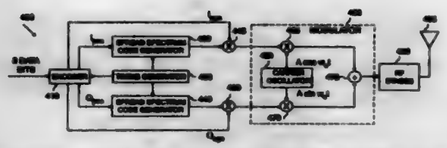
Filed Aug. 30, 1994, Ser. No. 298,260

Int. Cl.[6] H04K 1/00; H03K 7/04

U.S. Cl. 375—207 **20 Claims**

1. An apparatus for transmitting information across a communication channel, said apparatus comprising:

a first spread spectrum code generator for generating a first or second spread spectrum codeword to convey at least one bit of information, said codewords consisting of a plurality of chips transmitted during a symbol duration, said codewords



having a main lobe in one of said chip positions upon matched filtering in a receiver;

said first spread spectrum code generator further comprising a means for modulating the position of said codeword generated by said first spread spectrum code generator relative to the center of said symbol duration to modulate the position of said main lobe in said receiver output to convey one or more additional bits of information;

a first carrier signal source;

a modulator connected to said first spread spectrum code generator and said first carrier signal source, said modulator generating a first carrier signal modulated by said generated codeword having its position modulated relative to the center of said symbol duration; and

means for applying said modulated carrier signal to an input of said communication channel.

5,596,682

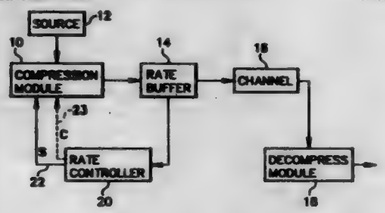
DATA COMPRESSION RATE CONTROL METHOD AND APPARATUS

Douglas W. Conrunshoven, Fairport; Bhavan R. Gandhi, Pittsford, both of N.Y., and Craig M. Smith, Setagaya-ku, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1995, Ser. No. 409,571

Int. Cl.[6] H04B *1/66;14/06*

U.S. Cl. 375—240 **5 Claims**



1. A transmitter for transmitting digital information through a channel at a fixed transmission rate, comprising:

a) compressor means for compressing said digital information, having a plurality of operating configurations, each configuration being characterized by a unique rate distortion function, said compression means being responsive to a configuration selection signal C for operating in a selected one of said configurations and a control signal S for controlling the operating point on said rate distortion function in said selected configuration;

b) a rate buffer means for temporarily storing compressed digital information received from said compressor means; and

c) rate control means responsive to fill conditions of said rate buffer, said control signal S and for generating said configuration selection signal C as a function of both said fill condition and the value of said control signal S such that the average output rate of said compression means is equal to said fixed transmission rate and distortion is minimized.

5,596,683

DEVICE FOR WIRELESS TRANSMISSION OF DIGITAL DATA, IN PARTICULAR OF AUDIO DATA, BY INFRARED LIGHT IN HEADPHONES

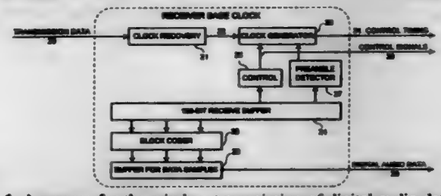
Axel Haupt, Langenhagen, and Karl-Hermann Dellbruegge, Hannover, both of Germany, assignors to Sennheiser electronic KG, Wedemark, Germany

Filed Aug. 22, 1994, Ser. No. 293,972

Claims priority, application Germany, Aug. 23, 1993, 43 28 252.0

Int. Cl.[6] H04B *14/04*

U.S. Cl. 375—242 **13 Claims**



1. A process for the wireless transmission of digital audio data, comprising the steps of:

based on digital stereo sampling values (audio data 3) having a word length of 16 bits in each instance and based on a system clock rate of 256-times the sampling rate (transmitter base clock 1), forming a data frame having a bit length of 128 bits for the transmission data (9, 20, 47), wherein the data frame contains three stereo sampling values (3) at the sampling rates of 48 kHz (A) and 44.1 kHz (B) or two stereo sampling values (3) at the sampling rate of 32 kHz (C) and, instead of the third stereo sampling value (3), contains a filling pattern and coded information about the current sampling rate;

sending the transmission data (9, 20, 47) at a transmission data rate which is obtained from the transmission base clock (1) by integral division;

feeding the transmission data (9, 20, 47) after transmission to a receiver parallel to a decoding device (24, 25, 26) and to a clock pulse recovery (21);

regenerating a clock pulse (22, 45) which is an integral multiple of (N-times) the transmission data rate by the clock pulse recovery (21); and

deriving by integral division the clock pulses required for a channel decoder (block decoder 25) for decoding the data stream of the data frames of 128-bit length, by a receiver base clock (22) and the transmitter base clock (1) which is 256-times the sampling rate.

5,596,684

MULTICARRIER MODULATION TRANSMISSION SYSTEM WITH VARIABLE DELAY

John M. Cioffi, Cupertino; Po Tong, Fremont; James T. Aslanis, Mountain View, and Antoinette H. Gooch, Palo Alto, all of Calif., assignors to Amati Communications Corporation, San Jose, Calif.

Filed Aug. 17, 1993, Ser. No. 107,200

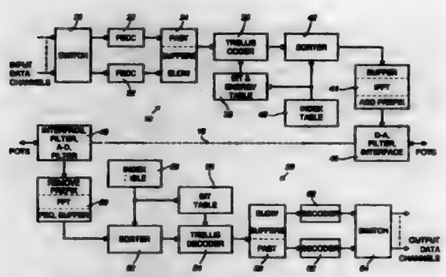
Int. Cl.[6] H04K *1/10*

U.S. Cl. 345—260 **22 Claims**

1. A data transmission system using multicarrier modulation, comprising:

FECC (forward error correction code) coding and codeword interleaving apparatus arranged for differently encoding a plurality of data signals to provide a plurality of encoded data signals with different delays through the coding and interleaving apparatus, the coding and interleaving apparatus comprises a plurality of data paths providing the encoded data signals with different delays, and a switch for switching different data signals to different data paths; and

a modulator arranged to modulate bits of the encoded data signals onto multiple carriers of the transmission system,



different numbers of bits in each transmission symbol period being allocated to different carriers.

5,596,685

RADIO RECEIVER FOR USE IN THE RECEPTION OF DIGITAL MULTIPLEXING SIGNALS

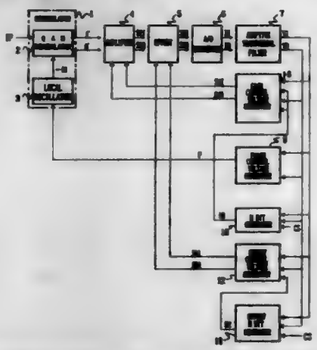
Hiroyuki Kiyanagi; Yuitsu Ogata, both of Sendai; Toshio Tanaura, Kawasaki; Hisao Narita; Takahiko Terakado, both of Sendai, and Kenzo Kobayashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 28, 1995, Ser. No. 408,143

Claims priority, application Japan, Mar. 18, 1994, 6-048712; Dec. 26, 1994, 6-322017

Int. Cl.[6] H04L *27/04;* **H03D** *3/24*

U.S. Cl. 375—326 **12 Claims**



1. A digital multiplexing radio receiver comprising:

first means for generating a carrier frequency signal;

second means for demodulating a received multi-level orthogonal amplitude signal with the carrier frequency signal output from the first means and outputting Ich and Qch demodulated orthogonal signals;

third means operatively connected to the second means for amplifying the Ich and Qch demodulated orthogonal signals and outputting Ich and Qch amplified signals;

fourth means operatively connected to the third means for adaptively equalizing the Ich and Qch amplified signals and outputting Ich and Qch adaptively-equalized data;

fifth means operatively connected to the first means and the fourth means for supplying a first control signal to the first means to make the frequency of the carrier frequency signal the same as that of the received multi-level orthogonal amplitude signal; and

sixth means operatively connected to the third means and the fourth means for generating and outputting a second control signal to the third means to amplify the Ich and Qch demodulated signals to a predetermined level, the second control signal being generated based on the Ich and Qch adaptively-equalized data output from the fourth means, of the multi-level orthogonal amplitude signal existing in a signal point area on a phase plane of Ich and Qch orthogonal coordinates in the case where the Ich and Qch demodulated orthogonal signal is synchronized with the carrier frequency signal, and of the multi-level orthogonal amplitude signal existing in a first specified area other than the signal point area on a phase plane of Ich and Qch orthogonal coordinates in the case where the Ich and Qch demodulated orthogonal signal is not synchronized with the carrier frequency signal.

5,596,686

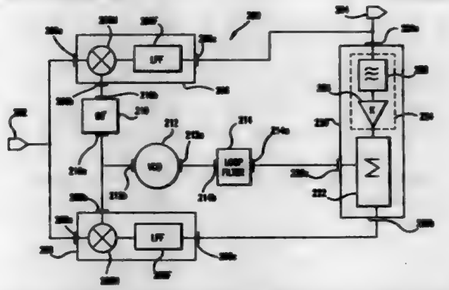
SYNCHRONOUS DETECTOR AND METHODS FOR SYNCHRONOUS DETECTION

Leo Montreuil, Atlanta, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Apr. 5, 1994, Ser. No. 223,223

Int. Cl.[6] H03D *3/24;* **H03C** *3/04*

U.S. Cl. 375—327 **26 Claims**



11. In a synchronous detector having a partial phase-locked loop circuit that incorporates an oscillator and first and second mixers in quadrature relationship therein, a canceler circuit cooperating with the partial phase-locked loop circuit to form a phase-locked loop circuit, the canceler circuit comprising:

a filter coupled to an output of the first mixer, the filter including one of a high pass filter and a bandpass filter; and

a summer coupled to an output of the filter and directly connected to an output of the second mixer, the summer having a summer output coupled to the oscillator of the partial phase-locked loop circuit.

5,596,687

METHOD AND AN ARRANGEMENT OF ESTIMATING TRANSMITTED SYMBOLS AT A RECEIVER IN DIGITAL SIGNAL TRANSMISSION

Lars G. Larsson, Stockholm; Persis B. O. Gudmundson, Sollentuna, and Karim Jamal, Stockholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 23, 1993, Ser. No. 79,886

Claims priority, application Sweden, Jun. 23, 1992, 9201924

Int. Cl.[6] H04L *27/06;* **H03D** *1/00*

U.S. Cl. 375—340 **26 Claims**

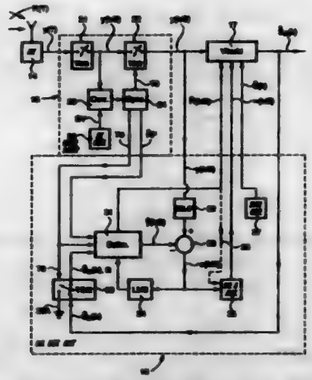
1. In a method of receiving successive digital symbols transmitted over a communication channel that uses a viterbi algorithm having a number of states, a method of estimating transmitted symbols comprising the steps of:

(a) sampling a received signal at a recurrent plurality of time points during each received symbol;

(b) correlating samples generated by step (a) with a predetermined sequence to produce at least an initial estimated impulse response of the communication channel;

(c) designating one of the plurality of time points as a symbol sampling time point based on the correlation performed in step (b);

(d) selecting at least two samples for each received symbol, the selected samples being generated at the symbol sampling point and at least one other time point;



(e) for each symbol, determining a plurality of delta-metric values according to the viterbi algorithm for each transition between states based on the selected samples and the estimated impulse response;

(f) for each symbol, weighting delta-metric values determined by step (e) and generating a combined delta-metric value for each transition between states by combining respective weighted delta-metric values determined by step (e); and

(g) generating at least preliminarily estimated symbols using the combined delta-metric values generated in step (f).

5,596,608

FADING DISTORTION COMPENSATION METHOD AND CIRCUIT

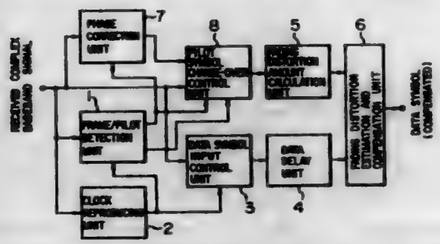
Atsushi Sasaa, and Masaru Adachi, both of Kodaira, Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1994, Ser. No. 240,381

Claims priority, application Japan, May 11, 1993, 5-132707

Int. Cl.[6] H03D *1/04*; H04B *1/10*

U.S. Cl. 375—346 **5 Claims**



3. A fading distortion compensation circuit of a receiver in a digital communication system in which transmission data having a frame format composed of a group of a predetermined number of symbols in which pilot symbols are periodically arranged among a series of data symbols are transmitted in a frame unit and a carrier is reset at each frame, comprising:

phase correction means for correcting phase variation due to said reset of the carrier in respect to a received input signal;

means for selecting the received input signal for a frame in which fading distortion is to be compensated and selecting an output signal of said phase correction means for other frames to extract a pilot symbol from said selected input signal; and

fading distortion compensation means for compensating fading distortion of data symbols from said extracted pilot symbol and data symbols contained in the received input signal.

5,596,609

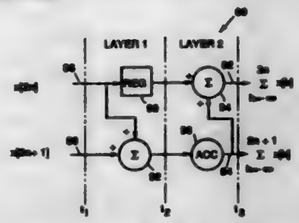
PARALLEL CASCADED INTEGRATOR-COMB FILTER

Thad J. Genrich, Aurora; Richard M. Davis, Littleton, and Bruce A. Martinez, Denver, all of Colo., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 322,665, Oct. 13, 1994, abandoned. This application Jun. 25, 1996, Ser. No. 670,109

Int. Cl.[6] H04B *1/10*

U.S. Cl. 375—350 **14 Claims**



1. A cascadeable integrator for use in a digital filter which receives a series of data words each represented by a plurality of parallel data bits, the integrator for processing a predetermined number of the series of data words in parallel during each of a plurality of clock cycles, the integrator comprising:

a first layer, including at least one summing element and at least one delay element, for receiving the predetermined number of data words in parallel and generating a first sequence of parallel output data words in response thereto, the first sequence of parallel output data words being available to at least one subsequent layer; and

at least one subsequent layer including at least one accumulator and at least one summing element, the at least one subsequent layer being connected to the first layer for generating a second sequence of parallel output data words, wherein each of the first sequence parallel output data words represents an integration of a unique sequence of previously received input data words so as to allow cascading of the integrator with subsequent parallel data word integrators.

5,596,610

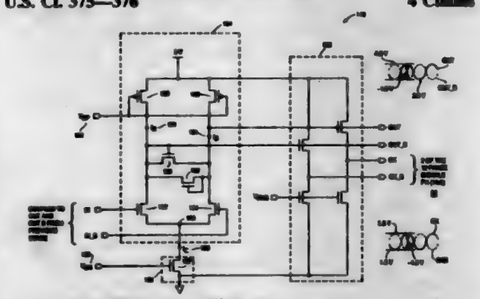
DELAY STAGE CIRCUITRY FOR A RING OSCILLATOR

Wingyu Leung, Cupertino, and Mark A. Horowitz, Mountain View, both of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Continuation of Ser. No. 161,769, Dec. 2, 1993, abandoned, which is a division of Ser. No. 890,034, May 28, 1992, abandoned. This application Dec. 1, 1994, Ser. No. 347,844

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **4 Claims**



1. A ring oscillator comprising:

an even-numbered plurality of ring coupled delay stages, each delay stage comprising:

(A) a differential amplifier for generating a first output signal at a first node and a second output signal complementary to the first output signal at a second node, wherein the differential amplifier further comprises:

(i) a first metal oxide semiconductor field effect transistor (MOSFET) of a first type coupled between the first node and a first potential source;

(ii) a second MOSFET of the first type coupled between the second node and the first potential source, wherein the first and second MOSFETs of the first type are biased by an output level biasing voltage;

(iii) a first MOSFET of a second type coupled to the first node and a third node, wherein the first MOSFET of the second type receives a first input signal;

(iv) a second MOSFET of the second type coupled to the second node and the third node, wherein the second MOSFET of the second type receives a second input signal;

(B) a voltage clamping circuit comprising:

(i) a first diode-coupled MOSFET; and

(ii) a second diode-coupled MOSFET, wherein the first and second diode-coupled MOSFETs are cross-coupled between the first and second nodes to limit a peak-to-peak voltage swing of each of the first and second output signals; and

(C) a current source coupled between the third node and a second potential source, the current source varying a bias current through the current source in accordance with a delay bias voltage.

5,596,611

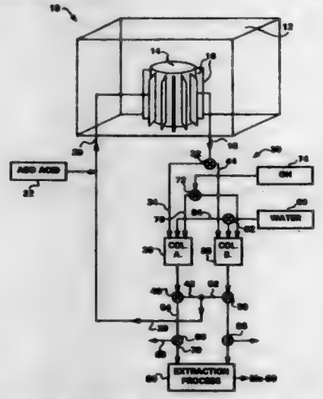
MEDICAL ISOTOPE PRODUCTION REACTOR

Russell M. Ball, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 986,939, Dec. 8, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 339,264

Int. Cl.[6] G21G *1/02*

U.S. Cl. 376—189 **16 Claims**



1. A method of collecting a medical isotope from a fission product produced in a nuclear reactor, the method comprising:

providing a reactor having a 100 to 300 kilowatt rating;

using a uranyl nitrate solution as a homogeneous fissionable material in the reactor, the fissionable material producing fission products including Molybdenum-99 in the uranyl nitrate solution;

passing a portion of the uranyl nitrate solution from the reactor to and through a column of alumina for fixing the fission products including Molybdenum-99 to alumina in the column;

adding acid to the portion of the uranyl nitrate solution to achieve a pH of about 2 to about 5;

passing the portion of the uranyl nitrate solution at pH of about 2 to about 5, back into the reactor;

removing the fixed fission products from the alumina column through elution with a hydroxide; and

precipitating the resulting elutriant with alpha-benzoinoxime for collecting the Molybdenum-99 as the medical isotope.

5,596,612

TESTING ARRANGEMENT FOR MATERIALS TESTING, PARTICULARLY IN A PRESSURIZED-WATER REACTOR

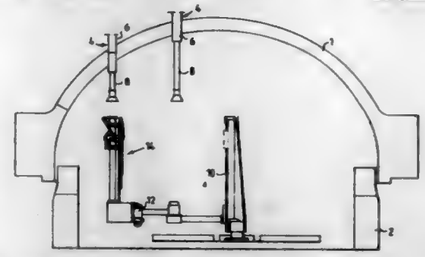
Bjorn H. Andersson, Akersberga, Sweden, assignor to ABB Teknisbka Rontgencentralen AB, Taby, Sweden

Filed May 5, 1994, Ser. No. 238,496

Claims priority, application Sweden, Jun. 16, 1993, 9302087

Int. Cl.[6] G21C *17/00*

U.S. Cl. 376—245 **14 Claims**



1. Testing arrangement (14) for materials testing at a lead-through (4) in a nuclear reactor, said lead-through (4) comprising a first tube (6) welded into an opening in a reactor cap (1) and a second tube (8) inserted in the first tube (6), whereby the first tube (6) and the second tube (8) are sealingly joined at a common upper end and whereby the second tube (8) projects further under the reactor cap (1) than the first tube (6), said testing arrangement comprising a probe-equipped sword (85) arranged for insertion into an annular gap (20) that is present between both the tubes and for scanning a testing area which extends around said gap, whereby a manipulator (10) is arranged to position the testing arrangement opposite to the lead-through (4), the testing arrangement (14) comprising a pinching arrangement (32), which applies a pinching force between a point at the outer surface of the first tube (6) and an opposite point at the outer surface of a projecting part of the second tube (8), in order to widen the gap (20) at the side of the second tube (8) at which the pinching force is applied, a sword guiding arrangement (74) cooperating with the pinching arrangement (32) to guide the sword (85) into the widened part of the gap (20), a first lifting arrangement (24,40,42,44) for bringing the pinching arrangement on a level with the lower part of the outer tube, a second lifting arrangement (82,83,84) for inserting the sword (85) into the gap (20), and a turning arrangement for displacing, in cooperation with the pinching arrangement (32), the widened part of the gap along the inner periphery of the first tube (6) and for displacing in connection therewith the sword in the gap through the testing area, wherein the testing arrangement (14) is attachable to the above mentioned manipulator, and wherein the testing arrangement (14) is dockable at a chosen lead-through (4) by means of the manipulator (10), wherein the lifting arrangements are arranged at the turning arrangement and wherein the pinching arrangement (32) is arranged at the first lifting arrangement (24,40,42,44), and the sword guiding arrangement (74) carrying the sword (85) is arranged at the second lifting arrangement (82,83,84), both lifting arrangements being linearly movable in the axial direction of the tubes.

5,596,613

PRESSURE SUPPRESSION CONTAINMENT SYSTEM FOR BOILING WATER REACTOR

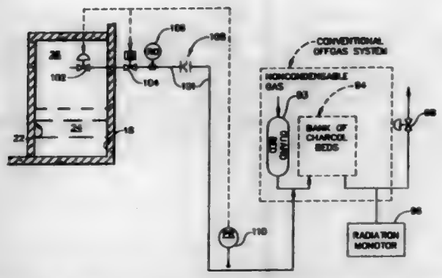
Douglas M. Gluntz, and Loyd B. Neablitt, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 10, 1995, Ser. No. 402,458

Int. Cl.[6] G21C *9/008*

U.S. Cl. 376—283 **12 Claims**

1. In a boiling water reactor comprising a containment vessel, a reactor pressure vessel surrounded by said containment vessel with



a drywell therebetween, a nuclear fuel core arranged inside said reactor pressure vessel, a suppression pool arranged inside said containment vessel and partly filled with water to form a wetwell airspace overlying said water, a condenser pool of water arranged above said drywell, a condenser submerged in said condenser pool, a condenser inlet flow path for coupling steam from said drywell into said condenser, a first condenser outlet flow path for coupling steam and noncondensable gas from said condenser into said suppression pool, a main condenser located outside said containment vessel and connected to receive gas from the reactor pressure vessel after the gas has passed through a turbine located outside said containment vessel, an offgas treatment system for removing radioactive species from gas not condensed by said main condenser (hereinafter "offgas"), a conduit which penetrates a wall of said containment vessel, said conduit having an inlet which communicates with said wetwell airspace and having a rupture disk installed in a portion of said conduit located outside said containment vessel, whereby noncondensable gas is released from said wetwell airspace via said conduit in response to rupture of said rupture disk, the improvement wherein said conduit has an outlet which communicates with an inlet of said offgas treatment system.

5,596,614

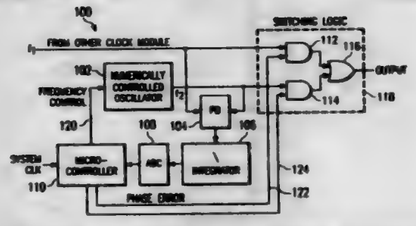
METHOD AND CIRCUITRY FOR ALIGNING THE PHASE OF HIGH-SPEED CLOCKS IN TELECOMMUNICATIONS SYSTEMS

Francesco Lodde, Plano, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Continuation of Ser. No. 115,420, Aug. 31, 1993, abandoned. This application Sep. 13, 1995, Ser. No. 528,424

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **4 Claims**



1. A method for negating a phase difference between clock signals in a high-speed telecommunications system, comprising the steps of:

detecting the phase difference between a first clock signal and at least a second clock signal;

calculating at once, a total time required to shift a frequency of said first clock signal by an amount required to negate said phase difference completely; and

shifting the frequency of said first clock signal in correspondence with said calculated total time.

5,596,615

FUEL ASSEMBLY FOR NUCLEAR REACTOR AND MANUFACTURING METHOD THEREOF

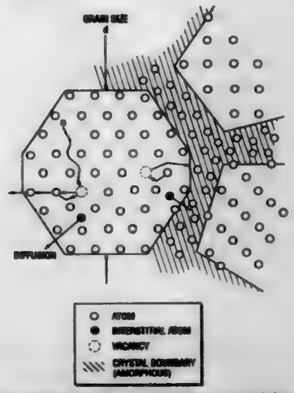
Kiyomi Nakamura; Masahiro Imazaki; Syouko Tsukioshi, all of Hitachi; Hideo Maki, Hitachinaka, and Tsuneyuki Hashimoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 404,041

Claims priority, application Japan, Mar. 18, 1994, 6-048266

Int. Cl.[6] G21C *3/34*

U.S. Cl. 376—438 **32 Claims**



1. A fuel assembly for a nuclear reactor comprising fuel assembly elements, said fuel assembly elements comprising:

a fuel sheath tube;

a spacer tier holding said fuel sheath tube; and

a channel box for containing a plurality of said sheath tubes,

wherein at least one fuel assembly element comprises a Zr-containing matrix alloy, wherein an average crystal grain size of said matrix alloy is in the range of 1000 nm or less.

5,596,616

BURST ADDRESS SEQUENCE GENERATOR FOR ADDRESSING STATIC RANDOM-ACCESS-MEMORY DEVICES

Fuh-Hwang Jeang, Hsinchu Hsien, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan

Filed Feb. 8, 1996, Ser. No. 597,388

Int. Cl.[6] H03K *21/08*

U.S. Cl. 377—56 **7 Claims**

1. A burst address sequence generator for a static random-access-memory device, comprising:

a counter, controlled by a mode signal, the counter including:

a first multiplexer, controlled by an inverse signal of said mode signal, driven by a first clock signal, for outputting a signal which is either an external address signal or a zero value;

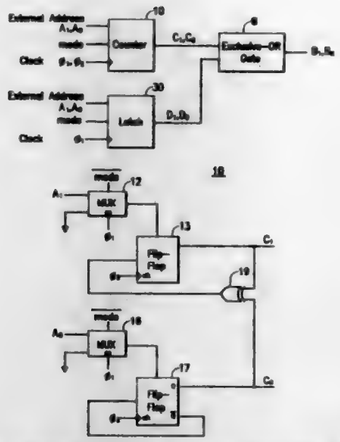
a first flip-flop, preset by the output signal of said first multiplexer, driven by a second clock signal, for outputting a count value;

a second multiplexer, controlled by said inverse signal of said mode signal, driven by said first clock signal, for outputting a signal which is either the external address signal or a zero value;

a second flip-flop, preset by the output signal of said second multiplexer, driven by said second clock signal, for outputting a count value, an inverse output end of the second flip-flop being connected to an input end thereof, and

a counter exclusive-OR gate, receiving said count values of said first flip-flop and said second flip-flop for providing an output to the input end of said first flip-flop;

a latch, controlled by said mode signal, the latch including



a third multiplexer, controlled by said mode signal, outputting a signal selected from said external address signal and a zero value;

a third flip-flop, receiving the output signal of said third multiplexer, driven by an inverse signal of said first clock signal, for generating a pre-address signal;

a fourth multiplexer, controlled by said mode signal, outputting a signal selected from said external address signal and a zero value; and

a fourth flip-flop, receiving the output signal of said fourth multiplexer, driven by said inverse signal of said first clock signal, for generating a pre-address signal;

and

a generator exclusive-OR gate, receiving said count values and said pre-address signals, for generating a burst address sequence.

5,596,617

FEEDBACK SHIFT REGISTER FOR GENERATING DIGITAL SIGNALS REPRESENTING SERIES OF PSEUDO-RANDOM NUMBERS

Andreas Wolf, and Hans W. Ahrweiler, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

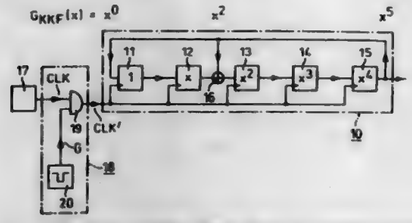
PCT No. PCT/DE94/00091, § 371 Date Sep. 12, 1995, § 102(e) Date Sep. 12, 1995, PCT Pub. No. WO94/17591, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 26, 1994, Ser. No. 495,493

Claims priority, application Germany, Jan. 27, 1993, 43 02 830.6

Int. Cl.[6] H03K *3/84*

U.S. Cl. 377—73 **6 Claims**



1. A circuit for generating digital signals representing pseudo-random sequences comprising:

a feedback shift register including n-stages and exclusive OR-circuits in the feedback logic;

a clock-pulse generator; and

a controllable gate circuit linking said clock pulse generator and said feedback shift register and blocking one clock pulse of every 2^n clock pulses of the clock-pulse generator.

5,596,618

EXPOSURE APPARATUS AND DEVICE MANUFACTURING METHOD USING THE SAME

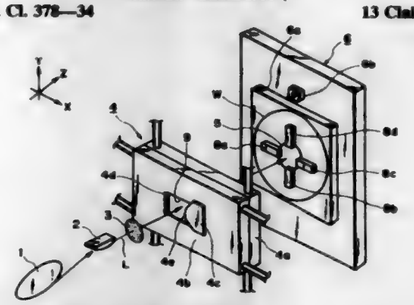
Nobuaki Oguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 300,121, Sep. 2, 1994, abandoned. This application Jul. 28, 1995, Ser. No. 508,787

Claims priority, application Japan, Sep. 6, 1993, 5-245935; Jul. 6, 1994, 6-177448

Int. Cl.[6] G21K *5/00*

U.S. Cl. 378—34 **13 Claims**



1. An exposure apparatus, comprising:

a holder for holding a substrate to be exposed; and

a movable shutter movable across a path of exposure light, having an intensity distribution in a predetermined direction, and in a direction intersecting the predetermined direction;

wherein said movable shutter has an edge with a protruded portion being protruded in the movement direction and having a shape and size determined on the bases of the intensity distribution of the exposure light.

5,596,619

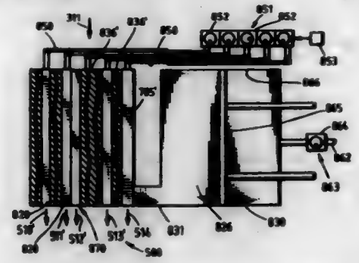
METHOD AND APPARATUS FOR CONFORMAL RADIATION THERAPY

Mark P. Carol, Milford, N.Y., assignor to Nomos Corporation, Sewickley, Pa.

Continuation-in-part of Ser. No. 933,409, Aug. 21, 1992, abandoned. This application May 17, 1994, Ser. No. 245,626

Int. Cl.[6] A61N *5/10*

U.S. Cl. 378—65 **37 Claims**



1. A method of conformal radiation therapy, with a radiation beam having a predetermined, constant beam intensity for treatment of a volume of tissue in a patient, the volume of tissue containing a tumor to be treated, the tumor having a total tumor volume and a varying thickness, comprising the steps of:

(a) directing the radiation treatment beam toward the volume of tissue;

(b) separating the radiation treatment beam into a plurality of radiation beam segments, with at least one beam segment being disposed contiguous to at least three adjacent beam segments; and

(c) independently modulating the beam intensity of the plurality of radiation beam segments to spatially modulate the beam intensity of the radiation treatment beam across the volume of tissue, to treat the tumor with the plurality of radiation beam segments, each radiation beam segment having a beam intensity related to the thickness of the portion of the tumor through which each radiation beam segment passes.

5,596,620

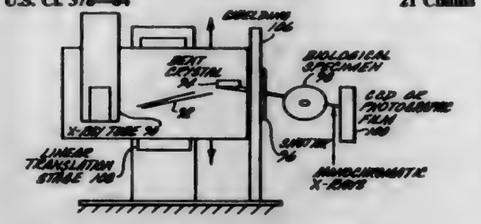
X-RAY BASED EXTENSOMETRY DEVICE FOR RADIOGRAPHY

Howard A. Canistraro, West Hartford; Eric H. Jordan, Storrs, and Douglas M. Pease, South Windsor, all of Conn., assignors to The University of Connecticut, Storrs, Conn.

Continuation-in-part of Ser. No. 56,307, Apr. 30, 1993, Pat. No. 5,398,273. This application Jan. 27, 1995, Ser. No. 379,309

Int. Cl.[6] H05G *1/64*

U.S. Cl. 378—84 **21 Claims**



1. A radiographic imaging device comprising:

a) an x-ray source and a natural diffractive constructive x-ray interference arrangement for focusing x-rays emitted from said x-ray source into an intense monochromatic image, said x-ray source and said natural diffractive constructive x-ray interference arrangement being mounted upon a common base which provides a fixed distance and orientation from source-to-interference arrangement;

b) a detector for detecting x-ray monochromatic radiation from said x-ray source and said natural diffractive constructive x-ray interference arrangement subsequent to said radiation passing through a specimen.

5,596,621

HIGH-VOLTAGE PLUG FOR AN X-RAY TUBE

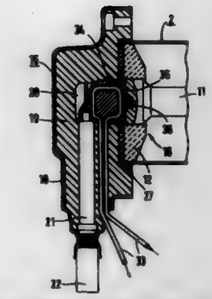
Reinmund Schwarz, Forchheim, and Thomas Weller, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 31, 1995, Ser. No. 521,911

Claims priority, application Germany, Sep. 9, 1994, 44 32 205.4

Int. Cl.[6] H01J *35/10*

U.S. Cl. 378—130 **8 Claims**



1. An X-ray tube system, comprising:

an X-ray tube having a high-voltage terminal provided at a vacuum housing of the X-ray tube;

a high-voltage plug for plugging onto said high-voltage terminal, said high-voltage plug containing a cooling channel for a coolant;

said high-voltage plug having an engagement surface provided for interaction with a corresponding surface of said high-voltage terminal of said X-ray tube;

said high-voltage plug having a contact part formed of an electrically conductive material and containing as said engagement surface a contact surface provided for interaction with said high-voltage terminal corresponding surface; and

said X-ray tube having a rotating anode, and said high-voltage terminal corresponding surface interacting with said high-voltage plug being in thermally conductive connection with a bearing of said rotating anode.

5,596,622

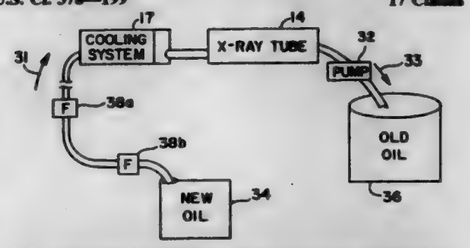
METHOD AND SYSTEM FOR EXTENDING THE SERVICE LIFE OF AN X-RAY TUBE

Eduardo Peralta, Freeport, N.Y., and David V. Habif, Jr., 24 Grandview Terr., Tenafly, N.J. 07670, assignors to David V. Habif, Jr., Tenafly, N.J.

Continuation-in-part of Ser. No. 90,703, Jul. 13, 1993, Pat. No. 5,440,608. This application Aug. 4, 1995, Ser. No. 511,414

Int. Cl.[6] H01J *35/10*

U.S. Cl. 378—199 **17 Claims**



1. In a radiographic apparatus having an x-ray tube coupled to a cooling system and the cooling system circulates an existing fluid through a closed circulation system which includes the x-ray tube, a method for extending the service life of the x-ray tube without removing the x-ray tube comprising the steps of:

a) determining, based on predetermined criteria, that the existing fluid has degraded below a predetermined tolerance;

b) opening the closed circulation system to gain access to the existing fluid;

c) filtering the existing fluid by way of the opening in step b); and

d) closing the circulation system.

5,596,623

TESTING AND COMPLAINT ACCEPTING COMMUNICATION UNIT

Makoto Uchiba, and Yuji Kuroki, both of Fukuoka, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

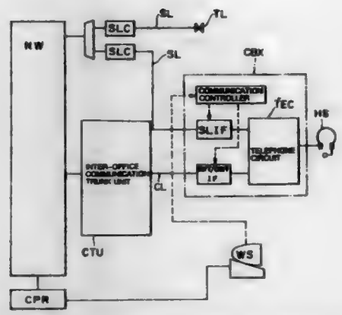
Filed Nov. 1, 1994, Ser. No. 333,065

Claims priority, application Japan, May 16, 1994, 6-101131

Int. Cl.[6] H04M *1/29;3/08;* H04J *1/16;3/14*

U.S. Cl. 379—15 **7 Claims**

1. A communication box which is connected with a workstation which can communicate with a call processor for controlling a digital switch module, comprising:



subscriber line interface means connected with a subscriber line from a subscriber line circuit for transmitting/receiving speech signals to/from another telephone connected with one exchange;

inter-office interface means connected with an inter-office communication line from an inter-office communication trunk unit for transmitting/receiving speech signals to/from another exchange; and

a telephone circuit for connecting a head set for talking;

wherein said communication box allows to select a line of one of said subscriber line interface means and said inter-office interface means to call and communicate with said subscriber line interface means or said inter-office interface means under control from said workstation and to communicate or to test a speech condition defined by monitoring test signals at said head set.

5,596,624

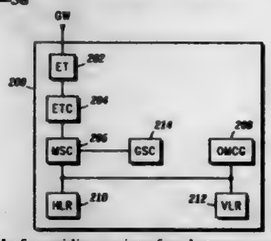
METHOD AND APPARATUS FOR PROVIDING INCREASED ACCESS TO A LOCAL COMMUNICATION NETWORK

Peter J. Armbruster, and James W. Bishop, Jr., both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 26, 1994, Ser. No. 312,364

Int. Cl.[6] H04Q *7/38;7/24*

U.S. Cl. 379—58 **18 Claims**



1. A method of providing an interface between a communication system and a local exchange, said interface including a mobile exchange unit (MXU), said method comprising the steps of:

(a) translating a called number to identify a user associated with said local exchange;

(b) requesting routing information to a destination gateway (DGW), said DGW being associated with said MXU;

(c) choosing by said DGW, an identifier for said called number, said identifier identifying a radio channel coupling said MXU with said communication system;

(d) signaling said MXU by identifying said user associated with said local exchange;

(e) assigning said radio channel; and

(f) establishing a connection to said local exchange using said called number,

wherein step (a) further comprises the steps of:

(a1) translating said called number at an originating gateway mobile switching center (OGMSC) to arrive at an initial address message (IAM), said IAM identifying said called number as said user associated with said DGW;

(a2) translating said called number by said OGMSC to yield a first point code which identifies said DGW;

(a3) sending said IAM to a mobile switching center (MSC) associated with said DGW;

(a4) identifying by said MSC said called number as being associated with said local exchange by using said IAM; and

(a5) translating said called number by said MSC to yield a second point code which identifies an earth terminal controller (ETC) associated with said local exchange.

5,596,625

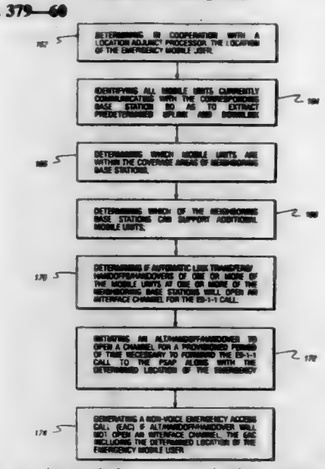
METHOD FOR ROUTING EMERGENCY CALLS DURING BUSY INTERFACE CHANNEL CONDITIONS

Frederick W. LeBlanc, Arvada, Colo., assignor to U S West Technologies, Inc., Boulder, Colo.

Filed Sep. 28, 1994, Ser. No. 314,180

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 379—60 **3 Claims**



1. For use in a wireless communication system including a plurality of base stations each operative to communicate with corresponding mobile units within its coverage area over air interface channels, the method of routing an E9-1-1 call from a mobile emergency user to a public safety answering point (PSAP) where all interface channels of the corresponding base station are busy, the method comprising:

for each of the base stations, determining in cooperation with a receiver, a plurality of RF measurements for the base station, including its link budget, for a predetermined plurality of arc segment regions;

for each of the base stations, modeling its determined RF measurements as a scaled contour shape having minimum and maximum boundaries which is capable of being projected on a graphical information system (GIS) ;

determining RF measurements from neighboring base stations;

determining where the corresponding contours of the RF measurements from neighboring base stations intersect so as to define a bounding polygon area that describes the location of the mobile emergency user in terms of a minimum and maximum error estimate;

identifying all mobile units currently communicating with the corresponding base station of the mobile emergency user and extracting predetermined uplink and downlink RF measurements for each unit;

by reference to the uplink and downlink RF measurements, determining which mobile units are also within the coverage areas of neighboring base stations;

determining which of the neighboring base stations can support additional mobile units;

determining if Automatic Link Transfers (ALTs)/handoffs/handovers of one or more of the identified mobile units at one or more of the neighboring base stations will open an interface channel for the E9-1-1 call;

if one or more ALTs/handoffs/handovers will not open an interface channel, generating a non-voice Emergency Alarm Call (EAC) for receipt by the PSAP, the EAC including the determined location of the mobile emergency user;

if one or more ALTs/handoffs will open an interface channel, initiating the ALTs/handoffs/handover and allowing the mobile emergency user to have the opened channel for a provisioned period of time necessary to forward the E9-1-1 call to the PSAP along with its determined location.

5,596,626

CORDLESS TELEPHONE SET WITH A BATTERY AND A BATTERY CHARGER AND HAVING A POWER SUPPLY LINE SETTING UNIT FOR ESTABLISHING A POWER SUPPLY LINE FOR POWER SUPPLY FROM THE BATTERY OR THE BATTERY CHARGER

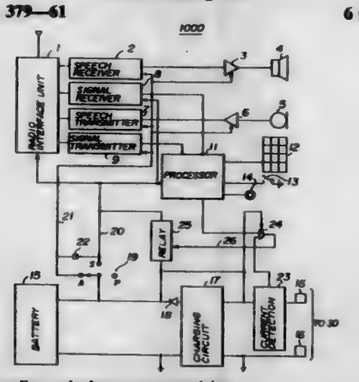
Mikio Nakayama, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawam, Japan

Continuation of Ser. No. 332,458, Oct. 31, 1994, Pat. No. 5,481,593, which is a continuation of Ser. No. 912,315, Jul. 13, 1992, abandoned. This application Oct. 10, 1995, Ser. No. 541,476

Claims priority, application Japan, Jul. 19, 1991, 3-179892

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 379—61 **6 Claims**



4. A cordless telephone set comprising:

communications means for communicating with another telephone set via a transmission medium including radio channels, said communications means comprising a part which detects a call received via the transmission medium and indicates receipt of said call;

a battery generating electricity necessary to operate the cordless telephone set;

stopping means for stopping supplying of electricity from the battery to the communications means;

D.C. signal detection means for detecting a D.C. signal when the battery is coupled to a battery charger and charged thereby;

electricity supply control means for supplying electricity from the battery charger to the communications means when the D.C. signal detection means detects the D.C. signal even if said stopping means stops supplying of electricity from the battery to the communications means,

wherein said electricity supply control means comprises means for continuously supplying the electricity to the communications means even if the communications means detects a call addressed to the cordless telephone set and the D.C. signal detection means cannot detect the D.C. signal.

5,596,627

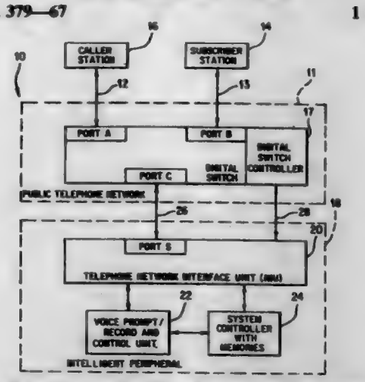
CALL SCREENING METHOD USING SELECTIVE CALL ACCEPTANCE

Merrill Solomon, Washington, D.C.; John Kimball, Germantown, and Dana L. Goldstein, Rockville, both of Md., assignors to The Telephone Connection, Rockville, Md.

Division of Ser. No. 265,865, Jun. 27, 1994, which is a division of Ser. No. 774,963, Oct. 11, 1991, Pat. No. 5,361,295, which is a continuation-in-part of Ser. No. 448,110, Dec. 12, 1989, Pat. No. 5,058,152. This application Jun. 7, 1995, Ser. No. 481,947

Int. Cl.[6] H04M *1/64;1/66;3/42*

U.S. Cl. 379—67 **1 Claim**



1. A call screening method for allowing a subscriber to screen calls made to him/her from callers, the method comprising the steps of:

storing in a telephone company switch an authorization list of telephone numbers of callers for each subscriber which are to be passed directly to the subscriber, callers calling from telephone numbers not on said authorization list being forwarded to a number for said subscriber at a system controller station;

storing data at a system controller station that is received from a plurality of subscribers at a plurality of respective subscriber stations, such data including a telephone number for each subscriber station;

recognizing the telephone number of a caller at said telephone company switch when a caller dials a telephone number of a particular subscriber;

comparing the telephone number of a caller in communication with the telephone company switch with entries in the authorization list for the particular subscriber; and

passing a call directly to the particular subscriber for callers having telephone numbers on the authorization list for the particular subscriber but for callers having telephone numbers not on the authorization list for the particular subscriber the further steps of:

forwarding the call to said system controller station from the switch;

passing a call at said system controller station along with the telephone number of the subscriber from a caller who dials the telephone number of the particular subscriber;

placing a second call to the particular subscriber by dialing the telephone number of the particular subscriber;

playing an introductory message to the caller in communication with said system controller station and prompting the caller to record a message identifying the caller;

if the particular subscriber picks up the second call, playing the calling message so that the particular subscriber may hear the caller's message but the caller does not hear or know that the particular subscriber is hearing the message; and

connecting the caller and the particular subscriber for full two-way communication upon the authorization of the particular subscriber.

5,596,628

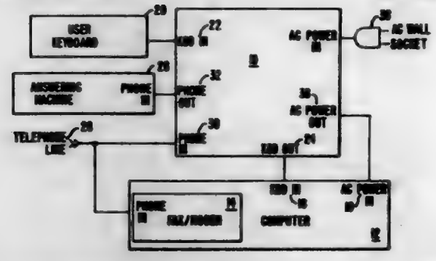
METHOD AND APPARATUS FOR INITIATING LOADING OF SOFTWARE IN A PERSONAL COMPUTER IN RESPONSE TO AN INCOMING SIGNAL

Jon Klein, 562 Military Way, Palo Alto, Calif. 94306

Continuation of Ser. No. 194,171, Feb. 9, 1994, abandoned. This application Apr. 12, 1996, Ser. No. 635,228

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—93 **20 Claims**



1. An apparatus for initiating loading of software in a single computer, the apparatus comprising:

a phone line interface for receiving a first signal over a phone line;

tone detection circuitry coupled to the phone line interface for determining whether the first signal comprises one of a plurality of different specific tone sequences;

control logic coupled to the tone detection circuitry for generating commands when the first signal comprises one of the specific tone sequences;

a power switch coupled to and controlled by the control logic for supplying power to the computer when the first signal comprises one of the specific tone sequences; and

a computer interface coupled to the control logic for transmitting the commands to the computer from the control logic, the commands for initiating loading of software corresponding to a particular one of the specific tone sequences, each of the specific tone sequences having different software corresponding thereto;

wherein the phone line interface is operable to release the phone line after the computer interface initiates loading of the software to prepare for a subsequent incoming call, the subsequent incoming call being related to detection of the first signal.

5,596,629

DATA TRANSMISSION OVER A COMMUNICATION LINE

Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 815,869, Jan. 3, 1992, abandoned, which is a continuation of Ser. No. 487,130, Mar. 2, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 183,985

Claims priority, application Japan, Mar. 7, 1989, 1-52776

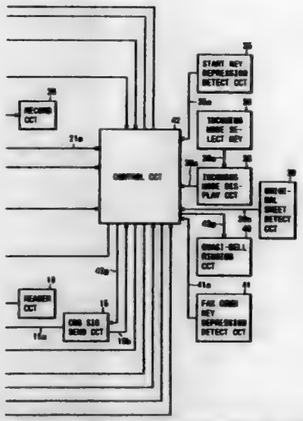
Int. Cl.[6] H04M *1/64;11/08*

U.S. Cl. 379—100 **13 Claims**

9. A method for data transmission through a communication line, comprising the steps taken at one end of the communication line of:

issuing a manual instruction for starting data transmission in an off-hook state of the communication line;

sending to the communication line a standard tone signal indicating a non-voice terminal operating at the one end of the communication line in response to the manual instruction; and



responsive to receipt of an initial recognition signal indicative of a data communication function received from the communication line after the standard tone signal has been sent, performing data transmission in accordance with an automatic procedure.

5,596,630

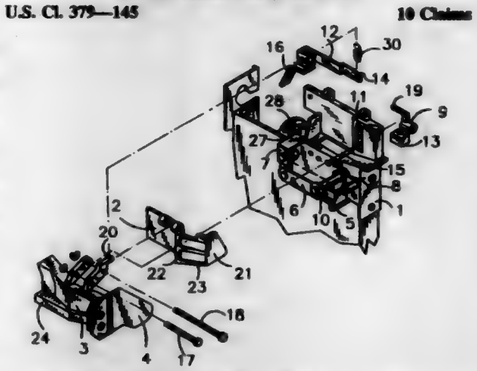
ANTI-STUFFING LEAD-IN-CHUTE ON COIN ACCEPTOR FOR PAYPHONE

Chen-yun Hsu, 141-03 15th Ave., Whitestone, N.Y. 11357

Filed Jan. 6, 1994, Ser. No. 178,028

Int. Cl.[6] H04M *17/00*; G07F *1/04*

U.S. Cl. 379—145 **10 Claims**



1. An anti-stuffing lead-in-chute device for use with a coin acceptor box comprising:

a rigid non-movable plate having an opening on the top of the coin acceptor box;

a rigid movable center plate that is bent in a zigzagged manner and parallel to said rigid non-movable plate;

a rigid movable outside plate that is bent in a zigzagged manner and parallel to said center plate and has a right angled flat with a vertical coin slot;

a first fastening means on the top edge of the outside plate for pivotally fastening the outside plate to the non-movable plate;

a second fastening means on the top edge of the center plate for pivotally fastening the center plate to the outside plate;

a lever connected to the rigid non-movable plate on a side opposite to the center plate by a pin on a first end of the lever such that the lever is rotatable about the pin;

a spring with one end connected to said first fastening means and the other end connected to a second end of the lever;

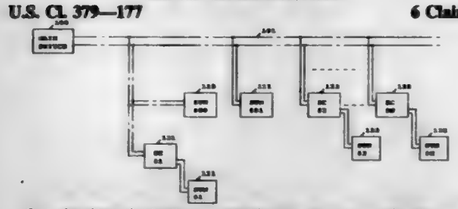
a connecting means for rotating the lever about said pin for facilitating movement of the center plate and the outside plate against the non-movable plate.

5,596,631

STATION CONTROLLER FOR DISTRIBUTED SINGLE LINE PABX

Abraham Y. Chen, 2035 Tripiano Ct., Mountain View, Calif. 94040-3870

Filed Oct. 5, 1994, Ser. No. 317,930
Int. Cl.[6] H04M *1/00;13/00*
U.S. Cl. 379—177 **6 Claims**



1. A distributed telephone switching system connecting between a Main Switch line and one or more station sets, for providing PABX features including auto attendant, call transfer, conferencing, and intercom services to said station sets, comprising:

one or more Station Controllers, each station controller to control one station set, identically designed with,

means to detect and to respond to ringing signals from said Main Switch line;

means to signal said Main Swiech line for service;

means to signal other said station sets via respective said Station Controllers;

means to detect and respond to signals from remote caller via said main swiech line or from other said station sets;

means to assume individualized address identity via subecriber settable ID swiches;

means to provide privacy to parties in communication by detecting said main swiech line in use coodition and consequently denying service request by said station set under said station controller's control;

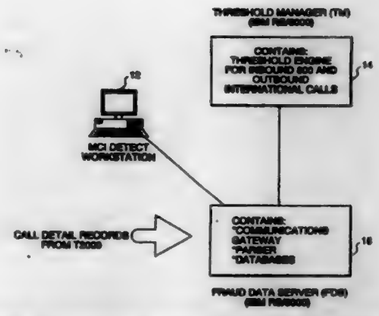
means to allow an additional said station set to generate a special request signal to superimpose on said main switch line to alert said station sets already in communication upon barge-in situations.

5,596,632

MESSAGE-BASED INTERFACE FOR PHONE FRAUD SYSTEM

Terrill J. Curtis; Jens L. Moller, and Matthew L. Galetti, all of Colorado Springs, Colo., assignors to MCI Communications Corporation, Washington, D.C.

Filed Aug. 16, 1995, Ser. No. 515,579
Int. Cl.[6] H04M *17/00*
U.S. Cl. 379—189 **7 Claims**



1. A method for monitoring and detecting network fraud at a plurality of workstations, comprising the steps:

displaying a list of detected alarms at a workstation;

sensing a workstation request for details regarding a displayed alarm;

creating a message packet at the workstation, the packet including header fields that respectively—

a. uniquely identify the occurrence order of the request;

b. identify the alarm for which details are requested;

c. identify the type of request being made;

d. identify the workstation making the request;

transmitting the message packet to a distribution server for checking format validity of the packet;

forwarding a validated packet to a workstation manager for checking the type of request;

routing the packet to an alarm manager that interfaces with a database containing the alarm detailed data being requested;

extracting the alarm identification at the alarm manager from the packet header;

looking up the alarm data, in the database, that corresponds to the alarm identification in the packet header;

creating a response packet at the alarm manager that includes the alarm data retrieved from the database;

sending the response packet to the distribution server;

identifying the workstation, having made the request, to receive the response packet;

routing the response packet to the identified workstation;

extracting the alarm data from the response packet at the workstation; and

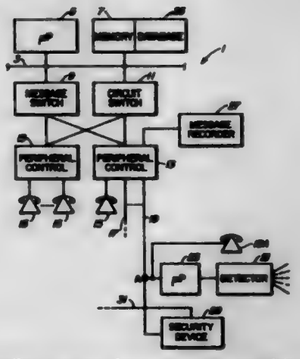
displaying the alarm data at the workstation.

5,596,633

CHARGER/DETECTOR FOR CORDLESS TELEPHONES

Rolf G. Meier, Carp; Michael C. Rehder, Kanata; Peter Bligh, Kanata, and Chris Butler, Kanata, all of Canada, assignors to Mitel Corporation, Ontario, Canada

Filed Oct. 11, 1994, Ser. No. 321,239
Claims priority, application Canada, Oct. 12, 1993, 2108225
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—201 **9 Claims**



1. A subscriber presence detector system comprising:

(a) a switching system for connecting calls to and from a plurality of lines,

(b) a person presence detector connected to a line, for automatically providing an indication to the switching system that a particularly identified person is adjacent or not adjacent said detector,

(c) means for storing said indication at the switching system comprised of an identity of the particular subscriber,

(d) means for enabling a security device by said switching system upon the switching system receiving and storing said indicating that said identified person is adjacent said detector, and

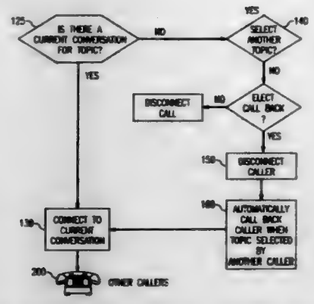
(e) the security device being at least one of an amplified microphone and a video camera disposed adjacent said line, and further including a separate transmission medium for transmission of at least one of sounds and images at a remote location from said at least one of an amplified microphone and video camera of said security to a monitoring location.

5,596,634

TELECOMMUNICATIONS SYSTEM FOR DYNAMICALLY SELECTING CONVERSATION TOPICS HAVING AN AUTOMATIC CALL-BACK FEATURE

Christopher Fernandez, Aurora; Angela R. Just, Downers Grove, both of Ill., and Gregory P. Kochanski, Dunellen, N.J., assignors to AT&T, Holmdel, N.J.

Filed Dec. 13, 1994, Ser. No. 355,384
Int. Cl.[6] H04M *3/42*
U.S. Cl. 379—201 **22 Claims**



21. A telecommunications system for connecting an initial caller to one of a plurality of conversations between other users of the system, each conversation relating to a particular conversation topic, comprising:

(a) voice recognition means for recognizing audio commands from said initial caller to select a desired conversation topic;

(b) memory means comprising a database of available conversation topics;

(c) processing means for searching the database to determine if the desired conversation topic selected by the initial caller is one of the available conversation topics and for determining whether a conversation between other users of the system relating to the desired conversation topic is on-going;

(e) an audio bridge connected to the voice recognition and response means for establishing a communication path between said initial caller and said other users having an on-going conversation relating to the desired conversation topic; and

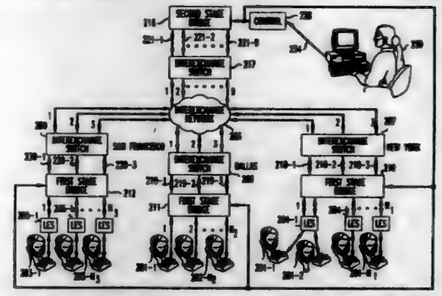
(f) an automatic dialer controlled by said processing means and connected to the audio bridge, wherein, if no current conversation relating to the desired conversation topic is on-going and said initial caller elects to be called back by said system, said automatic dialer automatically returns a call to said initial caller when a second caller selects the desired conversation topic selected by said initial caller and said audio bridge connects said initial caller to said second caller.

5,596,635

MULTI-STAGE TELECONFERENCING SYSTEM

V. R. Gopala Rao, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 30, 1995, Ser. No. 453,295
Int. Cl.[6] H04M *3/56*
U.S. Cl. 379—202 **9 Claims**



1. An arrangement for combining signals transmitted by a plurality of telecommunications devices into a single combined signal and returning the combined signal to each of said telecommunications devices, said telecommunications devices being in a plurality of groups of telecommunications devices associated with different geographic areas, the arrangement comprising:

a plurality of first bridging means, each of said first bridging means being associated with one of said groups of said telecommunications devices, each of said first bridging means comprising means for measuring a predetermined signal characteristic from the signals transmitted by the associated group of said telecommunications devices and means for individually outputting onto separate telecommunications circuits a predetermined number of said signals generated by said associated group of said telecommunications devices that have the best predetermined signal characteristic; and

second bridging means connected to each of the separate telecommunications circuits at the output of each of said plurality of first bridging means, said second bridging means comprising means for measuring said predetermined signal characteristic from said predetermined number of signals outputted by each of said first bridging means, means for forming said single combined signal by combining only said predetermined number of signals that have the best predetermined signal characteristic from among the signals outputted on said telecommunications circuits by each of said plurality of first bridging means; and means for outputting said single combined signal onto said telecommunications circuits for transmission to each of said first bridging means:

wherein each of said first bridging means transmits said single combined signal to each of said teleconununications devices.

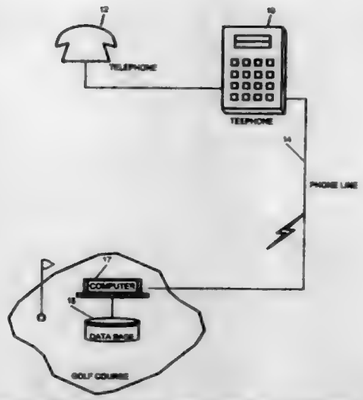
5,596,636

TEE TIME SCHEDULING DEVICE

Peter Davies, 4820 Westgrove, Apt. 2716, Dallas, Tex. 75248, and Larry T. Watson, 3306 Larkin La., Rowlett, Tex. 75088

Filed Apr. 21, 1995, Ser. No. 426,027
Int. Cl.[6] H04M *3/42;11/00;1/00;* G06F *15/00*
U.S. Cl. 379—216 **2 Claims**

1. Apparatus for automating connection to a remote reservation system comprising keypad input means for receiving user-defined reservation information, storage means for storing the reservation information while the apparatus is off line, communication means for transmitting the reservation information to the remote reservation system at a user-selected time and for receiving confirmation information back from the remote reservation system in response to the transmitted reservation information, and display means for



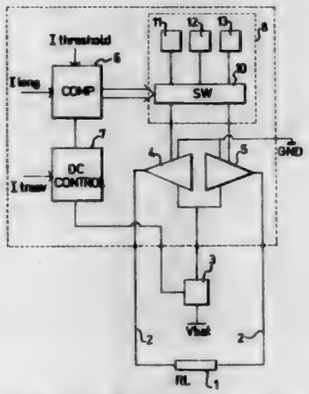
displaying information to the user regarding acceptance of the reservation information.

5,596,637

POWER DISSIPATION MANAGER CIRCUIT FOR AN INTERFACE DEVICE FEEDING A SUBSCRIBER TELEPHONE LINE

Mauro Pasetti; Vanni Saviotti, and Aldo Torazzina, all of Milano, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed May 2, 1994, Ser. No. 236,529
Int. Cl.[6] H04M *19/00*
U.S. Cl. 379—399 **53 Claims**



1. An integrated circuit for connection to an output stage of an interface device supplying a telephone subscriber line and to external power-dissipating components, comprising:

sensor circuits connected to detect longitudinal and transverse currents on the telephone subscriber line, and to provide corresponding outputs;

a comparator circuit connected to compare at least one of said sensor outputs against a threshold value, and thereby to detect when said longitudinal current exceeds a first threshold current;

a reference circuit operatively connected to the output stage of the interface device to provide predetermined and different maximum current values to be supplied to the telephone subscriber line according to the relation between the respective magnitudes of said longitudinal current detected on the telephone subscriber line and of said first threshold current,

said comparator circuit controlling a selection between said maximum current values; and

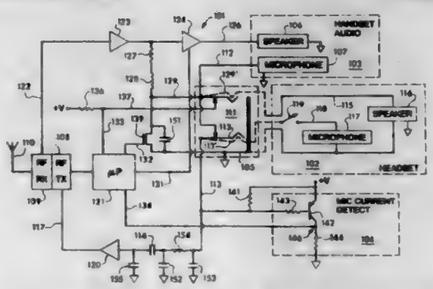
a control circuit coupled to said comparator circuit, and connected to compare at least one of said sensor outputs and to turn off the external power-dissipating components when said detected transverse current exceed a second threshold current.

5,596,638

HEADSET FOR HANDS-FREE WIRELESS TELEPHONE

Graeme S. Paterson, Boulder; Gary L. Bliss, Westminster, and Mark R. Boyd, Boulder, all of Colo., assignors to SpectraLink Corproation, Boulder, Colo.

Division of Ser. No. 97,881, Jul. 27, 1993, Pat. No. 5,557,653. This application Jun. 6, 1995, Ser. No. 475,020
Int. Cl.[6] H04M *1/00; H04B 1/38*
U.S. Cl. 379—430 **8 Claims**



1. A wireless telephone for receiving digitized voice information transmitted at a radio frequency, converting the received digitized voice information into a received audio signal on a speaker audio line, the wireless telephone comprising:

a headset jack for receiving a headset plug, the headset jack having a ground conductor, a movable conductor, and a stationary conductor, wherein the movable conductor is electrically isolated from the stationary conductor when a headset is plugged into the headset jack and the movable conductor is electrically coupled to the stationary conductor when the headset is removed from the headset jack;

means coupled to the stationary conductor for generating a headset detect logic signal on the stationary conductor indicating when the headset plug is plugged into the headset jack; and

a digital logic circuit having an input coupled to the stationary conductor and at least one logic output, the digital logic circuit including means for generating a programmed response to a signal on the input.

5,596,639

CD-PROM

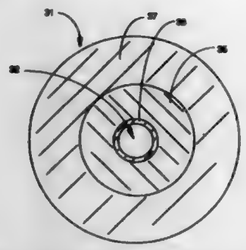
Dan Kikinis, Saratoga, Calif., assignor to Elonex IP Holdings Ltd., London, England

Continuation-in-part of Ser. No. 97,767, Jul. 26, 1993. This application Jan. 30, 1995, Ser. No. 380,049
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—4 **9 Claims**

1. A method for providing digital information to a host computer in a secure fashion on a compact disk read-only memory (CD-ROM), wherein information is recorded in physical structure of a recording track, comprising steps of:

(a) providing the digital information in formatted sectors of a recording region on the CD-ROM; and

(b) programming a password into a programming region on the CD-ROM by damaging the physical structure of the recording track in selected sectors in the programming region, forming thereby a sequence of physically damaged and undamaged



sectors, the sequence providing the password for use in enabling reading of the digital information in the recording region by a host computer;

wherein the password is recorded over an area of the programming region having a digital storage capacity of at least one megabyte of data storage.

5,596,640

DIGITAL IMAGE FORMING APPARATUS WITH DATA CONVERSION

Junichi Ohta, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 261,267
Claims priority, application Japan, Jun. 18, 1993, 5-147820
Int. Cl.[6] H04N *1/44; 1/417*
U.S. Cl. 380—18 **4 Claims**

PASSWORD	PAGE NUMBER	AREA POSITION INFORMATION	LENGTH OF DATA	DATA OF THE FIRST PAGE

PASSWORD	PAGE NUMBER	AREA POSITION INFORMATION	LENGTH OF DATA	DATA OF THE SECOND PAGE

PASSWORD	PAGE NUMBER	AREA POSITION INFORMATION	LENGTH OF DATA	DATA OF THE THIRD PAGE

1. An image forming apparatus comprising:

a document reader;

an image compressing means for compressing image data read by the document reader;

a controller for selectively adding first password data input by an operating board to the compressed image data;

a memory for coding and storing the compressed image data;

an output means for outputting said coded compressed image data;

determining means for determining if the first password data has been added to the output coded compressed image data and for separating the output coded compressed image data into separated password data and separated compressed image data if the first password data has been added to the output coded compressed image data;

compering means for compering a second password input by the operating board with the separated password data; and

restoring means for restoring the separated compressed image data only if the second password coincides with the separated password data; and

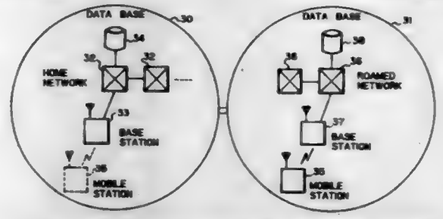
controlling means for controlling so as to combine page information to said compressed image data and to output the compressed image onto a plurality of pages when an amount of an original document information is greater than a predetermined level.

5,596,641

AUTHENTICATION METHOD FOR MOBILE COMMUNICATIONS

Masayoshi Ohashi; Yoshio Takeuchi, both of Saitama; Toshinori Suzuki, Tokyo; Akira Yamaguchi, Tokyo; Seiichiro Sakai, Tokyo, and Toshio Mizuno, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co. Ltd., Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 404,290
Claims priority, application Japan, Mar. 17, 1994, 6-071252; Mar. 17, 1994, 6-071253; Dec. 5, 1994, 6-329214
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—23 **15 Claims**



1. A mobile communication authentication method for authenticating a mobile station which accesses for roaming a network different from a home network of the mobile station, said mobile station and said home network having the same secret key and using the same cipher function, said method comprising the steps of:

preliminarily authenticating said mobile station by sending from said home network to said roamed network, a plurality of pairs of first random numbers and calculation results of the cipher function, said calculation being performed at said home network using said secret key and said first random numbers, sending, from said roamed network to said mobile station, third random numbers formed by coupling second random numbers produced at said roamed network with said first random numbers, sending, from said mobile station to said roamed network, calculation results of the cipher function, said calculation being performed at said mobile station using said secret key and said sent third random numbers, and confirming, at said roamed network, coincidence of the calculation results sent from said mobile station with the calculation results sent from said home network; and

authenticating said mobile station by using a pair of said second random number and of said calculation result with respect to the second random number, sent from said mobile station.

5,596,642

NETWORK SETTLEMENT PERFORMED ON CONSOLIDATED INFORMATION

Terry L. Davis, Scottsdale, Ariz.; James A. Hart, Radnor, Pa.; James F. Russell, Hockessin, Del.; John W. Sears, Peoria, and Philip H. Trice, Phoenix, both of Ariz., assignors to Electronic Payment Services, Inc., Wilmington, Del.

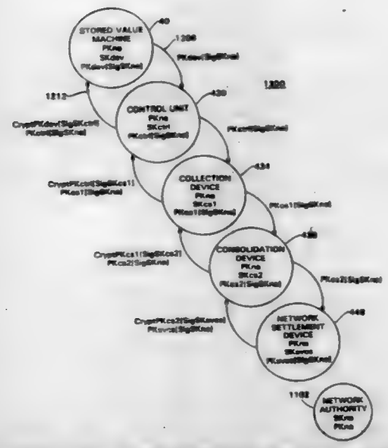
Filed Sep. 30, 1994, Ser. No. 316,662
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—24 **15 Claims**

1. A stored value transaction system comprising:

a first stored value transaction network having:

a first plurality of value transferring devices including a value distributing device for distributing cash-equivalent value to a user and a value collecting device for collecting cash-equivalent value from a user, each value transferring device including a memory for storing value transfer information corresponding to each transfer;

a first network consolidation device for periodically receiving the stored value transfer information from the memory of at least one of the value transferring devices, the first consolidation device including a first memory for storing the received value transfer information, a processor for consolidating the



received value transfer information into first consolidated information, and a second memory for storing the first consolidated information; and

a first network settlement device operatively coupled to the first consolidation device for receiving the first consolidated information from the second memory of the first consolidation device, the first network settlement device including a first memory for storing the received first consolidation information, a processor for performing settlement according to at least a portion of the first consolidated information to produce settlement information, and a second memory for storing the settlement information.

5,596,643

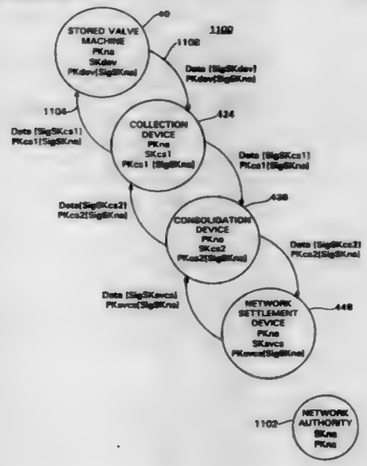
NETWORK SETTLEMENT PERFORMED ON CONSOLIDATED INFORMATION

Terry L. Davis, Scottsdale, Ariz.; James A. Hart, Radnor, Pa.; James F. Russell, Hockessin, Del.; John W. Sears, Peoria, and Philip H. Trice, Phoenix, both of Ariz., assignors to Electronic Payment Services, Inc., Wilmington, Del.

Division of Ser. No. 316,662, Sep. 30, 1994. This application Jan. 3, 1996, Ser. No. 581,012

Int. Cl.[6] H04L *9/00;9/30*

U.S. Cl. 380—24 **3 Claims**



1. A system for determining value in a stored value transaction system having a plurality of value storing transfer devices, comprising:

a first stored value transaction network including a first network consolidation device for receiving stored value information from at least one value storing transfer device of said plurality of value storing transfer devices and summarizing said received stored value information to provide a first consolidated portion of said received stored value information; wherein said value storing transfer devices comprise data encryption devices including an encryption key common to said data encryption devices in said first stored value transaction network; and

a first network settlement device coupled to said first network consolidation device for receiving said first consolidated portion and performing network settlement of said first stored value transaction network in accordance with said first consolidated portion.

5,596,644

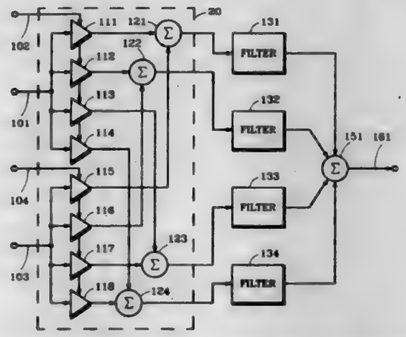
METHOD AND APPARATUS FOR EFFICIENT PRESENTATION OF HIGH-QUALITY THREE-DIMENSIONAL AUDIO

Jonathan S. Abel, Palo Alto, and Scott H. Foster, Groveland, both of Calif., assignors to Aureal Semiconductor Inc., Fremont, Calif.

Filed Oct. 27, 1994, Ser. No. 330,240

Int. Cl.[6] H04S *5/00*

U.S. Cl. 381—17 **50 Claims**



1. A method for providing an acoustic display of aural information conveying apparent location, said method comprising the steps of:

receiving an audio signal representing said aural information and receiving one or more location signals representing apparent location for a source of said aural information,

generating a plurality of filtered signals by applying a plurality of filters to said audio signal, wherein said plurality of filters have impulse responses which are substantially mutually orthogonal, and

for each respective filtered signal, generating a plurality of amplified signals by amplifying said respective filtered signal using a plurality of amplifiers, each of said amplifiers using a respective gain adapted in response to a respective location signal of said one or more location signals,

generating a plurality of output signals, wherein a respective output signal is generated by combining a plurality of said amplified signals.

5,596,645

SOUND IMAGE LOCALIZATION CONTROL DEVICE FOR CONTROLLING SOUND IMAGE LOCALIZATION OF PLURAL SOUNDS INDEPENDENTLY OF EACH OTHER

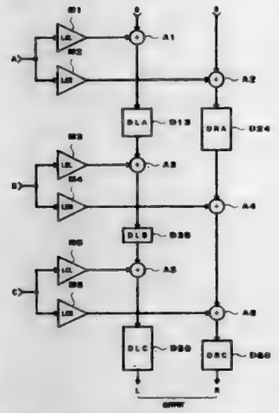
Junichi Fujimori, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 30, 1995, Ser. No. 413,347

Claims priority, application Japan, Mar. 30, 1994, 6-082663

Int. Cl.[6] H04R *5/00*

U.S. Cl. 381—17 **17 Claims**



1. A sound image localization control device for applying independent sound image localization control to each of plural input sound signals on the basis of at least individual amplitude coefficients and delay information for right and left channels that are separately provided for each of said input sound signals,

said sound image localization control device comprising at least two processing systems corresponding to the right and left channels, common said sound signals being distributively input to each of said processing systems,

each of said processing systems comprising:

a series of delay means providing plural delay stages;

coefficient operation means for arithmetically operating each of said input sound signals with said individual amplitude coefficient separately provided therefor; and

input means for additively inputting said sound signals, having been arithmetically operated with said individual amplitude coefficients, to said delay means at respective said delay stages corresponding to said individual delay information, whereby said sound signals input to said respective delay stages are gradually mixed together while being sequentially delayed, so as to ultimately output a single sound signal that is a mixture of said plural sound signals arithmetically operated with said amplitude coefficients.

5,596,646

AUDIO TAPE SATURATION SIMULATOR

James K. Waller, Jr., Lake Orion, and Mark J. Craven, Metamora, both of Mich., assignors to Rockfron Corporation, Rochester Hills, Mich.

Filed Nov. 7, 1994, Ser. No. 335,098

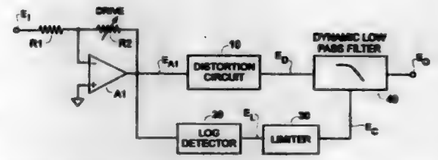
Int. Cl.[6] H03G *3/00;5/00*

U.S. Cl. 381—61 **7 Claims**

1. An audio tape saturation simulator comprising:

means for soft clipping an input audio signal to produce a distorted signal having an increase in distortion as said audio signal increases;

means for dynamically low pass filtering said soft clipped signal to produce an output audio signal;



means for level detecting said input audio signal to produce a DC signal of level increasing as said audio signal increases; and

means for limiting the range of said DC signal to produce a signal for controlling said filtering means whereby a decrease in high frequency bandwidth of said output signal simultaneously accompanies said increase in distortion.

5,596,647

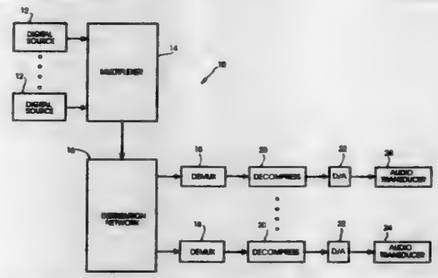
INTEGRATED VIDEO AND AUDIO SIGNAL DISTRIBUTION SYSTEM AND METHOD FOR USE ON COMMERCIAL AIRCRAFT AND OTHER VEHICLES

Bruce M. Wakal, Cypress; John E. Lemmer, Laguna Hills, and William A. Frost, Jr., San Juan Capistrano, all of Calif., assignors to Matsushita Avionics Development Corporation, Irvine, Calif.

Filed Jun. 1, 1993, Ser. No. 71,218

Int. Cl.[6] H04J *3/02*

U.S. Cl. 381—77 **2 Claims**



1. A digital audio distribution system for use on aircraft and other vehicles comprising:

a plurality of digital signal sources for generating a plurality of compressed digital audio signal outputs;

a multiplexer having a plurality of signal input terminals for receiving said compressed digital audio signal outputs, said multiplexer being adapted to time domain multiplex said compressed digital audio signal outputs to produce a single composite data signal;

a demultiplexer adapted to receive said composite data signal and to select a desired channel from said composite data signal;

a decompression circuit adapted to receive said selected channel from said demultiplexer and to decompress said selected channel to produce a decompressed digital output signal; and

a digital-to-analog converter adapted to receive said decompressed digital output signal and to convert said decompressed digital output signal to an analog audio signal; wherein

said composite data signal comprises a plurality of compression blocks having F frames per block, C digital audio channels per frame, and P compression parameters per channel;

said multiplexer is configured to allocate N time slots per frame for said compression parameters, N being an integer equal to or greater than (C×P)/F; and

said multiplexer assigns selected groups comprising N of said compression factors to selected frames within each compression block.

5,596,648

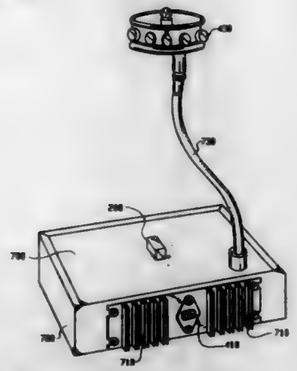
INFRARED AUDIO TRANSMITTER SYSTEM

Lawrence R. Fast, 498 Long Hill Rd., Gillette, N.J. 07933

Continuation of Ser. No. 224,348, Apr. 7, 1994. This application Dec. 29, 1994, Ser. No. 366,951

Int. Cl.[6] H04B *3/00; 10/00; 10/04*

U.S. Cl. 381—77 **20 Claims**



1. An infrared signal transmitter comprising:

a signal generator;

a housing in which said signal generator is housed;

a mount;

a plurality of infrared transmitting elements disposed on said mount and operatively connected to said signal generator for transmitting infrared signals in a multi-directional pattern, said plurality of infrared transmitting elements including

a single front throw emitter for transmitting said infrared signals substantially along a single direction, and a multi-directional emitter for transmitting said infrared signals at least along the rear and sides of said single direction; and

means jointly secured to said mount and said housing for extending said mount substantially above said housing so as to allow said transmitting elements to transmit said infrared signals substantially unobstructed to a user.

5,596,649

SOUND CONCENTRATOR FOR SELECTIVELY COLLECTING SOUND AND CONCENTRATING AND TRANSMITTING THE COLLECTED SOUND

Hong-Chuang Liu, No. 15, Alley 291, Sec. 1, Chien-Kuo S. Rd., Taipei, Taiwan

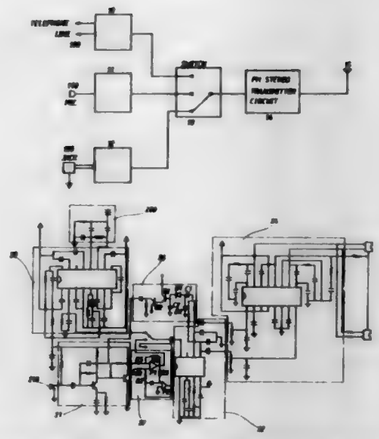
Filed Nov. 22, 1994, Ser. No. 346,276

Int. Cl.[6] H04B *3/00*

U.S. Cl. 381—79 **3 Claims**

1. An improved structure of sound concentrators comprising an emission circuit that contains a telephone signal coupling circuit, a microphone amplification circuit, a signal matching network, a selection switch, a stereo transmitter circuit, and an emission antenna; and a receiving circuit that contains a receiving antenna, a frequency modulation signal receiving circuit, a phase lock loop (PLL) stereo decoder, a microphone pre-amplification circuit, a selection switch, and an amplification circuit;

and characterized in that said emission antenna and said receiving antenna are used to transmit signals between said emission circuit and said receiving circuit; and in that said telephone signal coupling circuit, said microphone amplification circuit, and said signal matching network are in parallel connected to one end of said selection switch of the emission circuit; said stereo transmitter circuit, and said emission antenna are serially connected to the other end;



and in that said selection switch of the receiving circuit, at its one end, is serially connected with the amplification circuit; at the other end, said selection switch is linked with the phase lock loop (PLL) stereo decoder and the microphone pre-amplification circuit; said PLL stereo decoder being serially affixed by the frequency modulation signal receiving circuit and the receiving antenna, and said microphone pre-amplification circuit being in series affixed by the microphone;

and in that an automatic volume control circuit and a treble/bass boosting circuit are arranged between said PLL stereo decoder of the receiving circuit and said microphone pre-amplification circuit.

5,596,650

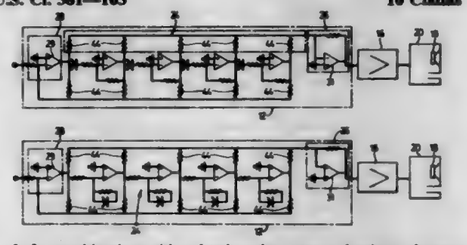
EQUALIZING CIRCUIT FOR A LOUDSPEAKER SYSTEM

Stefan R. Hiibowicki, Scarborough, Canada, assignor to Audio Products International Corp., Scarborough, Canada

Filed Apr. 29, 1994, Ser. No. 234,736

Int. Cl.[6] H03G *5/00*

U.S. Cl. 381—103 **10 Claims**



1. In combination with a loudspeaker system having a known loudspeaker transfer function and a known loudspeaker cutoff frequency, a circuit adapted for generating a desired target response function having a target cutoff frequency below the loudspeaker cutoff frequency, the circuit comprising:

circuit means for generating a circuit transfer function having both a numerator and a denominator, wherein the numerator defines sufficient zeroes to cancel all of the poles of the transfer function of the loudspeaker system and wherein the poles of the target transfer function provide a target cutoff frequency below the loudspeaker cutoff frequency, whereby the desired target response function is obtained by combining the circuit transfer function and the loudspeaker transfer function and the cutoff frequency is lowered from the loudspeaker cutoff frequency to the target cutoff frequency, wherein the transfer function of the loudspeaker system is of order n and defines n poles, wherein the denominator and the numerator of the transfer function of the circuit are both of order m and respectfully define m zeroes and m poles, and wherein n is ≤m, and wherein the circuit comprises an input, an output, an output summing and scaling amplifier connected to the output, a feedback summing and scaling amplifier connected to the input, and a plurality of filter elements connected in series to the output of the feedback amplifier, wherein the output of the feedback amplifier and the outputs of each of the filter elements are connected to inputs of both the output amplifier and the feedback amplifier, said amplifier inputs defining scaling factors for achieving the desired target response function.

5,596,651

SYSTEM AND METHOD FOR ELECTRONIC VOLUME CONTROL OF AUDIO SIGNALS

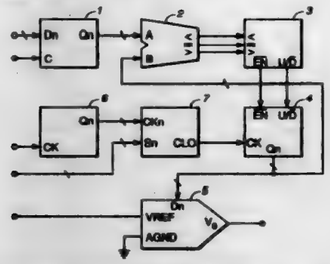
Hisashi Yamaguchi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 25, 1993, Ser. No. 83,791

Claims priority, application Japan, Jun. 25, 1992, 4-167864

Int. Cl.[6] H03G *3/00*

U.S. Cl. 381—104 **7 Claims**



1. An electronic volume control comprising:

a) a volume control register for storing a digital value used for volume control;

b) an N-stage frequency divider, where N is an integer greater than or equal to one, each stage providing an output clock signal which is half the frequency of a previous stage, said frequency divider having an input terminal coupled to a base clock signal;

c) a selector, having a plurality of input terminals coupled to said N-stage frequency divider, that selects one output clock signal of said N-stage frequency divider and provides said selected signal as an output;

d) an up-down counter having an input clock terminal coupled to said output of said selector, and a plurality of output terminals for accessing a count value in said up/down counter;

e) a comparator, coupled to said volume control register and coupled to said up/down counter, for comparing said value in said volume control register with a value in said up/down counter;

f) a control circuit, coupled to said comparator, and coupled to said up/down counter, that enables up counting and down counting by said up/down counter; and

g) a digital/analog converter having a reference voltage terminal to which an audio signal is coupled, and further having a plurality of digital data input terminals coupled to said up/down counter output terminals.

5,596,652

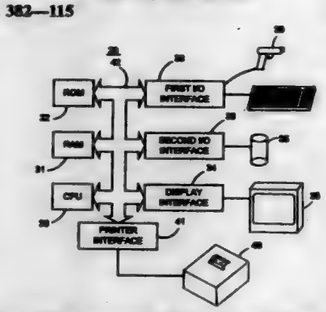
SYSTEM AND METHOD FOR ACCOUNTING FOR PERSONNEL AT A SITE AND SYSTEM AND METHOD FOR PROVIDING PERSONNEL WITH INFORMATION ABOUT AN EMERGENCY SITE

John T. Pistek, Williamsburg; Frederick M. Muller, Traverse City; Brad W. Schmidt, Grawn, and Wayne D. Hanna, Traverse City, all of Mich., assignors to Portable Data Technologies, Inc., Traverse City, Mich.

Filed Mar. 23, 1995, Ser. No. 409,308

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—115 **36 Claims**



1. A method for accounting for personnel at any site using a portable system having a data reading device comprising the sequentially performed steps of:

transporting the portable system to a site;

using the data reading device to read machine-readable data, which is associated with and carried by a person arriving at the site and which includes the person's identification and qualification information, in order to log that person into a computer;

determining the person's qualifications based upon information obtained by reading the person's machine-readable data with the data reading device so that the person arriving at the site can be assigned to a sector in which the person is qualified to work;

assigning the person to a sector of the site based upon the person's qualifications; and

recording in the computer the sector to which the person is assigned.

5,596,653

RADIATION THERAPY TREATMENT PLANNING SYSTEM

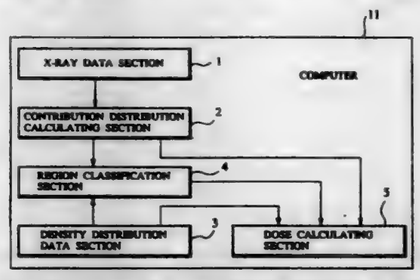
Masaaki Kakehawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 866,285, Apr. 9, 1992, abandoned. This application Jul. 21, 1994, Ser. No. 278,160

Claims priority, application Japan, Apr. 9, 1991, 3-103421

Int. Cl.[6] G06K *9/00*; G06F *15/00*

U.S. Cl. 382—128 **24 Claims**



1. A radiation therapy treatment planning system for calculating dose at a point of concern in a body of a patient irradiated with

X-ray from an X-ray source, in a radiation therapy treatment, comprising a computer;

the computer including:

an X-ray data section for storing X-ray data, including tissue peak dose ratios and field factors, which concern said X-ray from said X-ray source and are obtained in advance by measurement;

a contribution distribution calculating section for calculating, on the basis of said X-ray data stored in said X-ray data section, contribution factors indicating a degree to which respective neighboring points in the body of the patient contribute to the dose at point of concern;

a density distribution data section for storing first electron density data at the respective neighboring points in the body of the patient on whom the radiation therapy treatment is planned, said first electron density data being obtained in advance by measurement;

a region classification section for calculating, on the basis of second electron density data of a plurality of typical patient models in advance, classification data of respective neighboring points in each of the typical patient models depending on the class of the X-ray causing emission of electron beam which gives energy to the point of concern, for storing said classification data, and for selecting said classification data in connection with one of the typical patient models on the basis of the similarity with said first electron density data stored in said density distribution data section; and

a dose calculating section for calculating the dose at the point of concern on the basis of said contribution factors calculated by said contribution distribution calculating section, said first electron density data stored in said density distribution data section, and said classification data of the typical patient model selected in said region classification section.

5,596,654

METHOD OF DETERMINING DESIRED IMAGE SIGNAL RANGE BASED ON HISTOGRAM DATA

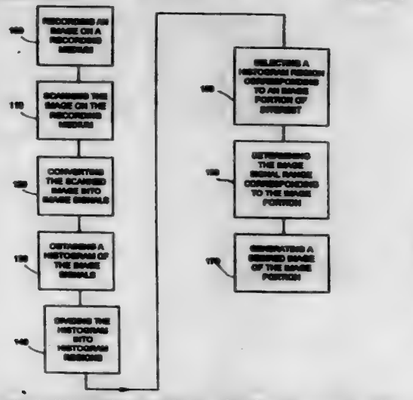
Nobuyuki Tanaka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 60,858, May 13, 1993, abandoned, which is a continuation of Ser. No. 784,744, Oct. 29, 1991, abandoned, which is a continuation of Ser. No. 382,043, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 183,961, Apr. 20, 1988, abandoned. This application Feb. 16, 1994, Ser. No. 197,456

Claims priority, application Japan, Apr. 20, 1987, 62-96716

Int. Cl.[6] G06K 9/36

U.S. Cl. 382—168 **8 Claims**



1. A method of determining an image signal range corresponding to a particular image portion of an image recorded on a recording medium, the image having a plurality of image portions, the method comprising:

scanning and converting said image on said recording medium into image signals;

obtaining a histogram of said image signals for the recorded image;

dividing said histogram into a plurality of histogram regions which each correspond substantially to a different one of said plurality of image portions, by performing said dividing using a predetermined threshold value selecting method employing a discriminant criterion or a reference equivalent thereto;

selecting one histogram region of the plurality of histogram regions which corresponds to the particular image portion of predetermined interest on the basis of information about the image recorded on the recording medium;

determining the image signal range corresponding to the particular image portion based on statistical analysis of the image signal range of the one selected histogram region, wherein said statistical analysis is carried out by obtaining a weighted average and a variance for the image signals in the particular image portion; and

generating a desired image of the particular image portion using the determined image signal range corresponding to the particular image portion;

wherein said image signal range corresponding to the particular image portion has first and second boundaries Smin and Smax, respectively, and said first and second boundaries are determined according to the following equations:

$$Smin=\mu c-p\sigma c^2$$

$$Smax=\mu c-q\sigma c^2$$

where μc is said weighted average, σc² is said variance, and p and q are empirically determined coefficients.

5,596,655

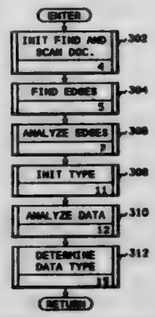
METHOD FOR FINDING AND CLASSIFYING SCANNED INFORMATION

Patricia D. Lopez, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 931,637, Aug. 18, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,359

Int. Cl.[6] G06K 9/46

U.S. Cl. 382—173 **19 Claims**



1. A method for locating graphical information within a scanned image and drawing a bounding rectangle around said information, said method comprising the steps of:

(a) scanning said image into a computer system;

(b) locating left and right edges of information within each row of said image;

(c) locating a top row of said information as a first row of said image having a predetermined number of pixels between left and right edges and defining said top row as a top boundary of said rectangle;

(d) locating a bottom row of said information as a last row of said image having said predetermined number of pixels between left and right edges and defining said bottom row as a bottom boundary of said rectangle;

(e) fitting a first straight line to said left edges and fitting a second straight line to said right edges;

(f) locating a leftmost point of said first straight line and placing a left boundary line of said rectangle at said leftmost point; and

(g) locating a rightmost point of said second straight line and placing a right boundary line of said rectangle at said rightmost point.

5,596,656

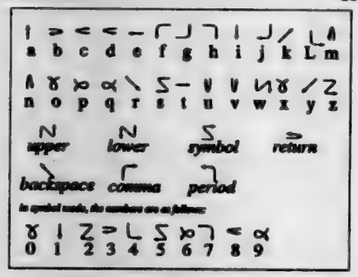
UNISTROKES FOR COMPUTERIZED INTERPRETATION OF HANDWRITING

David Goldberg, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 132,401, Oct. 6, 1993, abandoned. This application Oct. 26, 1995, Ser. No. 548,416

Int. Cl.[6] G06K 9/18

U.S. Cl. 382—186 **16 Claims**



16. A machine implemented handwriting recognition process comprising the steps of

correlating natural language symbols with unistroke symbols, where each of said unistroke symbols is fully defined by a single continuous stroke that conforms geometrically and directionally to a predetermined graphical specification, at least certain of said unistroke symbols being arcuate;

writing user selected unistroke symbols in sequential time order while performing a predetermined, symbol independent delimiting operation for delimiting successive ones of said unistroke symbols from each other, said delimiting operation distinguishing successive unistroke symbols from each other without reference to and totally independently of the spatial relationship of said unistroke symbols with respect to each other;

detecting said selected unistroke symbols; and

translating the detected unistroke symbols that are written into said machine into a corresponding natural language representation.

5,596,657

METHOD OF SORTING OUT CANDIDATE CHARACTERS IN CHARACTER RECOGNITION SYSTEM

Jae G. Choi, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 955,915, Oct. 2, 1992, abandoned. This application May 23, 1995, Ser. No. 447,365

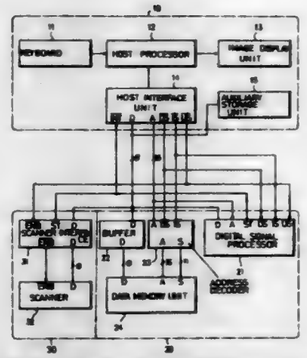
Claims priority, application Rep. of Korea, Oct. 9, 1991, 17699/1991

Int. Cl.[6] G06K 9/68

U.S. Cl. 382—227 **3 Claims**

1. An apparatus for sorting candidate characters in a character recognition system, comprising:

means for extracting X-axis and Y-axis features from an individual character of a classification set of characters, respectively, said extracting means including:



means for forming a box accurately circumscribing a character inputted through a scanner;

means for scanning character pixels in the character circumscribing box from left to right by units of a line to detect white runs and the subsequent black runs of the character and storing the detected values $W_x(i)$, $B_x(i)$ where i is a variable which is incremented by one whenever the black run is detected subsequent to the white run;

means for obtaining white run and black run pair values $WB_x(i)=W_x(i)+B_x(i)$ of the character when the scanning for the character is completed in the X-axis direction by said means for scanning;

means for obtaining, on the basis of the detected white run values, black run values and white/black run pair values an X-axis F(x) characteristic of the character expressed as:

$$F(x)=\frac{\sum_i [W_x(i)][W_x(i)]}{\sum_i WB_x(i)};$$

means for scanning the character pixels in the character circumscribing box from top to bottom by units of a line to obtain a Y-axis characteristic F(y) of the character in the same manner as obtaining the X-axis characteristic F(x) of the character;

means for obtaining the average position vector $F_{ak}(x)$, $F_{ak}(Y)$ and a standard deviation $\Delta_k(X)$, $\Delta_k(Y)$ of the character where a is an average, k is a kth character and Δ is a standard deviation with respect to the above operations; and

means for obtaining the X-axis and Y-axis characteristics F(x), F(y) with respect to all characters inputted through the scanner in the same manner as mentioned above and detecting position coordinates of the characters which are expressed on a X-Y plane, on the basis of the average position vectors and the standard deviations of the characters;

means for repeating the above operations a plurality of times to obtain an average position vector and an average standard deviation of said extracted X-axis and Y-axis features;

means for obtaining a feature point of said individual character on an X-Y plane by using said average position vector of the individual character;

means for obtaining a plurality of X-axis and Y-axis histograms which accumulate the number of characters having the same X-axis and Y-axis coordinates of the feature point, respectively;

means for assigning said X-Y plane to a plurality of ranges which have a critical value of the X-axis, Y-axis coordinates of the feature points, respectively; and

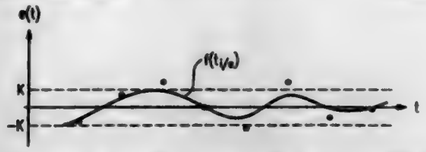
means for sorting position coordinates of the assigned ranges and characters which belong to the individual ranges as reference data in a data storage means.

5,596,658

METHOD FOR DATA COMPRESSION

Robert B. Levy, Morrisville, Pa., and Rajarshi Ray, Princeton, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 1, 1993, Ser. No. 69,321
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—243 **4 Claims**



1. A method for storing an analog signal y(t) in a compressed form and for reproducing said signal, comprising the steps of:

(a) sampling the analog signal y(t) at periodic intervals to yield a set of signal samples $y(t_0).y(t_1).y(t_2) \ldots y(t_e)$, each representing the amplitude of the analog signal at one of a plurality of corresponding time intervals $t_0.t_1.t_2 \ldots t_e$, respectively;

(b) performing a first regression analysis on the signal samples $y(t_0).y(t_1).y(t_2) \ldots y(t_e)$to fit them to a curve given by a first polynomial of the form $f(t)=a_0+a_1t+a_2t^2+ \ldots a_nt^n$;

(c) passing each of the coefficients $a_0.a_1.a_2 \ldots a_n$ of the first polynomial to a memory for storage;

(d) measuring each of a set of errors $e(t_1).e(t_2) \ldots e(t_e)$ between the curve given by the first polynomial and each of the original signal samples $y(t_0).y(t_1).y(t_2) \ldots y(t_e)$, respectively;

(e) thresholding the errors;

(f) performing a weighted regression analysis to fit each of the thresholded measured errors $e(t_1).e(t_2) \ldots e(t_e)$ to a second curve given by a second polynomial $f(t|_e)=b_0+b_1t+b_2t^2+b_3t^3+ \ldots b_qt^q$;

(g) passing to the memory a second set of coefficients $b_0.b_1.b_2.b_3 \ldots b_q$;

(h) retrieving the coefficients $a_1.a_2 \ldots a_n$ and $b_0.b_1.b_2.b_3 \ldots b_q$ from the memory;

(i) determining an approximated signal amplitude value $y(t_i)$ for an interval t_i from the first polynomial using the retrieved coefficient $a_1.a_2 \ldots a_n$;

(j) determining an approximate error value $e(t_i)$ for the interval t_i from the second polynomial using the retrieved coefficients;

(k) compensating the approximated signal amplitude by adding the approximated error thereto;

(l) repeating the steps of (i). (j) and (k) for each of a plurality of different intervals (i.e., different t_i's; and

(m) establishing the original analog signal from the approximated analog signal amplitude.

5,596,659

PREPROCESSING AND POSTPROCESSING FOR VECTOR QUANTIZATION

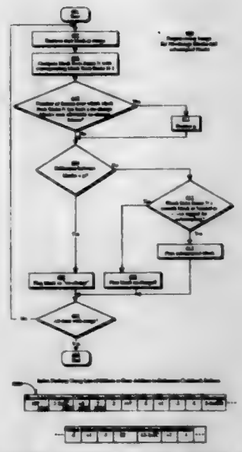
James O. Normile, Sunnyvale; Katherine S. Wang, San Jose, and Hai-Jung Wu, Cupertino, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 1, 1992, Ser. No. 938,942
Int. Cl.[6] G06K 9/36;9/38;9/46
U.S. Cl. 382—253 **47 Claims**

1. A method of encoding an image comprising the following steps:

a. adaptively preprocessing a first bitstream representative of said image in order to eliminate spatial redundancy by selectively subsampling individual vectors in said image based upon luminance of said individual vectors, reduce noise and control data rate, and generate a second bitstream on which to perform vector quantization, wherein said individual vectors include a block of adjacent pixels in said image;

b. applying vector quantization to said second bitstream in order to create a third bitstream comprising a codebook and indices referencing said codebook; and



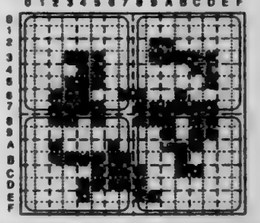
c. performing index packing on said indices in said third bitstream in order to generate a fourth bitstream, said fourth bitstream including a single base address into said codebook for a plurality of said indices in said third bitstream and an associated offset value each for each of said plurality of indices from said single base address to reference entries in said codebook.

5,596,660

COMPRESSION/REDUCTION METHOD FOR EXTRACTING ICONIC/SYMBOIC INFORMATION FROM AN IMAGE ARRAY

David B. Shu, Canoga Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 99,302, Jul. 28, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 599,545
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—302 **6 Claims**



1. A method of analyzing a two dimensional grouping of data represented by a matrix of binary mask pixels and associated object pixels where the binary mask pixels represent an object mask and the object pixels associated therewith carry information related to the object at each of the binary mask pixels, to extract symbolic information from the object pixels representative of objects embedded therein, said method comprising:

loading the binary mask pixels into a machine having at least one level of Processing Elements forming an array matrix such that each binary mask pixel is stored in a memory in one Processing Element;

forming a gated connection network of Processing Elements for each object in the array by comparing the value of the binary mask pixels stored in each Processing Element with the value of the binary mask pixels stored in its neighboring Processing Elements and closing the gates between Processing Elements that contain the same pixel value and opening the gates between Processing Elements that contain different pixel values;

then, executing a sequence of processing steps on the array matrix to form region increasing in two dimensions, the size, of each region increasing and the total number of region decreasing after execution of each sequence, said sequence comprising:

(a) forming regions of Processing Elements, each region having a plurality of Processing Elements connected so as to be capable of communicating with each other;

(b) determining, for each gated connection network of Processing Elements in each of said regions, the Processing Element which is at a coordinate minimum of the array matrix in that region and assigning an unique source label to said Processing Element;

(c) determining for each gated connection network of Processing Elements in each of said regions, the Processing Element which is at a coordinate maximum of the array matrix in that region and assigning an unique destination label to said Processing Element;

(d) transferring to and combining in a preselected manner the contents of the object pixels associated with the Processing Element assigned the source label with the contents of the object pixels associated with the Processing Element assigned the destination label;

(e) removing the binary mask pixel stored in the Processing Element assigned the source label from any further minimum or maximum coordinate determination so that said Processing Element is removed from any further minimum or maximum coordinate determination; and

(f) repeating steps (a) through (e) to form regions in a second dimension, and

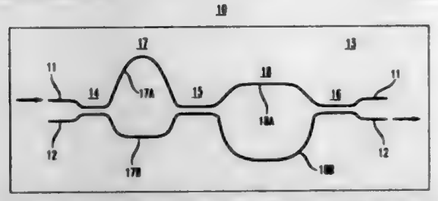
(g) repeating steps (a) through (f) until no further transferral and combination as in step (d) is possible since all available Processing Elements assigned the source label have been removed from further minimum or maximum coordinate determination.

5,596,661

MONOLITHIC OPTICAL WAVEGUIDE FILTERS BASED ON FOURIER EXPANSION

Charles H. Henry, Skillman; Edward J. Laskowski, Scotch Plains, both of N.J.; Yuan P. Li, Alpharetta, Ga.; Cecilia Y. Mak, Bedminster, N.J., and Henry H. Yaffe, Dunwoody, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 28, 1994, Ser. No. 365,618
Int. Cl.[6] C02B 6/28
U.S. Cl. 385—24 **17 Claims**



1. A monolithic optical waveguide filter comprising a pair of optical waveguides forming a sequence of N>2 couplers alternating with delay paths between said couplers, wherein

a) said couplers and delay paths are selected such that there are 2^{N-1} distinct paths from an input to an output of the optical waveguide filter, and are furthermore selected such that an input signal radiation simultaneously propagates through a multiplicity of said 2^{N-1} distinct paths from the input to the output of the optical waveguide filter; and

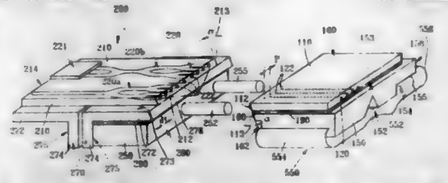
b) an effective length of one of said couplers differs by more than 5% from the effective length of another coupler, and a differential delay provided by one of said delay paths differs by more than 10% from the differential delay provided by another of said delay paths.

5,596,662

MULTICHANNEL OPTICAL CONNECTION METHOD FOR OPTICAL FIBERS

Daniel Boscher, Trebeurden, France, assignor to France Telecom, France

Filed Mar. 2, 1995, Ser. No. 399,160
Claims priority, application France, Mar. 3, 1994, 94 02458
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—55 **31 Claims**



1. Multichannel optical connection process, in particular for optical fibers, comprising the following steps:

making a multichannel optical connection wafer having a plurality of optical outlets disposed on a common face in a predetermined configuration and with a precise pitch,

disposing said connection wafer on a support having mechanical positioning means,

placing an assembly comprising said connection wafer and said support facing a reference termination comprising a reference base having mechanical positioning means adapted to cooperate with those of said support to define a unique relative position between them and a multichannel optical connection reference plate fixed rigidly to said base and having on a common face at least two optical outlets disposed in the same predetermined configuration as said connecting wafer,

dynamically aligning two outlets of said connection wafer with respective outlets of said connection plate by three independent relative movements between said connection wafer and the associated support, and

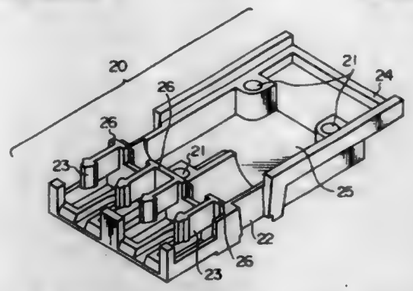
fixing said connection wafer to said support when said alignment is obtained.

5,596,663

FIBER OPTIC MODULE

Shin Ishibashi; Hideyuki Nagao, and Tomiya Miyazaki, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 12, 1995, Ser. No. 372,078
Claims priority, application Japan, Apr. 25, 1994, 6-086691
Int. Cl.[6] G02B 6/00;6/36
U.S. Cl. 385—92 **58 Claims**



1. A fiber optic module comprising:

a connector for connection with a mother board;

laser diode electric signal conversion means for converting serial data received from said mother board to an laser diode electric signal for a laser diode;

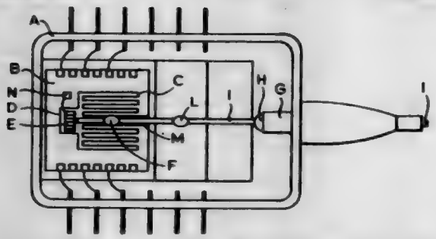
an laser diode module for converting said laser diode electric signal to an laser diode optical signal;

a photo diode module for converting a photodiode optical signal to a photo diode electric signal;
photo diode electric signal conversion means for converting said photo diode electric signal to photo diode serial data;
a circuit board for carrying thereon said connector, said laser diode electric signal conversion means, said laser diode module and said photo diode module; and
first and second frames for holding said circuit board, said laser diode module and said photo diode module,
wherein said connector is of a surface mounting type.

5,596,664
TRANSMITTER MODULE FOR OPTICAL INTERCONNECTIONS

Bruno Bostica, Pino Torinese; Franco Delpiano, Collegno, and Luca Pesando, Bussoleno, all of Italy, assignors to CSELT-Centro E Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 28, 1995, Ser. No. 531,244
Claims priority, application Italy, Sep. 29, 1994, TO94A0757
Int. Cl.[6] G02B *6/421*
U.S. Cl. 385—92 **4 Claims**



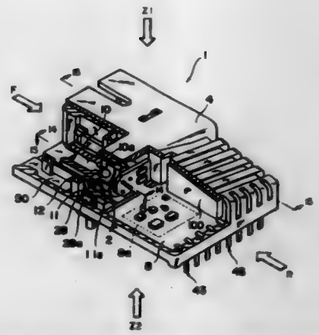
2. A transmitter module for optical interconnections, comprising:
a metal container;
an optical emitting device housed in said container and having an anode and a cathode;
an integrated circuit containing a driving circuit for the optical emitting device and received in said container;
an optical fiber outgoing from the container through a fiber guiding device; and
mounting means in said container and including a first metal-ground area formed on said integrated circuit for mounting of said optical emitter device thereon, said optical emitting device having its cathode electrically connected to the first area and its anode connected to a second metal area connected with the output of the driving circuit, said optical fiber confronting the light-emitting surface of optical emitting device and being secured onto said integrated circuit, said first ground area extending over the surface of the integrated circuit by means of metallization strips, acting as thermal dissipation means for said optical emitting device.

5,596,665
OPTICAL MODULE HAVING STRUCTURE FOR DEFINING FIXING POSITION OF SLEEVE

Hiromi Kurashima; Hisato Takahashi; Ken-ichi Kitayama; Ryoji Sakamoto; Soushu Sawada; Takeshi Sekiguchi; Ichiro Tomai, and Nobuo Shiga, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 31, 1995, Ser. No. 551,270
Claims priority, application Japan, Oct. 31, 1994, 6-267391; Nov. 9, 1994, 6-275094; Feb. 7, 1995, 7-019250
Int. Cl.[6] G02B *6/42*
U.S. Cl. 385—92 **16 Claims**

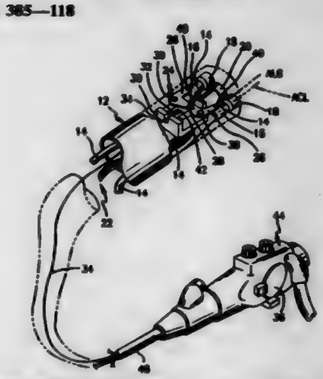
1. An optical module comprising:
a sleeve having a first holding portion with an insertion hole being capable of accommodating a ferrule arranged at a distal end of an optical fiber, a second holding portion arranged to oppose said first holding portion and having an insertion hole for accommodating an optical operation element, and a flange arranged on an outer wall of said sleeve between said first and second holding portions and having first and second surfaces opposite to each other;
a circuit board electrically connected to a terminal extending from said optical operation element, said circuit board holding said optical operation element;
a housing having a cavity for accommodating said entire sleeve held by said circuit board, and a support portion, projecting from an inner wall of said housing, for fixing said sleeve at a predetermined position in the cavity, said support portion having a first reference surface abutting against said first surface of said flange of said sleeve; and
a sleeve holder, attached to said housing, for fixing said sleeve at the predetermined position in the cavity of said housing together with said housing, said sleeve holder having a first spring piece abutting against said second surface of said flange of said sleeve to urge said first surface of said flange of said sleeve against said first reference surface.



5,596,666
ILLUMINATION SYSTEM FOR ENDOSCOPES

Hitoshi Miyano, and Masaaki Moritsuni, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Oct. 19, 1995, Ser. No. 545,099
Claims priority, application Japan, Oct. 20, 1994, 6-254890
Int. Cl.[6] G02B *6/06*
U.S. Cl. 385—118 **8 Claims**

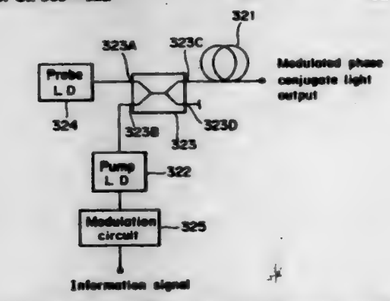


1. An illumination system for an endoscope having at least one light guide fiber bundle extending from an external light source into a distal end cap of said endoscope for guiding light generated by said light guide source to a light exit end thereof and an objective lens system stationarily disposed in said distal end cap for forming an image of an illuminated object of an internal organ, said illumination optical system comprising:
an illumination lens system disposed in front of said light exit end of said light guide fiber bundle in said distal end cap, said illumination lens system having an optical axis which is stationary relative to an optical axis of said objective lens system and diverging and directing illumination light beams from said light exit end of said light guide fiber bundle toward a field of view of said objective lens system;
shift means disposed in said distal end cap and linked with an distal end portion of said light guide fiber bundle for causing parallel movement of an optical axis of said light exit end of said light guide fiber bundle with respect to and in a plane including said optical axis of said illumination lens system; and
an externally operated shift knob operationally linked with said shift means for causing said shift means to cause said parallel movement of said optical axis of said light exit end of said light guide fiber bundle relative to said axis of said objective lens system.

5,596,667
APPLICATION OF PHASE CONJUGATE OPTICS TO OPTICAL SYSTEMS

Shigeki Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP93/01514, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO94/09403, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 20, 1993, Ser. No. 244,995
Claims priority, application Japan, Oct. 20, 1992, 4-281752; Nov. 16, 1992, 4-304250
Int. Cl.[6] G02B *6/00*; H01S *3/10*; H04J *14/02*
U.S. Cl. 385—122 **52 Claims**

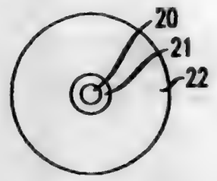


1. A phase conjugate light generation apparatus, comprising:
a non-linear optical medium;
a pump light source for outputting pump light;
signal light/pump light supply means connected to a signal light input port, for supplying input signal light supplied to the signal light input port to said non-linear optical medium together with the pump light from said pump light source; and
signal light/phase conjugate light extraction means for extracting output signal light and phase conjugate light generated by an interaction between the input signal light and the pump light supplied to said non-linear optical medium and outputting the output signal light and the phase conjugate light from a signal light output port and a phase conjugate light output port, respectively;
wherein said signal light/pump light supply means comprises an optical coupler having first to third ports connected to said signal light input port, said pump light source and a first end of said non-linear optical medium, respectively, for outputting light supplied to said first and second ports from said third port thereof.

5,596,668
SINGLE MODE OPTICAL TRANSMISSION FIBER, AND METHOD OF MAKING THE FIBER

David J. DiGiovanni, Montclair, and Kenneth L. Walker, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 30, 1995, Ser. No. 497,346
Int. Cl.[6] G02B *6/16*
U.S. Cl. 385—123 **8 Claims**



1. Single mode optical transmission fiber comprising a core of diameter d, a deposited cladding of diameter D contactingly surrounding the core, and a tube-derived cladding contactingly surrounding the deposited cladding,
CHARACTERIZED IN THAT
the tube-derived cladding contains hydrogen getter sites selected to substantially prevent migration of hydrogen into the deposited cladding during manufacture of the fiber, and D and d are selected such D/d <2.5.

5,596,669
RADIATION CURABLE COATING COMPOSITION AND COATED OPTICAL FIBER

Edward J. Murphy; Stephen C. Lapin, and Gerry K. Noren, all of Elgin, Ill., assignors to DSM N.V., Heerlen, Netherlands

Filed Apr. 21, 1995, Ser. No. 426,601
Int. Cl.[6] G02B *6/22*
U.S. Cl. 385—128 **24 Claims**

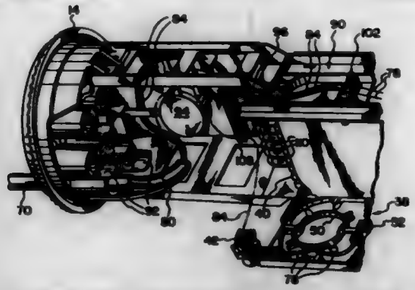
18. A glass optical fiber coated with a cured coating composition comprising:
about 20 to about 99.9 weight % of at least one of Components:
(A.) a non-reactive thermoplastic non-crosslinking polymer; and
(D.) an ethylenically-unsaturated oligomeric compound having a backbone comprising one or more thermally labile groups, and with
from 0 to about 60 weight % of Component (B.) an ethylenically-unsaturated diluent;
from 0 to about 60 weight % of Component (C.) a multifunctional ethylenically-unsaturated compound, and
from 0 to about 10 weight % of Component (E.) a photoinitiator, provided that if the composition comprises (A.) and not (D.), then the composition comprises (B.) in an amount up to about 60 weight % and (C.) in amount up to about 60 weight %, wherein the coating is tack-free and handleable, and is fugitive upon thermolysis to the extent of at least about 99.5% weight loss in a gravimetric scan analysis, whereby the coating can be removed along a desired length of the fiber by thermolysis leaving a bare glass fiber with essentially no residue.

5,596,670

OPTICAL FIBER CABLE ENCLOSURE

George Debortoli, Ottawa; Brian T. Osborne, Kanata; Helmut H. Lukas, Carleton Place, and Jaroslav M. Hvezda, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 163,633, Dec. 9, 1993, abandoned. This application Jan. 16, 1996, Ser. No. 587,161
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—135 20 Claims



1. An optical cable enclosure for interconnecting optical fibers of a supply cable to optical fibers of a customer cable comprising:

a housing and an internal structure;

an inlet in the housing for the supply cable and a first storage region provided by the structure for optical fibers of the supply cable;

an inlet in the housing for the customer cable, a second storage region provided by the structure, the second storage region for unused optical fibers of the customer cable, and an interconnection region provided by the internal structure for interconnecting optical fibers of the customer cable to optical fibers of the supply cable;

the housing comprising an end plate which defines the inlets for the supply and customer cables, and a cover, the internal structure being secured to the end plate, and the cover being movable over the internal structure between a position around the internal structure and sealed to the end plate and a position removed from the internal structure for access to the internal structure;

and guide means defining two paths each of which extend from the customer cable inlet and diverge with one of the paths leading to the second storage region for guiding optical fibers of the customer cable to the second storage region and the other of the paths leading to the interconnection region for guiding optical fibers of the customer cable to the interconnection region.

5,596,671

OPTICAL WAVEGUIDE DISPLAY SYSTEM

Marshall A. Rockwell, III, 303 Grenola St., Pacific Palisades, Calif. 90272

Filed Apr. 28, 1994, Ser. No. 232,089
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—147 8 Claims

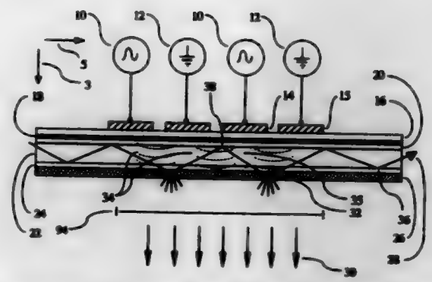
1. A display system comprising:

a plurality of optical waveguides, each including first and second associated optical waveguide cores,

a light source for supplying light to said plurality of optical waveguides,

a controllable light exiting means for selectively causing at least a portion of the light to selectively pass from said first core to said second core,

and a visible-light-absorbing material layer placed with respect to said plurality of optical waveguides in order to darken the



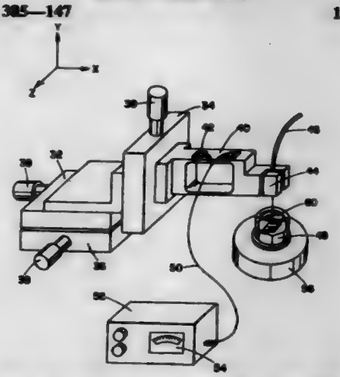
appearance of images formed by said plurality of optical waveguides and said controllable light exiting means.

5,596,672

METHOD AND APPARATUS FOR CONTROLLING THE CONTACT OF OPTICAL FIBERS

Murray R. Harman, Gloucester, and James D. Marshall, Stittsville, both of Canada, assignors to Fiberlign Division of Preformed Line Products (Canada) Ltd., Nepean, Canada

Filed Jan. 27, 1994, Ser. No. 266,205
Claims priority, application Canada, Mar. 3, 1994, 2116934
Int. Cl.[6] G02B 6/255
U.S. Cl. 385—147 13 Claims



4. A system for positioning a first optical fiber having an end portion relative to an object, comprising:

a load sensing means;

means for securing a one of the first fiber and the object to the load sensing means;

means for moving the end portion of the first fiber and the object relative to one another along a predetermined path; and,

control circuitry for monitoring the load sensing means to detect a value of a force between the end portion of the first fiber and the object at a point of contact therebetween.

5,596,673

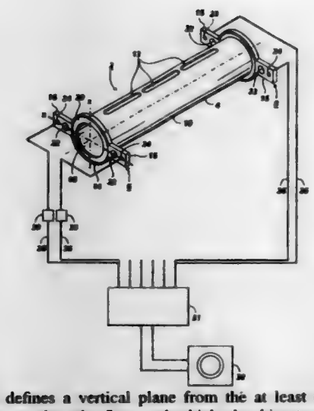
EVAPORATION CRUCIBLE ASSEMBLY

Anthony T. Ward, Webster; Donald J. Teney, Rochester, and Steven J. Grammatica, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 18, 1994, Ser. No. 342,330
Int. Cl.[6] B01D 7/00; F27B 14/10; C23C 16/00
U.S. Cl. 392—389 7 Claims

1. A crucible assembly comprising:

(a) an electrically conductive tube having a first end portion and a second end portion, a tube floor and at least one opening in the surface of the tube opposing the tube floor, wherein the



tube defines a vertical plane from the at least one opening across to the tube floor and which also bisects the end portions of the tube, and a first horizontal line which bisects the first end portion of the tube and a second horizontal line which bisects the second end portion of the tube, said first and second lines being perpendicular to the vertical plane;

(b) a first end member having a hole and a rim connected to the first end portion of the tube, said first end member having at least two power connection areas, wherein the at least two power connection areas are positioned on opposite sides of the vertical plane and approximately along the first horizontal line of the first end portion of the tube;

(c) a second end member having a hole and a rim connected to the second end portion of the tube, said second end member having at least two power connection areas, wherein the at least two power connection areas are positioned on opposite sides of the vertical plane and approximately along the second horizontal line of the second end portion of the tube;

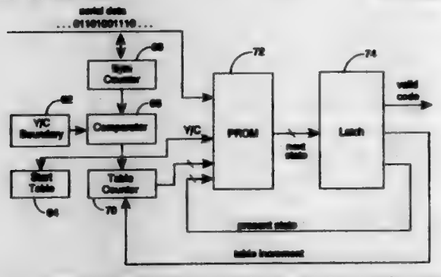
whereby condensation near the at least one opening is reduced or eliminated.

5,596,674

STATE MACHINE APPARATUS AND METHODS FOR ENCODING DATA IN SERIAL FORM AND DECODING USING MULTIPLE TABLES

Rajan Bhandari, and Clive H. Gillard, both of Basingstoke, United Kingdom, assignors to Sony Corporation, Tokyo, Japan, and Sony United Kingdom Limited, Weybridge, United Kingdom

Filed May 26, 1993, Ser. No. 67,117
Claims priority, application United Kingdom, Jun. 24, 1992, 9213426
Int. Cl.[6] G10L 3/02;9/00
U.S. Cl. 395—2.1 22 Claims



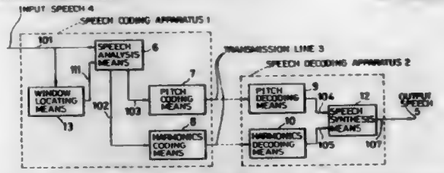
1. A serial data decoder for generating output data words according to a selectable one of a plurality of decoding tables, said serial data decoder comprising a state machine responsive to received bits of serial data so as to move between states within a selectable one of a plurality of branching hierarchies of states, each branching hierarchy corresponding to one of said plurality of decoding tables and being such that each bit of said serial data controls which succeeding state is selected until a state corresponding to a valid data word is reached, and wherein at least one of said plurality of branching hierarchies includes a state corresponding to a complete internal table selecting word for selecting a predetermined different branching hierarchy and corresponding decoding table for subsequent use from among said plurality of branching hierarchies.

5,596,675

METHOD AND APPARATUS FOR SPEECH ENCODING, SPEECH DECODING, AND SPEECH POST PROCESSING

Jun Ishii, and Shinya Takahashi, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 243,181, May 16, 1994. This application Sep. 13, 1995, Ser. No. 527,575
Claims priority, application Japan, May 21, 1993, 5-119959
Int. Cl.[6] G10L 3/02
U.S. Cl. 395—2.2 16 Claims



1. A speech coding apparatus for coding an input speech signal within an analysis window of an analysis frame, comprising:

(a) window locating means for defining a plurality of analysis windows at different locations in the analysis frame, the window locating means including

means for receiving a segment of the input speech signal within each of the analysis windows,

means for calculating a predefined feature of the segment of the input speech signal within each analysis window,

means for comparing the calculated features of each analysis window, and

means for selecting an analysis window based on a result of the comparison;

(b) speech analysis means for extracting characteristic parameters of the input speech signal in the selected analysis window selected by the window locating means; and

(c) coding means for receiving the characteristic parameters and for encoding the characteristic parameters.

5,596,676

MODE-SPECIFIC METHOD AND APPARATUS FOR ENCODING SIGNALS CONTAINING SPEECH

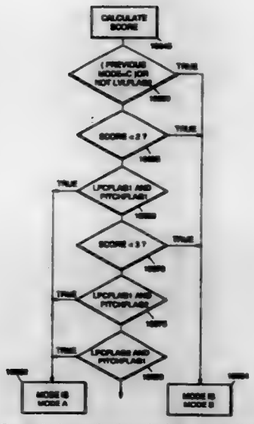
Kumar Swaminathan, Gaithersburg; Kalyan Ganesan, and Prabhat K. Gupta, both of Germantown, all of Md., assignors to Hughes Electronics, Los Angeles, Calif.

Division of Ser. No. 229,271, Apr. 18, 1994, which is a continuation-in-part of Ser. No. 227,881, Apr. 15, 1994, which is a continuation-in-part of Ser. No. 905,992, Jun. 25, 1992, Pat. No. 5,495,555, which is a continuation-in-part of Ser. No. 891,596, Jun. 1, 1992, abandoned. This application Oct. 11, 1995, Ser. No. 540,637
Int. Cl.[6] G10L 9/12;9/14
U.S. Cl. 395—2.17 24 Claims

1. A method of encoding a signal having a speech component, the signal being organized as a plurality of frames, the method comprising the steps, performed for each frame, of:

analyzing a first linear prediction window to generate a first set of filter coefficients for a frame;

analyzing a second linear prediction window to generate a second set of filter coefficients for the frame;



analyzing a first pitch analysis window to generate a first pitch estimate for the frame;

analyzing a second pitch analysis window to generate a second pitch estimate for the frame;

determining whether the frame is one of a first mode, a second mode and a third mode, depending on measures of energy content of the frame and spectral content of the frame;

encoding the frame, depending on the second set of filter coefficients and the first and the second pitch estimates, independently of the first set of filter coefficients, when the frame is determined to be the third mode;

encoding the frame, depending on the first and the second sets of filter coefficients, independently of the first and the second pitch estimates, when the frame is determined to be the second mode; and

encoding the frame, depending on the second set of filter coefficients, independently of the first set of filter coefficients and the first and the second pitch estimates, when the frame is determined to be the first mode.

5,596,677

METHODS AND APPARATUS FOR CODING A SPEECH SIGNAL USING VARIABLE ORDER FILTERING

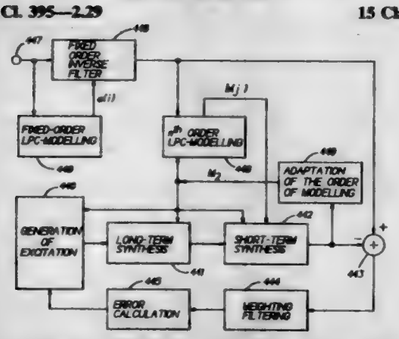
Kari Jarvinen, and Olli Ali-Yrkko, both of Tampere, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Nov. 19, 1993, Ser. No. 155,574

Claims priority, application Finland, Nov. 26, 1992, 925376

Int. Cl.[6] G10L *3/02*

U.S. Cl. 395—2.29 **15 Claims**



1. A method of coding an input signal comprising a series of speech signal blocks, the method comprising the steps of:

a) developing, in a short-term analyzer, a group of prediction parameters that are characteristic of the input signal, in which in each speech signal block to be coded the prediction parameters are characteristic of the speech signal's short-term spectral content;

b) forming an excitation signal which, when fed to a synthesis filter operating in accordance with the prediction parameters, results in the synthesis of a coded speech signal corresponding to the input signal;

c) the step of developing including a preliminary step of forming a short-term filtering model from two components, one of the two components being a fixed-order, short-term filtering model component with low model order and the other one of the two components being a variable-order, short-term filtering model component with a high model order;

d) the step of developing including the steps of, calculating short-term prediction parameters for both components;

e) adapting a total order of the short-term filtering model in each speech block to be coded, in accordance with the speech signal; and

f) adapting a bit rate used for coding the prediction parameters and a bit rate used for coding the excitation signal in such a manner that increasing the order increases the bit rate used for coding the prediction parameters and, correspondingly, reduces the bit rate used for coding the excitation signal.

5,596,678

LOST FRAME CONCEALMENT

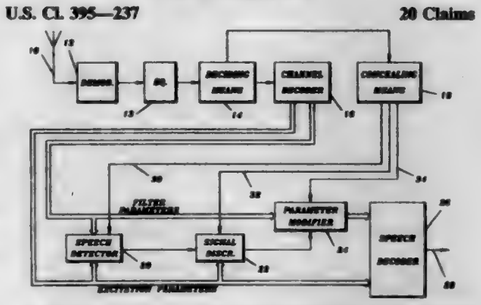
Karl T. Wigren, Uppsala, and Rolf A. Bergström, Mölndal, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 10, 1994, Ser. No. 258,577

Claims priority, application Sweden, Jun. 11, 1993, 9302025; Dec. 6, 1993, 9304058

Int. Cl.[6] H04B *1/10*

U.S. Cl. 395—237 **20 Claims**



1. An apparatus in a receiver in a frame based communication system, for concealing the effects of lost frames in a speech decoder, said speech decoder is of the source-filter type and is controlled by means including internal state variables updated on a frame by frame basis for modifying received filter defining parameters representing background sounds, said apparatus comprising:

means for detecting loss of frames; and

means for concealing the effects of a lost frame by restricting updating of at least one of said internal state variables, wherein said filter parameter modifying means includes a voice activity decoder with at least a threshold for speech/background sound decisions and means for low pass filtering of the filter defining parameters, said concealing means restricting updating of said threshold and updating of filter coefficients of the low pass filtering process in the case of a lost frame.

5,596,679

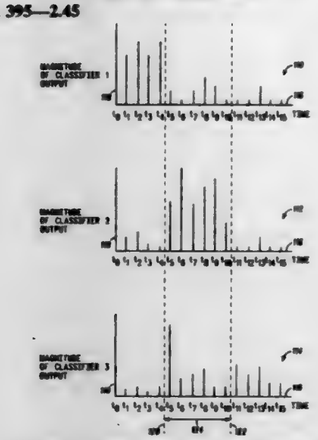
METHOD AND SYSTEM FOR IDENTIFYING SPOKEN SOUNDS IN CONTINUOUS SPEECH BY COMPARING CLASSIFIER OUTPUTS

Shay-Ping T. Wang, Long Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1994, Ser. No. 329,395

Int. Cl.[6] G10L *5/00*

U.S. Cl. 395—2.45 **22 Claims**



1. In a speech-recognition system having a plurality of classifiers a method of identifying a spoken sound the method comprising the following steps:

(a) receiving a plurality of classifier output signal sequences from the classifiers, each of the classifier output signal sequences having been generated according to a polynomial discriminant function;

(b) defining a voting window to include portions of the classifier output signal sequences occurring within a finite period of time;

(c) selecting a winning classifier output corresponding to an interval within the finite period of the voting window, the winning classifier output signal having a magnitude larger than other classifier output signals that correspond to the same interval;

(d) repeating step (c) for a plurality of intervals occurring within the finite period to generate a plurality of winning classifier output signals; and

(e) identifying the spoken sound by determining which of the classifier output signal sequences includes the most winning classifier output signals within the voting window.

5,596,680

METHOD AND APPARATUS FOR DETECTING SPEECH ACTIVITY USING CEPSTRUM VECTORS

Yen-Lu Chow, Saratoga, and Erik P. Staats, Felton, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 31, 1992, Ser. No. 999,128

Int. Cl.[6] G10L *5/06;9/00*

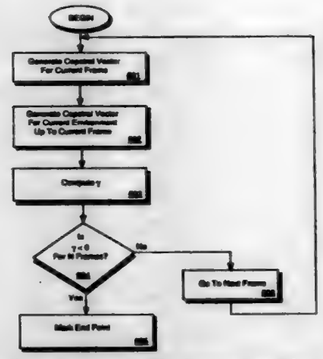
U.S. Cl. 395—257 **31 Claims**

1. A method for detecting an endpoint of speech in an input signal, wherein the input signal is sampled, said method comprising the steps of:

generating cepstrum vectors representing each spectrum of individual samples of the input signal;

generating a cepstrum vector for a steady state portion of the input signal; and

comparing the cepstrum vectors of individual samples with the cepstrum vector for the steady state portion of the input signal to identify the endpoint of speech as that portion of the input signal having a spectrum that converges to the steady state portion of the input signal.



5,596,681

METHOD OF DETERMINING AN OPTIMAL NUMBER OF NEURONS CONTAINED IN HIDDEN LAYERS OF A NEURAL NETWORK

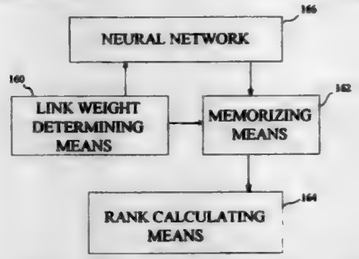
Shinichi Tamura, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 21, 1994, Ser. No. 326,950

Claims priority, application Japan, Oct. 22, 1993, 5-287649; Feb. 21, 1994, 6-022518

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—23 **14 Claims**



11. A method of constructing a neural network comprising an input layer having at least one neuron into which input values are inputted, an output layer having at least one neuron from which an output value is outputted, and at least one hidden layer having at least one neuron provided between said input layer and said output layer, each neuron in each layer being linked to every neuron of a next layer from said input layer to said output layer, said method determining the number of said neurons in said hidden layer;

said method comprising:

a link weight determining process including inputting a plurality of teacher signals as learning data into said input layer and determining link weights between said each neuron;

a rank calculating process including calculating a rank value of a matrix O expressed by the following linear equation:

$$O \times w = t$$

wherein w stands for a column vector of said link weights and t stands for a column vector of said teacher signals, and taking said rank value as the number of the neurons in said hidden layer.

5,596,682

METHOD AND APPARATUS OF AUTOMATED THEOREM PROVING FOR INFORMATION PROCESSING

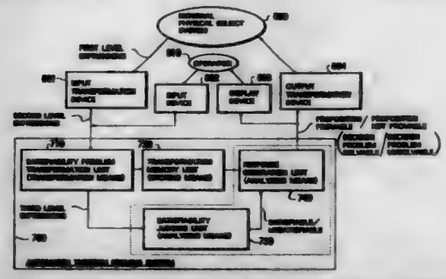
Izuura Yamazaki, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 756,224, Sep. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 381,078, Jul. 18, 1989, abandoned. This application Jan. 21, 1994, Ser. No. 183,798

Claims priority, application Japan, Jul. 18, 1989, 63-179210

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—66 **27 Claims**



27. A computer-implemented method of resolving a decision problem and then carrying out a solution thereof by judging provability of a proposition concerning relationships among physical objects on a basis of a given set of knowledge about the relationships among physical objects, the method comprising the steps of:

(a) transforming sets of clauses representing the decision problem defined in terms of a negation of the proposition and the given set of knowledge into expressions in terms of elements of a module;

(b) constructing a linear equation with the elements of the module as coefficients and elements of a ring of scalars of the module as unknowns;

(c) checking for an existence of a non-negative solution to the linear equation;

(d) determining the set of clauses as being unsatisfiable when the non-negative solution exists, and as being satisfiable otherwise;

(e) judging the decision problem as provable when the set of clauses is determined as unsatisfiable at the step (d), and as unprovable otherwise;

(f) rejecting the proposition when the decision problem is judged as unprovable at the step (e), and otherwise determining a solution of the decision problem from values of the unknowns in the linear equation; and

(g) carrying out the solution of the decision problem obtained in the step (f).

5,596,683

TEACHING CONTROL DEVICE FOR MANUAL OPERATIONS OF TWO INDUSTRIAL ROBOTS

Fumio Kasuganai, Nara, and Yasuhiro Kajiwa, Osaka, both of Japan, assignors to Daihen Corporation, Osaka, Japan

Filed Dec. 30, 1993, Ser. No. 176,864

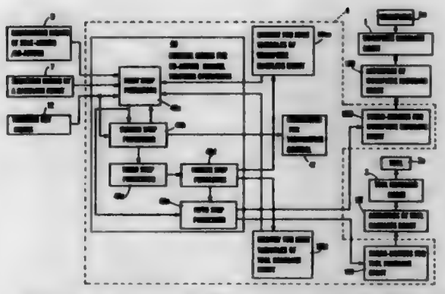
Claims priority, application Japan, Dec. 31, 1992, 4-359945

Int. Cl.[6] B25J *9/00*

U.S. Cl. 395—83 **3 Claims**

1. A teaching control device for manual operations of an industrial robotic system, the robotic system having a workpiece handling robot for manipulating a position and an attitude of a workpiece and a tool handling robot for manipulating a position and an attitude of a tool processing of said workpiece, said teaching control device comprising:

(a) designating means of a sole-action/co-action for supplying a mode signal to designate either



(i) a sole-acting mode of the manual operation of said robotic system wherein manipulation of the position and the attitude of the workpiece by said workpiece handling robot are performed independently of the manipulation of the position and the attitude of the tool by said tool handling robot, or

(ii) a co-acting mode of the manual operation wherein the manipulation of the position and the attitude of the tool by said tool handling robot are coordinated with an interdependent on the manipulation of the position and the attitude of the workpiece by said workpiece handling robot;

(b) selecting means of a handling robot for supplying a robot signal to select either the workpiece handling robot or the tool handling robot;

(c) teaching key means for generating actuating signals to change the position and the attitude of said workpiece or the position and the attitude of said tool;

(d) control means for controlling the co-acting mode of the manual operations of said robotic system in response to the co-acting signal supplied by said designating means, the robot signal selecting the workpiece handling robot supplied by said selecting means and the actuating signals generated by said teaching key means, said control means comprising a computer for performing the following steps;

(i) receiving a co-acting mode signal, robot signal and actuating signals, computing the previous position and the previous attitude of the workpiece in the absolute coordinates system, an attitude of the tool against the ground and a relative position of the tool against the workpiece in response to joint variables of the workpiece handling robot and the joint variables of the tool handling robot obtained just before receiving said actuating signals;

(ii) controlling an execution of a calculating step in response to said actuating signals maintained for a preset time interval, controlling a repetition of said computing step in response to new actuating signals when said actuating signals has already changed during said preset time interval or controlling a termination of said co-acting mode of the manual operation in response to an absence of said actuating signals during said preset time interval;

(iii) calculating the position and the attitude of said workpiece after a preset time interval in response to said actuating signals and said previous position and previous attitude of the workpiece in the absolute coordinates system obtained by said computing step and calculating the position and the attitude of the tool after a preset time interval in response to said attitude of the tool against the ground obtained by said computing step, said relative position of the tool against the workpiece obtained by said computing step and said position and attitude of the workpiece after a preset time interval;

(iv) calculating the joint variables of the workpiece handling robot after a preset time interval in response to said position and attitude of the workpiece after a preset time interval obtained by said calculating step and calculating the joint variables of the tool handling robot after a preset time interval in response to said position and attitude of the tool after a preset time interval obtained by said calculating step; and

(v) calculating actuating values for the actuators of the workpiece handling robot in response to said joint variables of the workpiece handling robot after a preset time interval and calculating the actuating values for the actuators of the tool handling robot, and simultaneously and independently supplying control signals of the actuating values for the actuators of the workpiece handling robot and control signals of the actuating values for the actuators of the tool handling robot, and further commanding a repetition of above said steps (i)–(v).

5,596,684

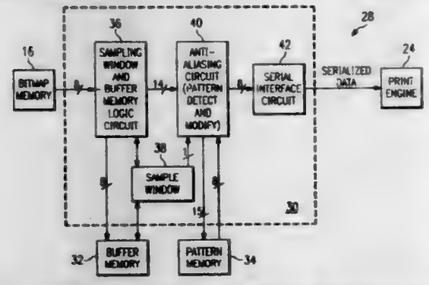
ANTI-ALIASING APPARATUS AND METHOD USING FAST SCAN-LINE MEMORY MAPPING FOR SAMPLING PIXEL PATTERNS

Thomas M. Ogletree, Austin, and Michael J. Dougherty, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 23, 1994, Ser. No. 344,549

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—109 **18 Claims**



1. A method of processing a plurality of bits stored in a first memory and representing an image to be printed by reproducing said bits in a fast scan direction, the method comprising:

reading a plurality of groups from said first memory into a second memory, wherein each of said groups comprises a number of bits greater than one bit and is stored in said second memory in said fast scan direction, and wherein each said group is read one group at a time;

copying a predetermined number of bits from each of said plurality of groups to a sample storage area;

after said copying step, sampling said bits of said copied groups wherein said sampled bits form a pattern having a center bit having a binary state; and

after said sampling step:

outputting a print signal representative of said binary state if said pattern does not match a predetermined pattern; and

outputting a print signal different than said binary state if said pattern matches a predetermined pattern.

5,596,685

RAY TRACING METHOD AND APPARATUS FOR PROJECTING RAYS THROUGH AN OBJECT REPRESENTED BY A SET OF INFINITE SURFACES

Martin Ashton, Berkhamsted, United Kingdom, assignor to VideoLogic Limited, Kings Langley, United Kingdom

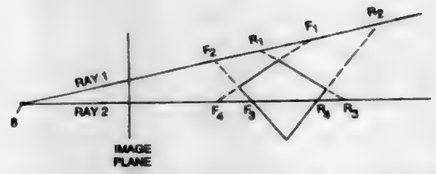
Filed Jul. 26, 1994, Ser. No. 280,649

Claims priority, application United Kingdom, Jul. 30, 1993, 9315852

Int. Cl.[6] G06T *15/40*

U.S. Cl. 395—121 **22 Claims**

1. A method for shading a three dimensional image for display on a screen, the image comprised of at least one object, each object having a set of surfaces, the screen having a plurality of elementary areas, said method comprising the steps of:



representing the surfaces of each object in the image by a group of infinite surfaces;

for each elementary area of the screen projecting a ray from a view point into the three-dimensional image;

determining the location of the intersection of the ray with each said infinite surface;

determining whether any said infinite surface intersected by said ray is visible at that elementary area; and

shading the elementary area for display so as to be representative of said visible intersected surface based on said visible surface determination.

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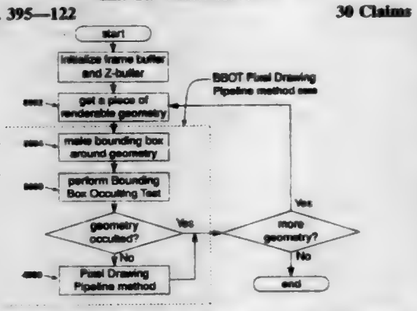
METHOD AND APPARATUS FOR SIMULTANEOUS PARALLEL QUERY GRAPHICS RENDERING Z-COORDINATE BUFFER

Jerome F. Duluk, Jr., Santa Clara, Calif., assignor to Silicon Engines, Inc., Palo Alto, Calif.

Filed Apr. 21, 1994, Ser. No. 231,251

Int. Cl.[6] G06T *15/40*

U.S. Cl. 395—122 **30 Claims**



1. A method of writing graphics images from a set of geometry data stored in a data memory to rasterized pixel data stored in a frame buffer for presentation on a display screen, said method comprising the steps of:

storing a number for use as a z-coordinate value with each image pixel location represented by said frame buffer in a magnitude comparison content addressable memory buffer;

selecting a geometry data item having at least one z-coordinate value from said set of geometry data stored in said data memory;

generating a bounding box around said selected geometry data;

determining a minimum z-coordinate value of said selected geometry data;

simultaneously performing for each of a plurality of pixels, prior to generation of pixel raster data from said selected geometry data, an arithmetic magnitude comparison between said minimum z-coordinate value and previously stored z-coordinate values associated with each of said plurality of pixels of previously selected geometry data currently stored on a pixel-by-pixel basis in said magnitude comparison content addressable memory buffer; and

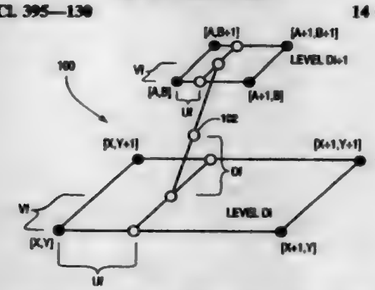
discarding on a pixel-by-pixel basis, prior to generation of pixel raster data from said selected geometry data, a portion of said selected geometry data for which said minimum z-coordinate value is greater than said previously stored z-coordinate values within said bounding box so that said discarded portion of said selected geometry data is not written to said frame buffer.

5,596,687

APPARATUS AND METHOD FOR ADDRESSING PIXEL VALUES WITHIN AN IMAGE PYRAMID USING A RECURSIVE TECHNIQUE

Joseph E. Peters, Jr., East Brunswick, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Jul. 29, 1994, Ser. No. 282,296
Int. Cl.[6] G06T 11/00
U.S. Cl. 395—130 14 Claims



4. A method for generating addresses to access an image pyramid of pixel values sequentially stored in a memory, said method comprising the steps of:

(a) temporarily storing the integer portions of a plurality of address values that define a target location of a pixel value in said image pyramid;

(b) initializing, in response to said integer portions, a base value, an offset value, and a stride value, where said base value represents a reference address of a reference pixel value within said pyramid, said offset value represents a number of pixel values to be added to the base value to compute an address value of a particular pixel value within the image pyramid, and the stride value is a number of pixel values in a row of pixel values within a specific level of the image pyramid;

(c) storing said base value in a base register;

(d) storing said offset value in an offset register;

(e) storing said stride value in a stride register;

(f) generating a memory address by combining the base value with the offset value;

(g) updating said offset value and said stride value and respectively storing the updated offset and stride values in the offset and stride registers; and

(h) repeating steps (f) and (g) until a plurality of memory addresses are generated for accessing said pixel values in said image pyramid.

5,596,688

Patent Not Issued For This Number

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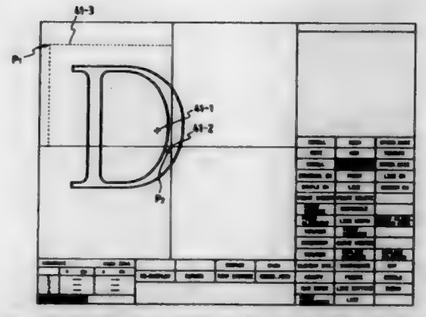
FIGURE PROCESSING WITH MAGNIFICATION OF DESIGNATED PORTION OF DISPLAY

Masaaki Tamura, Fuchu; Ayako Fujii; Yoshiko Koberi, both of Kawasaki; Masaru Nagano, Yokohama; Kiyoshi Watanabe, Kawasaki; Hidehiko Morinaga, Tokyo; Shigeki Koyama, Yokohama, and Yoshikazu Sawada, Inagi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,580
Claims priority, application Japan, Aug. 3, 1990, 2-206541
Int. Cl.[6] G06T 3/00
U.S. Cl. 395—133 10 Claims

1. A figure processing method comprising the steps of:

displaying on a screen a figure pattern represented by coordinate information;



designating on the screen a desired rectangular frame by pointing to two points on the screen;

deriving an enlargement factor of the displayed figure pattern based on the designated rectangular frame and a predetermined area; and

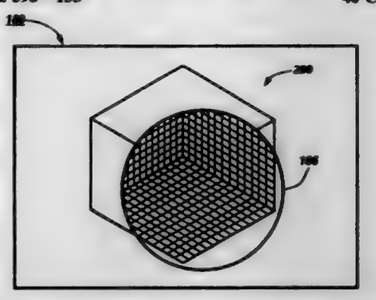
operating on the coordinate information based on the derived enlargement factor to convert the operated coordinate information into a dot pattern, thereby displaying information of the designated rectangular frame in the predetermined area.

5,596,690

METHOD AND APPARATUS FOR OPERATING ON AN OBJECT-BASED MODEL DATA STRUCTURE TO PRODUCE A SECOND IMAGE IN THE SPATIAL CONTEXT OF A FIRST IMAGE

Maureen C. Stone, Los Altos, Calif., and Anthony DeRose, Seattle, Wash., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 21, 1993, Ser. No. 96,200
Int. Cl.[6] G06T 15/00
U.S. Cl. 395—133 40 Claims



1. A method of operating a machine; the machine including:

a signal source for producing signals indicating image display requests;

output circuitry connected to a display having a display area for presenting images; the display area having a first image displayed in a present image position therein; the first image including a first display object;

a processor connected for receiving the signals from the signal source, and connected for providing image definition data defining images to the output circuitry; and

memory for storing data; the data stored in the memory including:

instruction data indicating instructions the processor executes; and

a first image model data structure used by a model-based operation to produce the first image; the first image model data structure including a first object data item; the model-based operation mapping the first object data item to the first display object in the first image when producing the first image;

the processor further being connected for accessing the data stored in the memory;

the method comprising:

operating the processor to receive request signal data from the signal source indicating a display request to present a viewing operation region in a present viewing position in the display area coextensive with the present image position of a first image segment of the first image; the first image segment including the first display object; the viewing operation region having a viewing operation associated therewith for producing image definition data defining a second image; and

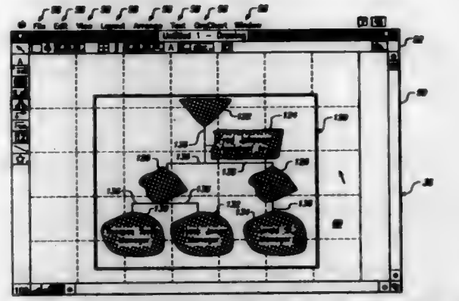
operating the processor to respond to the request signal data indicating the display request by performing the viewing operation, including the steps of

obtaining, from the first image model data structure, the first object data item represented by the first display object included in the first image segment using the present viewing position of the viewing operation region in the display area;

producing the image definition data defining the second image using the first object data item represented by the first display object; the second image having size and shape dimensions substantially identical to size and shape dimensions of the viewing operation region and including a second display object showing a modified view of the first display object; and

providing the image definition data defining the second image to the output circuitry connected to the display so that the display presents the second image in the viewing operation region substantially at the same time as the first image is being displayed in the display area; the second image replacing the first image segment in the display area such that when a first portion of the second display object produced by the viewing operation is within a boundary of the viewing operation region and a second portion of the second display object is outside the boundary of the viewing operation region, the modified view of the first display object is clipped to the boundary of the viewing operation region and only the first portion of the second display object is shown in the second image as the modified view of the first display object;

presentation in the viewing operation region of the second image produced using the first object data item giving a perception to the machine user of presenting in the second image a modified view of the first image segment in the spatial context of the first image.



characteristic to each of the drawing elements of the drawing which are in the first drawing element group and applying the second display characteristic to each of the drawing elements of the drawing which are in the second drawing element group; and

a processing unit operating under the control of the means for modifying the display characteristics, the processing unit coupled to the display device, the input device and the memory.

5,596,691

COMPUTER SYSTEM AND METHOD FOR MANIPULATING THE DISPLAY OF DRAWINGS

Charles F. Good, Milford, Ohio; Craig S. Young, Zephyr Cove, Nev., and Antonio M. Fernandez, Monte Sereno, Calif., assignors to Claris Corporation, Santa Clara, Calif.

Continuation of Ser. No. 260,014, Jun. 15, 1994, abandoned.
This application May 15, 1996, Ser. No. 647,644
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—140 13 Claims

1. A system for automatically changing at least one display characteristic of a plurality of drawing elements forming a drawing, the system comprising:

a display device having an input;

an input device having an output;

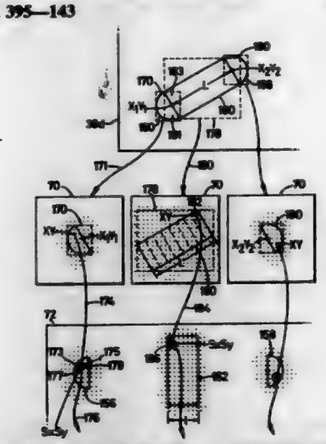
a memory having inputs and outputs for storing data, the memory including a plurality of drawing elements, routines for creating and manipulating drawing elements, a model style identifying a plurality of element groups including a first element group with a corresponding first display characteristic and a second element group with corresponding second display characteristic, and model routines for modifying the drawing using the model style by applying the first display

5,596,692

COMPUTER GRAPHICS

Philip D. Martin, Enfield; Kenneth A. Woodhouse, Crowthorne, and Simon G. Shaw, St. Albans, all of United Kingdom, assignors to Accom, Incorporated, Menlo Park, Calif.

PCT No. PCT/GB91/00900, § 371 Date Jan. 26, 1993, § 102(e) Date Jan. 26, 1993, PCT Pub. No. WO91/19266, PCT Pub. Date Dec. 12, 1991
PCT Filed Jun. 5, 1991, Ser. No. 952,509
Claims priority, application United Kingdom, Jun. 8, 1990, 9012805
Int. Cl.[6] G06T 11/00
U.S. Cl. 395—143 39 Claims



1. A method of generating a line so that the generated line simulates the result of a moving painting or drawing implement, said method comprising:

a) providing first shape signals representative of at least part of a selected implement shape and second shape signals representative of a cross-sectional portion of said implement shape;

b) determining first and second positions between which said line is to be generated; and

c) generating said line utilising said first shape signals in a set of regions of said first and second positions and said second

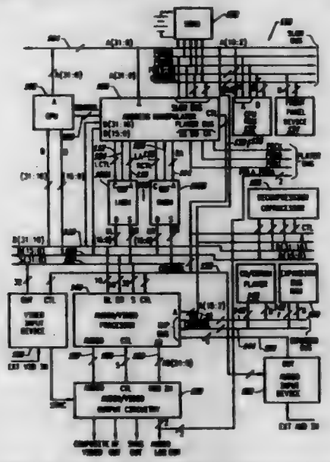
shape signals for creating a segment in a region between said first and second positions, and wherein the shape signals represent multiple pixels in both length and width and are rotated to match changes in the angle of said line.

5,596,693

METHOD FOR CONTROLLING A SPRYTE RENDERING PROCESSOR

David L. Needle, Alameda, and Robert J. Mical, Redwood City, both of Calif., assignors to The 3DO Company, Redwood City, Calif.

Continuation of Ser. No. 970,278, Nov. 2, 1992, abandoned. This application Jul. 31, 1995, Ser. No. 509,674
Int. Cl.[6] G03B 21/32
U.S. Cl. 395—174 34 Claims



1. A method for rendering a graphical image into a destination buffer, comprising the steps of:

preparing a linked list of control blocks in a memory, each control block carrying rendering information for a corresponding sub-image;

writing a value into a first control register (RBGCTL2) indicating a base address in said memory of an additional image portion;

writing a value into a second control register (REGCTL3) indicating a base address in said memory of said destination buffer; and

causing a graphics manipulation processor to render said sub-images into the destination buffer identified by the value in said second control register (REGCTL3), in response to sequential ones of said control blocks in said linked list, and in combination with the additional image portion identified by the value in said first control register (REGCTL2).

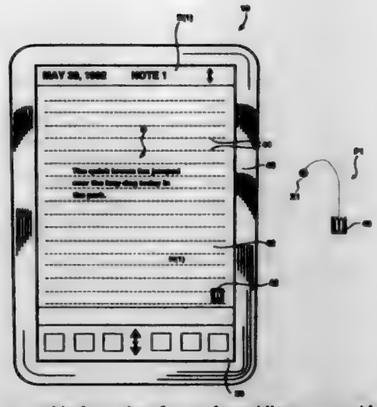
5,596,694

METHOD AND APPARATUS FOR INDICATING A CHANGE IN STATUS OF AN OBJECT AND ITS DISPOSITION USING ANIMATION

Stephen P. Capps, San Carlos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 890,637, May 27, 1992, Pat. No. 5,544,295. This application Apr. 8, 1996, Ser. No. 629,439
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—152 25 Claims

1. A method for changing a status of an object having an image displayed on a display screen of a pointer based computer system



having a graphical user interface and providing a user with visual feedback indicative of the change in status, the method comprising the steps of:

receiving a change in status command indicating a desired status of a selected object having an image displayed on the display screen of the computer system, the change in status command being initiated using the pointer, the desired status of the selected object being established prior to movement of the image which is indicative of the desired status, and the image of the selected object having an initial visual appearance indicative of the initial status;

modifying the visual appearance of the image of the selected object displayed on the display screen through graphical animation to provide the user with an animated indication of the change in status of the selected object, the modifying being done in response to the change in status command without requiring any additional inputs from the user;

automatically moving said modified image of the selected object across the display to a position that overlaps an icon on the screen which indicates the disposition of said object, said moving being done in response to the change in status command without requiring any additional inputs from the user; and

automatically executing the change in status command on the selected object without any additional input from the user.

5,596,695

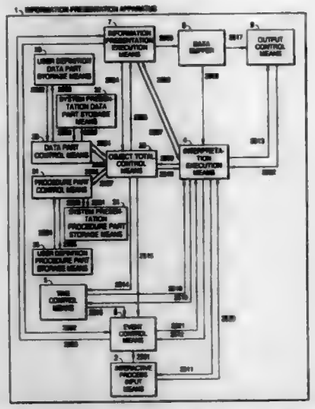
INTERACTIVE MULTI-MEDIA EVENT-DRIVEN INHERITABLE OBJECT ORIENTED PROGRAMMING APPARATUS AND METHOD

Hiroyuki Hamada, Hirakata, and Kiyomi Sakamoto, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1992, Ser. No. 912,179
Claims priority, application Japan, Jul. 12, 1991, 3-172589; Jan. 30, 1992, 4-015143; Apr. 28, 1992, 4-109456
Int. Cl.[6] G06F 9/455
U.S. Cl. 395—333 2 Claims

1. An information presentation apparatus for presenting a plurality of objects according to interactive manipulation, comprising:

an object control means for storing therein a plurality of object data each of which represents an object and is composed of a pair of a data part containing presentation information of at least one of text, graphics, image, video and sound and a processing procedure part containing a procedure for processing the presentation information in the data part and for controlling spatial allocation and moving statuses of the plurality of objects, said object control means for detecting a status change in which one arbitrary object and another arbitrary object come to a predetermined specific relation to each



other and producing a change event signal indicative of the detected status change;

interactive processing input means for inputting parameters necessary for the interactive manipulation;

interpretation and execution means for interpreting the parameters and the procedure contained in the processing procedure part of an object data retrieved from the object control means and for executing the procedure;

time control means for producing a timer interrupt signal which occurs at a specific timing;

event control means for producing a status change command in response to the change event signal and for producing the status change command in response to the timer interrupt signal;

information presentation execution means for controlling the object control means and the interpretation and execution means, said information presentation means being responsive to the status change command from the event control means for controlling the object control means so as to activate or deactivate the detection of the status change and the interpretation and execution means so as to change a status of at least one of the plurality of objects,

wherein said interpretation and execution means is responsive to the parameters for retrieving an object data from the object control means according to the parameters and for interpreting and executing a procedure contained in the processing procedure part of the retrieved object data, and is responsive to a control by said information presentation execution means for retrieving two or more object data from the object control means according to the status change command and for interpreting and executing procedures contained in the processing procedure parts of the retrieved two or more object data in parallel;

wherein the data part of the object data includes a basic data part presented by the apparatus and a user data part defined by a user based on the basic data part, and the processing procedure part of the object data includes a basic processing procedure part presented by the apparatus and a user processing procedure part defined by the user based on the basic processing procedure part, and

wherein said object control means includes:

system presentation data part storage means for storing the basic data part;

user definition data part storage means for storing the user data part;

data part control means for controlling the data parts stored in the system presentation data part storage means and the user definition data part storage means and retrieving a selected data part from one of the system presentation data part storage means and the user definition data part storage means;

system presentation procedure part storage means for storing the basic processing procedure part;

user definition procedure part storage means for storing the user processing procedure part;

procedure part control means for controlling the procedure parts stored in the system presentation procedure part storage means and user definition procedure part storage means and retrieving a selected processing procedure part from one of the system presentation procedure part storage means and the user definition procedure part storage means; and

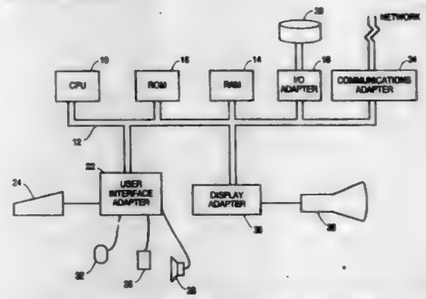
object total control means for controlling the data part control means and the procedure part control means to prepare an object data from the selected data part and the selected processing procedure part retrieved by the data part control means and the procedure part control means, respectively.

5,596,696

METHOD AND APPARATUS FOR SYNCHRONIZING GRAPHICAL PRESENTATIONS

James M. Tindell, LaHonda, and Matthew L. Denman, Los Gatos, both of Calif., assignors to Object Technology Licensing Corp., Cupertino, Calif.

Filed May 10, 1993, Ser. No. 60,151
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—806 11 Claims



1. A computer system for synchronizing multimedia graphic presentations, the system comprising:

(a) a storage;

(b) a display;

(c) a clock object in the storage and including means for providing a current time value,

(d) a graphical sequence object in the storage containing a plurality of graphic objects, each of the plurality of graphic objects having image data and a duration attribute;

(e) a presentation object in the storage and having means, cooperating with the graphic sequence object and responsive to the current time value, for selecting one of the plurality of a graphic objects and means, responsive to the selected graphic object, for presenting the image data of the selected graphic object on the display;

(f) means, responsive to the selected graphic object, for blocking the selection means for a time period equal to the duration attribute of the selected graphic object;

(g) a master clock object in the storage and having means for generating a master current time value: and wherein the clock object includes means responsive to the master time value for determining the current time value as a function of the master time so that the master clock object and the clock object operate in synchronism;

wherein the clock object further includes:

means for storing a rate value and an offset value, and

means, responsive to the master time signal, for computing the current time value as a predetermined function of the master time signal, the rate value, and the offset value; and

(h) clock synchronizing means, responsive to a synchronization request, for synchronizing the clock object to the master time signal to keep the current time value of the clock object

unchanged, while changing the rate value of the clock object, the clock synchronizing means comprising:

means for receiving a new rate value;

means for computing a new offset value based on the master time signal and the new rate value such that the predetermined function yields a current time value that is unchanged with the new rate value and the new offset value; and

means for providing the new rate value and the new offset value to the clock object.

5,596,697

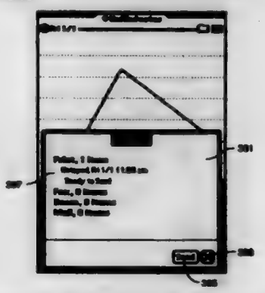
METHOD FOR ROUTING ITEMS WITHIN A COMPUTER SYSTEM

Gregg S. Foster, Woodside; John R. Meier, Cupertino, and Stephen P. Capps, San Carlos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1993, Ser. No. 130,049

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—340 **29 Claims**



25. A pointer-based computer system comprising:

processing means;

memory means coupled to said processing means;

a display coupled to said processing means;

a plurality of ports;

a plurality of computer implemented routing processes which run on the processing means and reside, at least in part, in the memory means;

an out box in communication with the plurality of ports and temporarily holding documents being routed by the routing processes, the out box residing, at least in part, in the memory means;

an out box window representing the out box and displayed on the display, the out box window containing a list of documents held in the out box; and

an out box categories list containing instructions for dialog appearing in the out box window and other windows associated with the out box, the out box categories list residing, at least in part, in the memory means.

5,596,698

METHOD AND APPARATUS FOR RECOGNIZING HANDWRITTEN INPUTS IN A COMPUTERIZED TEACHING SYSTEM

Michael W. Morgan, 733 Sutton Dr., Walnut Creek, Calif. 94598

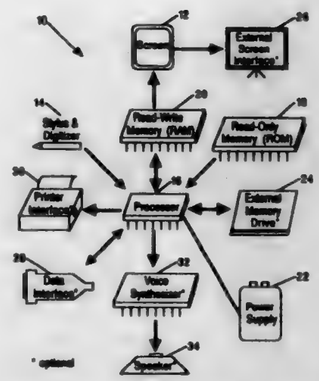
Continuation of Ser. No. 82,031, Jun. 24, 1993, abandoned, which is a continuation-in-part of Ser. No. 994,950, Dec. 22, 1992, Pat. No. 5,428,805. This application Jan. 30, 1995, Ser. No. 381,010

Int. Cl.[6] G06K *900*; G06F *3033*

U.S. Cl. 395—339 **24 Claims**

1. A computer-implemented teaching system, comprising:

(a) a display screen covered by a touch sensitive surface; and



(b) a processing circuit, coupled to the display screen and touch sensitive surface, for recording movements of a pointing member as the pointing member traces across the surface, for recognizing the recorded movements of the pointing member across the surface as handwritten input, for interpreting the handwritten input as characters, numbers and commands, and for displaying the recorded movements of the pointing element on the display screen, the processing circuit further comprising instructional means for interpreting lesson scripts to generate a lesson sequence for teaching mental skills, for displaying the lesson sequence on the display screen, and for recognizing a student's response to the lesson sequence from the characters, numbers and commands.

5,596,699

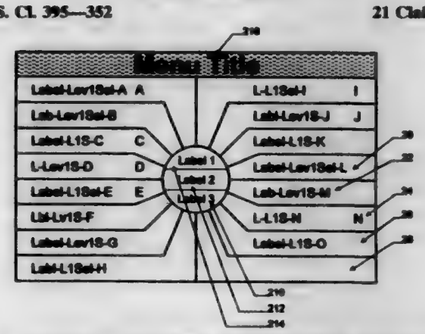
LINEAR-VIEWING/RADIAL-SELECTION GRAPHIC FOR MENU DISPLAY

Stanley W. Driskell, 4830 Washtenaw Ave., No. C2, Ann Arbor, Mich. 48108

Filed Feb. 2, 1994, Ser. No. 191,015

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—352 **21 Claims**



1. A computer menu selection system for pointing device selection of a plurality of menu options by a user, comprising:

a computer system for generating a plurality of option target areas, each target area corresponding to one of said menu options;

said option target areas each in part comprising an active generally rectangular area responsive to pointing device selection which contains one of said menu options;

said option target areas being disposed such that each of said rectangular areas is vertically arranged in one of two parallel

columns, each column defining a generally vertical axis and to present said menu options as two vertically arranged lists, each list being justified along a line;

said computer system including an origin establishing means for defining an origin point which is offset from each of said vertical axes;

said option target areas each further comprising an active non-rectangular area responsive to pointing device selection and laterally adjacent said rectangular area and having a plurality of boundaries which converge at said origin point;

whereby said option target areas are geometrically configured and arranged such that the user visually scans said list of menu options in a vertical direction and wherein said pointing device, when positioned at said origin point, allows a user to select any of said option target areas with substantially equal movement.

5,596,700

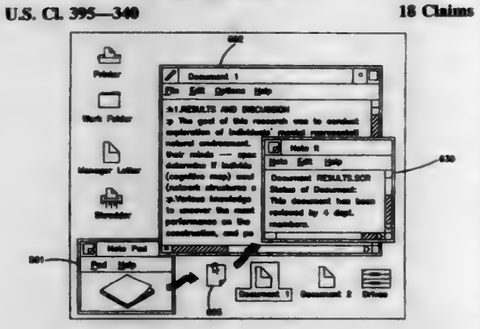
SYSTEM FOR ANNOTATING SOFTWARE WINDOWS

Michael J. Darnell, and Elissa D. Sailowitz, both of Aptos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1993, Ser. No. 18,679

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—340 **18 Claims**



1. A method of operating a computer system having a processor, a memory, a nonvolatile storage, text entry means, pointer positioning means, execute key means, display means and means for displaying multiple windows, comprising the steps of:

entering a new note mode upon detecting a selected action by a user;

detecting the pressing of the execute key when the pointer is located in a portion of a window having an associated title;

recording the title of the window as a note title;

recording the pointer position relative to the window as a note position;

displaying text entered by the user as a note text at the note position;

storing the note title, note position and note text in nonvolatile storage as a note record;

exiting the new note mode; and

for each new window displayed having a title, comparing the new window title with the note title and if the new title and the note title are equivalent, then displaying the note text at the note position.

5,596,701

METHOD FOR AUTOMATICALLY RESTORING CONSISTENCY IN A HIERARCHICAL OBJECT STRUCTURE IN A COMPUTER AFTER A USER INTERACTION, AND COMPUTER COMPRISING SUCH A SYSTEM FOR AUTOMATIC CONSISTENCY RESTORATION

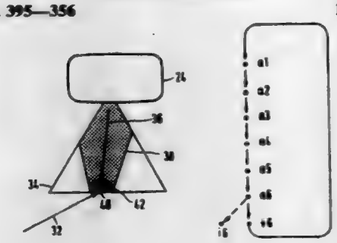
Alexander Augusteijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1994, Ser. No. 311,221

Claims priority, application Belgium, Sep. 24, 1993, 09301002

Int. Cl.[6] G06T *9/40*

U.S. Cl. 395—356 **19 Claims**



1. A method for restoring logical consistency in an information display structure in a computer having a memory and a relevancy boundary of said information display structure, after an user interaction, based on a set of objects in a hierarchical object structure, said object structure comprising a network of logical consistency relations stored in said memory, each of which specifies one or more incremental objects as a function of objects lower in said hierarchical object structure selected from the group consisting of one or more incremental objects and one or more variable incremental objects at a next-lower hierarchical level, at least one of said logical consistency relations specifying one or more incremental objects as a function of less than all of said incremental objects and said variable objects, said relevancy boundary distinguishing objects within said relevancy boundary, a logical consistency of which is necessary to restore logical consistency of said information display structure, from those objects which are outside said relevancy boundary, a logical consistency of which is unnecessary to restore logical consistency of said information display structure, at least one of the group consisting of said incremental objects and said variable objects being outside said relevancy boundary, the user interaction initially causing modification of one or more of said variable incremental objects at a lowest level to create a logical inconsistency, and variable objects within said object structure being subsequently updated, said method comprising the steps of:

during a bottom-up signaling step, after said modification signaling a set of inconsistencies, based on the logical consistency relations, for values of said incremental objects at successively higher hierarchical levels;

during a top-down updating step, after said bottom-up signaling step, at successively lower hierarchical levels, on the basis of each element of said set of signaled inconsistencies updating values of at least each associated incremental object within said relevancy boundary, so that logical consistency is selectively restored within said relevancy boundary to said information display structure, based on a change of value of said lower objects of said function; and

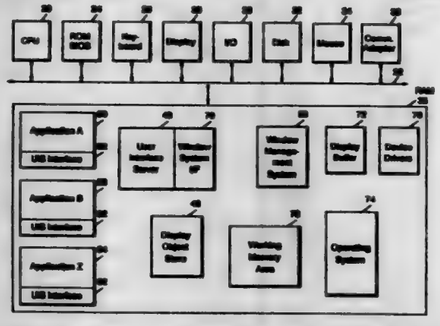
outputting said updated information display structure.

5,596,702

METHOD AND SYSTEM FOR DYNAMICALLY SHARING USER INTERFACE DISPLAYS AMONG A PLURALITY OF APPLICATION PROGRAM

Joan E. Stucka, and Richard Wise, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 16, 1993, Ser. No. 49,697
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—340 **6 Claims**



1. In a data processing system including computing means, memory means, display means, and input means interconnected by a system bus, a subsystem for the dynamic sharing of user interfaces, said subsystem comprising:

a display object store stored in the memory means, said display object store containing a plurality of user interfaces, wherein each user interface display includes a plurality of hierarchically related user interface components and each of said user interfaces being identified by a user interface identifier;

a plurality of applications stored in the memory means, each application requiring the display of a user interface;

a window management system, stored in the memory means, for rendering user interfaces on the display means;

a user interface server stored in the memory means, the user interface server comprising:

control means for executing a received command from an application;

first command interface means for receiving said received command and associated data, wherein the received command is one of a first set of commands;

second command interface means for formulating and sending one or more rendering commands to the window management system in response to a received command, wherein the rendering command is one of a second set of commands; and

third command interface means for causing the retrieval of user interfaces from the display object store in response to a received command;

wherein a first application issues a load command from the first set of commands, the load command having a user interface identifier, the user interface server receiving the load command through the first command interface means, in response to receiving the load command the control means retrieving the user interface identified by the user interface identifier from the display object store through the third interface means, the control means then loading the user interface into a working memory area;

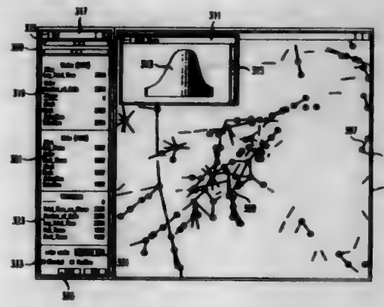
and wherein said first application issues one or more modify commands from the first command set wherein each modify command specifies a user interface component resource identifier and a new resource value, the user interface server receiving each modify command from the first command interface means, in response to receiving the modify command the control means locates the user interface component resource in the working memory area associated with the issuing application as specified by the user interface component resource identifier, the control means then setting the value of the resource in working memory the new resource value.

5,596,703

GRAPHICAL DISPLAY OF RELATIONSHIPS

Stephen G. Eick, Naperville, and Graham J. Wills, Lisle, both of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 22, 1993, Ser. No. 141,885
Int. Cl.[6] G06F 3/14
U.S. Cl. 395—326 **3 Claims**



1. Computer apparatus for representing information which describes relationships between entities, the apparatus comprising:

a display for displaying a graph whose nodes are a plurality of entity representations, each entity representation corresponding to one of the entities;

means responsive to the information for arranging the entity representations in clusters on the display, the entity representations in a cluster being representations of entities whose relationships with each other as determined from the information are more significant than their relationships with others of the entities,

each entity representation being associated with a value of a first statistic,

the display further displaying edges belonging to the graph, the edges representing the relationships,

each edge being associated with a value of a second statistic,

the second statistic being a weight,

the means for arranging the entity representations positioning the entity representations in the clusters according to the weights of the edges, and

the means for arranging the entity representations doing so by minimizing the function

$$\Sigma\left(w_{ij}-\frac{1}{d_{ij}}\right)^2=\Sigma\frac{(d_{ij}w_{ij}-1)^2}{d_{ij}^2},$$

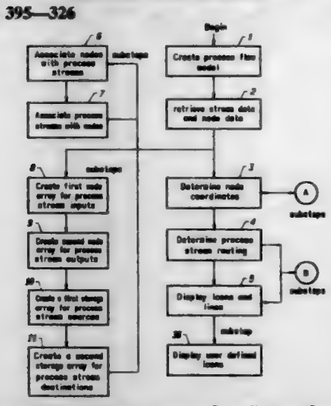
where d_{ij} is the displayed edge length and w_{ij} is the edge's weight.

5,596,704

PROCESS FLOW DIAGRAM GENERATOR

David D. Geddes, Katy; Basil Jolfe, and Patrick P. Davis, both of Houston, all of Tex., assignors to Bechtel Group, Inc., San Francisco, Calif.

Filed Nov. 11, 1993, Ser. No. 151,067
Int. Cl.[6] G06F 3/14;17/50
U.S. Cl. 395—326 **6 Claims**



1. A method for creating a process flow diagram from a process model, wherein the process model includes a plurality of process streams and a plurality of nodes, wherein the process streams represent material transfers and the nodes represent processes, the method using a computer system, the computer system including a processor coupled to an output device, user input device and storage means, the method comprising the steps of:

(a) retrieving a plurality of tables of data representing the process model, the process model describing stream data and node data, said node data defining the plurality of nodes and said stream data defining the plurality of process streams between the plurality of nodes;

(b) using the processor, said stream data and said note data to determine corresponding node coordinates for an adjacency matrix between each of the plurality of nodes, the step further comprising the steps of:

(i) creating an adjacency matrix between each of the plurality of nodes;

(ii) subsequent to creating an adjacency matrix, using the processor, said stream data and said node data to identify an origin node, starting node and an ending node;

(iii) creating a placement matrix, with a row dimension and a column dimension, for output placement of the plurality of modes;

(iv) subsequent to creating a placement matrix, placing said origin node in a top row of a first column of said placement matrix;

(v) subsequent to placing said origin node, placing said starting node in a second column of said placement matrix, wherein placement order occurs in said second column from said top row downwards in said placement matrix;

(vi) subsequent to placing said starting node, using said adjacency matrix to determine starting adjacent nodes, said starting adjacent nodes being nodes which are adjacent to said starting node;

(vii) subsequent to using said adjacency matrix to determine starting adjacent nodes placing said starting adjacent nodes into a third column of said placement matrix, wherein placement order occurs in said third column from said top row downwards in said placement matrix; and

(viii) subsequent to placing each of the plurality of nodes, placing said ending node in said top row of a last column of said placement matrix;

(c) using the processor, said stream data and said node data to determine corresponding stream routing coordinates for the plurality of process streams between the plurality of nodes; and

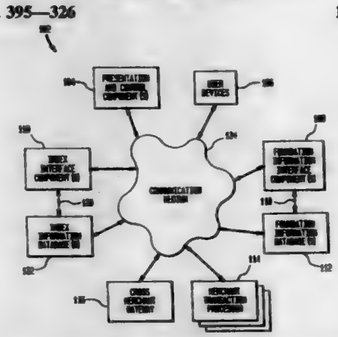
(d) displaying to the output device an icon for each node at said corresponding respective node row and column coordinates in response to the adjacency matrix and displaying to the output device a line interconnecting two or more icons for each process stream at said corresponding stream routing coordinates.

5,596,705

SYSTEM AND METHOD FOR LINKING AND PRESENTING MOVIES WITH THEIR UNDERLYING SOURCE INFORMATION

James A. Reimer, Morgan Hill, and Roger A. Reinsch, Cupertino, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1995, Ser. No. 407,306
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—326 **18 Claims**



8. A system for providing on demand access to movie related information while said movie is being continuously presented to a user, wherein said movie related information includes any of actor, director, character, prop, contract, set, location, or other movie related information said movie having been generated from said movie related information, the system comprising:

movie presenting means for presenting said movie to said user in a continuous manner;

pause means for pausing the presentation of said movie in response to a user generated pause signal deriving a pause generated at user determined intervals;

query signal receiving means for receiving during a pause of said movie a user generated query signal representing a query pertaining to said movie;

frame identifying means for identifying a frame of said movie that was being continuously presented to said user when said query signal was received, wherein said frame identifying means comprises means for extracting from said movie a time code of said frame that was being presented to said user when said query signal was received;

means for identifying, as specified by said query signal, portions of said movie related information relating to said frame;

means for retrieving said portions of said movie related information;

means for presenting to said user the retrieved portions of said movie related information, while said movie is being continuously presented, and

means for resuming presentation of said movie to said user in a continuous manner.

5,596,706

HIGHLY RELIABLE ONLINE SYSTEM

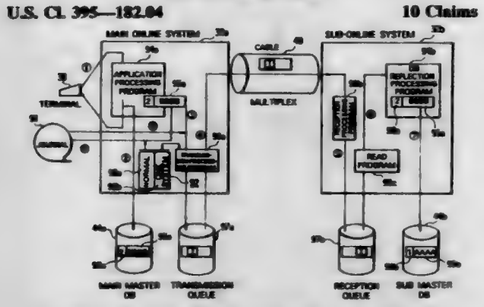
Hiroyuki Shimazaki, Tokyo; Masamichi Mizoguchi, Yokohama; Hajime Yamazaki, Kawasaki; Kazuaki Ogawa, Osaka; Shinji Tanaka, Tokyo; Tatsushi Yano, Abiko; Takatoshi Shimizu, Kawasaki; Yukio Kouguchi, Tokyo; Tetsuo Yamashita, Matsudo; Satoshi Murabayashi, Yokohama; Nobuyuki Suzuki, Yokohama; Yoshikuni Watanabe, Yokohama; Koichi Nakagawa, Yokohama; Daisuke Fukagawa, Kashiwa, and Kouji Ogino, Ichihara, all of Japan, assignors to Hitachi, Ltd., and The Sanwa Bank Limited, both of Tokyo, Japan

Continuation of Ser. No. 129,960, Sep. 30, 1993, Pat. No. 5,379,418, which is a continuation of Ser. No. 660,633, Feb. 25, 1991, Pat. No. 5,307,481. This application Aug. 10, 1994, Ser. No. 288,584

Claims priority, application Japan, Feb. 28, 1990, 2-045433; Mar. 7, 1990, 2-053695; Mar. 7, 1990, 2-053696; Mar. 7, 1990, 2-053697

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.04 10 Claims



1. A database synchronization control system comprising:

a main computer system for accessing ones of a plurality of related first records in a main database based on transactions inputted from terminals wherein said accessing includes updating said ones of a plurality of related first records, and delivering main database update information relating to the updating performed on said main database; and,

a sub-computer system coupled with said main computer system for receiving the update information and updating ones of a plurality of related second records in a sub-database corresponding to said main database, the updating being executed on the basis of said update information, wherein:

said terminals include means for storing and transmitting both i) transaction sequence numbers counted up each time a transaction is generated and ii) transaction data to said main computer system;

said main computer system includes means for transmitting the main database update information and the transaction sequence number of each of said terminals to said sub-computer system; and,

means in each of said-terminals operative when said main computer system is changed over to said sub-computer system, for receiving a latest transaction sequence number of a transaction which has been reflected to the sub-database from said sub-computer system, comparing the received transaction sequence number with the latest transaction sequence number transmitted to said main computer system and stored therein and automatically retransmitting a number of transactions, said number matching the difference between the received transaction sequence number and the latest transaction sequence number stored in the terminal, whereby contents of said main database and said sub-database are synchronized with each other.

5,596,707

INFORMATION PROCESSING SYSTEM HAVING BACKUP/RECOVERY FACILITIES

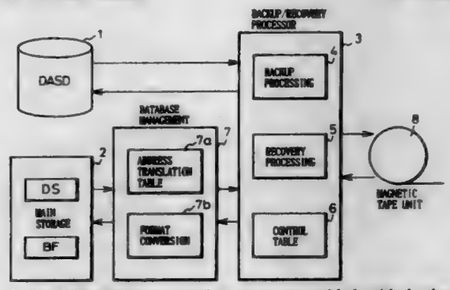
Sadao Obata, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 109,600, Aug. 20, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,230

Claims priority, application Japan, Feb. 26, 1993, 5-038127

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.04 10 Claims



1. An information processing system provided with backup/recovery facilities, comprising:

a main storage;

a first external storage unit which holds a large amount of data partially selected by main storage for use;

a second external storage unit which saves the aforesaid large amount of data held in that first external storage unit;

a control table being operative to show a region in said first external storage unit of data which is held in said main storage; and

backup/recovery means for backing up and recovering data, which backup/recovery means is operative, when backup processing is started, to write data, which is discriminated to be not introduced in the aforesaid main storage with reference to the control table, from the aforesaid first external storage unit into the aforesaid second external storage unit in certain units of volume and to write the data, which is discriminated to be introduced in the aforesaid main storage with reference to control table, from the main storage into the aforesaid second external storage unit, and which backup/recovery means is operative, when the recovery processing is started, to read out the aforesaid data held in the aforesaid second external storage unit for the backup purpose and write it into the aforesaid first external storage unit and, when finding data which should be introduced in the aforesaid main storage with reference to the aforesaid control table, to write this data into the main storage

wherein a database management means is formed between the aforesaid backup/recovery means and the aforesaid main storage;

wherein said database management means has an address conversion table which displays, for data introduced in the aforesaid main storage, the correspondence between logical addresses of the data in said main storage and the physical addresses of said data in the aforesaid first external storage unit; and

wherein said database management means is operative, when the aforesaid backup processing is started, to output the data read out from the aforesaid main storage, as data given the physical address of the related data in the aforesaid first external storage unit with reference to the aforesaid address conversion table, to the aforesaid second external storage unit and said database management means is operative, when the aforesaid recovery processing is started, to discriminate, for the data read out from said second external storage unit and having a physical address of the related data in the aforesaid first external storage unit, the logical address of said data in the aforesaid main storage corresponding to that physical address with reference to the aforesaid address conversion table and then to write the data in that logical address in said main storage.

5,596,708

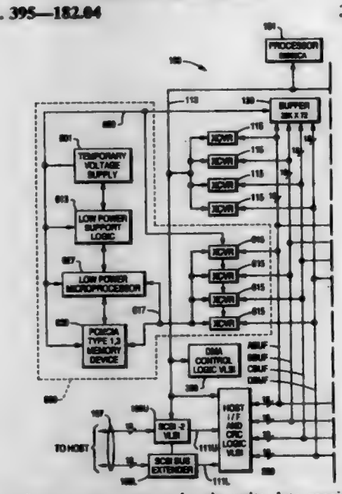
METHOD AND APPARATUS FOR THE PROTECTION OF WRITE DATA IN A DISK ARRAY

Bret S. Weber, Wichita, Kans., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Continuation of Ser. No. 223,264, Apr. 4, 1994. This application Jan. 25, 1996, Ser. No. 591,366

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—182.04 31 Claims



1. In a data storage system wherein write data received from a host is written into a transfer buffer and a write complete status signal is provided by the data storage system to the host prior to said write data being written to a permanent storage device within said data storage system, a method for preventing the loss of data residing in said transfer buffer comprising the steps of:

transferring the data residing in said transfer buffer to a low power non-volatile storage device upon an occurrence of a data storage system failure and, in the absence of said data storage system failure, not transferring the data residing in said transfer buffer to said low power non-volatile storage device and in which said low power non-volatile storage device receives the data from said transfer buffer after the data has been received by said transfer buffer upon occurrence of said data storage system failure and the data transferred to said low power non-volatile storage device being the same data that is to be transferred to said permanent storage device, wherein said low power non-volatile storage device is different from said permanent storage device and in which less power is utilized in transferring data residing in said transfer buffer to said low power non-volatile storage device than power utilized in transferring data residing in said transfer buffer to said permanent storage device.

5,596,709

METHOD AND APPARATUS FOR RECOVERING PARITY PROTECTED DATA

Milton F. Bond; Brian E. Clark, and Raymond S. McRoberts, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 542,216, Jun. 21, 1990, abandoned. This application Nov. 12, 1992, Ser. No. 122,739

Int. Cl.[6] G06F *11/10;11/20*

U.S. Cl. 395—182.05 51 Claims

1. A method of operating a computer system having a set of storage blocks, said set comprising a plurality of data storage blocks for containing data and at least one error-correction storage block for containing error correction information for the data stored in said data storage blocks, each of said storage blocks being contained on a respective data storage unit, said method comprising the steps of:

reconstructing data contained in a data storage block, while the data storage unit containing said data storage block is failing, from the remaining storage blocks in the set; and

storing data reconstructed by said reconstructing step on one of said data storage units other than said data storage unit which is failing.

5,596,710

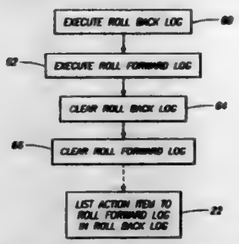
METHOD FOR MANAGING ROLL FORWARD AND ROLL BACK LOGS OF A TRANSACTION OBJECT

Douglas L. Voigt, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 25, 1994, Ser. No. 329,558

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.17 12 Claims

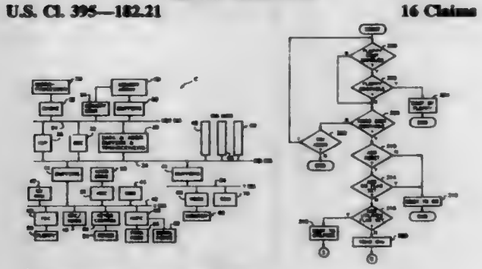


1. In a transaction object used in a controller, the transaction object maintaining a roll forward log and a roll back log which separately list action items to be performed by the controller, the transaction object being configured to commit to performing the action items listed in the roll forward log upon occurrence of a commit event, a method for operating on the transaction object comprises the following steps:

listing, in the roll back log, an action item to clear all action items in the roll forward log; and

defining the commit event as a single instruction to clear the roll back log.

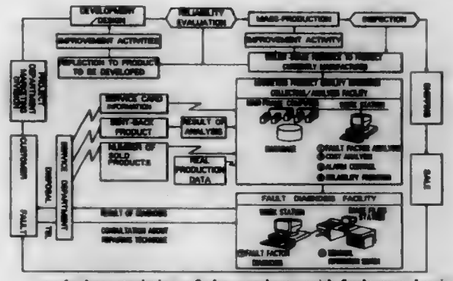
5,596,711
COMPUTER FAILURE RECOVERY AND ALERT SYSTEM
David M. Burckhartt; Lazaro D. Perez; Theodore F. Emerson, all of Houston; Randolph O. Dow, Cypress, and Gary A. Stinnet, Montgomery, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Continuation of Ser. No. 955,849, Oct. 2, 1992, Pat. No. 5,390,324. This application Jan. 26, 1995, Ser. No. 390,499
Int. Cl.[6] G06F 11/34
U.S. Cl. 395—182.21 16 Claims



1. A computer system, comprising:
a host bus;
a processor coupled to said host bus;
a memory array coupled to said host bus;
an input/output bus coupled to said host bus;
a hard drive coupled to said input/output bus;
a floppy controller coupled to said input/output bus;
at least one floppy drive coupled to said floppy controller;
a keyboard controller coupled to said input/output bus;
at least one serial port coupled to said input/output bus;
a parallel port coupled to said input/output bus;
a video graphics controller coupled to said input/output bus;
detection means for detecting a computer system failure;
reset means responsive to said detection means for generating a reset signal when a failure is detected, wherein said reset signal resets the computer system to reset;
said hard drive having a plurality of bootable partitions, one partition containing a normal operating system and one partition containing a diagnostic program;
selection memory means storing a bootable partition selection; and
boot means connected to said hard drive, responsive to said reset signal to commence booting of the computer system from one of said plurality of bootable partitions on said hard drive and responsive to said selection memory means to select which of said plurality of bootable partitions is utilized to boot the computer system.

5,596,712
METHOD AND SYSTEM FOR DIAGNOSIS AND ANALYSIS OF PRODUCTS TROUBLES
Tsutomu Tsuyama; Shigeru Sato; Kayo Tsuchkawa, all of Yokohama; Sadao Shimoyashiro, Fujisawa; Toshimasa Harada, Shizuoka-ken; Koichi Higano, Tochigi; Toshio Nozaki, Utsunomiya; Chikaaki Yamaguchi, Tochigi-ken, and Mitsuo Morito, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 8, 1992, Ser. No. 910,453
Claims priority, application Japan, Jul. 8, 1991, 3-166695; May 25, 1992, 4-132196
Int. Cl.[6] G06F 11/34;11/00
U.S. Cl. 395—183.02 10 Claims

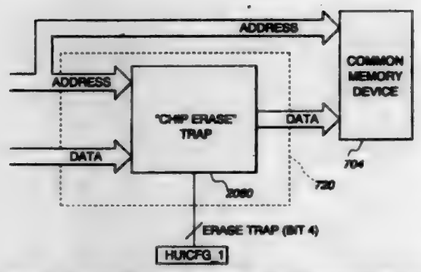
6. A system for diagnosing and analyzing fault information of a product with assistance from a computer, comprising:
a fault diagnosis system, including:
storage means for storing a fault tree representing causal relations for previous faults and causes thereof in a tree structure together with information concerning structure



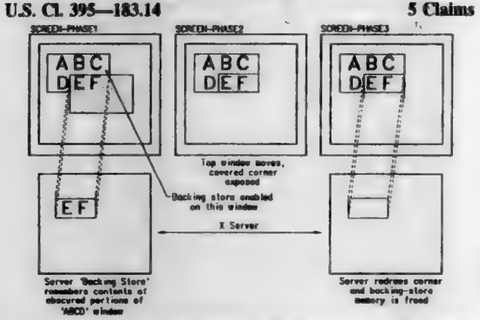
and characteristics of the product, said fault tree having branches allocated with weighting coefficients,
a terminal capable of communicating with said computer for inputting new fault information of the product,
means responsive to the inputting of said new fault information for searching said fault tree in accordance with said weighting coefficients based on said fault information stored in said storage means to thereby determine the cause of the fault of said product, and
means for generating and outputting information concerning adjustment or repair of said product suffering from the fault based on the determined cause of the fault as well as said information concerning the structure and characteristics of said product; and
a marketing product quality information collecting/analysis facility, including:
means for receiving specific fault information including information concerning timing of an occurrence of the fault of said product, symptoms appearing in the fault, the determined cause of the fault and the information concerning said adjustment and repair, via a data collecting station, wherein said marketing product quality information collecting/analysis facility receives the specific fault information regarding a plurality of units of the product, to thereby provide a database for the fault information, wherein the database fault information is continuously updated; and
means for statistically analyzing quality of said product based on all or a part of the database fault information.

5,596,713
METHOD TO PREVENT DATA LOSS IN AN ELECTRICALLY ERASABLE READ ONLY MEMORY
David T. DeRoo, St. Joseph; Mark D. Nicol, Stevensville; David J. DeLisle, Berrien Springs; Saifuddin Fakhruddin, St. Joseph, all of Mich.; Lloyd W. Gauthier, Austin, Tex., and Robert A. Kohtz, St. Joseph, Mich., assignors to Zenith Data Systems Corporation, Buffalo Grove, Ill.
Continuation of Ser. No. 218,412, Mar. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 139,946, Dec. 8, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 478,363
Int. Cl.[6] G06F 11/00
U.S. Cl. 395—183.11 15 Claims

1. An apparatus for use in a computer system which includes a central processing unit (CPU), an address bus and a data bus, said apparatus used for preventing a peripheral device connected to said address bus and said data bus from executing a predetermined command sequence, said apparatus comprising:
means for receiving address and data signals to said peripheral device;
means for detecting said predetermined command sequence, said command sequence comprising a predetermined plurality of sequences of address and data signals received by said address and data signal receiving means; and
means for trapping said predetermined command sequence to prevent said predetermined command sequence from being read by said predetermined peripheral device and for substituting a predetermined data signal with a user programmable signal, once said predetermined sequence is detected to form a new command sequence determined by said user programmable signal.

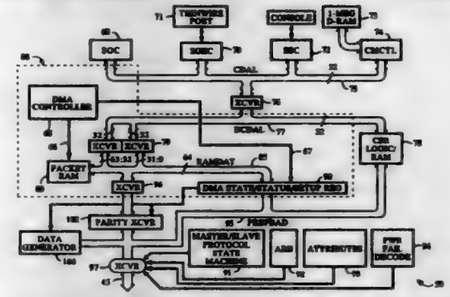


5,596,714
METHOD FOR SIMULTANEOUSLY TESTING MULTIPLE GRAPHIC USER INTERFACE PROGRAMS
Mark A. Connell, Los Gatos, Calif., assignor to Pure Atria Corporation, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 273,302, Jul. 11, 1994, abandoned. This application Feb. 28, 1995, Ser. No. 396,116
Int. Cl.[6] G06F 11/00
U.S. Cl. 395—183.14 5 Claims



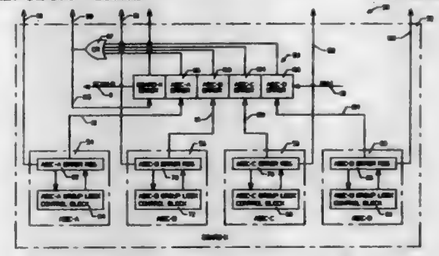
1. A method for simultaneously testing multiple graphic user interface programs comprising the steps of:
establishing criteria indicative of a successful test for each program under test;
inducing operation of each program under test to generate a resulting display window;
synchronizing the induced operation of each of said programs under test so that each resulting display window generated by each of said programs under test is in a determinable state;
comparing each of said display windows to said associated established criteria indicative of a successful test of each program under test;
generating a signal for each program under test indicative of a successful test when said display window generated in accordance with the operation of said program under test matches the established criteria indicative of a successful test; and
further comprising the steps of:
intentionally damaging a portion of the display window for the program under test so that if a non-displayed representation of the display window for the program under test is available it will be used for comparison purposes and if no non-displayed representation of the display window for the program under test is available the program will redraw the display window prior to performing the steps of comparing the display window to the established test criteria.

5,596,715
METHOD AND APPARATUS FOR TESTING HIGH SPEED BUSSES USING GRAY-CODE DATA
Philippe Klein, Newton; David W. Maruska, Hopkinton, and Kevin W. Ludlam, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 88,290, Jul. 6, 1993, abandoned. This application Aug. 4, 1995, Ser. No. 514,348
Int. Cl.[6] G06F 11/00; G01R 31/28
U.S. Cl. 395—183.19 6 Claims



1. A method for testing a bus driving a plurality of bytes of data comprising the steps of:
providing a sequence of transactions on said bus, each transaction comprising a plurality of sequential data cycles, the data provided for each data cycle including an expected parity value and where the parity values of sequential data cycles are inversely related; and
comparing, at a receiver coupled to said bus, said parity value provided on said bus against said expected parity value.

5,596,716
METHOD AND APPARATUS FOR INDICATING THE SEVERITY OF A FAULT WITHIN A COMPUTER SYSTEM
Larry L. Byers, Apple Valley; Gary R. Robeck, Albertville, and Terry J. Brunmeier, Shoreview, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.
Filed Mar. 1, 1995, Ser. No. 396,953
Int. Cl.[6] G06F 11/08;11/14
U.S. Cl. 395—185.01 48 Claims



1. In an electrical apparatus having a plurality of hardware elements and a number of error detection circuits, the number of error detection circuits being coupled to predetermined ones of the plurality of hardware elements, each of the number of error detection circuits continuously monitoring a corresponding one of the predetermined ones of the plurality of hardware elements and providing a corresponding error bit whenever an error is detected thereby, each of the corresponding error bits being serviced by a support controller, the improvement of the electrical apparatus comprising:

a. receiving means coupled to at least one of the number of error detection circuits for receiving a corresponding error bit from each of said at least one of the number of error detection circuits; and

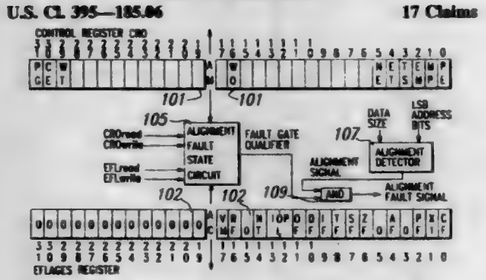
b. determining means coupled to said receiving means for determining which of the corresponding error bits provided by said at least one of the number of error detection circuits are to be serviced immediately by the support controller, and which of the corresponding error bits provided by said at least one of the number of error detection circuits are to be serviced at a predetermined time later by the support controller.

5,596,717

FOUR STATE TOKEN PASSING ALIGNMENT FAULT STATE CIRCUIT FOR MICROPROCESSOR ADDRESS MISALIGNMENT FAULT GENERATION

Robert D. Marshall, Jr., Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 7, 1995, Ser. No. 478,308
Int. Cl.[6] G06F *11/30*
U.S. Cl. 395—185.06 **17 Claims**



1. An address alignment fault state circuit comprising:

a set of four latches, each latch holding either a first state or a second state;

a source of instructions including

an alignment check on instruction executing at an application program privilege level indicating the application program enables generation of an address alignment fault state signal,

an alignment check off instruction executing at said application program privilege level indicating the application program disables generation of an address alignment fault state signal,

an alignment mask permit instruction executing at an operating system privilege level indicating the operating system permits generation of an address alignment fault signal if said application program has enabled generation of an address alignment fault signal via said alignment check on instruction, and

an alignment mask prohibit instruction executing at said operating system privilege level indicating the operating system prohibits generation of an address alignment fault signal regardless or whether said application program has enabled generation of an address alignment fault signal via said alignment check on instruction;

an instruction responsive circuit connected to said set of four latches and said source of instructions, said instruction responsive circuit controlling said set of four latches whereby a only single one of said four latches has said first state and others of said four latches have said second state, said single one of said four latches having said first state determined by whether said instruction responsive circuit has last received said alignment check on instruction or said alignment check off instruction and whether said instruction responsive circuit has last received said alignment mask permit instruction or said alignment mask prohibit instruction; and

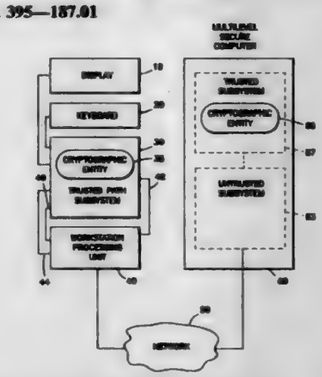
an output circuit connected to a predetermined one of said latches, said output circuit generating an alignment fault qualifier signal enabling generation of an address alignment fault signal if said predetermined one of said latches has said first state.

5,596,718

SECURE COMPUTER NETWORK USING TRUSTED PATH SUBSYSTEM WHICH ENCRYPTS/DECRYPTS AND COMMUNICATES WITH USER THROUGH LOCAL WORKSTATION USER I/O DEVICES WITHOUT UTILIZING WORKSTATION PROCESSOR

William E. Beebert, Minneapolis; Mark H. Hanson, Eagan, and Thomas R. Markham, Anoka, all of Minn., assignors to Secure Computing Corporation, Roseville, Minn.

Filed Jul. 10, 1992, Ser. No. 911,900
Int. Cl.[6] G06F *15/17*
U.S. Cl. 395—187.01 **13 Claims**



1. A secure computing network, comprising:

a network computer, wherein the network computer comprises a trusted subsystem including a cryptographic entity;

communications means, connected to the network computer, for transferring data between the network computer and another computer;

an input/output device;

a workstation connected to the communications means, wherein the workstation comprises an input/output device port and an auxiliary data port; and

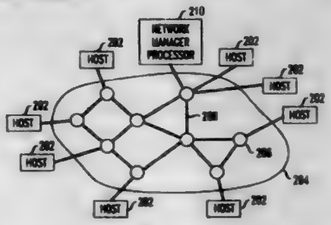
a trusted path subsystem, connected to the input/output device, the input/output device port and the auxiliary data port, wherein the trusted path subsystem comprises encryption means for encrypting and decrypting data transferred over said communications means.

5,596,719

METHOD AND APPARATUS FOR ROUTING AND LINK METRIC ASSIGNMENT IN SHORTEST PATH NETWORKS

Kajamalai G. Ramakrishnan, Berkeley Heights, and Manoel A. Rodrigues, Atlantic Highlands, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 83,822, Jun. 28, 1993, abandoned.
This application Aug. 29, 1995, Ser. No. 521,285
Int. Cl.[6] G06F *13/00*; H04L *12/56*
U.S. Cl. 395—200.02 **9 Claims**



1. A method of routing information in a network, the method comprising the steps of:

assigning link metrics in said network, wherein said network comprises nodes connected by links, the step of assigning comprising the steps of:

a. assigning an initial link metric value to each link;

b. determining an initial set of shortest paths between each pair of nodes in said network;

c. determining a level of initial performance of said network with said initial link metric values according to a performance measure;

d. finding a neighborhood to said initial set of shortest paths wherein said neighborhood is a set of neighbors and wherein each neighbor is a set of shortest paths and associated link metrics wherein only a minimum number of paths in the set of shortest paths for each neighbor are changed with respect to the initial set of shortest paths as a consequence of an increase in an initial link metric associated with a specific neighbor;

e. selecting the neighbor in said neighborhood that yields a performance level for said network meeting a first performance criterion as determined according to the performance measure; and

f. assigning as link metrics for said network the link metrics associated with said selected neighbor; and

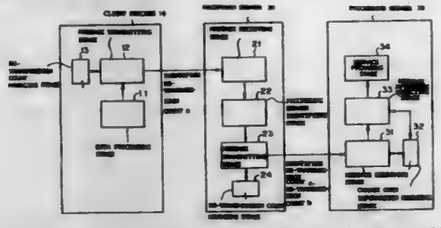
routing information on a single path between a pair of nodes, said single path between said pair of nodes being determined as a function of the assigned link metrics.

5,596,720

REDUNDANT MESSAGE PROCESSING SYSTEM FEATURING RECEPTION SERVER CONTROLLING COMMUNICATION BETWEEN CLIENT AND SERVER PROCESS, AND STAND-BY SERVER RETRANSMITTING MESSAGE WITH INFORMATION INDICATING THE MESSAGE BEING A RETRANSMITTED MESSAGE

Syuji Hamada; Koji Miyazaki, and Hidefumi Maruyama, all of Numazu, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 773,937, Nov. 5, 1991, abandoned.
This application May 3, 1994, Ser. No. 237,408
Claims priority, application Japan, Mar. 5, 1990, 2-53391; May 30, 1990, 2-140985; Jun. 18, 1990, 2-159362
Int. Cl.[6] G06F *11/00; 11/16*
U.S. Cl. 395—200.03 **13 Claims**



1. A message communication processing system implemented by a computer network including first, second, and third interconnected computers, said message communication processing system comprising:

client process means for issuing a message including a demand and implemented by the first computer of the computer network;

processing server means for processing the message and implemented by the second computer of the computer network; and

processing server means for processing the message implemented by the second computer of the computer network; and

reception server means for controlling communication between said client process means and said processing server means and implemented by the second computer of the computer network or by the third computer of the computer network, said reception server means including demand discrimination means for distinguishing between a first demand used only for referencing and not updating one of a medium and a state of a source, and a second demand used for refereacing and updating a process associated with a change of the state of the source, wherein

said processing server means comprises:

discrimination stage means for determining whether the processing of the message transmitted from the client process means has already been completed;

demand processing stage means for performing a demand process for the message received from the client process means when said discrimination stage means determines that the processing of the message transmitted from the client processing means is not completed;

writing stage means for writing the results of the demand process performed in said demand processing stage to a non-volatile memory; and

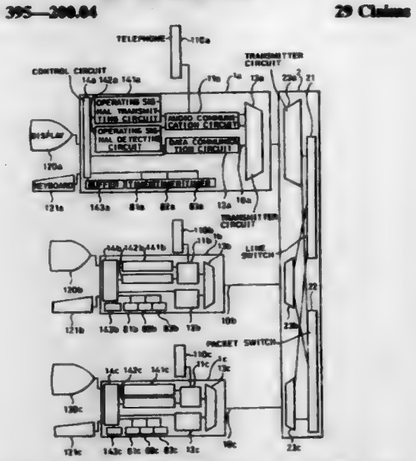
issuing stage means for issuing a first notice that the message processing has already been completed as determined by said discrimination stage means and a second notice that the demand process performed by the demand processing stage means is normally completed when said discrimination stage means determines that the processing is not completed, said client process means determines that the message communication is normal when a re-transmission process for the message is performed and said first notice that the process has already been performed is issued.

5,596,721

SCREEN COMMUNICATIONS SYSTEM GRANTING SCREEN MODIFYING REQUESTS IF NO OTHER REQUESTS RECEIVED AFTER FIRST PERIOD OF TIME AND RELEASING REQUESTS AFTER SECOND PERIOD OF TIME

Ichiro Mase, Yokohama; Takanori Miyamoto, Fuchu; Takashi Morita, Yokohama; Toshiro Suzuki, Tama, and Eiichi Amada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1991, Ser. No. 760,872
Claims priority, application Japan, Sep. 13, 1990, 2-242907
Int. Cl.[6] H01J *13/00*
U.S. Cl. 395—200.04 **29 Claims**



1. A screen communications method for communicating screen data between a plurality of interconnected terminals, each of said terminals having a display part and an input part, said method comprising the steps of:

connecting each of said plurality of terminals to a first transmitter which transmits information via a non-delay service switching system and to a second transmitter which transmits information via a storage-and-forward switching system so

that information from any one of said terminals may be transmitted to another terminal or to other remaining terminals through said first transmitter, and so that information from said any one of said terminals may be transmitted to said another terminal or to said other remaining terminals through said second transmitter;

upon input of screen modifying data into said any one of said terminals from said input part of said other remaining terminals, performing the following steps, in said anyone of said terminals, of:

transmitting a modifying right request to any other remaining terminal through said first transmitter;

detecting whether or not any modifying right request which has been transmitted from any other terminal has been received through said first transmitter within a first predetermined period of time,

transmitting said input screen modifying data to said another terminal or to said other remaining terminals through said second transmitter when no other modifying right request has been received, and

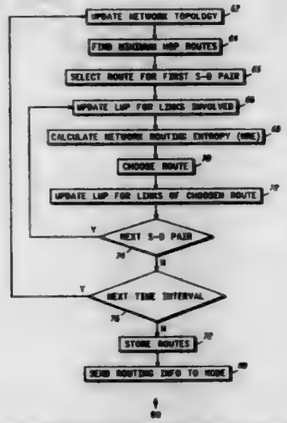
releasing said modifying right of said any one of said terminals when no screen modifying data has been input from said input part of said other remaining terminals for a second predetermined period of time.

5,596,722

PACKET ROUTING SYSTEM AND METHOD FOR ACHIEVING UNIFORM LINK USAGE AND MINIMIZING LINK LOAD

Moe Rahnema, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1995, Ser. No. 415,948
Int. Cl.[6] H04J 3/24
U.S. Cl. 395—200.15 **14 Claims**



1. In a communication system comprising a plurality of nodes that communicate with each other over links wherein each of said links has a link capacity associated therewith, a method of routing data packets among said plurality of nodes comprising the steps of:

(a) finding routes between a source node and a destination node, each of said routes comprising a sequence of links over which to send a data packet;

(b) calculating a link usage probability (LUP) for each link associated with each of said routes, said LUP being proportional to a number of times an associated link is included on one of said routes and inversely proportional to said link capacity of said associated link;

(c) calculating a normalized network routing entropy (NRE) for each of said routes using said LUPs associated with each link of said routes, said normalized NRE being normalized by an aggregate traffic load on all of said links;

(d) selecting a final route from said routes, said final route having a largest of said normalized NREs; and

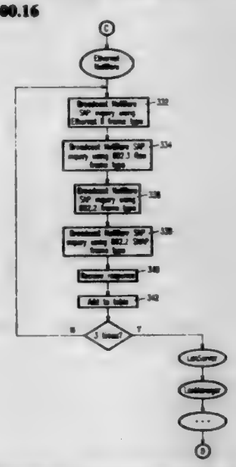
(e) routing said data packet from said source node to said destination node over said final route.

5,596,723

METHOD AND APPARATUS FOR AUTOMATICALLY DETECTING THE AVAILABLE NETWORK SERVICES IN A NETWORK SYSTEM

Steven D. Romohr, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jun. 23, 1994, Ser. No. 264,830
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—200.16 **34 Claims**



27. A computer system which automatically detects at least one feature of each of a plurality of nodes interconnected in a network to which said computer system is attached, wherein features of the nodes include a network operating system and a frame type, the computer system comprising:

memory for storing one or more network operating systems;

a network interface card coupled to said memory for interfacing to said network;

broadcasting means coupled to said network interface card for broadcasting to said nodes one or more inquiries for each of said one or more network operating systems, wherein each inquiry uses a frame type;

receiving means coupled to said network interface card for receiving responses to said one or more inquiries from said nodes on said network using said network operating system and frame type used by any of said one or more inquiries;

storing means coupled to said receiving means for storing said received responses;

determining means coupled to said storing means for determining said network operating systems on said network and for determining a most prevalent network operating system being used on said network using said stored responses; and

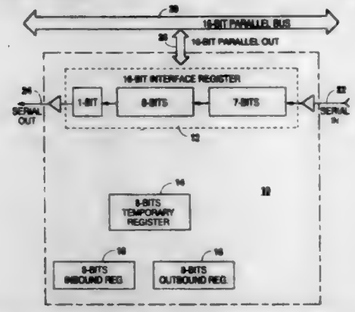
configuring means coupled to said determining means for configuring said first computer system according to said most prevalent network operating system determined by said determining means.

5,596,724

INPUT/OUTPUT DATA PORT WITH A PARALLEL AND SERIAL INTERFACE

Jacqueline Mullins; Joseph W. Peterson; John Bartkowiak, and Alan F. Hendrickson, all of Austin, Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Feb. 4, 1994, Ser. No. 191,948
Int. Cl.[6] G06F 5/00
U.S. Cl. 395—250 **19 Claims**



1. An I/O data port circuit electrically connecting a parallel data bus with an input serial data bus and an output serial data bus, and selectively operable in at least a linear mode and a buffered mode, comprising:

an interface register connected in parallel to said parallel data bus, comprising at least two flip-flops;

a temporary register comprising at least two flip-flops, serially connected to at least one of a first most significant flip-flop and a first least significant flip-flop of said interface register;

an outbound register comprising at least two flip-flops, connected in parallel to said temporary register and having at least one of a second most significant flip-flop and a second least significant flip-flop, said second most significant flip-flop connected serially with said output serial data bus; and

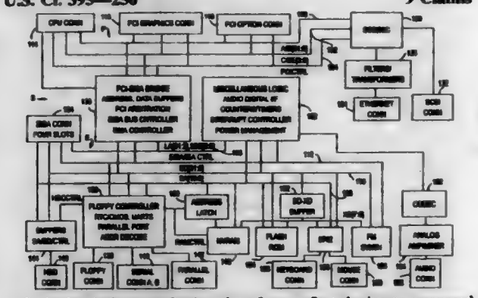
an inbound register comprising at least two flip-flops, connected in parallel to said temporary register and having at least one of a third most significant and a third least significant flip-flop, said third least significant flip-flop connected serially with said input serial data bus.

5,596,725

FIFO QUEUE HAVING REPLACEABLE ENTRIES

Patrick L. Ferguson, Houston, and David J. Maguire, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Feb. 14, 1994, Ser. No. 196,586
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—250 **9 Claims**



1. A circuit for transferring data from a first device to a second device, wherein the first device performs a write operation to transfer data, the circuit comprising:

a plurality of registers addressable by the first device for storing data to be transferred from the first device to the second device;

a write operation detection circuit detecting a write operation to one of said plurality of registers;

a storage response circuit operable in response to said write operation detection circuit and storing the data of a detected write operation to said one of said plurality of registers;

a FIFO queue for storing addresses of said plurality of registers;

an address determination circuit coupled to said FIFO queue for determining if the address of one of said plurality of registers is stored in said FIFO queue;

an address addition circuit responsive to said address determination circuit and said write operation detection circuit, said address addition circuit adding the address of said one of said plurality of registers to said FIFO queue if said address is not stored in said FIFO queue when said write operation is detected, and not adding the address of said one of said plurality of registers to said FIFO queue if said address is stored in said FIFO queue when said write operation is detected;

a data provision circuit coupled to said plurality of registers and said FIFO queue;

said data provision circuit providing the data from a register, indicated among by the register address at the top of said FIFO queues, to the second device;

said data provision circuit also shifting said addresses stored in said FIFO queue when said data is provided;

said data provision circuit further performing a parallel to serial conversion of said data; and

a time multiplexed serial link connected to the second device, said time multiplexed serial link having a plurality of time slots, one of said time slots being a designated time slot to receive data from said plurality of registers; and

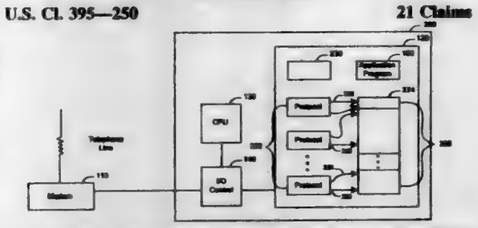
said data provision circuit performing said parallel to serial conversion during said designated time slot of said time multiplexed serial link.

5,596,726

METHOD AND SYSTEM FOR BUFFERING TRANSIENT DATA USING A SINGLE PHYSICAL BUFFER

David Thielen, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 85,770, Jun. 30, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 481,218
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—250 **21 Claims**



1. A method of buffering transient data, the transient data being passed among multiple communications protocols while being transferred from a first device to a second device, the method performed by a computer and comprising the steps of:

(a) providing a communications management driver for managing passing of the transient data between the multiple communications protocols;

(b) using the communications management driver, allocating to each of the multiple communications protocols a corresponding logical buffer comprising a region in a common physical buffer, the common physical buffer storing data contiguously in an order in which the data is transferred;

(c) receiving from a first communications protocol a request for the transient data;

(d) in response to the received request from the first communications protocol, using the communications management driver, passing the transient data from the first device to the first communications protocol by shifting, in the common physical buffer, an allocated first logical buffer that corresponds to the first communications protocol to include a new portion of the common physical buffer and by storing the transient data in the new portion;

(e) receiving from a last communications protocol a request for the transient data; and

(f) in response to the received request from the last communications protocol, using the communications management driver, passing the transient data from the first communications protocol to the last communications protocol by shifting, in the common physical buffer, an allocated last logical buffer to include the portion of the common physical buffer storing the transient data and by shifting, in the common physical buffer, the allocated first logical buffer to exclude the portion of the common physical buffer storing the transient data.

5,596,727

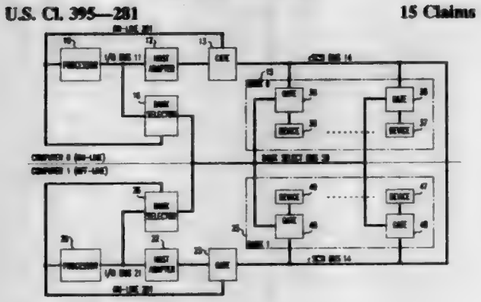
ARRANGEMENT FOR EXPANDING THE DEVICE CAPACITY OF A BUS

Alan J. Literati, Westminster; John M. Nichols; David M. Sueper, both of Broomfield, and Richard A. Windhausen, Boulder, all of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 2, 1993, Ser. No. 70,571

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—281 **15 Claims**



8. An apparatus comprising:

a communications bus;

a plurality of device banks each comprising a plurality of active addressable devices connected to the communications bus for communicating on the communications bus, the active addressable devices of one device bank being addressed by same addresses on the communications bus as the active addressable devices of the other device banks; and

selection means coupled to the plurality of device banks, for enabling the active addressable devices of only one of the plurality of device banks at any one time to receive, and thus be addressed by, addresses on the communications bus while preventing the active addressable devices of the others of the plurality of device banks at the one time from receiving, and thus being addressed by, addresses on the communications bus.

5,596,728

METHOD AND APPARATUS FOR RESOLVING RESOURCE CONFLICTS AFTER A PORTABLE COMPUTER HAS DOCKED TO AN EXPANSION BASE UNIT

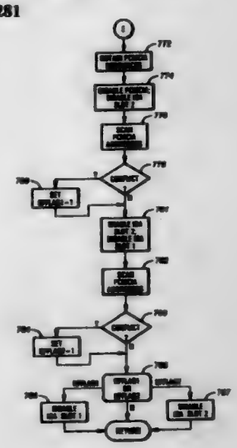
Brian V. Belmont, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 238,271, May 4, 1994, abandoned.

This application Apr. 16, 1996, Ser. No. 632,760

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—281 **16 Claims**



1. A docking computer system, comprising:

a portable computer system, including:

an expansion bus;

an expansion connector coupled to said expansion bus; and

a device being coupled to said expansion bus and having resource requirements; and

an expansion base system for docking or undocking said portable computer system, wherein said expansion base system includes:

an expansion bus;

a docking connector coupled to said expansion base system expansion bus for connection to said expansion connector when said portable computer system is docked to said expansion base system;

an expansion slot coupled to said expansion base system expansion bus for connection to an expansion device having resource requirements; and

a slot disabler coupled to said expansion slot for disabling said expansion slot,

wherein said portable computer system fisher includes:

a conflict decoder coupled to said portable computer system expansion bus for determining if said resource requirements of said portable computer system device and said expansion device conflict after said portable computer system has docked to said expansion base system; and

a command decoder coupled to said conflict decoder and said portable computer system expansion bus for activating said slot disabler to disable said expansion slot if said resource conflict is present and is non-fatal and otherwise insulating said portable computer system said expansion base system.

5,596,729

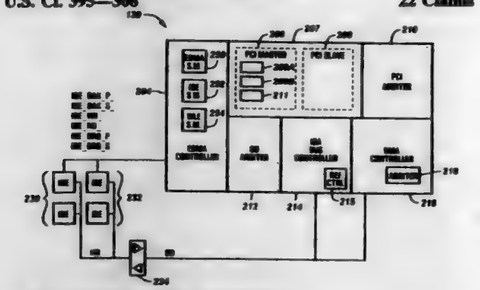
FIRST ARBITER COUPLED TO A FIRST BUS RECEIVING REQUESTS FROM DEVICES COUPLED TO A SECOND BUS AND CONTROLLED BY A SECOND ARBITER ON SAID SECOND BUS

Robert A. Lester, Houston, and Jeff W. Wolford, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Mar. 3, 1995, Ser. No. 398,366

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—308 **22 Claims**



12. A computer system, comprising:

a first bus;

a second bus;

a slave device coupled to said first bus;

a plurality of first bus master devices coupled to said first bus;

an I/O device coupled to said second bus;

a plurality of second bus master devices coupled to said second bus;

a data routing circuit coupled to said first and second buses for routing data between said I/O device and said slave device, wherein said first bus master devices each asserts a corresponding one of a plurality of first bus request signals to indicate a request for said first bus, wherein said plurality of first bus master devices include a data transfer controller for providing control signals to said data routing circuit for transferring data between said first and second buses, wherein said data transfer controller provides a command strobe to said second bus I/O device to indicate a data transfer cycle, wherein each of said plurality of second bus master devices requests control of said second bus by asserting one of a plurality of second bus master request signals, wherein said data transfer controller further asserts a data controller second bus request signal to indicate a request for said second bus, and wherein said second bus I/O device and said plurality of second bus master devices utilize different control signals and the same data signals;

a first bus arbiter coupled to said first bus and receiving said plurality of first bus request signals for asserting one of a plurality of grant signals to select said first bus master device having highest priority; and

a second bus arbiter coupled to said second bus and receiving said data controller second bus request signal and said plurality of said second bus master request signals for asserting a data controller second bus grant signal or one of a plurality of second bus master grant signals to grant second bus ownership to said data transfer controller or one of said plurality of second bus master devices depending on which has highest priority on said second bus,

wherein said data transfer controller asserts said data controller second bus request signal when a transfer between said second bus I/O device and said slave device is indicated; wherein, when said data controller second bus grant signal is asserted by said second bus arbiter, said data transfer controller responds by asserting said first bus request signal corresponding to said data transfer controller; and wherein, when said first bus arbiter asserts said first bus grant signal corresponding to said data transfer controller, said data transfer controller generates said control signals for routing data through said data routing circuit.

5,596,730

INTERFACES FOR CROSS-CONNECT SYSTEM

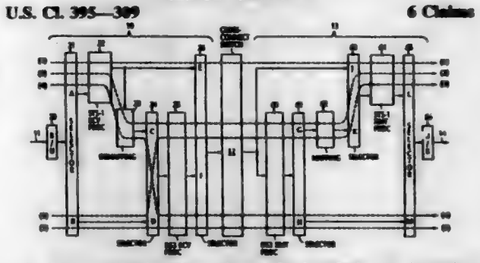
Yasuharu Sekine, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 30, 1994, Ser. No. 269,865

Claims priority, application Japan, Jun. 30, 1993, 5-161990

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—309 **6 Claims**



1. An incoming interface adapted for interfacing an incoming link to a cross-connect switch, comprising:

a first selector having an input terminal for receiving a signal from the incoming link, and first and second output terminals, said first selector establishing a connection between the input terminal thereof and one of said first and second output terminals thereof;

STS-1 (synchronous transport signal level-1) receive processor means connected to the first output terminal of the first selector for processing an STS-1 signal therefrom;

demapping means connected to the STS-1 receive processor for extracting a DS3 (digital signal-3) payload signal from the processed STS-1 signal;

a second selector having a first input terminal connected to said demapping means, a second input terminal connected to the second output terminal of said first selector, and an output terminal, said second selector establishing a connection between one of the first and second input terminals thereof and the output terminal thereof;

DS3 receive processor means connected to the output terminal of said second selector for processing a DS3 signal; and

a third selector having a first input terminal connected to said STS-1 receive processor means, a second input terminal connected to the DS3 receive processor means, and an output terminal adapted for connection to said cross-connect switch, said third selector establishing a connection between one of the first and second input terminals thereof and the output terminal thereof.

5,596,731

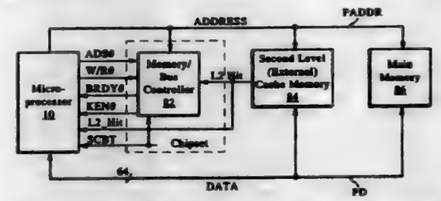
SINGLE CLOCK BUS TRANSFERS DURING BURST AND NON-BURST CYCLES

Marvin W. Martinez, Jr., and Mark W. Bluhm, both of Plano, Tex., assignors to Cyrix Corporation, Richardson, Tex.

Filed Apr. 21, 1995, Ser. No. 426,300

Int. Cl.[6] G06F *13/38*

U.S. Cl. 395—309 **18 Claims**



1. A computer system implementing a single clock bus transfer protocol, the computer system including a processor, system logic, and an external memory subsystem, which are intercoupled by a bus architecture using a bus protocol in which the processor

initiates a bus transfer between the processor and the memory subsystem by outputting an ADDRESS, and the system logic signals that the bus transfer is complete by returning a READY signal, comprising:

(a) a bus interface unit (BIU) in the processor that interfaces to the bus architecture and implements the bus protocol including a single clock bus transfer (SCBT) protocol;

(b) in response to the BIU initiating a bus transfer in a first clock cycle by outputting an ADDRESS, the memory subsystem generates a transfer ready signal to indicate that the memory subsystem is ready to complete the transfer, the transfer ready signal being provided to both the system logic and the processor, thereby enabling the system logic to signal READY to the processor in a subsequent clock cycle;

(c) for at least some bus transfers, the memory subsystem generates the transfer ready signal in the first clock cycle of such bus transfer;

(d) SCBT logic that generates an effective READY signal in response to either (i) READY from the system logic, or (ii) the transfer ready signal from the memory subsystem;

(e) in response to the generation of the effective READY, the BIU completes the bus transfer;

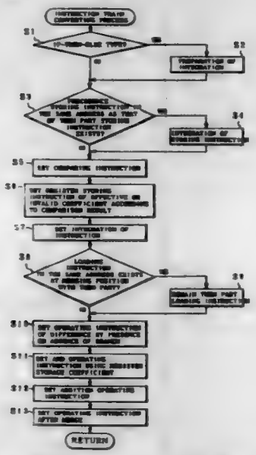
(f) such that, for bus transfers in which the memory subsystem generates the transfer ready signal in the first clock cycle of the bus transfer, the SCBT logic generates the effective READY in such first clock cycle, thereby enabling the BIU to complete the bus transfer in the first clock cycle.

5,596,732

METHOD OF OPTIMIZING INSTRUCTION SEQUENCE OF COMPILER

Akira Hozai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 2, 1994, Ser. No. 253,138
Claims priority, application Japan, Oct. 19, 1993, 5-260492
Int. Cl.[6] G06F 9/45
U.S. Cl. 395—709 **8 Claims**



1. A method of optimizing an instruction sequeace of a compiler, comprising:

a detecting step of detecting an instruction sequence including branch instructions from among instruction sequences which are obtained by converting an instruction sequence of a source program so that said instruction sequences can be executed by a pipeline computer; and

a converting step of converting said instruction sequence including the branch instructions detected in said detecting step into an equivalent instruction sequence including no branch instruction,

wherein in the case where an instruction sequence of the IF–THEN type is detected in said detecting step, said converting step comprises:

a first step of arranging a comparing instruction of the IF part of the instruction aequence of said IF–THEN part;

a second step of forming and arranging a register storing instruction for storing an effective coefficient into a value of a predetermined general register in the case where there is no branch when comparison conditions due to the execution of said comparing instruction are satisfied and for storing an invalid coefficient into the value of said general register in the case where there is a branch when the comparison conditions are not satisfied;

a third step of forming and arranging an operating instruction to obtain a difference between a value which is obtained in the case where the instruction of the THEN part was executed because there is no branch due to the execution of the comparing instruction and a value which is obtained in the case where the instruction of the THEN part was skipped by the branch instruction because there is a branch;

a fourth step of forming and arranging an AND calculating instruction for calculating the AND of the value which is obtained by executing the operating instruction of the difference due to the presence or absence of the branch in said third step and said effective coefficient or invalid coefficient which has been stored in said general register by said arranging instruction in said second step;

a fifth step of forming and arranging an adding instruction for adding the value which is obtained by the execution of said AND calculating instruction which was formed and arranged in said fourth step into a value that is used by an instruction of a merging destination; and

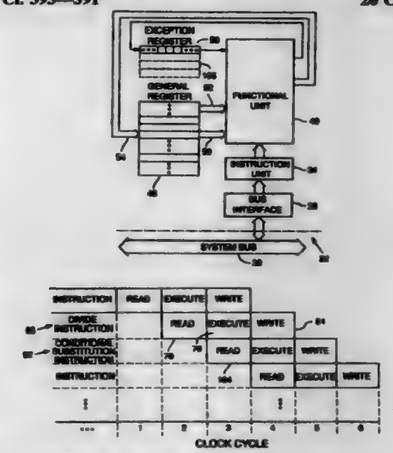
a sixth step of arranging the operating instruction at a merging position as it is.

5,596,733

SYSTEM FOR EXCEPTION RECOVERY USING A CONDITIONAL SUBSTITUTION INSTRUCTION WHICH INSERTS A REPLACEMENT RESULT IN THE DESTINATION OF THE EXCEPTING INSTRUCTION

William S. Worley, Jr., Saratoga; Jerome C. Huck, Palo Alto, and Rajiv Gupta, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 173,836, Dec. 23, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 361,874
Int. Cl.[6] G06F 9/302
U.S. Cl. 395—591 **20 Claims**



1. A computer system comprising:

a memory for storing data and instructions;

a central processing unit for processing the stored data according to the instructions, the central processing unit being operative to execute each of a set of instructions, the instruction set comprising data transfer instructions, arithmetic and logic operation instructions, and a conditional substitution instruction;

a plurality of general purpose registers for storing operands and results of instructions executed by the central processing unit; and

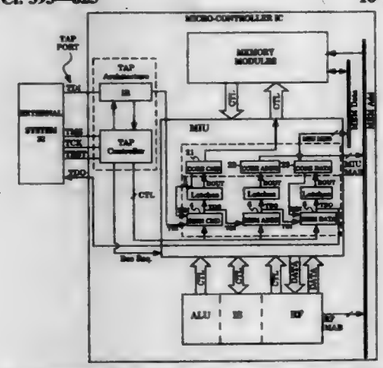
the central processing unit being operative, responsive to the conditional substitution instruction, to store a substitute result in a result register selected from the general purpose registers if a selected exception resulted from a previously executed instruction.

5,596,734

METHOD AND APPARATUS FOR PROGRAMMING EMBEDDED MEMORIES OF A VARIETY OF INTEGRATED CIRCUITS USING THE IEEE TEST ACCESS PORT

Lawrence C. Ferra, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 169,515, Dec. 17, 1993, abandoned. This application Dec. 19, 1995, Ser. No. 575,178
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—825 **10 Claims**



1. In an integrated circuit having processor means for processing instructions, storage means comprising one of an embedded memory and an on-chip cache and a memory unit having a memory bus coupled to the storage means for enabling access to the storage means, an apparatus is provided for programming memory locations of the storage means, the apparatus comprising:

a shift register disposed within the integrated circuit having a command field, an address field and a data field;

an input/output means disposed within the integrated circuit and coupled between an external system outside of the integrated circuit and the shift register for transmission of signals comprising an instruction specifying a write command, an address specifying a memory location within the storage means and data between the external system and the command field, the address field and the data field of the shift register, respectively;

first, second and third registers disposed within the memory unit and being coupled to the shift register for receiving from the command field, address field and data field of the shift register the instruction, address and data, respectively;

executable cede stored within the storage means for executing the instruction stored within the first register and writing the data stored in the third register to the memory location specified by the address stored in the second register; and

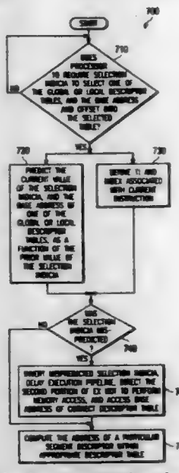
an interrupt unit coupled to the first register of the memory unit and to the processor means of the integrated circuit for interrupting operation of the processor means upon receipt of the instruction by the first register and transferring processor control to the executable code stored in the storage means.

5,596,735

CIRCUIT AND METHOD FOR ADDRESSING SEGMENT DESCRIPTOR TABLES

Mark W. Hervin, Dallas, Tex., and Raul A. Garibay, Jr., Los Altos, Calif., assignors to Cyrix Corporation, Richardson, Tex.

Filed Feb. 23, 1996, Ser. No. 606,150
Int. Cl.[6] G06F 9/38;9/42
U.S. Cl. 395—586 **26 Claims**



1. In a processor having a protected mode of operation in which a computer memory associated with said processor contains global and local descriptor tables addressed by a combination of a base address and an index, said processor having global and local base address registers alternatively to provide said base address, said processor further having a selector for containing said index and a table indicator (TI) bit indicating which of said global and local base address registers is to provide said base address, said processor requiring a time to derive said index and a value of said TI bit and a further time to combine said index and said base address, a base address register predicting circuit to predict which of said global and local base address registers is to provide said base address without having to wait for said processor to derive said value of said TI bit, comprising:

TI bit predicting circuitry to generate a predicted value of said TI bit as a function of a prior value of said TI bit; and

register access circuitry to access one of said global and local base address registers as a function of said predicted value of said TI bit.

5,596,736

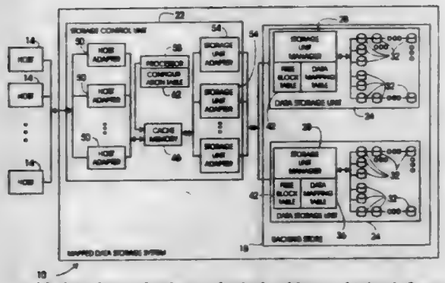
DATA TRANSFERS TO A BACKING STORE OF A DYNAMICALLY MAPPED DATA STORAGE SYSTEM IN WHICH DATA HAS NONSEQUENTIAL LOGICAL ADDRESSES

Randy G. Kerns, Boulder, Colo., assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 22, 1992, Ser. No. 920,196
Int. Cl.[6] G06F 13/00;12/00
U.S. Cl. 395—404 **16 Claims**

1. A method for destaging data in a dynamically mapped data storage system comprising:

determining a plurality of data items in a cache memory for destaging to a non-volatile backing storage means, each of



said data items having a logical address obtained from a logical data addressing scheme used by a host system for accessing data items on said dynamically mapped data storage system, said logical address used in dynamically mapping a data item to a backing storage address on said backing storage means, said backing storage address obtained from a backing storage addressing scheme different from said logical data addressing scheme of the host;

performing a write command for writing said plurality of data items onto an unallocated storage area of said backing storage means, said plurality of data items including at least a first data item being stored at a location having a first logical address and a second data item being stored at a location having a second logical address with at least said first and second logical addresses being non-sequential, said step of performing including ordering said first plurality of data items according to logical addresses wherein data items having relatively closer in number logical addresses are adjacent in said ordering, said step of performing further including decomposing said first plurality of data items into a first collection of data segments wherein each data segment in said first collection is stored in an unallocated storage area of said backing storage means with each data segment having an integral number of data items and in which said step of decomposing includes using a first predetermined criterion for varying a data segment size wherein relatively closer in number logically addressed data items are kept together in the same data segment of said first collection when a second predetermined criterion is satisfied, with said second predetermined criterion including restricting the size of a first data segment wherein a maximal difference in size between said first data segment and a second data segment is less than a predetermined value such that a data item excluded from said first data segment due to said restricting step is included in said second data segment and said step of decomposing including constructing data segments from said first plurality of data items, each constructed data segment having its data items ordered by logical address such that if a third data item and a fourth data item are in said constructed data segment and a fifth data item of said first plurality of data items has a logical address between said logical addresses of said third and fourth data items, then said fifth data item is also in said constructed data segment.

5,596,737

SEQUENCER MAP FOR A HARD DISK CONTROLLER COMBINING DATA AND NEXT-ADDRES FIELDS

Clifford E. Strang, Jr., San Jose, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

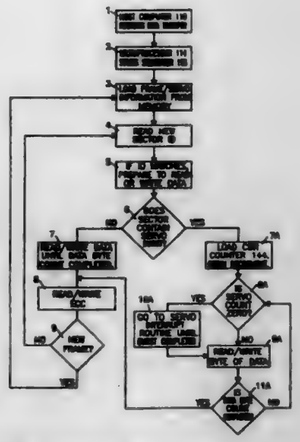
Division of Ser. No. 145,837, Oct. 28, 1993, which is a continuation of Ser. No. 704,568, May 17, 1991, abandoned. This application Apr. 23, 1996, Ser. No. 639,257

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—421.03 **7 Claims**

1. A computer system comprising:

a CPU;



a magnetic disk controller with a sequencer memory coupled to the CPU;

a magnetic disk having information written to and read from it under control of the magnetic disk controller; and

a sequencer map contained in the sequencer memory, the sequencer map having a combined data and next-address field, wherein the combined data and next-address field is identified as being used as a data field or being used as a next-address field, said data field storing data to be output from the sequencer memory, and said next-address field containing a condition code and a next-address in the sequencer map to which the sequencer memory is to branch depending on the outcome of a specified condition.

5,596,738

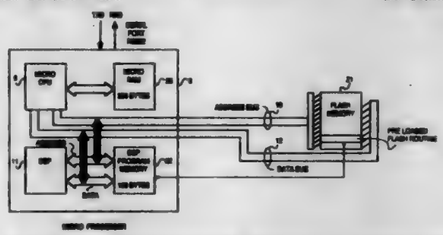
PERIPHERAL DEVICE CONTROL SYSTEM USING CHANGEABLE FIRMWARE IN A SINGLE FLASH MEMORY

Steven M. Pope, Los Gatos, Calif., assignor to Teac Corporation, Teac, Japan, and DZU Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 829,129, Jan. 31, 1992, abandoned. This application Apr. 12, 1995, Ser. No. 421,462

Int. Cl.[6] G06F *9/06*

U.S. Cl. 395—430 **20 Claims**



1. A peripheral device controller disposed on a printed circuit board located in a housing comprising:

a single flash memory chip disposed on the printed circuit board, the single flash memory chip including a preprogrammed portion having recorded control information stored therein and a changeable portion to receive and transmit changeable information;

a digital signal processor disposed on the printed circuit board, the digital signal processor including a memory store the memory store receiving

said recorded control information from said preprogrammed portion of said single flash memory chip and storing said recorded control information in said memory store;

said digital signal processor executing the recorded control information from the memory store during firmware changes, and said digital signal processor transmitting said recorded control information back to the preprogrammed portion of said flash memory chip upon completion of said firmware changes.

5,596,739

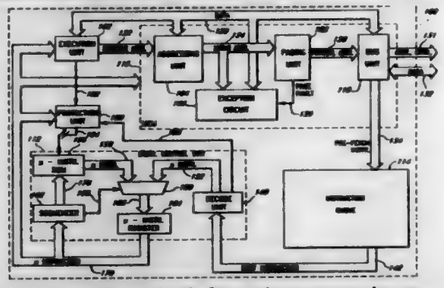
METHOD AND APPARATUS FOR DETECTING MEMORY SEGMENT VIOLATIONS IN A MICROPROCESSOR-BASED SYSTEM

James A. Kane, Newport Beach; Hsiao-Shih Chang, Orange, and Graham B. Whitted, III, Irvine, all of Calif., assignors to Meridian Semiconductor, Inc., Irvine, Calif.

Filed Feb. 8, 1994, Ser. No. 193,388

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—479 **13 Claims**



1. A memory control unit for a microprocessor that can run multiple tasks, said memory control unit having segment registers for directing memory access requests to specified segments in a memory associated with said memory control unit, said memory control unit further assigning privilege levels to said segments in said memory and assigning privilege levels to said multiple tasks, said memory control unit comprising:

a protection circuit that monitors privilege levels of tasks and privilege levels of said specified segments in said memory, said protection circuit verifying that a task requesting a specified memory segment has a task privilege level which permits said task to access said specified memory segment; and

at least one programmable protection register accessible by said protection circuit, said programmable protection register receiving as inputs said task privilege level of said task requesting said specified memory segment and a privilege level of said specified memory segment, said protection register combining said inputs and outputting at least one value that indicates whether access to said memory segment by said task is permitted, said protection circuit permitting said memory control unit to load a segment register with a value which selects said specified memory segment only when access to said specified memory segment by said task is permitted, said programmable protection register being reprogrammable to change said at least one value output by said protection register when said inputs remain the same.

5,596,740

INTERLEAVED MEMORY CONFLICT RESOLUTION WITH ACCESSES OF VARIABLE BANK WIDTHS AND PARTIAL RETURN OF NON-CONFLICTING BANKS

Marc A. Quattromani, Allen, and John K. Eitrheim, Plano, both of Tex., assignors to Cyrix Corporation, Richardson, Tex.

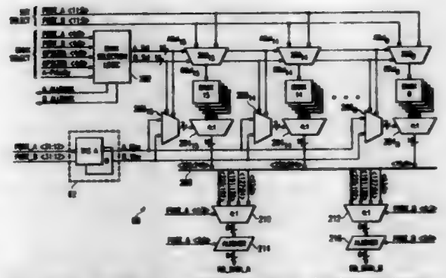
Filed Jan. 26, 1995, Ser. No. 378,330

Int. Cl.[6] G06F *12/00;13/00*

U.S. Cl. 395—484 **4 Claims**

1. A shared interleaved memory comprising:

a) a plurality of memory banks each having an address input and at least one set of data outputs;



b) a first plurality of multiplexers each having at least two address inputs and an address output respectively coupled to the plurality of memory banks;

c) a second plurality of multiplexers each having an output and at least one set of data inputs coupled to the at least one set of data outputs on the plurality of memory banks;

d) a plurality of concentrators each having an output and at least one set of data inputs coupled to the outputs of the plurality of the second multiplexers; and;

e) bank selection circuitry, coupled to the first and second plurality of multiplexers, to resolve bank conflicts between the at least two address inputs and to signal a losing bank request if either of the at least two address inputs did not receive all requested banks, the bank selection circuitry including,

(i) a mask generator having;

a premask circuit having an input for receiving an operand size code and an output;

a shifter having a first input coupled to the output of the premask circuit, a second input coupled to a plurality of address bits, and an output representative of the first input shifted N places wherein N is defined by the plurality of address bits; and,

bank width logic circuitry have an input coupled to the output of the shifter and an output for generating a bank request mask;

(ii) selection circuitry having inputs coupled to the bank request mask and an output for selecting banks; and,

(iii) received all banks indication circuitry having inputs coupled to the mask generator and to the selection circuitry.

5,596,741

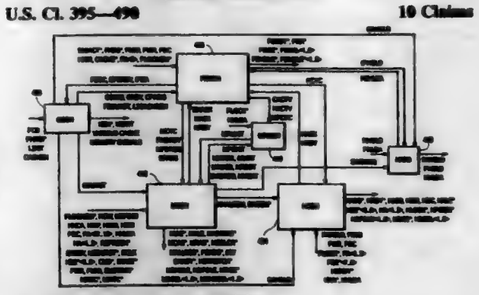
COMPUTER SYSTEM WHICH OVERRIDES WRITE PROTECTION STATUS DURING EXECUTION IN SYSTEM MANAGEMENT MODE

Gary W. Thome, Tomball, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 34,525, Mar. 22, 1993, Pat. No. 5,475,829. This application Oct. 3, 1995, Ser. No. 538,742

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—490 **10 Claims**



1. A computer system, comprising:

a disk drive for storing data;

a memory for storing data received from the disk drive in a portion of memory;

a processor having a system management mode, said processor for performing write operations to said memory during both the system management mode and in modes other than the system management mode, said processor for further providing an indication that system management mode is active and receiving an operation complete indication to proceed to the next operation;

a write protect detector for providing an indication when an accessed portion of the memory is write protected;

a memory controller coupled to said processor, to said memory and to said write protect detector for controlling operations of said memory, wherein said memory controller includes:

a determining circuit for determining when system management mode is active;

an overriding circuit for overriding a write protect indication when system management mode is determined to be active;

a control circuit for performing write operations to said memory and returning an operation complete signal to said processor when the write protect indication is not provided, said control circuit not performing a write operation to said memory and returning only said operation complete signal to said processor when the write protect indication is provided, and

wherein said overriding circuit prevents said control circuit from returning only said operation complete signal to said processor without performing a write operation to memory and causes said control circuit to write to said memory and return an operation complete signal to said processor when the write protect indication is provided and system management mode is determined to be active.

5,596,742

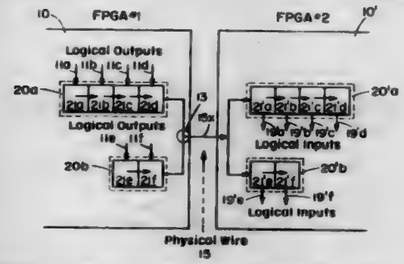
VIRTUAL INTERCONNECTIONS FOR RECONFIGURABLE LOGIC SYSTEMS

Anant Agarwal, Framingham, Mass.; Jonathan Babb, Ringgold, Ga., and Russell Tessier, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 2, 1993, Ser. No. 42,151

Int. Cl.[6] G06F *17/50*

U.S. Cl. 395—500 **42 Claims**



1. A reconfigurable electronic system comprising:

a plurality of reprogrammable logic modules, each logic module having a plurality of pins for communicating signals between logic modules;

inter-module connections between pins of different logic modules; and

a configurer to configure each logic module to define a partition of a specified target circuit with interconnections between the partitions of the target circuit being provided through pins and inter-module connections, a partition of the configured target circuit having a number of interconnections to other partitions that exceeds the number of pins on the logic module and the logic module being configured to communicate through virtual interconnections in a time-multiplexed fashion through at least one pin, the inter-module communications including interconnections which extend through intermediate reconfigurable logic modules.

5,596,743

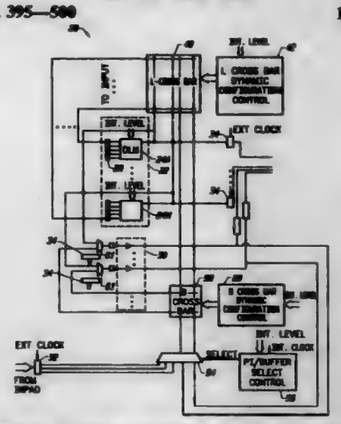
FIELD PROGRAMMABLE LOGIC DEVICE WITH DYNAMIC INTERCONNECTIONS TO A DYNAMIC LOGIC CORE

Narasimha B. Bhat, and Kamal Chaudhary, both of Berkeley, Calif., assignors to Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 70,102, May 28, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,291

Int. Cl.[6] G06F *19/00*

U.S. Cl. 395—500 **16 Claims**



1. A method of using a computing device for programming a field programmable logic device, said method comprising the steps of using said computing device for:

receiving a description of a circuit to be implemented in said field programmable logic device;

identifying logic levels within said circuit;

creating logic tables to execute the logic corresponding to each of said logic levels within said circuit;

producing input/buffer logic to select input values and buffered values to be applied to said logic tables;

generating buffer controller logic to enable the storage of buffered values at a first logic level which must be used at a subsequent logic level;

defining logic controller logic to enable the storage of input values and buffered values which are subsequently applied to said logic tables;

using said computing device for downloading said input/buffer logic, said buffer controller logic, and said logic controller logic through an interface structure to a non-volatile memory device; and

connecting said non-volatile memory device to a field programmable logic device including a dynamically configurable logic cross bar structure, a logic cross bar controller, a dynamically changing logic core dynamically changing in time with each of said logic levels a buffer cross bar structure, and a buffer controller.

5,596,744

APPARATUS AND METHOD FOR PROVIDING USERS WITH TRANSPARENT INTEGRATED ACCESS TO HETEROGENEOUS DATABASE MANAGEMENT SYSTEMS

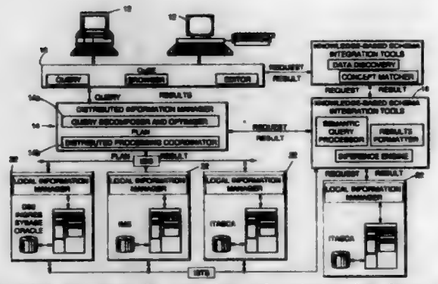
Son K. Dao, Northridge, and Nader Ebeid, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 20, 1993, Ser. No. 64,690

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—610 **22 Claims**

1. In a computer data network having a communications medium commonly connecting a plurality of local site databases containing data with a plurality of users each capable of generating



of global data query for accessing and retrieving data from said databases in accord with a single global query protocol, a method for controlling and directing a transmission of the user generated global data query to individual ones of the plurality of databases and for receiving and integrating the requested data received from the databases into a single response and for transmitting the integrated single response to the requesting user, said method comprising the following steps:

creating a smart data dictionary local site database profile containing data representing schema, data distribution, local site configuration and inter-site relationships of data among the local site databases in the network, for each local site database in the network;

communicating with said smart data dictionary local site database profile to retrieve data therefrom for decomposing the global data query into a local-site execution plan for retrieval of data from each local site database having data responsive to the global data query in accord with the data contained in said smart data dictionary local site database profile;

decomposing the global data query into a local-site execution plan for retrieval of data from each local site database having data responsive to the global data query in accord with the data contained in said smart data dictionary local site database profile;

transmitting that portion of said local-site execution plan to be executed to an appropriate said local site database for execution,

receiving data from each local site database responsive to said local-site execution plan and creating a global response database containing such responsive data received from each local site database;

providing the user access to the global response database in accord with the single global query protocol.

5,596,745

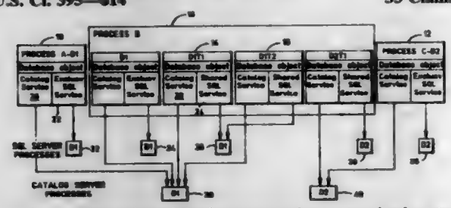
SYSTEM AND PROCEDURE FOR CONCURRENT DATABASE ACCESS BY MULTIPLE USER APPLICATIONS THROUGH SHARED CONNECTION PROCESSES

Meichen Lai; Tony Kuen Lee; Jenny Y. K. Nishimura, all of San Jose, and Gerda R. Shank, San Francisco, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1994, Ser. No. 242,939

Int. Cl.[6] G06F *17/30; 15/16*

U.S. Cl. 395—614 **33 Claims**



1. In an object-oriented database processing system having storage means for storing a plurality of databases and a plurality of user applications (UAs) for processing database access requests including schema queries and requests to execute standard query language (SQL) units of work (UOWs), for storing a plurality of catalog server processes, each linked to a respective database, and a plurality of SQL server processes, each linked to a respective database, and for storing a plurality of objects including a plurality of database access (DBA) objects for passing messages between said UAs and said databases, a method for accessing data in a first said database responsive to one or more said database access requests from a first said UA, said method comprising the steps of:

forming first logical paths between said plurality of catalog server processes and said plurality of DBA objects, and second logical paths between said plurality of SQL server processes and said plurality of DBA objects;

at least one of said first logical paths being shared among two or more DBA objects of the plurality of DBA objects;

followed by;

(a) sending said database access requests from said first UA to a first said DBA object for passing messages between said first UA and said first database, said first DBA object including first schema retrieval methods and first SQL execution methods;

(b) transferring schema query messages between said first schema retrieval methods of said first DBA object and said first database through a first said logical path; and

(c) transferring SQL UOW execution messages between said first SQL execution methods of said first DBA object and said first database through a second said logical path.

5,596,746

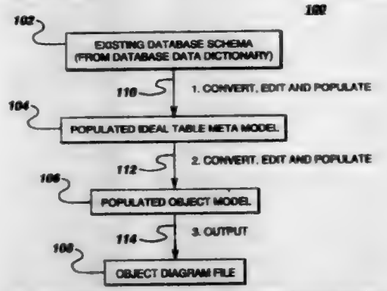
METHOD FOR TRANSFORMING RELATIONAL DATA BASE SCHEMAS INTO OBJECT MODELS USING IDEAL TABLE META MODELS

Hwa N. Shen; William J. Premerlani, both of Scotia, and Michael R. Blaha, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 779,772, Oct. 21, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,805

Int. Cl.[6] G06F *7/00; 17/30*

U.S. Cl. 395—612 **12 Claims**



1. A computer-implemented method for transforming a data base schema of a relational data base into an object model representative of said data base schema, the object model showing various objects within the data schema and their data attributes, operations, and relationships between each object in the data schema, said method comprising the steps of:

constructing an ideal table meta model of said data base schema;

populating said ideal table meta model with data extracted from said data base schema;

constructing an object diagram meta model of said data base schema from said ideal table meta model;

populating said object diagram meta model with data extracted from said ideal table meta model; and

transforming said object diagram meta model into said object model representative of said data base schema, the object model showing various objects within the data schema and their data attributes, operations, and relationships between each object in the data schema, said transforming including

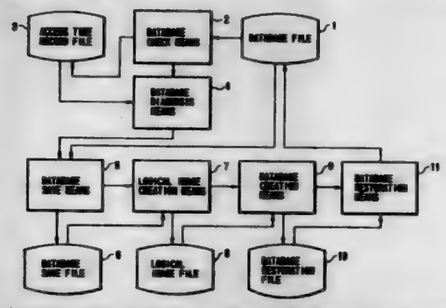
the step of transforming said object diagram meta model into a series of successive, intermediate, populated object diagram meta models describing the object model, wherein said step of transforming said object diagram meta model into said series of successive, intermediate, populated object diagram meta models comprises the steps of determining the multiplicity of associations on classes mapped from tables with foreign keys; converting classes mapped from tables whose primary keys can be partitioned into mutually exclusive primary key attributes of other classes, to many-to-many associations; converting classes mapped from tables whose primary keys are primary keys of other classes and whose non-primary key attributes include primary keys of other classes, to one-to-many associations; converting classes mapped from tables having multiple primary keys and wherein each said primary key is a primary key of another class, to one-to-one associations; and determining the actual multiplicity of said one-to-many and many-to-many associations.

5,596,747

METHOD AND APPARATUS FOR REORGANIZING AN ON-LINE DATABASE SYSTEM IN ACCORDANCE WITH AN ACCESS TIME INCREASE

Nobue Katabami, Tokyo; Tadashi Itoh, and Yasutomo Takahashi, both of Hokkaido, all of Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 979,771, Nov. 20, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 456,610
Claims priority, application Japan, Nov. 27, 1991, 3-335991
Int. Cl.[6] G06F *17/30;12/00*
U.S. Cl. 395—612 **16 Claims**



1. A database operation control system for reorganization processing of a database, which is performed while an online database system is active, comprising:

database check means for sequentially retrieving relational records from said database with an active online application program and logical addresses set to indicate correlation of the relational records, checking an access time taken for the retrieval, calculating an increase in access time from the access time and a previous access time and recording the access time increase in an access time record file;

database save means for saving data from said database to a save file;

database diagnosis means for obtaining a reorganization start increase from said access time record file as a reference value for determining whether to execute reorganization, comparing the access time increase obtained from said database check means with the reorganization start increase obtained from said access time record file, diagnosing that reorganization is necessary when the access time increase exceeds the reorganization start increase, and informing said database save means that reorganization processing of said database must be executed if the necessity of reorganization is determined;

logical image creation means for decomposing data of said save file into logical units, creating logical images as records arranged in the order of logical values, and storing the logical images in a logical image file;

database creation means for determining an optimal storage position for data in said logical image file, creating a restoration file and storing said logical images in said logical image file at said optimal storage position in said restoration file; and

restoration means for restoring data from said restoration file to said database,

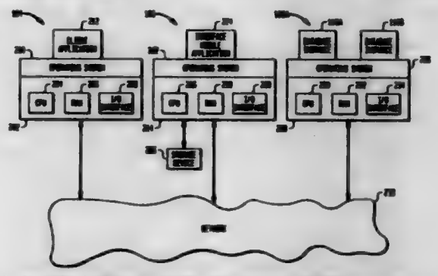
such that reorganization processing is performed in accordance with the access time increase obtained by said database check means.

5,596,748

FUNCTIONAL COMPENSATION IN A HETEROGENEOUS, DISTRIBUTED DATABASE ENVIRONMENT

James C. Kleewein; Eileen T. Lin, both of San Jose, and Yun Wang, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 314,644, Sep. 29, 1994. This application Apr. 26, 1996, Ser. No. 638,209
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—610 **2 Claims**



1. A method of compensating for functional differences between heterogeneous database management systems, wherein data associated with a client is distributed among said heterogeneous database management systems, comprising the steps of:

(1) simulating support of multiple pending database actions on a single connection, said single connection being a logical link between a client and a database instance, wherein said database instance is instantiated in any of said heterogeneous database management systems which does not support multiple pending database actions on a single connection;

(2) simulating support of cursors declared "with hold" in any of said heterogeneous database management systems which does not support cursors declared "with hold"; and

(3) compensating for security log-in procedure differences between said heterogeneous database management systems, said step of compensating comprising the steps of:

(a) receiving a local user identification and a local password when a user logs into said client;

(b) receiving a database statement issued by said client;

(c) identifying which of a plurality of database instances instantiated from said heterogeneous database management systems are needed to process said database statement;

(d) selecting one of said identified database instances;

(e) determining whether a record associated with said user and said selected database instance exists in a log-in table;

(f) if a record associated with said user and said selected database instance exists in said log-in table, then logging into said selected database instance using information contained in said record;

(g) if a record associated with said user and said selected database instance does not exist in said log-in table, then logging into said selected database instance using said local user identification and said local password; and

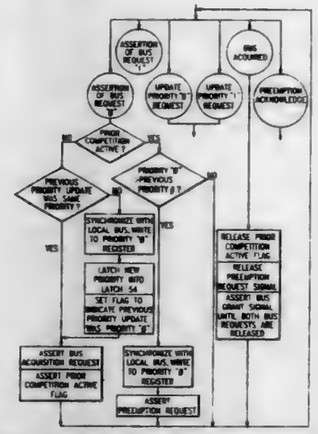
(h) performing steps (d)–(g) for each of said identified database instances.

5,596,749

ARBITRATION REQUEST SEQUENCER

Jay T. Cantrell, Dallas, and Edward R. Schurig, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 21, 1992, Ser. No. 948,048
Int. Cl.[6] G06F *13/26*
U.S. Cl. 395—673 **14 Claims**



1. A method of preventing priority inversions in a distributed mode arbitration system through self-preemption of a request competing for mastership of a bus on its own computer card, comprising the steps of:

determining whether a new task on a computer card having a priority value is greater in importance than the priority value of the task on the same computer card presently competing for mastership of the bus, wherein the presence of a new task is indicated by the sending of a message having a priority value to a send message register on the computer card; and

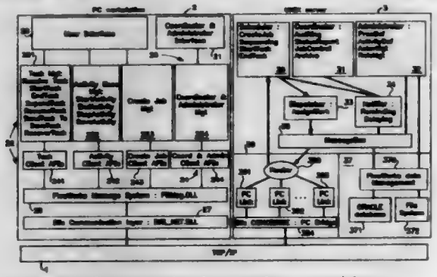
replacing the task presently competing for mastership of the bus with the new task if the new task possesses a greater priority value.

5,596,750

SYSTEM FOR TRANSACTIONAL PROCESSING BETWEEN AN INFORMATION PROCESSING SERVER AND A PLURALITY OF WORKSTATIONS

Jianzhong Li, Chateauy-Malabry; Jean-Philippe Brunon, and Mohammed Abdelmoumni, both of Paris, all of France, assignors to Bull S.A., Paris, France

Filed Jun. 8, 1993, Ser. No. 71,766
Claims priority, application France, Jun. 9, 1992, 92 06933
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—671 **30 Claims**



1. A system for transactional processing, comprising:

an information processing server (3) and at least one workstation (2) between which jobs corresponding to activities defined by procedures are executed, the server including a relational data base (37) for communicating with a message box (35), a scheduler module (30) for scheduling the execution of the jobs, said scheduler module being operable upon the completion of an activity to define a next activity and create at least one task necessary to complete the next activity;

a dispatcher module (33) for communicating between the scheduler and the message box for performing distribution of the task which is based on information defining a role and an actor stored in the relational data base which assigns a task to the actor, said dispatcher module being operable to selectively assign a task to the actor based on the work load of the system;

a notifier module (34) for communicating between the scheduler, a coordinator and the message box for preserving a log of system times and events, said notifier module being operable to receive information from the scheduler module (30) and from a coordinator module (31) which performs internal management monitoring of the server;

the message box (35) being operable to exchange signals between the dispatcher (33) and signaler (34) modules;

a communication module (36) for communication with the workstation;

a data management module (370) for managing the work flow; and

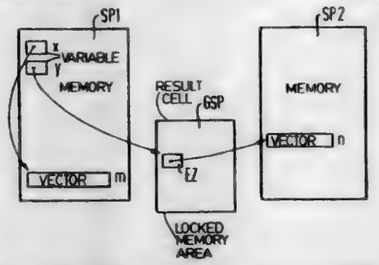
further wherein the workstation includes a communications layer (27), a message management layer (26) corresponding to work flow, an applications layer (24) including applications programming interfaces, a management services layer (25), and a user interface layer (20, 21).

5,596,751

METHOD FOR PROCESSING A USER PROGRAM ON A PARALLEL COMPUTER SYSTEM

Brigitte Glas, München; Dieter Kolb, Germering, and Markus Radlhammer, München, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 952,534, Dec. 3, 1992, abandoned. This application Mar. 23, 1995, Ser. No. 410,578
Claims priority, application Germany, Jun. 5, 1990, 40 18 012.3
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—676 **6 Claims**



1. A method for processing a user program on a parallel computer system comprising the steps of:

dividing the user program into individual processes that are respectively processed on different processors of the parallel computer system, active processes of the individual processes being respectively executed in parallel on respective different processors of the parallel computer system, said active processes having arguments that are normal data items and that are placeholders;

creating a result cell for a respective placeholder of a respective function process of said further processes during generation of

said respective function process, in a locked memory area of a memory, the locked memory area being locked from the user program;

executing in parallel, in a user mode, first and second processes of said further processes;

storing, by a system routine running in a system mode, a result of the second process in a predetermined result cell in the locked memory area when said result of the second process is associated with a placeholder, and storing a further result of the second process in a user memory area of the second processor when the further result is a normal data item;

generating, when a memory access which points to the predetermined result cell in the locked memory area is executed during execution of the first process in the user mode, an interrupt which causes an interrupt routine to run in a system mode which permits access by the interrupt routine to the predetermined result cell, and checking, by the interrupt routine, if the result from the second process is stored in the predetermined result cell, and if the result from the second process is not present in the predetermined result cell, suspending the first process until the result is present in the predetermined result cell;

wherein for normal data items the first process accesses a respective normal data item in said user memory area of the second processor without interrogation of the locked memory area.

5,596,752

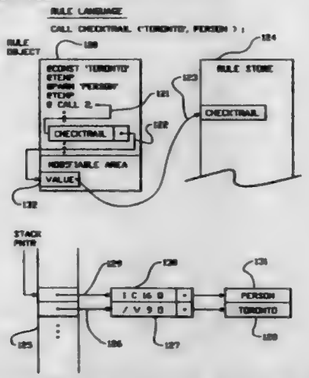
SYSTEM FOR CREATING, EDITING, DISPLAYING, AND EXECUTING RULES-BASED PROGRAMMING LANGUAGE RULES HAVING ACTION PART SUBSETS FOR BOTH TRUE AND FALSE EVALUATION OF THE CONDITIONAL PART

Helge Knudsen, Oakville; Daniel T. Chong, Woodbridge; John Yaffe, Mississauga; James E. Tougher, Mississauga; Michael Robertson, Mississauga, and Zbigniew Plazak, Etobicoke, all of Canada, assignors to Amdahl Corporation, Sunnyvale, Calif.

Division of Ser. No. 968,237, Oct. 29, 1992, which is a continuation of Ser. No. 830,548, Jan. 31, 1992, abandoned, which is a continuation of Ser. No. 450,298, Dec. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 402,862, Sep. 1, 1989. This application Mar. 11, 1993, Ser. No. 29,700

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—701 **11 Claims**



1. A programmable computer for use in creating, editing, displaying and executing programs in a rules-based programming language, said computer comprising:

means for displaying;

means for storing a set of actions in the form of executable statements and a plurality of rule means each of said rule means comprising:

i) a rule name,

ii) a set of parameters through which the computer provides input data to said rule means,

iii) a set of conditions in the form of logical expressions, each evaluating to a boolean result, said boolean result comprising one of a true state and a false state,

iv) a first ordered subset of actions from said set of actions to be executed when said result of said condition is evaluated as said true state, and

v) a second ordered subset of actions from said set of action to be executed when said result of said condition is evaluated as said false state;

wherein each action in said first and second subsets of actions has a sequence number indicating the order in which said actions in each said first and second subset of actions are to be executed; and

rule execution means for executing a rule means comprising;

means, coupled to said means for storing, for sequentially evaluating said condition of said set of conditions for a rule means being executed by said rule execution means and for generating an evaluation signal representing a first boolean value when said condition is in said true state and a second boolean value when said condition is in said false state; and

means, responsively coupled to said means for evaluating, for executing, in response to said evaluation signal for said condition presently being evaluated by said evaluation means for said rule means presently being executed by said execution means in order, said first subset of actions in response to said evaluation signal representing said first boolean value and in order said second subset of actions in response to said evaluation signal representing said second boolean value.

5,596,753

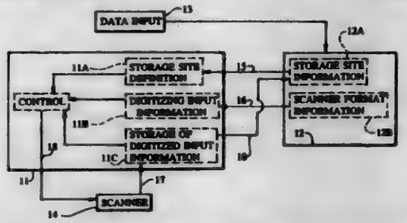
SCANNER INTERACTIVE APPLICATION PROGRAM

Bhuvnesh J. Bhatt, Stoughton, Mass., assignor to Fairhaven Software, Inc., New Bedford, Mass.

Filed Nov. 10, 1994, Ser. No. 337,105

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—682 **4 Claims**



1. Apparatus for processing input information, said apparatus comprising

(a) scanner means for creating digital representations of the input information, said scanner means having a scanner control language;

(b) a computer;

(c) an operating system in said computer to control said computer and to communicate with said scanner means using said scanner control language;

(d) an application program in said computer, said program including means to communicate with said operating system such that

(i) said application program transmits scanner format information to said operating system,

(ii) said operating system transmits to said scanner means in said scanner control language said scanner format information,

(iii) said scanner means after digitizing the input information transmits to said operating system a digitized stream representing the input information.

5,596,754

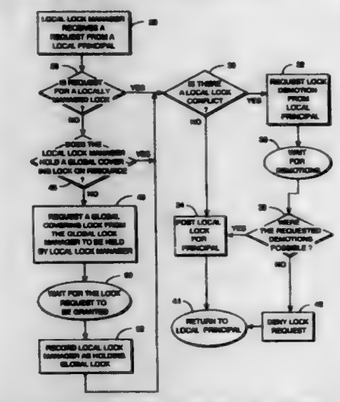
METHOD FOR PERFORMING PRIVATE LOCK MANAGEMENT

David B. Lomet, Westford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 216,787, Mar. 23, 1994, abandoned, which is a continuation of Ser. No. 968,193, Oct. 29, 1992, abandoned. This application Oct. 27, 1995, Ser. No. 549,294

Int. Cl.[6] G06F *13/36;12/14*

U.S. Cl. 395—726 **21 Claims**



1. A method for performing lock management in a distributed data sharing computer system in which a plurality of resources are shared by a plurality of servers, each of said servers associated with one of a plurality of local groups of servers, each of said local groups having a local lock manager associated therewith, said computer system having a global lock manager associated therewith, said method comprising the steps of:

defining a plurality of lock modes to govern the availability of said resources to said servers, including defining at least one lock mode that conflicts with at least another of said lock modes without covering any locks associated with said another of said lock modes;

assigning a lock to each one of said resources by one of said local lock managers, unless the requested lock has not been previously assigned by said global lock manager to one of said local lock managers, in which case said global lock manager assigns said lock to one of said local lock managers, said one of said local lock managers assigns said lock to said requesting server, each said lock being indicative of a specific one of said plurality of lock modes;

receiving requests for access to specific ones of said resources; and

administering said requests received from one of said plurality of servers by a local lock manager associated with the requesting server without exposing any of the lock modes associated with the locks on said resource to said global lock manager.

5,596,755

MECHANISM FOR USING COMMON CODE TO HANDLE HARDWARE INTERRUPTS IN MULTIPLE PROCESSOR MODES

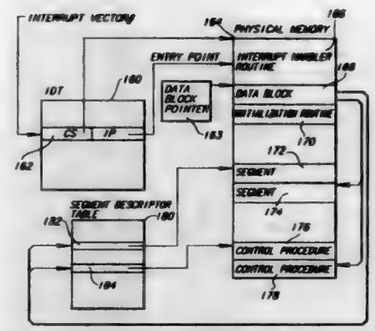
Richard A. Fletcher, Redmond, and Ralph A. Lipe, Kirkland, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 971,869, Nov. 3, 1992, abandoned. This application May 8, 1995, Ser. No. 436,085

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—734 **13 Claims**

1. In a data processing system having a processor for executing instructions and operating in different processor modes, a storage



for storing information and an interrupt handler for handling a type of interrupt, a method of handling interrupts comprising the steps of:

a) storing an indicator of a current processor mode in the storage;

b) storing information to be used by the interrupt handler when run in a first processor mode in the storage and storing information to be used by the interrupt handler when run in a second processor mode in the storage;

c) receiving an interrupt of the type handled by the interrupt handler responds;

d) in response to receiving the interrupt, determining what the current processor mode is by examining the indicator in storage;

e) running the interrupt handler using the stored information for the first processor mode in response to determining that the current processor mode is the first mode to avoid switching processor modes; and

f) running the interrupt handler using the stored information for the second processor mode in response to determining that the current processor mode is the second processor mode to avoid switching processor modes.

5,596,756

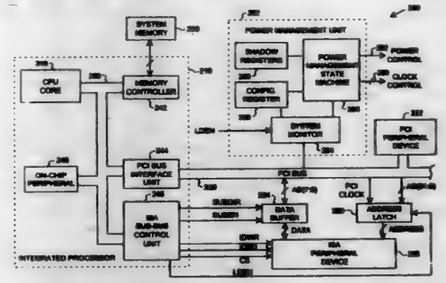
SUB-BUS ACTIVITY DETECTION TECHNIQUE FOR POWER MANAGEMENT WITHIN A COMPUTER SYSTEM

Rita M. O'Brien, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 13, 1994, Ser. No. 274,222

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—750 **13 Claims**



1. A computer system comprising:

a peripheral bus including a plurality of multiplexed address/data lines;

a latch having an input port coupled to said plurality of multiplexed address/data lines;

a data buffer having a first port coupled to said plurality of multiplexed address/data lines;

an integrated processor including:

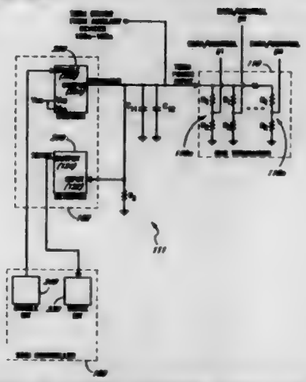
a CPU core;
a local bus coupled to said CPU core;
a bus interface unit capable of interfacing data, address, and control signals between said local bus and said peripheral bus; and
a sub-bus control unit coupled to said bus interface unit and to said latch and capable of generating a loading signal indicative of the presence of a valid address on said peripheral bus;
a peripheral device having a plurality of addressing lines coupled to an output port of said latch, and a plurality of data lines coupled to a second port of said data buffer; and
a power management unit coupled to said peripheral bus including:
a power management state machine for managing power within said computer system;
a system monitor coupled to said power management state machine and to said peripheral bus; and
a configuration register coupled to said system monitor, wherein said power management unit is configured to use a value stored within said configuration register to control a period of time after an occurrence of an address phase of said peripheral bus at which data from said peripheral bus is shadowed within said power management unit and wherein said power management unit is configured to provide said shadowed data to said peripheral bus.

5,596,757

SYSTEM AND METHOD FOR SELECTIVELY PROVIDING TERMINATION POWER TO A SCSI BUS TERMINATOR FROM A HOST DEVICE

Mark L. Smith, Laguna Beach, Calif., assignor to Simple Technology, Inc., Santa Ana, Calif.

Filed Feb. 16, 1995, Ser. No. 390,749
Int. Cl.[6] G06F *1/26;1/32*
U.S. Cl. 395—750 **30 Claims**



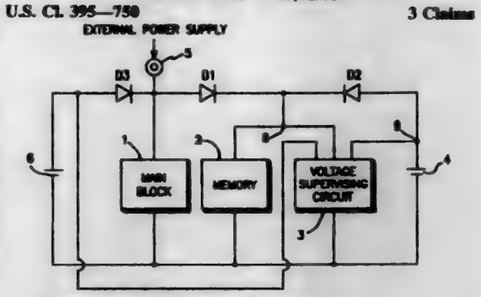
12. A system for providing termination power to a bus terminator on an information bus that interconnects a host device and one or more peripheral devices comprising:
a detector which detects whether said bus
terminator is receiving termination power from said one or more peripheral devices and provides a first signal indicative thereof;
a bus controller which controls information signals on said information bus wherein said bus controller receives said first signal from said detector and produces a second signal when said first signal indicates that said one or more peripheral devices are not providing termination power to said bus terminator; and
a switching device, engaged with a power supply providing power to said host device, that provides termination power to said bus terminator from said power supply in response to receiving said second signal from said controller.

5,596,758

MEMORY PROTECTING DEVICE FOR USE IN COMPACT ELECTRONIC APPARATUS EQUIPPED WITH AN EXTERNAL POWER SUPPLY

Yasufumi Yatsuzuka, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 887,754, May 27, 1992, abandoned. This application Mar. 15, 1995, Ser. No. 405,371
Claims priority, application Japan, May 30, 1991, 3-127692
Int. Cl.[6] G06F *15/20;12/16*
U.S. Cl. 395—750 **3 Claims**



1. A memory protecting device, comprising:
memory means;
a main power supply for supplying a main voltage to the memory means;
a backup power supply for supplying a backup voltage to the memory means;
an external power supply terminal for supplying an external voltage to the memory means;
first diode means connected between the memory means and the external power supply terminal, the first diode means including an anode terminal connected to the external power supply terminal and a cathode terminal connected to the memory means;
second diode means connected between the memory means and the backup power supply, the seconddiode means including an anode terminal connected to the main power supply and a cathode terminal connected to the memory means;
third diode means connected between the main power supply and the external power supply terminal, the third diode means including an anode terminal connected to have a same potential as the main power supply and a cathode terminal connected to the external power supply terminal;
voltage supervising means for detecting the level of the main voltage at a node between the anode terminal of the main power supply and the third diode means; and
control means for closing the memory means in accordance with a signal from the voltage supervising means when the level of the main voltage is detected to be below a specified level.

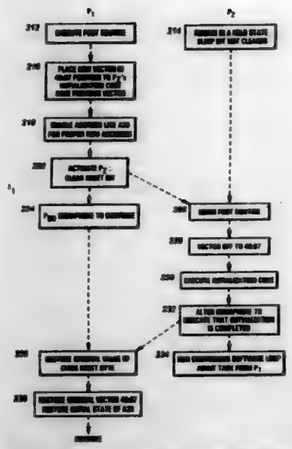
5,596,759

METHOD FOR INITIALIZING A MULTIPLE PROCESSOR COMPUTER SYSTEM USING A COMMON ROM

David A. Miller, Houston; Kenneth A. Jansen; Montgomery C. McGraw, both of Spring, and Darren J. Cepulis, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 51,601, Apr. 22, 1993, Pat. No. 5,497,497, which is a continuation of Ser. No. 431,743, Nov. 3, 1989, abandoned. This application Oct. 3, 1995, Ser. No. 538,779
Int. Cl.[6] G06F *1/24;15/167*
U.S. Cl. 395—750 **20 Claims**

1. A method of initializing a multi-processor computer system, the multi-processor computer system including at least two processors, one of which is considered a primary processor during initialization, said processors being powered up together; common



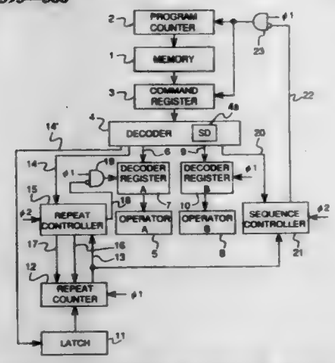
peripherals; and a common storage element which stores initialization code used during start up of the computer system, the common storage element being common to each processor, the initialization code having processor and common peripheral portions, the method comprising the steps of:
(a) each processor executing initialization code stored in the common storage element;
(b) each processor performing processor initialization code to initialize itself; and
(c) each processor determining if it is the primary processor and performing common peripheral initialization code only if it is said primary processor.

5,596,760

PROGRAM CONTROL METHOD AND PROGRAM CONTROL APPARATUS

Katsuhiko Ueda, Sakai, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 9, 1992, Ser. No. 989,056
Claims priority, application Japan, Dec. 9, 1991, 3-324417
Int. Cl.[6] G06F *9/30*
U.S. Cl. 395—588 **8 Claims**



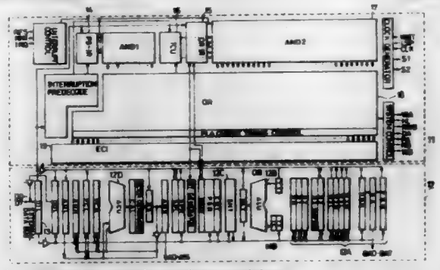
8. A program control method comprising the steps of:
storing at least a repeat command to a first address and specifying repeat execution, a repeating operation command to a second address after the first address and specifying a repeating operation to be carried out repeatedly, and subsequent commands to a third address after the second address and specifying subsequent operations to be carried out in parallel to said repeating operation, a move command to a fourth address following the third address and specifying a move function, and a wait command to a fifth address following the fourth address and specifying a wait function;
reading and decoding the commands;
executing a repeating operation determined by said repeating operation command repeatedly by a repetition number determined by said repeat command in a first execution means;
executing subsequent operations determined by said subsequent commands in parallel to the execution of the repeating operation in a second execution means for calculating a new repetition number;
renewing said repetition number, in response to said move command, with said new repetition number; and
stopping a further execution in said second execution means in response to said wait command until said repeating operation is executed repeatedly by said repetition number.

5,596,761

CENTRAL PROCESSING UNIT WITH INTERNAL REGISTER INITIALIZING MEANS

Keiichi Yoshioka, Takarazuka; Takashi Yasui, Toyonaka, and Shinichi Yamaura, Takarazuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 865,365, Apr. 8, 1992, abandoned, which is a continuation of Ser. No. 546,561, Jun. 29, 1990, abandoned. This application Aug. 2, 1993, Ser. No. 101,399
Claims priority, application Japan, Jul. 6, 1989, 1-175254
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—568 **6 Claims**



1. A central processing unit comprising:
means responsive to a reset interrupt signal and independent of dedicated circuitry for fetching arbitrary initialization data from an external data bus connected thereto, said internal registers including a program counter and a data bank register; and
means responsive to said interrupt signal for initializing said internal registers based on the initialization data fetched by said fetching means, said initializing means is configured to independently initialize said internal registers without saving a processing state of said central processing unit.

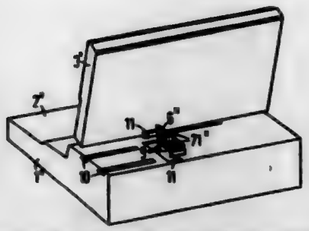
5,596,762

SMALL-SIZE COMPUTER HAVING PLUGGABLE MEMORY UNIT FOR DATA PROTECTION

Guttorm Rudi, Fjellhamar, Norway, assignor to Tandberg Data Storage AS, Oslo, Norway

Filed Nov. 9, 1990, Ser. No. 612,426
Claims priority, application Germany, Nov. 10, 1989, 39 37 541.2
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—800 **14 Claims**

1. A data store for a small size computer having a computer module and a power supply in a housing, a data display field and an input keyboard, comprising:



a memory unit for receiving and retaining data and for selectively emitting the retained data, said memory unit being a streaming mode tape recorder module in a housing, said memory unit being selectively connectable to and alternately removable from the small size computer; and

a multi-pin connector having a first part mounted on said memory unit and a second part mounted on said small size computer in said housing, said first and second parts being connectable together when said memory unit is connected said small size computer to directly connect said streaming mode tape recorder to said computer module, said multi-pin connector including line connections for supply lines, data signals, and control signal lines, said supply lines connecting said memory unit to said power supply of said small size computer.

5,596,763

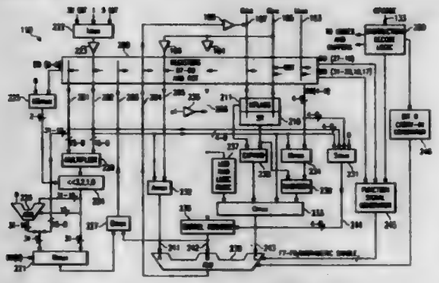
THREE INPUT ARITHMETIC LOGIC UNIT FORMING MIXED ARITHMETIC AND BOOLEAN COMBINATIONS

Karl M. Guttag, Missouri City, Tex.; Richard Simpson, and Brendan Walsh, both of Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1993, Ser. No. 159,285

Int. Cl.[6] G06F *7/38;7/50*

U.S. Cl. 395—800 **77 Claims**



1. A three input arithmetic logic unit comprising:

a first input receiving a first multibit input signal;

a second input receiving a second multibit input signal;

a third input receiving a third multibit input signal; and

a combinatorial unit connected to said first, second and third inputs, said combinatorial unit forming a multibit output signal at an output which is a mixed arithmetic and Boolean combination of said first, second and third multibit input signals, said combinatorial unit selecting said mixed arithmetic and Boolean combination selected from a set of more than three mixed arithmetic and Boolean combinations.

5,596,764

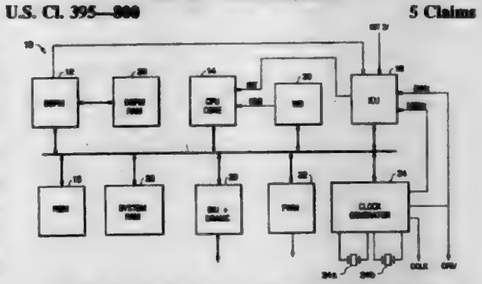
DEBUG MECHANISM FOR PARALLEL-OPERATING DSP MODULE AND CPU CORE

Gideon Intrater, Tel-Aviv; Lior Katzri, Ramat-Aviv; Omri Viner, Hod Hasharon; Raya Levitan, Givataim, and Yehezkel Tzadik, Hedera, all of Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 62,779, May 17, 1993, which is a division of Ser. No. 806,082, Dec. 6, 1991, abandoned. This application Sep. 14, 1994, Ser. No. 307,385

Int. Cl.[6] G06F *9/22;9/30*

U.S. Cl. 395—800 **5 Claims**



1. An integrated circuit data processing system comprising:

a shared internal bus for transferring both data and instructions;

a shared bus interface unit connected to the shared internal bus and connectable via a shared external bus to a shared external memory array such that instructions and data stored in the shared external memory array are transferrable to the shared internal bus via the shared bus interface unit;

a general purpose (GP) central processing unit (CPU) connected to the shared internal bus for retrieving GP instructions, the GP CPU including means for executing GP instructions to process data retrieved by the GP CPU from the shared internal bus;

a digital signal processor (DSP) module connected to the shared internal bus, the DSP module including means for executing DSP command-list code instructions to process an externally-provided digital signal received by the DSP module, execution of DSP command-list code instructions by the DSP module being independent of and in parallel with execution of GP instructions by the GP CPU; and

a debug mechanism connected to the shared internal bus for enabling breakpointing and execution resumption by the GP CPU and the DSP module, the debug mechanism including:

interrupt signal generating means associated with the DSP module for generating an interrupt signal upon occurrence of a prespecified condition within the DSP module; and

breakpoint handling means associated with the GP CPU for recognizing the interrupt signal and for causing the GP CPU to execute a prespecified breakpoint handling routine in response thereto.

5,596,765

INTEGRATED PROCESSOR INCLUDING A DEVICE FOR MULTIPLEXING EXTERNAL PIN SIGNALS

Gary Beum, and Michael S. Quimby, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 19, 1994, Ser. No. 325,906

Int. Cl.[6] G06F *13/00*

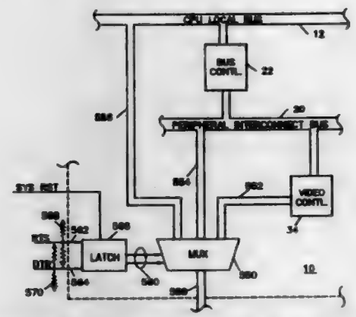
U.S. Cl. 395—800 **7 Claims**

6. An integrated processor comprising:

a CPU core and a memory controller coupled to a CPU local bus;

a DMA controller, a programmable timer, an interrupt controller, a video controller, a parallel port, a serial port and a real time clock connected to a peripheral interconnect bus;

a video controller having an input connected to said peripheral interconnect bus and an output connected to a plurality of video controller output lines;



a multiplexer having three ports and a single output port, wherein a first one of said three input ports is connected to receive a plurality of lines from said CPU local bus, a second one of said three input ports is connected to receive a plurality of lines from said peripheral interconnect bus, and a third one of said three input ports is connected to receive said plurality of video controller output lines, and wherein the output port of said multiplexer is coupled to couple one of said three input ports to said output port; and

said multiplexer comprises a selector input derived from a latch, wherein said latch is activated in one of four possible binary states dependent upon the binary condition of a pair of signals produced at the input to said latch.

5,596,766

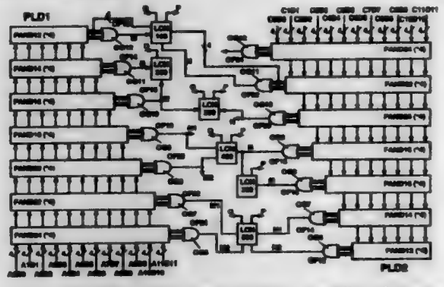
CONFIGURABLE LOGIC NETWORKS

Earle W. Jennings, III, Richardson, Tex., and George H. Landers, Mountain View, Calif., assignors to Infinite Technology Corporation, Richardson, Tex.

Continuation of Ser. No. 974,193, Nov. 10, 1992, abandoned. This application Feb. 16, 1995, Ser. No. 390,818

Int. Cl.[6] G06F *9/305*

U.S. Cl. 395—800 **33 Claims**



1. A configurable logic network having a plurality of programmable logic devices (PLD) coupled to a sub-network that is operable to perform logic operations using, logic instructions and logic values originating externally of the PLDs, under control of output logic control signals derived from said PLDs;

each programmable logic device comprising an AND logic array having inputs for receiving signals and generating product term output signals, OR logic array having inputs for receiving signals and generating sum term output signals, at least one of said logic arrays being programmable, said logic arrays interconnected to apply output signals from one of said AND and OR logic arrays as input signals to the other one of said AND and OR logic arrays, said other one of the AND and OR logic arrays providing PLD output signals;

a plurality of logic combination circuits coupled to at least one of said PLDs to receive selected ones of said PLD output signals and to produce at least one output logic control signal from each logic combination circuit as determined by the PLD output signals received by that logic combination circuit;

said sub-network comprising a controllable logic function sub-network operable to perform logic operations; inputs separate from said PLDs for supplying logic instructions and logic values to said sub-network for use in performing said logic operations; and

control logic circuitry coupling at least some of said logic combination circuits to said sub-network to supply selected ones of said output logic control signals to said sub-network to control routing within said sub-network of said logic instructions and logic values, including logic instructions and logic values generated by said sub-network in performing said logic operations.

5,596,767

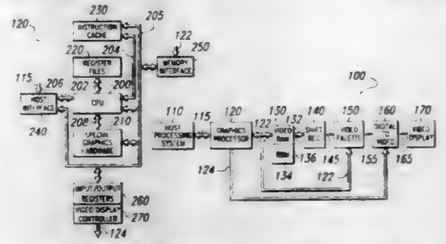
PROGRAMMABLE DATA PROCESSING SYSTEM AND APPARATUS FOR EXECUTING BOTH GENERAL PURPOSE INSTRUCTIONS AND SPECIAL PURPOSE GRAPHIC INSTRUCTIONS

Karl M. Guttag; Kevin C. McDonough, and Sergio Maggi, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 965,561, Oct. 23, 1992, Pat. No. 5,522,082, which is a continuation of Ser. No. 426,480, Oct. 23, 1989, abandoned, which is a continuation of Ser. No. 346,388, Apr. 27, 1989, abandoned, which is a continuation of Ser. No. 207,034, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 821,641, Jan. 23, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 483,810

Int. Cl.[6] G06F *9/30;15/76*

U.S. Cl. 395—800 **13 Claims**



9. A data processing apparatus comprising:

a memory interface for transmission of address, data and read/write control signals;

a microprocessor device connected to said memory interface for sequentially applying address signals and memory read control signals to said memory interface thereby recalling sequential program instructions;

performing data processing operations on data in response to the recall of a data manipulation instruction,

altering said sequence of applying said address signals to said memory interface in response to the recall of a program flow control instruction, and

applying a first address signal and a memory read control signal to said memory interface thereby recalling at least one pixel code, altering said pixel code and applying a second address signal, a memory write control signal and said altered pixel code to said memory interface thereby defining an altered visual image in response to recall of a graphics instruction;

said microprocessor device including:

a program counter having stored therein the address of the next program instruction in the program flow;

a plurality of register memories for temporary storage of data;

an arithmetic logic unit connected to said memory interface, said program counter and said register memories for performing data processing operations;

a special graphics hardware unit connected to said memory interface and said arithmetic logic unit;

an instruction register connected to said memory interface for storing a program instruction for execution;

an instruction decoder connected to said instruction register, said arithmetic logic unit and said special graphics hardware for generating a sequence of control signals for application to said arithmetic logic unit and said special graphics hardware corresponding to said program instruction stored in said instruction register, whereby said arithmetic logic unit performs data processing operations upon data stored in said register memories responsive to said sequence of control signals when a data manipulation instruction is stored in said instruction register, said arithmetic logic unit alters said address stored in said program counter responsive said sequences of control signals when a program flow control instruction is stored in said instruction register thereby controlling the order of recalling said program instructions, and said special graphics hardware unit alters pixel codes recalled from said first portion of said memory responsive said sequence of control signals when a graphics instruction is stored in said instruction register thereby altering said bit map stored in said first portion of said memory for defining an altered visual image.

DESIGNS

JANUARY 21, 1997

377,407

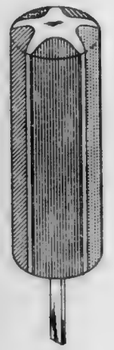
FROZEN CONFECTION

Kenneth D. Margolis, 10 Cedar Hollow Dr., Rose Valley, Pa. 19086

Filed Jun. 21, 1995, Ser. No. 40,543

Term of patent 14 years

U.S. Cl. D1—102



377,408

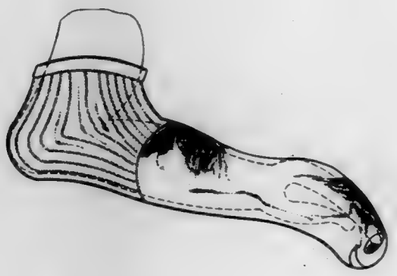
MIT FOR CHILDREN

Kathleen A. Gosselin, and Richard S. Gosselin, both of 201 Mendon Rd., North Attleboro, Mass. 02760

Filed Nov. 5, 1993, Ser. No. 14,942

Term of patent 14 years

U.S. Cl. D2—622



377,409

COMBINED DENIM AND LEATHER BOOT

Arturo A. Flores, 7613 Matamoras St., El Paso, Tex. 79915

Filed Dec. 18, 1995, Ser. No. 48,011

Term of patent 14 years

U.S. Cl. D2—910



377,410

SHOE LACE COVER

Kevin J. Crowley, Brentwood, N.H., assignor to Fila U.S.A., Inc., Hunt Valley, Md.

Filed Mar. 5, 1996, Ser. No. 51,857

Term of patent 14 years

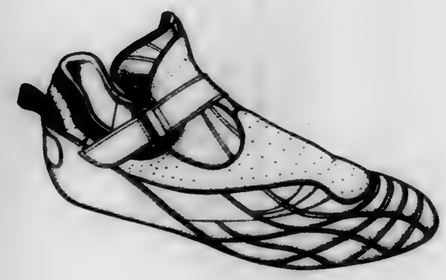
U.S. Cl. D2—946



377,411
SHOE SOLE
Cecilia Murray, Duxbury, Mass., assignor to The Keds Corporation, Cambridge, Mass.
Filed Oct. 25, 1995, Ser. No. 45,617
Term of patent 14 years
U.S. Cl. D2—953



377,412
SHOE UPPER
Mark A. Longbottom, Lockwood, and Simon J. Peel, Holmfirth, both of England, assignors to Genesco Inc., Nashville, Tenn.
Filed May 27, 1994, Ser. No. 23,622
Term of patent 14 years
U.S. Cl. D2—969



377,413
ELEMENT OF A SHOE UPPER
William J. Worthington, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 26, 1996, Ser. No. 49,659
Term of patent 14 years
U.S. Cl. D2—972



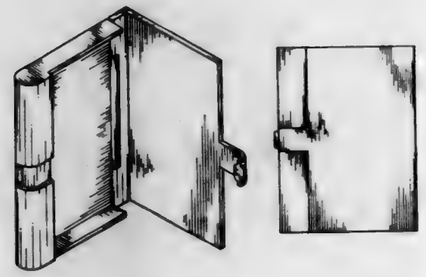
377,414
SIDE ELEMENT OF A SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 29, 1996, Ser. No. 50,911
Term of patent 14 years
U.S. Cl. D2—972



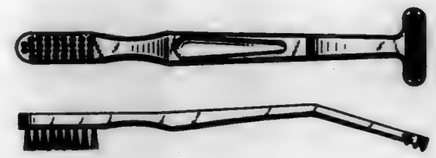
377,415
EXPANDABLE SCHOOLBAG WITH FRONT UTILITY COMPARTMENT
Steven Jacobs, New York, N.Y., and Julie B. Kampf, Tenafly, N.J., assignors to Michael Stevens, Ltd., New York, N.Y.
Filed Jun. 19, 1995, Ser. No. 40,462
Term of patent 14 years
U.S. Cl. D3—206



377,416
POCKET BUSINESS CARDS HOLDER
Chandler Aurora, 49 Horseley Hill Drive, Scarborough Ontario, Canada
Filed May 15, 1995, Ser. No. 38,890
Term of patent 14 years
U.S. Cl. D3—251



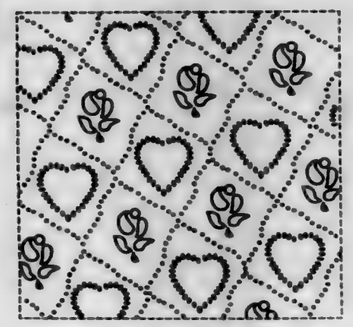
377,417
TONGUE CLEANER INTEGRALLY MOLDED WITH A TOOTHBRUSH
Subhash Gupta, 32-23 88th St., Apt. 106, Jackson Heights, N.Y. 11369
Filed Apr. 8, 1996, Ser. No. 52,832
Term of patent 14 years
U.S. Cl. D4—108



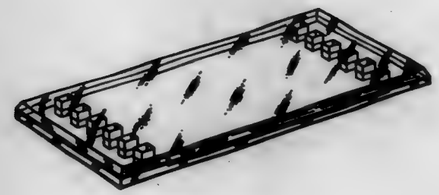
377,418
TOOTHBRUSH HOLDER
David L. Headrea, 2596 Petworth Ct., Reading, Ohio 45236
Filed Dec. 1, 1995, Ser. No. 47,358
Term of patent 14 years
U.S. Cl. D4—113



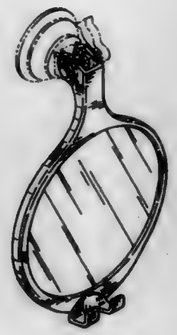
377,419
PAPER PRODUCT
Galyn A. Schulz, Greenville, Wis., assignor to James River Corporation of Virginia, Richmond, Va.
Filed Dec. 2, 1994, Ser. No. 32,881
The portion of the term of this patent subsequent to Jan. 31, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D5—35



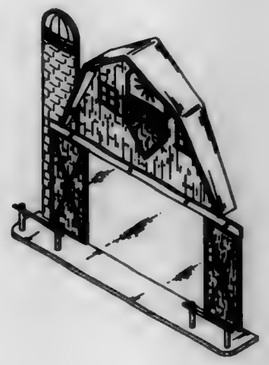
377,420
HOLDER FOR A MOVIE TRADING CARD
Ronald J. Slyh, Santa Rosa, and Joseph E. Walsmith, San Anselmo, both of Calif., assignors to Willitts Designs International, Inc., Petaluma, Calif.
Filed Jan. 1, 1995, Ser. No. 39,677
Term of patent 14 years
U.S. Cl. D6—300



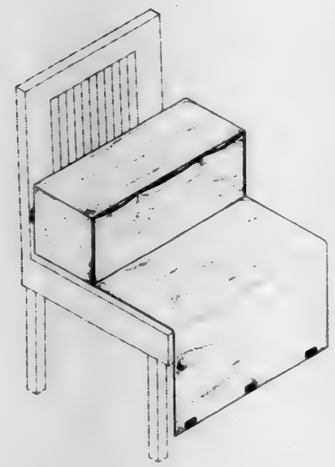
377,421
FLARED PERSONAL MIRROR
Joseph P. Young, 3796 Forsythe Way, Tallahassee, Fla. 32308
Filed Dec. 12, 1995, Ser. No. 47,755
Term of patent 14 years
U.S. Cl. D6—300



377,422
PICTURE FRAME
Robert E. Johnson, Castlewood, S. Dak., assignor to Castle Woodworks, Inc., Castlewood, S. Dak.
Filed Sep. 11, 1995, Ser. No. 43,732
Term of patent 14 years
U.S. Cl. D6—383



377,423
BOOSTER SEAT WITH SHOULDER STRAPS AND FOOT MAT
Tina L. Latrella, and Maria F. Torres, both of 3 Greenleaf Cir., Asheville, N.C. 28804
Filed Oct. 30, 1995, Ser. No. 45,807
Term of patent 14 years
U.S. Cl. D6—333



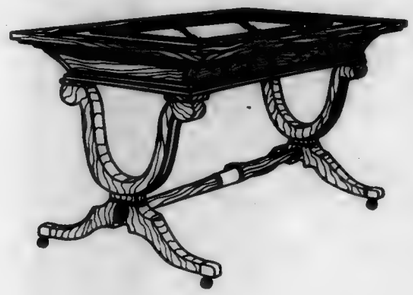
377,424
SWIVEL CHAIR
Ogden R. Olson, Muscatine, Iowa, assignor to Hon Industries, Inc., Muscatine, Iowa
Filed May 6, 1991, Ser. No. 695,760
Term of patent 14 years
U.S. Cl. D6—366



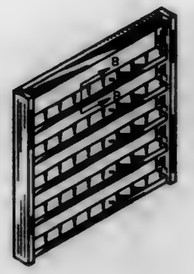
377,425
STORAGE DEVICE WITH SLIDE-OUT DRAWERS
David M. Stravitz, 16 Park Ave., Suite 14A, New York, N.Y. 10016
Filed May 7, 1992, Ser. No. 882,092
Term of patent 14 years
U.S. Cl. D6—407



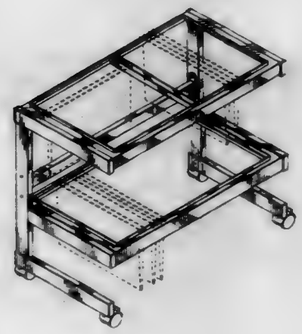
377,426
DESK
Paul A. Rosebrock, Morganton, N.C., assignor to Henredon Furniture Industries, Inc., Morganton, N.C.
Filed Nov. 30, 1995, Ser. No. 47,258
Term of patent 14 years
U.S. Cl. D6—428



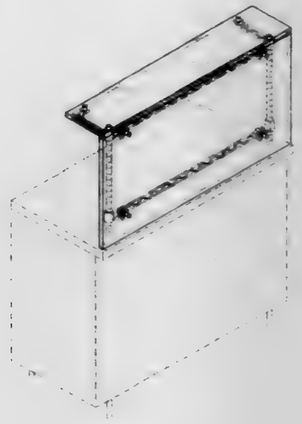
377,427
DISPLAY FOR PLURALITY OF OBJECTS
Thomas E. Ashton, II, 11833 Branch Mooring Dr., Tampa, Fla. 33635
Filed Jan. 18, 1994, Ser. No. 17,685
Term of patent 14 years
U.S. Cl. D6—474



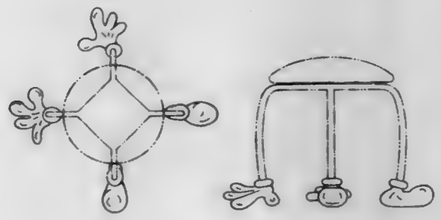
377,428
FILE TROLLEY
Ralph H. Roudeutscher, Cambridge, Canada, assignor to Performa Plus World Inc., Cambridge, Canada
Filed Jan. 20, 1995, Ser. No. 34,951
Term of patent 14 years
U.S. Cl. D6—475



377,429
SNEEZE SHIELD ASSEMBLY
Jeffrey C. Olson, Wilkes-Barre, Pa., assignor to Metro Industries, Inc., Reno, Nev.
Filed Feb. 28, 1995, Ser. No. 35,512
Term of patent 14 years
U.S. Cl. D6—491



377,430
CARTOON HANDS/FEET FOR FURNITURE
Richard C. Hopwood, Columbia, Md., assignor to Design Haus, Inc., Columbia, Md.
Filed Nov. 21, 1995, Ser. No. 46,922
Term of patent 14 years
U.S. Cl. D6—497



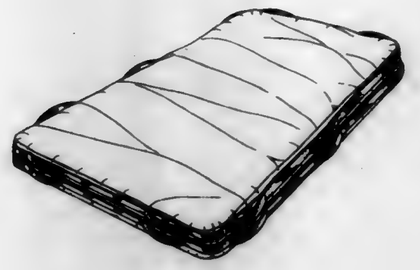
377,431
SEAT AND BACK UNIT FOR A CHAIR
William E. Stumpf; Rodney C. Schoenfelder, both of Minneapolis, Minn.; Donald Chadwick, Los Angeles, Calif., and Carolyn Keller, Holland, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.
Continuation-in-part of Ser. No. 14,382, Oct. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 898,999, Jun. 15, 1992, Pat. No. Des. 346,279. This application Sep. 29, 1994, Ser. No. 30,013
Term of patent 14 years
U.S. Cl. D6—500



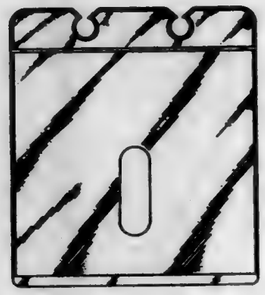
377,432
MODULAR SHELF
Joseph R. McPeek, 598 Manor Cir., Columbiana, Ohio 44408, and John J. LaBuda, 1462 Vienna Rd., Niles, Ohio 44446
Filed May 4, 1995, Ser. No. 38,353
Term of patent 14 years
U.S. Cl. D6—511



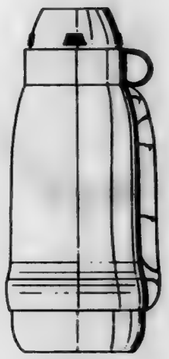
377,433
MATTRESS COVER
David A. Funk, 1606 Summernight Ter., Colorado Springs 80909, and Stephen A. Hutchins, 4190 Peach Tree Ct., Loveland, both of Colo. 80538
Filed Dec. 8, 1995, Ser. No. 47,621
Term of patent 14 years
U.S. Cl. D6—596



377,434
DISC SLEEVE
Peter J. Hammond, Auckland, New Zealand, assignor to Disk File Systems Limited, Auckland, New Zealand
Filed Oct. 5, 1993, Ser. No. 13,880
The portion of the term of this patent subsequent to Jan. 21, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—626



377,435
CONTAINER
Gary Dettmer, Braintree, and Sebastian Conran, London, both of Great Britain, assignors to Thermos Limited, Essex, United Kingdom
Filed Nov. 13, 1995, Ser. No. 46,263
Claims priority, application United Kingdom, Aug. 15, 1995, 2045592; Aug. 15, 1995, 2045613
Term of patent 14 years
U.S. Cl. D7—300



377,436
JUG
Anthony Poly, 8 Green Street, Revesby, New South Wales, Australia
Filed Feb. 27, 1995, Ser. No. 35,393
Term of patent 14 years
U.S. Cl. D7—319



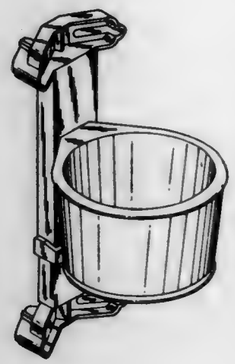
377,437
WATER PURIFICATION PITCHER
Jan H. Magnussen, Maintenvell, Minn., assignor to WTC Industries, Inc., Minneapolis, Minn.
Filed Aug. 14, 1995, Ser. No. 42,574
Term of patent 14 years
U.S. Cl. D7—319



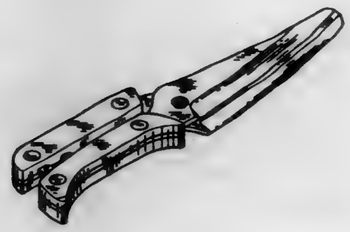
377,438
FRYING PAN
Gunther Brunnaya, Massiney, France, assignor to Tefal S.A., Rumilly, France
Filed Sep. 21, 1994, Ser. No. 28,734
Claims priority, application France, Apr. 8, 1994, 942829
Term of patent 14 years
U.S. Cl. D7—361



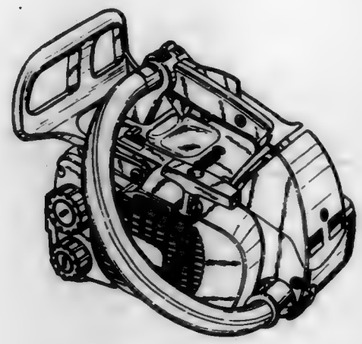
377,439
CUPHOLDER WITH SUPPORT ARMS FOR ATTACHMENT TO FURNITURE
John Ayotte, Eagan, and Peter W. A. Bergin, Hopkins, both of Minn., assignors to MTS Northwest Sound, Inc., Minneapolis, Minn.
Division of Ser. No. 26,729, Aug. 4, 1994, Pat. No. Des. 367,997, which is a continuation-in-part of Ser. No. 5,318, Feb. 26, 1993, abandoned. This application Dec. 29, 1995, Ser. No. 48,479
Term of patent 14 years
U.S. Cl. D7—620



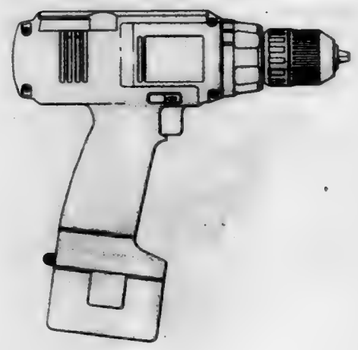
377,440
MULTI-USE SCISSORS
Kiichi Kobayashi, 922-22, Oaza-Tsukioka, Sanjo-shi, Niigata-ken 955, Japan
Filed Oct. 3, 1995, Ser. No. 44,931
Term of patent 14 years
U.S. Cl. D8—52



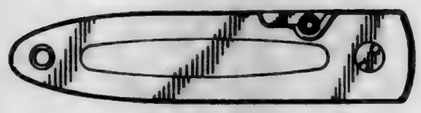
377,441
MOTOR-DRIVEN CHAIN SAW
Klaus Hüppner, Marbach; Gerd Fricke, Waiblingen, and Michael Tains, Elchingen, all of Germany, assignors to Andreas Stihl, Waiblingen, Germany
Filed Jan. 31, 1996, Ser. No. 49,737
Claims priority, application Germany, Aug. 3, 1995, 95 06 158.9
Term of patent 14 years
U.S. Cl. D8—65



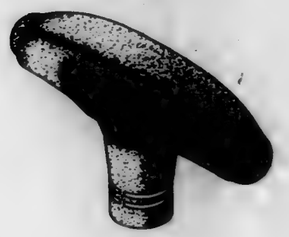
377,442
T-HANDLE DRILL
Naoki Kikuchi, Chandler, Ariz., assignor to Ryobi North America, Inc., Easley, S.C.
Filed Jul. 25, 1995, Ser. No. 41,830
Term of patent 14 years
U.S. Cl. D8—68



377,443
FOLDING KNIFE HANDLE
Brett P. Sebor, Escondido, and Roy L. Holton, Jr., San Diego, both of Calif., assignors to Buck Knives, Inc., El Cajon, Calif.
Continuation-in-part of Ser. No. 138,703, Oct. 18, 1993, abandoned, and a continuation-in-part of Ser. No. 138,670, Oct. 18, 1993, abandoned, and a continuation-in-part of Ser. No. 26,042, Jul. 18, 1994, Pat. No. Des. 369,287, and a continuation-in-part of Ser. No. 26,044, Jul. 18, 1994. This application Sep. 16, 1994, Ser. No. 28,589
Term of patent 14 years
U.S. Cl. D8—107



377,444
HANDLE FOR A TOOL
Li-Tzu Lin, No. 15, I-Chung E. Rd., Tai-Ping Hsiang, Taichung Hsien, Taiwan
Filed Oct. 30, 1995, Ser. No. 45,809
Term of patent 14 years
U.S. Cl. D8—107



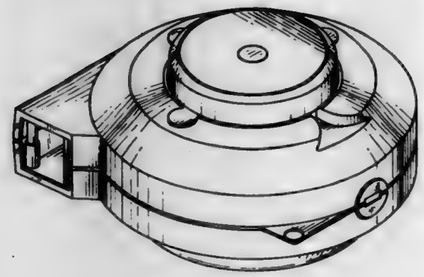
377,445
PULL
Gerald Caugh, Rockford; Kevin DeWald, Spring Lake, and Deborah Mattson, Plainwell, all of Mich., assignors to Belwith International, Grandville, Mich.
Division of Ser. No. 15,019, Nov. 5, 1993, Pat. No. Des. 369,259. This application Sep. 1, 1995, Ser. No. 43,393
Term of patent 14 years
U.S. Cl. D8—317



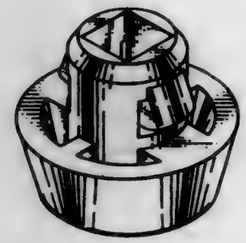
377,446
DRAW LATCH
James J. Ford, Niskayuna, N.Y.; Lynn B. Ziemer, Ridley Park, and Edward A. McCormack, Media, both of Pa., assignors to Southco, Inc., Concordville, Pa.
Division of Ser. No. 27,634, Aug. 25, 1994, Pat. No. Des. 367,218, which is a continuation-in-part of Ser. No. 19,345, Feb. 28, 1994, abandoned. This application Aug. 25, 1995, Ser. No. 43,129
Term of patent 14 years
U.S. Cl. D8—331



377,447
CASE FOR RETRACTABLY HOLDING ELONGATED FLEXIBLE OBJECT
Bruce A. Blye, Woodland Hills, Calif., assignor to National Electric Mfg. Corp., Commerce, Calif.
Filed Jan. 29, 1996, Ser. No. 49,569
Term of patent 14 years
U.S. Cl. D8—358



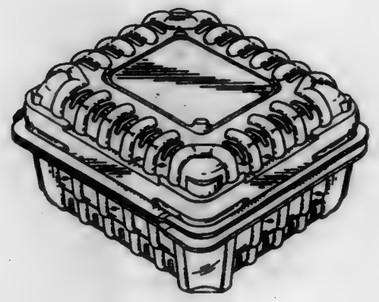
377,448
FOOT
Toshinobu Nakamura, Tokyo, Japan, assignor to Shimagawa Shoko Co., Ltd., Tokyo, Japan
Filed Feb. 12, 1996, Ser. No. 50,288
Term of patent 14 years
U.S. Cl. D8—374



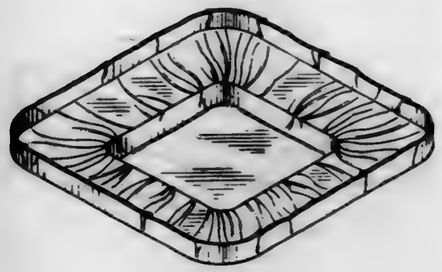
377,449
SHELF HOLDER
Clifford J. Roberts, London; Keith Brazier, Southend-on-Sea; Bryan C. Harrison, Alton, and Timothy J. H. Nicholson, Reading, all of United Kingdom, assignors to Cliffhanger Export Limited, United Kingdom
Filed Aug. 24, 1995, Ser. No. 43,070
Term of patent 14 years
U.S. Cl. D8—381



377,450
STACKABLE BERRY BOX CONTAINER WITH HINGED LID
Calvin S. Krupa, Medina, and Robert Knox, Anoka, both of Minn., assignors to Ultra Pac, Inc., Rogers, Minn.
Filed Oct. 16, 1995, Ser. No. 45,260
Term of patent 14 years
U.S. Cl. D9—425



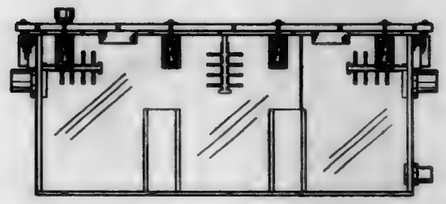
377,451
BAKING PAN
Arnold Gumowitz, Great Neck, and Gary Gumowitz, New York, both of N.Y., assignors to Seymour's Bakery, New York, N.Y.
Filed Jan. 18, 1995, Ser. No. 33,717
Term of patent 14 years
U.S. Cl. D9—432



377,452
CHILD'S TIMING DEVICE FOR MONITORING POTTY TIME
Kevin D. Boone, 4919 W. 121st St., Hawthorne, Calif. 90250
Filed Nov. 17, 1995, Ser. No. 48,752
Term of patent 14 years
U.S. Cl. D10—40



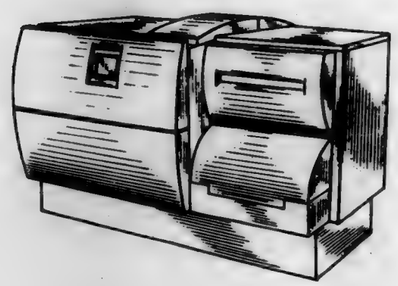
377,453
SIDE-STREAM SAMPLING DEVICE
M. Brent McClane, 3504 W. Main St., Belleville, Ill. 62223
Filed Feb. 22, 1994, Ser. No. 19,045
Term of patent 14 years
U.S. Cl. D10—46



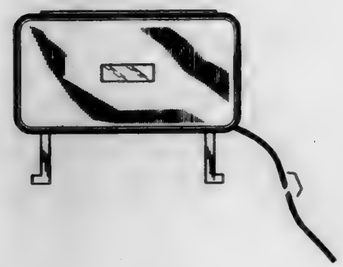
377,454
PLUMB BOB
John Littleboy, San Francisco, Calif., assignor to DWBH Ventures Ltd., Nassau, Bahamas
Filed Sep. 22, 1995, Ser. No. 44,352
Term of patent 14 years
U.S. Cl. D10—65



377,455
AUTOMATIC SAMPLE TESTING MACHINE
Thomas Burchard, Winchester; Gregg Flender, Quincy, both of Mass., and Ron Robinson, Bridgeton, Me., assignors to bioMérieux Vitek, Inc., Hazelwood, Mo.
Filed Feb. 16, 1996, Ser. No. 50,396
Term of patent 14 years
U.S. Cl. D10—81



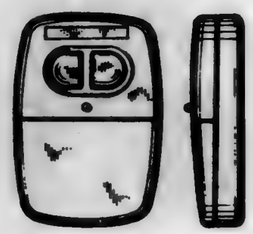
377,456
PROGRAMMABLE SPEED MONITOR DEVICE WITH PRESET SPEED INDICATOR LIGHT
Lawrence E. Healey, P.O. Box 3071, Arnold, Pa. 15068
Filed Oct. 20, 1995, Ser. No. 45,453
Term of patent 14 years
U.S. Cl. D10—98



377,457
BABY MONITOR RECEIVER
Michael D. Arney, Needham; Carl L. Madore, Allston; Elizabeth P. Goodrich, Roslindale, all of Mass.; Theodore B. Freese, Westminster, and Neil P. Zeller, Littleton, both of Colo., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Nov. 3, 1995, Ser. No. 45,985
Term of patent 14 years
U.S. Cl. D10—104



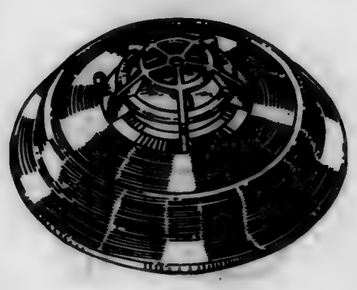
377,458
TRANSMITTER CASE
Philip Y. W. Tsui, 3513 Ingram Road, Mississauga, Canada
Filed Dec. 21, 1995, Ser. No. 48,167
Term of patent 14 years
U.S. Cl. D10—104



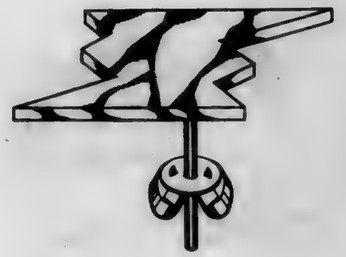
377,459
TRIANGULAR BUTTON REMOTE CONTROL TRANSMITTER
Mark Dolezal, Chicago, Ill., assignor to Audiovox Corporation, Hauppauge, N.Y.
Filed Jan. 6, 1995, Ser. No. 34,449
Term of patent 14 years
U.S. Cl. D10—106



377,460
HEAT DETECTOR
Wayne Nelson, Maynard; Lawrence G. Stanley, Templeton, and Charles Winterble, Princeton, all of Mass., assignors to Simplex Time Recorder Company, Gardner, Mass.
Filed Dec. 22, 1995, Ser. No. 48,797
Term of patent 14 years
U.S. Cl. D10—106



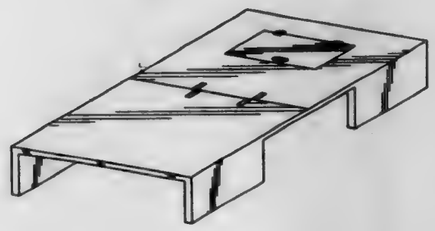
377,461
EARRING
Robert K. Kleppenburg, Jr., Middleton; Ward W. Wixon, and Craig A. Ostrom, both of Madison, all of Wis., assignors to Rayovac Corporation, Madison, Wis.
Filed Oct. 11, 1995, Ser. No. 45,175
Term of patent 14 years
U.S. Cl. D11—44



377,462
JEWELRY CLASP
Haroutioun Kassardjian, 3226 Williams Blvd., Kenner, La. 70065
Filed Nov. 6, 1995, Ser. No. 46,868
Term of patent 14 years
U.S. Cl. D11—87



377,463
PLATFORM FOR TRUCK BED
D. Brent Cressall, 982 Edwards Ave., Riverton, Wyo. 82501
Filed Nov. 27, 1995, Ser. No. 47,824
Term of patent 14 years
U.S. Cl. D12—98



377,464
BICYCLE FRAME
Bernhard Kcluk, Bellstein, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Feb. 21, 1996, Ser. No. 50,652
Claims priority, application Germany, Sep. 2, 1995, M 95 06 944.5
Term of patent 14 years
U.S. Cl. D12—111



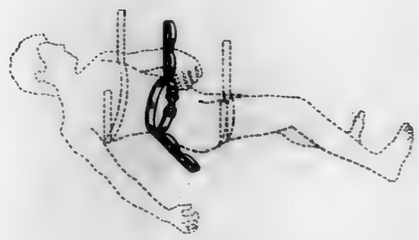
377,465
BICYCLE FRAME
Bernhard Kcluk, Bellstein, Germany, assignor to Dr. Inc. h.c.F. Porsche AG, Weissach, Germany
Filed Feb. 21, 1996, Ser. No. 50,653
Claims priority, application Germany, Sep. 2, 1995, M 95 06 945.3
Term of patent 14 years
U.S. Cl. D12—111



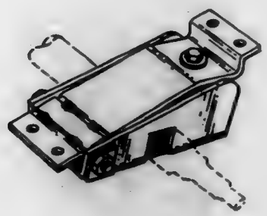
377,466
STROLLER/SWING COMBINATION
Michael Beem, 5521 Greenville Ave., Suite 104-863, Dallas, Tex. 75206
Filed Jul. 17, 1995, Ser. No. 41,491
Term of patent 14 years
U.S. Cl. D12—129



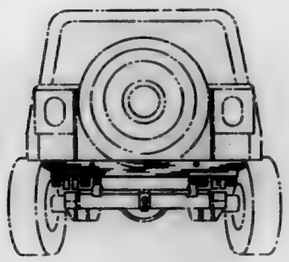
377,467
BODY LIFTING STRAP
Jerry J. Weimer, P.O. Box 1505, Livingston, Mont. 59047-1505
Filed Feb. 6, 1995, Ser. No. 34,464
Term of patent 14 years
U.S. Cl. D12—133



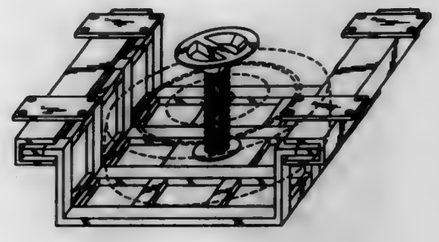
377,468
TRAILER SPRING
Daniel M. Gallagher, 10351 Highway 301 South, Dade City, Fla. 33525
Filed Nov. 21, 1994, Ser. No. 31,293
Term of patent 14 years
U.S. Cl. D12—159



377,469
LIFT FLANGE
Gary L. Howlett, P.O. Box 439, Paris, Ky. 40362
Filed Sep. 14, 1995, Ser. No. 43,899
Term of patent 14 years
U.S. Cl. D12—169



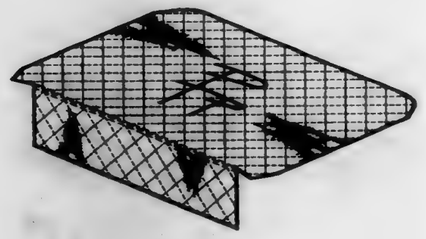
377,470
SPARE TIRE MOUNTING DRAWER
Joel Santangelo, 69 Hillcrest Dr., Greenville, N.H. 03048
Filed Sep. 29, 1995, Ser. No. 44,783
Term of patent 14 years
U.S. Cl. D12—202



377,471
FRONT FACE OF A VEHICLE WHEEL
Jens Stach, Ehningen, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Dec. 15, 1994, Ser. No. 32,319
Claims priority, application Germany, Jun. 18, 1994, 94 02 787.0
Term of patent 14 years
U.S. Cl. D12—209



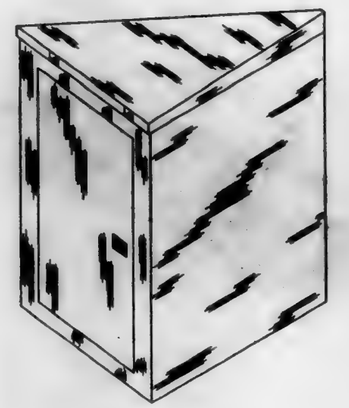
377,472
COMBINED AUTOMOTIVE TRUNK AND TRUCK BED PROTECTOR
James P. Perry, 2004 Bobby Jones, El Paso, Tex. 79936
Filed Dec. 26, 1995, Ser. No. 48,349
Term of patent 14 years
U.S. Cl. D12—221



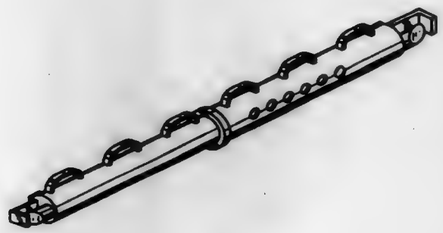
377,473
WATER CRAFT
Timothy A. Niemier, 1540 Wall St., Bellingham, Wash. 98226
Continuation-in-part of Ser. No. 11,308, Aug. 2, 1993. This application Mar. 25, 1994, Ser. No. 28,506
Term of patent 14 years
U.S. Cl. D12—302



377,474
MODULAR BIKE LOCKER
Ronald J. Rhead, Idaho Falls; Randall D. Rhead, Rexburg, and Kent Rhead, Pocatello, all of Id., assignors to Rhead Brothers Investment Corp., Rexburg, Id.
Filed Aug. 1, 1995, Ser. No. 42,120
Term of patent 14 years
U.S. Cl. D12—402



377,475
PICKUP TRUCK BED STABILIZER
William A. Bowen, P.O. Box 215, Fort Gay, W. Va. 25514
Filed Jul. 17, 1995, Ser. No. 41,493
Term of patent 14 years
U.S. Cl. D12—414



377,476

ARMREST WITH A SIDE STICK CONTROL FOR CONSTRUCTION VEHICLES AND TRUCKS

Inare Ljunggren, Hammarvägen; Jenny Lindblom, Bokskrivägen; Johnny Johansson, Hallonvägen, and HåKan Pettersson, Sunadjaga, all of Sweden, assignors to Volvo Wheel Loaders AB, Eskilstuna, Sweden

Filed Oct. 10, 1995, Ser. No. 45,141
Claims priority, application Sweden, Apr. 7, 1995, 95-0741
Term of patent 14 years
U.S. Cl. D12—421

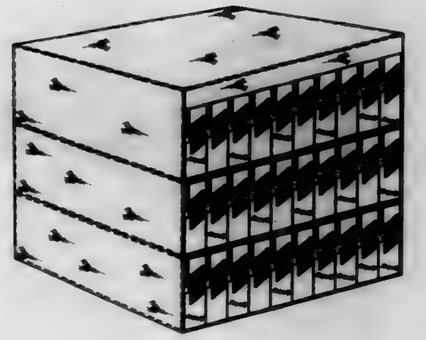


377,478

ENCLOSURE FOR HARD DRIVES

Friedrich G. Gock, Tinton Falls, N.J., assignor to ECCS, Inc., Tinton Falls, N.J.

Filed Nov. 13, 1995, Ser. No. 46,299
Term of patent 14 years
U.S. Cl. D14—100

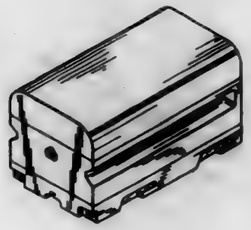


377,477

RECHARGEABLE BATTERY

Tomohiro Harata, and Yukari Miyata, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 32,753, Dec. 27, 1994, abandoned. This application May 2, 1995, Ser. No. 38,268
Claims priority, application Japan, Jun. 24, 1994, 6-12465; Nov. 14, 1994, 6-34372; Nov. 14, 1994, 6-34373
Term of patent 14 years
U.S. Cl. D13—103

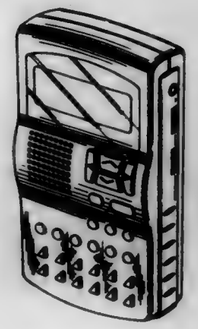


377,479

ELECTRONIC TRANSLATOR

Takeshi Matsubara, Yokohama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1996, Ser. No. 48,688
Claims priority, application Japan, Jul. 13, 1995, 7-20044
Term of patent 14 years
U.S. Cl. D14—100

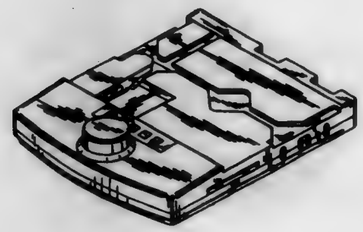


377,480

CONTROLLER COMBINED WITH A DISK PLAYER FOR A COMPUTER

Takayuki Kobayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1995, Ser. No. 43,743
Claims priority, application Japan, Mar. 27, 1995, 7-7887
Term of patent 14 years
U.S. Cl. D14—107

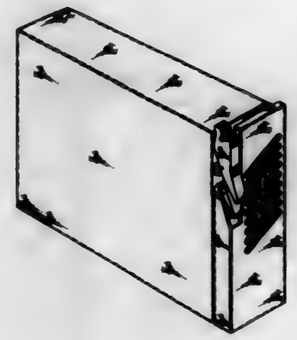


377,482

ENCLOSURE FOR A DISK DRIVE

Friedrich G. Gock, Tinton Falls, N.J., assignor to ECCS, Inc., Tinton Falls, N.J.

Filed Nov. 13, 1995, Ser. No. 46,361
Term of patent 14 years
U.S. Cl. D14—109

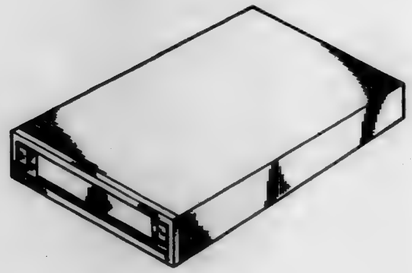


377,481

MAGNETIC DISC MEMORIZING DEVICE

Takashi Miyamoto, and Takao Watanabe, both of Tokyo, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 44,351
Claims priority, application Japan, Mar. 31, 1995, 7-8924
Term of patent 14 years
U.S. Cl. D14—108

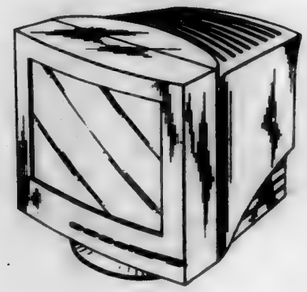


377,483

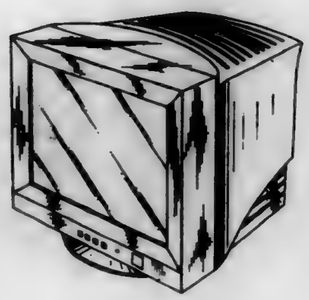
COMPUTER DISPLAY

Mitsuru Takami; Atsushi Onuma, both of Osaka, and Eiichiro Naito, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

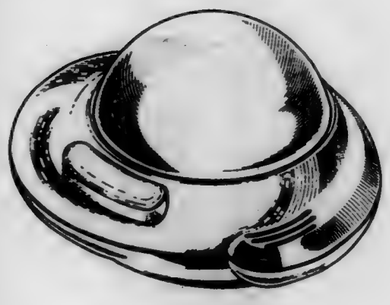
Filed Jan. 22, 1996, Ser. No. 49,279
Claims priority, application Japan, Jul. 28, 1995, 7-22242
Term of patent 14 years
U.S. Cl. D14—113



377,484
COMPUTER DISPLAY
Atsushi Ozawa; Mitsuru Takami, both of Osaka, and Eiichiro Naito, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 24, 1996, Ser. No. 49,382
Claims priority, application Japan, Jul. 28, 1995, 7-22241
Term of patent 14 years
U.S. Cl. D14—113



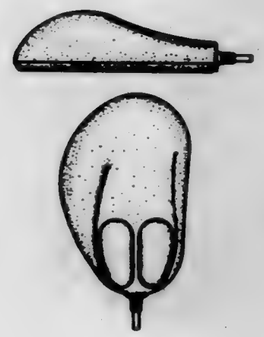
377,485
POINTING DEVICE
Steven T. Kaneko; Aditha M. Adams; Christopher Alviar, all of Seattle; Ferdinand van Engelen, Bellevue; Dana Kim, Redmond; Bridget C. Greenberg, and Dick C. K. Lin, both of Bellevue, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.
Filed Apr. 12, 1995, Ser. No. 37,711
Term of patent 14 years
U.S. Cl. D14—114



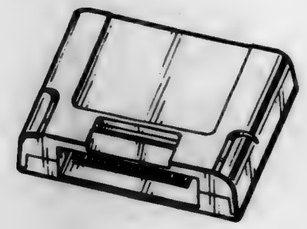
377,486
COMPUTER MOUSE
Yun-Ning Shih, 3F, No. 1, Alley 7, Lane 39, Kuo-Tai St., Panchiao, Taipei County, and Ming-Chieh Ma, 8, Alley 14, Hua-Sheng St., Shih Lin, Taipei, both of Taiwan
Filed Oct. 24, 1995, Ser. No. 46,564
Term of patent 14 years
U.S. Cl. D14—114



377,487
MOUSE
Yun Ning Shih, Panchiao, and Ming C. Ma, Taipei, both of Taiwan, assignors to Mouserey International Corp., Taipei, Taiwan
Filed Oct. 24, 1995, Ser. No. 46,699
Term of patent 14 years
U.S. Cl. D14—114



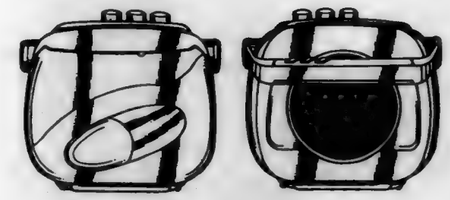
377,488
CARTRIDGE FOR GAME MACHINE
Kenichiro Ashida, Kyoto, Japan, assignor to Nintendo of America, Inc., Redmond, Wash.
Filed May 2, 1995, Ser. No. 38,391
Claims priority, application Japan, Apr. 4, 1995, 7-9414; Apr. 4, 1995, 7-9415; Apr. 4, 1995, 7-9416
Term of patent 14 years
U.S. Cl. D14—121



377,489
PORTABLE RADIOTELEPHONE
Marc Renard, Pierrefitte, France, assignor to Matra Communication, Quimper, France
Filed Jan. 11, 1996, Ser. No. 48,718
Claims priority, application WIPO, Jul. 26, 1995, Dm/033643
Term of patent 14 years
U.S. Cl. D14—138



377,490
CASSETTE PLAYER
Josh Zeitman, Brooklyn, N.Y., assignor to Lenexx Electronics Corp., Brooklyn, N.Y.
Filed Oct. 18, 1995, Ser. No. 45,138
Term of patent 14 years
U.S. Cl. D14—165



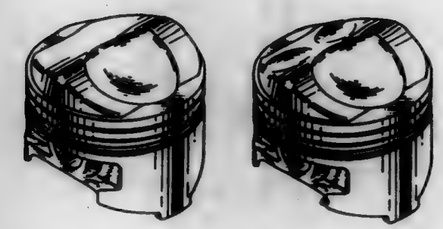
377,491
ELECTRONIC RECORDER
Peter Chou, P.O. Box 82–144, Taipei, Taiwan
Filed Feb. 8, 1996, Ser. No. 50,097
Term of patent 14 years
U.S. Cl. D14—167



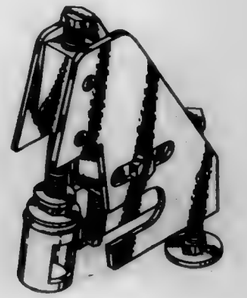
377,492
COMBINED BUMPER CAR AND CASSETTE PLAYER RADIO
Tjeerd Dijkstra, Van Der Haveslaan 102, 2353 WS Leiderdorf, Netherlands
Filed Jul. 11, 1995, Ser. No. 41,314
Claims priority, application WIPO, Feb. 16, 1995, DM32700
Term of patent 14 years
U.S. Cl. D14—160



377,493
PISTON
Hideyuki Oda; Nobuaki Murakami; Katsunori Ueda; Kyoya Igarashi; Hiromitsu Ando; Satoshi Yoshikawa; Kenji Goto, and Takashi Kawabe, all of Tokyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 15, 1995, Ser. No. 46,477
Claims priority, application Japan, May 16, 1995, 7-117555; Sep. 11, 1995, 7-26710; Sep. 11, 1995, 7-26711; Sep. 11, 1995, 7-26712; Sep. 11, 1995, 7-26713; Sep. 11, 1995, 7-26714; Sep. 11, 1995, 7-26715; Sep. 11, 1995, 7-233129
Term of patent 14 years
U.S. Cl. D15—5



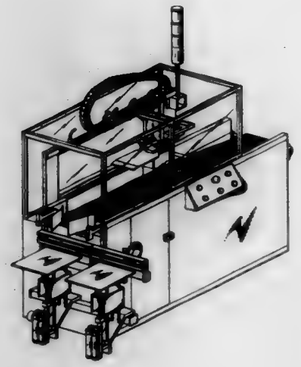
377,494
VALVE SPRING COMPRESSOR
Kelly E. Ewers, 1115 Walnut St., Osage, Iowa 50461-1743
Filed Jun. 13, 1995, Ser. No. 40,229
Term of patent 14 years
U.S. Cl. D15—122



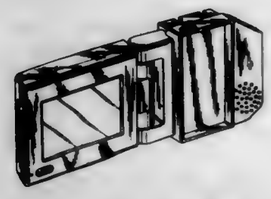
377,495
ROTATIONAL CUTTING TOOL HOUSING AND DRILL BIT CHUCK
Donald M. Cisle, 31 W. 161 Prairie La., W. Chicago, Ill. 60185-1070
Filed Oct. 23, 1995, Ser. No. 45,526
Term of patent 14 years
U.S. Cl. D15—140

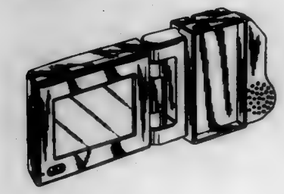


377,496
BAG LOADER
Bryan H. Poole, Lawrenceville, Ga., assignor to All-Pak Machinery Systems, Inc., Decatur, Ga.
Filed Dec. 22, 1995, Ser. No. 49,020
Term of patent 14 years
U.S. Cl. D15—145



377,497
LIQUID CRYSTAL MONITOR FOR VIDEO CAMERA
Shigetada Ninomiya, and Tsugio Akita, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 21, 1995, Ser. No. 48,150
Claims priority, application Japan, Jun. 26, 1995, 7-18452; Jun. 26, 1995, 7-18453
Term of patent 14 years
U.S. Cl. D16—219





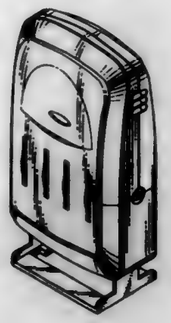
377,498
EYEGLASSES
James H. Jannard, Eastsound, Wash., and Peter Yee, Huntington Beach, Calif., assignors to Oakley, Inc., Irvine, Calif.
Filed Sep. 14, 1994, Ser. No. 28,390
Term of patent 14 years
U.S. Cl. D16—315



377,499
EYEGLASSES
Louis Garneau, St-Augustin, Canada, assignor to Louis Garneau Sports Inc., Canada
Filed Apr. 22, 1996, Ser. No. 53,409
Term of patent 14 years
U.S. Cl. D16—326



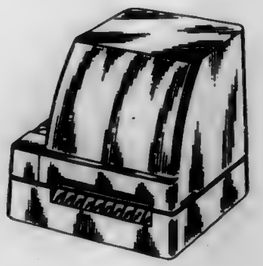
377,500
STAMPER
Masaki Kido, and Motohide Imaizumi, both of Tokyo, Japan, assignors to Shachihata Inc., Nagoya, Japan
Filed Apr. 19, 1996, Ser. No. 53,298
Claims priority, application Japan, Nov. 15, 1995, 7-34650
Term of patent 14 years
U.S. Cl. D18—15



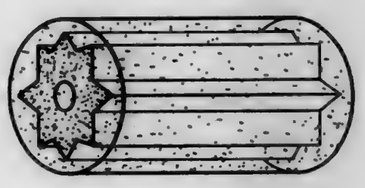
377,501
FONT OF MACHINE READABLE PATTERNS
David R. Pierce, Thousand Oaks, Calif., assignor to Computer Based Controls, Inc., Agoura Hills, Calif.
Filed Jan. 14, 1994, Ser. No. 17,469
Term of patent 14 years
U.S. Cl. D18—27



377,502
LABEL PRINTING MACHINE
Osamu Minoto, Sagamihara, Japan, assignor to Kabushiki Kaisha Tec, Japan
Filed Oct. 20, 1995, Ser. No. 49,576
Term of patent 14 years
U.S. Cl. D18—54



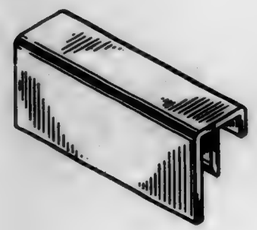
377,503
CYLINDRICAL ERASER
Sean Kitzmiller, Knoxville, and Charles M. Jackson, Nashville, both of Tenn., assignors to Berol Corporation, Brentwood, Tenn.
Filed May 19, 1995, Ser. No. 39,043
Term of patent 14 years
U.S. Cl. D19—53



377,504
VENDING MACHINE
Josef W. Schwarzli, 3927 Vanderf Road, R.R. #4, Stouffville, Ontario, Canada
Filed Nov. 6, 1995, Ser. No. 46,837
Term of patent 14 years
U.S. Cl. D20—7



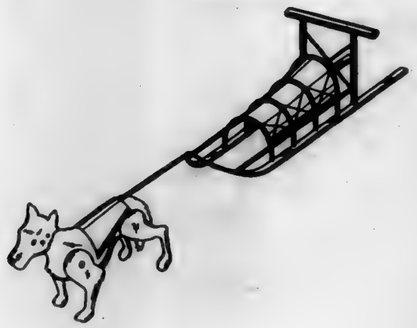
377,505
STORE DISPLAY MOUNTING BRACKET EXTRUSION
David G. Thompson, Toledo, Ohio, assignor to Valley Plastic Co., Inc., Perrysburg, Ohio
Filed Feb. 15, 1995, Ser. No. 34,913
Term of patent 14 years
U.S. Cl. D20—43



377,506
ARTICLE HOLDER
Don Shaw, Agincourt, Canada, assignor to Integrated Plastics Limited, Agincourt, Canada
Filed Feb. 16, 1996, Ser. No. 58,394
Term of patent 14 years
U.S. Cl. D20—43



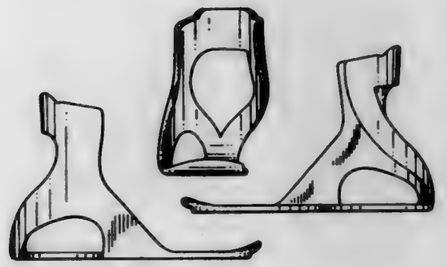
377,507
TOY DOG SLED
Silliafie Thomas, Sr., Box 22, Kwiguk, Ak. 99609
Filed Jun. 1, 1995, Ser. No. 39,654
Term of patent 14 years
U.S. Cl. D21—134



377,508
TOY
Constance R. Sisler, 50 Sutton Pl. South, New York, N.Y. 10022
Filed Nov. 28, 1995, Ser. No. 47,199
Term of patent 14 years
U.S. Cl. D21—171



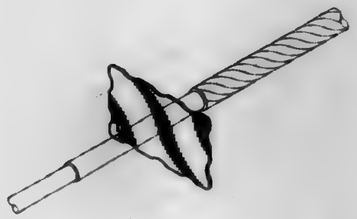
377,510
SUPPORT FRAME FOR A ROLLER SKATE
Wolfgang Bernadorfer, Mauerberg 8, A-4724 Neukirchen am Walde, Austria, assignor to B3-Vermittlungs-und Beratungs-GNBR Mag.; Gerhard Bonecker; Mario Bonecker, and Wolfgang Bernadorfer, Salzburg/Berghaim, Austria
Filed Aug. 16, 1995, Ser. No. 42,761
Term of patent 14 years
U.S. Cl. D21—226



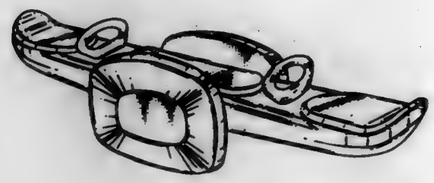
377,509
HEAD FOR GOLF CLUB
Yutaka Katayama, 11-21, 2-Chome Daizawa, Setagaya-Ku, Tokyo, Japan
Filed Dec. 28, 1995, Ser. No. 48,411
Claims priority, application Japan, Jul. 7, 1995, 7-19842
Term of patent 14 years
U.S. Cl. D21—214



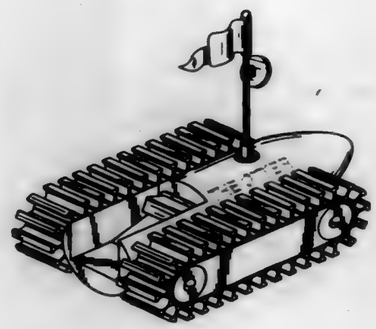
377,511
GOLF CLUB SUPPORT
Edward V. Gleason, 5191 Lakeside Dr., Palm Springs, Calif. 92264
Filed Nov. 13, 1996, Ser. No. 46,336
Term of patent 14 years
U.S. Cl. D21—234



377,512
TEETER TOTTER
Gary G. Lenihan, East Aurora, N.Y., assignor to Fisher-Price, Inc., East Aurora, N.Y.
Filed Aug. 17, 1995, Ser. No. 42,782
Term of patent 14 years
U.S. Cl. D21—251



377,514
REMOTE CONTROLLED FISHING LURE CARRIER
Gary W. Rogers, Pleasant St., P.O. Box 706, Livingston Manor, N.Y. 12758
Filed Mar. 31, 1995, Ser. No. 36,946
Term of patent 14 years
U.S. Cl. D22—134



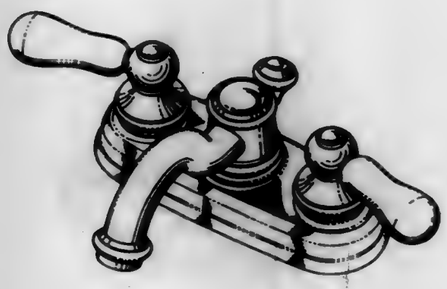
377,513
HANDGUN
Lee M. Lenkarski, Ware, Mass., and Philip H. Stevens, Skaneateles, N.Y., assignors to Smith & Wesson Corp., Springfield, Mass.
Filed May 17, 1995, Ser. No. 38,947
Term of patent 14 years
U.S. Cl. D22—104



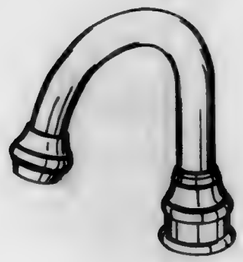
377,515
WATER FILTER CARTRIDGE
Richard D. Hembree, Edina, and James L. Land, Lake Elmo, both of Minn., assignors to Recovery Engineering, Inc., Minneapolis, Minn.
Filed May 13, 1994, Ser. No. 22,864
Term of patent 14 years
U.S. Cl. D23—289



377,516
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Apr. 4, 1996, Ser. No. 52,683
Term of patent 14 years
U.S. Cl. D23—241



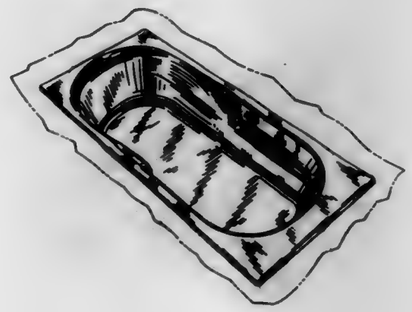
377,517
SPOUT
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Jan. 25, 1995, Ser. No. 33,976
Term of patent 14 years
U.S. Cl. D23—255



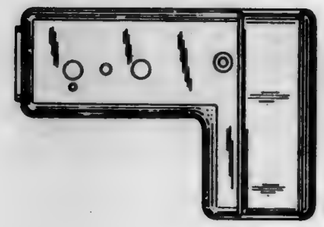
377,518
WHIRLPOOL TUB
Brent E. Bainey, New Hope, Minn., assignor to Pearl Baths, Inc., Minneapolis, Minn.
Filed Sept. 5, 1995, Ser. No. 43,573
Term of patent 14 years
U.S. Cl. D23—277



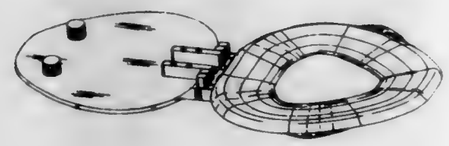
377,519
TUB FOR BATHING
Anne-Pia E. Formgren, Paris, France, assignor to Jacob Delafon, Paris, France
Filed Nov. 3, 1995, Ser. No. 45,954
Term of patent 14 years
U.S. Cl. D23—280.1



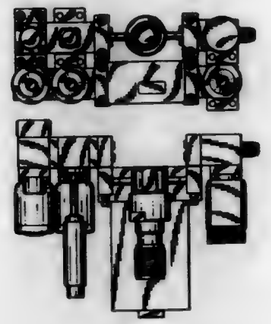
377,520
FAUCET CONTROL CASING
Robert E. Sandi; Brian N. Creager; Allen R. Becker, all of Erie, Pa., and Stephen R. Kovey, Glen Ellyn, Ill., assignors to Zurn Industries, Inc., Erie, Pa.
Filed Apr. 20, 1995, Ser. No. 37,836
Term of patent 14 years
U.S. Cl. D23—308



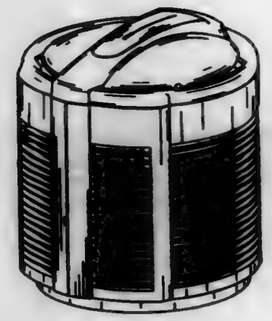
377,521
TOILET SEAT
Danny E. Hillhouse, Jr., 1523-A Peachtree St., Jackson, Miss. 39202
Filed Nov. 2, 1994, Ser. No. 30,588
Term of patent 14 years
U.S. Cl. D23—311



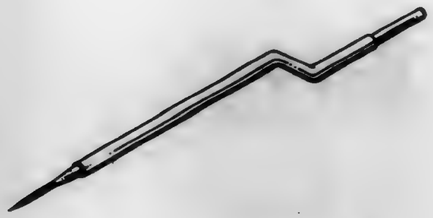
377,522
GAS FEEDER
Hiroshi Izufuji, Kasugai, Japan, assignor to CKD Kabushiki Kaisha, Komaki, Japan
Filed Aug. 22, 1995, Ser. No. 43,136
Claims priority, application Japan, Mar. 31, 1995, 7-9068
Term of patent 14 years
U.S. Cl. D23—355



377,523
AIR CLEANER
Robert Marvin, Farmington; John Staton, Bristol, both of Conn.; Brian Graves, and Andrew Parker, both of Farmington, Mass., assignors to Duracraft Corp., Southborough, Mass.
Filed Aug. 15, 1995, Ser. No. 42,642
Term of patent 14 years
U.S. Cl. D23—364



377,524
INSULATED ELECTROSURGICAL NEEDLE
Dennis C. Lipp, Lauderdale, Fla., assignor to MegaDyne Medical Products, Inc., Draper, Utah
Filed Oct. 5, 1995, Ser. No. 45,806
Term of patent 14 years
U.S. Cl. D24—144



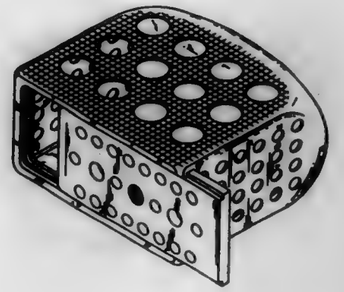
377,525
FLUID APPLICATOR LONG HANDLED BRISTLE BRUSH
Phillip Mark, 6417 Marlberry Dr., Orlando, Fla. 32819
Filed Jan. 29, 1996, Ser. No. 49,716
Term of patent 14 years
U.S. Cl. D24—152



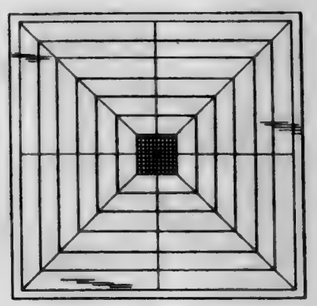
377,526
FLUID APPLICATOR LONG HANDLED KNOB BRUSH
Phillip Mark, 6417 Marlberry Dr., Orlando, Fla. 32819
Filed Jan. 29, 1996, Ser. No. 49,717
Term of patent 14 years
U.S. Cl. D24—152



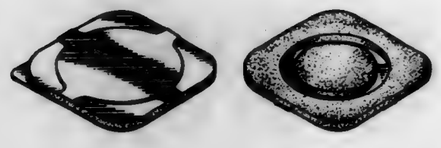
377,527
ARTIFICAL SPINAL INFUSION IMPLANT
Gary K. Michelson, Venice, Calif., assignor to Sofamor Danek Group, Inc., Memphis, Tenn.
Filed Jun. 3, 1994, Ser. No. 23,921
Term of patent 14 years
U.S. Cl. D24—155



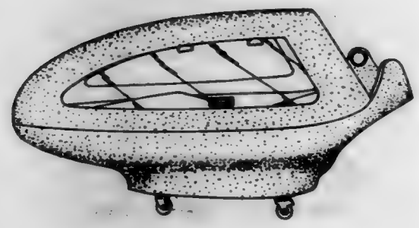
377,528
RETINA CHART
Steven A. Teich, 1735 York Ave., Apt. 3A, New York, N.Y. 10128
Division of Ser. No. 20,933, Apr. 5, 1994, Pat. No. Des. 370,259. This application Nov. 28, 1995, Ser. No. 47,188
Term of patent 14 years
U.S. Cl. D24—172



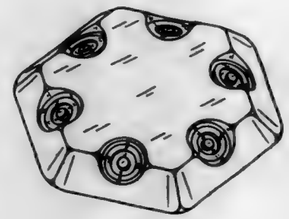
377,529
TOPICAL DRESSING
Adela Nyqvist-Mayer, Ekildsvägen 20, S-146 40 Tullinge, Sweden
Filed Oct. 4, 1994, Ser. No. 29,376
Claims priority, application Sweden, Apr. 5, 1994, 94-0796
Term of patent 14 years
U.S. Cl. D24—189



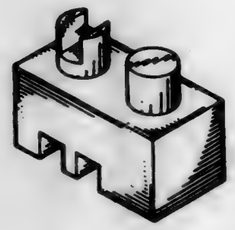
377,530
PHYSICAL THERAPY HEATED CAPSULE
Steven J. Duffer, Edina; Roger E. Mitchell, Bloomington, and Darren M. Lahann, Burnsville, all of Minn., assignors to Visibelle Derma Institute, Inc., Edina, Minn.
Filed Nov. 15, 1995, Ser. No. 49,583
Term of patent 14 years
U.S. Cl. D24—202



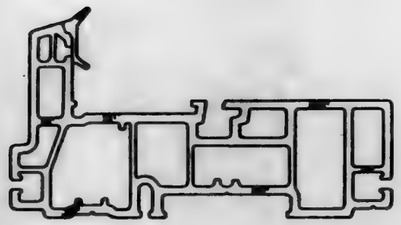
377,531
HEXAGONAL VERTICAL JET MOUND OR THE LIKE
Galvin Bartlett; Michael P. Leonhardt; W. James Clark, and Stephen S. Macey, all of c/o Sundance Spas; 13951 Monte Vista Ave., Chino, Calif. 91710
Filed Dec. 30, 1992, Ser. No. 3,158
Term of patent 14 years
U.S. Cl. D24—204



377,532
BUILDING BLOCK
Kuo Y. Lin, No. 43, Lane 14, Chung Shan N. Road, Sec. 7, Taipei, Taiwan
Filed Nov. 7, 1995, Ser. No. 46,102
Term of patent 14 years
U.S. Cl. D25—113



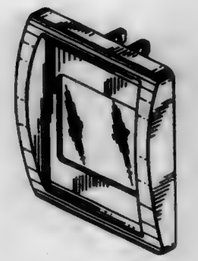
377,533
PICTURE WINDOW FRAME COMPONENT
Raymond Dallaire, and Dominique Dallaire, both of Levis, Canada, assignors to Dallaire Industries Ltd., Quebec, Canada
Filed Mar. 19, 1996, Ser. No. 51,900
Claims priority, application Canada, Sep. 22, 1995, 1995-2139
Term of patent 14 years
U.S. Cl. D25—124



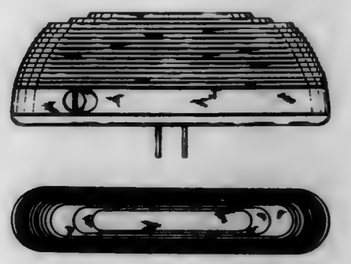
377,534
PLASTIC FENCE POST
Larry C. Bynum, 2770 Hwy. 43 N., Canton, Miss. 39046
Filed Oct. 6, 1993, Ser. No. 13,986
Term of patent 14 years
U.S. Cl. D25—126



377,535
ELECTROLUMINESCENT NIGHT LIGHT
Burt H. Shulman, Beacon, N.Y., assignor to American Tack & Hardware Co., Inc., Monsey, N.Y.
Filed Oct. 6, 1995, Ser. No. 45,856
Term of patent 14 years
U.S. Cl. D26—26



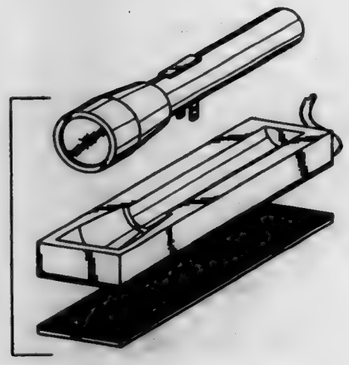
377,536
NIGHT LIGHT
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jan. 16, 1996, Ser. No. 48,992
Claims priority, application United Kingdom, Sep. 20, 1995, 2050530
Term of patent 14 years
U.S. Cl. D26—26



377,537
AUTOMOTIVE SAFETY STROBE LIGHT
Gerald Paugh, 3891 Vernon Asbury, South Vienna, Ohio 45369
Filed Dec. 1, 1995, Ser. No. 47,365
Term of patent 14 years
U.S. Cl. D26—28



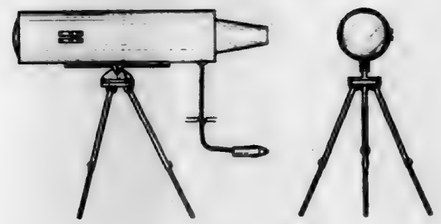
377,538
RECHARGEABLE FLASHLIGHT SYSTEM
Daniel Blevins, 157 Rockwood Dr., Jonesborough, Tenn. 37659
Filed Dec. 8, 1995, Ser. No. 47,620
Term of patent 14 years
U.S. Cl. D26—38



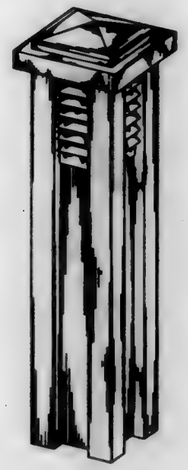
377,539
COMBINED TORCHIERE WITH TASK LIGHTS AND TABLE
Dennis K. Swanson, Woodland Hills, Calif., assignor to Lamps Plus, Inc., Chatsworth, Calif.
Filed Dec. 29, 1995, Ser. No. 48,485
Term of patent 14 years
U.S. Cl. D26—63



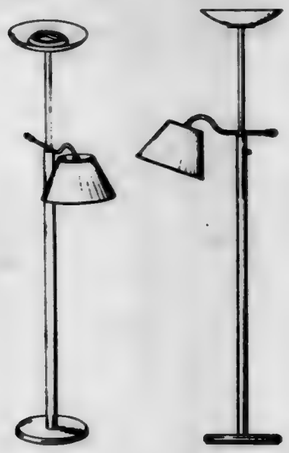
377,540
ELECTRIC FLASHLIGHT
George E. Lewthwaite, 6 Fraserton Crescent, Scarboro, Ontario, Canada
Filed May 30, 1995, Ser. No. 39,493
Term of patent 14 years
U.S. Cl. D26—64



377,541
OUTDOOR POST LAMP
David H. Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Jan. 20, 1995, Ser. No. 48,494
Term of patent 14 years
U.S. Cl. D26—68



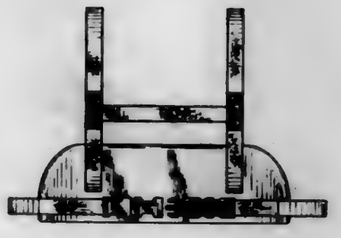
377,542
TORCHIERE LAMP WITH SIDE ARM
Thomas M. Huang, 5649 N. Peck Rd., Arcadia, Calif. 91006
Filed Oct. 27, 1995, Ser. No. 45,722
Term of patent 14 years
U.S. Cl. D26—102



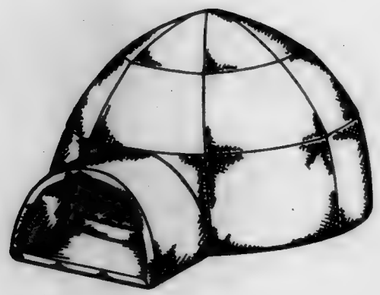
377,543
LIP BALM DISPENSER HOLDER
Thomas D. Hansen, 4827 N. E St., San Bernardino, Calif. 92407
Filed Aug. 30, 1995, Ser. No. 43,268
Term of patent 14 years
U.S. Cl. D28—73



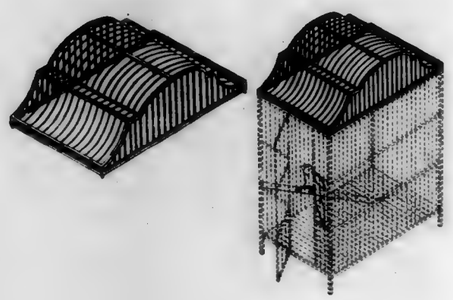
377,544
MOTORCYCLE SAFETY BELT
Stephen W. Baker, 13258 N.C. Hwy. 902, Bear Creek, N.C. 27207, and Vernon F. Baker, 4922 Cauliflower Ave., Billings, Mont. 59106
Filed Jan. 16, 1996, Ser. No. 48,920
Term of patent 14 years
U.S. Cl. D29—101



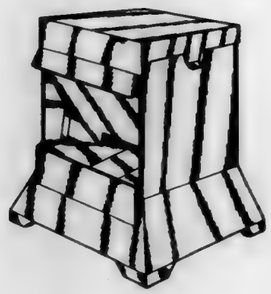
377,545
COVERED PET BED
Jeanne M. Iben, P.O. Box 5173, Gardnerville, Nev. 89410
Filed Apr. 8, 1996, Ser. No. 52,709
Term of patent 14 years
U.S. Cl. D30—118



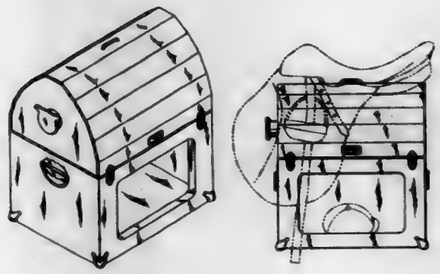
377,546
BIRD CAGE TOP
Richard King, 105 West Ln., Sayville, N.Y. 11782
Filed Jan. 10, 1995, Ser. No. 33,312
Term of patent 14 years
U.S. Cl. D30—119



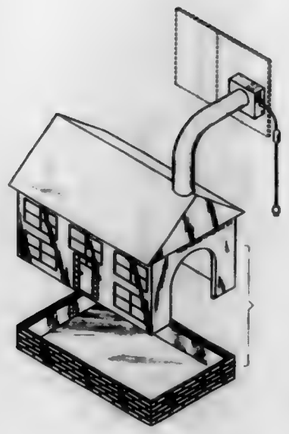
377,547
PET FOOD DISPENSER
Peter F. Bell, Wheona Coolamundra, New South Wales, 2590, Australia
Filed May 23, 1995, Ser. No. 39,199
Claims priority, application Australia, Nov. 25, 1994, 3953/94
Term of patent 14 years
U.S. Cl. D30—121



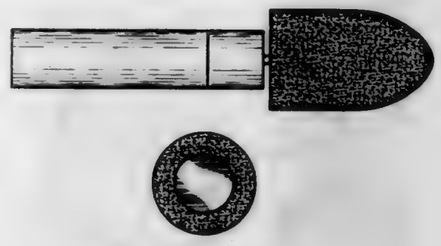
377,548
PORTABLE TACK AND GROOMING STATION
Darren J. O'Shea, 2783 Woodbridge Ave., Edison, N.J. 08817
Filed Jan. 5, 1996, Ser. No. 48,607
Term of patent 14 years
U.S. Cl. D30—143



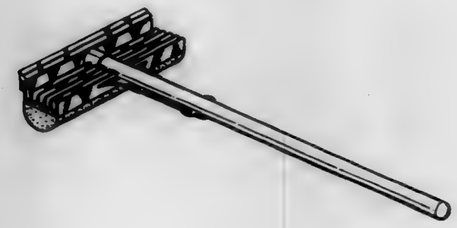
377,549
VENTED CAT LITTER BOX
Phillip A. Long, and Bob Tanner, both of 3724 Elderwood Ln., Charlotte, N.C. 28214
Filed Dec. 26, 1995, Ser. No. 48,315
Term of patent 14 years
U.S. Cl. D30—161



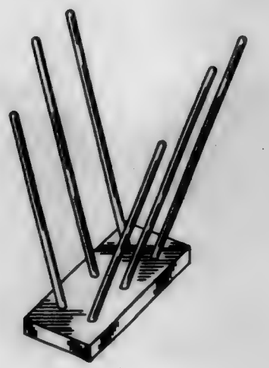
377,551
AUTOMOBILE CLEANER
Anthony E. Brown, P.O. Box 191163, Los Angeles, Calif. 90019
Filed Jun. 20, 1994, Ser. No. 24,706
Term of patent 14 years
U.S. Cl. D32—52



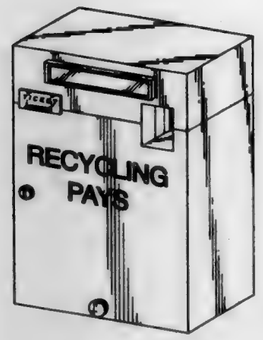
377,550
SQUEEGEE
Charles G. Shepherd, 1000 Westdale Rd., Oakville, Canada
Filed Dec. 7, 1995, Ser. No. 47,576
Claims priority, application Canada, Nov. 21, 1995, 1995-2621
Term of patent 14 years
U.S. Cl. D32—42



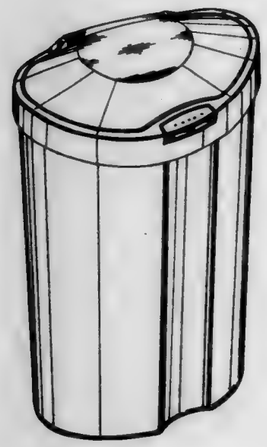
377,552
BAG DRYER
Mary Papadea, 801 Beltline Blvd., Columbia, S.C. 29205
Filed Nov. 1, 1995, Ser. No. 45,874
Term of patent 14 years
U.S. Cl. D32—58



377,553
CAN RECYCLER
Jason L. Cozart, 137 Long Branch Rd., Lawrenceburg, Tenn. 38464
Filed Nov. 16, 1995, Ser. No. 46,837
Term of patent 14 years
U.S. Cl. D34—1



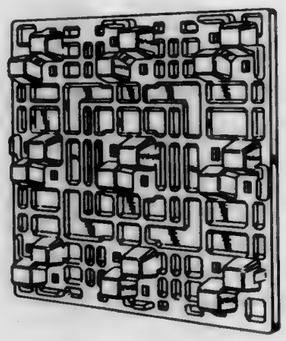
377,554
INDOOR WASTE CONTAINER
David L. Adriaansen, Boston, Mass., assignor to Tucker Housewares, Leominster, Mass.
Filed Nov. 9, 1996, Ser. No. 46,287
Term of patent 14 years
U.S. Cl. D34—7



377,555
LEVER OPERATED HOIST
toshio Ueno, Sayama, Japan, assignor to Elephant Chain Block Company Limited, Osaka, Japan
Filed Dec. 22, 1994, Ser. No. 32,656
Claims priority, application Japan, Jul. 4, 1994, 6-19932
Term of patent 14 years
U.S. Cl. D34—33



377,556
PALLET
Changize Sadr, North York, Canada, assignor to ABC Group, Rexdale, Canada
Filed Apr. 13, 1995, Ser. No. 37,464
Term of patent 14 years
U.S. Cl. D34—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21st DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.W.A.X. Progettazione E Ricerca S.r.L.: *See*—
Cappi, Angelo; and Rimondi, Renato, 5,595,042, Cl. 53-66.000.

Aaronson, Stuart A.: *See*—
Miki, Toru; and Aaronson, Stuart A., 5,595,895, Cl. 435-172.300.

Aasen, Steven M.: *See*—
Ario, Paula D.; and Aasen, Steven M., 5,595,487, Cl. 433-226.000.

ABB Teknishka Rontgencentralen AB: *See*—
Andersson, Bjorn H., 5,596,612, Cl. 376-245.000.

Abbott-Interfast Corporation: *See*—
DeHaitre, Lon, 5,595,466, Cl. 411-303.000.

Abbott Laboratories: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimm, Larry T.; and Solomon, Larry R., 5,595,739, Cl. 424-189.100.
Piontek, Carl J.; and Buck, Bradford L., 5,594,981, Cl. 29-235.000.

ABC Rail Products Corporation: *See*—
Remington, James A.; Young, Keith; and Kuhn, Stephen R., 5,595,361, Cl. 246-276.000.

Abdelmoumni, Mohammed: *See*—
Li, Jiazhong; Brunon, Jean-Philippe; and Abdelmoumni, Mohammed, 5,596,750, Cl. 395-671.000.

Abel, Jonathan S.; and Foster, Scott H., to Aureal Semiconductor Inc. Method and apparatus for efficient presentation of high-quality three-dimensional audio. 5,596,644, Cl. 381-17.000.

Abel, Steve; and Whelpley, Gordon, to AlliedSignal Inc. Pump shaft driven inlet and outlet radial pin arrangement for reducing fluid ripple. 5,595,476, Cl. 417-53.000.

Aberg, A. K. Gunnar; McCullough, John R.; and Smith, Emil R., to Sepracor Inc. Methods and compositions for treating allergic rhinitis and other disorders using descarboethoxyloratadine. 5,595,997, Cl. 514-290.000.

Abler, Frederick F. Reusable container for a stack of coins. 5,595,338, Cl. 229-87.200.

Accom, Incorporated: *See*—
Martin, Philip D.; Woodhouse, Kenneth A.; and Shaw, Simon G., 5,596,692, Cl. 395-143.000.

ACIC (Canada) Inc.: *See*—
Radatus, Bruno K.; Karimian, Khashayar; Daljeet, Anand; and Murthy, Keshava, 5,596,093, Cl. 536-55.300.

Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, to Hoffmann-La Roche Inc. Guanidine derivatives. 5,595,999, Cl. 514-309.000.

Acuson Corporation: *See*—
Wright, J. Nelson; Phugge, Jay S.; Fash, D. Grant, III; Langdon, Donald R.; Finger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.

ADAC Laboratories: *See*—
Jones, Steven M.; Lang, Thomas F.; Liebig, John R.; and Wang, Xiaohan, 5,596,197, Cl. 250-363.040.

Adachi, Masaru: *See*—
Sassa, Atsushi; and Adachi, Masaru, 5,596,608, Cl. 375-346.000.

Adams, Barry T.: *See*—
Gochenour, Daniel V.; Adams, Barry T.; Kusmer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,274, Cl. 192-70.250.
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Adams, Don L., to D/A Manufacturing Co., Inc. Steam trap test station. 5,595,211, Cl. 137-182.000.

Adams, James E., Jr.: *See*—
Hamilton, John F., Jr.; and Adams, James E., Jr., 5,596,367, Cl. 348-272.000.

Adams, Mark A.; Brill, Robert V.; and Vass, James R., to Monsanto Company. Water soluble caking inhibitors for ammonium phosphates. 5,595,688, Cl. 252-385.000.

Adamson, Mark, to Unarco LLC. Wheeled cart with child seat providing bag-hanging dividers. 5,595,394, Cl. 280-33.993.

Adaptec, Inc.: *See*—
Strang, Clifford E., Jr., 5,596,737, Cl. 395-421.030.

Adembri, Andrea; Credali, Lino; and Di Drusco, Giovanni, to Sir Industriale S.p.A. Crosslinkable polyester/isocyanate compositions suitable for preparing composite manufactured articles, in particular by means of injection processes, process for preparing them and their use. 5,596,021, Cl. 521-99.000.

Aden, James S.: *See*—
Hindagolla, Suraj L.; Hopkins, Glen A.; Taub, Howard H.; Lam, Si-Ty; McClelland, Paul H.; and Aden, James S., 5,595,785, Cl. 427-271.000.

Adir et Compagnie: *See*—
Billington, David; Dorey, Gilbert; Leon, Pascale; Atassi, Ghanem; Pierre, Alain; Burbridge, Michael; and Guilbaud, Nicolas, 5,595,976, Cl. 514-25.000.

Adusumilli, Prasad S.; and James, Kenneth W., to SmithKline Beecham Corporation. Soft-shelled gelatin encapsulated particles. 5,595,758, Cl. 424-456.000.

Advanced Interconnections Corporation: *See*—
Murphy, James V.; and Murphy, Michael J., 5,596,224, Cl. 257-666.000.

Advanced Micro Devices: *See*—
Mullins, Jacqueline; Peterson, Joseph W.; Bartkowiak, John; and Hendrickson, Alan F., 5,596,724, Cl. 395-250.000.

Advanced Micro Devices, Inc.: *See*—
Baum, Gary; and Quimby, Michael S., 5,596,765, Cl. 395-800.000.
Hanlin, Charles E., 5,596,471, Cl. 361-92.000.
Lin, Jonathan; and Sharpe-Geisler, Bradley A., 5,596,524, Cl. 365-185.100.
Liu, David K. Y.; Kwan, Ming S.; Chang, Chi; Haddad, Sameer; and Tang, Yuan, 5,596,531, Cl. 365-185.310.
Njinda, Charles A.; and Kaul, Neeraj, 5,596,585, Cl. 371-22.500.
O'Brien, Rita M., 5,596,756, Cl. 395-750.000.

Advertising Display Company: *See*—
Bauer, Jamie D.; and Kristo, John P., 5,595,309, Cl. 211-59.100.

Afonso, Adriano: *See*—
Wolin, Ronald L.; Afonso, Adriano; Kelly, Joseph M.; and Njoroge, F. George, 5,595,998, Cl. 514-293.000.

Agarwal, Anant; Babb, Jonathan; and Tessier, Russell, to Massachusetts Institute of Technology. Virtual interconnections for reconfigurable logic systems. 5,596,742, Cl. 395-500.000.

Agfa-Gevaert N.V.: *See*—
Bogaerts, Constant; Van Bchelpoel, Eric; Goossens, Henri; Van Gostheim, Luc; and Van Aken, Luc, 5,595,454, Cl. 403-263.000.
Janssens, Wilhelmus; and Vanmaele, Luc, 5,595,574, Cl. 8-471.000.
Leenders, Luc; Uytterhoeven, Hermans; Torfs, Rita; Oelbrandt, Leo; Uyttendaele, Carlo; and Van den Bogaert, Jan, 5,595,854, Cl. 430-200.000.
Tytgat, Bart; and Dierckx, Paul, 5,596,428, Cl. 358-518.000.
Van den Zegel, Marc; and Meatdagh, Marcel, 5,595,864, Cl. 430-569.000.

Aghassipour, Xerxes K. Insulated bag for beer keg. 5,595,320, Cl. 220-466.000.

Aguilar, Josephine: *See*—
Mead, Sharon B.; Brennan, Susan J.; Morelos, Arsenia; and Aguilar, Josephine, 5,596,027, Cl. 523-161.000.

Ahrweiler, Hans W.: *See*—
Wolf, Andreas; and Ahrweiler, Hans W., 5,596,617, Cl. 377-73.000.

Aida, Kazuo: *See*—
Sakakibara, Nobuhiro; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,596,441, Cl. 359-192.000.

Air Products and Chemicals, Inc.: *See*—
Walker, Frederick H., 5,596,030, Cl. 523-404.000.

Airtrol Components Inc.: *See*—
Atkinson, Louis D.; and Rave, Kevin M., 5,595,209, Cl. 137-116.500.

Aisan Kogyo Kabushiki Kaisha: *See*—
Miyata, Hiroshi; and Ishida, Katsumi, 5,596,257, Cl. 318-685.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Nagamori, Kiyosobu; Yagami, Sigeki; and Mitubayashi, Hidoaki, 5,595,425, Cl. 303-22.100.
Watanabe, Tsukasa; Miyashiro, Mutsumi; Suzaki, Shusetsu; Goto, Takeshi; and Fujita, Kozo, 5,595,089, Cl. 74-89.150.
Yokoi, Shinji; Michida, Shinji; Mori, Yoshinori; and Nishidera, Tsuyoshi, 5,594,961, Cl. 5-11.000.

Ajilore, Akin O., to Caterpillar Inc. Linkage arrangement. 5,595,471, Cl. 414-685.000.

Akahoshi, Haruo: *See*—
Itabashi, Takeyuki; Akahoshi, Haruo; and Takahashi, Akio, 5,595,943, Cl. 437-230.000.

Akaike, Kazuhiko: *See*—
White, Gail K.; Noguchi, Fujio; Akaike, Kazuhiko; and Schaffer, Mark, 5,596,373, Cl. 348-569.000.

Akama, Fumio; and Tanaka, Yasuyuki, to Nippon Mektron, Ltd. Manufacturing method for double-sided wiring board. 5,595,858, Cl. 430-314.000.

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Nakase, Kenji; Nishida, Yasunori; Akamatsu, Chikashi; Satoh, Tomoari; Tanino, Kazuyuki; and Yamamoto, Taketsugu, 5,595,842, Cl. 429-223.000.

Akasaka, Yoshihiro: *See*—
Tominatsu, Norihiro; Ohzu, Hideyuki; Akasaka, Yoshihiro; Nakagawa, Kazuaki; and Tateishi, Hiroshi, 5,595,832, Cl. 429-16.000.

Akgun, Ali; and Kerber, Michael M. Superconductive magnet system with low and high temperature superconductors. 5,596,303, Cl. 335-216.000.

Akimoto, Mamoru: *See*—
Kobayashi, Shuichi; Kobayashi, Masayuki; Yuri, Tsutomu; Serizawa, Yoiichi; Akimoto, Mamoru; and Otoshi, Shinichi, 5,595,604, Cl. 118-715.000.

Akiyama, Jun: *See*—
Suzuki, Yasuo; Sato, Takashi; and Akiyama, Jun, 5,594,992, Cl. 33-200.000.

Akro-Fireguard Products, Inc.: *See*—
Gochelbecker, Siegbard; Naegerl, Hans-Dieter; Dunker, George J.; and Kirk, Donald, 5,596,029, Cl. 523-179.000.

Akzo Nobel N.V.: *See*—
Chalmers, William S. K.; and Jacobs, Antonius A. C., 5,595,744, Cl. 424-253.100.
Habets, Winand J. A.; Klein-Rot, Miriam F. H. M.; Oosterlaken, Theodorus A. M.; and Yap, Sing H., 5,595,868, Cl. 435-5.000.
Pomato, Nicholas; and Ransom, Janet H., 5,595,738, Cl. 424-184.100.

Akzo Nobel nv: *See*—
Weuste, Burkhard; Weissen, Hans J.; and Fischer, Andrea G., 5,596,125, Cl. 560-171.000.

Albert, William C.; and Califano, Herbert T., to AlliedSignal Inc. Monolithic resonator for vibrating beam force sensors. 5,596,145, Cl. 73-514.290.

Alberti, Frank. Retractable leash apparatus providing for doubling the range and retraction speed of such apparatus without tension increase. 5,595,143, Cl. 119-794.000.

Albion Instruments, Inc.: *See*—
Bock, Kent F.; and Owen, Charles V., 5,596,404, Cl. 356-301.000.

Albion International, Inc.: *See*—
Ashmead, Stephen; and Ashmead, Harvey H., 5,596,016, Cl. 514-492.000.

Albizzati, Enrico: *See*—
Resconi, Luigi; and Albizzati, Enrico, 5,596,052, Cl. 526-127.000.

Albrecht Equipamentos Industriais Ltda.: *See*—
Ferraro, Gian F., 5,594,978, Cl. 26-84.000.

Albrecht, Thomas; Tortonese, Marco; and Barrett, Robert, to Leland Stanford Junior University, The. Method of fabricating cantilever for atomic force microscope having piezoresistive deflection detector. 5,595,942, Cl. 437-228.000.

Alcatel Alsthom Compagnie Generale d'Electricite: *See*—
Belouet, Christian; and Chambonnet, Didier, 5,595,960, Cl. 505-473.000.

Alcatel N.V.: *See*—
Le Bris, Jean, 5,595,669, Cl. 219-121.590.

Alcatel Network Systems, Inc.: *See*—
Ledda, Francesco, 5,596,614, Cl. 375-376.000.

Alcon Closure Systems International, Inc.: *See*—
Miller, Peter S., 5,596,251, Cl. 318-366.000.

Ald Vacuum Technologies GmbH: *See*—
Melber, Albrecht; Wenatzky, Erwin; and Unchkoreit, Dieter, 5,595,483, Cl. 432-205.000.

Alfa Laval Agriculture International AB: *See*—
Eriksson, Lars-Arne, 5,596,281, Cl. 324-713.000.

ALFA S.r.L.: *See*—
Barone, Giuseppe, 5,595,348, Cl. 241-36.000.

Alfacell Corporation: *See*—
Mikulski, Stanislaw M.; and Ardelt, Wojciech J., 5,595,734, Cl. 424-94.600.

Alfaro, Cesar: *See*—
Buico, David; Alfaro, Cesar; and Whelan, Mike, 5,595,330, Cl. 228-102.000.

Alfred, Henry L., to Netcom Technologies Corp. Composite, preform therefore, method of making, and apparatus. 5,595,795, Cl. 428-34.500.

Alicke, Gerhard: *See*—
Scherzer, Dietrich; Hunemann, Wolfram; Witt, Michael; Hahn, Klaus; Kaempfer, Knut; and Alicke, Gerhard, 5,596,045, Cl. 525-241.000.

Ali-Yrkko, Olli: *See*—
Jarvinen, Kari; and Ali-Yrkko, Olli, 5,596,677, Cl. 395-2.290.

Alla, Venkata R. R.; Mukund, K. Gurjar; and Sista, V. S. Lalitha, to Council of Scientific & Industrial Research. Process for the preparation of beta thymidine. 5,596,087, Cl. 536-22.100.

Allelix Biopharmaceutical Inc.: *See*—
Hammond, Geoffrey L.; and Arvakumov, George V., 5,595,969, Cl. 514-8.000.

Allen, Donald R., to Frazier Industrial Company. Storage rack system. 5,595,311, Cl. 211-151.000.

Allen, Loyd V., Jr.; and Wang, Biagnan, to University of Oklahoma, The Board of Regents of the. Particulate support matrix for making a rapidly dissolving tablet. 5,595,761, Cl. 424-484.000.

AlliedSignal Inc.: *See*—
Abel, Steve; and Whelpley, Gordon, 5,595,476, Cl. 417-53.000.
Albert, William C.; and Califano, Herbert T., 5,596,145, Cl. 73-514.290.

AlliedSignal Truck Brake Systems Co.: *See*—
Blevins, Jerry R., 5,595,588, Cl. 96-108.000.

Allina, Edward F. Transient voltage surge suppression (TVSS). 5,596,468, Cl. 361-56.000.

Allison, Lee F., to Andrew Corporation. Connector for coaxial cable having hollow inner conductor and method of attachment. 5,595,502, Cl. 439-429.000.

Alonso, Jean M.: *See*—
Rocancourt, Murielle; Brezin, Colette; Boucaud, Jean L.; Szatanik, Marek; and Alonso, Jean M., 5,595,901, Cl. 435-232.000.

Alps Electric Co., Ltd.: *See*—
Mizuta, Ken; Shibazaki, Ken; Miura, Yukio; Fujioka, Kazunori; Saito, Toshimichi; and Takagi, Isao, 5,596,253, Cl. 318-469.000.

Alt, Hans-Christian: *See*—
Schütze, Rüdiger; Ruhs, Alexander; Klasen, Claas-Jürgen; and Alt, Hans-Christian, 5,595,001, Cl. 34-579.000.

Aluminum Company of America: *See*—
Scherf, Thomas W., 5,595,086, Cl. 72-353.400.

Alza Corporation: *See*—
Wright, Jeri D.; Barclay, Brian L.; and Atkinson, Linda E., 5,595,759, Cl. 424-464.000.

Alzeta Corporation: *See*—
Carswell, Martin G., 5,595,816, Cl. 428-131.000.

Amada, Eiichi: *See*—
Masse, Ichiro; Miyamoto, Takanori; Morita, Takashi; Suzuki, Toshiro; and Amada, Eiichi, 5,596,721, Cl. 395-200.040.

Amati Communications Corporation: *See*—
Cioffi, John M.; Tong, Po; Aslanis, James T.; and Gooch, Antoinette H., 5,596,604, Cl. 345-260.000.

Amdahl Corporation: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,596,752, Cl. 395-701.000.

American Airlines, Incorporated: *See*—
Berkey, Rex A.; DeFant, Daniel; Hallum, Brad; Hansen, Jeffrey A.; Hopper, Edward L.; Johnson, Philip A.; Saari, Frank C.; and Sundell, Randy P., 5,595,470, Cl. 414-495.000.

American Cyanamid Company: *See*—
Cary, Gail E.; Wepplo, Peter J.; and Bench, Barbara A., 5,596,124, Cl. 560-61.000.

American Machine & Tool Company, Inc. of Pennsylvania: *See*—
Varley, David A., 5,595,227, Cl. 144-253.600.

American Power Conversion Corporation: *See*—
Campbell, Colin D.; and Bleck, James H., 5,596,479, Cl. 361-643.000.

Americhem, Inc.: *See*—
Kukanni, Vaman G.; and Campbell, John C., 5,595,689, Cl. 252-500.000.

Amiya, Takayuki: *See*—
Nanabu, Hiromi; Minami, Takahide; Amiya, Takayuki; and Kondo, Akihiro, 5,596,056, Cl. 526-207.000.

Amkor Electronics, Inc.: *See*—
Glenn, Thomas P.; and Holloway, Roy D., 5,596,485, Cl. 361-703.000.

Amlinger, Heinrich, to SGI-Prozesstechnik GmbH. Vacuum pumping stand. 5,595,477, Cl. 417-69.000.

Amoco Corporation: *See*—
Gardner, Hugh C.; Michno, Michael J., Jr.; and Cotter, Robert J., 5,596,050, Cl. 525-524.000.

Amr, Yehia M., to Carrier Corporation. Ceiling mounted indoor unit for an air conditioning system. 5,595,068, Cl. 62-418.000.

Analyst Ltd.: *See*—
Tisbel, Moshe, 5,595,775, Cl. 426-241.000.

Anayama, Hideki: *See*—
Maeda, Tatsuo; Anayama, Hideki; Kawamorita, Yoichi; Ohnori, Hiroyuki; and Kimura, Mayumi, 5,595,845, Cl. 430-58.000.

Andersen, Henrik S.: *See*—
Andersen, Knud E.; Olsen, Uffe B.; Petersen, Hans; Grunvald, Frederik; Sonnewald, Ursula; Jorgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.

Andersen, Knud E.; Olsen, Uffe B.; Petersen, Hans; Grunvald, Frederik; Sonnewald, Ursula; Jorgensen, Tine K.; and Andersen, Henrik S., to Novo Nordisk A/S. N-substituted azaheterocyclic carboxylic acids and esters thereof. 5,595,989, Cl. 514-217.000.

Anderson Corporation: *See*—
Fier, Duane T.; and Rote, Scott J., 5,595,409, Cl. 292-112.000.

Anderson, R. Rox; Grossman, Melanie; and Farinelli, William, to General Hospital Corporation, The. Permanent hair removal using optical pulses. 5,595,568, Cl. 606-9.000.

Anderson, Steven P. Two-sided, multi-angled wrench. 5,595,097, Cl. 81-125.100.

Anderson, Virgil L.; Feyder, Gusty; Vanderdonckt, Cathy; Forrest, Albert W., Jr.; and Young, Patrick H., to Du Pont de Nemours, E. I., and Company. Thin polyester film containing cubic calcium carbonate particles suitable for capacitor, digital stencil and thermal transfer media. 5,595,819, Cl. 428-330.000.

Andersson, Bjorn H., to ABB Teknishka Rontgencentralen AB. Testing arrangement for materials testing, particularly in a pressurized-water reactor. 5,596,612, Cl. 376-245.000.

Andersson, Lars H. H.; and Skoldback, Jan-Ake, to Ferring A.B. Synthesis of cyclic peptides. 5,596,078, Cl. 530-315.000.

Andersson, Roger: *See*—
Hedström, Lars-Gunnar; Andersson, Roger; Söderman, Göran; and Gustavsson, Torbjörn, 5,595,551, Cl. 477-109.000.

Anderton, Richard L.; and Curtis, Steven E., to OBC Medical Systems, Inc. Apparatus for cooling charge coupled device imaging systems. 5,596,228, Cl. 257-714.000.

Ando Electric Co., Ltd.: *See*—
Furuhashi, Masaaki; Handa, Ryouji; Tomita, Nobuo; and Enomoto, Yoshitaka, 5,596,449, Cl. 359-341.000.
Mitsui, Osamu, 5,596,270, Cl. 324-158.100.
Sakashiba, Nobuhiro; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,596,441, Cl. 359-192.000.

Andreas Stihl: *See*—
Höppner, Klaus; Förderer, Karl; Lohse, Georg; and Uhl, Klaus-Martin, 5,595,153, Cl. 123-198.00E.

Andreski, Henry M.: *See*—
Leibfred, Kevin J.; Hunt, Diane L.; Ferrer, Angel D.; and Andreski, Henry M., 5,595,774, Cl. 426-93.000.

Andrew Corporation: *See*—
Allison, Lee F., 5,595,502, Cl. 439-429.000.

Andrews, James A.: *See*—
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,596,347, Cl. 345-145.000.

Androphy, Elliot J.; and Bernoens, James G., to Biogen Inc.; and New England Medical Center Hospitals, Inc. Papillomavirus E2 transactivation repressor proteins and DNA. 5,595,884, Cl. 435-69.100.

Anergen, Inc.: *See*—
Kendrick, Teresa; Nag, Bishwajit; Mukka, Prabha V.; and Sharma, Somesh D., 5,595,881, Cl. 435-7.210.

Anetsberger Brothers, Inc.: *See*—
Anetsberger, Richard J., 5,595,106, Cl. 99-403.000.

Anetsberger, Richard J., to Anetsberger Brothers, Inc. Bagel cooker. 5,595,106, Cl. 99-403.000.

Angelini, Peter J.: *See*—
Fahy, Lawrence J.; Angelini, Peter J.; Diermeier, David A.; and Marconi, John, 5,595,801, Cl. 428-40.100.

Anselm, Michael C.; Blanchard, Clarence E.; and Nerstrom, James S., to Outboard Marine Corporation. Outboard motor exhaust housing and lost foam pattern therefor. 5,595,235, Cl. 164-235.000.

Antelec Engineering GmbH: *See*—
Kaufmann, Heiko, 5,596,490, Cl. 363-63.000.

Antioga, Kathleen M.: *See*—
Wilson, Joseph H.; Hacberle, David C.; Kralovic, Raymond C.; Lancaster, Kenneth R.; Mensel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; and Antioga, Kathleen M., 5,595,711, Cl. 422-119.000.

Anton Steinecker Entwicklungs GmbH & Co.: *See*—
Peager, Georg, 5,595,329, Cl. 228-9.000.

Antoniello, Frank: *See*—
Warshawsky, Jerome; and Antoniello, Frank, 5,595,212, Cl. 137-360.000.

Anzai, Kenji: *See*—
Tomioka, Yugo; Iwasa, Shoichi; Sato, Yasuo; Wada, Toshio; and Anzai, Kenji, 5,596,527, Cl. 365-185.200.

Aoki, Eiichiro, to Yamaha Corporation. Performance-information apparatus for analyzing pitch and key-on timing. 5,596,160, Cl. 84-653.000.

Aoki, Kazutaka: *See*—
Hoshiba, Masaaki; and Aoki, Kazutaka, 5,595,589, Cl. 106-19.00B.

Aoyama, Yoshiaki; and Tomotsu, Norio, to Idemitsu Kosan Co., Ltd. Process for producing styrenic polymer. 5,596,055, Cl. 526-153.000.

APD Cryogenics: *See*—
Boiarski, Michael; Longsworth, Ralph C.; Yudin, Boris; Hill, Dennis H.; Klusmier, Lawrence A.; Khatri, Ajay N.; and Owoc, Anthony L., 5,595,065, Cl. 62-222.000.

Appel, Andrew T.; and Chisholm, Michael F., to Texas Instruments Incorporated. Application of semiconductor IC fabrication techniques to the manufacturing of a conditioning head for pad conditioning during chemical-mechanical polish. 5,595,527, Cl. 451-28.000.

Appel, Andrew T.: *See*—
Tigelaar, Howard L.; Riemenschneider, Bert R.; Chapman, Richard A.; and Appel, Andrew T., 5,595,922, Cl. 437-40.000.

Apple Computer, Inc.: *See*—
Bliss, Anita L.; and Claassen, Stuart L., 5,596,352, Cl. 347-15.000.
Cappa, Stephen P.; and Pagallo, Gintia, 5,596,350, Cl. 345-173.000.
Cappa, Stephen P., 5,596,694, Cl. 395-152.000.
Chow, Yen-Lu; and Stutts, Brit P., 5,596,680, Cl. 395-257.000.
Foster, Gregg S.; Meier, John R.; and Cappa, Stephen P., 5,596,697, Cl. 395-340.000.
Moravec, Hans P.; Beninghaus, James R.; Blackwell, Michael K.; Dowling, Kevin J.; and Hollowell, J. Rhoads, II, 5,596,260, Cl. 320-30.000.
Normile, James O.; Wang, Katherine S.; and Wu, Hsi-Jung, 5,596,659, Cl. 382-253.000.

Applegate, Stephen S. Minimal shipping container and method of construction. 5,595,051, Cl. 53-442.000.

Appleyard, Margaret E.; and McDonald, Brendan, to E. R. Squibb & Sons, Inc. Method of diagnosing alzheimer's disease by measuring acetylcholinesterase activity in ocular fluid. 5,595,883, Cl. 435-20.000.

Applied Materials, Inc.: *See*—
Demaray, Richard E.; Herrera, Manuel; and Berkstresser, David E., 5,595,337, Cl. 228-193.000.

Arai, Kiyotaka, to Mita Industrial Co., Ltd. Sheet feeding roller holding mechanism. 5,595,382, Cl. 271-122.000.

Arai, Yutaka; Miura, Kunio; Nishikawa, Toshihisa; and Matsumoto, Mitsuaki, to Nippon Steel Corporation; and Nippon Steel Chemical Co., Ltd. Method for producing carbon fiber. 5,595,720, Cl. 423-447.600.

Arakawa, Satoshi, to Fuji Photo Film Co., Ltd. Radiation image storage panel and method for using the same. 5,596,202, Cl. 250-484.480.

Arataki, Yuji; Maeoka, Shozo; Kobayama, Kunichi; and Kadono, Tohru, to Sony Corporation. Data reproducing apparatus with controlled compensator for reducing correction error of main data with corresponding error correction decoded data. 5,596,558, Cl. 369-53.000.

ARCO Chemical Technology, L.P.: *See*—
Hager, Stanley L.; Knight, James E.; Helmer, Gregory F.; and Argento, Ben J., 5,596,059, Cl. 527-300.000.
Le-Khac, Bi, 5,596,075, Cl. 528-425.000.

Ardelt, Wojciech J.: *See*—
Mikulski, Stanislaw M.; and Ardelt, Wojciech J., 5,595,734, Cl. 424-94.600.

Argento, Ben J.: *See*—
Hager, Stanley L.; Knight, James E.; Helmer, Gregory F.; and Argento, Ben J., 5,596,059, Cl. 527-300.000.

Arimi, Yukio: *See*—
Maeda, Hisao; Matsushima, Yoshisuke; Nakamura, Morifumi; Shiina, Akito; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihito, 5,595,610, Cl. 148-233.000.

Ario, Paula D.; and Anson, Steven M., to Minnesota Mining and Manufacturing Company. Method for bonding amalgam to dental surfaces. 5,595,487, Cl. 433-226.000.

Arlington Industries, Inc: *See*—
Stark, Thomas S.; and Gretz, Thomas J., 5,596,177, Cl. 174-153.00R.

Armament Systems and Procedures, Inc.: *See*—
Parsons, Kevin L., 5,595,386, Cl. 473-47.700.

Armbruster, Peter J.; and Bishop, James W., Jr., to Motorola, Inc. Method and apparatus for providing increased access to a local communication network. 5,596,624, Cl. 379-58.000.

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Murofushi, Kanji; Homma, Taira; Nagura, Shigehiro; and Armentrout, Richard W., 5,595,892, Cl. 435-104.000.

Armor All Products Corporation: *See*—
Chara, William D.; Kozlowski, Edward; Liljeqvist, Lance; Jones, Stephen; Thompson, Mark; and Hewes, Charles, 5,595,345, Cl. 239-312.000.

Arndt, G. Dickey; Nguyen, Thanh X.; and Carl, James R., to United States of America, National Aeronautics and Space Administration, Capacitance probe for fluid flow and volume measurement. 5,596,150, Cl. 73-861.120.

Arnold, William M.: *See*—
Householder, William R.; Arnold, William M.; and Brewer, Charles S., 5,595,319, Cl. 220-629.000.

Artcraft Industries, Inc.: *See*—
Robinson, Larry D.; and Riley, James A., 5,595,341, Cl. 232-17.000.

Arthurs, Scott A.: *See*—
Weinerman, Lee S.; and Arthurs, Scott A., 5,595,076, Cl. 70-208.000.

Asahi Glass Company Ltd.: *See*—
Kawata, Takeshi; Ruckmongathan, Temkar; Nakagawa, Yutaka; Koh, Hidemasa; Hasebe, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takamori, 5,596,344, Cl. 345-103.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Komiya, Kyosuke; Kawakami, Yoshifumi; and Okamoto, Hiroshige, 5,596,067, Cl. 528-196.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Iizuka, Takashi; and Yamazaki, Yoshihiro, 5,596,424, Cl. 358-474.000.

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Kadomaru, Noriko; and Asami, Fumitaka, 5,596,294, Cl. 327-145.000.

Asano, Kazumori, to NEC Corporation. Semiconductor device and method of selecting the same. 5,596,223, Cl. 257-620.000.

Asat, Limited: *See*—
Combe, Edward G., 5,596,231, Cl. 257-776.000.

Asazawa, Hiroshi, to NEC Corporation. Clock driver circuit. 5,596,296, Cl. 327-291.000.

Aschenbeck, David P.; and Pellegrin, Michael T., to Owens Corning Fiberglas Technology, Inc. Low frequency sound distribution of rotary fiberizer veils. 5,595,585, Cl. 65-505.000.

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Shaffer, Theodore E.; and Okcuoglu, Murat N., 5,595,214, Cl. 137-517.000.

Ashihara, Ryohei: *See*—
Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kano, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.

Ashiwake, Noriyuki: *See*—
Daikoku, Takahiro; Ashiwake, Noriyuki; Kawasaki, Nobuo; and Zushi, Shizuo, 5,595,240, Cl. 165-80.400.

Ashland Inc.: *See*—
Cooper, John B.; Wise, Kent L.; Welch, William T.; and Sumner, Michael B., 5,596,196, Cl. 250-339.120.

Ashmead, Harvey H.: *See*—
Ashmead, Stephen; and Ashmead, Harvey H., 5,596,016, Cl. 514-492.000.

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Ashton, Martin, to VideoLogic Limited. Ray tracing method and apparatus for projecting rays through an object represented by a set of infinite surfaces. 5,596,685, Cl. 395-121.000.

Aalsma, James T.: *See*—
Cioffi, John M.; Tong, Po; Aalsma, James T.; and Gooch, Antoinette H., 5,596,604, Cl. 345-260.000.

Aoe, Takayuki; Ono, Isao; and Onchi, Masaru, to Dow Corning Toray Silicone Co., Ltd. Fiber treatment compositions. 5,595,675, Cl. 252-8.610.

Azar, Mahmud; and Koshkod, Parviz, to Lexar Microsystems, Inc. Non-volatile memory system of multi-level transistor cells and methods using same. 5,596,526, Cl. 365-185.170.

Asulab S.A.: *See*—
Born, Jean-Jacques; Bornand, Etienne; and Dinger, Rudolf, 5,596,551, Cl. 368-10.000.
Frenkel, Erik J.; and Born, Jean-Jacques, 5,594,986, Cl. 29-861.000.

AT&T: *See*—
Fernandez, Christopher; Just, Angela R.; and Kochanski, Gregory P., 5,596,634, Cl. 379-201.000.
Millito, Rodolfo A., 5,596,576, Cl. 370-450.000.

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Weber, Bret S., 5,596,708, Cl. 395-182.040.

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Billington, David; Dorey, Gilbert; Leon, Pascale; Atassi, Ghassan; Pierre, Alain; Burbridge, Michael; and Guilhaud, Nicolas, 5,595,976, Cl. 514-25.800.

Atkinson, Charles W. Soap absorbing, soap dispensing ceramic stone for skin or foliant treatment. 5,595,579, Cl. 51-295.000.

Atkinson, Gary M.: *See*—
Kabcenell, Randall L.; and Atkinson, Gary M., 5,596,194, Cl. 250-306.000.

Atkinson, Linda E.: *See*—
Wright, Jeri D.; Barclay, Brian L.; and Atkinson, Linda E., 5,595,759, Cl. 424-464.000.

Atkinson, Louis D.; and Reve, Kevin M., to Airtrol Components Inc. Fluid pressure regulator establishing a stable output fluid pressure. 5,595,209, Cl. 137-116.500.

Atlantic Richfield Company: *See*—
Lara, Pedro R.; and Meister, Mark W., 5,596,267, Cl. 324-71.100.

Atsumi Electric Co., Ltd.: *See*—
Itoh, Yuji, 5,596,310, Cl. 340-331.000.

Auburn International, Inc.: *See*—
Dechene, Ronald L.; Smith, Thomas B.; Marino, Scott A.; Tache, Ronald J.; and Roy, Ajoy K., 5,596,275, Cl. 324-307.000.

Audio Products International Corp.: *See*—
Hlibowicki, Stefan R., 5,596,650, Cl. 381-103.000.

Audousset, Mario-Pascale; and Maubru, Mireille, to L'Oreal. Keratin fiber dyeing compositions based on a combination of oxidation dyes and corresponding dyeing processes. 5,595,573, Cl. 8-412.000.

Augustejn, Alexander, to U.S. Philips Corporation. Method for automatically restoring consistency in a hierarchical object structure in a computer after a user interaction, and computer comprising such a system for automatic consistency restoration. 5,596,701, Cl. 395-356.000.

Augustinus, Per K.; and Riis, Ken. Double valve. 5,595,208, Cl. 137-68.110.

Autodin Corporation: *See*—
Greve, Donald W., 5,594,989, Cl. 29-896.600.

Autocel Semiconductor Inc.: *See*—
Abel, Jonathon S.; and Foster, Scott H., 5,596,644, Cl. 381-17.000.

Aurora Konrad G. Schulz GmbH & Co.: *See*—
Wolf, Hinnerc; and Kern, Alfred, 5,595,239, Cl. 165-41.000.

Austin, Peter W., to Zeneca Limited. Biocides. 5,596,102, Cl. 548-101.000.

Austpac Gold N.L.: *See*—
Walpole, Ernest A., 5,595,347, Cl. 241-20.000.

Automatic Liquid Packaging, Inc.: *See*—
Weiler, Gerhard H., 5,595,314, Cl. 215-50.000.

Automotive Products, plc: *See*—
Jarvis, Roger P.; and Jones, Charles J., 5,595,550, Cl. 477-84.000.

Avoni, Michael A.: *See*—
Lydon, Robert M.; and Avoni, Michael A., 5,595,004, Cl. 36-29.000.

Avvakumov, George V.: *See*—
Hammond, Geoffrey L.; and Avvakumov, George V., 5,595,969, Cl. 514-8.000.

Awad, Rami-Raimund: *See*—
Gerlitz, Martin; Awad, Rami-Raimund; and Fraydl, Thomas, 5,596,065, Cl. 528-71.000.

Axelrod, Stanley H.: *See*—
Capper, David G.; and Axelrod, Stanley H., 5,596,368, Cl. 348-333.000.

Axia Incorporated: *See*—
Whetsel, Larry E., 5,595,283, Cl. 198-812.000.

Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See*—
Spatafora, Mario, 5,595,280, Cl. 198-429.000.

Aziz, Nadim M.: *See*—
Tata, Kamaiah; Bagchi, Amit; and Aziz, Nadim M., 5,596,504, Cl. 364-468.270.

Azumatani, Yasushi: *See*—
Fukushima, Yoshihisa; Inagaki, Masahiro; Azumatani, Yasushi; and Hamanaka, Hiroshi, 5,596,564, Cl. 369-275.300.

B. F. Goodrich Company, The: *See*—
Catlin, Paul A.; Ballard, Douglas C.; Watson, Gary S.; and Worden, Alfred M., 5,595,357, Cl. 244-1.008.

B-Line Systems, Inc.: *See*—
Rinderer, Eric R.; and Witherbee, Marvin L., 5,595,362, Cl. 248-27.100.

Baba, Masanori; Schols, Dominique; Pauwels, Rudi; Balzarini, Jan; and De Clercq, Erik, to Toray Industries, Inc. Antiviral agents against side-causing virus. 5,596,018, Cl. 514-576.000.

Baban, Johan A.: *See*—
Elgendy, Said M. A.; Deadman, John J.; Patel, Geeta; Green, Donovan S.; Baban, Johan A.; Kakkar, Vijay V.; and Clarence, Goran K., 5,596,123, Cl. 558-288.000.

Babb, Jonathan: *See*—
Agarwal, Anant; Babb, Jonathan; and Tessier, Russell, 5,596,742, Cl. 395-500.000.

Babcock & Wilcox Company, The: *See*—
Ball, Russell M., 5,596,611, Cl. 376-189.000.
DeVault, Douglas J., 5,596,149, Cl. 73-756.000.
Gohara, Wasfie F.; and Johnson, Dennis W., 5,595,713, Cl. 422-170.000.

Bach, Erik; and Rydder, Morten, to INTERLEGO AG. Electric switch. 5,596,181, Cl. 200-8.008.

Badley, Rickey D.: *See*—
McDaniel, Max P.; Branham, Elizabeth A.; and Badley, Rickey D., 5,595,953, Cl. 502-237.000.

Baek, Bay H., to LG Semicon Co., Ltd. Method of manufacturing CCD image sensor by use of recesses. 5,595,930, Cl. 437-53.000.

Bagchi, Amit: *See*—
Tata, Kamaiah; Bagchi, Amit; and Aziz, Nadim M., 5,596,504, Cl. 364-468.270.

Bai, Sang-Chul; and Park, Joon-Sang, to Samsung Electronics Co., Ltd. Water current forming apparatus of washing machine. 5,595,072, Cl. 68-133.000.

Bailly, Christian M. E.: *See*—
Bloom, Margaret L.; Banach, Timothy E.; and Bailly, Christian M. E., 5,596,048, Cl. 525-393.000.

Baine, Neil H.; Holder, Neville L.; Klein, Donald N.; Webb, Robert L.; and Zaber, Gary E., to SmithKline Beecham Corporation. N-t-butyl-androst-3,5-diene-17β-carboxamide-3-carboxylic acid polymorph A. 5,596,109, Cl. 552-610.000.

Baird, J. Mark: *See*—
Sadwick, Laurence P.; Hwu, R. Jennifer; Baird, J. Mark; and Holmes, Sherman, 5,596,245, Cl. 313-293.000.

Baker Hughes Incorporated: *See*—
Tibbitts, Gordon A., 5,595,254, Cl. 175-320.000.
Voll, Beau A.; Kobodeman, Matthew S.; and Stringfellow, Steve, 5,595,246, Cl. 166-278.000.

Baker, William P.; and Hamilton, Charles, to Iomega Corporation. Combined SCSI/parallel port cable. 5,596,169, Cl. 174-33.000.

Bakopoulos, Christos P.: *See*—
McNair, Henry P.; and Bakopoulos, Christos P., 5,595,342, Cl. 236-51.000.

Baldwin, John J.; Claremon, David A.; Ellios, Jason M.; Liverton, Nigel; Remy, David C.; and Schnick, Harold G., to Merck & Co., Inc. Antiarrhythmic benzodiazepines. 5,595,990, Cl. 514-221.000.

Baldwin, Neil A.: *See*—
Bowey, Kenneth G.; and Baldwin, Neil A., 5,595,957, Cl. 504-118.000.

Ball, Lawrence E.: *See*—
Smierciak, Richard C.; Wardlow, Eddie, Jr.; and Ball, Lawrence E., 5,596,058, Cl. 526-342.000.

Ball, Russell M., to Babcock & Wilcox Company, The. Medical isotope production reactor. 5,596,611, Cl. 376-189.000.

Ballard, Douglas C.: *See*—
Catlin, Paul A.; Ballard, Douglas C.; Watson, Gary S.; and Worden, Alfred M., 5,595,357, Cl. 244-1.008.

Ballone, Michael: *See*—
Meixner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Bally, Marcel B.; Boman, Nancy L.; Cullis, Pieter R.; and Mayer, Lawrence D., to Inex Pharmaceuticals Corporation; and University of British of Columbia. Liposomal compositions for enhanced retention of bioactive agents. 5,595,756, Cl. 424-450.000.

Balzarini, Jan: *See*—
Baba, Masanori; Schols, Dominique; Pauwels, Rudi; Balzarini, Jan; and De Clercq, Erik, 5,596,018, Cl. 514-576.000.

Balzers Aktiengesellschaft: *See*—
Dingremont, Norbert M., 5,595,612, Cl. 148-318.000.

Bamford, Robert M., to Scharton, Terry D. Impact activated triggering mechanism for a camera mounted anywhere in a vehicle. 5,596,382, Cl. 396-429.000.

Banach, Timothy E.: *See*—
Bloom, Margaret L.; Banach, Timothy E.; and Bailly, Christian M. E., 5,596,048, Cl. 525-393.000.

Banerjibhoy, Saiod: *See*—
Bishop, Bruce F.; Combs, Rodney G.; and Banerjibhoy, Saiod, 5,595,905, Cl. 435-243.000.

Bancroft, John C.; and Geiger, Hugh D. Prestack seismic migration. 5,596,547, Cl. 367-51.000.

Bando, Atsushi: *See*—
Obori, Kenichi; Bando, Atsushi; and Yuzugi, Toshikazu, 5,596,195, Cl. 250-310.000.

Banjo Corporation: *See*—
Gillen, Mark E.; and Biggs, Stephen L., 5,595,217, Cl. 137-614.060.

Bank, Howard M.; and Nguyen, Binh T., to Dow Corning Corporation. Process for preparation of organosilanes. 5,596,120, Cl. 556-480.000.

Banner, David: *See*—

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Bannister, Ronald L.: *See*—
Huber, David J.; Bannister, Ronald L.; Khinkis, Mark J.; and Rabovitser, Josif K., 5,595,059, Cl. 60-39.020.

Barbeau, Albert: *See*—
Guinovart, Joan J.; Barbeau, Albert; and Rodríguez-Gil, Joan E., 5,595,763, Cl. 424-617.000.

Barclay, Brian L.: *See*—
Wright, Jeri D.; Barclay, Brian L.; and Atkinson, Linda E., 5,595,759, Cl. 424-464.000.

Bardasz, Ewa A., to Lubrizol Corporation, The. Ashless, low phosphorus lubricant. 5,595,964, Cl. 508-423.000.

Bar-David, Israel, to Lucent Technologies Inc. Method and apparatus for spread spectrum code pulse position modulation. 5,596,601, Cl. 375-207.000.

Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., to International Business Machines Corporation. Flexible dome electrical contact. 5,596,170, Cl. 174-35.008.

Barker, Susan L.: *See*—
Kayal, John J.; Barker, Susan L.; and Janson, John M., 5,595,907, Cl. 435-288.100.

Barlow, Christopher R.: *See*—
Koski, Robert E.; Henderson, Kenneth R.; and Barlow, Christopher R., 5,596,502, Cl. 364-468.010.

Barnes, Clarence W., to Optical Sensor Consultants Inc. System for detection of ice, water, glycol solution, and other chemical species. 5,596,320, Cl. 340-962.000.

Barnes, David J.; and Gilday, John P., to Imperial Chemical Industries PLC. Fluorinated polymers. 5,595,676, Cl. 252-62.200.

Barno, Keith, to Hoover Group, Inc. Composite container with improved outer shell. 5,595,318, Cl. 220-401.000.

Barone, Giuseppe, to ALFA S.r.L. Machine for triturating composite materials, particularly for triturating solid urban waste. 5,595,348, Cl. 241-36.000.

Baroni, Marco; Croci, Tiziano; Landi, Marco; Gozzi, Umberto; and Nisato, Dino, to Sanofi. 1-Halopyrazin- and 1-halopyrimidin-4-amino-4-alkylpiperidines. 5,595,994, Cl. 514-275.000.

Barr, Morton L.; Vinceuti, Paul J.; and Vanderhoof, Elaine L., to Mennen Company, The. Basic aluminum antiperspirant active materials having enhanced activity, antiperspirant active compositions containing such materials, and methods for preparation of such materials and compositions. 5,595,729, Cl. 424-68.000.

Barr, Neal, to Spunbon Pty Ltd. Electrolytic oxidation process. 5,595,645, Cl. 205-771.000.

Barrett, Robert: *See*—
Albrecht, Thomas; Tortonese, Marco; and Barrett, Robert, 5,595,942, Cl. 437-228.000.

Barrientos, Heriberto M., to Rags N' Things Inc. Head bandanna having a headband with closure tabs. 5,594,956, Cl. 2-207.000.

Barrus, Gordon; and Schumaker, Richard E., to Printronix, Inc. Printer power supply. 5,595,446, Cl. 400-124.130.

Barry, Michael W.; Rowe, Francis A.; and Tompkins, E. Neal, to T/R Systems. Multiple printer module electrophotographic printing device. 5,596,416, Cl. 358-296.000.

Barsoum, James G.: *See*—
Androphy, Elliot J.; and Barsoum, James G., 5,595,884, Cl. 435-69.100.

Barta, Thomas E.; and Mueller, Richard A., to G.D. Searle & Co. 2-chloro and 2-bromo derivatives of 1,5-iminosugars. 5,595,981, Cl. 514-63.000.

Bartkowiak, John: *See*—
Mullins, Jacqueline; Peterson, Joseph W.; Bartkowiak, John; and Hendrickson, Alan F., 5,596,724, Cl. 395-250.000.

Bartolone, John B.; Peaksa, Christine M.; Santhanam, Uma; and Lang, Brian D., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Lactate dehydrogenase inhibitors in cosmetic compositions. 5,595,730, Cl. 424-70.100.

BASF Aktiengesellschaft: *See*—
Götz, Walter, 5,596,070, Cl. 528-310.000.
Jahne, Ekkehard; and Dames, Burkhardt, 5,596,051, Cl. 526-73.000.
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spaeg, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zschiesche, Ruth, 5,596,063, Cl. 528-44.000.
Scherzer, Dietrich; Huecmann, Wolfram; Witt, Michael; Hahn, Klaus; Kaempfer, Kurt; and Alicke, Gerhard, 5,596,045, Cl. 525-241.000.
Schlarb, Alois; Hofmann, Jürgen; Ohlig, Hilmar; Ittemann, Peter; and Farwerck, Karl-Peter, 5,595,696, Cl. 264-118.000.

BASF Corporation: *See*—
Gopalkrishnan, Sridhar; and Guiney, Kathleen M., 5,595,968, Cl. 510-418.000.
Harris, Paul J.; and Foukes, Richard J., 5,596,043, Cl. 525-127.000.
Ilg, Otto M.; and Dugan, Jeffrey S., 5,595,660, Cl. 210-521.000.
Wright, Donald E.; and Flynn, William C., III, 5,595,699, Cl. 264-169.000.

BASF Magnetics GmbH: *See*—
Borch, Gerald-Wolfgang; Eicher, Jochen; Kuhn, Pierre; Müller, Norbert; and Salomé, Antoine, 5,595,297, Cl. 206-387.130.

Bassett, Michael L.: *See*—
Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,274, Cl. 192-70.250.
Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,275, Cl. 192-111.00A.

Basten, Frank: *See*—
Meixner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Bates, Aaron, to Mead Corporation, The. Carton having shock-absorbing carrying handle and package formed therefrom. 5,595,292, Cl. 206-158.000.

Batten, James B. Infant car seat stroller conversion and method therefor. 5,595,393, Cl. 280-30.000.

Batz, Hans-Georg: *See*—
Huber, Emanuus; Klein, Christian; Batz, Hans-Georg; and Zink, Bruno, 5,595,741, Cl. 424-194.100.

Baudour, Michel: *See*—
Moens, Luc; Maetens, Daniel; Loutz, Jean-Marie; and Baudour, Michel, 5,596,037, Cl. 524-539.000.

Bauer, Jamie D.; and Krisko, John P., to Advertising Display Company. Peghook with corrugated display panel. 5,595,309, Cl. 211-59.100.

Baugher, Garreth D.: *See*—
Baugher, Roger D.; and Baugher, Garreth D., 5,595,130, Cl. 111-52.000.

Baugher, Roger D.; and Baugher, Garreth D. Planting unit. 5,595,130, Cl. 111-52.000.

Baughman, Leonard, to Enviroplas, Inc. Dilution control method and apparatus. 5,596,154, Cl. 73-863.010.

Baum, Gary; and Quimby, Michael S., to Advanced Micro Devices, Inc. Integrated processor including a device for multiplexing external pin signals. 5,596,765, Cl. 395-800.000.

Baumann, Nicholas R.: *See*—
Markell, Craig G.; Hagen, Donald F.; Hansen, Paul E.; and Baumann, Nicholas R., 5,595,649, Cl. 210-198.200.

Baumeister, Hans P.: *See*—
Parulski, Kenneth A.; Baumeister, Hans P.; and Ellison, Richard N., 5,595,389, Cl. 463-31.000.

Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tam, Andrew C.; and Wu, Anthony, to International Business Machines Corporation. Process for texturing brittle glass disks. 5,595,791, Cl. 427-554.000.

Baumgartner, Mark: *See*—
Berg, Robin; and Baumgartner, Mark, 5,595,456, Cl. 405-53.000.

Bayer AG: *See*—
Bier, Peter, 5,595,789, Cl. 427-493.000.

Bayer Aktiengesellschaft: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Buuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
König, Eberhard; and Engbert, Theodor, 5,596,064, Cl. 528-45.000.
Lass, Hans-Josef; Halpaap, Reinhard; Meier-Westhues, Hans-Ulrich; and Schultz, Wolfgang, 5,596,066, Cl. 528-73.000.

Bayer Corporation: *See*—
Gindin, Lyuba K.; Wicks, Douglas A.; Yeske, Philip E.; and Jonsson, E. Hauksn, 5,596,044, Cl. 525-131.000.
Krishnan, Sivaram; Johnson, James B.; and Mafori, Robson, 5,596,034, Cl. 524-308.000.

Bazar, Leonard: *See*—
Young, Paul R.; Richard, David W.; and Bazar, Leonard, 5,596,486, Cl. 361-737.000.

Bazes, Mel, to Intel Corporation. Capacitive transformer having a switch responsive to clock signals. 5,596,489, Cl. 363-62.000.

BDAG Balcke-Dürr Aktiengesellschaft: *See*—
Trage, Burkhard; and Leitz, Richard, 5,595,063, Cl. 60-688.000.

Beadman, Michael A.; and Martin, Paul, to Enschie N.V. Label printing apparatus with display. 5,595,450, Cl. 400-615.200.

Beaman, Donald R.: *See*—
Pyzik, Aleksander J.; Fuller, Sharon M.; and Beaman, Donald R., 5,595,622, Cl. 156-89.000.

Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., to United States of America, Army. Low-temperature method for containing thermally degradable hazardous wastes. 5,595,561, Cl. 588-255.000.

Beaulat, Bernard, to Plasto SA. Twin-wall composite lining for automobiles. 5,595,415, Cl. 296-39.100.

Beauvais, W. Joseph: *See*—
McNulty, Peter J.; Beauvais, W. Joseph; Roth, David R.; Moran, Wanda K.; and Reed, Robert A., 5,596,199, Cl. 250-370.070.

Bechtel Group, Inc.: *See*—
Geddes, David D.; Joffe, Basil; and Davis, Patrick P., 5,596,704, Cl. 395-326.000.

Beck, Hubert, to Fichtel & Sachs AG. Vibration damper for a motor vehicle. 5,595,269, Cl. 188-282.000.

Beck, Kent F.; and Owen, Charles V., to Albion Instruments, Inc. Raman gas analysis system with flexible web and differential thread for precision optical alignment. 5,596,404, Cl. 356-301.000.

Beck, Martin H.; Caldicott, Robert; and Muszynski, John H., to DTL Technology Limited Partnership. Coinjection molding of decorative preforms and containers produced from such preforms. 5,595,799, Cl. 428-35.700.

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Kayal, John J.; Barker, Susan L.; and Janson, John M., 5,595,907, Cl. 435-288.100.

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Hasselwander, Jack G.; and Niederer, Kurt W., 5,594,968, Cl. 8-149.000.

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Bennett, Christopher: *See*—
Meisner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Bennett, Paul A.: *See*—
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Foos, Joseph S.; Edelman, Peter G.; Flaherty, James E.; and Berger, Joseph, 5,595,646, Cl. 205-783.000.

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Chang, Peter L. D.; and Bergeron, Marcel T., 5,596,209, Cl. 257-80.000.

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Berglund, Kurt, to Composite Scandinavia AB. Glass-fibre-reinforced plastic container. 5,595,321, Cl. 220-565.000.

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Wigren, Karl T.; and Bergström, Rolf A., 5,596,678, Cl. 395-237.000.

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Licking, Michael A.; and Bergum, Gerald E., 5,595,026, Cl. 49-360.000.

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Demaray, Richard E.; Herrera, Manuel; and Berkstresser, David E., 5,595,337, Cl. 228-193.000.

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Wright, Bruce E.; Witzig, William L.; Goliaszewski, Alan E.; Carey, William S.; and Pehler, Jeffrey H., 5,596,130, Cl. 585-3.000.

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Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Möller-Gliemann, Matthias; Beuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.

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Bianco, Michael P. Trailer-type snowplow. 5,595,007, Cl. 37-268.000.

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Daniel, Robert P.; and Biel, Bogusław S., 5,595,113, Cl. 101-115.000.

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Gillen, Mark E.; and Biggs, Stephen L., 5,595,217, Cl. 137-614.060.

Bilderback, Douglas W.: *See*—
Simpson, Vikki S.; Gullett, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bilderback, Douglas W.; and King, Clyde A., 5,595,522, Cl. 451-5.000.

Biller, Scott A.: *See*—
Wetterau, John R., II; Sharp, Daru Y.; Gregg, Richard E.; Biller, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Partyka, Richard A., 5,595,872, Cl. 435-6.000.

Billington, David; Dorey, Gilbert; Leon, Pascale; Atassi, Ghanem; Pierre, Alain; Burbridge, Michael; and Guilbaud, Nicolas, to Adir et Compagnie. Tetrahydropyran compounds. 5,595,976, Cl. 514-25.000.

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Pinna, Marco, 5,595,564, Cl. 600-14.000.

Biogen Inc.: *See*—
Androphy, Elliot J.; and Barsoum, James G., 5,595,884, Cl. 435-69.100.

Biomagnetic Technologies, Inc.: *See*—
Dilorio, Mark S.; Yoshizumi, Shozo; and Yang, Kai-Yuen, 5,595,959, Cl. 505-329.000.

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Brode, George L.; Doncel, Gustavo F.; Gabelnick, Henry L.; Kreeger, Russell L.; and Salensky, George A., 5,595,980, Cl. 514-57.000.

Biomeasure Incorporated: *See*—
Bogden, Arthur E., 5,595,973, Cl. 514-18.000.

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Coolidge, Thomas R.; Wagner, Fred; van Heeke, Gino; Schuster, Sheldon M.; Stout, Jay; and Wylie, Dwane E., 5,595,887, Cl. 435-69.700.

Biospace Instruments: *See*—
Charpak, Georges, 5,596,201, Cl. 250-385.100.

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Bishop, Bruce F.; Combs, Rodney G.; and Banankhah, Saied, to G.D. Searle & Co. Process control system for fed-batch fermentation using a computer to predict nutrient consumption. 5,595,905, Cl. 435-243.000.

Bishop, James W., Jr.: *See*—
Armbruster, Peter J.; and Bishop, James W., Jr., 5,596,624, Cl. 379-58.000.

Bivens, Thomas H. Filtering and treating device. 5,595,107, Cl. 99-408.000.

Black & Decker Inc.: *See*—
Meisner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Black, Terry M.: *See*—
Glusman, Steven I.; and Black, Terry M., 5,596,499, Cl. 364-424.060.

Blackwell, Michael K.: *See*—
Moravec, Hans P.; Beninghaus, James R.; Blackwell, Michael K.; Dowling, Kevin J.; and Hollowell, J. Rhoads, II, 5,596,260, Cl. 320-30.000.

Blaha, Michael R.: *See*—
Shea, Hwa N.; Premertani, William J.; and Blaha, Michael R., 5,596,746, Cl. 395-612.000.

Blanchard, Clarence E.: *See*—
Anselm, Michael C.; Blanchard, Clarence E.; and Nerstrom, James S., 5,595,235, Cl. 164-235.000.

Blank, Roy L., to Richardson-Vicks Inc. Use of salicylic acid for regulating skin wrinkles and/or skin atrophy. 5,595,984, Cl. 514-159.000.

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Campbell, Colin D.; and Bleck, James H., 5,596,479, Cl. 361-643.000.

Blevins, Jerry R., to AlliedSignal Truck Brake Systems Co. Air dryer cartridge mounting system. 5,595,588, Cl. 96-108.000.

Bligh, Peter: *See*—
Meier, Rolf G.; Rebder, Michael C.; Bligh, Peter; and Butler, Chris, 5,596,633, Cl. 379-201.000.

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Bliss, Gary L.: *See*—
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Blohm, Margaret L.; Banach, Timothy B.; and Bailly, Christian M. E., to General Electric Company. Method for making copolymers of polyarylene ethers and siloxanes. 5,596,048, Cl. 525-393.000.

Bloxham, Peter A.; Breikss, Anne I.; Ernst, Richard E.; Scott, Leon S.; Super, John D.; and Verbsky, James D., to Du Pont de Nemours, E. I., and Company. Method for controlling color formation during polytetramethylene ether glycol production. 5,596,074, Cl. 528-417.000.

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Martinez, Marvin W., Jr.; and Bluhm, Mark W., 5,596,731, Cl. 395-309.000.

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Board of Governors of Wayne State University, The: *See*—
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Board of Regents, Univ. of Texas: *See*—
Boulton, Teri G.; Cobb, Melanie H.; Yancopoulos, George D.; Nye, Steven; and Passyotatos, Nikos, 5,595,904, Cl. 435-240.200.

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Magda, Darren; Sessler, Jonathan L.; and Iverson, Brent, 5,595,726, Cl. 424-9.610.

Boaz, Neil W.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; Subramanyam, Chakrapani; Latimer, Lee H.; and Lodge, Eric P., 5,596,012, Cl. 514-373.000.

Bobry, Howard H. Hand-held optical scanner. 5,595,445, Cl. 400-88.000.

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Borel, Edouard, 5,595,335, Cl. 226-42.000.

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Bock, Larry E., to General Electric Company. Overvoltage surge arrester with quick-acting pressure relief means. 5,596,308, Cl. 338-20.000.

Bodenseewerk Geratetechnik GmbH: *See*—
Broas, Walter; and Uwira, Bernd, 5,596,185, Cl. 250-208.100.

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Boebert, William E.; Hanson, Mark H.; and Markham, Thomas R., to Secure Computing Corporation. Secure computer network using trusted path subsystem which encrypts/decrypts and communicates with user through local workstation user I/O devices without utilizing workstation processor. 5,596,718, Cl. 395-187.010.

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Esser, Franz; Schnorrenberg, Gerd; Dollinger, Horst; Jung, Birgit; and Burger, Erich, 5,596,000, Cl. 514-312.000.

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Huber, Emasmus; Klein, Christian; Batz, Hans-Georg; and Zink, Bruno, 5,595,741, Cl. 424-194.100.

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Krapcho, A. Paul; Menta, Ernesto; Oliva, Ambrogio; and Spinelli, Silvano, 5,596,097, Cl. 544-125.000.

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Meneghetti, Michael J., 5,595,359, Cl. 244-50.000.

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Bogaerts, Constant; Van Echelpoel, Eric; Goossens, Henri; Van Goethem, Luc; and Van Aken, Luc, to Agfa-Gevaert N.V. Panel assembly. 5,595,454, Cl. 403-263.000.

Bogdanoff, Joseph. Fluid filled medical mattress. 5,594,962, Cl. 5-422.000.

Bogdany, Arthur; and Davey, Alfred G. Apparatus for preventing slippage in pipe couplings. 5,595,368, Cl. 251-148.000.

Bogden, Arthur E., to Biomeasure Incorporated. Protection of hemopoietic cells during chemotherapy or radiotherapy. 5,595,973, Cl. 514-18.000.

Böhnlein-Mauss, Jutta: *See*—
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Koch, Kaelyn C.; and Bolek, Lisa M., 5,595,050, Cl. 53-441.000.

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Boman, Nancy L.: *See*—
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Bonaffini, Andrew M.; Bonaffini, Kathleen F.; Buehler, Michael J.; Miller, Hubert A.; Plunkett, Galen, Jr.; Rudolph, Sidney F.; Sweeney, Michael A.; and Wallis, Donald E., to Lockheed Martin Corporation. Real-time control sequencer with state matrix logic. 5,596,331, Cl. 342-455.000.

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Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Walterdorfer, Anna; Kern, Manfred; Lämmea, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.
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Goodby, John W.; Toyne, Kenneth J.; and Booth, Christopher J., 5,595,682, Cl. 252-299.010.
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Boulos, Mervet S.; Montrose, David C.; and Petrichel, Michael, to Henkel Corporation. Moderate temperature manganese phosphate conversion coating composition and process. 5,595,611, Cl. 148-259.000.
Boulton, Teri G.; Cobb, Melanie H.; Yancopoulos, George D.; Nye, Steven; and Panayotatos, Nikos, to Board of Regents, Univ. of Texas; and Regeneron Pharmaceuticals, Inc. Family of map2 protein kinases. 5,595,904, Cl. 435-240.200.
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Bourke, George C. Drill accessory. 5,595,250, Cl. 173-29.000.
Bowey, Kenneth G.; and Baldwin, Neil A., to Service Chemicals plc. Turf and soil drought stress treatment comprising a siloxane and a polyalkalene oxide surfactant. 5,595,957, Cl. 504-118.000.
Bowles, Cary R.; Jones, Sidney D.; and Peters, Gary A., to Framatome Technologies, Inc. Method for processing chemical cleaning solvent waste. 5,595,663, Cl. 210-652.000.
Bowman, Mark P.: *See*—
Childress, Thomas E.; and Bowman, Mark P., 5,596,116, Cl. 556-427.000.
Boyce, Christopher R.; and Haggett, Martin R., to Rover Group Limited. Method of monitoring vibrations in vehicles. 5,596,140, Cl. 73-105.000.
Boyce, Michael A.; and Moyer, Orville T., Jr., to Motorola, Inc. Antenna assembly with integrated installation support. 5,596,334, Cl. 343-702.000.
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Boyd, Mark R.: *See*—
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Zander, Hans-Joachim; Bozzer, Dieter; and Martin, Stefan, 5,595,499, Cl. 439-352.000.
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Brabston, William N.: *See*—
Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., 5,595,561, Cl. 588-255.000.
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Booff, William B.; and Bradbury, William H., 5,595,103, Cl. 91-51.000.
Braddick, Brist O., to TIW Corporation. Retrievable through tubing tool and method. 5,595,247, Cl. 166-297.000.
Bradley, Matthews O.: *See*—
Hoke, Glenn D.; Bradley, Matthews O.; Williams, Taffy J.; and Lee, Che-Hung, 5,596,090, Cl. 536-24.500.
Brady, L. Jeannine, to University of Florida. Cloning of non-IgA FC binding forms of the group B streptococcal beta antigens. 5,595,740, Cl. 424-190.100.
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Gardner, Frederick J.; Day, Michael J.; Brandon, Nigel P.; and Brownell, John B., 5,595,833, Cl. 429-19.000.
Brast, Ronald G.; and Houge, Michael S., to WCI Outdoor Products, Inc. Lawn trimming and edging apparatus having motor housing rotatable on extendable handle. 5,594,990, Cl. 30-122.000.
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Braun, Peter: *See*—
Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Walterdorfer, Anna; Kern, Manfred; Lämmea, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.
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Mead, Sharon B.; Brennan, Susan J.; Morelos, Arsenia; and Aguilar, Josephine, 5,596,027, Cl. 523-161.000.
Brewer, Charles S.: *See*—
Householder, William R.; Arnold, William M.; and Brewer, Charles S., 5,595,319, Cl. 220-429.000.
Brewer, Timothy T.: *See*—
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,596,347, Cl. 345-145.000.
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Bridges, Robert L., Jr. Corrugated paper pallet. 5,595,125, Cl. 108-51.300.
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Kuriya, Yoshinori, 5,595,057, Cl. 57-213.000.
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Brill, Robert V.: *See*—
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Mattson, Ronald J.; Keavy, Daniel J.; Parker, Michael F.; and Johnson, Graham, 5,596,019, Cl. 514-629.000.
Wetterau, John R., II; Sharp, Daru Y.; Gregg, Richard E.; Biller, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Pastyka, Richard A., 5,595,872, Cl. 435-6.000.
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Chan, Ferdinand; Jarman, Michael; and Potter, Gerard A., 5,595,995, Cl. 514-277.000.
Watkins, Jeffrey C.; and Jones, Arwel W., 5,595,983, Cl. 514-85.000.
Brocktest, Sue; O'Neal, Clifford; van der Lee, Herman; and Rogers, Brian, to Gillette Company, The. Amino acid β-lyase enzyme inhibitors as deodorants. 5,595,728, Cl. 424-65.000.

Brode, George L.; Doucet, Gustavo P.; Gabelnick, Henry L.; Kreeger, Russell L.; and Salensky, George A., to Medical College of Hampton Roads; and Biomaterials Corporation. Contraceptive compositions. 5,595,980, Cl. 514-57.000.
Bronicki, Lucien Y.: *See*—
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Broos, Walter; and Uwira, Bernd, to Bodenseewerk Geratetechnik GmbH. Device for generating picture information in real time for testing picture resolving sensors. 5,596,185, Cl. 250-208.100.
Brother Kogyo Kabushiki Kaisha: *See*—
Seo, Keiji, 5,595,112, Cl. 101-26.000.
Brouwer, Dirk M.; and van de Vondervoort, Elizabeth M. Crosslinked resins containing thermally stable sulfonic acid groups. 5,596,046, Cl. 525-353.000.
Brown, David J. B., to Caterpillar Inc. Work machine. 5,595,398, Cl. 280-763.100.
Brown, Douglas S.; Scherger, David F.; Heilman, George C.; and Brown, Robert B., to Fresh Products, Inc. Dual dispenser, supply unit, and method. 5,595,324, Cl. 222-1.000.
Brown, Franklin C., Jr. Hydraulic stabilizer for bow. 5,595,169, Cl. 124-89.000.
Brown, Lanny, to Huron, Inc. Quick connector with check valve. 5,595,213, Cl. 137-515.500.
Brown, Larry T.; and Kraska, Marvin P., to Ford Motor Company. Gearshift controller for automatic transmission. 5,596,495, Cl. 364-424.080.
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Brucker, Eugene J., to Motorola, Inc. Method and apparatus for conveying a communication signal between a communication unit and a base site. 5,596,333, Cl. 342-457.000.
Brucknüller, Elisabeth: *See*—
Hafner, Norbert; Mitter, Priedrich; Ledwinka, Hans; Brucknüller, Elisabeth; and Kurz, Josef, 5,596,076, Cl. 528-483.000.
Bruetsch, Robert I.: *See*—
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Bruinink, Jacob: *See*—
Bongaerts, Petrus F. G.; Bruinink, Jacob; Burgmans, Adrianus L. J.; Van Helleputte, Henri R. J. R.; Khan, Baber A.; and Kuijk, Karel E., 5,596,431, Cl. 349-32.000.
Bruker-Franzen Analytik GmbH: *See*—
Franzen, Jochen, 5,595,636, Cl. 204-464.000.
Brunnacier, Terry J.: *See*—
Byers, Larry L.; Robeck, Gary R.; and Brunmeier, Terry J., 5,596,716, Cl. 395-185.010.
Brunolli, Michael J.: *See*—
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Brunos, Jean-Philippe: *See*—
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Brusseleers, Joseph; and Claes, Jan, to Solvay (Société Anonyme). Device for cleaning the wall of a silo. 5,594,973, Cl. 15-304.000.
Bryant, Charles P.; Lal, Kasturi; and Pialet, Joseph W., to Lubrizol Corporation, The. Electrorheological fluids containing polyanilines. 5,595,680, Cl. 252-77.000.
Bryant, Frank R.: *See*—
Chan, Tsiu C.; Bryant, Frank R.; Lu, Lun-Theng; and Wei, Che-Chia, 5,595,935, Cl. 437-187.000.
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Menke, Klaus; Böhnlein-Mauss, Jutta; Schmid, Helmut; Bucerius, Klaus M.; and Engel, Walther, 5,596,168, Cl. 149-19.400.
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Buck Knives, Inc.: *See*—
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Buddendeck, Mark H.: *See*—
Dempsey, Neil J.; and Buddendeck, Mark H., 5,596,399, Cl. 399-45.000.
Budziliek, Russell A.; Monarchie, Dominick L.; Podoba, Myroslaw; and Swanson, Richard R., to Northrop Grumman Corporation. High contrast TPEL display in which light from the transparent phosphor layer is reflected by an electrode layer and the TPEL diffuse reflectance <about 2%. 5,596,246, Cl. 313-502.000.
Buehler, Michael J.: *See*—
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Buice, David; Alfaro, Cesar; and Whelan, Mike, to Verity Instruments, Inc. Power supply. 5,595,330, Cl. 228-102.000.
Builders Tools, Inc.: *See*—
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Bulgrien, Garth H.; Sedoni, Enrico; Sedoni, Carlo; and Gonano, Andrea, to New Holland North America, Inc. Measurement of rotational velocity and torque. 5,596,153, Cl. 73-862.326.
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Li, Jianzhong; Brunos, Jean-Philippe; and Abdelmoumni, Mohammed, 5,596,750, Cl. 395-671.000.
Marbot, Roland; Le Biban, Jean-Claude; Coller, Andrew; and Nezamzadeh-Moosavi, Reza, 5,596,285, Cl. 326-30.000.
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Burckhartt, David M.; Perez, Lazaro D.; Emerson, Theodore F.; Dow, Randolph O.; and Stimac, Gary A., to Compaq Computer Corporation. Computer failure recovery and alert system. 5,596,711, Cl. 395-182.210.
Burd, David M. Reflective hybrid lamp assembly. 5,595,438, Cl. 362-228.000.
Burgener, Mark L.: *See*—
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Burgess, Gary: *See*—
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Bongaerts, Petrus F. G.; Bruinink, Jacob; Burgmans, Adrianus L. J.; Van Helleputte, Henri R. J. R.; Khan, Baber A.; and Kuijk, Karel E., 5,596,431, Cl. 349-32.000.
Burk, Mark J., to Du Pont de Nemours, E. I., and Company. Chiral phospholanes via chiral 1 4-diol cyclic sulfates. 5,596,114, Cl. 556-22.000.
Burke, Rae L.: *See*—
Chapman, Barbara; and Burke, Rae L., 5,595,886, Cl. 435-69.600.
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Fuller, Lionel C.; and Burnett, Berin J., 5,595,010, Cl. 40-606.000.
Burns, Gary T.; Keenan, Linda D.; Roy, Aroop K.; and Theiopis, Arthur J., to Dow Corning Corporation. Treatment of fillers with oxa-silacycloalkanes. 5,595,593, Cl. 106-499.000.
Burns, Robert L. Firearm selectable between semi-automatic and automatic mode. 5,596,162, Cl. 89-128.000.
Burr, Larry W.: *See*—
Hofmann, Georg; Suchanek, Jürgen; and Burr, Larry W., 5,596,180, Cl. 200-6.00B.
Busch, Nicholas F., to Honeywell Inc. Magnetic sensor with a beveled permanent magnet. 5,596,272, Cl. 324-207.210.
Butchko, Gregory M.: *See*—
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Butler, Chris: *See*—
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Byers, Larry L.; Robeck, Gary R.; and Brunmeier, Terry J., to Unisys Corporation. Method and apparatus for indicating the severity of a fault within a computer system. 5,596,716, Cl. 395-185.010.
BYK-Gardner: *See*—
Lex, Konrad, 5,596,412, Cl. 356-371.000.
Bysedt, Stig; Torseing, Orvar; and Nordhammer, Henrik, to Stena Rederi, AB. Superstructure for multihull vessels. 5,595,132, Cl. 114-61.000.
C-Cube Microsystems, Inc.: *See*—
Howe, Bradley, 5,596,376, Cl. 348-718.000.
Cabral, Cyril, Jr.; Chan, Kevin K.; Chu, Jack O.; and Harper, James M. E., to International Business Machines Corporation. Low temperature selective growth of silicon or silicon alloys. 5,595,600, Cl. 117-83.000.
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Caillaud, Thierry: *See*—
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Calcomp Inc.: *See*—
Stapleton, Jeffrey, 5,596,351, Cl. 347-7.000.
Caldicott, Robert: *See*—

Beck, Martin H.; Caldicott, Robert; and Muszynski, John H., 5,595,799, Cl. 428-35.700.

Califano, Herbert T.: *See*—
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California Institute of Technology: *See*—
Chutjian, Ara; Hecht, Michael H.; and Orient, Otto J., 5,596,193, Cl. 250-292.000.
Hagan, Richard C.; and Zhang, Shou-Hua, 5,596,136, Cl. 73-28.040.

Cameron, Charles E. Enhancing fuel efficiency and abating emissions of engines. 5,595,576, Cl. 44-321.000.

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Campbell, John C.: *See*—
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Campina Melktrasie BV: *See*—
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Canada, Her Majesty the Queen in right of, as represented by the Department of Agriculture and Agri-Food Canada: *See*—
Tong, Alan K.; Jones, Stephen D. M.; and Schaefer, Allan L., 5,595,444, Cl. 374-45.000.

Canistraro, Howard A.; Jordan, Eric H.; and Pease, Douglas M., to University of Connecticut, The. X-ray based extensometry device for radiography. 5,596,620, Cl. 378-84.000.

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Dazeuka, Toshimitsu, 5,596,392, Cl. 399-98.000.
Harada, Toshiaki, 5,595,448, Cl. 400-320.000.
Hiramatsu, Makoto, 5,596,559, Cl. 369-59.000.
Hosoma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasunichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,596,427, Cl. 358-515.000.
Kobayashi, Tatsuya; Sasame, Hiroshi; Kobayashi, Tetsuya; and Miyashiro, Toshiaki, 5,596,393, Cl. 399-174.000.
Maeda, Tatsuo; Asayama, Hideki; Kawamorita, Yoichi; Ohmori, Hiroyuki; and Kimura, Mayumi, 5,595,845, Cl. 430-58.000.
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kotchi, Tetsunobu, 5,595,920, Cl. 437-40.000.
Ogushi, Nobuaki, 5,596,618, Cl. 378-34.000.
Okubo, Masaharu; and Honda, Mitsuru, 5,596,388, Cl. 399-111.000.
Otsuka, Mutsuo; Tanaka, Hisami; Shibayama, Shinichi; Otsubo, Yosuke; and Nakajima, Taizo, 5,595,848, Cl. 430-69.000.
Osato, Yoichi; and Miyata, Katsumi, 5,596,555, Cl. 369-13.000.
Saito, Katsuo, 5,596,599, Cl. 375-200.000.
Seki, Hiroyuki; Nishimoto, Yoshifumi; Tanaka, Hideki; Herada, Toshiaki; Kimura, Atsushi; Okazawa, Yoshitaka; and Yamamoto, Shinji, 5,596,241, Cl. 310-323.000.
Seki, Hiroyuki; and Kimura, Atsushi, 5,596,242, Cl. 310-328.000.
Takada, Yoshihiro; Suzuki, Akio; Dazeuka, Toshimitsu; Moriguchi, Haruhiko; Fukushima, Hitoshi; Izumizaki, Masami; and Miura, Yasushi, 5,596,353, Cl. 347-19.000.
Takashima, Tsuneo; and Ogino, Shigeru, 5,596,366, Cl. 348-208.000.
Taniguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; and Nakamura, Shinichi, 5,595,685, Cl. 252-299.610.
Tasuura, Masaaki; Fujii, Ayako; Kobori, Yoshiko; Nagano, Masaoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, 5,596,689, Cl. 395-133.000.
Terai, Hirohisko, 5,596,357, Cl. 347-64.000.
Ueno, Fumihiro; Toriseva, Akira; Ito, Yasuo; Sakaki, Eihiro; Obtake, Masaki; Kataoka, Hiromi; Kashihara, Atsushi; and Seto, Kaoru, 5,596,426, Cl. 358-500.000.
Yoshida, Takehiro, 5,596,629, Cl. 379-100.000.
Yoshimura, Katsuji; Takahashi, Koji; and Suzuki, Yasutomo, 5,596,419, Cl. 386-52.000.

Castrell, Jay T.; and Schurig, Edward R., to Texas Instruments Incorporated. Arbitration request sequencer. 5,596,749, Cl. 395-673.000.

Caoutchouc Manufacture et Plastiques: *See*—
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Caporiccio, Gerardo; and Spilzas, Hugh A., to Dow Corning Corporation. Fluorosilicone lubricant compositions. 5,595,962, Cl. 508-206.000.

Capper, David G.; and Axelrod, Stanley H., to Capper Technologies, Inc. Camera aiming mechanism and method. 5,596,368, Cl. 348-333.000.

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Capper, David G.; and Axelrod, Stanley H., 5,596,368, Cl. 348-333.000.

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Capps, Stephen P.; and Pagallo, Giulia, to Apple Computer, Inc. System and method of reflowing ink objects. 5,596,350, Cl. 345-173.000.

Capps, Stephen P., to Apple Computer, Inc. Method and apparatus for indicating a change in status of an object and its disposition using animation. 5,596,694, Cl. 395-152.000.

Capps, Stephen P.: *See*—
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Carey, William S.: *See*—
Wright, Bruce E.; Witzig, William L.; Goliaszewski, Alan E.; Carey, William S.; and Peltier, Jeffrey H., 5,596,130, Cl. 585-3.000.

Carl, James R.: *See*—
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Carlin, Josephine R.: *See*—
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Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., to Abbott Laboratories. Hepatitis B virus mutants, reagents and methods for detection. 5,595,739, Cl. 424-189.100.

Carney, Patrick. Blasting method and composition. 5,596,165, Cl. 102-312.000.

Carol, Mark P., to Nomos Corporation. Method and apparatus for conformal radiation therapy. 5,596,619, Cl. 378-65.000.

Carr, Albert A.; Kane, John M.; Maynard, George D.; Cheng, Hsien C.; and Dudley, Mark W., to Merrell Pharmaceuticals Inc. Piperidinyl thiacyclic derivatives. 5,596,003, Cl. 514-321.000.

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Amr, Yehia M., 5,595,068, Cl. 62-418.000.

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Ajilore, Akin O., 5,595,471, Cl. 414-685.000.
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Paketti, James J.; Feucht, Dennis D.; and Sinn, Scott G., 5,595,158, Cl. 123-321.000.
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Mattson, Ronald J.; and Catt, John D., 5,595,993, Cl. 514-255.000.

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Rybicki, Mathew A.; and Cave, Michael D., 5,596,301, Cl. 331-36.00R.

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Good, Thomas J.; and Redmond, Alan F., 5,595,653, Cl. 210-289.000.

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Blinov, Leonid; and Neuberger, Wolfgang, 5,595,793, Cl. 427-575.000.

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Belouet, Christine; and Chambonnet, Didier, 5,595,960, Cl. 505-473.000.

Chan, Ferdinand; Jarman, Michael; and Potter, Gerard A., to British Technology Group Limited. Pyridyl-propan-2-yl esters of 1-adamantane carboxylates. 5,595,995, Cl. 514-277.000.

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Divan, Deepakraj M.; and Chandorkar, Mukul, 5,596,492, Cl. 363-95.000.

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Liu, David K. Y.; Kwan, Ming S.; Chang, Chi; Haddad, Sameer; and Tang, Yuan, 5,596,531, Cl. 365-185.310.

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Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodyslyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Qaiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.

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Draper, Kenneth G.; Chapman, Sharon K.; and Kisner, Daniel L., 5,595,978, Cl. 514-44.000.

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Pan, Yang, 5,595,919, Cl. 437-29.000.

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Bhat, Narasimha B.; and Chaudhary, Kamal, 5,596,743, Cl. 395-500.000.

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Hearn, Dennis; Gildert, Gary R.; and Putman, Hugh M., 5,595,634, Cl. 203-29.000.

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Chen, Mike. Lock and alarm means lockable on window and door rail. 5,595,075, Cl. 70-95.000.

Chen, Ming-Hsiung. Safety lamp socket. 5,595,493, Cl. 439-188.000.

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Siew, Seok H.; and Chen, Roger C. T., 5,595,157, Cl. 123-306.000.

Chen, Sheng-Jia, to National Science Council. Beam-to-column connection. 5,595,040, Cl. 52-729.100.

Chen, Wu-Hsiung. Aluminum extruding machine. 5,595,085, Cl. 72-265.000.

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Zanidea, Alexander P.; Rose, Walter; and Cheney, Michael C., 5,595,745, Cl. 424-401.000.

Cheng, Chin-chang. Positioning device of retractable bars of a trolley. 5,595,092, Cl. 74-531.000.

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Carr, Albert A.; Kane, John M.; Maynard, George D.; Cheng, Hsien C.; and Dudley, Mark W., 5,596,003, Cl. 514-321.000.

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Bartolone, John B.; Peaksa, Christine M.; Santhanam, Uma; and Lang, Brian D., 5,595,730, Cl. 424-70.100.
Zanidea, Alexander P.; Rose, Walter; and Cheney, Michael C., 5,595,745, Cl. 424-401.000.

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Wilson, Daard W.; Gerber, Jon L.; and Christianson, Jeff G., 5,595,410, Cl. 292-306.000.

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Zander, Andrew T.; Cooper, Charles B., III; and Chien, Ring-Ling, 5,596,407, Cl. 356-328.000.

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Carswell, Gleta; Harms, Christian; Chang, Yin-Fu; and Chilton, Mary-Dell, 5,595,733, Cl. 424-93.210.

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Chapman, Barbara; and Burke, Rae L., 5,595,886, Cl. 435-69.600.

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Geysen, Hendrik M., 5,595,915, Cl. 436-518.000.

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Appel, Andrew T.; and Chisholm, Michael F., 5,595,527, Cl. 451-28.000.

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Cho, Han-Jin, to Electronics and Telecommunications Research Institute. Programmable logic module for data path applications. 5,596,287, Cl. 326-40.000.

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Lee, Jin-Bang; Choi, Byung-Cheol; Lee, Nam-Ho; and Kim, Seon-Kyu, 5,596,236, Cl. 310-68.00A.

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Choi, Kyeong K.; and Kim, Choon H., to Hyundai Electronics Industries Co., Ltd. Method for forming contacts in semiconductor device. 5,595,936, Cl. 437-192.000.

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Chrigui, Jihani, to Heidelberger Druckmaschinen AG; and Heidelberg Harris, S.A. Method and apparatus for damping bending vibrations of cylinders in a printing press. 5,595,117, Cl. 101-216.000.
Christen, Jack P., to White Mop Wringer Company. Adjustable tool handle. 5,594,975, Cl. 16-114.00R.
Christensen, Roy W.; Miller, Steven A.; and Mosser, David P., to General Electric Company. Apparatus and method for converting axisymmetric gas flow plasmas into non-axisymmetric gas flow plasmas. 5,595,765, Cl. 425-7.000.
Christian, John A. Apparatus for stereoscopically viewing screened images. 5,596,363, Cl. 348-58.000.
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Christianson, Jeff G.: *See*—
Wilson, Daniel W.; Garber, Jon L.; and Christianson, Jeff G., 5,595,410, Cl. 292-306.000.
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Polnicffka, Gerald P.; and Cole, Paul E., 5,595,433, Cl. 362-80.100.
Tinnakin, Lawrence J., 5,595,304, Cl. 206-598.000.
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Chung, Young J.: *See*—
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Church, William D.; Kozlowski, Edward; Liljequist, Lance; Jones, Stephen; Thompson, Mark; and Hewes, Charles, to Armor All Products Corporation. Double barrel sprayer for selective spraying of water or diluted product and use thereof. 5,595,345, Cl. 239-312.000.
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Ciba Corning Diagnostics Corp.: *See*—
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Law, Sey-Jong; and Piran, Uri, 5,595,875, Cl. 435-6.000.
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Horn, Michael E.; Hanna, Christian T.; and Shillito, Raymond D., 5,596,131, Cl. 800-205.000.
Horney, Douglas W.; and Ravichandran, Ramanathan, 5,596,033, Cl. 524-100.000.
Maier, Andreas, 5,595,650, Cl. 210-198.200.
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Hallbach, Raymond L.; Loretta, Miles E., Jr.; and Vallance, Douglas W., 5,595,218, Cl. 137-625.180.
Cinquin, Philippe; and Desbat, Laurent, to Universite Joseph Fourier. Three-dimensional energy distribution device. 5,595,767, Cl. 425-174.400.
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Russo, Michael E., 5,596,291, Cl. 327-108.000.
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Sekiguchi, Kunitaka, 5,596,432, Cl. 349-51.000.
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Jungemann, Ludger; Dreesbeimdieke, Hermann; and Sanders, Lambert, 5,595,537, Cl. 460-100.000.
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Claeson, Goran K.: *See*—
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Clarion Co., Ltd.: *See*—
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Clark, Arthur R.: *See*—
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Clark, Eugene V. Cadium-free corrosion protection for turbines. 5,595,831, Cl. 428-679.000.
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Tata, Kamesh; Bagchi, Amit; and Aziz, Nadim M., 5,596,504, Cl. 364-468.270.
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Harris, James M.; Kiba, Brigitte U.; and Click, Porter B., Jr., 5,596,171, Cl. 174-52.400.
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Coffman, George L. English-metric wrench socket or drive. 5,595,096, Cl. 81-121.100.
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Tonks, Nicholas K., 5,595,911, Cl. 435-320.100.
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Cole, Robert. Oil-based dust suppression suspension, emulsion for dust suppression, and method for suppressing dust. 5,595,782, Cl. 427-212.000.
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Coleman, Allen D. Bird decoy. 5,595,012, Cl. 43-3.000.
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Commereuc, Dominique, to Institut Francais Du Petrole. Compounds of rhenium and aluminium, preparation thereof and use thereof as catalysts. 5,596,115, Cl. 556-27.000.
Commins, Alfred D., to Simpson Strong-Tie Company, Inc. One-piece, in-line sheet metal holdown strap connector. 5,595,031, Cl. 52-264.000.
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Millington, Keith R., 5,595,572, Cl. 8-103.000.
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Belmont, Brian V., 5,596,728, Cl. 395-281.000.
Burckhart, David M.; Perez, Lazaro D.; Emerson, Theodore F.; Dow, Randolph O.; and Stimac, Gary A., 5,596,711, Cl. 395-182.210.
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Ogletree, Thomas M.; and Dougherty, Michael J., 5,596,684, Cl. 395-109.000.
Thome, Gary W., 5,596,741, Cl. 395-490.000.
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Berglund, Kurt, 5,595,321, Cl. 220-565.000.
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Levi, Ferruccio; and Conte, Giuseppe, 5,595,122, Cl. 104-173.100.
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Cooper, Elizabeth T.: *See*—
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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 5,595,721, Cl. 424-1.490.
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Short, Glenn D.; Sjöholm, Lars I.; and Rajewski, Thomas E., 5,595,678, Cl. 252-68.000.
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Weder, Donald E.; Straeter, William F.; Straeter, Joseph G.; Craig, Franklin J.; Donnelly, Wilma M.; and Redditt, Jack W., 5,595,802, Cl. 428-40.100.
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Konarck, James A.; Padgett, Clarence W.; Tanner, Scott B.; and Minney, Jack L., 5,596,544, Cl. 365-233.500.
Creatura, John A.; McKnight, Catherine A.; Duggan, Michael J.; Cogswell, Aron J.; Cunningham, Michael F.; and Dombroski, Thomas C., to Xerox Corporation. Conductive developer compositions with coated carrier particles. 5,595,851, Cl. 430-108.000.
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Bostica, Bruno; Delpiano, Franco; and Pesando, Luca, 5,596,664, Cl. 385-92.000.
Cue Dee Produkter AB: *See*—
Martinsson, Lars M. R.; and Hemmervall, Jan-Olof, 5,595,378, Cl. 269-210.000.
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Culpepper, Janice; McKenzie, Andrew; Dang, Warren; and Zurawski, Gerard, to Schering Corporation. Method of refolding human IL-13. 5,596,072, Cl. 530-351.000.
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de Ruyter, Anthony J.; and Means, David W., 5,596,590, Cl. 372-14.000.

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Martinez, Marvin W., Jr.; and Bluhm, Mark W., 5,596,731, Cl. 395-309.000.
Quattromani, Marc A.; and Eitrheim, John K., 5,596,740, Cl. 395-484.000.

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Wu, Kuang J.; and Quinn, Richard, 5,596,047, Cl. 525-375.000.

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Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Pritzsche, Helmut; Ye, Qaiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.

D/A Manufacturing Co., Inc.: *See*—
Adams, Don L., 5,595,211, Cl. 137-182.000.

Dadiomov, Edward: *See*—
Miller, Philip; Tobia, Joseph; and Dadiomov, Edward, 5,596,269, Cl. 324-73.100.

Daewoo Electronics Co., Ltd.: *See*—
Jung, Hae-Mook, 5,596,370, Cl. 348-416.000.
Lee, Jin-Bong; Choi, Byung-Cheol; Lee, Nam-Ho; and Kim, Seon-Kyu, 5,596,236, Cl. 310-68.00A.
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Daido Steel Co., Ltd.: *See*—
Hatano, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, 5,595,613, Cl. 148-319.000.

Daihen Corporation: *See*—
Kanagami, Fumio; and Kojima, Yasuhiro, 5,596,683, Cl. 395-83.000.

Daiki Co., Ltd.: *See*—
Ito, Hiroshi; Shinpo, Kaoru; and Kiritani, Yasuharu, 5,595,754, Cl. 424-443.000.

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Usui, Nobuaki; Fujimoto, Hiroki; Taniguchi, Kazutaka; and Imamura, Atsushi, 5,596,425, Cl. 358-500.000.

Dains, Michael: *See*—
Brinkmeyer, Horst; Hesse, Bernd; Dains, Michael; and Schwegler, Günter, 5,596,317, Cl. 340-825.310.

Dalebout, William T.; and Watterson, Scott R., to ICON Health & Fitness, Inc. Treadmill with upper body system. 5,595,556, Cl. 482-54.000.

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Radenac, Bruno K.; Karimian, Khashayar; Daljeet, Anand; and Murthy, Keshava, 5,596,093, Cl. 536-55.300.

Damac Products Inc: *See*—
Wiebe, Donald G., 5,595,494, Cl. 439-211.000.

Damen, Burkhardt: *See*—
Johns, Ekkehard; and Damen, Burkhardt, 5,596,051, Cl. 526-73.000.

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Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,274, Cl. 192-70.250.
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Loeffler, John M., 5,596,496, Cl. 364-424.034.

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Tedder, Thomas F.; Schlossman, Boris; and Spertini, Olivier, 5,595,737, Cl. 424-130.100.

Daneau, Isabelle M.: *See*—
Silversides, David W.; Daneau, Isabelle M.; and Houde, Alain, 5,596,089, Cl. 536-24.300.

Danfoss A/S: *See*—
Hansen, Gunnar L.; and Petersen, Hans C., 5,595,479, Cl. 418-61.300.
Thomsen, Svend E., 5,596,498, Cl. 364-424.051.

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Daniels, Nicholas R., to Emerson Electric Co. Ground wire attachment for a motor end-shield. 5,596,237, Cl. 310-71.000.

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Duo, Giang T., to Intel Corporation. Layout methodology, mask set, and patterning method for phase-shifting lithography. 5,595,843, Cl. 430-5.000.

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Darnell, Michael J.; and Smilowitz, Elissa D., to International Business Machines Corporation. System for annotating software windows. 5,596,700, Cl. 395-340.000.

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Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Daubenspeck, Timothy H.; and Howell, Wayne J., 5,596,226, Cl. 257-690.000.

Daughton, James M., to Nonvolatile Electronics, Incorporated. Magnetoresistive structure with alloy layer having two substantially immiscible components. 5,595,830, Cl. 428-611.000.

Daum, Daniel, to Cirrus Logic, Inc. Auto latency correction method and apparatus for MPEG playback system. 5,596,420, Cl. 386-110.000.

Davey, Alfred G.: *See*—
Bogdasy, Arthur; and Davey, Alfred G., 5,595,368, Cl. 251-148.000.

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Davis, Brian F.: *See*—
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Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,274, Cl. 192-70.250.
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Gearich, Thad J.; Davis, Richard M.; and Martinez, Bruno A., 5,596,609, Cl. 375-350.000.

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Elgendy, Said M. A.; Deadman, John J.; Patel, Geeta; Green, Donovan S.; Behan, Johan A.; Kakkar, Vijay V.; and Claeson, Goran K., 5,596,123, Cl. 558-288.000.

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Deburtoli, George; Osborne, Brian T.; Lukas, Helmut H.; and Hvenda, Jaroslav M., to Northern Telecom Limited. Optical fiber cable enclosure. 5,596,670, Cl. 385-135.000.

Decheine, Ronald L.; Smith, Thomas B.; Mariso, Scott A.; Tache, Ronald J.; and Roy, Ajoy K., to Auburn International, Inc. NMR analysis of polypropylene in real time. 5,596,275, Cl. 324-307.000.

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Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,595,739, Cl. 424-189.100.

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Jasper, Edward P.; and Jensen, Roderick J., 5,595,052, Cl. 56-220.000.

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Berkey, Rex A.; DeFant, Daniel; Hallum, Brad; Hansen, Jeffrey A.; Hopper, Edward L.; Johnson, Philip A.; Saari, Frank C.; and Sundell, Randy P., 5,595,470, Cl. 414-495.000.

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Goodby, John W.; Toyne, Kenneth J.; and Booth, Christopher J., 5,595,682, Cl. 252-299.010.

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Phillippi, R. Michael; Drzewiecki, Tadeusz M.; and Freimanis, Stephen A., 5,596,134, Cl. 73-19.070.

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DeHaitre, Los, to Abbott-Interfast Corporation. Double slot spanner lockout. 5,595,466, Cl. 411-303.000.

Deiso, James W., III: *See*—
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.00R.

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Cherif-Cheikh, Roland, 5,595,760, Cl. 424-464.000.

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Delaplaine, Robert W. Wine bottle aerator. 5,595,104, Cl. 99-323.100.

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Snider, Chris R., 5,596,343, Cl. 345-102.000.
Swanson, Gregory D., 5,596,144, Cl. 73-514.180.
Vitkin, Lev M., 5,595,449, Cl. 400-472.000.

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Haupt, Axel; and Delibruegge, Karl-Hermann, 5,596,603, Cl. 375-242.000.

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Romohr, Steven D., 5,596,723, Cl. 395-200.160.

Delmonte, Anthony W. Wind indicator. 5,595,137, Cl. 116-264.000.

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Tindell, James M.; and Denman, Matthew L., 5,596,696, Cl. 395-806.000.

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Lin, Cheng-I; and Tsay, Yuh-Geng, 5,595,867, Cl. 435-4.000.

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Way, Lowell B., Jr.; and Sheps, Martin I., 5,595,436, Cl. 362-190.000.

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Ripa, Giorgio; and Morosi, Paolo, 5,595,714, Cl. 423-21.100.

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Tytgat, Bart; and Dierckx, Paul, 5,596,428, Cl. 358-518.000.

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Domal Envirotech Inc.: *See*—
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Creatura, John A.; McKnight, Catherine A.; Duggan, Michael J.; Cogswell, Aron J.; Cunningham, Michael F.; and Dombroski, Thomas C., 5,595,851, Cl. 430-108.000.

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Koch, Kaelyn C.; and Bolek, Lisa M., 5,595,050, Cl. 53-441.000.
Pyzik, Aleksander J.; Fuller, Sharon M.; and Beaman, Donald R., 5,595,622, Cl. 156-89.000.
Walton, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., 5,595,705, Cl. 264-456.000.

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Kushibiki, Nobuo; Sugata, Yoko; and Suzuki, Toshio, 5,596,060, Cl. 528-15.000.

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Bank, Howard M.; and Nguyen, Binh T., 5,596,120, Cl. 556-480.000.
Burns, Gary T.; Kennon, Linda D.; Roy, Aroop K.; and Tselepis, Arthur J., 5,595,593, Cl. 106-499.000.
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Halm, Roland L.; Kuivila, Charles S.; and Wilding, Oliver K., 5,596,119, Cl. 556-472.000.

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Richards, Jeffrey; and Harvey, Martin C., 5,595,032, Cl. 52-306.000.

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Aso, Takayuki; Ona, Isao; and Ozaki, Masaru, 5,595,675, Cl. 252-8.610.
Koyama, Taku; and Sugiura, Yasushi, 5,596,118, Cl. 556-471.000.

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Burckhartt, David M.; Perez, Lazaro D.; Emerson, Theodore F.; Dow, Randolph O.; and Stimac, Gary A., 5,596,711, Cl. 395-182.210.

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Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Beuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zeiss, Siegfried, to Bayer Aktiengesellschaft. Trisubstituted biphenyls. 5,596,006, Cl. 514-340.000.

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Huffmeister, Alan D., 5,595,255, Cl. 175-331.000.

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DSM Desotech, Inc.: *See*—
Szum, David M., 5,595,820, Cl. 428-378.000.

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Murphy, Edward J.; Lapin, Stephen C.; and Noren, Gerry K., 5,596,669, Cl. 385-128.000.

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Beck, Martin H.; Caldicott, Robert; and Muszynski, John H., 5,595,799, Cl. 428-35.700.

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Anderson, Virgil L.; Feyder, Gusty; Vanderdonckt, Cathy; Forrest, Albert W., Jr.; and Young, Patrick H., 5,595,819, Cl. 428-330.000.
Blotham, Peter A.; Breikss, Anne I.; Brast, Richard E.; Scott, Leon S.; Super, John D.; and Verbsky, James D., 5,596,074, Cl. 528-417.000.
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Goodley, George R., 5,596,069, Cl. 528-280.000.
Harbster, Kevin H.; and Perrotto, Joseph A., 5,595,712, Cl. 422-129.000.
Jacobson, Howard W.; Scholla, Michael H.; and Wigfall, Annie W., 5,595,750, Cl. 424-421.000.
Moffett, Robert H., 5,595,630, Cl. 162-164.100.
Pelosi, Lorenzo F., 5,596,080, Cl. 530-373.000.
Rakestraw, Scott L., 5,595,876, Cl. 435-6.000.

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Ilg, Otto M.; and Dugan, Jeffrey S., 5,595,660, Cl. 210-521.000.

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Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; Subramanyam, Chakrapani; Latimer, Lee H.; and Lodge, Eric P., to Sterling winthrop Inc. Saccharin derivatives useful as proteolytic enzyme inhibitors and compositions and method of use thereof. 5,596,012, Cl. 514-373.000.

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Duplantier, Allen J., to Pfizer Inc. Dihydro pyrazolopyrroles. 5,596,013, Cl. 514-403.000.

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Duval, Benoit: *See*—
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Pakhchyan, Eduard; and Smushkovich, Yosif, 5,596,371, Cl. 348-452.000.

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Glover, Edward C. T. S.; and Earle, Anthony, 5,595,353, Cl. 242-348.100.

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Weinerman, Lee S.; and Arthurs, Scott A., 5,595,076, Cl. 70-208.000.

Eastman Chemical Comany: *See*—
Edgar, Kevin J.; and Lawniczak, Jonathan E., 5,595,591, Cl. 106-170.270.

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Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,595,823, Cl. 428-421.000.
Cosgrove, Patrick A.; Mitch, John; and Niedzielski, Mark, 5,596,415, Cl. 358-296.000.
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Fant, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., 5,595,862, Cl. 430-537.000.
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Marcus, Michael A.; Gross, Stanley; and Wideman, David C., 5,596,409, Cl. 356-357.000.
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Johnson, Richard A.; Engel, Joseph C.; Boccabella, Michael F.; Oravetz, David M.; and Wise, James L., 5,596,473, Cl. 361-97.000.

Ebara Corporation: *See*—
Kosao, Daisuke; Furukawa, Hideo; Nitta, Isami; and Konata, Kimio, 5,596,443, Cl. 359-200.000.

Ebeid, Nader: *See*—
Dao, Son K.; and Ebeid, Nader, 5,596,744, Cl. 395-610.000.

Echelbarger, Joshua U.: *See*—
Jasper, Edward P.; Frederick, James M.; and Echelbarger, Joshua U., 5,595,053, Cl. 56-226.000.

Eckhardt, Stephen K., to Minnesota Mining and Manufacturing Company. Fixed-focus triplet projection lens for overhead projectors. 5,596,455, Cl. 359-789.000.

Ecoff, William B.; and Bradbury, William H. Hydraulic drive assembly for electrical discharge machine. 5,595,103, Cl. 91-51.000.

Ecomed, Inc.: *See*—
Wilson, Joseph H.; Haeberle, David C.; Kralovic, Raymond C.; Lamaster, Kenneth R.; Mensel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; and Antloga, Kathleen M., 5,595,711, Cl. 422-119.000.

Edelman, Peter G.: *See*—
Foos, Joseph S.; Edelman, Peter G.; Flaherty, James E.; and Berger, Joseph, 5,595,646, Cl. 205-783.000.

Edgar, Kevin J.; and Lawniczak, Jonathan E., to Eastman Chemical Comany. Cellulose acetonacetate esters used in coating compositions. 5,595,591, Cl. 106-170.270.

Edwards, James D.; Staples, Paul R.; and Whited, David R., to France/Scott Fetzer Company. Icemaker. 5,596,182, Cl. 200-61.200.

EEG Enterprises, Inc.: *See*—
Berman, Eric B.; and McLaughlin, Philip T., 5,596,372, Cl. 348-537.000.

Egawa, Akira, to Fanuc Ltd. Laser oscillator. 5,596,594, Cl. 372-93.000.

Eguchi, Tatsuya, to Minolta Camera Kabushiki Kaisha. Optical apparatus having laser beam diameter variable according to image data. 5,596,444, Cl. 359-210.000.

Eicher, Jochen: *See*—
Borck, Gerald-Wolfgang; Eicher, Jochen; Kuhn, Pierre; Müller, Norbert; and Salomé, Antoine, 5,595,297, Cl. 206-387.130.

Eick, Stephen G.; and Wills, Graham J., to Lucent Technologies Inc. Graphical display of relationships. 5,596,703, Cl. 395-326.000.

Eifuku, Takayuki: *See*—
Takahashi, Shuji; Yanadori, Kazuhiro; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Eitrheim, John K.: *See*—
Quattromani, Marc A.; and Eitrheim, John K., 5,596,740, Cl. 395-484.000.

Ejnar Jensen & Son A/S: *See*—
Jensen, Jørn M., 5,595,467, Cl. 414-13.000.

EKATO Rühr- und Mischtechnik GmbH: *See*—

Weiss, Hans J.; Forschner, Peter; Krebs, Rainer; and Geisler, Reinhard, 5,595,475, Cl. 416-223.00R.

Ekström, Anders W.; and Ohlsson, Bo W., to Whirlpool Europe B.V. Microwave oven with microwave-actuable bottom and temperature sensor. 5,595,673, Cl. 219-710.000.

Ekstrom Industries, Inc.: *See*—
Robinson, Darrell; and Loehr, Karl, 5,595,506, Cl. 439-638.000.

Electric Fuel (E.F.L.) Ltd.,: *See*—
Goldstein, Jonathan R.; Harats, Yehuda; Sharon, Yuval; and Naimer, Neal, 5,595,949, Cl. 502-20.000.

Electric Power Research Institute, Inc.: *See*—
Divan, Deepakraj M.; and Chandorkar, Mukul, 5,596,492, Cl. 363-95.000.

Electro-Films Incorporated: *See*—
Madden, Jean D., Jr.; and Knapp, Christopher H., 5,595,668, Cl. 216-17.000.

Electrolux Zanussi Elettrodomestici S.p.A.: *See*—
Pavaro, Daniele, 5,595,200, Cl. 134-201.000.

Electronic Payment Services, Inc.: *See*—
Davis, Terry L.; Hart, James A.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,596,642, Cl. 380-24.000.
Davis, Terry L.; Hart, James A.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,596,643, Cl. 380-24.000.

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Cho, Han-Jin, 5,596,287, Cl. 326-40.000.

Elf Atochem S.A.: *See*—
Riondel, Alain, 5,596,126, Cl. 560-205.000.

Elgendy, Said M. A.; Deadman, John J.; Patel, Geeta; Green, Donovan S.; Baban, Jehan A.; Kakkar, Vijay V.; and Claeson, Goran K., to Thrombosis Research Institute. Boric ester synthesis. 5,596,123, Cl. 558-288.000.

Eli Lilly and Company: *See*—
Berg, David T.; and Grinnell, Brian W., 5,595,736, Cl. 424-94.640.
Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., 5,596,106, Cl. 549-57.000.
Dodge, Jeffrey A., 5,596,004, Cl. 514-324.000.
Wickiser, David L, 5,596,122, Cl. 558-56.000.

Elliott, Jason M.: *See*—
Baldwin, John J.; Claremon, David A.; Elliott, Jason M.; Liverton, Nigel; Remy, David C.; and Selnick, Harold G., 5,595,990, Cl. 514-221.000.

Elliott, Stanley B. Reaction products of lyotropic liquid crystal salt complexes. 5,595,683, Cl. 252-299.010.

Elliott, Steven A.; Froelich, Ronald W.; and Sogge, John W., to Walt Disney Company, The. Amusement ride and self-propelled vehicle therefor. 5,595,121, Cl. 104-53.000.

Ellson, Richard N.: *See*—
Parulski, Kenneth A.; Baumeister, Hans P.; and Ellson, Richard N., 5,595,389, Cl. 463-31.000.

Elomex IP Holdings Ltd.: *See*—
Kikinis, Dan, 5,596,639, Cl. 380-4.000.

Elopak Systems A.G.: *See*—
Skinner, Edward A., 5,595,340, Cl. 229-216.000.

Embley, Tommy J.: *See*—
Comer, Timothy J.; Embley, Tommy J.; Mastej, Eugene; and Wilson, Dorothy S. D., 5,596,501, Cl. 364-464.230.

Emerson Electric Co.: *See*—
Daniels, Nicholas R., 5,596,237, Cl. 310-71.000.
Huhtki, Ari M.; and Carr, Brian S., 5,595,306, Cl. 209-325.000.
Kieffer, Vernon E.; and Kliethermes, Andrew J., 5,594,984, Cl. 29-736.000.

Emerson, Theodore F.: *See*—
Burckhardt, David M.; Perez, Lazaro D.; Emerson, Theodore F.; Dow, Randolph O.; and Stimac, Gary A., 5,596,711, Cl. 395-182.210.

Emo, Bruce D.; and Wilson, Brian D., to Integral Peripherals, Inc. Variable zone layout for information storage disk drive. 5,596,458, Cl. 360-48.000.

Emo-Patvag AG: *See*—
Cutlisch, Erwin; and Bonsevic, Jorgen, 5,596,163, Cl. 102-202.200.

Endo, Nobuhiro, to NEC Corporation. Non-volatile semiconductor memory device having a metal-insulator-semiconductor gate structure and method for fabricating the same. 5,596,214, Cl. 257-324.000.

Endoh, Tetsuo; and Shirota, Riichiro, to Kabushiki Kaisha Toshiba. Electrically erasable programmable read-only memory with an array of one-transistor memory cells. 5,596,523, Cl. 365-182.000.

Endorecherche Inc.: *See*—
Labrie, Fernand, 5,595,985, Cl. 514-169.000.

Endoy, Robert; Debler, Edward J., Jr.; and Hanks, Mark A., to Ford Motor Company. Reverse lock for one-way clutch. 5,595,273, Cl. 192-45.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Qaiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.

Engbert, Theodor: *See*—
König, Eberhard; and Engbert, Theodor, 5,596,064, Cl. 528-45.000.

Engel, Joseph C.: *See*—
Johnson, Richard A.; Engel, Joseph C.; Boccabella, Michael F.; Oravetz, David M.; and Wise, James L, 5,596,473, Cl. 361-97.000.

Engel, Walther: *See*—
Menke, Klaus; Böhalein-Manss, Jutta; Schmid, Helmut; Bucerius, Klaus M.; and Engel, Walther, 5,596,168, Cl. 149-19.400.

Engelhard/ICC: *See*—
Mark, Henry Y.; and Heywood, James A., 5,595,238, Cl. 165-9.000.

Engelke, Bernward: *See*—
Ostermeier, Jörg; Borchers, Peter; and Engelke, Bernward, 5,595,278, Cl. 198-333.000.

English, Curtiss: *See*—
Morton, Randolph J.; Seber, Brent; English, Curtiss; and DeFelice, Mark, 5,594,967, Cl. 7-134.000.

Eniricerche S.p.A.: *See*—
Marcotullio, Armando; and Santori, Massimo, 5,595,596, Cl. 106-677.000.

Enomoto, Yoshitaka: *See*—
Furuhashi, Masaaki; Handa, Ryouji; Tomita, Nobuo; and Enomoto, Yoshitaka, 5,596,449, Cl. 359-341.000.

Enso-Gutzeit Oy: *See*—
Salonen, Hannu; and Kasnervo, Helena, 5,595,196, Cl. 131-362.000.

Enviroguard, Inc.: *See*—
Rieber, Roy S., 5,595,667, Cl. 210-769.000.

Enviroplan, Inc.: *See*—
Baughman, Leonard, 5,596,154, Cl. 73-863.010.

EP Technologies, Inc.: *See*—
Swanson, David K.; Panescu, Dorin; and Whayne, James G., 5,595,183, Cl. 128-697.000.

Epple, Ulrich; Kubilius, Uwe; and Schmidt, Holger, to Hoechst Aktiengesellschaft. Copolymers, their preparation, and their use in high-solids coating compositions. 5,596,057, Cl. 526-273.000.

Erb, Laura J.: *See*—
Boucher, Richard C.; Weisman, Gary A.; Turner, John T.; Harden, Thomas K.; Parr, Claude E.; Sullivan, Daniel M.; Erb, Laura J.; and Lustig, Kevin D., 5,596,088, Cl. 536-23.500.

Erbacher, Patrick: *See*—
Midoux, Patrick; Erbacher, Patrick; Roche-Degremont, Annie-Claude; and Monsigny, Michel, 5,595,897, Cl. 435-172.300.

Erhage, Lars, to Telefonaktiebolaget LM Ericsson. Method and arrangement for analogue-digital converters. 5,596,323, Cl. 341-155.000.

Erickson, John M.; and Crichton, Philip B., to United States of America, Army. Image stabilization apparatus for telescopic devices. 5,596,365, Cl. 348-208.000.

Erickson, Timothy K.: *See*—
Cummins, Brad L.; Erickson, Timothy K.; O'Brien, Gary R.; Sheriff, Alan V.; and Sies, Duane J., 5,596,408, Cl. 356-339.000.

Eriksen, Gunnar; and Olsen, Sissel W., to Kvaerner Eureka a.s. Heatable shield for heat treatment of paper-making machine textiles. 5,594,998, Cl. 34-111.000.

Eriksson, Lars-Arne, to Alfa Laval Agriculture International AB. Method and an apparatus for measuring the output voltage on an electric fence and for producing elecaric pulses in said fence. 5,596,281, Cl. 324-713.000.

Erlich, Nahum, to N.M.B. Medical Applications Ltd. Single puncture multi-biopsy gun. 5,595,185, Cl. 128-754.000.

Erlich, Sharon: *See*—
Gozlan, Eli; Brezzaitz, Shlomo; Nir, Dan; and Erlich, Sharon, 5,595,488, Cl. 434-236.000.

Ernst, Richard E.: *See*—
Bloxham, Peter A.; Breikss, Anne I.; Ernst, Richard E.; Scott, Leon S.; Super, John D.; and Verbsky, James D., 5,596,074, Cl. 528-417.000.

Erskine, Harry S.: *See*—
Bess, Emery L.; and Erskine, Harry S., 5,596,311, Cl. 340-384.700.

Eschholz, Siegmar K.: *See*—
Madonna, Robert P.; Eschholz, Siegmar K.; and Lynch, John T., 5,596,569, Cl. 370-217.000.

Espinosa, Mark A. Stressed arch structures. 5,595,203, Cl. 135-124.000.

Essche N.V.: *See*—
Beadman, Michael A.; and Martin, Paul, 5,595,450, Cl. 400-615.200.

Esser, Franz; Schaperenberg, Gerd; Dollinger, Horst; Jung, Birgit; and Burger, Erich, to Boehringer Ingelheim KG. Amino acid derivatives, processes for the manufacture thereof and pharmaceutical compositions containing these compounds. 5,596,000, Cl. 514-312.000.

Essentise: *See*—
Ysbrand, Floyd, 5,596,175, Cl. 174-117.00M.

Ethicon, Inc.: *See*—
Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,595,751, Cl. 424-422.000.

Ethyl Petroleum Additives Limited: *See*—
Rees, Mark; and MacPherson, Ian, 5,595,966, Cl. 508-591.000.

Eurolysine: *See*—
Richaud, François; Jarry, Bruno; Takinami, Koichi; Kurahashi, Osamu; and Beyou, Anne, 5,595,889, Cl. 435-71.200.

Eustace, Brian; and Zarate, Robert, to Hon Industries Inc. Shelving system. 5,595,127, Cl. 108-109.000.

Evans, Glen A., to Lucent Technologies Inc. Transporter for heavy loads. 5,595,469, Cl. 414-458.000.

Evans, Jeffrey A.: *See*—
Fawcett, Newton C.; and Evans, Jeffrey A., 5,595,908, Cl. 435-287.200.

Evans, Tom K.: *See*—
Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,595,514, Cl. 439-886.000.

Everdyke, Wayne D., to Xerox Corporation. Safety stapler. 5,595,336, Cl. 227-7.000.

Everitt, Christopher H., to Framatome Connectors International. Cable sealing arrangements. 5,596,176, Cl. 174-151.000.

Excel, Inc.: *See*—
Madonna, Robert P.; Eschholz, Siegmar K.; and Lynch, John T., 5,596,569, Cl. 370-217.000.

Excel Industries, Inc.: *See*—
MacPhail-Fausey, Bryan D., 5,595,025, Cl. 49-351.000.

Exedy Corporation: *See*—
Yamamoto, Kozo, 5,595,539, Cl. 464-24.000.

Exline, Michael P.: *See*—
Exline, William B.; and Exline, Michael P., 5,595,401, Cl. 281-2.000.

Exline, William B.; and Exline, Michael P., to William Exline, Inc. Wallet size card book. 5,595,401, Cl. 281-2.000.

Exxon Chemical Patents Inc.: *See*—
Puckace, James S.; and Martella, David J., 5,595,963, Cl. 508-421.000.
Sagar, Vispi-R.; and Jejelowo, Moses O., 5,595,950, Cl. 502-104.000.

Exxon Production Research Company: *See*—
Krebs, Jerome R., 5,596,548, Cl. 367-56.000.

F & L Machinery Design, Inc.: *See*—
Villaverde, Fernando, Sr.; and Villaverde, Fernando, Jr., 5,595,118, Cl. 101-424.100.

Factor, David F.: *See*—
Dong, Jie-Yi; Factor, David F.; Farzammehr, Hamid; and Sroka, Kenneth, 5,595,594, Cl. 106-661.000.

Fahey, Kennan J.: *See*—
Cullinan, George J.; Fahey, Kennan J.; and Koppel, Gary A., 5,596,106, Cl. 549-57.000.

Fahy, Lawrence J.; Angelini, Peter J.; Diermeier, David A.; and Marconi, John, to International Paper Company. Laminated shielding material and method for shielding an enclosure therewith. 5,595,801, Cl. 428-40.100.

Fairhaven Software, Inc.: *See*—
Bhatt, Bhuvnesh J., 5,596,753, Cl. 395-682.000.

Faita, Giuseppe: *See*—
Traini, Carlo; and Faita, Giuseppe, 5,595,641, Cl. 205-464.000.

Fakhruddin, Saifuddin: *See*—
DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,596,713, Cl. 395-183.110.

Faletti, James J.; Feucht, Dennis D.; and Sinn, Scott G., to Caterpillar Inc. Dynamic positioning device for an engine brake control. 5,595,158, Cl. 123-321.000.

Fant, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., to Eastman Kodak Company. Photographic elements containing matte particles of bimodal size distribution. 5,595,862, Cl. 430-537.000.

Fanton, Jeffrey T.; and Opsal, Jon, to Therma-Wave, Inc. Integrated spectroscopic ellipsometer. 5,596,411, Cl. 356-369.000.

Fanuc Ltd.: *See*—
Egawa, Akira, 5,596,594, Cl. 372-93.000.
Takegahara, Takashi; Takagi, Shigetoshi; and Nakamura, Shinya, 5,595,463, Cl. 409-132.000.

Faraday, Inc.: *See*—
Horton, Norman B., 5,596,477, Cl. 361-160.000.

Farinelli, William: *See*—
Anderson, R. Rox; Grossman, Melanie; and Farinelli, William, 5,595,568, Cl. 606-9.000.

Farmitalia Carlo Erba S.r.L.: *See*—
Mongelli, Nicola; Biasoli, Giovanni; Grandi, Maria; Ciomei, Marina; and Geroni, Maria C., 5,596,105, Cl. 548-518.000.

Farnier & Penin SNC: *See*—
Ouvrard, Gaston, 5,595,229, Cl. 160-23.100.

Farrell, Michael E.: *See*—
Dumas, Glen A.; and Farrell, Michael E., 5,596,389, Cl. 399-16.000.

Farwerck, Karl-Peter: *See*—
Schlarb, Alois; Hofmann, Jürgen; Ohlig, Hilmar; Ittemann, Peter; and Farwerck, Karl-Peter, 5,595,696, Cl. 264-118.000.

Farzammehr, Hamid: *See*—
Dong, Jie-Yi; Factor, David F.; Farzammehr, Hamid; and Sroka, Kenneth, 5,595,594, Cl. 106-661.000.

Fash, D. Grant, III: *See*—
Wright, J. Nelson; Plugge, Jay S.; Fash, D. Grant, III; Langdon, Donald R.; Finger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.

Fast, Lawrence R. Infrared audio transmitter system. 5,596,648, Cl. 381-77.000.

Fastron Company, The: *See*—
Langdon, Howard S., 5,595,512, Cl. 439-812.000.

Favaro, Daniele, to Electrolux Zanussi Elettrodomestici S.p.A. Dishwasher with vertically adjustable basket. 5,595,200, Cl. 134-201.000.

Fawcett, Newton C.; and Evans, Jeffrey A., to University of Southern Mississipi. Piezoelecaric device for detection of polynecleotide hybridization. 5,595,908, Cl. 435-287.200.

Fechner, Scott W.: *See*—
Nicholas, Thomas G.; and Fechner, Scott W., 5,595,698, Cl. 264-145.000.

Feher, John. Motion resistant freeline bobber. 5,595,016, Cl. 43-44.870.

Feldtkeller, Martin: *See*—
Bichler, Helmut; Herfurth, Michael; Feldtkeller, Martin; and Lenz, Michael, 5,596,264, Cl. 323-284.000.

Ferguson, Patrick L.; and Maguire, David J., to Compaq Computer Corporation. Fifo queue having replaceable entries. 5,596,725, Cl. 395-250.000.

Fernandes, Antonio M.: *See*—
Good, Charles F.; Young, Craig S.; and Fernandes, Antonio M., 5,596,691, Cl. 395-140.000.

Fernandez, Christopher; Just, Angela R.; and Kochanski, Gregory P., to AT&T. Telecommunications system for dynamically selecting conversation topics having an automatic call-back feature. 5,596,634, Cl. 379-201.000.

Ferra, Lawrence C., to Intel Corporation. Method and apparatus for programming embedded memories of a variety of integrated circuits using the IEEE test access port. 5,596,734, Cl. 395-825.000.

Ferrar, Wayne T.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,595,823, Cl. 428-421.000.

Ferraro, Gian F., to Albrecht Equipamentos Industriais Ltda. Expander for tubular fabrics. 5,594,978, Cl. 26-84.000.

Ferrer, Angel D.: *See*—
Leibfred, Kevin J.; Hnat, Diane L.; Ferrer, Angel D.; and Andreski, Henry M., 5,595,774, Cl. 426-93.000.

Ferring AB: *See*—
Andersson, Lars H. H.; and Skoldbeck, Jan-Ake, 5,596,078, Cl. 530-315.000.

Feucht, Dennis D.: *See*—
Faletti, James J.; Feucht, Dennis D.; and Sinn, Scott G., 5,595,158, Cl. 123-321.000.

Feuling, James J. Contra-rotating twin crankshaft internal combustion engine. 5,595,147, Cl. 123-52.400.

FEV Motorentechnik GmbH & Co. Kommanditgesellschaft: *See*—
Bollig, Christoph; Hermanns, Hans-Joerg; Schellhase, Torsten; and Widmann, Frank, 5,595,146, Cl. 123-48.00B.

Fey, Peter: *See*—
Dressel, Jürgen; Fey, Peter; Hauko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Beuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Staesch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.

Feyder, Gusty: *See*—
Anderson, Virgil L.; Feyder, Gusty; Vanderdonckt, Cathy; Forrest, Albert W., Jr.; and Young, Patrick H., 5,595,819, Cl. 428-330.000.

Fiat Ferroviaria S.p.A.: *See*—
Zingarelli, Angelo; and Santanera, Cesare, 5,596,203, Cl. 250-559.290.

Fiberlign Division of Preformed Line Products (Canada) Ltd.: *See*—
Harman, Murray R.; and Marshall, James D., 5,596,672, Cl. 385-147.000.

Fichtel & Sachs AG: *See*—
Beck, Hubert, 5,595,269, Cl. 188-282.000.
Braun, Günther; and Rucks, Sabine, 5,595,270, Cl. 188-284.000.
Mennel, Klaus, 5,595,276, Cl. 192-213.120.

Fier, Duane T.; and Rote, Scott J., to Anderson Corporation. Gliding door latch assembly. 5,595,409, Cl. 292-112.000.

Figueiredo, Antonio A.; and Kane, Adam S., to Lucent Technologies Inc. Protector device. 5,596,475, Cl. 361-119.000.

Figueiredo, Antonio A.: *See*—
Braun, Rudy R.; Figueiredo, Antonio A.; Kane, Adam S.; and Starace, Jeremia P., 5,595,507, Cl. 439-716.000.

Filburn, Thomas P.; Heddleston, John C.; and Killelea, Dean A., to Hamilton Standard. Method for improving water transport and reducing shrinkage stress in membrane humidifying devices and membrane humidifying devices. 5,595,690, Cl. 261-104.000.

Finger, David J.: *See*—
Wright, J. Nelson; Plugge, Jay S.; Fash, D. Grant, III; Langdon, Donald R.; Finger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.

Finkowski, James W.: *See*—
Perry, Michael R.; Finkowski, James W.; and Kivi, James A., 5,596,137, Cl. 73-49.200.

Finvetro S.r.l.: *See*—
Rossini, Mauro, 5,596,151, Cl. 73-861.550.

Firma Carl Freudenberg: *See*—
Schäfer, Werner; and Schaut, Gerhard, 5,595,817, Cl. 428-283.000.

Fischer, Andrea G.: *See*—
Weuste, Burkhard; Weissen, Hans J.; and Fischer, Andrea G., 5,596,125, Cl. 560-171.000.

Fischer, Eberhard, to Mannesmann Aktiengesellschaft. Horizontal continuous casting apparatus for metals. 5,595,237, Cl. 164-440.000.

Fischer, Paul B.: *See*—
Yan, Leopoldo D.; and Fischer, Paul B., 5,595,526, Cl. 451-8.000.

Fishel, David L.; and Digiglia, Terry M., to GenCorp Inc. Method of manufacturing an anti-fracture, water-resistant, masonry-bondable membrane. 5,595,625, Cl. 156-308.200.

Fishman, Jordan S. Method of making a wheel rim. 5,594,988, Cl. 29-894.353.

Fitts, Richard A., to Northrop Grumman Corporation. Secondary surveillance radar interrogation system using dual frequencies. 5,596,326, Cl. 342-30.000.

Fitz, Hartmut: *See*—
Leiber, Heinz; Burghoff, Heinz G.; Mungold, Karlheinz; Geber, Michael; and Fitz, Hartmut, 5,596,233, Cl. 307-9.100.

Fitzgerald, John J.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,595,823, Cl. 428-421.000.

Flagan, Richard C.; and Zhang, Shou-Hua, to California Institute of Technology. Radial differential mobility analyzer. 5,596,136, Cl. 73-28.040.

Flaherty, James E.: *See*—

Foos, Joseph S.; Edelman, Peter G.; Flaherty, James E.; and Berger, Joseph, 5,595,646, Cl. 205-783.000.
Fleischhauer, Grier S.: *See*—
Sikkra, Vinod K.; Deevi, Seetharama C.; Fleischhauer, Grier S.; Hajaligol, Mohammad R.; and Lilly, A. Clifton, Jr., 5,595,706, Cl. 420-81.000.
Fleshren, Donald F., to MCI Communications Corporation. Apparatus for protecting a telecommunications network from false alarm conditions due to T1 line signal interruption. 5,596,568, Cl. 370-249.000.
Flex Products, Inc.: *See*—
Markantes, Charles T.; and Phillips, Roger W., 5,596,402, Cl. 356-71.000.
Flint, Mary L. Process for making a doll's head looking like the head of a living person. 5,596,503, Cl. 364-468.250.
Flo Trend Systems, Inc.: *See*—
Caughman, Carl R., Jr., 5,595,654, Cl. 210-323.100.
Flowdril Corporation: *See*—
O'Hanlon, Thomas A., 5,595,252, Cl. 175-57.000.
Flowcon, Inc.: *See*—
Kassal, James J., 5,595,188, Cl. 128-773.000.
Flynn, William C., III: *See*—
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Christensen, Roy W.; Miller, Steven A.; and Mourer, David P., 5,595,765, Cl. 425-7.000.
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Harper, Ross T.; Johnston, James H.; and Wiseman, Nicholas, 5,595,717, Cl. 423-339.000.
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Giddings, James N.; and Howell, Robert P., to Texas Instruments Incorporated. Tester for integrated circuits. 5,596,282, Cl. 324-754.000.
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Barnes, David J.; and Gilday, John P., 5,595,676, Cl. 252-62.200.
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Matteucci, Mark; Jones, Robert J.; and Mangor, John, 5,596,086, Cl. 536-22.100.
Gillard, Clive H.: *See*—
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Gillon, Mark E.; and Biggs, Stephen L., to Banjo Corporation. Dry break coupling assembly with cam-locking connection system. 5,595,217, Cl. 137-614.060.
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Brochert, Sue; O'Neal, Clifford; van der Loo, Hermes; and Rogers, Brian, 5,595,728, Cl. 424-65.000.
Gilliland, Kevin A.; and Niemeyer, Larry A., to Crown Equipment Corporation. Rotary grip with paddle for use on pallet truck. 5,595,259, Cl. 180-332.000.
Gladin, Lyuba K.; Wicks, Douglas A.; Yeaka, Philip E.; and Jonsson, E. Haukur, to Bayer Corporation. Hydroxy-functional prepolymers containing hydantoin group precursors and their use in coating compositions. 5,596,044, Cl. 525-131.000.
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Glas, Brigitte; Kolb, Dieter; and Radlbeumer, Markus, to Siemens Aktiengesellschaft. Method for processing a user program on a parallel computer system. 5,596,751, Cl. 395-676.000.
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Kiefer, Jesse J.; and Glenn, Blake H., 5,595,757, Cl. 424-451.000.
Glenn, Gregory M., to United States of America, Agriculture. Aquagel-based lightweight concrete. 5,595,995, Cl. 106-672.000.
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Kaminski, Mark S.; Buechler, Gregory M.; Glenn, Stephen D.; and Wahl, Richard L., 5,595,721, Cl. 424-1.490.
Glenn, Thomas P.; and Holloway, Roy D., to Amkor Electronics, Inc. Plastic packaged integrated circuit with heat spreader. 5,596,485, Cl. 361-703.000.
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Nakamura, Hiroki, 5,595,036, Cl. 52-554.000.
Glover, Edward C. T. S.; and Earle, Anthony, to Eastman Kodak Company. Film spool for a filmstrip. 5,595,353, Cl. 242-348.100.
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Henning, Jeffrey M.; and Lund, David L., 5,595,840, Cl. 429-210.000.
Gobbini, Mauro; and Torri, Marco, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Process for the preparation of 3 β, 14 β-dihydroxyethianaldehyde. 5,596,110, Cl. 552-610.000.
Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., to Dana Corporation. Automatically adjusting friction torque device with relatively rotating cam rings. 5,595,274, Cl. 192-70.250.
Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., to Dana Corporation. Torsion spring assembly for an automatically adjusting friction torque device. 5,595,275, Cl. 192-111.00A.
Goebelbecker, Siegbard; Naegerl, Hans-Dieter; Danker, George J.; and Kirk, Donald, to Akzo-Fireguard Products, Inc.; and Chemische Fabrik Budenheim Rudolf A. Oetker. Intumescent composition of the two-component type. 5,596,029, Cl. 523-179.000.
Goelet, Philip: *See*—
Knapp, Michael R.; and Goelet, Philip, 5,595,870, Cl. 435-6.000.
Goetz, Richard J.: *See*—
Hager, Patrick J.; and Goetz, Richard J., 5,595,821, Cl. 428-402.000.
Gohara, Wadie F.; and Johnson, Dennis W., to Babcock & Wilcox Company, The. Hydrogen peroxide for flue gas desulfurization. 5,595,713, Cl. 422-170.000.
Gold, Andrew L. High voltage power supply for a helmet mounted display device. 5,596,491, Cl. 363-65.000.
Gold, Larry; and Tuerk, Craig, to NeXstar Pharmaceuticals, Inc. Methods of producing nucleic acid ligands. 5,595,877, Cl. 435-6.000.
Goldberg, David, to Xerox Corporation. Unistrokes for computerized interpretation of handwriting. 5,596,656, Cl. 382-186.000.
Goldman, Paul D., to Saint-Gobain/Norton Industrial Ceramics Corporation. Knife with blade sharpener stored in knife handle. 5,594,966, Cl. 7-120.000.
Goldstar C., Ltd.: *See*—
Maeng, Hyun J., 5,596,563, Cl. 369-219.000.
Goldstar Co., Ltd.: *See*—
Choi, Jae G., 5,596,657, Cl. 382-227.000.
Goldstein, Dana L.: *See*—
Solomon, Merrill; Kimball, John; and Goldstein, Dana L., 5,596,627, Cl. 379-67.000.
Goldstein, Jonathan R.; Harnis, Yehuda; Sharon, Yuval; and Naimer, Neal, to Electric Fuel (E.F.L.) Ltd., Scrubber system for removing carbon dioxide from a metal-air or fuel cell battery. 5,595,949, Cl. 502-20.000.
Goldstein, Mark K., to Quantum Group, Inc. Enclosure for a gas detector system. 5,596,314, Cl. 340-632.000.
Golembouski, Daniel: *See*—
Zaitlin, Milton; Golembouski, Daniel; and Lomonossoff, George, 5,596,132, Cl. 800-205.000.
Golias, Joseph H.: *See*—
Sanford, James R. M.; Frank, Patrick M.; Golias, Joseph H.; and Jennings, William C., 5,595,664, Cl. 210-656.000.
Goliaszewski, Alan E.: *See*—
Wright, Bruce E.; Witzig, William L.; Goliaszewski, Alan E.; Carey, William S.; and Peltier, Jeffrey H., 5,596,130, Cl. 585-3.000.
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Kowalik, Joseph W.; and Gomez, Heraclio R., 5,596,306, Cl. 337-282.000.
Gonano, Andrea: *See*—
Bulgrien, Garth H.; Sedoni, Enrico; Sedoni, Carlo; and Gonano, Andrea, 5,596,153, Cl. 73-862.326.
Gonzalez-Hernandez, Jesus: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Quiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.
Gooch, Antoinette H.: *See*—
Ciolfi, John M.; Tong, Po; Aslanis, James T.; and Gooch, Antoinette H., 5,596,604, Cl. 345-260.000.
Good, Charles F.; Young, Craig S.; and Fernandes, Antonio M., to Claris Corporation. Computer system and method for manipulating the display of drawings. 5,596,691, Cl. 395-140.000.
Good, Thomas J.; and Redmond, Alan F., to Cera, Inc. Microcolumn for extraction of analytes from liquids. 5,595,653, Cl. 210-289.000.
Goodby, John W.; Toyne, Kenneth J.; and Booth, Christopher J., to United Kingdom of Great Britain And Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the; and Defence Research Agency. Liquid crystal compounds, mixtures and devices. 5,595,682, Cl. 252-299.010.
Goodfellow, Michael J., to International Business Machines Corporation. Method for managing non-rectangular windows in a raster display. 5,596,345, Cl. 345-120.000.
Gooding, Robert B., Jr.; and Minor, Kimberly. Combination wet dry wipe. 5,595,807, Cl. 428-80.000.
Goodley, George R., to Du Pont de Nemours, E. I., and Company. Catalyst and process for producing catalyst. 5,596,069, Cl. 528-280.000.
Goodwin, Tom E., III, to U.S. Natural Resources, Inc. No-vent dry kiln. 5,595,000, Cl. 34-471.000.
Goodyear Tire & Rubber Company, The: *See*—
Halasa, Adel F.; and Jalics, George, 5,595,951, Cl. 502-154.000.
MacGregor, Clint J.; Malone, Joseph L.; and York, Monte H., 5,595,701, Cl. 264-255.000.
Tousteling, Charles; Palmer, Kenneth J.; Heifer, Farrel B.; Todd, Rodger; and Blum, Joey Jean, 5,595,617, Cl. 148-595.000.
Goossens, Henri: *See*—
Bogaerts, Constant; Van Eichelpoel, Eric; Goossens, Henri; Van Goethem, Luc; and Van Aken, Luc, 5,595,454, Cl. 403-263.000.
Gopalkrishnan, Sridhar; and Gainey, Kathleen M., to BASF Corporation. Polymeric dispersants for soda ash based detergent slurries. 5,595,968, Cl. 510-418.000.
Gordin, Myron K.; and Crookham, Joe P., to Musco Corporation. Means and method for highly controllable lighting of areas or objects. 5,595,440, Cl. 362-247.000.
Gordon, Otto W.; Plattner, Eric; and Doppenberg, Frank, to Grant S.A. Production of pulp by the soda-anthraquinone process (SAP) with recovery of the cooking chemicals. 5,595,628, Cl. 162-30.110.
Gorslin, Richard A. Telescopic-sight system for AK47-type rifles. 5,595,011, Cl. 42-101.000.
Goshima, Kunio: *See*—
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Goto, Masaaki: *See*—
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Goto, Takeshi: *See*—
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Götz, Walter, to BASF Aktiengesellschaft. High molecular weight polyamides obtained from nitriles. 5,596,070, Cl. 528-310.000.
Gould, Adam F.; Robertson, James R.; Nouseman, John W.; and Geim, John R., to Nokia Mobile Phones Ltd. CDMA radiotelephone having optimized slotted mode and long code operation. 5,596,571, Cl. 370-335.000.
Gould, Robert L., to Logicon RDA. Penetrating vehicle with rocket motor. 5,596,166, Cl. 102-362.000.
Gower, Teddy A. Hurricane shutters. 5,595,233, Cl. 160-232.000.
Gozlan, Eli; Breznitz, Shlomo; Nir, Dan; and Erlich, Sharon, to Vigilant Ltd. Apparatus and method for monitoring and improving the alertness of a subject. 5,595,488, Cl. 434-236.000.
GPT Ltd.: *See*—
Wille-Fier, Regina; and Cutler, John W., 5,596,572, Cl. 370-360.000.
Grabhorn, Howard, to Grabhorn, Inc. Biofilter bags for erosion control. 5,595,458, Cl. 405-258.000.
Grabhorn, Inc.: *See*—
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Graham, Donald W.; Cartin, Josephine R.; Chiu, Shuet-Hing L.; and Tolman, Richard L., to Merck & Co., Inc. 7-substituted 4-oxa cholesic acid derivatives and their use. 5,595,996, Cl. 514-284.000.
Grainger, David J.; and Metcalfe, James C., to NeoRx Corporation. Method for identifying an agent which increases TGF-beta levels. 5,595,722, Cl. 424-9.200.
Grammatica, Steven J.: *See*—
Ward, Anthony T.; Teney, Donald J.; and Grammatica, Steven J., 5,596,673, Cl. 392-389.000.
Grandi, Maria: *See*—
Mongelli, Nicola; Biasoli, Giovanni; Grandi, Maria; Cionci, Marina; and Geroni, Maria C., 5,596,105, Cl. 548-518.000.
Grant S.A.: *See*—
Gordon, Otto W.; Plattner, Eric; and Doppenberg, Frank, 5,595,628, Cl. 162-30.110.
Gray, Gerald M., Sr.; and Gray, Randy L. Product fabricating attachment and methods of constructing. 5,595,070, Cl. 66-147.000.
Gray, Patrick W.; and Rinderknecht, Ernst H., to Genentech, Inc. Recombinant methods of making gamma interferon compositions. 5,595,888, Cl. 435-69.510.
Gray, Randy L.: *See*—
Gray, Gerald M., Sr.; and Gray, Randy L., 5,595,070, Cl. 66-147.000.
Gray, Thomas E.; and Lutz, Michael A., to Dow Corning Corporation. Curable organopolysiloxane compositions with improved adhesion. 5,595,826, Cl. 428-450.000.
Green, Donovan S.: *See*—
Elgendy, Said M. A.; Deadman, John J.; Patel, Geeta; Green, Donovan S.; Baban, Jehan A.; Kakkar, Vijay V.; and Claeson, Goran K., 5,596,123, Cl. 558-288.000.
Green, Martin A.: *See*—
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Green, Robert B.: *See*—
Seltzer, Michael D.; and Green, Robert B., 5,596,405, Cl. 356-316.000.
Greenberg, Richard; and Perteet, John C., to International Business Machines Corporation. System and method for encoding a servo address. 5,596,460, Cl. 360-78.140.
Grease, Tweed of Delaware, Inc.: *See*—
Soria Vega, Sergio, 5,595,206, Cl. 137-15.000.
Greenstech L.L.C.: *See*—
Ripley, Thomas L., Sr.; and Cataldo, Stephen A., 5,595,021, Cl. 47-66.000.
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Weterrus, John R., II; Sharp, Dara Y.; Gregg, Richard E.; Biller, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Partyka, Richard A., 5,595,872, Cl. 435-6.000.
Gretz, Thomas J.: *See*—
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Greve, Donald W., to Aurafin Corporation. Process for making jewelry utilizing a hard photopolymer. 5,594,989, Cl. 29-896.400.
Grier, Jonathan F., to Research Corporation Technologies, Inc. Magnetic enteral gastrostomy. 5,595,562, Cl. 600-12.000.
Gries, Heinz; Rosenberg, Doowe; Weinmann, Hanns-Joachim; Speck, Ulrich; Mätzel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased (by Brigitte Pfeiffer, executrix); and Rosnecky, Franz-Josef, to Schering Aktiengesellschaft. Diagnostic media. 5,595,725, Cl. 424-9.340.
Grissinger, Morgan R.: *See*—
Schmidt, John W., III; and Grissinger, Morgan R., 5,595,166, Cl. 124-22.000.
Grinnell, Brian W.: *See*—
Berg, David T.; and Grinnell, Brian W., 5,595,736, Cl. 424-94.640.
Grobe, Philip R. Removable security box. 5,595,129, Cl. 109-22.000.
Grogan, Thomas M.: *See*—
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Gross, Stanley: *See*—
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Grossman, Melanie: *See*—
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Groth, Steven L.: *See*—
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Gschwendtner, Manfred: Gutmann, Rudolf; Wiesmüller, Jakob; and Riedel, Alfred, to Hoechst Aktiengesellschaft. Process for the continuous preparation of terpene esters. 5,596,127, Cl. 560-220.000.
Gubernator, Klaus: *See*—
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Möller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.
Gudmundson, Perols B. O.: *See*—
Larsson, Lars G.; Gudmundson, Perols B. O.; and Jansal, Karim, 5,596,607, Cl. 375-340.000.
Guerra, Art. Crime scene body shield. 5,595,230, Cl. 160-135.000.
Guilbaud, Nicolas: *See*—
Billington, David; Dorey, Gilbert; Leon, Pascale; Atassi, Ghanem; Pierre, Alain; Burbridge, Michael; and Guilbaud, Nicolas, 5,595,976, Cl. 514-25.000.
Guiney, Kathleen M.: *See*—
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Guinovart, Joan J.; Barbeat, Albert; and Rodríguez-Gil, Joan E., to Quimica Farmaceutica Bayer S.A. Tungsten (VI) compositions for the oral treatment of diabetes mellitus. 5,595,763, Cl. 424-617.000.
Guinelin, Olivier, to Saint-Gobain Vitrage. Transparent substrate provided with a stack of thin films acting on solar and/or infrared radiation. 5,595,825, Cl. 428-428.000.
Gullett, Tom G.: *See*—
Simpson, Vilchi S.; Gullett, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bilderback, Douglas W.; and King, Clyde A., 5,595,522, Cl. 451-5.000.
Gulton Industries, Inc.: *See*—
Vanderhoof, Troy, 5,595,432, Cl. 362-74.000.
Gundy, William P., to NPC, Inc. Grinding apparatus and method which supports a workpiece on the surface being ground. 5,595,524, Cl. 451-5.000.
Gunning, Frank W.: *See*—
Mansur, Brian E.; Ojeda, Peter A., IV; Poole, Aaron R.; and Gunning, Frank W., 5,596,480, Cl. 361-680.000.
Gupta, Prabhat K.: *See*—
Swaminathan, Kumar; Ganesan, Kalyan; and Gupta, Prabhat K., 5,596,676, Cl. 395-2.170.
Gupta, Rajiv: *See*—
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Guracar, Ismayil M.: *See*—
Wright, J. Nelson; Phagge, Jay S.; Pash, D. Grant, III; Langdon, Donald R.; Pfleger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.
Gustavsson, Torbjörn: *See*—
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Gutmann, Rudolf: *See*—
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Gutteg, Karl M.; Simpson, Richard; and Walsh, Brendan, to Texas Instruments Incorporated. Three input arithmetic logic unit forming mixed arithmetic and boolean combinations. 5,596,763, Cl. 395-800.000.
Gutteg, Karl M.; McDonough, Kevin C.; and Maggi, Sergio, to Texas Instruments Incorporated. Programmable data processing system and apparatus for executing both general purpose instructions and special purpose graphic instructions. 5,596,767, Cl. 395-800.000.
Gutteg, Karl M.: *See*—
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Guzik, Adam F.: *See*—
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Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, to Sanofi. N-substituted trifluoromethylphenylterahydropyridines, process for the preparation thereof, intermediates in said process and pharmaceutical compositions containing them. 5,596,101, Cl. 546-346.000.
Guzzi, Umberto: *See*—
Baroni, Marco; Croci, Tiziano; Landi, Marco; Guzzi, Umberto; and Nisato, Dino, 5,595,994, Cl. 514-275.000.
Gwaltney, Max R. Nasal adaptor, mask, and method. 5,595,174, Cl. 128-201.150.
Haasen, Rolf, to W. Schlafhorst AG & Co. Method for controlling a winding station of a bobbin winding machine when a take-up bobbin is changed and winding station for performing the method. 5,595,351, Cl. 242-18.0DD.
Haavisto, Seppo, to Valmet-Tampella Oy. Apparatus for drying a fibre web. 5,594,996, Cl. 34-66.000.
Habets, Wimand J. A.; Klein-Rot, Miriam F. H. M.; Oosterlaken, Theodorus A. M.; and Yap, Sing H., to Akzo Nobel N.V. Monoclonal antibodies to hepatitis C virus. 5,595,868, Cl. 435-5.000.
Habif, David V., Jr.: *See*—
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Hada, Narutoshi; Nakamura, Shingo; and Horiguchi, Takeshi, to Toshiba Kikai Kabushiki Kaisha. Method for automatic machine-plate change in rotary printing press and apparatus the same. 5,595,119, Cl. 101-477.000.
Haddad, Sameer: *See*—
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Haden Schweitzer Corporation: *See*—
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Hadvary, Paul: *See*—
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Haffely, Jeffrey L.: *See*—
Wixey, Barry D.; and Haffely, Jeffrey L., 5,595,124, Cl. 108-50.000.
Hafner, Norbert; Minter, Friedrich; Ledwinka, Hans; Bruckmüller, Elisabeth; and Kurz, Josef, to PCD Polymere Gesellschaft m.b.H. Process for the preparation of elastomeric polypropylenes. 5,596,076, Cl. 528-483.000.
Hagadorn, Hubert W. Set operation in a timepiece having an electrooptical display. 5,596,554, Cl. 368-82.000.
Hagen, Donald F.: *See*—
Martell, Craig G.; Hagen, Donald F.; Hansen, Paul E.; and Baumann, Nicholas R., 5,595,649, Cl. 210-198.200.
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Hager, Patrick J.; and Goetz, Richard J., to Minnesota Mining and Manufacturing Company. Repulpable plastic films. 5,595,821, Cl. 428-402.000.
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Soreq, Hermona; and Haim, Zakut, 5,595,903, Cl. 435-240.200.
Haines, Roger C. Method and apparatus for cable dispensing and placement. 5,595,355, Cl. 242-470.000.
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Ul-Haque, Israr; and Trimm, David L., 5,595,719, Cl. 423-418.200.
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Berkey, Rex A.; DeFant, Daniel; Hallum, Brad; Hansen, Jeffrey A.; Hopper, Edward L.; Johnson, Philip A.; Saari, Frank C.; and Sundell, Randy P., 5,595,470, Cl. 414-495.000.
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Slepian, Neil R.; Kirk, Michael P.; and Hamill, Joseph, 5,595,002, Cl. 36-27.000.
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Hamilton Standard: *See*—
Filburn, Thomas P.; Huddleston, John C.; and Killelea, Dean A., 5,595,690, Cl. 261-104.000.
Hammer, Klaus-Dieter; Siebrecht, Manfred; and Krams, Theo, to Hoechst Aktiengesellschaft. Foodstuff casing based on cellulose hydrate with improved peelability. 5,595,796, Cl. 428-34.800.
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Jaffe, Norman; and Hancock, Warren B., 5,595,571, Cl. 8-94.110.
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Handschy, Mark A.; Meadows, Michael R.; Shenker, Martin; and Weissman, Paul E., to Displaytech, Inc.; and Martin Shenker Optical Design, Inc. Miniature image generator including optics arrangement. 5,596,451, Cl. 359-633.000.
Handzlik, Walter A. Truss roof and floor joist storage device. 5,595,028, Cl. 52-32.000.
Hanig, Harvey: *See*—
Karl, Richard B.; and Hanig, Harvey, 5,594,983, Cl. 29-469.000.
Hankawa, Masashi, to Olympus Optical Co., Ltd. Projection and reception type focus detecting apparatus. 5,596,386, Cl. 396-110.000.
Hanke, Mark A.: *See*—
Badoy, Robert; Debler, Edward J., Jr.; and Hanke, Mark A., 5,595,273, Cl. 192-45.000.
Hanko, Rudolf: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubech, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Beuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
Hanlin, Charles E., to Advanced Micro Devices, Inc. Adjustable undervoltage trip fault interrupt circuit. 5,596,471, Cl. 361-92.000.
Hanna, Wayne D.: *See*—
Piatek, John T.; Muller, Fredrick M.; Schnaidt, Brad W.; and Hanna, Wayne D., 5,596,652, Cl. 382-115.000.
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Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCassbridge, Lora K., 5,596,347, Cl. 345-145.000.
Hanson, Mark H.: *See*—
Boebert, William E.; Hanson, Mark H.; and Markham, Thomas R., 5,596,718, Cl. 395-187.010.
Hantel, Peter; and Thiel, Jürgen. Interferometer system and method for controlling the activation of a regulating interferometer in response to an output signal. 5,596,410, Cl. 356-358.000.
Hara, Hiroyuki; and Sakurai, Takayasu, to Kabushiki Kaisha Toshiba. CMOS full adder circuit with pair of carry signal lines. 5,596,520, Cl. 364-786.000.
Harada, Chikao: *See*—
Ogura, Toshihiko; Yokozeki, Akihiro; and Harada, Chikao, 5,595,180, Cl. 128-686.000.
Harada, Toshiaki, to Canon Kabushiki Kaisha. Carriage shifting apparatus and serial recording system. 5,595,448, Cl. 400-320.000.
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Seki, Hiroyuki; Nishimoto, Yoshifumi; Tanaka, Hideki; Harada, Toshiaki; Kimura, Atsushi; Okamura, Yoshitaka; and Yamamoto, Shinji, 5,596,241, Cl. 310-323.000.
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Tsuyama, Tsutomu; Sato, Shigeru; Tsunekawa, Kayo; Shimoyashiro, Sadao; Harada, Toshimasa; Higano, Koichi; Namiki, Toshio; Yamaguchi, Chikaaki; and Morito, Mitsuzo, 5,596,712, Cl. 395-183.020.
Harats, Yehuda: *See*—
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Mena, Ismael; Diggles, Linda; Diggles, Douglas M., Sr.; Diggles, Robert E.; and Khalkhali, Iraj, 5,595,177, Cl. 128-653.100.
Harbster, Kevin H.; and Perrotto, Joseph A., to Du Pont de Nemours, E. I., and Company. Chemical mixing and reaction apparatus. 5,595,712, Cl. 422-129.000.
Harden, Thomas K.: *See*—
Boucher, Richard C.; Weisman, Gary A.; Turner, John T.; Harden, Thomas K.; Parr, Claude E.; Sullivan, Daniel M.; Erb, Laura J.; and Lustig, Kevin D., 5,596,088, Cl. 536-23.500.
Hardison, George T., Jr. Bat swing guide. 5,595,384, Cl. 473-453.000.
Harian, Kent S., to Motorola, Inc. Diffuser for uniform gas distribution in semiconductor processing and method for using the same. 5,595,602, Cl. 118-715.000.
Harless, Stanley J., to Harlmen Inc. Equine nutritional supplement. 5,595,962, Cl. 514-78.000.
Harlmen Inc.: *See*—
Harless, Stanley J., 5,595,982, Cl. 514-78.000.
Harman, Murray R.; and Marshall, James D., to Fiberliga Division of Preformed Line Products (Canada) Ltd. Method and apparatus for controlling the contact of optical fibers. 5,596,672, Cl. 385-147.000.
Harms, Christian: *See*—
Carswell, Gieta; Harms, Christian; Chang, Yin-Fu; and Chilton, Mary-Dell, 5,595,733, Cl. 424-93.210.
Harms, Christian T.: *See*—
Horn, Michael E.; Harms, Christian T.; and Shillito, Raymond D., 5,596,131, Cl. 800-205.000.
Harper, James M. E.: *See*—
Cabral, Cyril, Jr.; Chan, Kevin K.; Chu, Jack O.; and Harper, James M. E., 5,595,600, Cl. 117-83.000.
Harper, Ross T.; Johnston, James H.; and Wiseman, Nicholas, to Tasman Pulp & Paper Co., Limited; and Geochemistry Research Limited. Controlled precipitation of amorphous silica from geothermal fluids or other aqueous media containing silicic acid. 5,595,717, Cl. 423-339.000.
Harrell, Washington. Steering wheel disabling motor vehicle anti-theft device. 5,595,078, Cl. 70-209.000.
Harris, James M.; Kiba, Brigitte U.; and Click, Porter B., Jr. Package for a high frequency semiconductor device and methods for fabricating and connecting the same to an external circuit. 5,596,171, Cl. 174-52.400.
Harris, Linda G.: *See*—
Weber, Robert E.; Harris, Linda G.; and Reed, Amy B., 5,595,828, Cl. 428-537.500.
Harris, Paul J.; and Foukes, Richard J., to BASF Corporation. Coating containing urethane and acrylic resin mixture for improved resistance to chipping. 5,596,043, Cl. 525-127.000.
Harrison, William E., Jr., to Dunlap & Codding, P.C. Painting apparatus and methods. 5,595,451, Cl. 401-219.000.
Harsch, Erich, to Maschinenfabrik Mueller-Weingarten AG. Apparatus for the transport of parts in a multiple-die press. 5,595,087, Cl. 72-405.160.
Harsco Corporation: *See*—
Krysalica, William; and Linderman, Jack, 5,595,034, Cl. 52-318.000.
Hart, James A.: *See*—
Davis, Terry L.; Hart, James A.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,596,642, Cl. 380-24.000.

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Hart, Michael J. Collapsible storage container. 5,595,305, Cl. 206-600.000.

Hartig, Paul R.: *See*—
Weinshank, Richard L.; and Hartig, Paul R., 5,595,880, Cl. 435-7.210.

Hartmann, Kai: *See*—
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Hartz Mountain Corporation, The: *See*—
Rancher, Lawrence; Bishai, Samir; and Perlberg, William, 5,595,749, Cl. 424-405.000.

Haruch, James; and Oberg, Tim, to Spraying Systems Co. Air assisted atomizing spray nozzle. 5,595,346, Cl. 239-431.000.

Harvey, Martin C.: *See*—
Richards, Jeffrey; and Harvey, Martin C., 5,595,032, Cl. 52-306.000.

Harvey, Wilson: *See*—
Light, Nicholas D.; McGregor, James; Harvey, Wilson; and Watt, Paul W., 5,595,621, Cl. 156-80.000.

Hasbro, Inc.: *See*—
Shkolnik, Nikolay; Kastor, Baruch; and Joaquim, Domingos, 5,594,976, Cl. 16-380.000.

Hasebe, Hiroshi: *See*—
Kuwata, Takeshi; Ruckmongathan, Tenkar; Nakagawa, Yutaka; Koh, Hidemasa; Hasebe, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takanori, 5,596,344, Cl. 345-103.000.

Hasegawa, Junichi; Iwata, Yoshibumi; and Sanagawa, Yukio, to Sanshin Kogyo Kabushiki kaisha. Outboard motor exhaust system. 5,595,515, Cl. 440-89.000.

Hasegawa, Masaki; and Yamada, Fumiaki, to International Business Machines Corporation. Distributed index light deflector and method of light deflection. 5,596,430, Cl. 349-74.000.

Hasegawa, Minoru: *See*—
Hashiguchi, Yoshiharu; Hasegawa, Minoru; Goshima, Kunio; Takemura, Yasuhiko; Higuchi, Yoshiyuki; and Takeuchi, Motokazu, 5,596,041, Cl. 525-98.000.

Hasegawa, Rei: *See*—
Sunohara, Kazuyuki; Hasegawa, Rei; Nagata, Hiroyuki; Yamamoto, Takeshi; Yamamoto, Yasuhiro; and Okamoto, Masumi, 5,596,435, Cl. 349-132.000.

Hasegawa, Shizuo: *See*—
Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasunichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,596,427, Cl. 358-515.000.

Hasegawa, Tamotsu: *See*—
Ogawa, Takatoshi; Yoshioka, Yasuhiko; Tsubouchi, Nobuo; Saito, Toshio; Hasegawa, Tamotsu; Fujishima, Akira; and Hashimoto, Kazuhito, 5,595,813, Cl. 428-212.000.

Haselwander, Jack G.; and Niederer, Kurt W., to Belmont Textile Machinery Company. Method and apparatus for space dyeing yarn. 5,594,968, Cl. 8-149.000.

Hasenbuettl, Gerard L.: *See*—
Silver, Richard S.; and Hasenbuettl, Gerard L., 5,596,085, Cl. 536-18.600.

Hasenkamp Internationale Transport GmbH & Co. KG: *See*—
Pfitz, Manfred; and Szarata, Mathias, 5,595,301, Cl. 206-449.000.

Hashiguchi, Yoshiharu; Hasegawa, Minoru; Goshima, Kunio; Takemura, Yasuhiko; Higuchi, Yoshiyuki; and Takeuchi, Motokazu, to Japan Synthetic Rubber Co., Ltd. Hydrogenated block copolymer and hydrogenated block copolymer composition. 5,596,041, Cl. 525-98.000.

Hashimoto, Eiri: *See*—
Toyoda, Shinjiro; Ikeda, Hitoshi; Hashimoto, Eiri; and Miyakawa, Nobuaki, 5,596,511, Cl. 364-527.000.

Hashimoto, Isao: *See*—
Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishiochachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.

Hashimoto, Kazuhito: *See*—
Ogawa, Takatoshi; Yoshioka, Yasuhiko; Tsubouchi, Nobuo; Saito, Toshio; Hasegawa, Tamotsu; Fujishima, Akira; and Hashimoto, Kazuhito, 5,595,813, Cl. 428-212.000.

Hashimoto, Masanobu, to NEC Corporation. Recording/reproduction apparatus with an integrated inductive write, magnetoresistive read head. 5,596,463, Cl. 360-104.000.

Hashimoto, Shinichi, to Nippondenso Co., Ltd. Instrument. 5,596,143, Cl. 73-431.000.

Hashimoto, Shinya: *See*—
Takebuchi, Katashi; Fujito, Shinya; Hashimoto, Shinya; and Yajima, Koichi, 5,595,608, Cl. 148-104.000.

Hashimoto, Tsuneyuki: *See*—
Nakamura, Kiyomi; Inagaki, Masahisa; Tanikoshi, Syouko; Maki, Hideo; and Hashimoto, Tsuneyuki, 5,596,615, Cl. 376-438.000.

Hassen, Charles: *See*—
Copeland, Keith G.; Grogan, Thomas M.; Hassen, Charles; Humphreys, William R.; Lemme, Charles D.; Miller, Phillip C.; Richards, William L.; and Showalter, Wayne A., 5,595,707, Cl. 422-64.000.

Haste, Thomas E., III. Electronic gaming machine and method. 5,595,538, Cl. 463-17.000.

Hatano, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, to Nissan Motor Co., Ltd.; and Daido Steel Co., Ltd. Steel for gear, gear superior in strength of tooth surface and method for producing same. 5,595,613, Cl. 148-319.000.

Hatano, Tatsuo: *See*—
Fujikawa, Yuichiro; Hatano, Tatsuo; and Murakami, Seishi, 5,595,606, Cl. 118-725.000.

Hatsukami, Dorothy K.: *See*—
Keenan, Robert M.; and Hatsukami, Dorothy K., 5,596,007, Cl. 514-343.000.

Hattori, Morishige: *See*—
Tao, Takashi; Ishimaru, Yasuo; Hattori, Morishige; Ohmura, Keiji; and Ohbe, Hideshi, 5,595,123, Cl. 105-396.000.

Hattori, Yumi: *See*—
Otsu, Yuichi; Kitagawa, Yoshinori; Hattori, Yumi; Wada, Katsuaki; and Obinata, Toru, 5,596,017, Cl. 514-517.000.

Haupt, Axel; and Delibruegge, Karl-Hermann, to Sennheiser electronic KG. Device for wireless transmission of digital data, in particular of audio data, by infrared light in headphones. 5,596,603, Cl. 375-242.000.

Haustala, Jouko, to Valmet Corporation. Method of making a screen cylinder, and a screen cylinder. 5,595,307, Cl. 209-395.000.

Hawes, Charles: *See*—
Chura, William D.; Kozlowski, Edward; Liljeqvist, Lance; Jones, Stephen; Thompson, Mark; and Hawes, Charles, 5,595,345, Cl. 239-312.000.

Haworth, Inc.: *See*—
Johnson, Ross S.; and King, Steven J., 5,595,495, Cl. 439-215.000.

Hayakawa, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Input apparatus. 5,596,348, Cl. 345-146.000.

Hayao, Sakae, to Mitsubishi Pencil Corporation of America. Ink refilling assembly. 5,595,223, Cl. 141-375.000.

Hayashi, Hisataka: *See*—
Inazawa, Koichiro; Okamoto, Shin; Hayashi, Hisataka; and Matsushita, Takaya, 5,595,627, Cl. 156-643.100.

Hayashi, Ikuo: *See*—
Nishikawa, Yoshihiro; Hayashi, Ikuo; and Taguti, Takeyasu, 5,596,141, Cl. 73-146.200.

Hayashi, Mariko: *See*—
Shigematsu, Yasuyuki; Ohashi, Toyoshi; Hayashi, Mariko; and Suzuki, Shinichi, 5,595,846, Cl. 430-58.000.

Hayashi, Tomoyuki; Tatsumi, Yoshiaki; and Miyashita, Kinya, to Sohzohkagaku Co., Ltd.; and Nisshinbo Industries, Inc. Method of using a shaping mold for making ultra-thin shaped rubber articles. 5,595,704, Cl. 264-404.000.

Hayashi, Toshiharu; and Imoto, Akira, to Wako Electronics Company Limited. Thermostat. 5,596,307, Cl. 337-298.000.

Hayashi, Yutaka; and Nonoyama, Makoto, to Toyoda Koki Kabushiki Kaisha. Numerically controlled grinding machine. 5,595,525, Cl. 451-5.000.

Hayes Wheels International, Inc.: *See*—
Heck, Thomas E.; and Maloney, Michael V., 5,595,423, Cl. 301-37.430.

Hazama, Hiroaki: *See*—
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, 5,595,844, Cl. 430-5.000.

Hazeltine Corporation: *See*—
Mercado, Joseph T., 5,596,337, Cl. 343-770.000.

Hazzard, Aldez C.: *See*—
Watkins, Grant H.; Matthews, Norman G.; Hazzard, Aldez C.; and Muhlbeier, John P., 5,596,290, Cl. 327-105.000.

HCC, Inc.: *See*—
Jasper, Edward P.; and Jensen, Roderick J., 5,595,052, Cl. 56-220.000.
Jasper, Edward P.; Frederick, James M.; and Echelberger, Joshua U., 5,595,053, Cl. 56-226.000.

Head, Glenn D., Jr.; and Johnston, Mark, to Deere & Company. Flexible and resilient supports for a grain box. 5,595,131, Cl. 111-200.000.

Hearn, Dennis; Gildert, Gary R.; and Putman, Hugh M., to Chemical Research & Licensing Company. Process for selective hydrogenation of highly unsaturated compounds and isomerization of olefins in hydrocarbon streams. 5,595,634, Cl. 203-29.000.

Hebbard, Rick. Spoon shaped tick remover. 5,595,569, Cl. 606-131.000.

Hebert, Ray, to National Registry, Inc., The. Uneven surface image transfer apparatus. 5,596,454, Cl. 359-726.000.

Hebrew University of Jerusalem, Yissum Research Development Co. of the: *See*—
Soreq, Hermona; and Haim, Zakut, 5,595,903, Cl. 435-240.200.

Hecht, Michael H.: *See*—
Chutjian, Ara; Hecht, Michael H.; and Orient, Otto J., 5,596,193, Cl. 250-292.000.

Heckmann, Herbert B., to President and Fellows of Harvard College. Topical formulations and methods for treating hemorrhoidal pain and sphincter and smooth muscle spasm in the gastrointestinal tract. 5,595,753, Cl. 424-436.000.

Heck, Eugene J., to Bodo Oilfield Maintenance Ltd. Texas gate. 5,595,370, Cl. 256-17.000.

Heck, Thomas E.; and Maloney, Michael V., to Hayes Wheels International, Inc. Vehicle wheel cover retention system and method for producing same. 5,595,423, Cl. 301-37.430.

Hedström, Lars-Gunnar; Andersson, Roger; Söderman, Göran; and Gustavsson, Torbjörn, to Scania CV Aktiebolag. Method for control of engine torque during gear changing. 5,595,551, Cl. 477-109.000.

Heidelberg Harris, S.A.: *See*—
Chrigui, Jilani, 5,595,117, Cl. 101-216.000.

Heidelberger Druckmaschinen AG: *See*—
Chrigui, Jilani, 5,595,117, Cl. 101-216.000.
Métrope, Jacques, 5,595,120, Cl. 101-477.000.

Heidelberger, Richard A., to Dynabrade, Inc. Reciprocating sander. 5,595,530, Cl. 451-356.000.

Heijboer, Willem L. C. M., to U.S. Philips Corporation. Method for manufacturing a cathode. 5,595,933, Cl. 437-60.000.

Heilman, George C.: *See*—
Brown, Douglas S.; Scherger, David F.; Heilman, George C.; and Brown, Robert B., 5,595,324, Cl. 222-1.000.

Heinz, Erich-Jürgen, to U.S. Philips Corporation. X-ray device. 5,596,437, Cl. 359-144.000.

Heit, Martin A.: *See*—
Wilkins, John J.; Steffens, Walter L.; Koeninger, Timothy A.; and Heit, Martin A., 5,595,279, Cl. 198-370.020.

Hekstra, Andries P.; and Koster, Arian, to Koninklijke PTT Nederland N.V. System comprising a first encoder for coding a first digital signal, a second encoder for coding a second digital signal and at least one decoder for decoding coded digital signals, and coder and decoder for use in the system. 5,596,321, Cl. 341-76.000.

Helena Laboratories Corporation: *See*—
Sanford, James R. M.; Frank, Patrick M.; Golias, Joseph H.; and Jennings, William C., 5,595,664, Cl. 210-656.000.

Helfer, Farrel B.: *See*—
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Hellings, Carl T.: *See*—
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Lee, Michael H., 5,596,356, Cl. 347-55.000.
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Daikoku, Takahiro; Ashiwake, Noriyuki; Kawasaki, Nobuo; and Zushi, Shinzo, 5,595,240, Cl. 165-80.400.
Fukuda, Hiroshi; and Terasawa, Tsuneo, 5,595,857, Cl. 430-311.000.
Itabashi, Takeyuki; Akahoshi, Haruo; and Takahashi, Akio, 5,595,943, Cl. 437-230.000.
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Nakamura, Kiyomi; Inagaki, Masahisa; Tsuikoshi, Syouko; Maki, Hideo; and Hashimoto, Tsuneyuki, 5,596,615, Cl. 376-438.000.
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.
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Epple, Ulrich; Kubilius, Uwe; and Schmidt, Holger, 5,596,057, Cl. 526-273.000.
Gscheidmeier, Manfred; Gutmann, Rudolf; Wiesmüller, Jakob; and Riedel, Alfred, 5,596,127, Cl. 560-220.000.
Hemmer, Klaus-Dieter; Siebrecht, Manfred; and Krause, Theo, 5,595,796, Cl. 428-34.800.
Meier, Michael; and Kautz, Heinz-Georg, 5,596,099, Cl. 544-398.000.

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Padmanaban, Munirathan; Kinoshita, Yoshiaki; Suchiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, 5,595,855, Cl. 430-270.100.
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Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Kausf, Werner; Sachse, Burkhard; Waltersdorfer, Anne; Kern, Manfred; Lümmen, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.

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Ackermann, Jean; Benner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Trzeciak, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.
Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,595,732, Cl. 424-85.700.
Hofheinz, Werner; Jaquet, Catherine; and Jolidon, Synèse, 5,596,002, Cl. 514-313.000.
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Wenerus, John R., II; Sharp, Dave Y.; Gregg, Richard E.; Billez, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Partyka, Richard A., 5,595,872, Cl. 435-6.000.

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Hon Industries Inc.: *See*—
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Ikeda, Susumu; Inobe, Toshimi; Tajiri, Akihiro; Takagi, Masahiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,595,064, Cl. 62-126.000.
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Busch, Nicholas F., 5,596,272, Cl. 324-207.210.
Cummins, Brad L.; Brickson, Timothy K.; O'Brien, Gary R.; Sheriff, Alan V.; and Sies, Duane J., 5,596,408, Cl. 356-339.000.
Stangeland, Rodney L., 5,596,328, Cl. 342-357.000.

Hong, Gary, to United Microelectronics Corporation. Interconnection with self-aligned via plug. 5,596,230, Cl. 257-758.000.

Honjo, Masahiro: *See*—
Shibata, Hideaki; and Honjo, Masahiro, 5,596,421, Cl. 386-126.000.

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Horchler, Fred M., Jr.; and Leasch, H. Nevin, to New Holland North America, Inc. Pickup apparatus for a round baler. 5,595,055, Cl. 56-341.000.

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Obori, Kenichi; Bando, Atsushi; and Yurugi, Toshikazu, 5,596,195, Cl. 250-310.000.

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Horner, Jack R., 5,595,088, Cl. 73-290.00V.

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Horsey, Douglas W.; and Ravichandran, Ramanathan, to Ciba-Geigy Corporation. Gas fade resistant stabilizer system for polypropylene fiber. 5,596,033, Cl. 524-100.000.

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Horwitz, Arnold H.: *See*—
Robinson, Randy R.; Liu, Alvin Y.; Horwitz, Arnold H.; Better, Marc; Wall, Randolph; Lei, Shan-Ping; and Wilcox, Gary L., 5,595,898, Cl. 435-172.300.

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Okada, Makoto; Takahashi, Masaki; Hosoi, Kaoru; and Nakajima, Shokichi, 5,595,986, Cl. 514-202.000.

Hosoi, Kenichiro; and Iwami, Takashi, to Pioneer Electronic Corporation. Convergence correcting device. 5,596,248, Cl. 315-368.180.

Hosoya, Yoichi: *See*—
Yamamouchi, Junichi; and Hosoya, Yoichi, 5,595,863, Cl. 430-567.000.

Hossain, Sohrab, to Yardney Technical Products, Inc. Bipolar lithium-ion rechargeable battery. 5,595,839, Cl. 429-210.000.

Hotta, Yoshihiko: *See*—
Kondo, Kazumoto; and Hotta, Yoshihiko, 5,595,496, Cl. 439-271.000.

Houde, Alain: *See*—
Silversides, David W.; Daneau, Isabelle M.; and Houde, Alain, 5,596,089, Cl. 536-24.300.

Houge, Michael S.: *See*—
Brant, Ronald G.; and Houge, Michael S., 5,594,990, Cl. 30-122.000.

Hougen, E. Douglas: *See*—
Schmidt, John W., III; and Griesinger, Morgan R., 5,595,166, Cl. 124-22.000.

Houng, Yu-Min: *See*—
Tan, Michael R. T.; Houng, Yu-Min; and Wang, Shih-Yuan, 5,596,595, Cl. 372-96.000.

Houpt, Ronald A.; and Somers, Dennis C., to Owens-Corning Fiberglas Technology, Inc. Spinner for dual component fibers having multiple exits for each inlet. 5,595,766, Cl. 425-8.000.

Householder, William R.; Arnold, William M.; and Brewer, Charles S., to Nuclear Containers, Inc., A Tennessee Corporation. Reusable container unit having spaced protective housings. 5,595,319, Cl. 220-429.000.

Houston Engineers, Inc.: *See*—
Martin, Glenn J.; and Ting, Chuan C., 5,595,253, Cl. 175-297.000.
Roberts, Billy J., 5,595,244, Cl. 166-178.000.

Houston, Theodore W., to Texas Instruments Incorporated. Current limiting devices to reduce leakage, photo, or stand-by current in an integrated circuit. 5,596,286, Cl. 326-33.000.

Howe, Bradley, to C-Cube Microsystems, Inc. Structure and method for a multistandard video encoder including an addressing scheme supporting two banks of memory. 5,596,376, Cl. 348-718.000.

Howell, Robert P.: *See*—
Giddings, James N.; and Howell, Robert P., 5,596,282, Cl. 324-754.000.

Howell, Wayne J.: *See*—
Bellanca, Kenneth E., Jr.; Bertin, Claude L.; Dunhamspeck, Timothy H.; and Howell, Wayne J., 5,596,226, Cl. 257-690.000.

Hoyer, Georg-Alexander: *See*—
Grinz, Heinz; Rosenberg, Douwe; Weinmann, Hans-Joachim; Speck, Ulrich; Mittrad, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Rentsche, Franz-Josef, 5,595,725, Cl. 424-9.340.

Hoyle, David C.: *See*—
Delpuech, Alain G. M.; Hoyle, David C.; Saltwasser, Alan J.; and Seaman, Bronislaw, 5,596,142, Cl. 73-152.170.

Hsiao, Ling-Wen: *See*—
Lin, Tien-Lor; Wan, Ray L.; Hsiao, Ling-Wen; and Sung, Gilbert, 5,596,530, Cl. 365-185.290.

Hsieh, Hsuan-Jui. Switch structure with multiple usages. 5,595,290, Cl. 200-571.000.

Hsu, Chen-yuo. Anti-stuffing lead-in-chute on coin acceptor for payphone. 5,596,630, Cl. 379-145.000.

Hsu, Shui-Yuan. Air supply apparatus for pond fisheries. 5,595,691, Cl. 261-120.000.

Hu, Wei-Shou; and Cerra, Frank B., to University of Minnesota, Regents of the. Filter device. 5,595,909, Cl. 435-297.400.

Hua, Xu X. Mandrel for processing a workpiece with an internal spline. 5,595,376, Cl. 269-48.100.

Huang, Cheng-Yon. Knee-pad and elbow-pad. 5,594,954, Cl. 2-24.000.

Huang, Jammy C.-M., to Industrial Technology Research Institute. Performed screen for brightness enhancement. 5,595,519, Cl. 445-24.000.

Huang, Jenn M., to Taiwan Semiconductor Manufacturing Company. Method to improve buried contact resistance. 5,596,215, Cl. 257-344.000.

Huang, Michael. Ergonomic keyboard drawer. 5,595,428, Cl. 312-223.300.

Huang, Ming-Teh; Lambert, David R.; Gaita, Robert F.; and Lynch, Kevin G., to Lydall, Inc. Filter material for removing chlorine from cold water in preparing a human-consumable beverage. 5,595,659, Cl. 210-502.100.

Huang, Victor T.; and Sandifer, Karen V., to Pillsbury Company, The. Pie dough with reduced degree of cracking. 5,595,778, Cl. 426-556.000.

Huang, Wen-Yi: *See*—
Yang, Henry S.; Post, Donald L.; and Huang, Wen-Yi, 5,596,575, Cl. 370-468.000.

Hubbard, A. Robert. System for providing cardiac output and shunt quantitation. 5,595,181, Cl. 128-692.000.

Huber, David J.; Bannister, Ronald L.; Khinkis, Mark J.; and Rabovitser, Josif K., to Westinghouse Electric Corporation. Combined cycle power plant with thermochemical recuperation and flue gas recirculation. 5,595,059, Cl. 60-39.020.

Huber, Eraesmus; Kleia, Christine; Batz, Hans-Georg; and Zink, Bruno, to Boehringer Mannheim GmbH. Aminoalkylmaleimides and hapten and antigen derivatives derived therefrom as well as conjugates with peptides or proteins. 5,595,741, Cl. 424-194.100.

Huber, Werner; and Streib, Martin, to Robert Bosch GmbH. Method and arrangement for controlling the power of an internal combustion engine. 5,595,159, Cl. 123-362.000.

Hubsch, Walter: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Bouck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stauch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.

Huck, Jerome C.: *See*—
Worley, William S., Jr.; Huck, Jerome C.; and Gupta, Rajiv, 5,596,733, Cl. 395-591.000.

Huddleston, John C.: *See*—
Filburn, Thomas P.; Huddleston, John C.; and Killelea, Dean A., 5,595,690, Cl. 261-104.000.

Hudgens, Stephen J.: *See*—
Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Qaiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.

Huffstutler, Alan D., to Dresser Industries, Inc. Rotary cone drill bit with improved support arms. 5,595,255, Cl. 175-331.000.

Hughes Aircraft Company: *See*—
Dao, Son K.; and Ebeid, Nader, 5,596,744, Cl. 395-610.000.
Delaney, Michael J.; Nguyen, Loi D.; Le, Minh V.; Tinol, Jorge L.; and Loh, James C., 5,595,917, Cl. 437-8.000.
Gearich, Thad J.; Davis, Richard M.; and Martinez, Bruno A., 5,596,609, Cl. 375-350.000.

Kubota, Randall L.; and Atkinson, Gary M., 5,596,194, Cl. 250-306.000.
Sim, David B., 5,596,660, Cl. 382-302.000.
Spitzer, Arnon, 5,595,360, Cl. 244-158.000.

Hughes Electronics: *See—*
Swaminathan, Kumar; Ganesan, Kalyan; and Gupta, Prabhat K., 5,596,676, Cl. 395-2.170.

Hughes, Gary B.: *See—*
Romano, Timothy S.; Evens, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,595,514, Cl. 439-886.000.

Hughes, Michael J.: *See—*
Stubbs, Roy; Hughes, Michael J.; and Morris-Adams, James P., 5,595,578, Cl. 51-295.000.

Hukki, Ari M.; and Carr, Brian S., to Emerson Electric Co. Screening system. 5,595,306, Cl. 209-325.000.

Hukuda, Kounosi; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Ida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, to Nippon Steel Corporation; and Showa Electric Wire & Cable. Vibration isolating apparatus. 5,595,371, Cl. 267-34.000.

Hull, Anthony. Nail extracting device. 5,595,349, Cl. 254-26.00R.

Humphreys, William R.: *See—*
Copeland, Keith G.; Gregan, Thomas M.; Hansen, Charles; Humphreys, William R.; Lemaire, Charles D.; Miller, Phillip C.; Richards, William L.; and Shoemaker, Wayne A., 5,595,707, Cl. 422-64.000.

Hunt, David S.; Fong, Jon J.; Schaffelin, Joseph E.; and Zapada, Alfred U. N., to Hewlett-Packard Company. Method and apparatus for refilling a print cartridge having a reservoir pressure of less than ambient pressure. 5,596,358, Cl. 347-85.000.

Hunter Plumbing Products: *See—*
Nichols-Roy, David; and Woods, Dennis D., 5,594,959, Cl. 4-415.000.

Huron, Inc.: *See—*
Brown, Lanny, 5,595,213, Cl. 137-515.500.

Hussmann, Wolfram: *See—*
Scherzer, Dietrich; Hussmann, Wolfram; Wist, Michael; Hahn, Klaus; Kampfer, Kurt; and Alicke, Gerhard, 5,596,045, Cl. 525-241.000.

Hutchinson, Daniel M.: *See—*
Miller, Rick W.; and Hutchinson, Daniel M., 5,596,298, Cl. 329-337.000.

Hvezda, Jaroslav M.: *See—*
Debortoli, George; Osborne, Brian T.; Lukes, Helmut H.; and Hvezda, Jaroslav M., 5,596,670, Cl. 385-135.000.

Hwang, Chyi-Ming. Multi-use collapsible sun-shade tent. 5,595,204, Cl. 135-142.000.

Hwa, R. Jennifer: *See—*
Sadwick, Laurence P.; Hwa, R. Jennifer; Baird, J. Mark; and Holmes, Sherman, 5,596,245, Cl. 313-293.000.

Hyde Athletic Industries, Inc.: *See—*
Shapiro, Neil R.; Kirk, Michael P.; and Hamill, Joseph, 5,595,002, Cl. 36-27.000.

Hyundai Electronics America: *See—*
Weber, Bret S., 5,596,708, Cl. 395-182.040.

Hyundai Electronics Industries Co., Ltd.: *See—*
Choi, Kyeong K.; and Kim, Choon H., 5,595,936, Cl. 437-192.000.
Kim, Suk S., 5,595,931, Cl. 437-60.000.
Koh, Hwa S., 5,596,536, Cl. 365-200.000.
Park, Kee W., 5,596,533, Cl. 365-189.040.

I.D.M. Immuno-Designed Molecules: *See—*
Midoux, Patrick; Erbacher, Patrick; Roche-Degremont, Annie-Claude; and Monsigny, Michel, 5,595,897, Cl. 435-172.300.

I. W. Industries, Inc.: *See—*
Wandelowsky, Jerome; and Antonietto, Frank, 5,595,212, Cl. 137-360.000.

Iberle, Frank: *See—*
Letsche, Ulrich; Rehberger, Andreas; and Iberle, Frank, 5,595,148, Cl. 123-90.120.

Ichikawa, Yukihiro; Kasai, Yoshiyuki; and Ono, Yoshiro, to NGK Insulators, Ltd. Exhaust gas filter and apparatus for treating exhaust gases. 5,595,581, Cl. 55-302.000.

Ichinose, Shunichi, to Seiko Epson Corporation. Image reading apparatus with a half mirror. 5,596,360, Cl. 347-256.000.

ICON Health & Fitness, Inc.: *See—*
Dalebout, William T.; and Watterson, Scott R., 5,595,556, Cl. 482-54.000.

Ida, Michiaki: *See—*
Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetsuya, 5,595,473, Cl. 415-199.100.

Idemitsu Kosan Co., Ltd.: *See—*
Aoyama, Yoshiaki; and Tomotou, Norio, 5,596,055, Cl. 526-153.000.
Takeuchi, Mizutomo, 5,596,054, Cl. 526-134.000.

Ida, Hiromi: *See—*
Yazaki, Asao; Chuta, Masamoto; Matsumoto, Hiroshi; Satake, Junko; Iida, Hiromi; and Tomita, Koji, 5,596,235, Cl. 310-67.00R.

Iida, Yuji: *See—*
Hukuda, Kounosi; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Iimura, Haruo: *See—*
Shimoda, Masakatsu; Iimura, Haruo; Takahashi, Hiroyuki; and Matsumoto, Fuyuhiko, 5,595,852, Cl. 430-110.000.

Iinuma, Katsuharu: *See—*
Sakanaka, Osamu; Yamada, Shoshoi; Sumi, Shinjiro; Sekata, Katsufumi; Iinuma, Katsuharu; and Nishihata, Ken, 5,596,896, Cl. 540-352.000.

Ikeda, Takashi; and Yamazaki, Yoshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Scanning optical system having image forming optical system and rotating optical system with at least one common optical component. 5,596,424, Cl. 358-474.000.

Ikeda, Hitoshi: *See—*
Toyoda, Shinjiro; Ikeda, Hitoshi; Hashimoto, Eiri; and Miyakawa, Nobuaki, 5,596,511, Cl. 364-527.000.

Ikeda, Katahiro, to Tokai Rubber Industries, Ltd. Fluid-filled damping device having two axially spaced annular fluid chambers communicating with each other through orifice. 5,595,373, Cl. 267-140.120.

Ikeda, Masuto: *See—*
Katayanagi, Ryoichi; Ikeda, Masuto; Nakanishi, Keiko; and Sasao, Yuko, 5,595,894, Cl. 435-172.100.

Ikeda, Susumu; Isobe, Toshimi; Tajiri, Akihiro; Takagi, Masahiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, to Sandon Corporation; and Honda Gikon Kogyo Kabushiki Kaisha. Control system for air-conditioner on electric vehicle. 5,595,064, Cl. 62-126.000.

Ikezaki, Mitsuru; Kimura, Shinichi; and Koike, Tatsushi, to International Business Machines Corporation. Display device having separate short circuit wires for data and gate lines for protection against static discharges. 5,596,342, Cl. 345-87.000.

Ilg, Otto M.; and Dugan, Jeffrey S., to BASF Corporation. Plate-type separator. 5,595,660, Cl. 210-521.000.

Imamura, Atsushi: *See—*
Unai, Nobuaki; Fujimoto, Hiroki; Taniguchi, Kazutaka; and Imamura, Atsushi, 5,596,425, Cl. 358-500.000.

Imation Corp.: *See—*
Rasmussen, Norman R., 5,595,824, Cl. 428-425.900.

Imhof, Otwin: *See—*
Kistrup, Holger; and Imhof, Otwin, 5,595,787, Cl. 427-304.000.

Imoto, Ryuichi: *See—*
Nishiguchi, Yasuo; Kikuchi, Susumu; Imoto, Ryuichi; Tsukahara, Sigeki; and Yamane, Shinji, 5,596,394, Cl. 399-175.000.

Imoto, Akira: *See—*
Hayashi, Toshiharu; and Imoto, Akira, 5,596,307, Cl. 337-298.000.

Imperial Chemical Industries PLC: *See—*
Barnes, David J.; and Gilday, John P., 5,595,676, Cl. 252-62.200.

Ina Walzlager Schaeffler KG: *See—*
Speil, Walter; and Schmidt, Dieter, 5,595,149, Cl. 123-90.550.

Inaba, Hitoshi: *See—*
Ohori, Toshihiro; and Inaba, Hitoshi, 5,596,678, Cl. 361-212.000.

Inaba, Kazuki: *See—*
Hukuda, Kounosi; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Ida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Inagaki, Masahiro: *See—*
Fukushima, Yoshihiro; Inagaki, Masahiro; Azumatani, Yasushi; and Hamanaka, Hiroshi, 5,596,564, Cl. 369-275.300.

Inagaki, Masahiro: *See—*
Nakamura, Kiyomi; Inagaki, Masahiro; Tanikoshi, Syouko; Maki, Hideo; and Hashimoto, Tsuneyuki, 5,596,615, Cl. 376-438.000.

Inazawa, Koichiro; Okumoto, Shin; Hayashi, Hisataka; and Matsushita, Takaya, to Tokyo Electron Limited; and Kabushiki Kaisha Toshiba. Plasma etching method. 5,595,627, Cl. 156-643.100.

Indigo N.V.: *See—*
Lando, Beatrice; Lior, Ishaiau; and Chatow, Ehud, 5,596,396, Cl. 399-237.000.

Industrial Tradebuilders B.V.: *See—*
Paques, Gerardus H. P., 5,595,037, Cl. 52-591.500.

Industrial Technology Research Institute: *See—*
Chang, Ching-Te; and Wu, Rong-Tsun, 5,596,014, Cl. 514-444.000.
Chang, Ching-Te; Lee, Chen-Tao; and Lin, Fuang-Lun, 5,596,107, Cl. 549-59.000.
Huang, Jammy C.-M., 5,595,519, Cl. 445-24.000.
Tseng, Horng-Huei, 5,595,926, Cl. 437-52.000.
Wei, Chang-Kuang, 5,595,790, Cl. 427-510.000.

Inex Pharmaceuticals Corporation: *See—*
Belly, Marcel B.; Bosman, Nancy L.; Cullis, Pieter R.; and Mayer, Lawrence D., 5,595,756, Cl. 424-450.000.

Infinite Technology Corporation: *See—*
Jennings, Earle W., III; and Landers, George H., 5,596,766, Cl. 395-800.000.

Infopak International, Inc.: *See—*
Paik, Harry S.; and Shimogori, Kosuo, 5,595,300, Cl. 206-449.000.

Ingersoll-Rand Company: *See—*
Miller, David B., 5,595,461, Cl. 406-152.000.

Inomata, Carlos R.: *See—*
Fujimura, Shuzo; Ogawa, Hiroki; Ishikawa, Kenji; and Inomata, Carlos R., 5,595,916, Cl. 437-8.000.

Inomata, Masamitsu: *See—*
Oishi, Tetsuya; Ozawa, Hiroshi; Kanazawa, Minoru; Inomata, Masamitsu; Mega, Izumi; and Yamauchi, Atsuyoshi, 5,596,039, Cl. 524-714.000.

Inoue, Kazuo: *See—*
Tsukiro, Yuji; Inoue, Kazuo; and Suzuki, Tadashi, 5,596,062, Cl. 528-28.000.

Institut Francais Du Petrole: *See—*
Commereuc, Dominique, 5,596,115, Cl. 556-27.000.

Institut National de la Sante et de la Recherche Medicale: *See—*

Rocancourt, Murielle; Brezin, Colette; Boucaud, Jean L.; Szatanik, Marek; and Alonso, Jean M., 5,595,901, Cl. 435-232.000.

Institut Pasteur: *See—*
Rocancourt, Murielle; Brezin, Colette; Boucaud, Jean L.; Szatanik, Marek; and Alonso, Jean M., 5,595,901, Cl. 435-232.000.

Instromet B.V.: *See—*
Bergervoet, Josephus T. M.; and Oostendorp, Franciscus J. G. M., 5,596,152, Cl. 73-861.830.

Intégral Peripherals, Inc.: *See—*
Emo, Bruce D.; and Wilson, Brian D., 5,596,458, Cl. 360-48.000.

Intel Corporation: *See—*
Bazes, Mel, 5,596,489, Cl. 363-62.000.
Dao, Giang T., 5,595,843, Cl. 430-5.000.
Ferra, Lawrence C., 5,596,734, Cl. 395-825.000.
Yau, Leopoldo D.; and Fischer, Paul B., 5,595,526, Cl. 451-8.000.

Intelligent Medical Imaging, Inc.: *See—*
Van Dusen, John M.; and Petrie, Ross J., 5,595,710, Cl. 422-104.000.

INTERLEGO AG: *See—*
Bach, Erik; and Rydder, Morten, 5,596,181, Cl. 200-8.00R.

International Business Machines Corporation: *See—*
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.00R.
Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tam, Andrew C.; and Wu, Anthony, 5,595,791, Cl. 427-554.000.
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Daubenspeck, Timothy H.; and Howell, Wayne J., 5,596,226, Cl. 257-690.000.
Bond, Milton F.; Clark, Brian E.; and McRoberts, Raymond S., 5,596,709, Cl. 395-182.050.
Cabral, Cyril, Jr.; Chan, Kevin K.; Chu, Jack O.; and Harper, James M. E., 5,595,600, Cl. 117-83.000.
Darnell, Michael J.; and Smilowitz, Elissa D., 5,596,700, Cl. 395-340.000.
Gallaretti, Pat; Walker, Joel E.; and Steinbugler, Robert E., 5,595,316, Cl. 220-4.330.
Goodfellow, Michael J., 5,596,345, Cl. 345-120.000.
Greenberg, Richard; and Purkett, John C., 5,596,460, Cl. 360-78.140.
Hasegawa, Masaki; and Yamada, Fumiaki, 5,596,430, Cl. 349-74.000.
Horikoshi, Seita, 5,596,482, Cl. 361-683.000.
Ikezaki, Mitsuru; Kimura, Shinichi; and Koike, Tatsushi, 5,596,342, Cl. 345-87.000.
Kleewein, James C.; Lin, Eileen T.; and Wang, Yun, 5,596,748, Cl. 395-610.000.
Lai, Meichen; Lee, Tony Kuen; Nishimura, Jenny Y. K.; and Shank, Gerda R., 5,596,745, Cl. 395-614.000.
Reimer, James A.; and Reinsch, Roger A., 5,596,705, Cl. 395-326.000.
Riggio, Salvatore R., Jr., 5,596,280, Cl. 324-606.000.
Smith, Gordon J., 5,596,462, Cl. 360-99.120.
Stucka, Joan E.; and Wiss, Richard, 5,596,702, Cl. 395-340.000.
Yasrebi, Mehrad, 5,596,579, Cl. 395-678.000.

International Paper Company: *See—*
Fahy, Lawrence J.; Angelini, Peter J.; Diermeier, David A.; and Marconi, John, 5,595,801, Cl. 428-40.100.

International Rectifier Corporation: *See—*
Kinzer, Daniel M., 5,595,918, Cl. 437-29.000.

Intrater, Gideon; Katzri, Lior; Viner, Omri; Levitan, Raya; and Tzadik, Yehezkel, to National Semiconductor Corporation. Debug mechanism for parallel-operating DSP module and CPU core. 5,596,764, Cl. 395-800.000.

Invision Interactive, Inc.: *See—*
O'Connell, Steven S., 5,596,159, Cl. 84-622.000.

Iomega Corporation: *See—*
Baker, William P.; and Hamilton, Charles, 5,596,169, Cl. 174-33.000.

Iowa State University Research Foundation, Inc.: *See—*
Larock, Richard C., 5,596,100, Cl. 546-146.000.
Pometto, Anthony L., III; Demirci, Ali; and Johnson, Kenneth E., 5,595,893, Cl. 435-136.000.
Waller, David; and Brown, Robert C., 5,596,146, Cl. 73-590.000.

Irie, Noburyuki; Hirukawa, Shigeru; and Tateno, Hiroki, to Nikon Corporation. Method for aligning processing areas on a substrate with a predetermined position in a static coordinate system. 5,596,204, Cl. 250-548.000.

Ishibashi, Shin; Nagao, Hideyuki; and Miyazaki, Tomiya, to Matsushita Electric Industrial Co., Ltd. Fiber optic module. 5,596,663, Cl. 385-92.000.

Ishibashi, Shogo: *See—*
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.

Ishida Co., Ltd.: *See—*
Sakaeda, Keiko, 5,596,179, Cl. 177-25.180.

Ishida, Katsumi: *See—*
Miyata, Hiroshi; and Ishida, Katsumi, 5,596,257, Cl. 318-685.000.

Ishihara, Yukihiro: *See—*
Matsui, Hiroshi; Yamamoto, Tamotsu; and Ishihara, Yukihiro, 5,595,288, Cl. 200-513.000.

Ishii, Hiroshi, to Clarion Co., Ltd. Data playback device with verification of data output by calculating device. 5,596,560, Cl. 369-60.000.

Ishii, Jun; and Takahashi, Shinya, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for speech encoding, speech decoding, and speech post processing. 5,596,675, Cl. 395-2.200.

Ishii, Michio: *See—*
Mochizuki, Atsunao; Ishii, Michio; Maeda, Mauuko; and Higuchi, Kazumi, 5,595,856, Cl. 430-270.100.

Ishikawa, Hiromi, to Fuji Photo Film Co., Ltd. Light scanning system. 5,596,445, Cl. 359-210.000.

Ishikawa, Kenji: *See—*
Fujimura, Shuzo; Ogawa, Hiroki; Ishikawa, Kenji; and Inomata, Carlos R., 5,595,916, Cl. 437-8.000.

Ishikawa, Mitsuru: *See—*
Ikeda, Susumu; Isobe, Toshimi; Tajiri, Akihiro; Takagi, Masahiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,595,064, Cl. 62-126.000.

Ishikawa, Takanobi; and Yoneyama, Masakazu, to Fuji Photo Film Co., Ltd. Process for the processing of silver halide color photographic material. 5,595,860, Cl. 430-372.000.

Ishimaru, Hirotoshi: *See—*
Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetsuya, 5,595,473, Cl. 415-199.100.

Ishimaru, Yasuo: *See—*
Tao, Takashi; Ishimaru, Yasuo; Hattori, Morishige; Ohmura, Keiji; and Obba, Hideshi, 5,595,123, Cl. 105-396.000.

Ishinohachi, Toshiyuki: *See—*
Yokota, Norio; Sato, Nichiraka; Mukai, Kazuji; Ishinohachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.

Ishizaki, Akira: *See—*
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kokchi, Tetsuobu, 5,595,920, Cl. 437-40.000.

Ishizaki, Kazuyoshi; Yamamuro, Masateru; Ishizaka, Atsushi; Ohya, Shouji; and Hamao, Miyoko, to Unisia Jecs Corporation. Pump and control valve with annular sealing member to prevent corrosion. 5,595,478, Cl. 417-300.000.

Ishizaka, Atsushi: *See—*
Ishizaki, Kazuyoshi; Yamamuro, Masateru; Ishizaka, Atsushi; Ohya, Shouji; and Hamao, Miyoko, 5,595,478, Cl. 417-300.000.

Isis Pharmaceuticals, Inc.: *See—*
Draper, Kenneth G.; Chapman, Sharon K.; and Kisser, Daniel L., 5,595,978, Cl. 514-44.000.

Island Graphics: *See—*
Boenke, Mark, 5,596,510, Cl. 364-526.000.

Isliefson, Ronald D.: *See—*
Passow, Robin H.; Priebe, Gordon W.; Isliefson, Ronald D.; Mactaggart, I. Ross; and LeClair, Kevin R., 5,596,539, Cl. 365-210.000.

Isobe, Toshimi: *See—*
Ikeda, Susumu; Isobe, Toshimi; Tajiri, Akihiro; Takagi, Masahiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,595,064, Cl. 62-126.000.

Ison, Wendell: *See—*
Pittman, Carl R.; and Ison, Wendell, 5,595,503, Cl. 439-446.000.

Isover Saint Gobain: *See—*
Delahalle, Gerard; Maugeudre, Stephane; Caillaud, Thierry; Peigne, Pierre; and Szalata, Francois, 5,596,598, Cl. 373-93.000.

Isuzu Ceramics Research Institute Co., Ltd.: *See—*
Kawamura, Hideo, 5,595,580, Cl. 55-288.000.

Itabashi, Takeyuki; Akahoshi, Haruo; and Takahashi, Akio, to Hitachi, Ltd. Method for formation of conductor using electroless plating. 5,595,943, Cl. 437-230.000.

Itagaki, Hiroshi: *See—*
Honma, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasunichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,596,427, Cl. 358-515.000.

Itamochi, Sinji: *See—*
Tsuru, Yoshikazu; Itamochi, Sinji; Obishi, Junji; Shimamura, Tetsuro; and Tahara, Hiroshi, 5,596,243, Cl. 310-348.000.

Ito, Hiroshi; Shinpo, Kaoru; and Kiritani, Yasuharu, to Daiki Co., Ltd. Sheets for animals, sheet, bags, daily goods, ink and packaging materials. 5,595,754, Cl. 424-443.000.

Ito, Shinichi: *See—*
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, 5,595,844, Cl. 430-5.000.

Ito, Sumio; Terasawa, Hidekazu; and Sasaki, Yukio, to Nihon Tennessicio Kabushiki Kaisha. Continuous assembly of pots for raising and transplanting seedlings. 5,595,020, Cl. 47-66.000.

Ito, Yasuo: *See—*
Ueno, Fumihiro; Torisawa, Akira; Ito, Yasuo; Sakaki, Eihiro; Obuke, Masaki; Kataoka, Hiromi; Kashihara, Atsushi; and Seto, Kaoru, 5,596,426, Cl. 358-500.000.

Itoh, Fumihito: *See—*
Sawamura, Tadahide; Tawada, Takaaki; and Itoh, Fumihito, 5,596,395, Cl. 399-168.000.

Itoh, Fumisaka: *See—*
Yooda, Eiichi; and Itoh, Fumisaka, 5,595,598, Cl. 106-724.000.

Itoh, Keizou: *See—*
Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, 5,595,684, Cl. 252-299.610.

Itoh, Masayoshi; Takeuchi, Ryo; and Iwata, Kenji, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of organo silicon compounds and production process of silicon. 5,596,117, Cl. 556-430.000.

Itoh, Tadashi: *See—*
Kazabuni, Nobuo; Itoh, Tadashi; and Takahashi, Yasutsuna, 5,596,747, Cl. 395-612.000.

Itoh, Yuichi; Kobayashi, Kyoko; Uchiyama, Akira; and Takahara, Toru, to Mitsui Petrochemical Industries, Ltd. Olefin thermoplastic elastomer and laminate thereof. 5,596,042, Cl. 525-98.000.
Itoh, Yuji, to Atsumi Electric Co., Ltd. Received light level indicating system for beam sensor. 5,596,310, Cl. 340-331.000.
ITT Automotive, Inc.: *See*—
Hofmann, Georg; Suchanek, Jürgen; and Burr, Larry W., 5,596,180, Cl. 200-6.00B.
ITT Corporation: *See*—
Palmer, Gary L.; and Forsythe, William K., 5,595,435, Cl. 362-109.000.
ITT Richter Chemie-Technik GmbH: *See*—
Milinkel, Siegfried, 5,596,238, Cl. 310-103.000.
Itzmann, Peter: *See*—
Schlarb, Alois; Hofmann, Jürgen; Ohlig, Hilmar; Itzmann, Peter; and Pirrwitz, Karl-Peter, 5,595,696, Cl. 264-118.000.
Iverson, Edward P. Dust collector. 5,594,972, Cl. 15-301.000.
Iverson, Brent: *See*—
Magda, Darren; Sessler, Jonathan L.; and Iverson, Brent, 5,595,726, Cl. 424-9.610.
Iwahashi, Hiroshi, to Kabushiki Kaisha Toshiba. Memory cell of nonvolatile semiconductor memory device. 5,596,525, Cl. 365-185.170.
Iwai, Akira, to Toyota Jidosha Kabushiki Kaisha. Start up fuel control device for an engine. 5,595,162, Cl. 123-491.000.
Iwaki, Takashi: *See*—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; and Nakamura, Shinichi, 5,595,685, Cl. 252-299.610.
Iwami, Takashi: *See*—
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Iwamura, Ryuichi: *See*—
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, 5,596,565, Cl. 369-275.300.
Iwamuni, Eiichi: *See*—
Wada, Toshio; and Iwamuni, Eiichi, 5,596,474, Cl. 361-111.000.
Iwase, Shoichi: *See*—
Tomioka, Yugo; Iwase, Shoichi; Sato, Yasuo; Wada, Toshio; and Asazai, Kenji, 5,596,527, Cl. 365-185.200.
Iwasaki, Saburo: *See*—
Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetsuya, 5,595,473, Cl. 415-199.100.
Iwasaki, Takashi: *See*—
Torii, Kazuo; Iwasaki, Takashi; and Onodera, Yoshio, 5,595,716, Cl. 423-328.200.
Iwasaki, Yukio: *See*—
Umeda, Fumio; Noda, Takahisa; Shibagaki, Yuji; Iwasaki, Yukio; and Nakano, Yoshio, 5,596,234, Cl. 307-10.200.
Iwase, Yukiji: *See*—
Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetsuya, 5,595,473, Cl. 415-199.100.
Iwata, Kenji: *See*—
Itoh, Masayoshi; Takeuchi, Ryo; and Iwata, Kenji, 5,596,117, Cl. 556-430.000.
Iwata, Yoshifumi: *See*—
Hasegawa, Junichi; Iwata, Yoshifumi; and Sunagawa, Yukio, 5,595,515, Cl. 440-89.000.
IXYS Corporation: *See*—
Ochi, Sam. S., 5,596,466, Cl. 361-18.000.
Izumizaki, Masami: *See*—
Takada, Yoshihiro; Suzuki, Akio; Daizaka, Toshimitsu; Moriguchi, Haruhiko; Fukushima, Hisashi; Izumizaki, Masami; and Miura, Yasushi, 5,596,353, Cl. 347-19.000.
Izzi, Louis J.: *See*—
Krenik, William R.; Izzi, Louis J.; and Yin, Chenwei J., 5,596,583, Cl. 371-22.100.
J.D. Heat Corp.: *See*—
Knott, James M., 5,595,465, Cl. 410-24.000.
Jabłonski, Thaddeus M. Golf putter. 5,595,385, Cl. 473-295.000.
Jacam Chemical Partners Ltd.: *See*—
Zaid, Najib H., 5,595,679, Cl. 252-70.000.
Jackson, Ricky L.: *See*—
Steiner, Carl A.; and Jackson, Ricky L., 5,595,655, Cl. 210-391.000.
Jacobs, Antonius A. C.: *See*—
Chalmers, William S. K.; and Jacobs, Antonius A. C., 5,595,744, Cl. 424-253.100.
Jacobson, Howard W.; Scholla, Michael H.; and Wigfall, Annie W., to Du Pont de Nemours, E. I., and Company. Antimicrobial particles of silver and barium sulfate or zinc oxide. 5,595,750, Cl. 424-421.000.
Jacques, Bertrand: *See*—
Leduc, Pierre; and Jacques, Bertrand, 5,596,220, Cl. 257-587.000.
Jaffe, Norman; and Hancock, Warren B., to Hancock Jaffe Laboratories. Biological material pre-flotation treatment. 5,595,571, Cl. 8-94.110.
Jaffe, Richard R.: *See*—
Berglund, Victor P.; and Jaffe, Richard R., 5,596,313, Cl. 340-574.000.
Jäger, Arnold. Material filled plastic bowling pin. 5,595,542, Cl. 473-118.000.
Jagger Cars Limited: *See*—
ter Horst, Gerbrechts E. R.; and Moore, Donald J., 5,595,407, Cl. 292-5.000.
Jahns, Eckhard; and Dannes, Burkhardt, to BASF Aktiengesellschaft. Microcapsules, the production and use thereof. 5,596,051, Cl. 526-73.000.
Jakobi, Harald: *See*—
Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Weiserdorfer, Anna; Kern, Manfred; Lämmer, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.
Jalics, George: *See*—
Halasz, Adel F.; and Jalics, George, 5,595,951, Cl. 502-154.000.
Jalla, Maharaj K. Constructing and analyzing requirements of reusable roofline anchor. 5,595,260, Cl. 182-3.000.
Jamal, Karim: *See*—
Larsson, Lars G.; Gudmundson, Perola B. O.; and Jamal, Karim, 5,596,607, Cl. 375-340.000.
James, Jesse C., to McDonnell Douglas Corporation. Electronic baffle and baffle controlled microwave devices. 5,596,324, Cl. 342-5.000.
James, Kenneth W.: *See*—
Adusumilli, Prasad S.; and James, Kenneth W., 5,595,758, Cl. 424-456.000.
James Ross Limited: *See*—
Maciorowicz, Jacek, 5,595,632, Cl. 162-277.000.
Jamieson, J. Scott, to Johnson Service Company. Microprocessor control circuit with inverted reset and extendable runtime. 5,596,515, Cl. 364-570.000.
Jamiolkowski, Dennis D.: *See*—
Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,595,751, Cl. 424-422.000.
Janatka, Eric J.: *See*—
Belec, Eric A.; Janatka, Eric J.; Malick, Shahzad H.; and Pritting, Rebecca J., 5,595,334, Cl. 226-15.000.
Jansen, Kenneth A.: *See*—
Miller, David A.; Jansen, Kenneth A.; McGraw, Montgomery C.; and Cepulis, Darren J., 5,596,759, Cl. 395-750.000.
Janson, John M.: *See*—
Kayal, John J.; Barker, Susan L.; and Janson, John M., 5,595,907, Cl. 435-288.100.
Janssen Pharmaceutica N.V.: *See*—
Janssens, Frans E.; Lacrampe, Jean F. A.; and Pilatte, Isabelle N. C., 5,595,988, Cl. 514-214.000.
Janssens, Frans E.; Lacrampe, Jean F. A.; and Pilatte, Isabelle N. C., to Janssen Pharmaceutica N.V. Triazolo(pyrrolo, thieno or furano)azepine derivatives. 5,595,988, Cl. 514-214.000.
Janssens, Wilhelmus; and Vanmaele, Luc, to Agfa-Gevaert N.V. Dyes and dye-donor elements for use in thermal dye transfer. 5,595,574, Cl. 8-471.000.
Japan as directed by Director General of Agency of Industrial Science and Technology: *See*—
Torii, Kazuo; Iwasaki, Takashi; and Onodera, Yoshio, 5,595,716, Cl. 423-328.200.
Japan Storage Battery Co., Ltd.: *See*—
Miyamoto, Kenichi; Takamoto, Hitoshi; Kojima, Tetsuo; Maki, Takao; and Kogure, Masanori, 5,595,835, Cl. 429-56.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Hashiguchi, Yoshiharu; Hasegawa, Minoru; Goshima, Kaoio; Takemura, Yasuhiko; Higuchi, Yoshiyuki; and Takeuchi, Motokazu, 5,596,041, Cl. 525-98.000.
Jaquet, Catherine: *See*—
Hofheinz, Werner; Jaquet, Catherine; and Jolidon, Synèse, 5,596,002, Cl. 514-313.000.
Jarman, Michael: *See*—
Chan, Ferdinand; Jarman, Michael; and Potter, Gerard A., 5,595,995, Cl. 514-277.000.
Jarraud, Patrick, to Sachs Industries S.A. (Huret et Maillard Reunis). Hydraulic tensioner with lubricator for IC engine transmission chain. 5,595,549, Cl. 474-91.000.
Jarry, Bruno: *See*—
Richaud, François; Jarry, Bruno; Takinami, Koichi; Kurahashi, Osamu; and Beyou, Anne, 5,595,889, Cl. 435-71.200.
Jarvinen, Kari; and Ali-Yrkko, Olli, to Nokia Mobile Phones Ltd. Methods and apparatus for coding a speech signal using variable order filtering. 5,596,677, Cl. 395-2.290.
Jarvis, David W.: *See*—
Shah, Andrew T.; Jarvis, David W.; and Kawamura, Akihiro, 5,595,956, Cl. 503-227.000.
Jarvis, Roger P.; and Jones, Charles J., to Automotive Products, plc. Clutch control system. 5,595,550, Cl. 477-84.000.
Jasper, Edward P.; and Jensen, Roderick J., to Deere & Company; and HCC, Inc. Bat for a reel having an anti-wrap extension. 5,595,052, Cl. 56-220.000.
Jasper, Edward P.; Frederick, James M.; and Echelberger, Joshua U., to HCC Inc. Harvesting machine reel. 5,595,053, Cl. 56-226.000.
Jasper, Louis J.: *See*—
Saddow, Stephen E.; Funk, Eric; Jasper, Louis J.; and Lee, Chi H., 5,596,438, Cl. 359-154.000.
Jaycox: *See*—
Mhaker, Paul F., 5,595,431, Cl. 312-409.000.
Jeong, Poh-Hwang, to United Microelectronics Corp. Burst address sequence generator for addressing static random-access-memory devices. 5,596,616, Cl. 377-56.000.
Jeche, Peter. Safety door and safety apparatus for installation in a door. 5,595,408, Cl. 292-37.000.
Jego, Gérard; Nourry, Daniel; and Thierry, Jean-Pierre, to Schneider Electric SA. Connector for electrical trunking. 5,595,498, Cl. 439-342.000.
Jejelowo, Moses O.: *See*—

Sagar, Vispi R.; and Jejelowo, Moses O., 5,595,950, Cl. 502-104.000.
Jekerle, Jiri; and Schope, Bernd, to Schmidt'sche Heissdampf GmbH. Heat exchanger. 5,595,242, Cl. 165-154.000.
Jelinek, Vaclav, to Sony Corporation; and Materials Research Corp. Wafer heating chuck with dual zone backplane heating and segmented clamping member. 5,595,241, Cl. 165-80.100.
Jenkner, Christian: *See*—
Dietrich, Werner; and Jenkner, Christian, 5,596,300, Cl. 331-17.000.
Jennings, Earle W., III; and Landers, George H., to Infinite Technology Corporation. Configurable logic networks. 5,596,766, Cl. 395-800.000.
Jennings, William C.: *See*—
Sanford, James R. M.; Frank, Patrick M.; Golias, Joseph H.; and Jennings, William C., 5,595,664, Cl. 210-656.000.
Jensen, Jon B. Arrangement for towing of a disabled ship. 5,595,135, Cl. 114-253.000.
Jensen, Jørn M., to Ejnar Jensen & Son A/S. Method and an apparatus for feeding a laundry article to a laundry processing apparatus. 5,595,467, Cl. 414-13.000.
Jensen, Roderick J.: *See*—
Jasper, Edward P.; and Jensen, Roderick J., 5,595,052, Cl. 56-220.000.
Jensen, Roger P., to Miracle Tackle Co., Inc. Fishing lure. 5,595,015, Cl. 43-42.060.
Ji, Jianguo: *See*—
Sibi, Mukund P.; Boudjouk, Philip; and Ji, Jianguo, 5,596,111, Cl. 554-138.000.
Jiles, Stephen L., to Southern California Gas Company. Tension actuated gas shutoff valve. 5,595,207, Cl. 137-38.000.
Joaquim, Domingos: *See*—
Shkolnik, Nikolay; Kantor, Baruch; and Joaquim, Domingos, 5,594,976, Cl. 16-380.000.
Joffe, Basil: *See*—
Geddes, David D.; Joffe, Basil; and Davis, Patrick P., 5,596,704, Cl. 395-326.000.
John Brown Deutsche Engineering GmbH: *See*—
Kramer, Wolfgang; Wüllscheidt, Wilhelm; Jürgens, Theodor; Kleinecke, Klaus; and Geier, Rudolf, 5,596,068, Cl. 528-280.000.
John S. Shepard, D.D.S., P.C.: *See*—
Shepard, John S., 5,595,485, Cl. 433-58.000.
Johnson & Johnson Medical, Inc.: *See*—
Light, Nicholas D.; McGregor, James; Harvey, Wilson; and Watt, Paul W., 5,595,621, Cl. 156-80.000.
Saferstein, Lowell; and Wolf, Stephen J., 5,595,735, Cl. 424-94.640.
Johnson, Dennis W.: *See*—
Gohara, Wadie F.; and Johnson, Dennis W., 5,595,713, Cl. 422-170.000.
Johnson, Graham; Smith, Neil; Geen, Graham R.; Mann, Inderjit S.; and Novack, Vance, to SmithKline Beecham Plc. Process for preparing benzopyran compounds. 5,596,103, Cl. 548-253.000.
Johnson, Graham: *See*—
Mattson, Ronald J.; Keavy, Daniel J.; Parker, Michael F.; and Johnson, Graham, 5,596,019, Cl. 514-629.000.
Johnson, James B.: *See*—
Krishnan, Sivaram; Johnson, James B.; and Mafoti, Robson, 5,596,034, Cl. 524-308.000.
Johnson, Keith D., to United Pacific Development. Greetng card device. 5,595,008, Cl. 40-124.100.
Johnson, Kenneth E.: *See*—
Pometto, Anthony L., III; Demirci, Ali; and Johnson, Kenneth E., 5,595,893, Cl. 435-136.000.
Johnson, Philip A.: *See*—
Berkey, Rex A.; DeFant, Daniel; Hallum, Brad; Hansen, Jeffrey A.; Hopper, Edward L.; Johnson, Philip A.; Saari, Frank C.; and Sundell, Randy P., 5,595,470, Cl. 414-495.000.
Johnson, Richard A.; Engel, Joseph C.; Boccabella, Michael F.; Oravetz, David M.; and Wise, James I., to Eaton Corporation. Electrical switches with current protection interfaced with a remote station and a portable local unit. 5,596,473, Cl. 361-97.000.
Johnson, Richard H.: *See*—
Chang, John C. H.; and Johnson, Richard H., 5,595,955, Cl. 503-201.000.
Johnson, Ross S.; and King, Steven J., to Haworth, Inc. Electrified interior space-dividing members with low-voltage switching system. 5,595,495, Cl. 439-215.000.
Johnson Service Company: *See*—
Jamieson, J. Scott, 5,596,515, Cl. 364-570.000.
Johnston, James H.: *See*—
Harper, Ross T.; Johnston, James H.; and Wiseman, Nicholas, 5,595,717, Cl. 423-339.000.
Johnston, Mark: *See*—
Head, Glenn D., Jr.; and Johnston, Mark, 5,595,131, Cl. 111-200.000.
Jolidon, Synèse: *See*—
Hofheinz, Werner; Jaquet, Catherine; and Jolidon, Synèse, 5,596,002, Cl. 514-313.000.
Jones, Anthony M.; Dewar, Kevin D.; and Sotheran, Martin W., to Discovision Associates. Method and arrangement for transformation of signals from a frequency to a time domain. 5,596,517, Cl. 364-725.000.
Jones, Arwel W.: *See*—
Watkins, Jeffrey C.; and Jones, Arwel W., 5,595,983, Cl. 514-85.000.
Jones, Charles J.: *See*—
Jarvis, Roger P.; and Jones, Charles J., 5,595,550, Cl. 477-84.000.
Jones, Coleen T.: *See*—
Wolf, Stephen; Jones, Coleen T.; Webster, Arthur A., III; Voran, Stephen; Pinson, Margaret H.; and Kubichek, Robert F., 5,596,364, Cl. 348-192.000.
Jones, Jeffrey K.; and White, James. Method and apparatus for predictive maintenance of HVACR systems. 5,596,507, Cl. 364-505.000.
Jones, John E., to BP Chemicals Limited. Blowing agents for phenolic resias. 5,596,022, Cl. 521-131.000.
Jones, Robert J.: *See*—
Marteucci, Mark; Jones, Robert J.; and Munger, John, 5,596,086, Cl. 536-22.100.
Jones, Sidney D.: *See*—
Bowles, Cary R.; Jones, Sidney D.; and Peters, Gary A., 5,595,663, Cl. 210-652.000.
Jones, Stephen: *See*—
Chura, William D.; Kozlowski, Edward; Liljeqvist, Lance; Jones, Stephen; Thompson, Mark; and Hawes, Charles, 5,595,345, Cl. 239-312.000.
Jones, Stephen D. M.: *See*—
Tong, Alan K.; Jones, Stephen D. M.; and Schaefer, Allan L., 5,595,444, Cl. 374-45.000.
Jones, Steven M.; Lang, Thomas F.; Liebig, John R.; and Wang, Xiaohan, to ADAC Laboratories. Dual synchronized sliding transmission detection windows for dual transmission line sources. 5,596,197, Cl. 250-363.040.
Jonsson, E. Haakan: *See*—
Gindin, Lyuba K.; Wicks, Douglas A.; Yeske, Philip E.; and Jonsson, E. Haakan, 5,596,044, Cl. 525-131.000.
Joo, Yang S., to LG Semicon Co., Ltd. Semiconductor memory device. 5,596,538, Cl. 365-201.000.
Jordan, Eric H.: *See*—
Canistraro, Howard A.; Jordan, Eric H.; and Pease, Douglas M., 5,596,620, Cl. 378-84.000.
Jørgensen, Tine K.: *See*—
Andersen, Knud E.; Olsen, Uffe B.; Petersæa, Hans; Grønvald, Frederik; Sonnewald, Ursula; Jørgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.
Joshi, Abhay: *See*—
Perreault, John A.; Joshi, Abhay; Kabatepe, Mete; Lloyd, Lawrence W.; and Schroeder, Stephen, 5,596,577, Cl. 370-449.000.
Josoff, Peter L., to Lucent Technologies Inc. Apparatus for storing a variable quantity of moving strand material. 5,595,354, Cl. 242-364.000.
Joyce, Gerald F., to Scripps Research Institute, The. *T. thermophila* group I introns that cleave amide bonds. 5,595,873, Cl. 435-6.000.
Joyce, Terrence H.: *See*—
Li, Yun Z.; Lemberger, Richard R.; Schubert, Paul C.; Joyce, Terrence H.; and Warren, Jack K., 5,596,190, Cl. 250-236.000.
Juki Corporation: *See*—
Kataigi, Tutomu, 5,595,044, Cl. 53-396.000.
Jung, Birgit: *See*—
Esser, Franz; Schnorrenberg, Gerd; Dollinger, Horst; Jung, Birgit; and Burger, Erich, 5,596,000, Cl. 514-312.000.
Jung, Hae-Mook, to Daewoo Electronics Co., Ltd. Boundary matching motion estimation apparatus. 5,596,370, Cl. 348-416.000.
Jungemann, Ludger; Dreesbeimdieke, Hermann; and Sanders, Lambert, to Claas oHG beschraenkt haftende offene Handelsgesellschaft. Self-propelling harvester thresher. 5,595,537, Cl. 460-100.000.
Junker, Jürgen. Filter insert. 5,595,582, Cl. 55-497.000.
Jurewicz, Romuald M.: *See*—
Wong, Albert C. K.; Jurewicz, Romuald M.; and McCormack, Michael D., 5,596,512, Cl. 364-550.000.
Jürgens, Theodor: *See*—
Kramer, Wolfgang; Wüllscheidt, Wilhelm; Jürgens, Theodor; Kleinecke, Klaus; and Geier, Rudolf, 5,596,068, Cl. 528-280.000.
Just, Angela R.: *See*—
Fernandez, Christopher; Just, Angela R.; and Kochanski, Gregory P., 5,596,634, Cl. 379-201.000.
Just, Regine: *See*—
Fritsch, Detlev; Peinemann, Klaus V.; Behling, Rolf D.; and Just, Regine, 5,595,658, Cl. 210-490.000.
K. A. Schmersal GmbH & Co.: *See*—
Schulze, Klaus, 5,595,286, Cl. 200-335.000.
Kabasawa, Kenichi: *See*—
Arataki, Yuji; Masuda, Shozo; Kabasawa, Kenichi; and Kadono, Tohru, 5,596,558, Cl. 369-53.000.
Kabatepe, Mete: *See*—
Perreault, John A.; Joshi, Abhay; Kabatepe, Mete; Lloyd, Lawrence W.; and Schroeder, Stephen, 5,596,577, Cl. 370-449.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Maeda, Hisao; Matsushima, Yoshitake; Nakamura, Morifumi; Shiina, Akito; Hirabara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, 5,595,610, Cl. 148-233.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kamada, Ikuo, 5,595,560, Cl. 483-1.000.
Mori, Akira; Uchino, Ikuo; Hirosawa, Atsuhiko; and Yamazaki, Kunihiro, 5,596,266, Cl. 324-71.100.
Ozawa, Godo, 5,595,145, Cl. 123-41.350.
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Torimoto, Yoshifumi; and Sadakata, Masayoshi, 5,595,643, Cl. 205-634.000.

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Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; and Yamauchi, Atsuyoshi, 5,596,039, Cl. 524-714.000.

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Thomsen, Soeren H.; Sherwood, Charles A., II; and Karczewski, Casimir, 5,596,589, Cl. 371-37.800.

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Korfmacher, Georg, 5,595,806, Cl. 428-69.000.

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Wright, David E.; Solheim, John A.; and Kubica, Daniel J., 5,595,552, Cl. 473-332.000.

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Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, 5,595,684, Cl. 252-299.610.

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Kassal, James J., to Flowscan, Inc. Assembly process for polymer-based acoustic differential-output sensor. 5,595,188, Cl. 128-773.000.

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Keavy, Daniel J.: *See*—
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Kwon, Han D., 5,595,489, Cl. 434-319.000.

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Fast, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., 5,595,862, Cl. 430-537.000.

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Klinedinst, Keith A.; and Lester, Joseph E., to Osram Sylvania Inc. Apparatus for the controlled delivery of vaporized chemical precursor to an LPCVD reactor. 5,595,603, Cl. 118-715.000.
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Hager, Stanley L.; Knight, James E.; Helma, Gregory F.; and Argento, Ben J., 5,596,059, Cl. 527-300.000.
Knorr, Andreas: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Beuck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
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Strolle, Christopher H.; Limberg, Allen L.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., 5,596,418, Cl. 386-9.000.
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Honjo, Toshio; Sato, Yuji; Kayamoto, Kanao; Ogata, Masahiro; and Kobayashi, Hiromichi, 5,595,850, Cl. 430-106.600.
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Ohashi, Masayoshi; Takeuchi, Yoshio; Suzuki, Toshinori; Yamaguchi, Akira; Sakai, Seiichiro; and Mizuno, Toshio, 5,596,641, Cl. 380-23.000.
Kolb, Dieter: *See*—
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Treves, David; Fu, Hong; and O'Dell, Thomas, 5,595,768, Cl. 425-174.400.
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Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; and Minney, Jack L., to Creative Integrated Systems, Inc. Very large scale integrated planar read only memory. 5,596,544, Cl. 365-233.500.
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Murakami, Koichiro; Miyazaki, Takemi; Nakanishi, Kazuhiro; and Kaedeoka, Noriyuki, 5,596,381, Cl. 396-207.000.
Shimada, Takeichi; and Ushiroji, Takahiko, 5,596,397, Cl. 399-335.000.
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Konings, Mark S.: *See*—
Oxman, Joel D.; Konings, Mark S.; Tiers, George V. D.; Vogel, Kim M.; and Vogel, Dennis E., 5,596,025, Cl. 523-109.000.
Koninklijke PTT Nederland N.V.: *See*—
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Konishi, Yuzuru; Hirasawa, Kyotaro; and Taguchi, Kazunori, to Mitsubishi Denki Kabushiki Kaisha. Light trigger type semiconductor device with reflection prevention film. 5,596,210, Cl. 257-98.000.

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Korbel, Gerald E., to Minnesota Mining and Manufacturing Company. Splice means, a method of splicing an abrasive article with same and the spliced abrasive article formed thereby. 5,595,804, Cl. 428-57.000.

Korea Institute of Science and Technology: *See*—
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Korfmacher, Georg, to Karfmacher Trading GmbH. Mat for bearing and supporting objects, especially for packaging. 5,595,806, Cl. 428-69.000.

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Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Kovner, Vladimir; Minuhin, Vadim B.; and Surendran, Srinivasan, to Seagate Technology, Inc. Fully integrated programmable filters for disc drive subsystems. 5,596,459, Cl. 360-51.000.

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Kozlowski, Edward: *See*—
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Silver, Richard S.; and Hasenhuettl, Gerard L., 5,596,085, Cl. 536-18.600.

Kralovic, Raymond C.: *See*—
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Hammer, Klaus-Dieter; Siebrecht, Manfred; and Krams, Theo, 5,595,796, Cl. 428-34.800.

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Brown, Larry T.; and Kraska, Marvin P., 5,596,495, Cl. 364-424.080.

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Cuffe, John M., 5,596,508, Cl. 364-508.000.

Kreba, Jerome R., to Exxon Production Research Company. Seismic imaging using wave equation extrapolation. 5,596,548, Cl. 367-56.000.

Krebs, Rainer: *See*—
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Kreeger, Russell L.: *See*—
Brode, George L.; Doucel, Gustavo F.; Gabelnick, Henry L.; Kreeger, Russell L.; and Salensky, George A., 5,595,980, Cl. 514-57.000.

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Krieger, Stephan: *See*—
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Krishnan, Sivaram; Johnson, James B.; and Mafoti, Robson, to Bayer Corporation. Polycarbonate compositions having mold-release properties. 5,596,034, Cl. 524-308.000.

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Krisko, John P.: *See*—
Bauer, Jamie D.; and Krisko, John P., 5,595,309, Cl. 211-59.100.

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Meisner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Krivitski, Nikolai M., to Transonic Systems, Inc. Cardiovascular measurements by sound velocity dilution. 5,595,182, Cl. 128-692.000.

Kröll, Joachim; and Richter, Peter, to Mannesmann Aktiengesellschaft. Crane, particularly a track-bound mobile crane. 5,595,313, Cl. 212-225.000.

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Stetler-Stevenson, William G.; Liotta, Lance A.; and Krutzsch, Henry C., 5,595,885, Cl. 435-69.200.

Krysalka, William; and Linderman, Jack, to Harsco Corporation. Grid assembly with improved form pan for use in grid reinforced concrete decks and method of manufacturing same. 5,595,034, Cl. 52-318.000.

Kubena, Randall L.; and Atkinson, Gary M., to Hughes Aircraft Company. Single-wafer tunneling sensor and low-cost IC manufacturing method. 5,596,194, Cl. 250-306.000.

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Wright, David E.; Solheim, John A.; and Kubica, Daniel J., 5,595,552, Cl. 473-332.000.

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Wolf, Stephen; Jones, Coleen T.; Webster, Arthur A., III; Voran, Stephen; Pinson, Margaret H.; and Kubichek, Robert F., 5,596,364, Cl. 348-192.000.

Kubillus, Uwe: *See*—
Epple, Ulrich; Kubillus, Uwe; and Schmidt, Holger, 5,596,057, Cl. 526-273.000.

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Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.

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Kudo, Yasuharu: *See*—
Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Misako; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Tohru, 5,596,256, Cl. 318-600.000.

Kugou, Daisaku; Kikuchi, Hiroki; Kadono, Nobuaki; and Nakahara, Kunikazu, to Murata Manufacturing Co., Ltd. Composite electronic component and method of manufacturing the same. 5,596,244, Cl. 310-348.000.

Kuhn, Pierre: *See*—
Borck, Gerald-Wolfgang; Eicher, Jochen; Kuhn, Pierre; Müller, Norbert; and Salomé, Antoine, 5,595,297, Cl. 206-387.130.

Kuhn, Stephen R.: *See*—
Remington, James A.; Young, Keith; and Kuhn, Stephen R., 5,595,361, Cl. 246-276.000.

Kuijk, Karel E.: *See*—
Bongaerts, Petrus F. G.; Bruinink, Jacob; Burgmans, Adrianus L. J.; Van Helleputte, Henri R. J. R.; Khan, Babar A.; and Kuijk, Karel E., 5,596,431, Cl. 349-32.000.

Kuivila, Charles S.: *See*—
Halm, Roland L.; Kuivila, Charles S.; and Wilding, Oliver K., 5,596,119, Cl. 556-472.000.

Kulicke and Soffa Investments, Inc.: *See*—
Safabakhsh, Ali R.; Khelemsky, Valery; and Kulicke, Charles S., 5,595,328, Cl. 228-1.100.

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Kulkarni, Vaman G.; and Campbell, John C., to Americhem, Inc. Highly conductive polymer blends with intrinsically conductive polymers. 5,595,689, Cl. 252-500.000.

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Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishinobachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.

Kumazaki, Toshimi, to Mitsuboshi Belting Ltd. V-ribbed belt and grinding wheel for forming the belt. 5,595,533, Cl. 451-541.000.

Kummer, Martin E.: *See*—
Gochenour, Daniel V.; Adams, Barry T.; Kummer, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,274, Cl. 192-70.250.

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Gochenour, Daniel V.; Adams, Barry T.; Kumner, Martin E.; Davis, Christopher M.; Lepard, Steven D.; Bassett, Michael L.; and Schlosser, Kevin F., 5,595,275, Cl. 192-111.00A.

Kunimi, Nobutaka; Ueda, Yasuyoshi; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Monoazo compounds and method for dyeing or printing fiber materials using the same. 5,596,083, Cl. 534-642.000.

Kuo, Shihjong. Method and apparatus for acquiring digital maps. 5,596,494, Cl. 364-420.000.

Kurahashi, Osamu: *See*—
Richaud, François; Jarry, Bruno; Takinami, Koichi; Kurahashi, Osamu; and Beyou, Anne, 5,595,889, Cl. 435-71.200.

Kurashima, Hiromi; Takahashi, Hisato; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Sekiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, to Sumitomo Electric Industries, Ltd. Optical module having structure for defining fixing position of sleeve. 5,596,665, Cl. 385-92.000.

Kurby, Christopher N.: *See*—
Olds, Keith A.; Vatt, Gregory B.; and Kurby, Christopher N., 5,596,315, Cl. 340-825.030.

Kurek, Stephen R.; and Schroeder, David. Rocker-type electrical switch. 5,595,289, Cl. 200-559.000.

Kurihara, Hideshi: *See*—
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Kuriya, Yoshinori, to Bridgestone Corporation. Steel cords for the reinforcement of rubber articles. 5,595,057, Cl. 57-213.000.

Kuriyama, Hirotada, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device and a manufacturing method of the same. 5,596,212, Cl. 257-298.000.

Kuriyama, Minori: *See*—
Hukuda, Koumei; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Kuroda, Kazuyuki; Tanaka, Yasuyori; and Matsunaga, Tadahiro, to Sumitomo Chemical Company, Limited. Slow-releasing compositions containing hydrotalcites which have been intercalated with an organic anion and method of controlling insects and protecting fabric from insects. 5,595,747, Cl. 424-405.000.

Kuroda, Shun'ichi: *See*—
Fujisawa, Yukio; Kuroda, Shun'ichi; and Konishi, Hiroaki, 5,595,882, Cl. 435-7.210.

Kurokawa, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Radiation therapy treatment planning system. 5,596,653, Cl. 382-128.000.

Kurokawa, Tsuyoshi: *See*—
Tsubota, Kojiro; Fujioka, Kazuyoshi; Takafuji, Yutaka; Kurokawa, Tsuyoshi; and Tanaka, Fumio, 5,596,023, Cl. 522-100.000.

Kuroki, Yuji: *See*—
Uchiba, Makoto; and Kuroki, Yuji, 5,596,623, Cl. 379-15.000.

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Désor, Ulrich; Krieger, Stephan; Kuropka, Rolf; and Momper, Bernhard, 5,596,035, Cl. 524-460.000.

Kurz, Arthur A.: *See*—
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.00R.

Kurz, Josef: *See*—
Hafner, Norbert; Mitter, Friedrich; Ledwinka, Hans; Bruckmüller, Elisabeth; and Kurz, Josef, 5,596,076, Cl. 528-483.000.

Kushibiki, Nobuo; Sugata, Yoko; and Suzuki, Toshio, to Dow Corning Asia, Ltd. Curable polytitanosiloxane compositions and method for preparing cured polytitanosiloxanes using said compositions. 5,596,060, Cl. 528-15.000.

Kushiya, Toru, to SMC Corporation. Auto-drain unit. 5,595,210, Cl. 137-181.000.

Kussendrager, Klaas D.; Kivits, Marinus G. C.; and Verver, Albert B., to Campina Melkunie BV. Process for isolating lactoferrin and lactoperoxidase from milk and milk products, and products obtained by such process. 5,596,082, Cl. 530-416.000.

Kusuzawa, Hideo, to TOA Medical Electronics Co., Ltd. Particle analyzing apparatus using a coherence lowering device. 5,596,401, Cl. 356-23.000.

Kuwahara, Hisayuki: *See*—
Miya, Shinya; Kano, Yuichi; Kuwahara, Hisayuki; Kasuya, Takeshige; and Fukaya, Yosio, 5,596,040, Cl. 525-92.00B.

Kuwata, Takeshi; Ruckmongathan, Temkar; Nakagawa, Yutaka; Koh, Hidemasa; Hasebe, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takanori, to Asahi Glass Company Ltd. Driving method of driving a liquid crystal display element. 5,596,344, Cl. 345-103.000.

Kuznetsov, Stephen B., to Power Superconductor Applications Co. Apparatus for limiting high current electrical faults in distribution networks by use of superconducting excitation in transverse flux magnetic circuit. 5,596,469, Cl. 361-58.000.

Kuzuhara, Masaaki: *See*—
Onda, Kazuhiko; and Kuzuhara, Masaaki, 5,596,211, Cl. 257-194.000.

Kvaerner Eureka a.s: *See*—
Eriksen, Gunnar; and Olsen, Sissel W., 5,594,998, Cl. 34-111.000.

Kwan, Ming S.: *See*—
Liu, David K. Y.; Kwan, Ming S.; Chang, Chi; Haddad, Sameer; and Tang, Yuan, 5,596,531, Cl. 365-185.310.

Kwon, Gi J., to LG Electronics, Inc. Automatic brightness control apparatus for a monitor. 5,596,375, Cl. 348-687.000.

Kwon, Han D., to Kemongsa Publishing Co., Ltd. Electronic audio learning apparatus. 5,595,489, Cl. 434-319.000.

Kyocera Corporation: *See*—
Nishiguchi, Yasuo; Kikuchi, Susumu; Imoo, Ryushi; Tsukahara, Sigeki; and Yamane, Shinji, 5,596,394, Cl. 399-175.000.

Kyowa Hakko Kogyo Co. Ltd.: *See*—
Katsumata, Ryoichi; Ikeda, Masato; Nakanishi, Keiko; and Sasao, Yuko, 5,595,894, Cl. 435-172.100.
Katsumata, Ryoichi; and Kino, Kuniki, 5,595,906, Cl. 435-252.100.

L. Schuler GmbH: *See*—
Michael, Wolfgang; Strommer, Kurt; and Hofele, Hans, 5,595,111, Cl. 100-207.000.

Laas, Hans-Josef; Halpaap, Reinhard; Meier-Westhues, Hans-Ulrich; and Schultz, Wolfgang, to Bayer Aktiengesellschaft. Dimeric diol-modified powder coating cross-linking agents containing uretdione groups. 5,596,066, Cl. 528-73.000.

Labler, Ludvik: *See*—
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.

Laboratoires Virbac: *See*—
Derrieu, Guy; and Raynier, Bernard, 5,595,762, Cl. 424-490.000.

Labrie, Fernand, to Endorecherche Inc. Combination therapy for prophylaxis and/or treatment of benign prostatic hyperplasia. 5,595,985, Cl. 514-169.000.

Lacrampe, Jean F. A.: *See*—
Janssens, Frans E.; Lacrampe, Jean F. A.; and Pilatte, Isabelle N. C., 5,595,988, Cl. 514-214.000.

Ladd, Douglas W.: *See*—
Cusimano, Matt; and Ladd, Douglas W., 5,595,366, Cl. 248-354.300.

Ladouceur, Lawrence C., to Textron Automotive Company, Inc. Wheel cover assembly having anti-theft retainer system. 5,595,422, Cl. 301-37.210.

Laermer, Franz: *See*—
Trah, Hans-Peter; Laermer, Franz; and Schilp, Andrea, 5,595,940, Cl. 437-225.000.

Lagneau, Bernard P., to Eastman Kodak Company. Metering machine suitable for filling bottles of varying dimensions. 5,595,221, Cl. 141-177.000.

Lai, Meichen; Lee, Tony Kuen; Nishimura, Jenny Y. K.; and Shank, Gerda R., to International Business Machines Corporation. System and procedure for concurrent database access by multiple user applications through shared connection processes. 5,596,745, Cl. 395-614.000.

Lakeview Hutterian Brethren, Inc.: *See*—
Hofer, Joseph M.; and Wipf, Daniel J., 5,595,139, Cl. 119-54.000.

Lal, Kasturi: *See*—
Bryant, Charles P.; Lal, Kasturi; and Pialet, Joseph W., 5,595,680, Cl. 252-77.000.

Lam, Si-Ty: *See*—
Hindagolla, Suraj L.; Hopkins, Glen A.; Taub, Howard H.; Lam, Si-Ty; McClelland, Paul H.; and Aden, James S., 5,595,785, Cl. 427-271.000.

Lamaster, Kenneth R.: *See*—
Wilson, Joseph H.; Haeberle, David C.; Kralovic, Raymond C.; Lamaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; and Antloga, Kathleen M., 5,595,711, Cl. 422-119.000.

Lambert, David R.: *See*—
Huang, Ming-Teh; Lambert, David R.; Gatta, Robert F.; and Lynch, Kevin G., 5,595,659, Cl. 210-502.100.

Lambert, Lloyd J., Jr.: *See*—
Lambert, Lloyd J., Sr.; and Lambert, Lloyd J., Jr., 5,595,557, Cl. 482-57.000.

Lambert, Lloyd J., Sr.; and Lambert, Lloyd J., Jr. Exercise machine with two sets of pedals. 5,595,557, Cl. 482-57.000.

Landa, Benzion; Lior, Ishaiau; and Chanow, Ehud, to Indigo N.V. Latent image development apparatus. 5,596,396, Cl. 399-237.000.

Landers, George H.: *See*—
Jennings, Earle W., III; and Landers, George H., 5,596,766, Cl. 395-800.000.

Landi, Marco: *See*—
Baroni, Marco; Croci, Tiziano; Landi, Marco; Guzzi, Umberto; and Nisato, Dino, 5,595,994, Cl. 514-275.000.

Lane, Charles E., III: *See*—
Wilda, Douglas W.; Lane, Charles E., III; and Mathias, Milton W., 5,596,147, Cl. 73-717.000.

Lang, Brian D.: *See*—
Bartolone, John B.; Penksa, Christine M.; Santhanam, Uma; and Lang, Brian D., 5,595,730, Cl. 424-70.100.

Lang, Thomas F.: *See*—
Jones, Steven M.; Lang, Thomas F.; Liebig, John R.; and Wang, Xiaohan, 5,596,197, Cl. 250-363.040.

Langdon, Donald R.: *See*—
Wright, J. Nelson; Plugge, Jay S.; Fash, D. Grant, III; Langdon, Donald R.; Finger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.

Langdon, Howard S., to Fastron Company, The. Tilted terminal clamp. 5,595,512, Cl. 439-812.000.

Lange, Lene: *See*—
Breinholt, Jens; and Lange, Lene, 5,596,015, Cl. 514-473.000.

Langietti, Ronald J.: *See*—
Coles, Robert J.; Langietti, Ronald J.; and Vaccaro, Dennis D., 5,596,332, Cl. 342-455.000.

Lankhaar, Jenneke A. C.: *See*—
Zwanikken, Radboud H. G.; Lankhaar, Jenneke A. C.; and van den Nieuwelaar, Adrianus J., 5,595,066, Cl. 62-374.000.

Lapin, Stephen C.: *See*—
Murphy, Edward J.; Lapin, Stephen C.; and Noren, Gerry K., 5,596,669, Cl. 385-128.000.

Laplace, Carl J.: *See*—
Zavis, Wayne M.; Mizener, Jeffery C.; Hoaochick, James J.; Bellin, Michael A.; and Laplace, Carl J., 5,596,263, Cl. 323-255.000.

Lara, Pedro F.; and Mateer, Mark W., to Atlantic Richfield Company. Apparatus and method for measuring potentials through pavements for buried pipeline cathodic protection systems. 5,596,267, Cl. 324-71.100.

Larock, Richard C., to Iowa State University Research Foundation, Inc. Palladium catalyzed annulation of internal alkynes. 5,596,100, Cl. 546-146.000.

Larrick, Raymond: *See*—
Maher, Charles A., Jr.; and Larrick, Raymond, 5,596,514, Cl. 364-569.000.

Larsson, Lars G.; Gudmundson, Perols B. O.; and Jamal, Karim, to Telefonaktiebolaget LM Ericsson. Method and an arrangement of estimating transmitted symbols at a receiver in digital signal transmission. 5,596,607, Cl. 375-340.000.

Lasker, Steven; and Klein, Richard, to Trustees of Columbia University in the City of New York, The. Method of slowing ventricular arrhythmias using zatebradine. 5,595,987, Cl. 514-213.000.

Laskowski, Edward J.: *See*—
Henry, Charles H.; Laskowski, Edward J.; Li, Yuan P.; Mak, Cecilia Y.; and Yaffe, Henry H., 5,596,661, Cl. 385-24.000.

Latimer, Lee H.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; Subramanyam, Chakrapani; Latimer, Lee H.; and Lodge, Eric P., 5,596,012, Cl. 514-373.000.

Lausch, H. Nevin: *See*—
Horchler, Fred M., Jr.; and Lausch, H. Nevin, 5,595,055, Cl. 56-341.000.

Law, Say-Jong; and Piran, Uri, to Ciba Corning Diagnostics Corp. Method for detection of an analyte using acridinium ester and liposomes. 5,595,875, Cl. 435-6.000.

Lawlor, Joseph F.; and Musto, Joseph D., to Reference Diagnostics, Inc. Lipid fractionation. 5,595,913, Cl. 436-17.000.

Lawniczak, Jonathan E.: *See*—
Edgar, Kevin J.; and Lawniczak, Jonathan E., 5,595,591, Cl. 106-170.270.

Lawrence, R. Michael: *See*—
Wetterau, John R., II; Sharp, Daru Y.; Gregg, Richard E.; Biller, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Partyka, Richard A., 5,595,872, Cl. 435-6.000.

Lawson, John E.: *See*—
Wetterau, John R., II; Sharp, Daru Y.; Gregg, Richard E.; Biller, Scott A.; Dickson, John K.; Lawrence, R. Michael; Lawson, John E.; Holava, Henry M.; and Partyka, Richard A., 5,595,872, Cl. 435-6.000.

Le, Minh V.: *See*—
Delaney, Michael J.; Nguyen, Loi D.; Le, Minh V.; Tizol, Jorge L.; and Loh, James C., 5,595,917, Cl. 437-8.000.

Learn, Keith S.: *See*—
Morris, Robert L.; Neuenschwander, Kent W.; Learn, Keith S.; and Scotese, Anthony C., 5,596,020, Cl. 514-646.000.

Leban, Joseph F.; Levin, Robert F.; and Richardson, Mark B., to Panduit Corp. Portable cable tie installation tool. 5,595,220, Cl. 140-123.600.

Le Bihan, Jean-Claude: *See*—
Marbot, Roland; Le Bihan, Jean-Claude; Cofler, Andrew; and Nezamzadeh-Moosavi, Reza, 5,596,285, Cl. 326-30.000.

LeBlanc, Frederick W., to U S West Technologies, Inc. Method for routing emergency calls during busy interface channel conditions. 5,596,625, Cl. 379-60.000.

Le Bras, Philippe, to Mead Corporation, The. Bottle carrier with retaining means. 5,595,299, Cl. 206-434.000.

Le Bris, Jean, to Alcatel N.V. Method of forming coupling diopters at the ends of optical fibers. 5,595,669, Cl. 219-121.590.

Lebrocquy, Chester J. Portable vertical lift. 5,595,265, Cl. 187-261.000.

LeClair, Kevin R.: *See*—
Passow, Robin H.; Priebe, Gordon W.; Isliefson, Ronald D.; Mactaggart, I. Ross; and LeClair, Kevin R., 5,596,539, Cl. 365-210.000.

Ledda, Francesco, to Alcatel Network Systems, Inc. Method and circuitry for aligning the phase of high-speed clocks in telecommunications systems. 5,596,614, Cl. 375-376.000.

Leduc, Pierre; and Jacques, Bertrand, to U.S. Philips Corporation. Integrated lateral transistor with improved current amplification. 5,596,220, Cl. 257-587.000.

Ledwinka, Hans: *See*—
Hafner, Norbert; Mitter, Friedrich; Ledwinka, Hans; Bruckmüller, Elisabeth; and Kurz, Josef, 5,596,076, Cl. 528-483.000.

Lee, Che-Hung: *See*—
Hoke, Glenn D.; Bradley, Matthews O.; Williams, Taffy J.; and Lee, Che-Hung, 5,596,090, Cl. 536-24.500.

Lee, Chen-Tao: *See*—
Chang, Ching-Te; Lee, Chen-Tao; and Lin, Fueng-Lan, 5,596,107, Cl. 549-59.000.

Lee, Chi H.: *See*—
Saddow, Stephen E.; Funk, Eric; Jasper, Louis J.; and Lee, Chi H., 5,596,438, Cl. 359-154.000.

Lee, David L.: *See*—
Chin, Hsiao-Ling M.; Nguyen, Nhan H.; Kanne, David B.; and Lee, David L., 5,595,958, Cl. 504-250.000.

Lee, Douglas J.: *See*—
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,596,532, Cl. 365-185.180.

Lee, Ho-In; Kim, Ki-Bae; Han, Yo-Sub; and Kim, Yong-Joon, to Korea Institute of Science and Technology. Vertical squeeze casting apparatus. 5,595,236, Cl. 164-319.000.

Lee, Jin-Bang; Choi, Byung-Cheol; Lee, Nam-Ho; and Kim, Seon-Kyu, to Daewoo Electronics Co., Ltd. Motor capable of using high or low voltage. 5,596,236, Cl. 310-68.00A.

Lee, John S.; and Pearson, Michael J., to Discovery Chemicals, Inc. Method for making an HCL adsorbent. 5,595,954, Cl. 502-415.000.

Lee, Len F., to G. D. Searle & Co. 3,4-Diaryl substituted pyridines for the treatment of inflammation. 5,596,008, Cl. 514-347.000.

Lee, Michael H., to Hewlett-Packard Company. Toner ejection printer with dummy electrode for improving print quality. 5,596,356, Cl. 347-55.000.

Lee, Nam-Ho: *See*—
Lee, Jin-Bang; Choi, Byung-Cheol; Lee, Nam-Ho; and Kim, Seon-Kyu, 5,596,236, Cl. 310-68.00A.

Lee, Roger, to Micron technology, Inc. Shallow trench source EPROM cell. 5,596,213, Cl. 257-316.000.

Lee, Terence N.: *See*—
Douglas, Raymond W.; Stinger, Philip J.; Ng, Harold W.; and Lee, Terence N., 5,596,587, Cl. 371-27.000.

Lee, Tony Kuen: *See*—
Lai, Meichen; Lee, Tony Kuen; Nishimura, Jenny Y. K.; and Shank, Gerda R., 5,596,745, Cl. 395-614.000.

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Maciejewski, Wendell C., to United States of America, Navy. Rotating peel fixture. 5,596,133, Cl. 73-7.000.

Macierewicz, Jacek. to James Ross Limited. Shower for paper making machine. 5,595,632, Cl. 162-277.000.

Mackeen, Donald L., to DEO Corporation. Ophthalmic composition for treating dry eye. 5,595,764, Cl. 424-687.000.

MacPhail-Fanney, Bryan D., to Excel Industries, Inc. Window regulator assembly. 5,595,025, Cl. 49-351.000.

MacPherson, Ian: *See—*
Rees, Mark; and MacPherson, Ian, 5,595,966, Cl. 508-591.000.

Macronix International Co., Ltd.: *See—*
Lin, Tien-Ler; Wan, Ray L.; Hsiao, Ling-Wen; and Sung, Gilbert, 5,596,530, Cl. 365-185.290.

Mactaggart, I. Ross: *See—*
Passow, Robin H.; Priebe, Gordon W.; Isliefson, Ronald D.; Mactaggart, I. Ross; and LeClair, Kevin R., 5,596,539, Cl. 365-210.000.

Madden, Jean D., Jr.; and Knapp, Christopher H., to Electro-Films Incorporated. Laser slag removal. 5,595,668, Cl. 216-17.000.

Maddock, William H.; and Parshad, David A., to Noma Inc. Decorative light strings and multi-purpose lampholders therefor. 5,595,439, Cl. 362-238.000.

Madonna, Robert P.; Eschholz, Siegmar K.; and Lynch, John T., to Excel, Inc. Telecommunications switch with improved redundancy. 5,596,569, Cl. 370-217.000.

Maeda, Hisao; Matsushima, Yoshitake; Nakamura, Morifumi; Shiina, Akito; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, to Kabushiki Kaisha Kobe Seiko Sho; and Mazda Motor Corporation. Method of manufacturing case-hardened parts with little distortion in heat treatment and superior strength in bending fatigue. 5,595,610, Cl. 148-233.000.

Maeda, Kazuyuki; Kiyozumi, Yoshimichi; and Mizukami, Fujio, to Director-General of Agency of Industrial Science and Technology. Crystalline aluminum organophosphate. 5,595,952, Cl. 502-162.000.

Maeda, Masako: *See—*
Mochizuki, Amane; Ishii, Michie; Maeda, Masako; and Higashi, Kazumi, 5,595,856, Cl. 430-270.100.

Maeda, Tatsuo; Anayama, Hideki; Kawamorita, Yoichi; Otmori, Hiroyuki; and Kimura, Mayumi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, electrophotographic apparatus including same and electrophotographic apparatus unit. 5,595,845, Cl. 430-58.000.

Maeng, Hyun J., to Goldstar C., Ltd. Both-sides playing optical disc player. 5,596,563, Cl. 369-219.000.

Maeteas, Daniel: *See—*
Moens, Luc; Maeteas, Daniel; Loutz, Jean-Marie; and Baudour, Michel, 5,596,037, Cl. 524-539.000.

Mafoti, Robson: *See—*
Krishnan, Sivaram; Johnson, James B.; and Mafoti, Robson, 5,596,034, Cl. 524-308.000.

Magda, Darren; Sessler, Jonathan L.; and Iverson, Brent, to Pharmacyclics, Inc.; and Board of Trustees, Univ. of TX Sys. Chromophore probe for detection of nucleic acid. 5,595,726, Cl. 424-9.610.

Maggi, Sergio: *See—*
Guttag, Karl M.; McDonough, Kevin C.; and Maggi, Sergio, 5,596,767, Cl. 395-800.000.

Maguire, David J.: *See—*
Ferguson, Patrick L.; and Maguire, David J., 5,596,725, Cl. 395-250.000.

Maher, Charles A., Jr.; and Larrick, Raymond, to Tridelta Industries, Inc. Electronic control system for a heating apparatus. 5,596,514, Cl. 364-569.000.

Mak, Cecilia Y.: *See—*
Henry, Charles H.; Laskowski, Edward J.; Li, Yuan P.; Mak, Cecilia Y.; and Yaffe, Henry H., 5,596,661, Cl. 385-24.000.

Maki, Hideo: *See—*
Nakamura, Kiyomi; Inagaki, Masahisa; Tanikoshi, Syouko; Maki, Hideo; and Hashimoto, Tsuneyuki, 5,596,615, Cl. 376-438.000.

Maki, Takao: *See—*
Miyamoto, Kenichi; Tukamoto, Hisashi; Kojima, Teruzo; Maki, Takao; and Kogure, Masanori, 5,595,835, Cl. 429-56.000.

Maki, Voldi E., Jr.; and Sharma, Mukul M. Acoustic well cleaner. 5,595,243, Cl. 166-177.200.

Makin, Colin. Apparatus for heating concrete. 5,595,171, Cl. 126-271.100.

Malcher, Eric; and Zechner, Kurt, to Sandoz Ltd. Inhaler for administration of powdery substances. 5,595,175, Cl. 128-203.150.

Malick, Shahzad H.: *See—*
Belec, Eric A.; Janatka, Eric J.; Malick, Shahzad H.; and Pritting, Rebecca J., 5,595,334, Cl. 226-15.000.

Maliczyszyn, Walter: *See—*
Tsai, John J.; and Maliczyszyn, Walter, 5,595,631, Cl. 162-175.000.

Malkin, Rodney; and Burgess, Gary. Tool having jaws for gripping hexagonally shaped objects. 5,595,098, Cl. 81-165.000.

Malone, Joseph L.: *See—*
MacGregor, Cline J.; Malone, Joseph L.; and York, Monte H., 5,595,701, Cl. 264-255.000.

Malone, Philip G.: *See—*
Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., 5,595,561, Cl. 588-255.000.

Maloney, Michael V.: *See—*
Heck, Thomas E.; and Maloney, Michael V., 5,595,423, Cl. 301-37.430.

Man Roland Druckmaschinen AG: *See—*
Rau, Gunnar; and Müller, Karl H., 5,595,115, Cl. 101-142.000.
Schickedanz, Karl-Heinz, 5,595,381, Cl. 271-12.000.

Maness, James E. Energy pump. 5,595,067, Cl. 62-401.000.

Mangold, Karlheinz: *See—*
Leiber, Heinz; Burghoff, Heinz G.; Mangold, Karlheinz; Geber, Michael; and Fitz, Hartmut, 5,596,233, Cl. 307-9.100.

Mann, Inderjit S.: *See—*
Johnson, Graham; Smith, Neil; Gees, Graham R.; Mann, Inderjit S.; and Novack, Vance, 5,596,103, Cl. 548-253.000.

Mannesmann Aktiengesellschaft: *See—*
Fischer, Eberhard, 5,595,237, Cl. 164-440.000.
Kröll, Joachim; and Richter, Peter, 5,595,313, Cl. 212-225.000.

Manning, Troy A., to Micron Technology, Inc. Circuit including DRAM and voltage regulator, and method of increasing speed of operation of a DRAM. 5,596,534, Cl. 365-189.090.

Manocha, Ashok. Method and device for filling an endodontically prepared tooth. 5,595,486, Cl. 433-224.000.

Manser, Brian E.; Ojeda, Peter A., IV; Poole, Anton R.; and Guoming, Frank W., to Zenith Data Systems Corporation. Split rotatable keyboard. 5,596,480, Cl. 361-680.000.

Manson, John B., Sr.: *See—*
Meisner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Manz, Andreas, to Ciba-Geigy Corporation. Device and a method for the separation of fluid substances. 5,595,650, Cl. 210-198.200.

Marbot, Roland; Le Bihan, Jean-Claude; Coller, Andrew; and Nezamzadeh-Moosavi, Reza, to Bull S.A. Impedance adaptation process and device for a transmitter and/or receiver, integrated circuit and transmission system. 5,596,285, Cl. 326-30.000.

Marconi, John: *See—*
Fahy, Lawrence J.; Angelini, Peter J.; Diermeier, David A.; and Marconi, John, 5,595,801, Cl. 428-40.100.

Marcotullio, Armando; and Santori, Massimo, to Eniricerche S.p.A. Cement composition and its use for the preparation of lightweight concretes. 5,595,596, Cl. 106-677.000.

Marcus, Michael A.; Gross, Stanley; and Wideman, David C., to Eastman Kodak Company. Associated dual interferometric measurement method for determining a physical property of an object. 5,596,409, Cl. 356-357.000.

Maresh, Joseph D. Roto stepper exercise machine. 5,595,554, Cl. 482-52.000.

Marhelko, George. Snow coloring device. 5,595,343, Cl. 239-154.000.

Marino, Scott A.: *See—*
Dechene, Ronald L.; Smith, Thomas B.; Marino, Scott A.; Tache, Ronald J.; and Roy, Ajoy K., 5,596,275, Cl. 324-307.000.

Mark, Henry Y.; and Heywood, James A., to Engelhard/ICC. Rotatably supported regenerative fluid treatment wheel assemblies. 5,595,238, Cl. 165-9.000.

Markantes, Charles T.; and Phillips, Roger W., to Flex Products, Inc. Viewing device and method for ascertaining simultaneously optical color shift characteristics of an optically variable device. 5,596,402, Cl. 356-71.000.

Markell, Craig G.; Hagen, Donald F.; Hansen, Paul B.; and Baumann, Nicholas R., to Minnesota Mining and Manufacturing Company. Particle-loaded nonwoven fibrous article for separations and purifications. 5,595,649, Cl. 210-198.200.

Markham, Alexander F.: *See—*
Newton, Clive R.; and Markham, Alexander F., 5,595,890, Cl. 435-91.200.

Markham, Thomas R.: *See—*
Boebert, William E.; Hanson, Mark H.; and Markham, Thomas R., 5,596,718, Cl. 395-187.010.

Märkl, Martin: *See—*
Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Waltersdorfer, Anna; Kern, Manfred; Lümmen, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.

Marocco, Norbert. Suspended shutter. 5,595,231, Cl. 160-168.100.

Marsh, Douglas G.; and Vaidea, Robert H., to Lucent Technologies Inc. Reducing the number of trim links needed on multi-channel analog integrated circuits. 5,596,322, Cl. 341-120.000.

Marshall, James D.: *See—*

Harman, Murray R.; and Marshall, James D., 5,596,672, Cl. 385-147.000.

Marshall, Robert D., Jr., to Texas Instruments Incorporated. Four state token passing alignment fault state circuit for microprocessor address misalignment fault generation. 5,596,717, Cl. 395-185.060.

Martella, David J.: *See*—
Puckace, James S.; and Martella, David J., 5,595,963, Cl. 508-421.000.

Martich, Mark R.; Beling, Thomas E.; Ouseanacher, John M.; and McLeod, Stephen C., to Pacific Scientific Company. Compact dimmable fluorescent lamps with central dimming ring. 5,596,247, Cl. 315-56.000.

Martin Archery Inc.: *See*—
Martin, Terry G., 5,595,168, Cl. 124-89.000.

Martin, Christopher M. Electrically operable oiler for motorcycle drive chain. 5,595,262, Cl. 184-15.200.

Martin, Glenn J.; and Teng, Chuan C., to Houston Engineers, Inc. Hydraulic jar with improved detent ring. 5,595,253, Cl. 175-297.000.

Martin, Paul: *See*—
Beadman, Michael A.; and Martin, Paul, 5,595,450, Cl. 400-615.200.

Martin, Philip D.; Woodhouse, Kenneth A.; and Shaw, Simon G., to Accom, Incorporated. Computer graphics. 5,596,692, Cl. 395-143.000.

Martin Sheaker Optical Design, Inc.: *See*—
Handecky, Mark A.; Meadows, Michael R.; Sheaker, Martin; and Weissman, Paul E., 5,596,451, Cl. 359-633.000.

Martin, Stefan: *See*—
Zander, Hans-Joachim; Bozzer, Dieter; and Martin, Stefan, 5,595,499, Cl. 439-352.000.

Martin, Terry G., to Martin Archery Inc. Damping apparatus for an archery bow, handle riser for an archery bow, and method of fabricating a handle riser for an archery bow. 5,595,168, Cl. 124-89.000.

Martinez, Bruno A.: *See*—
Gesnick, Thad J.; Davis, Richard M.; and Martinez, Bruno A., 5,596,609, Cl. 375-350.000.

Martinez, Louis, to Radio Telecom & Technology, Inc. Two-way cable TV conversion system for data transmission over a dedicated frequency band. 5,596,361, Cl. 348-12.000.

Martinez, Marvin W., Jr.; and Bluhm, Mark W., to Cyrix Corporation. Single clock bus transfers during burst and non-burst cycles. 5,596,731, Cl. 395-309.000.

Martinsson, Lars M. R.; and Hemmervall, Jan-Olof, to Cue Dee Produkter AB. Clamping jaw. 5,595,378, Cl. 269-210.000.

Maruska, David W.: *See*—
Klein, Philippe; Maruska, David W.; and Ludlam, Kevin W., 5,596,715, Cl. 395-183.190.

Maruyama, Hidefumi: *See*—
Hamada, Syuji; Miyazaki, Koji; and Maruyama, Hidefumi, 5,596,720, Cl. 395-200.030.

Maruyama, Shinichiro: *See*—
Yamagata, Hiroshi; and Maruyama, Shinichiro, 5,595,814, Cl. 428-216.000.

Maschinenfabrik Mueller-Weingarten AG: *See*—
Harsch, Erich, 5,595,087, Cl. 72-405.160.

Massachusetts Institute of Technology: *See*—
Agarwal, Anant; Babb, Jonathan; and Tessier, Russell, 5,596,742, Cl. 395-500.000.
Wurtman, Judith J.; and Wurtman, Richard J., 5,595,772, Cl. 426-2.000.

Massaro, Michael R., Jr.; Holland, Robert H.; and Speas, William J., to Fuller Company. Comminution device. 5,595,350, Cl. 241-65.000.

Masse, Ichiro; Miyamoto, Takanori; Morita, Takashi; Suzuki, Toshiro; and Amada, Eiichi, to Hitachi, Ltd. Screen communications system grasting screen modifying requests if no other requests received after first period of time and releasing requests after second period of time. 5,596,721, Cl. 395-200.040.

Mauerer, Gernot M.: *See*—
Dulaig, Nikolai A.; and Mauerer, Gernot M., 5,595,414, Cl. 296-26.000.

Mautej, Eugene: *See*—
Comer, Timothy J.; Embley, Tommy J.; Mautej, Eugene; and Wilson, Dorothy S. D., 5,596,501, Cl. 364-464.230.

Masters, Albert D. Golf putting aid. 5,595,546, Cl. 473-280.000.

Mastrocola, Angelo R.; and Sonntag, Jeffrey L., to Lucent Technologies Inc. Ring oscillator using even numbers of differential stages with current mirrors. 5,596,302, Cl. 331-57.000.

Masuda, Satoki: *See*—
Tsuji, Masanori; Kashiyama, Motohisa; and Masuda, Satoki, 5,595,508, Cl. 439-752.000.

Masuda, Seiya: *See*—
Padmanaban, Munirathna; Kinoshita, Yoshiaki; Suchiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, 5,595,855, Cl. 430-270.100.

Masuda, Shozo: *See*—
Azutaki, Yuji; Masuda, Shozo; Kabasawa, Kenichi; and Kadono, Toru, 5,596,558, Cl. 369-53.000.

Masuoka, Fujio: *See*—
Sakai, Koji; Obuchi, Kazunori; and Masuoka, Fujio, 5,596,543, Cl. 365-233.000.

Mateer, Mark W.: *See*—
Lara, Pedro F.; and Mateer, Mark W., 5,596,267, Cl. 324-71.100.

Materialise, Naamloze Vennootschap: *See*—
Swaelens, Bart; Pauwels, Johan; and Vancraen, Wilfried, 5,595,703, Cl. 264-401.000.

Materials Research Corp.: *See*—
Jelinek, Vaclav, 5,595,241, Cl. 165-80.100.

Mathew, Ranjan J.; and Takiar, Hem P., to National Semiconductor Corporation. Leadframe for an integrated circuit package which electrically interconnects multiple integrated circuit die. 5,596,225, Cl. 257-667.000.

Mathias, Milton W.: *See*—
Wilda, Douglas W.; Lane, Charles E., III; and Mathias, Milton W., 5,596,147, Cl. 73-717.000.

Matsubushi, Akira, to Metrol Co., Ltd. Touch sensor. 5,594,995, Cl. 33-558.000.

Matsui, Hiroshi; Yamamoto, Tamotsu; and Ishihara, Yukihiro, to Matsushita Electric Industrial Co., Ltd. Thin switch including domed contact. 5,595,288, Cl. 200-513.000.

Matsumoto, Fuyuhiko: *See*—
Shimoda, Masakazu; Iimura, Haruo; Takahashi, Hiroyuki; and Matsumoto, Fuyuhiko, 5,595,852, Cl. 430-110.000.

Matsumoto, Hidehiko: *See*—
Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Misako; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Tohru, 5,596,256, Cl. 318-600.000.

Matsumoto, Hiroshi: *See*—
Yazaki, Asao; Chata, Masanobu; Matsumoto, Hiroshi; Satake, Junko; Iida, Hiromi; and Tomita, Koji, 5,596,235, Cl. 310-67.00R.

Matsumoto, Mitsuaki: *See*—
Arai, Yutaka; Miura, Kunio; Nishikawa, Toshihisa; and Matsumoto, Mitsuaki, 5,595,720, Cl. 423-447.600.

Matsumoto, Naoto; and Fujimoto, Hiroaki, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor exhaust system. 5,595,516, Cl. 440-89.000.

Matsumoto, Takashi: *See*—
Hatano, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, 5,595,613, Cl. 148-319.000.

Matsumoto, Tatsuya; Shimomiya, Kazuhiro; Tasaka, Masaaki; and Torii, Mikio, to Nippondenso Co., Ltd. Fuel supply system and delivery pipe for use in same. 5,595,160, Cl. 123-456.000.

Matsumoto, Yoshifumi: *See*—
Toyokura, Masaki; Okamoto, Kiyoshi; and Matsumoto, Yoshifumi, 5,596,518, Cl. 364-725.000.

Matsumoto, Yoshisori, to Sony Corporation. Disc skew detecting apparatus using two skew detectors arranged along the reproduced track. 5,596,557, Cl. 369-44.320.

Matsunaga, Tadahiro: *See*—
Kuroda, Kazuyuki; Tanaka, Yasuyori; and Matsunaga, Tadahiro, 5,595,747, Cl. 424-405.000.

Matsuoka, Nobuo: *See*—
Hosana, Toshio; Matsuoka, Nobuo; Hasegawa, Shizuo; Suzuki, Yasumichi; Itagaki, Hiroshi; and Sasahara, Kenji, 5,596,427, Cl. 358-515.000.

Matsushima, Yoshitaka: *See*—
Maeda, Hisao; Matsushima, Yoshitaka; Nakamura, Morifumi; Shiina, Akito; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, 5,595,610, Cl. 148-233.000.

Matsushita Avionics Development Corporation: *See*—
Wakai, Bruce M.; Lesmeister, John E.; and Frost, William A., Jr., 5,596,647, Cl. 381-77.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukushima, Yoshihisa; Inagaki, Masahiro; Azumatani, Yasushi; and Hamanaka, Hiroshi, 5,596,564, Cl. 369-275.300.
Hamada, Hiroyuki; and Sakamoto, Kiyomi, 5,596,695, Cl. 395-333.000.
Ishibashi, Shin; Nagao, Hideyuki; and Miyazaki, Tomiya, 5,596,663, Cl. 385-92.000.
Matsui, Hiroshi; Yamamoto, Tamotsu; and Ishihara, Yukihiro, 5,595,288, Cl. 200-513.000.
Shibata, Hideaki; and Honjo, Masahiro, 5,596,421, Cl. 386-126.000.
Taeo, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.
Toyokura, Masaki; Okamoto, Kiyoshi; and Matsumoto, Yoshifumi, 5,596,518, Cl. 364-725.000.
Tsuru, Yoshikazu; Itamochi, Sinji; Ohishi, Junji; Shimamura, Tetsuro; and Tahara, Hiroshi, 5,596,243, Cl. 310-348.000.
Ueda, Katsuhiko, 5,596,760, Cl. 395-588.000.

Matsushita, Kouji; Nakagami, Yasuhiro; and Yoseikawa, Noboru, to Minolta Co., Ltd. Image forming apparatus having transfer constant current source adjustable in response to the thickness of dielectric layer. 5,596,391, Cl. 399-45.000.

Matsushita, Takaya: *See*—
Inazawa, Koichiro; Okamoto, Shin; Hayashi, Hisataka; and Matsushita, Takaya, 5,595,627, Cl. 156-643.100.

Matsutani Chemical Industry Co., Ltd.: *See*—
Wada, Kimihito; and Tsukada, Koji, 5,595,773, Cl. 426-20.000.

Matsuura, Hiromi: *See*—
Sakegawa, Shunichi; Shiozaki, Shiyuzo; Matsuura, Hiromi; and Murasaka, Masaya, 5,596,537, Cl. 365-201.000.

Matteucci, Mark; Jones, Robert J.; and Munger, John, to Gilead Sciences, Inc. Modified internucleoside linkages having one nitrogen and two carbon atoms. 5,596,086, Cl. 536-22.100.

Matthews, Norman G.: *See*—
Watkins, Grant H.; Matthews, Norman G.; Hazzard, Aldez C.; and Muhlbaier, John P., 5,596,290, Cl. 327-105.000.

Mattson, Ronald J.; and Catt, John D., to Bristol-Myers Squibb Company. Antischemic piperazinyl- and piperidinyl-cyclohexanes. 5,595,993, Cl. 514-255.000.

Mattson, Ronald J.; Keavy, Daniel J.; Parker, Michael F.; and Johnson, Graham, to Bristol-Myers Squibb Company. N-acyl-cycloalkylamine derivatives as melatonergics. 5,596,019, Cl. 514-629.000.

Maubru, Mireille: *See*—
Audousset, Marie-Pascale; and Maubru, Mireille, 5,595,573, Cl. 8-412.000.

Maugendre, Stephane: *See*—
Delehalle, Gerard; Maugendre, Stephane; Caillaud, Thierry; Peigne, Pierre; and Szalata, Francois, 5,596,598, Cl. 373-93.000.

May, Geoffrey B.; Davis, Brian F.; and Nowak, Wladyslaw L., to P. P. Payne Limited. Filmic packaging material and a tear adherent thereto. 5,595,803, Cl. 428-43.000.

May, Lindy L. 240 volt receptacle module for modular electrical system. 5,595,491, Cl. 439-106.000.

May, Lindy L.: *See*—
Glass, Gerald E.; May, Lindy L.; and Norton, Robert C., Jr., 5,595,442, Cl. 366-213.000.

Maydwell, Jude D.; and Maydwell, Kathleen. Lunchbox. 5,595,302, Cl. 206-541.000.

Maydwell, Kathleen: *See*—
Maydwell, Jude D.; and Maydwell, Kathleen, 5,595,302, Cl. 206-541.000.

Mayen, Alfredo D.: *See*—
Boyd, Dennis; Luchonok, Jeffrey J.; and Mayen, Alfredo D., 5,594,964, Cl. 5-502.000.

Mayer, Lawrence D.: *See*—
Bally, Marcel B.; Bonnan, Nancy L.; Cullis, Pieter R.; and Mayer, Lawrence D., 5,595,756, Cl. 424-450.000.

Mayflower Communications Company, Inc.: *See*—
Dimos, George; and Upadhyay, Triveni N., 5,596,600, Cl. 375-206.000.

Maynard, George D.: *See*—
Carr, Albert A.; Kane, John M.; Maynard, George D.; Cheng, Hsien C.; and Dudley, Mark W., 5,596,003, Cl. 514-321.000.

Mazda Motor Corporation: *See*—
Maeda, Hisao; Matsushima, Yoshitake; Nakamura, Morifumi; Shiina, Akito; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, 5,595,610, Cl. 148-233.000.
Nobutoki, Yoshikazu; Hideshima, Masao; Satomura, Shigeyuki; and Sone, Akira, 5,596,588, Cl. 371-32.000.

McBride, John S., Jr.; and O'Connor, Kenneth J., to Costec, Inc. of Spartanburg. Method of preparing surface for receiving a coating and apparatus therefor. 5,595,786, Cl. 427-299.000.

McCallion, James P. Smooth rod-gripping apparatus. 5,594,977, Cl. 24-136.00B.

McCambridge, Lora K.: *See*—
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellinga, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,596,347, Cl. 345-145.000.

McCammon, Kent G.: *See*—
Sargis, Paul D.; Haigh, Ronald E.; and McCammon, Kent G., 5,596,436, Cl. 359-132.000.

McClelland, Paul H.: *See*—
Hindagolla, Saraj L.; Hopkins, Glen A.; Taub, Howard H.; Lam, Si-Ty; McClelland, Paul H.; and Aden, James S., 5,595,785, Cl. 427-271.000.

McCleskey, Ferne K.: *See*—
DelVecchio, Vito G.; Gallia, Gary L.; and McCleskey, Ferne K., 5,595,871, Cl. 435-6.000.

McClure, David C.; and Teel, Thomas A., to SGS-Thomson Microelectronics, Inc. Output driver circuitry with limited output high voltage. 5,596,297, Cl. 327-538.000.

McCormack, Michael D.: *See*—
Wong, Albert C. K.; Jurewicz, Ronnald M.; and McCormack, Michael D., 5,596,512, Cl. 364-550.000.

McCracken, Robert B., to Waxing Corporation of America, Inc. Electrically-powered polisher. 5,595,532, Cl. 451-357.000.

McCrory, Jennifer J.: *See*—
Walus, Richard L.; McCrory, Jennifer J.; Santangelo, John A.; and Meloul, Raphael, 5,595,193, Cl. 128-898.000.

McCue, Thomas E., Jr.; Sherman, Raymond C.; Casey, Shannon D.; Rasmussen, Steve O.; and Okazaki, Sandra Y., to Hewlett-Packard Company. Sheet media handling system for aligned insertion of single sheet medium. 5,595,380, Cl. 271-9.090.

McCullough, John R.: *See*—
Aberg, A. K. Gunnar; McCullough, John R.; and Smith, Emil R., 5,595,997, Cl. 514-290.000.

McDaniel, Max P.; Benham, Elizabeth A.; and Badley, Rickey D., to Phillips Petroleum Company. Chromium catalyst compositions. 5,595,953, Cl. 502-237.000.

McDonald, Brendan: *See*—
Appleyard, Margaret E.; and McDonald, Brendan, 5,595,883, Cl. 435-20.000.

McDonnell Douglas Corporation: *See*—
James, Jesse C., 5,596,324, Cl. 342-5.000.

McDonough, Kevin C.: *See*—
Gutting, Karl M.; McDonough, Kevin C.; and Maggi, Sergio, 5,596,767, Cl. 395-800.000.

McElroy, Patrick, to Wheaton Varec, Inc. Clock recovery system and rotational detection circuit. 5,596,188, Cl. 250-231.160.

McFadden, Jeffrey: *See*—
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.00R.

McGeachy, Donald E.; and Schaeid, Jeffrey R., to Numation, Inc. Fluid actuated gripper. 5,595,413, Cl. 294-88.000.

McGee, David I. Portable safety lighting device and method for increasing visibility of a person or vehicle. 5,595,441, Cl. 362-250.000.

McGraw, Montgomery C.: *See*—
Miller, David A.; Jansen, Kenneth A.; McGraw, Montgomery C.; and Cepulis, Darren J., 5,596,759, Cl. 395-750.000.

McGregor, Gordon L.: *See*—
Hanson, Gregory E.; McGregor, Gordon L.; and Minor, Raymond B., 5,596,450, Cl. 359-599.000.

McGregor, James: *See*—
Light, Nicholas D.; McGregor, James; Harvey, Wilson; and Watt, Paul W., 5,595,621, Cl. 156-80.000.

MCI Communications Corporation: *See*—
Curtis, Terrill J.; Moller, Jens L.; and Galetti, Matthew L., 5,596,632, Cl. 379-189.000.
Pleasure, Donald F., 5,596,568, Cl. 370-249.000.

McIntosh, J. Michael: *See*—
Olivera, Baldomero M.; Cruz, Lourdes J.; Hillyard, David R.; McIntosh, J. Michael; and Santos, Amaurfino D., 5,595,972, Cl. 514-13.000.

McKee, Jeffrey A.: *See*—
Krishnan, Srikanth; and McKee, Jeffrey A., 5,596,207, Cl. 257-48.000.

McKenzie, Andrew: *See*—
Culpepper, Janice; McKenzie, Andrew; Dang, Warren; and Zurawski, Gerard, 5,596,072, Cl. 530-351.000.

McKenzie, Archibald M.; McKenzie, Paul D.; and Suter, Robert. Modular packaging and holder for tool bits. 5,595,294, Cl. 206-349.000.

McKenzie, Paul D.: *See*—
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McKnight, Catherine A.: *See*—
Creatura, John A.; McKnight, Catherine A.; Duggan, Michael J.; Cogswell, Aron J.; Cunningham, Michael F.; and Dombroski, Thomas C., 5,595,851, Cl. 430-108.000.

McLaughlin, Philip T.: *See*—
Berman, Eric B.; and McLaughlin, Philip T., 5,596,372, Cl. 348-537.000.

McLelland, James G.: *See*—
Thronsburg, James L.; McLelland, James G.; Gallenstein, Victor J.; Kelley, Leon E.; and Richie, Douglas H., 5,595,005, Cl. 36-91.000.

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Martich, Mark R.; Beling, Thomas E.; Ouseanacher, John M.; and McLeod, Stephen C., 5,596,247, Cl. 315-56.000.

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Liu, Peter M.; and McMahan, Robert L., 5,596,481, Cl. 361-683.000.

McNair, Henry P.; and Bakopoulos, Christos P., to British Gas plc. Control system. 5,595,342, Cl. 236-51.000.

McNulty, Peter J.; Beauvais, W. Joseph; Roth, David R.; Morna, Wanda K.; and Reed, Robert A., to Clemson University. Passive solid state microdosimeter with electronic readout. 5,596,199, Cl. 250-370.070.

McRae, Cheryl F.: *See*—
Milner, Richard J.; Staples, Judith A.; Lenz, Michael; Lutton, George G.; McRae, Cheryl F.; Watson, John A. L., deceased, 5,595,746, Cl. 424-405.000.

McRoberts, Raymond S.: *See*—
Boad, Milton P.; Clark, Brian E.; and McRoberts, Raymond S., 5,596,709, Cl. 395-182.050.

McVicker, Joseph E., to Caterpillar Inc. Deep hardening boron steel article having improved fracture toughness and wear characteristics. 5,595,614, Cl. 148-334.000.

Mead Corporation, The: *See*—
Bates, Aaron, 5,595,292, Cl. 206-158.000.
Le Brun, Philippe, 5,595,299, Cl. 206-434.000.
Spanner, William S.; Suttles, J. Marshall; and Cooper, Elizabeth T., 5,595,310, Cl. 211-59.200.

Mead, Sharon B.; Brennan, Susan J.; Movsian, Armenia; and Aguilar, Josephine, to Videojet Systems International, Inc. Condensation and water resistant jet ink. 5,596,027, Cl. 523-161.000.

Meadows, Michael R.: *See*—
Handecky, Mark A.; Meadows, Michael R.; Sheaker, Martin; and Weissman, Paul E., 5,596,451, Cl. 359-633.000.

Meadows, Vernon: *See*—
deMauro, David M.; and Meadows, Vernon, 5,596,567, Cl. 320-5.000.

Means, David W.: *See*—
de Ruyter, Anthony J.; and Means, David W., 5,596,590, Cl. 372-14.000.

Medders, Jerry B.: *See*—
Simpson, Vikki S.; Gullet, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bildersback, Douglas W.; and King, Clyde A., 5,595,522, Cl. 451-5.000.

Medical College of Hampton Roads: *See*—
Brode, George L.; Doucet, Gustavo P.; Gabelnick, Henry L.; Krueger, Russell L.; and Salomsky, George A., 5,595,980, Cl. 514-57.000.

Medlin, Eric G. Selectively liftable cargo bed enclosing system. 5,595,418, Cl. 296-100.000.

Meeh, Linda: *See*—

Deutsch, Edward A.; Deutsch, Karen F.; Nosco, Dennis L.; Ralston, William H.; White, David H.; Wilking, Janet B.; Wolfangel, Robert G.; Woulfe, Steven R.; Cacheris, William P.; and Mech, Linda. 5,595,724, Cl. 424-9.500.

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Oishi, Tetsuya; Ozawa, Hiroshi; Kanasawa, Minato; Inomata, Masamitsu; Mega, Izumi; and Yamauchi, Atsuyoshi, 5,596,039, Cl. 524-714.000.

Meggos, Harry: *See*—
Signorino, Charles A.; and Meggos, Harry, 5,595,592, Cl. 106-198.100.

Mehrotra, Sanjay: *See*—
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,596,532, Cl. 365-185.180.

Meidhof, Helmuth: *See*—
Pirrung, Walter; Glabb, Berthold; Holun, Laurenz; Meidhof, Helmuth; and Wolf, Günther, 5,595,770, Cl. 425-188.000.

Meier, Henry: *See*—
Payne, Jewel M.; Kennedy, M. Keith; Randall, John B.; Meier, Henry; Urick, Heidi J.; Fonceneada, Luis; Schaepf, H. Ernest; Schwab, George E.; and Fu, Jenny, 5,596,071, Cl. 530-350.000.

Meier, John R.: *See*—
Foster, Gregg S.; Meier, John R.; and Capps, Stephen P., 5,596,697, Cl. 395-340.000.

Meier, Michael; and Kautz, Heinz-Georg, to Hoechst Aktiengesellschaft. Process for the preparation of N-(2-sulfatoethyl)-piperazine in high purity. 5,596,099, Cl. 544-398.000.

Meier, Rolf G.; Rehder, Michael C.; Bligh, Peter; and Butler, Chris, to Mitel Corporation. Charger/detector for cordless telephones. 5,596,633, Cl. 379-201.000.

Meier-Westhues, Hans-Ulrich: *See*—
Lass, Hans-Josef; Helpaap, Reinhard; Meier-Westhues, Hans-Ulrich; and Schultz, Wolfgang, 5,596,066, Cl. 528-73.000.

Meiji Milk Products Co., Ltd.: *See*—
Tone, Kaoru; Tone, Michiko; Tanaka, Hiroyuki; and Okazaki, Toshikazu, 5,596,493, Cl. 395-210.000.

Meiji Seika Kaisha, Ltd.: *See*—
Okada, Makoto; Takahashi, Masaki; Hosoi, Kaoru; and Nakajima, Shokichi, 5,595,986, Cl. 514-202.000.
Sakanaka, Osamu; Yasuda, Shoubei; Sumi, Shinjiro; Sebata, Katsufumi; Iimura, Katsuharu; and Nishihata, Ken, 5,596,096, Cl. 540-352.000.

Meiman, Yehouda: *See*—
Yokev, Hanoch; Peleg, Shimon; Meiman, Yehouda; and Porat, Boaz, 5,596,330, Cl. 342-387.000.

Meisner, Edward H.; Kristiansen, Keith; Balleae, Michael; Hall, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, to Black & Decker Inc. Utility box incorporating an integral clamping vise. 5,595,228, Cl. 144-285.000.

Melber, Albrecht; Wanstrky, Erwin; and Uschkoreit, Dieter, to Ald Vacuum Technologies GmbH. Method and apparatus for thermal treatment of materials containing vaporizable substances. 5,595,483, Cl. 432-205.000.

Mellitz, Richard L; and Dowd, Michael V., to Digital Equipment Corporation. Continuous motion electrical circuit interconnect test method and apparatus. 5,596,283, Cl. 324-754.000.

Meloul, Raphael: *See*—
Wahn, Richard L.; McCrory, Jennifer J.; Santangelo, John A.; and Meloul, Raphael, 5,595,193, Cl. 128-898.000.

Melville, Charles D.: *See*—
Furness, Thomas A., III; Melville, Charles D.; and Tidwell, Michael R., 5,596,339, Cl. 345-8.000.

Memmel, Klaus, to Fichtel & Sachs AG. Clutch disc with torsional vibration damper. 5,595,276, Cl. 192-213.120.

Mena, Ismael; Diggles, Linda; Diggles, Douglas M., Sr.; Diggles, Robert E.; and Khalkhali, Iraj, to Harbor-UCLA Research and Education Institute, Inc. Scintigraphy guided stereotaxic localizations apparatus for breast carcinomas. 5,595,177, Cl. 128-653.100.

Menegheni, Michael J., to Boeing Company, The. Landing gear axle steering. 5,595,359, Cl. 244-50.000.

Menke, Klaus; Böhnlein-Mauss, Jutta; Schmid, Helmut; Bucerius, Klaus M.; and Engel, Walther, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Solid propellant based on phase-stabilized ammonium nitrate. 5,596,168, Cl. 149-19.400.

Mennel, David B.: *See*—
Wilson, Joseph H.; Haeberle, David C.; Kralovic, Raymond C.; Lemaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; and Antlogo, Kathleen M., 5,595,711, Cl. 422-119.000.

Monsen Company, The: *See*—
Barr, Morton L.; Vinciunti, Paul J.; and Vanderhoof, Elaine L., 5,595,729, Cl. 424-68.000.

Menta, Ernesto: *See*—
Krapcho, A. Paul; Menta, Ernesto; Oliva, Ambrogio; and Spinelli, Silvano, 5,596,097, Cl. 544-125.000.

Mensel, Stanley W. O., to Rib Loc Australia Pty Ltd. Helically wound reinforced ribbed composite structure. 5,595,800, Cl. 428-363.000.

Mercedes-Benz AG: *See*—
Boll, Wolf, 5,596,262, Cl. 320-48.000.
Brinkmeyer, Horst; Hesse, Bernd; Daise, Michael; and Schwegler, Günter, 5,596,317, Cl. 340-825.310.
Leiber, Heinz; Burghoff, Heinz G.; Mangold, Karlheinz; Geber, Michael; and Fitz, Hartmut, 5,596,233, Cl. 307-9.100.
Letsche, Ulrich; Rehberger, Andreas; and Iberle, Frank, 5,595,148, Cl. 123-90.120.

Merck & Co., Inc.: *See*—
Baldwin, John J.; Claremon, David A.; Elliott, Jason M.; Liverton, Nigel; Remy, David C.; and Selnick, Harold G., 5,595,990, Cl. 514-221.000.
Douglas, Alan W.; DiMichele, Lisa; King, Steven A.; and Verhoeven, Thomas R., 5,596,113, Cl. 556-14.000.
Graham, Donald W.; Carlin, Josephine R.; Chiu, Shaut-Hing L.; and Tolman, Richard L., 5,595,996, Cl. 514-284.000.
Shoop, Wesley; Ostlind, Dan A.; and Michael, Bruce F., 5,595,991, Cl. 514-233.200.

Merceada, Joseph T., to Hazeltine Corporation. Slot array antennas. 5,596,337, Cl. 343-770.000.

Meridian Semiconductor, inc.: *See*—
Kane, James A.; Chang, Hsiao-Shih; and Whitted, Graham B., III, 5,596,739, Cl. 395-479.000.

Merrell Pharmaceuticals Inc.: *See*—
Carr, Albert A.; Kane, John M.; Maynard, George D.; Cheng, Hsien C.; and Dudley, Mark W., 5,596,003, Cl. 514-321.000.
Snyder, Ronald D., 5,595,979, Cl. 514-49.000.

Merrell, R. Scott: *See*—
Strong, A. Brent; Merrell, R. Scott; and Lunt, Barry M., 5,596,268, Cl. 324-71.100.

Messinger, Keith A.: *See*—
Castner, Glenn C.; Messinger, Keith A.; and Rowe, Donald E., 5,595,769, Cl. 425-183.000.

Meusdagh, Marcel: *See*—
Van den Zegel, Marc; and Meusdagh, Marcel, 5,595,864, Cl. 430-569.000.

Metagal Infodtris E Comercio Ltda.: *See*—
Do Espirito Santo, Antonio F., 5,595,285, Cl. 200-330.000.

Metallglanz Gesellschaft fuer Entgratung und Oberflaechentechnik mbH: *See*—
von Hoffmann, Timm, 5,595,640, Cl. 205-205.000.

Metcalfe, James C.: *See*—
Grainger, David J.; and Metcalfe, James C., 5,595,722, Cl. 424-9.200.

Methodist Hospital of Indiana, Inc.: *See*—
Critser, John K.; and Gao, Dayong, 5,595,866, Cl. 435-2.000.

Metrol Co., Ltd.: *See*—
Matsubashi, Akira, 5,594,995, Cl. 33-558.000.

Métrope, Jacques, to Heidelberger Druckmaschinen AG. Device for feeding printing forms to and changing them on a printing form cylinder. 5,595,120, Cl. 101-477.000.

Mezzenner, Rabah: *See*—
Kaya, Cetin; Holland, Wayland B.; and Mezzenner, Rabah, 5,596,528, Cl. 365-185.240.

Mical, Robert J.: *See*—
Needle, David L.; and Mical, Robert J., 5,596,693, Cl. 395-174.000.

Michael, Bruce F.: *See*—
Shoop, Wesley; Ostlind, Dan A.; and Michael, Bruce F., 5,595,991, Cl. 514-233.200.

Michael, Wolfgang; Stromsner, Kurt; and Hofele, Hans, to L. Schuler GmbH. Press installation comprising longitudinal traverses. 5,595,111, Cl. 100-207.000.

Michaud, Philippe; and Russo, Jean, to S.N.C. Kermel. Polyimide solutions and method of obtaining them. 5,596,073, Cl. 528-353.000.

Michaud, Serge: *See*—
Nattel, William; and Michaud, Serge, 5,595,453, Cl. 403-252.000.

Michida, Shinji: *See*—
Yokoi, Shinji; Michida, Shinji; Mori, Yoshinori; and Nishidera, Tsuyoshi, 5,594,961, Cl. 5-11.000.

Michno, Michael J., Jr.: *See*—
Gardner, Hugh C.; Michno, Michael J., Jr.; and Cotter, Robert J., 5,596,050, Cl. 525-524.000.

Mickael, Medhat W., to Western Atlas International, Inc. Method and apparatus for epithermal neutron porosity measurement corrected for tool standoff and formation lithology. 5,596,191, Cl. 250-269.400.

Micron technology, Inc.: *See*—
Lee, Roger, 5,596,213, Cl. 257-316.000.
Manning, Troy A., 5,596,534, Cl. 365-189.090.

Microsoft Corporation: *See*—
Mitchell, Edward R., 5,596,318, Cl. 340-825.440.
Pleschor, Richard A.; and Lipe, Ralph A., 5,596,755, Cl. 395-734.000.
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,596,347, Cl. 345-145.000.
Thielen, David, 5,596,726, Cl. 395-250.000.

Midoux, Patrick; Erbacher, Patrick; Roche-Degremont, Annie-Claude; and Monsigny, Michel, to I.D.M. Immuno-Designed Molecules. Polylysine conjugates. 5,595,897, Cl. 435-172.300.

Mikagi, Kaoru, to NEC Corporation. Method for fabricating semiconductor device with interconnections buried in trenches. 5,595,937, Cl. 437-192.000.

Miki, Toru; and Aaronson, Stuart A., to United States of America, Health and Human Services. Efficient directional genetic cloning system. 5,595,895, Cl. 435-172.300.

Mikulski, Stanislaw M.; and Ardelt, Wojciech J., to Alfacell Corporation. Compositions comprising ONCONASE (tm) and lovastatin. 5,595,734, Cl. 424-94.600.

Milito, Rodolfo A., to AT&T. Systems and methods for sharing of resources. 5,596,576, Cl. 370-450.000.

Miller, David A.; Jansen, Kenneth A.; McGraw, Montgomery C.; and Cepulis, Darren J., to Compaq Computer Corporation. Method for initializing a multiple processor computer system using a common ROM. 5,596,759, Cl. 395-750.000.

Miller, David B., to Ingersoll-Rand Company. Apparatus for controlled vacuuming of high density abrasive blast media. 5,595,461, Cl. 406-152.000.

Miller, Hubert A.: *See*—
Bonaffini, Andrew M.; Bonaffini, Kathleen F.; Buehler, Michael J.; Miller, Hubert A.; Plunkett, Galen, Jr.; Rudolph, Sidney F.; Sweeney, Michael A.; and Wallis, Donald E., 5,596,331, Cl. 342-455.000.

Miller, Mark J.: *See*—
Daalberg, Mark D.; Miller, Mark J.; and Mulligan, Michael G., 5,596,439, Cl. 359-161.000.

Miller, Peter S., to Alcoa Closure Systems International, Inc. Servo motor-driven plastic cutter system for compression molding. 5,596,251, Cl. 318-366.000.

Miller, Philip; Tobin, Joseph; and Dadiomov, Edward, to Motorola, Inc. Apparatus and method for testing electrical switch matrices. 5,596,269, Cl. 324-73.100.

Miller, Phillip C.: *See*—
Copeland, Keith G.; Grogan, Thomas M.; Hassen, Charles; Humphreys, William R.; Lemme, Charles D.; Miller, Phillip C.; Richards, William L.; and Showalter, Wayne A., 5,595,707, Cl. 422-64.000.

Miller, Rick W.; and Hutchinson, Daniel M., to Thomson Consumer Electronics, Inc. Bus aligned quadrature FM detector. 5,596,298, Cl. 329-337.000.

Miller, Robert A.; and Taylor, Philip M., to Tensar Corporation, The. Modular block retaining wall system and method of constructing same. 5,595,460, Cl. 405-284.000.

Miller, Roland G., to Pitney Bowes Inc. Display arrangement. 5,596,341, Cl. 345-52.000.

Miller, Steven A.: *See*—
Christensen, Roy W.; Miller, Steven A.; and Mourer, David P., 5,595,765, Cl. 425-7.000.

Miller, William R., to Rembrandt Photo Services. Wallet for containing a compact disc, and fabrication method. 5,595,293, Cl. 206-308.100.

Miller, William R., to Rembrandt Photo Services. Protective holders for disks. 5,595,797, Cl. 428-35.200.

Miller, William R., to Rembrandt Photo Services. Protective holders for disks. 5,595,798, Cl. 428-35.200.

Millet, Pascal: *See*—
Fouquet, Jean-Michel; Duval, Benoit; and Millet, Pascal, 5,595,399, Cl. 280-777.000.

Milliken Research Corporation: *See*—
Dischler, Louis, 5,595,809, Cl. 428-113.000.

Millington, Keith R., to Commonwealth of Australia Commonwealth Scientific and Industrial Research Organization, The. Wool and wool-blend fabric treatment. 5,595,572, Cl. 8-103.000.

Mills, George T.; and Gabaldon, Albert T., Jr., to United States of America, Navy. Radar encoder. 5,596,327, Cl. 342-195.000.

Milner, Richard J.; Staples, Judith A.; Lenz, Michael; Lutton, George G.; McRae, Cheryl F.; Watson, John A. L., deceased (by Barbara D. Watson, legal representative), to Commonwealth Scientific and Industrial Research Organization. Insect pest control. 5,595,746, Cl. 424-405.000.

Milnikel, Siegfried, to ITT Richter Chemie-Technik GmbH. Magnet attachment assembly for a magnetic clutch. 5,596,238, Cl. 310-103.000.

Mimms, Larry T.: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,595,739, Cl. 424-189.100.

Minami, Takahide: *See*—
Nambu, Hiromi; Minami, Takahide; Amiya, Takayuki; and Kondo, Akihiro, 5,596,056, Cl. 526-207.000.

Minasi, David H.: *See*—
Castaneda, Julio C.; Minasi, David H.; Chong, Kok H.; and Gamble, Roger D., 5,596,487, Cl. 361-814.000.

Minegishi, Hideki: *See*—
Mito, Yasuhiro; and Minegishi, Hideki, 5,596,135, Cl. 73-23.350.

Minges, Roland: *See*—
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zschiesche, Ruth, 5,596,063, Cl. 528-44.000.

Minnesota Mining and Manufacturing Company: *See*—
Ario, Paula D.; and Aasen, Steven M., 5,595,487, Cl. 433-226.000.
Eckhardt, Stephen K., 5,596,455, Cl. 359-789.000.
Hager, Patrick J.; and Goetz, Richard J., 5,595,821, Cl. 428-402.000.
Korbel, Gerald E., 5,595,804, Cl. 428-57.000.
Li, Yun Z.; Lemberger, Richard R.; Schubert, Paul C.; Joyce, Terrence H.; and Warren, Jack K., 5,596,190, Cl. 250-236.000.
Markell, Craig G.; Hagen, Donald F.; Hansen, Paul E.; and Baumann, Nicholas R., 5,595,649, Cl. 210-198.200.
Oxman, Joel D.; Konings, Mark S.; Tiers, George V. D.; Vogel, Kim M.; and Vogel, Dennis E., 5,596,025, Cl. 523-109.000.
Patnode, Gregg A.; Rutherford, Denise R.; and Schlei, Dietmar, 5,595,815, Cl. 428-219.000.
Stubbs, Roy; Hughes, Michael J.; and Morris-Adams, James F., 5,595,578, Cl. 51-295.000.
Woo, Edward J.; and Reeder, Thomas W., 5,596,398, Cl. 399-346.000.

Minney, Jack L.: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; and Minney, Jack L., 5,596,544, Cl. 365-233.500.

Mino, Takayuki; and Kokuga, Toshiharu, to Sanyo Electric Co., Ltd. Method of charging a secondary battery. 5,596,259, Cl. 320-21.000.

Minolta Camera Kabushiki Kaisha: *See*—
Eguchi, Tatsuya, 5,596,444, Cl. 359-210.000.

Minolta Co., Ltd.: *See*—
Kasamatsu, Toru; Ogino, Shigio; and Goto, Masaki, 5,596,400, Cl. 399-45.000.
Matsushita, Kouji; Nakagami, Yasuhiro; and Yonekawa, Noboru, 5,596,391, Cl. 399-45.000.

Minor, Kimberly: *See*—
Gooding, Robert B., Jr.; and Minor, Kimberly, 5,595,807, Cl. 428-80.000.

Minor, Raymond B.: *See*—
Hannon, Gregory E.; McGregor, Gordon L.; and Minor, Raymond B., 5,596,450, Cl. 359-599.000.

Minteer, John A.: *See*—
Sharma, Sukhdev R.; Wesbey, George E.; Gaalema, Stephen; and Minteer, John A., 5,596,200, Cl. 250-370.140.

Minuhin, Vadim B.: *See*—
Kovner, Vladimir; Minuhin, Vadim B.; and Surendran, Srinivasan, 5,596,459, Cl. 360-51.000.

Miracle, Gregory S.; Sivik, Mark R.; and Kellett, Patti J., to Procter & Gamble Company, The. Detergent compositions comprising multiperacid-forming bleach activators. 5,595,967, Cl. 510-372.000.

Miracle Tackle Co., Inc.: *See*—
Jensen, Roger P., 5,595,015, Cl. 43-42.060.

Miroballi, John F.: *See*—
Nuzzo, Joseph V.; and Miroballi, John F., 5,595,081, Cl. 70-446.000.

Mishima, Shin: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michito; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Wada, Toshiaki; Miyahara, Michito; Sasaki, Toyoshige; Mohri, Shigeki; and Nakano, Osamu, 5,595,947, Cl. 501-87.000.

Mita Industriel Co., Ltd.: *See*—
Arai, Kiyotaka, 5,595,382, Cl. 271-122.000.

Mitani, Tadayuki: *See*—
Yamada, Tetsuo; Yamao, Takeshi; Kondo, Yasukazu; Nakamura, Hideo; and Mitani, Tadayuki, 5,595,718, Cl. 423-344.000.

Mitate, Takehito: *See*—
Yamada, Kazuo; Tanaka, Hideaki; Mitate, Takehito; and Yoshikawa, Masahara, 5,595,838, Cl. 429-209.000.

Mitch, John: *See*—
Cosgrove, Patrick A.; Mitch, John; and Niedzielski, Mark, 5,596,415, Cl. 358-296.000.

Mitchell, Edward R., to Microsoft Corporation. Method for operating a two-way messaging system to extend battery life. 5,596,318, Cl. 340-825.440.

Mitchell, James W., to Monsanto Company. Prolonged release of biologically active polypeptides. 5,595,971, Cl. 514-12.000.

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Meier, Rolf G.; Rehder, Michael C.; Bligh, Peter; and Butler, Chris, 5,596,633, Cl. 379-201.000.

Mito, Yasuhiro; and Minegishi, Hideki, to Shimadzu Corporation. Apparatus for and method of determining purity of a peak of a peak of a chromatogram. 5,596,135, Cl. 73-23.350.

Mitsuba Electric Mfg. Co., Ltd.: *See*—
Onodera, Tsugio; and Takei, Shigeru, 5,596,138, Cl. 73-49.200.

Mitsubish Denki Kabushiki Kaisha: *See*—
Tanigami, Yoriko; Kadowaki, Tomoko; and Takemoto, Akira, 5,596,592, Cl. 372-46.000.

Mitsubishi Chemical Corporation: *See*—
Shigematsu, Yasuyuki; Ohashi, Toyoshi; Hayashi, Mariko; and Suzuki, Shinichi, 5,595,846, Cl. 430-58.000.
Sogame, Shingo; and Kimura, Masatsugu, 5,595,633, Cl. 201-1.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hayakawa, Masaharu, 5,596,348, Cl. 345-146.000.
Honda, Hiroki, 5,596,221, Cl. 257-588.000.
Honda, Ziro, 5,596,497, Cl. 364-424.055.
Ishii, Jun; and Takahashi, Shinya, 5,596,675, Cl. 395-2.200.
Konishi, Yuzuru; Hirasawa, Kyotaro; and Taguchi, Kazunori, 5,596,210, Cl. 257-98.000.
Kuriyama, Hirotada, 5,596,212, Cl. 257-298.000.
Kurokawa, Masaaki, 5,596,653, Cl. 382-128.000.
Mitsuhashi, Takao; Takahashi, Mitsugu; Fukuya, Kazunori; Nishina, Kenichi; and Yamagata, Shinji, 5,596,184, Cl. 218-32.000.
Miyazaki, Junji, 5,595,938, Cl. 437-195.000.
Moribayashi, Satoshi, 5,595,090, Cl. 74-462.000.
Nishida, Satoshi; and Ozuni, Akihiro, 5,596,597, Cl. 372-107.000.
Okamoto, Chikayuki; Nishioka, Tadashi; and Kawazu, Satoru, 5,595,941, Cl. 437-228.000.
Sakai, Hiroaki, 5,596,586, Cl. 371-25.100.
Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Mizuko; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Tohru, 5,596,256, Cl. 318-600.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Miya, Shinya; Kano, Yuichi; Kuwahara, Hisayuki; Kasuya, Takeshige; and Fukaya, Yosio, 5,596,040, Cl. 525-92.00B.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Togai, Kazuhide; and Koga, Kazuo, 5,595,060, Cl. 60-274.000.
Mitsubishi Materials Corporation: *See*—
Kimura, Etsuji; Yamaguchi, Kenichi; Ogino, Fumihiko; and Okabe, Susumu, 5,595,948, Cl. 501-108.000.
Mitsubishi Pencil Corporation of America: *See*—
Hayao, Sakae, 5,595,223, Cl. 141-375.000.
Mitsubishi Pencil Kabushiki Kaisha: *See*—
Hoshiba, Masaaki; and Aoki, Kazutaka, 5,595,589, Cl. 106-19.00B.
Kitazawa, Katsunori, 5,595,700, Cl. 264-211.000.
Mitsuboshi Belting Ltd.: *See*—
Kunazaki, Toshimi, 5,595,533, Cl. 451-541.000.
Mitsubushi, Takao; Takahashi, Mitsugu; Fukuya, Kazunori; Nishina, Kenichi; and Yamagata, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Switch including a moving element, a repelling element and a conductor. 5,596,184, Cl. 218-32.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.
Mitsui, Osamu, to Ando Electric Co., Ltd. IC transportation mechanism provided with a plurality of suction. 5,596,270, Cl. 324-158.100.
Mitsui Petrochemical Industries, Ltd.: *See*—
Itoh, Yuichi; Kobayashi, Kyoko; Uchiyama, Akira; and Takehara, Toru, 5,596,042, Cl. 525-98.000.
Murashige, Norio; Otamoto, Etsuro; and Suzuki, Shizu, 5,596,129, Cl. 562-414.000.
Yamada, Masaya; Toriumi, Michio; Shinozaki, Tetsunori; and Kioka, Mamoru, 5,595,827, Cl. 428-516.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Itoh, Masayoshi; Takeuchi, Ryo; and Iwata, Kenji, 5,596,117, Cl. 556-430.000.
Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Inomata, Masamitsu; Mega, Izumi; and Yamauchi, Atsuyoshi, 5,596,039, Cl. 524-714.000.
Mitter, Friedrich: *See*—
Hafner, Norbert; Mitter, Friedrich; Ledwinka, Hans; Bruckmüller, Elisabeth; and Kurz, Josef, 5,596,076, Cl. 528-483.000.
Mitubayashi, Hideaki: *See*—
Nagamori, Kiyonobu; Yagami, Sigeki; and Mitubayashi, Hideaki, 5,595,425, Cl. 303-22.100.
Miura, Hidefumi: *See*—
Horie, Ken'ichi; Miura, Hidefumi; and Tomioka, Eiichi, 5,596,024, Cl. 522-103.000.
Miura, Kunio: *See*—
Arai, Yutaka; Miura, Kunio; Nishikawa, Toshihisa; and Matsumoto, Mitsuaki, 5,595,720, Cl. 423-447.600.
Miura, Shinsuke; and Odagiri, Tsutomu, to Yamaichi Electronics Co., Ltd. Resonant liquid detecting device. 5,596,139, Cl. 73-54.240.
Miura, Yasushi: *See*—
Takada, Yoshihiro; Suzuki, Akio; Danzuka, Toshimitsu; Moriguchi, Harahiko; Fukushima, Hisashi; Izumizaki, Masami; and Miura, Yasushi, 5,596,353, Cl. 347-19.000.
Miura, Yukio: *See*—
Mizuta, Ken; Shibazaki, Ken; Miura, Yukio; Fujioka, Kazunori; Saito, Toshimichi; and Takagi, Isao, 5,596,253, Cl. 318-469.000.
Miya, Shinya; Kano, Yuichi; Kawahara, Hisayuki; Kasuya, Takeshige; and Fukaya, Yosio, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition containing modified aromatic hydrocarbon-formaldehyde resin, rubber polymer and polyamide resin. 5,596,040, Cl. 525-92.00B.
Miyahara, Kazuhiro, to NGK Insulators, Ltd. Temperature control method for heating kiln. 5,595,481, Cl. 432-24.000.
Miyahara, Michito: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michito; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Wada, Toshiaki; Miyahara, Michito; Sasaki, Toyoshige; Mohri, Shigeki; and Nakano, Osamu, 5,595,947, Cl. 501-87.000.
Miyakawa, Nobuaki: *See*—
Toyoda, Shinjiro; Ikeda, Hitoshi; Hashimoto, Eiri; and Miyakawa, Nobuaki, 5,596,511, Cl. 364-527.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,596,383, Cl. 396-315.000.
Miyamoto, Kenichi; Tukamoto, Hisashi; Kojima, Tetuzo; Maki, Takao; and Kogure, Masanori, to Japan Storage Battery Co., Ltd. Sealed type battery. 5,595,835, Cl. 429-56.000.
Miyamoto, Takanori: *See*—
Masse, Ichiro; Miyamoto, Takanori; Morita, Takashi; Suzuki, Toshiro; and Amada, Eiichi, 5,596,721, Cl. 395-200.040.
Miyano, Hitoshi; and Morizumi, Masaaki, to Fuji Photo Optical Co., Ltd. Illumination system for endoscopes. 5,596,666, Cl. 385-118.000.
Miyashiro, Mutsumi: *See*—
Watanabe, Tsukasa; Miyashiro, Mutsumi; Suzuki, Shuetsu; Goto, Takeshi; and Fujita, Kozo, 5,595,089, Cl. 74-89.150.
Miyashiro, Toshiaki: *See*—
Kobayashi, Tatsuya; Sasame, Hiroshi; Kobayashi, Tetsuya; and Miyashiro, Toshiaki, 5,596,393, Cl. 399-174.000.
Miyashita, Kinya: *See*—
Hayashi, Tomoyuki; Tatsumi, Yoshiaki; and Miyashita, Kinya, 5,595,704, Cl. 264-404.000.
Miyata, Hiroshi; and Ishida, Katsumi, to Toyota Jidosha Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Step motor controller. 5,596,257, Cl. 318-685.000.
Miyata, Katsumi: *See*—
Osato, Yoichi; and Miyata, Katsumi, 5,596,555, Cl. 369-13.000.
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kohchi, Tetsunobu, to Canon Kabushiki Kaisha. Method of manufacturing a semiconductor memory device for use with image pickup. 5,595,920, Cl. 437-40.000.
Miyazaki, Junji, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor device. 5,595,938, Cl. 437-195.000.
Miyazaki, Koji: *See*—
Hamada, Syuji; Miyazaki, Koji; and Maruyama, Hidefumi, 5,596,720, Cl. 395-200.030.
Miyazaki, Takemi: *See*—
Murakami, Koichiro; Miyazaki, Takemi; Nakanishi, Kazuhiro; and Kaedeoka, Noriyuki, 5,596,381, Cl. 396-207.000.
Miyazaki, Tomiya: *See*—
Ishibashi, Shin; Nagao, Hideyuki; and Miyazaki, Tomiya, 5,596,663, Cl. 385-92.000.
Miyazawa, Osamu, to Seiko Epson Corporation. Method of and apparatus for guiding microrobot. 5,596,255, Cl. 318-568.120.
Mizesar, Jeffery C.: *See*—
Zavis, Wayne M.; Mizesar, Jeffery C.; Honochick, James J.; Bellin, Michael A.; and Laplace, Carl J., 5,596,263, Cl. 323-255.000.
Mizoguchi, Masamichi: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.
Mizukami, Fujio: *See*—
Maeda, Kazuyuki; Kiyozumi, Yoshimichi; and Mizukami, Fujio, 5,595,952, Cl. 502-162.000.
Mizuno, Toshio: *See*—
Obashi, Massyoshi; Takeuchi, Yoshio; Suzuki, Toshinori; Yamaguchi, Akira; Sakai, Seiichiro; and Mizuno, Toshio, 5,596,641, Cl. 380-23.000.
Mizuta, Ken; Shibazaki, Ken; Miura, Yukio; Fujioka, Kazunori; Saito, Toshimichi; and Takagi, Isao, to Alps Electric Co., Ltd. Vehicle-mounted motor drive apparatus. 5,596,253, Cl. 318-469.000.
Mlakar, Paul F., to Jaycor. Strengthened hardened aircraft unit load device. 5,595,431, Cl. 312-409.000.
Mobil Oil Corporation: *See*—
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 5,595,961, Cl. 508-186.000.
Roth, Wieslaw J., 5,595,715, Cl. 423-328.100.
Yau, Thoung Y., 5,595,648, Cl. 208-308.000.
Mochizuki, Amane; Ishii, Michie; Maeda, Masako; and Higashi, Kazumi, to Nitto Denko Corporation. Heat-resistant photoresist composition and negative-type pattern formation method. 5,595,856, Cl. 430-270.100.
Moeas, Luc; Maetens, Daniel; Loutz, Jean-Marie; and Baudour, Michel, to U C B S.A. Carboxyl-terminated polyesters for the preparation of powder coating compositions. 5,596,037, Cl. 524-539.000.
Moffett, Robert H., to Du Pont de Nemours, E. I., and Company. Process for the manufacture of paper. 5,595,630, Cl. 162-164.100.
Mofidi, Mehrdad: *See*—
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,596,532, Cl. 365-185.180.
Mohri, Shigeki: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michito; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Wada, Toshiaki; Miyahara, Michito; Sasaki, Toyoshige; Mohri, Shigeki; and Nakano, Osamu, 5,595,947, Cl. 501-87.000.
Moisdon, Roger G. F. Method and apparatus for maintaining the position of body parts. 5,595,563, Cl. 600-12.000.
Mokler, Bernhard, to LTG Luftechnische GmbH. Article treatment apparatus. 5,595,282, Cl. 198-689.100.
Molex Incorporated: *See*—
Fry, Rupert J.; Guzik, Adam P.; and Luthy, John S., 5,595,509, Cl. 439-752.000.
Moller, Jens L.: *See*—
Curtis, Terrill J.; Moller, Jens L.; and Galetti, Matthew L., 5,596,632, Cl. 379-189.000.
Mombo-Caristan, Jean C., to Twentyfirst Century Corporation, The. Method of high speed high power welding. 5,595,670, Cl. 219-121.640.
Momma, Genzo: *See*—
Miyawaki, Mamoru; Ishizaki, Akira; Momma, Genzo; Yuzurihara, Hiroshi; and Kohchi, Tetsunobu, 5,595,920, Cl. 437-40.000.
Momper, Bernhard: *See*—
Désor, Ulrich; Krieger, Stephan; Kuropka, Rolf; and Momper, Bernhard, 5,596,035, Cl. 524-460.000.
Mona Industries, Inc.: *See*—
Berger, Abe; and Post, Dennis L., 5,596,061, Cl. 528-26.000.
Monarchie, Dominick L.: *See*—
Budzilek, Russell A.; Monarchie, Dominick L.; Podoba, Myroslaw; and Swatson, Richard R., 5,596,246, Cl. 313-502.000.

Mongelli, Nicola; Biasoli, Giovanni; Grandi, Maria; Cionni, Marina; and Geroni, Maria C., to Farmitalia Carlo Erba S.r.L. Therapeutically active naphthalenesulfonic pyrrolecarboxamido derivatives. 5,596,105, Cl. 548-518.000.
Monier Roof Tile, Inc.: *See*—
Nicholas, Thomas G.; and Fechner, Scott W., 5,595,698, Cl. 264-145.000.
Monsanto Company: *See*—
Adams, Mark A.; Brill, Robert V.; and Vass, James R., 5,595,688, Cl. 252-385.000.
Chalupa, William F.; and Sanderson, George R., 5,595,777, Cl. 426-305.000.
Hopfe, Harold H.; and Karagiannis, Aristoteles, 5,595,818, Cl. 428-327.000.
Kasser, Thomas R.; and Day, Jeffrey W., 5,595,752, Cl. 424-423.000.
Mitchell, James W., 5,595,971, Cl. 514-12.000.
Sanderson, George R.; Ortega, Dave; and Sifferman, Tom, 5,596,084, Cl. 536-3.000.
Monsigny, Michel: *See*—
Midoux, Patrick; Erbacher, Patrick; Roche-Degremont, Annie-Claude; and Monsigny, Michel, 5,595,897, Cl. 435-172.300.
Montell Technology Company bv: *See*—
Resconi, Luigi; and Albizzati, Enrico, 5,596,052, Cl. 526-127.000.
Montgomery, Thomas C.: *See*—
Rowe, Linwood M., Jr.; Montgomery, Thomas C.; Geil, Frederick G.; and Pye, Brad M., 5,596,550, Cl. 367-103.000.
Montreuil, Leo, to Scientific-Atlanta, Inc. Synchronous detector and methods for synchronous detection. 5,596,606, Cl. 375-327.000.
Montrose, David C.: *See*—
Boulos, Marvet S.; Montrose, David C.; and Petschel, Michael, 5,595,611, Cl. 148-259.000.
Moon, Daniel R. Exerciser. 5,595,558, Cl. 482-72.000.
Moore, Clifton H. Fishing rod tie. 5,595,014, Cl. 43-25.000.
Moore, Donald J.: *See*—
ter Horst, Gerhardus B. R.; and Moore, Donald J., 5,595,407, Cl. 292-5.000.
Moran, Wanda K.: *See*—
McNulty, Peter J.; Beauvais, W. Joseph; Roth, David R.; Moran, Wanda K.; and Reed, Robert A., 5,596,199, Cl. 250-370.070.
Moravec, Hans P.; Beninghaus, James R.; Blackwell, Michael K.; Dowling, Kevin J.; and Hollowell, J. Rhoads, II, to Apple Computer, Inc. Apparatus and method for determining a charge of a battery. 5,596,260, Cl. 320-30.000.
Morelos, Arsenia: *See*—
Mead, Sharon B.; Brennan, Susan J.; Morelos, Arsenia; and Aguilar, Josephine, 5,596,027, Cl. 523-161.000.
Morgan Construction Company: *See*—
Shore, Terence M., 5,595,083, Cl. 72-249.000.
Morgan, Michael W. Method and apparatus for recognizing handwritten inputs in a computerized teaching system. 5,596,698, Cl. 395-339.000.
Mori, Akira; Uchino, Ikuo; Hirosawa, Atsuhiko; and Yamazaki, Kunihiro, to Kabushiki Kaisha Komatsu Seisakusho. Metal particle detecting sensor, metal particle detecting method and metal particle detecting apparatus. 5,596,266, Cl. 324-71.100.
Mori, Yoshinori: *See*—
Yokoi, Shinji; Michida, Shinji; Mori, Yoshinori; and Nishidera, Tsuyoshi, 5,594,961, Cl. 5-11.000.
Moribayashi, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Planet gear type torque transmission device. 5,595,090, Cl. 74-462.000.
Moriguchi, Harahiko: *See*—
Takada, Yoshihiro; Suzuki, Akio; Danzuka, Toshimitsu; Moriguchi, Harahiko; Fukushima, Hisashi; Izumizaki, Masami; and Miura, Yasushi, 5,596,353, Cl. 347-19.000.
Morinaga, Hidehiko: *See*—
Tamura, Masaaki; Fujii, Ayako; Kobari, Yoshiko; Nagano, Mamoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, 5,596,689, Cl. 395-133.000.
Morita, Takashi: *See*—
Masse, Ichiro; Miyamoto, Takanori; Morita, Takashi; Suzuki, Toshiro; and Amada, Eiichi, 5,596,721, Cl. 395-200.040.
Morito, Mitsuzo: *See*—
Tsuyama, Tsutomu; Sato, Shigeru; Tsunekawa, Kayo; Shimoyashiro, Sadeo; Harada, Toshimasa; Higano, Koichi; Namiki, Toshio; Yamaguchi, Chikashi; and Morito, Mitsuzo, 5,596,712, Cl. 395-183.020.
Moriwaki, Kazuhiko: *See*—
Kobayashi, Mitsugu; Fujioka, Makoto; Tanioka, Atsuyoshi; Moriwaki, Kazuhiko; Shimizu, Makoto; and Uehara, Hisao, 5,596,349, Cl. 345-147.000.
Morizumi, Masaaki: *See*—
Miyano, Hitoshi; and Morizumi, Masaaki, 5,596,666, Cl. 385-118.000.
Morosi, Paolo: *See*—
Ripa, Giorgio; and Morosi, Paolo, 5,595,714, Cl. 423-21.100.
Morris, Robert L.; Neuenschwander, Kent W.; Learn, Keith S.; and Scotese, Anthony C., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Amino bi- and tri-carbocyclic alkane bis-aryl squalene synthase inhibitors. 5,596,020, Cl. 514-646.000.
Morris-Adams, James F.: *See*—
Stubbs, Roy; Hughes, Michael J.; and Morris-Adams, James F., 5,595,578, Cl. 51-295.000.
Morton, Randolph J.; Seber, Brett; English, Curtis; and DeFelice, Mark, to Buck Knives, Inc. Bayonet system including bayonet with integral tang and scabbard with hand protection. 5,594,967, Cl. 7-134.000.
Motorola, Inc.: *See*—
Armbruster, Peter J.; and Bishop, James W., Jr., 5,596,624, Cl. 379-58.000.
Boyce, Michael A.; and Moyer, Orville T., Jr., 5,596,334, Cl. 343-702.000.
Brackett, Eugene J., 5,596,333, Cl. 342-457.000.
Castaneda, Julio C.; Minasi, David H.; Chong, Kok H.; and Gamble, Roger D., 5,596,487, Cl. 361-814.000.
Dydyk, Michael, 5,596,239, Cl. 310-311.000.
Harlan, Kent S., 5,595,602, Cl. 118-715.000.
Miller, Philip; Tobin, Joseph; and Dadiomov, Edward, 5,596,269, Cl. 324-73.100.
Olds, Keith A.; Vatt, Gregory B.; and Kurby, Christopher N., 5,596,315, Cl. 340-825.030.
Perreault, John A.; Joshi, Abhay; Kahatapc, Mete; Lloyd, Lawrence W.; and Schroeder, Stephen, 5,596,577, Cl. 370-449.000.
Rahnema, Moe, 5,596,722, Cl. 395-200.150.
Raskin, Glenn D.; Cole, Setsuko J.; and Hoggatt, Mark C., 5,596,172, Cl. 174-52.400.
Rybicki, Mathew A.; and Carve, Michael D., 5,596,301, Cl. 331-36.00B.
Thomsen, Soeren H.; Sherwood, Charles A., II; and Karczewski, Casimir, 5,596,589, Cl. 371-37.800.
Wang, Shay-Ping T., 5,596,679, Cl. 395-2.450.
deMuro, David M.; and Meadows, Vernon, 5,596,567, Cl. 320-5.000.
Mourer, David P.: *See*—
Christensen, Roy W.; Miller, Steven A.; and Mourer, David P., 5,595,765, Cl. 425-7.000.
Moyer, Orville T., Jr.: *See*—
Boyce, Michael A.; and Moyer, Orville T., Jr., 5,596,334, Cl. 343-702.000.
Mueller, Emmerich: *See*—
Patz, Dietmar; Mueller, Emmerich; and Hentschel, Christian, 5,596,440, Cl. 359-177.000.
Mueller, Richard A.: *See*—
Barta, Thomas B.; and Mueller, Richard A., 5,595,981, Cl. 514-63.000.
Mueller, Robert, to Dr. Ing. h.c.F. Porsche AG. Assembly bearing favorable in crash situations. 5,595,256, Cl. 180-232.000.
Muhlbaier, John P.: *See*—
Watkins, Grant H.; Matthews, Norman G.; Hazzard, Aldez C.; and Muhlbaier, John P., 5,596,290, Cl. 327-105.000.
Mukai, Katsuji: *See*—
Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishiwhachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.
Mukai, Yoshinobu: *See*—
Shimizu, Yasuo; Hiroaka, Shinzi; Mukai, Yoshinobu; and Yamawaki, Shigieru, 5,596,252, Cl. 318-432.000.
Mukka, Prabha V.: *See*—
Kendrick, Teresa; Nag, Bishwajit; Mukka, Prabha V.; and Sharma, Somesh D., 5,595,881, Cl. 435-7.210.
Mukund, K. Gurjar: *See*—
Alla, Venkata R. R.; Mukund, K. Gurjar; and Sista, V. S. Lalitha, 5,596,087, Cl. 536-22.100.
Muller, Fredrick M.: *See*—
Pisack, John T.; Muller, Fredrick M.; Schmaidt, Brad W.; and Hanna, Wayne D., 5,596,652, Cl. 382-115.000.
Müller, Karl H.: *See*—
Rau, Gunnar; and Müller, Karl H., 5,595,115, Cl. 101-142.000.
Müller, Klaus: *See*—
Ackermann, Jens; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.
Muller, Mark W., to Siecor Corporation. Sealed connector. 5,595,504, Cl. 439-521.000.
Müller, Norbert: *See*—
Borck, Gerald-Wolfgang; Eicher, Jochen; Kuhn, Pierre; Müller, Norbert; and Salomé, Antoine, 5,595,297, Cl. 206-387.130.
Müller, Ulrich E.: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubach, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Bouck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
Müller-Gliemann, Matthias: *See*—
Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubach, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Bouck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Stasch, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
Mulligan, Michael G.: *See*—
Dankberg, Mark D.; Miller, Mark J.; and Mulligan, Michael G., 5,596,439, Cl. 359-161.000.
Mullias, Jacqueline; Peterson, Joseph W.; Bartkowiak, John; and Hendrickson, Alan F., to Advanced Micro Devices. Input/output data port with a parallel and serial interface. 5,596,724, Cl. 395-250.000.
Multicraft International: *See*—
Lowery, Vernon, 5,596,271, Cl. 324-174.000.
Munger, John: *See*—

Matteucci, Mark; Jones, Robert J.; and Munger, John, 5,596,086, Cl. 536-22.100.

Munro, Robert G. Desktop security locking station for a laptop computer or similarly sized computer peripheral. 5,595,074, Cl. 70-58.000.

Mura, Albert J.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; Subramanyam, Chakrapani; Latimer, Lee H.; and Lodge, Eric P., 5,596,012, Cl. 514-373.000.

Murabayashi, Satoshi: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Murahashi, Yoshimitsu: *See*—
Hukuda, Koumei; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Murakami, Hajime: *See*—
Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.

Murakami, Koichiro; Miyazaki, Takemi; Nakanishi, Kazuhiro; and Kaedeoka, Noriyuki, to Konica Corporation. Camera for use with photographic film in a cartridge. 5,596,381, Cl. 396-207.000.

Murakami, Seishi: *See*—
Fujiikawa, Yuichiro; Hatano, Tatsuo; and Murakami, Seishi, 5,595,606, Cl. 118-725.000.

Muranaka, Masaya: *See*—
Sakegawa, Shunichi; Shiozaki, Shiyuzo; Matsuura, Hiromi; and Muranaka, Masaya, 5,596,537, Cl. 365-201.000.

Murao, Mikio: *See*—
Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishinohachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.

Murashige, Norio; Okamoto, Etsuro; and Suzuki, Shizu, to Mitsui Petrochemical Industries, Ltd. Process and apparatus for producing aromatic carboxylic acid. 5,596,129, Cl. 562-414.000.

Murata Manufacturing Co., Ltd.: *See*—
Kugou, Daisaku; Kikuchi, Hiroki; Kadowo, Nobuaki; and Nakahara, Kunikazu, 5,596,244, Cl. 310-348.000.

Murayama, Yoshinobu: *See*—
Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, 5,595,684, Cl. 252-299.610.

Murnick, Daniel E., to Rutgers, The State University. Apparatus for localized surface glazing of ceramic articles. 5,595,583, Cl. 65-350.000.

Murofushi, Kanji; Honma, Taira; Nagura, Shigehiro; and Armentrout, Richard W., to Shin-Etsu Chemical Co., Ltd.; and Shin-Etsu Bio, Inc. Process for preparation of purified xanthan gum. 5,595,892, Cl. 435-104.000.

Murphy, Charles F., to Pitney Bowes Inc. Ink priming device for ink jet printer. 5,596,354, Cl. 347-30.000.

Murphy, Edward J.; Lapin, Stephen C.; and Noren, Gerry K., to DSM N.V. Radiation curable coating composition and coated optical fiber. 5,596,669, Cl. 385-128.000.

Murphy, James V.; and Murphy, Michael J., to Advanced Interconnections Corporation. Molded-in lead frames. 5,596,224, Cl. 257-666.000.

Murphy, Michael J.: *See*—
Murphy, James V.; and Murphy, Michael J., 5,596,224, Cl. 257-666.000.

Murray, Fred L.: *See*—
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.008R.

Murthy, Keshava: *See*—
Radutsa, Bruno K.; Karimian, Khashayar; Daljeet, Anand; and Murthy, Keshava, 5,596,093, Cl. 536-55.300.

Musco Corporation: *See*—
Gordin, Myron K.; and Crookham, Joe P., 5,595,440, Cl. 362-247.000.

Mushya, Tatsunori; Kawamura, Masayasu; and Sakegawa, Shunichi, to Texas Instruments Incorporated. Semiconductor storage device. 5,596,535, Cl. 365-200.000.

Musto, Joseph D.: *See*—
Lawlor, Joseph F.; and Musto, Joseph D., 5,595,913, Cl. 436-17.000.

Muszynski, John H.: *See*—
Beck, Martin H.; Caldicott, Robert; and Muszynski, John H., 5,595,799, Cl. 428-35.700.

Mützel, Wolfgang: *See*—
Gries, Heinz; Rosenberg, Douwe; Weiamann, Hasso-Joachim; Speck, Ulrich; Mützel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Rennicke, Franz-Josef, 5,595,725, Cl. 424-9.340.

Mycogen Corporation: *See*—
Payne, Jewel M.; Kennedy, M. Keith; Randall, John B.; Meier, Henry; Uick, Heidi J.; Fonceerrada, Luis; Schneepf, H. Ernest; Schwab, George E.; and Pu, Jenny, 5,596,071, Cl. 530-350.000.

Myers, Gary L., to Fort Lock Corporation. Motorcycle steering lock. 5,595,079, Cl. 70-233.000.

N.M.B. Medical Applications Ltd.: *See*—
Brlich, Nahum, 5,595,185, Cl. 128-754.000.

Nabeshima, Takashige; Kato, Katsuhisa; and Hidaka, Toshiaki, to Sony/Tektronix Corporation. Reduced inductance coaxial resistor. 5,596,309, Cl. 338-61.000.

Nabisco, Inc.: *See*—
Leibfred, Kevin J.; Hast, Diane L.; Ferrer, Angel D.; and Andreski, Henry M., 5,595,774, Cl. 426-93.000.
Zook, Denise E., 5,595,780, Cl. 426-632.000.

NACAM: *See*—
Fouquet, Jean-Michel; Duval, Benoit; and Millet, Pascal, 5,595,399, Cl. 280-777.000.

Naegerl, Hans-Dieter: *See*—
Goebelbecker, Sieghard; Naegerl, Hans-Dieter; Danker, George J.; and Kirk, Donald, 5,596,029, Cl. 523-179.000.

Nag, Bishwajit: *See*—
Kendrick, Teresa; Nag, Bishwajit; Mukku, Prabha V.; and Sharma, Somesh D., 5,595,881, Cl. 435-7.210.

Nagamori, Kiyonobu; Yagami, Sigeki; and Mitubayashi, Hideaki, to Aisin Seiki Kabushiki Kaisha. Brake pressure control unit of vehicle load responsive type. 5,595,425, Cl. 303-22.100.

Nagano, Hideyuki: *See*—
Kuwata, Takeshi; Ruckmongathan, Temkar; Nakagawa, Yutaka; Koh, Hidemasa; Hasebe, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takanori, 5,596,344, Cl. 345-103.000.

Nagano, Mamoru: *See*—
Tamura, Masaaki; Fujii, Ayako; Kobari, Yoshiko; Nagano, Mamoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, 5,596,689, Cl. 395-133.000.

Nagao, Hideyuki: *See*—
Ishibashi, Shin; Nagao, Hideyuki; and Miyazaki, Tomiya, 5,596,663, Cl. 385-92.000.

Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetuya, to Hitachi, Ltd. Centrifugal fluid machine. 5,595,473, Cl. 415-199.100.

Nagata, Hiroyuki: *See*—
Sunohara, Kazuyuki; Hasegawa, Rei; Nagata, Hiroyuki; Yamamoto, Takeshi; Yamamoto, Yasuhiro; and Okamoto, Masumi, 5,596,435, Cl. 349-132.000.

Nagura, Shigehiro: *See*—
Murofushi, Kanji; Honma, Taira; Nagura, Shigehiro; and Armentrout, Richard W., 5,595,892, Cl. 435-104.000.

Naim, Ari B.; Dubin, Stephen; and Schrope, Beth A., to Reshet; and Drexel University. Methods and apparatus for measuring body composition. 5,595,189, Cl. 128-774.000.

Naimer, Neal: *See*—
Goldstein, Jonathan R.; Harats, Yehuda; Sharon, Yuval; and Naimer, Neal, 5,595,949, Cl. 502-20.000.

Nakada, Junji: *See*—
Kashiwaya, Makoto; and Nakada, Junji, 5,595,792, Cl. 427-570.000.

Nakagami, Yasuhiro: *See*—
Matsushita, Kouji; Nakagami, Yasuhiro; and Yonekawa, Noboru, 5,596,391, Cl. 399-45.000.

Nakagawa, Kazuaki: *See*—
Tominatsu, Norihiro; Ohzu, Hideyuki; Akasaka, Yoshihiro; Nakagawa, Kazuaki; and Tateishi, Hiroshi, 5,595,832, Cl. 429-16.000.

Nakagawa, Kazuo; Tsuneda, Makoto; Nukanobu, Atsushi; Nakanishi, Akio; and Furuse, Akira, to Nikkiso Co., Ltd.; and Sumitomo Special Metals Co. Cavity resonator for an electron spin resonator. 5,596,276, Cl. 324-316.000.

Nakagawa, Kiyoshi: *See*—
Sakakibara, Nobuhiro; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,596,441, Cl. 359-192.000.

Nakagawa, Koichi: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Nakagawa, Takao, to S.T. Japan Inc. Mini plane. 5,595,424, Cl. 30-169.000.

Nakagawa, Yutaka: *See*—
Kuwata, Takeshi; Ruckmongathan, Temkar; Nakagawa, Yutaka; Koh, Hidemasa; Hasebe, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takanori, 5,596,344, Cl. 345-103.000.

Nakahara, Kunikazu: *See*—
Kugou, Daisaku; Kikuchi, Hiroki; Kadowo, Nobuaki; and Nakahara, Kunikazu, 5,596,244, Cl. 310-348.000.

Nakai, Tetsuo: *See*—
Fukaya, Tomohiro; and Nakai, Tetsuo, 5,596,156, Cl. 75-238.000.

Nakaizumi, Sanae: *See*—
Yanagi, Masao; Kagao, Satoru; Dohi, Makoto; and Nakaizumi, Sanae, 5,596,028, Cl. 523-176.000.

Nakajima, Junsaku: *See*—
Nakayama, Junichiro; Nakajima, Junsaku; Takahashi, Akira; and Ohta, Kenji, 5,595,805, Cl. 428-64.300.

Nakajima, Masayuki: *See*—
Olson, Kurt G.; Sandala, Michael G.; Zawacky, Steven R.; Kahle, Charles F., II; and Nakajima, Masayuki, 5,595,859, Cl. 430-325.000.

Nakajima, Shotichi: *See*—
Okada, Makoto; Takahashi, Masaki; Hosoi, Kaoru; and Nakajima, Shokichi, 5,595,986, Cl. 514-202.000.

Nakajima, Tatsu: *See*—
Ohtaka, Mutsuo; Tanaka, Hisami; Shibayama, Shinichi; Okubo, Yosuke; and Nakajima, Tatsu, 5,595,848, Cl. 430-69.000.

Nakamura, Hideo: *See*—
Yamada, Tetsuo; Yamao, Takeshi; Kondo, Yasukazu; Nakamura, Hideo; and Mitani, Tadayuki, 5,595,718, Cl. 423-344.000.

Nakamura, Hiroki, to Globe Japan Corporation. Roof shingles. 5,595,036, Cl. 52-554.000.

Nakamura, Kiyomi; Inagaki, Masahisa; Tanikoshi, Syouiro; Maki, Hideo; and Hashimoto, Tsuneyuki, to Hitachi, Ltd. Fuel assembly for nuclear reactor and manufacturing method thereof. 5,596,615, Cl. 376-438.000.

Nakamura, Morifumi: *See*—
Maeda, Hisao; Matsushima, Yoshitake; Nakamura, Morifumi; Shiina, Akio; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, 5,595,610, Cl. 148-233.000.

Nakamura, Sadayuki: *See*—
Hataso, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, 5,595,613, Cl. 148-319.000.

Nakamura, Shingo: *See*—
Hada, Narutoshi; Nakamura, Shingo; and Horiguchi, Takeshi, 5,595,119, Cl. 101-477.000.

Nakamura, Shinichi: *See*—
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; and Nakamura, Shinichi, 5,595,685, Cl. 252-299.610.

Nakamura, Shinya: *See*—
Takegahara, Takashi; Takagi, Shigetoshi; and Nakamura, Shinya, 5,595,463, Cl. 409-132.000.

Nakane, Kenji; Nishida, Yasunori; Akamatsu, Chikashi; Satoh, Tomoari; Tanino, Kazuyuki; and Yamamoto, Taketsugu, to Sumitomo Chemical Company Limited. Lithium secondary battery having a cathode containing gallium. 5,595,842, Cl. 429-223.000.

Nakanishi, Akio: *See*—
Nakagawa, Kazuo; Tsuneda, Makoto; Nukanobu, Atsushi; Nakanishi, Akio; and Furuse, Akira, 5,596,276, Cl. 324-316.000.

Nakanishi Construction Company: *See*—
Nakanishi, Teruo, 5,595,226, Cl. 144-69.000.

Nakanishi, Kazuhiro: *See*—
Murakami, Koichiro; Miyazaki, Takemi; Nakanishi, Kazuhiro; and Kaedeoka, Noriyuki, 5,596,381, Cl. 396-207.000.

Nakanishi, Keiko: *See*—
Katsumata, Ryoichi; Ikeda, Masato; Nakanishi, Keiko; and Sasao, Yuko, 5,595,894, Cl. 435-172.100.

Nakanishi, Teruo, to Nakanishi Construction Company. Drilling/cutting machine for making joints in wooden members. 5,595,226, Cl. 144-69.000.

Nakano, Osamu: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michito; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Wada, Toshiaki; Miyahara, Michito; Sasaki, Toyoshige; Mohri, Shigeki; and Nakano, Osamu, 5,595,947, Cl. 501-87.000.

Nakano, Yoshio: *See*—
Umeda, Fumio; Noda, Takahisa; Shibagaki, Yuji; Iwasaki, Yukio; and Nakano, Yoshio, 5,596,234, Cl. 307-10.200.

Nakase, Makoto: *See*—
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, 5,595,844, Cl. 430-5.000.

Nakashima, Mutsuo: *See*—
Shimizu, Takaaki; Kinsho, Takeshi; Ogihara, Tsutomu; Kaneko, Tatsushi; Nakashima, Mutsuo; and Kurihara, Hideshi, 5,595,686, Cl. 252-299.610.

Nakayama, Junichiro; Nakajima, Junsaku; Takahashi, Akira; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Magneto-optical recording medium. 5,595,805, Cl. 428-64.300.

Nakayama, Mikio, to Fujitsu Limited. Cordless telephone set with a battery and a battery charger and having a power supply line setting unit for establishing a power supply line for power supply from the battery or the battery charger. 5,596,626, Cl. 379-61.000.

Nakayama, Satoshi: *See*—
Yabe, Satoru; Chiba, Norio; and Nakayama, Satoshi, 5,596,273, Cl. 324-248.000.

Nakazawa, Takeshi: *See*—
Yoshida, Susumu; and Nakazawa, Takeshi, 5,595,257, Cl. 180-287.000.

Nalco Chemical Company: *See*—
Begala, Arthur J., 5,595,629, Cl. 162-158.000.

Nambu, Hironsi; Misasni, Takahide; Amiya, Takayuki; and Kondo, Akihiro, to Kao Corporation. Process for producing polymer particles with irregular shape by polymerizing a water-soluble polymerizable monomer. 5,596,056, Cl. 526-207.000.

Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, to Kashima Oil Company. Optically active tetrahydropyran derivative, liquid crystal composition, and liquid crystal device containing the same. 5,595,684, Cl. 252-299.610.

Namikawa, Takeshi: *See*—
Sumiyoshi, Hajime; and Namikawa, Takeshi, 5,596,374, Cl. 348-673.000.

Namiki, Toshio: *See*—
Tsuyama, Tsutomu; Sato, Shigeru; Tsunekawa, Kayo; Shimoyashiro, Sadao; Harada, Toshimasa; Higano, Koichi; Namiki, Toshio; Yamaguchi, Chikaaki; and Morito, Mitsuzo, 5,596,712, Cl. 395-183.020.

Nanz, Kirk L.: *See*—
Georgas, Michael J.; and Nanz, Kirk L., 5,595,258, Cl. 180-287.000.

Narita, Hisao: *See*—
Kiyanagi, Hiroyuki; Ogata, Yuitsu; Tamura, Toshio; Narita, Hisao; Terakado, Takahiko; and Kobayashi, Kenzo, 5,596,605, Cl. 375-326.000.

Naritake, Isao: *See*—
Sugibayashi, Tadahiko; Utsugi, Satoshi; and Naritake, Isao, 5,596,542, Cl. 365-230.060.

National Registry, Inc., The: *See*—
Hebert, Ray, 5,596,454, Cl. 359-726.000.

National Rejectors, Inc.: *See*—
Wenstus, Dieter, 5,595,535, Cl. 453-40.000.

National Science Council: *See*—
Chen, Sheng-Jia, 5,595,040, Cl. 52-729.100.
Liu, Shen-Iuan, 5,596,289, Cl. 327-67.000.

National Semiconductor Corporation: *See*—
Intrater, Gideon; Katzri, Lior; Viner, Omri; Levitan, Raya; and Tzadik, Yehezkel, 5,596,764, Cl. 395-800.000.
Mathew, Ranjan J.; and Takiar, Hem P., 5,596,225, Cl. 257-667.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Tsai, John J.; and Maliczyszyn, Walter, 5,595,631, Cl. 162-175.000.

Nattel, William; and Michaud, Serge, to Thomas & Betts Corporation. Construction member protector plate unit. 5,595,453, Cl. 403-252.000.

Navid, Nasrollah S.: *See*—
Persico, Charles J.; Navid, Nasrollah S.; and Fotowat-Ahmady, Ali, 5,596,299, Cl. 330-260.000.

Navratil, James D.: *See*—
Kochen, Robert L.; and Navratil, James D., 5,595,666, Cl. 210-679.000.

Nayuki, Shinichi: *See*—
Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, 5,595,684, Cl. 252-299.610.

NBC Corporation: *See*—
Asano, Kazunori, 5,596,223, Cl. 257-620.000.
Asazawa, Hiroshi, 5,596,296, Cl. 327-291.000.
Endo, Nobuhiro, 5,596,214, Cl. 257-324.000.
Hashimoto, Masanobu, 5,596,463, Cl. 360-104.000.
Kasabami, Nobue; Itoh, Tadashi; and Takahashi, Yasutomo, 5,596,747, Cl. 395-612.000.
Kawano, Hideo, 5,596,591, Cl. 372-46.000.
Mikagi, Kaoru, 5,595,937, Cl. 437-192.000.
Onda, Kazuhiko; and Kuzuhara, Masaaki, 5,596,211, Cl. 257-194.000.
Sato, Toru; and Saito, Masafumi, 5,596,582, Cl. 370-509.000.
Sekine, Yasuharu, 5,596,730, Cl. 395-309.000.
Sugibayashi, Tadahiko; Utsugi, Satoshi; and Naritake, Isao, 5,596,542, Cl. 365-230.060.
Yanagigawa, Hiroshi, 5,596,216, Cl. 257-355.000.

Needle, David L.; and Mical, Robert J., to 3DO Company, The. Method for controlling a spryte rendering processor. 5,596,693, Cl. 395-174.000.

Negelen, Emanuel, to Riverwood International Limited. Container for articles. 5,595,291, Cl. 206-143.000.

Negishi, Hideo; and Ohinata, Yoshiharu, to Riso Kagaku Corporation. Stencil printing drum having squeegee and doctor roller end ink banks. 5,595,114, Cl. 101-120.000.

Negus, Joel A., to Lisle Corporation, The. Oil filter wrench. 5,595,094, Cl. 81-3.440.

Nelson, James A. Paint roller frame assembly with lock equipped end member. 5,594,971, Cl. 15-230.110.

Nelson, Jeffrey G.: *See*—
Neurgaonkar, Ratnakar R.; Oliver, John R.; and Nelson, Jeffrey G., 5,595,677, Cl. 252-62.900.

Nelson, Linda H.: *See*—
Gallucci, Robert R.; Nelson, Linda H.; and Shannon, Thomas G., 5,596,049, Cl. 525-438.000.

Nelson, Ryan: *See*—
King, Douglas A.; and Nelson, Ryan, 5,595,308, Cl. 211-40.000.

NeoRx Corporation: *See*—
Grainger, David J.; and Metcalfe, James C., 5,595,722, Cl. 424-9.200.

Neri, Armando: *See*—
Di Stefano, Giuseppe; Ghini, Marco; Neri, Armando; and Gamberini, Antonio, 5,596,187, Cl. 250-222.100.

Nerstrom, James S.: *See*—
Anselm, Michael C.; Blanchard, Clarence E.; and Nerstrom, James S., 5,595,235, Cl. 164-235.000.

Nesbitt, Loyd B.: *See*—
Glantz, Douglas M.; and Nesbitt, Loyd B., 5,596,613, Cl. 376-283.000.

Netcom Technologies Corp.: *See*—
Alfred, Henry L., 5,595,795, Cl. 428-34.500.

Neuberger, Wolfgang: *See*—
Blinov, Leonid; and Neuberger, Wolfgang, 5,595,793, Cl. 427-575.000.

Neueaschwander, Kent W.: *See*—
Morris, Robert L.; Neuenschwander, Kent W.; Learn, Keith S.; and Scotese, Anthony C., 5,596,020, Cl. 514-646.000.

Neumann, Harald: *See*—
Hoetzel, Gerhard; Neumann, Harald; and Riegel, Johann, 5,595,647, Cl. 205-784.500.

Neumann, Karl H.: *See*—
Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,595,514, Cl. 439-886.000.

Neurgaonkar, Ratnakar R.; Oliver, John R.; and Nelson, Jeffrey G., to Rockwell International Corporation. Nb-doped PLZT piezoelectric ceramics. 5,595,677, Cl. 252-62.900.

Neutzler, Jay K.: *See*—
Wilson, Mahlon S.; and Neutzler, Jay K., 5,595,834, Cl. 429-30.000.

New England Medical Center Hospitals, Inc.: *See*—
Androphy, Elliot J.; and Barsoum, James G., 5,595,884, Cl. 435-69.100.

New Focus, Inc.: *See*—
Luecke, Francis C., 5,596,456, Cl. 359-831.000.

New Holland North America, Inc.: *See*—
Bulgrien, Garth H.; Sedoni, Enrico; Sedoni, Carlo; and Gonano, Andrea, 5,596,153, Cl. 73-862.326.
Horchler, Fred M., Jr.; and Lausch, H. Nevin, 5,595,055, Cl. 56-341.000.
New York University: *See*—
Corazzi, Gloria M.; and Tsai, Fong-Ying, 5,595,896, Cl. 435-172.300.
Newton, Clive R.; and Markham, Alexander F., to Zeneca Limited. Method of detecting nucleotide sequences. 5,595,890, Cl. 435-91.200.
Newton, Danny R.: *See*—
Simpson, Vikki S.; Gullett, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bilderback, Douglas W.; and King, Clyde A., 5,595,522, Cl. 451-5.000.
NeXstar Pharmaceuticals, Inc.: *See*—
Gold, Larry; and Tuerk, Craig, 5,595,877, Cl. 435-6.000.
Nexus Telecommunication Systems Ltd.: *See*—
Yokev, Hanoch; Peleg, Shimon; Meiman, Yehouda; and Porat, Boaz, 5,596,330, Cl. 342-387.000.
Nezamzadeh-Mooosavi, Reza: *See*—
Marbot, Roland; Le Bihan, Jean-Claude; Coffer, Andrew; and Nezamzadeh-Mooosavi, Reza, 5,596,285, Cl. 326-30.000.
Ng, Harold W.: *See*—
Douglas, Raymond W.; Stinger, Philip J.; Ng, Harold W.; and Lee, Terrance N., 5,596,587, Cl. 371-27.000.
NGK Insulators, Ltd.: *See*—
Ichikawa, Yukihito; Kasai, Yoshiyuki; and Ono, Yoshiro, 5,595,581, Cl. 55-302.000.
Miyahara, Kazuhiro, 5,595,481, Cl. 432-24.000.
Nguyen, Binh T.: *See*—
Bask, Howard M.; and Nguyen, Binh T., 5,596,120, Cl. 556-480.000.
Nguyen, Hung V.: *See*—
Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tran, Andrew C.; and Wu, Anthony, 5,595,791, Cl. 427-554.000.
Nguyen, Lanh N. Hands-off toilet seat lifting apparatus. 5,594,958, Cl. 4-246.500.
Nguyen, Loi D.: *See*—
Delaney, Michael J.; Nguyen, Loi D.; Le, Minh V.; Tizol, Jorge L.; and Loh, James C., 5,595,917, Cl. 437-8.000.
Nguyen, Nhan H.: *See*—
Chin, Hsiao-Ling M.; Nguyen, Nhan H.; Kasse, David B.; and Lee, David L., 5,595,958, Cl. 504-250.000.
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DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Fakhruddin, Saifeddin; Gauthier, Lloyd W.; and Kohtz, Robert A., 5,596,713, Cl. 395-183.110.
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Yazaki, Asao; Chata, Masanobu; Matsumoto, Hiroshi; Satake, Junko; Iida, Hiromi; and Tomita, Koji, 5,596,235, Cl. 310-67.00R.
Nidek Co., Ltd.: *See*—
Yano, Nobuyuki, 5,596,377, Cl. 351-211.000.
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Haselwander, Jack G.; and Niederer, Kurt W., 5,594,968, Cl. 8-149.000.
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Gilliland, Kevin A.; and Niemeyer, Larry A., 5,595,259, Cl. 180-332.000.
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Nihon Kohden Corporation: *See*—
Yamaura, Masahiko, 5,595,176, Cl. 128-633.000.
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Irie, Nobuyuki; Hirukawa, Shigeru; and Tateno, Hiroki, 5,596,204, Cl. 250-548.000.
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Sugasawa, Ryoichi, 5,596,240, Cl. 310-323.000.
Takagi, Tadao, 5,596,387, Cl. 396-50.000.
Nippon Hoso Kyokai: *See*—
Sato, Toru; and Saito, Masafumi, 5,596,582, Cl. 370-509.000.
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Akama, Fumio; and Tanaka, Yasuyuki, 5,595,858, Cl. 430-314.000.
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Arai, Yutaka; Miura, Kunio; Nishikawa, Toshihisa; and Matsumoto, Mitsuaki, 5,595,720, Cl. 423-447.600.
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Furuhashi, Masaaki; Handa, Ryouji; Tomita, Nobuo; and Enomoto, Yoshitaka, 5,596,449, Cl. 359-341.000.
Sakakibara, Nobuhiro; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,596,441, Cl. 359-192.000.
Nippon Tungsten Co., Ltd.: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michiio; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
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Hashimoto, Shinichi, 5,596,143, Cl. 73-431.000.
Matsumoto, Tatsuya; Shimomiya, Kazuhiro; Tanaka, Masaaki; and Torii, Mikio, 5,595,160, Cl. 123-456.000.
Nishikawa, Yoshihiro; Hayashi, Ikuo; and Taguti, Takeyasu, 5,596,141, Cl. 73-146.200.
Ozaki, Seiichirou; Watanabe, Yoshifumi; and Kato, Yukihiro, 5,595,939, Cl. 437-209.000.
Tamura, Shinichi, 5,596,681, Cl. 395-23.000.
Yamaoka, Masami; and Toyoshima, Shoji, 5,596,217, Cl. 257-367.000.
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Gozlan, Eli; Breznitz, Shlomo; Nir, Dan; and Eirlich, Sharon, 5,595,488, Cl. 434-236.000.
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Baroni, Marco; Croci, Tiziano; Landi, Marco; Guzzi, Umberto; and Nisato, Dino, 5,595,994, Cl. 514-275.000.
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Yokoi, Shinji; Michida, Shinji; Mori, Yoshinori; and Nishidera, Tsuyoshi, 5,594,961, Cl. 5-11.000.
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Wada, Noriyuki; and Nishigaki, Takayuki, 5,595,697, Cl. 264-735.000.
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Kokawa, Shozo; Nishihara, Michiharu; and Seto, Yukikazu, 5,596,429, Cl. 349-67.000.
Nishihata, Ken: *See*—
Sakanaka, Osamu; Yasuda, Shoubei; Sumi, Shinjiro; Sebata, Katsufumi; Iinuma, Katsuharu; and Nishihata, Ken, 5,596,096, Cl. 540-352.000.
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Lai, Meichen; Lee, Tony Kuen; Nishimura, Jenny Y. K.; and Shank, Gerda R., 5,596,745, Cl. 395-614.000.
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Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Misako; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Toru, 5,596,256, Cl. 318-600.000.
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Mitsuhashi, Takao; Takahashi, Mitsugu; Fukuya, Kazunori; Nishina, Kenichi; and Yamagata, Shinji, 5,596,184, Cl. 218-32.000.
Nishioka, Tadashi: *See*—
Okamoto, Chikayuki; Nishioka, Tadashi; and Kawazu, Satoru, 5,595,941, Cl. 437-228.000.
Nissan Motor Co., Ltd.: *See*—
Hatano, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, 5,595,613, Cl. 148-319.000.
Kimura, Takashi; and Takenouchi, Shinichi, 5,596,258, Cl. 320-2.000.
Nisshinbo Industries, Inc.: *See*—
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Nitta, Isami: *See*—
Kosuo, Daisuke; Furukawa, Hideo; Nitta, Isami; and Komata, Kimio, 5,596,443, Cl. 359-200.000.
Nittetsu Semiconductor Co., Ltd.: *See*—
Wada, Toshio; and Iwasami, Eiichi, 5,596,474, Cl. 361-111.000.
Nitto Denko Corporation: *See*—
Mochizuki, Atsuse; Ishii, Michie; Maeda, Masako; and Higashi, Kazumi, 5,595,856, Cl. 430-270.100.
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Wolia, Ronald L.; Afonso, Adriano; Kelly, Joseph M.; and Njoroge, F. George, 5,595,998, Cl. 514-293.000.
Nobunoki, Yoshikazu; Hideshima, Masao; Satomura, Shigeyuki; and Sone, Akira, to Mazda Motor Corporation. Multiplex transmission method. 5,596,588, Cl. 371-32.000.
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Belding, Blake Q.; Silkmitter, JoAnn; Stevenson, Kevin B.; and Stovold, Terry W., 5,595,590, Cl. 106-21.00A.
Noda, Junichiro; and Tohyama, Daisuke, to Kabushiki Kaisha Toshiba. Nonvalatile semiconductor memory device. 5,596,529, Cl. 365-185.280.
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Noe, Robert J. L., to UOP. Process vessel head flush apparatus. 5,595,665, Cl. 210-662.000.
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White, Gail K.; Noguchi, Fujio; Akaike, Kazuhiko; and Schaffer, Mark, 5,596,373, Cl. 348-569.000.
Noine, Yasukazu: *See*—
Ueno, Masaji; and Noine, Yasukazu, 5,596,295, Cl. 327-170.000.
NOK Corporation: *See*—
Wada, Noriyuki; and Nishigaki, Takayuki, 5,595,697, Cl. 264-735.000.
Nokia Mobile Phones Ltd.: *See*—
Gould, Adam F.; Robertson, James R.; Noneman, John W.; and Gelm, John R., 5,596,571, Cl. 370-335.000.
Jarvinen, Kari; and Ali-Yrkko, Olli, 5,596,677, Cl. 395-2.290.
Noma Inc.: *See*—
Maddock, William H.; and Parshad, David A., 5,595,439, Cl. 362-238.000.
Nomos Corporation: *See*—
Carol, Mark P., 5,596,619, Cl. 378-65.000.
Noneman, John W.: *See*—
Gould, Adam F.; Robertson, James R.; Noneman, John W.; and Gelm, John R., 5,596,571, Cl. 370-335.000.
Nonlinear Technologies, Inc.: *See*—
Maas, Stephen A., 5,596,325, Cl. 342-28.000.
Nonoyama, Makoto: *See*—
Hayashi, Yutaka; and Nonoyama, Makoto, 5,595,525, Cl. 451-5.000.
Nonvolatile Electronics, Incorporated: *See*—
Daughton, James M., 5,595,830, Cl. 428-611.000.
Nordhammar, Henrik: *See*—
Bystedt, Stig; Torrakog, Orvar; and Nordhammar, Henrik, 5,595,132, Cl. 114-61.000.
Noren, Gerry K.: *See*—
Murphy, Edward J.; Lapin, Stephen C.; and Noren, Gerry K., 5,596,669, Cl. 385-128.000.
Norix Group, Inc.: *See*—
Karl, Richard B.; and Hanig, Harvey, 5,594,983, Cl. 29-469.000.
Normand, Brian M.: *See*—
Wright, J. Nelson; Phegley, Jay S.; Pash, D. Grant, III; Langdon, Donald R.; Finger, David J.; Normand, Brian M.; and Gurucar, Ismayil M., 5,595,179, Cl. 128-660.070.
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North Dakota State University: *See*—
Sibi, Mukund P.; Boudjouk, Philip; and Ji, Jianguo, 5,596,111, Cl. 554-138.000.
Northern Telecom Limited: *See*—
Debortoli, George; Osborne, Brian T.; Lukas, Helmut H.; and Hvenda, Jaroslav M., 5,596,670, Cl. 385-135.000.
Searle, Jeffrey G.; Dean, Stuart J.; Chrystie, Peter J.; Broome, Keith R.; Cox, Christopher R.; and Westlake, Stephen J., 5,596,329, Cl. 342-374.000.
Northrop Corporation: *See*—
Coles, Robert J.; Langieri, Ronald J.; and Vaccaro, Dennis D., 5,596,332, Cl. 342-455.000.
Northrop Grumman Corporation: *See*—
Beck, William C., 5,595,234, Cl. 164-9.000.
Beck, William C., 5,595,548, Cl. 473-324.000.
Budzilek, Russell A.; Monarchie, Dominick L.; Podoba, Myroslaw; and Swanson, Richard R., 5,596,246, Cl. 313-502.000.
Cook, Richard S., 5,595,783, Cl. 427-240.000.
Fitts, Richard A., 5,596,326, Cl. 342-30.000.
Rowe, Linwood M., Jr.; Montgomery, Thomas C.; Geil, Frederick G.; and Pye, Brad M., 5,596,550, Cl. 367-103.000.
Sheriff, Robert W., 5,596,549, Cl. 367-88.000.
Watkins, Grant H.; Matthews, Norman G.; Hazzard, Aldez C.; and Muhlbaier, John P., 5,596,290, Cl. 327-105.000.
Norton, Robert C., Jr.: *See*—
Glass, Gerald E.; May, Lindy L.; and Norton, Robert C., Jr., 5,595,442, Cl. 366-213.000.
Nosco, Dennis L.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Nosco, Dennis L.; Ralston, William H.; White, David H.; Wilking, Janet B.; Wolfangel, Robert G.; Woulfe, Steven R.; Cacheris, William P.; and Mech, Linda, 5,595,724, Cl. 424-9.500.
Nourry, Daniel: *See*—
Jego, Gérard; Nourry, Daniel; and Thierry, Jean-Pierre, 5,595,498, Cl. 439-342.000.
Novack, Vance: *See*—
Johnson, Graham; Smith, Neil; Gees, Graham R.; Mann, Inderjit S.; and Novack, Vance, 5,596,103, Cl. 548-253.000.
Novell, Inc.: *See*—
Perlman, Radia J.; and Castagnoli, Neal D., 5,596,574, Cl. 370-389.000.
Novo Nordisk A/S: *See*—
Andersen, Knud E.; Olsen, Uffe B.; Petersen, Hans; Grunwald, Frederik; Sonnewald, Ursula; Jørgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.
Breinholt, Jens; and Lange, Lene, 5,596,015, Cl. 514-473.000.
Nowak, Deanne M.: *See*—
O'Reilly, Neil J.; Derwin, William S.; Lin, Henry C.; and Nowak, Deanne M., 5,596,104, Cl. 548-480.000.
Nowak, Wladyslaw L.: *See*—
May, Geoffrey B.; Davis, Brian P.; and Nowak, Wladyslaw L., 5,595,803, Cl. 428-43.000.
Nozaki, Shohei: *See*—
Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, 5,595,836, Cl. 429-166.000.
Nozaki, Yuko: *See*—
Padmanaban, Munirathna; Kinoshita, Yoshiaki; Suchiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, 5,595,855, Cl. 430-270.100.
NPC, Inc.: *See*—
Gundy, William P., 5,595,524, Cl. 451-5.000.
NTT Mobile Communications Network Inc.: *See*—
Higashi, Akihiro; Ohno, Koji; and Umeda, Narumi, 5,596,516, Cl. 364-717.000.
Nuclear Containers, Inc., A Tennessee Corporation: *See*—
Householder, William R.; Arnold, William M.; and Brewer, Charles S., 5,595,319, Cl. 220-429.000.
Nukanobu, Atsushi: *See*—
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Numatica, Inc.: *See*—
McGeachy, Donald E.; and Schneid, Jeffrey R., 5,595,413, Cl. 294-88.000.
Nuzzo, Joseph V.; and Miroballi, John F., to Penta Products, Inc. Lockable container, such as toy safe. 5,595,081, Cl. 70-446.000.
Nye, Steven: *See*—
Boulton, Teri G.; Cobb, Melanie H.; Yanconpoulos, George D.; Nye, Steven; and Panayotatos, Nikos, 5,595,904, Cl. 435-240.200.
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Oberlander, Jack: *See*—
Steinberger, Dan P.; and Oberlander, Jack, 5,595,249, Cl. 172-156.000.
Obijeski, Todd J.: *See*—
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Obinata, Toru: *See*—
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Object Technology Licensing Corp.: *See*—
Tindell, James M.; and Denman, Matthew L., 5,596,696, Cl. 395-806.000.
Obligar, Rizal A. Snap-on battery cable connector. 5,595,510, Cl. 439-761.000.

Obori, Kenichi; Bando, Atsushi; and Yurugi, Toshikazu, to Horiba, Ltd. Method and apparatus for measuring the distribution of elements contained in sample. 5,596,195, Cl. 250-310.000.

O'Brien, Gary R.: *See*—
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O'Brien, Rita M., to Advanced Micro Devices, Inc. Sub-bus activity detection technique for power management within a computer system. 5,596,756, Cl. 395-750.000.

O'Brien, Timothy M., to Track Trainer, Inc. Golf swing training track apparatus. 5,595,545, Cl. 473-259.000.

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Knutson, Hans, 5,595,405, Cl. 285-96.000.

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Ochi, Sean. S., to IXYS Corporation. Intelligent, isolated half-bridge power module. 5,596,466, Cl. 361-18.000.

Ochiai, Masashi, to Kabushiki Kaisha Toshiba. Horizontal output circuit. 5,596,249, Cl. 315-371.000.

O'Connell, Steven S., to Invision Interactive, Inc. Software sound synthesis system. 5,596,159, Cl. 84-622.000.

O'Connor, Kenneth J.: *See*—
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Odagiri, Tsutomu: *See*—
Miura, Shinsuke; and Odagiri, Tsutomu, 5,596,139, Cl. 73-54.240.

O'Dell, Thomas: *See*—
Treves, David; Fu, Hong; and O'Dell, Thomas, 5,595,768, Cl. 425-174.400.

OBC Medical Systems, Inc.: *See*—
Anderton, Richard L.; and Curtis, Steven E., 5,596,228, Cl. 257-714.000.

Oelbrandt, Leo: *See*—
Leenders, Luc; Uyterhoeven, Herman; Torfs, Rita; Oelbrandt, Leo; Uyttendaele, Carlo; and Van den Bogaert, Jan, 5,595,854, Cl. 430-200.000.

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Hoajo, Toshio; Sato, Yuji; Kayamoto, Kazuo; Ogata, Masahiro; and Kobayashi, Hiromichi, 5,595,850, Cl. 430-106.600.

Ogata, Yuitsu: *See*—
Kiyanagi, Hiroyuki; Ogata, Yuitsu; Tamura, Toshio; Narita, Hisao; Terakado, Takahiko; and Kobayashi, Kenzo, 5,596,605, Cl. 375-326.000.

Ogawa, Hiroki: *See*—
Fujimura, Shuzo; Ogawa, Hiroki; Ishikawa, Kenji; and Inomata, Carlos R., 5,595,916, Cl. 437-8.000.

Ogawa, Kazuaki: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

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Ogino, Fumihiko: *See*—
Kimura, Etsuji; Yamaguchi, Koichi; Ogino, Fumihiko; and Okabe, Susumu, 5,595,948, Cl. 501-108.000.

Ogino, Kouji: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

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Tatsushima, Tsuneo; and Ogino, Shigeru, 5,596,366, Cl. 348-208.000.

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Kazamatsu, Toru; Ogino, Shigio; and Goto, Masaaki, 5,596,400, Cl. 399-45.000.

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O'Grady, Paul J. Apparatus for clamping stacked items for cutting. 5,595,102, Cl. 83-435.170.

Ogura, Toshihiko; Yokoyoshi, Akihiro; and Harada, Chikao, to Colin Corporation. Method and apparatus for winding cuff in blood pressure measurement. 5,595,180, Cl. 128-686.000.

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O'Hanlon, Thomas A., to Plowdril Corporation. Fixed-cutter drill bit assembly and method. 5,595,252, Cl. 175-57.000.

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Ohashi, Toyoshi: *See*—
Shigematsu, Yasuyuki; Ohashi, Toyoshi; Hayashi, Mariko; and Suzuki, Shinichi, 5,595,846, Cl. 430-58.000.

Ohba, Hideshi: *See*—
Tao, Takashi; Ishimaru, Yasuo; Hattori, Morishige; Ohmura, Keiji; and Ohba, Hideshi, 5,595,123, Cl. 105-396.000.

Ohinata, Yoshiharu: *See*—
Negishi, Hideo; and Ohinata, Yoshiharu, 5,595,114, Cl. 101-120.000.

Ohishi, Junji: *See*—
Tsuru, Yoshikazu; Itamochi, Sinji; Ohishi, Junji; Shimamura, Tetsuro; and Tahara, Hiroshi, 5,596,243, Cl. 310-348.000.

Ohkawara, Tamaki, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Dampening apparatus of lithographic printing machine. 5,595,116, Cl. 101-147.000.

Ohkubo, Masaharu; and Honda, Mitsuru, to Canon Kabushiki Kaisha. Process cartridge with an information feature and image forming apparatus for use with the same. 5,596,388, Cl. 399-111.000.

Ohlig, Hilmar: *See*—
Schlarb, Alois; Hofmann, Jürgen; Ohlig, Hilmar; Intemann, Peter; and Parwerck, Karl-Peter, 5,595,696, Cl. 264-118.000.

Ohlsson, Bo W.: *See*—
Ekström, Anders W.; and Ohlsson, Bo W., 5,595,673, Cl. 219-710.000.

Ohmi, Tadahiro; and Inaba, Hitoshi, to Ohmi, Tadahiro; and Takasago Netsugaku Kogyo Kabushiki-Kaisha. Apparatus for neutralizing charged body. 5,596,478, Cl. 361-212.000.

Ohmori, Hiroyuki: *See*—
Maeda, Tetsuo; Anayama, Hideki; Kawamorita, Yoichi; Ohmori, Hiroyuki; and Kimura, Mayumi, 5,595,845, Cl. 430-58.000.

Ohmura, Keiji: *See*—
Tao, Takashi; Ishimaru, Yasuo; Hattori, Morishige; Ohmura, Keiji; and Ohba, Hideshi, 5,595,123, Cl. 105-396.000.

Ohnishi, Takanori: *See*—
Kuwata, Takeshi; Ruckmongathan, Temkar; Nakagawa, Yutaka; Koh, Hidemasa; Haseba, Hiroshi; Yamashita, Takashi; Nagano, Hideyuki; and Ohnishi, Takanori, 5,596,344, Cl. 345-103.000.

Ohno, Koji: *See*—
Higashi, Akihiro; Ohno, Koji; and Umeda, Narumi, 5,596,516, Cl. 364-717.000.

Ohta, Junichi, to Ricoh Company, Ltd. Digital image forming apparatus with data conversion. 5,596,640, Cl. 380-18.000.

Ohta, Kenji: *See*—
Nakayama, Junichiro; Nakajima, Junsaku; Takahashi, Akira; and Ohta, Kenji, 5,595,805, Cl. 428-64.300.

Ohta, Sadao, to Fujitsu Limited. Information processing system having backup/recovery facilities. 5,596,707, Cl. 395-182.040.

Ohtaka, Mutsuo; Tanaka, Hisami; Shibayama, Shinichi; Okubo, Yosuke; and Nakajima, Tatsu, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member produced from aluminum pipe. 5,595,848, Cl. 430-69.000.

Ohtake, Masaki: *See*—
Ueno, Fumihiro; Torisawa, Akira; Ito, Yasuo; Sakaki, Eihiro; Ohtake, Masaki; Kataoka, Hiromi; Kashihara, Atsushi; and Seto, Kaoru, 5,596,426, Cl. 358-500.000.

Ohuchi, Kazunori: *See*—
Sakai, Koji; Ohuchi, Kazunori; and Masuoka, Fujio, 5,596,543, Cl. 365-233.000.

Ohya, Shouji: *See*—
Ishizaki, Kazuyoshi; Yamamuro, Masateru; Ishizuka, Atsushi; Ohya, Shouji; and Hamao, Miyoko, 5,595,478, Cl. 417-300.000.

Ohzu, Hideyuki: *See*—
Tominatsu, Norihiro; Ohzu, Hideyuki; Akasaka, Yoshihiro; Nakagawa, Kazushi; and Tateishi, Hiroshi, 5,595,832, Cl. 429-16.000.

Oishi, Tetsuya; Ozawa, Hiroshi; Karasawa, Minato; Isomata, Masamitsu; Maga, Izumi; and Yamauchi, Atsuyoshi, to Mitsui Toatsu Chemicals, Incorporated. Diguanamines and preparation process, derivatives and use thereof. 5,596,039, Cl. 524-714.000.

Ojeda, Peter A., IV: *See*—
Manser, Brian E.; Ojeda, Peter A., IV; Poole, Anton R.; and Guoming, Frank W., 5,596,480, Cl. 361-680.000.

Okabe, Susumu: *See*—
Kimura, Etsuji; Yamaguchi, Koichi; Ogino, Fumihiko; and Okabe, Susumu, 5,595,948, Cl. 501-108.000.

Okada, Hajime, to Sumitomo Wiring Systems, Ltd. Battery terminal. 5,595,511, Cl. 439-762.000.

Okada, Makoto; Takahashi, Masaki; Hosoi, Kaoru; and Nakajima, Shokichi, to Meiji Seika Kaisha, Ltd. Stably storable and readily water soluble composition of cephalosporin for injections. 5,595,986, Cl. 514-202.000.

Okada, Misako: *See*—
Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Misako; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Tohru, 5,596,256, Cl. 318-600.000.

Okada, Yoshio: *See*—
Hatano, Atsumi; Nakamura, Sadayuki; Yoshida, Makoto; Okada, Yoshio; and Matsumoto, Takashi, 5,595,613, Cl. 148-319.000.

Okamoto, Chikayuki; Nishioka, Tadashi; and Kawana, Satoru, to Mitsubishi Denki Kabushiki Kaisha; and Ryoden Semiconductor System Engineering Corporation. Method of forming fine patterns. 5,595,941, Cl. 437-228.000.

Okamoto, Etsuro: *See*—
Murashige, Norio; Okamoto, Etsuro; and Suzuki, Shizu, 5,596,129, Cl. 562-414.000.

Okamoto, Hiroshige: *See*—
Komiya, Kyosuke; Kawakami, Yoshifumi; and Okamoto, Hiroshige, 5,596,067, Cl. 528-196.000.

Okamoto, Kiyoshi: *See*—
Toyokura, Masaki; Okamoto, Kiyoshi; and Matsumoto, Yoshifumi, 5,596,518, Cl. 364-725.000.

Okamoto, Masumi: *See*—
Sunohara, Kazuyuki; Hasegawa, Rei; Nagata, Hiroyuki; Yamamoto, Takeshi; Yamamoto, Yasuhiro; and Okamoto, Masumi, 5,596,435, Cl. 349-132.000.

Okamoto, Shin: *See*—
Inazawa, Koichiro; Okamoto, Shin; Hayashi, Hisataka; and Matsushita, Takaya, 5,595,627, Cl. 156-643.100.

Okamura, Yoshitaka: *See*—
Seki, Hiroyuki; Nishimoto, Yoshifumi; Tanaka, Hideki; Harada, Toshiaki; Kimura, Atsushi; Okamura, Yoshitaka; and Yamamoto, Shinji, 5,596,241, Cl. 310-323.000.

Okazaki, Hiroshi: *See*—
Padmanaban, Munirathna; Kinoshita, Yoshiaki; Saehiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, 5,595,855, Cl. 430-270.100.

Okazaki, Sandra Y.: *See*—
McCue, Thomas E., Jr.; Sherman, Raymond C.; Casey, Shannon D.; Rasmussen, Steve O.; and Okazaki, Sandra Y., 5,595,380, Cl. 271-9.090.

Okazaki, Toshikazu: *See*—
Tone, Kaoru; Tone, Michiko; Tanaka, Hiroyuki; and Okazaki, Toshikazu, 5,596,493, Cl. 395-210.000.

Okcuoglu, Murat N.: *See*—
Shaffer, Theodore E.; and Okcuoglu, Murat N., 5,595,214, Cl. 137-517.000.

Oki Electric Industry Co., Ltd.: *See*—
Tanaka, Yasuhiro; Tanabe, Tetsuya; and Tanoi, Satoru, 5,596,521, Cl. 365-49.000.

Okitsu, Shigeru: *See*—
Yoshimatsu, Eiji; Fujii, Shinichi; and Okitsu, Shigeru, 5,595,101, Cl. 83-40.000.

Okoshi, Shinichi: *See*—
Kobayashi, Shuichi; Kobayashi, Masayuki; Yuri, Tsutomu; Serizawa, Youichi; Akimoto, Mamoru; and Okoshi, Shinichi, 5,595,604, Cl. 118-715.000.

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Okuyama, Hiroshi: *See*—
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.

Olah, Andrew M.: *See*—
Rubinstein, Alan; Olah, Andrew M.; and Olah, Emery, 5,595,186, Cl. 128-754.000.

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Rubinstein, Alan; Olah, Andrew M.; and Olah, Emery, 5,595,186, Cl. 128-754.000.

Olds, Keith A.; Vatt, Gregory B.; and Kurby, Christopher N., to Motorola, Inc. Message unit for use with multi-beam satellite-based messaging system and method of operation thereof. 5,596,315, Cl. 340-825.030.

Oliva, Ambrogio: *See*—
Krapcho, A. Paul; Menta, Ernesto; Oliva, Ambrogio; and Spinelli, Silvano, 5,596,097, Cl. 544-125.000.

Oliver, John R.: *See*—
Neurgaonkar, Ratnakar R.; Oliver, John R.; and Nelson, Jeffrey G., 5,595,677, Cl. 252-62.900.

Olivera, Baldomero M.; Cruz, Lourdes J.; Hillyard, David R.; McIntosh, J. Michael; and Santos, Ameurfino D., to University of Utah Research Foundation. Conotoxin peptides. 5,595,972, Cl. 514-13.000.

Olsen, Ib I.; and Kobsbaug, Rene, to Valence Technology, Inc. Process for prelithiation of carbon based anodes for lithium batteries. 5,595,837, Cl. 429-194.000.

Olsen, Sissel W.: *See*—
Eriksen, Gunnar; and Olsen, Sissel W., 5,594,998, Cl. 34-111.000.

Olsen, Uffe B.: *See*—
Andersen, Knud E.; Olsen, Uffe B.; Petersen, Hans; Grunvald, Frederik; Sonnewald, Ursula; Jørgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.

Olson, Kurt G.; Sandala, Michael G.; Zawacky, Steven R.; Kahle, Charles F., II; and Nakajima, Masayuki, to PPG Industries, Inc. Process for preparing an article having deposited thereon a photoimageable electrodepositable photoresist composition. 5,595,859, Cl. 430-325.000.

Olympus Optical Co., Ltd.: *See*—
Hankawa, Masashi, 5,596,386, Cl. 396-110.000.
Komuro, Osamu, 5,596,433, Cl. 359-631.000.

Omori, Mitsuko. Psychological test paper. 5,595,402, Cl. 283-67.000.

Omura, Takashi: *See*—
Kunimi, Nobutaka; Ueda, Yasuyoshi; and Omura, Takashi, 5,596,083, Cl. 534-642.000.

Ona, Isao: *See*—
Aso, Takayuki; Ona, Isao; and Ozaki, Masaru, 5,595,675, Cl. 252-8.610.

Onaka, Hiroshi; and Sekiya, Motoyoshi, to Fujitsu Limited. Dispersion compensator and optical amplifier. 5,596,448, Cl. 359-341.000.

Onda, Kazuhiko; and Kuzuhara, Masaaki, to NEC Corporation. Field effect transistor having a graded bandgap InGaAsP channel formed of a two-dimensional electron gas. 5,596,211, Cl. 257-194.000.

O'Neal, Clifford: *See*—
Brockett, Sue; O'Neal, Clifford; van der Lee, Hermes; and Rogers, Brian, 5,595,728, Cl. 424-65.000.

Ono, Makoto; and Yanagihara, Naoto, to Fuji Photo Film Co., Ltd. Optical image forming material. 5,595,853, Cl. 430-138.000.

Ono Pharmaceutical Co., Ltd.: *See*—
Hamanaka, Nobuyuki; Takahashi, Kanji; and Tokumoto, Hidekado, 5,596,009, Cl. 514-357.000.

Ono, Yoshiro: *See*—
Ichikawa, Yukihiko; Kasai, Yoshiyuki; and Ono, Yoshiro, 5,595,581, Cl. 55-302.000.

Onodera, Koichi, to Tokin Corporation. Magnetooptical element. 5,596,447, Cl. 359-324.000.

Onodera, Tsugio; and Takei, Shigeru, to Mitsuba Electric Mfg. Co., Ltd. Air-tightness testing arrangement for electric devices. 5,596,138, Cl. 73-49.200.

Onodera, Yoshio: *See*—
Torii, Kazuo; Iwasaki, Takashi; and Onodera, Yoshio, 5,595,716, Cl. 423-328.200.

Ono, Kengo: *See*—
Tamura, Yoshikazu; Ono, Kengo; and Yamashiro, Toshikatsu, 5,594,980, Cl. 29-33.00M.

Oostendoys, Franciscus J. G. M.: *See*—
Bergervoet, Josephus T. M.; and Oostendoys, Franciscus J. G. M., 5,596,152, Cl. 73-861.830.

Oosterlaken, Theodorus A. M.: *See*—
Habets, Winand J. A.; Klein-Rot, Miriam F. H. M.; Oosterlaken, Theodorus A. M.; and Yap, Sing H., 5,595,868, Cl. 435-5.000.

Opsal, Jon: *See*—
Fanton, Jeffrey T.; and Opsal, Jon, 5,596,411, Cl. 356-369.000.

Optec Co., Ltd.: *See*—
Hiroki, Toyohisa; and Suzuki, Tadashi, 5,595,702, Cl. 264-318.000.

Optical Security Group, Inc.: *See*—
Cariel, Yoram, 5,595,624, Cl. 156-277.000.

Optical Sensor Consultants Inc.: *See*—
Barnes, Clarence W., 5,596,320, Cl. 340-962.000.

Oravetz, David M.: *See*—
Johnson, Richard A.; Engel, Joseph C.; Boccabella, Michael F.; Oravetz, David M.; and Wise, James L., 5,596,473, Cl. 361-97.000.

O'Reilly, Neil J.; Derwin, William S.; Lin, Henry C.; and Nowak, Deanne M., to Occidental Chemical Corporation. Preparation of 3,4,6-trifluorophthalic acid. 5,596,104, Cl. 548-480.000.

Orient, Otto J.: *See*—
Chutjian, Ara; Hecht, Michael H.; and Orient, Otto J., 5,596,193, Cl. 250-292.000.

Oritasa, Masaaki; and Kawaguchi, Kozo, to GAC International, Inc. Orthodontic bracket. 5,595,484, Cl. 433-8.000.

Oriev Scientific Computing Ltd.: *See*—
Sirovich, Lawrence; Levich, Evgene; and Bronicki, Lucien Y., 5,595,205, Cl. 137-13.000.

Ortega, Dave: *See*—
Sanderson, George R.; Ortega, Dave; and Sifferman, Tom, 5,596,084, Cl. 536-3.000.

Orton, Paul A. Measuring system for determining transverse deflection of a rotary shaft. 5,596,189, Cl. 250-231.160.

Osato, Yoichi; and Miyata, Katsumi, to Canon Kabushiki Kaisha. Magnetooptical recording medium having magnetic layers that satisfy predetermined coercive force relationships, and recording/reproduction method for the medium. 5,596,555, Cl. 369-13.000.

Osborne, Brian T.: *See*—
Debortoli, George; Osborne, Brian T.; Lukas, Helmut H.; and Hvezda, Jaroslav M., 5,596,670, Cl. 385-135.000.

OSi Specialties, Inc.: *See*—
Childress, Thomas E.; and Bowman, Mark P., 5,596,116, Cl. 556-427.000.

Osipov, Eduard S.: *See*—
Demidov, German V.; and Osipov, Eduard S., 5,595,358, Cl. 244-7.00A.

Osram Sylvania Inc.: *See*—
Klinedinst, Keith A.; and Lester, Joseph E., 5,595,603, Cl. 118-715.000.

Ossenmacher, John M.: *See*—
Martich, Mark E.; Beling, Thomas E.; Ossenmacher, John M.; and McLeod, Stephen C., 5,596,247, Cl. 315-56.000.

Ostermeier, Jörg; Borchers, Peter; and Engelke, Bernward, to Otis Elevator Company. Pallet for a conveyor. 5,595,278, Cl. 198-333.000.

Ostlind, Dan A.: *See*—
Shoop, Wesley; Ostlind, Dan A.; and Michael, Bruce F., 5,595,991, Cl. 514-233.200.

Otake, Seiichirou; Watanabe, Yoshifumi; and Kato, Yukihiro, to Nippondenso Co., Ltd. Liquid-sealed semiconductor pressure sensor and manufacturing method thereof. 5,595,939, Cl. 437-209.000.

Otani, Akihiro: *See*—
Nishida, Satoshi; and Otani, Akihiro, 5,596,597, Cl. 372-107.000.

Otis Elevator Company: *See*—

Ostermeier, Jörg; Borchers, Peter; and Engelke, Bernward, 5,595,278, Cl. 198-333.000.

Osumi, Koichi, to Kabushiki Kaisha Toshiba. Three-dimensional image display device. 5,596,340, Cl. 345-31.000.

Otsu, Yuichi; Kitagawa, Yoshinori; Hattori, Yumi; Wada, Katsuaki; and Obinata, Toru, to Nihon Bayer Agrochem K.K. Sulfamide derivatives. 5,596,017, Cl. 514-517.000.

Ott, Karl; Walter, Klaus; and Strate, Joachim, to Robert Bosch GmbH. Device for controlling the fuel injection in an internal combustion engine. 5,595,161, Cl. 123-491.000.

Ours, Roger. Fin device, in particular for water sports, and method of manufacture of such a device. 5,595,518, Cl. 441-64.000.

Outboard Marine Corporation: *See*—
Anselm, Michael C.; Blanchard, Clarence E.; and Nerstrom, James S., 5,595,235, Cl. 164-235.000.

Ouvrard, Gaston, to Farnier & Penin SNC. Self-winding blind. 5,595,229, Cl. 160-23.100.

Overy, Colin: *See*—
Meisner, Edward H.; Kristiansen, Keith; Ballone, Michael; Hafl, Roberta S.; Loferski, Michael A.; Dolson, Michael D.; Bennett, Christopher; Manson, John B., Sr.; Basten, Frank; and Overy, Colin, 5,595,228, Cl. 144-285.000.

Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Quiyi; Kostylev, Sergey A.; and Chao, Benjamin S., to Energy Conversion Devices, Inc. Homogeneous compositions of microcrystalline semiconductor material, semiconductor devices and directly overwritable memory elements fabricated therefrom, and arrays fabricated from the memory elements. 5,596,522, Cl. 365-113.000.

Owen, Charles V.: *See*—
Beck, Kent F.; and Owen, Charles V., 5,596,404, Cl. 356-301.000.

Owens Corning Fiberglas Technology, Inc.: *See*—
Aschenbeck, David P.; and Pellegrin, Michael T., 5,595,585, Cl. 65-505.000.
Houpt, Ronald A.; and Souers, Dennis C., 5,595,766, Cl. 425-8.000.
Loftus, James E.; and Pellegrin, Michael T., 5,595,584, Cl. 65-442.000.

Owoc, Anthony L.: *See*—
Boiarski, Michael; Longsworth, Ralph C.; Yudin, Boris; Hill, Dennis H.; Klusmier, Lawrence A.; Khatri, Ajay N.; and Owoc, Anthony L., 5,595,065, Cl. 62-222.000.

Owsley, William D.: *See*—
Barina, Richard M.; Deiso, James W., III; Kurz, Arthur A.; McFadden, Jeffrey; Murray, Fred L.; and Owsley, William D., 5,596,170, Cl. 174-35.008.

Oxman, Joel D.; Konings, Mark S.; Tiers, George V. D.; Vogel, Kim M.; and Vogel, Dennis E., to Minnesota Mining and Manufacturing Company. Dental impression material with cure-indicating dye. 5,596,025, Cl. 523-109.000.

Ozaki, Masaru: *See*—
Aso, Takayuki; Ona, Isao; and Ozaki, Masaru, 5,595,675, Cl. 252-8.610.

Ozaki, Yoshio; Shirasu, Toshiyuki; and Saito, Etsuro, to Sony Corporation; and Sony Cinema Products Corporation. Digital sound signal reproducing apparatus for projector. 5,596,380, Cl. 352-30.000.

Ozawa, Godo, to Kabushiki Kaisha Komatsu Seisakusho. Cooling structure of diesel engine piston. 5,595,145, Cl. 123-41.350.

Ozawa, Hiroshi: *See*—
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P.I.V. S.A.: *See*—
Ducagnon, Jean, 5,595,541, Cl. 464-154.000.

P + P Geotechnik GmbH: *See*—
Doring, Falk R.; and Doring, Niels, 5,595,644, Cl. 205-766.000.

P. P. Payne Limited: *See*—
May, Geoffrey B.; Davis, Brian F.; and Nowak, Wladyslaw L., 5,595,803, Cl. 428-43.000.

Pacific Scientific Company: *See*—
Martich, Mark E.; Beling, Thomas E.; Ossenmacher, John M.; and McLeod, Stephen C., 5,596,247, Cl. 315-56.000.

Padgett, Clarence W.: *See*—
Komarek, James A.; Padgett, Clarence W.; Tanner, Scott B.; and Minney, Jack L., 5,596,544, Cl. 365-233.500.

Padmanaban, Munirathna; Kinoshita, Yoshiaki; Suchiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, to Hoechst Japan Limited. Radiation sensitive composition. 5,595,855, Cl. 430-270.100.

Pagallo, Giulia: *See*—
Cappa, Stephen P.; and Pagallo, Giulia, 5,596,350, Cl. 345-173.000.

Page, Michael P., to Cooper Industries, Inc. Quick release electrical connector. 5,595,500, Cl. 439-372.000.

Paik, Harry S.; and Shimogori, Kotaro, to Infopak International, Inc. Apparatus for holding and dispensing flat articles. 5,595,300, Cl. 206-449.000.

Pakhchyan, Edvard; and Smushkovich, Yosif, to DWIN Electronics Inc. Film-mode video line-doubler motion detectors. 5,596,371, Cl. 348-452.000.

Palmer, Gary L.; and Forsythe, William K., to ITT Corporation. Flashlight illuminator for a night vision device. 5,595,435, Cl. 362-109.000.

Palmer, Kenneth J.: *See*—
Tonteling, Charles; Palmer, Kenneth J.; Helfer, Parrel B.; Todd, Rodger; and Blum, Joey Jean, 5,595,617, Cl. 148-595.000.

Palmieri, Costantino: *See*—
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,596,101, Cl. 546-346.000.

Pan, Yang, to Chartered Semiconductor Manufacturing Pte Ltd. Method of making self-aligned halo process for reducing junction capacitance. 5,595,919, Cl. 437-29.000.

Panandiker, Rajan K.; and Zhen, Yueqian, to Procter & Gamble Company, The. Liquid laundry detergents containing polyamino acid and polyalkyleneglycol. 5,595,681, Cl. 510-299.000.

Panayotatos, Nikos: *See*—
Boulton, Teri G.; Cobb, Melanie H.; Yancopoulos, George D.; Nye, Steven; and Panayotatos, Nikos, 5,595,904, Cl. 435-240.200.

Panduit Corp.: *See*—
Leban, Joseph F.; Levin, Robert F.; and Richardson, Mark B., 5,595,220, Cl. 140-123.600.

Panescu, Dorin: *See*—
Swanson, David K.; Panescu, Dorin; and Whayne, James G., 5,595,183, Cl. 128-697.000.

Paper Converting Machine GmbH: *See*—
Wald, Ulrich, 5,595,468, Cl. 414-331.000.

Paques, Gerardus H. F., to Industrial Tankbuilders B.V. Method of building up a silo or tank with a lining, and a wall sheet for building up a silo or tank and method of manufacturing such wall sheet. 5,595,037, Cl. 52-591.500.

Paquin, Thomas T.: *See*—
Vallelunga, Anthony J.; Paquin, Thomas T.; and Crawford, Brian, 5,595,566, Cl. 604-197.000.

Park, Joon-Sang: *See*—
Bai, Sang-Chul; and Park, Joon-Sang, 5,595,072, Cl. 68-133.000.

Park, Kee W., to Hyundai Electronics Industries Co., Ltd. Method and apparatus for reading/writing data from/into semiconductor memory device. 5,596,533, Cl. 365-189.040.

Parker, Michael F.: *See*—
Matson, Ronald J.; Keavy, Daniel J.; Parker, Michael F.; and Johnson, Graham, 5,596,019, Cl. 514-629.000.

Parker, Thomas E.: *See*—
Borchelt, Earl F.; and Parker, Thomas E., 5,594,979, Cl. 29-25.350.

Parr, Claude E.: *See*—
Boucher, Richard C.; Weisman, Gary A.; Turner, John T.; Harden, Thomas K.; Parr, Claude E.; Sullivan, Daniel M.; Erb, Laura J.; and Lustig, Kevin D., 5,596,088, Cl. 536-23.500.

Parshad, David A.: *See*—
Maddock, William H.; and Parshad, David A., 5,595,439, Cl. 362-238.000.

Parsons, Kevin L., to Armament Systems and Procedures, Inc. Elongated button lock for expandable batons. 5,595,386, Cl. 473-47.700.

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Partyka, Richard A.: *See*—
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Patel, Rajen M.: *See*—
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Padmanaban, Munirathna; Kinoshita, Yoshiaki; Suchiro, Natsumi; Kudo, Takanori; Masuda, Seiya; Nozaki, Yuko; Okazaki, Hiroshi; and Pawlowski, Georg, 5,595,855, Cl. 430-270.100.

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Pearson, Michael J.: *See*—
Lee, John S.; and Pearson, Michael J., 5,595,954, Cl. 502-415.000.

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Canistraro, Howard A.; Jordan, Eric H.; and Pease, Douglas M., 5,596,620, Cl. 378-84.000.

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Delahalle, Gerard; Maugendre, Stephane; Caillaud, Thierry; Peigne, Pierre; and Szalata, Francois, 5,596,598, Cl. 373-93.000.

Peinemann, Klaus V.: *See*—
Pritsch, Detlev; Peinemann, Klaus V.; Behling, Rolf D.; and Just, Regine, 5,595,658, Cl. 210-490.000.

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Yokev, Hanoch; Peleg, Shimon; Meiman, Yehouda; and Porat, Boaz, 5,596,330, Cl. 342-387.000.

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Aschenbeck, David P.; and Pellegrin, Michael T., 5,595,585, Cl. 65-505.000.
Loftus, James E.; and Pellegrin, Michael T., 5,595,584, Cl. 65-442.000.

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Wright, Bruce E.; Witzig, William L.; Goliaszewski, Alan E.; Carey, William S.; and Peltier, Jeffrey H., 5,596,130, Cl. 585-3.000.

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Bartolone, John B.; Peraksa, Christine M.; Santhanam, Uma; and Lang, Brian D., 5,595,730, Cl. 424-70.100.

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Nuzzo, Joseph V.; and Miroballi, John F., 5,595,081, Cl. 70-446.000.

Pentalpha Enterprises Ltd.: *See*—
Sham, John C. K.; and Leung, Pan K., 5,595,672, Cl. 219-257.000.

Pentel Kabushiki Kaisha: *See*—
Yokouchi, Nobuo; and Saito, Hiroyuki, 5,595,626, Cl. 156-577.000.

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Niemela, Paul W.; and Peot, David G., 5,595,531, Cl. 451-357.000.

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Reedy, Ronald E.; and Burgener, Mark L., 5,596,205, Cl. 257-9.000.

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Wallace, Ian F.; and Stamford, John, 5,595,215, Cl. 137-554.000.

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Perrissoud, Claude; and Borel, René, to Salomon S.A. Reinforced ski boot. 5,595,006, Cl. 36-117.500.

Perrotto, Joseph A.: *See*—
Harbster, Kevin H.; and Perrotto, Joseph A., 5,595,712, Cl. 422-129.000.

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Persico, Charles J.; Navid, Nasrollah S.; and Fotowat-Ahmady, Ali, to Philips Electronics North America Corporation. IF amplifier/limiter with positive feedback. 5,596,299, Cl. 330-260.000.

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Berglund, Victor P.; and Jaffe, Richard R., 5,596,313, Cl. 340-574.000.

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Bostica, Bruno; Delpiano, Franco; and Pesando, Luca, 5,596,664, Cl. 385-92.000.

Pete, Ira J. Towing system for dredges and method for using same. 5,595,134, Cl. 114-244.000.

Peters, Chris R.; and Henderson, James W., to Transfer Flow International, Inc. Modular countertop. 5,595,427, Cl. 312-140.400.

Peters, Gary A.: *See*—
Bowles, Cary R.; Jones, Sidney D.; and Peters, Gary A., 5,595,663, Cl. 210-652.000.

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Petersen, Hans: *See*—
Andersen, Knud E.; Olsen, Uffe B.; Petersen, Hans; Grønvald, Frederik; Sonnewald, Ursula; Jørgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.

Petersen, Hans C.: *See*—
Hansen, Gunnar L.; and Petersen, Hans C., 5,595,479, Cl. 418-61.300.

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Mullins, Jacqueline; Peterson, Joseph W.; Bartkowiak, John; and Hendrickson, Alan F., 5,596,724, Cl. 395-250.000.

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Van Dusen, John M.; and Petrie, Ross J., 5,595,710, Cl. 422-104.000.

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Petschel, Michael: *See*—
Boulos, Mervet S.; Montrose, David C.; and Petschel, Michael, 5,595,611, Cl. 148-259.000.

Petty, Douglas M.: *See*—
Hoormann, Ronald A.; and Petty, Douglas M., 5,595,277, Cl. 194-217.000.

Pezzani, Robert, to SGS-Thomson Microelectronics S.A. A.C. switch triggered at a predetermined half-period. 5,596,292, Cl. 327-124.000.

Pfeiffer, Brigitte, executrix: *See*—
Gries, Heinz; Rosenberg, Douwe; Weinmann, Hanns-Joachim; Speck, Ulrich; Mätzel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Renneke, Franz-Josef, 5,595,725, Cl. 424-9.340.

Pfeiffer, Heinrich, deceased (by Brigitte Pfeiffer, executrix): *See*—
Gries, Heinz; Rosenberg, Douwe; Weinmann, Hanns-Joachim; Speck, Ulrich; Mätzel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Renneke, Franz-Josef, 5,595,725, Cl. 424-9.340.

Pfizer Inc: *See*—
Duplantier, Allen J., 5,596,013, Cl. 514-403.000.

Pfizer Inc.: *See*—
Hamanaka, Ernest S., 5,596,001, Cl. 514-313.000.

Pharmaco Behavioral Associates, Inc.: *See*—
Keenan, Robert M.; and Hatsukami, Dorothy K., 5,596,007, Cl. 514-343.000.

Pharmacyclics, Inc.: *See*—
Magda, Darren; Sessler, Jonathan L.; and Iverson, Brent, 5,595,726, Cl. 424-9.610.

Phelan, John R.: *See*—
Vaughn, Mark R.; Robinett, Rush D., III; Phelan, John R.; and Van Zuiden, Don M., 5,596,254, Cl. 318-568.110.

Philip Morris Incorporated: *See*—
Sikka, Vinod K.; Deevi, Seetharama C.; Fleischhauer, Grier S.; Hajaligol, Mohammad R.; and Lilly, A. Clifton, Jr., 5,595,706, Cl. 420-81.000.

Philipossian, Ara: *See*—
Soleimani, Hamid R.; Doyle, Brian; and Philipossian, Ara, 5,596,218, Cl. 257-369.000.

Philipp, Gottfried: *See*—
Beinert, Norbert; Knote, Manfred; Philipp, Gottfried; and von Tluck und Toechonowitz, Christian, 5,595,810, Cl. 428-156.000.

Philips Electronics North America Corp.: *See*—
Bongaerts, Petrus F. G.; Bruinink, Jacob; Burgmans, Adrianus L. J.; Van Helleputte, Henri R. J. R.; Khan, Babar A.; and Kuijk, Karel E., 5,596,431, Cl. 349-32.000.
Persico, Charles J.; Navid, Nasrollah S.; and Fotowat-Ahmady, Ali, 5,596,299, Cl. 330-260.000.
Saeijs, Ronald W. J. J.; Shah, Imran A.; and Sato, Takashi, 5,596,581, Cl. 370-394.000.

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Phillips & Temro Industries Inc.: *See*—
Thimmesch, Jan P., 5,595,164, Cl. 123-549.000.

Phillips Petroleum Company: *See*—
McDaniel, Max P.; Benham, Elizabeth A.; and Badley, Rickey D., 5,595,953, Cl. 502-237.000.

Phillips, Roger W.: *See*—
Martantes, Charles T.; and Phillips, Roger W., 5,596,402, Cl. 356-71.000.

Physiometrix, Inc.: *See*—
Subramaniam, Raj, 5,596,038, Cl. 524-547.000.

Pinlet, Joseph W.: *See*—

Bryant, Charles P.; Lal, Kasturi; and Pialet, Joseph W., 5,595,680, Cl. 252-77.000.

Fiaccinski, Joseph J.; Fritz, Eric E.; Nicrosberg, Morton J.; Wilbur, Leonard P., Jr.; and Horn, Leroy W., to Thomson Consumer Electronics, Inc. Cathode-ray tube particle removal apparatus and method. 5,595,520, Cl. 445-59.000.

Piatek, John T.; Muller, Fredrick M.; Schmidt, Brad W.; and Hanna, Wayne D., to Portable Data Technologies, Inc. System and method for accounting for personnel at a site and system and method for providing personnel with information about an emergency site. 5,596,652, Cl. 382-115.000.

Pierre, Alain: *See*—
Billington, David; Dorey, Gilbert; Leon, Pascale; Atassi, Ghassem; Pierre, Alain; Burbridge, Michael; and Guilhaud, Nicolas, 5,595,976, Cl. 514-25.000.

Pignataro, Anthony. Merchandizing means and method. 5,595,263, Cl. 186-53.000.

Pilate, Isabelle N. C.: *See*—
Janssens, Frans E.; Lacrampe, Jean F. A.; and Pilate, Isabelle N. C., 5,595,988, Cl. 514-214.000.

Pilsbury Company, The: *See*—
Hoang, Victor T.; and Sandifur, Karen V., 5,595,778, Cl. 426-556.000.
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Pilolla, Joseph J. Sink arrangement with faucet having dual operational mode. 5,595,216, Cl. 137-607.000.

Pinna, Marco, to Biofarm S.R.L. Device for retarding hair loss and for stimulating its regrowth. 5,595,564, Cl. 600-14.000.

Pinson, Margaret H.: *See*—
Wolf, Stephen; Jones, Coleen T.; Webster, Arthur A., III; Voran, Stephen; Pinson, Margaret H.; and Kubichek, Robert F., 5,596,364, Cl. 348-192.000.

Pioneer Electronic Corporation: *See*—
Hosoi, Kenichiro; and Iwami, Takashi, 5,596,248, Cl. 315-368.180.

Piostek, Carl J.; and Buck, Bradford L., to Abbott Laboratories. Apparatus for telescopically assembling a tubing segment on a length of tubing. 5,594,981, Cl. 29-235.000.

Piran, Uri: *See*—
Law, Say-Jong; and Piran, Uri, 5,595,875, Cl. 435-6.000.

Pirrung, Walter; Glabb, Berthold; Hohm, Laurenz; Meidhof, Helmuth; and Wolf, Günther, to Rieter Automatik GmbH. Granulating device for strand materials. 5,595,770, Cl. 425-188.000.

Pitney Bowes Inc.: *See*—
Belec, Eric A.; Janatka, Eric J.; Malick, Shahzad H.; and Pritting, Rebecca J., 5,595,334, Cl. 226-15.000.
Miller, Roland G., 5,596,341, Cl. 345-52.000.
Murphy, Charles F., 5,596,354, Cl. 347-30.000.

Pitman, Carl R.; and Ison, Wendell, to Woods Industries, Inc. Rotatable electrical plug and power cord. 5,595,503, Cl. 439-446.000.

Pitts, Barbara R.; and Sarao, Mary R. Posterboard. 5,595,829, Cl. 428-537.500.

Plastics Welding Systems Ltd.: *See*—
David, David A., 5,595,671, Cl. 219-137.620.

Plasto SA: *See*—
Beaulat, Bernard, 5,595,415, Cl. 296-39.100.

Plattner, Eric: *See*—
Gordon, Otto W.; Plattner, Eric; and Doppenberg, Frank, 5,595,628, Cl. 162-30.110.

Plazak, Zbigniew: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Tsugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,596,752, Cl. 395-701.000.

Pleshko, George A., to GAP Technologies, Inc. Gyrating axial scanner. 5,596,442, Cl. 359-199.000.

Pleshko, George A., to Gap Technologies, Inc. Ultra compact scanning system for a wide range of speeds, angles and field depth. 5,596,446, Cl. 359-214.000.

Pletcher, Richard A.; and Lipe, Ralph A., to Microsoft Corporation. Mechanism for using common code to handle hardware interrupts in multiple processor modes. 5,596,755, Cl. 395-734.000.

Plugge, Jay S.: *See*—
Wright, J. Nelson; Plugge, Jay S.; Pueh, D. Grant, III; Langdon, Donald R.; Pinger, David J.; Normand, Brian M.; and Guracar, Ismayil M., 5,595,179, Cl. 128-660.070.

Plunkett, Galen, Jr.: *See*—
Bonaffini, Andrew M.; Bonaffini, Kathleen F.; Buehler, Michael J.; Miller, Hubert A.; Plunkett, Galen, Jr.; Rudolph, Sidney F.; Sweeney, Michael A.; and Wallis, Donald E., 5,596,331, Cl. 342-455.000.

Poch, Poest; Pouv, Vorng; Vannak, Tan; and Bophan, Chhim. Rotary internal combustion engine. 5,595,155, Cl. 123-240.000.

Podd, Stephen D.: *See*—
Podd, Victor T.; Podd, Stephen D.; and Podd, Victor I., 5,595,315, Cl. 220-1.500.

Podd, Victor I.: *See*—
Podd, Victor T.; Podd, Stephen D.; and Podd, Victor I., 5,595,315, Cl. 220-1.500.

Podd, Victor T.; Podd, Stephen D.; and Podd, Victor I. Bracing system for a liner for a cargo container. 5,595,315, Cl. 220-1.500.

Podlesak, Thomas F., to United States of America, Army. Apparatus and method for indicating electrical breakdown in water cooling systems. 5,596,279, Cl. 324-439.000.

Podoba, Myroslaw: *See*—
Budzilek, Russell A.; Monarchie, Dominick L.; Podoba, Myroslaw; and Swanson, Richard R., 5,596,246, Cl. 313-502.000.

Pokrieflka, Gerald P.; and Cole, Paul E., to Chrysler Corporation. Back light assembly. 5,595,433, Cl. 362-80.100.

Poland, Sydney W.: *See*—
Van Aken, Jerry R.; Guttag, Karl M.; and Poland, Sydney W., 5,596,519, Cl. 364-766.000.

Poly Vac, Incorporated: *See*—
Wood, Timothy E., 5,595,296, Cl. 206-363.000.

Pomato, Nicholas; and Ransom, Janet H., to Akzo Nobel N.V. CTAA 81AV78, the antigen recognized by human monoclonal antibody 81AV78. 5,595,738, Cl. 424-184.100.

Pometto, Anthony L., III; Demirci, Ali; and Johnson, Kenneth E., to Iowa State University Research Foundation, Inc. Immobilization of microorganisms on a support made of synthetic polymer and plant material. 5,595,893, Cl. 435-136.000.

Poole, Anton R.: *See*—
Mansur, Brian E.; Ojeda, Peter A., IV; Poole, Anton R.; and Gooming, Frank W., 5,596,480, Cl. 361-680.000.

Pope, Steven M., to Teac Corporation; and DZU Corporation. Peripheral device control system using changeable firmware in a single flash memory. 5,596,738, Cl. 395-430.000.

Porat, Boaz: *See*—
Yokev, Hanoch; Peleg, Shimon; Meiman, Yehouda; and Porat, Boaz, 5,596,330, Cl. 342-387.000.

Portable Data Technologies, Inc.: *See*—
Piatek, John T.; Muller, Fredrick M.; Schmidt, Brad W.; and Hanna, Wayne D., 5,596,652, Cl. 382-115.000.

Possanza, Steven D.; Wooster, Daniel J.; and Bendle, David R., to Eastman Kodak Company. Method of chilling a photographic emulsion. 5,595,865, Cl. 430-642.000.

Post, Donald L.: *See*—
Yang, Henry S.; Post, Donald L.; and Huang, Wen-Yi, 5,596,575, Cl. 370-468.000.

Potter, Gerard A.: *See*—
Chan, Ferdinand; Jarman, Michael; and Potter, Gerard A., 5,595,995, Cl. 514-277.000.

Poulton, Jason T.: *See*—
Kang, Jung W.; and Poulton, Jason T., 5,596,053, Cl. 526-132.000.

Pouv, Vorng: *See*—
Poch, Poest; Pouv, Vorng; Vannak, Tan; and Bophan, Chhim, 5,595,155, Cl. 123-240.000.

Powdertech Co., Ltd.: *See*—
Honjo, Toshio; Sato, Yuji; Kayamoto, Kanao; Ogata, Masahiro; and Kobayashi, Hiromichi, 5,595,850, Cl. 430-106.600.

Powell, Jeffrey J.; Price, Tony A.; and Whaley, Lisa, to Siemens Electric Limited. Releasable connection for molded parts. 5,595,151, Cl. 123-184.610.

Power Superconductor Applications Co.: *See*—
Kuznetsov, Stephen B., 5,596,469, Cl. 361-58.000.

Powerplant Fuel Modules, LLC: *See*—
Comer, Timothy J.; Embley, Tommy J.; Mastej, Eugene; and Wilson, Dorothy S. D., 5,596,501, Cl. 364-464.230.

PPG Industries, Inc.: *See*—
Dishart, Peter T.; and Pazal, Frank J., 5,596,335, Cl. 343-713.000.
Olson, Kurt G.; Sandala, Michael G.; Zawacky, Steven R.; Kahle, Charles F., II; and Nakajima, Masayuki, 5,595,859, Cl. 430-325.000.

Prashad, Mahavir; and Kapa, Prasad K., to Sandoz Ltd. Process for preparing 2'-O- alkyl adenosine derivatives. 5,596,094, Cl. 536-55.300.

Preco, Inc.: *See*—
Bess, Emery L.; and Erskine, Harry S., 5,596,311, Cl. 340-384.700.

Premerlani, William J.: *See*—
Shea, Hwa N.; Premerlani, William J.; and Blaha, Michael R., 5,596,746, Cl. 395-612.000.

President and Fellows of Harvard College: *See*—
Hochman, Herbert B., 5,595,753, Cl. 424-436.000.

Prestenback, Alfred. Construction modules. 5,595,038, Cl. 52-592.100.

Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Waltersdorfer, Anna; Kern, Manfred; Lümmen, Peter; and Bonin, Werner, to Hoechst Schering AgrEvo GmbH. Substituted pyridines and pyrimidines, processes for their preparation and their use as pesticides and fungicides. 5,595,992, Cl. 514-254.000.

Price, Tony A.: *See*—
Powell, Jeffrey J.; Price, Tony A.; and Whaley, Lisa, 5,595,151, Cl. 123-184.610.

Priebe, Gordon W.: *See*—
Passow, Robin H.; Priebe, Gordon W.; Isliefson, Ronald D.; Mactaggart, I. Ross; and LeClair, Kevin R., 5,596,539, Cl. 365-210.000.

Prillwitz, Kenneth G. Abrasive resistant bearing. 5,595,443, Cl. 366-331.000.

PrimeX: *See*—
Sharma, Sukhdev R.; Wesbey, George E.; Gaalema, Stephen; and Minteer, John A., 5,596,200, Cl. 250-370.140.

Prince Corporation: *See*—
Hoseck, Brian S., 5,596,316, Cl. 340-825.030.

Printronix, Inc.: *See*—
Barrus, Gordon; and Schumaker, Richard E., 5,595,446, Cl. 400-124.130.

Pritchard, Thomas B., to Hewlett-Packard Company. Method and apparatus for compression and decompression of data used by a serial printer. 5,596,423, Cl. 358-433.000.

Pritting, Rebecca J.: *See*—
Belec, Eric A.; Janatka, Eric J.; Malick, Shahzad H.; and Pritting, Rebecca J., 5,595,334, Cl. 226-15.000.

Procept, Inc.: *See*—
Roberts, John C.; and Patch, Raymond J., 5,596,095, Cl. 540-226.000.

Procter & Gamble Company, The: *See*—
Benge, W. Dennis, 5,594,970, Cl. 15-208.000.
King, Willie F.; and Kline, Mark J., 5,595,567, Cl. 604-391.000.
Miracle, Gregory S.; Sivik, Mark R.; and Kellett, Patti J., 5,595,967, Cl. 510-372.000.
Panandiker, Rajan K.; and Zhen, Yueqian, 5,595,681, Cl. 510-299.000.

Protz, William F., Jr., to Santa's Best. Suction cup and hanger. 5,595,364, Cl. 248-205.500.

Puckace, James S.; and Martella, David J., to Exxon Chemical Patents Inc. Synergistic antioxidant combinations for lubricating oils. 5,595,963, Cl. 508-421.000.

Pulscher, Calvin L. Vent stack frost build up inhibitor. 5,595,030, Cl. 52-218.000.

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Hoang, Thang, 5,595,379, Cl. 270-52.060.

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Huber, David J.; Bannister, Ronald L.; Khinkis, Mark J.; and Rabovitser, Josif K., 5,595,059, Cl. 60-39.020.

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Atkinson, Louis D.; and Rave, Kevin M., 5,595,209, Cl. 137-116.500.

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Horsey, Douglas W.; and Ravichandran, Ramanathan, 5,596,033, Cl. 524-100.000.

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Miller, William R., 5,595,293, Cl. 206-308.100.
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Grier, Jonathan F., 5,595,562, Cl. 600-12.000.

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Morris, Robert L.; Neunschwander, Kent W.; Learn, Keith S.; and Scotese, Anthony C., 5,596,020, Cl. 514-646.000.

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Menzel, Stanley W. O., 5,595,800, Cl. 428-363.000.

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Mabrey, Gerald B., 5,595,281, Cl. 198-687.100.

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Otz, Karl; Walter, Klaus; and Strate, Joachim, 5,595,161, Cl. 123-491.000.
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Barry, Michael W.; Rowe, Francis A.; and Tompkins, E. Neal, 5,596,416, Cl. 358-296.000.

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Dechene, Ronald L.; Smith, Thomas B.; Marino, Scott A.; Tache, Ronald J.; and Roy, Ajoy K., 5,596,275, Cl. 324-307.000.

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Braun, Günther; and Rucks, Sabine, 5,595,270, Cl. 188-284.000.

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Murnick, Daniel E., 5,595,583, Cl. 65-350.000.

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Walser, Robert A.; and Rydell, Earl E., 5,596,580, Cl. 370-455.000.

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Niemela, Paul W.; and Peot, David G., 5,595,531, Cl. 451-357.000.

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Okamoto, Chikayuki; Nishioka, Tadashi; and Kawazu, Satoru, 5,595,941, Cl. 437-228.000.

S.C.M.D., Ltd.: *See*—
Smith, G. Richard, 5,595,570, Cl. 606-166.000.

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Nakagawa, Takao, 5,595,424, Cl. 30-169.000.

Saari, Frank C.: *See*—
Berkey, Rex A.; DeFant, Daniel; Hallum, Brad; Hansen, Jeffrey A.; Hopper, Edward L.; Johnson, Philip A.; Saari, Frank C.; and Sundell, Randy P., 5,595,470, Cl. 414-495.000.

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Jarrand, Patrick, 5,595,549, Cl. 474-91.000.

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Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Waltersdorfer, Anna; Kern, Manfred; Lümmen, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.

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Sadwick, Laurence P.; Hwu, R. Jennifer; Baird, J. Mark; and Holmes, Sherman, to University of Utah. Micromininature thermionic vacuum tube. 5,596,245, Cl. 313-293.000.
Saeijs, Ronald W. J. J.; Shah, Imran A.; and Sato, Takashi, to Philips Electronics North America Corporation. Recording and reproducing an MPEG information signal using tagged timing information. 5,596,581, Cl. 370-394.000.
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Saferstein, Lowell; and Wolf, Stephen J., to Johnson & Johnson Medical, Inc. Hemostatic thrombin paste composition. 5,595,735, Cl. 424-94.640.
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Selby, Theodore W.; Cox, Jerry G.; Bennett, Paul A.; and Cox, Rebecca S., 5,595,152, Cl. 123-196.00R.
Saikalis, George: *See*—
Nogi, Toshiharu; Bruetsch, Robert I.; and Saikalis, George, 5,595,163, Cl. 123-494.000.
Saint-Gobain Vitrage: *See*—
Guiselin, Olivier, 5,595,825, Cl. 428-428.000.
Saint-Gobain/Norton Industrial Ceramics Corporation: *See*—
Goldman, Paul D., 5,594,966, Cl. 7-120.000.
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Ozaki, Yoshio; Shirasu, Toshiyuki; and Saito, Etsuro, 5,596,380, Cl. 352-30.000.
Saito, Hiroshi, to Yamaha Corporation. Ball grid array type semiconductor device. 5,596,227, Cl. 257-701.000.
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Yokouchi, Nobuo; and Saito, Hiroyuki, 5,595,626, Cl. 156-577.000.
Saito, Katsuo, to Canon Kabushiki Kaisha. Spread spectrum receiving apparatus. 5,596,599, Cl. 375-200.000.
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Ohashi, Masayoshi; Takeuchi, Yoshio; Suzuki, Toshisori; Yamaguchi, Akira; Sakai, Seiichiro; and Mizuno, Toshio, 5,596,641, Cl. 380-23.000.
Sakaki, Eihiro: *See*—
Ueno, Fumihiro; Torisawa, Akira; Ito, Yasuo; Sakaki, Eihiro; Obtake, Masaki; Kataoka, Hiromi; Kashihara, Atsushi; and Seto, Kaoru, 5,596,426, Cl. 358-500.000.
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Hamada, Hiroyuki; and Sakamoto, Kiyomi, 5,596,695, Cl. 395-333.000.
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Sakai, Koji; Obuchi, Kazunori; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Semiconductor memory device including circuitry for activating and deactivating a word line within a single RAS cycle. 5,596,543, Cl. 365-233.000.
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Sakurai, Takayasu: *See*—
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Salensky, George A.: *See*—
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Sallwasser, Alan J.: *See*—
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Salomé, Antoine: *See*—
Borck, Gerald-Wolfgang; Eicher, Jochen; Kuhn, Pierre; Müller, Norbert; and Salomé, Antoine, 5,595,297, Cl. 206-387.130.
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Bourdeau, Joël, 5,595,396, Cl. 280-607.000.
Perrissoud, Claude; and Borel, René, 5,595,006, Cl. 36-117.500.
Salonen, Hannu; and Kanervo, Helena, to Enso-Gutzeit Oy. Method of producing a filter cigarette with tipping paper having lip release properties. 5,595,196, Cl. 131-362.000.
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Yuan, Jack H.; and Samachisa, Gheorghe, 5,595,924, Cl. 437-43.000.
Samain, Henri; and Sturla, Jean-Michel, to L'Oreal. Process for directly coloring keratinous fibres using sulphonic dyes and water vapor. 5,595,197, Cl. 132-208.000.
Samsung Aerospace Industries, Ltd.: *See*—
Kim, Moon-hyeon, 5,596,453, Cl. 359-692.000.
Samsung Electronics Co., Ltd.: *See*—
Bai, Sang-Chul; and Park, Joon-Sang, 5,595,072, Cl. 68-133.000.
Kim, Chun-Sup, 5,596,422, Cl. 386-26.000.
Kim, Yoon S., 5,595,934, Cl. 437-180.000.
Lim, Sang-il, 5,596,552, Cl. 368-47.000.
Strolle, Christopher H.; Limberg, Allen L.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., 5,596,418, Cl. 386-9.000.
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Olson, Kurt G.; Sandala, Michael G.; Zawacky, Steven R.; Kahle, Charles F., II; and Nakajima, Masayuki, 5,595,859, Cl. 430-325.000.
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Ikeda, Susumu; Isobe, Toshimi; Tajiri, Akihiro; Takagi, Masahiro; Ishikawa, Mitsuru; Sakuma, Choji; and Yuri, Nobuyuki, 5,595,064, Cl. 62-126.000.
Sanders, Lambert: *See*—
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Sanderson, George R.; Ortega, Dave; and Sifferman, Tom, to Monsanto Company. Alginate gels. 5,596,084, Cl. 536-3.000.
Sanderson, George R.: *See*—
Chalupa, William F.; and Sanderson, George R., 5,595,777, Cl. 426-305.000.
Sanderson, Ronald D., to Water Research Commission. Water purification device. 5,595,662, Cl. 210-640.000.
Sandia Corporation: *See*—
Vaughn, Mark R.; Robinett, Rush D., III; Phelan, John R.; and Van Zuiden, Don M., 5,596,254, Cl. 318-568.110.
Sandifur, Karen V.: *See*—
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SanDisk Corporation: *See*—
Cernea, Raul-Adrian; Lee, Douglas J.; Mofidi, Mehrdad; and Mehrotra, Sanjay, 5,596,532, Cl. 365-185.180.
Yuan, Jack H.; and Samachisa, Gheorghe, 5,595,924, Cl. 437-43.000.
Sandler, Stanley D.: *See*—
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Sandoz Ltd.: *See*—
Dischö, Karoly, 5,596,036, Cl. 524-496.000.
Dong, Jie-Yi; Factor, David F.; Farzammehr, Hamid; and Sroka, Kenneth, 5,595,594, Cl. 106-661.000.
Malcher, Eric; and Zechner, Kurt, 5,595,175, Cl. 128-203.150.
Prashad, Mahavir; and Kapa, Prasad K., 5,596,094, Cl. 536-55.300.
Sanford, James R. M.; Frank, Patrick M.; Golias, Joseph H.; and Jennings, William C., to Helena Laboratories Corporation. Column analyzer system and improved chromatograph column for use in the system. 5,595,664, Cl. 210-656.000.
Sano, Hiroki; Sasaki, Taeyuki; and Kobayashi, Akira, to Toyo Seikan Kaisha, Ltd. Method of making a mold having a nickel and graphite surface coating for molding glass. 5,595,639, Cl. 205-109.000.
Sanofi: *See*—
Baroni, Marco; Croci, Tiziano; Landi, Marco; Guzzi, Umberto; and Nisato, Dino, 5,595,994, Cl. 514-275.000.
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,596,101, Cl. 546-346.000.
Sanshin Kogyo Kabushiki kaisha: *See*—
Hasegawa, Junichi; Iwata, Yoshibumi; and Sumigawa, Yukio, 5,595,515, Cl. 440-89.000.
Matsumoto, Naoto; and Fujimoto, Hiroaki, 5,595,516, Cl. 440-89.000.
Santa Barbara Research Center: *See*—
Romano, Timothy S.; Evans, Tom K.; Hughes, Gary B.; and Neumann, Karl H., 5,595,514, Cl. 439-886.000.
Santanera, Cesare: *See*—
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Sanwa Bank Limited, The: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.
Sanyo Chemical Industries, Ltd.: *See*—
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Sanyo Electric Co., Inc.: *See*—
Kobayashi, Mitsugu; Fujioka, Makoto; Tanioka, Atsuyoshi; Moriwaki, Kazuhiko; Shimizu, Makoto; and Uehara, Hisao, 5,596,349, Cl. 345-147.000.
Sanyo Electric Co., Ltd.: *See*—
Mino, Takayuki; and Kokuga, Toshiharu, 5,596,259, Cl. 320-21.000.
Sapienza, Joseph. Expandable electrical outlet box. 5,596,174, Cl. 174-57.000.
Sarao, Mary R.: *See*—
Pitts, Barbara R.; and Sarao, Mary R., 5,595,829, Cl. 428-537.500.
Sargis, Paul D.; Haigh, Ronald E.; and McCammon, Kent G., to University of California, The Regents of the. Subcarrier multiplexing with dispersion reduction and direct detection. 5,596,436, Cl. 359-132.000.
Sasahara, Kenji: *See*—
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Sasaki, Toyoshige: *See*—
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Sasaki, Yukio: *See*—
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Sasame, Hiroshi: *See*—
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Sasao, Yuko: *See*—
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Sassa, Atsushi; and Adachi, Masaru, to Hitachi Denshi Kabushiki Kaisha. Fading distortion compensation method and circuit. 5,596,608, Cl. 375-346.000.
Satake, Junko: *See*—
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Sato, Katsuhiro: *See*—
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Sato, Koichi: *See*—
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Sato, Masahiro; and Tada, Nobuhiro, to Hoechst Japan Limited. Methods of introducing foreign DNA into cells. 5,595,899, Cl. 435-172.300.
Sato, Nichitaka: *See*—
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Sato, Shigeru: *See*—
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Sato, Takashi: *See*—
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Suzuki, Yasuo; Sato, Takashi; and Akiyama, Jun, 5,594,992, Cl. 33-200.000.
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, 5,595,844, Cl. 430-5.000.
Sato, Toru; and Saito, Masafumi, to NEC Corporation; and Nippon Hoso Kyokai. AFC in OFDM modulation by shift of a window along a reception sample sequence. 5,596,582, Cl. 370-509.000.
Sato, Yasuo: *See*—
Tomioka, Yugo; Iwasa, Shoichi; Sato, Yasuo; Wada, Toshio; and Anzai, Kenji, 5,596,527, Cl. 365-185.200.
Sato, Yuji: *See*—
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Sato, Yukikazu: *See*—
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Satoh, Tomomi: *See*—
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Saviotti, Vanni: *See*—
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Sawada, Masaithi, to Ricoh Company, Ltd. Image forming apparatus and system for administering the same. 5,596,390, Cl. 399-8.000.
Sawada, Sosaku: *See*—
Kurashima, Hiromi; Takahashi, Hisato; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Sekiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, 5,596,665, Cl. 385-92.000.
Sawada, Takashi, to Sony Corporation. Locking assembly for a lid member of a tape cassette. 5,596,464, Cl. 360-132.000.
Sawada, Yoshikazu: *See*—
Tamura, Masaaki; Fujii, Ayako; Kobari, Yoshiko; Nagano, Mamoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, 5,596,689, Cl. 395-133.000.
Sawai, Ken: *See*—
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Sawamura, Tadahide; Tawada, Takaaki; and Itoh, Fumihito, to Ricoh Company, Ltd. Image forming apparatus and its control system having a single device for moving a charging member and a transfer member. 5,596,395, Cl. 399-168.000.
Scaccia, David M. Umbrella tear prevention and repair device. 5,595,202, Cl. 135-33.600.
Scania CV Aktiebolag: *See*—
Hedström, Lars-Gunnar; Andersson, Roger; Söderman, Göran; and Gustavsson, Torbjörn, 5,595,551, Cl. 477-109.000.
Schaefer, Allan L.: *See*—
Tong, Alan K.; Jones, Stephen D. M.; and Schaefer, Allan L., 5,595,444, Cl. 374-45.000.
Schäfer, Werner; and Schaut, Gerhard, to Firma Carl Freudenberg. Flame penetration blocker for fuselages. 5,595,817, Cl. 428-283.000.
Schaffer, Mark: *See*—
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Schaper, Wolfgang: *See*—
Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Knauf, Werner; Sachse, Burkhard; Waltersdorfer, Anna; Kern, Manfred; Lämmlen, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.
Scharton, Terry D.: *See*—
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Schaut, Gerhard: *See*—
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Scheffelin, Joseph E.: *See*—
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Scherf, Thomas W., to Aluminum Company of America. Apparatus for calibrating hollow nonsymmetrical multiplane extrusions and associated method. 5,595,086, Cl. 72-353.400.
Scherger, David F.: *See*—
Brown, Douglas S.; Scherger, David F.; Heilman, George C.; and Brown, Robert B., 5,595,324, Cl. 222-1.000.
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Garfield, Robert E.; Chwalisz, Krzysztof; Bukowski, Radoslaw; and Yallampalli, Chandra, 5,595,970, Cl. 514-12.000.
Gries, Heinz; Rosenberg, Douwe; Weinmann, Hanns-Joachim; Speck, Ulrich; Mützel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Rennecke, Franz-Josef, 5,595,725, Cl. 424-9.340.
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Culpepper, Janice; McKenzie, Andrew; Dang, Warren; and Zurawski, Gerard, 5,596,072, Cl. 530-351.000.
Li, Michael Hsin-Chwen; Tikku, Hari K.; and Steinman, Marc, 5,595,661, Cl. 210-634.000.
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Scheufler, Mathias, to Zinser Textilmaschinen GmbH. Ring-spinning machine or ring-twisting machine with ring-rail lifter brackets extending toward vertical center of gravity plane. 5,595,056, Cl. 57-75.000.
Schickedanz, Karl-Heinz, to MAN Roland Druckmaschinen AG. Sheet feeder unit. 5,595,381, Cl. 271-12.000.
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Schlarb, Alois; Hofmann, Jürgen; Ohlig, Hilmar; Ittemann, Peter; and Fuerwerck, Karl-Peter, to BASF Aktiengesellschaft. Plastic material, and process for the preparation thereof. 5,595,696, Cl. 264-118.000.
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Schultz, Wolfgang: *See*—
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Schwegler, Günter: *See*—
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Scott, George L., III. Systems of injecting phenolic resin activator during subsurface fracture stimulation for enhanced oil recovery. 5,595,245, Cl. 166-250.100.
Scott, John W. Secure archery wrist strap. 5,595,167, Cl. 124-35.200.
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Wong, Chi-Huey; Kajimoto, Tetsuya; Liu, Kun-Chin; and Chen, Lihren, 5,596,005, Cl. 514-335.000.
Seagate Technology, Inc.: *See*—
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Searle, Jeffrey G.; Dean, Stuart J.; Chrystie, Peter J.; Broome, Keith R.; Cox, Christopher R.; and Westlake, Stephen J., to Northern Telecom Limited. Base station antenna arrangement. 5,596,329, Cl. 342-374.000.
Sears, John W.: *See*—
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Seki, Hiroyuki; Nishimoto, Yoshifumi; Tanaka, Hideki; Harada, Toshiaki; Kimura, Atsushi; Okamura, Yoshitaka; and Yamamoto, Shinji, to Canon Kabushiki Kaisha. Vibration wave driven linear-motor or printer. 5,596,241, Cl. 310-323.000.
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Selby, Theodore W.: Cox, Jerry G.; Bennett, Paul A.; and Cox, Rebecca S., to Saginaw Valley Institute of Materials, Inc., The. Clandestine sampling apparatus and method. 5,595,152, Cl. 123-196.00R.
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Seltzer, Michael D.; and Green, Robert B., to United States of America, Navy. Method of and apparatus for the continuous emissions monitoring of toxic airborne metals. 5,596,405, Cl. 356-316.000.
Selz, Mark E., to Kraft Foods, Inc. Process for preparing edge-to-edge assembled bacon slices. 5,595,776, Cl. 426-272.000.
Semiconductor Energy Laboratory Co., Inc.: *See*—
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Yamazaki, Shunpei, 5,596,206, Cl. 257-30.000.
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Senna, Randall. Toilet bowl arcade game. 5,595,387, Cl. 273-369.000.
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Seo, Keiji, to Brother Kogyo Kabushiki Kaisha. Stamp assembly and stamp unit including the stamp assembly and a perforation device. 5,595,112, Cl. 101-26.000.
Sepracor Inc.: *See*—
Aberg, A. K. Gunnar; McCullough, John R.; and Smith, Emil R., 5,595,997, Cl. 514-290.000.
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Seto, Kaoru: *See*—
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Sezginer, Abdurrahman, to Schlumberger Technology Corporation. Determining bound and unbound fluid volumes using nuclear magnetic resonance pulse sequences. 5,596,274, Cl. 324-303.000.
SGI-Prozesstechnik GmbH: *See*—
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SGS-Thomson Microelectronics, Inc.: *See*—
Chan, Tsiu C.; Bryant, Frank R.; Lu, Lun-Tseng; and Wei, Che-Chia, 5,595,935, Cl. 437-187.000.
McClure, David C.; and Teel, Thomas A., 5,596,297, Cl. 327-538.000.
SGS-Thomson Microelectronics Limited: *See*—
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SGS-Thomson Microelectronics S.A.: *See*—
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Sham, John C. K.; and Leung, Pan K., to Pentalpha Enterprises Ltd. Automatic power interrupting apparatus for an electric appliance. 5,595,672, Cl. 219-257.000.
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Nakayama, Junichiro; Nakajima, Junsaku; Takahashi, Akira; and Ohta, Kenji, 5,595,805, Cl. 428-64.300.
Tsubota, Kojiro; Pujioka, Kazuyoshi; Takafuji, Yutaka; Kurokawa, Tsuyoshi; and Tanaka, Fumio, 5,596,023, Cl. 522-100.000.
Yamada, Kazuo; Tanaka, Hideaki; Mitate, Takehito; and Yoshikawa, Masaharu, 5,595,838, Cl. 429-209.000.
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Shelton, Winston L., to Carton Drive Enterprises. Food storage device with dehumidification means. 5,595,109, Cl. 99-476.000.
Shen, Hwa N.; Premerlani, William J.; and Blaha, Michael R., to General Electric Company. Method for transforming relational data base schemas into object models using ideal table meta models. 5,596,746, Cl. 395-612.000.
Shenker, Martin: *See*—
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Shepard, John S., to John S. Shepard, D.D.S., P.C. Dental recording device, articulator and methods. 5,595,485, Cl. 433-58.000.
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Sheu, Jin-Yuh. Fast assembled oil-collecting through and clip ring structure. 5,595,108, Cl. 99-425.000.
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Shibata, Hideaki; and Honjo, Masahiro, to Matsushita Electric Industrial Co., Ltd. Optical disk recorder for video signals and an optical disk for use therein. 5,596,421, Cl. 386-126.000.
Shibata, Ryoichi; and Watanabe, Rikizou, to Hitachi Metals, Ltd. High toughness and high strength aluminum alloy casting. 5,595,615, Cl. 148-440.000.
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Shiga, Nobuo: *See*—
Kurashima, Hiromi; Takahashi, Hisato; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Sekiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, 5,596,665, Cl. 385-92.000.

Shigematsu, Yasuyuki; Ohashi, Toyoshi; Hayashi, Mariko; and Suzuki, Shinichi, to Mitsubishi Chemical Corporation. Phthalocyanine mixed crystal, production method thereof,and electrophotographic photoreceptor. 5,595,846, Cl. 430-58.000.

Shih, Ching-Li: *See*—
Thi, Wen-Kuang; and Shih, Ching-Li, 5,595,605, Cl. 118-715.000.

Shih, Shiu F. Foldable toilet seat cover. 5,594,957, Cl. 4-242.100.

Shiina, Akito: *See*—
Maeda, Hisao; Matsushima, Yoshitake; Nakamura, Morifusa; Shiina, Akito; Hirahara, Mikio; Arimi, Yukio; and Kojima, Yoshihiko, 5,595,610, Cl. 148-233.000.

Shillito, Raymond D.: *See*—
Horn, Michael E.; Harms, Christian T.; and Shillito, Raymond D., 5,596,131, Cl. 800-205.000.

Shimabukuro, Kenji, to Yugen Kaisha Okinawa Yukali Farm. Eucalyptus tea. 5,595,779, Cl. 426-597.000.

Shimada, Takeichi; and Ushiroji, Takahiko, to Konica Corporation. Image forming apparatus provided with a heat pipe which has a center located on the sheet passage reference side with respect to the center of the heat roller. 5,596,397, Cl. 399-335.000.

Shimadzu Corporation: *See*—
Mito, Yasuhiro; and Minegishi, Hideki, 5,596,135, Cl. 73-23.350.
Waki, Hiroaki, 5,596,192, Cl. 250-288.000.

Shimamura, Tetsuro: *See*—
Tsuru, Yoshikazu; Itamochi, Sinji; Ohishi, Junji; Shimamura, Tetsuro; and Tahara, Hirobi, 5,596,243, Cl. 310-348.000.

Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takaoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, to Hitachi, Ltd.; and Sanwa Bank Limited, The. Highly reliable online system. 5,596,706, Cl. 395-182.040.

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Hakuda, Koumei; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Isaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Shimizu, Makoto: *See*—
Kobayashi, Mitsugu; Fujioka, Makoto; Tanioka, Atsuyoshi; Moriwaki, Kazuhiko; Shimizu, Makoto; and Uehara, Hisao, 5,596,349, Cl. 345-147.000.

Shimizu, Takaaki; Kinsho, Takeshi; Ogihara, Tsutomu; Kaneko, Tatsushi; Nakashima, Mutsuo; and Kurihara, Hideshi, to Shin-Etsu Chemical Co., Ltd. Silacyclohexane compounds, a liquid crystal composition comprising the same and a liquid crystal device comprising the composition. 5,595,686, Cl. 252-299.610.

Shimizu, Takatoshi: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takaoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Shimizu, Yasuo; Hironaka, Shinzi; Mukai, Yoshinobu; and Yamawaki, Shigeru, to Honda Giken Kogyo Kabushiki Kaisha. Electrically operated power steering apparatus for assisting manual steering operation in a motor vehicle. 5,596,252, Cl. 318-432.000.

Shimoda, Masakazu; Iimura, Haruo; Takahashi, Hiroyuki; and Matsumoto, Fuyuhiko, to Ricoh Company, Ltd. Organosilicon compound, producing method thereof and toner and dry-type developer using the same. 5,595,852, Cl. 430-110.000.

Shimogori, Kotaro: *See*—
Paik, Harry S.; and Shimogori, Kotaro, 5,595,300, Cl. 206-449.000.

Shimoyashiro, Sadao: *See*—
Tsuyama, Tsutomu; Sato, Shigeru; Tsunekawa, Kayo; Shimoyashiro, Sadao; Harada, Toshimasa; Higano, Koichi; Numiki, Toshio; Yamaguchi, Chikaaki; and Morito, Mitsuzo, 5,596,712, Cl. 395-183.020.

Shin A Sports Co., Ltd.: *See*—
Oh, Cheol S., 5,595,352, Cl. 242-233.000.

Shin-Etsu Bio, Inc.: *See*—
Murofushi, Kanji; Homma, Taira; Nagura, Shigehiro; and Armentrout, Richard W., 5,595,892, Cl. 435-104.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Murofushi, Kanji; Homma, Taira; Nagura, Shigehiro; and Armentrout, Richard W., 5,595,892, Cl. 435-104.000.
Shimizu, Takaaki; Kinsho, Takeshi; Ogihara, Tsutomu; Kaneko, Tatsushi; Nakashima, Mutsuo; and Kurihara, Hideshi, 5,595,686, Cl. 252-299.610.

Shin-Etsu Handotai Co., Ltd.: *See*—
Kobayashi, Shuichi; Kobayashi, Masayuki; Yuri, Tsutomu; Serizawa, Yoshichi; Akimoto, Mamoru; and Okoshi, Shinichi, 5,595,604, Cl. 118-715.000.
Kudo, Hideo; and Uchiyama, Isao, 5,595,412, Cl. 294-87.100.

Shinomiya, Kazuhiro: *See*—
Matsumoto, Tetsuya; Shinomiya, Kazuhiro; Tanaka, Masaaki; and Torii, Mikio, 5,595,160, Cl. 123-456.000.

Shinozaki, Tetsunori: *See*—
Yamada, Masaya; Toriumi, Michio; Shinozaki, Tetsunori; and Kioka, Mamoru, 5,595,827, Cl. 428-516.000.

Shinpo, Kaoru: *See*—
Ito, Hiroshi; Shinpo, Kaoru; and Kiritani, Yasuharu, 5,595,754, Cl. 424-443.000.

Shinsky, Michael. Harness release device for water skiing. 5,595,136, Cl. 114-253.000.

Shiozaki, Shiyuzo: *See*—
Sukegawa, Shunichi; Shiozaki, Shiyuzo; Matsuura, Hiromi; and Muranaka, Masaya, 5,596,537, Cl. 365-201.000.

Shirasu, Toshiyuki: *See*—
Ozaki, Yoshio; Shirasu, Toshiyuki; and Saito, Etsuro, 5,596,380, Cl. 352-30.000.

Shirota, Riichiro: *See*—
Endoh, Tetsuo; and Shirota, Riichiro, 5,596,523, Cl. 365-182.000.

Shkolnik, Nikolay; Kantor, Baruch; and Joaquim, Domingos, to Hasbro, Inc. Pivot assembly. 5,594,976, Cl. 16-380.000.

Shoop, Wesley; Outlind, Dan A.; and Michael, Bruce F., to Merck & Co., Inc. Anthelmintic use of nodulisporic acid and analogs thereof. 5,595,991, Cl. 514-233.200.

Shore, Terrence M., to Morgan Construction Company. Modular rolling mill. 5,595,083, Cl. 72-249.000.

Short, Glenn D.; Sjöholm, Lars I.; and Rajewski, Thomas E., to CPI Engineering Services, Inc. Lubricant composition for ammonia refrigerants used in compression refrigeration systems. 5,595,678, Cl. 252-68.000.

Showa Denko K.K.: *See*—
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.

Showa Electric Wire & Cable: *See*—
Hukuda, Koumei; Takuma, Kenji; Kuriyama, Minori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Isaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.

Showalter, Wayne A.: *See*—
Copeland, Keith G.; Grogan, Thomas M.; Hassen, Charles; Humphreys, William R.; Lemme, Charles D.; Miller, Phillip C.; Richards, William L.; and Showalter, Wayne A., 5,595,707, Cl. 422-64.000.

Shu, David B., to Hughes Aircraft Company. Compression/reduction method for extracting iconic/symbolic information from an image array. 5,596,660, Cl. 382-302.000.

Shyuto, Yoichi: *See*—
Takahashi, Shuji; Yasadori, Kazuhito; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Sibi, Mukund P.; Boudjouk, Philip; and Ji, Jianguo, to North Dakota State University. Method for preparation of carboxylic acids. 5,596,111, Cl. 554-138.000.

Siebrecht, Manfred: *See*—
Hammer, Klaus-Dieter; Siebrecht, Manfred; and Kramm, Theo, 5,595,796, Cl. 428-34.800.

Siecor Corporation: *See*—
Muller, Mark W., 5,595,504, Cl. 439-521.000.

Siemens Aktiengesellschaft: *See*—
Bichler, Helmut; Herfurth, Michael; Feldtkeller, Martin; and Lenz, Michael, 5,596,264, Cl. 323-284.000.
Dietrich, Werner; and Jenkner, Christian, 5,596,300, Cl. 331-17.000.
Glas, Brigitte; Kolb, Dieter; and Radlhammer, Markus, 5,596,751, Cl. 395-676.000.
Hierold, Christofer, 5,596,219, Cl. 257-467.000.
Kirch, Johannes; and Leuschner, Hans, 5,596,476, Cl. 361-127.000.
Roehl, Wolfgang, 5,596,472, Cl. 361-93.000.
Schwarz, Raimund; and Weller, Thomas, 5,596,621, Cl. 378-130.000.
Thies, Werner, 5,596,148, Cl. 73-720.000.
Urbigkeit, Frank, 5,596,470, Cl. 361-91.000.
Wille-Fier, Regina; and Cutler, John W., 5,596,572, Cl. 370-360.000.
Wolf, Andreas; and Ahrweiler, Hans W., 5,596,617, Cl. 377-73.000.

Siemens Electric Limited: *See*—
Powell, Jeffrey J.; Price, Tony A.; and Whaley, Lisa, 5,595,151, Cl. 123-184.610.

Siemens Energy & Automation, Inc.: *See*—
Zavis, Wayne M.; Mitzener, Jeffery C.; Honochick, James J.; Bellin, Michael A.; and Laplace, Carl J., 5,596,263, Cl. 323-255.000.

Sies, Duane J.: *See*—
Cummins, Brad L.; Erickson, Timothy K.; O'Brien, Gary R.; Sheriff, Alan V.; and Sies, Duane J., 5,596,408, Cl. 356-339.000.

Siew, Seok H.; and Chen, Roger C. T. Air guiding device. 5,595,157, Cl. 123-306.000.

Sifferman, Tom: *See*—
Sanderson, George R.; Ortega, Dave; and Sifferman, Tom, 5,596,084, Cl. 536-3.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Gobbini, Mauro; and Torri, Marco, 5,596,110, Cl. 552-610.000.

Sigsorino, Charles A.; and Meggos, Harry, to Warner-Jenkinson Company, Inc. Dye compositions and methods for film coating tablets and the like. 5,595,592, Cl. 106-198.100.

Silcia, Vinod K.; Deevi, Seetharama C.; Fleischhauer, Grier S.; Hajaligol, Mohammad R.; and Lilly, A. Clifton, Jr., to Philip Morris Incorporated. Aluminum containing iron-base alloys useful as electrical resistance heating elements. 5,595,706, Cl. 420-81.000.

Silent Systems, Inc.: *See*—
Wyler, Gregory T., 5,596,483, Cl. 361-683.000.

Silicon Engines, Inc.: *See*—
Duluk, Jerome F., Jr., 5,596,686, Cl. 395-122.000.

Siliconix incorporated: *See*—
Wrathall, Robert S.; and Franck, Steven J., 5,596,265, Cl. 323-315.000.

Silknitter, JoAnn: *See*—
Belding, Blaine Q.; Silknitter, JoAnn; Stevenson, Kevin B.; and Stovold, Terry W., 5,595,590, Cl. 106-21.00A.

Silver, Richard S.; and Hasenhuettl, Gerard L., to Kraft Foods, Inc. Method for preparing polyol fatty acid polyesters by transesterification. 5,596,085, Cl. 536-18.600.

Silversides, David W.; Duneau, Isabelle M.; and Houde, Alain, to Universite De Montreal. Oligonucleotide probe and primers specific to bovine or porcine male genomic DNA. 5,596,089, Cl. 536-24.300.

Simmons, Laura B.; and Thomsen, Joseph A., to VLSI Technology, Inc. Status register with asynchronous read and reset and method for providing same. 5,596,288, Cl. 327-12.000.

Simon, James F., to Raytheon Company. Chip carrier structure. 5,596,229, Cl. 257-727.000.

Simple Technology, Inc.: *See*—
Smith, Mark L., 5,596,757, Cl. 395-750.000.

Simpson, Richard: *See*—
Gattag, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,596,763, Cl. 395-800.000.

Simpson Strong-Tie Company, Inc.: *See*—
Commins, Alfred D., 5,595,031, Cl. 52-264.000.

Simpson, Vikki S.; Gullett, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bilderback, Douglas W.; and King, Clyde A., to Texas Instruments Incorporated. Semiconductor wafer edge polishing system and method. 5,595,522, Cl. 451-5.000.

Singleton, Bruce: *See*—
Kant, Wayne D.; and Singleton, Bruce, 5,595,910, Cl. 435-289.100.

Sinn, Scott G.: *See*—
Faletti, James J.; Feucht, Dennis D.; and Sinn, Scott G., 5,595,158, Cl. 123-321.000.

Sir Industriale S.p.A.: *See*—
Adembri, Andrea; Credali, Lino; and Di Drusco, Giovanni, 5,596,021, Cl. 521-99.000.

Sirovich, Lawrence; Levich, Evgene; and Bronicki, Lucien Y., to Orlev Scientific Computing Ltd. Method of and apparatus for controlling turbulence in boundary layer and other wall-bounded fluid flow fields. 5,595,205, Cl. 137-13.000.

Sista, V. S. Lalitha: *See*—
Alla, Venkata R. R.; Mukund, K. Gurjar; and Sista, V. S. Lalitha, 5,596,087, Cl. 536-22.100.

Sivavec, Timothy M., to General Electric Company. Method for recovery of volatile organic compounds. 5,595,586, Cl. 95-143.000.

Sivik, Mark R.: *See*—
Miracle, Gregory S.; Sivik, Mark R.; and Kellett, Patti J., 5,595,967, Cl. 510-372.000.

Sjöholm, Lars I.: *See*—
Short, Glenn D.; Sjöholm, Lars I.; and Rajewski, Thomas E., 5,595,678, Cl. 252-68.000.

Skees, Hugh B., to Standard Register Company, The. Mailer intermediate or business form. 5,595,404, Cl. 283-116.000.

Skinner, Edward A., to Ekopak Systems A.G. Packaging. 5,595,340, Cl. 229-216.000.

Skoldback, Jan-Ake: *See*—
Andersson, Lars H. H.; and Skoldback, Jan-Ake, 5,596,078, Cl. 530-315.000.

Stark, Andrew T.; Jarvis, David W.; and Kawamura, Akihiro. Thermal transfer printing dye sheet. 5,595,956, Cl. 503-227.000.

Slepian, Neil R.; Kirk, Michael P.; and Hamill, Joseph, to Hyde Athletic Industries, Inc. Stabilizing grid wedge system for providing motion control and cushioning. 5,595,002, Cl. 36-27.000.

SMC Corporation: *See*—
Kushiya, Toru, 5,595,210, Cl. 137-181.000.

Smierciak, Richard C.; Wardlow, Eddie, Jr.; and Ball, Lawrence E., to Standard Oil Company, The. Process for making an acrylonitrile/methacrylonitrile copolymer. 5,596,058, Cl. 526-342.000.

Smilowitz, Elissa D.: *See*—
Darnell, Michael J.; and Smilowitz, Elissa D., 5,596,700, Cl. 395-340.000.

Smith, Craig M.: *See*—
Coerweshoven, Douglas W.; Gandhi, Bhavan R.; and Smith, Craig M., 5,596,602, Cl. 375-240.000.

Smith, Dennis E.: *See*—
Fant, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., 5,595,862, Cl. 430-537.000.

Smith, Emil R.: *See*—
Aberg, A. K. Gunnar; McCullough, John R.; and Smith, Emil R., 5,595,997, Cl. 514-290.000.

Smith, Gordon J., to International Business Machines Corporation. Data storage disk clamp apparatus for minimizing disk clamping force and surface area. 5,596,462, Cl. 360-99.120.

Smith, G. Richard, to S.C.M.D., Ltd. Keratome with spring loaded adjustable plate, cutting length adjustment plate, method of cutting a corneal flap, and gauge-mounted bracket for adjusting plate on keratome head. 5,595,570, Cl. 606-166.000.

Smith, James R.; and Kay, Brian K. Mimetics of senescent cell derived inhibitors of DNA synthesis. 5,596,079, Cl. 530-328.000.

Smith, Mark L., to Simple Technology, Inc. System and method for selectively providing termination power to a SCSI bus terminator from a host device. 5,596,757, Cl. 395-750.000.

Smith, Neil: *See*—
Johnson, Graham; Smith, Neil; Geen, Graham R.; Mann, Inderjit S.; and Novack, Vance, 5,596,103, Cl. 548-253.000.

Smith, Richard: *See*—
Hogan, James; and Smith, Richard, 5,595,874, Cl. 435-6.000.

Smith, Samuel H.: *See*—
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,596,347, Cl. 345-145.000.

Smith, Stephen L. Support for boat oars. 5,595,517, Cl. 440-104.000.

Smith, Steven M.: *See*—
Leone, Anthony J.; Szczepanski, Jeffrey R.; and Smith, Steven M., 5,596,346, Cl. 345-127.000.

Smith, Terry M., to Space Systems/Loral, Inc. Multifunction antenna assembly. 5,596,338, Cl. 343-786.000.

Smith, Thomas B.: *See*—
Dechene, Ronald L.; Smith, Thomas B.; Marino, Scott A.; Tache, Ronald J.; and Roy, Ajoy K., 5,596,275, Cl. 324-307.000.

Smith, William A. Rotary engine. 5,595,154, Cl. 123-222.000.

SmithKline Beecham Corporation: *See*—
Adusumilli, Prasad S.; and James, Kenneth W., 5,595,758, Cl. 424-456.000.
Baine, Neil H.; Holder, Neville L.; Klein, Donald N.; Webb, Robert L.; and Zuber, Gary E., 5,596,109, Cl. 552-610.000.

SmithKline Beecham Plc: *See*—
Johnson, Graham; Smith, Neil; Geen, Graham R.; Mann, Inderjit S.; and Novack, Vance, 5,596,103, Cl. 548-253.000.

Smushkovich, Yosif: *See*—
Pakhchyan, Eduard; and Smushkovich, Yosif, 5,596,371, Cl. 348-452.000.

Snap-on Technologies, Inc.: *See*—
Pusateri, Daniel S., 5,595,099, Cl. 81-177.850.

Snider, Chris R., to Delco Electronics Corporation. Pushbutton controller with backlit display and switch means. 5,596,343, Cl. 345-102.000.

Snow, A. Ray. Athletic shoe with a force responsive sole. 5,595,003, Cl. 36-28.000.

Snyder, David, deceased (by Nancy Snyder, legal representative.): *See*—
Vakharia, Vikram; Snyder, David, deceased, 5,595,912, Cl. 435-320.100.

Snyder, Nancy, legal repreeasatative.: *See*—
Vakharia, Vikram; Snyder, David, deceased, 5,595,912, Cl. 435-320.100.

Snyder, Ronald D., to Merrell Pharmaceuticals Inc. Method of treating a neoplastic disease state by conjunctive therapy with 2'-fluoromethylidene derivatives and radiation or chemotherapy. 5,595,979, Cl. 514-49.000.

Societe d'Applications Generales d'Electricite et de Mecanique SAGEM: *See*—
Frederic, Alain, 5,596,359, Cl. 347-188.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lefumeux, Alain, 5,596,232, Cl. 264-3.200.

Societe Nationale D'Etude et de Construction de Moteurs D'Aviation S.N.E.C.M.A.: *See*—
Claret, Pierre J. E., 5,595,138, Cl. 116-268.000.

Söderman, Göran: *See*—
Hedström, Lars-Gunnar; Andersson, Roger; Söderman, Göran; and Gustavsson, Torbjörn, 5,595,551, Cl. 477-109.000.

Sofab: *See*—
Bougamont, Jean-Louis; and Peronnet, Stanislas, 5,595,326, Cl. 222-321.700.

Sogame, Shingo; and Kimura, Masatsugu, to Mitsubishi Chemical Corporation. Coking process for a battery of coke ovens. 5,595,633, Cl. 201-1.000.

Sogge, John W.: *See*—
Elliott, Steven A.; Froelich, Ronald W.; and Sogge, John W., 5,595,121, Cl. 104-53.000.

Sohzohkagaku Co., Ltd.: *See*—
Hayashi, Tomoyuki; Tatsumi, Yoshiaki; and Miyashita, Kinya, 5,595,704, Cl. 264-404.000.

Soleimani, Hamid R.; Doyle, Brian; and Philipossian, Ara, to Digital Equipment Corporation. Hot carrier-hard gate oxides by nitrogen implantation before gate oxidation. 5,596,218, Cl. 257-369.000.

Solheim, John A.: *See*—
Wright, David E.; Solheim, John A.; and Kubica, Daniel J., 5,595,552, Cl. 473-332.000.

Soliman, Samir S., to Qualcomm Incorporated. System and method for simulating interference received by subscriber units in a spread spectrum communication network. 5,596,570, Cl. 370-252.000.

Sollo, Robert E. Hand guard for locking pliers. 5,595,100, Cl. 81-427.000.

Solomon, Charlene; and Copeland, Karin. Hair container. 5,595,199, Cl. 132-273.000.

Solomon, Larry R.: *See*—
Carman, William F.; Decker, Richard H.; Wallace, Lesley; Mimms, Larry T.; and Solomon, Larry R., 5,595,739, Cl. 424-189.100.

Solomon, Merrill; Kimball, John; and Goldstein, Dana L., to Telephone Connection, The. Call screening method using selective call acceptance. 5,596,627, Cl. 379-67.000.

Solvay (Société Anonyme): *See*—
Brasseleers, Joseph; and Claes, Jan, 5,594,973, Cl. 15-304.000.

Sommers, Jay R., to Kimberly-Clark Corporation. Surgical gown sleeve. 5,594,955, Cl. 2-114.000.

Sommers, Sonja. Muzzle flash suppressor. 5,596,161, Cl. 89-14.200.
Sone, Akira: *See*—
Nobutoki, Yoshitozzu; Hideshima, Masao; Satomura, Shigeyuki; and Sone, Akira, 5,596,588, Cl. 371-32.000.
Sonnewald, Ursula: *See*—
Andersen, Knud E.; Olsen, Ulle B.; Petersen, Hans; Gyarvald, Frederik; Sonnewald, Ursula; Jørgensen, Tine K.; and Andersen, Henrik S., 5,595,989, Cl. 514-217.000.
Sonntag, Jeffrey L.: *See*—
Mastrocola, Angelo R.; and Sonntag, Jeffrey L., 5,596,302, Cl. 331-57.000.
Sonus Pharmaceuticals: *See*—
Quay, Steven C., 5,595,723, Cl. 424-9.500.
Sony Cinema Products Corporation: *See*—
Ozaki, Yoshio; Shirasu, Toshiyuki; and Saito, Etsuro, 5,596,380, Cl. 352-30.000.
Sony Corporation: *See*—
Arataki, Yuji; Masuda, Shozo; Kabasawa, Kenichi; and Kadono, Toru, 5,596,558, Cl. 369-53.000.
Bhandari, Rajen; and Gilliard, Clive H., 5,596,674, Cl. 395-2.100.
Jelinek, Vaclav, 5,595,241, Cl. 165-80.100.
Kamota, Keiji; Kubota, Yukio; and Seki, Takahashi, 5,596,457, Cl. 360-48.000.
Matsumoto, Yoshinori, 5,596,557, Cl. 369-44.320.
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Sawada, Takashi, 5,596,464, Cl. 360-132.000.
Suzuki, Yuji, 5,596,484, Cl. 361-685.000.
Taki, Yoshitsugu, 5,596,566, Cl. 369-291.000.
White, Gail K.; Noguchi, Fujio; Akaike, Kazuhiko; and Schaffer, Mark, 5,596,373, Cl. 348-569.000.
Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, 5,596,565, Cl. 369-275.300.
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Toyoguchi, Tsutomu, 5,596,561, Cl. 369-77.100.
Sony Electronics, Inc.: *See*—
White, Gail K.; Noguchi, Fujio; Akaike, Kazuhiko; and Schaffer, Mark, 5,596,373, Cl. 348-569.000.
Sony United Kingdom Limited: *See*—
Bhandari, Rajen; and Gilliard, Clive H., 5,596,674, Cl. 395-2.100.
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Nabeshima, Takeshige; Kato, Katsuhisa; and Hidaka, Toshiaki, 5,596,309, Cl. 338-61.000.
Sood, Anup; and Spielvogel, Bernard F., to Boron Biologicals, Inc. Detection of biopolymers and biooligomers with boron hydride labels. 5,595,878, Cl. 435-6.000.
Soreq, Hermona; and Hasin, Zakut, to Hebrew University of Jerusalem, Yissum Research Development Co. of the. Genetically engineered human acetylcholinesterase. 5,595,903, Cl. 435-240.200.
Soria Vega, Sergio, to Greene, Tweed of Delaware, Inc. Ball valve having one-piece machined seat member. 5,595,206, Cl. 137-15.000.
Soshi, Isao: *See*—
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,596,383, Cl. 396-315.000.
Sotherm, Martin W.: *See*—
Jones, Anthony M.; Dewar, Kevin D.; and Sotherm, Martin W., 5,596,517, Cl. 364-725.000.
Souers, Dennis C.: *See*—
Houpt, Ronald A.; and Souers, Dennis C., 5,595,766, Cl. 425-8.000.
Southern California Gas Company: *See*—
Jiles, Stephen L., 5,595,207, Cl. 137-38.000.
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Straeter, William F., 5,595,298, Cl. 206-423.000.
Weder, Donald E., 5,595,022, Cl. 47-72.000.
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Smith, Terry M., 5,596,338, Cl. 343-786.000.
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Speers, Dan E. Segmented air deflector assembly. 5,595,419, Cl. 296-180.200.
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Peterson, Graeme S.; Bliss, Gary L.; and Boyd, Mark R., 5,596,638, Cl. 379-430.000.
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Cossa, Joseph V.; and Day, Lawrence O., 5,595,529, Cl. 451-291.000.
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Massaro, Michael R., Jr.; Holland, Robert H.; and Spess, William J., 5,595,350, Cl. 241-65.000.
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Sood, Anup; and Spielvogel, Bernard F., 5,595,878, Cl. 435-6.000.
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Caporiccio, Gerardo; and Spikes, Hugh A., 5,595,962, Cl. 508-206.000.
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Haresh, James; and Oberg, Tim, 5,595,346, Cl. 239-431.000.
Spry, Willie L. Vehicle remote control system. 5,596,319, Cl. 340-903.000.
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Barr, Neal, 5,595,645, Cl. 205-771.000.
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Chow, Yen-Lu; and Staats, Erik P., 5,596,680, Cl. 395-257.000.
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Smierciak, Richard C.; Wardlow, Eddie, Jr.; and Ball, Lawrence E., 5,596,058, Cl. 526-342.000.
Standard Register Company, The: *See*—
Skees, Hugh B., 5,595,404, Cl. 283-116.000.
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Stanton, Stuart; White, Donald L.; and Zipfel, George G., Jr., to Lucent Technologies Inc. Sub-micron through-the-lens positioning utilizing out of phase segmented gratings. 5,596,413, Cl. 356-401.000.
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Staples, Paul R.: *See*—
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Stapleton, Jeffrey, to Calcomp Inc. Ink level sensing on a pen carriage in a pen plotter. 5,596,351, Cl. 347-7.000.
Starace, Jeromia P.: *See*—
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Stark, Thomas S.; and Gretz, Thomas J., to Arlington Industries, Inc. Bushing for multiple sized and shaped holes in structural members. 5,596,177, Cl. 174-153.00R.
Starace, Gary D. Surgical instrument cleaning device. 5,595,344, Cl. 239-307.000.
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Schilling, Peter; and Starr, Fredricke S., 5,596,032, Cl. 524-60.000.
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Dressel, Jürgen; Fey, Peter; Hanko, Rudolf; Hubsch, Walter; Kramer, Thomas; Müller, Ulrich E.; Müller-Gliemann, Matthias; Benck, Martin; Kazda, Stanislav; Wohlfeil, Stefan; Knorr, Andreas; Staudt, Johannes-Peter; and Zaiss, Siegfried, 5,596,006, Cl. 514-340.000.
Staudenmayer, William J.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vroeland, William B., II; Perrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,595,823, Cl. 428-421.000.
Steed, Victor O. Apparatus for treating air with electrically charged and uncharged liquid sprays. 5,595,587, Cl. 96-27.000.
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Steinman, Marc: *See*—
Li, Michael Hsin-Chwen; Tiklu, Hari K.; and Steinman, Marc, 5,595,661, Cl. 210-634.000.
Steinmetz, Rudolf D.: *See*—
Fant, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., 5,595,862, Cl. 430-537.000.
Steinweg, Russell L.; Zampaglione, Michael A.; and Lin, Pei H., to VLSI Technology, Inc. Estimation of pin-to-pin timing for compiled blocks. 5,596,505, Cl. 364-490.000.
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Bystedt, Stig; Torestkog, Orvar; and Nordhammar, Henrik, 5,595,132, Cl. 114-61.000.
Step Loc Corporation: *See*—
Hoopengardner, Merle R., 5,595,041, Cl. 52-746.100.
Steris Corporation: *See*—
Wilson, Joseph H.; Haeberle, David C.; Kralovic, Raymond C.; Lancaster, Kenneth R.; Mennel, David B.; Rapp, Jeffrey C.; Schwartz, Lewis I.; and Antloga, Kathleen M., 5,595,711, Cl. 422-119.000.
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Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; Subramanyam, Chakrapani; Latimer, Lee H.; and Lodge, Eric P., 5,596,012, Cl. 514-373.000.
Stern, Robert. Swimming pool cover with drainage and filter. 5,594,960, Cl. 4-498.000.
Sternes, Roy; and Rutledge, Mark A. Automatic holding device for gasoline pump handles. 5,595,367, Cl. 251-90.000.
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Stevenson, Kevin B.: *See*—
Belding, Blake Q.; Silknitter, JoAnn; Stevenson, Kevin B.; and Stovold, Terry W., 5,595,590, Cl. 106-21.00A.
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Douglas, Raymond W.; Stinger, Philip J.; Ng, Harold W.; and Lee, Terence N., 5,596,587, Cl. 371-27.000.
Stokoe, Philip T.: *See*—
Cohen, Thomas S.; and Stokoe, Philip T., 5,595,490, Cl. 439-74.000.
Stone, Maureen C.; and DeRose, Anthony, to Xerox Corporation. Method and apparatus for operating on an object-based model data structure to produce a second image in the spatial context of a first image. 5,596,690, Cl. 395-133.000.
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Zwanikken, Radboud H. G.; Laakhaar, Jenneke A. C.; and van den Nieuwelaar, Adrianus J., 5,595,066, Cl. 62-374.000.
Stout, Jay: *See*—
Coolidge, Thomas R.; Wagner, Fred; van Heeke, Gino; Schuster, Sheldon M.; Stout, Jay; and Wylie, Dwane E., 5,595,887, Cl. 435-69.700.
Stout, William A., Jr. Packaging material. 5,595,811, Cl. 428-181.000.
Stovold, Terry W.: *See*—
Belding, Blake Q.; Silknitter, JoAnn; Stevenson, Kevin B.; and Stovold, Terry W., 5,595,590, Cl. 106-21.00A.
Straeter, Joseph G.: *See*—
Weder, Donald E.; Straeter, William F.; Straeter, Joseph G.; Craig, Franklin J.; Donnelly, Wilma M.; and Reddit, Jack W., 5,595,802, Cl. 428-40.100.
Straeter, William F., to Southpac Trust International, Inc. Method and apparatus for providing a wrapper for a floral grouping having a flap for closing the upper end or the lower end of the wrapper. 5,595,298, Cl. 206-423.000.
Straeter, William F.: *See*—
Weder, Donald E.; and Straeter, William F., 5,595,045, Cl. 53-397.000.
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Ovshinsky, Stanford R.; Hudgens, Stephen J.; Strand, David; Czubatyj, Wolodymyr; Gonzalez-Hernandez, Jesus; Fritzsche, Hellmut; Ye, Quiyi; Kostylev, Sergey A.; and Chao, Benjamin S., 5,596,522, Cl. 365-113.000.
Strang, Clifford E., Jr., to Adaptec, Inc. Sequencer map for a hard disk controller combining data and next-addres fields. 5,596,737, Cl. 395-421.030.
Strate, Joachim: *See*—
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Streib, Martin: *See*—
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Dubriske, Paul C., 5,595,013, Cl. 43-19.200.
Stringfellow, Steve: *See*—
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Strolle, Christopher H.; Limberg, Allen L.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., to SamSung Electronics Co., Ltd. Deemphasis and subsequent reemphasis of high-energy reversed-spectrum components of a folded video signal. 5,596,418, Cl. 386-9.000.
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Michael, Wolfgang; Strommer, Kurt; and Hofele, Hans, 5,595,111, Cl. 100-207.000.
Strong, A. Brent; Merrell, R. Scott; and Lust, Barry M., to Brigham Young University. Method and apparatus for determining extent of cure in polymers. 5,596,268, Cl. 324-71.100.
Stubbs, Roy; Hughes, Michael J.; and Morris-Adams, James F., to Minnesota Mining and Manufacturing COmpany. Coated abrasives utilizing a moisture curable polyurethane hot melt make coating. 5,595,578, Cl. 51-295.000.
Stucka, Joan E.; and Wiss, Richard, to International Business Machines Corporation. Method and system for dynamically sharing user interface displays among a plurality of application programs. 5,596,702, Cl. 395-340.000.
Stucka, Mark A. Storm drainage underflow dam unit. 5,595,457, Cl. 405-87.000.
Sturla, Jean-Michel, to L'Oreal. Aqueous cosmetic composition for setting the hair based on the combination of hydrodispersible polycondensate and a hydrosoluble copolymer. 5,595,727, Cl. 424-47.000.
Sturla, Jean-Michel: *See*—
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Subramaniam, Raj, to Physiometrix, Inc. Hydrogel having a silicon-based crosslinker for biosensors and electrodes. 5,596,038, Cl. 524-547.000.
Subramanyam, Chakrapani: *See*—
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Suchanek, Jürgen: *See*—
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Suehiro, Natsumi: *See*—
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Sueper, David M.: *See*—
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Sugazuma, Ryoichi, to Nikon Corporation. Ultrasonic motor. 5,596,240, Cl. 310-323.000.
Sugata, Yoko: *See*—
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Sugawara, Akira: *See*—
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Sugibayashi, Tadahiko; Utsugi, Satoshi; and Naritake, Isao, to NEC Corporation. Semiconductor memory device having dual word line configuration. 5,596,542, Cl. 365-230.060.
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Sukegawa, Shunichi; Shiozaki, Shiyuzo; Matsuura, Hiromi; and Murasaka, Masaya, to Texas Instruments Incorporated; and Hitachi Ltd. Semiconductor device test circuit having test enable circuitry and test mode-entry circuitry. 5,596,537, Cl. 365-201.000.
Sukegawa, Shunichi: *See*—
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Sullivan, Daniel M.: *See*—
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Sullivan, John J. Weatherproof multiple padlock case, cover and method. 5,595,073, Cl. 70-18.000.
Sumi, Shinjiro: *See*—
Sakanaka, Osamu; Yasuda, Shouhei; Sumi, Shinjiro; Sebata, Katsufumi; Iimura, Katsuharu; and Nishihata, Ken, 5,596,096, Cl. 540-352.000.
Sumigawa, Yukio: *See*—
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Sumitomo Cement Co., Ltd.: *See*—
Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishinobachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, 5,595,599, Cl. 106-744.000.
Sumitomo Chemical Company, Limited: *See*—
Kunimi, Nobutaka; Ueda, Yasuyoshi; and Onura, Takashi, 5,596,083, Cl. 534-642.000.
Kuroda, Kazuyuki; Tanaka, Yasuyori; and Matsunaga, Tadahiro, 5,595,747, Cl. 424-405.000.
Nakane, Kenji; Nishida, Yasunori; Akamatsu, Chikashi; Satoh, Tomomi; Tanino, Kazuyuki; and Yamamoto, Taketsugu, 5,595,842, Cl. 429-223.000.
Sumitomo Electric Industries, Ltd.: *See*—
Fukaya, Tomohiro; and Nakai, Tetsuo, 5,596,156, Cl. 75-238.000.
Kurashima, Hiromi; Takahashi, Hisao; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Sekiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, 5,596,665, Cl. 385-92.000.

Sumitomo Rubber Industries, Ltd.: *See*—
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Sumitomo Special Metals Co.: *See*—
Nakagawa, Kazuo; Tsumoda, Makoto; Nakanobu, Atsushi; Nakanishi, Akio; and Furuse, Akira, 5,596,276, Cl. 324-316.000.
Sumitomo Special Metals Co., Ltd.: *See*—
Tsujimoto, Shinji; Mishima, Shin; Kawahara, Shigeru; Mohri, Shigeki; Sasaki, Toyoshige; Miyahara, Michito; and Nakano, Osamu, 5,595,946, Cl. 501-87.000.
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Sumitomo Wiring Systems, Ltd.: *See*—
Kondo, Kazumoto; and Hotta, Yoshihiko, 5,595,496, Cl. 439-271.000.
Okada, Hajime, 5,595,511, Cl. 439-762.000.
Tamura, Yoshikazu; Oono, Kengo; and Yamashiro, Toshikatsu, 5,594,980, Cl. 29-33.00M.
Sumiyoshi, Hajime; and Naunikawa, Takeshi, to Kabushiki Kaisha Toshiba. Television receiver that controls display contrast based on the type of videos being displayed. 5,596,374, Cl. 348-673.000.
Sumner, Michael B.: *See*—
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Sun Microsystems, Inc.: *See*—
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Sung, Gilbert: *See*—
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Sung, Hung-Cheng: *See*—
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Sunohara, Kazuyuki; Hasegawa, Rei; Nagata, Hiroyuki; Yamamoto, Takeshi; Yamamoto, Yasuhiro; and Okamoto, Masumi, to Kabushiki Kaisha Toshiba. Liquid crystal display device. 5,596,435, Cl. 349-132.000.
SunOptech, Ltd.: *See*—
Kotki, Robert E.; Henderson, Kenneth R.; and Barlow, Christopher R., 5,596,502, Cl. 364-468.010.
Super, John D.: *See*—
Bloxham, Peter A.; Breikss, Anne I.; Ernst, Richard E.; Scott, Leon S.; Super, John D.; and Verbsky, James D., 5,596,074, Cl. 528-417.000.
Surendran, Srinivasan: *See*—
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Suter, Robert: *See*—
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Suttles, J. Marshall: *See*—
Spencer, William S.; Suttles, J. Marshall; and Cooper, Elizabeth T., 5,595,310, Cl. 211-59.200.
Suyama, Kouichi, to Honda Giken Kogyo Kabushiki Kaisha. Charge-status display system for an electric vehicle. 5,596,261, Cl. 320-48.000.
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Suzuki, Atsuhiro: *See*—
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Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.
Suzuki, Ryuta, to Fuji Photo Film Co., Ltd. Nonaqueous secondary battery. 5,595,841, Cl. 429-217.000.
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Shigematsu, Yasuyuki; Ohashi, Toyoshi; Hayashi, Mariko; and Suzuki, Shinichi, 5,595,846, Cl. 430-58.000.
Suzuki, Shizu: *See*—
Murashige, Norio; Okamoto, Etsuro; and Suzuki, Shizu, 5,596,129, Cl. 562-414.000.
Suzuki, Shuseitsu: *See*—
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Suzuki, Toshinori: *See*—
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Suzuki, Toshio: *See*—
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Suzuki, Toshiro: *See*—
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Suzuki, Yasumichi: *See*—
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Suzuki, Yasuo; Sato, Takashi; and Akiyama, Jun, to Kabushiki Kaisha Topcon. Apparatus for measuring a lens frame configuration. 5,594,992, Cl. 33-200.000.
Suzuki, Yasutomo: *See*—
Yoshimura, Katsuji; Takahashi, Koji; and Suzuki, Yasutomo, 5,596,419, Cl. 386-52.000.
Suzuki, Yasuyuki: *See*—
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Suzuki, Yuji, to Sony Corporation. Mounting device for mounting a small electronic device in a space for a larger electronic device. 5,596,484, Cl. 361-685.000.
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Weber, Bret S., 5,596,708, Cl. 395-182.040.
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Weinshank, Richard L.; and Hartig, Paul R., 5,595,880, Cl. 435-7.210.
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Kennedy, Thomas A., 5,595,429, Cl. 312-235.200.
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Huang, Jenn M., 5,596,215, Cl. 257-344.000.
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Kurashima, Hiromi; Takahashi, Hisato; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Sekiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, 5,596,665, Cl. 385-92.000.
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Okada, Makoto; Takahashi, Masaki; Hosoi, Kaoru; and Nakajima, Shokichi, 5,595,986, Cl. 514-202.000.
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Tanaka, Yasuhiko; and Takahashi, Minoru, 5,596,384, Cl. 396-413.000.
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Ishii, Jun; and Takahashi, Shinya, 5,596,675, Cl. 395-2.200.
Takahashi, Shuji; Yanadori, Kazuhito; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, to Yokohama Rubber Co. Ltd., The; and Tokyo Rope Mfg. Co., Ltd. Conveyor belt. 5,595,284, Cl. 198-847.000.
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Katabami, Nobue; Itoh, Tadashi; and Takahashi, Yasutomo, 5,596,747, Cl. 395-612.000.
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Obmi, Tadahiro; and Inaba, Hitoshi, 5,596,478, Cl. 361-212.000.
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Fujisawa, Yukio; Kuroda, Shun'ichi; and Konishi, Hiroaki, 5,595,882, Cl. 435-7.210.
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Namekawa, Masaaki; Itoh, Keizou; Nayuki, Shinichi; Takeda, Mitsunori; and Murayama, Yoshinobu, 5,595,684, Cl. 252-299.610.
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Takei, Jiro, to Casio Computer Co., Ltd. Apparatus and method for manufacturing polymer dispersion type liquid crystal display device. 5,595,620, Cl. 156-64.000.
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Onodera, Tsugio; and Takei, Shigeru, 5,596,138, Cl. 73-49.200.
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Tanigami, Yoriko; Kadowaki, Tomoko; and Takemoto, Akira, 5,596,592, Cl. 372-46.000.
Takemura, Yasuhiko: *See*—
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Ogawa, Takatoshi; Yoshioka, Yasuhiko; Tsubouchi, Nobuo; Saito, Toshio; Hasegawa, Tamotsu; Fujishima, Akira; and Hashimoto, Kazuhito, 5,595,813, Cl. 428-212.000.
Takenouchi, Shinichi: *See*—
Kimura, Takashi; and Takenouchi, Shinichi, 5,596,258, Cl. 320-2.000.
Takeuchi, Mizutomo, to Idemitsu Kosan Co., Ltd. Transition metal compound, polymerization catalyst using same and process for producing styrenic polymer using said polymerization catalyst. 5,596,054, Cl. 526-134.000.
Takeuchi, Motokazu: *See*—
Hashiguchi, Yoshiharu; Hasegawa, Minoru; Goshima, Kunio; Takemura, Yasuhiko; Higuchi, Yoshiyuki; and Takeuchi, Motokazu, 5,596,041, Cl. 525-98.000.
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Takeuchi, Yoshio: *See*—
Ohashi, Masayoshi; Takeuchi, Yoshio; Suzuki, Toshinori; Yamaguchi, Akira; Sakai, Seiichiro; and Mizuno, Toshio, 5,596,641, Cl. 380-23.000.
Taki, Yoshitsugu, to Sony Corporation. Optical disk cartridge having disk thickness sample plate. 5,596,566, Cl. 369-291.000.
Takiar, Hem P.: *See*—
Mathew, Ranjan J.; and Takiar, Hem P., 5,596,225, Cl. 257-667.000.
Takiguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; and Nakamura, Shinichi, to Canon Kabushiki Kaisha. Mesomorphic compound, liquid crystal composition containing same, liquid crystal device using same and display apparatus. 5,595,685, Cl. 252-299.610.
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Richaud, François; Jarry, Bruno; Takinami, Koichi; Kurahashi, Osamu; and Beyou, Anne, 5,595,889, Cl. 435-71.200.
Takizawa, Yoshichika; Suzuki, Yasuyuki; Okada, Misako; Nishimura, Makoto; Matsumoto, Hidehiko; Kudo, Yasuharu; and Tsujimoto, Tohru, to Mitsubishi Denki Kabushiki Kaisha. Positioning and control apparatus that is interactively programmable using a display. 5,596,256, Cl. 318-600.000.
Takuma, Kenji: *See*—
Hukuda, Koumei; Takuma, Kenji; Kuriyama, Misori; Murahashi, Yoshimitsu; Kawakami, Hiroaki; Iida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.
Talbot, Adam J. Pivotally mountable ash tray. 5,595,194, Cl. 131-241.000.
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Schneider, Claudio, 5,596,092, Cl. 536-25.400.
Tam, Andrew C.: *See*—
Baumgart, Peter M.; Leung, Wing P.; Nguyen, Hung V.; Nguyen, Thao A.; Tam, Andrew C.; and Wu, Anthony, 5,595,791, Cl. 427-554.000.
Tamura, Masaaki; Fujii, Ayako; Koberi, Yoshiko; Nagano, Mamoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, to Canon Kabushiki Kaisha. Figure processing with magnification of designated portion of display. 5,596,689, Cl. 395-133.000.
Tamura, Shinichi, to Nippondenso Co., Ltd. Method of determining an optimal number of neurons contained in hidden layers of a neural network. 5,596,681, Cl. 395-23.000.
Tamura, Toshio: *See*—
Kiyanagi, Hiroyuki; Ogata, Yuitsu; Tamura, Toshio; Narita, Hisao; Terakado, Takahiko; and Kobayashi, Keizo, 5,596,605, Cl. 375-326.000.
Tamura, Yoshikazu; Oono, Kengo; and Yamashiro, Toshikatsu, to Sumitomo Wiring Systems, Ltd. Electric wire producing control device and electric wire measuring and cutting apparatus including the control device. 5,594,980, Cl. 29-33.00M.

Tan, Michael R. T.; Hsong, Yu-Min; and Wang, Shih-Yuan, to Hewlett-Packard Company. Current and heat spreading transparent layers for surface-emitting lasers. 5,596,595, Cl. 372-96.000.

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Tanaka, Yasuhiro; Tanabe, Tetsuya; and Tanoi, Satoru, 5,596,521, Cl. 365-49.000.

Tanaka, Fumio: *See*—
Tsuboe, Kojiro; Fujioka, Kazuyoshi; Takafuji, Yutaka; Kurokawa, Tsuyoshi; and Tanaka, Fumio, 5,596,023, Cl. 522-100.000.

Tanaka, Hideaki: *See*—
Yamada, Kazuo; Tanaka, Hideaki; Mitate, Takehito; and Yoshikawa, Masahara, 5,595,838, Cl. 429-209.000.

Tanaka, Hideki: *See*—
Seki, Hiroyuki; Nishimoto, Yoshifumi; Tanaka, Hideki; Harada, Toshiaki; Kimura, Atsushi; Okazawa, Yoshitaka; and Yamamoto, Shinji, 5,596,241, Cl. 310-323.000.

Tanaka, Hiroyuki: *See*—
Hakuda, Kounei; Takuma, Kenji; Kuriyama, Minori; Murabashi, Yoshimitsu; Kawakami, Hiroki; Iida, Yuji; Inaba, Kazuki; Tanaka, Hiroyuki; and Shimizu, Katsumi, 5,595,371, Cl. 267-34.000.
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Tanaka, Hisami: *See*—
Okuda, Mutsuo; Tanaka, Hisami; Shibuyama, Shinichi; Okubo, Yosuke; and Nakajima, Tatsu, 5,595,848, Cl. 430-69.000.

Tanaka, Masaaki: *See*—
Matsumoto, Tetsuya; Shimomiya, Kazuhiro; Tanaka, Masaaki; and Torii, Mikio, 5,595,160, Cl. 123-456.000.

Tanaka, Masatoshi, to Sumitomo Rubber Industries, Ltd. Pneumatic tire including shoulder parts. 5,595,619, Cl. 152-209.00A.

Tanaka, Nobuyuki, to Fuji Photo Film Co., Ltd. Method of determining desired image signal range based on histogram data. 5,596,654, Cl. 382-168.000.

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Nagaoka, Yoshihiro; Tanaka, Sadashi; Iwase, Yukiji; Ida, Michiaki; Ishimaru, Hirotoshi; Iwasaki, Saburo; Ueyama, Yoshiharu; and Yoshida, Tetsuya, 5,595,473, Cl. 415-199.100.

Tanaka, Shinji: *See*—
Shimozaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Futagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Tanaka, Yasuhito; and Takahashi, Minoru, to Fuji Photo Optical Co., Ltd. Film feeder that reduces film tension. 5,596,384, Cl. 396-413.000.

Tanaka, Yasuhiro; Tanabe, Tetsuya; and Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Semiconductor memory with built-in cache. 5,596,521, Cl. 365-49.000.

Tanaka, Yasuyori: *See*—
Kuroda, Kazuyuki; Tanaka, Yasuyori; and Matsunaga, Tadahiro, 5,595,747, Cl. 424-405.000.

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Akutsu, Fumio; and Tanaka, Yasuyuki, 5,595,858, Cl. 430-314.000.

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Redi, Gustorm, 5,596,762, Cl. 395-900.000.

Tang, Yuan: *See*—
Liu, David K. Y.; Kwan, Ming S.; Chang, Chi; Haddad, Sameer; and Tang, Yuan, 5,596,531, Cl. 365-185.310.

Tanigami, Yoriko; Kadowaki, Tomoko; and Takemoto, Akira, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 5,596,592, Cl. 372-46.000.

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Usui, Nobuaki; Fujimoto, Hiroki; Taniguchi, Kazutaka; and Imamura, Atsushi, 5,596,425, Cl. 358-500.000.

Tanikoshi, Syouko: *See*—
Nakamura, Kiyomi; Inagaki, Masahisa; Tanikoshi, Syouko; Maki, Hideo; and Hashimoto, Tsuneyuki, 5,596,615, Cl. 376-438.000.

Tanino, Kazuyuki: *See*—
Nakase, Kenji; Nishida, Yasunori; Akamatsu, Chikashi; Satoh, Tomomi; Tanino, Kazuyuki; and Yamamoto, Takeyasu, 5,595,842, Cl. 429-223.000.

Tanioka, Atsuyoshi: *See*—
Kobayashi, Mitsuga; Fujioka, Makoto; Tanioka, Atsuyoshi; Moriwaki, Kazuhiko; Shimizu, Makoto; and Uehara, Hisao, 5,596,349, Cl. 345-147.000.

Tanner, Scott B.: *See*—
Kosnavek, James A.; Padgett, Clarence W.; Tanner, Scott B.; and Mooney, Jack L., 5,596,544, Cl. 365-233.500.

Tano, Eiji; Nozaki, Shohei; Ashihara, Ryohei; Murakami, Hajime; Kubota, Kohei; Kato, Akira; and Sato, Koichi, to Matsushita Electric Industrial Co., Ltd.; and Mitsui Mining & Smelting Co., Ltd. Manganese dry battery. 5,595,836, Cl. 429-166.000.

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Tanaka, Yasuhiro; Tanabe, Tetsuya; and Tanoi, Satoru, 5,596,521, Cl. 365-49.000.

Tao, Takeshi; Ishimaru, Yasuo; Hattori, Morishige; Ohmura, Keiji; and Ohbe, Hideshi, to Hitachi, Ltd. Rolling stock and method for equipping the interior the same. 5,595,123, Cl. 105-396.000.

Taouk, Michael Y.: *See*—
Wenham, Stewart R.; Green, Martin A.; and Taouk, Michael Y., 5,595,607, Cl. 136-244.000.

Tashiro, Kazuhiro: *See*—
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.

Tashiro, Yuji; Inoue, Kazuo; and Suzuki, Tadashi, to Tonen Corporation. Silicon-containing copolymer and method of producing same. 5,596,062, Cl. 528-28.000.

Tasman Pulp & Paper Co., Limited: *See*—
Harper, Ross T.; Johnston, James H.; and Wiseman, Nicholas, 5,595,717, Cl. 423-339.000.

Tata, Kamesh; Bagchi, Amit; and Aziz, Nadim M., to Clemson University. Apparatus and method for layered modeling of intended objects represented in STL format and adaptive slicing thereof. 5,596,504, Cl. 364-468.270.

Tatchyn, Roman O., to Leland Stanford Junior University, The Board of Trustees of the. Permanent magnet edge-field quadrupole. 5,596,304, Cl. 335-306.000.

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Tominatsu, Noribiro; Okza, Hideyuki; Akasaka, Yoshihiro; Nakagawa, Kazuaki; and Tateishi, Hiroshi, 5,595,832, Cl. 429-16.000.

Tateno, Hiroki: *See*—
Irie, Nobuyuki; Hirukawa, Shigeru; and Tateno, Hiroki, 5,596,204, Cl. 250-548.000.

Tatsumi, Yoshiaki: *See*—
Hayashi, Tomoyuki; Tatsumi, Yoshiaki; and Miyashita, Kinya, 5,595,704, Cl. 264-404.000.

Tatum, Eugene T. Restraining garment for surgical patients. 5,595,192, Cl. 128-869.000.

Taub, Howard H.: *See*—
Hindagolla, Suraj L.; Hopkins, Glen A.; Taub, Howard H.; Lam, Si-Ty; McClelland, Paul H.; and Aden, James S., 5,595,785, Cl. 427-271.000.

Taugher, James E.: *See*—
Knudsen, Helge; Chong, Daniel T.; Yaffe, John; Taugher, James E.; Robertson, Michael; and Plazak, Zbigniew, 5,596,752, Cl. 395-701.000.

Tawada, Takaaki: *See*—
Sawamura, Tadahide; Tawada, Takaaki; and Itoh, Fumihito, 5,596,395, Cl. 399-168.000.

Taylor, Philip M.: *See*—
Miller, Robert A.; and Taylor, Philip M., 5,595,460, Cl. 405-284.000.

TDK Corporation: *See*—
Takebuchi, Katashi; Fujito, Shinya; Hashimoto, Shinya; and Yajima, Koichi, 5,595,608, Cl. 148-104.000.

Teac Corporation: *See*—
Pope, Steven M., 5,596,738, Cl. 395-430.000.

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Teel, Thomas A.: *See*—
McClure, David C.; and Teel, Thomas A., 5,596,297, Cl. 327-538.000.

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Bertland, Staffan, 5,596,573, Cl. 370-474.000.
Erhage, Lars, 5,596,323, Cl. 341-155.000.
Larsson, Lars G.; Gudmundson, Perole B. O.; and Jamal, Karim, 5,596,607, Cl. 375-340.000.
Wigren, Karl T.; and Bergström, Rolf A., 5,596,678, Cl. 395-237.000.

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Solomon, Merrill; Kimball, John; and Goldstein, Dana L., 5,596,627, Cl. 379-67.000.

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Tenny, Donald J.: *See*—
Ward, Anthony T.; Tenny, Donald J.; and Grammatica, Steven J., 5,596,673, Cl. 392-389.000.

Teng, Chuan C.: *See*—
Martin, Glenn J.; and Teng, Chuan C., 5,595,253, Cl. 175-297.000.

Teng, Clarence W.: *See*—
Chen, Ih-Chin; Shichijo, Hisashi; and Teng, Clarence W., 5,595,925, Cl. 437-52.000.

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Casteel, Glenn C.; Messinger, Keith A.; and Rowe, Donald E., 5,595,769, Cl. 425-183.000.

Tensor Corporation, The: *See*—
Miller, Robert A.; and Taylor, Philip M., 5,595,460, Cl. 405-284.000.

Teradyne, Inc.: *See*—
Cohen, Thomas S.; and Stokes, Philip T., 5,595,490, Cl. 439-74.000.
Douglas, Raymond W.; Stinger, Philip J.; Ng, Harold W.; and Lee, Terence N., 5,596,587, Cl. 371-27.000.

Terai, Haruhito, to Canon Kabushiki Kaisha. Liquid jet recording substrate, the method of manufacture therefor, a liquid jet recording head using such a substrate, and a recording apparatus provided with such a recording head. 5,596,357, Cl. 347-64.000.

Terakado, Takahito: *See*—
Kiyasagi, Hiroyuki; Ogata, Yuitsu; Tamura, Toshio; Narita, Hisao; Terakado, Takahito; and Kobayashi, Kenzo, 5,596,605, Cl. 375-326.000.

Terasawa, Hidekazu: *See*—
Ito, Sumio; Terasawa, Hidekazu; and Sasaki, Yukio, 5,595,020, Cl. 47-66.000.

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Fukuda, Hiroshi; and Terasawa, Tsuneo, 5,595,857, Cl. 430-311.000.

ter Horst, Gerhardus E. R.; and Moore, Donald J., to Jaguar Cars Limited. Roof latching device. 5,595,407, Cl. 292-5.000.

Tescorp Seismic Products, Inc.: *See*—
Wood, Richard G., 5,595,497, Cl. 439-282.000.

Tessier, Russell: *See*—
Agarwal, Anant; Babb, Jonathan; and Tessier, Russell, 5,596,742, Cl. 395-500.000.

Texas Instruments: *See*—
Tigelaar, Howard L.; Riemenschneider, Bert R.; Chapman, Richard A.; and Appel, Andrew T., 5,595,922, Cl. 437-40.000.

Texas Instruments Incorporated: *See*—
Appel, Andrew T.; and Chisholm, Michael F., 5,595,527, Cl. 451-28.000.
Cantrell, Jay T.; and Schurig, Edward R., 5,596,749, Cl. 395-673.000.
Chen, Ih-Chin; Shichijo, Hisashi; and Teng, Clarence W., 5,595,925, Cl. 437-52.000.
Diem, Benjamin C.; and Ward, M. Dwayne, 5,596,540, Cl. 365-221.000.
Giddings, James N.; and Howell, Robert P., 5,596,282, Cl. 324-754.000.
Gustg, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,596,763, Cl. 395-800.000.
Gustg, Karl M.; McDonough, Kevin C.; and Maggi, Sergio, 5,596,767, Cl. 395-800.000.
Houston, Theodore W., 5,596,286, Cl. 326-33.000.
Kaya, Cetin; Holland, Wayland B.; and Mezzenner, Rabah, 5,596,528, Cl. 365-185.240.
Krenik, William R.; Izzi, Louis J.; and Yin, Chenwei J., 5,596,583, Cl. 371-22.100.
Krishnan, Srikanth; and McKee, Jeffrey A., 5,596,207, Cl. 257-48.000.
Marshall, Robert D., Jr., 5,596,717, Cl. 395-185.060.
Mushya, Tatsunori; Kawamura, Masayasu; and Sukegawa, Shunichi, 5,596,535, Cl. 365-200.000.
Simpson, Vikki S.; Gullet, Tom G.; Medders, Jerry B.; Clark, Arthur R.; Robbins, Bobby R.; Newton, Danny R.; Dyer, Lawrence D.; Bilderback, Douglas W.; and King, Clyde A., 5,595,522, Cl. 451-5.000.
Sukegawa, Shunichi; Shiozaki, Shiyuzo; Matsuura, Hiromi; and Murasaka, Masaya, 5,596,537, Cl. 365-201.000.
Van Aken, Jerry R.; Gustg, Karl M.; and Poland, Sydney W., 5,596,519, Cl. 364-766.000.
Varley, Jerry M., 5,594,985, Cl. 29-823.000.

Textron Automotive Company, Inc.: *See*—
Ladouceur, Lawrence C., 5,595,422, Cl. 301-37.210.

Therma-Wave, Inc.: *See*—
Fanton, Jeffrey T.; and Opsal, Jon, 5,596,411, Cl. 356-369.000.
Rosencwaig, Allan; and Willenborg, David L., 5,596,406, Cl. 356-327.000.

Thermo King Corporation: *See*—
Wong, Albert C. K.; Jurewicz, Romuald M.; and McCormack, Michael D., 5,596,512, Cl. 364-550.000.

Therond, Marcel. Marking device. 5,594,991, Cl. 33-18.100.

Thiel, Jürgen: *See*—
Hantel, Peter; and Thiel, Jürgen, 5,596,410, Cl. 356-358.000.

Thielen, David, to Microsoft Corporation. Method and system for buffering transient data using a single physical buffer. 5,596,726, Cl. 395-250.000.

Thierry, Jean-Pierre: *See*—
Jego, Gérard; Nourry, Daniel; and Thierry, Jean-Pierre, 5,595,498, Cl. 439-342.000.

Thies, Werner, to Siemens Aktiengesellschaft. Pressure difference measurement transducer with electric lead-through in bore parallel to housing longitudinal axis. 5,596,148, Cl. 73-720.000.

Thimmesch, Jan P., to Phillips & Temro Industries Inc. Low profile intake manifold heater. 5,595,164, Cl. 123-549.000.

Thoman, Christopfer M.: *See*—
Thoman, David C.; and Thoman, Christopfer M., 5,595,417, Cl. 296-100.000.

Thoman, David C.; and Thoman, Christopfer M. Tonneau cover for a pick-up truck. 5,595,417, Cl. 296-100.000.

Thomas & Betts Corporation: *See*—
Nattel, William; and Michaud, Serge, 5,595,453, Cl. 403-252.000.

Thomas, David R.: *See*—
Pasch, Ricky C.; and Thomas, David R., 5,595,434, Cl. 362-102.000.

Thomas Jefferson University: *See*—
Reynolds, Stuart; and Dettre, Robert H., 5,595,687, Cl. 252-312.000.

Thome, Gary W., to Compaq Computer Corporation. Computer system which overrides write protection status during execution in system management mode. 5,596,741, Cl. 395-490.000.

Thompson, Mark: *See*—
Chura, William D.; Kozlowski, Edward; Liljeqvist, Lance; Jones, Stephen; Thompson, Mark; and Hawes, Charles, 5,595,345, Cl. 239-312.000.

Thompson, Robert H., to Ford Motor Company. Positive seal retainer for quick install fuel cap. 5,595,222, Cl. 141-312.000.

Thomsen, Joseph A.: *See*—
Simmons, Laura E.; and Thomsen, Joseph A., 5,596,288, Cl. 327-12.000.

Thomsen, Soeren H.; Sherwood, Charles A., II; and Karczewski, Casimir, to Motorola, Inc. Method and apparatus for encoding and decoding error correction codes in a radio communication system. 5,596,589, Cl. 371-37.800.

Thomsen, Svend E., to Danfoss A/S. Hydraulic steering arrangement for vehicles. 5,596,498, Cl. 364-424.051.

Thomson Consumer Electronics, Inc.: *See*—
Miller, Rick W.; and Hutchinson, Daniel M., 5,596,298, Cl. 329-337.000.
Pinciaski, Joseph J.; Fritz, Eric E.; Nierzberg, Morton J.; Wilbur, Leonard P., Jr.; and Horn, Leroy W., 5,595,520, Cl. 445-59.000.
Trustaio, Walter, 5,596,250, Cl. 315-371.000.

Three Bond Co., Ltd.: *See*—
Horie, Ken'ichi; Miura, Hidefumi; and Tomioka, Eiichi, 5,596,024, Cl. 522-103.000.

Thrombosis Research Institute: *See*—
Elgendy, Said M. A.; Deadman, John J.; Patel, Geeta; Gr.en, Donovan S.; Baban, Jehan A.; Kakkar, Vijay V.; and Clarson, Goran K., 5,596,123, Cl. 558-288.000.

Throneburg, James L.; McLelland, James G.; Gallenstein, Victor J.; Kelley, Leon E.; and Richie, Douglas H., to Throneburg, James L. Footwear system. 5,595,005, Cl. 36-91.000.

Tibbet, Michael D., to Gainer Tool Co. Workpiece presetting assembly. 5,595,377, Cl. 269-71.000.

Tibbitts, Gordon A., to Baker Hughes Incorporated. Tilting bit crown for earth-boring drills. 5,595,254, Cl. 175-320.000.

Tidwell, Michael R.: *See*—
Furness, Thomas A., III; Melville, Charles D.; and Tidwell, Michael R., 5,596,339, Cl. 345-8.000.

Tiers, George V. D.: *See*—
Oxman, Joel D.; Kosinga, Mark S.; Tiers, George V. D.; Vogel, Kim M.; and Vogel, Dennis E., 5,596,025, Cl. 523-109.000.

Tigelaar, Howard L.; Riemenschneider, Bert R.; Chapman, Richard A.; and Appel, Andrew T., to Texas Instruments. Process for thickening selective gate oxide regions. 5,595,922, Cl. 437-40.000.

Tikku, Hari K.: *See*—
Li, Michael Hsin-Chwen; Tikku, Hari K.; and Steinman, Marc, 5,595,661, Cl. 210-634.000.

Timken Company, The: *See*—
Zhou, Rao-Sheng, 5,595,272, Cl. 192-45.000.

Timmins, Lawrence J., to Chrysler Corporation. Shipping container. 5,595,304, Cl. 206-598.000.

Tindell, James M.; and Deaman, Matthew L., to Object Technology Licensing Corp. Method and apparatus for synchronizing graphical presentations. 5,596,696, Cl. 395-806.000.

Tishel, Moshe, to Analyst Ltd. Method for preserving fresh fruit and vegetable. 5,595,775, Cl. 426-241.000.

TIW Corporation: *See*—
Braddick, Britt O., 5,595,247, Cl. 166-297.000.

Tizol, Jorge L.: *See*—
Delaney, Michael J.; Nguyen, Loi D.; Le, Minh V.; Tizol, Jorge L.; and Loh, James C., 5,595,917, Cl. 437-8.000.

TM Industrial Supply, Inc.: *See*—
Steiner, Carl A.; and Jackson, Ricky L., 5,595,655, Cl. 210-391.000.

TMA Technologies, Inc.: *See*—
Schiff, Tod F.; Cheever, Daniel R.; and Wilson, Daniel J., 5,596,403, Cl. 356-139.030.

TOA Medical Electronics Co., Ltd.: *See*—
Kusuzawa, Hideo, 5,596,401, Cl. 356-23.000.

Tobin, Joseph: *See*—
Miller, Philip; Tobin, Joseph; and Dadiomov, Edward, 5,596,269, Cl. 324-73.100.

Tobishi Pharmaceutical Co., Ltd.: *See*—
Tomaru, Takanobu, 5,595,974, Cl. 514-21.000.

Toda, Haruki, to Kabushiki Kaisha Toshiba. Synchronous dynamic random access memory. 5,596,541, Cl. 365-230.030.

Todd, Rodger: *See*—
Tonteling, Charles; Palmer, Kenneth J.; Helfer, Farrel B.; Todd, Rodger; and Blum, Josy Jean, 5,595,617, Cl. 148-595.000.

Togai, Kazuhide; and Koga, Kazuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Apparatus and method for internal-combustion engine control. 5,595,060, Cl. 60-274.000.

Togano, Takeshi: *See*—
Taniguchi, Takao; Iwaki, Takashi; Togano, Takeshi; Yamada, Yoko; and Nakamura, Shinichi, 5,595,685, Cl. 252-299.610.

Tohoku Munekata Co., Ltd.: *See*—
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.

Tohyama, Daisuke: *See*—
Noda, Junichiro; and Tohyama, Daisuke, 5,596,529, Cl. 365-185.280.

Tokai Rubber Industries, Ltd.: *See*—
Ikeda, Katahisa, 5,595,373, Cl. 267-140.120.

Tokin Corporation: *See*—
Onodera, Koichi, 5,596,447, Cl. 359-324.000.

Tokumoto, Hidekado: *See*—
Hamanaka, Nobuyuki; Takahashi, Kanji; and Tokumoto, Hidekado, 5,596,009, Cl. 514-357.000.

Tokyo Electron Limited: *See*—
Fujikawa, Yuichiro; Hatano, Tatsuo; and Murakami, Seishi, 5,595,606, Cl. 118-725.000.
Inazawa, Koichiro; Okamoto, Shin; Hayashi, Hisataka; and Matsushita, Takaya, 5,595,627, Cl. 156-643.100.

Tokyo Rope Mfg. Co., Ltd.: *See*—
Takahashi, Shuji; Yasadori, Kazuhiro; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Tolman, Richard L.: *See*—
Graham, Donald W.; Carlin, Josephine R.; Chin, Shuet-Hing L.; and Tolman, Richard L., 5,595,996, Cl. 514-284.000.

Tom, Judy C.: *See*—
Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., 5,595,561, Cl. 588-255.000.
Tomaru, Takanobu, to Tobishi Pharmaceutical Co., Ltd. Medicaments for the treatment of restenosis and arterial sclerosis. 5,595,974, Cl. 514-21.000.
Tomimatsu, Norihiro; Okza, Hideyuki; Akasaka, Yoshihiro; Nakagawa, Kazuaki; and Tateishi, Hiroshi, to Kabushiki Kaisha Toshiba. Molten carbonate fuel cell. 5,595,832, Cl. 429-16.000.
Tomioka, Eiichi: *See*—
Horie, Ken'ichi; Miura, Hidefumi; and Tomioka, Eiichi, 5,596,024, Cl. 522-103.000.
Tomioka, Yugo; Iwasa, Shoichi; Sato, Yasuo; Wada, Toshio; and Anzai, Kenji, to Nippon Steel Corporation. Electrically alterable n-bit per cell non-volatile memory with reference cells. 5,596,527, Cl. 365-185.200.
Tomita, Koji: *See*—
Yazaki, Asao; Chuta, Masanobu; Matsumoto, Hiroshi; Satake, Junko; Iida, Hiromi; and Tomita, Koji, 5,596,235, Cl. 310-67.00R.
Tomita, Nobuo: *See*—
Furuhashi, Masaaki; Handa, Ryouji; Tomita, Nobuo; and Esonoto, Yoshitaka, 5,596,449, Cl. 359-341.000.
Tomofuji, Yoko; Nakase, Makoto; Sato, Takashi; Hazama, Hiroaki; Komano, Haruki; and Ito, Shinichi, to Kabushiki Kaisha Toshiba. Method of exposing light in a method of fabricating a reticle. 5,595,844, Cl. 430-5.000.
Tomotsu, Norio: *See*—
Aoyama, Yoshiaki; and Tomotsu, Norio, 5,596,055, Cl. 526-153.000.
Tompkins, E. Neal: *See*—
Barry, Michael W.; Rowe, Francis A.; and Tompkins, E. Neal, 5,596,416, Cl. 358-296.000.
Tonai, Ichiro: *See*—
Kurashima, Hiromi; Takahashi, Hisao; Kitayama, Ken-ichi; Sakamoto, Ryoji; Sawada, Sosaku; Seltiguchi, Takeshi; Tonai, Ichiro; and Shiga, Nobuo, 5,596,665, Cl. 385-92.000.
Tone, Kaoru; Tone, Michiko; Tanaka, Hiroyuki; and Okazaki, Toshikazu, to Meiji Milk Products Co., Ltd.; and Tone, Kaoru. Method for classifying sale amount characteristics, method for predicting sale volume, method for ordering for restocking, system for classifying sale amount characteristics and system for ordering for restocking. 5,596,493, Cl. 395-210.000.
Tone, Michiko: *See*—
Tone, Kaoru; Tone, Michiko; Tanaka, Hiroyuki; and Okazaki, Toshikazu, 5,596,493, Cl. 395-210.000.
Tonen Corporation: *See*—
Tashiro, Yuji; Inoue, Kazuo; and Suzuki, Tadashi, 5,596,062, Cl. 528-28.000.
Toney, Gloria G.: *See*—
Lulham, Cedric M.; and Toney, Gloria G., 5,595,623, Cl. 156-244.140.
Tong, Alan K.; Jones, Stephen D. M.; and Schaefer, Allan L., to Canada, Her Majesty the Queen in right of, as represented by the Department of Agriculture and Agri-Food Canada. Method for detecting poor meat quality in groups of live animals. 5,595,444, Cl. 374-45.000.
Tong, Po: *See*—
Ciolfi, John M.; Tong, Po; Ashanin, James T.; and Gooch, Antoinette H., 5,596,604, Cl. 345-260.000.
Tonks, Nicholas K., to Cold Spring Harbor Laboratory. Isolation of a cDNA encoding a protein tyrosine phosphatase which localizes to focal adhesions. 5,595,911, Cl. 435-320.100.
Toone, Thomas S. Three-point suspension of musical instruments. 5,596,158, Cl. 84-327.000.
Toneling, Charles; Palmer, Kenneth J.; Helfer, Parrel B.; Todd, Rodger; and Blum, Josy Jean, to Goodyear Tire & Rubber Company, The. Process for producing patented steel wire. 5,595,617, Cl. 148-595.000.
Toray Industries, Inc.: *See*—
Baba, Masanori; Schols, Dominique; Pauwels, Rudi; Balzarini, Jan; and De Clercq, Erik, 5,596,018, Cl. 514-576.000.
Yatsushiro, Tsugio; and Torikai, Jun, 5,595,781, Cl. 427-10.000.
Torazzina, Aldo: *See*—
Pasetti, Mauro; Saviotti, Vanni; and Torazzina, Aldo, 5,596,637, Cl. 379-399.000.
Toreskog, Orvar: *See*—
Bystedt, Stig; Toreskog, Orvar; and Nordhammar, Henrik, 5,595,132, Cl. 114-61.000.
Torfs, Rita: *See*—
Leenders, Luc; Uytterhoeven, Herman; Torfs, Rita; Oelbrandt, Leo; Uytendaele, Carlo; and Van den Bogaert, Jan, 5,595,854, Cl. 430-200.000.
Torii, Kazuo; Iwasaki, Takashi; and Onodera, Yoshio, to Japan as directed by Director General of Agency of Industrial Science and Technology. Synthetic mixed-layer silicate and method for the preparation thereof. 5,595,716, Cl. 423-328.200.
Torii, Mikio: *See*—
Matsumoto, Tatsuya; Shinomiya, Kazuhiro; Tanaka, Masaaki; and Torii, Mikio, 5,595,160, Cl. 123-456.000.
Torikai, Jun: *See*—
Yatsushiro, Tsugio; and Torikai, Jun, 5,595,781, Cl. 427-10.000.
Torimoto, Yoshifumi; and Sadakata, Masayoshi, to Kao Corporation; and Sadakata, Masayoshi. Method for generating negatively charged oxygen atoms and apparatus used therefor. 5,595,643, Cl. 205-634.000.
Torisawa, Akira: *See*—
Ueno, Fumihiro; Torisawa, Akira; Ito, Yasuo; Sakaki, Eihiro; Ohtake, Masaki; Katsuoka, Hiromi; Kashihara, Atsushi; and Seto, Kaoru, 5,596,426, Cl. 358-500.000.
Toriumi, Michio: *See*—
Yamada, Masaya; Toriumi, Michio; Shinozaki, Tetsunori; and Kioka, Mamoru, 5,595,827, Cl. 428-516.000.
Torri, Marco: *See*—
Gobbini, Mauro; and Torri, Marco, 5,596,110, Cl. 552-610.000.
Torsi, Luisa: *See*—
Dodabalapur, Ananth; Katz, Howard E.; and Torsi, Luisa, 5,596,208, Cl. 257-66.000.
Tortonese, Marco: *See*—
Albrecht, Thomas; Tortonese, Marco; and Barrett, Robert, 5,595,942, Cl. 437-228.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Hada, Narutoshi; Nakamura, Shingo; and Horiguchi, Takeshi, 5,595,119, Cl. 101-477.000.
Toshiba machine Co., Ltd.: *See*—
Fujita, Shigeru; Okuyama, Hiroshi; Tashiro, Kazuhiro; Ishibashi, Shogo; Suzuki, Atsuhiro; and Hirata, Motoyuki, 5,595,693, Cl. 264-40.100.
Toska Co., Ltd.: *See*—
Hiroki, Toyohisa; and Suzuki, Tadashi, 5,595,702, Cl. 264-318.000.
Toyne, Kenneth J.: *See*—
Goodby, John W.; Toyne, Kenneth J.; and Booth, Christopher J., 5,595,682, Cl. 252-299.010.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Yanagi, Masato; Kagao, Satoru; Dohi, Makoto; and Nakaizumi, Sanae, 5,596,028, Cl. 523-176.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Sano, Hiroki; Sasaki, Tateyuki; and Kobayashi, Akira, 5,595,639, Cl. 205-109.000.
Toyo Seiyaku Kabushiki Kaisha: *See*—
Fujiwara, Hiroshi; and Sawai, Ken, 5,595,742, Cl. 424-195.100.
Toyoda, Katsuhiko, to Suzuki Motor Corporation. Catalyst deterioration-detecting device for internal combustion engine. 5,595,061, Cl. 60-274.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Hayashi, Yutaka; and Nonoyama, Makoto, 5,595,525, Cl. 451-5.000.
Toyoda, Shinjiro; Ikeda, Hitoshi; Hashimoto, Eiri; and Miyakawa, Nobuaki, to Fuji Xerox Co., Ltd. Computing method and apparatus for a many-body problem. 5,596,511, Cl. 364-527.000.
Toyoguchi, Tsutomu, to Sony Corporation. Shifting device and loading device for disc-shaped recording medium. 5,596,561, Cl. 369-77.100.
Toyokura, Masaki; Okamoto, Kiyoshi; and Matsumoto, Yoshifumi, to Matsushita Electric Industrial Co., Ltd. Orthogonal transform processor. 5,596,518, Cl. 364-725.000.
Toyoshima, Shoji: *See*—
Yamaoka, Masami; and Toyoshima, Shoji, 5,596,217, Cl. 257-367.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Iwai, Akira, 5,595,162, Cl. 123-491.000.
Miyata, Hiroshi; and Ishida, Katsuaki, 5,596,257, Cl. 318-685.000.
Watanabe, Tsukasa; Miyashiro, Mutsumi; Suzuki, Shunetsu; Goto, Takeshi; and Fujita, Kozo, 5,595,089, Cl. 74-89.150.
Track Trainer, Inc.: *See*—
O'Brien, Timothy M., 5,595,545, Cl. 473-259.000.
Trage, Burkhard; and Leitz, Richard, to BDAG Balcke-Dürr Aktiengesellschaft. Device and method for degassing make-up water for a steam turbine process. 5,595,063, Cl. 60-688.000.
Trah, Hans-Peter; Laermer, Franz; and Schilp, Andrea, to Robert Bosch GmbH. Method of producing micromechanical structures. 5,595,940, Cl. 437-225.000.
Traini, Carlo; and Psaila, Giuseppe, to DeNora Permelec S.p.A. Apparatus and process for electrochemically decomposing salt solutions to form the relevant base and acid. 5,595,641, Cl. 205-464.000.
Transfer Flow International, Inc.: *See*—
Peters, Chris R.; and Henderson, James W., 5,595,427, Cl. 312-140.400.
Transonic Systems, Inc.: *See*—
Krivitski, Nikolai M., 5,595,182, Cl. 128-692.000.
Treat, Michael R.; and Trimmer, William S., to Trustees of Columbia University in the City of New York, The. Self-propelled endoscope using pressure driven linear actuators. 5,595,565, Cl. 600-114.000.
Treves, David; Fu, Hong; and O'Dell, Thomas, to Komag, Incorporated. Laser disk texturing apparatus. 5,595,768, Cl. 425-174.400.
Trice, Philip H.: *See*—
Davis, Terry L.; Hart, James A.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,596,642, Cl. 380-24.000.
Davis, Terry L.; Hart, James A.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,596,643, Cl. 380-24.000.
Tridelta Industries, Inc.: *See*—
Maher, Charles A., Jr.; and Larrick, Raymond, 5,596,514, Cl. 364-569.000.
Trimble Navigation Limited: *See*—
Sprague, David S.; and Woo, Arthur N., 5,596,500, Cl. 364-449.700.
Trimm, David L.: *See*—
Ul-Haque, Israr; and Trimm, David L., 5,595,719, Cl. 423-418.200.
Trimmer, William S.: *See*—
Treat, Michael R.; and Trimmer, William S., 5,595,565, Cl. 600-114.000.
Trotta, Frank P., Jr. System and method for automated shopping. 5,595,264, Cl. 186-56.000.
Trunkalo, Walter, to Thomson Consumer Electronics, Inc. Timing of deflection waveform correction circuit. 5,596,250, Cl. 315-371.000.
Trustees of Columbia University in the City of New York, The: *See*—
Knapp, Michael R.; and Goelet, Philip, 5,595,870, Cl. 435-6.000.
Lasker, Steven; and Klein, Richard, 5,595,987, Cl. 514-213.000.

Treat, Michael R.; and Trimmer, William S., 5,595,565, Cl. 600-114.000.
Trützschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 5,595,049, Cl. 53-430.000.
TRW Inc.: *See*—
Liu, Chung C., 5,596,336, Cl. 343-770.000.
TRW Occupant Restraint Systems GmbH: *See*—
Wier, Franz, 5,595,400, Cl. 280-806.000.
Tsai, Fong-Ying: *See*—
Corazzi, Gloria M.; and Tsai, Fong-Ying, 5,595,896, Cl. 435-172.300.
Tsai, John J.; and Maliczyszyn, Walter, to National Starch and Chemical Investment Holding Corporation. Method of paper sizing using modified cationic starch. 5,595,631, Cl. 162-175.000.
Tsay, Yuh-Geng: *See*—
Liu, Cheng-I; and Tsay, Yuh-Geng, 5,595,867, Cl. 435-4.000.
Tschopp, Thomas B.: *See*—
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.
Tsiolpis, Arthur J.: *See*—
Burns, Gary T.; Keenan, Linda D.; Roy, Aroop K.; and Tsiolpis, Arthur J., 5,595,593, Cl. 106-499.000.
Tseng, Cheng-Tzu. Sanitary chopping plate structure. 5,595,110, Cl. 99-483.000.
Tseng, Horng-Huei, to Industrial Technology Research Institute. Method for fabricating a DRAM trench capacitor with recessed pillar. 5,595,926, Cl. 437-52.000.
Tseng, Horng-Huei, to Vanguard International Semiconductor Corporation. Method for fabricating a dram cell with a cup shaped storage node. 5,595,929, Cl. 437-52.000.
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United Microelectronics Corp.: *See*—
Chen, Chih-Haica, 5,596,562, Cl. 369-124.000.
Hong, Gary, 5,596,230, Cl. 257-758.000.
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Tsi, Wen-Kuang; and Shih, Ching-Li, 5,595,605, Cl. 118-715.000.
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Hill, Clinton W.; and Crandall, Robert M., 5,595,452, Cl. 403-221.000.
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Glenn, Gregory M., 5,595,595, Cl. 106-672.000.
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Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., 5,595,561, Cl. 588-255.000.
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Podlesak, Thomas F., 5,596,279, Cl. 324-439.000.
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Cook, Joseph S., Jr., 5,595,251, Cl. 173-178.000.
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Augusteijn, Alexander, 5,596,701, Cl. 395-356.000.
Heijboer, Willem L. C. M., 5,595,933, Cl. 437-60.000.
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Folsom, Michael; and DiMora, Paul, 5,595,692, Cl. 264-36.000.
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Cinquin, Philippe; and Desbat, Laurent, 5,595,767, Cl. 425-174.400.
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Varley, Jerry M., to Texas Instruments Incorporated. End pin extractor for semiconductor storage tube. 5,594,985, Cl. 29-823.000.
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Bloxham, Peter A.; Breilas, Anne I.; Ernst, Richard E.; Scott, Leon S.; Super, John D.; and Verbsky, James D., 5,596,074, Cl. 528-417.000.
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Douglas, Alan W.; DiMichele, Lisa; King, Steven A.; and Verhoeven, Thomas R., 5,596,113, Cl. 556-14.000.
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Buice, David; Alfaro, Cesar; and Whelan, Mike, 5,595,330, Cl. 228-102.000.
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Becker, Edward, 5,595,528, Cl. 451-72.000.
Verver, Albert B.: *See*—
Kuiseadrager, Klaas D.; Kivits, Marinus G. C.; and Verver, Albert B., 5,596,082, Cl. 530-416.000.
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Gerlitz, Martin; Awad, Rami-Raimund; and Fraydl, Thomas, 5,596,065, Cl. 528-71.000.
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Mead, Sharon B.; Brennan, Susan J.; Morelos, Arnesin; and Aguilar, Josephine, 5,596,027, Cl. 523-161.000.
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Ashton, Martin, 5,596,685, Cl. 395-121.000.
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Viel, Joseph B. Muscle stretching apparatus and method. 5,595,559, Cl. 482-91.000.
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Gozlan, Eli; Brezzniz, Shlomo; Nir, Dan; and Erlich, Sharon, 5,595,488, Cl. 434-236.000.
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Barr, Morton L.; Vincenti, Paul J.; and Vanderhoof, Elaine L., 5,595,729, Cl. 424-68.000.
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Geurts, Catherine; and Vivat, Michel, 5,596,108, Cl. 552-596.000.
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Simmons, Laura E.; and Thomsen, Joseph A., 5,596,288, Cl. 327-12.000.
Steinweg, Russell L.; Zampaglione, Michael A.; and Lin, Pei H., 5,596,505, Cl. 364-490.000.
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Voigt, Douglas L., to Hewlett-Packard Company. Method for managing roll forward and roll back logs of a transaction object. 5,596,710, Cl. 395-182.170.
Voll, Beau A.; Kebodeaux, Matthew S.; and Stringfellow, Steve, to Baker Hughes Incorporated. One trip cement and gravel pack system. 5,595,246, Cl. 166-278.000.
von Hoffmann, Timm, to Metallglanz Gesellschaft fuer Entgratung und Oberflaechentechnik mbH. Method and apparatus for continuous galvanic application of metallic layers on a body. 5,595,640, Cl. 205-205.000.
von Thuck und Toschonowitz, Christian: *See*—
Beinert, Norbert; Knote, Manfred; Philipp, Gottfried; and von Thuck und Toschonowitz, Christian, 5,595,810, Cl. 428-156.000.
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Hannon, Gregory E.; McGregor, Gordon L.; and Minor, Raymond B., 5,596,450, Cl. 359-599.000.

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Ludham, Cedric M.; and Toney, Gloria G., 5,595,623, Cl. 156-244.140.

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Hansen, Rolf, 5,595,351, Cl. 242-18.0DD.

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Otsu, Yuichi; Kitagawa, Yoshinori; Hattori, Yumi; Wada, Katsuaki; and Obinata, Toru, 5,596,017, Cl. 514-517.000.

Wada, Kimihito; and Tsukada, Koji, to Matsutani Chemical Industry Co., Ltd. Method for preparing frozen baker's dough. 5,595,773, Cl. 426-20.000.

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Cecere, James A., 5,595,266, Cl. 188-251.00A.

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Kaminski, Mark S.; Butchko, Gregory M.; Glenn, Stephan D.; and Wahl, Richard L., 5,595,721, Cl. 424-1.490.

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Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,596,383, Cl. 396-315.000.

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Wakai, Bruce M.; Lemmer, John E.; and Frost, William A., Jr., to Matsushita Avionics Development Corporation. Integrated video and audio signal distribution system and method for use on commercial aircraft and other vehicles. 5,596,647, Cl. 381-77.000.

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Bean, Dennis L.; Wakeley, Lillian D.; Tom, Judy C.; Sykes, Melvin C.; Brabston, William N.; and Malone, Philip G., 5,595,561, Cl. 588-255.000.

Waki, Hiroshi, to Shimadzu Corporation. Mass spectrometric apparatus for use with a liquid chromatograph. 5,596,192, Cl. 250-288.000.

Wako Electronics Company Limited: *See*—
Hayashi, Toshiharu; and Imoto, Akira, 5,596,307, Cl. 337-298.000.

Walba, David M.; and Liberto, Charles A., to University Research Corporation. Self-assembled monolayers for liquid crystal alignment. 5,596,434, Cl. 349-123.000.

Wald, Ulrich, to Paper Converting Machine GmbH. Empty bag feeder for packaging machines. 5,595,468, Cl. 414-331.000.

Waldock, Kevin H., to Clipmate Corp. Electric detonator and lead connector assembly. 5,596,164, Cl. 102-202.900.

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Walker, Joel E.: *See*—
Gallarelli, Pat; Walker, Joel E.; and Steinbugler, Robert E., 5,595,316, Cl. 220-4.330.

Walker, Kenneth L.: *See*—
DiGiovanni, David J.; and Walker, Kenneth L., 5,596,668, Cl. 385-123.000.

Wall, Randolph: *See*—
Robinson, Randy R.; Liu, Alvin Y.; Horwitz, Arnold H.; Bester, Marc; Wall, Randolph; Lei, Shan-Ping; and Wilcox, Gary L., 5,595,898, Cl. 435-172.300.

Wallace Computer Services, Inc.: *See*—
Chang, John C. H.; and Johnson, Richard H., 5,595,955, Cl. 503-201.000.
Garrison, Ronald R., 5,595,403, Cl. 283-74.000.

Wallace, Ian F.; and Stamford, John, to Pertins Limited. Improvements in or relating to fluid-flow control valves. 5,595,215, Cl. 137-554.000.

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Carman, William F.; Decker, Richard H.; Wallace, Lesley; Miums, Larry T.; and Solomon, Larry R., 5,595,739, Cl. 424-189.100.

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Waller, James K., Jr.; and Craven, Mark J., to Rocktron Corporation. Audio tape saturation simulator. 5,596,646, Cl. 381-61.000.

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Walpole, Ernest A., to Ausmac Gold N.L. Process for seperating ilmenite. 5,595,347, Cl. 241-20.000.

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Walsh, Brendan: *See*—
Gattag, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,596,763, Cl. 395-800.000.

Walt Disney Company, The: *See*—
Elliott, Steven A.; Froehich, Ronald W.; and Sogge, John W., 5,595,121, Cl. 104-53.000.

Walter, Klaus: *See*—
Ott, Karl; Walter, Klaus; and Strate, Joachim, 5,595,161, Cl. 123-491.000.

Walteradorfer, Anna: *See*—
Preuss, Rainer; Schaper, Wolfgang; Märkl, Martin; Jakobi, Harald; Braun, Peter; Kraaf, Werner; Sachse, Burkhard; Walteradorfer, Anna; Kern, Manfred; Lämmer, Peter; and Bonin, Werner, 5,595,992, Cl. 514-254.000.

Walton, Kim L.; Patel, Rajen M.; Chum, Pak-Wing S.; and Obijeski, Todd J., to Dow Chemical Company, The. Method of manufacturing packaging and wrapping film. 5,595,705, Cl. 264-456.000.

Walus, Richard L.; McCrory, Jennifer J.; Santangelo, John A.; and Meloul, Raphael. Tool for implanting a fiducial marker. 5,595,193, Cl. 128-898.000.

Wan, Ray L.: *See*—
Lin, Tien-Ler; Wan, Ray L.; Hsiao, Ling-Wen; and Sung, Gilbert, 5,596,530, Cl. 365-185.290.

Wanetzky, Erwin: *See*—
Melber, Albrecht; Wanetzky, Erwin; and Uschkoreit, Dieter, 5,595,483, Cl. 432-205.000.

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Allen, Loyd V., Jr.; and Wang, Bingnan, 5,595,761, Cl. 424-484.000.

Wang, Hsun. Process for sintering industrial waste. 5,595,480, Cl. 432-13.000.

Wang, Katherine S.: *See*—
Normile, James O.; Wang, Katherine S.; and Wu, Hsi-Jung, 5,596,659, Cl. 382-253.000.

Wang, Shay-Ping T., to Motorola, Inc. Method and system for identifying spoken sounds in continuous speech by comparing classifier outputs. 5,596,679, Cl. 395-2.450.

Wang, Shih-Yuan: *See*—
Tan, Michael R. T.; Hoang, Yu-Min; and Wang, Shih-Yuan, 5,596,595, Cl. 372-96.000.

Wang, Xiaohan: *See*—
Jones, Steven M.; Lang, Thomas F.; Liebig, John R.; and Wang, Xiaohan, 5,596,197, Cl. 250-363.040.

Wang, Yongcai: *See*—
Fast, Alfred B.; Wang, Yongcai; Smith, Dennis E.; Kestner, Melvin M.; and Steinmetz, Rudolf D., 5,595,862, Cl. 430-537.000.

Wang, Yun: *See*—
Kleerwein, James C.; Lin, Eileen T.; and Wang, Yun, 5,596,748, Cl. 395-610.000.

Warchol, Andrew M. E., to Hewlett-Packard Co. Capillary tubing connector. 5,595,406, Cl. 285-319.000.

Ward, Anthony T.; Tenney, Donald J.; and Grammatica, Steven J., to Xerox Corporation. Evaporation crucible assembly. 5,596,673, Cl. 392-389.000.

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Diem, Benjamin C.; and Ward, M. Dwayne, 5,596,540, Cl. 365-221.000.

Wardlow, Eddie, Jr.: *See*—
Smiercinik, Richard C.; Wardlow, Eddie, Jr.; and Ball, Lawrence E., 5,596,058, Cl. 526-342.000.

Warner-Jenkinson Company, Inc.: *See*—
Signorino, Charles A.; and Meggos, Harry, 5,595,592, Cl. 106-198.100.

Warner-Lambert Company: *See*—
Kiefer, Jesse J.; and Glenn, Blake H., 5,595,757, Cl. 424-451.000.

Warren, Jack K.: *See*—
Li, Yun Z.; Lemberger, Richard R.; Schubert, Paul C.; Joyce, Terrence H.; and Warren, Jack K., 5,596,190, Cl. 250-236.000.

Warren, Leslie F., Jr.: *See*—
Teach, D. Morgan; Warren, Leslie F., Jr.; and Chung, Young J., 5,595,637, Cl. 205-91.000.

Warren, Robert, to SGS-Thomson Microelectronics Limited. Single clock scan latch. 5,596,584, Cl. 371-22.300.

Warshawsky, Jerome; and Antoniello, Frank, to I. W. Industries, Inc. Wall mount inlet stop system. 5,595,212, Cl. 137-360.000.

Watanabe, Kenji: *See*—
Takayama, Masaji; Watanabe, Kenji; and Furuya, Yoshikiyo, 5,595,447, Cl. 400-231.000.

Watanabe, Kiyoshi: *See*—
Tamura, Masaaki; Fujii, Ayako; Kobari, Yoshiko; Nagano, Mamoru; Watanabe, Kiyoshi; Morinaga, Hidehiko; Koyama, Shigeki; and Sawada, Yoshikazu, 5,596,689, Cl. 395-133.000.

Watanabe, Rikizou: *See*—
Shibata, Ryoichi; and Watanabe, Rikizou, 5,595,615, Cl. 148-440.000.

Watanabe, Shigeki, to Fujitsu Limited. Application of phase conjugate optics to optical systems. 5,596,667, Cl. 385-122.000.

Watanabe, Tsukasa; Miyashiro, Mutsumi; Suzuki, Shunetsu; Goto, Takeshi; and Fujita, Kozo, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Actuator for steering rear wheels. 5,595,089, Cl. 74-89.150.

Watanabe, Yoshifumi: *See*—
Otake, Seiichirou; Watanabe, Yoshifumi; and Kato, Yukihiro, 5,595,939, Cl. 437-209.000.

Watanabe, Yoshikuni: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kouguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

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Sanderson, Ronald D., 5,595,662, Cl. 210-640.000.

Watkins, Grant H.; Matthews, Norman G.; Hazzard, Aldez C.; and Muhlbaier, John P., to Northrop Grumman Corporation. Direct frequency synthesizer having moderate bandwidth. 5,596,290, Cl. 327-105.000.

Watkins, Jeffrey C.; and Jones, Arwel W., to British Technology Group Limited. Substituted piperazine 2-carboxylic acids useful in the treatment of central nervous system disorders. 5,595,983, Cl. 514-85.000.

Watson, Barbara D., legal representative: *See*—
Milner, Richard J.; Staples, Judith A.; Lenz, Michael; Lutton, George G.; McRae, Cheryl F.; Watson, John A. L., deceased, 5,595,746, Cl. 424-405.000.

Watson, Gary S.: *See*—
Catlin, Paul A.; Ballard, Douglas C.; Watson, Gary S.; and Worden, Alfred M., 5,595,357, Cl. 244-1.00R.

Watson, John A. L., deceased (by Barbara D. Watson, legal representative): *See*—
Milner, Richard J.; Staples, Judith A.; Lenz, Michael; Lutton, George G.; McRae, Cheryl F.; Watson, John A. L., deceased, 5,595,746, Cl. 424-405.000.

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Davies, Peter; and Watson, Larry T., 5,596,636, Cl. 379-216.000.

Watt, Paul W.: *See*—
Light, Nicholas D.; McGregor, James; Harvey, Wilson; and Watt, Paul W., 5,595,621, Cl. 156-80.000.

Watterson, Scott R.: *See*—
Daleboot, William T.; and Watterson, Scott R., 5,595,556, Cl. 482-54.000.

Wattron, James; and Lisowski, Walter E., to Wattron, James P. Releasable caster. 5,594,974, Cl. 16-30.000.

Wattron, James P.: *See*—
Wattron, James; and Lisowski, Walter E., 5,594,974, Cl. 16-30.000.

Waxing Corporation of America, Inc.: *See*—
McCracken, Robert E., 5,595,532, Cl. 451-357.000.

Way, Lowell B., Jr.; and Sheps, Martin I., to Diamondlight Industries, Inc. Flashlight with articulating stand. 5,595,436, Cl. 362-190.000.

WCI Outdoor Products, Inc.: *See*—
Brant, Ronald G.; and Houge, Michael S., 5,594,990, Cl. 30-122.000.

Webb, Robert L.: *See*—
Baine, Neil H.; Holder, Neville L.; Klein, Donald N.; Webb, Robert L.; and Zuber, Gary E., 5,596,109, Cl. 552-610.000.

Weber, Bret S., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Method and apparatus for the protection of write data in a disk array. 5,596,708, Cl. 395-182.040.

Weber, Robert E.; Harris, Linda G.; and Reed, Amy B., to Kimberly-Clark Corporation. Polymer-reinforced, eucalyptus fiber-containing paper. 5,595,828, Cl. 428-537.500.

Webster, Arthur A., III: *See*—
Wolf, Stephen; Jones, Coleen T.; Webster, Arthur A., III; Voran, Stephen; Pinson, Margaret H.; and Kubichek, Robert F., 5,596,364, Cl. 348-192.000.

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Strolle, Christopher H.; Limberg, Allen L.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., 5,596,418, Cl. 386-9.000.

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Strolle, Christopher H.; Limberg, Allen L.; Wedam, Werner F.; Schnitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., 5,596,418, Cl. 386-9.000.

Weder, Donald E., to Southpac Trust International Inc. Decorative covering for a flower pot. 5,595,022, Cl. 47-72.000.

Weder, Donald E., to Southpac Trust International, Inc. Decorative plant cover with attached sleeve. 5,595,023, Cl. 47-72.000.

Weder, Donald E., to Southpac Trust International, Inc. Plant cover and sleeve formed from two materials. 5,595,024, Cl. 47-79.000.

Weder, Donald E.; and Stracter, William F., to Southpac Trust International, Inc. Method of wrapping a floral grouping with a sleeve. 5,595,045, Cl. 53-397.000.

Weder, Donald E., to Southpac Trust International, Inc. Wrapping a floral grouping with sheets having adhesive or cohesive material applied thereto. 5,595,046, Cl. 53-397.000.

Weder, Donald E.; and Stracter, William F., to Southpac Trust International, Inc. Floral grouping wrapper having a detachable portion. 5,595,048, Cl. 53-399.000.

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Weeks, Jane; and Searcy, Tammy. Multi-function toilet accessory. 5,595,303, Cl. 206-576.000.

Wei, Che-Chia: *See*—
Chen, Tsiu C.; Bryant, Frank R.; Lu, Lan-Tseng; and Wei, Che-Chia, 5,595,935, Cl. 437-187.000.

Wei, Chang-Kuang, to Industrial Technology Research Institute. Method for forming a reflective surface for a LCD. 5,595,790, Cl. 427-510.000.

Weiler, Gerhard H., to Automatic Liquid Packaging, Inc. Torque-resistant closure for a hermetically sealed container. 5,595,314, Cl. 215-50.000.

Weinerman, Lee S.; and Arthurs, Scott A., to Eastern Company, The. Handle operable two-point latch and lock. 5,595,076, Cl. 70-208.000.

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Gries, Heinz; Rosenberg, Dowwe; Weinmann, Hanns-Joachim; Speck, Ulrich; Mittzel, Wolfgang; Hoyer, Georg-Alexander; Pfeiffer, Heinrich, deceased; and Renneke, Franz-Josef, 5,595,725, Cl. 424-9.340.

Weinshank, Richard L.; and Hartig, Paul R., to Synaptic Pharmaceutical Corporation. DNA encoding an α_{2B} adrenergic receptor and uses thereof. 5,595,880, Cl. 435-7.210.

Weissman, Gary A.: *See*—
Boucher, Richard C.; Weissman, Gary A.; Turner, John T.; Hawden, Thomas K.; Parr, Claude E.; Sullivan, Daniel M.; Erb, Laura J.; and Lustig, Kevin D., 5,596,088, Cl. 536-23.500.

Weiss, Hans J.; Forschner, Peter; Krebs, Rainer; and Geisler, Reinhard, to EKATO Rühr- und Mischtechnik GmbH. Agitating element. 5,595,475. Cl. 416-223.00R.

Weissen, Hans J.: *See*—
Weuste, Burkhard; Weissen, Hans J.; and Fischer, Andrea G., 5,596,125, Cl. 560-171.000.

Weissman, Paul E.: *See*—
Handschy, Mark A.; Meadows, Michael R.; Sheaker, Martin; and Weissman, Paul E., 5,596,451, Cl. 359-633.000.

Welch, William T.: *See*—
Cooper, John B.; Wise, Kent L.; Welch, William T.; and Sumner, Michael B., 5,596,196, Cl. 250-339.120.

Weller, Thomas: *See*—
Schwarz, Raimund; and Weller, Thomas, 5,596,621, Cl. 378-130.000.

Weng, Tian-Tsair; and Cheng, Yang-Hui. Steering lock. 5,595,077, Cl. 70-209.000.

Wenham, Stewart R.; Green, Martin A.; and Taouk, Michael Y., to Unisearch Limited. Buried contact interconnected thin film and bulk photovoltaic cells. 5,595,607, Cl. 136-244.000.

Wenskus, Dieter, to National Rejectors, Inc. Device for paying off coins from at least a pair of coin collecting tubes. 5,595,535, Cl. 453-40.000.

Weppio, Peter J.: *See*—
Cary, Gail E.; Weppio, Peter J.; and Beach, Barbara A., 5,596,124, Cl. 560-61.000.

Wesbey, George E.: *See*—
Sharma, Sukhdev R.; Wesbey, George E.; Gaalema, Stephen; and Minteer, John A., 5,596,200, Cl. 250-370.140.

Wessel, Hans P.: *See*—
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hadvary, Paul; Hilpert, Kurt; Müller, Klaus; Labler, Ludvik; Schmid, Gérard; Tschopp, Thomas B.; Wessel, Hans P.; and Wirz, Beat, 5,595,999, Cl. 514-309.000.

Western Atlas, Inc.: *See*—
Hensley, Jerry C., 5,595,462, Cl. 409-132.000.
Wilkins, John J.; Steffens, Walter L.; Koeninger, Timothy A.; and Heit, Martin A., 5,595,279, Cl. 198-370.020.

Western Atlas International, Inc.: *See*—
Mickael, Medhat W., 5,596,191, Cl. 250-269.400.
Wisecup, R. Daniel, 5,596,546, Cl. 367-47.000.

Western, Linda M.: *See*—
Rose-Samuel; Western, Linda M.; Becker, Martin; and Ullman, Edwin F., 5,595,891, Cl. 435-91.500.

Western Printing Machinery Company: *See*—
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Yamamoto, Yasuhiro: *See*—
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Yamamoto, Yoshiyuki: *See*—
Takahashi, Shuji; Yanadori, Kazuhito; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Yamamuro, Masatoru: *See*—
Ishizaki, Kazuyoshi; Yamamuro, Masatoru; Ishizuka, Atsushi; Ohya, Shouji; and Hamao, Miyoko, 5,595,478, Cl. 417-300.000.

Yamane, Shinji: *See*—
Nishiguchi, Yasuo; Kikuchi, Susumu; Imoo, Ryushi; Tsukahara, Sigeki; and Yamane, Shinji, 5,596,394, Cl. 399-175.000.

Yamanouchi, Junichi; and Hosoya, Yoichi, to Fuji Photo Film Co., Ltd. Silver halide emulsion prepared in the presence of polymers and a photographic material using the same. 5,595,863, Cl. 430-567.000.

Yamao, Takeshi: *See*—
Yamada, Tetsuo; Yamao, Takeshi; Kondo, Yasukazu; Nakamura, Hideo; and Mitani, Tadayuki, 5,595,718, Cl. 423-344.000.

Yamaoka, Masami; and Toyoshima, Shoji, to Nippondenso Co., Ltd. Semiconductor device including overvoltage protection diode. 5,596,217, Cl. 257-367.000.

Yamasaki, Hajime: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kosguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Yamashiro, Toshikatsu: *See*—
Tamura, Yoshikazu; Oono, Kengo; and Yamashiro, Toshikatsu, 5,594,980, Cl. 29-33.00M.

Yamashita, Takashi: *See*—
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Yamashita, Tetuo: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kosguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Yamauchi, Atsuyoshi: *See*—
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Yamazaki, Masahiko, to Nihon Kohden Corporation. Pulse oximeter. 5,595,176, Cl. 128-633.000.

Yamazaki, Shinichi: *See*—
Yoshioka, Keiichi; Yasui, Takashi; and Yamazaki, Shinichi, 5,596,761, Cl. 395-568.000.

Yamazaki, Shigieru: *See*—
Shimizu, Yasuo; Hironaka, Shinzi; Mukai, Yoshinobu; and Yamazaki, Shigieru, 5,596,252, Cl. 318-432.000.

Yamazaki, Isamu, to Kabushiki Kaisha Toshiba. Method and apparatus of automated theorem proving for information processing. 5,596,682, Cl. 395-66.000.

Yamazaki, Kunihiro: *See*—
Mori, Akira; Uchino, Ikuo; Hirosawa, Atsuhiko; and Yamazaki, Kunihiro, 5,596,266, Cl. 324-71.100.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Superconducting device. 5,596,206, Cl. 257-30.000.

Yamazaki, Yoshihiro: *See*—
Iizuka, Takashi; and Yamazaki, Yoshihiro, 5,596,424, Cl. 358-474.000.

Yan, Tsoung Y., to Mobil Oil Corporation. Two phase removal of halides from liquid hydrocarbons cross-reference to related applications. 5,595,648, Cl. 208-308.000.

Yanadori, Kazuhito: *See*—
Takahashi, Shuji; Yanadori, Kazuhito; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Yanagi, Masato; Kagao, Satoru; Dohi, Makoto; and Nakaizumi, Sanae, to Toyo Ink Manufacturing Co., Ltd. Anaerobic adhesive and sheet. 5,596,028, Cl. 523-176.000.

Yanagigawa, Hiroshi, to NBC Corporation. Semiconductor device with diode and capable of device protection. 5,596,216, Cl. 257-355.000.

Yanagihara, Naoto: *See*—
Ono, Makoto; and Yanagihara, Naoto, 5,595,853, Cl. 430-138.000.

Yanase, Norio: *See*—
Ogata, Eiji; Yanase, Norio; and Kitahara, Takayuki, 5,596,128, Cl. 562-95.000.

Yancopoulos, George D.: *See*—
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Yang, Cheeror: *See*—
Chang, Cheng C.; and Yang, Cheeror, 5,595,195, Cl. 131-349.000.

Yang, Henry S.; Post, Donald L.; and Huang, Wen-Yi, to Digital Equipment Corporation. Automatic network speed adapter. 5,596,575, Cl. 370-468.000.

Yang, Kai-Yuen: *See*—
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Yano, Nobuyuki, to Nidek Co., Ltd. Ophthalmic apparatus having three dimensional calculating means. 5,596,377, Cl. 351-211.000.

Yano, Sadahide, to Yugen Kaisha Yano Engineering. Hollow die and an apparatus for continuous extrusion forming of hollow articles. 5,595,084, Cl. 72-262.000.

Yano, Tatsushi: *See*—
Shimazaki, Hiroyuki; Mizoguchi, Masamichi; Yamasaki, Hajime; Ogawa, Kazuaki; Tanaka, Shinji; Yano, Tatsushi; Shimizu, Takatoshi; Kosguchi, Yukio; Yamashita, Tetsuo; Murabayashi, Satoshi; Suzuki, Nobuyuki; Watanabe, Yoshikuni; Nakagawa, Koichi; Fukagawa, Daisuke; and Ogino, Kouji, 5,596,706, Cl. 395-182.040.

Yap, Sing H.: *See*—
Habets, Winand J. A.; Klein-Rot, Miriam F. H. M.; Oosterlaken, Theodorus A. M.; and Yap, Sing H., 5,595,868, Cl. 435-5.000.

Yardney Technical Products, Inc.: *See*—
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Yasrebi, Mehrad, to International Business Machines Corporation. High performance machine for switched communications in a heterogeneous data processing network gateway. 5,596,579, Cl. 395-678.000.

Yasuda, Shouhei: *See*—
Sakazaka, Osamu; Yasuda, Shouhei; Sumi, Shinjiro; Sebata, Katsufumi; Iinuma, Katsuharu; and Nishihata, Ken, 5,596,096, Cl. 340-352.000.

Yasui, Takashi: *See*—
Yoshioka, Keiichi; Yasui, Takashi; and Yamaura, Shinichi, 5,596,761, Cl. 395-568.000.

Yasuoshiro, Tsugio; and Torikai, Jun, to Toray Industries, Inc. Vapor deposited film, and a geometry measuring method, production process control method, production method, geometry measuring apparatus and production process control apparatus therefor. 5,595,781, Cl. 427-10.000.

Yatsuzuka, Yasufumi, to Sharp Kabushiki Kaisha. Memory protecting device for use in compact electronic apparatus equipped with an external power supply. 5,596,758, Cl. 395-750.000.

Yau, Leopoldo D.; and Fischer, Paul B., to Intel Corporation. Method and apparatus for endpoint detection in a chemical/mechanical process for polishing a substrate. 5,595,526, Cl. 451-8.000.

Yazaki, Asao; Chuta, Masanobu; Matsumoto, Hiroshi; Satake, Junko; Iida, Hiromi; and Tomita, Koji, to Nidec Corporation. Spindle motor with seal structure. 5,596,235, Cl. 310-67.00R.

Yazaki Corporation: *See*—
Kondo, Hiroyuki, 5,595,513, Cl. 439-862.000.
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Ye, Qaiyi: *See*—
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Yeh, Hsin-Ho. Shape-changeable table. 5,595,126, Cl. 108-64.000.

Yeske, Philip E.: *See*—
Giudin, Lyuba K.; Wicks, Douglas A.; Yeske, Philip E.; and Jonsson, E. Haakan, 5,596,044, Cl. 525-131.000.

Yi, Deog-Soo, to Daewoo Electronics Co., Ltd. Grounding structure for use in electric appliances. 5,596,173, Cl. 174-5.0SG.

Yin, Chenwei J.: *See*—
Krenik, William R.; Izzi, Louis J.; and Yin, Chenwei J., 5,596,583, Cl. 371-22.100.

YKK Corporation: *See*—
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Yokev, Hanoch; Peleg, Shimon; Meiman, Yehouda; and Porat, Boaz, to Nexus Telecommunication Systems Ltd. Differential ranging for a frequency-hopped remote position determination system. 5,596,330, Cl. 342-387.000.

Yokohama Rubber Co. Ltd., The: *See*—
Takahashi, Shuji; Yanadori, Kazuhito; Yamamoto, Yoshiyuki; Shyuto, Yoichi; and Eifuku, Takayuki, 5,595,284, Cl. 198-847.000.

Yokoi, Shinji; Michida, Shinji; Mori, Yoshinori; and Nishidera, Tsuyoshi, to Aisin Seiki Kabushiki Kaisha. Adjustable height bed. 5,594,961, Cl. 5-11.000.

Yokota, Norio; Sato, Nichitaka; Mukai, Katsuji; Ishinohachi, Toshiyuki; Hashimoto, Isao; Murao, Mikio; Kanamori, Shozo; and Kumagai, Chikanori, to Kawasaki Jukogyo Kabushiki Kaisha; and Sumitomo Cement Co., Ltd. Method and apparatus for sintering cement clinker. 5,595,599, Cl. 106-744.000.

Yokouchi, Nobuo; and Saito, Hiroyuki, to Pentel Kabushiki Kaisha. Tape dispenser. 5,595,626, Cl. 156-577.000.

Yokozeki, Akihiro: *See*—
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Yonekawa, Noboru: *See*—
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Yonemitsu, Jun; Iwamura, Ryuichi; Yoshimura, Shunji; and Kawamura, Makoto, to Sony Corporation. Method and apparatus for recording MPEG-compressed video data and compressed audio data on a disk. 5,596,565, Cl. 369-275.300.

Yoneyama, Masakazu: *See*—
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Yooda, Eiichi; and Itoh, Fumitaka, to Taisei Rotec Co., Ltd. Method for adjusting consistency. 5,595,598, Cl. 106-724.000.

York, Monte H.: *See*—
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Yoshida, Makoto: *See*—
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Yoshida, Susumu; and Nakazawa, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Control apparatus for a vehicle. 5,595,257, Cl. 180-287.000.

Yoshida, Takehiro, to Canon Kabushiki Kaisha. Data transmission over a communication line. 5,596,629, Cl. 379-100.000.

Yoshida, Tetuya: *See*—
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Yoshikawa, Masaharu: *See*—
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Yoshimatsu, Eiji; Fujii, Shinichi; and Okitsu, Shigeru, to Fuji Photo Film Co., Ltd. Method and apparatus for making splice indicating holes through photographic paper. 5,595,101, Cl. 83-40.000.

Yoshimura, Katsuji; Takahashi, Koji; and Suzuki, Yasutomo, to Canon Kabushiki Kaisha. Video system using two different kinds of recording media. 5,596,419, Cl. 386-52.000.

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Yoshioka, Keiichi; Yasui, Takashi; and Yamaura, Shinichi, to Ricoh Company, Ltd. Central processing unit with internal register initializing means. 5,596,761, Cl. 395-568.000.

Yoshioka, Yasuhiko: *See*—
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Yoshizumi, Shozo: *See*—
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Good, Charles F.; Young, Craig S.; and Fernandes, Antonio M., 5,596,691, Cl. 395-140.000.

Young, Keith: *See*—
Remington, James A.; Young, Keith; and Kuhn, Stephen R., 5,595,361, Cl. 246-276.000.

Young, Patrick H.: *See*—
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Young, Paul R.; Richard, David W.; and Bazar, Leonard, to Kaman Aerospace Corporation. Hermetically sealed memory or PC card unit having a frame, header and covers in bonded engagement. 5,596,486, Cl. 361-737.000.

Ysbrand, Floyd, to Esterline. Molded cabling, preform for making and method of making. 5,596,175, Cl. 174-117.00M.

Yuan, Jack H.; and Samachisa, Gheorghe, to SanDisk Corporation. Technique of forming over an irregular surface a polysilicon layer with a smooth surface. 5,595,924, Cl. 437-43.000.

Yudin, Boris: *See*—
Boiarski, Michael; Longsworth, Ralph C.; Yudin, Boris; Hill, Dennis H.; Klusmier, Lawreace A.; Khatri, Ajay N.; and Owoc, Anthony L., 5,595,065, Cl. 62-222.000.

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Shimabukuro, Kenji, 5,595,779, Cl. 426-597.000.

Yugen Kaisha Yano Engineering: *See*—
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Yun, Chang H. Device for filtering agricultural water. 5,595,656, Cl. 210-416.100.

Yun, Jung K.: *See*—
Strolle, Christopher H.; Limberg, Allen L.; Wodam, Werner F.; Schmitzler, Raymond; Weckenbrock, Hermann J.; Ko, Jung W.; and Yun, Jong K., 5,596,418, Cl. 386-9.000.

Yuri, Nobuyuki: *See*—
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Zaid, Najib H., to Jacam Chemical Partners Ltd. Corrosion inhibitor. 5,595,679, Cl. 252-70.000.

Zaiss, Siegfried: *See*—
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Zaitlin, Milton; Golemboski, Daniel; and Lomonossoff, George, to Cornell Research Foundation, Inc. Induction of resistance to virus diseases by transformation of plants with a portion of a plant virus genome involving a read-through replicase gene. 5,596,132, Cl. 800-205.000.

Zampaglione, Michael A.: *See*—
Steinweg, Russell L.; Zampaglione, Michael A.; and Lin, Pei H., 5,596,505, Cl. 364-490.000.

Zander, Andrew T.; Cooper, Charles B., III; and Chien, Ring-Ling, to Varian Associates, Inc. Optical detector for echelle spectrometer. 5,596,407, Cl. 356-328.000.

Zander, Hans-Joachim; Bozzer, Dieter; and Martin, Stefan, to Whitaker Corporation, The. Coaxial connector having improved locking mechanism. 5,595,499, Cl. 439-352.000.

Zarate, Robert: *See*—
Eustace, Brian; and Zarate, Robert, 5,595,127, Cl. 108-109.000.

Zavis, Wayne M.; Mizener, Jeffery C.; Honochick, James J.; Bellin, Michael A.; and Laplace, Carl J., to Siemens Energy & Automation, Inc. Electrical power distribution system apparatus-resident personality memory module. 5,596,263, Cl. 323-255.000.

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Zenith Data Systems Corporation: *See*—
DeRoo, David T.; Nicol, Mark D.; DeLisle, David J.; Fakhruddin, Saifuddin; Gauthier, Lloyd W.; and Kobtz, Robert A., 5,596,713, Cl. 395-183.110.
Manser, Brian E.; Ojeda, Peter A., IV; Poole, Anton R.; and Guoming, Frank W., 5,596,480, Cl. 361-680.000.

Zepeda, Alfred U. N.: *See*—
Hunt, David S.; Fong, Jon J.; Scheffelin, Joseph E.; and Zepeda, Alfred U. N., 5,596,358, Cl. 347-85.000.

Zhang, Hongyong; Uochi, Hideki; Takayama, Toru; Takemura, Yasuhiko; and Yamamoto, Mutsuo, to Semiconductor Energy Laboratory Co., Ltd. Method of forming a thin film transistor. 5,595,923, Cl. 437-41.000.

Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Inc. Transistor and process for fabricating the same. 5,595,944, Cl. 437-41.000.

Zhang, Shou-Hua: *See*—
Flagan, Richard C.; and Zhang, Shou-Hua, 5,596,136, Cl. 73-28.040.

Zhao, Yuegian: *See*—
Pasandideh, Rajan K.; and Zhao, Yuegian, 5,595,681, Cl. 510-299.000.
Zhou, Rao-Sheng, to Timken Company, The. Unidirectional clutch. 5,595,272, Cl. 192-45.000.
Zhou, Yong, to Lucent Technologies Inc. Low bit rate audio-visual communication having improved face and lip region detection. 5,596,362, Cl. 348-14.000.
Zingarelli, Angelo; and Santanera, Cesare, to Fiat Ferroviaria S.p.A. System and method for detecting the relative position and motions between a rail vehicle and track. 5,596,203, Cl. 250-559.290.
Zink, Bruno: *See*—
Huber, Emmanuel; Klein, Christian; Batz, Hans-Georg; and Zink, Bruno, 5,595,741, Cl. 424-194.100.
Zinser Textilmaschinen GmbH: *See*—
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Zipfel, George G., Jr.: *See*—
Stanton, Stuart; White, Donald L.; and Zipfel, George G., Jr., 5,596,413, Cl. 356-401.000.
Zmaiden, Alexander P.; Rose, Walter; and Cheney, Michael C., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Petroleum butter. 5,595,745, Cl. 424-401.000.
Zook, Denise E., to Nabisco, Inc. Process for the preparation of partially-defatted nuts and product thereof. 5,595,780, Cl. 426-632.000.
Zschiesche, Ruth: *See*—
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zschiesche, Ruth, 5,596,063, Cl. 528-44.000.
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Zurawski, Gerard: *See*—
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Zushi, Shizuo: *See*—
Daikoku, Takahiro; Ashiwake, Noriyuki; Kawasaki, Nobuo; and Zushi, Shizuo, 5,595,240, Cl. 165-80.400.
Zwanikken, Radboud H. G.; Laakhaar, Jenneke A. C.; and van den Nieuwelaar, Adrianus J., to Stork PMT B.V. Method and device for preserving the meat of a slaughtered bird. 5,595,066, Cl. 62-374.000.
Zweckform Büro-Produkte GmbH: *See*—
Beinert, Norbert; Kaose, Manfred; Philipp, Gottfried; and von Tluck und Tzschonowitz, Christian, 5,595,810, Cl. 428-156.000.
3DO Company, The: *See*—
Needle, David L.; and Mical, Robert J., 5,596,693, Cl. 395-174.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21st DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fiskars Inc.: *See*—
Seals, Robert L., Re. 35,424, Cl. 7-138.000.
Inoue, Michihiro: *See*—
Yamada, Toshio; and Inoue, Michihiro, Re. 35,430, Cl. 365-189.010.
Isom, Jack F.: *See*—
Isom, Patrick D.; Montgomery, Frank T.; and Isom, Jack F., Re. 35,425, Cl. 74-6.000.
Isom, Patrick D.; Montgomery, Frank T.; and Isom, Jack F., to Isom, Patrick D. Universal starter motor assembly. Re. 35,425, Cl. 74-6.000.
Kondo, Ryoji, to Nippendenso Co., Ltd. Spark plug and the method of manufacturing the same. Re. 35,429, Cl. 313-141.000.
Mally, Timothy G., to Oscar Mayer Foods Corporation. Forming casingless sausage and the like. Re. 35,426, Cl. 99-483.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Yamada, Toshio; and Inoue, Michihiro, Re. 35,430, Cl. 365-189.010.
Montgomery, Frank T.: *See*—
Isom, Patrick D.; Montgomery, Frank T.; and Isom, Jack F., Re. 35,425, Cl. 74-6.000.
Nartron Corporation: *See*—
Wilhelm, Daniel D., Re. 35,428, Cl. 307-10.800.
Nippendenso Co., Ltd.: *See*—
Kondo, Ryoji, Re. 35,429, Cl. 313-141.000.
O.R. Concepts, Inc.: *See*—
Poettgen, Robert J., Re. 35,427, Cl. 128-849.000.
Oscar Mayer Foods Corporation: *See*—
Mally, Timothy G., Re. 35,426, Cl. 99-483.000.
Poettgen, Robert J., to O.R. Concepts, Inc. Sterilizable reflective surgical drape. Re. 35,427, Cl. 128-849.000.
Seals, Robert L., to Fiskars Inc. Multipurpose bicycle tool kit. Re. 35,424, Cl. 7-138.000.
Wilhelm, Daniel D., to Nartron Corporation. Electronic rheostat method and apparatus. Re. 35,428, Cl. 307-10.800.
Yamada, Toshio; and Inoue, Michihiro, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device. Re. 35,430, Cl. 365-189.010.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Elographics, Inc.: *See*—
Gibson, William A.; and Talmage, John E., Jr., B1 4,661,655, Cl. 178-18.000.
Gibson, William A.; and Talmage, John E., Jr., to Elographics, Inc. Electrographic touch sensor and method of reducing bowed equipotential fields therein. B1 4,661,655, Cl. 178-18.000.
Talmage, John E., Jr.: *See*—
Gibson, William A.; and Talmage, John E., Jr., B1 4,661,655, Cl. 178-18.000.

LIST OF DESIGN PATENTEES

ABC Group: *See*—
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208 5,595,197
218 5,595,198
273 5,595,199

CLASS 134
57 D 5,595,201
201 5,595,200

CLASS 135
33.6 5,595,202
124 5,595,203
142 5,595,204

CLASS 136
244 5,595,607

CLASS 137
13 5,595,205
15 5,595,206
38 5,595,207
68.11 5,595,208
116.5 5,595,209
181 5,595,210
182 5,595,211
360 5,595,212
515.5 5,595,213
517 5,595,214
554 5,595,215
607 5,595,216
614.06 5,595,217
625.18 5,595,218

CLASS 140
123 5,595,219
123.6 5,595,220

CLASS 141
177 5,595,221
312 5,595,222
375 5,595,223
388 5,595,224

CLASS 144
34.1 5,595,225
69 5,595,226
253.6 5,595,227
285 5,595,228

CLASS 148
104 5,595,608
5,595,609
233 5,595,610
259 5,595,611
318 5,595,612
319 5,595,613
334 5,595,614
440 5,595,615
538 5,595,616
595 5,595,617

CLASS 149
19.4 5,596,168

CLASS 152
209 A 5,595,619

CLASS 156
64 5,595,620
80 5,595,621
89 5,595,622
164 5,595,618
244.14 5,595,623
277 5,595,624
308.2 5,595,625
577 5,595,626
643.1 5,595,627

CLASS 160
23.1 5,595,229
135 5,595,230
168.1 5,595,231
178.1 5,595,232
232 5,595,233

CLASS 162
30.11 5,595,628
158 5,595,629
164.1 5,595,630
175 5,595,631
277 5,595,632

CLASS 164
9 5,595,234
235 5,595,235
319 5,595,236
440 5,595,237

CLASS 165
9 5,595,238
41 5,595,239
80.1 5,595,241
80.4 5,595,240
154 5,595,242

CLASS 166
177.2 5,595,243
178 5,595,244
250.1 5,595,245
278 5,595,246

297 5,595,247
379 5,595,248

CLASS 172

156 5,595,249

CLASS 173

29 5,595,250
178 5,595,251

CLASS 174

5 SG 5,596,173
33 5,596,169
35 R 5,596,170
52.4 5,596,171
5,596,172
57 5,596,174
117 M 5,596,175
151 5,596,176
153 R 5,596,177
265 5,596,178

CLASS 175

57 5,595,252
297 5,595,253
320 5,595,254
331 5,595,255

CLASS 177

25.18 5,596,179

CLASS 178

18 B1 4,661,655

CLASS 180

232 5,595,256
287 5,595,257
5,595,258
332 5,595,259

CLASS 182

3 5,595,260
129 5,595,261

CLASS 184

15.2 5,595,262

CLASS 186

53 5,595,263
56 5,595,264

CLASS 187

261 5,595,265

CLASS 188

251 A 5,595,266
261 5,595,267
271 5,595,268
282 5,595,269
284 5,595,270

CLASS 191

4 5,595,271

CLASS 192

45 5,595,272
5,595,273
70.25 5,595,274
111 A 5,595,275
213.12 5,595,276

CLASS 194

217 5,595,277

CLASS 198

333 5,595,278
370.02 5,595,279
429 5,595,280
687.1 5,595,281
689.1 5,595,282
812 5,595,283
847 5,595,284

CLASS 200

6 B 5,596,180
8 R 5,596,181
61.2 5,596,182
61.45 R 5,596,183
330 5,595,285
335 5,595,286
501 5,595,287
513 5,595,288
559 5,595,289
571 5,595,290

CLASS 201

1 5,595,633

CLASS 203

29 5,595,634

CLASS 204

412 5,595,635
464 5,595,636

CLASS 205

91 5,595,637
96 5,595,638
109 5,595,639
205 5,595,640
464 5,595,641
591 5,595,642
634 5,595,643
766 5,595,644
771 5,595,645
783 5,595,646
784.5 5,595,647

CLASS 206

143 5,595,291
158 5,595,292
308.1 5,595,293
349 5,595,294
5,595,295
363 5,595,296
387.13 5,595,297
423 5,595,298
434 5,595,299
449 5,595,300
5,595,301
541 5,595,302
576 5,595,303
598 5,595,304
600 5,595,305

CLASS 208

308 5,595,648

CLASS 209

325 5,595,306
395 5,595,307

CLASS 210

198.2 5,595,649
5,595,650
232 5,595,651
282 5,595,652
289 5,595,653
323.1 5,595,654
391 5,595,655
416.1 5,595,656
461 5,595,657
490 5,595,658
502.1 5,595,659
521 5,595,660
634 5,595,661
640 5,595,662
652 5,595,663
656 5,595,664
662 5,595,665
679 5,595,666
769 5,595,667

CLASS 211

40 5,595,308
59.1 5,595,309
59.2 5,595,310
151 5,595,311
188 5,595,312

CLASS 212

225 5,595,313

CLASS 215

50 5,595,314

CLASS 216

17 5,595,668

CLASS 218

32 5,596,184

CLASS 219

121.59 5,595,669
121.64 5,595,670
137.62 5,595,671
257 5,595,672
710 5,595,673
715 5,595,674

CLASS 220

1.5 5,595,315
4.33 5,595,316
335 5,595,317
401 5,595,318
429 5,595,319
466 5,595,320
565 5,595,321
619 5,595,322

CLASS 221

194 5,595,323

CLASS 222

1 5,595,324
135 5,595,325
321.7 5,595,326
327 5,595,327

CLASS 223

91 5,595,331

CLASS 224

264 5,595,332
536 5,595,333

CLASS 226

15 5,595,334
42 5,595,335

CLASS 227

7 5,595,336

CLASS 228

1.1 5,595,328
9 5,595,329
102 5,595,330
193 5,595,337

CLASS 229

87.2 5,595,338
109 5,595,339
216 5,595,340

CLASS 232

17 5,595,341

CLASS 236

51 5,595,342

CLASS 239

154 5,595,343
307 5,595,344
312 5,595,345
431 5,595,346

CLASS 241

20 5,595,347
36 5,595,348
41 5,595,349
65 5,595,350

CLASS 242

18 DD 5,595,351
233 5,595,352
348.1 5,595,353
364 5,595,354
470 5,595,355
613.5 5,595,356

CLASS 244

1 R 5,595,357
7 A 5,595,358
30 5,595,359
158 R 5,595,360

CLASS 246

276 5,595,361

CLASS 248

27.1 5,595,362
72 5,595,363
205.5 5,595,364
354.3 5,595,366

CLASS 250

208.1 5,596,185
214.1 5,596,186
222.1 5,596,187
231.16 5,596,188
5,596,189
236 5,596,190
269.4 5,596,191
288 5,596,192
292 5,596,193
306 5,596,194
310 5,596,195
339.12 5,596,196
363.04 5,596,197
370.07 5,596,198
370.11 5,596,199
370.14 5,596,200
385.1 5,596,201
484.4 5,596,202
548 5,596,204
559.29 5,596,203

CLASS 251

90 5,595,367
148 5,595,368

CLASS 252

8.61 5,595,675
62.2 5,595,676
62.9 5,595,677
68 5,595,678
70 5,595,679
77 5,595,680
299.01 5,595,682
299.61 5,595,683
5,595,684
5,595,685
5,595,686
312 5,595,687
385 5,595,688
500 5,595,689

CLASS 254

26 R 5,595,369

CLASS 256

17 5,595,370

CLASS 257

9 5,596,205
30 5,596,206
48 5,596,207
66 5,596,208
80 5,596,209
98 5,596,210
194 5,596,211
298 5,596,212
316 5,596,213
324 5,596,214
344 5,596,215
355 5,596,216
367 5,596,217
369 5,596,218
467 5,596,219
587 5,596,220
588 5,596,221
620 5,596,222
5,596,223
666 5,596,224
667 5,596,225
690 5,596,226
701 5,596,227
714 5,596,228
727 5,596,229
758 5,596,230
776 5,596,231

CLASS 261

104 5,595,690
120 5,595,691

CLASS 264

3.2 5,596,232
36 5,595,692
40.1 5,595,693
50 5,595,694
83 5,595,695
118 5,595,696
145 5,595,698
169 5,595,699
211 5,595,700
255 5,595,701
318 5,595,702
401 5,595,703
404 5,595,704
456 5,595,705
735 5,595,697

CLASS 267

34 5,595,371
64.13 5,595,372
140.12 5,595,373
220 5,595,374

CLASS 269

32 5,595,375
48.1 5,595,376
71 5,595,377
210 5,595,378

CLASS 270

52.06 5,595,379

CLASS 271

9.09 5,595,380
12 5,595,381
122 5,595,382
140 5,595,383

CLASS 273

369 5,595,387

CLASS 279

103 5,595,391

CLASS 280

7.13 5,595,392
30 5,595,393
33.993 5,595,394
47.26 5,595,395
607 5,595,396
677 5,595,397
763.1 5,595,398
777 5,595,399
806 5,595,400

CLASS 281

2 5,595,401

CLASS 283

67 5,595,402
74 5,595,403
116 5,595,404

CLASS 285

96 5,595,405
319 5,595,406

CLASS 292

5 5,595,407
37 5,595,408
112 5,595,409
306 5,595,410

CLASS 294

74 5,595,411
87.1 5,595,412
88 5,595,413

CLASS 296

26 5,595,414
39.1 5,595,415
91 5,595,416
100 5,595,417
5,595,418
180.2 5,595,419

CLASS 297

85 5,595,420

CLASS 301

37.21 5,595,422
37.43 5,595,423

CLASS 303

22.1 5,595,425

CLASS 307

9.1 5,596,233
10.2 5,596,234
10.8 Re.35,428

CLASS 310

67 R 5,596,235
68 A 5,596,236
71 5,596,237
103 5,596,238
311 5,596,239
323 5,596,240
5,596,241
328 5,596,242
348 5,596,243
5,596,244

CLASS 312

109 5,595,426
140.4 5,595,427
223.3 5,595,428
235.2 5,595,429
319.1 5,595,430
409 5,595,431

CLASS 313

141 Re.35,429
293 5,596,245
502 5,596,246

CLASS 315

56 5,596,247
368.18 5,596,248
371 5,596,249
5,596,250

CLASS 318

366 5,596,251
432 5,596,252
469 5,596,253
568.11 5,596,254
568.12 5,596,255
600 5,596,256
685 5,596,257

CLASS 320

2 5,596,258
5 5,596,567
21 5,596,259
30 5,596,260
48 5,596,261
5,596,262

CLASS 323

255 5,596,263
284 5,596,264
315 5,596,265

CLASS 324

71.1 5,596,266
5,596,267
5,596,268
73.1 5,596,269
158.1 5,596,270
174 5,596,271
207.21 5,596,272
248 5,596,273
303 5,596,274
307 5,596,275
316 5,596,276
329 5,596,277
435 5,596,278
439 5,596,279
606 5,596,280
713 5,596,281
754 5,596,282
5,596,283

CLASS 326

27 5,596,284
30 5,596,285
33 5,596,286
40 5,596,287

CLASS 327

12 5,596,288
67 5,596,289
105 5,596,290
108 5,596,291
124 5,596,292
142 5,596,293
145 5,596,294
170 5,596,295
291 5,596,296
538 5,596,297

CLASS 329

337 5,596,298

CLASS 330

260 5,596,299

CLASS 331

17 5,596,300
36 R 5,596,301
57 5,596,302

CLASS 335

216 5,596,303
306 5,596,304

CLASS 336

205 5,596,305

CLASS 337

282 5,596,306
298 5,596,307

CLASS 338

20 5,596,308
61 5,596,309

CLASS 340

331 5,596,310
384.7 5,596,311
457.1 5,596,312
574 5,596,313
632 5,596,314
825.03 5,596,315
5,596,316
825.31 5,596,317
825.44 5,596,318
903 5,596,319
962 5,596,320

CLASS 341

76 5,596,321
120 5,596,322
155 5,596,323

CLASS 342

5 5,596,324
28 5,596,325
30 5,596,326
195 5,596,327
357 5,596,328
374 5,596,329
387 5,596,330
455 5,596,331
5,596,332
457 5,596,333

CLASS 343

702 5,596,334
713 5,596,335
770 5,596,336
5,596,337
786 5,596,338

CLASS 345

8 5,596,339
31 5,596,340
52 5,596,341
87 5,596,342
102 5,596,343

103 5,596,344
120 5,596,345
127 5,596,346
145 5,596,347
146 5,596,348
147 5,596,349
173 5,596,350
260 5,596,604

CLASS 347

7 5,596,351
15 5,596,352
19 5,596,353
30 5,596,354
43 5,596,355
53 5,596,356
64 5,596,357
85 5,596,358
188 5,596,359
256 5,596,360

CLASS 348

12 5,596,361
14 5,596,362
58 5,596,363
192 5,596,364
208 5,596,365
5,596,366
272 5,596,367
333 5,596,368
402 5,596,369
416 5,596,370
452 5,596,371
537 5,596,372
569 5,596,373
673 5,596,374
687 5,596,375
718 5,596,376

CLASS 349

32 5,596,431
51 5,596,432
67 5,596,429
74 5,596,430
123 5,596,434
132 5,596,435

CLASS 351

211 5,596,377
233 5,596,378
244 5,596,379

CLASS 352

30 5,596,380

CLASS 356

23 5,596,401
71 5,596,402
139.03 5,596,403
301 5,596,404
316 5,596,405
327 5,596,406
328 5,596,407
339 5,596,408
357 5,596,409
358 5,596,410
369 5,596,411
371 5,596,412
401 5,596,413
417 5,596,414

CLASS 358

296 5,596,415
5,596,416
433 5,596,423
474 5,596,424
500 5,596,425
5,596,426
515 5,596,427
518 5,596,428

CLASS 359

132 5,596,436
144 5,596,437
154 5,596,438
161 5,596,439
177 5,596,440
192 5,596,441
199 5,596,442
200 5,596,443
210 5,596,444
5,596,445
214 5,596,446
324 5,596,447
341 5,596,448
5,596,449
599 5,596,450
631 5,596,433
633 5,596,451
641 5,596,452
692 5,596,453
726 5,596,454
789 5,596,455
831 5,596,456

CLASS 360

48 5,596,457
5,596,458
51 5,596,459
78.14 5,596,460
97.01 5,596,461
99.12 5,596,462
104 5,596,463
132 5,596,464

CLASS 361

18 5,596,465
5,596,466
38 5,596,467
56 5,596,468
58 5,596,469
91 5,596,470
92 5,596,471
93 5,596,472
97 5,596,473
111 5,596,474
119 5,596,475
127 5,596,476
160 5,596,477
212 5,596,478
643 5,596,479
680 5,596,480
683 5,596,481
5,596,482
5,596,483
685 5,596,484
703 5,596,485
737 5,596,486
814 5,596,487

CLASS 362

74 5,595,432
80.1 5,595,433
102 5,595,434
109 5,595,435
5,595,437
190 5,595,436
228 5,595,438
238 5,595,439
247 5,595,440
250 5,595,441

CLASS 363

62 5,596,489
63 5,596,490
65 5,596,491
95 5,596,492

CLASS 364

420 5,596,494
424.034 5,596,496
424.051 5,596,498
424.055 5,596,497
424.06 5,596,499
424.08 5,596,495
449.7 5,596,500
464.23 5,596,501
468.01 5,596,502
468.25 5,596,503
468.27 5,596,504
490 5,596,505
491 5,596,506
505 5,596,507
508 5,596,508
516 5,596,509
526 5,596,510
527 5,596,511
550 5,596,512
557 5,596,513
569 5,596,514
570 5,596,515
717 5,596,516
725 5,596,517
5,596,518
766 5,596,519
786 5,596,520

CLASS 365

49 5,596,521
113 5,596,522
182 5,596,523
185.1 5,596,524
185.17 5,596,525
5,596,526
185.18 5,596,532
185.20 5,596,527
185.24 5,596,528
185.28 5,596,529
185.29 5,596,530
185.31 5,596,531
Re.35,430
189.04 5,596,533
189.09 5,596,534
200 5,596,535
5,596,536
201 5,596,537
73 5,596,617

CLASS 378

34 5,596,618
65 5,596,619
84 5,596,620
130 5,596,621
199 5,596,622

CLASS 379

15 5,596,623
58 5,596,624
60 5,596,625
61 5,596,626
67 5,596,627
93 5,596,628
100 5,596,629
145 5,596,630
177 5,596,631
189 5,596,632
201 5,596,633
5,596,634
202 5,596,635
216 5,596,636
399 5,596,637
430 5,596,638

CLASS 380

4 5,596,639
18 5,596,640
23 5,596,641
24 5,596,642
5,596,643

CLASS 381

17 5,596,644
5,596,645
61 5,596,646
77 5,596,647
5,596,648
79 5,596,649
103 5,596,650
104 5,596,651

CLASS 382

115 5,596,652
128 5,596,653
168 5,596,654
173 5,596,655
186 5,596,656
227 5,596,657
243 5,596,658
253 5,596,659
302 5,596,660

CLASS 385

24 5,596,661
55 5,596,662
92 5,596,663
5,596,664
5,596,665
118 5,596,666
122 5,596,667
123 5,596,668
128 5,596,669
135 5,596,670
147 5,596,671
5,596,672

CLASS 386

9 5,596,418
17 5,596,417
26 5,596,422
52 5,596,419
110 5,596,420
126 5,596,421

CLASS 392

389 5,596,673

CLASS 395

2.1 5,596,674
2.17 5,596,676
2.2 5,596,675
2.29 5,596,677
2.45 5,596,679
23 5,596,681
66 5,596,682
83 5,596,683
109 5,596,684
121 5,596,685
122 5,596,686
130 5,596,687
133 5,596,689
5,596,690
140 5,596,691
143 5,596,692
152 5,596,694
174 5,596,693
182.04 5,596,706
5,596,707
5,596,708
182.05 5,596,709
182.17 5,596,710
182.21 5,596,711
183.02 5,596,712
183.11 5,596,713
183.14 5,596,714
183.19 5,596,715
185.01 5,596,716
185.06 5,596,717
187.01 5,596,718
200.02 5,596,719
200.03 5,596,720
200.04 5,596,721
200.15 5,596,722
200.16 5,596,723
210 5,596,493
237 5,596,678
250 5,596,724
5,596,725
5,596,726
257 5,596,680
281 5,596,727
5,596,728
308 5,596,729
309 5,596,730
5,596,731
326 5,596,703
5,596,704
5,596,705
333 5,596,695
339 5,596,698
340 5,596,697
5,596,700
5,596,702
352 5,596,699
356 5,596,701
404 5,596,736
421.03 5,596,737
430 5,596,738
479 5,596,739
484 5,596,740
490 5,596,741
500 5,596,742
5,596,743
568 5,596,761
586 5,596,735
588 5,596,760
591 5,596,733
610 5,596,744
5,596,748
612 5,596,746
5,596,747
614 5,596,745
671 5,596,750
673 5,596,749
676 5,596,751
678 5,596,579
682 5,596,753
701 5,596,752
709 5,596,732
726 5,596,754
734 5,596,755
750 5,596,756
5,596,757
5,596,758
5,596,759
800 5,596,762
5,596,763
5,596,764
5,596,765
5,596,766
5,596,767
806 5,596,696
825 5,596,734

CLASS 396

6 5,596,385
50 5,596,387
110 5,596,386
207 5,596,381
315 5,596,383
413 5,596,384
429 5,596,382

CLASS 399

8 5,596,390
16 5,596,389
45 5,596,391
5,596,399
5,596,400
98 5,596,392
111 5,596,388
168 5,596,395
174 5,596,393
175 5,596,394
237 5,596,396
335 5,596,397
346 5,596,398

CLASS 400

88 5,595,445
124.13 5,595,446
231 5,595,447
320 5,595,448
472 5,595,449
615.2 5,595,450

CLASS 401

219 5,595,451

CLASS 403

221 5,595,452
252 5,595,453
263 5,595,454

CLASS 404

25 5,595,455

CLASS 405

53 5,595,456
87 5,595,457
258 5,595,458
272 5,595,459
284 5,595,460

CLASS 406

152 5,595,461

CLASS 409

132 5,595,462
5,595,463
219 5,595,464

CLASS 410

24 5,595,465

CLASS 411

303 5,595,466

CLASS 414

13 5,595,467
331 5,595,468
458 5,595,469
495 5,595,470
685 5,595,471

CLASS 415

110 5,595,472
199.1 5,595,473

CLASS 416

1 5,595,474
223 R 5,595,475

CLASS 417

53 5,595,476
69 5,595,477
300 5,595,478

CLASS 418

61.3 5,595,479

CLASS 420

81 5,595,706

CLASS 422

64 5,595,707
82.06 5,595,708
88 5,595,709
104 5,595,710
119 5,595,711
129 5,595,712
170 5,595,713

CLASS 423

21.1 5,595,714
328.1 5,595,715
328.2 5,595,716
339 5,595,717
344 5,595,718
418.2 5,595,719
447.6 5,595,720

CLASS 424

1.49 5,595,721
9.2 5,595,722
9.34 5,595,725
9.5 5,595,723
5,595,724
9.61 5,595,726
47 5,595,727
65 5,595,728
68 5,595,729
70.1 5,595,730
76.4 5,595,731
85.7 5,595,732
93.21 5,595,733
94.6 5,595,734
94.64 5,595,735
5,595,736
130.1 5,595,737
184.1 5,595,738
189.1 5,595,739
190.1 5,595,740
194.1 5,595,741
195.1 5,595,742
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253.1 5,595,744
401 5,595,745
405 5,595,746
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421 5,595,750
422 5,595,751
425 5,595,752
436 5,595,753
443 5,595,754
450 5,595,756
451 5,595,757
456 5,595,758
464 5,595,759
5,595,760
484 5,595,761
490 5,595,762
617 5,595,763
687 5,595,764

CLASS 425

7 5,595,765
8 5,595,766
174.4 5,595,767
5,595,768
183 5,595,769
188 5,595,770
443 5,595,771

CLASS 426

2 5,595,772
20 5,595,773
93 5,595,774
241 5,595,775
272 5,595,776
305 5,595,777
556 5,595,778
597 5,595,779
632 5,595,780

CLASS 427

10 5,595,781
212 5,595,782
240 5,595,783
255.2 5,595,784
271 5,595,785
299 5,595,786
304 5,595,787
421 5,595,788
493 5,595,789
510 5,595,790
554 5,595,791
570 5,595,792
575 5,595,793

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34.5 5,595,795
34.8 5,595,796
35.2 5,595,797
5,595,798
35.7 5,595,799
40.1 5,595,801
5,595,802
43 5,595,803
57 5,595,804
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69 5,595,806
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131 5,595,816
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212 5,595,813
216 5,595,814
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283 5,595,817
327 5,595,818
330 5,595,819
363 5,595,800
378 5,595,820
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421 5,595,823
425.9 5,595,824
428 5,595,825
450 5,595,826
516 5,595,827
537.5 5,595,828
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679 5,595,831

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19 5,595,833
30 5,595,834
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209 5,595,838
210 5,595,839
5,595,840
217 5,595,841
223 5,595,842

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5,595,844
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64 5,595,847
69 5,595,848
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108 5,595,851
110 5,595,852
138 5,595,853
200 5,595,854
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311 5,595,857
314 5,595,858
325 5,595,859
372 5,595,860
510 5,595,861
537 5,595,862
567 5,595,863
569 5,595,864
642 5,595,865

CLASS 432

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24 5,595,481
95 5,595,482
205 5,595,483

CLASS 433

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224 5,595,486
226 5,595,487

CLASS 434

236 5,595,488
319 5,595,489

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5 5,595,868
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5,595,879
7.21 5,595,880
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20 5,595,883
69.1 5,595,884
69.2 5,595,885
69.51 5,595,888
69.6 5,595,886
69.7 5,595,887
71.2 5,595,889
91.2 5,595,890
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104 5,595,892
136 5,595,893
172.1 5,595,894
172.3 5,595,895
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232 5,595,901
240.1 5,595,902
240.2 5,595,903
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243 5,595,905
252.1 5,595,906
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288.1 5,595,907
289.1 5,595,910
297.4 5,595,909
320.1 5,595,911
5,595,912

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177 5,595,914
518 5,595,915

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5,595,917
29 5,595,918
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43 5,595,924
52 5,595,925
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33 5,595,930
60 5,595,931
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180 5,595,934
187 5,595,935
192 5,595,936
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5,595,938
209 5,595,939
225 5,595,940
228 5,595,941
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230 5,595,943

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106 5,595,491
157 5,595,492
188 5,595,493
211 5,595,494
215 5,595,495
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352 5,595,499
372 5,595,500
377 5,595,501
429 5,595,502
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630 5,595,505
638 5,595,506
716 5,595,507
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761 5,595,510
762 5,595,511
812 5,595,512
862 5,595,513
886 5,595,514

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89 5,595,515
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224 5,595,521

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28 5,595,527
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356 5,595,530
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CLASS 453

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CLASS 454

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CLASS 460

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CLASS 464

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85 5,595,540
154 5,595,541

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47.7 5,595,386
118 5,595,542
162 5,595,543
203 5,595,544
259 5,595,545
280 5,595,546
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332 5,595,552
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52 5,595,554
54 5,595,556
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87 5,595,946
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108 5,595,948

CLASS 502

20 5,595,949
104 5,595,950
154 5,595,951
162 5,595,952
237 5,595,953
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CLASS 504

118 5,595,957
250 5,595,958

CLASS 505

329 5,595,959
473 5,595,960

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186 5,595,961
206 5,595,962
421 5,595,963
423 5,595,964
491 5,595,965
591 5,595,966

CLASS 510

299 5,595,681
372 5,595,967
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49 5,595,979
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159 5,595,984
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217 5,595,989
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233.2 5,595,991
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277 5,595,995
284 5,595,996
290 5,595,997
293 5,595,998
300 5,595,999
312 5,596,000
313 5,596,001
5,596,002
321 5,596,003
324 5,596,004
335 5,596,005
340 5,596,006
343 5,596,007
347 5,596,008
357 5,596,009
369 5,596,011
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646 5,596,020

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161 5,596,027
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179 5,596,029
404 5,596,030

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5,596,069
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353 5,596,073
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483 5,596,076

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328 5,596,079
330 5,596,071
351 5,596,072
373 5,596,080
391.1 5,596,081
416 5,596,082

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18.6 5,596,085
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3 5,596,130

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620 377,439
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374 377,448
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D9— 425 377,450
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D14— 100 377,478
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219 377,497
D16— 315 377,498
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D18— 15 377,500
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171 377,508
214 377,509
226 377,510
234 377,511
251 377,512
D22— 104 377,513
134 377,514
D23— 209 377,515
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28 377,537
38 377,538
63 377,539
64 377,540
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D28— 73 377,543
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143 377,548
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01	:	5,595,318	5,595,155	5,595,765	5,596,265	5,596,570	5,596,458
		5,596,073	5,595,177	5,595,768	5,596,284	5,596,571	5,596,461
		5,596,098	5,595,179	5,595,783	5,596,293	5,596,580	5,596,556
		5,596,324	5,595,183	5,595,791	5,596,299	5,596,585	5,596,609
02	:	5,596,501	5,595,186	5,595,794	5,596,304	5,596,587	5,596,625
04	:	5,595,011	5,595,199	5,595,797	5,596,314	5,596,590	5,596,632
		5,595,323	5,595,203	5,595,798	5,596,319	5,596,595	5,596,638
		5,595,418	5,595,206	5,595,816	5,596,320	5,596,604	5,596,655
		5,595,476	5,595,207	5,595,831	5,596,325	5,596,610	5,596,702
		5,595,532	5,595,214	5,595,843	5,596,327	5,596,613	5,596,727
		5,595,552	5,595,223	5,595,861	5,596,336	5,596,628	5,596,736
		5,595,570	5,595,230	5,595,867	5,596,338	5,596,631	09	:	5,594,976
		5,595,707	5,595,234	5,595,873	5,596,345	5,596,639			5,595,100
		5,595,879	5,595,271	5,595,874	5,596,350	5,596,644			5,595,188
		5,596,161	5,595,293	5,595,881	5,596,351	5,596,647			5,595,264
		5,596,172	5,595,300	5,595,886	5,596,352	5,596,656			5,595,334
		5,596,239	5,595,312	5,595,888	5,596,356	5,596,659			5,595,345
		5,596,288	5,595,317	5,595,891	5,596,358	5,596,660			5,595,690
		5,596,315	5,595,337	5,595,892	5,596,361	5,596,671			5,595,692
		5,596,485	5,595,338	5,595,898	5,596,368	5,596,680			5,595,730
		5,596,624	5,595,360	5,595,917	5,596,369	5,596,686			5,595,745
		5,596,642	5,595,366	5,595,918	5,596,371	5,596,690			5,595,839
		5,596,643	5,595,377	5,595,924	5,596,376	5,596,693			5,595,887
		5,596,722	5,595,379	5,595,927	5,596,379	5,596,694			5,595,993
		5,596,734	5,595,392	5,595,942	5,596,382	5,596,696			5,596,001
05	:	5,595,018	5,595,410	5,595,958	5,596,402	5,596,697			5,596,019
		5,595,250	5,595,427	5,595,959	5,596,405	5,596,698			5,596,047
		5,595,465	5,595,428	5,596,005	5,596,406	5,596,700			5,596,133
06	:	Re.35,424	5,595,436	5,596,038	5,596,407	5,596,705			5,596,246
		Re.35,425	5,595,437	5,596,071	5,596,411	5,596,714			5,596,274
		5,594,959	5,595,443	5,596,072	5,596,420	5,596,733			5,596,326
		5,594,965	5,595,446	5,596,084	5,596,436	5,596,737			5,596,341
		5,594,967	5,595,494	5,596,086	5,596,439	5,596,738			5,596,354
		5,594,971	5,595,514	5,596,091	5,596,454	5,596,739			5,596,486
		5,594,977	5,595,538	5,596,131	5,596,456	5,596,743			5,596,503
		5,594,993	5,595,543	5,596,136	5,596,466	5,596,744			5,596,514
		5,595,008	5,595,547	5,596,157	5,596,471	5,596,745			5,596,620
		5,595,031	5,595,548	5,596,159	5,596,500	5,596,748	10	:	5,595,406
		5,595,033	5,595,571	5,596,166	5,596,505	5,596,757			5,595,687
		5,595,041	5,595,595	5,596,183	5,596,509	08	:	5,595,485			5,595,712
		5,595,095	5,595,635	5,596,188	5,596,510	5,595,624			5,595,750
		5,595,097	5,595,637	5,596,193	5,596,524	5,595,666			5,595,876
		5,595,103	5,595,651	5,596,194	5,596,526	5,595,877			5,596,080
		5,595,104	5,595,653	5,596,197	5,596,530	5,595,978			5,596,114
		5,595,121	5,595,677	5,596,198	5,596,531	5,596,011			5,596,450
		5,595,127	5,595,698	5,596,200	5,596,532	5,596,167	11	:	5,596,469
		5,595,136	5,595,723	5,596,205	5,596,544	5,596,364			5,596,627
		5,595,142	5,595,726	5,596,225	5,596,545	5,596,434	12	:	5,594,975
		5,595,147	5,595,759	5,596,231	5,596,554	5,596,451			5,594,988

	5,594,989		5,596,634		5,596,483		5,595,442		5,595,577		5,596,116
	5,595,000		5,596,669		5,596,569		5,595,491		5,595,586		5,596,149
	5,595,059		5,596,679		5,596,574		5,595,688		5,595,600		5,596,496
	5,595,133		5,596,703		5,596,575		5,595,724		5,595,732		5,596,691
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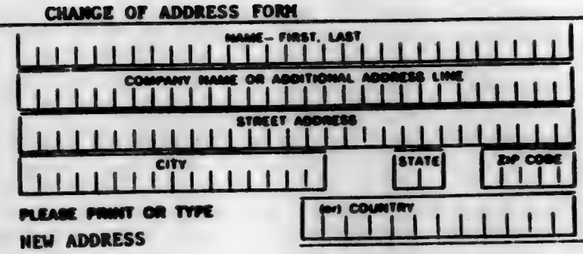
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For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1190 O.G. 3, on September 3, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

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Transmittal fee	230.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	680.00
— Corresponding prior U.S. national application filed	440.00
— Supplemental search fee, per additional invention (payable only upon invitation)	200.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	480.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	730.00
— Additional examination fee, per additional invention (payable only upon invitation)	260.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	48.00	96.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	350.00	700.00
USPTO was ISA but not IPEA	385.00	770.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	520.00	1040.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	455.00	910.00
Other National fees		
— For each independent claim in excess of 3	40.00	80.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	130.00	260.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Dec. 26, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on January 25, 1994 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,280,652 through 5,282,275
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 23, 1990 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,894,865 through 4,896,374
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 21, 1986 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,564,956 through 4,566,135
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1996, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $510.00
By other than a small entity $1,020.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,025.00
By other than a small entity $2,050.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,540.00
By other than a small entity $3,080.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:
(1) unavoidable $680.00
(2) unintentional $1,600.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED November 20, 1996 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,625	06/898,032	03/15/88
(4,483,629)	(06/455,852)	(11/20/84)
Re. 33,489	07/411,962	12/11/90
(4,785,102)	(06/899,133)	(11/15/88)
4,483,023	06/295,160	11/20/84
4,483,024	06/412,124	11/20/84
4,483,032	06/436,048	11/20/84
4,483,034	06/586,788	11/20/84
4,483,035	06/483,385	11/20/84
4,483,044	06/521,155	11/20/84
4,483,046	06/383,780	11/20/84
4,483,048	06/533,304	11/20/84
4,483,051	06/383,172	11/20/84
4,483,053	06/479,767	11/20/84
4,483,055	06/388,134	11/20/84
4,483,060	06/450,478	11/20/84
4,483,065	06/445,383	11/20/84
4,483,070	06/420,896	11/20/84
4,483,081	06/433,996	11/20/84
4,483,092	06/409,587	11/20/84
4,483,094	06/412,831	11/20/84
4,483,098	06/425,972	11/20/84
4,483,110	06/440,434	11/20/84
4,483,111	06/426,088	11/20/84
4,483,113	06/420,530	11/20/84
4,483,133	06/485,705	11/20/84
4,483,142	06/580,249	11/20/84
4,483,147	06/257,864	11/20/84
4,483,148	06/498,285	11/20/84
4,483,150	06/470,568	11/20/84
4,483,156	06/604,664	11/20/84
4,483,160	06/449,797	11/20/84
4,483,176	06/317,643	11/20/84
4,483,184	06/492,175	11/20/84
4,483,187	06/454,297	11/20/84
4,483,190	06/422,765	11/20/84
4,483,202	06/479,901	11/20/84
4,483,205	06/362,822	11/20/84
4,483,212	06/409,762	11/20/84
4,483,213	06/350,387	11/20/84
4,483,218	06/520,735	11/20/84
4,483,219	06/468,167	11/20/84
4,483,221	06/485,464	11/20/84
4,483,226	06/421,159	11/20/84
4,483,234	06/440,306	11/20/84
4,483,235	06/380,330	11/20/84
4,483,240	06/476,067	11/20/84
4,483,242	06/359,874	11/20/84
4,483,254	06/496,372	11/20/84
4,483,259	06/506,128	11/20/84
4,483,277	06/500,343	11/20/84
4,483,281	06/507,909	11/20/84
4,483,284	06/432,912	11/20/84
4,483,285	06/471,087	11/20/84
4,483,295	06/476,276	11/20/84
4,483,297	06/410,670	11/20/84
4,483,305	06/423,437	11/20/84
4,483,306	06/395,664	11/20/84
4,483,307	06/404,518	11/20/84

Patent Number	Serial Number	Issue Date
4,483,319	06/485,502	11/20/84
4,483,323	06/440,205	11/20/84
4,483,333	06/383,758	11/20/84
4,483,335	06/500,646	11/20/84
4,483,341	06/448,114	11/20/84
4,483,342	06/375,459	11/20/84
4,483,345	06/405,143	11/20/84
4,483,349	06/238,038	11/20/84
4,483,350	06/392,588	11/20/84
4,483,351	06/406,032	11/20/84
4,483,352	06/307,800	11/20/84
4,483,362	06/373,513	11/20/84
4,483,367	06/572,408	11/20/84
4,483,368	06/518,462	11/20/84
4,483,371	06/516,317	11/20/84
4,483,380	06/454,131	11/20/84
4,483,383	06/310,968	11/20/84
4,483,384	06/379,073	11/20/84
4,483,385	06/318,380	11/20/84
4,483,388	06/362,783	11/20/84
4,483,389	06/356,677	11/20/84
4,483,390	06/403,860	11/20/84
4,483,391	06/338,727	11/20/84
4,483,394	06/438,078	11/20/84
4,483,396	06/507,567	11/20/84
4,483,404	06/527,790	11/20/84
4,483,408	06/427,312	11/20/84
4,483,409	06/472,493	11/20/84
4,483,423	06/420,727	11/20/84
4,483,431	06/310,480	11/20/84
4,483,433	06/339,083	11/20/84
4,483,449	06/456,604	11/20/84
4,483,457	06/480,972	11/20/84
4,483,459	06/400,612	11/20/84
4,483,467	06/400,455	11/20/84
4,483,470	06/331,231	11/20/84
4,483,475	06/446,248	11/20/84
4,483,477	06/395,475	11/20/84
4,483,485	06/443,571	11/20/84
4,483,490	06/484,426	11/20/84
4,483,493	06/365,762	11/20/84
4,483,494	06/502,765	11/20/84
4,483,496	06/417,111	11/20/84
4,483,498	06/398,089	11/20/84
4,483,499	06/502,456	11/20/84
4,483,506	06/263,878	11/20/84
4,483,508	06/351,269	11/20/84
4,483,517	06/481,124	11/20/84
4,483,518	06/382,168	11/20/84
4,483,521	06/380,355	11/20/84
4,483,526	06/421,380	11/20/84
4,483,527	06/491,888	11/20/84
4,483,528	06/317,733	11/20/84
4,483,529	06/413,430	11/20/84
4,483,530	06/464,540	11/20/84
4,483,534	06/415,417	11/20/84
4,483,544	06/422,194	11/20/84
4,483,549	06/440,997	11/20/84
4,483,556	06/421,180	11/20/84
4,483,559	06/474,991	11/20/84
4,483,560	06/475,022	11/20/84
4,483,565	06/276,280	11/20/84
4,483,570	06/469,659	11/20/84
4,483,571	06/491,803	11/20/84
4,483,572	06/470,260	11/20/84
4,483,581	06/401,666	11/20/84
4,483,590	06/439,463	11/20/84
4,483,596	06/353,726	11/20/84
4,483,605	06/506,818	11/20/84
4,483,607	06/529,541	11/20/84
4,483,608	06/448,181	11/20/84
4,483,620	06/535,923	11/20/84
4,483,627	06/521,634	11/20/84
4,483,632	06/398,537	11/20/84
4,483,638	06/268,175	11/20/84
4,483,639	06/393,582	11/20/84
4,483,645	06/349,006	11/20/84
4,483,648	06/291,459	11/20/84
4,483,652	06/338,069	11/20/84
4,483,660	06/378,303	11/20/84
4,483,668	06/493,569	11/20/84
4,483,672	06/459,279	11/20/84
4,483,673	06/472,475	11/20/84
4,483,676	06/471,764	11/20/84
4,483,683	06/405,941	11/20/84
4,483,687	06/326,396	11/20/84
4,483,691	06/579,842	11/20/84
4,483,694	06/475,687	11/20/84
4,483,707	06/462,257	11/20/84
4,483,708	06/350,811	11/20/84
4,483,712	06/538,080	11/20/84
4,483,713	06/394,919	11/20/84
4,483,716	06/429,095	11/20/84
4,483,717	06/309,917	11/20/84
4,483,719	06/537,942	11/20/84
4,483,723	06/469,111	11/20/84
4,483,730	06/449,758	11/20/84
4,483,734	06/485,903	11/20/84
4,483,739	06/579,154	11/20/84
4,483,740	06/519,831	11/20/84
4,483,744	06/377,398	11/20/84
4,483,749	06/508,659	11/20/84
4,483,750	06/590,323	11/20/84
4,483,755	06/379,032	11/20/84
4,483,756	06/423,917	11/20/84
4,483,757	06/601,831	11/20/84
4,483,759	06/394,537	11/20/84
4,483,761	06/510,524	11/20/84
4,483,763	06/453,715	11/20/84
4,483,767	06/598,111	11/20/84
4,483,768	06/262,787	11/20/84
4,483,770	06/423,627	11/20/84
4,483,772	06/543,216	11/20/84
4,483,784	06/401,170	11/20/84
4,483,786	06/498,791	11/20/84
4,483,790	06/333,612	11/20/84
4,483,793	06/432,580	11/20/84
4,483,797	06/257,833	11/20/84
4,483,799	06/230,321	11/20/84
4,483,803	06/429,925	11/20/84
4,483,820	06/230,103	11/20/84
4,483,825	06/396,563	11/20/84
4,483,832	06/363,680	11/20/84
4,483,833	06/339,882	11/20/84
4,483,846	06/464,174	11/20/84
4,483,848	06/410,780	11/20/84
4,483,849	06/430,755	11/20/84
4,483,856	06/478,600	11/20/84
4,483,860	06/531,326	11/20/84
4,483,864	06/464,061	11/20/84
4,483,868	06/256,932	11/20/84
4,483,869	06/330,998	11/20/84
4,483,872	06/512,234	11/20/84
4,483,873	06/452,844	11/20/84
4,483,878	06/443,264	11/20/84
4,483,887	06/581,873	11/20/84
4,483,891	06/539,495	11/20/84
4,483,900	06/398,653	11/20/84
4,483,906	06/476,248	11/20/84
4,483,913	06/514,408	11/20/84
4,483,916	06/463,287	11/20/84
4,483,917	06/569,093	11/20/84
4,483,923	06/329,859	11/20/84
4,483,926	06/373,829	11/20/84
4,483,928	06/415,300	11/20/84
4,483,930	06/468,228	11/20/84
4,483,932	06/549,114	11/20/84
4,483,934	06/493,353	11/20/84
4,483,940	06/451,475	11/20/84
4,483,942	06/540,781	11/20/84
4,483,943	06/483,039	11/20/84
4,483,946	06/460,263	11/20/84
4,483,947	06/413,472	11/20/84
4,483,951	06/326,903	11/20/84
4,483,953	06/531,610	11/20/84
4,483,954	06/575,976	11/20/84

Patent Number	Serial Number	Issue Date
4,483,957	06/551,106	11/20/84
4,483,960	06/548,984	11/20/84
4,483,961	06/524,050	11/20/84
4,483,964	06/506,153	11/20/84
4,483,972	06/462,949	11/20/84
4,483,987	06/506,157	11/20/84
4,483,998	06/484,058	11/20/84
4,484,002	06/339,236	11/20/84
4,484,003	06/459,634	11/20/84
4,484,004	06/421,209	11/20/84
4,484,010	06/456,921	11/20/84
4,484,011	06/557,691	11/20/84
4,484,013	06/567,205	11/20/84
4,484,016	06/510,538	11/20/84
4,484,024	06/579,758	11/20/84
4,484,026	06/475,418	11/20/84
4,484,029	06/527,323	11/20/84
4,484,035	06/468,744	11/20/84
4,484,039	06/527,595	11/20/84
4,484,049	06/388,891	11/20/84
4,484,050	06/514,854	11/20/84
4,484,051	06/347,387	11/20/84
4,484,054	06/573,627	11/20/84
4,484,061	06/377,627	11/20/84
4,484,096	06/522,011	11/20/84
4,484,101	06/293,226	11/20/84
4,484,103	06/422,450	11/20/84
4,484,108	06/404,021	11/20/84
4,484,110	06/505,197	11/20/84
4,484,112	06/477,731	11/20/84
4,484,124	06/391,150	11/20/84
4,484,128	06/480,194	11/20/84
4,484,129	06/551,140	11/20/84
4,484,141	06/441,018	11/20/84
4,484,152	06/379,810	11/20/84
4,484,155	06/363,867	11/20/84
4,484,165	06/395,174	11/20/84
4,484,173	06/527,037	11/20/84
4,484,181	06/369,445	11/20/84
4,484,187	06/392,001	11/20/84
4,484,211	06/542,555	11/20/84
4,484,214	06/332,713	11/20/84
4,484,215	06/546,407	11/20/84
4,484,219	06/389,042	11/20/84
4,484,220	06/306,862	11/20/84
4,484,221	06/413,762	11/20/84
4,484,231	06/306,766	11/20/84
4,484,232	06/421,232	11/20/84
4,484,234	06/358,577	11/20/84
4,484,240	06/347,786	11/20/84
4,484,241	06/378,970	11/20/84
4,484,242	06/366,249	11/20/84
4,484,249	06/369,925	11/20/84
4,484,251	06/425,076	11/20/84
4,484,254	06/380,496	11/20/84
4,484,261	06/221,417	11/20/84
4,484,264	06/312,659	11/20/84
4,484,271	06/392,500	11/20/84
4,484,284	06/298,629	11/20/84
4,484,289	06/344,174	11/20/84
4,484,300	06/219,810	11/20/84
4,484,306	06/360,195	11/20/84
4,484,310	06/363,194	11/20/84
4,484,312	06/392,077	11/20/84
4,484,313	06/321,351	11/20/84
4,484,333	06/348,566	11/20/84
4,484,335	06/434,530	11/20/84
4,484,336	06/380,789	11/20/84
4,484,339	06/396,980	11/20/84
4,484,341	06/308,015	11/20/84
4,484,345	06/470,093	11/20/84
4,484,347	06/348,668	11/20/84
4,484,351	06/497,229	11/20/84
4,484,355	06/484,045	11/20/84
4,783,853	07/040,543	11/15/88
4,783,854	07/149,077	11/15/88
4,783,855	07/109,063	11/15/88
4,783,859	07/119,203	11/15/88
4,783,860	07/053,704	11/15/88
4,783,861	06/927,764	11/15/88
4,783,863	06/898,718	11/15/88
4,783,866	07/002,052	11/15/88
4,783,868	07/129,450	11/15/88
4,783,870	06/897,289	11/15/88
4,783,871	07/010,465	11/15/88
4,783,872	06/934,902	11/15/88
4,783,885	07/076,316	11/15/88
4,783,889	07/121,540	11/15/88
4,783,890	06/845,147	11/15/88
4,783,901	07/053,747	11/15/88
4,783,902	07/115,770	11/15/88
4,783,903	07/074,378	11/15/88
4,783,906	06/934,883	11/15/88
4,783,911	06/899,958	11/15/88
4,783,912	07/076,273	11/15/88
4,783,913	07/046,263	11/15/88
4,783,916	07/030,508	11/15/88
4,783,919	06/885,565	11/15/88
4,783,923	07/101,490	11/15/88
4,783,928	07/174,153	11/15/88
4,783,929	07/093,183	11/15/88
4,783,936	06/929,576	11/15/88
4,783,940	06/946,713	11/15/88
4,783,941	06/923,410	11/15/88
4,783,943	06/850,016	11/15/88
4,783,946	06/906,912	11/15/88
4,783,948	07/041,446	11/15/88
4,783,961	07/145,660	11/15/88
4,783,966	07/091,978	11/15/88
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4,783,968	06/894,777	11/15/88
4,783,978	07/058,133	11/15/88
4,783,981	06/852,618	11/15/88
4,783,985	07/023,668	11/15/88
4,783,986	07/051,462	11/15/88
4,783,990	07/068,027	11/15/88
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4,783,995	07/022,676	11/15/88
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4,784,787	07/049,128	11/15/88
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5,163,327	07/639,919	11/17/92
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5,163,333	07/618,911	11/17/92
5,163,340	07/760,381	11/17/92
5,163,343	07/838,892	11/17/92
5,163,344	07/779,043	11/17/92
5,163,346	07/757,191	11/17/92
5,163,348	07/826,393	11/17/92
5,163,351	07/738,206	11/17/92
5,163,352	07/769,836	11/17/92
5,163,362	07/763,434	11/17/92
5,163,365	07/403,583	11/17/92
5,163,369	07/776,606	11/17/92
5,163,373	07/762,615	11/17/92
5,163,378	07/835,123	11/17/92
5,163,382	07/879,298	11/17/92
5,163,383	07/764,361	11/17/92
5,163,388	07/778,782	11/17/92
5,163,389	07/858,497	11/17/92
5,163,393	07/805,326	11/17/92
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5,163,400	07/638,698	11/17/92
5,163,415	07/803,538	11/17/92
5,163,419	07/680,373	11/17/92
5,163,425	07/158,122	11/17/92
5,163,442	07/738,159	11/17/92
5,163,449	07/616,451	11/17/92
5,163,451	07/826,305	11/17/92
5,163,452	07/855,733	11/17/92
5,163,453	07/467,066	11/17/92
5,163,454	07/746,256	11/17/92
5,163,458	07/704,211	11/17/92
5,163,462	07/748,670	11/17/92
5,163,466	07/802,086	11/17/92
5,163,467	07/801,579	11/17/92
5,163,470	07/626,800	11/17/92
5,163,474	07/792,823	11/17/92
5,163,479	07/799,388	11/17/92
5,163,483	07/725,654	11/17/92
5,163,487	07/715,447	11/17/92
5,163,494	07/640,464	11/17/92
5,163,495	07/729,696	11/17/92
5,163,496	07/754,961	11/17/92
5,163,504	07/216,426	11/17/92
5,163,509	07/748,554	11/17/92
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5,163,522	07/703,024	11/17/92
5,163,526	07/613,855	11/17/92
5,163,534	07/731,089	11/17/92
5,163,535	07/699,985	11/17/92
5,163,547	07/821,163	11/17/92
5,163,549	07/782,655	11/17/92
5,163,550	07/824,579	11/17/92
5,163,552	07/784,663	11/17/92
5,163,561	07/835,518	11/17/92
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5,163,582	07/767,807	11/17/92
5,163,589	07/747,798	11/17/92
5,163,590	07/787,125	11/17/92
5,163,592	07/586,298	11/17/92
5,163,595	07/830,758	11/17/92
5,163,597	07/775,459	11/17/92
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5,163,606	07/301,332	11/17/92
5,163,608	07/585,254	11/17/92
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5,163,624	07/650,876	11/17/92
5,163,626	07/826,412	11/17/92
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5,163,685	07/777,185	11/17/92
5,163,686	07/802,540	11/17/92
5,163,687	07/825,568	11/17/92
5,163,690	07/511,242	11/17/92
5,163,693	07/774,826	11/17/92
5,163,694	07/754,757	11/17/92
5,163,695	07/763,893	11/17/92
5,163,696	07/771,114	11/17/92
5,163,697	07/688,866	11/17/92
5,163,698	07/657,174	11/17/92
5,163,699	07/459,072	11/17/92
5,163,700	07/732,581	11/17/92
5,163,707	07/658,857	11/17/92
5,163,724	07/791,310	11/17/92
5,163,725	07/850,470	11/17/92
5,163,728	07/613,386	11/17/92
5,163,745	07/729,188	11/17/92
5,163,747	07/857,823	11/17/92
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5,163,758	07/707,377	11/17/92
5,163,767	07/635,723	11/17/92
5,163,778	07/776,206	11/17/92
5,163,780	07/682,655	11/17/92
5,163,781	07/623,443	11/17/92
5,163,785	07/712,877	11/17/92
5,163,788	07/639,601	11/17/92
5,163,789	07/667,590	11/17/92
5,163,791	07/765,662	11/17/92
5,163,794	07/689,181	11/17/92
5,163,799	07/732,106	11/17/92
5,163,806	07/723,104	11/17/92
5,163,807	07/247,156	11/17/92
5,163,811	07/754,288	11/17/92
5,163,814	07/535,465	11/17/92
5,163,823	07/810,891	11/17/92
5,163,825	07/680,154	11/17/92
5,163,828	07/637,122	11/17/92
5,163,835	07/714,410	11/17/92
5,163,839	07/734,436	11/17/92
5,163,853	07/831,494	11/17/92
5,163,857	07/757,826	11/17/92
5,163,858	07/754,638	11/17/92
5,163,860	07/750,205	11/17/92
5,163,862	07/789,806	11/17/92
5,163,863	07/653,039	11/17/92
5,163,865	07/697,089	11/17/92
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5,163,887	07/751,743	11/17/92
5,163,897	07/427,002	11/17/92
5,163,902	07/581,699	11/17/92
5,163,907	07/720,208	11/17/92
5,163,909	07/646,804	11/17/92
5,163,915	07/817,537	11/17/92
5,163,917	07/765,873	11/17/92
5,163,919	07/490,587	11/17/92
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5,164,018	07/853,280	11/17/92
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5,164,039	07/755,437	11/17/92
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5,164,054	07/784,870	11/17/92
5,164,057	07/762,272	11/17/92
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5,164,065	07/808,412	11/17/92
5,164,069	07/809,442	11/17/92
5,164,071	07/662,160	11/17/92
5,164,074	07/419,169	11/17/92
5,164,079	07/550,643	11/17/92
5,164,087	07/647,198	11/17/92
5,164,089	07/492,980	11/17/92
5,164,094	07/455,442	11/17/92
5,164,101	07/664,705	11/17/92
5,164,105	07/683,486	11/17/92
5,164,106	07/688,775	11/17/92
5,164,113	07/515,754	11/17/92
5,164,114	07/283,449	11/17/92
5,164,116	07/716,107	11/17/92
5,164,119	07/604,050	11/17/92
5,164,124	07/160,465	11/17/92
5,164,127	07/591,954	11/17/92
5,164,130	07/513,339	11/17/92
5,164,131	07/584,813	11/17/92
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5,164,135	07/589,779	11/17/92
5,164,141	07/666,244	11/17/92
5,164,142	07/763,005	11/17/92
5,164,160	07/509,771	11/17/92
5,164,161	07/649,017	11/17/92
5,164,165	07/719,617	11/17/92
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5,164,186	07/617,376	11/17/92
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5,164,216	07/751,976	11/17/92
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5,164,236	07/662,830	11/17/92
5,164,238	07/709,069	11/17/92
5,164,267	07/526,627	11/17/92
5,164,272	07/488,025	11/17/92
5,164,273	07/732,196	11/17/92
5,164,287	07/655,999	11/17/92
5,164,302	07/436,582	11/17/92
5,164,304	07/347,545	11/17/92
5,164,309	07/448,137	11/17/92
5,164,312	07/517,539	11/17/92
5,164,314	07/715,718	11/17/92
5,164,315	07/653,133	11/17/92
5,164,318	07/613,979	11/17/92
5,164,322	07/507,526	11/17/92
5,164,323	07/581,274	11/17/92
5,164,325	07/107,725	11/17/92
5,164,338	07/605,211	11/17/92
5,164,343	07/703,962	11/17/92
5,164,345	07/674,830	11/17/92
5,164,346	07/519,434	11/17/92
5,164,349	07/714,624	11/17/92
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5,164,358	07/600,893	11/17/92
5,164,375	07/766,311	11/17/92
5,164,376	07/619,540	11/17/92
5,164,382	07/509,802	11/17/92
5,164,383	07/854,182	11/17/92
5,164,386	07/541,106	11/17/92
5,164,388	07/678,266	11/17/92
5,164,389	07/757,434	11/17/92
5,164,395	07/663,585	11/17/92
5,164,400	07/552,127	11/17/92
5,164,406	07/353,890	11/17/92
5,164,407	07/516,502	11/17/92
5,164,408	07/552,037	11/17/92
5,164,412	07/681,669	11/17/92
5,164,414	07/645,124	11/17/92
5,164,422	07/796,956	11/17/92
5,164,436	07/730,571	11/17/92
5,164,437	07/605,629	11/17/92
5,164,441	07/631,612	11/17/92
5,164,452	07/359,704	11/17/92
5,164,458	07/413,948	11/17/92
5,164,463	07/603,282	11/17/92
5,164,468	07/577,905	11/17/92
5,164,477	07/739,539	11/17/92
5,164,484	07/778,764	11/17/92
5,164,489	07/197,689	11/17/92
5,164,494	07/327,977	11/17/92
5,164,499	07/460,203	11/17/92
5,164,500	07/619,032	11/17/92
5,164,502	07/789,510	11/17/92
5,164,503	07/698,895	11/17/92
5,164,504	07/641,840	11/17/92

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5,164,509	07/618,277	11/17/92
5,164,511	07/765,825	11/17/92
5,164,512	07/540,252	11/17/92
5,164,514	07/584,108	11/17/92
5,164,517	07/647,084	11/17/92
5,164,519	07/801,437	11/17/92
5,164,525	07/374,508	11/17/92
5,164,534	07/839,670	11/17/92
5,164,535	07/755,634	11/17/92
5,164,538	07/662,402	11/17/92
5,164,542	07/740,840	11/17/92
5,164,547	07/506,058	11/17/92
5,164,550	07/691,838	11/17/92
5,164,567	07/681,293	11/17/92
5,164,581	07/588,854	11/17/92
5,164,585	07/765,913	11/17/92
5,164,586	07/704,177	11/17/92
5,164,587	07/757,030	11/17/92
5,164,590	07/726,433	11/17/92
5,164,593	07/662,468	11/17/92
5,164,597	07/696,354	11/17/92
5,164,605	07/745,032	11/17/92
5,164,607	07/719,719	11/17/92
5,164,615	07/709,320	11/17/92
5,164,620	07/798,535	11/17/92
5,164,624	07/754,982	11/17/92
5,164,631	07/753,166	11/17/92
5,164,636	07/708,983	11/17/92
5,164,642	07/140,558	11/17/92
5,164,653	07/604,140	11/17/92
5,164,656	07/393,391	11/17/92
5,164,657	07/363,325	11/17/92
5,164,662	07/733,530	11/17/92
5,164,664	07/687,180	11/17/92
5,164,669	07/555,864	11/17/92
5,164,670	07/583,914	11/17/92
5,164,681	07/804,420	11/17/92
5,164,687	07/716,524	11/17/92
5,164,697	07/679,609	11/17/92
5,164,700	07/684,683	11/17/92
5,164,701	07/516,526	11/17/92
5,164,706	07/757,530	11/17/92
5,164,710	07/867,294	11/17/92
5,164,713	07/776,187	11/17/92
5,164,715	07/507,691	11/17/92
5,164,718	07/746,802	11/17/92
5,164,746	07/523,546	11/17/92
5,164,751	07/531,093	11/17/92
5,164,752	07/798,843	11/17/92
5,164,753	07/727,579	11/17/92
5,164,755	07/784,246	11/17/92
5,164,823	07/632,329	11/17/92
5,164,838	07/687,247	11/17/92
5,164,843	07/539,577	11/17/92
5,164,847	07/717,219	11/17/92
5,164,856	07/656,695	11/17/92
5,164,865	07/335,857	11/17/92
5,164,866	07/742,336	11/17/92
5,164,871	07/650,851	11/17/92
5,164,904	07/557,743	11/17/92
5,164,921	07/703,255	11/17/92
5,164,922	07/776,209	11/17/92
5,164,941	07/469,321	11/17/92
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5,164,957	07/753,141	11/17/92
5,164,972	07/769,800	11/17/92
5,164,991	07/479,157	11/17/92
5,164,999	07/703,003	11/17/92
5,165,017	07/485,863	11/17/92
5,165,025	07/711,496	11/17/92
5,165,045	07/774,781	11/17/92
5,165,052	07/691,382	11/17/92
5,165,063	07/642,200	11/17/92
5,165,066	07/782,894	11/17/92
5,165,070	07/556,443	11/17/92
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5,165,094	07/526,566	11/17/92
5,165,098	07/623,815	11/17/92
5,165,100	07/800,197	11/17/92

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,331,483, Re. S.N. 08/690,246, July 19, 1996, Cl. 360/86, AXIALLY COMPACT DIRECT DRIVE FOR STORAGE DISK HUB, Uwe Muller, et. al., Owner of Record: *Papst Licensing Gmbh Spaichingen, Germany*, Attorney or Agent: Wilford L. Wisner, Ex. Gp.: 2512

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,363,877, Reexam. No. 90/004,491, Dec. 19, 1996, Cl. 435/320.1, RECOMBINANT DNA TRANSFER VECTORS, Howard M. Goodman, Owner of Record: *The Regents of The University of California, Berkeley, Calif.*, Attorney or Agent: Gary J. Sertich, Arnold White & Durkee, Houston, Tex., Ex. Gp.: 1801, Requester: Margaret B. Kelley, Rogers & Wells, New York, N.Y.

4,854,198, Reexam. No. 90/004,492, Dec. 19, 1996, Cl. 081/098, HAND WRENCHING TOOL, Ronald W. Batten, Owner of Record: *Fairchild Holding Corp., Chantilly, Va.*, Attorney or Agent: Robert E. Strauss, Plante & Strauss, Santa Ana, Calif., Ex. Gp.: 3203, Requester: Owner

4,919,631, Reexam. No. 90/004,495, Nov. 7, 1996, Cl. 441/040, UNDERWATER DIVING SYSTEM, Michael Stafford, Owner of Record: *Scuba International, Inc., Michael Stafford, Cameron Park, Calif.* Attorney or Agent: Bernhard Kreton, Sacramento, Calif., Ex. Gp.: 3102, Requester: Owner

4,956,821, Reexam. No. 90/004,490, Dec. 18, 1996, Cl. 366/008, SILO AND DELIVERY SYSTEM FOR PRE-MIXED DRY MORTAR BLENDS TO BATCH MIXERS, Terrance P. Fenelon, Owner of Record: *Spec Mix, Inc., Vadnais Heights, Minn.*, Attorney or Agent: Merchant Gould Smith Edell Weiter & Schmidt, St. Paul, Minn., Ex. Gp.: 3405, Requester: Owner

5,301,103, Reexam. No. 90/004,489, Dec. 20, 1996, Cl. 073/514.29, TWO-PART ELECTROMAGNETIC DRIVE FOR A DOUBLE-ENDED TUNING FORK, James R. Woodruff, et. al., Owner of Record: *Allied Signal, Inc., Morristown, N.J.*, Attorney or Agent: Allied Signal, Inc., Morristown, N.J. (Attn: Jeanne C. Sechodolski), Ex. Gp.: 2212, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED SEPTEMBER 30, 1996 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
107,738	71/078,767	12/28/1915
107,789	71/084,375	12/28/1915
107,819	71/088,017	12/28/1915
107,821	71/088,000	12/28/1915
107,847	71/088,737	12/28/1915
107,857	71/087,279	12/28/1915
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330,983	71/355,195	12/24/1935
331,002	71/366,609	12/24/1935
331,003	71/366,571	12/24/1935
331,006	71/366,526	12/24/1935
331,057	71/367,758	12/24/1935
331,062	71/367,354	12/24/1935
331,066	71/368,122	12/24/1935
331,081	71/361,343	12/24/1935
331,089	71/359,184	12/24/1935
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618,021	71/678,927	12/27/1955
618,026	71/667,578	12/27/1955
618,030	71/675,138	12/27/1955
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618,046	71/670,989	12/27/1955
618,047	71/677,977	12/27/1955
618,057	71/681,332	12/27/1955
618,067	71/685,595	12/27/1955
618,069	71/686,663	12/27/1955
618,078	71/681,802	12/27/1955
618,079	71/681,822	12/27/1955
618,081	71/682,032	12/27/1955
618,082	71/682,033	12/27/1955
618,086	71/682,454	12/27/1955
618,093	71/684,451	12/27/1955
618,095	71/682,775	12/27/1955
618,102	71/669,937	12/27/1955
618,103	71/676,812	12/27/1955
618,105	71/646,266	12/27/1955
618,106	71/655,430	12/27/1955
618,107	71/655,877	12/27/1955
618,113	71/682,590	12/27/1955
618,130	71/666,668	12/27/1955
618,133	71/671,551	12/27/1955
618,136	71/659,527	12/27/1955
618,138	71/670,948	12/27/1955
618,140	71/672,705	12/27/1955
618,145	71/681,400	12/27/1955
618,146	71/681,829	12/27/1955
618,151	71/685,865	12/27/1955
618,154	71/656,588	12/27/1955
618,160	71/663,256	12/27/1955
618,163	71/665,925	12/27/1955
618,173	71/676,135	12/27/1955
618,179	71/682,880	12/27/1955
618,181	71/683,482	12/27/1955
618,186	71/685,218	12/27/1955
618,187	71/685,247	12/27/1955
618,208	71/683,690	12/27/1955
618,215	71/674,398	12/27/1955
618,221	71/633,406	12/27/1955
618,227	71/680,520	12/27/1955
618,228	71/668,666	12/27/1955
618,232	71/612,653	12/27/1955
618,242	71/658,718	12/27/1955
618,243	71/667,793	12/27/1955
618,245	71/668,090	12/27/1955
618,250	71/681,351	12/27/1955
618,252	71/663,831	12/27/1955
618,256	71/681,377	12/27/1955
618,259	71/665,467	12/27/1955
618,260	71/665,468	12/27/1955
618,269	71/677,641	12/27/1955
618,273	71/680,834	12/27/1955
618,287	71/681,167	12/27/1955
618,295	71/682,481	12/27/1955
618,314	71/679,712	12/27/1955
618,317	71/681,029	12/27/1955
618,318	71/681,031	12/27/1955
618,319	71/681,032	12/27/1955
618,324	71/675,887	12/27/1955
618,325	71/681,312	12/27/1955
618,328	71/676,746	12/27/1955
618,330	71/634,651	12/27/1955
618,331	71/666,487	12/27/1955
618,336	71/667,707	12/27/1955
618,337	71/667,709	12/27/1955
618,338	71/667,710	12/27/1955
618,339	71/667,712	12/27/1955
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618,341	71/667,714	12/27/1955
618,345	71/670,303	12/27/1955
618,347	71/672,251	12/27/1955
618,348	71/673,023	12/27/1955
618,350	71/673,326	12/27/1955
618,355	71/675,823	12/27/1955
618,370	71/676,168	12/27/1955
618,372	71/660,093	12/27/1955
618,373	71/674,520	12/27/1955
618,381	71/589,299	12/27/1955
1,007,273	73/005,088	03/25/1975
1,027,703	73/004,355	12/23/1975
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1,027,707	73/024,278	12/23/1975
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1,027,718	73/050,638	12/23/1975
1,027,720	73/026,915	12/23/1975
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1,027,723	73/035,507	12/23/1975
1,027,724	73/037,386	12/23/1975
1,027,725	73/045,165	12/23/1975
1,027,730	73/011,431	12/23/1975
1,027,737	73/033,048	12/23/1975
1,027,738	73/037,941	12/23/1975
1,027,744	73/043,121	12/23/1975
1,027,752	73/036,198	12/23/1975
1,027,753	73/049,256	12/23/1975
1,027,756	73/019,774	12/23/1975
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1,027,765	73/031,948	12/23/1975
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1,027,768	73/032,602	12/23/1975
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1,027,775	73/045,628	12/23/1975
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1,027,784	73/024,899	12/23/1975
1,027,794	73/008,945	12/23/1975
1,027,795	73/010,093	12/23/1975
1,027,799	73/016,235	12/23/1975
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1,027,802	73/016,685	12/23/1975
1,027,803	73/019,665	12/23/1975
1,027,804	73/021,142	12/23/1975
1,027,807	73/022,709	12/23/1975
1,027,808	73/022,855	12/23/1975
1,027,810	73/026,487	12/23/1975
1,027,813	73/026,981	12/23/1975
1,027,814	73/028,038	12/23/1975
1,027,818	73/035,084	12/23/1975
1,027,822	73/038,044	12/23/1975
1,027,827	73/043,810	12/23/1975
1,027,833	73/049,852	12/23/1975
1,027,834	73/048,679	12/23/1975

Reg. Number	Serial Number	Reg. Date
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1,027,844	73/044,850	12/23/1975
1,027,845	73/009,546	12/23/1975
1,027,846	73/011,258	12/23/1975
1,027,848	73/019,928	12/23/1975
1,027,849	73/020,202	12/23/1975
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1,027,860	73/034,307	12/23/1975
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1,027,866	73/048,498	12/23/1975
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1,027,888	73/026,223	12/23/1975
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1,027,897	73/042,030	12/23/1975
1,027,898	73/033,507	12/23/1975
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1,027,911	73/018,221	12/23/1975
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1,027,917	73/023,926	12/23/1975
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1,027,925	73/029,259	12/23/1975
1,027,927	73/029,651	12/23/1975
1,027,931	73/034,375	12/23/1975
1,027,932	73/035,418	12/23/1975
1,027,934	73/035,785	12/23/1975
1,027,935	73/036,047	12/23/1975
1,027,936	73/036,049	12/23/1975
1,027,942	73/039,254	12/23/1975
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1,027,944	73/040,558	12/23/1975
1,027,949	73/042,361	12/23/1975
1,027,960	73/023,546	12/23/1975
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1,027,975	73/040,715	12/23/1975
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1,027,987	73/042,118	12/23/1975
1,027,989	73/033,945	12/23/1975
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1,027,993	73/016,754	12/23/1975
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1,028,044	73/050,932	12/23/1975
1,028,045	73/051,093	12/23/1975
1,028,048	73/014,476	12/23/1975
1,028,057	73/053,461	12/23/1975
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1,028,071	73/043,853	12/23/1975
1,028,073	73/046,156	12/23/1975
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1,028,105	73/046,426	12/23/1975
1,028,115	73/042,172	12/23/1975
1,028,116	73/042,210	12/23/1975
1,028,117	73/042,702	12/23/1975
1,028,118	73/043,843	12/23/1975
1,028,122	73/048,665	12/23/1975
1,028,123	73/051,558	12/23/1975
1,028,124	73/017,359	12/23/1975
1,028,136	73/043,113	12/23/1975
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1,028,141	73/035,838	12/23/1975
1,028,142	73/036,738	12/23/1975
1,028,146	73/009,716	12/23/1975
1,028,165	73/018,087	12/23/1975
1,028,168	73/029,824	12/23/1975
1,028,169	73/030,667	12/23/1975
1,028,177	73/039,960	12/23/1975
1,028,178	73/042,369	12/23/1975
1,028,185	72/444,458	12/23/1975
1,028,188	72/450,788	12/23/1975
1,028,189	72/441,187	12/23/1975
1,028,191	72/465,164	12/23/1975
1,028,194	72/436,658	12/23/1975
1,028,195	72/399,489	12/23/1975
1,028,198	72/432,611	12/23/1975
1,028,200	72/434,393	12/23/1975
1,028,205	72/454,549	12/23/1975
1,028,207	72/463,683	12/23/1975
1,028,208	72/461,901	12/23/1975
1,028,209	72/441,131	12/23/1975
1,028,212	72/441,720	12/23/1975
1,028,213	72/441,730	12/23/1975
1,028,214	72/441,978	12/23/1975
1,028,215	72/445,087	12/23/1975
1,028,220	72/393,180	12/23/1975
1,028,222	72/431,227	12/23/1975
1,028,223	72/463,358	12/23/1975
1,028,227	72/445,616	12/23/1975
1,028,229	72/463,684	12/23/1975
1,028,232	72/446,818	12/23/1975
1,028,243	72/432,924	12/23/1975
1,028,246	72/376,141	12/23/1975
1,028,247	72/418,559	12/23/1975
1,028,248	72/443,002	12/23/1975
1,028,250	72/440,438	12/23/1975
1,028,252	72/447,172	12/23/1975
1,028,253	72/452,888	12/23/1975
1,028,255	72/467,105	12/23/1975
1,028,263	72/462,246	12/23/1975
1,028,265	73/042,555	12/23/1975
1,028,271	73/030,101	12/23/1975
1,028,273	73/010,557	12/23/1975
1,028,275	73/012,003	12/23/1975
1,028,279	73/016,494	12/23/1975
1,028,282	73/005,055	12/23/1975
1,028,285	72/439,103	12/23/1975

Disclaimers

5,114,129 — Robert Chang, Westlake Village; Thomas J. McNicholas, Sr., Fountain Valley, both of California. SIGNA-

TURE FEEDING APPARATUS. Patent dated May 19, 1992. Disclaimer filed October 28, 1996, by the assignee, R. R. Donnelley & Sons Company.

Hereby enters this disclaimer to claims 1-8 of said patent.

5,246,103 — Valerie S. Hicks, Girdwood, Arkansas. JEWELRY CONTAINER. Patent dated September 21, 1993. Disclaimer filed November 21, 1996, by the inventor.

Hereby enters this disclaimer to claim 10 and claim 13 of said patent.

5,457,855 — Randall B. Keaney, Concord; Der-Shi Wang; Normand A. Cote, both of Bedford, all of N.H. WOVEN SELF-ENGAGING FASTENER. Patent dated October 17, 1995. Disclaimer filed November 7, 1996, by the assignee Velcro Industries, B.V.

Hereby enters this disclaimer to claims 3, 4, 9, through 22 of said patent.

5,487,529 — Duane H. Newville, St. Petersburg, Florida. FLOW-THROUGH WASHING AND SCRUBBING BRUSH HANDLE. Patent dated January 30, 1996. Disclaimer filed October 23, 1996, by the inventor.

The term of this patent shall not extend beyond the expiration date of Pat. No. 5,336,012.

5,554,437 — Rakesh K. Gupta, Conyers; Randall E. Kozalla, Social Circle; Richard J. Legare, Conyers, all of Georgia. Patent dated September 10, 1996. Disclaimer filed October 7, 1996, by the assignee, Hercules Incorporated.

The term of this patent subsequent to 10/29/13 has been disclaimed.

5,575,986 — Fumio Mori; Tadashi Okano; Kazuki Murakami; Masakazu Shintome; Hiromichi Mukai; Ikuko Miyagi; Takashi Imagawa; Sang-Won Kim, all of Osaka; Taro Murakawa, Nagoya; Takahiro Kozuka, Kobe, all of Japan. CHELATING AGENT, COMPLEX COMPOUND OF SAID CHELATING AGENT AND METALLIC ATOM, AND DIAGNOSTIC AGENT COMPRISING SAME. Patent dated November 19, 1996. Disclaimer filed August 29, 1996, by the assignee, The Green Cross Corporation.

The term of this patent shall not extend beyond the expiration date of Pat. No. 5,453,264.

Dedication

4,858,154 — Frank C. Anderson, Hialeah; Dean E. Twedt, Miami, both of Florida. INTERLABORATORY QUALITY ASSURANCE PROGRAM. Patent dated August 15, 1989. Dedication filed October 21, 1996, by the assignee, Coulter Electronics, Inc.

Hereby dedicates to the public the entire term of said patent.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Computer Site Technologies, Inc., Concord, Calif., Reg. No. 1,857,550, for the mark "RESPONSEWARE", Can. No. 25,541.

Tinsley Hancock, Tucson, Ariz., Reg. No. 1,680,442, for the mark "LIFE'S A BALL", Can. No. 24,938.

JEAN BROWN
Technical Program Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Certificates of Correction
For the Week of January 28, 1997

P. 09,198	5,502,653	5,542,649	5,561,492
D. 366,939	5,502,932	5,543,755	5,561,930
D. 369,331	5,503,325	5,544,176	5,562,214
D. 369,859	5,505,268	5,544,249	5,562,688
D. 372,488	5,507,458	5,545,161	5,562,734
D. 372,753	5,508,274	5,545,464	5,563,532
D. 375,628	5,508,917	5,545,552	5,563,894
5,049,679	5,509,481	5,545,657	5,564,241
5,068,678	5,509,792	5,546,322	5,564,609
5,153,977	5,510,803	5,546,418	5,565,209
5,270,583	5,511,759	5,546,802	5,565,408
5,272,570	5,512,489	5,547,044	5,565,426
5,286,690	5,513,321	5,547,049	5,565,457
5,303,389	5,514,653	5,547,241	5,565,499
5,322,692	5,515,796	5,547,878	5,566,163
5,345,250	5,517,157	5,548,905	5,566,248
5,345,531	5,517,947	5,549,397	5,566,337
5,349,204	5,521,021	5,549,859	5,566,355
5,358,757	5,522,137	5,549,887	5,566,947
5,374,627	5,524,443	5,550,447	5,567,453
5,407,115	5,524,674	5,551,244	5,567,591
5,410,710	5,525,378	5,551,424	5,567,734
5,415,882	5,525,607	5,551,541	5,568,028
5,418,542	5,525,951	5,551,922	5,568,638
5,420,032	5,526,906	5,552,269	5,568,657
5,422,908	5,527,061	5,552,438	5,568,928
5,423,735	5,528,380	5,552,874	5,569,467
5,428,641	5,529,407	5,552,901	5,569,633
5,437,592	5,529,911	5,552,960	5,569,789
5,439,670	5,529,988	5,553,972	5,569,807
5,442,320	5,531,532	5,555,438	5,570,046
5,444,492	5,531,579	5,555,967	5,570,357
5,453,986	5,531,900	5,556,383	5,570,405
5,462,417	5,531,952	5,556,471	5,571,003
5,463,113	5,532,179	5,556,804	5,571,066
5,463,691	5,533,749	5,556,944	5,571,383
5,464,016	5,533,866	5,557,502	5,571,880
5,468,428	5,534,379	5,557,749	5,572,862
5,469,665	5,534,632	5,557,767	5,572,892
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5,475,691	5,536,664	5,557,790	5,573,640
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5,482,977	5,540,350	5,558,535	5,574,246
5,484,624	5,540,421	5,558,544	5,574,444
5,486,766	5,540,618	5,559,099	5,574,753
5,488,513	5,541,631	5,559,971	5,574,956
5,488,910	5,542,144	5,560,707	5,575,494
5,492,702	5,542,471	5,561,223	5,575,889
5,497,246	5,542,541	5,561,268	5,577,026

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
December 2-6, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
12-2	EX	74/515,675	Metagenics, Inc.	2(d)	Refusal Affirmed		"MONSTER 1100" [nutritional supplements, namely, high calorie powder drink mix providing electrolytes, vitamins, proteins and carbohydrates]	"MONSTER MASS" [nutritional supplement, namely, a protein and carbohydrate powder for use for weight gain]	No
12-2	EX	74/533,633	Breadsmith Franchising, Inc.	2(d)	Refusal Affirmed (but only on the basis of the cited registration for the mark "THE BAGELSMITH")		"BREADSMITH" (and design) [baked goods, namely, bread, muffins, cookies, croutons; retail bakery store services]	"THE BAGELSMITH" [restaurant, bakery and deli services]; two word-and-design marks (each featuring the graphic representation of a child, seated and holding a bag on which the word "BAGELSMITH" appears in small letters) [restaurant, bakery and deli services]	No
12-3	EX	74/463,751	Ronald C. Coxser	2(d)	Refusal Affirmed (but only on the basis of the cited registration for the mark "CRAFTSMAN SHOPPE CS" (and design)		"THE CRAFTSMAN" (and design) [furniture]	"THE ART OF THE CRAFTSMAN" [furniture]; "CRAFTSMAN SHOPPE CS" (and design) [wooden furniture]	No
12-3	EX	74/538,222	Marin Mountain Bikes, Inc.	2(e)(2)	Refusal Reversed		"SAN RAFAEL" [bicycles]		No
12-3	EX	74/538,223	Marin Mountain Bikes, Inc.	2(e)(3)	Refusal Reversed		"SAUSALITO" [bicycles]		No
12-3	EX	74/495,933	Giltech, Inc.	2(d)	Refusal Affirmed		"1919" [frozen desserts and ice cream]	"1919" [handmade chocolate candy)	No
12-4	EX	74/426,267	DHL Airways, Inc.	Section 6(a) disclaimer requirement (of word "GLOBALTRACK")	Refusal Affirmed		"DHL GLOBALTRACK" [satellite tracing of documents and parcels delivered by air and courier]		No

[1] EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
12-4	EX	74/518,782	Pittsburgh Sports Heritage, Inc.	2(d)	Refusal Reversed		"PITTSBURGH INNOCENTS" (t-shirts, sweatshirts, sweatpants, tank tops, jerseys, shorts, pajamas, sport shirts, rugby shirts, sweaters, nightshirts, hats/caps, warm-up suits, jackets, parkas, coats, wrist bands, shirts, boxer shorts, 3/4 sleeve jerseys, visors)	"INNOCENTS" [brassieres]	No
12-4	EX	74/451,678	Healthy Cells, Inc.	2(d)	Refusal Affirmed		"STERI-PHONE SHIELD" [sanitary covers/ shields, not made of paper, for telephone handsets]	"STERI-PHONE" [sterile packaged telephones for personal use in hospitals, hotels, and other areas where infection control is a concern]	No
12-5	EX	74/481,435	Ultravit Enterprises, Inc.	2(e)(1)	Refusal Affirmed		"ECHINACEA-STICK" [medicated lip balm]		No
12-5	EX	74/316,378	Gourmets Fresh Pasta	2(d)	Refusal Reversed		"RAVI-OLE" [bounded pasta filled with jalapeno peppers and/or other Mexican cheese]	"MINI RAVIOLI" [ravioli in tomato sauce]; "RAVIOLIOS" (in stylized lettering) [ravioli]	No
12-5	EX	74/345,211	Bogdon Candy Co., Inc.	2(d)	Refusal Reversed		"DOUBLE DIP" [candy]	"HEALTH DOUBLE DIP ALMOND TOFFEE CHIPS" (and design) [candy]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
12-5	EX	74/530,482	Outdoor Entertainment, Inc.	Section 6 disclaimer requirement (of term "OUTDOOR ENTERTAINMENT")	Refusal Affirmed		"OUTDOOR ENTERTAINMENT" (and design) (entertainment services, namely, television programming)		No
12-5	EX (R)	74/287,220	Darren Rittenhouse	2(a) ((falsely suggests a connection with the Baltimore Orioles baseball team and its owners); 2(d)	Request for Reconsideration Denied [Refusal Affirmed (on both grounds)]		"O's" (and design) (clothing, namely, t-shirts and caps)	"ORIOLES BALTIMORE" (and design) (shirts and caps); "ORIOLES" (and design) [t-shirts and caps]; "WHY NOT" (and design) [t-shirts]; etc.	No
12-6	EX	74/324,941	GTE Directories Corp.	2(d)	Refusal Reversed		"SENIORS DISCOUNT" (and design) [promoting the goods and services of others through the distribution of discount cards]	"SD SENIOR DISCOUNTS" [promoting the goods and services of others indicating business merchants who advertise their senior citizens discount programs]	No
12-6	EX EX	74/630,464 74/630,465	Ciba-Geigy Corp.	2(e)(4)	Refusal Affirmed (in both cases)		"HART" AND "HARTS" (chemicals, namely, hindered amine radical traps, used as polymerization inhibitors)		No
12-6	EX	74/538,329	Boston Espresso Co., Inc.	2(d)	Refusal Affirmed		"CONCERTO ESPRESSO" [professional electric espresso-making machines for hotel and restaurant commercial use]	"CAFFE MAURO CAFFE CONCERTO ESPRESSO" (and design) [coffee]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Applicat'n/ Respondent's Mark and Goods/Services	Opposer's/ Petitioner's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
12-6	EX	74/515,942	Metagenics, Inc.	2(d)	Refusal Affirmed	"MONSTER BITES" [nutritional supplements, namely, ready-to-eat dietary supplements]		"MONSTER MASS" [nutritional supplement, namely, a protein and carbohydrate powder for use for weight gain]	No
12-6	OPP OPP OPP OPP [motion to dismiss all four oppositions]	99,845 100,431 101,186 101,216	William B. Richie v. Orenthal James Simpson	2(a) [immoral/scandalous mark]; 2(e)(4)	Oppositions Dismissed	"O.J. SIMPSON" [figurines, trading cards, sportswear, toys, etc.] "O.J." [figurines, trading cards, sportswear, toys, etc.]; "O.J. SIMPSON" [medallions and coins, prepaid telephone cards]; and "THE JUICE" [prepaid telephone cards]			Yes
12-6	EX	74/380,570	A.M.R.P. Handels AG	2(e)(1)	Refusal Reversed	"MECHANICAL MEMORY" [automatic machines, namely, packaging machines and filing machines for chemical, pharmaceutical, alimentary, and cosmetic articles; machines for making packaging and containers, labeling machines; machines for making of cigars and cigarettes, and packaging therefor, and storing machines for chemical, pharmaceutical, alimentary, and cosmetic articles]			No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (BOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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	New York Public Library (The Research Libraries)	(212) 592-7000
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(303) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaguez: General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/16/95
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	08/23/95
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—JOHN F. TERAPANE, Director	308-0651	08/31/95
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/29/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	02/13/95
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	02/13/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	06/22/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director	305-9600	03/15/95
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/24/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	05/29/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/31/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/18/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—MARGARET FOCARINO, Director	308-1113	07/31/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	07/13/95
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	09/12/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/28/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/02/95

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).

(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).

(3) All design patents are granted for a term of 14 years from the date of the grant.

However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office

Condition of Trademark Applications as of January 1, 1997

Law Office	Oldest Date New[3]	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/10/96	10/11/96
Law Office 102—Myra Kazdoud, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/07/96	08/02/96
Law Office 103—Kathryn Enskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/12/96	12/12/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/08/96	10/14/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/22/96	08/13/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/12/96	10/18/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/29/96	11/12/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/08/96	10/15/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/96	11/14/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Tarron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)	10/31/96	—0—
Renewals (All Classes)	10/21/96	—0—
Section 12(c) Publications (All Classes)	07/01/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

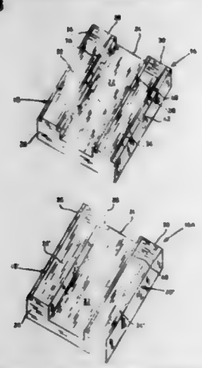
3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

JANUARY 28, 1997

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,870,519 (3110th)
UNIFORM FLYING HEIGHT SLIDER ASSEMBLY WITH IMPROVED DYNAMIC AIR BEARING CHARACTERISTICS
James W. White, 135 Olive Ave., Los Gatos, Calif. 95030
Reexamination Request Nos. 90/003,639, Nov. 17, 1994 and 90/003,735, Feb. 21, 1995.
Reexamination Certificate for Patent 4,870,519, issued Sep. 26, 1989, Ser. No. 123,398, Nov. 20, 1987.
Int. Cl.[6] G11B *5/60*
U.S. Cl. 360—103



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **26** is confirmed.

Claims **3**, **4**, **7**, **10–12**, **20**, **24**, **25** and **27** are cancelled.

Claims **1**, **2**, **5**, **8**, **9**, **13–19** are determined to be patentable as amended.

Claims **6**, **21–23**, dependent on an amended claim, are determined to be patentable.

New claims **28–133** are added and determined to be patentable.

46. A slider assembly for supporting a magnetic transducer in a uniform flying height relationship to a moving magnetic recording medium, which comprises:

a support structure having leading and trailing edges relative to the motion of said recording medium, and a longitudinal axis disposed along the length of said support structure, said longitudinal axis being at a skew angle ranging from zero to positive and negative values with respect to the direction of motion of said recording medium at said support structure;

a pair of rails carried by said support structure with one rail along each edge thereof and forming a recess therebetween, each of said rails defining a face toward said recording medium, each of said faces being provided with a converging portion at said leading edge for pressurizing air between said faces and said recording medium causing said slider assembly to fly at close proximity to said recording medium during moving of said recording medium;

wherein each of said rails is provided with a transverse pressurization contour along only one corresponding side edge of said faces for providing flying height stability to said slider assembly during operation at a skew angle that is non-zero and damping of variations in flying height caused by dynamic forces applied to said slider assembly; and

wherein said one transverse pressurization contour on each of said rails is a step having a height, B, and width, C, to establish an average angle, θ, of about 0.05 to about 5 degrees according to the formula

$$\theta = \tan^{-1}(B/C).$$

110. A slider assembly for supporting a magnetic transducer in a uniform flying height relationship to a moving magnetic recording medium, which comprises:

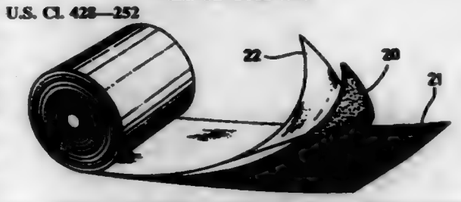
a support structure having leading and trailing edges relative to the motion of said recording medium, and a longitudinal axis disposed along the length of said support structure, said longitudinal axis being at a skew angle ranging from zero to positive and negative values with respect to the direction of motion of said recording medium at said support structure;

at least one rail carried by said support structure, said rail defining a face toward said recording medium, said face being provided with a converging portion at said leading edge for pressurizing air between said face and said recording medium causing said slider assembly to fly at close proximity to said recording medium during moving of said recording medium;

wherein said rail is provided with a transverse pressurization contour along only one side edge of said face for providing flying height stability to said slider assembly during operation at a skew angle that is non-zero and damping of variations in flying height caused by dynamic forces applied to said slider assembly, said transverse pressurization contour having an average angle, with respect to said face of said rail of about 0.05 to about 5 degrees; and

wherein said at least one rail is further provided with a transverse pressurization contour along a second side edge of said face for producing pressurization in one of said contours and expansion in the second of said contours when air flow across said face has a substantially unidirectional transverse component when said skew angle is non-zero, at least one of said transverse pressurization contours each having an average angle, θ, with respect to said face of said rail of about 0.05 to less than 0.5 degrees, and wherein said average angles of said transverse pressurization contours on said rail are different from each other.

B1 4,983,449 (3111th)
PROTECTIVE WRAPPING MATERIAL
Robert M. Nee, Houston, Tex., assignee to Polyguard Products Incorporated, Ennis, Tex.
Reexamination Request No. 90/003,839, May 23, 1995.
Reexamination Certificate for Patent 4,983,449, issued Jan. 8, 1991, Ser. No. 413,129, Sep. 27, 1989.
Int. Cl.[6] B32B *7/00*
U.S. Cl. 428—252



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–8**, dependent on an amended claim, are determined to be patentable.

1. A continuous non-shielding strip protective wrapping for buried pipe consisting essentially of:

(a) a substantially non-elastic support backing comprising a continuous strip of porous material comprising a basket weave fabric of essentially flat thermoplastic fibers [which has an open surface area] *having sufficient density to be substantially non-elastic, said fabric having a porosity* of not more than twenty percent *open surface area*; and

(b) a layer of cold-flowable rubberized bitumen secured to at least one side of said support backing.

B1 5,054,615 (3112th)

HOT WORK ORGANIZER

Ross I. Stillwagon, 12741 Los Nietos Rd., Santa Fe Springs; Fernando Fischbach, 8363 Dinsdale St., Downey, and Jon F. Linscott, 12741 Los Nietos Rd., Santa Fe Springs, all of Calif. 90670

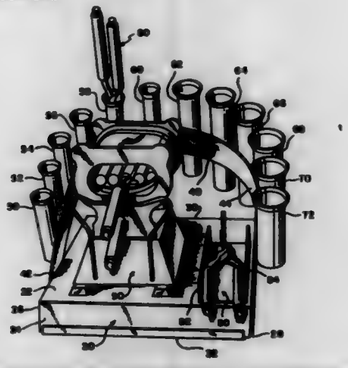
Reexamination Request No. 90/003,837, May 18, 1995.

Reexamination Certificate for Patent 5,054,615, issued Oct. 8, 1991, Ser. No. 635,244, Dec. 28, 1990.

The portion of the term of this patent subsequent to Dec. 21, 2007, has been disclaimed.

Int. Cl.[6] B65D *85/20*

U.S. Cl. 206—373



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **6** are determined to be patentable as amended.

Claims **3–5** and **7–9**, dependent on an amended claim, are determined to be patentable.

1. A hot work organizer including:

a base *having front and rear portions of a top surface thereof;*

a supporting [band] *strip* mounted on said base and extending upwardly therefrom, *said supporting strip having an arcuately directed portion extending over and around the rear portion of said base top surface for providing access to the front portion of said base top surface*; and

a plurality of curling iron holders carried by said [band] *strip* positioned above and toward the rear of said base, said holders adapted to receive a variety of different size curling irons having handle and heating iron portions at the opposite ends thereof.

B1 5,173,195 (3113th)

PHASE SEPARATOR MODULE

Francis C. Wright, Yardville, and David A. Goding, Dover, both of N.J., assignors to Mercer International, Inc., Mendham, N.J.

Reexamination Request No. 90/003,848, May 26, 1995.

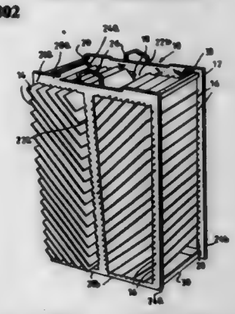
Reexamination Certificate for Patent 5,173,195, issued Dec. 22, 1992, Ser. No. 693,338, Apr. 29, 1991.

Continuation of Ser. No. 484,682, Feb. 23, 1990, Pat. No. 5,028,333.

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[6] B01D *21/00*

U.S. Cl. 210—802



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **3** and **21–26** is confirmed.

Claims **1** and **19** are cancelled.

Claims **2**, **4**, **9**, **13**, **15**, **18**, **20**, **27**, **31**, **32** and **35** are determined to be patentable as amended.

Claims **5–8**, **10–12**, **14**, **16**, **17**, **28–30**, **33**, **34** and **36**, dependent on an amended claim, are determined to be patentable.

New claims **37** and **38** are added and determined to be patentable.

37. An improved separator apparatus as recited in claim 1, wherein said removable retention means comprises means for selectively retaining and removing individual impingement plates with the frame.

B1 5,350,442 (3114th)

GAS HANDLING SYSTEM AND ADSORBENT DRYER REGENERATION APPARATUS

John E. Thelen, Ocala, and Sundar R. Mylavarapu, Gainesville, both of Fla., assignors to Pneumatic Products Corp., Ocala, Fla.

Reexamination Request No. 90/004,097, Jan. 5, 1996.

Reexamination Certificate for Patent 5,350,442, issued Sep. 27, 1994, Ser. No. 103,002, Aug. 6, 1993.

Int. Cl.[6] B01D *53/04*

U.S. Cl. 95—115

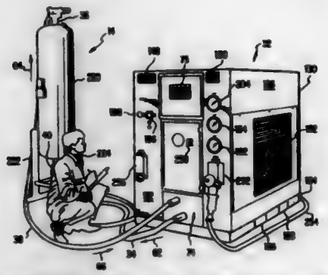
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** and **14–16** is confirmed.

Claims **8**, **11** and **17** are determined to be patentable as amended.

Claims **9**, **10**, **12**, **13** and **18–20**, dependent on an amended claim, are determined to be patentable.

New claims **21–63** are added and determined to be patentable.



24. A method of handling gas, said method comprising the steps of:

flowing a first gas through a first adsorbent dryer, using said dryer to dry said first gas, and subsequently compressing said first gas into a first storage vessel;

flowing a second gas through a second adsorbent dryer, using said second adsorbent dryer to dry said second gas, and subsequently compressing said second gas into a second storage vessel, said second dryer being remote from said first dryer; and

using a mobile regeneration apparatus to regenerate said first and second dryers; and

wherein said method further comprises the step of purging said mobile regeneration apparatus, said purging step occurring prior to said step of using said mobile regeneration apparatus to regenerate said first and second dryers; and

wherein said step of purging said regeneration apparatus includes the step of purging a closed loop conduit system of oxygen and natural gas; and

wherein said step of using said mobile regeneration apparatus to regenerate said first and second dryers includes the step of flowing nitrogen gas through said first and second dryers.

REISSUES

JANUARY 28, 1997

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,432

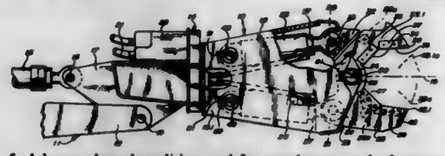
DEMOLITION TOOL FOR A HYDRAULIC EXCAVATOR

Roy E. LaBounty, and Kenneth R. LaBounty, both of Two Harbors, Minn., assignors to LaBounty Manufacturing Co., Two Harbors, Minn.

Original No. 5,060,378, dated Oct. 29, 1991, Ser. No. 451,377, Dec. 15, 1989. Application for reissue Mar. 9, 1995, Ser. No. 401,366

Int. Cl.[6] B23D *17/06*

U.S. Cl. 30—134 **19 Claims**



1. A heavy-duty demolition tool for attachment to the boom and hydraulic system of a hydraulic excavator, comprising:

a frame mountable on the boom structure,

a pair of demolition jaws having pivot means connecting the jaws to each other and to the frame means, the jaws being swingable through predetermined operational arcs between open and closed positions, *said pivot means including coupling means coupling said jaws and enabling pivotal motion thereof about a common axis relative to said frame and relative to each other and maintaining said jaws in assembly with each other when said jaws are dismounted as a unitary assembly from said frame,* and

a pair of juxtaposed hydraulic cylinders mounted on the frame means and connectable to the hydraulic system of the excavator, each of the cylinders having a pivotal connection to a respective jaw, and the hydraulic cylinders being extensible and retractable to move the pivotal connections through such operational arc which are nearly bisected by radii which are normal to the directions of extension and retraction of the cylinders.

Re. 35,433

COALESCER FILTER AND METHOD

William J. Alexander, III, Mauldin, S.C., assignor to Alexander Machinery, Inc., Mauldin, S.C.

Original No. 5,061,300, dated Oct. 29, 1991, Ser. No. 541,070, Jun. 20, 1990. Continuation of Ser. No. 808188, Dec. 13, 1991, abandoned. Application for reissue Mar. 25, 1993, Ser. No. 38,561

Int. Cl.[6] B01D *53/26*

U.S. Cl. 95—24 **9 Claims**

11. The method of removing liquids from air comprising the steps of:

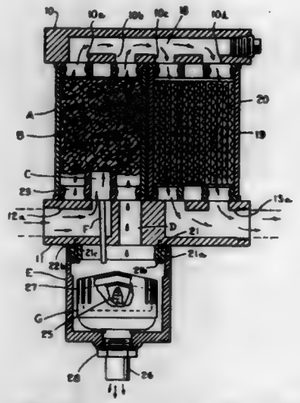
forming an inlet air stream;

providing an upright cylindrical housing containing coalescing material;

introducing said inlet air stream to said cylindrical housing through an inlet air conduit and thence upwardly through said coalescing material;

causing liquids contained within said air to coalesce and flow downwardly;

causing a pressure drop in a canister positioned below said housing receiving coalesced liquids by positioning a tube having one end in said canister and the other end in said inlet air stream in said conduit prior to passage through said coalescing material to create a pressure drop in said canister;



draining said liquids from a lower portion of said housing through an opening spaced laterally of said inlet air conduit with the aid of said pressure drop in the canister.

Re. 35,434

BIPOLAR-MOS COMPARATOR CIRCUIT WITH SATURATION PREVENTION

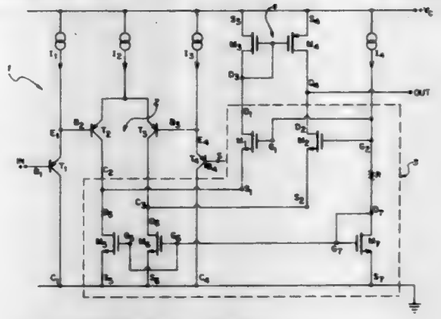
Alberto Gola, Broni; Angelo Alzati, Bollate, and Aldo Novelli, S. Lorenzo di Parabiago, all of Italy, assignors to SGS-Thomson Microelectronics S. r. L, Agrate Brianza, Italy

Original No. 5,077,489, dated Dec. 31, 1991, Ser. No. 606,838, Oct. 30, 1990. Application for reissue Dec. 30, 1993, Ser. No. 176,859

Claims priority, application Italy, Nov. 22, 1989, 22474/89

Int. Cl.[6] H03K *5/24*

U.S. Cl. 327—77 **13 Claims**



7. A comparator circuit, comprising:

a differential pair having a first bipolar transistor and a second bipolar transistor with an emitter of the first bipolar transistor electrically connected to an emitter of the second bipolar transistor,

a biasing circuit for biasing the differential pair so as to preclude the differential pair from operating in saturation mode, said biasing circuit including a first MOS transistor and a second MOS transistor forming a current source respectively connected to a collector of the first bipolar transistor and to a collector of the second bipolar transistor, and

a MOS transistor arrangement connected to the collectors of the first and second bipolar transistors, a drain of the MOS

transistor arrangement providing an output of the comparator circuit, the MOS transistor arrangement being biased to a conductive state by a second biasing circuit.

Re. 35,435

METHOD AND APPARATUS FOR INFORMATION RECORDING AND REPRODUCTION OF A PIT-SHAPE-FORMING OPTICAL RECORDING TYPE

Atsushi Saito, Ichikawa; Takeshi Maeda; Hisataka Sugiyama, both of Kokubunji, and Wasao Takasugi, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,866,692, dated Sep. 12, 1989, Ser. No. 85,964, Aug. 17, 1987. Application for reissue Sep. 11, 1991, Ser. No. 757,911

Claims priority, application Japan, Aug. 22, 1986, 61-195376

Int. Cl.[6] G11B *7/007*

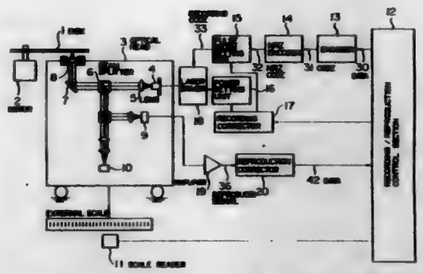
U.S. Cl. 369—59 39 Claims

19. An information recording and reproducing apparatus comprising:

a recording medium which has a pre-formatted region with at least one header signal including a track address and a data recording region which are alternatively arranged along said track;

irradiating means for irradiating a radiated beam onto said recording medium;

pulse width setting means for correcting the width of a pulse, a leading edge and a trailing edge of said pulse corresponding to "1" of a predetermined code, respectively, by a predetermined amount in response to a line speed of said radiated beam on said recording medium;



modulating means for modulating the strength of said radiated beam from high level to low level by means of a recording pulse from said pulse width setting means such that said leading edge and trailing edge of a pit which is formed in said data recording region by scanning said radiated beam onto said recording medium corresponding to "1" of said predetermined code, respectively; and

reproducing means for independently detecting signals corresponding to said leading edge and trailing edge respectively of said pit in response to a reproducing signal which corresponds to said pit on said recording medium and reproducing data by correcting an interval of said two signals corresponding to said leading edge and trailing edge respectively of said pit.

PLANT PATENTS

GRANTED JANUARY 28, 1997

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,785

MINIATURE ROSE PLANT NAMED 'SAVACOOK'

F. Harmon Saville, Newburyport, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Dec. 20, 1995, Ser. No. 575,282

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, upright, well branched, compact habit, substantially as illustrated and described, characterized by buds and flowers of an apricot blend, borne in clusters but also singly making them ideal for cut flowers; and further characterized by a plant of vigorous growth, being good as a hardy graden perennial, easy to propagate from cuttings, with an abundant amount of medium green foliage.

9,786

MINIATURE ROSE PLANT NAMED 'QUIET TIME'

Susan M. O'Brien, 489 Minot Ave., Chula Vista, Calif. 91910, and Cecilia L. D. Bennett, deceased, late of Chula Vista, Calif.

Filed Jan. 2, 1996, Ser. No. 582,199

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of miniature rose plant, named 'Quiet Time', hardy, dwarf, vigorous growth, well-branched and attractive in appearance, substantially as illustrated and described; characterized by its hybrid tea form blooms, ranging from near Phylox Purple to near Pale Mauve with the base of innermost petals ranging from near Egyptian Buff to near Salmon, which are abundant on the bush and usually borne one to a stem but occasionally in sprays of 3 to 5 or more.

9,787

CHERRY TREE: 'RED CRYSTAL'

Hideki Otani, Reedley, Calif., assignor to Otani Enterprises, Reedley, Calif.

Filed Dec. 19, 1994, Ser. No. 370,578

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—37 1 Claim

1. A new and distinct variety of cherry tree described and illustrated, particularly characterized by an earlier maturing dark red, sweet cherry fruit than Brooks variety.

9,788

SWEET GUM TREE NAMED 'GRANT'S SEEDLESS ZN-4'

William R. Grant; Elizabeth M. Grant, and W. Cal Grant, all of 1018 Pawnee Rd., Wilmette, Ill. 60091

Filed Aug. 31, 1995, Ser. No. 521,243

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—51.1 1 Claim

1. A new and distinct variety of Sweet Gum tree, named 'Grant's Seedless Zn-4' as described and illustrated, and which is particularly characterized by its lack of fruits or seed pods, and its hardiness to minus 25 degrees Fahrenheit (USDA Zone 4b). and, its canopy, which allows vigorous and healthy lawn growth and has intense Burgundy red and golden yellow Fall colors.

9,789

HEATHER 'MELANIE'

Kurt Kramer, Edesmer Strase 26, 26188 Edewecht, Germany

Filed Jul. 21, 1995, Ser. No. 505,814

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—54.1 1 Claim

1. A new and distinct variety of Heather plant named *Calluna vulgaris* Melanie, substantially as herein shown and described, characterized particularly by its white flowers which remain as an unopened bud from fall through early spring.

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PATENTS

GRANTED January 28, 1997

ERRATA

For CLASS	See PATENT NO.
105–458	5,596,936
105–096	5,596,937
206–279	5,597,065
473–485	5,597,158
473–424	5,597,159
124–016	5,597,160
473–588	5,597,161
440–067	5,597,245
482–100	5,597,257
441–130	5,597,277
425–387	5,597,353
055–274	5,597,385
508–421	5,597,506
510–340	5,597,507
510–417	5,597,508
510–223	5,597,509
464–119	5,597,566
096–099	5,597,645
442–195	5,597,646
442–382	5,597,647
396–319	5,598,236
396–264	5,598,237
396–178	5,598,238
396–538	5,598,239
396–084	5,598,240
396–079	5,598,241
396–055	5,598,242
396–051	5,598,243
396–495	5,598,244
396–440	5,598,245
396–055	5,598,246
396–095	5,598,247
396–051	5,598,248
399–030	5,598,251
399–046	5,598,252
399–240	5,598,253

ERRATA–CONTINUED

For CLASS	See PATENT NO.
399–262	5,598,254
399–234	5,598,255
399–316	5,598,256
399–364	5,598,257
399–085	5,598,258
386–009	5,598,273
386–013	5,598,274
386–117	5,598,275
386–046	5,598,276
386–116	5,598,277
395–222	5,598,331
395–224	5,598,332
395–183	5,598,333
379–094	5,598,401
345–173	5,598,527

PATENTS

GRANTED JANUARY 28, 1997

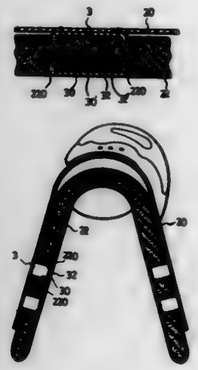
GENERAL AND MECHANICAL

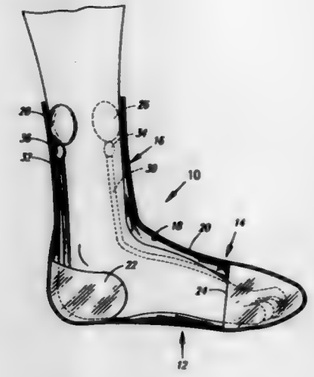
5,596,768

ATHLETIC PROTECTIVE GEAR WITH CONCEALED FASTENING ELEMENTS

Hudson Wang, No. 20, Lane 1968, Feng-Lin-Erh Rd., Lin-Yuan Hsiang, Kaohsiung Hsien, Taiwan

Filed Dec. 26, 1995, Ser. No. 578,341
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—462 **1 Claim**





1. An athletic protective gear comprising:
a protective structural member adapted to overlie a body part to be protected;
a protective pad of depressible material adapted to be disposed between said protective structural member and the body part and having two openings formed therethrough; and
a fastener strap secured on an inner surface of said protective structural member and having two opposed end portions extending through said openings respectively, and two hook-and-loop elements which are secured to said end portions respectively and which engage each other in such a manner that said protective structural member abuts against an outer side surface of said protective pad, so as to retain said end portions on an inner side surface of said protective pad, thereby confining said protective pad between said structural member and said body part;
whereby, a person cannot impact directly said elements so as to prevent untimely removal of said hook-and-loop elements from each other.

5,596,769

Patent Not Issued For This Number

5,596,770

TWO-PLY INFLATABLE SOCK

J. Denise Kuneah, 2415 Tanglewood Cir., Stillwater, Okla. 74074

Filed Nov. 1, 1995, Ser. No. 551,715
Int. Cl.[6] A41B *11/00*
U.S. Cl. 2—239 **8 Claims**

8. A two-ply sock, comprising:
(a) an inner layer constructed of polypropylene;
(b) a water repellant outer layer;
(c) an inflatable toe cup disposed between said inner layer and said outer layer adapted to encase the toes of a wearer, said toe cup having an air inlet and being partially filled with a gel material selected from the group consisting of plastisols and hydrogels;
(d) an inflatable heel collar disposed between said inner layer and said outer layer adapted to circumscribe the heel of the wearer, said heel collar having an air inlet and being partially filled with said gel material;
(e) a first finger pump and release valve assembly adapted for fluid communication with said toe cup via a first air conduit; and
(f) a second finger pump and release valve assembly adapted for fluid communication with said heel collar via a second air conduit.

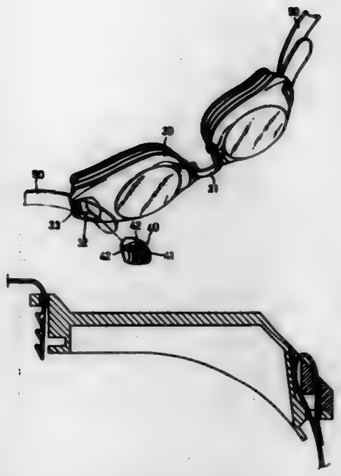
5,596,771

SWIM GOGGLES WITH NESTED TYPE OF HEAD BAND FASTENING MEANS

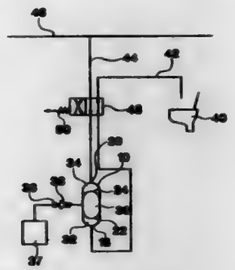
Chao-Chin Hou, T'ai Nan, and Ruey B. You, Taipei, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinch, Taiwan

Filed Nov. 7, 1995, Ser. No. 551,792
Int. Cl.[6] A61F *9/02*
U.S. Cl. 2—428 **2 Claims**

1. A pair of swim goggles with nested type of head band fastening structure, comprising:
(a) a head band;
(b) two goggles; each of said goggles being provided at an outer front corner with a recess which has a long slot formed at a rear wall thereof;
(c) two fastening means; each of said fastening means being provided at a front surface with a vertically extending central bar, and said fastening means having a contour which permits said fastening means to nest in said recess of said goggle with a front surface of said fastening means which is substantially flush with an outer surface of said goggle to provide said swim goggle with an integrated and smooth appearance;
(d) wherein said head band has two free ends which respectively pass through said long slots of said recesses on said goggles, return about said central bars of said fastening means, and then pass through said long slots of said recesses again so as to be fixed thereto.

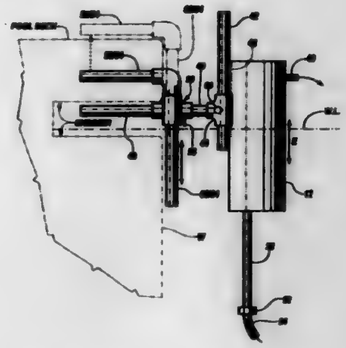


5,596,772
TOILET FLUSHING SYSTEM WITH MULTI-DIAPHRAGM STORAGE CONTAINER HAVING THREE FLUID RECEIVING CHAMBERS
Otmar Schön, Bexbach-Hochen, Germany, assignor to Hydac Technology GmbH, Sulzbach/Saar, Germany
PCT No. PCT/EP93/01708, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO94/01680, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 2, 1993, Ser. No. 360,718
Claims priority, application Germany, Jul. 9, 1992, 42 22 502.7
Int. Cl.[6] E03D 3/10
U.S. Cl. 4—361 9 Claims



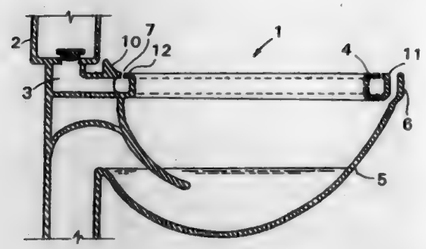
1. A toilet flushing system, comprising:
a toilet;
a fresh water feed;
a fluid storage container connected to said fresh water feed, said fluid storage container having a container casing and first and second separating diaphragms within said container casing, said separating diaphragms defining first, second and third partial chambers within said container casing, said second partial chamber being defined between said separating diaphragms and receiving a pressurized fluid;
a supply line coupled to said storage container and said toilet; and
valve means, in said fresh water feed and said supply line, for selectively coupling said fresh water feed and said supply line to said first partial chamber, said valve means being movable between a first switch position for filling said first partial chamber with fresh water from said fresh water feed and a second switch position for delivering fresh water from said first partial chamber through said supply line to said toilet and for simultaneously filling said third partial chamber with a fluid.

5,596,773
WATER LEVEL CONTROL DEVICE
Ronald J. Caesman, 2283 Cork Oak St. E., Sarasota, Fla. 34232
Filed Aug. 9, 1995, Ser. No. 512,768
Int. Cl.[6] E04H 4/14
U.S. Cl. 4—508 2 Claims

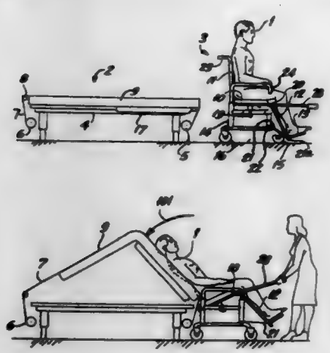


1. A portable swimming pool water level control device, the swimming pool having a built-in recess defining a skimmer positioned in a wall of the swimming pool at the desired water level of the swimming pool and slightly lower than the level of a deck of the swimming pool, said control device comprising:
a straight tubular upright conduit having open ends;
a toilet ball cock valve and vertically slidable float assembly connected within said conduit, said valve having a water inlet and outlet, said float opening and closing said valve responsive to relative height positioning between said valve and said float;
said inlet connectable to a water discharge end of a garden hose, another end of the garden hose connectable to a water supply;
three spaced, parallel elongated slender horizontal support members connected to and laterally extending away from said conduit;
said horizontal support members spaced apart to supportively and cooperatively engage against an upper surface inside the skimmer and the pool deck whereby the conduit is held upright and positioned vertically in the swimming pool adjacent the skimmer at the desired water level;
an upright support extending downwardly from said horizontal support members to engage against the wall of the swimming pool below the skimmer to prevent rotation of said conduit away from the wall;
said float moving vertically with respect to said valve responsive to the swimming pool water level to open said valve when pool water level drops below a preselected level established by vertical positioning of said float.

5,596,774
SELF CLEANING TOILET
Frederick T. Howard, 4111 Russell Ave., #2, Mt. Rainier, Md. 20712
Filed Jun. 15, 1995, Ser. No. 490,760
Int. Cl.[6] E03D 11/02
U.S. Cl. 4—420 13 Claims
1. A toilet bowl with a self-cleaning rim for use with a flush water supply, said self-cleaning rim comprising, a hollow rim surrounding a periphery of the toilet bowl, said rim having a top surface with a first plurality of openings arranged therein for directing water to flow upwardly from the hollow rim through said openings; a trough integral with the bowl and spaced away from and outside the rim, for intercepting water overflowing from said top surface and a second plurality of openings provided at a bottom of the trough, for draining water from the trough into the toilet bowl; whereby the rim is cleaned by the water issuing from the first plurality of openings.

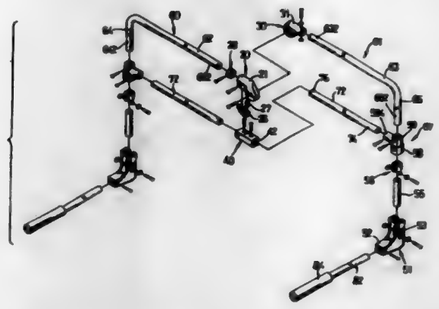


5,596,775
PATIENT TRANSFER SEAT
Paul DiMattee, Dix Hills, and Charles Chubb, Brookville, both of N.Y., assignors to Neva Technologies, Inc., Hauppauge, N.Y.
Continuation-in-part of Ser. No. 183,094, Jan. 18, 1994, Pat. No. 5,535,459. This application Jan. 30, 1995, Ser. No. 388,900
Int. Cl.[6] A61G 7/10
U.S. Cl. 5—81.1 C 15 Claims



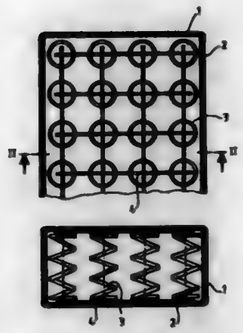
1. A chair-bed transfer arrangement, comprising:
a) a bed including:
i) a head end and a foot end;
ii) a mattress;
iii) a head-end roller at the head end of the bed;
iv) a foot-end roller at the foot end of the bed;
v) a transfer sheet extending across the mattress and wound on each roller;
b) a chair positioned at the foot end of the bed, the chair having a seat and a movable leg rest and the seat movably mounted on the chair; and
c) a lever attached to the leg rest to enable the leg rest to be raised to transfer a person from the seat to the bed; and
d) at least one roller drive attached to at least one roller to cause the head-end roller to wind and the foot-end roller to unwind the transfer sheet so as to assist in the transfer of the person from the seat to the bed.

5,596,776
COLLAPSIBLE SAFEGUARD RAIL STRUCTURE
Li-chu C. Huang, No. 9, Alley 2, Lane 606, Sec. 2, Po Ai Rd., Chia Yi City, Taiwan
Filed Nov. 28, 1995, Ser. No. 563,729
Int. Cl.[6] A47C 19/02
U.S. Cl. 5—426 6 Claims



1. A rail structure comprising:
two L-shaped bases (51) each having a horizontal section (52) and a vertical section (53);
two supports (82) each having one distal end fixedly attached to the horizontal section (52) of a corresponding one of said two bases (51);
two tubes (55) each movably mounted in the vertical section (53) of a corresponding one of said two bases (51);
two catches (56) each fixedly mounted on an upper portion of a corresponding one of said two tubes (55);
two fasteners (57) each including a lower portion (58) detachably mounted on a corresponding one of said two catches (56), an upper portion (59), and a horizontal portion (594) formed on said upper portion (59);
two supporting braces (72) each having a first distal end fixedly attached to the horizontal portion (594) of a corresponding one of said two fasteners (57) and a second distal end;
a pivot bracket (40) including two distal ends each pivotally engaged with the second distal end of a corresponding one of said two supporting braces (72);
L-shaped first and second resting rails (60) and (61) each including a vertical section (64) and (65) fixedly mounted in the upper portion (59) of a corresponding one of said two fasteners (57), and a horizontal section (62) and (63);
a tubular block (28) fixedly mounted around one distal end of the horizontal section (62) of said first resting rail (60);
a first transmission member (20) rotatably mounted on said tubular block (28); and
a second transmission member (30) rotatably mounted on one distal end of the horizontal section (63) of said second resting rail (61) and pivotally engaged with said first transmission member (20).

5,596,777
MATTRESS WITH BENT RATTAN SPRINGS
Michael Pohn, Weiser Str. 65, D-90489 Nürnberg, Germany
Filed Jul. 17, 1995, Ser. No. 503,113
Claims priority, application Germany, Jul. 19, 1994, 9411638 U
Int. Cl.[6] A47C 23/04; 27/06
U.S. Cl. 5—721 4 Claims
1. A spring mattress, comprising:
a sheath;
a plurality of helical springs extending between top and bottom of said sheath and forming a plurality of parallel spaced from each other rows of helical springs;



two stiffening grids provided at opposite ends of said helical springs for retaining said helical springs in a predetermined position;

wherein said helical springs are formed of best rattan tubes.

5,596,778

AIR CONTROLLED COMFORTER

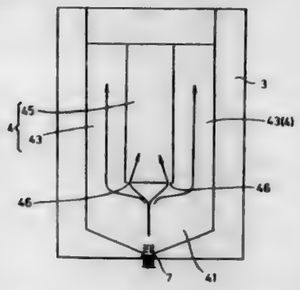
Hiroko Suzuki; Emi Suzuki, and Yosuke Suzuki, all of 11-32, Tenryuma 6-chome, Toyonaka-shi, Osaka, Japan

Filed Dec. 19, 1994, Ser. No. 359,069

Claims priority, application Japan, Dec. 20, 1993, 5-345203

Int. Cl.[6] A47G 9/00; A47C 27/00

U.S. Cl. 5—502 **1 Claim**



1. An air controlled comforter having a front cloth and a rear cloth joined together at peripheral edges thereof so as to contain insulation material inside the comforter, comprising:

an air-permeable cloth, which is joined together with the rear cloth at a peripheral portion of the air-permeable cloth so as to form an air passage between the rear cloth and the air-permeable cloth; and

an air inlet nozzle provided at a foot portion of the comforter for feeding temperature controlled air to the air passage therethrough, wherein

said air passage comprises a foot portion air passage, right and left side air passages and a central air reservoir;

said foot portion air passage is arranged near the air inlet nozzle so that the air flows into the foot portion air passage through the inlet nozzle;

said right and left side air passages are branched from the foot portion air passage and extend toward a shoulder portion of the comforter so that the air flows from the foot portion air passage toward the right and left side air passages;

said central air reservoir is located between the right and left side air passages; and

small air openings are provided at a peripheral portion of the central air reservoir so that the air flows from the foot portion air passage into the central air reservoir through said small openings and the air is distributed less in a center part of the comforter.

5,596,779

MEDICAL APPARATUS COMPRISING A MOVABLE PATENT TABLE HAVING A COMMON CONTROL MEMBER FOR OPERATING LONGITUDINAL DRIVE AND LOCKING MECHANISMS

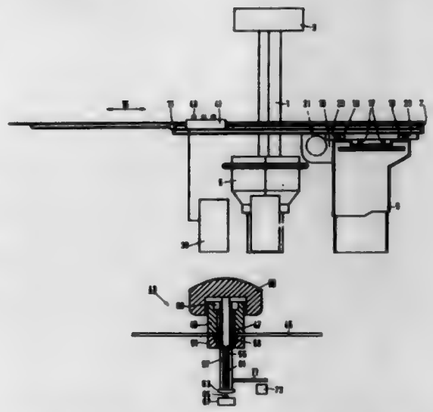
Gerrit J. Meek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1994, Ser. No. 328,309

Claims priority, application Belgium, Oct. 27, 1993, 09301146

Int. Cl.[6] A47B 13/00; H01H 9/00

U.S. Cl. 5—600 **19 Claims**



1. A medical apparatus, comprising a patient table with a table support and a table top which is movable at least in a longitudinal direction of the table top relative to the table support, a first motorized drive mechanism which selectively assists this movement, a locking mechanism for selectively locking said table top relative to the table support, and a common control member controlling both the first drive mechanism and the locking mechanism, said control member comprising a link rod which is movable in a longitudinal direction of the link rod and which cooperates with a switch in order to control the locking mechanism, and also comprises a control element which is movable transversely of the longitudinal direction of the link rod and which cooperates with a sensor which supplies an output signal for operating the drive mechanism which is a measure of the amount of displacement of the control element transversely of the longitudinal direction of the link rod, the link rod and the control element being movable by means of a common control knob whereby the table top can be moved also without assistance from the first drive mechanism.

5,596,780

SURGERY PATIENT HEADREST

Bruce R. Brems, Landenberg, Pa., assignor to The Nemours Foundation, Wilmington, Del.

Continuation of Ser. No. 346,406, Nov. 29, 1994, abandoned. This application Mar. 26, 1996, Ser. No. 621,894

Int. Cl.[6] A47C 20/00; A61B 19/00

U.S. Cl. 5—636 **6 Claims**

1. In conducting a surgical procedure on an unconscious human patient lying supinely on a horizontal table, a method of positioning the head of the patient comprising the steps of:



(a) placing a headrest on the table, the headrest including:

two elongated lobes, each lobe having a broad end, a narrow end, and a cross section perpendicular to an axis of elongation, the cross section defined by a convexly curved top adapted to form a top surface to contact the head at a point of convex curvature, and a substantially straight bottom adapted to form a flat surface to rest on a flat support, and the axis of elongation being defined by the top surface in a direction from the broad end to the narrow end, each lobe also having a tapered shape defined by a reduction of height of the top surface along the axis of elongation from the broad end to the narrow end; and

a connecting means for maintaining the lobes in a fixed spatial relationship wherein the axes of elongation are in horizontal V-shape orientation converging at an acute angle, and wherein each lobe is disposed on an opposite side of the head from the other lobe so that the two lobes are more distant from each other at the broad ends than at the narrow ends;

(b) placing the headrest behind the head the headrest positioned on the table with the top surface facing upward, with the V-shape orientation converging toward the neck, and with the lobes on opposite sides of the head and the lobes not contacting the head;

(c) placing the head in a desired position;

(d) sliding the headrest along the table in a direction away from the neck until the lobes engage the head, thereby firmly wedging the head in the desired position between the lobes.

5,596,781

VACUUM/HEAT FORMED CUSHION WITH PYRAMIDAL, INFLATABLE CELLS

Robert H. Graebe, St. Clair County, Ill., assignor to Crown Therapeutics, Inc., Belleville, Ill.

Division of Ser. No. 328,724, Oct. 25, 1994, Pat. No. 5,561,875, which is a continuation-in-part of Ser. No. 12,580, Feb. 3, 1993, Pat. No. 5,369,828, which is a division of Ser. No. 839,305, Feb. 2, 1992, abandoned. This application Oct. 20, 1995, Ser. No. 546,451

Int. Cl.[6] A47C 27/10

U.S. Cl. 5—710 **19 Claims**

1. An inflatable cushion comprising:

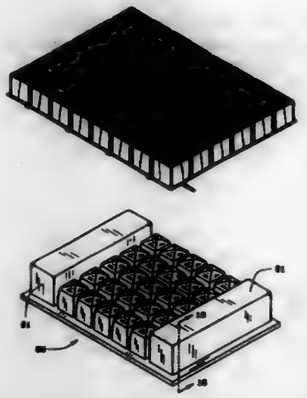
a flexible, gas impervious bottom wall;

a preformed, flexible, gas impervious top sheet formed with a plurality of air cells;

each air cell having a lower portion and an upper portion extending above the lower portion, the lower portion having a generally cubical shape defined by four generally vertical interconnected side walls each having a bottom edge and a top edge, the upper portion of each air cell being defined by four substantially triangular panels which incline upwardly from the lower portion of the air cell and meet in an apex, giving the upper portion a generally pyramidal shape extending upwardly from the top edges of the side walls to an apex of the air cell;

air-tight seals attaching the top sheet to the bottom wall along the bottom edges of the air cell side walls, the air cells being inflatable to support an exterior load thereon;

the side walls of each air cell being spaced laterally from the side walls of adjacent air cells when the air cells are not inflated, but being positioned sufficiently close to the side walls of adjacent air cells to distend and contact the side walls of adjacent air cells when the air cells are inflated and not subjected to an exterior load.



5,596,782

Patent Not Issued For This Number

5,596,783

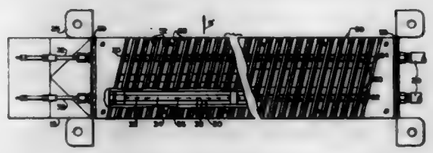
SHEET AND WEB CLEANER WITH FACE PLATE ON SUCTION HOOD

Anthony Q. Testone, Schwenksville, Pa., assignor to Electrostatics, Inc., Harleysville, Pa.

Filed Jun. 7, 1995, Ser. No. 486,235

Int. Cl.[6] A47L 13/40

U.S. Cl. 15—1.51 **18 Claims**



1. Apparatus for cleaning from a moving web particles which are adhered to it by static electricity comprising:

an elongate suction hood having a substantially rectangular inlet slot having two ends, said suction hood having an end for connection to a source of suction and being of reducing transverse cross-section from said end to the opposite end thereof,

a pair of linearly extending pressurized air ionizing bars, one on either side of said inlet slot for discharging away from said suction hood high velocity air containing ions,

a plate having opposite sides over said substantially rectangular inlet slot, said plate having in the side thereof proximate said inlet slot a central tapered elongate inlet opening overlying said inlet slot, said inlet opening in said plate being of tapering width with the greater width thereof at the end of said inlet slot proximate said opposite end of said suction hood, and

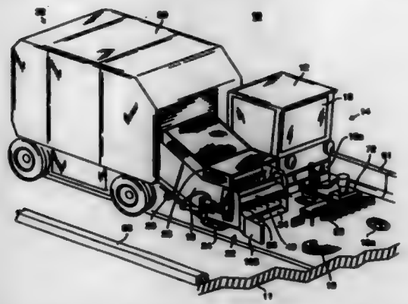
openings in said plate extending from the opposite side of said plate to and in communication with said central elongate tapered inlet opening.

5,596,784

VEHICLE FOR COLLECTING DEBRIS FROM A ROAD

David Tolmachoff, 10145 W. Rose Ln., Glendale, Ariz. 85037

Filed Sep. 22, 1995, Ser. No. 532,475
Int. Cl.[6] E01H 1/04
U.S. Cl. 15—83 23 Claims



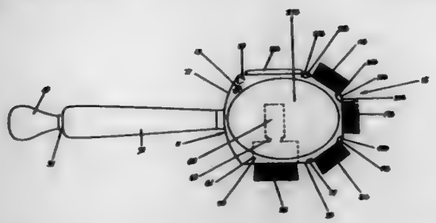
1. A vehicle for collecting debris from a road, said vehicle comprising:
a front section;
a back section;
an operator cab located proximate said front section;
a collection bin located proximate said back section;
a conveyor belt assembly located adjacent to said operator cab, said conveyor belt assembly being configured to transport said debris to said collection bin;
means for transferring said debris from said road to said conveyor belt assembly, said means for transferring being located proximate said front section;
a guide assembly located proximate said front section;
a drive chain configured to revolve around said guide assembly; and
a plurality of relocation elements coupled to said drive chain, said plurality of relocation elements being adapted to relocate said debris from a remote location on said road to a location on said road proximate said means for transferring; wherein
said operator cab, said conveyor belt assembly, and said means for transferring are configured to allow an operator to view collection of said debris at said means for transferring.

5,596,785

MULTI-UTILITY SHOE BRUSH SYSTEM

Hyun C. Park, 8445 Mandarin Ave., Rancho Cucamonga, Calif. 91730

Filed Aug. 10, 1995, Ser. No. 513,229
Int. Cl.[6] A47L 23/05
U.S. Cl. 15—114 17 Claims



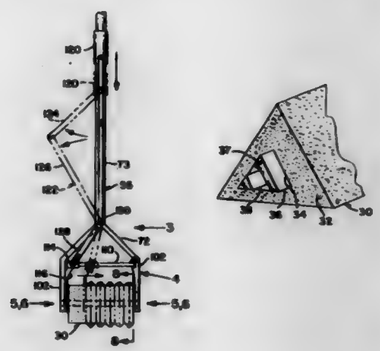
17. A multi-utility shoe brush system comprising:
a) a main body comprising an upper face, a lower face, and a plurality of sides, wherein the plurality of sides comprises a first side, a second side, a third side, a fourth side, a fifth side, and a sixth side; the first side and the second side are adjacent sides to form a first angle greater than ninety degrees, the second side and the third side are adjacent sides to form a second angle greater than ninety degrees, the third side and the fourth side are adjacent sides to form a third angle greater than ninety degrees, and the fourth side and the fifth side are adjacent sides to form a fourth angle greater than ninety degrees;
b) a cleaning system comprising a first brush attached to the second side, a second brush attached to the third side, and a third brush attached to the fourth side, wherein each of the first brush, the second brush, and the third brush has different brush stiffness; the cleaning system further comprises a buffing brush on the lower face, the buffing brush having a different brush stiffness from the first brush, the second brush, and the third brush; the cleaning system further comprises a first polishing pad attached to the first side, a second polishing pad attached to the upper face, and a means for removably attaching the second polishing pad to the upper face; the cleaning system further comprises a fourth brush attached to the fifth side, the fifth side having a rectangular cavity formed by a plurality of walls extending from the fifth side into the main body, a means for slidably attaching the fourth brush within the rectangular cavity, and a means for locking the fourth brush inside the body and outside the main body;
c) a handle with a first end and a second end wherein the second is attached to the sixth side; and
d) a shoe horn attached to the second end of the handle.

5,596,786

TRIANGULAR SHAPED FLOOR MOP

Gam Khaiters, 132 Greenpoint Ave., 3rd Floor, Brooklyn, N.Y. 11222

Filed Jun. 9, 1995, Ser. No. 488,983
Int. Cl.[6] A47L 13/14
U.S. Cl. 15—119.2 6 Claims



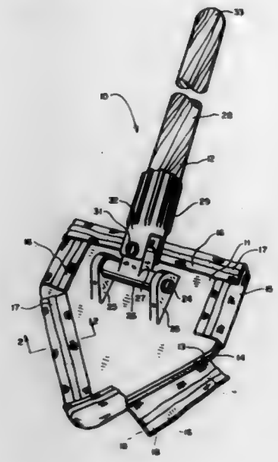
1. A floor mop, comprising:
a) a mop head having a sponge, the sponge having a triangular cross section and a channel extending through the sponge, the mop head having a core which extends through the channel, the core being triangular in shape, the core having two ends, each end having a core face, each core face having a center, the core further comprising a shaft, extending through the core past both core faces, and
b) a handle assembly, attached to the core, allowing the mop head to rotate with the core, the handle assembly comprising a mast and a flared base attached to the mast, the flared base comprising two side panels, the side panels comprising a shaft opening, the shaft openings are tear drop shaped, having a rounded portion and a wedge shaped portion, the rounded portion immediately below and adjacent to the wedge shaped portion, the shaft extending through the shaft openings.

5,596,787

WIPING DEVICE FOR INTERIOR SURFACES OF VEHICLE WINDSHIELD GLASS

Elwood L. Stevens, and Valinda Houghton, both of 1464 Liberty Ave., Ogden, Utah 84404

Filed Aug. 8, 1995, Ser. No. 512,661
Int. Cl.[6] A47L 1/15
U.S. Cl. 15—220.1 2 Claims



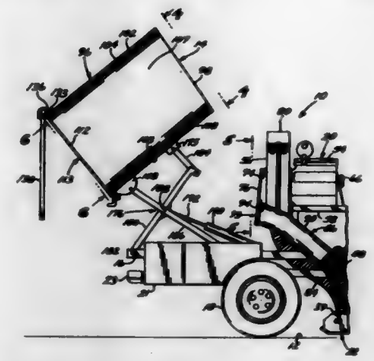
1. A windshield glass scrubbing and wiping device comprising:
a substantially rigid planar wiping head assembly having a forward, glass facing side and an opposite rear side;
an elongate handle means secured biaxially pivotable to the wiping head on the rear side thereof, said handle means comprising;
a sleeve member to which the elongate handle is secured pivotally;
a pair of spaced pivot posts outstanding from the rear side of the wiping head, and means pivotally securing the sleeve member thereto; wherein
the sleeve member pivots about an axis parallel to the plane of the wiping head; and
the handle pivots in a plane perpendicular to the sleeve pivot axis; wherein
the handle means is rotatable into a position substantially parallel to and against the wiping head;
wherein the wiping head assembly comprises;
a substantially rigid rearmost plate having a glass facing side and a rearward side;
a layer of resilient material having a glass facing side and a rearwardly facing side, said layer being secured to the glass facing side of the rearmost plate;
a reversible glass wiping material assembly secured to cover the glass facing side of the resilient material, said wiping material assembly comprising;
a pair of sheets of strong scrubbing paper,
a moisture absorbing pad between the pair of sheets of scrubbing paper, wherein
said pair of sheets have matching edge portions thereof extending beyond the pad, said matching portions being adhesively joined together to form flap portions each having a pair of opposite sides each carrying adhesive strips for attachment of the wiping material assembly to the wiping head.

5,596,788

VACUUM SWEEPER VEHICLE WITH LIGHTWEIGHT HOPPER

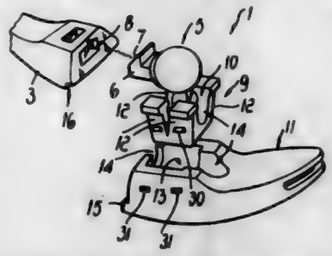
Renny E. Linville, 4984 Casa Loma Cir., and Roger D. Linville, 5464 Lakeview St., both of Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 337,776, Nov. 14, 1994, abandoned. This application Feb. 16, 1995, Ser. No. 389,588
Int. Cl.[6] E01H 1/08
U.S. Cl. 15—352 21 Claims



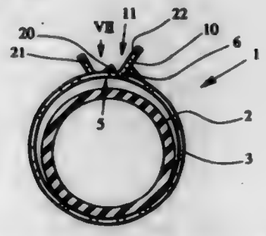
1. A hopper for mounting to a vacuum truck chassis including a vacuum system for drawing a predetermined partial vacuum at a vacuum fan inlet and having a suspended vacuum sweeper head including a debris conduit leading to a debris outlet, said hopper comprising:
a hopper tank formed with a front wall having a vacuum outlet for mating with said vacuum fan inlet and a debris inlet for mating with said debris outlet, a peripheral wall formed with pairs of laterally disposed respective upper and lower longitudinally extending rounded corners formed integrally between respective laterally disposed side walls and respective top and bottom walls;
said tank terminating at its back end in a sealing flange configured to form a debris removal outlet;
a screen partition interposed between said debris inlet and vacuum outlet and including a screen spaced from said top wall and cooperating with said peripheral wall to form therebelow a debris collection chamber and thereabove a return plenum chamber extending to said vacuum outlet;
a diverter interposed between said debris inlet and said vacuum outlet and extending from said front wall to said screen to direct air flow from said debris inlet to said vacuum outlet;
a rear door hingedly connected to the rear of said tank to be disposed in closing relation over the back of said tank; and
a peripheral gasket on said door for sealing engagement with said sealing flange whereby when said door is closed and said vacuum outlet and said debris inlet are mated with said respective vacuum inlet and debris outlet and said vacuum system operated to draw said partial vacuum, debris suspended in air drawn through said vacuum head through said conduit into said debris inlet will be swept along rearwardly in said tank along said bottom wall and respective lower bottom corners to be drawn upwardly to said screen allowing the debris to fall downwardly in said tank and, as said air is drawn upwardly through said screen, removing the remaining debris out of said air to cause the filtered air to flow forwardly in said return plenum along said top wall and said laterally disposed top corners to then be drawn into said vacuum outlet.

5,596,789
HINGE FOR EYEGLASSES
Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Federobba, Italy
Filed Nov. 30, 1994, Ser. No. 352,037
Claims priority, application Italy, Dec. 3, 1993, TV93A0108
Int. Cl.[6] G02C 5/22
U.S. Cl. 16—228 16 Claims



1. In a pair of eyeglasses couprising a first portion and a second portion, a hinge for mutually pivotally connecting the first portion and the second portion, the hinge comprising:
a shaped element with a substantially spherical shape provided at one of said first and second portions; and
a support seat provided at the other of said first and second portions;
wherein said first portion is a temple element having a longitudinal extension axis; and
wherein said shaped element is rotatably supported in said support seat such that, in a free rotation condition between said temple element and said second portion, said temple element is rotatable with respect to said second portion about at least two rotation axes all passing substantially through a central point of said spherical shaped element, one of said two rotation axes corresponding substantially to said longitudinal extension axis of the temple element; and
wherein the hinge further comprises means for substantially allowing rotation of said temple element with respect to said second portion when said temple element and said second portion are in a substantially fully open condition only about a single axis so as to rotate the temple element with respect to the second portion about said single axis to move said temple from said fully open condition into said free rotation condition between said temple element and said second portion.

5,596,790
HOSE CLAMP
Rudolf Müller, Attendorn, Germany, assignor to Muhr und Bender, Attendorn, Germany
Filed Nov. 20, 1995, Ser. No. 560,969
Claims priority, application Germany, Nov. 23, 1994, 44 41 439.0
Int. Cl.[6] B65D 63/00
U.S. Cl. 24—20 EE 13 Claims



1. Hose clamp with a clamp body which is ring-shaped with overlapping end areas for enclosing an end of a hose, said clamp body having an initial diameter and being spreadable to a second larger diameter against an inherent spring force of the clamp body by a clamping tool, a first end area of the clamp body having a catch projection which is offset rearward relative to an end edge thereof and which is engageable with a second end area of the clamp body to releasably maintain the clamp body in said larger diameter, and a longitudinally extending recess being provided in said second end area for holding said first end area, said first end area being smaller than said recess; wherein said catch projection rests against an end edge of the second end area; wherein a stop is formed on the clamp body at a location spaced from the end edge of the first end area, between said end edge and said catch projection; and wherein the catch projection and said stop are formed on a side edge area.

5,596,791
ROPE CLAMP
Llewellyn B. Parsons, 113 Cook Street Unit #3, Barrie, Ontario, Canada
Filed Mar. 29, 1996, Ser. No. 623,806
Int. Cl.[6] A44B 21/00
U.S. Cl. 24—130 7 Claims

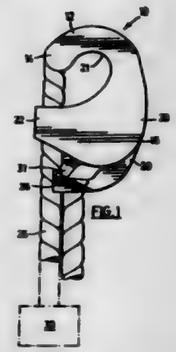
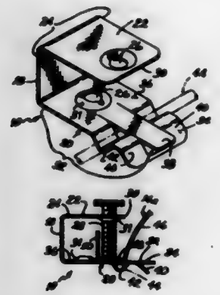


FIG.1

1. A rope clamp shaped as an open hook for hanging on a support and having a forward opening for accessing the support and comprising a pair of parallel walls forming:
an arch having a free forward end adjacent said opening, and
a body depending from the arch and merging with the arch;
the arch comprising a ropeway between said parallel walls, the ropeway being open exteriorly of a curve of the arch and closed interiorly of the curve of the arch by a base wall connecting said parallel walls;
the body comprising a rope entry guide comprising a vertical cylindrical open ended rope guide located between the parallel walls below and spaced below said free forward end of the arch to bias a rope towards said base wall;
an exit rope guide downstream of said ropeway and positioned forwardly and below said ropeway to additionally bias a rope towards said base wall; and
rope gripping wedges provided between inner surfaces of the parallel walls.

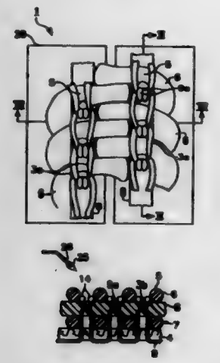
5,596,792
LIGHT GUARD ATTACHMENT CLAMP
William J. Shelton, Decatur, Ga., assignor to L&P Property Management Company, Chicago, Ill.
Filed May 20, 1996, Ser. No. 650,873
Int. Cl.[6] A44B 21/00
U.S. Cl. 24—336 9 Claims

1. A hinge clamp for attaching a wire grid to an edge portion of a sheet metal light fixture which clamp comprises:



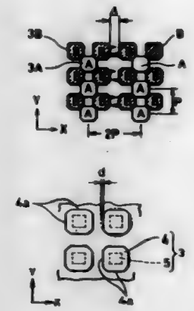
a base plate,
a short leg plate and a long leg plate extending orthogonally from opposite side edges of said base plate and disposed in spaced parallel relation to each other,
an aperture in at least one of said leg plates,
said long leg plate having a planar inner portion and a curved outer portion, said planar inner portion comprising a near section proximate said base plate and a middle finger extending from said planer inner portion of said long leg plate, said middle finger being co-planer with said near section, said outer curved portion comprising two identically configured outer fingers located on opposite sides of said middle finger and extending generally parallel to said middle finger, said outer fingers each having an arcuate detent formed therein, which detent is adapted to receive a wire of said wire grid such that said wire is entrapped on one side by said detents and on the other side by said middle finger.

5,596,793
ABRASION RESISTANT SLIDE FASTENER
Gary T. Davis, 230 Saddletree Rd., Oxford, N.C. 27565
Filed Feb. 21, 1995, Ser. No. 391,962
Int. Cl.[6] A44B 19/12
U.S. Cl. 24—394 6 Claims



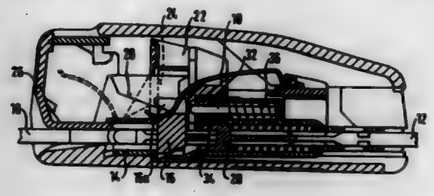
1. An abrasion resistant slide fastener, comprising:
a support tape;
a coupling element having a plurality of spirals each of which have upper and lower shanks, said coupling element positioned along said support tape for interengagement with a complementary coupling element;
a filler cord positioned within and extending through said plurality of spirals of said coupling element;
a looper thread having upper and lower looper portions stitched to said coupling element with said upper looper portion overlying said upper shank of said coupling element;
a needle thread having upper and lower needle portions with said lower needle portion stitched through said support tape, said upper needle portion stitched through said filler cord and overlying said lower looper portion, thereby securing said looper thread, said coupling element and said filler cord to said support tape, said needle thread being stitched under a greater tension than said looper thread whereby said lower looper portion engages said filler cord and said upper looper portion is drawn toward said filler cord by said greater tension of said needle thread; and
anchoring means formed by melting and severing said upper looper portion from said upper shank of said coupling element thereby forming a plasticized end of greater diameter than the lower looper portion, said anchoring means engaging said filler cord, said upper needle portion overlying and holding the midportions of said lower looper portion substantially in the interior of said filler cord after said upper portions melted from said upper shank forming anchoring means at the ends of said lower looper portion for anchoring said looper thread and said needle thread to said filler cord against said greater tension of said needle thread.

5,596,794
PLASTIC SURFACE FASTENER
Yoshio Shibanushi, Toyota, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Oct. 12, 1994, Ser. No. 321,769
Claims priority, application Japan, Oct. 12, 1993, 5-277397
Int. Cl.[6] A44B 18/00
U.S. Cl. 24—452 1 Claim



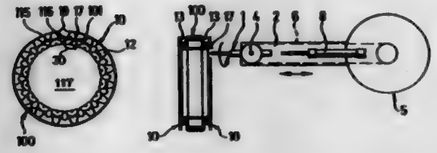
1. A plastic surface fastener comprising:
first and second surface fastener members each having a plastic base and multiple projecting members having identically sized engagement heads and standing upright on the plastic base as arranged in a matrix of prescribed pitch, selected projecting members of one of said first and second surface fastener members being removed in an appropriate pattern to provide for a space for the projecting members of the other of said first and second surface fastener members to escape into when the projecting members of said one fastener member are forced into openings enclosed by the projecting members of said other fastener member;
wherein a shape of the engagement heads of the first and second surface fastener members as viewed from a top is that obtained by cutting off peripheral regions from four sides of a circle so as to provide for an increase of a size of said space.

5,596,795
SEAT BELT BUCKLE
Dieter Bolzenwenger, Enderbach, Germany, assignor to TRW Repa GmbH, Alfdorf, Germany
Filed Apr. 25, 1995, Ser. No. 428,576
Claims priority, application Germany, May 9, 1994, 44 16 301.0
Int. Cl.[6] A44B *11/26*
U.S. Cl. 24—633 5 Claims



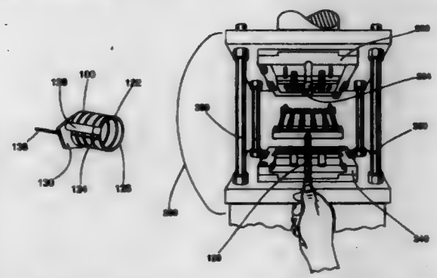
1. A seat belt buckle comprising a frame wherein an insertion channel for an insert tongue is formed, a pawl movable in said frame transverse to said insertion channel between a latching position and a release position, a release button slidably guided on said frame in a direction parallel to said insertion channel, said release button, when depressed, engaging said pawl and moving said pawl to the release position, and a catch slidably guided in a direction parallel to said insertion channel between a blocking position and a retracted position, said catch being biased by a spring to the retracted position and movable into said blocking position by inertia when the buckle is exposed to a predetermined acceleration in a direction in which the release button moves upon depression, and said catch, when in said blocking position, engaging the pawl and blocking the pawl in the latching position.

5,596,796
PROCESS FOR PROVIDING A STATOR CORE WITH STATOR WINDINGS
Gerhard Ruess, Neidlingen, Germany, assignor to Ruess Spezialmaschinen, Neidlingen, Germany
Filed Nov. 7, 1994, Ser. No. 335,081
Claims priority, application Germany, Nov. 5, 1993, 43 37 870.6
Int. Cl.[6] H02K *15/00*
U.S. Cl. 29—596 12 Claims



1. A process for providing a stator plate having an end face disk mounted on each of two faces of the stator plate with windings with a random winding pattern having a winding pitch greater than 1 where the stator plate is provided with stator slots between poles and a stator core and mounted on a rotary mount for the rotary movement of the stator plate around its axis and where the end face disk is made of an electrically insulating material and forms a winding wire receiver space lying radially and axially outside of the stator slots and running in the circumferential direction and the end face disk has radially projecting retaining fingers between every two adjacent stator slots, comprising the steps of:
installing a winding wire under tension in a stator slot by using a wire moving means in such a manner that the wire moving means moves by means of a supporting arm in at least two controlled axes and is conveyed through the stator core; and rotating the wire moving means about an axis perpendicular to its longitudinal axis to install the winding wire in the winding wire receiver space of an end face disk.

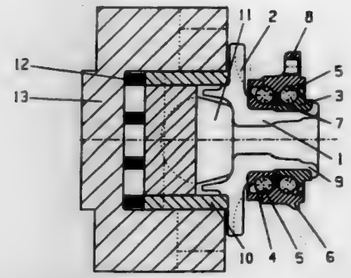
5,596,797
METHOD AND APPARATUS FOR MAKING A MOLDED CELLULAR ANTENNA COIL
Thomas C. Bunsted, Elgin, Ill., assignor to D & M Plastics Corporation, Burlington, Ill.
Filed Apr. 3, 1995, Ser. No. 415,336
Int. Cl.[6] H01P *11/00*
U.S. Cl. 29—601 16 Claims



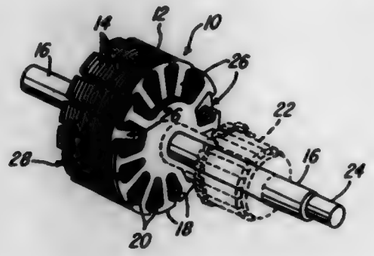
1. An apparatus for forming an antenna for a wireless communication device, the antenna having a precise dimension, comprising:
(a) the apparatus including a handle assembly and a mold assembly;
(b) the handle assembly securing at least one coil in a predetermined handle position;
(c) the mold assembly receiving the handle assembly;
(d) a handle holding means in the mold assembly for securing the handle assembly in the mold assembly;
(e) a mold coil holding means in the mold assembly for contacting the coil;
(f) the mold coil holding means and the handle holding means cooperating to set the predetermined fixed position;
(g) the mold assembly having a handle receiving side for receiving the handle assembly; and
(h) the mold assembly having a plastic receiving side for receiving an encapsulating medium to surround the coil.

5,596,798
APPARATUS FOR ASSEMBLING A BEARING UNIT, IN PARTICULAR A WHEEL BEARING UNIT FOR MOTOR VEHICLES
Heinrich Hofmann; Günther Glas, both of Schweinfurt; Roland Langer, Schwanfeld, and Vasilis Mamiotis, Niederwerrn, all of Germany, assignors to FAG Kugelfischer Georg Schafer AG, Germany
Filed Oct. 18, 1994, Ser. No. 324,912
Claims priority, application Germany, Oct. 28, 1993, 42 35 793.8
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—724 8 Claims

1. An apparatus for applying a plastic deformation force during assembly of a bearing unit, to produce an annular bead at one end of a hub whereon there is an outer hub flange at the opposite end of the hub;
said bearing unit including said hub, antifriction bearing elements, at least one inner ring constituting an inner raceway for said antifriction bearing elements, and said inner raceway being fixed axially on the hub by said bead;
the apparatus comprising a flange receiver sized and shaped for engaging the hub flange and a ram for engaging a central portion of the hub radially inward of the hub flange, the flange receiver and the ram having respective resilient supports for dividing the plastic deformation force so that only a part of the force of deformation is conducted by the hub flange, and the rest of the force is conducted by the hub to the ram.



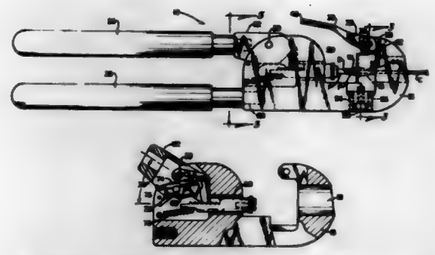
5,596,799
APPARATUS FOR MANUFACTURING ARMATURES
John M. Beaken, Fairborn, Ohio, assignor to Globe Products Inc., Huber Heights, Ohio
Division of Ser. No. 267,285, Jun. 28, 1994, Pat. No. 5,500,993, which is a continuation of Ser. No. 234,136, Apr. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 477,352
Int. Cl.[6] H02K *15/02*
U.S. Cl. 29—733 10 Claims



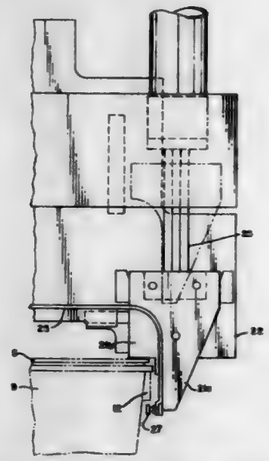
1. Apparatus for rotationally orienting a stack of laminations for an electric motor armature, a circumferential portion of the laminations at one end of the stack lacking radially outermost portions that other laminations in said stack have, said apparatus comprising a support for said stack, means for rotating said support, and proximity detectors for detecting the position of said circumferential portion to interrupt operation of said rotating means.

5,596,800
CRIMPING TOOL WITH RATCHET MECHANISM
Randall A. Holliday, Westminster, and Donald Kesinger, Morrison, both of Colo., assignors to Cable Ready, Inc., Denver, Colo.
Continuation-in-part of Ser. No. 992,524, Dec. 17, 1992, abandoned, and a continuation-in-part of Ser. No. 218,624, Mar. 28, 1994, Pat. No. 5,392,508. This application Jan. 26, 1995, Ser. No. 378,971
Int. Cl.[6] H01R *43/042*
U.S. Cl. 29—751 20 Claims

1. A crimping device for connecting a cable fitting having a generally tubular connector sleeve to an end of a cable, said device comprising:
a die member defining a tapered cavity having a first diameter at a first end thereof substantially corresponding to an outer diameter of said sleeve and a second diameter axially spaced from said first diameter which substantially corresponds to an outer diameter of said cable end;
carrier means axially spaced from said cavity for supporting said sleeve in facing relation to said first end of said cavity with said cable end extending through said cavity and at least partially inserted into said sleeve;
support means mounting said carrier for axial movement toward and away from said die member; and
force-multiplying means between said carrier means and said support means for multiplying the force applied to said sleeve and for regulating axial movement of said sleeve toward said die member whereby to force said sleeve axially into said cavity under sufficient force to radially contract said sleeve into a tapered configuration conforming with said tapered cavity of said die thereby to connect said sleeve to said end of said cable.



5,596,801
BAILING ASSEMBLY FOR PLASTIC HANDLE APPLICATION
Brian Graham, Lodi, Ohio, assignor to Cardinal Packaging, Inc., Streetsboro, Ohio
Filed Sep. 8, 1993, Ser. No. 118,089
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—774 10 Claims



1. An apparatus for attaching a plastic handle having first and second ends to a plastic container having an opening and first and second receptacles comprising:
(a) a mandrel comprised of a top, a bottom and a tapered side portion, said tapered side portion adjacent said top having a

diameter at least as great as a diameter of said container opening and said tapered side portion adjacent said bottom having a diameter less than said container opening;

(b) a means for placing said container in a mated position with said tapered side portion of said mandrel received internally of said container; and

(c) a means for attaching said first and second handle ends to said first and second container receptacles while said container is mated with said mandrel.

5,596,802

PROCESS FOR CUTTING OFF A SECTION OF SHEATHING

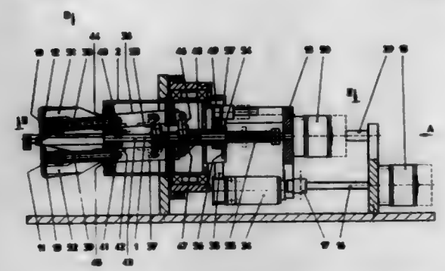
Max Koch, Meggen, and Alois Lustenberger, Littau, both of Switzerland, assignors to Komax Holding AG, Meggen, Switzerland

Filed Mar. 15, 1995, Ser. No. 404,856

Claims priority, application Switzerland, Mar. 16, 1994, 778/94

Int. Cl.[6] H01R *43/00*

U.S. Cl. 29—825 **8 Claims**



1. A process for cutting off a section of at least one layer of sheathing from an end section extending from a free end of a cable, the cable having a length dimension that extends in a longitudinal direction and the end section from which the sheathing is to be cut having a previously determined length in the longitudinal direction, said process comprising the steps of:

clamping the cable at a point spaced from the free end and the end section of the cable;

scanning the end section of the cable in the longitudinal direction to locate the free end of the cable;

advancing cutting means relative to the cable in the longitudinal direction to place the cutting means in contact with the sheathing at a distance from the free end of the cable which is equal to the previously determined length;

operating the cutting means to cut the sheathing; and

displacing the cutting means toward the free end while the cutting means is in contact with the sheathing in order to slide the length of sheathing which has been cut from the end section of the cable.

5,596,803

ELECTRODE FOR ELECTROPHORETIC DEPOSITION

Claude Encrenaz, Volvon, France, assignor to Pechiney Recherche, Courbevoie, France

Continuation of Ser. No. 138,252, Oct. 20, 1993, abandoned.

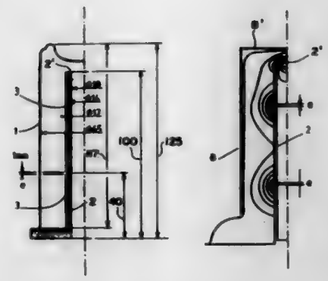
This application Jul. 17, 1995, Ser. No. 502,944

Int. Cl.[6] H01R *43/00*; C25D *13/14*

U.S. Cl. 29—825 **3 Claims**

1. A method of producing a tubular electrode for electrophoretic deposition of a coating material on a surface of an object comprising the steps of:

covering an outer lateral, electrically conductive surface of the electrode with an insulating coating material;



determining a position with respect to a base of the electrode of one annular zone for exposing the electrically conductive surface of the tubular electrode so that an equipotential curve close to the surface of the object to be coated has a shape which corresponds to said surface;

cutting a slit to form said annular zone, and

removing the insulating material along said one annular zone,

said electrode producing a substantially uniform layer of coating material on the surface of the object.

5,596,804

METHOD OF CONSTRUCTING AN ELECTROMAGNETICALLY SHIELDED MICROSTRIP CIRCUIT

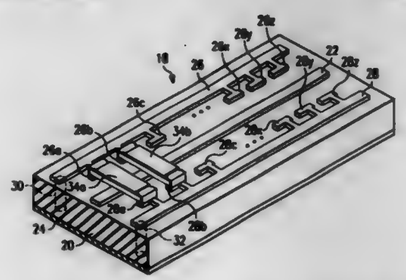
Charles R. Hogge, Jr., and Pankaj H. Bhatt, both of Plano, Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Division of Ser. No. 16,960, Feb. 12, 1993, Pat. No. 5,436,405.

This application Apr. 27, 1995, Ser. No. 429,893

Int. Cl.[6] H05K *3/34*

U.S. Cl. 29—840 **16 Claims**



1. A method of constructing an electromagnetically shielded strip conductor in a circuit for communicating electrical signals, comprising:

forming a strip conductor having a first and second side along a first surface of a substrate;

forming a ground plane along a second surface of said substrate and seperated from said strip conductor by an insulating material;

operating an automated assembly machine to select a low impedance device from a plurality of components;

operating said automated assembly machine to place said low impedance device in electrical contact with said ground plane, wherein a combination of said ground plane and said low impedance device forms a circumferential shield around said strip conductor;

forming a first ground conductor along said substrate and adjacent said first side of said strip conductor;

forming a second ground conductor along said substrate and adjacent said second side of said strip conductor;

wherein said step of forming a first ground conductor along said substrate comprises forming a first plurality of contact pads in electrical communication with said first ground conductor and adjacent said first side of said strip conductor; and

wherein said step of forming a second ground conductor along said substrate comprises forming a second plurality of contact pads in electrical communication with said second ground conductor and adjacent said second side of said strip conductor.

5,596,805

METHOD OF MANUFACTURING A PLAIN BEARING FOR A MOVABLE FUNCTIONAL PART OF SYNTHETIC RESIN MATERIAL, WHILE RETAINING AN UNPERTURBED MOLECULAR STRUCTURE

Norbert Kunze, Ehringshausen; Georg Weber, Lohra-Weipoltshausen; Wolfgang Fallenbock, Herborn-Hörbach; Helmut Klufer, Mettmann, and Georg Klammler, Berlin, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

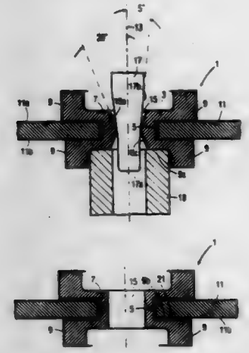
Continuation of Ser. No. 939,272, Sep. 2, 1992, abandoned.

This application May 16, 1995, Ser. No. 442,076

Claims priority, application Germany, Sep. 5, 1991, 41 29 468.8

Int. Cl.[6] F16C *33/20*

U.S. Cl. 29—898.055 **31 Claims**



1. A method of manufacturing a functional part of synthetic material in a bearing plate so as to have bearing properties, said method comprising the steps of:

a) providing a bearing plate with opposing plate surfaces and a hole wall defining a hole extending through said plate between said plate surfaces;

b) molding a functional part of synthetic resin material on said bearing plate with said functional part including retaining portions each which bear on a respective said plate surface adjacent said hole and a bridge portion extending through said hole between said retaining portions transverse to said bearing plate, said bridge portion including a bore wall defining a bore extending into said bridge portion; and

c) displacing the bore wall in said bridge portion so that (i) said synthetic resin material flows towards said hole wall of said bearing plate and in a direction transverse to said bearing plate to displace said retaining portions away from each other, whereby clearance is created between the retaining portions and their respective plate surfaces.

5,596,806

Patent Not Issued For This Number

5,596,807

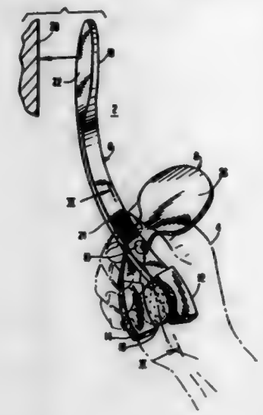
HAND TOOL AND METHOD FOR USE THEREOF

Charles C. Carr, 273 Saint Marks Pl., Staten Island, N.Y. 10301

Filed Jun. 23, 1995, Ser. No. 494,611

Int. Cl.[6] A47J *43/26*

U.S. Cl. 30—120.3 **14 Claims**



1. A hand tool for compressing an object comprising:

first and second lever members;

means for pivotally connecting said first and second lever members at a pivot point;

said first and second lever members respectively having said first and second receiving ends configured for accepting the object to be compressed;

said first and second receiving ends being disposed proximate said pivot point;

said first lever member having an arm projecting from said pivot point opposite said first receiving end;

one of said first and second lever members having at least one engagement surface for engaging a user's hand grasping said first and second receiving ends;

said arm having a striking portion for making contact with a surface to effect compression of the object when said striking portion of said arm is struck upon the surface;

said second lever member including a projection extending from said pivot point and terminating opposite said pivot point from said first receiving end, a length of said projection being less than a length of said arm of said first lever and a width of said projection being greater; and

said projection having an inertial mass for compressing said object by pivoting said second receiving end toward said first receiving end in response to said arm of said first lever member being struck upon the surface.

5,596,808

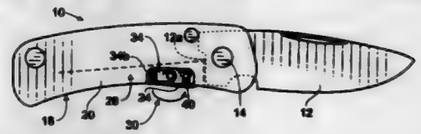
SAFETY FOR KNIFE-BLADE LOCK

Ronald W. Lake, 3360 Bendix Ave., Eugene, Oreg. 97401, and Michael L. Walker, 2925 Powell St., Eugene, Oreg. 97405

Filed Jun. 28, 1995, Ser. No. 496,842

Int. Cl.[6] B26B *1/04*

U.S. Cl. 30—161 **11 Claims**



10. A knife comprising:

a handle;

a blade mounted for pivoting relative to the handle about a first axis between a closed position and an open position;

a leaf-spring having a lock element biased against the blade when the blade is in the closed position, for moving to a lock position in line with the blade when the blade is opened, the lock element being movable between the lock position in which the blade is locked in the open position and an unlock position in which the blade in the open position is allowed to pivot; and

a safety having a safety position in which the lock element is prevented from being moved from the lock position and a release position in which the lock element is allowed to be moved from the lock position, the safety being movable between the safety position and the release position, the safety comprising a stud and an exposed contact surface, the safety being mounted adjacent to the handle for movement of the stud, by manual movement of the contact surface, between the safety position and the release position.

5,596,809

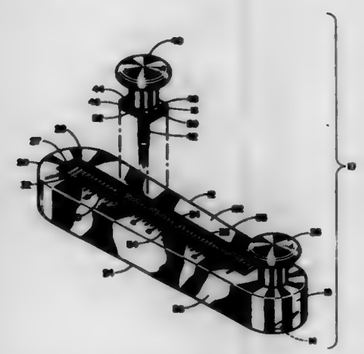
CIRCLE CUTTER FOR DRYWALL WITH MEASURE GUIDE

Jay T. Beard, 413 E. Poplar Ave., San Mateo, Calif. 94401

Filed Dec. 27, 1995, Ser. No. 567,188

Int. Cl.[6] B43L *9/04*

U.S. Cl. 30—310 **18 Claims**



1. A device for cutting drywall comprising:

a) a knife blade having predetermined dimensions and having a cutting end;

b) a beam comprising: (1) a first end, (2) a second end opposing the first end, (3) a longitudinal axis positioned centrally in the beam, (4) a beam top surface, (5) a beam bottom surface opposing the beam top surface, (6) a beam first side, (7) a beam second side, (8) a first region along the top surface defining a groove which is substantially parallel to the longitudinal axis wherein the groove has a groove bottom comprising: (i) groove teeth which are spaced substantially equidistant from each other and (ii) a second region defining a groove slot, which is substantially parallel to the longitudinal axis, extending through the beam to the beam bottom surface and (9) a beam handle having a threaded shaft extending substantially coaxial from the beam handle, (10) a removable beam portion extending from the first end to a region proximate the groove wherein the removable beam portion comprises: (i) a first surface which is substantially co-planar with the beam top surface when the removable portion contacts the beam, (ii) a second surface which is substantially parallel with the first surface wherein the second surface is adapted for contacting the beam, (iii) a first area defining a through-hole extending from the first surface to the second surface for receiving the beam handle threaded shaft and (11) a second area defining a threaded hole for threadably receiving the beam handle threaded shaft;

c) a pivoting member comprising: (1) a pivoting handle, (2) a bit which is substantially coaxial with the pivoting handle and (3) a beam fitting member intermediate the pivoting handle and the bit wherein the beam fitting member is shaped to fit inside the groove and wherein the beam fitting member has a beam fitting surface for contacting the groove bottom in which the beam fitting surface comprises beam fitting teeth which are shaped to interlock with the groove teeth when the beam fitting surface is brought into contact with the groove bottom; and

d) a third region defining a knife slot in the beam bottom surface for retaining the knife blade wherein the knife slot is positioned along a plane which is substantially perpendicular to the longitudinal axis and which is proximate the first end.

5,596,810

MACHINE TOOL

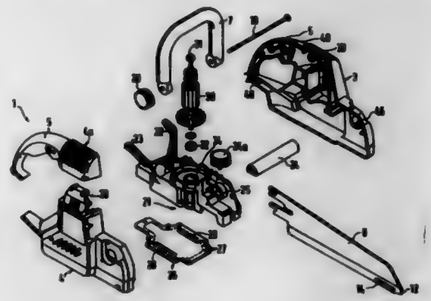
Werner Neubert; Joachim Schadow; Joachim Mueller, all of Stuttgart; Manfred-Otto Staebler, Waldenbuch; Manfred Dohr, Reutlingen, and Heinz Warkentin, Allmersbach im Tal, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 7, 1994, Ser. No. 207,824

Claims priority, application Germany, Mar. 5, 1993, 43 06 975.4

Int. Cl.[6] B23D *49/10*; B27B *19/09*

U.S. Cl. 30—369 **11 Claims**



1. A hand-held machine tool assembly operated with two hands, comprising a machine housing composed of insulating synthetic plastic shells; a fixed main handle formed as a part of said machine housing; an auxiliary handle; a drive including a motor; at least one inner housing accommodating said motor and surrounded by said synthetic plastic shells; and a tool driven by said drive; said handles being connected with said inner housing and said inner housing being connected with said tool so that forces applied to at least one of said handles are transferred during operation directly to said inner housing without being applied to and thereby deforming said machine housing and then the forces are transferred from the inner housing to said tool, said inner housing having two arms provided with ends which are directly connected with said main handle, said inner housing being provided with a guiding cylinder directly connecting said auxiliary handle to said inner housing, and said tool having a sword which carries saw blade and is connected with said inner housing.

5,596,811

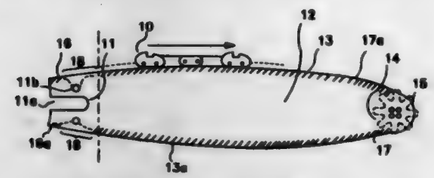
CHAINSAW GUIDE BAR

Robert C. Payne, Jackson, Tenn., assignor to Sandvik AB, Sandviken, Sweden

Filed Apr. 25, 1995, Ser. No. 428,736

Int. Cl.[6] B27B *17/02*

U.S. Cl. 30—383 **20 Claims**



1. A guide bar for saw chain, comprising:

a guide bar body, the guide bar body including longitudinal edges having one or more grooves for guiding drive links of a saw chain, an attachment end having a configuration for mounting the guide bar to a chain power drive and at least one oil hole for receiving lubricating oil for distribution in the groove, and a nose sprocket end for receiving a nose sprocket; and

a nose sprocket for supporting the saw chain while it traverses a front end of the guide bar, the nose sprocket being inserted in the guide bar body at the nose sprocket end, wherein the longitudinal edges of the guide bar have regions locally hardened to a higher hardness than the rest of the guide bar, the guide bar including one or more of the locally hardened regions extending a limited distance from the nose sprocket end toward the attachment end, and one or more of the locally hardened regions extending a limited distance from the attachment end toward the nose sprocket end, and one or more regions which are not locally hardened extending from a point no farther toward the nose sprocket end from the attachment end than adjacent to oil holes in the attachment end to a point located forward, in a direction from the attachment end toward the nose sprocket end, of where outer edges of a mounting assembly of a chain power drive are disposed when the guide bar is mounted to the chain power drive.

5,596,812

GROOVE DEPTH GAUGE FOR GOLF CLUB HEADS

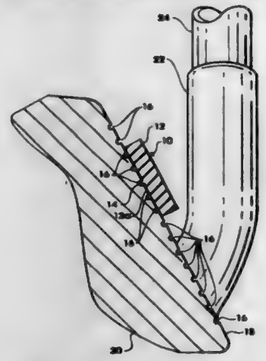
John A. Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.

Filed Sep. 1, 1995, Ser. No. 522,961

Int. Cl.[6] G01B *5/18*

U.S. Cl. 33—508 **6 Claims**

1. A gauge for measuring depths of a plurality of grooves formed



in a face of a golf club head, each of said grooves having a maximum depth, said gauge comprising:

a base having a generally flat surface;

a single ridge extending across said flat surface of said base, said single ridge having a vertical height and being adapted for insertion into one of said grooves whereby said flat surface of said base lies flush against the face of the golf club head in the event the maximum depth of said one groove is greater than said vertical height of said single ridge; and

the vertical height of said single ridge being correlated to the maximum depth of each of said grooves such that the maximum depth of each of said grooves may be checked to determine if the maximum depth of each of said grooves conforms to a preselected maximum depth.

5,596,813

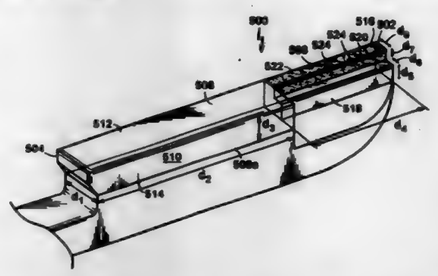
MEASURING INSTRUMENT WITH DIAMOND COATED CONTACTS

Eric E. Olson, Jr., Bolton, and Bela G. Nagy, Acton, both of Mass., assignors to Saint Gobain/Norton Industrial Ceramics Corp., Worcester, Mass.

Filed Aug. 30, 1994, Ser. No. 298,255

Int. Cl.[6] G01B *3/18*; *3/20*

U.S. Cl. 33—816 **19 Claims**



1. A measuring instrument for measuring an object, comprising:

first and second opposed contact members with respective first and second contact faces, at least said first contact member having an end portion comprising a hard substrate fixed to said contact member and coated with a diamond film coating on at least a portion of an exposed surface of said hard substrate to form said first contact face.

5,596,814

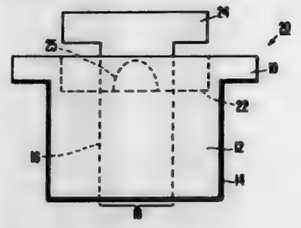
VENTED VIAL STOPPER FOR PROCESSING FREEZE-DRIED PRODUCTS

Ralph D. Zingle, Philadelphia, Pa., and Nelson A. George, North East, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 6, 1995, Ser. No. 554,854

Int. Cl.[6] F26B *25/00*

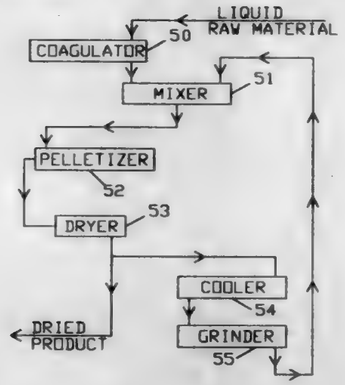
U.S. Cl. 34—296 **4 Claims**



1. A device for sealing and venting a freeze-drying container that comprises

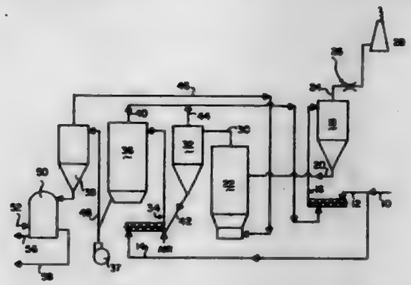
a sealable core adapted to seal an opening in the container, the core having at least one passageway therethrough;
a membrane of expanded polytetrafluoroethylene, the membrane being resistant to liquid penetration and permeable to moisture vapor, the membrane being adhered to the core so as to serve both as a barrier to liquids passing through the passageway and as a protective covering to the core;
wherein moisture vapor within the container vents through the membrane and the passageway to outside the container during the freeze-drying process; and
wherein the membrane protects resilient core against chemical attack and adhesion to the container.

5,596,815
MATERIAL DRYING PROCESS
Garland G. Rice, Atchison, Kans., and David H. Long, Springfield, Ohio, assignors to Jet-Pro Company, Inc., Atchison, Kans.
Filed Jun. 2, 1994, Ser. No. 252,999
Int. Cl.[6] F26B *3/00;7/00*
U.S. Cl. 34—346 **2 Claims**



1. A process for drying of raw materials that consist of solids and a substantial proportion of moisture comprising the steps of:
1) mixing the raw material with a relatively dry material of characteristics different from that of the raw material and in proportion according to their relative moisture contents to obtain a predetermined quantity of a combination material having a moisture content enabling processing in accordance with the following steps 3 through 6;
2) processing the combination material in accordance with the following steps 3 through 6 producing dried pellets of the combination material;
3) extruding the combination material through a forming die into one or more strands that are each of a predetermined cross-sectional area having the solids compacted into a cohesively secured mass;
4) separating each strand that is formed into elements of selected lengths forming rod-shaped pellets;
5) depositing the pellets at a first point on an upper surface of an elongated supporting plate that is formed with a plurality of apertures through which air is caused to flow, forming the deposited pellets into a layer of predetermined thickness and displacing the pellets at a selected velocity over the supporting plate to a second point spaced a distance from the first point and which second point the pellets are removed from the plate;
6) passing heated air upwardly through the apertures in the supporting plate and the layer of pellets being displaced thereover at a temperature and volumetric rate that affects vaporization and removal of the moisture carried by the pellets to reduce the moisture content of the pellets to a predetermined weight percentage during the time they are being displaced over the supporting plate;
7) mixing pellets of combination material that have been dried by preceding step 6 with raw material in a second cycle and repeating the process to affect a reduction in the proportion of the dry material in the resulting pellets, repeating the cyclic process until the proportion of the dry material in the dried pellets is reduced to a predetermined proportion.

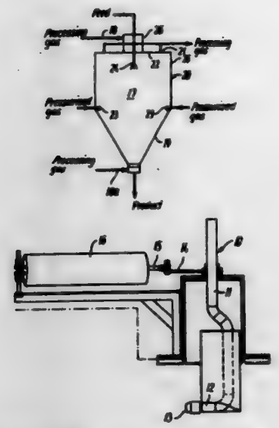
5,596,816
METHOD FOR DRYING PARTICULATE MATERIAL
Gregory J. Mills, Jandakot, and William S. Maley, Mount Pleasant, both of Australia, assignors to Alcoa of Australia Ltd., Melbourne, Australia
Filed Oct. 6, 1995, Ser. No. 540,834
Claims priority, application Australia, Oct. 6, 1994, PM8686
Int. Cl.[6] F26B *3/00*
U.S. Cl. 34—346 **22 Claims**



1. A method for drying particulate material, the method comprising the steps of:
a) subjecting a first portion of a wet particulate material feed to pre-drying to product at least partially dried particulate material and moisture;
(b) heating the at least partially dried particulate material, utilising excess combustion air, to a temperature higher than the temperature of the pre-drying to produce hot particulate material, water vapour and products of combustion;
c) passing the water vapour and products of combustion from step (b) to the pre-drier of step (a);
d) mixing the hot particulate material with a second portion of the wet particulate material feed to cool the hot particulate material; and
e) further cooling of the cooled particulate material and subsequent separation to produce a low temperature particulate material product.

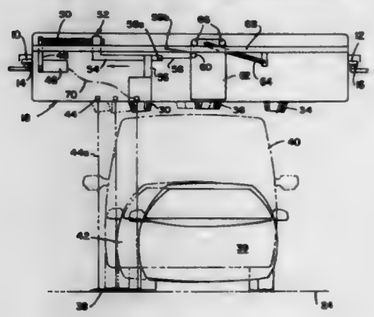
5,596,817
METHOD AND AN APPARATUS FOR MINIMIZING DEPOSITS IN A DRYING CHAMBER
Ove E. Hansen, Allerød, Denmark, assignor to Niro Holding A/S, Soborg, Denmark
PCT No. PCT/DK93/00170, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/23129, PCT Pub. Date Nov. 25, 1993
PCT Filed May 19, 1992, Ser. No. 341,598
Claims priority, application European Pat. Off., May 21, 1992, 92610037
Int. Cl.[6] F26B *3/08*
U.S. Cl. 34—373 **19 Claims**

1. A method for minimizing deposition of products on the inner surfaces of a chamber (1, 17) in which a liquid feed is atomized and subjected to the influence of a processing gas to form a granular or particulate product, the chamber being composed of a mainly cylindrical upper section (2, 20) joining an underlying mainly conical or frusto-conical lower section (3, 19), both with a mainly vertical axis, an inlet (6, 18) for said processing gas being provided at the upper end of the cylindrical chamber section and an outlet (7, 21) for the processing gas being provided at the lower or upper end of the chamber, an auxiliary gas flow being further introducing into the chamber to reduce deposition of products on the walls of the chamber characterized in that the auxiliary gas flow is injected in the form of at least one jet of pressurized gas at a site or sites of injection, at the end of said cylindrical section (2, 20) which is most remote from said processing gas outlet (7, 21) and close to a circumferential wall (9, 26) of said cylindrical section, said at least one jet having a high flow velocity compared to the flow velocity of the processing gas at the site of injection, but a total flow rate of all jets which is low compared to the flow rate of said processing gas and being injected with a main flow direction which is horizontal and substantially tangential with respect to said circumferential wall (9, 26) to interact with the flow of said processing gas to supply kinetic energy thereto so as to increase the flow velocity of said processing gas in a region extending along at least said circumferential wall (9, 26) of the cylindrical section between said level and said processing gas outlet (7, 21).



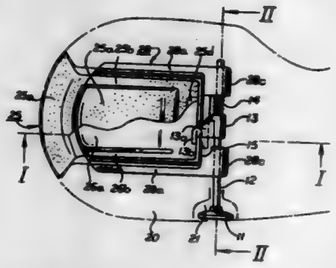
5,596,818
MOTOR VEHICLE DRYER
Allen Jones, Oneida, Wis., assignor to PDQ Manufacturing, Inc., Green Bay, Wis.
Filed Oct. 17, 1994, Ser. No. 324,351
Int. Cl.[6] F26B *17/00*
U.S. Cl. 34—666 **21 Claims**

1. A dryer used to dry a motor vehicle, comprising:



a first nozzle;
a second nozzle;
a center nozzle disposed between said first and second nozzles;
blower means for providing a gas at a high velocity to said first, second, and center nozzles;
support means for supporting said first, second, and center nozzles;
means for oscillating said first, second, and center nozzles in a synchronized manner; and
means for changing the distance between said first nozzle and said center nozzle to position said first nozzle over the side portion of the vehicle and said centering nozzle over the center portion of the vehicle.

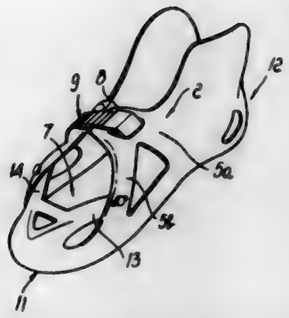
5,596,819
REPLACEABLE SHOE HEEL SPRING AND STABILIZER
Mark R. Goldston, Santa Monica; Jon Bemis, Rancho Palos Verdes, and David Pelone, Downey, all of Calif., assignors to L.A. Gear, Inc., Santa Monica, Calif.
Continuation of Ser. No. 13,633, Feb. 4, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 469,793
Int. Cl.[6] A43B *21/26;13/28;21/32*
U.S. Cl. 36—35 R **26 Claims**



1. An athletic shoe comprising:
an upper;
a mid-sole formed from a resilient material;
an out-sole;
absorbing means, selectively replaceable by a user of the athletic shoe, for absorbing shock energy and returning at least a portion of the absorbed shock energy to the foot of the user, wherein the absorbing means comprises a replaceable spring cartridge including a spring plate having a spring member upwardly inclined and cantilevered relative to a plane of the spring plate, and a first pair of lateral side rails; and
receptacle means for supporting the absorbing means in the athletic shoe.

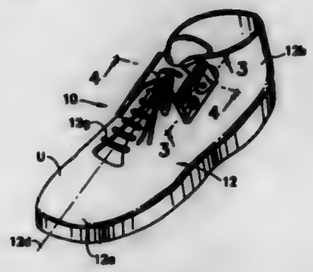
5,596,820
ADJUSTABLE SHELL FOR SPORTS SHOES
Peter Edauw, Camalo' Di Povegliano, Italy; Carey Portzline, St. Louis Park, and Timothy Wiener, Minnetonka, both of Minn., assignors to Nordica S.p.A., Trevignano, Italy, and Rollerblade, Inc., Minnetonka, Minn.
Filed Apr. 24, 1995, Ser. No. 427,136
Claims priority, application Italy, Apr. 26, 1994, TV94A0041
Int. Cl.[6] A43B *5/04;5/16*
U.S. Cl. 36—115 **18 Claims**

1. Shell for sports shoes comprising a single body having a first flap and a second flap, at least one of said flaps being arranged transversely to a foot instep region of the shell, a single fastening device being arranged between said flaps, either one of said first and second flaps being connected along two directrices that are oblique with respect to toe and heel regions of the shell, the shell further comprising a third flap and a fourth flap that extend from



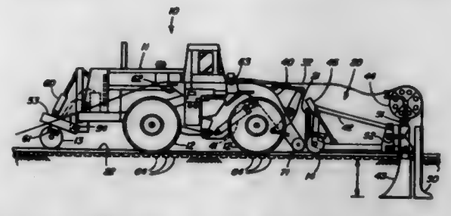
said toe region and connect respectively to said first flap and said second flap, and wherein said shell is provided with means for adapting the fit in the toe region, said fit adapting means comprising a temporary engagement means which are provided at free ends of said third and fourth flaps, said temporary engagement means being arrangeable at complementarily shaped coupling means formed on said first and second flaps for providing a relative sliding connection between said free ends of said third and fourth flaps and said first and second flaps, wherein said first flap protrudes towards said second flap, said second flap being arranged transversely to the foot instep region of the shell, and wherein said first flap has a substantially triangular shade and comprises first sides that are connected to an edge that surrounds laterally a region where a sole of a user's foot rests and are mutually connected at a vertex that is directed towards said second flap, and wherein said single fastening device comprises a lever that allows said first and second flaps to move mutually closer and is interposed between said vertex and said facing second flap.

5,596,821
UTILITY ARTICLE ATTACHABLE TO FOOTWEAR
Alan J. Sole, 1835 Burnett St., Brooklyn, N.Y. 11229
Filed Jan. 21, 1995, Ser. No. 493,320
Int. Cl.[6] A43B *23/00*
U.S. Cl. 36—136 **20 Claims**



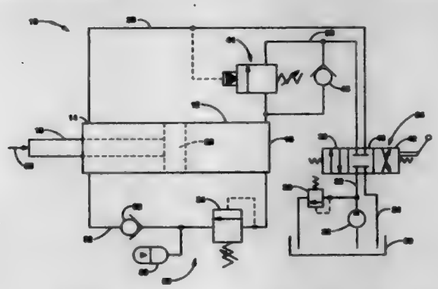
1. Utility article in combination with footwear having an upper which has a central section and two side sections one on each side of said central section, the utility article comprising a generally planar central portion and two side portions one on each side of said central portion; attachment means on said central portion for detachably attaching said central portion to the central section of the shoe upper, said two side portions being arranged in planes inclined at angles relative to the plane of said central portion to configure the utility article generally in a U-shaped to form a shoe-receiving space for receiving the shoe upper, said central portion being dimensioned and said side portions being inclined at angles selected to cause said side portions to abut against corresponding side sections of the shoe upper when said central portion is secured to the central section of the shoe upper to thereby securely attach the utility article to the shoe during normal use.

5,596,822
RUBBER TIRED RAILWAY PLOUGH
Lionel C. Demaruis, Calgary, and Bernie A. Stene, Landdowne, both of Canada, assignors to Ledcor Industries Limited, Mississauga, Canada
Filed Sep. 7, 1994, Ser. No. 301,598
Int. Cl.[6] E02F *5/10*
U.S. Cl. 37—104 **13 Claims**



1. Cable laying apparatus for laying cable comprising a self-powered vehicle, said self powered vehicle having a leading end and a lagging end, rubber tires on said self-powered vehicle, rail wheels mounted to said self-powered vehicle and being operable to allow said vehicle to move along a railway track, a cable plough mounted on said lagging end of said self-powered vehicle during operative movement of said self-powered vehicle, said cable plough being mounted to said self-powered vehicle so as to engage ground outside said railway track in one of two different positions, each of said positions being on opposite sides of the longitudinal axis of said self-powered vehicle and outside railway track, said cable plough being operable to lay said cable outside said railway track and in said ground.

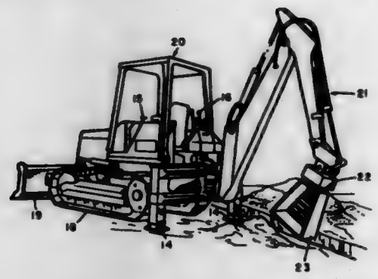
5,596,823
HYDRAULIC SYSTEM FOR A DOUBLE ACTING CYLINDER
Dennis R. Claeys, Wamego, and Don H. Kleiner, Manhattan, both of Kans., assignors to Caterpillar Inc., Peoria, Ill.
Filed Dec. 12, 1995, Ser. No. 571,324
Int. Cl.[6] F15B *1/02*; E01H *5/04*
U.S. Cl. 37—232 **3 Claims**



1. In a hydraulic system for raising and lowering a snow wing of an articulated motor grader and for maintaining the snow wing in a fixed roading position, the hydraulic system including a manual control valve and a double acting hydraulic cylinder having a rod end and a head end, the hydraulic cylinder being disposed at a remote location from the valve and having a first line connecting the head end of the hydraulic cylinder to the valve and a second line connecting the rod end of the cylinder to the valve, the improvement comprising:

a pressure relief circuit for relieving pressure in the head end of the hydraulic cylinder when the cylinder is subjected to a high force tending to collapse the cylinder, the relief circuit including a third line connecting the head end of the hydraulic cylinder to the rod end thereof, a relief valve disposed in the third line and responsive to pressure from the head end of the hydraulic cylinder, and an accumulator connected to the third line between the relief valve and the rod end of the hydraulic cylinder.

5,596,824
SINGLE SHOVEL EARTH MOVING AND COMPACTING RIG
Thomas M. Scott, and David R. Scott, both of Rte. 1-Box 914, Petersburg, W. Va. 26847
Continuation of Ser. No. 838,167, Feb. 20, 1992, Pat. No. 5,398,430, and a continuation of Ser. No. 702,405, May 20, 1991, abandoned, and a continuation of Ser. No. 369,607, Jun. 21, 1989, abandoned. This application Mar. 13, 1995, Ser. No. 402,848
Int. Cl.[6] C02F *3/28*
U.S. Cl. 37—403 **22 Claims**



1. A system for tamping of material in a trench opening, comprising:

a powered vehicle;

a boom means coupled to said powered vehicle at one end and adjustably controlled therefrom and having an opposite end;

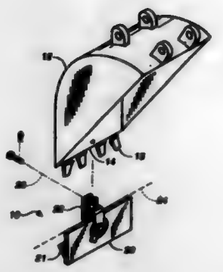
bucket means coupled to said opposite end of said boom means, for forming and filling a trench opening and wherein said bucket means has a flat bottom portion which functions as a tamping plate that fits into said trench opening;

vibrating means coupled to said opposite end of said boom means positioned between said boom means and said bucket means and external of said bucket means for periodically vibrating said bucket means so as to assist in tamping and compacting material dumped in said trench opening by said bucket means; and

means positioned between said vibrating means and said boom means for absorbing and minimizing vibrations during the tamping and compacting of material placed by said bucket means in said trench opening.

5,596,825
EXCAVATION BUCKET GRADING ATTACHMENT
Craig C. Von Schaischa, 629 Vendola Dr., San Rafael, Calif. 94903
Filed Nov. 29, 1994, Ser. No. 346,477
Int. Cl.[6] E02F *3/76*
U.S. Cl. 37—407 **2 Claims**

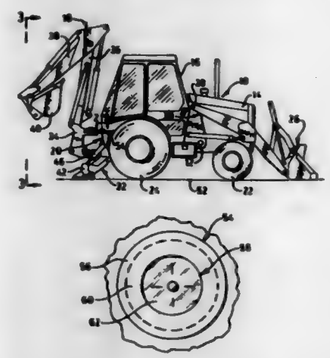
1. A grading attachment for releasable attachment to an excavation bucket, said excavation bucket having a front edge bearing a plurality of bucket teeth, said grading attachment comprising:



a generally V-shaped blade body portion having a width and adapted to fit over and accommodate said plurality of bucket teeth on said excavation bucket; and

a blade/bucket attachment assembly connected to said blade body portion and adapted for releasable attachment to the front edge of the excavation bucket, said blade body portion and said blade/bucket attachment assembly together defining a blade lateral axis along the width of the blade body portion at the attachment to the excavation bucket, and a longitudinal axis in line with the excavation bucket and generally perpendicular to the blade lateral axis, said blade/bucket attachment assembly adapted for selective and releasable one-point adjustment of the relative distance between said excavation bucket front edge and said blade body portion, wherein when said blade/bucket attachment assembly is tightened said blade body portion is pulled tightly against the bucket front edge, and when said blade/bucket attachment assembly is loosened said blade body portion is separated from the bucket front edge and permitted to roll about said longitudinal axis.

5,596,826
LEVEL INDICATING MECHANISM FOR A WORK MACHINE
William M. Barden, Raleigh, N.C., assignor to Caterpillar Inc., Peoria, Ill.
Filed Oct. 18, 1995, Ser. No. 544,749
Int. Cl.[6] A01B *15/10*; G01C *9/36*
U.S. Cl. 37—466 **10 Claims**

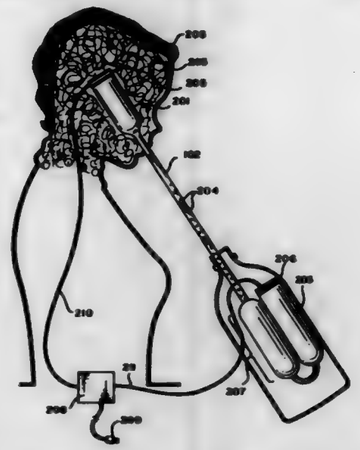


1. A level indicating mechanism, comprising:

means for indicating to an operator a relative level position of an excavating machine with respect to a surface which supports the excavating machine;

said indicating means including a magnet, a level instrument associated with the magnet, and a potting material adapted to secure said level instrument to said magnet.

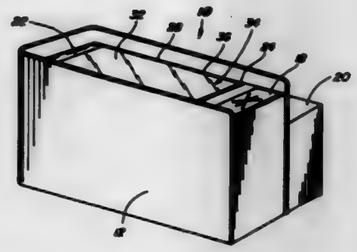
5,596,827
DEVICE FOR MAKING A LIQUID APPEAR TO RISE UP A TUBE
Daniel M. Bouloc, 3707 Rolling Hills Ave. #B-2, Alexandria, Va. 22309
Filed Aug. 25, 1995, Ser. No. 519,810
Int. Cl.[6] G09F 19/00
U.S. Cl. 40—406 44 Claims



1. A device for simulating the travel of liquid up a tube, said device comprising:
- a lower reservoir in thermal contact with heat producing means and substantially filled, under steady state operation, with vapor of a volatile liquid;
- a bubble generation section external to said lower reservoir and connected to said lower reservoir for producing bubbles in said volatile liquid upon receiving vapor from said lower reservoir;
- a bubble refining section connected to said bubble generation section for decreasing the size of said bubbles;
- a bubble transfer tube connected to said bubble refining section for transferring the bubbles from said bubble refining section; and
- an upper reservoir connected to said bubble transfer tube and in thermal contact with heat removal means, said upper reservoir receiving and condensing bubbles from said bubble transfer tube.

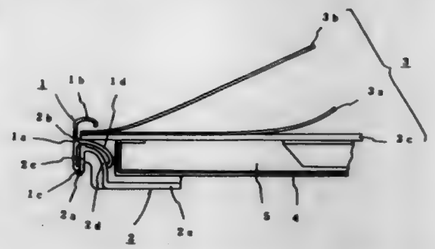
5,596,828
ENDLESS BELT DISPLAY DEVICE
Paul Smallwood, 12015 Craigview, St. Louis, Mo. 63146
Continuation of Ser. No. 230,101, Apr. 20, 1994, abandoned. This application Nov. 16, 1995, Ser. No. 558,210
Int. Cl.[6] G09F 11/12
U.S. Cl. 40—524 11 Claims

1. A visual display device comprising:
- a flexible conveyor belt having a top surface and a top edge, means for rotating the belt for recirculating movement along an endless path in a horizontal plane, the rotating means comprising a pair of roller assemblies and tensioning bolts which are loosened to decrease the span between the pair of roller assemblies; and
- a transparent panel having all but one edge bonded to the top surface of the belt with the unbonded edge being parallel to the top edge, the panel forming a pocket with the belt through which an advertisement is placed to be viewed through the panel while the belt is being recirculated along the endless path in the horizontal plane, the unbonded edge and the top edge being in direct contact with each other as the belt is



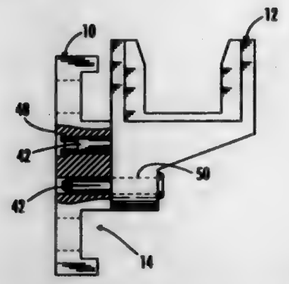
being rotated and effectively sealed together while the belt is being recirculated along the endless path, the unbounded edge and the top edge being separated by loosening the tensioning bolts to decrease the span between the roller assemblies, and the panel providing a surface upon which articles may be placed.

5,596,829
PICTURE FRAME DEVICE
Takeo Kumamura, Matsudo, Japan, assignor to Seiken Co., Ltd., Tokyo, Japan
PCT No. PCT/JP94/00198, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO94/17701, PCT Pub. Date Aug. 18, 1994
PCT Filed Feb. 9, 1994, Ser. No. 307,618
Claims priority, application Japan, Feb. 12, 1993, 5-009406
Int. Cl.[6] G09F 1/12
U.S. Cl. 40—721 1 Claim



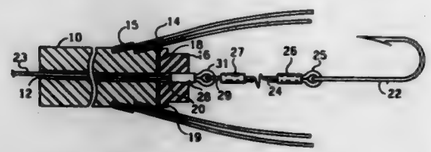
1. A picture frame device, comprising framing straight members having at least two ends, corner joints pivotally rotatably fitted at respective both ends of the framing straight members, an exhibit held on a front side of the framing straight members, and a container installed behind the exhibit, wherein each of the framing straight members has a holding portion formed inward at a front end to hold a surface of the exhibit and a pivotal rotation supporting portion formed inward at a back end of the framing straight members; from an intermediate position between the holding portion and the pivotal rotation supporting portion is extended a partition at least partially located on a pivotal rotation are formed with the pivotal rotation supporting portion as an approximate center; each of the corner joints has a pivotal rotation base strip engaged, at a back end of the corner joint, with the pivotal rotation supporting portion of the framing straight member, and kept, at a front end of the corner joint, in slidable contact with the partition and engaged partially with the partition; extending from the pivotal rotation base strip is an arcuate portion which is kept in slidable contact and engaged with a tip of the partition; from the arcuate portion, a corner joint board is further extended; and said container has a space formed, and together with the exhibit, the container is installed between the holding portions of the framing straight members and the corner joint boards.

5,596,830
FIREARM REST
James M. Morgan, 109 Crestmont Dr., Hendersonville, Tenn. 37075
Filed Jan. 30, 1995, Ser. No. 380,302
Int. Cl.[6] F41A 23/02
U.S. Cl. 42—94 14 Claims



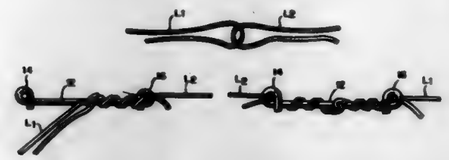
6. A rest for supporting a firearm relative to a vertical support surface attached to the ground, comprising:
- a base component having channel means for receiving a fastener configured to attach the base to the vertical support surface;
- a pair of spaced apart walls projecting substantially perpendicularly to and merging with a crossmember to form a unitary firearm seat component having a substantially rigid U-shaped configuration to receive a portion of the firearm while shooting; and
- at least one pin insertable into any of a plurality of pin receiving bores arranged to enable the firearm seat to be attached to the base component in a variety of user selected positions.

5,596,831
FISHING LURE WITH SELECTABLE HOOK ORIENTATION
William H. McWethy, Jr., P.O. Box 8441, Rancho Santa Fe, Calif. 92067
Filed Feb. 24, 1995, Ser. No. 393,816
Int. Cl.[6] A01K 85/00
U.S. Cl. 43—42.36 16 Claims



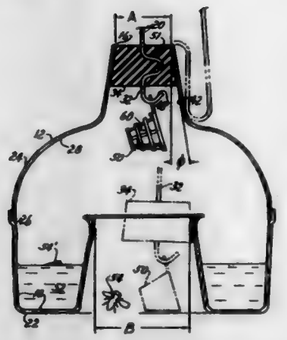
1. A fishing lure comprising:
- a body having an axis and an axial bore;
- an elastomeric mounting attached to said body; and
- a leader having a longitudinal axis; said leader disposed through said axial bore; said leader including:
- a front portion including:
  - a rear end;
- a rear portion including:
  - a front end; and
  - a hook end for attachment of a hook; said hook end distal from said front end of said leader rear portion; said leader rear portion sufficiently torsionally rigid such that said hook end has a substantially fixed rotational orientation about said longitudinal axis relative to said front end of said leader rear portion; and
- connection attached to said rear end of said leader front portion and attached to said front end of said leader rear portion such that said front end of said leader rear portion has a substantially fixed rotational orientation about said longitudinal axis relative to said connection; said connection removably and frictionally retainable in said mounting in one of a plurality of selectable fixed rotational orientations with respect to said axis.

5,596,832
KNOTLESS LINE SPLICERS
Joseph T. Manne, Star Route, Box 24, Kane, Pa. 16735
Filed Apr. 28, 1995, Ser. No. 430,840
Int. Cl.[6] A01K 91/00
U.S. Cl. 43—44.83 9 Claims



1. A combination line splicer and line connection wherein the splicer consists of a relatively straight and relatively rigid shank, formed with a pair of open eyes, one at each of two opposite ends thereof; and a pair of lines securely fastened to the splicer by a knotless arrangement wherein end portions of the lines are looped about each other, wrapped about the shank in opposite linear directions towards said opposite ends and pulled into respective ones of said pair of open eyes, and wherein said open eyes have free ends which like, respectively, on opposite sides of said shank.

5,596,833
FLY TRAP CONTAINER
Michael R. Harrie, and Gary L. Merrill, both of 1215 Zanjero Ct., Meatone, Calif. 92359-9634
Filed Dec. 16, 1994, Ser. No. 358,234
Int. Cl.[6] A01M 1/10
U.S. Cl. 43—122 17 Claims



1. In a suspendable ventilated container including a vial having an annular reservoir, a bottom opening extending between opposite portions of the reservoir, an upper wall of the vial extending upwardly and inwardly above the reservoir and having a centrally located upper opening therein and means for closing the upper opening, the improvement comprising:
- (a) an elongate hook member having a stem portion, and a downwardly facing main hook portion connected to an upper extremity of the stem portion for supporting the hook member on an external support member; and

(b) a stopper member connected proximate a lower extremity of the hook member for supporting the vial,

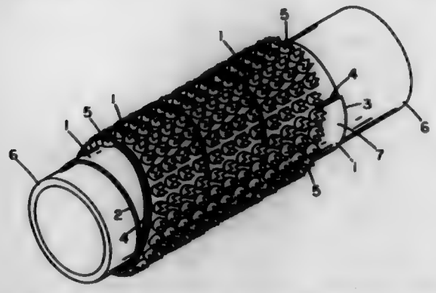
wherein the hook member together with the stopper member is passable vertically through the bottom opening, and the main hook portion of the hook member is passable vertically through the upper opening for supporting the container suspended from the support member with the stopper member engaging the upper wall on opposite sides of the upper opening.

5,596,834

RODENT EXCLUSION DEVICE

Vincent A. Ritter, 21B Pheasant Run, Smithfield, R.I. 02917

Filed Mar. 10, 1995, Ser. No. 401,808
Int. Cl.[6] A01M 29/00
U.S. Cl. 43—124 4 Claims



1. A rodent exclusion device for use on a supporting surface, comprising:

an elongate planar strip of flexible material having first and second opposing surfaces and first and second opposing longitudinal edges, the first surface having an elongate portion of hook and loop material extending adjacent the first longitudinal edge, the second surface having a mating elongate portion of hook and loop material extending adjacent the second longitudinal edge,

a means for excluding rodents on the first surface, said means for excluding rodents including a plurality of sharp projections, and

whereto the elongate strip of flexible material is windable about said supporting surface in a spiral earning the elongate portions of hook and loop material to interengage.

5,596,835

Patent Not Issued For This Number

5,596,836

UNDERGROUND SYSTEM FOR TREATING SOIL

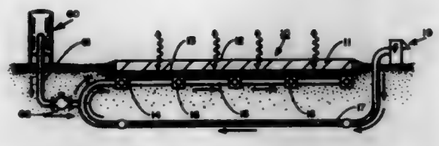
William M. Benson, 3537 Pebble Beach Dr., Martinez, Ga. 30907

Division of Ser. No. 177,441, Jan. 5, 1994, Pat. No. 5,433,759.
This application May 19, 1995, Ser. No. 445,295
Int. Cl.[6] A01G 1/00
U.S. Cl. 47—1.01 2 Claims

1. A system for controlling the soil temperature of a grass playing field that includes:

a soil profile containing a lower gravel bed, and a soil layer over the gravel bed for supporting turf,

a duct network of interconnected perforated pipes buried in the gravel bed having perforations that are in air flow communication with the gravel bed,



a blower means having a suction port and a discharge port that is connectable to said duct network,

connector means for selectively coupling one of the blower ports to said duct network to either pass air upwardly through the entire thickness of the soil profile, or draw air downwardly through the entire soil profile, and

soil treatment means for introducing a soil treatment material into the flow of air supplied to said subsoil.

5,596,837

INJECTION DEVICE FOR INJECTING ARTICLES INTO TREES AND A METHOD OF TREATING SAME

Michael Duff, Mississauga, Canada, assignor to Monsanto Canada Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 840,533, Feb. 25, 1992, abandoned. This application Aug. 4, 1994, Ser. No. 287,597
Claims priority, application Canada, Mar. 28, 1991, 2039447
Int. Cl.[6] A01G 29/00
U.S. Cl. 47—57.5 17 Claims



1. An apparatus for injecting an article into a tree comprising:

at least one continuous retaining member for retaining a plurality of articles;

a non-movable head having a passage extending therethrough, said head being fixedly connected with said at least one continuous retaining member;

an injection member at least partially movable within said passage for injecting an article in said head into a tree; and

a housing slidably mounted on said non-movable head for housing and retaining said injection member whereby said housing is slidable to effect movement of said injection member from a non-injecting position within said head to an injecting position therein.

5,596,838

METHOD AND INSTRUMENT FOR THE PREPARATION OF POLLEN FOR CRYOGENIC STORAGE

John A. Greaves, Sheldahl; Norman P. Cloud; Martin A. Stoecker, both of Ames, all of Iowa, and Raymond Russell, Hudson, N.H., assignors to Zenco (No. 4) Limited, London, England

Continuation-in-part of Ser. No. 260,184, Jun. 15, 1994, abandoned. This application Jul. 29, 1994, Ser. No. 282,629
Int. Cl.[6] A01G 7/00; A01H 5/00
U.S. Cl. 47—58 17 Claims

1. A method of preparing pollen for storage, wherein the moisture level of the pollen is reduced to a second moisture level wherein substantial viability of the pollen during Storage is maintained, said method comprising the steps of:

(a) selecting pollen having a first moisture level;

(b) exposing said pollen having a first moisture level to reduced atmospheric pressures;

(c) monitoring by an indirect, remote sensor, the moisture level of said pollen wherein a selected second moisture level can be identified;

(d) reducing the first moisture level of said pollen to a second moisture level; and

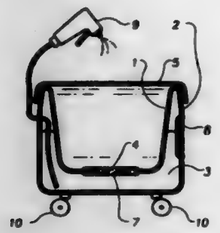
(e) storing in storage said pollen having said second moisture level.

5,596,839

MODIFIED LONG TERM SELF FEEDING PLANTER

Emmanuel Ellis-El, Grand Rapids, Mich., assignor to Robert J. Sayfie, Grand Rapids, Mich.

Filed Dec. 11, 1995, Ser. No. 570,650
Int. Cl.[6] A01G 25/00
U.S. Cl. 47—79 4 Claims



1. A planter comprising:

a. an upstanding inner wall (1);

b. an upstanding outer wall (2), said upstanding inner wall (1) and said upstanding outer wall (2) defining a cavity (3);

c. said inner wall (1) having a liquid intake means (4); and

d. a cover (5) disposed between said upstanding inner wall (1) and said upstanding outer wall (2) to cover said cavity (3);

e. a mobility means (10) supporting the planter, whereby the planter can be rolled to different locations;

f. a water level indicator (8) disposed on said upstanding outer wall (2), said water level indicator (8) being a transparent area, whereby one can look through to see the water level;

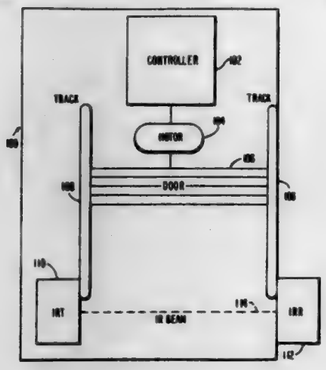
g. a sprayer (9) disposed on the upstanding outer wall (2), whereby said sprayer (9) draws water from the cavity (3), whereby the user can spray the plant.

5,596,840

GARAGE DOOR OPENER WITH REMOTE SAFETY SENSORS

Ruder Teich, South Orange, N.J., assignor to RMT Associates, Inc., South Orange, N.J.

Continuation-in-part of Ser. No. 280,718, Jul. 26, 1994, which is a continuation-in-part of Ser. No. 122,236, Sep. 15, 1993, Pat. No. 5,493,812. This application Nov. 4, 1994, Ser. No. 334,815
Int. Cl.[6] E05F 15/02
U.S. Cl. 49—26 15 Claims



1. An automatic door opening safety system for operating on a door, said door being moved along a path, comprising:

means for controlling movement of said door being electrically coupled to a controlling infrared receiver;

means for detecting whether an obstruction is located in said path and providing a signal to indicate that said obstruction has been detected;

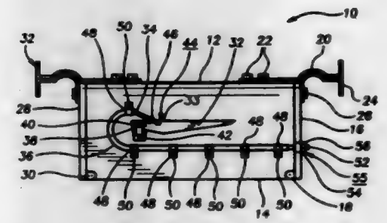
said detecting means including a first and a second infrared transmitter and a detection infrared receiver, said first infrared transmitter and said detection infrared receiver cooperating to detect said obstruction, said second infrared transmitter being optically coupled to said controlling infrared receiver and receiving an input from said detection infrared receiver to generate said signal for said controlling infrared receiver.

5,596,841

MAILBOX WITH SIGNAL DEVICE

Paul E. Gentry, and Barbara J. Gentry, both of P.O. Box 6042, Biloxi, Miss. 39532

Filed Apr. 26, 1995, Ser. No. 429,335
Int. Cl.[6] B65D 91/00
U.S. Cl. 49—35 3 Claims



1. In a mailbox having an elongated housing including a front end, a rear end and a flat bottom; a front closure for said front end of said housing, movable from a closed position to an open position; and a rear closure for said rear end of said housing, movable from a closed position to an open position; the improvement comprising:

a signal device movable between a first and second position, said signal device including an elongated signal member pivotally mounted on said housing and a pivot pin having said elongated signal member mounted thereon in a manner such that said elongated signal member tends to remain in whatever position it is brought to;

a sleeve member, having an initial and a terminal orifice, in connection with said housing, said initial orifice being disposed adjacent said signal device and said terminal orifice being disposed adjacent said front closure;

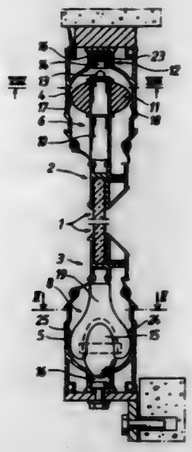
a flexible cable, having a substantial portion thereof slidably disposed within said sleeve member, a first end functionally connected to said signal device and a second end functionally connected to said front closure, said flexible cable being of a length sufficient for moving said signal device from said first position to said second position upon moving said front closure from said closed position to said open position, said first end of said flexible cable extending beyond said initial orifice of said sleeve member and said second end of said flexible cable extending beyond said terminal orifice of said sleeve member; and

a rib having a pathway formed therethrough attached to said front closure in a manner such that said pathway is substantially aligned with said terminal orifice of said sleeve member when said front closure is in said closed position, said second end of said flexible cable being disposed through and beyond said pathway of said rib.

5,596,842
SLIDING ELEMENT SYSTEM

Jarmo Sjöholm, Hovitie 20, FIN-01380 Vantaa, Finland

PCT No. PCT/FI93/00423, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO94/09238, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 14, 1993, Ser. No. 416,769
Claims priority, application Finland, Oct. 14, 1992, 924654
Int. Cl.[6] E05D 15/22
U.S. Cl. 49—177 13 Claims

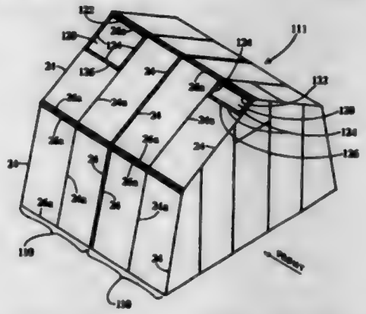


1. A sliding element system, comprising a substantially vertical sliding element (1) having an upper side (2) and a lower side (3), parallelling each other; an elongated and box-like upper guide section (4), located adjacent to the upper side; an elongated and box-like lower guide section (5) located adjacent to the lower side; guide wheel sets (6, 7, 8, 9), which are connected to the upper side and the lower side of said sliding element and comprising at least one horizontal wheel set (6), comprising a vertical wheel axle (10), which is attached to the upper side (2), and a horizontal wheel (11), rotatably carried on a wheel shaft so that its plane of rotation is horizontal, and the guide wheel sets are disposed to run in guidance of the guide sections and within them; and a hinge arrangement (12), comprising interlocking members: a first coupling member (13), connected to the wheel axle (10); and a second coupling member (14), connected to the upper guide section (4); and wherein the wheel axle (10), upon engagement of the coupling members serves as a hinge axis about which the sliding element can be swivelled; wherein the guide wheel sets (8, 9) on the lower side (3) support the sliding element (1) on the lower guide section (5); to the lower side (3) is connected a vertical wheel set (8), comprising a vertical wheel (15), the diameter of which is smaller than the transverse inside dimension of the lower guide section and the plane of rotation of which is located on the same vertical plane with the central axis of the vertical wheel axle (10); the lower guide section (5) comprises a longitudinal, upward open bottom groove (16), the edges of which serve as rolling surfaces for the vertical wheel (15); and the vertical wheel (15) and the bottom groove (16) are so fitted together that when the plane of rotation of the vertical wheel parallels the bottom groove, the vertical wheel extends partly into the bottom groove, whereby when the sliding element is swivelled at a hinging point to form an angle with the guide sections, and the vertical wheel (15) which is fixedly disposed in relation to the sliding element will turn to the same angle against the longitudinal direction of the bottom groove and will rise upwardly carried by the edges of the bottom groove (16), whereby the first coupling member (13) will be coupled in form-locked connection with the second coupling member (14).

5,596,843
RIGID STRUCTURAL MEMBERS AND STRUCTURES FOR BUILDINGS AND RETAINING MEANS FOR SECURING SHEETS THERETO

Robert L. Watson, P.O. Box 30, Lot 20, Concession 5, North Elmsley Township, Rideau Ferry, Ontario, Canada

Filed Feb. 27, 1995, Ser. No. 395,489
Int. Cl.[6] E04B 1/344
U.S. Cl. 52—71 20 Claims

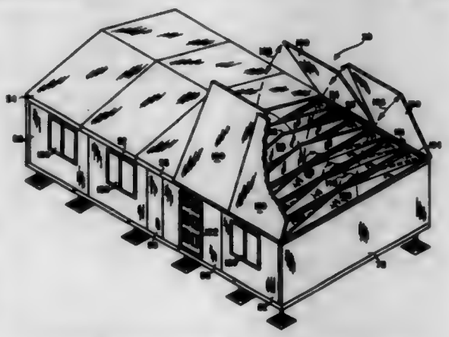


1. A structural assembly for a building comprising two wall structures and two roof structures, each structure comprising two main elongate rigid side structural members each having four sides, each side formed with a groove extending longitudinally of the member, each member also having lip means defining a narrow opening to each of the grooves, and the two main elongate rigid side structural members are located at the sides of the structure and are held spaced apart by secondary elongate rigid structural members extending between and secured to the main structural members with two of the grooves of each main member provided in oppositely outwardly facing sides of the structure to provide sheet retaining grooves for releasably accepting sheet holding members for securing within the retaining grooves two flexible enclosure sheets extending in face-to-face relationship across the two opposite sides of the structure, and the structures are hinged together in series as an assembly with the two wall structures at ends of the series and separated by the two roof structures, the structures being relatively movable about hinged positions between an erected state of the assembly and a collapsed state of the assembly.

5,596,844
FOLDABLE PORTABLE BUILDING

Juan R. Kalinowski, 21669- 50B Avenue, Langley, British Columbia, Canada

Filed Feb. 3, 1995, Ser. No. 383,172
Int. Cl.[6] E04H 1/12; E04B 7/16
U.S. Cl. 52—79.5 29 Claims



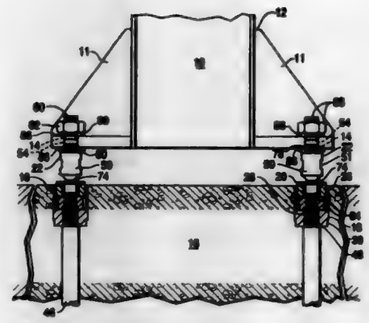
1. A foldable portable building, comprising, when erected:

(a) a main support comprising a main floor section, a main wall section and a main roof section, the main wall section being supported on the main floor section and supporting the main roof section, the sections being rigidly interconnected,
(b) a plurality of generally horizontal and planar hingedly interconnected floor sections, including a first floor section hingedly interconnected to the main floor section,
(c) a plurality of generally horizontal and planar hingedly interconnected roof sections a spaced above the floor sections, and including a first roof section hingedly interconnected to the main roof section, and
(d) a plurality of generally vertical, hingedly interconnected wall sections comprising at least one transversely disposed end wall section, two first wall sections and two second wall sections, the first and second wall sections being disposed adjacent opposite ends of the floor sections, the first and second wall sections having adjacent side edges hingedly connected to each other and opposite side edges hingedly connected to the main wall section and to the end wall section respectively to form a bellows shaped connection, at least one of the first, second or end wall sections being supported and guided by the floor sections as the wall sections move between retracted and extended positions thereof, upper edges of the wall sections being generally co-planar to each other to support thereon the roof sections extending therebetween, the upper edges of the wall sections being generally co-planar with a lower surface of the main roof section of the main support, the roof sections further comprising:
(i) at least one base ceiling member supported by the wall sections;
(ii) a pair of outer roof members, each outer roof member being hingedly connected to an opposite end edge of the base ceiling member for rotation of the outer roof members about respective axes of rotation relative to said base ceiling member; and
(iii) a plurality of trusses disposed parallel to each other to extend generally across the base ceiling member from the opposite end edges thereof, the trusses being hinged for rotation relative to the base ceiling member to permit rotation of the trusses from retracted positions thereof in which the trusses lie generally parallel and adjacent to the base ceiling member, to extended positions thereof in which the trusses extend vertically from the base ceiling member, each truss having a sloping top chord reaching an apex, wherein the trusses lie generally horizontally between the outer roof members and the base ceiling member when in the retracted position, and wherein the outer roof members rest on the top chords of the trusses when the trusses are in the extended positions thereof.

5,596,845
ADJUSTABLE SAFETY BREAKAWAY MOUNTING APPARATUS

Richard Strizki, Box 66-K, R.R. #1, Uniondale, Pa. 18470

Filed May 4, 1995, Ser. No. 434,629
Int. Cl.[6] E04B 1/00
U.S. Cl. 52—98 20 Claims



1. An improved adjustable safety breakaway mounting apparatus, for attachment of a vertical post assembly defining post bracket mounting holes therein with respect to a foundation, comprising:
A. an anchor means fixedly secured to a foundation, said anchor means comprising:
(1) an anchor body means defining an anchor chamber means therein;
(2) an anchor collar means detachably and adjustably secured to said anchor body means and defining a collar aperture means extending therethrough being in communication with respect to said anchor chamber means, said anchor collar means being vertically adjustable with respect to said anchor body means, said anchor collar means further including:
a. an upper collar abutment surface extending around said collar aperture means and facing generally upwardly therefrom;
b. a lower collar abutment surface extending around said collar aperture means and facing generally downwardly therefrom;
c. a collar lip means extending upwardly from said upper collar abutment surface and peripherally therearound, said collar lip means extending around said collar aperture means defined in said anchor collar means, said upper collar abutment surface and said collar lip means together defining a containment bore means thereadjacent facing upwardly;
B. a breakaway coupling means including;
(1) a main shaft member exteading generally vertically, said main shaft member comprising a plurality of monolithic shaft members each extending vertically into the post bracket mounting holes and into said anchor chamber means of said anchor means to enhance structural stability therebetween;
(2) an upper support member extending into the post bracket mounting hole defined in the vertical post assembly and securable therewithin;
(3) an upper securement means operative to detachably secure said breakaway coupling means to the vertical post assembly by securement of said upper support member in position extending through the post bracket mounting hole;
(4) a lower support member detachably securable to said anchor body means by securement thereof in position extending through said collar aperture means into said anchor chamber means therebelow, said lower support member being smaller than said collar aperture means to define together a lateral clearance space therebetween to provide lateral moveability of said breakaway coupling means with respect to said anchor collar means and said anchor body means to facilitate lateral adjustment therebetween;
(5) a lower securement means operative to detachably and fixedly secure said breakaway coupling means to said anchor collar means by securement of said lower support member in position extending through said collar aperture means into said anchor chamber means therebelow to facilitate vertical adjustment in the position of affixing of said breakaway coupling means with respect to said anchor body means;
(6) a weakened section positioned between said upper support member and said lower support member and being breakable to facilitate release of the vertical post assembly from said anchor collar means of said anchor means responsive to exertion of lateral force on the vertical post assembly in the area adjacent said breakaway coupling;
(7) a coupling support shoulder positioned below said weakened section and being adjustably retained within said containment bore means to facilitate maintaining of vertical alignment of said breakaway coupling while simultaneously allowing lateral adjustment thereof, said coupling support shoulder being retained within said containment

bore means and cooperating with said collar lip means extending peripherally therearound to allow limited horizontal movement of said breakaway coupling means for facilitating horizontal adjustment of positioning of said breakaway coupling means with respect to said anchor means, said anchor collar means cooperating with said anchor body means and said lower securement means to provide vertical adjustment in positioning of said breakaway coupling means with respect to said anchor body means while also cooperating with said coupling support shoulder within said containment bore means and said lateral clearance space to provide horizontal adjustment therebetween; and

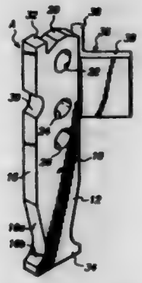
C. a load concentrating means positioned between said breakaway coupling means and the vertical post assembly adjacent said post bracket mounting hole to enhance breaking of said weakened section responsive to lateral force being exerted on the vertical post assembly adjacent said breakaway coupling and to resist breaking of said weakened section responsive to lateral force exerted on the vertical post assembly distant from said breakaway coupling means.

5,596,846

LIFTING ANCHOR FOR EMBEDMENT IN CONCRETE MEMBERS

David L. Kelly, Sacramento, Calif., assignor to The Burke Group, Sacramento, Calif.

Filed Oct. 13, 1995, Ser. No. 542,727
Int. Cl.[6] E04G 21/16; E04H 12/34
U.S. Cl. 52—125.2 23 Claims



1. An anchor for embedment in a concrete slab to provide for the lifting of the slab, said anchor comprising:

a. an elongate metallic bar having distal and proximal ends;

b. a lifting connection on the bar adjacent the distal end thereof for engagement by a lifting coupling;

c. an enlarged foot formed on the proximal end of the bar for embedment in the slab;

d. a convergent section formed on the bar between the proximal and distal ends, said convergent section having surfaces converging toward said enlarged foot;

e. a divergent section formed on the bar between the convergent section and the distal end to merge the convergent section with the enlarged foot and provide divergent surfaces which transmit pull-out forces divergently and laterally of the bar when the anchor is embedded in a concrete slab and,

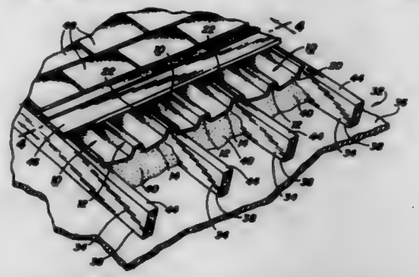
f. a pair of divergent wings fixed to and extending laterally from the bar for embedment in a concrete slab to transmit lateral lifting forces to the slab in outwardly divergent directions.

5,596,847

BAFFLE VENT STRUCTURE

Michael R. Stephenson, Springfield, Ill., assignor to Inno-Vent Plastics, Inc., Springfield, Ill.

Filed Oct. 14, 1994, Ser. No. 323,535
Int. Cl.[6] E04B 7/00
U.S. Cl. 52—198 9 Claims



1. A single baffle vent for positioning between the underside of a roof and the top edges of roof rafters to define a duct means between the rafters and between the baffle vent and the interior surface of the roof for directing air over the interior surface of the roof, the baffle vent being compatible with both 16 inch and 24 inch center roof rafters, the baffle vent comprising:

an elongated self-supporting structure of sheet-like material having a plurality of longitudinal ribs spaced transversely of the structure on eight inch centers and adapted for positioning onto the top edges of the roof rafters, and

a plurality of longitudinal troughs between the ribs defining said duct means between the rafters, and

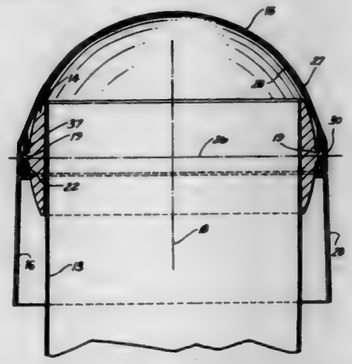
said troughs including bottom walls spaced a predetermined distance below the interior surface of the roof.

5,596,848

ADJUSTABLE SKYLIGHT

Steven Lynch, Five Dock, Australia, assignor to Skydome Industries Limited, New South Wales, Australia

PCT No. PCT/AU94/00614, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO95/10676, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 10, 1994, Ser. No. 481,281
Claims priority, application Australia, Oct. 11, 1993, PM1710
Int. Cl.[6] E04B 7/18
U.S. Cl. 52—200 7 Claims



1. An adjustable skylight assembly adapted to suit a variety of roof pitches, said assembly comprising a sunlight receiving means adapted to be mounted on a roof for receiving sunlight therethrough, sunlight transmitting means for transmitting sunlight beneath the roof and rotatably adjustable mounting means for connecting the sunlight transmitting means to the sunlight receiving means.

5,596,849

SHUTTER SYSTEM AND METHOD

George A. Hill, 8561 N.W. 52nd St., Lauderhill, Fla. 33351

Continuation-in-part of Ser. No. 344,222, Nov. 23, 1994, Pat. No. 5,487,244. This application Oct. 10, 1995, Ser. No. 541,393
Int. Cl.[6] E06B 3/26
U.S. Cl. 52—202 6 Claims

1. A shutter system for enclosing an opening in a wall of a structure comprising, in combination:

a plurality of shutter panels,

each of said panels having lateral edges that terminate in a pair of parallel lips,

each such lip having a lip bottom and an edge lock angled upwardly from the lip bottom, such that each panel can be overlapped with a like panel along their lips,

each of said panels having a vertically spaced releasably securable means along the lip bottoms for securing said panel to a like panel that has been placed adjacent thereto and overlapped along the lip,

each of said panels having a laterally spaced releasably securable means top and bottom for securing said panel to a wall opening,

each of said panels having a laterally spaced releasably securable means top and bottom for securing said panel to a wall opening,

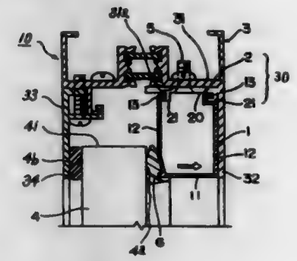
each panel being characterized by an isoceles trapezoidal cross-sectioned configuration comprised of a pair of parallel ribs flanking a single groove, whereby when said panels are overlapped on their lips to form an interlocked panel system they form a shutter system for enclosing an opening in a wall of a structure.

5,596,850

FIXED WINDOW HAVING GLAZING DEVICE HELD STABLY IN POSITION AGAINST DISPLACEMENT BY WIND PRESSURE

Yuichi Kubo, Toyama-ken, Japan, assignor to YKK Architectural Products Inc., Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,983
Claims priority, application Japan, Dec. 28, 1993, 5-067738 U
Int. Cl.[6] E06B 3/964
U.S. Cl. 52—204.62 3 Claims



1. A fixed window comprising:

(a) a panel with an inner face and an outer face;

(b) a window frame including a frame component with an inner edge and an outer edge, said frame component comprising:

(i) a frame base portion positioned outwardly of a peripheral edge of said panel, and

(ii) a flange positioned on the inner edge of the frame component, said flange projecting toward the panel and beyond the peripheral edge of said panel; and

(c) a glazing device for clamping said panel within said window frame, said glazing device comprising:

(i) a plate-like base detachably mounted to a surface of a panel side of the frame base portion, said plate-like base including a retaining portion open toward the outer edge of the frame component; and

(ii) a glazing strip engageable with the base and positioned between the flange of the frame component and the inner face of said panel;

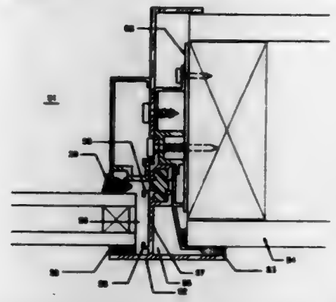
wherein the glazing strip is held in contact with the flange and is attached to the base by a locking portion of the glazing strip which releasably engages with the retaining portion.

5,596,851

EXTERIOR WALL PERIMETERS

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Jan. 13, 1995, Ser. No. 372,554
Int. Cl.[6] E06B 1/04
U.S. Cl. 52—211 19 Claims



1. A perimeter sealing structure for sealing a wall enclosing structure into an opening in an exterior wall structure for preventing water infiltration through said opening comprising:

at least one perimeter having:

(a) an inner transition member overlaying said opening in said exterior wall structure and being secured to a surface adjacent to an exterior surface of said wall structure and sealed to said wall structure using a sealant;

(b) an exterior member being secured to said inner transition member wherein at least one pressure equalized wall cavity is formed between said exterior member and said inner transition member, and an air gap is formed between said wall opening surface and said exterior member; and

(c) means for allowing exterior air to enter said wall cavity.

5,596,852

PLASTIC BUILDING PRODUCT

Charles E. Schiedegger, Metamora, Mich., assignor to Mid-America Building Products Corporation, Plymouth, Mich.

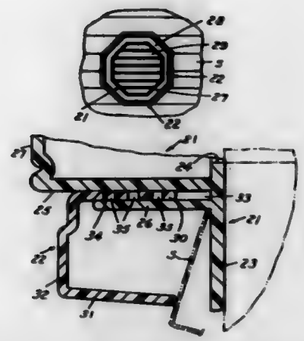
Filed Jul. 20, 1994, Ser. No. 277,734
Int. Cl.[6] E06B 1/04
U.S. Cl. 52—212 7 Claims

1. A plastic building product comprising

a plastic body having a flat base,

an integral continuous annular wall extending at a right angle from the base,

a plurality of integral wall segments spaced radially outwardly from said continuous wall to define spaces between the wall segments and continous wall, said wall segments circumferentially spaced from one another and extending outwardly from said base,



said base having portions extending radially outwardly for mounting said plastic body on a building,

a plurality of plastic flange members,

each said flange member including spaced integral walls and an integral wall connecting said spaced integral walls,

said spaced integral walls comprising an outer wall and an inner wall,

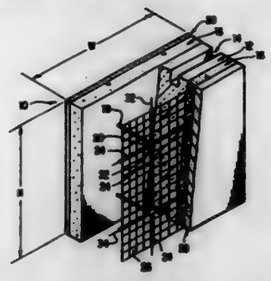
the inner integral wall of each said flange member extending into the space between said continuous wall and respective integral wall segments of said plastic body,

integral interengaging means on said inner integral walls and on said continuous wall such that the said integral walls can be held in a plurality of positions to accommodate siding of different thicknesses,

said integral interengaging means comprising the sole means for holding said flange members on said continuous wall,

said flange members have a length such that adjacent flange members abut to provide the appearance of a continuous flange.

5,596,853
BUILDING BLOCK; SYSTEM AND METHOD FOR CONSTRUCTION USING SAME
Geoffrey W. Blaney, and Richard R. Tingum, both of San Antonio, Tex., assignors to Board of Regents, University of Texas
Continuation of Ser. No. 953,672, Sep. 29, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 411,547
Int. Cl.[6] E04B 2/00; E04C 2/288
U.S. Cl. 52—223.7 **22 Claims**



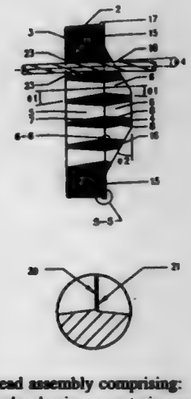
1. A modular system for making a building envelope with building blocks, comprising:

a plurality of building blocks placed substantially adjacent to one another to form the envelope, each block comprising a core with a pair of opposed surfaces, at least one cross strut placed through the core having two ends protruding from the surfaces, and at least one conduit attached to each end of the cross strut along the surface of the core such that the conduit conforms to its respective said surface of the core, and that the corresponding conduits in adjacent blocks are aligned to form a continuous conduit through the envelope;

a connecting line extending through the continuous conduit adjoining the building blocks; and

at least one tensioning device for locking tension in the connecting line extending through the continuous conduit.

5,596,854
POST-TENSIONING ANCHOR HEAD ASSEMBLY
John R. Crigler, Morgan Hill, Calif., assignor to VSL International AG, Lyssach, Switzerland
Filed Jan. 19, 1994, Ser. No. 183,526
Int. Cl.[6] E04C 5/12
U.S. Cl. 52—223.13 **24 Claims**

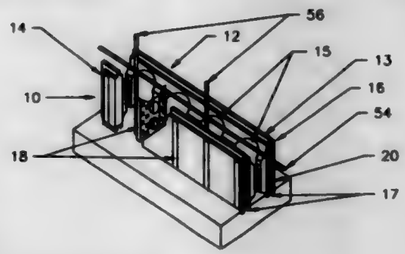


12. An anchor head assembly comprising:

a main body member having an exterior section with a plurality of cavities having the shape of a frustum of a cone and an interior section having a dome-shaped surface and an equal number of corresponding cavities wherein each cavity has the shape of a frustrum of a cone, corresponding ones of said cavities in said exterior and interior sections being located in communication with each other; and

means in each of said plurality of cavities in said exterior section for capturing a strand or tendon after said strand or tendon has been passed through a corresponding one of said cavities in said interior section.

5,596,855
INSITU INSULATED CONCRETE WALL STRUCTURE
Juan R. Batch, P.O. Box 3089, Odessa, Tex. 79766
Filed Nov. 14, 1994, Ser. No. 340,028
Int. Cl.[6] E04B 2/20
U.S. Cl. 52—309.11 **11 Claims**



1. A module comprising:

first and second foam panels each having inner and outer surfaces, said panels arranged in spaced parallel relation with their respective inner surfaces facing each other; and

at least one tension member extending between and anchored within said panels, the tension member made of sheet metal;

each said tension member having a polygonal shape, opposed faces, a top, a bottom, and opposed sides;

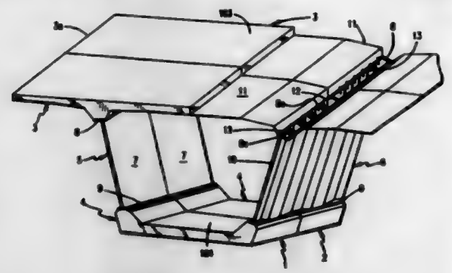
the sides each including a flange anchored within the panels and extending perpendicular to said opposed faces of said tension member, said flanges extending in a first plane parallel to each other and the inner surfaces of said panels, each of the flanges bent 180 degrees back onto itself and extending in a second direction opposite said first direction, each of the flanges terminating in a free end, the free end being a stiffener;

the stiffener extending parallel to said opposed faces of said tension member;

upper and lower bonding holes formed through said tension member and having a diameter substantially about ⅓ the distance measured between said flanges and arranged equidistant said flanges; and

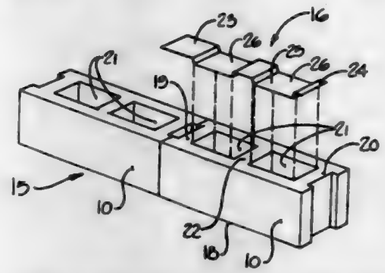
spaced tabs formed on said tension member and arranged in vertical rows on either side of said bonding holes and inwardly of said flanges, apertures formed by said tabs.

5,596,856
METAL GIRDER ELEMENT FOR CONSTRUCTING A HYBRID ELONGATE STRUCTURE HAVING A BOX-TYPE CROSS SECTION, METHOD FOR EMPLOYING THIS ELEMENT, AND ELONGATE STRUCTURE CONSTRUCTED BY IMPLEMENTING THIS METHOD
Jean-Daniel Lebon, St Germain en Laye, France, assignor to Campenon Bernard SGE, Rueil-Malmaison, France
Filed Aug. 3, 1994, Ser. No. 285,808
Claims priority, application France, Aug. 4, 1993, 93 09625
Int. Cl.[6] E04B 1/16
U.S. Cl. 52—334 **5 Claims**



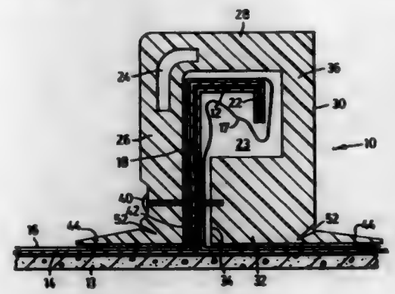
1. A hybrid elongate structure of box-type cross section including a concrete upper slab and a concrete lower slab connected to each other over their entire length by two continuous series of metal girders, each said series of girders and each slab forming a side of said box-type cross section with said two series of girders spaced apart horizontally from each other and said slabs spaced apart vertically from each other, each said girder of each said series of girders comprising a web and two spaced flanges on opposite edges of the web, each said flange having on its surface opposite the web projecting members embedded in the concrete of a respective one of said slabs, said webs of adjacent said girders in each said series being secured to each other, each said flange being shorter than its associated said web in a direction lengthwise of said flanges and having ends which are spaced from ends of said flanges of adjacent said girders.

5,596,857
MASONRY REINFORCEMENT
Charles F. Besche, 30 Severnadale Rd., Severna Park, Md. 21146
Filed Dec. 1, 1994, Ser. No. 347,899
Int. Cl.[6] E04B 2/48
U.S. Cl. 52—421 **18 Claims**



1. A masonry reinforcement device for reinforcing courses of hollow block in masonry construction, wherein said hollow block has a rectangular configuration, a top first end, a top second end and two exposed hollow cells formed by a lateral wall in the center of said hollow block, said masonry reinforcement device being made of a stiffened material consisting essentially of a first end, a second end and an elongated surface between said first end and said second end, the first end and second end of said masonry reinforcing device being shaped to fit on the top first end and top second end of said hollow masonry block, respectively, the elongated surface between said first end and said second end of the masonry reinforcing device defining two troughs to be positioned over said two exposed hollow cells and lateral wall, such that when the masonry reinforcement device is positioned over exposed hollow cells of hollow masonry block in a bottom course of hollow block, and a top course of hollow masonry block is set over the block in the bottom course of block and an adequate amount of mortar dropped into the exposed hollow cells of the top masonry block, the dropped mortar will land in said troughs to bind and adhere the interior hollow cell surfaces of both the bottom hollow block and the top hollow block and thereby form a secure bond between the blocks.

5,596,858
COVER FOR STANDING SEAM OF ROOF WHICH IS CLAD WITH PLASTIC MEMBRANE
Franklin F. Jordan, Oakville, Canada, assignor to Prospec Roofing Products Inc., Mississauga, Canada
Filed Nov. 24, 1995, Ser. No. 563,429
Int. Cl.[6] E04D 3/36
U.S. Cl. 52—460 **7 Claims**



1. A cover for a standing roof seam comprising an elongate extrusion of plastics material having:

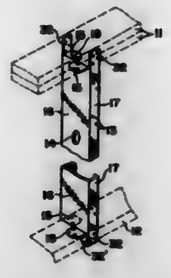
a first side web to form a first downwardly extending side leg of the cover;

a top web and a second side web forming respectively, a top of the cover and a second downwardly extending side leg parallel to the first downwardly extending side leg;

an elongate bending region being provided between the first side web and the top web along the length of the extrusion whereby the first side web is bendable with respect to the top and second side webs into and out of position as the first downwardly extending leg;

the cover including an inner recess to accommodate laterally projecting parts of the standing seam.

5,596,859
METAL WALL STUD
Jim W. Horton, 1307 River Hills Cir. East, Apt. #8, Jacksonville, Fla. 32211, and Harvel E. Crumley, 3395 Lighthouse Pointe Ln., Jacksonville, Fla. 32250
Filed Sep. 20, 1994, Ser. No. 308,989
Int. Cl.[6] E04C *3/32*
U.S. Cl. 52—733.3 **20 Claims**



1. A metal construction wall stud having an elongated channel beam having in transverse cross section a rectangular U-shape including a flat planar bottom wall, two parallel spaced planar side walls perpendicular to the bottom wall, a pair of short inwardly directed lips attached to each side wall and spaced from the bottom wall, the improvement comprising a pair of spaced tabs attached respectively to the side walls at each end thereof and extending beyond the end of the bottom wall and being hole-punched for the receipt of a fastening member therethrough, said spaced tabs being adapted to span respective side walls of each of a top and a sole plate of a wall, a pair of foldable tabs attached to the bottom wall at each end thereof and adapted to be bent perpendicular to the bottom wall and being hole-punched for the receipt of a fastening member therethrough for attachment to facing walls of a top and a sole plate.

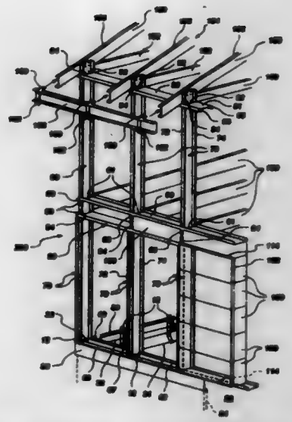
5,596,860
FOAMED CEMENT INSULATED METAL FRAME BUILDING SYSTEM
John H. Hacker, Cathedral City, Calif., assignor to Inno-Form Incorporated, Cathedral City, Calif., and Omega Transworld, Ltd., New Kensington, Pa.
Filed Sep. 9, 1994, Ser. No. 304,011
Int. Cl.[6] E04B *2/08*
U.S. Cl. 52—763 **22 Claims**

1. A building system for habitable structures, comprising:

a plurality of vertical, laterally spaced sheet metal studs, each having a flat, continuous base;

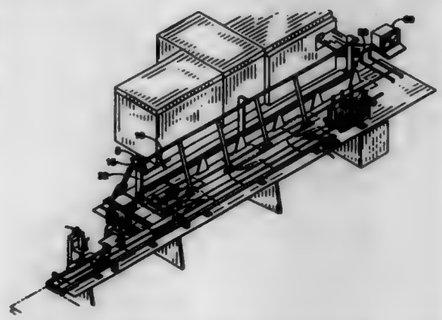
a horizontal sheet metal sole blocking track supporting and secured to the bottom of each stud with said bases of said studs extending transversely across said sole blocking track;

a horizontal sheet metal cap blocking track above said sole blocking track supported by and secured to each stud;



a plurality of substantially rectangular insulating blocks, each including two substantially parallel ends, said blocks being vertically stacked between at least two laterally adjacent studs, said block stack extending substantially from said sole blocking track to said cap blocking track, said insulating blocks each including a vertical, exterior groove in at least one end thereof engaging at least one of said at least two adjacent studs, said blocks being dimensioned to fit snugly between said at least two adjacent studs with said block ends substantially abutting said stud bases.

5,596,861
SYSTEM AND METHOD FOR ESTABLISHING AN ABSOLUTE REFERENCE POINT FOR AN ENVELOPE INSERTER CYCLE
Charles E. Preston, 9445 Central Ave., Orangevale, Calif. 95662, and Marc J. Fagan, 2786 Brentwood Pl., Davis, Calif. 95616
Filed Oct. 24, 1995, Ser. No. 547,240
Int. Cl.[6] B65B *57/00*
U.S. Cl. 53—52 **11 Claims**



1. For use on a cyclically operating apparatus having a rotating shaft and a reciprocating member linked to the rotating shaft, a system for establishing an absolute reference point for timing a cycle of the apparatus, comprising:

a) a shaft encoder that reports a rotational angle value for the rotating shaft;

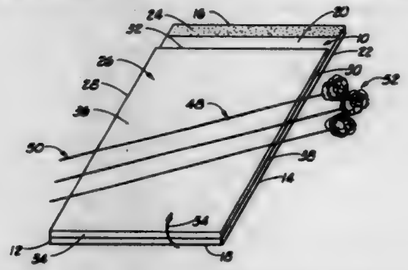
b) a detector mounted to sense passing of the reciprocating member for initiating a signal to a controller for establishing for the reciprocating member a first reference point as the reciprocating member moves in a first direction to a first limit and a second reference point as the reciprocating member moves in a second direction to a second limit, wherein if said reciprocating member is initially within said detector said first reference point is signaled by said detector when said reciprocating member is exiting said detector and said second reference point is signaled by said detector when said reciprocating member is entering said detector or if said reciprocating member is initially not within said detector said first reference point is signaled by said detector when said reciprocation member is entering said detector and said second reference point is signaled by said detector when said reciprocating member is exiting said detector and said first and said second reference points are each in terms of a rotational angle value reported from said shaft encoder;

c) said controller responsive to said detector and said shaft encoder for determining from said first and said second reference points a rotational angle value position for the absolute reference point, wherein said determination by said controller comprises:

establishing by means of said shaft encoder said rotational angle values for said first and said second reference points and

averaging a difference between said rotational angle values for said first and said second reference points and adding a resultant angle to whichever of said rotational angle values for said first and said second reference points is smaller to produce said rotational angle value for the absolute reference point.

5,596,862
METHOD AND APPARATUS FOR WRAPPING A FLORAL GROUPING WITH MULTIPLE SHEET WRAPPER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Oct. 13, 1992, Ser. No. 923,202
The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.
Int. Cl.[6] B65B *25/02;11/02;11/04*
U.S. Cl. 53—397 **11 Claims**



1. A method for wrapping a floral grouping, comprising:

providing a first sheet of material having a first side, a second side, a first end, a second end, an upper surface and a lower surface with a closure bonding material being disposed on the upper surface of the first sheet of material near the first side of the first sheet of material;

providing a second sheet of material having a first side, a second side, a first end and a second end wherein the second sheet of material is constructed of paper;

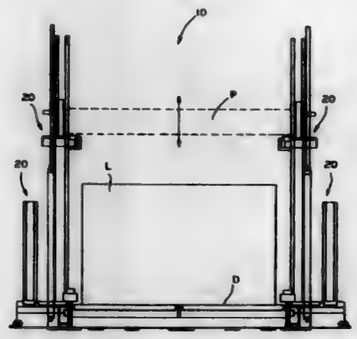
disposing the second sheet of material on the first sheet of material with the lower surface of the second sheet of material being disposed adjacent the upper surface of the first sheet of material and positioning the first and second sheets of material so that the first side of the first sheet of material extends a distance beyond the first side of the second sheet of material whereby the closure bonding material on the first sheet of material is exposed and not covered by the second sheet of material;

providing the floral grouping having a bloom end and a stem end;

disposing the floral grouping on at least one of the first and the second sheets of material; and

wrapping the first and the second sheets of material about the floral grouping and disposing the closure bonding material adjacent a portion of the second sheet of material or about a portion of the first sheet of material for cooperating to secure the first and the second sheets of material wrapped about the floral grouping to provide a wrapper.

5,596,863
METHOD AND APPARATUS FOR APPLYING EDGE PROTECTORS
Calvin E. Kasel, Wauconda, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed Jun. 12, 1995, Ser. No. 489,452
Int. Cl.[6] B65B *61/22*
U.S. Cl. 53—399 **16 Claims**



12. A method of protecting edges of a load from tensioned strapping applied to said load by a strapping applicator at a strapping station, comprising the steps of:

providing a deck for defining a strapping station;

moving a load onto said deck so as to be disposed at said strapping station;

raising said load above said deck of said strapping station;

positioning lower edge protectors adjacent to bottom surface edge portions of said load such that said lower edge protectors are interposed between said bottom surface edge portions of said load and said deck in such a manner that said lower edge protectors extend partially beyoad said bottom surface edge portions of said load;

lowering said load back down onto said deck so as to secure said lower edge protectors between said bottom surface edge portions of said load and said deck;

providing a vertically movable means within the vicinity of top surface edge portions of said load;

raising said vertically movable means to a first position at which said vertically movable means is spaced above said top surface edge portions of said load;

positioning upper edge protectors adjacent to said top surface edge portions of said load such that said upper edge protectors are interposed between said top surface edge portions of said load and said vertically movable means in such a manner that

said top surface edge protectors extend partially over said top surface edge portions of said load;

lowering said vertically movable means to a second position at which said vertically movable means is disposed adjacent to said top surface edge portions of said load so as to secure said upper edge protectors between said top surface edge portions of said load and said vertically movable means; and

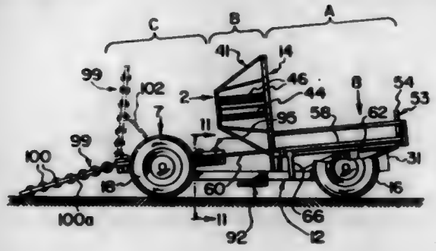
applying tensioned strapping around said load and said upper and lower edge protectors, respectively secured between said vertically movable means and said top surface edge portions of said load, and between said bottom surface edge portions of said load and said deck, such that said tensioned strapping respectively folds said extended portions of said upper and lower edge protectors over said top and bottom surface edge portions of said load so as to protect said top and bottom surface edge portions of said load from said tensioned strapping.

5,596,864

CYLINDRICAL BALE-WRAPPING MACHINE

Holdsworth Reeves, c/o H & C Garage, N. St. Eleanors Rd., R.R. #1, Miscouche, Prince Edward Island, Canada

Filed Sep. 18, 1995, Ser. No. 529,529
Int. Cl.[6] B65B *13/12*
U.S. Cl. 53—399 **32 Claims**



14. A method of wrapping a bale in a bale-wrapping apparatus which includes a forward end portion including front wheels and a loading zone, a rear end portion including rear wheels and a bale-wrapping station disposed intermediate said forward end portion and said rear end portion, a single rotatable bale-wrapping ring located at said bale-wrapping station, said bale-wrapping ring extending around a longitudinally-extending pass line for said bales, a bale wrap material dispenser and a tensioner for tensioning said bale wrap material as it is being unrolled from said dispenser, a mounting for said bale wrap material dispenser and tensioner, said mounting being carried by, and being rotatable with, said bale-wrapping ring, a ram feed device at said forward end portion of said apparatus means on said ram feed device to actuate an on/off switch, said ram feed device being actuatable to be reciprocally-moveable intermittently between a forward position and a rearward limit position in bale feeding strokes for urging unwrapped bales in succession longitudinally along said pass line, and through said bale-wrapping ring, a conveyor at said rear end portion for directing wrapped bales from said bale-wrapping ring, and cooperative means for moving the apparatus forwardly, said method comprising:

(i) detecting an unwrapped bale at said loading zone and as a consequence actuating said ram feed device in a bale feeding stroke to urge said unwrapped bale longitudinally and rearwardly along said pass line towards said bale-wrapping station;

(ii) actuating an said "on/off" switch to the "on" position when said ram food device in its bale feeding strokes and said actuating means thereon pass a first region, thereby causing rotation of said bale-wrapping ring to cause bale wrap material to be wrapped around a bale at said bale-wrapping station;

(iii) automatically initiating a ram return stroke to return said ram feed device forwardly to its forward position when said ram feed device abuts a stop detecting means at its rearward limit position; and

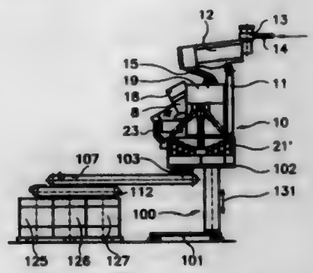
(iv) actuating said "on/off" switch to the "off" position when said ram feed device and said actuating means thereon pass said first region in its ram return stroke to stop rotation of said bale-wrapping ring.

5,596,865

METHOD FOR THE REMOVAL AND THE FURTHER PROCESSING OF TABLETS OR PILLS OR THE LIKE DERIVED FROM A TABLET PRESS AND A DEVICE FOR PERFORMING THE METHOD

Norbert Krämer, Röntgenstrasse 68, D-64291 Darmstadt, Germany

PCT No. PCT/DE92/00468, § 371 Date Feb. 7, 1994, § 102(e) Date Feb. 7, 1994, PCT Pub. No. WO92/22278, PCT Pub. Date Dec. 23, 1992
PCT Filed Jun. 9, 1992, Ser. No. 157,191
Claims priority, application Germany, Jun. 9, 1991, 41 18 878.8; Jun. 9, 1991, 9107053 U
Int. Cl.[6] B65B *63/00*
U.S. Cl. 53—428 **28 Claims**



1. Method for removal and further processing of tablets or pills derived from a tablet press or pill press into a plurality of closely spaced containers standing on a restricted area, comprising the steps of

discharging the tablets or pills from a tablet press or pill press, whereby the tablets or pills form a tablet stream or pill stream;

transporting the tablet stream or pill stream upwardly;

passing the tablet stream or pill stream, driven by gravity alone without adding additional energy, from an upper position to a lower position through a deburring and dust-removing station (12);

passing the tablet stream or pill stream driven by gravity alone through a distributing guide (15) for subdividing the tablet stream or pill stream into two partial streams;

feeding the partial streams driven by gravity alone to a metal testing apparatus (18) and to a tablet or pill testing device (19);

placing the tablets or pills, found to be good and acceptable in the metal testing apparatus (18), based on gravity onto a transport belt conveyor (107, 112);

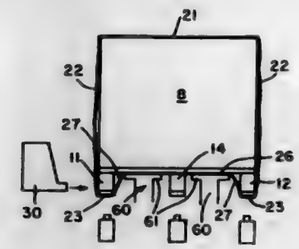
directing the transport belt conveyor (107, 112) to a predetermined container (125, 126, 127) being one of the plurality of containers; and filling the tablets or pills from the transport belt conveyor (107, 112) into the predetermined container (125, 126, 127).

5,596,866

METHOD AND DEVICE FOR THE EXTERIOR PACKAGING, BY HEAT-SHRINKING, OF A PALLETIZED LOAD

Jean-Paul Martin-Cocher, La Motte Servolex, and Georges Jacucelli, Brison St-Innocent, both of France, assignors to Newtec International, Viroflay, France

Filed Aug. 14, 1995, Ser. No. 514,880
Claims priority, application France, Aug. 12, 1994, 94 09992
Int. Cl.[6] B65B *53/02*
U.S. Cl. 53—442 **28 Claims**



1. A method for the exterior packaging of a palletized load, supported upon a pallet comprising a platform and at least two longitudinal supports having two longitudinally extending sides disposed adjacent to two longitudinally extending sides of a lower surface of said pallet platform and two ends disposed adjacent to two transversely extending sides of said lower surface of said pallet platform so as to define therebetween, along said transversely extending sides of said pallet platform, at least one space for accommodating a pallet handling device, comprising the steps of:

covering said palletized load with a film made of heat-shrinkable material such that dependent lower end portions of said film extend below said longitudinal supports along both of said longitudinally extending sides of said pallet platform and along both of said transversely extending sides of said pallet platform;

heat shrinking portions of said film disposed along said longitudinally extending sides of said pallet platform such that said heat-shrunk portions of said film are disposed beneath said longitudinally extending sides of said longitudinal supports; and

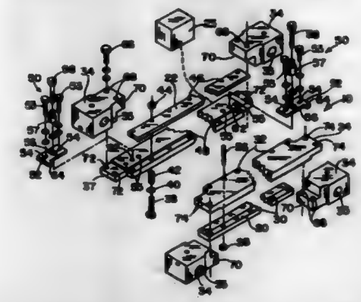
conforming portions of said film disposed along said transversely extending sides of said pallet platform to said transversely extending sides of said lower surface of said pallet platform by raising said dependent lower end portions of said film disposed along both of said transversely extending sides of said pallet platform across the entire width of said at least one space defined along both of said transversely extending sides of said pallet platform and between said at least two longitudinal supports disposed adjacent to said two longitudinally extending sides of said pallet platform such that said raised dependent lower end portions of said film are disposed at a level which is substantially coincident with said lower surface of said pallet platform so as to provide free entry, into said at least one space defined along each one of said transversely extending sides of said pallet platform, of a pallet handling device from a position external of said palletized load without any interference with said heat-shrinkable film disposed along said transversely extending sides of said pallet platform.

5,596,867

CUTOFF ASSEMBLY FOR A FORM FILL AND SEAL PACKAGING MACHINE

Steven D. Davis, Yucaipa, Calif., assignor to Winpak Lane, Inc., San Bernardino, Calif.

Filed Oct. 25, 1995, Ser. No. 547,769
Int. Cl.[6] B65B *9/20;61/06*
U.S. Cl. 53—554 **16 Claims**



1. A cutoff assembly means adapted to be used in a packaging machine, to simultaneously cut off a plurality of collapsible dispenser pouches in a number of streams of pouches formed from thin films of sheet material traveling downwardly, in a vertical direction, from a top to a bottom of said packaging machine, and holding viscous food product formed, filled and sealed in said packaging machine, comprising, in combination:

a side seal means and a head seal means in said packaging machine;

a plurality of cutoff blades secured in said packaging machine, in a downstream direction, after said head seal means;

said plurality of cutoff blades including a fixed blade means and a movable blade means;

said fixed blade means being immovably secured in said packaging machine;

operating means for said movable blade means for slidable movement in said packaging machine, into and out of contact with said fixed blade means;

said fixed blade means and said movable blade means secured to holding means held in said packaging machine; and

said movable blade means includes a plurality of adjustable means securing said movable blade means to a first holding means, whereby said entire movable blade means is floatable with respect to said first holding means.

5,596,868

SWATH TURNER

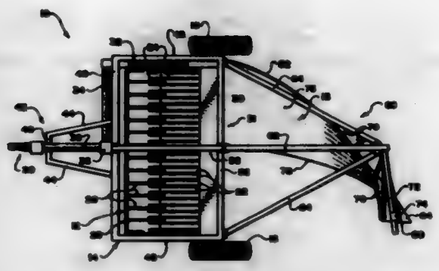
Harold F. Gerbrandt, Box 115, Waldeck, Saskatchewan, Canada

Filed Jun. 20, 1995, Ser. No. 492,874
Claims priority, application Canada, Jun. 20, 1994, 2126277
Int. Cl.[6] A01D *84/00*
U.S. Cl. 56—365 **3 Claims**

1. A swath turner for inverting a swath of cut crop as the turner advances in a direction of travel along the swath, said swath turner comprising:

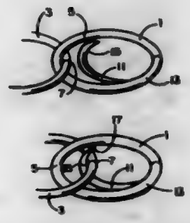
pickup means having a front pickup end and a rear delivery end with two sides spaced apart transversely of the direction of travel;

a mold board extending rearwardly from one of the sides of the delivery end of the pickup means and across the direction of travel towards the other side, the mold board having a concavely-curved leading face with a bottom edge that is substantially horizontal and that extends in a concave curve from a position spaced inwardly from and below said one of the sides of the delivery end of the pickup means to an upright trailing edge at a trailing end of the mold board, and a top



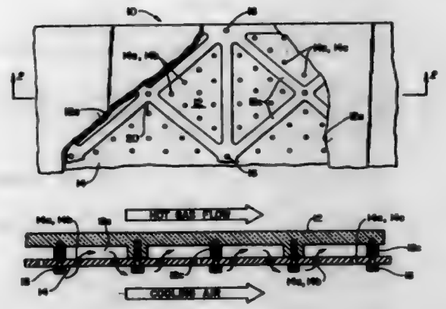
edge that extends in a concave curve from a position above said one of the sides of the delivery end of the pickup means to the upright trailing edge of the mold board.

5,596,869
CHAIN NECKLACES
Beat Meszerer, Munsterhoff 14, 8001 Zurich, Switzerland
Filed Oct. 14, 1994, Ser. No. 323,486
Claims priority, application Switzerland, Oct. 15, 1993, 3117/93
Int. Cl.[6] F16G *15/00*
U.S. Cl. 59—82 8 Claims



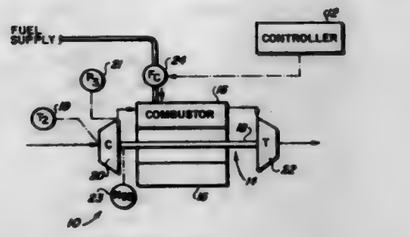
1. A chain having a length and comprising a plurality of chain links, each of said chain links having an outer periphery surrounding an interior and being linked to an adjacent chain link, so that said adjacent chain links can not be detached from one another, and a retaining segment projecting from one point on the outer periphery of at least a first of said plurality of chain links inwardly of said outer periphery and into the interior thereof towards a second point on the outer periphery of said first chain link such that a passage is established between said retaining segment and said second point, said passage permitting a second of said plurality of chain links that is adjacent and linked to said first chain link to be moved through said passage and past said retaining segment so as to be engaged by and coupled to said retaining segment at the interior of said first chain link to shorten the length of said chain between said first and second chain links.

5,596,870
GAS TURBINE EXHAUST LINER WITH MILLED AIR CHAMBERS
Gary J. Dillard, Stuart, and Timothy J. McAlice, Jupiter, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Sep. 9, 1994, Ser. No. 303,915
Int. Cl.[6] F23R *3/42*
U.S. Cl. 60—39.82 5 Claims



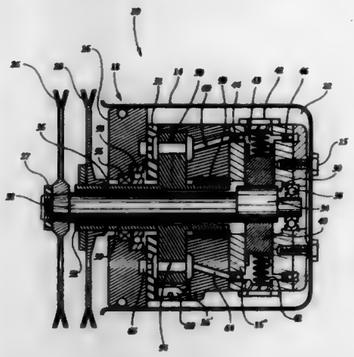
1. An exhaust liner for a gas turbine engine, characterized by:
an impingement sheet comprising a plurality of air holes:
a liner comprising a unitary sheet having milled, homogeneously joining ribs that form connected walls defining air chambers for receiving air from said air holes; and
fasteners at nodes on the liner, said fasteners extending through the impingement sheet into to the liner, said nodes being at the intersections of said ribs, said ribs intersecting at equal angles and being the same length.

5,596,871
DECELERATION FUEL CONTROL SYSTEM FOR A TURBINE ENGINE
James E. Leuerts, Scottsdale, Ariz., assignor to AlliedSignal Inc., Morris Township, N.J.
Filed May 31, 1995, Ser. No. 455,802
Int. Cl.[6] F02C *9/28*
U.S. Cl. 60—39.83 17 Claims



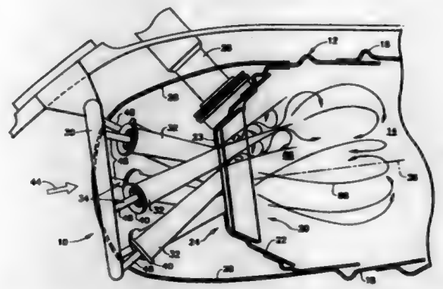
1. A fuel control system for regulating fuel flow to a turbine engine having a turbocompressor rotating group with a compressor stage and a turbine stage, a combustor, and fuel supply means for supplying fuel to the combustor, said fuel control system comprising:
sensor means for monitoring engine parameters indicative of combustor air flow and engine rotational speed and for generating sensor signals representative thereof; and
a controller responsive to said sensor signals and a known choke flow constant for the compressor stage to derive combustor air flow, and for responding to the derived combustor air flow for regulating said fuel supply means to maintain an actual fuel flow to the combustor in relation to combustor air flow sufficient to sustain combustion during an engine deceleration condition.

5,596,872
HYDRO-MECHANICAL POWER TRANSMISSION
William H. Payne, 111 Pratt St., Madison, N.C. 27025
Filed Oct. 17, 1994, Ser. No. 323,629
Int. Cl.[6] F16D *31/02;39/00*
U.S. Cl. 60—468 20 Claims



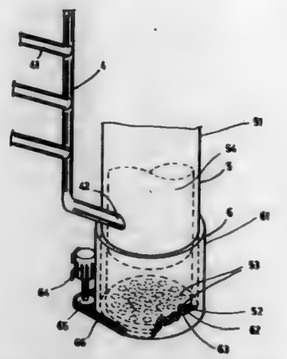
1. A hydro-mechanical power transmission for receiving a variable speed rotary input and transmitting a relatively substantially constant speed rotary output, said transmission comprising:
a fixed housing;
first rotor means rotatably mounted to said housing for being rotatably driven by the input in direct variable speed relation therewith;
pump means mounted within said housing and driven by said first rotor means;
hydraulic motor means mounted within said housing;
second rotor means rotatably mounted to said housing and being rotatably driven by said hydraulic motor means for presenting the constant speed rotary output for power takeoff thereof;
conduit means formed in said housing and extending between said pump means and said hydraulic motor means for fluid communication therebetween;
working fluid means flowably disposed in said conduit means for driving said hydraulic motor means responsive to operation of said pump means; and
means for controlling flow of said working fluid means to maintain said hydraulic motor means at a substantially constant rotary speed as the rotary speed of said pump means is varied by the variable speed input, said substantially constant speed of said hydraulic motor means maintaining a substantially constant speed rotary output at said second rotor means.

5,596,873
GAS TURBINE COMBUSTOR WITH A PLURALITY OF CIRCUMFERENTIALLY SPACED PRE-MIXERS
Narendra D. Joshi, and John M. Koshoffer, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Sep. 14, 1994, Ser. No. 305,629
Int. Cl.[6] F02C *7/08*
U.S. Cl. 60—738 21 Claims



1. An annular combustor for a gas turbine engine having a centerline axis, comprising:
(a) an annular, radially inner liner having an upstream end and a downstream end;
(b) an annular, radially outer liner having an upstream end and a downstream end, said outer liner being spaced outwardly of said inner liner;
(c) an annular dome joined to said upstream ends of said inner and outer liners, wherein a combustion chamber is defined between said inner liner, said outer liner, and said dome;
(d) a plurality of circumferentially spaced mixers for premixing fuel and air so that an air/fuel mixture is provided to said combustion chamber, each of said mixers having a centerline axis substantially parallel to said combustor centerline axis and further comprising a plurality of mixing tubes, wherein each mixing tube has an upstream end, a downstream end, and a longitudinal axis therebetween, said mixing tubes of each mixer being oriented so that said longitudinal axes converge and are skewed with respect to said respective mixer centerline axis; and
(e) means for injecting fuel into said upstream ends of said mixing tubes for each said mixer.

5,596,874
APPARATUS FOR MAKING CARBON-DIOXIDE SNOW BAR
Te-San Liu, C/O Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan
Filed May 10, 1996, Ser. No. 644,193
Int. Cl.[6] F25C *1/00;* B29C *43/00*
U.S. Cl. 62—1 10 Claims



1. An apparatus for making carbon-dioxide snow bar comprising:
means for providing a liquefied carbon dioxide;
means for providing at least an edible filler;
an extruding means for receiving a raw material mixed by said carbon dioxide and said edible filler as delivered through a feeding means and controlled by a control means, said extruding means operatively extruding at least a streamflow containing said carbon dioxide and said filler;
a forming means disposed around said extruding means for forming and shaping the streamflow from said extruding means for producing a snow bar as discharged from said forming means;
a packaging means for packing said snow bar after being cut into a small piece of the snow bar; and

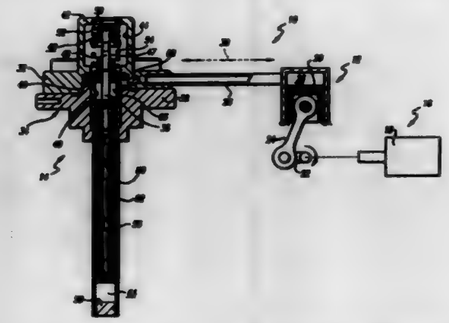
a freezing storage means for storing the snow bar.

5,596,875

SPLIT STIRLING CYCLE CRYOGENIC COOLER WITH SPRING-ASSISTED EXPANDER

Robert L. Berry, Ashville, N.C., and Gerald R. Pruitt, San Pedro, Calif., assignors to Hughes Aircraft Co, Los Angeles, Calif.

Filed Aug. 10, 1995, Ser. No. 513,647
Int. Cl.[6] F25B 9/00
U.S. Cl. 62—6 **9 Claims**



1. A split Stirling cycle cryogenic cooler having portions thereof which operate substantially at resonant frequency to achieve improved cooling performance and quiet operation both during and after cool down from ambient temperatures to cryogenic temperatures, said cryogenic cooler comprising:

a compressor portion cyclically receiving and discharging a flow of pressurized gas via a flow path at a characteristic cyclic rate;

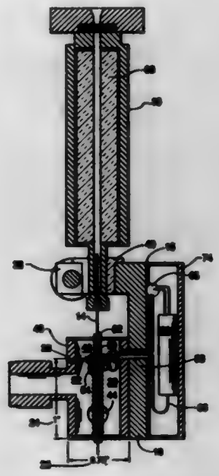
an expander portion having a housing defining a part of said flow path to communicate said cyclic flow of pressurized gas to a working chamber therewithin; a drive piston member reciprocal in said housing and being exposed to both said working chamber to be reciprocally driven by said cyclical flow of pressurized gas, and to gas pressure in a substantially closed pneumatic spring chamber cooperatively defined by said drive piston member and said housing; pressurized gas in said pneumatic spring chamber applying a first pneumatic spring force to said drive piston member; said housing including an elongate tubular extension portion having an end wall and defining a blind bore communicating with said working chamber; an elongate gas displacer member reciprocal in said blind bore and drivingly coupled to said drive piston member for reciprocation in unison therewith; said gas displacer member cooperating with said tubular extension portion to define a cold chamber adjacent to said end wall, and said gas displacer member also including an elongate gas-permeable regenerator matrix of heat-transfer and heat-absorption material providing gas flow communication between said working chamber and said cold chamber through said gas displacer member; a resilient mechanical spring member disposed within said pneumatic spring chamber in isolation from said cyclic gas flow of pressurized gas, said mechanical spring member applying a second spring force to said drive piston member both to center said drive piston member and said gas displacer member relative to said housing, and to add said second spring force to the pneumatic first spring force effective on said drive piston member; said pneumatic first spring force and said mechanical second spring force together providing substantially harmonic reciprocation of said piston member and said gas displacer member at said characteristic cyclic rate and at a substantially 90 degree phase angle with respect to said compressor portion.

5,596,876

MINIATURIZED CRYOGENIC TRAP APPARATUS

John J. Manura, Pennington, N.J.; Christopher W. Baker, Doylestown, Pa., and John N. Manos, Mercerville, N.J., assignors to Scientific Instrument Services, Inc., Ringoes, N.J.

Filed Nov. 28, 1995, Ser. No. 566,577
Int. Cl.[6] B01D 8/00; 15/08
U.S. Cl. 62—55.5 **20 Claims**



1. A miniaturized cryogenic trap apparatus for selective cooling and heating of a capillary column for analyzing of volatile components passing therethrough, said miniaturized cryogenic trap apparatus including;

A. a main housing means defining a main chamber means therein for selectively cooling and heating therewithin;

B. a capillary guide tube means extending into said main housing means through said main chamber means, said capillary guide tube means defining a feedthrough bore means extending longitudinally therethrough adapted to receive the capillary column extending therethrough for selective heating and cooling of volatile components passing therethrough responsive to selective cooling and heating of said main chamber means, said feedthrough bore means extending through said main chamber means along a distance of not greater than one inch in length for miniaturization of said main chamber means;

C. a cooling fluid inlet means in fluid flow communication with respect to said main chamber means for selectively supplying cooling fluid thereinto for cooling of said feedthrough bore means extending therethrough and for cooling of volatile components passing through the capillary column positioned extending therethrough;

D. a cooling fluid outlet means in fluid flow communication with respect to said main chamber means for selectively exhausting cooling fluid therefrom in order to allow subsequent heating of said feedthrough bore means extending therethrough and for allowing heating of volatile components passing through the capillary column positioned extending therethrough; and

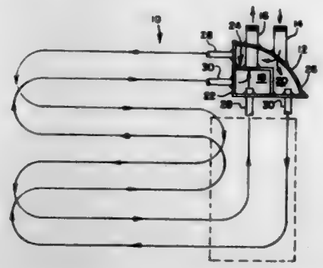
E. a heating means at least partially positioned within said main chamber means extending about said feedthrough bore means to facilitate heating of the capillary column and of volatile components passing therethrough.

5,596,877

HEADER AND COIL ARRANGEMENT FOR COOLING APPARATUS

Frank T. Morrison, Arnold, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Aug. 16, 1995, Ser. No. 515,596
Int. Cl.[6] F25D 17/02
U.S. Cl. 62—59 **15 Claims**



1. A method of operating a thermal storage apparatus wherein liquid is frozen and stored during a storage cycle, comprising the steps of passing cold refrigerant liquid through one or more tubular passageways immersed in a pool of storage liquid confined within a vessel thereby creating an envelope of frozen storage liquid around the tubular passageways,

wherein said cold refrigerant is provided to said tubular passageways and withdrawn from said tubular passageways through a header assembly comprising an elongated structure having an inner chamber and an outer chamber,

said inner chamber operatively connected to one end of each of said tubular passageways and to a first external flow nozzle, said outer chamber operatively connected to the other end of each of said tubular passageways and to a second external flow nozzle,

such that said cold refrigerant enters through one of said external flow nozzles into one of said inner or outer chambers, and flows through each of said tubular passageways into the other of said inner or outer chambers and then through the other of said external flow nozzles,

wherein said cold refrigerant enters said outer chamber through said second external flow nozzle, flows through each of said tubular passageways into said inner chamber and exits through said first external flow nozzle.

5,596,878

METHODS AND APPARATUS FOR OPERATING A REFRIGERATION UNIT

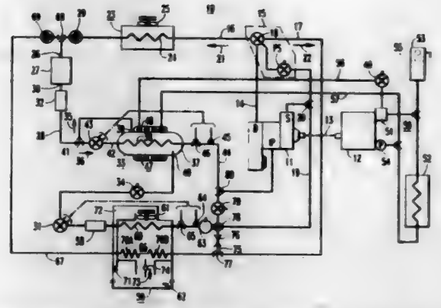
Jay L. Hanson, Bloomington; James E. Nixon, Woodbury; Stanley O. Holum, Eagan, and Peter W. Freund, Bloomington, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Jun. 26, 1995, Ser. No. 494,453
Int. Cl.[6] F25B 13/00
U.S. Cl. 62—160 **18 Claims**

1. A method of operating a refrigeration unit having a compressor driven by a liquid cooled prime mover, and an economizer cycle which enhances cooling and heating cycles initiated to control the temperature of a conditioned space to a predetermined set point temperature, with the enhancing of the heating cycle including adding heat to the economizer cycle from liquid used to cool the prime mover, comprising the steps of:

sensing the temperature of the liquid which cools the prime mover,

initiating a heating cycle when required, when the sensing step detects the temperature of the liquid is above a predetermined value,



and initiating a special refrigeration cycle when a heating cycle is required, prior to the step of initiating the heating cycle, when the sensing step detects the temperature is not above the predetermined value,

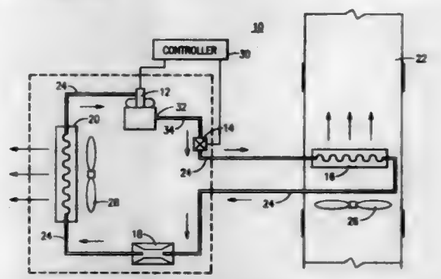
said step of initiating the special cycle including the step of increasing the load on the prime mover, at least until the sensing step desects that the temperature of the liquid is above the predetermined value.

5,596,879

METHOD FOR DETERMINING OPTIMUM PLACEMENT OF REFRIGERANT LINE MUFFLER

Larry J. Burkhart, Indianapolis; Floyd B. Gast, Jr., E. Brownsburg; Kenneth W. Shearer, and Mark D. Singer, both of Indianapolis, all of Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 4, 1994, Ser. No. 317,862
Int. Cl.[6] F04B 39/00; F25D 19/00
U.S. Cl. 62—296 **9 Claims**



1. A method for determining the optimum location for installing a muffler in a refrigerant line to reduce refrigerant line vibration caused by acoustical resonances, the refrigerant line forming the tubing system in a heating or cooling system including a compressor, said method comprising the steps of:

measuring the frequency (f) of pulsations of compressor discharge gas occurring during operation of the compressor;

ascertaining the speed of sound (C) in the compressor discharge gas;

calculating the wavelength (λ) of the compressor discharge gas pulsation frequency (f) according to the formula:

$$\lambda = C/f$$

calculating a critical length (cl) according to the formula:

$cl = n(\lambda/2)$ where n is a positive integer;

providing a refrigerant discharge line with a length of $n(\lambda/2)$ between the compressor discharge and a first termination point downstream of the compressor discharge, said providing

step thereby allowing the formation of at least one standing wave in the discharge line, said refrigerant discharge line being a segment within the tubing system; and

installing a refrigerant line muffler in the refrigerant discharge line at a distance $n(\lambda/4)$ from the compressor discharge to thereby substantially eliminate acoustical resonances downstream from the muffler.

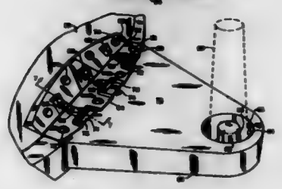
5,596,880

CHILLED BEVERAGE DISPLAY CONTAINER

Brian H. Walker, Winston-Salem; Mark T. Beeler, Pfafftown, and David M. Rogers, Winston-Salem, all of N.C., assignors to Decision Point Marketing, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 195,568, Feb. 14, 1994, Pat. No. 5,433,085. This application Jul. 10, 1995, Ser. No. 500,435
Int. Cl.[6] F25D *3/08*; G09F *15/00*
U.S. Cl. 62—372 22 Claims





1. A beverage container adapted to hold ice and beverages separate from water formed from melted ice comprising

(a) a receptacle having an interior cavity for holding ice and beverages;

(b) a float having a density less than water adapted to support said ice and beverages and move upwardly within said cavity as said ice melts;

(c) a cover mounted on said receptacle by a hinge, and

(d) a tubesign base removably attached to said hinge.

5,596,881

PICK-UP TUBE ATTACHMENT TECHNIQUE

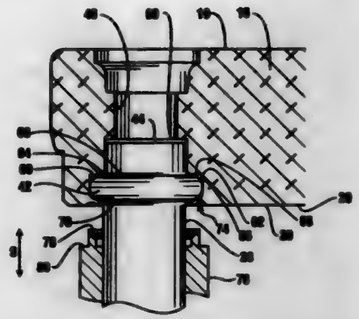
Tom C. Wilson, Bonneville, and Howard Sims, Rienzi, both of Miss., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 22, 1995, Ser. No. 392,462
Int. Cl.[6] F25B *43/00*; B21D *39/00*; B23P *11/00*
U.S. Cl. 62—503 22 Claims

11. A method for attaching a pick-up tube to an end cap of a refrigerant apparatus without using an elastomeric seal, comprising the steps of:

forming a bore axially through the end cap, said bore including a counterbore extending axially inward from one surface of the end cap with a radius larger than the bore and defining a transverse shoulder with a sharp edge,

forming a bead around the circumference of the tube toward one end of the tube,



inserting the pick-up tube with the formed bead axially into the bore from the one surface such that the bead of the pick-up tube engages the shoulder formed by the counterbore, and subsequently,

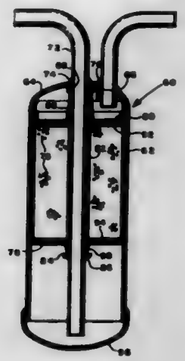
mechanically staking the surface of the end cap around the bore in such a manner that the end cap material engages the bead to secure the pick-up tube to the end cap in a fluid tight manner without using an elastomeric seal.

5,596,882

RECEIVER FOR REFRIGERANT AND METHOD OF MAKING SAME

Wayne K. Hutchison, Ingersoll; William N. Eybergen, Dutton; Ken R. Blackman, St. Thomas, and Victor A. Phillips, London, all of Canada, assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 13, 1995, Ser. No. 402,595
Int. Cl.[6] F25B *43/00*
U.S. Cl. 62—503 22 Claims



12. A method of making a refrigerant receiver assembly comprising:

(a) forming a tubular canister having an integral closed end and forming an inlet and outlet port therein;

(b) sealing an inlet tube in said inlet port and sealing an outlet standpipe in said outlet port;

(c) forming a cup with a center tube integrally formed with the bottom of the cup and filling said cup with desiccant and covering said cup with a perforated closure washer and forming a sub-assembly;

(d) inserting said sub-assembly in the open end of said canister and sliding said center tube over said standpipe and sealing said center tube on said standpipe; and,

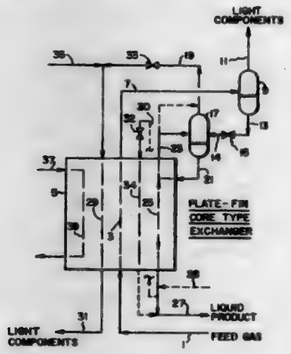
(e) forming a closure and sealing same over the open end of said canister.

5,596,883

LIGHT COMPONENT STRIPPING IN PLATE-FIN HEAT EXCHANGERS

Dennis P. Bernhard, Allentown; Howard C. Rowles, Center Valley, both of Pa.; Ramanathan R. Tarakad, Sugar Land, Tex., and John D. Bennett, Surbiton, Great Britain, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 3, 1995, Ser. No. 538,540
Int. Cl.[6] F25J *3/00*
U.S. Cl. 62—618 19 Claims



1. A process for the separation of a liquid feed mixture comprising one or more heavier, higher-boiling components and one or more lighter, lower-boiling components which comprises:

(a) introducing the liquid feed mixture into a first group of vertical flow passageways having an upper end and a lower end wherein said passageways are disposed in indirect heat exchange with one or more additional groups of passageways in a heat exchange-mass transfer zone;

(b) passing said liquid feed mixture into said upper end and downwardly through said first group of vertical flow passageways, and warming the liquid during downward flow by indirect heat exchange with a condensing process fluid flowing upwardly in one of said additional groups of flow passageways, wherein said liquid is partially vaporized to form vapor which flows upwardly in said first group of vertical flow passageways to provide a stripping medium in countercurrent flow to the downwardly flowing liquid and promotes vaporization of lighter components from the liquid, thereby enriching the upwardly flowing vapor in said lighter components and enriching the downwardly flowing liquid in said heavier components;

(c) withdrawing a vapor stream enriched in said lighter components from the upper end of said first group of passageways; and

(d) withdrawing a liquid product enriched in said heavier components from the lower end of said first group of passageways.

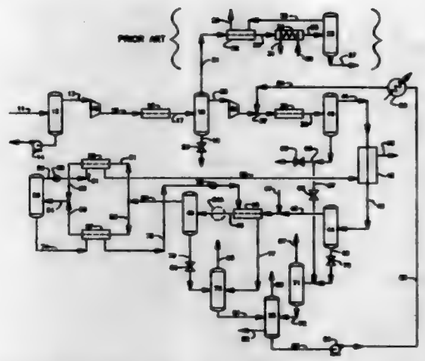
5,596,884

CRYOGENIC TREATMENT OF LANDFILL GAS TO REMOVE TROUBLESOME COMPOUNDS

Stephen J. Markbreiter, Edison, N.J., and Irving Weiss, Merrick, N.Y., assignors to Kryos Energy Inc., New York, N.Y.

Filed Dec. 26, 1995, Ser. No. 578,856
Int. Cl.[6] F25J *3/00*
U.S. Cl. 62—633 12 Claims

1. A cryogenic process for removing moisture and troublesome compounds from landfill gas by chilling said gas to a temperature below −20° F., which comprises compressing said gas to an elevated pressure, cooling the compressed gas to form a first water condensate, separating said first condensate from said compressed gas, further cooling said compressed gas to form a second water condensate, separating said second condensate from said compressed gas, injecting methanol into said compressed gas, chilling said compressed gas containing said methanol to a temperature below −20° F. to form a methanol-rich condensate containing said troublesome compounds, separating said methanol-rich condensate from said chilled compressed gas, isenthalpically expanding said chilled compressed gas, and using the thus further chilled expanded gas to effect the aforesaid chilling of said compressed gas containing said methanol and then to effect the aforesaid further cooling of said compressed gas.

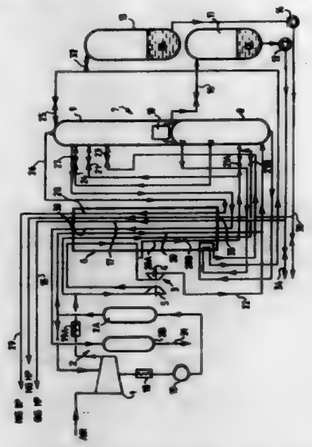


5,596,885

PROCESS AND INSTALLATION FOR THE PRODUCTION OF GASEOUS OXYGEN UNDER PRESSURE

Maurice Grenier, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris Cedex, France

Filed Apr. 10, 1995, Ser. No. 419,555
Claims priority, application France, Jun. 20, 1994, 94 07531
Int. Cl.[6] F25J *3/02*
U.S. Cl. 62—646 12 Claims



1. In a process for the production of gaseous oxygen under pressure, of the type in which: air is distilled in an installation with a double distillation column (7; 44) which comprises a medium pressure column (8; 45) operating under a medium pressure, a low pressure column (9; 46) operating under a low pressure, and a heat exchange line (6; 47) to place the air to be distilled in heat exchange relation with products withdrawn from the double col-

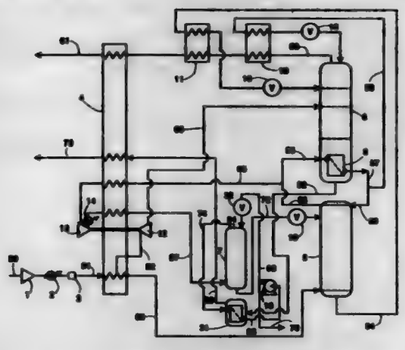
umn; liquid oxygen is withdrawn from the low pressure column; the withdrawn liquid oxygen is brought to an oxygen vaporization pressure of at least about 13 bars, and it is vaporized and reheated under said vaporization pressure, by heat exchange with the air to be distilled in the course of cooling; the improvement comprising compressing a first fraction of the air to be distilled to a first pressure adjacent the medium pressure, cooling the compressed first fraction of air to the vicinity of its dew point in the heat exchange line (6; 47), and sending the cooled compressed first fraction of air to the double column (7; 44); compressing a second fraction of the air to be distilled to a high air pressure at least equal to about 25 bars but lower than the condensation pressure of the air by heat exchange with the oxygen in the course of vaporization under said oxygen vaporization pressure, cooling and partially liquefying the compressed second fraction of air, then expanding and introducing the compressed second fraction of air into the double column; withdrawing a portion of air under the high pressure from the heat exchange line (6; 47) at an intermediate cooling temperature, expanding the latter air to the medium pressure in a first expansion turbine (4; 51), then sending the latter expanded air to the double column (7; 44); and withdrawing at least one liquid product (in 33, 34; 72, 72A) from the installation.

5,596,886

CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING GASEOUS OXYGEN AND HIGH PURITY NITROGEN

Henry E. Howard, Grand Island, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Apr. 5, 1996, Ser. No. 628,372
Int. Cl.[6] F25J 3/04
U.S. Cl. 62—646 **6 Claims**



1. A cryogenic rectification method for the production of gaseous oxygen and high purity nitrogen comprising:

(A) passing feed air into a higher pressure column and separating the feed air within the higher pressure column by cryogenic rectification into oxygen-enriched liquid and into nitrogen-enriched fluid;

(B) passing oxygen-enriched liquid and a first portion of the nitrogen-enriched fluid into a lower pressure column and producing oxygen-richer liquid within the lower pressure column;

(C) passing a second portion of the nitrogen-enriched fluid from the higher pressure column into an auxiliary column comprising a condenser and producing nitrogen-richer vapor within the auxiliary column;

(D) passing oxygen-richer liquid from the lower pressure column into the condenser of the auxiliary column and therein vaporizing the oxygen-richer liquid by indirect heat exchange with nitrogen-richer vapor to produce gaseous oxygen and high purity nitrogen; and

(E) recovering gaseous oxygen and high purity nitrogen from the auxiliary column.

5,596,887

RING REMOUNT WRAP ASSEMBLY

Norberto Bergagnini, Garden City, N.Y., assignor to Sandberg & Sikorski Diamond Corp., New York, N.Y.

Filed Mar. 6, 1996, Ser. No. 611,688
Int. Cl.[6] A44C 9/00
U.S. Cl. 63—15.1 **13 Claims**



1. A wrap assembly for a ring having a band with first and second opposite facing sides and at least one jewelry stone display protruding therefrom, also having first and second opposite sides in substantial alignment with said first and second sides of said ring band, comprising:

a first wrap member comprising an annular band for substantially receiving said ring band, such that said first side of said ring band faces and substantially abuts said annular band of said first wrap member, and a substantially curved deformation in said annular band extending in a substantially axial direction therefrom and cooperating with said annular band for substantially receiving said at least one jewelry stone display such that said second side of said at least one jewelry stone display faces and substantially abuts said first wrap member curved deformation;

a second wrap member comprising an annular band for substantially receiving said ring band such that said second side of said ring band faces and substantially abuts said annular band of said second wrap member, and a substantially curved deformation in said annular band extending in a substantially axial direction therefrom and cooperating with said annular band for substantially receiving said at least one jewelry stone display, such that said first side of said at least one jewelry stone display faces and substantially abuts said second wrap member curved deformation;

wherein said wrap members cooperatively interlock such that said ring band is substantially hidden and said at least one jewelry stone display is disposed between and protrudes from said wrap members;

wherein said axial direction of said deformation of said second wrap member is opposite said axial direction of said deformation of said first wrap member;

wherein said deformations cooperate to define an opening therebetween through which said at least one jewelry stone display protrudes.

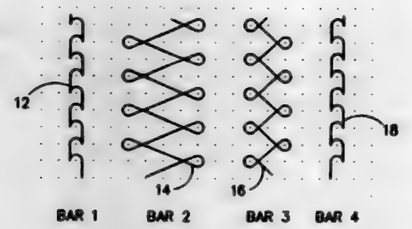
5,596,888

KNITTED FURNITURE SUPPORT FABRIC

George C. McLarty, III, Greenville; Anthony R. Waldrop, Easley, and Paul S. Leadholdt, Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 23, 1995, Ser. No. 546,639
Int. Cl.[6] D04B 21/00
U.S. Cl. 66—195 **10 Claims**

1. A furniture support material in a warp knitted configuration comprising: a first yarn of textured polyester disposed in a full chain stitch in Bar 1, a second yarn of textured polyester disposed in a traversing loop stitch in Bar 2, a first elastomeric monofilament yarn disposed in a traversing loop stitch in Bar 3, and a second elastomeric monofilament yarn disposed in a full chain stitch in Bar 4 and wherein said furniture support material has an elongation at break of about 17 percent or greater in both the warp and the fill direction.

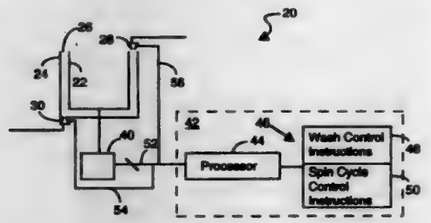


5,596,889

LAUNDRY MACHINE WITH REDUCED SUDS SPIN CYCLE

Lawrence E. Guerra, Roeland Park, Kans., and Craig S. Ruhl, Des Moines, Iowa, assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Oct. 20, 1995, Ser. No. 546,496
Int. Cl.[6] D06F 33/02
U.S. Cl. 68—12.02 **15 Claims**



1. A laundry machine, comprising:

a laundry basket to hold laundry which contains a liquid, said laundry basket including a basket base surrounded by a basket wall;

a tub surrounding said laundry basket and defining a circular drainage void therebetween;

a motor to rotationally drive said laundry basket; and

a control circuit to modulate said motor such that said laundry basket achieves

a first rotational speed sufficient to force substantially all of said laundry against said basket wall,

a second rotational speed, greater than said first rotational speed, to force said liquid from said laundry into said circular drainage void,

an intermediate rotational speed substantially equivalent to said first rotational speed, said intermediate rotational speed maintaining said laundry against said basket wall while reducing the suds formation associated with said second rotational speed, and

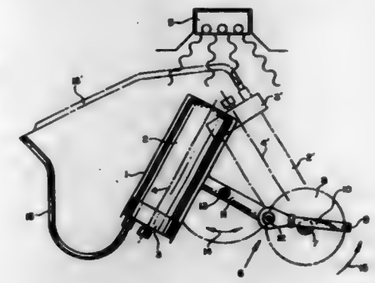
a third rotational, speed greater than said second rotational speed, to force additional liquid from said laundry into said circular drainage void.

5,596,890

BEAKER TYPE DYEING MACHINE

Josef-Anton Suess, Buron/Lu, Switzerland, assignor to Datacolor International Applied Color Systems, Inc., Lawrence, N.Y.

Filed Jun. 1, 1995, Ser. No. 458,835
Claims priority, application Switzerland, Jun. 7, 1994, 1788/94
Int. Cl.[6] D06B 3/30;3/36;23/10
U.S. Cl. 68—15 **4 Claims**



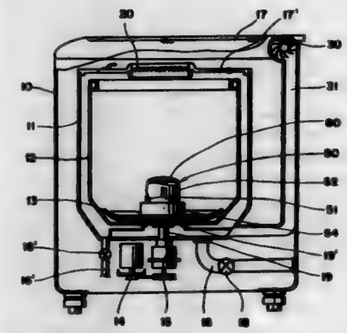
1. A dyeing apparatus, comprising a plurality of beakers for materials to be dyed, each beaker being provided with a lid and having a longitudinal axis, a support for receiving the beakers, said support containing dyeing liquor, a drive means for reciprocatingly pivoting said beakers relative to said longitudinal axes, and a heater for heating said beakers, wherein each beaker is equipped with a dosing hose for adding additives into the inner space of the beaker and the heater comprises a planar infrared rays emitter apparatus.

5,596,891

APPARATUS FOR UNTWISTING CLOTHES IN AN AUTOMATIC WASHER

Sang C. Bae; Jae R. Park, and Jong C. Seo, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 8, 1995, Ser. No. 525,183
Claims priority, application Rep. of Korea, Sep. 15, 1994, 24085; May 8, 1995, 11142
Int. Cl.[6] D06F 37/30
U.S. Cl. 68—133 **14 Claims**



1. In a wash articles washing machine having a water tub provided in a body, a pulsator being oscillatably mounted in the water tub for generating a stream of water, a wash articles untwisting apparatus placed on said pulsator, a drive shaft connected to the

pulsator, and a motor for supplying rotation force to said shaft, said wash articles untwisting apparatus for an automatic washing machines comprising:

a bearing member mounted at the upper center of said pulsator and having an extending-through hole at the center thereof, and said hole receiving said shaft;

a housing freely mounted in said bearing member and having a plurality of openings at the vertical wall;

a rotating shaft engaging in said hole, which is rotated by said drive shaft;

a motion convertible means being rotated by said shaft for transforming rotational motion into reciprocal motion; and

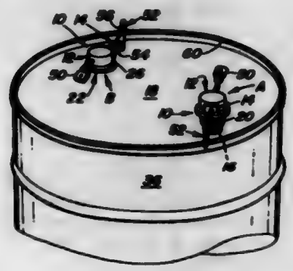
a plurality of thrusters reciprocated through said openings by the operation of said motion convertible means, thereby pushing wash articles concentrated in the center of said water tub outward.

5,596,892

SECURITY DRUM LOCKOUT DEVICE

Roy S. Edgar, Angola; Jerry T. Dennis, and Ralph D. Trine, both of Fremont, all of Ind., assignors to Vestil Manufacturing Company, Angola, Ind.

Filed Jun. 20, 1995, Ser. No. 492,802
Int. Cl.[6] B65D 55/14
U.S. Cl. 70—164 **6 Claims**



1. A lockout device for a drum having an end wall, a flange extending axially outwardly from the periphery of said end wall and a threaded drum opening at a predetermined distance from said flange, said lockout device comprising:

a generally cylindrical locking head having a threaded plug at one end for engaging said drum opening and an axially extending base at its other end, said base having a diametrically extending shank receiving through-hole;

a locking key having an elongated shank, a transverse hole through one end of said shank and a handlebar extending transversely across the other end of said shank;

wherein said shank has a crossectional area smaller than said base through-hole so that said one end of said shank is insertable through said base through-hole;

a stop block secured to said shank intermediate said ends of said shank, said stop block being positioned such that, with said shank inserted through said through-hole until said stop block abuts against said base, said one end of said shank is positioned closely adjacent said base and there is a predetermined distance between said stop block and said handlebar whereby said handlebar is adapted to abut against the drum flange, and the stop block is adapted to abut against the locking head to thereby prevent a complete rotation of the locking head; and

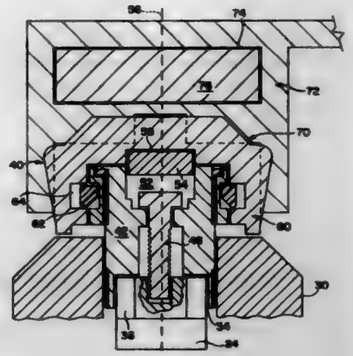
wherein said one end of said shank is adapted to receive a padlock shackle through said transverse hole.

5,596,893

DEVICES FOR SECURING FIRE HYDRANT VALVES

Henry J. Stehling, Bedford; Roy Istre, Jr., Spring; Sheldon Levine, Houston, and Horace E. Nichols, Jr., Humble, all of Tex., assignors to Hydra-Shield Manufacturing, Inc., Irving, Tex.

Filed Dec. 28, 1995, Ser. No. 579,767
Int. Cl.[6] F16K 35/16
U.S. Cl. 70—175 **8 Claims**



1. A valve operator securing arrangement for fire hydrants having a valve stem, the valve stem having a valve nut, the valve stem being connected to a valve wherein rotation of the valve stem opens and closes the valve, the device comprising:

an inner cylindrical member having a lower end with a recess opening downwardly for receiving the valve nut in a non-rotational relationship, and an upper end with a first coupling element;

an outer rotational member mounted over the inner cylindrical member for rotation with respect to the inner cylindrical member, the outer rotational member including a second coupling element;

a movable magnetizable element urged to a first position, decoupling the first and second coupling elements, the magnetizable element being moveable to a second position coupling the first and second elements in a non-rotational relationship, wherein rotation of the outer rotational member rotates the inner cylindrical member to rotate the valve stem and operate the valve;

a wrench mechanically interlockable with the outer rotational member for rotating the outer rotational member, the wrench further including a reaching permanent magnet with a very strong magnetic field integral therewith and alignable with the magnetizable element for moving the magnetizable element from the first to the second position;

a fire hydrant cap for being fixed being with respect to the fire hydrant with a recess therein in which the valve nut is positioned, the recess having a circular wall surrouding the nut; and

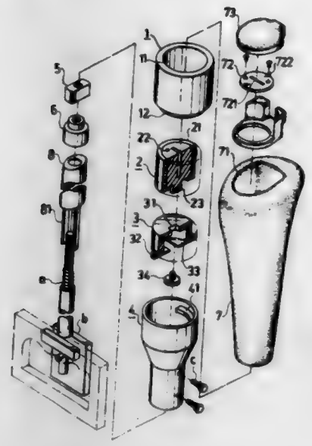
a knurled surface on the exterior of the inner cylindrical member for engaging the circular wall if an attempt is made to grip the inner cylindrical member with the outer member by applying a force to the outer rotational member tilting the outer rotational member with respect to the inner cylindrical member, so that the inner cylindrical member binds with the wall of the recess preventing the inner cylindrical member from turning with respect to the fire hydrant cap, thereby preventing the valve nut from turning.

5,596,894

LOCK STRUCTURE FOR THE AUTOMATIC SHIFT LEVER OF A CAR

Chi-Yuan Lee, Back Building, No. 740-7, Chung-Cheng Road, Hsin-Chuang City, Taipei, Taiwan

Filed Jan. 13, 1995, Ser. No. 372,334
Int. Cl.[6] F16H 57/00
U.S. Cl. 70—201 **13 Claims**



1. A lock structure for an automatic shift lever of a car, comprising:

an outer pipe provided at an upper part of a shift lever in said car and having a receiving hole therein as well as a connecting part at a bottom outer edge thereof;

a lever lock received in said receiving hole, having a top exposed to form a push button, a lock core provided centrally in said outer pipe extending down to a bottom of said lever lock to form an engaging piece;

an axle tube received in said receiving hole, having on a top thereof an engaging hole for engagement with said engaging piece, and having two protruding pieces provided at each side of a bottom outer edge thereof respectively, a hollow recess being provided therein; and

a sheath having a top connecting to said connecting part on said outer pipe, the sheath having two protruding ribs provided on sides thereof and under said protruding pieces said protruding ribs having gaps therebetween for enabling downward moving of said protruding pieces, a limiting block engaged in said hollow recess of said axle tube so as to be limited from upward and downward movement, and being fixed at a bottom end on a control link of said automatic shift lever; whereby

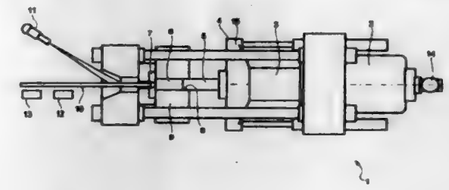
when said protruding ribs are supported by said protruding pieces, and said limiting block is engaged in said hollow recess, said push button, said lever lock, said axle tube, said limiting block and said control link are locked and prevented from moving, and when said lock core is rotated said engaging piece being engaged in said engaging hole to cause said axle tube to rotate there with so as to move said protruding pieces to said gaps between said two protruding ribs, thereby enabling depression of said push button to force said lever lock, said axle tube, said limiting block and said control link downwards, to enable shifting of the shift lever.

5,596,895

METHOD FOR THE EXTRUSION OF METAL OR PLASTIC PROFILES AND APPARATUS FOR WORKING METHOD

Torben Bredal, Radyrvaenget 4, DK-3450 Allerod, Denmark

PCT No. PCT/DK93/00128, § 371 Date Nov. 9, 1994, § 102(e) Date Nov. 9, 1994, PCT Pub. No. WO93/19862, PCT Pub. Date Oct. 14, 1993
PCT Filed Apr. 6, 1993, Ser. No. 318,640
Claims priority, application Denmark, Apr. 6, 1992, 0464/92
Int. Cl.[6] B21C 31/00
U.S. Cl. 72—16.5 **13 Claims**



1. A method for the manufacturing of lengths of profiles by extrusion, said method comprising:

(a) selecting a workpiece of metal or plastics;

(b) preheating said workpiece;

(c) introducing said workpiece into a bore of an extrusion machine, said bore communicating with an extrusion die orifice;

(d) driving a punch in a stroke longitudinally into said bore in a direction towards said orifice so as to apply onto said workpiece a pressure sufficient to deform said workpiece and drive it gradually through said extrusion die orifice at a speed of extrusion which increases gradually from the onset of each stroke until it has reached a predetermined minimum value, whereby said workpiece is gradually formed into an extrudate eventually building a length of extruded profile;

(e) continually measuring the temperature of said extrudate by detecting the thermal radiation from said extrudate at a point close to its emergence from said die orifice;

(f) measuring the speed of extrusion of said extrudate;

(g) once said speed of extrusion has reached said predetermined minimum value, adjusting said speed of extrusion by adjusting the extrusion pressure driving said punch with the purpose of maintaining the temperature of said extrudate as close to a predetermined temperature set-point value as possible, in that said extrusion pressure is reduced if said temperature rises above said temperature set-point value and said extrusion pressure is increased if said temperature drops below said temperature set-point value;

(h) checking the quality and the geometric dimensions of said extruded length of profile and comparing to predetermined values to determine whether said extruded length of profile is acceptable or not;

(i) if yes, then stepping up said temperature set-point value in a small increment, retracting the punch, and repeating from step (a);

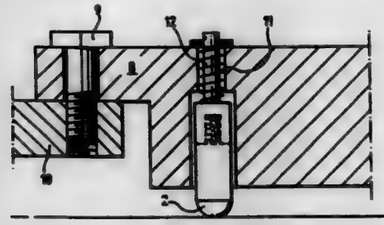
(j) if no, then stepping down said temperature set-point value to the value previously used and storing this value in a memory together with other data relating to the extrusion operation.

5,596,896

METHODS AND APPARATUS FOR EFFECTING DOMAIN REFINEMENT OF ELECTRICAL STEELS

David Snell, Gwent, Great Britain, assignor to Orb Electrical Steels Limited, Great Britain

PCT No. PCT/GB93/00971, § 371 Date Nov. 7, 1994, § 102(e) Date Nov. 7, 1994, PCT Pub. No. WO93/23576, PCT Pub. Date Nov. 25, 1993
PCT Filed May 12, 1993, Ser. No. 335,847
Claims priority, application Great Britain, May 13, 1992, 9210292
Int. Cl.[6] B21B *1/00*
U.S. Cl. 72—75 10 Claims



1. An apparatus for effecting domain refinement of electrical steels comprising:

a supporting structure;

an array of rotatable members mounted within said supporting structure, adjacent ones of said rotatable members being spaced by a first distance relative to each other;

means for moving said array of rotatable members into direct contact with a surface of a piece of electrical steel to create lines of local plastic deformation which extend substantially across the width of the piece of electrical steel to effect domain refinement thereof, said first distance being such that a distance between adjacent lines of local plastic deformation is at least 5 mm;

means for imparting relative linear movement between said rotatable members and said piece of electrical steel; and

resilient biasing means between said rotatable members and said supporting structure for urging said rotatable members towards a piece of electrical steel to be locally plastically deformed.

5,596,897

MECHANISM FOR CONTROLLING FORM ROLL MOVEMENT IN SPIN FLOW NECKING MACHINE

Charles T. Payne, Jr., and Field I. Robertson, both of Chesterfield County, Va., assignors to Reynolds Metals Company, Richmond, Va.

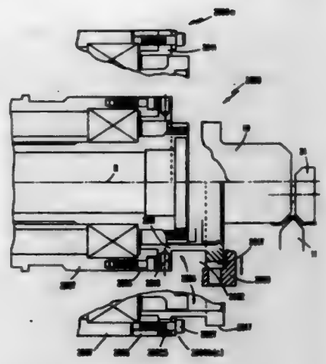
Filed Sep. 12, 1995, Ser. No. 527,250
Int. Cl.[6] B21D *19/12*
U.S. Cl. 72—84 13 Claims

1. Apparatus for necking-in an open end of a side wall of a container body, comprising:

a) a first member and a second member mounted for engaging inside surfaces of the container side wall defining said open end;

b) an arrangement for rotating said container body;

c) an externally located member mounted for radially inward movement into deforming contact with an outside surface of said container side wall in a region thereof overlying an interface between said first and second members, whereby contact between said externally located member with said side wall causes the contacted wall portion to move radially inwardly into a gap formed at the interface caused by axial separation of said first and second members under the action of the radially inward advancing movement of the externally located member into the gap to thereby neck-in said side wall; and



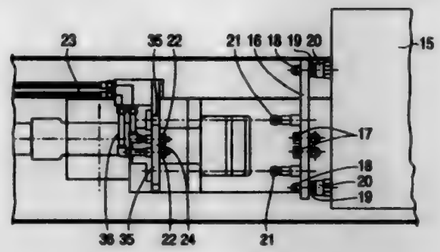
d) stop means for limiting radial inward movement of said externally located member.

5,596,898

DEVICE FOR THE AXIAL CLAMPING/RELEASE OF THE CHOCKS OF THE ROLLS IN A ROLLING MILL STAND

Fausto Drigani, Zugliano, and Pietro Moracca, Fresonara, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Nov. 28, 1994, Ser. No. 348,219
Claims priority, application Italy, Nov. 29, 1993, UD93A0237; Nov. 29, 1993, UD93A0238
Int. Cl.[6] B21B *28/00*
U.S. Cl. 72—236 7 Claims



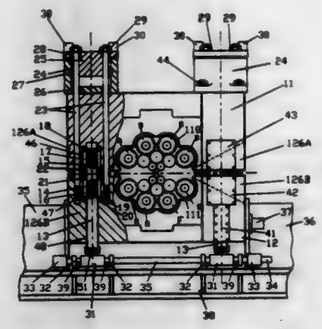
1. Device for the axial clamping and release of chocks of working rolls on a rolling mill stand, the rolling mill stand including an actuation side and a working side, stationary housings associated with stationary blocks being comprised at the sides, each of the stationary blocks being associated with a relative sliding block positioned in a direction axial to the working rolls, each sliding block defining a lodgement for a chock, bearings of the working rolls being lubricated with a centralized air-oil system which comprises a first part of connectors located on the device and fixed to supporting means and a second part of connectors included on a front portion of a relative chock, the device being characterised in that the sliding blocks are associated, on the actuation side, with oscillatory means for clamping the sliding blocks to and releasing the sliding blocks from relative chocks, the oscillatory means being able to move from a second position of releasing the relative chock from a relative sliding block to a first clamping position the oscillatory means in the second position acting on the supporting means that support the first part of the connectors so as to clamp transversely the first part of the connectors in a determined position coordinated axially with the position of the second part of the connectors.

5,596,899

MILL HOUSINGS FOR CLUSTER MILLS

Michael G. Sendzimir, Woodbury, and John W. Turley, Oxford, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.

Filed Jul. 22, 1994, Ser. No. 279,048
Int. Cl.[6] B21B *31/24*
U.S. Cl. 72—242.4 15 Claims



1. A cluster mill housing assembly having substantially the same size, form and structure as a monobloc mill housing, said cluster mill housing assembly having a horizontal center line and being divided along a horizontal plane located at or close to said horizontal center line of said housing assembly into upper and lower mill housings, said mill housing assembly having two forward and two rearward corners, each of said mill housings having a roll cavity and a roll cluster in said cavity, each roll cluster comprises a work roll, intermediate rolls and backing assemblies, a gap defined between said work rolls, screw and nut assembly means mounted at each of said four mill housing assembly corners for adjusting said work roll gap by shifting said upper and lower mill housings toward and, simultaneous and symmetrically about a fixed plane coincident with said horizontal center line, away from each other depending upon the direction of rotation of said screws of said screw and nut assembly means, means for supporting said screw means and for rotating said screw means, said screw means supporting the weight of said upper and lower mill housings, and means for prestressing said upper and lower mill housings together at a spacing therebetween determined by said screw means.

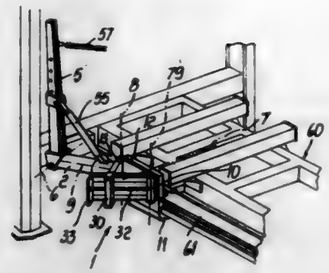
5,596,900

TRACTION AND ALIGNMENT ARM PARTICULARLY FOR MOTOR VEHICLE BODY REPAIR BENCHES

Giuseppe Pietrelli, Massa, Italy, assignor to Car Bench S.p.A., Massa, Italy

PCT No. PCT/EP94/01052, § 371 Date Oct. 2, 1995, § 102(e) Date Oct. 2, 1995, PCT Pub. No. WO94/23859, PCT Pub. Date Oct. 27, 1994
PCT Filed Apr. 5, 1994, Ser. No. 530,145
Claims priority, application Italy, Apr. 8, 1993, MI93A0716
Int. Cl.[6] B21J *13/08*
U.S. Cl. 72—457 18 Claims

1. Traction and alignment arm, particularly for motor vehicle body repair benches, which comprises a base which is associable with a repair bench and a post that extends from said base and has means for engaging a portion of the object to be repaired which is placed on said bench, first means for rotation of said base about a first axis that is substantially horizontal and substantially at right angles to a front plane for applying said base to said repair bench; second means for rotation of said base about a second axis that is substantially at right angles to said first axis; and third means for the rotation of said base about a third axis that is substantially at right angles to said second axis; first means for locking the rotation of said base about said first axis; second means for locking the rotation of said base about said second axis; and third means for locking the rotation of said base about said third axis; and in that said locking means can be activated and deactivated to vary the position of said post with respect to said repair bench, wherein said first rotation means couple a first supporting plate about said first axis to a mutually facing second supporting plate, and in that said second rotation means couple a third supporting plate to said second supporting plate about said second axis, said third supporting plate being articulated about one edge thereof to said second supporting plate about said second axis, means being provided to swing said third supporting plate open with respect to said second supporting plate.

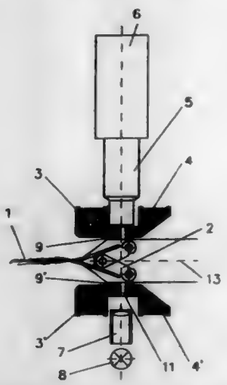


5,596,901

METHOD FOR THE ABSOLUTE MEASUREMENT OF THE TEARING STRENGTH OF FIBRES

René Gloor, Schönenberg, Switzerland, assignor to Zellweger Luwa AG, Uster, Switzerland

PCT No. PCT/CH95/00018, § 371 Date Oct. 10, 1995, § 102(e) Date Oct. 10, 1995, PCT Pub. No. WO95/22044, PCT Pub. Date Aug. 17, 1995
PCT Filed Jan. 26, 1995, Ser. No. 532,613
Claims priority, application Switzerland, Feb. 10, 1994, 395/94
Int. Cl.[6] G01L *5/04*
U.S. Cl. 73—159 10 Claims



1. Method for measuring the tearing strength of fibres, especially of textile fibres, comprising the following steps:

A) the fibres to be measured or part regions of such fibres are treated to form a single-layer planar fibre tuft (1);

B) the fibre tuft (1) is clamped in the fibre plane (13) perpendicularly to the fibre direction along two parallel lines (18, 19) having a predetermined clearance;

C) the cross-section of the fibres clamped between the two lines (18, 19) is determined individually and summed to form the total cross-section;

D) the fibre tuft (1) is pulled apart to tear the fibres clamped between the two lines (18, 19) by the application of a force in the fibre plane (13) in a direction perpendicular to the two lines (18, 19);

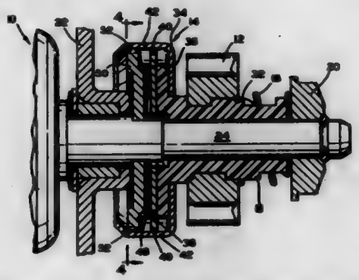
E) the tearing strength is determined from the tearing force occurring and the total cross-section determined.

5,596,902

STARTER DRIVE CLUTCH

Bobby E. McMillen, Columbus, Miss., assignor to United Technologies Motor Systems, Inc., Dearborn, Mich.

Filed Nov. 15, 1994, Ser. No. 339,941
Int. Cl.[6] F02N 15/06
U.S. Cl. 74—7 C 1 Claim



1. An electric starter for an internal combustion engine comprising:

an electric motor having a rotatable armature shaft;

a pinion gear mounted for selectively driving a flywheel of an engine; and

a clutch assembly for transmitting torque between the shaft of said motor and said pinion gear, said clutch assembly comprising:

a driving member including a base plate drivingly coupled to the shaft of said motor for rotational movement,

a spline rotatingly mounted to the shaft of said motor for slight axial movement relative to the shaft, and

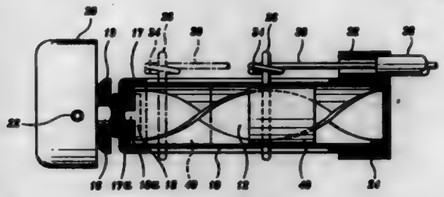
a housing interlocking said driving member and said spline for fictionally transmitting torque between said driving member and said spline, wherein said housing is formed with diametrically opposed recesses and the base plate of said driving member is formed with radially extending tabs adapted to be received within the recesses of said housing.

5,596,903

ROTARY TO LINEAR ACTUATOR

Steven E. Parker, Tacoma, Wash., assignor to Tuthill Corporation, Hinsdale, Ill.

Filed Apr. 28, 1995, Ser. No. 425,372
Int. Cl.[6] F16H 25/20
U.S. Cl. 74—89 11 Claims



11. An actuator for transforming motion between a rotary force transmitting member and a flexible linear force transmitting member, comprising:

a cylindrical tube;

a rigid helix-shaped ribbon journalled within said tube for rotating movement about a longitudinal axis, said ribbon having a first end coupled to the rotary force transmitting member; and

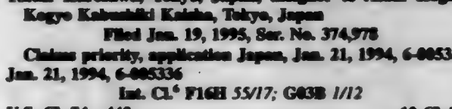
a ribbon follower mounted on said ribbon, said ribbon follower having first and second spaced parallel arm portions straddling said ribbon to receive said ribbon therebetween so that the ribbon follower moves along the longitudinal axis of said ribbon as the ribbon and rotary force transmitting member rotate, said ribbon follower being coupled to the flexible linear force transmitting member so that the flexible linear force transmitting member and ribbon follower cooperatively advance and retract longitudinally relative to said tube.

5,596,904

STEERING GEAR APPARATUS OF RACK-AND-PINION TYPE

Yoshisada Wada, Okazaki; Takahiro Iwase, Anjo; Kunio Hayashi, Aichi-gun; Kazuhiko Tsuda, Nagoya; Shigemi Shioya, Okazaki, and Yasushi Hayashida, Nishikamo-gun, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed May 16, 1995, Ser. No. 441,939
Claims priority, application Japan, May 17, 1994, 6-102982
Int. Cl.[6] B62D 3/12
U.S. Cl. 74—422 3 Claims



1. A steering gear apparatus of the rack-and-pinion type including a pinion formed with a toothed portion, a rack member formed with a toothed portion which is brought into meshing engagement with the toothed portion of said pinion in such a manner that a steering effort is applied to the meshed portion of the toothed portions of said pinion and rack member at a predetermined angle relative to an axis line of said rack member, and resilient means for resiliently biasing said rack member toward said pinion,

wherein each tooth of the toothed portion of said pinion or said rack member is formed with a tip portion to be brought into contact with a root of each tooth of the toothed portion of said rack member or said pinion.

5,596,905

OSCILLATION DAMPING GEAR

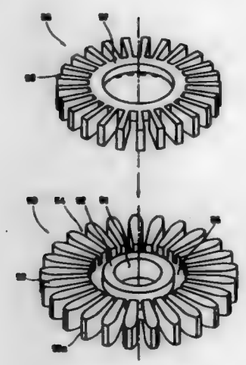
Yuichi Kurosawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 374,978
Claims priority, application Japan, Jan. 21, 1994, 6-005335; Jan. 21, 1994, 6-005336
Int. Cl.[6] F16H 55/17; G03B 1/12
U.S. Cl. 74—443 10 Claims

1. An oscillation damping gear comprising:

a gear member, generally in the form of a chrysanthemum, having teeth and radial grooves defined between and by adjacent teeth; and

an oscillation damping member comprising a central annular portion, and a plurality of legs extending radially from said central annular portion, said plurality of legs being fitted in said radial grooves of said gear member.

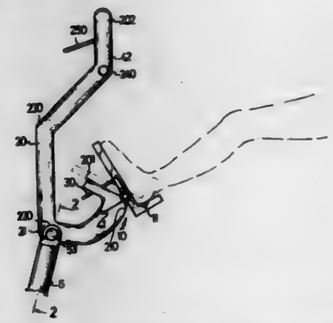


5,596,906

COMBINED ACCELERATING/BRAKING APPARATUS OF A VEHICLE

Sam Lin, 2 Fl., No. 29-1, Lane 52, Hsinan Rd., Nankang Dist., Taipei, Taiwan, assignor to Sam Lin, Taipei, Taiwan

Continuation-in-part of Ser. No. 252,584, Jun. 1, 1994, abandoned. This application Nov. 2, 1995, Ser. No. 556,758
Int. Cl.[6] G05G 9/00
U.S. Cl. 74—478 5 Claims



1. A combined accelerating/braking apparatus of a vehicle comprising

a substantially hook-shaped rod which includes a first end, a first elbow, a second elbow, a third elbow, a fourth elbow, and a second end, where the fourth elbow is pivotally connected to a wall in the vehicle;

a pedal being pivotally connected to the first elbow of the hook-shaped rod;

a bracket which is secured to a wall of the vehicle and includes a fork having two prongs and defining a slot between said two prongs for detachably located the second elbow of the hook-shaped rod;

a first torsion spring being biased between the pedal and a rod portion between the first elbow and the second elbow of the hook-shaped rod for providing a recovery tension when the pedal is pivotally depressed by a driver's foot sole with respect to the first elbow of the hook-shaped rod;

a second torsion spring being biased between a wall of the vehicle and a rod portion between the third elbow and the fourth elbow of the hook-shaped rod for providing a recovery tension when the hook-shaped rod is pivotally moved with respect to the fourth elbow thereof;

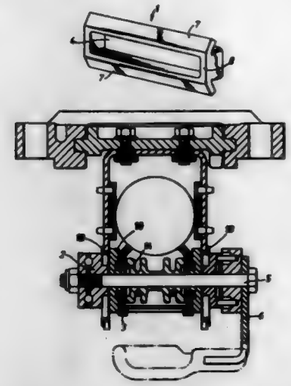
whereby the pedal is pivotally depressed by a driver's foot sole with respect to the first elbow of the hook-shaped rod for acceleration, the hook-shaped rod is pivotally moved with respect to the fourth elbow of the hook-shaped rod for braking when the pedal is depressed by the driver's heel.

5,596,907

ANTIFRICTION ELEMENT FOR USE BETWEEN RELATIVELY SLIDING COMPONENTS OF AN ADJUSTABLE STEERING COLUMN

Laurence G. H. Barton, Warwickshire, England, assignor to The Torrington Company, Torrington, Conn.

Filed Jun. 22, 1994, Ser. No. 263,857
Claims priority, application United Kingdom, Jul. 9, 1993, 9314263
Int. Cl.[6] B62D 1/18
U.S. Cl. 74—493 13 Claims



10. An antifriction element for use between relatively sliding components of an adjustable steering column construction for a vehicle, the antifriction element being located between two said components and being formed such that, in an unclamped state of the components, a segment of the element acts to urge the components away from contact with one another to allow relative free sliding of the components on the antifriction element and, in a clamped state of the components, said segment is deflected to allow direct contact between surfaces of the components to provide the clamping friction, the antifriction element having an elongated slot therein.

5,596,908

LOCK FOR SLIDE AND LOCK L-ARM

Michael Hall, Ortonville, Mich., assignor to Teleflex Incorporated, Plymouth Meeting, Pa.

Filed Aug. 28, 1995, Ser. No. 519,775
Int. Cl.[6] F16C 1/14; F16G 11/00
U.S. Cl. 74—502.4 14 Claims

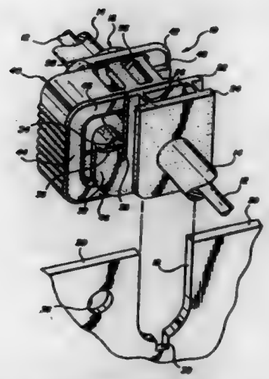
1. A motion transmitting remote control assembly for transmitting forces along a curved path and being supported in a substantially U-shaped seat in a bulkhead, said assembly comprising:

guide means having first and second ends and a bore therethrough defining a first axis for extending through the U-shaped seat;

a core element movably supported in said bore in said guide means for transmitting motion between said ends of said guide means;

abutment means for positioning said guide means in the U-shaped seat;

gripping means disposed laterally from said abutment means and from said guide means for gripping engagement with the bulkhead to prevent said guide means from moving out of the U-shaped seat, said gripping means being axially movable to



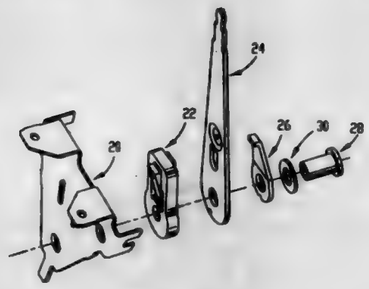
a deflected position out of gripping engagement with the bulkhead for installation of said abutment means into the U-shaped seat; and

characterized by a lock slidably supported on said guide means for movement transversely to said axis between an unlocked position to allow axial movement of said gripping means to said deflected position and a locked position to engage and thereby prevent said gripping means from moving axially out of gripping engagement with the bulkhead.

5,596,909
CONTROL LEVER ASSEMBLY

Marvin L. Cox; Anthony F. Bongiolatti; Ted E. Deubner; Donald R. Novak, and Arthur L. Urban, all of Wichita, Kans., assignors to Wescon Products Company, Wichita, Kans.

Filed Jan. 27, 1995, Ser. No. 379,347
Int. Cl.[6] G05G *1/04*
U.S. Cl. 74—523 **13 Claims**



1. A control lever assembly comprising:

a mounting bracket presenting a generally planer sliding surface and including a detent element formed in the surface;

a control lever supported on the bracket adjacent the sliding surface for movement across the sliding surface, the control lever defining a first pivot axis about which the lever pivots relative to the mounting bracket;

a detent plate including a finger that is supported on the plate for pivotal movement into and out of engagement with the detent element about a second pivot axis extending in a direction parallel to the sliding surface and perpendicular to the first pivot axis,

the plate including a guide means for guiding pivotal movement of the finger relative to the plate while preventing relative movement between the plate and finger in a direction parallel to the second pivot axis;

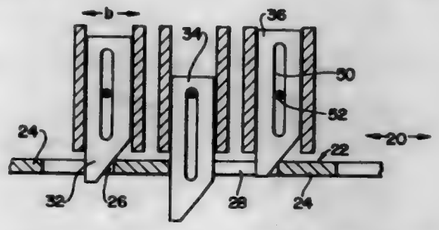
a positioning means for positioning the detent plate between the control lever and the bracket, and for securing the detent plate to the lever for pivotal movement relative to the bracket, and

a spring plate mounted on the lever for biasing the finger against the sliding surface.

5,596,910
STEPLESS LOCKING DEVICE FOR AN ADJUSTABLE SEAT OF A VEHICLE

Heinz Bauer; Burckhard Becker; Ernst-Reiner Frohnhaus, and Ulrich Karthaus, all of D-Solingen, Germany, assignors to C. Rob. Hammerstein GmbH, Germany

Filed Jan. 5, 1995, Ser. No. 369,168
Claims priority, application Germany, Jan. 5, 1994, 44 00 232.7
Int. Cl.[6] G05G *5/18*
U.S. Cl. 74—526 **19 Claims**



1. A locking device for an adjustable vehicle seat, having a snap-in bar extending parallel to an adjustment direction, which snap-in bar has lockings and locking gaps arranged in a periodic measure P, and having a locking unit pertaining to said snap-in bar and shiftable in the adjustment direction along said snap-in bar, which locking unit has more than two ratchet teeth, which are independently movable in a locking direction extending across the snap-in bar, and elastically preloaded in the locking direction by a biasing means, are disengaged simultaneously by bias operating means are arranged one behind the other at equal distance in the adjustment direction, are of the same construction, each have two lateral flanks designated to be contacted with the lockings, with at least one of the two lateral flanks having a partial area located at the front in locking direction, which extends at an acute angle to the locking direction, so that one of said at least two ratchet teeth cannot be pushed out of its locking position in a locking gap when the vehicle seat is exposed to force in adjustment direction due to an accident, characterized in that for each periodic measure P, there is provided a short locking gap, a first locking, a long locking gap, and a second locking corresponding in width to the first locking, with the long locking gap being at least 1.5 times as wide as the short locking gap, and with the first and the second lockings together making up for less than 40% of the periodic measure P.

5,596,911
DRIVE GEAR FOR A GROUP OF CYLINDERS AND METHOD IN THE DRIVE OF CYLINDERS

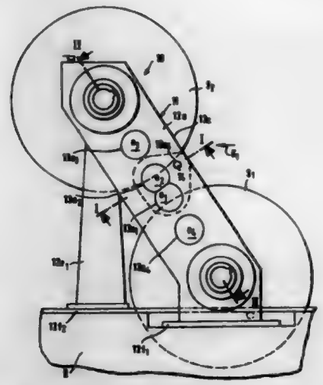
Ville Panttila, Jyväskylä, Finland, assignor to Valmet Power Transmission Inc., Jyvaskyla, Finland

Filed Feb. 27, 1995, Ser. No. 394,638
Claims priority, application Finland, Sep. 12, 1994, 944209
Int. Cl.[6] F16H *37/06*
U.S. Cl. 74—665 GA **20 Claims**

1. A combination of first and second cylinders supported on a foundation and having first and second shafts, respectively, and a gearbox coupled to said first and second cylinders, comprising

a box frame having an interior,

drive means for providing a rotation force to said first and second cylinders, said drive means including a third shaft extending from an exterior of said box frame into the interior of said box frame,



a first cogwheel coupled to said third shaft and being rotated upon rotation of said third shaft,

second and third cogwheels each engaging with said first cogwheel and rotatively coupled to said first and second cylinders, respectively, such that rotation of said first cogwheel causes rotation of said second and third cogwheels and thus said first and second cylinders,

means for connecting said box frame to the foundation to fix said box frame in a stationary position with respect to the foundation such that a load arising from the weight of said gearbox is transferred to the foundation through said box frame, and

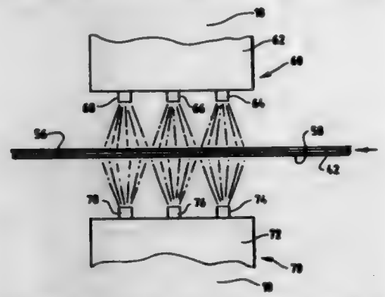
means for providing a floating coupling between said first and second shafts of said first and second cylinders and said gearbox which permits changes in the angle between an axis of said first and second shafts of said first and second cylinders and said gearbox such that torsion arising from faults in directions of said first and second shafts of said first and second cylinders is not transferred from said first and second cylinders to said gearbox or from said gearbox to said first and second cylinders.

5,596,912
PRESS PLATE HAVING TEXTURED SURFACE FORMED BY SIMULTANEOUS SHOT PEENING

Kenneth J. Laurence, West Chester, Ohio, and Michel J. Broussard, Quillan, France, assignors to Formica Technology, Inc., Wilmington, Del.

Filed Aug. 12, 1993, Ser. No. 106,243
Int. Cl.[6] B21K *5/20*
U.S. Cl. 76—107.1 **15 Claims**

1. A press plate for producing decorative laminate having a



textured surface formed by shot peening the surface simultaneously with a mixture of shot particles,

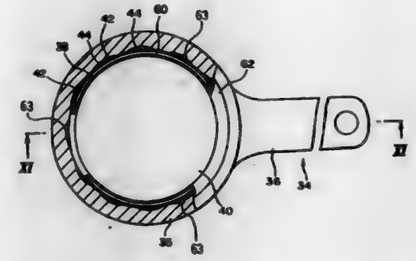
the mixture of shot particles including a first quantity of shot comprising shot grades for imparting a texture to the surface and a second quantity of shot comprising shot grades for adjusting a gloss level of the surface of the plate.

5,596,913
WRENCH

Masayuki Matsubara, and Yasuhiko Kitamura, both of Osaka, Japan, assignors to Daishowa Seiki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1994, Ser. No. 272,219
Claims priority, application Japan, Jul. 8, 1993, 5-193106
Int. Cl.[6] B25B *13/00*
U.S. Cl. 81—59.1 **13 Claims**

7. A wrench for tightening a tightening member to another



member by rotating the tightening member around its own axis, comprising:

an inner surface to be attached to the outer surface of said tightening member;

a wedge member arranged on said inner surface which is wedged between the outer surface of the tightening member and said inner surface by rotating the wrench body in one direction; and

a holding means provided on said inner surface for holding said wedge member, including

i) a recess with a circular-curved cross section formed on the inner surface of the wrench body for receiving the wedge member, said recess including a slack portion for housing said wedge member in a non-wedging position, and wedging portions flanking said slack portion for extending said wedge member into a wedging position;

ii) an annular retainer arranged around the inner surface of the wrench for limiting the extent that the wedge member is extended into said wedging position, and

iii) a bias means for biasing the retainer so that the wedge member is biased from the slack area towards the wedge area, said bias means including a ring-shaped spring corresponding to the shape of the retainer.

5,596,914
FOIL CUTTING DEVICE

Benker P. C. Liao, 5th Fl., No. 278, Sec. 4, Chungsiao E. Rd., Taipei, Taiwan

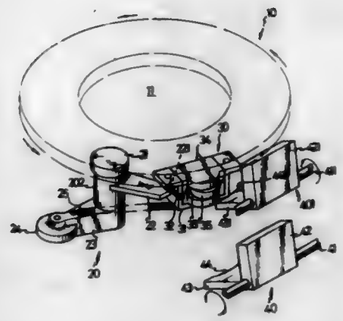
Filed Dec. 15, 1995, Ser. No. 573,558
Int. Cl.[6] B23B *7/00*
U.S. Cl. 82—70.2 **11 Claims**

1. A foil cutting device, comprising:

a rotatable disk defining a hollow portion;

a die barrel extending through the hollow portion of the disk and defining a gap with the disk, said gap being adapted to allow a foil to be cut to extend therethrough;

a cutting unit having a base fixedly mounted on the disk, a cutting tool mounting block slideably mounted on the base, and a cutting tool fixedly attached on the mounting block and extending toward the hollow portion of the disk;



a manipulating unit pivotably mounted on the disk, having an arm with a hooked end extending toward the cutting unit, a leg extending in a direction substantially away from the cutting unit, and a force generating means continually exerting a force to cause the arm to extend into the cutting unit;

a first cam means defining a first cam surface whereby when the mounting block is rotated with the disk to contact with the first cam surface, the mounting block with the cutting tool will move toward the hollow portion until the cutting tool reaches a fully extended position in which the hooked end of the arm of the manipulating unit is engaged with the mounting block to lock the mounting block in place; and

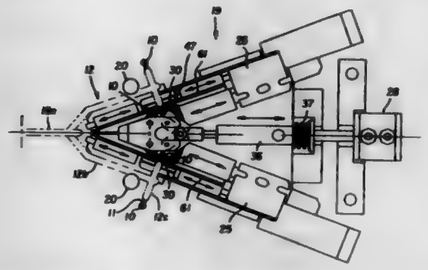
a second cam means defining a second cam surface whereby when the leg of the manipulating unit is rotated with the disk to contact with the second cam surface, the engagement between the hooked end of the arm and the mounting block is released.

5,596,915

METHOD AND APPARATUS FOR PRECISION DEGATING MECHANISM

Timothy F. Spencer, and Gerald N. Walter, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,348
Int. Cl.[6] B26D *7/08;7/10*
U.S. Cl. 83—20 **16 Claims**



1. A method of severing a molded part from a runner at a mold gate/part interface comprising:

bringing the runner having molded parts attached at a gate region into close association with a movable degating fixture having a cutting nest to hold the part, the nest having an access passage throat through which the mold gate and part extend and having a first and second opposing cutting edges positioned on a first and second side of the mold gate/part interface;

engaging positioning pins to contact an outer surface of the runner and supplying force sufficient to flex the runner inwardly toward the movable degating fixture;

moving the degating fixture in a direction to locate the part vertically over the nest;

engaging a first clamp to vertically clamp the part in the nest;

engaging a second clamp to supply horizontal force to further orient the part in the nest;

engaging said cutting edges such that the edges are brought into motion toward each other and through the mold gate/part interface to a predetermined stop position; and

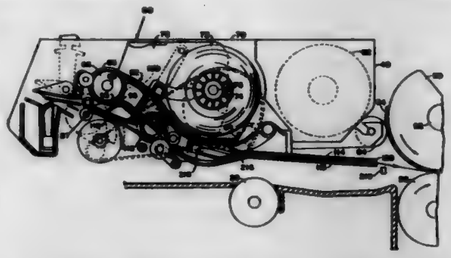
cleanly severing the part from the runner.

5,596,916

METHOD FOR PREVENTING JAMS IN A TAPE EJECTING APPARATUS

Dennis M. Gallagher, Danbury, and John R. Noble, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 28, 1994, Ser. No. 203,130
Int. Cl.[6] B26D *5/28*
U.S. Cl. 83—23 **3 Claims**



1. A method for sequencing the exiting of a cut tape segment from a tape roll feeding, cutting and ejecting apparatus of a mailing machine having a tape roll drive for feeding the tape in a feeding direction for printing and cut tape segment ejection means in which the cut tape segment from the tape roll is ejected in an opposite direction from the feeding direction, the method comprising the steps of feeding the tape in the feeding direction for a first predetermined time period for extending a predetermined length of tape, further feeding the tape in the feeding direction to create a trail edge margin to assure that the tape is not cut shorter than a minimum length, printing on the tape; then feeding the tape in the opposite direction until one of a first and second conditions occurs, the first condition being the sensing of a leading edge of the tape by a sensor and the second condition being feeding the tape in the opposite direction beyond a second predetermined time period; then at times when the first condition occurs cutting the tape with a cutting apparatus to create the cut tape segment and subsequently ejecting the tape segment from the tape roll feeding, cutting and ejecting apparatus, and at times when the second condition occurs feeding the tape in the tape feed direction to alleviate a tape jam condition.

5,596,917

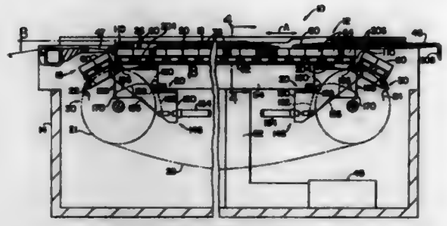
APPARATUS FOR CONVEYING AND CUTTING SHEET MATERIAL ON A VACUUM BED WITH SYSTEM FOR SEALING END PORTIONS OF THE BED

H. Joseph Gerber, West Hartford, and Richard Kuchta, Tolland, both of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Feb. 18, 1994, Ser. No. 198,839
Int. Cl.[6] B26D *7/02;7/20;* B65H *20/10;* D06H *7/00*
U.S. Cl. 83—152 **27 Claims**

21. An apparatus for conveying sheet material, comprising:

a conveyor including a plurality of elongated supports coupled together in succession, each support including an elongated base portion and a permeable layer coupled to one side of the



base portion, and defining elongated faces extending in the elongated direction of the support on opposite sides of the support relative to each other, each elongated face including a permeable portion formed by the permeable layer of the support and extending from approximately one end of the support to another end in the elongated direction of the support, the permeable layers of a plurality of the supports forming a permeable supporting surface for supporting the sheet material;

two rotatable units located on substantially opposite sides of the supporting surface relative to each other and coupled to the conveyor for guiding the conveyor along a path of movement substantially transverse to the elongated direction of the supports, the conveyor defining an upper run extending between the rotatable units, and at least two gaps, each gap being located at a respective end of the upper run and defined between exposed elongated faces of two of the supports located adjacent to each other;

first means extending in the elongated direction of the supports and mounted beneath the upper run adjacent to one of the gaps for engaging in a sealing position the permeable portion of one of the elongated faces forming said gap for sealing the respective end of the upper run;

second means for actuating the first means between said sealing position and a retracted position below said gap away from the path of conveyor movement; and

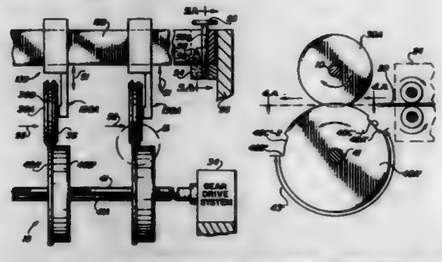
third means for biasing the first means toward the engaged face.

5,596,918

SPORTS CARD SLITTING DEVICE AND METHOD

Michael V. Longwell, San Marcos, and Richard J. Lee, Walnut, both of Calif., assignors to The Upper Deck Company, Carlsbad, Calif.

Filed Apr. 21, 1994, Ser. No. 230,600
Int. Cl.[6] B26D *1/24*
U.S. Cl. 83—332 **7 Claims**



1. In a sport card slitting machine including a first slitting stage for producing a plurality of interrupted cut slits of a predetermined length in a sheet, the first slitting stage having a lower slitting assembly including

i. a gear-driven lower shaft,

ii. a plurality of lower hubs rigidly mounted on the lower shaft,

iii. a plurality of lower blades rigidly attached to the lower hubs, respectively, each lower blade having first and second notches in a circumferential cutting edge of the lower blade, the first notch having a trailing edge, the second notch having a leading edge, there being a circumferential distance between the trailing edge of the first notch and the leading edge of the second notch,

iv. a sheet feeder synchronized to a location of the trailing edge of the first notch of each of the lower blades to effectuate interruptions in the slits made by the first slitting stage,

the improvement comprising in combination:

(a) a track in the first slitting stage;

(b) a plurality of separate upper slitting assemblies each attached rigidly to the track above a corresponding lower blade, the upper slitting assemblies each including

i. a freely rotatable upper hub,

ii. an upper blade attached to each upper hub,

iii. a resilient band circumferentially disposed on the upper hub to drive the upper hub by frictional engagement with the lower hub or the sheet as it is being slit, and

iv. an upper blade biasing mechanism to resiliently urge an edge of the upper blade against the circumferential cutting edge of the corresponding lower blade,

a plane of a cutting edge of each upper blade being parallel to a plane of a cutting edge of each corresponding lower blade to achieve a cant angle that avoids interference between each upper blade and the first and second notches of each corresponding lower blade, respectively, and

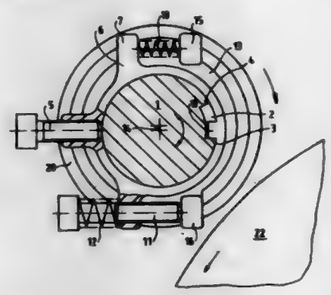
the circumferential distance between the trailing edge of the first notch and the leading edge of the second notch being equal to the predetermined length of each slit plus an amount corresponding to a predetermined average slippage of the resilient band on a surface of the sheet as the lower blade rotates from a point at which the trailing edge of the first notch meets the edge of the upper blade to another point at which the leading edge of the second notch meets the edge of the upper blade.

5,596,919

DEVICE FOR HOLDING OR RECEIVING INDEXABLE PERFORATING TOOLS

Hans-Jürgen Knoch, Neckargemünd; Bernd Ruf, Weiterstadt, and Rudi Stellberger, Kronau, all of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Aug. 19, 1994, Ser. No. 293,677
Claims priority, application Germany, Aug. 19, 1993, 43 27 863.9
Int. Cl.[6] B26D *1/22*
U.S. Cl. 83—507 **8 Claims**



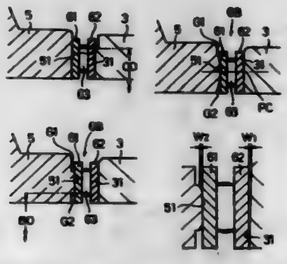
1. A device for holding perforating tools opposite a sheet-carrying cylinder of a rotary printing press, comprising a bearing and indexing shaft, a carrier body axially displaceably supported by said shaft, said carrier body being formed with a bore extending therethrough axially parallel to said shaft, said carrier body being provided with clamping means for clamping said carrier body relative to said shaft and with actuating means for effecting a mutual clamping of said shaft and said carrier body and for releasing a mutual clamping of said shaft and said carrier body, said actuating means comprising rotatably supported rings carried by said carrier body around said shaft, said rings including an

eccentric ring provided with a perforating tool, wherein said carrier body is formed with a stop, and said eccentric ring is formed with a pair of stops, and including a compression spring disposed between said stop of said carrier body and one of said pair of stops of said eccentric ring.

5,596,920
SWASH PLATE TYPE COMPRESSOR

Satoshi Umemura; Hisato Kawamura; Toshiyuki Mizuno, all of Kariya, Japan; Michelle Alberda, Kuala Lumpur, Malaysia; Hayato Ikeda, Kariya, Japan; Tomoji Tarutani, Kariya, Japan; Keishi Nakagaki, Kariya, Japan; Yasunori Ueda, Kariya, Japan; Hideo Meri, Kariya, Japan; Kazuya Kimura, Kariya, Japan; Yuji Kawashige, Kariya, Japan, and Hirofumi Sato, Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 342,713, Nov. 21, 1994, Pat. No. 5,528,976. This application Apr. 5, 1995, Ser. No. 417,386
Claims priority, application Japan, Apr. 6, 1994, 6-068768; Apr. 25, 1994, 6-086542; May 2, 1994, 6-093482
Int. Cl.[6] F01B 3/00
U.S. Cl. 92—71 26 Claims



26. A compressor having a drive shaft rotatably supported in a cylinder block, a swash plate coupled to said drive shaft for rotation in accordance with rotation of the drive shaft, and a plurality of pistons reciprocating in associated cylinder bores in said cylinder block to compress gas in accordance with rotation of said swash plate, said compressor comprising:

a first thrust bearing and a second thrust bearing provided in said cylinder block, with said first thrust bearing located on one side of said swash plate and said second thrust bearing located on the opposite side of said swash plate for receiving axial loads applied to said swash plate and drive shaft upon reciprocation of said pistons;

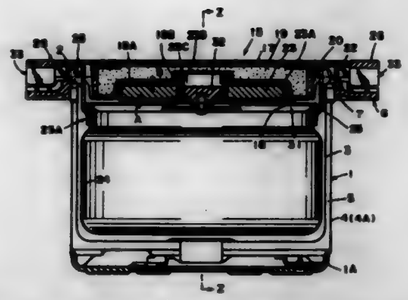
said first thrust bearing having a radially inner portion clamped at opposite sides thereof continuously around its entire circumference between the swash plate and the cylinder block, and having a radially outer portion spaced by a clearance gap from at least one of the swash plate and the cylinder block to allow the swash plate to tilt with respect to the first thrust bearing within the clearance gap in response to a force moment applied to the swash plate when the compressor is operating.

5,596,921
THERMALLY INSULATED COOKING DEVICE

Takashi Kawano; Yoshiya Nishino; Yasuhiko Komiya, and Kunio Matsuda, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan

Filed Apr. 30, 1996, Ser. No. 640,316
Claims priority, application Japan, Aug. 31, 1995, 7-223709
Int. Cl.[6] A47J 27/00;36/00; A45C 11/20
U.S. Cl. 99—340 6 Claims

1. A thermally insulated cooking device comprising; an insulated container, a cooking pot suspended in space inside the insulated container, an insulated outer lid which is able to close off an upper opening of said insulated container, and an inner lid for closing off an upper opening of said cooking pot, wherein a heat retaining material which can be heated by microwaves is removably provided on an inner face of said insulated outer lid.



5,596,922
APPARATUS FOR COOKING A FOOD PRODUCT

Cynthia W. Chan, Kowloon, Hong Kong, assignor to Ylng Fat Electric Products Ltd., Hong Kong

Filed May 22, 1995, Ser. No. 446,485
Int. Cl.[6] A47J 37/00; A21B 5/02
U.S. Cl. 99—380 8 Claims

1. Apparatus for cooking a food product comprising a mold assembly for receiving the food product, said mold assembly comprising co-operating first and second molds, wherein each of said molds each mold having an associated heating element is provided with two radially opposed arcuate side wall portions, the side wall portions in one of said molds being disposed at substantially 90° relative to the side wall portions formed in the other of said molds, whereby when said first and second molds are brought together to define said mold assembly, said partial side wall portions define a substantially continuous side wall.

5,596,923
PRESS WORKING MACHINE

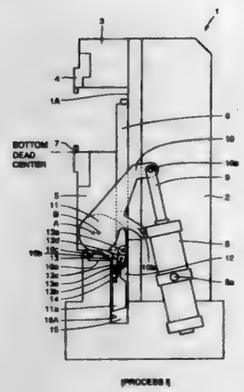
Toshiaki Enami, Kyoto, Japan, assignor to Enami Seiki Mfg. Co., Ltd., Yao, Japan

Filed Apr. 17, 1996, Ser. No. 633,570
Claims priority, application Japan, May 25, 1995, 7-126838
Int. Cl.[6] B30B 15/16;1/08
U.S. Cl. 100—53 1 Claim

1. A press working machine comprising:

a frame having a prescribed reference plane spreading out in the vertical direction;

an upper mold base being fixedly provided on said reference plane for fixing an upper mold;



a guide rail being provided on said reference plane under said upper mold base along the vertical direction;

a lower mold base for fixing a lower mold being slidable in the vertical direction along said guide rail;

a first side wall being provided on the lower end portion of said reference plane at a first distance with respect to said reference plane, for defining a groove portion along with said reference plane;

a horizontal plane being provided in an opposite direction to said reference plane to be continuous from the upper end of said first side wall;

a second side wall being provided on said horizontal plane in a position separated from said reference plane by a second distance being larger than said first distance in the vertical direction with respect to said horizontal plane;

a first working plate having an end being rotatably mounted on said lower mold base about a first rotation axis;

an air cylinder being mounted on the other end of said first working plate for rotating said first working plate about said first rotation axis;

a second working plate being rotatably mounted with respect to said first working plate about a second rotation axis being provided on a side closer to said reference plane than said first rotation axis, said second working plate being provided on its another end with an insertion member being receivable in said groove portion;

urge means being mounted on said insertion member of said second working plate to be movable between a first position for coming into contact with said reference plane and supplying urging force to said second working plate for separating the same from said reference plane and a second position canceling said urging force;

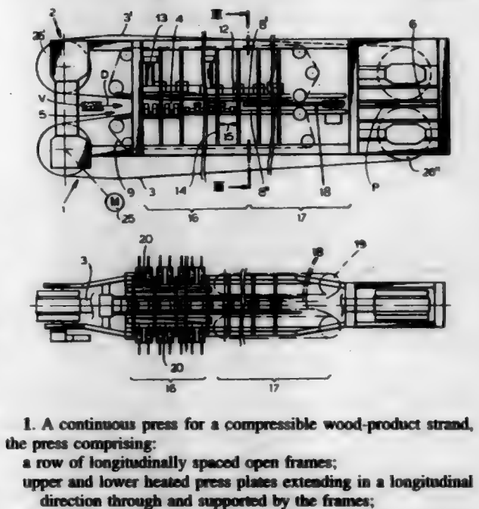
a first engaging member being mounted on said first working plate for moving said urge means from said first position to said second position following rotation of said first working plate in a state upwardly positioning said lower mold base, and a second engaging member for moving said urge means from said second position to said first position; and

a conversion member being mounted on a prescribed position under said reference plane for converting said first and second positions of said urge means following vertical movement of said second working plate in a state downwardly positioning said lower mold base.

5,596,924
BELT PRESS FOR CONTINUOUS MANUFACTURE OF WOOD-PRODUCT MEMBERS

Klaus Gerhardt, Rheurdt, Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Germany

Filed Oct. 24, 1995, Ser. No. 547,423
Claims priority, application Germany, Oct. 29, 1994, 44 38 729.6
Int. Cl.[6] B30B 5/06
U.S. Cl. 100—930 RP 7 Claims



1. A continuous press for a compressible wood-product strand, the press comprising:

a row of longitudinally spaced open frames;

upper and lower heated press plates extending in a longitudinal direction through and supported by the frames;

respective upper and lower sheet-steel belts having respective lower and upper stretches extending longitudinally parallel to each other through the row of frames between the plates from the upstream to the downstream ends and defining a longitudinally extending passage having an upstream end, a downstream end, and a center between the ends;

means for advancing the stretches longitudinally downstream and thereby drawing in the wood-product strand longitudinally and compressing it transversely;

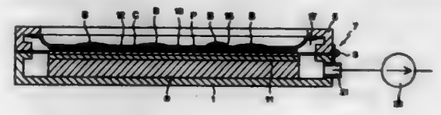
two sets of transversely displaceable downstream pressing elements transversely oppositely engageable between the center and the downstream end with the strand between the belts and displaceable longitudinally downstream synchronously with the strand; and

means mounted on the press plates between the frames for urging the pressing elements transversely inward against the strand.

5,596,925
METHOD AND DEVICE FOR PRESSURE TYPE STENCIL PRINTING

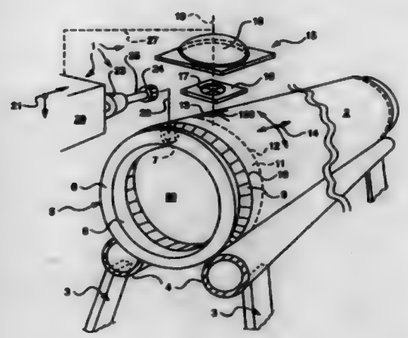
Takanori Hasegawa, Tokyo-to, Japan, assignor to Riso Kagaku Corporation, Tokyo-to, Japan

Continuation of Ser. No. 212,833, Mar. 15, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 514,983
Claims priority, application Japan, Mar. 18, 1993, 5-058572
Int. Cl.[6] B41F 15/20
U.S. Cl. 101—127.1 22 Claims



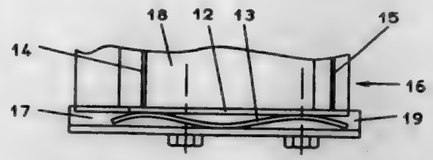
1. A method for stencil printing, comprising the steps of:
preparing printing ink having a sufficient consistency to retain its shape;
depositing said printing ink as ink lumps on a stencil master plate;
placing said stencil master plate in a pressure chamber having a wall portion defined by a diaphragm which is at least either flexible or elastic, with a surface of said stencil master plate on which said ink lumps are deposited facing said diaphragm; and
depressurizing said pressure chamber to cause said diaphragm to come into close contact with said ink lumps deposited on said stencil master plate and said stencil master plate to come into close contact with a printing surface;
whereby a stencil printing is made on said printing surface by applying a pressure onto said ink lumps deposited on said stencil master plate by way of said diaphragm.

5,596,926
PROCESS AND APPARATUS FOR PRODUCING PRECISELY-REGISTERED ROTARY SCREENS
Johannes Zimmer, Ebentaler Str. 133, 9020 Klagenfurt, Germany
Filed Sep. 23, 1992, Ser. No. 949,147
Claims priority, application Germany, Sep. 23, 1991, 41 32 088.3
Int. Cl.[6] B41M *1/12*; B41L *13/00*
U.S. Cl. 101—129 **23 Claims**



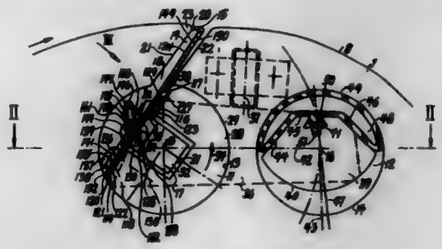
1. A process for the manufacture of a precisely-registered rotary screen drum for a printing machine of the type utilizing a thin-walled screen drum, a screen register mark precisely coinciding with a screen pattern register, and two circular end rings each fixed to a respective end of the screen drum by an adhesive, at least one of the two end rings being provided with a register notch which can be made to coincide with the associated screen register mark with respect to a circumferential direction of the screen, comprising the steps of:
(a) fitting first and second end rings without register notches to first and second ends of a rotary screen drum having a screen register mark thereon;
(b) after step (a), providing a rotation-and sliding-proof connection for each of the first and second end rings to the respective ends of the rotary screen drum using an adhesive;
(c) curing the adhesive to form a bonded joint between each of the end rings and the rotary screen drum; and
(d) after step (c), forming a register notch in at least one of the end rings in register with the screen register mark, using a tool that is oriented with the screen register mark in accordance with a given relative setting between the tool and the rotary screen drum.

5,596,927
CHAMBER DOCTOR
Dieter Maurer, Kissing; Manfred Stadlmair, Kühbach, and Ernst Marny, Friedberg, all of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach am Main, Germany
Filed May 27, 1994, Ser. No. 250,403
Claims priority, application Germany, May 27, 1993, 9307999 U; Aug. 10, 1993, 43 26 810.2
Int. Cl.[6] B41F *31/04*; B41L *27/06*
U.S. Cl. 101—363 **15 Claims**



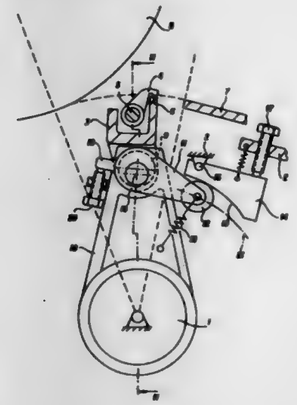
1. A chamber doctor, comprising: a body; a work blade fastened to the body and having lateral end sides; side members on each end side of said chamber doctor body arranged so as to laterally encloae the chamber doctor body; and magnet means for drawing the side members toward the lateral end sides of the work blade so that the side members are resiliently held against the lateral end sides of the work blade.

5,596,928
PLATE CYLINDER
Jean-Claude Marmin, Estrees-Saint-Denis, and Joel Bastard, Thiverny, both of France, assignors to Heidelberg Harris S.A., Montaire, and Heidelberger Druckmaschinen AG, Heidelberg, both of Germany
Continuation of Ser. No. 293,993, Aug. 22, 1994, abandoned. This application Oct. 30, 1995, Ser. No. 550,429
Claims priority, application France, Aug. 20, 1993, 93 10145
Int. Cl.[6] B41F *27/00*
U.S. Cl. 101—378 **17 Claims**



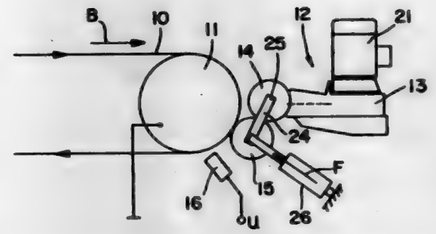
1. A plate cylinder for fastening a printing plate having a posterior end and an anterior end, the plate cylinder having a longitudinal axis of rotation, the plate cylinder comprising:
an external surface, the plate cylinder having a longitudinal bore and a longitudinal slit, the longitudinal slit having a first mouth and a second mouth, the first mouth opening along the external surface of the plate cylinder and the second mouth opening along the longitudinal bore;
the longitudinal slit defining a rear side and a front side, the rear side of the longitudinal slit connecting with the external surface of the printing plate to form a spur for fastening the anterior end of the printing plate;
a first leaf having a first end region and a second end region, the first leaf located in the longitudinal slit, the first end region for contacting the posterior end of the printing plate; and
a bar located at least partially in the longitudinal bore, the first leaf removably connected to the bar at the second end region of the first leaf, the bar capable of moving the first leaf between a first limiting position and a second limiting position;
the first leaf being removable through the slit by movement of said first end region causing disconnection of said bar and said second end region.

5,596,929
DEVICE FOR REGISTER CORRECTION AND FOR COMPENSATING FOR DISTORTED SHEETS IN A FEEDER OF A SHEET-FED ROTARY PRINTING PRESS
Andreas Fricke, Eberbach, and Heiner Luzem, Wilhelmsfeld, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Filed Sep. 28, 1995, Ser. No. 535,710
Claims priority, application Germany, Sep. 28, 1994, 44 34 624.7
Int. Cl.[6] B41F *21/00*
U.S. Cl. 101—410 **7 Claims**



1. A device for register correction and for compensating for distorted sheets in a pregripper of a feeder for a sheet-fed rotary printing press, comprising:
a pregripper shaft and a pregripper assembly supported on said pregripper shaft, said pregripper assembly including a gripper bar having end supports supported on said regripper shaft, and a plurality of sheet grippers disposed side by side on said gripper bar for gripping an slaving sheets in a sheet feeding direction;
a frame-fixed brace disposed on said pregripper shaft and located approximately centrally between said end supports of said gripper bar, said frame-fixed brace serving to elastically bead said gripper bar in the sheet-feeding direction before a sheet is gripped by said sheet grippers;
an adjustable cam having a frame-fixed support;
said frame-fixed brace including an eccentric element with a lever arm articulated on an eccentric joint, and a cam roller carried on said lever arm distally from said eccentric joint, said cam roller rolling on said adjustable cam.

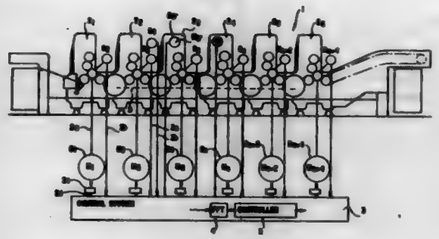
5,596,930
PROCESS AND DEVICE FOR MOISTENING A MOVING PRINTED THEN THERMALLY DRIED WEB OF MATERIAL
Alfred Keller, Leinfelden-Echterdingen, and Günther Cernoe, Steinenbronn, both of Germany, assignors to Weitmann & Konrad GmbH & Co., Leinfelden-Echterdingen, Germany
PCT No. PCT/DE93/00715, § 371 Date Feb. 16, 1995, § 102(e) Date Feb. 16, 1995, PCT Pub. No. WO94/04364, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 7, 1993, Ser. No. 387,822
Claims priority, application Germany, Aug. 17, 1992, 42 27 136.3
Int. Cl.[6] B41M *7/00*
U.S. Cl. 101—483 **34 Claims**



1. A process for moistening a moving web of material, having two opposed sides, especially for remoistening a printed and thermally dried web of printed material, where a moistening agent is applied to the web of material, comprising the steps of:
cooling the web following the thermal drying by, in part, passing the web of material onto a cooled guide element (11) with one of the sides of the web of material in contact with the cooled guide element;
wetting at least one of the sides of the web by:
supplying a metered amount of a moistening agent onto one roll (15); and at a point at which the web contacts the cooled guide element,
pressing the one roll (15) with a predetermined amount of force against the side of the web of material opposed to the one side in contact with the cooled guide element (11) to apply the metered amount of moistening agent to the web of material (10) while the web is still substantially hot and dry.

5,596,931
DEVICE AND METHOD FOR DAMPING MECHANICAL VIBRATIONS OF A PRINTING PRESS
Georg Rämer, Angelbachtal, and Bernhard Wagenmann, Wiesloch, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany
Continuation-in-part of Ser. No. 138,333, Oct. 18, 1993, abandoned. This application Sep. 1, 1995, Ser. No. 522,862
Claims priority, application Germany, Oct. 16, 1992, 42 34 928.1
Int. Cl.[6] B41F *1/66*
U.S. Cl. 101—484 **12 Claims**

11. In a rotary printing press having rotating parts, at least one actuating member coupled to the rotating parts, and at least one vibration pick-up coupled to said rotating parts for picking up vibrations in the rotating parts, a method for damping vibrations i the rotating parts, the method which comprises the steps of:
generating with said pick-up signals representing amplitude and phase of the vibrations;
applying a correction factor to the amplitude of the signals; and
applying the signals with the corrected signal amplitude to said actuating member opposingly to said vibrations for damping said vibrations.



1. A reinforced, thermoformed, plastic pallet for bearing a load, comprising a generally rectilinear body having an upper surface and a lower surface and at least one pair of opposing support sides; at least one reinforcing bar-receiving channel extending substantially longitudinally between said at least one pair of opposing support sides; and reinforcing bar means received within said at least one reinforcing bar-receiving channel, said reinforcing bar means being of a thin-steel construction; said rectilinear body having a plurality of opposed reinforcing bar positioning detents which extead into said bar-receiving channel, said positioning detents being laterally offset and longitudinally spaced to engage said reinforcing bar means such that said reinforcing bar is substantially prevented from moving laterally within said channel by contact with said detents.

5,596,932

PROCESS AND APPARATUS FOR THE TYPOGRAPHICAL LABELING OF FOLDED PRINTED PRODUCTS ON AN INNER SIDE

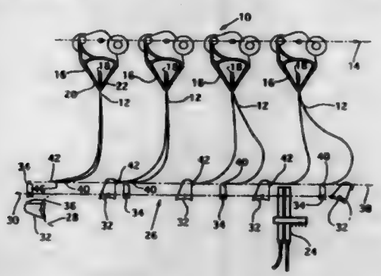
Werner Honegger, Bich, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 26, 1995, Ser. No. 548,447

Claims priority, application Switzerland, Oct. 28, 1994, 03230/94

Int. Cl.[6] B41F 27/00

U.S. Cl. 101—485 16 Claims



1. A process for the typographical labeling of folded printed products on at least an inner side in a border region thereof comprising the steps of retaining folded printed products defined substantially by two halves by a conveying device, at least partially opening and guiding the printed products past a printing head wherein the typographical labeling is applied to the inner side of at least one half of a printed product in an at least essentially planar region thereof, transporting the folded printed products with their fold transverse with respect to a conveying direction to expose a region which is to be labelled typographically, moving apart the printed product halves in the conveying direction by providing an opening device, and retaining the two halves of the printed products at the fold thereof and pressing them against one another with grippers of the conveying device.

5,596,933

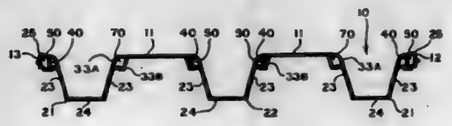
REINFORCED PLASTIC PALLET

John W. Knight, New Concord; Paul W. Baker, Cambridge, and David P. Jones, Kimbolton, all of Ohio, assignors to The Fabri-Form Co., Byesville, Ohio

Filed Feb. 14, 1994, Ser. No. 194,866

Int. Cl.[6] B65D 19/00

U.S. Cl. 108—51.1 22 Claims



5,596,934

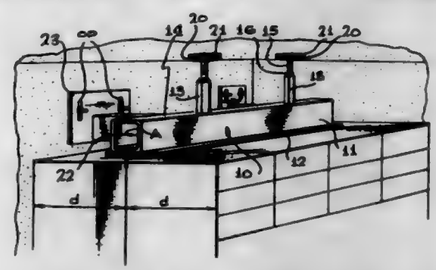
SEISMIC RESTRAINT SYSTEM

Dennis Hamm; Glenn Brake, and James G. Johanson, all of Pasadena, Calif., assignors to Pacific Bank Technology, Inc., Pasadena, Calif.

Filed Feb. 1, 1995, Ser. No. 381,746

Int. Cl.[6] E05G 1/00

U.S. Cl. 109—50 12 Claims



1. A seismic restraint system in combination with safe deposit boxes in a safe depoait vault having seismic resistant walls, floor and ceiling comprising:

a compression beam having a length substantially the length of a stack of safe deposit boxes;

said compression beam having a lower surface for the application of bearing pressure upon the stack of safe deposit boxes;

a ceiling plate for the application of bearing pressure from the ceiling of the vault to the stack of safe deposit boxes through said compression beam; and

adjustable extension means for engaging said compression beam and said ceiling plate to transmit compresive load therethrough after adjustment to accommodate the difference in space between said ceiling plate and said compression beam.

5,596,935

SYSTEM FOR AND METHOD OF SOIL REMEDIATION AND HOT MIX ASPHALT PRODUCTION

Malcolm L. Swanson, Chickamauga, Ga., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Nov. 3, 1995, Ser. No. 552,720

Int. Cl.[6] B09B 3/00

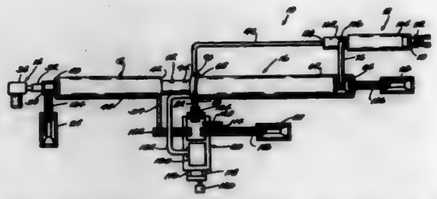
U.S. Cl. 110—235 20 Claims

1. A system for remediating contaminated soils and producing hot mix asphalt (HMA), said system comprising:

(A) a soil incinerator having first and second axial ends and having a contaminated soil inlet and a reclaimed soil outlet;

(B) a burner which directs a flame into said first end of said soil incinerator;

(C) an aggregate dryer having first and second axial ends and having a raw aggregate inlet and a heated and dried aggregate outlet; and



(D) a duct extending directly from said second end of said soil incinerator to said first end of said dryer, wherein said duct

(1) directs heated gases from said soil incinerator to said dryer,

(2) acts as a heat source for said dryer, and

(3) is dimensioned and configured to form an afterburner which incinerates combustible products driven from said contaminated soil in said soil incinerator but not destroyed in said soil incinerator.

15. A method of remediating contaminated soils and producing hot mix asphalt (HMA), said method comprising:

(A) introducing contaminated soil into a contaminated soil inlet of a rotary soil incinerator;

(B) directing a burner flame into a first end of said soil incinerator thereby to incinerate said soil to form reclaimed soil;

(C) discharging said reclaimed soil from said soil incinerator;

(D) drawing hot gases from a second end of said soil incinerator and into a duct connected to said second end of said soil incinerator;

(E) drawing hot gases from said duct into a first end of a rotary dryer;

(F) feeding raw aggregate into a raw aggregate inlet of said dryer;

(G) heating and drying raw aggregate in said dryer, via heat transfer from said hot gases, thereby producing heated and dried aggregate;

(H) discharging said heated and dried aggregate from said dryer; and

(I) incinerating, in said duct, combustible products driven from said contaminated soil in said soil incinerator but not incinerated in said soil incinerator.

5,596,936

RAIL CAR BRIDGE PLATE

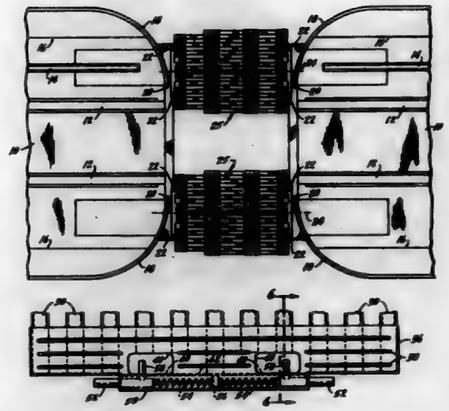
Robert L. Bullock, and Bruce M. Bullock, both of Antioch, Ill., assignors to Standard Car Truck Company, Park Ridge, Ill.

Continuation of Ser. No. 192,055, Feb. 4, 1994, which is a continuation-in-part of Ser. No. 161,755, Dec. 3, 1993, abandoned. This application Aug. 11, 1995, Ser. No. 514,414

Int. Cl.[6] B61D 49/00

U.S. Cl. 105—458 10 Claims

1. A portable bridge plate assembly attachable to and removable from facing ends of rail cars for use in moving vehicles between stationary rail cars for loading and unloading, said plate assembly having a maximum weight of 40 lbs., a minimum strength requirement of 4500 lbs., and a fatigue load of 1500 lbs., said plate assembly having sufficient length to span the space between adjacent rail cars, having sufficient width to accommodate vehicles of varying wheelbase and having sufficient strength to support a vehicle, said plate assembly including two relatively movable telescoping load bearing plate members, said plate members being relatively movable to accommodate variant spacing between the facing ends of stationary rail cars, said plate members being secured together to permit relative movement only in a direction parallel to the plate assembly, each said plate member including a plurality of spaced tubular members, an end connector at the outboard end of each said plate member, a spring-biased latch for securing each said plate member to the end of a rail car, each of said end connectors including a hand opening in the end thereof adjacent the spring-biased latch, each said spring-biased latch having an operating handle accessible through said hand openings.



5,596,937

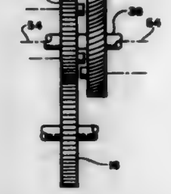
DELAYED MOTION DRIVE FOR MODEL RAILROAD LOCOMOTIVES

William J. McKown, 2527 Mary St., Montrose, Calif. 91020

Filed Sep. 1, 1994, Ser. No. 300,153

Int. Cl.[6] B61C 9/00

U.S. Cl. 105—96 1 Claim



1. Apparatus for imparting a delayed rotary motion to a gear, comprising:

a first gear having a first face, said first gear rotatable about an axis through its center;

a second gear having a first face that faces the first face of said first gear, said second gear rotatable about said axis;

means for mounting said first gear and said second gear for rotation about said axis;

a first pin that protrudes parallel to said axis from the first face of said first gear;

a second pin and a third pin that both protrude parallel to said axis from the first face of said second gear;

said first pin, said second pin, and said third pin all located at the same radius from said axis;

the protrusion of said first pin plus the protrusion of said second pin exceeding the separation between said first gear and said second gear;

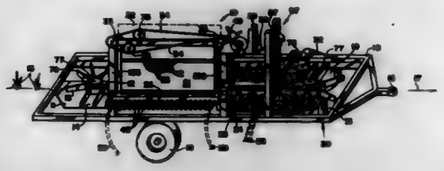
the protrusion of said first pin plus the protrusion of said third pin exceeding the separation between said first gear and said second gear.

5,596,938

APPARATUS FOR UNLOADING SEEDLINGS FROM A TRAY AND TRANSPORTING THEM ELSEWHERE

Lawrance N. Shaw, 8715 NW. 4th Pl., Gainesville, Fla. 32607-1412

Filed Jun. 7, 1995, Ser. No. 487,893
Int. Cl.[6] A01C *11/02*
U.S. Cl. 111—105 15 Claims



1. An apparatus for receiving at an entrance station successive trays of nursery seedlings growing in individual cells each having an ejector hole in the bottom thereof, the cells being arranged in rows in a checkerboard pattern; ejecting the seedlings from their cells individually into moving compartments, and transporting them to an exit station for discharge one at a time; said apparatus comprising an entrance station including a vertical chute for holding said trays positioned on edge vertically with the stalks of said seedlings generally horizontal, and including means for moving each tray vertically downward at selected times to position each successive horizontal row of said cells at a selected elongation for ejection of seedlings therefrom; said apparatus including a plurality of ejection fingers arranged in a horizontal row and adapted to be extended one at a time to protrude into said ejection hole of each cell successively in a row of said tray to eject the seedling from said cell and subsequently to be withdrawn from said cell; said apparatus including a succession of moving compartments each of a size to receive a single seedling as it is ejected from said tray and to retain that seedling lying on its side as it is transported horizontally to said exit station to be discharged therefrom; said apparatus including pneumatic means to power said ejection fingers in their movement of extension and withdrawal and to time the movement of the tray past the ejection fingers; and power means to operate all other moving components of said apparatus.

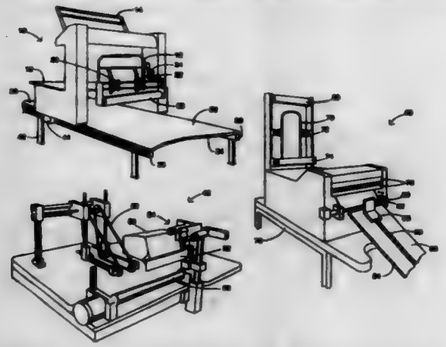
5,596,939

APPARATUS FOR FORMING TUBULAR COLLARS

Edward R. LaVelle, Staley, and Robert E. Butler, Fairmont, both of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Jun. 22, 1994, Ser. No. 263,881
Int. Cl.[6] D05B *33/02;35/02;41/00;* B26D *1/24*
U.S. Cl. 112—130 85 Claims

1. An apparatus for converting a length of tubular fabric into a



plurality of fabric bands for use in the manufacture of apparel collars, cuffs and bands, said apparatus comprising:

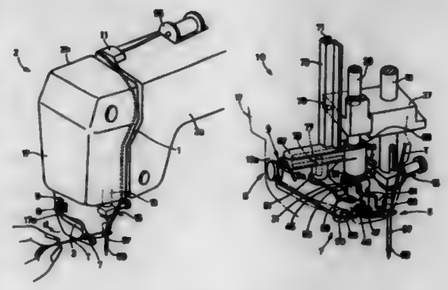
(a) a slitter adapted to cut said tubular fabric into longitudinal fabric strips with opposed edges;
(b) an overhead frame located downstream of said slitter having a plurality of rollers for separating adjacent plies of said longitudinal fabric strips into individual plies;
(c) a seamer adapted to longitudinally fold said individual plies of fabric strips and to seam said edges together to form a plurality of tubes; and
(d) a cutter adapted to transversely cut each of said tubes into bands having a predetermined width.

5,596,940

APPARATUS FOR TREATING END PORTION OF SEWING THREAD

Takahiro Yamada, Toyoake; Masao Ogawa, and Eiji Shibata, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 14, 1995, Ser. No. 572,712
Claims priority, application Japan, Dec. 22, 1994, 6-320548
Int. Cl.[6] D05B *87/02*
U.S. Cl. 112—225 20 Claims



1. An apparatus for treating, before commencement of a sewing operation of a sewing machine including a threading device which puts a sewing thread through an eye hole of a sewing needle, an end portion of the sewing thread so that a predetermined length of the thread is drawn out through the needle eye, the apparatus comprising:

a guiding device which guides, along a thread-guiding route passing near the sewing needle, the sewing thread supplied from a thread supplying device before the commencement of the sewing operation of the sewing machine;

said guiding device including a guiding member which is provided in said thread-guiding route and which engages the sewing thread supplied from the thread supplying device;

an intermediate holding device which is provided on a downstream side of said guiding member in said thread-guiding route and which holds the sewing thread with a biasing force applied substantially perpendicularly to the thread-guiding route;

a cutting device which is provided, on a downstream side of said intermediate holding device in said thread-guiding route, at a position around a visible side surface of the sewing machine, and which cuts off an excessive length of the end portion of the sewing thread held by the intermediate holding device, at said position distant by a predetermined distance from said guiding member in the thread-guiding route; and

a downstream holding device which is provided on an upstream side of said cutting device, and on a downstream side of said intermediate holding device, in said thread-guiding route and which holds a remaining end portion of the sewing thread cut by said cutting device,

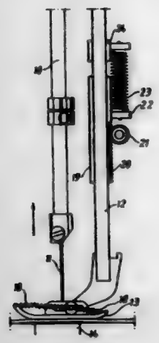
said guiding member being movable toward the sewing needle to stretch a portion of the sewing thread in front of the needle eye, so that the sewing thread is put through the needle eye by the threading device of the sewing machine.

5,596,941

LIFTING CONTROL FOR SLIDABLE PRESSER FOOT

Jan-Olof Lundén, Huskvarna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 28, 1996, Ser. No. 608,253
Claims priority, application Sweden, Mar. 17, 1995, 9500954
Int. Cl.[6] D05B *29/02;29/08*
U.S. Cl. 112—239 7 Claims



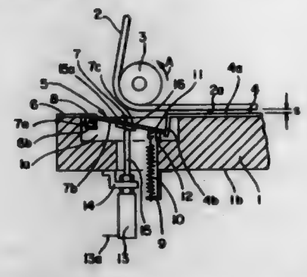
1. An arrangement in a sewing machine, comprising a needle bar (10; 40) having a needle (11; 41), a feed dog (14; 44) for feeding a fabric to be sewn, and a vertically movable presser bar (12; 42) having a presser foot (13; 43; 63) and a presser spring (23; 53), said presser bar being actuated by a power-driven actuating means (19; 49) connected to said presser spring and slidable in parallel with said presser bar, said actuating means being movable relative to said presser bar to control the presser foot pressure and to engage the presser bar in order to raise and lower the presser foot during a sewing procedure in accordance with a predetermined program, wherein the presser foot is horizontally movable relative to the presser bar together with the fabric during feeding steps, said actuating means is operable to raise said presser foot independently of the needle bar, and said presser foot is actuated by resilient means in order to, when raised, be returned to an initial position relative to the presser bar.

5,596,942

FEEDING SUPPORT FOR A SEWN PRODUCT

Hiroshi Kojima, Utsunomiya, and Nobuo Baba, Kaminokawa-machi, both of Japan, assignors to The Singer Company N.V., Curacao, Netherlands

Filed Aug. 4, 1994, Ser. No. 285,684
Claims priority, application Japan, Sep. 21, 1993, 5-256281
Int. Cl.[6] D05B *35/00*
U.S. Cl. 112—260 1 Claim



1. A feeding support for a sewn product provided in a sewing device of the type comprising a sewing machine table having a feeding surface and a feeding end, and feeding members positioned above the feeding surface and spaced therefrom by a given gap, wherein the sewn product is sewn by the sewing device as the sewn product is advanced along the table by the feeding members from the feeding end of the table through the gap past a sewing station, said feeding support comprising:

a sewn product supporting member positioned under the feeding members at the feeding end of the table for carrying the sewn product thereon; and

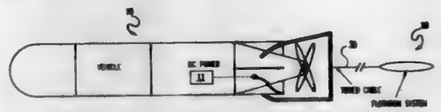
a vertically driving unit attached to said sewn product supporting member for vertically moving the supporting member between a first position located below the height of the feeding surface and a second position located at the height of the feeding surface, said supporting member partially overlapping the feeding members and being spaced therefrom by the given gap when the supporting member is in its second position.

5,596,943

APPARATUS AND METHOD FOR FLOATING A TOWED DEVICE FROM A SUBMERGED VEHICLE

Duane M. Horton, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1995, Ser. No. 521,380
Int. Cl.[6] B63G *8/14*
U.S. Cl. 114—245 17 Claims



1. A method of surfacing a payload comprising the steps of:

providing a surfaceable underwater vehicle having water therein, said payload being located on said vehicle;

electrolyzing said water into its constituent gases; and

displacing water from within the submerged vehicle with said constituent gases to increase positive buoyancy.

5,596,944

BOAT TRAILER MARKING DEVICE

Richard A. Massie, H.C. 1 Box 188, Forsyth, Mo. 65653

Continuation-in-part of Ser. No. 7,069, Jan. 21, 1993, abandoned, and a continuation-in-part of Ser. No. 152,194, Nov. 12, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,365
Int. Cl.[6] B60Q *1/50;* G08B *21/00*
U.S. Cl. 116—28 R 12 Claims

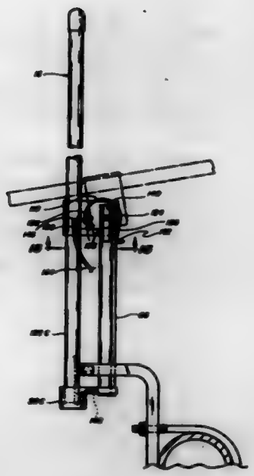
1. A boat trailer marking device comprising:

an elongated element, said elongated element attached to a mounting device in pivotal relation therewith at a pivot point in said elongated element,

said elongated element having an extension arm projecting from said pivot point,

said extension arm having visible means for marking water depth included with said extension arm,

said elongated element having a weight arm projecting from said pivot point in the opposite direction from said extension arm, said weight arm having a weight device associated therewith, and a spring associated with said elongated element, said weight arm and said spring adapted to effect rotation of said extension arm into a substantially vertical position.

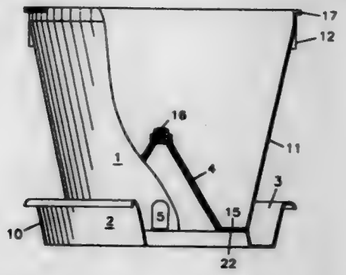


5,596,945
CONSTRUCTION FOR AUTOMATICALLY MILKING ANIMALS
Cornelis van der Lely, Bruchenrain 7, CH-6300, Zug, Switzerland
Filed Jul. 1, 1994, Ser. No. 265,261
Int. Cl.[6] A01K *1/12*
U.S. Cl. 119—14.03 **37 Claims**



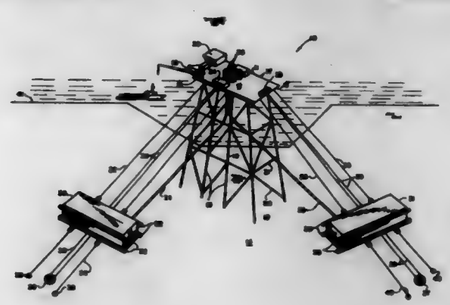
24. A construction for milking animals, such as cows, comprising a milking parlor and a milking robot having a robot head which carries one or more teat cups, characterized in that the milking parlor includes at least two adjacently arranged milking compartments and the milking robot is set-up in such a manner that in a first of said compartments the robot head can enter from one side and in a second of said compartments from another side.

5,596,946
POULTRY AND BIRD FEED DELIVERY SYSTEM
John C. Bryant, 9210 Henry Harris Rd., Fort Mill, S.C. 29715, and James C. Harkey, 8501 Landsford Rd., Monroe, N.C. 28112
Filed May 4, 1995, Ser. No. 435,882
Int. Cl.[6] A01K *39/01*
U.S. Cl. 119—52.1 **20 Claims**



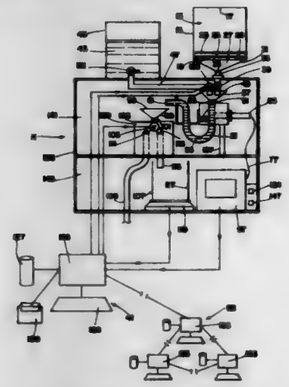
1. A bird feeder comprising:
a feed storage hopper;
said hopper having an inverted frustum having a bottom, a peripheral wall and an open top;
said bottom being flat adjacent to said peripheral wall with a concentric conical projection rising out of said bottom;
said concentric conical projection having a connecting means;
said peripheral wall having uniformly spaced feed distribution aperture spaced from said bottom;
a feed trough having a flat floor, a concentric projection rising out of said floor and outwardly sloping peripheral wall;
said concentric projection having a connecting means; and
said feed storage hopper being connected to said feed trough.

5,596,947
AQUACULTURE APPARATUS FOR USE ADJACENT AN OFFSHORE FIXED PLATFORM
Gregg G. Creppel, New Orleans, and Charles C. Crochet, Lafayette, both of La., assignors to The Watermark Corporation, New Orleans, La.
Filed Aug. 31, 1994, Ser. No. 298,723
Int. Cl.[6] A01K *61/00*
U.S. Cl. 119—223 **10 Claims**



1. An aquaculture apparatus comprising:
a) a platform having a lower end that engages the seabed and an upper end that extends above the water surface;
b) a deck that provides a work surface at the upper end of the platform;
c) multiple guy wires extending from the platform upper end to the seabed along a diagonal path that forms an acute angle of between 20 and 90 degrees with the seabed;
d) anchor pile means for anchoring a first end of each of the guy wires to the seabed, a second end of each guy wire being anchored to the upper end of the platform;
e) at least one powered winch line extending between the platform and the seabed and generally tracking the guy wires;
f) at least one fish pen mounted respectively on the at least one winch line for travel to and from the platform on the at least one winch line and along the guy wires, the at least one winch line providing a means for raising and lowering the at least one fish pen;
g) ballast tank means on each fish pen for aiding in raising or lowering the fish pens relative to the seabed; and
h) flexible conduit means communicating between the work surface and the at least one fish pen for supplying food, oxygenated water, and air for the ballast tank means.

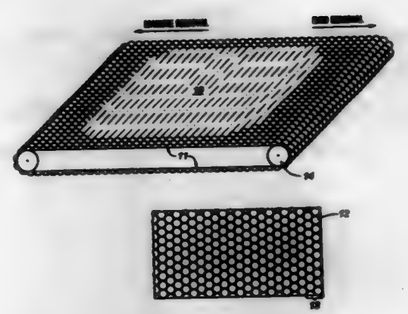
5,596,948
ANIMAL URINE COLLECTION AND ANALYSIS SYSTEM AND ITS METHOD OF USE
David A. Ritchie, Crestwood, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
Filed Jun. 19, 1995, Ser. No. 492,380
Int. Cl.[6] A01K *1/03*
U.S. Cl. 119—417 **40 Claims**



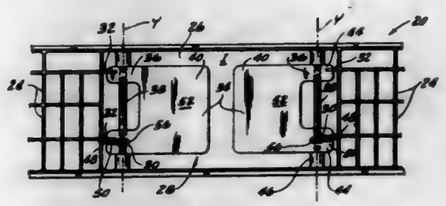
1. An animal urine analysis system, comprising:
a column structured and arranged to receive urine from an animal and to discharge a volume of liquid corresponding to the volume of received urine;
measuring means engaged with said column for measuring a characteristic of said urine; and
weighing means positioned to collect said volume of liquid discharged from said column, said weighing means weighing said volume of discharged liquid to determine a weight of the volume of urine corresponding to said volume of discharged liquid.

5,596,949
HEMISPHERE-BELT FLOOR SYSTEM
Roy C. Fanguy, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.
Filed Sep. 27, 1994, Ser. No. 312,713
Int. Cl.[6] A01K *1/01;31/04*
U.S. Cl. 119—458 **24 Claims**

1. An animal cage apparatus, comprising:
a frame for enclosing the animal; and
a movable floor mounted adjacent said frame to complete the enclosure of the animal, said floor comprising a plurality of protrusions each having a rounded profile and said plurality of protrusions comprising a majority of said floor.

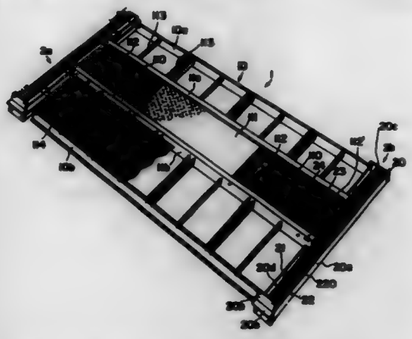


5,596,950
POULTRY TRANSPORT COMPARTMENT WITH INWARDLY OPENING DOORS
Douglas V. Briggs, and George C. Stevens, both of Northwood, N.H., assignors to American Cairn, Inc., Northwood, N.H.
Filed Aug. 4, 1994, Ser. No. 285,997
Int. Cl.[6] A01K *31/07*
U.S. Cl. 119—489 **20 Claims**



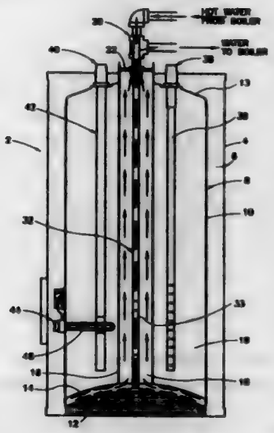
1. A poultry container comprising
a frame assembly defining an interior space, the frame assembly having an opening accessing the interior space to enable the loading of poultry into the poultry container,
two loading doors, each having an end pivotally mounted on the frame assembly of the poultry container to situate the loading door in the opening accessing the interior space, the loading doors being operable to pivot between an open position in which a free end of the door is positioned in the interior space and a closed position in which the loading doors substantially block the opening accessing the interior space of the poultry container,
means for biasing each of the loading doors in the closed position, and
means for restricting the free end of each of the loading doors from swinging outwardly away from the poultry container, whereby upon actuation of the loading doors by an external force directed to the interior space of the poultry container the loading doors pivot inwardly to the open position to define an entryway for the loading of poultry into the container and upon removal of the external force the loading doors are urged to the closed position by the biasing means.

5,596,951
GRATED FLOORBOARD FOR ANIMAL HOUSING
Jean Legadec, Le Relecq-Kerhuon, France, assignor to Galvelpor SA, France
Filed Apr. 3, 1995, Ser. No. 415,486
Claims priority, application France, Jul. 1, 1994, 94 08372
Int. Cl.[6] A01J *1/00*
U.S. Cl. 119—525 8 Claims



1. A floor for an animal box comprising facilities in a form of a ditch for removal of excrement from an upper surface of said floor (1), said floor (1) being mounted above the facilities, said facilities being formed in at least one section (112') of said floor (1), inclined grate mean having one end extending from the surface of said floor (1) towards a vertical orifice (23) at an opposite end of said grates, said orifice providing an exit opening for the evacuation of the excrement, and means accessed via said orifice for emptying said excrement onto collection facilities.

5,596,952
INDIRECT WATER HEATER
Eric M. Lasater, Kentwood, Mich., and Charles W. Staats, Yeadon, Pa., assignors to Bradford White Corporation, Ambler, Pa.
Filed Jul. 24, 1995, Ser. No. 506,094
Int. Cl.[6] F22B *5/00*
U.S. Cl. 122—13.1 26 Claims



1. A heater for potable water adapted for connection to a source of external heated fluid for transfer of heat from said external heated fluid to said potable water in said heater, said heater comprising:

a tank for containing and delivering heated potable water, potable water supply and potable hot water delivery means connected to said tank for introduction of potable water into said tank and for delivery of potable hot water from said tank at a target temperature;

a heat exchanger positioned within said tank and forming a substantially enclosed passageway in the form of a heat exchange chamber within said tank, said heat exchange chamber being connected to receive said external heated fluid from said external source and to transfer heat from said external heated fluid to said potable water in said tank, said heat exchange chamber including a heat exchange section which is oriented at an angle to said substantially enclosed passageway;

supply means connected to said external source and to said heat exchange chamber for introduction of said external heated fluid from said external source into said heat exchange chamber, said supply means including a supply line extending into said substantially enclosed passageway for delivery of said external heated fluid into said heat exchange chamber, wherein said external heated fluid in said supply line is in countercurrent flow with respect to said external heated fluid in said substantially enclosed passageway, thereby inducing countercurrent heat exchange between said external heated fluid in said supply line and said external heated fluid in said substantially enclosed passageway;

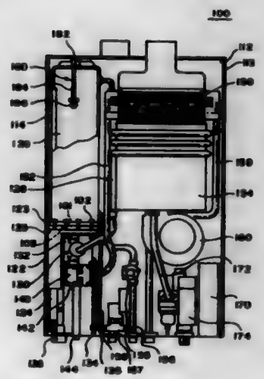
return means connected to said heat exchange chamber and to said external source for returning said external heated fluid from said substantially enclosed passageway of said heat exchange chamber to said external source for reheating;

a supplemental heater connected to said tank and positioned to heat potable water in said tank; and

a control means connected for activating said supplemental heater and shutting off said supply means when heat transferred from said external heated fluid is inadequate to heat said potable water to said target temperature;

said heat exchange section which is oriented at an angle to said substantially enclosed passageway including a heat exchange wall located adjacent a base of said tank.

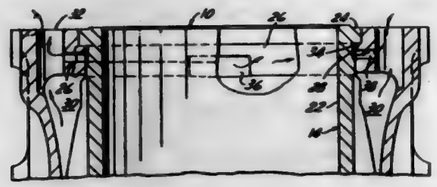
5,596,953
GAS BOILER
Woong S. Hong, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 29, 1995, Ser. No. 580,849
Claims priority, application Rep. of Korea, May 31, 1995, 95-14198
Int. Cl.[6] F22B *5/00*
U.S. Cl. 122—17 19 Claims



1. A gas boiler comprising:
a water tank;

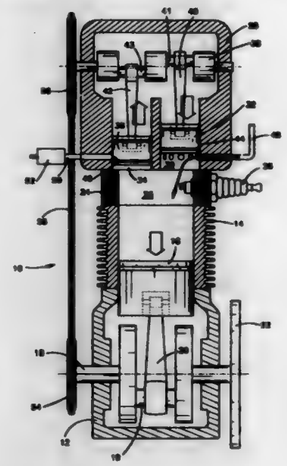
a heat exchanger for heating a first water and a second water;
a circulation pump mounted at the lower portion of said water tank;
a three-way valve mounted at the lower portion of said circulation pump;
a first guide means for supplying the first water to said heat exchanger and for supplying the first water heated within said heat exchanger to a user;
a second guide means for circulating the heated second water between said three-way valve and said heat exchanger by an operation of said three-way valve when the operational mode of said gas boiler is the hot water mode, and for directing the heated second water to a heating place by the operation of said three-way valve when the operational mode of said gas boiler is the heating mode;
a third guide means for guiding the second water which returns from the heating place into said water tank;
a fourth guide means for guiding the second water which has been directed into said water tank into said circulation pump; and
a printed circuit board box having a printed circuit board therein for controlling the operation of said gas boiler.

5,596,954
INTERNAL COMBUSTION ENGINE BLOCK HAVING A CYLINDER LINER SHUNT FLOW COOLING SYSTEM AND METHOD OF COOLING SAME
Lawrence C. Kennedy, Bingham Farms, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 376,870, Jan. 20, 1995, Pat. No. 5,505,167, which is a continuation-in-part of Ser. No. 57,451, May 5, 1993, Pat. No. 5,299,538. This application Dec. 4, 1995, Ser. No. 566,787
Int. Cl.[6] F02F *1/10*
U.S. Cl. 123—41.84 9 Claims



1. In combination, in an internal combustion engine, a cylinder block, having at least one cylinder bore;
a cylinder liner concentrically located within said cylinder bore and secured to said cylinder block;
a main cooling chamber surrounding said cylinder liner and having an inlet port and at least one outlet port for circulating a coolant fluid about a main portion of said cylinder liner;
a secondary cooling chamber located about the uppermost portion of said cylinder liner, said secondary cooling chamber having at least one inlet port and at least one outlet port, said ports being spaced from one another by a substantial distance about the circumference of said secondary cooling chamber, whereby fluid coolant circulated about said secondary coolant chamber is divided into at least two separate flow paths about said secondary cooling chamber and exiting through said secondary cooling chamber outlet port;
said secondary cooling chamber being generally rectangular in cross-section and having an aspect ratio ranging from at least 0.085:1, thereby providing a flow of coolant fluid through said secondary cooling chamber at a flow velocity of substantial magnitude and a significantly increased rate of removal of thermal energy per unit area of said cylinder liner at the uppermost portion of said cylinder liner.

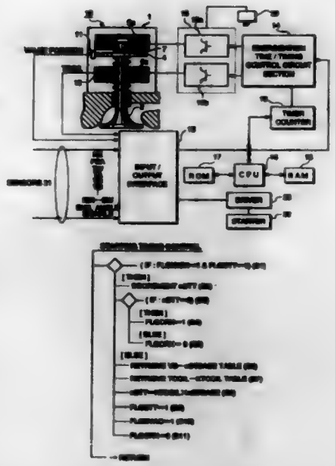
5,596,955
INTERNAL COMBUSTION ENGINE
Louis Szuba, 3219 Bowmen Ln., Parma, Ohio 44134
Filed Oct. 2, 1995, Ser. No. 545,853
Int. Cl.[6] F02B *25/12*
U.S. Cl. 123—51 AA 18 Claims



1. An internal combustion engine, comprising:
a first cylinder;
a first piston disposed in the first cylinder for reciprocating movement therein;
a second cylinder, the second cylinder being in fluid communication with the first cylinder;
a second piston disposed in the second cylinder for reciprocating movement therein;
an intake port opening into the second cylinder, the intake port being covered and uncovered by the reciprocating movement of the second piston;
a third cylinder, the third cylinder being in fluid communication with the first cylinder;
a third piston in the third cylinder for reciprocating movement therein;
an exhaust port opening into the third cylinder, the exhaust port being covered and uncovered by reciprocating movement of the third piston;
means for igniting a fuel-air mixture introduced into the first cylinder through the intake port; and
means for reciprocating the second and third pistons in coordination with the first piston to draw a combustible fuel-air mixture into the first cylinder, to compress the fuel-air mixture in the first cylinder, to ignite the fuel-air mixture in the first cylinder, and to exhaust the combusted fuel-air mixture from the first cylinder.

5,596,956
ELECTROMAGNETICALLY DRIVEN VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES
Ken Ogawa; Eiji Machida, and Hiroshi Sono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 15, 1995, Ser. No. 573,439
Claims priority, application Japan, Dec. 16, 1994, 6-333926; Dec. 16, 1994, 6-333927
Int. Cl.[6] F01L *9/04*
U.S. Cl. 123—90.11 17 Claims

13. An electromagnetically driven valve control system for an internal combustion engine having a combustion cylinder with a valve, comprising:



electromagnetic driving means for electromagnetically driving said valve;

starting signal-detecting means for detecting a starting signal indicative of a command for starting cranking of the engine;

valve-closing control means responsive to detection of said starting signal for driving said valve in a valve closing direction; and

control means for delaying said starting cranking of the engine until said valve is closed in response to said valve-closing control means.

14. An electromagnetically driven valve control system for an internal combustion engine having a combustion cylinder with a valve, comprising:

electromagnetic driving means for electromagnetically driving said valve;

control means for delivering a control signal to said electromagnetic driving means to control same;

starting signal-detecting means for detecting a signal indicative of a command to start cranking the engine;

stoppage signal-detecting means for detecting a signal indicative of a command to stop the engine;

said control means responsive to detection of said signal for starting cranking and said signal to stop the engine for driving said valve in a valve closing direction in response to each said signal; and

said control means including means for maintaining said valve in a closed position after responding to each said signal for a period that avoids interference between said valve and a piston in the combustion cylinder during the starting of cranking and the stopping of the engine.

5,596,957

ENGINE

Hiroki Ichinose, Fujinomiya; Keizo Takeda, Mishima; Susumu Kajima, and Shinji Sadakane, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 16, 1995, Ser. No. 515,883

Claims priority, application Japan, Aug. 17, 1994, 6-193121; Apr. 7, 1995, 7-082857

Int. Cl.[6] F02M *17/00*

U.S. Cl. 123—179.18 **65 Claims**

1. An engine having an intake passage, a throttle valve arranged in the intake passage, and a fuel injector arranged in the intake passage downstream of the throttle valve for injecting fuel into the intake passage, the engine comprising:

an air-flow control valve arranged in the intake passage between the fuel injector and the throttle valve and having a valve element with an axis, the valve element being rotatably about the axis thereof, the air-flow control valve being able to be controlled between a closed position and a full open position; and

valve control means for controlling a valve position of the air-flow control valve, wherein the valve control means controls the air-flow control valve to be substantially closed during an engine starting operation, and to be open after the engine starting operation is finished, and wherein a rotational direction of the valve element is selected so that air flowing through the air-flow control valve is guided by the air-flow control valve toward the fuel injector when the air-flow control valve is controlled to an intermediate open position which is between the closed position and the full open position.

5,596,958

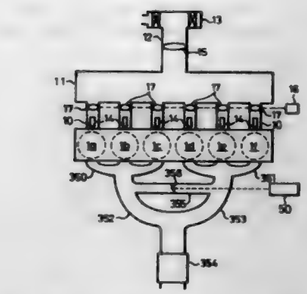
ROCKER ARM BRIDGE FOR INTERNAL COMBUSTION ENGINES

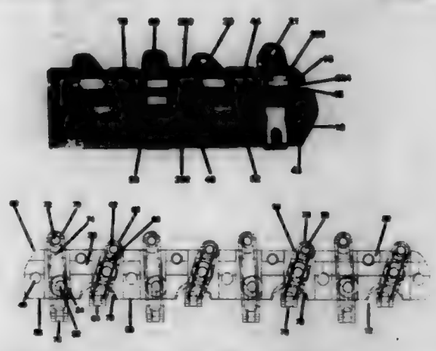
James Miller, 1791 Blount Rd., Suite 501, Pompano Beach, Fla. 33069

Filed Aug. 11, 1995, Ser. No. 514,070

Int. Cl.[6] F01L *1/18*

U.S. Cl. 123—90.23 **13 Claims**





1. A bridged rocker arm assembly comprising:

a base formed from a single piece of rectangularly shaped rigid support structure sized to encompass a bank of cylinders on a cylinder head, said base support structure having an upper surface and a bottom surface, a plurality of support members extend upwardly from said bottom surface with an aperture disposed between each said support member extending to said bottom surface, receptive to a cylinder head mounting bolt for coupling said base support structure to said cylinder head; said upper surface forming a first common shaft receptacle parallel to said bottom surface;

a bridge top formed from a single piece of rectangularly shaped rigid support structure having a bottom surface and a top surface providing an integral support for a plurality of downwardly extending support members having a lower surface forming a second common shaft receptacle;

a shaft means positionable in said first and second shaft receptacles; and

means for coupling said bridge top to said cylinder head.

5,596,959

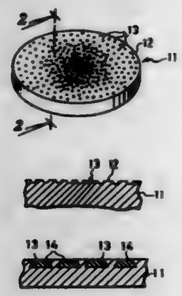
SHIM FOR A TAPPET IN AN INTERNAL COMBUSTION ENGINE

Takeji Kanesaka; Akihiro Hamada, and Shinichi Umino, all of Fujisawa, Japan, assignors to Fuji Oozx Inc., Japan

Continuation-in-part of Ser. No. 539,324, Oct. 4, 1995, abandoned, which is a continuation-in-part of Ser. No. 386,398, Feb. 8, 1995, abandoned. This application Jun. 6, 1996, Ser. No. 659,302

Int. Cl.[6] F01L *1/14*

U.S. Cl. 123—90.33 **8 Claims**



1. A shim for a tappet in an internal combustion engine having a cam which rotates with the engine, comprising;

a shim member mounted on the tappet and having a contact surface thereon for slidably contacting the cam, the contact surface having a central area and a second area surrounding the central area;

the shim having a plurality of bores on the contact surface, the density of the bores in the central area being higher than the density of the bores in the surrounding second area.

5,596,960

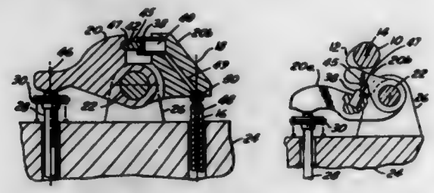
INTERNAL COMBUSTION ENGINE

David J. Hazen, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 2, 1995, Ser. No. 537,969

Int. Cl.[6] F01L *1/18;1/24*

U.S. Cl. 123—90.44 **8 Claims**



1. A rocker arm assembly for an internal combustion engine comprising:

a first rocker arm portion rotatably mounted to a support on said engine thereby providing an axis of rotation, said first rocker arm portion having a surface radially spaced from said axis of rotation for engaging an end of a shaft of said engine;

a second rocker arm portion rotatably mounted relative to said first rocker arm portion, said second rocker arm portion being rotated by a cam surface of a camshaft so as to rotate said second rocker arm portion about said axis of rotation; and,

a hydraulic lash adjuster disposed within said first and said second rocker arm portions and radially spaced from said axis of rotation such that said first rocker arm portion, said second rocker arm portion and said hydraulic lash adjuster, when in use, rotate about said axis of rotation, with said hydraulic lash adjuster comprising:

a fluid filled body fixed relative to one of said first and second rocker arm portions; and,

a plunger reciprocally housed within said body, with said plunger having a substantially convex tip engaging one of said first and second rocker arm portions in a substantially concave recess formed therein such that said convex tip of said plunger is placed substantially in surface contact within said substantially concave recess.

5,596,961

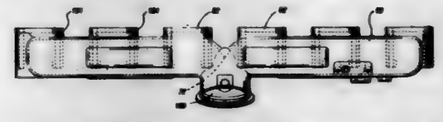
INTAKE MANIFOLD ASSEMBLY FOR FOUR-CYCLE INTERNAL COMBUSTION ENGINE

Roger A. Faber, South Lyon, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.

Filed Oct. 2, 1995, Ser. No. 538,289

Int. Cl.[6] F02M *35/10*

U.S. Cl. 123—184.38 **14 Claims**



1. An intake manifold assembly for an internal combustion engine, said intake manifold assembly comprising:

an intake manifold of a predetermined length, said intake manifold including a plenum having an interior wall surface and a predetermined cross-sectional area in a plane transverse to the length of said plenum, an air inlet located mid-way of the length of said plenum, said air inlet being generally circular in cross-section;

a plurality of outlet portions, each having an outlet port in air flow communication with said plenum, each of said outlet ports being substantially equally spaced along the length of said plenum, the cross-sectional area of the outlet port of each outlet portion being substantially equal to the cross-sectional flow area of said plenum and of said air inlet portion; and

a diverter partition extending integrally from the direction of the inner wall of said plenum in a direction toward the mid-point of said air inlet for diverting incoming air flow and evenly distributing the air flow to each of the respective outlet ports.

5,596,962

INTAKE SILENCER IN VERTICAL TYPE ENGINE

Masaki Tsunoda, and Tetsu Wada, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1995, Ser. No. 533,773

Claims priority, application Japan, Sep. 26, 1994, 6-230873

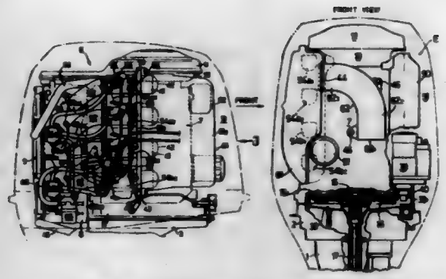
Int. Cl.[6] F02M *35/12*

U.S. Cl. 123—184.39 **10 Claims**

1. An intake silencer of a vertical-type engine, with the engine having a crankshaft vertically disposed in an engine body thereof, said engine body having a cylinder head and being accommodated in an engine compartment, said intake silencer comprising:

a first intake silencing chamber disposed adjacent said engine body, said first intake silencing chamber receiving a flow of intake air therethrough;

a second intake silencing chamber located upstream in said flow of intake air from said first intake silencing chamber, said



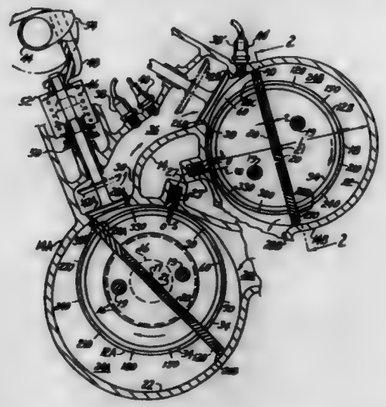
second intake silencing chamber receiving said flow of intake air as an input thereto, with an output of said second intake silencing chamber becoming an input to said first intake silencing chamber, wherein said second intake silencing chamber is disposed along an opposite end of the engine body from the cylinder head.

5,596,963

STAGE COMBUSTION ROTARY ENGINE

Jui H. Lai, No. 171 Long Chang Rd., I-Lan, Taiwan

Filed Aug. 14, 1995, Ser. No. 515,059
Int. Cl.[6] F02B 53/00
U.S. Cl. 123—236 **11 Claims**



1. A stage combustion rotary engine comprising:

(a) a rotary compressor having a first rotor rotatably mounted in a compressor housing having intake and exhaust ports thereof, and compressor seal means contacting the first rotor and the compressor housing for defining at least one compression chamber between the first rotor and the compressor housing, a periodic sequence of compressed gas being delivered from the compressor exhaust port in response to rotation of the first rotor;

(b) a rotary gas motor having a second rotor rotatably mounted in a motor housing having intake and exhaust ports thereof, and motor seal means contacting the second rotor and the motor housing for defining at least one expansion chamber between the second rotor and the motor housing, a periodic sequence of expanded gas being delivered from the motor exhaust port with rotation of the second rotor in response to pressurized gas in the expansion chamber;

(c) an output shaft coupled to the first and second rotors for synchronized rotation thereof;

(d) a transfer passage fluid-connected between the exhaust port of the compressor and the intake port of the motor, the transfer passage including a combustion chamber, the combustion chamber being periodically pressurized by gas flow from the compressor exhaust port;

(e) means for admitting a combustible fuel into the combustion chamber;

(f) means for igniting the fuel in the combustion chamber, combustion occurring during expansion of gas from the combustion chamber into the expansion chamber; and

(g) means for isolating the combustion products in the combustion chamber and in the expansion chamber from the compression chamber during expansion thereof,

wherein at least one of the first and second rotors is a vane rotor having a cylindrical outside surface, the corresponding housing being a vane housing having a cylindrical inside surface, and wherein:

(i) the seal means comprises a pair of vane members slidably carried by the vane rotor, the inside surface of the vane housing being proximately tangent to outside surface of the vane rotor and shaped for defining a chamber of changing volume within the vane housing in response to rotation of the vane rotor, the vane members movably projecting from the outside surface of the vane rotor in a chord plane of the inside surface for sealingly contacting the inside surface of the vane housing opposite the intake and exhaust ports from the point of proximate tangency, the vane members also having interlocking contact surfaces for limiting a combined chordal length of the pair to a maximum extended length; and

(ii) a rotor seal member is movably connected to the vane housing in interrupting relation to the inside surface of the vane housing proximate the point of tangency for sealing contact with the vane rotor, the maximum extended length of the vane members being less than a corresponding maximum length L of the chord plane for momentarily retracting each vane member within the vane rotor as that vane member passes the seal member in response to the other member of the pair being centrifugally forced against the inside surface of the housing opposite the rotor seal member, thereby avoiding contact between the vane members and the seal member, and

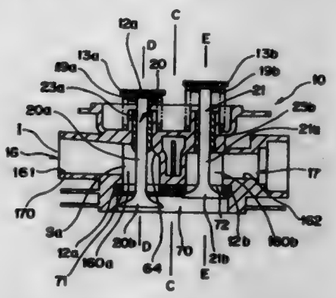
wherein the compressor and the output shaft are powered by combustion in the combustion chamber and expansion in the expansion chamber.

5,596,964

INTAKE AND EXHAUST VALVES AND INTAKE PORT OF INTERNAL COMBUSTION ENGINE

Katsumi Kurihara, Nagoya, Japan, assignor to Ryobi Limited, Tokyo, Japan

Filed Oct. 18, 1995, Ser. No. 544,761
Claims priority, application Japan, Oct. 19, 1994, 6-281308
Int. Cl.[6] F02B 31/00
U.S. Cl. 123—306 **8 Claims**



1. In a structure of intake and exhaust valves in a combustion engine in which intake and exhaust ports are opened and closed by intake and exhaust valves, respectively, the intake and exhaust valves having valve portions for opening and closing the intake and exhaust ports and valve stems for supporting the valve portions, each of the valve stems being provided, at its upper portion, with a valve retainer for receiving a spring force of a valve spring, each of the valve stems being engaged with a rocker arm to be moved so as to open and close the intake and exhaust ports, cooperating with the valve spring,

wherein each of the valve stems has means for holding a connecting member to be detachably held by the valve stem, said means for holding the connecting member comprising a hole diametrically provided in the upper portion of the valve stem and extended perpendicularly to the axis of the valve stem, and the connecting member comprising a pin which is detachably held in the hole provided in the upper portion of the valve stem,

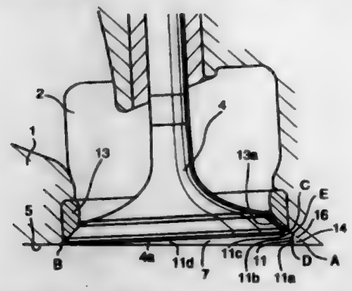
and wherein the valve retainer comprises a center hole through which the upper portion of the valve stem passes, means for receiving an upper portion of the valve spring provided between the valve retainer and a wall of a cylinder head of the internal combustion engine, and means for supporting the connecting member held by the upper portion of the valve stem.

5,596,965

CYLINDER HEAD FOR AN INTERNAL COMBUSTION ENGINE

Masahisa Nagata, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 24, 1996, Ser. No. 590,425
Claims priority, application Japan, Jan. 24, 1995, 7-009293
Int. Cl.[6] F01L 3/20; F02B 31/00; F02F 1/00
U.S. Cl. 123—308 **6 Claims**



1. A cylinder head for an internal combustion engine having at least one cylinder, comprising:

a plurality of intake ports and at least one exhaust port associated with each said at least one cylinder, said plurality of intake ports and said at least one exhaust port each defining openings which open onto a surface of the cylinder head, wherein a first said intake port is constructed and arranged to generate a swirl flow in said at least one cylinder, and a second said intake port is constructed and arranged to generate a flow within said at least one cylinder in a direction opposing said swirl flow generated by said first intake port; and

an intake valve operably associated with said second intake port, wherein said intake valve is constructed and arranged within said second intake port to define a wall portion of only said second intake port extending in a downstream direction away from said intake valve, said wall portion comprising an upstream part, a downstream part, and an intermediate part therebetween,

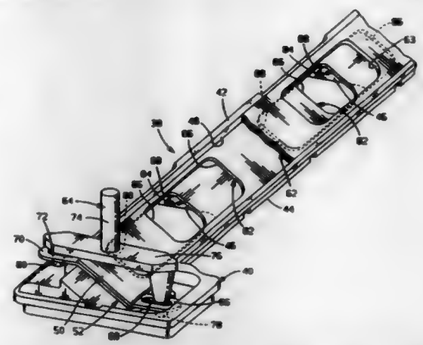
wherein at least some of said downstream part of said wall portion adjacent to said at least one exhaust port is radially inside a projection of said upstream part of said wall portion, said projection extending in a substantially downstream direction.

5,596,966

SLIDE PORT VALVE FOR AN INTERNAL COMBUSTION ENGINE

Jack E. Elder, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 355,076, Dec. 12, 1994, Pat. No. 5,454,357. This application Sep. 29, 1995, Ser. No. 536,979
Int. Cl.[6] F02M 35/00
U.S. Cl. 123—337 **1 Claim**



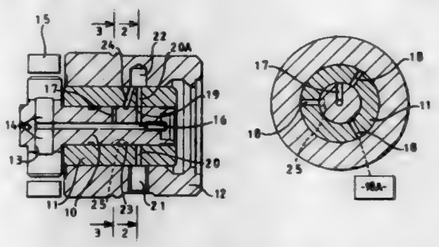
1. An intake system for an internal combustion engine comprising an air inlet in communication with said engine through first and second intake runners and a valve, said valve comprising a first valve plate having an opening for passage of air from said second intake runner through said valve and a second valve plate, in adjacent relationship to said first valve plate, having an opening for registry with said opening in said first valve plate for passage of air from said second intake runner through said valve, said first and said second valve plates slideable, in opposed directions relative to one another such that a first edge of said opening in said first valve plate, and a second edge of said opening in said second valve plate are moved towards one another to terminate said registry of said openings in said first and second valve plates centrally of said second intake runner to terminate flow communication of said air inlet with said engine through said second intake runner.

5,596,967

FUEL PUMP

William R. Burborough, Gillingham, England, assignor to Lucas Industries public limited company, England

Filed Dec. 18, 1995, Ser. No. 574,121
Claims priority, application United Kingdom, Jan. 7, 1995, 9500294
Int. Cl.[6] F02M 41/00
U.S. Cl. 123—450 **4 Claims**



1. A rotary distributor type fuel injection pumping apparatus for supplying fuel to a three cylinder compression ignition engine, the apparatus being of the kind comprising a rotary distributor member which is driven in use in timed relationship with the associated engine, the distributor member being housed within a sleeve in

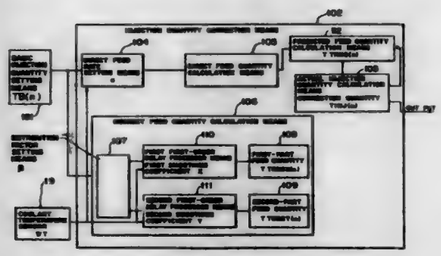
which there is formed six equi-angularly spaced outlet ports, the distributor member being provided with a delivery passage which registers with said outlet ports in turn as the distributor member rotates, the delivery passage communicating with a pumping chamber defined between a pair of pumping plungers located in a diametrically disposed bore formed in the distributor member, a cam ring surrounding the distributor member and having six equi-angularly spaced cam lobes formed on its internal peripheral surface, said cam lobes imparting movement to the pumping plungers as the distributor member rotates and during the time when the delivery passage is in register with an outlet port, alternate ones of said outlet ports being connected to a fuel reservoir defined in a body of the apparatus and the remaining outlet ports being connected to outlets respectively which in use are connected to the injection nozzles respectively of the associated engine and fuel supply means operable to supply fuel to the pumping chamber to effect outward movement of the pumping plungers in those periods between actuation of the pumping plungers by the cam lobes, prior to registration of the delivery passage with an outlet port connected to an outlet and by means operable to connect said reservoir to a low pressure source of fuel prior to registration of the delivery passage with the inactive outlet ports.

5,596,968

FUEL INJECTION CONTROL SYSTEM AND METHOD FOR INTERNAL COMBUSTION ENGINE

Katsunori Ueda, Kyoto; Satoshi Yoshikawa, Otsu, and Takashi Kawabe, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 355,262
Claims priority, application Japan, Dec. 9, 1993, 5-309476
Int. Cl.[6] F02D *41/32*
U.S. Cl. 123—480 **31 Claims**



1. A fuel injection control system for an internal combustion engine, said system being provided with:

means for setting a basic injection quantity of fuel in correspondence to the quantity of air to be inducted and fed to said internal combustion engine so that a desired air/fuel ratio can be achieved in a combustion chamber,

means for correcting the basic injection quantity, and

means for injecting an actual injection quantity of fuel into an intake port of said internal combustion engine, said actual injection quantity having been obtained by correcting the basic injection quantity by said injection quantity correction means, wherein

said injection quantity correction means comprises:

means for setting a direct feed rate at which a quantity of fuel out of the basic injection quantity is directly fed to said combustion chamber; and

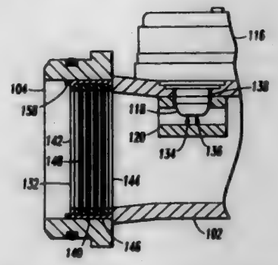
means for calculating an indirect feed quantity of fuel, said fuel being to evaporate from an adhered liquid layer of fuel in said intake port and then to be fed into said combustion chamber, as the sum of plural partial feed quantities of different evaporation characteristics.

5,596,969

FLOW CONDITIONING GAS MASS SENSOR

Matthew M. Lipinski, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 2, 1995, Ser. No. 538,002
Int. Cl.[6] G01F *1/68*; F02M *21/04*
U.S. Cl. 123—494 **24 Claims**



1. A flow sensor for sensing a flow of pressurized gaseous fuel to an internal combustion engine comprising:

a main flow passage having an inlet and an outlet forming a flow passage for the flow of pressurized gaseous fuel to the internal combustion engine;

a secondary flow passage positioned within said main flow passage;

a fuel flow sensing means positioned in said secondary flow passage for sensing a flow rate of pressurized gaseous fuel through said secondary passage; and

a pressurized gaseous fuel flow conditioning means for conditioning the flow of pressurized gaseous fuel through at least said secondary flow passage; said pressurized gaseous fuel flow conditioning means including;

a plurality of screening elements positioned substantially transverse to a direction of the pressurized gaseous fuel flow passing through said main flow passage; and

a plurality of spacing means for spacing adjacent screening elements from one another, said spacing means spacing said screening elements in a range of 20 to 100 thousandths of an inch from one another.

5,596,970

FUEL PUMP FOR AN AUTOMOTIVE FUEL DELIVERY SYSTEM

Gregory B. Schoenberg, Ann Arbor; Jeong Y. Kim, Troy, and Jeffrey J. Brautigan, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 28, 1996, Ser. No. 623,091
Int. Cl.[6] F02M *37/04*; F01D *1/12*
U.S. Cl. 123—497 **19 Claims**

1. A fuel delivery system for an automotive internal combustion engine comprising:

a fuel tank;

a reservoir mounted inside and in fluid communication with said tank;

a fuel pump for pumping fuel from said fuel tank to said reservoir and for pumping fuel from said reservoir to said engine, said fuel pump comprising;

a pump casing;

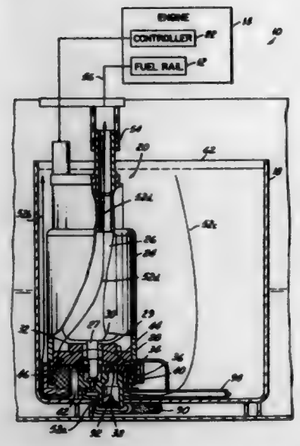
a motor housed within said casing and having a drive shaft extending therefrom;

an impeller engaged onto said drive shaft and having first and second sets of vanes; and,

an impeller housing mounted within said pump casing and encasing said impeller therein, said impeller housing comprising:

i) a first channel having a fuel tank inlet and a reservoir outlet and being in fluid communication exclusively therebetween, said first channel being radially aligned with said first set of vanes such that when said impeller rotates, fuel from said fuel tank enters said fuel tank inlet, flows through said first channel and exits through said reservoir outlet to fill said reservoir with fuel; and,

ii) a second channel having a reservoir inlet and a fuel outlet and being in fluid communication exclusively therebetween, said second channel being radially aligned with said second set of vanes such that when said impeller rotates, fuel from said reservoir enters said reservoir inlet, flows through said second channel and exits through said fuel outlet to supply fuel to said engine.

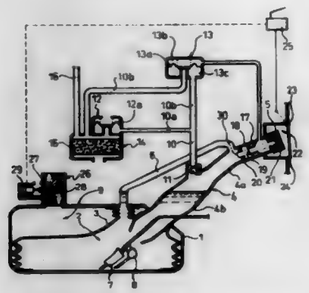


5,596,971

FUEL STORING DEVICE FOR MOTOR VEHICLE

Toru Kidokoro, Hadano, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 19, 1995, Ser. No. 545,066
Claims priority, application Japan, Oct. 21, 1994, 6-256813; Jan. 24, 1995, 7-008979; Sep. 8, 1995, 7-231242
Int. Cl.[6] F02M *33/02*
U.S. Cl. 123—516 **18 Claims**



1. A fuel storing device for a motor vehicle comprising:

a fuel storage container;

a pliable stretchable film disposed in said fuel storage container and separating the inside of said fuel storage container into a fuel storage portion and a space portion;

a refuel pipe connected to said fuel storage portion; and

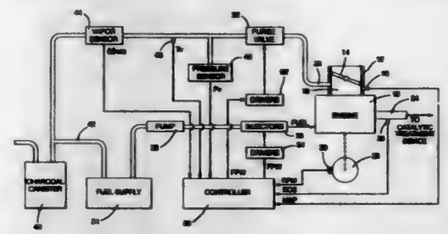
pressure regulating means able to hold the pressure of the space portion at a pressure higher than atmospheric pressure.

5,596,972

INTEGRATED FUELING CONTROL

Myrna C. Sultan; Charles H. Folkerts, both of Troy; Gregory P. Matthews, West Bloomfield, and Mark D. Kushion, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1995, Ser. No. 558,600
Int. Cl.[6] F02M *33/02*
U.S. Cl. 123—520 **8 Claims**



1. In an internal combustion engine having an intake manifold for receiving engine intake air and distributing the intake air to a plurality of engine cylinders, the engine having at least one fuel injector controlled to inject fuel from a fuel supply for combustion in the engine cylinders and in which a purge valve is controlled for controlling the mass flow rate of fuel vapor from a canister to the intake manifold for distribution to the engine cylinders and combustion therein, the canister for trapping fuel vapors released by the fuel supply, an integrated engine fuel control method for integrating fuel injector and purge valve control to provide a desirable engine fueling rate, comprising the steps of:

measuring purge vapor concentration;

measuring purge vapor pressure;

predicting the actual mass flow rate of cylinder purge vapor as a function of the measured purge vapor concentration and pressure;

generating a desired engine cylinder fuel mass;

reducing the desired engine cylinder fuel mass by the predicted actual mass of cylinder purge vapor;

calculating a fuel injector command as the fuel injector command that will provide for injection of the reduced desired engine cylinder fuel mass; and

controlling at least one fuel injector in accord with the calculated fuel injector command.

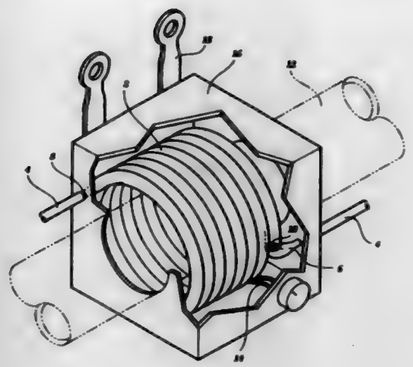
5,596,973

FUEL EXPANDER

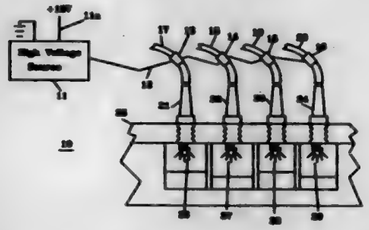
Franklin R. Grice, P.O. Box 326, Aynor, S.C. 29511

Filed Jun. 5, 1995, Ser. No. 463,924
Int. Cl.[6] F02M *31/00*
U.S. Cl. 123—557 **8 Claims**

5. A fuel expander comprising a tube having fuel therein, wherein said tube comprises windings which contact a hose having a temperature which is above ambient temperature, and wherein a first length of said tube which is upstream from said windings has a smaller diameter and a second length of said tube which is downstream from said first length of said tube has a larger diameter and wherein a mesh member is positioned within said tube near a point of said tube were said first length joins said second length, and wherein said fuel is transported through said mesh member so as to interfere with the flow of said fuel as said fuel is transported through said tube.



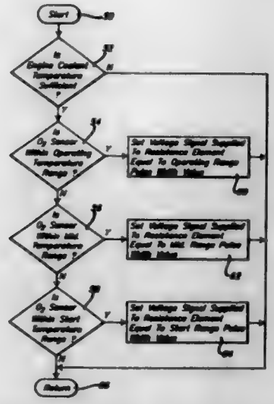
5,596,974
CORONA GENERATOR SYSTEM FOR FUEL ENGINES
Richard Z. Hall, Arlington, and Carl E. Gall, Garland, both of Tex., assignors to LuLu Trust, Garland, Tex.
Filed Oct. 23, 1995, Ser. No. 546,891
Int. Cl.[6] F02P 3/02
U.S. Cl. 123—620 23 Claims



1. A corona producing device for use in conjunction with an ignition system of a fuel engine to place a continuous corona in the combustion chamber at the tip of each spark plug of the engine; comprising:
a high voltage generator, independent of the ignition system, for producing a continuous AC voltage having frequency components in an RF range;
a coupler attached to each spark plug wire; and
a single connecting wire between each coupler and the RF generator for producing a continuous corona at the tip of each spark plug.

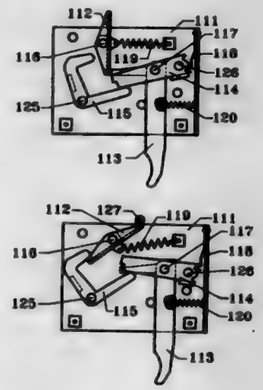
5,596,975
METHOD OF PULSE WIDTH MODULATING AN OXYGEN SENSOR
Christopher P. Thomas, West Bloomfield; Timothy A. Coatesworth, Lake Orion; Kenneth P. DeGroot, Macomb Twp.; Jeffery C. Ehlers, Davisburg; Mark E. McMackin, Royal Oak, and Keith L. Jones, Woodhaven, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed Dec. 20, 1995, Ser. No. 575,920
Int. Cl.[6] F02D 41/14; G01N 27/416
U.S. Cl. 123—686 3 Claims

1. A method for pulse width modulating a resistance element of an oxygen sensor, the oxygen sensor having a start temperature range, a mid temperature range, and an operating temperature range, the method comprising the steps of:
determining whether the oxygen sensor is within the operating temperature range;



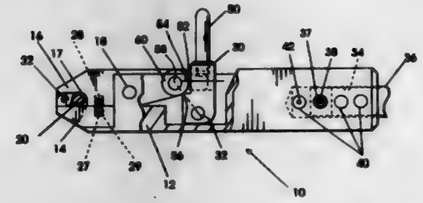
setting a pulse width modulated voltage signal supplied to the resistance element equal to an operating range pulse width value if the oxygen sensor is within the operating temperature range;
determining whether the oxygen sensor is within the mid temperature range if the oxygen sensor is not within the operating temperature range;
setting the pulse width modulated voltage signal supplied to the resistance element equal to a mid range pulse width value if the oxygen sensor is within the mid temperature range;
determining whether the oxygen sensor is within the start temperature range if the oxygen sensor is not within the mid temperature range; and
setting the pulse width modulated voltage signal supplied to the resistance element equal to a start range pulse width value if the oxygen sensor is within the start temperature range.

5,596,976
TRIGGER DEVICE FOR CROSSBOWS, WITH AUTOMATICALLY ACTIVATED SAFELY MEANS
Shimon Walser, 1227 E. 84 St., Brooklyn, N.Y. 11236
Filed Feb. 5, 1996, Ser. No. 596,651
Int. Cl.[6] F41B 5/12
U.S. Cl. 124—25 20 Claims



1. In a projectile shooting device: a projectile pusher; trigger means including a trigger and a turnable catch for holding said projectile pusher in a cocked position and for releasing said projectile pusher therefrom; and safety means for preventing unintentional shooting, said safety means including a movable intermediate element movable between fire and safe positions and cooperating with said projectile pusher so that when said projectile pusher moves during cocking said intermediate element is moved under the action of said projectile pusher to the safe position into a turning path of said catch preventing the catch from being turned for a shot and thereby preventing unintentional shooting.

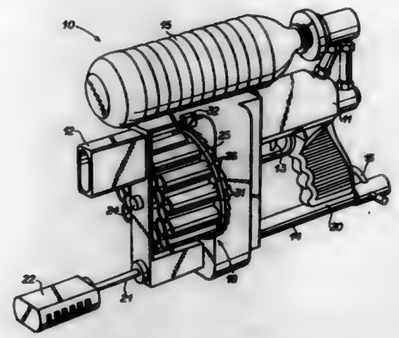
5,596,977
BOWSTRING RELEASE DEVICE
John W. Scott, 587 Adams Ridge Rd., Clay City, Ky. 40312
Continuation of Ser. No. 191,385, Jan. 31, 1994, Pat. No. 5,448,983. This application Jun. 7, 1995, Ser. No. 486,697
Int. Cl.[6] F41B 5/18
U.S. Cl. 124—35.2 11 Claims



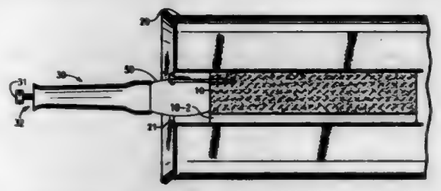
1. An adjustable bowstring release device comprising:
a pair of jaws for engaging and releasing an archery bowstring;
a body supporting said jaws for cooperation in engaging and releasing said bowstring;
a control trigger cooperatively associated with at least one of said jaws;
said body comprised of a hollow portion forming a tube, said tube defining a plurality of apertures extending through a wall of said tube and spaced along a length of said tube;
a wrist attachment assembly;
an interconnection member coupled to said wrist attachment assembly and complimenting said tube, said interconnection member defining at least a hole therethrough, said hole alignable with one of said apertures in said tube;
a force transmission member engaged with and extending through said hole and one of said apertures, whereby selection of said aperture into which said force transmission member is engaged establishes a distance from said wrist attachment assembly to said control trigger and said jaws.

5,596,978
RAPID FIRE COMPRESSED AIR GUN
Lonnie G. Johnson, Smyrna, and John Applewhite, Atlanta, both of Ga., assignors to Johnson Research & Development Co, Inc., Smyrna, Ga.
Filed May 15, 1995, Ser. No. 441,229
Int. Cl.[6] F41B 11/02
U.S. Cl. 124—72 34 Claims

1. A rapid fire compressed air gun comprising:
a magazine in which a plurality of projectiles may be loaded;
a pressure tank;
pump means for compressing air in said pressure tank;
pneumatic indexing means for sequentially positioning projectiles in said magazine for firing;
conduit means for conveying compressed air from said pressure tank to said magazine and to said pneumatic indexing means; and
trigger means for controlling the flow of pressurized air from said pressure tank to said magazine and to said pneumatic indexing means,
said pneumatic indexing means includes a manifold in fluid communication with said pressure tank, a pistoo positioned within said manifold for reciprocal movement between a first position and a second position, biasing means for biasing said piston toward said first position, and wherein said conduit means includes a conduit for conveying pressurized air from said pressure tank to said manifold for use in pneumatically biasing said piston toward said second position, and coupling means for coupling said piston to said magazine.



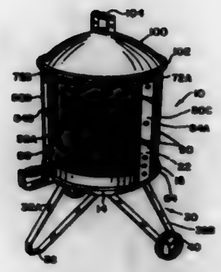
5,596,979
SOUND INHIBITOR BAFFLES
Stanley E. Sobotka, Flint; John G. Charles, Sr., Tyler, both of Tex.; Dale E. Nagel, Wampsville, and James T. Kalla, Cheektowaga, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 18, 1995, Ser. No. 573,980
Int. Cl.[6] F24C 3/00
U.S. Cl. 126—91 A 4 Claims



1. Combustion means for a gas fired furnace comprising:
an inshot burner adapted to burn gaseous fuel and to produce a flame;
a heat exchanger having an inlet facing said burner;
a single baffle recessed in said heat exchanger in facing relationship with said burner so as to be within said flame;
said baffle being made of high temperature ceramic foam and having a plurality of flutes defining flow paths whereby said baffle coacts with said flame to increase the velocity of the flame pattern to reduce sound while causing turbulence and heat transfer which reduces NO_x generation.

5,596,980
PORTABLE FIREPLACE
Bernard F. Whalen, Wacouh, and Paul Doubet, Farmington, both of Ill., assignors to Yetter Manufacturing Company, Colchester, Ill.
Filed Jan. 11, 1995, Ser. No. 371,298
Int. Cl.[6] F24B 1/181
U.S. Cl. 126—519 25 Claims

1. A portable fireplace adapted for outdoor use and ease of transport including:



a base member defining a fire chamber adapted to receive and contain materials to be burned;

one or more screen members supported by and extending upwardly from said base member, each said screen member adapted to prevent burning embers from being expelled from said portable fireplace;

a cover member supported above said screen members and spaced above said base member, said cover member being selectively removable from said screen members so as to provide access to said fire chamber when desired;

a screen support member adapted to be positioned on said base member and extending upwardly therefrom for supporting said screen members, at least one screen member being removably supported by said screen support member, said screen support member adapted to support said cover member above said screen members; and

a support structure extending downwardly from said base member adapted to support said base member at a sufficient height above a support surface on which it rests to prevent the burning or scorching of the support surface.

5,596,981

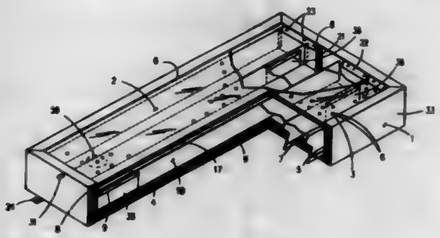
SOLAR DEVICE AND METHOD FOR ASSEMBLY

Paul B. Soucy, 119 West St., Methuen, Mass. 01844

Filed Jul. 19, 1993, Ser. No. 93,464

Int. Cl.[6] F24J 2/46

U.S. Cl. 126—704 **21 Claims**



1. A solar collector comprising:

at least one frame member, having a plurality of centrally directed projections;

said member having front and back edges;

a back, having a surface substantially flush with said back edge and at an least one adjacent surface supported by said frame member projections;

an absorber plate, having inner and outer faces; the outer face of said absorber plate being receptive to absorption of radiant energy being located frontward of said back; and, at least a portion inner face of said absorber plate positioned frontward of said back to form a cavity; and

a light transmissive cover attached frontward of said plate and engaged by projections in said frame member.

5,596,982

APPARATUS FOR DRYING AND BUFFERING AEROSOLS

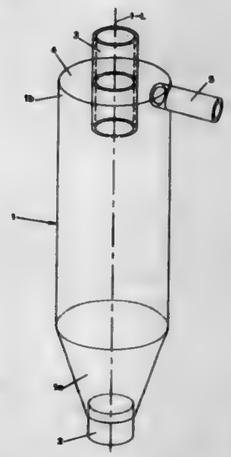
Alex Blaha-Schnabel, Nürnburg, Germany, assignor to Paul Ritzau Pari-Werk GmbH, Starnberg, Germany

Filed May 17, 1995, Ser. No. 442,582

Claims priority, application European Pat. Off., May 19, 1994, 94107770

Int. Cl.[6] A61M 11/00

U.S. Cl. 128—200.14 **21 Claims**



1. An apparatus for drying and/or buffering aerosols for purposes of inhalation therapy, comprising:

a main body having rotational symmetry about a first longitudinal axis, the main body comprising a wall defining an inner surface, the main body having first and second ends, the first end of the main body being tapered for connection to an outlet of an aerosol generator, the second end of the main body being closed with a surface;

a first tubular member extending through the surface closing the second end of the main body, having a longitudinal axis that is disposed parallel to the longitudinal axis of the axis of rotation of the main body, protruding by a defined length into the main body from the second end; and

an intake member separate from said first tubular member for supplying intake air into the main body to form turbulence around the axis of rotation of the main body.

5,596,983

APPARATUS FOR OXYGENATING A PATIENT

Rolf Zander, Luisenstrasse 17, DE-6500 Mainz, and Friedrich Mertzluft, Katzenberg 31, 6500 Mainz 21 DE, both of Germany

Continuation-in-part of Ser. No. 672,184, Mar. 20, 1991, abandoned. This application Oct. 7, 1992, Ser. No. 957,740

Claims priority, application Germany, Mar. 15, 1991, 40 09 008.6

Int. Cl.[6] A61M 16/00

U.S. Cl. 128—204.18 **14 Claims**

1. An apparatus for oxygenating a patient, comprising an oxygen supply means with an oxygen applicator for supplying oxygen via the nose, the oxygen applicator being a closed system, said applicator affixable about the nose in a tightly-sealable manner so that it supplies pure oxygen solely via the nose in a directed flow, and additionally comprising a one-way valve which can be inserted in substantially sealing tight manner into the mouth of the patient, the one-way valve opening only upon gas outflow out of the mouth, said closed system at all times having a pressure which is greater



than the pressure necessary to open said one-way valve during gas outflow, such that respired air from the patient can escape only through the mouth and no air can escape through the nose.

5,596,984

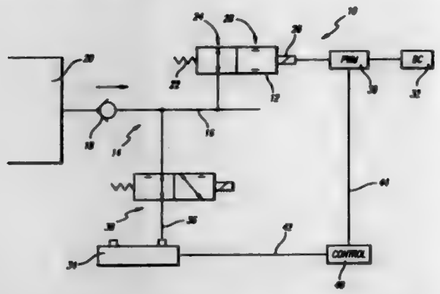
LUNG VENTILATOR SAFETY CIRCUIT

John J. O'Mahony, Galway, Ireland, and Floyd R. Farnham, III, Encinitas, Calif., assignors to Puritan-Bennett Corporation, Overland Park, Kans.

Filed Sep. 12, 1994, Ser. No. 304,047

Int. Cl.[6] A61M 16/00

U.S. Cl. 128—205.24 **7 Claims**



1. A lung ventilator safety valve apparatus for relieving pressure in a patient airway of a ventilator system, comprising:

a safety valve connected to a patient airway of a ventilator system, said safety valve having a normally open position venting pressure from said patient airway and a closed position;

pressure sensor means connected to said patient airway for monitoring pressure in said patient airway and for generating a pressure signal indicative of sensed pressure in said patient airway;

valve control means connected to said safety valve for controlling operation of said safety valve, and connected to said pressure sensor means for receiving said preasure signal, said valve control means including means for setting a maximum airway pressure threshold, means for comparing said sensed pressure in said patient airway with said maximum airway pressure threshold, and means for generating a valve open signal when said sensed pressure in said patient airway is equal to or greater than said maximum airway pressure; and

valve switching means connected to said valve control means for receiving said valve open signal for switching said safety valve to said open position in response to said valve open signal.

5,596,985

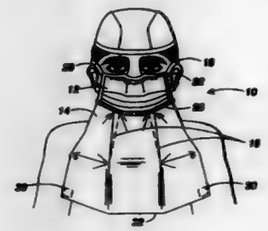
SURGICAL MASK

John M. Collier, 1417 Buckingham, Grosse Pointe Park, Mich. 48230

Filed Jan. 31, 1996, Ser. No. 594,838

Int. Cl.[6] A62B 7/10

U.S. Cl. 128—206.19 **7 Claims**



1. A surgical mask to be worn by a medical attendant, for wearing about the nose, mouth, lower face and frontal neck and upper torso of the wearer for protecting the wearer from exposure to the body fluids expelled from a patient, comprising:

an upper mask for coveting the wearer's nose, mouth and chin, said upper mask including a segment of sheet material formed of air permeable material to permit the wearer to breathe through the upper mask while protecting the nose and mouth of the wearer from fluids expelled from a patient and having an upper edge portion for placement across the bridge of the wearer's nose and a lower edge portion for placement under the chin of the wearer, and opposing side portions intersecting said upper edge portion and said lower edge portion for extending about the cheeks of the face of the wearer;

an upper tie string means fastened to said upper mask at the upper edge portion of said upper mask with said upper tie string means having end portions freely extending from said upper mask for extending over the ears and about the head of the wearer a distance sufficient to be tied together behind the head of the wearer;

a lower tie string means fastened to said upper mask at the lower edge portion of said upper mask, with said lower tie string means having end portions extending from said upper mask for extending beneath the ears and about the neck of the wearer a distance sufficient to be tied together behind the neck of the wearer;

a lower mask for coveting the wearer's neck and frontal torso, said lower mask including a segment of sheet material formed of fluid impervious material for protecting the wearer from exposure to body fluids expelled from a patient, said lower mask having an upper edge portion for placement beneath the chin of the wearer and a lower edge portion for placement at the front torso of the wearer, and side portions sized and shaped for extending about the sides of the neck and upper torso of the wearer;

the upper edge portion of said lower mask being connected at said lower tie string means and to the lower portion of said upper mask for forming a continuous shield from the nose downwardly to the torso of the wearer;

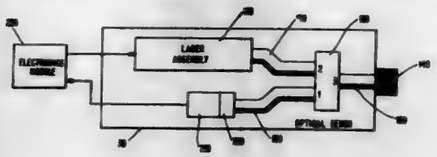
said upper edge portion of said lower mask extending along said lower tie string means farther than the lower edge portion of said upper mask on opposite sides of said upper mask, with the lower tie string means arranged for suspending the side portions of said lower mask about the opposite sides of the neck of the wearer and across the breast of the wearer to protect the front and sides of the wearer's neck and the breast of the wearer from fluids expelled from a patient.

5,596,986

BLOOD OXIMETER

David Goldfarb, Burke, Va., assignor to Scico, Inc., Annapolis, Md.

Continuation of Ser. No. 769,153, Sep. 27, 1991, abandoned, which is a continuation of Ser. No. 324,939, Mar. 17, 1989, abandoned. This application Feb. 16, 1993, Ser. No. 18,349
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—633 14 Claims



1. An apparatus for measuring the oxygen content of blood within a patient comprising:

a light source for transmitting an incident beam with a linearly polarized, monochromatic light having a first amplitude;

a directional coupler having a first port, a second port, and a third port, said second port optically coupled to said light source;

an optical fiber coupled to the third port of said directional coupler;

an optical coupler coupled to said optical fiber for interfacing between said optical fiber and said patient, with said optical coupler including a flat optical glass for flattening an underlying capillary bed of skin of said patient, thereby presenting a flat surface area perpendicular to said optical fiber, with the incident beam passing through the second port and the third port of said directional coupler, through said optical fiber and said optical coupler, to the underlying capillary bed, with a portion of the incident beam reflecting from the underlying capillary bed as a reflected beam, with the reflected beam passing from said optical coupler, through the optical fiber, through the third port and out the first port of said directional coupler;

a polarizing filter coupled to said first port for filtering the reflected beam with linear polarization and for passing the reflected beam having a 180 degree phase shift with respect to the incident beam;

a detector optically coupled through said polarizing filter to the first port of said directional coupler for measuring a second amplitude of the reflected beam having a 180 degree phase shift with respect to the incident beam, with the reflected beam passing from said underlying capillary bed through the optical coupler, through the third port of said directional coupler, through the first port of said directional coupler, and through said polarizing filter; and

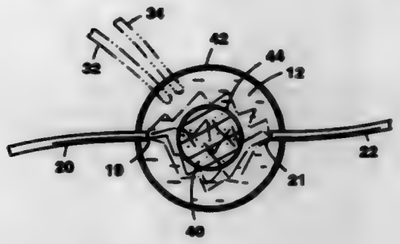
processing means, electrically coupled to said light source and to said detector, for receiving the first amplitude from the light source and the second amplitude from the detector, said processing means having a data table summarizing blood oxygen values and comparing the first amplitude with the second amplitude and, referencing the data table, determining a value indicating a quantity of oxygen in the blood.

5,596,987

OPTICAL COUPLER FOR IN VIVO EXAMINATION OF BIOLOGICAL TISSUE

Britton Chance, Marathon, Fla., assignor to NonInvasive Technology, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 6,233, Jan. 19, 1993, Pat. No. 5,402,778, which is a continuation-in-part of Ser. No. 583,006, Sep. 17, 1990, abandoned, which is a continuation of Ser. No. 266,116, Nov. 2, 1988, abandoned. This application Jan. 3, 1995, Ser. No. 367,939
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—633 37 Claims



1. An optical coupling system for non-invasively monitoring a region of living tissue, comprising:

an excitation port positionable at the tissue and adapted to introduce optical radiation into the monitored tissue;

an excitation light guide defining an excitation channel for conveying said radiation from a source to said excitation port;

a detection port, positionable at the tissue, adapted to receive radiation that has migrated in the tissue from said excitation port to said detection port, said detection port having a detection area larger than an input area of said excitation port;

a detecting light guide, connected to said detection port, for conveying said radiation from said detection port to an optical detector; and

optical matching fluid, contained within a flexible optically transparent bag, disposed partially around the monitored tissue and said excitation and detection ports.

5,596,988

MULTI-PARAMETER SENSOR APPARATUS

David R. Markle, Paoli, Pa.; Barry C. Crane, Aston Clinton, England; Michael P. Irvine, Watlington, England; Stuart P. Hendry, Aylesbury, England, and William Paterson, High Wycombe, England, assignors to Biomedical Sensors, Ltd., High Wycombe, England

Division of Ser. No. 85,844, Jun. 30, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 352,340
Int. Cl.[6] A61B 5/05
U.S. Cl. 128—635 8 Claims



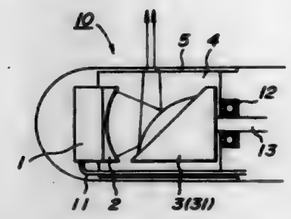
1. A multi-parameter catheter for the in vivo determination of multiple parameters in a patient's blood comprising an elongated tube with a distal hollow chamber having a wall terminating in a distal end, the wall of said chamber being defined at least in part by a biphasic membrane which is a microporous polyethylene tube having micropores which are filled with a polyacrylamide hydrogel which allows the passage of water-bound ions, said chamber containing a plurality of sensors mounted sequentially from said distal end within a polyacrylamide hydrogel, the sequentially mounted sensors comprising, in sequence from the distal end of the chamber, an optical fiber pH sensor, an optical fiber pCO_2 sensor, a thermocouple temperature sensor and a pO_2 sensor, and the distal end of the chamber being sealed by a solid plug made from a thermoplastic polymer.

5,596,989

ULTRASONIC PROBE

Katsuaki Morita, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 363,878
Claims priority, application Japan, Dec. 28, 1993, 5-337213
Int. Cl.[6] A61B 8/12
U.S. Cl. 128—660.1 14 Claims



1. An ultrasonic probe comprising:

an ultrasonic wave generating means, having an ultrasonic transducer, for generating an ultrasonic wave;

a focusing element, having a first non-zero focusing power, for focusing the ultrasonic wave generated by the ultrasonic wave generating means to produce a focused ultrasonic wave; and

a reflecting mirror, disposed in a path of the focused ultrasonic wave and having a second non-zero focusing power, for reflecting the focused ultrasonic wave to produce a reflected ultrasonic wave;

wherein the first non-zero focusing power, the second non-zero focusing power and a distance between the focusing element and the reflecting mirror are selected so that the reflected ultrasonic wave is substantially collimated as the reflected ultrasonic wave exits the ultrasonic probe.

5,596,990

ROTATIONAL CORRELATION OF INTRAVASCULAR ULTRASOUND IMAGE WITH GUIDE CATHETER POSITION

Paul Yock, 2200 Redington Rd., Hillsborough, Calif. 94010; Yue-Teh Jang, 43659 Skye Rd., Fremont, Calif. 94539, and Stephen M. Salmon, 859 Rattan Ter., Sunnyvale, Calif. 94086

Filed Jun. 6, 1995, Ser. No. 470,673
Int. Cl.[6] A61B 8/12
U.S. Cl. 128—662.06 22 Claims

1. A method for introducing an imaging catheter to coronary vasculature, said method comprising:

introducing a guiding catheter so that a distal end of the guiding catheter engages a coronary ostium, wherein said distal end is shaped so that a mark on the distal end is disposed in predetermined orientation relative the coronary vasculature;

introducing an imaging catheter through the guiding catheter;

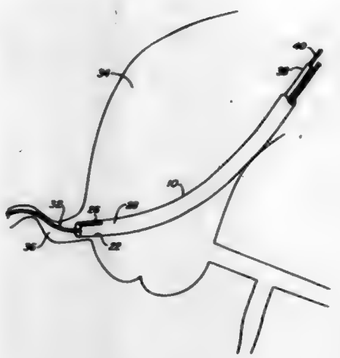
producing with the imaging catheter an image of the mark while in the guiding catheter, whereby the relative orientation of the produced image and the coronary vasculature is known.

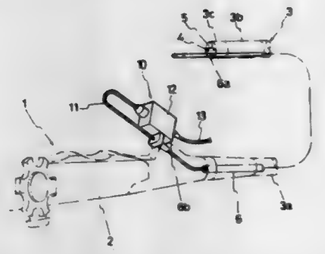
5,596,991

CATHETER TYPE ULTRASOUND PROBE

Toshizumi Tanaka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 14, 1995, Ser. No. 403,960
Claims priority, application Japan, Apr. 7, 1994, 6-092912
Int. Cl.[6] A61B 8/12
U.S. Cl. 128—662.06 4 Claims





1. A catheter type ultrasound probe including an elongated flexible catheter member having an ultrasound transducer mounted on a tip end portion thereof and a controller having a rotational drive means for said ultrasound transducer, said catheter member comprising:

a flexible sheathing tube closed with an acoustic end cap at the distal end thereof through an annular stopper ring;

a rotatable support member located within said acoustic end cap at the distal end of said sheathing tube;

an ultrasound transducer mounted on said rotatable support member;

a flexible transmission shaft constituted by at least a transmission coil consisting of a series of intimately contacting helices, said flexible transmission shaft being extended through said flexible sheathing tube and connected at the fore end thereof to said rotatable support member;

a rotational shaft coupled with the rear end of said flexible transmission shaft and rotationally driven from said rotational drive means on said controller; and

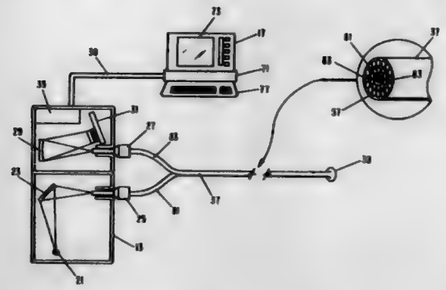
fore and rear stopper means located in fore and rear end portions of said catheter member to retain the flexible transmission shaft in tensioned state between predetermined head and tail end positions of said catheter member, said fore stopper means being constituted by an annular stopper surface formed on the inner periphery of said stopper ring and abutted against a proximal end face of said rotatable support member for sliding contact therewith.

5,596,992

MULTIVARIATE CLASSIFICATION OF INFRARED SPECTRA OF CELL AND TISSUE SAMPLES

David M. Haaland; Howland D. T. Jones, and Edward V. Thomas, all of Albuquerque, N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Filed Jun. 30, 1993, Ser. No. 85,709
Int. Cl.[6] A61B 6/00
U.S. Cl. 128—664 23 Claims



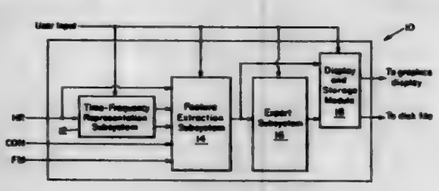
1. A method of classifying a cell or tissue sample comprising:
generating a plurality of different wavelengths of infrared light;
irradiating the sample with the plurality of different wavelengths so that there is differential intensity attenuation caused by variations between different classes of the sample as a function of the different wavelengths;
measuring such intensity attenuations to obtain intensity information at at least three different wavelengths; and
classifying the sample as one of two or more cell or tissue types from the measured intensity attenuations by using a multivariate classification model.

5,596,993

FETAL DATA PROCESSING SYSTEM AND METHOD

Nancy E. Oriol, Cambridge, and Frederick M. Bennett, Holden, both of Mass., assignors to Beth Israel Hospital, Brookline, Mass.

Filed Sep. 21, 1994, Ser. No. 309,856
Int. Cl.[6] A61B 5/0444
U.S. Cl. 128—698 38 Claims



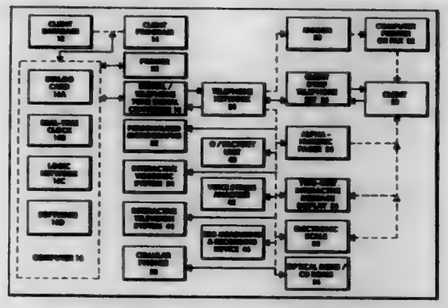
1. A fetal data processing method comprising:
receiving a signal indicative of fetal heart rate time data for the fetus, said fetal heart rate time data indicating heart rate of the fetus over
performing a non-linear time-frequency transformation on the fetal heart rate time data to generate a frequency-domain representation for the fetal heart rate time data; and
analyzing the frequency domain representation to indicate a condition of the fetus related to the fetal heart rate time data.

5,596,994

AUTOMATED AND INTERACTIVE BEHAVIORAL AND MEDICAL GUIDANCE SYSTEM

William L. Bro, 8939 S. Sepulveda #530, Los Angeles, Calif. 90045

Continuation of Ser. No. 112,955, Aug. 30, 1993, Pat. No. 5,377,258. This application May 2, 1994, Ser. No. 237,261
Int. Cl.[6] A61B 5/04
U.S. Cl. 128—732 48 Claims



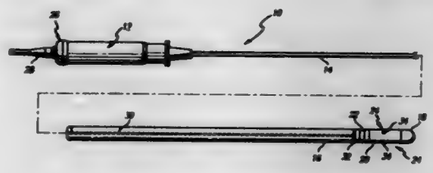
1. A personalized automated interactive behavioral motivational intervention system for changing a person's behavior comprising:
(a) polling means for polling the person from a number of pre-determined queries and receiving responses from the person to be incorporated into that person's personalized data base, including pre-selected information about that person;
(b) evaluation means for evaluating the person's responses received from said polling means and comparing those responses to said pre-selected data and classifying the person in accordance with at least one of a plurality of different behavioral stages;
(c) program means for programming the person's behavior based upon the responses provided by said polling means and evaluated by said evaluation means to determine the person's preferred behavior to be achieved; and
(d) feedback means for providing stimulus to the person as to the success or failure of his progress based upon the responses provided to said polling means and evaluated by said evaluation means as measured by said program means, wherein the person is queried as to particular actions he has undertaken within a given period of time which can be evaluated based upon certain standards that have been established for desired behavior change of the person which are recorded and measured, whereby the person is subsequently alerted as to his success or failure in progressing toward achieving the desired behavioral stage.

5,596,995

BIOMEDICAL DEVICE HAVING A TEMPERATURE SENSING SYSTEM

Marshall L. Sherman, Cardiff; Thomas M. Castellano, and José J. Moya, both of Temecula, all of Calif., assignors to Heart Rhythm Technologies, Inc., Temecula, Calif.

Filed May 2, 1995, Ser. No. 432,837
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—736 14 Claims



1. A biomedical device having a temperature sensing system, comprising:
a connector mounted in the biomedical device and including a plurality of connecting devices having first and second ends, the connecting devices conducting signals between respective first and second ends;
a first temperature sensor providing a first temperature signal mounted to the biomedical device having sensor leads connected to respective first ends of the connecting devices;
wherein the connection of a first temperature sensor lead to a first end of a connecting device creates a second temperature signal that combines with the first temperature signal to form a combined temperature signal, the connecting device conducting the combined temperature signal to its second end; and
a reference temperature sensor mounted at the connector to sense the temperature at the connector and to provide a temperature reference signal.

5,596,996

HIGH SUPPORT NITINOL TUBE GUIDEWIRE WITH PLASTIC PLUG TRANSITION

Mark A. Johansen, Littleton, Mass., and Michael S. Noone, Londonderry, N.H., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 30, 1995, Ser. No. 413,524
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—772 19 Claims



1. A guidewire for use in a catheter comprising:
an elongate core wire having a uniform outer diameter, a proximal end and a distal end;
an elongate tube defining a tube lumen, the tube having the same outer diameter as the core wire, the tube having a proximal end and a distal end, the proximal end of the tube being affixed to the distal end of the core wire, the tube having a smooth exterior surface;
two or more plug segments, each plug segment having the same uniform outer diameter as each other along their length, the plug segments filling the tube lumen, each plug segment having a proximal end and a distal end, each plug segment having a stiffness less than that of the core wire and less than that of the proximally preceding plug segment, the proximal end of the proximal most plug segment being affixed to the distal end of the core wire, the distal end of the tube being affixed to the distal most plug segment; and
a smoothly rounded distal tip extending beyond and affixed to the distal end of the tube.

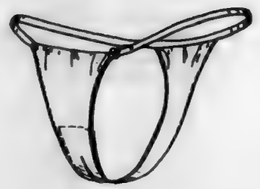
5,596,997

PANTY CONDOM

Max M. Abadi, Carrera 68 No. 21-85, Santafé de Bogotá, Colombia

Filed Jun. 19, 1995, Ser. No. 491,741
Int. Cl.[6] A61F 6/04
U.S. Cl. 128—844 13 Claims

1. A female panty condom, comprising:
a panty having an opening generally at the genital area and located approximately over the vagina of a wearer; and
a sheath having an open end, and
a pouch connected to the panty for affixing the open end of the sheath over the opening in the panty, said pouch including a front side having a slit and a back side having a slit such that the opening, the slit in the front side of the pouch and the slit in the back side of the pouch are aligned such that a penis of a male partner can enter the open end through the opening in the panty, the sheath extending over the penis as it enters the vagina.

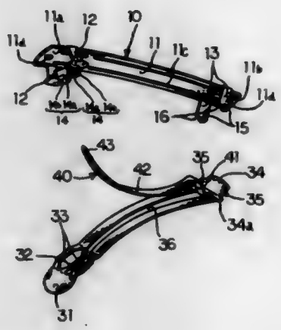


5,596,998

HAIR CLIP

Masahiro Yasuda, Osaka, Japan, assignor to Kabushiki Kaisha Yasuda Corporation, Osaka, Japan

Filed Aug. 8, 1995, Ser. No. 512,639
Int. Cl.[6] A45D 8/12
U.S. Cl. 132—275 8 Claims



1. A hair clip, comprising:
a base plate having at one end portion a pair of hooking arms;
a hair retainer having one end portion rotatably connected to the other end portion of said base plate;
said hair retainer further having at the other end portion thereof an engaging part releasably latched by said pair of hooking arms;
a spring board having one end portion connected to said one end portion of said hair retainer and the other end portion being a free end;
said spring board being positioned between said base plate and said hair retainer and curved in the opposite direction to the curve of said hair retainer.

5,596,999

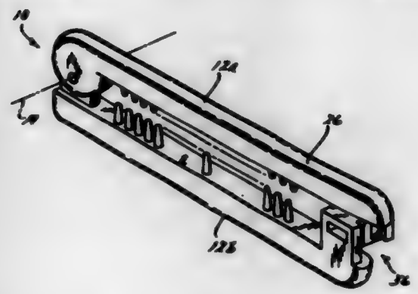
Patent Not Issued For This Number

5,597,800

METHOD AND APPARATUS FOR HAIR STYLING

Lisa Garbus, 2085 E. Hampton Ave. #184, Mesa, Ariz. 85204

Continuation-in-part of Ser. No. 342,114, May 13, 1994, abandoned. This application Apr. 3, 1995, Ser. No. 415,522
Int. Cl.[6] A45D *8/22;8/28*
U.S. Cl. 132—279 16 Claims



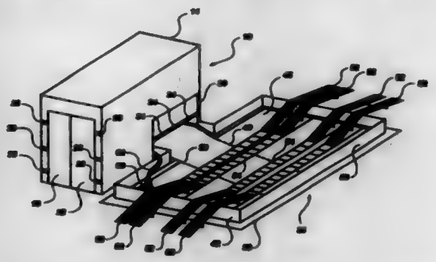
1. A hair styling device comprising:
a first elongated member having a longitudinal axis;
a second elongated member pivotally attached to said first elongated member for relative rotation thereto;
a first latch member extending from said first elongated member, said first latch member having a generally U-shaped cross section in a direction substantially normal to said longitudinal axis; and
a second latch member extending from said second elongated member, said second latch member adapted to releasably engage said first latch member.

5,597,801

PORTABLE EQUIPMENT WASH STATION WITH RETRACTABLE FLOORING SYSTEM

Royce C. Rasmussen, Salt Lake City, and Victor D. McFarland, West Jordan, both of Utah, assignors to Royce Industries, L.C., Salt Lake City, Utah

Filed Jan. 12, 1995, Ser. No. 489,222
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—104.2 16 Claims



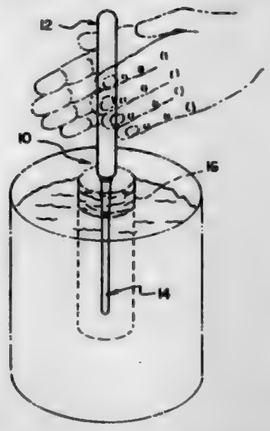
1. An equipment cleaning station for the washing of contaminants from vehicles and other equipment with a liquid and retaining contaminated wash liquid comprising:
applicator means for applying wash liquid containing cleaning and rinsing agents to a vehicle or other equipment;
a plurality of retractable flooring layers for providing a floor to overlie existing terrain and on which to apply the wash liquid to the vehicle or other equipment and retaining contaminated wash liquid comprising:
a ground pad layer for covering the existing terrain and providing protection to the other layers of retractable flooring;
a berm pad layer for containing contaminated wash liquid resulting from the washing of the vehicle or other equipment; and
a track pad layer for allowing contaminated liquid to flow through to the berm means while also providing protection against damage which could result from contact of the ground pad means or berm pad means with tires or tracks of the vehicle or other equipment being cleaned; and
a portable container means for housing the applicator means and retractable flooring layers thereby providing transportability of the equipment cleaning station.

5,597,802

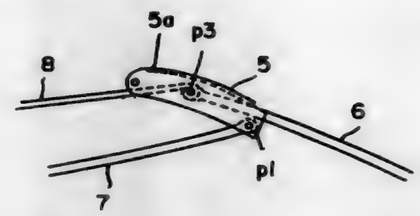
ROLLER SPINNING TOOL

Ronald D. Stanley, Jr.; Carin M. Schauer, and Jim K. Schauer, all of P.O. Box 192, Running Springs, Calif. 92382

Filed Jul. 18, 1995, Ser. No. 503,504
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—149 1 Claim



1. A roller spinning tool comprising:
a handle means for being rotated, the handle means comprises an elongated cylindrical handle member having respectively opposed upper and lower ends, the elongated cylindrical handle member being shaped so to define a cylindrical outer surface having a constant radius or curvature as well as a constant diameter along a longitudinal length thereof to permit placement and rotation of the cylindrical handle member between opposed palms of a pair of human hands;
a central engaging means extending from the handle means and being axially aligned therewith for engaging a center of a roller to effect rotation of the roller within a solvent, the central engaging means comprises a conical neck extending from the lower end of the elongated cylindrical handle and being coaxially aligned therewith, the conical neck being of a first diameter equal to a diameter of the elongated cylindrical handle member at the lower end thereof and tapering to a second diameter spaced from the lower end of the elongated cylindrical handle member, wherein the first diameter is substantially greater than the second diameter, the central engaging means further comprises a tapered gripping cone extending from the conical neck and being coaxially aligned therewith, the tapered gripping cone being of the second diameter at an intersection of the conical neck with the tapered gripping cone and tapering to a third diameter spaced from the conical neck, wherein the third diameter is substantially less than the second diameter so as to define a tapered conical shape of the gripping cone, the conical neck tapers from the first diameter to the second diameter over a first longitudinal length, with the tapered gripping cone tapering from the second diameter to the third diameter over a second longitudinal length and a difference between the second longitudinal length is substantially greater than the first longitudinal length and a difference between the first diameter and the second diameter is equal to a difference between the second diameter and the third diameter such that a slope of the side wall of the conical neck is substantially greater than a slope of the side wall of the tapered gripping cone relative to a longitudinal axis of the roller spinning tool, the central engaging means further comprises an elongated cylindrical engaging member projecting in an axially aligned manner from the tapered gripping cone, the elongated cylindrical engaging member being of the third diameter and of a constant diameter along a longitudinal length thereof.

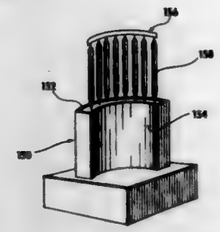


5,597,803

APPARATUS FOR THE ULTRASONIC CLEANING OF CHANDELIERS HAVING DOWNWARDLY EXTENDING PENDANTS ARRANGED IN A CIRCLE

Keith S. Campbell, 13432 Third Ave. NE., Bradenton, Fla. 34202

Continuation of Ser. No. 153,294, Nov. 16, 1993, Pat. No. 5,472,005. This application Aug. 28, 1995, Ser. No. 520,894
Int. Cl.[6] B08B *3/12*
U.S. Cl. 134—184 11 Claims



1. Apparatus for use in the ultrasonic cleaning of a chandelier comprising a plurality of concentric circles of downwardly extending members, said apparatus comprising:
(a) a base member, a cavity being provided in said base member of predetermined size, and an open top end being provided in said base member; and
(b) a top member being detachably connected to the open top end of the base member, said top member being defined by an open bottom end and by an arcuate-shaped open top end, and a cavity being provided in the top member communicating with the cavity in the bottom member.

5,597,804

WINDPROOF UMBRELLA

Yukihiro Okuda, 4-3, 1-Chome Sugi, Hirakata City, Osaka, Japan

Filed Dec. 12, 1995, Ser. No. 570,931
Int. Cl.[6] A45B *25/00*
U.S. Cl. 135—29 1 Claim

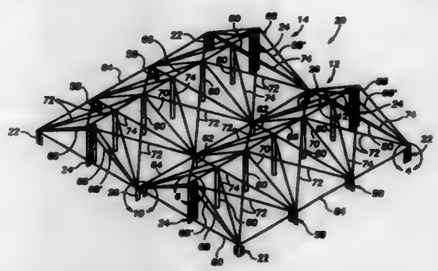
1. In a windproof umbrella of the type having a shaft, a crown, a slider movably supported on the shaft and a collapsible frame secured to the crown and slider, wherein the frame includes a plurality of struts, a plurality of stays, a plurality of tension members, a plurality of joint members and plurality of spokes, with each strut having an inner end pivotally secured to the slider and an outer end pivotally secured to an outer end of a joint member, each stay having an inner end pivotally secured to the crown and an outer end pivotally secured to a strut at an intermediate position, each tension member having an inner end pivotally secured to a stay at an intermediate position, and an outer end pivotally secured to a middle position of a joint member and a spoke secured to and extending outwardly from each joint member, the improvement comprising each strut being formed of a round resilient material; the inner and outer ends of each tension member being bent downwardly to form loops; each joint member having a common axis for pivotally connecting both the outer end of the tension member and the inner end of the spoke and providing with a continued curved portion extending inwardly from the common axis; so that when the umbrella frame is turned inside out the tension members are curved downwardly by virtue of the extended portion of the joint member under tension for urging the joint members upwardly when the slider is pulled downwardly on the shaft, thereby restoring the umbrella to its originally closed condition.

5,597,805

AUTOMOTIVE HAIL PROTECTION AND SHADE CANOPY

James H. Thomas, 12 NE. 28th, Oklahoma City, Okla. 73105

Filed Jan. 16, 1996, Ser. No. 586,396
Int. Cl.[6] E04B *1/347*
U.S. Cl. 135—87 9 Claims



1. An automotive parking lot hip-and-valley roof-type hail protection structure, comprising:
a first plurality of upright post assemblies arranged in longitudinal and transverse rows for defining a rectangular boundary of a parking lot;
a second plurality of upright posts interposed in aligned spaced relation between said longitudinal and transverse rows,
each post of said first and second plurality of posts having a portion of its depending end embedded in the surface of the earth;
a plurality of parallel longitudinal cables tautly extending between and connected with the upper limit of the posts in said longitudinal post rows for defining roof-type ridge and eave cables;
a plurality of transverse cables tautly extending between and connected with the upper limit of the posts in said transverse rows;
a plurality of other cables tautly extending between diagonally opposite posts and post assemblies;
a plurality of structure cover support cables tautly extending transversely of the structure between said eave cables in

parallel spaced-apart relation between said transverse cables on the transverse rows of posts;

structure cover means including elongated juxtaposed fabric strips, transversely equal with the spacing between said structure cover support cables, secured together by parallel rows of stitching in longitudinal fabric edge overlapping relation juxtaposition to form a longitudinally coextensive fabric loop between each two adjacent strips surrounding the respective said cover support cable, and in overlying relation with respect to said ridge cables;

said fabric strips having aligned transverse end portion loops; and,

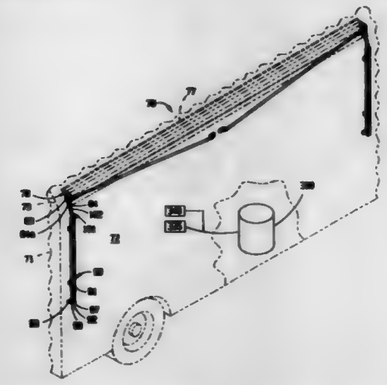
a fabric eave cable in each said fabric strip end portion loop and connected with respective corner and eave post assemblies.

5,597,006

AUTOMATIC AWNING FOR RECREATIONAL VEHICLES

Louis Simonetti, Elk Grove, Ill., assignor to Zip Dee, Inc., Elk Grove Village, Ill.

Filed Jun. 6, 1995, Ser. No. 465,975
Int. Cl.[6] E04F *10/00*
U.S. Cl. 135—88.1 **51 Claims**



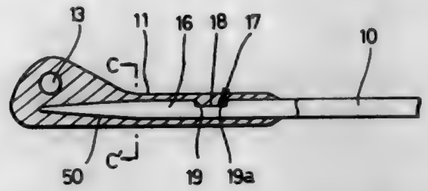
1. An automatically extendible and retractable awning for a vehicle, comprising an awning material connected at one end to a recreational vehicle and at the other end to a roller assembly, said roller assembly being movable between a stored position wherein said awning material is wrapped around said roller assembly and is positioned adjacent the recreational vehicle and an extended position wherein said awning material extends away from the recreational vehicle, mechanism for providing energy to said roller assembly to effectuate movement of said roller assembly between the extended and the stored positions thereof, two support arm assemblies, each being mounted at one end thereof to the recreational vehicle and at the other end to said roller assembly, said support arm assemblies being movable between a stored position thereof wherein said support arm assemblies are close and generally parallel to the side of the recreational vehicle and an extended position wherein said support arm assemblies extend away from the recreational vehicle, two rafter arm assemblies, each being mounted at one end thereof to the recreational vehicle and at the other end thereof to said other end of an associated one of said support arm assemblies, said rafter arm assemblies being movable between a retracted position and an extended position wherein said rafter arm assemblies assist holding said roller assembly in the extended position thereof with the awning material unrolled and extending away from the recreational vehicle, mechanism for using pressurized fluid for moving said support arm assemblies to an extended position thereof when said roller assembly is moving to the extended position thereof, and means for connecting said mechanism for using pressurized fluid to a source of pressurized fluid for automatically extending said awning.

5,597,007

FOLDABLE TENT FRAME

Dong S. Ju, Seoul, Rep. of Korea, assignor to Baejin Corporation, Rep. of Korea

Filed Aug. 21, 1995, Ser. No. 517,086
Claims priority, application Rep. of Korea, Feb. 27, 1995, 3200/1995
Int. Cl.[6] E04H *15/00*
U.S. Cl. 135—124 **8 Claims**



1. For a foldable dome shape tent of the type which comprises a plurality of arcuate frame members extending from a central fastening hub and wherein the arcuate frame members each comprise a plurality of elongated frame member segments having end portions on which are provided joint portions, the joint portions being effective to permit the frame member segments to be moved between a first, folded position to permit compact stowage of the tent, and a second, unfolded position which enables the frame member segments to form the arcuate frame members to support the tent in a dome shape deployed position, a method for fabricating a firm connection between a frame member segment and a respective joint portion in a manner which prevents loose axial rotation and separation between the frame member segment and the joint portion, the method comprising:

a) providing an elongated frame member segment having a longitudinal axis and an end portion;

b) forming a channel shaped dented recess adjacent the end portion of the frame member segment, the channel shape recess being oriented substantially transverse to the longitudinal axis of the frame member segment;

c) inserting the end portion of the frame member segment into a molding die corresponding to a desired joint portion configuration; and

d) forming a joint portion onto the end portion of the frame member segment by injecting resin into the molding die and allowing the resin to cool and harden, and whereby the resin which fills the channel shaped indented recess prevents loose axial rotation and separation between the frame member segment and the joint portion.

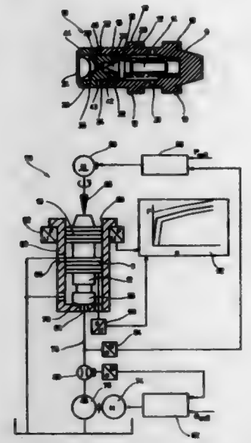
5,597,008

PRESSURE-LIMITING VALVE AND METHOD OF SETTING OPENING PRESSURE OF THE PRESSURE-LIMITING VALVE

Gerhard Overdick, Friedrichsdorf; Hans-Jürgen Lauth, Usingen; Van D. Nguyen, Frankfurt, and Randolf Körtge, Usingen, all of Germany, assignors to Luk Fahrzeug-Hydraulik GmbH & Co., KG., Bad Homburg, Germany

Filed Apr. 12, 1995, Ser. No. 420,549
Claims priority, application Germany, Apr. 12, 1994, 44 13 190.9
Int. Cl.[6] F16K *15/06*; G01L *27/00*
U.S. Cl. 137—15 **25 Claims**

19. A method of setting an opening pressure of a pressure-limited valve including a housing having a bore, a valve seat



located in the bore, a sealing element displaceable in the bore between a closed position in which it engages the valve seat, and an open position in which it is spaced from the valve seat, and spring means for biasing the sealing element to a closed position thereof, said method comprising the steps of:

pressing-in of the valve seat into the housing bore; and

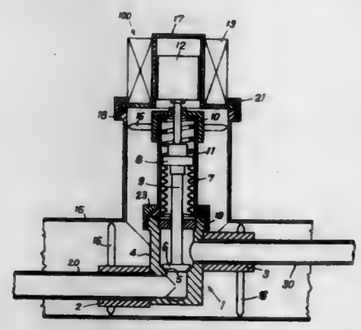
continuously controlling pressing-in forces during a pressure-in process, whereby an opening pressure of the pressure-limiting valve, which results in displacement of the sealing element against a biasing element against a biasing force of the spring means, is set.

5,597,009

VACUUM-ENCLOSED INTEGRAL CRYOGENIC VALVE

Norbert Scherrer, St Just; Philippe Guilon, La Chapelle Reanville, and Etienne Hardouin, Hennezis, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

Filed Mar. 14, 1995, Ser. No. 403,650
Claims priority, application France, Mar. 17, 1994, 94 03126
Int. Cl.[6] F16K *31/04;31/10*
U.S. Cl. 137—375 **6 Claims**



1. An electrically-controlled vacuum-enclosed cryogenic valve including:

a body receiving a seat for a valve member, and inlet and outlet channels for a cryogenic fluid defining a flowpath, the body and the channels being disposed in an enclosure in which a vacuum is created; and

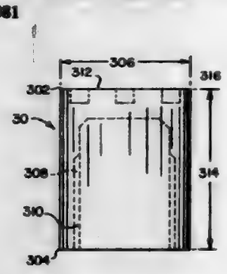
the valve member including a stem, the valve member being actuated by excitation means comprising a moving core and a control electromagnetic winding, a return spring pressing the valve member against the seat in the absence of excitation, wherein said moving core is placed inside the vacuum enclosure and disposed outside the flowpath for the cryogenic fluid.

5,597,010

SAFETY CAP FOR FLUID VALVE

John W. Hoffman, P.O. Box 951195, Lake Mary, Fla. 32795, and Curtis W. Hoffman, 111 Maplewood Dr., Sanford, Fla. 32771

Filed Sep. 8, 1995, Ser. No. 525,828
Int. Cl.[6] F16K *27/08*
U.S. Cl. 137—381 **14 Claims**



1. A safety cap for preventing unauthorized access to a valve leading to a fluid storage vessel, the safety cap comprising:

a collar having:

means for retaining the collar in surrounding relation to an access port of the valve; and

a bore dimensioned to encompass the valve access port and further having a height dimensioned to extend thereabove; and

a locking piece dimensioned to cover the valve access port and to reside within the collar bore, the locking piece mechanically decoupled from the collar, the locking piece comprising:

means for releasably attaching the locking piece to the valve; and

means for interfacing with a releasing tool for engaging and disengaging the locking piece from the valve.

5,597,011

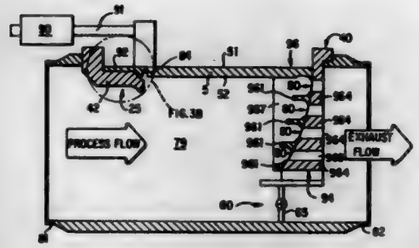
FLOW REGULATOR

David W. Palmer, 200 Berkeley Rd., North Andover, Mass. 01845

Continuation-in-part of Ser. No. 126,151, Sep. 23, 1993, Pat. No. 5,456,280, and Ser. No. 141,498, Oct. 22, 1993, Pat. No. 5,450,873, which is a continuation-in-part of Ser. No. 965,909, Oct. 23, 1992, abandoned, and Ser. No. 965,907, Oct. 23, 1992, Pat. No. 5,320,124, said Ser. No. 965,909and Ser. No. 965,907, , each is a continuation-in-part of Ser. No. 850,767, Mar. 13, 1992, Pat. No. 5,251,654, Ser. No. 851,017, Mar. 13, 1992, Pat. No. 5,255,710, Ser. No. 852,084, Mar. 13, 1992, Pat. No. 5,255,709, and Ser. No. 851,016, Mar. 13, 1992, Pat. No. 5,220,940, said Ser. No. 850,767Ser. No. 851,017, Ser. No. 852,084, and Ser. No. 851,016, , each is a continuation-in-part of Ser. No. 669,746, Mar. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 405,835, Sep. 11, 1989, Pat. No. 5,000,221, which is a continuation-in-part of Ser. No. 178,585, Apr. 7, 1988, abandoned. This application Jan. 27, 1995, Ser. No. 380,853
Int. Cl.[6] G05D *7/01*
U.S. Cl. 137—497 **22 Claims**

1. A device for regulating the flow of fluid through a passageway, the device comprising:

a conduit having a wall defining the passageway through the device;



a member having a top face, exposed to a reference preasure, and a bottom face forming a portion of the conduit wall, the member being hingedly mounted about a pivot point, wherein the member includes a downward-facing groove at the pivot point, so that the member can pivotally rest on a rod fixedly attached to the conduit at the pivot point;

a gate attached to the member at a point downstream from the pivot point the gate extending into the passageway so as to variably impede fluid flowing through the passageway at a constriction point, the gate's impedance on the fluid flow varying as a function of the preasure differential across the member's top and bottom faces, the gate and the member being mounted so that each moves in a direction transverse to the direction of the fluid through the constriction point; and

restoring means for exerting a torque on the member around the pivot point so as to tend to cause the gate to lessen the impedance on the fluid flow, and so that when there is no flow through the passageway the amount that the gate impedes the flow is relatively low, the restoring means including the weight of the member upstream of the pivot point.

5,597,012

VALVE WITH A THRESHOLD WITH RETRACTABLE PUSH ROD

Patrice Meinard, Montreuil, France, assignor to AlliedSignal Europe Services Techniques, Drancy, France

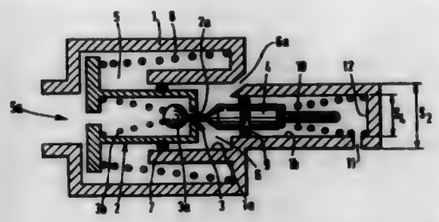
PCT No. PCT/FR94/01058, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO95/09751, PCT Pub. Date Apr. 13, 1995

PCT Filed Sep. 8, 1994, Ser. No. 313,145

Claims priority, application France, Oct. 5, 1993, 93 11830

Int. Cl.[6] B60T *8/30*

U.S. Cl. 137—505.13 **2 Claims**



1. A valve assembly having a fluid pressure threshold for producing an outlet pressure which is shifted with respect to an inlet pressure of for a fluid, said valve assembly comprising: a body in which is pierced with at least one cylindrical bore; a piston defining in said bore, a first chamber into which there emerges a pressure inlet, and a second chamber into which there emerges a pressure outlet, said piston being capable of sliding in sealed fashion in said bore, from a rest position as far as a limiting position, under the effect of the inlet pressure and counter to a first force which is exerted by first elastic means; a valve element carried by said piston and capable of causing said first and second chambers to communicate with one another when said valve element is open; and a push rod located in said second chamber and having a surface facing said valve element and capable of causing said valve element to open when said push rod and said valve element are urged towards one another with a force greater than a predetermined opening threshold, said valve assembly being characterised in that said push rod closes said second chamber in sealed fashion downstream of the pressure outlet and said push rod slides in this second chamber under the effect of the outlet pressure over a stroke of determined length, and counter to a second force exerted by a second elastic means, said second force being greater than said opening threshold and in the same direction as said first force, said stroke of said push rod being defined between said rest position which this push rod adopts when said piston is in a rest position and a limiting position of said push rod in which said push rod encounters a stop piece secured to said body, said push rod opening said valve element when it a rest position, the length of the stroke of said push rod being greater than a relative displacement which said push rod and said piston have to undergo from their respective rest positions in order to close the valve element, and said rest position and said limiting position of the piston are separated by a distance at least equal to that which separates the position of said push rod for which said valve element closes from a limiting position of said push rod in which said push rod encounters said stop piece.

5,597,013

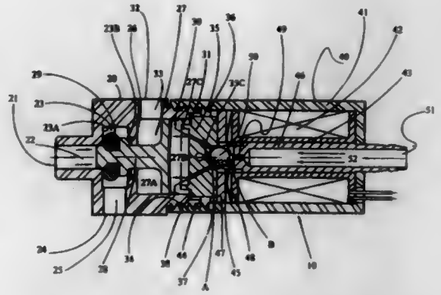
ELECTROMAGNETIC CONTROL BALL VALVE

Arkady Ushakov, Cleveland, Ohio, assignor to Serge Vaks, Cleveland, Ohio

Filed Oct. 10, 1995, Ser. No. 541,951

Int. Cl.[6] F16K *31/06*

U.S. Cl. 137—596.16 **19 Claims**



1. An improved electromagnetic valve comprising:

body structure presenting a plurality of chambers wherein a multi-stepped control valve member is disposed for axial displacement, said member has a minor end whose surface area is substantially less than the surface area of its extreme major end,

opposing pressure is simultaneously supplied to both ends and is the sole force that controls the position and movement of said member, said member rests in one extreme when dual pressure is uninterrupted,

an electric coil having a core magnetically responsive to energization of said coil, said core positioned to attract a magnetically responsive ball to draw it towards said core and effectively restrict a pressure supply passage, said passage supplies pressure to said major end of said member when not restricted by said ball,

an axial inlet port and a radial port lead to a minor chamber wherein said minor end of said member undergoes displacement, when pressure is restricted from said passage, the pressure from said inlet port urges said member to the other extreme, permitting said inlet port to communicate with said radial port thereby opening the valve.

5,597,014

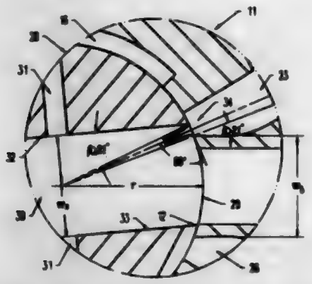
HIGH-FLOW DIRECT-DRIVE ROTARY SERVOVALVE

Ralph L. Vick, Granada Hills, Calif., assignor to Moog Inc., East Aurora, N.Y.

Continuation-in-part of Ser. No. 447,113, May 22, 1995, abandoned, which is a continuation of Ser. No. 220,803, Mar. 31, 1994, abandoned. This application Nov. 8, 1995, Ser. No. 555,574

Int. Cl.[6] F15B *13/04*

U.S. Cl. 137—625.23 **12 Claims**



1. In a rotary valve adapted to be associated with a fluid source and a fluid return, and adapted to control the flows of fluid through variable-area metering ports with respect to the opposed chambers of a fluid-powered load, said valve having a body provided with an elongated bore, said body having at least one passageway communicating at a location along said bore with said one of said source, return and load, said valve also having a spool member rotatably mounted in said bore, said spool member having a passage adapted to cooperate with said body passageway so as to selectively uncover a metering port therebetween, the orifice area of said metering port being a function of the angular position of said spool member relative to said body, wherein the improvement comprises:

said cooperative body passageway and spool passage being so configured and arranged so as to cause the flow through said metering port to be oriented such that the application of tangential reaction forces attributable to said flow to said spool member is eliminated, and wherein a wall of the passage or passageway located upstream of said orifice terminates in an edge of said metering port which is arranged in a plane containing the axis of said spool and said wall is relieved from said plane by an angle of at least 21° such that the flow through said metering port is radial.

5,597,015

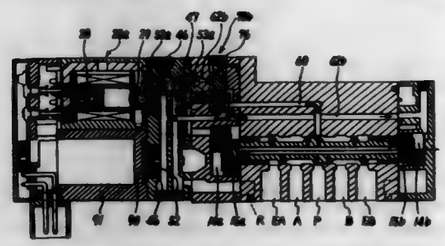
ELECTROMAGNETIC PILOT TYPE SELECTOR VALVE

Yoshio Asou; Bunya Hayashi; Hidehara Sato, and Takumi Matsumoto, all of Yawara-mura, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 159,586

Int. Cl.[6] F15B *13/043*

U.S. Cl. 137—625.64 **4 Claims**



1. An electromagnet pilot type selector valve, comprising:

a main valve body having an input port, an output port and a discharge port for main fluid and a spool type main valve disc for switching communication between these ports;

two end plates mounted on both ends in an axial direction of the main valve body;

large and small pistons for driving the main valve disc having different pressure receiving areas and being mounted at both ends in the axial direction of the main valve disc in large and small size piston chambers formed on said end plates;

a pilot valve body mounted on one of the end plates and provided with two pilot supply valve seats positioned between the input port and the piston chambers, and two pilot discharge valve seats positioned between the piston chambers and the pilot discharge port;

a solenoid mechanism replaceably mounted on the pilot valve body and used for opening or closing said pilot supply valve seats and the pilot discharge vale seats;

two manual operators for manually communicating the input port with the large size and the small size piston chambers;

a power feeding means for feeding power to the solenoid mechanism;

a solenoid mechanism for opening or closing the pilot supply valve seat between the input port and the large size piston chamber and the pilot discharge valve seat between the large size piston chamber and the pilot discharge port, and the manual operator corresponding to the small size piston chamber maintains the input port and the small size piston chamber directly communicated with each other, and the pilot supply valve seat not in use and positioned between the input port and the small size piston chamber is closed by an adequate means to make the valve serve as a single-solenoid type selector valve; and

a dummy body for filling a space is mounted at a position to match the pilot supply valve seat not in use and the pilot discharge valve seat and adjacent to the solenoid mechanism, which is provided alone.

5,597,016

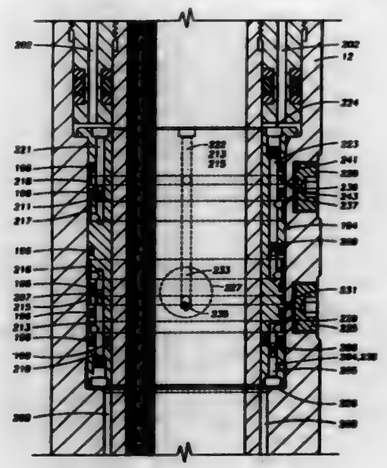
MECHANICAL LOCKOUT FOR PRESSURE RESPONSIVE DOWNHOLE TOOL

Kevin R. Manke, Flower Mound, and Paul Ringgenberg, Carrollton, both of Tex., assignors to Halliburton Company, Dallas, Tex.

Division of Ser. No. 238,417, May 5, 1994. This application Jun. 7, 1995, Ser. No. 481,555

Int. Cl.[6] F15D *1/14*

U.S. Cl. 138—46 **4 Claims**



1. A metering apparatus providing an adjustable resistance flow path for metering of fluid, said apparatus comprising:

a. a fluid flow path for communicating fluid therealong, said fluid flow path comprising at least two alternate paths;

b. a plurality of fluid flow restrictors operable to restrict fluid flow through the fluid flow path, each of said alternate paths passing through a different number of said fluid flow restrictors;

at least one flow diverter that is disposable within the flow path, said flow diverter capable of diverting said fluid flow from one of said at least two alternate paths to the other.

5,597,017

METHOD AND APPARATUS FOR PRODUCING A RETAINING NET

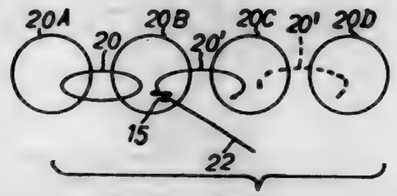
Bernhard Eicher, Roggwil, and Xaver Popp, Leonmoosschwil, both of Switzerland, assignors to Futura AG, Romanshorn, Switzerland

Filed Apr. 5, 1995, Ser. No. 416,612

Claims priority, application Switzerland, Apr. 8, 1994, 01048/94

Int. Cl.[6] B21F 31/00

U.S. Cl. 140—3 R 7 Claims



1. A method for producing a retaining net made of wire rings, comprising the following steps:

(a) prefabricating first closed wire rings (20A, 20B, 20C, . . .) each having a plurality of windings held together by clamps (21),

(b) suspending said first closed wire rings in a row to freely hang down in a substantially vertical plane,

(c) feeding a single strand wire (22) through a bending tool (15) to form an initial arcuate configuration (22A),

(d) interlooping said initial arcuate configuration in a substantially horizontal plane through at least two first closed wire rings (20A, 20B) extending in said substantially vertical plane and continuing to bend and feed said single strand wire (22) to form a looping second closed wire ring (20, 20') having a plurality of turns that interloop said two first closed wire rings (20A, 20B),

(e) securing a number of clamps (21) to said plurality of turns of said looping second closed wire ring (20, 20') for holding said turns together,

(f) displacing said bending tool (12, 11) in a substantially horizontal plane when said interlooping step is completed, and

(g) repeating said interlooping, securing, and displacing steps until a number of first closed wire rings (20A, 20B, 20C, . . .) are interlooped with a required number of second closed wire rings (20, 20', . . .) to form said retaining net.

5,597,018

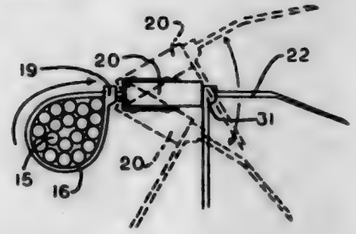
BUNDLE TIE TIGHTENING AND CUT OFF TOOL

Barry Shipman, P.O. Box 3916, Christiansted, St. Croix, Virgin Islands (U.S.)

Filed Dec. 29, 1994, Ser. No. 366,270

Int. Cl.[6] B21F 9/02

U.S. Cl. 140—123.6 14 Claims



1. A tool for use in tightening and trimming the excess tail portion of a self-locking strap installed about a plurality of articles, said self-locking strap having a stop head, said tool having a longitudinal axis and comprising:

(a) a carrier lever of rigid material of a size to be easily held and manipulated by hand and shaped to accommodate the protruding tail of said self-locking strap before and in combination with the stop head of a like strap, said carrier lever having a forward end, said forward end of said carrier lever including fulcrum means for bearing on said stop head of said self-locking strap,

(b) a strap cutter means integral with the forward end of said carrier lever to sever said excess tail portion during the course of rotating about the longitudinal axis of said tool.

5,597,019

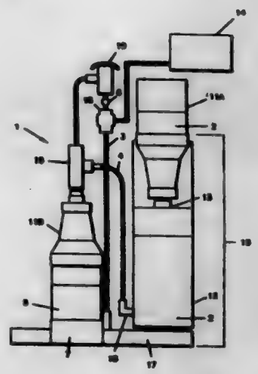
DILUTION SYSTEM FOR FILLING SPRAY BOTTLES

John E. Thomas, River Falls, Wis.; Daniel K. Boche, Eagan, Minn.; John E. McCall, Jr., West St. Paul, Minn.; Eric R. Bair, Eagan, Minn.; Elizabeth J. Gladfelter, Roseville, Minn., and Daniel E. Pederson, Cottage Grove, Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Mar. 30, 1995, Ser. No. 413,782

Int. Cl.[6] B65B 1/04;3/04

U.S. Cl. 141—18 20 Claims



1. An apparatus for diluting a liquid concentrate with a liquid diluent to form a dilute use solution using a dilute use solution container substantially similar to a container for liquid concentrate, the apparatus comprising:

(a) an aspirator comprising:

(i) an inlet for liquid diluent;

(ii) an inlet for liquid concentrate; and

(iii) an outlet for the dilute use solution;

(b) a reservoir comprising:

(i) a reservior container adapted to contain about 1000 to 5000 milliliters liquid concentrate discharged from a liquid concentrate container;

(ii) a liquid concentrate outlet in liquid communication with the aspirator inlet for liquid concentrate;

(iii) a mating surface in the reservoir shaped and configured to support a liquid concentrate container and a means to open a liquid concentrate container fitment in the liquid concentrate container when introduced into the reservoir;

(c) a source of liquid diluent in liquid communication with the aspirator inlet for liquid diluent;

(d) a controller with means to control flow of liquid diluent from a source of liquid diluent to the aspirator inlet; and

(e) at least one container selected from the group consisting of a container for the liquid concentrate or a container for the dilute use solution in the reservoir;

wherein a concentrate container, when empty, is used as a dilute use solution container.

5,597,020

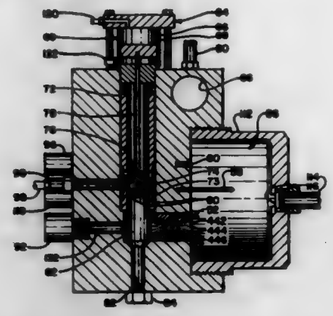
METHOD AND APPARATUS FOR DISPENSING NATURAL GAS WITH PRESSURE SENSOR CALIBRATION

Charles E. Miller, 150 Seminole, Boulder, Colo. 80303; John F. Waers, 123 Snowmass Pl.; James A. Magin, 8983 Walker Rd., both of Longmont, Colo. 80503; Randal L. Custer, 566 Mt. Evans, Longmont, Colo. 80501, and John T. Lopez, 6844 Twin Lakes Rd., Boulder, Colo. 80301

Continuation of Ser. No. 155,169, Oct. 27, 1993, abandoned, which is a continuation of Ser. No. 858,143, Mar. 27, 1992, Pat. No. 5,259,424, which is a continuation-in-part of Ser. No. 722,494, Jun. 27, 1991, Pat. No. 5,238,030. This application Mar. 3, 1995, Ser. No. 400,282

Int. Cl.[6] B65B 31/00

U.S. Cl. 141—95 5 Claims



1. Fluid dispensing apparatus for dispensing fluid from a fluid source to a fluid receiver at an ambient temperature, wherein the fluid in the fluid source has a stagnation pressure and a stagnation temperature and wherein the fluid receiver has a receiver pressure capacity rating at a standard pressure and temperature, comprising:

conduit means for connecting said fluid source in fluid flow relation to said fluid receiver for conducting a flow of fluid from said fluid source to said fluid receiver;

valve means positioned in said conduit means between said fluid source and said fluid receiver for selectively closing and opening said conduit means to the flow of fluid from said fluid source to said fluid receiver;

value control means connected to said value means for actuating said valve means to close and open said conduit means to the flow of fluid;

flow measuring means positioned in said conduit means for measuring flow rate of fluid flowing in said conduit means from said fluid source to said fluid receiver, said flow measuring means including a throat with a restricted cross-sectional area through which the fluid must flow in flowing from said fluid source to said fluid receiver, upstream pressure measuring means positioned upstream from said throat for measuring fluid pressure upstream of said throat, downstream pressure measuring means positioned downstream from said throat for measuring fluid pressure downstream of said throat, wherein said throat, said upstream pressure measuring means, and said downstream pressure measuring means are all positioned in the same fluid flow relation to said value means; and

calibration means for matching pressure measurements from said downstream pressure measuring means to pressure measurements from said upstream pressure measuring means, wherein said calibration means includes microprocessor means for receiving both an upstream fluid pressure measurement from said upstream fluid measuring means and a downstream fluid pressure measurement from said downstream fluid measuring means when said valve means is actuated by said valve control means to close said conduit means to the flow of fluid, for comparing and determining any difference between said downstream fluid pressure measurement with said upstream fluid pressure measurement, and for adding said difference algebraically to downstream fluid pressure measurements received subsequently by said microprocessor means from said downstream flow measuring means.

5,597,021

DISPENSING CLOSURE FOR LIQUID CONTAINERS

Garry W. Crossdale, Ripley, and Michael Veveris, Sleaford, both of Great Britain, assignors to Unilever N.V., Rotterdam, Netherlands

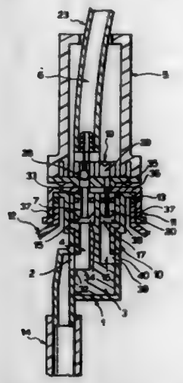
PCT No. PCT/CA93/00550, § 371 Date Aug. 29, 1995, § 102(e) Date Aug. 29, 1995, PCT Pub. No. WO94/14697, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 21, 1993, Ser. No. 491,840

Claims priority, application United Kingdom, Dec. 12, 1992, 9226624

Int. Cl.[6] B65B 1/04;3/04

U.S. Cl. 141—346 15 Claims



1. A closure for allowing the emptying of the contents of a container, the closure having:

a hollow closure member for a container, the closure member having an outlet for the contents;

a rotatable plug mounted within the closure member, the plug having a first through-passage for the contents with an inlet and an outlet, said plug being rotatable between a first closed position in which said inlet of the through-passage is out of register with the closure member outlet and a second open

position in which said inlet is in register with the closure member outlet to permit the contents to pass into the passageway;

means for retaining said closure member in a container;

a connector for transfer of the contents out of the container, the connector having means to engage an exposed portion of the plug, the connector having a second through-passage with an inlet in communication with said outlet of said first through-passage of said plug;

said closure being characterized in that a means is provided for sealing said plug with said closure member, where, when engaged, said plug retains an airtight seal when in register with said closure member;

said retaining means retaining said rotatable plug within said closure member, said retaining means exposing an outer portion of said rotatable plug, said exposed portion having said outlet of said first through-passage therein, and

means for sealing said second through-passage with said outlet of said first through-passage where said connector is able to engage said plug in one motion, without losing an airtight seal;

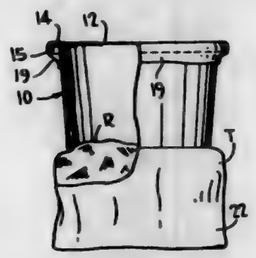
the connector when engaged with the plug, can be turned to rotate said plug to said open position or to said closed position, wherein said sealing means for said connector retains said seal between said plug and said connector in said open position.

5,597,022

DEVICE FOR LOADING TRASH BAGS

Richard F. Reifers, 549 Oenoke Ridge, New Canaan, Conn. 06840

Division of Ser. No. 311,106, Sep. 23, 1994, abandoned. This application Sep. 19, 1995, Ser. No. 530,013
Int. Cl.[6] B65F *1/06*
U.S. Cl. 141—390 3 Claims



1. A device for loading a flexible trash bag with compactible refuse including leaves, lawn clippings, and scrap paper, comprising, in combination:

a loading ring comprising a continuous and uninterrupted sidewall forming a truncated cone having an open upper end of a given diameter and an open lower end of a diameter less than said given diameter;

said lower end presenting a continuous, annular edge at which said ring is supported in an upstanding position;

said ring being of one-piece rigid material having outwardly extending handle means at said upper end;

said trash bag having a capacity of about 30 to 55 gallons and said sidewall having a height slightly less than said diameter of said open lower annular edge;

said bag having a sidewall of a given diameter and height, an open top end and a closed bottom end, said diameter of said bag sidewall being greater than the diameter of said lower annular edge;

said sidewall height of said ring being slightly less than one-half the height of said bag;

said open top of said bag being secured about said handle means, and said bag sidewall extending within said ring from said upper end thereof to at least said annular edge when said bag is collapsed in a first empty condition prior to loading;

said ring being supported at said annular edge on the surface of the ground or a floor in said first condition, and said ring sidewall forming a first enclosure for refuse in said first condition; and

said bag sidewall extending beyond said annular edge when the bag is partially filled or completely filled with refuse in a second filled condition;

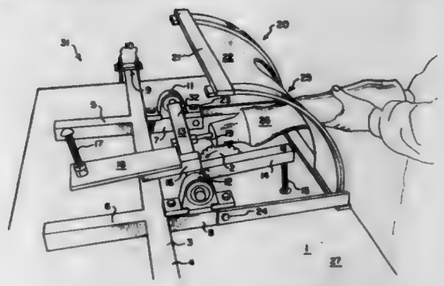
said ring being supported at said annular edge directly on the bag in said second condition for both compacting the refuse upon application of a downward manual external force to said ring and for forming a second enclosure for refuse in said second condition.

5,597,023

TABLE SAW TENONIZER JIG

Michael G. Heintzeman, 8200 Semmler Rd., Nisswa, Minn. 56468

Continuation of Ser. No. 994,529, Dec. 21, 1992, abandoned. This application Nov. 9, 1995, Ser. No. 555,004
Int. Cl.[6] B23Q *3/00*
U.S. Cl. 144—284.2 12 Claims



1. In combination with a table saw having a table top and a rotating dado blade with a perimeter cutting edge, a device for cutting a tenon into the end of an elongated wood stock, the device comprising:

a main frame removably fastened to the table top;

a rocker assembly affixed to said main frame, functioning to enable the rotation of a central shaft in an arc over the table top;

said rocker assembly further comprising an axis shaft mounted perpendicular to the central shaft, functioning to support the wood stock along a hole in the longitudinal axis of one end of the wood stock; and

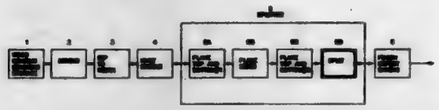
said rocker assembly further comprising means for predetermining an arc of rotation of the central shaft and axis shaft, whereby a tenon is cut into the wood stock at the end mounted on the axis shaft when the wood stock is rotated around the axis shaft and into the perimeter cutting edge of the dado blade within the predetermined arc of rotation of the axis shaft.

5,597,024

LOW PROFILE HARDWOOD FLOORING STRIP AND METHOD OF MANUFACTURE

Darl J. Belyard, Whitmer, W. Va.; James E. Price; Dicky R. Welch, both of Jackson, Tenn.; Gerhard Hess, Kleinheim, and Jürgen Potseid, Bad Rappenau, both of Germany, assignors to Triangle Pacific Corporation, Dallas, Tex.

Filed Jan. 17, 1995, Ser. No. 373,042
Int. Cl.[6] B27L *5/02*; B27C *9/00*
U.S. Cl. 144—369 12 Claims



1. A method of producing a hardwood flooring product, comprising the steps of:

(a) processing a strip of raw wood into a blank having a predetermined thickness and width defined by top and bottom surfaces and opposing side edge surfaces which reside in parallel planes relative to each other;

(b) planing the top and bottom surfaces of the blank;

(c) planing the side edge surfaces of the blank;

(d) splitting the blank along the width of the blank from one side to the other to form two low profile flooring strips having the same width as the blank and a thickness less than one-half the thickness of the blank;

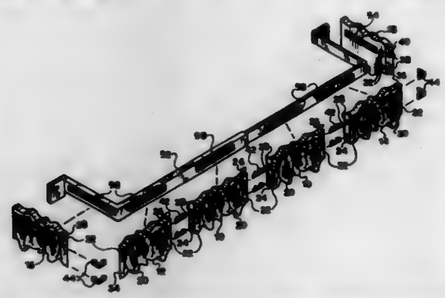
(e) the steps of (b), (c) and (d) comprising sequential automatic steps without intermediate handling.

5,597,025

SECTIONED WINDOW CORNICE

Sharon A. Fortner, 903 E. Seventh, Lamar, Mo. 64759

Filed Feb. 14, 1995, Ser. No. 388,552
Int. Cl.[6] E06B *9/00*
U.S. Cl. 160—38 20 Claims



1. A sectioned window cornice in use with a drapery rod adapted to be affixed to a wall, the drapery rod having a front surface, said window cornice comprising:

a plurality of symmetrical central front sections, each having a flat first end, an outwardly facing front face, an opposite rear face, and an opposite flat second end, each said flat end including at least one passage therein for mutual end to end abutting and removably assembling with one another;

a left and a right cornice front section, each having a flat first end including at least one passage therein for mutual end to end abutting and removably assembling with one of said symmetrical cornice front sections, an outwardly facing front face, an opposite rear face, and an opposite beveled second end including at least one passage therein;

a left and a right cornice side section, each having a flat first end, an outwardly facing front face, an opposite rear face, and an opposite beveled second end, each said beveled end including at least one passage therein for mutual assembly respectively of said left cornice front section and said left cornice side section together to form a right angle, and of said right cornice front section and said right cornice side section together to form a right angle;

a plurality of straight clips providing for the abutting connection of said cornice front sections together;

a plurality of right angle clips providing for the connection respectively of said left cornice front section and said left cornice side section together, and of said right cornice front section and said right cornice side section together; and;

a plurality of hook and loop material, a first component of hook and loop material being secured to each said rear face of each of said sections, a second component of hook and loop material being secured to the drapery rod providing for the removable installation of each of said sections to the drapery rod, whereby;

said central front sections and said left and right cornice front sections are removably assembled together end-to-end by means of said straight clips to form a straight front cornice panel length as desired, said left and said right cornice side section are removably assembled respectively to said left and said right front cornice section by means of said right angle clips to form a completed cornice, and said completed cornice is installed to the drapery rod using said plurality of hook and loop material.

5,597,026

VERTICAL BLIND ASSEMBLY

Luis C. Fuentes; Nilsida E. Gonzalez, and Pedro R. Gonzalez, all of 1025 W. 77th St., Unit P, Hialeah, Fla. 33014

Filed Oct. 25, 1994, Ser. No. 328,687
Int. Cl.[6] E06B *3/48*
U.S. Cl. 160—115 4 Claims



1. A vertical blind assembly comprising:

an elongate header casing including a top wall, a first side wall, an opposite side wall and a central wall spaced between said first side wall and opposite side wall in parallel relation thereto and defining a first channel and an adjacent, parallel second channel, said side walls and said central wall each including a pair of inwardly disposed rails extending perpendicularly therefrom within said first and second channels to form guide rails on opposite sides of each of said first and second channels, said walls and said guide rails extending along a length of said header casing,

a first traveler assembly movably supported in said first channel and structured to vertically support and selectively move a first set of individual louvers along the length of said header casing,

a second traveler assembly movably supported in said second channel and structured to vertically support and selectively move a second set of individual louvers along the length of said header casing,

said first and said second traveler assemblies each including a plurality of louver carriers and a retracting and extending scissor linkage,

said louver carriers each including:

a stem having an upper end zone, a lower end zone, a first aperture extending through said upper end zone, and a second aperture in parallel relation to said first aperture and extending through said stem between said upper end zone and said lower end zone,

a transverse axle extending through said upper end zone of said stem in perpendicular relation to said first aperture of said stem, said transverse axle including locking means for securing said scissor linkage thereon,

a pair of wheels rotatably fitted to opposite ends of said axle and supported on said guide rails in a respective one of said first and second channels,

a hook formed on said lower end zone of said stem and structured for hanging one of said individual louvers thereon, said hook being offset relative to a transverse axis of said axle so as to support the individual louver at an angled orientation relative to a longitudinal plane of said header casing, thereby facilitating stacking when said first set of individual louvers or said second set of individual louvers is moved to one side,

said scissor linkages each including a plurality of pivotally interconnected scissor arms having an aperture centrally located, said scissor linkage being vertically supported within said respective first and second channels and supportably connected at select pivot points therealong to said axles of said louver carriers, wherein extension and retraction of said scissor linkage serves to move said plurality of louver carriers along said guide rails of said respective first and second channels,

said locking means for securing said scissor linkage onto said transverse axle including a pair of outwardly disposed tabs extending from opposite sides of said transverse axle, said tabs being structured to be forcibly inserted through said apertures of said scissor linkage at said select pivot points so that said scissor linkage is supported on said transverse axle between said stem and said tabs, and

control means for selectively and individually extending and retracting said scissor linkage of each of said respective first and second traveler assemblies, thereby allowing either said first set of individuals louvers or said second set of individual louvers to be opened or closed while the other remains stationary.

5,597,827

VENETIAN BLIND HAVING REPLACEABLE LADDER CORD COVERS

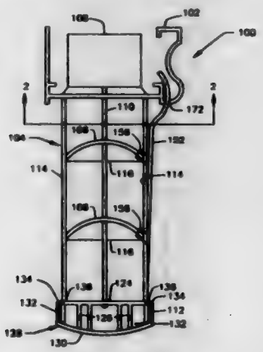
Terry Simon, West Olive, Mich.; Merrill Gitkin, Franklin Lakes, and Frank Sowa, Pompton Lakes, both of N.J., assignors to Jencraft Corporation, Totowa, N.J.

Filed Nov. 1, 1995, Ser. No. 551,483

Int. Cl.[6] E06B 9/30

U.S. Cl. 160—168.1 **53 Claims**

1. A blind comprising a headrail, support means extending from



said headrail for supporting a plurality of slats, cover means removably attachable overlying said support means for concealing a portion of said support means, and resilient means for attaching one end of said cover means to said headrail, whereby said cover means may be removed and replaced with another cover means.

5,597,828

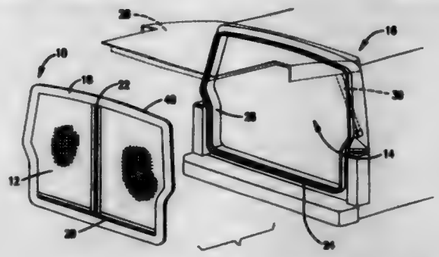
FABRIC DEVICE FOR COVERING VEHICLE OPENING

Devon A. Rolf; Rebecca L. Rolf, both of 4428 NW. Briarcliff La., Gladstone, Clay County, Mo. 64116, and Leland L. Wong, 9831 N. Holmes, Kansas City, Clay County, Mo. 64118

Filed Jul. 19, 1994, Ser. No. 277,326

Int. Cl.[6] A47H 23/00

U.S. Cl. 160—354 **20 Claims**



1. An article in combination with a vehicle, said vehicle having an opening defined by a periphery having a rim protruding outwardly from a body of said vehicle, said rim for abutting with a door of said vehicle when said door is closed, said combination comprising:

a flexible screen having an outer periphery; and

engaging means for releasably engaging said periphery of said flexible screen at least substantially about said outwardly protruding rim of said vehicle, thereby positioning said screen over said vehicle opening.

5,597,829

SHOOTING HEAD FOR A CORE SHOOTER

Werner Landua, Mannheim, Germany, assignor to Adolf Hottinger Maschinenbau GmbH, Mannheim, Germany

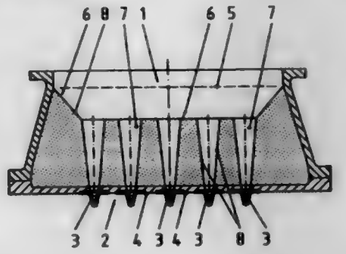
PCT No. PCT/DE94/00821, § 371 Date Feb. 5, 1996, § 102(e) Date Feb. 5, 1996, PCT Pub. No. WO95/04620, PCT Pub. Date Feb. 16, 1995

PCT Filed Jul. 16, 1994, Ser. No. 591,504

Claims priority, application Germany, Aug. 4, 1993, 43 26 180.9

Int. Cl.[6] B22C 13/12;15/26

U.S. Cl. 164—200 **7 Claims**



1. Shooting head for a core shooter for shooting foundry cores or molds, the shooting head comprising an opening (1) at its inlet end for selective connection to a filling device immersed with an outlet

member into the shooting head and defining therein a filling level (5), or to a clamping head serving to sealingly apply compressed air, and a shooting plate (4) arranged at its outlet end and accommodating shooting nozzles (3), characterized that inside the shooting head a core sand guide system (6) is formed, the core guide system (6) extending substantially from the lower edge of the maximally immersed outlet member, or from the filling level (5) defined by the outlet member, to the shooting nozzles (3), and being provided with channels (7) extending to the shooting nozzles (3), and that walls (8) defining the channels (7) converge in a wedge shape on the side facing away from the shooting nozzles (3).

5,597,830

APPARATUS FOR DEBURRING FLAME CUT SLABS

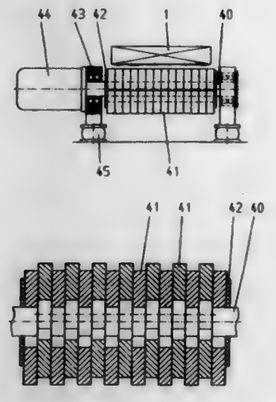
Horst K. Lotz, and Mattias Lotz, both of Hofheim-Wallau, Germany, assignors to Gega Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1995, Ser. No. 403,370

Claims priority, application European Pat. Off., Mar. 16, 1994, 94104071

Int. Cl.[6] B22D 11/12

U.S. Cl. 164—263 **7 Claims**



1. Apparatus for removing burrs from flame cut steel slabs comprising an eccentric cam like shaft rotatable at high speed, shaft drive means, and a plurality of burr knocking members loosely supported on the shaft, said burr knocking members having center bores of greater diameter than the outside diameter of the shaft.

5,597,831

PROCESS AND DEVICE FOR THE UNPACKING OF CASTING CLUSTERS

Wendelin Weinmann, Klettgau, Germany, assignor to Georg Fischer Giesserei Ianingen AG, Schaffhausen, Switzerland

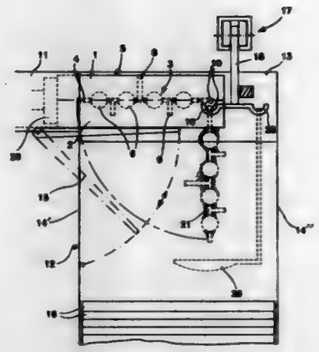
Filed Feb. 7, 1995, Ser. No. 385,096

Claims priority, application Switzerland, Feb. 11, 1994, 00410/94

Int. Cl.[6] B22D 29/02;47/00

U.S. Cl. 164—270.1 **2 Claims**

1. A device for the casting and unpacking cast clusters comprises a casting station, a primary cooling path downstream of the casting station, an unpacking station downstream of the primary cooling path and a secondary cooling path downstream of the unpacking station, said unpacking station comprises a shaft for receiving a molded clump, said shaft opening over a discharge shaft; a transport hook means disposed over said discharge shaft for receiving a molded casting cluster from said shaft; conveyor means associated with said transport hook for guiding said transport hook and molded casting cluster along a path over said discharge shaft to the secondary cooling path; and a collecting plate supported on said conveyor means below the casting cluster transport hook.



5,597,832

CONTROLLED METHOD FOR INJECTION CASING USING A MOLD UNDER VACUUM, ESPECIALLY INTENDED FOR ALUMINIUM OR MAGNESIUM ALLOYS AND DEVICE FOR CARRYING OUT SAID METHOD

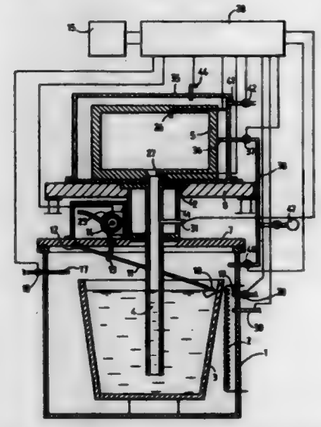
Pierre Merrien, 29 Rue des Chênes, 64140 Billere, France

Continuation of Ser. No. 239,574, May 9, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 617,959

Claims priority, application France, May 10, 1993, 93 05580

Int. Cl.[6] B22D 17/32

U.S. Cl. 164—457 **20 Claims**



1. A process for injection casting parts, particularly thin walled parts made of metallic alloys, polymers and alloy fiber composites, comprising:

placing inside a furnace a crucible containing a casting metal;

plunging an injection tube, arranged upon a plate covering the furnace, into the casting metal;

placing a mold on a support with the mold in fluid communication with the injection tube;

sealingly positioning a bell about the mold;

creating an equal vacuum level in both the mold and furnace without causing either the injection of the metal into the mold or the expulsion of the metal from the crucible;

filling the mold by pressurizing the furnace while maintaining pressure variations inside the furnace and the mold and speed variations of the metal inside the mold at any given instant at desired values based on a geometry of a part to be poured and a difference in height of the metal inside the crucible from the beginning of the filling of the mold to the given instant thereby causing a controlled injection of the metal into the mold while creating a pressure differential between the furnace and the bell;

bringing the bell to a pressure at least equal to atmospheric pressure while maintaining a difference in pressure between the furnace and the bell at least equal to said pressure differential;

maintaining the pressures in the furnace and the bell while the metal in the mold cools and solidifies; and

depressurizing the furnace and the bell to atmospheric pressure.

10. An injection casting device comprising:

a sealed furnace;

a table;

a bell sealed to said table and fluidly isolated from said furnace;

a metal containing crucible located in said furnace;

a tube fixed to one of said table and said bell and extending into said crucible;

a mold located in said bell and open to said tube;

means for simultaneously creating a vacuum in said bell and said furnace, said creating means including:

at least one vacuum pump;

a first pipe interconnected between said at least one vacuum pump and said bell;

a second pipe interconnected between said at least one vacuum pump and said furnace;

a first valve arranged in said first pipe; and

a second valve arranged in said second pipe;

pressure sensors for directly sensing a pressure in said mold and in said furnace respectively;

means for continuously determining the height of metal inside the crucible; and

means for controlling, based on signals received from said pressure sensor and said determining means and through at least said first and second valves, the pressure inside said mold and said furnace in order to fill said mold with metal from said crucible and to regulate a metal flowing speed and pressure inside said mold during filling thereof.

5,597,833

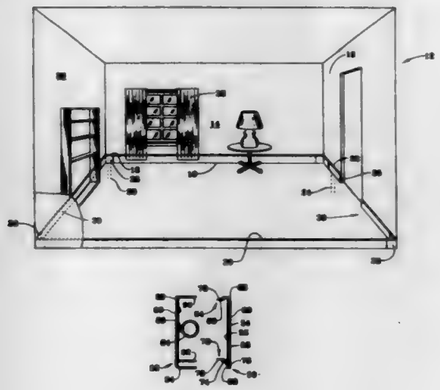
BASEBOARD HEATER

Philip Call, 9416 W. Irving Park Rd., Schiller Park, Ill. 60176

Continuation of Ser. No. 77,420, Jun. 15, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 321,404

Int. Cl.[6] F24D *19/02*; F28D *1/04*

U.S. Cl. 165—55 **11 Claims**



1. A baseboard heating device adapted to be mounted against the base of a vertical wall at or near a floor comprising:

a single piece support member having a length and a back surface and a front surface, said back surface secured lengthwise along the base of a vertical wall, said front surface of said support member having at least two spaced apart sidewalls formed thereto, each said sidewall formed from an edge wall having a first length formed perpendicular to said back surface leading to an inwardly disposed offset wall formed parallel to said back surface of a second length and a locking flange formed parallel to said edge wall of a third length, said locking flange having an outwardly facing raised ridge which tapers along an angular insertion slope to a projecting edge;

at least one heat transferring panel constructed of aluminum having an inner surface and an outer surface and a length, said inner surface having a centrally disposed hollow pipe chamber positioned a predetermined distance from said inner surface, said pipe chamber having an outer surface that is substantially exposed to free air space at a distance from said inner surface extending longitudinally along said length of said inner surface of said panel, said panel having spaced apart sidewalls having a first length formed perpendicular to an inner surface leading to an inwardly facing raised ridge which tapers along an angular insertion slope forming an insertion edge;

whereby said inner surface of said panel and said front surface of said support member cooperate to define a free air chamber encompassing said pipe chamber for distribution of heat convected during fluid transfer though said pipe chamber throughout said panel.

5,597,834

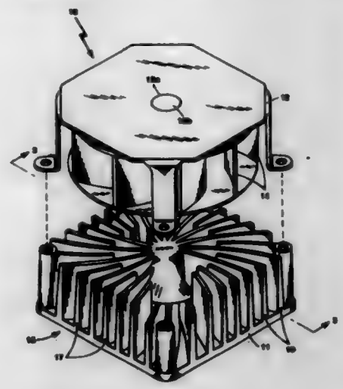
HIGH PERFORMANCE FAN HEATSINK ASSEMBLY

Charles R. Barker, III, Harvard; Richard E. Olson; Stephen E. Lindquist, both of Boylston, all of Mass.; Maximo Hartsarich, Kuuselaan, Germany; David A. Cease, Avon, and Robert S. Sobolewski, Woodbury, both of Conn., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1994, Ser. No. 270,193

Int. Cl.[6] F28F *7/00*

U.S. Cl. 165—80.3 **4 Claims**



2. A fan heatsink assembly comprising:

a heat dissipating member including a base, a truncated conical shaped central member disposed over a central portion of said base, wherein said central member maybe a truncated hyperbolic shade, and a plurality of fins supported on said base; and

a fan assembly directly mounted on said heat dissipating member,

wherein said plurality of fins comprises a first plurality of fins extending from said central member to the periphery of said heat dissipating member interposed with a second plurality of fins extending from the periphery of said heat dissipating member to a portion of a sidewall of said central member.

5,597,835

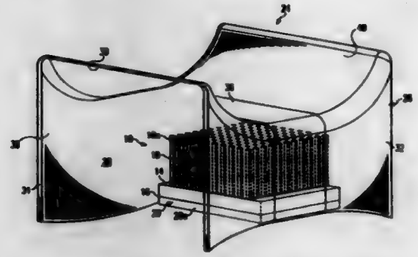
FOR USE WITH A HEATSINK A SHROUD HAVING A VARYING CROSS-SECTIONAL AREA

Randall Smith, Georgetown, and R. Steven Mills, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Aug. 18, 1995, Ser. No. 515,726

Int. Cl.[6] F28F *7/00*

U.S. Cl. 165—80.3 **18 Claims**



13. A method of cooling a heat generating electrical component, said heat generating electrical component having a heatsink associated therewith, said heatsink having a base portion with a first side and an oppositely disposed second side, said first side having cooling projections with outer ends, said cooling projections extending from said first side and said second side being attached to said heat generating electrical component, said method comprising the step of:

placing a shroud about and over said heatsink after said heat sink is attached to said heat generating electrical component, said shroud having a wall extending about and covering a portion of said cooling projections to form a passage for a flow of fluid about said cooling projections, said wall having a generally elongated rectangular shape comprised of a first side wall and an oppositely disposed second side wall, both transversely joined to an intermediate wall and said first side wall being concave from front to back and toward said cooling projections, said passage having a varying cross-sectional area with a shape that is concave from front to back to maximize said flow of said fluid about said cooling projections, to thereby enhance transfer of heat from said cooling projections to said fluid flowing through said passage; and

passing a flow of fluid through a fluid intake opening of the shroud and discharging said fluid through an oppositely disposed fluid export opening, said fluid intake and fluid export openings each having a cross-sectional area greater than said varying a cross-sectional area of said passage.

5,597,836

BALANCED DRIVE WITH RADIALLY SLOTTED COUNTERCRANK FOR ORBITAL TUBE WHIP ROD HEAT EXCHANGER

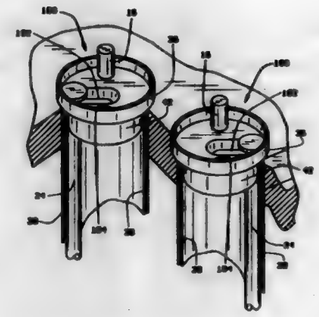
Joseph B. O'Hanlon, Springfield, Mo., assignor to Paul Mueller Company, Springfield, Mo.

Continuation-in-part of Ser. No. 262,239, Jun. 20, 1994, Pat. No. 5,513,698. This application Mar. 22, 1996, Ser. No. 621,812

Int. Cl.[6] F28F *13/02*

U.S. Cl. 165—94 **36 Claims**

33. In an orbital tube, whip rod heat exchanger, said heat exchanger having a plurality of tubes with each of said tubes having at least one whip rod located therein, the improvement comprising a driving connection between a drive source and said whip rods, said driving connection having slots to permit individual ones of said whip rods to migrate within said slots.



5,597,837

HEAT EXCHANGING APPARATUS

Kazuhiko Asada; Keichi Ueno; Shin-ichiro Kashihara; Shigemi Okamoto; Katsuo Kurose; Kazuhiko Kuwahara, and Ken-ichiro Mitsubushi, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

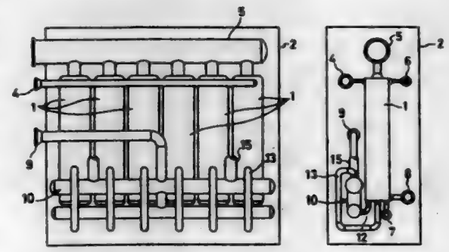
PCT No. PCT/JP95/00360, § 371 Date Nov. 7, 1995, § 102(e) Date Nov. 7, 1995, PCT Pub. No. WO95/24595, PCT Pub. Date Sep. 14, 1995

PCT Filed Mar. 7, 1995, Ser. No. 532,798

Claims priority, application Japan, Mar. 7, 1994, 6-064665

Int. Cl.[6] F25B *41/00*

U.S. Cl. 165—110 **10 Claims**



1. A heat exchanging apparatus comprising:

a gas-liquid separator to separate gas and liquid phases of refrigerants;

a plurality of plate-fin heat exchangers for exchanging heat between said refrigerants and a fluid to be cooled; and

a hollow body containing said plurality of plate-fin heat exchangers and said gas-liquid separator, wherein:

said plurality of plate-fin heat exchangers are arranged in their upright position; and

said gas-liquid separator includes:

an upper accommodation portion which is a hollow cylindrical member laid in a horizontal direction both ends of which are airtightly sealed;

a lower accommodation portion which is a hollow cylindrical member laid in the horizontal direction both ends of which are airtightly sealed; and

an intermediate accommodation portion which connects said upper accommodation portion to said lower accommodation portion so that the refrigerants may flow through and so as to form a sideways H-letter shape in the horizontal direction;

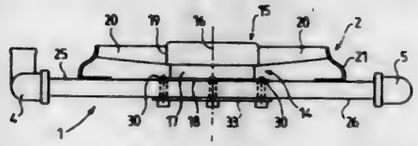
a plane including said H-letter shape of said gas-liquid separator is parallel to a wall of said plate-fin heat exchangers.

5,597,838

ASSEMBLY COMPRISING A MOTORISED FAN UNIT FIXED ON A HEAT EXCHANGER

Michel Potier, Rambouillet, France, assignor to Valeo Thermique Moteur, Le Mesnil-Saint-Denis, France

Filed Jan. 29, 1996, Ser. No. 592,985
Claims priority, application France, Jan. 30, 1995, 95 01042
Int. Cl.[6] F24H 3/02
U.S. Cl. 165—121 11 Claims



1. In combination, a heat exchanger and a motorized fan unit for producing a stream of air in thermal contact with the heat exchanger, the heat exchanger comprising a rigid matrix defining a first major face and a second major face in respective planes substantially parallel to each other and defining between them a transverse thickness of the matrix, the matrix consisting of at least one row of tubes parallel to each other and to the planes, and cooling fins attached to the tubes, the motorized fan unit comprising a fixed part which includes a base plate in facing relationship with the first major face of the matrix, with securing and locating means securing the base plate to the heat exchanger, the fixed part of the fan unit defining an axis of rotation perpendicular to the planes of the major faces of the matrix, the fan unit further comprising a rotatable part carried by the fixed part for rotation on the axis of rotation, wherein the matrix has apertures through the thickness of the matrix, with a plurality of adjacent said fins of the matrix being interrupted by a void defining each aperture and extending over the whole thickness of the matrix and between two adjacent tubes in each said row, and wherein the securing and locating means comprises: first abutment elements in fixed relationship to the base plate and bearing on the first face of the matrix; second abutment elements bearing on the second face of the matrix; fastening elements extending through the matrix and clamping the matrix between the first abutment elements and second abutment elements; and spacing elements extending through the matrix and retaining each first element in spaced relationship from the corresponding second abutment element by substantially the thickness of the matrix, each fastening element and each abutment element being together disposed in one of the apertures.

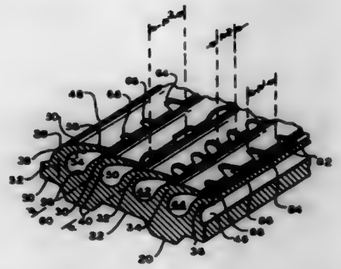
5,597,839

EVAPORATOR TUBE

Klaus K. Rieger, Sinsous Island, Ga., assignor to High Performance Tube, Inc., Warren, N.J.

Continuation-in-part of Ser. No. 217,892, Mar. 23, 1994, abandoned. This application Oct. 27, 1995, Ser. No. 549,042
Int. Cl.[6] F28F 1/42
U.S. Cl. 165—133 8 Claims

1. A heat exchanger tube for use in an evaporator tube or tube bundle comprising:
- an annular wall or base member having an inner surface, an outer surface and an elongate axis,
- an inner rib on the inner surface of the annular wall,
- a plurality of axially spaced fin convolutions on the outer surface of the annular wall,
- sectors having precisely sized and designed indentations located at specific intervals along an extreme outer edge of the axially spaced fin convolutions, wherein
- each of the precisely sized and designed indentations on an individual fin having a different designed depth or size than an immediately adjacent indentation,



- each fin convolution being bent over so that a tip of each convolution is brought into contact or overlapped contact to a side of an adjacent fin convolution and defines therewith an elongated circumferential tunnel or enclosed cavity,
- each bent over fin convolution being of curvilinear cross-section over substantially its entire height starting from a skewed plane normal to the elongate tube axis, and
- each of said indentations on said bent over fin convolution forming precisely, different shaped and sized pore openings communicating with said tunnel,
- the pore openings allowing a media or refrigerant to continuously fill and flow inside the tunnels whereby the heat exchanged through the inner surface, the base member and the fin convolutions will promote and sustain a nucleate boiling process in the media at a maximum efficiency over a wide range of heat fluxes.

5,597,840

COMBINATION GRAVEL PACKING/FRAC APPARATUS FOR USE IN A SUBTERRANEAN WELL BORE

Gregg W. Stout, Montgomery, Tex., and James T. Matte, Broussard, La., assignors to Western Company of North America, Houston, Tex.

Filed Aug. 17, 1994, Ser. No. 291,979
Int. Cl.[6] E21B 43/02
U.S. Cl. 166—51 5 Claims



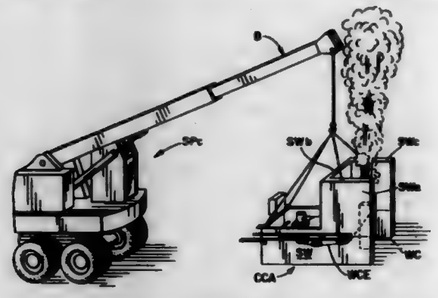
1. A combination gravel packing/frac apparatus for use in a subterranean well bore and adapted to be introduced into the well bore on a tubular conduit for circulating fluid into and from the well bore when said apparatus is in one position and for placing particulate matter transmitted within said fluid from the top of the well to around the exterior of said apparatus when said apparatus is in another position, said apparatus comprising:
- a packer assembly;
- an exterior liner assembly extending from said packer assembly and including a perforated tubular section; and
- crossover means releasably secured to said packer assembly and extending into said liner assembly, said crossover means including:
- a cylindrical conduit having a fluid flow area thereacross and communicable to said tubular conduit to form a fluid flow passage;
- crossover port means having a fluid flow area thereacross through said cylindrical conduit and selectively providing a fluid flow path between the interior of the cylindrical conduit and the interior of the liner assembly; and
- means for selectively isolating said fluid flow path from the interior of said cylindrical conduit, the flow area across said crossover port means being at least about three times the flow area across said cylindrical conduit.

5,597,841

WELL HEAD CUTTING AND CAPPING SYSTEM

Jerry H. Robinson, Mobile, Ala., assignor to Wellcutter Inc., Brewton, Ala.

Division of Ser. No. 167,892, Dec. 16, 1993, Pat. No. 5,524,517. This application Jan. 16, 1996, Ser. No. 586,227
Int. Cl.[6] E21B 29/08;35/00
U.S. Cl. 166—55 27 Claims



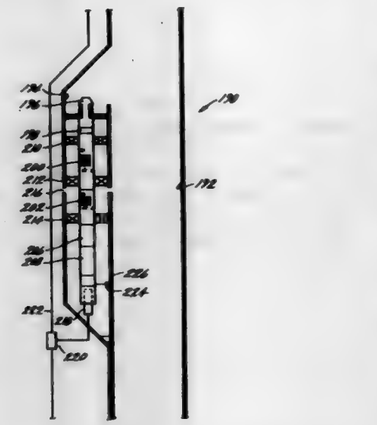
1. A system for cutting a well casing and then capping the cut well casing comprising a well casing cutting assembly and a well casing capping assembly, wherein
- (i) said well casing cutting assembly includes:
- shield walls providing a frame for said well casing cutting assembly and having an open-ended front to allow a forward portion of said shield walls to surround substantially the well casing to be cut when the well casing cutting assembly is positioned therebeside;
- a flexible tensioned cutting element having a cutting region disposed transversely at said open-ended front of said shield walls so as to be in a cutting position relative to the well casing to be cut;
- said cutting element mounted for reciprocal displacements relative to the well casing to be cut in forwardly and rearwardly directions as well as transversely in back and forth directions so as to effect cutting of the well casing; and
- (ii) said well capping assembly includes:
- a shield enclosure; and
- a thread cutting subassembly having an interiorly threaded pipe coupling which rigidly carries a normally open remotely controlled valving assembly;
- said thread cutting subassembly being mounted to said shield enclosure for rotational and vertical movements relative to the cut well casing so as to form threads on an exterior surface of the cut well casing while simultaneously causing said pipe coupling and said formed threads on the exterior of the well casing to be threadably engaged with one another, whereby subsequent closure of said valving mechanism caps the well casing.

5,597,842

METHOD FOR CONTROLLING PRODUCTION WELLS HAVING PERMANENT DOWNHOLE FORMATION EVALUATION SENSORS

Paulo S. Tubel, The Woodlands; Albert A. Mullins, II; Kevin R. Jones, both of Humble, and Frank D. Richardson, Huntsville, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 9, 1995, Ser. No. 386,480
Int. Cl.[6] E21B 43/00
U.S. Cl. 166—250.01 27 Claims



1. A method for controlling at least one downhole tool in a production well having a downhole formation evaluation sensor permanently located in a producing zone downhole, including:
- sensing at least one downhole formation parameter from the formation surrounding the production well using the downhole formation evaluation sensor to define at least one sensed formation parameter, wherein said sensed downhole formation parameter constitutes a parameter which is not normally present within the borehole; and
- controlling at least one downhole tool in response to the sensed parameter.

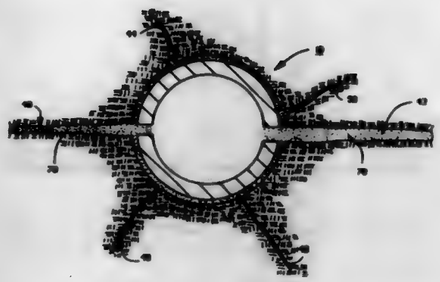
5,597,843

METHOD OF COMPLETING WELLBORES TO CONTROL FRACTURING SCREENOUT CAUSED BY MULTIPLE NEAR-WELLBORE FRACTURES

Jerome M. Stodulis, Arlington, Tex., assignor to Cross Timbers Oil, Fort Worth, Tex.

Filed Mar. 17, 1995, Ser. No. 405,601
Int. Cl.[6] E21B 43/269
U.S. Cl. 166—280 14 Claims

1. A method of fracturing a wellbore to facilitate production of hydrocarbons from a surrounding formation, comprising the method steps of:
- performing a preliminary controlled screenout fracturing operation by directing a plurality of relatively low-volume, high-concentration proppant slugs into said formation to screenout narrow fractures; and



performing a secondary conventional fracturing operation by directing fracturing fluids into said formation in order to create and enlarge a relatively small number of remaining wider fractures.

5,597,044

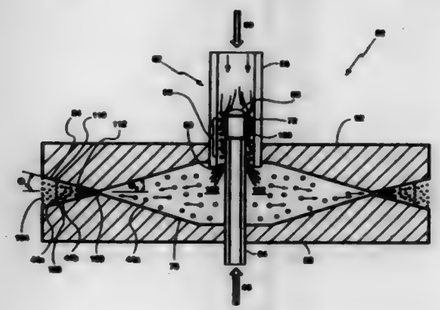
METHOD FOR DISPERSING AN ATOMIZED LIQUID STREAM

Daryl Roberts, Winchester, Mass., and James R. Butz, Denver, Colo., assignors to ADA Technologies, Inc., Englewood, Colo.

Continuation of Ser. No. 240,271, May 10, 1994, Pat. No. 5,495,893. This application Mar. 4, 1996, Ser. No. 610,746

Int. Cl.[6] A62C 35/68

U.S. Cl. 169—46 **21 Claims**



1. A method for dispensing a stream of liquid droplets in a space comprising the steps of

providing a liquid stream in a conduit;

providing carrier gas;

dispersing the carrier gas into the liquid stream as the liquid stream passes through the conduit;

decreasing the velocity of the liquid stream after the dispersing step;

atomizing the liquid stream to form a stream of liquid droplets entrained in the carrier gas;

increasing the velocity of the liquid droplets to a supersonic velocity;

decreasing the velocity of the liquid droplets to a sonic velocity;

decreasing the average size of the liquid droplets when the liquid droplet velocity decreases from the supersonic to the sonic velocity; and

dispersing the liquid droplets into the space, wherein the Sauter mean Diameter of the liquid droplets in the dispersing step is less than about 80 microns.

5,597,045

PROCESS AND TOOL FOR LAYING UNDERGROUND COLLECTOR MAINS FOR LIQUIDS AND GASES

Ingo Sass, Hildebrand strasse 4, D-76227 Karlsruhe; Hans-Joachim Bayer, Ettlingen; Klaus Kleiner, Stutensee-Büchig, and Jörg Glinger, Straubenhardt, all of Germany, assignors to Flowtex-Service Gesellschaft Fur Horizontalbohrsysteme mbH & Co. KG, Ettlingen; Ingo Sass, Karlsruhe, and Schumacher Umweltund Transtechnik, Crailsheim, all of Germany

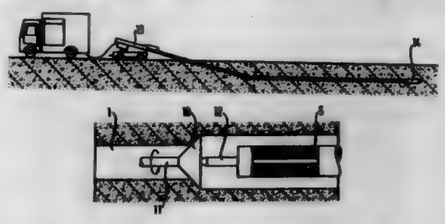
PCT No. PCT/EP94/01248, § 371 Date Feb. 6, 1995, § 102(e) Date Feb. 6, 1995, PCT Pub. No. WO94/24414, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 21, 1994, Ser. No. 360,747

Claims priority, application Germany, Apr. 22, 1993, 43 13 221.9

Int. Cl.[6] E03B 3/11; E21B 7/28

U.S. Cl. 175—62 **32 Claims**



1. A process for laying underground collector mains for liquids and gases, the process comprising steps of:

introducing at least one bore having an entry aperture and an exit aperture into predetermined soil layers using a steerable boring device, the bore extending downwardly into the soil layers from the entry aperture and upwardly out of the soil layers to the exit aperture, at least a portion of the bore being substantially horizontal,

drawing a filter strand drawing in unit, which includes a filter strand and an outer protective pipe, into the bore, and

removing the outer protective pipe of the filter strand drawing in unit.

5,597,046

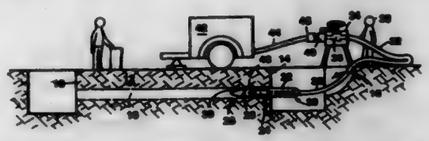
GUIDED MOLE

Allan T. Fisk, Needham, Mass., assignor to Foster-Miller, Inc., Waltham, Mass.

Filed Apr. 12, 1995, Ser. No. 420,663

Int. Cl.[6] E21B 7/04

U.S. Cl. 175—67 **18 Claims**



1. Moling apparatus for forming a generally horizontally underground passage in soil for a utility conduit or the like comprising tool head structure having a tool axis and a base portion, a nose portion mounted on said base portion such that an interface region is formed between surfaces of said nose and base portions, said nose portion being movable relative to said base portion between a first position in which surfaces of said nose portion are symmetrical with respect to the tool axis so that the tool will move through soil along a generally straight path, and a second position in which said nose surfaces are in asymmetrical position with respect to said tool axis so that said tool will tend to move through soil along a curved path in response to propulsion forces applied to said tool head structure, structure for creating a positive pressure during

system operation, a reservoir containing a displaceable lubricating material communicating with said structure for creating a positive pressure, and a channel from said reservoir to said interface region between said base portion and said nose portion.

5,597,047

RADIATOR MOUNTING FOR INTEGRATED POWER MODULE

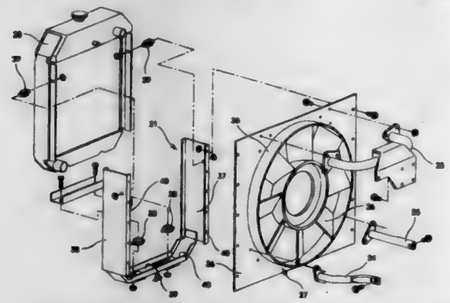
David Thompson, Darlington; Alistair J. Foster, Gainford; Steve Sekell, Ferryhill; John T. Foot, Hartburn, and Brian Hoskinson, Darlington, all of England, assignors to Cummins Engine Company Limited, Surrey, England

Continuation of Ser. No. 406,634, Mar. 20, 1995, abandoned, which is a continuation of Ser. No. 43,277, Apr. 6, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 551,539

Claims priority, application Germany, Oct. 6, 1992, 9213450 U

Int. Cl.[6] B60K 11/04

U.S. Cl. 180—68.4 **10 Claims**



1. A radiator mount for mounting a radiator to an engine having an engine-driven fan comprises:

a radiator support frame having two upstanding side panels and a bottom panel; said two upstanding side panels being connected to said bottom panel;

stationary attachment means for rigidly connecting said radiator support frame at a plurality of locations to said engine; and

side isolation mount means positioned between and connected to said side panels and the radiator for mounting said radiator to each of said side panels so as to allow limited movement of said radiator relative to said radiator support frame;

bottom isolation mount means positioned between said bottom panel and the radiator and coupled to said bottom panel for mounting said radiator to said bottom panel so as to allow limited movement of said radiator relative to said radiator support frame; and

wherein said side isolation mount means and said bottom isolation mount means being independent of each other.

5,597,048

ACCELERATOR PEDAL OVERRIDE APPARATUS FOR SELF-PROPELLED MOTORIZED CART WITH ALIGNED BRAKE AND ACCELERATOR PUSHROD TYPE OPERATOR PEDALS

Charles Brister, Amite, La., and Dale Schenkel, Yankton, S. Dak., assignors to Charles C. Brister, Amite, La.

Continuation of Ser. No. 370,107, Jan. 9, 1995, Pat. No. 5,477,940. This application Dec. 22, 1995, Ser. No. 577,842

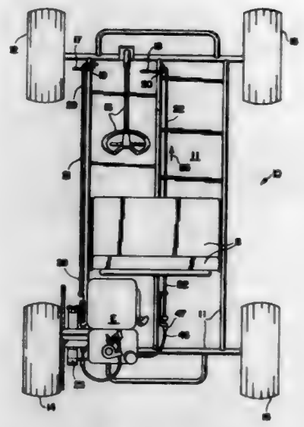
Int. Cl.[6] B60K 41/20

U.S. Cl. 180—292 **10 Claims**

1. A motorized cart apparatus comprising:

a) a horizontal cart frame having front and rear end portions;

b) a wheelbase defined by a pair of front, steerable wheels and a pair of rear wheels;



c) a seat positioned between the front and rear wheels;

d) a motor drive positioned at the rear end portion of the frame, behind the seat and adjacent the rear wheels;

e) brake means on at least one of the rear wheels for braking at least one of the rear wheels;

f) a throttle for controlling the motor drive;

g) a pair of movable pedals positioned on the frame in front of the seat at the front end portion of the frame, adjacent the front wheels, each of the pedals being inclined relative to the horizontal frame during use, positioned to be operated by a users feet, one of the pedals defining an accelerator pedal, the other pedal defining a brake pedal;

h) a brake pushrod extending from the brake pedal to the brake means so that when the brake pedal is depressed, the brake pushrod activates the brake means;

i) a throttle pushrod extending from the accelerator pedal to the throttle so that when the accelerator pedal is depressed, the throttle is activated;

j) a linkage extending from a combination of the brake pedal and brake pushrod to the throttle for placing the throttle in the idle position when the brake pedal and accelerator pedal are simultaneously depressed as when the cart driver panics.

5,597,049

RACK-AND-PINION STEERING SYSTEM MOUNTING

Hubert Bruehl, Waldstetten, and Harald Schwer, Ulm-Eggingen, both of Germany, assignors to Mercedes-Benz AG, Germany

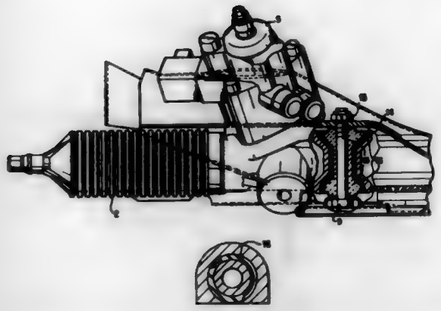
Filed Apr. 20, 1995, Ser. No. 425,623

Claims priority, application Germany, Apr. 22, 1994, 44 14 020.7

Int. Cl.[6] B62D 3/00; F16F 1/387

U.S. Cl. 180—400 **10 Claims**

1. A mounting of a rack-and-pinion steering system including a steering gear for a motor vehicle, comprising two elastic bearings having two spaced-apart bearing guides arranged upright in a direction perpendicular to longitudinal and transverse directions of the motor vehicle and connected to casing of the steering gear, wherein, in the bearing guide, upper and lower bearing bodies tapering towards a center of the respective bearing guide are aligned with one another in a symmetrical arrangement, each of the bearing bodies have through-holes in a longitudinal direction of the bearing guide, a damping element is arranged on an inner surface of an outer wall of the bearing body, a wall thickness of the



damping element in the longitudinal direction of the motor vehicle being greater than a wall thickness of the damping element in the transverse direction of the motor vehicle, an inner wall of the bearing guide is shaped to match an external contour of the respective bearing bodies which are clamped axially together with a defined initial stress when installed in the bearing guide.

5,597,850

RETAINING AND SUPPORT ASSEMBLY FOR MACHINERY LIFT PLATFORMS

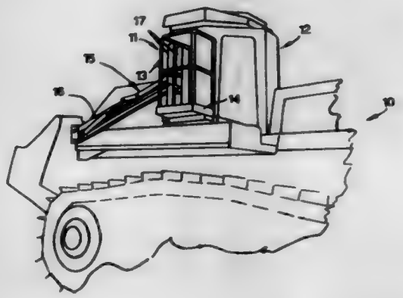
Rodney G. Johnson, P.O. Box 231, Robina, Gold Coast, Queensland, Australia

Filed Mar. 10, 1994, Ser. No. 208,216

Claims priority, application Australia, Mar. 11, 1993, PL7733

Int. Cl.[6] B60R 3/02

U.S. Cl. 182—2 **14 Claims**



1. In combination, a lift platform assembly, and a retaining and support assembly for said lift platform assembly, said platform assembly being adapted to be mounted to machinery for movement between a lowered position and an elevated position, said retaining and support assembly being adapted to be mounted to said machinery at said elevated position, said platform assembly including engagement means and said retaining and support assembly including a stop and a pin, said pin being movable between an extended position and a retracted position, said engagement means being receivable between said stop and said pin in its extended position so that said platform assembly is supported at said elevated position, said platform means including releasing means for engaging said pin to move said pin to said retracted position to release said engagement means of said platform assembly and permit said platform assembly to be moved away from said elevated position.

5,597,851

LUBRICATING OIL SUPPLY UNIT FOR TWO-CYCLE ENGINES

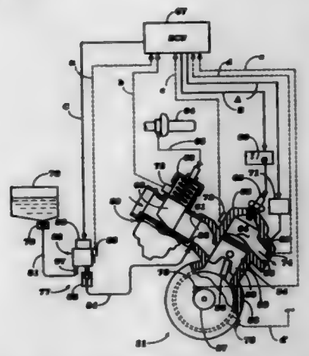
Takao Moriya, and Masaya Suemori, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 6, 1994, Ser. No. 221,943

Claims priority, application Japan, Apr. 2, 1993, 5-077027; Apr. 23, 1993, 5-097509

Int. Cl.[6] F01M 1/06;3/02

U.S. Cl. 184—6.1 **42 Claims**



1. A system for lubricating a machine comprising a reciprocating pump operable through a fixed range of movement comprising a suction cycle, a dwell cycle, and a delivery cycle for delivering a fixed amount of lubricant only upon movement through said fixed range, a stepper motor for driving said pump in incremental steps of movement each less than said fixed range, a sensor for sensing at least one machine running condition, a lubricant consumption determiner for determining the consumption of lubricant by said machine from the output of said sensor, and an operator for operating said stepper motor to effect a step of movement of said stepper motor upon a predetermined amount of lubricant consumption, said stepper motor having a pair of stator windings having spaced apart coils and wherein the operator is selectively operable to energize respective of said stator windings depending upon predetermined conditions.

5,597,852

DESCENDER

Boris Rogelja, 9 Nelson Avenue, Padstow NSW 2211, Australia

Filed Aug. 15, 1995, Ser. No. 515,583

Int. Cl.[6] B65H 59/14

U.S. Cl. 188—65.5 **5 Claims**

1. A descender for connecting a harness to a rope and operating on the rope during abseiling, the descender comprising:

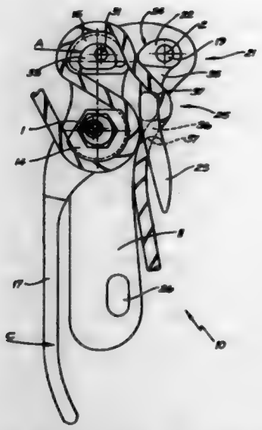
a base having a connection means for connecting to said harness;

a pivotal member pivotally mounted on the base about a pivot axis extending generally normal thereof, the pivot axis being spaced from the connection means;

the pivotal member having first and second spaced projections for engaging said rope, the projections both extending generally parallel to the pivot axis with the first projection being disposed about the pivot axis and the second projection being located substantially on the opposite side of the pivot axis with respect to the connection means;

the pivotal member having a handle means for pivoting the pivotal member relative to the base; and

a variable braking member, displaceably mounted on said base, having a braking surface which is selectively movable in a direction towards and away from the second projection to engage the rope between the braking surface and the second projection to effect a braking action such that, in operation, the rope passes around and between the first and second projections, and between the second projection and the braking surface will have a minimum level of resistive force applied thereto when the second projection is selectively moved away from the variable braking member by actuating the handle means, and the rope will have a maximum level of resistive force applied thereto when the handle means is released and tension of the rope causes the second projection to bear against the rope between the braking surface and the second projection and thereby create additional braking force, and wherein the additional braking force is reducible by selectively moving the braking surface in the direction away from the second projection.



5,597,853

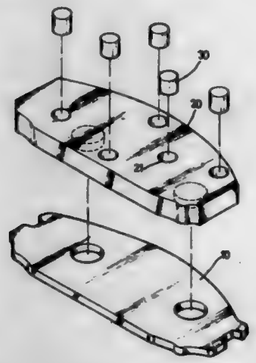
BRAKE LINING HAVING INSERTS OF CHALK INFILTRATED WITH ROSIN

Dah-cherng Weng, No. 12, Lane 40, Sec. 3, Chihnan Rd., Taipei, Taiwan

Filed Dec. 14, 1995, Ser. No. 572,426

Int. Cl.[6] F16D 69/00

U.S. Cl. 188—256 **6 Claims**



1. A brake lining comprising:

a lining body having a plurality of holes defined in a first face thereof, a second opposite face thereof being adapted to be coupled to a brake plate; and

a plurality of blocks made of chalk infiltrated with rosin, each block having a height substantially the same as that of the lining body and being disposed in a corresponding one of the holes of the lining body, said blocks coating a surface of a disk of a disk brake in frictional contact therewith.

5,597,854

HYDRAULIC DAMPER

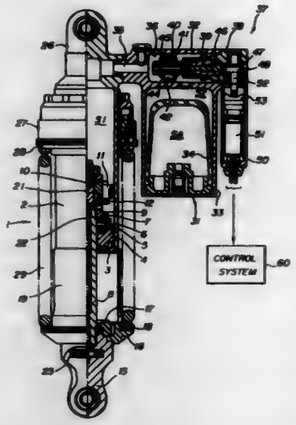
Osamu Nagai, Sizuoka; Kunihide Okamoto, Shizuoka, and Kaoru Yamamoto, Kanagawa, all of Japan, assignors to Showa Corporation, Japan

Division of Ser. No. 128,987, Sep. 29, 1993, Pat. No. 5,480,011. This application Aug. 16, 1995, Ser. No. 515,537

Claims priority, application Japan, Sep. 29, 1992, 4-73582; Sep. 29, 1992, 4-73583

Int. Cl.[6] F16F 9/46

U.S. Cl. 188—299 **6 Claims**



1. A hydraulic damper for use on a motor vehicle, comprising:

a damper assembly including a cylinder having an end joined to a body attachment adapted to be coupled to a vehicle body of the motor vehicle, and a rod extending in said cylinder and having on an end thereof a piston slidably held against an inner surface of said cylinder and defining at least a first oil chamber in the cylinder, said rod having an opposite end joined to an axle attachment adapted to be coupled to an axle of the motor vehicle;

an auxiliary tank defining a second oil chamber therein;

a joint member interconnecting said damper assembly and said auxiliary tank;

a communication mechanism including at least a communication passage defined in said joint member and defining a communication oil passage which provides fluid communication between said first and second oil chambers;

a damping force adjusting mechanism coupled to said joint member for acting on working oil flowing through said communication oil passage between said first and second oil chambers to adjust damping forces of the hydraulic damper;

said damping force adjusting mechanism comprising:

an adjusting rod having an end disposed in said communication oil passage, said adjusting rod being movable toward and away from said communication oil passage to vary a cross-sectional area of said communication oil passage;

an eccentric cam rotatably disposed in engagement with an opposite end of said adjusting rod; and

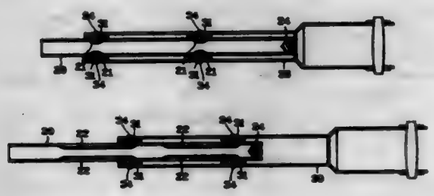
a rotary actuator for rotating said eccentric cam to move said adjusting rod toward and away from said communication oil passage to adjust the damping forces.

5,597,855

CLAMPED TUBE TYPE IMPACT ABSORBER

Wei-kuo Hsu, and Chung-Hsiung Cheng, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Aug. 22, 1995, Ser. No. 518,207
Int. Cl.[6] F16F 7/12
U.S. Cl. 188—371 3 Claims



1. An impact absorber comprising:

(a) a substantially square inner tube with a plurality of opposing walls each wall having an exterior surface, wherein the inner tube has at least a pair of concave identations formed on the exterior surfaces of two opposing walls, respectively, of the inner tube;

(b) a substantially square outer tube with a plurality of opposing walls each wall having an interior surface, wherein the outer tube has at least a pair of arc-shaped convex elements formed on the interior surfaces of two opposing walls, respectively, of the outer tube at locations corresponding to those of the concave indentations formed on the inner tube, the arc-shaped convex elements are dimensioned such that they can be exactly embedded into the concave identations of the inner tube; and

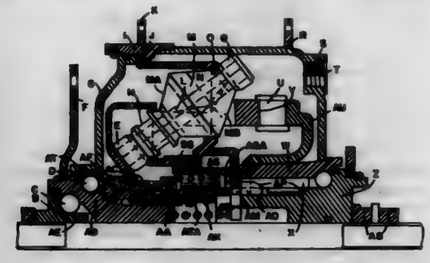
(c) further wherein the inner tube is made of a deformable material such that during an impact the inner tube and the outer tube stretch or extend relative to each other, the arc-shaped convex elements on the outer tube forming respective channels on the exterior surfaces of the inner tube so as to absorb impact.

5,597,856

TORQUE CONTROLLED INFINITE RATIO FRICTION DRIVE HUB

William L. Blake, 631 SW. 6th St., JKV Villa 307, Pompano Beach, Fla. 33060

Filed Dec. 30, 1994, Ser. No. 366,733
Int. Cl.[6] B60K 41/26; F16H 15/18
U.S. Cl. 192—6 A 19 Claims



1. A hub with a continuously variable transmission ratio between input and output rotation rates for a wheel on a cycle frame, the hub comprising:

(A) an input shaft rotating about a first axis with a rotary driver connected thereto;

(B) an output means for connection to a wheel for rotation thereof, said output means coaxial with said input shaft;

(C) a shaft carrier rotatable about said first axis and arranged to move axially between a first axial position and a second axial position;

(D) a plurality of carrier shafts attached to said shaft carrier, each shaft being inclined at a common angle to said first axis;

(E) a plurality of spool members with a spool member mounted freely rotatable upon each carrier shaft;

(F) a plurality of double cone elements, including a first cone and a second cone joined together, with one double cone element mounted freely rotatable upon each carrier shaft;

(G) a spool driving element rotatably coupled to said input shaft and arranged to move axially with said shaft carrier, said spool driving element having a running surface rotatably driving all of said spool members simultaneously;

(H) a spool driven element arranged to rotate about said first axis and to move axially with said shaft carrier, and having a running surface rotatably driven by all of said spool members simultaneously to thereby rotate said spool driven element in a direction opposite to said input shaft;

(I) a cone driving element rotatably coupled to said spool driven element and axially unmovable, said cone driving element having a running surface tangentially contacting, and rotatably driving, a first cone of all of said double cone elements simultaneously;

(J) a cone driven element rotatably coupled to said output means and axially unmovable, said cone driven element having a running surface tangentially contacting, and rotatably driven by, a second cone of all of said double cone elements simultaneously to thereby rotate said output means in a direction opposite to said cone driving element and the same as said input shaft;

(K) spring bias means for urging said shaft carrier axially toward said first axial position;

(L) a non-rotating assembly arranged for connection to a cycle frame;

(M) cam means operatively connected between said non-rotating assembly and said shaft carrier for urging said shaft carrier axially toward said second axial position when said shaft carrier is rotated in the same direction as said output means for forward motion of said frame;

(N) wherein increased input shaft torque for forward motion causes said shaft carrier to rotate and said cam means to move said shaft carrier toward said second axial position in which said cone driving element contacts a larger diameter portion of said first cone and said cone driven element contacts a smaller diameter portion of said second cone to thereby reduce the output/input ratio as input torque is increased.

5,597,857

ONE-WAY CLUTCH APPARATUS

Stephen M. Ruth; Brian D. Klecker, both of Chesterfield, Va., and A. Richard Frank, West Bloomfield, Mich., assignors to Bruce, Inc., Midlothian, Va.

Continuation-in-part of Ser. No. 179,105, Jan. 10, 1994, Pat. No. 5,449,057, which is a continuation-in-part of Ser. No. 143,485, Oct. 26, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 382,070
Int. Cl.[6] F16D 41/12
U.S. Cl. 192—46 8 Claims

1. A one-way clutch apparatus comprising:

a planar driving member;

said planar driving member including at least one recess formed on an inside surface thereof;

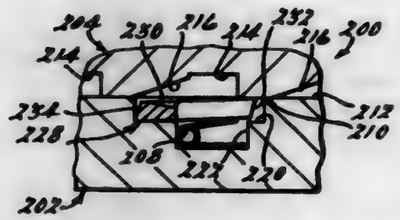
at least one biasing member disposed on said recess;

a free floating key disposed in said recess over said biasing member so as not to be physically secured to said planar driving member, said key having at least one arm portion having a ramp portion thereon, said key being operable to pivot about said arm portion between an engaged position and a disengaged position;

a planar driven member disposed closely adjacent said driving member, said planar driven member having at least one key-engaging notch formed on an inside surface thereof at a position in radial alignment with said key;

said planar driving and said driven members being rotatable about a common longitudinal axis such that when said planar driving member is rotated in a first direction, said key is moved over said key-engaging notch without engaging within said key-engaging notch, and when said planar driving member is rotated in a second rotational direction opposite to said first direction, said biasing member is allowed to urge said key into engagement with said key-engaging notch, thereby causing said driven member to be driven rotationally in accordance with rotation of said driving member; and

said ramp portion of said arm portion of said key further enabling said key to be pivoted into engagement with said key-engaging notch without said arm portion key interfering with said inside surface of said planar driven member when said planar driven member is in assembled and in close proximity with said planar driving member.

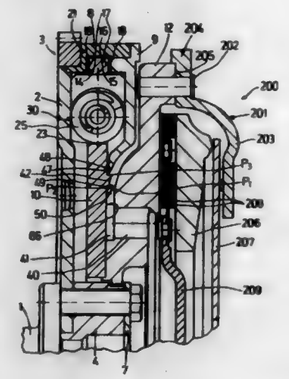


5,597,859

FLYWHEEL ASSEMBLY FOR A MOTOR VEHICLE, THE FLYWHEEL ASSEMBLY HAVING A GAP SEAL

Andreas Gebauer; Joachim Lindner, both of Schweinfurt; Bernhard Schierling, Kürnach, all of Germany; Bernd Stockmann, Troy, Mich., and Jörg Sudau, Niederwerrn, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Feb. 21, 1995, Ser. No. 391,049
Claims priority, application Germany, Feb. 19, 1994, 44 05 384.3
Int. Cl.[6] F16D 13/60;3/14; F16J 15/44; F16F 15/16
U.S. Cl. 192—70.12 18 Claims

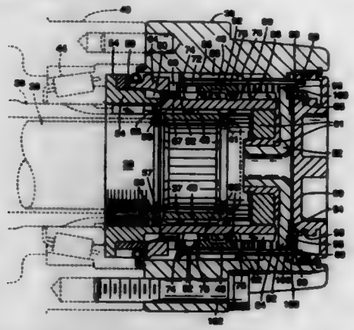


5,597,858

HUB LOCK FOR VEHICLE

Fred L. Ewer, 8448 SE. Jannsen Rd., Clackamas, Oreg. 97015

Continuation-in-part of Ser. No. 234,681, Apr. 28, 1994, Pat. No. 5,520,272. This application Feb. 17, 1995, Ser. No. 390,538
Int. Cl.[6] F16D 1/06;11/04;43/02
U.S. Cl. 192—69.43 10 Claims



1. A hub lock interconnection between an axle and a wheel hub of a vehicle comprising:

an axle, a wheel hub and a movable clutch ring having first and second positions, a first position locking wheel hub to the axle and a second position unlocking the wheel hub from the axle;

a cylindrical spindle, said axle having an exterior end projected through the spindle, and an inner drive gear coupled to the exterior end and restricting withdrawal of the axle inwardly through the spindle, and an outer drive gear slidably spline fit to the exterior of the inner drive gear;

said outer drive gear having exterior splines and said clutch ring slidably spline fit to the exterior splines of the outer drive gear for producing connection between the clutch ring and axle.

12. A transmission system for a motor vehicle, said transmission system comprising:

a flywheel assembly;

a pressure plate releasably fastened to said flywheel assembly;

a clutch disc disposed between said pressure plate and said flywheel assembly;

said pressure plate being axially movable and for applying pressure to said clutch disc to engage said clutch disc with said flywheel assembly;

said clutch disc comprising friction linings for contacting said pressure plate and said flywheel assembly during engagement of said clutch disc with said flywheel assembly;

said flywheel assembly comprising:

a first flywheel portion;

a second flywheel portion disposed adjacent said first flywheel portion;

said first flywheel portion comprising means for non-rotationally connecting said first flywheel portion to a crankshaft of an internal combustion engine;

said first flywheel portion being rotatable about an axis of rotation, said axis of rotation defining an axial direction parallel to said axis of rotation;

said second flywheel portion being rotatable about said axis of rotation;

hub disc means for connecting said first flywheel portion and said second flywheel portion to one another, and for rotating said second flywheel portion with said first flywheel portion;

a cover plate disposed between said second flywheel portion and said hub disc means, said cover plate comprising an outer circumferential portion and an inner circumferential portion, said inner circumferential portion being disposed immediately adjacent said hub disc means;

said first flywheel portion and said cover plate defining a chamber therebetween, at least a portion of said chamber comprising a viscous medium;

at least a portion of said hub disc means being disposed within said chamber;

said cover plate, said second flywheel portion and said hub disc means together defining an air channel;

said hub disc means further comprising means for deflecting the air in said air channel away from said inner circumferential portion of said cover plate;

said means for deflecting comprising an annular surface, said inner circumferential portion of said cover plate being disposed immediately adjacent said annular surface to form a seal for sealing said chamber;

said annular surface being oriented substantially parallel to the axis of rotation and extending in a direction towards said second flywheel portion; and

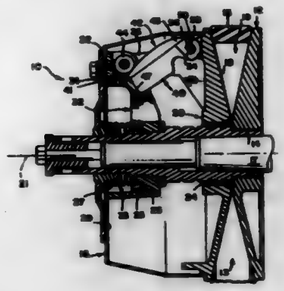
said second flywheel portion comprising at least one orifice disposed radially inwardly of said seal, said at least one orifice being in fluid communication with said air channel.

5,597,060

CENTRIFUGAL ACTUATOR FOR CENTRIFUGAL CLUTCH

H. Mike Huddleston, Richmond, Ind., and Charles W. Sieb, New Paris, Ohio, assignors to Hoffco, Inc., Richmond, Ind.

Filed Oct. 14, 1994, Ser. No. 323,376
Int. Cl.[6] F16D *43/06*; F16H *55/52*
U.S. Cl. 192—105 C **26 Claims**



1. A centrifugal actuator for a centrifugal clutch including a drive spider having a cam lever-following roller and a movable clutch housing, the centrifugal actuator comprising

two bosses having means for coupling to the clutch housing, each boss being formed to include a pin-receiving opening, the bosses being arranged in spaced-apart relation on the clutch housing to form a central slot therebetween,

a cam lever having an interior wall arranged to define a D-shaped pin-receiving opening, the cam lever being positioned to lie in the central slot and arranged to pivot to maintain engagement of the cam lever and the cam lever-following roller, and

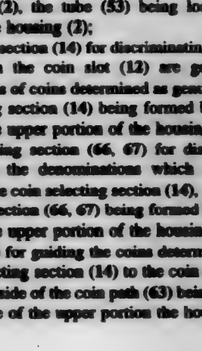
a pivot pin rotatably received in the pin-receiving openings of the two bosses and the D-shaped pin-receiving opening of the cam lever, the pivot pin including an elongated flat exterior wall and an elongated curved exterior wall arranged so that a transverse cross section of the pivot pin is D-shaped, the entirety of the interior wall of the cam lever engaging the pilot pin.

5,597,061

COIN PROCESSING APPARATUS

Kenji Nishiumi, Hanno, and Shunsuke Sumi, Tsurugashima, both of Japan, assignors to Kabushiki Kaisha Nippon Conlux, Japan

Continuation of Ser. No. 876,167, Apr. 30, 1992, abandoned. This application Dec. 8, 1994, Ser. No. 354,750
Claims priority, application Japan, Sep. 17, 1991, 3-236460
Int. Cl.[6] G07D *3/04*; *5/08*
U.S. Cl. 194—348 **5 Claims**



1. A coin processing apparatus comprising:

a single-piece housing (2) having a coin accommodating section (4) disposed at a middle portion of the housing (2), the coin accommodating section (4) including a plurality of coin tubes for accommodating coins according to denominations of the coins, and a coin pay-out section (3) disposed at a lower portion of the housing (2) for paying out coins from the coin accommodating section (4) in accordance with an amount of change;

a coin slot (12) for receiving the coins, one side of the coin slot (12) being formed at an upper portion of the housing (2);

a slanted guide groove (20) formed at a position immediately below the coin slot (12) for downwardly guiding liquid poured into the coin slot (12), one side of the groove (20) being formed by an inside upper surface of the upper portion of the housing (2);

a liquid collecting section (50) disposed below the groove (20), for collecting the liquid falling along the groove (20), one side of the liquid collecting section (50) being formed by said inside upper surface of the upper portion of the housing (2);

a liquid discharge path (52, 53) including a hole (52) formed on a side of the liquid collecting section (50) and a tube (53) communicating with the hole (52), for discharging the liquid collected in the liquid collecting section (50) to the outside of the housing (2), the tube (53) being located at the upper portion of the housing (2);

a coin selecting section (14) for discriminating whether the coins inserted from the coin slot (12) are genuine or not and denominations of coins determined as genuine, one side of the coin selecting section (14) being formed by the inside upper surface of the upper portion of the housing (2);

a coin distributing section (66, 67) for distributing the coins according to the denominations which are determined as genuine by the coin selecting section (14), one side of the coin distributing section (66, 67) being formed by the upper inside surface of the upper portion of the housing (2);

a coin path (63) for guiding the coins determined as genuine by the coin selecting section (14) to the coin distributing section (66, 67), one side of the coin path (63) being formed the upper inside surface of the upper portion the housing (2); and

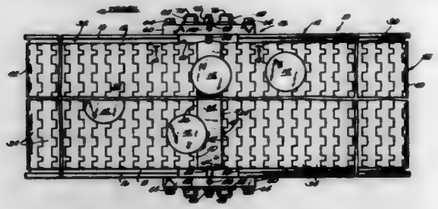
a coin path (68, 69, 70) for guiding a plurality of kinds of coins distributed according to the denominations by the coin distributing section (66, 67) to each corresponding one of the coin tubes of the coin accommodating section (4), one side of the coin path (68, 69, 70) being formed at the upper portion of the housing (2).

5,597,062

TENSIONED TRANSFER PLATE FOR SMALL PITCH CHAIN CONVEYOR

Martin R. Biwer, Greenfield, Wis., assignor to Rexnord Corporation, Milwaukee, Wis.

Filed Sep. 7, 1994, Ser. No. 301,818
Int. Cl.[6] B65G *47/66*
U.S. Cl. 198—600 **20 Claims**



1. A conveying apparatus comprising

a frame,

a conveyor system supported on the frame, the conveyor system including a pair of spaced apart article supporting surfaces, and

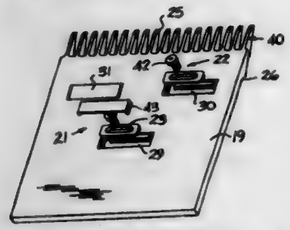
a transfer mechanism supported on the frame, the transfer mechanism including a transfer plate for transferring articles between the spaced apart articles supporting surfaces, spaced apart support means mounted on the frame, each support means including holding means for supportingly engaging the opposite ends of the transfer plate and for suspending the transfer plate in the space between the article supporting surfaces, at least one of said holding means including means for adjusting the tension in said transfer plate.

5,597,063

REMOVAL OF GLASS ARTICLES FROM CONVEYOR BELTS

David W. Bogle, Mandeville; Timothy J. Hicks, Hammond, both of La., and Clinton T. Favre, Bel Air, Md., assignors to The Laitram Corporation, La.

Filed Nov. 6, 1995, Ser. No. 553,954
Int. Cl.[6] B65G *47/74*
U.S. Cl. 198—635 **11 Claims**



1. An article receiving platform assembly for abutting a conveyor belt passing about a sprocket wheel of a conveyor belt thereby providing a substantially planar conveying surface characterized by the outer surface of a set of spaced ribs defining channels for receiving interdigitated members of the platform assembly, said assembly being particularly adapted for processing glass articles and removing broken glass fragments from the conveyor belt without interrupting flow of articles from the belt onto the platform assembly, comprising in combination:

a substantially rectangular finger plate of predetermined thickness over a planar mounting surface having a set of elongated laterally directed openings therethrough,

a stable mounting bracket with a planar receptacle surface for slidably mating with the finger plate planar mounting surface while supporting the finger plate in position to receive articles from said belt, and

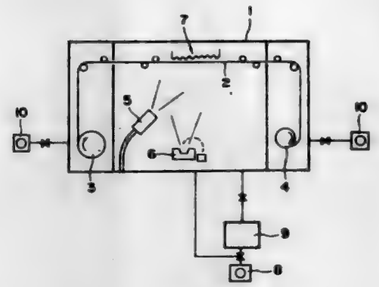
fastening means for affixing said finger plate on said bracket in a laterally sliding configuration comprising lateral ridges defined along sidewalls of the finger plate elongated openings and elongated slider members extending partly through the attachment openings and firmly attached to the mounting bracket in predetermined lateral positions for permitting a designated degree of sliding contact with the lateral ridges in said finger plate for slidably securing the finger plate to said mounting member.

5,597,064

ELECTRIC CONTACT MATERIALS, PRODUCTION METHODS THEREOF AND ELECTRIC CONTACTS USED THESE

Masanori Ozaki, Utsunomiya, and Keiji Mashimo, Nikko, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00589, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/13685, PCT Pub. Date Nov. 15, 1990
PCT Filed May 9, 1990, Ser. No. 623,647
Claims priority, application Japan, May 10, 1989, 1-116285; May 17, 1989, 1-123670; Oct. 6, 1989, 1-261857; Feb. 14, 1990, 2-33180
Int. Cl.[6] H01H *1/02*
U.S. Cl. 200—269 **3 Claims**



1. An electric contact material comprising a substrate, an outermost covering layer which is 0.03 to 100 μm thick for electric contact, said covering layer comprising a material selected from the group consisting of a carbide, nitride, boride, silicide or aluminide of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo or W as a major ingredient, and a not less than 0.1 μm thick intermediate layer disposed between the substrate and the covering layer having a composition ABx, where A is Ti, Zr, Hf, V, Nb, Ta, Cr or Mo; B is carbon, nitrogen, boron, silicon or aluminum, and having a gradient composition where x=0 on the side of the intermediate layer nearest the substrate and x=1 in the case of carbon and nitrogen, x=2 in the cases of boron and silicon and x=3 in the case of aluminum on the side of the intermediate layer nearest the covering layer of electric contact.

5,597,865

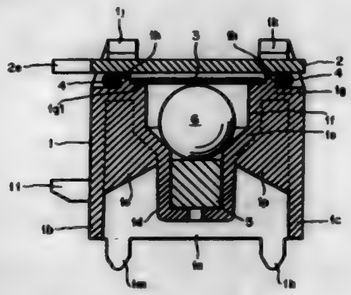
Patent Not Issued For This Number

5,597,866

ACCELERATION LIMIT SWITCH

Heino Burmeister, Leihnitstrasse 17, D-42579 Heiligenhaus, Germany

Filed Sep. 19, 1995, Ser. No. 530,875
Claims priority, application Germany, Sep. 26, 1994, 44 34 349.3
Int. Cl.[6] H01H 9/00
U.S. Cl. 200—292 9 Claims



1. An acceleration limit switch, comprising:
a housing;
a ball-shaped inertia body made of a ferromagnetic material and having a housing bridge;
a permanent magnet;
a printed circuit board with said ball-shaped inertia body being maintained in a resting position by said permanent magnet spaced from said printed circuit board, said, printed circuit board having two contact elements symmetrically positioned with respect to each other, said printed circuit board acting as a cover for said housing;
an elastic, conductive plastic mat being mounted between said ball-shaped inertia body and said printed circuit board, said mat being deformed when impacted by said ball-shaped inertia body, thereby connecting said two contact elements;
a ring-shaped support surface for supporting said conductive plastic mat, said ring-shaped support surface being contained within an interior space of said housing with said interior space being symmetrical;
elastic hooks being formed on said housing; and,
a sealing ring being disposed outside of said housing with said printed circuit board being supported between said elastic hooks and said sealing ring to thereby cause deformation of said sealing ring.

5,597,867

PUSHBUTTON SWITCH

Masayuki Yoneyama, Tokyo, Japan, assignor to Mitsubea Company, Ltd., Nagano, Japan

Filed Nov. 2, 1994, Ser. No. 333,983
Claims priority, application Japan, Aug. 3, 1994, 6-201341
Int. Cl.[6] H01H 13/70
U.S. Cl. 200—344 11 Claims

1. A pushbutton switch for opening and closing a contact circuit, comprising:
a membrane sheet carrying the contact circuit;
a keyboard frame guide disposed on said membrane sheet about said contact circuit;
a stem having an opening wherein an external actuating force moves the stem along the keyboard frame guide;



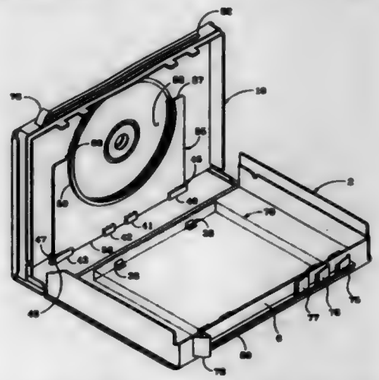
a spring disposed between the stem and the membrane sheet for closing said contact circuit when moved by the stem and for urging the stem upward when the stem is released from the actuating force;
a stabilizer assembly formed of an X shape in cross section by intersecting two arms, each arm having an actuator rod extending orthogonal thereto and slidably received within the opening of the stem; and
a key cap supporting an end of the stabilizer assembly.

5,597,868

COMPACT DISC SECURITY CONTAINER

James T. Weisburn, Massillon, and Ronald K. Burdett, Strasburg, both of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Aug. 25, 1995, Ser. No. 519,360
Int. Cl.[6] B65D 85/57
U.S. Cl. 206—308.1 17 Claims



1. A container for displaying and storing a disc-shaped data storage medium and a jewel box, said container including:
a base and a cover hingedly connected to one another by a hinge panel for movement between open and closed positions, said base and cover forming a storage compartment;
first attachment means formed on the base of the container for attaching the jewel box to said base, said first attachment means including a plurality of spaced flexible retaining tabs formed on the base for snap-fitting into holes formed in the jewel box for removably mounting the jewel box on the container base, wherein each of the tabs have a latching flange for engagement with the jewel box;
a holder including a generally flat panel formed with at least one substantially U-shaped groove for slidable receiving and retaining at least one disc-shaped data storage medium, said panel extending generally parallel to and spaced from the cover and forming a graphics storage space therebetween; and
second attachment means formed on the hinge panel for mounting the holder panel on said hinge panel.

5,597,869

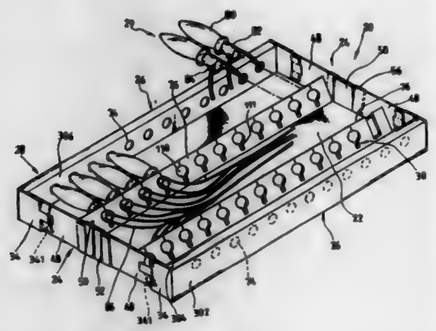
Patent Not Issued For This Number

5,597,870

LAMP STRING HOLDING CONTAINER STRUCTURE

Gordon K. H. Wu, No. 51. Licking Erh Street, Keelung City, Taiwan

Filed Nov. 27, 1995, Ser. No. 562,759
Int. Cl.[6] A65D 85/42
U.S. Cl. 206—419 8 Claims



1. A lamp string holding container formed from a single sheet of paperboard blank, comprising a bottom section having two side opposite panels defined by two first fold lines extending on the bottom section in a first direction to be folded along the first fold lines to an upright position substantially normal to the bottom section and two opposite end panels defined by two second fold lines extending on the bottom section in a second direction to be folded along the second fold lines to an upright position normal to the bottom section, each of the side panels comprising an inner side section, a central section and an outer side section defined by two parallel third fold lines running parallel with the first fold lines so as to allow each of the side panels to be further folded along the third fold lines to form a double layer structure with the inner and outer side sections substantially parallel with each other, substantially normal to the bottom section and connected by the central section, the outer side section of each of the side panels having two opposite end sections extending from ends thereof in the first direction and each having first retaining means formed thereon to secure to the end panel so as to maintain both the side and end panels in the folded, upright positions relative to the bottom section, each of the end panels having two first cutouts formed adjacent the respective end section of each of the side panels with bottoms of the first cutouts coincident with the respective second fold line and at least one pair of second cutouts formed along the respective second fold line and between the first cutouts with bottoms of the second cutouts coincident with the respective second fold line so as to divide the end panel into two side sections, defined between the first cutouts and the corresponding second cutouts, and at least one central section, defined between the second cutouts, second retaining means being provided between each of the end panel side section and the central section, the bottom section further comprising a plurality of fold line sets, each corresponding to one of the second cutouts and comprising a central fold line and two side fold lines arranged on two sides of the central fold line extending in the first direction between the two second fold lines to allow the bottom section to be folded along the central fold line and the side fold lines of each fold line set, with the end panel side sections partially overlapping the end panel central section and secured thereto with the second retaining means, so as to form and maintain an inverted V-shaped ridge substantially extending along the first direction, the central fold line being top of the ridge and the side fold lines being feet of the ridge, each of the ridges being provided with a plurality of lamp securing seats spaced along the first direction to receive and retain therein a lamp of the lamp string.

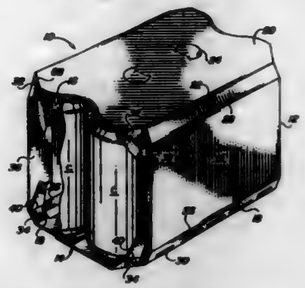
8. A blank for making a lamp string holding container, wherein the lamp string holding container comprising a bottom with two double-layered side panels and two end panels and a plurality of inverted V-shaped ridges formed on the bottom, the blank comprising a bottom section having two first edges running along a first direction and two second edges running along a second direction, two first fold lines being provided on the bottom section to extend along the first direction to define two side panel sections and two second fold lines being provided on the bottom section to extend along the second direction to define two end panel sections, each of the side panels having two substantially parallel fold lines running in the first direction and dividing the side panel into an inner side section, a central section and an outer side section, the outer side section having formed on two opposite ends thereof two end sections defined by a fold line running in the second direction, two first cutouts being formed on each of the end panels to each juxtapose an adjacent end section of one of the side panels with bottoms of the first cutouts coincident with the respective second fold line, each of the end panels further comprising two spaced second cutouts formed thereon between the first cutout with bottoms of the second cutouts coincident with the respective second fold line so to define a central section of the end panel, each of the second cutouts together with the adjacent first cutout defining a side section of the end panel, each of the end sections of the side panels having two opposite flaps formed thereon to be foldable about fold lines collinear with each other and extending parallel with the first direction to be insertable and received and retained within a hole formed on the adjacent end panel side section at such a location adapted to receive and retain the flaps of the end section therein when the container is fully assembled, each of the end panel side sections further comprising a slit extending in the first direction to intersect the respective second fold line and a further slit extending along a portion of the second fold line from the intersection of the previously mentioned slit and the second fold line to the adjacent second cutout to define a pivotable flap and a corresponding slit being provided on the end panel central section to extend in the first direction to the second edge of the blank adapted to matingly engage the pivotable flap of the end panel side section when the container is fully assembled, the bottom section having a plurality of fold line sets each corresponding to one of the second cutouts and comprising a central fold line and two side fold lines arranged on two sides of the central fold line to define with the central fold line two zones, a plurality of hole pairs being formed along the central fold line and each comprising two holes symmetrically formed on the two zones with a slit extending therebetwoen and across the central fold line, each of the holes having a slot integrally formed therewith, the inner side section of each of the side panels having a plurality of holes formed thereon to each correspond to one of the hole pairs along the central fold line, a flap being formed on each of two opposite ends of the inner side section of each of the side panels having a depth corresponding to height of the central section of the side panel measured between the inner and outer side sections of the side panel to be foldable about the respective second fold line.

5,597,871

WRAP-AROUND CARRIER WITH CORNER BED RESTRAINTS

Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed May 15, 1995, Ser. No. 441,698
Int. Cl.[6] B65D 75/00
U.S. Cl. 206—434 12 Claims



1. A package comprised of a wrap-around carrier containing two rows of adjacent articles having upper and lower portions, comprising:

opposite side panels, each side panel being connected to a top panel and to a bottom panel flap along fold lines, the bottom panel flaps being connected to each other to form a bottom panel;

the top panel, each bottom panel flap and each side panel having opposite end edges;

two upper corner restraint panels connected to each end edge of the top panel and a lower corner restraint panel connected to each end edge of each bottom panel flap, the upper and lower corner restraint panels contacting the upper and lower portions, respectively, of adjacent articles in the package;

means for locking the upper and lower corner restraint panels in place, said means being comprised of a side panel locking flap connected to each end edge of the side panels along a fold line, each side panel locking flap also being connected to associated upper and lower corner restraint panels along fold lines, each side panel locking flap extending between, and being in contact with, an associated side panel and an article adjacent thereto; and

a fold line in each of the upper and lower corner restraint panels extending transversely thereof to relieve carrier forming stresses;

the upper corner restraint panels being connected to the top panel along angled fold lines which form an obtuse angle with the fold line connecting the top panel to an associated side panel, the top panel having a length between angled fold lines greater than the length of the fold line connecting the top panel to said associated side panel.

5,597,872

TOTALLY INTERACTIVE PATIENT COMPLIANCE METHOD

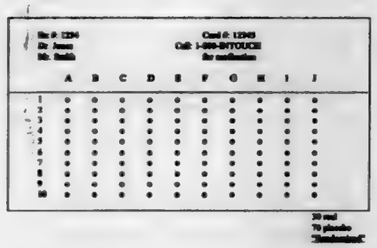
Robert E. Lieberman, Morris Township; Jacques Kramy, Morristown, and Ian B. Ferrier, Morris Township, all of N.J., assignors to Bagert, Delafield, Ferrier Inc., Morristown, N.J.

Filed Dec. 17, 1993, Ser. No. 169,307
Int. Cl.[6] B65D 83/04; B42D 15/00
U.S. Cl. 206—534 2 Claims

1. A method for helping prevent drug abuse by a patient taking medicine in a totally interactive patient compliance Program which comprises the steps of:

(A) providing a patient with a medication compliance dispenser having a multicompartment container wherein:

Academic Medal



(a) at least some of the compartments contain individual doses of medicine and at least some of the compartments contain a placebo;

(b) the compartments containing the medicine are randomly arranged;

(c) each compartment is labeled with a code to identify the compartment;

(d) the container has means permitting random access to each compartment and the dispensing of its contents; and

(e) the dispenser displays a telephone number which the patient must call to learn the code of a compartment which contains the medicine; and

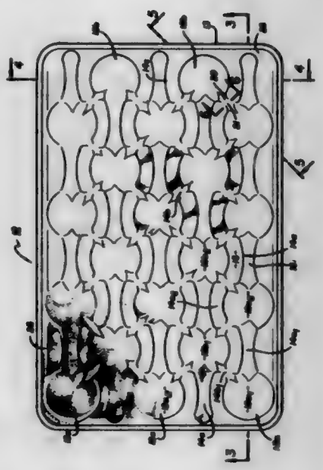
(B) instructing the patient to call the telephone number to learn the code of a compartment which contains the medicine in order to take the medicine.

5,597,873

TRAYS FOR HOLDING FOOD PRODUCTS

Stephen J. Kocis, Roswell, Ga., assignor to Delco Packaging Corp.

Continuation of Ser. No. 181,642, Jan. 13, 1994, abandoned.
This application Nov. 3, 1995, Ser. No. 553,000
Int. Cl.[6] B65D 1/34
U.S. Cl. 206—564 10 Claims



1. A tray, comprising:

sheeting of resilient material;

a matrix of cells formed on said sheeting, including first and second longitudinal rows of cells interlacing and staggering from each other;

a first set of ribs, each extending between a pair of longitudinally adjacent cells; and

a second set of ribs, each extending between a pair of diagonally adjacent cells;

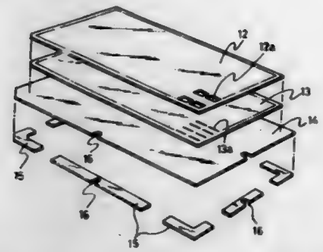
wherein each rib of the first set of ribs has a longitudinally arched surface and extends tangentially from a surface of each of the adjacent pair of cells between which said each rib of the first set of ribs extends.

5,597,874

PACKING TRAY OF SEMICONDUCTOR DEVICES AND A METHOD FOR MANUFACTURING THE SAME

Seung S. Ko, Jugong Apartment 139-504, 10-1 Dunchon-Dong, Kangdong-Ku, Seoul, Rep. of Korea

Filed Dec. 28, 1994, Ser. No. 365,553
Claims priority, application Rep. of Korea, Apr. 25, 1994, 94-8583; Japan, Nov. 3, 1994, 94-28703
Int. Cl.[6] B65D 73/02
U.S. Cl. 206—725 6 Claims



1. A packing tray for semiconductor packages comprising:

a first member provided with a multiplicity of serially-punched quadrilateral holes in which semiconductor packages can be inserted and fixed therein,

a second member adhered to a lower face of the first member by an adhesive agent and having slots punched therein corresponding to each of said holes for accommodating and fixing therein the leads of said semiconductor packages to be inserted therein,

a third member adhered to a lower face of the second member by an adhesive agent to cover the bottom face of each slot, and also to function as a bottom board for the second member, and

a fourth member adhered to the periphery of a bottom face of the third member to act as a leg therefor.

5,597,875

METHOD AND APPARATUS FOR SCREENING WASTE PAPER PULP

Naoyuki Iwashige, and Masakazu Eguchi, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, and Ishikawajima Sangyo Kikai Kabushiki Kaisha, both of Tokyo-to, Japan

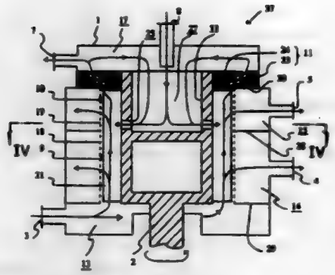
Division of Ser. No. 317,362, Oct. 4, 1994. This application Oct. 20, 1995, Ser. No. 546,022
Claims priority, application Japan, Oct. 20, 1993, 5-284225
Int. Cl.[6] B02B 1/00
U.S. Cl. 209—10 2 Claims

1. A method for screening waste paper pulp, comprising;

introducing waste paper stock pulp slurry containing undefibered waste paper into a screening section,

separating the slurry into a high quality stock passing through a screen plate and a rejected stock not passing through said screen plate, said high quality stock being sent to a next state as accepted stock, and;

passing said rejected stock through a gap in a defibering section which is adjacent to said screen plate and which comprises a defibration stator and a defibration rotor, such that undefibered waste paper contained in the rejected stock is defibered and the rejected stock is subjected to increased pressure, the rejected stock is discharged to a rejection chamber, the rejected stock is diluted with dilution water, and the diluted rejected stock is circulated through a dilution chamber to the screening section while part of said rejected stock is discharged out of the system.

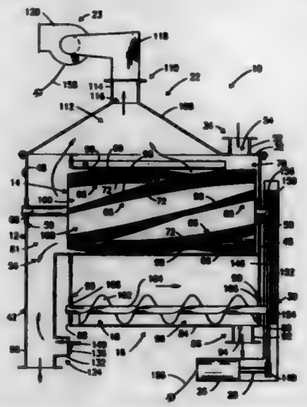


5,597,876

GRAIN SEPARATOR

Robert Kershner, 1305 Bell Shoals Rd., Brandon, Fla. 33511

Filed Dec. 30, 1994, Ser. No. 366,616
Int. Cl.[6] B07B 9/00
U.S. Cl. 209—29 44 Claims



1. A grain separator to separate and remove contaminants from grain comprising an intermediate separator housing including a grain inlet to receive grain to be scoured from an external source and a grain outlet to feed scoured grain to an external collector, a lower contaminants enclosure having a first contaminants discharge to discharge heavier contaminants removed from the grain to a first external receptacle, said intermediate separator housing having a mechanical separator and transport assembly disposed therein to receive the grain and contaminants from said grain inlet and to separate the contaminants from the grain and to move the grain from said grain inlet to said grain outlet for collection in the external collector, a first contaminants transport assembly disposed to receive the heavier contaminants from said mechanical separator

and transport assembly and to move the heavier contaminants to the first contaminants discharge for collection in the first external receptacle, said mechanical separator and transport assembly comprises a hollow stationary drum having a plurality of perforations formed therethrough and a rotor operatively supporting at least one separator member rotationally disposed within said hollow stationary drum and further including a second contaminants discharge to discharge lighter contaminants removed from the grain to a second external receptacle and a second contaminants transport assembly disposed to receive the lighter contaminants from said mechanical separator and transport assembly and to move the lighter contaminants to the second contaminants discharge for collection in the second external receptacle wherein said second contaminants transport assembly comprises an air blower and at least one primary air flow control means formed on one of said lower side walls of said intermediate separator housing to control the flow of the lighter contaminants from said mechanical separator and transport assembly to said second contaminants discharge.

5,597,877

VENTILATED SHELF LINERS AND ATTACHMENT MEANS THEREFOR

Matthew G. Hartmann, 920 Big Bend Station Dr., St. Louis, Mo. 63088

Filed May 18, 1995, Ser. No. 444,265
Int. Cl.[6] A47F 3/14
U.S. Cl. 211—134 3 Claims



1. In combination, a wire shelf, a shelf liner therefor, and a two element shelf liner retaining mechanism wherein the wire shelf is a shelf of the type including a plurality of spaced apart transverse deck rods having rearward and forward edges, the deck rods being supported by longitudinal rods attached to the rearward and forward edges of the deck rods with an intermediate longitudinal rod attached to the underside of the transverse rods therebetween so that the longitudinal and deck rod combination forms a shelf with the lengths of the transverse deck rods defining a depth of the shelf and the lengths of the longitudinal rods defining a shelf length, wherein the shelf liner includes a panel in the form of a sheet of a plastic having an impact strength sufficiently high to resist breaking by impact during placement of metal and glass objects thereon; wherein the shelf liner is sized to rest on the transverse rods and to extend lengthwise along the longitudinal rods, and wherein the two element liner retaining mechanism includes as a first element, two flat tong members oppositely, vertically disposed and joined at one end to form a U-shaped bifurcated spring clip, and as a second element integral with the spring clip, a rod engaging element adapted to engage the forward longitudinal rod to prevent the shelf liner from sliding, the distance between the tong members being approximately equal to the thickness of the panel so that the tong members grasp the edge of the panel, and the lengths of the tong members being such that they do not permit the panel to slide out of the tong members should the panel slide at an angle tending to spread the tong members apart, the forward longitudinal rod engaging element being a tab adapted to extend downwardly from the tong members and between transverse rods to abut the forward longitudinal rod of the shelf.

5,597,878

MOBILE CRANE

Rudolf Becker, Ehingen; Hans-Dieter Willan, Unterweiler, and Uwe Frommelt, Ehingen, all of Germany, assignors to Liebherr-Werk Ehingen GmbH, Ehingen/Donau, Germany

Filed Aug. 5, 1994, Ser. No. 286,746
Claims priority, application Germany, Aug. 6, 1993, 9311778 U
Int. Cl.[6] B66C 23/04
U.S. Cl. 212—231 9 Claims



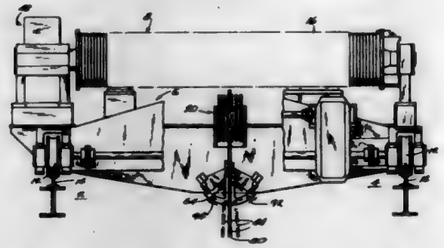
1. A mobile crane comprising:
a platform rotatably mounted on a vehicle; and
a lower telescopic boom and an upper telescopic boom; wherein
at least one telescopic section is structured and arranged to be extended out of each of said upper and lower telescopic booms;
said lower telescopic boom being pivotably connected to said platform and supported by a luffing cylinder for performing tilting movement thereof; and
said lower telescopic boom and said upper telescopic boom are structured and arranged to be removably bolted together in a non-pivotal manner,
such that said mobile crane can be operated both with and without said upper telescopic boom and said upper telescopic boom can be transported separately from said vehicle; and further comprising
a rear bracing jib being pivoted upon a lower terminal part of said upper telescopic boom,
a collapsible auxiliary strut coupling said rear bracing jib and said upper telescopic boom to retain said rear bracing jib,
a lower brace coupling said rear bracing jib and a foot portion of said lower external telescopic boom to brace said rear bracing jib, and
an upper brace arranged to couple said rear bracing jib with a head portion of said at least one telescopic section extending out of said upper telescopic boom,
wherein said upper brace being arranged to be collapsible, and
said lower brace is structured and arranged to be separated at a middle portion of said lower brace.

5,597,879

DIRECTIONAL INDICATING DEVICE FOR DETECTING IMPROPER ORIENTATION OF A HOIST LIFTING LINE

Jeffrey A. Konop, Grafton, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Aug. 24, 1995, Ser. No. 518,697
Int. Cl.[6] B66C 13/06
U.S. Cl. 212—273 14 Claims



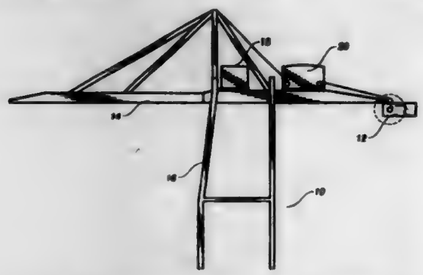
14. In a hoist having a frame and a rope depending from the hoist at a desired orientation, an indicating device for detecting lateral shifting of the rope from the desired orientation comprising:
a fixed member mounted on the frame;
a pivotal member mounted on the fixed member and having a pair of spaced apart projections between which the depending rope extends, the pivotal member being engaged by and pivotally movable in opposite directions with the rope upon movement of the rope from the desired orientation;
first and second arms mounted on the frame and respectively having first and second means for adjusting the positions of the arms; and
sensing means mounted on the fixed member and including first and second spaced apart actuating arms respectively mounted on the first and second arms and each engageable by and movable with the pivotable member to indicate the movement of the pivotable member and thereby the movement of the rope from the desired orientation.

5,597,080

SNAG LOAD PROTECTION SYSTEM FOR A CRANE

Jeff C. Culwell, Savannah, Ga., assignor to Kranco Crane Services, Inc., Houston, Tex.

Filed Aug. 2, 1994, Ser. No. 284,056
Int. Cl.[6] B66C 13/10
U.S. Cl. 212—278 5 Claims



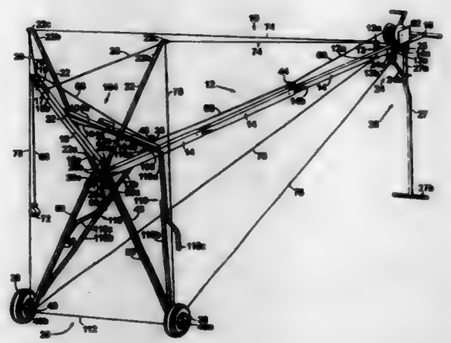
1. A snag load protection system for a crane comprising:
a guide frame;
a sheave housing slidably received within said guide frame, said sheave housing having means therein for receiving a rotatable sheave; and
a hydraulic cylinder means connected to said guide frame and to said sheave housing, said hydraulic cylinder means for exerting a compressive force against said sheave housing so as to resist relative movement between said guide frame and said sheave housing when forces exerted by said sheave housing are within a predetermined value, said hydraulic cylinder means comprising:
a piston rod having one end connected to said sheave housing;
a cylinder receiving an opposite end of said piston rod, said cylinder affixed to said guide frame;
hydraulic supply means connected to said cylinder for supplying fluid to said cylinder at a desired pressure, said hydraulic supply means comprising:
a fluid reservoir;
a fluid line exteading from said fluid reservoir to said cylinder; and
pressurizing means connected to said fluid line for pressurizing the fluid in said cylinder, said pressurizing means comprising:
a pump connected to said fluid line; and
a pressure switch means connected to said fluid line and to said pump, said pressure switch means for actuating said pump when the pressure of the fluid in the line falls below a predetermined value;
a relief valve means connected to said hydraulic supply means, said relief valve means for releasing said hydraulic fluid from said cylinder when the forces exceed the predetermined value; and
a pressure sensor means connected to said hydraulic cylinder means, said pressure sensor means for transmitting a signal when the forces exceed the predetermined value.

5,597,081

PORTABLE CRANE

Kirk B. Shirley, 2705 Bay Meadow Cir., Dallas, Tex. 75234

Filed Mar. 30, 1995, Ser. No. 413,348
Int. Cl.[6] B66C 23/78
U.S. Cl. 212—299 16 Claims



5. A portable crane operable between a first, extended position for lifting loads and a second, collapsed position for transportation, comprising:
a handle having first and second ends and including a plurality of telescoping members operable between an extended position in the crane first position and a retracted position in the crane second position;
a boom having first and second ends, said first end being pivotally interconnected to said first end of said handle and extending outwardly from said first end of said handle, in the crane first position and being disposed parallel to said handle in the crane second position;
means for supporting said handle first end and extending opposite said boom in the crane first position and disposed generally parallel to said handle in the crane second position;
a cable extending between said handle second end and said boom second end for receiving loads, such that as said cable is retracted, loads are lifted toward said boom second end;

first and second outriggers each having first and second ends, said first ends thereof being pivotally interconnected to said handle and extending outwardly and perpendicularly to said handle in the crane first position and being disposed parallel to said handle in the crane second position;

a first top guy cable extending between said handle second end and said first outrigger second end;

a second top guy cable extending between said handle second end and said second outrigger second end;

a first bottom guy cable extending between said handle second end and said handle support means;

a first side guy cable extending between said handle support means and said first outrigger second end;

a second side guy cable extending between said handle support means and said second outrigger second end;

a first front guy cable extending between said first outrigger second end and said second end of said boom; and

a second front guy cable extending between said second outrigger second end and said second end of said boom.

5,597,082

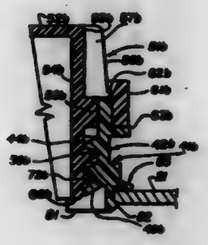
SPOUT FITMENT CLOSURE PLUG

Daniel Lach, Los Gatos, and Brian M. Adams, Newark, both of Calif., assignors to Portola Packaging, Inc., San Jose, Calif.

Continuation of Ser. No. 57,050, May 3, 1993, abandoned, which is a division of Ser. No. 13,258, Feb. 3, 1993, Pat. No. 5,249,695, which is a continuation-in-part of Ser. No. 664,658, Mar. 5, 1991, abandoned. This application May 5, 1995, Ser. No. 437,078

Int. Cl.[6] B65D *41/47*

U.S. Cl. 215—44 4 Claims



1. A fitment for use with a closure of the type having a top, a skirt depending from said top formed with external threads, said fitment comprising a spout formed with internal threads engageable with said external threads, attachment means for attaching said fitment vicinal an aperture, in a panel of a container, a ring on the lower end of said spout, a barb on said ring adapted to fit through said aperture and engage the interior of said panel, a second attachment member on said spout above said barb to engage the exterior of said panel and a plurality of discrete remnants of fractured frangible means initially interconnecting a portion of said fitment and said skirt, said remnants being spaced around the inner surface of said spout, wherein said frangible means initially comprised a gate whereby thermoplastic material flowed from said closure to said fitment, said frangible means being positioned so that said closure cannot be moved relative to said fitment without breaking said frangible means, first tamper-evidencing means on said fitment, second tamper-evidencing means on said closure cooperable with said first tamper-evidencing means to restrain movement of said skirt relative to said spout after said first and second tamper-evidencing means are brought into engagement, at least one of said tamper-evidencing means being breakable, said tamper-evidencing means being discrete from said frangible means.

5,597,083

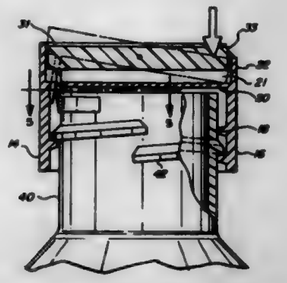
CONTAINER WITH CHILD RESISTANT CAP

Terri C. Childers, Lawrenceville; Jack E. Haney, Norcross; Debra R. Joe, Alpharetta; William B. Mikolaitis, Lilburn; Randal D. Porter, Duluth, and H. Neal Thomas, Norcross, all of Ga., assignors to Sligan Plastics Corporation, Chesterfield, Mo.

Filed Sep. 7, 1995, Ser. No. 524,784

Int. Cl.[6] B65D *50/04*

U.S. Cl. 215—220 11 Claims



1. A closure for a container with a threaded neck comprising:

(a) a generally cylindrical body member having a peripheral wall with a lower, internally threaded skirt portion and a transversely extending wall intermediate the axial length of said body member above said skirt portion, said peripheral wall and transversely extending wall defining a generally cylindrical cup portion above said transversely extending wall, said transversely extending wall having a slot therein adjacent the inner periphery of said peripheral wall; and

(b) a disc member seated in said cup portion and pivotally mounted on said peripheral wall of said body member at two points about its periphery spaced above said transversely extending wall, said disc member having a depending leg portion adjacent its periphery and extending through said slot in said transversely extending wall, said disc being pivotable about said points to move said leg portion downwardly and upwardly in said slot, whereby said leg portion may be moved downwardly through said transverse wall to engage in a recess in the neck of an associated container and movable upwardly to disengage therefrom.

5,597,084

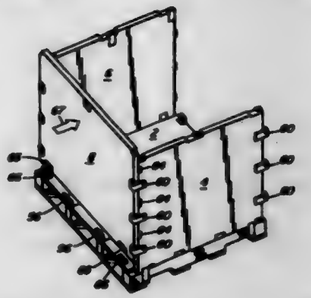
COLLAPSIBLE PALLET BIN

Alexander V. Parada, Vancouver, Canada, assignor to Canadian Plywood Association, North Vancouver, Canada

Filed Feb. 17, 1995, Ser. No. 390,614

Int. Cl.[6] B61D *9/00*

U.S. Cl. 220—4.28 21 Claims



1. A container comprising:

a base, a pair of side walls, and first and second end walls;

means for releasably connecting the pair of side walls to the base by slidable movement of the side walls from a first position to an intermediate position and then to a final position on the base;

means for releasably connecting the side walls to the first and second end walls; and

means for releasably connecting the first end wall to the base after the first end wall has been connected to the side walls when the side walls are in their intermediate position by slidable movement of the pair of side walls and the first end wall as a unit over the base to the final position of the side walls whereupon the second end wall is releasably connected to the side walls atop the base to complete the container.

5,597,085

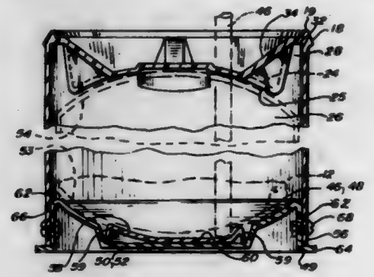
COMPOSITE, PRESSURE-RESISTANT DRUM TYPE CONTAINER

Barry L. Rauworth, Victoria, and John M. Hennen, Eden Prairie, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.

Filed Jul. 20, 1994, Ser. No. 278,823

Int. Cl.[6] B65D *7/00*

U.S. Cl. 220—403 23 Claims



1. A composite, pressure-resistant, drum type container for fluid, comprising:

an inner plastic liner for receiving fluids,

an outer plastic shell enclosing said inner liner,

said outer shell having an elongate sidewall having an upper edge portion and a lower end portion, a top end structure adjacent said upper edge portion, and a bottom end structure connected to the lower end portion of said sidewall,

said top end structure further comprising a dome-shaped top end wall having a peripheral edge portion adjacent the sidewall, the dome-shaped top end wall having a concave inner side facing the interior of the container and concave with respect thereto and the peripheral edge portion of said dome-shaped top end wall being disposed below the upper edge portion of the sidewall, said top end structure further comprising an offset wall extending around the dome-shaped top end wall and said offset wall extending between the dome-shaped top end wall and the sidewall, the offset wall connected to both of the peripheral edge portion of the dome-shaped top end wall and the upper edge portion of the sidewall thereby resisting the pressure of fluids contained within said container,

the container having an opening for receiving and dispensing the fluids.

5,597,086

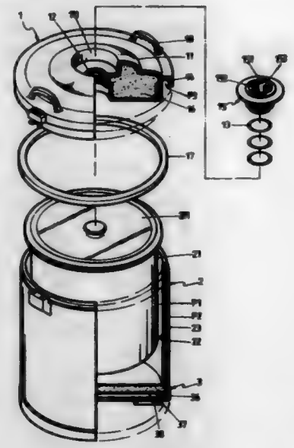
MOISTUREPROOF TEA CONTAINER AND FOOD THERMOS

Tsai King-Shui, 15 Nan Hsu Road, Wu-Kuei Village, Yuan-Chan Hsien, Yun Lin Hsien, Taiwan

Filed Mar. 18, 1996, Ser. No. 617,086

Int. Cl.[6] B65D *25/14*

U.S. Cl. 220—421 1 Claim



1. A moistureproof tea container and food thermos comprising top cover, a container body, and a bottom cover;

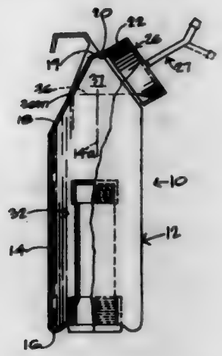
said top being a disc-like member having a raised central portion which includes an annular seat defining a hole therein, said hole being formed with several annular grooves around its inner peripheral wall and each of such annular grooves receiving a seal ring therein for a first air-vent plug to very tightly engage thereinto, said first air-vest plug being substantially an elastomeric cylindrical member having an air vent projecting from a central portion thereof, said air vent having four equally spaced ribs radially extending from a root portion thereof and a slit provided at a top center thereof; said top cover also having a downward extended flange normal to an outer periphery thereof and an annular chamber formed at underside of said top cover for filling with heat insulation material, such as PU, such that an outer wall of said annular chamber and said flange together define an annular groove between them for a seal ring to dispose therein, permitting said top cover to tightly contact with an upper edge of said container body; two handles being provided to a top surface of said top cover for easily handling the same;

said container body being substantially a cylindrical body having an upward opening into which an inner container with a removable lid is disposed, said container body and said inner container being so sized that a clearance is left between them; an outer wall and an inner wall of said container body further defining an interwall space between them for filling heat insulation material, such as PU foaming plastic material; said container body being provided at a bottom surface with a hole, an inner peripheral wall of said hole being formed with several annular grooves for each accommodating a seal ring therein, such that a second air-vent plug is tightly engaged into said hole; said second air-vent plug being substantially an elastomeric cylindrical member having an air vent projecting from a central portion thereof, and said air vent having four equally spaced ribs radially extending from a root portion thereof and a slit provided at a top center thereof; and

said lower cover being substantially a disc member covered to said bottom surface and a lower outer periphery of said container body, said lower cover being provided with a plurality of screw seats corresponding to a plurality of screw receivers provided on said bottom surface of said container

body, such that screws can be used to tightly attach said bottom cover to said container body, said lower cover also having a plurality of downward projected slip-resistant pads and a bottom chamber provided to a bottom surface thereof for accommodating said second air-vent plug.

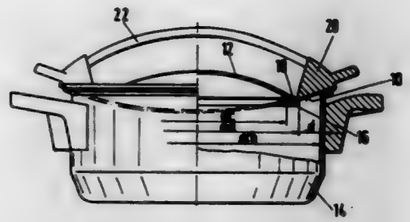
5,597,087
SPORTS BOTTLE
Michael A. Vinarsky, 671 Dover Ct., Elgin, Ill. 60120-7610
Filed Jul. 7, 1995, Ser. No. 498,249
Int. Cl.[6] B65D 25/24
U.S. Cl. 220—462 2 Claims



1. A liquid-tight sports bottle, comprising
a body having a circumferential wall extended along a longitudinal center axis, and first, second and third transverse walls connected off of the circumferential wall;
the first transverse wall being disposed approximately normal relative to the circumferential wall and near the bottom of the bottle;
the second and third transverse walls being spaced from the first transverse wall and angled upwardly and inwardly from respective lower ends merged directly with the circumferential wall and converging on one another near respective upper ends near the bottle top, and the second and third transverse walls being completely disposed on opposite lateral sides of the longitudinal axis;
a neck projecting from said second transverse wall and defining a liquid fill opening to the bottle, the fill opening being spaced entirely laterally off-set from the longitudinal axis and angled at approximately 30 degrees relative to the longitudinal axis; and
a cap for removable connection to the neck for closing the fill opening.

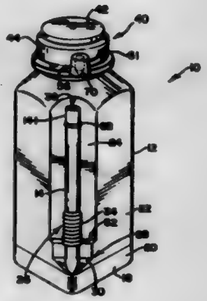
5,597,088
COOKING POT COVER
Hans Fingerle, Riedlingen, and Horst Weigand, Ertingen, both of Germany, assignors to Silit-Werke GmbH & Co. KG, Germany
PCT No. PCT/DE93/00336, § 371 Date Dec. 9, 1993, § 102(e) Date Dec. 9, 1993, PCT Pub. No. WO93/20738, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 8, 1993, Ser. No. 162,873
Claims priority, application Germany, Apr. 10, 1992, 9205199 U
Int. Cl.[6] B65D 25/24
U.S. Cl. 220—462 9 Claims

1. A cover for a cooking pot, comprising:



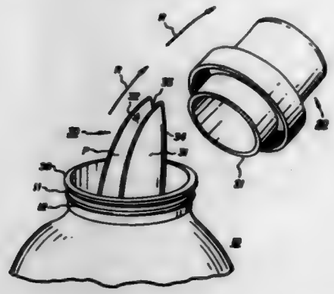
a cover ring having an annular bottom surface with a shape of a portion of an imaginary sphere having a center point above the pot;
a cover surface substantially closing the cover ring, an average ring diameter of the cover ring approximately corresponds to the inside diameter of a rim of the pot;
said annular bottom surface for flushly resting on the rim of the pot and having a width sufficient to allow displacement of the annular bottom surface on the rim of the pot for decanting through a sickle shaped opening between the rim of the pot and the cover ring while said cover ring otherwise maintains flush contact around said rim to prevent scalding of a user while decanting; and
a gripping surface operatively connected to said cover ring for displacing said cover ring by the user for decanting.

5,597,089
BEVERAGE CONTAINER
Willem J. Smith, P.O. Box 877, Parow, 7500, South Africa
Filed Sep. 6, 1994, Ser. No. 300,534
Int. Cl.[6] B65D 5/74
U.S. Cl. 220—710 17 Claims



1. A beverage container suitable for liquids, the container including
a vessel which defines a filling orifice proximate a first end thereof;
a drinking straw integral with, and external of, the vessel, so that the straw and the vessel form a one-piece unit, the straw communicating with the interior of the vessel proximate an end thereof remote from the filling orifice, a free end of the straw being sealed by a rupturable membrane;
a closure element for sealingly closing the filling orifice of the vessel, the closure element including a tamper indicating means; and
a closure cap formed integrally with the tamper indicating means of the closure element as a one-piece article, the closure cap being mountable on said free end of the straw, after rupturing of the membrane, to close off said free end of the straw.

5,597,090
CONTROLLED POURABILITY OF FLUIDS
David J. Leahy, 415 Franklin St., Framingham, Mass. 01701
Filed Nov. 25, 1994, Ser. No. 344,942
Int. Cl.[6] G01F 11/00
U.S. Cl. 222—1 17 Claims

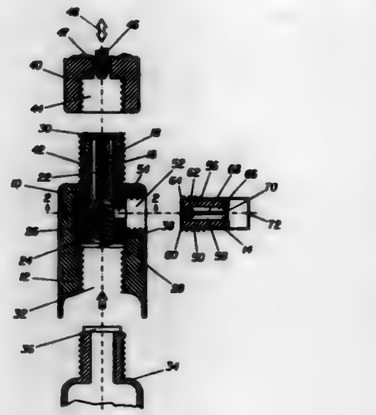


1. A pouring spout for pouring viscous and semiviscous fluids with reduced dripping therefrom, comprising:
(a) a paraboloidal shell having entry and exit ends and partially open sides, and forming a conduit for the pouring of fluid from an entry end of said shell to an apex exit end thereof opposite said partially open sides;
(b) said shell having a sharp discontinuity in the form of a V-shaped notch completely interrupting said apex exit end opposite said partially open sides to abruptly cut off the flow of said fluid when said apex exit end is positioned above the path of said flow.

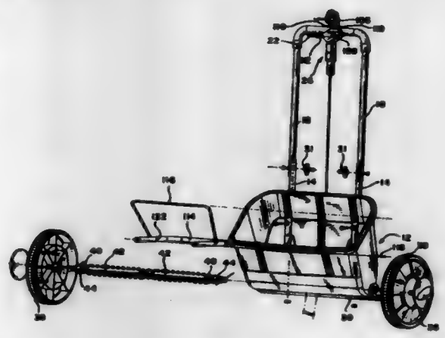
14. The method of reducing unwanted dripping of fluid from a paraboloidal pouring spout having partially open sides extending from a base in said container to a tip, which comprises the steps of:
(a) causing fluid from within said container to flow into said pouring spout and therealong opposite said open sides; and
(b) interrupting said flow at a single, V-shaped notch before said tip and extending through said spout opposite said open sides to the extremity of said tip.

5,597,091
SAFETY INDICATOR FOR AN INFLATION SYSTEM
Donald Mah, Richmond, and Adrian Post, Vancouver, both of Canada, assignors to M.E.T.A. Research Inc., Richmond, Canada
Filed Feb. 27, 1995, Ser. No. 394,993
Int. Cl.[6] G01L 19/12
U.S. Cl. 222—3 5 Claims

1. A gas containing cylinder discharge indicating system comprising means for opening said gas cylinder to permit discharge of gas contained therein, a gas passage for receiving gas discharged from said cylinder, a chamber, a piston means in said chamber, said piston means dividing said chamber into a high pressure side and a low pressure side and including an O-ring sealing means sealing said high pressure side and said low pressure side from each other and forming a means to resist movement of said piston means, a connecting passage, said connecting passage connecting said gas passage to said high pressure side of said chamber, said means to resist movement tending to hold said piston means in fixed position in said chamber under normal conditions, but insufficient to prevent movement of said piston means in said chamber from an initial position to a displaced position spaced from said initial position when subjected to gas pressure applied to said high pressure side of said chamber upon opening of said cylinder for discharge of gas therefrom, and indicator means connected to said piston means for actuation by movement of said piston means to indicate that said piston means has been displaced into said displaced position.

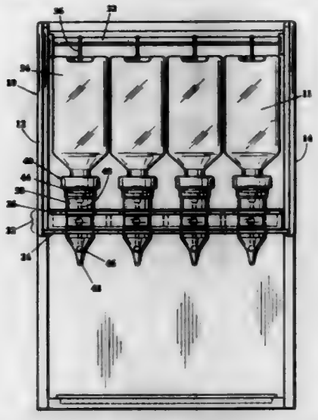


5,597,092
COLLAPSIBLE DROP SPREADER
Paul M. Havlovitz, Escondido, Calif., assignor to Republic Tool & Mfg. Corp., Carlsbad, Calif.
Filed Jan. 13, 1995, Ser. No. 372,579
Int. Cl.[6] B67D 5/22
U.S. Cl. 222—45 13 Claims



1. A drop spreader comprising,
a frame and handle member,
a hopper connected to said frame and handle member,
a material exit aperture means in said hopper extending substantially the length thereof,
a wheel-bearing axle extending through a bottommost portion in said hopper,
bearing means for said axle journaled at opposing end apertures of said hopper,
an agitator means comprising a pair of hollow roller members surrounding said axle in tandem,
keying means on said axle for keying said agitator means to said axle to rotate therewith, said roller members being free to slide axially with respect to said axle, and
spring washer means disposed between said roller members of said agitator means for biasing said roller members axially apart from each other respectively towards said bearing means at opposite ends of said hopper.

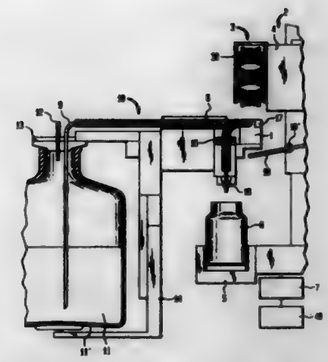
5,597,893
PUSH PAD UNIT FOR DISPENSING FLUIDS
Gary K. Lee, 5827 S. 81st East Pl., Tulsa, Okla. 74145
Filed Feb. 24, 1995, Ser. No. 394,132
Int. Cl.[6] B67D *3/02*; G01F *11/02*
U.S. Cl. 222—113 6 Claims



1. A dispensing unit for holding at least one dispensing bottle, each having a flexible dispensing nipple with a hole in the end which comprises;
a housing having a front and a back;
a bottom tray fixed to said housing with at least one passage therethrough to receive a dispensing nipple;
a slide-in tray spaced above said bottom tray and having at least one notch opening toward the back edge and of a depth such that when the slide-in tray is pushed in, the notch aligns with a corresponding passage of the bottom tray;
a squeezing means supported within said housing between said bottom tray and said slide-in tray and includes a) a back pad of a resilient sponge-like material, and b) a front pad toward the front portion of said housing and positioned between said trays, there being sufficient room between the two pads when relaxed so that a dispensing nipple can be placed therebetween; and
means operable to force such front pad towards its corresponding back pad.

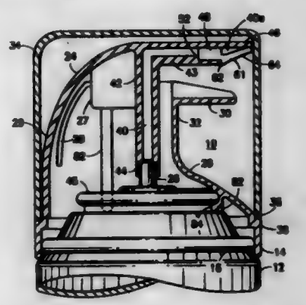
5,597,894
DEVICE WITH PERISTALTIC PUMP WHICH MAKES IT POSSIBLE TO DRAW, WEIGHT AND MIX LIQUIDS AUTOMATICALLY
Bernard Vilbert, Carnon, France, assignor to Seligmac Industries S.A., France
Continuation of Ser. No. 384,625, Feb. 6, 1995, abandoned, which is a continuation of Ser. No. 985,836, Dec. 3, 1992, abandoned. This application Jul. 12, 1995, Ser. No. 501,430
Int. Cl.[6] B65D *37/00*
U.S. Cl. 222—214 10 Claims

1. A modular peristaltic pump assembly for automatically drawing off measured quantities of a plurality of liquids comprising:
a plurality of juxtaposed pumping modules each comprising a supply of liquid and a squeezable hose;
a mobile assembly readily movable among said plurality of juxtaposed pumping modules, said mobile assembly comprising a recipient container, each said squeezable hose of said pumping modules being in communication with said supply of liquid and said recipient container; and
a peristaltic pump for pumping predetermined amounts of liquid from said pumping modules, said pump comprising a pump body integrally connected to each of said pumping modules



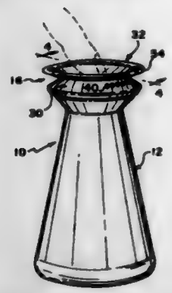
and horizontally receiving at least a portion of said hose thereon and pressure means for drawing said liquid from said supply of liquid through said hose into said recipient container, said pressure means being movable into operative communication and horizontal engagement with said pump body to exert peristaltic pressure on said hose to draw said liquid from said supply of liquid to said recipient container.

5,597,895
DUAL ARM AEROSOL ACTUATOR HAVING A MOVABLE AND STATIONARY ARM
Daniel A. Ferraro, Jr., Bantam, Conn., assignor to Precision Valve Corporation, Yonkers, N.Y.
Filed Jun. 9, 1993, Ser. No. 71,769
Int. Cl.[6] B65D *83/00*
U.S. Cl. 222—402.12 8 Claims



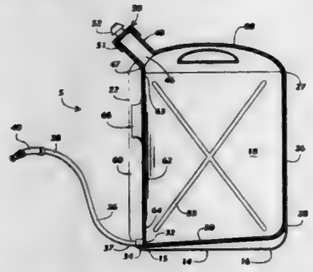
1. A dispensing actuator for dispensing material stored within an aerosol container having a valve-bearing mounting cup with a pedestal portion and further having a valve stem extending through an opening in the pedestal portion of the mounting cup, the dispensing actuator comprising:
a recess to receive in sealing engagement of the valve stem extending through the pedestal portion of the mounting cup;
a duct extending from the valve stem receiving recess to a discharge outlet, which duct provides a passage allowing product to exit the dispensing actuator;
two arms extending transverse the valve stem receiving recess in proximate relation and in an outer and inner spatial relation relative to the valve-bearing mounting cup when the actuator is disposed on an aerosol container, the outer arm being movable towards the inner arm and the outer arm being operably connected with the valve-stem receiving recess such that the movement of the outer arm towards the inner arm opens the valve in the valve-bearing mounting cup to dispense product from the aerosol container.

5,597,896
SHAKER FOR CONDIMENTS
Hanne D. Jeppesen, Holte; Jakob Helberg, Charlottenlund, and Stig Lillelund, Gentofte, all of Denmark, assignors to Dart Industries Inc., Orlando, Fla.
Filed Feb. 15, 1996, Ser. No. 593,098
Int. Cl.[6] B65D *5/72*
U.S. Cl. 222—498 11 Claims



1. A condiment shaker comprising a chamber-defining base with an upwardly opening mouth for the selective introduction of a condiment in bulk, a seal removeably mounted to said base over said mouth, said seal having a lower wall, said lower wall having an outer peripheral portion releasably engagable with said base peripherally about said mouth for mounting said seal to said base, said lower wall having an inner periphery, said seal further including an upper wall overlying said lower wall, a living hinge integrally formed with the inner periphery of the lower wall and with the upper wall thereabove for a pivotal movement of the upper wall relative to said lower wall, said upper wall including an outer portion outward of said living hinge overlying said lower wall, said upper wall including an inner portion inward of said living hinge, at least one dispensing opening defined through said lower wall, said seal having a closed position wherein said outer portion of said upper wall closely overlies said lower wall in contact therewith and sealing said at least one dispensing opening, said seal having an open position wherein said outer portion of said upper wall upwardly diverges from said lower wall outwardly from said living hinge to expose said at least one dispensing opening.
a generally rectangular front wall, a generally rectangular back wall, and a pair of generally rectangular sidewalls, each of said walls having a first end and a second end;
wherein said sidewalls are each fastened at their first end to the side edges of said top wall and extend between the first end and second end of said top wall, said front wall and said back wall being fastened at their first end to the first end and second end, respectively, of said top wall and also being fastened along their common side edges to each of said sidewalls;
a generally rectangular interior partition positioned within the container and spaced intermediate the first end and second end of said front wall, said back wall, and said sidewalls, said partition being sealed along its edges to said front wall, said back wall, and said sidewalls;
wherein said partition extends downwardly from said back wall toward said front wall with respect to said front wall, said back wall, and said sidewalls, said partition being sealed to said front wall along the second end of said front wall;
a space between the partition and bottom wall for storing items;
a fluid outlet opening defined in the front wall spaced above and adjacent said partition;
an elongated flexible hose having a first end and second end, the first end of said hose being in sealed fluid communication with said fluid outlet opening;
clamp means disposed on the container for holding said hose;
a nozzle in sealed fluid communication with the second end of said hose, the nozzle being adapted to be selectively opened and closed for passing fluid through the hose;
a fluid inlet opening defined in the container where said front and top walls are joined together, said fluid inlet opening being angled away from both the top wall and front wall of the container; and
a cap removably received on said fluid inlet opening for sealing the fluid inlet opening on the container, said cap including an integral vent adapted to be selectively opened and closed;
whereby fluid is drained from the container through the hose when the nozzle and vent are opened while the interior partition assists in the passage of fluid from the container, and whereby the container can be stored and transported not only in an upright position but may also be placed on its back wall so that both the fluid inlet and outlet openings face upward to prevent leakage of fluid stored and carried in the container.

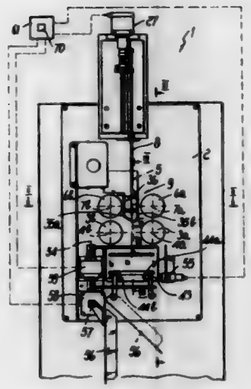
5,597,897
FLUID DISPENSING CONTAINER
Glenn Morris, 8080 Banks Mill Rd., Douglasville, Ga. 30135
Filed Jan. 11, 1995, Ser. No. 371,415
Int. Cl.[6] B67D *5/06*
U.S. Cl. 222—529 22 Claims



17. A container for dispensing fuel and other fluids, comprising:
a generally rectangular top wall having a first end and a second end;
a bottom wall having a first and second end;
a handle formed as an integral part of said top wall;

5,597,898
MACHINE FOR TURNING STOCKINGS THE RIGHT WAY OUT, WITH HIGH OPERATING RELIABILITY
Renato Pandolfi, Gerle, and Mario Valle, Pavia, both of Italy, assignors to Conti Complett S.p.A., Milan, Italy
Filed May 3, 1996, Ser. No. 642,739
Claims priority, application Italy, May 23, 1995, MI95A1055
Int. Cl.[6] A41H *43/00*
U.S. Cl. 223—39 41 Claims

1. A machine for turning stockings the right way out, with high operating reliability, comprising: protruding from slots at least one first pair of rollers that have mutually parallel axes, are arranged laterally on opposite sides with respect to an imaginary median plane that is parallel to the axes of said rollers, and can be rotated about their respective axes in mutually opposite rotational directions; means for positioning a stocking to be turned the right way out between said first pair of rollers; first motor means for moving said rollers mutually closer or further apart along a straight line in sliding movement on carriages to retain, between said rollers, the stocking carried by said positioning means; first actuation means for rotating said rollers about their respective axes in mutually opposite rotational directions; a rod controllably insertable between said rollers and cooperating with said rollers to turn the stocking the right way out along said rod; means for moving said rod along its own axis, which is arranged in said median plane and is substantially perpendicular to the axes of said rollers, for the insertion of said rod between said rollers or the extraction of said



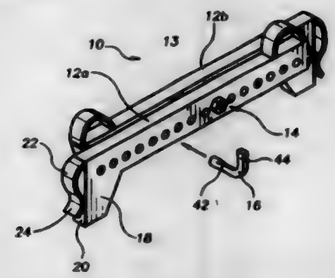
rod therefrom; wherein said first means for rotating said rollers about their respective axes comprise at least one first variable-speed motor.

5,597,099

GARMENT WAISTBAND STRETCHER

Shirley Sharp, 904 N. 2nd St., Amite, La. 70422

Filed Nov. 13, 1995, Ser. No. 556,381
Int. Cl.[6] D06C *15/00;3/08*
U.S. Cl. 223—61 4 Claims



1. A garment waistband stretcher comprising:

a first elongated stretching arm having a first expanded end member that includes a first waistband contact surface and a first resilient waistband clip secured adjacent to said first expanded end having a first distal end portion that is directed away from said first waistband contact surface, said first stretching arm having a first plurality of pin receiving apertures formed entirely therethrough and spaced along the length thereof at equal intervals;

a second elongated stretching arm having a second expanded end member that includes a second waistband contact surface and a second resilient waistband clip secured adjacent to said second expanded end having a second distal end portion that is directed away from said second waistband contact surface, said second stretching arm having a second plurality of pin receiving apertures formed entirely through said second stretcher arm and spaced along the length thereof at equal intervals, said first and second elongated stretching arms being placed adjacent to each other with at least two of said first pin apertures in registration with at least two of said second pin apertures;

a pivot pin assembly including a pivot pin having a shaft passing sequentially through one of said first pin apertures and one of said second pin apertures; and

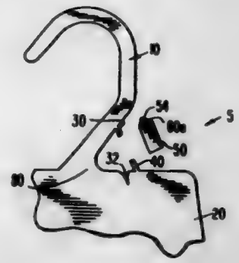
a locking pin having a shaft passing sequentially through one of said first pin apertures and one of said second pin apertures.

5,597,100

GARMENT HANGER HAVING LABEL INDICATOR

Leslie S. Blitz, New Hyde Park, N.Y., assignor to S.J. Bee Corp., New York, N.Y.

Filed Feb. 14, 1996, Ser. No. 601,078
Int. Cl.[6] A47G *25/14;* G09F *3/00*
U.S. Cl. 223—85 20 Claims



1. A hanger for displaying information, comprising:

a hanger body, said hanger body having a first prong extending therefrom;

a hanger hook, said hanger hook having a second prong extending therefrom, said second prong extending toward said first prong;

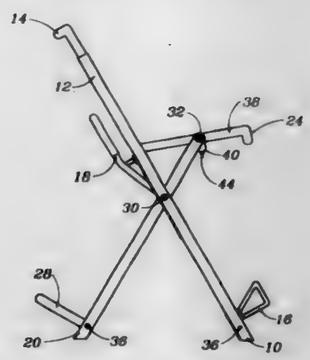
an information indicator having a first hole on a first end, and a second hole on an opposed second end, said first hole being of a size to receive said first prong, and said second hole being of a size to receive said second prong, said information indicator being of a length such that it can be attached to said hanger by mating said first hole with said first prong and said second hole with said second prong.

5,597,101

BACKPACK FRAME/CHAIR

Ted Barber, Rte. 1, Box 811, and Gary D. Avery, 407 Harper, both of Fletcher, Okla. 73541, assignors to Gary D. Avery, and Ted Barber, both of Fletcher, Okla.

Filed Mar. 22, 1995, Ser. No. 408,218
Int. Cl.[6] A45F *4/02*
U.S. Cl. 224—155 5 Claims



1. A backpack frame convertible to a chair comprised of:

an outer leg frame comprised of two substantially parallel opposing U-shaped channels joined at upper ends thereof by an extension brace;

an inner leg frame comprised of two opposing substantially parallel support portions joined at lower ends thereof by a lower brace member wherein central portions of said support portions of said inner leg frame are pivotally connected to respective central portions of said opposing U-shaped channels of said outer leg frame by a pair of first pivot connections;

a seat frame comprised of opposed side braces, a rear brace connecting ends of said side braces, a front brace connecting opposite ends of said side braces and a central brace connecting central portions of said side braces wherein said central portions of said side braces are respectively pivotally connected to upper ends of said support portions of said inner leg frame by a pair of second pivot connections and said seat frame rear brace includes protruding extensions on opposite ends thereof which are respectively slidingly engaged in said opposed U-shaped channels of said outer leg frame;

a plurality of shoulder strap guides positioned on said seat frame central brace and adapted to receive shoulder straps in order to enable a user to wear the backpack frame and

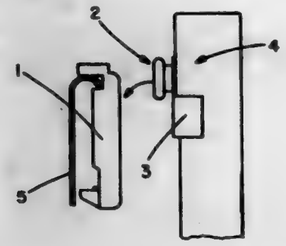
a pack support bracket attached to said central portions of said opposing U-shaped channels of said outer leg frame and adapted to support a pack thereon whereby said frame folds from a folded backpack frame position wherein the inner leg frame, the outer leg frame and the seat frame are disposed in a substantially vertical orientation such that the frame can be carried upon a user's back to an unfolded chair position wherein the inner leg frame is pivoted with respect to the outer leg frame about said first pivot connections, said seat frame side braces are pivoted with respect to said inner leg frame at said second pivot connections and said protruding extensions of said seat frame are slid along respective U-shaped channels of said outer leg frame such that a lower portion of said outer leg frame forms front legs of said chair, a lower portion of said inner leg frame forms the rear legs of said chair, an upper portion of said outer leg frame forms the back rest of said chair and said seat frame forms a seat portion of said chair.

5,597,102

ATTACHMENT DEVICE FOR A MOBILE STATION

Anssi Saurikko; Lassi Lahti; Pekka Niemi, all of Salo; Robert Hellier, and Matti Makkonen, both of Turku, all of Finland, assignors to Nokia Mobile Phones Ltd., Finland

Filed May 15, 1995, Ser. No. 441,680
Claims priority, application Finland, May 18, 1994, 942306
Int. Cl.[6] A01K *97/04;97/06;* B65D *25/52*
U.S. Cl. 224—197 10 Claims



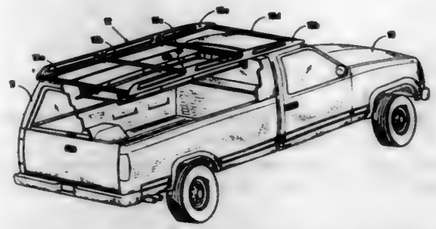
1. An attachment device to be used with a mobile station which is removable from the attachment device and reinstallable to it, wherein the attachment device comprises a body having an attachment plate with peripheral side portions adaptable to be attached to a belt and a fastener having a fitting piece adaptable to be attached to said mobile station, said body including guide flanges formed by said side portions, bent inward from two opposite sides thereof and from a lower side thereof to guide the fastener, the fastener including a neck and a wider end comprising a flange which slides behind the guide flanges, to a locked position behind said side and lower flanges and said body including a projection and a spring member acting against said projection, which when the fastener is in the locked position, reasists the upward movement of the fastener.

5,597,103

RACK WITH CONVOLUTED MAIN MEMBERS FOR PICKUP TRUCKS

Kenneth E. Nichols, P.O. Box 528, Carson City, Nev. 89702-0528

Filed May 11, 1994, Ser. No. 241,836
Int. Cl.[6] B60P *7/06*
U.S. Cl. 224—324 8 Claims



1. A tool and material restraining platform for pickup trucks comprising;

a pair of side rails;

a load bearing bed rail arranged perpendicular to the side rail, said bed rails formed of extruded material formed into a convoluted, upwardly opea channel;

attachment means for securing the bed rail to the side rails;

a self-locking base comprising a t-shaped actuation pin and a pair of wedges, the vertical shaft of said pin being located in one of a plurality of openings in the bed rail, said wedges being spread apart by the actuation pin when the pin is in a lowermost position, causing the wedges to be separated and secure the base in the convoluted bed rail, said wedges release from the bed rail when the bin is raised from the lowermost position, said base further comprising a lever arm arranged to block upward movement of the pin when in a closed position, thereby securing the base to the bed rail;

said base further comprising a continuous length of chain secured by a hook on the lever arm, one end of the chain being further secured to holding means on the bed rail;

whereby the lever arm, the holding means and the chain cooperate to produce tension around a load on the bed rail and whereby the lever arm, wedges and pin retain the base in the bed rail.

5,597,104

DISPOSABLE COUPON HOLDER FOR A SHOPPING CART

Gregory E. Elliott, Livonia, Mich., assignor to Charles Domen, Canton, Mich.

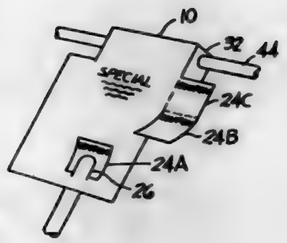
Filed Sep. 15, 1995, Ser. No. 529,089
Int. Cl.[6] B60R *7/00*
U.S. Cl. 224—411 9 Claims

9. A coupon holder for use on a horizontal rod of a shopping cart, comprising:

a planar sheet having a pair of spaced integral ears, and parallel fold lines permitting each of the pair of ears to be folded down at right angles to the plane of the sheet;

a slot in each of said ears for receiving the horizontal rod of said shopping cart to support the sheet in an inclined position; and

indicia printed on the sheet.



5,597,105

APPARATUS FOR BUFFERING A VARIABLE LENGTH LOOP OF STRIP MATERIAL

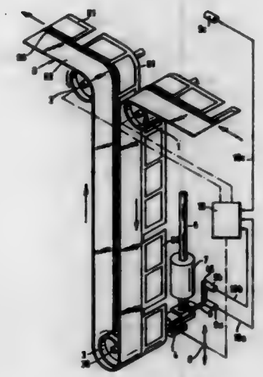
Guido Keller, Adliken, Switzerland, assignor to Gretag Imaging AG, Regensdorf, Switzerland

Filed Jan. 23, 1995, Ser. No. 377,802

Claims priority, application Germany, Feb. 24, 1994, 94810118.3

Int. Cl.[6] B65H *20/24*; G11B *15/56*

U.S. Cl. 226—118 **15 Claims**



1. A loop buffer for a conveyor of continuous strip material having loop length which is variable between a minimum value and a maximum value, comprising:

a deflector roll on each of an input side and an output side, respectively;

a loop roll movably mounted for displacement in a vertical direction between the deflector rolls at a height relative to the deflector rolls which determines the length of the loop;

a ballast body; and

a spring which links said loop roll to said ballast body, said ballast body being guided freely movably in a vertical path between a first position in which the loop length has its minimum value and a second position in which the loop length has its maximum value,said loop soll being gravity tensioned by said ballast body via said spring.

5,597,106

DRIVE DEVICE FOR A NAILING MACHINE

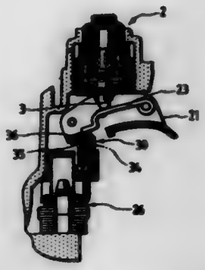
Terufumi Hasegawa; Michiaki Adachi; Kazuhiko Mashima; Noboru Ishikawa, and Nobuo Kishi, all of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1995, Ser. No. 387,429

Claims priority, application Japan, Feb. 28, 1994, 6-055179

Int. Cl.[6] B25C *1/04*

U.S. Cl. 227—8 **6 Claims**



4. An improved drive device of a nailing machine for driving a nail hitting mechanism for hitting a nail supplied to a housing, a drive valve being operated through cooperation of a trigger operation of a trigger lever and movement of a contact arm toward a top dead center position thereof that is performed when a contact arm is pressed against a member to which a nail is to be driven, the improvement which comprises a locking mechanism operating such that movement of the contact arm to top dead center and trigger operation of the trigger lever following said movement of the contact arm cooperating to lock the drive valve in an operation state whereby successive nail driving is precluded and the drive valve is released from its locked state when the trigger lever is released.

5,597,107

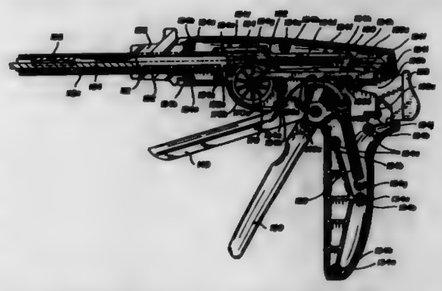
SURGICAL STAPLER INSTRUMENT

Bryan D. Knodel; Bennie Thompson, both of Cincinnati, and Richard P. Nuchols, Loveland, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 235,070, Apr. 29, 1994, Pat. No. 5,487,500, which is a continuation-in-part of Ser. No. 191,412, Feb. 3, 1994, Pat. No. 5,465,895. This application Jun. 1, 1995, Ser. No. 457,721

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—175.2 **5 Claims**



1. A surgical stapler instrument (**100**) comprising:

an implement portion (**110**) having an elongated channel (**112**) releasably receiving a staple cartridge (**120**) therein, said cartridge housing a plurality of drivers (**122***a*–**122***d*), each of said drivers supporting one or more staples (**124**), and an anvil (**114**) movable toward and away from said cartridge for clamping bodily tissue (**200**) and thereafter releasing said bodily tissue positioned between said anvil and said cartridge after said staples have been fired;

a handle portion (**130**) having a base section (**130***a*), and a closure trigger (**150**) including an elongated, generally linear handle section (**150***a*) having a longitudinal axis, said closure trigger pivotally mounted in said handle portion for pivoting said handle section from a first handle position spaced from said base section to a second handle position adjacent said base section, said closure trigger normally biased toward said first handle position;

a closure tube (**152**) having a proximal end connected to said handle portion and a distal end being adapted to engage said anvil for effecting movement of said anvil toward and away from said cartridge when said handle section of said closure trigger is pivoted to and from said first and second handle positions;

a closure yoke (**154**) reciprocatable within said handle portion from a first proximal yoke position to a second intermediate and third distal yoke positions, respectively, said yoke having distal and proximal ends, said distal end of said yoke being connected to said proximal end of said closure tube and said proximal end of said yoke connected to said closure trigger such that pivotal movement of said handle section of said closure trigger from said first handle position to said second handle position effects movement of said closure tube; and

a releasable locking assembly (**138**) mounted in said handle portion and engageable with said yoke only when said yoke is in said third distal yoke position so as to lock said handle section of said closure trigger in said second handle position adjacent said base section of said handle portion and prevent said handle section from returning to said first handle position when said pivotal movement is released;

wherein said closure yoke includes a sliding surface (**154***h*) and a recessed surface (**154***f*), and said releasable locking assembly includes a release button pivotally mounted in said handle portion, said release button having a latch arm (**138***a*) slidable on said sliding surface of said yoke when said yoke reciprocates from said first proximal yoke position to said second intermediate yoke position, and said latch arm pivotably engages said recessed surface so as to prevent proximal reciprocating movement of said yoke when said yoke is in said third distal yoke position.

5,597,108

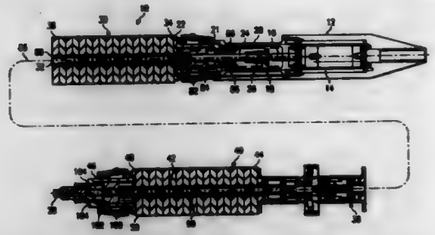
PLUG STYLE PIPE LINE-UP CLAMP WITH COPPER BACK-UP SHOES

Oliver T. Dierlam, Houston, Tex., assignor to CRC-Evans Pipeline International, Inc., Houston, Tex.

Filed Apr. 28, 1995, Ser. No. 434,303

Int. Cl.[6] B23K *37/06*; *101/10*

U.S. Cl. 228—49.3 **13 Claims**



1. A line-up clamp for clamping first and second pipe sections in alignment for welding, comprising:

a guide assembly;

a fluid cylinder mounted on the guide assembly and having an elongate rod movable between a first position and a second position relative the fluid cylinder, the elongate rod having a distal end;

a first plurality of expandable disks concentric with a first portion of the elongate rod;

a second plurality of expandable disks concentric with a second portion of the elongate rod;

a center member concentric with the elongate rod positioned between the first and second plurality of expandable disks;

an end member rigidly mounted on the elongate rod at the distal end thereof;

the elongate rod in the first position expanding the first and second plurality of disks between the end member, center member and guide assembly to clamp the first and second pipe sections in alignment for welding; and

at least one back-up shoe assembly positioned at the center member urged against the interior surfaces of the aligned pipe sections when the elongate rod is in the first position and released from the interior surfaces of the aligned pipe sections when the elongate rod is in the second position.

7. A backup shoe device for welding first and second pipe sections at abutting ends thereof, comprising:

a first actuator body;

a second actuator body;

a first backup shoe assembly pivoted to the first actuator body, the first backup shoe assembly having a first side, a second side and tapered ends;

a second backup shoe assembly pivoted to the second actuator body, the second backup shoe assembly having a first side, a second side and tapered ends;

a guide for guiding the actuator bodies along an axis concentric with the elongate axis of the first and second pipe sections aligned for welding;

a mechanism for moving the actuator bodies toward each other along the guide, the first sides of the backup shoe assemblies facing each other, the tapered ends of the first and second shoe assemblies engaged to pivot the first and second backup shoe assemblies into engagement with the interior surfaces of the aligned first and second pipe sections.

5,597,109

WELDING METHOD FOR FORMING CHROMIUM OXIDE PASSIVATED FILM AT WELDED PORTION, WELDING APPARATUS, AND PROCESS APPARATUS

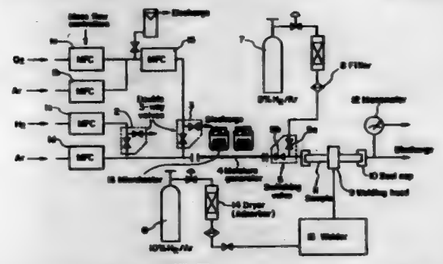
Tadahiro Ohmi; Shinji Miyoshi, both of Sendai, and Yasunobu Mizuguchi, Higashiosaizuyama, all of Japan, assignors to Osaka Sanso Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1994, Ser. No. 296,542

Claims priority, application Japan, Aug. 24, 1993, 5-209779

Int. Cl.[6] B23K *31/02*; *35/38*

U.S. Cl. 228—199 **18 Claims**



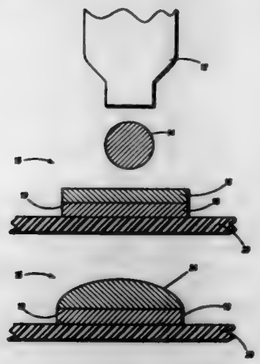
1. A method for forming a chromium oxide passivated film on a welded area during the welding process, said method comprising the steps of:

providing a flow of back shield gas comprising an inert gas having 800 ppm–2.5% (volumetric percent) of moisture around an area to be welded;

welding the area; and

forming an oxide passivated film having chromium oxide as a chief component on the surface of the welded area during welding.

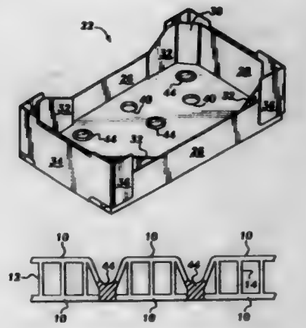
5,597,110
METHOD FOR FORMING A SOLDER BUMP BY SOLDER-JETTING OR THE LIKE
Cynthia M. Melton, Bolingbrook, and Robert Pfahl, Glen Ellyn, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 25, 1995, Ser. No. 519,439
Int. Cl.[6] B23K 1/20;1/00
U.S. Cl. 228—203 22 Claims



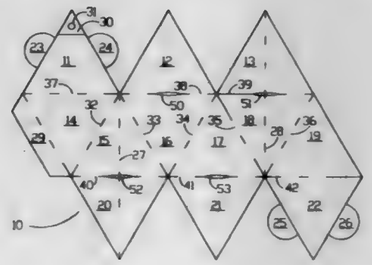
1. A method for forming a solder bump bonded to a bond pad on a substrate, said bond pad having a copper faying surface, said method comprising:
coating the copper faying surface with a plate formed of a first metal having a first melting temperature;
projecting a discrete microdroplet onto the plate, said microdroplet being formed of a molten second metal having a second melting temperature greater than the first melting temperature and fusible to the first metal to form a solder alloy, said microdroplet being projected onto the plate so as to fuse the microdroplet to the plate to form the solder bump.

5,597,111
CORRUGATED THERMOPLASTIC BLANK FOR A CONTAINER
Malcolm R. Mackinnon, London, England, and Ronald Grobler, Cape Town, South Africa, assignors to Korpak Limited, London, England
PCT No. PCT/GB93/01585, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO94/02364, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 16, 1993, Ser. No. 374,613
Claims priority, application United Kingdom, Jul. 16, 1992, 9215103
Int. Cl.[6] B65D 5/20;5/42
U.S. Cl. 229—3.5 R 10 Claims

1. A container blank made of corrugated thermoplastic sheet having two skins spaced from one another by flutes, said blank including a base comprising a weld line welding the two skins together and substantially reducing or destroying the original memory of the thermoplastic along the length of the weld line, and wherein the blank includes edges being sealed to prevent liquid from entering the blank and surrounding and reinforcing each panel thereby increasing the strength of each panel of the blank and thereby the strength of a container erected from the blank, the corrugated thermoplastic sheet being between 5 mm and 10 mm thick and having a weight of between 400 grams/m^2 and 850 grams/m^2.



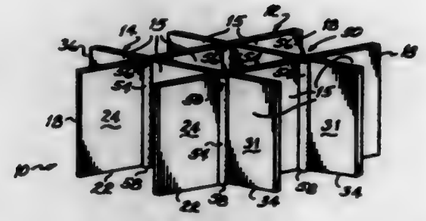
5,597,112
COLLAPSIBLE OCTAHEDRAL CONTAINER
Frederick W. Knapp, 23 Otis Pl., Verona, N.J. 07044
Filed Oct. 13, 1994, Ser. No. 322,925
Int. Cl.[6] B65D 5/02
U.S. Cl. 229—116 12 Claims



1. A blank for forming a collapsible octahedral structure comprising;
a sheet having six adjacent triangular side panels with five side fold lines therebetween and at least two longitudinal fold lines traversing at least two of the six adjacent triangular side panels,
at least one triangular top panel, and
at least one triangular bottom panel;
at least one top fold line lying between the top panel and the side panels; and
at least one bottom fold line lying between the bottom panel and the side panels
wherein when the blank is folded along its longitudinal fold lines it may be stored in a compact flattened form, and when it is folded along each of the side panel fold lines and the top and bottom fold lines, it creates an octahedral three dimensional structure.

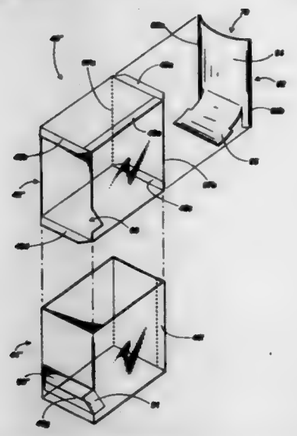
5,597,113
RECYCLABLE CONTAINER PARTITION
Judson A. Bradford, Holland, Mich., assignor to Bradford Company, Holland, Mich.
Filed Nov. 20, 1995, Ser. No. 559,619
Int. Cl.[6] B65D 5/499
U.S. Cl. 229—120.36 35 Claims

1. A collapsible partition assembly for dividing the space inside a container comprising:



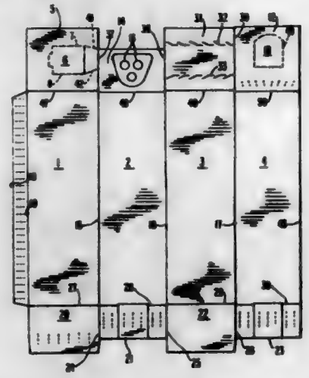
a set of parallel longitudinal dividers, each longitudinal divider having a series of spaced slots, each slot extending downwardly from a top edge of said longitudinal divider toward a bottom edge;
a set of parallel transverse dividers, each transverse divider having a series of spaced slots, each slot extending upwardly from a bottom edge of said transverse divider toward a top edge;
the slots of the transverse dividers being engaged with the slots of the longitudinal dividers so that each longitudinal divider intersects each transverse divider at an intersection;
and the set of longitudinal dividers being flexibly and permanently affixed to the set of transverse dividers by a securement bead applied to at least one intersection.

5,597,114
INTERLOCKING MODULAR PRODUCT DELIVERY SYSTEM
Armand J. Kramedjian, 415 Golfview Dr., Atlanta, Ga. 30309, and Terrance F. O'Brien, 4300 Chimney Lake Dr., Roswell, Ga. 30075
Filed Feb. 16, 1994, Ser. No. 197,406
Int. Cl.[6] B65D 5/32;5/72
U.S. Cl. 229—122.1 40 Claims



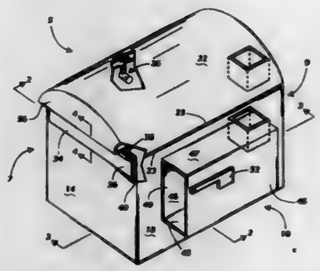
1. A product dispenser, comprising:
a first sleeve member including four adjoined wall segments surrounding and defining an open ended cavity;
a second sleeve member including four adjoined wall segments surrounding and defining an open ended cavity;
said first sleeve member occupying the cavity of said second sleeve member;
said first sleeve member and said second sleeve member being oriented relative to one another such that two of said wall segments of said first sleeve member are positioned in the open ends of said cavity of said second sleeve member, whereby the two sleeve members combine to form a six sided, rectilinear cartridge having an interior storage space defined by the cavity of the first sleeve member; and
an access port defined in one of said adjoined wall segments providing access to said interior storage space.

5,597,115
RESEALABLE CONTAINER FOR POWDERED MATERIALS
Joseph Roe, Princeton Jct., N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.
Filed May 10, 1996, Ser. No. 644,385
Int. Cl.[6] B65D 5/54
U.S. Cl. 229—229 6 Claims



1. A three dimensional resealable container for dispensing powder or particulate material comprising a top portion, a bottom portion and at least one side portion, the top portion being comprised of an inner section with a die-cut piece, an intermediate section contiguous to said inner section and provided with a hinged flap portion adapted to open and close the container with the die-cut piece secured to the hinged flap, and an outermost section with a pattern of perforations such that a segment of such section which covers the hinged flap can be manually removed.

5,597,116
TOP OPENING LOCKING MAILBOX
Glenn Morris, 8080 Banks Mill Rd., Douglasville, Ga. 30135
Filed Nov. 16, 1994, Ser. No. 340,217
Int. Cl.[6] A47G 29/12
U.S. Cl. 232—20 19 Claims



1. A top opening locking mailbox for receiving mail and other deliveries, to include newspapers and magazines, in a weather and theft resistant enclosure, comprising:

a generally rectangular housing, the housing having a closed bottom, closed sides, and an open top;

a top panel supported on the housing, said panel being spaced apart from the closed bottom of the housing and being movable from an open position into a closed position;

locking means disposed on said housing, wherein said locking means lock said top panel on the housing in said panel's closed position for enclosing a first compartment thus formed in the housing;

an elongated mail slot defined in the housing for passing mail and deliveries into the first compartment;

an elongated flap mounted on said housing in relationship to said slot, said flap being pivotally supported on the inside of the housing in overlapping fashion on the mail slot and being sized and shaped to close the mail slot;

a second compartment mounted on the housing and having an opening defined therein for holding outgoing mail;

whereby outgoing mail is placed in the second compartment for pickup, and mail and deliveries are passed through the mail slot into the first compartment and held therein until the top panel of the mailbox is unlocked and the contents of the compartment removed.

5,597,117

EXPANSION VALVE WITH NOISE SUPPRESSION

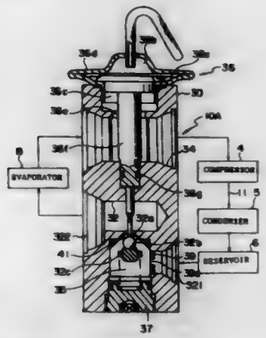
Kazuhito Watanabe, Kanagawa-ken; Kota Shinohara, Tokyo, and Tetsuroo Ikeura, Kanagawa-ken, all of Japan, assignors to Fujikoki MFG. Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1995, Ser. No. 423,143

Claims priority, application Japan, Nov. 17, 1994, 6-283483

Int. Cl.[6] F25B *41/09*

U.S. Cl. 236—92 B **15 Claims**



1. An expansion valve comprising:

a valve housing defining a passage for a refrigerant to be reduced in pressure to run through in a liquid phase and a passage for said refrigerant to run through in a gaseous phase from an evaporator toward a compressor,

a valve seat and a valve chamber interposed in said passage for the refrigerant in the liquid phase,

a valve driving rod having one end fixed to a diaphragm supported by said valve housing and the other end supporting a valve member so that said passage for the refrigerant in the liquid phase is adjusted in cross-sectional area in response to the temperature and pressure of the refrigerant in the gaseous phase, and

an orifice fixed in said passage for the refrigerant in the liquid phase between an inlet port and said valve chamber, said orifice having a throttling hole; wherein said passage for the refrigerant in the liquid phase and said throttling hole are configured to limit the amount of bubbles that pass through the orifice to thereby reduce noise during operation of the expansion valve.

5,597,118

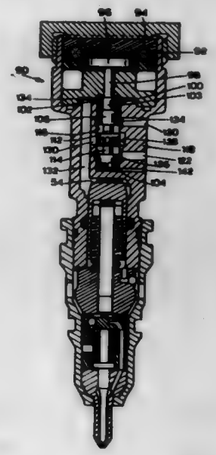
DIRECT-OPERATED SPOOL VALVE FOR A FUEL INJECTOR

Jeffrey J. Carter, Jr.; Howard N. Cannon, both of Peoria; Kirk S. Shively, Dunlap; Glen F. Ferch; Raj T. Nagarajan, both of Peoria, and Steven F. Meister, Chillicothe, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed May 26, 1995, Ser. No. 452,668

Int. Cl.[6] F02M *51/00*; F15B *13/044*

U.S. Cl. 239—92 **14 Claims**



1. In combination:

an actuation valve for a hydraulically-operated fuel injector having an injection mechanism, comprising an actuator having a plunger and a spool valve coupled to the plunger and having a high pressure port and a low pressure port and operable by the actuator to selectively place the high pressure port or the low pressure port in fluid communication with the injection mechanism, the spool valve including a body having a valve bore, a spool disposed in the valve bore and coupled to the plunger, a first passage coupled between the valve bore and the high pressure port, a second passage coupled between valve bore and the low pressure port and a third passage coupled between the valve bore and the injection mechanism wherein the spool is alternately and repetitively movable during normal operation of the actuation valve between a first position when the actuator is actuated and a second position when the actuator is deactuated; and

a high pressure fluid source coupled to the high pressure port and a low pressure fluid source coupled to the low pressure port;

wherein the spool valve further includes a spring and means operable in cooperation with the spring for hydraulically assisting movement of the spool each time the spool moves from the first position to the second position.

5,597,119

ROTATING SPINKLER HAVING MAGNETIC COUPLING ELEMENTS FOR TRANSMITTING MOTION

Moshe Gorney, and Izhak Gal, both of Kibbutz Naan, Israel, assignors to Naan Irrigation Systems, Kibbutz Naan, Israel

Filed Jun. 29, 1994, Ser. No. 268,238

Claims priority, application Israel, Jun. 30, 1993, 106200

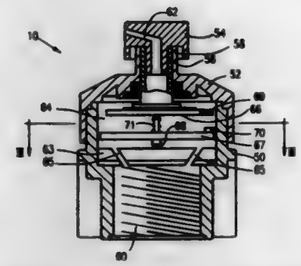
Int. Cl.[6] B05B *3/04*

U.S. Cl. 239—241 **22 Claims**

1. A sprinkler comprising:

a liquid inlet;

a liquid outlet rotatable with respect to said liquid inlet; and



apparatus, driven by a pressurized flow of liquid entering said liquid inlet, for rotating said liquid outlet, said apparatus including a magnetic coupling for transmitting motion, said magnetic coupling including at least one driving magnet and at least one driven magnet and wherein rotation of said at least one driving magnet produces intermittent rotation of said at least one driven magnet.

5,597,120

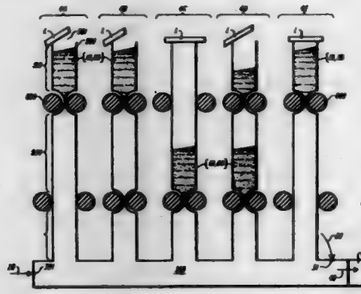
METHOD AND APPARATUS FOR MIXING, SPRAYING AND PLACING CEMENTITIOUS MATERIALS

Henry L. Chess, Jr., Minneapolis, Minn., assignor to Blue Oaks Materials Limited Partnership, Minneapolis, Minn.

Division of Ser. No. 261,927, Jun. 17, 1994, Pat. No. 5,494,708. This application Nov. 30, 1995, Ser. No. 564,990

Int. Cl.[6] B05B *7/04*; C04B *12/00*

U.S. Cl. 239—307 **4 Claims**



1. A material mixing and dispensing system for continuously making and dispensing a sprayable rapid setting cementitious material, comprising:

a) at least one paired first and second receptacles, the first receptacle being in fluid communication with and disposed upstream of the second receptacle, each of the first and second receptacles being independently pressurizable to a selected uniform pressure by introduction of a pressurized gas thereto;

b) fluidizing element disposed downstream from the second receptacle and in communication with the first and second receptacles for fluidizing and transporting a dry component therethrough in a pressurized gas stream, the fluidizing means including a gas entry port for introducing the pressurized gas;

c) a liquid entry port disposed downstream of the fluidizing element; the liquid entry port being effective to add a liquid to a fluidized dry component exiting the fluidizing element;

d) an impingement element disposed downstream of the fluidizing element and the liquid entry port, the impingement element being effective to mix the dry component with the liquid to form a slurry; and

e) constricting means disposed downstream of the impingement element for atomizing the slurry to yield a sprayable cementitious material.

5,597,121

FUEL INJECTION VALVE

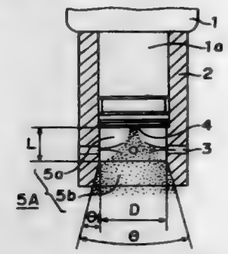
Tsuyoshi Muneyasu, Hyogo; Norihisa Fukutomi, and Osamu Matsumoto, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 219,361, Mar. 29, 1994, Pat. No. 5,411,212. This application Feb. 8, 1995, Ser. No. 385,423

Claims priority, application Japan, Jun. 23, 1993, 5-151769

Int. Cl.[6] B05B *7/12*

U.S. Cl. 239—408 **2 Claims**



1. An air assist type fuel injection valve adapted to be disposed in an air intake passage communicated with a combustion chamber in an internal combustion engine to apply air to fuel to atomize the fuel, wherein the fuel injection valve has an adapter at a bottom end thereof for mixing the fuel with air; the adapter including an air-fuel mixing portion into which an air injection opening opens; and the air-fuel mixing portion comprising a cylindrical upstream portion (5*a*) followed by a coaxial cylindrical downstream portion (5*b*), wherein an inner diameter D_1 of the upstream portion and an inner diameter D_2 of the downstream portion have a relation of $D_1<D_2$, wherein a connecting portion between the upstream and downstream portions defines an annular, outwardly directed shoulder substantially perpendicular to a common axis of said upstream and downstream portions, and wherein the air injection opening (3) is disposed in the upstream portion.

5,597,122

FLAT JET NOZZLE FOR A HIGH-PRESSURE CLEANING DEVICE

Wilhelm Eisenmann, Althütte, Germany, assignor to Alfred Kärcher GmbH & Co., Winnenden, Germany

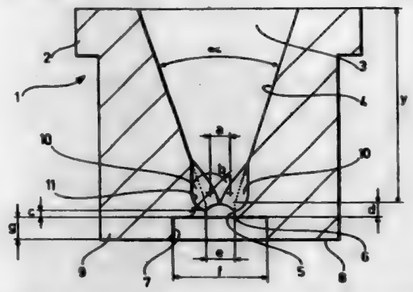
PCT No. PCT/EP94/00330, § 371 Date Oct. 2, 1995, § 102(e) Date Oct. 2, 1995, PCT Pub. No. WO94/17921, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 5, 1994, Ser. No. 588,999

Claims priority, application Germany, Feb. 9, 1993, 43 03 762.3

Int. Cl.[6] B05B *1/04*

U.S. Cl. 239—589 **20 Claims**



1. A flat jet nozzle for a high-pressure cleaning device comprising:

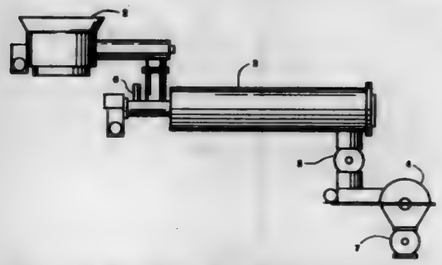
an outlet opening;
a flow channel with a circular cross section arranged concentrically and upstream of and opening into said outlet opening;
said flow channel narrowing conically in the direction of flow and merging into a circular-cylindrical section located upstream in front of said outlet opening, the end of said circular-cylindrical section forming the outlet opening;
wherein pocket-like extensions of the flow channel are arranged on diametrally opposite sides of the flow channel in the region where the conical section of the flow channel merges into the circular-cylindrical section;
said extensions being arranged and designed symmetrically to one another and having a deflecting surface for conducting part of a liquid flowing through the conical section essentially transversely into the cylindrical section;
said outlet opening having a circular cross section transversely to the direction of flow; and
the pocket-like extensions together essentially surrounding the circumference of the entire circular-cylindrical section.

5,597,123

ULTRA-HIGH ENERGY CRYOGENIC IMPACT SYSTEM

Frederic N. Steigmann, Ossining, N.Y.; Rudolph H. Kohler, Danbury, Conn., and Robert B. Davis, Nyack, N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jun. 30, 1995, Ser. No. 497,654
Int. Cl.[6] B02C *19/00;19/12*
U.S. Cl. 241—23 10 Claims



6. A process for reducing the particle size of material to an average diameter as small as about 40 μm, said process comprising the steps of:
(a) cooling said material to a temperature within the range of from about –40° F. to about –450° F. by directly contacting said material with liquid refrigerant; and
(b) milling the resulting cooled materials in a modified gaseous atmosphere, at a milling station which does not require cooling by refrigerant, employing a rotor operating at a tip speed within the range of from about 600 to about 1500 feet per second.

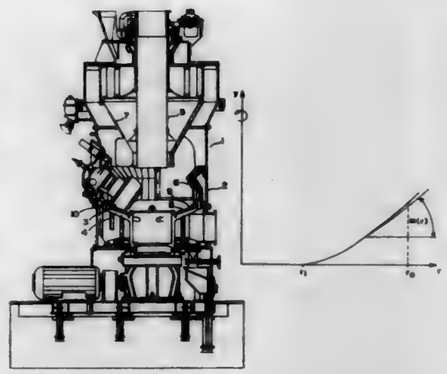
5,597,124

PARTICLE SIZE REDUCTION

Werner Kassel, Fellbach, and Eckart Knapp, Metzingen, both of Germany, assignors to EVT Energie- und Verfahrenstechnik GmbH, Stuttgart, Germany

Filed Mar. 9, 1994, Ser. No. 208,619
Claims priority, application Germany, Mar. 13, 1993, 43 08 042.1
Int. Cl.[6] B02C *15/04*
U.S. Cl. 241—30 4 Claims

4. A process for determining the profile of the roll surface of the lining of the grinding bowl of a rolling mill characterized by the fact that a constant change in the angle α of the grinding bowl necessary to accelerate the movement of the product through a grinding zone is calculated as a function of the distance to the turning point of the rolling mill for several radii, wherein the frictional value between the grinding rolls and the lining of the grinding bowl and the rotational speed being selected of the grinding bowl as constant values in the calculation.

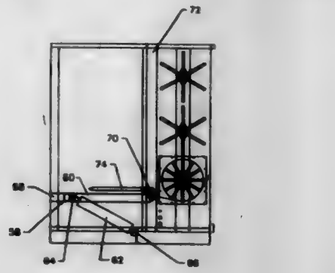


5,597,125

APPARATUS FOR FLUFFING BALES OF PEAT MOSS AND OTHER ORGANIC MATTER

Floyd E. Bouldin, Murfreesboro, Tenn., assignor to Bouldin & Lawson, Inc., McMinnville, Tenn.

Filed Dec. 12, 1994, Ser. No. 353,713
Int. Cl.[6] B02C *13/286;18/06*
U.S. Cl. 241—136 14 Claims



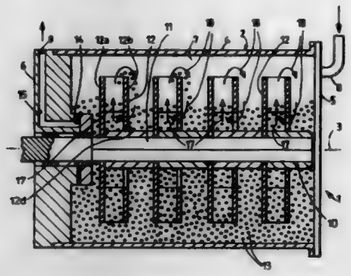
1. An apparatus for disassociating organic material from a compressed bale, the apparatus comprising:
a cabinet housing having a front and a back, an inside, a top, and a bottom; a plurality of agitators rotatably mounted to the housing in a vertically parallel alignment within the interior of the cabinet and having a central shaft portion with a first end spaced apart from a second end and a plurality of agitator bars extending from the central shaft in a helical pattern from the first end to the second end;
a lifting platform pivotally mounted within the interior of the cabinet and configured to operably raise a compressed bale of organic material into engagement with the plurality of agitators during use;
hydraulic drive means for rotating the plurality of agitators;
an ejection port for expelling the disassociated organic material from the cabinet; and
motor means for powering the hydraulic drive means.

5,597,126

STIRRED BALL MILL

Harald Frommberz, Richenbach-Egg, Germany; Albert Leuthold, Oberwil, Switzerland, and Marc Welder, Blotzheim, France, assignors to Willy A. Bachofen, Basel, Switzerland

Filed Jun. 1, 1994, Ser. No. 251,901
Claims priority, application Switzerland, Jun. 1, 1993, 01632/93
Int. Cl.[6] B02C *17/00*
U.S. Cl. 241—172 14 Claims



1. A continuously operating stirred ball mill for fine and very fine milling of a material, comprising a grinding chamber for receiving grinding media; a material inlet arranged at one end of said grinding chamber and opening into an interior space of said grinding chamber; a material outlet arranged at another end of said grinding chamber and leading out of the interior space of said grinding chamber; a stirrer provided with stirring members, said stirrer being arranged coaxially with an axis of said grinding chamber and being operative for moving the grinding media, each of said stirring members consisting of two circular discs and a get of transport members located axially between said two circular discs and connecting said two circular discs with one another so, that said stirrer is free of additional circular discs between said stirring members, at least one of said two circular disks having at least one central orifice through which a mixture formed from the grinding media and a material to be milled can flow, said stirring members being formed and dimensioned so that during operation of the stirred ball mill, a part of the mixture flows back continuously over an edge of said at least one disk having said central orifice, radially inward toward said central orifice, and from there into an intermediate space between said two circular disks, so as to maintain uniform axial distribution of the grinding media in said interior space of said grinding chamber.

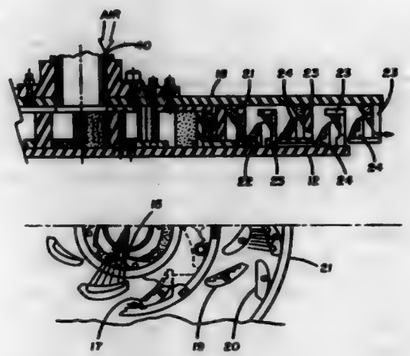
5,597,127

ULTRAFINES COAL PULVERIZER

David K. Brown, 4602 Briary Dr., Apt. E, Richmond, Va. 23224

Filed Aug. 4, 1995, Ser. No. 511,418
Int. Cl.[6] B02C *13/22*
U.S. Cl. 241—188.2 16 Claims

1. A counter-rotating rotor system for a coal/mineral pulverizer, comprising:
a center feed pipe;
an upper rotor having a bottom surface;
a first rotation means for rotating said upper rotor connected to a pulverizer;
a lower rotor having a top surface, said lower rotor facing said upper rotor and rotating in an opposite direction relative to said upper rotor;
a second rotation means for rotating said lower rotor connected to said pulverizer;
a first plurality of irregularly shaped elements which are contoured with a curvature defined by a continuous series of perpendiculars of dimensions approaching zero said perpendiculars relative to tangents from an inside wall of said feed pipe and for retention of a material barrier when said material is centrifugally accelerated;
wherein said elements outwardly extend from said top surface of said lower rotor; and
a second plurality of irregularly shaped elements which are contoured each increment of said contour being defined by a series of perpendiculars to the lines of impact of particles that exit an immediately preceding plurality of irregularly shaped members wherein the impact of said particles is maximized and further curved for retention of process material when said material is centrifugally accelerated wherein said elements outwardly extend from either said bottom surface of said upper rotor or said top surface of said lower rotor.

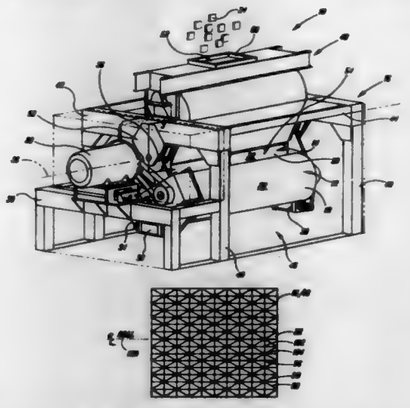


5,597,128

MACHINE FOR DESTRUCTURING WOOD CHIPS

Gabriel M. Terrenzio, Seattle; P. Robert Diehl, Langley, and Ronald C. Oxford, Issaquah, all of Wash., assignors to Acrowood Corporation, Everett, Wash.

Filed Jan. 1, 1995, Ser. No. 457,316
Int. Cl.[6] B02C *4/30*
U.S. Cl. 241—231 24 Claims



16. A wood chip processing machine for destructuring similarly sized wood chips each having opposite faces separated by a thickness dimension, said machine comprising:
a pair of intermeshing rollers, each of the rollers having a destructuring surface defined by a knurled pattern formed by two like sets of equally spaced V-shaped grooves extending helically around the roller and crisscrossing each other at a plurality of junctures such as to form four-sided protrusions

each having a peak, each of the plurality of junctures of the criascrossing V-shaped grooves on each of the rollers being positioned opposite the peak of one of the protrusions on the other roll in the nip where the rolls intermesh, the clearance between the intermeshing rollers at the nip being less than the normal thickness dimension of the chips being processed so that the chips in the nip will be compressed and deformed to destructure the chips, said protrusions being of a size that four of the protrusions on one of said rollers will engage one of said opposite faces of a chip in said nip while a protrusion on the other roller between said four protrusions engages the other of the opposite faces of such chip for assisting in destructuring of the chip while in the nip;

a drive mechanism for turning said rollers on parallel axes at the same rotational speed;

swing arms rotatably carrying said rollers in a side-by-side relationship; and

a frame pivotally supporting said swing arms, said swing arms being pivotal about a common swing axis.

5,597,129

DRIVE ROLLER FOR THE ROTATIONAL FRICTIONAL DRIVE OF A TEXTILE BOBBIN

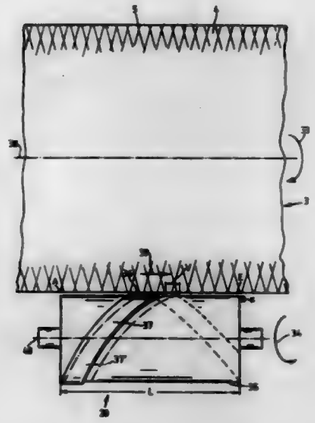
Wilhelm Oehrl, Erkelenz, Germany, assignor to W. Schlafhorst AG & Co., Monchengladbach, Germany

Filed Nov. 8, 1994, Ser. No. 336,316

Claims priority, application Germany, Nov. 8, 1993, 9317852 U

Int. Cl.[6] B65H *54/00;69/04;* D01H *13/04*

U.S. Cl. 242—18 DD 9 Claims



1. In a textile machine including a bobbin winder for winding a textile bobbin having a longitudinal axis, a given length and a yarn package with a peripheral surface, a drive roller assembly, comprising:

a drive roller for rotationally frictionally driving the textile bobbin;

said drive roller having an active width defined by a periphery thereof which actively drives the textile bobbin, said active width being substantially less than the given length of the bobbin; and

said drive roller having structures formed thereon defining contact lines for contacting the peripheral surface of the yarn package of the bobbin, said contact lines being chronologically successive during rotation of said drive roller, and said contact lines being shifted relative to one another in the direction of the longitudinal axis of the bobbin.

5,597,130

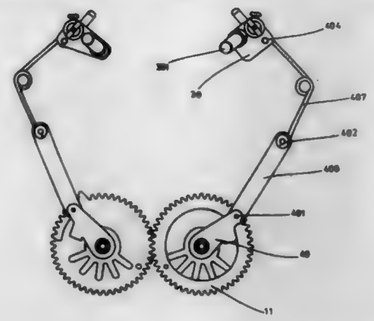
TAPE WINDING LINKAGE OF DRUM TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS

Ming-Jer Chin, Hsinchu, and Jew-Horng Tzeng, Fongyuan, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 21, 1995, Ser. No. 493,291

Int. Cl.[6] G11B *15/665*

U.S. Cl. 242—356 7 Claims



1. A tape deck tape winding linkage of drum type magnetic recording and reproducing apparatus, comprising:

a drum base mounted on said deck;

a gear shaft;

a tape winding gear installed at the gear shaft on the deck which possesses a guide slot;

a first link which is a two-joint link with one end connected to said gear shaft of the tape winding gear;

a second link which is connected to said first link by a first pivot joint and is also connected to a third link by a second pivot joint and a second link guide pin on the second pivot joint;

the third link being a two-joint torsion spring type link; and

an inclined pole base which is connected to said third link by the third pivot joint where said inclined pole base and said guide pin sliding in the guide slot on said deck;

wherein there is no tape winding torsion spring set between said tape winding gear and the first link and by permitting the second link's guide pin to slide in said guide slot, as the third link is subjected to a force action and is deformed to create a pressing force relative to the drum base and transmit a reaction force back to the tape winding gear.

5,597,131

METHOD AND APPARATUS FOR LOADING FILM INTO A CASSETTE

Akimasa Kaya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 208,382, Mar. 10, 1994. This application Sep. 26, 1995, Ser. No. 534,163

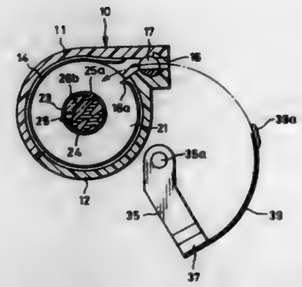
Claims priority, application Japan, Mar. 10, 1993, 5-049665

Int. Cl.[6] G03C *3/00*

U.S. Cl. 242—532.4 7 Claims

1. A method of loading photo film into a cassette, said cassette including a spool, and a cassette shell provided with a spool chamber for containing said spool rotatably and a photo film passage port extending from said chamber to an outside of said cassette shell, at least one retaining hole being formed in a trailer of said photo film, said spool includes, a slot extended in an axial direction of a core of said spool, for receiving said trailer, said slot being defined by first and second walls, at least one retaining claw projecting from said first wall into said slot for being fitted in said retaining hole to retain said trailer in said slot, said method comprising the steps of:

forming at least one preventive projection on said second wall to project into said slot for preventing disengagement of said



retaining hole from said retaining claw, said preventive projection being retractable away from said first wall said second wall being defined by a cantilever portion;

picking up said trailer with pick-up means;

first inserting said pick-up means through said passage port, to insert said trailer into said cassette shell;

second inserting said pick-up means into said slot, to retract said preventive projection away from said first wall, and to mount said trailer on said spool by engaging said retaining hole on said retaining claw;

drawing said pick-up means out of said cassette shell, to allow said preventive projection to recover its original position to retain said retaining hole on said retaining claw;

rotating said spool to wind said photo film around said spool, so as to wind said photo film up into said cassette shell.

5,597,132

TAPE WINDING DEVICE PROVIDING UNIFORM WINDING AND RAPID INSTALLATION AND REMOVAL OF WINDING ARM

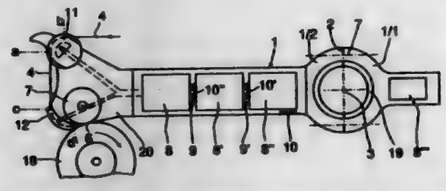
Manfred Schlatter, Freiburg, and Bernd Scholtyssik, Munich, both of Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Continuation of Ser. No. 199,013, Feb. 18, 1994, abandoned. This application Dec. 11, 1995, Ser. No. 570,201

Claims priority, application Germany, Feb. 20, 1993, 9302492 U

Int. Cl.[6] B65H *18/26*

U.S. Cl. 242—547 4 Claims



1. In a winding device for recording media in tape form having at least one tape winding element which is rotatably driven when a tape is wound onto a tape roll,

said tape being engaged by a tape guiding and deflecting element provided with an airguide surface which causes said tape to reach a predetermined winding up point on the roll,

a guide arm having a free end and a joint end and being pivotally mounted on a pivot means in a pivot plane which is in the plane of said tape roll, the guide arm extending up to the tape roll,

a tubular member secured to said guide arm and connected to an air pressure source for conducting air under pressure to said tape guiding and deflecting element,

and a pressure means for biasing said air-guide surface onto said tape as it is being wound onto the tape roll,

the improvement therein comprising:

the guide arm connected at its free end to said tape guiding and deflecting element, and the guide arm communicating with said tubular member for conducting air pressure to said tape guiding and deflecting element, the guide arm having a structure provided with a plurality of cavities which are positioned along the longitudinal axis of the guide arm and separated from each other by walls arranged as transversal axes of the guide arm,

said walls having bores therein for conducting said air under pressure through the cavities to the guiding and deflecting means, the joint end of the guide arm consisting of two parts which are connected to each other in the pivot plane of the guide arm and form a circular hole having an inner diameter,

the pivot means having an axis and at least one rotatable mounting ring thereon, the outer diameter of the at least one rotatable mounting ring mating with the inner diameter of the circular hole, so that the joint end of the guide arm is rotatable on said axis and provides a pivoting movement to said guide arm with said tape guiding and deflecting element at its free end, and

when the guide arm is directly biased by said pressure means, said air guide surface of the tape and deflecting element is biased onto said tape guiding at said predetermined winding point on said tape roll.

5,597,133

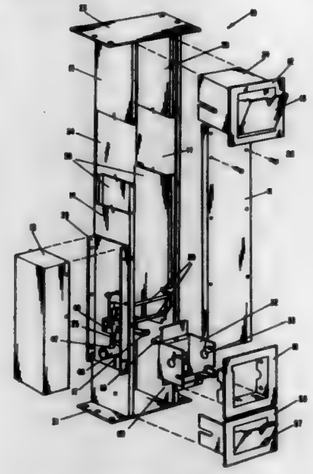
ARTICLE DISPENSING APPARATUS AND METHOD

Michael Teague, 520 Jose St., #4, Santa Fe, N.M. 87501

Filed Mar. 23, 1995, Ser. No. 409,510

Int. Cl.[6] B65H *19/00*

U.S. Cl. 242—560.3 17 Claims



1. Apparatus for storing, advancing releasing and replacing roll material comprising:

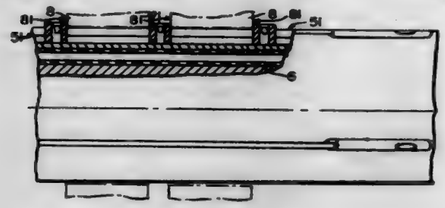
means for imparting a single mechanical impetus to the apparatus;

means for thereby releasing one roll while simultaneously retaining another roll;

means for thereby sequentially replacing a spent roll on a spindle with said one roll, said means sequentially replacing a spent roll comprising a lever arm assembly comprising a flip lever arm for laterally cramming a spring arm comprising an elongated spindle for mounting said one roll; and

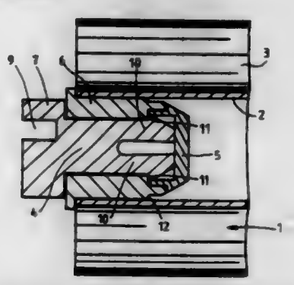
a spindle housing from which said spindle telescopically and concentrically protrudes when said one bottom roll is mounted and into which said spindle retracts during roll replacement.

5,597,134
PERFECTED EXPANDING SHAFT
Giancarlo Maria, Montecchio Maggiore, Italy, assignor to Svecom PE Srl, Montecchio Maggiore, Italy
Filed Jun. 29, 1995, Ser. No. 496,291
Claims priority, application Italy, Mar. 3, 1995, VI95A0034
Int. Cl.[6] B65H 75/24
U.S. Cl. 242—571.2 5 Claims



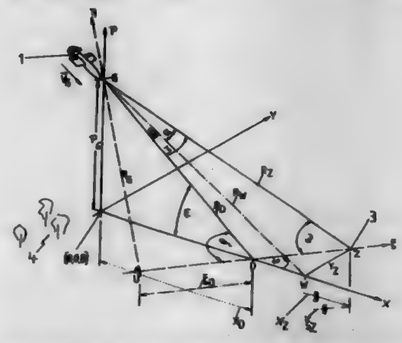
1. An expanding shaft, comprising:
a cylindrical shaft formed with a plurality of elongated axially aligned radial slots for receiving one or more coaxially coupled external tubular supports having side edges;
a plurality of mobile sectors, each one located in one of said slots;
thrusting means positioned inside each of said slots located in the slot between the shaft and the inwardly mobile sector and cooperating with each one of said mobile sectors to urge the mobile sector outwardly, wherein at least one of said mobile sectors is formed with a longitudinal seat;
two or more bucking elements slidingly inserted in the seat for engaging the side edges of and axially locking said tubular supports in said seat; and
locking means in the bucking element for locking the tubular supports.

5,597,135
FITTING PIECE FOR ATTACHING AND LOCKING A FREELY-ROTATING REPLACEMENT ROLLER
Eric Vandersteene, Gent, Belgium, assignor to American Biltrite, Inc., Wellesley Hills, Mass.
Filed Oct. 28, 1993, Ser. No. 144,122
Claims priority, application Belgium, Oct. 29, 1992, 09200938
Int. Cl.[6] B65H 75/02
U.S. Cl. 242—599.4 6 Claims



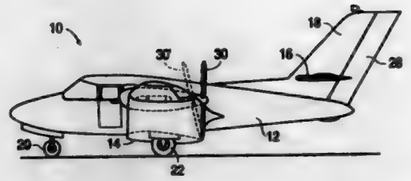
1. A fitting piece for attaching and locking a replaceable roll, disc, reel, bobbin, spool, wheel, drum or like rotatable object in a holder therefor, the object having a hollow core and two end spindles and the holder having attachment points for securing the spindles of the object for free rotation;
said fitting piece being characterized by at least one of said spindles comprising:
(A) a cylindrical sleeve for gluing to one end of the core of the object for rotation with the object as a unit, said sleeve having a longitudinal axis;
(B) a plug releasably and freely rotatably mounted in said sleeve, said plug having a longitudinal axis, a head and a foot, said foot defining means for releasably clamping said plug along said sleeve longitudinal axis, and said head defining means for fitting in a specific manner into a respective one of the attachment points of the holder; and
(C) a blanking cap means mounted on said sleeve for preventing any glue applied between said sleeve and said plug core from blocking relative rotation of said sleeve and said plug.

5,597,136
METHOD OF INDEPENDENTLY CONTROLLING A GUIDED FLYING BODY BEARING A WARHEAD AND ARRANGEMENT FOR IMPLEMENTING THE METHOD
Karl-Heinz Wilke, Ulm, Germany, assignor to Deutsche Aerospace AG, Munich, Germany
Continuation of Ser. No. 86,640, Jun. 28, 1993, abandoned.
This application Mar. 1, 1996, Ser. No. 609,416
Claims priority, application Germany, Jun. 29, 1992, 42 20 748.7; Mar. 23, 1993, 43 09 295.0
Int. Cl.[6] F41G 7/24
U.S. Cl. 244—3.16 20 Claims



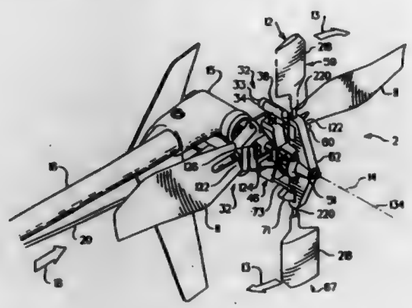
1. In a method for independently controlling a guidable flying body provided with a warhead, wherein the flying body is a projectile or a sub-caliber missile which is provided with an active target seeking head that transmits target seeking signals and receives reflected signals, and a guidance system, and which flying body is employed for combatting stationary and moving ground targets, which method includes emitting target seeking signals from the target seeking head, receiving reflected target seeking signals, evaluating the received reflected signals, and guiding the flying body along a flight path in response to the evaluated signals; the improvement wherein said step of guiding includes causing the flying body, during its target approach phase, to fly on a curved flight path such that, on the curved flight path, on the average, the ratio S/C between signals S reflected by a ground target and the signals C reflected from the ground is kept constant, or at least approximately constant, and with a path vector of the flying body during the target approach phase being oriented in a direction toward the ground.

5,597,137
VERTICAL TAKE-OFF AND LANDING AIRCRAFT
Willard Skoglun, 200 Airport Way - M, E. Wenatchee, Wash. 98802
Filed Dec. 28, 1994, Ser. No. 365,546
Int. Cl.[6] B64C 39/10
U.S. Cl. 244—12.4 15 Claims
1. Apparatus for providing vertical take-off and landing capability for an aircraft having a fuselage and fixed wings each defining a front edge and a rear edge, comprising:



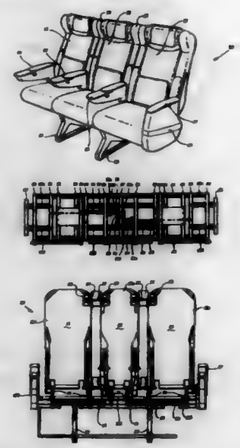
an upwardly-open channel extending from the front edge to the rear edge of each of the wings;
for each wing, a thrust-providing device having an inlet side at which the thrust providing device produces low pressure, said thrust-providing device drawing air in along a path, said inlet side being positioned within said channel and above said wing at the rear edge of said wing, and
means for mounting said thrust-providing device on the aircraft for tilting movement relative to the wing,
whereby the air drawing-in path of the thrust-providing device is tiltable relative to an upper surface of the wing to enhance the lift of the wing,
wherein the thrust-providing device is a propeller driven by an engine, the propeller includes blades having tips which define a circle as the propeller rotates, and said mounting means comprises means for mounting said engine on the aircraft such that said propeller tilts about a line tangent to the bottom of said circle.

5,597,138
YAW CONTROL AND STABILIZATION SYSTEM FOR HELICOPTERS
Paul E. Arlton, and David J. Arlton, both of 1132 Anthrop Dr., Lafayette, Ind. 47906
Continuation-in-part of Ser. No. 233,159, Apr. 25, 1994, which is a continuation-in-part of Ser. No. 770,013, Sep. 30, 1991, Pat. No. 5,305,968. This application Aug. 18, 1994, Ser. No. 292,719
Int. Cl.[6] B64C 27/78
U.S. Cl. 244—17.13 112 Claims



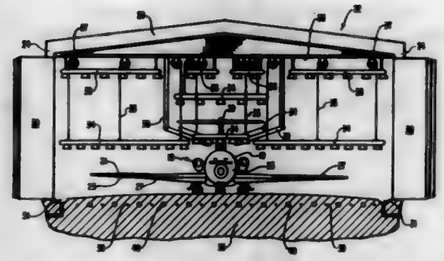
1. In a helicopter having a tail rotor with a plurality of rotor blades extending radially from a rotor shaft which is mounted for rotation about a transverse rotor axis, and having a device for automatically stabilizing the yaw motion of the helicopter including a gyro rotor mounted to rotate with the tail rotor and to pivot about a substantially longitudinal pivot axis to automatically vary the collective pitch of the blades in response to yaw motion,
a device for restoring the gyro rotor to a nominal orientation, the device comprising gyro drive means and a plurality of aerodynamic paddle means cyclically pitchable in response to pivot of said gyro rotor to generate aerodynamic forces in opposition to pivot of said gyro rotor.

5,597,139
CONVERTIBLE PASSENGER SEAT ASSEMBLY
Michael T. Beroth, Lewisville, N.C., assignor to Burns Aerospace Corporation, Winston-Salem, N.C.
Filed Apr. 15, 1994, Ser. No. 228,512
Int. Cl.[6] B64D 11/06
U.S. Cl. 244—118.6 15 Claims



1. A passenger seat assembly convertible between a two-seat configuration and a three-seat configuration, comprising:
(a) a seat assembly base;
(b) first, second and third seats for carrying respective seat bottom and seat back cushions, said first and third seats defining outboard seats moveable on said seat assembly base and said second seat defining a center seat carried in a fixed position on said seat assembly base;
(c) manual drive means carried by said seat assembly base and drivably interconnecting said first and third seats for simultaneous movement of said first and third seats through said drive means relative to each other and to said second seat;
(d) said first and third seats moveable towards each other into said two-seat configuration wherein said first and third seats encroach upon said second seat and define a dead zone between said first and third seat; and
(e) said first and third seats moveable away from each other into said three-seat configuration wherein said second seat defines a center seat having the same seating width as the first and third seats.

5,597,140
INFRARED DEICERS FOR AIRCRAFT POSITIONED ON A TAXIWAY AND METHODS FOR USING SAME
Robert C. Madsen, 6291 S. Westbridge St., Murray, Utah 84107
Continuation-in-part of Ser. No. 106,299, Aug. 13, 1993. This application Jan. 12, 1995, Ser. No. 372,866
Int. Cl.[6] B64D 15/00; 15/12
U.S. Cl. 244—134 R 21 Claims
1. An apparatus for rapidly deicing and substantially drying the exterior surface of an aircraft on an approach area awaiting to takeoff, the apparatus comprising:
(a) a shelter capable of enclosing an aircraft therein;
(b) a deicing surface positioned within the shelter such that the aircraft rests thereon;
(c) means for emitting infrared radiation on a portion of the exterior surface of the aircraft enclosed within the shelter to melt the ice on that portion of the exterior surface; and
(d) means for causing the deicing surface within the shelter to transfer thermal energy by convection within the shelter to



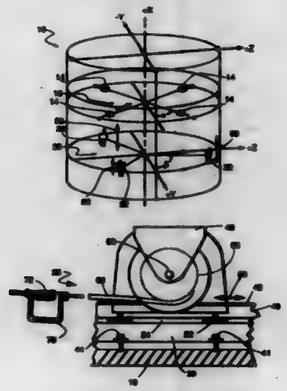
warm both the exterior surface of the aircraft and the air surrounding the aircraft to promote melting the ice and evaporating the melted ice on all portions of the exterior surface of the aircraft, the combination of the infrared radiation and the thermal energy substantially deicing and drying all portions of the exterior surface of the aircraft.

5,597,141

EFFICIENT MASS TRANSLATION DEVICE

Allen G. Stornelli, Hermosa Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1994, Ser. No. 280,635
Int. Cl.[6] B64G 1/24
U.S. Cl. 244—164 20 Claims



1. A balance mechanism for a satellite comprising;
an elongated gear rack mounted to and supported along its length by said satellite;
a mass positionable along said gear rack;
said mass including a motor and a pinion gear connected to said motor and in meshing engagement with said elongated rack for positioning said mass.

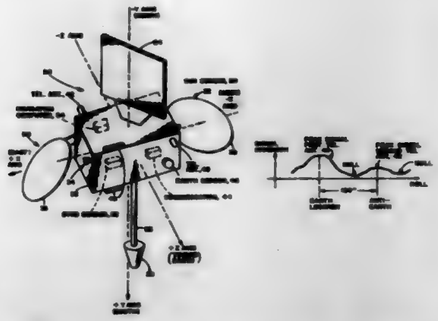
5,597,142

SPACECRAFT ACQUISITION OF ORIENTATION BY SCAN OF EARTH SENSOR FIELD OF VIEW

Yat F. Leung, Redwood City, and Scott W. Tilley, Belmont, both of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Mar. 6, 1995, Ser. No. 398,981
Int. Cl.[6] B64G 1/24
U.S. Cl. 244—164 4 Claims

1. A method of orienting a spacecraft relative to the earth with the aid of the sun during an orbiting of the earth by the spacecraft, the spacecraft being describable in terms of a local coordinate system having an x axis and a y axis and a z axis which are mutually perpendicular, the positive direction of the z axis facing the earth upon completion of an orientation of the spacecraft, the spacecraft having an earth sensor facing in the positive z direction, the spacecraft having a sun sensor facing in the negative x direction wherein the x axis is the roll axis and the y axis is the pitch axis, there being an earth vector extending from the spacecraft to the earth and a sun line vector extending from spacecraft to the sun, the spacecraft carrying a gyro sensor assembly outputting angle increment during a rotation of the spacecraft and enabling an inertial rotation of the spacecraft through a desired amount of angle rotation, the x and the z axes defining an x-z plane, the method comprising the steps of:
rotating the spacecraft to point the sun sensor at the sun;
aligning the z axis with the sun by further rotation of the spacecraft;
rotating the y axis of the spacecraft to bring the magnitude of an included angle between the spacecraft z axis and the sun line to equal the magnitude of an included angle between the earth vector and the sun line;
spinning the spacecraft about the sun line vector;
acquiring the earth via a scanning by the earth sensor field of view during said spinning step for pointing the z axis at the earth; and
gyrocompassing the spacecraft to orient the x and the y axes in desired directions.



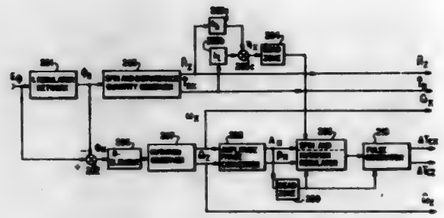
5,597,143

PROCESS AND A DEVICE FOR CONTROLLING THE ATTITUDE OF A THREE-AXES STABILIZED SPINNING SPACECRAFT

Michael Surauer, Chiemsee, and Helmut Bittner, Munich, both of Germany, assignors to Deutsche Aerospace AG, Germany

PCT No. PCT/EP92/02050, § 371 Date Jun. 10, 1994, § 102(e) Date Jun. 10, 1994, PCT Pub. No. WO93/04924, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 4, 1992, Ser. No. 204,325
Claims priority, application Germany, Sep. 6, 1991, 41 29 628.1
Int. Cl.[6] B64G 1/24
U.S. Cl. 244—164 4 Claims

1. A process for controlling the attitude of a three-axis stabilized, spacecraft having a stored spin to maintain a spin direction of the spacecraft in inertial space and limit a nutation amplitude of the spacecraft while using at least one dead zone element, comprising:
continuously checking to determine if predetermined threshold values for deviation of the spin direction from a desired orientation and for nutation amplitude are exceeded using separate dead zone elements to define each of the predetermined threshold value; and
triggering control interventions, only for reduction of nutation, even when the spinning direction is within a range limited by the predetermined threshold values.

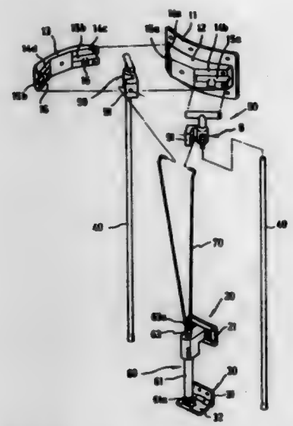


5,597,144

GOLF BAG STAND

Seong-Yeol Lee, 1061-47, Daejeo-1Dong, Kangseo-Ku, Pusan, Rep. of Korea

Filed Dec. 14, 1994, Ser. No. 353,219
Claims priority, application Rep. of Korea, Dec. 14, 1993, 93-27686
Int. Cl.[6] A63B 55/00
U.S. Cl. 248—96 2 Claims



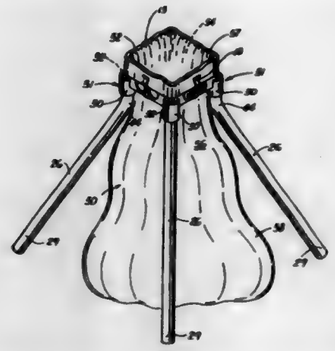
1. A golf bag stand, comprising:
a hinge block adapted to be mounted to said bag and to accommodate upper ends of a pair of vertical support rods, said hinge block including a lower half member having an attachment flange integrally formed therein for rigidly mounting said lower half member to the upper end of the bag and a upper half member engaged to said lower half member to form said complete hinge block in which each of said upper and lower half members have opposing T-shaped grooves between their contact surface of semi-circular cross section;
a pair of vertical support rods pivotally attached to said hinge block through a T-shaped member provided at a topmost end thereof and movable from an unfolding position to a folding position, said rods being unfolded to support said bag in an inclined position and being folded to be held against the outer surface of said bag in a substantially upright position;
a hinge means pivotally attached to a lower end of said bag, said hinge means having an attachment plate rigidly secured to said lower end of the bag and a pivot plate pivotally movable against said attachment plate;
a resilient means, adapted to be mounted on said hinge means, including a hollow tube secured to said pivot plate at the lower end thereof, a retainer means adapted to receive an upper end of said hollow tube and to be secured onto said bag, and a shaft inserted within said hollow tube and secured to a bottom of said hollow tube at the lower end thereof, the shaft being movable between an upward position against a bias of the spring mounted around said shaft and a normal downward position by said spring bias; and
a V-shaped connecting rod extending between said T-shaped member and an upper end of said shaft to unfold said support rods when the bag is in its substantially upright position.

5,597,145

INDIVIDUAL SANDBAGGING ACCESSORY APPARATUS

David L. Meyers, and Howard J. Hudson, both of Navarre, Fla., assignors to Metric Systems Corporation, Fort Walton Beach, Fla.

Filed Apr. 18, 1995, Ser. No. 423,889
Int. Cl.[6] A63B 55/04
U.S. Cl. 248—97 16 Claims



1. An individual sandbagging accessory apparatus, comprising:
a) a sandbag support frame, having a plurality of sidewalls defining an opening therethrough;
b) a plurality of leg members removably engaged to the sandbag support frame for supporting the frame above the ground;
c) clip means mounted on the frame for engaging an upper end of a sandbag in the open position onto the sandbag support frame;
d) a plurality of openings in the sidewalls of the sandbag support frame for accommodating each of the leg members therethrough when the apparatus is in a stowage configuration; and
e) means for maintaining the legs engaged through the plurality of openings in the sidewalls when the apparatus is transported in a knapsack or tote bag.

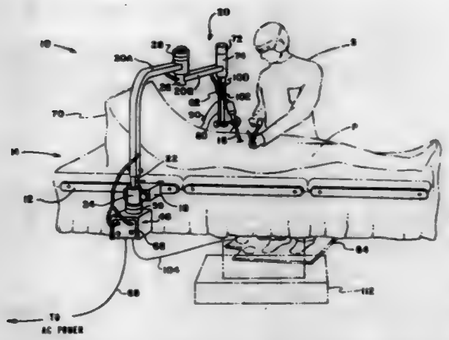
5,597,146

RAIL-MOUNTED STABILIZER FOR SURGICAL INSTRUMENT

J. Michael Putman, 3707 Gaston Ave., Suite 410, Dallas, Tex. 75246

Continuation-in-part of Ser. No. 15,393, Feb. 8, 1993, Pat. No. 5,351,676, which is a continuation of Ser. No. 740,413, Aug. 5, 1991, Pat. No. 5,184,601. This application Sep. 28, 1994, Ser. No. 314,517
Int. Cl.[6] A61B 1/00
U.S. Cl. 248—276.1 9 Claims

1. Surgical instrument support apparatus comprising, in combination:
a rail clamp assembly adapted for releasable attachment to the side rail of an operating table;
an upright support shaft coupled to the rail clamp assembly for rotation relative to the rail clamp assembly;
a support arm assembly coupled to the upright support shaft for holding a surgical instrument during a surgical procedure, the support arm assembly including a proximal support arm and a



distal support arm which are movably coupled together for folding movement relative to each other;

first means coupled between the distal support arm and the rail clamp assembly for adjusting the elevation of the distal support arm relative to the rail clamp assembly;

second means coupled between the proximal support arm and the distal support arm for adjusting the angular displacement of the distal support arm with respect to the proximal support arm; and,

third means coupled between the rail clamp assembly and the upright support shaft for selectively holding the upright support shaft in a fixed rotational position relative to the rail clamp assembly, and for selectively releasing the upright support shaft so that it can be moved to a different rotational position relative to the rail clamp assembly.

5,597,147

ARTICULATION MECHANISM AND A UNIVERSAL ARM MEANS APPLYING THE MECHANISM

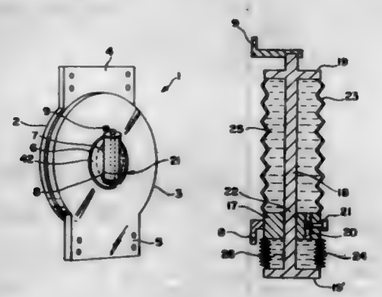
Masahiko Hashi, Koshigaya, Japan, assignor to Transport Corporation, Japan

Filed Mar. 7, 1995, Ser. No. 399,983

Claims priority, application Japan, Mar. 8, 1994, 6-064466; May 26, 1994, 6-136415; Aug. 29, 1994, 6-227313

Int. Cl.[6] F16M *11/12*; F16F *9/44*

U.S. Cl. 248—280.11 **9 Claims**



1. Articulation mechanism comprising:

at least two rotary members which rotate relatively;

a first portion freely selected on one of said rotary members and a second portion freely selected on another of said rotary members, wherein each of said portions changes relative to the distance between them and each of said rotary members based on said relative rotation of said rotary members;

a first member and a second member each of which is connected with the first portion and the second portion respectively, and

a fluid hermetically sealing space formed between the first member and the second member; wherein said fluid sealing space is adapted to be able to release said hermetically sealing condition of a fluid which is sealed therein with predetermined opening and closing means, characterized in that:

the first member and the second member are pivotally secured respectively to the first and second rotary members by hinge means.

5,597,148

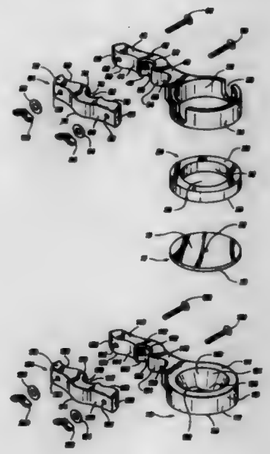
COMBINATION WHEELCHAIR AND BEVERAGE CONTAINER HOLDER FOR ATTACHMENT TO A VERTICAL SUPPORT MEMBER OF A WHEELCHAIR

James A. Gospodarich, Euclid, Ohio, assignor to Jeanette M. Kanios, Euclid, Ohio

Filed Jun. 14, 1995, Ser. No. 490,282

Int. Cl.[6] A47K *1/09*

U.S. Cl. 248—311.2 **18 Claims**



1. In combination a wheelchair and a cup holder comprising:

a. a wheelchair having a vertical tubular support member;

b. a cup holder having a circumferentially continuous wall open at both ends, said upper end having a larger diameter than said lower end and said ends having an inner diameter sized for engaging a portion of a tapered beverage container sidewall;

c. a first attachment arm integral and a continuation of said wall and projecting outwardly from said wall and having an inner surface, said inner surface having a substantially centrally positioned arcuate portion and curved portions positioned on each side of said arcuate portion;

d. a second attachment arm having an inner surface, said inner surface having a substantially centrally positioned arcuate portion and curved portions positioned on each side of said arcuate portion, wherein when said first and second attachment arms contact each other, said inner surface curved portions mate and said arcuate portions define an aperture approximately the size of the diameter of said wheelchair vertical tubular support member for receiving said vertical support member and said first and second attachment arms being substantially thick for supporting the weight of a large, full beverage container within said wall; and

e. a means for removably securing said first and second attachment arm arcuate portions on said vertical tubular support of said wheelchair whereby said curved portions of said first and second arms mate and wherein said cup holder can be repeatedly repositioned by loosening and tightening said securing means without enlargement of said aperture.

5,597,149

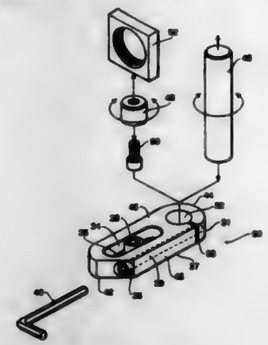
CLAMPING BASE

Robert Hodge, Grants Pass, Oreg., assignor to Siskiyou Design, Inc., Grants Pass, Oreg.

Filed Nov. 9, 1994, Ser. No. 336,881

Int. Cl.[6] A47G *1/10*

U.S. Cl. 248—316.4 **9 Claims**



1. A clamping mechanism comprising

a clamping base having an adjustment end and a clamping end,

a channel in said clamping base between the adjustment and clamping ends, said channel receiving a fastener fastening said clamping base to a surface,

a hole in said clamping base proximate the clamping end and having a slot through said clamping base defining a jaw, and

a cavity in said clamping base extending from the adjustment end to the jaw for receiving a clamping screw, said cavity further having an opening proximate said adjustment end to allow an operator access to the cavity.

5,597,150

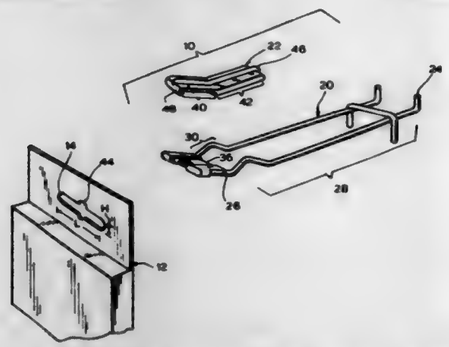
PILFER-RESISTANT PEG HOOK ASSEMBLY

Arthur Stein, Whitestone, N.Y., and William C. Updegrave, Jackson, N.J., assignors to Display Technologies, Inc., Whitestone, N.Y.

Filed Mar. 22, 1995, Ser. No. 408,726

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—551 **11 Claims**



1. A pilfer-resistant peg hook assembly for supporting a plurality of articles incorporating defined slots and enabling only one article at a time to be removed, comprising:

(A) a peg hook having a pair of opposed ends and a body connecting the same, one of said hook ends being configured and dimensioned to maintain said hook body in a first plane when mounted on an appropriate surface and the other of said hook ends being a free end, said hook body being configured and dimensioned to be received in the slots of the articles and defining a transversely extending bump adjacent to but spaced from said free end; and

(B) a flipper pivotably secured to said hook adjacent said free end and being movable between an enabling orientation enabling at least partial passage of a lead article along said hook body and onto said flipper as the lead article moves towards said free end, and a blocking orientation precluding passage of a second article onto said flipper as the fist article moves towards said free end, said flipper normally remaining in said enabling orientation under the influence of gravity and being cammed into said blocking orientation by said first article passing over said bump.

5,597,151

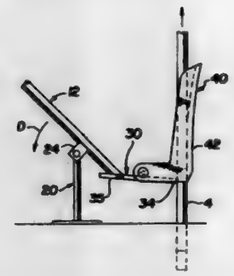
STAKE PULLER WITH STAKE SUPPORTING BACK PLATE

Charles W. Duncan, 1308 Cole, Denison, Tex. 75020

Filed Jul. 15, 1994, Ser. No. 276,835

Int. Cl.[6] B25B *25/00*

U.S. Cl. 254—199 **18 Claims**



1. A stake puller for removing a wooden stake from the ground wherein the stake to be pulled has a thickness, width and opposite flat surfaces, comprising:

a lever arm having a proximal end which serves as a handle, an intermediate portion and a distal end opposite the handle;

a fulcrum pivotally attached to the intermediate portion of the lever arm, having a central pillar and a foot which rests on the ground to support the lever arm when pulling a stake;

a generally planar blade having a back portion fixed to the distal end of the lever arm and a front portion having forward edge for engaging a flat side of a stake;

a rigid back plate having a generally rectangular primary surface facing the forward edge of the blade and a pair of generally right angled flange portions spaced apart by the primary surface and each flange portion extending generally perpendicularly away from the primary surface of the back plate toward the lever arm;

means for pivotally attaching the pair of flange portions to the blade at an intermediate location between the back portion and forward edge of the blade at a distance from said forward edge which establishes a gap sufficient for receiving a wooden stake between the primary surface of the back plate and the forward edge of the blade, said back plate and blade being configured to slide over the upper end of a stake to be pulled by pivoting of the back plate toward the lever arm;

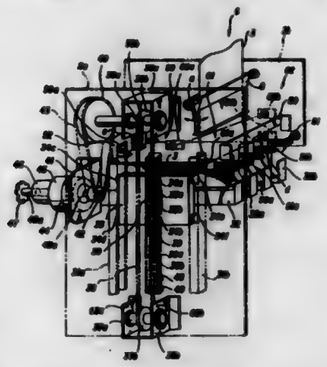
said gap being reduced by downward force on the handle until the opposite flat surfaces are engaged at substantially opposed locations whereby nearly directly opposite force is applied to opposite flat surfaces of the stake which are pressed between the blade and the back plate while the stake is raised from the ground.

5,597,152

PAPER ACCUMULATOR UNIT

Kiyoshi Chinzei, Hyogo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 7, 1995, Ser. No. 499,577
Claims priority, application Japan, Jul. 11, 1994, 6-158482
Int. Cl.[6] B65H *43/04*; B31B *1/26*
U.S. Cl. 270—39.05 15 Claims



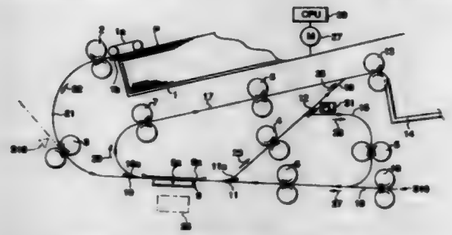
1. A paper accumulator unit comprising:
(a) a table which can be lifted and lowered, being kept in a horizontal condition and on which paper which has been discharged from above is continuously stacked and stored;
(b) a stepping motor for lifting and lowering the table with the driving torque of its rotary shaft; and
(c) an electromagnetic brake coupled to the rotary shaft of the stepping motor, which brakes the rotation of the rotary shaft when the brake is in a deenergized state.

5,597,153

AUTOMATIC ORIGINAL FEED APPARATUS

Hiroyoshi Maruyama, Yokohama; Yuji Takahashi, Tokyo; Yoshikuni Toyama, Yokohama; Shinichi Tanada, Ischara; Toshihito Kuramoto, and Masahiko Yashiro, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 199,654, Feb. 22, 1994, abandoned.
This application Sep. 22, 1995, Ser. No. 531,887
Claims priority, application Japan, Feb. 22, 1993, 5-056527
Int. Cl.[6] B65H *5/22*
U.S. Cl. 271—4.1 16 Claims



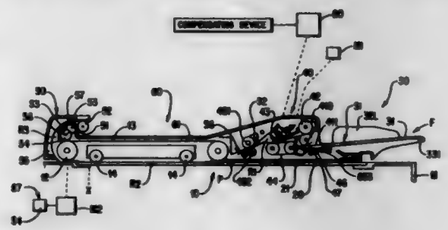
1. An automatic original feed apparatus comprising:
an original stacking portion on which a plurality of originals can be rested;
a transport path having (i) an introduction path for directing the original supplied from said original stacking portion to a reading position via a first side of said reading position, (ii) an annular path for reversing the surface of the original discharged from said reading position via a second side of said reading position and for directing the original to said reading position via said second side of said reading position again, said annular path being located on said second side of said reading position opposite to that of said introduction path, the original entering into said annular path and going out from said annular path through said second side, and (iii) a discharge path for discharging the original discharged from said reading position via said first side of said reading position to a discharge portion; and
original feed rotary members arranged in said transport path, which totally provide the conveyance of the original along said transport path, wherein all of said original feed rotary members rotate in a single predetermined direction relating to a sheet supply direction.

5,597,154

AUTOMATIC DOCUMENT FEEDER WITH POSITION COMPENSATING DEVICE

Masashi Yamashita, Kofu, Japan, assignor to Nisca Corporation, Yamanashi-ken, Japan

Division of Ser. No. 141,972, Oct. 28, 1993, Pat. No. 5,484,141.
This application Sep. 7, 1995, Ser. No. 524,486
Claims priority, application Japan, Oct. 29, 1992, 4-313953
Int. Cl.[6] B65H *5/00*
U.S. Cl. 271—10.05 4 Claims



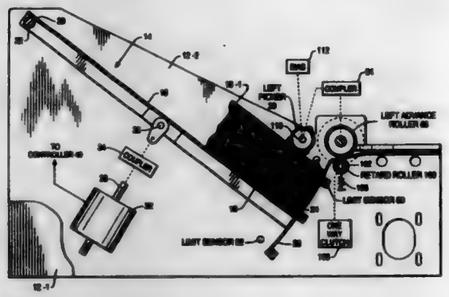
1. An automatic document feeder for feeding manuscripts, comprising:
a motor having a pulse generating device proportional to a manuscript transfer operation,
a feeding device operated by the motor and separating one manuscript from others,
a manuscript detecting device for detecting an edge of the manuscript, said detecting device being located at a downstream side of the feeding device,
register rollers situated at a downstream side of the detecting device, said register rollers setting a timing for transferring the manuscript,
a controlling device electrically connected to the motor and the detecting device, said controlling device, while the motor is actuating, outputting a stop signal to the motor when a predetermined number of pulses N_0 has counted after the detecting device detects a front edge of the manuscript, said motor being stopped after reference overrun pulses N_1 so that a front edge of the manuscript abuts against the register rollers and a rear edge of the manuscript is further transferred to adjust a posture of the manuscript, and
a compensating device connected to the controlling device, said compensating device detecting an overrun amount of the motor from a time that the motor receives the stop signal to a time that the motor is actually stopped, and compensating an output time for the stop signal of the motor based on the overrun amount.

5,597,155

DUAL DRIVE DOCUMENT DESKEW SHEET FEEDER

Joseph Guido, Elmira; Kenneth S. Seymour, Conestoga, and Murray R. Zink, Waterloo, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 146,398, Nov. 1, 1993, abandoned.
This application Feb. 26, 1996, Ser. No. 606,664
Int. Cl.[6] B65H *3/06*
U.S. Cl. 271—119 19 Claims



1. A sheet feeder comprising:
a hopper for storing a stack of documents to be fed, with said stack having a top and a bottom and with the documents in said stack positioned therein in a face-up position;
a picker mechanism including first and second picker rollers for picking a document from the top of said stack and for moving the document downstream in a feeding direction;
a leading edge detector including first, second, and third aligned sensors positioned downstream from said picker mechanism for generating first, second, and third outputs, respectively, as a leading edge of the document encounters the associated sensors;
first and second drive rollers positioned between said picker mechanism and said leading edge detector;
first and second motors for driving said first and second drive rollers independently of each other for moving said document, with said first and second picker rollers being coupled to said first and second motors to move said document in the same direction and at substantially the same speed as the associated first and second drive rollers;
a document receiver located downstream from said first and second drive rollers in said feeding direction for receiving said document from said first and second drive rollers; and
a controller and a program for receiving said first, second, and third outputs to obtain a measure of skewness of said document approaching said first, second, and third sensors relative to said feeding direction and for controlling the operation of said first and second motors to present said document to said document receiver in a deskewed orientation with respect to said feeding direction.

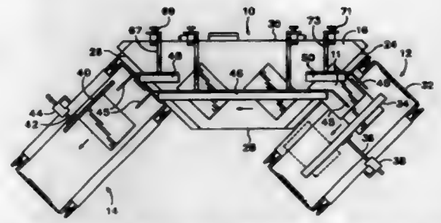
5,597,156

MODULAR FOLDED SHEET CONVEYOR SYSTEM

Robert D. Claassen, Medford, Oreg., assignor to MasterFlo Technology, Inc., Bromard, Canada

Filed Nov. 3, 1994, Ser. No. 334,267
Int. Cl.[6] B65H *5/00*
U.S. Cl. 271—225 14 Claims

1. A modular conveyor system for flat folded product including:
(a) a central drive unit having a trapezoidally shaped horizontal conveying surface said surface having a pair of parallel edges and first and second obtuse angled edges, said horizontal conveying surface including a main pinch roller and endless belt conveyor assembly extending substantially between said first and second obtuse angled edges, and parallel to said pair of parallel edges;



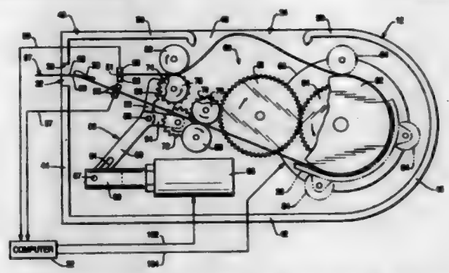
(b) a drive motor associated with said central drive unit coupled to said pinch roller and endless belt conveyor assembly;
(c) a first driven conveyor unit detachably connectable to said central drive unit and having a first substantially rectangular horizontal conveying surface including a first conveyor belt, said first driven conveyor unit being coupled to said central drive unit along said first obtuse angled edge of said central drive unit; and
(c) a second driven conveyor unit detachably connectable to said central drive unit having a second substantially rectangular horizontal conveying surface including a second conveyor belt, said second driven conveyor unit being coupled to said central drive unit along said second obtuse angled edge of said central drive unit.

5,597,157

DOCUMENT HANDLING DEVICE FOR OVERTURNING A DOCUMENT

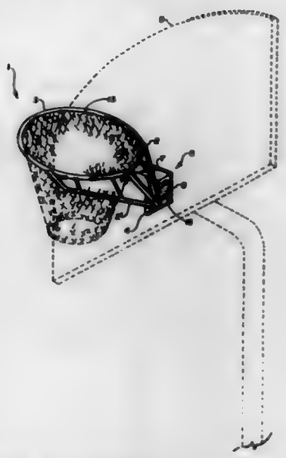
Alistair R. Hamilton, Dayton, Ohio, and Robert W. Phillips, Waterloo, Canada, assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed Nov. 1, 1995, Ser. No. 551,388
Int. Cl.[6] B65H *5/00*; *29/66*
U.S. Cl. 271—225 4 Claims



1. A document handling device for overturning a document having a first side, a second side lying opposite the first side, a leading edge, a trailing edge, and a relatively long lengthwise dimension between the leading and trailing edges without reversing the leading and trailing edges, said device comprising:
a housing unit including an outer wall and a reference surface defining at least in part a document feed opening in said wall through which the document is fed into a document path defined within said housing unit; and
a transport unit for (i) receiving the document which has been fed through the document feed opening with the first side of the document facing said reference surface of said housing unit, (ii) overturning the received document, (iii) feeding the overturned document back through the same document feed opening with the second side of the document facing said reference surface of said housing unit and (iv) generating a bulge in the document while the document is being overturned;
said housing units defining an accumulating space into which the document can bulge while the document is being overturned.

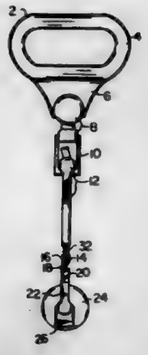
5,597,158
BASKETBALL GOAL
Preston Spikes, 800 Allen St., Oakdale, La. 71463
Filed Dec. 19, 1995, Ser. No. 574,656
Int. Cl.[6] A63B 63/08
U.S. Cl. 473—485 8 Claims



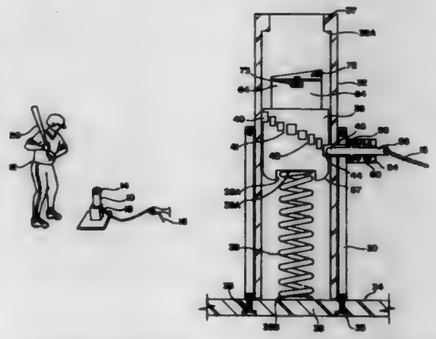
1. A basketball goal comprising:
a hoop;
an L-brace having a horizontal section and a vertical section extending from one end of said horizontal section, said hoop rigidly attached to said horizontal section on an end opposite said vertical section;
at least one vertically disposed center plate brace attached on one edge to said vertical section of said L-brace and attached on another edge to said horizontal section of said L-brace;
a first side support arm attached on one end to said hoop at a point spaced from said L-brace and on the other end to said L-brace;
a second side support arm attached on one end to said hoop at a point spaced from said L-brace symmetrically opposite said first side support arm, and on the other end to said L-brace;
said first side support arm and said second side support arm each having a first section and a second section adjoined at an angle; and
a plurality of buttresses, each of said buttresses being rigidly attached on one end to said hoop and on the other end to said second section of one of said first side support arm and said second side support;
wherein said basketball goal is mounted to a backboard through said vertical section of said L-brace.

5,597,159
BATTING PRACTICE DEVICE
James G. Haygood, 1805 E. Okaloosa Ave., Tampa, Fla. 33604, and Jeffrey T. Calloway, Tampa, Fla., assignors to James G. Haygood, Tampa, Fla.
Filed Nov. 15, 1995, Ser. No. 558,095
Int. Cl.[6] A63B 69/00
U.S. Cl. 473—424 20 Claims

1. A batting practice device for use by a first person to provide batting practice to a second person with a bat, said batting practice device comprising a handle having a ball joint support attached thereto for connection to the ball of a universal joint; a practice ball having a removable cap attached thereto so that said practice ball can be quickly removed from the remainder of said batting practice device for replacement; at least two universal joints connected between said handle and said practice ball, each of said universal joints comprising a ball and a ball joint support; a plurality of flexible members connected between said handle and said practice ball; a plurality of energy absorbing members connected between said handle and said practice ball; and connection means to connect said universal joints, said flexible members and said energy absorbing members between said handle and said practice ball so that most of the energy transferred to said practice ball when said practice ball is hit by said bat is absorbed and diverted away from said first person and so that said universal joints work together to diminish tangling of said first flexible member.

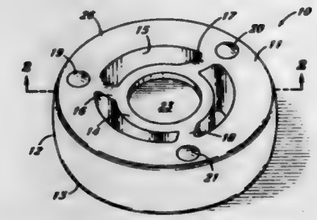


5,597,160
BASEBALL BATTING TRAINING APPARATUS
Calvin Mims, 709 N. Cuyler Ave., Oak Park, Ill. 60302
Filed Jun. 28, 1995, Ser. No. 495,845
Int. Cl.[6] A63B 69/40
U.S. Cl. 124—16 7 Claims



1. An apparatus for presenting a baseball within the hitting zone of a batter, comprising: a base, a rigid-wall tube having an axis extending perpendicular from said base and forming a closed end with said base, said tube having an open end on said axis opposite said closed end and arranged to support a baseball, spring means positioned within said rigid-wall tube and engaged with said closed end, a striker movably mounted within said rigid-wall tube and arranged for selective rotation therein, said striker having axially spaced apart first and second end portions, said first end portion in contact with said spring means and said second end portion in alignment with said open end of said tube for extension therethrough, said striker being movable toward said closed end of said tube, a plurality of pin receiving means on said striker, each pin receiving means spaced axially and annularly within said striker and between said first and second end portions, latching pin means secured to the exterior surface of said rigid-wall tube, said latching pin means having first and second ends and an intermediate flange portion, said first end of said latching pin means extending through said rigid-wall tube for engagement with a selected one of said plurality of pin receiving means of said striker as said striker is moved toward said closed end of said tube, thereby placing said latching pin means in engagement with said selected one of said plurality of pin receiving means to latch said striker, said selected one of said plurality of pin receiving means arranged for alignment with said latching pin means by axially rotation and depression of said striker and, release means attached to said second end of said latching pin means to remove said latching pin means from said selected one of said plurality of pin receiving means, thereby allowing said striker to unlatch and move upward by the force of said spring means to impinge with said baseball and propel said baseball into the hitting zone of a batter to a height determined by said selected one of said plurality of pin receiving means.

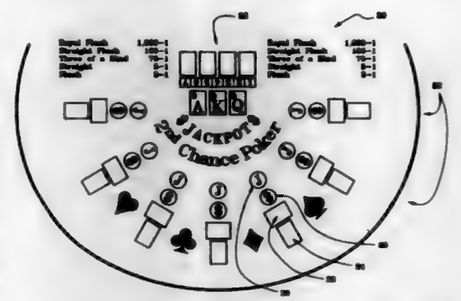
5,597,161
PUCK FOR USE ON A NON-ICE SURFACE
Alex R. Bellehumeur, 6240 Napoli Ct., Long Beach, Calif. 90803; John R. Nelsmeus, II, 13424 Wandering Ridge Way, and Guy W. Haarlammert, 3272 Skyview Ridge, both of Chino Hills, Calif. 91709
Continuation of Ser. No. 303,589, Sep. 9, 1994, abandoned, which is a continuation of Ser. No. 150,428, Nov. 10, 1993, abandoned, which is a division of Ser. No. 949,877, Sep. 22, 1992, Pat. No. 5,275,410. This application Jan. 24, 1996, Ser. No. 590,870
Int. Cl.[6] A63B 71/00
U.S. Cl. 473—588 3 Claims



1. A puck for use on a non-ice surface, said puck having a puck body which is generally cylindrical in shape and molded from a polymer and having an upper surface, a lower surface and an outer peripheral surface and having a vertical central axis when its upper or lower surface is resting on a horizontal floor, said puck comprising:
a puck body having a plurality of runners held by said puck body, each of said runners having a shaft portion held by said puck body and the plurality of runners having heads which extend above the upper surface and below the lower surface, said runners being located near the outer peripheral surface of said puck the runner heads being positioned so that the puck rests on a plurality of the runners when on a horizontal floor, and said runners being fabricated from a polymer which has a lower coefficient of friction than the polymer from which the puck body is formed.

5,597,162
POKER GAME WHERE PLAYERS ARE GIVEN TWO CHANCES AT RECEIVING REPLACEMENT CARDS
Thomas L. Franklin, 810 Ford St., Gulfport, Miss. 39507
Filed Dec. 27, 1995, Ser. No. 579,897
Int. Cl.[6] A63F 1/00
U.S. Cl. 273—292 15 Claims

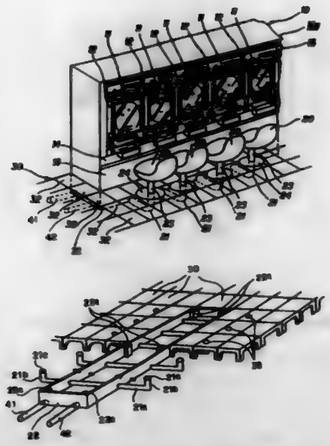
8. A method of playing a card game comprising the steps of:



(a) obtaining at least one deck of at least 52 standard playing cards;
(b) a player placing a first bet;
(c) a dealer dealing only four cards to himself, three cards face-down and one card face-up;
(d) the dealer dealing the player only three cards face-down;
(e) the player examining his three cards and the dealer's exposed card, then the player electing to stay or replace one of said three cards in his hand, and if said player elects to replace one of said cards, said player discarding a card and said dealer dealing said player a new card;
(f) the player electing to stay or again replace one of said three cards in his hand, and if said player elects to again replace one of said cards, said player placing a second bet and discarding one of said cards, and said dealer dealing said player a new card;
(g) said dealer forming a hand of three cards from said four cards, discarding one of said cards;
(h) determining the winner of said event by comparing said player's hand to said dealer's hand.

5,597,163
GAMING MACHINE ISLANDS AND GAMING HOUSE FACILITIES WHERE THE GAMING MACHINE ISLANDS ARE INSTALLED
Takatoshi Takemoto, and Kazunori Kawashima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ace Denken, Japan
PCT No. PCT/JP93/00652, § 371 Date Nov. 18, 1994, § 102(e) Date Nov. 18, 1994, PCT Pub. No. WO93/23124, PCT Pub. Date Nov. 25, 1994
PCT Filed May 19, 1993, Ser. No. 338,622
Claims priority, application Japan, May 19, 1992, 4-126455
Int. Cl.[6] A63F 7/36
U.S. Cl. 273—309 15 Claims

1. Gaming house facilities having one or more gaming machine islands each comprising a plurality of machine rows, each containing a plurality of gaming machines placed side by side, and a floor on which the gaming machine islands are placed, which are characterized by:
an island pillar unit for fixing and supporting the machines and placing the machines in two rows for forming the gaming machine island;
a base frame installed on the floor for fixing and supporting said island pillar unit, said base frame having a pair of spaced, opposing frame members lying along a length direction of said base frame, said frame members being in contact with the gaming house floor along substantially their entire length when the base frame is in use; and
a plurality of extending frames attached to said base frame at predetermined intervals along a length direction of said base frame, said extending frames extending in a width direction of said base frame, said extending frames having central portions lying between said frame members and extending portions extending beyond said frame members in the width direction of said base frame,



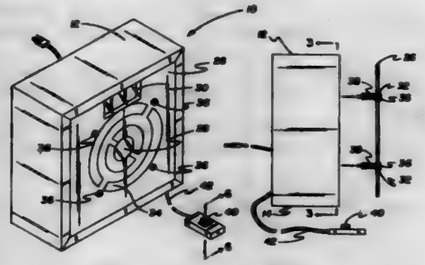
said extending frames being placed corresponding to positions at which the gaming machines are placed and being in contact with the floor along substantially the entire length of a horizontal part thereof when the base frame is in use for stabilizing said base frame on the gaming house floor.

5,597,164

DRAW TIMER TARGET FOR PAINT BALL GUNS, PELLET GUNS, AND THE LIKE

Denis Dodds, 10737-135 A St., Surrey B.C., Canada

Filed Jan. 16, 1996, Ser. No. 586,204
Int. Cl.[6] F41J 5/052
U.S. Cl. 273—371 **1 Claim**



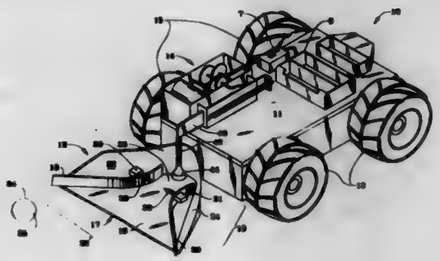
1. A draw timer target for paint ball guns and pellet guns comprising, in combination:
- a square housing constructed of wood having a top surface, a bottom surface, and a pair of side surfaces defining a periphery and an interior space with an open front face and an open rear face, the housing further comprising a rectangular mounting plate coupled within the interior space adjacent to the front face whereby the periphery adjacent to the front face forms a flange;
- a lamp centrally situated on the mounting plate, the lamp adapted to emit light outwardly from the front face upon the actuation thereof;
- four push button switches each coupled to a front surface of the mounting plate in a different quadrant thereof, the push button switches connected in parallel thereby allowing the passage of current therethrough upon the depression of at least one of the switches;
- a numeric light emitting diode display with a rectangular configuration coupled to the front face of the mounting plate and positioned adjacent to the top surface of the housing, the numeric light emitting diode display adapted to display a 3-digit number;
- a resilient target plate with square configuration having a length and a width approximately equal to a length and a width of an inner surface of the periphery of the housing, the resilient target plate constructed of a thin metallic material which is impenetrable to non-lethal guns, the target plate further comprising a circular transparent window centrally situated therein whereby the lamp is visible therethrough, a rectangular transparent window situated adjacent to a top edge thereof whereby the display is visible therethrough, and four apertures each situated in different quadrants of the target plate, the target plate further having circular markings encompassing the circular window for aiding in the targeting thereof;
- four screws adapted to insert within the apertures of the target plate and screwably couple within four threadedly lined bores formed in different quadrants of the mounting plate, the four screws each comprising a spring coupled thereabout and biased between the mounting plate and the rear surface of the target plate thereby holding the target plate flush with the front face of the housing and further allowing resilient depression of the switches, whereby the screws are removable for allowing the target plate to be removed for cleaning;
- an actuator button adapted to communicate an actuating signal upon the depression thereof; and
- control circuitry coupled to the mounting board and connected to the lamp, the display, the switches, the actuator button and a transformer adapted to supply power thereto upon the receipt of an alternating current from a conventional power receptacle, the control circuitry adapted to actuate the lamp, the control circuitry further having timing capabilities wherein the control circuitry is adapted to depict an incrementing timer on the display upon the receipt of the actuating signal from the actuator button, the control circuitry further adapted to stop the timer, turn off the lamp, and depict the time at which the timer stopped on the display upon the depression of at least one of the push button switches.

5,597,165

GAME DEVICE FOR A RADIO CONTROLLED VEHICLE

Christopher Rundle, 12598 SW. 60th Ct., Miami, Fla. 33156, and Michael Borell, 7787 SW. 86th St., Apt. 310, Miami, Fla. 33143

Filed Jan. 17, 1996, Ser. No. 588,870
Int. Cl.[6] A63F 7/26
U.S. Cl. 273—442 **18 Claims**



1. A radio controlled land based vehicle comprising:
- a means for entrapping and channeling a ball into a retaining area;
- a flexible retaining means allowing retention of said ball in said retaining area;
- a ball propelling means for dislodging said ball from said flexible retaining means and imparting a directional velocity to said ball away from said vehicle.

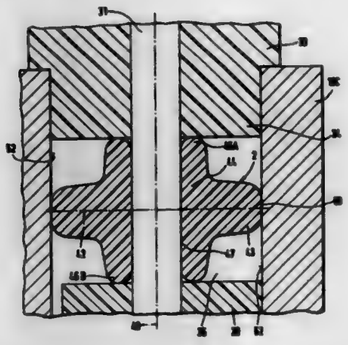
17. A method of using said radio controlled land-based vehicles for playing a game between at least two teams said method including the steps:
- defining the boundaries of a playing area;
- defining at least one goal on the playing area;
- positioning at least one radio control vehicles comprising a means for entrapping and channeling a ball into a retaining area, a flexible retaining means allowing retention of said ball in said retaining area and a ball propelling device for dislodging said ball from said flexible retaining means and imparting a directional velocity to said ball away from said vehicle on said area for each said team;
- positioning a ball on said playing area;
- maneuvering at least one of the vehicle within said playing area to scoop said ball into said vehicle's retaining area by driving said vehicle towards said ball with sufficient velocity to channel said ball into said flexible retaining means;
- maneuvering said vehicle with said ball around opposing vehicles and towards said goal; and
- aiming said vehicle towards said goal and commanding said ball propelling device to shoot said ball.

5,597,166

SEALING RING FOR A CONTACT PIN

Uwe Grytz, Bamberg, and Ulrich Vieweg, Freusdorf, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 17, 1993, Ser. No. 153,690
Claims priority, application Germany, Dec. 15, 1992, 42 42 238.8
Int. Cl.[6] F16J 15/56
U.S. Cl. 277—12 **10 Claims**



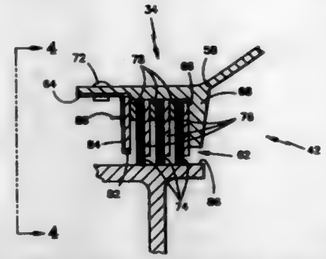
1. A fuel injection valve comprising:
- a housing part having at least one circular opening, the circular opening having a circular inner side;
- at least one contact pin for providing an electrical connection, the contact pin passing through the circular opening;
- a support body surrounding each contact pin at one end of the circular opening;
- a pressure member surrounding each contact pin at the other end of the circular opening;
- at least one sealing ring, the sealing ring having a ring inner part surrounding the contact pin and a bulge which protrudes radially around the ring inner part, the bulge protruding axially in the middle of the ring inner part, so that the sealing ring has a T-shaped cross section;
- the ring inner part extending axially between the support body and the pressure member to provide an axial seal for the contact pin; and
- the bulge contacting the circular inner side of the circular opening to provide a radial seal for the contact pin.

5,597,167

BRUSH SEAL WITH FOOL PROOFING AND ANTI-ROTATION TAB

James G. Snyder, Newark, Ohio, and Gregory H. Gernhardt, Old Saybrook, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 28, 1994, Ser. No. 314,834
Int. Cl.[6] F16J 15/48
U.S. Cl. 277—53 **18 Claims**



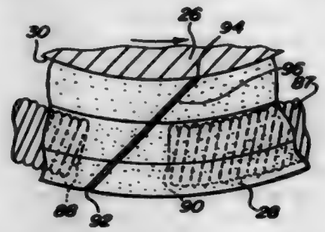
1. A brush seal for discouraging fluid flow through an annular spacing between a stationary carrier and a rotating surface proximate to the carrier, the annular spacing disposed about a longitudinal axis and separating a first cavity and a second cavity, the first cavity having a higher pressure than the second cavity, the carrier including a retaining means being engageable with the brush seal and thereby fixedly retain the brush seal to the carrier with the brush seal in an installed condition, the brush seal including:
- at least one brush stage, the brush stage including:
  - an array of brushes extending through the spacing;
  - a backing plate adjacent the side of the array of brushes, the backing plate facing the second cavity with the brush seal in the installed condition; and
  - a sideplate adjacent the opposite side of the array of brushes; and
- a tab disposed in a fixed relationship to the brush stage, the tab engaging the retaining means to block rotation of the brush stage about the longitudinal axis, and the tab extending outward from the brush seal, the tab being located such that if the brush seal is installed with the backing plate between the array of brushes and the first cavity, the tab interfaces with the carrier to thereby prevent fixed retention of the brush seal to the carrier by the retaining means.

5,597,168

SINGLE SPLIT OIL SEAL

Joe Antonini, Chicago, Ill., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 365,713, Dec. 28, 1994, abandoned.
This application Feb. 29, 1996, Ser. No. 609,896
Int. Cl.[6] F16J 9/06
U.S. Cl. 277—152 **21 Claims**



1. A flexible fluid seal adapted to be disposed between and entirely encircle a rotating journal and a journal case, comprising:

a single annular seal body with an inner radial periphery and an outer radial periphery having only one split between said inner and outer peripheries;

a lip integrally joined to said seal body at said inner radial periphery and extending radially inwardly to a distal end, said distal end adapted to sealingly engage the journal; and

an annular retaining ring embedded in said seal body adapted to urge said seal body radially outwardly to sealingly engage the case.

5,597,169

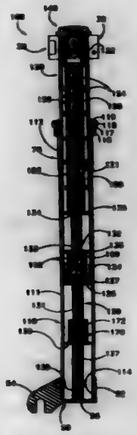
SUSPENSION FORK FOR BICYCLES

E. Douglas Bradbury, Colorado Springs, Colo., assignor to Manitou Mountain Bikes, Inc., Colorado Springs, Colo.

Continuation of Ser. No. 241,850, May 10, 1994, Pat. No. 5,445,401, which is a continuation-in-part of Ser. No. 116,683, Sep. 7, 1993, Pat. No. 5,470,090. This application Jun. 6, 1995, Ser. No. 483,451

Int. Cl.[6] B62K *25/08*

U.S. Cl. 280—276 **18 Claims**



1. A bicycle fork for interconnecting a bicycle wheel to a bicycle frame, said bicycle fork comprising:

at least one leg assembly comprising first and second leg members slidably engaged with each other, said at least one leg assembly being compressible by relative movement of said first and second leg members toward each other, and being expandable by relative movement of said first and second leg members away from each other;

biasing means for providing a biasing force when said leg assembly compresses, said biasing means including at least one elastomer; and

at least one positioning member positioned adjacent to said at least one elastomer and including a raised portion extending toward said at least one elastomer on the perimeter thereof for facilitating maintenance of said at least one elastomer in alignment with said leg members.

5,597,170

ALPINE SKI EQUIPPED WITH A DOUBLE ACTION STIFFENING AND/OR SHOCK ABSORBING DEVICE

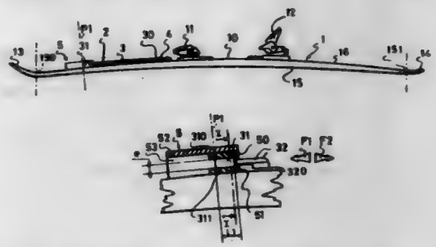
Jacques Le Masson, and Philippe Cousnier, both of Cran Gevrier, France, assignors to Salomon S.A., Metz-Tessy, France

Filed Apr. 27, 1995, Ser. No. 429,873

Claims priority, application France, May 18, 1994, 94 06218

Int. Cl.[6] A63C *5/07*

U.S. Cl. 280—602 **20 Claims**



1. A ski including a beam and a device for at lease one of modifying stiffness and shock absorption of vibrations, said ski comprising:

at least one elongated element positioned longitudinally with respect to the ski, said elongated element having at least one free end portion, said free end portion being longitudinally displaceable with respect to the ski in response to flexion of the ski from a resting position to a maximum flexed position;

means for rigidly affixing a further portion of said elongated element to the ski, said further portion of said elongated element being spaced from said free end portion of said elongated element;

a resistance device affixed to the ski, said resistance device having a structure that is operatively connected to said free end portion of said elongated element to resist longitudinal displacement of said free end portion of said elongated element with respect to the ski, by producing a resisting force of a predeterminate magnitude during flexion of the ski from said resting position, and a resisting force of a magnitude less than said predeterminate magnitude during flexion at said maximum flexed position of the ski, regardless of the direction of said longitudinal displacement of said elongated element with respect to the ski, said structure including a friction surface that engages said free end portion of said elongated element.

5,597,171

VEHICLE SUSPENSION SYSTEM FOR A STEERABLE DRIVE WHEEL

Unkoo Lee, Kyunghi-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed May 17, 1995, Ser. No. 442,974

Int. Cl.[6] B60G *5/00*

U.S. Cl. 280—667 **7 Claims**

1. A vehicle suspension system for a steerable drive wheel, comprising:

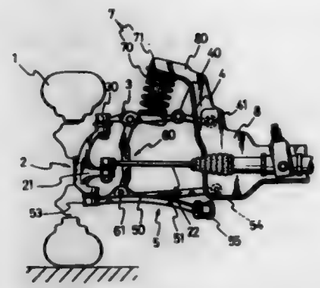
a wheel carrier for rotatably supporting a wheel;

an outer upper control arm having a first end pivotally coupled to the wheel carrier and a second end;

an inner upper control arm having a first end pivotally coupled to the second end of the outer upper control arm and a second end coupled to a subframe;

a lower control arm having front and rear control arms to connect a lower end of the wheel carrier to the subframe and a vehicle body, respectively;

a connecting link having an upper end coupled to a middle portion of the outer upper control arm and a lower end coupled to the lower control arm; and



a strut assembly for absorbing vibration and impact transmitted in an up and down direction, which is formed with a shock absorber and a spring, a lower end of the strut assembly being positioned on an upper surface of the outer upper control arm and an upper end of the strut assembly being supported on a supporting portion of the subframe.

5,597,172

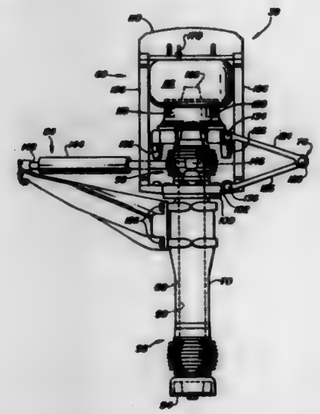
SPRAYER SUSPENSION AND STEERING

Marvin A. Malwald, Ankeny, Iowa, and Bernard E. Romig, Illinois City, Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 17, 1995, Ser. No. 545,189

Int. Cl.[6] B60P *1/16*

U.S. Cl. 280—672 **24 Claims**



1. In an agricultural sprayer having a frame adapted for forward movement over the ground where crops to be sprayed are located, a suspension system comprising:

an upright strut shaft having upper and lower ends and a central portion;

an axle having a strut journal mounting the central portion of the strut shaft for axial movement therein;

a ground-engaging wheel connected to the lower end of the strut shaft;

an upper mount extending above the axle; and

a spring located above the axle and supported between the upper end of the strut shaft and the upper mount, the strut shaft moving axially in the journal and cushioning between the ground-engaging wheel and the frame as the strut shaft moves axially in the journal.

5,597,173

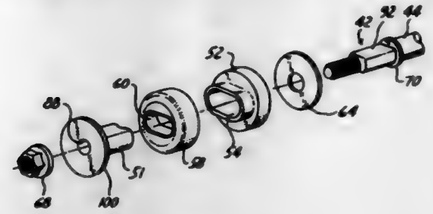
ATTACHMENT APPARATUS FOR CONTROLLING ROTATIONS OF A TENSION STRUT

James H. Schindler, Novi; Robert W. Haberstroh, Farmington Hills, and John B. Hicks, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 31, 1995, Ser. No. 414,822

Int. Cl.[6] B60G *3/20;7/02;* F16F *1/36*

U.S. Cl. 280—690 **7 Claims**



1. A suspension for a vehicle comprising:

a chassis;

a wheel support member;

an upwardly extending telescopic damper having a lower end secured to said wheel support member and an upper end connected to said chassis;

transversely extending front and rear control arms, each of said control arms having an inboard end pivotably connected to said chassis and an outboard end connected to said wheel support member;

a tension strut having a rearward end pivotally connected to said wheel support member and a forward end adapted to be attached to said chassis; first elastomeric body having a first aperture;

a second elastomeric body having a second aperture being adapted to be axially aligned with said first aperture when said first and second elastomeric bodies are clamped to said chassis;

a sleeve having a first portion disposed in said first aperture, a second portion opposite said first portion and disposed in said second aperture, and a center portion disposed therebetween;

said sleeve further includes a bore passing through said sleeve for receiving said tension strut therein and operatively preventing relative rotation between said tension strut and said sleeve;

said center portion of said sleeve includes a non-circular outer circumference for engaging a non-circular chassis aperture disposed on said chassis and forming a region therebetween, said region being operative to permit rotations within a predetermined range of said sleeve and said tension strut relative to said chassis.

5,597,174

STEERABLE TAG AXLE

Ronald E. Christenson, Parsons, Tenn.; Tracy L. Schrafel, West Concord, and William P. Bartlett, Dodge Center, both of Minn., assignors to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Mar. 2, 1995, Ser. No. 398,946

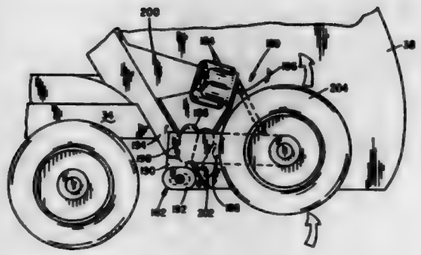
Int. Cl.[6] B60G *11/26*

U.S. Cl. 280—704 **29 Claims**

1. A steerable auxiliary wheel system for a vehicle, including a pair of spaced steerable tag axle assemblies each of which comprises:

(a) a suspension system including an axle mounting lever movably pivotally attached to the vehicle and carrying a stub axle and a wheel on the stub axle;

(b) fluid operated actuator means connected to said suspension system for moving the axle mounting lever and the wheel between a deployed position and a stowed position;



(c) steering means attached to the axle mounting lever for allowing lateral adjustment of the wheel; and

(d) wherein said steering means comprises a kingpin steering system having a pivot pin connecting the axle mounting lever to a pivot attached to the vehicle such that the axle mounting lever pivots laterally about said pivot pin and between the deployed and stowed positions at said pivot.

5,597,175

REAR SUSPENSION SYSTEM OF A MOTOR VEHICLE

Pham A. Tuan, Elancourt, France, assignor to SOLLAC, Puteaux, France

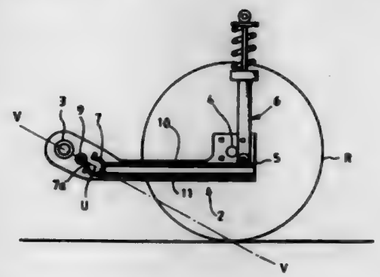
PCT No. PCT/FR94/01325, § 371 Date Jul. 31, 1995, § 102(e) Date Jul. 31, 1995, PCT Pub. No. WO95/13931, PCT Pub. Date May 26, 1995

PCT Filed Nov. 14, 1994, Ser. No. 454,217

Claims priority, application France, Nov. 16, 1993, 93 13658; Apr. 5, 1994, 94 03992

Int. Cl.[6] B60G *11/18*

U.S. Cl. 280—723 **10 Claims**



10. A rear suspension system for a motor vehicle comprising:

an axle assembly comprising:

two longitudinal suspension arms, each suspension arm carrying a wheel stub axle and having a strut attachment portion near an associated wheel stub axle,

a transverse beam interconnecting said suspension arms and having an open section, an opening of said open section facing towards a front of the vehicle,

elastic articulations carried by each of said suspension arms constructed and arranged to attach said axle to the vehicle, and

a pair of struts, each strut being coupled to an associated strut attachment portion and being constructed and arranged to be attached to the vehicle, and

a pair of wheels, one wheel of the pair being mounted on an associated wheel stub axle,

wherein each said transverse beam is an Ω-shaped member having a plane of symmetry which passes substantially through points of contact between the wheels and the ground.

5,597,176

PASSENGER-SIDE AIRBAG DEVICE FOR A VEHICLE

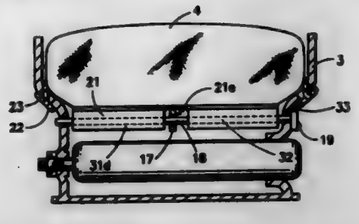
Hirohiko Kikuchi, Saitama, Japan, assignor to Kansei Corporation, Saitama, Japan

Filed Jul. 10, 1995, Ser. No. 500,440

Claims priority, application Japan, Jul. 11, 1994, 6-158873; Jul. 11, 1994, 6-158874; May 15, 1995, 7-115448

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—728.2 **4 Claims**



4. A resin clip for attaching an airbag to a wall of an airbag device, said clip comprising:

an attachment portion having a first end attachable to a rim of said airbag;

an initial insertion piece attached to a second end of said attachment portion;

a hook attached to said initial insertion piece and to said second end of said attachment portion;

said initial insertion piece deformably passing into a slot before said hook when attaching said airbag to said wall;

said initial insertion piece and said hook resiliently resuming an original shape after deformably passing into said slot;

said resin clip being enveloped by a cloth; and

said resin clip being fitted into said slot while enveloped.

5,597,177

STEERING WHEEL PAD STRUCTURE

Naoki Matsuura, Aichi-ken, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-ken, Japan

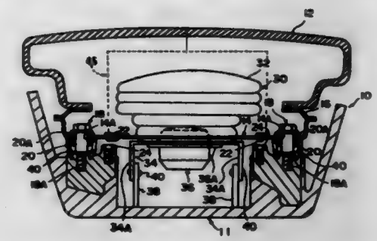
PCT No. PCT/JP93/01650, § 371 Date Jan. 12, 1995, § 102(e) Date Jan. 12, 1995, PCT Pub. No. WO94/11230, PCT Pub. Date May 26, 1994

PCT Filed Nov. 11, 1993, Ser. No. 424,475

Claims priority, application Japan, Nov. 13, 1992, 4-878286 U

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—731 **5 Claims**



1. A steering pad structure in which a pad, which houses an energy absorbing member which absorbs inertial movement force of a vehicle occupant, is supported at a steering wheel via an urging member, and by pushing said pad against the urging force of said urging member, the entire pad moves and a horn switch is operated,

wherein said energy absorbing member is mounted to said steering wheel separately and independently of said pad so that said energy absorbing member dos not move in accordance with movement of said entire pad, and

said steering wheel has a base portion, and said pad is mounted to said base portion via said urging member, and said energy absorbing member is mounted to said base portion, and

said pad includes a contact plate portion having a contact of said horn switch, and said contact plate portion being mounted to said base portion via said urging member.

5,597,178

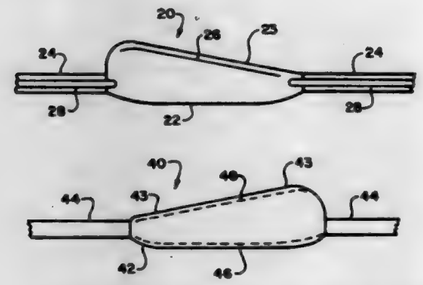
SEATBELT AIRBAG

Paul W. Hardin, Jr., 3086 Park La., Snellville, Ga. 30278

Filed Aug. 18, 1994, Ser. No. 292,411

Int. Cl.[6] B60R *21/18*

U.S. Cl. 280—733 **4 Claims**



1. A vehicle restraint system comprising: at least one airbag, means for mounting said airbag adjacent to a seatbelt of a vehicle, said airbag having inflation means connected thereto for inflating said airbag, said system further having a pouch surrounding said airbag, said pouch having openings for said seatbelt to be threaded therethrough and wherein said pouch has a first weakened area thereon, whereby inflation of said airbag ruptures said weakened area to permit said airbag to escape from said pouch, further wherein said pouch has an inclined surface and said weakened area is located in said inclined surface, and further wherein the surface of said pouch further includes a second weakened area, with said first and said second weakened areas being positioned on opposite sides of said pouch such that upon inflation said airbag simultaneously deploys through both said first and said second weakened areas.

5,597,179

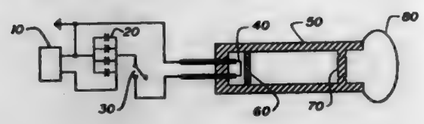
AIRBAG INFLATION DEVICES AND METHODS

Murray Kornhauser, 620 Argyle Rd., Wynnewood, Pa. 19096

Filed Feb. 23, 1994, Ser. No. 200,392

Int. Cl.[6] B60R *21/32*

U.S. Cl. 280—735 **22 Claims**



1. A system for inflating an airbag in a vehicle comprising:

energy storage means for storing electrical energy;

switching means interfaced with the energy storage means for switching the electrical energy so that the electrical energy can actuate inflation of the airbag; and

energy conversion means interfaced with the switching means for receiving the electrical energy used to inflate the airbag.

5,597,180

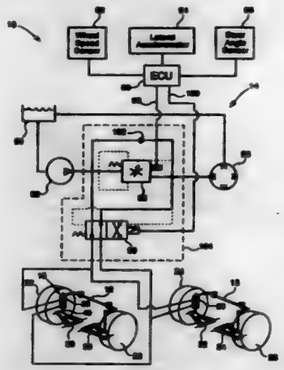
VEHICLE ROLL CONTROL APPARATUS

Blaise J. Gassel, 3317 Alton Ct., Ann Arbor, Mich. 48105

Filed Aug. 15, 1994, Ser. No. 290,581

Int. Cl.[6] B60G *21/06*

U.S. Cl. 280—772 **20 Claims**



1. An apparatus for controlling the roll of a motor vehicle, the apparatus comprising:

a hydraulic circuit including a power steering pump;

an actuator connected between a sprung portion of the vehicle and an unsprung portion of the vehicle, the actuator having first and second ports;

a first valve situated in the hydraulic circuit downstream of the power steering pump and adapted to selectively establish a pressure differential thereacross; and

a directional valve having first and second positions, the first position putting the first port of the actuator in communication with a first side of the first valve and the second port of the actuator in communication with a second side of the first valve, and the second position putting the first port in communication with the second side of the first valve and the second port in communication with the first side of the first valve.

5,597,181

STEERING ASSEMBLY WITH IDLER LEVER MOUNTED TO HOUSING

Thomas W. Lyles, and Daniel C. Allen, both of Martinez, Ga., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 156,811, Nov. 22, 1993. This application May 5, 1995, Ser. No. 435,183

Int. Cl.[6] B62D *3/12*

U.S. Cl. 280—846 **8 Claims**

1. A steering system for a car comprising:

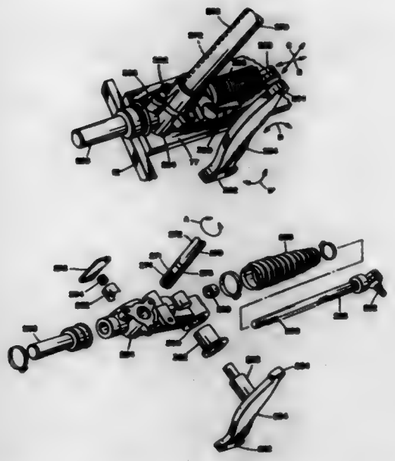
a rack and pinion housing having a unitary idler lever mount;

a steering shaft assembly connected to the housing and having a pinion gear located in the housing;

a driven rack assembly operably connected to the pinion gear and extending out of the housing;

a single idler lever pivotally mounted to the housing at the idler lever mount, the single idler lever having the driven rack assembly attached thereto, and two tie rods connected to a single end of the idler lever, the two tie rods extending away from the end of the idler lever in general opposite directions,

wherein an end of the driven rack assembly is movable in two orthogonal directions to both pivot the idler lever on the housing and compensate for pivotal movement of the idler lever on the housing, and wherein the steering system further comprises a rack guide located against a back portion of the driven rack and a spring that biases the rack guide against the driven rack which biases the driven rack against the pinion



gear to allow for compensation between the rack and pinion for the two orthogonal directions of movement of the end of the driven rack.

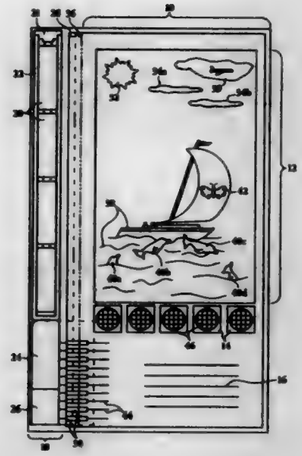
5,597,182
PERSONAL HUMAN ANATOMY CARD AND METHODS AND SYSTEMS FOR PRODUCING SAME
William L. Reber, Schaumburg, Ill., and Cary D. Perttunen, Shelby Township, Mich., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 26, 1995, Ser. No. 533,825
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—67 26 Claims



1. A method of producing a personal human anatomy card for an individual, the method comprising the steps of:
(a) providing a card member having a machine-readable storage medium integrated therein;
(b) tomographically creating a plurality of two-dimensional cross-sectional images of a portion of the individual;
(c) processing the plurality of two-dimensional cross-sectional images to form data representative of a three-dimensional model of the portion of the individual;
(d) compressing the data to form compressed data representative of the three-dimensional model; and
(e) storing the compressed data in a machine-readable form on the machine-readable storage medium of the card member.

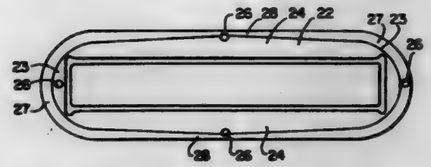
5,597,183
INTERACTIVE BOOK HAVING ELECTROLUMINESCENT DISPLAY PAGES AND ANIMATION EFFECTS
William R. Johnson, Alberta, Canada, assignor to Junkyard Dogs, Ltd., San Jose, Calif.
Filed Dec. 6, 1994, Ser. No. 349,888
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—83 19 Claims

1. A display comprising,
a layer bearing a first set of a plurality of icons,



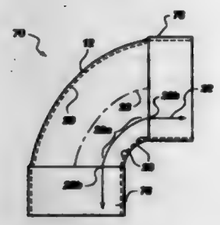
a tier of electroluminescent material disposed adjacent to said layer forming a pattern corresponding to said first set of icons, said pattern disposed to show a series of illuminated images corresponding to said plurality of icons of said first set, with said plurality of icons and said pattern arranged to provide an illusion of movement of said first set of icons upon said pattern being illuminated in accord with a predetermined sequence, and
means, electronically coupled to said electroluminescent material, for activating said first pattern in accord with said predetermined sequence, with each of said plurality of icons of said first set adapted to be selectively viewable with an unaided eye upon said activating means illuminating said pattern.

5,597,184
QUICK RELEASE CLAMP FOR BONNET AND FLANGE OF GATE VALVES
Arthur J. Brenes, Castro Valley, and Fabian M. Van De Graff, Fremont, both of Calif., assignors to High Vacuum Apparatus Mfg., Inc., Hayward, Calif.
Filed Sep. 30, 1994, Ser. No. 315,562
Int. Cl.[6] F16L *35/00*
U.S. Cl. 285—24 26 Claims

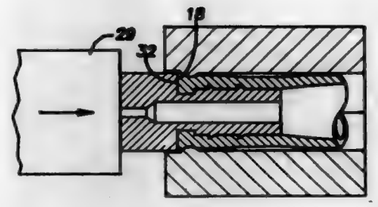


1. In combination, a first member having a non-circular, outward-extending upper edge comprising opposed semi-circular first member ends and opposed first member sides having first member centers said first member sides interconnecting said first member ends, a second member having an external outline substantially congruent with an external outline of said first member comprising opposed semi-circular second member ends and opposed second member sides having second member centers interconnecting said second member ends, said first member having a first top surface and a first bottom surface, said first top surface being formed with a circumferential first bevel, said second member having a second top and a second bottom surface, said second bottom surface being formed with a circumferential second bevel, said first bottom surface overlying said second top surface, said first bevel being substantially thinner at said first member centers than at said first member sides, said second bevel being substantially thinner at said second member centers than at said second member sides, and a clamp having a first arm formed with a third bevel substantially complementary to said first bevel, a second arm formed with a fourth bevel substantially complementary to said second bevel and a base connecting the outer edges of said first and second arms, said clamp fitting around and partially overlapping said upper edges of said first member ends and sides and partially overlapping the lower edges of said second member ends and sides, said clamp comprising a plurality of sections hinged together and connecting means for connecting said sections together, whereby said first and second members are clamped together.

5,597,185
ONE PIECE TUBULAR ELBOW AND PROCESS OF MANUFACTURE
Verne Bray, and Glen Hansen, both of Logan, Utah, assignors to Naco Industries, Inc., Logan, Utah
Filed Nov. 18, 1994, Ser. No. 342,389
Int. Cl.[6] F16L *43/00*
U.S. Cl. 285—179 8 Claims



1. A one-piece tubular elbow comprising:
a unitary one-piece conduit body defining a long axis extending in a longitudinal direction and including continuous, generally cylindrical side walls having a seamless configuration, said side walls being curved in an axial direction to define a flow channel having an axially arcuate flowpath and a generally circular cross section, said conduit body being constructed from continuous rigid plastic conduit having an unoriented molecular structure which has been oriented and aligned to form stronger, oriented molecular structure, wherein the oriented and aligned molecular structure comprises stretched regions of the plastic conduit body, said stretched regions comprising noncircumferential stretching in the longitudinal direction on at least one side of the conduit body.

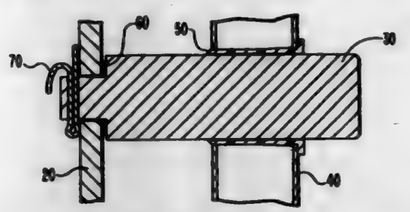


wherein an end of the tube is radially outwardly expanded adjacent said abutment and radially inwardly contracted on the fitting at said abutment and at said cylindrical surface making a fluid-tight seal between the tube and at least one of said abutment and said cylindrical surface.

5,597,186
TUBE FITTING
Ralph G. Ridenour, Mansfield, and Dennis W. Kerr, Ashland, both of Ohio, assignors to Universal Enterprises, Inc., Mansfield, Ohio
Continuation of Ser. No. 445,282, May 19, 1995, abandoned, which is a division of Ser. No. 233,846, Apr. 26, 1994, Pat. No. 5,544,406. This application Jul. 3, 1996, Ser. No. 675,696
Int. Cl.[6] F16L *25/00*
U.S. Cl. 285—330 11 Claims

1. A tube and fitting assembly comprising:
a malleable tube; and
a rigid fitting having an external surface at a forward end, an abutment facing said forward end and located rearward of said external surface, and a cylindrical surface contiguous with said abutment and radially recessed from said external surface;

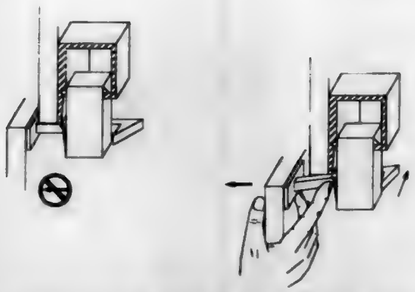
5,597,187
FLOATING LATCHING MECHANISM FOR A SAFE DOOR
Terry M. Hjorth, 274 S. 1065 West, Orem, Utah 84058
Filed Mar. 23, 1995, Ser. No. 409,466
Int. Cl.[6] E05C *1/02*
U.S. Cl. 292—137 2 Claims



1. A floating latching mechanism for a safe door, comprising:
a pin having a connecting end;
a bar movably attached to the connecting end of the pin to retract and extend the pin; and
a pin support member having a bushing hole to receive the pin, wherein the bar has a hole greater than the diameter of the connecting end of the pin to receive the connecting end of the pin to allow proper alignment of the pin with the bushing hole.

5,597,188
EARTHQUAKE LATCH
John A. Miché, 1405 S. 58th St., Richmond, Calif. 94804
Filed Jun. 19, 1995, Ser. No. 491,638
Int. Cl.[6] E05C *1/08*
U.S. Cl. 292—183 8 Claims

1. A latch which detects the initial shocks of major earthquakes and locks cabinet doors and drawers closed before the onset of destructive ground motions, comprised of;
a) a frame for fastening to objects within, or elements of, structures in contact with the earth;
b) and a latch mass suspended within the frame by an integral spring and friction forces acting between the latch mass and frame, so as to decouple the motion of the latch mass from that of the frame, allowing the latch mass to move vertically downward, when the frame experiences the upward acceleration and displacement characteristic of the initial shocks of a major earthquake;
c) the spring being adjustable to friction forces acting between the latch mass and frame so as to tune the spectral response of



the latch mass specifically to the acceleration and displacement characteristic of the initial shocks of major earthquakes;

d) means to retain the latch mass in an extended position below the frame when the latch is activated;

e) means to keep the latch mass down and locked in its extended position below the frame;

f) means to reset the latch mass to its up and ready position within the frame so as to be ready to detect another major earthquake or its after shocks;

g) and a flexible catch which is fastened to cabinet doors or drawers so that it engages the latch mass when the latch mass is in its down and locked position and restricts the motion of cabinet doors or drawers;

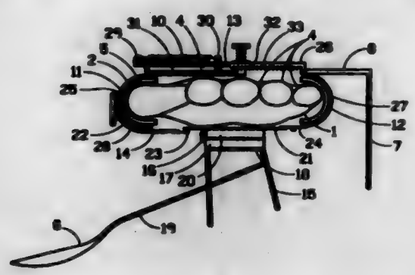
h) means to release the catch after the earthquake subsides so as to reset the latch mass to its up and ready position to detect another major earthquake or after shocks.

5,597,189

PROSTHETIC UTENSIL AND TOOL HOLDING DEVICE FOR BOTH THE RIGHT HAND AND LEFT HAND

Gary W. Barbee, Sr., 707 Rolling Ridge, Duncanville, Tex. 75116

Filed Apr. 26, 1994, Ser. No. 233,262
Int. Cl.[6] A46B *5/02*; A61F *2/54*; A45F *5/00*
U.S. Cl. 294—25 2 Claims



1. A prosthetic device for enabling a person with a disabled hand or other upper extremity to use utensils and tools comprising:

a substantially elongated semi-rigid band having compression adjustment means, securing means, and guide means, said elongated band having first and second ends, said first and second ends defining curved members;

said compression adjustment means including an adjustment spring, meshing ratchet teeth having two separate sets of rachet teeth, and a compression pin having a compression spring, said adjustment spring rigidly attached to said first end and to said first set of rachet teeth which engage said second set of rachet teeth, said second set of rachet teeth attache to said second end, said compression pin being rigidly attached to said first set of rachet teeth to disengage upon depression of said compression pin, said compression spring being disposed around said compression pin for returning said compression pin to original position;

said securing means including a hook and loop fastener, an attachment bar and a hinge for allowing said elongated band to remain secured at a predetermined size set by said adjustment means, said hinge attached to said first end, said hook and loop fastener attached to said second end, said attachment bar located there between for attaching said utensils or tools to said elongated band, said hinge for allowing said attachment bar to pivot to an open position for insertion of said hand or other upper extremity;

said guide means comprising an elongated slot in each of said elongated band and said second set of rachet teeth for guiding said adjustment spring and compression pin along a line parallel to edges of said elongated band.

5,597,190

CAN HOLDER

Robert A. DeMars, 23221 Ladrillo St., Woodland Hills, Calif. 91367

Continuation-in-part of Ser. No. 35,293, Mar. 22, 1993, abandoned. This application Apr. 25, 1994, Ser. No. 231,793
Int. Cl.[6] B65D *25/28*
U.S. Cl. 294—33 1 Claim



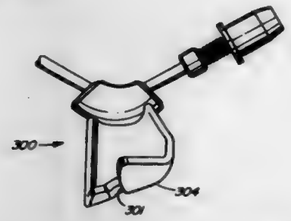
1. A novelty beverage can holder comprising the combination of: a first attachment means for attachment to a small portion of the upper rim of a beverage can, a second attachment means for attachment to a small portion of the bottom surface of a beverage can and an intermediate portion operatively connected to said first and second attachment means and forming a handle capable of being grasped by the human hand, said intermediate portion forming said handle having an equipoise axis formed by a line through the center of gravity of said intermediate portion forming said handle independent of said can holder's association with a beverage can, and stabilizing means adapted to contact a surface upon which said beverage can holder is set, and being outwardly projecting at least beyond said equipoise axis, and being operatively connected to said second attachment means for stabilizing said beverage can holder, whereby said beverage can holder is maintained in an upright position when said holder is attached to said beverage can and placed upon said surface, and wherein said holder is configured as a human being having feet and the feet thereof lie inward towards the can and said stabilizing means extends laterally beyond the feet.

5,597,191

AUTO RELEASE CHOKER

J. Brent McPhee, Seamville, and James M. Ewart, North Vancouver, both of Canada, assignors to Forest Engineering Research Institute of Canada, Pointe Claire, Canada

Filed Feb. 28, 1994, Ser. No. 202,573
Claims priority, application United Kingdom, Sep. 21, 1993, 9319472
Int. Cl.[6] B66C *1/14*
U.S. Cl. 294—82.14 6 Claims



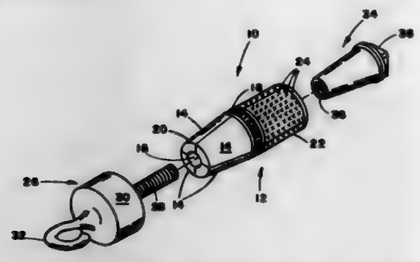
1. A choker hook movable on a cable having a ferrule and used to pull at least one log from a felled to a transport position, said choker hook having a first position wherein said cable extends through an arcuate passageway, and said ferrule of said cable is biased into a locking position within said hook when the direction of pull in said cable is such that said log is moving from said felled to said transport position and a second position wherein the direction of pull in said cable is biased in a reverse direction from that in said first position and said ferrule is biased and moves away from said locking possition, said choker hook rotating through a predetermined angle and about predetermined axes during movement of said hook from said first to said second positions, said arcuate passageway remaining stationary relative to said locking position of said ferrule within said hook during rotation of said hook from said first to said second positions.

5,597,192

PIPE PULLING DEVICE

David J. Smith, 506 Smithdale St., Winston-Salem, N.C. 27107

Filed Dec. 22, 1993, Ser. No. 171,452
Int. Cl.[6] B66C *1/56*
U.S. Cl. 294—96 11 Claims



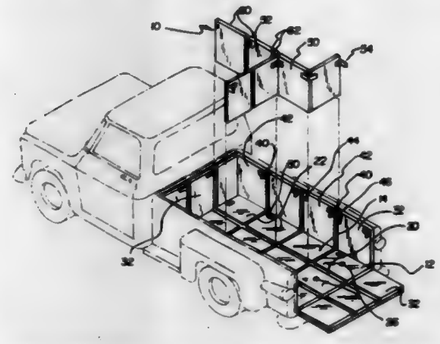
1. A pipe pulling device for pulling a pipe with pulling means, the pipe having an open interior, the device comprising: a body portion for placement within the pipe interior having a plurality of discrete sections forming a substantially frusto conical circular outer surface and a hollow interior with a substantially frusto conical circular interior surface; means releasably retaining the discrete body portion sections in a configuration to form the substantially frusto conical circular outer surface and the hollow interior with a substantially frusto conical circular interior surface; a cap having a threaded member extending into the body portion hollow interior; and a securing plug positionable within the pipe interior and having a threaded front, a larger rear portion, and a frusto conical circular exterior surface, the plug threaded front cooperatively receiving and securing the cap threaded member, the discrete body portion sections separating each from the other and expanding as the plug threaded front continues to receive the cap threaded member and the plug frusto conical circular exterior surface mates with the hollow interior substantially frusto conical circular interior surface to engage and secure the pipe interior so that the pipe can be pulled at the cap by the pulling means.

5,597,193

INTERLOCKING PANEL TRUCK BED LINERS

Robert H. Conner, 5906 Raymond Rd., Apt. 2B, Madison, Wis. 53711

Filed May 31, 1994, Ser. No. 251,343
Int. Cl.[6] B62D *33/02*
U.S. Cl. 296—37.6 2 Claims



1. An interlocking panel truck bed liner comprising, in combination:

a horizontal grid base, the base being comprised of plastic and formed in a generally solid planar rectangular configuration with parallel long side edges defining a length thereof and parallel short side edges defining a width thereof, the base having an upper surface and a lower surface with a small thickness therebetween, the upper surface having a plurality of perpendicularly intersecting, long rectangular-shaped horizontal grooves arranged in a grid configuration, an area between the grooves comprising a plurality of generally rectangular-shaped floor segments, the floor segments adjacent to a tailgate of a truck including centrally located circular depressions each having a rotatable roller ball positioned therein, each circular depression including a perimeter with a ring positioned thereround to secure the balls within the depressions while allowing rotation of the balls therein, a portion of a surface of each ball being positioned through a ring and above a plane of the floor segments, the balls aiding a user in placing items in a bed of the truck by sliding the items over the roller balls, the upper surface of six of the floor segments including generally oval-shaped notches with centrally located rods positioned therein;

four vertical sidewall liners, the liners being formed in a generally solid planar rectangular configuration with parallel long side edges defining a length thereof, with parallel short side edges defining a width thereof, each liner having a front surface and a rear surface with a small thickness therebetween, the rear surface of each liner including pile type fasteners, each liner being positioned vertically in an operative orientation with the rear surface of each liner being affixed to a sidewall and the tailgate of the truck, the front surface of each sidewall liner including grooves positioned vertically in an operative orientation, the grooves of each sidewall liner being positioned in alignment with the grooves in the grid base, an area between the grooves in each sidewall liner comprising a plurality of generally rectangular-shaped

sidewall segments, the liners having an upper region with upper corners and a lower region with lower corners when positioned in said operative orientation thereof, each liner including first and second pile type fasteners affixed near the upper corners of each sidewall segment, each first fastener being formed in a flat generally planar rectangular configuration, each second fastener being formed as a flexible generally planar rectangular member shaped in an L-shaped configuration, one portion of the L-shaped member being affixed to one of the sidewall segments and another portion of the L-shaped member being positioned perpendicular to a plane of one of the sidewall segments; and

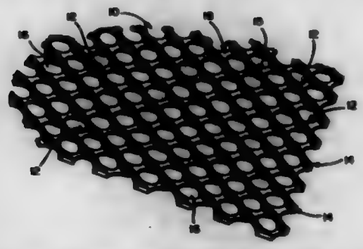
a plurality of interlocking panels, each panel being comprised of plastic and formed in a generally solid planar rectangular configuration with parallel long side edges defining a length thereof and parallel short side edges defining a width thereof, each panel having two identical surfaces with a small thickness therebetween, each panel measuring approximately the same length and width as the floor segments of the grid base and the sidewall segments of the sidewall liners, each panel being positioned vertically in an operative orientation and including an upper region with upper corners and a lower region with lower corners, each panel including first, second, third, and fourth pile type fasteners affixed near the upper corners thereof, said first and second pile type fasteners thereof being formed in a flat generally planar rectangular configuration, said third and fourth pile type fasteners thereof being formed as flexible generally planar rectangular members shaped in an L-shaped configuration, said first and second fasteners thereof being affixed to the upper corners of each surface of each panel, said third and fourth pile type fasteners each having one end affixed to the upper corners of each panel, with another end of each third and fourth pile type fastener being positioned perpendicular to a plane of each interlocking panel, each panel being adapted to securely couple to each other in parallel and perpendicular orientations in order to form different configurations, each panel being adapted to be positioned within the grooves of the sidewall liners and the grid base in the operative orientation.

5,597,194

HIGH FRICTION, NON-SLIP, FLEXIBLE AND HEAT RESISTANT PLASTIC NET

David Daugherty, and Janet Rivett, both of Stone Mountain, Ga., assignors to The Tensar Corporation, Atlanta, Ga.

Filed Apr. 10, 1995, Ser. No. 419,606
Int. Cl.[6] B62D *33/02*
U.S. Cl. 296—39.2 24 Claims



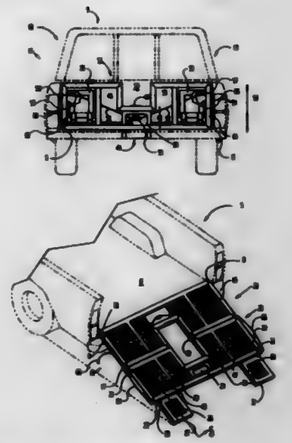
13. A truck bed liner positioned in contact with a truck bed comprising a high friction, non-slip and heat resistant plastic net having a plurality of plastic strands formed in a pattern having openings therebetween, said plastic strands being a blend of at least first and second components having different densities and melting points, said first component having a density of about 0.890 to 0.965 g./cc. and a peak melting point of about 185° to 280° F. and said second component having a density of about 0.865 to 0.889 g./cc. and a peak melting point of about 120° to 185° F., said net having a peak melting point of at least 170° F.

5,597,195

RAMPABLE TAILGATE

Keith C. Meek, 5502 56th St., Lubbock, Tex. 79414

Filed Jun. 2, 1995, Ser. No. 458,739
Int. Cl.[6] B62D *33/03*
U.S. Cl. 296—61 5 Claims



1. A tailgate mountable to a rear end of a truck bed and convertible into a ramp between the truck bed and the ground, said tailgate comprising:

a first frame member having first and second sides, said first side of said first frame member being pivotally couplable to a rear end of said truck bed for pivotal movement relative to the truck between a substantially upstanding position and a rearwardly extending position:

a second frame member having first and second sides, said first side of said second frame member being pivotally coupled to said second side of said first frame member so that said first and second frame members are movable between a folded configuration in which said first frame member is along-side and adjacent to said second frame member and an extended configuration in which said first and second frame members are arranged end-to-end in a substantially linear orientation;

a third frame member having first and second sides, said first side of said third frame member being pivotally coupled to said second side of said second frame member so that said third frame member is movable between a folded configuration in which said third frame member is nested between said first and second frame members and at least partially within said second frame member and an extended configuration in which said third and second frame members are arranged end-to-end in a substantially linear orientation:

a fourth frame member having first and second sides, said first side of said fourth frame member being pivotally coupled to said second side of said second frame member so that said fourth frame member is movable between a folded configuration in which said fourth frame member is nested between said first and second frame members and at least partially within said second frame member and an extended configuration in which said forth and second frame members are arranged end-to-end in a substantially linear orientation:

said fourth frame member being positioned along-side said third frame member so that said third and fourth frame members independently pivot between said folded and extended configurations:

an elongate rail connected to said second side of said second frame member and positioned substantially parallel to said second side of said second frame member; and

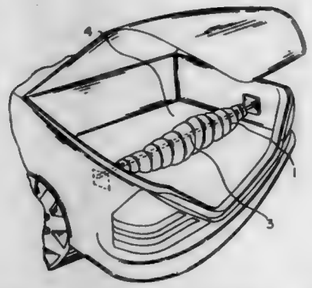
said third and fourth frame members being pivotally coupled to said rail for sliding movement across at least a majority of a length of said second side of said second frame member so that variable spacing is establishable between said third and fourth frame members.

5,597,196

AUTOMOBILE COVER DEPLOYMENT AND STORAGE SYSTEM

Edward R. Gibbs, 107 S. Gomez Ave., Tampa, Fla. 33615

Continuation of Ser. No. 141,849, Oct. 22, 1993, abandoned.
This application Sep. 8, 1995, Ser. No. 524,913
Int. Cl.[6] B60J *11/00*
U.S. Cl. 296—98 1 Claim



1. A system for deploying and retracting a vehicle cover designed for use with a vehicle having a front, a trunk with laterally opposed trunk walls, a trunk liner, a trunk locking mechanism, and a trunk lid movable between opened positions and a closed position wherein said trunk lid is tightly secured against said trunk in said closed position, said system removably mounted in said trunk and comprising

an elongated roller assembly, said roller assembly having an inner axle with a longitudinal axis and an outer roller pivotally disposed about said axis, said inner axle being removably placed in a fixed position between said laterally opposed trunk walls during use, said outer roller capable of rotational movement about said longitudinal axis, said inner axle comprising opposite ends, one of said opposite ends being in the form of a pin, the other of said opposite ends being in the form of a slat, and said outer roller having a surface for receiving, winding, and storing said vehicle cover;

said vehicle cover comprising lightweight flexible material and having adequate size to substantially envelop said vehicle, said vehicle cover also having a configuration closely contoured to said vehicle and a cut-out area adapted to fit around said trunk locking mechanism, said vehicle cover having a front end and a back end, said back end being connected to said surface of said outer roller, said vehicle cover capable of movement between a deployed position and a retracted position, said front end engaging said front of said vehicle when said vehicle cover is in said deployed position, said vehicle cover being compactly wrapped around said outer roller when in said retracted position;

connection means to connect said vehicle cover to said roller assembly;

spring means connected to said roller assembly and having opposite ends, said spring means capable of storing torsional energy as said vehicle cover is moved into said deployed position, said torsional energy being conserved in said spring means for use in retracting said vehicle cover by said trunk lid engaging and securely holding said vehicle cover while said trunk lid is in said closed position, one of said opposite ends of said spring means being attached to said axle and the other of said opposite ends being attached to said outer roller so that deployment of said vehicle cover causes said outer roller to rotate relative to said axle thereby causing said spring means to store said torsional energy; and

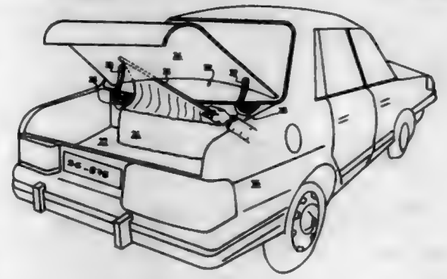
mounting means to removably mount said roller assembly between said laterally opposed trunk walls in said trunk so that after said front end of said vehicle cover is removed from said front of said vehicle and said trunk lid is opened, said vehicle cover is retracted directly, neatly, compactly, and automatically into said trunk, said mounting means comprising a plurality of end plates, and a plurality of mounting plates, at least one of said end plates being disposed between said trunk liner and each of said laterally opposed trunk walls, said mounting plates being disposed between said trunk liner and said end plates, said mounting plates attached to said end plates, said inner axle being connected between said mounting plates, one of said mounting plates comprising a hole for releasably receiving said pin-shaped end of said inner axle, another of said mounting plates comprising a slot-shaped receptacle for releasably receiving said slat-shaped end of said inner axle securely against rotation, and said mounting means capable of securing said roller assembly in said trunk without permanent modification to said laterally opposed trunk walls.

5,597,197

AUTOMOBILE COVER

Zeev Mowaz, and Amnon Kariv, both of 17 Ben-Gurion St., Raanana, Israel

Filed Aug. 29, 1994, Ser. No. 297,133
Claims priority, application Israel, Aug. 29, 1993, 106828
Int. Cl.[6] B60J *11/00*
U.S. Cl. 296—136 12 Claims



1. An automobile sunshade comprising:

a cover for covering at least a passenger compartment of an automobile, said cover comprising a cloth having a substantially rigid crossbar attached to a free edge thereof;

a pouch for storing said cover wherein one end of said cover is attached to said pouch; and

at least a pair of laces, said laces being attached by tying to a respective one of a pair of hinges of a trunk lid of said automobile, to maintain said pouch in freely suspended fashion from said hinges of said automobile trunk lid,

such that said cover can be deployed by withdrawal directly from said pouch through an opening between said trunk lid and said automobiles, and unfurled while said substantially rigid crossbar is held by a user walking alongside said automobile.

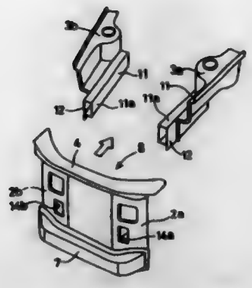
5,597,198

FRONT BODY STRUCTURE FOR MOTOR VEHICLE

Toshiaki Takanishi, and Moriyuki Ohno, both of Hamamatsu, Japan, assignors to Suzuki Motor Corporation, Shizuoka-ken, Japan

Filed Jun. 24, 1994, Ser. No. 265,408
Claims priority, application Japan, Dec. 17, 1993, 5-317736
Int. Cl.[6] B62D *25/08*
U.S. Cl. 296—194 6 Claims

1. A front body structure for a motor vehicle in which an apron side member composing part of a fender apron is inserted into an opening of a lamp support panel disposed at each side of a vehicle



body, and is protruded through said lamp support panel, and said lamp support panel, said fender apron, and an extension member are welded in the condition where said extension member is disposed to said protruded apron side member,

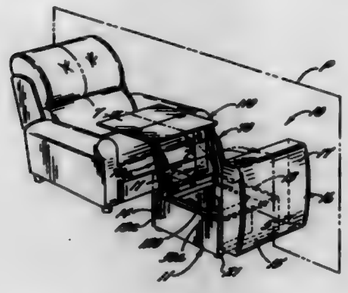
wherein said extension member is subassembled to said fender apron by welding said extension member to said fender apron, said extension member and said fender apron being joined at an interface, and said fender apron is welded to said lamp support panel in the condition where said interface between said extension member and said fender apron is disposed substantially in the longitudinal direction of the vehicle body, so that when a load in the longitudinal direction is applied to said extension member, said load acts as a shearing force on the welded portion of said extension member and said fender apron and a towing hook is welded to said fender apron and said extension member.

5,597,199

OTTOMAN INCLUDING RETRACTABLE TABLE

D. Stephen Hoffman, and Charles F. Lowe, both of High Point, N.C., assignors to Ultra-Mak, Inc., Denton, N.C.

Continuation of Ser. No. 84,439, Jun. 29, 1993, abandoned. This application Jan. 12, 1995, Ser. No. 375,561
Int. Cl.[6] A47B 83/02
U.S. Cl. 297—144 44 Claims



10. An ottoman convertible into a table comprising:

an ottoman comprising:

a base having an internal cavity; and

a removable top cover;

a table surface; and

table surface four-bar linkage means attached to said base and said table surface for moving said table between a retracted position, in which said table surface resides within the cavity of said ottoman base, and an extended position, in which a major portion of said table surface is disposed generally horizontally above and forwardly of said ottoman base, said table surface four bar linkage means comprising:

base mounting means fixed to said base;

a forward pivot link pivotally interconnected to said base mounting means at a first pivot;

a rearward pivot link pivotally interconnected with said base mounting means at a second pivot positioned rearwardly of said first pivot; and

table surface mounting means attached to said table surface, pivotally interconnected to said forward pivot link at a third pivot, and pivotally interconnected to said rearward pivot link at a fourth pivot positioned rearwardly of said third pivot.

5,597,200

VARIABLE TEMPERATURE SEAT

Christian T. Gregory, Alhambra; David R. Noles, Glendale; David F. Gallup, Garden Grove, and David H. Heller, La Palma, all of Calif., assignors to Amerigon, Inc., Burbank, Calif.

Filed Nov. 22, 1993, Ser. No. 156,562
Int. Cl.[6] A47C 7/74
U.S. Cl. 297—180.13 9 Claims



1. Apparatus for selectively varying the environmental temperature of a vehicle seat comprising:

a support member in the seat formed from a resilient material, wherein the support member includes:

an integral air flow channel that extends through the support member from a bottom surface to a top surface of the support member, the air flow channel having an inlet at the bottom surface of the support member for receiving temperature conditioned air therein, and further having an outlet at the top surface of the support member for dispensing temperature conditioned air therefrom; and

at least one air subchannel integral with and extending along a top surface of the support member, wherein the air subchannel is connected with the outlet of the air flow channel; and

a porous member which substantially covers the top surface area of the support member, the porous member having an interface with the air subchannel; and

a seat cover that substantially encapsulates the porous member to the support member.

5,597,201

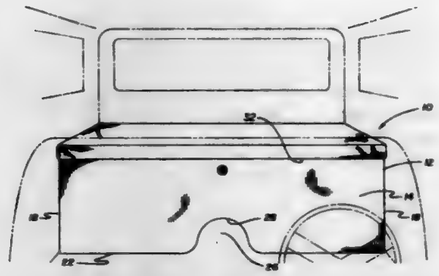
EXTENDED CAB TRUCK STORAGE SEAT

Billy W. Hinze, Rte. 2, Box 118, Sedgewickville, Mo. 63781

Filed Oct. 2, 1995, Ser. No. 537,526
Int. Cl.[6] A47C 7/62
U.S. Cl. 297—188.1 2 Claims

1. A new and improved extended cab truck storage seat comprising, in combination:

a box of an essentially rigid material comprising a front wall and a rear wall in a generally vertical orientation and parallel side walls in a generally vertical orientation coupled at their side edges to the side edges of the front and rear walls, the box including a lower generally horizontal wall in an essentially rectangular configuration coupled at its front, rear and side edges to the bottom edges of the front, rear and side walls, the front and rear walls having a generally arcuate recess extending upwardly from their lower edges about an essentially common axis of rotation, the lower wall having an upwardly extending arcuate intermediate extent coupled at the front and rear edges thereof to the peripheral edges of the recesses of the front and rear walls, the front, rear, side and lower walls being fabricated of steel and defining an open rectangular top at the top edges of the front, rear and side walls;



a lid in a generally rectangular configuration having peripheral front, rear and side edges adapted to overlie the upper edges of the front, rear and side walls of the box;

a hinge pivotally coupling the rear edge of the lid to the upper edge of the rear wall to allow the lid to move between a lower closed orientation for sealing the box and a raised open orientation for allowing access to the interior of the box;

a lock with a button extending through an aperture in the front wall of the box adjacent to the upper edge thereof having a finger pivotable in response to the depression of the button and, in association therewith, a locking finger with a horizontal surface extending downwardly from the lower surface of the lid adjacent to the finger to allow locking the lid in the lower orientation and unlocking the lid upon the depression of the button and pivoting away of the finger;

padding positionable upon the upper surface of the lower wall having laterally disposed rectangular sections and an arcuately shaped raised intermediate section therebetween resting over the raised intermediate extent of the lower wall; and

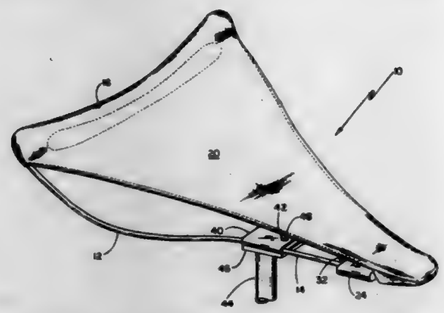
a covering for the upper and side surfaces of the lid including a foam layer and a fabric covering thereover.

5,597,202

SLUNG FABRIC BICYCLE SEAT

Scott Andersen, 14959 Riverside North, Marine on St. Croix, Minn. 55047

Continuation-in-part of Ser. No. 184,843, Jan. 21, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 377,693
Int. Cl.[6] B60N 2/38
U.S. Cl. 297—195.1 4 Claims



1. A bicycle seat, comprising:

(a) a frame member extending from a proximal end to a distal end with a midsection therebetween, with the midsection lying along a predetermined plane, said distal end extending upwardly from the plane of the midsection of the frame; and

(b) a single piece of flexible fabric slung between and secured to both said frame proximal end and said distal end, said flexible fabric being drawn taut to define a bicycle seat supporting surface disposed between lateral edges and with the bicycle seat supporting surface lying entirely in a single plane and extending above the plane of said frame midsection, said fabric seat supporting surface having a generally triangular shape with the base portion thereof defining the distal end, and with the two sides of the triangular shape defining the lateral edges of said bicycle seat supporting surface, and with the apex of the triangle defining the proximal end, said bicycle seat supporting surface being freely suspended over said frame midsection with said two sides being elevated thereover;

(c) the arrangement being such that said tautly drawn flexible fabric defines said bicycle seat supporting surface and wherein said bicycle seat supporting surface is disposed in elevated spaced relationship over said frame midsection;

(d) said frame comprises an elongated rod, with said rod extending laterally at the frame distal end and with said frame distal end supporting the entire length of the base portion of said triangularly shaped tautly held flexible fabric;

(e) wherein said flexible fabric base portion has an elongated sleeve formed integrally therewith and adapted to slidably and releasably receive said frame rod to support said slung fabric along said frame distal end;

(f) wherein said frame further includes an adjustable attachment member at said proximal end, said fabric apex being formed into an attachment member receiving pocket and adapted to receive said frame proximal end therewithin, said attachment member facilitating drawing said slung flexible fabric taut when in extended disposition, and loosening said flexible fabric tautness when in retracted disposition to facilitate removing said flexible fabric from said frame; and

(g) wherein said pocket is greater in width at the top than at the bottom so as to cause said flexible fabric to roll inwardly about itself at its edges at said apex when drawn taut.

5,597,203

SEAT WITH BIOMECHANICAL ARTICULATION

Robert P. Hubbard, East Lansing, Mich., assignor to Board of Trustees Operating Michigan State University, East Lansing, Mich.

Filed Jun. 14, 1994, Ser. No. 259,662
Int. Cl.[6] A47C 3/025
U.S. Cl. 297—284.3 19 Claims



1. A seat with biomechanical articulation for a person seated in the seat comprising:

a seat portion extending generally horizontally;

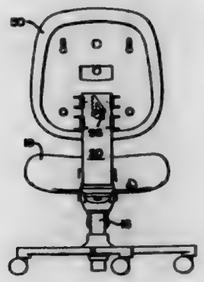
a back portion extending generally upwardly from said seat portion;

a frame interconnecting said seat portion and said back portion;

said seat portion having a seat member pivotally connected to said frame and thigh means pivotally connected to said seat member for supporting thighs of a person seated on said seat member and rotating relative to said seat member in response to movement of said seat member by the person seated in said seat; and

pelvis means connected to said seat member for supporting a pelvis of a person seated on said seat member and moving in response to movement of said seat member by the person seated in said seat.

5,597,204
HEIGHT ADJUSTMENT DEVICE
Donald G. Karam, Jr., Saugatuck, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Aug. 4, 1995, Ser. No. 511,702
Int. Cl.[6] B60N 2/02
U.S. Cl. 297—353 14 Claims



9. A device for adjusting and releasably locking a chair backrest in any of a plurality of vertical positions relative to the seat support of the type in which the backrest is vertically slidably mounted on the vertically extending strap portion of the seat support, the backrest and strap portion have overlapping tracks and slots including cam surfaces that receive a lock pin, the lock pin moves in the tracks and slots in response to gravity and the vertical movement of the backrest and the lock pin locks the backrest in a series of vertical locked positions, wherein the invention comprises:

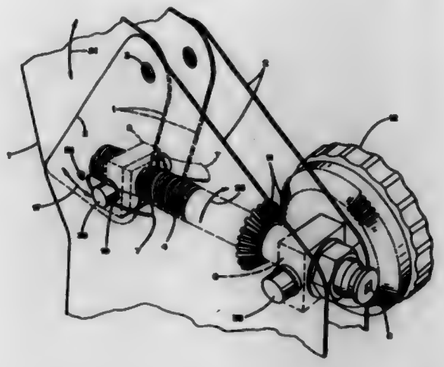
said track including a first downwardly inclined cam surface that the lock pin encounters when the backrest is lifted from a highest locked position, said first downwardly inclined cam surface causes the lock pin to move laterally to a first rest position at which the backrest is at a higher elevation than its highest locked position;

said track includes a first upwardly inclined cam surface including a hook portion at its upper end, said upwardly inclined cam surface overlies said first rest position such that when said backrest is released the lock pin encounters said upwardly inclined cam surface and follows it into the hook portion, when said hook portion is encountered by said lock pin further downward movement of the backrest is prevented and the backrest is in a stopped position;

said track includes a second downwardly inclined cam surface that includes a second rest position at its lower end, said second downwardly inclined cam surface underlies said hook portion such that when said backrest is raised from its stopped position in the hook portion the lock pin encounters said second downwardly inclined cam surface and follows it down to said second rest position,

said track includes a second upwardly inclined cam surface, the bottom portion of said second inclined cam surface overlies said second rest position and the upper portion of said second inclined cam surface terminating adjacent a lowest locked position of said track such that when the backrest is released from its second rest position the lock pin will encounter said second inclined cam surface and follow it to said lowest locked position.

5,597,205
ENERGY ABSORBING RESTRAINT SEAT BACK RECLINER FOR APPLICATION ON A RESTRAINT SAFETY SEAT
Patrick M. Glance, and Brad M. Glance, both of Plymouth, Mich., assignors to Concept Analysis Corporation, Plymouth, Mich.
Filed Feb. 25, 1994, Ser. No. 202,818
Int. Cl.[6] B60N 2/22
U.S. Cl. 297—362.14 10 Claims



1. An automotive seat safety restraint recliner for mounting a seat frame to a back frame comprising:

high strength upper and lower body members that are pivotally joined by a recliner pivot pin, the lower body member comprising a pair of longitudinally extending and laterally spaced support plates, the upper body member comprising spaced side walls that are mounted on the pivot pin and fit inside and abut the support plates of the lower body member, the lower body support plates providing outer reinforcement for the upper body side walls where they overlap;

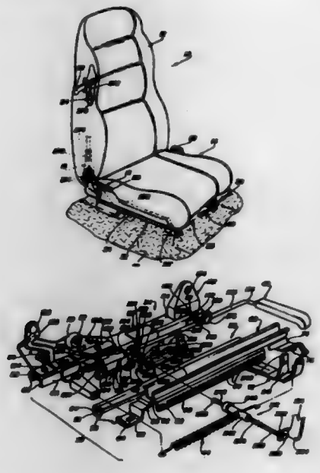
a rotatable lead screw mechanism mounted inside the lower body member between the lower body support plates and below the pivot pin joining the upper and lower body members, the lead screw mechanism comprising a lead screw threadably supported at one end in a travelling pinion nut attached on opposite sides to the upper body side walls at a position inside the lower body support plates, another end of the lead screw being rotatably mounted to a fixed pinion attached at opposite sides to the lower body support plates, the travelling pinion having a pin extending from opposite lateral sides thereon, the pin extending through openings in both side walls of the upper body member and riding in a guide slot in each of the lower body support plates;

rotation of the lead screw creating travel of the travelling pinion nut in the Guide slots and causing pivotal movement of the upper body member relative to the lower body member;

the upper body member being attached to the back frame and an occupant upper shoulder belt being attached to a top of the back frame, such that the recliner resists forward loading created from the shoulder belt during a frontal vehicle crash situation by means of a tension force exerted by the pinion and pinion nut on the lead screw;

the lower body member being attached to a vehicle seat track, which is attached to a lower vehicle structure, such that the upper belt load is transmitted through the lower body member to the lower vehicle structure.

5,597,206
EASY ENTRY SEAT ADJUSTER
Dean R. Ainsworth, Columbus, and Russell D. Bartling, Fremont, both of Nebr., assignors to Douglas & Lomason Company, Farmington, Mich.
Filed Oct. 31, 1995, Ser. No. 550,604
Int. Cl.[6] B60N 2/02
U.S. Cl. 297—378.12 1 Claim



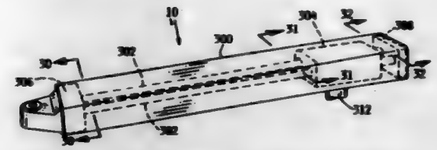
1. A vehicle seat assembly comprising:

a seat cushion;

a seatback mounted to a seat bottom for pivotal movement between an upright position and a forwardly folded dump position; and

a manual seat adjuster having a lower rail assembly adapted to be mounted to a vehicle floor structure, an upper rail assembly supported for sliding movement on said lower rail assembly and on which said seat bottom is mounted, a latch member carried by said upper rail assembly and movable between a first position engaged with said lower rail assembly for inhibiting sliding movement of said upper rail assembly and a second position disengaged from said lower rail assembly for permitting sliding movement of said upper rail assembly, a release handle for moving said latch member from said first position to said second position, a biasing mechanism for normally biasing said latch member toward said first position, and an easy entry latch release mechanism that is operable in a non-actuated mode for permitting movement of said latch member between said first and second positions via actuation of said release handle when said seatback is in said upright position, and in an actuated mode for holding said latch member in said second position in response to pivotal movement of said seatback to said forwardly dumped position, said easy entry latch release mechanism including a stationary lug and means carried by said upper rail assembly for moving said latch member to said second position in response to rotation of said seatback to said forwardly dumped position and holding said latch member in said second position until said seatback has been returned to said upright position and said upper rail assembly has been rearwardly slid past a predetermined memory position whereat said means engages said stationary lug for releasing said latch member to return to said first position so as to latch said upper rail assembly to said lower rail assembly at said memory position.

5,597,207
ERGONOMIC ARM SUPPORT
Jeffrey D. Bergsten, Brooklyn Park, and Donald A. Bergsten, Eden Prairie, both of Minn., assignors to Industrial Ergonomics, St. Louis Park, Minn.
Continuation-in-part of Ser. No. 141,196, Oct. 21, 1993, Pat. No. 5,369,805, which is a continuation-in-part of Ser. No. 755,432, Sep. 5, 1991, Pat. No. 5,281,001. This application Oct. 20, 1994, Ser. No. 326,825
Int. Cl.[6] A47C 7/54
U.S. Cl. 297—411.35 11 Claims



1. An arm support connectable to an object, comprising:

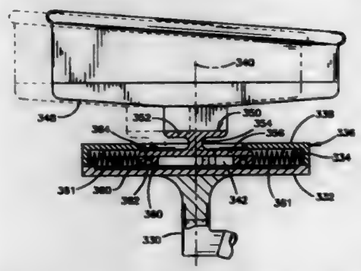
(a) a base connectable to the object;

(b) an arm rest for engaging at least a portion of an arm; and

(c) a pillow block having at least one linear slide, said pillow block confining a plurality of roller bearing means, said roller bearing means engaging a portion of said linear slide for reducing friction generated by said linear slide, said linear slide and said pillow block connectable between said base and said arm rest for sliding said arm rest to and away from said base, said linear slide being swingable relative to said base, said linear slide having a front stop and a rear stop, said pillow block preventing axial rotation of said linear slide, said pillow block further having a standard connected and vertically adjustable to said base whereby a wide range of fluid motion is provided for said arm supported by said arm rest; and

(d) a shroud engaged to said front stop and to said rear stop.

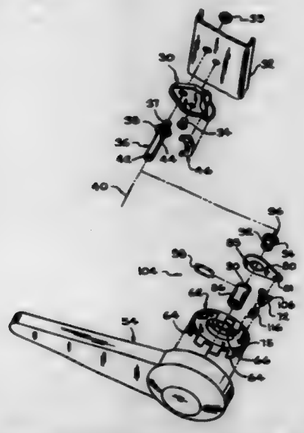
5,597,208
ARMREST ASSEMBLY
Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401
Division of Ser. No. 955,201, Oct. 1, 1992, Pat. No. 5,407,249, which is a continuation-in-part of Ser. No. 597,691, Oct. 15, 1990, Pat. No. 5,215,282. This application Mar. 6, 1995, Ser. No. 399,141
Int. Cl.[6] A47C 7/54
U.S. Cl. 297—411.35 24 Claims



1. An armrest assembly for use with a chair having a seat with a lower side and an upper side which is engaged by a person sitting on the seat, said armrest assembly comprising an arm disposed beneath the seat and having a first end portion pivotally connected with the lower side of the seat at a location spaced from edge portions of the seat by a distance which is at least substantially as great as the length of said arm, said arm being pivotal about a first axis which extends transversely to a central axis of said arm to move said arm along the lower side of the seat, said arm having a

second end portion which is disposed adjacent to one of the edge portions of the seat, a support member connected with and extending upward from said second end portion of said arm, an armrest connected with said support member, said support member being pivotal relative to said arm about a second axis which extends transversely to the central axis of said arm to enable said armrest to be pivoted about the first and second axes, and a slide assembly connected with said armrest and said support member, said slide assembly including a flat side surface, said armrest being movable relative to said support member in any direction parallel to said flat side surface.

5,597,209
ADJUSTABLE VEHICLE SEAT ARMREST WITH A RATCHET
Kurt A. Bart, Brighton; Wojciech Wdziekonski, Detroit, and Frank Wu, Novi, all of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.
Filed May 11, 1995, Ser. No. 438,770
Int. Cl.[6] A47C 7/54
U.S. Cl. 297—411.38 **14 Claims**



9. In a vehicle seat assembly having a generally horizontal seat cushion, a generally upright seat back having a lateral side and an armrest mounted to said lateral side of said seat back and extending generally forwardly therefrom and said armrest being rotatable over an adjustment range of use positions having upper and lower ends, ratchet means for preventing downward rotation of said armrest while permitting upward movement of said armrest within said adjustment range comprising:

a sector gear fixed to said seat back having an array of teeth arranged in an arc concentric about an axis of rotation of said armrest;

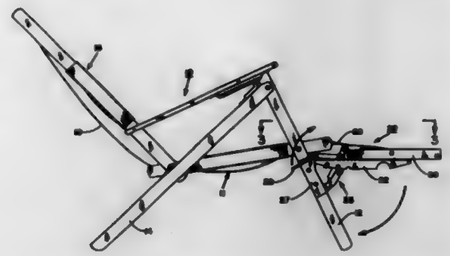
a pawl rotatably coupled to said armrest having a tooth engageable with said sector gear teeth, said pawl and sector gear teeth being configured to permit sliding of said pawl tooth along said sector gear teeth as said armrest is raised and said pawl and sector gear teeth being configured to abut one another when said armrest is forced downward to prevent lowering of said armrest in said adjustment range;

spring means for biasing said pawl tooth into engagement with said sector gear teeth;

release means for releasing said ratchet means after said armrest is moved upward beyond said upper end of said adjustment range to enable downward movement of said armrest until said armrest is lowered to said lower end of said adjustment range, said release means including an elongated release tooth at the end of said array of sector gear teeth causing sufficient rotation of said pawl as said pawl passes said release tooth to rotate said pawl over center with respect to said spring means whereby said spring means biases said pawl tooth away from said sector gear to enable said armrest to be lowered; and

said sector gear having an elongated return tooth at the opposite end of said array to engage said pawl tooth when in said release position to return said pawl over center with respect to said spring means to once again bias said pawl tooth toward said sector gear.

5,597,210
FOLDABLE CHAIR WITH RETRACTABLE LEG REST
Peter B. Pickard, R.D. #7, Box 142, Rome, N.Y. 13440
Filed Jan. 23, 1995, Ser. No. 377,839
Int. Cl.[6] A47C 1/034
U.S. Cl. 297—423.36 **8 Claims**



2. A foldable chair having a seat and a pair of spaced apart front legs, said chair including

a pair of opposed support members pivotally mounted upon the front legs of the chair beneath the seat;

said support members being rotatable between a stored position wherein the members are adjacent to and parallel with the front legs of the chair and a raised position wherein said members protrude outwardly from said legs;

actuating means connected to said support members for manually moving the members between said stored position and said elevated position;

a pair of extendable arms, slidably mounted upon the support members;

linkage means connected between the actuating means and the extendable arms for moving the arms from a fully retracted position when the support members are in the stored position to a fully extended position when the support members are in the raised position;

first and second guide rail means mounted upon each of said support members, said extendable arms being slidably mounted in said first guide rail means of each support member and said linkage means slidably mounted in said second guide rail means whereby the motion of the extendable arms is coordinated through said linkage means with the motion of the support members; and

a bracket means for cojoining the two extendable arms and further including a connecting means for coupling the linkage means to said bracket means.

5,597,211
BIDIRECTIONAL SIDE DUMP TRAILER
Randy Golden, 15 S. 14th St., Council Bluffs, Iowa 51501
Filed Jul. 30, 1996, Ser. No. 688,506
Int. Cl.[6] B60P 1/16
U.S. Cl. 298—17.6 **14 Claims**

14. A bidirectional side dump unit comprising:

a frame having a forward end, a rearward end and opposite sides;

first and second forward tub supports mounted on said frame adjacent said forward end of said frame, said first forward tub support adjacent one side of said frame and said second forward tub support adjacent the other side of said frame;

first and second rearward tub supports mounted on said frame adjacent said rearward end of said frame, said first rearward tub support adjacent one side of said frame and said second rearward tub support adjacent the other side of said frame;

a containment tub including a base wall, at least two side walls, a front wall and a rear wall thereby defining an open-topped containment tub having exterior and interior surfaces;

first and second forward pivotable support connectors mounted on said exterior surface of said containment tub adjacent said front wall;

first and second rearward pivotable support connectors mounted on said exterior surface of said containment tub adjacent said rear wall;

said containment tub being pivotably mounted on said frame by releasable connection of each of said first and second forward pivotable support connectors to a respective one of said first and second forward tub supports, and releasable connection of each of said first and second rearward pivotable support connectors to a respective one of said first and second rearward tub supports;

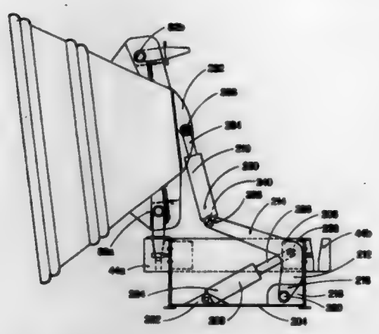
first and second forward releasable locking means each mounted adjacent a respective one of said first and second forward tub supports and first and second rearward locking means each mounted adjacent a respective one of said first and second rearward tub supports for releasably securing said first and second forward and rearward pivotable support connectors to a respective one of said forward and rearward tub supports;

a lifting system mounted on said frame intermediate said forward and rearward ends, said lifting system operative to lift and pivot said containment tub away from said frame;

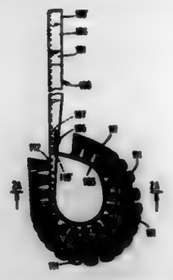
means for selectively engaging said lifting system whereby said containment tub will pivot about said first forward and rearward pivotable support connectors when said first forward and rearward pivotable support connectors are secured within said first forward and rearward tub supports by said first forward and rearward locking means, and said containment tub will pivot about said second forward and rearward pivotable support connectors when said second forward and rearward pivotable support connectors are secured within said second forward and rearward tub supports by said second forward and rearward locking means;

said containment tub further comprising at least one circumferential reinforcement band mounted on said tub, said band connected to said front wall, said rear wall and said side walls and extending around said containment tub such that said walls are reinforced by said circumferential reinforcement band; and

said containment tub further comprising a central tub reinforcement structure mounted within said containment tub, said central tub reinforcement structure having a generally inverted V-shaped cross-sectional shape including front and rear walls angled upwards and inwards and connecting to one another forming a top, said walls mounted on said base wall and said side walls, said top of said central tub reinforcement structure extending upwards to a point below the top of said containment tub whereby said containment tub may carry long objects.



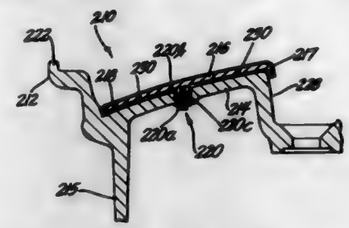
5,597,212
METHOD FOR FORMING INTEGRAL FUSED CONTRUCTIONS
John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Forestdale, Vt.
Division of Ser. No. 137,537, Oct. 18, 1993, Pat. No. 5,511,274. This application Jun. 6, 1995, Ser. No. 467,643
Int. Cl.[6] A46D 1/08; 1/10
U.S. Cl. 300—21 **7 Claims**



1. Method for forming a three-dimensional hollow tufted construction having a radially curved portion and a handle portion from a two-dimensional projection thereof comprising the steps of:

providing a thin, flexible thermoplastic sheet configured as a two-dimensional projection of said three-dimensional tufted construction said sheet including a portion having opposed curved edges; a first surface of said sheet having prefused monofilament tufts integrally fused thereon at predetermined sites at least on that portion having curved edges and joining opposite edges of said sheet to form said construction.

5,597,213
WHEEL AND OVERLAY ASSEMBLY
Lee A. Chase, Ada, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.
Filed Jun. 6, 1995, Ser. No. 467,700
Int. Cl.[6] B60B 7/06
U.S. Cl. 301—37.43 **40 Claims**



32. A wheel and overlay assembly comprising:

a disk portion and a rim portion circumscribing said disk portion, said disk and rim portions defining an outboard surface of said wheel;

an overlay juxtaposed said outboard surface of said wheel, said overlay having an inboard surface complementary to and facing said outboard surface of said wheel;

means attached to said inboard surface of said overlay and engaging said outboard surface of said wheel for temporarily securing and for positively positioning said overlay on said

outboard surface of said wheel, said securing and positioning means being attached to said inboard surface prior to securing and positioning said overlay on said wheel and causing said overlay to be centrally located with respect to said rim portion of said wheel and spaced from said outboard surface of said wheel so as to define at least one gap therebetween when said overlay is mounted on said wheel; and

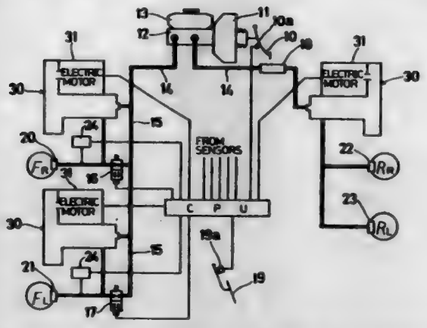
a permanent adhesive disposed in said at least one gap for permanently securing said overlay to said wheel.

5,597,214

BRAKE FORCE CONTROL DEVICE FOR A VEHICLE

Masayuki Katagiri, Toyota, and Kazuhiko Suzuki, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 2, 1994, Ser. No. 353,378
Claims priority, application Japan, Dec. 9, 1993, 5-309532
Int. Cl.[6] B60T *13/16*
U.S. Cl. 303—10 **5 Claims**



1. A brake force control device for a vehicle that includes an accelerator pedal and a brake pedal comprising:

a master cylinder for generating a brake pressure by operation of the brake pedal;

a wheel brake for being mounted on a vehicle wheel and connected to the master cylinder through a conduit;

a pressure control chamber connected to the wheel brake;

a displacement actuator which varies the capacity of the pressure control chamber; and

pressure apply means for starting operation of the displacement actuator to supply a predetermined brake pressure to the wheel brake whenever the brake pedal is not operated and the accelerator pedal is released.

5,597,215

METHOD FOR INCREASING DRIVE TORQUE WITH CONTROLLED BRAKE ENGAGEMENT

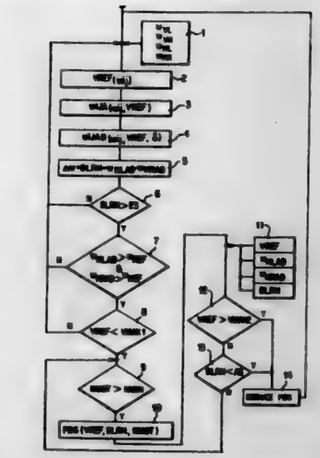
Gerhard Fischle, Reutlingen; Matthias Baumann, Boeblingen; Ralph Klingel, Winnebeim; Thomas Mieslinger, Igginger, and Carola Pfister, Pleidingen, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed May 30, 1995, Ser. No. 452,994
Claims priority, application Germany, May 28, 1994, 44 18 773.4
Int. Cl.[6] B60T *8/34*
U.S. Cl. 303—139 **23 Claims**

1. A method for increasing drive torque of a motor vehicle, comprising the steps of

(a) measuring wheel speeds of at least driven axle wheels;

(b) subjecting the measured wheel speeds of the wheels of each driven axle to a wheel calibration correction and a cornering detection correction;



(c) determining a speed difference of the wheels of each driven axle as a function of values of the wheel speeds obtained by the wheel calibration correction and the cornering detection correction;

(d) compensating the speed difference between wheels on one side of each driven axle and wheels on another side of each driven axle;

(e) determining a reference velocity representative of vehicle velocity;

(f) producing a braking torque when a cut-in threshold value for the speed difference is exceeded, on the wheels on the one side of each driven axle which have a higher wheel speed only when the wheel velocities corresponding to the wheel speeds are larger than the reference velocity on both sides of the driven axle; and

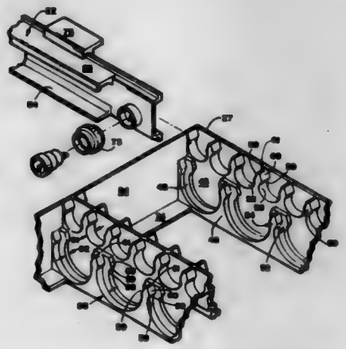
(g) regulating the braking torque as a function of the speed difference.

5,597,216

MULTI-MEDIA STORAGE DRAWER ASSEMBLY

Frank Real, and Francisco Real, both of 9950 Marconi Dr., Otay Mesa, Calif. 92173

Filed Nov. 6, 1995, Ser. No. 554,292
Int. Cl.[6] A47B *81/06*
U.S. Cl. 312—9.54 **11 Claims**



1. A multi-media storage drawer assembly comprising:

a drawer having a front wall, a rear wall, a left side wall and a right side wall;

a column of multi-media storage cells extending from said front wall to said rear wall;

substantially all of said storage cells having an upper flange extending inwardly a predetermined distance D1 from said respective left and right side walls, said upper flanges having a concave upper surface and said upper surfaces being spaced apart a predetermined width W1 so that they can removably receive a CD in its standard case; a first upright wall extends downwardly from each of said upper flanges;

substantially all of said storage cells having a middle flange extending inwardly a predetermined distance D2 from said respective left and right first upright walls, said middle flanges having a concave upper surface and said upper surfaces being spaced apart a predetermined width W2 so that they can removably receive a VHS tape in its standard case; a second upright wall extends downwardly from each of said middle flanges; and

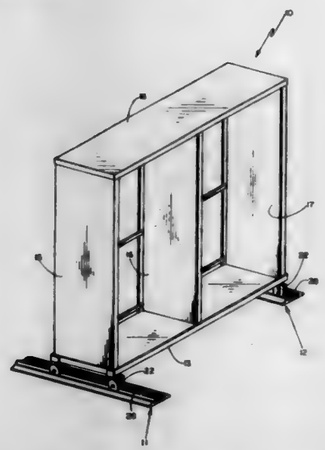
substantially all of said storage cells having a lower flange extending inwardly a predetermined distance D3 from said respective second upright walls, said lower flanges having a concave upper surface and said upper surfaces being spaced apart a predetermined width W3 so they can removably receive an audio cassette in its standard case.

5,597,217

ANTI-TIP BRACKET FOR HIGH CAPACITY SHELVING

Gerald R. Hoska, 10417 Fawns Way, Eden Prairie, Minn. 55347, and Stephen G. Hoska, 16512 NE. Edison St., Ham Lake, Minn. 55449

Filed May 19, 1995, Ser. No. 444,556
Int. Cl.[6] A47B *53/00*
U.S. Cl. 312—201 **3 Claims**



1. In combination with a laterally mobile modular storage cabinet system having a base rail support pad, a wheeled carriage frame having a base portion and being mounted on said rail support pad, and providing a movable bottom wall support for a cabinet enclosure mounted upon said carriage frame, and anti-tip means secured to the carriage frame of said system and guidingly engaging said rail support pad for providing anti-tip stability for said enclosures; said anti-tip means comprising:

(a) bracket means secured to the base of said wheeled carriage frame, said bracket means being in the configuration of an inverted "T" and including an elongated leg portion with a cross-member forming a pair of transversely extending legs at the base thereof, said bracket means consisting essentially of a polymer consisting of an acetal resin with the repeating structural unit of said polymer being oxymethylene, and with said polymer having a melting point of between about 175° C. and 181° C. and a melt index of 27.0;

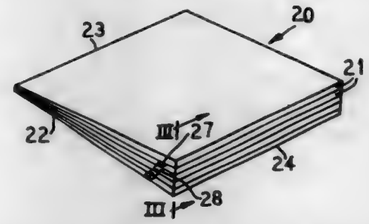
(b) said rail support pad having a top plate forming an upper surface and having a slotted groove with inwardly extending flanges formed along said upper surface and configured to receive the elongated leg portion of said bracket means therein, the configuration being such that the legs of said bracket means engage said inwardly extending flanges of said slotted groove to restrain arcuate tipping of said wheeled frame and cabinet enclosure from said rail support pad.

5,597,218

MONITOR SUPPORT STRUCTURE FOR TILT ANGLE ADJUSTMENT

John N. Lechman, Effingham, Ill., assignor to Nova Manufacturing & Assembly, Inc., Effingham, Ill.

Filed May 31, 1995, Ser. No. 451,028
Int. Cl.[6] A47B *97/00*
U.S. Cl. 312—223.3 **3 Claims**



1. An assembly for supporting a monitor means, said assembly being locatable under an aperture in a top member of a work station, said assembly comprising

(A) a shelf means for supporting said monitor means, said shelf means including a bottom support member having a front edge portion and a back edge portion and a back support member angularly associated with said back edge portion;

(B) a pair of shelf means side supports, each one being in laterally spaced relationship relative to the other and being located on a different opposing lateral side of said shelf means, and including means for mounting each one of said side supports to said work station beneath said top member;

(C) means for connecting said shelf means to each one of said side supports for holding said shelf means in angularly disposed relationship relative to said aperture; and

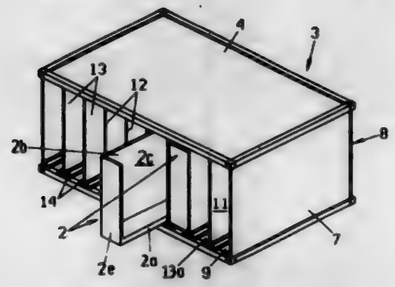
(D) a wedge structure comprising a plurality of selectively removable plies and having a front edge portion and a back edge portion, said front edge portion having a greater thickness than said back edge portion, and having an upper surface and an opposed lower surface, said lower surface resting upon said bottom support member so that a bottom portion of said monitor means can rest against said upper surface and also a back portion of said monitor means can rest against said back support member.

5,597,219

MOBILE RECEPTACLES FOR CIGARETTE TRAYS

Matthias Horn, Ahrensburg; Peter Kigeler, Geesthacht, and Christian Krousch, Berlin, all of Germany, assignors to Hauni Maschinenbau AG, Hamburg, Germany

Filed Feb. 3, 1995, Ser. No. 382,919
Claims priority, application Germany, Feb. 16, 1994, 44 04 901.3
Int. Cl.[6] A47B 88/00
U.S. Cl. 312—330.1 16 Claims



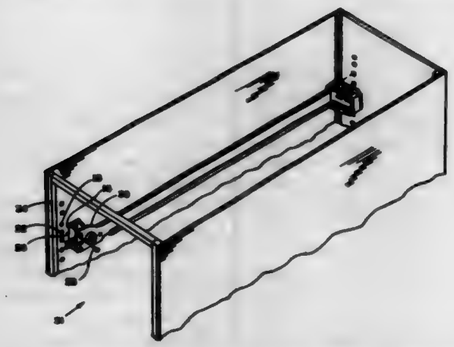
1. A mobile container adapted or temporary confinement and transport of trays each having an open side, a closed side opposite the open side, an open top and a closed bottom opposite the open top, comprising a plurality of walls defining a plurality of tray receiving compartments, said walls including a top wall, a rear wall, a plurality of first partitions including two spaced-apart sidewalls flanking said top wall and said rear wall, and a plurality of additional partitions spaced apart from each other and from said sidewalls, each of said compartments being flanked by two of said partitions and each having an at least substantially open underside an an open front side opposite said rear wall; and first and second ramps respectively provided on at least some of said partitions and at the undersides of said compartments to respectively engage and shift the closed sides and the closed bottoms of trays through the open front sides of said compartments and toward said rear wall.

5,597,220

BRACKET FOR MOUNTING A DRAWER GUIDE SUPPORTING A MOVEABLE STRUCTURE FOR USE IN A DESK OR CABINET

Georg Demenig, and Rick Marsh, both of Kernersville, N.C., assignors to Grass America, Inc., Kernersville, N.C.

Filed Feb. 15, 1995, Ser. No. 388,995
Int. Cl.[6] A47B 88/00
U.S. Cl. 312—334.4 5 Claims



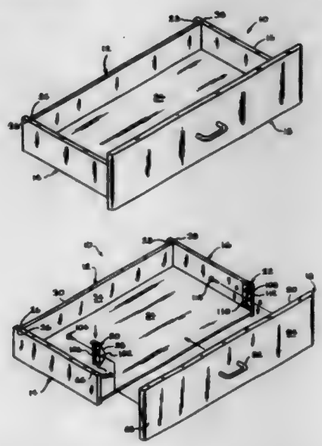
1. A bracket for mounting a drawer guide supporting a moveable structure in a furniture article, the furniture article having opposing sidewalls and a defined opening, the apparatus comprising: a body portion having a bottom surface and a top surface; means carried by said bottom surface for supporting said body portion on one of the sidewalls of the furniture article proximate the defined opening; and means carried by said top surface for supporting the drawer guide in predetermined spaced relationship to said sidewall and said defined opening, said bottom surface being spaced from said drawer guide support means carried by said top surface to enable movement of the moveable structure supported on said drawer guide through the defined opening, said drawer guide support means being positioned on said top surface to support said drawer guide in substantially horizontally aligned relationship to said sidewall, and said drawer guide support means comprising a plurality of holes defined in said top surface, each for receiving a drawer guide fastening screw.

5,597,221

DRAWER ASSEMBLY HAVING INTERLOCKING MEMBERS

Jerry D. Grieser, Archbold; Richard A. Nelson, Napoleon; Gordon D. Schumacher; Thomas B. Warner, both of Archbold, and David M. Dietrich, Napoleon, all of Ohio, assignors to Sauder Woodworking Co., Archbold, Ohio

Filed Nov. 1, 1995, Ser. No. 551,311
Int. Cl.[6] A47B 88/04
U.S. Cl. 312—348.1 10 Claims
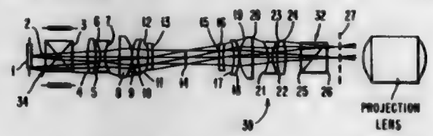


1. A drawer assembly comprising:
a drawer back having a first end, a second end, a top end, a bottom end and a drawer back inner surface, said first end defining a first tongue, said second end defining a second tongue;
a first drawer side having a first front portion, a first back portion, a first drawer side inner surface, said first front portion defining a first front portion groove, said first back portion defining a first back portion groove, said first back portion groove receiving said first tongue of said drawer back;
a second drawer side having a second front portion, a second back portion, a second top portion, a second bottom portion and a second drawer side inner surface, said second front portion defining a second front portion groove, said second back portion defining a second back portion groove, said second back portion groove receiving said second tongue of said drawer back;
a drawer front having an outside surface and an inside surface;
a first drawer bracket having a first front member and a first side member, said first front member defining a first opening for receiving first fastening means for attaching said first front portion to said inside surface of said drawer front, said first side member defining a first bracket tongue;
a second drawer bracket having a second front member and a second side member, said second front member defining a second opening for receiving second fastening means for attaching said second front portion to said inside surface of said drawer front, said second side member defining a second bracket tongue;
each of said first and second bracket tongues including a bracket central portion and a single bracket terminal portion including a bracket front wall, two opposed bracket back walls, a first bracket side wall and an opposed second bracket side wall, said bracket front wall being substantially parallel to said bracket back walls, said first bracket side wall being substantially parallel to said second bracket side wall, said front and back bracket walls being substantially perpendicular to said first and second bracket side walls, said bracket terminal portion having a first geometric configuration, said first and second front portion grooves having shapes corresponding to said first and second bracket tongues, respectively, whereby said first and second front portion grooves receive said first and second bracket tongues to join said first and second drawer brackets to said first and second drawer sides.

5,597,222

OPTICAL RELAY LENS SYSTEM FOR PROJECTION DISPLAYS

Fuad E. Doany, Katonah, N.Y., and Rama N. Singh, Bethel, Conn., assignors to IBM Corporation, Armonk, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,696
Int. Cl.[6] G03B 21/14
U.S. Cl. 353—33 5 Claims



1. Apparatus for projecting onto a screen a first image at a first wavelength, a second image at a second wavelength, and a third image at a third wavelength, comprising:
means, including a 1× relay lens, a color splitting prism assembly positioned on a first side of said 1× relay lens, and a polarizing prism assembly positioned on a second side of said 1× relay lens, for combining said first image, said second image and said third image to form a substantially superposed relayed image; and
means for projecting an image of said substantially superposed relayed image onto a screen.

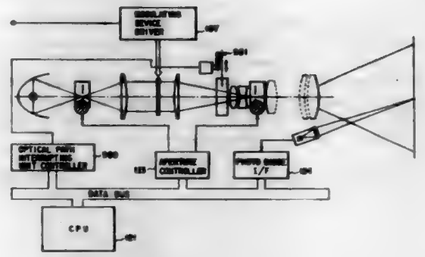
5,597,223

DISPLAY APPARATUS

Yoshihiro Watanabe, Yokohama; Hiroki Nakamura, Chigasaki; Nozomu Harada, Yokohama; Seiji Murakami; Tetsuo Sakamoto, both of Fukaya; Kazuki Taira, Kawasaki, and Yutaka Saitoh, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1994, Ser. No. 363,776
Claims priority, application Japan, Dec. 27, 1993, 5-331786; Jun. 30, 1994, 6-150192; Aug. 12, 1994, 6-190272; Aug. 12, 1994, 6-190273; Aug. 12, 1994, 6-190350
Int. Cl.[6] G03B 21/14
U.S. Cl. 353—97 56 Claims

1. A display apparatus comprising:
a light source;
a modulating device for modulating light emitted from said light source;



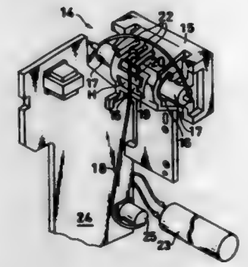
modulating device driving means for driving said modulating device;
first aperture stop means, arranged between said light source and said modulating device, for limiting a bundle of rays to be incident on said modulating device from said light source, said first aperture stop means having an aperture with a variable size;
a display screen onto which exit light from said modulating device is projected;
a projection optical system for projecting the exit light from said modulating device onto said display screen;
second aperture stop means, arranged between said modulating device and said projection optical system, for limiting a bundle of rays to be incident on said projection optical system from said modulating device, said second aperture stop means having an aperture with a variable size;
a photosensor for detecting a display luminance on said display screen; and
aperture control means for controlling the size of the aperture of at least one of said first and second aperture stop means on the basis of a display luminance signal from said photosensor.

5,597,224

STROBOSCOPIC DEVICE FOR HOLDING A TRIGGER LEAD

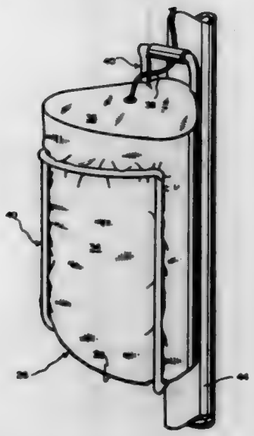
Hideo Kobayashi, Omiya, Japan, assignor to Fuji Photo Optical Co. Ltd, Omiya, Japan

Filed Apr. 4, 1995, Ser. No. 416,350
Claims priority, application Japan, Apr. 14, 1994, 6-101987
Int. Cl.[6] G03B 15/03
U.S. Cl. 362—16 5 Claims



1. A stroboscopic device for holding a trigger lead, comprising:
a housing elastic interposing member for contacting a core wire of said trigger lead directly to a reflector of a lamp said core wire being interposed between said reflector and said housing; and
a holding member for holding said trigger lead with said lead bent at least one time, the holding member being integrally formed in said housing at an end of said trigger lead where a contact portion of said core wire contacts said reflected lamps.

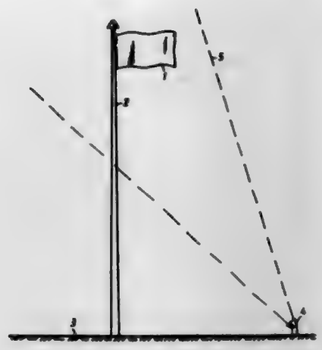
5,597,225
BATTERY SYSTEM FOR SUSTAINED BICYCLE PATHWAY ILLUMINATION, AND METHODS
McKay H. Davis, P.O. Box 520084, Salt Lake City, Utah 84152
Continuation of Ser. No. 401,822, Mar. 9, 1995, Pat. No. 5,523,924, which is a continuation of Ser. No. 221,288, Mar. 31, 1994, Pat. No. 5,426,570. This application Nov. 13, 1995, Ser. No. 554,950
Int. Cl.[6] B62J 6/00
U.S. Cl. 362—72 5 Claims



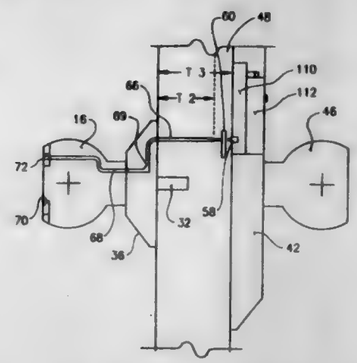
1. A combination comprising:
a bicycle comprising a frame and a pathway illuminating light;
a water bottle cage mounted by fasteners to the frame so as to be entirely open at one end at all times;
a portable source of electrical power comprising a longitudinal axis, terminals free of contact with the water bottle cage and an external casing encasing the source of electrical power in a stationary position therein and comprising at least one exterior side surface removably force compression-fit transverse to said longitudinal axis into tight compressively contiguous relation with the water bottle cage so that (a) the terminals are adjacent to the entirely open end of the cage, (b) the one side surface of the external casing is subjected to transverse force thereby holding the power source in the water bottle cage and (c) the one side surface of the external casing is also substantially exposed to the atmosphere, the terminals being electrically connected to the pathway-illuminating light.

5,597,226
METHOD AND AN ARRANGEMENT FOR ILLUMINATING FLAGS
Peder Fust, Kallsvik, Sweden, assignor to Ultralux AB, Gotteborg, Sweden
PCT No. PCT/SE93/00060, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/15494, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 28, 1993, Ser. No. 256,571
Claims priority, application Sweden, Jan. 29, 1992, 9200250
Int. Cl.[6] F21V 9/16
U.S. Cl. 362—84 12 Claims

1. A method for illuminating flags, and particularly advertising flags which are placed along roads and highways in the neighborhood or restaurants, hotels and gasoline stations, said method comprising: providing a flag including ultralight fluorescent material; raising the flag on a flagpole; and illuminating the flag with a lamp located separate from and spaced apart from the flag, wherein the lamp emits light that includes a significant proportion of ultraviolet light.

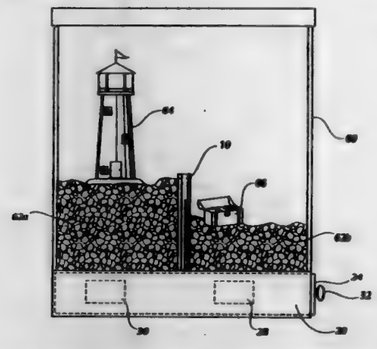


5,597,227
ILLUMINATED DOOR LOCK
Gary R. Bergan, Yorba Linda, and George E. Malley, Dana Point, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Aug. 11, 1995, Ser. No. 514,512
Int. Cl.[6] E05B 17/10
U.S. Cl. 362—100 3 Claims



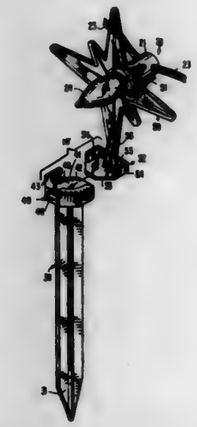
1. A door lock assembly to be secured within a horizontally extending through hole in a door which can have from a minimum to a maximum thickness, comprising
an exterior lock assembly including
a plug having a key receiving opening,
an exterior rose liner,
light pipe means for illuminating said key receiving opening including a rod shaped portion secured to said exterior rose liner and extending axially inwardly for receiving light, and
tubular housing means for receiving said axially extending rod shaped portion,
said tubular housing means having a length corresponding to the length of said axially extending rod shaped portion,
an interior lock assembly including
an interior rose liner and
light transmitting means including a light source for transmitting light axially,
said light transmitting means being supported by said interior rose assembly so that when said door lock assembly is secured within a door having a maximum thickness said light transmitting means will be axially spaced from said rod shaped portion by a distance at least equal to the difference between the minimum and maximum door thickness.

5,597,228
AQUARIUM LANDSCAPE SYSTEM
Daniel Boyle, 101 Earle Ave., Lynbrook, N.Y. 11563
Continuation-in-part of Ser. No. 408,896, Mar. 22, 1995, abandoned. This application Jun. 7, 1995, Ser. No. 475,468
Int. Cl.[6] F21V 33/00
U.S. Cl. 362—101 20 Claims



1. An aquarium landscape system for glass or transparent aquariums having decorative structures and gravel, the decorative structures being hollow and having an exterior surface, the landscape system comprising:
at least one partition means disposed within the aquarium for creating at least one different terrain level therein, said at least one partition means comprising a board having a top and a bottom and extending from one side of the aquarium to the other, said bottom of the board resting on the bottom of the aquarium; and
lighting means for illuminating at least one of the decorative structures within the aquarium.

5,597,229
MULTIPURPOSE COUPLING FOR CONNECTING DECORATIONS TO A STAKE
Wojtek Plichta, Toronto; Ivan Liu, Ontario, both of Canada; Charles W. Fennessy, Lemont, and Frank Lang, Warrenville, both of Ill., assignors to Nomis Inc., Canada
Filed Apr. 6, 1995, Ser. No. 417,923
Int. Cl.[6] F21S 1/10
U.S. Cl. 362—153.1 10 Claims



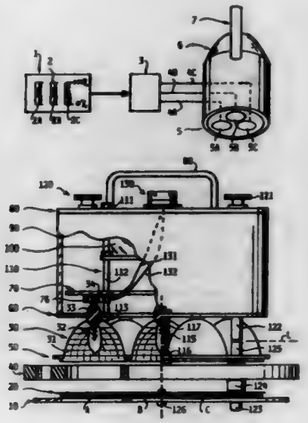
1. A decorative lighting arrangement, comprising:
a) an upright support having an upper region, said support being an elongated stake having a trailing end portion constituting said upper region when said stake is driven into the ground;
b) a lighting fixture including a socket and a light bulb mounted in said socket; and
c) means for connecting said lighting fixture to said support in such a manner that said light bulb and at least a predominant portion of said socket of said lighting fixture are disposed upwardly of said upper region of said support to be visible thereat, said connecting means including a coupling element integral with said trailing end portion of said stake, said coupling elemeat including a platform and an upstanding rim peripherally surrounding a portion of said platform;
said connecting means further including a coupling portion connected with said socket of said lighting fixture and at least frictionally engaging said platform and said rim of said coupling element of said stake to retain said lighting fixture on said stake, said coupling portion including a bottom portion of a housing of said socket, said bottom portion having a bottom surface that is in contact with said platform of said lighting fixture, and respective electric wires emerging from said bottom portion of said housing at opposite sides thereof; and
said upstanding rim bounding a recess for receiving said bottom portion of said housing and having respective open-ended slots for introduction of said wires thereinto as said lighting fixture is being assembled with said stake, said wires being frictionally retained in said slots following such assembly.

5,597,230
ORNAMENTAL CARRIER WITH FLASHLIGHT-TYPE EYES
Alfred T. Newman, 229 Marine Ave., Suite E, Balboa Island, Calif. 92662
Filed Dec. 22, 1995, Ser. No. 577,142
Int. Cl.[6] F21V 33/00
U.S. Cl. 362—154 17 Claims



1. A hollow carrier for carrying treats comprising, in combination:
a shaped body having an opening formed through a top portion thereof through which said treats are freely inserted into and removed from a hollow interior;
a pair of eye openings formed in said shaped body within a face formed on said shaped body;
a handle means for carrying said body secured within said opening at the top portion of said body;
a plurality of light means secured within said hollow interior of said shaded body aligned with said eye openings; each of said plurality of light means comprising a socket, a bulb, a reflector and a lens;
holding means within said hollow interior of said shaped body behind said eye openings for removably capturing said light means therein so that each of said plurality of light means are aligned with said eye openings; and
switch means connected to a power source for actuating said bulbs in said carrier so as to shine beams of light through said eye openings.

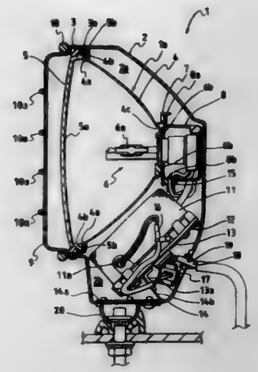
5,597,231
VARIABLE COLOR LIGHT PROJECTOR
James Ronnet, Chemin de la Petite-Garenne 18, CH-1214 Verner, Switzerland
Filed May 22, 1995, Ser. No. 446,410
Claims priority, application Switzerland, May 24, 1994, 1595/94
Int. Cl.[6] F21P *3/00*
U.S. Cl. 362—231 30 Claims



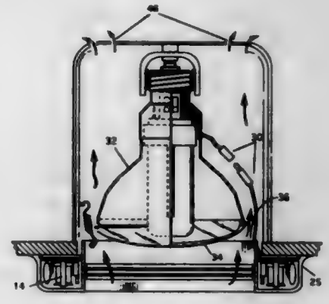
1. A variable color light projector comprising:
at least three lamps each capable of projecting a light beam, and the lamps being oriented so that respective light beams thereof are projected substantially parallel;
at least a set of three color filters positioned relative to the lamps to supply color to the respective beams of light from the lamps;
three supply circuits, each respectively for one of the lamps;
three control devices, each for a respective one of the supply circuits; and
a white light lamp disposed in a central position to the three lamps, with an independent supply circuit and control device.

5,597,232
VEHICULAR HEADLAMP HAVING IMPROVED COLLISION SAFETY
Hideki Ohashi, and Shinji Karasawa, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Jun. 28, 1995, Ser. No. 496,172
Claims priority, application Japan, Jun. 28, 1994, 6-167516
Int. Cl.[6] F21V *15/00*
U.S. Cl. 362—265 9 Claims

1. A vehicular headlamp comprising:
a lamp housing;
a reflector having a frontward-facing, light reflecting surface and an opposite rearward facing surface;
an electric discharge lamp disposed on the frontward facing side of said reflector; and
a container casing containing a lighting circuit board for operating said electric discharge lamp, said reflector, electric discharge lamp and container casing being mounted within said lamp housing, said container casing having a generally rectangular parallelepiped shape, and a fixing member for elastically mounting said casing on said lamp housing in a position adjacent said rearward-facing surface of said reflector, said fixing member being operative to move said casing in a predetermined direction upon application of a force from said frontward facing direction.



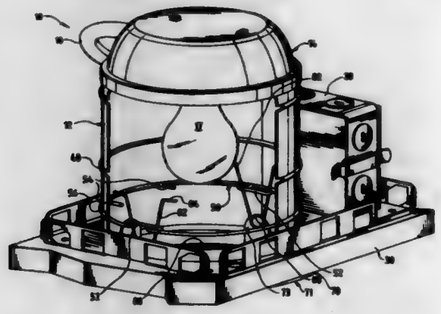
5,597,233
LIGHT FIXTURE
Kenneth Lau, 4327 Point Reyes Ct., Carlsbad, Calif. 92008
Continuation-in-part of Ser. No. 188,807, Jan. 31, 1994, Pat. No. 5,471,375, and a continuation-in-part of Ser. No. 832,988, Feb. 10, 1992, abandoned, and a continuation-in-part of Ser. No. 61,599, May 12, 1993, Pat. No. 5,362,246. This application Apr. 1, 1994, Ser. No. 221,883
Int. Cl.[6] F21V *29/00*
U.S. Cl. 362—294 6 Claims



1. A lamp fixture for mounting at least one lamp which requires a power stabilizer circuit to operate and defines a base, and which illuminates a target area through an opening which passes a beam of light from said lamp therethrough, comprising:
(a) a lamp mount device defining a socket connectable to an available electrical power source for physically receiving and electrically powering the base of said lamp when inserted in said socket;
(b) a substantially continuous-loop-shaped ballast housing of planform dimension similar to the dimensions of said opening, for housing a power stabilizer circuit device;
(c) said power stabilizer circuit device for processing available power, said circuit device being substantially comprised of components housed in said ballast housing and operatively interconnected between said socket and power source to intercept and stabilize power from said power source and deliver power so stabilized and useable by said lamp to said socket; and,
(d) means for supporting said ballast housing, in substantial thermal isolation from said lamp, as a rim around said opening such that said ballast housing is substantially distanced from lamp-generated accumulated heat; and,

(e) said lamp fixture is of a recessed type which mounts said lamp spaced behind a room surface and said opening is defined in said surface and said ballast housing acts as a trim for said opening.

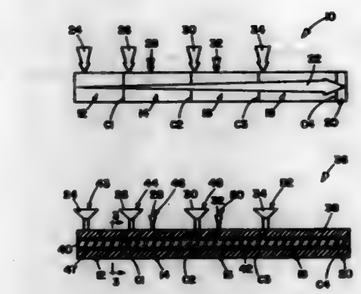
5,597,234
TRIM RETAINER
William Winkelhake, Hoffman Estates, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed May 2, 1994, Ser. No. 237,019
Int. Cl.[6] F21S *1/06*
U.S. Cl. 362—364 18 Claims



1. A trim-ring auxiliary member system for capturing and supporting an auxiliary member relative to an interior and an open end of a lighting housing comprising
said auxiliary member, said housing includes at least one annular groove formed in an inner wall of said housing, said annular groove axially spaced from said open end of said housing,
a support spring member sized to be removably secured to said interior of said housing,
said support spring member disposed within and retained by said at least one annular groove, a connecting spring removably attaching said auxiliary member to said support spring member,
said support spring member including at least one bridge-like rod means extending inwardly into said housing, one end of said connecting spring connected to said rod means and another end of said connecting spring connected to said auxiliary member.

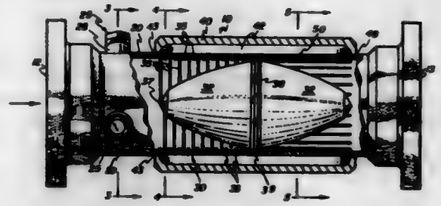
5,597,235
TWIN SCREW EXTRUDER FOR PROCESSING ELASTOMERIC COMPOSITIONS
Roger P. Barnes, Arvada, and Jonathan A. Johnston, Northglenn, both of Colo., assignors to The Gates Corporation, Denver, Colo.
Continuation of Ser. No. 10,126, Jan. 29, 1993, Pat. No. 5,374,387. This application Nov. 15, 1994, Ser. No. 339,969
Int. Cl.[6] B29B *7/88*
U.S. Cl. 366—76.6 5 Claims

1. In a twin screw extruder for mixing carbon black with rubber and of the type with a pair of cylinders with feed ports for adding materials to be mixed, a pair of extrusion screws positioned within the cylinders and with elements for shearing, admixing, moving and extruding materials through the extruder and wherein the screws and cylinders define a plurality of successively interconnected mixing zones of the extruder, the improvement comprising;
a first mixing zone with a first port for adding rubber and materials exclusive of carbon black, and with screw elements as a means for shearing the rubber and raising it to a temperature between 130°–220° C.; and



a second mixing zone with a second port for adding carbon black and materials exclusive of rubber and a third port for adding oil.

5,597,236
HIGH/LOW VISCOSITY STATIC MIXER AND METHOD
Julian B. Fasano, Englewood, Ohio, assignor to Chemineer, Inc., Dayton, Ohio
Filed Mar. 24, 1995, Ser. No. 410,317
Int. Cl.[6] B01F *5/06*
U.S. Cl. 366—181.5 15 Claims



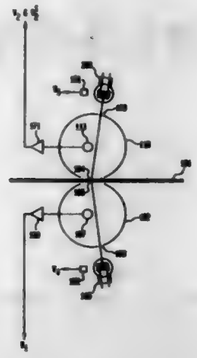
1. An in-line laminar flow mixer for mixing a second fluid into the mainstream flow of a first fluid, comprising:
a first tubular section having an inlet which may be connected to receive therein said mainstream flow,
an injection nozzle extending into said first tubular section and having an outlet slot for admitting a striation of said second fluid into said mainstream flow to form a composite flow,
a first series of slots formed in said first tubular section downstream from said nozzle,
means closing said first tubular section at a position downstream from said slots whereby said composite flow is caused to turn radially outwardly through said first series of slots,
a second tubular section positioned in general axial alignment with said first tubular section,
a second series of slots formed in said second tubular section,
means closing said second tubular section at a position upstream from said second series of slots,
said second tubular section having an outlet positioned downstream of said second series of slots,
a circumferential jacket surrounding said sections and closed at one end at said first tubular section at a position upstream of said first series of slots and closed at an opposite end at said second tubular section at a position downstream of said second series of slots and defining with said first and second section an axial flow path encompassing said first and second series of slots whereby flow from said first section through said first series of slots is directed by said jacket to said second series of slots into said second section.

5,597,237

APPARATUS FOR MEASURING THE EMISSIVITY OF A SEMICONDUCTOR WAFER

Alexander Stein, Secaucus, N.J., assignor to Quantum Logic Corp, Westport, Conn.

Filed May 30, 1995, Ser. No. 458,659
Int. Cl.[6] G01N 25/00;21/47
U.S. Cl. 374—9 2 Claims



1. Apparatus adapted for use in measuring emissivity of a semiconductor wafer having first and second oppositely disposed reflecting surfaces, a portion of any radiant energy directed upon either surface passing through the wafer and its other surface, said apparatus comprising:

a first hollow integrating sphere having first and second spaced apart openings and having an inner surface upon which radiant energy can be distributed, said wafer being disposed with the first reflecting surface adjacent the second opening;

a second hollow integrating sphere having third and fourth spaced apart openings and having an inner surface upon which radiant energy can be distributed, said wafer being disposed with the second reflecting surface adjacent said fourth opening;

a first radiant energy detector disposed on the inner surface of the first sphere to detect the energy distributed thereon;

a second radiant energy detector disposed on the inner surface of the second sphere to detect the energy distributed thereon;

first means to direct a beam of radiant energy through said first opening in said first sphere in such manner that the beam passes through the first sphere and the second opening to strike the first wafer reflecting surface and is thereupon reflected into the first sphere, the reflected energy being distributed upon the inner surface of the first sphere and being detected by said first detector;

second means to direct a beam of radiant energy through said third opening in said second sphere in such manner that the beam passes through the second sphere and the fourth opening to strike said second reflecting surface of said wafer and is thereupon reflected into the second sphere, the reflected energy being distributed upon the inner surface of the second sphere and being detected by said second detector;

third means coupled to said first detector and responsive to its detected energy to derive therefrom a first electrical signal proportional to the energy reflected from said first reflecting surface of said wafer; and

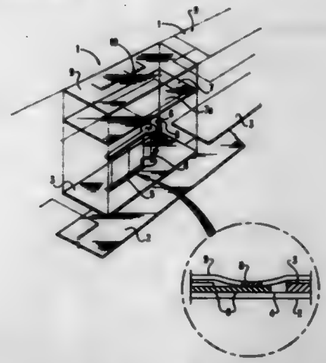
fourth means coupled to said second detector and responsive to its detected energy to derive therefrom a second electrical signal proportional to the energy reflected from said second reflecting surface of said wafer.

5,597,238

MARKING ELEMENT

Terence Culley, Bewdley; Stephen Minter, Hayfield, and John Carnie, Heaton Mersey, all of United Kingdom, assignors to Food Guardian Limited, Malvern, United Kingdom

Filed Jun. 25, 1993, Ser. No. 82,995
Int. Cl.[6] G01K 11/06
U.S. Cl. 374—106 13 Claims



1. A marking element for indicating whether a pre-defined temperature condition has been maintained, comprising:

(a) a base layer;

(b) a film layer; and

(c) an indicating layer;

said indicating layer being disposed between said base layer and said film layer; wherein said indicating layer comprises:

(i) a flowable material which flows when and only when at a temperature above a predetermined temperature;

(ii) an absorbent material which cooperates with said flowable material to produce a detectable change in an area of said absorbent material when said area is contacted by said flowable material; and

(iii) a barrier material disposed between said flowable material and said absorbent material, said barrier material being effective to separate said flowable material from said absorbent material until the barrier material is breached, wherein said barrier material has a melting point lower than that of said film layer and is breachable by the application of a source of heat to said film layer.

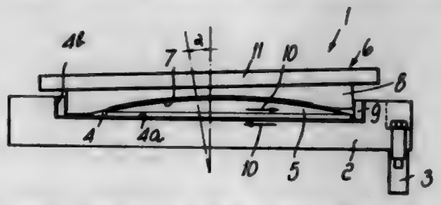
5,597,239

SPHERIC CAP BEARING DEVICE FOR SAFELY CONNECTING ELEMENTS OF BRIDGES, VIADUCTS, BUILDINGS AND THE LIKE

Mauro Scaramuzza, and Mauro Piccolo, both of Selvazzano Dentro, Italy, assignors to FIP Industriale S.p.A., Selvazzano Dentro, Italy

Filed Oct. 2, 1995, Ser. No. 537,532
Claims priority, application Italy, Oct. 4, 1994, MI94A2024
Int. Cl.[6] F16C 31/02
U.S. Cl. 384—36 8 Claims

1. A spheric cap bearing device for safely connecting elements



of bridges, viaducts, and buildings, characterized in that said

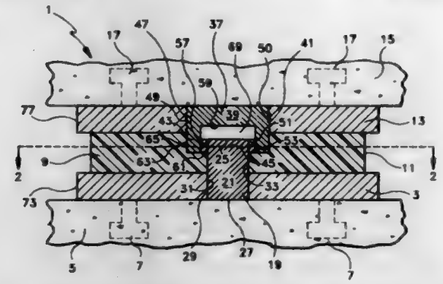
bearing device comprises a bottom element, in which is defined a recess engaging therein a spheric cap coupling element, said coupling element having a bottom slidably bearing on the bottom of said recess and a top element having, on a lower side thereof, a concave recess mating with a spheric surface of said coupling element.

5,597,240

STRUCTURAL BEARING

Edward R. Fyfe, Del Mar, Calif., assignor to Hexcel-Fyfe Co., L.L.C., San Diego, Calif.

Filed Mar. 4, 1996, Ser. No. 610,375
Int. Cl.[6] F16C 27/06; E01D 19/06
U.S. Cl. 384—36 55 Claims



1. A structural bearing subjected to loads having vertical, horizontal, rotational and torsional components comprising:

a) a first, rigid-support member for mounting on a structure on which the bearing is supported;

b) a first layer of elastomeric material mounted on top of said first support member;

c) a second, rigid-support member for operative engagement with a structure supported by the bearing mounted on top of said first layer of elastomeric material;

d) a pin of finite length and terminated by spaced-apart distal ends rigidly attached at one said distal end to one of said support members and extending through said first layer of elastomeric material toward said other support member;

e) a ring extending, from said support member to which said pin is not attached, toward and surrounding said other distal end of said pin and spaced-apart therefrom and further extending at least partially about the free end of said pin thereof to form a cavity thereabout; and,

f) a ring-shaped layer of elastomeric material interposed said ring and said pin and in contact with said first layer of elastomeric material, said first layer of elastomeric material and said ring-shaped layer of elastomeric material for sharing the components of the vertical, horizontal, rotational and torsional loads on the bearing.

5,597,241

Patent Not Issued For This Number

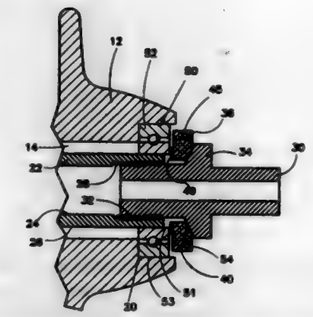
5,597,242

BICYCLE HUB WITH BEARING PRELOAD ADJUSTER

Douglas C. Bealer, Ashville, N.C., assignor to Dia-Compe, U.S.A., Inc., Fletcher, N.C.

Filed Aug. 25, 1995, Ser. No. 519,419
Int. Cl.[6] F16C 23/06
U.S. Cl. 384—517 9 Claims

1. A bicycle hub with a bearing preload device comprising:



a cylindrical hub having two ends, said hub including a passage extending from one end of said hub, through said hub, to the other end of said hub;

a hub bearing assembly positioned in said passage;

an axle positioned within said passage of said hub and rotatably supported upon said bearing assembly;.

an axle end cap adjustably and detachably attached to an end of said axle, said axle end cap having a circumferential flange;

a compression means for adjusting an axial preload on the hub bearing by expansion and contraction thereof; said compression means being positioned around said axle end cap between the circumferential flange of said axle end cap and said hub bearing assembly and in engagement therewith;

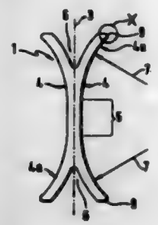
wherein said circumferential flange of said axle end cap has a bevel at a side thereof which faces the bearing assembly.

5,597,243

RADIAL ROLLING BEARING

Theodor Kaiser, Hochstadt an der Aisch; Roland Lippert, Furth; Cornelius Hartmann, Nuremberg; Horst D. Kohler, Herzogenaurach; Ernst Mayer, Grossenseebach, and Bruno Scherb, Cadolzburg, all of Germany, assignors to Ina Walzlager Schaeffler KG, Germany

PCT No. PCT/EP93/02817, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO94/10470, PCT Pub. Date May 11, 1994
PCT Filed Oct. 13, 1993, Ser. No. 411,611
Claims priority, application Germany, Oct. 31, 1992, 42 36 847.3
Int. Cl.[6] F16C 33/51
U.S. Cl. 384—551 13 Claims



1. A radial rolling bearing having cylindrical rolling elements (2) which roll between an inner and an outer ring (11, 10) while individual spacers (1) are disposed between every two adjacent rolling elements (2), the spacers (1) comprising, on both sides of their central longitudinal plane (3), contact surfaces (4) while being guided during rotation of the radial rolling bearing by one of their end sections (4a) on a raceway of the inner or the outer ring (11, 10), characterized in that one portion (5) of the contact surfaces (4) on each side of a pitch circle (12) of the radial rolling bearing has a convex, a concave or a flat contour, and that the contact surfaces

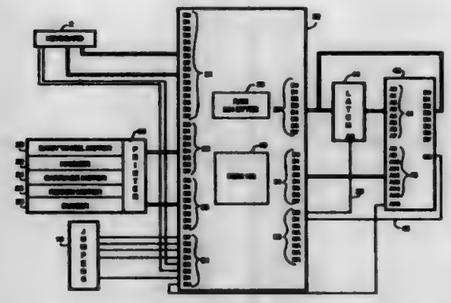
of at least one end section of each spacer are concave having a radius of curvature (7) which is larger than the radius of curvature (8) of the rolling elements (2), and in case of a concave configuration of said portion (5), a radius of curvature thereof is larger than the radius of curvature (7) of the contact surfaces of the end sections (4a).

5,597,244

ELECTRONIC TYPEWRITER WITH SPELL VERIFY

Hiroyuki Ueda, Irvine, and John M. Curren, Huntington Beach, both of Calif., assignors to Canon Business Machines, Inc., Costa Mesa, Calif.

Continuation of Ser. No. 921,644, Jul. 30, 1992, abandoned. This application May 18, 1995, Ser. No. 444,014
Int. Cl.[6] B41J 5/30
U.S. Cl. 400—63 131 Claims



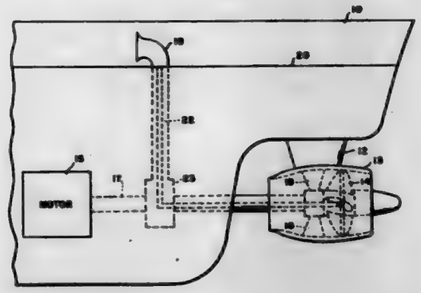
1. A printing apparatus comprising:
input means for manually inputting print information;
output means for outputting print information;
storage means for storing at least one spelling information dictionary; and
processing means including a first dedicated interface comprised of a first multi-bit connection to said output means for interfacing to said output means, a second dedicated interface comprised of a second multi-bit connection to said storage means for delivering address information to said storage means, and a third dedicated interface comprised of a third multi-bit connection and which is connected to an address latching means for latching address information from the third dedicated interface to the storage means simultaneously with the delivery of address information from the second dedicated interface to the storage means and which is also connected to the storage means for receiving spelling information accessed from the storage means, said processing means including a single chip microprocessor having internal program storage means for storing process steps that control said output means to output print information based on print information input by said input means and that access said storage means in accordance with print information input by said input means,
wherein said processing means writes 1) a first part of address information through the second dedicated interface to the storage means and 2) a second part of address information through the third dedicated interface to the storage means; and
wherein the storage means outputs spelling information to the third dedicated interface based on the first and second parts of address information.

5,597,245

CAVITATION SUPPRESSING DUCTED PROPELLER SYSTEM

Leonard Meyerhoff, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 13, 1962, Ser. No. 217,257
Int. Cl.[6] B63H 5/15
U.S. Cl. 440—67 2 Claims



1. A ducted propeller system comprising a propeller having a plurality of blades, a duct fixedly mounted in position around said propeller and having a diameter such that the most radial peripheral portion of said blades rotate in close proximity to said duct, a hollow shaft connected at one end to said propeller for driving said propellers a fluid inlet means connected to said hollow shaft, a peripheral slot in the surface of the propeller blade tips facing the inner surface of said duct wall of each of said propeller blades, said blades further defining an internal passage interconnecting said slot and said hollow shaft whereby fluid supplied to said fluid inlet is discharged through said slot to the area between the duct and the tips of said blades to minimize cavitation in said area.

5,597,246

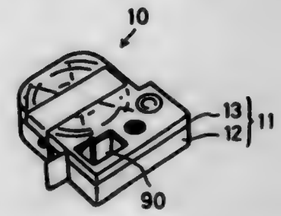
Patent Not Issued For This Number

5,597,247

TAPE CARTRIDGE FOR USE IN A TAPE PRINTER

Daisuke Inabushi, and Hideo Sodeyama, both of Nagano, Japan, assignors to Seiko Epson Corporation, Chiba, and King Jim Co., Ltd., Tokyo, both of Japan

Filed Dec. 15, 1994, Ser. No. 357,126
Int. Cl.[6] B41J 35/28
U.S. Cl. 400—207 13 Claims



1. A tape cartridge for use in a tape printer, said tape cartridge comprising: a casing constituted by an upper casing part and a lower casing part; a tape supplying section positioned inside said casing; means defining a tape path for transferring a tape fed from said tape supplying section through a printing position; an ink ribbon supplying section positioned inside said casing; an ink ribbon recovery section positioned inside said casing; and means defining an ink ribbon path extending from said ink ribbon supplying section and through the printing position to said ink ribbon recovery section, wherein said casing has first and second side wall portions facing one another across a predetermined gap, which gap defines a part of said ink ribbon path, said first side wall portion being provided with an opening, and said casing further has a shutter portion which is positioned to close said opening when said upper and lower casing parts are assembled with each other.



amount of ink ribbon from being paid out during the printing operation and for maintaining tension in the ribbon.

5,597,250

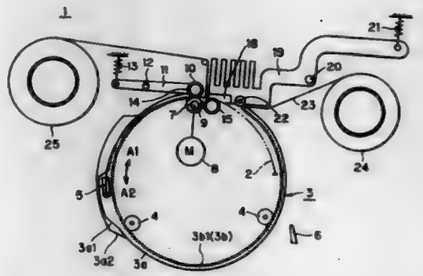
Patent Not Issued For This Number

5,597,251

COLOR PRINTER

Yoshitaka Suzuki, Sagito-machi; Osamu Tajima; Morihiko Ota, both of Moriya-machi; Satoshi Yonemitsu, and Masaki Takahashi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 21, 1995, Ser. No. 576,230
Claims priority, application Japan, Dec. 22, 1994, 6-336198
Int. Cl.[6] B41J 13/10
U.S. Cl. 400—645.4 6 Claims



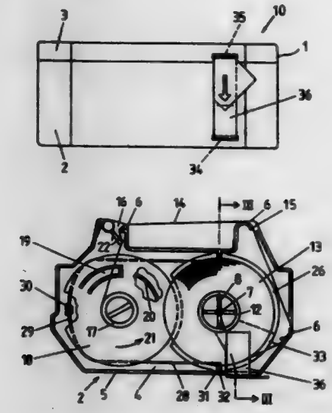
1. An image recording apparatus comprising:
a thermal head;
a capstan roller;
a platen roller having a circumference which is shorter than a length of a print medium which is pre-cut to said length;
a pinch roller for transporting said print medium with said pinch roller being driven by a constant rotation of said capstan roller, and with said print medium being held between said pinch roller and said capstan roller;
printing means for printing an image on said print medium by transporting an ink ribbon and said print medium between said thermal head and said platen roller;
a pair of clamp rings each having a circumference which has at least a same length as that of said print medium, said clamp rings rotatably installed respectively and correspondingly with ends of said thermal head; and
a clamper being connected with said pair of clamp rings for clamping said print medium, and for rotating said print medium together with said clamp rings and for printing said image on said print medium.

5,597,248

INK RIBBON CASSETTE

Markus Burgin, Uster, Switzerland, assignor to Pelikan Produktions AG, Egg, Switzerland

Filed Apr. 27, 1995, Ser. No. 430,877
Claims priority, application Germany, Apr. 27, 1994, 9407018 U
Int. Cl.[6] B41J 35/28
U.S. Cl. 400—207 15 Claims



1. An ink ribbon cassette for feeding and driving an ink ribbon, said ink ribbon having a front end, said ink ribbon cassette comprising: a housing; a take-up core rotatably mounted in said housing, the front end of the ink ribbon being coupled to said take-up core; a take-off core rotatably mounted in said housing; an ink ribbon spool mounted upon said take-off core, said ink ribbon spool having an outer periphery, and a brake assembly having a conical plate, said outer periphery of said ink ribbon spool resting on said conical plate.

5,597,249

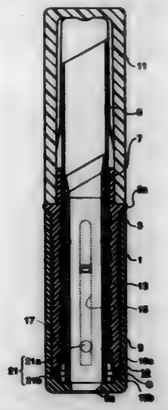
INK RIBBON CARTRIDGE

John D. Mistyurik, Troy, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 137,660, Oct. 15, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 320,884
Int. Cl.[6] B41J 33/52
U.S. Cl. 400—234 15 Claims

1. An ink ribbon cartridge for use in a printer during a printing operation, the cartridge comprising: a cartridge housing having a pair of housing sections, an ink ribbon supply roll having a tubular core, a movable latch member for releasably latching the housing sections to each other, and means including a brake member disposed on the movable latch member for preventing an excessive

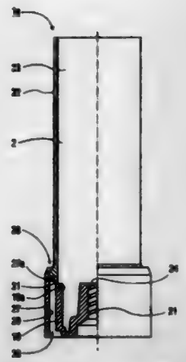
5,597,252
COSMETIC CONTAINER
Kenichi Ito, Funabashi, and Hirokuni Matayoshi, Toride, both of Japan, assignors to Hidan Co., Japan
Filed Jul. 17, 1995, Ser. No. 503,122
Claims priority, application Japan, Jul. 18, 1994, 6-187766
Int. Cl.[6] A45D *40/06;40/04*
U.S. Cl. 401—78 10 Claims



1. A cosmetic container comprising: a main body provided at a lower portion thereof with slot means extending in a longitudinal direction; an outer body provided with a continuous spiral groove on an inner peripheral surface thereof, said outer body surrounding said main body substantially in close relation to each other but allowing relative rotation therebetween; a cosmetic holder accommodated within said main body substantially in close relation to each other but allowing relative longitudinal sliding movement therebetween, said cosmetic holder being provided with projection means projecting outwardly therefrom through said slot means to be in engagement with said continuous spiral groove so that said cosmetic holder moves longitudinally with respect to said main body in response to rotation of said outer body; a casing surrounding said outer body and rotatable simultaneously with said outer body; a bottom end of said main body being enlarged to form a circumferentially outward projecting bottom extension to be engaged within an annular recess formed cooperatively by lower end portions of said outer body and said casing.

5,597,253
STICK REFILL SYSTEM
Tilwin Lepsius, Duesseldorf; Gerhard Gierenz, Solingen; Klaus Trunelle, Muelheim; Gerd-Ruediger Reisdelder, Meerbusch; Joachim Franken, Duesseldorf, and Hans Hahn, Herne, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany
Division of Ser. No. 50,460, Jul. 15, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 410,948
Claims priority, application Germany, Nov. 15, 1990, 40 36 396.1; Apr. 16, 1991, 41 12 432.4; Jun. 25, 1991, 41 20 969.9
Int. Cl.[6] A45D *40/16;40/06*
U.S. Cl. 401—98 22 Claims

1. A system for refilling a stick product dispenser with a new stick product from a refill tube, dispensing being accomplished by using said dispenser to rub an exposed end of said stick product against a surface to which the stick product adheres, said dispenser including a case having an open end for receiving and dispensing stick product, and a bottom end opposing said open end, whereby said stick product extends over and is movable along the entire longitudinal axis of the case, a manually rotatable knurled nut being rotatably secured to the bottom of said case, an elongated screw threaded spindle having one end concentric with and rigidly



attached to a portion of said knurled nut interior to said case, said threaded spindle extending with its other end terminating at said open end of said case, an advancing component secured against rotation within said case between an innermost end of said stick product and said bottom end of said case, said advancing component having a centrally located threaded hole for receiving said threaded spindle, whereby as said threaded spindle is rotated via said knurled nut in a given direction, said advancing component pushes said stick product out of said case, said stick product being configured to fill an interior portion of said case between said advancing component and the open end of said case, wherein the improvement comprises:

said advancing component being a bowl-shaped piston;

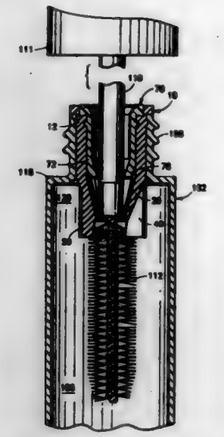
said stick product consisting of a molding of spreadable material having one end secured to said bowl-shaped piston, said stick product having a centrally located blind hole opposing the threaded hole of said piston for receiving said threaded spindle;

a refill tube for containing said molding of said stick product, with said piston protruding from below one end of said refill tube;

a socket formed by a cylindrical skirt of greater diameter than said tube, surrounding said piston with said skirt having one end attached to a bottom exterior circumferential portion of said tube, and the other end of said skirt being open, with an annular space formed between an interior wall of said skirt and an exterior side wall of said piston being dimensioned for securing said socket to a wall portion immediately below the open end of said case, with a ring-shaped stop face being formed about the attachment of said skirt to said tube for abutting against an exterior edge of the open end of said case, whereby when a stick product is spent from said dispenser, the associated piston is removed from said threaded spindle and discarded, a refill tube with new stick product is mounted via said socket onto said case, and said knurled nut is rotated for rotating said spindle to engage said piston to withdraw said piston and attached stick product into said case, and after the new said stick product fills said case, said refill tube and associated skirt are removed from said case.

5,597,254
WIPER WITH VANES FOR USE WITH VISCOUS COSMETICS
Martin M. Vasse, Fairfield, Conn., assignor to The Bridgeport Metal Goods Manufacturing Company, Bridgeport, Conn.
Filed Sep. 25, 1995, Ser. No. 533,362
Int. Cl.[6] A45D *40/26*
U.S. Cl. 401—122 25 Claims

1. A wiper for use in a cosmetics container having a bottle with a neck and an applicator rod and applicator, the wiper removing excess cosmetics from the applicator rod and applicator as they are withdrawn through the neck of the container, the wiper comprising:

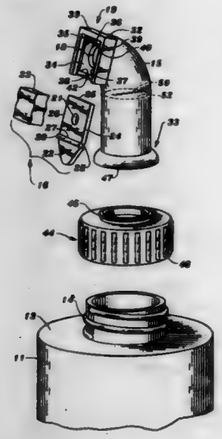


A) a wiper diaphragm adapted for mounting at the lower end of the neck of the bottle of a cosmetics container, the wiper diaphragm defining a wiper orifice and including a conical lower surface extending outwardly from the wiper orifice to an outer periphery of the wiper and descending from the outer periphery of the wiper to the wiper orifice;

B) a plurality of spaced-apart vanes extending downwardly from the lower surface of the wiper diaphragm and angularly outwardly from the wiper orifice; and

C) a plurality of flow channels defined between adjacent spaced-apart vanes and the lower surface of the wiper diaphragm for carrying wiped excess cosmetics away from the wiper orifice.

5,597,255
LIQUID CONTAINER WITH APPLICATOR
Timothy J. Yager, and David C. Yager, both of 1836 Laburnum Ave., Chico, Calif. 95926
Filed Jun. 6, 1995, Ser. No. 476,600
Int. Cl.[6] A47L *1/15;13/17*
U.S. Cl. 401—207 20 Claims



5. In an article for a liquid application, including:

a liquid container having an orifice on an upper portion thereon,

a hollow tubular liquid conduit having a first and second end, respectively, said liquid conduit being connected by the second end to the orifice on the liquid container,

an applicator support on the first end of the liquid conduit, the applicator support having a securing means,

an applicator removably secured to the applicator support, the applicator having a porous foam material,

wherein the improvement comprises:

the applicator comprising a substantially rectangular plate, the rectangular plate having respective sides,

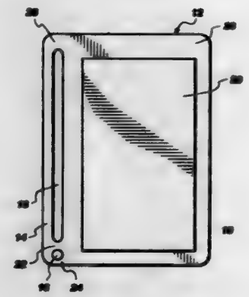
a tab, integrally connected to the plate,

a hole substantially in the center of the plate to provide a first control of liquid therebeyond,

the porous foam material secured on the plate above the hole, such that the applicator being removably secured to the applicator support by the securing means engaging the respective sides on the plate, and

a disc located in said liquid conduit transverse to a liquid flow path and having a slit passing therethrough to provide a second control of liquid therebeyond.

5,597,256
INSERT FOR LOOSE-LEAF BINDER
Joseph D. Burton, 572 Center St., Salt Lake City, Utah 84103-1722; Stephen P. Vuyk, 3898 W. Holyoke Pl., South Jordan, Utah 84095, and Steven C. Hatch, 2943 S. Farah Dr., Salt Lake City, Utah 84118
Filed Jan. 5, 1994, Ser. No. 177,427
Int. Cl.[6] B42F *13/20*
U.S. Cl. 402—4 14 Claims



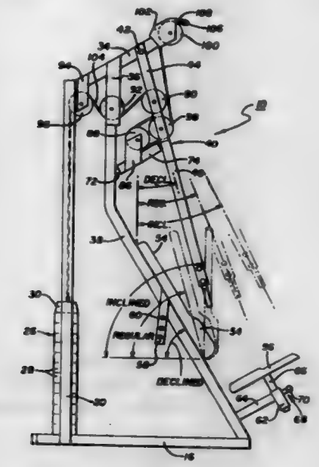
1. An insert for a looseleaf binder of the type having a plurality of retainers disposed in a row along a length thereof proximate a spine to be selectively openable for receiving loose leaves, said insert comprising:

a panel for extending away from the plurality of retainers of the looseleaf binder, a surface of the panel having a securement structure for receiving and retaining an object;

a rib secured at a first end to a first edge of the panel by a first web positioned proximate one end of the panel and secured at a second end to the first edge of the panel by a second web positioned proximate another end of the panel to form a slot extending longitudinally between the first web and the second web and extending laterally between the rib and the first edge of the panel for receiving a first retainer of the plurality of retainers at an arbitrary longitudinal position;

a third web extending between the rib and the first edge of the panel to form an aperture positioned between the second and third webs, the aperture being sized to receive a second retainer of the plurality of retainers for positioning the panel longitudinally.

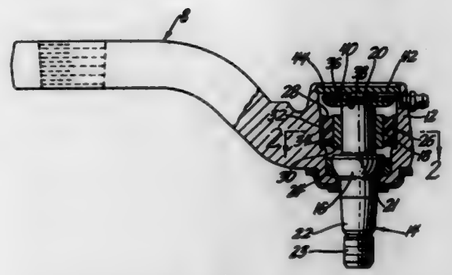
5,597,257
ADJUSTABLE PRESS ARM
Theodore G. Habing, Pacific Fitness Corporation, 6600 W. Katella Ave., Cypress, Calif. 90630
Filed Mar. 23, 1994, Ser. No. 217,199
Int. Cl.[6] A63B 21/00
U.S. Cl. 482—100 11 Claims



1. An exercise machine, comprising:
a frame;
an exercise member pivotally coupled to said frame;
a weight adapted to move relative to said frame;
a cable operatively connected to said exercise member and said weight such that said weight moves relative to said frame when said exercise member is moved relative to said frame;
adjustment means coupled to said frame for engaging said exercise member to define a rest position of said exercise member, said adjustment means being selectively secured to said frame in one of at least two positions, thereby defining a respective one of at least two rest positions for the exercise member, wherein said adjustment means includes a sleeve that slides along an adjustment arm which extends from said frame, said sleeve being adapted to engage said exercise member to define the rest position thereof; and
pulley means connected to said adjustment means and said exercise member for guiding said cable from said exercise member to said weight, said pulley means being adapted to keep said cable free of slack for each rest position of said exercise member.

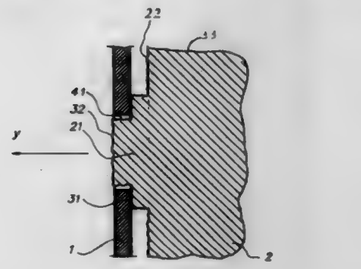
5,597,258
PRELOADED PIVOT JOINT
Jeffrey Klucznik, Clarkston; Manoj Bhandiwad, Utica, and Kenneth G. Kraft, Warren, all of Mich., assignors to American Axle & Manufacturing Inc., Detroit, Mich.
Filed Feb. 2, 1996, Ser. No. 595,658
Int. Cl.[6] F16C 11/06
U.S. Cl. 403—144 3 Claims

1. A preloaded pivot joint assembly comprising;
a housing having an axis,
a stud having an inner end portion that is retained in the housing so that the stud rotates and angulates with respect to the housing,
the inner end portion of the stud having a part spherical collar that engages a fixed bearing seat in the housing, a cylindrical extension and a part spherical tip that engages a moveable bearing seat in the housing,



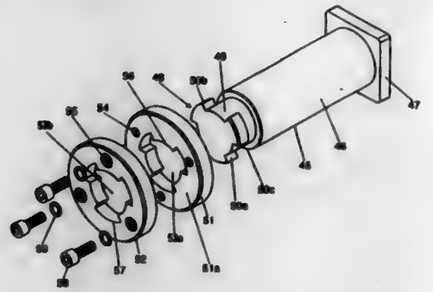
a compression spring biasing the moveable bearing seat against the tip of the stud, and
a resilient bushing mounted in the housing and engaging the cylindrical extension of the stud for accommodating limited angulation of the stud with respect to the housing.

5,597,259
PLATE ASSEMBLY
Constant Bogaerts, Schilde; Eric Van Eckelpoel, Lier; Henri Goossens; Luc Van Goetheem, both of Wilrijk, and Luc Van Aken, Kuringen, all of Belgium, assignors to AGFA-Gevaert N. V., Mortsel, Belgium
Filed Jun. 27, 1994, Ser. No. 265,764
Claims priority, application European Pat. Off., Jul. 12, 1993, 93202054
Int. Cl.[6] F16B 5/00; H05K 5/02;7/18
U.S. Cl. 403—263 8 Claims



1. A panel assembly comprising a generally planar first panel having at least one insertion notch in at least one edge thereof, and a generally planar second panel which is arranged in substantially perpendicular relation to said first panel, said second panel having projecting outwardly from at least one edge thereof at least one projecting tab which terminates in a free end and fits into an insertion notch, said tab including at least one shoulder located at a point along the projecting length of said tab which is between said free end and said one edge of said second panel, said shoulder defining a generally straight shoulder edge directed generally perpendicular to the tab length which is in abutting contact with a portion of said first panel adjacent said insertion notch, whereby said one edge of the second panel is maintained by said shoulder edge out of contact with said first panel, said first panel having one face adjacent said shoulder edge and an opposite face remote therefrom and the free tab end lies substantially flush with said opposite face.

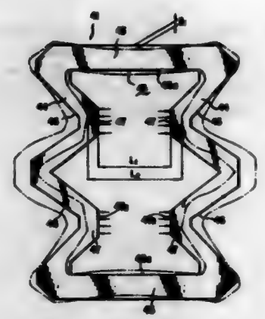
5,597,260
PIN RETENTION SYSTEM
Louis G. Peterson, Queensland, Australia, assignor to G.E.T. Australia Pty Ltd., Queensland, Australia
Filed Nov. 18, 1994, Ser. No. 341,102
Claims priority, application Australia, Nov. 19, 1993, PM2514
Int. Cl.[6] F16B 21/04
U.S. Cl. 403—319 22 Claims



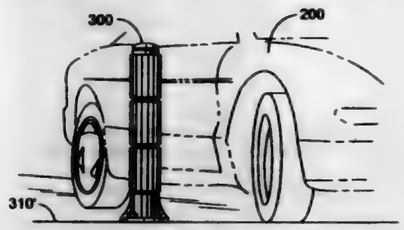
1. A releasable retention system for a clevis pin of a clevissed coupling member of heavy engineering equipment, said retention system comprising:
a male coupling element having an end boss with a least one radially extending projection;
a female coupling element having a flange member with an axially extending aperture of a shape complementary to a cross sectional shape of said end boss having at least one radially extending projection, said male and female coupling elements in use being slidably and non-rotatably engageable by relative axial movement therebetween whereby said end boss is extendable through the aperture in said female element when the at least one radially extending projection on said end boss is aligned with the complementary axially extending aperture in said female element and thereafter, by relative coaxial rotation between said male and female coupling elements, said one or more radially extending projections engage against a retaining face of said flange member to prevent withdrawal of said boss through said aperture, wherein when said male and female coupling elements are engaged, said end boss is circumferentially surrounded by said female coupling element for protection against physical damage.

5,597,261
COUPLING JOINT FOR AN OPERATIVE LEVER APPARATUS
Seita Hayashi, Kanagawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP93/01752, § 371 Date May 31, 1995, § 102(e) Date May 31, 1995, PCT Pub. No. WO94/12922, PCT Pub. Date Jun. 9, 1994
PCT Filed Dec. 1, 1993, Ser. No. 446,622
Claims priority, application Japan, Dec. 1, 1992, 4-082857 U
Int. Cl.[6] B25G 3/28; F16B 7/00; F16C 3/00; F16D 3/00
U.S. Cl. 403—354 10 Claims

1. A coupling member for coupling a rotatable shaft to a rotary shaft of a rotary angle sensor, said coupling member comprising:
a first side having a zig-zag shape;
a second side having a zig-zag shape and being located opposite said first side of said coupling member;
a third linear side connecting a first end of said first side of said coupling member and a first end of said second side of said coupling member;
a fourth linear side, connecting a second end of said first side of said coupling member and a second end of said second side of said coupling member, said fourth linear side being located opposite said third linear side;
wherein said first, second, third and fourth sides of said coupling member define an opening configured to receive a projection extending from a rotary shaft, and said third linear side and said fourth linear side are engageable in a recess formed on a rotatable shaft.

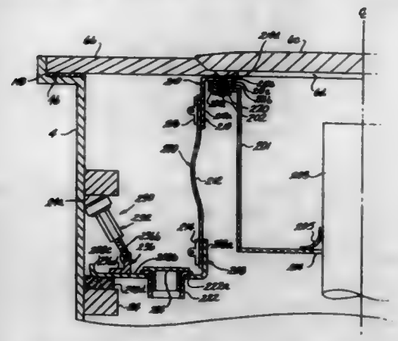


5,597,262
RESILIENT TRAFFIC BOLLARD WITH ROTATABLE COLLAR
Dale W. Beavers, 200 Deer Creek, Powell, Ohio 43065; Jerry F. Fischer, West Chester, Ohio; Vince Dicola, Cincinnati, Ohio, and John D. Boyer, Lebanon, Ohio, assignors to Dale W. Beavers, Powell, Ohio
Filed Mar. 28, 1995, Ser. No. 411,484
Int. Cl.[6] E01F 9/01
U.S. Cl. 404—6 18 Claims



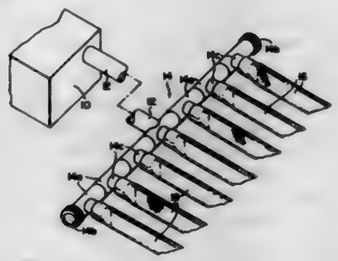
10. A traffic bollard mountable to a path surface for providing a barrier to a vehicle moving on the path surface, said bollard comprising:
a stanchion member extending along a longitudinal axis from an upper distal end to a lower proximal end biasedly attachable to the path surface in a normally upright position, said stanchion member being flexible along substantially the entire extent of its longitudinal axis to be realiiestly deflectable from its normally upright position upon said bollard being contacted with a predetermined amount of force by the moving vehicle; and
at least one collar rotatably mounted about said stanchion member along the longitudinal axis thereof, said collar extending intermediate the distal and proximal ends of said stanchion member and rotating freely about the longitudinal axis thereof upon being contacted by the moving vehicle.

5,597,263
WATERTIGHT SEALING SYSTEM FOR MANHOLE HAVING A SPILL BUCKET
Sergio M. Bravo, 2872 Tigertail Dr., Los Alamitos, Calif. 90720
Continuation-in-part of Ser. No. 286,136, Aug. 4, 1994, Pat. No. 5,474,396. This application Sep. 12, 1995, Ser. No. 527,370
Int. Cl.[6] E02D *29/14*
U.S. Cl. 404—26 18 Claims



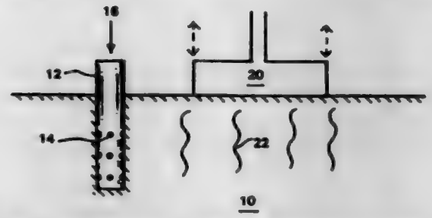
1. A sealing assembly for sealing a manhole against entering liquid, the manhole containing at least one pipe, the sealing assembly comprising:
(a) means for fixing to interior walls of the manhole for providing a supporting surface;
(b) a sealing member for resting on top of the supporting surface and for providing a seal around the pipe, and with the interior walls of the manhole, the sealing member having a base, a first sealing element attached to the base and disposed on the supporting surface and actuable for sealing the interior walls of the manhole with respect to the base, a top, means for connecting the base and top in a fluid tight manner, and a second sealing element attached to the top, the top having an aperture formed therein for enabling access through the manhole to the pipe, and the second sealing element being actuable to provide a seal between the top and the manhole;
(c) first means for actuating the first sealing element; and
(d) second means for actuating the second sealing element.

5,597,264
LEACHING FIELD AND METHOD OF MAKING
Rein Laak, 149 Browns Rd., Storrs Mansfield, Conn. 06268-2208
Filed Jun. 30, 1995, Ser. No. 497,220
Int. Cl.[6] E02B *13/00*; B01D *43/00*
U.S. Cl. 405—36 5 Claims



1. The method for fabricating a leaching field associated with a septic system comprising the following steps:
providing a distribution manifold in a horizontal orientation downstream of the septic tank for receiving the effluent from that tank, and directing the effluent through parallel outlets provided in the manifold in a direction generally perpendicular to the manifold,
coupling in-drains of geotextile fabric envelopes surrounding an elongated rectangular fin to each of these outlets of the distribution manifold,
placing a template on top of a plurality of such in-drain envelopes to support them in upright parallel spaced relationship to one another, and
filling the spaces between the in-drain envelopes with a sandy soil to provide an improved leaching field for the septic system.

5,597,265
METHOD AND APPARATUS FOR THE IN-SITU TREATMENT OF CONTAMINATION IN SOIL
Bruce M. Gallo, 88 Hillside Rd., Chester, N.J. 07930
Filed Feb. 1, 1995, Ser. No. 382,133
Int. Cl.[6] A62D *3/00*; B09C *1/00;1/08*
U.S. Cl. 405—128 9 Claims

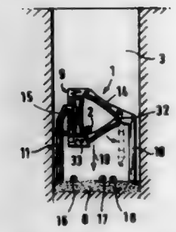


2. An apparatus for the in-situ treatment of contaminants from a contaminated region, comprising:
means including perforated piping for delivering treatment fluid to the contaminated region; and
ultrasonic energy supplying means located within the perforated piping for supplying energy to the contaminated region to momentarily increase the permeability of the contaminated region, thereby facilitating flow of the treatment fluid through the contaminated region and maximizing removal of the contaminants contained therein.

3. A method for the in-situ treatment of contaminants from a contaminated region, comprising the steps of:
delivering a treatment solution to the contaminated region; and
supplying ultrasonic sound waves in the frequency range between 2,000 to 20,000 Hz to the contaminated region to momentarily increase the permeability of the contaminated region by exciting particles of the contaminated region so that the treatment fluid flows through the contaminated region to mix with the contaminants and maximize the removal thereof, the ultrasonic waves being supplied by an ultrasonic horn located within the means for delivering treatment solution.

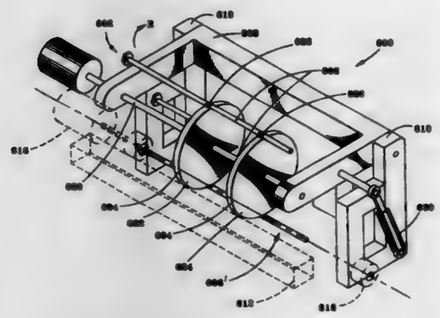
5,597,266
CABLE-LAYERS
Werner Cleiker, Haus Papillon, D-54587 Birgel, Germany
Filed Mar. 10, 1995, Ser. No. 401,797
Claims priority, application European Pat. Off., Mar. 10, 1994, 94103649
Int. Cl.[6] F16L *1/032*; H02G *1/06*
U.S. Cl. 405—154 16 Claims

1. Apparatus for laying cables into upwardly open cable ditches comprising a frame (9) and at least one rotatably supported conveyer roller (13) adapted to receive and support a cable thereon, said conveyer roller (13) being held by one of its ends to the frame (9) and another roller end thereof being linked by a quick-connect/disconnect mechanism (33) to the frame (9) such that upon opening the quick-connect/disconnect mechanism (33) the conveyer



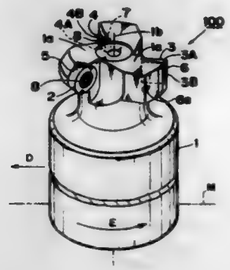
roller (13) drops and therewith the supported cable drops by gravity into an associated cable ditch.

5,597,267
BOLT DELIVERY SYSTEM
Ward D. Morrison, and Perry L. Coombs, both of Claremont, N.H., assignors to Cannon Industries, Inc, Claremont, N.H.
Division of Ser. No. 390,746, Feb. 17, 1995, Pat. No. 5,556,235. This application Jan. 24, 1996, Ser. No. 590,498
Claims priority, application Canada, Oct. 19, 1994, 2118447
Int. Cl.[6] E21D *20/00*
U.S. Cl. 405—303 11 Claims



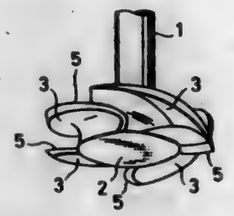
1. A bolt delivery system for feeding bolts to a rock bolter, the rock bolter having a feed shell on which a bolt driver travels, the bolt delivery system comprising:
a bolt magazine having advancable peripheral surfaces defining a bolt path,
said bolt magazine having a park position where the bolt driver will pass thereunder and a work position where the bolt driver, advancing on the feed shell, will engage one of the bolts in said magazine;
a magazine base which is fixed with respect to the feed shell;
a magazine holder supporting said bolt magazine, said magazine holder being pivotally attached to said magazine base such that when one of the bolts is withdrawn from said bolt magazine it is withdrawn substantially normal to said advancable peripheral surfaces; and
means for pivoting said magazine holder with respect to said magazine base thereby moving said bolt magazine between said park position and said work position.

5,597,268
MILLING CUTTER FOR T SHAPED GROOVE
Mitsuo Izumi, Shijonawate, Japan, assignor to Izumi Industry Kabushiki Kaisha, Osaka-fu, Japan
Filed Dec. 5, 1995, Ser. No. 567,700
Claims priority, application Japan, Dec. 6, 1994, 6-302048
Int. Cl.[6] B23C *3/28*
U.S. Cl. 407—51 7 Claims



1. A milling cutter for cutting laterally extending portions of a T-shaped groove, said milling cutter having an axis of rotation and being configured to move perpendicularly to the axis of rotation to form the laterally extending portions, said milling cutter comprising:
at least three cutting edge mounting seats arranged on an end flange of the milling cutter and distributed peripherally about the axis of rotation, said milling cutter being configured to extend along the axis of rotation through an upright groove comprising an upright portion of the T-shaped groove;
a first cutting edge mounted on a first of said mounting seats and configured to cut a first portion of the T-shaped groove located axially opposite said upright groove;
a second cutting edge mounted on a second of said mounting seats and configured to cut a second portion of the T-shaped groove located axially adjacent said upright groove; and
a third cutting edge mounted on a third of said mounting seats and configured to cut a third portion of the T-shaped groove extending axially between the first portion and the second portion, said third cutting edge being arranged to extend radially farther from the axis of rotation than said first cutting edge and said second cutting edge.

5,597,269
CUTTING TOOL FOR HONEYCOMB CORE
Ryuichi Ogawa, Tochigi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 9, 1994, Ser. No. 257,728
Claims priority, application Japan, Jun. 30, 1993, 5-162434
Int. Cl.[6] B23C *5/10;3/00*
U.S. Cl. 407—54 9 Claims



1. A cutting tool for cutting a honeycomb core comprising:
a shank for being cramped on a machine tool;
a cylinder coaxially connected to said shank;

a plurality of blades spirally and integrally formed on said cylinder;

a radial edge provided on an outer ridge of said blades for continuously cutting said honeycomb core;

a bottom edge formed at a lower end of said radial edge for initially biting said honeycomb core;

a boundary edge smoothly and continuously connected between said radial edge and said bottom edge for cutting a boundary region of said honeycomb core, wherein:

said blades have a lead angle which is 60 degrees or greater; and

lip angles of said radial edge and said bottom edge are between 1 and 20 degrees so as to speedily and accurately cut said honeycomb core and to improve durability of said cutting tool.

5,597,270

CUTTING INSERT FOR BORERS

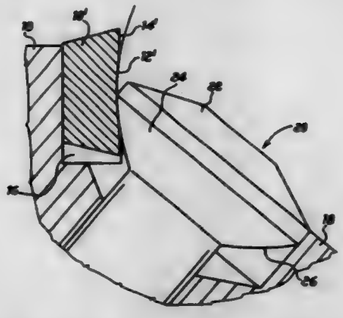
Enzo Maria, Sedrinse, Italy, assignor to OMUS S.p.A. in Amministrazione Straordinaria, Bellaio, Italy

Filed Sep. 28, 1994, Ser. No. 314,859

Claims priority, application Italy, Oct. 1, 1993, MI930761 U

Int. Cl.[6] B23B *27/00*

U.S. Cl. 407—102 5 Claims



1. The combination of a cutting insert for borer, the borer and a screw, wherein the cutting insert is made of hard metal, has two cutting sides, a front surface and is constituted by a substantially prismatic body (10) or (10'), said borer has a head (18), said head has a hollow space (16) and said cutting insert is housed in said hollow space and is restrained in it by at least one screw (20), said screw having a head (22) and a lower part (26), said lower part having a convex configuration, said insert having along a longitudinally extended central portion (12) (12'), a slight concavity, said concavity of said insert being completely complementary to said convex configuration of said lower part (26) of said screw (20).

5,597,271

EXCHANGEABLE CUTTING INSERT HAVING SECONDARY CUTTING EDGES USED AS WIPERS

Yuri Men, Haifa, and Amir Satran, Kfar Vradim, both of Israel, assignors to Iscar Ltd., Migdal Tefen, Israel

Filed Mar. 2, 1995, Ser. No. 397,519

Claims priority, application Israel, Mar. 16, 1994, 108995

Int. Cl.[6] B23C *5/10;5/20*

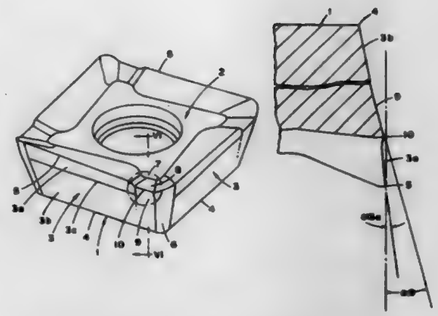
U.S. Cl. 407—113 4 Claims

1. An exchangeable cutting insert for mounting in a cutting tool and comprising:

a substantially square, planar base;

a substantially square upper rake surface and side flanks extending outwardly from respective edges of said base;

each side flank intersecting said rake surface at successive main and secondary cutting edges, and forming an adjacent relief flank surface adjacent said main cutting edge and an auxiliary



relief flank surface adjacent said secondary cutting edge, said secondary cutting edges adapted to be used as wipers;

an imaginary extension of an outermost portion of each secondary cutting edge along said adjacent relief flank surface of its associated main cutting edge and a portion of said auxiliary relief flank surface being outwardly spaced from said adjacent relief flank surface;

each secondary cutting edge being displaced towards said base with respect to its associated main cutting edge, wherein each secondary cutting edge does not project beyond a surface which is perpendicular to the base and passes through its associated main cutting edge.

5,597,272

COATED HARD ALLOY TOOL

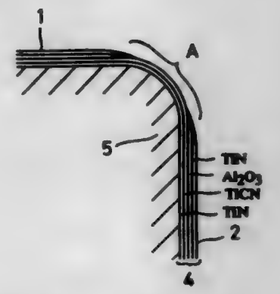
Hideki Moriguchi; Daisuke Murakami; Akihiko Ikegaya, and Toshio Nomura, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 24, 1995, Ser. No. 427,601

Claims priority, application Japan, Apr. 27, 1994, 6-089758

Int. Cl.[6] B23B *27/14*

U.S. Cl. 407—119 7 Claims



1. A coated hard alloy tool having a cutting edge including a ridge and comprising a substrate made of a hard alloy, and a multi-layer ceramic coating film provided on the surface of said substrate, said coating film including at least one oxide layer and at least one non-oxide layer, the top several layers of said coating film being missing partially or completely along said ridge, at least one oxide layer being included in missing layers among said top several layers, whereby a non-oxide layer, having an average surface roughness Ra not more than 0.05 μm, of said coating film is exposed along said ridge where said top several layers are missing.

5,597,273

DUAL DIRECTION COUNTERSINK

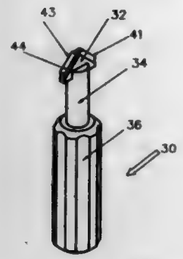
Mordechai Hirsch, Nahariya, Israel, assignor to Noga Engineering Ltd., Israel

Filed Feb. 14, 1995, Ser. No. 388,443

Claims priority, application Israel, Feb. 16, 1994, 108659

Int. Cl.[6] B23B *51/00*

U.S. Cl. 408—199 5 Claims



1. A hand operated countersink comprising a shaft attached at one end to a cutting insert and at the other end to a handle, wherein said cutting insert is substantially of isosceles triangular shape, said insert having at least two cutting edges each disposed along an equal side of the triangle, said insert being ground along said cutting edges to form a rake angle, one of said cutting edges being operative to cut when the shaft is rotated in one direction, and the other cutting edge being operative to cut when the shaft is rotated in the other direction.

5,597,274

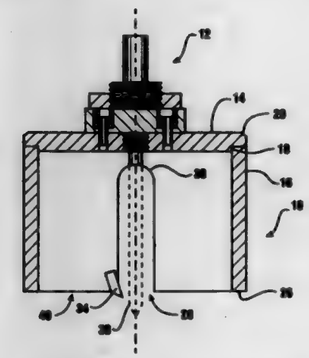
HOLE CUTTER

Ray E. Behner, 4001 Laurel Rd., Brunswick, Ohio 44212

Filed Aug. 17, 1995, Ser. No. 516,118

Int. Cl.[6] B23B *51/04*

U.S. Cl. 408—204 18 Claims



1. A hole cutter for cutting a hole through a workpiece comprising:

a drill bit portion extending in a longitudinal direction;

a tube member having an annular side wall concentric with said bit portion and extending in the longitudinal direction, said side wall terminating in a generally smooth planar radially extending face;

no more than one gullet extending radially through said smooth face and longitudinally in said side wall; and

a cutting bit fixably mounted to said side wall, said cutting bit mounted adjacent to said gullet, said cutting bit extending longitudinally outward from said smooth face.

5,597,275

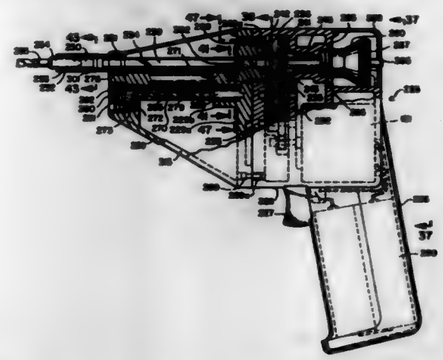
TOOL WITH CHANGEABLE WORKING TIP

Scott H. Hogan, 469 Heritage Dr., Bountiful, Utah 84010

Filed Mar. 28, 1995, Ser. No. 411,987

Int. Cl.[6] B23B *45/00;31/10*

U.S. Cl. 408—239 R 24 Claims



1. A tool having a shaft with a working tip receiving end adapted to removably engage a working tip to perform a job, wherein the working tip may be changed so that the tool is capable of performing different jobs depending upon the working tip engaged, and wherein the shaft moves during use of the tool with respect to a tool body which can be held and manipulated by a user, comprising:

a shaft having a working tip attachment end;

a tool body coupled to the shaft and by which the shaft can be manipulated and with respect to which the shaft moves during use of the tool; and

a sleeve movable between a position wherein the sleeve surrounds the working tip attachment end of the shaft and is secured to the tool body so that the shaft moves within the sleeve, and a position removed from the working tip attachment end of the shaft;

whereby, when the sleeve surrounds the working tip attachment end of the shaft it will maintain a working tip in engagement with the shaft and when removed from the working tip attachment end, will allow disengagement of a working tip from the shaft.

5,597,276

APPARATUS FOR VENTING TUBES

Stanley Yokell, 4390 Caddo Pkwy., Boulder, Colo. 80303

Filed Jul. 29, 1994, Ser. No. 282,921

Int. Cl.[6] B23C *3/34*

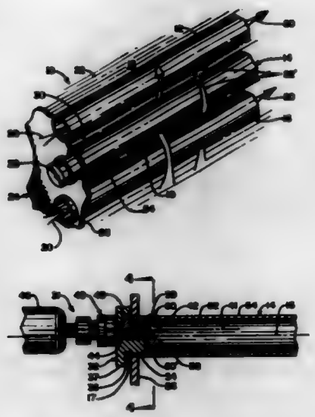
U.S. Cl. 409—132 10 Claims

1. A method of cutting a vent hole in a sidewall of an elongated tube, wherein the sidewall is substantially concentric with a longitudinal axis of the tube and wherein the tube has an accessible open end, comprising the steps of:

inserting a guide comprising a body with a bore that has a longitudinal axis extending through the body into the open end of the tube with the body bearing on the sidewall of the tube in such a manner that the bore is positioned and maintained in eccentric relation to the tube with the longitudinal axis of the bore oriented substantially parallel to and radially offset from the longitudinal axis of the tube;

inserting an elongated, rotatable cutting tool with a radially extendable and retractable cutting tip through said bore in said guide a sufficient distance such that the cutting tip protrudes into said tube beyond said guide while a portion of the cutting tool remains in the bore in the guide;

rotating the cutting tool about the longitudinal axis of the bore while maintaining the guide stationary in relation to the tube



and slowly extending the cutting tip radially into contact with a portion of the sidewall of the tube that is closest to a linear extension of the longitudinal axis of the bore and continuing to rotate the cutting tool in the bore while maintaining the guide stationary in relation to the tube and also continuing to extend the cutting tip radially and allowing the cutting tip to cut into the sidewall until the cutting tip cuts and extends entirely through the portion of the sidewall that is closest to the linear extension of the longitudinal axis of the bore.

5,597,277

PERSONAL FLOTATION/TRANSPORTATION DEVICE

Daniel R. Mayfield, P.O. Box 114, Mesa, Wash. 98356

Filed Dec. 30, 1994, Ser. No. 366,688
Int. Cl.[6] B63C 9/08
U.S. Cl. 441—130 **14 Claims**

1. A flotation device capable of being propelled by at least one leg of at least one user, the device comprising;

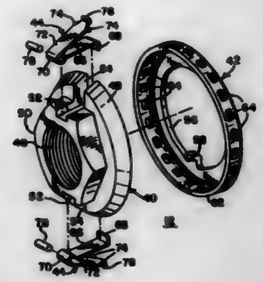
a hull having a bow, a stern, a full keel, and an opening defined through the hull for receiving the leg of the user therethrough, said full keel including a curved side surface, a lower surface adjacent to the curved side surface, a substantially horizontal bottom surface and a cavity formed between the curved side surface, and said cavity providing a seating space for seating the user therein.

5,597,278

LOCKING FASTENER ASSEMBLY FOR THREADED JOINT

Steven D. Peterkort, Hawthorn Woods, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Jul. 24, 1995, Ser. No. 506,186
Int. Cl.[6] F16B 35/04;37/04;39/10
U.S. Cl. 411—134 **4 Claims**



1. A threaded joint such as an automotive wheel assembly of the type tightened or loosened by a wrench socket and comprising:

a fixed mounting structure including a threaded member extending along an axis and including first restraining means;

a locking fastener assembly engageable with said fixed mounting structure and including a rotatable fastener and a retainer;

said fastener having a tool receiving portion with wrenching flats and corners between said flats, a flange, and a thread structure engageable with said threaded member for tightening and loosening of the threaded joint in response to rotation of the fastener around the axis;

said retainer including means for holding said retainer in relatively rotatable assembly with said flange;

said retainer including second restraining means engageable with said first restraining means for permitting axial movement and preventing rotation of said retainer relative to said fixed mounting structure; and

latch means connected between said fastener and said retainer for permitting relative rotation between said fastener and said retainer in a released position and preventing relative rotation between said fastener and said retainer in a latched position;

said latch means including latch release means disposed at said tool receiving portion of said fastener for releasing said latch means in response to engagement of said fastener by the tool;

the threaded joint being characterized by:

said latch means comprising a pair of resilient latch clips mounted in a resiliently compressed condition at diametrically opposed positions between said fastener and said retainer, said positions being on said wrenching flats and spaced from said corners.

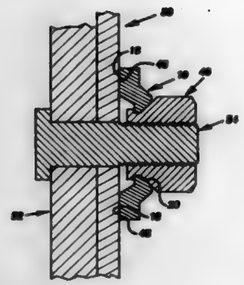
5,597,279

WHEEL NUT

David E. Thomas, Kent; Fred A. Beczar, Maple Hts., both of Ohio, and Ronald D. Geferthe, Birmingham, Mich., assignors to R B & W Corporation, Cleveland, Ohio

Filed Mar. 6, 1995, Ser. No. 398,985
Int. Cl.[6] F16B 37/08
U.S. Cl. 411—432 **25 Claims**

1. A washer and threaded fastener in combination comprising a washer including a seat portion having a center axis and a conically-shaped seat surface concentric with the center axis, an annular ring portion parallel to said seat portion and offset from said seat portion along said center axis, a frustoconically-shaped cantilever portion connecting said seat portion and said annular ring portion, said cantilever portion having an inner frustoconical surface disposed at an angle of less than about 45° relative to said center axis, an outer frustoconical surface and a cross-sectional thickness between said inner and outer frustoconical surfaces, and said washer and said threaded fastener each having a hardness with the washer hardness being greater than the threaded fastener hardness to achieve increased elastic deflection of said washer and threaded fastener and reduced tendency to loosen during fastening operation.

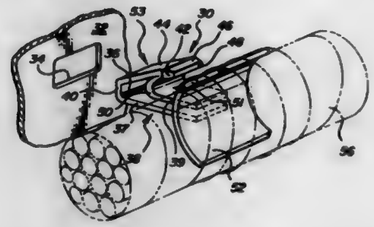


5,597,280

LOCKING CLIP WITH RESILIENT BARB ARM

Eric J. Stern, Farmington Hills, Mich., assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 30, 1995, Ser. No. 550,378
Int. Cl.[6] F16B 19/00;15/00;45/00
U.S. Cl. 411—508 **9 Claims**



1. A bayonet-type fastener comprising a single barb body portion for engagement with an aperture in a support panel and an integral tie portion for engagement with a member to be secured, said body portion being formed of flat, ribbon stock to define a hollow, open-sided base portion of essentially spaced-apart, parallel legs, a single barb portion defining a flared cam surface in non-parallel, spaced relation to said legs, and a resilient member connecting said base portion with said barb portion; said cam surface terminating in a retention leg in spaced, parallel relation to said legs whereby insertion of said fastener through an appropriately-sized aperture causes compression flexure of said cam surface, said resilient member and said retention leg toward said parallel legs.

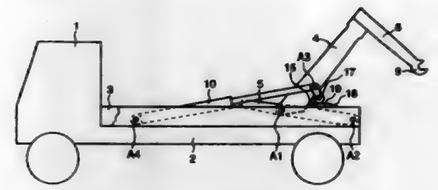
5,597,281

DEVICE FOR HANDLING LOADS FROM A VEHICLE

Christian Croiset, St Etienne, and Michel Robert, Villars, both of France, assignors to Marrel Société Anonyme, Andrezieux Boutheon, France

Filed Oct. 6, 1994, Ser. No. 318,998
Claims priority, application France, Oct. 7, 1993, 93 12139
Int. Cl.[6] B60P 1/48
U.S. Cl. 414—498 **10 Claims**

1. A device for handling loads from a vehicle, designed to be fitted on a carrying platform of said vehicle, comprising:



one lower hinged arm including one front section hinged on a rear section by a first hinge pin, said first hinge pin being situated at a first end of said front section, said rear section being hinged by a second hinge pin on said platform,

one upper arm linked at a lower end to a second end of said front section, and having at an upper end a means of gripping loads,

at least one jack for allowing a tilting movement of said front section around said first hinge pin, a rear end of said jack being linked to said front section around a third hinge pin, its front end being linked to said platform around a fourth hinge pin, said third hinge pin being positioned between said first hinge pin and said second end of said front section, said third hinge pin for forming a circular trajectory during said tilting movement of said front section around said first hinge pin, and

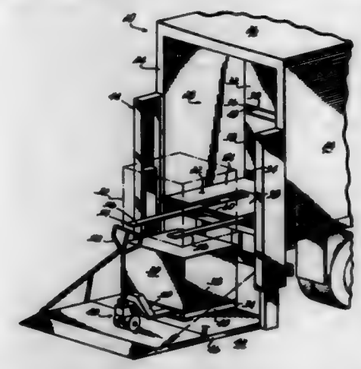
temporary supporting means for supporting said rear end of said jack, said temporary supporting means comprising a first part integral with said platform, and a second part integral with said front section or with said rear end of the jack or with said third hinge pin, said first part for establishing a temporary force of reaction against said second part during said tilting movement of said front section around said first hinge pin, said second part being positioned between said first hinge pin and said second end of said front section, said first part or said second part including a support surface fit for partially modifying said circular trajectory of said third hinge pin.

5,597,282

METHOD AND APPARATUS FOR UNSTACKING AND UNLOADING A STACKED LOAD FROM ONE LEVEL TO ANOTHER LEVEL

Bradley P. Hoffman, Loveland; Douglas H. Kent, Mariemont, and William C. Hall, West Chester, all of Ohio, assignors to Leyman Manufacturing Corporation, Cincinnati, Ohio

Filed Aug. 29, 1995, Ser. No. 521,033
Int. Cl.[6] B60P 1/44
U.S. Cl. 414—545 **15 Claims**



1. Apparatus for stacking or unstacking a stacked load carried in a vehicle, the vehicle having a bed and a load lift operably disposed adjacent a bed edge for lowering loads from a height of

the bed to a ground level, with the load lift supporting the stacked load, the apparatus comprising:

a first extensible arm disposed in the bed and selectively movable in a direction generally parallel with a plane defined by the bed between a first, load-bearing position extended outwardly from the bed edge and beneath a portion of the stacked load supported on the load lift, and a second, nonload-bearing position retracted back into the bed.

5,597,283

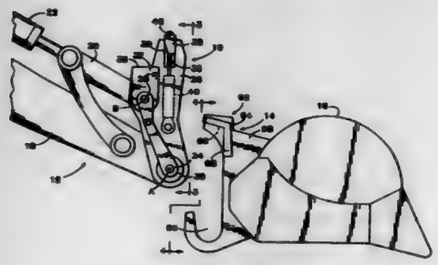
QUICK COUPLING FOR HEAVY EQUIPMENT ATTACHMENT

Gordon James, 3309 SE. 179th, Portland, Oreg. 97236

Continuation of Ser. No. 956,476, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 682,928, Apr. 9, 1991, abandoned. This application Mar. 10, 1993, Ser. No. 32,837

Int. Cl.[6] E02F 9/00

U.S. Cl. 414—723 **7 Claims**



1. A quick coupling for attaching an implement, that is designed to be rotated about an implement rotational axis, to a piece of heavy equipment having a stick that is rotatably attached to a implement at a first attachment axis and a moveable linkage that is rotatably attached to an implement at a second attachment axis that is parallel with the first attachment axis, with the first and second attachment axes having a defined geometrical relationship with respect to one another such that the implement is rotated relative to the stick in a predetermined manner when the linkage is extended and retracted, said quick coupling comprising:

(a) a coupler that is attached to said stick and said linkage rotatably at said first and second attachment axes respectively, said coupler having at least one coupling element located thereon;

(b) a bracket that is attached to said implement, said bracket having receptacle means for releasably receiving said coupling element with said implement rotational axis being coaxial with said first attachment axis and said bracket being rotatable relative to said coupler about said implement rotational axis;

(c) said bracket having a first planar surface defined thereon;

(d) said coupler having a second planar surface defined thereon;

(e) said first and second surfaces being oriented to overlappingly engage one another when said coupling element is placed in said receptacle means;

(f) said first and second surfaces being angularly offset from a plane that is normal to a plane that extends through said implement rotational axis and bisects said second surface so that the interaction of said first and second surfaces causes said coupling element to be urged into said receptacle when said bracket is rotated towards said coupler; and;

(g) means located on said coupler and said bracket for rotating said bracket toward said coupler.

5,597,284

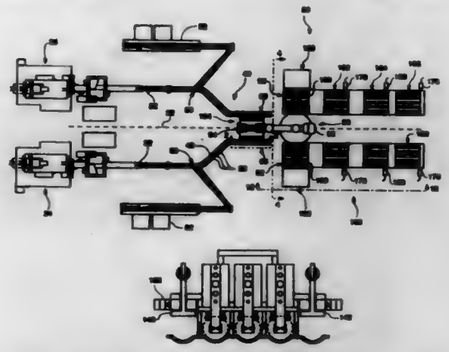
METHOD AND APPARATUS FOR PROCESSING CONTAINER ENDS

Kenneth E. Weitlich, Westminster; Howard C. Chasteen, Broomfield, both of Colo.; Michael A. Shuster, and Stephen R. Pickenbrock, both of Findlay, Ohio, assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 232,780, Feb. 25, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,371

Int. Cl.[6] B65G 57/24

U.S. Cl. 414—791.1 **35 Claims**



1. An assembly for processing container ends received from at least two sources, said assembly comprising:

a pick-up area for receiving a plurality of container ends from a first source and second source, different from the first source;

a first loading area for accommodating a plurality of container ends and comprising a first tray;

a second loading area for accommodating a plurality of container ends and comprising a second tray, said first and second trays being positioned so as to be simultaneously accessible for receiving container ends; and

a moving means for engaging container ends from the first source at said pick-up area and depositing the container ends at said first loading area and in said first tray to form a first load and for engaging container ends from the second source at said pick-up area and depositing the container ends at said second loading area and in said second tray to form a second load, wherein container ends from said first source are only deposited at said first loading area, and wherein container ends from said second source are only deposited at said second loading area, said moving means comprising a common pick-up head which interfaces with container ends from each of said first and second sources and moves said container ends to said first and second loading areas, respectively.

5,597,285

APPARATUS FOR FORMING STACKS

Erich Meyer, Schwaebisch Hall, and Juergen Rothbauer, Michelfeld, both of Germany, assignors to Optima-Maschinenfabrik Dr. Bühler GmbH & Co., Schwaebisch Hall, Germany

Filed Jun. 1, 1995, Ser. No. 458,088

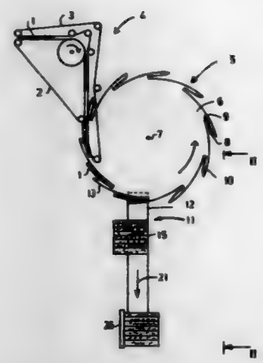
Claims priority, application Germany, Jun. 2, 1994, 44 19 329.7

Int. Cl.[6] B65G 57/11

U.S. Cl. 414—798.6 **20 Claims**

1. Apparatus for forming stacks from a plurality of individual articles formed of sheet products that are folded to provide said articles with front ann back faces, top and bottom edge surfaces and opposite end surfaces, said apparatus comprising:

a supply mechanism that moves the articles in a longitudinal direction, such that each article is lead by a leading one of the opposite end surfaces;



a revolving transfer wheel having a central circular portion with a periphery and with a plurality of receptacles, each receptacle having a closed end located along a circumference of said central circular portion, each receptacle extending from said closed end to an open end along approximately a tangent from the periphery of said central circular portion, wherein a leading one of said opposite end surfaces of a respective one of said articles is fed into a respective one of said receptacles and is retained therein, so that each article is carried by said revolving transfer wheel in an arcuate path around a portion of said circumference to translate positioning of said articles from longitudinal to transverse, said receptacles being positioned to hold said articles in a non-bending position and in non-overlapping relation to each other

a sequencing device including first means for stopping movement of the leading end surface of each respective article carried by said transfer wheel as each of said articles passes said sequencing device so as to remove said individual articles from their respective receptacles, said sequencing device having second means for stacking said articles at a point where the articles are stopped, said articles being positioned transversely in a stack formed along a stacking path running approximately parallel to a radius of said transfer wheel.

5,597,286

TURBINE FRAME STATIC SEAL

John Dawson, Benford, and John J. Patrikus, Salem, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 21, 1995, Ser. No. 576,146

Int. Cl.[6] F01D 11/00

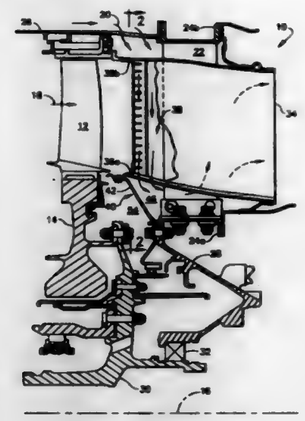
U.S. Cl. 415—115 **10 Claims**

1. In a turbine frame including a plurality of struts joined to a radially inner band, and an annular inner flowpath disposed adjacent to the inner band and over which is flowable combustion gases, said inner flowpath being supported by the struts for unrestrained differential thermal movement therewith, a seal for confining cooling air channeled between said inner flowpath and said inner band comprising:

a frustoconical support having a proximal end fixedly coaxially joined to said inner flowpath, and a smaller diameter distal end, and a portion of said support spaced from said inner flowpath to define a chamber therewith for receiving said cooling air;

a radially outer ring integrally coaxially joined with said support distal end; and

a radially inner ring fixedly joined to said inner band coaxially with said outer ring and spaced radially inwardly thereof to define a gap therebetween sized for limiting leakage of said cooling air from said chamber.



5,597,287

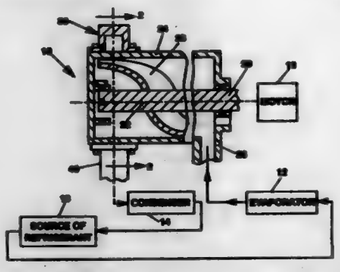
ROTARY COMPRESSOR WITH PULSATION MINIMIZING DISCHARGE

Richard L. Helmick, Severn, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1995, Ser. No. 515,878

Int. Cl.[6] F04D 29/66

U.S. Cl. 415—119 **14 Claims**



1. A rotary compressor of the type that includes a housing having a discharge muffler within which delivery of a centrifugally driven refrigerant is received and a diffuser through which kinetic energy in the refrigerant is converted to pressure; the improvement residing in said discharge muffler having a continuous volute-shaped flow passage within which the diffuser is established, the flow passage further including a collection portion within which the centrifugally driven refrigerant is received and conducted to the diffuser; and an outlet duct portion through which the refrigerant is discharged from the diffuser in a direction substantially perpendicular to said delivery thereof to the collection portion.

5,597,288

SCREW TYPE WATER FLOW GENERATING APPARATUS

Miyoshi Hatanaka, 22-19, Matsubara 5-chome, Setagaya-ku, Tokyo 156, Japan

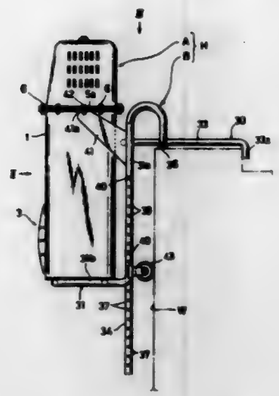
Continuation of Ser. No. 915,128, Jul. 17, 1992, abandoned. This application Apr. 6, 1994, Ser. No. 223,817

Claims priority, application Japan, Jun. 9, 1992, 4-173781

Int. Cl.[6] F04D 29/42

U.S. Cl. 415—182.1 **2 Claims**

1. A screw type water flow generating apparatus, comprising:



a box-shaped casing comprising an upper casing portion and a lower casing portion, wherein the upper casing portion is coaxially positioned vertically above the lower casing portion;

an engine portion positioned in said upper casing portion for obtaining a rotating and driving force;

a rotating and driving force transmission portion positioned in said lower casing portion, the rotating and driving force transmission portion being operatively connected to said engine portion and coaxially extending from said engine portion;

a screw rotating shaft positioned in a horizontal direction in said lower casing portion and operatively connected to said rotating and driving force transmission portion, said screw rotating shift being substantially perpendicular to the rotating and driving force transmission portion;

screw vanes mounted on said screw rotating shaft and substantially positioned within said lower casing portion at a recess in said casing;

a frame fitted in the recess of said casing; and

a plurality of perpendicularly intersecting longitudinal and lateral straightening plates secured to said frame and positioned in front of said screw vanes for straightening water flow, said plurality of intersecting longitudinal and lateral straightening plates defining a plurality of square-shaped spaces, and each of said plurality of intersecting longitudinal and lateral straightening plates being in the form of a thin rectangular flat plate, each of said plurality of longitudinal and lateral straightening plates having a plane intersecting at a right angle to a front surface of said screw vanes and being disposed symmetrically to an axis of the screw vanes;

said casing having water holes bored in at least a rear portion of said casing, wherein rotation of said screw vanes sucks water in through said water holes and leads the water toward the straightening plates in a horizontal direction which is parallel to a rotational axis of said screw rotating shaft.

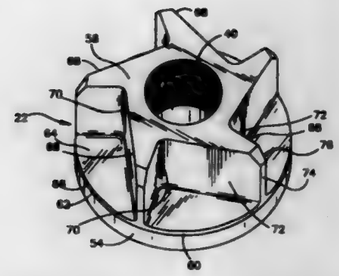
5,597,289

DYNAMICALLY BALANCED PUMP IMPELLER

Bruno H. Thut, 16755 Park Circle Dr., Chagrin Falls, Ohio 44023

Filed Mar. 7, 1995, Ser. No. 399,451
Int. Cl.[6] F04D 7/06
U.S. Cl. 415—200 **7 Claims**

1. In a non-metallic pump for pumping molten metal including a shaft, a motor at one end of the shaft, an impeller at the other end of the shaft, and a base having a chamber in which the impeller is rotatable, the improvement comprising a dynamically balanced impeller made of a non-metallic, heat resistant material, comprising a circular base, a substantially cylindrical center hub portion located on the base, and five vanes extending from the base and outwardly from the hub portion, wherein said vanes are equally spaced around the periphery of the hub portion.

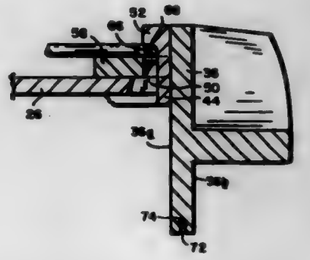


5,597,290

MULTI-COMPONENT FAN ASSEMBLY

Edward W. Viposki, Gardener, and Robert W. Shaffer, II, East Templeton, both of Mass., assignors to Tuthill Corporation, Millbury, Mass.

Filed May 1, 1996, Ser. No. 640,709
Int. Cl.[6] F04D 29/34
U.S. Cl. 416—204 R **19 Claims**



1. A fan assembly comprising in combination:

a circular disc having a rotational axis and first and second sides;

a cylindrical side wall extending around the periphery of said disc, said side wall having axially spaced first and second rims and being circumferentially subdivided into a plurality of wall segments, each wall segment having inner and outer surfaces, with the second rim of said wall protruding axially beyond the second side of said disc;

fan blades carried on the outer surfaces of said side wall segments;

mounting members protruding from the first side of said disc at locations spaced circumferentially around the periphery thereof;

connecting members on the inner surfaces of said wall segments, said connecting members coacting in separable interlocked engagement with said mounting members to fasten said wall segments to said disc;

first ring means on the first side of said disc for preventing said connecting members from separating from their interlocked engagement with said mounting members; and

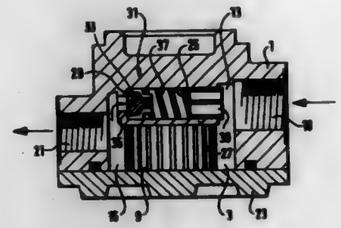
second ring means on the second side of said disc for interconnecting said wall segments.

5,597,291

FUEL FEED PUMP FOR A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Stanislaw Bodzak, Klosterneu, and Hanspeter Mayer, Hallein, both of Austria, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 22, 1995, Ser. No. 561,651
Claims priority, application Germany, Nov. 22, 1994, 44 41 505.2
Int. Cl.[6] F02M 41/12
U.S. Cl. 417—310 **20 Claims**



1. A fuel feed pump for a fuel injection system of internal combustion engines, comprising a housing, a pair of intermeshing gearwheels in said housing, said pair of gearwheels being rotatable in a pumping chamber (3), said gearwheels feed fuel out of a suction space (13), connected to a supply tank, along a feed duct (17), formed between an end face of the gearwheels and a circumferential wall for the pumping chamber (3), into a pressure space (15) in said housing, and a bypass duct (25) is formed in the pump housing relative to the pumping chamber (3), said bypass duct (25) connects the suction space (13) to the pressure space (15) of the fuel feed pump, said bypass duct includes a valve seat face (29) with a pressure valve (31) arranged in said bypass duct relative thereto, said pressure valve (31) controls fuel pressure in the pressure space, the pressure valve (31) is inserted into and secured in the bypass duct (25) by a securing means via an inlet opening of the intake chamber.

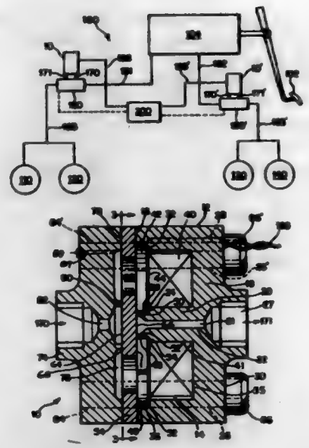
5,597,292

PIEZOELECTRIC BOOSTER PUMP FOR A BRAKING SYSTEM

Seong K. Rhee, Northville; Alistair G. Thig, Edwardsburg, both of Mich., and Kenneth S. Towers, Granger, Ind., assignors to AlliedSignal, Inc., Morristown, N.J.

Filed Jun. 14, 1995, Ser. No. 490,360
Int. Cl.[6] F04B 17/00
U.S. Cl. 417—322 **16 Claims**

1. An ultrasonic pump, comprising a first housing connected to a second housing with a cavity formed therebetween, said first housing having a central stem that extends into said cavity with a passage for connecting said cavity with an outlet port, said second housing having an inlet port for communicating hydraulic fluid to said cavity, a plurality of piezoelectric disc surrounding said stem, a first diaphragm secured to said stem for isolating said piezoelectric disc from hydraulic fluid supplied to said cavity and for placing a predetermined axial force on said piezoelectric disc, a second diaphragm located in said cavity between said passage and said inlet port, and means to excite said piezoelectric discs to develop a fluctuating force having an axial component and a radial component, said axial component of said fluctuating force after overcoming said predetermined axial force changing the fluid pressure of the hydraulic fluid in said cavity as a function of said axial component force, said change in fluid pressure causing sequential movement of said second diaphragm toward said inlet port and said passage to transmit hydraulic fluid from said cavity through the passage to said outlet port.

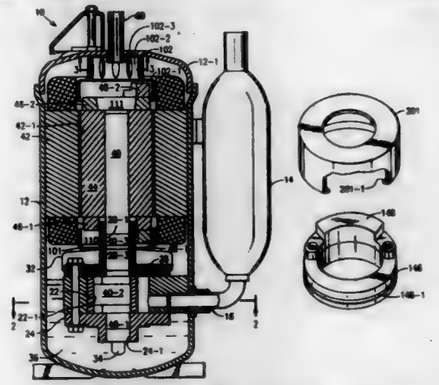


5,597,293

COUNTERWEIGHT DRAG ELIMINATOR

Paul J. Bushnell, Syracuse, and Donald Yannascoli, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 11, 1995, Ser. No. 570,865
Int. Cl.[6] F04B 17/03
U.S. Cl. 417—410.3 **3 Claims**



1. A high side rotary compressor comprising:

shell means having a first end and a second end and defining an interior;

cylinder means containing pump means including a vane and a piston coacting with said cylinder means to define suction and compression chambers;

said cylinder means being fixedly located in said shell means near said first end and defining with said first end a first chamber which has an oil sump;

first bearing means secured to said cylinder means and extending towards said oil sump;

second bearing means secured to said cylinder means and extending towards said second end;

motor means including rotor means and stator means;

said stator means fixedly located in said shell means between said cylinder means and said second end and axially spaced from said cylinder means and said second bearing means;

eccentric shaft means supported by said first and second bearing means and including eccentric means operatively connected to said piston;

said rotor means secured to said shaft means so as to be integral therewith and located within said stator means so as to define therewith an annular gap;

end ring means and counterweight means secured to said rotor means;

suction means for supplying gas to said pump means;

discharge means fluidly connected to said shell means;

cover means fixed to said second bearing means and separating said end ring means and said counterweight means from said interior whereby when said counterweight means is rotated said cover means prevents said counterweight means from acting as a fan with a resultant pressure profile acting on said oil sump.

5,597,294

ELECTROMAGNETIC LINEAR COMPRESSOR WITH ROTATIONAL BEARING BETWEEN SPRINGS

Michael A. McGrath, Hayling Island, United Kingdom, assignor to Pegasus Airwave Limited, Waterlooville, England

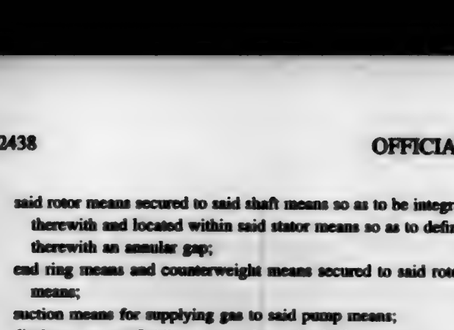
PCT No. PCT/GB94/01193, § 371 Date Nov. 29, 1995, § 102(e) Date Nov. 29, 1995, PCT Pub. No. WO94/28306, PCT Pub. Date Dec. 8, 1994

PCT Filed Jun. 2, 1994, Ser. No. 556,901

Claims priority, application United Kingdom, Jun. 2, 1993, 9311385

Int. Cl.[6] F04B *35/04;39/00;* F16J *1/24*

U.S. Cl. 417—417 **7 Claims**



1. An electromagnetic linear compressor including:

a cylinder;

a linearly reciprocating piston with a piston head which travels in the cylinder;

two helical coil springs having a common longitudinal axis and acting in series to bias the piston in a first direction;

a rotational bearing transmitting thrust between said two helical springs;

electromagnetic driving means for driving the piston in a second direction opposite to said first direction;

at least one fluid inlet path to the cylinder having a fluid inlet valve; and

at least one fluid outlet path from the cylinder having a fluid outlet valve;

wherein said rotational bearing permits relative rotation of said two helical springs about their common longitudinal axis.

5,597,295

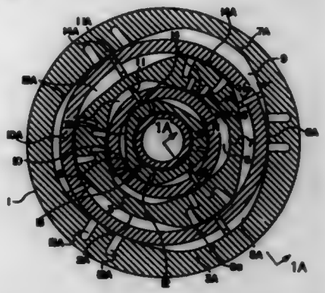
MULTI-CHAMBER ROTARY FLUID MACHINE WITH AT LEAST TWO RING MEMBERS CARRYING VANES

Alexander G. Pipaloff, 1408 Stanford St., Irvine, Calif. 92715

Continuation-in-part of Ser. No. 224,666, Apr. 7, 1994, abandoned, which is a division of Ser. No. 974,191, Nov. 10, 1992, Pat. No. 5,378,985. This application Oct. 11, 1994, Ser. No. 320,217

Int. Cl.[6] F01C *1/344;1/356;11/00;19/00*

U.S. Cl. 418—6 **12 Claims**



1. A multi-chamber rotary fluid machine comprising:

an inner member provided with a plurality of lobes;

at least one intermediate member provided with inner and outer surfaces which correspond to the plurality of lobes of said inner member;

a housing surrounding said intermediate member, said housing being provided with a plurality of depressions which correspond to said plurality of lobes;

at least two ring members, said ring members being provided between said inner member and said intermediate member and between said intermediate member and said housing and together with said inner member, intermediate member and housing defining a plurality of fluid chambers, said at least two ring members being rotatable relative to said intermediate members and said housing;

a plurality of sealing vanes extending through each of said ring members and the plurality of sealing vanes extending through one ring member engaging with an outer surface of the inner member and an inner surface of the intermediate member and the sealing vanes extending through the other of said at least two ring member engaging with an outer surface of said intermediate member and an inner surface of said housing, said sealing vanes being provided in any number relative to the number of lobes of said inner member; and

a plurality of fluid communicating means provided in said inner member, intermediate member and housing with every other one of said plurality of fluid communicating means being coupled together and with each of said plurality of said fluid communicating means in communication with said plurality of fluid chambers.

5,597,296

SCROLL COMPRESSOR HAVING A CHECK VALVE RECEIVED IN A STATIONARY SCROLL MEMBER RECESS

Teruyuki Akazawa, Kusatsu; Sadao Kawahara, Otsu; Akihiko Shimizu, and Yoshifumi Abe, both of Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

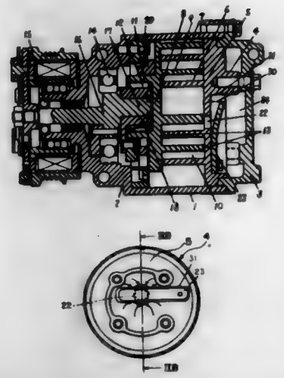
Filed Jul. 5, 1995, Ser. No. 498,139

Claims priority, application Japan, Nov. 30, 1994, 6-296751

Int. Cl.[6] F04C *18/04;29/00;* F16K *15/16*

U.S. Cl. 418—55.1 **8 Claims**

1. In a scroll compressor having a compressor housing and stationary and orbiting scroll members in engagement with each other, wherein the improvement comprises:



said stationary scroll member comprising a stationary end plate having first and second end surfaces opposite to each other, a stationary scroll wrap protruding axially from the first end surface of said stationary end plate, a discharge port defined in said stationary end plate at a location close to a center thereof, and a recess defined in said stationary end plate on the second surface thereof;

a check valve received in said recess so as to open or close said discharge port; and

said recess having a shape substantially identical to the shape of said check valve and having a size relative to a size of said check valve so as to define gaps between opposite side edges of said check valve and associated inner side walls of said recess, said recess having a depth greater than a maximum lift of said check valve and said gaps being sufficiently narrow so as to increase a resistance to backflow into said discharge port.

5,597,297

SCROLL TYPE COMPRESSOR

Shinya Yamamoto; Tetsuhiko Fukanuma, and Shigeru Hisanaga, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, and Nippondenso Co., Ltd., both of Kariya, Japan

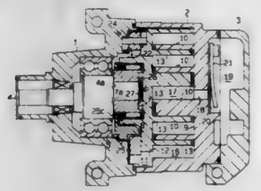
Filed Jul. 25, 1995, Ser. No. 507,039

Claims priority, application Japan, Jul. 27, 1994, 6-175751

Int. Cl.[6] F01C *1/04*

U.S. Cl. 418—55.1 **22 Claims**

1. A compressor comprising: a rotary shaft, a fixed scroll and a movable scroll having a first surface and a second surface, said first surface being opposed to said fixed scroll to define a displaceable fluid pocket, said movable scroll being supported on said rotary shaft via an eccentric pin to move along a predetermined orbit around an axis of said rotary shaft, wherein gas is introduced into and compressed in said fluid pocket;



a boss formed with said second surface of said movable scroll;

a bushing supported on said eccentric pin and rotatably received by said boss;

said rotary shaft having an inner end surface for securely supporting said eccentric pin;

a holding member engaging said eccentric pin to hold said bushing in a predetermined position on said eccentric pin in cooperation with said inner end surface of said rotary shaft;

said bushing comprising a first end surface contacting said inner end surface of said rotary shaft and a second end surface contacting said holding member; and

a balance weight secured around said bushing to cancel a dynamic imbalance of said movable scroll due to the orbital movement of said movable scroll, said balance weight comprising an end surface disposed between said first and second end surfaces of said bushing, said end surface of said balance weight being opposed to and spaced from said inner end surface of said rotary shaft.

5,597,298

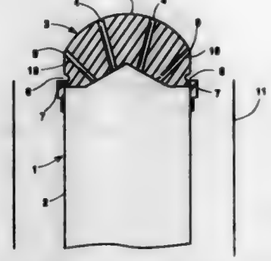
LAMINAR FLOW BURNER

William J. Snyder, Ossining; Maynard G. Ding, Yorktown; Richard T. Semenza, Shrub Oak, all of N.Y., and Johnny D. Jackson, Sandy Hook, Conn., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Dec. 13, 1994, Ser. No. 355,129

Int. Cl.[6] F23C *5/00*

U.S. Cl. 431—8 **4 Claims**



1. An oxidant provision means for a burner comprising:

(A) a conduit;

(B) a nozzle attached to the conduit having a surface and at least one passage for passage of main oxidant from the conduit through the nozzle to the nozzle surface; and

(C) an indentation on the nozzle surface having a rounded surface, and a passage connecting the indentation with the conduit.

5,597,299

IGNITION SAFETY DEVICE OF GAS LIGHTER

Jong K. Jon, 4-1104, Yeowonhoongun Apt., Hongun 2-dong, Seodaemun-gu, Seoul, Rep. of Korea

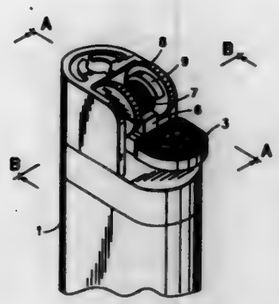
Filed Apr. 28, 1994, Ser. No. 234,046

Claims priority, application Rep. of Korea, May 24, 1993, 93-8803; Mar. 15, 1994, 94-5171

Int. Cl.[6] F23D *11/36*

U.S. Cl. 431—153 **14 Claims**

1. An ignition safety device of a gas lighter, said gas lighter comprising a lighter body including a fuel tank, a gas nozzle



communicating with said fuel tank, an ignition lever provided on said lighter body for pulling said nozzle upward in order to open said nozzle, a knurled rolling shaft rotatably mounted on said lighter body at a position near the distal end of said nozzle, a pair of thumb operable rolling flanges mounted on opposed side ends of said rolling shaft for rotating this rolling shaft, a lighter flint frictionally contacting with a knurled outer surface of said rolling shaft and generating sparks for igniting gas out of said nozzle, and a support body provided on said lighter body and receiving said lighter flint therein and rotatably supporting both said rolling shaft and said rolling flanges, comprising:

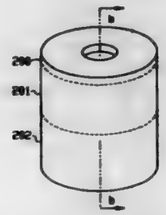
a rotation limiter structured to prevent more rotation of said rolling shaft after the rolling shaft has been rotated at a predetermined rotating angle and has ignited the gas flowing out of said nozzle, wherein said rotation limiter is mounted on said rolling flanges such that the rotation limiter is caught by said support body after said rolling shaft has been rotated at the predetermined rotating angle and has ignited the gas.

5,597,300

CANDLE AND PROCESS FOR ITS MANUFACTURE

Michael C. Wohl, 1512 Windham La., Silver Springs, Md. 20902, and Stephen G. Schulhoff, 107 W. Monument St., #3A, Baltimore, Md. 21201

Filed Oct. 25, 1994, Ser. No. 328,986
Int. Cl.[6] F23D *3/16*
U.S. Cl. 431—288 23 Claims



1. A method of casting a candle comprising the steps of:

casting a first layer of an outer shell of said candle from a first wax material having a first melting point;

casting a second layer of said outer shell from a second wax material having a second melting point, wherein said second layer is in contact with said first layer, and wherein said second melting point is less than said first melting point;

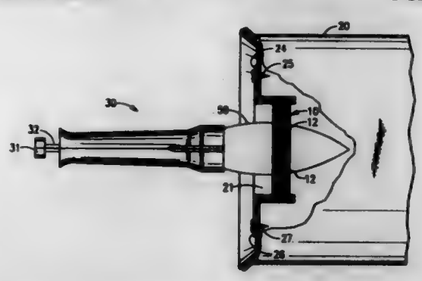
casting an inner core of said candle inside said inner shell from a third wax material having a third melting point, wherein said third melting point is less than said second melting point.

5,597,301

BURNER EMISSION DEVICE

William J. Roy, Plainfield, Ind., and Thomas J. Legutko, Canastota, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 4, 1995, Ser. No. 566,523
Int. Cl.[6] F23D *14/12*
U.S. Cl. 431—347 8 Claims



1. A burner emission device for reducing NO_x comprising:

an inshot burner;

a heat exchanger;

a plurality of laminations each having a plurality of holes therein;

said plurality of laminations secured in a stack with said holes in each of said plurality of laminations aligned with corresponding holes in every other one of said plurality of laminations whereby said holes define a plurality of continuous flow paths through said stack;

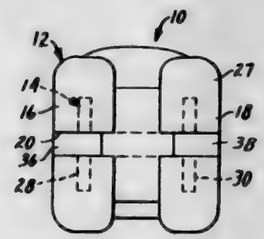
said stack is located in said heat exchanger which is opposite and spaced from said burner with said burner facing said stack, whereby flow from said burner impinges upon said stack with said flow dividing in passing through said passages and engaging in heat exchange with said stack which defines a thermal mass such that quenching occurs and NO_x production is reduced.

5,597,302

AESTHETIC PLASTIC ORTHODONTIC BRACKET WITH LOAD BEARING FRAMEWORK

Jirina V. Pospisil, Covina; James D. Hansen, Duarte, and James D. Cleary, Glendora, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 14, 1994, Ser. No. 322,988
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—8 18 Claims



1. A plastic orthodontic bracket comprising:

a plastic body having a mesial tiewing section with a mesial side, a distal tiewing section with a distal side and an elongated archwire slot extending through said mesial tiewing section and said distal tiewing section, said archwire slot including a lingual side; and

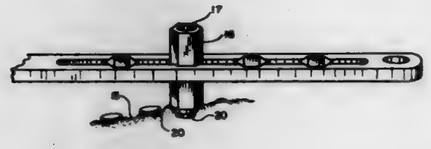
a metallic framework partially embedded in said plastic body, said framework including a mesial portion exteading in said mesial tiewing section in a transverse direction with respect to the longitudinal axis of said archwire slot and a distal portion extending in said distal tiewing section in a transverse direction with respect to the longitudinal axis of said archwire slot, said framework including an intermediate portion interconnecting said mesial portion and said distal portion, said framework including a first end portion extending between said mesial portion and said mesial side and a second end portion extending between said distal portion and said distal side, said first end portion and said second end portion each having a buccolabially-facing surface that is coplanar with said lingual side of said archwire slot.

5,597,303

DEVICE AND METHOD FOR CONFIRMING BITE REGISTRATION FOR DENTAL IMPLANTS

David E. Simmons, 1534 Aline St., New Orleans, La. 70115

Filed Feb. 17, 1995, Ser. No. 390,879
Int. Cl.[6] A61C *19/04*
U.S. Cl. 433—74 15 Claims



1. A device for confirming bite registration for dental implants, comprising:

a substantially flat plate of a discreet length having an outer surface, an inner surface and a through opening, said opening being defined by an annular wall oriented at an angle which generally corresponds to an angle of natural position of a healed dental implant extending above a patient's gumline; and

a hollow post having a first portion for engaging said dental implant, said first portion extending outwardly from said inner surface, a second portion which extends outwardly from said outer surface after the post has been fittingly engaged in said through opening, said post being provided with an inner aperture suitable to fittingly engage the portion of the dental implant extending above a patient's gumline.

5,597,304

UNIVERSAL ALIGNMENT INDICATOR

Isaac Ray, 3700 Bedford Ave., Brooklyn, N.Y. 11229, and Lawrence Avrasenko, 3845 Lime Ave., Brooklyn, N.Y. 11224

Filed Jul. 21, 1995, Ser. No. 505,682
Int. Cl.[6] A61C *3/00;1/00;3/02*
U.S. Cl. 433—75 14 Claims

1. A precise orientating tooth drilling device, comprising:

a) drill orientatioe means attachable to a dental drill for generating a drill angular position signal representing an angular position of said dental drill;

b) tooth orientation means removably attachable to a tooth for generating a tooth angular position signal representing an angular position of said tooth;

c) comparing means for comparing said drill angular position signal and said tooth angular position signal to each other and determining if a difference therebetween is within a predetermined value; and

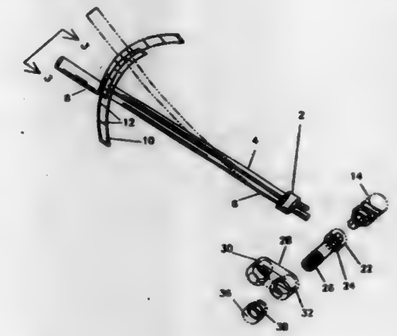
d) alarm means for alerting when said difference between said drill angular position signal and said tooth angular position signal is not within said predetermined value, so that repositioning of said drill can be initiated.

5,597,305

DENTAL WRENCH

Charles M. Ray, Sr., 12755 Nemo Rd., Rapid City, S. Dak. 57702

Filed Jun. 12, 1995, Ser. No. 489,230
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—141 1 Claim



1. A dental wrench for applying a measured torque to dental components comprising:

(1) a joint block having the general shape of a cube, the joint block having a forward face, a rearward face, a top, and a bottom; said joint block having two aligned, parallel holes passing from the forward face to the rearward face; one of said holes being near the top of said joint block; and one of said holes being near the bottom of said joint block;

(2) an indicator rod having a generally cylindrical shape, the indicator rod passing through the top hole in said joint block and having sufficient length that a small portion of the length of said indicator rod protrudes beyond the forward face of said joint block and a larger portion of the length of said indicator rod protrudes beyond the rearward face of said joint block;

(3) a torque rod having a generally cylindrical shape and having approximately the same length as said indicator rod, the torque rod passing through the bottom hole in said joint block and having a slightly longer length of said torque rod than the length of said indicator rod which protrudes beyond the forward face of said joint block protruding beyond the forward face of said joint block and a larger portion of the length of said torque rod protrudes beyond the rearward face of said joint block;

(4) a handle having a generally cylindrical shape and a diameter slightly greater than the diameter of said torque rod affixed to

the rearward end of said torque rod with the longitudinal axis of the handle being aligned with the longitudinal axis of said torque rod;

(5) a scale having the general shape of an arc with the center of the arc being the point where the top of said torque rod contacts the rearward face of said joint block, the scale being affixed to the top of said torque rod just forward of said handle such that the bottom of said indicator rod is slightly above the top surface of said scale and the rearward end of said indicator rod protrudes slightly beyond the forward surface of said scale; and

(6) scale indicator marks on the top surface of said scale, the scale indicator marks being roughly parallel to the longitudinal axis of said torque rod and said scale indicator marks being symmetrical about the longitudinal axis of said torque rod;

whereby when the forward ends of said indicator rod and of said torque rod are inserted into a driver and the driver is engaged with a screw used to fasten a dental component the dental wrench may be used by an operator grasping said handle and by applying force to said handle to apply torque to the screw and said torque rod bends from the force exerted upon said handle and the torque applied to the screw may be read by determining the position of said indicator rod relative to said scale indicator marks.

5,597,306

METHOD FOR SEPARABLE ATTACHMENT OF AN EPITHESIS TO A BONE, AND EPITHESIS WITH A FIXING DEVICE BY MEANS OF WHICH THIS METHOD CAN BE APPLIED

Sieglinde Herlitz, Wilhelm-Busch-Str. 39., D-41541 Dormagen, and Andy Ovist, Koln-Rodenkirchen, both of Germany, assignors to Sieglinde Herlitz, Dormagen, Germany

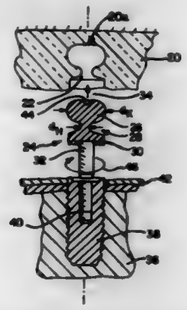
PCT No. PCT/DE92/00997, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/03684, PCT Pub. Date Mar. 4, 1993

PCT Filed Jul. 24, 1992, Ser. No. 193,142

Claims priority, application Germany, Aug. 13, 1991, 41 26 735.4

Int. Cl.[6] A61C *8/00;13/24*

U.S. Cl. 433—173 10 Claims



1. A method for separable attachment of an epithesis (20) to a bone (36), in which at least one fixture (38) is implanted in the bone (36), the fixture (38) being externally accessible, comprising:

a. implanting said at least one fixture (38) into said bone (36);

b. providing at least one fastening means (24) for attaching said epithesis (20) to said bone (36), each said fastening means (24) including an outwardly protruding head (26), and further including an undercut;

c. fastening one said fastening means (24) to each said fixture (38);

d. providing a recess in said epithesis (20) for each said fastening means (24), each said recess having a shape corresponding to the shape of said outwardly protruding head (26) and said undercut; and

e. fastening said epithesis (20) to said bone (36) by pressing each said fastening means (24) into each said recess.

5,597,307

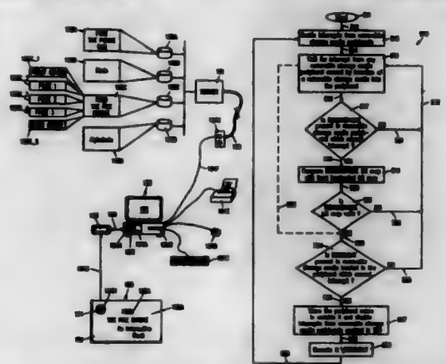
METHOD FOR STARTING UP A PROCESS AUTOMATICALLY ON INSERTION OF A STORAGE MEDIA INTO A HOST DEVICE

Peter M. Redford, Los Gatos, and Donald S. Stern, San Jose, both of Calif., assignors to TV Interactive Data Corporation, San Jose, Calif.

Division of Ser. No. 269,492, Jul. 1, 1994. This application May 11, 1995, Ser. No. 439,562

Int. Cl.[6] G09B *19/00*

U.S. Cl. 434—118 32 Claims



1. A method for automatically starting up a process in a host device based on insertion of a storage media into a peripheral, comprising:

booting an operating system of the host device, said step of booting including checking for an initialization file;

automatically enabling an interrupt;

automatically checking for a file other than said initialization file in at least one removable storage media associated with at least one peripheral on occurrence of said interrupt, said removable storage media being encoded with electronic content including said file;

automatically loading at least a portion of the electronic content from said removable storage media in response to finding said file during said step of automatically checking;

automatically executing an application identified by or associated with said file; and

returning to said step of automatically enabling.

5,597,308

ASSEMBLY INCLUDING INTERLOCKING COMPONENTS FOR TEACHING MATHEMATICAL CONCEPTS

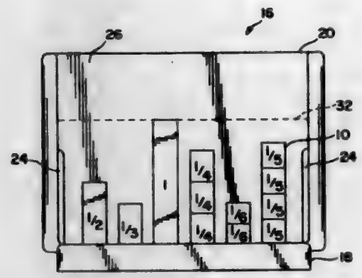
Richard Woldenberg, 176 Hastings, Highland Park, Ill. 60035, and Lisa Hoffman, 102 N. Maple St., Mt. Prospect, Ill. 60056

Filed Nov. 16, 1994, Ser. No. 340,599

Int. Cl.[6] G09B *1/06*

U.S. Cl. 434—196 13 Claims

1. An assembly for teaching mathematical concepts comprising removably interlocking componeats, each of said components having a hollow body and means at opposite ends of said body for connecting one component to another, said connecting means comprising a male end and a female end, said female end being an open end of said body and sized to receive and frictionally retain a male end of another component, each body having a predetermined length, said assembly including bodies of at least two different lengths, whereby the length of each of said bodies indicates an assigned mathematical value and the sum of lengths of any given number of assembled bodies provides an overall length which indicates the sum of the assigned mathematical values for said given number of said assembled bodies.



5,597,309

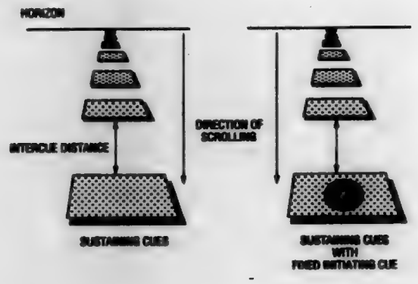
METHOD AND APPARATUS FOR TREATMENT OF GAIT PROBLEMS ASSOCIATED WITH PARKINSON'S DISEASE

Thomas Riess, 176 Morningside Ct., San Anselmo, Calif. 94960

Filed Mar. 28, 1994, Ser. No. 218,669

Int. Cl.[6] G09B *19/00*

U.S. Cl. 434—258 8 Claims



1. A method for the treatment of gait problems associated with Parkinson's Disease in a subject which comprises the steps of:

a) providing an apparatus to be worn by the subject during treatment of gait problem associated with Parkingson's disease; which delivers optical images to the subject's view without disturbing the subject's visual perception of the subject's physical environment;

b) delivering an initiating cue to the subject through the optical image apparatus to initiate ambulation when needed; and,

c) delivering sustaining cues to the subject through the optical image apparatus as needed to sustain ambulation once initiated.

5. An apparatus for use in the treatment of gait problems associated with Parkinson's Disease in a subject which compriaes:

a) virtual reality headwear including means for providing video-based imagery to the subject's field of vision while allowing continued visual perception of the subject's physical environment;

b) means for delivering a video-based gait initiating cue to the subject during treatment through the virtual reality headwear to initiate ambulation; and

c) means for delivering a video-based gait sustaining cues to the subject during treatment through the virtual reality headwear to sustain ambulation.

5,597,310

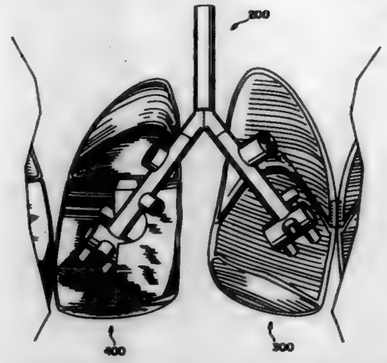
TEACHING MODEL OF THE BRONCHIAL AND LUNGS USEFUL FOR TEACHING THE BIOLOGY OF THOSE ORGANS

Pierre Edde, 2 Radio Ave., A-17, Secaucus, N.J. 07094

Filed May 15, 1995, Ser. No. 441,486

Int. Cl.[6] G09B *23/30*

U.S. Cl. 434—272 12 Claims



1. A teaching model comprising a hollow-tube replica of the bronchis of a creature made up of a multiplicity of hollow tube members of a plurality of different diameters, the members having means for reversibly connecting them to and disconnecting them from one another, the diameters of the assembled members of the replica generally decreasing from the top to the bottom of the replica.

5,597,311

SYSTEM FOR MAKING EXAMINATION PAPERS AND HAVING AN AUTOMATIC MARKING FUNCTION

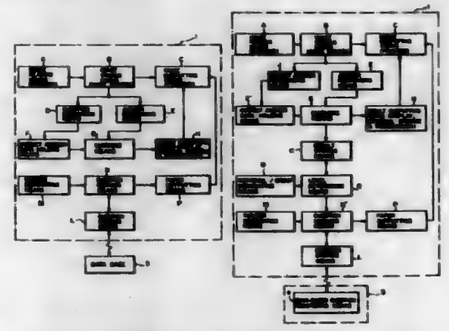
Masato Yanagida, Tokyo; Takuko Sato, Yokohama, and Tetsuya Kagawa, Ebina, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 30, 1994, Ser. No. 367,429

Claims priority, application Japan, Dec. 30, 1993, 5-354382; Jul. 28, 1994, 6-177199

Int. Cl.[6] G09B *7/00*

U.S. Cl. 434—358 10 Claims



1. An image processing apparatus comprising:

image reading means for reading an image of a document;

image storing means for storing image data generated by said image reading means;

image outputting means for forming the image data stored in said image storing means on a sheet;

question recognizing means for recognizing, when said image reading means reads an examination paper, questions out of the image data;

correct answer recognizing means for recognizing correct answers;

answer recognizing means for recognizing, out of the image data, characters, symbols or marks representing answers to the questions;

correct answer data holding means for holding data of correct answers to the questions beforehand or holding data of correct answers recognized by said correct answer recognizing means;

marking means for comparing the answers recognized by said answer recognizing means and the correct answers held by said correct answer data holding means question by question to thereby determine whether or not said answers are correct, and for calculating marks on the basis of a result of decision;

result outputting means for outputting the result of marking produced by said marking means on a sheet by forming an image representing said result;

question storing means for receiving data of questions from a data base either directly or via a network;

number designating means for designating a desired number of questions;

question making means for randomly selecting, among a number of questions registered at said data base, the desired number of questions and storing said desired number of questions in said question storing means to thereby make questions; and

examination paper outputting means for causing said image outputting means to form an image representing the questions made by said question making means on a sheet, and for outputting said sheet as an examination paper.

3. An image processing apparatus comprising:

image reading means for reading an image of a document;

image storing means for storing image data generated by said image reading means;

image outputting means for forming the image data stored in said image storing means on a sheet;

question recognizing means for recognizing, when said image reading means reads an examination paper, questions out of the image data;

correct answer recognizing means for recognizing correct answers;

answer recognizing means for recognizing, out of the image data, characters, symbols or marks representing answers to the questions;

correct answer data holding means for holding data of correct answers to the questions beforehand or holding data of correct answers recognized by said correct answer recognizing means;

marking means for comparing the answers recognized by said answer recognizing means and the correct answers held by said correct answer data holding means question by question to thereby determine whether or not said answers are correct, and for calculating marks on the basis of a result of decision;

result outputting means for outputting the result of marking produced by said marking means on a sheet by forming an image representing said results;

result storing means for storing the result of marking on an individual basis or a group basis;

question storing means for receiving data of questions from a data base either directly or via a network;

number designating means for designating a desired number of questions;

designating means for designating an individual or a group;

level determining means for determining, based on cumulative data stored in said result storing means, a level of the individual or the group designated by said designating means;

question making means for selecting, among the number of questions registered at said data base and classified by rank, the desired number of questions designated by said number designating means and belonging to the rank matching the level determined by said level determining means, and for storing said desired number of questions in said question storing means to thereby make questions; and

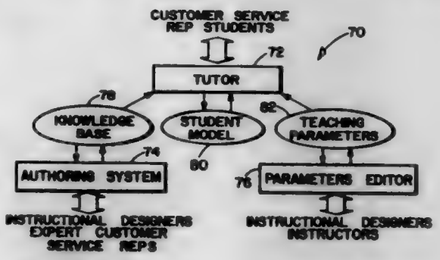
outputting means for forming an image representing the questions made by said question making means on a sheet and outputting said sheet as an examination paper.

5,597,312

INTELLIGENT TUTORING METHOD AND SYSTEM

Charles P. Bloom, Superior; Brigham R. Bell, Boulder, both of Colo.; Franklyn N. Linton, Jr., Woburn, Mass.; Mark H. Haines, Arvada, and Edwin H. Norton, Northglenn, both of Colo., assignors to U S West Technologies, Inc., Boulder, Colo.

Filed May 4, 1994, Ser. No. 237,648
Int. Cl.[6] G09B 7/00
U.S. Cl. 434—362 18 Claims



1. A computer based intelligent method for tutoring a student in an interactive application, the method comprising:

providing a teaching parameter having a plurality of adjustable factors;

selecting a contribution percentage for each of the plurality of adjustable factors of the teaching parameter;

generating a student model;

monitoring a student interactive task based upon the teaching parameter and the student model;

generating an updated student model based upon a student response to the student interactive task generated; and

monitoring a student interactive task based upon the teaching parameter and the updated student model.

10. A computer based intelligent system for tutoring a student in an interactive application, the system comprising:

a teaching parameter having a plurality of adjustable factors;

means for selecting a contribution percentage for each of the plurality of adjustable factors of the teaching parameter;

means for generating a student model;

means for monitoring a student interactive task based upon the teaching parameter and the student model;

means for generating an updated student model based upon a student response to the student interactive task generated; and

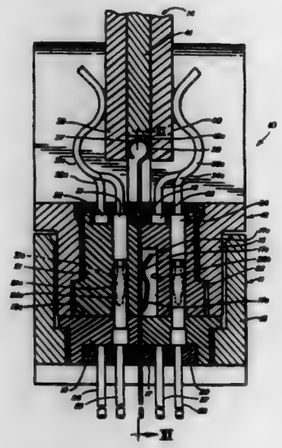
means for monitoring a student interactive task based upon the teaching parameter and the updated student model.

5,597,313

ELECTRICAL CONNECTORS

Richard J. Lindeman, Wood Dale, Ill., assignor to Labinal Components and Systems, Inc., Bensenville, Ill.

Continuation of Ser. No. 647,907, Jan. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 518,295, May 3, 1990, Pat. No. 5,004,427, which is a continuation of Ser. No. 297,383, Jan. 13, 1989, abandoned, which is a division of Ser. No. 947,317, Dec. 29, 1986, Pat. No. 4,806,110, which is a continuation-in-part of Ser. No. 876,179, Jun. 19, 1986, Pat. No. 4,710,133, said Ser. No. 647,907is a continuation-in-part of Ser. No. 406,142, Sep. 12, 1989, Pat. No. 5,013,249, and a continuation-in-part of Ser. No. 375,588, Jul. 5, 1989, Pat. No. 4,992,053, and a continuation-in-part of Ser. No. 352,499, May 16, 1989, Pat. No. 4,988,306, said Ser. No. 406,142is a continuation-in-part of Ser. No. 297,383, Jan. 13, 1989, abandoned, said Ser. No. 361,448is a continuation-in-part of Ser. No. 241,663, May 11, 1994, which is a continuation of Ser. No. 647,865, Jan. 30, 1991. This application Dec. 21, 1994, Ser. No. 361,448
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—66 21 Claims



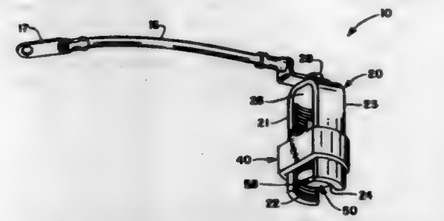
1. An electrical connector assembly for propagation of electrical signals therethrough between opposite sides of said assembly, comprising: support means having opposite surfaces corresponding to said opposite sides, a plurality of spaced signal-propagating interconnect means extending through said support means between said opposite surfaces thereof and arranged in generally parallel relation to one another for interconnecting circuit components at said opposite sides of said assembly, ground conductor means included in said support means and having portions in adjacent relation to said signal-propagating interconnect means, ground interconnect means for connecting said ground conductor means to ground conductors of said circuit components, and insulating means of dielectric material included in said support means for supporting said signal-propagating interconnect means and in electrically insulated relation to adjacent portions of said ground conductor means to provide each supported signal-propagating interconnect means with an adjacent ground path of very low inductance and resistance to obtain efficient signal propagation between interconnected circuit components and to inhibit the build-up of any potential difference between such interconnected circuit components, said support means having a plurality of spaced openings extending between said opposite surfaces and arranged in a multi-directional array of openings into which said signal propagating interconnect means are disposed for selectively obtaining a desired pattern of propagation paths between said circuit components.

5,597,314

CABLE SHIELD GROUND CLAMP

William T. Auclair, Wlasted; John W. Auclair, Norfolk, and Randolph L. Auclair, New Hartford, all of Conn., assignors to Electric Motion Company, Inc., Wlasted, Conn.

Continuation-in-part of Ser. No. 58,159, May 5, 1993, Pat. No. 5,429,532. This application Feb. 28, 1995, Ser. No. 395,453
Int. Cl.[6] H01R 13/648
U.S. Cl. 439—98 20 Claims



1. A cable shield ground clamp comprising:

a generally U-shaped yoke having a pair of legs and defining a receiving aperture, said legs having opposed thread surfaces;

keeper means mounted to said yoke, said keeper means comprising driver means and clamp jaw means disposed between said legs, said driver means being threadably engageable with said yoke thread surfaces for variable positioning said clamp jaw means therealong and for maintaining the position of said clamp jaw means at a selected fixed position relative to said yoke, said keeper means comprising lock means for locking said clamp jaw means at said fixed position, said lock means comprising a first surface on said driver means and a second surface on said clamp jaw means wherein said first surface engages said second surface; and

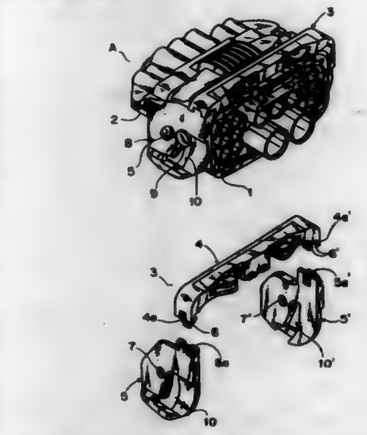
ground connection means for connecting said yoke with a ground connector.

5,597,315

CONNECTOR WITH ENGAGING LEVER

Naoto Taguchi, Hadano-gun, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jan. 23, 1995, Ser. No. 376,966
Claims priority, application Japan, Jan. 26, 1994, 6-006817
Int. Cl.[6] H01R 13/62
U.S. Cl. 439—157 6 Claims



1. A pair of connectors with an engaging lever comprising:

a first housing having an engaging lever pivotally attached thereto;

a second housing for coupling and uncoupling to said first housing by actuation by said engaging lever; and

said engaging lever containing a pair of operative pieces and an interconnecting actuating handle which are each separately formed, cooperating connecting portions being provided on each of said operative pieces and said actuating handle for interconnecting each other, and said connecting portions, when interconnected, forming said combined engaging lever, wherein each connecting portion comprises locking hooks on said operative piece having a pair of mutually oppositely disposed hooking edges, and a cooperating end of said actuating handle containing a pair of mutually oppositely disposed hooking edges cooperable with, and disposed in opposition to, said hooking edges on said operative piece for latched connection therewith.

5,597,316

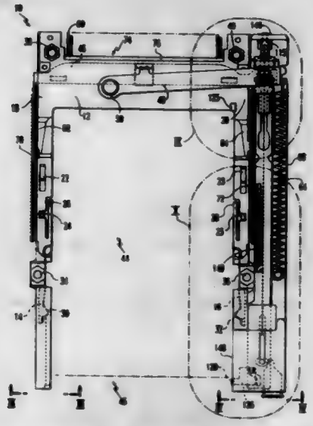
MEMORY CARD CONNECTOR HAVING IMPROVED EJECT MECHANISM AND METHOD OF USE

James J. David, Mechanicsburg; Scott S. Duesterhoeft, Etters; John M. Spichler, Marietta, all of Pa., and Naoki Hiyama, Yokohama, Japan, assignors to Berg Technology, Inc., Reno, Nev.

Continuation of Ser. No. 348,734, Dec. 7, 1994, abandoned. This application Feb. 29, 1996, Ser. No. 608,979

Int. Cl.[6] H01R *13/635*

U.S. Cl. 439—159 24 Claims



1. A connector apparatus for a card-like electronic medium, said connector apparatus comprising:

(a) a frame having a rear transverse element and opposed longitudinal elements extending forward from said rear transverse element and spaced at an interval substantially equal to the width of said card-like electronic medium, said opposing side elements defining a storage space, one end of said frame defining an insertion inlet for inserting the card-like electronic medium into the storage space;

(b) a header positioned adjacent the rear transverse element of the frame opposite the insertion inlet;

(c) a eject plate movably mounted on the frame and operable to slide toward the header to allow engagement of the card-like electronic medium from the header and away from the header to eject the card-like electronic medium; and

(d) a link arm having a pivot point where the link arm is connected to the frame having a first contact point where the link arm is engaged by the eject plate when the eject plate and the card-like electronic medium are being moved toward the header and a first distance between the first contact point and the pivot point when the card-like electronic medium is inserted and a second contact point where the link arm engages the eject plate when the card-like electronic medium is ejected and a second distance between the second contact point and the pivot point and said first distance being greater than said second distance.

5,597,317

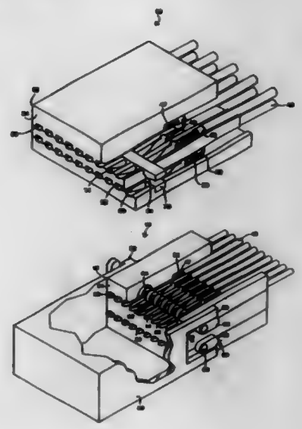
SURFACE MATING ELECTRICAL CONNECTOR

George A. Hansell, III, Newark, and John Voltz, Hockessin, both of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Aug. 11, 1995, Ser. No. 514,335

Int. Cl.[6] H01R *9/09*

U.S. Cl. 429—289 24 Claims



1. An electrical connector comprising:

at least one electrically insulating first housing portion;

at least one elongated flexible metal buckling beam element having a predetermined length and width dimension, wherein the length dimension is greater than the width dimension, the at least one buckling beam element being positioned in a predetermined location on the first housing portion, each at least one buckling beam element having a contact end and an opposed termination end, wherein the termination end of the at least one buckling beam elemeat is fixedly positioned on the first housing portion;

preloading means for ensuring that the at least one buckling beam element bends predictably in a predetermined direction; and

an electrically insulating second housing portion which at least partially encloses the at least one buckling beam element, the second housing portion having a facing surface portion having formed therethrough at least one aperture for permitting extension of the at least one buckling beam element therethrough, the second housing portion being moveable, back and forth, in a direction substantially parallel to the at least one buckling beam, from a first position wherein the second housing portion protectably encloses the contact end of the at least one buckling beam element, to a second position wherein the contact end of the at least one buckling beam element extends through the aperture.

5,597,318

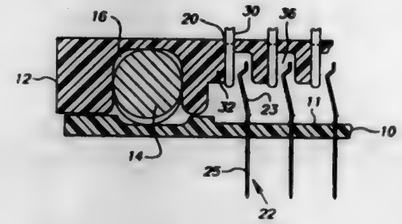
ZIF FOR PLASTIC CHIP CARRIER

Peter K. Townsend, Camp Hill, Pa., assignor to Berg Technology, Inc., Reno, Nev.

Filed Jul. 15, 1994, Ser. No. 275,959

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—342 42 Claims



1. A pin grid array socket for connecting an integrated circuit (IC) having a plurality of pins to a circuit substrate, comprising:

a base for supporting a plurality of contacts which extend through the base to electrically connect to the circuit substrate;

a cover having a plurality of insertion holes for receiving said plurality of pins and being slidably attached with said base so that said plurality of pins can be moved to form an electrical interface with said plurality of contacts; and

a plurality of buttresses having an arcuate surface thereof connected to said cover for supporting said plurality of pins,t he arcuate surface of each buttress engaging a respective pin to provide support over a substantial length of the pin.

5,597,319

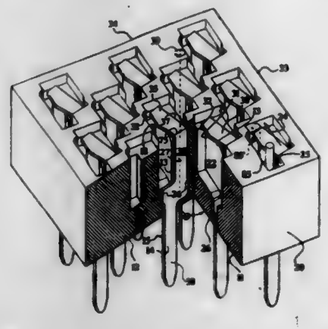
ZERO INSERTION FORCE PIN GRID ARRAY SOCKET

John T. Scheitz, Barrington, and Kathleen A. Capilupo, Palatine, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Nov. 29, 1994, Ser. No. 346,546

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—342 19 Claims



1. A zero insertion force pin grid array socket comprising:

a cover having an array of holes formed therethrough slidably engaged to a base; said base having a first side and a corresponding array of passages to said holes, said holes and corresponding passages for receiving pins of an IC package; and

contacts mounted in said passages including a tail at a first end and a torsional beam at the opposite end, said contacts mounted within said base having said tail mounted at an angle of 60°–85° to said first side of said base.

5,597,320

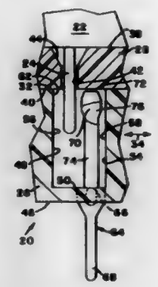
ZERO INSERTION FORCE ELECTRICAL CONNECTOR AND TERMINAL

Leland Wang, Hacienda Hts., Calif., and Nai K. Wong, Singapore, Singapore, assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 3, 1995, Ser. No. 367,566

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—342 21 Claims



1. A zero insertion force electrical connector for use with a device having an array of pin terminals, said electrical connector comprising:

a first connector housing component having an array of cavities corresponding to the array of pin terminals;

a second connector housing component having an array of openings through which the pin terminals are adapted to extend into said cavities;

each of said cavities including a base wall spaced from the second connector housing and a side wall;

a terminal in each of said cavities, said terminal including a mounting portion for securing said terminal in said base wall, a free end portion, a contact structure adjacent said free end portion and a generally planar leaf spring portion extending from said base wall to said contact structure, each said terminal having only one leaf spring portion and only one contact structure; and

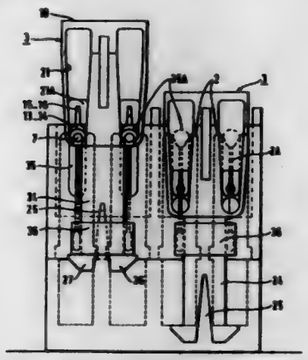
means mounting said connector housing components for relative movement in a first direction along a path of travel between a pin terminal insertion position wherein the pin terminals of said device when mounted on said connector are spaced from said contact structures in said cavities and an engagement position wherein the pins engage said contact structures;

said leaf spring portion of each said contact being flexible in a second direction generally perpendicular to said first direction to provide a contact force when mated with one of the pin terminals, the plane of said leaf spring portion of each said terminal being generally parallel to said path of travel;

said leaf spring portion and said contact structure having side edges generally perpendicular to said second direction and said terminal having a generally uniform width between said side edges along said leaf spring portion and said contact structure between said leaf spring portion and said free end portion, said side edges of said leaf spring portion defining lateral bounds thereof; and

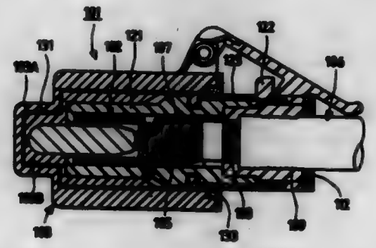
said contact structure including a pin engagement surface at least partly inclined with respect to said path of travel and disposed within the lateral bounds of said leaf spring portion.

5,597,321
PUSH-IN CONNECTING PIECE AND TERMINAL STRIP EQUIPPED WITH SAME
Didier Jacques, La Francheville, France, assignor to Alcatel Cable Interface, Vrigne aux Bois, France
Filed Mar. 24, 1995, Ser. No. 409,589
Claims priority, application France, Mar. 30, 1994, 94 03786
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—417 11 Claims



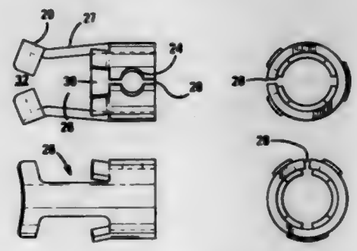
1. A push-in piece for connecting an insulated wire to an insulation displacement contact by sliding said push-in piece onto said contact, said push-in piece comprising an end actuating head and at least two longitudinal elongate members which face each other, said at least two longitudinal elongate members having first end portions formed integrally with said end actuating head and having second, free end portions formed with mutually aligned holes for inserting the insulated wire, wherein said at least two elongate members are also provided with respective mutually aligned gripping slits, for gripping the insulated wire, opening out into the respective holes of the elongate members and extending from the respective holes towards said end actuating head.

5,597,322
ELECTRO-MAGNETICALLY SHIELDED CONNECTOR
Shigenobu Inaba; Shigeaki Hashizawa, and Hidehiko Kobashima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Division of Ser. No. 439,788, May 12, 1995, Pat. No. 5,501,615, which is a division of Ser. No. 249,199, May 26, 1994, Pat. No. 5,460,544. This application Dec. 28, 1995, Ser. No. 580,386
Claims priority, application Japan, May 26, 1993, 5-145407; May 26, 1993, 5-145408; Aug. 31, 1993, 5-216839
Int. Cl.[6] H01R 17/04
U.S. Cl. 439—578 10 Claims



1. An electro-magnetically shielded connector comprising:
a first connector body including at least two housings;
an electrically conductive layer formed on a surface of one of the two housings in such a manner that the electrically conductive layer covers a surface of the one housing, and when the two housings are combined with each other, at least a part of the electrically conductive layer on an outer surface of the one housing is exposed; and
main electrically connecting means for electrically connecting the electrically conductive layer of the first connector body and a shield of a shielded cable to seal an inside of the first connector body.

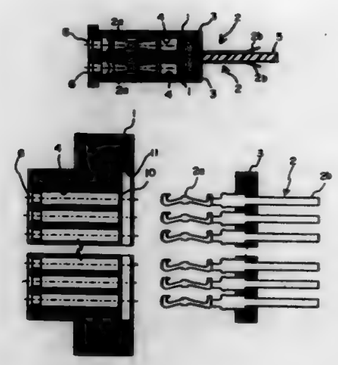
5,597,323
RF CONNECTOR JACK AND PLUG ASSEMBLY
Paul Renick, Roxborough, and Hubert Chow, Lexington, both of Mass., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Aug. 7, 1995, Ser. No. 512,030
Int. Cl.[6] H01R 4/24
U.S. Cl. 439—582 10 Claims



1. In a jack and plug assembly,
the jack having downwardly extending inner and outer coaxial connectors,
the jack being designed to receive a coaxial cable at a right angle to the axis of the jack,
with the inner conductor of a coaxial cable attached to the inner connector,
the improvement wherein said inner connector comprises a downwardly extending hollow cylindrical spring metal conductor, the upper portion of said conductor having a surface hole of a size slightly smaller than the diameter of the inner conductor of the coaxial cable to be connected thereto,
a lower portion of the hollow cylinder below the hole being removed and the surface of the hollow cylinder between the top and the lower portion being slotted to permit forcible expansion of the upper portion so that the hole is enlarged sufficiently to receive the larger inner conductor of the coaxial cable.

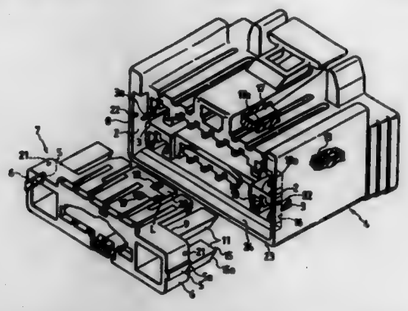
5,597,324
SEALED RECEPTACLE CONNECTOR FOR PC CARD
Kazuhara Katsunori, Fuchu, Japan, assignor to Molex Incorporated, Lisle, Ill.
Filed Jun. 30, 1995, Ser. No. 497,011
Claims priority, application Japan, Aug. 2, 1994, 6-200200
Int. Cl.[6] H01R 13/40
U.S. Cl. 439—587 7 Claims

1. A receptacle connector for an IC card, the IC card including a circuit board with electronic circuitry thereon, the receptacle connector comprising:
an elongated housing having a plurality of terminal-receiving cavities extending therethrough, and a plurality of inlet openings formed at a first end of the housing and communicating with the terminal-receiving cavities for receiving contact pins of a mating connector,



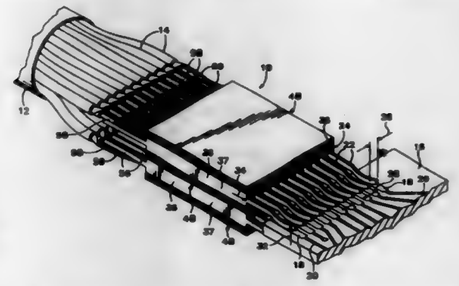
a plurality of terminals within the terminal-receiving cavities each having a terminal contact for electrically connecting to the contact pins of the mating connector and a generally planar conductor extension extending from the terminal contact with a free end for electrically connecting to the electronic circuitry of the circuit substrate,
a plurality of stoppers each attached to a corresponding one of the conductor extensions wherein each stopper is press-fit within the housing at an end opposite the first end, whereby each terminal-receiving cavity is sealed by one of the stoppers to prevent the ingress of foreign particles therethrough.

5,597,325
DOUBLE-LOCK CONNECTOR
Tsuhiro Maejima, and Yoshinori Uchida, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jan. 23, 1996, Ser. No. 590,448
Claims priority, application Japan, Jan. 31, 1995, 7-013469
Int. Cl.[6] H01R 13/40
U.S. Cl. 439—595 4 Claims



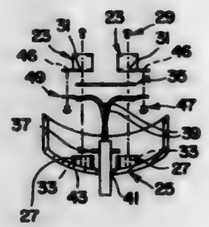
1. A double-lock connector, comprising:
a connector housing including a flexible locking lance for a terminal; and
a spacer including an antideflection plate for said flexible locking lance, said spacer being to be inserted into said connector housing;
wherein said connector housing comprises an inclined guide part including an inclined surface for pushing up said spacer;
wherein said spacer comprises an inclined slide contact part for said inclined guide part, said inclined slide contact part being located lower than said inclined guide part; and
wherein said antideflection plate includes an inclined surface, at a tip of said antideflection plate, for pushing down said flexible locking lance.

5,597,326
LAMINATED MINIATURE MULTI-CONDUCTOR CONNECTOR AND METHOD FOR MANUFACTURE
Daniel DeLessert, Newberg, and Michael L. Dunster, Vernonia, both of Oreg., assignors to The Whitaker Corporation, Wilmington, Del.
Continuation of Ser. No. 330,983, Oct. 28, 1994, abandoned.
This application Feb. 26, 1996, Ser. No. 607,049
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—608 18 Claims



1. An electrical connector for connection to multiple cable conductors comprising: multiple conductor elements, insulating separator elements separating the conductor elements from one another, body portions of the conductor elements and the separator elements being fabricated from sheets of material laminated together, an array of spaced apart spring contact portions projecting from the body portions of the conductor elements, and an array of spaced apart termination portions projecting from the body portions of the conductor elements for connection to respective multiple cable conductors, a transverse shield extending across margins on the conductor elements and margins on the separator elements, the transverse shield comprises, a sheet of conductive material between sheets of insulating material, and the insulating material facing toward said margins.

5,597,327
SPRING TERMINAL AND METHOD FOR MAKING A SPRING TERMINAL
James V. Agro, Geneva, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed May 18, 1995, Ser. No. 443,451
Int. Cl.[6] H01R 17/00
U.S. Cl. 439—617 11 Claims



1. A socket assembly, comprising:
a pair of spring terminals formed of an electrically conductive material, each spring terminal including a central web, and a left and a right spring assembly, each spring assembly being substantially U-shaped and including first and second legs interconnected by a bight, a first leg of each spring assembly being attached to the central web and extending therefrom toward a respective bight, a second leg of each spring assembly extending toward the central web from a respective bight,

with both second legs of the spring assemblies being disposed between the first legs and defining a socket together with the central web, the second legs being flexible with respect to the central web in directions toward and away from each other;

a contact cover, the pair of spring terminals being mounted inside of the contact cover such that the sockets of the pair of spring terminals are aligned with each other.

5,597,328

MULTI-POLE CONNECTOR WITH FILTER CONFIGURATION

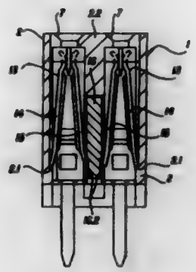
Bob Mouissie, Ek Berlicum, Netherlands, assignor to Filtec-Filtertechnologie GmbH, Lippstadt, Germany

Filed Jan. 13, 1995, Ser. No. 372,653

Claims priority, application Germany, Jan. 13, 1994, 9400491 U

Int. Cl.[6] H01R *13/66*

U.S. Cl. 439—620 25 Claims



1. In a multi-pole connector for connecting a number of signal lines, the improvement comprising:

a connector casing;

rows of adjacent connecting pins and connecting sockets;

at least one planar filter having a number of condensers being adjacent one of said rows of said connecting pins or sockets, said at least one planar filter having edge regions producing a ground connection and a connecting site producing connections between the signal lines and said condensers, the number of condensers corresponding to the number of the signal lines to be connected;

each of said condensers being assigned to a respective one of said pins or sockets and each having a first coating connected to an associated signal line, a second coating to be connected to ground and a dielectric layer interposed between said first and second coatings;

each of said connecting pins or sockets having a connecting conductor connected to said connecting site;

securing connectors being conductively connected with said connector casing and securing at least one of said edge regions; and

said rows of said connecting pins and sockets being disposed in pairs, said at least one planar filter including one planar filter disposed between each of said pairs of rows of said connecting pins or sockets, said planar filter having contact sites and having sides both being printed with said condensers, said connecting conductors of said adjacent connecting pins or sockets lying on opposing sites of said corresponding contact sites, said planar filter having a number of said rows of condensers corresponding to said rows of connecting pins or sockets assigned to said planar filter, and said planar filter being rectangular and having pairs of sides, one of said pairs of sides being oriented parallel to said connecting pins or sockets.

5,597,329

CONNECTOR ATTACHMENT COMPONENT

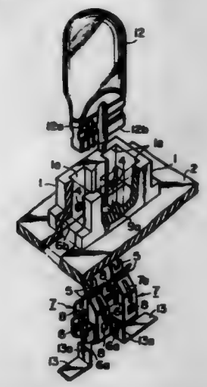
Tsunesuke Takano, and Kouichi Sinnawa, both of Tokyo, Japan, assignors to Daiichi Denso Buhin Co., Ltd., Japan

Filed Oct. 31, 1994, Ser. No. 332,531

Claims priority, application Japan, Nov. 15, 1993, 5-065716 U; Dec. 17, 1993, 5-072882 U

Int. Cl.[6] H01R *19/40*

U.S. Cl. 439—699.2 1 Claim



1. A connector component for a wedge-base lamp comprising:

an electrically insulative base which includes an upright inverted T-shaped electrically insulated frame member defining a central interior rectangular space for receiving a wedge-base of a lamp, and an opposed pair of lateral shoulder pockets which open into a lower portion of said central interior rectangular space;

a pair of opposed bulb guides integral with said frame member and disposed substantially midway of said interior rectangular space, said opposed bulb guides each defining a respective arcuate concavity for receiving a portion of said wedge-base of said lamp therein so as to provide a holder for said wedge-base lamp;

said bulb guides further defining a pair of lateral socket spaces within said interior rectangular space of said frame member, said socket spaces each having a projection member extending into said socket space;

a pair of U-shaped electrically conductive clamp elements positioned in a respective one of said lateral socket spaces, each said clamp element having (i) an attachment aperture which receives a projection member of a respective said socket space to positionally restrain said clamp element therewithin, and (ii) a lateral connection piece positioned within a respective said lateral shoulder pocket for connection to a bus bar.

5,597,330

PRESSURE-CONTACT CONNECTOR

Yuji Hatagishi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 14, 1995, Ser. No. 528,230

Claims priority, application Japan, Sep. 14, 1994, 6-220300

Int. Cl.[6] H01R *13/514*

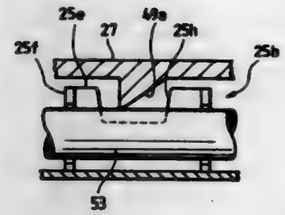
U.S. Cl. 439—752 2 Claims

1. A pressure-contact connector, comprising:

pressure-contact terminals having pressure-contact portions for pressure-contacting with wires;

a housing having partitions defining terminal reception chambers for receiving said pressure-contact terminals between said partitions, said terminal reception chambers being arranged side by side in a horizontal direction of said housing; and

a cover fitted onto said housing;



wherein said pressure-contact portions include side plates which are opposite to each other in a direction perpendicular to a longitudinal direction of said wires, and said side plates are provided with notch portions cut more deeply than upper ends of said wires pressure-contacted by said pressure-contact portions;

wherein said partitions are provided with hollow portions which coincide with said notch portions when said pressure-contact terminals are mounted in said terminal reception chambers;

wherein said cover includes an upper plate, a lower plate and a side wall connecting said upper plate to said lower plate, and said cover includes an insertion hole for said housing so that said cover is removably fitted onto said housing horizontally; and

wherein an inner surface of said cover is provided with rail-like projections so as to project therefrom so that said projections are inserted into said notch portions and said hollow portions which coincide with each other, when said cover is fitted onto said housing, so as to be disposed on upper ends of said wires which are pressure-contacted by said pressure-contact portions.

5,597,331

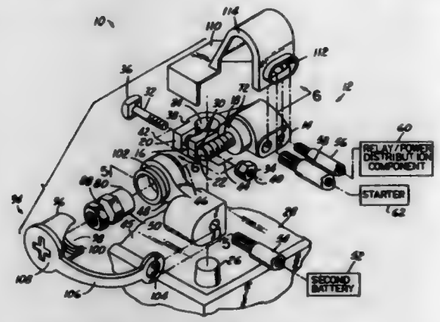
BATTERY CONNECTOR FOR AN AUTOMOTIVE ELECTRICAL SYSTEM

Patricia A. Goble, Ypsilanti; David J. Shreat, Canton, and Jeffrey A. Stone, Lathrup Village, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1996, Ser. No. 605,825

Int. Cl.[6] H01R *4/28*

U.S. Cl. 439—754 20 Claims



1. A battery connector assembly comprising:

an electrically conductive body member;

a first connection portion joined to said body for removable electrical connection to a terminal of a first battery;

a second connection portion joined to said body for providing an electrically conductive terminal connection point for a second battery;

a transfer terminal electrically connected to the second battery, said transfer terminal being removably connected to said second connection portion; and,

a securing means for securing said first connection portion to the first battery terminal, said securing means being obstructed from access when both said first connection portion is connected to the first battery and said transfer terminal is connected to said second connection portion.

5,597,332

SOLDER CONTACT

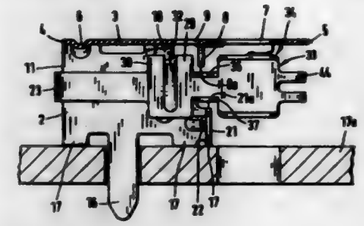
Wolfram Walbrecht, Wuppertal, Germany, assignor to Grote & Hartmann GmbH & Co. KG, Wuppertal, Germany

Filed Aug. 5, 1994, Ser. No. 286,704

Claims priority, application Germany, Aug. 6, 1993, 43 26 456.5

Int. Cl.[6] H01R *13/11*

U.S. Cl. 439—850 19 Claims



3. A solder contact made of a stamped piece of sheet metal with a housing with housing walls (1,2,3) and with a movably attached contact position (35) defined by two contact spring arms (33,34) for contact with a contact plug pin, whereby the housing comprises at least one soldering post (16) insertable through a hole in a printed-circuit board, characterized in that the contact spring arms (33,34) defining the contact position (35) are connected by a bow spring arm support (23) to one of the housing walls (1,2,3) and the bow spring arm support (23) extends freely in the housing in an arched shape, so that the contact position (35) defined by the contact spring arms (33,34) is elastically movable in a direction of a plug axis and perpendicular to said direction, and wherein the plug axis direction of the contact plug pin is perpendicular to a longitudinal direction of the solder contact.

5,597,333

TRIM SYSTEM FOR OUTBOARD ENGINE SYSTEM

Chiharu Sodo, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1995, Ser. No. 532,453

Claims priority, application Japan, Sep. 26, 1994, 6-230071

Int. Cl.[6] B63H *21/26*

U.S. Cl. 440—61 11 Claims

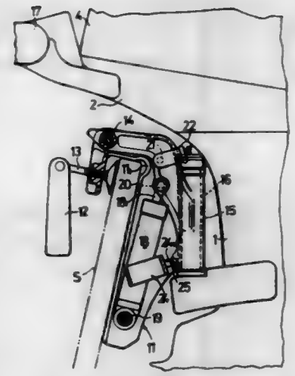
1. A trim system for an outboard engine system, comprising:

a stern bracket having a tilting shaft;

a swivel case having a) a mounting hole formed in said swivel case, b) a swivel shaft mounted in the swivel case and c) a thrust receiver mounted on the swivel case, an outboard engine body being pivotally supported through said swivel shaft, such that said outboard engine body can be laterally steered, and said swivel case is vertically swingably supported on said stern bracket through said tilting shaft; and

a trim cylinder mounted on said stern bracket, said trim cylinder having an output rod provided thereon to abut against said thrust receiver which is mounted on said swivel case,

wherein said thrust receiver includes a mounting shaft portion to be inserted into said mounting hole formed in said swivel case, said mounting shaft having a first tapered surface formed thereon and reduced in diameter in a direction away from said output rod of said trim cylinder, said mounting hole



having a second tapered surface formed therein, said first tapered surface being wedged to said second tapered surface, and

wherein said thrust receiver is prevented from being rotated relative to said swivel case by a detent means provided between said thrust receiver and said swivel case.

5,597,334

OUTBOARD DRIVE TRANSMISSION SYSTEM

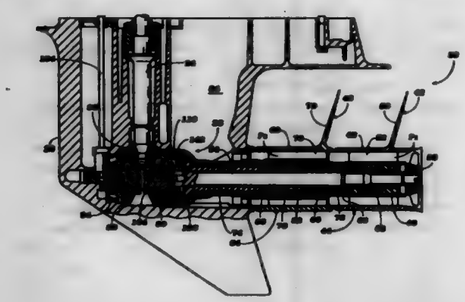
Hiroshi Ogino, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Continuation-in-part of Ser. No. 346,397, Nov. 29, 1994, and a continuation-in-part of Ser. No. 346,383, Nov. 29, 1994, Pat. No. 5,514,014. This application Jun. 5, 1995, Ser. No. 465,247

Claims priority, application Japan, Nov. 29, 1993, 5-298250; Nov. 29, 1993, 5-298656; Jun. 30, 1994, 6-149451

Int. Cl.[6] B63H *21/28*

U.S. Cl. 440—75 **38 Claims**



1. A transmission for a marine outboard drive comprising a first driven gear and a corresponding first clutch coupled to a first propulsion shaft, said first clutch arranged to selectively couple said first propulsion shaft to said first driven gear when actuated by an actuator, said actuator connected to an annular member journaled within said first clutch in a manner permitting said first clutch to rotate relative to said annular member.

5,597,335

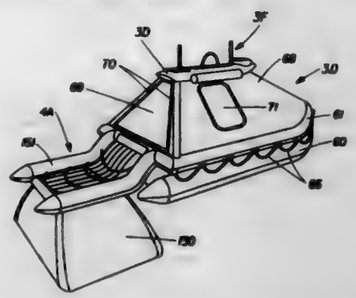
MARINE PERSONNEL RESCUE SYSTEM AND APPARATUS

Richard L. K. Woodland, 581 Broadway St., Victoria, British Columbia, Canada

Filed Oct. 18, 1995, Ser. No. 544,460

Int. Cl.[6] B63B *7/00*

U.S. Cl. 441—36 **23 Claims**



1. A marine personnel rescue system and apparatus for rescuing persons in peril comprising:

(a) an autonomous marine vehicle apparatus comprising:

a rigid hull shaped to form a concavity having first and second sides, the two sides being joined by a bow and a stern, and having an upper periphery around the first and second sides, and the bow and stern, the concavity forming an interior and an exterior, the interior forming an interior hull surface and forming at least one interior chamber;

a first and second foldable rigid hull wings hingedly attached to the first and second sides of the rigid hull;

an inflatable hull and weather hood assembly adhesively attached to the upper periphery of the rigid hull and the foldable rigid hull wings and forming an interior cabin space, the interior cabin space being defined by a generally vertical sidewall having a top, the generally vertical sidewall also having an interior hood surface and an exterior surface;

a power pack means attached to the interior hull surface in one interior chamber of the rigid hull;

a propulsion means coupled to the power pack means;

means for control including navigation and collision avoidance;

means for communication to and from the persons in peril;

means for electrical generation;

means for compressing air;

means for storing compressed air;

transom means;

(b) a personnel recovery means, proximately secured to the transom means of the autonomous marine vehicle apparatus, for recovery of the persons in peril;

(c) a targeting and sensor array means for detecting the persons in peril;

(d) a sensor array control means for controlling the targeting and sensor array means; and

(e) a deployment means for launching the autonomous marine vehicle apparatus.

5,597,336

UNIQUE SWIM FIN

Robert B. Evans, 28 Anacapa St., Santa Barbara, Calif. 93101

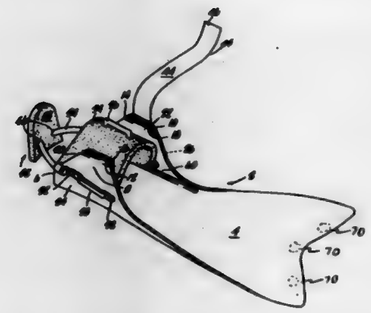
Filed Feb. 27, 1995, Ser. No. 395,081

Int. Cl.[6] A63B *31/11*

U.S. Cl. 441—64 **16 Claims**

1. A swim fin comprising the combination of:

a foot portion having an open instep and an open, planar heel portion adapted to receive the human foot, said fin having



upstanding, projecting ear portions adjacent and coterminous with said open, planar heel portion and forming a receiving channel for the foot of the user of said fin and cushioned, fastening means secured to said upstanding ear portions and said heel portion for securing said fin to the human foot, said cushioned, fastening means including a substantially planar contoured cushion member conformable to a rear portion of said human foot, said cushion member having a pair of displaced openings formed therethrough and an elastic loop member having opposing ends secured to respective ones of said ear portions, said elastic loop member passing through said openings formed through said cushion member.

5,597,337

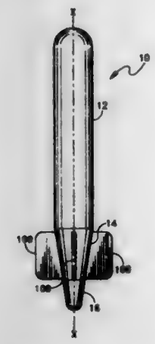
QUICK CHANGE FIN ASSEMBLY FOR BUOYANT TEST VEHICLES

William H. Neddermann, Jr., Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 21, 1995, Ser. No. 394,109

Int. Cl.[6] A63C *15/00*

U.S. Cl. 441—79 **6 Claims**



1. An assembly for attaching a replaceable fin to a body of the type having a groove extending along a surface of the body for slidably and removably receiving the assembly, the body further having a removable end piece for retaining the assembly with reference to a direction along the groove, the assembly comprising:

a fin base plate slidably and removably inserted into the groove of the body, the base plate engaging with a groove surface for retaining the base plate with reference to a direction perpendicular to the groove;

a fin structure removably attached to the base plate, the fin structure extending from the base plate in a direction away from the surface of the body;

at least one bolt extending through the base plate, the at least one bolt engaging at least one corresponding threaded bore in the fin structure for removably attaching the fin structure to the base plate; and

a vibration absorbing bushing between the base plate and the at least one bolt.

5,597,338

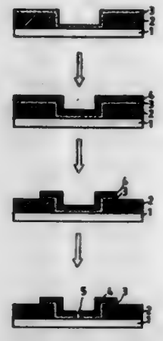
METHOD FOR MANUFACTURING SURFACE-CONDUCTIVE ELECTRON BEAM SOURCE DEVICE

Kumi Iwai, Isehara; Ichiro Nomura, Atsugi, and Tetsuya Kaneko, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 24,435, Mar. 1, 1993, abandoned. This application Sep. 25, 1995, Ser. No. 532,545

Int. Cl.[6] H01J *9/00;9/02*

U.S. Cl. 445—51 **21 Claims**



1. A method for forming a surface-conductive electron beam source comprising the following steps:

(a) forming at least one pair of electrodes on a substrate;

(b) applying an organic metal compound solution between said electrodes, and then calcining the applied organic metal compound to form a fine particle film, and repeating the applying and calcining steps a plurality of times; and

(c) applying a voltage to said fine particle film to form an electron-emitting portion.

5,597,339

STUFFED TOY FIGURE AND OFFSPRING ASSEMBLY

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 30, 1995, Ser. No. 550,173

Int. Cl.[6] A63H *3/06;3/02*

U.S. Cl. 446—226 **7 Claims**



1. A toy figure and offspring assembly comprising:

A. a stuffed toy figure resembling a particular type of animal most of whose body is covered with a simulated hairy fur of a character appropriate to the figure, the body being provided with a closable internal pouch which when closed is then concealed by the hairy fur; and

B. a single latent offspring receivable in the pouch in a collapsed state consisting of an outer spherical casing covered with a simulated fur which corresponds to that of the figure and a deflated balloon enclosed in the casing having a neck projecting through a port in the casing, the dimensions of the pouch being sufficient only to accommodate the offspring in the collapsed state whereby when the latent offspring is removed from the pouch and the balloon is inflated through its neck to expand the casing, after which the neck is tied, a furry playball is then produced which is a roly-poly offspring of the figure.

5,597,340

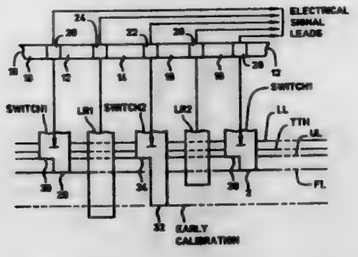
ULTIMATE INDUCTIVE HEAD INTEGRATED LAPPING SYSTEM

Mark A. Church, San Jose; Alain M. Desouches, Santa Cruz, and Richard E. Krebs, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 936,823, Aug. 28, 1992, Pat. No. 5,361,547. This application Sep. 2, 1994, Ser. No. 300,820

Int. Cl.[6] B24B *49/02;49/10*

U.S. Cl. 451—5 **13 Claims**



1. A lapping control process for accurately providing a desired throat height of each of a plurality of batch fabricated thin film magnetic transducers, said system comprising:

forming a row of thin film transducers on a substrate, said row comprising a height defining edge and at least four spaced sensing devices, a first two of said sensing devices comprising switch devices, each switch device offset a predetermined amount from said height defining edge, and a second two of said sensing devices comprising resistive devices, each resistive device offset a predetermined amount from said height defining edge;

forming a plurality of parting kerfs in said row of thin film transducers each parting kerf of said plurality of parting kerfs being located in said row between adjacent transducers, said switching devices and said resistance devices each being separately confined substantially to an area of a parting kerf;

mounting said row of thin film magnetic transducers in a position to lap said height defining edge of each of said thin film magnetic transducers and said sensing devices;

measuring the resistance of said resistive devices during lapping of said height defining edge;

calibrating resistance versus throat height characteristics for each of said thin film magnetic transducers in said row in response to said measured resistance and to a selected state of at least one of said switch devices; and

terminating said lapping process when a predetermined throat height is reached for each of said thin film magnetic transducers.

5,597,341

SEMICONDUCTOR PLANARIZING APPARATUS

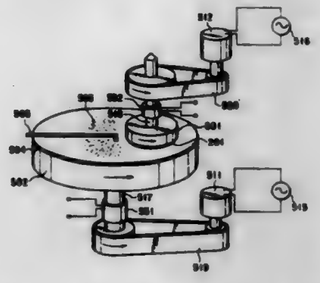
Masako Kodera, Kawasaki, Japan; Hiroyuki Yano, Wappingers Falls, N.Y.; Atsushi Shigeta, Yamato, Japan; Riichiro Aoki, Tokyo, Japan; Hiromi Yajima, Yokohama, Japan, and Haruo Okano, Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 402,879, Mar. 13, 1995, which is a division of Ser. No. 66,375, May 25, 1993, Pat. No. 5,445,996. This application May 26, 1995, Ser. No. 451,226

Claims priority, application Japan, May 26, 1992, 4-132978; Sep. 25, 1992, 4-256889; Oct. 28, 1992, 4-281194; Nov. 30, 1992, 4-319175; Dec. 11, 1992, 4-331945

Int. Cl.[6] B24B *49/00;51/00*

U.S. Cl. 451—5 **14 Claims**



1. An apparatus for chemically and mechanically planarizing a semiconductor wafer comprising means for detecting the absolute value of a load applied to a surface of the wafer to polish the wafer during a polishing operation said means measuring the distortion of a rotation shaft of the apparatus during the polishing operation.

5,597,342

Patent Not Issued For This Number

5,597,343

Patent Not Issued For This Number

5,597,344

MACHINE FOR TREATING, IN PARTICULAR SANDING SKI SOLES

Jean-Pierre Becquet, La Motte Servolex, France, assignor to SKID, La Motte Servolex, France

Filed Mar. 7, 1995, Ser. No. 399,741

Claims priority, application France, Mar. 11, 1994, 94 03017

Int. Cl.[6] B24B *7/00;9/00*

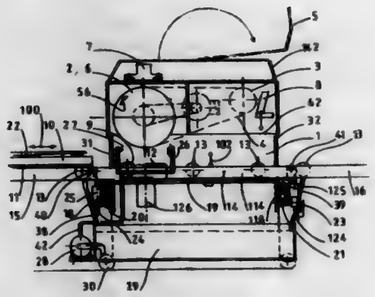
U.S. Cl. 451—65 **12 Claims**

1. Machine for treating ski soles comprising a frame and a plurality of tools, disposed on said frame, for carrying out at least one ski sole treatment and including means for holding and displacing the skis and applying said ski soles to each of said plurality of tools in succession, wherein:

each of said plurality of tools is disposed and oriented so that each of said plurality of tools has a working face which is a lower face,

a first of said plurality of tools is offset transversely relative to a second of said plurality of tools,

said means for holding and displacing said skis are adapted to hold said skis with said ski soles facing upwards and to move said skis under said plurality of tools by reciprocating movement in longitudinal translation in the lengthwise direction of said skis, by transverse movement in translation to move said skis selectively in line with one of said plurality of tools and in vertical translation to selectively move said skis against and away from said plurality of tools.



5,597,345

APPARATUS FOR MAKING AN APERTURE IN A TILE

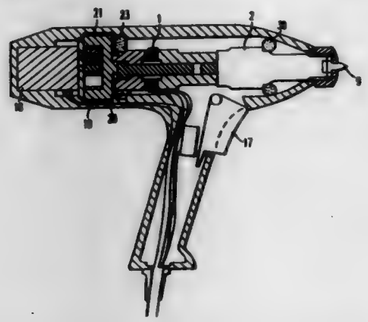
Michael J. R. Young, Bremridge Farm, Ashburton, South Devon, TQ13 7JX, England

Filed Jun. 20, 1994, Ser. No. 262,184

Claims priority, application United Kingdom, Jun. 19, 1993, 9312699

Int. Cl.[6] B24B *7/00;9/00*

U.S. Cl. 451—165 **33 Claims**



8. A method of producing an aperture in a workpiece of brittle material, said method comprising the steps of providing an apparatus, comprising a piezoelectric transducer generating longitudinal vibrations at a frequency within the range of 20–40 kHz and a tip operatively coupled to said transducer and contacting said workpiece

generating a small amplitude movement of said tip at a frequency in the range of 10–100 Hz and in a plane transverse to the direction of the longitudinal vibrations, said transverse movements being generated by a motor, a cam and a cam follower arrangement such that actuation of the motor causes intermittent transverse movement of the tip,

applying the tip thereof to the material, and removing the material.

5,597,346

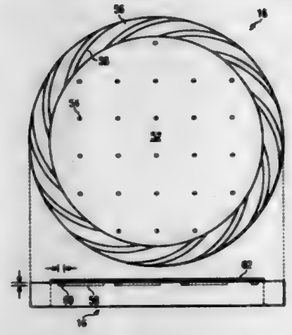
METHOD AND APPARATUS FOR HOLDING A SEMICONDUCTOR WAFER DURING A CHEMICAL MECHANICAL POLISH (CMP) PROCESS

Eugene O. Hempel, Jr., Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 9, 1995, Ser. No. 401,738

Int. Cl.[6] B24B *7/00*

U.S. Cl. 451—287 **18 Claims**



1. An improved wafer polishing carrier for holding a semiconductor wafer during a chemical mechanical polish process involving the use of a slurry between the semiconductor wafer and a conditioning pad, said carrier further for directing slurry between the semiconductor wafer and the conditioning pad and comprising:

a wafer holding surface for holding the semiconductor wafer as the semiconductor wafer contacts the conditioning pad and the slurry;

an outer rim portion surrounding said wafer holding surface; and

a plurality of slurry channels associated with said outer rim portion for receiving the slurry and directing the slurry between the semiconductor wafer and the conditioning pad to maintain an essentially uniform layer of the slurry between the semiconductor wafer and the conditioning pad.

5,597,347

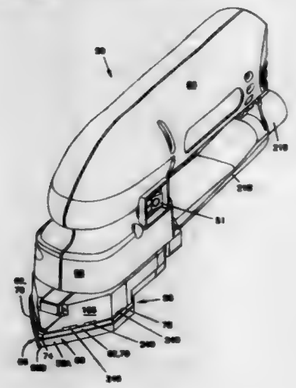
SANDER VACCUM HOUSING AND PAD FRAME SYSTEM

Donald R. Boston; John R. Kriauki, both of Jackson, and Randy G. Cooper, Milan, all of Tenn., assignors to Porter-Cable Corporation, Jackson, Tenn.

Filed Feb. 9, 1995, Ser. No. 386,002

Int. Cl.[6] B24B *23/00;55/10*

U.S. Cl. 451—356 **20 Claims**



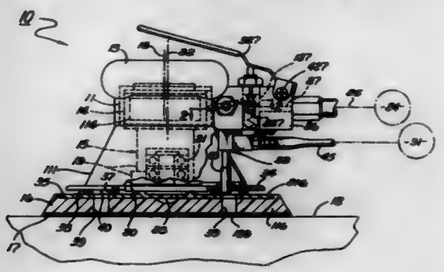
1. A sander vacuum housing and pad frame system, comprising:
(a) a vacuum housing arranged and configured to be coupled to a motorized sanding mechanism of a sander so that the motorized sanding mechanism moves the vacuum housing in a sanding motion when the motorized sanding mechanism is energized, the vacuum housing defining at least the upper portion of a dust channel within the housing, the dust channel being arranged and configured for connection to a dust collection system;
(b) a pad frame arranged and configured to be coupled under the vacuum housing in order to move the lower surface of the pad frame so coupled in a sanding motion, the pad frame comprising a relatively soft sanding pad for supporting sandpaper;
(c) the vacuum housing defining peripheral air flow dust ports extending through a peripheral edge of the vacuum housing, the peripheral dust ports permitting a continuous flow of air during dust collection from a region outside the vacuum housing, through the vacuum housing dust channel, and to the dust collection system; and
(d) whereby airborne dust proximate the peripheral air flow dust ports will be drawn continuously into the dust collection system.

5,597,348

WATER FEED FOR SANDING TOOL

Donald H. Hutchins, Sierra Madre, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

Filed Nov. 29, 1994, Ser. No. 346,985
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—450 **16 Claims**



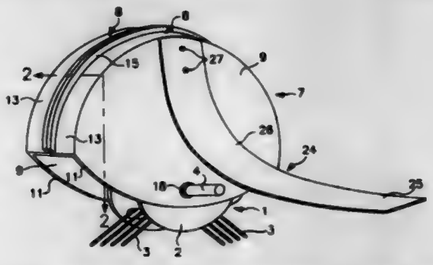
1. A portable abrading or polishing tool, comprising:
a tool body to be held and manipulated by a user;
a motor carried by said body and driven by pressurized air;
a head movable relative to said body by said motor and adapted to carry an element for abrading or polishing a work surface;
a water inlet;
an aspirator energized by pressurized air to induce a flow of water from said inlet to the work surface near said head;
means for delivering a first flow of air from a source to and through said motor to drive it and for delivering a second flow of air separately from said source to said aspirator, to induce a flow of water to the work surface, without passage of said second flow of air through the motor; and
valve means acting when air is not being supplied from said source to said motor or aspirator to prevent flow of water from said inlet into the motor.

5,597,349

ROTARY STRIPPER AND SHIELD

Anthony Tremaglio, Waterbury, and Ronald Brightman, Cheshire, both of Conn., assignors to Everlast Products Inc., Watertown, Conn.

Filed Oct. 13, 1994, Ser. No. 322,331
Int. Cl.[6] B24B *55/05*
U.S. Cl. 451—451 **8 Claims**



1. A shield for a rotary stripper tool, said shield comprising first and second parallel, spaced, planar, semi-circular walls and a third arcuate wall joining said first and second walls along semi-circular edges thereof, thereby forming a hollow, semi-circular housing open along one edge and having a volume to rotatably receive a rotary stripper tool freely rotatable therein so that, at any one time during rotation of said stripper tool, substantially one half of said stripper tool is covered by said shield, means to attach said shield to said rotary stripper tool whereby said stripper tool is freely rotatable about its axis therein, and an elongated handle member fixed to one of said first and second planar walls and extending substantially perpendicular to the plane of said wall to engage a power tool on which said rotary stripper tool is mounted, whereby said shield is held in a fixed position relative to said rotary stripper tool and said power tool;
said shield further comprising first and second shield sections, said first and second shield sections being identical and each comprising a semi-circular wall and an arcuate skirt extending perpendicularly to the plane of said wall along the semi-circular edge thereof whereby said first and second shield sections are joined along cooperating edges of said skirts to form said hollow semi-circular housing, and whereby said joined arcuate skirts form said third arcuate wall of said shield;
wherein said first and second shield sections have axially aligned apertures capable of receiving a hub shaft of said stripper, said apertures having low friction bushings therein to receive said hub shaft whereby said stripper is freely rotatable within said shield and wherein said handle comprises an elongated, resiliently flexible neck portion and a molded head portion at one end of said neck portion, whereby the other end of said neck portion is fixed to one of said first and second walls of said shield and said handle extends substantially perpendicularly to the plane of said wall whereby said molded head portion engages said power tool.

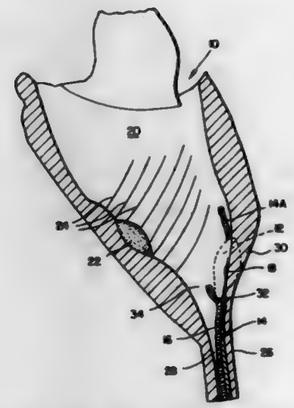
5,597,350

FLEXIBLE PROBE FOR DECROPPING POULTRY CARCASSES

Maurice J. Hunking; Gerald F. Banks, both of Lehigh Acres, and Todd E. Walter, Fort Myers, all of Fla., assignors to Baader North America Corporation, Fort Myers, Fla.

Filed Nov. 3, 1995, Ser. No. 552,948
Int. Cl.[6] A22C *21/06*
U.S. Cl. 452—117 **23 Claims**

1. A probe for use in poultry decropping apparatus, the apparatus operating to pass the probe into a poultry carcass cavity and through a carcass neck passage so that the probe in a travel thereof and while the probe is being rotated, can snag and effect carcass



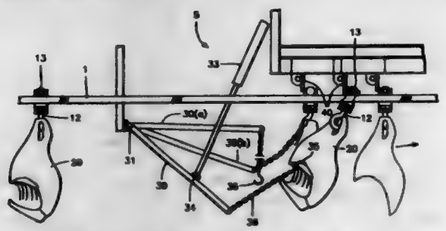
membrane, crop, trachea and esophagus inedibles pull away removal from the neck passage and carcass cavity environs proximal said neck passage, the probe comprising
a probe body,
said probe body being elongated and flexibly structured so that said probe body can along at least an appreciable fore length part thereof will when in its travel it contactingly engages a carcass obstruction encroaching such travel deflect from said travel enough to prevent the probe from damaging and/or puncturing the carcass, and
fingers carried on and extending outwardly from the probe body, said fingers being sufficiently flexible to bend on engagement with carcass bone structure from a normally unbent condition thereof to a deflected condition thereby to inhibit possibility of breaking of such bone structure with said fingers; said fingers having a length and configuration to be effective when contacting said inedibles to snag and effect pull away removal of said inedibles from said carcass.

5,597,351

CARCASS DEBONING

Peter Queally, and Oliver Lennon, both of Waterford, Ireland, assignors to Ess-Away Limited, Newtown, Ireland

PCT No. PCT/IE93/00055, § 371 Date Jun. 15, 1995, § 102(e) Date Jun. 15, 1995, PCT Pub. No. WO94/10847, PCT Pub. Date May 26, 1994
PCT Filed Nov. 17, 1993, Ser. No. 433,400
Claims priority, application Ireland, Nov. 17, 1992, 2825/92
Int. Cl.[6] A22C *17/04*
U.S. Cl. 452—135 **33 Claims**



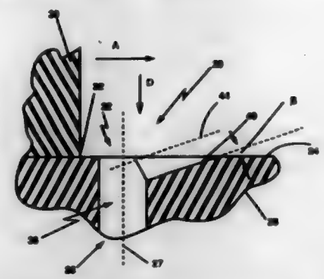
1. Apparatus for deboning carcasses comprising:
a transport hook for hanging of a carcass;
a transport rail for support of said transport hook;
transport hook engaging means for pushing said transport hook along said transport rail as a skeletal part is being separated from a carcass;
engagement means for engaging part o a carcass; and
means for pushing the engagement means downwardly and for supporting the engagement means in a lowered position relative to the transport rail to apply a separating force as a skeletal part is being separated from a carcass.

5,597,352

SEPARATOR SCREEN AND SCREENING METHOD

Eldon Roth, Dakota Dunes, S. Dak., assignor to Freezing Machines, Inc., Dakota Dunes, S. Dak.

Continuation-in-part of Ser. No. 482,420, Jun. 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 355,644, Dec. 14, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 556,712
Int. Cl.[6] A22C *17/06*
U.S. Cl. 452—138 **21 Claims**



1. A separator screen comprising:
(a) a screen body having a cylindrical inner surface, an input end, and an output end, with the direction from the input end to the output end defining a cutting direction;
(b) a plurality of screen openings formed in the screen body, each screen opening having a cross-sectional size sufficient for enabling a material to be separated to pass therethrough from within the area defined by the cylindrical inner surface of the screen body;
(c) an inner portion of each screen opening having a deflecting surface extending at an acute deflecting angle to the inner surface of the screen body; and
(d) the deflecting surface of each screen opening sloping to meet the inner surface of the screen body in the cutting direction.

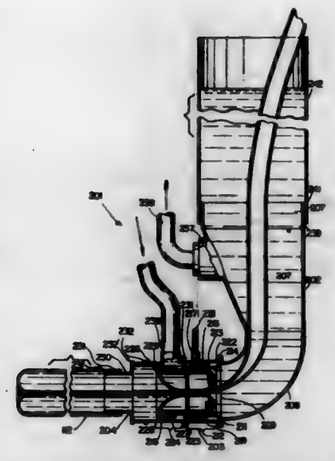
5,597,353

COMPACT APPARATUS FOR EVERTING A LINER AND METHOD

Joseph A. Alexander, Jr., Memphis, Tenn., assignor to Insituform (Netherlands) B.V., Netherlands

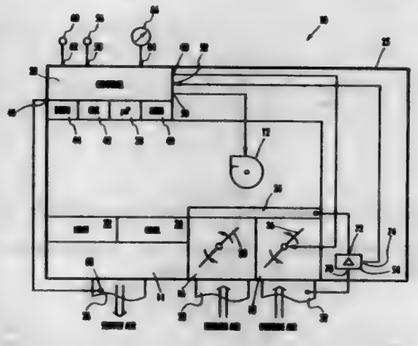
Filed Oct. 7, 1994, Ser. No. 320,506
Int. Cl.[6] B29C *63/36*
U.S. Cl. 425—387.1 **25 Claims**

3. An apparatus for everting a liner into an existing conduit to be lined, comprising:
a sphincter valve formed from a tubular flexible wall having an inlet and an outlet mounted to a cylindrical wall of a given diameter;
an eversion boot coupled to the outlet of the sphincter valve and having an outlet at the opposite end, the eversion boot having a diameter larger than the tubular member of the sphincter-type valve with the tubular eversion boot overlapping the tubular flexible wall of the sphincter valves, wherein an end of said liner to be everted is adapted to be secured to the outside of the eversion boot to close the outlet of the eversion boot;
means for supplying fluid to the sphincter valve to press the flexible wall against the liner selectively as the liner moves through the valve; and



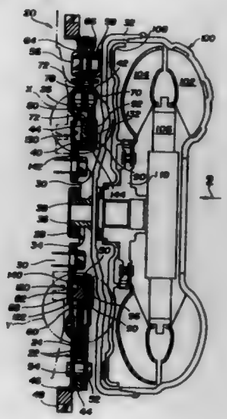
means for supplying fluid to said eversion boot at the outlet of the eversion boot closed by the an end of the liner to cause the liner to evert out from the apparatus.

5,597,354
INDOOR AIR QUALITY CONTROL FOR CONSTANT VOLUME HEATING, VENTILATING AND AIR CONDITIONING UNITS
George J. Jann, Brookfield, Wis., and Clay G. Nesler, Ratingen, Germany, assignors to Johnson Service Company, Milwaukee, Wis.
Filed Jun. 13, 1995, Ser. No. 489,684
Int. Cl.[6] F24F 11/04
U.S. Cl. 454—229 28 Claims



11. A method for controlling the amount of outside air introduced into a system for circulating ventilating air in a space, the system including a fan for circulating the ventilating air and an outside air damper for controlling supply of outside air to the system, the outside air damper having a plurality of settings, the outside air damper establishing a predetermined relationship between each outside air damper setting and outside air flow volume, the method comprising the steps of:
- determining a minimum outside air flow volume for the space;
- selecting an outside air damper setting according to the predetermined relationship to provide the minimum outside air flow volume;
- adjusting the outside air damper to the selected setting; and
- wherein the system further includes a supply duct for communicating supply air from the fan to the space, the method further comprising the steps of determining a supply duct resistance associated with the supply duct and adjusting the outside air damper position in response to the supply duct resistance to maintain the minimum outside air flow.

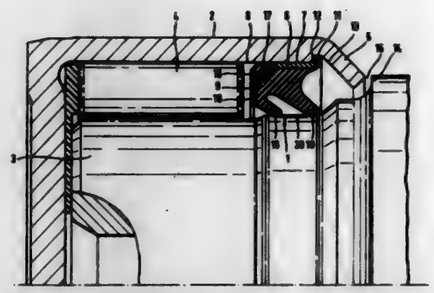
5,597,355
TORSIONAL DAMPER WITH GUIDED FRICTION BLOCKS
Tatsuya Morishita, Atsugi, and Takashi Murasugi, Ebina, both of Japan, assignors to Unisia Jecs Corporation, Atsugi, and Nissan Motor Co., Ltd., Yokohama, both of Japan
Filed Oct. 25, 1994, Ser. No. 328,911
Claims priority, application Japan, Nov. 18, 1993, 5-061978 U
Int. Cl.[6] F16F 15/12; F16D 3/12
U.S. Cl. 464—68 8 Claims



1. A torsional damper comprising:
- first and second damper elements resiliently coupled by a spring arrangement, said first damper element having a wall;
- a plurality of windows in said second damper element, each of said windows having radially inner and outer edges;
- a plurality of friction blocks received in said plurality of windows, respectively, with play in the circumferential direction of said second damper element;
- means on said first damper element for biasing said friction blocks against said wall; and
- means in fixed relationship with said first damper element and engaging opposite ends of the friction block for holding each of said friction blocks out of engagement with said radially outer and inner edges of the corresponding one of said windows.

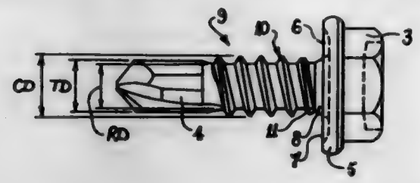
5,597,356
SEALING ARRANGEMENT FOR A CARDAN SPIDER BUSH
Guido Rieder, Wilhelmsdorf, Germany, assignor to INA Walzlager Schaeffler KG, Germany
Continuation of Ser. No. 407,417, Mar. 17, 1995, abandoned.
This application May 13, 1996, Ser. No. 645,128
Claims priority, application Germany, Apr. 8, 1994, 44 12 132.6
Int. Cl.[6] F16C 33/78; F16J 15/32
U.S. Cl. 464—131 4 Claims

1. A sealing arrangement for a needle roller bearing having rolling elements (4), and which rotatably receives a bearing journal (3) therein, said sealing arrangement comprising an armored seal



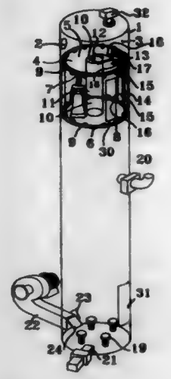
(1,21) which is arranged on an open end of a bearing bush (2) and is guided on an inner surface (8) of the bearing bush (2) while being fixed in position by a radially inwards crimped end portion (5) of a wall of the bearing bush (2), said armored seal (1, 21) comprising at least one sealing lip (18, 19; 38, 39) which bears sealingly against the bearing journal (3), characterized in that the seal (1, 21) is completely surrounded radially by the wall of the bearing bush (2), and a free end of the end portion (5) forms an open sealing gap (15) with a shoulder (14) of the bearing journal (3).

5,597,357
SELF-DRILLING SCREW
David J. Roberts, Mornington, Australia, assignor to W. A. Deutscher Pty. Ltd., Moorabbin, Australia
Division of Ser. No. 257,308, Jun. 9, 1994, Pat. No. 5,487,633.
This application May 22, 1995, Ser. No. 446,969
Int. Cl.[6] B21H 3/02
U.S. Cl. 470—9 18 Claims



1. A method of making a self-drilling screw for use with both relatively thick metal plate and relatively thin metal sheet, comprising the steps of:
- forming a blank comprising an elongate shank, and an enlarged head and a drilling tip disposed at respective opposite ends of said elongate shank, wherein said elongate shank is substantially cylindrical throughout substantially its entire axial length but has an enlarged section disposed adjacent to said enlarged head wherein the cross-sectional size of said enlarged section of said elongate shank progressively increases in a direction extending away from said drilling tip and toward said enlarged head, and wherein further, said drilling tip has a predetermined diametrical extent; and
- forming a first thread portion upon a portion of said elongate shank which extends between said drilling tip and said enlarged shank section, and having a crest diameter dimension which is greater than said diametrical extent of said drilling tip and a root diameter dimension which is less than said diametrical extent of said drilling tip such that said first portion of said thread is able to threadedly engage a relatively thick metal plate when said self-drilling screw is inserted through said relatively thick metal plate; and a second portion which also extends onto said enlarged section of said elongate shank such that said enlarged shank section and said second portion of said thread are able to distort a relatively thin metal sheet into wedging interengagement with said second portion of said thread and said enlarged shank section when said self-drilling screw is inserted through said relatively thin metal sheet.

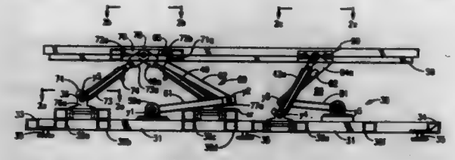
5,597,358
FREE FALL SYSTEM
Mihail I. Marcu, 43 Renata Court, Dundas, Ontario, Canada
Filed Jun. 2, 1994, Ser. No. 253,130
Int. Cl.[6] A63J 5/12
U.S. Cl. 472—59 1 Claim



1. A free fall system comprising;
- a tubular structure with interior and exterior walls and a bottom, said tubular structure disposed at an angle to the horizontal;
- a capsule having an upper and lower part, the capsule disposed within the tubular structure;
- gaskets disposed at the upper and lower parts of the capsule, said gaskets being flexible and expandable;
- rollers disposed on the gaskets, the rollers pressed on the interior wall of the tubular structure such that the gaskets are adjacent the interior wall of the tubular structure;
- a gap between the gasket and tubular structure being between 0.0004–1.000 inches;
- a communication tube disposed between the upper and lower parts of the capsule;
- a valve able to close or open the communication tube;
- a mechanism connected to the valve, the mechanism being positive or deamodromic;
- a tube tightly closed at both ends and having adjustable flow droseling taps at both ends connecting the inside and outside of the tube;
- a counterweight connected via the mechanism to the valve, any positive movement of the counterweight is translated into a positive movement of the valve such that the valve opens or closes, said counterweight has seals, the counterweight disposed within the tube, a small gap between the counterweight and the tube, wherein the counterweight is movable within the tube;
- a packing gland, the mechanism passing through an end of the tube via the packing gland;
- a valve return spring, wherein the spring keeps the valve closed while the counterweight is not moving, when the counterweight moves downward, the valve automatically opens;
- shock absorbing springs, wherein the springs are disposed at the bottom of the tubular structure;
- a breathing valve placed on the wall of the tubular structure at a predetermined height from the ground, said breathing valve allowing the space within the tubular structure and the atmosphere to be in communication;
- a drosseling valve, said valve placed at the bottom of the tubular structure and allowing the space within the tubular structure and the atmosphere to be in communication;

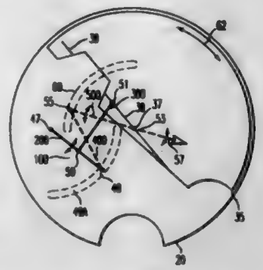
a fan placed at the bottom of the tubular structure, said fan having an exit flap valve which closes if there is pressure inside the tubular structure and closes if the pressure of the fan is higher than the pressure inside the tubular structure;
an accelerometer to sense vertical acceleration;
a power supply;
a microprocessor controlled actuator to actuate the valve;
a microprocessor controller connected with the accelerometer and with the microprocessor controlled actuator and the power supply;
dedicated software, the software in the form of a dedicated control card to relate movement of the actuator with the acceleration sensed by the accelerometer, wherein the valve, the microprocessor controlled actuator, the microprocessor controller, the accelerometer, the power supply and the dedicated card are all contained on the capsule;
a capsule access door;
a tubular structure access door;
harnesses for passengers inside the capsule; and
a stopper with shock absorbing means rigidly connected with the tubular structure, and able to stop the rising movement of the capsule.

5,597,359
AUDIENCE MOTION PLATFORM
David C. Byerly, Brackney, Pa., assignor to Doron Precision Systems, Inc., Binghamton, N.Y.
Filed Oct. 26, 1995, Ser. No. 548,880
Int. Cl.[6] A63G *31/16*
U.S. Cl. 472—60 2 Claims



1. Platform motion means for moving, relative to a base(30), a rigid platform (50) adapted to seat a plurality of people facing a projection screen means (11) upon which pictorial matter may be projected for viewing by said people, comprising, in combination:
a rigid platform;
front and rear gimbal block means (70, 90*b*) each having respective longitudinally-extending shaft means attached to from and rear portions, respectively, of said platform (50), for supporting said platform for rotation about a longitudinal axis X_b—X_b of said platform, each of said gimbal block means also having a respective laterally extending shaft means(78, 91*b*);
front hinge means (60) having lower (61) and upper (62) frames, said lower frame of said front hinge means having a first end adapted to be attached to said base to pivot about a fixed first lateral axis (y_1)and a second end hinged to a first end of said upper frame to pivot about a second lateral axis (y_2), a second end of said upper frame of said from hinge means being attached to said laterally-extending shaft means (78) of said front gimbal block means;
rear hinge means (80) having lower (81) and upper (82) frames, said lower frame of said rear hinge means having a first end adapted to be attached to said base to pivot about a third lateral axis (y_3) and a second end hinged to a first end of said upper frame to pivot about a fourth lateral axis (y_4), a second end of said upper frame of said rear hinge means being attached to said laterally-extending shaft means (91*b*) of said rear gimbal block means (90*b*);
a pair of laterally spaced-apart double-acting hydraulic cylinders (42*a*, 42*b*) adapted to be connected between said base (30) and said rear gimbal block means (90*a*, 90*c*) to rotate said platform (50) through limited amounts about said longitudinal axis of said platform by differential extension and retraction of said cylinders of said pair, and to lift and lower the rear end of said platform by mutual extension and retraction of said cylinders of said pair;
third and fourth double-acting cylinders each adapted to be pivotally mounted on said base (30) to pivot about a fifth (y_5) and sixth (y_7) lateral axes, respectively, and connected to said laterally extending shaft means (78) of said front gimbal to lift and lower the front end of said platform (50) and to move said platform in mutually-opposite directions along said longitudinal axis X_b—X_b of said platform.

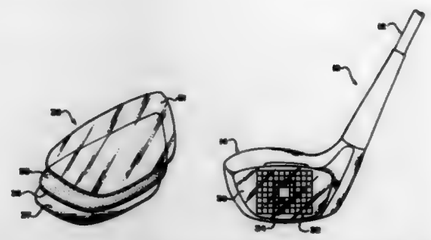
5,597,360
CUE GAME TRAINING APPARATUS
Philip J. Freedenberg, 1443 McLean Mews Ct., McLean, Va. 22101
Filed Feb. 9, 1995, Ser. No. 385,879
Int. Cl.[6] A63B *37/00*
U.S. Cl. 473—2 19 Claims



1. A mechanical analog apparatus for cue games, the computer comprising:
means for aligning a fixed arrow with an object ball so as to set and display the object ball's intended direction of travel;
means for setting an aiming line of a cue ball based on a position of the object ball with respect to a cue ball;
means for determining a cut angle between the object ball's intended direction of travel and the aiming line;
means for determining a carom angle of the cue ball after it hits the object ball, the carom angle being defined between the aiming line and a direction in which the cue ball travels after it hits the object ball; and
means for measuring a distance from a vertical axis of a cue-ball to determine a location where the cue-ball is to be hit with a cue stick.

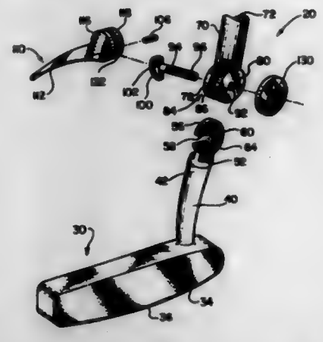
5,597,361
GOLF CLUB STRIKE INDICATOR
Normann B. Hope, P.O. Box 1629, Princeton, British Columbia, Canada
PCT No. PCT/CA94/00315, § 371 Date Dec. 11, 1995, § 102(e) Date Dec. 11, 1995, PCT Pub. No. WO94/28982, PCT Pub. Date Dec. 22, 1994
PCT Filed Jun. 10, 1994, Ser. No. 564,098
Claims priority, application Canada, Jun. 11, 1993, 2093933
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—237 15 Claims

1. A device (30) for providing a temporary indication (34) of the area of impact of a ball, such as a golf ball, on a ball-striking face, such as a golf club face, said device having an inner surface for adherence to said ball-striking face and an outer impact surface, said inner surface of said device comprising means for removably securing said device to said ball striking face, characterized in that said device further comprises:



a) a sheet (31) of light transmitting, hard, durable material sized to fit on said ball-striking face, having first and second surfaces, said first surface forming said outer impact surface of said device; and
b) a layer of thermochromic material provided on said second surface of said sheet (31) of light transmitting, hard durable material.

5,597,362
INTERCHANGEABLE AND ADJUSTABLE PUTTER
Young J. Lee, 3519 Maple Leaf Dr., Glenview, Ill. 60025, and Backchul Shin, 142 Kenlock St., Libertyville, Ill. 60048
Filed May 21, 1996, Ser. No. 651,678
Int. Cl.[6] A63B *53/06*
U.S. Cl. 473—244 7 Claims



1. A golf club having an elongate shaft and a head, and being useful as a putter, said head having a face for presentation to a golf ball, and an upwardly extending stub shaft,
said club including coupling means for pivotally attaching said head to said shaft and for firmly and positively locking said head to extend at selectable vertical angles to meet specific needs and preferences of a golfer,
said coupling means comprising interengaging components including a first component carried by said head at an upper end of said stub shaft thereof, and a second component carried by said elongate shaft of said club at a lower end thereof,
said stub shaft of said club head being formed at an upper extremity thereof with a plate-like, upwardly-projecting disc extending in a plane generally paralleling said face of said club head,
said disc being formed with a horizontal slot opening laterally of said disc,
said elongate shaft of said club carrying at a lower extremity thereof a yoke including first and second vertically-extending plates spaced from and parallel to one another to define a slot-like recess therebetween for receiving said plate-like disc of said club head in close engagement therewithin,
said plates of said yoke being formed with aligned transverse bores extending transversely therethrough in a central zonal area thereof,
double-ended bolt means extending through said bores in said plates of said yoke, said bolt means being formed at a first end thereof with threads,
a digitally manipulable and adjustable tensioning nut threadedly engaged on said bolt means at said threaded first end thereof,
a second end of said bolt means being formed to define a flattened head having a bore extending transversely therethrough for accommodating a pin,
a locking lever including an elongate rod-like body and being formed at an end thereof with spaced, parallel, flat arms defining an endwise-opening, slot-like recess for slidably receiving said flattened head of said bolt therewithin,
said plate-like disc of said stub shaft of said club head being disposed to enter between said plates of said yoke to receive said bolt means within said slot formed in said plate-like disc,
said arms of said lever including at said end thereof arcuately contoured camming edge surfaces for abuttingly and stressingly engaging against an outer lateral face of said yoke,
said arms of said lever being formed with off-set bores remote from said camming edge surfaces and extending transversely through said arms for registering alignment with said bore in said bolt means,
a pivot pin extending through said arms of said lever and through said head of said bolt means,
said lever being positionable about said pivot pin to assume, selectively, a first position in which said lever exreads generally outwardly from said elongate shaft of said club, to a locking, second position in which said lever overlies said elongate shaft,
said lever being operative through camming action of said lever to impress forces laterally against said yoke to effect a positive locking engagement of said disc of said club head between said plates of said yoke to retain said club head fixed at a selectable vertical angle with respect to said elongate shaft of said club.

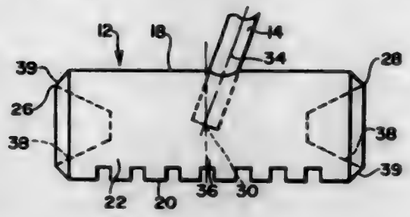
5,597,363
GOLFER'S ACCESSORY
Joseph A. Leote, 68 N. Pascack Rd., Nanuet, N.Y. 10954
Filed Apr. 26, 1994, Ser. No. 233,853
Int. Cl.[6] A63B *55/10;55/02*
U.S. Cl. 473—282 4 Claims



1. A support device for holding a golf club substantially upright, said golf club including a shaft portion, comprising:
a support shaft having a top end and a ground insert portion disposed at a bottom end thereof;
a handle including a receptacle region provided thereon; and
a pivot member engaging said shaft and said handle, said handle being rotatably mounted on said shaft by said pivot member substantially at said top end of said shaft;
said handle being rotatable between
a storage position substantially aligned with said shaft thereby facilitating compact storage in a golf bag, and

an operative position substantially at a right angle to said shaft, wherein said receptacle region receives a portion of said golf club shaft thereby supporting said golf club in a substantially upright position when said insert portion is inserted into the ground.

5,597,364
GOLF PUTTER
James M. Thompson, 12 Snowberry Ct., Hunt Valley, Md. 21030
Filed Jan. 22, 1996, Ser. No. 592,841
Int. Cl.[6] A63B 53/04
U.S. Cl. 473—314 14 Claims



14. A golf putter for hitting a golf ball having a diameter, the putter comprising:

a cylindrical head having a diameter substantially equal to the diameter to the diameter of the golf ball, the head having a circumference, a top, a bottom, a face, an opposite back, a toe, an opposite heel, a midpoint between said toe and heel and between said top and bottom wherein a center of mass of the head is disposed at said midpoint,

a bore formed in the top of the head, the bore having a longitudinal axis extending angularly to the center of mass of the head, the bore forming an angle ranging from 14° to 22° with respect to a vertical axis between the top and the bottom and the bore being oriented from the center of mass toward the heel,

a shaft disposed in the bore and extending outwardly therefrom,

a grip connected to the shaft,

the toe and heel each having a respective frusto-conical counterbore formed therein,

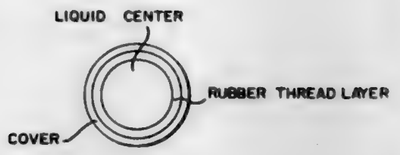
a plurality of spaced-apart parallel slots formed circumferentially in the bottom of the head, each slot having a length approximately one-fifth to one-quarter of the circumference of the head,

a friction reducing coating on the head,

the head being symmetrical such that the face and the back are identical and the golf putter can be used by both a right hand golfer and a left hand golfer, and

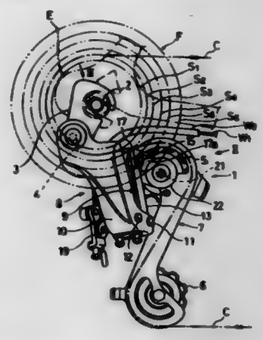
wherein when the golf putter is swung, the center of mass of the head is directed toward the center of mass of the golf ball to impart maximum impact thereto and further wherein the center of mass of the head is in line with the shaft permitting control by the golfer.

5,597,365
LIQUID CENTER THREAD WOUND GOLF BALL
Mikio Yamada, Kobe; Tadahiro Ebisuno, Nishinomiya; Keiji Moriyama, and Kazushige Sugimoto, both of Akashi, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan
Filed Sep. 6, 1994, Ser. No. 305,323
Claims priority, application Japan, Sep. 6, 1993, 5-220923
Int. Cl.[6] A63B 37/08
U.S. Cl. 473—354 9 Claims



1. A thread wound golf ball comprising a liquid center composed of a rubber bag containing a liquid, a rubber thread layer provided on the outside of the liquid center, and a cover for covering the rubber thread layer, wherein a moment of inertia measured at 23° C. of the golf ball is 75 to 80 g·m^2, a rate of increase of a moment of inertia measured at −30° C. to that measured at 23° C. is within 2%, and the liquid contained in said rubber bag has a specific gravity of 1.3 to 1.6.

5,597,366
BICYCLE REAR DERAILLEUR
Nobuo Ozaki, 1-4-14 Kohama, Sumiyoe-ku, Osaka, Japan
Filed Dec. 6, 1994, Ser. No. 349,819
Claims priority, application Japan, Dec. 6, 1993, 5-343775
Int. Cl.[6] F16H 9/00
U.S. Cl. 474—82 8 Claims



1. A bicycle rear derailleur for shifting a chain from one sprocket to another of a multiple freewheel which includes a plurality of sprockets, the sprockets diametrically increasing inward axially of a hub shaft, each of the sprockets having a lowermost edge portion, the derailleur comprising:

a control mechanism pivotally mounted to a rear fork end of a bicycle frame by a first pivot shaft which is parallel to the hub shaft; and

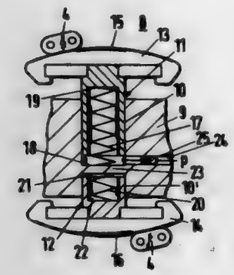
a chain guide pivotally mounted to the control mechanism by a second pivot shaft which is parallel to the hub shaft, the chain guide rotatably supporting an upper guide wheel and a lower tension wheel, the chain guide being biased in a chain tensioning direction by a spring, the chain guide being controlled by the control mechanism to move axially of the hub shaft, the guide wheel having an uppermost edge portion located ahead of the lowermost edge portion of each sprocket which the chain engages;

the control mechanism being constructed and arranged to move the guide wheel of the chain guide downwardly and forwardly when the guide wheel moves inward axially of the hub shaft;

the control mechanism comprising a pantograph linkage assembly which includes a base member pivotally connected to the first pivot shaft, inner and outer links having respective base ends pivotally connected to the base member by first and second pins, and a movable member pivotally connected to the respective free ends of the inner and outer links by third and fourth pins for carrying the second pivot shaft; the first to fourth pins being located at four corners of a parallelogram, the base member having an upper end pivotally connected to the first pivot shaft and extending downwardly to provide a lower end below the freewheel, the base ends of the inner and outer links being pivotally connected to the lower end of the base member by the first and second pins, the inner and outer links extending upward from the lower end of the base member;

each of the first and fourth pins having a forward end and a rearward end and being inclined so that the forward end is located laterally outwardly from the rearward end.

5,597,367
APPARATUS FOR TENSIONING OF A CAM SHAFT DRIVE
Alfred Trunkel, Grafenberg; Wolfgang Stephan, Zizishausen, and Peter Schmied, Oberboihingen, all of Germany, assignors to Hydraulik-Ring Antriebs- und Steuerungstechnik GmbH, Nürtingen, Germany
Filed Sep. 27, 1994, Ser. No. 313,353
Claims priority, application Germany, Nov. 5, 1993, 43 37 827.7
Int. Cl.[6] F16H 7/08
U.S. Cl. 474—110 15 Claims



1. An apparatus for tensioning of a camshaft drive with two camshafts connected with each other by an endless drive, said apparatus comprising:

a housing;

a first piston displaceably guided in said housing;

a first tensioning shoe fixedly connected to said first piston and engaging an inner side of a first branch of the endless drive;

a first tensioning means engaging said first piston for biasing said first tensioning shoe in a first teasioning direction against said inner side of the first branch of the endless drive;

said first tensioning means being elastically yieldable counter to said first tensioning direction;

a means for supplying a hydraulic medium to said first piston for loading said first piston in said first tensioning direction;

a second piston displaceably guided within said housing;

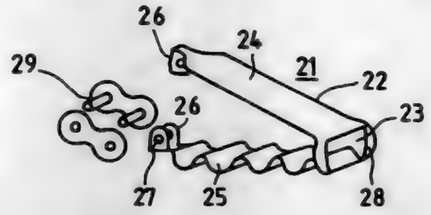
a second tensioning shoe fixedly connected to said second piston and engaging an inner side of a second branch of the endless drive;

a second tensioning means engaging said second piston for biasing said second tensioning shoe in a second tensioning direction against said inner side of the second branch of the endless drive;

said second tensioning means being elastically yieldable counter to said second tensioning direction; and

wherein said first and said second pistons operate independently of one another and wherein at least said second tensioning means is a damping means for compensating shocks occurring within the endless drive.

5,597,368
TOOTHED BELT HAVING AN END ATTACHMENT PART
Hubert Gäser, Dannenberg; Detlef Harbecke, Resche, and Helmut Wille, Aichwald, all of Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany
Filed Jun. 28, 1995, Ser. No. 495,893
Claims priority, application Germany, Jun. 28, 1994, 44 22 549.0
Int. Cl.[6] F16G 3/02
U.S. Cl. 474—204 5 Claims



1. A toothed belt having an end portion with first and second sides and with a tooth configuration formed in one of said sides, said tooth configuration having a plurality of teeth with each two mutually adjacent ones of said teeth defining a tooth gullet, the toothed belt comprising:

an end attachment part for connecting said end portion to a component including a housing part or a part to be driven by said toothed belt;

said end attachment part including a formed strip made of metal or plastic;

said formed strip being bent over 180° to define first and second legs enclosing said end portion therebetween;

said first leg being formed to have a profile corresponding to said tooth configuration so that said first leg interengages with said tooth configuration when placed thereagainst;

holding means coacting with said second leg to hold said first leg in said tooth gullets of said tooth configuration; and,

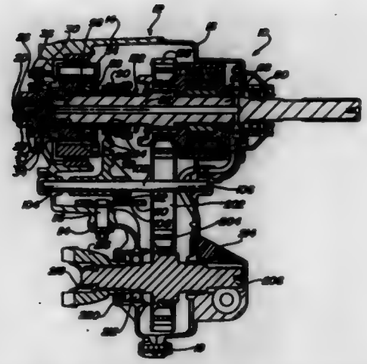
said formed strip having an end section conjointly defined by said first and second legs when said formed strip is bent over and said end section defining connecting means for facilitating the connection of said end portion of said toothed belt to the component.

5,597,369
TRANSFER CASE WITH INTEGRATED VISCOUS COUPLING
James S. Brinceden, Baldwinsville; Robert J. Wilson, Warners, and Sanjeev K. Varma, Syracuse, all of N.Y., assignors to New Venture Gear, Inc., Troy, Mich.
Filed Sep. 12, 1994, Ser. No. 304,279
Int. Cl.[6] F16H 48/26
U.S. Cl. 475—89 21 Claims

1. A vehicle transfer case having an input shaft adapted to be rotatably driven about a central axis and first and second outputs operatively driven by said input shaft for rotatively driving first and second axles, respectively, the transfer case comprising:

a transfer case housing, said input shaft rotatably supported within said housing along said central axis;

a speed reduction gear set, said speed reduction gear set including an input sun gear, said input sun gear being operatively connected to said input shaft to rotate therewith at a first rotational speed, said input sun gear having a plurality of internal splines concentrically arranged about said central axis, said speed reduction gear set being operatively connected to and rotatively driven by said input sun gear, said speed reduction gear set further including an output planet pinion carrier, said output planet pinion carrier being operatively connected to said input shaft to rotate therewith at a second rotational speed, said second rotational speed being



less than said first rotational speed, said output planet pinion carrier having a plurality of internal splines concentrically arranged about said central axis;

a central shaft rotatably supported within said housing along said central axis, said central shaft having its front end disposed adjacent an aft end of said input shaft and having its aft end constituting said first output of said transfer case, said central shaft formed with concentrically-surrounding external splines;

a rotary member coaxially disposed relative to said central shaft such that said central shaft and said rotary member are rotatable with respect to each other, said rotary member being operatively connected with said second output, said rotary member having a plurality of internal splines concentrically arranged about said central shaft;

a clutch assembly, said clutch assembly comprising a range clutch sleeve and a locking clutch, said range clutch sleeve concentrically surrounding said central shaft, said range clutch sleeve having internal splines slidably engaging said central shaft external splines and said range clutch sleeve having external splines to selectively drivingly connect said internal splines of said sun gear or said internal splines of said planet pinion carrier to said central shaft, said locking clutch concentrically surrounding said central shaft, said locking clutch having internal splines slidably engaging said central shaft external splines and said locking clutch having external splines to selectively drivingly connect said internal splines of said rotary member to said central shaft, said locking clutch being provided adjacent said range clutch sleeve, said clutch assembly being axially movable between a first position and a second position;

return means interposed between said clutch assembly and said rotary member for operatively biasing said clutch assembly toward its first position;

means for shifting said clutch assembly between said first position wherein said internal splines of said input sun gear operatively engage said external splines of said range clutch sleeve and said second position wherein said internal splines of said planet pinion carrier operatively engage said external splines of said range clutch sleeve and said external splines of said locking clutch operatively engage said internal splines of said rotary member; and

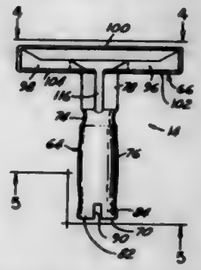
a viscous coupling chamber defined by an outer drum assembly operatively connected to said rotary member and an inner drum assembly fixably secured to said central shaft, said outer drum assembly including an outer drum housing and front and rear annular end cover plates fixably secured thereto, said chamber including first and second sets of viscous clutch plates disposed therein, said first set of viscous clutch plates being coupled to said outer drum housing for rotation with said rotary member and said second set of viscous clutch plates being coupled to said inner drum housing for rotation with said central shaft, said sets of first and second viscous clutch plates being alternately interleaved such that outermost plates of said first clutch plates are adjacent each of said end plate covers, said chamber further including a viscous fluid, said viscous fluid in said chamber being adapted to be sheared when said first and second viscous plates are rotated relative to one another, said fluid transmitting torque from said central shaft to said rotary member and increasing in temperature as a result of shearing action, said fluid expanding as its temperature increases and when said locking clutch is in said second position, said viscous coupling is selectively locked out to shut out relative rotation between said first and second plates.

5,597,370

LUBRICATING DEVICE FOR A PLANETARY GEAR UNIT

Thomas D. Nagle, Troy, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Oct. 17, 1995, Ser. No. 543,661
Int. Cl.[6] F16H 57/04; F16C 33/66
U.S. Cl. 475—159 **10 Claims**



1. A lubricating device for feeding oil to a bearing of a planetary pinion gear supported by a shaft fixed to a carrier of a planetary gear unit, said shaft having an axially extending opening and a radially extending port formed therein the latter of which communicates with said bearing, said lubricating device comprising a tubular plug member having a body and located in said opening of said shaft and having an annular groove formed in the body of said plug member that is aligned with said port in said shaft, a funnel member integrally formed with one end of said plug member and being located exterior to said shaft in fixed relationship with said carrier, a portion of said plug member cooperating with said opening to form a passage for connecting said funnel member with said groove, the arrangement being such that lubricating oil fed by centrifugal force to said funnel member flows via said passage to said groove and through said port in said shaft for lubricating said bearing.

5,597,371

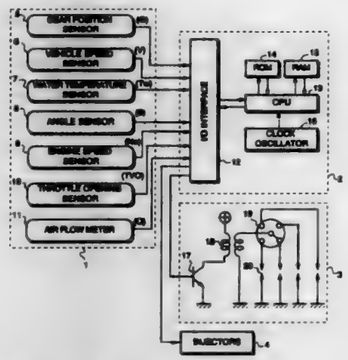
ENGINE TORQUE CONTROLLER

Nobusuke Tsukura, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 12, 1995, Ser. No. 501,568
Claims priority, application Japan, Jul. 22, 1994, 6-171102; Dec. 20, 1994, 6-316718
Int. Cl.[6] B60K 41/04
U.S. Cl. 477—111 **9 Claims**

1. A torque controller for use with a vehicle engine, said engine having a plurality of cylinders, an accelerator for supplying a fuel amount according to an operation amount of said accelerator to each of said cylinders in a predetermined sequence, means for respectively igniting the fuel supplied to said cylinders, and means for interrupting the supply of fuel to said cylinders when said operation amount is zero under predetermined conditions, comprising:

means for determining a timing according to which the vehicle accelerates from a state where fuel supply to the cylinders is cut off,



means for detecting a cylinder in which combustion is performed immediately after said timing,

means for specifying, from said detected cylinder and said sequence, a cylinder at a predetermined combustion order from said detected cylinder, and

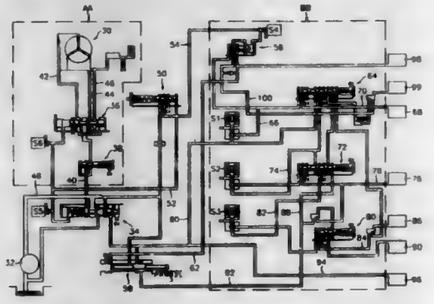
means for reducing the torque generated by said specified cylinder.

5,597,372

HYDRAULIC CONTROL SYSTEM OF AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLE

Jaeduk Jang, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Co., Seoul, Rep. of Korea

PCT No. PCT/KR94/00078, § 371 Date Feb. 13, 1995, § 102(e) Date Feb. 13, 1995, PCT Pub. No. WO95/00778, PCT Pub. Date Jan. 5, 1995
PCT Filed Jun. 21, 1994, Ser. No. 381,914
Claims priority, application Rep. of Korea, Jun. 22, 1993, 93-11423; Jul. 1, 1993, 93-12307
Int. Cl.[6] F16H 59/00;61/00; B60K 41/00
U.S. Cl. 477—143 **6 Claims**



1. A hydraulic control system of an automatic transmission for an automotive vehicle, comprising:

a hydraulic pump, driven by an engine, for pressurizing fluid;

a pressure regulating valve for varying a hydraulic pressure when shifting to a forward mode or a reverse mode or shifting between speed stages;

a torque converter for transmitting a power of the engine to an input shaft of the transmission;

a converter clutch regulator valve for actuating a damper clutch to improve a transmission efficiency of said torque converter;

first, second and third solenoid valves controlled by means of a transmission control unit for supplying the hydraulic pressure or obstructing a supply of the hydraulic pressure which is varied in said pressure regulating valve to shift valves of a transmission control section to displace valve spools of said shift valves;

a first friction element actuated at each speed stage in response to pressure supplied from at least said pressure regulating valve;

second, third, fourth and fifth friction elements, at least one of which is actuated according to a corresponding speed stage and in response to pressure supplied from at least said pressure regulating valves and one of said first, second, and third solenoid valves;

a reverse friction element actuated in a reverse mode;

second speed and third speed clutch valves and a fourth speed band valve controlled by ON/OFF functions of said first, second and third solenoid valves, respectively, for selectively supplying the hydraulic pressure to said friction elements to perform shifting;

a reverse clutch inhibiter valve for obstructing a supply of the hydraulic pressure to a sixth friction element to prevent the vehicle from malfunctioning when the reverse mode is selected in error while driving forward; and

a manual valve operated by a shift select lever for supplying line pressure to either one of a reverse pressure conduit or to a forward pressure conduit,

wherein said second speed clutch valve comprises:

a first port to which the hydraulic pressure from said forward pressure conduit is supplied;

a second port for supplying the hydraulic pressure supplied to said first port to said second friction element;

a third port for supplying the hydraulic pressure from said forward pressure conduit to a fourth port such that said fourth port supplies hydraulic pressure to said third speed clutch valve;

fifth and sixth ports for supplying the hydraulic pressure to said fourth friction element at a second speed of a "D" range;

a seventh port for supplying the hydraulic pressure to said sixth friction element at a first speed of either one of the "D" range or at an "L" range; and

a valve spool for selectively opening said ports comprising a first land for opening and closing said first and second ports, a second land for opening and closing said third and fourth ports and a third land for making said fifth port communicate with either one of said sixth port or said seventh port.

5,597,373

PHYSIOLOGICAL EVALUATION AND EXERCISE SYSTEM

Malcolm Bond, Winters; Gary Engle, Fair Oaks; Joseph J. Forma, Grass Valley, and Theodore F. Naumann, Shingle Springs, all of Calif., assignors to Cedaron Medical, Inc., Davis, Calif.

Filed Nov. 8, 1991, Ser. No. 789,834
Int. Cl.[6] A63B 21/00
U.S. Cl. 482—4 **17 Claims**

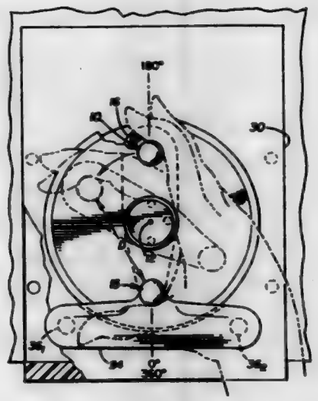
1. A system for isolating, evaluating and exercising muscle groups of a hand of a test subject, comprising:

means for detecting the movements of the hand during abduction, opposition, flexion or extension of several or individual digits of the hand, said means for detecting translating the movements into rotational data for the system and effectively isolating the movements of said several or individual digits so that movements of other muscle groups of the test subject are not detected by the system; and

means for providing a variable resistance to the means for detecting and for ascertaining the force applied to the means for detecting by the movements of said several or individual digits, said variable resistance including isotonic, isokinetic, and isometric modes of resistance against said several or individual digits.

5,597,374

Patent Not Issued For This Number

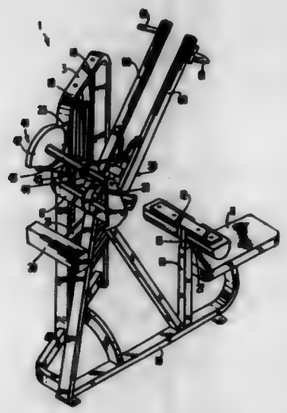


5,597,375

LAT PULLDOWN EXERCISE MACHINE AND METHOD OF EXERCISE

Roy Simonson, Cybex Division of Lumex, Inc. 2840 Jamtell Rd., Colorado Springs, Colo. 80906

Continuation-in-part of Ser. No. 396,670, Mar. 1, 1995. This application Mar. 10, 1995, Ser. No. 401,816
Int. Cl.[6] A63B 21/062;23/02
U.S. Cl. 482—100 23 Claims



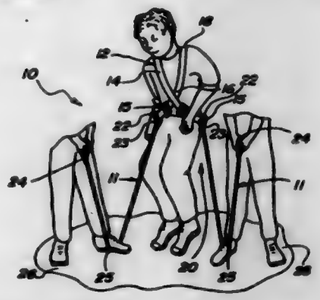
1. An apparatus for exercising the latissimus dorsi muscles of a user by resisting displacement of the user's limb comprising:
a frame;
means for engaging the user's limb such that downward displacement of the user's limb causes displacement of the engagement means;
means for mounting the engagement means to the frame for rotation about at least two axes, said at least two axes being skew in relation to one another so as to provide a lateral resistance component to the displacement of the engagement means;
a weight stack displacably mounted to the frame; and
means for connecting the engagement means to the weight stack such that downward displacement of the engagement means causes displacement of the weight stack.

5,597,376

VERTICAL JUMP ENHANCEMENT SYSTEM

Barbara A. Bode, 201 Willowick Ave., Temple Terrace, Fla. 33617, and Joe Cattaderis, Jr., 478 Elmhurst Rd., Utica, N.Y. 13502

Continuation of Ser. No. 45,567, Apr. 9, 1993, Pat. No. 5,415,608. This application Apr. 14, 1995, Ser. No. 422,270
Int. Cl.[6] A63B 21/04
U.S. Cl. 482—121 4 Claims



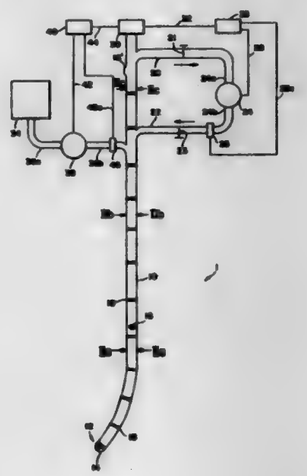
1. A plyometrics training device comprising:
an attaching means for attachment to the upper torso of a user;
a pair of resilient cords attached to said attaching means to resist the vertical movement of a user as the user jumps vertically upwardly from a surface, said cords having free ends when attached to said attaching means,
hand grips at each of said free ends of said resilient cords said hand grips being adapted to the gripped by two assistants, said resilient cords having a predetermined length such that each of said cords are anchorable to said surface by passing underneath at least one foot of each of said two assistants and gripped at said hand grips, each of said resilient cords having a reinforced portion adapted to fit beneath the respective foot of each of said two assistants.

5,597,377

CORONARY SINUS REPERFUSION CATHETER

Gabriel S. Aldea, Chestnut Hill, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed May 6, 1994, Ser. No. 238,860
Int. Cl.[6] A61N 1/362
U.S. Cl. 600—16 17 Claims



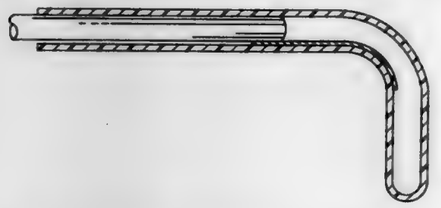
1. A non-occluding catheter for retroperfusion of tissue having a defined systemic vein, said vein draining blood from said tissue through a venous junction coupling said vein to the greater circulatory system, comprising:
a non-occluding infusion tip, such that when retroperfusing said tissue with a retroperfusate flow, said tip is extends within said vein to a depth in a range of about 2 to 4 inches (5.08 to 10.16 cm) from said venous junction and does not occlude said vein, such that said blood continues to flow from said vein;
a pump having an inlet orifice and an outlet orifice;
a tube defining a plurality of channels including at least one withdrawal channel, each of which has a first withdrawal end, a withdrawal port, and a second withdrawal end, wherein said first withdrawal end is coupled to said withdrawal port and said second withdrawal end is coupled to said inlet orifice of said pump; at least one infusion channel, each of which has a first infusion end, an infusion port located in said infusion tip, and a second infusion end, wherein said first infusion end is coupled to said infusion port and said second infusion end is coupled to said outlet orifice of said pump; and a pressure monitoring channel for monitoring pressure at a pressure port at said infusion tip having a first monitoring end, a second monitoring end, and a pressure sensor, wherein said first monitoring end is coupled to said pressure port and said second monitoring end is coupled to said pressure sensor; and
means for controlling said pump having a flowmeter for measuring a rate of said retroperfusate flow, whereby fluid entering said withdrawal port is discharged at said infusion port at a flow rate in a range of about 5 to 50 ml./min. and at a pressure less than about 15 mm Hg, said tube and tip made from biocompatible, non-thrombogenic material.

5,597,378

MEDICAL DEVICES INCORPORATING SIM ALLOY ELEMENTS

James E. Jervis, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 682,243, Apr. 9, 1991, Pat. No. 5,190,546, which is a division of Ser. No. 252,019, Sep. 27, 1988, Pat. No. 5,067,957, which is a continuation of Ser. No. 177,817, Mar. 30, 1988, abandoned, which is a continuation of Ser. No. 47,824, May 8, 1987, abandoned, which is a continuation of Ser. No. 865,703, May 21, 1986, Pat. No. 4,665,906, which is a continuation of Ser. No. 541,852, Oct. 14, 1983, abandoned.
This application Oct. 7, 1992, Ser. No. 956,653
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[6] A61B 17/58
U.S. Cl. 606—78 40 Claims



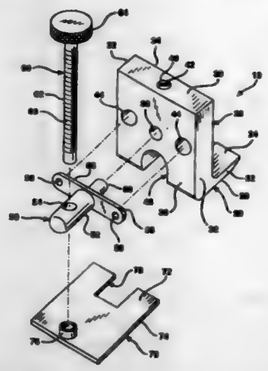
1. A medical device which comprises:
(a) an element for use within a human body or in such proximity to a human body that the device is substantially at human body temperature, the element comprising a shape memory alloy which displays a stress-induced martensite behavior at body temperature; and
(b) a restraint holding the shape memory alloy element in a deformed configuration at a temperature less than the body temperature of the human for positioning the shape memory alloy element within or in proximity to the human body in its deformed configuration, the deformation occurring through the formation of stress-induced martensite;
wherein the shape memory alloy element is sufficiently deformed that when the shape memory alloy element is at human body temperature removal of the restraint from the shape memory alloy element, without change in temperature of the device, releases at least a portion of the shape memory alloy element from its deformed configuration.

5,597,379

METHOD AND APPARATUS FOR FEMORAL RESECTION ALIGNMENT

Timothy G. Haines, and David B. Goldstein, both of Hoboken, N.J., assignors to Hudson Surgical Design, Inc., Rutherford, N.J.

Continuation-in-part of Ser. No. 308,379, Sep. 2, 1994. This application Nov. 18, 1994, Ser. No. 342,143
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—80 29 Claims



1. An apparatus for locating and orienting a cutting guide for resecting a human distal femur comprising:
tibia referencing means for referencing a resected surface of a tibia;
extension means extending from the tibia referencing means;
rotational alignment means engageable with the extension means and movable therealong, the rotational alignment means including guide means for locating and orienting drill holes on a distal femur; and
body means for contacting a distal femur, the body means including a tongue extending from a lower end thereof for contacting posterior condyles of a femur, the body means rotatably interconnected with the rotational alignment means.

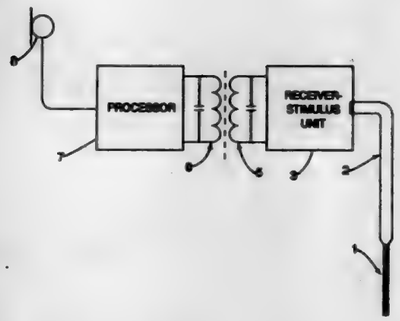
5,597,380

SPECTRAL MAXIMA SOUND PROCESSOR

Hugh J. McDermott, Carlton, and Andrew E. Vandali, Oak Park, both of Australia, assignors to Cochlear Ltd., Lane Cove, Australia

Continuation-in-part of Ser. No. 92,263, Jul. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 788,591, Nov. 6, 1991, abandoned. This application May 9, 1994, Ser. No. 239,757
Claims priority, application Japan, Jul. 2, 1991, 3-161802
Int. Cl.[6] A01N 1/36
U.S. Cl. 607—57 8 Claims

1. A sound processing device for an auditory prosthesis, comprising:
means for receiving an electrical signal representing a sound signal having a amplitude;
filter means for providing amplitude signals corresponding to said amplitude in each of a number of spaced frequency analysis channels, said number of analysis channels being at least 10;



means for selecting up to a pre-determined number of the amplitude signals according to the ones of said amplitude signals having the greatest magnitude, said amplitude signals being selected only if the amplitude in the respective analysis channel exceeds a predetermined level, said predetermined number being at least 4, but less than or equal to half the number of analysis channels;

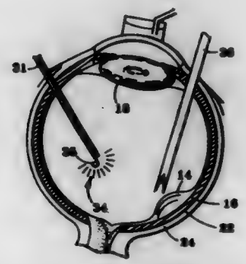
and means for producing a plurality of output signals, each output signal corresponding to one of said selected amplitude signals and hence to one of said frequency channels.

5,597,381

METHODS FOR EPI-RETINAL IMPLANTATION

Joseph Rizzo, III, Boston, Mass., assignor to Massachusetts Eye and Ear Infirmary, Boston, Mass.

Filed Jun. 3, 1993, Ser. No. 72,321
Int. Cl.[6] A61F 2/14
U.S. Cl. 623—4 17 Claims



1. A method for removing a cortical vitreous of an eye, comprising:

transforming a cortical vitreous from a transparent to a visible condition by mechanically stimulating the transparent cortical vitreous to induce formation of collagen fibrils and contraction thereof; and

separating at least a portion of the cortical vitreous from an adherent retinal surface to form an epi-retinal space.

5,597,382

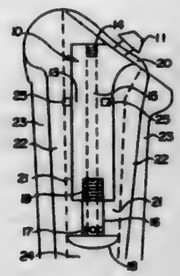
Patent Not Issued For This Number

5,597,383

METHOD FOR CEMENTING INTRAMEDULLARY BONE PROSTHESIS

John J. Carbone, 7300 Old Harford Rd., Baltimore, Md. 21234

Continuation-in-part of Ser. No. 945,622, Sep. 16, 1992, abandoned, which is a division of Ser. No. 777,726, Oct. 16, 1991, Pat. No. 5,340,362. This application Dec. 10, 1993, Ser. No. 164,764
Int. Cl.[6] A61F 2/32;2/28;5/04
U.S. Cl. 623—23 11 Claims



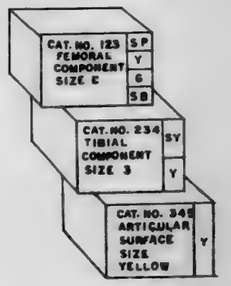
1. A method for cementing a femoral intramedullary bone prosthesis to a bone structure, comprising the steps of providing a prosthesis including a stem, a distal restrictor, a separate spacer connecting the distal restrictor to the stem, apertures disposed in the spacer next to the distal restrictor and a canal in the prosthesis communications with the apertures, inserting the prosthesis in a prepared bone cavity, positioning the apertures at a distalmost end of a remaining unfilled space in the bone cavity defined between the prosthesis and the bone structure, introducing bone cement through the canal to cause the bone cement to enter the remaining unfilled space through the apertures and filling in a substantially completely retrograde manner the remaining unfilled space with the bone cement introduced through the canal.

5,597,384

COLOR CODING FOR IMPLANT SELECTION

Michael R. Walker, and Timothy R. Miller, both of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Sep. 13, 1994, Ser. No. 305,232
Int. Cl.[6] A61F 2/38
U.S. Cl. 623—66 5 Claims



1. A coding scheme in combination with femoral, tibial and articular surface components of a prosthetic knee system for communicating the compatibility of the femoral, tibial and articular surface components of the system, the system having a plurality of

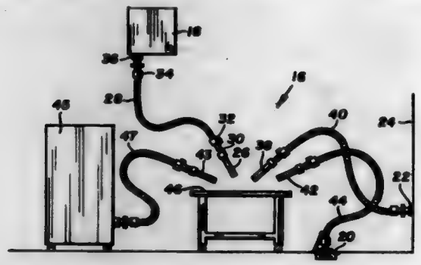
sizes each of femoral, tibial and articular surface components: each of the components being enclosed in a package, wherein a visual code is placed on the package of a particular size articular surface component and all femoral components which are compatible with the particular size articular surface component have the same visual code placed on their packages as is placed on the package of the articular surface component and all tibial components which are compatible with the particular size articular surface component have the same visual code placed on their packages as is placed on the package of the articular surface component, the implant system having at least one size of the femoral components and tibial components which is marked with more than one visual code thus indicating compatibility of the at least one size of the femoral or tibial component with more than one of the sizes of the articular surface component, whereby compatibility of a selected packaged femoral component, a selected packaged tibial component, and a selected packaged articular surface component is communicated when a common code is on all three packages.

5,597,385

FILTERED EXHAUST WAND FOR REMOVING LASER SMOKE

Duane C. Moerke, Bloomington, Minn., assignor to Moerke Custom Products, Inc., Bloomington, Minn.

Filed Nov. 21, 1994, Ser. No. 343,336
Int. Cl.[6] B01D *39/00*
U.S. Cl. 55—274 14 Claims



1. A device for removing the airborne elements generated as a product of a surgical procedure; including:

an elongate housing having a proximal opening at its proximal end and a distal opening at its distal end, and defining an internal passageway for accommodating a flow of air from the distal opening to the proximal opening;

a partition means disposed inside of the housing for dividing the internal passageway into an upstream chamber in direct fluid communication with the distal opening, and a downstream chamber in direct fluid communication with the proximal opening; said partition means including a filtering means for allowing the flow of air therethrough while collecting airborne elements within the air flow, thus to prevent passage of the airborne elements from the upstream chamber to the downstream chamber;

a means for mounting the partition means to the housing; and

a vacuum means, downstream of the housing and in fluid communication with the proximal opening, for drawing air out of the housing through the proximal opening, thus to generate the flow of air into the housing through the distal opening and through the filtering means into the downstream chamber;

wherein the housing is positionable by hand at a location near a surgical site with the distal opening in confronting relation to the surgical site, whereby said flow of air as it enters the housing includes airborne elements generated as a product of a surgical procedure at the surgical site.

5,597,386

HAIR COLORING COMPOSITION COMPRISING ANTI-HAIR ANTIBODIES IMMOBILIZED ON COLORING MATERIALS, AND HAIR COLORING METHODS

Shigeru Igarashi; Toshihiro Usui, both of Odawara; Junichiro Hiraoka, Yokohama; Keiko Hashimoto; Hideyo Uchiwa, both of Odawara; Umeji Murakami, Naka-gun; Kenichi Sugimoto; Hiromi Minamino, both of Odawara, and Toshio Horikoshi, Chigasaki, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

PCT No. PCT/JP93/01780, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO94/13253, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 8, 1993, Ser. No. 284,524
Claims priority, application Japan, Dec. 8, 1992, 4-351971; Dec. 8, 1992, 4-351973; Nov. 24, 1993, 5-319141
Int. Cl.[6] A61K *7/13*; C07K *16/18*
U.S. Cl. 8—405 21 Claims

1. A hair coloring composition comprising an antibody having an immunoactivity against hair and a coloring material, wherein said antibody is immobilized on said coloring material, said coloring material is a composite of a macromolecular carrier and a coloring substance selected from the group consisting of dyes and pigments, and the substance-constituting unit size of said coloring material is at least equivalent to that of said antibody.

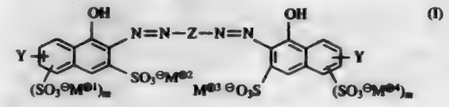
5,597,387

WATER-SOLUBLE POLYAZO DYESTUFFS

Wolfgang Bauer, Mainta; Dieter Baumgart, Egelsbach, and Walter Zöller, Klingenberg, all of Germany, assignors to Hoechst AG, Germany

Filed Nov. 9, 1995, Ser. No. 555,388
Claims priority, application Germany, Nov. 19, 1994, 44 41 232.0
Int. Cl.[6] D06P *3/32*; C09B *39/00*; C09D *11/00*; C07C *245/22*
U.S. Cl. 8—437 14 Claims

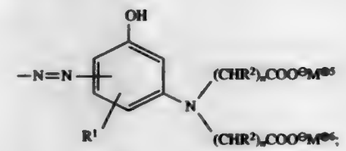
1. Water-soluble polyazo dyestuffs of the formula I



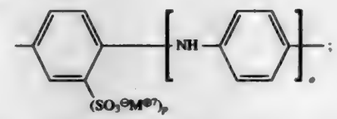
(I)

wherein

Y is the group



Z is



R^1 is hydrogen, (C_1–C_4)-alkyl or halogen;

R^2 is hydrogen or (C_1–C_4)-alkyl;

$M^{\oplus 1}$ to $M^{\oplus 7}$ independently of one another are a cation;

m, o and p independently of one another are 0 or 1; and

n is 1 or 2.

5,597,388

PROCESS FOR FIXATION OF DYES CONTAINING AT LEAST ONE POLYMERIZABLE DOUBLE BOND BY MEANS OF UV LIGHT

Katharina Fritzsche, Weil am Rhein, Germany, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

PCT No. PCT/EP93/01272, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO93/24701, PCT Pub. Date Dec. 9, 1993
PCT Filed May 21, 1993, Ser. No. 343,587
Claims priority, application Switzerland, Jun. 4, 1992, 1802/92; Jun. 4, 1992, 1803/92; Dec. 1, 1992, 3684/92
Int. Cl.[6] D06P *5/20*; *1/38*
U.S. Cl. 8—444 41 Claims

1. A process for the dyeing or printing of organic material, which comprises applying a dye containing at least one polymerisable double bond together with at least one colourless cationic compound containing at least one polymerisable double bond, and at least one photoinitiator, and optionally one or more colourless nonionic compounds containing at least one polymerisable double bond, and optionally further auxiliaries to the organic material, and then fixing them by means of UV light, whose emission is between 200 and 450 nm.

5,597,389

DYEING OF POLYKETONE FIBER

Houston S. Brown, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 19, 1993, Ser. No. 19,939
Int. Cl.[6] D06P 3/79;5/00
U.S. Cl. 8—490 11 Claims

1. A process for dyeing fiber of linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the fiber in aqueous dyebath consisting essentially of water, disperse dye and surfactant, under mild dyeing conditions.

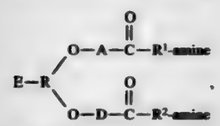
5,597,390

AMINE ESTER-CONTAINING ADDITIVES AND METHODS OF MAKING AND USING SAME

John T. Leper, Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 25, 1995, Ser. No. 533,578
Int. Cl.[6] C10L 1/22; C10M 133/04
U.S. Cl. 44—391 32 Claims

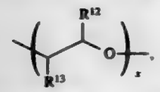
1. A compound of a Formula I:



I

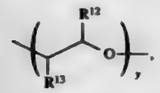
wherein R is selected from a hydrocarbyl residue of a diol and a hydrocarbyl residue of a triol,

A represents the moiety



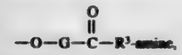
VIII(a)

D represents the moiety



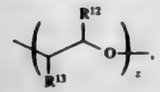
VIII(b)

E represents H or the moiety



VIII(c)

G represents the moiety



VIII(d)

wherein each amine comprises a member of the group consisting of ammonia, a primary amino group, a secondary amino group, and mixtures thereof,

wherein R^{12} and R^{13}, which may be the same or different, each independently represents a member of the group consisting of H, CH_3 and C_2H_5,

x, y and z, which may be the same or different, are each an integer of from 1 to 40,

R^1, R^2 and R^3, which may be the same or different, are each an alkylene having from 2 to 5 carbon atoms, and

the amines being moieties which are the same or different, and each amine having from 1 to 10 nitrogen atoms, wherein each amine comprises at least one member of the group consisting of a primary amino group, a secondary amino group, and an ammonia moiety.

5,597,391

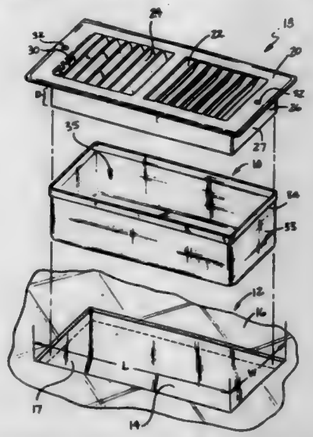
Patent Not Issued For This Number

5,597,392

REGISTER FILTER

Roger S. Hawkins, Waterford, and Christopher N. Loridas, Clarkston, both of Mich., assignors to Hawkins & Loridas, Inc., Troy, Mich.

Filed Dec. 20, 1994, Ser. No. 359,528
Int. Cl.[6] A61L 9/00; B01D 29/11;35/02
U.S. Cl. 55—274 27 Claims



12. In combination with a register (18) for covering a forced air duct outlet (12) of the type used in heating/cooling systems utilizing air ducts wherein said register (18) comprises a face plate (20) having a vent (22) and a skirt (26) having an interior surface (25) and an exterior surface (27) extending outwardly from said face plate (20) for insertion into the forced air duct outlet (12), filter means (10) for disposition about said exterior surface (27) for removing contaminant particles from air flowing through the forced air duct outlet (12), said filter means (10) comprising:

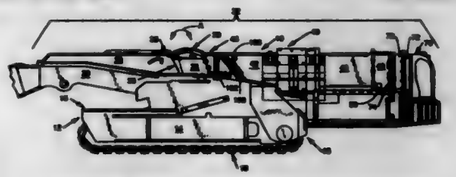
a permeable and pliable filter material (33); and a band (34) secured along the periphery of said filter material (33) to secure said filter material (33) to said exterior surface (27) of said skirt (26).

5,597,393

DISPLACEABLE FILTERING APPARATUS FOR AIRBORNE CONTAMINATES

Randall F. Johnson, Franklin, and Christopher G. Stewart, Oil City, both of Pa., assignors to Joy MM Delaware Inc.

Filed Jul. 6, 1994, Ser. No. 271,147
Int. Cl.[6] B01D 46/00
U.S. Cl. 55—356 33 Claims



1. Apparatus for filtering airborne contaminates, comprising:

frame means;

a collection duct attached to said frame means;

an elongated discharge duct assembly pivotally attached to said frame means, said discharge duct assembly being selectively pivotable about an axis parallel to its longitudinal axis between a first position wherein said discharge duct assembly is attachable at a first end thereof to said collection duct to create a continuous duct assembly and a second position wherein said discharge duct assembly is displaced from said frame means;

air flow inducing means operatively connected to said discharge duct assembly, said air flow inducing means selectively causing contaminate-laden air to be drawn into said continuous duct assembly and flow therethrough; and

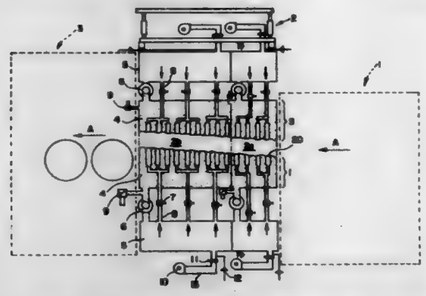
filter means operatively attached to said continuous duct assembly for filtering said contaminate-laden air drawn into said continuous duct assembly.

5,597,394

PROCESS FOR THE MANUFACTURE OF A FLAT GLASS SHEET WITH IMPROVED CHARACTERISTICS

Jean C. Marique, Sambreville, Belgium, and Pier P. Bonttini, Vasto, Italy, assignors to Societa Italiana Vetro - SIV - S.p.A., San Salvo CH, Italy

Filed Nov. 28, 1994, Ser. No. 348,976
Claims priority, application Italy, Nov. 30, 1993, RM93A0797
Int. Cl.[6] C03B 35/00
U.S. Cl. 65—25.2 5 Claims



1. A process for the manufacture of a flat glass sheet including forming a glass sheet strip at a molten tin bath, conveying said glass sheet strip from said molten tin bath in a direction of travel by an annealing lehr having rollers, and precooling said glass sheet strip while supporting said glass sheet strip by a fluid bed at a stage of travel of said glass sheet strip between said molten tin bath and said annealing lehr, said precooling and supporting comprising:

forming a first, upstream section of said fluid bed, relative to said direction of travel, from a first gas mixture;

forming a second, downstream section of said fluid bed, relative to said direction of travel, from a second gas mixture; and

separately supplying said first gas mixture to said first section and said second gas mixture to said second section from respective first and second supplies that are separate and not in direct fluid communication.

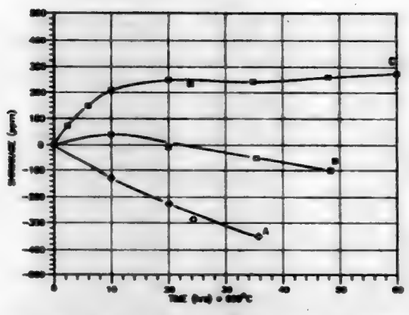
5,597,395

METHOD FOR LOW TEMPERATURE PRECOMPACTION OF GLASS

Peter L. Bocko, Painted Post; Josef C. Lapp, Corning; John W. Nelson, and Carolyn K. Schad, both of Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 28, 1995, Ser. No. 563,878
Int. Cl.[6] C03B 32/00
U.S. Cl. 65—33.4 13 Claims

1. A method for precompacting a glass sheet substrate for a flat panel display comprising:



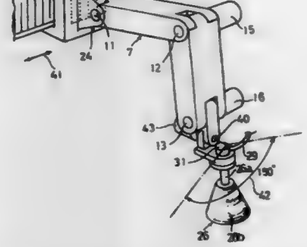
exposing a glass sheet to a temperature which corresponds to a viscosity in the glass sheet between about 10^{12} and 10^{17} poises, and simultaneously applying greater than atmospheric pressure to precompact the glass sheet, thereby making the glass sheet suitable for use as a flat panel display substrate.

5,597,396

METHOD OF AND DEVICE FOR LUBRICATING MOLDS OF BOTTLE MAKING MACHINE

Kanehiro Tohjo, Nishinomiya, Japan, assignor to Yamamura Glass Co., Ltd., Hyogo-ken, Japan

Filed May 11, 1994, Ser. No. 241,610
Int. Cl.[6] C03B 40/027
U.S. Cl. 65—169 33 Claims



1. A swabbing device for molds of a bottle making machine, comprising:

a swabbing member for supplying the surface of a mold with a swabbing agent, the swabbing member made of an absorbent material provided around a core member for supplying the surface of a mold with a preliminarily impregnated swabbing agent by being rubbed against the surface of the mold;

a multijoint robot having a robotic arm with four or more joints which traverses above a plurality of bottle forming sections for carrying said swabbing member to a position adjacent each of the molds and performing an automatic swabbing operation at each section wherein each joint is capable of a pivoting and a rotational movement independent of, and concurrent with, the other joints;

a plurality of motors for separately driving each of the joints of the robotic arm; and

a controller for separately controlling the activation of each motor to drive the swabbing member relative to each mold to a position within a mold, to press the swabbing member against the surface of the mold, and to move the swabbing member along the surface.

5,597,397

TRANSFER DEVICE FOR BENT GLASS SHEETS

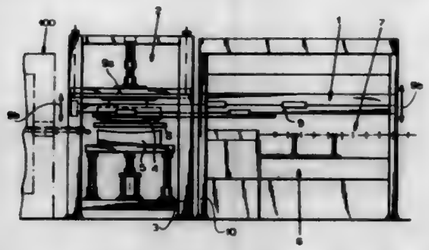
Dieter Funk, Witten; Dieter Bruns, Rheinberg; Rolf Wenning, Bocholt; Walter Bruns, Recklinghausen, and Joachim Pilz, Gelsenkirchen, all of Germany, assignors to Flachglas Aktiengesellschaft, Furth, Germany

Filed Apr. 12, 1995, Ser. No. 422,499

Claims priority, application Germany, Apr. 15, 1994, 44 12 748.0

Int. Cl.[6] C03B *23/03*

U.S. Cl. 65—171 **10 Claims**



1. In a production line for production of bent glass sheets comprising:

a continuous furnace for heating glass sheets to be bent to bending temperature;

a bending press with a male bending mold and a female bending mold installed on a press frame, at least one of the male bending mold and the female bending mold being raisable and lowerable for bending heated glass sheets successively in a horizontal orientation;

a toughening station for cooling bent glass sheets;

a device for onward conveyance of the cooled glass sheets downstream of said toughening station; and

a transfer device operating between said bending press and said toughening station, the improvement wherein:

(a) the transfer device comprises a shuttle guided on sides facing in a direction of travel on shuttle guide rails extending in said direction,

(b) the shuttle guide rails are supported statically on the press frame of the bending press and on a station frame of the toughening station as respective beams,

(c) the shuttle comprises a shuttle frame as well as a shuttle ring mounted therein and the shuttle frame is guided on the shuttle guide rails by means of a shuttle frame mounting,

(d) the shuttle ring is adjustable in relation to the shuttle frame mounting and thus in relation to the male bending mold,

(e) the shuttle ring incorporates at its edges positioning devices for engaging and retaining respective glass sheets,

(f) means are provided whereby at least the areas of the shuttle guide rails which project into the press frame of the bending press are removable for the purpose of carrying out maintenance and retooling work on the bending press, and

(g) means for mounting said shuttle frame rigidly but adjustably to the shuttle frame mounting.

5,597,398

PROCESS FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Shinji Ishikawa; Yoshiki Chigusa; Motonori Nakamura; Yoshinori Makio, and Morio Watanabe, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

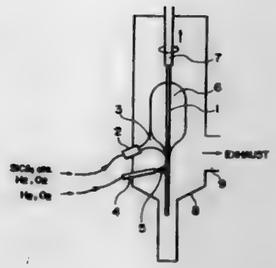
Filed Jun. 15, 1994, Ser. No. 260,747

Claims priority, application Japan, Jun. 16, 1993, 5-144746

Int. Cl.[6] C03B *37/018*

U.S. Cl. 65—413 **16 Claims**

1. A process for producing a porous glass preform for an optical fiber comprising:



preheating a glass surface portion of a member at a maximum preheating temperature of not lower than 1100° C. and lower than 1600° C. for a period of time of not less than 5 minutes to clean the glass surface portion; and

depositing fine glass particles on the glass surface portion of the member cleaned by said preheating.

5,597,399

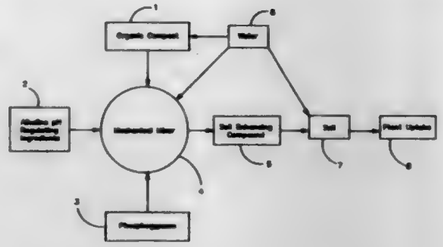
SOIL ENHANCING COMPOUND AND METHOD FOR PRODUCING SAME

Dibyendu Basu, and Susan M. Basu, both of 526 Jean Lafitte, Baton Rouge, La. 70810

Continuation-in-part of Ser. No. 55,846, Apr. 30, 1993, abandoned. This application Jul. 27, 1995, Ser. No. 507,877

Int. Cl.[6] C05F *5/00*

U.S. Cl. 71—9 **3 Claims**



1. A method for producing a soil enhancing compound, comprising:

(a) mechanically mixing a portion of composted agricultural waste consisting essentially of plant by-products with a portion of phosphogypsum, said phophogypsum having about 1% phosphate by weight and at least 25% calcium sulfate by weight, to form an intermediate mixture, wherein said composted agricultural waste comprises about 40% to 80% by weight of said intermediate mixture and wherein said phophogypsum comprises 20% to 60% by weight of said intermediate mixture;

(b) adding an amount of water to said intermediate mixture effective to cause the formation of a nutrient-containing gelatin within said intermediate mixture by the interaction of said water, said composted agricultural waste, and said phosphogypsum;

(c) adding an amount of a pH regulating ingredient to said intermediate mixture effective to create a pH of between 6.0 and 7.5 in said intermediate mixture; and

(d) adjusting the amount of said composted agricultural waste in said intermediate mixture to form a soil enhancing compound having a radioactivity of 10 pCi/gram or less.

5,597,400

METHODS AND COMPOSITIONS FOR ENHANCING CARBON FIXATION IN PLANTS

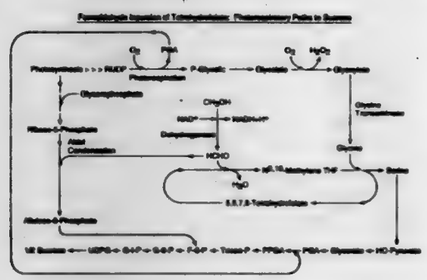
Arthur M. Nonomura, 145 E. Estero La., Litchfield Park, Ariz. 85340, and Andrew A. Benson, 6044 Folsom Dr., La Jolla, Calif. 92037

PCT No. PCT/US93/05676, § 371 Date Feb. 24, 1995, § 102(e) Date Feb. 24, 1995, PCT Pub. No. WO94/00009, PCT Pub. Date Jan. 6, 1994

Continuation-in-part of Ser. No. 901,366, Jun. 19, 1992, abandoned. This PCT application Jun. 14, 1993, Ser. No. 351,348

Int. Cl.[6] A01N *31/02; C05C 9/00*

U.S. Cl. 71—28 **13 Claims**



1. A method for promoting growth in plants, said method comprising:

applying a growth promoting composition to the plant as a foliar spray, wherein said growth promoting composition contains (a) an amount of methanol or methanol metabolite selected from the group consisting of formaldehyde, formic acid, and methyl formate sufficient to increase plant turgidity and enhance carbon fixation within the plant, wherein said amount is at at least 10% by volume, and (b) an amount of an agriculturally acceptable surfactant effective to enhance wetting of the plant and penetration of methanol into the plant; and

exposing the plants to a minimum light intensity of 1000 μEin/m^2/sec for a period of at least two hours after application of the growth promoting composition.

5,597,401

REFRACTORY METAL SWARF COMPOSITION AND METHOD OF MAKING SAME

Joseph A. Megy, P.O. Box 91, 100 N. Chester St., New Cumberland, W. Va. 26047

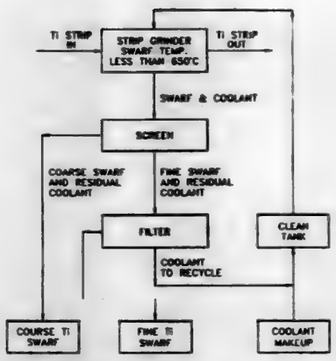
PCT No. PCT/US92/08688, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO94/08859, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 5, 1992, Ser. No. 338,594

Int. Cl.[6] C22C *29/00*

U.S. Cl. 75—304 **82 Claims**

1. An improved process for producing refractory metal SWARF substantially free of oxide and nitride impurities wherein the SWARF is produced by grinding a refractory metal with an abrasive tool to grind off surfaces of the refractory metal thus producing SWARF, the improvement comprising performing the grinding operating with sufficient grinding fluid so that the grinding fluid does not reach its boiling point temperature to prevent the produced SWARF from being heated to a temperature of 650° C. or more.



5,597,402

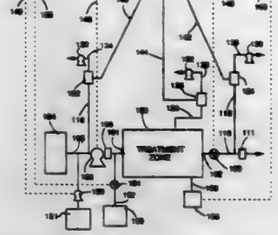
SELF-REGULATED BIOLOGICAL SCRUBBER AND/OR GAS STRIPPER FOR THE TREATMENT OF FLUID STREAMS

Mark A. LaPack; Terry J. Nestrick; William F. Martin, and Gary M. Klecka, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 210,108, Mar. 17, 1994, Pat. No. 5,498,933, which is a continuation of Ser. No. 680,663, Apr. 4, 1991, abandoned. This application Oct. 27, 1995, Ser. No. 549,137

Int. Cl.[6] C02F *3/00; 1/44*

U.S. Cl. 95—12 **4 Claims**



1. A process for treating a gaseous stream comprising:

(a) introducing into a treatment zone at a first volumetric flow rate a gaseous influent stream containing at least one constituent which may be reduced in concentration by a biodegradation treatment, the influent stream being characterized by a first mass flow rate of each of the constituents introduced;

(b) treating the influent stream in the treatment zone to reduce the concentration of the at least one constituent by biodegrading with an effective biomass;

(c) discharging from the treatment zone a gaseous effluent stream at a second volumetric flow rate, the effluent stream being characterized by a second mass flow rate of each of the constituents or by-products thereof

(d) making an on-line determination of the first mass flow rate of at least one constituent and the second mass flow rate of the constituent or a by-product thereof; and

(e) adjusting at least one of either the first mass flow rate or the second mass flow rate in response to the determination of step (d).

5,597,403

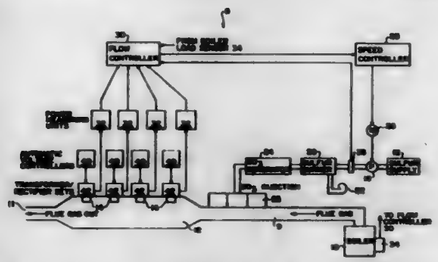
FLUE GAS CONDITIONING SYSTEM FOR INTERMITTENTLY ENERGIZED PRECIPITATION

William G. Hankins, Issaquah, Wash., assignor to The Chemithon Corporation, Seattle, Wash.

Division of Ser. No. 254,937, Jun. 7, 1994. This application May 31, 1995, Ser. No. 455,849

Int. Cl.[6] B03C *3/013*

U.S. Cl. 96—23 **22 Claims**



22. A system for preconditioning flue gas to be treated in an electrostatic precipitator having a set of electrostatic elements and a power supply which supplies intermittent power having energized half-cycles and non-energized half-cycles to the electrostatic elements, said system comprising:

a source of a conditioning agent which supplies an amount of the conditioning agent to the flue gas;

detecting means for separately detecting first and second parameters of the intermittent power supplied to the electrostatic elements during one or more energized half-cycles only of the intermittent power;

developing means, responsive to the measurements of the first and second parameters during the one or more energized half-cycles, for developing an indication of the intermittent power supplied to the electrostatic elements; and

controlling means, responsive to the power indication, for controlling the amount of conditioning agent added to the flue gas.

5,597,404

APPARATUS FOR PROCESSING A PRODUCT FROM CATALYTIC REFORMING

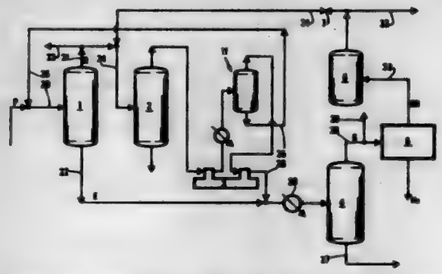
Bruno Demerges; Beatrice Fischer, both of Rueil Malmaison, and Larry Mauk, Orgeval, all of France, assignors to Institut Francais Du Petrole, France

Division of Ser. No. 271,466, Jul. 7, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 466,686

Claims priority, application France, Jul. 8, 1993, 93/08413

Int. Cl.[6] B01D *53/04;53/14*

U.S. Cl. 96—134 **2 Claims**



1. A plant for processing a reformate withdrawn from a reforming reactor for reforming a hydrocarbon charge, said plant comprising:

a separator 1 provided with an inlet duct 20 for product withdrawn from the reforming reactor, a duct 21 for withdrawing a hydrogen rich gaseous phase R, and a duct 22 for discharging an effluent E,

a duct 23 connected to the duct for withdrawing the gaseous phase R from the separator and terminating at a duct for supplying the reforming reactor, for recycling a part of the said gaseous phase R withdrawn from the separator,

a compression loop comprising at least one compressor 3 integrated with the duct for withdrawing the phase R for compressing to at least 10 bars the gaseous phase withdrawn from the separator and which is not recycled,

a duct 26 for feeding resultant non-recycled compressed gaseous phase into the duct 22 carrying the effluent E to a recontactor 4, said recontactor 4 being provided with a duct 27 for the intake of effluent mixed with the compressed gaseous phase, a duct 34 for withdrawing the reformate, and a duct 28 for withdrawing the gas,

a purification unit 5 having an intake duct for said gas withdrawn from the recontactor, an outlet duct 32 for hydrogen having a purity greater than 99%, and an outlet duct for a residual gas,

a duct 33 for passing the residual gas to an intermediate container 6, and

a duct 31 for recycling said residual gas, connecting the intermediate container 5 to a duct 24 communicating with the compression loop.

5,597,405

MAGNETIC COMPOSITION, MAGNETIC TONER AND INK CONTAINING THE MAGNETIC COMPOSITION

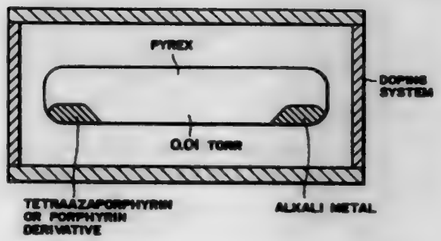
Leonid S. Grigoryan, 2-3-6-104, Higashi, Tsukuba-shi, Ibaraki-ken, Tsukuba, and Kyuya Yakushi, Okazaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo; Leonid S. Grigoryan, Tsukuba, and Kyuya Yakushi, Okazaki, all of Japan

Division of Ser. No. 395,316, Feb. 28, 1995, Pat. No. 5,506,079. This application Dec. 7, 1995, Ser. No. 568,687

Claims priority, application Japan, Feb. 28, 1994, 6-054530

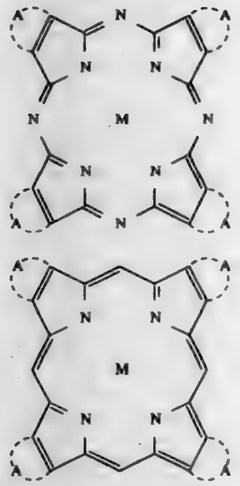
Int. Cl.[6] C09D *11/00*

U.S. Cl. 106—20 R **6 Claims**

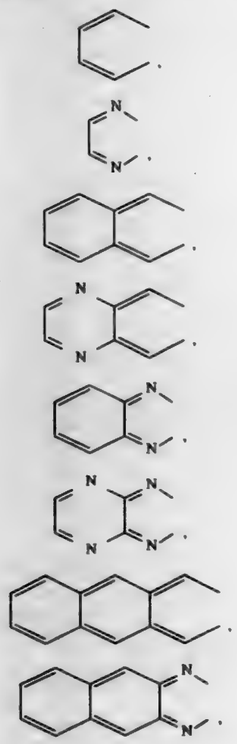


1. A magnetic ink comprising:

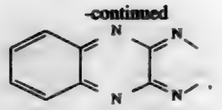
a magnetic composition comprising an alkali-metal-doped tetraazaporphyrin derivative which is prepared by doping a tetraazaporphyrin derivative of formula (I) with an alkali metal, or an alkali-metal-doped porphyrin derivative which is prepared by doping porphyrin derivative of formula (II) with an alkali metal:



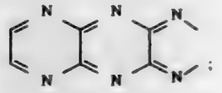
wherein M represents at least one metal or a metal composition consisting of a plurality of metals; and A represents two individual hydrogen atoms, or a condensation substituent selected from the group consisting of:



-continued

(i) 

and

(j) 

and

(II) a vehicle.

5,597,406

METHOD OF THICKENING AQUEOUS FORMULATIONS

Stephen A. Fischer, Yardley; Kartar S. Arora, Chalfont; Reuben Grinstein, Blue Bell; Patrick M. McCurry, Jr., Lansdale, and Judith C. Giordan, Villanova, all of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 146,549, Nov. 2, 1993, Pat. No. 5,501,813. This application Nov. 1, 1994, Ser. No. 338,353

Int. Cl.[6] G05D *24/00;* **C11D** *1/72;3/20;1/74*

U.S. Cl. 106—237 **30 Claims**

1. A method of thickening an aqueous-based formulation which

(a) comprises adding to said aqueous formulation a thickening-effective amount of a composition comprising: (a) about 1.0% to about 25% by weight of a cosolvent selected from the group consisting of a diol, the mono alkyl ether of a diol, a salt of a

(b) sulfated ethoxylated alcohol, a salt of a sulfated ethoxylated alkyl phenol, and a complex organic phosphate ester which is a mixture of mono- and di-esters of phosphoric acid wherein the ester groups are ethoxylated alcohols or ethoxylated alkyl phenols; (b) water;

(c) (c) about 20% to about 60% by weight of a nonionic surfactant having an HLB of less than about 14; (d) about 25% to about 50% by weight of an ester of an ethoxylated polyol having at least 3 alcohol groups and having degree of ethoxylation from about 80 to

(d) about 400.

5,597,407

(e) **METHOD OF THICKENING AQUEOUS FORMULATIONS**

Stephen A. Fischer, Yardley; Kartar S. Arora, Chalfont; Reuben Grinstein, Blue Bell; Patrick M. McCurry, Jr., Lansdale, and Judith C. Giordan, Villanova, all of Pa., assignors

(f) **to Henkel Corporation, Plymouth Meeting, Pa.**

Division of Ser. No. 146,549, Nov. 2, 1993, Pat. No. 5,501,813. This application Jun. 2, 1995, Ser. No. 458,307

Int. Cl.[6] G05D *24/00;* **C11D** *1/72;3/20;1/74*

(g) **U.S. Cl. 106—237** **17 Claims**

1. A method of thickening an aqueous-based formulation which comprises adding to said aqueous formulation a thickening-effective amount of a composition comprising: (a) from about 10%

(h) to about 25% by weight of a cosolvent selected from the group consisting of a diol, the mono alkyl ether of a diol, a salt of a sulfated ethoxylated alcohol, a salt of a sulfated ethoxylated alkyl phenol, and a complex organic phosphate ester; (b) from about 5% to about 25% by weight of water; (c) from about 20% to about 60% by weight of a nonionic surfactant having an HLB of less than about 14; (d) from about 25% to about 60% by weight of an ester of an ethoxylated polyol having at least 3 alcohol groups and having degree of ethoxylation from about 80 to about 400.

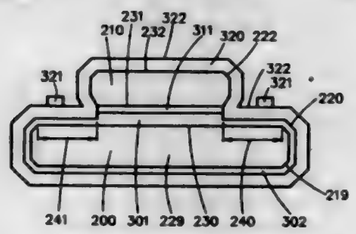
5,597,408
ANTI-REFLECTIVE COATING COMPOSITION
Young-Joon Choi, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Nov. 30, 1995, Ser. No. 564,959
Claims priority, application Rep. of Korea, Nov. 30, 1994, 94-32130
Int. Cl.[6] C09D 5/32;101/02;105/00;201/06
U.S. Cl. 106—481 7 Claims

1. An anti-reflective coating composition comprising 1.0– 50.0 wt % of a dyed organosilicon compound having both a structure of organosilicon compound and a structure of a dye compound having light absorbing ability at a particular wavelength region, 50.0–99.0 wt % of solvent, and 0–10 wt % water-soluble polymer.

5,597,409
BITUMINOUS REINFORCING MATERIAL FOR GROUTING
Akira Ito, and Hiroyuki Ishii, both of Tochigi, Japan, assignors to Nichireki Company, Limited, Tokyo, Japan
Filed Jul. 24, 1995, Ser. No. 506,108
Int. Cl.[6] C04B 24/36; C08L 95/00
U.S. Cl. 106—671 9 Claims

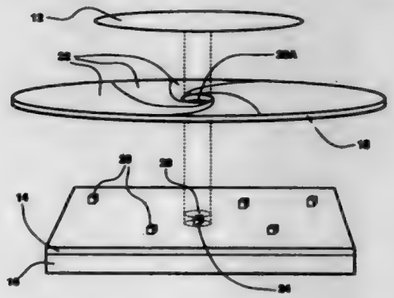
1. A bituminous reinforcing material produced by mixing together liquid A and liquid B;
wherein liquid A comprises a mixture of an asphalt emulsion, a hydraulic inorganic material, a reactive water-soluble resin, and water;
wherein liquid B comprises a mixture of an asphalt emulsion, a hydraulic inorganic material, a polymerization catalyst, and water;
wherein the total amount of asphalt emulsion in the bituminous reinforcing material ranges from about 4 to about 60% by weight;
the total amount of hydraulic inorganic material in the bituminous reinforcing material ranges from about 6 to about 60% by weight;
the total amount of reactive water soluble resin in the bituminous reinforcing material ranges from about 4 to about 15% by weight;
the amount of polymerization catalyst in the bituminous reinforcing material ranges from about 1 to about 6% by weight; and
the amount of water in each of liquid A and liquid B is from about 4 to 40% by weight.

5,597,410
METHOD TO MAKE A SOI WAFER FOR IC MANUFACTURING
Yung C. Yen, 5770 Harder St., San Jose, Calif. 95129
Filed Sep. 15, 1994, Ser. No. 306,471
Int. Cl.[6] C30B 25/02
U.S. Cl. 117—84 12 Claims



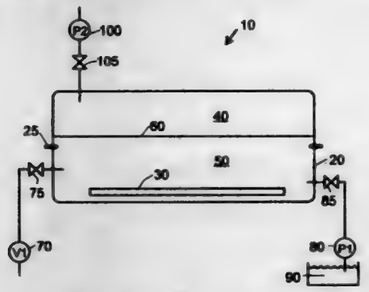
1. A method of making a single crystal semiconductor film comprising:
a) providing a single crystal semiconductor wafer with bevelled edges which is encapsulated by a first oxide layer, wherein said first oxide layer forms at least a bonding front surface and a bonding back surface opposite said bonding front surface;
b) providing a substrate with bevelled edges which is encapsulated by a second oxide layer, wherein said first oxide layer forms at least a holding front surface and a holding back surface opposite said holding front surface;
c) bonding said bonding front surface of the wafer from step a) to said holding front surface of the substrate from step (b), wherein said holding front surface is longer than said bonding front surface;
d) eaching said bonding back surface and a portion of said single crystal semiconductor wafer so as to reduce the thickness thereof;
e) forming a layer on all exposed surfaces of the assembly resulting from step d);
f) removing that portion of the layer formed in step e) which covers the bonding back surface, as well as a portion of the single crystal semiconductor wafer such that said wafer becomes an exposed single crystal film which is planar with the portion of the polysilicon layer which remain above the holding front surface of the substrate.

5,597,411
METHOD OF FORMING A SINGLE CRYSTAL MATERIAL
Helmut Fritzsche, Chicago, Ill.; Stanford R. Ovshinsky, Bloomfield Hills, and Roen Young, Troy, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.
Filed Feb. 19, 1991, Ser. No. 656,697
Int. Cl.[6] C30B 25/04
U.S. Cl. 117—104 34 Claims



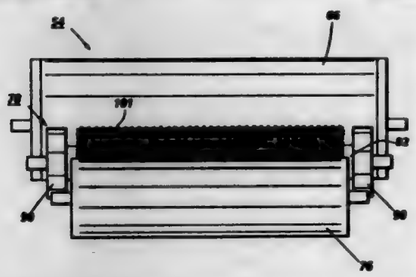
1. A method of growing a unit-cell-basal-plane-aligned, single crystal, superconducting material on non-perovskite substrates, said method including the steps of:
providing a non-perovskite substrate selected from the group consisting of metals, ceramics, polymers and glasses, said substrate including at least one nucleation site for initiating unit-cell-basal-plane-aligned, single crystal growth of superconducting material therefrom;
vapor phase depositing superconducting material onto said non-perovskite substrate;
promoting the unit-cell-basal-plane-aligned, single crystal growth of said superconducting material at one of said at least one nucleation sites in deference to all other nucleation sites on said non-perovskite substrate, whereby polycrystalline growth of said superconducting material is inhibited during the vapor phase deposition of said superconducting material.

5,597,412
APPARATUS FOR FORCING PLATING SOLUTION INTO VIA OPENINGS
Carlo Grilletto, San Carlos, and David G. Love, Pleasanton, both of Calif., assignors to Fujitsu Limited, Japan
Filed Feb. 15, 1995, Ser. No. 388,998
Int. Cl.[6] C23C 18/00
U.S. Cl. 118—50 2 Claims



1. Apparatus for forcing a liquid into a high aspect ratio opening in a generally flat substrate, comprising:
a sealable chamber for holding said substrate, said chamber having a wall comprising a flexible diaphragm,
a vacuum pump in fluid communication with said sealable chamber,
means for introducing said liquid into said chamber while said chamber is sealed, such that said opening in said substrate is immersed in said liquid, and
means to exert pressure against said flexible diaphragm such that hydrostatic pressure is created within said liquid.

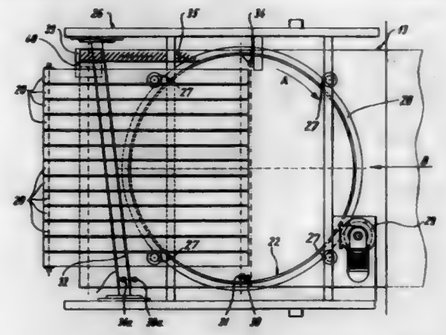
5,597,413
DONOR BRUSH
Alvin D. Kroman, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 7, 1992, Ser. No. 986,198
Int. Cl.[6] B05C 11/00; G03G 15/00
U.S. Cl. 118—60 11 Claims



1. Apparatus for applying offset preventing liquid to the surface of one member of a contact fuser for fixing powder images to a substrate, said apparatus comprising:
a supply of release agent material;
a release agent metering member supported for contact with said supply of release agent material;
means for effecting movement of said metering member in an endless path;
donor structure having first and second members thereof contacting said surface of said one member of a contact fuser, one of said members exhibiting a low coefficient of friction between it and said surface of said fuser member and another of said members exhibiting a high coefficient of friction between it and said surface of said fuser member; and
means for positively driving said fuser member such that simultaneous movement of said donor structure via said another of said members is effected.

9. A release agent management donor member for use in applying release agent material to a fuser member, said member comprising:
first and second members for contacting the surface of said fuser member, one of said members exhibiting a low coefficient of friction between it and said surface of said fuser member and another member exhibiting a high coefficient of friction between it and said surface of said fuser member.

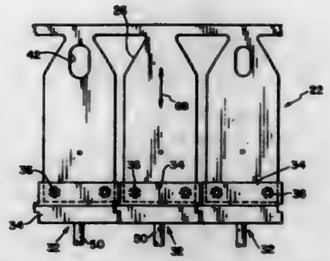
5,597,414
SPRAYER FOR COATING ARTICLES
Bernhard Potthoff, Herzebrock-Clarholz, Germany, assignor to Venjakob Maschinenbau GmbH & Co KG, Rheda-Wiedenbruck, Germany
Filed Apr. 4, 1994, Ser. No. 223,253
Claims priority, application Germany, Apr. 6, 1993, 43 11 310.9
Int. Cl.[6] B05C 11/00
U.S. Cl. 118—70 26 Claims



1. A sprayer for coating articles, comprising: a plurality of sprayguns accommodated in a substantially solid-walled spray-booth, a conveyor with a motor-revolved belt for conveying articles through the spraybooth, belt-wiping means resting against and extending across the belt for wiping a surface of the belt clean, wherein the belt-wiping means includes at least one wiping ring mounted for rotation around an axis and having an active edge and wherein the axis is at least substantially perpendicular to the surface of the belt such that at least a portion of the wiper's active edge will contact the surface of the belt, a motor for rotating the at least one wiping ring and at least three wheels for positioning the at least one wiping ring.

5,597,415
PROFILING BAR FOR A WEB COATING DEVICE
Edwin X. Graf, Menasha, Wis., assignor to Voith Sulzer Paper Technology North America, Inc., Appleton, Wis.
Filed Feb. 9, 1995, Ser. No. 385,779
Int. Cl.[6] B05C 21/00
U.S. Cl. 118—123 21 Claims

1. A profiling device for a coating metering blade for use in a moving web coating system, said profiling device comprising:
an elongate non-segmented profile bar defining an axis and being deformable in a direction transverse to said axis,
a plurality of independently moveable bar limiter elements attached to said profile bar at a plurality of axially spaced locations along said bar, and
a plurality of adjustment actuators connected respectively to said bar limiter elements,



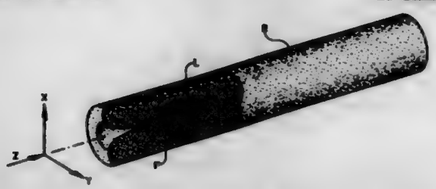
said bar limiter elements being mechanically interlocked with each other such that the movement of each limiter element relative to an adjacent said limiter element in the direction of bar deformation is limited to a maximum distance by said respective adjacent limiter element, whereby local over-deformation of said profile bar is inhibited.

5,597,416

METHOD OF MAKING CRYSTALLINE SUGAR AND PRODUCTS RESULTING THEREFROM

Richard C. Fuisz, Great Falls; Gerald E. Battist, and Garry L. Myers, both of Reston, all of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Filed Oct. 7, 1993, Ser. No. 133,669
The portion of the term of this patent subsequent to Sep. 10, 2013, has been disclaimed.
Int. Cl.[6] C13F *3/00;1/02*
U.S. Cl. 127—30 28 Claims



1. A method of forming a crystalline sugar product comprising:
forming a bi-dimensionally stabilized sugar crystalline frame from an outer portion of a shearform amorphous sugar mass, said bi-dimensionally stabilized frame having a linear dimension and a cross-sectional dimension, and
converting the remaining portion of said mass to a substantially completely crystalline structure which substantially retains said cross-sectional dimension of said bi-dimensionally stabilized sugar crystalline frame.

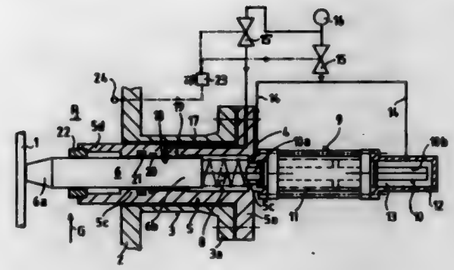
5,597,417

METHOD AND APPARATUS FOR THE PERCUSSIVE CLEANING OF OBJECTS

Gustav Thünen, Gummersbach, and Ulrich Rettländer, Overath, both of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Germany

PCT No. PCT/EP94/03339, § 371 Date Oct. 6, 1994, § 102(e) Date Oct. 6, 1994, PCT Pub. No. WO94/18518, PCT Pub. Date Aug. 18, 1994
PCT Filed Feb. 7, 1994, Ser. No. 318,738
Claims priority, application Germany, Feb. 6, 1993, 43 03 484.5
Int. Cl.[6] B08B *7/02;* F28G *7/00*
U.S. Cl. 134—1 12 Claims

1. A method for percussively cleaning an object disposed in a process chamber that is under process pressure, said method including the steps of:



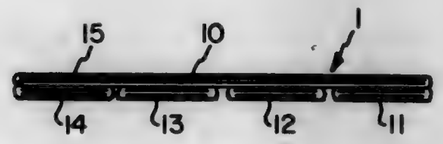
providing an elongated percussive element below and in contact with said object that is to be cleaned;
providing an elongated striker having two ends;
accelerating said striker to apply percussive energy to said percussive element to effect said percussive cleaning of said object; and
at least during said acceleration of said striker, maintaining an identical pressure at said two ends of said striker, with said identical pressure corresponding essentially to said pressure in said process chamber.

5,597,418

METHOD OF MAKING FOLDABLE MAT FOR ABSORBING LIQUIDS

Raymond D. Evans, Jr., Everett; Timothy R. McMillen, Tyrone, and Mark S. Woytowich, Altoona, all of Pa., assignors to New Pig Corporation, Tipton, Pa.

Division of Ser. No. 315,549, Sep. 30, 1994. This application Jun. 29, 1995, Ser. No. 496,332
Int. Cl.[6] B08B *7/00*
U.S. Cl. 134—6 6 Claims



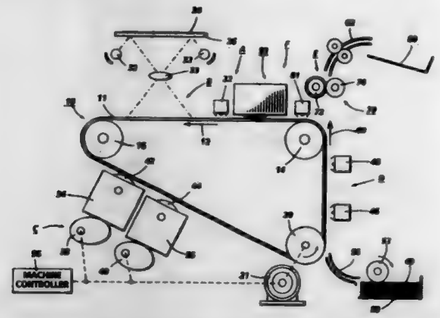
1. A method of making and using a multilayered flexible strip for walk-on mats for absorbing liquids comprising the steps of:
a. providing a nonsegmented flexible sheet layer comprised of woven or nonwoven fabrics for absorbing liquids;
b. providing a segmented flexible sheet layer comprised of woven or nonwoven fabrics for absorbing liquids, wherein the segments of the segmented layer are separated by substantially straight boundaries extending across one dimension of the sheet;
c. tacking the segmented layer in a face-to-face relationship with the nonsegmented layer, the segmented layer and nonsegmented layer forming a multilayered strip, such that the multilayered sheet is easily folded along the boundaries between the segments of the segmented layer such that the multilayered flexible strip can be used folded without the need for mechanical means to hold the folded segmented layers together;
d. cutting or tearing off a length of the multilayered strip; and
e. laying the length of the multilayered strip segmented face down upon a floor subject to foot traffic whereby the length of strip will absorb liquids and protect against slips and falls.

5,597,419

SLOW BRUSH ROTATION IN STANDBY TO AVOID BRUSH FLAT SPOTS

Dennis G. Gerbasi; Bruce E. Thayer, both of Webster, and Clark V. Lange, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 354,391, Dec. 17, 1994, abandoned. This application May 10, 1996, Ser. No. 644,469
Int. Cl.[6] G01G *21/00*
U.S. Cl. 134—6 3 Claims



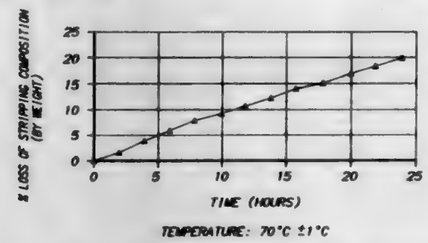
1. A method for preventing set from occurring in a deformable member of a printing machine, the printing machine having operational and non-operational modes, comprising:
moving a deformable member in the operational mode by a moving means to remove particles from an image surface of a printing machine, said deformable member comprising a cleaner brush having fibers extending radially from a core;
compressibly contacting the fibers of said cleaner brush with a member, wherein said member causes set to occur in said fibers of said cleaner brush; and
periodically moving said cleaner brush and said member relative to one another in a non-operational mode by said moving means to prevent contact therebetween in a common area, said periodic moving preventing set from occurring in said fibers of the cleaner brush during %he non-operational mode.

5,597,420

STRIPPING COMPOSITION HAVING MONOETHANOLAMINE

Irl E. Ward, Bethlehem, Pa., assignor to Ashland Inc., Dublin, Ohio

Filed Jan. 17, 1995, Ser. No. 373,559
Int. Cl.[6] B08B *3/08;* C11D *7/26;7/32;7/34*
U.S. Cl. 134—38 5 Claims



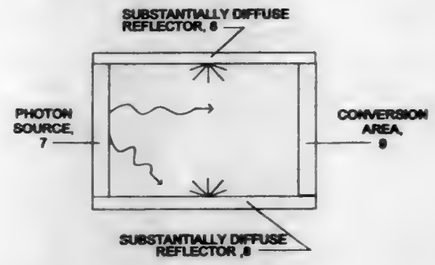
1. A stripping composition free of hydroxylamine compounds, consisting essentially of the admixture of monoethanolamine in an amount of about 70 to 95% weight, about 8 to 2% by weight of a corrosion inhibitor which is a compound selected from the group consisting of catechol, pyrogallol, anthranilic acid, gallic acid and gallic ester and the balance being water.

5,597,421

REFLECTOR/COLLECTOR FOR USE IN DIRECT ENERGY CONVERSION SYSTEMS

Thomas Regan, 7 Beaverbrook Rd., Westford, Mass. 01886, and Jose Martin, 85 Manseur Rd., Lowell, Mass. 01852

Filed Nov. 14, 1995, Ser. No. 557,618
Int. Cl.[6] H01L *31/058*
U.S. Cl. 136—253 16 Claims



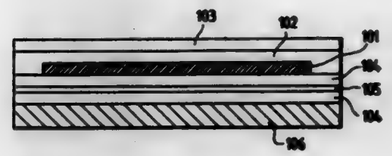
1. An energy conversion system comprising:
a thermal radiation source for emitting a photon flux;
a reflective surface optically coupled to the radiation source, the reflective surface reflecting the photon flux such that the reflected photon flux is substantially isotropically reflected, independent of the radiation source; and
an energy collector for receiving and converting the substantially isotropically reflected photon flux to electrical energy.

5,597,422

LIGHT-TRANSMISSIVE RESIN SEALED SEMICONDUCTOR AND PRODUCTION PROCESS THEREOF

Ichiro Kataoka, Tsuzuki-gun; Takahiro Meri, Ikoma; Satoru Yamada; Hidenori Shiotsuka, both of Tsuzuki-gun, and Ayako Komori, Nara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1995, Ser. No. 429,049
Claims priority, application Japan, Apr. 30, 1994, 6-114113
Int. Cl.[6] H01L *31/048*
U.S. Cl. 136—259 21 Claims

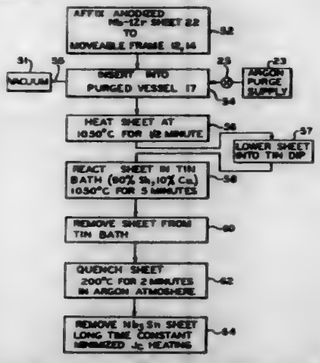


1. A light-transmissive resin sealed semiconductor comprising a covering material provided on the incident light side surface of a photoelectric transducer, said covering material comprising a cross-linked multi-component copolymer containing vinylidene fluoride and hexafluoropropylene as the major components.

5,597,423
NIOBIUM TIN SHEET FOR SUPERCONDUCTING MAGNETS

John E. Bock, Effingham; Delton A. Grey, Jr.; Christopher G. King, both of Florence, and Antony Mantone, Effingham, all of S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 20, 1995, Ser. No. 575,299
Int. Cl.[6] B05D 1/18
U.S. Cl. 148—98 17 Claims



1. A method of forming small grain Nb_3Sn layer on NbTi sheet suitable for superconducting shields for superconducting magnets with minimized Jc heating during superconducting operation comprising:

heating anodized Nb-1Zr niobium sheet for a short period of time at a temperature of approximately 1050° C.;

tin dipping and reacting said heated niobium sheet in a bath of molten tin for a much longer period of time approximately 10 times the shorter period at approximately the same temperature as the heating of the sheet to provide an Nb_3Sn layer on the sheet; and

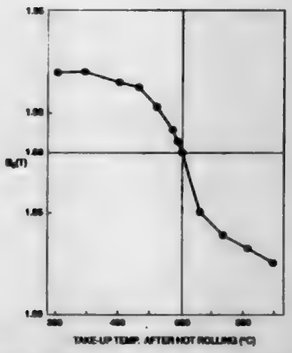
quenching the tin dipped sheet at a temperature of less than approximately 200° C. for less than approximately 2 minutes.

5,597,424
PROCESS FOR PRODUCING GRAIN ORIENTED ELECTRICAL STEEL SHEET HAVING EXCELLENT MAGNETIC PROPERTIES

Yasunari Yoshitomi, and Takehide Senuma, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 132,146, Oct. 5, 1993, abandoned, which is a continuation of Ser. No. 778,225, Dec. 12, 1991, abandoned. This application Jul. 13, 1995, Ser. No. 502,238
Claims priority, application Japan, Apr. 13, 1990, 2-98267
Int. Cl.[6] C21D 8/12; C22C 38/60
U.S. Cl. 148—111 2 Claims

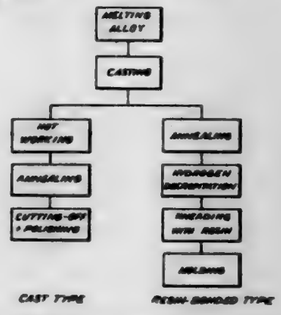
1. A process for producing a grain oriented electrical steel strip having excellent magnetic flux density, characterized by heating a slab consisting essentially of by weight 0.021 to 0.075% of C, 2.5 to 4.5% of Si, 0.010 to 0.060% of acid sol. Al, 0.0030 to 0.0130% of N, 0.014% or less of (S and 0.405 Se) and 0.05 to 0.8% of Mn with the balance being Fe and unavoidable impurities, to a temperature below 1280° C., hot rolling the slab to provide a hot rolled strip, cooling the hot rolled strip, taking up the resultant cooled strip in coil form at a temperature of 600° C. or below, then immediately cooling at a cooling rate of less than 0.01° C./sec down to an ambient temperature to prevent coarsening Fe_3C and $Fe_{16}N_4$ precipitates in the strip, subjecting the hot rolled strip after said taking up to cold rolling with a reduction rate of 80% or more without annealing either prior to or during said cold rolling to provide a cold rolled strip, and subjecting the cold rolled strip to decarburization and then finish annealing to provide for secondary recrystallization, and steel strip being subjected to nitriding after completion of the hot rolling and prior to the completion of the secondary recyrstallization.



5,597,425
RARE EARTH CAST ALLOY PERMANENT MAGNETS AND METHODS OF PREPARATION

Koji Akioka; Osamu Kobayashi; Tatsuya Shimoda; Toshiyuki Ishibashi, and Ryuichi Ozaki, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 265,474, Jun. 24, 1994, which is a continuation of Ser. No. 82,190, Jun. 24, 1993, Pat. No. 5,538,565, which is a continuation-in-part of Ser. No. 670,828, Mar. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 34,089, Mar. 19, 1993, which is a continuation-in-part of Ser. No. 760,555, Sep. 16, 1991, abandoned, and a continuation-in-part of Ser. No. 730,399, Jul. 16, 1991, abandoned, which is a continuation of Ser. No. 577,830, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 346,678, May 3, 1989, abandoned, which is a continuation of Ser. No. 895,653, Aug. 12, 1986, abandoned, said Ser. No. 670,828is a division of Ser. No. 524,687, May 14, 1990, abandoned, which is a continuation of Ser. No. 101,608, Sep. 28, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 487,196
Claims priority, application Japan, Aug. 13, 1985, 60-178113; Feb. 7, 1986, 61-25437; Feb. 13, 1986, 61-29501; Mar. 2, 1987, 62-047042; Apr. 30, 1987, 62-104623; WIPO, Mar. 1, 1988, PCT/JP88/00225
Int. Cl.[6] H01F 1/053
U.S. Cl. 148—302 13 Claims



1. A rare earth permanent magnet prepared by a preparation process, comprising:

melting a rare earth-iron alloy comprising between about 8 and 30 atomic percent of at least one rare earth element, between about 2 and 28 atomic percent boron, iron and other impurities that are inevitably included during the preparation process;

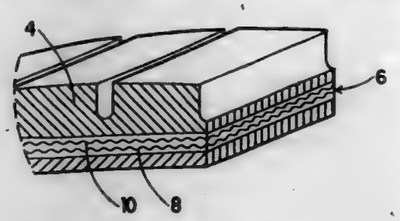
casting the alloy to obtain a cast ingot; and

hot working the ingot at a temperature greater than about 500° C. to make the ingot magnetically anisotropic.

5,597,426
TIRES FOR VEHICLES

Dieter Ludwig, Föhrenweg 10, CH-4460 Gelterkinden, Switzerland

Filed May 26, 1993, Ser. No. 67,369
Claims priority, application Switzerland, May 26, 1992, 01697/92
Int. Cl.[6] B60K 9/18; 9/24
U.S. Cl. 152—200 26 Claims



1. Tires for vehicles comprising a body including at least one carcass, a tread, and a ring-shaped belt in a region under the tread, said ring-shaped belt including at least two strengthening layers including sheet material as strengthening and stabilizing means, said sheet material being either foils or sheets, said sheet material being embedded in elastomeric material and contiguously extending in a circumferential direction, said strengthening layers overlying each other in at least one area, said foils or sheets possessing direction-dependent mechanical characteristics presenting a highest value of rigidity in a preferred direction, and said foils or sheets being arranged such that the preferred direction is oblique to the circumferential direction.

5,597,427
METHOD OF MAKING MULTILAYER NONWOVEN THERMAL INSULATING BATTS

Carol E. Herzberg, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 247,216, May 20, 1994, Pat. No. 5,443,893. This application May 3, 1995, Ser. No. 433,575
Int. Cl.[6] B32B 31/16
U.S. Cl. 156—628 9 Claims



1. A method of making a thermal insulating nonwoven multilayer batt comprising the steps of:

(a) forming a web of bonding staple fibers and staple fill fibers, the fibers having a fiber length ratio of staple fill fibers to staple bonding fibers of at least 2:1;

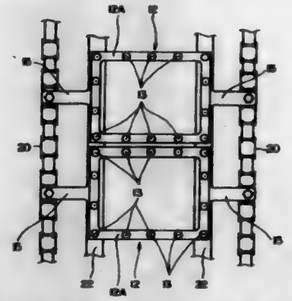
(b) forming a batt of multiple layers of said webs;

(c) subjecting said layered batt to sufficient heat to cause bonding of the bonding staple fibers to other bonding staple fibers and staple fill fibers at points of contact within each layer and sufficient bonding between each layer to stabilize the batt yet permit delamination of the layers when the batt is subjected to laundering mechanical action.

5,597,428
METHOD OF SEALING CONTAINERS

Tadahiro Matsumoto; Hiroyuki Takahashi, both of Himeji, and Kouzaburo Matsuzawa, Tokyo, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 101,997, Aug. 4, 1993, abandoned. This application May 30, 1995, Ser. No. 454,408
Claims priority, application Japan, Aug. 6, 1992, 4-210227
Int. Cl.[6] B65B 7/28
U.S. Cl. 156—69 3 Claims



1. A method of sealing containers, comprising the steps of:

providing a rim on a bucket with an anti-slip means;

placing a thermoplastic resin container having an open end and an integral peripheral flange encircling the open end into the bucket so that the flange on the container overlies the anti-slip means;

pre-heating a thermoplastic resin sheet or film to a temperature that is in the range of 50° to 120° C.;

pre-heating the flange to a temperature that is in the range of 50° to 120° C.;

overlaying the pre-heated thermoplastic resin sheet or film over the pre-heated flange;

urging the pre-heated thermoplastic resin sheet or film into engagement with the pre-heated flange backed by the anti-slip means with a force that is in the range of 20 to 50 kgf/cm^2 to cause at least the pre-heated flange to engage the anti-slip means and become fixedly positioned relative to the rim on the bucket thereby positively preventing the occurrence of a relative slipping movement between the rim and the pre-heated flange;

thermally fusing the pre-heated thermoplastic resin sheet or film to the pre-heated flange at a temperature that is in the range of 195° to 225° C.; and

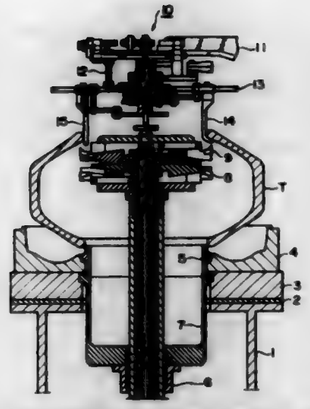
wherein the above step of providing the rim on a bucket with an anti-slip means includes the step of burying spikes in the rim so that an exposed portion of the spikes projecting from the rim will engage at least the pre-heated flange during the urging step.

5,597,429
METHOD OF LOADING GREEN TIRE ON A BLADDERLESS TIRE VULCANIZER

Nobuhito Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 390,997
Claims priority, application Japan, Feb. 24, 1994, 6-026828
Int. Cl.[6] B29D 30/00
U.S. Cl. 156—111 1 Claim

1. A method of loading a green tire on a bladderless tire vulcanizer having a pair of upper and lower pressing members opposite to upper and lower bead rings of upper and lower tire molds, said upper and lower pressing members being expandable, shrinkable, and movable up and down for molding inner surfaces of upper and lower bead portions of the tire, said method being performed using a green tire gripping device having an arm and a disk fixed to the arm, for loading a green tire, a plurality of blocks being arranged slidably in a radial direction of said disk and at



intervals on a circumference of said disk, said green tire gripping device having first grip claws with bent distal ends and second grip claws with straight distal ends, said first grip claws and second grip claws being alternately fixed to each of said blocks, said green tire gripping device further having first driving means and second driving means at said arm so that said first driving means is actuatable so as to radially expand or radially shrink said first grip claws via said blocks, and said second driving means is actuatable so as to radially expand or shriak said second grip claws via said blocks, said method comprising the steps of:

(a) arranging the green tire concentrically above said lower tire mold and above said pressing members while said pressing members remain radially shrunken and while gripping the inner surface of the upper bead portion of the green tire by means of said first and second grip claws of said tire gripping device;

(b) positioning said pressing members between upper and lower beads of said green tire and subsequently radially expanding said pressing members;

(c) actuating said first driving means so as to radially shrink said first grip claws thereby guiding said green tire by said second grip claws as the upper bead portion of said green tire is lowered onto said upper pressing member;

(d) subsequently actuating said second driving means so as to radially shrink said second grip claws, and lowering said lower pressing member until said lower pressing member comes in contact with the lower bead portion of said green tire, thereby causing said lower bead portion to seat on said lower bead ring and pushing said lower bead portion into the lower bead ring; and

(e) subsequently lowering said upper tire mold until the upper bead portion of said green tire is seated on said upper bead ring and pushing said upper bead portion into the upper bead ring.

5,597,430

PROCESS AND APPARATUS FOR MANUFACTURING A BODY REINFORCED WITH FIBER-COMPOSITE MATERIAL

Christian Rasche, Bochum, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Mar. 9, 1995, Ser. No. 401,259

Claims priority, application Germany, Mar. 9, 1994, 44 08 637.7

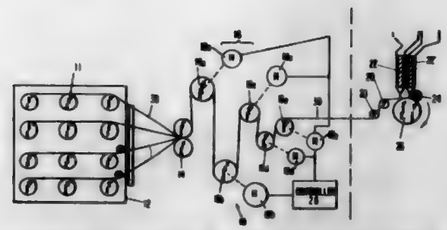
Int. Cl.[6] B65H *81/00*

U.S. Cl. 156—161 **21 Claims**

1. A process for manufacturing a body suitable for holding gas under pressure, reinforced with a fiber-composite material, comprising the steps of:

unwinding a plurality of yarns from a plurality of spools;

consolidating the plurality of yarns in a rolling device;



controllably tensioning the plurality of yarns by guiding the yarns along a path including a plurality of controllable tensioning rollers, which tension is controlled by controlling rotational speed of the tensioning rollers;

feeding the controllably tensioned yarns onto the body while maintaining the controlled tension; and

dispensing a thermoplastic melt onto the controllably tensioned yarns at a location at which the controllably tensioned yarns are being wrapped around the body to form a layer of fiber-reinforcement of fiber composite material on the body.

5. An apparatus for manufacturing a body reinforced with a fiber-composite material, comprising:

a spool stand providing for a plurality of yarn spools supplying yarns;

a roller combination for consolidating said yarns;

a plurality of tensioning rollers;

a means operatively connected to said plurality of tensioning rollers for controlling rotational speed of said rollers and for controllably tensioning said yarns moving along a path extending between said spool stand and a rotating body to be reinforced;

a dispenser means for supplying a thermoplastic melt, said dispenser means being positioned adjacent the body so that the thermoplastic melt is dispensed onto the yarns while the yarns wrap the body; and

a smoothing roller for smoothing the yarns onto the body, said smoothing roller being disposed adjacent the body.

5,597,431

DEVICE AND METHOD FOR THE SERIES PRODUCTION OF FIBER REINFORCED RESIN PARTS

François Grosjean, Versailles; Michel Huvey, Bougival, and Bernard Dewinille, Corbeil Essonne, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 319,684, Oct. 7, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 517,657

Claims priority, application France, Oct. 8, 1993, 93 12104

Int. Cl.[6] B65H *81/00*; F16F *1/18*

U.S. Cl. 156—169 **14 Claims**



1. A method for manufacturing articles made from resin and reinforcing fibers, wherein said articles are cut from an elongated main blank at sections thereof having a substantially constant arcuate surfaces, the method comprising the following steps:

providing molding means (5) including a plurality of female forms (1, 1*a*, 1*b*, 1*c*) corresponding to the shapes of the parts being manufactured,

arranging said forms sequentially to form a substantially continuous groove formed as a single helix about the axis (4) of the molding means, wherein the groove is defined by non-parallel, radially extending, spaced apart stationary walls to provide sections of the main blank which when severed from the main blank by cuts in a direction transverse thereto form a plurality articles with non-parallel side surfaces;

filling said groove by winding fibers coated with a polymerizable resin on the molding means by rotating said molding means in one direction around the axis (4) of the helix while advancing the fibers in only one axial direction with respect to the groove to form helically the elongated main blank in the groove into a molded helical blank; and

severing the molded helical blank at selected locations to form the plurality of individual articles having shapes complementing the female forms.

8. A device for manufacturing a plurality of articles made from resin and reinforcing fibers, wherein said articles are cut from a single elongated main blank at sections thereof having a substantially constant arcuate surface, the device comprising molding means including a plurality of female forms corresponding in shape to the shapes of the articles, said forms being arranged sequentially substantially helically, so that said shapes when joined end to end make a single substantially continuous helical groove, wherein the groove is defined by non-parallel, radially extending, spaced apart stationary walls to provide the sections of the main blank which are severed from the main blank by cuts in a direction transverse thereto to form articles with non-parallel side surfaces end wherein the device further includes a cutter for severing the main blank.

5,597,432

METHOD FOR MAKING BALLS FOR SPORTS

Hideomi Shishido; Shigeo Doi; Masanori Hirakiuchi, and Hajime Okimoto, all of Hiroshima, Japan, assignors to Molten Corporation, Hiroshima-ken, Japan

Division of Ser. No. 98,198, Jul. 28, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 338,896

Claims priority, application Japan, Jul. 31, 1992, 4-224948; Nov. 11, 1992, 4-327385

Int. Cl.[6] B65H *54/64*

U.S. Cl. 156—170 **17 Claims**

1. A method for making a ball for sports which comprises providing a round rubber body, forming a reinforcing layer of a covered yarn wound about the body, forming a rubber cover layer formed on the reinforcing layer, and vulcanizing the rubber cover layer to provide a carcass, wherein said covered yarn is made of a urethane elastomer core thread which is wound thereabout with a synthetic resin filament.

5,597,433

METHOD AND APPARATUS FOR MANUFACTURING PLASTIC CANISTERS

Bertie J. Dyble, Janesville; Robert W. Dyson, deceased, late of Janesville, and William C. Foss, Janesville, all of Wis., assignors to Panoramic, Inc., Janesville, Wis.

Filed May 27, 1994, Ser. No. 250,525

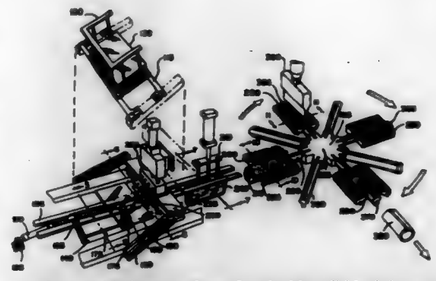
Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—203 **38 Claims**

1. Apparatus for forming successive canisters from successively supplied sidewall blanks, each such sidewall blank having an inner face and an outer face opposite from the inner face and separated from the inner face by opposite side edges and a top and bottom edge, and from successively supplied canister bases, each such canister base having a disk surface with a disk periphery from which descends a depending skirt, comprising:

(a) a pair of sidewall blank support surfaces, each having a top side and an adjacent inner side, with the inner sides facing each other and separated by a ram gap;

(b) sidewall placement means for placing successive sidewall blanks upon the top sides of the sidewall blank support surfaces, with the outer face of each sidewall blank in contact with the top sides of the sidewall blank support surfaces;



(c) ram means for forcing each successive sidewall blank which rests upon the sidewall blank support surfaces into a U-shaped configuration by translating the sidewall blank between the sidewall blank support surfaces and into the ram gap;

(d) holding means located on the sidewall blank support surfaces for catching the side edges of each successive sidewall blank and fixing the sidewall blank in its U-shaped configuration;

(e) support means, having a surface, for supporting the side edges of each successive sidewall blank upon the surface of the support means in overlapping fashion;

(f) clamping means for pushing the side edges of each successive sidewall blank against the surface of the support means, with one side edge overlapping the other;

(g) tube welding means for welding the overlapping side edges of each successive sidewall blank together, thereby forming a tube having an inner cavity bounded by a sidewall with a top edge and a bottom edge;

(h) at least one forming surface upon which a canister base may be placed;

(i) canister base placement means for placing each successive canister base atop an individual forming surface;

(j) tube placement means for placing successive tubes each atop a canister base which has been placed on a forming surface so that the inner cavity of the tube rests over the disk surface and the bottom edge of the tube rests in close relation to the skirt; and

(k) canister welding means for welding together the bottom edge of each successive tube and each succeasive canister base which rest on a forming surface, thereby forming a canister with a substantially tubular sidewall, which extends from a top canister edge to a bottom canister edge, and a bottom canister base which is attached to the bottom canister base in an orientation substantially perpendicular to the tubular sidewall, with the tubular sidewall and the bottom canister base bounding an inner cavity.

5,597,434

DECORATIVE ARTICLES AND METHOD OF MAKING SAME

Michael L. Kukoff, Short Hills, N.J., assignor to Jay J. Kukoff, Springfield, N.J.

Filed Jul. 7, 1994, Ser. No. 268,965

Int. Cl.[6] B44C *1/17*

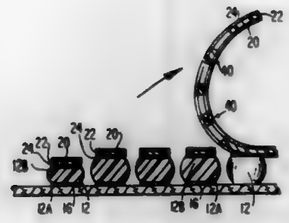
U.S. Cl. 156—240 **11 Claims**

1. A method of making a decorative, flexible article having a raised, light-reflective pattern thereon, comprising the steps of:

a) applying a curable plastisol adhesive on a flexible release sheet in the pattern;

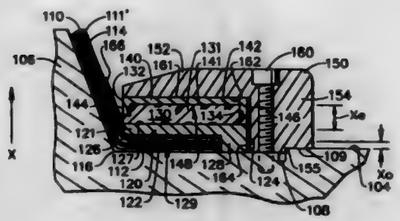
b) contacting lower surfaces of a plurality of discrete, shaped particles of synthetic plastic material onto the plastisol adhesive prior to curing, each particle having a longitudinal dimension on the order of 50 mils;

c) heating the plastisol adhesive to a temperature at least equal to 300° F. in order to cure the plastisol adhesive and secure thereto the particles that are in contact with the plastisol adhesive;



d) removing the release sheet to form an applique; and
e) fixing the applique on a flexible fabric material.

5,597,435
METHOD USING RESTRAINED CAULS FOR COMPOSITE MOLDING
John T. Dennstedt, Albuquerque, N.M.; Timothy J. Bayer, Cincinnati, Ohio, and Juan R. Mora, Albuquerque, N.M., assignors to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 996,451, Dec. 24, 1992. This application Jun. 7, 1995, Ser. No. 473,388
Int. Cl.[6] B32B *31/04*
U.S. Cl. 156—245 5 Claims

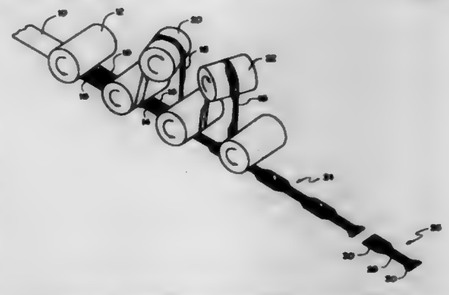


1. A method for molding a heat setting laminated composite material, the method comprising the steps of:
placing a plurality of heat setting laminated plies, one on top of each other, over an outer surface of a mold, the plies including fibers in a curable resin matrix to form a moldable structure characterized by a curing temperature;
debulking the moldable structure by heating to a first temperature below the curing temperature; and
heating the moldable structure within an autoclave to the curing temperature while applying a first pressure to the moldable structure with the autoclave and applying a second pressure against a portion of the moldable structure with a forcing member, the second pressure being in addition to the first pressure applied by the autoclave, the forcing member being constrained such that the second pressure is applied in a preselected direction against the portion of the moldable structure by thermal expansion of the forcing member during the heating, the forcing member having a sufficient size and sufficient coefficient of thermal expansion such that the second pressure uniformly increases with increasing temperature until the second pressure exceeds the first pressure when the curing temperature is reached.

5,597,436
PROCESS FOR PRODUCING A PRINT LAMINATED STEEL STRIP USED FOR THE MANUFACTURE OF A THREE-PIECE CAN BODY
Yashichi Ooyagi; Tomohiko Hayashi, both of Futtsu; Mitsutoshi Inoue, Kitakyusyu; Michiyuki Kakimoto, Shimizu, and Ryuichi Eguchi, Shimizu, all of Japan, assignors to Nippon Steel Corporation, and Daiwa Can Company, both of Tokyo, Japan
Division of Ser. No. 346,982, Nov. 3, 1994, which is a continuation of Ser. No. 883,357, May 15, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 470,684
Claims priority, application Japan, May 17, 1991, 3-113494; May 17, 1991, 3-113495; May 17, 1991, 3-113496; May 17, 1991, 3-113497; May 17, 1991, 3-113498; May 17, 1991, 3-113499; Jun. 6, 1991, 3-135192; Jul. 3, 1991, 3-162798; Nov. 26, 1991, 3-311120
Int. Cl.[6] B32B *31/08*
U.S. Cl. 156—259 2 Claims

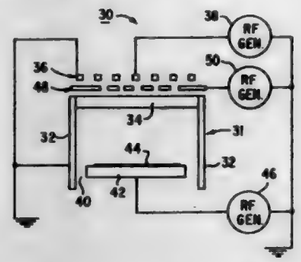
1. A method of producing a coiled steel strip for the manufacture of a three-piece can body having a printed thermoplastic resin film on one of the surfaces of said strip by continuous lamination of said printed thermoplastic resin film, while said strip is being unwound and dispensed from an uncoiler, directly to the surface of said strip or to an organic film of a thermosetting coating applied to the surface of said strip in a plurality of stripes extending continuously along the length direction of said strip, each stripe having a width smaller than the circumferential length of the can body to be cut from said strip and being spaced from adjacent stripes, comprising the steps of preparing a roll of a printed thermoplastic resin film having a plurality of stripes of printed portions carrying a layer of inks to represent repetitive images of a label to be provided on the can body, said stripes of printed portions being spaced from one another with a print free portion provided therebetween, slitting said printed film prior to lamination into a plurality of stripes each having a width smaller than the circumferential length of the can body to be cut from said strip for removing said print free portions, and bonding said printed portions to said strip while removing said print free portions from said printed film.

5,597,437
ZERO SCRAP ABSORBENT CORE FORMATION PROCESS
Stephen J. Lange, Cincinnati, Ohio; Douglas H. Benson, West Harrison, Ind.; John W. Hackett, Cincinnati, Ohio; Gary D. Lavon, Middletown, Ohio, and Bret D. Seitz, West Chester, Ohio, assignors to Procter & Gamble, Cincinnati, Ohio
Filed Jan. 12, 1995, Ser. No. 371,886
Int. Cl.[6] B32B *31/08;31/18*
U.S. Cl. 156—269 17 Claims



1. A method for manufacturing a multiple layer absorbent core having a front ear section, a crotch section and a back ear section, wherein the machine direction length of said crotch section equals the combined machine direction length of said front ear section and said back ear section, said core being suitable for use in an absorbent article, said method comprising:
providing a single web of absorbent core material from a roll, said web having parallel straight longitudinal side edges;
continuously transporting said web of absorbent core material in the machine direction;
continuously cutting said web of absorbent core material longitudinally into web sections comprising at least one full-pattern strip having a repeating hourglass-shape defined by first and second non-linear longitudinal edges, and first and second side trim pieces, each of said side trim pieces having a straight edge defined by one of said parallel straight longitudinal side edges of said web and an opposite non-linear longitudinal edge having a pattern corresponding to one of said non-linear longitudinal edges of said full-pattern strip;
continuously orienting said side trim pieces relative to said full-pattern strip such that said non-linear edge of said first side trim piece is superimposed in registration with said first non-linear edge of said full-pattern strip and said second side trim piece is superimposed in registration with said second non-linear edge of said full pattern strip to form a continuous multiple layer composite strip; and
successively cutting said composite strip in the transverse direction at predetermined intervals to form discrete multiple layer absorbent cores.

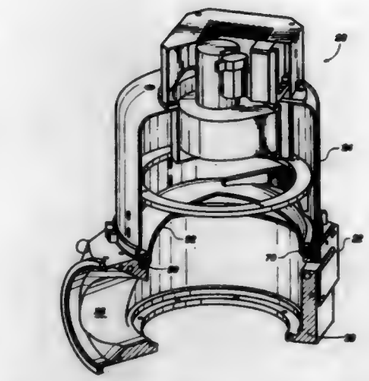
5,597,438
ETCH CHAMBER HAVING THREE INDEPENDENTLY CONTROLLED ELECTRODES
Virinder S. Grewal, Fishkill, N.Y., and Volker B. Laux, Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Sep. 14, 1995, Ser. No. 527,909
Int. Cl.[6] H01L *21/00*
U.S. Cl. 156—345 20 Claims



16. In an etch chamber of the type having an enclosure with a dielectric window, an induction coil located externally to said enclosure and adjacent to said dielectric window for generating a plasma within said enclosure, and a wafer holding chuck located within said enclosure for exciting said plasma generated by said induction coil, said etch chamber being useful for anisotropic and selective etching of a semiconductor wafer, the improvement therewith comprising:
electrode means located between said induction coil and said dielectric window for sputtering said dielectric window to provide sidewall passivation for anisotropic and selective etching of at least one semiconductor wafer to be supported on said chuck in said enclosure.

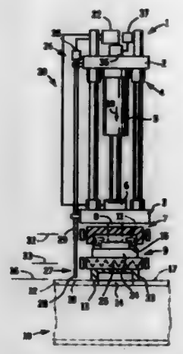
5,597,439
PROCESS GAS INLET AND DISTRIBUTION PASSAGES
Philip M. Saltzman, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.
Filed Oct. 26, 1994, Ser. No. 329,584
Int. Cl.[6] B44C *1/22*
U.S. Cl. 156—345 21 Claims

1. A processing chamber gas distribution manifold comprising:



a gas distribution ring configured to obstruct a generally annular gas feed channel opening of the processing chamber, wherein said gas distribution ring has a surface facing said opening, said surface including a set of grooves which are connected to, and provide a passage between, said opening and said processing chamber.

5,597,440
APPARATUS FOR THE ADHESIVE FIXING OF AT LEAST ONE JOINING PART
Ernst Pecha, Stauferweg, D-7430, Metzingen, Germany
Continuation of Ser. No. 544,317, Jun. 24, 1990, abandoned. This application Dec. 14, 1992, Ser. No. 989,680
Claims priority, application Germany, Jul. 5, 1990, 39 22 066.4
Int. Cl.[6] B32B *35/00*
U.S. Cl. 156—351 26 Claims



1. An apparatus for adhesively fixing at least one joining part (11) to a workpiece (10) in the vicinity of a joining point (13) of a substantially elastically flexible workpiece surface (17) having a give-way resiliency, said apparatus comprising:
means (5) for applying a compressive force to said workpiece (10) to cause the joining point (13) to undergo a resilient displacement according to the give-way resiliency;
detecting means (26) for detecting the give-way resiliency of the joining point;
joining means (21) for adhesively fixing the joining part (11) to the joining point (13) under a compressive joining force resulting in a resilient joining displacement of the joining point (13), said resilient displacement and said resilient joining displacement of the joining point being substantially equidirectional; and

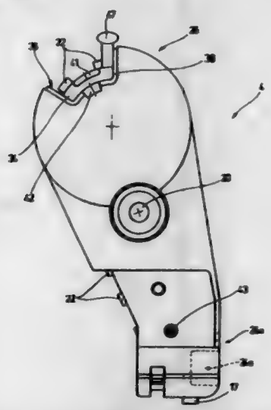
control means (20) for substantially eliminating the effects of the resilient joining displacement of said joining point (13) caused by the compressive joining force, said compressive force being substantially equal to said compressive joining force caused by said fixing of the joining part (11), said control means (20) being provided for operating said joining means (21) as a function of said resilient displacement of the joining point (13) as detected for the joining point by said detecting means (26).

5,597,441

PORTABLE HAND-HELD LABELLING AND MARKING DEVICE AND PRINTING MECHANISM HOUSING THEREFOR

Helmrich Volk, Beerfelden, Germany, assignor to Esselte Meto International GmbH, Heppenheim, Germany

Filed Mar. 10, 1995, Ser. No. 402,128
Claims priority, application Germany, Mar. 12, 1994, 44 08 462.5
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—579 18 Claims



1. A hand-held, portable labelling device for printing a print-type image on a label, said labelling device comprising:

a first housing;

handle means for gripping said labelling device in a hand;

printing means removably disposed within said first housing for printing on a label to produce a printed label, said printing means being movable in a direction towards and away from the label;

means for actuating said printing means to move said printing means towards and away from the label;

means for providing ink to said printing means;

means for supplying labels;

means for feeding labels from said label supply means to said printing means;

said printing means comprising:

a second housing, said second housing comprising a first housing portion and a second housing portion, said first housing portion and said second housing portion together defining an interior space therebetween, said first housing portion defining a housing wall, and said second housing portion defining a housing wall, said housing wall of said first and second housing portions being disposed substantially parallel to one another;

print-type disposed in said interior space of said second housing for printing on the label;

means for selectively positioning the print-type for printing on the label; and

means, being disposed about at least a part of said housing wall of each of said first and second housing portions, for holding together said first and second housing portions at least about said holding means; and

said holding means comprising a substantially U-shaped clamping member, said substantially U-shaped clamping member comprising:

a base portion with first and second legs extending from said base portion;

said first leg comprising means for releasably engaging said at least a part of said housing wall of said first housing portion;

said second leg comprising means for releasably engaging said at least a part of said housing wall of said second housing portion; and

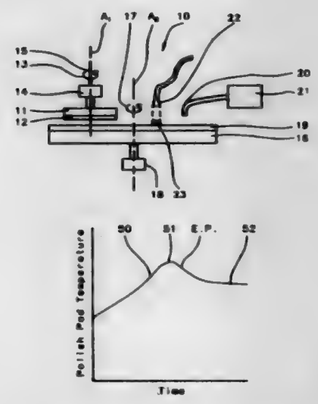
said base portion comprising means for positioning said first and second legs of said holding means with respect to one another for pressing together said first and second housing portions.

5,597,442

CHEMICAL/MECHANICAL PLANARIZATION (CMP) ENDPOINT METHOD USING MEASUREMENT OF POLISHING PAD TEMPERATURE

Hai-Chieh Chen, Chu-Tung, and Shun-Liang Hsu, Hsin-Chu, both of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Taiwan

Filed Oct. 16, 1995, Ser. No. 543,816
Int. Cl.[6] H01L *21/461*
U.S. Cl. 156—626.1 17 Claims



1. A method of chemical/mechanical planarization (CMP) of an article comprising:

planarizing the article by holding the article on a rotating platen against a rotating polishing pad in the presence of a polishing slurry;

controlling the temperature of the polishing slurry in the temperature range between about 20° to 22° C.;

dispensing said temperature controlled slurry onto said rotating polishing pad;

measuring by infrared detection means the temperature of said polishing pad at a selected polishing pad location which is abrading the surface of said article; and

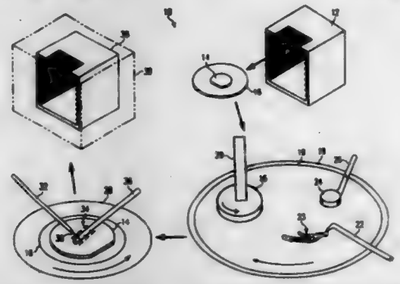
terminating the planarization process when said polishing pad temperature decreases by at least 2° C. below the maximum temperature reached by said polishing pad during the planarization process.

5,597,443

METHOD AND SYSTEM FOR CHEMICAL MECHANICAL POLISHING OF SEMICONDUCTOR WAFER

Eugene O. Hempel, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1994, Ser. No. 298,808
Int. Cl.[6] B24B *37/00*; H01L *21/00*
U.S. Cl. 156—636.1 12 Claims



1. A method for chemical mechanical polishing a semiconductor wafer, comprising the steps of:

(a) coating the semiconductor wafer with a slurry having a pH value;

(b) polishing the slurry-coated semiconductor wafer with a polishing pad; and

(c) spraying the semiconductor wafer with an aqueous solution including a pH controlling compound for controlling the pH of said slurry and removing said slurry from the semiconductor wafer, said step of spraying including spraying water to the semiconductor wafer through a mist of an NH_4OH mixture.

5,597,444

METHOD FOR ETCHING SEMICONDUCTOR WAFERS

Terry L. Gilton, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jan. 29, 1996, Ser. No. 593,226
Int. Cl.[6] H01L *21/3065*
U.S. Cl. 156—643.1 14 Claims

1. A method for plasma etching semiconductor wafers in a plasma etching apparatus comprising:

exposing the wafer to a plasma comprising at least a mixture of a reduced carbon compound and a non-CFC halogen compound.

5,597,445

METHOD FOR RECOVERING SODIUM FROM A SPENT COOKING LIQUOR

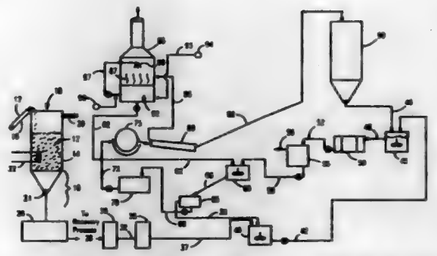
J. Lennart Westerberg, Mobile, Ala., assignor to International Paper Company, Purchase, N.Y.

Filed Nov. 29, 1993, Ser. No. 158,962
Int. Cl.[6] D21C *11/06; 11/10; 11/12*
U.S. Cl. 162—29 8 Claims

1. A method for recovering sodium from a spent cooking liquor used in a kraft pulping process employing sodium hydroxide as a cooking agent resulting in the presence of sodium and sulfur combined with various elements in the spent cooking liquor, the method comprising the steps of:

(a) concentrating the spent cooking liquor and combusting the concentrated liquor to produce a smelt containing Na_2CO_3, and combining the smelt with water to provide a green liquor;

(b) reacting the green liquor with $Ca(OH)_2$ in a causticizer to produce a solution of NaOH containing $CaCO_3$ as a precipitate and separating the $CaCO_3$ precipitate from the NaOH solution to provide a source of recovered NaOH for use in providing fresh cooking liquor;



(c) heating at least a portion of the separated $CaCO_3$ in a kiln to convert $CaCO_3$ to CaO, wherein CaO emerges from the kiln as a dry product and hot gases containing CaO particles entrained therein are evolved from the kiln;

(d) conducting the CaO dry product from the kiln to a slaker for reacting with the green liquor of step (a) to provide $Ca(OH)_2$ for the reaction of step (b), wherein the CaO dry product is provided to the slaker in a stoichiometric excess so that unreacted lime is present in the reaction products from the causticizer;

(e) contacting the hot gases evolved from the kiln containing CaO particles with a scrubbing solution consisting essentially of water, NaOH, and Na_2CO_3 with some $CaCO_3$ and CaO solids suspended therein, to produce $CaCO_3$ and NaOH from a reaction of the CaO particles with Na_2CO_3, wherein the Na_2CO_3 is present in the scrubbing solution in stoichiometric excess so that a resulting solution of $NaOH/Na_2CO_3$ contains $CaCO_3$ as a precipitate, and separating the $CaCO_3$ precipitate from the $NaOH/Na_2CO_3$ solution to provide a source of recovered NaOH for use in providing fresh cooking liquor and a source of Na_2CO_3 for reacting with lime to produce NaOH;

(f) recycling the $CaCO_3$ precipitate from step (e) to the kiln; and

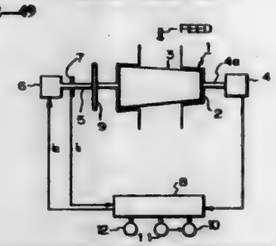
(g) conducting the excess lime and the $CaCO_3$ precipitate from the causticizer to a mixing tank and contacting the $NaOH/Na_2CO_3$ solution of step (e) to react Na_2CO_3 in the solution with excess lime from the causticizer, producing NaOH and $CaCO_3$.

5,597,446

METHOD OF CONTROLLING A POSITION OF ROTOR IN A HIGH PRESSURE FEEDER

Junichiro Sato; Tadayo Ando; Sumio Hayakawa, and Ryuji Ouchi, all of Kasugai, Japan, assignors to New Oji Paper Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 9,068, Jan. 26, 1993, abandoned.
This application Sep. 13, 1994, Ser. No. 304,829
Claims priority, application Japan, Jan. 31, 1992, 4-042345
Int. Cl.[6] D21C *7/06*
U.S. Cl. 162—49 1 Claim



1. A method of controlling a position of a rotor having smaller and larger diameter end sides in a truncated conical feeder for feeding a feed comprising a lignocellulosic material and an alkaline cooking liquor to a pulping digester, comprising:

rotating the rotor for feeding said feed;

detecting a position of the rotor by a detector with an accuracy of +0.01 mm or less; and

adjusting the position of the rotor by inputting a signal, showing information concerning the position of the rotor from the detector to a control device, and then by outputting a signal, responding to the information signal from the detector, from the control device to an electric motor to push in the direction of the smaller diameter end side of the rotor, or pull in the direction of the larger diameter end side of the rotor, the shaft of the rotor the pushing or pulling of the rotor shaft being carried out at a rate of 0.03 to 0.4 mm every 0.3 to 4 days.

5,597,447

BLADE-COATED PAPER HAVING A PAPER LAMINA PRODUCED FROM A FURNISH COMPRISING RECYCLED CORRUGATED CONTAINERS

Mark A. Hank; Leo T. Mulcahy, both of Covington; Ralph S. Peterson, Clifton Forge, all of Va., and Robert C. Streisel, Mt. Pleasant, S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 216,448, Mar. 23, 1994, abandoned, which is a division of Ser. No. 21,662, Mar. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 862,996, Apr. 6, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 472,169

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—135 **4 Claims**

1. A generally streak and scratch-free blade-coated paper consisting of a paper produced from a furnish having at least 10% by weight of a fiber pulp produced from recycled paper substantially comprising recycled corrugated containers, said paper containing less than about 20 ppm per unit area solid, non-fibrous contaminants of a size greater than 0.05 mm^2, and

said fiber pulp being produced from said recycled paper by a method comprising the steps of:

a) combining a quantity of paper substantially comprised of corrugated containers to be recycled, containing lignin, cellulosic fibers and solid non-fibrous contaminants, with an aqueous liquid to form a slurry containing about 9–15% by weight solids and agitating said slurry in a low shear mixer at a temperature of less than 65.6° C. for a time sufficient to separate said lignin and cellulosic fibers from said solid contaminants without significantly degrading said solid contaminants, and then sequentially;

b) removing from said slurry gross contaminants of a size in a range greater than about 5 mm^2 by passing said slurry through holes of a predetermined diameter;

c) removing from said slurry contaminants having a specific gravity in a range greater than 1;

d) removing from said slurry intermediate contaminants having a size in a range greater than about 2 to 3 mm^2 by passing said slurry through holes of a predetermined size;

e) removing sand from said slurry;

f) removing from said slurry fine contaminants of a size in a range at least about 0.15 mm^2, by passing said slurry through elongated slots of a predetermined width;

g) removing from said slurry by centrifugal means contaminants having a specific gravity less than 1;

h) dewatering said slurry to form a wet, friable pulp having a moisture content of about 30–60%;

i) digesting said pulp in a cooking liquor for a time and at a temperature sufficient to hydrolyze a substantial portion of said lignin remaining in intimate association with said cellulosic fibers wherein said digesting takes place at a target temperature in a range of 121°–150° C.; and

j) separating said digested pulp from spent cooking liquor;

k) preparing paper from said separated pulp; and

l) coating said paper using a blade to regulate coating weight.

5,597,448

METHOD FOR REDUCING PITCH DEPOSITION USING COPOLYMER OF N-VINYL ACETAMIDE

Peter E. Reed, Plainfield, and Carol S. Greer, Lisle, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 141,296, Oct. 21, 1993, abandoned. This application May 16, 1995, Ser. No. 442,869

Int. Cl.[6] D21H *13/26;21/02*

U.S. Cl. 162—166 **2 Claims**

1. A process for controlling pitch deposition in pulp and papermaking systems which comprises adding to a pulp slurry of the papermaking systems of about 0.01 to 1 pound per ton, based on the weight of the pulp slurry, a pitch controlling amount of water-soluble polymer of N-vinyl acetamide and at least one monomer selected from the group consisting of vinyl amine, vinyl glycine, N-vinyl amide having an alkyl group of from 12 to 22 carbon atoms, vinyl acetate and vinyl alcohol wherein the polymer contains at least 5 mole percent of the N-vinyl acetamide and the pitch deposition in the pulp and papermaking systems is reduced.

5,597,449

METHOD AND DEVICE FOR CONDITIONING THE COATING OF A PAPER MACHINE ROLL

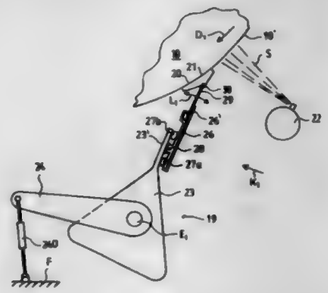
Juhani Vestola, and Pekka Harinen, both of Jyväskylä , Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Aug. 30, 1994, Ser. No. 298,328

Claims priority, application Finland, Apr. 8, 1994, 941620

Int. Cl.[6] D21F *1/32;* B24B *1/00*

U.S. Cl. 162—199 **25 Claims**



1. Method for conditioning a ceramic or metal-ceramic coating of a paper machine roll having a doctor situated in operative relationship therewith, the doctor comprising a doctor beam, a holder coupled to the doctor beam and a doctor blade retained in the holder and positionable in engagement with a face of the roll, with the roll situated in said paper machine at its operating site, comprising the steps of:

providing an elongate grinding member having grinding particles with a grain size in a range from about 15 μm to about 200 μm,

detachably mounting the grinding member on the doctor blade in proximity to the roll,

grinding a face of the roll by periodically pressing the grinding member into contact with the roll face while simultaneously rotating the roll, such that if the roll face to be ground is rough, it is smoothed by the grinding member and if the roll face to be ground is smooth, it is roughened by the grinding member,

coupling the doctor to a first actuator and a second oscillation actuator,

moving the doctor and thus the grinding member to press against the roll face during grinding via the first actuator, and

oscillating the grinding member in an axial direction of the roll via the second oscillation actuator.

5,597,450

PAPER MACHINE DRYER FABRICS CONTAINING HOLLOW MONOFILAMENTS

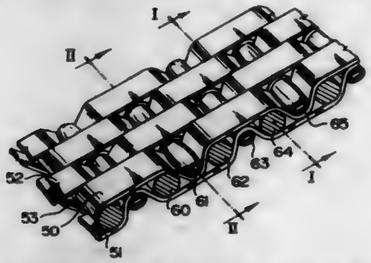
Samuel Baker, Carleton Place, and James Harrison, Kanata, both of Canada, assignors to JWI Ltd, Kanata, Canada

PCT No. PCT/CA93/00075, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO93/17180, PCT Pub. Date Sep. 2, 1993

Continuation-in-part of Ser. No. 982,118, Nov. 25, 1992, abandoned, which is a continuation of Ser. No. 843,155, Feb. 28, 1992, abandoned. This PCT application Feb. 25, 1993, Ser. No. 290,849

Int. Cl.[6] D21F *7/12*

U.S. Cl. 162—348 **3 Claims**



1. A heatset fabric, including weft strands, for use in papermaking machines, wherein at least a portion of the weft strands are hollow thermoplastic polymer monofilaments which, prior to heat setting, have a solidity in their undeformed cross-sectional area of from about 60% to about 75%, and wherein the circumference of said hollow monofilaments is greater than, or equal to, the perimeter of the weft passageway they are to occupy in the fabric after heatsetting.

5,597,451

APPARATUS FOR THERMALLY DECOMPOSING PLASTICS AND PROCESS FOR CONVERTING PLASTICS INTO OIL BY THERMAL DECOMPOSITION

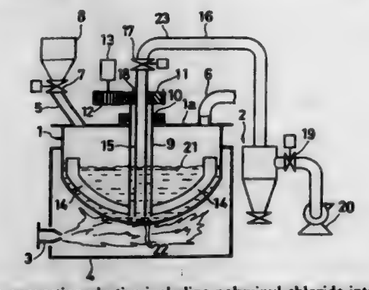
Kenichi Nagai, Takatsuki; Kenji Yasuda, Amagasaki; Toshio Hama, Nishinomiya; Yoshitoshi Sekiguchi, Maizaru; Toshio Tachibana, Nara; Osamu Nakanishi, Kadoma, and Tadashi Moriyama, Yamatotakada, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Division of Ser. No. 282,269, Jul. 29, 1994. This application Jun. 15, 1995, Ser. No. 490,872

Claims priority, application Japan, Jul. 29, 1993, 5-187820; Jul. 30, 1993, 5-189571; Aug. 4, 1993, 5-193287; Dec. 16, 1993, 5-316587; May 13, 1994, 6-99740

Int. Cl.[6] B01D *45/00;* C10B *27/00*

U.S. Cl. 201—4 **4 Claims**



1. In converting plastics including polyvinyl chloride into oil by thermal decomposition, a process for thermally decomposing plastics to obtain oil comprising the steps of: thermally decomposing said plastics to produce HCl gas, reacting said HCl gas produced by thermal decomposition with a desalting agent to convert the gas into a solid chloride, removing the solid chloride from the gas fraction resulting from the thermal decomposition, and, thereafter, condensing the gas fraction to recover oil therefrom.

5,597,452

METHOD OF RESTORING HEATING WALLS OF COKE OVEN BATTERY

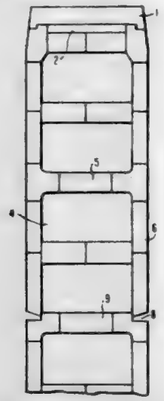
Werner Hippe, Gladbeck; Günter Meyer, Essen, and Martin Reinke, Dortmund, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of Ser. No. 128,575, Sep. 10, 1993, Pat. No. 5,443,694. This application Mar. 22, 1995, Ser. No. 408,918

Claims priority, application Germany, Sep. 24, 1992, 42 31 922.6

Int. Cl.[6] C10B *29/00;* F27D *1/16*

U.S. Cl. 201—41 **6 Claims**



1. A method of renovating a portion of a heating wall of a coke oven battery, comprising the steps of constructing new masonry starting with the wall head of the wall portion to be renovated and abutting the new masonry exactly on the wall protection plate of the heating wall; and arranging between the new masonry and the old masonry of the heating wall a welding joint for sealing by ceramic welding after heating up the new masonry and reaching final thermal expansion of the new masonry, said arranging including arranging the welding joint by cutting a rectangular shaped groove at an outer edge of a header brick head and cutting a brick in a course above and below the header brick head to provide a straight rectangular shaped groove.

5,597,453

APPARATUS AND METHOD FOR VAPOR COMPRESSION DISTILLATION DEVICE

Stephan B. Sears, Menlo Park, Calif., assignor to Superstill Technology, Inc., Redwood City, Calif.

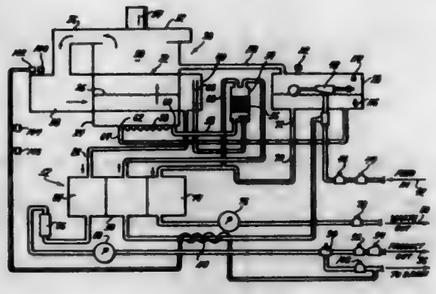
Filed Oct. 16, 1992, Ser. No. 962,256

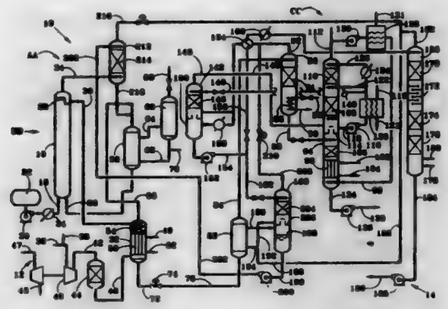
Int. Cl.[6] B01D *1/28;3/00*

U.S. Cl. 203—24 **21 Claims**

1. A vapor compression distillation-product concentration device comprising:

a plate-heat exchanger having a plurality of spaced apart plates arranged in a face-to-face configuration with the spaces therebetween forming a plurality of boiling chambers for evaporating a feed liquid into a vapor and a plurality of alternating condensing chambers for condensing said vapor into a distillate, said boiling chambers extending from a first edge of the heat exchanger to a second edge of the heat exchanger, said





condensing chambers extending from a third edge of the heat exchanger to a fourth edge of the heat exchanger;

a compressor for pressurizing said vapor as it passes between said boiling chambers and said condensing chambers;

a first edge manifold adjacent the first edge of said heat exchanger and in fluid communication with the boiling chambers for supplying the feed liquid to the plurality of boiling chambers along the first edge of said heat exchanger;

a second edge manifold adjacent the second edge of said heat exchanger and in fluid communication with the boiling chambers for collecting the vapor escaping from the boiling chambers along the second edge of said heat exchanger; and

a third edge manifold adjacent to the third edge of said heat exchanger and in fluid communication with the condensing chambers for feeding said compressed vapor to the plurality of condeasing chambers along the third edge of said heat exchanger;

a fourth edge manifold adjacent the fourth edge of said heat exchanger and in fluid communication with the condensing chambers for collecting the distillate exiting said condensing chambers along the fourth edge of said heat exchanger;

each of said edges being offset from each of the other of said edges.

17. A method for producing a distillate from a feed material which is at least in part liquid utilizing a vapor compression distillation device having a plate-heat exchanger with alternating boiling and condensing chambers, the method comprising the steps of:

continuously feeding a circulating supply of said feed material into bottom edges of said boiling chambers,

evaporating a portion of said feed material into a vapor,

channeling the vapor upward through top edges of the boiling chambers,

collecting said vapor exiting through the top edges of said boiling chambers,

compressing said vapor after it exits through the top edges of said boiling chambers,

channeling said compressed vapor into first side edges of said condensing chambers to feed the compressed vapor laterally into the condensing chambers,

cooling the compressed vapor laterally fed through the condensing chambers by the feed material being channeled upwardly through the boiling chambers such that the feed material is heated by the compressed vapor,

collecting the distillate produced in said condensing chambers along second edges thereof, and collecting non-evaporated feed material after it circulates through the boiling chambers, the collected feed material comprising a concentrate.

5,597,454

PROCESS FOR PRODUCING UREA

Jing M. Lee, 11602 Blair Meadow, Stafford, Tex. 77477

Filed Apr. 6, 1995, Ser. No. 418,089

Int. Cl.[6] B01D *3/00;3/38;* **C07C** *273/16*

U.S. Cl. 203—49 **11 Claims**

1. A urea production process, comprising the steps of:

(a) continuously reacting ammonia and carbamate at an elevated pressure and temperature to form an aqueous effluent stream containing urea, ammonia and ammonium carbamate;

(b) stripping ammonia and carbamate from the effluent stream from step (a) at about the reaction pressure to form a high pressure stripper bottoms stream of enhanced urea content containing from about 15 to about 30 percent by weight ammonium carbamate;

(c) heating and letting down the high pressure bottoms stream from step (b) to a relatively lower superatmospheric pressure to drive off water and ammonium carbamate vapor to form a low pressure stripper overhead stream containing at least about 30 weight percent water, and to form a low pressure stripper bottoms stream having a urea content of at least about 80 weight percent and an ammonium carbamate concentration less than about 2 weight percent;

(d) heating and contacting the low pressure stripper bottoms stream from step (c) with an inert gas to form a urea product stream having a concentration suitable for prilling or granulation;

(e) concentrating the low pressure stripper overhead stream from step (c) to form an aqueous stream of at least 70 weight percent ammonium carbamate; and

(f) recycling said aqueous stream from step (e) to the reaction step (a).

5,597,455

SEPARATION OF 3-CARENE AND LIMONENE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Jan. 16, 1996, Ser. No. 586,179

Int. Cl.[6] B01D *3/40;* **C07C** *7/08*

U.S. Cl. 203—57 **1 Claim**

1. A method for recovering 3-carene from a mixture consisting of 3-carene and limonene which consists essentially of distilling said mixture consisting of 3-carene and limonene in the presence of an extractive distillation agent, recovering the 3-carene as overhead product and obtaining the limonene and the extractive distillation agent as bottoms product, wherein said extractive distillation agent consists of one material selected from the group consisting of ethyl salicylate, dibutyl phthalate, 4-ethyl phenol, 3-isopropyl phenol, o-sec. butyl phenol, 4-nitrotoluene, nonyl phenol, diethylene glycol phenyl ether, tripropylene glycol methyl ether and 2-phenoxyethanol.

5,597,456

METHOD FOR PRODUCING MEDICAL MATERIALS

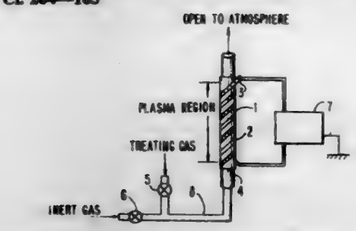
Tohru Maruyama, Sagamihara; Michio Abe, Ohita; Hiroaki Nomiyama, Sagamihara; Sachiko Okazaki, No. 20-11, Takaido-Higashi, 2-chome, Suginami-ku, Tokyo; Masahiro Kogoma, No. 843-15, Shimo-Nikkura, Wako-shi, Saitama-ken, and Makoto Kodama, Tsukuba-ken, all of Japan, assignors to Hiroshi Kashiwagi; Agency of Industrial Science & Technology; Sachiko Okazaki, all of Tokyo; Masahiro Kogoma, Wako, and Kawasumi Laboratories Inc., Tokyo, all of Japan

Continuation of Ser. No. 254,947, Jun. 7, 1994, abandoned. This application Feb. 2, 1996, Ser. No. 595,835

Claims priority, application Japan, Jul. 6, 1993, 5-166011; Oct. 22, 1993, 5-286227; Apr. 28, 1994, 6-111668

Int. Cl.[6] B01K *1/00;* **B05D** *3/06*

U.S. Cl. 204—165 **12 Claims**



1. Method of making medical materials comprising the steps of:

a) exposing at least one surface of a material to a gas mixture comprising a glow discharge-stabilizing gas and a treating gas, said gas mixture having a pressure substantially equal to atmospheric pressure; and

b) applying an alternating current voltage to the material during said exposing step a) to perform a plasma glow discharge treatment of said at least one surface of said material wherein said treatment produces an anti-thrombotic film on said at least one surface of said material.

5,597,457

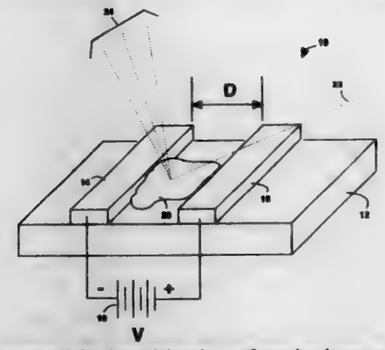
SYSTEM AND METHOD FOR FORMING SYNTHETIC PROTEIN CRYSTALS TO DETERMINE THE CONFORMATIONAL STRUCTURE BY CRYSTALLOGRAPHY

George D. Craig, Lafayette; Robert Glass, Livermore, and Bernhard Rupp, Dublin, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 376,612, Jan. 23, 1995, Pat. No. 5,525,198. This application Apr. 8, 1996, Ser. No. 630,711

Int. Cl.[6] C10M *171/00;169/04*

U.S. Cl. 204—165 **10 Claims**



1. A method for determining the conformational structure of a protein sample, the method comprising the steps of:

applying an electrical voltage between two electrodes that interface with a liquid and protein macromolecule mixture;

maintaining said electrical voltage to promote formation of said protein macromolecules into pearl chains and synthesized three-dimensional protein crystals; and

screening said synthesized three-dimensional protein crystals by x-ray crystallography to determine the conformational structure of said basic protein.

5,597,458

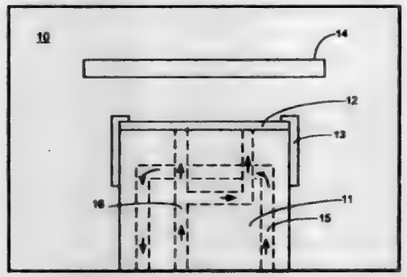
METHOD FOR PRODUCING ALLOY FILMS USING COLD SPUTTER DEPOSITION PROCESS

John E. Sanchez, Jr., Palo Alto; Darin A. Chan, Campbell, and Paul R. Besser, Cupertino, all of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Jul. 10, 1995, Ser. No. 500,296

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.3 **12 Claims**



4. A method for forming an aluminum alloy film on a substrate, the method comprising the steps of:

mounting the substrate on a platen;

pumping a coolant fluid through the platen such that the platen is maintained at a first temperature, thereby cooling the substrate to a temperature lower than 100° C.; and

depositing the aluminum alloy film on the cooled substrate using a sputter deposition process while maintaining the substrate at a temperature lower than 100° C.

5,597,459

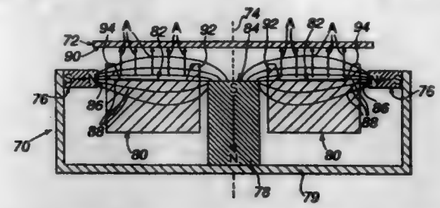
MAGNETRON CATHODE SPUTTERING METHOD AND APPARATUS

Alexander Altshuler, Pawtucket, R.I., assignor to Nobler Technologies, Inc., Avon, Mass.

Filed Feb. 8, 1995, Ser. No. 385,868

Int. Cl.[6] C23C *14/35*

U.S. Cl. 204—192.12 **13 Claims**



11. A method for sputtering target material onto a substrate, comprising the steps of:

providing a target having a sputtering surface, the sputtering surface comprising an annulus having opposing inner and outer edges that define an open center section and an outer circumference, the target being located adjacent the substrate so that said sputtering surface of said target approximately

defines a plane in an orientation that faces the substrate, said target being located within a vacuum;

orienting a first magnet and a second magnet aside each of said opposing edges of said sputtering surface including orienting said first magnet so that a North-to-South magnetic orientation of said first magnet is aligned substantially parallel to said plane defined by said sputtering surface and a North-to-South orientation of said second magnet is aligned substantially perpendicular to said plane defined by said sputtering surface, said step of orienting including mounting each of said first magnet and said second magnet on a magnetically permeable material housing, each of said first magnet and said second magnet being oriented so that a free end is positioned approximately within said plane defined by said sputtering surface and wherein the step of mounting further includes mounting each of the first magnet and the second magnet so at least one of the first magnet and the second magnet includes a South pole more closely located to said housing while the other of said first magnet and said second magnet includes a North pole more closely located to said housing;

providing a pair of walls at said sputtering surface that extend from said sputtering surface at each of said opposing edges toward said substrate, wherein said walls, said first magnet, and said second magnet define a magnetic field having flux lines that form a closed-loop array of radial magnetic flux lines with said flux lines passing from a North pole of one of said first magnet and said second magnet through said walls and above said sputtering surface to a South pole of the other of said first magnet and said second magnet

applying a voltage to said target to generate a plasma at said sputtering surface, said plasma being substantially contained adjacent said sputtering surface by said magnetic field; and

wherein said step of orienting said first magnet includes providing a ring magnet adjacent the outer circumference and said step of orienting said second magnet includes providing a magnet within said open center section.

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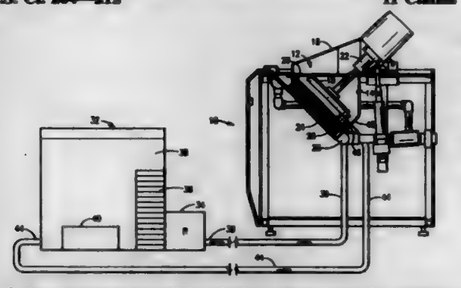
PLATING CELL HAVING LAMINAR FLOW SPARGER

H. Vincent Reynolds, Marcellus, N.Y., assignor to Reynolds Tech Fabricators, Inc., East Syracuse, N.Y.

Filed Nov. 13, 1995, Ser. No. 556,463

Int. Cl.[6] C25D *17/02;17/12;21/06;21/10*

U.S. Cl. 204—212 **11 Claims**



1. An electroplating cell in which a planar face of a substrate may be plated with a metal layer, wherein a plating bath is adapted to contain an electrolyte in which said substrate is immersed, said electroplating cell having holder means for holding said substrate in position in said plating bath, sparger means for introducing the electrolyte into the bath, an anode chamber in which an anode is disposed for containing a quantity of metal that is consumed during plating, a weir for separating said anode chamber from said bath and permitting the electrolyte to spill over from the bath into the anode chamber, said weir including semipermeable barrier means permitting metal ions to pass through from the anode chamber into said plating bath but blocking passage of any liquid or particulate matter, drain outlet means located in said anode chamber for carrying electrolyte and any entrained particulate matter from the anode chamber, and means for coupled between the drain outlet and the sparger means for removing any particulate matter from said electrolyte and for returning the electrolyte to said sparger means wherein said sparger means is adapted to establish a flow regime for said electrolyte in which fresh electrolyte is introduced through said sparger means into said plating bath, said electrolyte flows past said substrate and spills over said weir into said anode chamber, and said electrolyte exits said chamber out said drain outlet; and wherein said sparger means includes a hollow body defining a plenum, said hollow body being shaped to fit against a lower wall of said plating bath, including an upper wall over said plenum containing a series of flow holes such that said sparger means produces a uniform, parallel laminar flow of said electrolyte across the planar face of the substrate when on said holder means.

2. An electroplating cell according to claim 1 wherein said substrate is a master on which a stamper for a compact disc is formed, and said holder means includes a rotary mount on which said substrate may be held in said bath.

5,597,461

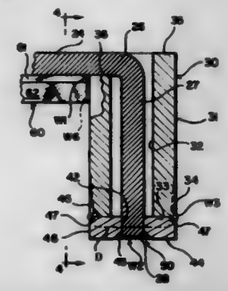
METHOD OF MANUFACTURING AN ANODE BAR FROM A METAL SLEEVE, A METAL ROD AND A METAL RING

Ray H. Pate, 1923 Chestnut Grove Rd., Knoxville, Tenn. 37923

Division of Ser. No. 420,813, Apr. 12, 1995. This application Jun. 7, 1995, Ser. No. 483,896

Int. Cl.[6] C25B *11/00*

U.S. Cl. 204—286 **19 Claims**



1. A method of manufacturing an anode bar for utilization during the production of molten metal by electrolysis comprising the step of providing a metal sleeve, a metal rod and a metal ring; positioning the metal rod in internal telescopic relationship to the sleeve and the ring and with an end of the rod disposed at least partially within an opening of the ring to define therewith a cavity, welding the ring and sleeve together, welding the ring and rod end together, and during the welding of the rod end and ring at least partially filling the cavity with weld.

5,597,462

CONDENSING DEVICE FOR SPUTTERING DEVICE

Gyeong S. Cho, Ichon-kun, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Jun. 24, 1994, Ser. No. 265,659

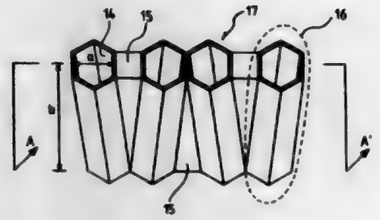
Claims priority, application Rep. of Korea, Jun. 24, 1993, 93-11254

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—298.11 **5 Claims**

1. A condensing device for use in a sputtering apparatus having a metal target for ejecting metal atoms therefrom onto a semiconductor substrate, the condensing device comprising:

a plurality of condensing tubes arranged in a bundle and adapted to condense the metal atoms ejected from the metal target, each of the condensing tubes comprising a set of condensing plates; and



a plurality of inclination adjusting plates each interposed between adjacent ones of the condensing tubes and adapted to incline each of the adjacent condensing tubes at a predetermined angle.

5,597,463

DEVICE FOR ELECTROCHEMICAL MEASUREMENTS

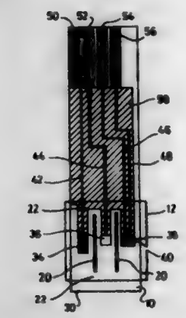
Brian J. Birch, Chelveston, and Nicholas A. Morris, Kempston, both of United Kingdom, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Jun. 7, 1995, Ser. No. 476,774

Claims priority, application United Kingdom, Jul. 5, 1994, 9413525

Int. Cl.[6] G01N *27/26*

U.S. Cl. 204—405 **12 Claims**



1. A titration device for measuring the amount of a species in solution in a test liquid, comprising a capillary fill device comprising a generator electrode, a counter electrode, a reference electrode and two parallel spaced-apart plates for receiving a thin layer of test liquid and defining an open ended chamber, the chamber being internally divided by ridges to define at least two side-by-side compartments open at both ends, wherein the ridges do not extend along the full length of the chamber, so that ionic communication between the compartments is permitted, said generator electrode and said counter electrode being located in different compartments.

5,597,464

FLOW-THROUGH CELL WITH A HANGING MERCURY DROP ELECTRODE

Dietrich Saur, Rilkeallee 39A, D-55127 Mainz, Germany

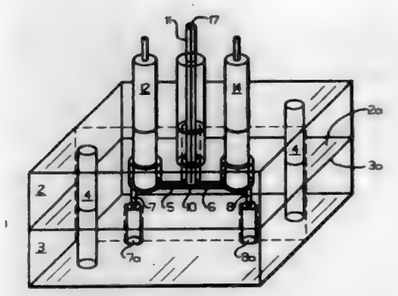
Filed Sep. 21, 1994, Ser. No. 310,956

Claims priority, application Germany, Sep. 24, 1993, 9314456 U

Int. Cl.[6] G01N *27/26*

U.S. Cl. 204—409 **21 Claims**

1. A flow-through cell comprising a working electrode, an auxiliary electrode, a reference electrode and a channel wherein said working electrode is a mercury drop electrode, said channel has a cross-sectional area of less than 1 mm 2 in a region of said working electrode and said mercury drop is situated in said channel.



5,597,465

ACID AQUEOUS PHOSPHATIC SOLUTION AND PROCESS USING SAME FOR PHOSPHATING METAL SURFACES

Cesare Pedrazzini, Milan, Italy, assignor to Novamax ITB s.r.l., Milan, Italy

Continuation-in-part of Ser. No. 372,225, Jan. 13, 1995, abandoned. This application Jul. 31, 1995, Ser. No. 509,535

Claims priority, application Italy, Aug. 5, 1994, MI94A1715

Int. Cl.[6] C25D *13/20*

U.S. Cl. 204—486 **31 Claims**

1. An acid aqueous phosphatic solution suitable for forming compact and resistant phosphatic films on metal surfaces, in the absence of white spots, containing a zinc phosphate solution and a hydroxylamine phosphate in association with a cationic surfactant which is a quaternary ammonic surfactant in an amount which is sufficient to prevent the formation of white spots.

5,597,466

PREPARATION OF SUBSTANTIALLY SALT-FREE AQUEOUS SOLUTIONS OF BISAMINOXYALKANES

Gerhard Bauer, Weinheim; Roland Baumstark, Neustadt; Kaspar Bott, Mannheim, and Hartwig Voss, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 26, 1994, Ser. No. 279,888

Claims priority, application Germany, Jul. 29, 1993, 43 25 455.1

Int. Cl.[6] B65D *83/04*

U.S. Cl. 204—529 **9 Claims**

1. A process for the preparation of a substantially salt-free aqueous solution of a bisaminoxyalkane (I), comprising

a) reacting a dihaloalkane (II) with a ketoxime (III) in an aqueous solution of a strong mineral base to form an alkylene bisoxime ether (IV),

b) cleaving the alkylene bisoxime ether (IV) with a strong mineral acid and water to form (1) a ketone and (2) salt(s) of the mineral acid and the bisaminoxyalkane (I), and then separating off the ketone,

c) adding an alkali metal hydroxide to the remaining aqueous solution to react with the salt(s) of the mineral acid and the bisaminoxyalkane (I) to form the bisaminoxyalkane (I) and salt(s) of the mineral acid and the alkali metal hydroxide, and

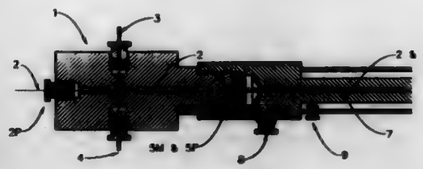
d) removing substantially all of said salt(s) from the resulting aqueous solution by electrodialysis.

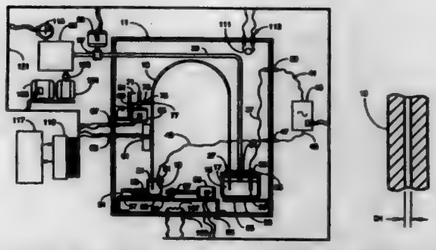
5,597,467

SYSTEM FOR INTERFACING CAPILLARY ZONE ELECTROPHORESIS AND INDUCTIVELY COUPLED PLASMA-MASS SPECTROMETER SAMPLE ANALYSIS SYSTEMS, AND METHOD OF USE

Jianzhong Zhu, and Daniel R. Wiederin, both of Omaha, Nebr., assignors to Cetac Technologies Inc., Omaha, Nebr.

Filed Feb. 21, 1995, Ser. No. 391,152
Int. Cl.[6] G01N 27/26;27/447; H01J 49/04
U.S. Cl. 204—603 11 Claims





1. A system for interfacing capillary zone electrophoresis with inductively coupled plasma-mass spectrometer sample analysis systems comprising a nebulizer, said nebulizer comprising:

a. an elongated primary body element with a centrally located longitudinally oriented hole therethrough;

b. a concentric centrally located sample delivery tube present inside said centrally located longitudinally oriented hole through said primary body element;

c. a concentric centrally located capillary electrophoresis tube present inside said sample delivery tube;

d. means on said primary body element for entering a flow of gas into an annular space between an outer surface of said concentric centrally located sample delivery tube and an inner surface of said longitudinally oriented hole through said primary body element;

e. means for entering a flow of make-up liquid into the annular space between an outer surface of said concentric centrally located sample capillary electrophoresis tube and an inner surface of said concentric centrally located sample delivery tube;

f. means for entering a sample component containing solution to said concentric centrally located capillary tube from a source of sample component containing solution into which it is inserted at an end thereof distal to that present in said primary body element; and

g. said system for interfacing capillary zone electrophoresis with inductively coupled plasma-mass spectrometer sample analysis systems further comprising a torch, said torch comprising a centrally located sample injector tube concentrically surrounded by at least an outer tube, said nebulizer being present inside said centrally located sample injector tube, such that a space exists within said outer tube and above said sample injector tube.

5,597,468

CAPILLARY ELECTROPHORESIS

Henk H. Lauer, Belmont; Paul D. Grossman, Redwood City, and Dennis E. Mead, Campbell, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Continuation of Ser. No. 110,449, Aug. 23, 1993, abandoned, which is a division of Ser. No. 461,568, Jan. 5, 1990, Pat. No. 5,240,576, which is a division of Ser. No. 156,430, Feb. 16, 1988, abandoned. This application Oct. 17, 1994, Ser. No. 324,359
Int. Cl.[6] G01N 27/26;27/447
U.S. Cl. 204—604 3 Claims

1. An apparatus for capillary electrophoresis comprising:

a first reservoir for holding a first electrophoretic solution, the first reservoir having a first pressure;

a second reservoir that is electrically isolated from said first reservoir for holding a second electrophoretic solution;

a sample reservoir located in proximity to said first reservoir for holding a sample to be electrophoresed, the sample reservoir having said first pressure;

a high voltage power supply connected between said first reservoir and said second reservoir;

a pressure reservoir having a second pressure that is lower than said first pressure;

a capillary tube in which to electrophorese said sample, said capillary tube having an inlet end and an outlet end, the inlet end being located in the first reservoir during electrophoresis and in the sample reservoir during sample introduction;

connecting means for connecting said second reservoir to said pressure reservoir, said connecting means comprising valve means for venting said connecting means and for blocking communication between said second reservoir and said pressure reservoir while venting said connecting means;

inserting means for inserting the inlet end of said capillary tube into said sample reservoir and into said first reservoir, and

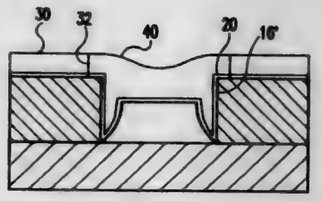
computer means for controlling said insertion means and said valve means, so that when said inlet end of said capillary tube is in said sample reservoir, said valve means permits communication of said second reservoir with said pressure reservoir for a period of time for sucking said sample from said sample reservoir into said capillary tube.

5,597,469

PROCESS FOR SELECTIVE APPLICATION OF SOLDER TO CIRCUIT PACKAGES

Charles F. Carey, Endicott; Kenneth M. Fallon, Vestal; Voya R. Markovich, Endwell; Douglas O. Powell, Endicott; Gary P. Vlasak, Owego, and Richard S. Zarr, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1995, Ser. No. 387,686
Int. Cl.[6] C25D 5/02
U.S. Cl. 205—118 7 Claims



1. A method of forming a solder deposit on a solder wettable material including the steps of

electroplating solder materials onto portions of a conductive layer on at least surfaces of a first layer of non-solder wettable material covering a portion of said solder wettable material, said portions of said conductive layer being exposed by apertures in a second layer of non-solder wettable material, chemically replacing conductive material in said conductive layer with at least one material which is also contained in said solder material by an electrochemical exchange, and

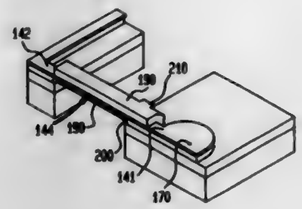
reflowing solder materials away from a portion of said surfaces of said first layer of non-solder wettable material.

5,597,470

METHOD FOR MAKING A FLEXIBLE LEAD FOR A MICROELECTRONIC DEVICE

Konstantine Karavakis, Cupertino; Thomas H. DiStefano, Monte Sereno, and Joseph Fjelstad, Sunnyvale, all of Calif., assignors to Tessera, Inc., San Jose, Calif.

Filed Jun. 18, 1995, Ser. No. 491,809
Int. Cl.[6] C25D 5/02
U.S. Cl. 205—118 27 Claims



1. A method of fabricating leads on a flexible dielectric layer having first and second major surfaces, the first major surface of the dielectric layer further having a sheet of a conductive base material attached thereto, the method comprising the steps of:

providing elongated strips of a lead material on said sheet of base material;

etching the base material sheet after providing said strips so as to remove said base material from beneath said strips of lead material in a bond region of each said strip but leave each said strip attached to said base material at opposite ends of each such bond region; and

plating a layer of a cover material onto each said strip of lead material in the bond region of such strip.

5,597,471

SOLUTION FOR COATING NON-CONDUCTORS WITH CONDUCTIVE POLYMERS AND THEIR METALLIZATION PROCESS

Andrea Ragge; Helarich Meyer, and Gonzalo Urrutia Desmaison, all of Berlin, Germany, assignors to Atotech Deutschland GmbH, Berlin, Germany

PCT No. PCT/DE93/00789, § 371 Date Apr. 11, 1995, § 102(e) Date Apr. 11, 1995, PCT Pub. No. WO94/04591, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 20, 1993, Ser. No. 387,917
Claims priority, application Germany, Aug. 20, 1992, 42 27 836.8
Int. Cl.[6] C25D 5/54;5/56;7/00
U.S. Cl. 205—159 18 Claims

1. A process for metallizing non-conductive surfaces, consisting essentially:

(a) treating the non-conductive surface with a solution containing at least one suspended or solute oxidation agent;

(b) contacting the treated non-conductive surface with an acidic solution containing

at least one water-soluble polymer, selected from the group consisting of homopolymers and copolymers, wherein each water-soluble polymer contains uncharged structural elements or is cationic polyelectrolyte and each water-soluble polymer undergoes protonizing/deprotonizing reactions, formation of hydrogen bridge compounds and van der Waals interactions, and

at least one aromatic compound, where the water-soluble polymer and the aromatic compound immediately chemically polymerize to form a conductive polymer; and

(c) electroplating the conductive polymer.

5,597,472

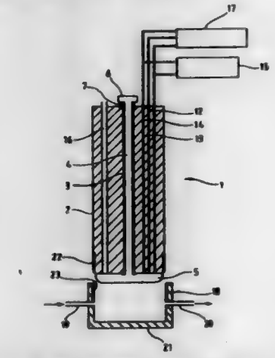
Patent Not Issued For This Number

5,597,473

PROCESS FOR THE DETECTION OF NITROTOLUENES

Günther Hambitzer, Pfinztal, and Winfried Böhe, Karlsruhe, both of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Germany

Filed Jan. 13, 1995, Ser. No. 372,327
Claims priority, application Germany, Jan. 14, 1994, 44 00 859.7
Int. Cl.[6] G01N 27/26
U.S. Cl. 205—780.5 18 Claims



1. A process for the detection of nitrotoluenes and derivatives of nitrotoluenes in a substance comprising soil, liquid or gas, which comprises providing electrodes including a working electrode; applying a voltage to the working electrode in contact with an electrolytic solution containing the substance; during a measuring cycle reducing the voltage for producing a reduction reaction and increasing the voltage for producing an oxidation reaction; and determining at least a current intensity of a residual current and an anodic current maximum occurring during the measuring cycle as a function of the voltage applied, whereby the presence of the nitrotoluene can be detected.

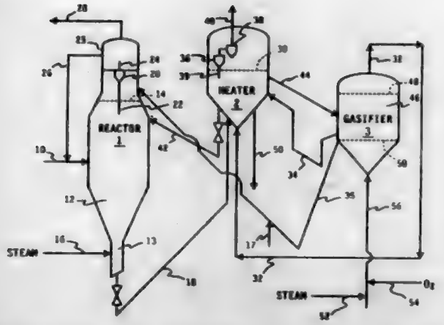
5,597,474

PRODUCTION OF HYDROGEN FROM A FLUID COKING PROCESS USING STEAM REFORMING

Michael C. Kerby; Roby Bearden, Jr.; Stephen M. Davis, and LeRoy Clevenna, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 144,906, Oct. 27, 1993, abandoned.
This application Nov. 14, 1994, Ser. No. 339,109
The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.
Int. Cl.[6] C10B 55/10; C10G 51/00
U.S. Cl. 208—50 5 Claims

1. An integrated process for converting a heavy hydrocarbonaceous chargestock to lower boiling products and for producing hydrogen, said process being performed in a fluid coking process unit comprised of a fluid coking reactor, a heater, and a gasifier,



said fluid coking reactor containing a coking zone, a scrubbing zone located above the coking zone for collecting vapor phase products, and a stripping zone for stripping hydrocarbons from solid particles passing downwardly through the coking zone, which process comprises:

(a) introducing the heavy hydrocarbonaceous chargestock having a Conradson carbon content of at least about 5 wt. %, to the coking zone containing a fluidized bed of solid particles and maintained at temperatures from about 450° and 650° C. and pressures from about 0 to 150 paig, wherein it is convened to lower boiling products which includes a vapor phase product, including normally liquid hydrocarbons, and where coke is deposited on the solid particles;

(b) passing the vapor phase product to said scrubbing zone wherein entrained solid particles are removed and conversion products are collected overhead;

(c) passing a portion of the solid particles which remained in the coking zone with coke deposited thereon downwardly through the coking zone, past the stripping zone, thereby stripping hydrocarbons from said solid particles, where it exits and is passed to the heating zone which contains a fluidized bed of solid particles and operated at a temperature from about 40° to 200° C. greater than that of the coking zone;

(d) recycling at least a portion of the heated solid particles from the heating zone to said coking zone;

(e) passing a portion of heated solid particles from the heater to the gasifier, said gasifier being operated at a temperature from about 870° to 1100° C., thereby further heating said solid particles;

(f) recycling a portion of further heated solid particles from the gasifier to the heater;

(g) passing another portion of further heated solid particles from the gasifier to the scrubbing zone;

(h) introducing methane and steam into the stream of solids passing from said gasifier to said scrubbing zone, thereby producing carbon oxides and hydrogen;

(i) collecting a gaseous stream from said scrubbing zone, which gaseous stream includes carbon oxides and hydrogen; and

(j) separating and collecting hydrogen from the gaseous stream of (i) above.

5,597,475

DADMAC/VINYL TRIALKOXYSILANE COPOLYMERS FOR DEWATERING COPPER AND TACONITE SLURRIES IN THE MINING INDUSTRY

E. Michael Kerr, Aurora, and Manhar Ramesh, Lisle, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 28, 1995, Ser. No. 508,642
Int. Cl.[6] C10G *33/04*; B01D *21/01*; C10L *5/00*
U.S. Cl. 208—188 **10 Claims**

1. A method for dewatering mineral slurries containing water wherein said slurries are selected from the group consisting of copper and taconite comprising the steps of:

a. feeding the mineral slurry into a thickener;

b. treating said mineral slurry with an effective amount of a coagulant which comprises a copolymer of diallyldimethyl ammonium halide and a vinyl alkoxysilane;

c. allowing the water to separate from the mineral slurry;

d. withdrawing water from said thickener; and

e. discharging the dewatered mineral products from said thickener.

5,597,476

GASOLINE DESULFURIZATION PROCESS

Dennis Hearn, Pasadena, and Thomas P. Hickey, Houston, both of Tex., assignors to Chemical Research & Licensing Company, Pasadena, Tex.

Filed Aug. 28, 1995, Ser. No. 519,736
Int. Cl.[6] C10G *53/02*
U.S. Cl. 208—208 R **13 Claims**

1. A process for removing sulfur from a naphtha boiling range hydrocarbon stream, comprising the steps of:

(a) feeding a naphtha boiling range hydrocarbon stream containing olefins, diolefins, mercaptans and thiophenes and an effectuating amount of hydrogen to a first distillation column reactor into a feed zone;

(b) boiling a fraction of said naphtha boiling range hydrocarbon stream containing mercaptans, diolefins and a substantial portion of said olefins upward into a first distillation reaction zone containing a Group VIII metal hydrogenation catalyst suitably supported and spaced in said first distillation column to act as a catalytic distillation structure under conditions to react a portion of said mercaptans with a portion of the diolefins to form sulfides and an overhead distillate product having a reduced mercaptan content;

(c) removing said sulfides, thiophenes and heavier mercaptans with a higher boiling fraction as bottoms from said first distillation column reactor;

(d) feeding said bottoms and hydrogen to a second distillation column reactor having a second distillation reaction zone containing a hydrodesulfurization catalyst suitably supported and spaced in said second distillation column to act as a catalytic distillation structure under conditions to react a portion of said sulfides, thiophenes and heavier mercaptans with said hydrogen to form H_2S;

(e) removing said H_2S as a gas from the overheads from said second distillation column reactor; and

(f) recovering a naphtha product from said second distillation column reactor.

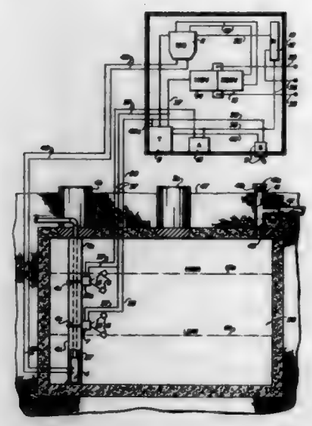
5,597,477

SEWAGE EFFLUENT DISPOSAL SYSTEM HAVING SPARGER IN HOLDING TANK

David W. Harry, III, 7385 Red Bud La., Olive Branch, Mich. 38654

Filed May 11, 1995, Ser. No. 439,118
Int. Cl.[6] B01D *17/12*
U.S. Cl. 210—96 **17 Claims**

1. A sewage effluent disposal system comprising a primary sewage treatment tank for receiving sewage, treating the sewage and discharging the effluent; an effluent holding tank provided in fluid communication with said primary sewage treatment tank for further treating the effluent a treatment riser provided on said effluent holding tank for receiving the effluent from said primary sewage treatment tank, said treatment riser communicating with the interior of said effluent holding tank; and sparger means provided in said treatment riser for scattering the effluent into multiple streams for entry into said effluent holding tank; pump means provided in said effluent holding tank for pumping effluent from said effluent holding tank; filter means provided in fluid communication with said pump means for filtering the effluent pumped from said effluent holding tank; and a drip field provided in fluid communication with said filter means for receiving and discharging the effluent.



3. The sewage effluent disposal system of claim 1 wherein said pump means comprises a substantially vertically-oriented pump casing provided in said effluent holding tank; a submersible pump provided in said pump casing; float switch means pivotally-mounted on said pump casing and provided in fluid communication with the effluent in said effluent holding tank, said float switch means further electrically connected to said submersible pump, whereby said submersible pump is periodically energized and deenergized responsive to pivotal movement of said float switch means as the level of the effluent in said effluent holding tank falls and rises, respectively.

5. The sewage effluent disposal system of claim 3 comprising alarm switch means pivotally mounted on said pump casing above said float switch means and provided in fluid communication with the effluent on said effluent holding tank when the effluent rises to a predetermined alarm level, and alarm means electrically connected to said alarm switch means, whereby said alarm means is activated responsive to rising of the effluent in said effluent holding tank to said predetermined alarm level and pivotal movement of said alarm switch means with said rising of the effluent.

5,597,478

Patent Not Issued For This Number

5,597,479

ELECTRO-COALESCENCE/MAGNETIC SEPARATION (ECMS) SYSTEM AND COMPONENTS FOR REMOVAL OF CONTAMINANTS FROM WATER STREAMS, INCLUDING DESALINIZATION

Dennis E. J. Johnson, Aurora, Ill., assignor to Aqua-Ion Systems, Inc., Littleton, Colo.

Filed Jan. 25, 1995, Ser. No. 377,620
Int. Cl.[6] C02F *1/463*
U.S. Cl. 210—192 **63 Claims**

1. A filtration assembly for removing coagulated contaminants from a water stream, comprising:

a tank, having at least one inlet port in communication with substantially an uppermost portion of an internal volume thereof, and at least one outlet port;

piping means connecting said at least one inlet port to a source of said water stream;

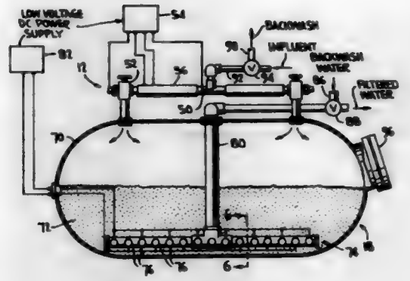
a quantity of a polarizable filtration medium, filling substantially a lower half of the internal volume of said tank;

an underdrain assembly extending over substantially the lowermost portion of the internal volume of said tank, and comprising means defining a plurality of small-dimension openings in communication with conduit means, such that water filtered by said medium passes through said small-dimension openings into said conduit means, said medium being excluded by said small-dimension openings from said conduit means;

further piping means connecting said conduit means to said at least one outlet port;

wherein said means defining a plurality of small-dimension openings of said underdrain assembly comprises a manifold connected by said further piping means to said at least one outlet port, and a plurality of substantially similar conductive filter members each defining internal conduits in communication with said manifold and having said small-dimension openings on external surfaces thereof; and

power supply means for applying DC power to said conductive filter members, to polarize said filtration medium.

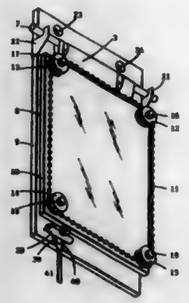


5,597,480

GRADIENT GENERATOR

Deming Zhou, 310 Brookwood Dr., Richardson, Tex. 75080

Filed Apr. 18, 1994, Ser. No. 229,198
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **3 Claims**



1. A gradient generator for delivering an effluent whose composition varies in a controlled and predictable manner in a separation process comprising plural vessels of identical height but varied in cross section filled with compositional different liquids, having inlets for filling and outlets connected to a common discharge tube for discharge and delivering; wherein said plural vessels are formed by plural pieces of non-rigid bags with different profiles arranged side by side and sandwiched within a clearance of an erect parallel plate pair, and has an extrusion means at bottom to extrude and press flat of said filled n non-rigid bag vessels parallel from their bottom toward the top when said outlets are connected to said common discharge tube at the top.

5,597,481

ELECTROCHEMICAL PRETREATMENT SYSTEM FOR LIQUID SAMPLE ANALYSIS

John R. Stillian, Pleasanton, and Archava Siriraks, Santa Clara, both of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Division of Ser. No. 319,370, Oct. 6, 1994, Pat. No. 5,518,622, which is a continuation of Ser. No. 919,935, Jul. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 833,334, Feb. 10, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 460,467

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 9 Claims



1. An analytical apparatus for analyzing ions comprising

(a) a source of a liquid sample stream, comprising a plurality of ionic species to be detected and at least one matrix compound,

(b) electrochemical means for pretreating said aqueous sample stream for removing at least part of the matrix ions of such matrix compound, said matrix ions being of opposite charge to said ionic species, and replacing the said matrix ions with hydroxide or hydronium ions causing the neutralization of the matrix compound to a substantially unionized compound, said pretreatment means including

(1) sample compartment means having an inlet end and an outlet end,

(2) matrix ion receiving compartment means having an inlet end and an outlet end,

(3) at least one ion exchange membrane partitioning said sample compartment means and said matrix ion receiving compartment means and defining therewith a sample flow channel and a matrix ion receiving flow channel, respectively, said one ion exchange membrane being preferentially permeable to ions of one charge only, positive or negative, of the same charge as said matrix ions, and including exchangeable ions of said one charge,

(c) first and second electrode means in electrical communication with said sample flow channel and said matrix ion receiving flow channel, respectively,

(d) conduit means for recycling said liquid sample stream from the outlet of said sample compartment means to the inlet thereof to flow through said sample flow channel,

(e) means for separating the ionic species in said pretreated sample stream, and

(f) detector means for detecting said separated ionic species, wherein said pretreatment means is capable of reducing a concentration of said matrix ions which would be otherwise incompatible with a downstream analytical system to a concentration that would be compatible with said downstream analytical system.

5,597,482

WATER PURIFICATION APPARATUS

Solly Melyon, 7834 Bankside Dr., Houston, Tex. 77071

Filed Apr. 25, 1995, Ser. No. 428,372

Int. Cl.[6] C02F *1/32*; B01D *27/08*

U.S. Cl. 210—209 25 Claims

1. Water purification apparatus comprising in combination:

an electrical module having a socket connectable to a source of electricity and upwardly from which extend an elongated ultraviolet light ray emitting lamp;

an elongate housing attachable to said electrical module for surrounding said lamp and having a water inlet and a water outlet;

a hollow elongate tube centrally disposed in said housing, capable of passing ultraviolet rays, closed at one end and opened at the other to permit insertion of said lamp thereinto;

an outer annular passage defined by inner and outer cylindrical walls between which is provided filter means, said outer annular passage providing a flow path for water flowing from said housing inlet and said filter means providing filtering of suspended particles from said water prior to exposure to ultraviolet rays from said ultraviolet light;

an inner annular passage the inner surface of which is defined by the exterior of said elongate tube and the outer surface of which is defined by said inner cylindrical wall of said outer annular passage spaced therefrom, said inner annular passage providing a second flow path, counter to the flow of said first mentioned flow path, for water flowing through said outer annular passage from said housing inlet for continuous flow to said housing outlet and exposing said water to ultraviolet light rays from said lamp; and

a thin sheet of ultraviolet ray reflective material lining said inner cylindrical wall to block ultraviolet rays from said first flow path and to reflect ultraviolet rays passing through said second flow path.

5,597,483

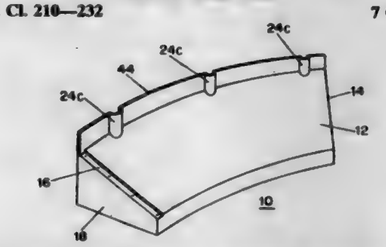
VENTED BAFFLE SYSTEM

Earle Schaller, Palm Beach Gardens, Fla., assignor to NEFCO Inc., Palm Beach Gardens, Fla.

Filed Jan. 18, 1995, Ser. No. 374,328

Int. Cl.[6] B01D *21/24*

U.S. Cl. 210—232 7 Claims



1. A baffle in a clarifier tank for gravitationally separating solids suspended in a liquid contained in the tank, the clarifier tank having a tank bottom and a substantially vertical peripheral wall bounding the liquid contained in the tank, the clarifier tank having a tank bottom and a substantially vertical peripheral wall bounding the liquid-containing interior of the tank, said baffle comprising:

a panel member downwardly sloping from the peripheral tank wall toward the interior of the tank and the tank bottom, said panel member having a lower side and an upper side, said panel member extending downwardly from an upper edge to a lower edge disposed in a spaced relation to the tank bottom said panel member having a first lateral side and a second lateral side, said panel member defining a space formed between the junction of the lower side of the panel member and the peripheral tank wall;

an end bracket for securement with said first lateral side of said panel member for supportingly securing said panel member to the peripheral wall of the clarifier tank;

a mounting flange integrally extending from said upper edge of said panel member and secured to the peripheral wall for securing said panel member to the peripheral wall of the clarifier tank, said mounting flange provided with an upper edge; and

a relief conduit integrally molded into said mounting flange and in fluid communication with said space formed between the junction of the lower side of the panel member and the peripheral tank wall for venting the pressure in said space, said relief conduit having a first inlet end proximate said upper edge of said panel member and a second outlet end proximate said upper edge of said mounting flange.

5,597,484

METAL REMOVAL FROM AQUEOUS SOLUTION

Mark R. Tolley, Cambridge, and Lynne E. Macaskie, Oxford, both of England, assignors to British Nuclear Fuels plc, Cheshire, England

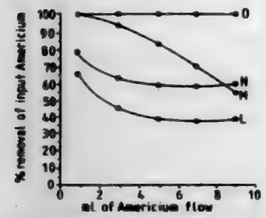
PCT No. PCT/GB94/00626, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/22770, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 25, 1994, Ser. No. 525,633

Claims priority, application United Kingdom, Mar. 26, 1993, 9306403

Int. Cl.[6] C02F *3/34*

U.S. Cl. 210—611 9 Claims



1. A method of removing a metal having an insoluble phosphate (hereinafter called the "target metal") from an aqueous solution, said method comprising the steps of immobilising in a bioreactor a phosphatase-producing microorganism which has been cultivated using a growth medium containing an assimilable organic source of phosphorus; contacting the microorganism with an element, other than the target metal, having an insoluble phosphate (hereinafter called the "priming element") so as to deposit the phosphate of the priming element on cell surfaces of the microorganism; and subsequently passing the aqueous solution containing the target metal to be removed through the bioreactor in order to precipitate the target metal out of said solution.

5,597,485

PROCESS FOR SEPARATING PROTEINS

Jorge A. Mazza, and Pablo Outumuro, both of Buenos Aires, Argentina, assignors to Vilmax S.A., Buenos Aires

Continuation of Ser. No. 938,015, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 349,694, May 10, 1989, abandoned. This application Dec. 27, 1994, Ser. No. 365,068

Claims priority, application Argentina, May 13, 1988, 310844

Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—635 15 Claims

1. A process of separating proteins comprising contacting a material containing at least one protein to be separated therefrom with a polymeric composition comprising a polymer formed from at least one monomer containing a polymerizable moiety chemically bonded to an organic dye of the anionic type, said dye having affinity for said protein to be separated from said material;

retaining said protein on said dye fraction of said polymer; and recovering said protein from said polymer.

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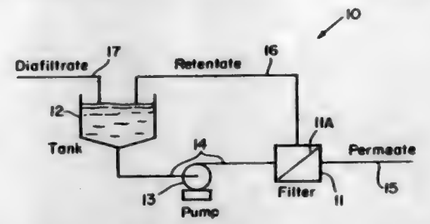
MEMBRANE FILTRATION WITH OPTIMIZED ADDITION OF SECOND LIQUID TO MAXIMIZE FLUX

Herb Lutz, Belmont, Mass., assignor to Millipore Investment Holdings Limited, Wilmington, Del.

Filed May 1, 1995, Ser. No. 431,562

Int. Cl.[6] B01D *11/04*; *61/22*

U.S. Cl. 210—639 20 Claims



1. A process for optimizing the performance of a filtration system during a filtration run comprising the steps of:

a. delivering a liquid sample containing concentrations of two or more components in a solvent to be separated to an inlet portion of a filtration device having membrane separation means to produce a permeate stream passing through said separation means and the concentration of each of said two or more components in said inlet portion being sufficient to produce polarization at a given time during said filtration run;

b. maximizing the mass flux maximizing the mass flux of one of said two or more components in said permeate stream by controlling the flow rate of a second liquid to said inlet portion of said filtration device and adjusting over time during said filtration run said flow rate of said second liquid in response to changes in said sufficiency to effectively control within a predetermined range the concentrations of said two or more components in said inlet portion to produce an optimum control response which maximizes the mass flux of said one component in said permeate stream; and

c. recovering at least one of said two or more components.

5,597,487

WATER PURIFICATION AND DISPENSING SYSTEM

Gerald Vogel, Wilmar, and Joseph Thelen, Walconia, both of Minn., assignors to J. Vogel Premium Water Co., Wilmar, Minn.

Division of Ser. No. 947,125, Sep. 17, 1992, Pat. No. 5,427,682. This application Sep. 2, 1994, Ser. No. 300,638

Int. Cl.[6] B01D *61/12*

U.S. Cl. 210—652 12 Claims

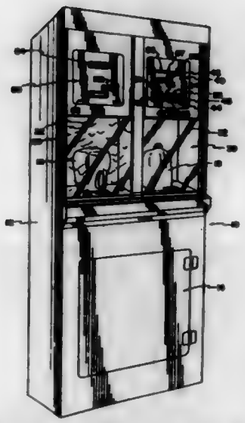
11. A process for purifying and dispensing water comprising the steps of:

obtaining unpurified water from a supply source;

providing a demand condition for purified water;

filtering the unpurified water through filtering means to obtain purified water, said filtering means including a reverse osmosis element which creates the purified water and a concentrate;

on receiving the demand condition, recycling purified water from the filtering means by recirculating the purified water



from the filtering means back through the filtering means to flush said filtering means;

following said recycling step, directing the purified water to a water dispensing arrangement; and

subsequent to demand no longer being present, stopping water flow.

5,597,488

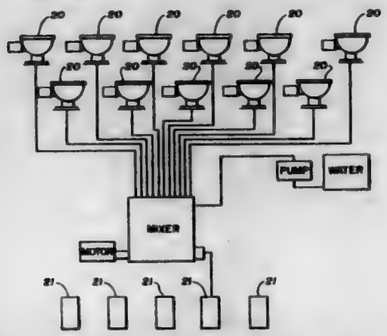
METHOD FOR PREPARING VARIOUS THERMAL WATERS

Kye-Whan Yu, P.O. Box 137-130, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 335,141, Nov. 7, 1994, abandoned. This application Oct. 19, 1995, Ser. No. 545,279

Int. Cl.[6] C02F *1/42*

U.S. Cl. 210—663 6 Claims



1. A method for preparing thermal water comprising the steps of:

mixing a plurality of thermal water solutions, each thermal water solution made up by mixing a plurality of chemical components with highly pure water at predetermined rates to prepare thermal water solutions having components similar to those of a natural sodium bicarbonated spring, a simple thermal spring, a carbon dioxide spring, a radioactive spring or a sulfur spring;

providing each of the plurality of thermal water solutions within its own solution tank;

in order, passing fresh water through an activated carbon filter, a microfilter, an anion-exchange resin and a cation-exchange resin to prepare pure water, and running the pure water into a mixing chamber;

selecting one of the plurality of thermal water solutions for making the thermal water to be distributed and directing the thermal water solution from a selected solution tank to the mixing chamber with the pure water; and

mixing the thermal water solution with the pure water within the mixing chamber, heating the water mixed with the thermal water solution to prepare the thermal water, and therafter distributing the water mixed with the thermal water solution to a bathtub.

5,597,489

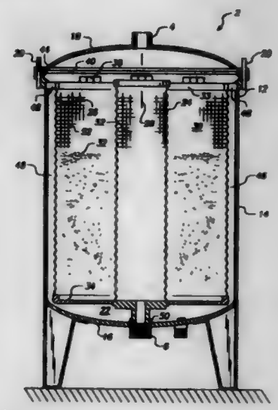
METHOD FOR REMOVING CONTAMINANTS FROM WATER

H. Michael Schneider, Atherton; Edward Allen, Pleasanton; Richard Woodling, Redwood Estates, and Roy Barnes, Union City, all of Calif., assignors to Sepragen Corporation, Hayward, Calif.

Filed Mar. 2, 1995, Ser. No. 399,169

Int. Cl.[6] C02F *1/42*

U.S. Cl. 210—670 27 Claims



1. A method for treating water to remove contaminants therefrom, comprising the steps of:

providing a fluid chamber, a substantially cylindrical inner screen, and a substantially cylindrical enter screen surrounding the inner screen, the fluid chamber having an inlet, an outlet, and a sidewall, the inner and outer screens being positioned in the fluid chamber, the inner screen being spaced apart from the outer screen and defining a single compartment for holding a media bed therebetween and interposing a distribution plate between said inlet and a feed channel formed between said sidewall and said outer screen in said fluid chamber whereby said water to be treated will be substantially distributed equally around said outer screen;

coupling the inlet to a source of contaminated water containing dissolved contaminants including heavy metals;

filling the compartment with a contaminant removing media capable of removing said dissolved contaminants including heavy metals; and

flowing the contaminated water through the inlet, through the distribution plate and through said outer screen, through the contaminant removing media where said dissolved contaminants in the contaminated water are removed, through said inner screen, and out the outlet.

5,597,490

DADMAC/VINYL TRIALKOXYSILANE COPOLYMERS FOR TREATMENT OF FOOD PROCESSING WASTES

Daniel K. Chung, Burlington, Canada, and Manian Ramesh, Lisle, Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Aug. 31, 1995, Ser. No. 521,938

Int. Cl.[6] C02F *1/56*

U.S. Cl. 210—727 9 Claims

1. A method for conditioning food processing waste water prior to chemical dewatering comprising the steps of:

a) treating the food processing waste water containing fat, blood and tissue with an effective coagulating amount of a water soluble silicone containing polymer coagulant prepared from a diallyldimethyl ammonium halide and a vinyl alkoxysilane wherein .the coagulant has a reduced specific viscosity in one molar sodium nitrate solution for one percent polymer actives from 0.2 to 8 dl/gm and the mole ratio of diallyldimethyl ammonium chloride to vinyl alkoxysilane ranges from 99.9:0.1 to 80:20;

b) allowing a floc of fat, blood and tissue to separate from said waste water; and

c) removing the floc from the treated water.

5,597,491

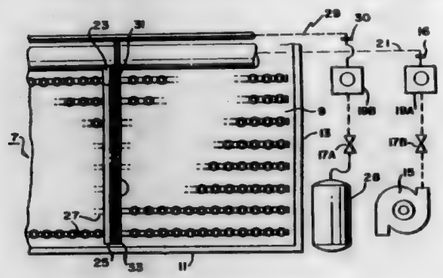
DIRECT DELIVERY IN-SITU DIFFUSER CLEANING

William W. Winkler, Delafield, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.

Continuation of Ser. No. 984,122, Dec. 4, 1992, Pat. No. 5,378,355. This application Nov. 1, 1994, Ser. No. 332,750

Int. Cl.[6] C02F *3/20*

U.S. Cl. 210—754 6 Claims



1. A process for aerating water with aeration gas, comprising:

A. conducting a flow of aeration gas from a source of said gas along a first flow path,

B. delivering said aeration gas via said first flow path to a multiplicity of fine pore diffusers submerged, distributed and spaced apart from one another in one or more horizontally disposed arrays in a body of water and respectively having diffusion elements,

C. introducing said aeration gas into said diffusers through connections between said first flow path and said diffusers for causing discharge of said aeration gas through said diffusion elements, thereby aerating the water,

D. conducting a flow of cleaning fluid which is aggressive toward such foulant from a source of said cleaning fluid along a second flow path,

E. delivering said cleaning fluid to said multiplicity of diffusers via said secood flow path,

F. maintaining said flow of cleaning fluid substantially separate from said first flow path until said cleaning fluid reaches said diffusers, and

G. introducing said cleaning fluid into said diffusers from said second flow path for causing discharge of said cleaning fluid through said diffusion elements for cleaning said elements.

5,597,492

DEVICE FOR DISCHARGE LIMITATION AND SIMULTANEOUS TEMPORARY STORAGE OF WASTE WATER AND ALSO SEPARATION OF SETTLEABLE AND FLOATING MATTER FROM FOUL WATER AND SUCH A METHOD

Anton Felder, Schillerstr. 48, D-87435 Kempten, Germany

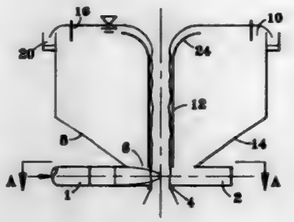
PCT No. PCT/EP94/02997, § 371 Date Apr. 5, 1995, § 102(e) Date Apr. 5, 1995, PCT Pub. No. WO95/08717, PCT Pub. Date Mar. 30, 1995

PCT Filed Aug. 4, 1994, Ser. No. 411,643

Claims priority, application Germany, Sep. 23, 1993, 43 32 404.5

Int. Cl.[6] B01D *21/26*

U.S. Cl. 210—787 19 Claims



16. A method for discharge limitation and temporary storage of waste water and separation of settleable and floating material from foul water comprising:

impressing a first spiral vortex flow of a fluid within a container onto an increased inflow, thereby developing that increased inflow as a second spiral vortex flow resulting in the first spiral vortex flowing above the second spiral vortex flow, taking place within a space having a substantially cylindrical geometry, which is situated above the space in which the second spiral vortex flow exists, and utilizing the two spiral flows in a synergistic manner to separate solids.

5,597,493

DEVICE AND METHOD TO SEPARATE THE COMPONENTS IN MIXTURE OF NON-MISCIBLE LIQUIDS

Alberto Torini, Milan, Italy, assignor to Italtraco S.r.L., Milan, Italy

PCT No. PCT/EP93/01053, § 371 Date Mar. 23, 1995, § 102(e) Date Mar. 23, 1995, PCT Pub. No. WO93/22023, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 30, 1993, Ser. No. 325,464

Claims priority, application Italy, Apr. 30, 1992, MI92A1045

Int. Cl.[6] C02F *1/40*

U.S. Cl. 210—799 31 Claims

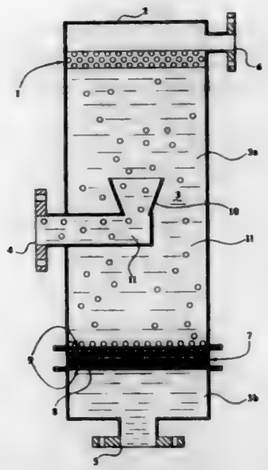
17. A method for separating two components of a mixture of at least partially non-miscible liquids that form heavier and lighter components thereof, carried out in a chamber having an inlet port to feed said mixture and first and second outlet ports to discharge the separated components, comprising the steps of:

a) dipping a filter positioned between said inlet port and one of first and second said outlet ports into only one of the components of said mixture, up to fully expelling any air trapped in the filter, and thoroughly soaking a filtering bed of the filter;

b) causing said mixture to pass through said previously soaked and deaerated filter under a predetermined hydrostatic head;

c) recovering said one of the components, used in the step a), from the first outlet port facing a side of the filter opposite to that facing the inlet port, while maintaining the filtering bed soaked with said one of the components of said mixture; and

d) recovering the other component from the second outlet port



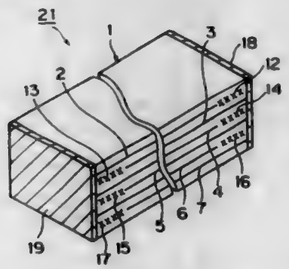
facing a same side of the filter as the inlet port such that said filtering bed forms a barrier to said other component.

5,597,494

METHOD OF MANUFACTURING MULTILAYER CERAMIC ELECTRONIC COMPONENT

Yoshiaki Kakuo, and Tatsuya Suzuki, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 216,617, Mar. 23, 1994. This application Feb. 1, 1995, Ser. No. 382,136
Claims priority, application Japan, Mar. 26, 1993, 5-67795
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—6 **15 Claims**



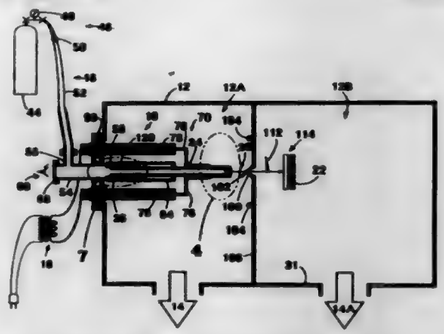
1. A method of manufacturing a multilayer ceramic electronic component, comprising:
- a step of preparing ceramic green sheets and metal films formed by a thin film forming method,
- a step of preparing a laminate having a portion in which said ceramic green sheets and internal electrodes consisting of said metal films formed by the thin film forming method are alternately stacked and having at least a pair of opposite side surfaces to which said internal electrodes are exposed,
- a step of electrochemically etching those of said internal electrodes not to be finally exposed on said pair of opposite side surfaces of said laminate on said opposite side surfaces for dissolving/removing exposed portions of said internal electrodes and portions close thereto;
- a step of filling up said dissolved/removed portions of said internal electrodes with an insulating material; and
- a step of forming external electrodes on said pair of opposite side surfaces of said laminate respectively.

5,597,495

METHOD AND APPARATUS FOR ETCHING SURFACES WITH ATOMIC FLUORINE

Mark Keil, 801 Nancy Lynn Ter., Norman, Okla. 73069; Joel H. Young, 7510 E. Lindsey, Norman, Okla. 73071, and Kyle Copeland, 609 Stinson, Apt. B, Norman, Okla. 73072

Filed Nov. 7, 1994, Ser. No. 335,564
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—66 **39 Claims**



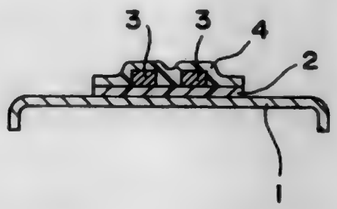
15. A method for producing a fluorine jet, comprising:
- providing an apparatus comprising a hollow crystalline tube for receiving a pressurized fluorine gas, the tube having an inlet end and an outlet end and constructed from a fluoride crystal;
- heating the terminal portion of the crystalline tube to a temperature within the range of from about 20° C. to about 10° C. below the melting point of the crystal; and
- introducing a pressurized fluorine gas mixture into the crystalline tube wherein a jet of fluorine is emitted from the terminal end of the crystalline tube.

5,597,496

METHOD FOR MANUFACTURING A MAGNETIC HEAD SUSPENSION PROVIDED WITH CIRCUIT WIRING

Inaba Masuichi; Matsumoto Hirofumi, both of Ushiku, and Tanaka Yasuyuki, Tsuchiura, all of Japan, assignors to Nippon Mektron, Ltd., Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 465,757
Claims priority, application Japan, Jul. 15, 1994, 6-186457
Int. Cl.[6] G11B *5/48*
U.S. Cl. 216—94 **13 Claims**



1. A method of manufacturing a magnetic head suspension assembly with integrally formed circuit wiring, comprising the steps of:
- forming a laminated plate having a flexible insulating base material with opposing first and second surfaces, an electrically conductive layer disposed on the first surface of the base material and a springy metal layer disposed on the second surface of the base material;
- selectively removing the electrically conductive layer from the laminated plate to thereby expose to view a portion of the first surface of the base material;

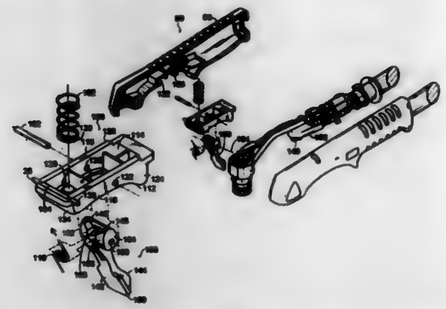
- removing from the plate the portion of the base material having the first surface thereof exposed to view;
- further selectively removing the electrically conductive layer from the plate to thereby produce a desired circuit wiring pattern from the remaining electrically conductive layer;
- producing a surface protecting layer on the surface of the circuit wiring pattern; and
- shaping the springy metal layer into a predetermined shape.

5,597,497

SWITCH MECHANISM FOR OPERATING A PLASMA ARC TORCH, OTHER TOOLS OR WEAPONS

James C. Dean, Lebanon, N.H.; Robert C. Dean, Jr., Norwich, Vt., and E. Hubbard Yeakers, Contoocook, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Filed Dec. 20, 1994, Ser. No. 359,909
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.48 **23 Claims**



1. A plasma arc torch for piercing or cutting a workpiece, comprising:
- a torch body;
- a power supply electronically coupled to the torch body; and
- a switch mechanism for operating the torch disposed in the torch body, including a trigger;
- a safety member disposed adjacent to the trigger and having a rest position for preventing the trigger from contacting the switch and having a second position for allowing the trigger to contact the switch; and
- a positioning member that positions the safety member in the rest position absent an external force.

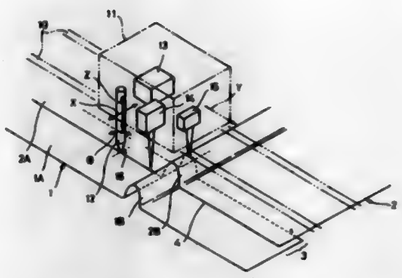
5,597,498

METHOD FOR WELDING CORRUGATE PORTIONS BY MEANS OF WELDING ROBOT FOR CORRUGATION LAP JOINT

Kazuyuki Sunayama, Toyonaka; Kunio Miyawaki, Kobe; Minoru Ohno, Kumamoto-ken, and Tatsuo Miyazaki, Arao, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jul. 24, 1995, Ser. No. 506,242
Claims priority, application Japan, Jul. 29, 1994, 6-177354; Jul. 29, 1994, 6-177357; Mar. 10, 1995, 7-050261; Jun. 9, 1995, 7-142288
Int. Cl.[6] B23K *9/127*
U.S. Cl. 219—124.34 **5 Claims**

1. A method for welding a corrugate portion by means of a welding robot for a corrugation lap joint, in which a sensor for measurement of a corrugate configuration travels ahead of the welding robot and controls a welding torch, said method comprising the steps of:
- preliminarily storing a plurality of standard corrugate configurations as data in a control device;



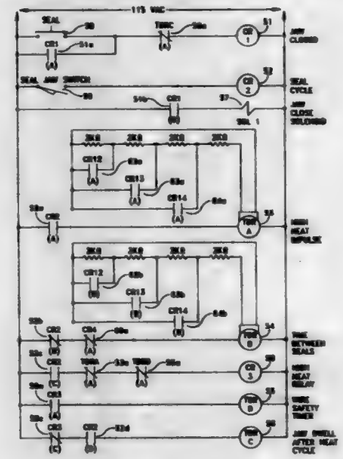
- selecting one standard corrugate configuration from data preliminarily stored in the control device based on the measurement of the sensor traveling ahead of the welding robot;
- obtaining numerical control (NC) data of a welding line of the corrugate portion based on the selected standard corrugate configuration;
- employing parameters for increasing a welding speed in a foot region of the corrugate portion by gradually changing a torch angle slightly before the welding torch reaches an arcuate portion of the foot region, along with the NC data of the welding line;
- employing parameters for increasing the welding speed in an apex of the corrugate portion along with the NC data of the welding line; and
- controlling the welding speed and the welding torch angle to weld the corrugate portion by employing said parameters.

5,597,499

SEAL WIRE CONTROL FOR PACKAGING MACHINERY RESPONSIVE TO PRODUCT FLOW

Murray R. Dunn, Encinitas, Calif., assignor to Shanklin Corporation, Ayer, Mass.

Filed Mar. 31, 1995, Ser. No. 414,714
Int. Cl.[6] H05B *1/02*
U.S. Cl. 219—243 **10 Claims**



1. In an apparatus for sealing thermoplastic film having at least one sealing jaw including a seal wire wherein the temperature of the wire is controlled by a control apparatus that provides a series of power impulses the duration of which is responsive to the rapidity of the sealing jaw operation comprising:
- means for applying power for a first time period;

means for applying power for a second time period shorter than the first and responsive to the initiation of another seal cycle within a preset time period;

means for applying power for a third time period shorter than the second time period responsive to the initiation of another seal cycle within a second preset time period;

wherein said power supplying means continues to operate such that it steps to the shorter incremental time periods as the apparatus operates and wherein a break in the flow of product causing the seal jaw to rest, causes the power supplying means to move from the third time period power means to the second time period power means and thence to the first time period power means in sequence until product causes initiation of jaw operation.

5,597,500

CONTAINER APPARATUS FOR FOOD

Rene Hasenfratz, Eschlikon, Switzerland, and Siegfried Mutschler, Blaustein, Germany, assignors to Spring AG Metallwarenfabrik Eschlikon, Switzerland

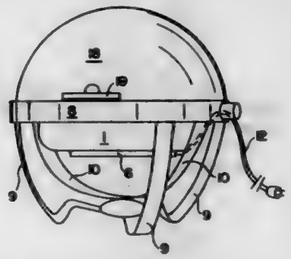
PCT No. PCT/CH94/00078, § 371 Date Mar. 29, 1995, § 102(e) Date Mar. 29, 1995, PCT Pub. No. WO94/23629, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 20, 1994, Ser. No. 356,328

Claims priority, application Switzerland, Apr. 21, 1993, 1210/93

Int. Cl.[6] H05B *3/06*; B65D *43/14*

U.S. Cl. 219—385 **10 Claims**



1. Apparatus for food comprising a receptacle (1) supported by a frame (2, 8–10) intended for direct or indirect receipt of food, an electric line (12) for the supply of energy having one end mounted to a base (5) of the receptacle (1) for the transmittal of energy, a receptacle supporting ring (2) of the frame being provided with at least one supporting pin (11) for the electric line (12) projecting therefrom, said supporting pin (11) having a side opening groove (13) for laterally receiving and hooking of the electric line (12) thereby guiding the electric line (12) outboard of the receptacle (1) through the supporting pin (11).

5,597,501

PRECISION CONTROL OF HIGH TEMPERATURE FURNACES USING AN AUXILIARY POWER SUPPLY AND CHARGED PRACTICE CURRENT FLOW

George G. Pollock, San Ramon, Calif., assignor to United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1994, Ser. No. 335,342

Int. Cl.[6] H05B *1/02*

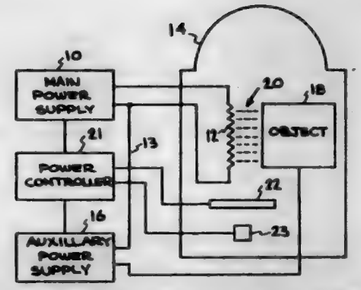
U.S. Cl. 219—494 **18 Claims**

1. An apparatus comprising:

a vacuum furnace enclosure;

a heating element located inside said enclosure;

a main power supply located outside said enclosure, wherein said main power supply is electrically connected through a wall of said enclosure to said heating element, wherein said main power supply provides electrical energy to said heating element, thereby creating thermionic emissions;



an object holder located inside said enclosure, wherein said thermionic emissions from said heating element produce charged particles between said object holder and said heating element; and

an auxiliary power supply located outside said enclosure, wherein said auxiliary power supply is electrically and operatively connected through a wall of said enclosure to said object holder, said auxiliary power supply having an output in common with said main power supply, wherein a charged particle current flows through said charged particles between said object holder and said heating element to precisely control the temperature of an object to be heated within said object holder.

5,597,502

SINGLE PHASE/THREE PHASE HEATER ELEMENT CIRCUIT FOR A CERAMIC FIBER HEATER

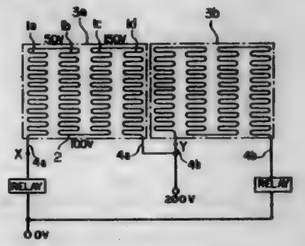
Toru Watanabe, and Shigetoshi Nagano, both of Tokyo, Japan, assignors to Sakaguchi Dennetsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1994, Ser. No. 353,708

Claims priority, application Japan, Dec. 20, 1993, 5-344506

Int. Cl.[6] H05B *3/02;3/34*; A21B *1/22*

U.S. Cl. 219—528 **20 Claims**



12. A ceramic fiber heater comprising:

(a) a base constructed of a ceramic fiber insulation;

(b) first and second heater blocks arranged side by side with each other on said base,

said first heater block comprising a first series circuit comprising a plurality of heater elements arranged side by side on said base and connected together in series such that said heater elements are carried substantially along said length of said first series circuit by said base, said first series circuit having first and second ends spaced apart from one another and located on a common side of said base,

said second series circuit including a second series circuit comprising a plurality of heater elements arranged side by side on said base and connected together in series such that said heater elements are carried substantially along said length of said second series circuit by said base, said second series circuit having first and second ends spaced apart from one another and located on said common side of said base, said second end of said first series circuit being located between said first end of said first series circuits and said first end of said second series circuit, said first end of said second series circuit being located between said second end of said first series circuit and said second end of said second series circuit, said second end of said first series circuit being located adjacent said first end of said second series circuit; and

(b) a source of electrical power having at least first and second terminals and a voltage differential between said terminals, wherein said second end of said first series circuit and said first end of said second series circuit are both connected to said first terminal of said power source thereby to minimize current leakage between said second end of said first series circuit and said first end of said second series circuit.

5,597,503

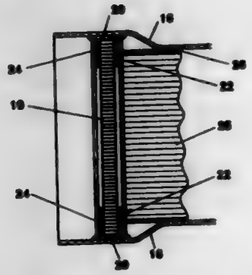
AXIALLY ASSEMBLED ENCLOSURE FOR ELECTRICAL FLUID HEATER HAVING A PERIPHERAL COMPRESSION RING PRODUCING A DIAMETRICALLY BALANCED FORCE

James G. Anderson, Beaver Dams; Thomas A. Collins, Horseheads; Leslie E. Hampton, Corning; G. Daniel Lipp, Painted Post; Alfred N. Mack, and David S. Weiss, both of Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 2, 1995, Ser. No. 459,851

Int. Cl.[6] H05B *3/10*; F01N *3/10*

U.S. Cl. 219—552 **7 Claims**



1. An electric heater module for heating a gas stream which comprises:

a cylindrical metal enclosure comprising a wall member of one-piece, closed-curved configuration forming a channel through the enclosure;

a circumferential support member connected to an inner surface of the wall which extends into the channel to form a first peripheral support surface;

a conductive metal honeycomb heating element positioned across the channel adjacent the support member and having a first peripheral edge surface in proximity to the inner surface and first peripheral support surface;

a peripheral compression ring disposed in the channel in proximity to the heating element, the ring being attached to the inner surface of the wall and extending into the channel to form a second peripheral support surface facing a second peripheral edge surface of the heating element;

at least one layer of refractory resilient insulation material disposed between the edge surfaces of the heating element and each of the inner surface of the wall and the first and second peripheral support surfaces;

wherein the compression ring is positioned against and fastened to the inner wall by point attachments at a location maintaining a balanced axial compressive force on the insulation material and peripheral edge surfaces of the heating element, said compressive force being diametrically balanced across the diameter of the heating element.

5,597,504

MICROWAVE REFINING AND MELTING FURNACE

Xavier Berson, Jouques; Alain Vivet, Aix en Provence, and Eric Bertrand, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

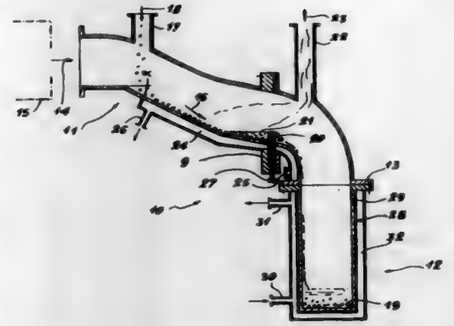
PCT No. PCT/FR94/00684, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO94/30032, PCT Pub. Date Dec. 22, 1994

PCT Filed Jun. 9, 1994, Ser. No. 379,570

Claims priority, application France, Jun. 11, 1993, 93 07056

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—693 **14 Claims**



1. Microwave melting and refining furnace for the treatment of dissolved or solid products, comprising: a first waveguide inclined with respect to horizontal and traversed by microwave beams generated by a generator coupled to a first end of the guide, said first waveguide having in an upper part thereof in proximity with a first end and in front of a lower, downwardly inclined wall of the first waveguide, a supply orifice supplying materials to said upper part such that said first waveguide initially performs drying, calcining and melting of said materials

wherein said first waveguide has in a lower part thereof in proximity to a second end thereof a variable height overflow lock retaining a retention volume for said materials receiving the microwave beams and which have been progressively melted by a continuous flow of the melted material along the lower wall of the first waveguide from the first end of said first waveguide, and

a second waveguide located downstream of the first waveguide, said second waveguide refining the melted materials.

5,597,505

HOLE FORM APPARATUS

Donald H. Koenig, 4563 Robbins St., San Diego, Calif. 92122, and Myron N. Koenig, 47587 Hwy. 55, Brooten, Minn. 56316

Filed Jan. 11, 1995, Ser. No. 371,404

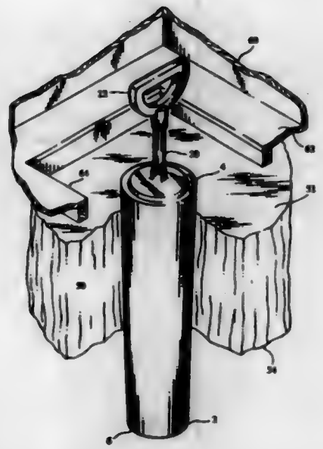
Int. Cl.[6] B28B *7/28*; B29C *33/76*

U.S. Cl. 249—63 **20 Claims**

1. A form for defining a hole comprising:

(a) a hollow, tubular body having a long axis, a first end along the axis, and a second end along the axis opposite said first end, said second end being closed so as to be watertight,

(b) an impact surface normal to the long axis within and connected to the body,



(c) impact means, disposed within the body, for impacting the impact surface of the body when said impact means is forcefully pulled, and

(d) means for forcefully pulling the impact means.

5,597,506

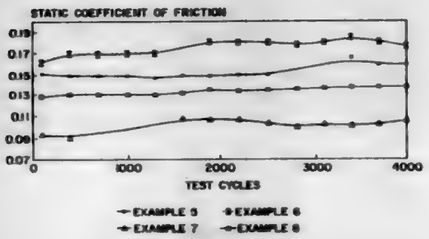
INCREASING THE FRICTION DURABILITY OF POWER TRANSMISSION FLUIDS THROUGH THE USE OF OIL SOLUBLE COMPETING ADDITIVES

Ricardo A. Bloch, Scotch Plains; Roger K. Nibert, Hampton; Jack Ryer, East Brunswick, and Raymond F. Watts, Long Valley, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 170,570, Dec. 20, 1993. This application May 30, 1995, Ser. No. 453,939

Int. Cl.[6] C10M *137/00*

U.S. Cl. 508—421 **8 Claims**



1. A method of improving the friction durability of an oleaginous composition, which compriaes:

adding to a major portion of an oil of lubricating viscosity a friction durability improving effective mount of an oil soluble combination of chemical additives comprising (a) a first chemical additive comprising a polar head group and a friction reducing substituent group, wherein said polar head group contains a phosphorus acid moiety, and (b) at least one other chemical additive having the same polar head group as said first chemical additive but having a substituent group selected from non-friction reducing substituent groups and friction increasing substituent groups.

5,597,507

MICROEMULSION DETERGENT COMPOSITION CONTAINING SPECIFIC ETHOXYLATED ALCOHOL BASED SURFACTANT SYSTEM

Peter R. Garrett, Meld, and Dennis Giles, Wirral, both of United Kingdom, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Mar. 29, 1995, Ser. No. 412,440

Claims priority, application United Kingdom, Mar. 31, 1994, 9406524; Jul. 15, 1994, 9414333

Int. Cl.[6] C11D *3/06;3/37;3/43;17/00*

U.S. Cl. 510—340 **8 Claims**

1. A fabric washing detergent composition comprising:

(i) from 5 to 25 wt. % of an organic surfactant system comprising:

(a) 50–100 wt. % of ethoxylated alcohol nonionic surfactant having an average alkyl chain length of less than C_{12} and a content of C_{10} material (based on the alcohol) of at least 45 wt. %;

(b) optionally up to 50 wt. % of co-surfactant other than ethoxylated alcohol nonionic surfactant,

(ii) from 0.5 to 55 wt. % of C_{12-16} alkane solvent,

(iii) from 0.2 to 3 wt. % of water-soluble detergency builder, selected from the group consisting of sodium tripolyphosphate, acrylate/maleate copolymers and poly(vinylacetate/itaconate) copolymers,

(iv) water and optional minor ingredients to 100 wt. %,

wherein the surfactant system (i) and the C_{12-16} alkane solvent (ii) together with water form a stable oil-in-water microemulsion.

5,597,508

LIQUID DETERGENT COMPOSITION CONTAINING DEFLOCCULATING POLYMER WITH IONIC MONOMERS

Frederik J. Schepers, Ridgewood, N.J., and Peter G. Montague, Dunchurch, Great Britain, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

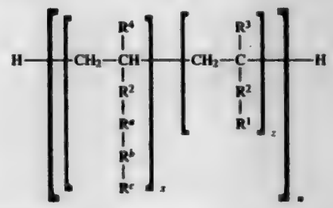
Continuation of Ser. No. 257,228, Jun. 9, 1994, abandoned, which is a continuation of Ser. No. 849,393, Apr. 27, 1992, abandoned. This application Dec. 4, 1995, Ser. No. 566,590

Claims priority, application United Kingdom, Oct. 31, 1989, 8924478

Int. Cl.[6] C11D *3/37;17/00*

U.S. Cl. 510—417 **2 Claims**

1. A liquid detergent composition comprising a dispersion of lamellar droplets comprising bi-layers of surfactant material in an aqueous continuous phase, from 5–40% by weight of electrolyte and from 0.01 to 5.0% by weight of the composition of a deflocculating polymer, characterized in that the polymer consists of nonionic monomers and ionic monomers wherein the ionic monomers constitute from 0.1 to 50% by weight of the polymer, and are selected from the group consisting of polymers having the formula:



wherein:

z is 1, x:z is from 4:1 to 2,000:1, and n is at least 1;

R^3 and R^4 represent hydrogen or C_{1-4} alkyl;

R^2 represents —CO—O—, —O—, —O—CO—, —CH_2—, —CO—NH—, or is absent;

R^1 represents —C_2H_6—N^+—$(CH_3)_3(Cl^-)$, —C_2H_4—OSO_3—(Na^+), —SO_3—(Na^+), —$C_2H_4N^+(CH_3)_3Cl^-$, —$C_2H_4N^+(C_2H_6)_3$ Cl^-, —$CH_2N^+(CH_3)_3$ Cl^-, —$CH_2N^+(C_2H_6)_3Cl^-$ or benzyl-$SO_3^-(Na^+)$;

R^a is CH_2, C_2H_4, C_3H_6 or is absent;

R^b represents from 1 to 50 independently selected alkylene oxide groups, or is absent;

R^c represents —OH or —H;

and wherein if R^2, R^a and R^b are absent, then R^c is not —H;

said polymer having a weight average molecular weight of from 500 to 5000,000.

5,597,509

AQUEOUS PROCESS FOR PREPARING LOW MOLECULAR WEIGHT POLYMERS AND DETERGENT COMPOSITIONS COMPRISING SAME

Thomas C. Kirk, Langhorne, and David Witiak, Yardley, both of Pa., assignors to Rohm and Haas Company, Phila., Pa.

Division of Ser. No. 223,351, Apr. 5, 1994. This application Jun. 6, 1995, Ser. No. 471,948

Int. Cl.[6] C11D *3/37;3/10;7/12*

U.S. Cl. 510—223 **12 Claims**

1. A cleaning composition, comprising: at least one polymer product, wherein the polymer product is prepared by a process, comprising:

a) establishing an initial charge of water in a reactor;

b) adding into the reactor to form a reaction mixture

i) from 1 to 35 weight percent of at least one water soluble chain transfer agent selected from alkali metal salts of sulfites;

ii) at least one water soluble initiator selected from persulfates,

iii) at least one metal promoter,

iv) from about 65 to about 95 weight percent, based on the total weight of monomer added to the reactor, of at least one water soluble monoethylenically unsaturated monocarboxylic acid monomer,

v) from about 5 to about 35 weight percent, based on the total weight of monomer added to the reactor, of at least one monoethylenically unsaturated dicarboxylic acid monomer selected from the group consisting of maleic acid, mesaconic acid, fumaric acid, citraconic acid, α-methylene glutaric acid, maleic anhydride, cis-3,4,5,6-tetrahydrophthalic anhydride, and combinations thereof, and

vi) from 0 to about 40 weight percent, based on the total weight of monomer added to the reactor, of one or more water soluble carboxyl-free monoethylenically unsaturated monomers, wherein the total weight percent of monomers iv), v), and vi) equals 100 weight percent;

c) maintaining the reaction mixture at a temperature of from about 60° C. to about 120° C. over a reaction time;

d) maintaining the reaction mixture at a pH of 3 or less over the reaction time; and

e) recovering a water soluble polymer product having a weight average molecular weight from 1,000 to 15,000; wherein the chain transfer agent, initiator, and monoethylenically unsaturated monocarboxylic acid monomer iv) are added to the reactor over at least 25 percent of the reaction time.

5,597,510

COAGULANTS CONTAINING BASIC ALUMINUM POLYCHLORIDE OR POLYCHLOROSULFATEAN IRON COMPOUND, AND AN ALKALI OR ALKYLINE EARTH METALL HALIDE

Sylvain Dondo, Marly Le Ville; Magnus Kvant, Niederroedern, and Yvette Pescher, Bagneux, all of France, assignors to Kemirhone France, Courbevoie Cedex, France

Filed May 24, 1994, Ser. No. 248,178

Claims priority, application France, May 24, 1993, 93 06159

Int. Cl.[6] C02F *5/00*

U.S. Cl. 252—175 **18 Claims**

1. A stable coagulant composition of matter comprising (i) at least one basic aluminum polychloride or polychlorosulfate, having the general formula:

$$[Al_n(OH)_mCl_{3n-m-2k}(SO_4)][H_2O]_z$$

in which n, m, and k are positive numbers; 3n–m–2k is positive; z is a positive integer at least equal to 1; add k is a number ranging from 0 to 0.4×n, and wherein said at least one basic aluminum polychloride or polychlorosulfate has an (m/3n)×100 ratio of from 10% to 80%, (ii) at least one iron (II) and/or iron (III) compound, and (iii) at least one sodium or potassium metal halide.

5,597,511

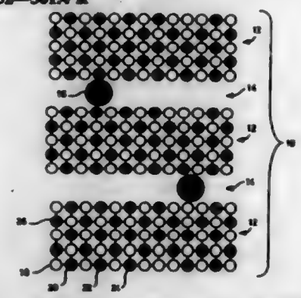
PHOSPHOR AND METHOD OF MAKING SAME

James R. Cox, Mouroeton; Ru-Yi Qi, and Ronald E. Karam, both of Towanda, all of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 189,812, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 999,637, Dec. 31, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,849

Int. Cl.[6] C09K *11/61;11/59*

U.S. Cl. 252—301.4 R **7 Claims**



1. A phosphor having a general formula $(2NaF)(NaMg_3AlSi_3O_{10}F_2):Tb_x$, where x is from about 0.03 to about 0.15.

5,597,512

METHOD FOR PREPARING ELONGATED-SHAPED SILICA SOL

Yoshitane Watanabe; Yoshiyuki Kashima, and Hiroyuki Takagi, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Oct. 14, 1994, Ser. No. 323,119

Claims priority, application Japan, Oct. 15, 1993, 5-280783

Int. Cl.[6] B01J *13/00*

U.S. Cl. 252—315.6 **16 Claims**

1. A method of preparing a stable alkaline aqueous silica sol having an SiO_2 concentration of from 8.9 to 30% by weight, and having elongated-shaped amorphous colloidal silica particles each having at least 5 as a ratio of D_1/D_2 where D_1 (nm) is a particle size of 40 to 300 nano meters measured by a dynamic light-scattering method and D_2 (nm) is a particle size measured by a nitrogen gas-adsorbing method, having an elongated shape elongated in only one plane and having a uniform thickness along the elongation within the range of from 5 to 20 nano meters, as observed with an electron microscope, comprising the following steps (a), (b) and (c):

(a) mixing an aqueous solution containing a water-soluble calcium salt or magnesium salt or a mixture of said calcium salt and magnesium salt with an aqueous colloidal liquid of a silicic acid containing from 1 to 6% by weight of SiO_2 and having a pH in the range of from 2 to 5 in an amount of 1500 to 8500 ppm as a weight ratio of CaO or MgO or a mixture of CaO and MgO to SiO_2 in the silicic acid;

(b) mixing an alkali metal hydroxide or a water-soluble organic base or a water-soluble silicate of said alkali metal hydroxide or said water-soluble organic base with the aqueous solution

obtained in the step (a) in a molar ratio of SiO_2/M_2O of from 20 to 200, where SiO_2 represents the total silica content derived from the silicic acid and the silica content of the silicate and M represents the alkali metal atom or organic base molecule; and

(c) heating at least a part of the mixture obtained in the step (b) to 60° C. or higher to obtain a heel solution, and preparing a feed solution by using another part of the mixture obtained in the step (b) or a mixture prepared separately in accordance with the step (b) to prepare a feed solution, and adding said feed solution to said heel solution while vaporizing water from the mixture during the adding step until the concentration of SiO_2 is concentrated to from 8.9 to 30% by weight.

5,597,513

DEMULSIFIER COMPOSITION AND METHOD OF USE

Elliot Cohen, 9700 NW. 48th Dr., Coral Springs, Fla. 33076

Continuation of Ser. No. 875,429, Apr. 29, 1992, Pat. No. 5,385,675, which is a continuation-in-part of Ser. No. 523,728, May 15, 1990, Pat. No. 5,110,503. This application Dec. 13, 1994, Ser. No. 354,534

Int. Cl.[6] B01D *17/04*; C11D *1/10*

U.S. Cl. 252—358 **18 Claims**

1. A composition of matter comprising:

(A) an alkyl beta-iminopropionate or salt thereof having from 6to 10 carbons in the alkyl group; and

(B) at least one:

(i) an alkoxylated alcohol of the formula:

$$RO(EO)_a(PO)_b(BO)_c(PO)_dH$$

where R contains from 8 to 14 carbon atoms; a, b, c, and d all have values of one or greater; and EO and PO are ethylene and propylene oxide residues respectively.

5,597,514

CORROSION INHIBITOR FOR REDUCING CORROSION IN METALLIC CONCRETE REINFORCEMENTS

Boris A. Miksic, North Oaks; Christophe Chandler, Woodbury; Margarita Khorshan, Little Canada; Alla Furman, Shoreview; Barry Rudman, Woodbury, and Larry Gelner, St. Paul, all of Minn., assignors to Cortec Corporation, St. Paul, Minn.

Filed Jan. 24, 1995, Ser. No. 377,761

Int. Cl.[6] C04B *103/61;111/26*; C23F *11/12;11/14*

U.S. Cl. 252—390 **5 Claims**

1. A corrosion inhibitor for reducing corrosion of metallic reinforcement embedded in situ within poured concrete structures comprising a mixture of the following formulation:

(a) a benzoic acid component selected from the group consisting of water soluble salts of benzoic acid and benzoic acid in the range of from between about 8% to 12% by weight;

(b) an aldonic acid component selected from the group consisting of aldonic acid and its water soluble salts in the range of from between about 34% to 36% by weight;

(c) water in the range of from between about 52% to 58%;

(d) a triazole selected from the group consisting of benzotriazole, tolyltriazole and their water soluble salts in the range of up to 1% by weight; and

(e) wherein the formulation is provided in an admixture with raw concrete prior to pouring and curing in an amount ranging from between about 8 ounces and 48 ounces per cubic yard of raw cement.

5. The method of inhibiting the corrosion of metallic reinforcements embedded in situ within poured concrete structures which comprises providing, in admixture with raw concrete prior to pouring and curing of the raw concrete, a compound of the following formulation:

(a) a benzoic acid component selected from the group consisting of water soluble salts of benzoic acid and benzoic acid in the range of from between about 8% to 12% by weight;

(b) an aldonic acid component selected from the group consisting of aldonic acid and its water soluble salts in the range of from between about 34% to 36% by weight;

(c) water in the range of from between about 52% to 58%;

(d) a triazole selected from the group consisting of benzotriazole, tolyltriazole and their water soluble salts in the range of up to 1% by weight; and

(e) with the formulation being present in the raw concrete prior to pouring in an amount ranging from between about 8 ounces and 48 ounces per cubic yard of said raw concrete.

5,597,515

CONDUCTIVE, POWDERED FLUORINE-DOPED TITANIUM DIOXIDE AND METHOD OF PREPARATION

James W. Kauffman, and Bruce R. Palmer, both of Edmond, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 27, 1995, Ser. No. 534,678

Int. Cl.[6] B01B *1/00*

U.S. Cl. 252—520 **28 Claims**

1. A process for producing a conductive, fluorine-doped titanium dioxide product which is doped throughout, said process comprising the steps of:

reacting the precursors in a system to form fluorine-doped TiO_2, said precursors consisting essentially of a titanium alkoxide and a fluorine source;

reducing the fluorine-doped titanium dioxide product at a temperature sufficient to form said conductive, fluorine-doped titanium dioxide product; and

recovering the reduced product.

5,597,516

PROCESS FOR IMMOBILIZING PLUTONIUM INTO VITREOUS CERAMIC WASTE FORMS

Xiangdong Feng, and Robert E. Ekuziger, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 11, 1995, Ser. No. 514,308

Int. Cl.[6] C09K *3/00*

U.S. Cl. 252—625 **3 Claims**

1. A final waste form comprising:

a) radionuclide, hazardous element, or mixtures thereof in a crystalline phase

b) said crystalline phase being bound in a glass phase consisting essentially of between 43% and 84% SiO_2, between 10% and 24% Al_2O_3, up to 24% Fe_2O_3, between 1% and 20% CaO, and less than 10% alkalis by weight.

5,597,517

TWO-COMPONENT CHEMILUMINESCENT COMPOSITION

Vilas M. Chopdekar, Edison; James R. Schleck, Somerset; Cheng Guo, Harrison, and Amanda J. Hall, Raritan, all of N.J., assignors to Jame Fine Chemicals, Inc., Bound Brook, N.J.

Filed Apr. 30, 1996, Ser. No. 640,869

Int. Cl.[6] C09K *3/00*

U.S. Cl. 252—700 **18 Claims**

1. A chemiluminescent composition comprising:

a) an oxalate component comprising an oxalate ester and a solvent, wherein the solvent comprises a propylene glycol dihydrocarbyl ether containing one to three propyleae moieties and each hydrocarbyl moiety contains up to 8 carbon atoms and is independently selected from the group consisting of straight chain alkyl and branched chain alkyl groups;

b) an activator component comprising a peroxide compound and a catalyst; and

c) a fluorescer contained in the oxalate component, activator component, or in both the oxalate component and the activator component.

5,597,518

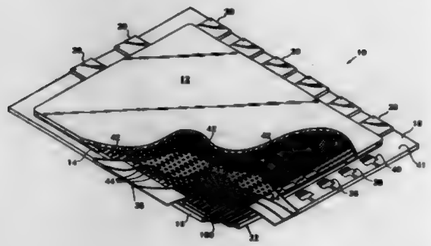
METHOD FOR PRODUCING SELF SUPPORTING FLAT VIDEO DISPLAY

Paul A. Level, Saratoga, Calif., assignor to Silicon Video Corporation, San Jose, Calif.

Division of Ser. No. 867,044, Apr. 10, 1992, Pat. No. 5,424,605. This application Nov. 2, 1994, Ser. No. 333,450

Int. Cl.[6] B29D *11/00*

U.S. Cl. 264—1.21 **5 Claims**



1. A method for producing a face plate for a cathode ray tube display, comprising:

providing a sheet of unfired ceramic tape of suitable length and width for a display,

forming a multiplicity of small holes through the unfired ceramic tape, in a desired pattern for location of pixel dots,

filling the holes with generally transparent glass, to form generally transparent plugs in the desired pattern,

curing the ceramic tape to a hardened state by firing to an appropriate temperature, and

coating each plug, at an inner, anode side of the face plate, with phosphor of appropriate color.

5,597,519

ULTRAVIOLET CYCLING OVEN FOR POLYMERIZATION OF CONTACT LENSES

Wallace A. Martin, Orange Park, Fla.; Ture Kindt-Larsen, Holte, Denmark, and Jonathan P. Adams, Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Jun. 10, 1994, Ser. No. 257,799

Int. Cl.[6] B29D *11/00*

U.S. Cl. 264—1.38 **22 Claims**



1. An apparatus for polymerizing a polymerizable composition held in a mold to form a contact lens therefrom, wherein said mold is transparent to polymerization-initiating radiation and imparts the desired shape of a contact lens to said composition upon polymerization of said composition, the apparatus comprising

a source of polymerization-inducing radiation, said source having a longitudinal axis; wherein the intensity of said radiation transmitted to a given plane parallel to said axis exhibits maximal intensity, sufficient to initiate polymerization of said composition at a first polymerization rate, within at least two regions of maximal intensity along said axis and lesser values less than said maximal values, yet sufficient to initiate polymerization at a second polymerization rate lower than the first polymerization rate, in regions of lesser intensity between each adjacent pair of said at least two regions and at each end of said axis, and wherein the intensity of said radiation varies smoothly between said maximal and said lesser intensities;

a transport apparatus capable of moving said mold relative to said source in said plane along a path equidistant from said longitudinal axis from one end thereof to the other, at a distance from said source such that said polymerizable composition is exposed to radiation of said maximal intensity value when said mold is adjacent to said regions of maximal intensity and to radiation of said lesser intensity when said mold is adjacent said regions of lesser intensity;

a heater capable of maintaining the temperature of the polymerizable composition above the glass transition temperature of the composition while the composition is exposed to said radiation, the temperature being effective to promote the propagation of said polymerization and to minimize shrinkage of said composition upon polymerization thereof; and

a controller which controls the rate of movement of said mold relative to said source and the temperature of said composition during exposure thereof to heat from said heater, so as to cause complete initiation of polymerization of said composition and effective to cause polymerization of said composition into a body useful as a contact lens.

10. A process for forming a contact lens comprising

providing a mold assembly comprising a front mold half and a back mold half which together form a cavity therebetween in the shape and size of a contact lens, the mold cavity further comprising a composition disposed in said cavity which is polymerizable upon exposure thereof to polymerization-initiating radiation, wherein at least one of said mold halves is transparent to said radiation;

providing a source of polymerization-initiating radiation, said source having a longitudinal axis, wherein the intensity of said radiation transmitted to a given plane parallel to said axis exhibits maximal values, sufficient to initiate polymerization of said composition, within at least two regions of maximal intensity along said axis and values less than said maximal values in regions of lesser intensity between each adjacent pair of said at least two regions and at each end of said axis, wherein the intensity of said radiation varies smoothly between said maximal and lesser intensities;

providing heat to said polymerizable composition in said cavity while said composition is being exposed to said radiation from said source, said heat being sufficient to promote the propagation of said polymerization and to minimize shrinkage of said composition upon polymerization thereof; and

exposing said polymerizable composition to radiation from said source while moving said mold assembly relative to said source in said plane along a line equidistant from said longitudinal axis from one end thereof to the other at a distance from said source such that said polymerizable composition is exposed to radiation sufficient to initiate polymerization of said composition at a first initiation rate when said mold assembly is adjacent to said regions of maximal intensity and at a second initiation rate less than said first initiation rate when said mold assembly is adjacent said regions of lesser intensity while controlling the rate of said movement and the amount of heat supplied to said composition from said heat so as to cause complete initiation of polymerization of said composition and to cause said composition to polymerize into a body useful as a contact lens.

5,597,520

SIMULTANEOUS MULTIPLE LAYER CURING IN STEREOLITHOGRAPHY

Dennis R. Smalley, 25029 Wheeler Rd., Newhall, Calif. 91321; Thomas J. Vergitch, 4846 Summit Ave., Simi Valley, Calif. 93063; Chris R. Manners, 4337 Rivergien St., Moorpark, Calif. 93021; Charles W. Hull, 15605 Live Oak Springs, Santa Clarita, Calif. 91351, and Stacie L. VanDorin, 27923 Harwood Dr., Saugus, Calif. 91350

Continuation-in-part of Ser. No. 16,282, Feb. 9, 1993, abandoned, which is a continuation of Ser. No. 606,802, Oct. 30, 1990, Pat. No. 5,192,469. This application Apr. 25, 1994, Ser. No. 233,827

Int. Cl.[6] B29C *35/08;41/02;41/52*

U.S. Cl. 264—401 31 Claims

1. An improved method of stereolithographically forming a three-dimensional object by forming cross-sectional layers of said object from a material capable of physical transformation upon exposure to synergistic stimulation comprising the steps of receiving data descriptive of said cross-sectional layers, forming said cross-sectional layers by selectively exposing said material to said synergistic stimulation according to said data descriptive of said cross-sectional layers to build up the three-dimensional object layer-by-layer, the improvement comprising the steps of:

modifying data descriptive of at least a portion of at least one cross-sectional layer by copying said data from a first cross-section to a second cross-section; and

using said modified data in forming said three-dimensional object.

5,597,521

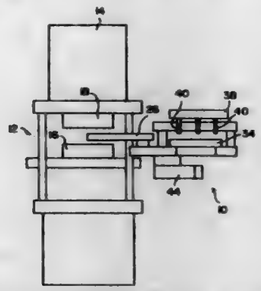
UNLOADER-SEPARATOR

John L. Wickham, 11752 Harford Rd., Glen Arm, Md. 21057

Filed Jun. 9, 1995, Ser. No. 488,504

Int. Cl.[6] B29C *45/42;45/00;* B22D *17/00;29/04*

U.S. Cl. 264—37 12 Claims



1. An unloader-separator for castings and moldings, the castings and moldings being a plurality of spaced-apart components removably connected to a gate formed in a die casting machine, the unloader-separator being connected to the die casting machine and comprising:

a swing arm having a first end and a second end, the first end being rotatably connected to a support means, the second end having a pair of spaced-apart gripper means attached thereto, the swing arm being rotatable between a first position and a second position,

the gate having a pair of spaced-apart extracting means formed thereon, the extracting means being releasably gripped by the gripper means on the swing arm,

a link arm having a first end and an opposite second end, the first end being connected to the swing arm, the second end being connected to a cam unit having a cam therein, means for rotating the cam, wherein the link arm moves the swing arm alternately between the first position and the second position,

a window platen disposed adjacent to the second position of the swing arm, the window platen having a plurality of openings formed therein, the openings corresponding with the plurality of spaced-apart components on the gate,

a punch platen disposed opposite the window platen, the punch platen having a plurality of punch rods extending outwardly therefrom and oriented toward the window platen, each punch rod corresponding with a respective component on the gate, means for moving the punch platen toward the swing arm holding the gate in the second position of the swing arm, wherein the plurality of punch rods push the plurality of components off of the gate and through the respective openings in the window platen,

such that the unloader-separator grips a gate in the die casting machine, moves the gate outside the die casting machine, removes the components from the gate and repeats the cycle.

5,597,522

METHOD OF MAKING POLYOLEFIN/FILLER COMPOSITE MATERIALS

Alan D. Carson, Northwich; Ronald G. White, Wilmslow, and Aidan P. R. Jones, Manchester, all of United Kingdom, assignors to Shell Research Limited, London, England

Continuation-in-part of Ser. No. 75,449, Jun. 11, 1993, abandoned. This application Dec. 7, 1994, Ser. No. 350,636

Claims priority, application European Pat. Off., Jun. 19, 1992, 92305671

Int. Cl.[6] C08J *9/32;* C08K *7/28*

U.S. Cl. 264—177.16 5 Claims

1. A process for producing a smooth-surfaced microsphere filled polyolefin tape or sheet having an average roughness of less than 20μ and/or a maximum peak-valley distance of less than 100μ as measured on a surface measuring apparatus comprising: extruding a composite material of a polyolefin and hollow microsphere filler through a die, wherein the die has a cross sectional area of about 250 mm^2 and a land length to thickness (l:t) ratio less than 7:1, and the temperature of extrusion is greater than 200° C. and less than 230° C.

5,597,523

MOLDING APPARATUS AND METHOD IN WHICH A MOLD CAVITY GASKET IS DEFORMED BY SEPARATELY APPLIED PRESSURE

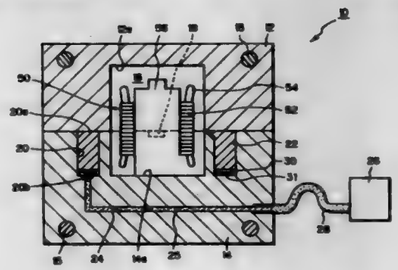
Kunito Sakai; Kazuharu Oshio, and Hiroosh Kanegae, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,269

Claims priority, application Japan, Feb. 22, 1994, 6-024272

Int. Cl.[6] B29C *45/02;45/14*

U.S. Cl. 264—219 23 Claims



1. A molding apparatus comprising:

a first mold made of metal;

a second mold made of metal and cooperating with said first mold to define a mold cavity when said first and second molds are clamped together, said mold cavity being adapted to receive a molding material;

a recess defined around said mold cavity and having a bottom and an open top with an edge extending along and substantially coinciding with a portion of the mold cavity where said first and second molds mate with each other;

a gasket received in said recess and made of a deformable material;

means for pressing said gasket so that said gasket is deformed to seal said portion of the mold cavity, said means for pressing including a source of pressure medium and at least one passage having one end communicated with said recess and the other end connected to said source of pressure medium; and

means for defining a space adjacent to the bottom of said recess so as to allow a pressure medium to flow below and along said gasket, whereby sufficient pressure is exerted uniformly on said gasket to cause deformation of said gasket, said means for defining including at least one spacer member and placed in the bottom of said recess,

whereby said space is defined between said at least one spacer member and the bottom of said recess.

5,597,524

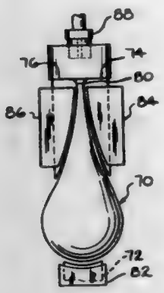
METHOD OF REMOVING FLASH FROM A BLOW MOLDED CONTAINER

Ralph B. Powell, Jr., Jackson, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Mar. 27, 1995, Ser. No. 410,778

Int. Cl.[6] B29C *49/72*

U.S. Cl. 264—536 4 Claims



1. A method for producing a molded plastic container and for removing an unwanted flash portion, the plastic container having walls and being molded to a predetermined size and having an opening therein, the method comprising the steps of:

molding the plastic container having a closed lower end in a mold forming the flash portion joined to the plastic container along a weakened line and extending from the lower end;

removing the container from the mold;

gripping the flash portion to hold the flash portion stationary;

inserting a fluid flow nozzle into the opening in the plastic container; and

passing a fluid through the nozzle to change the size of the container from the predetermined size to move the walls of the container while the flash portion is held stationary whereby the flash portion is at least partially torn away from the plastic container along the weakened line.

5,597,525

METHOD FOR INJECTION MOLDING POLYETHYLENE TEREPHTHALATE

Hideaki Koda, Ueda, and Hisashi Nakajima, Nagano-ken, both of Japan, assignors to A. K. Technical Laboratory Inc., Japan

Filed May 2, 1994, Ser. No. 236,478

Claims priority, application Japan, Apr. 30, 199?, 5-128436; Apr. 14, 1994, 6-099163

Int. Cl.[6] B29C *47/76;47/82*

U.S. Cl. 264—537 11 Claims



1. A method of injection molding an undried polyethylene terephthalate employing a vent-type injection unit comprising a heating cylinder having an inside wall, a vent, a hopper and an injection screw rotatably and movably mounted in the cylinder, the length of said injection screw being divided into sequential first and second stages, each of said first and second stages being divided in sequence into a feed zone, a compression zone and a metering zone, said first stage also having a receiving zone connected to said feed zone of said first stage and receiving said undried polyethylene terephthalate from the hopper, said vent being located at a position corresponding to the feed zone of the second stage, said method comprising

providing said undried polyethylene terephthalate in said hopper,

causing said screw to rotate to thereby convey any polyethylene terephthalate present in the area between said injection screw and the inside wall of the heating cylinder,

receiving said polyethylene terephthalate in the receiving zone of the first stage from the hopper,

feeding and plasticizing said polyethylene terephthalate,

wherein the feeding rate of the polyethylene terephthalate is limited by an arrangement such that the depth of the screw groove in the receiving zone is shallower than the depth of the screw groove in the feed zone, thus making an area available between two adjacent screw flights for molding the polyethylene terephthalate smaller in the receiving zone than in the feed zone of said first stage, and

removing volatile substances from the polyethylene terephthalate through the vent.

5,597,526

LITHIUM CELL TREATING APPARATUS

Katsunori Nishimura; Hidetoshi Honbo; Akihiro Gotoh, all of Hitachi; Mamoru Mizumoto, Katsuta, and Tatsuo Horiba, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 220,220, Mar. 30, 1994. This application Apr. 21, 1995, Ser. No. 426,180

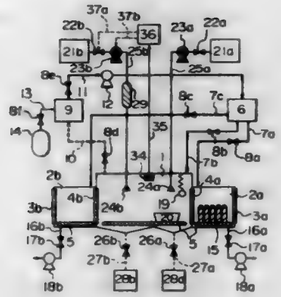
Claims priority, application Japan, Apr. 1, 1993, 5-075443; Sep. 20, 1993, 5-232778

Int. Cl.[6] C22B *3/02*

U.S. Cl. 266—80 13 Claims

1. A lithium cell treating apparatus comprising:

a treating chamber; means for exposing a lithium-containing electrode in the cell within the treating chamber; means for supplying an inert gas or a dry gas whose moisture content is lower than that of air to the treating chamber; and treating



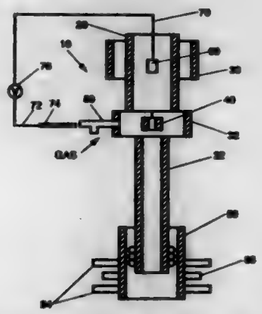
means for contacting the lithium-containing electrode with at least two different treating fluids which are reactive with lithium.

5,597,527

THERMOMAGNETIC APPARATUS FOR DETERMINING OPTIMUM HEAT TREATMENT OF ALLOYS

Paul J. Cote, Clifton Park, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1995, Ser. No. 462,989
Int. Cl.[6] C21B 7/24
U.S. Cl. 266—80 2 Claims



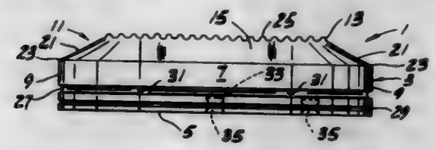
1. Apparatus for treating a metal alloy comprising
a first insulating tube having an upper end and a lower end,
a first high-temperature furnace at the upper end of said tube,
means adjacent to said first tube for introducing a sample alloy,
a quench block beneath the lower end of said first tube and aligned therewith, said quench block having an axial through-hole and a radial hole extending through its wall,
a second tube extending beneath said first furnace,
a coupling coupled between said first tube and said second tube, said quench block being disposed within said coupling, said coupling having a hole aligned with said axial hole in said quench block,
a hollow pipe secured to said coupling and aligned with waid radial hole in said quench block,
a thermocouple including a first wire secured to a specimen at the upper end of said first tube and a second wire insertable into said hollow pipe and into said quench block to contact a specimen therein, said first and second wires being coupled to measuring means,
a second low-temperature furnace,
electrical coils for generating an electric field enclosing said second tube near the lower end thereof and enclosing said low temperature furnace, and
a pickup electrical coil enclosing said tube near the lower end thereof.

5,597,528

IMPACT PAD

Lee R. Whaley, St. Clair, Pa., assignor to A.P. Green Industries, Inc., Mexico, Mo.

Filed Aug. 31, 1995, Ser. No. 522,198
Int. Cl.[6] C21B 7/24
U.S. Cl. 266—100 11 Claims



1. An impact pad for use on the bottom of a vessel into which molten metal is poured comprising a body of refractory material having:
a lower portion of such shape in plan as to fit in the vessel on the bottom of the vessel with space around said lower portion for pouring of refractory material around said lower portion, said lower portion having opposite sides and ends each having an upper edge;
an upper portion integral with the lower portion tapering upwardly from the upper edges of the sides and ends of the lower portion having a generally horizontal upper area of smaller shape in plan than the shape in plan of the lower portion;
said horizontal upper area having opposite sides and corrugations extending from one of said sides to the other;
said lower portion of the body being grooved around its periphery for interlocking with the poured refractory material; and
means in said lower portion of the body which is exposed on wearing away of the body visually to indicate a need for replacement of the pad said means having an upper end surface below said upper portion of the body.

5,597,529

ALUMINUM-SCANDIUM ALLOYS

William T. Tack, Castle Rock, Colo., assignor to Ashurst Technology Corporation (Ireland Limited), County Clare, Ireland

Division of Ser. No. 249,823, May 25, 1994, abandoned. This application Nov. 7, 1994, Ser. No. 335,488
Int. Cl.[6] C22C 21/12;21/02;21/08
U.S. Cl. 420—532 21 Claims

1. An aluminum-based alloy comprising:
from about 0.20 to about 1.8 weight percent silicon;
from about 0.20 to about 0.80 weight percent manganese;
from about 0.40 to about 1.40 weight percent magnesium;
from about 0.01 to about 1.0 weight percent zirconium;
from about 0.02 to about 10.0 weight percent scandium; and
from about 60 to about 99 weight percent aluminum, wherein any presence of chromium in said alloy is as an unavoidable impurity.

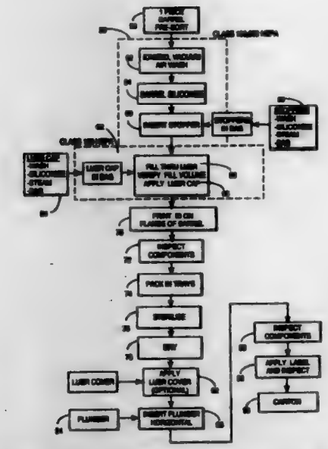
5,597,530

PROCESS FOR PREFILLING AND TERMINALLY STERILIZING SYRINGES

Gary N. Smith, Libertyville, and John C. Tanner, II, Lake Bluff, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 532,827, Sep. 21, 1995, abandoned, which is a continuation of Ser. No. 292,676, Aug. 18, 1994, abandoned. This application Apr. 26, 1996, Ser. No. 638,397
Int. Cl.[6] A61L 2/00;9/00; B65B 1/20
U.S. Cl. 422—28 10 Claims

1. A method of prefilling and terminally sterilizing a syringe, consisting of the sequential steps of:



a) providing an empty syringe barrel having first and second opposite ends, said first end having a port therethrough with a connector member formed about an exterior of said port and said second end being open;
b) removing particulate matter from the interior of said syringe barrel;
c) sterilizing a cap and a stopper, said stopper having first and second opposite longitudinal ends;
d) prior to filling said empty syringe barrel, inserting said first end of said stopper into the second open end of said empty syringe barrel and moving said stopper toward said first end of said empty syringe barrel until said first end of said stopper reaches a position against said first end of said empty syringe barrel;
e) prior to connecting the cap to the connector member to seal the port, filling said syringe barrel with a desired fluid medicament through said port of said first end of said syringe barrel wherein substantially no air enters said syringe barrel, said stopper moving from said first end to said second end of said syringe barrel by fluid pressure of said fluid medicament as the syringe barrel is filled;
f) after filling the syringe barrel through the port, connecting said cap to said connector member of said first end of said filled syringe barrel to seal said port; and
g) terminally sterilizing said prefilled and assembled syringe barrel, stopper and cap in an autoclave having a spray over-pressure cycle which maintains pressure about the exterior of said syringe barrel at least equal to the pressure within the interior of said syringe barrel.

5,597,531

RESUSPENDABLE COATED MAGNETIC PARTICLES AND STABLE MAGNETIC PARTICLE SUSPENSIONS

Paul A. Liberti, Churchville, and Maria A. Pino, Philadelphia, both of Pa., assignors to Immunivest Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 245,351, Sep. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 906,521, Sep. 16, 1986, Pat. No. 4,795,698, which is a continuation-in-part of Ser. No. 784,863, Oct. 4, 1985, abandoned. This application Aug. 22, 1989, Ser. No. 397,106
Int. Cl.[6] G01N 31/02; C12Q 1/68
U.S. Cl. 423—57 24 Claims

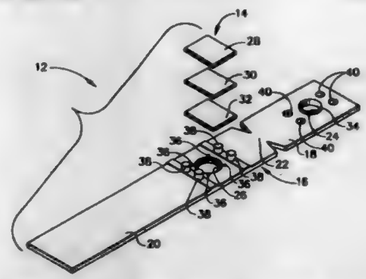
1. A process for making resuspendable coated magnetic particles, said process comprising:
a. forming a liquid mixture of a particulate magnetic starting material and a coating material characterized by the ability to form a coating on disrupted particles of said magnetic starting material,
b. treating said mixture to subdivide the particles of said magnetic starting material,
c. simultaneously with step b., permitting said coating material to form a coating on the subdivided particles of said magnetic starting material to form stable, resuspendable coated particles of said magnetic starting material,
d. recovering the resuspendable coated magnetic particles from the liquid mixture.

5,597,532

APPARATUS FOR DETERMINING SUBSTANCES CONTAINED IN A BODY FLUID

James Connolly, 8181 Morningside Dr., Indianapolis, Ind. 46240-2530

Filed Oct. 20, 1994, Ser. No. 326,788
Int. Cl.[6] G01N 33/48;33/49
U.S. Cl. 422—58 20 Claims



1. A diagnostic test strip for use in an analyzer for measuring analyte in a sample, said test strip comprising:
an elongate body including a first end, a second end, and a hinged portion between said first and second ends, said first end being foldable over said second end, said first end and said second end each having an opening that is aligned with one another when said first end is folded over said second end; and
a single carrier layer means comprising a plurality of layers fixed in position without use of adhesives between said openings within said first end and said second end, said carrier layer means including a separating layer that when exposed to a whole blood sample excludes red blood cells from passing therethrough while allowing the liquid portion of the whole blood sample to pass therethrough,
whereby a sample communicated to said carrier layer means is prevented from pooling within said carrier layer means.

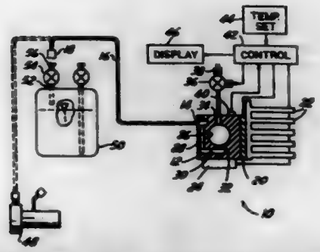
5,597,533

APPARATUS FOR ANALYZING REFRIGERANT PROPERTIES

Daniel L. Olds, and Sandra Sheehe, both of Bryan, Ohio, assignors to SPX Corporation, Muskegon, Mich.

Division of Ser. No. 378,894, Jan. 9, 1995, Pat. No. 5,514,595. This application Dec. 15, 1995, Ser. No. 573,329
Int. Cl.[6] G01N 1/42
U.S. Cl. 422—68.1 5 Claims

1. Apparatus for analyzing refrigerant that comprises:
a cell block having an internal chamber, a passage inlet, and passage means extending through said block tangential to said chamber and extending from said passage inlet to said chamber,
means coupled to said cell block for cooling simultaneously said chamber and said passage means,
means for selectively connecting said inlet of said cell block passage means to a vacuum pump for evacuating said chamber and said passage means, and to a source of refrigerant in vapor phase so as to draw a vapor phase refrigerant sample



into said passage means and said chamber and condense the refrigerant sample to liquid phase within said chamber, and means operatively coupled to said cell block for detecting one or more properties of a condensed refrigerant sample in said chamber.

5,597,534

APPARATUS FOR WIRELESS CHEMICAL SENSING

Ulrich Kaiser, Wurstein, Germany, assignor to Texas Instruments Deutschland GmbH, Germany

Filed Jul. 5, 1994, Ser. No. 283,962
Int. Cl.[6] G01N *27/07*
U.S. Cl. 422—82.02 **14 Claims**



1. A chemical sensor system, comprising:
an interrogation unit operable to transmit an interrogation signal and receive responses;
an environmentally-sealed housing;
a responder unit disposed within said environmentally-sealed housing, said responder unit being powered from said interrogation signals, said responder unit operable to receive said interrogation signals and transmit responses to said interrogation signals;
a chemical sensor disposed within said housing and operable to generate an output based on predetermined physical parameters;
at least one electrode extending outwardly from said housing and in electrical communication with said chemical sensor; and
a measurement circuit disposed within said housing and coupled to said chemical sensor, said measurement circuit operable to measure the output of said chemical sensor and provide measurement data to be communicated to said interrogation unit in said responses.

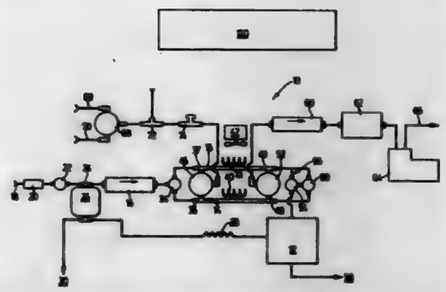
5,597,535

APPARATUS FOR DETECTING MERCURY

Frank H. Schnedlich, Toronto, and Daniel R. Schneeberger, Scarborough, both of Canada, assignors to Tekran Inc., Toronto, Canada

Filed Feb. 25, 1994, Ser. No. 201,949
Int. Cl.[6] G01N *1/40*
U.S. Cl. 422—88 **19 Claims**

1. An apparatus, for detecting mercury, the apparatus comprising: a main carrier inlet; a sample gas inlet; inlet valve means connected to the carrier gas and sample gas inlets; a cartridge including gold, for accumulating mercury as an amalgam, connected to the inlet valve means; an outlet valve means connected to the cartridge; a sample gas flow path extending from the sample gas inlet through the inlet and outlet valve means and through the cartridge; a pump connected to outlet valve means for pumping



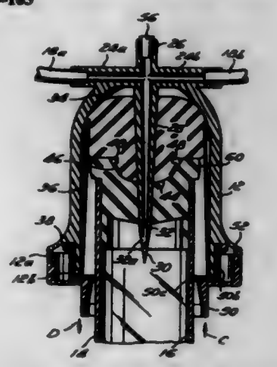
sample air through the cartridge in the sample gas path; a vent; a mercury detector; means for heating the cartridge to desorb mercury therein; a vent three-way valve connected to the outlet valve means and to both the detector and the vent; and a control unit connected to the inlet and outlet valve means, to the heating means and to the vent three-way valve for control thereof, wherein with the sample gas inlet and the pump connected to the cartridge by the inlet valve means and outlet valve means, the pump draws sample air through the cartridge, and with the carrier gas inlet connected by the inlet valve means through the cartridge and through the outlet valve means to the vent three-way valve, the vent three-way valve selectively connects the cartridge to one of the vent, for venting residual air, and the detector for detection of any mercury.

5,597,536

NEEDLELESS VACUUM CONTAINER PORT SYSTEM

Bruno Franz P. Mayer, Santa Ana, Calif., assignor to Critical Device Corporation, Brea, Calif.

Continuation of Ser. No. 279,496, Jul. 22, 1994. This application Feb. 28, 1996, Ser. No. 608,529
The portion of the term of this patent subsequent to Jul. 22, 2014, has been disclaimed.
Int. Cl.[6] A61M *25/00*; B01L *11/00*
U.S. Cl. 422—103 **1 Claim**



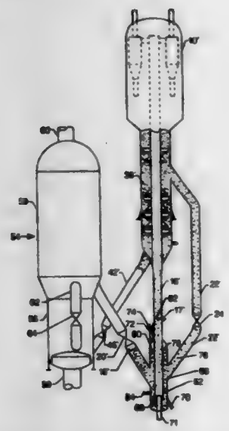
1. An apparatus for depositing a sample of biological material into a vacuum container having a septum comprising:
(a) a bell-shaped housing having an open end for axially engaging with said septum of said vacuum container;
(b) at least one passageway disposed within said housing, said at least one passageway having a distal end through which said sample of biological material is passed into said vacuum container, said distal end of at least one passageway having means for penetrating said septum;
(c) a seal member affixed within said housing, said seal member axially sealing said distal end of said at least one passageway;
(d) wherein when said septum and said vacuum container are axially advanced into said opened end of said housing, said septum forces said seal member to axially retract about said distal end of said at least one passageway such that said distal end of said at least one passageway penetrates said septum of said vacuum container and allows said sample of biological material to be deposited within said vacuum container;
(e) wherein when said septum and said vacuum container are withdrawn from said opened end of said housing, said seal member axially advances about said distal end of said at least one passageway such that said passageway through which said sample of biological material is passed into said vacuum container is closed off;
(f) wherein said distal end of said at least one passageway comprises a hollow, spike-shaped member, said spike-shaped member being oriented toward said septum of said vacuum container; and
(g) wherein seal member is fabricated from elastic material and is oriented such that said seal is biased toward said distal end of said at least one passageway such that said seal member continuously acts to close off said passageway through which said sample of biological material is deposited into said vacuum container.

5,597,537

FCC FEED CONTACTING WITH CATALYST RECYCLE REACTOR

David A. Wegerer, Lisle, and David A. Lomas, Barrington, both of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 216,378, Mar. 23, 1994, Pat. No. 5,451,313, which is a continuation-in-part of Ser. No. 125,723, Sep. 24, 1993, Pat. No. 5,346,613. This application Jun. 6, 1995, Ser. No. 467,245
Int. Cl.[6] F27B *15/00*
U.S. Cl. 422—144 **8 Claims**



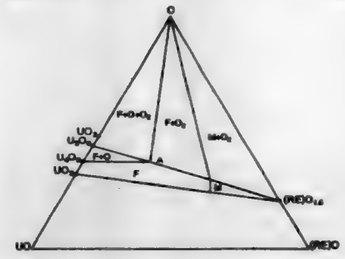
1. An apparatus for the fluidized catalytic cracking of hydrocarbons, said apparatus comprising:
a) a mixing vessel comprising a mixing chamber having a first diameter;
b) a riser conduit defining an inlet in communication with said mixing chamber at one end and an outlet at its opposite end, said riser conduit having a second diameter that is smaller than said first diameter;
c) means for injecting a feedstream into said riser conduit at a location between said inlet and said outlet;
d) a separator in communication with said outlet for separating spent catalyst from gases;
e) a regenerator;
f) means for passing spent catalyst particles to said regenerator to regenerate catalyst particles;
g) means for passing regenerated catalyst particles from said regenerator to said mixing vessel; and,
h) means for passing recycle catalyst comprising a portion of said spent catalyst particles to said mixing vessel.

5,597,538

PROCESS TO REMOVE RARE EARTHS FROM SPENT NUCLEAR FUEL

Peter Taylor, and Roderick J. McEachern, both of Pinawa, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 19, 1995, Ser. No. 444,748
Int. Cl.[6] C01G *56/00*; *57/00*
U.S. Cl. 423—3 **10 Claims**



UO2-(RE)-O Portion of the Ternary U-RE-O Phase Diagram for a Typical Rare-Earth Element for the Temperature Range from 1000 to 1500°C. The fields are identified as F = fluorite, O= orthorhombic, and M = mixture.

1. A method of removing rare earths from spent nuclear fuel comprising the steps of:
oxidizing said spent nuclear fuel at a temperature of between about 200° C. to about 800° C. thereby oxidizing UO_2 to U_3O_8;
heating said spent nuclear fuel at a temperature of between about 1000° to about 1600° C. thereby causing U_3O_8 to segregate into a RE-rich fluorite phase and an RE-poor U_3O_8 phase;
separating the RE-rich fluorite phase.

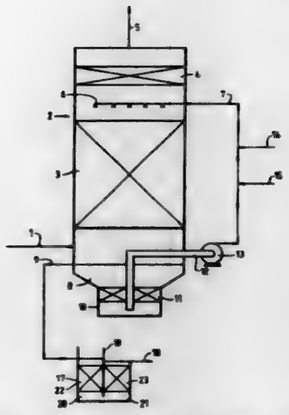
5,597,539

CATALYTIC PROCESS

Martin E. Fakley, Stockton on Tees, and Friedrich H. H. Valentin, Letchworth, both of England, assignors to Imperial Chemical Industries PLC, United Kingdom

PCT No. PCT/GB93/02196, § 371 Date Jun. 26, 1995, § 102(e) Date Jun. 26, 1995, PCT Pub. No. WO94/11091, PCT Pub. Date May 26, 1994
PCT Filed Oct. 25, 1993, Ser. No. 436,369
Claims priority, applic `n United Kingdom, Nov. 18, 1992, 9224201
Int. Cl.[6] B01D *47/00*
U.S. Cl. 423—210 **10 Claims**

1. A process for the removal of volatile organic or odoriferous substances from a gas stream comprising passing said gas stream through a scrubber, feeding an aqueous liquor having an oxidant selected from hydrogen peroxide and hypochlorite ions dissolved therein to the scrubber whereby said liquor flows through the scrubber in vapor/liquid contact with said gas stream and said substances are scrubbed from said gas stream into the aqueous liquor to give a loaded liquor containing said oxidant and said substances, collecting said loaded liquor from the scrubber, discharging a part of the collected liquor as an effluent stream, taking the remainder of the collected liquor as a recycle stream, adding a fresh aqueous solution of said oxidant to the recycle stream, feeding the recycle stream containing said fresh aqueous solution of said oxidant as the aqueous liquor fed to the scrubber, and, before addition of said fresh solution of oxidant, passing at least a part of the collected liquor including at least part of the recycle



stream, through a fixed bed of a metal oxide catalyst for the decomposition of said oxidant said catalyst bed being disposed such that it is filled with liquor even when the flow of liquor is interrupted whereby said oxidant is decomposed and said substances are oxidized to less volatile or less odoriferous substances.

5,597,540

PROCESS FOR CLEANING HARMFUL GAS

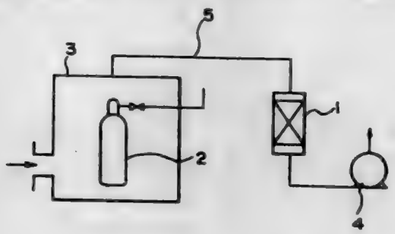
Noboru Akita; Toshiya Hatakeyama; Takashi Shimada, and Keiichi Iwata, all of Hiratsuka, Japan, assignors to Japan Pionics Co., Ltd., Tokyo, Japan

Division of Ser. No. 975,698, Nov. 13, 1992, Pat. No. 5,378,444. This application Sep. 19, 1994, Ser. No. 308,648

Claims priority, application Japan, Dec. 11, 1991, 3-8327576; Jun. 26, 1992, 4-169104

Int. Cl.[6] C01B *7/07*; B01D *53/68*

U.S. Cl. 423—241 **10 Claims**



1. A process for cleaning a harmful gas which comprises contacting a gas, at a space linear velocity of from 0.05 to 0.3 m/sec, containing at least one gaseous component selected from the group consisting of silicon tetrachloride, chlorine, hydrogen chloride, silicon tetrafluoride, phosphorus tricloride, fluorine, chlorine trifluoride, tungsten hexafluoride, hydrogen fluoride, dichlorosilane, boron trichloride, boron trifluoride and hydrogen bromide, said gaseous component being in a concentration of over 1,000 ppm to 1% by volume by volume, with a cleaning agent in a bulk density of from 0.4 to 2.0 g/mL comprising (i) zinc oxide, (ii) aluminum oxide and (iii) at least one compound selected from the group consisting of potassium carbonate, potassium hydrogencarbonate, potassium hydroxide, sodium carbonate, sodium hydrogencarbonate, sodium hydroxide, magnesium carbonate, magnesium hydrogencarbonate, magnesium hydroxide, calcium carbonate, calcium hydrogencarbonate, calcium hydroxide and ammonium hydroxide, to remove said gaseous component, a ratio of the aluminum oxide to the zinc oxide being 0.02 to 0.60 expressed in terms of the number of aluminum atoms per one zinc atom.

5,597,541

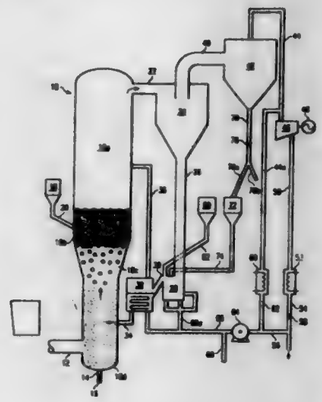
APPARATUS FOR CLEANING AND COOLING SYNTHESIZED GAS

John T. Tang, Robbinsville, N.J., assignor to Foster Wheeler Energy Corporation, Perryville, N.J.

Continuation-in-part of Ser. No. 198,752, Feb. 18, 1994, Pat. No. 5,464,597. This application Aug. 7, 1995, Ser. No. 512,256

Int. Cl.[6] B01J *8/18*; B01D *53/12*; *53/48*

U.S. Cl. 423—244.01 **32 Claims**



1. An apparatus for cooling and removing sulfur from gases, the apparatus comprising a vessel; means for introducing the gases into the vessel; the vessel containing a particulate material, including sorbent for the sulfur, at a temperature less than the gases so that the material cools the gases, removes the sulfur from the gases and is entrained by the gases; a separator for separating the entrained material from the gases; a pressure seal device connected between the separator and the vessel for permitting the material to flow from the separator to the vessel and for establishing a pressure seal between the vessel and the separator to prevent backflow from the vessel to the separator; and means for passing at least a portion of the gases from the separator to the pressure seal device to promote the flow of the material from the pressure seal device back to the vessel.

5,597,542

PROCESS FOR THE TREATMENT OF NATURAL APATITES WITH A VIEW TO THE USE THEREOF FOR STORING IRRADIATED FUEL ELEMENTS

Joëlle Carpena, Jouques, and Jean-Louis Lacout, Toulouse, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jun. 15, 1994, Ser. No. 260,013

Claims priority, application France, Jun. 16, 1993, 93 07265

Int. Cl.[6] C01B *25/32*; *25/165*

U.S. Cl. 423—305 **6 Claims**

1. Process for the treatment of a natural apatite, comprising the step of contacting a natural apatite powder with an acid aqueous solution with a pH above 1 for between a few seconds and 10 minutes to modify the natural apatite surface to better fix cationic and anionic groups contacted therewith.

5,597,543

SPHERICAL NITRIDE

Hans Zehringer, Kapfenberg/Kreuzfeld, Austria, assignor to Treibacher Industrie AG, Treibach, Austria

Filed Jul. 17, 1995, Ser. No. 503,339

Claims priority, application Austria, Jul. 22, 1994, 1457/94

Int. Cl.[6] C01C *3/08*; C01B *21/076*

U.S. Cl. 423—300 **16 Claims**

1. A process of preparing a spherical powder selected from the group consisting of titanium nitride and titanium carbonitride, said powder having an average grain size of more than 2 μm and a narrow grain spectrum, which comprises the steps of

(a) introducing into a reaction vessel at least one substance selected from the group consisting of titanium metal and an oxide, carbide, nitride and carbonitride of said metal,

(b) establishing a nitrogen atmosphere in the reaction vessel,

(c) heating the substance in the reaction vessel to a temperature between 800° C. and 2400° C. and maintaining the temperature between 1400° C. and 2000° C. until gaseous reaction products are produced,

(d) removing the gaseous reaction products as they are produced while contacting the substance with nitrogen or a nitrogen-generating gas,

(e) evacuating the reaction vessel to a pressure of <10 mbar and subsequently flooding the same with nitrogen or a nitrogen-generating gas to a pressure of 50 to 1000 mbar after the substance has been heated to said temperature and maintained at said temperature,

(f) then repeating the evacuation and flooding cycles several times, and

(g) cooling the resultant reaction product in the reaction vessel.

5,597,544

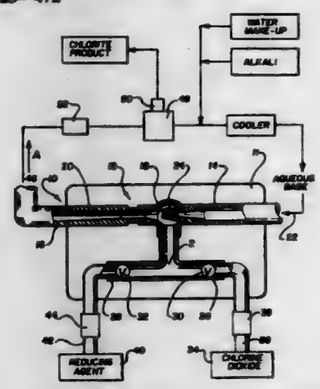
PREPARATION OF CHLORITE

George R. Barber, Summerville, S.C.; Andrew Adsetts, Sacramento, Calif.; Peter W. Deacon, Fair Oaks, Calif.; Dora Matchim, Citrus Heights, Calif., and Yan Wang, Davis, Calif., assignors to Rio Linda Chemical Co., Inc., Sacramento, Calif.

Filed Nov. 29, 1995, Ser. No. 563,937

Int. Cl.[6] C01B *11/10*

U.S. Cl. 423—472 **10 Claims**



1. A process for the preparation of a substantially saturated aqueous solution of chlorite salt, comprising the steps of providing a vacuum eductor having an inlet, an outlet, with a venturi therebetween, the venturi having a venturi nozzle and a venturi throat; a reaction chamber being in fluid communication with the vacuum eductor; introducing an aqueous solution of a base into the inlet of the vacuum eductor to produce a vacuum within the reaction chamber; introducing chlorine dioxide and a reducing agent substantially simultaneously into the reaction chamber wherein the chlorine dioxide and the reducing agent react substantially instantaneously to form the chlorous acid, the chlorous acid being drawn by the vacuum into the vacuum eductor, reacting the chlorous acid with the aqueous solution of the base thereby forming the chlorite salt, passing the chlorite salt solution through the venturi throat, reintroducing the chlorite salt solution into the inlet of the vacuum eductor together with the aqueous solution of the base and repeating the steps to obtain the substantially saturated solution of the chlorite salt.

5,597,545

RECOVERY OF HF FROM AQUEOUS STREAMS

Chin-Hsiung Chang, Palatine, and Miguel A. Gauldron, Skokie, both of Ill., assignors to AlliedSignal Inc., Morris County, N.J.

Filed Nov. 14, 1994, Ser. No. 338,935

Int. Cl.[6] C01B *7/19*

U.S. Cl. 423—484 **10 Claims**

1. A method of recovering HF from aqueous streams comprising the steps of:

(a) contacting said aqueous stream containing HF with a carbon molecular sieve and adsorbing both HF and water in pores of said carbon molecular sieve;

(b) heating said carbon molecular sieve containing substantially all the HF adsorbed in step (a), and water adsorbed in step (a) to at least a first temperature higher than the contacting of step (a) and removing water and HF desorbed at said temperature until substantially all of said water has been removed;

(c) heating said carbon molecular sieve after step (b) to at least a second temperature higher than said first temperature and removing substantially pure HF desorbed at said second temperature; and

(d) separately recovering the water and HF desorbed in step (b) and the substantially pure HF desorbed in step (c).

5,597,546

SELECTIVE OXIDATION OF HYDROGEN SULFIDE IN THE PRESENCE OF BISMUTH-BASED CATALYSTS

Kuo-Tseng Li; Min-Yu Huang, and Wen-Da Cheng, all of Taichung, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Aug. 29, 1995, Ser. No. 521,122

Int. Cl.[6] B01D *53/52*

U.S. Cl. 423—573.1 **2 Claims**

1. A process for selectively oxidizing hydrogen sulfide to elemental sulfur from a gas mixture containing from about 0.8 to about 3 volume percent of said hydrogen sulfide, said process consisting the steps of:

forming a solution of bismuth and molybdenum salts;

precipitating said solution with a hydroxide to obtain a precipitate having bismuth and molybdenum in a molar ratio of not greater than about 5 to 1;

separating and calcinating said precipitate to the corresponding oxides;

presulfurizing said corresponding oxides; and

contacting said presulfurized oxides with said gas mixture in the presence of a gaseous feed stream containing an overstoichiometric amount of oxygen at a temperature of from about 100° C. to about 350° C.

5,597,547

REDUCTION OF RESIDUAL CHLORIDE IN IRON OXIDES

David M. Hamilton, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 13, 1995, Ser. No. 421,648
Int. Cl.[6] C01G 49/02
U.S. Cl. 423—632 2 Claims

1. A process for removing chloride from a regenerated iron oxide comprising from about 800 to about 5000 ppm by weight of chloride, wherein said regenerated iron oxide is produced from a hydrochloric acid waste liquid generated from steel pickling, which process comprises the steps of:

(a) mixing the regenerated iron oxide with from about 3 wt % to about 25 wt % of yellow iron oxide containing crystalline water to form a first mixture;

(b) adding from about 1 wt % to about 90 wt % of water to said first mixture obtained from step (a) to form a second mixture; and

(c) heating the second mixture to a temperature ranging from about decomposition temperature of the yellow iron oxide to about 800° C. above the decomposition temperature of the yellow iron oxide at a pressure from about 0.1 to about 10 atm for a period of time from about 15 minutes to about 10 hours which is:

(i) sufficient to release at least a part of the crystalline water contained in the hydrated metal compound, and

(ii) sufficient to reduce the chloride content in said chloride-containing iron oxide by from about 20 wt % to about 99.9 wt %;

wherein yellow iron oxide decomposes at a temperature from about 150° C. to about 350° C. to release crystalline water;

wherein chloride content of the yellow iron oxide is less than 100 ppm by weight.

5,597,548

^{13}C ISOTOPOMER ANALYSES IN INTACT TISSUE USING (^{13}C) HOMONUCLEAR DECOUPLING

A. Dean Sherry; Piyu Zhao, and Craig R. Malloy, all of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 220,102, Mar. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 555,270, Jul. 18, 1990, Pat. No. 5,413,917. This application Jul. 3, 1995, Ser. No. 497,779
Int. Cl.[6] A61K 51/04; C12Q 1/00;1/02;1/04
U.S. Cl. 424—9.3 12 Claims

1. A method of determining ^{13}C labeled substrate utilization in an intact, metabolizing tissue or cell, comprising:

introducing ^{13}C-labeled substrate into a viable tissue or cell wherein said substrate is metabolized to acetyl Co-A;

measuring a ^{13}C glutamate earichment pattern;

selectively homonuclear decoupling C3 glutamate resonances to collapse glutamate C2 and C4 multiplets into a three line multiplet; and

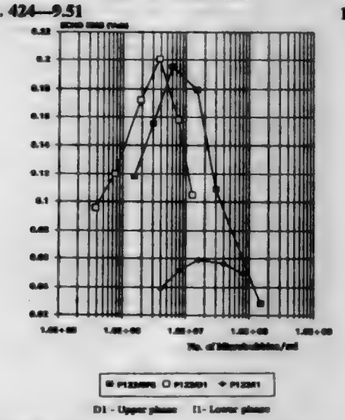
determining relative areas of collapsed resonances to obtain a measure of substrate utilization.

5,597,549

STABLE MICROBUBBLE SUSPENSIONS AS ENHANCEMENT AGENTS FOR ULTRASOUND ECHOGRAPHY

Michel Schneider, Trulnez, Switzerland; Jean Brochot, Feigeres; Jérôme Puginier, Le Chable-Beaumont, both of France, and Feng Yan, Geneva, Switzerland, assignors to Bracco International B.V., Netherlands

Division of Ser. No. 134,671, Oct. 12, 1993, Pat. No. 5,445,813. This application Mar. 31, 1995, Ser. No. 414,718
Claims priority, application European Pat. Off., Nov. 2, 1992, 92810837
Int. Cl.[6] A61B 8/08
U.S. Cl. 424—9.51 10 Claims



1. A method of preparation of a suspension of air or gas filled microbubbles comprising a film forming surfactant, a hydrophilic stabilizer and an aqueous liquid carrier, said method comprising the steps of:

dissolving the film forming surfactant and the hydrophilic stabilizer in an organic solvent;

freeze drying the solution to form a dry powder;

contacting the powder with air or another gas; and

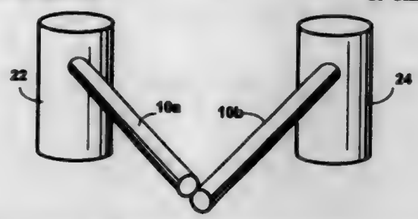
admixing said powder with the aqueous carrier.

5,597,550

APPARATUS AND METHOD FOR ADMINISTERING MINERALS

Buxing Mo, 1060 Kam Hwy. #383A, Pearl City, HI. 96782

Filed Dec. 9, 1994, Ser. No. 354,209
Int. Cl.[6] A61K 33/00
U.S. Cl. 424—40 10 Claims



1. A process for administering essential minerals to a human body through the skin, comprising:

mixing said minerals with graphite and a petrochemical binder to form a bar;

vaporizing said bar, thereby creating a supply of heated vapor containing said minerals;

directing said vapor into contact with said skin, whereby said vapor and said minerals are absorbed through said skin and into said human body.

5,597,551

LOW VOC HAIR SPRAY COMPOSITION

Edward G. Maiawer; Kolazi S. Narayanan, both of Wayne, N.J.; James P. Cullen, Bartonsville, Pa., and Colleen M. Rocafort, Lake Hiawatha, N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Jan. 5, 1995, Ser. No. 369,016
Int. Cl.[6] A61K 7/11;9/107
U.S. Cl. 424—47 8 Claims

1. A low volatile organic compound hair spray composition in the form of a stable, clear, single phase microemulsion in which the particles therein have a diameter of less than 1 micron, consisting essentially of by weight,

(a) a butyl half-ester of a copolymer of maleic anhydride and ethyl vinyl ether in an amount of about 2–10%, optionally neutralized up to 20 mole %,

(b) poly(methyl vinyl ether) as a surface active polymer in an amount of at least 0.75 to 1 part of (a);

(c) a secondary surfactant that is a polyethoxylated glyceryl fatty acid ester in an amount of at least 0.1%, and which has a hydrophilic-hydrophobic balance of greater than 10,

(d) ethanol in an amount of 20 to 50%, and

(e) water to 100%.

5,597,552

DENTINAL DESENSITIZING COMPOSITIONS

James K. Herrus, Jersey City, and Kenneth J. Markowitz, Fanwood, both of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Continuation-in-part of Ser. No. 811,811, Dec. 20, 1991, Pat. No. 5,270,031. This application Dec. 14, 1993, Ser. No. 167,558
Int. Cl.[6] A61K 7/16;31/315;33/30;31/78
U.S. Cl. 424—49 14 Claims

1. In a gel or paste dentrifice containing a desensitizing amount of a desensitizing agent, the improvement which consists essentially of the desensitizing agent being at least one water soluble or water swellable alkali metal or ammonium salt of an acrylic acid polymer containing about 0.005–0.4 mole equivalent of zinc and in which the dentrifice does not contain an additional desensitizing agent, said desensitizing amount being sufficient to reduce dentinal fluid flow.

5,597,553

EXPANDED PERLITE TOOTHPASTE

Gianni Baffelli, Tesserete, and Beat A. von Weissenfluh, Gentilino, both of Switzerland, assignors to Hawe Neos Dental Dr H.v. Weissenfluh AG, Bioggio, Switzerland

PCT No. PCT/CH94/00003, § 371 Date Sep. 13, 1994, § 102(e) Date Sep. 13, 1994, PCT Pub. No. WO94/15577, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 5, 1994, Ser. No. 302,758
Claims priority, application Switzerland, Jan. 14, 1993, 00 104/93
Int. Cl.[6] A61K 7/16
U.S. Cl. 424—49 10 Claims

1. A toothpaste having improved cleaning power, containing an aqueous liquid and an abrasive body, characterized in that the toothpaste contains as the sole abrasive body expanded perlite which is present in the form of sharp-edged particles which disintegrate by mechanical stress under the conditions of toothbrushing into smaller, also sharp-edged particles, and wherein said abrasive body is present in the toothpaste in an amount of from 1% to not more than 15% by weight.

5,597,554

ORAL HYGIENE SYSTEM

Eugene C. Wagner, Mount Kisco, N.Y., assignor to Dental Concepts Inc., Elmsford, N.Y.

Continuation-in-part of Ser. No. 58,565, Apr. 21, 1993, Pat. No. 5,302,374. This application Apr. 11, 1994, Ser. No. 225,725
Int. Cl.[6] A61K 9/16;9/18
U.S. Cl. 424—53 16 Claims

1. A method of cleansing tooth surfaces while reducing dentin abrasion which occurs during tooth brushing with a conventional abrasive-containing toothpaste, which comprises the steps of:

(a) providing a sufficient amount of a conventional toothpaste and containing from 20% to 50% by weight of an abrasive agent selected from the group consisting of hydrated silica, aluminum hydroxide, calcium carbonate, and dicalcium phosphate dihydrate;

(b) providing a sufficient amount of non-abrasive, homogeneously dispersed dentifrice comprising from 0.2% to 15% by weight of a peroxide compound, based upon the weight of total dentifrices;

(c) providing a toothbrush having bristles, the bristles having ends;

(d) placing the amount of conventional toothpaste from step (a) and the amount of dentrifice from step (b) in strips on the bristle ends, the strip being in other than side by side relationship;

(e) admixing the conventional toothpaste from step (a) with the dentifrice from step (b) to accelerate the release of oxygen from the dentifrice; and

(f) brushing tooth surfaces with the admixture from step (e).

5,597,555

FATTY ALKOXYLATE ESTERS OF ALIPHATIC AND AROMATIC DICARBOXYLIC ACIDS

Abel G. Pereira, Belleville; Kevin F. Gallagher, Middletown; Phillip G. Abend, Fort Lee, and John C. Carson, Jr., Highland Park, all of N.J., assignors to Croda, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 862,874, Apr. 2, 1992, Pat. No. 5,302,377. This application Apr. 12, 1994, Ser. No. 226,638
Int. Cl.[6] A61K 7/42
U.S. Cl. 424—59 14 Claims

1. A fatty alkoxylate ester consisting of a diester of an aliphatic or aromatic dicarboxylic acid, formed by reacting said acid with a stoichiometric excess of one or more polyalkoxylated fatty alcohols, the fatty moieties of which contain from 14 to 22 carbon atoms.

5,597,556

COLORED BICARBONATE CONTAINING SOLID COMPOSITION

Bhalchandra Megbe, Edison; Makarand Shevade, Plainsboro; Radhakrishna Kaout, Bellemead, and Elizabeth Lian, North Arlington, all of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Apr. 20, 1995, Ser. No. 425,926
Int. Cl.[6] A61K 7/32
U.S. Cl. 424—65 35 Claims

1. A colored, soap-gelled composition, comprising: an alcohol; a soap in an amount effective to gel the composition; an alkali metal bicarbonate; and an inorganic pigment.

5,597,557

COLORANT COMPOSITIONS AND PROCESSES

Kanta Kumar, Maplewood; Robert A. Davis, Cottage Grove; Sheila M. Nichols, Richfield, and Howard J. Buttery, Newport, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 145,492, Oct. 29, 1993, Pat. No. 5,411,802. This application May 1, 1995, Ser. No. 431,771

Int. Cl.[6] A61K *7/06*; C04B *14/00*

U.S. Cl. 424—70.17 9 Claims

1. A washable hair colorant composition comprising solid colored particles made in accordance with a process comprising

a) preparing a reaction solution in water comprising

i) formaldehyde,

ii) urea,

iii) a cyclic polyamine functional triazine compound, and

iv) acid to form a reaction solution having only a water phase and a polymer phase and

b) heating said reaction solution under high shear mixing to polymerize the reactive components of said reaction solution, thereby forming particles having a mean particle size between 1 and 100 microns.

5,597,558

USE OF EXTRACTS OF FILAMENTOUS BACTERIA AS COSMETIC AGENTS TO COMBAT AGEING OF THE SKIN

Lucien Aubert, Cap d'Ail, and Richard Martin, Vouvray, both of France, assignors to L'Oreal, Paris, France

Filed May 9, 1995, Ser. No. 437,546

Claims priority, application France, May 10, 1994, 94 05741

Int. Cl.[6] A61K *7/06*; *7/48*

U.S. Cl. 424—70.1 7 Claims

1. A cosmetic treatment process to combat ageing of the skin comprising applying an extract of at least one non-photosynthetic and non-fruiting filamentous bacterium of the order Beggiatoales to the skin or scalp of a person in need of at least one of: enhancing the elasticity and tonicity of the skin, reducing the number and length of wrinkles of the skin, reducing the thinning of the skin due to ageing, stimulating the proliferation of fibroblasts of human skin, stimulating melanocytes, reducing greying of the hair, delaying greying of the hair, or increasing skin respiration.

5,597,559

OPHTHALMIC FORMULATION

Orest Olejnik, Trabuco Canyon, Calif., and Fred W. Wendel, Asheboro, N.C., assignors to Ciba Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 152,119, Nov. 12, 1993, abandoned. This application Oct. 26, 1994, Ser. No. 329,888

Int. Cl.[6] A61K *31/765*; *9/08*

U.S. Cl. 424—78.04 24 Claims

1. An preservative-free ophthalmic composition, comprising:

(a) about 0.20 to 2.5 weight percent of hydroxyalkyl cellulosic; polymer and from about 0.5 to 2.0 weight percent polyalkylene glycol;

(b) a non-ionic tonicity adjusting agent selected from the group consisting of mannitol, sorbitol, dextrose, sucrose, urea, glycerol, and mixtures thereof, in amount sufficient to generate a tonicity of about 50 to 350 milliosmols per kilogram (mOsmol/kg);

(c) an ionic salt, selected from the group consisting of alkali metal halides, in an amount sufficient to approximate the salt concentration of the human tear fluid; and

(d) an antimicrobial in an amount sufficient to generate sufficient borate to maintain or reduce microbial concentrations for a period of 12 hours to 72 hours.

5,597,560

DICLOFENAC AND TOBRAMYCIN FORMULATIONS FOR OPHTHALMIC AND OTIC TOPICALUSE

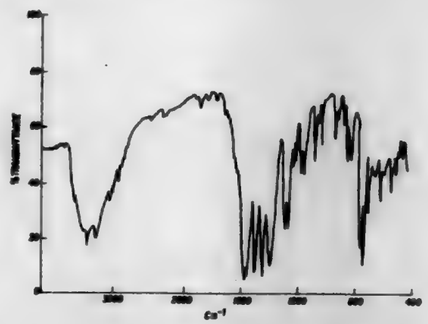
Michael V. W. Bergamini, Alella; José A. Vallet Mas, Barcelona; Gemma T. Cabello, El Masnou, and Antonio L. Cabrera, Barcelona, all of Spain, assignors to Laboratorios Cusi, S.A., Spain

Filed Apr. 10, 1995, Ser. No. 419,387

Claims priority, application Spain, May 17, 1994, 9401078

Int. Cl.[6] A61K *31/74*

U.S. Cl. 424—78.04 96 Claims



1. An ophthalmologically or otically effective solution comprising:

between about 0.001% to about 0.20% diclofenac,

between about 0.001% to about 1.0% tobramycin,

between 0.25% to about 8.5% of a pharmaceutically acceptable solubility agent, said solubility agent being present in an effective amount which prevents the formation of a precipitate, and

sufficient solvent to form said ophthalmologically or otically effective solution with a pharmaceutically acceptable shelf-life wherein the pH of said solution is compatible with the eye and wherein the amount of tobramycin and diclofenac is sufficient to treat the eye or ear of a patient in need of treatment.

5,597,561

ADHERENT DISINFECTING COMPOSITIONS AND METHODS OF USE IN SKIN DISINFECTION

Robert D. Kross, Bellmore, N.Y., assignor to Alcide Corporation, Redmond, Wash.

Filed Dec. 14, 1994, Ser. No. 356,867

Int. Cl.[6] A61K *31/74*; *33/14*

U.S. Cl. 424—78.07 26 Claims

1. A compoeition for disinfecting a substrate and providing a protective anti-microbial barrier, comprising:

(a) a protic acid;

(b) a metal chlorite; and

(c) a gelling agent in an amount ranging from about 0.25% to about 3.0% by weight of the composition, wherein the gelling agent comprises 25% to 100% by weight polyacrylamide.

5,597,562

ORAL DOSAGE FORM OF BIOLOGICALLY ACTIVE PROTEINS

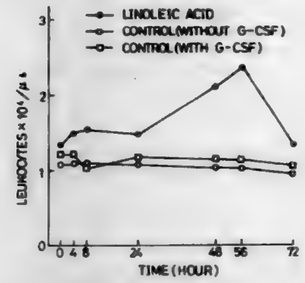
Hideaki Nomura, Takasaki, and Kazutoshi Maruyama, Machashi, both of Japan, assignors to Kirin-Amgen, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 994,076, Dec. 17, 1992, abandoned, which is a continuation of Ser. No. 709,622, Jun. 3, 1991, abandoned. This application Dec. 15, 1993, Ser. No. 167,721

Claims priority, application Japan, Jun. 1, 1990, 2-145231; May 24, 1991, 3-149737

Int. Cl.[6] A61K *45/05*; *9/64*; *38/19*; *38/22*

U.S. Cl. 424—85.1 13 Claims



1. An oral dosage form comprising the components:

(a) granulocyte colony stimulating factor or erythropoietin;

(b) surfactant(s);

(c) fatty acid(s); and

(d) enteric material,

wherein said components (a), (b) and (c) are mixed in liquid phase and lyophilized prior to combination with component (d).

5,597,563

METHOD INDUCTION OF ANTIGEN-SPECIFIC IMMUNE TOLERANCE

William E. Beschorner, 4310 Farnfield Ct., Baldwin, Md. 21013-9638

Continuation of Ser. No. 940,640, Sep. 4, 1992, abandoned. This application Dec. 18, 1995, Ser. No. 573,648

Int. Cl.[6] A61K *39/00*; *38/22*; *35/28*

U.S. Cl. 424—93.7 13 Claims

1. A method of inducing at least partial tolerance to an alloantigen comprising:

administering to a recipient animal a dendritic cell depleting amount of an immunosuppresive agent, for a time and under conditions sufficient for depletion of the dendritic cells in the recipient's thymic medulla;

administering to the recipient animal a tolerogeaic, amount of an intraspecies deadritic cell population in combination with the antigen, substantially contemporaneously with the immunosuppressive agent wherein the intraspecies dendritic cell population is enriched with intraspecies dendritic cells tolerogenic for the antigen and the administering is under conditions sufficient to repopulate the recipient's dendritic cell-depleted thymic medulla; and

administering a thymic regeneration agent for a time and under conditions sufficient to induce recruitment of dendritic cells to the thymus, wherein the thymic regenerating agent is administered following the immunosuppressive agent and simultaneously or following administration of dendritic cells.

5,597,564

METHOD OF ADMINISTERING A MICROGRANULAR PREPARATION TO THE INTESTINAL REGION OF ANIMALS

Thomas K. S. Ying, South Belgrave, Australia, assignor to Enzacor Properties Limited, St. Heller, United Kingdom

Continuation-in-part of Ser. No. 316,354, Feb. 27, 1989, Pat. No. 5,356,625. This application Jul. 26, 1994, Ser. No. 280,828

Claims priority, application Australia, Aug. 28, 1986, PH 7715

Int. Cl.[6] A61K *38/54*; *38/48*; *9/50*; *33/00*

U.S. Cl. 424—94.65 10 Claims

1. A method for the prevention and treatment of diarrhea in a human or non-human animal subject, comprising orally administering to a subject in need thereof a therapeutically effective amount of bromelin.

5,597,565

ANTIBIOTICS FOR BIOLOGICAL CONTROL OF POST HARVEST DISEASES

Carlo Leifert, Aberdeen; Harold A. S. Epton, Cheadle, and David C. Sigee, Sale, all of United Kingdom, assignors to The Secretary of State for Ministry of Agriculture, Fisheries & Food in her Britannic Majesty's Government of Great Britain and Northern Ireland, United Kingdom

Division of Ser. No. 307,686, Nov. 1, 1994. This application Mar. 27, 1995, Ser. No. 411,280

Claims priority, application United Kingdom, Mar. 26, 1992, 9206645; WIPO, Mar. 26, 1992, GB93/00604

Int. Cl.[6] A61K *35/00*

U.S. Cl. 424—115 8 Claims

1. A process of producing an antibiotic comprising the steps of:

(a) providing a source of bacteria isolates having all the identifying characteristics of an isolate selected from the group consisting of *Bacillus subtilis* NCIMB 40489 and *Bacillus pumulis* NCIMB 40491, said isolate having the characteristic of inhibiting growth of *Alternaria brassicola* or *Botrytis cineria* or both on cabbage leaves at temperature of about 20° C.;

(b) culturing said bacteria isolates in a broth of homogenized cabbage leaves and water in a concentration of between 5 g and 100 g leaves per liter until a sufficient amount of the antibiotic has been accumulated; and thereafter

(c) recovering the antibiotic so produced.

7. An antibiotic composition produced by the process of claim 1 containing cell free antibiotics cultured from bacteria isolates having all the identifying characteristics of an isolate selected from the group consisting of *Bacillus pumulis* NCIMB 40489 and *Bacillus subtilis* NCMB 40491, said isolates sharing the characteristic of inhibiting growth of *Alternaria brassicola* or *Botrytis cineriea* or both on cabbage leaves at temperature of about 20° C.

5,597,566

VIBRATION DAMPING UNIVERSAL JOINT

Timothy A. Huls, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 6, 1992, Ser. No. 879,047

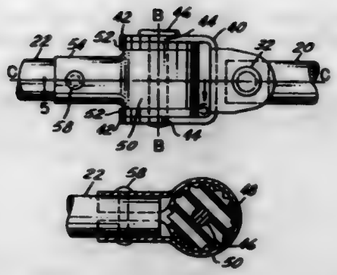
Int. Cl.[6] F16D *3/16*; *3/00*

U.S. Cl. 464—119 5 Claims

5. A vibration damping universal joint for providing three degree of freedom orientation and limiting rotational deflection between a first rod portion connected to a manual transmission of an automotive vehicle and a second rod portion connected to a gear shift lever in said vehicle, said universal joint comprising:

a first clevis including a pair of flanges, each flange having an aperture for receiving a first pin therethrough for connecting said first rod portion thereto, said first pin defining a first axis of rotation perpendicular to the elongation axis of said first rod portion;

a second clevis formed integrally with said first clevis, said second clevis including a pair of flanges, each flange having



an aperture for receiving a second pin therethrough for connecting said second rod portion thereto, said second pin defining a second axis of rotation mutually perpendicular to said first axis and the elongation axis of said second rod portion; and

a pair of disc-shaped bushings interposed between an inner surface of each of said flanges of said second clevis and an outer surface of said second rod portion, said disc-shaped bushings being operative to provide axial deflection of said second rod portion relative to said second clevis and to limit rotational deflection between said first and second rod portions while providing for offset alignment about three mutually perpendicular axes of a manual transmission and a gear shift lever disposed in said vehicle.

5,597,567

BLOCKING CELL ADHESION MOLECULES AND TREATING ANIMALS WITH OCULAR INFLAMMATION

Scott M. Whitcup, Rockville; Chi-Chao Chan, Kensington, and Robert B. Nussenblatt, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 822,042, Jan. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 770,026, Oct. 4, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 192,198

Int. Cl.[6] A61K *39/00; C07K 16/28*

U.S. Cl. 424—143.1 **12 Claims**

1. A method of treating an animal with acute ocular inflammation comprising administering to said animal an amount of an antibody having binding affinity for a cell adhesion molecule selected from the group consisting of ELAM-1, Mac-1, ICAM-1 and LFA-1 effective to bind the cell adhesion molecule such that said antibody binds the cell adhesion molecule and said treatment is effected.

5,597,568

Patent Not Issued For This Number

5,597,569

BRYODIN 2 A RIBOSOME-INACTIVATING PROTEIN ISOLATED FROM THE PLANT *BRYONIA DIOICA*

Clay B. Siegall, Edmonds; Susan L. Gawlak, Bellevue, and Hans Marquardt, Mercer Island, all of Wash., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 141,891, Oct. 25, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 324,301

Int. Cl.[6] A61K *39/44; C07K 14/415;16/46*

U.S. Cl. 424—183.1 **41 Claims**

1. A ribosome-inactivating protein comprising a single chain protein having a molecular weight of about 27,000 daltons by polyacrylamide gel electrophoresis under reducing and non-reducing conditions, an EC_{50} of about 0.017 mM in a rabbit reticulocyte lysate system, an LD_{50} in mice of greater than 10 mg/kg when administered intravenously and about 8 mg/kg when administered intraperitoneally, and further comprising an amino terminal amino acid residue sequence comprises the following contiguous amino acid sequence:

Val Asp Ile Asn Phe Ser Leu Ile Gly Ala Thr Gly Ala Thr Tyr Lys Thr Phe Ile Arg Asn Leu Arg Thr Thr Leu Thr Val Gly Thr Pro Arg (SEQ ID #1), and

(a) Leu Pro Tyr Gly Gly Asn Tyr Asp Gly Leu Glu Thr Ala Ala Gly Arg (SEQ ID #2);

Glu Asn Ile Glu Leu Gly Phe Ser Glu Ile Ser Ser Ala Ile Gly Asn Met Phe Arg (SEQ ID #3);

(c) Phe Arg His Asn Pro Gly Thr Ser Val Pro Arg Ala Phe Ile Val Ile Ile Gln Thr Val Ser Glu Ala Ala Arg Phe Lys Tyr Ile Glu Gln Arg (SEQ ID #4);

(d) Tyr Ile Glu Gln Arg Val Ser Glu Asn Val Gly Thr Lys (SEQ ID #5);

(e) Phe Lys Pro Asp Pro Ala Phe Leu Ser Leu Gln Asn Ala Trp Gly Ser Leu Ser Glu Gln Ile Gln Ile Ala Gln Thr Arg Gly Gly Glu Phe Ala Arg Pro Val Glu Leu Arg Thr (SEQ ID #6); or

(f) Leu Arg Thr Val Ser Asn Thr Pro Thr Phe Val Thr Asn Val Asn (SEQ ID #7), as determined by automated amino acid sequencing.

5,597,570

PROTEIN RECOGNIZED BY ANTIBODIES RAISED AGAINST NATIVE P28 OF SCHISTOSOMA MANSONI

Paul Sondermeyer, Strasbourg; Jean-Marc Balloul, Lille; Raymond Pierce, Seclin; Jean-Marie Grzych, Marcq en Baroeul; Marie-Paule Kieny; Gérard Loison, both of Strasbourg; André Capron, Phalempin, and Jean-Pierre Lecocq, Reichstett, all of France, assignors to Transgene S.A., France

Continuation of Ser. No. 819,600, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 663,805, Mar. 4, 1991, abandoned, which is a continuation of Ser. No. 449,449, Dec. 12, 1989, abandoned, which is a continuation of Ser. No. 88,615, Aug. 24, 1987, abandoned. This application Oct. 21, 1992, Ser. No. 964,471

Claims priority, application France, Aug. 22, 1986, 8611986; Apr. 22, 1987, 8705691; Apr. 22, 1987, 8705692

Int. Cl.[6] A61K *39/002; C07K 14/00; C12N 9/10*

U.S. Cl. 424—191.1 **4 Claims**

1. A substantially purified protein having an amino acid sequence substantially as shown in FIGS. 1*a*–1*c*.

5,597,571

EIMERIA ANTIGENIC COMPOSITION WHICH ELICITS ANTIBODIES AGAINST AVIAN COCCIDIOSIS

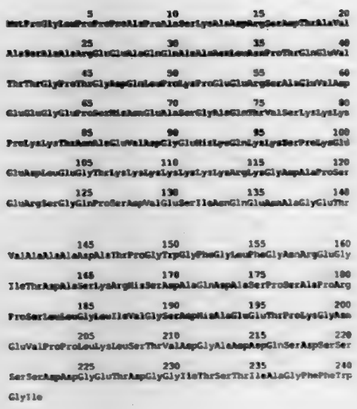
James W. Jacobson, Rockville; Robert L. Strausberg, Silver Spring; Susan D. Wilson, Rockville; Sharon H. Pope, Gaithersburg; Susan L. Strausberg, Silver Spring; Michael D. Ruff, Bowie; Patricia C. Augustine, Laurel, and Harry D. Danforth, Severn, all of Md., assignors to British Technology Group USA Inc., Gulph Mills, Pa.

Division of Ser. No. 148,432, Nov. 8, 1993, Pat. No. 5,482,709, which is a division of Ser. No. 581,693, Sep. 12, 1990, Pat. No. 5,273,901, which is a continuation-in-part of Ser. No. 215,162, Jul. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 746,520, Jun. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 627,811, Jul. 5, 1984, abandoned. This application Jun. 7, 1995, Ser. No. 484,387

Int. Cl.[6] A61K *39/012; C07K 14/455*

U.S. Cl. 424—191.1 **2 Claims**

1. An antigenic composition capable of eliciting an antibody response against arian coccidiosis, wherein said antigenic composition comprises an isolated polypeptide having an amine acid



sequence selected from the group consisting of the amine acid sequences shown in FIG. 2A–2B, FIG. 8, and FIG. 10.

5,597,572

METHOD OF PRODUCING *NEISSERIA MENINGITIDIS* B VACCINE, AND VACCINE PRODUCED BY METHOD

Concepción C. Huergo, Havana; Victoriano G. Sierra González, Villa Santa Clara; María M. Gutiérrez Vazquez, Bejucal; Gonzalo Blaet Jorrin, Havana; Luis G. García Imia, Havana; Gisela de la Caridad Puentes Rizo, Havana; María del Carmen Sampedro Herrera, Havana; Franklin Sotolongo Padrón, Havana; Eloisa X. Le Riverend Morales, Havana, and Manuel A. Galguera Domínguez, Santa Clara, all of Cuba, assignors to Centro Nacional De Biopreparados, Playa, Cuba

Continuation of Ser. No. 767,341, Sep. 27, 1991, abandoned, which is a continuation of Ser. No. 225,859, Jul. 29, 1988, abandoned. This application Nov. 12, 1993, Ser. No. 152,938

Claims priority, application Cuba, Jul. 30, 1987, 125/87

Int. Cl.[6] A61K *39/095;39/385;* **A23J** *3/20;3/34*

U.S. Cl. 424—197.91 **11 Claims**

1. A method for producing a vaccine against *Neisseria meningitidis* B pathogens comprising the steps performed in the following order of:

a) extracting the vesicles of the outer membrane and protein antigenic complex weighing from 65 to 95 kD from live, active pathogens of group B serotypes with a treatment selected from the group consisting of:

(i) treating with detergent,

(ii) treating with detergent and ultrasound, and

(iii) treating with detergent, enzymatic solution and ultrasound to create an extract;

b) treating said extract to eliminate nucleic acids to create a treated extract;

c) purifying said treated extract to separate as a fraction the said vesicles from the protein antigenic complex by a dissociative treatment with detergent solution, ultrasound, and column chromatography to produce purified protein antigenic complex;

d) further purifying said purified protein antigenic complex by a chromatographic step from the group consisting of high performance liquid chromatography, affinity chromatography with monoclonal antibodies, hydrophobic chromatography, and ionic exchange chromatography, and combinations thereof, to obtain a further purified protein antigenic complex;

e) combining said further purified protein antigenic complex with a fraction containing the vesicles by ultrasound treatment to anchor said further purified protein antigenic complex and vesicles to each other in an effective mount in a proportion of 15%±3% by weight to create an anchored protein complex; and,

f) adding capsular polysaccharide and adjuvant to anchored protein complex of step (e), wherein the adjuvant is selected from the group consisting of aluminum hydroxide, aluminum phosphate, and calcium phosphate; and recovering the resultant vaccine.

5,597,573

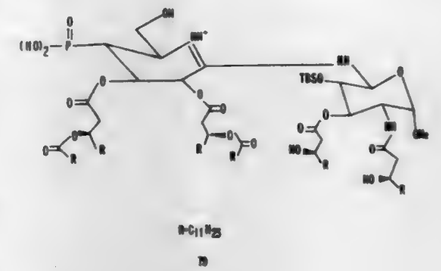
LIPID-A ANALOGS: NEW MONOSACCHARIDE AND DISACCHARIDE INTERMEDIATES FOR ELICITING THERAPEUTIC ANTIBODIES AND FOR ANTITUMOR AND ANTIVIRAL ACTIVITIES

Balreddy Kamireddy, Hockessin, Del.; Michael J. Darsley, Rockville, Md.; David M. Simpson, Adelphi, Md., and Richard J. Massey, Rockville, Md., assignors to Igen, Inc., Gaithersburg, Md.

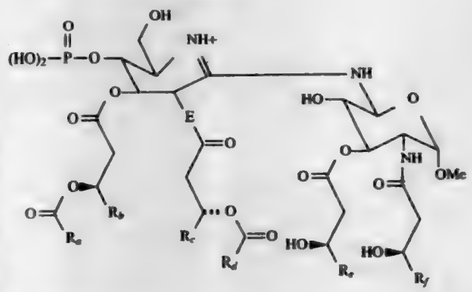
Continuation-in-part of Ser. No. 761,868, Sep. 3, 1991, and a continuation-in-part of Ser. No. 37,261, Mar. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 871,229, Apr. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 861,362, Mar. 27, 1992, abandoned. This application Mar. 14, 1995, Ser. No. 405,438

Int. Cl.[6] A61K *39/02;31/70;* **C07H** *17/02*

U.S. Cl. 424—234.1 **6 Claims**



1. A compound of the formula



wherein each of R_a, R_b, R_c, R_d, and R_e and R_f independent of each other, is a branched or linear, substituted or unsubstituted C_{1-11} alkyl, alkene or alkyne group, and E is NH or O.

5,597,574

UV PROTECTIVE AQUEOUS EMULSION AND EMULSIFIABLE SOLIDS FOR COSMETIC AND AGRICHEMICAL FORMULATIONS

Kolazi S. Narayanan, Palisades Park; Robert M. Iannicello, Oak Ridge, and David W. Pritchard, Kinnelon, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 975,811, Nov. 13, 1992, and Ser. No. 17,093, Feb. 12, 1993, Pat. No. 5,425,955. This application Sep. 28, 1993, Ser. No. 128,511

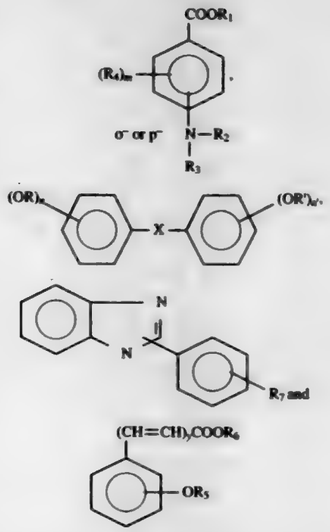
Int. Cl.[6] A61K *7/44;47/32;* A01N *25/24;25/14*

U.S. Cl. 424—401 18 Claims

1. A stable, film-forming concentrate composition which is resistant to deterioration by UV exposure containing

(a) from about 60 to about 99 wt. % of a water insoluble, film-forming mixture comprising between about 12 and about 60 wt. % of a C_8 to C_{14} alkyl C_4 to C_6 lactam or a mixture thereof; between about 8 and about 15 wt. % of a Na, Ca or K salt of an organic surface active sulfate or sulfonate; between about 5 and about 30 wt. % of a water insoluble C_{10} to C_{20} α-olefin/N-vinyl C_4 to C_6 lactam copolymer; between about 0 and about 20 wt. % of N-methylpyrrolidone and between about 15 and about 40 wt. % water and

(b) from about 1 to about 40 wt. % of a water insoluble aromatic compound having extended conjugation and UV absorption in the range of 260–400 nm selected from the group consisting of



or a mixture of one or more of the above aromatic compounds wherein R and R' are individually hydrogen or C_1 to C_4 alkyl with the proviso that at least one of R and R' is hydrogen in the o- or p-position of the aromatic ring and another of R and R' is C_1 to C_4 alkyl also in the o- or p- position of the aromatic ring;

R_1 is hydrogen or linear, branched or cyclic C_1 to C_{18} alkyl or the corresponding metal or amine salt of —$COOR_1$;

R_2 and R_3 are individually C_1 to C_4 alkyl;

R_4 is hydrogen or C_1 to C_4 alkyl or alkoxy;

R_5 is hydrogen or C_1 to C_4 alkyl and OR_5 is in the o- or p-position of the aromatic ring;

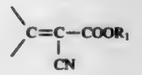
R_6 is C_5 to C_{10} alkyl or an organic salt of —$COOR_6$;

R_7 is a sulfonic acid group or a metal or amine salt thereof;

m has a value of from 0 to 3;

n and n' each have a value of from 0 to 2;

X is —CO— when n or n' has a positive value or is



when the sum of n and n' is 0 to 2 and y has a value of from 0 to 1.

5,597,575

COMPOSITION FOR STIMULATING AND INDUCING HAIR GROWTH

Richard Breitbarth, 10 Old Bloomfield Ave. PO Box 682, Pinebrook, N.J. 07058

Filed Jun. 6, 1994, Ser. No. 254,568

Int. Cl.[6] A61K *7/06;9/10;9/14;9/18*

U.S. Cl. 424—401 16 Claims

1. A composition for stimulating and inducing hair growth which comprises a member selected from the group consisting of vitamin D_3, the nitro-benzoic acid esters of vitamin D_3, and the biologically active metabolites of vitamin D_3 affixed to microparticulate non-metallic particles having a particle size of between 3 and 10 μm in the form of a microdispersion thereof in a pharmaceutically acceptable vehicle wherein said microparticulate particles exhibit a negative charge about that of an aqueous solution of silicas due to the presence of charged ionic groups.

5,597,576

OIL-BASED TRANSPARENT GELS

Calogero Genova, Vizzolo Predabissi; Francesco Busnì, Milan, and Sandra Guarnerio, Cusano Milanino, all of Italy, assignors to Enichem Augusta Industriale S.r.l., Milan, Italy

Filed Jul. 13, 1994, Ser. No. 274,447

Claims priority, application Italy, Jul. 21, 1993, MI93A1610

Int. Cl.[6] A61K *7/00*

U.S. Cl. 424—401 11 Claims

1. A transparent lipogel formulation for cosmetic and pharmaceutical use, characterised by a viscosity of between 4.8 and 68 Pa.s and consisting essentially of:

A) an ester selected from the group consisting of:
—tartaric acid diester of C_{12}–C_{13} single-branch fatty alcohols in a quantity of between 46 and 95 wt %, and
—malic acid diester of C_{12}–C_{13} single-branch fatty alcohols in a quantity of between 87 and 95 wt %;

B) an oil or ester selected from the group consisting of:
—2-ethyl-hexanoic acid alkyl (C_{12}–C_{13} single-branch) ester,
—2-hydroxy-1,2,3-propanetricarboxylic acid alkyl (C_{12}–C_{13} single-branch) triester,
—white oil,
—jojoba oil,
—benzophenone-6
—ethylhexyl-p-methoxy-cinnamate, and
—sweet almond oil,
in a quantity of between 0 and 46 wt %;

C) hydrophilic or hydrophobic pyrogenic silica in a quantity of between 2.8 and 7.0 wt. %;

D) a polyalcohol selected from the group consisting of:
—polyethyleneglycol 200 (PEG),
—ethyleneglycol,
—1,2-propyleneglycol, and
—glycerin,
in a quantity of between 1 and 10 wt %, said components A), B), C) and D) being present in amounts that result in a transparent lipogel.

5,597,577

WATER HYDRATABLE GEL-FILLED TEXTILE WRAP

Paul R. Matheson, 7726 N. Buckboard Dr., Park City, Utah 84098

Filed Jun. 19, 1995, Ser. No. 492,398

Int. Cl.[6] A01N *25/34*

U.S. Cl. 424—402 7 Claims



1. A device for provision of cooling relief to the body during physical recreational/leisure activity comprising: a reusable, flexible, water-permeable envelope structured to release water therethrough to effect evaporative cooling, said water-permeable envelope containing a particulate, water-hydratable, resinous, gel-forming material providing releasable water for evaporative cooling.

5,597,578

TGF-β PROTEIN COMPOSITIONS FOR INHIBITION OF CELL PROLIFERATION

Dennis M. Brown; Edward Lack, both of Menlo Park, Calif.; Daniel R. Twardzik, Bainbridge Island, and Anthony F. Purchio, Seattle, both of Wash., assignors to Oncogen, Wash., and Matrix Pharmaceuticals, Calif.

Continuation of Ser. No. 852,828, Mar. 13, 1992, abandoned, which is a continuation of Ser. No. 627,602, Dec. 11, 1990, abandoned, which is a continuation of Ser. No. 405,534, Sep. 11, 1989, abandoned. This application Apr. 28, 1994, Ser. No. 234,589

Int. Cl.[6] A61K *9/00;9/10;38/18;38/39*

U.S. Cl. 424—422 14 Claims

1. In a method for inhibiting proliferation of cells sensitive to TGF-β1 by contacting said cells with an antiproliferative composition, the improvement which comprises:

an antiproliferative composition consisting essentially of an amorphous, viscous, injectable proteinaceous matrix comprising a uniform dispersion of collagen fibrils in a physiologically acceptable aqueous medium and wherein said matrix contains TGF-β1 in an amount sufficient, when released from said matrix, to inhibit proliferation of said cells.

5,597,579

BLENDS OF ABSORBABLE POLYOXAAMIDES

Rao S. Bezwada, Whitehouse Station, and Dennis D. Jamiolkowski, Long Valley, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 554,614, Nov. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 399,308, Mar. 6, 1995, Pat. No. 5,464,929. This application Mar. 5, 1996, Ser. No. 611,532

Int. Cl.[6] A61F *2/00*

U.S. Cl. 424—426 26 Claims

1. An aliphatic polyoxaamides comprising a first divalent repeating unit of formula I:

$$[X—C(O)—C(R_1)(R_2)—O—(R_3)—O—C(R_1)(R_2)—C(O)—] \quad \text{I}$$

and a second repeating unit selected from the group of formulas consisting of:

$$[—Y—R_{17}—]_P \quad \text{II}$$

$$[—O—R_5—C(O)—]_P \quad \text{III}$$

$$([—O—R_6—C(O)]_P—O—)_LG \quad \text{XI}$$

and combinations thereof, wherein X and Y are selected from the group consisting of —O— and —N(R)—, provided that X and Y cannot both be —O—; R, R_1 and R_2 are independently selected from the group consisting of hydrogen and an alkyl group containing 1 to 8 carbon atoms; R_3 is selected from the group consisting of an alkylene unit and an oxyalkylene group of the following formula:

$$—[(CH_2)_C—O—]_D—(CH_2)_E— \quad \text{IV}$$

wherein C is an integer in the range of from 2 to about 5, D is an integer in the range of from 0 to about 2,000, and E is an integer in the range of from about 2 to about 5, except when D is zero, in which case E will be an integer in the range of from 2 to 12; R_{17} is an alkylene unit containing from 2 to 8 carbon atoms which may have substituted therein an internal ether oxygen, an internal —$N(R_{18})$— or an internal —C(O)—$N(R_{21})$—; T is an integer in the range of from 1 to 2,000; R_{18} and R_{21} are independently selected from the group consisting of hydrogen and an alkyl group containing 1 to 8 carbon atoms; R_5 and R_6 are selected from the group consisting of —$C(R_8)(R_7)$—, —$(CH_2)_3$—O—, —CH_2—CH_2—O—CH_2—, —CR_8H—CH_2—, —$(CH_2)_4$—, —$(CH_2)_P$—O—C(O)— and —$(CH_2)_K$—C(O)—CH_2—; R_8 and R_7 are independently selected from the group consisting of hydrogen and an alkyl containing from 1 to 8 carbon atoms; R_6 is selected from the group consisting of hydrogen and methyl; F and K are independently selected integer in the range of from 2 to 6; B is an integer in the range of from 1 to a such that the number average molecular weight of formula III is less than about 200,000; P is an integer in the range of from 1 to m such that the number average molecular weight of formula XI is less than about 1,000,000; G represents the residue minus from 1 to L hydrogen atoms from the hydroxyl groups of an alcohol previously containing from 1 to about 200 hydroxyl groups; and L is an integer from about 1 to about 200.

5,597,580

METHOD AND APPARATUS FOR IMPROVING THE APPEARANCE OF SPIDER VEINS

Ernest H. Sickler, Jr., Elizabeth, N.J.

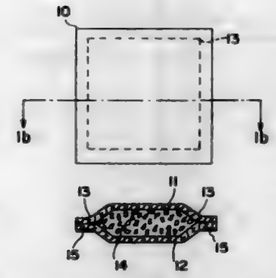
Filed May 3, 1994, Ser. No. 237,219

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—443 6 Claims

1. A method for improving the appearance of spider veins in human extremities comprising the steps of:

lowering relative to the heart the area of the extremity to be treated; and



applying topically to the area of the extremity to be treated an effective amount of loose tea contained in a pouch, said tea consisting essentially of tannin, caffeine, and essential oils;

wherein the step of applying tea is practiced by alternately patting and rubbing the area of the extremity to be treated for about 15 to 30 minutes and the step of rubbing the area to be treated is practiced by rubbing the tea from the area of the extremity to be treated toward a nearby fatty portion.

5,597,581

CHITOSAN FOIL FOR WOUND SEALING AND PROCESS FOR ITS PREPARATION

Hans-Jürgen Kaessmann, Hamburg, and Karl W. An Haak, Am Hedreich 25, D-44225 Dortmund, both of Germany, assignors to Karl W. An Haak, Dortmund, Germany

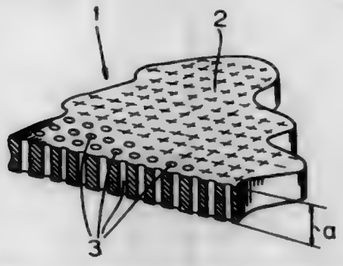
PCT No. PCT/EP94/02104, § 371 Date Apr. 14, 1995, § 102(e) Date Apr. 14, 1995, PCT Pub. No. WO95/01808, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 28, 1994, Ser. No. 397,219

Claims priority, application Germany, Jul. 9, 1993, 43 22 956.5

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—449 **5 Claims**



1. An oxygen-permeable, breathable foil through which wound secretions cannot pass, for sealing a wound to promote exudative healing of said wound, said oxygen-permeable, breathable foil capable of sealing wound secretions and at the same time permitting gas exchange between said wound and a surface of said oxygen-permeable, breathable foil, which consists essentially of:

a dried porous film consisting of:

(a) chitosan;

(b) glycerine as a suppleness promoter; and

(c) an agent for promoting wound healing which is liberated from the dried porous film by enzymatic decomposition; wherein the oxygen-permeable, breathable foil has a thickness of at least 200 microns and a surface provided with breathing openings of a maximum diameter of 100 microns capable of promoting gas exchange therethrough between said wound and said surface of said oxygen-permeable, breathable foil thereby permitting the wound to heal and capable of sealing the wound to prevent escape of wound secretions.

5,597,582

ORAL GEL CAPSULE FORMULATION OF 1,2,4-BENZOTRIAZINE OXIDES

Stephen Brown, Northumberland, and Ross Blundell, Newcastle upon Tyne, both of England, assignors to Sanofi, Paris Cedex, France

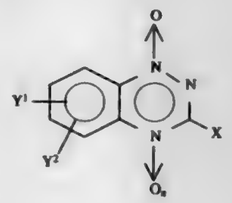
Filed Sep. 12, 1995, Ser. No. 527,233

Int. Cl.[6] A61K *9/48*

U.S. Cl. 424—456 **10 Claims**

1. A gelatin capsule comprising a gelatin shell having enclosed therein based on the total weight of content of from about 200 to about 2000 mg:

of from about 5 to about 50% w/w of an anticancer compound of the formula



wherein

X is H; hydrocarbyl (1–4C); hydrocarbyl (1–4C) substituted with OH, NH_2, NHR or NRR; halogen; OH; alkoxy (1–4C); NH_2; NHR or NRR; wherein each R is independently selected from lower alkyl (1–4C) and lower acyl (1–4C) and lower alkyl (1–4C) and lower acyl (1–4C) substituted with OH, NH_2, alkyl (1–4C) secondary and dialkyl (1–4C) tertiary amino groups, alkoxy (1–4C) or halogen; and when X is NRR, both R's taken together directly or through a bridge oxygen to form a morpholino ring, pyrrolidino ring or piperidino ring;

n is 0 or 1; and

Y^1 and Y^2 are independently either H; nitro; halogen; hydrocarbyl (1–14C) including cyclic and unsaturated hydrocarbyl, optionally substituted with 1 or 2 substituents selected from the group consisting of halogen, hydroxy, epoxy, alkoxy (1–4C), alkylthio (1–4C), primary amino (NH_2), alkyl (1–4C) secondary amino, dialkyl (1–4C) tertiary amino, dialkyl (1–4C) tertiary amino where the two alkyls are linked together to produce a morpholino, pyrrolidino or piperidino, acyloxy (1–4C), acylamido (1–4C) and thio analogs thereof, acetylaminoalkyl (1–4C), carboxy, alkoxycarbonyl (1–4C), carbamyl, alkylcarbamyl (1–4C), alkylsulfonyl (1–4C) or alkylphosphonyl (1–4C), wherein the hydrocarbyl can optionally be interrupted by a single ether (—O—) linkage; or wherein Y^1 and Y^2 are indepeadently either morpholino, pyrrolidino, piperidino, NH_2, NHR', NR'R'O(CO)R', NH(CO)R', O(SO)R', or O(POR')R' in which R' is a hydrocarbyl (1–4C) which may be substituted with OH, NH_2, alkyl (1–4C) secondary amino, dialkyl (1–4C) tertiary amino, morpholino, pyrrolidino, piperidino, alkoxy (1–4C), or halogen substituents, or pharmacologically acceptable salt of said compound;

of from about 50 to about 95% w/w of an oily excipient selected from the group consisting of soybean oil and fractionated coconut oil;

of from about 0 to about 30% w/w of viscosity modifier; and

of from about 0 to about 10% w/w of a pharmaceutically acceptable surface active agent.

5,597,583

PHARMACEUTICAL COMPOSITION

Timothy J. Grattan, Guildford, England, assignor to Smith-Kline Beecham p.l.c., Brentford, England

PCT No. PCT/GB93/00782, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO93/20850, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 2, 1993, Ser. No. 318,739

Claims priority, application United Kingdom, Apr. 10, 1992, 9207990

Int. Cl.[6] A61K *9/14;9/20*

U.S. Cl. 424—464 **6 Claims**

1. A method for oral dosing of ibuprofen comprising administering to a patient an ibuprofen-β-cyclodextrin complex in a solution comprising hot water, wherein the ibuprofen β-cyclodextrin complex delivers a therapeutic dosage level of 100 to 600 mg ibuprofen in solution as a single dosage unit, in a pH range of 2.5 to 7.0, and wherein the β-cyclodextrin of the ibuprofen-β-cyclodextrin complex is derived from β-cyclodextrin undecahydrate.

5,597,584

METHOD OF CONTROLLING RELEASE OF AN ACTIVE OR DRUG FROM A SILICONE RUBBER MATRIX

Padmanabh P. Bhatt, and Victor A. Raul, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 261,790, Jun. 20, 1994, abandoned. This application Aug. 2, 1995, Ser. No. 510,249

Int. Cl.[6] A61K *9/14*

U.S. Cl. 424—486 **25 Claims**

1. A method of controlling release of a drug from a silicone rubber matrix having a crosslink density comprising

(A) loading a drug into a liquid silicone rubber comprising

(a) a polydiorganosiloxane containing at least two alkenyl radicals per molecule;

(b) a organohydrogensiloxane containing at least two silicon-bonded hydrogen atoms per molecule; and

(c) a hydrosilylating catalyst in an amount sufficient to promote curing of the liquid silicone rubber;

wherein the organohydrogensiloxane (b) is present in an amount sufficient to provide a molar ratio of alkenyl radicals in polyorganosiloxane (a) to silicon-bonded hydrogen atoms in organohydrogensiloxane (b) of from 0.5:1 to 20:1;

(B) curing the liquid silicone rubber while being molded into a shape;

(C) thereafter releasing the drug at a rate;

wherein the rate of release is controlled by changing the crosslink density of the silicone rubber matrix.

5,597,585

VITAMIN/MINERAL COMPOSITION

Andrew H. Williams, and Eric A. Williams, both of 3608 Heathwood Ct., Jacksonville, Fla. 32277

Filed Dec. 26, 1995, Ser. No. 578,284

Int. Cl.[6] A61K *35/28;35/26;33/32;33/24;31/70;31/34;31/355;31/07*

U.S. Cl. 424—579 **4 Claims**

1. A composition of multivitamins and minerals comprising the following components in the indicated amounts and optionally including ethylenediamine tetraacetic acid,

Vitamin A	33,000 to 40,000 I.U.
Vitamin C	4,000 to 5,000 mg.
Vitamin E	600 to 650 I.U.
Vitamin B-1	20 to 200 mg.
Vitamin B-2	10 to 150 mg.
Vitamin B-6	30 to 150 mg.
Vitamin B-12	30 to 250 mg.

-continued

Niacin	40 to 70 mg.
Niacinamide	20 to 50 mg.
Pantothenic Acid	20 to 500 mg.
Folic Acid	0.3 to 0.6 mg.
Biotin	30 to 100 mg.
Choline	400 to 725 mg.
Inositol	40 to 100 mg.
DL-Methionine	160 to 1,000 mg.
Magnesium	300 to 420 mg.
Potassium	100 to 420 mg.
Manganese	5 to 10 mg.
Zinc	15 to 30 mg.
Chromium	130 to 200 mg.
Selenium	200 to 250 mg.
Betaine	120 to 130 mg.
L-Cysteine	660 to 1,000 mg.
Thymus Concentrate	30 to 100 mg.; and
Spleen concentrate	30 to 100 mg..

5,597,586

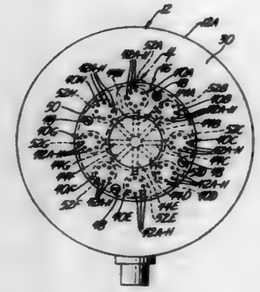
UNDERWATER PELLETIZER DIE SYSTEM FOR FORMING MULTISIZE THERMOPLASTIC PELLETS

Phillip S. Wilson, Dover, and Marie J. Herzman, Durham, both of N.H., assignors to Davidson Textron, Inc., Dover, N.H.

Filed Jun. 28, 1995, Ser. No. 496,300

Int. Cl.[6] B29C *47/12;* B29B *9/00*

U.S. Cl. 425—67 **8 Claims**



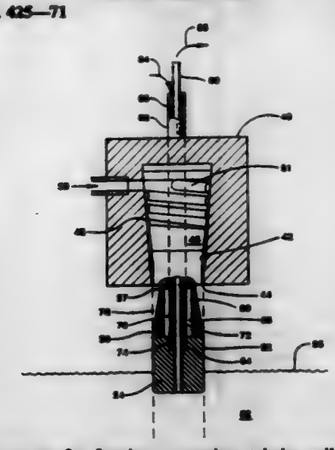
1. In an underwater thermoplastic polymer pelletizer die system having an extruding die, a cutter for cutting a thermoplastic polymer extruded from the die into pellets as the polymer is solidified from a melt to a solid under water, and a water system for circulating cooling water past the extruded polymer to solidify same for cutting and to convey away the pellets, the improvement comprising a main feed passage located centrally in said die adapted to receive a molten thermoplastic polymer, a plurality of groups of miniature extruding die holes in said die connected to said main feed passage, the die holes in each said group being arranged in a circular pattern about a center line that intersects with a circle having a center on the center line of the cutter, and at least some of the die holes in each said group having a hole size that is different from that of at least some of the die holes in the other groups; and

wherein the size of the die holes in each said group is a uniform size and is different from that of the die holes in at least one of the other groups, and said groups of die holes connected to said main feed passage by separate distribution feed passages having a hole size that varies from a largest size for the group having the largest size die holes to a smallest size for the group having the smallest size die holes.

5,597,587
APPARATUS FOR THE MANUFACTURE OF CELLULOSE FOOD CASING

Myron D. Nicholson, Lemont; Edward M. Kajiwara, Skokie; Paul E. Ducharme, Jr., Tinley Park; Morton E. McAllister, Clarendon Hills, and Joseph R. Waite, Lagrange, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 135,647, Oct. 14, 1993, abandoned, which is a division of Ser. No. 822,506, Jan. 17, 1992, Pat. No. 5,277,857. This application Mar. 29, 1995, Ser. No. 412,677
Int. Cl.[6] B29C 47/88
U.S. Cl. 425—71 7 Claims



1. Apparatus for forming a seamless tubular cellulose food casing film comprising:

a) an extrusion nozzle having an annular extrusion outlet disposed and arranged for downwardly extruding a seamless tube composed of a thermoplastic solution of nonderivatized cellulose and an amine oxide cellulose solvent;

b) a vessel disposed below said extrusion outlet, said vessel having a closed bottom and an open top for receiving said seamless tube being downwardly extruded from said annular extrusion outlet and said vessel containing a bath wherein the level of liquid in said bath and said extrusion outlet define an air gap therebetween;

c) said bath being composed of a nonsolvent liquid which causes a precipitation of cellulose from said thermoplastic solution upon contact therewith;

d) a cylindrical mandrel depending from said extrusion nozzle such that said seamless tube being extruded from said nozzle surrounds said mandrel and passes downwardly along said mandrel and through said air gap into said vessel with a portion of the seamless tube below a lowermost end face of said mandrel becoming filled with the nonsolvent liquid in said bath;

e) means in said vessel and below the level of said mandrel lowermost end face for turning said seamless tube upwardly such that it passes up and out of said bath through said vessel open top;

f) said mandrel having an upper portion and a lower portion, said upper portion including a cylindrical outer surface and being smaller in diameter than said extrusion outlet so the cylindrical surface of said mandrel upper portion is spaced radially inward from an inner surface of said seamless tube and said mandrel upper portion having a port opening in said cylindrical outer surface;

g) said mandrel lower portion having a diameter larger than said mandrel upper portion and said mandrel lowermost end face being disposed below the level of liquid in said bath;

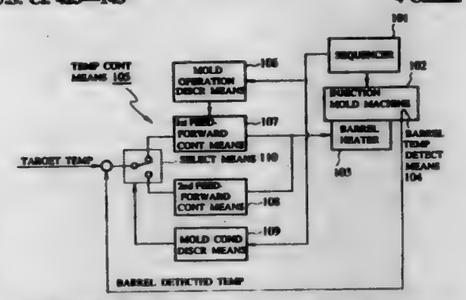
h) a first conduit within said mandrel and communicating with said port for conducting nonsolvent liquid to said port and the nonsolvent liquid issuing from said port flowing down along the outer surface of said mandrel upper and lower portions and in the course of said flow contacting the inner surface of said seamless tube and thereafter said nonsolvent liquid passing off of said mandrel and entering into that portion of the nonsolvent liquid of said bath which is disposed within said seamless tube; and

i) a second conduit being disposed concentrically within said first conduit and extending axially up through said mandrel, said second conduit having a lower end which terminates at an inlet in said mandrel lowermost end face providing for the upward removal of nonsolvent liquid from that portion of said bath disposed within said seamless tube.

5,597,588
BARREL TEMPERATURE CONTROL SYSTEM FOR INJECTION MOLDING MACHINE

Tsuginobu Totani; Kazuhiro Tashiro; Shogo Ishibashi, and Kiyoshi Suzuki, all of Shizuoka-ken, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 413,157
Claims priority, application Japan, Mar. 30, 1994, 6-061620
Int. Cl.[6] B29C 45/78
U.S. Cl. 425—143 4 Claims



1. A barrel temperature control apparatus for an injection molding machine having a sequence-controlled injection molding operation in which resin supplied to a barrel is is mixed and melted, the barrel temperature control apparatus comprising:

a barrel heater for heating the barrel;

temperature detecting means for detecting the temperature of the barrel; and

barrel temperature control means for determining a temperature deviation between the detected temperature and a target temperature, and for feedback controlling the barrel heater on the basis of a manipulated variable obtained from the temperature deviation, the barrel temperature control means including

molding operation determining means for determining start and stop of the injection molding machine based on the sequence-controlled injection molding operation,

first feed-forward control means for estimating a disturbance value based on one of an increase and decrease in temperature fluctuations of the barrel due to a disturbance at an initial response stage of the barrel heater at each start and stop of the injection molding machine, and for feed-forward controlling the barrel heater based on an estimated change manipulated variable calculated from said estimated disturbance value,

second feed-forward control means for learning a first manipulated variable of the barrel heater during the injection molding operation and a second manipulated variable of the barrel heater during the stop of the injection molding machine, and for feed-forward controlling the barrel heater based on learned change manipulated variable obtained from the first and second manipulated variables,

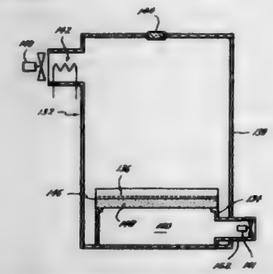
molding condition determining means for determining whether current injection molding conditions and preceding injection molding conditions are identical or different during the injection molding operation based on the sequence-controlled injection molding operation, and

selecting means for selecting said second feed-forward control means when the current injection molding conditions are identical to those of the preceding injection molding conditions, and for selecting said first feed-forward control means when the current injection molding conditions are different from those of the preceding injection molding conditions.

5,597,589
APPARATUS FOR PRODUCING PARTS BY SELECTIVE SINTERING

Carl R. Deckard, Clemson, S.C., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 911,879, Jul. 10, 1992, Pat. No. 5,316,580, which is a division of Ser. No. 541,788, Jun. 21, 1990, Pat. No. 5,132,143, which is a division of Ser. No. 105,316, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 920,580, Oct. 17, 1986, Pat. No. 4,863,538.
This application May 31, 1994, Ser. No. 251,609
Int. Cl.[6] B29C 35/08
U.S. Cl. 425—174.4 10 Claims



1. An apparatus for producing a part from a powder, comprising:

means for successively dispensing a plurality of layers of powder at a target surface;

an energy source;

a controller for directing the energy source at locations of each dispensed layer of powder at the target surface corresponding to cross-sections of the part to be produced therein and fusing the powder thereat; and

temperature control means for moderating the temperature difference between unfused powder in a topmost layer of powder at the target surface and fused powder in the one of the plurality of layers of powder immediately beneath the topmost layer.

5,597,590
APPARATUS FOR REMOVING A THIN FILM LAYER

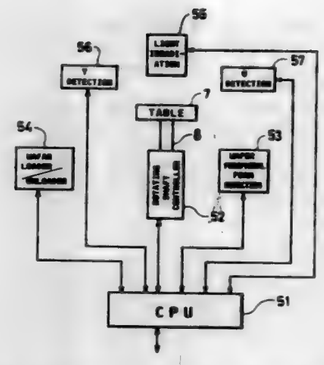
Akikazu Tanimoto; Kiyoshi Motegi, and Yukako Komaru, all of Kanagawa, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 384,444, Feb. 2, 1995, abandoned, which is a continuation of Ser. No. 200,353, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 803,644, Dec. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 657,460, Feb. 19, 1991, abandoned. This application Nov. 28, 1995, Ser. No. 563,349
Claims priority, application Japan, Feb. 20, 1990, 2-039236; Mar. 5, 1990, 2-051901; Dec. 5, 1990, 2-404633
Int. Cl.[6] B23K 26/08
U.S. Cl. 425—174.4 10 Claims

1. A removal apparatus for removing a resist layer from a substrate on which an alignment mark is exposed by irradiating an energy beam, the removal apparatus comprising:

a rotatable table having a center of rotation and adapted to support said substrate so that said substrate rotates when said table rotates;

detection means for detecting the position of said alignment mark on said substrate;



means for providing design position information of said alignment mark in a rectangular coordinate system;

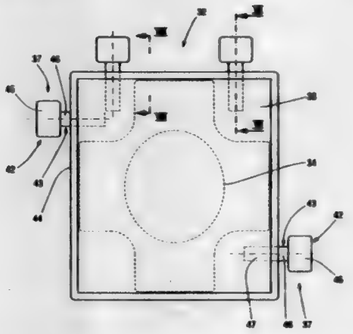
means for calculating said position of said alignment mark in the polar coordinate system based on said center of rotation of said table in accordance with said design position information and said position of said alignment mark detected by said detection means; and

an irradiation device adapted to irradiate said resist layer which covers said alignment mark with said energy beam during the rotation of said table and said substrate in accordance with the result of said calculation means.

5,597,591
APPARATUS FOR THE PRODUCTION OF CONCRETE PAVING STONES

Gerhard Hagenah, Worpswede, Germany, assignor to SF-Kooperation GmbH Beton-Konzepte, Bremen, Germany

Filed Jan. 26, 1995, Ser. No. 378,458
Claims priority, application Germany, Jan. 27, 1994, 44 02 281.6
Int. Cl.[6] B28B 3/06
U.S. Cl. 425—346 5 Claims

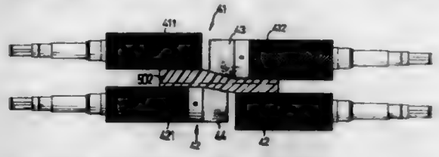


1. An apparatus for the production of paving stones, said apparatus comprising:

(a) an open top mold having a plurality of die cavities each with adjoining recesses, said recesses further comprising a free volume and an upper filling-in region, wherein said free volume of said recesses is reduced by local cross-sectional constrictions at said upper filling-in region of said recesses; and

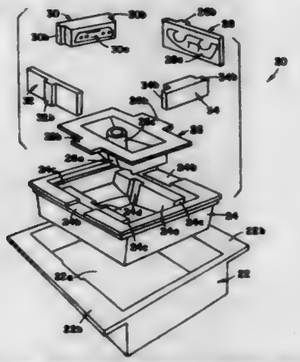
(b) a pressure ram for cooperation with each said die cavity, said pressure ram having lateral projections each having a contour corresponding to said recesses at said constrictions.

5,597,592
MIDDLE SOLE SLOPING MACHINE WITH LENGTH/HEIGHT ADJUSTABLE ROLLS
Tien-fu Yeh, No. 53, Alley 87, Lane 538, Sec. 4, An Ho Rd., Tainan, Taiwan
Continuation-in-part of Ser. No. 292,493, Aug. 18, 1994, Pat. No. 5,505,605, which is a continuation-in-part of Ser. No. 133,620, Oct. 7, 1993, Pat. No. 5,364,257. This application Nov. 13, 1995, Ser. No. 558,026
Int. Cl.[6] B29C 53/00;43/46; B29D 7/00
U.S. Cl. 425—367 8 Claims



1. A middle sole sloping machine, comprising:
a base plate,
upper and lower roll assemblies each comprising first and second rolls separated from each other and an elastomeric sloping section fixedly attached to one of the rolls;
a fixed mount plate and a movable mount plate extending upward from the base plate, the movable mount plate being movable relative to the fixed mount plate in a direction parallel to the extending direction of the upper and lower roll assemblies, the first rolls being movably attached to the fixed mount plate, the second rolls being movably attached to the movable mount plate;
a first means for effecting relative movements between the fixed and movable mount plates along the extending direction of the upper and the lower roll assemblies;
a second means for effecting vertical movements of the first and second rolls of the upper and lower roll assemblies; and
a third means for rotating the upper and lower roll assemblies.

5,597,593
TOY MOLD SYSTEM WITH UNDERCUTS
Steven Lebensfeld, 5 Cove La., Kings Point, N.Y. 11024, and Lawrence Blaustein, 11310 Juniper Rd., Cleveland, Ohio 44106
Filed Feb. 10, 1995, Ser. No. 386,488
Int. Cl.[6] B29C 33/44;39/34
U.S. Cl. 425—410 19 Claims

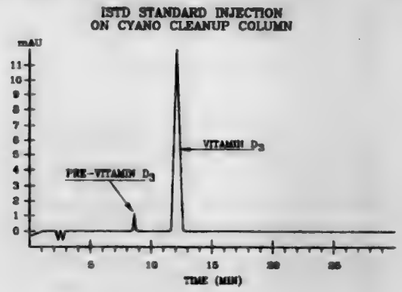


1. A toy mold system comprising at least three preformed mold sections each having a configuration such that, in an assembled condition of the toy mold system, the at least three mold sections define a cavity in the shape of a toy figure to be molded, the mold sections in the assembled condition of the mold system defining at least one undercut in the cavity, and further comprising engaging means for releasably engaging the at least three mold sections in the assembled condition of the toy mold system, whereby a molded toy figure with an undercut section may be formed in the assembled condition of the mold system and removed from the mold system by a child when the mold sections are released from engagement.

5,597,594
PROCESS FOR PREPARING CHEESE-LIKE FOOD PRODUCT
Masaru Matsuura, and Jun Sasaki, both of Noda, Japan, assignors to Kikkoman Corporation, Noda, Japan
Filed Feb. 28, 1995, Ser. No. 403,426
Claims priority, application Japan, Mar. 3, 1994, 6-056828
Int. Cl.[6] A23L 1/211
U.S. Cl. 426—44 5 Claims

1. A process for preparing of a cheese-like food product which comprises preparing soybean milk in which at least 60% of the soluble saccharide fractions are removed from raw soybeans; adding a saccharide and a lactic acid bacterium or mixed lactic acid bacteria to the soybean milk and carrying out lactic acid fermentation; subjecting curds formed by the lactic acid fermentation to solid-liquid separation; and molding, fermenting and maturing the curds after the solid-liquid separation.

5,597,595
LOW PH BEVERAGE FORTIFIED WITH CALCIUM AND VITAMIN D
Normanella T. DeWille, Columbus; Michael A. Chandler, Gahanna; Terrence B. Mazer, Reynoldsburg; Robert J. Ragan, Gahanna; Gregory A. Snowden, Westerville; Maureen E. Geraghty, Columbus, and Catherine D. Johnson, Dublin, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Apr. 7, 1995, Ser. No. 418,391
Int. Cl.[6] A23L 1/303;1/304
U.S. Cl. 426—74 9 Claims

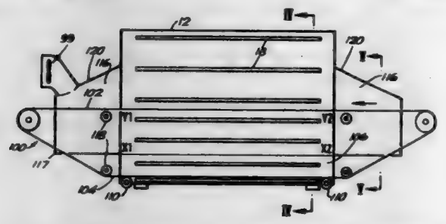


1. A liquid beverage concentrate consisting essentially of:
a. water;
b. a calcium source selected from the group consisting of calcium glycerophosphate; and
c. an emulsion comprising vitamin D_3, vegetable oil and a gum selected from the group consisting of gum arabic, gum tragacanth and xanthan gum, said liquid beverage concentrate having a pH in the range of about 2.8 to 4.6 and wherein said liquid beverage concentrate contains from about 7.2 to 18.0% calcium on a dry weight basis.

5,597,596
METHOD OF COLORING CRYSTALLINE MATERIAL
Pamela D. Henderson, 4420 St. Peter St., New Orleans, La. 70119
Filed Nov. 30, 1995, Ser. No. 565,744
Int. Cl.[6] A23L 1/00; H05B 6/00
U.S. Cl. 426—242 17 Claims

7. A method of manufacturing a colored crystalline material, which comprises:
mixing a crystalline material with a liquid coloring agent and exposing the resultant mixture to microwave energy for a period sufficient to cause drying of the mixture.

5,597,597
METHOD OF STERILIZING AN EDIBLE SUBSTRATE WITH UV RADIATION
Paul B. D. Newman, Northcote House, Northlew, Okehampton, Great Britain
PCT No. PCT/GB94/00898, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO94/24875, PCT Pub. Date Nov. 10, 1994
PCT Filed Apr. 27, 1994, Ser. No. 356,378
Claims priority, application United Kingdom, Apr. 27, 1993, 9308672
Int. Cl.[6] A23B 4/01;4/015; A23L 3/005;3/28
U.S. Cl. 426—248 3 Claims



1. A method of sterilizing an edible substrate comprising conveying the substrate in a non-wrapped state into a treatment cavity and subjecting substantially the entire surface of said substrate to UV irradiation, said method further comprising (i) conveying the substrate into the treatment cavity by a conveyor means which supports the substrate at regions of contact and which comprises a metal mesh conveyor belt that carries the substrate in a conveying direction, and (ii) displacing the substrate transversely of the conveying direction by contacting the substrate with at least one baffle as the substrate is conveyed by said conveyor means such that said regions of contact on the substrate are changed as the substrate is being conveyed, whereby said regions of contact do not escape irradiation.

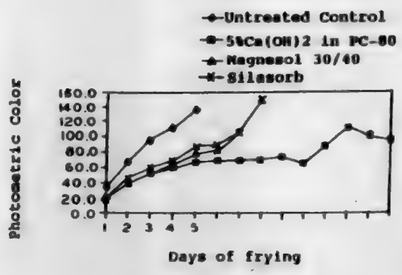
5,597,598
FUNGICIDE COMPOSITION TO PREVENT THE GROWTH OF MOULD ON FOODSTUFF AND AGRICULTURAL PRODUCTS
Ferdinand T. J. van Rijn, Delft; Hong S. Tan, Bleiswijk, and Martinus J. M. Warmerdam, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Netherlands
Continuation of Ser. No. 188,048, Jan. 26, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 514,746
Claims priority, application European Pat. Off., Jan. 27, 1993, 93200200
Int. Cl.[6] A23B 4/14;5/12;7/14
U.S. Cl. 426—310 7 Claims

1. An aqueous composition free of alcohol comprising 0.01 to 1.0% by weight of a polyene antifungal agent and 0.05 to 5.0% by weight of an acidic antifungal compound selected from the group consisting of benzoic acid, propionic acid and sorbic acid, and 0.05 to 5.0% by weight of an additional acid or an alkaline earth metal salt thereof selected from the group consisting of acetic acid and lactic acid.

5,597,599
METHOD FOR PROCESSING A PERISHABLE PRODUCT
Brian S. Smith; Kenneth W. McMillin; John H. Wells; A. James Farr, all of Baton Rouge, La., and Jerry L. Mitchell, Livingston, Tex., assignors to Paker, Inc., Livingston, Tex., and Louisiana State University and Agricultural College, Baton Rouge, La.
Continuation-in-part of Ser. No. 880,869, May 11, 1992, Pat. No. 5,352,467, which is a continuation-in-part of Ser. No. 510,987, Apr. 19, 1990, abandoned, which is a continuation of Ser. No. 214,195, Jun. 27, 1988, Pat. No. 4,919,955, which is a division of Ser. No. 94,384, Sep. 8, 1987, abandoned. This application Oct. 4, 1994, Ser. No. 323,439
Int. Cl.[6] B65B 31/04
U.S. Cl. 426—316 26 Claims

1. A method for processing a perishable product comprising the steps of:
positioning a perishable product having a high porosity and permeability in a gas impermeable package such that a substantial portion of the product is in gas communication with a selected first agent; and
thereafter sealing such product in said package for a selected resident time such that gas communication with said product and said first agent is maintained, where the type and concentration of said first agent is determined by the compositional characteristics of said product.

5,597,600
TREATMENT OF COOKING OILS AND FATS WITH MAGNESIUM SILICATE AND ALKALI MATERIALS
James R. Munson, Branchburg, N.J.; Bryan L. Bertram, Georgetown, Ind., and Joseph D. Caldwell, Louisville, Ky., assignors to The Dallas Group of America, Inc., Liberty Corner, N.J.
Filed Jun. 5, 1995, Ser. No. 462,510
Int. Cl.[6] A23D 7/00
U.S. Cl. 426—330.6 15 Claims



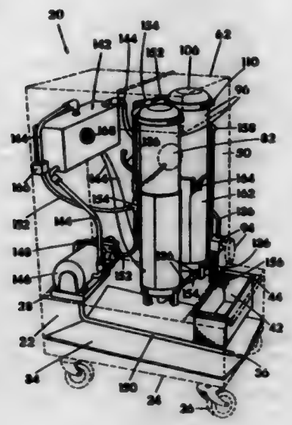
1. A process for treating cooking oil or fat, comprising:
contacting cooking oil or fat with (a) magnesium silicate and (b) at least one alkali material selected from the group consisting of alkaline earth metal hydroxides; alkaline earth metal oxides; alkali metal carbonates; alkali metal bicarbonates; alkaline earth metal carbonates; and alkali metal silicates, said magnesium silicate and said at least one alkali material being present in amounts effective to reduce the content of free fatty acids in the oil or fat and extend the usable life of the oil or fat for cooking.

5,597,601

COOKING OIL FILTERING APPARATUS AND PROCESS EMPLOYING CYLINDRICAL SINTERED METAL FILTERS

Jerry A. Griffin, Citrus Heights, Calif., assignor to Purifry, LLC, Cordova, Calif.

Filed Feb. 29, 1996, Ser. No. 608,643
Int. Cl.[6] B01D 17/12; A47J 37/12
U.S. Cl. 426—417 14 Claims



1. An improved process for on-site filtering of cooking oil of a deep fat fryer vat;

wherein the improvements comprise;

moving cooking oil from the fryer vat and

utilizing a motorized fluid pump to

forcefully move the cooking oil of the fryer vat through a reuewable filter element comprised substantially of fused metal granules defining said filter element with a porosity sufficiently small as to filter solid particles at least down to 50 microns in dimension out of the cooking oil as the cooking oil moves through said filter element, and

filtering solid particles at least down to 50 microns in dimension from the cooking oil by the forceful movement of the cooking oil through said filter element prior to

returning filtered cooking oil to the fryer vat utilizing said motorized fluid pump to return the filtered cooking oil to said fryer vat, and

cleaning said filter element after a significant amount of solid particles have accumulated against said filter element in preparation of future filtering of cooking oil.

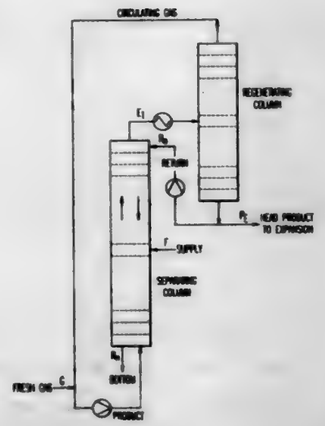
5,597,602

PROCESS FOR DE-OILING CRUDE LECITHIN

Siegfried Peter, Lindenweg 3, D-91080 Uttenreuth-Weiher; Bernd Czech, Erlangen; Eckard Weidner, Erlangen, and Zhenfeng Zhang, Erlangen, all of Germany, assignors to Siegfried Peter, Uttenreuth-Weiher, Germany

PCT No. PCT/EP93/01750, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO94/01004, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 6, 1993, Ser. No. 362,448
Claims priority, application Germany, Jul. 6, 1992, 42 22 153.6
Int. Cl.[6] A23D 7/005
U.S. Cl. 426—478 20 Claims

1. A process for recovering lecithin from oil- and lecithin-containing mixtures, comprising:



extracting a lecithin/oil mixture with an extractant selected from the group consisting of a hydrocarbon having 3 carbon atoms, an unbranched hydrocarbon having 4 carbon atoms, a branched hydrocarbon having 4 carbon atoms, and mixtures thereof, at a pressure of from 1 to 8 MPa and a temperature of from 20° to 100° C., which conditions ensure liquid phase extraction with the development of two liquid phases, one of which is an oil enriched liquid hydrocarbon phase and the other of which is a lecithin enriched hydrocarbon phase;

separating the two liquid hydrocarbon phases; and

recovering substantially lecithin-free oil from the oil-enriched phase and substantially oil-free, pure lecithin from the lecithin-enriched phase.

5,597,603

SUGAR-FREE, FAT-FREE INSTANT PUDDING MIX

Alice S. Chu, Mt. Kisco, and William J. Dell, Wappinger Falls, both of N.Y., assignors to Kraft Foods, Inc., Northfield, Ill.

Filed Feb. 28, 1995, Ser. No. 396,318
Int. Cl.[6] A23L 1/0522; 1/054
U.S. Cl. 426—573 20 Claims

1. A dry mix for preparing a sugar-free, fat-free instant pudding; said mix comprising of: 50% to 70% agglomerated, pregelatinized starch, 5% to 23% carbohydrate bulking agent, 3% to 8% alkali metal pyrophosphate, 3% to 7% alkali metal orthophosphate, 0.1% to 1.5% xanthan gum, 0.1% to 0.8% slow-reacting calcium salt, emulsifier, intensive sweetening agent, flavor agent and color agent.

5,597,604

GELLAN GUM BEVERAGE AND PROCESS FOR MAKING A GELLED BEVERAGE

William F. Chalupa, Aurora, Ill.; Alan H. King, Westfield, and Donald A. Giampetro, Cherry Hill, both of N.J., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 265,982, Jun. 24, 1994, abandoned.
This application Sep. 6, 1995, Ser. No. 524,447
Int. Cl.[6] A23L 1/05
U.S. Cl. 426—590 12 Claims

1. A beverage comprising between about 0.01% and 0.15% low acyl gellan gum, wherein said beverage has the rheological properties of a gel system when measured using dynamic viscoelastic measurements and the viscosity of a non-gelled beverage.

5,597,605

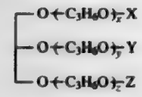
REDUCED CALORIE FAT COMPONENT

Harry Mazurek, Bala Cynwyd, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Feb. 9, 1995, Ser. No. 386,049
Int. Cl.[6] A23D 9/02
U.S. Cl. 426—611 16 Claims

1. A reduced calorie fat component comprised of

(a) a digestion resistant esterified propoxylated glycerin having a dilatometric solid fat index of at least 50 at 21° C. and at least 10 at 37° C. and structure

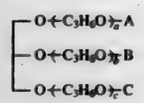


wherein x, y, and z are each at least 1, the sum of x+y+z is from 3 to 20, and X, Y, and Z are the same or different and are selected from the group consisting of H and

wherein R is a C_4–C_{23} aliphatic group and at least two of X Y, or Z are

and

(b) a partially digestible liquefying agent having a dilatometric solid fat index of less than 50 at 21° C. and less than 10 at 37° C. and structure



wherein a, b, and c are 0 or an integer of from 1 to 20, the sum of a+b+c is from 1 to 20, at least one of a, b, or c is 0, and A, B, and C are the same or different and are selected from the group consisting of H and



wherein R^1 is a C_4–C_{23} aliphatic group and at least two of A, B, or C are

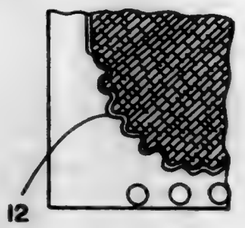
wherein the partially digestible liquefying agent is present in the reduced calorie fat component in an amount effective to provide a dilatometric solid fat index of less than 50 at 21° C. and less than 10 at 37° C.

5,597,606

COOKED MEAT PRODUCTS HAVING A SIMULATED NET SURFACE

Lee Kramer, West Point, Miss.; Roger S. Williams, New Richmond, Ohio; Jeffrey A. Williams, Calhoun, Ga.; Frank C. Mello, Columbus, Miss., and Dale V. Miller, Muskegon, Mich., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Division of Ser. No. 309,832, Jan. 9, 1995, Pat. No. 5,508,597.
This application Mar. 13, 1996, Ser. No. 615,629
Int. Cl.[6] A23L 1/31
U.S. Cl. 426—641 4 Claims



1. A defined surface meat product formed by the process comprising the steps of: forming a cooking cavity from a heat shrinkable material by positioning the material in a dye cavity having an interior with a three dimensional simulated net design; dispensing a meat product on the material in the formed cooking cavity; urging the meat product against the material and into the formed cooking cavity to fill the formed cooking cavity; closing the meat product containing cooking cavity with a heat shrinkable material; cooking the cavity-filled meat product in a hot water bath to heat shrink the cavity forming material and give the cooked meat product surface the simulated net design of the cooking cavity interior; and removing the heat shrunken material and retaining the simulated net design on the cooked meat product surface while retaining the natural meat product juices.

5,597,607

PROCESS FOR PREPARING FRACTIONATED SOYBEAN PROTEINS AND FOODS USING THE SAME

Masahiko Sumoto; Takeshi Akasaka, both of Tsukuba-gun, and Hiroyuki Mori, Ahiko, all of Japan, assignors to Fuji Oil Company, Limited, Osaka-fu, Japan

Filed Dec. 27, 1994, Ser. No. 364,102
Claims priority, application Japan, Jan. 7, 1994, 6-000628; Nov. 22, 1994, 6-288425
Int. Cl.[6] A23J 1/14;3/16; A23L 1/20
U.S. Cl. 426—656 11 Claims

1. A process for preparing fractionated soybean proteins which comprises treating soybean proteins under acidic conditions at a pH of therewith 2–4.7 with an aqueous solution in which an alkaline metal or an alkaline earth metal salt is dissolved to selectively concentrate Gly m Bd 30k in a precipitation fraction without fractionation of 7S and 11S fractions and collecting a supernatant fraction.

5,597,608

SACCHARIDE-BASED MATRIX INCORPORATING MALTODEXTRIN AND PROCESS FOR MAKING

Richard C. Fuisz, Great Falls, Va., assignor to Fuisz Technologies Ltd., Chantilly, Va.

Division of Ser. No. 847,595, Mar. 5, 1992, Pat. No. 5,387,431, which is a continuation-in-part of Ser. No. 782,430, Oct. 25, 1991, abandoned. This application Dec. 28, 1994, Ser. No. 365,591

Int. Cl.[6] A23L *1/0522*

U.S. Cl. 426—658 **28 Claims**

1. A saccharide-based substantially solid matrix comprising a solid maltodextrin feedstock which has been subjected to conditions of force and temperature which induce flash flow of said feedstock whereby said matrix possesses physically or chemically altered structure from said feedstock.

5,597,609

PROCESS AND APPARATUS FOR THE CONTINUOUS OR SEMI-CONTINUOUS COATING OF EYEGLASS LENSES

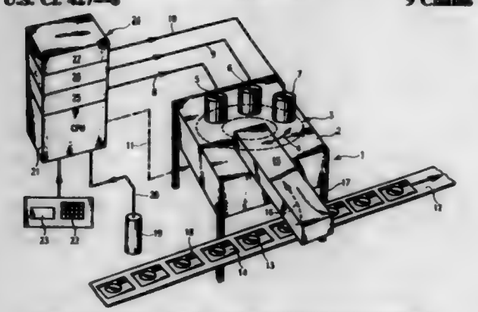
Siegfried Beiswenger, Alzenau, and Michael Fliedner, Bruchköbel, both of Germany, assignors to Leybold Aktiengesellschaft, Hanau am Main, Germany

Filed Mar. 9, 1995, Ser. No. 401,379

Claims priority, application Germany, Mar. 9, 1994, 44 07 909.5

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—8 **9 Claims**



1. Process for the coating of eyeglass lenses, comprising
providing a readable code containing coating parameters information associated with each of a plurality of eyeglass lenses,
transporting said eyeglass lenses in tandem to a vacuum coating apparatus,
reading the code associated with each eyeglass lens as it is transported,
transferring each eyeglass lens to a rotatable substrate carrier in said vacuum coating apparatus via a lock,
moving said lenses through at least one coating station on a circular path defined by said substrate carrier, and
coating each lens at each coating station according to coating parameters determined by the code read for said each substrate.

5. Apparatus for coating of eyeglass lenses comprising
at least one coating station,
a vacuum chamber having therein a rotatable substrate carrier which moves through said at least one coating station,
transport means for moving eyeglass lenses in tandem to said vacuum chamber,
means for associating a readable code containing coating parameters information with each eyeglass lens,
reading means for reading each said code and providing an output signal corresponding to each lens,
transfer means for transferring each said lens from said transport means to said substrate carrier via a lock,
control means for determining coating parameters at each said coating station and controlling movement of said substrate holder in response to said output signals.

5,597,610

METHOD FOR COATING ELECTRIC COMPONENT WITH RESIN

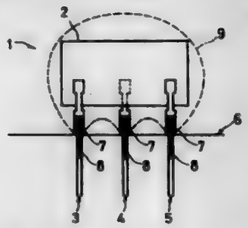
Satoshi Miura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 240,919, May 10, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 479,847

Claims priority, application Japan, May 11, 1993, 5-109090

Int. Cl.[6] B05D *5/12*; H04R *17/00*; H01L *41/04*

U.S. Cl. 427—58 **7 Claims**



1. A method for covering an electric component with a resin wherein an electric element and parts of terminals connected and fixed with said electric element are covered with a coating resin, comprising the steps of:
coating a repelling material, which is effective for repelling a releasing agent but which is not effective for repelling said resin, on a part of said terminals on one side of a standard line which is a limit of planned parts of said terminals to be covered with said coating resin,
coating a releasing agent which is effective for repelling said resin on a part of said terminals on the opposite side of said standard line, and
coating said coating resin on said electric element from said standard line on said terminals, said coating step including exposing said electric element and said parts of said terminals on which said repelling material and said releasing agent are coated to said resin, and releasing the resin which contacts the parts where said releasing agent is coated, so that said electric element and said parts of said terminals on said one side of said standard line are coated with said coating resin.

5,597,611

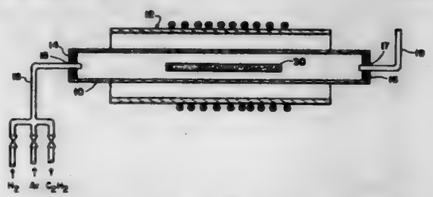
REINFORCED CARBON COMPOSITES

James R. Lennox, Saco; Daniel C. Nelson, Old Orchard Beach, and Roger T. Pepper, Saco, all of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Oct. 1, 1990, Ser. No. 591,147

Int. Cl.[6] B05D *5/12*; C01B *31/04*

U.S. Cl. 427—113 **9 Claims**



1. Process for preparing carbon fiber composites comprising:
(a) placing multilayered carbon fiber cloth in a nickel nitrate solution under vacuum;
(b) removing said cloth from said solution and drying it by heating to about 100° C.;
(c) heating said dried cloth to about 600° C. in an inert atmosphere for a time sufficient to reduce the nickel nitrate to nickel; and,
(d) contacting said cloth with acetylene while maintaining the temperature at about 600°–800° C. for a period of time sufficient to promote the growth of graphite whiskers between the carbon fiber cloth layers.

5,597,612

PROCESS FOR THE MANUFACTURE OF PAPER WEBS HAVING CF OR CB LAYERS FOR PRESSURE-SENSITIVE RECORDING

Horst Schoen, Bielefeld; Horst W. Heyer, Schwalmtal, and Wolfram Friesen, Nettetal-Lobberich, all of Germany, assignors to Stora Feldmuhle AG, Dusseldorf, Germany

PCT No. PCT/EP93/01982, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO94/02258, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 26, 1993, Ser. No. 256,846

Claims priority, application Germany, Jul. 27, 1992, 42 24 716.0; Jul. 27, 1992, 42 24 718.7; Jul. 27, 1992, 42 24 719.5

Int. Cl.[6] B41M *5/124*

U.S. Cl. 427—152 **17 Claims**

1. Method for the manufacture of a paper web having a CF layer for pressure-sensitive recording papers, by application of an aqueous coating composition containing reactive color acceptors consisting essentially of color-reactive mineral pigment, characterized by the combination of the following characteristics:
the paper web is internally sized;
the application of the coating composition is done with a coating device, in which the paper web is guided between two transfer rolls separated by a gap or set to a pressing pressure;
wherein one of said rolls transfers volumetrically predosed coating composition for forming the CF layer on one side of the paper web with the aid of a rotatable and driven surface-profiled doctor bar;
the other of said rolls transfers simultaneously a volumetrically predosed aqueous solution or composition onto the other side of the paper web with the aid of a rotatable and driven surface profiled doctor bar; the amount of the color-reactive pigment in the CF layer is 3.5 to 5 g/m^2 calculated on a dry basisi the solid content of the CF coating composition is >40 wt %;
the viscosity of the CF coating composition is in the ranqe of 500 to 2000 mPa.s; and,
the CF coating composition is applied in an amount of 4 to 9 g/m^2 (calculated as dry parts by weight).

5,597,613

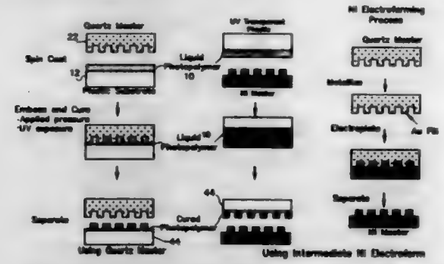
SCALE-UP PROCESS FOR REPLICATING LARGE AREA DIFFRACTIVE OPTICAL ELEMENTS

Lynn Galarneau, Golden Valley, and Daniel J. Rogers, White Bear Lake, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1994, Ser. No. 366,853

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—162 **21 Claims**



1. A method of creating large area diffractive optical elements from smaller diffractive optical elements, comprising the steps of:
a) applying a layer of radiation curable photopolymer material to one side of a substrate member;
b) contacting a portion of the layer of photopolymer material with a face of a master optical element so that the master optical element transfers a pattern on the face of the master optical element;
c) placing the substrate member and the master optical element into a fixture means for receiving and aligning the substrate member to the master optical element and for coupling a remote radiation source to the portion of the layer of the radiation curable photopolymer;
d) applying radiation to the fixture means and ultimately to the portion of the layer of photopolymer material so that the portion of the layer of photo polymer material cures; and,
e) removing the fixture means and repeating steps b through d, wherein the portion of the layer of photopolymer material is adjacent a previously cured portion.

5,597,614

ULTRAFINE PARTICLE DISPERSED GLASSY MATERIAL AND METHOD

Toru Noguchi, Hyogo; Kazuo Goto, Amagasaki; Sigehiko Hayashi, Hyogo; Masahito Kawahara, Osaka; Susumu Murakami, Kobe; Yoshio Yamaguchi, and Shigehito Deki, both of Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Division of Ser. No. 109,223, Aug. 19, 1993. This application Jun. 7, 1995, Ser. No. 466,229

Claims priority, application Japan, Aug. 20, 1992, 4-245739; Sep. 24, 1992, 4-280480; Oct. 22, 1992, 4-309266

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—162 **7 Claims**

1. A method of producing an ultrafine particle dispersed glassy material, the method comprising the steps of:
(a) dissolving a polymer composite and an organometallic fixation reagent in an organic solvent to produce a film-forming composition, the polymer composite comprising a polymer having ultrafine particles dispersed therein, the particles being selected from the group consisting of:
(i) a noble metal selected from the group consisting of gold, platinum, palladium, rhodium and silver;
(ii) Cu_2O;
(iii) metals selected from the group consisting of titanium, vanadium, chromium, manganese, iron, nickel, copper, zinc, cadmium, yttrium, tungsten, tin, germanium, indium and gallium; and
(iv) oxides of the metals disclosed in (iii);
(b) applying the film-forming composition to a surface of a substrate;
(c) drying the applied composition to produce a film; and
(d) firing the film to produce a glassy material.

5,597,615

EXTRUSION COATING METHOD AND COATING APPARATUS FOR COATING BOTH SIDES OF A WEB

Eizo Tsunoda, Komoro; Yutaka Shimizu, Saku; Naomi Yoshike, Nagano-ken; Katsumi Owozawa, Saku; Kazuo Katsi, Saku, and Eiichi Watanabe, Saku, all of Japan, assignors to TDK Corperation, Tokyo, Japan

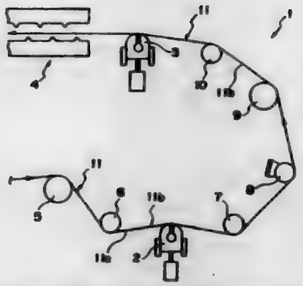
Filed Dec. 20, 1994, Ser. No. 359,828

Claims priority, application Japan, Dec. 28, 1993, 5-349101

Int. Cl.[6] B05D *3/12;3/02*; B05C *5/02*

U.S. Cl. 427—172 **27 Claims**

1. A coating method for uniformly coating a running web with coating liquid, comprising the steps of:
exclusively disposing an extrusion coating head between a drier performing a non-contact drying operation and a support roll which is located at an upstream side of said drier and nearest to said drier, said extrusion coating head having a back edge surface located at a dowastream side of a web feeding direction, said back edge surface having one of a rounded and



curved surface which has a radius of curvature R satisfying the following inequality: 3 mm≦R≦30 mm, wherein the entire rounded-surface portion of said back edge of said coating head is located at a position higher than a tangential line which is drawn to a front edge surface at a slit-side edge point of said front edge so as to project toward a web side;

uniformly coating the running web with the coating liquid from at least said extension coating head; and

performing the non-contact drying operation with said drier after the coating of the coating liquid on the running web.

5,597,616

Patent Not Issued For This Number

5,597,617

CARBON-COATED INORGANIC SUBSTRATES

Evelyn M. DeLiso, Corning; Kishor P. Gadkaree, Big Flats; Joseph F. Mach, Lindley, and Kevin P. Streicher, Big Flats, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 11,385, Jan. 29, 1993, Pat. No. 5,451,444. This application May 25, 1995, Ser. No. 450,857

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—228 **11 Claims**

1. A method of making an inorganic, carbon-coated substrate comprising the steps of:

providing an inorganic substrate having pores extending from its outer surface and being formed of a material selected from the group consisting of ceramic and metallic materials;

contacting said inorganic substrate with a coating and impregnating liquid consisting essentially or wholly of a curable carbon precursor liquid;

treating said inorganic substrate under conditions effective to cure substantially said carbon precursor liquid;

heating said inorganic substrate under conditions effective to convert said cured carbon precursor liquid to carbon; and

treating said inorganic substrate under conditions effective to activate said carbon.

5,597,618

APPLICATION MEMBER FOR APPLYING A COATING MATERIAL TO A SUBSTRATE

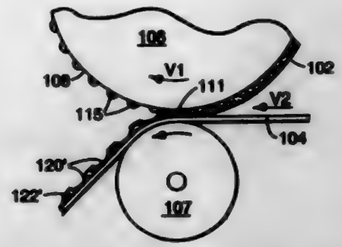
Glen H. Bayer, Jr., Cottage Grove, and Timothy J. O'Leary, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 393,881, Feb. 23, 1995, abandoned, which is a continuation of Ser. No. 56,362, Apr. 30, 1993, abandoned. This application Feb. 14, 1996, Ser. No. 601,379

Int. Cl.[6] B05C *1/12*; B05D *1/28;5/00;5/10*

U.S. Cl. 427—207.1 **24 Claims**

15. A method for applying a coating material to a receiving surface, said method comprising the steps of:



(a) providing an application member comprising a hub having a central axis and a metal peripheral layer defining a generally cylindrical peripheral surface, and a plurality of discrete structures projecting from and spaced in all directions along the peripheral surface;

(b) rotating the application member about the axis to provide a surface velocity at the peripheral surface and to move the peripheral surface along a generally cylindrical path from a source position to an application interface position along the path;

(c) causing the application member to receive the coating material on the peripheral surface and the structures at the source position and to carry a layer of the coating material on the peripheral surface and the structures to the application interface position; and

(d) moving the receiving surface at a surface velocity along a path having a path portion at the application interface position in the same direction along the path portion as the peripheral surface is moved at the application interface position with the receiving surface in sufficiently close face to face relationship with a portion of the peripheral surface along the path portion to transfer the layer of coating material to the receiving surface.

5,597,619

FILTERING MATERIAL AND METHOD OF PRODUCING THE SAME

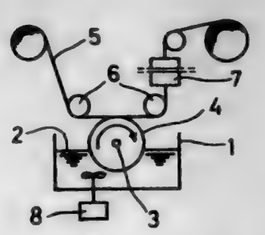
Susumu Ibaraki, Tokyo, Japan, assignor to Bestex Kabushiki-Kaisha, Tokyo, Japan

Continuation of Ser. No. 31,901, Mar. 16, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,758

Claims priority, application Japan, Apr. 16, 1992, 4-091684

Int. Cl.[6] B05D *5/00;1/36;1/40*

U.S. Cl. 427—244 **12 Claims**



1. A method of producing a filtering material, comprising:

a first step of dispersing calcium phosphate particles of 0.5 to 40% by weight, excluding porous apatite particles, and which calcium phosphate particles have not been treated to impart porosity thereto and a water soluble glucan of 0.5 to 15% by weight in water to prepare an aqueous treatment solution,

a second step of dipping a sheet-shaped raw material in said aqueous treatment solution and taking up said sheet-shaped raw material coated with said aqueous treatment solution, and

a third step of drying said sheet-shaped raw material coated with said aqueous treatment solution after completion of the taking-up operation to produce said filtering material.

5,597,620

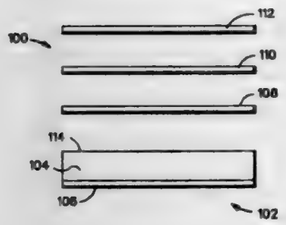
SEMI-FINISHED WOOD SIMULATING PRODUCT AND METHOD

Ralph A. Martino, Tampa, Fla., assignor to Premdor, Inc., Canada

Division of Ser. No. 163,798, Dec. 9, 1993. This application May 24, 1995, Ser. No. 448,880

Int. Cl.[6] B05D *5/06;7/06*

U.S. Cl. 427—262 **16 Claims**



1. A method for manufacturing a semi-finished wood simulating product, comprising the steps of:

a) providing a substrate having at least one surface to be finished;

b) applying a liquid basecoat onto the surface;

c) drying the liquid basecoat;

d) depositing, in liquid form, a wood grain pattern on the basecoat printing, and commencing to dry the wood grain pattern;

e) transferring a tacky portion of the wood pattern from the originally deposited position on the basecoat to a position spaced therefrom on the basecoat and thereby creating a resulting wood grain pattern having voids and skips;

f) completing drying the resulting wood grain pattern;

g) applying a catalyst-containing polymerizable protective coating over the basecoat and the resulting wood grain pattern, the protective coating after polymerization accepting a woodstain applied directly to the protective coating; and

h) polymerizing the protective coating.

5,597,621

METHOD OF MANUFACTURING PHOTOLUMINESCING SEMICONDUCTOR MATERIAL USING LASERS

Rolf E. Hummel; Matthias H. Ludwig, and Martin Vala, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Dec. 1, 1995, Ser. No. 566,088

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—554 **10 Claims**

1. A method for the manufacture of a photoluminescing porous surface layer on a semiconductor substrate comprising the steps of providing a laser capable of delivering a pulsed laser beam and exposing the surface of the semiconductor substrate to said pulsed laser beam, where said beam has an energy of approximately 10 millijoules, is pulsed at a frequency from approximately 1 to 100 hertz with pulse duration between approximately 1 and 20 nanoseconds, is focused to a beam diameter of up to 3 millimeters, and for a period of time of 2 to 20 minutes.

5,597,622

PROCESS FOR THE PRODUCTION OF A REFLECTION-REDUCING COATING ON LENSES

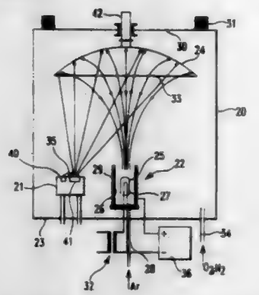
Alfons Zöller, Bad Soden-Salmünster; Karl Matl, Kleinostheim; Rainer Götzelmann, Rodenbach, and Günther Sauer, Maintal, all of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Continuation of Ser. No. 838,988, Feb. 21, 1992, abandoned. This application Jan. 4, 1994, Ser. No. 177,638

Claims priority, application Germany, Aug. 28, 1991, 41 28 547.6

Int. Cl.[6] B05D *3/06;5/06*; H05H *1/02;1/24*

U.S. Cl. 427—563 **8 Claims**



1. Process for applying thin layers onto a synthetic substrate, said process comprising

arranging at least one synthetic substrate in a substrate holder,

vaporizing SiO to form layer of SiO on said substrate, said layer having a thickness of one molecule to 50 nm,

concurrently with the vaporizing of SiO, irradiating the substrate and the layer of SiO being formed with a first plasma,

following formation of said layer of SiO, vaporizing SiO_2 to form a layer of SiO_2 at least 500 nm thick,

concurrently with the vaporizing of SiO_2, irradiating the layer of SiO and the layer of SiO_2 being formed with a second plasma, and

concurrently with the vaporizing of SiO_2, varying process parameters including at least one of plasma power, gas pressure, and coating rate so that the layer of SiO_2 has a hardness gradient wherein the SiO_2 has a hardness which increases from the SiO layer outward.

5,597,623

PROCESS FOR USING MICROWAVE PLASMA CVD

Yasuyoshi Takai; Tetsuya Takei; Hirokazu Otoshi, all of Nagahama, and Ryuji Okamura, Shiga-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

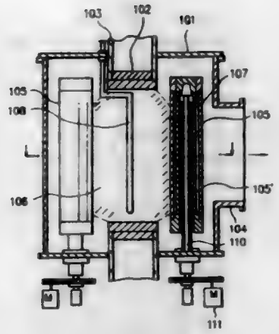
Division of Ser. No. 63,048, May 19, 1993, Pat. No. 5,360,484, which is a continuation of Ser. No. 915,658, Jul. 21, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,899

Claims priority, application Japan, Jul. 26, 1991, 3-187650

Int. Cl.[6] H05H *1/30*

U.S. Cl. 427—575 **15 Claims**

1. A process for forming a functional deposited film on a substrate using a microwave plasma CVD apparatus, said microwave plasma CVD apparatus comprising a deposition chamber having a deposition space, a supporting means for a substrate arranged in said deposition space, means for supplying a film-forming raw material gas into said deposition space for forming said functional deposited film on said substrate arranged in said deposition space, means for evacuating the inside of said deposition chamber, and a microwave introducing means including a microwave transmissive window, said microwave transmissive window being composed of a sintered alpha-alumina ceramics body containing alpha-alumina as a matrix comprised of fine particles with a mean particle size d satisfying the equation 0.5 μm≦d≦50 μm and with a ratio of ρ_2/ρ_1 between the theoretical



density ρ_1 and the bulk density ρ_2 satisfying the equation $0.800 \leq \rho_2/\rho_1 \leq 0.995$, said process comprising the steps of:

evacuating the inside of the deposition chamber having a deposition space to a desired vacuum,

introducing a film-forming raw material gas into said deposition space, and

introducing a microwave energy through the microwave transmissive window into said deposition space to cause discharge and generate a plasma in said deposition space, whereby a functional deposited film is formed on the substrate arranged in said deposition space.

5,597,624

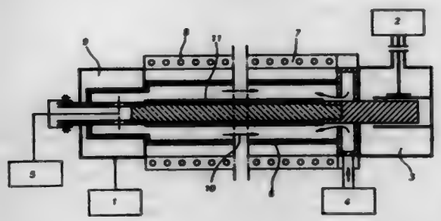
METHOD AND APPARATUS FOR COATING DIELECTRICS

Leonid Bilnov, Moscow, Russian Federation, and Wolfgang Neuberger, Monchen-Gladbach, Germany, assignors to Ceram Optic Industries, Inc., East Longmeadow, Mass.

Filed Apr. 24, 1995, Ser. No. 428,769

Int. Cl.[6] H05H 1/30

U.S. Cl. 427—575 **17 Claims**



1. A method for coating the outside of dielectric starting bodies by a plasma enhanced CVD deposition process with a dielectric layer, using a microwave generated plasma, comprising the steps of:

a. introducing a dielectric starting body with an outer surface to be coated into a deposition chamber and having a length;

b. supplying said deposition chamber with a reactive gas containing a coating material precursor and having a pressure P;

c. generating a plasma in said deposition chamber as surface plasma wave on said dielectric starting body's surface with said surface plasma wave generated as one of the following group—a symmetric E_{01} wave and an asymmetric HE_{11} hybrid azimuthal wave; and

d. having said reactive gas react with said surface plasma wave depositing at least one layer of a desired coating onto said dielectric starting body.

5,597,625

LOW PRESSURE GROWTH OF CUBIC BORON NITRIDE FILMS

Tiong P. Ong, Austin, Tex., and Yuh-Han Shing, Hsinchu, Taiwan, assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 338,281, Nov. 14, 1994, abandoned, which is a continuation of Ser. No. 180,534, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 16,132, Feb. 10, 1993, abandoned. This application Oct. 3, 1995, Ser. No. 538,258

Int. Cl.[6] B05D 3/06; C23C 16/00

U.S. Cl. 427—575 **10 Claims**

1. A method for making a tool comprising the steps of:

providing a tool having a tungsten carbide cutting surface;

etching said tungsten carbide cutting surface to form an acid etched surface;

rubbing said acid etched surface with sub-micron diamond powder to form a diamond powder treated surface;

depositing amorphous silicon onto said diamond powder treated surface to form a layer of amorphous silicon thereon;

depositing a sufficient amount of diamond onto said amorphous silicon layer on said tungsten carbide cutting surface by chemical vapor deposition to form a substantially continuous polycrystalline diamond interlayer which covers said tungsten carbide cutting surface; and

depositing boron nitride onto said polycrystalline diamond interlayer by chemical vapor deposition at a temperature of between 400° C. and 1000° C. and a pressure of up to 100 Torr to form a polycrystalline coating which consists essentially of cubic boron nitride.

5,597,626

LIQUID CRYSTAL DEVICE

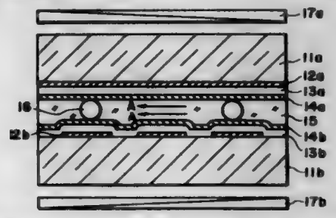
Ken Eguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1993, Ser. No. 165,454

Claims priority, application Japan, Dec. 11, 1992, 4-352364

Int. Cl.[6] G02F 1/1337

U.S. Cl. 428—1 **10 Claims**



1. A liquid crystal device, comprising: a pair of substrates each having thereon an electrode, a polymeric ion-conductive film and an organic electroconductive alignment film in this order, and a liquid crystal disposed between the substrates; wherein said polymeric ion-conductive film comprises a material selected from the group consisting of polyether, polyester, polyimine and crosslinked polymer thereof represented by the following formulae

$$+CH_2-CH_2-O+_n \quad (1)$$

$$+CH_2-\underset{CH_3}{CH}-O+_n \quad (2)$$

$$+O-CH_2-CH_2-O-\overset{O}{\overset{\|}{C}}+CH_2+_x\overset{O}{\overset{\|}{C}}+_n \quad (3)$$

$$+CH_2-CH_2-\overset{O}{\overset{\|}{C}}-O+_n \quad (4)$$

-continued

$$+CH_2-CH_2-\underset{H}{N}+_n \quad (5)$$

$$+CH_2-CH_2-\underset{CH_3}{N}+_n. \quad (6)$$

5,597,627

STONE PRODUCT IN SHEET FORM, METHOD FOR ITS MANUFACTURE AND APPROPRIATE MEANS

Jan-Inge Lindeberg, Styrsö, Sweden, assignor to Techstone i Kinna AB, Kinna, Sweden

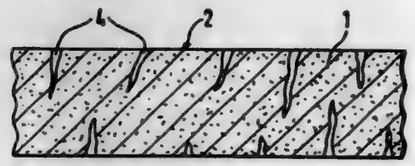
PCT No. PCT/SE93/00487, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/00651, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 2, 1993, Ser. No. 356,326

Claims priority, application Sweden, Jun. 24, 1992, 9201963

Int. Cl.[6] B32B 9/00

U.S. Cl. 428—15 **11 Claims**



1. Stone product in sheet form suitable for outdoors and indoors use as a facade cladding or a fitting comprising: the presence of an impregnating agent existing in the openings present in the stone sheet thereby increasing the strength and flexibility of the stone sheet.

5,597,628

LINING

Renzo Cetrelli, Finspong, and Ingvar Hultmark, Norrköping, both of Sweden, assignors to ABB Carbon AB, Finspong, Sweden

Continuation of Ser. No. 30,107, Mar. 12, 1993, abandoned. This application Aug. 19, 1994, Ser. No. 293,199

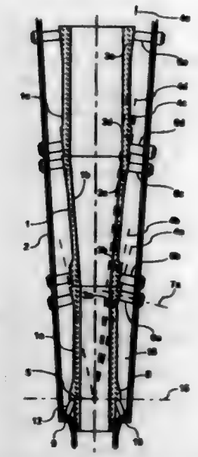
Claims priority, application Sweden, Sep. 14, 1990, 9002924

Int. Cl.[6] F16L 9/22

U.S. Cl. 428—34.6 **11 Claims**

1. A tubular member having an inner liner, said liner having an axis and being made of material having a different coefficient of linear expansion than said casing, said liner being supported in said casing by support means coaxially supporting said liner within said casing, said liner comprising at least one tubular section having an outer surface which defines at least one conical support section for resting against at least one set of angularly disposed radial supports, included in said support means, at a plurality of contact points with said radial supports, said contact points being located on generatrices of a conceived cone or pyramid, said generatrices radiating from a fixed point on the axis of said liner coinciding with the tip of said cone or pyramid;

said support means also including flexible support members longitudinally spaced from said radial supports for flexibly supporting said liner in said casing wherein said fixed point maintains fixed position with respect to said liner and said casing upon thermal volumetric changes of at least one of said liner and said casing.



5,597,629

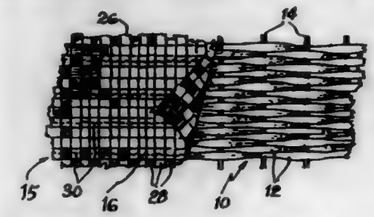
HIGH SHEAR STRENGTH PULTRUSION

David W. Johnson, San Diego, Calif., assignor to Ebert Composites Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 128,800, Sep. 28, 1993, abandoned, and Ser. No. 196,650, Feb. 14, 1994, and Ser. No. 259,431, Jun. 14, 1994, which is a continuation-in-part of Ser. No. 715,912, Jun. 14, 1991, Pat. No. 5,247,774, and Ser. No. 541,547, Jun. 21, 1990, Pat. No. 5,024,036, and Ser. No. 231,379, Aug. 12, 1988, Pat. No. 4,991,726, which is a continuation-in-part of Ser. No. 137,101, Dec. 23, 1987, Pat. No. 4,809,146, and Ser. No. 137,100, Dec. 23, 1987, Pat. No. 4,825,620, and Ser. No. 848,573, Apr. 7, 1986, Pat. No. 4,715,503. This application Jan. 26, 1995, Ser. No. 325,981

Int. Cl.[6] B29D 22/00

U.S. Cl. 428—36.1 **15 Claims**



1. A pultrusion of enhanced isotropic strength characteristics comprising:

(a) a fiber component defining a longitudinal pultrusion direction and being comprised of:

(I) at least one layer of bidirectional woven roving fiber cloth having

(a) an array of transverse woof fiber tows and having at least one unfinished side edge defined at least in part by exposed fiber ends of fibers of said transverse fiber tows;

(b) an array of longitudinally extended warp fiber tows interwoven with said woof fiber tows;

(ii) a longitudinally extended binder layer superimposed on said layer of woven roving at least over a portion thereof adjacent said at least one unfinished side edge;

(iii) said binder layer binding said exposed ends of fibers of said transverse fiber tows and matting same to minimize the exposure of frayed ends; and,

(b) a solidified resin matrix impregnated into said fiber component to define a rigid mass having bidirectional interwoven fibers at least a portion of which has been pultruded into multiple continuous layers of bidirectional fiber cloth in a switchback pleat configuration with pleat fold lines parallel to the pultrusion direction and at least some of the fibers of said fiber cloth having substantial transverse directional components to define cross fibers such that machine cuts made into said pultrusion in a direction substantially parallel to said cross fibers are reinforced by same against longitudinal shearing forces.

5,597,630

SEAMLESS, TAPERED TUBULAR MEMBER

Harold P. Hogarth, 88 Westbrook Dr., O'Fallon, Mo. 63366, and Wayne E. Hogarth, 8685 7th St., Downey, Calif. 90241

Division of Ser. No. 977,927, Nov. 18, 1992, which is a continuation-in-part of Ser. No. 855,462, Mar. 20, 1992, abandoned, which is a continuation of Ser. No. 712,991, Jun. 10, 1991, abandoned, which is a continuation of Ser. No. 504,879, Apr. 5, 1990, abandoned, which is a continuation of Ser. No. 308,215, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 46,637, May 7, 1987, abandoned. This application Feb. 8, 1995, Ser. No. 385,798

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—36.1 **11 Claims**



1. A seamless, elongated, tapered, tubular member of net shape having a length of 3 to 90 feet and a diameter of 0.1 inches to 4 feet, said tubular member formed by a method comprising the steps of:

providing an elongated, tapered mandrel;

applying a composite material consisting of a matrix of reinforcing fibers combined with a resin material onto said mandrel;

providing a one piece shell having an elongated, tapered bore;

inserting said mandrel with said composite material applied thereon into said bore of said shell to provide a mold assembly;

heating said mold assembly;

applying a tensile force at one end of said mandrel while simultaneously applying a compressive force at the other end of said mandrel;

displacing said mandrel and shell longitudinally toward each other under said tensile force and said compressive force to compress said composite material;

allowing said mold assembly to cool while continuing to apply said tensile and compressive forces on said composite material;

separating said shell and mandrel and

removing said tubular member from said mandrel.

5,597,631

PREPREG, COMPOSITE MOLDING BODY, AND METHOD OF MANUFACTURE OF THE COMPOSITE MOLDED BODY

Goro Furumoto, Moriyama; Takashi Fujiwara, Nobeoka, and Tomoo Igarashi, Moriyama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

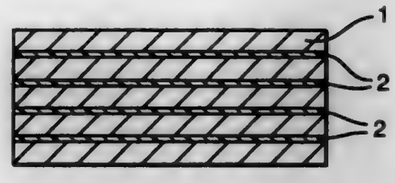
Continuation of Ser. No. 582,183, Nov. 14, 1990, abandoned. This application Feb. 12, 1993, Ser. No. 34,171

Claims priority, application Japan, Jan. 25, 1989, 1-14124; Apr. 19, 1989, 1-97595; Apr. 19, 1989, 1-97596; Apr. 27, 1989, 1-107756; Nov. 21, 1989, 1-300083; Nov. 24, 1989, 1-303250

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—364 **20 Claims**

1. A tubular molded body comprising (i) at least one film of an aromatic polyamide having substantially no melting point and having a tensile modulus of 700 kg/mm^2 or more and a tensile strength of 35 kg/mm^2 or more and having a thickness between 2 to 100 micrometers and (ii) at least one layer including a resin, wherein said film and said layer are adhesively bonded to each other by said resin in said layer.



5,597,632

SHEET FOR RETAINING FRESHNESS OF CUT FLOWERS

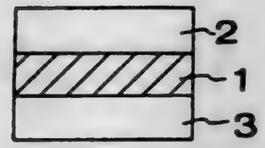
Bo Liu, 1-6-12, Higashi Narusecho, Nishinomiya-shi, Hyogo, Japan, and Hideaki Suzuki, 2-7-1, Umami Kita, Koryo-cho, Kita Katsuragi-gun, Nara, Japan

Filed Jul. 29, 1994, Ser. No. 282,979

Claims priority, application Japan, Jul. 30, 1993, 5-042187 U

Int. Cl.[6] A61F *13/02*

U.S. Cl. 428—41.1 **13 Claims**



1. A sheet for retaining freshness of cut flowers, in which a life-prolonging agent layer is formed on a substrate with a water permeability between 50 and 1000 g/m^2-hr and a synthetic resin protective layer is formed on said life-prolonging agent layer, said life-prolonging agent layer mainly containing at least one aluminum compound selected from the group consisting of aluminum sulfate, aluminum polychloride and potassium alum and being substantially water-soluble.

5,597,633

TRANSFER ADHESIVE TAPE

Norbert Mecke, Hanover, and Lothar Titze, Uetze, both of Germany, assignors to Pelikan GmbH, Hanover, Germany

Continuation of Ser. No. 180,532, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 978,939, Nov. 18, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 387,012

Claims priority, application Germany, Nov. 18, 1991, 41 37 936.5

Int. Cl.[6] C09J *7/02*

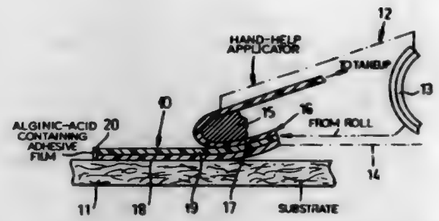
U.S. Cl. 428—41.5 **1 Claim**

1. An adhesive transfer tape comprising

(a) a flexible carrier; and

(b) an adhesive film applied to said flexible carrier and capable of separating from said flexible carrier and adhering to a substrate and of cleanly tearing without leaving adhesive threads, said adhesive film consisting essentially of:

a pressure-sensitive adhesive which is a copolymer of methyl methacrylate mixed with butyl acrylate containing from about 0.5 to 10% by weight of alginic acid, in finely divided form, said adhesive film prepared by the steps of:



(i) mixing an aqueous dispersion of an acrylate-based adhesive with an alginate dissolved in water to form an aqueous mixture;

(ii) stirring the resulting aqueous mixture;

(iii) acidifying the aqueous mixture to a pH of about 2 to 3 under stirring to obtain alginic acid, and precipitating the alginic acid in finely divided form to obtain an alginic acid-containing aqueous dispersion;

(iv) applying the alginic acid-containing aqueous dispersion, prepared according to steps (i), (ii) and (iii) to the flexible carrier in an amount of 10 to 80 g/m^2, in terms of the dry substance content of the dispersion; and

(v) drying the alginic acid-containing aqueous dispersion applied to the flexible carrier by evaporating water therefrom by contacting the aqueous dispersion with air heated to a temperature of 100° C. to form the adhesive film.

5,597,634

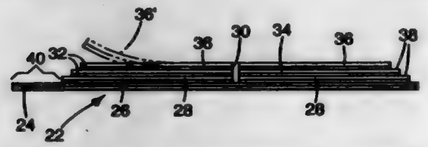
CHANGEABLE MEDIA LABELS

Glenn A. Bloomer, Maplewood, and Daniel L. VanLanen, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 245,978, May 19, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 459,289

Int. Cl.[6] B42D *15/00*

U.S. Cl. 428—40.1 **29 Claims**



1. A changeable label pad for attaching to an information container during use, for marking on to indicate information about the information container, wherein the information container has a label area, and wherein the changeable label pad has a length and comprising:

a base label layer which can adhesively attach the changeable label pad to the information container, wherein the base label layer is shaped to conform to the shape of the label area on the information container;

a first adhesive for attaching the base label layer to the information container; and

a stack of labels comprising:

a first label comprising at least two label segments attached to the base label layer, wherein the first label segments combine to cover at least most of the base label layer, wherein the first label segments are separated from each other by at least a separation;

a second label comprising at least two label segments attached to the first label, wherein the second label segments combine to cover at least most of the first label segments, and wherein the second label segments are separated from each other by at least a separation; and

a second adhesive for attaching the first label segments to the base label layer and the second label segments to the first label segments, wherein the label segments remain on the label pad and the label pad remains on the information container during use, wherein the label segments are marked on to indicate information about the information container to which the pad is attachable, and when it is desired to change the markings, the marked label segments can be removed from the information container to permit another label segment to be marked on;

wherein the label segments separation comprises means for reducing curling of the labels under conditions of extreme variations in humidity and temperature, wherein the reducing means comprises a transverse gap which runs transverse to the length of the label pad and which has a maximum width of 1.6 mm.

5,597,635

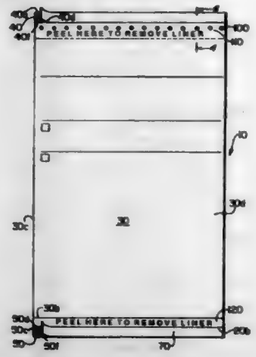
BUSINESS FORM WITH ADHESIVE FOR WINDOW MOUNTING

Kenneth E. Paul, Valencia, and C. Vincent Sidili, Oxnard, both of Calif., assignors to The Reynolds and Reynolds Company, Dayton, Ohio

Filed Jul. 29, 1994, Ser. No. 283,299

Int. Cl.[6] B32B *7/12;3/08;3/02*

U.S. Cl. 428—42.2 **8 Claims**



1. A business form for window mounting comprising:

a back sheet having opposed top and bottom edges, opposed side edges, a front surface, and a back surface;

first and second adhesive strips having an adhesive surface and a non-adhesive surface, said first adhesive strip overlapping said top edge of said back sheet to define a top adhesive area extending outwardly of said top edge of said back sheet, and said second adhesive strip overlapping said bottom edge of said back sheet to define a bottom adhesive area extending outwardly of said bottom edge of said back sheet, with said adhesive surfaces of said first and second adhesive strips contacting said back surface of back sheet;

first and second releasable liner strips substantially coextensive with and adhesively attached to said top and bottom adhesive areas, respectively, at said adhesive surfaces;

a first top sheet having opposed top and bottom edges, opposed side edges, a front surface, and a back surface, said first top sheet being substantially coextensive with said back sheet, said back surface of said first top sheet facing said front surface of said back sheet, and a first line of adhesive adhering said back surface of said first top sheet to said front surface of said back sheet, said first line of adhesive being parallel to and inwardly offset from said top edges of said first top and back sheets, and said first top sheet including a first line of weakness parallel to and downwardly offset from said first line of adhesive; and

a second top sheet having opposed top and bottom edges, opposed side edges, a front surface, and a back surface, said second top sheet being substantially coextensive with said

first top sheet and said back sheet, said back surface of said second top sheet facing said front surface of said first front sheet, and a second line of adhesive adhering said back surface of said second top sheet to said front surface of said first top sheet, said second line of adhesive being aligned with said first line of adhesive, and said second top sheet including a second line of weakness aligned with said first line of weakness.

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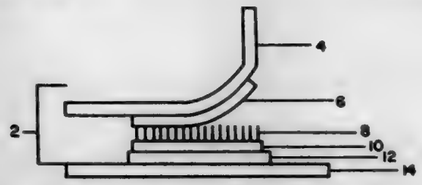
Patent Not Issued For This Number

5,597,637

ELASTOMERIC BACKING FOR FLOCK TRANSFER

Louis B. Abrams, Fort Collins, and William J. Anderson, Loveland, both of Colo., assignors to High Voltage Graphics, Inc., Fort Collins, Colo.

Filed Sep. 6, 1994, Ser. No. 301,080
Int. Cl.[6] B05D 1/14;1/6; D05C 17/00; B05B 5/02
U.S. Cl. 428—90 **2 Claims**



1. A stretchable flock transfer for use for application to a shirt, sock or stretchable clothing, said stretchable flock being of the type capable of stretching with the stretchable clothing when used, comprising:
- a base sheet having a surface area coated with a release adhesive;
- a flock adhered to the surface area in a desired pattern;
- a binding adhesive of a water based acrylic applied to said flock;
- a hot-melt adhesive applied to the binding adhesive and which also adheres said transfer to a shirt, sock or stretchable clothing such that said transfer may stretch if the clothing is stretched;
- said hot-melt comprising a blend of polyester and thermoplastic urethane, the ratio of polyester and thermoplastic urethane in said hot-melt is 80:20 to 20:80.

5,597,638

MAGNETIC RECORDING MEDIUM

Shinji Saito, and Nobuo Yamazaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1994, Ser. No. 181,239
Claims priority, application Japan, Jan. 13, 1993, 5-004286
Int. Cl.[6] B05D 5/12; G11B 5/66;5/70
U.S. Cl. 428—141 **19 Claims**

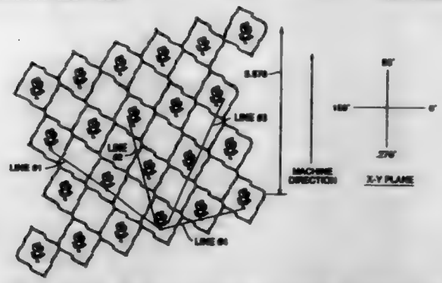
1. A magnetic recording medium comprising a nonmagnetic layer having a nonmagnetic particle dispersed in a binder provided on a nonmagnetic flexible support and a magnetic recording layer having a magnetic material dispersed in a binder provided on the nonmagnetic layer, wherein the magnetic layer comprises a hexagonal ferrite magnetic material and has a thickness of 1 μm or less, a central line average surface roughness at a cut off value of 0.08 mm of 0.006 μm or less, a switching field distribution of 0.3 or less in the longitudinal direction, a coercive force of 1,000 to 4,000 Oe and a ratio of residual magnetic flux density to coercive force of less than 1.5.

5,597,639

HIGH SOFTNESS EMBOSSED TISSUE

Galyn A. Schulz, Appleton, Wis., assignor to James River Corporation of Virginia, Richmond, Va.

Continuation-in-part of Ser. No. 999,414, Dec. 24, 1992, Pat. No. 5,436,057. This application Dec. 20, 1993, Ser. No. 169,628
Int. Cl.[6] D04H 1/64; B32B 31/20
U.S. Cl. 428—156 **69 Claims**



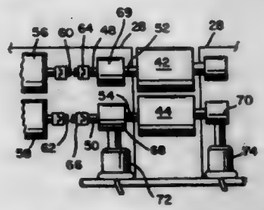
1. A nonwoven fibrous web having a machine direction and a cross direction, with the machine direction extending substantially parallel to a free edge of the web, and having a plurality of bosses formed therein comprising:
- a pattern which is made up of uniform stitch shaped bosses to form polygonal cells which make up a lattice structure; and
- a pattern which is made up of signature bosses which fill at least some of the cells;
- wherein the combination of lattice structure and signature bosses are offset from the machine direction.

5,597,640

ORIENTED PLASTIC STRAP

Donald L. Van Erden, Wildwood; Manuel C. Enriquez, Morton Grove, and Hans Weltekamper, Lincolnshire, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Division of Ser. No. 353,721, Dec. 12, 1994, Pat. No. 5,525,287, which is a continuation-in-part of Ser. No. 958,803, Oct. 9, 1992, Pat. No. 5,387,388. This application Sep. 14, 1995, Ser. No. 528,286
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—192 **25 Claims**



1. A plastic strap made from a solid sheet of material having a predetermined original thickness dimension and simultaneously milled and stretched by being passed through a nip defined between a pair of opposed rollers which are spaced apart with respect to each other so as to define said nip therebetween which has a predetermined space dimension which is substantially less than said predetermined original thickness dimension of said solid sheet of material, and wherein said pair of opposed rollers are rotated in opposite directions at different lineal surface velocities, comprising:
- first surface means of said solid sheet of material for engaging a first circumferential portion of a first one of said pair of opposed rollers at a position upstream of said nip defined between said pair of opposed rollers and having a first predetermined temperature value; and

- second surface means of said solid sheet of material disposed out of contact with said first one of said pair of opposed rollers and having a second predetermined temperature value, at said position upstream of said nip defined between said pair of opposed rollers, which is greater than said first predetermined temperature value of said first surface means such that when said first and second surface means of said solid sheet of material reach said nip defined between said opposed rollers so as to be simultaneously milled and stretched by being passed through said nip defined between said pair of opposed rollers, said temperature values of said first and second surface means of said solid sheet of material will be substantially the same such that the density of said solid sheet of material across the thickness dimension of said solid sheet of material is substantially uniform.

5,597,641

THERMAL TRANSFER MEDIUM

Hideki Suematsu; Manabu Ikemoto, and Yuriko Kameda, all of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Jan. 31, 1995, Ser. No. 381,209
Claims priority, application Japan, Feb. 19, 1994, 6-010473
Int. Cl.[6] B41M 5/26;5/34
U.S. Cl. 428—195 **9 Claims**

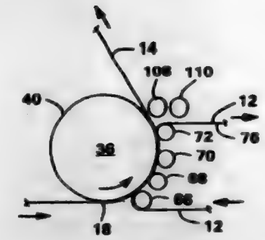
1. A thermal transfer medium for use in a method for forming a color image comprising selectively melt-transferring at least two of a yellow heat-meltable ink layer, a magenta heat-meltable ink layer or a cyan heat-meltable layer onto a receptor, said receptor having a microporous surface layer, in a predetermined order and each ink entering into micropores of the receptor in a molten state, thereby forming a color image, said color image comprising at least one color region developed on the basis of subtractive color mixture of at least two of yellow, magenta and cyan, or a combination of said color region with at least one color region of single color selected from yellow, magenta and cyan,
- the thermal transfer medium comprising a foundation, a non-transferable undercoat layer provided on the foundation, and at least one of a yellow heat-meltable ink layer, a magenta heat-meltable ink layer and a cyan heat-meltable ink layer provided on the undercoat layer, each of the ink layers comprising a coloring agent and a vehicle comprising a wax as a major ingredient, each of the ink layers having a melt viscosity of 20 to 200 cps/90° C., the undercoat layer consisting essentially of a resin exhibiting a strong adhesion to a wax or a mixture of a resin exhibiting a strong adhesion to a wax and filler.

5,597,642

DUAL SUBSTRATE, SINGLE-PASS PRINTING PROCESS AND SUBSTRATES PRINTED THEREBY

Robert J. Schleinz, Appleton, Wis.; Daniel J. Conrad, Murfreesboro, Tenn., and Joseph S. Kucherovsky, Philadelphia, Pa., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 347,983, Dec. 2, 1994, Pat. No. 5,501,149. This application May 12, 1995, Ser. No. 440,430
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—195 **13 Claims**



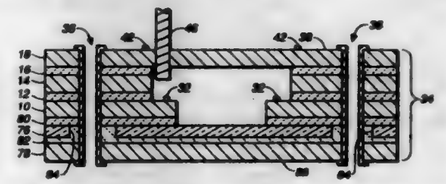
1. A printed substrate made by the process comprising:
- providing a continuously moving first substrate,
- moving the first substrate to an ink printing station comprising at least two ink printing cylinders,
- printing a pattern on the first substrate with one of the two ink printing cylinders,
- then introducing a continuously moving second substrate between the first substrate and the other of the ink printing cylinders,
- printing a pattern on the second substrate with the other of the ink printing cylinders, and
- collecting ink striking through the second substrate onto the first substrate.

5,597,643

MULTI-TIER LAMINATE SUBSTRATE WITH INTERNAL HEAT SPREADER

Patrick O. Weber, San Jose, Calif., assignor to Hestia Technologies, Inc., Sunnyvale, Calif.

Filed Mar. 13, 1995, Ser. No. 402,957
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—209 **9 Claims**



1. A multi-tier laminate substrate for use in electronic device packaging comprising:
- a first layer having a trace on a first side and a first window of sufficient size for placing an electronic device therein;
- a second layer having a trace on a first side and a second window of sufficient size to expose said trace on said first side of said first layer;
- a third layer having a trace on a first side;
- a heat spreader adjacent to a second side of said first layer and adjacent to said first side of said third layer;
- vias passing through the multi-tier laminate substrate;
- said heat spreader having clearance openings sufficiently large to accommodate the vias;
- at least one layer of dielectric between said first side of said first layer and a second side of said second layer, said dielectric having a third window of sufficient size to expose said trace on said first side of said first layer;

at least one layer of dielectric between said second side of said first layer and a first side of said heat spreader, said dielectric having a fourth window corresponding to said first window;

a spacer layer having at least one layer of dielectric on a first side and a fifth window of sufficient size to expose said trace on said first side of said first layer, said spacer layer and the at least one layer of dielectric being interposed between said second side of said second layer and said at least one layer of dielectric located between said first side of said first layer and said second side of said second layer; and

at least one layer of standard prepreg between said first side of said third layer and a second side of said heat spreader, said standard prepreg filling the clearance openings between the heat spreader and the vias.

5,597,644

CERAMIC CIRCUIT BOARD AND PROCESS FOR PRODUCING SAME

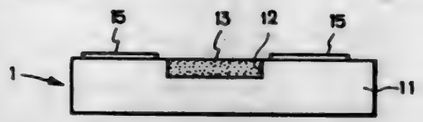
Hideaki Araki; Junzo Fukuta, both of Nagoya, and Masashi Fukaya, Kuwana, all of Japan, assignors to Sumitomo Metal Ceramics, Inc., Mine, Japan

Filed Nov. 9, 1995, Ser. No. 555,402

Claims priority, application Japan, Nov. 11, 1994, 6-303069

Int. Cl.[6] B32B 9/00

U.S. Cl. 428—210 **18 Claims**



1. A ceramic circuit board comprising a ceramic substrate having a glaze film formed thereon, wherein the ceramic substrate and the glaze film are made by co-firing of a ceramic green substrate and a glaze-forming glass material both capable of being sintered at a temperature below 1000° C.

5,597,645

NONWOVEN FILTER MEDIA FOR GAS

Richard D. Pike, Norcross, and Richard M. Peterson, Marietta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 30, 1994, Ser. No. 298,000

Int. Cl.[6] B01D 39/16;46/00; B03C 3/28; B32B 33/00

U.S. Cl. 96—99 **26 Claims**

1. A filter medium comprising an electretized nonwoven web of crimped fibers selected from the group consisting of spunbond filaments and staple fibers, wherein said nonwoven web has a Frazier permeability equal to or greater than about 100 $ft^3/min/ft^2$ and a density between about 0.01 g/cm^3 and about 0.095 g/cm^3, and wherein said crimped fibers are crimped before they are formed into said nonwoven web and have a crimp level of at least 2 crimps per extended inch, as measured in accordance with ASTM D3937-82.

5,597,646

POLYMERIC CABLE AND FABRIC MADE THEREFROM

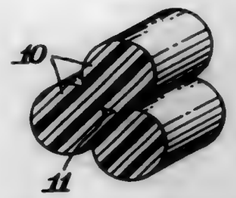
Robert A. Keller, Columbia, S.C., assignor to Shakespeare, Columbia, S.C.

Division of Ser. No. 224,243, Apr. 7, 1994. This application Aug. 23, 1995, Ser. No. 518,150

Int. Cl.[6] D03D 3/00

U.S. Cl. 442—195 **24 Claims**

1. A fabric comprising at least one cable structure, the cable structure comprising at least three oriented thermoplastic filaments



arranged symmetrically about a central axis, each filament having a cross-sectional shape that is bilaterally symmetrical and wherein each filament is fused to at least one adjacent filament along about from 1 to 100% of its perimeter and wherein the central axis of the cable structure is a void.

5,597,647

NONWOVEN PROTECTIVE LAMINATE

Michael D. Powers, Canton, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 28, 1995, Ser. No. 425,517

Int. Cl.[6] B32B 5/26;27/02

U.S. Cl. 442—382 **7 Claims**

1. A protective laminate comprising a first outer repellent spunbond layer of from about 0.1 to about 1 osy (3.4 to 34 gsm) containing an alcohol repellent in an amount of from about 0.1 to about 2 weight percent, and;

an inner repellent meltblown layer of from about 0.1 to about 1 osy (3.4 to 34 gsm) containing an alcohol repellent in an amount of from about 0.1 to about 1 weight percent, adhesively bonded using from about 0.1 to about 0.5 osy (3.4 to 17 gsm) of a meltblown adhesive to an absorbent, polyethylene-polypropylene side-by-side conjugate fiber layer of from about 0.1 to about 3 osy (3.4 to 102 gsm) having a density of between about 0.026 and about 0.013 ounces/cubic inch (0.045 to 0.022 grams/cubic centimeter) and containing an internal wetting agent in an amount from about 0.1 to about 3 weight percent, and;

wherein said layers are thermally point bonded to form said laminate.

5,597,648

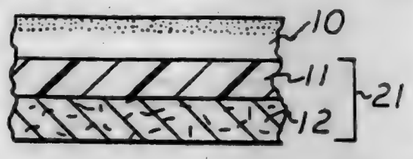
LOW-VOLATILITY PRESSURE SENSITIVE ADHESIVES

Larry F. Hanneman, Midland County, Mich.; Val Krukonis, Middlesex County, Mass.; Thomas J. Tangney, Midland County, Mich., and James J. Watkins, Middlesex County, Mass., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 18, 1991, Ser. No. 779,230

Int. Cl.[6] B32B 7/12;15/04;27/00;5/16

U.S. Cl. 428—40.7 **29 Claims**



1. An article of manufacture comprising a substrate having disposed on at least some of the surface thereof a layer of a pressure sensitive adhesive having a total mass loss of less than 1 percent by weight and a collected volatile condensable material content of less than 0.1 percent by weight, both based on the weight of the pressure sensitive adhesive, when the pressure sensitive adhesive is heated to a temperature, of 125° C. at a pressure of less than 5×10^{-5} torr for 24 hours.

5,597,649

COMPOSITE YARNS HAVING HIGH CUT RESISTANCE FOR SEVERE SERVICE

Robert B. Sander, South Orange; Herman L. LaNieve, III, Warren, and Robert E. Roetcheu, Wall Township, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Nov. 16, 1995, Ser. No. 558,456

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—370 **11 Claims**

1. A cut resistant composite yarn comprising: (a) a high modulus fiber, said fiber having a modulus greater than 200 gpd as measured by ASTM Test Method D- 3822, wherein said fiber is selected from the group coasisting of aramid fiber, extended chain polyolefin fiber, thermotropic liquid crystalline fiber, high strength poly-(vinyl alcohol) fiber, and poly(ethylene naphthalate) fiber, and (b) a particle-filled fiber, said fiber comprising a semi-crystalline polymer selected from the group coasisting of poly(ethylene terephthalate), poly(butylene terephthalate), poly(ethylene naphthalate), poly(phenylene sulfide), poly(1,4-cyclohexanedimethanol terephthalate), nylon-6, nylon-66, polyethylene, and polypropylene and hard particles having a Mobs Hardness Value greater than 3 selected from the group coasisting of tungsten metal particles and calcined aluminum oxide particles, where the average particle size is in the range of about 0.25 to about 6 microns, said particles being included in an amount less than 10% by volume.

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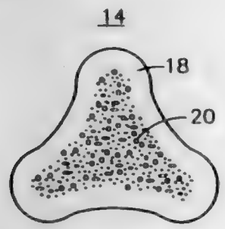
CONJUGATE CARPET FACE YARN

William C. Mallonee, P.O. Box 2318, Dalton, Ga. 30722

Filed Nov. 14, 1994, Ser. No. 339,336

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—370 **12 Claims**



1. A carpet face yarn having a denier in the range of from about 1350 to about 1550 per 84 filaments consisting essentially of a trilobal cross-section polyolefin matrix containing a plurality of generally co-linear substantially smaller polyamide fibrils embedded within the polyolefin matrix wherein the polyamide fibrils comprise from about 5 to about 40 wt. % and the polyolefin comprises from about 60 to about 95 wt. % of the filaments.

5,597,651

RUBBER-POLYESTER COMPOSITES INCLUDING POLYSTYRENE-POLYESTER COPOLYMERS

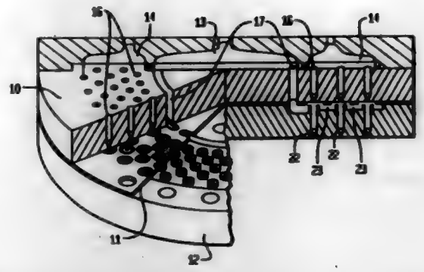
Eui W. Choe, Randolph; Charles E. Forbes, Bridgewater, both of N.J.; Jennifer A. Flibey, Charlotte, and Stephen F. Sherriff, Salisbury, both of N.C., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Oct. 26, 1995, Ser. No. 548,769

Int. Cl.[6] D02G 3/00

U.S. Cl. 428—373 **25 Claims**

1. A tri-component rubber-polyester composite comprising in adherent contact a rubber component, a linear polyester of an alkyl glycol and a first aromatic diacid as a second component, and a styrene containing copolyester as a third component.



5,597,652

CONDUCTIVE ROLL

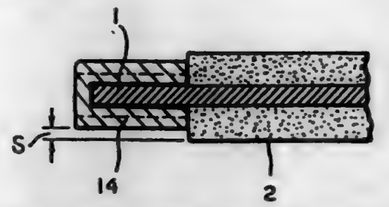
Tadashi Utsunomiya; Yoshinori Shimokawa, and Minoru Toyoda, all of Kanagawa-ken, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 752,556, Sep. 4, 1991, abandoned. This application Jul. 5, 1994, Ser. No. 270,521

Claims priority, application Japan, Jan. 12, 1990, 2-5845

Int. Cl.[6] B32B 25/00

U.S. Cl. 428—382 **17 Claims**



1. A conductive roll comprising a conductive shaft provided at a core, an intermediate layer provided on an outer periphery of said shaft and having means for imparting electrical conductivity and having elasticity, and a coated film layer provided on the outer periphery of said intermediate layer and having a resistivity higher than that of the intermediate layer, and said intermediate layer is made of a non-foamed or foamed elastic member selected from the gorup consisting of silicone rubber, urethane rubber, polybutadiene base urethane rubber, polynorbornane rubber, natural rubber, polybutadiene rubber, polyisoprene rubber, styrene butadiene rubber, acrylonitrile rubber, ethylene propylene diene rubber, acrylic rubber, epichlorohydrin rubber, ethylene vinyl acetate rubber, fluororubber and mixtures thereof.

5,597,653

ANTITHEFT LABEL FOR USE ON OBJECTS AND AN ABSORPTIVE PAD HAVING SUCH AN ANTITHEFT LABEL FOR USE ON FOOD

Takashi Ikeda, and Akira Homma, both of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Division of Ser. No. 186,470, Jan. 26, 1994, Pat. No. 5,496,611. This application May 24, 1995, Ser. No. 449,339

Claims priority, application Japan, Jan. 27, 1993, 5-029637; Oct. 27, 1993, 5-292787

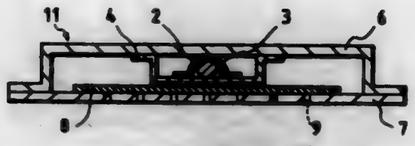
Int. Cl.[6] B32B 9/04

U.S. Cl. 428—411.1 **1 Claim**

1. An absorptive pad for absorbing fluids flowing from food, comprising:

a lower tape having a plurality of holes passing therethrough;

an absorptive sheet disposed on said lower tape;



an upper tape superposed on said lower tape so that said absorptive sheet is positioned therebetween; and

an antitheft label interposed between said upper tape and said absorptive sheet and attached to at least one of said upper tape and said lower tape, said antitheft label comprising an electroconductive nonmagnetic metal member permanently applied to a magnetic metal strip, wherein said electroconductive nonmagnetic metal member is shaped so as to include a plurality of corners, each of said corners of said electroconductive nonmagnetic metal member having a radius of curvature which is greater than or equal to 0.3 mm, wherein edges of said magnetic metal strip do not extend beyond edges of said electroconductive nonmagnetic metal member.

5,597,654

REPULPABLE PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS

William F. Scholz, Altadena, and Robert H. Van Ham, Pasadena, both of Calif., assignors to Avery Dennison Corporation, Pasadena, Calif.

Division of Ser. No. 211,763, Apr. 14, 1994, which is a continuation-in-part of Ser. No. 799,555, Nov. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 777,667, Oct. 15, 1991, Pat. No. 5,196,504. This application Jun. 7, 1995, Ser. No. 486,949

Int. Cl.[6] B32B *23/08*

U.S. Cl. 428—514 28 Claims

1. A construction comprising a repulpable paper backing supporting on at least one surface thereof a water-dispersible, inherently tacky pressure-sensitive adhesive comprising a tacky emulsion polymer formed from about 55% to 90% by weight of a first monomer which is at least one alkyl acrylate containing from 4 to about 8 carbon atoms in the alkyl group, from about 10% to about 20% by weight of a mixture of acrylic acid with at least one oleophilic unsaturated carboxylic acid, from 0% to about 15% by weight of at least one vinyl ester, and from 0% to about 15% by weight methyl acrylate, said emulsion polymer being formed in the presence of anionic and nonionic surfactants, said polymer having a glass transition temperature of about −15° to about −50° C., and formed in the presence of a sufficient amount of chain transfer agent to provide an emulsion polymer which, when coated onto a repulpable paper substrate, is sufficiently dispersible to enable recovery of paper fibers substantially free of adhesive and capable of passing TAPPI Useful Method 204, said adhesive being resistant to loss of adhesive properties and bleed on exposure to high humidity.

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DISTRIBUTOR TROUGH JUNCTIONS

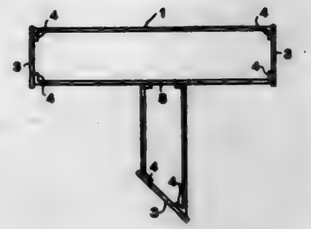
Gail W. Hausch, Clinton, and Donald Thomas, Stow, both of Ohio, assignors to Norton Chemical Process Products Corporation, Worcester, Mass.

Continuation of Ser. No. 394,986, Feb. 27, 1995, abandoned. This application Oct. 17, 1995, Ser. No. 544,288

Int. Cl.[6] B32B *3/04;3/10;3/26*

U.S. Cl. 428—595 3 Claims

1. A liquid distribution trough adapted to be joined to an element with a flat surface, said trough comprising opposed containment walls and a trough bottom having liquid distribution perforations therein joining said containment walls at their lower extremities in which at least one end of the trough is modified by the provision of



a internal flange within the trough and extending from the bottom and opposed containment walls thereof and adapted to be bolted to the element to which the trough is to be joined.

5,597,656

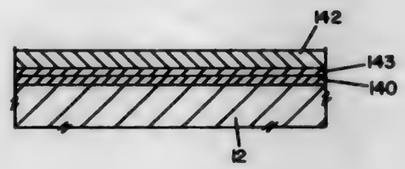
COATED METAL STRIP

Jay F. Carey, II, Follansbee, W. Va., and Mahroos Zamanzadeh, Pittsburgh, Pa., assignors to The Louis Berkman Company, Steubenville, Ohio

Continuation-in-part of Ser. No. 338,306, Nov. 14, 1994, Pat. No. 5,470,667, which is a continuation of Ser. No. 175,523, Dec. 30, 1993, Pat. No. 5,401,586, which is a continuation-in-part of Ser. No. 154,376, Nov. 17, 1993, abandoned, which is a continuation of Ser. No. 42,649, Apr. 5, 1993, abandoned. This application May 8, 1995, Ser. No. 438,042

Int. Cl.[6] B32B *15/18;15/20*

U.S. Cl. 428—647 77 Claims



1. A coated metal strip formed of a strip selected from the group consisting of carbon steel, stainless steel, copper, nickel alloys, tin, bronze and titanium, said strip having a thickness of 0.005–0.2 inch and supplied from a coil of strip and coating said strip by continuously passing said strip in a longitudinal direction at a speed through a molten both of metal alloy having a temperature of at least about 449° F. such that the residence time of said strip in said molten bath is about 0.08–10 minutes to deposit an uninterrupted layer of said metal alloy on the surface of said strip and forming an intermetallic layer between said strip surface and said coating, said coating having a generally uniform thickness of at least 0.0001 inch along the longitudinal length of said strip, said intermetallic layer having a thickness of about 1–10 microns and comprising a heat created interface alloy created from a mixture of said strip and metal alloy, said coating a two-phase coating comprising tin, a metal additive and more than about 10 weight percent zinc, and said tin plus zinc at least about 80 weight percent of said coating, said metal additive selected from the group consisting of a metal stabilizer, a coloring agent, a corrosion-resistant agent and mixtures thereof, said metal stabilizer including at least an effective amount of metal selected from the group consisting of antimony, bismuth, copper and mixtures thereof, said corrosion-resistant agent including at least an effective amount of metal selected from the group consisting of antimony, bismuth, copper, magnesium, nickel and mixtures thereof, and said coloring agent including at least an effective amount of copper.

5,597,657

SLIDE SURFACE CONSTRUCTION

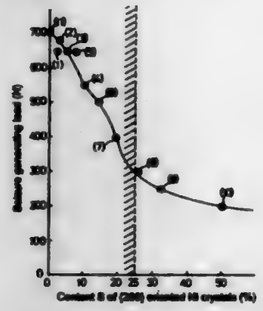
Takahiro Genji; Yoshikazu Fujisawa; Masamune Tabata, and Kazuhisa Okamoto, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1993, Ser. No. 164,338

Claims priority, application Japan, Dec. 10, 1992, 4-352558

Int. Cl.[6] F16C *33/12;* B32B *15/00*

U.S. Cl. 428—680 4 Claims



1. A slide surface construction having a slide surface, said slide surface construction comprising an aggregate of metal crystals, wherein:

said metal crystals are formed from at least one metal selected from the group consisting of Ni and Ni alloy, said metal crystals have a face-centered cubic structure and are shaped at least partly into pyramid-shaped crystals, said aggregate of metal crystals include (hh0) oriented crystals with their (hh0) planes (by Miller indices) oriented toward the slide surface, the content S of said (hh0) oriented crystals being in a range represented by 0%≦S<25%, and said pyramid-shaped crystals include ones having their slant portions formed by (h00) planes.

5,597,658

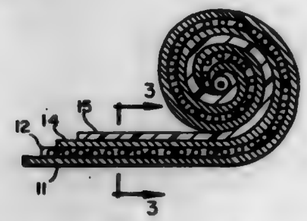
ROLLED SINGLE CELL AND BI-CELL ELECTROCHEMICAL DEVICES AND METHOD OF MANUFACTURING THE SAME

Joseph B. Kejha, c/o Hope Technologies, Inc. 3701 Welsh Rd., Willow Grove, Pa. 19090-1293

Filed Feb. 28, 1995, Ser. No. 395,717

Int. Cl.[6] H01M *10/40*

U.S. Cl. 429—94 10 Claims



1. A rolled cell electrochemical device which comprises:

at least one cathode layer,

at least one composite polymer electrolyte layer in contact with said cathode layer,

an anode layer in contact with said composite polymer electrolyte layer,

said cell has positive and negative terminals thereon, and

wherein said electrolyte is wet or semi-solid during rolling and may be solidified after rolling.

5,597,659

MANUFACTURING METHOD OF A SEPARATOR FOR A LITHIUM SECONDARY BATTERY AND AN ORGANIC ELECTROLYTE LITHIUM SECONDARY BATTERY USING THE SAME SEPARATOR

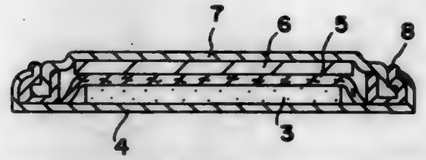
Kenichi Morigaki, Nishinomiya; Noriko Kakuta, Moriguchi, and Kazunori Hasegawa, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1994, Ser. No. 319,738

Claims priority, application Japan, Oct. 7, 1993, 5-277829; Dec. 7, 1993, 5-306383

Int. Cl.[6] H07M *10/40*

U.S. Cl. 429—190 17 Claims



1. An organic electrolyte lithium secondary battery comprising:

an electrode group comprising a negative electrode formed of material selected from the group consisting of metallic lithium and lithium alloys, a positive electrode and a separator in between said negative and positive electrodes, wherein said separator comprises a separator matrix formed of a microporous polyolefin membrane impregnated with an ionic conductive gel electrolyte.

5,597,660

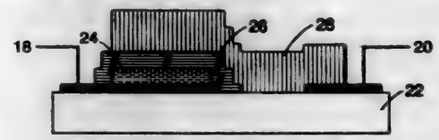
ELECTROLYTE FOR AN ELECTROCHEMICAL CELL

John B. Bates, Oak Ridge, and Nancy J. Dudney, Knoxville, both of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Division of Ser. No. 921,536, Jul. 29, 1992, Pat. No. 5,338,625. This application May 25, 1994, Ser. No. 248,929

Int. Cl.[6] H01M *10/36*

U.S. Cl. 429—191 2 Claims



1. An electrolyte for an electrochemical cell comprising an amorphous lithium phosphorous oxinitride material.

5,597,661

SOLID POLYMER ELECTROLYTE, BATTERY AND SOLID-STATE ELECTRIC DOUBLE LAYER CAPACITOR USING THE SAME AS WELL AS PROCESSES FOR THE MANUFACTURE THEREOF

Masataka Takeuchi; Koji Tokita; Miyuki Ueda; Jun Noguchi, all of Chiba, and Hideo Yashima, Ichihara, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

PCT No. PCT/JP94/00983, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO94/29884, PCT Pub. Date Dec. 22, 1994

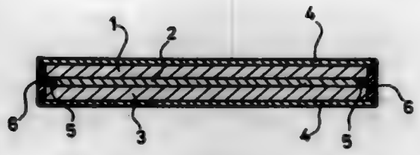
PCT Filed Jun. 3, 1994, Ser. No. 343,683

Claims priority, application Japan, Oct. 23, 1992, 4-286325; Jun. 3, 1993, 5-133620; Nov. 29, 1993, 5-323192; Nov. 29, 1993, 5-323193; Mar. 4, 1994, 6-060867; May 24, 1994, 6-133839

Int. Cl.[6] H01H *6/18*

U.S. Cl. 429—42 30 Claims

1. A solid polymer electrolyte comprising a composite of:



(a) a polymeric component, wherein said polymeric component comprises at least one member selected from the group consisting of:

(i) a homopolymer of a 2-acryloyloxyethylcarbamic acid ester monomer,

(ii) a homopolymer of a 2-methacryloyloxyethylcarbamic acid ester monomer, and

(iii) a copolymer comprising at least one monomer selected from the group consisting of a 2-acryloyloxyethylcarbamic acid ester, and a 2-methacryloyloxyethylcarbamic acid ester,

wherein said 2-acryloyloxyethylcarbamic acid ester is represented by formula (I):

$$CH_2=C(R^1)C(=O)O(CH_2)_2NHC(=O)OR^2 \quad (I)$$

wherein

R^1 represents hydrogen;

R^2 represents an organic chain containing at least one oxyalkylene group, wherein said organic chain may be linear, branched or cyclic, and may contain one or more atoms other than carbon, hydrogen or oxygen; and

wherein said 2-methacryloyloxyethylcarbamic acid ester is represented by formula (I'):

$$CH_2=C(R^{1'})C(=O)O(CH_2)_2NHC(=O)OR^{2'} \quad (I')$$

wherein

$R^{1'}$ represents methyl;

$R^{2'}$ represents an organic chain containing at least one oxyalkylene group, wherein said organic chain may be linear, branched or cyclic, and may contain one or more atoms other than carbon, hydrogen or oxygen; and

(b) at least one electrolyte salt.

5,597,662

CURABLE SOLID ELECTROLYTES CONTAINING A MODIFIED VISCOSITY AGENT AND ELECTROLYTIC CELLS PRODUCED THEREFROM

Mark J. Isaacson, Santa Clara, and Milton N. Golovin, San Jose, both of Calif., assignors to Valence Technology, Inc., Henderson, Nev.

Continuation of Ser. No. 74,107, Jun. 8, 1993, abandoned. This application Aug. 4, 1995, Ser. No. 511,299

Int. Cl.[6] H01M 10/40

U.S. Cl. 429—192 22 Claims

1. An electrolyte precursor for an electrolytic cell which comprises:

a solid matrix forming monomer;

a salt;

a solvent; and

a viscosifying agent containing a latent reactive group which covalently bonds to a polymeric matrix or the solvent of said electrolyte precursor upon curing.

5,597,663

LOW TEMPERATURE MOLTEN LITHIUM SALT ELECTROLYTES FOR ELECTROCHEMICAL CELLS

Shekhar L. Pendalwar, Sunrise, and Frank R. Denton, III, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 30, 1995, Ser. No. 452,898

Int. Cl.[6] H01M 10/40

U.S. Cl. 429—198 12 Claims



5. An electrochemical cell comprising:

an anode;

a cathode; and

a low temperature liquid organic lithium salt electrolyte having the formula

$$M^{x+}[(ZR_1Z'R_2Z''R_3Z'''R_4)A^-]_x$$

where M is a group IA or IIA metal; A is a group III element; Z, Z', Z'', and Z''' are each selected from the group of S, or O; R_1, R_2, R_3, and R_4 are each an organic group of up to 20 carbons and x is 1 or 2.

5,597,664

LITHIUM MANGANESE OXIDE COMPOUND AND METHOD OF PREPARATION

Paul C. Ellgen, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Sep. 7, 1995, Ser. No. 524,599

Int. Cl.[6] H01M 4/50

U.S. Cl. 429—224 16 Claims

1. A method for manufacturing $Li_2Mn_2O_4$ comprising the steps of:

(a) Providing $LiMn_2O_4$;

(b) Providing a lithium salt selected from the group consisting of LiOH and Li_2CO_3;

(c) Forming a solution or suspension of the $LiMn_2O_4$ and lithium salt in a liquid medium; and

(d) Adding a reducing agent to the solution or suspension.

5,597,665

POROUS METAL BODY, PROCESS FOR PRODUCING THE SAME AND BATTERY PLATE FORMED THEREFROM

Keizo Harada; Masayuki Ishii, and Shosaku Yamanaka, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

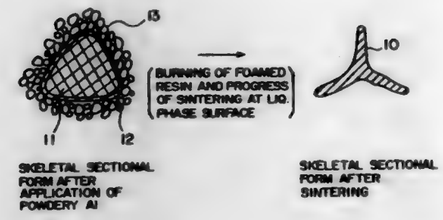
Filed Oct. 17, 1995, Ser. No. 544,098

Claims priority, application Japan, Dec. 15, 1994, 6-311852

Int. Cl.[6] H01M 4/80

U.S. Cl. 429—235 8 Claims

1. A porous metal body containing Al as the principal component, having a porous structure of three-dimensional network provided with interconnected pores at a porosity of 90% or higher and having at least 10 pores per cm, which comprises metallic skeleton



2parts whose average sectional form satisfies the relationships represented by the following formulae:

$$S1/S2 \leq 2 \text{ and } L1/L2 \leq 0.1$$

wherein

S1=area of a closed region in one metallic skeletal section,

S2=area of a region filled with at least one metal in a closed region in one metallic skeletal section,

L1=maximum thickness of one metallic skeletal section, and

L2=outer peripheral length of one metallic skeletal section.

5,597,666

METHOD FOR FABRICATION OF A MASK

Hong S. Kim, Seoul, Rep. of Korea, assignor to Gold Star Electron Co., Ltd., Rep. of Korea

Filed Jan. 14, 1992, Ser. No. 821,938

Claims priority, application Rep. of Korea, Jan. 14, 1991, 461/1991

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 4 Claims



1. A method for fabricating a mask, comprising:

providing a quartz plate;

depositing a Cr layer on the quartz plate;

depositing an oxidizable material layer over the Cr layer;

forming a photoresist pattern over the oxidizable material layer;

etching both the Cr layer and the oxidizable material layer, using the photoresist pattern as a mask; and

extending the oxidizable material in volume by an oxidation process to form a phase-shifter.

5,597,667

PHOTOMASK AND PHOTOMASK BLANK

Shuji Nakao, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 316,498

Claims priority, application Japan, Dec. 27, 1993, 5-330802

Int. Cl.[6] G03F 9/00

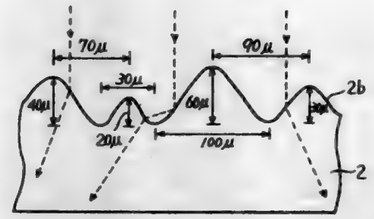
U.S. Cl. 430—5 4 Claims

1. A photomask used in photolithography, comprising:

a transparent substrate having two opposite main surfaces; and

a light-shielding pattern formed on one of said main surfaces; wherein

the other of said main surfaces includes a plurality of randomly distributed concaves and convexes, spacings and heights of



said concaves and convexes being within a range from 50 to 1000 times a wavelength of light used in said photolithography.

5,597,668

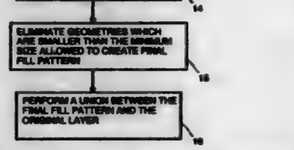
PATTERNED FILLED PHOTO MASK GENERATION FOR INTEGRATED CIRCUIT MANUFACTURING

Edward D. Nowak, Pleasanton; Subhas Bothra, San Jose; David Estock, Cupertino, and Wesley Erck, Danville, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 19, 1995, Ser. No. 504,157

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 18 Claims



1. A method for increasing planarity of a processing layer of an integrated circuit, the method comprising the following step:

(a) generating a mask for the processing layer, including the following substeps,

(a.1) generating active circuitry lines for the mask,

(a.2) generating a fill pattern for the mask, the fill pattern being placed in areas of the mask not filled by the active circuitry lines, and

(a.3) performing a union of the active circuitry lines generated in substep (a.1) and the fill pattern generated in substep (a.2) to produce a final pattern for the mask.

5,597,669

FRAME-SUPPORTED PELLICLE FOR PHOTOLITHOGRAPHY

Yuichi Hamada; Megura Kashida, and Yoshihiro Kubota, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1995, Ser. No. 524,546

Claims priority, application Japan, Sep. 30, 1994, 6-236240

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 2 Claims

1. A frame-supported pellicle for photolithography as an integral device which comprises:

(a) a frame made from a rigid material; and

(b) a membrane spread over and adhesively bonded to one end surface of the frame in a slack-free fashion, said membrane being formed from a plastic resin which is a homopolymer of a norbornene compound or a copolymer of a monomer mixture mainly consisting of a norbornene compound.

5,597,670

EXPOSURE METHOD AND APPARATUS

Masato Aketagawa, Kawasaki, and Naoto Sano, Kunitachi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 92,568, Jul. 16, 1993, abandoned, which is a continuation of Ser. No. 666,127, Mar. 7, 1991, abandoned. This application Apr. 27, 1995, Ser. No. 430,158

Claims priority, application Japan, Mar. 9, 1990, 2-596147; Mar. 5, 1991, 3-064002

Int. Cl.[6] G03F *7/20*

U.S. Cl. 430—30 **29 Claims**

1. A method of exposing a photosensitive substrate with a band-narrowed laser beam from an excimer laser, said method comprising the steps of:

detecting a change in bandwidth of the laser beam;

changing the diameter of the laser beam to substantially compensate for the change in bandwidth of the laser beam; and

exposing the substrate with the diameter-changed laser beam.

5,597,671

ELECTROPHOTOGRAPHIC PRINTING PLATE PRECURSOR AND METHOD FOR DEVELOPMENT THEREOF

Shigeyuki Dan, and Takao Nakayama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 23, 1995, Ser. No. 518,336

Claims priority, application Japan, Sep. 20, 1994, 6-225077

Int. Cl.[6] G03G *5/04*

U.S. Cl. 430—49 **4 Claims**

1. An electrophotographic printing plate precursor which comprises an electrically conductive support having thereon a photoconductive layer and a back layer, said back layer being provided on the surface of said support opposite to said photoconductive layer, wherein said back layer comprises at least an outermost layer having a surface resistivity of from 1×10^{10} to 1×10^{14} Ω and an inner layer having a surface resistivity of less than 1×10^{10} Ω.

5,597,672

METHOD FOR PREPARATION OF PRINTING PLATE BY ELECTROPHOTOGRAPHIC PROCESS

Eiichi Kato, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 5, 1995, Ser. No. 567,249

Claims priority, application Japan, Dec. 5, 1994, 6-329292

Int. Cl.[6] G03G *5/047*

U.S. Cl. 430—49 **29 Claims**

1. A method for preparation of a printing plate by an electrophotographic process comprising (i) providing a peelable first transfer layer (T_1) containing a resin (A) capable of being removed upon a chemical reaction treatment on an electrophotographic light-sensitive element, (ii) forming a toner image on the first transfer layer by an electrophotographic process, (iii) either (a) providing a second transfer layer (T_2) containing a resin (A) capable of being removed upon the chemical reaction treatment on the toner image and the first transfer layer in the non-image area and transferring the toner image together with the first transfer layer and the second transfer layer from the light-sensitive element to a receiving material having a surface capable of providing a hydrophilic surface suitable for lithographic printing at the time of printing, or (b) transferring the toner image together with the first transfer layer from the light-sensitive element onto the second transfer layer (T_2) provided on the receiving material, and then (iv) removing the whole first transfer layer (T_1) and the second transfer layer (T_2) in the non-image area by the chemical reaction treatment.

5,597,673

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Kazuhito Watanabe, Numazu, and Toshiki Nanya, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1995, Ser. No. 522,929

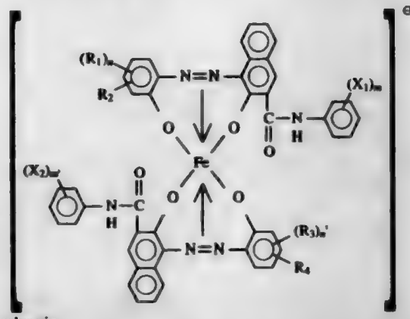
Claims priority, application Japan, Sep. 2, 1994, 6-234325

Int. Cl.[6] G03G *9/087;9/09;9/097*

U.S. Cl. 430—96 **8 Claims**

1. A negatively chargeable toner for developing an electrostatic image, comprising a polyester resin obtained by reaction of a polyhydric alcohol with a carboxylic acid as binder resin, a colorant, and a charge controlling agent including

(a) an iron-containing azo dye expressed by the following general formula (I):



(I)

wherein

X_1 and X_2 are independently selected from the group consisting of a hydrogen atom, a lower alkyl group, an alkoxy group, a nitro group, and a halogen atom,

R_1 and R_3 are independently selected from the group consisting of a hydrogen atom, an alkyl group having 1–18 carbon atoms, an alkenyl group, a sulfonamide group, an organic sulfonyl group, a carboxylic acid ester group, a hydroxyl group, an alkoxy group having 1– 18 carbon atoms, an acetylamino group, and a halogen atom,

R_2 and R_4 are independently selected from the group consisting of a hydrogen atom, and a nitro group,

$A^{\oplus}$ stands for a cation, and

m, m', n and n' are each an integer of 1–3, and

(b) a copolymer of a styrene monomer and/or an acrylic monomer with a sulfonic acid group-containing acrylamide, wherein the amount of said azo dye present on the surface of said toner is 7×10^{-3} to 20×10^{-3} g per 1 g of said toner.

5,597,674

TONER RESIN COMPOSITION AND TONER

Tatsuo Suzuki, Shiga-ken, and Takashi Ueyama, Kusatsu, both of Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Filed Jul. 7, 1995, Ser. No. 499,549

Claims priority, application Japan, Jul. 7, 1994, 6-155740

Int. Cl.[6] G03G *9/087*

U.S. Cl. 430—109 **15 Claims**

1. A toner resin composition mainly comprising vinyl-type copolymer(s) wherein: said vinyl-type copolymer contains a cross-linked low polymer component which has a peak molecular weight at a low molecular weight and a non-cross-linked high polymer component which has a peak molecular weight at a high molecular weight; said low polymer component being cross-linked using a cross-linking agent comprising diacrylate or dimethacrylate obtained from a diol which has a linear chain with a carbon number of 5 or more with no branches or a branch(es) with a carbon number of 1 or less, and has a peak molecular weight in a molecular weight distribution curve of from about 4×10^3 to 8×10^4; the amount of cross-linking agent used being about 0.1 to 10 wt % in the polymer which has a peak at a low molecular weight; the peak molecular weight in the molecular weight distribution curve of said high polymer component being from about 1×10^5 to 4×10^6; and, said vinyl-type copolymer mainly comprising styrene-type monomers with (meth)acrylic ester monomers and/or other vinyl-type monomers as structural units.

5,597,675

DISPERSING POLYMERS FOR PHTHALOCYANINE PIGMENTS USED IN ORGANIC PHOTOCONDUCTORS

Ravindra L. Arndt, Woodbury, and John C. Haidos, St. Paul, both of Minn., assignors to Imation Corp., Woodbury, Minn.

Division of Ser. No. 414,278, Mar. 31, 1995, Pat. No. 5,536,611. This application Apr. 18, 1996, Ser. No. 634,539

Int. Cl.[6] G03G *5/06*

U.S. Cl. 430—134 **16 Claims**

1. A method for producing an organic photoconductor comprising the steps of;

a) preparing a photoconductive layer solution by combining a phthalocyanine pigment dispersion comprising: i)a phthalocyanine pigment, ii) a dispersing polymer comprising a polymeric material having a plurality of pendant quaternary ammonium salt groups, and iii) an organic solvent, with a binder and a crosslinking agent;

b) coating said photoconductive layer solution on an electroconductive substrate to form a coating;

c) drying said coating; and

d) crosslinking said coating.

5,597,676

METHOD FOR MAKING IMPROVED IMAGING ELEMENTS SUITABLE FOR USE IN SILVER SALT DIFFUSION TRANSFER PROCESS

Ludo Van Rompuy, Destelbergen, and Paul Coppens, Turnhout, both of Belgium, assignors to AGFA-Gevaert. N.V., Mortsel, Belgium

Filed Aug. 17, 1995, Ser. No. 516,108

Claims priority, application European Pat. Off., Sep. 8, 1994, 94202575

Int. Cl.[6] G03C *8/06;8/28;11/12;* G03F *7/07*

U.S. Cl. 430—204 **7 Claims**

1. A method for obtaining an imaging element suitable for use in a silver salt diffusion transfer process by the steps of:

preparing an image receiving element by coating the anodized surface of an aluminum foil with an image-receiving layer comprising physical development nuclei,

preparing a photosensitive layer packet by coating a temporary base with at least one photosensitive silver halide emulsion layer,

pressing the thus formed photosensitive layer packet with its photosensitive silver halide emulsion coated side against said image receiving layer, which has been wet with an aqueous moistening liquid, and

optionally removing said temporary base, characterized in that between said temporary base and said at least one photosensitive silver halide emulsion layer a barrier layer is present which comprises gelatin as hydrophilic binder, is substantially free of developing agents, is substantially unhardened, comprises one or more hydrophilic binders in an amount of at least 0.25 g/m^2 and is in water permeable relationship with said image receiving layer.

5,597,677

PHOTOIMAGEABLE ELEMENTS

Steven L. Kangas, Woodbury; Emil D. Sprute, Apple Valley, and Dean J. Stych, New Brighton, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 2, 1994, Ser. No. 333,421

Int. Cl.[6] G03F *7/11;7/095*

U.S. Cl. 430—273.1 **21 Claims**

1. A photoimageable element developable in an aqueous-based developing solution; the photoimageable element comprising:

(a) a substrate;

(b) a layer of a photosensitive composition comprising a photosensitive material coated on the substrate; and

(c) a protective overcoating comprising an oxygen barrier component and a moisture resistant component; wherein the oxygen barrier component has an oxygen permeability of no greater than about 10^{-14} cc(cm)/cm^2(sec)(Pa) and the protective overcoating is removable in an aqueous-based developing solution, and wherein the moisture resistant component comprises a carboxylated styrene acrylic resin.

12. A photoimageable element comprising:

(a) a substrate;

(b) a layer of a photosensitive composition comprising a photosensitive material coated on the substrate; and

(c) a protective overcoating comprising an oxygen barrier component, a moisture resistant component, and antiblocking particulate material; wherein the oxygen barrier component comprises polyvinyl alcohol and the moisture resistant component comprises styrene acrylic resin.

19. A photoimageable element comprising:

(a) a substrate;

(b) a layer of a photosensitive composition comprising a photosensitive material coated on a first side of the substrate;

(c) a protective overcoating comprising an oxygen barrier component, a moisture resistant component, and antiblocking particulate material; wherein the oxygen barrier component comprises polyvinyl alcohol and the moisture resistant component comprises styrene acrylic resin;

(d) a layer of a pressure sensitive adhesive coated on a second side of the substrate; and

(e) a release liner covering the pressure sensitive adhesive.

5,597,678

NON-CORROSIVE PHOTORESIST STRIPPER COMPOSITION

Kenji Honda, Barrington; Donald F. Perry, North Providence, and Talebib Maw, Cumberland, all of R.I., assignors to OCG Microelectronic Materials, Inc., West Paterson, N.J.

Continuation-in-part of Ser. No. 228,775, Apr. 18, 1994, Pat. No. 5,472,830, and Ser. No. 436,548, May 8, 1995, Pat. No. 5,545,353. This application Jul. 7, 1995, Ser. No. 499,808

Int. Cl.[6] G03C *5/00;* C11D *7/06*

U.S. Cl. 430—331 **4 Claims**

1. A non-corrosive positive photoresist stripper composition comprising:

(a) solvent selected from the group consisting of N-methyl-2-pyrrolidone, N-hydroxyethyl-2-pyrrolidone, 1,3-dimethyl-2-imidazolidinone, dimethylsulfoxide, and admixtures thereof;

(b) a corrosion inhibitor selected from the group consisting of tricine, bicine, (2-benzothiozolylthio)succinic acid, and admixtures thereof;

(c) optionally, an alkanolamine selected from the group consisting of diethyleneglycolamine, monoethanolamine, diethanolamine, triethanolamine, and admixtures thereof;

(d) optionally, water; and

(e) optionally, a water-soluble surface active compound.

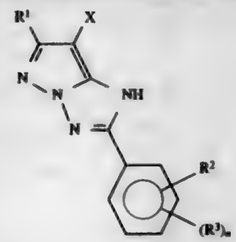
5,597,679

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yasuhiro Yoshioka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1995, Ser. No. 425,865
Claims priority, application Japan, May 11, 1994, 6-121719
Int. Cl.[6] G03C 1/46
U.S. Cl. 430—503 **20 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon, in any order, at least one yellow color developable light-sensitive silver halide emulsion layer, at least one magenta color developable light-sensitive silver halide emulsion layer, and at least one cyan color developable light-sensitive silver halide emulsion layer, wherein each of these emulsion layers has a different light-sensitive wavelength region, and wherein at least one magenta color developable light-sensitive silver halide emulsion layer contains at least one dye-forming coupler represented by formula (M-I), and at least one yellow color developable light-sensitive silver halide emulsion layer contains at least one dye-forming coupler represented by formula (Y-I),



(M-I)

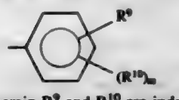
wherein R^1 is a group selected from the group consisting of formula (Q-1), (Q-2) and (Q-3):

$$—C(R^4)\ (R^5)—R^6 \qquad \text{(Q-1)}$$

wherein R^4 is an alkyl, cycloalkyl, aryl or heterocyclic group, R^5 and R^6 are independently substituents, and R^4, R^5 and R^6 may be linked to each other to form a single ring having 5–7 members or a condensed ring having 5–7 members,

$$—CH(R^7)—R^8 \qquad \text{(Q-2)}$$

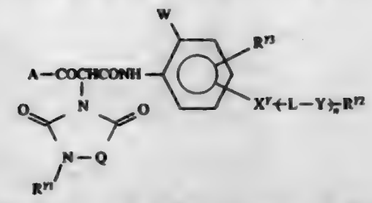
wherein R^7 is an alkyl, cycloalkyl, aryl or heterocyclic group, R^8 represents a substituent, and R^7 and R^8 may be linked to each other to form a single ring having 5–7 members or a condensed ring having 5–7 members,



(Q-3)

wherein R^9 and R^{10} are independeatly substituents, and m is an integer of 0–4,provided that a plurality of R^{10} are the same or different when m is not less than 2,

R^2 and R^3 are independently substituents, n is an integer of 0–4, and X is a halogen atom or a group which is removable by a coupling reaction with an oxidized developing agent,



(Y-I)

wherein A is a tertiary alkyl, or a tertiary cycloalkyl, W is a halogen atom, an alkoxy, aryloxy, or alkyl group, X^Y is a group —$NR^{71}CO$— or —$NR^{71}SO_2$—, L is an alkylene group, Y is a divalent group selected from the group consisting of —O—, COO, —SO_2— and —$PO(OR^{72})O$—, n is 0 or 1, and Q is a divalent group selected from the group consisting of —$CR^{74}R^{75}$—, —NR^{76}— and —CO—, wherein R^{71} and R^{76} are indepeadeatly hydrogen atoms or alkyl groups, R^{72} is an alkyl, cycloalkyl or aryl group, R^{73} is a hydrogen atom or a monovalent group which may be substituted on a benzene ring, R^{711} and R^{712} are indepeadeatly alkyl, cycloalkyl or aryl groups, R^{74} and R^{75} are independently hydrogen atoms, alkyl or alkoxy groups, provided that the total sum of the carbon atoms contained in the groups R^{71}, R^{76}, R^{75} and R^{76} is not greater than 4.

5,597,680

IMAGING ELEMENT COMPRISING AN AUXILIARY LAYER CONTAINING SOLVENT-DISPERSIBLE POLYMER PARTICLES

Yongcai Wang; Charles C. Anderson, both of Penfield; James L. Bello, Rochester, and Mario D. DeLaura, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1995, Ser. No. 567,788
Int. Cl.[6] G03C 1/76
U.S. Cl. 430—523 **23 Claims**

1. An imaging element for use in an image-forming process; said imaging element comprising a support, an image-forming layer and an auxiliary layer; said auxiliary layer having been coated from a dispersion of polymer particles in a liquid organic medium; said polymer particles comprising a core portion which is insoluble in said organic medium and a shell portion which has an affinity for both said core portion and said organic medium.

5,597,681

IMAGING ELEMENT COMPRISING AN ELECTRICALLY-CONDUCTIVE LAYER AND A PROTECTIVE OVERCOAT LAYER CONTAINING SOLVENT-DISPERSIBLE POLYMER PARTICLES

Charles C. Anderson; Yongcai Wang, both of Penfield; Mario D. DeLaura, Hamlin, and James L. Bello, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1995, Ser. No. 567,789
Int. Cl.[6] G03C 1/76
U.S. Cl. 430—523 **24 Claims**

1. An imaging element for use in an image-forming process; said imaging element comprising a support, an image-forming layer, an electrically-conductive layer and a protective overcoat layer that overlies said electrically-conductive layer; said protective overcoat layer having been coated from a dispersion of polymer particles in a liquid organic medium; said polymer particles comprising a core portion which is insoluble in said organic medium and a shell portion which has an affinity for both said core portion and said organic medium.

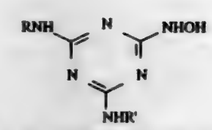
5,597,682

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Yoshio Ishii; Keiji Mihayashi, and Masakazu Morigaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

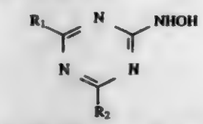
Filed Jan. 11, 1995, Ser. No. 371,418
Claims priority, application Japan, Jan. 25, 1994, 6-006384
Int. Cl.[6] G03C 1/795
U.S. Cl. 430—533 **4 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one photographic layer, wherein at least one of said photographic layers contains at least one radical scavenger compound represented by formula (A):



(A)

wherein R and R', which may be the same or different, each represent an alkyl group or an aryl group; provided that when R and R' are the same unsubstituted alkyl group, the alkyl group contains 7 or more carbon atoms,
or represented by formula (B):



(B)

wherein R_1 and R_2, which may be the same or different, each represent a hydroxylamino group, a hydroxyl group, an amino group, an alkylamino group, an arylamino group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkyl group or an aryl group, provided that R_1 and R_2 do not simultaneously represent —NHR, wherein R is an alkyl group or an aryl group;

wherein, said radical scavenger compound is present in an amount necessary to provide resistance to staining with time, and resistance to processing unevenness and change in sensitivity from the time of exposure to development of the photographic material, and

said support comprises a poly(alkylene aromatic dicarboxylate) whose glass transition point is from 50° to 200° C. and has been subjected to a heat treatment at a temperature of lower than the glass transition point thereof and not lower than 40° C. either before formation of a subbing layer or after formation of a subbing layer and before formation of a silver halide emulsion layer.

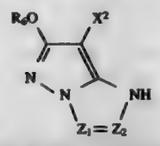
5,597,683

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Minoru Uchida; Shunichi Tomita, and Toshio Kawagishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 843,166, Feb. 28, 1992, abandoned.
This application May 26, 1994, Ser. No. 250,338
Claims priority, application Japan, Mar. 1, 1991, 3-057694
Int. Cl.[6] G03C 1/035;7/38;7/305
U.S. Cl. 430—544 **11 Claims**

1. A silver halide color photographic photosensitive material comprising a support, having thereon at least one photosensitive silver halide emulsion layer, wherein at least 50% of the total projected area of the silver halide grains in said emulsion layer is accounted for by tabular grains of an aspect ratio at least 2:1, wherein at least 50% of the total projected area of the silver halide grains in said emulsion layer is accounted for by hexagonal tabular silver halide grains which have two parallel planes as external surfaces and for which the ratio of the length of the longest side with respect to the length of the shortest side is not more than 2, and wherein a compound which can be represented by formula (III) indicated below is in at least one layer:



(III)

wherein R_6 represents an alkyl or aryl group; X^2 represents a group which may be eliminated by a coupling reaction with the oxidized form of a developing agent during development to form a development inhibitor, or a group which after elimination, reacts during development with another molecule of the oxidized form of the developing agent to form a development inhibitor, provided that X^2 does not contain a group according to formula (B-1) below;

Z_1 and Z_2 each represents a nitrogen atom or $=C(R_2)$- and when Z_1 is a nitrogen atom, Z_2 is $=C(R_2)$- and when Z_1 is $=C(R_2)$- Z_2 is a nitrogen atom, wherein R_2 represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a cyano group, a hydroxyl group, a nitro group, a carboxyl group, an amino group, an alkoxy group, an aryloxy group, an acylamino group, an alkylamino group, an anilino group, a ureido group, a sulfamoylamino group, an alkylthio group, an arylthio group, an alkoxycarbonylamino group, sulfonamido group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, an alkoxycarbonyl group, a heterocyclic oxy group, an azo group, an acyloxy group, carbamoyloxy group, a silyloxy group, an aryloxycarbonylamino group, an imido group, a heterocyclic thio group, a sulfinyl group, a phosphonyl group, an aryloxycarbonyl group, an acyl group or an azolyl group;

$$-X_1-(X_2=X_3)_b-X_4—H \qquad \text{(B-1)}$$

wherein X_1 and X_4 each represents an oxygen atom or —N(—SO_2R_{71})- in which R_{71} represents an aliphatic, an aromatic or a heterocyclic group, X_2 and X_3 each represents a methine group or a nitrogen atom, b represents an integer of 1 to 3, at least one of the X_2 groups and X_3 groups is a methine group, when b is greater than 1, the X_2 groups and the X_3 groups may be the same or different, and when X_2 and X_3 are methine groups which have substituent groups, these substituent groups may be joined together to form a ring structure.

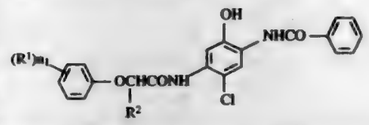
5,597,684

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Satoru Ikesu, and Yutaka Kaneko, both of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed Nov. 27, 1995, Ser. No. 562,687
Claims priority, application Japan, Nov. 29, 1994, 6-294898
Int. Cl.[6] G03C 7/34
U.S. Cl. 430—549 **6 Claims**

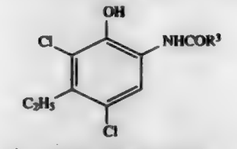
1. A silver halide color photographic light sensitive material comprising a support having thereon a silver halide emulsion layer wherein said silver halide emulsion layer contains a cyan coupler representedby the following formula (I),



Formula (I)

wherein R^1 represents an unsubstituted alkyl group; R^2 represents a hydrogen atom or an unsubstituted alkyl group having 1 to 10 carbon atoms; n_1 is an integer of 1 to 5.

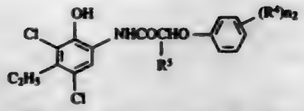
2. The silver halide color photographic material of claim 1, wherein said silver halide emulsion layer further contains a cyan coupler represeated by the following formula (II),



Formula (II)

wherein R^3 represents an alkyl group.

5. The silver halide color photographic material of claim 1, wherein said silver halide emulsion layer further contains a cyan coupler represented by the following formula (III),



Formula (III)

wherein R_4 represents an unsubstituted alkyl group; R^5 represents a hydrogen atom or an alkyl group having 1 to 10 carbon atoms; n_2 is an integer of 1 to 5.

5,597,685

COLOR PHOTOGRAPHIC ELEMENT HAVING IMPROVED IMAGE STABILITY

Krishnan Chari, and Wendell P. Smith, Jr., both of Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

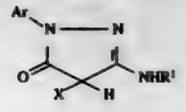
Filed Apr. 25, 1995, Ser. No. 429,269
Int. Cl.[6] G03C *1/34;7/384*
U.S. Cl. 430—551 **14 Claims**

1. A photographic element comprising a support bearing thereon:

(a) a photosensitive first layer comprising

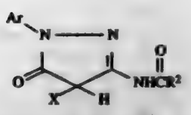
(i) a silver halide emulsion,

(ii) a magenta coupler dispersion wherein the magenta coupler comprises a pyrazolone compound of the general formula:



(M-1)

or



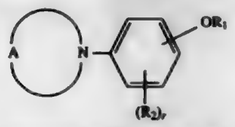
(M-2)

wherein Ar is an unsubstituted aryl group or an aryl group substituted with one or more substituents selected from halogen atoms and cyano, alkylsulfonyl, arylsulfonyl, sulfamoyl, sulfonamido, carbamoyl, carbonamido, alkoxy, acyloxy, aryloxy, alkoxycarbonyl, aryloxycarbonyl, ureido, nitro, alkyl, and trifluoromethyl groups, or is an aryl group substituted with a group which forms a link to a polymeric chain,

R^1 is a substituted or unsubstituted phenyl group and R^2 is a substituted or unsubstituted alkyl or phenyl group, the R^1 and R^2 substituents being individually selected from halogen atoms, and alkyl, aryl, alkoxy, aryloxy, carbonamido, carbamoyl, sulfonamido, sulfamoyl, alkylsulfinyl, arylsulfinyl, alkylsulfonyl, arylsulfonyl, alkoxycarbonyl, aryloxycarbonyl, acyl, acyloxy, ureido, imido, carbamate, heterocyclic, cyano, trifluoromethyl, alkylthio, nitro, carboxyl and hydroxyl groups, provided that R^1 and R^2 each contain at least 6 carbon atoms or the R^1 and R^2 substituents may individually comprise a group which forms a link to a polymeric chain, and

X is hydrogen or a coupling-off group selected from the group consisting of halogens, alkoxy, aryloxy, alkylthio, arylthio, acyloxy, sulfonamido, carbonamido, arylazo, nitrogen-containing heterocyclic and imido groups, and

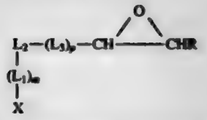
(iii) an image stabilizer of the following formula STG-A:



STG-A

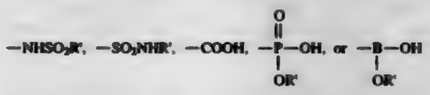
wherein R_1 represents an alkyl group, a cycloalkyl group, an alkenyl phenyl group, an aryl group, a heterocyclic group, an acyl group, a bridged hydrocarbon group, an alkyl sulfonyl group or an aryl sulfonyl group; R_2 represents a group capable of being substituted on the benzene ring; r represents an integer between 0 and 4; and A represents a group of non metal atoms necessary for the formation of a 5 to 8 membered ring together with the nitrogen atom and comprises an electron withdrawing sulfone or sulfoxide group; and

(b) a second layer comprising a dispersion of an epoxy compound of the structural formula SI:



SI

wherein R is H, an alkyl group, or an aryl group; L_1 is an alkyl group or an aryl group; L_2 is —O—, —CO—, —S—, $—SO_2—$, $—PO_2—$, $—CO_2—$, —NHCO— or $—NHSO_2—$, wherein L_2 may be orientated in either direction; L_3 is an alkyl group; m is 0 or 1; p is 0 or 1; and X is



wherein R' is H or an alkyl or aryl group, with the proviso that where L_2 comprises an ionizable group, X may also be an alkyl group or an aryl group.

5,597,686

PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING CONTRAST IMPROVING DOPANTS

Gladys L. MacIntyre, Clyde, and Eric L. Bell, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 3,181, Jan. 12, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,989
Int. Cl.[6] G03C *1/09*
U.S. Cl. 430—567 **19 Claims**

1. A photographic silver halide emulsion comprising silver halide grains internally containing at least two dopants, wherein the first of said dopants is an osmium-based transition metal complex containing a nitrosyl or thionitrosyl ligand, and the second dopant is a transition metal complex containing a transition metal selected from Group 8 of the periodic table.

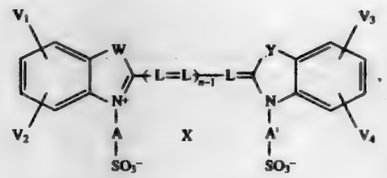
5,597,687

SENSITIZING DYE COMBINATION FOR PHOTOGRAPHIC MATERIALS

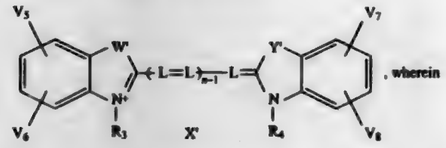
Thomas R. Dobbs, Hilton; David A. DuMont, Rochester; Paul B. Gilman, Penfield; Sung H. Kim, Pittsford; Steven G. Link, Rochester, and Richard L. Parton, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 182,840, Jan. 13, 1994, abandoned, which is a continuation of Ser. No. 568,382, Aug. 16, 1990, abandoned. This application Oct. 19, 1995, Ser. No. 545,368
Int. Cl.[6] G03C *1/29*
U.S. Cl. 430—574 **10 Claims**

1. A photographic element comprising a support having thereon a silver halide emulsion layer spectrally sensitized with a supersensitizing combination of a first dye having the formula:



and a second dye having the formula:



, wherein

W, W', Y, and Y" each independently represents O, S or N—R_1 where R_1 represents alkyl,

V_1, V_2, V_3, and V_4 each independently represents H, halogen, aryl, CF_3, cyano, sulfonyl, acyl, or carbamoyl,

V_5, V_6, V_7, and V_8 each independently represents H, alkyl, methoxy, ethoxy, acetoxy, hydroxy, acetamido, amino, or V_5 and V_6 or V_7 and V_8 together form a methylenedioxy group, with the proviso that if V_1, V_2, V_3, and V_4 are all H, then V_5, V_6, V_7, and V_8 are not all H,

n is 2 or 3,

each L represents an unsubstituted methine group or a methine group substituted with a phenyl or a 1 to 6 carbon alkyl;

X represents a cation as needed to balance the charge of the molecule,

X' represents a counterion as needed to balance the charge of the molecule,

A and A' each independently represents a divalent linking group such that at least one of H—A—SO_3H and H—A'—SO_3H has a log P value that is more negative than about −0.3,

R_3 and R_4 each independently represents an alkyl of from 1 to 6 carbon atoms, or an aryl of from 6 to 15 carbon atoms, either of which is unsubstituted or substituted with a hydroxy, alkoxy, carboxy, sulfo, sulfato, acyloxy, alkoxycarbonyl or aryl, or represents a p-chlorophenyl, and

the second dye has an oxidation potential that is at least about 0.08 volts less positive than the oxidation potential of the first dye and a reduction potential that is equal to or more negative than the reduction potential of the first dye when the oxidation and reduction potentials of said first and second dyes are calculated through the use of Brooker deviations.

5,597,688

CELL FIXATIVE AND METHOD OF ANALYZING VIRALLY INFECTED CELLS

Mark C. Connelly, Doylestown, Pa.; Utpal R. Chakraborty, Flemington, and Houston G. Brooks, Jr., Somerset, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Division of Ser. No. 859,212, Mar. 27, 1992, Pat. No. 5,422,277. This application Jun. 6, 1995, Ser. No. 467,799
Int. Cl.[6] C12Q *1/70;* G01N *33/53;33/569*
U.S. Cl. 435—5 **9 Claims**

1. A method for monitoring human immunodeficiency virus (HIV) infection in a patient so infected, comprising the steps of:

a) contacting a sample of whole blood from said patient with a fixative composition in an amount and for a period of time effective to fix white blood cells present in said whole blood, without substantially destroying the ability of white blood cell antigens and viral components to bind ligands, wherein said fixative composition comprises:

i) a first fixative compound selected from the group consisting of 2,4-dinitrobenzene sulfonic acid, 2,4-dinitrobenzoic acid, 2,4-dinitrophenol, and a combination of two or more of these;

ii) a second fixative compound which is methanol-free, high-grade formaldehyde in a concentration ranging from about 0.1% to about 4%;

iii) dimethylsulfoxide in a concentration of about 1% (v/v) to about 20% (v/v); and

iv) a polyoxyethylene sorbitan surfactant in a concentration of about 0.001% to about 0.2% (w/v);

b) isolating white blood cells present in said sample;

c) either concurrently with the contact Step in a) or thereafter, contacting the cells so fixed with at least one antibody to a white blood cell antigen and at least one binding ligand that binds to at least one component from HIV;

d) examining the scattering and fluorescent properties of said cells so fixed with a flow cytometer; and

e) comparing the results of said examination to data obtained in the same manner from patients at various stages of HIV infection.

5,597,689

NUCLEOTIDE SEQUENCES PERMITTING THE REPLICATION AND MAINTENANCE OF A GENETIC INFORMATION IN ANIMAL CELLS

Gérard Devauchelle; Martine Cerutti, both of Saint Christol-Les-Ales, and Cécile Perrillon, Ales, all of France, assignors to Institut National de la Recherche Agronomique (I.N.R.A.), and Centre National de la Recherche Scientifique (C.N.R.S.), both of Paris, France

Filed Jul. 26, 1994, Ser. No. 280,320
Claims priority, application France, Jul. 26, 1993, 93 09156
Int. Cl.[6] C12Q *1/70;* C12N *15/64*
U.S. Cl. 435—5 **8 Claims**

1. A process for producing a vector which autonomously replicates in a lepidopteran cell and is maintained in the progeny of the said cell in the form of an episome, said process comprising the step of ligating a DNA fragment consisting of the sequence SEQ ID NO:1 in a host vector.

5,597,690

Patent Not Issued For This Number

5,597,691

HEPATITIS C VIRUS PROTEASE

Michael Houghton, Danville; Qui-Lim Choo, El Cerrito, and George Kuo, San Francisco, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 350,884, Dec. 6, 1994, which is a division of Ser. No. 680,296, Apr. 4, 1991, Pat. No. 5,371,017. This application May 12, 1995, Ser. No. 440,548
Int. Cl.[6] C12Q *1/37;* C12N *9/50;15/57;15/51*
U.S. Cl. 435—23 **5 Claims**

1. A method for assaying compounds for activity against hepatitis C virus comprising the steps of:

providing an NS3 domain hepatitis C virus protease or active NS3 domain hepatitis C virus protease truncation analog and a NS3 domain hepatitis C virus protease peptide substrate;
contacting said protease or protease truncation analog with a candidate inhibitory compound in the presence of said peptide substrate; and
measuring the inhibition of the proteolytic activity of said NS3 domain hepatitis C virus protease or protease truncation analog.

5,597,692

HYBRIDIZATION HISTOCHEMISTRY METHOD FOR DETERMINING THE PRESENCE AND LOCATION IN ANIMAL OR PLANT TISSUE OF RNA

John P. Coghlan, Kew; Jennifer D. Penschow, Greensborough; Geoffrey W. Tregear, Hawthorn, and Hugh D. Niall, Elwood, all of Australia, assignors to Howard Florey Institute of Experimental Physiology and Medicine, Victoria, Australia

Continuation of Ser. No. 815,095, Dec. 4, 1985, abandoned. This application Dec. 30, 1988, Ser. No. 294,971

Claims priority, application Australia, Apr. 5, 1984, PG4433/84

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **6 Claims**



1. A hybridization histochemistry method for determining the presence and location in animal or plant tissue of a specific target mRNA population which comprises:
(a) preparing a section of the tissue to be examined;
(b) hybridizing the tissue section with a substantially pure chemically synthesized labelled single-stranded oligonucleotide probe wherein said probe is complementary to a portion of the coding region of the target mRNA, wherein the probe is from 10 to 100 nucleotides,
(c) removing unhybridized probe from the tissue section; and
(d) detecting or identifying the locations in the tissue section where labelling by hybridization of the labelled probe has occurred.

5,597,693

HORMONE RESPONSE ELEMENT COMPOSITIONS AND ASSAY

Ronald M. Evans, and Kazuhiko Umesono, both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation-in-part of Ser. No. 325,240, Mar. 17, 1989, abandoned. This application Mar. 16, 1990, Ser. No. 494,618

Int. Cl.[6] C12Q *1/68*; C12P *21/02*; C07K *7/06*;*14/705*

U.S. Cl. 435—6 **10 Claims**

1. Isolated steroid/thyroid hormone receptor DNA-binding domain compositions comprising element P peptide sequences of amino acid residues selected from the group consisting of GSCKV, EGCKA, EGCKG, EGCKS and EACKA, said sequences being functional to control target gene specificity in host cells normally deficient in such sequences.

5,597,694

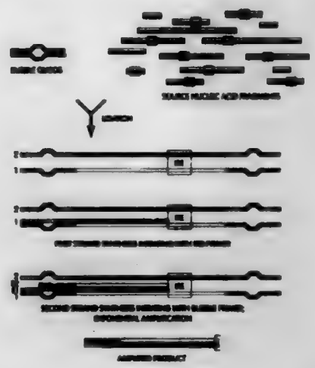
INTERSPERSED REPETITIVE ELEMENT-BUBBLE AMPLIFICATION OF NUCLEIC ACIDS

David J. Munroe, Somerville, and David E. Housman, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 7, 1993, Ser. No. 133,629

Int. Cl.[6] C12Q *1/68*; C12P *19/34*

U.S. Cl. 435—6 **34 Claims**



1. A method for amplifying a nucleic acid fragment having an interspersed repetitive element, which method comprises:
cleaving a source nucleic acid having at least one interspersed repetitive element so as to obtain at least one nucleic acid fragment having an interspersed repetitive element, said nucleic acid fragment having a first strand and a second strand;
ligating to at least one said nucleic acid fragment at least one bubble oligonucleotide having a first and a second double stranded portion, each of said double stranded portion flanking a substantially non-complementary portion consisting of a first single strand and a second single strand, to make at least one bubble/nucleic acid unit having a first strand and a second strand, said ligation occurring between one of said double stranded portions of said at least one bubble oligonucleotide and said at least one nucleic acid fragment;
separating said first strand of said unit from said second strand of said unit;
treating said separated strands of said unit with a first oligonucleotide primer that is substantially complementary to at least a portion of said interspersed repetitive element on said first strand of said unit under conditions such that an extension product of said first primer is synthesized which is complementary to said first strand of said unit, said extension product containing a complementary region to at least a part of said first single strand of said bubble oligonucleotide;
treating said separated strands of said unit with a second oligonucleotide primer that is substantially complementary to at least a portion of said extension product of said first primer, said portion of said extension product of said first primer containing sequences complementary to said part of said first single strand of said bubble oligonucleotide, under conditions such that an extension product of said second primer is synthesized which is complementary to said extension product of said first primer;
separating said primer extension products from their complements to produce separated single stranded extension products;
treating said separated single stranded extension products with said first primer and said second primer under conditions such that an extension product is synthesized from each of said separated single stranded extension products.

5,597,695

Patent Not Issued For This Number

5,597,696

COVALENT CYANINE DYE OLIGONUCLEOTIDE CONJUGATES

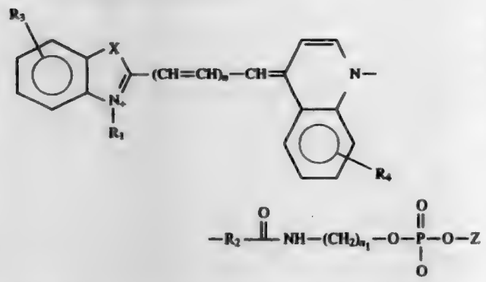
C. Preston Linn; J. Bruce Pitner, and Pat D. Mize, all of Durham, N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 18, 1994, Ser. No. 276,238

Int. Cl.[6] C12Q *1/68*; C07H *21/04*

U.S. Cl. 435—6 **10 Claims**

1. A compound of the formula



wherein X is O, S, Se, N-alkyl having from 1–6 carbons or $C(CH_3)_n$;
R_1 is alkyl having from 1–6 carbons;
R_2 is alkyl having from 1–6 carbons;
R_3 is fused benzene, alkyl having from 1–6 carbons, methoxy or is absent,
R_4 is alkyl having from 1–6 carbons, methoxy or is absent;
Z is an oligonucleotide having from 8 to 50 bases;
n is zero or an integer from 1–6; and
n_1 is an integer from 2 to 10.

5,597,697

SCREENING ASSAY FOR INHIBITORS AND ACTIVATORS OF RNA AND DNA-DEPENDENT NUCLEIC ACID POLYMERASES

Paul Diamond, 693 Somerville Ave., Apt. 4, Somerville, Mass. 02143

Filed Sep. 30, 1994, Ser. No. 315,987

Int. Cl.[6] C12Q *1/68*;*1/48*;*1/02*; G01N *21/78*

U.S. Cl. 435—6 **26 Claims**

1. A polynucleic acid reporter-template molecule comprising:
a) means for conferring at least one discernable characteristic and
b) rendering means for rendering said nucleic acid molecule a functional template for at least one predetermined nucleic acid polymerase so that utilization of said polynucleic acid molecule as a template by said polymerase causes a discernable change in the extent of the characteristic conferring activity of said polynucleic acid molecule.

5,597,698

METHOD OF DETECTING TOXINS USING HOST CELLS EXPRESSING AN URF13-T GENE

Charles S. Levings, III, Raleigh, N.C.; Ralph E. Dewey, Metuchen, N.J., and Carl J. Braun, Raleigh, N.C., assignors to Mycogen Plant Science, Inc., San Diego, Calif.

Division of Ser. No. 58,052, May 5, 1993, Pat. No. 5,469,837, which is a continuation of Ser. No. 342,119, Apr. 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 144,557, Jan. 14, 1988, abandoned. This application Apr. 21, 1995, Ser. No. 426,392

Int. Cl.[6] C12Q *1/68*;*1/18*; C12N *1/21*

U.S. Cl. 435—6 **3 Claims**

1. A method of detecting and measuring BmT toxin and other compounds having toxin-like specificity for maize plants having T-cytoplasm in a sample of material to be tested comprising the steps of:
(a) culturing microorganisms transformed by and expressing an urf13-T gene;
(b) treating samples of the culture respectively with the materials to be tested, a sample of known toxicity and a control sample known to be nontoxic; and
(c) measuring respiration or ion leakage of the cultured microorganism in each sample.

5,597,699

METHOD FOR DETERMINING DRUG COMPOSITIONS TO PREVENT DESENSITIZATION OF CELLULAR RECEPTORS

Richard G. Lanzara, 30 W. 86th St.-1B, New York, N.Y. 10024

Continuation-in-part of Ser. No. 188,951, Jan. 31, 1994, abandoned, which is a continuation of Ser. No. 954,865, Sep. 30, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 407,911

Int. Cl.[6] G01N *33/567*

U.S. Cl. 435—7.21 **1 Claim**

1. A method for making a composition that elicits a desired response from cellular receptors and prevents subsequent desensitization of said receptors, the method comprising the steps of:
selecting an agonist suitable for eliciting said response;
determining a first amount of the agonist effective for binding to said receptors in both a high and a low affinity state effective for obtaining said response;
selecting an inhibitor of said agonist specific to said receptors, said inhibitor selected from the group consisting of partial antagonists, antagonists, and competitive antagonists to the agonist;
determining a second amount of said inhibitor sufficient to prevent desensitization of said receptors, wherein said second amount is determined to be $K_i(K_{DL}K_{DH}/2)^{-1/4}$ of said first amount, where K_{DL} and K_{DH} are dissociation constants of said agonist in low and high affinity states, respectively, and K_i is the dissociation constant of said inhibitor; and
combining said second amount of said inhibitor with said first amount of said agonist to form a composition that elicits said desired response from cellular receptors and prevents subsequent desensitization of said receptors.

5,597,700

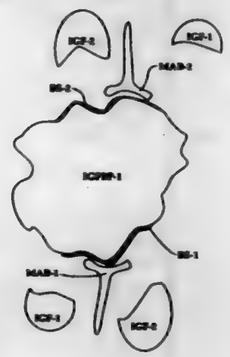
METHOD FOR DETECTING FREE INSULIN-LIKE GROWTH-FACTOR-BINDING PROTEIN 1 AND A TEST DEVICE FOR DETECTING THE RUPTURES OF FETAL MEMBRANES USING THE ABOVE METHOD

Alexander Konstantinov, Princeton, N.J.; Boris Feux, Moscow, Russian Federation; Alexander Stepanov, Moscow, Russian Federation; Evgeny Zavalsky, Moscow, Russian Federation; Svetlana Nazimova, Moscow, Russian Federation; Marina Boltovskaya, Moscow, Russian Federation, and Nelli Staroselskaya, Moscow, Russian Federation, assignors to California Research, LLC, Mountain View, Calif.

Filed Apr. 28, 1994, Ser. No. 234,851

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.92 6 Claims



1. A device for detecting free insulin-like growth factor-binding protein 1 (IGFBP-1) in a sample, comprising in fluid communication:

a central porous sample application pad having a first end and an opposing second end, where said central pad (i) contains a mobilizable first monoclonal antibody labeled with a detectable marker, said labeled first monoclonal antibody competing with insulin-like growth factor 1 (IGF-1) and insulin-like growth factor 2 (IGF-2) for specifically binding to said free IGFBP-1, and (ii) having bidirectional migration of said first labeled monoclonal antibody and of a liquid sample therethrough towards both said first and second ends;

a porous test region (i) positioned at said first end and allowing migration of said liquid sample and said labeled first monoclonal antibody therethrough from said central pad into a first absorbent region adjacent said test region, and (ii) containing a second monoclonal antibody immobilized therein, said second monoclonal antibody competing with IGF-1 and IGF-2 for specifically binding to said free IGFBP-1, where said first and second monoclonal antibodies each bind to different sites on said free IGFBP-1;

a porous control region positioned at said second end and allowing migration of said liquid sample and said labeled first monoclonal antibody therethrough from said central pad into a second absorbent region adjacent said control region, said control region comprising (i) a first control area containing said free IGFBP-1 immobilized therein, and (ii) a second control area containing said second monoclonal antibody immobilized therein, where the liquid sample and the labeled first monoclonal antibody can migrate from said first control area to said second control area.

5,597,701

PROCESS FOR DETERMINING ANDROSTENONE CONTENTS IN ADIPOSE TISSUES

Rolf P. Claus, Stuttgart, and Martin Dehnhard, Waldenbuch, both of Germany, assignors to Riedel-De Haen Aktiengesellschaft, Germany

PCT No. PCT/EP93/02350, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/06018, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 31, 1993, Ser. No. 397,099

Claims priority, application Germany, Sep. 8, 1992, 42 29 904.7

Int. Cl.[6] G01N *33/53;33/537;33/543;33/48*

U.S. Cl. 435—7.93 14 Claims

1. Process for determining androstenone contents tissues, which comprises the following steps:

a) liquefying an adipose tissue sample by heating at a temperature in the range from 45° to 60° C. to produce a liquid fat;

b) mixing the liquid fat with a water-soluble solvent for the androstenone at the temperature of the liquid fat;

c) cooling the fat/solvent mixture to a temperature at which considerable proportions of the fat dissolved in the solvent are separated out of the solution, and the predominant part of the androstenone dissolved in the solvent phase remains dissolved in the solvent;

d) removing the androstenone-containing solvent phase and diluting in an aqueous buffer solution which is suitable for the detection process used;

e) measuring the androstenone content in the solvent/buffer solution phase by means of competitive immunological detection reactions.

5,597,702

AUTOMATED LEAD ASSAY

Martin Wong, Grayslake; David M. Finley, Spring Grove; John M. Ramp, Gurnee; Gary L. Bottinghouse, Jr., McHenry, all of Ill.; Mark R. Shaffar, Kenosha, Wis.; Stephen D. Stroupe, Libertyville, Ill., and John M. Brackett, Kenosha, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 171,121, Dec. 21, 1993, abandoned, and a continuation-in-part of Ser. No. 171,035, Dec. 21, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 350,241

Int. Cl.[6] C12Q *1/34;* G01N *33/00*

U.S. Cl. 435—18 27 Claims

1. An assay for detecting lead present in a sample of whole blood, comprising the steps of:

(a) adding a lead recovery agent to a supernatant obtained from the blood sample, said supernatant comprising the lead;

(b) adding to the supernatant a disulfide enzyme which is inhibited in the presence of lead; and

(c) correlating the activity of the disulfide enzyme to the amount of lead in the blood sample.

5,597,703

METHODS FOR DETERMING CHOLESTEROL OXIDASE ACTIVITY IN AN AQUEOUS TEST SAMPLE, DETERMINING WHETHER A TEST COMPOUND IS CAPABLE OF INHIBITING CHOLESTEROL OXIDASE ACTIVITY AND DETERMINING THE DEGREE OF CHOLESTEROL OXIDASE INHIBITORY ACTIVITY

Toru Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,227

Claims priority, application Japan, Mar. 10, 1994, 6-039707; Apr. 21, 1994, 6-083269

Int. Cl.[6] C12Q *1/26;1/60*

U.S. Cl. 435—25 3 Claims

1. A method for determining a cholesterol oxidase activity in an aqueous test sample comprising cholesterol oxidase, comprising the steps of:

(A) forming a monolayer on a surface of said aqueous test sample, wherein said monolayer consists essentially of a pre-determined concentration of sterol, and a phospholipid and fluorescent dye labeled phospholipid;

(B) measuring a period of time during which sterol domain fade-out occurs in said monolayer, as observed with a fluorescence microscope; and

(C) determining said cholesterol oxidase activity in said aqueous test sample by comparing said period of time measured in step (B) to the periods of time during which sterol domain fade-out occur on a standard curve obtained using a range of cholesterol oxidase activities and said pre-determined concentration of sterol.

5,597,704

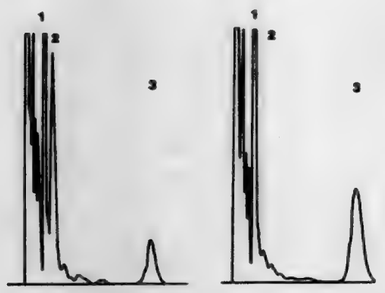
BIOCONVERSION OF CEPHALOSPORIN C TO GLUTARYL-7-AMINOCEPHALOSPORANIC ACID

Yun-Huey Lee, Kaohsiung; Wen-Shen Chu, Hsinchu, and Wen-Hwei Hsu, Taichung, all of Taiwan, assignors to Food Industry Research and Development Institute, Taiwan

Filed May 1, 1995, Ser. No. 431,962

Int. Cl.[6] C12Q *1/26;1/00;1/02;* C12P *35/00*

U.S. Cl. 435—25 21 Claims



1. A method of converting cephalosporin C to glutaryl-7-aminocephalosporanic acid, the method comprising:

obtaining a cell preparation from a microorganism which produces D-amino acid oxidase (EC No. 1.4.3.3), said cell preparation being a cell-free extract or a suspension of permeated cells;

adding a D-α-amino acid to said cell preparation;

after the adding step, heating said cell preparation at 50°–75° C. for 5–60 minutes; and

incubating cephalosporin C in said cell preparation.

5,597,705

DNA ENCODING THYROID HORMONE RECEPTOR COMPOSITIONS AND METHODS

Ronald M. Evans, San Diego, Calif.; Cary A. Weinberger, Silver Springs, Md.; Stanley M. Hollenberg, Vincent Giguere, both of San Diego, Calif.; Jeffrey Arriza, Carlsbad, Calif.; Catherine C. Thompson, La Jolla, Calif., and Estelita S. Ong, San Diego, Calif., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Division of Ser. No. 667,602, Mar. 7, 1991, Pat. No. 5,312,732, which is a division of Ser. No. 108,471, Oct. 20, 1987, Pat. No. 5,071,773, which is a continuation-in-part of Ser. No. 922,585, Oct. 24, 1986, abandoned. This application Dec. 10, 1993, Ser. No. 165,708

Int. Cl.[6] C12N *5/10;15/12;* C07K *14/705;* C22N *15/62*

U.S. Cl. 435—69.1 15 Claims

1. A recombinant expression system for production of functional thyroid hormone receptor protein(s), wherein said system comprises host cells containing non-endogenous DNA encoding said thyroid hormone receptor protein(s), wherein said thyroid hormone receptor protein(s) are selected from the group consisting of thyroid hormone receptor alpha and thyroid hormone receptor beta, and wherein the DNA is operably linked to control sequences compatible with said host cells.

5,597,706

Patent Not Issued For This Number

5,597,707

TUMOR ASSOCIATED ANTIGEN RECOGNIZED BY THE MURINE MONOCLONAL ANTIBODY L6, ITS OLIGONUCLEOTIDE SEQUENCE AND METHODS FOR THEIR USE

John Markus; Gary L. Schieven; Ingegerd Hellstrom; Karl E. Hellstrom, all of Seattle, and Alejandro Aruffo, Edmonds, all of Wash., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Apr. 15, 1993, Ser. No. 48,700

Int. Cl.[6] C07H *21/00;* C12P *21/06;* C12N *15/00;* G01N *33/574*

U.S. Cl. 435—69.3 13 Claims

1. A purified oligonucleotide sequence encoding a polypeptide having the contiguous sequence of amino acid residues depicted in Sequence I.D. No. 2.

5,597,708

CLONING OF A MALARIAL GENE

Anthony A. Holder; Michael J. Lockyer; Jasbir S. Sandhu; Valentina Riveros-Moreno, all of Beckenham, England, and Karel G. Odink, Rheinfelden, Switzerland, assignors to Burroughs Wellcome Company, Research Triangle Park, N.C.

Continuation of Ser. No. 985,448, Dec. 3, 1992, abandoned, which is a continuation of Ser. No. 678,980, Mar. 28, 1991, abandoned, which is a continuation of Ser. No. 108,273, Oct. 13, 1987, abandoned, which is a division of Ser. No. 703,663, Feb. 21, 1985, abandoned. This application Dec. 2, 1993, Ser. No. 160,158

Claims priority, application United Kingdom, Feb. 22, 1984, 8404692; Sep. 26, 1984, 8424340

Int. Cl.[6] C12N *15/30;15/62;1/21;* C12P *21/02*

U.S. Cl. 435—69.3 16 Claims

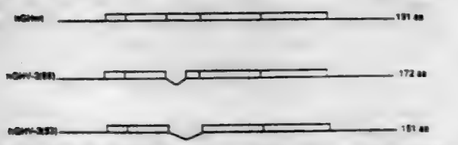
1. An isolated nucleic acid consisting of a sequence encoding the P.195 protein of *P. falciparum* having the amino acid sequence shown in FIGS. 1A–1I.

5,597,709

HUMAN GROWTH HORMONE SPLICE VARIANTS HGHV-2(88) AND HGHV-3(53)

Craig A. Rosen, Laytonsville; Timothy A. Coleman, Gaithersburg; Mark D. Adams, North Potomac, and Jeannine D. Gocayne, Silver Spring, all of Md., assignors to Human Genome Sciences, Inc.

Filed Jan. 27, 1994, Ser. No. 187,756
Int. Cl.[6] C07K 14/61; C12N 15/63; C12P 21/06; C07H 21/02
U.S. Cl. 435—69.4 50 Claims



1. An isolated polynucleotide comprising a member selected from the group consisting of:

(a) a polynucleotide encoding the polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:5;

(b) a polynucleotide encoding the polypeptide comprising amino acid 1 to amino acid 172 as set forth in SEQ ID NO:5; and

(c) a polynucleotide which is complementary to the polynucleotide of (a) or (b).

5,597,710

HUMANIZED MONOCLONAL ANTIBODIES AGAINST HUMAN INTERLEUKIN-4

Barbara Dalle, Berkeley Heights; Kenneth Miller, Cranford; Nicholas Murgolo, Millington, and Stephen Tindall, Madison, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 10, 1994, Ser. No. 208,886
Int. Cl.[6] C07H 21/04; C07K 16/46; C12N 1/20;15/00
U.S. Cl. 435—69.6 12 Claims

1. A polypeptide comprising an amino acid sequence shown in SEQ ID NO: 70 or SEQ ID NO: 79, which sequences correspond, respectively, to a light chain and heavy chain variable region of a humanized monoclonal antibody that specifically binds to human IL-4.

5,597,711

FACTOR VIII BINDING DOMAIN OF VON WILLEBRAND FACTOR

Theodore S. Zimmerman, La Jolla; Paul A. Foster, San Diego, and Carol A. Fulcher, La Jolla, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 125,559, Sep. 23, 1993, abandoned, which is a division of Ser. No. 725,560, Jul. 3, 1991, Pat. No. 5,260,274, which is a continuation of Ser. No. 45,032, May 1, 1987, Pat. No. 5,043,429. This application Mar. 24, 1995, Ser. No. 410,574
Int. Cl.[6] C07K 1/14;1/22;14/755; C12N 15/22
U.S. Cl. 435—69.6 6 Claims

1. A method of preparing Factor VIII comprising:

(a) adding a 29 kDa von Willebrand Factor polypeptide having an amino acid sequence which is a sequential subset of the following sequence:

3
|
SCRPPMVKLVCPADNLRAEGLECXKTCQNYDLECMSMG

CVSGCLCPPGMVRHENRCVALERCPCFHQGKEYAPGET

VKIGCNTCVCRDRKWNCTDHVCDATCSTIGMAHYLTFD

GLKYLFPGECQYVLVQDYCGSNPGTFRILVGNKGCSHPS

-continued

VKCKKRVTILVEGGEIELFDGEVNVKRPMKDETHFEVV

ESGRYIILLLGKALSVVWDRHLSISVVLKQTYQEKVCGLC

GNFDGIQNNDLTSSNLQVEEDPVDFGNSWKVSSQCADTR

285
|
KVPLDSSPATCHN.

wherein the N-terminal amino acid of said polypeptide is selected from amino acid 3 Ser through 44 Gly of said sequence,

a polypeptide having the amino-terminal sequence beginning with amino-terminal amino acid 3 Ser and ending approximately with carboxy-terminal amino acid 244 Leu,

a polypeptide having the amino-terminal sequence beginning with amino-terminal amino acid 24 Glu and ending approximately with carboxy-terminal amino acid 265 Ser,

a polypeptide having the amino-terminal sequence beginning with amino-terminal amino acid 44 Gly and ending approximately with carboxy-terminal 285 Asn,

or a polypeptide having the amino-terminal sequence beginning with amino-terminal amino acid 44 Gly and ending approximately with carboxy-terminal 244 Leu,

to Factor VIII from a recombinantly produced, plasma or commercial concentrate source to form a polypeptide fragment/Factor VIII complex;

(b) subjecting the complex to purification procedures; and

(c) recovering the highly purified complex.

5,597,712

Patent Not Issued For This Number

5,597,713

PROCESS FOR PRODUCING CDNAS WITH COMPLETE LENGTH, PROCESS FOR PRODUCING INTERMEDIATES THEREOF AND PROCESS FOR PRODUCING VECTORS CONTAINING CDNAS WITH COMPLETE LENGTHS

Seishi Kato, and Shingo Sekine, both of Sagamihara, Japan, assignors to The Kanagawa Academy of Science and Technology Foundation, Kanagawa, and Sagami Chemical Research Center, Tokyo, both of Japan

PCT No. PCT/JP93/01359, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO94/00001, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 22, 1993, Ser. No. 244,188
Claims priority, application Japan, Sep. 25, 1992, 4-280932; Mar. 3, 1993, 5-067589
Int. Cl.[6] C12N 15/11;15/64; C12P 19/34
U.S. Cl. 435—91.41 7 Claims

1. A process for producing an intermediate for the synthesis of a full-length cDNA, which process comprises the steps of:

treating mRNA extracted from cells with an alkaline phosphatase to eliminate the phosphate group from the 5' end of an uncapped degraded mRNA;

decapping the 5' end of a capped intact mRNA; and

ligating by the action of T4 RNA ligase either a DNA oligonucleotide or a DNA-RNA chimeric oligonucleotide to the 5' end phosphate group formed in the above decapping step, thereby selectively adding either the DNA oligonucleotide or the DNA-RNA chimeric oligonucleotide to the 5' end of the intact mRNA, wherein the DNA oligonucleotide or the DNA-RNA chimeric oligonucleotide has the following formula (I)

5'-dN1-dN2- . . . -dNm-N1-N2- . . . -Nn-3' (I)

and wherein dN represents a deoxyribonucleotide selected from dAMP, dCMP, dGMP and dTMP; N represents a ribonucleotide selected from AMP, CMP, GMP and UMP; "-" represents a phosphoric ester linkage; m represents an integer of 1 or more; and n represents an integer of 0 or more.

5,597,714

STRONG ACID HYDROLYSIS OF CELLULOSIC AND HEMICELLULOSIC MATERIALS

William A. Farone, Irvine, and John E. Cuzens, Santa Ana, both of Calif., assignors to Arkenol, Inc., Mission Viejo, Calif.

Continuation-in-part of Ser. No. 38,628, Mar. 9, 1993, Pat. No. 5,326,701. This application Jun. 7, 1995, Ser. No. 483,455
Int. Cl.[6] C13K 1/02; C12P 19/12;19/02; B01J 3/00
U.S. Cl. 435—100 57 Claims

1. A method of producing sugars from materials containing cellulose and hemicellulose comprising:

mixing the materials with a solution of about 25–90% acid by weight thereby at least partially decrystallizing the materials and forming a gel that includes solid material and a liquid portion;

diluting said gel to an acid concentration of from about 20% to about 30% by weight and heating said gel to a temperature between about 80° C. and 100° C. thereby partially hydrolyzing the cellulose and hemicellulose contained in said materials;

separating said liquid portion from said solid material, thereby obtaining a first liquid containing sugars and acid;

mixing the separated solid material with a solution of about 25–90% acid until the acid concentration of the gel is between about 20–30% acid by weight and heating the mixture to a temperature between about 80° C. and 100° C. thereby further hydrolyzing cellulose and hemicellulose remaining in said separated solid material and forming a second solid material and a second liquid portion;

separating said second liquid portion from said second solid material thereby obtaining a second liquid containing sugars and acid;

combining the first and second liquids; and

separating the sugars from the acid in the combined first and second liquids by resin separation to produce a third liquid containing a total of at least about 15% sugar by weight, which is not more than 3% acid by weight.

5,597,715

7,42-BIS(O-DEMETHYL)RAPAMYCIN

Brian D. Ford, Forest Green, England, assignor to SmithKline Beecham p.l.c., Brentford, United Kingdom

PCT No. PCT/GB94/00269, § 371 Date Aug. 10, 1995, § 102(e) Date Aug. 10, 1995, PCT Pub. No. WO94/18208, PCT Pub. Date Aug. 18, 1994
PCT Filed Feb. 10, 1994, Ser. No. 492,129
Claims priority, application United Kingdom, Feb. 10, 1993, 9302569
Int. Cl.[6] C12P 17/18; A61K 31/455; C07D 311/00
U.S. Cl. 435—118 16 Claims

1. 7,42-Bis (O-demethyl)rapamycin or a pharmaceutically acceptable derivative thereof.

5. A process for the preparation of a compound according to claim 1, which process comprises the cultivation of a microorganism from the genus Streptomyces in the presence of rapamycin, and the subsequent recovery of the said compound or a derivative thereof from the culture medium.

5,597,716

PROCESS FOR PRODUCING D-LACTIC ACID AND L-LACTAMIDE

Eiji Sato, Tokyo; Eiji Ozaki; Chimami Eda, both of Otake; Yoshimasa Kobayashi, Tokyo, and Akihiro Sakimae, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1994, Ser. No. 340,996
Claims priority, application Japan, Nov. 18, 1993, 5-289622; Mar. 7, 1994, 6-036084; Mar. 7, 1994, 6-036085; Apr. 15, 1994, 6-077683
Int. Cl.[6] C12P 13/02;7/56;41/00
U.S. Cl. 435—129 29 Claims

1. A process for producing D-lactic acid and L-lactamide, comprising the steps of mixing DL-lactamide with an agent selected from the group consisting of a microorganism, a culture broth of a microorganism, a microorganism lysate, and an immobilized microorganism, said microorganism belonging to a genus selected from the group consisting of Alcaligenes, Pseudomonas, Agrobacterium, Brevibacterium, Acinetobacter, Corynebacterium, Enterobacter, Micrococcus and Rhodococcus, wherein the agent catalyses the asymmetric hydrolysis of DL-lactamide to produce a composition comprising D-lactic acid and L-lactamide, and recovering D-lactic acid and L-lactamide from the composition.

5,597,717

SULFONAMIDE RESISTANCE GENES AND THEIR USE

Jean F. Guerineau, Invergowrie; Philip M. Mullineaux, Norwich, and Edgar W. Parnell, Ongar, all of United Kingdom, assignors to Rhone-Poulenc Agrochimie Limited, Lyons, France

Division of Ser. No. 102,395, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 985,352, Dec. 1, 1992, abandoned, which is a continuation of Ser. No. 746,386, Aug. 14, 1991, abandoned, which is a continuation of Ser. No. 429,227, Oct. 31, 1989, abandoned. This application May 19, 1995, Ser. No. 444,860
Claims priority, application United Kingdom, Oct. 31, 1988, 8825402
Int. Cl.[6] C12N 15/82
U.S. Cl. 435—172.3 8 Claims

1. A method of transforming a plant cell, which method comprises:

(i) transforming a plant cell whose growth is sensitive to inhibition by a sulfonamide or a salt thereof with a chimaeric gene comprising a sul gene which encodes a modified DHPS conferring sulfonamide resistance, or a sequence having at least 70% homology thereto conferring sulfonamide resistance, and which has a sequence encoding a transit peptide fused to the 5' -end of the resistance gene wherein the gene and the sequence are operable linked, and

(ii) selecting a transformed plant cell whose growth is resistant to inhibition by a sulfonamide or salt thereof.

5,597,718

GENETICALLY ENGINEERING COTTON PLANTS FOR ALTERED FIBER

Maliyakal E. John, Middleton; Paul F. Umbeck, and Winston J. Brill, both of Madison, all of Wis., assignors to Agracetus, Middleton, Wis.

Continuation-in-part of Ser. No. 138,814, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 617,239, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 253,243, Oct. 4, 1988, abandoned. This application Sep. 20, 1995, Ser. No. 530,797
Int. Cl.[6] C12N 15/29;5/14;15/82; A01H 5/00
U.S. Cl. 435—172.3 2 Claims

1. A method of producing transgenic cotton plants that produce fiber of altered strength comprising the steps of

(a) constructing a plant expression vector which comprises in sense orientation either a protein coding sequence from SEQ ID NO:2 or nucleotide sequence encoding H6 protein and which will express that sense-oriented sequence when introduced onto cotton cells;
(b) introducing the plant expression vector into a cotton plant so that the sense-oriented sequence in the plant expression vector is expressed in the fiber cells of the resulting transgenic cotton plant to produce a protein product;
(c) selecting transgenic cotton plants of step (b) which have a fiber strength different from that of the untransformed cotton plant; and
(d) propagating the transgenic cotton plants of step (c).

5,597,719

INTERACTION OF RAF-1 AND 14-3-3 PROTEINS

Ellen Freed, Oakland, and Rosemarie Ruggieri, San Francisco, both of Calif., assignors to Onyx Pharmaceuticals, Inc., Richmond, Calif.

Filed Jul. 14, 1994, Ser. No. 276,151
Int. Cl.[6] C12N 9/12
U.S. Cl. 435—194 **6 Claims**

1. A composition comprising a substantially pure protein complex comprising a raf-1 polypeptide and a 14-3-3 polypeptide.

5,597,720

ALKALINE PROTEASE FROM BACILLUS SP. PD498, METHOD OF MAKING AND METHOD OF USE

Helle Outtrup, Bollerup; Claus Dambmann, Soborg, and Dorrit A. Aaslyng, Roskilde, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK93/00183, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO93/24623, PCT Pub. Date Dec. 9, 1993
PCT Filed May 26, 1993, Ser. No. 325,386
Claims priority, application Denmark, May 27, 1992, 0702/92
Int. Cl.[6] C12N 9/50;9/52;9/54;9/56; D06M 16/00
U.S. Cl. 435—221 **14 Claims**

1. An isolated protease obtainable from Bacillus sp. PD498, NCIMB No. 40484 having the following properties:
a. an apparent molecular weight of 34 kD as determined by SDS-PAGE;
b. pI of approximately 9.3;
c. pH optimum of pH 9–11 at 25° C. and with casein as substrate; and
d. temperature optimum of 40°–55° C. at pH 9.5 and with casein as substrate.

5,597,721

PREPARATION OF ANTIGENS OF AND OF VACCINES FOR THE VIRUS OF MYSTERY DISEASE, ANTIGENS AND VACCINES OBTAINED FOR THE PREVENTION OF THIS DISEASE

André Brun, Caluire; Marie-Claude Tardy, Lyons; Alain Vagnay, Villeurbanne, and Joris Vandepitte, Dicmer, all of France, assignors to Rhone Merieux, Lyons, France

PCT No. PCT/FR93/00026, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/14196, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 13, 1993, Ser. No. 256,539
Claims priority, application France, Jan. 14, 1992, 92 00294
Int. Cl.[6] C12N 7/00; A61K 39/145;39/155;39/295
U.S. Cl. 435—235.1 **3 Claims**

1. A composition comprising purified viral particles of Mystery Disease virus (A) deposited in the CNCM under deposit no. I-1153 and a carrier.

5,597,722

METHOD FOR INACTIVATING PATHOGENS IN COMPOSITIONS CONTAINING CELLS AND PLASMA USING PHOTOACTIVE COMPOUNDS AND PLASMA PROTEIN REDUCTION

John Chapman, Lake Villa, Ill.; Patricia M. Logan, Vancouver, Canada; Herma C. Neyndorff, Vancouver, Canada, and Janice North, Vancouver, Canada, assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 10,469, Jan. 28, 1993, Pat. No. 5,360,734. This application Jul. 13, 1994, Ser. No. 274,507
Int. Cl.[6] C12N 7/06; A01N 1/02
U.S. Cl. 435—238 **29 Claims**

1. A method for inactivating pathogens in a blood component containing red blood cells and plasma protein comprising:
preparing the red blood cells by contacting a membrane-binding photoactive agent with the blood component;
irradiating the prepared red blood cells in a fluid which has 5% or less, by weight of plasma protein, with light of an appropriate wavelength under conditions sufficient to activate the photoactive agent and inactivate at least some of the pathogens;
preventing the irradiated red blood cells from contacting additional plasma protein for a period sufficient to prevent the red blood cells from non-specifically binding with plasma protein upon contacting the additional plasma protein; and
contacting the red blood cells with additional plasma protein.

5,597,723

Patent Not Issued For This Number

5,597,724

Patent Not Issued For This Number

5,597,725

CADHERIN-SPECIFIC ANTIBODIES AND HYBRIDOMA CELL LINES

Shintaro Suzuki, Torrance, Calif., assignor to Doheny Eye Institute, Los Angeles, Calif.

Continuation-in-part of Ser. No. 49,460, Apr. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 872,643, Apr. 17, 1992, abandoned. This application Jan. 26, 1994, Ser. No. 188,228
Int. Cl.[6] C12N 5/12; A61K 51/10; C07K 16/00;16/28
U.S. Cl. 435—328 **6 Claims**

1. A hybridoma cell line producing a monoclonal antibody capable of specifically binding to a cadherin selected from the group consisting of cadherin-4 (SEQ. ID. NO.: 48), cadherin-5, cadherin-6, cadherin-7, cadherin-8, cadherin-9, cadherin-10, cadherin-11 and cadherin-12.

5,597,726

MONOCLONAL ANTIBODIES REACTIVE WITH A HUMAN ATHEROMA ASSOCIATED ANTIGEN

Thomas F. Bumol, Carmel, Ind., and Leslie M. McEvoy, Mountain View, Calif., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 983,452, Nov. 30, 1992, abandoned, which is a division of Ser. No. 599,549, Oct. 17, 1990, Pat. No. 5,196,324, which is a continuation-in-part of Ser. No. 451,399, Dec. 15, 1989, abandoned. This application Mar. 30, 1995, Ser. No. 413,738
Int. Cl.[6] C12N 5/12;15/02; C12P 21/08; C07K 16/18
U.S. Cl. 435—337 **8 Claims**

1. Hybridoma P5C11 (LY-MB1) Accession No. ATCC HB10262.

5,597,727

CORYNEFORM BACTERIA DNA FRAGMENT CONTAINING A GENE RESPONSIBLE FOR THE FUNCTION OF AUTONOMOUS REPLICATION OF PLASMID

Keiko Kohama; Kazuhisa Hatakeyama; Yasurou Kurusu, and Hideaki Yukawa, all of Inashiki-gun, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed May 18, 1994, Ser. No. 245,688
Claims priority, application Japan, May 20, 1993, 5-118397
Int. Cl.[6] C07H 21/04; C12N 15/00;15/74;15/77
U.S. Cl. 435—252.32 **4 Claims**

1. A DNA molecule consisting of the sequence of SEQ. ID. NOS: 7, 9, or 11.

5,597,728

METHODS FOR BIODEGRADATION SEPARATION OF NATURAL FIBERS TO RELEASE PARTICULATE CONTAMINATION

Caryl H. Wyatt, and Bobby G. Wyatt, both of 3410 37th St., Lubbock, Tex. 79413

Continuation-in-part of Ser. No. 96,615, Jul. 23, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 319,872
Int. Cl.[6] B09B 3/00; C12S 11/00
U.S. Cl. 435—262.5 **13 Claims**

1. A method for separating radioactive contaminants adsorbed or entrained onto organic natural fibers, comprising:
admixing organic natural fibers containing radioactive contaminates with an effective amount of enzymes to degrade the organic natural fibers in an aqueous medium, said enzymes capable of degrading the fibers;
maintaining the admixture at a pH of from about 3.5 to about 8.0 and a temperature of from about 20° C. to about 60° C., as is sufficient to maintain the enzymes activity;
degrading the organic natural fibers by enzyme breakage of molecular chains constituting the fibers;
destroying the natural fiber integrity, fiber lengths sufficient for release of the radioactive contaminants;
removing the radioactive contaminants from the aqueous medium; and
disposing of the aqueous medium and degraded fibers.

5,597,729

METHOD FOR THE REMOVAL AND RECOVERY OF MERCURY

Clay E. Easterly, Knoxville; Arpad A. Vass, Oak Ridge, and Richard L. Tyndall, Clinton, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Apr. 13, 1995, Ser. No. 422,028
Int. Cl.[6] B09C 1/02;1/10
U.S. Cl. 435—262.5 **19 Claims**

1. A method for the removal of mercury from mercury-contaminated matrices comprising the steps of:
a. providing a culture of a bacterium comprising an intramoebic isolate possessing all the identifying characteristics of American Type Culture Collection Deposit Number 75529, a mutant of said isolate possessing all the identifying characteristics thereof, or mixtures thereof;
b. deriving an aqueous dispersant solution from said culture;
c. rinsing a mercury-contaminated matrix with a sufficient amount of said aqueous dispersant solution to release said mercury from said mercury-contaminated matrix.

5,597,730

PROCESS FOR THE DEGRADATION OF COAL TAR AND ITS CONSTITUENTS BY WHITE ROT FUNGI

Steven D. Aust, North Logan, and John A. Bumpus, Logan, both of Utah, assignors to Utah State University Foundation, Logan, Utah

Continuation of Ser. No. 65,563, May 21, 1993, Pat. No. 5,459,065, which is a continuation of Ser. No. 662,214, Feb. 28, 1991, abandoned, which is a continuation of Ser. No. 183,115, Apr. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 899,000, Aug. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 702,944, Feb. 19, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 477,410
Int. Cl.[6] C02F 1/00;3/00; C12N 1/14; C12P 1/02
U.S. Cl. 435—262.5 **28 Claims**

1. A process for degrading degradation-resistant organic pollutants comprising the steps of:
a) combining at least one degradation-resistant organic pollutant which is an aromatic hydrocarbon having three or more fused rings selected from the group consisting of coal tar, constituents of coal tar, distillation fractions of coal tar, and polycyclic aromatic organic compounds capable of being derived from coal tar or a constituent or distillation fraction thereof, with lignin-degrading fungal enzymes expressed by white rot fungi placed in contact with the pollutant in the presence of hydrogen peroxide; and
b) allowing the degradation reaction to proceed until the pollutant is convened to less toxic degradation products.

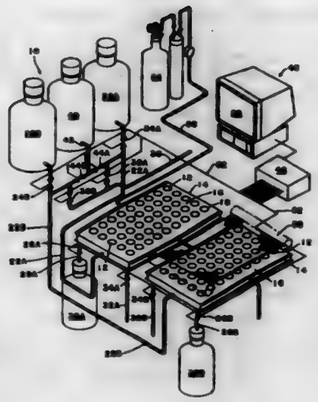
5,597,731

PLANT PROPAGATION SYSTEM

Roy E. Young, Six Mile, and Jeffrey W. Adelberg, Clemson, both of S.C., assignors to Clemson University, Clemson, S.C.

Division of Ser. No. 189,499, Jan. 31, 1994, Pat. No. 5,525,505. This application Jun. 2, 1995, Ser. No. 458,988
Int. Cl.[6] C12M 3/00; A01G 31/02
U.S. Cl. 435—284.1 **30 Claims**

1. A plant propagation system comprising:
at least one sealed, semipermeable membrane vessel for containing growing plant material therein, said at least one vessel including a first membrane portion and a second membrane portion, said first membrane portion being at least permeable to gases while remaining impermeable to microorganisms, said second membrane portion being at least permeable to liquid while remaining impermeable to microorganisms;
a vessel support tray for receiving said at least one sealed, semipermeable membrane vessel, said vessel support tray



including a fluid retaining chamber adapted to contain and circulate various fluids for contact with said at least one vessel;

a growth media reservoir means for supplying a growth media to said fluid retaining chamber of said vessel support tray for diffusion into said at least one sealed vessel;

valved conduit means for connection between said vessel support tray and said growth media reservoir means and for regulating the flow of said growth media therebetween; and

central control means in communication with at least one element of said system for automatically controlling thereof.

5,597,732

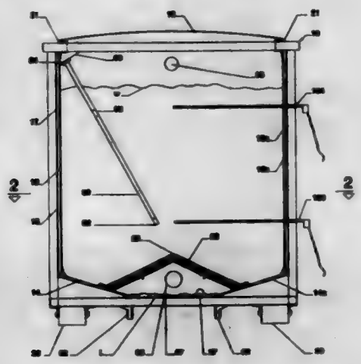
COMPOSTING APPARATUS

Michael Bryan-Brown, Box 17, Whitingham, Vt. 05361

Filed Apr. 14, 1995, Ser. No. 421,988

Int. Cl.[6] C12M *1/04*

U.S. Cl. 435—290.4 **19 Claims**



12. An apparatus utilizing pressurized air for composting organic waste comprising of:

a. a solid bottom portion;

b. a cross-sectionally raised perforated upper portion mounted atop of said solid bottom portion and forming a chamber with said solid bottom portion, wherein said cross-sectionally raised perforated upper portion has a surface shape which is peaked upwardly; and

c. a first air passage means for allowing air to be introduced into or exhausted from said chamber.

5,597,733

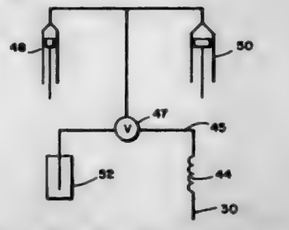
AUTOMATIC MULTIPLE-SAMPLE MULTIPLE-REAGENT DISPENSING METHOD IN CHEMICAL ANALYZER

Charles A. Bell, Weston; Warren J. Heath, Marlboro, and Norman M. Kleinman, Framingham, all of Mass., assignors to Precision Systems, Inc., Natick, Mass.

Continuation of Ser. No. 93,576, Jul. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 807,772, Dec. 9, 1991, Pat. No. 5,229,074, which is a continuation of Ser. No. 224,059, Jul. 25, 1988, abandoned. This application Mar. 14, 1995, Ser. No. 404,168

Int. Cl.[6] G01N *35/10*

U.S. Cl. 436—54 **2 Claims**



1. A method of dispensing reagent and samples from containers into test cells in an automatic analyzer system comprising the steps of:

drawing into a probe from a reagent container an amount of reagent sufficient for plural tests; and

subsequently drawing sample into the probe and dispensing sample and reagent for plural tests by sequentially, for each test, drawing into the probe sample for an individual test and dispensing sample and reagent for the individual test without drawing additional reagent between tests.

5,597,734

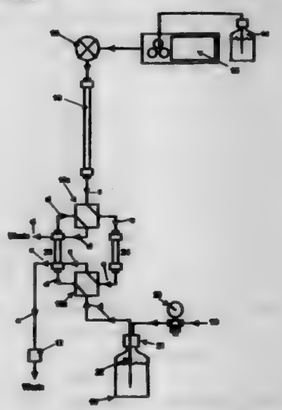
ION CHROMATOGRAPHY USING FREQUENT REGENERATION OF BATCH-TYPE SUPPRESSOR

Hamish Small, Leland, Mich.; John Riviello, Santa Cruz, and Christopher A. Pohl, Union City, both of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 319,350, Oct. 6, 1994, abandoned, which is a continuation of Ser. No. 113,775, Aug. 27, 1993, abandoned. This application Jul. 19, 1995, Ser. No. 503,999

Int. Cl.[6] G01N *30/02*

U.S. Cl. 436—161 **17 Claims**



1. An ion chromatography method for analysis of a plurality of analyte ions in a sequential flow of sample solutions, each analyte ion being of a common charge, said charge being one of positive or negative, said method comprising:

(a) eluting at least one sample solution containing said analyte ions in the presence of an eluent comprising an electrolyte through separating medium effective to separate the analyte ions, thereby exiting as separation medium effluent,

(b) flowing said separation medium effluent through an ion exchange resin bed suppressor containing ion exchange resin for suppressing said at least one sample solution, said electrolyte being converted to weakly ionized form by the non-precipitating ion retention on said suppressor ion exchange resin of the electrolyte ions of opposite charge to said analyte ions and said analyte ions being converted to acid or base form thereby exiting as a suppressor effluent,

(c) analyzing said suppressor effluent by a detector to produce a first signal,

(d) after completion of step (c), flowing a regenerant solution through said suppressor to regenerate in one step said suppressor ion exchange resin, the ratio of the time for step (c) to the time for step (d) being at least about 2:1, and

(e) then, repeating steps (a)–(c) for at least a subsequent sample solution.

5,597,735

GLYCOLIPIDS FOR SERODIAGNOSIS OF TUBERCULOSIS AND LEPROSY

Adalbert Laszlo; Vera Handzel, both of Nepean, and Lucio Vera-Cabrera, Ottawa, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Health and Welfare, Ottawa, Canada

Continuation-in-part of Ser. No. 881,193, May 11, 1992, Pat. No. 5,344,759. This application Sep. 2, 1994, Ser. No. 300,268

Int. Cl.[6] G01N *33/553;33/544;33/00*

U.S. Cl. 436—525 **3 Claims**

1. A spot test kit useful for the serodiagnosis of tuberculosis in a human or animal suspected of being exposed to *Mycobacterium tuberculosis*, comprising:

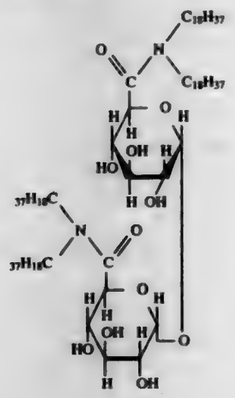
at least one tube for collecting a blood sample;

protein A-colloidal gold conjugate;

a rabbit anti-human immunoglobulin;

instructions for carrying out the test procedure; and

a strip of test paper coated with a glycolipid having the following formula:



5,597,736

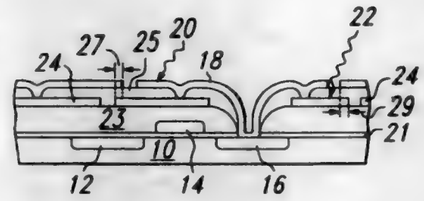
HIGH-YIELD SPATIAL LIGHT MODULATOR WITH LIGHT BLOCKING LAYER

Jeffrey B. Sampsell, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 928,251, Aug. 11, 1992. This application Jun. 7, 1995, Ser. No. 482,598

Int. Cl.[6] H01L *31/18*

U.S. Cl. 437—2 **7 Claims**



1. A method of manufacturing a semiconductor device comprising:

a. preparing a substrate;

b. forming electrically active regions in said substrate;

c. depositing a blocking layer over said substrate;

d. depositing an electrode layer over said blocking layer; and

e. patterning said electrode layer to form landing and address electrodes separated by a gap wherein said gap and said blocking layer are aligned such that light incident said semiconductor device which passes through said gap is blocked by said blocking layer.

5,597,737

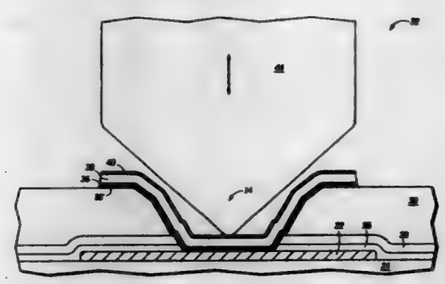
METHOD FOR TESTING AND BURNING-IN A SEMICONDUCTOR WAFER

Stuart E. Greer; Joel P. Dietz, and Aubrey K. Sparkman, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 3, 1995, Ser. No. 552,448

Int. Cl.[6] H01L *21/66*

U.S. Cl. 437—8 **19 Claims**



1. A method for testing a semiconductor wafer, comprising the steps of:

providing a semiconductor wafer containing a plurality of semiconductor dice, each semiconductor die having a plurality of bonding pads, wherein the semiconductor wafer has a top layer of an under-bump-metallurgy overlying the plurality of bonding pads; and

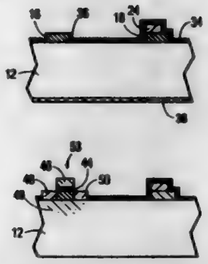
contacting the plurality of bonding pads via the top layer of the under-bump-metallurgy with a probe tip of a tester to determine whether each semiconductor die on the semiconductor wafer is functional.

5,597,738

METHOD FOR FORMING ISOLATED CMOS STRUCTURES ON SOI STRUCTURES

Anthony D. Kurtz, Teaneck, N.J.; Joseph S. Shor, Flushing, N.Y., and Alexander A. Ned, Bloomingdale, N.J., assignors to Kulite Semiconductor Products, Inc., Leonia, N.J.

Continuation of Ser. No. 162,715, Dec. 3, 1993, abandoned.
This application Mar. 6, 1995, Ser. No. 400,139
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—21 12 Claims



1. A method of fabricating a silicon-on-insulated conductor structure for semiconductor integrated circuits, comprising the steps of:

providing a substrate of semiconductor material of a first conductivity type having a substantially smooth and trenchless first side and a second side;

depositing a first layer of semiconducting material of a second conductivity type directly on all of said first side of said substrate;

defining a plurality of islands in said first layer;

growing a second layer of said semiconducting material on at least one of said islands, said second layer being of said first conductivity type;

forming a porous region beneath said at least one island; and

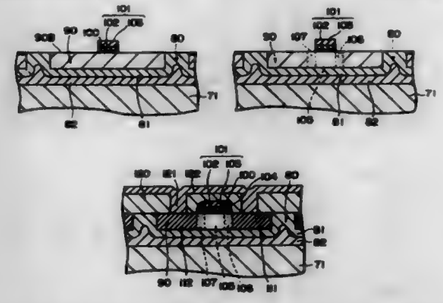
selectively oxidizing said porous region to form an isolating layer.

5,597,739

MOS TRANSISTOR AND METHOD FOR MAKING THE SAME

Hirofumi Sumi, and Naoki Nagashima, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 372,243, Jan. 13, 1995, abandoned.
This application Apr. 23, 1996, Ser. No. 636,848
Claims priority, application Japan, Jan. 19, 1994, 6-018991
Int. Cl.[6] H01L 21/265;21/20;21/44;21/302
U.S. Cl. 437—21 11 Claims



1. A method for making a transistor device of a type which comprises a semiconductor layer formed on an insulating layer and having a channel region, a doped source region and a doped drain region therein, comprising the steps of:

bonding a first semiconductor substrate as said semiconductor layer with a second semiconductor substrate, said first semiconductor substrate having an insulating layer thereon at a surface thereof;

forming a gate electrode on a surface of said semiconductor layer opposite said insulating layer;

using said gate electrode as a mask along with a resist mask, thereby forming by ion implantation said doped source and drain regions at portions of said semiconductor layer in a direction laterally outwardly of said gate electrode and terminating at a distance outwardly from said gate electrode which is shorter than an overall lateral extent of said semiconductor layer both to the left and to the right so that remaining portions of said semiconductor layer outwardly of said doped source and drain regions are not effected by the ion implantation, said channel region being defined between said doped source and doped drain regions beneath said gate electrode;

forming gate side walls of an insulating material at both lateral sides of said gate electrode and substantially coincident in lateral extent with a width and lateral extent of said doped source and doped drain regions;

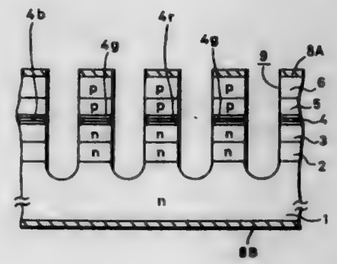
using said gate side walls and said gate electrode as another mask, converting said remaining portions of said semiconductor layer outwardly of said source and drain regions which have not been effected by the ion implantation to first and second conductive regions respectively lying adjacent said doped source and doped drain regions, and wherein said first and second conductive regions are made of an element selected from the group consisting of a metal and a metal compound.

5,597,740

SEMICONDUCTOR DISPLAY DEVICE AND A METHOD OF FABRICATING THE SAME

Satoshi Ito; Futoshi Hiei; Akira Ishibashi; Atsushi Toda, and Norikazu Nakayama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 197,310, Feb. 16, 1994, Pat. No. 5,459,337. This application Jul. 5, 1995, Ser. No. 498,438
Claims priority, application Japan, Feb. 19, 1993, 5-030560; Feb. 26, 1993, 5-038899
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—23 4 Claims



1. A method for fabricating a light emitting device comprising the steps of:

forming a first cladding layer on a substrate;

forming red, green and blue light emitting portions each made of II–VI semiconductor in a horizontal direction with respect to a surface of said substrate on said first cladding layer;

forming a second cladding layer on said light emitting portions; and

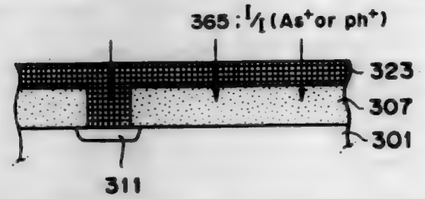
electrically separating said red, green and blue light emitting portions from each other.

5,597,741

PROCESS FOR FORMING A RECRYSTALLIZED LAYER AND DIFFUSING IMPURITIES

Masaru Sakamoto, Atsugi; Masakazu Morishita, and Shigeru Nishimura, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 67,788, May 27, 1993, Pat. No. 5,476,799, which is a division of Ser. No. 755,452, Sep. 5, 1991, Pat. No. 5,242,858. This application Feb. 17, 1995, Ser. No. 390,548
Claims priority, application Japan, Sep. 7, 1990, 2-235893; Sep. 7, 1990, 2-235894; Sep. 28, 1990, 2-257248; Sep. 28, 1990, 2-326852; Jan. 22, 1991, 3-20269
Int. Cl.[6] H01L 21/266
U.S. Cl. 437—25 13 Claims



1. A process for preparing a semiconductor device, comprising the steps of:

forming a polycrystalline silicon film on monocrystalline semiconductor substrate;

injecting arsenic or phosphorus as an impurity into the polycrystalline silicon film by an ion-injection method to make the polycrystalline silicon film an amorphous layer;

heat-treating the amorphous layer at a temperature of 600° C. to 650° C. to recrystallize the amorphous layer and form a recrystallized layer having a grain size greater than that of polycrystalline silicon by solid phase growth; and

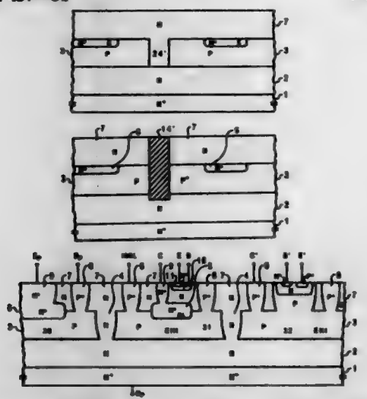
heat-treating the recrystallized layer at a temperature of 800° C. to 900° C. to diffuse the impurity into the monocrystalline semiconductor substrate.

5,597,742

SEMICONDUCTOR DEVICE AND METHOD

Raffaele Zambrano, San Giovanni la Punta, Italy, assignor to Consorzio per la Ricerca Sulla Microelettronica Nel Mezzogiorno, Italy

Division of Ser. No. 869,760, Apr. 16, 1992, Pat. No. 5,432,376. This application May 16, 1995, Ser. No. 442,015
Claims priority, application European Pat. Off., Apr. 17, 1991, 91830151
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—31 4 Claims



1. A process for the manufacture of a monolithic semiconductor device having an integrated control circuit, a horizontal isolation region of said circuit and at least one bipolar power transistor integrated in the same chip, comprising the steps of:

growing a first epitaxial layer with a first conductivity type on a substrate with the same conductivity type;

growing a second epitaxial layer with a second conductivity type opposite to the first conductivity type on the first epitaxial layer;

defining, in the second epitaxial layer, a region with the first conductivity type to create a buried layer of the integrated control circuit, and further defining a region with the first conductivity type designed to form the emitter of the power transistor;

forming a trench through the second epitaxial layer between the buried layer and the emitter;

growing a third epitaxial layer with the first conductivity type, wherein the third epitaxial layer fills the trench through the second epitaxial layer to form an isolation region between the power transistor and the control circuit;

providing, in the third epitaxial layer, regions with the second conductivity type designed to isolate the integrated control circuit components from each other; and

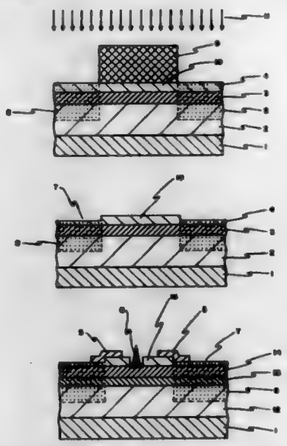
providing, in the third epitaxial layer, sink regions designed to connect at the surface the buried layer of the integrated control circuit and the power transistor emitter.

5,597,743

METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR WITH IMPROVED ISOLATION BETWEEN ELECTRODE

Kazuhiko Onda, and Yoichi Makino, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 761,421, Sep. 17, 1991, abandoned.
This application Jun. 13, 1994, Ser. No. 259,149
Claims priority, application Japan, Sep. 17, 1990, 2-246600
Int. Cl.[6] H01L 21/265;21/44
U.S. Cl. 437—39 7 Claims



1. A method for manufacturing a field effect transistor comprising steps of:

forming at least a channel layer comprising a non-doped first semiconductor layer having a first electron affinity, an electron supply layer comprising a doped second semiconductor layer having a second electron affinity which is lower than the first electron affinity of said first semiconductor layer, and a contact layer comprising a doped third semiconductor material having a third electron affinity which is higher than the second electron affinity of said second semiconductor material, said first, second and third semiconductor layers being formed in a sequence of steps corresponding to an order in which the first, second, and third layers are mentioned above, said first, second, and third layers are being formed on a semi-insulating

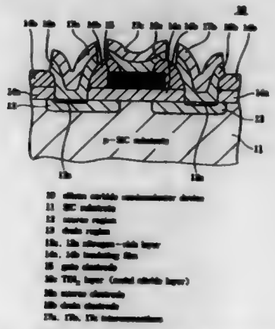
semiconductor material, said contact layer having a first portion and a second portion surrounding said first portion;
covering said first portion of said contact layer with a mask layer;
implanting ions into a surface of said second portion of said contact layer by using said mask layer as a mask, said ions being implanted into said second portion of said contact layer and into portions of said channel layer and electron supply layer; and
selectively removing a surface part of said second portion of said contact layer that is not covered by said mask, thereby leaving a remaining part thereof.

5,597,744

METHOD OF PRODUCING A SILICON CARBIDE SEMICONDUCTOR DEVICE

Eiji Kamiyama; Kazuhiro Fuseguwa, and Noaho Toyama, all of Saitama-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, and Research Institute of Innovative Technology for the Earth, Kyoto, both of Japan

Division of Ser. No. 448,130, May 23, 1995. This application Aug. 17, 1995, Ser. No. 516,298
Claims priority, application Japan, Jun. 7, 1994, 6-150425
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—40 **3 Claims**



1. A method of producing a silicon carbide semiconductor device, comprising the steps of:
forming N-type source/drain SiC regions (12, 13) on a P-type silicon carbide substrate (11);
forming an insulating film (14*a*) on said silicon carbide substrate (11) between said source/drain SiC regions (12, 13);
forming a gate electrode (15) on said insulating film (14*a*);
forming on said gate electrode (15) and said source/drain SiC regions (12, 13) metal nitride layers (16*c*, 16*a*, 16*b*) composed of either one of TiN, ZrN, HfN, VN and TaN; and
forming interconnections (17*c*, 17*a*, 17*b*) on said metal nitride layers (16*c*, 16*a*, 16*b*).

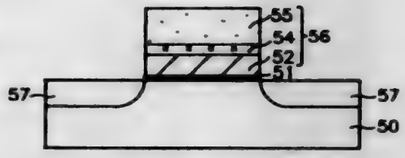
5,597,745

METHOD FOR FORMING TIN FILM AND TIN FILM/THIN TISI$_2$ FILM, AND METHOD FOR FABRICATING SEMICONDUCTOR ELEMENT UTILIZING THE SAME

Jeong S. Byun, and Hak N. Kim, both of Chungcheongbuk-do, Rep. of Korea, assignors to L G Semicon Co., Ltd., Cheonju, Rep. of Korea

Filed Apr. 17, 1995, Ser. No. 423,916
Int. Cl.[6] H01L *21/283;21/336*
U.S. Cl. 437—41 **20 Claims**

15. A method for fabricating a semiconductor element comprising the steps of:
forming a gate oxide film on a first conductivity type semiconductor substrate;



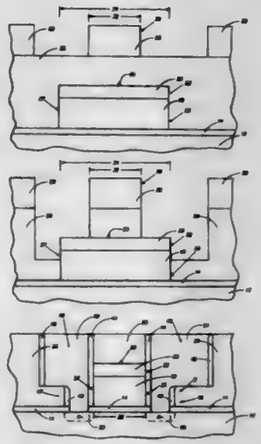
forming a polysilicon film on the gate oxide film;
forming a titanium nitride film on a titanium target;
depositing a titanium film containing nitrogen on the polysilicon film by sputtering under an argon atmosphere the titanium target having the titanium nitride film formed thereon;
forming a titanium nitride film on the polysilicon film and a titanium silicide film between the polysilicon film and the titanium nitride film by heat-treating the titanium film containing nitrogen;
forming a gate by patterning the titanium nitride film, the titanium silicide film and the polysilicon film; and
forming impurity regions in the substrate by injecting second conductivity type impurity ions into the substrate using the gate as a mask.

5,597,746

METHOD OF FORMING FIELD EFFECT TRANSISTORS RELATIVE TO A SEMICONDUCTOR SUBSTRATE AND FIELD EFFECT TRANSISTORS PRODUCED ACCORDING TO THE METHOD

Kirk Prall, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Aug. 9, 1995, Ser. No. 512,804
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—416 **25 Claims**



1. A method of forming a field effect transistor relative to a semiconductor substrate, the transistor having a transistor gate which defines a resultant lateral expanse of semiconductive material therebeneath for provision of a transistor channel region, the method comprising the following steps:
providing a conductive gate layer over the semiconductor substrate;
patterning the conductive gate layer into a first gate block, the first gate block having a first lateral expanse which is greater than the resultant lateral expanse;
providing an insulating dielectric layer over the first gate block;

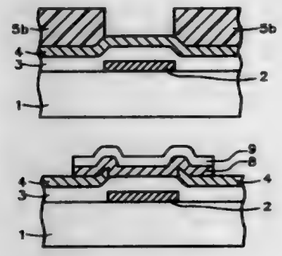
providing a layer of patterned photoresist over the first gate block and the insulating dielectric layer, the patterned photoresist comprising a patterned photoresist block positioned over and within the first lateral expanse of the first gate block;
after providing the layer of patterned photoresist, etching the insulating dielectric layer;
after etching the insulating dielectric layer, etching the first gate block to define the transistor gate having a second lateral expanse adjacent the semiconductor substrate which is equal to the resultant lateral expanse; and
providing a conductivity enhancing impurity into the semiconductor substrate adjacent the transistor gate.

5,597,747

METHOD OF MAKING INVERTED THIN FILM TRANSISTOR USING BACKSICK EXPOSURE AND NEGATIVE PHOTORESIST

Mei-Soong Chen, Taichung, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Dec. 15, 1995, Ser. No. 572,809
Int. Cl.[6] H01L *21/84*
U.S. Cl. 437—41 **13 Claims**



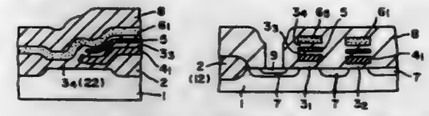
1. A method for forming a self-aligned thin film transistor comprising:
providing a substrate, having upper and lower surfaces, that is transparent to radiation used to activate photoresist;
depositing, then patterning and etching, a first matellic layer to form a gate electrode on said upper surface of said substrate;
depositing an insulating layer over said first metallic layer and said substrate;
then depositing a layer of doped semiconductor over said insulating layer;
coating said doped semiconductor layer with a layer of negative photoresist;
exposing said layer of photoresist to radiation that will activate it and that has been directed to said photoresist layer through said lower surface of said substrate; and
then developing said layer of photoresist;
etching said doped semiconductor layer down to the level of said insulating layer in all areas not protected by photoresist thereby forming a gap between source and drain regions;
stripping away said layer of photoresist;
depositing a semiconducting layer over said doped semiconductor layer and said insulating layer; and
then depositing a protective layer over said semiconducting layer;
patterning and then eching portions of said protective layer and said semiconducting layer down to the level of said doped semiconductor layer;
depositing a second metallic layer, on said protective layer and said doped semiconductor layer;
patterning and then etching said second metallic layer to form connections to circuitry outside of said thin film transistor; and
etching that portion of said doped semiconductor layer that is not covered by the second metallic layer.

5,597,748

METHOD OF MANUFACTURING NAND TYPE EEPROM

Masanaichi Azuma, Tokyo-To; Hiroshi Iwahashi, Yokohama; Ryoshei Kirisawa, Yokohama; Ryoso Nakayama, Yokohama; Satoshi Inoue, Kawasaki; Riichiro Shirota, Kawasaki; Tetsuo Endoh, Yokohama, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 499,342, Jun. 21, 1990, Pat. No. 5,323,039. This application May 23, 1994, Ser. No. 247,589
Claims priority, application Japan, Oct. 21, 1988, 63-265370; Aug. 30, 1989, 1-224086; WIPO, Sep. 14, 1989, PCT/JP89/00942
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **2 Claims**



1. A method of manufacturing a NAND type non-volatile semiconductor memory, comprising the steps of:
forming an element separation insulating film on a silicon substrate to separate two NAND type memories arranged in a longitudinal direction and two NAND type memories arranged in a lateral direction from one another;
forming a first gate insulating film on a surface of the silicon substrate to form a channel region on a part of the silicon substrate that is located directly beneath the surface of the silicon substrate on which the first gate insulating film is formed;
depositing a first silicon film on at least the first gate insulating film;
etching the first silicon film and the first gate insulating film to form first slits extending in the longitudinal direction to separate the NAND type memories arranged in the lateral direction from one another, a part of the channel region of each memory cell of each NAND type memory being exposed by each of the first slits, one part of the channel region being bisected by a line extending along the longitudinal direction thereof to expose one part of the channel region and to cover the other part of the channel region with the first gate insulating film and the first silicon film;
covering the exposed part of the channel region and the first silicon film both with a second gate insulating film;
depositing a second silicon film on the second gate insulating film;
etching the surface of the silicon substrate to form second slits extending in the lateral direction thereof for separating the memory cells of each NAND type memory, a control gate extending in the lateral direction being formed from the second silicon film and further a floating gate being formed from the first silicon film by the second slits; and
implanting ions by using the control gate and the floating gate as a mask, to form source and drain diffusion regions on the surface of the silicon substrate.

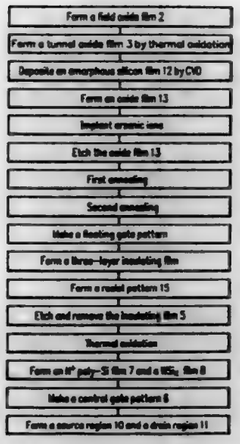
5,597,749

METHOD OF MAKING NONVOLATILE MEMORY CELL WITH CRYSTALLIZED FLOATING GATE

Katsuji Iguchi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 262,831, Jun. 21, 1994, Pat. No. 5,493,140. This application May 22, 1995, Ser. No. 447,243
Claims priority, application Japan, Jul. 5, 1993, 5-165789
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **9 Claims**

1. A method of producing a nonvolatile memory cell comprising the steps of:
forming an active region and an element isolating region on a semiconductor substrate;



forming a first insulating film on the semiconductor substrate;

forming a polycrystalline silicon film having a thickness of 55 nm or less on the first insulating film, the polycrystalline silicon film having a shape to cover at least the active region;

forming a second insulating film on the polycrystalline silicon film;

forming a conductive film on the second insulating film,

etching the conductive film, the second insulating film and the polycrystalline silicon film sequentially, so as to form a control gate made of the conductive film and to form a floating gate made of the polycrystalline silicon film,

wherein the step of forming the polycrystalline silicon film includes the steps of:

depositing an amorphous silicon film on the first insulating film; and

crystallizing the amorphous silicon film by annealing to form the polycrystalline silicon film.

5,597,750

METHOD OF MANUFACTURING A MATRIX OF MEMORY CELLS HAVING CONTROL GATES

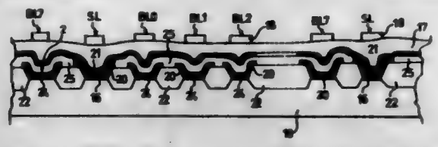
Federico Pio; Carlo Riva, and Silvia Lucherini, all of Milan, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 282,148, Jul. 28, 1994. This application Jun. 7, 1995, Ser. No. 474,735

Claims priority, application European Pat. Off., Jul. 29, 1993, 93830339.3

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **19 Claims**



1. A method for making a matrix of memory cells in MOS technology on a semiconductor substrate, the memory cells including floating gate transistors having active source and drain areas, each memory cell being connected to at least one enabling transistor and connected serially to a respective selection transistor, the method comprising the steps of:

(a) forming gate oxide layers for the selection transistors, the enabling transistors and the memory cells, the thickness of the gate oxide layers for the memory cells being different from the gate oxide layers for the selection and enabling transistors;

(b) after step (a), depositing and defining a first polysilicon layer over the gate oxide layers of the memory cells to form floating gates;

(c) forming an interpoly dielectric layer over the first polysilicon layer; and

(d) depositing a second polysilicon layer to concurrently form gates for the selection and enabling transistors and control gates for the memory cells.

5,597,751

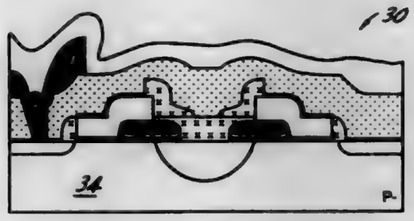
SINGLE-SIDE OXIDE SEALED SALICIDE PROCESS FOR EPROMS

Jung-Chun Wang, Hsin-Chu, Taiwan, assignor to Winbond Electronics Corp., Taiwan

Filed Dec. 20, 1995, Ser. No. 575,748

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **12 Claims**



1. A method of forming a memory cell structure in a semiconductor substrate having a first conductivity type compriaing the steps of:

forming a layer of a first dielectric material over the semiconductor substrate including a tunnel dielectric region,

forming a floating gate from a first conductive material on said layer of first dielectric material extending over said tunnel dielectric region,

forming a layer of a second dielectric material on said floating gate,

forming a control gate from a second conductive material on said layer of second dielectric material,

forming in said substrate a zone of a second conductivity type at an area defining a source region,

forming a layer of a third dielectric material on said control gate,

depositing a layer of a photo resist on said layer of the third dielectric material overlaying said source region and at least a portion of said control gate and said floating gate,

etching away said layer of third dielectric material except the area under said photo resist and the sidewall spacers at the edge of said control gate,

forming a drain region in the semiconductor substrate having the second conductivity type, and

forming a metal silicide layer over said control gate not covered by said layer of third dielectric material and over said drain region.

5,597,752

METHOD FOR MANUFACTURING LDD TYPE SEMICONDUCTOR DEVICE WITH COMPLETE SELF-ALIGNMENT

Kenji Niwa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

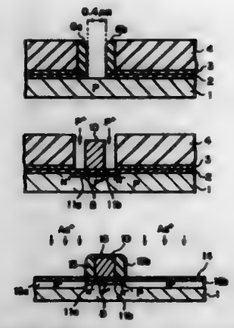
Filed Aug. 25, 1995, Ser. No. 519,642

Claims priority, application Japan, Aug. 27, 1994, 6-225891

Int. Cl.[6] H01L *21/8234*

U.S. Cl. 437—44 **13 Claims**

1. A method for manufacturing a lightly-doped drain (LDD)-type semiconductor device, comprising the steps of:



forming an insulating layer on a semiconductor substrate of a first conductivity type;

forming an opening in said insulating layer;

forming a first sidewall insulating layer on a sidewall of said insulating layer within said opening;

forming a gate insulating layer on said semiconductor substrate within said opening;

forming a gate electrode buried in said opening on said first sidewall insulating layer and said gate insulating layer;

removing said first sidewall insulating layer after formation of said gate electrode;

introducing impurities of a second conductivity type opposite to said first conductivity type into said semiconductor substrate with a mask of said gate electrode and said insulating layer to form a first impurity region of said second conductivity type in said semiconductor substrate;

removing said insulating layer after formation of said first impurity region;

forming a second sidewall insulating layer on a sidewall of said gate electrode after removal of said insulating layer; and

introducing impurities of said second conductivity type into said semiconductor substrate with a mask of said gate electrode and said second sidewall insulating layer to form a second impurity region of said second conductivity type in said semiconductor substrate,

said second impurity region having a higher impurity concentration than said first impurity region.

5,597,753

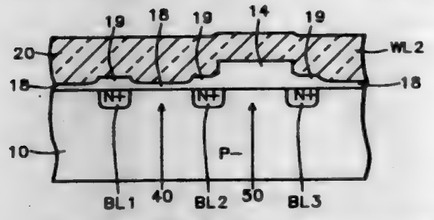
CVD OXIDE CODING METHOD FOR ULTRA-HIGH DENSITY MASK READ-ONLY-MEMORY (ROM)

Shing-Ren Sheu, Tso-Yuan; Kuan-Cheng Su, Taipei; Chen-Hui Cheng, Hsin-Chu, and Yi-Cheng Sheng, Tai-cheng, all of Taiwan, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Dec. 27, 1994, Ser. No. 364,318

Int. Cl.[6] H01L *21/8246*

U.S. Cl. 437—52 **25 Claims**



1. A method of manufacturing an array of coded memory cells for a Read Only Memory (ROM) semiconductor device on a semiconductor substrate, comprising the steps of:

providing a semiconductor substrate having a principle surface with device areas thereon;

forming by masking and ion implantation an array of parallel buried bit lines oriented in a first direction in a portion of said device areas;

depositing a ROM code insulating layer on said substrate;

forming a ROM code mask on said ROM code insulating layer, said ROM code mask being formed between said buried bit lines and over coded cell areas, leaving exposed said ROM code insulating layer elsewhere on said substrate;

etching said ROM code insulating layer to said substrate, leaving masked portions of said ROM code insulating layer on said coded cell areas;

removing said ROM code mask;

growing a silicon oxide layer on exposed portions of said substrate by thermal oxidation, thereby forming a gate oxide layer between said buried bit lines and an insulating layer over said buried bit lines;

depositing a polysilicon layer over said substrate and in contact with said gate oxide layer;

patterning said polysilicon layer by masking and etching, and forming an array of parallel word lines oriented in a second direction, orthogonal to and above said buried bit lines and aligned over said patterned ROM code insulating layer and thereby completing said array of memory cells having coded cell areas on said ROM semiconductor device.

5,597,754

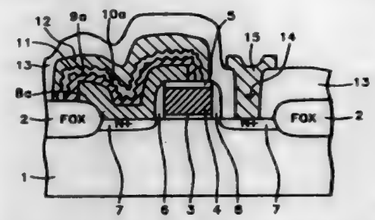
INCREASED SURFACE AREA FOR DRAM, STORAGE NODE CAPACITORS, USING A NOVEL POLYSILICON DEPOSITION AND ANNEAL PROCESS

Chine-Gie Lou, and Yu-Hua Lee, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsin-chu, Taiwan

Filed May 25, 1995, Ser. No. 450,299

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **20 Claims**



1. A method for fabricating stacked capacitor, dynamic random access memory, (DRAM), devices, on a semiconductor substrate, comprising the steps of:

providing a transfer gate transistor in said substrate;

depositing an in-situ doped first polysilicon layer, on said transfer gate transistor;

depositing a second polysilicon layer on said in-situ doped first polysilicon layer;

annealing of said in-situ doped first polysilicon layer, and said second polysilicon layer in nitrogen ambient followed by an in-situ vacuum annealing, to increase roughness of top surface of said second polysilicon layer, and drive dopant from said in-situ doped first polysilicon layer into said second polysilicon layer;

patterning of said in-situ doped first polysilicon layer, and said second polysilioca layer to form lower capacitor electrode structure;

formation of composite dielectric layer on said lower capacitor electrode structure, and on said transfer gate transistor, not covered by said lower electrode structure;

depositing a third polysilicon layer on said composite dielectric layer;

ion implanting a first conductivity imparting dopant into said third polysilicon layer;

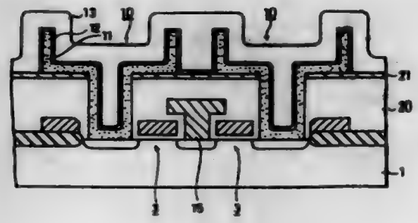
patterning of third polysilicon layer to form upper electrode structure;
depositing an insulator layer on said upper electrode structure, and on said transfer gate transistor, not covered by said upper electrode structure;
opening a contact hole in said insulator layer, to a region in said transfer gate transistor; and
forming a metal land in said contact hole.

5,597,755

METHOD OF MANUFACTURING A STACKED CAPACITOR IN A DRAM

Natsuo Ajika; Hideaki Arima, and Atsushi Hachisuka, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 163,647, Dec. 9, 1993, Pat. No. 5,434,439, which is a continuation of Ser. No. 645,988, Jan. 23, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 457,193
Claims priority, application Japan, Jan. 26, 1990, 2-16960; Apr. 3, 1990, 2-89869; Sep. 19, 1990, 2-251306
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 9 Claims



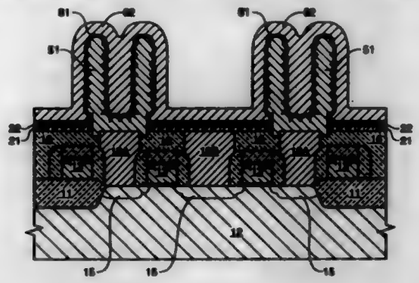
1. A method of manufacturing a semiconductor memory device having first and second stacked capacitors formed partly covering a surface of an insulation layer covering a main surface of a semiconductor substrate, comprising the steps of:
forming an insulation layer on the main surface of said semiconductor substrate,
forming a capacitor isolating layer having vertical side surfaces in first and second capacitor isolation regions on a surface of said insulation layer,
forming a contact hole in said insulation layer reaching the main surface of said semiconductor substrate,
forming a first conductive layer on an inner surface of said contact hole, on the surface of said insulation layer and on a surface of said capacitor isolating layer,
forming a layer to be etched back having a different etching ratio from that of said first conductive layer on a surface of said first conductive layer,
etching said layer to be etched back to expose the surface of said first conductive layer located on an upper surface of said capacitor isolating layer,
partially etching and removing said first conductive layer exposed from said etched back layer to isolate said first conductive layer into a first capacitor portion and a second capacitor portion,
removing said capacitor isolating layer and said etched back layer,
forming a dielectric layer on the surface of said first conductive layer,
forming a second conductive layer on a surface of said dielectric layer.

5,597,756

PROCESS FOR FABRICATING A CUP-SHAPED DRAM CAPACITOR USING A MULTI-LAYER PARTLY-SACRIFICIAL STACK

Pierre C. Fazan, and Thomas A. Figura, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 21, 1995, Ser. No. 493,139
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 29 Claims



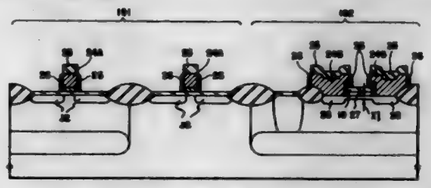
1. A method of forming a dynamic random access memory cell capacitor, said method comprising the following steps:
(a) providing a silicon substrate having a storage-node junction on an upper surface thereof;
(b) depositing alternating layers of silicon dioxide and silicon nitride superjacent the substrate;
(c) etching a hole through the alternating layers directly above the storage-node junction;
(d) forming a storage-node plate from an amorphous silicon layer which is in electrical communication with the storage-node junction through the hole, and which is in contact with at least an edge of each of said alternating layers;
(e) forming HSG polysilicon asperities on only the storage-node plate while one of said silicon dioxide layers is exposed;
(f) removing said one of said silicon dioxide layers to expose an underlying silicon nitride layer;
(g) forming a cell dielectric layer on the asperity-covered storage-node plate; and
(h) depositing a cell plate layer on top of the cell dielectric layer.

5,597,757

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING BIPOLAR AND MOS TRANSISTORS

Takeo Maeda, and Hiroshi Momose, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 300,565, Sep. 6, 1994, abandoned, which is a continuation of Ser. No. 42,597, Apr. 2, 1993, abandoned. This application Jul. 18, 1995, Ser. No. 503,489
Claims priority, application Japan, Apr. 3, 1992, 4-82385
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—59 6 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:
forming a oxide film on a semiconductor substrate;
forming a nitride film on the oxide film;

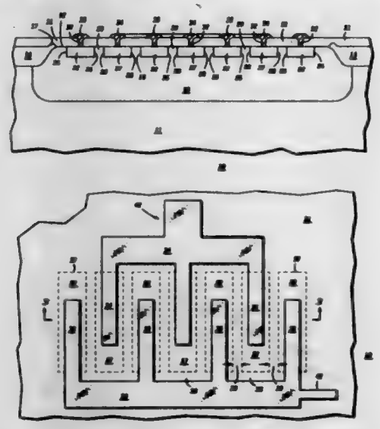
etching the nitride film and the oxide film such that only those portions of the nitride and oxide films formed over a bipolar transistor formation region of the semiconductor substrate remain;
forming a gate oxide film over a MOS transistor formation region of the semiconductor substrate;
doping impurities for forming an inner base region into the bipolar transistor formation region;
etching the remaining nitride and oxide films to form a first opening to an outer base electrode formation region;
forming a conductive film on an entire surface of the semiconductor substrate;
etching the conductive film to form a gate electrode on the MOS transistor formation region, an outer base electrode in the first opening, and a second opening to the nitride film over the inner base region; and
performing thermal oxidation to form oxide films at least on a surface of the gate electrode and a surface of the outer base electrode, thereby rounding an edge portion of the gate electrode and an edge portion of the outer base electrode.

5,597,758

METHOD FOR FORMING AN ELECTROSTATIC DISCHARGE PROTECTION DEVICE

Barry B. Heim, Mesa, and Freeman D. Colbert, Gilbert, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1994, Ser. No. 283,437
Int. Cl.[6] H01L 21/265;21/70;27/00
U.S. Cl. 437—60 17 Claims



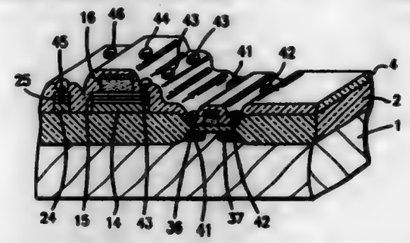
1. A method for fabricating an electrostatic discharge protection device, comprising the steps of:
providing a semiconductor substrate of a first conductivity type, the semiconductor substrate having a surface;
forming a first layer of photoresist on the surface;
forming an opening in the first layer of photoresist;
implanting an impurity material of the first conductivity type through the opening in the first layer of photoresist into a first portion of the semiconductor substrate to form a dopant region of the first conductivity type;
removing the first layer of photoresist;
forming a second layer of photoresist on the surface;
forming an opening in the second layer of photoresist;
implanting an impurity material of the second conductivity type through the opening in the second layer of photoresist into a second portion of the semiconductor substrate to form a dopant region of the second conductivity type;
removing the second layer of photoresist; and
forming first and second electrodes, the first electrode in contact with the dopant region of the first conductivity type and the second electrode in contact with the dopant region of the second conductivity type.

5,597,759

METHOD OF FABRICATING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A CAPACITOR AND A RESISTOR

Masanori Yoshimori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 426,137, Apr. 21, 1995. This application Oct. 6, 1995, Ser. No. 539,929
Claims priority, application Japan, Apr. 21, 1994, 6-82909
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—60 4 Claims



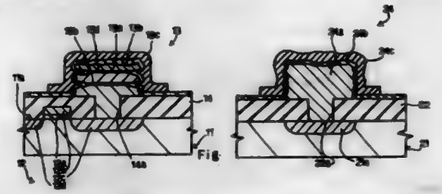
1. A method of fabricating a semiconductor integrated circuit device comprising the steps of:
selectively forming a field insulation layer on a main surface of a semiconductor substrate to define an active region;
forming a first polysilicon layer on said field insulation layer and said active region;
forming a dielectric layer having at least one oxide layer and a nitride layer on said first polysilicon layer;
patterning said dielectric layer and said first polysilicon layer to form a lower electrode of a capacitor made of said first polysilicon layer and a dielectric film of said capacitor made of said dielectric layer;
forming a second polysilicon layer on at least said dielectric film and said active region after the step of patterning said dielectric layer and said first polysilicon layer; and
patterning said second polysilicon layer to form an upper electrode of said capacitor and a gate electrode formed on said active region, whereby said upper electrode of said capacitor and said gate electrode are formed after the step of pattering said dielectric layer and said first polysilicon layer.

5,597,760

PROCESS OF FABRICATING SEMICONDUCTOR DEVICE HAVING CAPACITOR INCREASED IN CAPACITANCE BY ROUGHENING SURFACE OF ACCUMULATING ELECTRODE

Toshiyuki Hirota, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 22, 1996, Ser. No. 589,268
Claims priority, application Japan, Jan. 25, 1995, 7-009834
Int. Cl.[6] H01L 21/70
U.S. Cl. 437—60 16 Claims



1. A process of fabricating a semiconductor device, comprising the steps of:

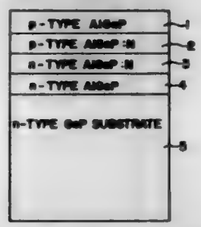
a) introducing an element selected from the group consisting of oxygen, nitrogen and carbon into a polysilicon layer during a period of a deposition of said polysilicon layer;
b) exposing a surface of said polysilicon layer to an etchant so as to roughen said surface;
c) covering said surface of said polysilicon layer with a dielectric layer; and
d) covering said dielectric layer with a conductive layer.

5,597,761

SEMICONDUCTOR LIGHT EMITTING DEVICE AND METHODS OF MANUFACTURING IT

Keizo Adomi; Nobuhiko Noto; Akio Nakamura, and Takao Takenaka, all of Annaka, Japan, assignors to Shin-Etsu Handotai Co Ltd, Tokyo, Japan

Division of Ser. No. 216,278, Mar. 23, 1994, Pat. No. 5,442,201. This application Mar. 10, 1995, Ser. No. 402,487
Claims priority, application Japan, Mar. 25, 1993, 5-090736
Int. Cl.[6] H01L *21/208*
U.S. Cl. 437—127 4 Claims



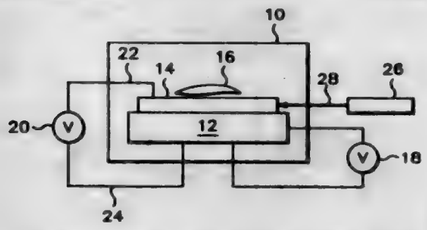
1. A method of manufacturing a semiconductor light emitting device having an epitaxial layer(s) of compound semiconductor alloy doped with nitrogen and represented by the formula $(Al_xGa_{1-x})_yIn_{1-y}P$ ($0<x\leq 1$, $0<y\leq 1$), comprising the steps of forming said device on a compound semiconductor single crystal substrate composed of an element(s) from Group III and an element(s) from Group V in the periodic table by means of the metal organic vapor phase epitaxy method (MOVPE method), and controlling efficiency of nitrogen doping in the epitaxial layer(s) of compound semiconductor alloy by an amount of organic aluminum compound introduced.

5,597,762

FIELD-ENHANCED DIFFUSION USING OPTICAL ACTIVATION

Golian Popovici; Mark A. Prelas; T. Sung, and S. Khasawinah, all of Columbia, Mo., assignors to Nanophase Diamond Technologies, Inc., Vancouver, Canada

Filed Sep. 27, 1994, Ser. No. 313,641
Int. Cl.[6] H01L *21/225*
U.S. Cl. 437—169 19 Claims



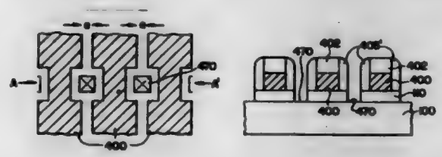
1. A method of making semiconductor material comprising the steps of:
(a) placing a diamond substrate material on a substrate holder in an inert atmosphere or a vacuum vessel;
(b) placing an impurity on the diamond substrate material;
(c) creating a voltage potential across the diamond substrate material;
(d) heating at least a portion of the diamond substrate material; and
(e) bombarding the diamond substrate material with photons during the execution of steps (c) and (d).

5,597,763

METHOD FOR MANUFACTURING A SEMICONDUCTOR WIRING STRUCTURE INCLUDING A SELF-ALIGNED CONTACT HOLE

Sang-pil Sim, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 288,887, Jul. 27, 1994. This application Apr. 26, 1995, Ser. No. 427,855
Claims priority, application Rep. of Korea, Jul. 27, 1993, 9314293
Int. Cl.[6] H01L *21/28*
U.S. Cl. 437—195 7 Claims



1. A method for manufacturing a semiconductor memory device having a transistor, the transistor including a gate electrode formed on a semiconductor substrate with a gate insulating film disposed therebetween, and first and second impurity regions formed in said semiconductor substrate and spaced apart from each other by said gate electrode, comprising the steps of:
forming a first insulating film over said transistor, said first insulating film having first contact holes which respectively expose said first and second impurity regions;
forming first and second pad electrodes on said first insulating film which are connected with said first and second impurity regions, respectively, through said first contact holes;
forming a second insulating film having second contact holes which expose said first and second pad electrodes, respectively, on the resultant structure having said first and second pad electrodes;
forming a plurality of bit-line electrodes on said second insulating film which are connected with said second pad electrodes through respective said second contact holes, each bit-line electrode being formed so that a portion of the bit-line electrode adjacent to where a third contact hole will be subsequently formed has a first width and a remaining portion of the bit-line electrode has a second width being wider than the first width;
depositing a third insulating film on resultant structure having said bit-line electrodes formed thereon, and etching said third insulating film to thereby fill a space between adjacent said bit-line electrode portions having said second width with said third insulating film, and to form a spacer composed of said third insulating film on the sidewalls of said bit-line electrode portions having said first width, thereby leaving a portion of the second insulating film exposed therethrough; and
etching said second insulating film using said third insulating film as an etch-mask to thereby form a third contact hole to expose said first pad electrode.

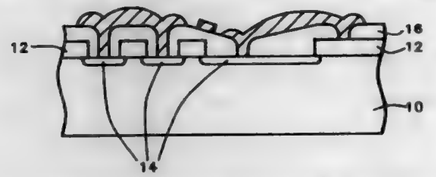
implanting a dopant of the first conductivity type into the entire principal surface, thereby forming a doped channel stop region in the termination region;
implanting a dopant of a second opposite conductivity type in a central portion of the substrate, thereby forming a body region of the transistor;
forming a trench in the central portion of the substrate; and
forming a conductive gate electrode in the trench.

5,597,764

METHOD OF CONTACT FORMATION AND PLANARIZATION FOR SEMICONDUCTOR PROCESSES

Chao-Ming Koh, Hsinchu; Yeh-Sen Lin, Tso-Yuan, and Rong-Wu Chien, Chyai, all of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Jul. 15, 1996, Ser. No. 679,859
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—195 25 Claims



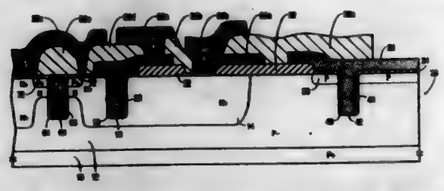
1. A method for forming small contacts and for planarizing the dielectric layer in the fabrication of an integrated circuit device comprising:
forming semiconductor device structures in and on a semiconductor substrate;
depositing a first dielectric layer overlying said semiconductor device structures;
covering said first dielectric layer with a photoresist mask and partially etching into said first dielectric layer to form first openings of a first width wherein said first openings do not contact said underlying semiconductor device structures;
depositing a second dielectric layer over said first dielectric layer and within said first openings whereby second openings are formed having a second width smaller than said first width;
etching away said second dielectric layer whereby said second openings are extended downward through said first dielectric layer to said underlying semiconductor device structures to form small contact openings having said second width and whereby said first dielectric layer is planarized; and
depositing and patterning a conducting layer to complete the formation of said small contacts and said planarized dielectric layer in the fabrication of said integrated circuit device.

5,597,765

METHOD FOR MAKING TERMINATION STRUCTURE FOR POWER MOSFET

Hamza Yilmaz, Saratoga, and Fwu-Iuan Hshieh, San Jose, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Division of Ser. No. 371,174, Jan. 10, 1995. This application Apr. 17, 1995, Ser. No. 423,588
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—203 11 Claims



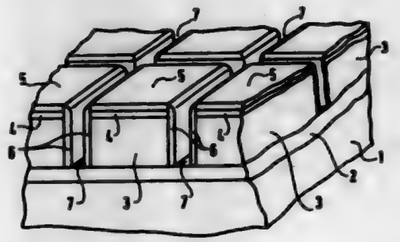
1. A method of forming a trenched semiconductor transistor device including a channel stop, comprising the steps of:
providing a substrate having a principal surface and being doped with a dopant of a first conductivity type;
forming a field oxide layer on portions of the principal surface, the field oxide layer not being present on a portion of the principal surface towards an edge of the substrate which is a termination region of the transistor;
implanting a dopant of the first conductivity type into the entire principal surface, thereby forming a doped channel stop region in the termination region;
implanting a dopant of a second opposite conductivity type in a central portion of the substrate, thereby forming a body region of the transistor;
forming a trench in the central portion of the substrate; and
forming a conductive gate electrode in the trench.

5,597,766

METHOD FOR DETACHING CHIPS FROM A WAFER

Franz Neppl, Ottobrunn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 20, 1994, Ser. No. 246,768
Claims priority, application Germany, May 27, 1993, 43 17 721.2
Int. Cl.[6] H01L *21/301*
U.S. Cl. 437—226 10 Claims



1. Method for detaching chips produced in a silicon layer of an SOI substrate wafer from said wafer, comprising the steps of:
etching trenches between said chips proceeding from a side of said wafer on which said chips are disposed to remove material that carries said chips, said trenches extending down to an insulating layer of said SOI substrate; and
selectively etching said insulating layer, thereby removing same to detach said chips from one another.

5,597,767

SEPARATION OF WAFER INTO DIE WITH WAFER-LEVEL PROCESSING

Michael A. Mignardi, Dallas; Laurinda Ng, Plano; Ronald S. Croff, Allen; Robert McKenna, Houston, and Lawrence D. Dyer, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 6, 1995, Ser. No. 369,838
Int. Cl.[6] H01L *21/302*
U.S. Cl. 437—227 20 Claims



1. A method of separating a wafer into die, comprising the steps of:
covering the top surface of said wafer with a protective coating;
inscribing separation lines on said wafer, said separation lines representing boundaries between die;
removing said protective coating;
processing said wafer with at least one wafer-level process; and
separating said wafer into die along said separation lines.

5,597,768

METHOD OF FORMING A GA_2O_3 DIELECTRIC LAYER

Matthias Passlack, Chandler, and Jonathan K. Abrokwah, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1996, Ser. No. 619,408
Int. Cl.[6] H01L 21/316
U.S. Cl. 437—236 14 Claims

6. A method of forming a dielectric layer on a supporting structure comprising the steps of:

providing a supporting structure of III-V material having a surface to be coated with a dielectric layer; and

depositing a layer of Ga_2O_3, having a sublimation temperature, on the surface of the supporting structure by evaporation using a high purity single crystal of material including Ga_2O_3 and a second oxide with a melting point greater than 700° C. above the sublimation temperature of the Ga_2O_3.

5,597,769

DIELECTRIC CERAMIC COMPOSITION FOR BOUNDARY LAYER CONDENSERS AND A METHOD FOR PREPARING THE SAME

Yoon H. Kim; In-Kyu Yoo, and Jae-Dong Byun, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Apr. 19, 1995, Ser. No. 423,496
Claims priority, application Rep. of Korea, Apr. 20, 1994, 8362/1994
Int. Cl.[6] C04B 35/46; C03C 14/00
U.S. Cl. 501—136 3 Claims

1. A dielectric ceramic composition for boundary layer condensers, having the following empirical formula:

$$Sr_{1-2x}Bi_xTi_{1-y}W_yO_3$$

wherein

x is in a range of 0.0005 to 0.003; and

y is in a range of 0.0015 to 0.009.

5,597,770

TITANIUM-BASED CATALYST COMPOSITION FOR POLYMERIZING ETHYLENE

Yong C. Chee, Seo-ku, Rep. of Korea, assignor to Hanwha Chemical Corporation, Seoul, Rep. of Korea

Continuation of Ser. No. 169,222, Dec. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 889,233, May 28, 1992, abandoned. This application Mar. 21, 1994, Ser. No. 215,414
Claims priority, application Rep. of Korea, May 30, 1991, 91-8944
Int. Cl.[6] C08F 4/654; 4/651; 10/02
U.S. Cl. 502—104 22 Claims

1. A catalyst of formula (I):

$$Mg_cTiCl_eAl_f(R^o)_gX'_h[ED]_iB_jBr_2 \quad (I)$$

wherein R^o is an aliphatic or aromatic hydrocarbon radical containing 1–14 carbon atoms or OR'', wherein R'' is an aliphatic or aromatic hydrocarbon radical containing 1–14 carbon atoms,

ED is an electron donor compound selected from the group consisting of aliphatic or aromatic alkyl esters, aliphatic ethers, cyclic ethers, and aliphatic ketones,

a represents a number from 0.5–56

c represents a number from 2–116,

d is d'+0.33, wherein d' represents a number from greater than zero to 33,

f represents a number from 0–1.5,

e+f equals 3,

h represents a number from 2–85,

i represents a number from 2–20,

j represents a number from greater than zero to 33,

X' is Cl or OR'', wherein R'' is an aliphatic or aromatic hydrocarbon radical containing 1–14 carbon atoms.

5,597,771

LAYERED CATALYST COMPOSITE

Zhicheng Hu, Edison; Chung-Zong Wan, Somerset; Yiu-Kwan Lai, Parlin, and Joseph C. Dettling, Howell, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 83,143, Jun. 25, 1993. This application Jun. 24, 1994, Ser. No. 265,876
Int. Cl.[6] B01J 21/04; 23/02
U.S. Cl. 502—304 84 Claims

1. A layered catalyst composite comprising a first layer and a second layer:

the first layer comprising:

a first support;

at least one first palladium component; and

a first oxygen storage component in intimate contact with the first palladium component; and

the second layer comprising:

a second support; and

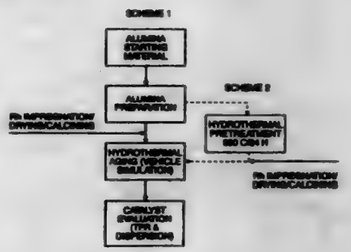
at least one second palladium component free from intimate contact with the oxygen storage component.

5,597,772

THERMALLY STABLE RHODIUM/ALUMINA CATALYSTS

Robert W. McCabe, Lathrup Village; Rengin K. Usmen, Troy, and Harendra S. Gandhi, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 9, 1995, Ser. No. 370,139
Int. Cl.[6] B01J 23/56
U.S. Cl. 502—332 4 Claims



1. A method for making a thermally stable rhodium-containing phase of a catalyst system for treating exhaust gases from an internal combustion engine, which comprises steps of:

providing a substrate,

providing a support material of α-alumina;

subjecting said α-alumina to a steam-air mixture for at least 24 hours at a temperature of at least 950° C. to hydrothermally pre-treat said α-alumina, and

impregnating said α-alumina support material with rhodium.

5,597,773

ETHYLENE OXIDE CATALYST AND PROCESS

Wayne E. Evans, Richmond, Tex., and Carolus M. A. M. Mesters, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 176,844, Dec. 30, 1993, Pat. No. 5,418,202. This application Dec. 29, 1994, Ser. No. 366,069
Int. Cl.[6] B01J 21/06; 23/04; 23/50
U.S. Cl. 502—348 25 Claims

1. A catalyst comprising a porous refractory support having deposited thereon a catalytically effective amount of silver, a promoting amount of alkali metal, a promoting amount of rhenium, and a promoting amount of Group IVB metal applied to the support in the form of oxycation-containing compound(s), wherein said Group IVB metal is selected from the group consisting of titanium, zirconium, and hafnium.

5,597,774

IMAGE RECEIVING SHEET FOR SUBLIMATION TRANSFER

Hiroyuki Uemura, Mishima, and Chiharu Nogawa, Shizuoka-ken, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,093
Claims priority, application Japan, Dec. 21, 1993, 5-322751
Int. Cl.[6] B41M 5/035; 5/38
U.S. Cl. 503—227 19 Claims

1. An image receiving sheet for sublimation transfer, comprising

a) a substrate; and

b) a dye receiving layer, comprising

i) a dye receiving resin;

ii) an unmodified silicone oil; and

ii) a modified silicone oil, wherein

said unmodified silicone oil is methyl phenyl silicone oil, and said modified silicone oil is an alcohol modified silicone oil;

said unmodified silicone oil is dimethyl silicone oil, and said modified silicone oil is modified with a modifier selected from the group consisting of epoxy and carboxyl compounds; or

said unmodified silicone oil is methyl hydrogen silicone oil, and said modified silicone oil is modified with a modifier selected from the group consisting of alcohol, epoxy, and carboxyl compounds.

18. A thermal transfer recording process comprising the steps of:

superimposing a thermal sublimating transfer recording medium comprising a sublimating dye on the receiving sheet as claimed in claim 1; and

applying heat imagewise to said transfer recording medium so as to imagewise transfer said sublimating dye from said recording medium to said receiving sheet by a heat application recording means as said recording medium and said receiving sheet are moved at an equal speed.

5,597,775

DYE-RECEIVER SUBBING LAYER FOR THERMAL DYE TRANSFER

Thomas W. Martin, Rochester, and Ronald S. King, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 16, 1996, Ser. No. 586,568
Int. Cl.[6] B41M 5/035; 5/38
U.S. Cl. 503—227 20 Claims

13. A process of forming a dye transfer image comprising:

I) imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a binder, and

II) transferring a dye image to a dye-receiving element comprising a support having thereon a dye image-receiving layer to form said dye transfer image,

wherein said receiving element comprises a polyolefin-coated support or a polyolefin support having thereon, in order, a subbing layer and a dye image-receiving layer, wherein said subbing layer comprises a colored reaction product of a mixture of

a) an aminofunctional organo-oxysilane, and

b) a hydrophobic organo-oxysilane;

said subbing layer also containing a mixture of brown and black colorants, said brown colorant being present in an amount of about 0.0007 to about 0.015 g/m^2 and said black colorant being present in an amount of about 0.004 to about 0.007 g/m^2, and the ratio of black to brown colorant being about 3.5:1 to 6.5:1; and said subbing layer also containing at least 0.2 wt. % of a water-soluble, cellulose derivative.

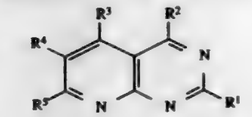
5,597,776

SUBSTITUTED PYRIDO{2, 3-DIPYRIMIDINES AS ANTIDOTES FOR HERBICIDAL CYCLOHEXENONES

Matthias Bratz, Speyer; Reiner Kober, Frankenthal; Rainer Seele, Ellerstadt; Thomas Saupe, Sandhausen; Norbert Meyer, Ladenburg; Nigel Walker, Dannenheim; Andreas Landes, Limburgerhof, and Helmut Walter, Obrigheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 946,516, Sep. 16, 1992, abandoned. This application Apr. 10, 1995, Ser. No. 419,518
Claims priority, application Germany, Sep. 18, 1991, 41 31 029.2
Int. Cl.[6] A01N 25/32; 39/04; 43/90; C07D 471/02
U.S. Cl. 504—105 9 Claims

1. A herbicidal composition containing at least one substituted pyrido[2,3-d]pyrimidine of the formula I as safener



I

where

R^1 and R^2 are each hydrogen; C_1–C_8-alkyl; C_1–C_8 -haloalkyl; C_1–C_6-alkoxy; C_1–C_6-haloalkoxy; C_1–C_4 -alkoxy-C_1–C_6-alkyl; C_1–C_8-alkylamino; C_2–C_8-alkenyl; C_2–C_8-alkynyl; C_3–C_8-cycloalkyl with which a benzene radical may be fused, where this group may furthermore carry from one to three of the following radicals: hydroxyl, halogen, C_1–C_4-alkyl, C_1–C_4 -haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1–C_4 -alkylthio;

phenyl, naphthyl, phenyl-C_1–C_6-alkyl, a 5-membered aromatic ring which, in addition to carbon atoms, may contain from one to three nitrogen atoms and one oxygen or one sulfur atom as hetero atoms or which, in addition to carbon atoms, may contain from one to three nitrogen atoms or one oxygen or one sulfur atom as heteroatoms, a 6-membered aromatic ring which, in addition to carbon atoms, may contain from one to three nitrogen atoms as heteroatoms, where a benzene ring may be fused with the abovementioned 5-membered and 6-membered heteroaromatics and where the aromatic and heteroaromatic radicals may additionally carry from one to three of the following groups: nitro, cyano, halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1– C_4-alkoxycarbonyl, C_1–C_6-alkylthio, C_3–C_6-alkenyl and C_3–C_6-alkynyl;

R^3 is hydroxyl; amino; halogen; C_1–C_6-alkythio; di-C_1–C_6-alkylamino; C_3–C_8-cycloalkylamino; C_1–C_8-alkoxycarbonyl or one of the groups stated for R^1;

R^4 is one of the groups stated for R^1;

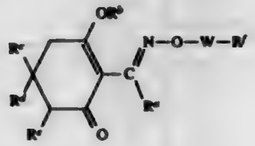
CN; NO_2; COOH; CSOH; Di-C_1–C_4-alkylamino-C_1–C_4-alkyl; SO_2—R^6; C(=X)—R^7; C(=Y)—R^8 or R ^{7}—C(YR^9)—ZR^{10};

R^6 is one of the groups stated for R^1;

hydroxyl; amino; di-C_1–C_8-alkylamino; C_3–C_8 -cycloalkylamino; C_1–C_6-alkylthio;

R^7 amino; hydroxyamino (—NH—OH); C_1–C_8-alkylamino; di-C_1–C_8-alkylamino; C_3–C_8-cycloalkylamino; C_1–C_8-alkoxy; C_1–C_6-alkylthio; phenylamino;

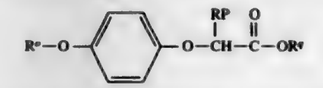
R^8 is one of the groups stated for R^1;
R^9 and R^{10} are each C_1–C_6-alkyl; C_1–C_6-haloalkyl; C_1–C_4-alkoxy-C_2–C_6-alkyl or C_2–C_6-alkenyl, or
R^9 and R^{10} together form —CH_2CH_2—, —$CH_2CH_2CH_2$— or —$CH_2CH_2CH_2CH_2$—, where one or two hydrogen atoms in these groups may be replaced by the following radicals: =O, C_1–C_6-alkyl, C_1–C_6-haloalkyl or C_1–C_6-alkoxy;
X is oxygen, sulfur or NR^{11}, where
R^{11} is one of the groups stated for R^1 or has the following meanings:
hydrogen; hydroxyl; amino; di-C_1–C_6-alkylamino; C_3–C_6-cycloalkylamino;
phenoxy, naphthyloxy, phenylamino or naphthylamino, where the aromatic radicals may carry from one to three of the following groups: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkoxycarbonyl, C_1–C_6-alkylthio, C_3–C_6 -alkenyl and C_3–C_6-alkynyl; and
Y is oxygen or sulfur;
R^5 is one of the groups stated for R^1;
hydroxyl; amino; halogen; C_1–C_6-alkylthio; di-C_1–C_6-alkylamino; C_3–C_6-cycloalkylamino; pyrrolidin-1-yl; piperidin-1-yl; morpholin-1-yl; C_1–C_6-alkylcarbonyloxy; C_1–C_6-haloalkylcarbonyloxy; C_1–C_6-alkylsulfonyloxy; C_1–C_6-haloalkylsulfonyloxy;
phenoxy, naphthyloxy, phenylamino, naphthylamino, benzyloxy, benzylamino, benzoyloxy, 2-naphthoyloxy or phenylsulfonyloxy, where the aromatic radicals may carry from one to three of the following groups: halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl and C_1–C_6-alkoxy;
$N(R^{12})$—SO_2—R^{13}; $N(R^{12})$—CO—R^{14}; $N(R^{12})$—CS—R^{14};
R^{12} is hydrogen; C_1–C_6-alkyl;
phenyl, which may carry from one to three of the following radicals: halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl and C_1–C_6-alkoxy;
R^{13} is one of the groups stated for R^1;
amino, di-C_1–C_6-alkylamino or C_3–C_6 -cycloalkylamino;
R^{14} is one of the groups stated for R^1;
amino; hydroxyamino (—NH—OH); di-C_1–C_6 -alkylamino or C_3–C_6-cycloalkylamino,
and the plant-tolerated salts of those compounds I in which at least one of the substituents R^1 to R^5 is an acidic or basic group,
and at least one herbicidal active ingredient selected from
A) the group consisting of the cyclohexenone derivatives of the formula II



II

where
R^a is C_1–C_6-alkyl;
R^b is hydrogen;
one equivalent of an agriculturally useful cation;
C_1–C_6-alkylcarbonyl; C_1–C_{10}-alkylsulfonyl; C_1–C_{10} -alkylphosphonyl;
benzoyl, benzenesulfonyl or benzenephosphonyl, where the aromatic rings may carry from 1 to 5 halogen atoms;
R^c is hydrogen; CN; CHO;
C_1–C_6-alkyl which may carry one of the following radicals: C_1–C_6-alkoxy, C_1–C_6-alkylthio, phenoxy, phenylthio, pyridyloxy or pyridylthio, where the aromatic radicals in turn may carry from one to three of the following groups: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_3–C_6-alkenyl, C_3–C_6-alkenyloxy, C_3–C_6-alkynyl, C_3–C_6-alkynyloxy or NR^gR^h;
R^d is hydrogen; C_1–C_6-alkyl; C_3–C_6-alkenyl; C_3–C_6 -alkynyl; C_1–C_6-alkylcarbonyl;
benzoyl which may carry from one to three of the following radicals: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy and C_1–C_6-alkylthio;
R^e is hydrogen; C_1–C_6-alkyl; C_3–C_6-alkenyl; C_3–C_6 -alkynyl;
R^c is furthermore
C_3–C_7-cycloalkyl or C_3–C_7-cycloalkenyl, where these rings may carry from one to three of the following radicals: hydroxyl, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-alkylthio, benzylthio, C_1–C_6-alkylsulfonyl, C_1–C_6-alkylsulfenyl and C_1–C_6-alkylsulfinyl;
a 5-membered saturated ring which, in addition to carbon ring members, contains one or two oxygen or sulfur atoms or one oxygen and one sulfur atom and may carry from one to three of the following radicals: C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy and C_1–C_6-alkylthio;
a 6- or 7-membered saturated or monounsaturated or diunsaturated ring which, in addition to carbon ring members, contains one or two oxygen or sulfur atoms or one oxygen and one sulfur atom and may carry from one to three of the following radicals: hydroxyl, halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl, C_1–C_6-alkoxy and C_1–C_6-alkylthio;
a 5-membered aromatic ring which, in addition to carbon ring members, contains one or two nitrogen atoms and one oxygen or sulfur atom or from one to three nitrogen atoms or one oxygen or one sulfur atom and may carry from one to three of the following radicals: cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_2–C_6-alkenyl, C_2–C_6-alkenyloxy, C_2–C_6-alkynyl, C_2–C_6-alkynyloxy and C_1–C_4-alkoxy-C_1–C_4-alkyl;
phenyl or pyridyl, where these rings may carry from one to three of the following radicals: nitro, formyl, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6-alkylthio, C_2–C_6-alkenyl, C_2–C_6-alkenyloxy, C_2–C_6-alkynyl, C_2–C_6-alkynyloxy and NR^kR^l;
R^f is hydrogen; C_1–C_6-alkyl; C_2–C_6-alkenyl; C_3–C_6 -alkynyl;
R^g is hydrogen: C_1–C_6-alkyl; C_3–C_6-alkenyl; C_3–C_6 -alkynyl; C_1–C_6-alkylcarbonyl;
benzoyl, which may carry from one to three of the following radicals: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy and C_1–C_6-alkylthio;
R^h is hydrogen, hydroxyl or, if R^c is C_1–C_6-alkyl, also C_1–C_6-alkyl;
R^i is hydrogen; cyano; halogen; C_1–C_6-alkoxycarbonyl; C_1–C_6-alkylthiocarbonyl;
W is C_1–C_6-alkylene, C_3–C_6-alkenylene or alkynylene, where these groups may carry a methylene group (=C_2) and/or from one to three of the following radicals: halogen and C_1–C_3-alkyl;
C_3–C_6-alkylene or C_3–C_6-alkenylene, in each of which radicals a methylene group is replaced with oxygen, sulfur, SO, SO_2 or NR^i and from one to three hydrogen atoms may be replaced with C_1–C_3-alkyl radicals;
R^i is hydrogen; C_1–C_4-alkyl; C_3–C_6-alkenyl; C_3–C_6-alkynyl; and
R^j is hydrogen; CH=C—Z^1, where
Z^1 is hydrogen; cyano; carboxyl; halogen; C_1–C_4-alkyl; C_1–C_4-haloalkyl; C_1–C_6-alkoxy; C_1–C_6-alkoxycarbonyl; benzyloxycarbonyl;
C_3–C_6-cycloalkyl which in turn may carry from one to three of the following radicals: hydroxyl, halogen, C_1–C_4-alkyl, C_1–C_6-haloalkyl and C_1–C_6-alkoxy;
phenyl, halophenyl, dihalophenyl, thienyl or pyridyl, where these radicals may carry from one to three of the following groups: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy, C_1–C_6-haloalkoxy, C_1–C_6alkylthio or C_3–C_6-cycloalkyl, where the cyclic radical in turn may furthermore carry from one to three of the following groups: halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl and C_1–C_6-alkoxy;
R^j is furthermore
Ethynyl, which may carry one of the following radicals: C_1–C_6-alkyl, or C_3–C_6-cycloalkyl, where these groups may furthermore carry from one to three of the following radicals: hydroxyl, halogen, C_1–C_6-alkyl, C_1–C_4-haloalkyl and C_1–C_6-alkoxy;

ethynyl which carries one of the following radicals: phenyl, thienyl or pyridyl, where the aromatic radicals may carry from one to three of the following groups: nitro, cyano, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkoxy and C_1– C_4-alkylthio;
phenyl, a 5-membered aromatic ring which, in addition to carbon members, contains one or two nitrogen atoms and one oxygen or sulfur atom or from one to three nitrogen atoms or one oxygen or one sulfur atom, or a 6-membered aromatic ring which, in addition to carbon ring members, contains from one to four nitrogen atoms, where these aromatic and heteroaromatic groups may carry from one to three of the following radicals: nitro, C_1–C_4-alkoxy, C_1–C_4 -haloalkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkylthio or the radicals stated for Z^1 and NR^kR^l where R^k and R^l have the abovementioned meanings; or
B) the group consisting of the 2-(4-hetaryloxy)- or 2-(4-aryloxy)-phenoxycarboxylic acid derivatives of the formula III



III

where
R^o is phenyl, pyridyl, benzoxazolyl, benzothiazolyl or benzopyrazinyl, where these aromatic and heteroaromatic ring systems may carry one or two of the following radicals: nitro, halogen, C_1–C_4-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_1–C_4 -haloalkoxy and C_1–C_4-alkylthio;
R^p is hydrogen or methyl;
R^q is hydrogen; C_1–C_4-alkyl; C_3–C_4-alkenyl; C_3–C_4 -alkynyl; C_1–C_4-alkoxy-C_1–C_4-alkyl; C_3–C_4 -alkylideneiminoxy-C_2–C_3-alkyl; tetrahydrofuranylmethyl; isoxazolidinyl;
or one equivalent of an agriculturally useful cation.

5,597,777

OXYFLUORFEN DISPERSIBLE GRANULE FORMULATION

Christine M. Cayer, Wyncote; Vincent A. Musco, Southampton, and Robert F. Peterson, Jr., New Hope, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 667,136, Mar. 11, 1991, abandoned. This application Jun. 10, 1994, Ser. No. 263,118
Int. Cl.[6] A01N 25/32;31/14
U.S. Cl. 504—116 21 Claims

1. A dispersible oxyfluorfen granule comprising: from about 10 percent to about 90 percent by weight oxyfluorfen, the oxyfluofen particles having an initial diameter of from about 3 microns to about 15 microns; from 90 percent to 10 percent by weight of at least one material selected from the group consisting of dispersants, wetting agents, disintegrants, flow aids and defoaming agents; and optionally from about 0.1 percent to about 25 percent by weight of one or more surfactants;
said oxyfluorfen granule having a particle size of at least 0.1 mm and a suspensibility of at least 70 percent and providing a reduction of at least 30 percent in vapor injury to desirable plants as compared to conventional oxyfluorfen formulations.

5,597,778

HERBICIDAL COMPOSITIONS CONTAINING DMSO

Bernard Smale, 2640 SW. Talbot Rd., Portland, Oreg. 97201

Continuation-in-part of Ser. No. 300,267, Sep. 2, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 475,987
Int. Cl.[6] A01N 57/04;31/02
U.S. Cl. 504—127 18 Claims

1. A composition of matter comprising at least one post-emergent herbicide, an agriculturally acceptable carrier and dimethyl sulfoxide wherein the dimethyl sulfoxide accounts for 1% to 2.5% of the total volume of said composition and the post-emergent herbicide is present at a concentration of from 25% to 75% less than the commercially recommended concentration formulation without DMSO.

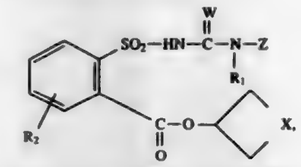
5,597,779

SULFONYLUREAS

Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

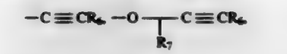
Continuation of Ser. No. 373,713, Jan. 17, 1995, abandoned, which is a division of Ser. No. 154,768, Nov. 19, 1993, Pat. No. 5,412,107, which is a division of Ser. No. 14,947, Feb. 8, 1993, Pat. No. 5,286,709, which is a division of Ser. No. 823,515, Jan. 21, 1992, Pat. No. 5,209,771. This application Apr. 10, 1995, Ser. No. 419,307
Claims priority, application Switzerland, Jan. 25, 1991, 220/91
Int. Cl.[6] C07D 239/69;405/12;409/12; A01N 43/54
U.S. Cl. 504—215 17 Claims

1. A compound of formula I

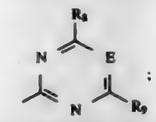


(I)

in which X is oxygen, sulfur, SO or SO_2; W is oxygen or sulfur; R_1 is hydrogen or methyl; R_2 is hydrogen, fluorine, chlorine, bromine, iodine, $(X)_nR_3$, NO_2, NR_4R_5,



or cyano; n is the number 0 or 1; R_3 is C_1–C_4alkyl or C_1–C_4alkyl which is substituted by 1–4 halogen atoms, C_1–C_3alkoxy or C_1–C_3alkylthio; or C_2–C_4alkenyl or C_2–C_4alkenyl which is substituted by 1–4 halogen atoms; R_4 is hydrogen, CH_2O, CH_2CH_2O or C_1–C_3alkyl; R_5 is hydrogen or C_1–C_3alkyl; R_6 is hydrogen, methyl or ethyl; R_7 is hydrogen or methyl; Z is



Z1

E is methine; R_8 is C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_3haloalkoxy, C_1–C_4haloalkyl, C_1–C_4haloalkylthio, C_1–C_4alkylthio, halogen, C_2–C_3alkoxyalkyl, C_2–C_3alkoxyalkoxy, amino, C_1–C_3alkylamino or di(C_1–C_3alkyl)amino; R_9 is C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4haloalkylthio, C_1–C_4alkylthio, C_2–C_3alkoxyalkyl, C_2–C_3alkoxyalkoxy, C_2–C_3alkylthioalkyl or cyclopropyl; or a salt thereof.

5,597,780

LOW VOLATILITY FORMULATIONS OF MICROENCAPSULATED CLOMAZONE

Fui-Tzeng H. Lee, Princeton, and Paul Nicholson, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 340,699, Nov. 16, 1994, abandoned. This application Sep. 21, 1995, Ser. No. 531,699
Int. Cl.[6] A01N 25/28;43/80
U.S. Cl. 504—271 14 Claims

1. A process for the preparation of herbicidally effective formulations of clomazone having a volatility less than fifty percent of the volatility of an emusifiable concentrate of clomazone contain-

ing four pounds of clomazone per gallon of formulation which comprises microencapsulating the clomazone by interfacial polymerization by the steps of:

a) providing an aqueous phase containing 0.3 to 3.0 wt. % of one or more emulsifiers; optionally 0.02 to 0.20 wt. % of a xanthan gum viscosity modifier/stabilizer, and 0.1 to 1.0 wt. % of an antifoam agent;

b) providing a water immiscible phase consisting of clomazone, polymethylene polyphenyl isocyanate (PMPPI), and a hydrocarbon solvent; the weight ratio of clomazone to PMPPI being in the range of 1:1 to 6:1;

c) emulsifying the water immiscible phase in the aqueous phase, forming a dispersion of water immiscible droplets throughout the aqueous phase;

d) agitating the dispersion while adding thereto an aqueous solution of 15 to 100 weight percent of at least one polyfunctional amine selected from ethylenediamine (EDA), diethylitriamine (DETA), triethylenetetramine (TETA), and 1,6-hexanediamine (HDA), with the proviso that (EDA) is used only in a mixture, the weight ratio of polyfunctional amine to PMPPI being in the range of 0.1:1 to 1:1, thus forming microcapsules having a polyurea shell wall around the water immiscible droplets;

e) curing the microcapsules by continuing the agitation while heating the dispersion at a temperature in the range of 35° to 60° C. for a period of 3 to 10 hours to produce a formulation in which the average size of the microcapsules is in the range of 5 to 50 microns;

f) optionally adjusting the pH to between 6.5 and 9.0.

5,597,781

R-TL-SR-CA-CU-O SUPERCONDUCTORS AND PROCESSES FOR MAKING SAME

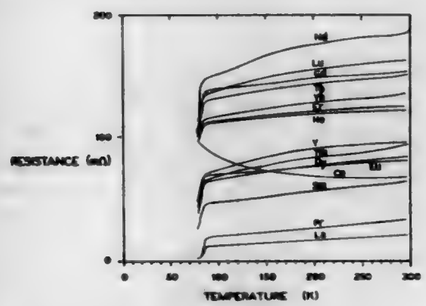
Zhengzhi Sheng, and Allen M. Hermann, both of Fayetteville, Ark., assignors to University of Arkansas, Little Rock, Ark.

Continuation of Ser. No. 251,348, Sep. 29, 1988, Pat. No. 5,036,044. This application Feb. 15, 1990, Ser. No. 480,258

The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.

Int. Cl.[6] H01B *12/00*; H01L *39/12*

U.S. Cl. 505—120 **4 Claims**



1. A composition having superconductive properties the composition comprising a melt produced complex having the nominal formula:

RTlSrCaCuO;

wherein R is chosen from the group consisting of La, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and Y; and

wherein the atomic molar ratio of R:Tl:Sr:Ca:Cu is 1:2:2:2:3.

5,597,782

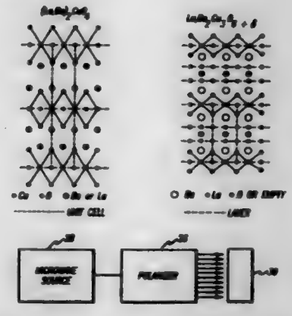
METHOD FOR MICROWAVE PROCESSING OF HIGH TEMPERATURE SUPERCONDUCTORS

David L. Henty, c/o Spensley Horn Jubas & Lubitz, Suite 730, 650 Town Center Dr., Costa Mesa, Calif. 92626

Continuation of Ser. No. 532,180, Jun. 4, 1990, Pat. No. 5,380,702, which is a continuation-in-part of Ser. No. 74,896, Jul. 17, 1987, abandoned. This application Jan. 9, 1995, Ser. No. 370,302

Int. Cl.[6] H01B *12/00*; H01L *39/12*; B29C *35/08*; C01B *13/14*

U.S. Cl. 505—480 **3 Claims**



1. A method for preparing a high temperature ceramic superconductor material, comprising the steps:

mixing together powders of the constituent compounds in desired cation ratios, the constituent compounds including Cu and O;

heating said mixture by application of microwave energy to thereby heat said mixture to a processing temperature sufficient to form a superconducting ceramic material; and

cooling the compound from said processing temperature.

5,597,783

DRILLING PROCESSES AND FLUID USED IN WELL DRILLING APPLICATIONS

Annie Audibert, Le Vesinet; Jean-François Argillier, Suresnes; Jacqueline Lecourtier, Rueil Malmaison, all of France; Louise Bailey, Comberton Cambridge, and Paul L Reid, Cambridgeshire, both of Great Britain, assignors to Institut Francais du Petrole, Rueil Malmaison, France, and Dowell Schlumberger, Inc., Sugarland, Tex.

Filed May 4, 1995, Ser. No. 433,958

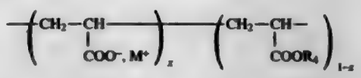
Claims priority, application France, May 4, 1994, 94 05488

Int. Cl.[6] C08L *33/08*; C09K *7/02*

U.S. Cl. 507—120 **24 Claims**

1. A fluid suitable for use in a well drilled through at least one permeable geologic formation, comprising in aqueous solution an effective amount of:

a) a water soluble polymer called Hb1 having a -(Hb)-(Hy)-type structure with a statistical distribution, said structure resulting from the radical polymerization of an C_1–C_{30} acrylate/alkylacrylate copolymer corresponding to the following formula:



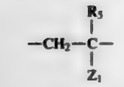
where x ranges between 0.4 and 0.8, where M is H or Na or K or any other monovalent ion R_4 is C_1–C_{30} alkyl, aryl or alkyl-aryl radical, and where the length of the hydrophobic units R_4 is selected as a function of the molecular mass of said polymer according to the following rules:

for a polymer having a molecular mass less than about 10^5 daltons, R_4 contains at least two carbon atoms,

for a polymer having a molecular mass ranging between about 10^5 and 2.5 10^6 daltons, R_4 contains at least four carbon atoms,

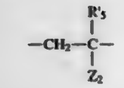
b) a water soluble polymer called HM PAM, resulting from the polymerization of hydrophilic units with a hydrophobic unit, the hydrophilic unit includes:

acrylamide according to the following formula:



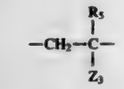
where R_5 is H or CH_3, and Z_1 is $CONH_2$,

and optionally acrylic acid, acrylate or sulfonate comonomers according to the following formula:



where R'_5 is H or CH_3, and Z_2 is COOH or COO—, M^+ or $CONHR_1SO_3$—, M^+; R_1 is H or a C_1–C_{30} alkyl, aryl or alkyl-aryl radical,

said hydrophobic unit having the general formula as follows:



where R_5 is H or CH_3, and Z_3 is $COOR_7$, $COOR_2$, $CONR_1R_2$, or $CONR_1R_7$, R_7 being a nonionic surfactant and R_2 a C_1–C_{30} alkyl, aryl or alkyl-aryl radical, R_1 is H or a C_1–C_{30} alkyl, aryl or alkyl-aryl radical,

c) a hydrophobically modified cellulose derivative,

d) a polysaccharide type polymer having a double or triple helical rigid or semirigid molecular structure.

5,597,784

COMPOSITE AND REINFORCED COATINGS ON PROPPANTS AND PARTICLES

A. Richard Sinclair, and Richard L. Johnson, II, both of Houston, Tex., assignors to Santrol, Inc., Houston, Tex.

Division of Ser. No. 69,929, Jun. 1, 1993, Pat. No. 5,422,183. This application Jun. 6, 1995, Ser. No. 465,823

Int. Cl.[6] C09K *7/00*

U.S. Cl. 507—219 **1 Claim**

1. A method of propping a fracture in a subterranean formation comprising:

creating a fracture in said subterranean formation;

placing in said fracture a quantity of high strength free flowing particles comprising:

a particulate substrate;

an inner coating of a substantially cured resin covering said substrate;

an outer coating of resin covering said inner coating; and

a reinforcing agent interspersed at the inner coating/outer coating boundary.

5,597,785

SUCCINIMIDE DERIVATIVES OF 2,5-DIMERCAPTO-1,3,4-THIADIAZOLE

Thomas J. Karol, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

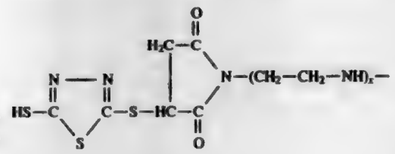
Continuation-in-part of Ser. No. 189,260, Jan. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 770,000, Oct. 2, 1991, abandoned. This application Jun. 26, 1995, Ser. No. 494,828

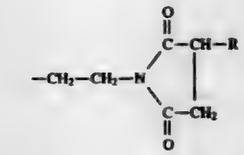
The portion of the term of this patent subsequent to Apr. 22, 2011, has been disclaimed.

Int. Cl.[6] C10M *141/06;141/08*; C07D *285/14*

U.S. Cl. 508—274 **4 Claims**

3. An automotive gasoline engine lubricating composition comprising a major portion of natural or synthetic oil of lubricating viscosity and a minor antiwear and oxidation inhibiting amount of a compound selected from the group consisting of compounds having the structural formula





wherein x=0 to 4, and R represents an alkenyl radical having from 8 to 400 carbon atoms.

5,597,786

LUBRICANT FOR PLASTIC WORKING

Hunaltaka Itoh, Sabae; Toru Makino, Fukui; Masayasu Katoh, Katsuyama, and Toshio Gensho, Fukui, all of Japan, assignors to Nicca Chemical Co., Ltd., Fukui, Japan

Filed May 30, 1995, Ser. No. 453,138

Claims priority, application Japan, May 31, 1994, 6-118652; Feb. 2, 1995, 7-016176

Int. Cl.[6] C10M *173/02;129/34*

U.S. Cl. 508—506 **12 Claims**

1. A lubricant for plastic working which contains 0.01–40 wt % of an alkali metal salt of an alicyclic polyvalent carboxylic acid, 0.01–40 wt % of a thermosetting resin powder with an average particle size of 0.1–20 μm, 0.01–20 wt % of a water-soluble polymeric compound, and the remainder water.

5,597,787

LEAD PAINT REMOVAL

Irvin Barnett, P.O. Box 27209, San Diego, Calif. 92198-1209

Filed Nov. 15, 1993, Ser. No. 151,952

Int. Cl.[6] C09D *9/00*; C11D *7/06;7/50;7/60*

U.S. Cl. 510—203 **2 Claims**

1. An aqueous solution for the removal of oil-based paints, including those containing lead compounds, from a substrate, comprising:

a) a solvent that does not dissolve said paint, and is compatible with water, said solvent being ethylene glycol monobutyl ether present in an amount of 50.6 percent by weight;

b) a film former for retarding evaporation, said film former being a thermoplastic resin comprising an all-acrylic polymer

or copolymer, in emulsion form having 50 percent solids, said emulsion being present in an amount of 11.6 percent by weight;

e) a viscosity builder to fortify said solution and prevent slumping thereof during application to vertical and overhead horizontal surfaces, said viscosity builder being a plastic clay composed of bentonite and being present in an amount of 18.1 percent by weight; and

d) an alkaline compound for reacting with the pigment portion of said paint, said alkaline compound being a sodium hydroxide solution having 10 percent solids, said sodium hydroxide solution being present in an amount of 19.7 percent by weight, whereby said solution penetrates said paint and causes its separation from said substrate.

5,597,788

PAINT STRIPPING COMPOSITIONS AND METHODS

Edwin Stevens, 30 Brookside Rd., West Orange, N.J. 07052

Division of Ser. No. 227,789, Apr. 14, 1994, Pat. No. 5,427,710, which is a continuation-in-part of Ser. No. 48,466, Apr. 14, 1993, Pat. No. 5,425,893. This application Jun. 19, 1995, Ser. No. 492,167

Int. Cl.[6] C09D 9/00

U.S. Cl. 510—212 **20 Claims**

1. A composition for use in removing polymeric coatings from flexible and inflexible surfaces consisting essentially of:

a) about 10% to about 40% by weight of a conjugated terpene selected from the group consisting of alpha-terpinene, tagetone, terpinolene, isoterpinolene, allo-ocimene, myrcene, ocimenone and mixtures thereof;

b) about 5% to about 60% by weight of benzyl alcobol;

c) 0% to about 70% by weight of a terpene compound other than a conjugated terpene selected from the group consisting of alpha-terpinene, tagetone, terpinolene, isoterpinolene, allo-ocimene, myrcene, ocimenone and mixtures thereof;

d) 0% to about 20% by weight of a surfactant; and

e) about 0.05% to about 60% by weight of a rheological additive;

f) about 2% to about 70% by weight a solvent selected from the group consisting of N-methylpyrrolidone, ethylene carbonate, propylene carbonate, butylene carbonate and mixtures, thereof; and

g) an amine selected from the group consisting of aminomethylpropanol, methylamine, dimethylamine, trimethylamine, ethylamine, diethylamine, triethylamine, propylamine, dipropylamine, tripropylamine, ethanolamine, triethanolamine and mixtures, thereof.

5,597,789

LIQUID OR GRANULAR AUTOMATIC DISHWASHING DETERGENT COMPOSITIONS CONTAINING SILICATE AND LOW MOLECULAR WEIGHT MODIFIED POLYACRYLATE COPLOYMERS

Eugene S. Sadlowski, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 344,400, Nov. 23, 1994, abandoned, which is a continuation of Ser. No. 172,630, Dec. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 53,619, Apr. 27, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 469,740

Int. Cl.[6] C11D 3/37;3/36;7/14;7/36

U.S. Cl. 510—230 **14 Claims**

1. An automatic dishwashing detergent composition comprising by weight:

a) from about 0.01% to about 40% alkali metal silicate;

b) from about 0.1% to about 10% polyacrylate copolymer having a molecular weight of from about 1,000 to about 5,000 which contains monomer units;

(i) from about 10% to 90% of; by weight of said copolymer, of a monomer which is acrylic acid or its salt; and

(ii) from about 10% to 90% by weight of a comonomer which is a substituted acrylic acid or salt of the formula



wherein R_1 and R_2 are each H, C_{1-4} alkyl or hydroxyalkyl with at least one of R_1 and R_2 being C_{1-4} alkyl or hydroxyalkyl and wherein R_3 is H, C_{1-4} alkyl or hydroxyalkyl or alkali metal; and

c) from about 15% to about 90% of a detergency builder selected from the group consisting of water-soluble, alkali metal, ammonium or substituted ammonium phosphates, polyphosphates, citrates, and mixtures thereof;

d) optionally about 5% to about 40% detergency builder selected from the group consisting of water-soluble, alkali metal, ammonium or substituted ammonium carbonates, bicarbonates, and mixtures thereof; and

e) optionally about 0.2% to about 5% detergency builder selected from the group consisting of water-soluble, alkali metal, ammonium or substituted ammonium phosphonates, polyphosphonates, and mixtures thereof.

5,597,790

LIQUID DETERGENT COMPOSITIONS CONTAINING A SUSPENDED PEROXYGEN BLEACH

Christiaan A. J. K. Thoen, Haasdonk, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 39,074, Apr. 8, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,653

Claims priority, application European Pat. Off., Oct. 22, 1990, 90870197

Int. Cl.[6] C11D 3/39;3/08

U.S. Cl. 510—303 **11 Claims**

1. A stable liquid detergent composition having a pH of at least 8 and less than about 11 and comprising from about 5% to about 50% by weight of a solid, water-soluble peroxygen compound selected from perborates and percarbonates wherein said water-soluble peroxygen compound is suspended in a liquid phase containing water and at least one water-miscible organic solvent, the amount of the solid water-soluble peroxygen compound and the ratio of water to organic solvent being such that the amount of available oxygen provided in solution by said peroxygen compound is from 0.5% to 3%, said compositions also containing from 1% to 3% by weight of a silicate suspending agent of said peroxygen compound and wherein said water-soluble peroxygen compound is in the form of solid particles having a weight average particle diameter ranging from 0.5 to 20 microns.

5,597,791

STABLE PERACID SOLS, GELS AND SOLIDS

Joseph C. Richards, Cranbury; William A. Hills, Lawrenceville, both of N.J., and William C. Snow, Rockland, Me., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 13, 1994, Ser. No. 322,635

Int. Cl.[6] C11D 3/22;3/39;3/395;7/38

U.S. Cl. 510—372 **15 Claims**

1. An aqueous colloidal peroxygen composition consisting essentially of a sufficient amount to provide up to about 5% by weight of a water-soluble C2 to C6 unreacted peroxycarboxylic acid with a sufficient amount of a polysaccararide gum selected from the group consisting of konjac gum, locust bean gum and carrageenan gum to form viscous solutions, gels and solids thereof, and optionally containing a gel-assisting cross-linking agent.

5,597,792

HIGH WATER CONTENT, LOW VISCOSITY, OIL CONTINUOUS MICROEMULSIONS AND EMULSIONS, AND THEIR USE IN CLEANING APPLICATIONS

John Kller, Midland; Gary M. Strandburg, Mount Pleasant, and Christopher J. Tucker, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 42,366, Apr. 2, 1993, abandoned. This application Aug. 10, 1994, Ser. No. 288,419

Int. Cl.[6] C11D 17/00;3/43;3/60; C23G 5/06

U.S. Cl. 510—417 **25 Claims**

1. A single phase oil continuous microemulsion useful as a liquid cleaning composition, comprising:

A. water in an amount greater than 40 percent by weight and less than 75 percent by weight based on the total weight of the microemulsion;

B. an organic solvent or a mixture of two or more organic solvents, wherein the organic solvent or mixture of organic solvents are characterized as containing no more than 2 weight percent water at 25° C. when the organic solvent is saturated with water in the absence of surfactants or other additives, and wherein the organic solvent or the mixture of two or more organic solvents are in an amount greater than 10 percent and less than 60 percent by weight based on the total weight of the microemulsion;

C. one or more ionic surfactants which are soluble in the one or more organic solvents, wherein the one or more ionic surfactants have an average molecular weight in the range from 350 to 700 exclusive of a counterion, and wherein the one or more ionic surfactants are present in a total amount greater than 0.1 percent and less than 10 percent by weight based on the total weight of the microemulsion;

the microemulsion characterized as being an oil continuous microemulsion having an electrical conductivity of less than Z (microSiemens/centimeter) when measured at 25° C. and a viscosity less than 20 centistokes as measured at 25° C., wherein Z is represented by the following formula: $Z=(\frac{1}{2})(\Phi_w)^2\Sigma_i A_i m_i$, wherein Φ_w represents the volume fraction of water in the microemulsion, i represents any given electrolyte which is present in the microemulsion, A_i represents the molar conductivity of electrolyte i and m_i represents the molarity of electrolyte i in the aqueous phase.

5,597,793

ADHERENT FOAM CLEANING COMPOSITIONS

Michael Besse, Golden Valley; Timothy Gutzmann, Eagan; Roger Keppers, St. Paul, and Richard Ruhr, Buffalo, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 69,601, Jun. 1, 1993, abandoned. This application Nov. 15, 1994, Ser. No. 339,568

Int. Cl.[6] C11D 3/37;3/48;11/00;17/00

U.S. Cl. 510—434 **22 Claims**

8. A method of preparing an adherent foam cleaning composition comprising adding a foam stabilizing composition, said foam stabilizing composition comprising an amount of alkalinity source sufficient to attain a pH between about 4.5 and 5.5 in said foam stabilizing composition, from about 1.0 wt-% to 95 wt-% of a vinyl polymer emulsion, from about 0.1 wt-% to 0.3 wt-% of an antimicrobial agent and a balance of water, to an alkaline cleaning composition to provide said adherent foam cleaning composition having viscosity of less than 300 centipoise.

17. An adherent foam cleaning composition comprising:

(a) an amount of a halogenated alkaline cleaner effective in the removal of soil; and

(b) a foam stabilizing composition consisting essentially of:

(i) an amount of alkalinity source effective to raise the pH of said foam stabilizing composition to between about 4.5 and 5.5;

(ii) from about 1.0 wt-% to 95 wt-% of vinyl polymer emulsion;

(iii) from about 0.1 wt-% to 0.3 wt-% of an antimicrobial agent; and

(c) a balance of water, said adherent foam cleaning composition has a viscosity of less than 300 centipoise.

5,597,794

PROCESS FOR THE PRODUCTION OF DETERGENT SURFACTANT GRANULES COMPRISING A RECYCLE STEP

Volker Baner; Wilfried Rachse; Andreas Syldath, all of Duesseldorf, and Ditmar Kischkel, Monheim, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 956,486, Mar. 5, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 324,317

Claims priority, application Germany, Jul. 5, 1990, 40 21 476.1

Int. Cl.[6] C11D 11/00;3/04;3/12

U.S. Cl. 510—457 **16 Claims**

1. A process for production of surfactant granules comprising at least one surfactant selected from the group consisting of fatty alcohol sulfates, sulfofatty acid methyl esters, sulfofatty acid disalt, alkyl glycosides, fatty acid soaps, and alkyl benzene sulfonates which comprises: mixing in a mixing zone, a mixture comprising the surfactant and from 20% to 80% by weight water with an amount of at least one solid selected from the group consisting of water soluble solids and water insoluble solids, sufficient to form granules when dried, comprised of at least about 20% by weight of surfactant; drying the granules to form dried granules; and introducing at least a portion of the dried granules into the mixing zone as at least a portion of the solid whereby the surfactant content of the dried granules is increased above the surfactant content of dried granules produced without introduction of dried granules into the mixing zone.

5,597,795

DETERGENT COMPOSITIONS INHIBITING DYE TRANSFER

Abdenaceur Fredj, Brussels; James P. Johnston, Overijse; Regine Labeque, Brussels, and Christiaan A. Thoen, Haasdonk, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US93/09936, § 371 Date Apr. 7, 1995, § 102(e) Date Apr. 7, 1995, PCT Pub. No. WO94/10277, PCT Pub. Date May 11, 1994

PCT Filed Oct. 15, 1993, Ser. No. 416,678

Claims priority, application European Pat. Off., Oct. 27, 1992, 92203287

Int. Cl.[6] C11D 3/37;3/30

U.S. Cl. 510—528 **6 Claims**

1. A detergent composition comprising:

a) a polyamine N-oxide containing polymer which is Poly(4-vinylpyridine)-N-oxide; and,

b) a terephthalate polymer; and,

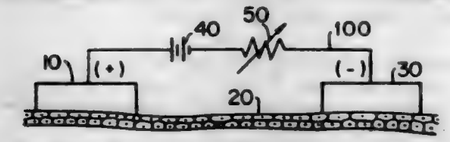
wherein said polyamine N-oxide containing polymer is present at a level of from about 0.01% to about 10% by weight of said detergent composition, and wherein said terephthalate polymer is present at a level of from about 0.01% to about 10% by weight of said detergent composition.

5,597,796

TRANSDERMAL INSULIN

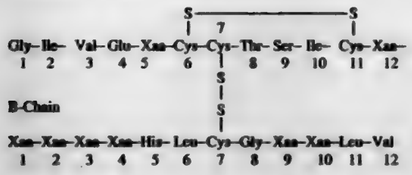
Jens J. V. Brange, Klampenborg, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 85,473, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 751,836, Aug. 30, 1991, abandoned. This application Sep. 7, 1994, Ser. No. 301,838
Claims priority, application Denmark, Jan. 22, 1991, 0101/91
Int. Cl.[6] A61K *38/28*; A61N *1/30*; C07K *14/62*
U.S. Cl. 514—3 11 Claims

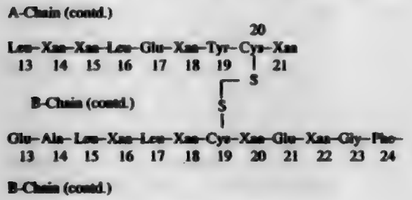


1. An insulin analogue having the general formula III:

A-Chain (Seq. I.D. 1) (III)



A-Chain (contd.)



B-Chain (contd.)

Phe–Xaa–Xaa–Xaa–Xaa–Xaa (SEQ ID NO:6)
25 26 27 28 29 30

wherein the amino acid residue designated Xaa in at least one of the positions B9,B10,B16, B26,B28,B1,B2,B18,B20,B28, or A21 and furthermore an amino acid residue designated Xaa in at least one of the positions A5,A15,A18,B3,B4,A12,A14,B22,B29 or B30 is independently substituted by Asp or Glu while any remaining Xaa designated the amino acid residue occurring in human insulin in the pertinent position, the terminal ends of the B-chain optionally being extended by one or two amino acid residues which can be chosen independently among Asp and Glu, with the proviso that if no amino acid residue designated Xaa in position A12,A14,B22,B29 or B30 is substituted, or if the terminal ends of the B-chain have not been extended, then the total number of substitutions is at least five.

5,597,797

METHOD FOR TREATMENT OR PREVENTION OF OBESITY

Ross G. Clark, Pacifica, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

PCT No. PCT/US93/10259, § 371 Date Nov. 19, 1993, § 102(e) Date Nov. 19, 1993, PCT Pub. No. WO91/18621, PCT Pub. Date Dec. 12, 1991
PCT Filed Oct. 26, 1993, Ser. No. 150,890
Int. Cl.[6] A61K *38/00;37/24*; C07K *14/00*
U.S. Cl. 514—12 20 Claims

1. A method for reducing total body fat mass in an obese mammal comprising administering to the mammal an effective amount of IGF-I and growth hormone.

5,597,798

TAXOL AND EPIDERMAL GROWTH FACTOR USED TO ENHANCE TREATMENT OF OVARIAN CANCER

Stephen B. Howell, Del Mar; Randolph D. Christen, San Diego, both of Calif.; Seiji Isonishi, Sagamani-Ku, Japan, and Paul A. Andrews, Washington Grove, Md., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 100,510, Jul. 30, 1993, abandoned, which is a continuation of Ser. No. 488,199, Mar. 5, 1990, Pat. No. 5,252,342. This application Mar. 11, 1994, Ser. No. 212,110
Int. Cl.[6] A61K *37/00, 31/225*
U.S. Cl. 514—12 1 Claim

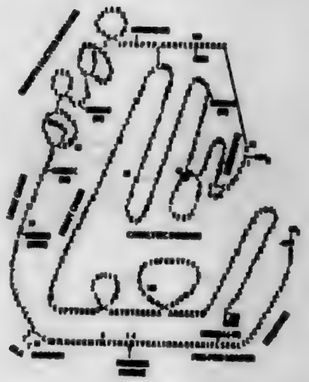
1. A method of enhancing the toxicity of taxol in human ovarian carcinoma cells consisting of administering to individuals in need thereof an effective amount of taxol and an effective amount of epidermal growth factor.

5,597,799

RECOMBINANT AGENTS AFFECTING THROMBOSIS

David Wolf, Palo Alto, Calif., assignor to COR Therapeutics, Inc., South San Francisco, Calif.

Continuation of Ser. No. 808,329, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 578,646, Sep. 4, 1990, Pat. No. 5,278,144. This application May 26, 1994, Ser. No. 249,777
Int. Cl.[6] A61K *38/36;38/48;35/14*; C07K *14/745*
U.S. Cl. 514—12 14 Claims



1. A single chain precursor polypeptide comprising the light chain and heavy chain of Factor X in which at least a portion of the native activation peptide sequence has been deleted and a proteolytic cleavage site has been inserted between the C-terminus of said light chain and the N-terminus of said heavy chain, said polypeptide being convertible to Factor Xai by proteolysis and capable of competing with native Factor Xa in the formation of a prothrombinase complex, and said light chain or said heavy chain being modified from its native amino acid sequence so that said Factor Xai lacks protease activity when incorporated into said prothrombinase complex.

5,597,800

TREATMENT WITH LYS-PLASMINOGEN OF REPERFUSION INJURY AND BRAIN EDEMA CAUSED BY ISCHEMIA

Johann Eibl; Ludwig Pichler, and Hans-Peter Schwarz, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 88,033, Jul. 2, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 345,468
Int. Cl.[6] A61K *38/48;38/00*
U.S. Cl. 514—12 9 Claims

1. A method of treating reperfusion injury, comprising the step of administering to a subject in need thereof a pharmaceutical preparation comprising lys-plasminogen in a dosage of about 10 to 1000 CU of lys-plasminogen per kg of said subject.

5,597,801

BIOCIDAL PROTEINS

Willem F. Broekaert, Dilbeek; Bruno P. A. Cammue, Alsemberg, both of Belgium; Sarah B. Rees, Forest Park, England, and Josef Vanderleyden, Heverlee, Belgium, assignors to Zeneca Limited, London, England

Division of Ser. No. 149,839, Nov. 10, 1993, which is a continuation-in-part of Ser. No. 2,842, Jan. 14, 1993, abandoned. This application May 26, 1995, Ser. No. 451,568
Claims priority, application United Kingdom, Jun. 7, 1991, 9112300; Nov. 12, 1992, 9223708; Feb. 23, 1993, 9303564
Int. Cl.[6] A01N *63/00;65/00*; A61K *38/16*
U.S. Cl. 514—12 25 Claims

3. A process of combating fungi gram-positive or bacteria which comprises exposure of said fungi or gram-positive bacteria to a composition containing an antimicrobial protein having the amino acid sequence as represented by any one of SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:15 or SEQ ID NO:16.

5,597,802

METHOD OF FORMULATING IGF-I WITH GROWTH HORMONE

Ross G. Clark, Pacifica; Douglas A. Yeung, Fremont, and James Q. Oeswein, Moss Beach, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 71,819, Jun. 4, 1993, which is a continuation-in-part of Ser. No. 806,748, Dec. 13, 1991, abandoned, which is a division of Ser. No. 535,885, Jun. 7, 1990, Pat. No. 5,126,324. This application Jun. 2, 1995, Ser. No. 458,595
Int. Cl.[6] A61K *38/30;38/27*
U.S. Cl. 514—12 7 Claims

1. A process for preparing a formulation comprising mixing an IGF-I-containing composition comprising about 2–20 mg/ml of IGF-I, about 2–50 mg/ml of an osmolyte, about 1–15 mg/ml of a stabilizer, and a buffered solution at about pH. 5–5.5 with a buffered solution comprising growth hormone at pH about 6 in a dose (mg) ratio of from about 2:1 to 100:1 IGF-I:growth hormone up to a dose no greater than about 5 mg/ml of growth hormone.

5,597,803

BRADYKININ PEPTIDES WITH MODIFICATIONS AT THE N TERMINUS

Gerhard Breipohl, Frankfurt am Main; Stephan Henke, Hofheim am Taunus; Jochen Knolle, Kriftel/Ts.; Berawerd Schillkens, Kelkheim; Hans-Georg Alpermann, Königstein/Taunus; Hermanus Gerhards, Hofheim am Taunus, and Klaus Wirth, Kriftel/Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 41,176, Apr. 1, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,464
Claims priority, application Germany, Apr. 4, 1992, 42 11 406.3
Int. Cl.[6] A61K *38/00;38/04*; C07K *5/00;7/00*
U.S. Cl. 514—15 3 Claims

1. A peptide of the formula I

Z-P-A-B-C-E-F-K-(D)Q-G-M-F-I (I)

in which
Z is Fmoc, dibenzylacetyl, cyclohexylcarbonyl, N,N-dibenzylglycyl, 2-(4-isobutylphenyl)propionyl, (2-R-(tert butylsulfonylmethyl)-3-(1-naphthyl)propionyl, indole-3-yl-acetyl, 6-(4-benzoyl-benzoylamino)hexanoyl, 1,8-naphthalimidoacetyl, 7-theophyllineacetyl or N-benzoyl;
P is a direct linkage, Aoc, ε-aminohexanoyl, D-Aoc, Aeg(Fmoc), 4-aminocyclohexylcarbonyl or Oic;
A is (D)- or (L)-Arg, (D)- or (L)-Lys, or is a bond;
B is Arg;
C is Pro-Hyp-Gly;
E is Thia;
F is Ser;
K is a direct linkage;
Q is Tic;
M is a direct linkage;
G is cis-endo-, cis-exo-, trans-octahydroindole-2-carboxylic acid;
F is Arg; and
I is OH.

2. A method for the treatment of inflammation in a mammal wherein the inflammation is mediated, induced or assisted by bradykinin or peptides related to bradykinin, which comprises administering to said mammal an anti-inflammatorily effective amount of a peptide of the formula I as claimed in claim 1.

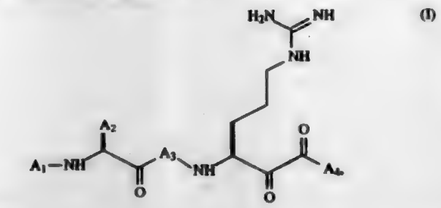
5,597,804

N-SULFONYLARGININE KETO-AMIDE COMPOUNDS

Thomas R. Webb; Todd A. Miller, both of Encinitas; George P. Vlasuk, Carlsbad, and Matthew M. Abelman, Solana Beach, all of Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 962,301, Oct. 16, 1992, Pat. No. 5,371,072. This application Oct. 18, 1993, Ser. No. 139,300
Int. Cl.[6] A61K *37/00;37/02*; C07K *5/08*
U.S. Cl. 514—18 73 Claims

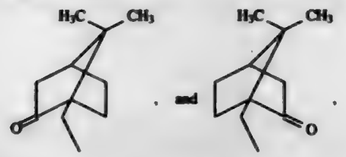
1. A compound of the formula



(I)

wherein
(a) A_1 is R_1—$S(O_2)$—, wherein R_1 is selected from the group consisting of

alkyl of 1 to about 12 carbon atoms,
alkenyl of about 3 to about 6 carbon atoms,
aryl of about 6 to about 14 carbon atoms which is optionally mono-substituted with X_1 or optionally di-substituted with X_1 and X_2,
aralkyl of about 6 to about 15 carbon atoms which is optionally mono-substituted in the aryl ring with X_1 or optionally di-substituted in the aryl ring with X_1 and X_2,
aralkenyl of about 8 to about 15 carbon atoms which is optionally mono-substituted in the aryl ring with X_1 or optionally di-substituted in the aryl ring with X_1 and X_2,
perfluoroalkyl of 1 to about 12 carbon atoms, perfluoroaryl of about 6 to about 14 carbon atoms, trimethylsilylalkyl of 4 to about 8 carbon atoms,



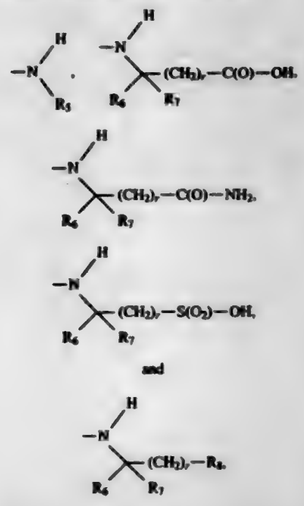
wherein X_1 and X_2 are independently selected from the group consisting of bromo, chloro, fluoro, Y_1—, HO—, Y_1—O—, NH_2—, Y_1—NH—, $(Y_1,Y_2)N$—, Y_1—C(O)—NH—, HS—, Y_1—S—, Y_1—S(O)—, Y_1—$S(O_2)$—, HO—$S(O_2)$—, Y_1—O—$S(O_2)$—, NH_2—$S(O_2)$— and Y_1—NH—$S(O_2)$—, wherein Y_1 and Y_2 are independently selected from the group consisting of trifluoromethyl, pentafluoroethyl, alkyl of 1 to about 12 carbon atoms, aryl of about 6 to about 14 carbon atoms, and aralkyl of about 6 to about 15 carbon atoms;

(b) A_2 is selected from the group consisting of
hydrogen,
R_2—,
—$(CH_2)_m$—C(O)—O—H,
—$(CH_2)_m$—C(O)—O—R_2,
—$(CH_2)_m$—$S(O_2)$—R_2,
—$(CH_2)_m$—$S(O_2)$—$(CH_2)_n$—C(O)—OH,
—$(CH_2)_m$—$S(O_2)$—$(CH_2)_n$—C(O)—O—R_2,
—$(CH_2)_m$—$S(O_2)$—O—H,
—$(CH_2)_m$—$S(O_2)$—O—R_2,
—$(CH_2)_m$—$S(O_2)$—NH_2,
—$(CH_2)_m$—$S(O_2)$—NH—R_2,
—$(CH_2)_m$—$S(O_2)$—NH—$CH(R_3)$—$(CH_2)_n$—C(O)—O—H,
—$(CH_2)_m$—$S(O_2)$—NH—$CH(R_3)$—$(CH_2)_n$—C(O)—O—R_2,
—$(CH_2)_m$—NH—$S(O_2)$—R_2, and
—$(CH_2)_m$—NH—C(O)—O—R_2,

wherein
(i) m is 1, 2 or 3;
(ii) n is 0, 1, 2, 3 or 4;
(iii) R_2 is selected from the group consisting of alkyl of 1 to about 12 carbon atoms, alkenyl of about 3 to about 6 carbon atoms, aryl of about 6 to about 14 carbon atoms, aralkyl of about 6 to about 15 carbon atoms and aralkenyl of about 8 to about 15 carbons atoms; and
(iv) R_3 is selected from the group consisting of hydrogen, alkyl of 1 to about 4 carbon atoms, aryl of about 6 to about 14 carbon atoms, aralkyl of about 6 to about 15 carbon atoms, and alkyl of 1 to about 4 carbon atoms substituted with a substituent selected from the group consisting of —OH, —C(O)—OH, — C(O)—NH_2, —S—CH_3, —S(O)—CH_3, —$S(O_2)$—CH_3 and —NH—$S(O_2)$—CH_3;

(c) A_3 is an amino acid residue of the amino acid selected from the group consisting of L-alanine, L-azetidinecarboxylic acid, glycine, L-isoleucine, L-leucine, L-lysine mono-substituted at its ε-amino group with R_4—$S(O_2)$—, L-methionine sulfone, N-methylglycine, L-ornithine mono-substituted at its δ-amino group with R_4—$S(O_2)$—, L-pipecolic acid, L-phenylalanine, L-proline, L-valine, and trans-4-hydroxy-L-proline; and

(d) A_4 is selected from the group consisting of



wherein
(i) p and q are each independently selected integers from 1 to 5 wherein the sum of p+q is 4 to 8;
(ii) R_4 is aryl of about 6 to about 14 carbon atoms which is optionally substituted with 1 or 2 substituents each independently selected from the group consisting of alkyl of 1 to about 4 carbon atoms, alkoxy of 1 to about 4 carbon atoms, —NH_2, —C(O)—OH, —C(O)—NH_2, fluoro, —OH, —NO_2 and —CF_3;
(iii) R_5 is aryl of about 6 to 14 carbon atoms;
(iv) R_6 is selected from the group consisting of hydrogen and alkyl of 1 to about 4 carbon atoms;
(v) R_7 is selected from the group consisting of
hydrogen;
alkyl of 1 to about 4 carbon atoms;
aryl of about 6 to about 14 carbon atoms which is optionally substituted with 1 or 2 substituents each independently selected from the group consisting of —NH_2, —C(O)—OH, —C(O)—NH_2, fluoro, —OH, —NO_2, —CF_3, alkyl of 1 to about 4 carbon atoms, and alkoxy of 1 to about 4 carbon atoms;
aralkyl of about 6 to about 15 carbon atoms which is optionally substituted with 1 or 2 substituents each independently selected from the group consisting of —NH_2, —C(O)—OH, —C(O)—NH_2, fluoro, —OH, —NO_2, —CF_3, alkyl of 1 to about 4 carbon atoms, and alkoxy of 1 to about 4 carbon atoms; and
alkyl of 1 to about 4 carbon atoms substituted with a substituent selected from the group consisting of —OH, —C(O)—OH, —C(O)—NH_2, —S—CH_3, —S(O)—CH_3, —$S(O_2)$—CH_3, and —NH—$S(O_2)$—CH_3; and
(vi) R_8 is selected from the group consisting of alkyl of 1 to about 12 carbon atoms, aryl of about 6 to about 14 carbon atoms optionally mono-substituted with X_3 or optionally di-substituted with X_3 and X_4, and aralkyl of about 6 to about 15 carbon atoms optionally mono-substituted with X_3 or optionally di-substituted with X_3 and X_4, wherein X_3 and X_4 are independently selected from the group consisting of —C(O)—OH and —$S(O_2)$—OH, and
(vii) r is 0, 1, 2 or 3; and pharmaceutically acceptable salts thereof.

5,597,805

PERITONEAL DIALYSIS SOLUTIONS

Andrzej Breborowicz, Poznan, Poland, and Dimitrios G. Oreopoulos, Etobicoke, Canada, assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 830,721, Feb. 4, 1992, abandoned.
This application Jun. 15, 1993, Ser. No. 77,815
Int. Cl.[6] A61K *38/00*
U.S. Cl. 514—19 2 Claims

1. A peritoneal dialysis solution comprising:
physiological salts in concentrations sufficient to affect the removal of solutes by diffusion from the patient's blood across the peritoneal membrane into the solute, and
a mixture of amino acids sufficient to contribute to protein synthesis and a positive nitrogen balance, wherein tryptophan is present in a glycine-tryptophan form, the glycine-tryptophan present in a concentration of about 2 mM to about 10 mM based upon one liter of solution, to aid the proliferation of mesothelial cells.

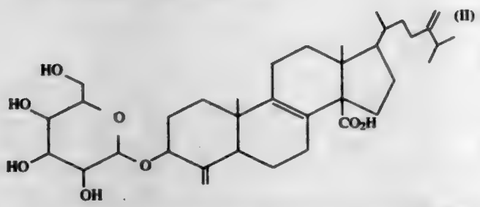
5,597,806

ANTIFUNGAL AGENTS

Wendy H. Clapp, New York, N.Y.; Guy H. Harris, Cranford, N.J.; Gerald F. Bills, Clark, N.J.; James E. Curotto, Morgan, N.J.; Anne W. Dombrowski, East Brunswick, N.J.; Sarah J. Driekers, Scotch Plains, N.J.; Myra B. Kurtz, Martinsville, N.J.; Maria S. Meinz, Fair Haven, N.J.; Janet C. Onishi, Westfield, N.J.; Jon D. Polishook, Cranford, N.J.; Stanley L. Streicher, Verona, N.J.; John R. Thompson, Scotch Plains, N.J.; Marie Williams, Cranford, N.J., and Deborah L. Zink, Manalapan, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 9, 1995, Ser. No. 437,718
Int. Cl.[6] A61K *31/71*; C07J *19/00*
U.S. Cl. 514—25 7 Claims

4. A compound having the structure:



6. A method for combatting fungal infections in mammals which comprises administering to a region of the animal afflicted with said fungi a therapeutically effective amount of the compound of claim 4.

5,597,807

QUINOA SAPONIN COMPOSITIONS AND METHODS OF USE

Alberto Estrada; Mark J. Redmond, and Bernard Laarveld, all of Saskatchewan, Canada, assignors to University of Saskatchewan, Saskatchewan, Canada

Filed Aug. 1, 1994, Ser. No. 283,900
Int. Cl.[6] A61H *31/705*; A61K *35/78*
U.S. Cl. 514—26 6 Claims

1. A pharmaceutical composition comprising at least one Quinoa saponin, a selected antigen, and a pharmaceutically acceptable vehicle.

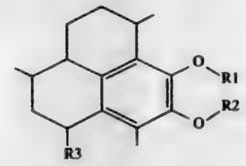
5,597,808

USE OF PSEUDOPTEROSINS FOR PROMOTING WOUND HEALING

Howard B. Haimes, South Natick, and Pablo A. Jimenez, Somerville, both of Mass., assignors to OsteoArthritis Sciences, Incorporated, Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 486,359
Int. Cl.[6] A61K *31/70*
U.S. Cl. 514—33 29 Claims

1. A method of promoting the healing of a wound on an individual or animal comprising contacting the wound with a composition comprising an effective wound healing amount of a compound having the following structural formula:



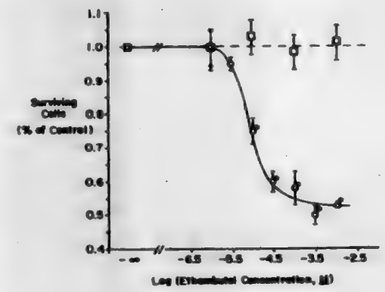
wherein:
R1 and R2 are independently selected from the group consisting of —H, lower alkyl, substituted lower alkyl, phenyl, substituted phenyl, benzyl, substituted benzyl, acyl, alkoxycarbonyl and a monosaccharide and wherein R1 and R2 are different and one of R1 and R2 is a monosaccharide; and
R3 is a substituted or unsubstituted lower alkyl group.

5,597,809

TREATMENT OF OPTIC NEURITIS

Evan B. Dreyer, Chestnut Hill, Mass., assignor to Massachusetts Eye & Ear Infirmary, Boston, Mass.

Filed Jun. 23, 1994, Ser. No. 264,728
Int. Cl.[6] A01N *43/04*
U.S. Cl. 514—37 7 Claims



1. A method of treatment or propylaxis of optic neuritis in a mammal suffering from or at risk of developing drug-induced optic neuritis, said method comprising administering to said mammal a protective agent which inhibits glutamate-mediated retinal cell damage.

5,597,810

METHOD FOR REDUCING ABSORPTION OF UNDESIRED LIPIDS IN THE GASTROINTESTINAL TRACT

Allan S. Hoffman, 4528 Laurel Dr. NE., Seattle, Wash. 98105, and N. S. Choi, P.O. Box 10 - Dae Duk Dan Ji, Dae Jeon, Chung Nam, Rep. of Korea

Continuation of Ser. No. 888,396, May 20, 1992, abandoned, which is a continuation of Ser. No. 609,813, Oct. 30, 1990, abandoned, which is a continuation of Ser. No. 497,752, Mar. 20, 1990, abandoned, which is a continuation of Ser. No. 382,042, Jul. 18, 1989, abandoned, which is a continuation of Ser. No. 266,217, Oct. 28, 1988, abandoned, which is a continuation of Ser. No. 136,476, Dec. 23, 1987, abandoned, which is a continuation of Ser. No. 686,844, Dec. 27, 1984, abandoned. This application Apr. 28, 1994, Ser. No. 234,719

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—54 4 Claims

1. A method for effecting reduction of the biologically active level of an undesired lipid present in the fluid media of the gastrointestinal tract of humans or animals, said undesired lipid capable of being bound by cholesterol, comprising:

orally administering therapeutically effective doses of a pharmaceutical composition containing a substantially water-soluble nondigestible polymer having multiple reactable hydroxyl groups, wherein said polymer is selected from the group consisting of cellulose polymers, algin, pectin, agar, chitin, polyvinyl alcohol and hydroxyethyl methacrylate, bonded through a biologically stable ether linkage to cholesterol, the cholesterol being capable of attracting and bonding, by means of van der Waals or hydrophobic forces, the undesired lipid present in the gastrointestinal tract for a time sufficient for the composition to be discharged from the gastrointestinal tract, and wherein the polymer is bonded to cholesterol by reacting cholesterol with the polymer at a ratio of 1–50% by weight cholesterol relative to the polymer.

5,597,811

OXIRANE CARBOXYLIC ACID DERIVATIVES OF POLYGLUCOSAMINES

James V. Gruber, Somerville, N.J., assignor to Amerchol Corporation, Edison, N.J.

Filed Apr. 10, 1995, Ser. No. 416,139

Int. Cl.[6] A61K *31/70*; C07B *37/08*

U.S. Cl. 514—55 16 Claims

1. A polyglucosamine derivative containing free amine groups wherein at least a portion of said amine groups are substituted with an oxirane carboxylic acid in an amount of from about 0.05 to 1.0 mole of said oxirane carboxylic acid per mole of glucosamine monomer unit.

14. A composition comprising:

(i) from about 0.1 to 99.9 weight percent of the derivative of claim 1; and

(ii) from about 0.1 to 99.9 weight percent of an organic acid selected from the group consisting of tartaric acid, lactic acid, acetic acid, glycolic acid, pyrrolidone carboxylic acid and mixtures of said acids or salts thereof.

5,597,812

PHOSPHORAMIDOTHIOATE AND PROCESS OF USE TO COMBAT PESTS

Fritz Maurer, Tochigi, Japan; Christoph Erdelen, Leichlingen, Germany; Ulrike Wachendorff-Neumann, Monheim, Germany; Jürgen Hartwig, Leichlingen, Germany; Andreas Turberg, Erkrath, Germany, and Norbert Mencke, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

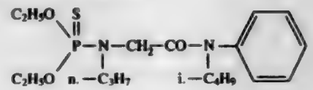
Filed Dec. 7, 1994, Ser. No. 350,569

Claims priority, application Germany, Dec. 14, 1993, 43 42 621.2

Int. Cl.[6] A01N *57/30*; C07F *9/24*

U.S. Cl. 514—118 3 Claims

1. A compound of the formula



5,597,813

USE OF SALICYLIC ACID FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy L. Blank, Spring Valley, N.Y., assignor to Richardson-Vicks Inc., Shelton, Conn.

Division of Ser. No. 434,250, May 3, 1995, abandoned, which is a continuation of Ser. No. 28,756, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 796,750, Nov. 25, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 465,504

Int. Cl.[6] A61K *31/60*; *31/56*

U.S. Cl. 514—159 1 Claim

1. A method for preventing, retarding, arresting, or reversing wrinkles or atrophy in mammalian skin comprising treating the skin with a safe and effective amount of a composition comprising:

(a) a safe and effective amount of salicylic acid;

(b) a safe and effective amount of an anti-inflammatory agent selected from the group consisting of hydrocortisone, hydroxyltriamcinolone, alpha-methyl dexamethasone, dexamethasone-phosphate, beclomethasone dipropionate, clobetasol valerate, desonide, desoxymethasone, desoxycorticosterone acetate, dexamethasone, dichlorisone, diflorasone diacetate, diflucortolone valerate, fluadrenolone, fluclorolone acetonide, fludrocortisone, flumethasone pivalate, fluosinolone acetonide, fluocinonide, flucortine butylester, fluocortolone, fluprednidene (fluprednylidene) acetate, flurandrenolone, halcinonide, hydrocortisone acetate, hydrocortisone butyrate, methylprednisolone, triamcinolone acetonide, cortisone, cortodoxone, flucetonide, fludrocortisone, difluorosone diacetate, fluradrenolone acetonide, medrysone, amcinafel, amcinafide, betamethasone and the balance of its esters, chloroprednisone, chlorprednisone acetate, clocortelone, clescinolone, dichlorisone, difluprednate, flucloronide, flunisolide, fluoromethalone, fluperolone, fluprednisolone, hydrocortisone valerate, hydrocortisone cyclopentylpropionate, hydrocortamate, meprednisone, paramethasone, prednisolone, prednisone, beclomethasone dipropionate, triamcinolone, piroxicam, isoxicam, tenoxicam, sudoxicam, CP-14,304, aspirin, disalcid, benorylate, triflusate, safapryn, solprin, diflunisal, and fendosal, diclofenac, fenclofenac, indomethacin, sulindac, tolmetin, isoxepac, furofenac, tiopinac, zidometacin, acemetacin, fentiazac, zomepiract, clidanac, oxepinac, and felbinac, mefenamic, meclofenamic, flufenamic, niflumic, and tolfenamic acid, ibuprofen, naproxen, benoxaprofen, flurbiprofen, ketoprofen, fenoprofen, fenbufen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, suprofen, alminoprofen, and tiaprofenic, phenybutazone, oxyphesbutazone, feprazone, azapropazone, and trimethazone and mixtures thereof; and

(c) a pharmaceutically-acceptable carrier.

5,597,814

USE OF SALICYLIC ACID FOR REGULATING SKIN WRINKLES AND/OR SKIN ATROPHY

Roy L. Blank, Spring Valley, N.Y., assignor to Richardson-Vicks Inc., Shelton, Conn.

Division of Ser. No. 434,250, May 3, 1995, abandoned, which is a continuation of Ser. No. 28,756, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 796,750, Nov. 25, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 465,508

Int. Cl.[6] A61K *31/60*; *31/355*

U.S. Cl. 514—159 1 Claim

1. A method for preventing, retarding, arresting, or reversing wrinkles or atrophy in mammalian skin comprising treating the skin with a safe and effective amount of a composition comprising:

(a) a safe and effective amount of salicylic acid;

(b) a safe and effective amount of an anti-oxidant or radical scavenger selected from the group consisting of ascorbic acid, tocopherol, butylated hydroxy benzoic acids, 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid, gallic acid, uric acid, sorbic acid, N,N-diethylhydroxylamine, aminoguanidine, sulfhydryl compounds, and dihydroxy fumaric acid, derivatives thereof and mixtures thereof; and

(c) a pharmaceutically-acceptable carrier.

5,597,815

PREVENTION OF HYPERPHOSPHATEMIA IN KIDNEY DISORDER PATIENTS

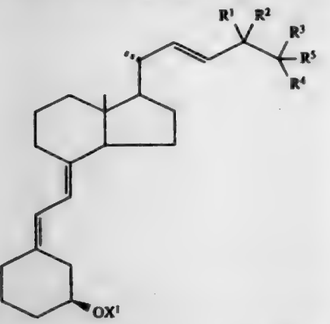
Hector F. Deluca, Deerfield, Wis., and Eduardo Slatopolsky, St. Louis, Mo., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 13, 1995, Ser. No. 502,288

Int. Cl.[6] A61K *31/59*

U.S. Cl. 514—167 11 Claims

1. A method of treating a patient having renal osteodystrophy while avoiding hyperphosphatemia comprising administering to said patient a vitamin D compound that has minimal effect on blood serum phosphorus of said patient, said vitamin D compound selected from a 19-nor-vitamin D_2 compound having the formula:



where X^1 and X^2 each represent, independently, hydrogen or a hydroxy-protecting group; and where R^1 is selected from hydrogen, hydroxy, protected hydroxy, fluoro, trifluoromethyl, and C_{1-5}— alkyl, which may be straight chain or branched and, optionally, bear a hydroxy or protected-hydroxy substituent; and where each of R^2, R^3, and R4, independently, is selected from hydrogen, fluoro, trifluoromethyl and C_{1-5} alkyl, which may be straight-chain or branched, and optionally, bear a hydroxy or protected-hydroxy substituent; and where R^1 and R^2, taken together represent an oxo group, or an alkylidene group, $=CR^2R^3$, or the group $—(CH_2)_p—$, where p is an integer from 2 to 5; and where R^3 and R^4, taken together, present an oxo group, or a group $—(CH_2)_q—$, where q is an integer from 2 to 5; and where R^5 represents hydrogen, hydroxy, protected hydroxy, or C_{1-5} alkyl.

5,597,816

PYRAZOLOAZEPINO SUBSTITUTED OXIMES USEFUL AS ANTI-ATHEROSCLEROSIS AND ANTI-HYPERCHOLESTEROLEMIC AGENTS

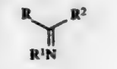
Scott D. Larsen, and Charles H. Spilman, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 313,684, Sep. 27, 1994, which is a continuation-in-part of Ser. No. 900,229, Jun. 17, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 468,158

Int. Cl.[6] A61K *31/33*; *31/55*; C07D *223/14*; *225/04*

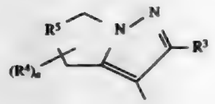
U.S. Cl. 514—183 4 Claims

1. A compound having the formula



I

wherein R is



II

R_1 is

(a) -hydroxy,

(b) —OC(O)C_1–C_5 alkyl,

(c) —O—C_1C_5 alkyl - OH,

(d) —NHC(O)C_1–C_5 alkyl;

R_2 is

(a) -straight chain C_1–C_8 alkyl,

(b) -phenyl-X,

(c) —C_1–C_5 alkyl-R^6-phenyl-X;

R_3 is

(a) -hydrogen,

(b) —C_1–C_8 alkyl,

(c) furanyl,

(d) —C_1–C_5 alkyl-R^6-phenyl-X,

(e) -phenyl-X, or

(f) —Si (C_1–C_5 alkyl)$_3$;

R_4 is

(a) -phenyl-X,

(b) —C_1–C_5 -phenyl-X,

(c) -halogen,

(d) —C_1–C_5 alkyl,

(e) —OH,

(f) —OC_1–C_5 alkyl-phenyl-X,

(g) —NHC(O)C_1–C_5 alkyl,

(h) —OC(O)C_1–C_5 alkyl, or

(i) -hydrogen;

R^5 is —$(CH_2)_c$—;

R^6 is,

(a) —O—,

(b) —S—, or

(c) —CH_2—;

a is 0–4;

c is 3–6;

phenyl-X is phenyl substituted by 1 to 3 of the same or different substituent selected from the group

(a) —H,

(b) -halogen,

(c) —OH,

(d) —OC_1–C_5 alkyl,

(e) —SC_1–C_5 alkyl,

(f) —NH_2,

(g) —N(C_1–C_5 alkyl)$_2$,

(h) —NHC(O)C_1–C_5 alkyl,

(i) —OC(O)C_1–C_5 alkyl,

(j) —CF_3,

(k) —CN, or

(l) —CO_2 C_1–C_5 alkyl; and

pharmaceutically acceptable acid addition salts thereof; with proviso that where R_1 is hydroxy or —NHC(O)C_1–C_5)alkyl, R_2 is not

C_1–C_6 alkyl, R_3 is not C_1–C_6 alkyl or phenyl-X and R_4 is not halogen, C_1–C_6 alkyl or hydrogen.

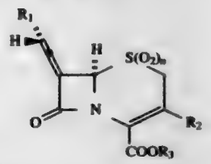
5,597,817

7-VINYLIDENE CEPHALOSPORINS AND METHODS OF USING THE SAME

John D. Buynak, and Brian Bachmann, both of Dallas, Tex., assignors to Southern Methodist University, Dallas, Tex.

Filed Dec. 9, 1994, Ser. No. 354,858
Int. Cl.[6] C07D 501/00; A61K 31/545
U.S. Cl. 514—200 **8 Claims**

1. A compound of the formula (1)



wherein n is 0 or 1;

R_1 is selected from the group consisting of

a) hydrogen;

b) linear or branched C_{1-10}-alkyl;

c) halogen;

d) hydroxy-C_{1-10}-alkyl;

e) C_{1-10}-alkoxy;

f) C_{2-10}-alkanoyloxy;

g) C_{2-10}-alkene;

h) C_{2-10}-alkene substituted with one or more groups selected from the group consisting of chlorine, fluorine, bromine or phenyl;

i) C_{1-10}-alkoxycarbonyl;

j) C_{1-10}-alkoxycarbamido;

k) N-C_{1-10}-alkoxy-N-C_{1-10}-alkylaminocarbonyl;

l) halo-C_{1-10}-alkyl;

m) C_{6-10}-aryl;

n) C_{6-10}-aryl substituted with one or more groups selected from the group consisting of ethyl, n-propyl, isopropyl, amino, methylamino and dimethylamino;

o) —COOH or —COOY, wherein Y is a pharmaceutically acceptable cation;

R_2 is selected from the group consisting of

1) —COOH;

2) Cl or F;

3) trifluoromethyl;

4) —CHO; and,

5) —CH_2M, wherein M is selected from the group consisting of

a) hydrogen;

b) halo;

c) hydroxy;

d) C_{1-10}-alkoxy;

e) C_{6-10}-aryloxy;

f) C_{6-10}-aryl-C_{1-10}-alkoxy;

g) mercapto;

h) mercapto substituted with one or more groups selected from the group consisting of methyl, ethyl or phenyl;

i) C_{2-10}-acylthio;

j) C_{2-10}-acyloxy or carbamoyloxy;

k) C_{2-10}-acyloxy or carbamoyloxy substituted with one or more groups selected from the group consisting of —COOH, aminophenyl, phenyl, C_{1-6}-alkyl, chlorine, bromine or fluorine;

l) a quaternary ammonium salt;

m) amino or amido group; and

n) amino or amido group substituted with one or two C_{1-10}-alkyl groups;

R_3 is selected from the group consisting of

a) hydrogen; and,

b) pharmaceutically acceptable cations.

5,597,818

METHODS OF TREATING CARDIAC ARRHYTHMIA

Michael C. Sanguinetti, Park City, Utah; Joseph J. Saiata, Newtown, and Joseph J. Lynch, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 156,184, Nov. 22, 1993, Pat. No. 5,428,031, which is a continuation-in-part of Ser. No. 18,912, Feb. 17, 1993, abandoned, which is a continuation of Ser. No. 802,000, Dec. 3, 1991, abandoned. This application Mar. 20, 1995, Ser. No. 407,337
Int. Cl.[6] A61K 31/55
U.S. Cl. 514—221 **1 Claim**

1. A method of treating cardiac arrhythmia in mammals comprising block of the slowly activating delayed rectifier potassium (K+) current (IK_s) and the rapidly activating and deactivating delayed rectifier potassium current (IK_r), wherein the slowly activating delayed rectifier potassium (K^+) current (IK_s) in isolated myocytes is selectively blocked by a compound at a concentration of 1 μM or less (IC_{50}) and the concentration that blocks IKs by 50% is at least 10 fold lower than the concentration required to cause 50% block of IK_r and or IK_1.

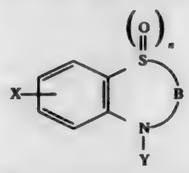
5,597,819

PHENOTHIAZINE CYTOKINE INHIBITORS

Jean-Daniel Brion, St-Leu-La-Foret; Anne-Marie Chollet, Viroflay; Luc Demuynck, Orleans; Lucy De Montarby, Courbevoie; Yves Rolland, Vanves; Jacqueline Bonnet, Paris, all of France; Pietro Ghezzi, Milan, Italy, and Armel Fradin, Neuilly-Sur-Seine, France, assignors to Adir Et Compagnie, Courbevoie, France

Continuation of Ser. No. 66,524, May 24, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,394
Claims priority, application France, May 25, 1992, 92 06353
Int. Cl.[6] C07D 417/12;417/06;279/16; H61K 31/54
U.S. Cl. 514—225.2 **10 Claims**

1. A compound selected from those of formula (I):



(I)

in which v represents 1 to 4 inclusive, R_v and x are as defined above, Q represents halogen, and each of R_v and R'_v, independently of the other, represents alkyl having 1 to 5 carbon atoms inclusive in a straight or branched chain, optionally substituted aryl, or optionally substituted arylalkyl,

it being understood that unless otherwise specified, "aryl radical" represents a radical chosen from phenyl and naphthyl, and "arylalkyl radical" represents a radical chosen from phenyl and naphthyl bound to an alkyl radical containing 1 to 4 carbon atoms, inclusive,

it being also understood that, unless otherwise specified, the expression "optionally substituted" means that the alkyl, aryl, or arylalkyl group may be substituted by one or more substituents chosen from halogen, hydroxy nitro, cyano, alkyl, alkoxy, haloalkyl, amino, alkylamino and dialkylamino,

and their possible stereoisomers, epimers, N-oxides and pharmaceutically-acceptable acid or base addition salts.

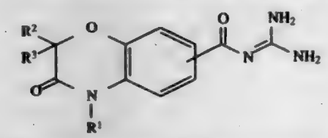
5,597,820

1, 4-BENZOXAZINE DERIVATIVE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Manabu Hori; Ikuo Watanabe; Hiroshi Ohtaka; Kengo Harada, all of Osaka-fu; Joji Maruo; Tominori Morita, both of Nara-ken; Takeshi Yamamoto, and Hisayoshi Tsutsui, both of Osaka-fu, all of Japan, assignors to Kanebo, Ltd., Toyko-to, Japan

Filed Dec. 22, 1995, Ser. No. 577,348
Claims priority, application Japan, Dec. 27, 1994, 6-340044; Jul. 7, 1995, 7-195939
Int. Cl.[6] A61K 31/535; C07D 265/36
U.S. Cl. 514—230.5 **14 Claims**

1. A 1,4-benzoxazine compound of the following formula (I):



(I)

wherein R^1 is hydrogen atom, an alkyl group having 1 to 6 carbon atoms or a cycloalkyl group having 5 to 7 carbon atoms; R^2 and R^3 may be the same or different and are hydrogen atom or an alkyl group having 1 to 4 carbon atoms; the guanidinocarbonyl group bonds at the 6- or 7-position of the benzoxazine ring, or a pharmaceutically acceptable salt thereof.

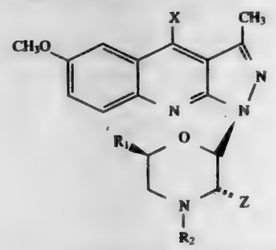
5,597,821

PYRAZOLOQUINOLINES

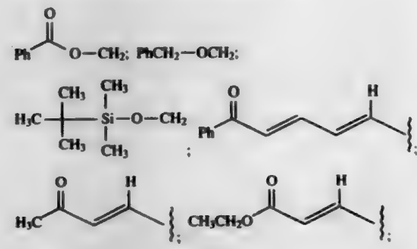
Ronald L. Wolin, 406 Mountain Ave., Westfield, N.J. 07090, and Adriano Afonso, 10 Woodmere Rd., West Caldwell, N.J. 07006

Filed Dec. 15, 1994, Ser. No. 356,826
Int. Cl.[6] A61K 31/535; C07D 487/04
U.S. Cl. 514—232.8 **17 Claims**

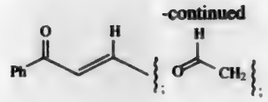
1. A compound of the formula:



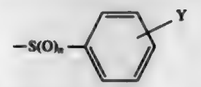
wherein R_1 is $HOCH_2$; (C_1–C_6)-alkyl-OCH_2;



-continued



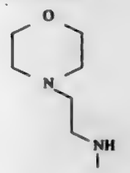
R_2 is H; $PhCH_2OCO$; CH_3CH_2CO—; $PhCH_2$; PhCO;; R_3R_4NCO—, wherein R_3 and R_4 are each independently C_1–C_3 alkyl or phenyl, or taken together with the nitrogen to which they are attached are morpholine;



wherein n is 0, 1 or 2,

Y is H, NHOH, Br, NO_2, $NHCOCH_3$;

Z is H or CN;



X is H, Cl, or a stereoisomer thereof, or pharmaceutically acceptable salt thereof.

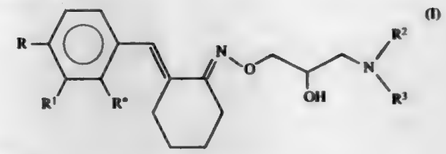
5,597,822

PHARMACEUTICAL COMPOSITIONS FOR THE PREVENTION AND/OR TREATMENT A GASTROINTESTINAL DISEASES

Eniko Szirt nee Kinielly; Zoltan Budai; Tibor Mezei; Gabor Blasko; Klara Kazo nee Daroczi; Andras Egyed; Gabor Gigler; Marton Fekete; Klara Reiter nee Esses; Gyula Simig, and Katalin Szemeredi, all of Budapest, Hungary, assignors to Egis Pharmaceutical, Budapest, Hungary

Continuation-in-part of Ser. No. 277,872, Jul. 19, 1994, abandoned. This application May 18, 1995, Ser. No. 443,487
Claims priority, application Hungary, Jul. 20, 1993, 20579/93
Int. Cl.[6] A61K 31/50;31/495;31/505;31/15
U.S. Cl. 514—247 **1 Claim**

1. A method for the treatment of gastrointestinal diseases connected with infections caused by *Helicobacter pylori*, which comprises administering an effective non-toxic dose of a compound of the formula I



(I)

wherein

R and R' mean independently hydrogen or halo;

R^0 stands for hydrogen or a C_{1-4} alkoxy group;

R^2 and R^3 independently represent hydrogen, a straight or branched chain C_{1-8} alkyl optionally substituted by a dimethylamino group, a C_{2-6} alkenyl or a C_{3-7} cycloalkyl group; or

R^2 and R^3 together with the adjacent nitrogen atom form a 6-membered heterocyclic group containing an additional nitrogen atom that may bear a phenyl group optionally substituted by a C_{1-4} alkoxy group;

or a stereoisomer or optical isomer or a possible mixture thereof, or a pharmaceutically acceptable acid additional salt or quaternary ammonium salt thereof to a patient suffering from gastrointestinal disorders.

5,597,823

TRICYCLIC SUBSTITUTED HEXAHYDROBENZ [E]ISOINDOLE ALPHA-1 ADRENERGIC ANTAGONISTS

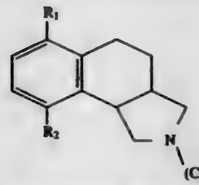
Michael D. Meyer, Lake Villa; Robert J. Altenbach, Chicago; Fatima Z. Basha, Lake Forest; William A. Carroll, Evanston; Irene Drizin, Wadsworth; Steven W. Elmore, Libertyville; James F. Kerwin, Jr., Grayslake; Suzanne A. Lebold, Chicago; Edmund L. Lee, Lake Zurich; Kevin B. Sippy, Lindenhurst; Karin R. Tietje, Mundelein, and Michael D. Wendt, North Chicago, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 379,414, Jan. 27, 1995, abandoned. This application Jun. 5, 1995, Ser. No. 463,528

Int. Cl.[6] A61K *31/505*; C07D *495/04;495/14;487/04*

U.S. Cl. 514—250 17 Claims

1. A compound of the formula:



(I)

or a pharmaceutically acceptable salt thereof; wherein

n is an integer from 2 to 6, inclusive;

R_1 and R_2 are independently selected from the group consisting of

hydrogen,

alkoxy,

hydroxy,

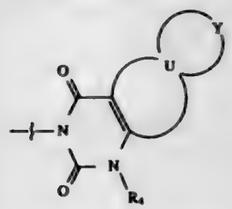
alkyl,

halo,

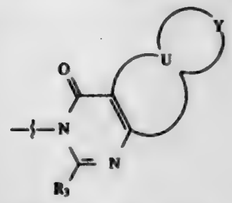
carboxy, and

alkoxycarbonyl;

W is selected from the group consisting of



wherein R_4 is hydrogen or lower alkyl, and



wherein R_3 is selected from the group consisting of

hydrogen,

lower alkyl,

unsubstituted phenyl, and

phenyl substituted with lower alkyl;

U, taken together with the carbon atoms to which it is attached toms a fused ring selected from the group consisting of

(a) an unsubstituted or substituted five membered ring having four carbon atoms, two double bonds and one heteroatom selected from the group consisting of —N(R_5)—, —O— and —S— wherein R_5 is hydrogen or lower alkyl and the ring substituent is selected from the group consisting of lower alkyl, phenyl, halo, cyano, nitro, carboxy, alkoxycarbonyl and alkoxy, and

(b) a six-membered carbocyclic aromatic ring which is unsubstituted or substituted with a substituent selected from the group consisting of lower alkyl, halo, cyano, nitro, carboxy, alkoxycarboxyl and alkoxy;

Y, is attached to two adjacent atoms of the ring U and, taken together with the two atoms of ring U to which it is attached, forms a fused ring selected from the group consisting of

(a) a five membered ring having four carbon atoms, two double bonds and one heteroatom selected from the group consisting of —N(R_5)—, —O— and —S— wherein R_5 is hydrogen or lower alkyl and the ring is unsubstituted or substituted with 1, 2, or 3 substituents independently selected from the group consisting of lower alkyl, phenyl, halo, cyano, nitro, carboxy, alkoxycarbonyl and alkoxy,

(b) a six-membered carbocyclic aromatic ring which is unsubstituted or substituted with 1, 2, or 3 substituents selected from the group consisting of lower alkyl, halo, cyano, nitro, carboxy, alkoxycarbonyl, and alkoxy; and

(c) a six membered aromatic ring having one or two nitrogen atoms, wherein the ring is unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of lower alkyl, phenyl, halo, cyano, nitro, carboxy, alkoxycarbonyl and alkoxy.

5,597,824

ANALOGS OF OXETANYL PURINES AND PYRIMIDINES

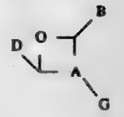
Daniel W. Norbeck, Lindenhurst; Jacob J. Plattner, Libertyville, both of Ill., and Terry J. Rosen, East Lyme, Conn., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 615,138, Nov. 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 574,617, Aug. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 453,520, Dec. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 116,685, Nov. 3, 1987, abandoned. This application Jun. 25, 1992, Ser. No. 904,407

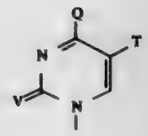
Int. Cl.[6] A61K *31/495*; C07D *239/02;403/00*; C07F *9/02*

U.S. Cl. 514—252 16 Claims

1. A compound of the formula:



wherein B is



wherein V is O or S;

Q is (i) —OH or (ii) —NH; and

T is (i) hydrogen, (ii) C_1 to C_{10} alkyl,

(iii) 2-haloethyl, (iv) halomethyl, (v) difluoromethyl,

(vi) trifluoromethyl, (vii) halogen, (viii) vinyl,

(ix) 2-halovinyl or (x) alkynyl;

A is CH and D and G are —CH_2OH; or a pharmaceutically acceptable salt or ester thereof.

5,597,825

BIPHENYL DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS AND PROCESSES FOR PREPARING THEM

Frank Himmelsbach, Mittelbiberach; Helmut Pieper; Volkhard Austel, both of Biberach; Günter Linz, Mittelbiberach; Thomas Müller, Biberach; Wolfgang Eisert, Biberach, and Johannes Weisenberger, Biberach, all of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

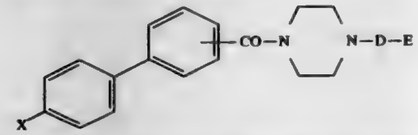
Continuation of Ser. No. 825,246, Jan. 24, 1992, abandoned. This application May 16, 1994, Ser. No. 257,759

Claims priority, application Germany, Jan. 24, 1991, 41 02 024.3

Int. Cl.[6] A61K *31/495;31/40;31/445*; C07D *295/185*

U.S. Cl. 514—255 8 Claims

1. A biphenyl compound of formula



wherein one of the tings of the biphenyl moiety can be mono- or disubstituted by R_1 and the other can be mono- or disubstituted by R_2, wherein

R_1 and R_2, which may be identical or different, are halogen atoms, alkyl, hydroxy, trifluoromethyl, amino, nitro, alkoxy, alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, alkylcarbonylamino, N-alkylalkylcarbonylamino, arylcarbonylamino, N-alkyl-arylcarbonylamino, alkylsulphonylamino, N-alkyl-alkylsulphonylamino, arylsulphonylamino or N-alkyl-arylsulphonylamino groups, wherein the aryl moiety is a phenyl ring which can be mono-, di- or trisubstituted by halogen atoms, hydroxy, amino, alkyl, alkoxy, alkylsulphenyl, alkylsulphinyl, alkylsulphonyl, alkylcarbonylamino and alkylsulphonylamino groups and each alkyl moiety has 1 to 3 carbon atoms, or R_1 and R_2 each are a naphthyl ring,

X is an amidino group,

D is a straight-chained or branched C_{1-4}-alkylene group which can be mono- or polyunsaturated, and

E is a carboxy group or a C_{2-6}(alkoxycarbonyl) group wherein the alkoxy moiety can be substituted in the 1-, 2- or 3-position by a phenyl group (which can be mono- or disubstituted by the above-mentioned groups R_1 and R_2),

a stereoisomer thereof, or a mixture thereof, or a pharmaceutically acceptable salt thereof with inorganic or organic acid or base.

5,597,826

COMPOSITIONS CONTAINING SERTRALINE AND A 5-HT_{1D} RECEPTOR AGONIST OR ANTAGONIST

Harry R. Howard; John E. Macor; Bertrand L. Chenard; Jeffrey S. Sprouse, and David W. Schulz, all of New York, N.Y., assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 14, 1994, Ser. No. 306,230

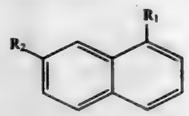
Int. Cl.[6] A01N *43/60*; A61K *31/495*

U.S. Cl. 514—255 13 Claims

1. A pharmaceutical composition for treating or preventing disorders arising from deficient or excessive serotonergic neurotransmission in a mammal, comprising:

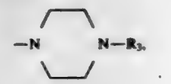
a) a pharmaceutically acceptable carrier;

b) a compound of the formula

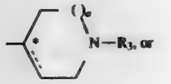


I

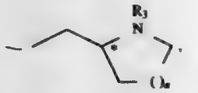
where R_1 is of the formula



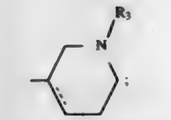
II



III



IV

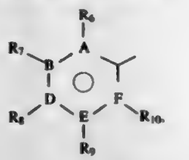


V

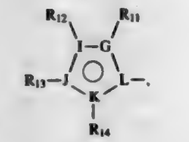
R_2 is —R_4, —O—R_4, —O—S(O)$_2$—R_4, —NR_4R_5, R_4—$(CH_2)_b$—NH(C=X)—$(CH_2)_c$—, R_4—$(CH_2)_b$—O(C=O)NH—$(CH_2)_c$—(C=O)NH—, R_4—(C=O)NH—(C=O)NH—, —$(CH_2)_b$—NH(C=X)—$(CH_2)_c$—R_4, R_4—$(CH_2)_b$—O(C=O)—$(CH_2)_c$—, —$(CH_2)_b$—O(C=O)—$(CH_2)_c$—R_4, —NH(C=X)NH—R_4, R_4—O(C=O)O—, —O(C=L)NH—R_4, R_4—O(C=O)NH—, —$(CH_2)_b$—(C=O)—$(CH_2)_c$—R_4, —NH—S(O)$_2$—R_4, —C(OH)R_4R_3, —CH(OH)—R_4, —(C=O)—NR_4R_5, —CN, —NO_2, substituted C_1 to C_6 alkyl, substituted or unsubstituted C_1 to C_6 alkenyl, or substituted or unsubstituted C_1 to C_6 alkynyl, said substituted moieties substituted with a moiety of the formulae —R_4, —R_4R_5, —O—R_4, or —S(O)$_d$—R_4;

R_3 is hydrogen, $CH_3OCH_2CH_2$, C_1 to C_6 alkyl, C_1 to C_6 alkylaryl, or aryl;

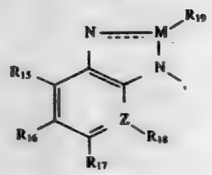
R_4 and R_5 are each, independently,



XV



XVI



XVII

hydrogen, —CF_3, C_1 to C_6 alkyl, or C_1 C_6 alkylaryl, with the proviso that when R_2 is —R_4 or —OR_4, R_4 is not hydrogen or C_1 to C_6 alkyl;

R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, and R_{18} are each independently H, halogen, —CF_3, —(C=O)R_{20}, —CN, —OR_{20}, —$NR_{20}R_{21}$, —$NR_{20}SO_2R_{22}$, —$N_{20}CO_2R_{22}$, —N=C—$N(CH_3)_2$, —S(O)$_2R_{20}$, —$SO_2NR_{20}R_{21}$, —NO_2, aryl, C_1 to C_6 alkylaryl, —(C=O)OR_{20}, —(C=O)$NR_{20}R_{21}$, C_1 to C_6 alkyl, C_1 to C_6 alkenyl, and C_1 to C_6 alkynyl;

R_6 and R_7, R_7 and R_8, R_8 and R_9, R_9 and R_{10}, R_{11} and R_{12}, R_{12} and R_{13}, R_{13} and R_{14}, R_{16} and R_{16}, R_{16} and R_{17}, and R_{17} and R_{18} may be taken together to form a five-to-seven-membered alkyl ring, a six-membered aryl ring, a five to seven membered heteroalkyl ring having one heteroatom of N, O, or S, or a five-to six-membered heteroaryl ring have 1 to 2 heteroatoms of N, O, or S;

R_{19} is hydrogen or C_1 to C_3 alkyl;

R_{20} and R_{21} are each independently hydrogen, C_1 to C_6 alkyl, aryl, or C_1 to C_6 alkylaryl, or may be taken together to form a C_4 to C_7 alkyl ring;

R_{22} is C_1 to C_6 alkyl, aryl, or C_1 to C_6 alkylaryl;

A, B, D, E, and F are each, independently, C, N, or (C=O);

G, I, J, and K are each, independently, C, N, O, S, or (C=O), with the proviso that there is at most one of O, (C=O), and S per ring;

L and Z are each, independently, C or N;

M is C, N, or (C=O);

X is O or S;

a is 0, 1 or 2;

e is 0, 1 or 2;

d is 0, 1, or 2;

b and c are each, independently, 0, 1, 2, 3, 4, 5, or 6, with b+c being at most 6;

a broken line indicates the presence optionally of a double bond and the above aryl groups and the aryl moieties of the above alkylaryl groups are independently selected from the group consisting of phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one to three groups selected from the group consisting of C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, intro, and C_1 to C_4 alkoxy;

and the pharmaceutically acceptable salts thereof; and

c) a 5-HT re-uptake inhibitor or a pharmaceutically acceptable salt thereof; wherein the active compounds "b" and "c" are present in amounts that render said pharmaceutical composition effective in treating or preventing such condition.

5,597,827

TREATMENT OF INJURY OF THE SPINAL CORD OR BRAIN USING 4-AMINO-2-(4-METHYLPIPERAZIN-1-YL)-5-(2,3,5-TRICHLOROPHENYL)PYRIMIDINE

Alistair A. Miller; Malcolm S. Nobbs; Richard M. Hyde, and Michael J. Leach, all of Langley Court, Beckenham, Kent, England

Division of Ser. No. 444,963, Dec. 4, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,146

Claims priority, application United Kingdom, Dec. 7, 1988, 8828620; Apr. 14, 1989, 8908561; Aug. 18, 1989, 8918093

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—255 **11 Claims**

1. A method of treating a mammal who has suffered physical injury or trauma of the spinal cord or brain, which method comprises administering to said mammal a nontoxic effective amount of 4-amino-2-(4-methylpiperazin-1-yl)-5-(2,3,5-trichlorophenyl)pyrimidine or a pharmaceutically acceptable acid addition salt thereof.

5,597,828

CERTAIN 2,4-DIAMINO-5-(2,3-DIHALOPHENYL)-6-SUBSTITUTED PYRIMIDINES WHICH ARE PHARMACOLOGICALLY ACTIVE CNS COMPOUNDS

Alistair A. Miller; Malcolm S. Nobbs; Richard M. Hyde, and Michael J. Leach, all of Beckenham, England, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

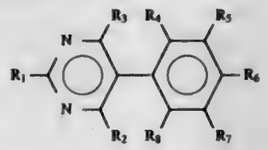
Division of Ser. No. 444,963, Dec. 4, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,951

Claims priority, application United Kingdom, Dec. 7, 1988, 8828620.8; Apr. 14, 1989, 8908561.7; Aug. 18, 1989, 8918893.2

Int. Cl.[6] A61K *31/505*; C07D *239/48*

U.S. Cl. 514—275 **18 Claims**

1. A pyrimidine of formula (I):



(I)

wherein:

R_1 is selected from the group consisting of NH_2, N—(C_1–C_6 alkyl)amino and N,N-di(C_1–C_6 alkyl)amino;

R_2 is NH_2;

R_3 is trifluoromethyl or —CH_2X wherein X is selected from the group consisting hydroxy, C_1–C_6 alkoxy, phenoxy, benzyloxy and halo;

R_4 and R_5 are each halo; and

R_6 to R_8 are each hydrogen;

and pharmaceutically acceptable acid addition salts thereof.

5,597,829

LACTONE STABLE FORMULATION OF CAMPTOTHECIN AND METHODS FOR USES THEREOF

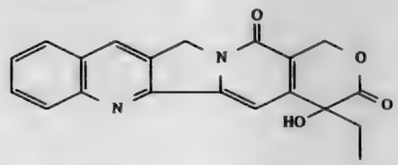
Frederick H. Hausheer, San Antonio, and Kochat Haridas, Houston, both of Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

Filed May 9, 1994, Ser. No. 240,035

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—283 **39 Claims**

1. A method for administration of a compound camptothecin having the formula



wherein said compound further comprises an effective amount of dimethylacetamide or an effective amount of dimethylisosorbide and an effective amount of a pharmaceutically acceptable acid selected from the group consisting of hydrochloric acid, tartaric acid, citric acid, succinic, fumaric, maleic acid, gluconic acid, ascorbic acid, taurocholic acid or a pharmaceutically acceptable salt thereof, an effective amount of and tacurocholic acid in an admixture with an effective amount of citric acid and wherein said method of administration to a patient with cancer comprises infusing from about 2.0 mg/m^2 to about 33.0 mg/m^2 of said compound over a duration of approximately 120 minutes every 21 to 28 days.

5,597,830

COMBINATION CHEMOTHERAPY

Wayne D. Kloke, and Charles D. Kowal, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1994, Ser. No. 359,488

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—283 **8 Claims**

1. A combination of antineoplastic agents useful for treating prostate cancer or breast cancer comprising effective synergistic amounts of suramin and vinblastine.

5,597,831

6-[X-(2-HYDROXYETHYL) AMINOALKYL]-5,11-DIOXO-5,6-DIHYDRO-11-H-INDENO[1,2-C]ISOQUINOLINES AND THEIR USE AS ANTINEOPLASTIC AGENTS

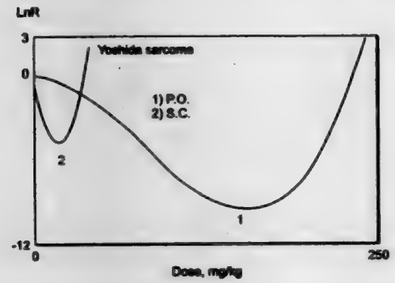
Jiří Michalský, deceased, late of Olomouc; Jiří Hrbata, Olšany; Jiří Křepelka, Praha; Milan Měška, Hradec Králové; Milan Mika, Bratislava; Milan Hrubý; Milan Ferenc, both of Olomouc; Eva Skácelová, Hulvotín; Irena Kejhová, Praha; R ó žena Reichlová, Praha; Anna Kargerová, Praha; Jitka Šedivá, Praha; Alois Kolouličný, Pardubice, and Josef Urbanec, Hradec Králové, all of Czechoslovakia, assignors to VUFB a.s, Praha, Czechoslovakia

Continuation of Ser. No. 199,153, Jul. 13, 1994, abandoned. This application Sep. 26, 1995, Ser. No. 533,859

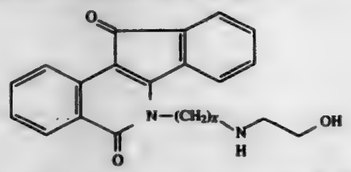
Claims priority, application Czechoslovakia, Aug. 29, 1991, 2669-91

Int. Cl.[6] C07D *221/18*; A61K *31/47*

U.S. Cl. 514—284 **5 Claims**



1. 6-[X-(2-hydroxyethyl)aminoalkyl]-5,11-dioxo-5,6- dihydro-11H-indeno[1,2-c]isoquinolines of the formula I



(I)

wherein X is a number from 0 to 5, or a pharmaceutically acceptable inorganic or organic acid addition salt thereof.

5,597,832

TETRACYCLIC COMPOUNDS AS DOPAMINE AGONISTS

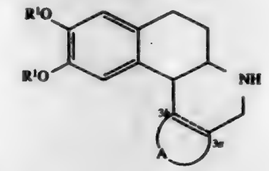
Michael R. Michaelides, Gurnee, Ill., and Yufeng Hong, San Diego, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 209,982, Mar. 17, 1994, abandoned, which is a continuation-in-part of Ser. No. 43,424, Apr. 6, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,348

Int. Cl.[6] A01N *43/90*; C07D *471/00*; *487/00*; *498/00*

U.S. Cl. 514—285 **11 Claims**

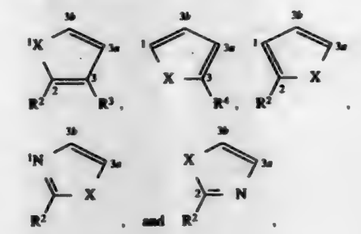
1. A compound of the formula:



or a pharmaceutically-acceptable salt, ester or carbamate thereof, wherein:

R^1 is hydrogen or a prodrug moiety;

A and the atoms to which it is attached are selected from the group consisting of:



wherein:

X is sulfur or oxygen,

R^2 is hydrogen, C_1, CF_3, C_1–C_6-alkyl, C_3–C_7-cycloalkyl, —CH_2—C_3–C_5-cycloalkyl, phenyl or thienyl;

R^3 is hydrogen, or when R^2 is hydrogen, Cl, C_1–C_6-alkyl or CF_3, then R^3 is additionally Cl, C_1–C_5-alkyl or CF_3; and

R^4 is hydrogen, Cl, C_1–C_6-alkyl, or C_3–C_7-cycloalkyl.

5,597,833

SUBSTITUTED QUINOL-2-YL-METHOXY-PHENYLACETIC ACID DERIVATIVES

Michael Matzke; Klaus-Helmut Molzer, both of Wuppertal; Siegfried Raddatz; Romanis Fruchtmann, both of Cologne; Reiner Müller-Peddinghaus, Bergisch Gladbach, and Armin Hatzelmann, Constance, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

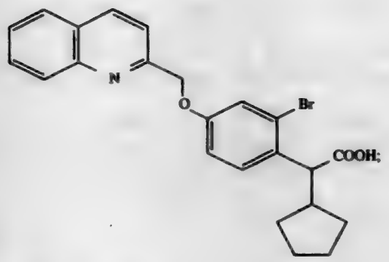
Filed Aug. 4, 1993, Ser. No. 102,453

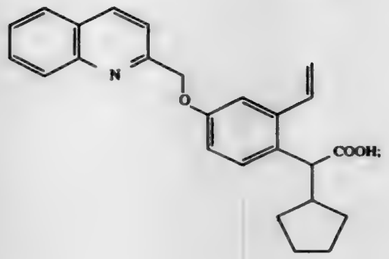
Claims priority, application Germany, Aug. 11, 1992, 42 26 519.3

Int. Cl.[6] C07D *215/14*; A61K *31/47*

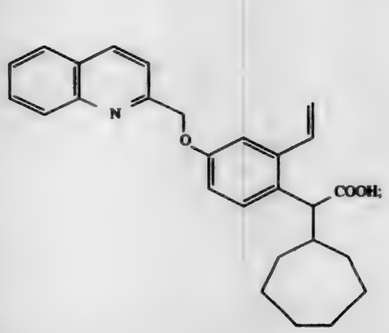
U.S. Cl. 514—312 **4 Claims**

1. A compound selected from the group consisting of compounds of the formula:





and



or a pharmaceutically acceptable salt thereof.

5,597,835

ACYL COA:CHOLESTEROL ACYLTRANSFERASE INHIBITORS

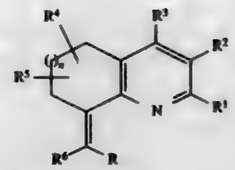
Song H. Bok; Tae S. Jeong; Sung U. Kim; Byoung M. Kwon; Young K. Kim; Kwang H. Seo; Hang W. Lee, and Yong K. Kwon, all of Daejeon, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Oct. 7, 1994, Ser. No. 320,708

Claims priority, application Rep. of Korea, Oct. 8, 1993, 1993-20836

Int. Cl.[6] A61K *31/44*; C07D *405/00*

U.S. Cl. 514—338 3 Claims



(I)

or a salt thereof, wherein R represents an optionally substituted heteroaryl radical, wherein a heteroatom is nitrogen R^1, R^2 and R^3 each independently represent hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, (C_1–C_6alkoxy)carbonyl, carboxy, hydroxy (C_1–C_6)alkyl, halogen, halo(C_1–C_6)alkyl, carboxy(C_1–C_6)alkyl, optionally substituted aryl or optionally substituted aralkyl;

n represents 1;

R^4 and R^5 each independently represent hydrogen or a substituent selected from lower alkyl, optionally substituted aryl and optionally substituted aralkyl or R^4 and R^5 are geminal C_1–C_6 alkyl substituents and R^6 is hydrogen or C_1–C_6 alkyl.

5,597,834

Z-BENZYLIDENE-TETRAHYDROQUINOLINES AND ANALOGUES THEREOF

Roger Crossley, Woodley, and Albert Opalko, Maidenhead, both of England, assignors to American Home Products Corporation, Madison, N.J.

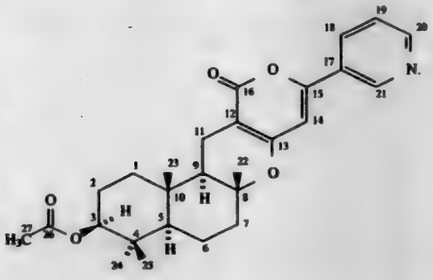
Filed Dec. 1, 1994, Ser. No. 347,758

Claims priority, application United Kingdom, Dec. 1, 1993, 9324653

Int. Cl.[6] C07D *215/12*; A61K *31/47*

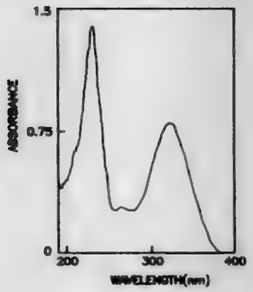
U.S. Cl. 514—314 11 Claims

1. A compound having the Z-configuration of formula:



(I)

1. A compound of formula (I), GERI-BP001:



5,597,836

N-(4-PYRIDYL) (SUBSTITUTED PHENYL) ACETAMIDE PESTICIDES

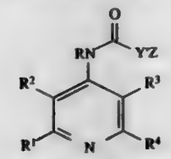
Ronald E. Heckler, and Peter L. Johnson, both of Indianapolis, Ind., assignors to DowElanco, Indianapolis, Ind.

Division of Ser. No. 932,405, Aug. 19, 1992, Pat. No. 5,399,564, which is a continuation-in-part of Ser. No. 753,519, Sep. 3, 1991, abandoned. This application Feb. 7, 1995, Ser. No. 385,029

Int. Cl.[6] C07D *213/72;213/75;213/81*; A01N *43/40*

U.S. Cl. 514—352 12 Claims

1. A compound of the formula (1):



(1)

or an N-oxide or a salt thereof, wherein

R is H or C_1–C_4 alkyl;

R^1, R^2, R^3, and R^4 are one of the following:

a) R^3 and R^4 are H, and R^1 and R^2 are independently halo or C_1–C_4 alkyl;

b) one of R^1, R^2, R^3, and R^4 is C_1–C_4 alkyl and the rest are H; or

c) R^1, R^2, R^3, and R^4 are independently H or halo;

Y' is CH_2;

Z is phenyl group optionally substituted with one or two groups independently selected from:

halo,

phenoxy, optionally substituted with one or two groups selected from halo, CN, NO_2, C_1–C_4-alkoxy, C_1–C_4 alkyl, or C_1–C_4 haloalkyl;

phenyl,

C_1–C_{12} alkyl, straight chain or branched,

C_1–C_4 haloalkyl,

C_1–C_4 alkoxy;

C_3–C_7 branched alkoxy,

halo C_1–C_6 alkoxy,

halo C_3–C_7 branched alkoxy.

5,597,837

METHOD AND COMPOSITION FOR TREATING PSORIASIS WITH STYRYL-SUBSTITUTED PYRIDYL COMPOUNDS

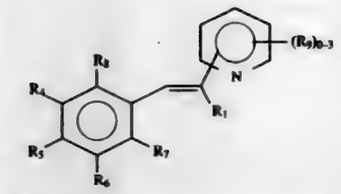
Alfred P. Spada, Lansdale, and Paul E. Persons, King of Prussia, both of Pa., assignors to Rhône-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Division of Ser. No. 685,854, Apr. 16, 1991, Pat. No. 5,302,606, which is a continuation-in-part of Ser. No. 509,942, Apr. 16, 1990, abandoned. This application Apr. 11, 1994, Ser. No. 225,755

Int. Cl.[6] C07D *213/57*; A61K *31/44*

U.S. Cl. 514—357 6 Claims

1. A method for the treatment of psoriasis in a patient suffering such disorder comprising administering to said patient a pharmaceutically effective amount of a pharmaceutical composition containing, in admixture with a pharmaceutically acceptable carrier, a compound of the formula



II

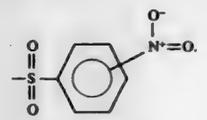
wherein:

R_1 is —CN,—COOR, —CONRR or —CSNRR;

R is lower alkyl, —H or aralkyl;

R_4, R_5, R_6, R_7 and R_8 are each independently lower alkyl, —H, halo, lower alkoxy or —OH; and

each R_9 is independently lower alkyl, halo, lower alkoxy, —OH or



5,597,838

1-ALKYL-, 1-ALKENYL-, AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Harner, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

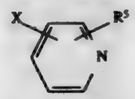
Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, abandoned, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,208, Mar. 13, 1990, abandoned. This application Apr. 21, 1995, Ser. No. 426,759

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—357 1 Claim

1. A method of relieving memory dysfunction in mammals comprising administering to a mammal requiring memory dysfunction relief, a memory dysfunction relieving effective amount of a compound of the formula

$RCH(OR^1)CH(NR^2R^3)R^4$ or $RCH_2CR^{35}(NR^2R^3)R^4$ wherein R is



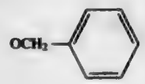
wherein R^5 is $CH_3(CH_2)_mC{\equiv}C$ wherein m is 3 to 15 and X is hydrogen, hydroxy, loweralkyl, loweralkoxy, halogen or trifluoromethyl, or



wherein R^{23} is loweralkyl; R^1 is hydrogen, loweralkyl,

wherein R^{24} is loweralkyl or

wherein R^6 is hydrogen, loweralkyl, loweralkoxy, $N(R^{21})_2$ wherein R^{21} is hydrogen, loweralkyl or



R^2 is hydrogen or loweralkyl; R^3 is hydrogen, loweralkyl or

wherein R^6 is as above or NHR^{27} wherein R^{27} is loweralkyl; R^4 is



wherein R^7 is hydrogen, loweralkyl or $C(R^{25})^2OR^8$ wherein R^8 is hydrogen, loweralkyl or

wherein R^6 is as above and R^{25} is hydrogen or loweralkyl; the optical isomers thereof, or the pharmaceutically acceptable salts thereof.

5,597,839

DI(AROMATIC) COMPOUNDS AND THEIR USE IN HUMAN AND VETERINARY MEDICINE AND IN COSMETICS

Jean-Michel Bernardon, Nice, and William R. Pilgrim, Valbonne, both of France, assignors to Centre International de Recherches Dermatologiques Galderma (Cird Galderma), Valbonne, France

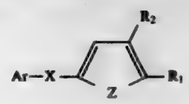
Division of Ser. No. 167,145, Dec. 16, 1993, Pat. No. 5,439,925, which is a division of Ser. No. 859,522, Aug. 4, 1992, Pat. No. 5,387,594. This application Apr. 28, 1995, Ser. No. 430,615

Claims priority, application Luxembourg, Oct. 12, 1990, 87821

Int. Cl.[6] A61K *31/165;31/19;31/235;* **C07C** *69/76*

U.S. Cl. 514—357 **21 Claims**

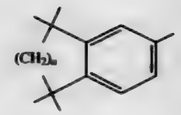
1. A di(aromatic) compound having the formula



(I)

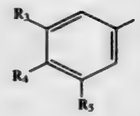
wherein

Ar represents



(II)

wherein n=1 or 2 or



(III)

wherein

R_3 and R_5 represent hydrogen, OH, alkoxy having 1–6 carbon atoms, α-branched alkyl having from 3–12 carbon atoms, α,α-branched alkyl having from 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, or mono- or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted,

R_4 represents hydrogen, OH, alkoxy having 1–6 carbon atoms, α -branched alkyl having 3–12 carbon atoms, α,α-branched alkyl having 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, moso-or polycyclic cycloalkyl having 5–12 carbon atoms in which the carbon having the free valence is trisubstituted, monohydroxyalkyl, polyhydroxyalkyl, fluorine, chlorine, SH, SR_6, SOR_6, SO_2R_6, alkenyl having 2–6 carbon atoms or alkenyloxy having 2 to 6 carbon atoms,

R_6 represents lower alkyl,

R_1 represents OH, $—CH_3$, $—CH_2OH$, $—CH(OH)CH_3$, $—CH_2OCOR_8$, $—SO_2R_9$, $—SOR_9$ or $—SR_9$,

R_{10} represents alkyl having 1–12 carbon atoms or alkenyl having 2–12 carbon atoms,

r' and r", each independently, represent hydrogen, lower alkyl, aryl, aralkyl, an amino acid residue, a sugar residue, an amino sugar residue or a heterocycle, or r' and r" taken together form a heterocycle,

R_8 represents a saturated or unsaturated, linear or branched alkyl having 1–20 carbon atoms or a sugar residue,

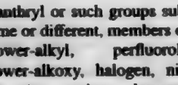
R_9 represents OH, lower alkyl or $—N(r'r")$,

R_2 represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine, CF_3 , CH_2OH or CH_2OR_6 wherein R_6 has the meaning given above,

Z represents an oxygen atom, a sulphur atom, $—CH=CR_{11}—$, $—N=CH—$ or $—N=CR_6—$ wherein R_6 has the meaning given above,

R_{11} represents hydrogen, OH, lower alkyl, alkoxy having 1–6 carbon atoms, fluorine, chlorine or CF_3, and

X represents a divalent radical which can be read from left to right or vice versa and has the formula



wherein

R' represents hydrogen or $—CH_3$,

W represents an oxygen or sulfur atom or —NR',

Y represents an oxygen atom or alternatively a sulphur atom when W represents —NR'.

5,597,840

MICROEMULSION FORMULATION FOR INJECTION INTO TREES

Carolyn E. Moore, Kernersville, N.C., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jul. 7, 1994, Ser. No. 271,809

Int. Cl.[6] A01N *25/02*

U.S. Cl. 514—365 **11 Claims**

1. An agrachemical microemulsion composition suitable for microinjection into trees without dilution, said composition comprising:

a) a nonpolar fungicide selected from the group consisting of non-polar triazoles, non-polar carbamates, non-polar acetanilides, and non-polar imidazoles having a particle size in the microemulsion of between about 0.01 and about 0.1 microns;

b) a water-miscible solvent which is present in an amount between about 0.5 to about 5 parts by weight per part of the fungicide; and

c) an emulsifying agent which is present in an amount between about 0.2 to about 3 parts by weight per part of the fungicide.

5,597,841

2-SACCHARINYLMETHYL ARYL CARBOXYLATES USEFUL AS PROTEOLYTIC ENZYME INHIBITORS AND COMPOSITIONS AND METHOD OF USE THEREOF

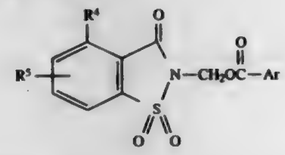
Richard P. Dunlap, Penfield; Neil W. Boaz, Waterloo; Albert J. Mura, Rochester, all of N.Y.; Virendra Kumar, Tredyffrin Township, Chester County, Pa.; Chakrapani Subramanyam; Ranjit C. Desai, both of Towamencin Township, Montgomery County, Pa.; Dennis J. Hlasta, Lower Salford Township, Montgomery County, Pa.; Manohar T. Saindane, Upper Providence Township, Montgomery County, Pa.; Malcolm R. Bell, East Greenbush, N.Y.; John J. Court, West Norriton, and Robert P. Farrell, East Vincent, both of Pa., assignors to Sterling Winthrop, Inc., New York, N.Y.

Division of Ser. No. 116,416, Sep. 3, 1993, Pat. No. 5,512,589, which is a continuation-in-part of Ser. No. 965,593, Oct. 23, 1992, Pat. No. 5,306,818, which is a continuation-in-part of Ser. No. 860,340, Mar. 30, 1992, Pat. No. 5,250,696, which is a division of Ser. No. 782,016, Oct. 24, 1991, Pat. No. 5,128,339, which is a continuation-in-part of Ser. No. 608,068, Nov. 1, 1990, abandoned. This application May 19, 1995, Ser. No. 445,118

Int. Cl.[6] A61K *31/425;* **C07D** *275/06*

U.S. Cl. 514—373 **20 Claims**

1. A composition which comprises a pharmaceutical carrier and an effective proteolytic enzyme inhibiting amount of a compound having the formula:



wherein:

Ar is phenyl, naphthyl or anthryl or such groups substituted by from one to three, the same or different, members of the group consisting of lower-alkyl, perfluorolower-alkyl, perchlorolower-alkyl, lower-alkoxy, halogen, nitro, cyano, carboxy, $PO(lower\text{-}alkoxy)_2$, amino, lower-alkylamino, dilower-alkylamino, lower-alkanoylamino, lower-alkoxycarbonyl, hydroxy, benzyloxy, carboxylower-alkoxy, —O—(alkylene)-1-lower-alkyl-4-piperidinyl, —O—(alkylene)-1-lower-alkyl-2- or 3-pyrrolidinyl, $—SO_2—N=B$, —CO—N=B, —(alkylene)—N=B, —COO(alkylene)—N=B, —NH—(alkylene)—N=B; —N(lower-alkyl)-(alkylene)—N=B or —O—(alkylene)—N= B, where N=B in each instance is amino, lower-alkylamino, dilower-alkylamino, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4 -benzyl-1-piperazinyl, 1-imidazolyl, carboxy-lower-alkylamino or —NR—(alkylene-N(alkyl))$_2$, where R is lower alkyl;

R^4 is hydrogen, halogen, lower-alkyl, perfluorolower-alkyl, perchlorolower-alkyl, polyfluorolower-alkyl, polychlorolower-alkyl, lower-alkenyl, lower-alkynyl, cyano, amino, lower-alkylamino, dilower-alkylamino, lower-alkoxy, benzyloxy, lower-alkoxycarbonyl, phenyl or carboxamido; and

R^5 is hydrogen or from one to two the same or different substituents in any of the 5-, 6- or 7-positions selected from halogen, cyano, nitro, N=B, 1-lower-alkyl-2-pyrrolyl, lower-alkylsulfonylamino, polyfluorolower-alkyl-sulfonylamino, polychlorolower-alkylsulfonylamino, aminosulfonyl, lower-alkyl, polyfluorolower-alkyl, polychlorolower-alkyl, cycloalkyl, lower-alkoxy, hydroxy, carboxy, carboxamido, hydroxylower-alkyl, methylenedioxy, cycloalkyloxy, formyl, aminomethyl, lower-alkylsulfonyl, polyfluorolower-alkylsulfonyl, polychlorolower-alkylsulfonyl, lower-alkylsulfonylaminosulfonyl, lower-alkoxypoly-lower-alkyleneoxy, benzyloxypolylower-alkyleneoxy, hydroxypoly-lower-alkyleneoxy, benzyloxylower-alkoxy, hydroxylower-alkoxy, polyhydroxylower-alkoxy or said hydroxy groups of polyhydroxylower-alkoxy substituted by benzyl; poly(lower-alkoxy)lower-alkoxy, —SR, —SOR, $—SO_2R$, —OCOR, —O—(alkylene)—COOR, —O—(alkylene)—COOH, —O—(alkylene)—N=B, $—O—C(R')_2COOH$, $—O—C(R')_2—COOR$, $—O—C(X')_2COOH$, $—O—C(X')_2COOR$, $—O—(CH_2)_nOC(O)(CH_2)_m—N=B$, $—O—(CH_2)_n—O—(CH_2)_nOC(O)(CH_2)_m—N=B$, $—O—(CH_2O)_m—A$, $—O—(CH_2)_n—((5-(CH_2)_n—N=B)-2$-furanyl), $—O—(CH_2)_n—(5-((CH_2)_n—N=B)-2$-thienyl), $—O—(CH_2)_n—(5-((CH_2)_n—N=B)-1-R-2$-pyrrolyl), $—O—(CH_2)_m—C(O)—N=B''$, $—O—(CH_2)_n—=—(CH_2)_n—N=B''$, $—O—(CH_2)_n—=—(CH_2)_n—N=B''$, aminosulfonyloxy, or dilower-alkylaminosulfonyloxy, wherein R is lower-alkyl, phenyl, benzyl, 1,1-diphenylmethyl, or naphthyl, or phenyl or napthyl substituted by from one to two substituents selected from lower-alkyl, lower-alkoxy or halogen; N=B has the meanings given above; each R' group is independently hydrogen, or lower-alkyl; X' is chlorine or fluorine; n is an integer from one to four; m is an integer from zero to four; A is an azetidinyl, pyrrolidinyl, or piperidinyl ring attached through any available carbon atom, or said ring substituted on nitrogen by an R substituent wherein R is as defined above; N=B" is amino, lower-alkylamino, dilower-alkylamino, dibenzylamino, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl, 4-tert-butoxycarbonyl-1-piperazinyl, 1-imidazolyl, or —NR"(alkylene)—N(alkyl)$_2$ wherein R" is hydrogen or lower-alkyl; and N=B'" is amino, lower-alkylamino, dilower-alkylamino, dibenzylamino, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl, 1-imidazolyl, or —NR"(alkylene)—N(alkyl)$_2$ wherein R" is hydrogen or lower-alkyl;

or R^5 is a 5- or 6-membered saturated ring fused to the saccharin at the 5,6 or 6,7 positions, said ring containing two heteroatoms chosen from the group consisting of nitrogen, oxygen and sulfur or a methylated derivative of said ring;

or acid-addition salts of basic members thereof or base-addition salts of acidic members thereof.

5,597,842

3-HETEROARYL-1-PYRROLIDINEALKANOLS AND DERIVATIVES THEREOF AND THEIR THERAPEUTIC UTILITY

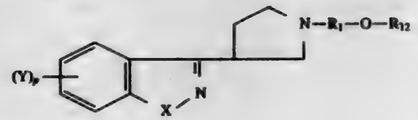
Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station; Joseph T. Strupczewski, Flemington, all of N.J.; Kenneth J. Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, and John J. Tegeler, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,088, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,438

Int. Cl.[6] A61K *31/495;31/44;31/55;31/505;* **C07D** *401/04;403/04;417/04;419/04;221/04;275/04;239/02*

U.S. Cl. 514—373 **14 Claims**

1. A compound of the formula:



wherein,

X is —O—, —S—, —NH—, or —N(R_2);

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, (C_2–C_{20}) cycloalkyl, aroyl, (C_2–C_{18}) alkanoyl, (C_1–C_{18}) alkoxycarboxyl and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—($CR_{23}R_{27}$)$_n$—, where n is 0,1,2 or 4; or

—CHR_{24}CH═CH—CHR_{24}—,

—CHR_{24}—C═C—CHR_{24}—,

—CHR_{24}—CH═CH—$CR_{23}R_{24}$—CHR_{24}—,

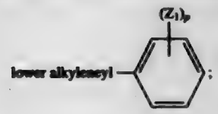
—CHR_{24}—$CR_{23}R_{24}$—CH═CH—CHR_{24}—;

—CHR_{24}—C═C—$CR_{23}R_{24}$—CHR_{24}—, or

—CHR_{24}—$CR_{23}CR_{24}$—C═C—CHR_{24},

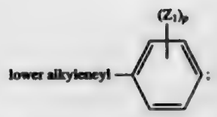
the —CH═CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18}) alkoxy, aryloxy, aryl (C_1–C_{18}) alkyloxy, (C_1–C_{18}) alkanoyloxy, hydroxy (C_1–C_6) alkyl, (C_1–C_{18}) alkoxy (C_1–C_6)alkyl, phenyl (C_1–C_6)alkyloxy, aryl (C_1–C_{18}) alkyloxy(C_1–C_6) alkyl, (C_1–C_{18}) alkanoyloxy(C_1–C_6)alkyl or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined;

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy (C_1–C_6) alkyl, (C_1–C_{18})alkoxy (C_1–C_6)alkyl, phenyl (C_1–C_6)alkyloxy, aryl (C_1–C_{18})alkyoxy(C_1–C_6)alkyl, (C_1–C_{18}) alkanoyloxy (C_1–C_6) alkyl or



where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C═O or C═S;

R_{12} is selected from the group consisting of:

hydrogen,

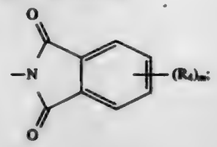
alkyl,

—C(═O)—(C_1–C_{18} straight chain or branched) alkyl,

—C(═O)—$NR_{13}R_{14}$,

—C(═O)—$NR_{15}R_{16}$,

—S(═O)$_2$—R_{17}, and



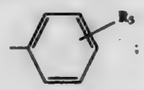
where R_{13} is selected from the group consisting of hydrogen and (C_1–C_{18})alkyl groups;

where R_{14} is selected from the group consisting of hydrogen and (C_1–C_{18})alkyl groups;

where $NR_{15}R_{16}$ taken together form a ring structure selected from the group consisting of piperidinyl, morpholinyl and piperazinyl;

where R_{17} is selected from the group consisting of (C_1–C_{18})alkyl and aryl groups;

aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4–C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or pharmaceutically acceptable acid addition salt thereof.

5,597,843

USE OF A SUBSTITUTED 1,3-BENZODIOXOLE TO REDUCE A WASTING CONDITION

Beverly E. Girten, San Diego, and Ronald R. Tuttle, Escondido, both of Calif., assignors to Houghten Pharmaceuticals, San Diego, Calif.

Filed Jun. 7, 1995, Ser. No. 485,609

Int. Cl.[6] A61K *31/42;31/36*

U.S. Cl. 514—376 **10 Claims**

1. A method of reducing a wasting condition in a subject, comprising administering to a subject having a wasting condition a therapeutically effective amount of a substituted 1,3-benzodioxole.

5,597,844

CIMETIDINE GRANULES COATED WITH A PARTIALLY HYDROGENATED VEGETABLE OIL

Sushil Chauhan; Gordon France, and John Buehler, all of SmithKline Beecham Corporation, Corporate Intellectual Property - U.S., UW2220, P.O. Box 1539, King of Prussia, Pa. 19406-0939

PCT No. PCT/EP93/03272, § 371 Date Jul. 14, 1995, § 102(e) Date Jul. 14, 1995, PCT Pub. No. WO94/12188, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 22, 1993, Ser. No. 446,708

Claims priority, application United Kingdom, Nov. 27, 1992, 9224855

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—400 **10 Claims**

1. A pharmaceutical composition comprising cimetidine granules coated with a partially hydrogenated vegetable oil or a chemical equivalent thereof, in an amount corresponding to at least 20% by weight relative to the cimetidine.

5,597,845

SUBSTITUTED ALKYLDIAMINE DERIVATIVES

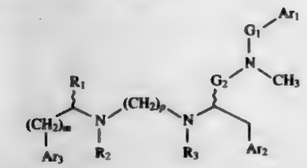
Timothy P. Burkholder, Fairfield; Elizabeth M. Kudlacz, and Tieu-Binh Le, both of Cincinnati, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 20, 1994, Ser. No. 262,209

Int. Cl.[6] C07D *209/18;407/06;* **A61K** *31/405*

U.S. Cl. 514—419 **40 Claims**

1. A compound of the formula



wherein

G_1 is —CH_2— or —C(O)—;

G_2 is —CH_2— or —C(O)—;

p is 2 or 3;

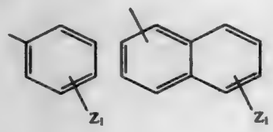
m is 0 or 1;

R_1 is hydrogen, C_1–C_4 alkyl, —CHO, —C(O)OR_4, or —C(O)NHR_4, wherein R_4 is hydrogen, benzyl, or C_1–C_4 alkyl;

R_2 is hydrogen, or C_1–C_4 alkyl,

R_3 is hydrogen or —C(O)OR_5 wherein R_5 is benzyl or C_1–C_4 alkyl;

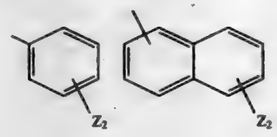
Ar_1 is a radical chosen from the group:



wherein

Z_1 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

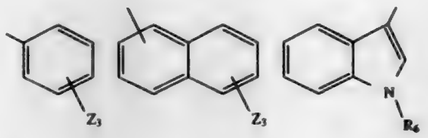
Ar_2 is a radical chosen from the group



wherein

Z_2 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy;

Ar_3 is a radical chosen from the group



wherein

Z_3 is from 1 to 3 substituents each independently chosen from the group consisting of hydrogen, halogen, benzyloxy, hydroxy, CF_3, C_1–C_4 alkyl, and C_1–C_4 alkoxy; R_6 is hydrogen, C_1–C_4 alkyl, —CHO, —C(O)NHR_7, —$(CH_2)_n$$NHC(NH)NH_2$, —$(CH_2)_n$$N(CH_3)_2$, or —C(O)$OR_8$, wherein n is 2 or 3, R_7 is hydrogen, benzyl, or C_1–C_4 alkyl, and R_8 is benzyl or C_1–C_4 alkyl;

or stereoisomers, or a pharmaceutically acceptable salt thereof.

5,597,846

RADICICOL DERIVATIVES, THEIR PREPARATION AND THEIR ANTI-TUMOR ACTIVITY

Yukio Sugimura; Kimio Ihac; Yoshio Tsujita; Yoko Shimada; Tomowo Kobayashi, all of Tokyo, and Takeshi Kaganaki, Iwaki, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 121,956, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 711,217, Jun. 6, 1991, abandoned. This application Sep. 23, 1994, Ser. No. 311,518

Claims priority, application Japan, Jun. 6, 1990, 2-146299

Int. Cl.[6] A61K *31/335;* **C07D** *313/00*

U.S. Cl. 514—450 **14 Claims**

1. A radicicol compound selected from the group consisting of

14,16-dilauroylradicicol,

14,16-ditridecanoylradicicol,

14,16-dimyristoylradicicol,

14,16-dipentadecanoylradicicol,

14,16-dipalmitoylradicicol,

14,16-diheptadecanoylradicicol,

14,16-distearoylradicicol,

14,16-dipalmitoleoylradicicol,

14,16-dioleoylradicicol,

14,16-dielaidoylradicicol and

14,16-dilinolenoylradicicol and salts thereof.

5,597,847

NITRIC ESTERS OF DERIVATIVES OF THE 2-(2,6-DI-HALO-PHENYLAMINO) PHENYLACETIC ACID AND PROCESS FOR THEIR PREPARATION

José A. Matji, and Antonio Alcalde, both of Madrid, Spain, assignors to Corlay S.L., Madrid, Spain, and Metgrove Ltd., Dublin, Ireland

PCT No. PCT/EP93/01986, § 371 Date Mar. 31, 1994, § 102(e) Date Mar. 31, 1994, PCT Pub. No. WO94/04484, PCT Pub. Date Mar. 3, 1994

PCT Filed Jul. 20, 1993, Ser. No. 211,447

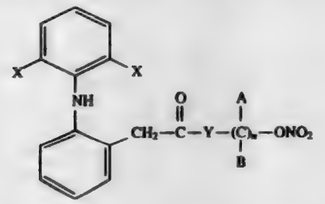
Claims priority, application Italy, Aug. 20, 1992, MI92A2006

Int. Cl.[6] A61K *31/21*; C07C *203/04*

U.S. Cl. 514—589 14 Claims

1. Derivatives of the 2-(2,6-di-halo-phenylamino)pheaylacetic acid, characterized in that they lave the following general formula:

(I)



wherein:

A and B are selected among hydrogen, linear or branched, substituted or non substituted alkyl chains, X is halogen selected among chlorine and bromine, Y is selected among oxygen, NH, NR_1, wherein R_1 is a linear or branched alkyl group, and n is comprised between 1 and 10.

5,597,848

BENZENESULFONAMIDE DERIVATIVES AND USE THEREOF

Yasuo Ito, Katsuyama; Hideo Kato, Fukui; Shingo Yasuda, Katsuyama; Nobuo Ogawa, Katsuyama; Shunichiro Sakurai, Katsuyama, and Tomio Suzuki, Fukui-ken, all of Japan, assignors to Hokuriku Seiyaku Co., Ltd., Katsuyama, Japan

PCT No. PCT/JP93/01382, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO94/07848, PCT Pub. Date Apr. 14, 1994

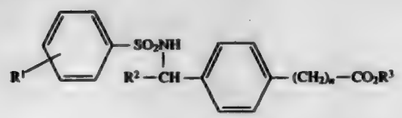
PCT Filed Sep. 29, 1993, Ser. No. 397,868

Claims priority, application Japan, Oct. 1, 1992, 4-284938; Jun. 11, 1993, 5-165041

Int. Cl.[6] A61K *31/24*

U.S. Cl. 514—539 11 Claims

1. A benzenesulfonamide derivative represented by the following general formula:



wherein R^1 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom; R^2 represents a C_2–C_{10} straight- or branched-chain alkyl group, a C_3–C_8 cycloalkyl group which may be substituted with one or more C_1–C_6 alkyl groups on its ring, a C_1–C_6 alkyl group substituted with one or more C_3–C_8 cycloalkyl groups, 1-adamantylmethyl group, 2-norbornylmethyl group, or a C_1–C_6 alkyl group substituted with one or more phenyl groups whose benzene ring may have one or more substituents; R^3 represents a hydrogen atom or a lower alkyl group; and n is an integer of from 2 to 4, and a pharmacologically acceptable salt thereof.

5,597,849

STICK FORMULATIONS FOR TOPICAL DRUG DELIVERY OF THERAPEUTIC AGENTS AND USES THEREOF

James W. McGinity, Austin; Thomas G. Gerding, Georgetown, both of Tex., and Roland Bodmeier, Berlin, Germany, assignors to Medical Polymer Technologies, Inc., Austin, Tex.

Filed Nov. 14, 1994, Ser. No. 345,051

Int. Cl.[6] A61K *31/135;7/32*

U.S. Cl. 514—648 21 Claims

1. A stick formulation comprising from about 40% to about 70% w/w wax, from about 10 to about 55% w/w oil, from about 1 to about 30% w/w water, a surfactant and an antihistamine, wherein said antihistamine is at least partially dissolved in water droplets dispersed in the wax.

5,597,850

SPONGE FOR THE ABSORPTION OF METAL IONS

Norman B. Rainer, 2008 Fondulac Rd., Richmond, Va. 23229

Filed Jul. 31, 1990, Ser. No. 561,006

The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.

Int. Cl.[6] C08J *5/20*

U.S. Cl. 521—29 4 Claims

1. A product comprised of an open celled sponge comprised of continuously interconnected cellulosic material having durably associated therewith between 15% and 60% by weight of said product of thermally insolubilized polyethyleneimine (PEI) derived from the interaction of PEI with a polycarboxylic acid, said sponge having a cuboid configuration comprised of a primary pair of parallel flat surfaces spaced apart by a distance representing an X axis having a length between 10 and 35 mm, and joined by a sidewall perimeter comprised of four sides orthogonally disposed to said primary flat surfaces and causing said sponge to have at least one plane of symmetry perpendicular to said primary surfaces and including the X axis, the shortest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Y axis, and the longest straight line distance spanning said perimeter while perpendicularly intersecting said X axis being considered to be a Z axis, the sum of the X and Y axes being in the range of 20–50 mm, said Z axis being between one and eight times the X axis and less than 119 mm.

5,597,851

METHOD FOR THE ADDITION OF VULCANIZED WASTE RUBBER TO VIRGIN RUBBER PRODUCTS

Robert A. Romine, Pasco, and Lesley J. Snowden-Swan, Benton City, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Sep. 14, 1995, Ser. No. 528,076

Int. Cl.[6] C12M *1/10*; C12R *1/07*

U.S. Cl. 521—41 20 Claims

1. A method for modifying a surface layer of a vulcanized rubber article, comprising the steps of:

(a) placing said vulcanized rubber article in contact with at least one thiophyllic microbe;

(b) converting sulfur in said surface layer of the vulcanized rubber article to sulfoxide or sulfone; and

(c) halting the converting (step (b)) to prevent further reaction of the sulfur to a sulfur compound that is non-reactive with virgin rubber; wherein

(d) said surface layer is devulcanized and contains partially oxidized sulfur, said surface layer remaining on a vulcanized core.

5,597,852

METHOD AND APPARATUS FOR REPROCESSING SOLID POLYESTER MATERIAL

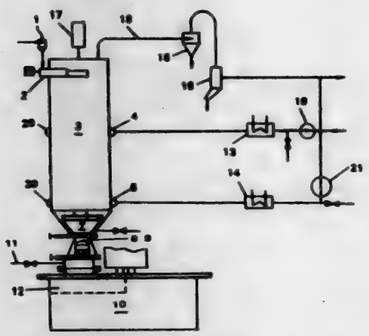
Reinhard Unger, Forst; Hartmut Stockmann, Weimar, and Karl-Heinz Wittner, Bad Blankenburg, all of Germany, assignors to Polymer Engineering GmbH, Germany

Filed Apr. 29, 1994, Ser. No. 235,297

Claims priority, application Germany, Apr. 30, 1993, 43 14 345.8

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—48.5 15 Claims



1. A method for reprocessing polyester waste, comprising the steps of:

(a) sintering the polyester waste to be reprocessed at a temperature of about 140° C. to about 210° C. in a stream of gas;

(b) mixing the sintered waste with a polyester having a degree of polycondensation within the range of about 50 to 135 and having hydroxyl end groups after heating to not more than 230° C.; and

(c) maintaining the mixture in a reactive state for a predetermined amount of time.

5,597,853

SILICONE RUBBER COMPOSITIONS

Kunio Itoh; Toshio Shinohara, and Masaharu Takahashi, all of Usui-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1994, Ser. No. 337,002

Claims priority, application Japan, Nov. 8, 1993, 5-302409; Feb. 17, 1994, 6-043195

Int. Cl.[6] C08K *9/06;5/54*

U.S. Cl. 523—213 14 Claims

1. A silicone rubber composition comprising

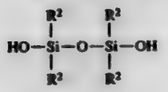
(A) an organopolysiloxane of the following general formula (1):

$$R^1_aSiO_{(4-a)/2} \quad (1)$$

wherein R^1 is a substituted or unsubstituted monovalent hydrocarbon group, 0.001 to 0.5 mol % of the R^1 group being an alkenyl group, and letter a is a positive number of 1.95 to 2.05, having an average degree of polymerization of at least 100,

(B) a reinforcing silica filler having a specific surface area of at least 50 m^2/g as measured by a BET method, and

(C) at least one wetter selected from compounds of the following general formulae (2), (3), and (4):

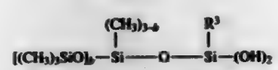


(2)

-continued



(3)



(4)

wherein R^2 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 10 carbon atoms, R^3 is a methyl, trimethylsiloxy, vinyl or trifluoropropyl group, and letter b is equal to 0, 1, 2 or 3.

5,597,854

LATENT LIGHT STABILIZERS

Jean-Luc Birbaum, Kobe, Japan; Gerhard Rytz, Bern; Vien Van Toan, Lentigny, both of Switzerland; Andreas Valet, Binzen, Germany, and Norbert Wilms, Urtenen, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Nov. 9, 1995, Ser. No. 556,159

Claims priority, application Switzerland, Nov. 14, 1994, 3410/94

Int. Cl.[6] C08K *5/3492*; C07D *403/00;251/02;251/00;234/02*; G03C *1/46*

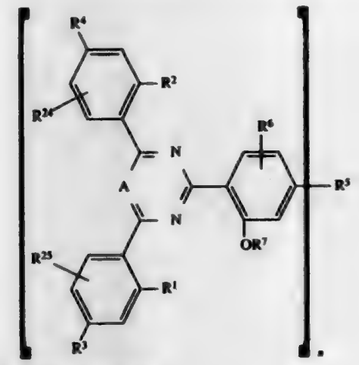
U.S. Cl. 524—100 16 Claims

1. A composition comprising

A) an organic material which is sensitive to damage by light, oxygen and/or heat and

B) a sufficient stabilizing amount of a compound of the formula I

(I)



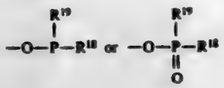
in which n is 1 or 2;

A is CH or a nitrogen atom;

R^1 and R^2, independently of one another, are H, C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, trifluoromethyl or OR^7;

R^3 and R^4, independently of one another, are H, C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, OR^{17}, phenyl, CN, halogen or OR^7;

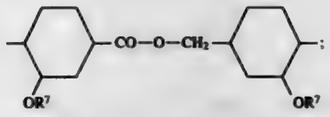
R^5, in the case where n=1, is as a monovalent radical C_6–C_{18}alkyl, C_1–C_{18}alkoxy, halogen, —O—CO—R^{12}, —O—SO_2—R^{13},



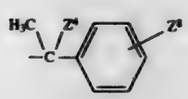
or R^5, in the case where n=1, is as defined for R^{17} or is —O—R^{17}, and R^5 as a monovalent radical in the case where

neither of the radicals R^1 and R^2 is OR^7 also comprises H or C_1–C_5alkyl;

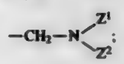
R^5, in the case where n=2, is as a divalent radical —O—G—O—, where G is C_2–C_{16}alkylene, C_4–C_{12}alkenylene, xylylene or C_3–C_{20}alkylene which is interrupted by —O— and/or is substituted by OR^7, or G is one of the groups $—CH_2CH(OR^7)CH_2O—R^{20}—OCH_2CH(OR^7)CH_2—$, —CO—$R^{21}$—CO—, —CO—NH—$R^{22}$—NH—CO— and $—(CH_2)_m—COO—R^{23}—OOC—(CH_2)_m—$, in which m is an integer in the range from 1 to 3, or is



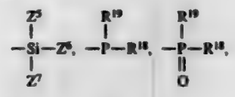
R^6 is H, C_2–C_{18}alkenyl, —X—Z^3, benzoyl which is unsubstituted or substituted on the phenyl ring by methyl, halogen, —CN or methoxy; or R^6 is halogen, —SR^{14}, SOR^{13}, —SO_2R^{13}, $—C(Z^5)=N—Z^3$, $—CH(Z^5)—NH—Z^3$, a radical of the formula



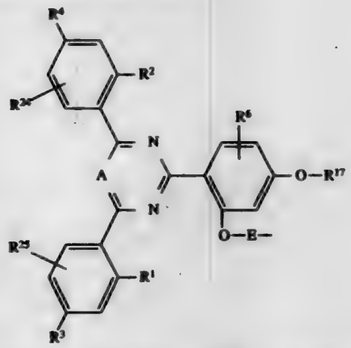
or a radical of the formula



R^7 is —CO—R^{11}, —SO_2—R^{13},

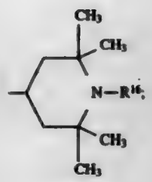


allyl or a group of the formula



in which E is C_3–C_{18}alkylene or C_4–C_{18}alkenylene;

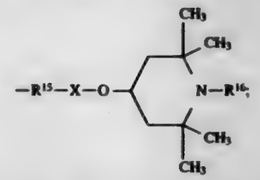
R^8 is C_1–C_{18}alkyl; C_3–C_{18}alkenyl; C_3–C_{20}alkyl which is interrupted by O, N or S and/or is substituted by OR^7; C_1–C_8alkyl which is substituted by —P(O)$(OR^{14})_2$, —N$(R^9)(R^{10})$, —$OCOR^{11}$ and/or OR^7; glycidyl; C_5–C_{12}cycloalkyl or C_7–C_{11}phenylalkyl; or a group of the formula



R^9 and R^{10}, independently of one another, are C_1–C_{12}alkyl, C_3–C_{12}alkoxyalkyl, C_4–C_{16}dialkylaminoalkyl or C_5–C_{12}cycloalkyl, or R^9 and R^{10} together are C_3–C_9alkylene or -oxaalkylene or -azaalkylene;

R^{11} is C_1–C_{18}alkyl, halogen-substituted C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_2–C_{18}alkenyl, —CH_2—CO—CH_3, C_7–C_{12}aralkyl, C_1–C_{12}alkoxy; or phenyl which is unsubstituted or substituted by C_1–C_{12}alkyl, C_1–C_8alkoxy, halogen and/or benzyl;

R^{12} is C_1–C_{18}alkyl, halogen-substituted C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, C_2–C_{18}alkenyl, phenyl or —R^{15}—O—CO—R^{11}, or is a group of the formula



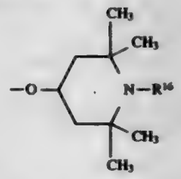
R^{13} is C_1–C_{12}alkyl, C_6–C_{10}aryl, or C_7–C_{18}alkylaryl;

R^{14} is C_1–C_{12}alkyl, phenyl or C_7–C_{15}phenylalkyl;

R^{15} is C_1–C_{18}alkylene or C_2–C_{18}alkenylene;

R^{16} is hydrogen, N-oxide, formyl, C_2–C_8alkanoyl, C_1–C_8alkyl, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkyl, C_5–C_{12}cycloalkoxy, C_7–C_{11}phenylalkyl, C_7–C_{11}phenylalkyl which is substituted on the phenyl ring by 1 to 3 C_1–C_4alkyl or C_1–C_8alkanoyl radicals, or is C_7–C_{11}phenylalkoxy;

R^{17} is C_5–C_{18}alkyloxycarbonyl, C_2–C_{18}alkenyl or C_1–C_{18}alkyl which is substituted by OR^7, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_2–C_{18}alkanoyl, C_2–C_8alkenyloxy, halogen, —$COOR^8$, —$CONH_2$, —$CONHR^9$, —$CON(R^9)(R^{10})$, —NHR^9, —$N(R^9)(R^{10})$, —NHCOR^{11}, —CN, —$OCOR^{11}$, a group of the formula



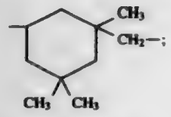
and/or phenoxy which is unsubstituted or substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen, or R^{17} is C_3–C_{50}oalkyl which is interrupted by O or may be substituted by OR^7, or is glycidyl, C_5–C_{12}cycloalkyl, C_5–C_{12}cycloalkyl which is substituted by OR^7, C_1–C_8alkyl or —$OCOR^{11}$, or is C_7–C_{11}phenylalkyl which is unsubstituted or substituted by OR^7, Cl or CH_3;

R^{18} and R^{19}, independently of one another, are C_1–C_{12}alkoxy, pheaoxy, C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, benzyl, tolyl or phenyl;

R^{20} is C_2–C_{16}alkylene, C_4–C_{50}alkylene which is interrupted by —O—, or R^{20} is phenylene or a -phenylene-D-phenylene- group in which D is —O—, —S—, —SO_2—, —CH_2— or —$C(CH_3)_2$—;

R^{21} is C_2–C_{10}alkylene, C_6–C_{12}arylene, C_2–C_6alkenylene, or C_2–C_{10}alkylene which is interrupted by O or S;

R^{22} is C_2–C_{10}alkylene, phenylene, tolylene, diphenylenemethane or



R^{23} is C_2–C_{10}alkylene or C_4–C_{20}alkylene which is interrupted by —O—;

R^{24} and R^{25}, independently of one another, are H, C_1–C_{12}alkyl, C_2–C_6alkenyl, C_1–C_{12}alkoxy, C_3–C_{18}alkenyloxy, halogen, trifluoromethyl, C_7–C_{11}phenylalkyl, phenyl, phenyl which is substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen, or are phenoxy, or phenoxy which is substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen;

X is a direct bond or —CO—;

Z^1 and Z^2, independently of one another, are C_1–C_{12}alkyl or together are C_4–C_{16}alkylene, which may be interrupted by an oxygen atom;

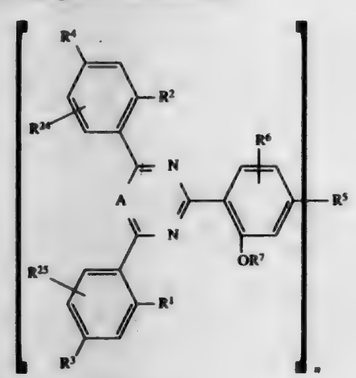
Z^3 is C_1–C_{20}alkyl or C_7–C_{15}phenylalkyl;

Z^4 and Z^9, independently of one another, are hydrogen or methyl; and

Z^5, Z^6 and Z^7, independently of one another, are C_1–C_{18}alkyl, cyclohexyl, pheayl or C_1–C_{18}alkoxy.

10. A composition according to claim 1, wherein component A is a thermoplastic polymer, a binder for coatings or a photographic material.

12. A compound of the formula Ia



(Ia)

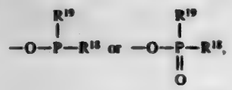
in which n is 1 or 2;

A is CH or a nitrogen atom;

R^1 and R^2, independently of one another, are H, C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, trifluoromethyl or OR^7;

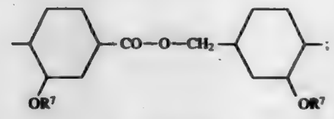
R^3 and R^4, independently of one another, are H, C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, OR^{17}, halogen or OR^7;

R^5, in the case where n=1, is as a monovalent radical C_6–C_{18}alkyl, C_1–C_{18}alkoxy, halogen, —O—SO_2—R^{13},

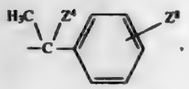


or R^5, in the case where n=1, is as defined for R^{17} or is —O—R^{17}, and R^5 as a monovalent radical in the case where neither of the radicals R^1 and R^2 is OR^7 also compriaes H, C_1–C_5alkyl;

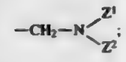
R^5, in the case where n=2, is as a divalent radical —O—G—O—, where G is C_2–C_{16}alkylene, C_4–C_{12}alkenylene, xylylene or C_3–C_{20}alkylene which is interrupted by —O— and/or is substituted by OR^7, or G is one of the groups $—CH_2CH(OR^7)CH_2O—R^{20}—OCH_2CH(OR^7)CH_2—$, —CO—$R^{21}$—CO—, —CO—NH—$R^{22}$—NH—CO— and $—(CH_2)_m—COO—R^{23}—OOC—(CH_2)_m—$, in which m is an integer in the range from 1 to 3, or is



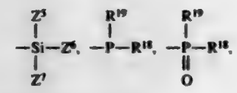
R^6 is H, C_2–C_{18}alkenyl, —X—Z^3, benzoyl which is unsubstituted or substituted on the pheayl ring by methyl, halogen, —CN or methoxy, or R^6 is halogen, —SR^{14}, —SOR^{13}, —SO_2R^{13}, $—C(Z^5)=N—Z^3$, $—CH(Z^5)—NH—Z^3$, a radical of the formula



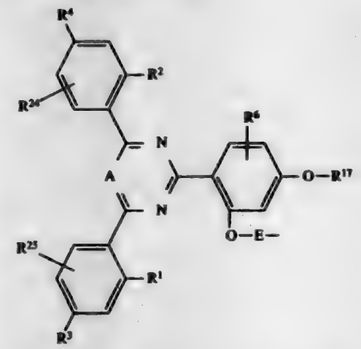
or a radical of the formula



R^7 is —CO—R^{11}, —SO_2—R^{13},

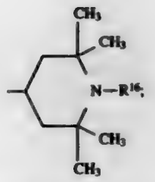


allyl or a group of the formula



in which E is C_3–C_{18}alkylene or C_4–C_{18}alkenylene;

R^8 is C_1–C_{18}alkyl, C_3–C_{18}alkenyl, C_3–C_{20}alkyl which is interrupted by O, N or S and/or is substituted by OR^7, or R^8 is C_1–C_8alkyl which is substituted by —P(O)$(OR^{14})_2$, —N$(R^9)(R^{10})$, —$OCOR^{11}$ and/or OR^7, or R^8 is glycidyl, C_5–C_{12}cycloalkyl or C_7–C_{11}phenylalkyl, or a group of the formula



R^9 and R^{10}, independently of one another, are C_1–C_{12}alkyl, C_3–C_{12}alkoxyalkyl, C_4–C_{16}dialkylaminoalkyl or C_5–C_{12}cycloalkyl, or R^9 and R^{10} together are C_3–C_9alkylene or -oxaalkylene or -azaalkylene;

R^{11} is C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl, halogen-substituted C_1–C_{18}alkyl, C_2–C_{18}alkenyl, —CH_2—CO—CH_3, C_7–C_{12}aralkyl, C_1C_{12}alkoxy, or phenyl which is unsubstituted or substituted by C_1–C_{12}alkyl, C_1–C_4alkoxy, halogen and/or benzyl;

R^{13} is C_1–C_{12}alkyl, C_6–C_{10}aryl or C_7–C_{18}alkylaryl;

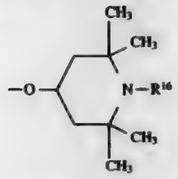
R^{14} is C_1–C_{12}alkyl, phenyl or C_7–C_{15}phenylalkyl;

R^{15} is C_1–C_{18}alkylene or C_2–C_{18}alkenylene;

R^{16} is hydrogen, N-oxide, formyl, C_2–C_8alkanoyl, C_1–C_{18}alkyl, C_1–C_{18}alkoxy,

C_5–C_{12}cycloalkyl, C_5–C_{12}cycloalkoxy, C_7–C_{11}phenylalkyl, C_7–C_{11}phenylalkyl which is substituted on the phenyl ring by 1 to 3 C_1–C_4alkyl or C_1–C_8alkanoyl radicals, or is C_7–C_{11}phenylalkoxy;

R^{17} is C_5–C_{18}alkyloxycarbonyl, C_2–C_{18}alkenyl or C_1–C_{18}alkyl which is substituted by OR^7, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_2–C_{18}alkanoyl, C_2–C_8alkenyloxy halogen, —$COOR^8$, —$CONH_2$, —$CONHR^9$, —$CON(R^9)(R^{10})$, —NHR^9, —$N(R^9)(R^{10})$, —$NHCOR^{11}$, —CN, —$OCOR^{11}$, a group of the formula



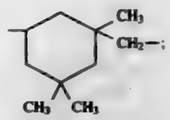
and/or phenoxy which is unsubstituted or substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen, or R^{17} is C_3–C_{50}alkyl which is interrupted by O and may be substituted by OR^7, or is glycidyl, C_5–C_{12}cycloalkyl, C_5–C_{12}cycloalkyl which is substituted by OR^7, C_1–C_4alkyl or —$OCOR^{11}$, or is C_7–C_{11}phenylalkyl which is unsubstituted or substituted by OR^7, Cl or CH_3;

R^{18} and R^{19}, independently of one another, are C_1–C_{12}alkoxy, phenoxy, C_1–C_{12}alkyl, C_5–C_7cycloalkyl, benzyl, tolyl or phenyl;

R^{20} is C_2–C_{10}alkylene, C_4–C_{50}alkylene which is interrupted by —O—, phenylene or a -phenylene-D-phenylene- group in which D is —O—, —S—, —SO_2—, —CH_2— or —$C(CH_3)_2$—;

R^{21} is C_2–C_{10}alkylene, C_2–C_{10}alkylene which is interrupted by O or S, or is C_6–C_{12}arylene or C_2–C_6alkenylene;

R^{22} is C_2–C_{10}alkylene, phenylene, tolylene, diphenylenemethane or



R^{23} is C_2–C_{10}alkylene or C_4–C_{20}alkylene which is interrupted by —O—;

R^{24} and R^{25}, independently of one another, are H, C_1–C_{12}alkyl, C_2–C_6alkenyl, C_1–C_{12}alkoxy, C_3–C_{18}alkenyloxy, halogen, trifluoromethyl, C_7–C_{11}phenylalkyl, phenyl, phenyl which is substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen, or are phenoxy, or phenoxy which is substituted by C_1–C_{18}alkyl, C_1–C_{18}alkoxy or halogen;

X is a direct bond or —CO—;

Z^1 and Z^2, independently of one another, are C_1–C_{12}alkyl or together are C_4–C_{10}alkylene, which may be interrupted by an oxygen atom;

Z^3 is C_1–C_{20}alkyl or C_7–C_{15}phenylalkyl;

Z^4 and Z^6, independently of one another, are hydrogen or methyl; and

Z^5, Z^6 and Z^7, independently of one another, are C_1–C_8alkyl, cyclohexyl, pheayl or C_1–C_{18}alkoxy.

5,597,855

POLY(PENTAERYTHRITYL DIPHOSPHONATE) AND ITS USE IN SELF-EXTINGUISHING THERMOPLASTIC COMPOSITIONS

William Giraldini; Antonio Rinaldi, both of S. Donato Milanese; Gianluigi Landoni, Milan, and Neri Carlo, S. Donato Milanese, all of Italy, assignors to Enrichcerche S.p.A., Milan, Italy

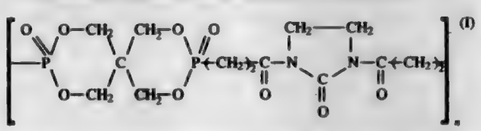
Filed May 24, 1995, Ser. No. 448,879

Claims priority, application Italy, May 27, 1994, MI94A1088

Int. Cl.[6] C08K *5/34;3/32;* **C07F** *9/06*

U.S. Cl. 524—105 **17 Claims**

1. Poly(pentaerythrityl diphosphonate) of formula (I):



(I)

wherein n is an integer comprised within the range of from 3 to 100.

5,597,856

HOT MELT INK FOR TRANSPARENCY APPLICATIONS

Kelvin W. Yu, West Hills, Calif., and Susan Schalitzel, Linthicum, Md., assignors to Dataproducts Corporation, Simi Valley, Calif.

Filed Sep. 24, 1993, Ser. No. 126,578

Int. Cl.[6] C08K *5/20;* **C09D** *11/10;11/12;11/02*

U.S. Cl. 524—227 **14 Claims**

1. A hot melt ink comprising a monoamide, an unsaturated amide, and a tetra-amide.

5,597,857

LOW-DUST GRANULES OF PLASTIC ADDITIVES

Daniel Thibaut, Michelbach-Le-Bas, France; Benjamin Breitenstein, Rheinfelden, Switzerland, and Linda Kirchberger, Franklin Lakes, N.J., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 365,262, Dec. 28, 1994, abandoned. This application Apr. 12, 1995, Ser. No. 420,388

Int. Cl.[6] C08K *5/09;* **C09K** *15/32*

U.S. Cl. 524—400 **29 Claims**

1. A low-dust granule of plastic additives, comprising at least 10% by weight of calcium stearate, where the water content of the calcium stearate is less than 2%, having a particle size distribution, in accordance with ISO 3435, of from 1 mm to 10 mm, a loose bulk density of greater than 400 g/l and a flowability in accordance with DIN 53492 of less than 15 s (tR25).

5,597,858

HYDROPHOBICALLY ASSOCIATING DISPERSANTS USED IN FORMING POLYMER DISPERSIONS

Mantan Ramesh, Lisle; Jeffrey R. Cramm, Winfield; Darrell L. Werges, Naperville, and Christopher P. Howland, Aurora, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

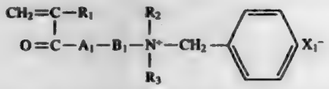
Division of Ser. No. 228,320, Apr. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 74,960, Jun. 10, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 408,764

Int. Cl.[6] C08L *13/02*

U.S. Cl. 524—458 **12 Claims**

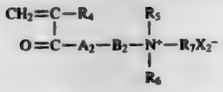
1. A process for polymerizing:

(a) a first cationic monomer represented by the formula:



where R_1 is either hydrogen or CH_3; R_2 and R_3 are each an alkyl group having 1 to 3 carbon atoms; A_1 is either an oxygen atom or NH; B_1 is either an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group, and X_1^- is an anionic counterion;

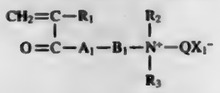
(b) a second cationic monomer represented by the formula:



where R_4 is either hydrogen or CH_3; R_5 and R_6 are each an alkyl group having 1 to 2 carbon atoms; R_7 is a hydrogen atom or an alkyl group having 1 to 2 carbon atoms; A_2 is either an oxygen atom or NH; B_2 is either an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group and X_2^- is an anionic counterion; and,

(c) (meth)acrylamide in an aqueous solution of a polyvalent anion salt which comprises: conducting said polymerization in the presence of a hydrophobically associating dispersant copolymer of diallyldimethylammonium chloride and a monomer selected from the group consisting of:

a. a monomer having the formula



where R_1 is either hydrogen or CH_3; R_2 and R_3 are each an alkyl group having 1 to 3 carbon atoms; A_1 is either an oxygen atom or NH; B_1 is either an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group, Q is benzyl, or C_6–C_{20} alkyl, and X_1^- is an anionic counterion; and,

b. an alkyl ester of acrylic acid.

5,597,859

SEED PROCESS FOR SALT DISPERSION POLYMER

John R. Hurlock, Hickory Hills, and Manian Ramesh, Naperville, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

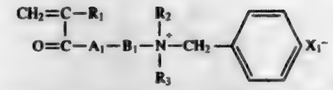
Division of Ser. No. 163,778, Dec. 9, 1993. This application May 19, 1995, Ser. No. 446,119

Int. Cl.[6] C08F *2/16;2/28;220/60;220/54*

U.S. Cl. 524—458 **14 Claims**

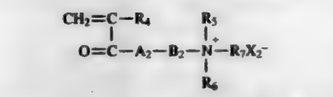
1. A process for preparing a water soluble polymer dispersion which comprises polymerizing a water soluble mixture which comprises:

a cationic monomer represented by the following general formula (I):



(I)

wherein R_1 is either hydrogen or CH_3; R_2 and R_3 are each an alkyl group having 1 to 3 carbon atoms: A_1 is either an oxygen atom or NH; B_1 is either an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group, and X_1^- is an anionic counterion, and/or a second cationic monomer represented by the following general formula (II):



(II)

where R_4 is either hydrogen or CH_3; R_5 and R_6 are each an alkyl group having 1 to 2 carbon atoms; R_7 is a hydrogen atom or an alkyl group having 1 to 2 carbon atoms; A_2 is either an oxygen atom or NH; B_2 is either an alkylene group having 2 to 4 carbon atoms or a hydroxypropylene group and X_2^- is an anionic counterion; and,

b. (meth)acrylamide in an aqueous solution of a polyvalent anion salt,

wherein said polymerization is carried out in the presence of a first dispersant polymer which comprises a copolymer of diallyldimethyl-ammonium chloride and a hydrophobic monomer selected from the group consisting of dialkylaminoalkylacrylates having C_6 to C_{20} quaternaries, dialkylaminoalkylmethacrylates having C_6 to C_{20} quaternaries, and alkyl esters of acrylic acid, and a second dispersant polymer which is a water soluble cationic copolymer composed of at least 20 mole percent of cationic monomer units represented by formula (II) above.

5,597,860

VULCANIZABLE RUBBER COMPOSITIONS AND VULCANIZED RUBBER

Masashi Aoshima; Hironobu Shigematsu; Takeru Wadaki, all of Ibaraki; Toshikatsu Kanehara, Ichinomiya; Kazuya Watanabe, Inazawa, and Toshiyuki Tanaka, Aichi, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, and Toyoda Gosei Co., Ltd., Aichi-ken, both of Japan

Continuation of Ser. No. 117,838, Sep. 7, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,708

Claims priority, application Japan, Jan. 8, 1992, 4-001397

Int. Cl.[6] C08L *53/02;23/26;* **C08F** *255/04*

U.S. Cl. 524—505 **7 Claims**

1. A vulcanized rubber obtained by vulcanizing a vulcanizable rubber composition comprising 100 parts by weight of a polymer component consisting of 30 to 80 wt. % of an ethylene-α-olefin-non-conjugated diene copolymer having a Mooney viscosity of 10 to 100 (ML_{1+4} 100° C.) and an iodine value of 20 to 45 and containing ethylene and α-olefin in a weight ratio of 50:50 to 90:10, and 20 to 70 wt. % of a non-hydrogenated styrene-conjugated diolefin block copolymer, 20 to 150 parts by weight of a reinforcing filler, 3 to 30 parts by weight of sulfur, 0 to 50 parts by weight of a styrene resin and 0 to 100 parts by weight of an extending oil.

5,597,861

WATERBORNE POLYESTER PAINT

Yasuhiko Nakae, Sakai; Shigeru Ishida, Osaka; Shoichi Mure, Neyagawa, and Yasuhiro Shibata, Yokohama, all of Japan, assignors to Nippon Paint Company, Ltd., Osaka, Japan

Filed Mar. 15, 1995, Ser. No. 404,569

Claims priority, application Japan, Mar. 16, 1994, 6-072551; Mar. 16, 1994, 6-072552

Int. Cl.[6] C08J *3/00;* **C08K** *3/20;* **C08L** *51/00;67/00*

U.S. Cl. 524—601 **18 Claims**

1. A water-based paint comprising

(a) polyester resin having an acid number from 5 to 150 and a hydroxyl number from 30 to 150 and containing a hydroxy-terminated polyalkadienediol having an average degree of polymerization from 5 to 50, a hydrogenated product of said polyalkadienediol or a mixture thereof in a proportion from 1 to 30% by weight of the entire polyester-forming reactants,

(b) a crosslinker for the resin,

(c) a neutralizing base, and

(d) an aqueous medium,

said polyester resin and said crosslinker being dispersed in said aqueous medium.

5,597,862

Patent Not Issued For This Number

5,597,863

IMMOBILIZED BUFFERED GELS AND MEMBRANES OF HYDROXY GROUPS CONTAINING POLYMERS

Charles Linder, Rehovot; Mara Nemas, Neve Monosson; Mordechai Perry, Petach Tikva, and Reuven Ketraro, Rishon Letzion, all of Israel, assignors to Aligena AG, Basel, Switzerland

Division of Ser. No. 67,617, May 27, 1993, Pat. No. 5,430,099. This application Apr. 5, 1995, Ser. No. 417,117

Claims priority, application United Kingdom, May 28, 1992, 92 11324.0

Int. Cl.[6] C08F *8/32*

U.S. Cl. 525—61 **7 Claims**

1. An immobilized buffered gel which comprises an optionally cross-linked matrix of a mixture of (I) and (II),

(I) being an acid reaction product of

(A) a hydroxy group containing neutral polymer which comprises a polysaccharide or a synthetic homo- or copolymer selected from the group consisting of a polyvinyl alcohol, a copolymer on the basis of vinylalcohol, a poly-(hydroxyalkyl)- or poly-(hydroxyalkoxyalkyl)-acrylate or -methacrylate, a homopolymer based on an N-(meth)acryloyl-tris-(hydroxyalkyl)aminomethane, a copolymer of a hydroxyalkylacrylate or -methacrylate, or a hydroxyalkoxyalkyl acrylate or -methacrylate and at least one comonomer, and a block co- or terpolymer of said (meth)acrylates and said at least one comonomer, and

(B) a reactive acid reaction product of

(a) an alkylamino carboxylic or alkylamino sulfonic acid, each independently containing 1 to 6 carbon atoms in the alkyl moiety, and

(b) a di- or triazine containing at least two nucleophilic leaving groups selected from the group consisting of a halogen atom, ammonium, sulfonium and sulfo, and

(II) being a basic reaction product of

(A) as hereinbefore defined and

(B') a reactive basic reaction product of

(c) an alkyl monoamine or an alkylene polyamine of 1 to 10 carbon atoms and

(b) a di- or triazine containing at least two nucleophilic leaving groups selected from the group consisting of a halogen atom, ammonium, sulfonium and sulfo.

5,597,864

SINGLE-LAYER OR MULTIPLE-LAYER SURFACE FOIL FOR LAMINATING ON SUBSTRATES

Dirk Leins, Grossburgwedel, Germany, assignor to Benecke-Kaliko AG, Hanover, Germany

Continuation-in-part of Ser. No. 253,154, Jun. 2, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 509,104

Claims priority, application Germany, Jun. 2, 1993, 9308242 U

Int. Cl.[6] C08L *55/02;67/04;51/04*

U.S. Cl. 525—64 **18 Claims**

1. A surface sheet having at least one layer for laminating on wood, plastic, metal or other substrates and having a colored, colorless or patterned base sheet of a thermoplastic plastic comprising:

a) an ABS copolymer having a MFI (220° C./10 kg) of approximately 2 to 12 g/10 minutes;

b) a polycaprolactone in an amount from about 1 to 16 parts by weight; and

c) from about 2 to 20 parts by weight of an elastomer-modified styrene-acrylonitrile copolymer (SAN) having an elastomer component of a grafted acrylate-rubber,

all parts by weight being based on 100 parts by weight of ABS polymer.

5,597,865

ADHESIVE BLENDS FOR POLYSTYRENE

Paul H. Jackson, Loveland, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Nov. 21, 1994, Ser. No. 342,889

Int. Cl.[6] C08L *31/04;33/06;51/06;53/02*

U.S. Cl. 525—71 **10 Claims**

1. An adhesive blend, consisting of a mixture of:

(a) about 60 wt. % to about 80 wt. % of an ethylene/ester copolymer selected from the group consisting of ethylene/vinyl acetate copolymers and ethylene/acrylate copolymers;

(b) about 20 wt. % to about 40 wt. % of an impact-modified polystyrene having a melt index according to ASTM D-1,238, Condition G in the range of about 0.5 g/10 min to about 12 g/10 min;

(c) about 4 wt % to about 16 wt. % of a styrene-ethylene/butylene-styrene (SEBS) block copolymer grafted with about 0.02 wt. % to about 20 wt. % of an ethylenically unsaturated carboxylic acid or anhydride grafting monomer; and

(d) optionally, an antioxidant.

5,597,866

PROPYLENE POLYMER COMPOSITIONS HAVING IMPROVED IMPACT STRENGTH

Donald A. White, Keasbey, N.J.; Hsien-Chang Wang, Bellaire, Tex., and Dongming Li, Webster, N.Y., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Jun. 30, 1995, Ser. No. 497,486

Int. Cl.[6] C08L *51/06;23/10;23/22*

U.S. Cl. 525—74 **18 Claims**

1. A thermoplastic polymer composition comprising a blend of:

a) a crystalline propylene polymer;

b) an interpolymer of a C_4 to C_7 isomonoolefin containing from about 0.5 to about 20 mole % of copolymerized para-alkylstyrene, said interpolymer present in said composition at a level of from about 1 to about 35 wt %, based on the polymer content of said composition, and from about 0 5 to about 15 wt % of an additive polymer comprising the amide reaction product of:

(i) a modified crystalline propylene polymer containing a grafted unsaturated organic compound, said unsaturated organic compound selected from the group consisting of an unsaturated carboxylic acid, an unsaturated carboxylic acid anhydride and mixtures thereof; and

(ii) a polyfunctional primary amine having one primary amine group and at least one hydroxyl, secondary amine or tertiary amine group.

5,597,867

THERMOPLASTIC ELASTOMER COMPOSITION

Motoyoshi Tsujimoto, Akashi, and Sumiya Miyake, Yokohama, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Division of Ser. No. 326,207, Oct. 20, 1994, abandoned. This application Dec. 11, 1995, Ser. No. 570,188

Claims priority, application Japan, Oct. 21, 1993, 5-263910; Dec. 1, 1993, 5-301795; Dec. 1, 1993, 5-301796

Int. Cl.[6] C08L *21/00;23/16;23/22*

U.S. Cl. 525—74 **10 Claims**

1. A thermoplastic elastomer composition obtained by dynamically heat-treating a mixture of (a) 100 parts by weight of a carbon-to-carbon double bond-containing rubber, (b) 5 to 300 parts by weight of a thermoplastic resin, (c) 0.5 to 30 parts by weight of an organo-siloxane crosslinking agent having at least two SiH groups in the molecule, (d) 0.001 to 20 parts by weight of a hydrosilylating catalyst and (e) 0.5 to 20 parts by weight of a compatibilizing agent, wherein

the carbon-to-carbon double bond-containing rubber (a) is an ethylene-α-olefin-non-conjugated diene copolymer rubber; the thermoplastic resin (b) is a crystalline olefin resin; and the compatibilizing agent (e) is at least one member selected from the group consisting of the following compatibilizing agents (e-11), (e-12) and (e-13):

(e-11): a compatibilizing agent prepared by melt-reacting a polypropylene resin having epoxy group as an essential component with at least one member selected from the group consisting of a maleic anhydride-modified resin having a maleic anhydride group in the molecule, ethylene copolymer having a maleic anhydride group in the molecule, styrene block copolymer having a maleic anhydride group in the molecule, a hydrogenated product thereof, styrene random copolymer having a maleic anhydride group in the molecule and a hydrogenated product thereof,

(e-12): a compatibilizing agent prepared by melt-reacting a polypropylene having maleic anhydride group in the molecule as an essential component with at least one epoxy-modified resin selected from the group consisting of polyethylene having an epoxy group in the molecule, ethylene copolymer having an epoxy group in the molecule, styrene block copolymer having an epoxy group in the molecule, a hydrogenated product thereof, styrene random copolymer having an epoxy group in the molecule and a hydrogenated product thereof, and

(e-13): a compatibilizing agent prepared by dynamically heat-treating, in the presence of a peroxide, a blend of a polypropylene as an essential component with at least one resin selected from the group consisting of polyethylene, ethylene copolymer, styrene block copolymer, a hydrogenated product thereof, styrene random copolymer and a hydrogenated product thereof.

5,597,868

POLYMERIC ANTI-REFLECTIVE COMPOUNDS

Roderick R. Kunz, Acton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 4, 1994, Ser. No. 206,595

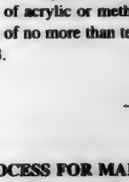
Int. Cl.[6] C08L *61/10;33/12*

U.S. Cl. 525—154 **8 Claims**

1. An anti-reflective, light-attenuating, photolithography coating composition comprising:

a phenol-formaldehyde novolac polymer which attenuates actinic radiation to inhibit reflection artifacts during photolithography; and

a polymer having a first repeating unit of methylmethacrylate, and having a second repeating unit selected from the group consisting of:



wherein R_1 represents a hydrogen, a halogen, a lower alkyl, or a halogenated lower alkyl and, R_2 represents a moiety containing an epoxide and selected from a group including alkyls, alkenyls, alkynyls, aryls, heterocycles, and polycycles;

said composition being about 30–70 percent by weight phenol-formaldehyde novolac polymer.

5,597,869

LOW-HAZE IONOMERS OF COPOLYMERS OF ALPHA-OLEFINS, CARBOXYLIC ACID ESTERS, AND OPTIONAL COMONOMERS, AND PROCESSES FOR MAKING AND ACIDIFYING THESE IONOMERS

James H. Wang, Appleton, Wis.; David Rosendale, Mauriceville, Tex.; Victor P. Kurkov, San Rafael, Calif.; Leslie P. Theard, Houston, Tex.; Ta Y. Ching, Novato, Calif.; Lewis R. Compton; Tor H. G. Palmgren, both of Orange, Tex., and Mitchell P. Eichelberger, The Woodlands, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 379,411, Jan. 27, 1995, which is a continuation-in-part of Ser. No. 330,290, Oct. 27, 1994, which is a continuation-in-part of Ser. No. 144,173, Oct. 27, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,338

Int. Cl.[6] C08F *8/42*

U.S. Cl. 525—192 **3 Claims**

1. A film comprising at least two layers, a first layer selected from the group consisting of polypropylene, polyethylene, linear low density polyethylene, and nylon and a second layer comprising a copolymer of alpha-olefins having from two to eight carbon atoms, esters of alpha, beta-ethylenically-unsaturated Carboxylic acids having from four to twenty-two carbon atoms, and metal salts of acrylic or methacrylic acid, wherein said copolymer has a haze of no more than ten percent as measured by ASTM method D 1003.

5,597,870

PROCESS FOR MAKING C_1-C_{22} DIALKYL ESTERS OF A COPOLYMER OF A MONOETHYLENICALLY UNSATURATED DICARBOXYLIC ACID AND A VINYL MONOMER

Herbert Ulmer, Hoboken, and Robert B. Login, Oakland, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Nov. 16, 1995, Ser. No. 558,405

Int. Cl.[6] C08F *8/14;22/04;20/06*

U.S. Cl. 525—304 **8 Claims**

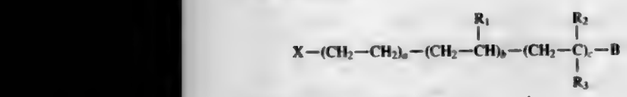
1. A process for making a C_1–C_{22} dialkyl ester of a copolymer of a monoethylenically unsaturated dicarboxylic acid mono-C_1–C_{22} alkyl ester thereof, and a vinyl monomer, which comprises reacting said copolymer with a molar excess of C_1–C_{22} alcohol in the presence of an esterification catalyst sufficient to form the desired dialkyl ester product at an elevated temperature above 100° C., and at a superatmospheric pressure.

5,597,871
COMB POLYMERS

Clemens Auschra, Mainz; Juergen Omeis, Bickenbach, and Horst Peanewiss, Darmstadt, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

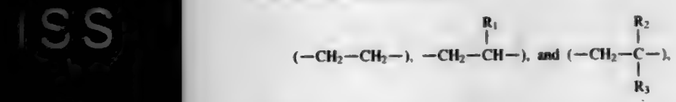
Filed Sep. 1, 1995, Ser. No. 523,518
Claims priority, application Germany, Sep. 2, 1994, 44 31 302.0
Int. Cl.[6] C08F 290/04
U.S. Cl. 525—309 16 Claims

1. Comb polymer KP, produced from at least one macromonomer of formula I



(I)

comprising monomeric units



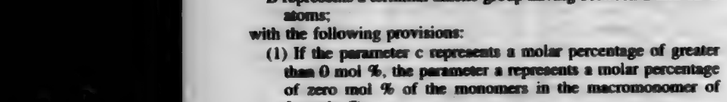
where

X represents a group which is contributed from an initiator system, said group being an alkyl group with 1–50 C atoms;
R1 represents an alkyl group with 1–18 C atoms,
R2 and R3 each represent an alkyl group with 1–8 C atoms; and
B represents a terminal alkene group having between 2 and 12 C atoms;

with the following provisions:

(1) If the parameter c represents a molar percentage of greater than 0 mol %, the parameter a represents a molar percentage of zero mol % of the monomers in the macromonomer of formula (I);
(2) the sum of the parameters (a+b) equals 100 mol % of said monomeric units of said macromonomer of formula (I), and a is at most 80 mol %, or
(3) the sum of b and c equals 100 mol % of said monomeric units of said macromonomer of formula (I); and
(4) if a is zero, R1 becomes R1', wherein said R1' is an alkyl group with 2–18 C atoms;

wherewith the compound of formula (I) is converted, by a known method, to a compound of formula (II) said compound of formula (II) contains an active hydrogen substituent in the terminal position:



(II)

where

X, R1, R2, R3, a, b, and c are as defined above, and
A represents the group B modified by the introduction of an active hydrogen function;

wherewith said compound of formula (II) is further acylated to a macromonomer of formula (IV) by a reagent MR which introduces a (meth)acryloyl group:

(IV)

where

X, R1, R2, R3, A, a, b, and c are as defined above, and
R4 represents hydrogen or methyl; and

the macromonomers of formula (IV) thus obtained are converted to the comb polymer KP by radical polymerization with a monomer m selected from the group consisting of:

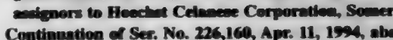
(meth)acrylic acid of a C_1–C_{28}-alkanol,
functionalized, radically polymerizable monomer,
vinyl ester of a fatty acid, and
vinylaromatic monomer.

5,597,872
HYDROGENATION OF POLYMERS HAVING KETONE GROUPS

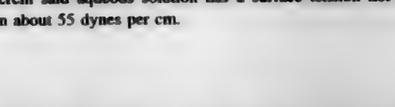
Carl L. Willis, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 29, 1990, Ser. No. 529,304
Int. Cl.[6] C08F 297/04; 8/04
U.S. Cl. 525—314 14 Claims

1. A block copolymer comprising at least one monoalkenylarene block and at least one block comprising polymerized 1,3-butadiene units and both carboxylic ester groups and alcohol linking groups, the ester groups being pendent from backbone carbon atoms and the alcohol linking groups having the structure



which connects two backbone carbon atoms, wherein the ester groups include either of the following structures



wherein R represents a hydrocarbon group having 1 to 20 carbon atoms, and wherein the block copolymer does not contain ketone groups when analyzed by an infrared method.

8. A process for hydrogenating a polymer or copolymer containing ketone groups, comprising the steps of:

contacting the polymer or copolymer with hydrogen in the presence of a catalyst which comprises a cobalt compound, selected from cobalt 2-ethylhexanoate, cobalt acetate, and cobalt carbonyl, and an alkyl aluminum compound; and
recovering the polymer or copolymer after sufficient time for conversion of ketone groups to alcohol groups.

5,597,873
SUPERABSORBENT POLYMERS AND PRODUCTS THEREFROM

Douglas R. Chambers, Chesapeake; William G-J Chiang, Virginia Beach, and Guy T. Woodrum, Chesapeake, all of Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 226,160, Apr. 11, 1994, abandoned.
This application May 25, 1995, Ser. No. 450,267
Int. Cl.[6] C08F 8/14
U.S. Cl. 525—330.1 20 Claims

1. A superabsorbent polymer having a 0.6 psi AUL value of at least 25 g/g and a centrifuge retention value of at least 35 g/g wherein said superabsorbent polymer is the product of a process which comprises dispersing an aqueous solution of C_3–C_6 diol and a crosslinking compound having at least two reactive, functional groups onto a crosslinked, partially neutralized, carboxyl or carboxylate group base polymer having a 0.3 psi AUL value of 15 g/g or less and heating said dispersion to crosslink said polymer wherein said aqueous solution has a surface tension not greater than about 55 dynes per cm.

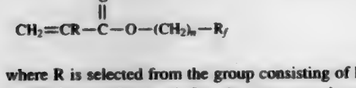
5,597,874
COATING COMPOSITIONS OF AN ACRYLIC FLUOROCARBON POLYMER AND A FLUORINATED POLYISOCYANATE

Douglas R. Anton, Wilmington, Del.; Michael J. Darmon, Aston; William F. Graham, Wayne, both of Pa., and Richard R. Thomas, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 16, 1995, Ser. No. 543,721
Int. Cl.[6] C08F 8/18; 14/18
U.S. Cl. 525—331.2 8 Claims

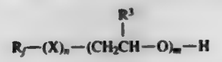
1. A coating composition containing about 45–80% by weight of a binder and 20–55% by weight of an organic liquid; wherein the binder comprises

(A) about 40–90% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of about 20–45% by weight, based on the weight of the acrylic polymer, of polymerized hydroxyl containing monomers selected from the group consisting of hydroxy alkyl acrylate and hydroxy alkyl methacrylates having 1–4 carbon atoms in the alkyl groups, 50–79.9% by weight, based on the weight of the acrylic polymer, of polymerized monomers selected from the group consisting of alkyl acrylates and alkyl methacrylates having 1–18 carbon atoms in the alkyl groups, styrene and any mixtures of the above and 0.1–5.0% by weight, based on the weight of the acrylic polymer, of polymerized fluoroalkyl containing monomer represented by the formula



where R is selected from the group consisting of hydrogen or an alkyl group having 1–2 carbon atoms, n is an integer of 1–11 and R_f is a fluoroalkyl containing group having at least 4 carbon atoms and the acrylic polymer having a weight average molecular weight of about 2,000–20,000 determined by gel permeation chromatography, and

(B) about 10–60% by weight, based on the weight of the binder, of a fluorinsted organic polyisocyanate crosslinking agent consisting essentially of an adduct of a fluorinated monofunctional alcobol and an organic polyisocyanate where the fluorinated monofunctional alcobol is represented by the formula



where R_f is as defined above, X is a divalent radical, R^3 is H or an alkyl group having 1–4 carbon atoms, n is 1 and m is 1–30 and where about 0.1– 33 mole percent of active isocyanate groups are reacted with the fluorinated monofunctional alcobol.

5,597,875
PROCESS TO IMPROVE CHEMICAL AND OXIDATIVE STABILITY OF HYDROGENATED POLYMERS

H. James Harwood, Stow, and Steven W. Jolly, Wooster, both of Ohio, assignors to University of Akron, Akron, Ohio

Filed Jun. 27, 1995, Ser. No. 495,210
Int. Cl.[6] C08F 8/34
U.S. Cl. 525—332.8 30 Claims

1. A process for improving the chemical stability of a hydrogenated polymer which contains at least one residual unsaturated unit therein, comprising the step of reacting at least one residual unsaturated unit with at least one reagent selected from the group consisting of alkyl aromatic ethers, alkyl phenyl ethers, cyclic ethers, thioethers, acyl amines, and substituted derivatives thereof.

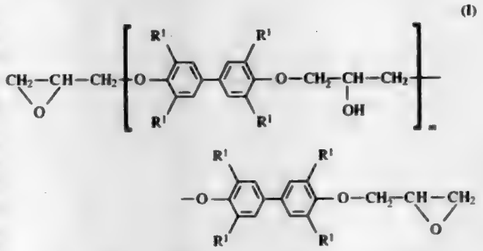
5,597,876
EPOXY RESIN COMPOSITION CONTAINING NOVOLAC WITH ADJACENT HYDROXYL GROUPS

Yasuyuki Murata; Yoshinori Nakanishi, both of Yokkaichi, and Mitsukazu Ochi, Suita, all of Japan, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 301,219, Sep. 6, 1994, abandoned.
This application Apr. 1, 1996, Ser. No. 625,839
Claims priority, application Japan, Sep. 24, 1993, 5-258967
Int. Cl.[6] C08G 59/24; C08L 63/00
U.S. Cl. 525—481 14 Claims

1. A curable epoxy resin composition comprising:

(a) a biphenol epoxy resin represented by the following formula (I):



(I)

wherein R^1 is independently a hydrogen atom, a halogen atom, an alkyl group of 1–10 carbon atoms, a substituted or unsubstituted phenyl group, a substituted or unsubstituted aralkyl group or an alkoxy group, and m is a number with an average value of 0–5; and

(b) a polyhydric phenol resin curing agent provided by oligomerizing a polyhydric phenol compound having 2 or more phenolic hydroxyl groups attached at adjacent positions on the aromatic ring.

5,597,877

Patent Not Issued For This Number

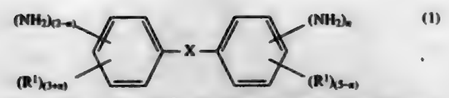
5,597,878
PROCESS OF PRODUCING VINYL CHLORIDE POLYMER

Toshihiko Nakano, and Tadashi Amano, both of Kamisu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1995, Ser. No. 505,626
Claims priority, application Japan, Jul. 22, 1994, 6-192181; Sep. 5, 1994, 6-235866
Int. Cl.[6] C08F 2/16; 14/06
U.S. Cl. 526—62 20 Claims

1. A process of producing a vinyl chloride polymer, which comprises suspension polymerizing a vinyl chloride monomer material consisting of either vinyl chloride or a mixture of vinyl monomers containing vinyl chloride in an aqueous medium in the presence of an oil-soluble polymerization initiator in a polymerization vessel having, at its inner wall surface, a polymer scale deposition preventive coating, wherein said polymer scale deposition preventive coating has been formed by applying an alkaline coating liquid to said inner wall surface, followed by drying, said alkaline coating liquid comprising:

(a) at least one condensation product selected from the group consisting of (a-1) a condensate, which has a molecular weight of 400 to 50,000, of a quinone compound and (a-2) a condensate of a quinone compound with a diphenyl compound containing at least two amino groups represented by the following general formula (1):



(1)

wherein a plurality of R^1, which may be the same or different, repreaent —H, —OH, —COOH, —SO_3H, —NH_2, —Cl, —NO_2, —$COCH_3$, —OCH_3, —$N(CH_3)_2$, and an alkyl group having 1 to 3 carbon atoms, X represents a bivalent group selected from the group consisting of an alkylene group having 1 to 5 carbon atoms, —$N(CH_3)$—, —$C(CH_3)_2$—, —CONH—, —P(=O)H—, —SO_2—, —O—, —S—, and —$Si(R)_2$— in which R represents an alkyl group having 1 to 10 carbon atoms, and n is an integer of from 1 to 2, and

(b) at least one substance selected from the group consisting of a water-soluble polymer compound, an inorganic colloid and an alkali metal silicate; and wherein said oil-soluble polymerization initiator comprises a combination of:

(A) a t-butyl peroxyneoheptanoate, and

(B) a peresteric peroxide other than the t-butyl peroxyneoheptanoate of the above component (A), said peresteic peroxide of (B) being such that a 10-hour half-life period temperature of a benzene solution containing 0.1 mol of the peresteric peroxide per liter of benzene is 44° to 55° C.

5,597,879

PROCESS FOR PRODUCING STYRENIC POLYMER

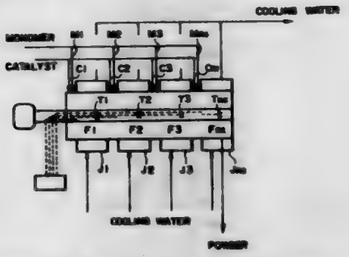
Hisashi Aso; Kazutoshi Ishikawa, and Hideki Imabayashi, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 391,898, Feb. 21, 1995, abandoned, which is a continuation of Ser. No. 105,426, Aug. 13, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 523,207

Claims priority, application Japan, Aug. 14, 1992, 4-216835

Int. Cl.[6] C08F 2/02

U.S. Cl. 526—65 **6 Claims**



1. A process for continuously producing a styrene polymer having a degree of syndiotacticity such that the proportion of racemic diad in the polymer is at least 75% by continuously feeding a styrenic monomer as the starting material and a catalyst into a horizontal self-cleaning reactor, which is divided into a plurality of at least two portions in the axial direction, which process comprises:

feeding said catalyst and said styrene monomer through separate feed lines into the reactor having an inside temperature of 0°–120° C. such that (i) the catalyst is divided and fed into the reactor through at least first and second feed nozzles into the at least first and second portions of the reactor while monomer is fed into the first portion of the reactor through a monomer feed nozzle or such that (ii) each of the catalyst and styrene monomer feeds is divided wherein the divided catalyst is fed into at least the first and second portions of the reactor through at least first and second catalyst feed nozzles and wherein the divided monomer is fed into the at least first and second portions of the reactor through at least first and second monomer feed nozzles, each of said portions being equipped with a jacket which allows cooling water to pass therethrough, and the ratio of the minimum temperature difference between inside of the reactor and the jacket to the maximum temperature difference therebetween being 1:1.5 or less.

5,597,880

ETHYLENE COPOLYMERS WITH TETRAFLUOROETHYLENE AND/OR CHLOROTRIFLUOROETHYLENE HAVING IMPROVED MECHANICAL PROPERTIES AT HIGH TEMPERATURES

Julio A. Abusleme, Saronno, and Pasqua Colaianna, Milano, both of Italy, assignors to Ausimont S.p.A., Italy

Filed Jan. 4, 1996, Ser. No. 582,648

Claims priority, application Italy, Jan. 4, 1995, MI95A0009

Int. Cl.[6] C08F 16/24

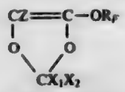
U.S. Cl. 526—247 **8 Claims**

1. Copolymers comprising

(a) from 30 to 70% by moles of ethylene;

(b) from 30 to 70% by moles of a fluorinated monomer selected from tetrafluoroethylene, chlorotrifluoroethylene, or their mixtures;

(c) from 0.1 to 10% by moles with respect to the total amount of monomers (A) and (B), of a fluorodioxol having the formula:



(I)

wherein R_f is a perfluoroalkyl having from 1 to 5 carbon atoms; X_1 and X_2, equal to or different from each other, are —F or —CF_3, Z is selected from —F, —H, —Cl.

5,597,881

POLYOLEFIN MOLDING COMPOSITION FOR THE PRODUCTION OF MOLDING OF HIGH RIGIDITY AND TRANSPARENCY BY INJECTION MOLDING

Andreas Winter, Glashuetten; Horst Bermuth, Egelsbach, and Bernd Bachmann, Eppstein, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 481,571, Jun. 7, 1995, abandoned, which is a continuation of Ser. No. 128,117, Sep. 10, 1993, abandoned. This application Mar. 20, 1996, Ser. No. 619,899

Claims priority, application Germany, Sep. 11, 1992, 42 30 372.9

Int. Cl.[6] C08F 4/76;10/04;10/06;10/14

U.S. Cl. 526—348 **4 Claims**

1. A method of using a molding composition for the production of thin-wall injection moldings, wherein the molding composition comprises a polyolefin derived from an olefin having at least 3 carbon atoms, of the formula R^a— CH=CH—R^b, in which R^a and R^b are identical or different and are hydrogen or C_1 -C_{15}-alkyl, straight-chain or branched, or R^a and R^b, together with the atoms connecting them, from a ring, where the polyolefin molding composition may contain up to 10% by weight of ethylene or a second olefin as defined above as comonomer, having a molecular weight M_w of >80,000 g/mol, a polydispersity M_w/M_n of from 1.8 to 3.5, a viscosity index of >70 cm^3/g, a melting point of from 130° to 160° C., an isotactic block length of from 30 to 100, an aligned transparency of >30% and an ether-extractable content of less than 2% by weight.

5,597,882

TIN COMPOUND-CONTAINING COMPOSITIONS AS ONE OF THE TWO COMPONENTS OF TWO COMPONENT SYSTEMS WHICH CROSSLINK AT ROOM TEMPERATURE TO GIVE ORGANOPOLYSILOXANE ELASTOMERS

August Schiller, Neuoetting; Norman Dorsch, Burghausen; Werner Graf, Burghausen, and Alois Strasser, Burhgausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Sep. 6, 1994, Ser. No. 240,742

Claims priority, application Germany, Nov. 15, 1991, 41 37 698.6

Int. Cl.[6] C08G 77/06

U.S. Cl. 528—18 **6 Claims**

1. Tin compound-containing compositions as one of the two components of two-component systems which crosslink at room temperature to give organopolysiloxane elastomers, the compositions containing, as essential constituents

(a) a diorganopolysiloxane which contains triorganosiloxy groups as terminal units and in which the organic radicals are hydrocarbon radicals, which are optionally halogenated,

(b) a product of the reaction of a disilaalkane containing at least two monovalent hydrocarbon radicals per molecule which are bonded to silicon via oxygen and are optionally substituted by an alkoxy group, or an oligomer thereof, with a diorganotin diacylate,

(c) an organosilicon compound containing at least one amino or imino group per molecule which is bonded to silicon via carbon, optionally

(d) a filler and optionally

(e) a disilaalkane and/or silane containing at least three monovalent hydrocarbon radicals per molecule which are bonded to silicon via oxygen and are optionally substituted by an alkoxy group or an oligomer thereof.

5,597,883

Patent Not Issued For This Number

5,597,884

PHENOLIC-RESIN-MODIFIED NATURAL RESIN ACID ESTERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS BINDER RESINS IN PRINTING INKS

Albert Bender, Mainz, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 214,963, Mar. 14, 1994, abandoned. This application Jan. 30, 1995, Ser. No. 380,634

Claims priority, application Germany, Mar. 15, 1993, 43 08 108.8

Int. Cl.[6] C08G 77/04

U.S. Cl. 528—34 **5 Claims**

1. A phenolic-resin-modified natural resin acid ester prepared from compounds selected from the group consisting of

A) natural resins and natural resin acids,

B) mononuclear and polynuclear alkylolizable phenols,

C) aldehydes and aldehyde acetals,

D) aliphatic, cycloaliphatic and araliphatic polyols,

E) calcium compounds and zinc compounds and

F) ethylenically unsaturated hydrocarbon resins;

by reaction of at least one compound of each of A) to E) and optionally F); at a temperature of 100° to 250° C.; and by subsequent removal of water by azeotropic distillation with an entraining agent at 200° to 300° C.

5,597,885

PREPARATION OF CHLOROFLUOROCARBON-FREE FLEXIBLE POLYURETHANE FOAMS USING DIPHENYLMETHANE DIISOCYANATE-BASED POLYISOCYANATE MIXTURES CONTAINING URETHANE GROUPS, AND MODIFIED POLYISOCYANATE MIXTURES

Heinz-Dieter Lutter, Neckargemuend; Bernd Bruchmann, Ludwigshafen; Claudia Spang, Eisenberg-Steinborn; Roland Minges, Gruenstadt; Dietrich Scherzer, Neustadt; Michael Lugmayr, Groebenzell, and Ruth Zschiesche, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Germany

Division of Ser. No. 15,746, Feb. 10, 1993, Pat. No. 5,494,941.

This application Jun. 7, 1995, Ser. No. 430,926

Int. Cl.[6] C08G 18/10

U.S. Cl. 528—44 **6 Claims**

1. A liquid, CFC-free, diphenylmethane diisocyanate-based polyisocyanate mixture containing bonded urethane groups and containing from 20 to 30% by weight of NCO groups, obtained

1.) by reacting

a) a mixture (I) of diphenylmethane diisocyanates and polyphenylene-polymethylene polyisocyanates containing from 35 to 94% by weight, based on the total weight, of diphenylmethane diisocyanate isomers, with

b) a polyether-polyol mixture (b) which contains

b_1) at least one polyoxypropylene glycol having a hydroxyl number of from 120 to 25, and

b_2) at least one trifunctional polyoxypropyleae-polyoxyethylene-polyol having a hydroxyl number of from 120 to 25 and containing from 10 to 90% by weight, based on the weight of polymerized alkylene oxide units, of polymerized ethylene oxide units, or

2.) by diluting

c) a quasi-prepolymer containing urethane groups and containing from 10 to 19% by weight of NCO, obtained by reacting 4,4'-diphenylmethane diisocyanate or a mixture of diphenylmethane diisocyanate isomers (II) with the polyether-polyol mixture (b),

a) using the abovementioned mixture (I) of diphenylmethane diisocyanates and polyphenyl-polymethylene polyisocyanates containing from 35 to 94% by weight, based on the total weight, of diphenylmethane diisocyanate isomers, said mixture yielding CFC-free, flexible polyurethane foams and elastic polyurethane molded foams.

5,597,886

HEAT-CURABLE EPOXY RESIN SYSTEMS HAVING A GOOD REACTIVITY/STABILITY RATIO

Roland Meser, Basel, and Daniel Bär, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 399,687, Mar. 7, 1995, abandoned. This application Aug. 7, 1995, Ser. No. 512,044

Claims priority, application Switzerland, Mar. 10, 1994, 720/94-3

Int. Cl.[6] C08G 59/68;59/72;59/42

U.S. Cl. 528—91 **5 Claims**

1. A heat-curable epoxy resin system comprising

(a) at least one epoxy resin,

(b) at least one polycarboxylic acid anhydride, and

(c) 1,4-diazabicyclo(2,2,2)octane or a C1-C4alkyl-substituted derivative of a 1,4-diazobicyclo(2,2,2)octane as curing accelerator, and wherein a portion of the curing accelerator (c) is replaced by

(d) a complex of BCl_3 with N,N-dimethyloctylamine, and wherein the weight ratio of component (c) to component (d) ranges from 8/92 to 75/25.

5,597,887

BRANCHED POLYCARBONATE PREFORMS, BLOW MOLDABLE POLYCARBONATE AND METHOD FOR MAKING

Joseph A. King, Jr., Niskayuna; Patrick J. McCloskey, Watervliet; Alice M. Colley, Latham, and David M. Dardaris, Ballston Spa, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 325,769, Oct. 20, 1994, abandoned. This application Aug. 9, 1995, Ser. No. 501,898

Int. Cl.[6] C08G *64/30*

U.S. Cl. 528—196 **18 Claims**

1. A method for making a blow moldable polycarbonate comprising the steps of:

a. making a branched polycarbonate preform by contacting a polyfunctional branching agent in the amount of 2.1–10 mole percent based on carbonate structural units, a diaryl carbonate and a dihydric phenol in a melt transesterification process; and,

b. melt equilibrating said polycarbonate preform with a second polycarbonate.

5,597,888

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYAMIDE 6

Werner Nielinger; Andreas Glitzinger, both of Krefeld; Edgar Ostlinning, Düsseldorf; Karsten-Josef Idel, and Helmut Schulte, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 9, 1995, Ser. No. 488,819

Claims priority, application Germany, Jun. 21, 1994, 44 21 704.8

Int. Cl.[6] C08G *69/04;69/16;69/28*

U.S. Cl. 528—335 **13 Claims**

1. A process for the production of polyamide 6 with a relative viscosity of >5.5 by hydrolytic polymerization of caprolactam and post-condensation of the product obtained in the solid phase, wherein the hydrolytic polymerization is carried out with addition of a carboxylic acid containing at least two carboxyl groups in quantities of 0.0004 to 0.00005 mole, based on 100 g of caprolactam.

5,597,889

ORGANIC POLYMER AND PREPARATION AND USE THEREOF

Akio Takimoto; Hirofumi Wakemoto, both of Neyagawa; Eiichiro Tanaka, Kishiwada; Masnaori Watanabe, Katano; Junko Aoyama, Suita; Hisahito Ogawa, Ikoma-gun; Shigehiro Sato, Osaka, and Fumiko Yokotani, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Division of Ser. No. 90,638, Jul. 13, 1993, Pat. No. 5,486,442, which is a continuation of Ser. No. 673,759, Mar. 25, 1991, abandoned. This application May 26, 1995, Ser. No. 451,727

Claims priority, application Japan, Mar. 23, 1990, 2-073777; Mar. 23, 1990, 2-073778; Mar. 23, 1990, 2-073779; [illegible] 25, 1990, 2-074971; Nov. 29, 1990, 2-335910

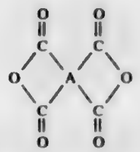
Int. Cl.[6] C08G *69/26;* C09K *19/00*

U.S. Cl. 528—353 **7 Claims**

1. A process for preparing a polyimide comprising reacting a diamine of the formula:

$$NH_2—(Y_i-X_i)_n—Y_i—NH_2 \quad \text{(III)}$$

wherein n is a number of at least 2, i is a positive integer not larger than n, Y is an aromatic or substituted aromatic group, and X is O, S, Se, Te or the divalent group —CH=CH—, and a tetracarboxylic dianhydride of the formula:



(IV)

wherein A is a tetravalent hydrocarbon group in a molar ratio of said diamine to said dianhydride of 1:(1+m) wherein m is a positive number to obtain a polyamic acid, wherein said diamine and said tetracarboxylic dianhydride are reacted in a ratio of said diamine to said dianhydride of 1:(1+m), wherein m is larger than zero and smaller than 1, to form said polyamic acid, and then an additional amount of said carboxylic anhydride is added to said polyamic acid; polymerizing said polyamic acid; and annealing the resultant polymerization product at a temperature of 200° to 400° C. to obtain polyimide.

5,597,890

CONJUGATED POLYMER EXCIPLEXES AND APPLICATIONS THEREOF

Samson A. Jenekhe, Fairport, N.Y., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 146,266, Nov. 2, 1993. This application Jan. 26, 1994, Ser. No. 187,278

Int. Cl.[6] C08G *73/22*

U.S. Cl. 528—397 **99 Claims**

1. A composition comprising an exciplex of a π-conjugated polymer first component and an electron donor or electron acceptor second component, said second component different from said first component and effective to form said exciplex with said first component when at least one of said first component or said second component is in an excited state.

5,597,891

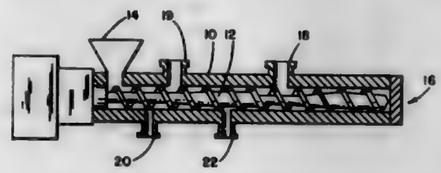
PROCESS FOR PRODUCING POLYESTER ARTICLES HAVING LOW ACETALDEHYDE CONTENT

Gregory W. Nelson; Clinton Cherry, and Eric G. Olsen, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Aug. 1, 1995, Ser. No. 624,028

Int. Cl.[6] C08F *6/00;* B29C *47/38*

U.S. Cl. 528—481 **13 Claims**



1. A process for removing acetaldehyde from polyester derived from components comprising at least one dicarboxylic acid and at least one glycol which comprises the steps of

a) transporting molten polyester to a vented, continuous screw conveyor having a polymer compression zone,

b) rotating the screw of said conveyor so as to compress and convey through the extruder the molten polymer for a time of less than 15 minutes and at a temperature of less than 300° C.,

c) simultaneously with step b), flowing a purge agent into and out of said extruder to thereby remove volatile impurities from said molten polyester and avoid appreciable build-up of acetaldehyde, and

d) conveying the devolatized polymer melt to a forming device wherein an article of manufacture is formed.

5,597,892

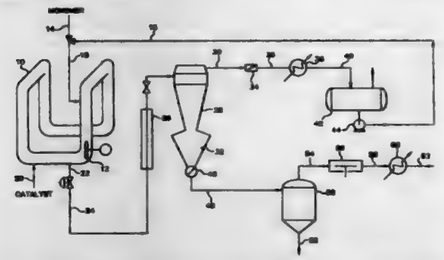
PROCESS FOR SEPARATING DILUENTS FROM SOLID POLYMERS UTILIZING A TWO-STAGE FLASH AND A CYCLONE SEPARATOR

Donald O. Hanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 663,515, Mar. 4, 1991. This application Jun. 6, 1995, Ser. No. 467,583

Int. Cl.[6] C08F *6/24*

U.S. Cl. 528—501 **10 Claims**



1. A method of recovering polymer solids from a polymerization effluent extracted from a polymerization zone at a first temperature and a first pressure, said effluent comprising a slurry of said polymer solids in a liquid diluent, comprising the steps of:

(a) exposing said effluent to a pressure and temperature drop from said first pressure to a second pressure and from said first temperature to a second temperature, at least partially, in a first flash zone having the form of a cyclone with an extended solids receiving zone sufficient to allow an amount of polymer solids to collect in said extended solids receiving zone, so that a major portion of said diluent is vaporized to produce diluent vapor;

(b) separating said diluent vapor from said effluent in said first flash zone by means of said pressure and temperature drop and by means of cyclonic action induced by the cyclonic shape of said first flash vessel;

(c) removing said diluent vapor from said first flash zone;

(d) condensing said diluent vapor without compression by heat exchange to produce condensed diluent;

(e) recycling at least part of said thus produced condensed diluent to said polymerization zone;

(f) passing said polymer solids into said extended solids receiving zone;

(g) holding said polymer solids in said extended solids receiving zone until said extended solids receiving zone is at least partially full; and

(h) thereafter passing said polymer solids from said extended solids receiving zone into a second flash zone at a third pressure lower than said second pressure wherein residual diluent remaining with said polymer solids is vaporized to residual diluent vapor.

5,597,893

PREPARATION OF STABLE INSULIN ANALOG CRYSTALS

Jeffrey C. Baker, Indianapolis, and Bradley M. Roberts, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 31, 1994, Ser. No. 332,296

Int. Cl.[6] A61K *38/28;* C07K *14/62*

U.S. Cl. 530—304 **9 Claims**

1. A process for preparing a crystalline $Lys^{B28}Pro^{B29}$-human insulin alkali metal or ammonium salt, which comprises adjusting the pH of a solution from a pH below the isoelectric point of $Lys^{B28}Pro^{B29}$-human insulin to between about pH 8.5 to about pH 9.5 with an alkali metal or ammonium base; wherein said solution comprises about 5 mg/mL to about 50 mg/mL $Lys^{B28}Pro^{B29}$-human insulin, a pharmaceutically acceptable preservative, and an initial cation concentration of about 30 mM to about 100 mM said cation being selected from the group consisting of an alkali metal or ammonium.

5,597,894

MULTI-TYROSINATED SOMATOSTATIN ANALOGS

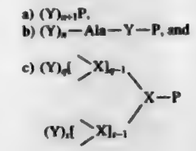
David H. Coy, New Orleans; Eugene A. Woltering, Kenner, both of La.; M. Sue O'Dorisio; Thomas M. O'Dorisio, both of Columbus, Ohio, and William A. Murphy, Slidell, La., assignors to The Louisiana State University Medical Center Foundation, New Orleans, La.; Children's Hospital, Inc., Columbus, Ohio; The Administrators of the Tulane Educational Fund, New Orleans, La., and The Ohio State University Research Foundation, Columbus, Ohio

Filed Jun. 5, 1995, Ser. No. 462,223

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00*

U.S. Cl. 530—311 **12 Claims**

1. A compound having a formula selected from the group consisting of:



wherein

P is a somatostatin peptide analog which binds to a somatostatin receptor;

Y is D-tyrosine, L-tyrosine, or desamino-tyrosine;

n is an integer from 1 to 32, inclusive;

each q, independently, is an integer from 1 to 32, inclusive, each s, independently, is an integer from 1 to 32, inclusive, where q and s can be the same or different, and

X is of the formula

$$D—NH_2—CH(CH_2)_mNH_2—CO_2H \text{ or}$$

$$L—NH_2—CH(CH_2)_mNH_2—CO_2H,$$

wherein m is an integer from 1 to 10, inclusive.

5,597,895

TRANSDOMINANT TAT MUTANTS AND USES THEREOF

Richard B. Gaynor, Dallas, Tex.; Joseph A. Garcia, Santa Monica, Calif., and David Harrich, Carrollton, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 788,266, Nov. 5, 1991, Pat. No. 5,350,835. This application Jul. 2, 1992, Ser. No. 910,867

Int. Cl.[6] C07K *14/15;14/155*

U.S. Cl. 530—324 **11 Claims**

1. A transdominant mutant HIV Tat protein, the protein inhibiting HIV gene expression in the presence of an equimolar concentration of wild-type Tat protein and being encoded by a substitution mutant tat gene having a substituted basic domain in which more than two positively-charged amino acids are replaced by neutral amino acids.

5,597,896

RETROVIRUS HUMAN IMMUNODEFICIENCY VIRUS TYPE 2(HIV2), CAPABLE OF CAUSING AIDS, ANTIGENS OBTAINED FROM THIS RETROVIRUS AND CORRESPONDING ANTIBODIES AND THEIR APPLICATION FOR DIAGNOSTIC PURPOSES

Luc Montagnier, Le Plessis Robinson; Denise Guetard, Paris; Francoise Brun-Vezinet, Paris, and Francois Clavel, Paris, all of France, assignors to Institut Pasteur, Paris, France

Division of Ser. No. 929,432, Aug. 14, 1992, Pat. No. 5,364,933, which is a division of Ser. No. 911,364, Jul. 13, 1992, abandoned, which is a continuation of Ser. No. 771,893, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 365,117, Jun. 12, 1989, abandoned, which is a division of Ser. No. 835,228, Mar. 3, 1986, Pat. No. 4,839,288. This application Feb. 25, 1994, Ser. No. 202,260

Claims priority, application France, Jan. 22, 1986, 86 00910; Jan. 22, 1986, 86 00911; Feb. 6, 1986, 86 01635; Feb. 13, 1986, 86 01985

Int. Cl.[6] C07K *16/10*

U.S. Cl. 530—388.35 2 Claims

1. A polyclonal antibody which specifically binds with the gp130–140 envelope glycoprotein of Human Immunodeficiency Virus Type 2 (HIV-2), said polyclonal antibody obtained from the sera of an animal inoculated with a composition comprising HIV-2 or envelope glycoproteins thereof.

2. A monoclonal antibody which specifically binds with the gp130–140 envelope glycoprotein of Human Immunodeficiency Virus Type 2 (HIV-2).

5,597,897

PHARMACEUTICAL FORMULATIONS OF OSTEOGENIC PROTEINS

Eyal Ron, Lexington; Thomas J. Turek, Boston; Benjamin S. Isaacs; Himanshi Patel, both of Tewksbury, and Richard A. Kenley, Andover, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

PCT No. PCT/US92/05309, § 371 Date Jun. 29, 1993, § 102(e) Date Jun. 29, 1993, PCT Pub. No. WO93/00050, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 22, 1992, Ser. No. 81,378

Int. Cl.[6] C07K *14/51*

U.S. Cl. 530—350 26 Claims

1. A composition comprising a pharmaceutically acceptable admixture of

(i) an ostcogenic protein;

(ii) a polymer matrix component selected from the group consisting of poly(lactic acid), poly(glycolic acid), and copolymers of lactic acid and glycolic acid; and

(iii) an osteogenic protein-sequestering alkylcellulose, wherein said alkylcellulose is present in an amount of approximately 0.5–20 wt % based on total composition weight, wherein said osteogenic protein is not encapsulated within the polymer matrix.

5,597,898

NF-κB ACTIVATION REGULATORY PROTEIN, IκB-β

Sankar Ghosh, Madison, Conn., assignor to Yale University, New Haven, Conn.

Division of Ser. No. 71,819, Jun. 4, 1993, which is a continuation-in-part of Ser. No. 806,748, Dec. 13, 1991, abandoned, which is a division of Ser. No. 535,005, Jun. 7, 1990, Pat. No. 5,126,324. This application Feb. 15, 1995, Ser. No. 388,756

Int. Cl.[6] C07K *14/47*

U.S. Cl. 530—350 1 Claim

1. An isolated IκB-β polypeptide having the amino acid sequence of SEQ ID NO: 2.

5,597,899

TUMOR NECROSIS FACTOR MUTEINS

David Banner, Basle; Werner Lesslauer, Riehen; Hansruedi Lötscher, Möhlin, all of Switzerland, and Dietrich Stüber, Grenzach-Wyhlen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 24, 1994, Ser. No. 217,529

Claims priority, application European Pat. Off., Mar. 29, 1993, 93810224

Int. Cl.[6] C07K *14/525*; C12P *21/06*

U.S. Cl. 530—351 10 Claims

1. A human TNF α mutein having the sequence of wild-type human TNF α [SEQ ID:2] wherein the amino acid at position 143 of said sequence has been changed from aspartic acid to asparagine, and the amino acid at position 145 of said sequence has been changed from alanine to arginine.

5,597,900

CRYSTALLINE INTERLEUKIN-4

Gerald Hammond, East Orange; Hung V. Le, Rockaway; T. L. Nagabhushan, Parsippany; Paul Reichert, Montville, and Paul P. Trotta, Secaucus, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 949,817, Dec. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 538,636, Jun. 15, 1990, abandoned. This application Jan. 20, 1995, Ser. No. 376,536

Int. Cl.[6] C07K *14/54*

U.S. Cl. 530—351 6 Claims

1. Crystalline human, non-glycosylated interleukin-4.

5,597,901

HOMOGENEOUS HUMAN INTERLEUKIN 2

Alvin S. Stern, Passaic Park, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 653,165, Sep. 24, 1984, which is a division of Ser. No. 418,927, Sep. 16, 1982, Pat. No. 4,490,289. This application May 25, 1995, Ser. No. 450,508

Int. Cl.[6] C07K *14/55*

U.S. Cl. 530—351 2 Claims

2. Human interleukin 2 as a homogeneous protein.

5,597,902

BI -AND POLYFUNCTIONAL REACTIVE DYESTUFFS, THEIR PREPARTION AND THEIR USE

Konrad Boetz, Wetter; Manfred Hoppe; Eckhard Bock, both of Kürten-Bechen; Wolfram Reddig, Bergisch Gladbach; Thomas Eisenhöfer, Cologne; Wolfgang Harms, and Karl-Joseph Herd, both of Odenthal-Holz, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

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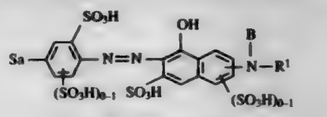
Claims priority, application Germany, May 4, 1992, 42 14 743.3; Feb. 16, 1993, 43 04 614.2

Int. Cl.[6] C09B *62/08;62/507*; D06P *1/38*

U.S. Cl. 534—622 8 Claims

1. A reactive dyestuff of one of the following formulae

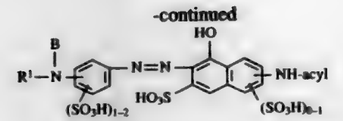
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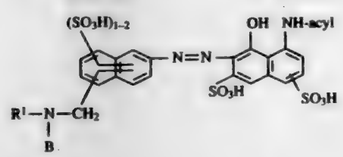
where Sa = OCH_3 or OC_2H_5

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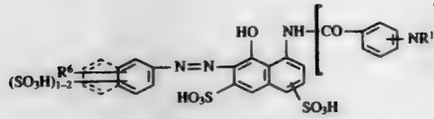
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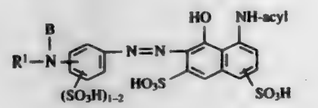


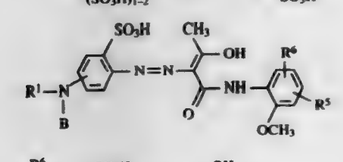
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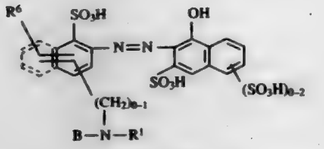
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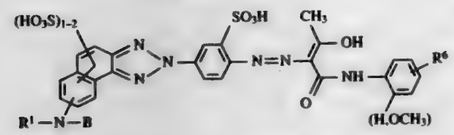




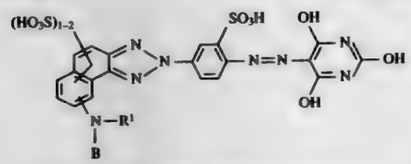
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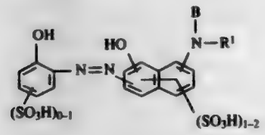


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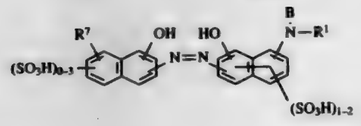


Metal complexes of dyestuffs of the formulae (12) to (16)

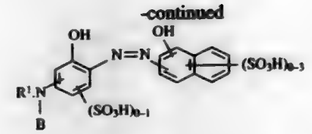
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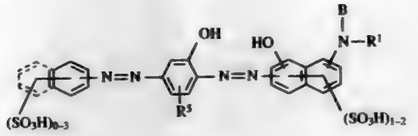
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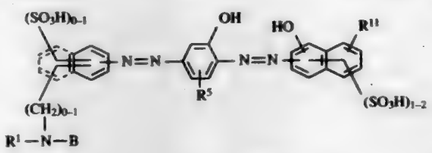
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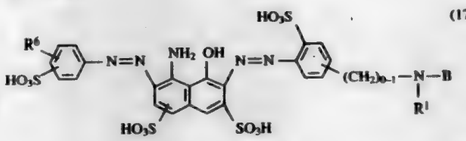
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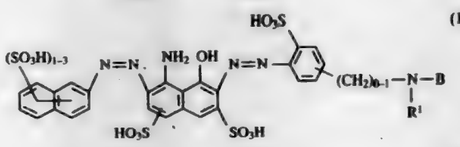
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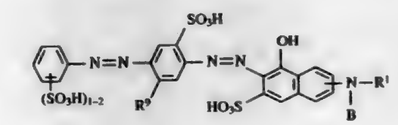
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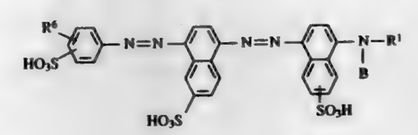
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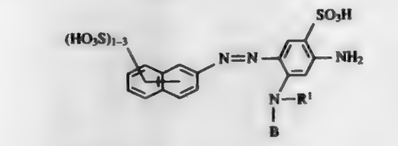
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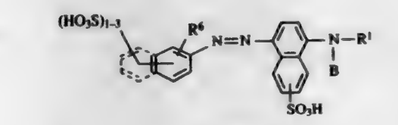
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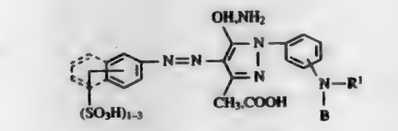
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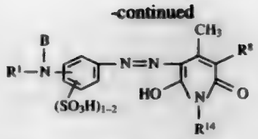
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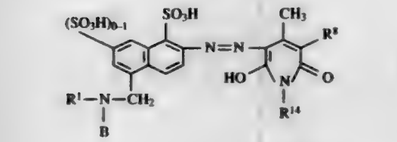
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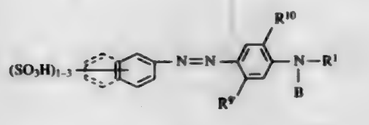
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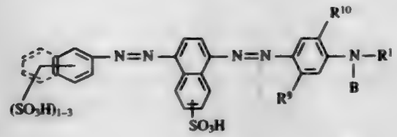
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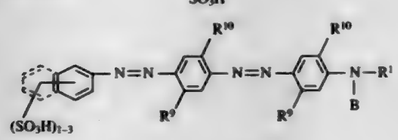
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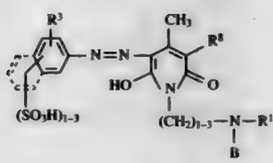
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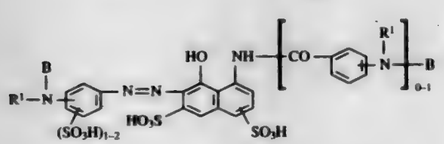
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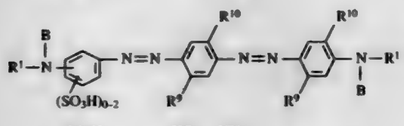
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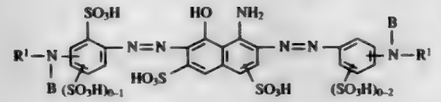
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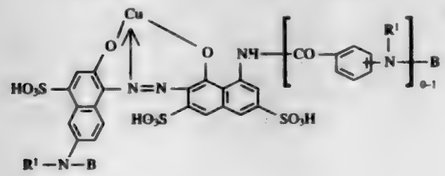
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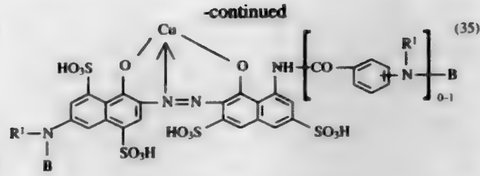


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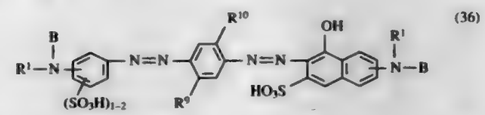


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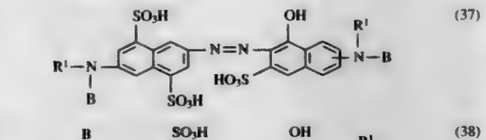
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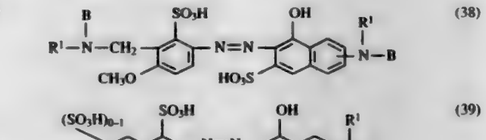
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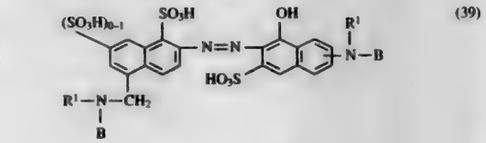
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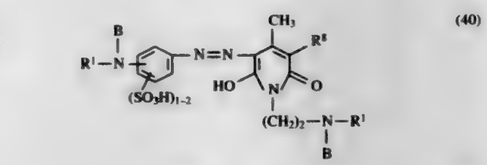
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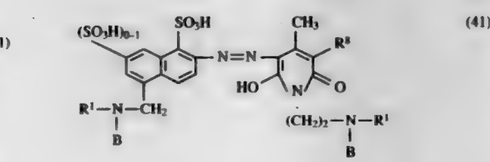
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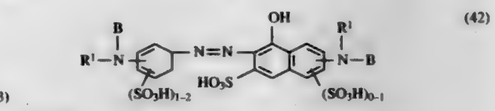


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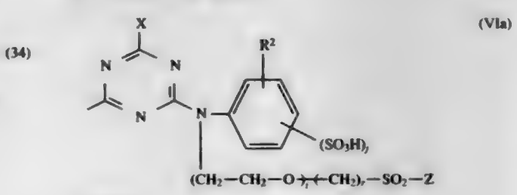
or



(42)

wherein

B is a radical of the formula



(VIa)

in which

X is F, Cl or Br,

i is 0 or 1,

R^2 is H, C_1–C_4-alkyl, Cl, Br, C_1–C_4-alkoxy or COOH,

j is 0, 1 or 2,

r is 2 or 3 and

Z is $-CH=CH_2$, $-CH_2-CH_2-OSO_3H$, $-CH_2-CH_2-S_2O_3H$, $-CH_2-CH_2-O-CO-CH_3$, $-CH_2-CH_2-OPO_3H_2$ or $-CH_2-CH_2-OH$ and

wherein

acyl is acetyl or unsubstituted or substituted benzoyl,

R^{14} is H or C_1–C_2-alkyl which is unsubstituted or substituted by SO_3H or NH_2,

R^1 is H, CH_3 or C_2H_5,

R^3 is H or sulpho,

R^5 is H, CH_3, OCH_3 or Cl,

R^6 is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl, Br, COOH or SO_3H,

R^7 is H, OH, NH_2, $NHCOCH_3$, NHCOPH, Cl, C_1–C_4-alkoxy or C_1–C_4-alkyl,

R^8 is H, SO_3H, CH_2SO_3H, Cl, C_1–C_4-alkylsulphonyl, CN or carbonamide,

R^9 is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl, Br, arylcarbonylamino, aminocarbonylamino, C_1–C_4-alkylsulphonylamino, alkylcarbonylamino or arylsuphonylamino, and

R^9 is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl, Br, arylcarbonylamino, aminocarbonylamino, C_1–C_4-alkylsulphonylamino or arylsulphonylamino, and

R^{10} is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, OH or SO_3H,

R^{11} is H, C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl, Br, acylamino, or C_1–C_4-alkylsulphonylamino, aminocarbonylamino, and arylsulphonylamino,

and wherein the condensed rings indicated by the dashes represent alternatively possible naphthalene systems.

5,597,903

DISAZO DYES CONTAINING 1-AMINO-8-HYDROXY-NAPHTHALENE-3,6-OR 4,6-DISULFONIC ACID BISCOUPLING COMPONENT RADICALS AND 5-CYANO-2, 4-OR 4,6-DICHLOROPYRIMIDYL FIBER-REACTIVE GROUPS

Markus Gisler, Rheinfelden, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

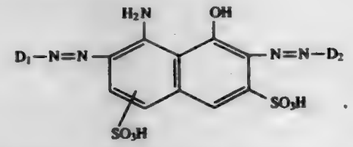
Continuation of Ser. No. 909,558, Jul. 6, 1992, abandoned, which is a continuation of Ser. No. 627,292, Dec. 14, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 470,669

Claims priority, application Germany, Dec. 16, 1989, 39 41 639.9

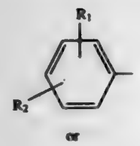
Int. Cl.[6] C09B 62/08

U.S. Cl. 534—637 **19 Claims**

1. A compound of the formula



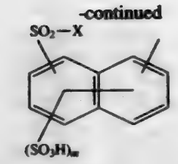
or a salt thereof, or a mixture of such compounds or salts, wherein D_1 is



(a)

or

-continued



(b)

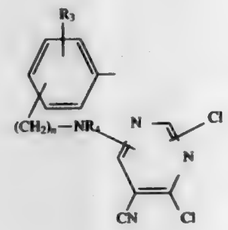
wherein

R_1 is hydrogen, halo; C_{1-4}alkyl, C_{1-4}alkoxy, $-SO_3H$ or —COOH,

R_2 is —COOH, $-CONR_6R_7$, $-SO_2NR_6R_7$ or $-SO_2-X$, wherein each of R_6 and R_7 is independently hydrogen, C_{1-4}alkyl, C_{2-4}hydroxyalkyl or C_{2-4}sulfatoalkyl, and

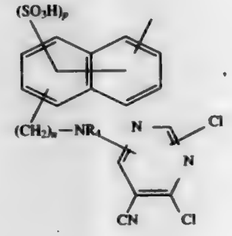
m is 0, 1 or 2, and

D_2 is



(d)

or



(e)

wherein

R_3 is hydrogen, $-SO_3H$ or —COOH,

R_4 is hydrogen, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by hydroxy, halo, cyano, $-SO_3H$, $-OSO_3H$ or —COOH,

n is 0 or 1, and

p is 1 or 2,

wherein

X is $-CH=CH_2$ or —W—Y,

wherein

W is linear or branched C_{2-4}alkylene, and

Y is hydroxy, OSO_3H, chloro, bromo, $-OPO_3H_2$, $-SSO_3H$, $-OCOCH_3$, $-OCOC_6H_5$ or $-OSO_2CH_3$,

with the provisos that (i) R_1 may be —COOH only when R_2 is $-SO_2-X$, (ii) D_2 must be a group of Formula (d) when D_1 is a group of Formula (a) wherein R_1 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy or $-SO_3H$, and R_2 is —COOH, $-CONR_6R_7$ or $-SO_2NR_6R_7$ or a group of Formula (b), and (iii) D_2 must be a group of Formula (e) when D_1 is a group of Formula (a) wherein R_1 is —COOH, and R_2 is $-SO_2-X$.

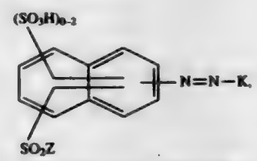
5,597,904

REACTIVE DYES, PROCESS FOR THEIR PREPARATION AND THE USE THEREOF

Athanassios Tzikas, Prattein, and Claudia Carisch, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

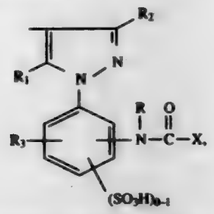
Division of Ser. No. 320,093, Oct. 7, 1994, Pat. No. 5,523,397. This application Mar. 12, 1996, Ser. No. 614,119
Claims priority, application Switzerland, Oct. 12, 1993, 3072/93
Int. Cl.[6] C09B *62/51;62/473;* D06P *1/384*
U.S. Cl. 534—642 13 Claims

1. A reactive dye of formula



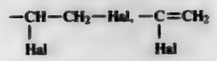
(1)

wherein Z is a group of formula —CH=CH$_2$ or —CH$_2$—CH$_2$—Y, Y is a leaving group, and
K is a radical of formula



(3)

wherein X is a radical of formula —(CH$_2$)$_n$—Cl,



or —CH=CH$_2$, Hal
is halogen and n is 1, 2, 3 or 4,
R is hydrogen or unsubstituted or substituted C$_1$–C$_4$alkyl,
R$_1$ is amino or hydroxyl,
R$_2$ is methyl or carboxyl, and
R$_3$ is hydrogen, C$_1$–C$_4$alkyl, C$_1$–C$_4$alkoxy, C$_2$–C$_4$alkanoylamino, halogen or carboxyl.

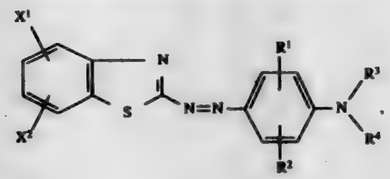
5,597,905

PREPARATION OF BENZOTHIAZOLYLAZOANILINES

Rudolf Bernes, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

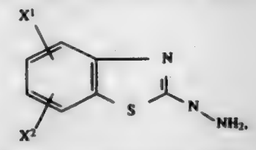
Filed Dec. 15, 1995, Ser. No. 574,427
Claims priority, application Germany, Dec. 23, 1994, 44 46 382.0
Int. Cl.[6] C09B *41/00*
U.S. Cl. 534—788 6 Claims

1. A process for preparing azo dyes of the formula I



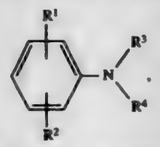
(I)

where
X^1 is hydrogen, nitro or halogen,
X^2 is hydrogen, C$_1$–C$_4$-alkoxy or halogen,
R^1 is hydrogen or C$_1$–C$_4$-alkoxy,
R^2 is hydrogen, C$_1$–C$_4$-alkyl or C$_1$–C$_4$-alkanoylamino, and
R^3 and R^4 are independently of each other C$_1$–C$_6$-alkyl with or without hydroxyl, C$_1$–C$_6$-alkoxy, C$_1$–C$_6$-alkanoyloxy, cyano or halogen substitution, which comprises
a) first diazotizing an amine of the formula II



(II)

where X^1 and X^2 are each as defined above, in a mixture consisting essentially of from 10 to 65% by weight, based on the total weight of the mixture, of phosphoric acid, from 5 to 25% by weight, based on the total weight on the mixture, of sulfuric acid and from 10 to 85% by weight, based on the total weight on the mixture, of water using a customary diazotizing agent, and
b) adding the resulting reaction mixture to an aqueous acidic solution of the aniline of the formula III



(III)

where R^1, R^2, R^3 and R^4 are each as defined above.

5,597,906

CARBON LINKED GLYCOSYL COMPOUNDS

Chi-Huey Wong, Rancho Sante Fe, and Hironato Kondo, San Diego, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Mar. 18, 1993, Ser. No. 33,608
Int. Cl.[6] C07H *15/00*
U.S. Cl. 536—1.11 7 Claims

1. A substitution reaction for producing carbon linked glycosylation products comprising the following steps:
Step A: providing a blocked carbohydrate donor having an anomeric carbon with an acid labile phosphite leaving group attached thereto for generating an intermediate susceptible to nucleophilic attack;
Step B: providing a blocked glycosyl acceptor having an unprotected carbon;
Step C: providing a promotor having Lewis acid activity for catalyzing the phosphite leaving group of said Step A; then
Step D: reacting the blocked carbohydrate donor of said Step A with the blocked glycosyl acceptor of said Step B in the presence of the promotor of said Step C within a solvent favoring the formation of carbon linked glycosylation products; and then
Step E: quenching the reaction of said Step D.

5,597,907

Patent Not Issued For This Number

5,597,908

IMMUNOREACTIVE PEPTIDES OF APO(A)

W. C. Taddei-Peters, Gaithersburg, and Sandra M. Butler, Laurel, both of Md., assignors to Akzo Nobel N.V., Arnham, Netherlands

Division of Ser. No. 266,407, Jun. 27, 1994, which is a continuation-in-part of Ser. No. 172,461, Dec. 21, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 456,840
Int. Cl.[6] C07H *19/00*
U.S. Cl. 536—23.1 18 Claims

1. An isolated nucleic acid molecule which consists of a sequence that codes for a peptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:10, SEQ ID NO:12, SEQ ID NO:14, SEQ ID NO:16, SEQ ID NO:18, SEQ ID NO:20, SEQ ID NO:22, and sequences fully complementary thereto.

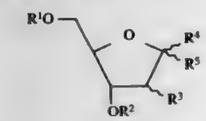
5,597,909

POLYNUCLEOTIDE REAGENTS CONTAINING MODIFIED DEOXYRIBOSE MOIETIES, AND ASSOCIATED METHODS OF SYNTHESIS AND USE

Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Aug. 25, 1994, Ser. No. 296,368
Int. Cl.[6] C07H *21/04;21/00;21/02;* C12Q *1/68*
U.S. Cl. 536—24.3 26 Claims

1. A reagent having the structural formula



wherein:
R^1 is selected from the group consisting of hydrogen, acid-sensitive, base-stable protecting groups and acyl capping groups;
R^2 is a phosphorus derivative selected to enable addition of the reagent to a molecular species containing a free hydroxyl group, or is a linkage to a solid support;
R^3 is selected from the group consisting of hydrogen, hydroxyl, sulfhydryl, halogeno, amino, alkyl, allyl, -OR^6 wherein R^6 is alkyl, allyl, silyl or phosphate;
R^4 is either hydrogen or -(CH$_2$)$_m$OR^7 wherein R^7 is alkyl or -(CO)R^8, R^8 is alkyl and m is an integer in the range of 0 to 12 inclusive;
R^5 is -A-Z-X(R^9)n;
A is oxygen, sulfur or methylene;
Z is arylene, C$_6$–C$_{18}$ aralkylene or C$_1$–C$_{12}$ alkylene containing 0 to 6 heteroatoms selected from the group consisting of O, S, N, Si and Se and 0 to 6 linkages selected from the group consisting of -CO-, -COO-, -CONH-, -NHCO-, -S-S-, -SO$_2$-, -CH(OH)-CH(OH)-, -CH(OR^{15})-CH(OR^{15})-,-O-PO(O^{31})-O-, -O-P(R^{15})-, -O-P(OR^{15})-O-, -O-P(OR^{15})-R^{16}- and -PO(OR^{15})-O-R^{16}- in which R^{15} is lower alkyl and R^{16} is lower alkylene, and, if Z is aralkylene or alkylene, containing 0 to 3 unsaturated bonds;
X is selected from the group consisting of -NH-, -CONH-, -NHCO-, -CO-, -S- and -Si=;
R^9 is hydrogen, a protecting group, a detectable label, or, unless X is -Si=, a solid support; and
n is 1 when X is -NH-, -CONH-, -NHCO-, -CO-, or -S-, and is 3 when X is -Si=,
with the proviso that if R^2 represents a linkage to a solid support, R^9 is hydrogen, a protecting group, or a detectable label.

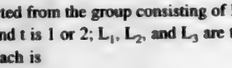
5,597,910

ELECTROCHEMILUMINESCENT LABEL FOR DNA PROBE ASSAYS

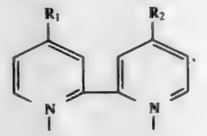
Satyanarayana R. Gudibande, Rockville, Mass., and John H. Kenten, Gaithersburg, Md., assignors to Igen, Inc., Gaithersburg, Md.

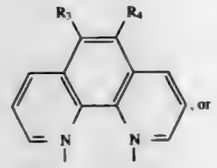
Continuation of Ser. No. 307,026, Sep. 15, 1994, abandoned, which is a continuation of Ser. No. 805,537, Dec. 11, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,817
Int. Cl.[6] C07H *21/04;* C12Q *1/68;* G01T *1/20;* C09K *11/06*
U.S. Cl. 536—24.3 9 Claims

1. A compound of the formula:

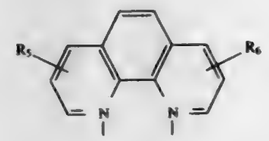


wherein M is selected from the group consisting of Ru, Os and Re; u.t=v, u is 1 or 2 and t is 1 or 2; L$_1$, L$_2$, and L$_3$ are the same or not all the same and each is

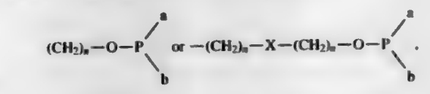




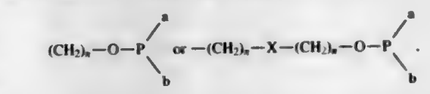
, or



wherein R$_1$, R$_2$, R$_3$, R$_4$, R$_5$ and R$_6$ are the same or not all the same and each is H, alkyl of from 1–5 carbon atoms,



and at least one of R$_1$, R$_2$, R$_3$, R$_4$, R$_5$ and R$_6$ is either



n is an integer in the range from 1–20; X is selected from the group consisting of O, S, SO$_2$, COO, and CONH; a and b are —N(CH—(CH$_3$)$_2$)$_2$, —NH—CH—(CH$_3$)$_2$, O—(CH$_2$)$_2$—CN, O—CH$_3$ or morpholino, provided that a and b are not the same; and Z is a counterion, provided that said counterion is an anion associated with the synthesis or purification of the compound; and further provided that ligands L$_1$, L$_2$ and L$_3$ are selected such that the compound is capable of electrochemiluminescence.

5,597,911
MYCOBACTERIAL NUCLEIC ACID HYBRIDIZATION PROBES AND METHODS OF USE

Jean-Luc Gaeadon, Paris; Dominique Thierry, Boulogne; Agnès Ullmann, Paris; Brigitte Gicquel, Paris, and Anne Brisson-Noel, Parris, all of France, assignors to Institut Pasteur, Paris, France

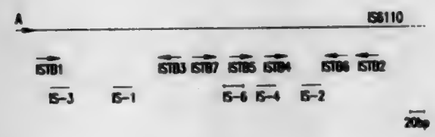
PCT No. PCT/FR90/00591, § 371 Date Apr. 14, 1992, § 102(e) Date Apr. 14, 1992, PCT Pub. No. WO91/03558, PCT Pub. Date Mar. 21, 1991

PCT Filed Sep. 6, 1990, Ser. No. 829,016

Claims priority, application France, Sep. 6, 1989, 89 11665; Mar. 2, 1990, 90 02676

Int. Cl.[6] C07H *21/00;* **C12Q** *1/68;* **C12P** *19/34;* **C07K** *14/00*

U.S. Cl. 536—24.32 **8 Claims**



1. An isolated DNA, having a nucleotide sequence selected from the group consisting of SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15 and SEQ ID NO:16.

5,597,912
PROCESS FOR PREPARING CELLULOSE ESTERS BY USE OF CARBOXYLIC ACIDS

Kevin J. Edgar, Kingsport, and Charles M. Buchanan, Bluff City, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 509,385, Apr. 16, 1990, abandoned. This application Mar. 4, 1994, Ser. No. 206,236

Int. Cl.[6] C08B *3/24*

U.S. Cl. 536—63 **15 Claims**

1. A process for reducing the degree of substitution of C_1–C_{20} esters of cellulose without mineral acid catalysis, said process comprising

contacting at least one of said esters of cellulose with:

(i) a solvent system comprising at least one solvent selected from the group consisting of an alcohol having from about 1 to 11 carbon atoms, and a polyol having from 2 to 11 carbon atoms, or a mixture of water with said polyol or said alcohol or with said polyol and said alcohol, and

(ii) at least one solvolysis promoter selected from a carboxylic acid of the formula:

R^1—COOH

wherein R^1 is hydrogen, a straight chain alkyl group having 1 to 7 carbon atoms, a branched chain alkyl group having 3 to 7 carbon atoms, or an aryl group having 7 to 11 carbon atoms,

wherein said solvolysis promoter is present in an amount of from 10 to 10,000 mol %, based on the moles of anhydroglucose repeat units of the cellulose ester,

wherein said product ester of cellulose has a lower degree of substitution than the corresponding ester of cellulose starting material,

wherein said contacting is carried out for a reaction time of about 10 to about 18 hours at a temperature of about 130° C. to 180°C., and

wherein the product cellulose ester is water absorbent or water soluble, and has a degree of substitution falling in the range of 0.4 up to 1.2.

5,597,913
GLYCOGEN POLYSACCHARIDES

Rosario Nicoletti, and Leandro Baiocchi, both of Rome, Italy, assignors to Istituto Ricerca Francesco Angelini S.p.A., Rome, Italy

Filed Jan. 26, 1995, Ser. No. 373,266

Claims priority, application Italy, Aug. 4, 1992, MI91A1927

Int. Cl.[6] C07H *1/00;* **C07G** *17/00*

U.S. Cl. 536—123.1 **7 Claims**

1. A process for preparing a glycogen polysaccharide having a nitrogen content of less than 60 ppm when measured by the Kjeldahl method and reducing sugars content of less than 0.25% when measured by the method of F.D. Snell and Snell, comprising:

boiling an animal tissue rich in glycogen in an aqueous solution of a strong base, cooling the broth thus obtained, adding a non-acidic, volatile solvent miscible in water to promote formation of a precipitate, separating the precipitate and dissolving said precipitate in water to form an aqueous solution, adjusting the pH of said aqueous solution to neutral and treating the solution with a cationic resin, separating the cationic resin from the solution and adding a non-acidic, volatile solvent miscible in water to precipitate a polysaccharide free of nitrogenous compounds and reducing sugars, then recovering the precipitate formed.

5,597,914
PROCESS FOR THE PRODUCTION OF CEPHALOSPORINS

Johann Dankbmaier, Schwarz/Tyrol, Austria, assignor to BIOCHEMIE Gesellschaft m.b.H., Austria

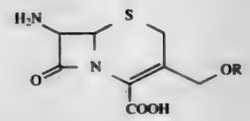
Filed Oct. 20, 1994, Ser. No. 326,578

Claims priority, application Austria, Oct. 22, 1993, 2143/93

Int. Cl.[6] C07D *501/18*

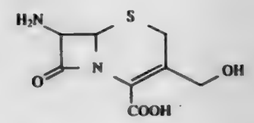
U.S. Cl. 540—230 **11 Claims**

1. In a process for the preparation of a compound of the formula



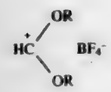
I

where R is alkyl, aryl, or aralkyl, by reacting a compound of the formula



II

in a solvent with an etherification agent, the improvement which comprises using as the etherification agent a compound of the formula



where R is as defined above.

5,597,915
BENZODIAZEPINE DERIVATIVES, COMPOSITIONS CONTAINING THEM AND THEIR USE IN THERAPY

Mark S. Chambers, Watford; Stephen R. Fletcher, Hatfield Heath; Victor G. Matassa, Furneux Pelham, all of United Kingdom, and Mark G. Bock, Hatfield, Pa., assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

PCT No. PCT/GB93/00535, § 371 Date Sep. 15, 1994, § 102(e) Date Sep. 15, 1994, PCT Pub. No. WO93/19063, PCT Pub. Date Sep. 30, 1993

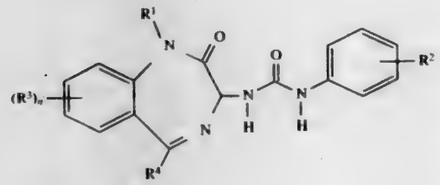
PCT Filed Mar. 15, 1993, Ser. No. 295,918

Claims priority, application United Kingdom, Mar. 16, 1992, 9205669; Nov. 3, 1992, 9223006

Int. Cl.[6] C07D *417/12;413/12;403/12;* **A61K** *31/55*

U.S. Cl. 540—509 **4 Claims**

1. A compound of formula (I):

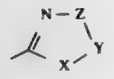


(I)

wherein:

R^1 represents H, $(CH_2)_q$imidazolyl, $(CH_2)_q$tetrazolyl, $(CH_2)_q$triazolyl, (where q is 1, 2 or 3); C_{1-6}alkyl optionally substituted by one or more groups selected from halo, hydroxy and NR^6R^7 (where R^6 and R^7 each independently represents H or C_{1-4}alkyl, or R^6 and R^7 together form a chain $(CH_2)_p$ where p is 4 or 5); C_{3-7}cycloalkyl; cyclopropylmethyl; $CH_2CO_2R^5$ (where R^5 is C_{1-4}alkyl), $CH_2CONR^6R^7$ or $CH_2CH(OH)$—W—$(CH_2)_2NR^6R^7$ where W is S or NH and R^6 and R^7 are as previously defined;

R^2 represents a group



wherein:

X represents O, S or NR^8 where R^8 represents H or C_{1-4}alkyl;

one of Z and Y is C=O and the other is O, S or NR^9, where R^9 represents H or C_{1-4}alkyl;

R^3 represents C_{1-6}alkyl, or halo;

R^4 represents C_{3-7}cycloalkyl; and

n is 0, 1, or 2;

or a pharmaceutically salt thereof.

5,597,916
1 SUBSTITUTED OXINDOLES AND AZAOXINDOLES

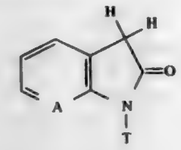
Christopher A. Teleha, New Castle, Del., assignor to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

Division of Ser. No. 392,017, Feb. 21, 1995, Pat. No. 5,519,132, which is a division of Ser. No. 191,416, Feb. 11, 1994, Pat. No. 5,428,035, which is a division of Ser. No. 957,152, Oct. 7, 1992, Pat. No. 5,296,478. This application Feb. 21, 1996, Ser. No. 604,658

Int. Cl.[6] C07D *209/34;471/04*

U.S. Cl. 544—127 **16 Claims**

1. A compound of formula:

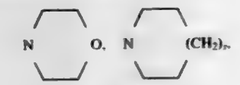


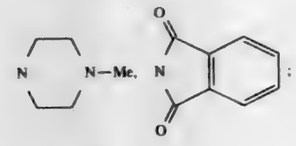
III

wherein:

T is selected from the group:

$N(Ph)_2$, $N(Me)_2$, N(Ph) (Me),





;

wherein s is 1–3; and,

A is selected from CH or N with the proviso that whan A is CH then T is not $N(Ph)_2$.

5,597,917
METHOD FOR THE PRODUCTION OF N-CYCLIC AND N,N'-DICYCLIC UREAS AND THEIR USE AS CHEMICAL SOLVENTS

Kurt A. Hackl; Markus Rössler; Martin Müllner, all of Linz, and Gerhard Stern, Sonnberg, all of Austria, assignors to DSM Chemie Linz GmbH, Linz, Austria

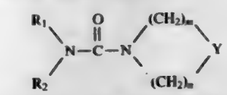
Division of Ser. No. 185,246, Jan. 24, 1994, Pat. No. 5,414,083. This application Jan. 30, 1995, Ser. No. 380,517

Claims priority, application Austria, Jan. 22, 1993, 94/93

Int. Cl.[6] C07D *413/02;411/02;403/02;211/02*

U.S. Cl. 544—130 **4 Claims**

1. A process for the dissolution of a chemical compound by a chemical solvent comprising dissolving a chemical compound in at least one urea of the formula



I

in which R_1 and R_2 independently of one another denote a straight-chain, branched or cyclic alkyl group having 1 to 22 C atoms, which is unsubstituted or substituted by fluorine atoms; nitro groups; alkenyl- or alkylidene groups having 2 to 6 C atoms; phenyl groups which are unsubstituted or substituted by fluorine atoms, nitro groups, alkyl groups having 1 to 5 C atoms, alkoxy groups having 1 to 5 C atoms or phenoxy groups; benzyl or phenylethyl groups which are unsubstituted or substituted by fluorine atoms, nitro groups, alkyl groups having 1 to 5 C atoms,

alkoxy groups having 1 to 5 C atoms or phenoxy groups; alkoxy groups having 1 to 5 C atoms, phenoxy groups which are unsubstituted or substituted by fluorine atoms, nitro groups, alkyl groups having 1 to 5 C atoms, alkoxy groups having 1 to 5 C atoms or phenoxy groups; or, together with the nitrogen atom, a five or six-member non-aromatic ring which can be broken by an oxygen or sulphur atom; Y represents a methylene group, an oxygen or sulphur atom, n and m represent independently of one another the numbers 1 to 3, whereby n plus m represent the numbers 3 or 4.

5,597,918

FUSED PYRIDAZINE COMPOUND

Tohru Nakao; Hiroshi Tanaka, both of Fukuoka; Yasuto Morimoto, Osaka, and Shuzo Takehara, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

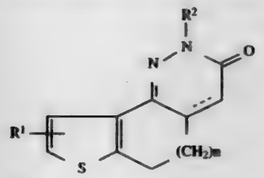
Continuation of Ser. No. 208,958, Feb. 28, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 460,758

Claims priority, application Japan, Aug. 27, 1991, 3-240378

Int. Cl.[6] C07D *495/04*

U.S. Cl. 544—234 **4 Claims**

1. A fused pyridazine compound of the formula:



(I)

wherein:

R^1 is hydroxyalkyl having 1 to 4 carbon atoms in the alkyl moiety or alkoxyalkyl having 1 to 4 carbon atoms in each of the alkoxy and alkyl moieties;

R^2 is phenyl having at least one substituent selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms;

n is 1 or 2;

the bond represented by the full line and dotted line is a single bond or a double bond.

5,597,919

PYRIMIDINYL OR PYRIDINYL ALKENYL AMINE COMPOUNDS

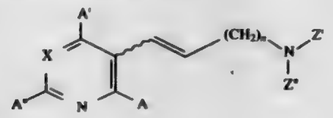
Gary M. Dull, 1175 Sequoia Dr., Lewisville, N.C. 27023, and William S. Caldwell, 1270 Yorkshire Rd., Winston-Salem, N.C. 27106

Filed Jan. 6, 1995, Ser. No. 364,979

Int. Cl.[6] C07D *213/02;239/24*

U.S. Cl. 544—242 **12 Claims**

1. A compound having the formula:



where X is C—OCH_3; n is an integer which ranges from 1 to 5; Z' and Z" individually represent hydrogen, methyl or isopropyl; A, A' and A" represent hydrogen; and the wavy line represents a cis (Z) or trans (E) form of the compound.

5,597,920

GABAA RECEPTOR SUBTYPES AND METHODS FOR SCREENING DRUG COMPOUNDS USING IMIDAZOQUINOXALINES AND PYRROLOPYRIMIDINES TO BIND TO GABAA RECEPTOR SUBTYPES

Kenneth Shaw, Weston; Alan Hutchison, Madison; Andrew Thurkauf, Branford, and John Tallman, Guilford, all of Conn., assignors to Neurogen Corporation, Branford, Conn.

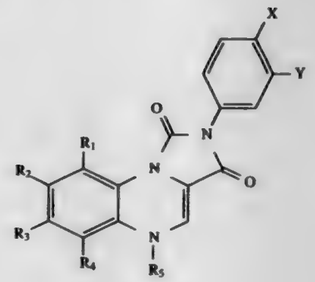
Filed Apr. 30, 1992, Ser. No. 876,050

The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.

Int. Cl.[6] C07D *487/06;487/04;487/02*

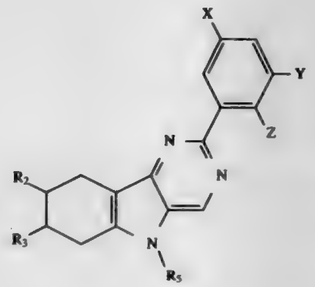
U.S. Cl. 544—250 **1 Claim**

1. Tritium or iodine isotope radiolabeled compounds of the formulas



I

and



II

and the pharmaceutically acceptable salts thereof where:

R_1, R_2, R_3, R_4 are the same or different and represent hydrogen, halogen, straight chain or branched lower alkyl having 1–6 carbon atoms, or straight chain or branched lower alkoxy having 1–6 carbon atoms;

R5 is hydrogen or straight chain or branched lower alkyl having 1–6 carbon atoms;

X and Y are the same or different and represent hydrogen, halogen, straight chain or branched lower alkyl having 1–6 carbon atoms, or straight chain or branched lower alkoxy having 1–6 carbon atoms; and

Z is hydrogen or fluorine.

5,597,921

INDOLO[2,3-B]QUINOXALINE DERIVATIVES

Taro Matsumoto; Hisaya Wada; Yoshihiro Migita; Katsuo Hatayama, and Yoshinori Sekiguchi, all of Tokyo, Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP94/00673, § 371 Date Oct. 16, 1995, § 102(e) Date Oct. 16, 1995, PCT Pub. No. WO94/24135, PCT Pub. Date Oct. 27, 1994

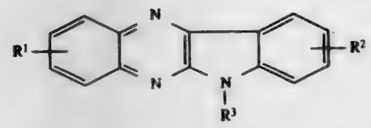
PCT Filed Apr. 22, 1994, Ser. No. 532,566

Claims priority, application Japan, Apr. 22, 1993, 5-095778

Int. Cl.[6] C07D *241/36*

U.S. Cl. 544—343 **1 Claim**

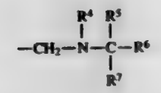
1. An indolo[2,3-b]quinoxaline derivative represented by Formula (I):



(I)

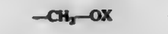
wherein

one of R^1 and R^2 is a hydrogen atom and the other is a group represented by Formula (II):



(II)

wherein R^4 is a hydrogen atom or a methyl group, R^5, R^6 and R^7 are the same or different, and are each a hydrogen atom, a straight or branched lower alkyl group or a group represented by Formula (III):



(III)

wherein X is a hydrogen atom, a straight or branched lower alkyl group or an acetyl group; and

R_3 is a hydrogen atom, a methyl group or a group represented by Formula (IV):



(IV)

wherein m is 1, 2 or 3, n is 1 or 2, P is an oxygen atom or a sulfur atom, and Q is a hydrogen atom, a hydroxyl group, a methoxy group, an ethoxy group, an acetoxy group or an acetamido group; or a pharmaceutically acceptable salt thereof.

5,597,922

GLYCINE RECEPTOR ANTAGONIST PHARMACOPHORE

Sui X. Cai, Irvine, Calif.; John F. W. Keana, Eugene, Oreg., and Eckard Weber, Laguna Beach, Calif., assignors to State of Oregon, Acting by and through the Oregon State Board of Higher Education, Acting for and on Behalf of the Oregon Health Sciences University and the University of Oregon, Eugene, Oreg.; Acea Pharmaceuticals, Inc., Irvine, and The Regents of the University of California, Oakland, both of Calif.

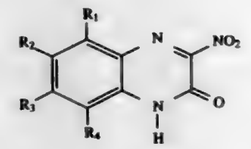
Filed Jul. 29, 1994, Ser. No. 281,995

Int. Cl.[6] C07D *241/44;265/36;* A61K *31/495;31/535*

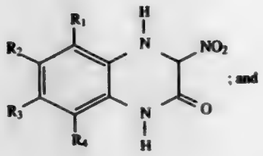
U.S. Cl. 544—354 **6 Claims**

1. A compound selected from the group consisting of:

XXVI

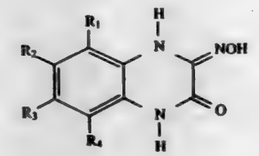


XXVII



; and

XLIX



wherein R_1, R_2 and R_3 are independently selected from the group consisting of:

a) hydrogen,

b) C_1-C_4 alkyl,

c) nitro,

d) amino,

e) halo,

f) C_1-C_4 haloalkyl,

g) cyano,

h) C_2-C_4 alkenyl,

i) C_2-C_4 alkynyl,

j) alkanoylamino, where the alkyl portion of the alkanoyl moiety has from 1 to 4 carbon atoms,

k) azido,

l) C_1-C_4 alkoxy,

m) alkoxycarbonyl, where the alkoxy portion has from 1 to 4 carbon atoms, and

n) alkylcarbonyl, where the alkyl portion has from 1 to 4 carbon atoms; and R_4 is hydrogen or fluorine.

5,597,923

QUINOLONE CARBOXYLIC ACID DERIVATIVES IN CRYSTALLINE HYDRATE FORM

Hiroyuki Nagano, Shizuoka, and Nobuyuki Suzuki, Tokyo, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP93/00109, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/15070, PCT Pub. Date Aug. 5, 1993

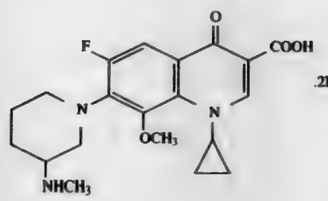
PCT Filed Jan. 31, 1993, Ser. No. 256,726

Claims priority, application Japan, Jan. 31, 1992, 4-016545

Int. Cl.[6] A61K *31/47*; C07D *215/233*;*215/38*

U.S. Cl. 546—156 3 Claims

1. 1-Cyclopropyl-6-fluoro-1,4-dihydro-8-methoxy-7-(3-methylaminopiperidin-1-yl)-4-oxoquinoline-3-carboxylic acid dihydrate having the following formula:



.2H$_2$O.

5,597,924

COVERSION OF SUBSTITUTED 8-CHLOROQUINOLINES TO SUBSTITUTED 8-HYDROXYQUINOLINES

Robert S. Marmor, Princeton Junction, and Henry L. Strong, Somerset, both of N.J., assignors to American Cyanamid Company, Madison, N.J.

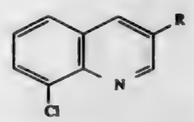
Filed May 24, 1995, Ser. No. 448,693

Int. Cl.[6] C07D *215/18*;*215/26*

U.S. Cl. 546—179 6 Claims

1. A process for preparing substituted 8-hydroxyquinolines which comprises

reacting substituted 8-chloroquinoline of the formula



wherein R is C$_1$–C$_4$alkyl, hydroxy-C$_1$–C $_4$alkyl, C$_1$–C$_6$-alkoxy-C$_1$–C$_4$alkyl, C$_1$–C$_4$haloalkyl, and di-C$_1$–C$_4$alkylamino-C$_1$–C$_4$alkyl in a stirred pressure reactor with dilute alkaline solution in the presence of a cupric catalyst at a temperature within the range of about 150°–200° C.

5,597,925

METHOD OF PRODUCING OXADIAZOLE COMPOUNDS

Masafumi Ohta, Susono; Yohta Sakon, Numazu; Toshihiko Takahashi, Numazu; Chiharu Adachi, Numazu, and Kazukiyo Nagai, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 321,765, Oct. 12, 1994, which is a division of Ser. No. 51,070, Apr. 14, 1993, Pat. No. 5,420,288. This application Jun. 7, 1995, Ser. No. 476,681

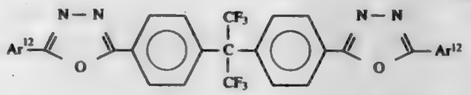
Claims priority, application Japan, Apr. 14, 1992, 4-121194; Jun. 9, 1992, 4-174801; Jun. 20, 1992, 4-186851; Jul. 27, 1992, 4-219792; Sep. 17, 1992, 4-273692; Sep. 29, 1992, 4-284041; Apr. 1, 1993, 5-098890

Int. Cl.[6] C07D *271/07*

U.S. Cl. 548—145 2 Claims

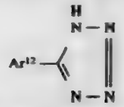
1. A method for producing an oxadiazole derivative represented by formula (VII):

(VII)



by reacting a compound represented by formula (VIII) with a compound or mixture of compounds represented by formula (IX):

(IX)



wherein Ar^{12} independently represents an alkyl group having 1 to 20 carbon atoms, an aromatic hydrocarbon ring or an aromatic heterocyclic ring, and X is a halogen atom.

5,597,926

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

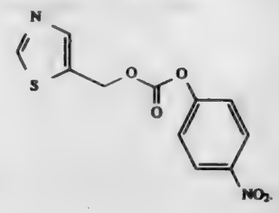
Dale J. Kempf, Libertyville, and Daniel W. Norbeck, Lindenhurst, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 270,210, Aug. 23, 1994, abandoned, which is a division of Ser. No. 121,673, Sep. 14, 1993, Pat. No. 5,354,866, which is a continuation of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 23, 1995, Ser. No. 409,767

Int. Cl.[6] C07D *277/30*

U.S. Cl. 548—204 1 Claim

1. A compound of the formula:



5,597,927

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

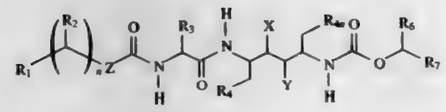
Dale J. Kempf, Libertyville; Daniel W. Norbeck, Crystal Lake; Hing L. Sham, and Chen Zhao, both of Gurnee, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 158,587, Dec. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 998,114, Dec. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 29, 1995, Ser. No. 412,438

Int. Cl.[6] C07D *277/30*

U.S. Cl. 548—204 12 Claims

1. A compound of the formula:



wherein R_1 is monosubstituted thiazolyl or monosubstituted oxazolyl wherein the substituent is selected from (i) C_1-to-C_6-loweralkyl, (ii) C_2-to-loweralkenyl, (iii) C_3-to-C_7-cycloalkyl, (iv) C_3-to-C_7-cycloalkyl-C_1-to-C_6-alkyl, (v) C_5-to-C_7-cycloalkenyl, (vi) C_5-to-C_7-cycloalkenyl-C_1-to-C_6-alkyl, (vii) C_1-to-C_6-alkoxy-C_1-to-C_6-alkyl or benzyloxy-C_1-to-C_6-alkyl, (viii) C_1-to-C_6-thioalkoxy-C_1-to-C_6-alkyl or benzyl-S-C_1-to-C_6-alkyl, (ix) C_1-to-C_6-alkylamino, (x) di-C_1-to-C_6-alkylamino, (xi) phenyl wherein the phenyl ring is unsubstituted or substituted with a substituent selected from halo, C_1-to-C_6-loweralkyl, hydroxy, C_1-to-C_6-alkoxy, benzyloxy, benzyl-S— and thioalkoxy, (xii) phenyl-C_1-to-C_6-alkyl wherein the phenyl ring is unsubstituted or substituted as defined above, (xiii) di-C_1-to-C_6-alkylamino-C_1-to-C_6-alkyl, (xiv) C_1-to-C_6-alkoxy or benzyloxy and (xv) C_1-to-C_6-thioalkoxy or benzyl-S—:

n is 1, 2 or 3;

R_2 is hydrogen or C_1-to-C_6-loweralkyl;

R_3 is C_1-to-C_6-loweralkyl;

R_4 is phenyl wherein the phenyl ring is unsubstituted or substituted with a substituent selected from (i) halo, (ii) C_1-to-C_6-loweralkyl, (iii) hydroxy, (iv) C_1-to-C_6-alkoxy or benzyloxy and (v) C_1-to-C_6-thioalkoxy or benzyl-S—;

R_{4a} is thiazolyl or oxazolyl wherein the thiazolyl or oxazolyl ring is unsubstituted or substituted with a substituent selected from (i) halo, (ii) C_1-to-C_6-loweralkyl, (iii) hydroxy, (iv) C_1-to-C_6-alkoxy or benzyloxy and (v) C_1-to-C_6-thioalkoxy or benzyl-S—;

R_6 is hydrogen or C_1-to-C_6-loweralkyl;

R_7 is thiazolyl or oxazolyl wherein the thiazolyl or oxazolyl ring is unsubstituted or substituted with C_1-to-C_6-loweralkyl;

X is hydrogen and Y is —OH; and

Z is absent, —O—, —S—, —CH_2— or —N(R_8)— wherein R_8 is C_1-to-C_6-loweralkyl, C_3-to-C_7-cycloalkyl, —OH or —NHR_{8a} wherein R_{8a} is hydrogen or C_1-to-C_6-loweralkyl; or a pharmaceutically acceptable salt thereof.

5,597,928

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

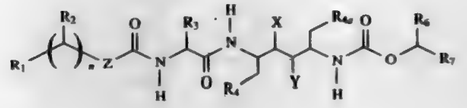
Dale J. Kempf, Libertyville; Daniel W. Norbeck, Crystal Lake; Hing L. Sham, and Chen Zhao, both of Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 158,587, Dec. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 998,114, Dec. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Apr. 4, 1995, Ser. No. 416,607

Int. Cl.[6] C07D *277/30*

U.S. Cl. 548—204 11 Claims

1. A compound of the formula:



wherein

R_1 is monosubstituted thiazolyl or monosubstituted oxazolyl wherein the substituent is selected from (i) heterocyclic wherein the heterocyclic is selected from aziridinyl, azetidinyl, pyrrolidinyl, piperidinyl, piperazinyl, morpholinyl, thiomorpholinyl, thiazolyl, oxazolyl, isoxazolyl, isothiazolyl, pyridinyl, pyrimidinyl, pyridazinyl and pyrazinyl and wherein the heterocyclic is unsubstituted or substituted with a substituent selected from halo, C_1-to-C_6-loweralkyl, hydroxy, C_1-to-C_6-alkoxy or benzyloxy and C_1-to-C_6-thioalkoxy or benzyl-S— and (ii) (heterocyclic)-C_1-to-C_6-alkyl wherein heterocyclic is defined as above;

n is 1, 2or 3;

R_2 is hydrogen or C_1-to-C_6-loweralkyl;

R_3 is C_1-to-C_6-loweralkyl;

R_{4a} is phenyl wherein the phenyl ring is unsubstituted or substituted with a substituent selected from (i) halo, (ii) C_1-to-C_6-loweralkyl, (iii) hydroxy, (iv) C_1-to-C_6-alkoxy or benzyloxy and (v) C_1-to-C_6-thioalkoxy or benzyl-S—

R_4 is thiazolyl or oxazolyl wherein the thiazolyl or oxazolyl ring is unsubstituted or substituted with a substituent selected from (i) halo, (ii) C_1-to-C_6-loweralkyl, (iii) hydroxy, (iv) C_1-to-C_6-alkoxy or benzyloxy and (v) C_1-to-C_6-thioalkoxy or benzyl-S—;

R_6 is hydrogen or C_1-to-C_6-loweralkyl;

R_7 is thiazolyl or oxazolyl wherein the thiazolyl or oxazolyl ring is unsubstituted or substituted with C_1-to-C_6-loweralkyl;

X is hydrogen and Y is —OH; and

Z is absent, —O—, —S—, —CH_2— or —N(R_8)— wherein R_8 is C_1-to-C_6-loweralkyl, C_3-to-C_7-cycloalkyl, —OH or —NHR_{8a} wherein R_{8a} is hydrogen or C_1-to-C_6-loweralkyl; or a pharmaceutically acceptable salt thereof.

5,597,929

PRODUCTION PROCESS OF 2-(TETRAZOL-5-YL)-4-OXO-4H-BENZOPYRAN

Hideki Ushio, Takatsuki, Japan, and Takayuki Higashi, Irvington, N.Y., assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

PCT No. PCT/JP95/01261, § 371 Date Feb. 23, 1996, § 102(e) Date Feb. 23, 1996, PCT Pub. No. WO96/08225, PCT Pub. Date Jan. 4, 1996

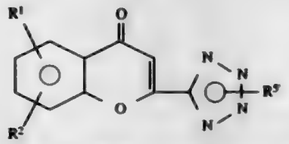
PCT Filed Jun. 23, 1995, Ser. No. 601,829

Claims priority, application Japan, Jun. 23, 1994, 6-141759

Int. Cl.[6] C07D *405/04*

U.S. Cl. 548—253 **17 Claims**

16. A 2-(tetrazol-5-yl)-4-oxo-4H-benzopyran of general formula (1'):



(1')

wherein R^1 and R^2 are the same or different and are a hydrogen atom, a hydroxy group, a halogen atom, a C_1–C_{20} alkyl group, a C_1–C_{20} alkoxy group, an R^3CONH group or a nitro group, in which R^3 is a C_1–C_{20} alkyl group optionally substituted with an aryl group, or a phenyl group optionally substituted with R^4; R^4 is a C_1–C_{20} alkyl group optionally substituted with an aryl group, or a C_1–C_{20} alkoxy group optionally substituted with an aryl group; R^5 is an alkyl or alkenyl group optionally substituted with an electron withdrawing group, an alkyl group substituted with 1 to 3 aryl groups, an alkoxycarbonyl group optionally substituted with an aryl group, an aryloxycarbonyl group, an alkoxymethyl group, a trialkyl tin group, a triaryl tin group or a trialkylsilyl group, in which the term "aryl group" or "aryl" means a phenyl group optionally substituted with a group selected from an alkyl group, an alkoxy group or a halogen atom.

5,597,930

ASPARTATE-FUNCTIONAL POLYHYDANTOIN PREPOLYMERS AND THEIR USE IN COATING COMPOSITIONS

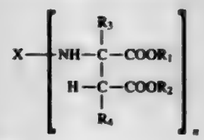
Douglas A. Wicks, Mt. Lebanon; Lyuba K. Gladis; Philip E. Yeske, both of Pittsburgh, and E. Hankan Jonsson, Cornopolis, all of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed May 18, 1995, Ser. No. 443,504

Int. Cl.[6] C07D *233/54*; C08G *33/02*;*18/32*;*18/38*

U.S. Cl. 548—314.1 **20 Claims**

1. An aspartate-functional hydantoin prepolymer prepared by reacting, at an equivalent ratio of aspartate groups to isocyanate groups of 1.05:1 to 10:1, a polyisocyanate having a functionality of at least 1.8 with a polyaspartate corresponding to the formula



(I)

wherein

X represents an organic group which has a valency of n and is inert towards isocyanate groups at a temperature of 100° C. or less, and

R_1 and R_2 may be the same or different and represent unsubstituted or substituted hydrocarbon radicals,

R_3 and R_4 may be identical or different and represent hydrogen or organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less and

n has a value of 2 to 6.

5,597,931

TOTAL SYNTHESIS OF TAXOL AND ANALOGUES THEREOF

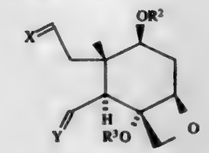
Samuel J. Danishefsky, Englewood, N.J.; John Masters, Indianapolis, Ind.; Wendy Young; J. Thomas Link, both of New York, N.Y.; Richard Isaacs, Harleysville, Pa., and Lawrence B. Snyder, Clinton, Conn., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 146,704, Nov. 2, 1993, Pat. No. 5,488,116, which is a continuation-in-part of Ser. No. 860,792, Mar. 30, 1992, Pat. No. 5,416,225. This application May 5, 1995, Ser. No. 436,809

Int. Cl.[6] C07D *305/14*;*317/70*;*317/72*

U.S. Cl. 549—214 **30 Claims**

1. A compound having the structure:

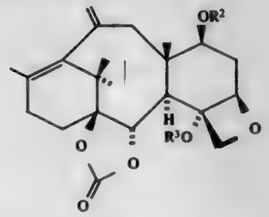


wherein X and Y are each independently $(OR)_2$, where R is a linear or branched chain alkyl group, or O, $—OCH_2CH_2O—$, $—SCH_2CH_2S—$ or $—OCH_2CH_2S—$; wherein R^2 is H, a linear or branched chain alkyl or arylalkyl group, or an aryl group, or a trialkylsilyl group; and wherein R^3 is H, a linear or branched chain alkyl or alkylaryl group, or an aryl group.

13. A compound having the structure:

wherein X is $(OR)_2$, where R is a linear or branched chain alkyl group, or O, $—OCH_2CH_2O—$, $—SCH_2CH_2S—$, or $—OCH_2CH_2S—$; wherein R^2 is H, a linear or branched chain alkyl or arylalkyl group, or an aryl group, or a trialkylsilyl group; wherein R_a is H, OH, halide, CN, NH_2, or a linear or branched substituted or unsubstituted chain alkyl, alkoxy, arylalkyl, aryl, alkoxycarbonyl, acyl, or carboxamido group; and wherein R^3 is H, a linear or branched chain alkyl, arylalkyl, acyl or alkylaryl group, or an aryl group.

19. A compound having the structure:



wherein R^2 is a trialkylsilyl group or a linear or branched chain alkyl group; and wherein R^3 is a linear or branched chain alkyl or alkylaryl group, or an aryl group.

5,597,932

INTERMEDIATE FOR THE PREPARATION OF 19-NOR VITAMIN D COMPOUNDS

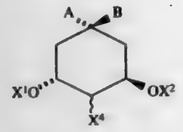
Hector F. DeLuca, Deerfield; Heinrich K. Schnoes; Kato L. Perlman, both of Madison, all of Wis., and Rolf E. Swenson, Lake Bluff, Ill., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 329,334, Oct. 26, 1994, Pat. No. 5,486,636, which is a division of Ser. No. 180,702, Jan. 13, 1994, Pat. No. 5,391,755, which is a division of Ser. No. 979,482, Nov. 20, 1992, Pat. No. 5,281,731, which is a continuation of Ser. No. 705,917, May 28, 1991, abandoned. This application May 16, 1995, Ser. No. 442,508

Int. Cl.[6] C07D *309/00*; C07F *7/18*; C07C *47/28*

U.S. Cl. 549—214 **1 Claim**

1. A compound of the structure:



Where X^1 and X^2, which may be the same or different, represents hydrogen or a hydroxy-protecting group, and where X^4 is hydrogen, and where A is selected from the group consisting of —COOALKYL and $—CH_2OH$, where B represents hydroxy, and where A and B, when taken together represent an oxo group.

5,597,933

PROCESS FOR THE PREPARATION OF N-ACETYL NEURAMINIC ACID DERIVATIVES

Andrew D. Searle, Stevenage, and Christopher Williamson, Dartford, both of United Kingdom, assignors to Biota Scientific Management Pty. Ltd., Victoria, Australia

PCT No. PCT/EP94/01940, § 371 Date Mar. 8, 1996, § 102(e) Date Mar. 8, 1996, PCT Pub. No. WO95/00503, PCT Pub. Date Jan. 5, 1995

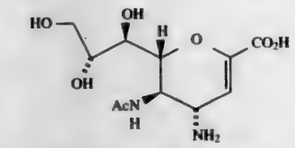
PCT Filed Jun. 15, 1994, Ser. No. 549,820

Claims priority, application United Kingdom, Jun. 17, 1993, 9312531

Int. Cl.[6] C07D *309/28*

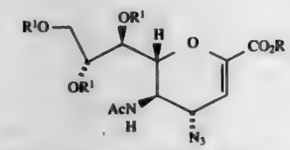
U.S. Cl. 549—424 **16 Claims**

1. A process for the preparation of a compound of formula (I)



(I)

which comprises catalytic hydrogenolysis of a compound of formula (II)



(II)

wherein R is H or C_{1-4}alkyl and R^1 is H or a hydroxyl protecting group, in aqueous formic acid.

5,597,934

PROCESS FOR PRODUCTION OF POLYOL COMPOUNDS

Johann Klein, Duesseldorf; Peter Daute, Essen; Udo Hees, Mayen, and Bernd Beuer, Monheim, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 182,112, Mar. 25, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 474,286

Claims priority, application Germany, Jul. 25, 1991, 41 24 665.9; Jul. 16, 1992, PCT/EP92/01617

Int. Cl.[6] C09F *7/06*

U.S. Cl. 534—26 **19 Claims**

1. A process for the production of a polyol compound comprising the steps of

a) condensing glycerol in the presence of from about 0.001 to about 0.1% by weight, based on the weight of glycerol, of a lithium catalyst which is lithium hydroxide or a lithium salt of a hydroxy-functionalized fatty acid having from about 6 to about 22 carbon atoms to form an oligoglycerol mixture and water of reaction; and

b) continuously removing said water of reaction as it is formed.

5,597,935

SYNTHESIS OF ANSA-METALLOCENE CATALYSTS

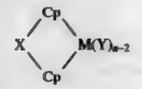
Richard F. Jordan, and Gary M. Diamond, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Oakdale, Iowa

Continuation-in-part of Ser. No. 252,591, Jun. 1, 1994, Pat. No. 5,495,035. This application May 15, 1995, Ser. No. 440,628

Int. Cl.[6] C07F *17/00*;*9/00*;*5/00*

U.S. Cl. 556—11 **37 Claims**

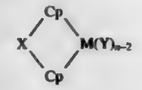
1. A process of synthesizing in high yield ansa-metallocene complexes of the formula:



wherein Cp independently and in each occurrence is cyclopentadienyl, indenyl, fluorenyl, or a related group that can π-bond to the metal, or a hydrocarbyl, alkyl, aryl, silyl, halo, halohydrocarbyl, hydrocarbylmetalloid, or halohydrocarbylmetalloid substituted derivative of said cyclopentadienyl, indenyl, fluorenyl or related group, X is a bridging group which links the Cp groups, M is a metal selected from the group consisting of Group 3, 4 and 5 metals, Y is a leaving group wherein each Y moiety may be the same or different or linked, and n is from 3 to 5, said process comprising:

reacting an ansa-bis-cyclopentadiene, indene, fluorene or related group as defined above with a metal leaving group complex MY_n to provide a high yield of ansa-metallocene complex.

21. A process of synthesizing in high yield ansa-metallocene complexes of the formula:

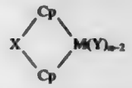


wherein Cp independently and in each occurrence is cyclopentadienyl, indenyl, fluorenyl, or a related group that can π-bond to the metal, or a hydrocarbyl, alkyl, aryl, silyl, halo, halohydrocarbyl, hydrocarbylmetalloid, or halohydrocarbylmetalloid substituted derivative of said cyclopentadienyl, indenyl, fluorenyl or related group, X is a bridging group which links the Cp groups, M is a metal selected from the group consisting of Group 3, 4 and 5

metals, Y is a leaving group wherein each Y moiety may be the same or different or linked and n is from 3 to 5, said process comprising:

reacting an ansa-bis-cyclopentadiene, indene, fluorene or related group as defined above with a metal leaving group complex MY_n to provide a high yield of ansa-metallocene complex and isolating the ansa-metallocene complex from the reaction mixture.

37. A process of synthesizing in high yield ansa-metallocene complexes of the formula:



wherein Cp independently and in each occurrence is cyclopentadienyl, indenyl, fluorenyl, or a related group that can π-bond to the metal, or a hydrocarbyl, alkyl, aryl, silyl, halo, halohydrocarbyl, hydrocarbylmetalloid, or halohydrocarbylmetalloid substituted derivative of said cyclopentadienyl, indenyl, fluorenyl or related group, X is methylene or substituted methylene which links the Cp groups, M is a metal selected from the group consisting of Group 3, 4 and 5 metals, Y is a leaving group wherein each Y moiety may be the same or different or linked, and n is from 3 to 5, wherein the metal leaving group complex, MY_n, is a metal amide $M(NRR')_n$ of a Group 4 metal and R and R' are each hydrogen, hydrocarbyl radicals of from C_1 to C_{20} or silyl radicals and R and R' may be the same or different or linked, said process comprising:

reacting an ansa-bis-cyclopentadiene, indene, fluorene or substituted derivative as defined above with a metal leaving group complex MY_n to provide a high yield of ansa-metallocene complex and isolating the ansa-metallocene complex from the reaction mixture.

5,597,936

METHOD FOR MANUFACTURING COBALT CATALYSTS

Christopher M. Perkins, Cincinnati, and Mark R. Sivik, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 491,185, Jun. 16, 1995, abandoned. This application Jul. 27, 1995, Ser. No. 508,198

Int. Cl.[6] C07F 15/06

U.S. Cl. 556—148 **16 Claims**

1. A method for manufacturing cobalt complexes having the formula:

$$[Co(NH_3)_5M]T_y$$

wherein the M ligand is selected from substituted and unsubstituted C_1–C_{30} carboxylic acids having the formula:

$$RC(O)O—;$$

said method comprising the steps of:

(a) reacting a cobalt (II) salt having the formula:

$$[Co(H_2O)_6]T_y$$

wherein T is one or more counteranions present in a number y to obtain a charge-balanced salt; and y is 1 or 2;

with concentrated ammonium hydroxide and ammonium chloride; followed by

(b) reacting the product of step (a) with an oxidizing agent selected from the group consisting of oxygen, hydrogen peroxide, and mixtures thereof; followed by

(c) reacting the product of step (b) with a carboxylic acid anhydride of the formula:

$$RC(O)O(O)CR$$

wherein each R is independently selected from substituted or unsubstituted C_1–C_{30} moieties;

(d) optionally, exchanging one T counterion with another T counterion; and

(e) collecting the cobalt complex.

5,597,937

CONVERSION OF DEEP INTERNAL OLEFINS INTO PRIMARY ALKYLALUMINUM COMPOUNDS BY ISOMERIZATION-DISPLACEMENT

Edward G. Samsel, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Filed May 11, 1995, Ser. No. 438,686

Int. Cl.[6] C07F 5/06

U.S. Cl. 556—190 **24 Claims**

1. A process of converting at least one deep internal linear olefin having at least 6 carbon atoms in the molecule into at least one alkyl aluminum compound having at least one primary linear alkyl group derived from said olefin, said process comprising reacting said olefin with a C_{3-4} primary alkyl aluminum chloride in the liquid phase in the presence of a catalyst system formed from (i) a dicyclopentadienyl metal dihalide and/or a dicyclopentadienyl metal halohydride wherein the metallic constituent thereof is zirconium or hafnium and (ii) a hydridic co-catalyst component.

5,597,938

PROCESS FOR PRODUCING INTERMEDIATE FOR 13,14-DIDEHYDROPROSTAGLANDIN E

Fumie Sato, 1-219, Kugenumashigashi 3-chome, Fujisawa-shi, Kanagawa, Japan, assignor to Taisho Pharmaceutical Co., Ltd., and Fumie Sato, both of Japan

PCT No. PCT/JP94/00243, § 371 Date Aug. 10, 1995, § 102(e) Date Aug. 10, 1995, PCT Pub. No. WO94/19319, PCT Pub. Date Sep. 1, 1994

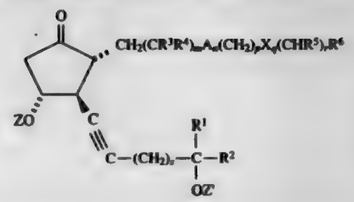
PCT Filed Feb. 17, 1994, Ser. No. 505,165

Claims priority, application Japan, Feb. 19, 1993, 5-030199

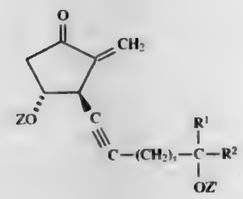
Int. Cl.[6] C07F 7/08;7/10;7/18

U.S. Cl. 556—436 **4 Claims**

1. A process for producing an intermediate for a 13,14,-didehydroprostaglandin E, represented by the formula:



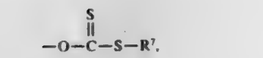
wherein Z and Z' and represents a protective group for the hydroxyl group; R^1 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; R^2 represents an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 8 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, a group represented by the formula —B—D (in which B represents an alkylene group having 1 to 4 carbon atoms and D represents a phenyl group, a phenoxy group, a phenyl group substituted with "a halogen atom, a trifluoromethyl group, an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group or a phenoxy group", a phenoxy group substituted with "a halogen atom, a trifluoromethyl group, an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group or a phenoxy group" or a cycloalkyl group having 5 to 7 carbon atoms), a phenyl group, a phenoxy group, a phenyl group substituted with "a halogen atom, a trifluoromethyl group, an alkyl group having 1 to 6 carbon atoms or an alkoxy group having 1 to 6 carbon atoms" or a phenoxy group substituted with "a halogen atom, a trifluoromethyl group, an alkyl group having 1 to 6 carbon atoms or an alkoxy group having 1 to 6 carbon atoms"; R^3 and R^4 each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms; R^5 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a halogen atom, a cyano group, an amino group, a hydroxyl group or a group represented by a formula —$COOR^8$ (in which R^8 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an alkenyl group having 2 to 6 carbon atoms); R^6 represents a group represented by a formula —$COOR^9$ (in which R^9 represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an alkenyl group having 2 to 6 carbon atoms), a cyano group, a hydroxyl group, a group represented by a formula —$OCOR^{10}$ (in which R^{10} represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an alkenyl group having 2 to 6 carbon atoms) or a group represented by a formula —$CONR^{11}R^{12}$ (in which R^{11} and R^{12} each represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or a phenyl group); A represents a vinylene group, an ethynylene group, a phenylene group or a group represented by a formula —C=C=C—; X represents an oxygen atom or a sulfur atom; m is an integer of 0 to 7; n is 0 or 1; each of p and r is an integer of 0 to 5; q is 0 or 1; and s is 0 or 1, with the proviso that the total number of straight chain carbon atoms of the s-chain in the formula is within the range of from 4 to 10, which comprises allowing a compound represented by the formula:



(wherein Z, Z', R^1, R^2 and s are as defined above) to undergo a radical reaction with a compound represented by the formula:

$$Y(CR^3R^4)_mA_n(CH_2)_pX_q(CHR^5)_sR^6$$

(wherein Y represents a halogen atom or a group represented by the formul



in which R^7 represents a hydrogen atom, an alkyl group having 1 to 9 carbon atoms or a phenyl group, and R^3, R^4, R^5, R^6, A, X, m, n, p, q and r are as defined above) using a radical generator.

5,597,939

HERBICIDAL SULPHONYLAMINOCARBONYLTRIAZOLINONES HAVING SUBSTITUENTS BONDED VIA OXYGEN OF THE FORMULA

Klaus-Helmut Müller, Duesseldorf; Klaus König, Odenthal; Joachim Kluth, Langenfeld; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Gergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

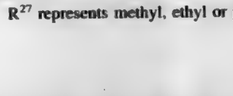
Division of Ser. No. 384,196, Feb. 6, 1995, Pat. No. 5,534,486, which is a continuation of Ser. No. 48,026, Apr. 15, 1993, abandoned, which is a continuation of Ser. No. 857,025, Mar. 24, 1992, abandoned. This application Apr. 10, 1996, Ser. No. 630,569

Claims priority, application Germany, Apr. 4, 1991, 41 10 795.0

Int. Cl.[6] C07C 275/70

U.S. Cl. 558—8 **2 Claims**

1. A compound of the formula (IX)



(IX)

in which

R^1 represents hydrogen, emino, or represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4alkoxy, C_1–C_4-alkylcarbonyl or C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6alkinyl, each of which is optionally substituted by fluorine, chlorine and/or bromine, or represents C_3–C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1–C_4-alkyl, or represents phenyl-C_1–C_4-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy and/or C_1–C_4-alkoxy-carbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, fluorine- and/or chlorine-substituted C_1–C_3-alkoxy, C_1–C_4-alkylthio, fluorine- and/or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl and/or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_4-alkylamino which is optionally substituted by fluorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-cycloalkylamino or di-(C_1–C_4-alkyl)-amino,

R^2 represents C_1–C_4-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy or C_1–C_4alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, each of which is optionally substituted by fluorine, chlorine and/or bromine, or represents C_3–C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine and/or C_1–C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1–C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy and/or C_1–C_4-alkoxy-carbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoro-methyl, C_1–C_4-alkoxy, fluorine- and/or chlorine-substituted C_1–C_3-alkoxy, C_1–C_4-alkylthio, fluorine- and/or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkyl-sulphinyl, C_1–C_4-alkyl-sulphonyl and/or C_1–C_4-alkoxy-carbonyl,

and

R^{27} represents methyl, ethyl or phenyl.

5,597,940

PROCESS FOR PRODUCING β-NITROENAMINE

Shinzo Seko, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

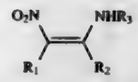
Filed Mar. 9, 1995, Ser. No. 401,928

Claims priority, application Japan, Mar. 16, 1994, 6-045723; Sep. 5, 1994, 6-211453; Sep. 9, 1994, 6-215913; Sep. 14, 1994, 6-220013

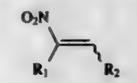
Int. Cl.[6] C07C *209/60;253/30*

U.S. Cl. 558—303 **14 Claims**

1. A process for producing β-nitroenamine represented by the formula I:



wherein R_1 and R_2 are the same or different and independently indicate a hydrogen atom or a straight-chain or branched C_1–C_{10} alkyl group which may be optionally substituted with at least one group selected from the group consisting of a halogen atom, a lower alkoxy group, an aryloxy group, a hydroxyl group or an aryl group, or an aryl group which may be optionally substituted with at least one group selected from the group consisting of a halogen atom, a lower alkyl group, a lower alkoxy group, an aryl group, an aryloxy group, a nitro group, a cyano group, an acylamino group, a lower dialkylamino group, an arylamino group, a hydroxyl group, an arylsulfonyl group, a mercapto group, a lower alkylthio group or an arylthio group; and R_1 and R_2 may bond together to form a cycloalkyl or bicycloalkyl group and R_3 is a hydrogen atom, a lower alkyl group, a cycloalkyl group or an aralkyl group, which comprises reacting a nitroolefin of the formula II:



wherein R_1 and R_2 are as defined above, with a hydroxylamine derivative of the formula III:

wherein R_3 is the same as defined above and R_4 is a lower alkyl group or an aralkyl group, or a salt thereof in the presence of a base.

5,597,941

PROCESS FOR PRODUCTION OF 5-AMINO-3-METHYLPYRAZOLE

Kazuya Minamisaka, Takaishi; Masahito Sekiguchi, Ibaraki, and Kenji Saito, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 141,988, Oct. 28, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,017

Claims priority, application Japan, Nov. 5, 1992, 4-295689; Nov. 9, 1992, 4-298702

Int. Cl.[6] C07C *253/14*

U.S. Cl. 558—337 **15 Claims**

1. A process for producing 2-butynenitrile which comprises the steps of:

(1) reacting 2,3-dichloropropene with prussic acid in the presence of a cuprous salt, calcium carbonate and a polar solvent to obtain 3-chloro-3-butenonitrile, and

(2) reacting the 3-chloro-3-butenonitrile with a base in the presence of water at a pH of 12.5 or above to produce 2-butynenitrile.

5,597,942

CARBODIIMIDES AND/OR OLIGOMERIC POLYCARBODIIMIDES BASED ON 1 3-BIS (1-METHYL-1-ISOCYANATOETHYL) BENZENE THEIR USE AS HYDROLYSIS STABILIZERS

Siegmund Pohl, Ludwigshafen; Friedhelm Lehrich, Lemfoerde; Manfred Genz, Damme; Bernd Bruchmann, Ludwigshafen; Helmut Teach, Roedersheim-Gronau; Roland Minges, Gruenstadt, and Joachim Streu, Dachau, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

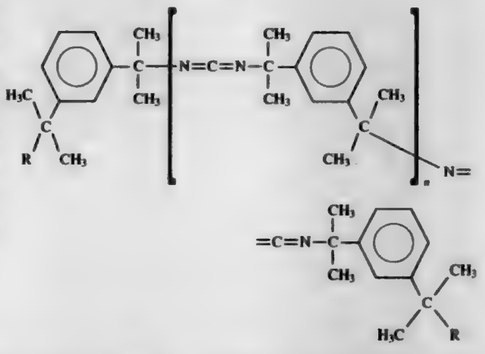
Division of Ser. No. 400,407, Mar. 7, 1995, Pat. No. 5,504,241. This application Jan. 30, 1996, Ser. No. 594,043

Claims priority, application Germany, Jun. 8, 1993, 43 18 979.2

Int. Cl.[6] C07C *275/24;271/20*

U.S. Cl. 560—25 **2 Claims**

1. A process for stabilizing against the hydrolytic degradation of polyaddition or polycondensation products containing bonded ester groups, comprising introducing a carbodiimide or oligomeric polycarbodiimide of the formula (I)



into said polyaddition or polycondensation products; where the R radicals are identical or different and are selected from the group consisting of —NHCONHR[1]-, —NHCONR[1]R[2]-, and —NHCOOR[3]-; R^1 and R^2 may be identical or different and are alkyl, cycloalkyl, or aralkyl; R^3 is identical to R^1 or is alkoxypolyoxyalkylene; and n is an integer from 0 to 10.

5,597,943

PHOSPHOLIPASE A_2 INHIBITOR

Mitsuaki Ohtani, Nara; Shigeru Matsutani, Hashimoto; Tadashi Yoshida, Toyono-gun; Kazushige Tanaka, Amagasaki; Yasuhiko Fujii, Kobe, and Kazuhiro Shirahase, Neyagawa, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

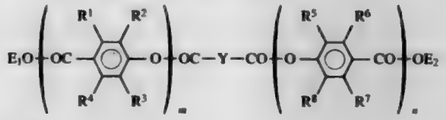
Continuation of Ser. No. 267,002, Jun. 21, 1994, abandoned, which is a continuation of Ser. No. 983,856, Mar. 2, 1993, abandoned. This application Dec. 13, 1995, Ser. No. 571,698

Claims priority, application Japan, Jul. 3, 1991, 3-162847

Int. Cl.[6] C07C *69/76*

U.S. Cl. 560—42 **4 Claims**

1. A thielocin derivative of the formula:



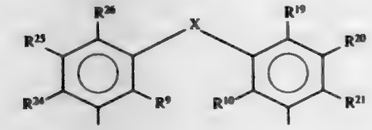
wherein

R^1, R^2, R^3, R^4, R^5, R^6, R^7, and R^8 are independently hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen;

E_1 and E_2 are independently hydrogen; unsubstituted C_1–C_8 alkyl, methoxymethyl, ethoxymethyl, iodoethyl, ethoxyethyl, methylthioethyl, methanesulfonylethyl, or trichloroethyl; unsubstituted C_3–C_8 alkenyl, or phenylpropenyl; unsubstituted C_7–C_{19} aralkyl, methylbenzyl, dimethylbenzyl, methoxybenzyl, ethoxybenzyl, nitrobenzyl, aminobenzyl, diphenylmethyl, trityl, di-t-butylhydroxybenzyl, phthalidyl, or phenacyl; unsubstituted C_6–C_{12} aryl, tolyl, diisopropylphenyl, xylyl, trichlorophenyl, pentachlorophenyl, or indanyl; noncyclic straight or branched C_2–C_{15} alkanoyloxyalkyl, cyclohexanacetoxyethyl, or cyclohexanecarbonyloxycyclohexylmethyl;

m and n are independently an integer of 0 to 4, provided that m and n are not simultaneously 0;

—Y— is a bivalent group of the following structure:



wherein

X is a single bond, CH_2, O, S, SO, or SO_2;

R^9 and R^{10} are independently hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen;

R^{19}, R^{20}, R^{21}, R^{24}, R^{25}, and R^{26} are independently hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen,

or a pharmaceutically acceptable salt thereof.

4. The compound [5-[4'-[4"-(4"'-Carboxy-3"'-methoxy-2"',5"',6"'-trimethylphenoxycarbony)-3"-methoxy-2",5",6"-trimethylphenoxycarbony]-3'-hydroxy-2',5'-dimethylphenoxycarbony] -2,4-dimethoxy-3,6-dimethylphenyl] [4""-(2""-amino-2""-carboxyethyl)phenyl] ether or a pharmaceutically acceptable salt thereof.

5,597,944

DEHYDROGENATION OF N-PARAFFIN TO N-OLEFIN EMPLOYING MANGANESE OXIDE OCTAHEDRAL MOLECULAR SIEVE AS CATALYST

Chi-Lin O'Young, Poughkeepsie; Robert A. Sawicki, Stormville, both of N.Y.; Yuan-Gen Yin, Mainfield, Conn.; Wen-Qing Xu, Willimtic, Conn., and Steven L. Suib, Storrs, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 7, 1994, Ser. No. 335,317

Int. Cl.[6] C07C *5/333;5/327*

U.S. Cl. 585—654 **20 Claims**

1. A method of converting n-paraffin to n-olefin which comprises contacting n-paraffin with synthetic manganese oxide octahedral molecular sieve as catalyst under dehydrogenation conditions to provide n-olefin.

5,597,945

PLANTS GENETICALLY ENHANCED FOR DISEASE RESISTANCE

Jesse M. Jaynes, Baton Rouge, La., and Kenneth S. Derrick, Lake Alfred, Fla., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 152,933, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 994,085, Dec. 16, 1992, abandoned, which is a continuation of Ser. No. 817,950, Jan. 3, 1992, abandoned, which is a continuation of Ser. No. 646,449, Jan. 25, 1991, abandoned, which is a continuation of Ser. No. 115,941, Nov. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 889,225, Jul. 25, 1986, abandoned. This application May 30, 1995, Ser. No. 453,436

Int. Cl.[6] A01H *5/00;* **C12N** *15/56;15/82;15/12*

U.S. Cl. 800—205 **15 Claims**

1. A dicotyledonous plant having a heterologous gene including a promoter operatively linked to a sequence coding for a lytic peptide, wherein said lytic peptide is an attacin or a cecropin.

5,597,946

METHOD FOR INTRODUCTION OF DISEASE AND PEST RESISTANCE INTO PLANTS AND NOVEL GENES INCORPORATED INTO PLANTS WHICH CODE THEREFOR

Jesse M. Jaynes, and Kenneth S. Derrick, both of Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 152,939, Nov. 15, 1993, abandoned, which is a continuation of Ser. No. 993,448, Dec. 16, 1992, abandoned, which is a continuation of Ser. No. 845,348, Mar. 4, 1992, abandoned, which is a continuation of Ser. No. 373,623, Jun. 29, 1989, abandoned, which is a continuation of Ser. No. 889,225, Jul. 25, 1986, abandoned. This application May 19, 1995, Ser. No. 444,762

Int. Cl.[6] A01H *5/00;* **C12N** *15/56;15/82;15/84;15/12*

U.S. Cl. 800—205 **7 Claims**

1. A method of inhibiting a pathogenic fungal or bacterial plant condition, said method comprising: incorporating into a dicotyledonous plant genome one or more genes which encode for a polypeptide inhibitor or inhibitor precursor of said pathogenic condition, which inhibitor or inhibitor precursor is selected from the group consisting of attacins and cecropins.

6. The method of claim 1 further comprising incorporating into the genome of said plant a gene which encodes for lysozyme.

7. A plant produced according the method of claim 1 or claim 6.

5,597,947

HIGH ENERGY FUEL GEL SLURRIES

William D. Stephens, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1995, Ser. No. 578,004
Int. Cl.[6] C10L 7/00
U.S. Cl. 44—268 5 Claims

1. A slurry fuel composition comprising:

(i) an energetic metal non-conductive powder prepared by subjecting a high purity metal, which is in an environment of an inert or noble gas under about 40 atmospheres pressure, to an external source of high voltage and amperes to achieve electrical explosion of said high purity metal, said high purity metal selected from the group consisting of aluminum, antimony, beryllium, bismuth, boron, calcium, cobalt, copper, gold, iron, lead, lithium, magnesium, manganese, nickel, potassium, silicon sodium, tin, zinc, and zirconium, said inert or noble gas selected from the group consisting of argon helium, neon, krypton, radon, and xenon;

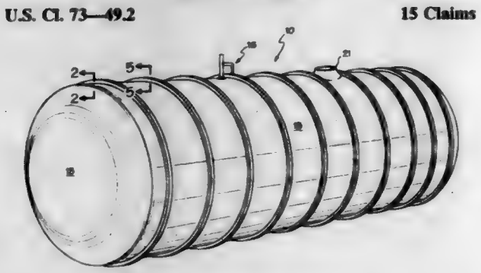
(ii) a liquid fuel with said energetic metal non-conductive powder suspended therein by means of a gelling agent.

5,597,948

STORAGE TANK SYSTEM WITH INDEPENDENT MONITORING OF RIBS AND TANK WALL

Bruce R. Sharp, 126 Leland Way, Marco Island, Fla. 33937

Filed Oct. 24, 1994, Ser. No. 327,592
Int. Cl.[6] G01M 3/04
U.S. Cl. 73—49.2 15 Claims



1. A double wall ribbed storage tank system for independently monitoring support rib areas for leakage and secondary containment areas for leakage, said storage tank system comprising:

(a) an inner storage tank having side walls and end walls to form an enclosed primary storage space for stored liquid and further having a set of support ribs extending around the side walls at spaced intervals to create support rib areas encompassed by the support ribs and to add strength to said inner storage tank;

(b) an outer wall extending over the inner storage tank to create secondary containment areas between adjacent support ribs and over the end walls for the stored liquid;

(c) an independent rib fluid communication means which fluidally connects together the support rib areas;

(d) an independent wall fluid communication means which fluidally connects together the secondary containment areas; and

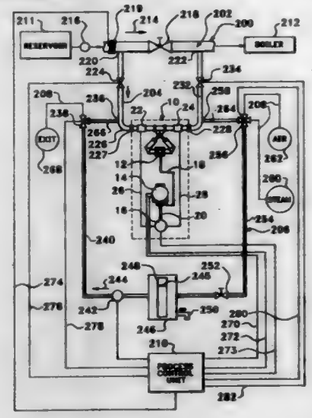
(e) a monitoring station operably associated with the independent rib fluid communication means and the independent wall fluid communication means to identify a structural failure in a support rib from a structural failure in the side wall or end walls of the inner storage tank or in the outer wall.

5,597,949

VISCOSIMETER CALIBRATION SYSTEM AND METHOD OF OPERATING THE SAME

Paul Zoltan Kalotay, Lafayette, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Filed Sep. 7, 1995, Ser. No. 524,485
Int. Cl.[6] G01N 11/02
U.S. Cl. 73—54.01 21 Claims



1. An in-line viscosimeter testing system for use in flow systems, comprising:

a main flow line adapted to receive flowing material;

a flow diversion line loop operably connected to said main flow line for transfer of flowing material from said main flow line to said flow diversion line loop and for return of said flowing material from said flow diversion line loop to said main flow line;

a viscosimeter mounted in said flow diversion line loop and operably configured for conducting viscosity measurements on materials flowing through said flow diversion line;

means for selectively diverting said flowing material from said main flow line into said flow diversion line to permit said viscosimeter to perform viscosity measurements on said flowing material;

means for selectively preventing diversion of flow from said main flow line into said flow diversion line to isolate said main flow line from said flow diversion line;

a purge line occupying a portion of said flow diversion line and providing means for purging said flow diversion line of said flowing material when said selectively preventing means is isolating said main flow line from said flow diversion line;

a test line loop including a reservoir containing a standard viscosity fluid, said test line loop being operably connected to said flow diversion line for supplying said standard viscosity liquid to said flow diversion line and said viscosimeter when said selectively preventing means is isolating said main flow line from said flow diversion line;

means for selectively flowing said standard viscosity fluid through said test line loop between said reservoir and said viscosimeter to permit said viscosimeter to perform viscosity measurements on said standard viscosity fluid when said flow diversion line is isolated from said main flow line; and

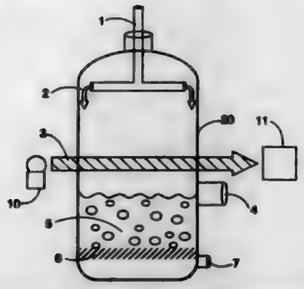
means for comparing said viscosity measurements performed on said standard viscosity fluid against standard correlation values for said standard viscosity fluid.

5,597,950

SURFACTANT MONITORING BY FOAM GENERATION

Ken I. Mullen, Los Alamos, N.M., assignor to The Regents of the University of California Office of Technology Transfer, Alameda, Calif.

Filed Nov. 3, 1994, Ser. No. 334,164
Int. Cl.[6] G01N 37/00
U.S. Cl. 73—60.11 12 Claims



1. A method of measuring active surfactant concentration within a solution comprising:

introducing a surfactant-containing solution into a container having a sidewall whereby a surface of said surfactant-containing solution is established;

introducing a gas under the surface of the surfactant-containing solution with the result that a foam is generated; and,

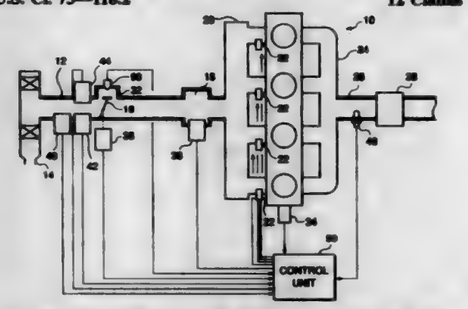
sensing height of said foam above the surface of said surfactant-containing solution by passing at least two light beams horizontally above the surfactant-containing solution into a detector, each light beam at a different vertical distance from the surface of said surfactant-containing solution, said height corresponding to active surfactant concentration, said method further characterized in that said surfactant-containing solution is introduced into said container by continuously passing said surfactant-containing solution downwards upon said sidewall in said container thereby continuously washing the sides of the container and cleaning the optical paths of said light beams.

5,597,951

INTAKE AIR AMOUNT-ESTIMATING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Masahiro Yoshizaki; Isao Komoriya, and Shinichi Kitajima, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1996, Ser. No. 607,866
Claims priority, application Japan, Feb. 27, 1995, 7-038853; Feb. 27, 1995, 7-038854
Int. Cl.[6] F02D 45/00; G01M 15/00
U.S. Cl. 73—118.2 12 Claims



1. An intake air amount-estimating apparatus for an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, and at least one combustion chamber, said intake air amount-estimating device estimating an amount Gc of intake air actually drawn into each of said at least one combustion chamber of said engine, based on a model formulated on said intake passage in which a portion of said intake passage extending from said throttle valve to said each of said at least one combustion chamber is regarded as a chamber, said intake air amount-estimating apparatus comprising:

operating condition-detecting means for detecting operating parameters of said engine including rotational speed of said engine, a degree of opening of said throttle valve, and pressure within said chamber;

intake air amount value-determining means for determining a value GC' of said amount of intake air in a steady operating condition of said engine, at least based on said rotational speed of said engine and said pressure within said chamber detected by said operating condition-detecting means;

effective opening area-determining means for determining an effective opening area A of said throttle valve, at least based on said degree of opening of said throttle valve and said pressure within said chamber detected by said operating condition-detecting means;

first-order delay value-determining means for determining a first-order delay value ADELAY of said effective opening area of said throttle valve; and

intake air amount value-correcting means for correcting said value Gc' of said amount of intake air in said steady operating condition of said engine by a ratio of said effective opening area A of said throttle valve to said first-order delay value ADELAY of said effective opening area of said throttle valve by the use of the following equation:

$$Gc=Gc'\times(A/ADELAY)$$

to thereby calculate said amount Gc of intake air actually drawn into said combustion chamber,

wherein said first-order delay value-calculating means comprises:

change-detecting means for detecting a change in an amount of air charged in said chamber;

setting means for setting a correction value for use in calculating a first-order delay value of said degree of opening of said throttle valve, in a manner depending on said change in said amount of air charged in said chamber detected by said change-detecting means; and

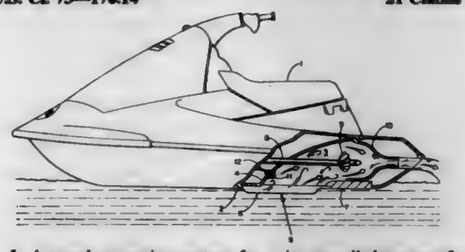
calculating means for calculating said first-order delay value of said effective opening area by the use of said correction value set by said setting means.

5,597,952

SPEED MEASURING AND COMPENSATION APPARATUS FOR JET-PROPELLED WATERCRAFT

David A. Struyk, Excelsior, Minn., assignor to Waterstrike Incorporated, Minn.

Filed Sep. 30, 1994, Ser. No. 316,553
Int. Cl.[6] G01F 13/00; 1/46; G01P 5/00
U.S. Cl. 73—170.14 21 Claims



1. A speed measuring system for a jet propelled watercraft, comprising:

a. a jet propelled watercraft having a jet intake chamber through which water is drawn to propel said watercraft;

b. a fluid pressure sensing device mounted within said jet intake chamber and positioned to protrude outwardly into said chamber in substantially unobstructed clean flow relation to said water flowing therethrough, said fluid pressure sensing device producing a pressure signal representative of the dynamic water pressure within said jet intake chamber;

c. a speed indicating apparatus connected to said fluid pressure sensing device for determining the actual speed of said watercraft, said speed indicating apparatus comprising:

1) a speed computing means for computing the actual speed of said watercraft as a function of said pressure signal, said computing means including a pressure compensation means for scaling said pressure signal to compensate for non-linear variances introduced in the dynamic water pressure within said intake chamber or a result of accelerated turbulent waterflow therethrough and the geometry of said intake chamber; and

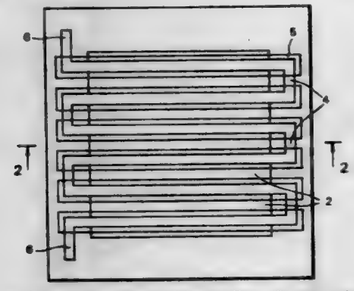
2) speed disclosure mechanism connected to said computing means for signaling to the watercraft operator the actual speed of said watercraft.

5,597,953

GAS MOISTURE SENSOR AND METHOD OF PRODUCING SAME

Jury G. Usanov, ulitsa Elninskaya, 20, korpus 3, kv. 66; Jury A. Voronov, and Pavel P. Polivanov, all of Moscow, Russian Federation, assignors to Jury Gennadievich Usanov, Moscow, Russian Federation

PCT No. PCT/RU94/00237, § 371 Date Jun. 12, 1995, § 102(e) Date Jun. 12, 1995, PCT Pub. No. WO95/11448, PCT Pub. Date Apr. 27, 1995
PCT Filed Oct. 19, 1994, Ser. No. 454,241
Claims priority, application Russian Federation, Oct. 19, 1993, 93048472; Nov. 17, 1993, 93051598
Int. Cl.[6] G01N 25/56
U.S. Cl. 73—335.02 7 Claims



1. A moisture sensor comprising a flat substrate with silicon dioxide film thereon, windows etched in the silicon dioxide film on each side of the substrate, a tape heater deposited on one of the faces of the substrate and the unetched portion of the film, a window etched into the face of the substrate below the tape heater, said tape heater having two faces and a moisture sensitive layer on both faces of the tape heater.

5,597,954

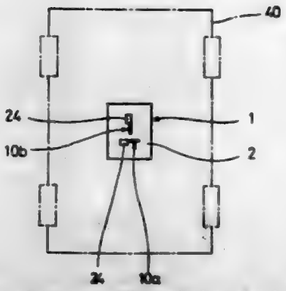
BEARING SENSOR AND BEARING-DISTANCE SENSOR

Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 4, 1995, Ser. No. 539,133
Claims priority, application Japan, Oct. 4, 1994, 6-266367; Nov. 17, 1994, 6-309993
Int. Cl.[6] G01P 7/00
U.S. Cl. 73—503 4 Claims

1. A bearing sensor for an automobile, comprising:

a first acceleration sensor being disposed on the automobile for detecting an acceleration of the automobile in a longitudinal direction of the automobile to obtain a signal related to the acceleration in said longitudinal direction;



a second acceleration sensor being disposed on the automobile for detecting a centrifugal force applied to the automobile in a direction perpendicular to said longitudinal direction to obtain a signal related to the centrifugal force applied in the direction perpendicular to said longitudinal direction;

a first integrating circuit for integrating the output signal of said first acceleration sensor over time to obtain a signal related to a velocity in said longitudinal direction;

a first arithmetic circuit for obtaining a signal related to a radius of curvature from the output signal of said second acceleration sensor and the output signal of said first integrating circuit;

a second arithmetic circuit for obtaining a signal related to an angular velocity from the output signal of said first arithmetic circuit and the output signal of said first integrating circuit; and

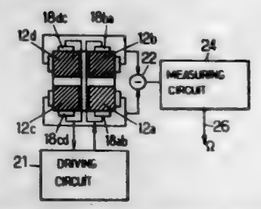
a further integrating circuit for integrating the output signal of said second arithmetic circuit over time to obtain a signal related to the travel bearing of said automobile.

5,597,955

VIBRATING BEAM GYROSCOPIC MEASURING APPARATUS

Pierre Leger, Issy-les-Moulineaux; Olivier Marchais, Paris, and Francis Biennime, Taverny, all of France, assignors to Societe D'Applications Generales D'Electricite et de Mecanique Sagem, Paris Cedex, France

Continuation of Ser. No. 75,110, Jun. 11, 1993, abandoned. This application Jan. 11, 1996, Ser. No. 583,942
Claims priority, application France, Jun. 11, 1992, 92 07032; May 10, 1993, 93 05578
Int. Cl.[6] G01P 15/14
U.S. Cl. 73—504.16 22 Claims



1. Vibrating beam gyroscopic measuring apparatus, having:

a resonator comprising four identical beams having central axes which are mutually parallel, a common base having a square surface, said four beams being integral with said base at said square surface and projecting in a same direction from said square surface of said base at all four corners formed by said square surface, said beams being constructed to have a same resonant frequency in two directions parallel to two adjacent sides of said square base,

first transducers for vibrating each of said beams in a first direction orthogonal to said beams, connected to a driving circuit, and

second transducers for detecting an amplitude of vibration of said beams in second directions each orthogonal to a respective said first direction and connected to a measurement circuit.

5,597,956

CAPACITOR TYPE ACCELERATION SENSOR

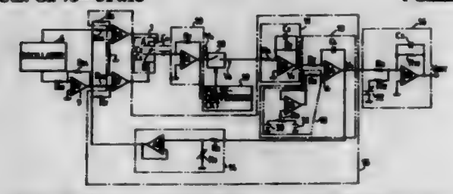
Nobuhiro Ito; Tomio Shibano, and Kazuo Yaji, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 18, 1995, Ser. No. 516,933

Claims priority, application Japan, Aug. 24, 1994, 6-222592

Int. Cl.[6] G01P *15/00;15/125*

U.S. Cl. 73—514.18 4 Claims



1. A capacitor type acceleration sensor of an electrostatic servo system, comprising:

an acceleration sensing element having two variable capacitors which include a couple of fixed electrodes and a movable electrode that is located between said fixed electrodes and movable in response to an acceleration;

capacitance-difference detector for detecting a difference in the capacitance between said two variable capacitors and for producing a voltage indicative of the detected capacitance difference;

electrostatic power generation/feedback circuit for applying an electrostatic power between said fixed electrodes and said movable electrode to set said movable electrode at a preset reference position according to the output signal of said capacitance-difference detector; and

a fixed capacitor having a capacitance value which is larger than the maximum capacitance-difference between said variable capacitors of which the capacitance values vary according to an acceleration, said fixed capacitor being connected in parallel with one of said variable capacitors.

5,597,957

MICROVACUUM SENSOR HAVING AN EXPANDED SENSITIVITY RANGE

Joerg Schieferdecker, Wiesbaden, and Friedemann Voelklein, Jena, both of Germany, assignors to Heimann Optoelectronics GmbH, Wiesbaden, Germany

Filed Dec. 21, 1994, Ser. No. 361,430

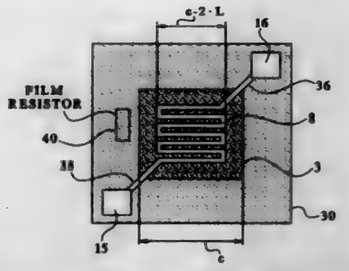
Claims priority, application Germany, Dec. 23, 1993, 43 44 256.0; Apr. 25, 1994, 44 14 349.4

Int. Cl.[6] G01L *21/12*

U.S. Cl. 73—755 18 Claims

7. A microvacuum sensor having an expanded sensitivity range, comprising:

a thin membrane, having poor thermal conductivity, freely suspended on a sensor chip of a semiconductor single-crystal, the membrane surface being suspended by at least one web of a material having at most a thermal conductivity of the membrane and having at most a thickness of the membrane, where the sensor is constructed to obey the condition L=c/2 proceeding from one or two side centers lying opposite one another along a center line of the sensor for sensor structures having a web connection of a heater to bond surfaces on the sensor chip, c being a side length of a membrane area of the membrane and L being substantially a differential length between c and a heater side length of the heater in a direction of c, and



where the sensor is constructed to obey the condition L=c/6 given sensor structures having a web connection of the heater to the bond surfaces that ensues along a diagonal of the sensor or having a membrane without a web suspension on any side of the membrane;

a thin metallic heating layer arranged on the membrane, the heating layer forming the heater and the heating layer having an extremely low emissivity of less than 0.1 in a near infrared range;

a film resistor, having substantially the same temperature coefficient as the metallic heating layer, arranged on the sensor chip in a region adjacent to the membrane for temperature compensation of temperature fluctuations;

members having planar walls arranged parallel to surfaces of the membrane at a spacing of less than 5 μm from the membrane, said members acting as heat sinks relative to the membrane; and

wherein gas from the environment of the sensor freely circulates between the membrane and surfaces of the walls of the members.

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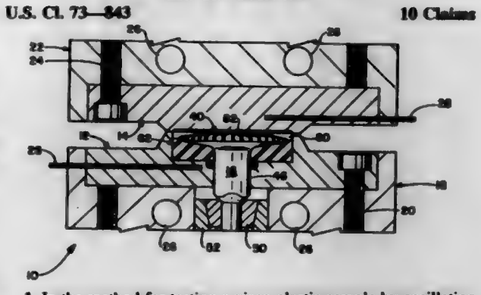
METHOD FOR TESTING VISCO-ELASTIC SAMPLE BY ROTOR OSCILLATION WITHIN A DIE-FORMED CAVITY

Raleigh W. Wise, Ft. Myers, Fla., assignor to Wise-Sullivan, Inc., Akron, Ohio

Division of Ser. No. 306,174, Sep. 14, 1994, Pat. No. 5,526,693. This application Jan. 11, 1996, Ser. No. 585,421

Int. Cl.[6] G01N *3/24*

U.S. Cl. 73—843 10 Claims



1. In the method for testing a visco-elastic sample by oscillating a rotor against it within a sample cavity formed between the rotor and one of a pair of dies, and measuring the torque in the rotor as an indication of the state of cure of the sample, the improvement comprising

providing a deep recess in the other one of the pair of dies,

providing in the recess a cured, elastomeric seal member having a thickness substantially greater than edge height of the sample cavity,

engaging an underside of a head of the rotor against the seal member, and

charming sample material onto the head of the rotor, but exclusively on a top surface thereof.

5,597,959

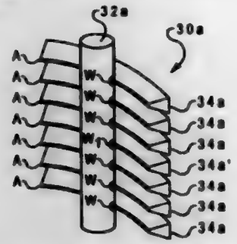
PARTICULATE FILTRATION SCREEN WELD JOINT TEST APPARATUS AND ASSOCIATED METHODS

Patrick W. Rice, Plano; Lon T. Youngberg, Coppell, and Kerry D. Kearns, Pearland, all of Tex., assignors to Halliburton Company, Dallas, Tex.

Filed Nov. 29, 1995, Ser. No. 564,463

Int. Cl.[6] G01N *3/20;3/08*

U.S. Cl. 73—850 16 Claims



1. A method of testing the tensile strength of a selected weld joint in a tubular metal screen structure of the type comprising a circumferentially spaced, generally circular array of parallel metal rod members outwardly circumscribed by a helical metal wrap member longitudinally spiraled around said rod members and having axially successive, generally annular portions each having a radially outer side edge portion and a radially inner side edge portion anchored by weld joints to each of the rod members, said method comprising the steps of:

removing a test specimen from the screen structure, said test specimen including a longitudinal segment of one of the rod members, and a spaced series of circumferential segments of the wrap member each extending past opposite sides of said longitudinal segment of one of the rod members, the circumferential wrap member segments including a first circumferential wrap member segment anchored to the rod member by the weld joint to be tested and positioned between other ones of the wrap member segments;

supporting said test specimen between first and second portions of a test fixture, one of said first and second portions being forcibly movable toward the other of said first and second portions in response to a compressive force operatively exerted on said test fixture, said first and second portions being positioned and configured to transmit at least a portion of said compressive force to the selected weld joint;

operatively exerting a weld joint strength testing compressive force on said test fixture.

5,597,960

PUMP STATION FLOWMETER

Benott Beaudoin, P.O. Box 580, 132 Corporate Blvd., Indian Trail, N.C. 28079

Filed Jun. 5, 1995, Ser. No. 461,264

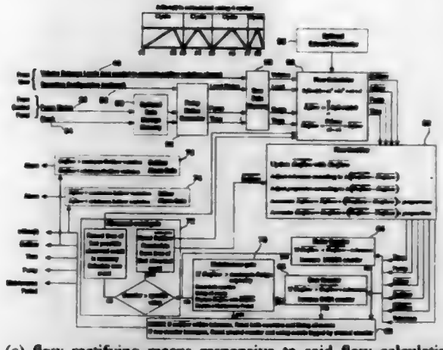
Int. Cl.[6] G01F *3/38*

U.S. Cl. 73—861 16 Claims

1. Apparatus for determining the liquid flow characteristics of a wet well system including a wet well, at least one pump connected to the wet well for pumping fluid from the wet well, a source of pump status signals responsive to the at least one pump, and a timing signal generator for generating a timing signal, the apparatus comprising:

(a) pump status converter means responsive to the pump status signals and the timing signal for converting the pump status signals into a level status signal;

(b) flow calculating means responsive to the level status signal, the timing signal, and a predetermined volume signal representative of a volume of fluid between predetermined levels of the wet well for calculating a plurality of filling and emptying characteristics of the wet well;



(c) flow rectifying means responsive to said flow calculating means for calculating an average emptying characteristic of a plurality of emptying characteristics and for rectifying the plurality of filling and emptying characteristics responsive to at least the average emptying characteristic and a predetermined tolerance;

(d) variation determining means responsive to said flow rectifying means for determining the occurrence of a variation between the average emptying characteristic and the predetermined tolerance, and tagging the level status signal, the timing signal, and the predetermined volume signal used to calculate the emptying characteristic as being a possible abnormal event;

(e) maintenance gate means responsive to said variation determining means for operating when a calculated emptying characteristic is higher than a predetermined maximum emptying characteristic, for calculating a time of operation of said maintenance gate means and the at least one pump, for calculating total flow through the wet well using the average emptying characteristic multiplied by the time of operation of the at least one pump, and for calculating average filling characteristic by dividing the total flow through wet well by the time of operation of said maintenance gate means to thereby generate a maintenance status signal;

(f) resetting means responsive to said variation determining means and said maintenance gate means for resetting said variation determining means and untagging the possible abnormal event tagged by said variation determining means if no variation between the average emptying characteristic and the predetermined tolerance occurs and responsive to said maintenance status signal; and

(g) abnormal event gate means responsive to said variation determining means and said maintenance gate means for operating when a value of said variation determining means is higher than a predetermined value representing the number of said possible abnormal events necessary to become confirmed abnormal events and for recalculating the average emptying characteristic from the time of first tagging the possible abnormal event.

5,597,961

TWO AND THREE PHASE FLOW METERING WITH A WATER CUT MONITOR AND AN ORIFICE PLATE

John D. Marrelli, Houston, Tex., assignor to Texaco, Inc., White Plains, N.Y.

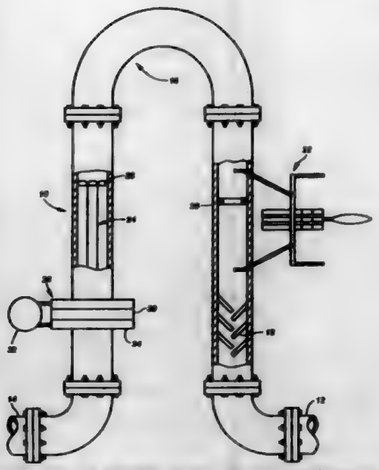
Continuation-in-part of Ser. No. 266,067, Jun. 27, 1994, abandoned. This application Jun. 15, 1995, Ser. No. 490,795

Int. Cl.[6] G01F *5/00*

U.S. Cl. 73—861.04 4 Claims

1. A system for determining the volumetric flow rates of the oil/water/gas fractions of three phase fluid flow in a fluid flow line corrected for density variations, comprising:

a continuous flow water cut monitor placed in a three phase fluid flow line and capable of continuously measuring on a statis-



tical basis and providing three separate continuous outputs representative of the oil fraction, the water fraction and the gas fraction of fluid flow in said flow line;

a total volume fluid flow meter placed in series in said fluid flow line with said water cut monitor and capable of measuring and producing a continuous output signal representative of the total volumetric flow rate of fluid in said flow line passing therethrough; and

means responsive to said three separate continuous outputs of said water cut monitor and said output signal representative of the total volumetric flow rate from said flow meter for continuously determining the total density of fluid entering said flow meter and for correcting said total volumetric flow rate representative signal from said flow meter for density changes whereby the oil fraction, gas fraction and water fraction volumetric flow rates in said fluid flow line are determined.

5,597,962

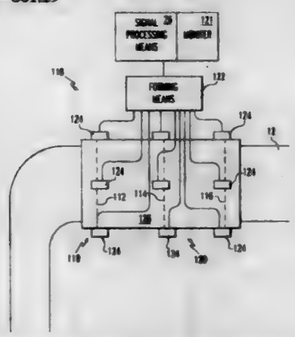
APPARATUS FOR DETERMINING FLUID FLOW

Calvin R. Hastings; Ernest M. Hauser, both of Pittsburgh, and Robert C. Miller, New Alexandria, all of Pa., assignors to Caldon, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 415,090, Mar. 31, 1995, Pat. No. 5,546,813. This application Jun. 6, 1995, Ser. No. 467,009

Int. Cl.[6] G01F *1/00*

U.S. Cl. 73—861.29 **8 Claims**



1. An apparatus for creating a transverse velocity profile of fluid having a transverse velocity flowing in a pipe comprising:

means for obtaining the transverse velocity of the fluid at a plurality of different locations by introducing acoustic energy into the pipe and analyzing the acoustic energy in the pipe, said obtaining means disposed on the outside of the pipe and acoustic energy following a path through the pipe wall; and

means for forming the transverse velocity profile from the transverse velocity at the plurality of different locations, said forming means in communication with said obtaining means.

5,597,963

SUBMERSIBLE STREAMLINED METER WITH A PITOT TUBE FOR MEASURING WATER FLOW IN AN OPEN CHANNEL

Graeme M. Smart; Michael P. Hayes, and Stephen G. George, all of Christchurch, New Zealand, assignors to National Institute of Water and Atmospheric Research, Wellington, New Zealand

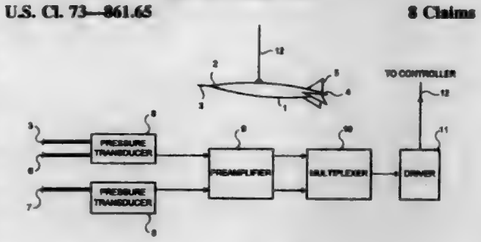
PCT No. PCT/NZ92/00009, § 371 Date Oct. 6, 1994, § 102(e) Date Oct. 6, 1994, PCT Pub. No. WO93/13425, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 23, 1992, Ser. No. 256,033

Claims priority, application New Zealand, Dec. 23, 1991, 240494; Oct. 20, 1992, 244811

Int. Cl.[6] G01F *1/46*

U.S. Cl. 73—861.65 **8 Claims**



1. An electronic gauging device comprising:

a housing,

means connected to the housing to submerge and support the housing in water flowing in an open channel,

said housing having a streamlined shape for flow of the water thereon, said housing having a forward end facing the water flowing theretowards and a rear end beyond which the water flows away from the housing,

a pitot tube connected to said housing and projecting forwardly thereof,

a stabilizing tail fin assembly on said housing at said rear end thereof,

said pitot tube having first, second and third pressure sensing ports,

transducer means connected in proximity to said ports to produce electrical signals indicative of pressures measured at said pressure sensing ports, and

electronic measuring means connected to said transducer means for producing output signals indicating velocity of flow of said water, and absolute pressure of said water which represents depth of immersion of said housing in said water flow in said channel, said electronic measuring means operating rapidly in succession a plurality of times per second such that the output signal of velocity of flow of said water is calculated from instantaneous pressure measurements not exceeding one second in duration, and

wherein said electronic measuring means calculates vertical depth of water above the pitot tube based on the pressures measured at said ports, so that at any point on the way down or up of the housing in the channel, both the velocity of water flow and depth of the device are measured to give a vertical sample through the water flow to give the depth and average flow velocity in the channel.

5,597,964

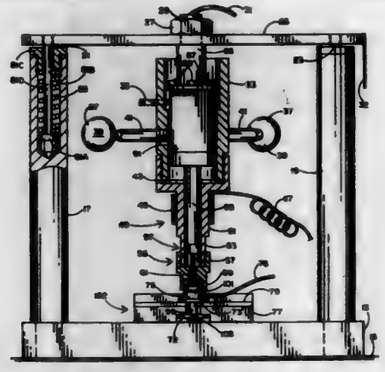
TORQUE MEASURING DEVICE FOR FREE RUNNING SELF-LOCKING NUT AND BOLT COMBINATION

Lloyd S. Binns, Harbor City, Calif., assignor to Air Industries Corporation, Garden Grove, Calif.

Filed Jun. 6, 1995, Ser. No. 485,179

Int. Cl.[6] G01L *1/00*

U.S. Cl. 73—861.21 **13 Claims**



1. A device for measuring mechanical forces when a torque is applied to a nut to connect said nut to a bolt, said device comprising:

a load cell for measuring a compressive force generated between the nut and the bolt when said nut and bolt are connected together;

means for measuring the torque applied to the nut when said nut and bolt are connected together;

means for measuring the torque generated by the bolt in response to the torque applied to the nut when said nut and bolt are connected together;

output means connected to each of said load cell, said means for measuring the torque applied to the nut, and said means for measuring the torque generated by the bolt to provide an indication of the respective compressive force and the torques measured thereby; and

a test stand for supporting said load cell, said means for measuring the torque applied to the nut, and said means for measuring the torque generated by the bolt, said test stand having a base for supporting said load cell, at least two uprights supported at first ends thereof by said base, and a top beam connected to opposite ends of said two uprights for supporting said means for measuring the torque applied to the nut and said means for measuring the torque generated by the bolt.

5,597,965

METHOD AND APPARATUS FOR MEASURING THE PRELOAD GAP OF A DOUBLE ROW ROLLING BEARING

Satoru Endo, Shiga-ken; Yoshinobu Imai, Moriyama, and Hiroyuki Okuno, Kusatsu, all of Japan, assignors to NSK Ltd., Tokyo, Japan

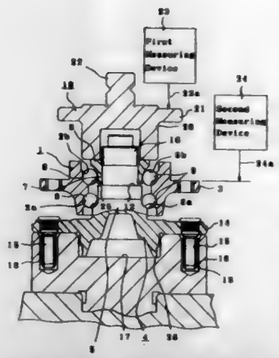
Filed Nov. 30, 1994, Ser. No. 346,638

Claims priority, application Japan, Feb. 4, 1994, 6-012554

Int. Cl.[6] G01L *5/12*

U.S. Cl. 73—862.49 **3 Claims**

1. A method for measuring an axial preload gap of a double row rolling bearing which comprises an outer ring having an inner peripheral face with first and second outer raceways thereon, a spindle concentrically disposed inside the outer ring and having an outer peripheral face with a first inner raceway provided therein,



the first inner raceway of the spindle being opposite to the first outer raceway of the outer ring, and a cylindrical surface formed on the outer peripheral face of the spindle, the cylindrical surface of the spindle being opposite to the second outer raceway of the outer ring, an inner ring fitted onto the cylindrical surface of the spindle and having an outer peripheral surface with a second inner raceway thereon, and a plurality of rolling bodies rotatably provided between the first outer raceway and the first inner raceway, and between the second outer raceway and the second inner raceway, comprising the steps of:

obtaining an axial displacement amount L1 of the outer ring with respect to the spindle and the inner ring by axially displacing the outer ring with respect to the spindle and the inner ring under conditions wherein the inner ring is pressed onto the cylindrical surface of the spindle without any preload applied to the rolling bodies, then

obtaining a pressed amount L2 by pressing the inner ring to a predetermined axial location so as to apply a preload to the rolling bodies, and

making the preload gap the difference (L2–L1) between the pressed amount L2 and the displacement amount L1.

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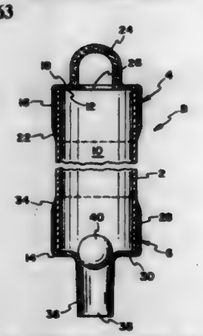
FLUID SAMPLING DEVICE

Robert D. Timmons, R.F.D. Meadowdale Rd., Prairie Du Sac, Wis. 53578

Filed Jun. 1, 1995, Ser. No. 456,486

Int. Cl.[6] G01N *1/12*

U.S. Cl. 73—864.63 **19 Claims**



1. An apparatus for collecting a sample from a body of fluid comprising:

a) an elongated hollow body receptacle having first and second ends and defining a chamber therebetween;

b) means for permitting fluid to enter said chamber and be retained therein as a collected sample; and

c) at least a portion of said hollow body receptacle comprising a high density plastic, said high density plastic is a polyolefin

having a specific gravity greater than about 1.20 g/cm³ whereby said hollow body receptacle having an overall specific gravity greater than the specific gravity of the body fluid to be sampled enabling said receptacle to sink and fluid to be collected therein.

5,597,967

ALUMINUM-SILICON ALLOY FOILS

Ann M. Ritter, Albany; Melvin R. Jackson, Niskayuna, and John R. Hughes, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1994, Ser. No. 265,890
Int. Cl.[6] C22C *1/04;21/04;* B22F *3/14*
U.S. Cl. 75—249 **17 Claims**



1. A foil of an alloy consisting essentially of Al and Si (Al—Si alloy), said foil having a thickness less than or equal to 0.017 in. and sufficient ductility to permit cold-rolling of said foil.

13. An Al—Si alloy foil made by the method, comprising the steps of:

selecting an Al—Si alloy powder;

loading the Al—Si alloy powder into a means for holding;

evacuating the means for holding;

hot pressing the means for holding to form an Al—Si alloy foil directly from the Al—Si alloy powder; and

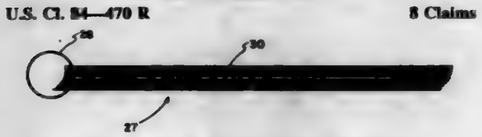
removing the means for holding from the Al—Si alloy foil.

5,597,968

PERCUSSION MUSIC TEACHING METHOD

Eric Okamoto, 1300 Salterton Ct., Raleigh, N.C. 27608

Filed Dec. 12, 1994, Ser. No. 354,224
Int. Cl.[6] G09B *15/00*
U.S. Cl. 84—470 R **8 Claims**



1. A method of teaching percussion music comprising:

selecting a plurality of basic percussion music exercises including percussion music indicia for at least one percussion instrument;

printing said basic percussion music exercises on music display means;

devising a plurality of complimentary percussion music exercises including percussion music indicia for at least one different percussion music instrument;

applying said complimentary percussion exercises onto a plurality of overlays; and

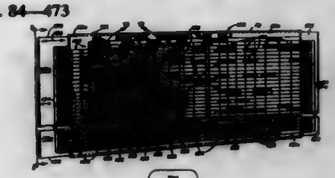
superimposing said overlays including said complimentary percussion exercises in alignment with said music display means having said basic percussion exercises printed thereon whereby said complimentary percussion music exercises are positioned in a functional relationship with said basic percussion exercises forming hybrid percussion exercises.

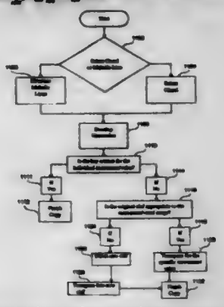
5,597,969

MUSIC SLIDE RULE REFERENCE DEVICE AND SYSTEM

Karl K. K. M. Brüser, San Jose, Calif., assignor to Leslie Mayr, San Jose, Calif.

Filed Feb. 23, 1994, Ser. No. 202,781
Int. Cl.[6] G09B *15/02*
U.S. Cl. 84—473 **8 Claims**





1. A music information reference device comprising:

a) a substantially flat sleeve body of thin sheet material having a front surface and a back surface and two opposing open ends, said body including:

(1) apertures disposing spatially arranged in a predetermined array on at least one of said front or back surfaces; and

(2) first music indicia disposed visible on at least one of said front or back surfaces in cooperative association with at least selected ones of said apertures;

b) a slide of said thin sheet material having a front side and a back side, said side having second music indicia disposed visible on at least one of said front or back sides, with said first music indicia of said body and at least some of said apertures visible therethrough;

c) said slide movably disposed between said front and back surfaces of said body, portion of the slide extending beyond at least one of said opposing ends of said body for moving the slide to a desired location relative to said apertures of said body for displaying therethrough segments of said second music indicia, which when read cooperatively with said first music indicia displays substantially all music information related to natural and artificial chords, scales, intervals, inversions of intervals, transpositions, key signatures, instrument transpositions and clef transpositions.

6. A music information reference system having first and second music indicia, the improvement comprising:

a) said first music indica includes cooperatively positioned locations for the selective display of a plurality of second music indicia, said first music indicia defines the spatial relationships of said second music indicia as displayed in said cooperative locations, said spatial relationships includes substantially all natural and artificial chords, scales, intervals, inversions of intervals, transpositions, key signatures, instrument transpositions and clef transpositions;

b) a database of music notes from which said plurality of second music indicia is determined for display in said cooperative locations to said first music indicia; and

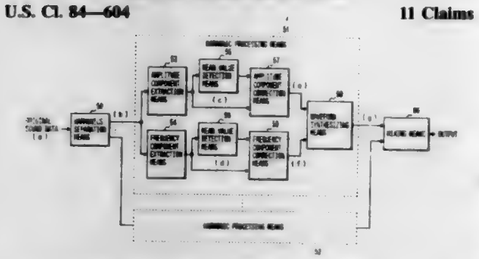
c) means for generating from selected ones of said music notes said second music indicia, and automatically displaying said second music indicia in said cooperative locations.

5,597,970

WAVEFORM PROCESSING APPARATUS AND AN ELECTRONIC MUSICAL INSTRUMENT USING THE OUTPUT WAVEFORM THEREOF

Hiroshi Sato, and Kaoru Matsunaga, both of Shizuoka-ken, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 21, 1994, Ser. No. 327,191
Claims priority, application Japan, Oct. 28, 1993, 5-292565
Int. Cl.[6] G10H *1/08;1/12;7/02*
U.S. Cl. 84—604 **11 Claims**



1. A waveform processing apparatus comprising:

a band dividing means for dividing an original sound signal into a plurality of frequency bands and outputting band signals,

an extraction means for extracting at least one parameter of amplitude and frequency of each band signal, the at least one parameter having parameter variations with time,

a parameter correction means for correcting the parameters of each band signal based on a mean of the parameter variations so that the parameter variations gradually decrease from a first time to a second time and disappear after the second time and for providing corrected parameters,

a synthesizing means for synthesizing each band signal using the corrected parameters, and

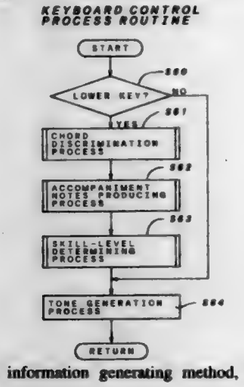
a mixing means for mixing each corrected band signal to provide an output.

5,597,971

CHORD INFORMATION GENERATING APPARATUS AND CHORD INFORMATION GENERATING METHOD

Tsutomu Saito, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka-ken, Japan

Filed Jun. 5, 1995, Ser. No. 462,885
Claims priority, application Japan, Sep. 8, 1994, 6-240514
Int. Cl.[6] G09B *15/00;* G10H *1/38*
U.S. Cl. 84—669 **17 Claims**



10. A chord information generating method, comprising the steps of

(A) detecting a key-depression state,

(B) producing data representing a skilled person or data representing a beginner in accordance with a result of the detection,

(C) sequentially accumulating the produced data,

(D) determining that a player is a skilled one when a ratio of the number of pieces of the accumulated data representing a skilled person to the number of all pieces of the accumulated data is equal to or greater than a predetermined value, or that the player is a beginner when the ratio is less than the predetermined value, and

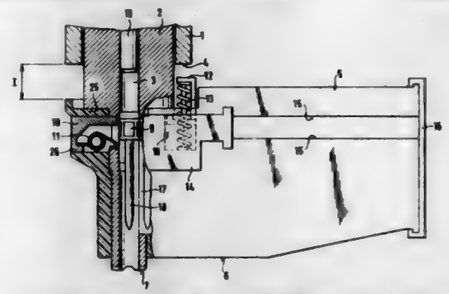
(E) generating chord information in accordance with a result of the determination and on the basis of the key-depression state.

5,597,972

EXPLOSIVE POWDER CHARGE OPERATED SETTING TOOL WITH A MAGAZINE FOR FASTENING ELEMENTS

Hannes Wachter, Vandans, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 15, 1996, Ser. No. 647,549
Claims priority, application Germany, May 15, 1995, 195 17 230.2
Int. Cl.[6] B25C *1/14*
U.S. Cl. 89—1.14 **7 Claims**



1. Explosive powder charge operated setting tool comprising a housing (1) having a leading end a trailing end and a setting direction extending in the trailing end to the leading end, a bolt guide (2) extending axially in the setting direction being mounted in and projecting axially from the leading end of said housing, said bolt guide (2) being axially displaceable relative to said housing (1), a magazine (5) for fastening elements mounted on said bolt guide (2) adjacent the leading end of said housing (1) and extending transversely of the axial direction of said bolt guide (2), said magazine (5) being displaceable counter to the setting direction against a force of a first spring (11) relative to said bolt guide (2), said first spring (11) having a spring travel in the setting direction, a second spring (13) mounted in said magazine and arranged to extend between said magazine and said housing, said second spring (13) having a maximum force acting in the setting direction and a corresponding spring travel greater than the spring force and travel of said first spring (11).

5,597,973

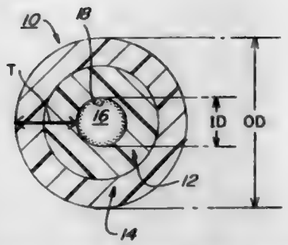
SIGNAL TRANSMISSION FUSE

Ernest L. Gladden, Granby; Gary R. Thureson; Alvaro Zappalorti, both of Avon; Eric R. Davis, Torrington, and Frank J. Lucca, Granby, all of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Jan. 30, 1995, Ser. No. 380,839
Int. Cl.[6] C06B *45/00;* C06C *5/06*
U.S. Cl. 102—289 **16 Claims**

1. A signal transmission fuse comprising:

a tube of synthetic polymeric material having a tube wall defining a tube outer surface and a tube inner surface, the tube inner surface defining a bore extending through the tube; and



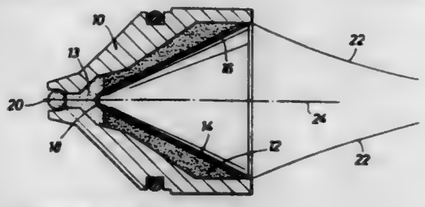
a reactive material dispersed within and extending along the length of the bore; wherein the tube has an outside diameter not greater than about 2.380 mm (0.0937 inch) and the ratio of the inside diameter of the tube to the thickness of the tube wall is from about 0.18 to 2.5.

5,597,974

SHAPED CHARGE FOR A PERFORATING GUN HAVING A MAIN BODY OF EXPLOSIVE INCLUDING TATB AND A SENSITIVE PRIMER

Wallace E. Voreck, Jr., Sparta, N.J.; James E. Brooks, Manvel, Tex.; John R. Eberhardt, and Hooshang A. Rezaie, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 4, 1996, Ser. No. 610,025
Int. Cl.[6] F42B *1/02*
U.S. Cl. 102—307 **23 Claims**



1. A shaped charge, comprising:

a case;

a main body of explosive disposed in said case, said main body of explosive including sym-triaminotrinitrobenzene (TATB); and

a primer disposed in said case adapted for detonating said main body of explosive, said primer being more sensitive than said TATB.

5,597,975

MECHANICAL PLATING OF SMALL ARMS PROJECTILES

Arnold Satow, New City, N.Y., assignor to McGean-Rohco, Inc., Cleveland, Ohio

Filed Oct. 4, 1995, Ser. No. 539,234
Int. Cl.[6] B05D *3/12*; F42B *5/02*
U.S. Cl. 102—514 **15 Claims**

7. A process for mechanically plating small arms projectiles having a composition comprising a deformable metal selected from the group consisting of lead, an alloy of lead and an alloy of bismuth, with a coating of copper, said process comprising the steps of:

(A) forming a slurry in an agitated container, said slurry comprising said small arms projectiles and an aqueous solution which contains components comprising a strong acid selected from the group consisting of fluoboric acid and methane sulfonic acid;

(B) continuing to agitate said slurry until the surface of said small arms projectiles is essentially clean and free of oxide;

(C) adding to the agitated container a plating agent and particulate copper metal; and

(D) continuing to agitate the container until said particulate copper metal has been mechanically applied over the surface of said small arms projectiles.

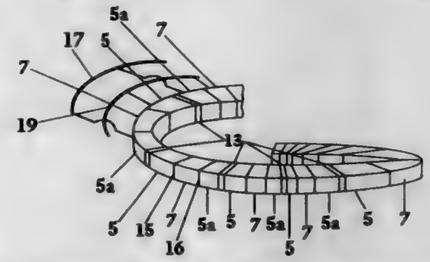
13. A small arms projectile mechanically plated according to claim 7.

5,597,976

THERMOELECTRIC GENERATOR AND MAGNETIC ENERGY STORAGE UNIT WITH CONTROLLABLE ELECTRIC OUTPUT

Jon M. Schroeder, 14301 Bag dad Rd., Leander, Tex. 78641

Continuation-in-part of Ser. No. 133,348, Oct. 8, 1993, Pat. No. 5,393,350. This application Nov. 25, 1994, Ser. No. 344,876
Int. Cl.[6] H01L *35/02*
U.S. Cl. 136—205 **14 Claims**



1. A thermoelectric generator and magnetic energy storage unit with controllable electric output comprising:

a) two dissimilar metal segments means joined to form a helix in a continuous loop in said unit,

b) a heating and cooling means to heat and cool alternate junctions of said metal segments means, thereby causing current flow and generation of a first magnetic field contained in said continuous loop;

c) a flux pump means with connections to said continuous loop to inject additional current into said current flow thereby increasing strength of said first magnetic field in said unit;

d) a switching means and output connection means located in said continuous loop with said output connection means located on either side of said switching means with said switching means controllably operable in fractions of a second and operating to discharge current into said output connections when said output connections are electrically connected to a load.

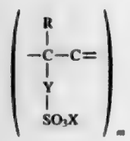
5,597,977

HARDENED POROUS AMMONIUM NITRATE

Arun K. Chattopadhyay, Brossard, Canada, assignor to ICI Canada, Inc., Ontario, Canada

Continuation of Ser. No. 878,720, May 4, 1992, abandoned. This application Oct. 25, 1995, Ser. No. 547,989
Int. Cl.[6] C06B *31/28*
U.S. Cl. 149—6 **12 Claims**

1. A hardened ammonium nitrate body, which is a combination of a functionally active polymer and ammonium nitrate, wherein said functionally active polymer has the formula:



Wherein

Y=phenylene

R=hydrogen or methyl

m=integer from 3 to 3000

X=alkali metal, ammonium, hydrogen, and further wherein the body has a core/shell structure with ammonium nitrate being the core and said polymer being the shell.

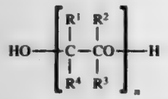
5,597,978

HIGH ENERGY HYDROXY-TERMINATED POLYAZIDO POLYMERS

Der-Shing Huang, Carmichael, and Renato R. Rindone, Fair Oaks, both of Calif., assignors to Aerojet-General Corporation, Rancho Cordova, Calif.

Continuation-in-part of Ser. No. 686,953, Dec. 27, 1984, abandoned. This application Sep. 18, 1987, Ser. No. 98,529
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.6 **41 Claims**

1. A hydroxy-terminated aliphatic polyether having the formula



in which R^1, R^2, R^3 and R^4 are independently selected from the group consisting of H, CH_2N_3 and $CHN_3CH_2N_3$, such that the total number of N_3 groups per monomer unit is 2 to 4, and n is an integer ranging from 2 to 40.

5,597,979

EMI SHIELDING HAVING FLEXIBLE CONDUSTIVE SHEET AND I/O GASKET

Daniel T. Courtney, Palmyra; Kenneth W. Hermann, Rochester, and Stanley R. Miska, Pittsford, all of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

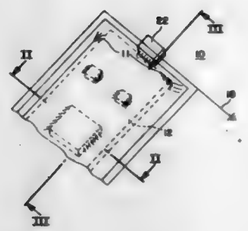
Filed May 12, 1995, Ser. No. 440,529
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 R **18 Claims**

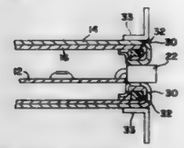
1. An electromagnetic shield, comprising:

a flexible sheet comprising an electrically insulating material;

a conductive material substantially coextensive with the flexible sheet and defining a shielding barrier, the insulating material spacing the conductive material from at least an exposed insulating area on at least one surface of the flexible sheet on at least one side thereof, and the conductive material being exposed at another area on at least one side thereof, presenting an exposed contact area for coupling electrically to the conductive material;

wherein the flexible sheet substantially forms an enclosure for a circuit element, the enclosure having an opening, and wherein the insulating area and the contact area are arranged selectively, for protecting portions of the circuit element from contact with the conductive material, and for coupling the conductive material to a conductive body; and,





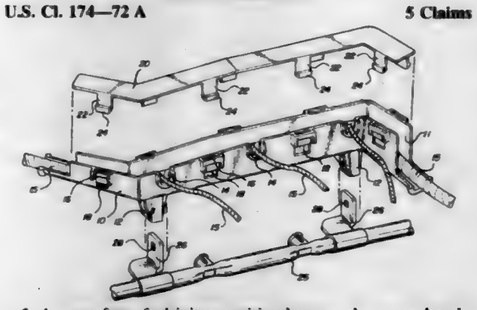
wherein the flexible sheet comprises a flange associated with the opening, a part of the contact area being disposed on the flange.

5,597,980

DETACHABLE MOUNTING MECHANISM FOR A FUEL INJECTOR WIRING HARNESS COVER

Kenneth A. Weber, Livonia, Mich., assignor to Yazaki Corporation, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 347,509
Int. Cl.[6] H02G *3/04*
U.S. Cl. 174—72 A **5 Claims**



1. A cover for a fuel injector wiring harness, the cover detachably mountable to first and second mounting tabs, each of the mounting tabs having an aperture, the cover comprising:

a base having a channel for receiving the fuel injector wiring harness, the channel having a bottom surface;

a lid attachable to the base for securing the fuel injector wiring harness within the channel;

first and second locking structures extending substantially perpendicularly from the channel bottom surface in spaced, parallel relationship with one another, each of the locking structures defining a cavity having an opening for receiving one of the mounting tabs;

first and second manually actuable locking levers formed integrally with the respective first and second locking structures, each of the locking levers pivotable with respect to the locking structure between a locked position and a released position, each of the locking levers having a projection extending into the respective cavity and engagable with the respective aperture when the respective mounting tab is received within the respective cavity and the locking lever is in the locked position; and

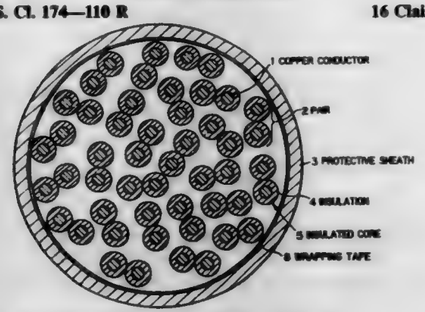
first and second handle portions extending substantially perpendicularly from respective first and second locking levers and substantially parallel with the channel bottom surface, each of

the handle portions having a first end attached to the locking lever and a distal end, the distal end being wider than the first end.

5,597,981
UNSHIELDED TWISTED PAIR CABLE

Shinji Hinoshita; Akinari Nakayama; Kiyoshi Watanabe; Hideki Yagyu; Shinya Ishi, and Shigeru Iwata, all of Hitachi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 398,566
Claims priority, application Japan, Nov. 9, 1994, 6-274944; Feb. 23, 1995, 7-035680
Int. Cl.[6] H01B 7/00
U.S. Cl. 174—110 R **16 Claims**

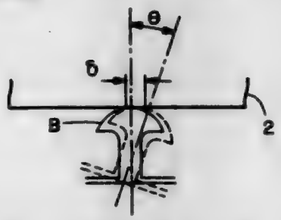


2. An unshielded twisted pair cable, comprising:
a predetermined number of pairs stranded by a predetermined lay-length, each pair being twisted and comprising a conductor and an insulation provided to insulate said conductor, said insulation being of a composition comprising a mixture of 100 parts by weight, and styrene polymer of 1 to 50 parts by weight, said mixture comprising polymer of a low dielectric loss tangent and flame-retardant properties, at least at an outer portion thereof; and
a protective sheath for covering said pairs.

5,597,982
ELECTRICAL CONNECTION STRUCTURE

Kiyoyasu Hiwada, Yamato, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 3, 1995, Ser. No. 398,345
Claims priority, application Japan, Mar. 6, 1994, 6-062018
Int. Cl.[6] H05K 1/02
U.S. Cl. 174—261 **15 Claims**

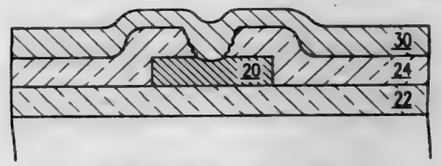


1. An electrical connection structure comprising:
a flexible dielectric film, including a surface to be contacted and an opposed surface;
a conductor pattern formed on said surface to be contacted of said dielectric film, said conductor pattern including at least one mushroom-shaped protrusion for providing electrical contact to a further conductive surface; and
an elastic member mounted on the opposed surface of said dielectric film, for causing an electrical connection to be made when the surface to be contacted and said further conductive surface are brought into pressure contact.

5,597,983
PROCESS OF REMOVING POLYMERS IN SEMICONDUCTOR VIAS

Loi N. Nguyen, and Yih-Shung Lin, both of Carrollton, Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 191,770, Feb. 3, 1994. This application Jan. 12, 1995, Ser. No. 371,996
Int. Cl.[6] H05K 1/00
U.S. Cl. 174—264 **5 Claims**



1. A structure in an integrated circuit comprising:
a first metal conductive element in an integrated circuit;
a silicon oxide layer deposited over the conductive element;
a via through the silicon oxide layer, wherein the sidewalls of the via are relatively rough, having a surface roughness characteristic of not having been exposed to either an wet or a cleanup plasma etch, and an upper surface of the first metal conductive element exposed in the via has a relatively small dip therein; and
a second metal conductive element over the device and extending into the via, wherein a conductive contact is made between the second metal conductive element and the first metal conductive element.

5,597,984
CAPACITANCE WEIGHING MAT WITH SUBSTANTIALLY RIGID SEPARATORS

Udo H. Mohaupt, Cambridge, Canada, assignor to Sowal Technologies International Inc., Oakville, Canada

PCT No. PCT/CA93/00395, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/18529, PCT Pub. Date Aug. 18, 1994
PCT Filed Sep. 23, 1993, Ser. No. 403,899
Claims priority, application Canada, Feb. 8, 1993, 2088936
Int. Cl.[6] G01G 3/14;7/06;19/02
U.S. Cl. 177—210 C **20 Claims**

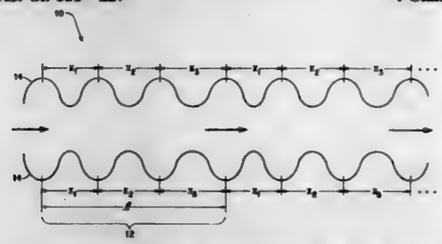


1. A capacitance mat for use in measuring loads, comprising:
a vertically stacked sandwich of a plurality of substantially horizontal electrode plates forming a capacitor; and
substantially rigid dielectric material separator means disposed between stacked electrode plates, said substantially rigid separator means defining spaces at which at least one of said electrode plates may bend in response to an applied load to move with respect to each other, causing the capacitance of the mat to change.

5,597,985
ACOUSTICALLY INACTIVE CORRUGATED STRUCTURE

Terrence A. Dear, Elkton, Md., and Karl U. Ingard, Kittery Point, Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 115,277, Aug. 31, 1993, abandoned. This application May 25, 1995, Ser. No. 450,644
Int. Cl.[6] F01N 7/08
U.S. Cl. 181—227 **4 Claims**

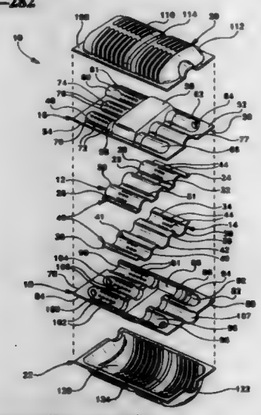


1. A corrugated structure, comprising: at least one group of sections, the group of sections having a given length and comprising a plurality of corrugations, wherein the pitch between each adjacent corrugation varies is determined by dividing the given length of the group of sections by the number of sections to obtain a constant value and adding a variation to the constant value, with each variation being different from the other variations, and further wherein the total of the varying pitches is approximately equal to the given length of the group of sections.

5,597,986
STAMP FORMED MUFFLER WITH NESTED CHAMBERS

Jon W. Harwood, Toledo, and Bennie A. Van Blaircum, Whitehouse, both of Ohio, assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Feb. 27, 1995, Ser. No. 395,049
Int. Cl.[6] F01N 7/18
U.S. Cl. 181—282 **23 Claims**

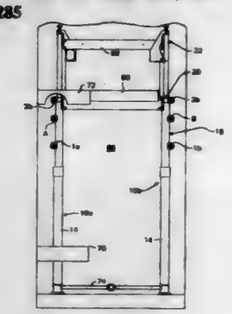


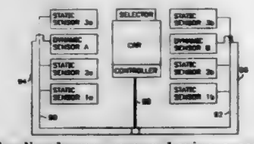
1. An exhaust muffler comprising:
a first plate, a second plate secured in face-to-face relationship with said first plate and a sheet secured to said first plate, said plates and said sheet being formed to define internal gas passages therebetween, said gas passages including an internal chamber and a plurality of tubes communicating with said internal chamber, said tubes including at least one inlet to the muffler and at least one outlet from the muffler, a plurality of said tubes being formed with perforation means therethrough for permitting gas communication between said tubes and portions of said muffler surrounding said tubes; and
an external shell having a peripheral flange secured to peripheral regions of said first plate and being formed to define at least one external chamber secured to said internal chamber and enclosing and communicating with portions of said tubes formed my said first plate.

5,597,987
TWIN POST, TELESCOPING JACK HYDRAULIC ELEVATOR SYSTEM

Oscar Gilliland, Nesbit, Miss.; Foad Vafale, Germantown; Martin W. Hughes, Memphis, both of Tenn.; Charlie R. Thurmond, III, Southaven, Miss., and Paul Tomes, Memphis, Tenn., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jan. 25, 1995, Ser. No. 377,078
Int. Cl.[6] B66B 9/04;1/04
U.S. Cl. 187—285 **14 Claims**





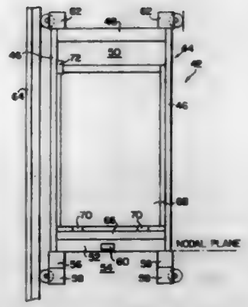
1. In a hydraulic elevator system having a car moveable in a shaft between at least two floors, a pair of telescoping jacks for supporting said car at spaced locations and for raising and lowering said car between floors, wherein each telescoping jack has a first cylinder coupled to the car, a second cylinder fixed relative to the ground, and at least one intermediate cylinder, the improvement comprising sensing means located at least one predetermined vertical position in said shaft for detecting each said intermediate cylinder, and processor means connected to each sensing means for determining relative differences in height between the intermediate cylinders for determining when the two jacks are out of synchronization.

5,597,988
CONTROL SYSTEM FOR ELEVATOR ACTIVE VIBRATION CONTROL USING SPATIAL FILTERING

Clement A. Skalski, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 220,751, Mar. 31, 1994, abandoned. This application Apr. 23, 1996, Ser. No. 636,259
Int. Cl.[6] B66B 1/44
U.S. Cl. 187—393 **18 Claims**

1. A control system for damping vibrations in an elevator car, said control system comprising:
a plurality of actuators, each actuator being associated with a roller guide for urging said roller guide against a rail in response to a sensed signal;
a massive and rigid plank arranged on the elevator car for providing a planar region on the elevator car where high frequency vibrational forces acting thereon are spatially filtered out; and



means for sensing horizontal force variations, said sensing means being disposed on said massive and rigid plank such that high frequency vibrations are isolated from said sensing means, for providing the sensed signal to said plurality of actuators, the sensed signal having a rigid body mode horizontal vibration component substantially without a high frequency horizontal vibration component.

5,597,989

SWITCH ASSEMBLY INCLUDING CAM OPERATED PIVOTED CONTACT

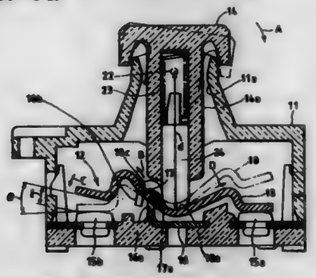
Minoru Nishio, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 321,927, Oct. 12, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 613,536

Claims priority, application Japan, Oct. 14, 1993, 5-055569 U

Int. Cl.[6] H01H *19/00;5/08*

U.S. Cl. 200—6 R **3 Claims**



1. A switch device comprising:

a switch casing including a top portion having an opening, a bottom portion, and a hollow interior;

a first stationary contact supported by said bottom portion within said hollow interior of said switch casing;

a second stationary contact supported by said bottom portion within said hollow interior of said switch casing in spaced relation to said first stationary contact;

an L-shaped common contact having a first part supported by said casing bottom portion and an upstanding second part terminating in laterally spaced projections;

a rigid movable contact member having spaced first and second movable contacts, a center portion having an actuating surface and being located between the first and second movable contacts, and a pair of integral, laterally spaced arms, wherein the actuating surface of the center portion extends between said arms, said arms are located between the first and second movable contacts and extend from the center portion, said arms having curved end portions swingably supported on free ends of the laterally spaced projections for movement of said first and second movable contacts into and out of respective engagements with said first and second stationary contacts; and

an operating knob movably mounted in said opening of said switch casing and including a reciprocatingly mounted, spring-biased pusher, said pusher having an actuating tip selectively positionable by said knob to apply a spring force over the actuating surface of the center portion of said movable contact member extending between said arms and to produce swinging motion of said movable contact member and associated movements of said first and second movable contacts into and out of respective engagements with said first and second stationary contacts, whereby a rotation axis of said movable contact member is at a height substantially the same as a height of a point of contact between the tip of the said pusher and the actuating surface of the center portion of said movable contact member.

5,597,990

ELECTRICAL SWITCH

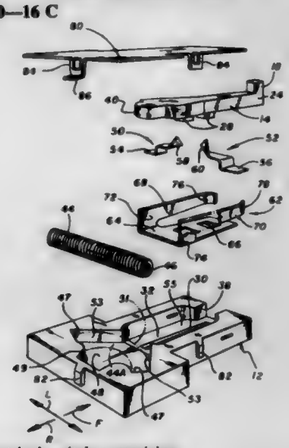
Alain Janniere, Paris, and Aurelien Carvalho, Sampans, both of France, assignors to ITT Corporation, New York, N.Y.

Filed Nov. 8, 1994, Ser. No. 336,369

Claims priority, application France, Nov. 9, 1993, 93 13334

Int. Cl.[6] H01H *13/00*

U.S. Cl. 200—16 C **6 Claims**



1. An electrical switch comprising:

a housing forming a stop;

first and second contact elements mounted on said housing;

a button that is slidably mounted on said housing to move in forward and rearward sliding directions, between closed and open button positions, said button being biased toward movement in said forward direction against said stop;

a mobile contact connected to said button to move with said button;

said mobile contact having at least one resiliently deformable contact blade that has a free end portion, and in said closed button position said first contact element engages and exerts a rearward force on said blade free end portion to urge said mobile contact and said button rearwardly.

5,597,991

ENCLOSED ELECTRICAL POWER DISCONNECT SWITCHES AND CIRCUIT BREAKER

Hai Chen; George W. Evans, Jr., both of Salisbury, and Leo V. Zirpoli, Berlin, all of Md., assignors to Eaton Corporation, Cleveland, Ohio

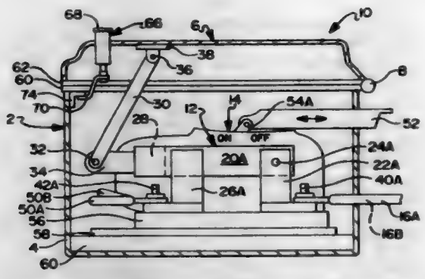
Filed Jun. 30, 1995, Ser. No. 497,305

Int. Cl.[6] H01H *9/20*

U.S. Cl. 200—50.02 **2 Claims**

1. An electrical power switch assembly comprising:

an enclosure having a main housing and a cover hinged to said main housing;



a disconnect switch mounted within said main housing, said disconnect switch having a moveable element for closing and opening electrical contacts contained within said disconnect switch;

a switch link connected at a first end to said moveable element and connected at a second end to said cover disposed to open said disconnect switch as said cover is opened;

a circuit breaker electrically connected to said disconnect switch, said circuit breaker opening an internal electrical contact when a breaker lever is moved in one direction to deactivate said circuit breaker and closing said internal electrical contact when said breaker lever is moved in an opposite direction to activate said circuit breaker;

a breaker link having a first end connected to said breaker lever and a second end extending outside of said enclosure for moving said breaker lever thereby activating or deactivating said circuit breaker.

a rigid dielectric housing having a chamber;

a current interrupting vacuum switch disposed within said chamber for selectively opening and, alternatively, closing an electrical path between said first and second terminals;

said switch including a stationary switch contact in electrical engagement with said first terminal and a movable switch contact;

a current interchange electrically connecting said movable switch contact and said second terminal, said movable switch contact being movable alternately into and out of engagement with said stationary switch contact to respectively close and open said electrical path;

an actuator for moving said movable switch contact into and out of engagement with said stationary switch contact;

said current interchange including an enclosure disposed on said housing for receiving one end of said movable switch contact and for electrical engagement with said second terminal and an electrical conductor having one end electrically connected to said movable switch contact and another end electrically connected to said second terminal;

an expansible seal extending into said enclosure and having an interior aperture for receiving said movable switch contact, one end of said seal being sealed to said housing and the other end of said seal being sealed to said one end of said movable switch contact;

said other end of said expansible seal being affixed to a spacer member disposed between said one end of said movable switch contact and a guide member for guiding said movable switch contact and further including a fastener member for attaching said spacer member and guide member to said movable switch contact.

5,597,992

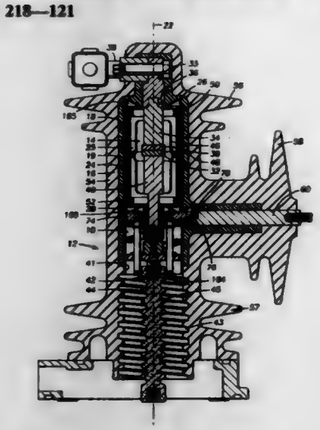
CURRENT INTERCHANGE FOR VACUUM CAPACITOR SWITCH

Jan J. Walker, Franklin, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 352,652, Dec. 9, 1994, abandoned. This application Feb. 16, 1996, Ser. No. 604,349

Int. Cl.[6] H01H *33/02;33/66*

U.S. Cl. 218—121 **16 Claims**



7. A high voltage circuit interrupter comprising:

a first electrical terminal for connection to a first high voltage power lead;

a second electrical terminal for connection to a second high voltage power lead;

5,597,993

VACUUM INTERRUPTER

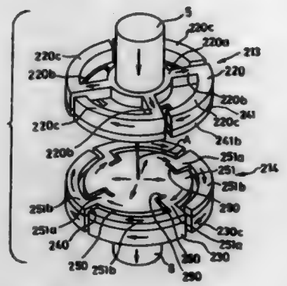
Mitsumasa Yorita, Marugame; Hideaki Toya, Amagasaki; Hiroshi Hasegawa, Marugame, and Kenichi Koyama, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 145,743, Nov. 4, 1993, Pat. No. 5,495,085. This application Jun. 7, 1995, Ser. No. 475,333

Claims priority, application Japan, Nov. 10, 1992, 4-326090; Nov. 10, 1992, 4-326892; Nov. 19, 1992, 4-335146; Nov. 19, 1992, 4-335147; Jul. 5, 1993, 5-165429; Jul. 5, 1993, 5-165430; Jul. 22, 1993, 5-181300; Jul. 22, 1993, 5-181301; Oct. 29, 1993, 5-271959

Int. Cl.[6] H01H *33/66;1/06*

U.S. Cl. 218—129 **3 Claims**



1. A vacuum interrupter comprising:

each electrode assembly of a pair of electrode assemblies having substantially the same structure and arranged in an evacuated envelope in opposed relationship adapted to be connected with or disconnected from each other comprising:

a coil electrode having a plurality of arms extending outwardly from a center ring shaped holding part and a plurality of arc-shaped coil parts formed substantially along the same circumference of said coil electrode and connected to respective ones of said arms,

a main electrode comprising:

an arc-shaped arm electrically connected to each arc-shaped coil part of said coil electrode, said coil parts being in contact with corresponding ones of said arc-shaped arms along entire surfaces thereof, and

a first arm connected to each of said arc-shaped arms of said main electrode and extended substantially toward a center of said main electrode in the radial direction, and

said first arms of one of electrode assemblies being arranged in substantially the same direction as the direction of first arms in the other electrode assembly arranged in opposed relationship to said electrode assembly.

5,597,994

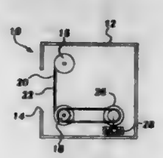
INFORMATION DISPLAY SYSTEM

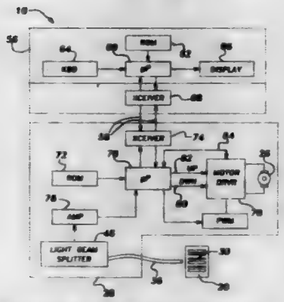
Thomas Hornung, 144 Wimbleton Dr., Birmingham, Mich. 48009

Continuation of Ser. No. 161,801, Dec. 6, 1993, abandoned. This application May 31, 1995, Ser. No. 455,594

Int. Cl.[6] G06F *17/00*

U.S. Cl. 235—375 **14 Claims**





1. An information display system comprising:

a plurality of housings, each having a viewing window,

a plurality of elongated flexible sheets, each said sheet having a plurality of discrete visual messages at longitudinally spaced intervals along each said sheet,

a coded index associated with each discrete visual message on each said sheet, each said index having a predefined location on said sheet with respect to its associated visual message,

means for movably mounting one of said sheets in each of said housings so that different visual messages are visible through each said window depending upon the position of each of said sheets in their respective housings,

controllable motor means contained in each of said housings for moving said sheet associated with each of said housings,

an encoder control module and a plurality of motor control modules positioned remotely from said encoder control module, one of said motor control module being positioned at each of said housings,

wherein said encoder control module having means for receiving said return signal from each motor control module.

5,597,995

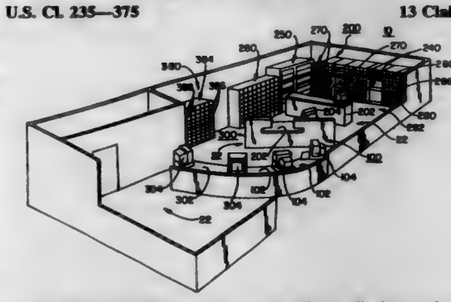
AUTOMATED MEDICAL PRESCRIPTION FULFILLMENT SYSTEM HAVING WORK STATIONS FOR IMAGING, FILLING, AND CHECKING THE DISPENSED DRUG PRODUCT

Jeffrey P. Williams, Dry Prong, La.; Dana Wells, Chandler, Ariz.; Robert Mathews, Brentwood, Tenn.; Alvin Towle, Boyce, and Alec Orrick, Pineville, both of La., assignors to Automated Prescription Systems, Inc., Pineville, La.

Filed Nov. 8, 1995, Ser. No. 555,272

Int. Cl.[6] G06F *17/00*

U.S. Cl. 235—375 **13 Claims**



1. A pharmacy system for automating the medical prescription fulfillment process for a customer, comprising:

a) an imaging work station including a host computer for receiving data entry of an original medical prescription for a prescribed drug product and customer information and for producing a prescription transaction data record; a first computer electronically connected to said host computer and including an image scanner for creating a digitized image of said original medical prescription; a first printer for printing a prescription label for applying to a drug vial for receiving a dispensed drug product; a second printer for printing a bar code label for applying to said drug vial; and means for communicating said prescription transaction data record from said host computer to said first computer;

b) a filling work station having a second computer electronically connected to said first computer at said imaging work station and further including dispensing means for counting, dispensing, and packaging of said dispensed drug product into said drug vial for the customer, and said second computer for controlling said dispensing means; and

c) a checking work station having a third computer electronically connected to said second computer at said filling work station and including a scanner for scanning said bar code label on said drug vial, and a display for displaying said digitized image of said original medical prescription, and for displaying a digitized image of said prescribed drug product to allow a first visual comparison between said digitized image of said prescribed drug product and said dispensed drug product in said drug vial, and a second visual comparison between said digitized image of said original medical prescription and said dispensed drug product in said drug vial before it is given to the customer.

5,597,996

CASH DISPENSING APPARATUS (ATM) AND METHOD FOR SEPARATING REJECTED BANK NOTES

Dennis Flood, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

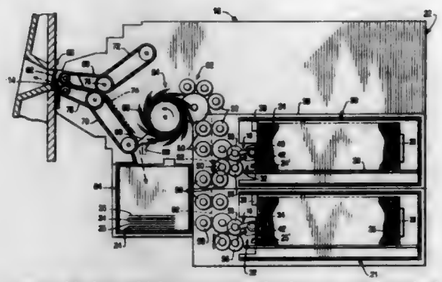
Filed Apr. 16, 1996, Ser. No. 633,237

Claims priority, application United Kingdom, Nov. 16, 1995, 9523378

Int. Cl.[6] G07G *1/10;1/12*

U.S. Cl. 235—379 **10 Claims**

1. A cash dispensing apparatus for dispensing bank notes, the cash dispensing apparatus comprising:



a purge bin into which one or more bank notes are deposited in the course of a purge operation;

storage means for storing sheets other than bank notes; and

sheet handling means for withdrawing a sheet from the storage means and depositing this sheet in the purge bin subsequent to a purge operation to separate from each other the note deposits made in the purge bin in successive purge operations.

5,597,997

OPTICAL INFORMATION READER

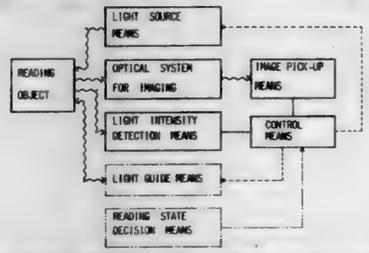
Kenzo Obata, Okazaki; Yoshmi Kitazumi, Chiryu; Takeshi Watanabe; Kouji Teramae, both of Kariya, and Tadao Nojiri, Oubu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 168,092, Dec. 17, 1993, abandoned. This application Oct. 5, 1995, Ser. No. 540,239

Claims priority, application Japan, Dec. 18, 1992, 4-339074; Mar. 1, 1993, 5-040065

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—455 **28 Claims**



1. An optical code information reader shaped as a hand-held type to be used in contact with and away from optical code information on a read object, said reader comprising:

a casing shaped to be held by hand, said casing having an opening;

light source means disposed in said casing for irradiating light to the read object having optical code information thereon;

an optical system for converging reflected light which is reflected by said reading object to enter through the opening and for focusing information image indicative of the optical code information on a predetermined reading position, said optical system including an iris;

image sensor means, having a scanning period and a shutter function and being arranged at the predetermined reading position, for converting the optical code information image into an electrical signal in accordance with the shutter function;

light intensity detection means for detecting, from a value of said electrical signal of said image sensor means, an intensity of the reflected light;

control means for controlling a shutter speed of said shutter function of said image sensor means in response to an output signal of said light intensity detection means so that said image sensor means operates with an optimum exposure condition; and

guide light means in said casing for irradiating a guide light to said read object so that a readable image is indicated thereby without interfering with light passing through said iris.

5,597,998

RECORDING MEDIUM USING REVERSIBLE RECORDING MATERIAL AND METHOD OF PROCESSING RECORD TO RECORDING MEDIUM

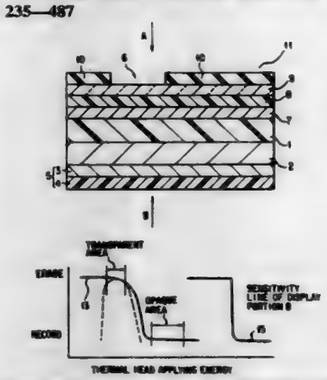
Tadayoshi Ohno; Shinichi Itoh; Takashi Yamaguchi, and Hisatoshi Tanaka, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 309,634, Sep. 21, 1994. This application Aug. 28, 1995, Ser. No. 520,086

Claims priority, application Japan, Sep. 22, 1993, 5-236691

Int. Cl.[6] G06K *19/00;5/00;* B41M *5/20*

U.S. Cl. 235—487 **6 Claims**



4. A method of processing a data storing medium which having a first display portion, provided on a substrate, for displaying predetermined data, said first display portion having recording material storing said data by first recording energy, and erasing said stored data of history of the use by predetermined erasing energy, and a second display portion, provided on said substrate, for displaying predetermined data, said second display portion having recording material for storing said data by a second recording energy different from said first recording energy, and erasing said data by second erasing energy different from said first erasing energy, comprising the steps of:

discriminating which display portion of said first and second display portions should be rewritten; and

rewriting first or second predetermined data of said first or second display portion in accordance with the discrimination result of said discriminating step based on said first recording energy, or said second recording energy, or said erasing energy.

5,597,999

AUTO FOCUS DETECTING DEVICE COMPRISING BOTH PHASE-DIFFERENCE DETECTING AND CONTRAST DETECTING METHODS

Akio Kinba, Saita; Masataka Hamada, Osakasayama; Hiroshi Ueda, Habikino; Kazumi Sugitani, Yao, and Hiroshi Ootsuka, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

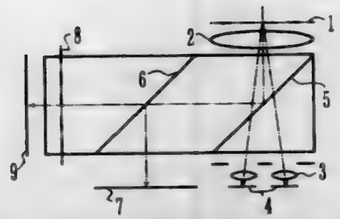
Continuation of Ser. No. 284,077, Aug. 1, 1994, abandoned. This application Jan. 2, 1996, Ser. No. 582,026

Claims priority, application Japan, Aug. 2, 1993, 5-211001

Int. Cl.[6] G03B *13/00*

U.S. Cl. 250—201.7 **20 Claims**

1. An auto focus detecting device comprising;



first image pick up means which converts an object image formed on an imaging face to an electric signal;

first detecting means which detects focus condition by a phase-difference detecting method based on output from the first image pick up means;

second image pick up means which converts the object image formed on the imaging face to an electric signal;

second detecting means which detects focus condition by a contrast detecting method based on an output from the second image pick up means; and

calculating means which calculates an amount of defocus based on output from the first detecting means and the second detecting means.

5,598,000

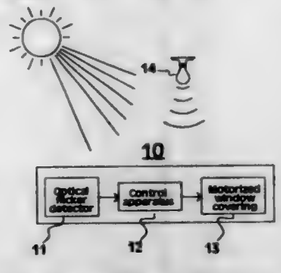
DUAL-MODE AUTOMATIC WINDOW COVERING SYSTEM RESPONSIVE TO AC-INDUCED FLICKER IN AMBIENT ILLUMINATION

Pradeep P. Popat, 1515 S. Jefferson Davis Hwy., Apt. 1321, Arlington, Va. 22202

Filed Feb. 22, 1996, Ser. No. 567,244

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—206 **2 Claims**



1. A system for automatic control of illumination transmitted through a host window, said system including:

A. means for electronically varying the illumination transmitted through said host window, said means having a control input, said means responsive to electrical signals registered on said control input;

B. means for detecting the periodic fluctuations in the illumination produced by an electric lamp powered by alternating current, said means having an output; and

C. a control apparatus having a sensing input and a control output, said sensing input being connected to said output of said detecting means and said control output being connected to said control input of said variable illumination transmission means, so that said control apparatus is capable of registering the presence of said fluctuations, and of regulating the illumination transmitted through said host window on the basis of said presence.

5,598,001

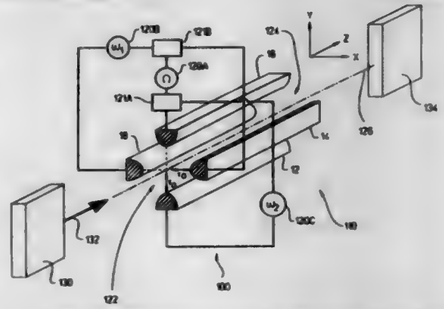
MASS SELECTIVE MULTINOTCH FILTER WITH ORTHOGONAL EXCISION FIELDS

Curt A. Flory, Los Altos, and Carl A. Myerholtz, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1996, Ser. No. 593,955

Int. Cl.[6] H01J *49/42*

U.S. Cl. 250—292 **18 Claims**



1. A multinotch filter for selectively removing from an ion beam at least two different target ions each with a different specific mass-to-charge ratio, comprising:

(a) a quadrupole having an inlet end and an outlet end so that the ion beam can be directed to traverse from the inlet end to the outlet end, the quadrupole having two pairs of parallel electrodes adapted to have oscillating voltages in the quadrupole, each pair having two oppositely facing parallel electrodes of equal voltage and one pair having oscillating voltage 180° out of phase with the other pair when a rf quadrupole voltage at a rf quadrupole frequency is applied between the two pairs of electrodes; and

(b) a power supply electrically connected to the quadrupole for driving the oscillating voltage of the quadrupole, capable of generating an oscillating voltage which is a combination comprising the rf quadrupole voltage between the two pairs of electrodes, a first excision voltage at a first excision frequency between one pair of said oppositely facing electrodes, and a second excision voltage at a second excision frequency between the other pair of said oppositely facing electrodes, such that the rf quadrupole voltage causes ions of above a selected mass-to-charge ratio in the ion beam to be guided along the quadrupole from the inlet end to the outlet end, the first excision voltage causes a first target ion to resonate and be removed from the ion beam before exiting the quadrupole, and the second excision voltage causes a second target ion to resonate and be removed from the ion beam before exiting the quadrupole.

5,598,002

ELECTRON BEAM APPARATUS

Hideo Todokoro, Tokyo; Tadashi Otaka, Katsuta; Tatsuya Maeda, Katsuta, and Katsuhiro Sasada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

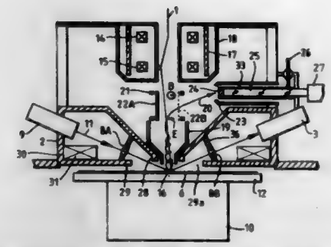
Continuation of Ser. No. 296,150, Aug. 25, 1994, abandoned. This application Mar. 28, 1996, Ser. No. 632,664

Claims priority, application Japan, Aug. 26, 1993, 5-211814

Int. Cl.[6] G02B *21/18*

U.S. Cl. 250—310 **11 Claims**

1. An electron beam apparatus having a mounting stage for supporting a specimen, an electron source for generating an electron beam to be incident on said specimen, an objective magnetic lens for focussing said electron beam on said specimen, a light



source for generating a light beam, and a light detector for detecting said light beam, an optical path for said light beam being defined from said light source to said light detector via said specimen; wherein said objective magnetic lens comprises first and second magnetic poles for generating a magnetic field of said objective magnetic lens therebetween, said first and second magnetic poles being respectively arranged on opposite sides of said optical path, said optical path being at least partially delimited between the complete extent of said first and second magnetic poles.

5,598,003

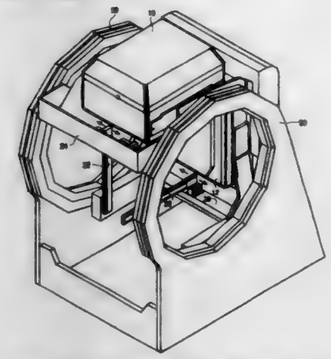
LARGE FIELD OF VIEW TRANSMISSION AND SMALL FIELD OF VIEW EMISSION SCAN WITHIN GAMMA CAMERA SYSTEM

Steven M. Jones, Pleasanton; Michael J. Janicki, San Jose; Thomas F. Lang, Fremont; J. Keenan Brown; John R. Liebig, both of San Jose, and Xiaohan Wang, Alameda, all of Calif., assignors to ADAC Laboratories, Milpitas, Calif.

Filed May 11, 1995, Ser. No. 438,834

Int. Cl.[6] G01T *1/161*

U.S. Cl. 250—363.04 **22 Claims**



1. An apparatus for imaging a body, said apparatus comprising:

a detector responsive to radiation both emitted from said body and transmitted through said body, said detector for generating image information;

a computer system coupled to said detector for acquiring said image information;

a radiation source for emitting transmission radiation through said body for detection by said detector as transmission image information;

said computer system for acquiring said transmission image information based on a first field of view of said detector encompassing said body in whole, wherein said transmission image information includes transmission matrices having pixels of a first size; and

said computer system for acquiring emission image information based on a second field of view of said detector encompassing only a portion of said body, wherein said emission image information includes emission matrices having pixels of a second size, and wherein said first size is larger than said second size.

5,598,004

IMAGE DETECTOR

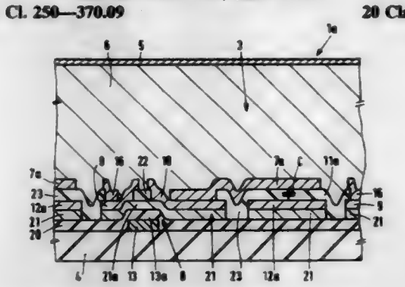
Martin J. Powell, and John R. Hughes, both of Horley, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 19, 1995, Ser. No. 504,195

Claims priority, application United Kingdom, Jul. 20, 1994, 9414639

Int. Cl.[6] G01T *1/24*; **H01L** *31/115*

U.S. Cl. 250—370.09 **20 Claims**



1. An image detector for sensing radiation, comprising an array of sensors formed from layers of material provided on a substrate and separated from a biasing electrode by a radiation conversion layer in which charge carriers are generated in response to incident radiation, each sensor comprising a collecting electrode for collecting charge carriers generated in the radiation conversion layer, a capacitor for storing charge and a switching element having at least first and second electrodes on a first insulating layer with one of the first and second electrodes being coupled to the collecting electrode for enabling charge carriers stored at the sensor to be read out, each collecting electrode extending laterally beyond the associated switching element on a second insulating layer provided substantially above said first insulating layer to form the associated capacitor with an underlying reference electrode separate from the collecting electrode by the second insulating layer.

5,598,005

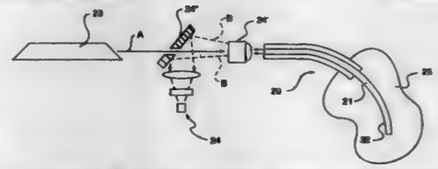
NON-DESTRUCTIVE METHOD FOR DETERMINING THE EXTENT OF CURE OF A POLYMERIZING MATERIAL AND THE SOLIDIFICATION OF A THERMOPLASTIC POLYMER BASED ON WAVELENGTH SHIFT OF FLUROESCENCE

Francis W. Wang, Gaithersburg, Md.; Robert E. Lowry, Falls Church, Va., and King-Fu Lin, Taipei, Taiwan, assignors to The United States of America as represented by the Secretary of the Commerce, Washington, D.C.

Filed Feb. 15, 1995, Ser. No. 389,823

Int. Cl.[6] G01N *21/64*; *33/44*

U.S. Cl. 250—459.1 **16 Claims**



1. A method of measuring extent of cure of a polymerizing material comprising the steps of:

selecting a polymerizing material;

selecting a wavelength-shift fluorophore;

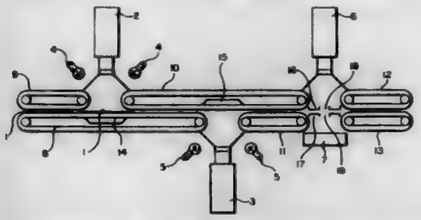
dissolving said fluorophore in said polymerizing material;
measuring change in peak fluorescence wavelength of said fluorophore resulting from a change in polarity and mobility of the polymerizing material surrounding said fluorophore; and
comparing said change with a known value to determine extent of cure of said polymerizing material.

5,598,006

INSTALLATION FOR QUALITY CONTROL OF PRINTED SHEETS, ESPECIALLY SECURITY PAPER

Luigi Stringa, Trento, Italy, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed Jan. 19, 1995, Ser. No. 374,889
Claims priority, application Italy, Feb. 4, 1994, MI94A0198
Int. Cl.[6] G01N *21/88*
U.S. Cl. 250—559.46 **7 Claims**



1. An installation for quality control of printed sheets including security paper, each having a top and bottom face comprising means for transferring said sheets and means for checking the print quality of each sheet, said means for transferring being constructed to transport said sheets in a plane to permit said means for checking to check on the print quality of each of the faces of the sheet in a single pass, the means for checking comprises:

first and second cameras (**2**, **3**; **22**, **23**) located on opposite sides of said plane respectively at two offset locations along said plane, said first and second cameras being used to check the print quality of the top and bottom faces of a check using reflection, the means for transferring having an open window adjacent a front of each camera to allow said first said second cameras to check the quality of the corresponding front and bottom faces using reflection while the sheet (**1**; **21**) is kept flat facing said camera (**2**, **3**; **22**, **23**); and

a third camera (**6**; **26**) for checking the print quality of the sheet using transparency, the means for transferring having a slit (**18**, **19**) facing the third camera (**6**; **26**),

wherein the means for transferring comprises a plurality of superposed conveyor belt devices (**8**, **9**, **10**, **11**, **12**, **13**; **8'**, **9'**, **10'**) between which the sheets (**1**; **1'**) travel, said plurality of conveyor belts include first and second conveyor belts (**8**, **10**; **10'**) that extend over a length corresponding to a length of the windows adjacent said first and second cameras,

said means for transferring (**8**, **10**; **28**, **31**; **8'**) holding the sheet by suction being equipped with holes (**50**) having an axis which is inclined relative to the transport plane,

wherein said installation further comprising suction means for holding the sheet (**1**;**1'**) flat against said first and second conveyor belts and facing said cameras, said installation further comprising a pair of superimposed plates (**16**, **17**) positioned in front of said third camera (**6**) for keeping the sheet (**1**) to be checked flat, said plates having a slit (**18**, **19**) for the checking the print quality by transparency, said slit being arranged perpendicularly to the direction of travel of the sheets,

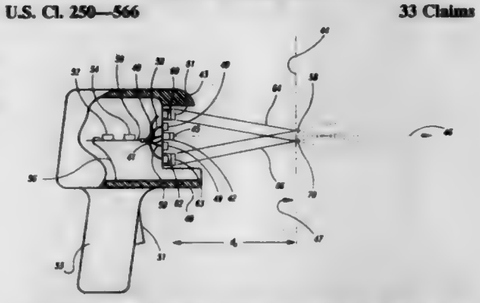
wherein said first, second and third cameras (**2**, **3**, **6**; **22**, **23**, **2**) being linear array cameras and wherein the window adjacent to the side of each camera (**2**, **3**; **22**, **23**) having a length corresponding to a fraction of the length of the sheet (**1**, **21**) to be checked.

5,598,007

SYMBOLOGY READER WITH FIXED FOCUS SPOTTER BEAM

Steven M. Bunce, Mill Creek, and Joel T. Aragon, Everett, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Mar. 21, 1994, Ser. No. 215,202
Int. Cl.[6] G06K *7/10*
U.S. Cl. 250—566 **33 Claims**



1. A symbology reader for reading a symbology having a plurality of areas of different reflectance, the symbology being on a target object, comprising:

a housing;

an optical detector assembly fixed to the housing and having an optical axis and detecting light reflected from the target object positioned along the optical axis, the reader being movable toward and away from the target object along the optical axis to change the distance between the detector assembly and the target object, the detector assembly having a fixed object distance from the detector assembly for reading of the symbology;

a first light source fixed to the housing and configured to produce a visible first cursor beam directed along a first optical path in non-parallel angular orientation relative to the optical axis and directed toward the target object at or proximate the symbology, the first cursor beam forming a first cursor image on the target object having a first predetermined shape;

a second light source fixed to the housing and configured to produce a visible second cursor beam directed along a second fixed optical path different from the first fixed optical path and directed toward the target object at or proximate the symbology, the second light source being positioned laterally offset from the first light source, the second cursor beam forming a second cursor image on the target object having a second predetermined shape, the first and second fixed optical paths being selected such that when the reader is moved to position the detector assembly with [illegible] target object at the selected object distance from the detector assembly, the first and second cursor images form a visibly recognizable composite image on the target object indicative of the positioning of the detector assembly with the target object at the selected object distance, and when the reader is moved to position the detector assembly at other than the selected object distance the composite image is not formed on the target object; and

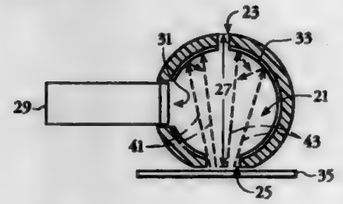
first and second beam shaping optical elements operative to shape the first and second cursor beams, respectively, to form the first and second cursor images with the first and second predetermined shapes, the first predetermined shape of the first cursor image being recognizably different from the second predetermined shape of the second cursor image.

5,598,008

WAVELENGTH SELECTIVE LIGHT COLLECTOR SYSTEM

Linden J. Livoni, Los Gatos, Calif., assignor to Lumisys, Inc., Sunnyvale, Calif.

Filed Oct. 18, 1995, Ser. No. 544,715
Int. Cl.[6] G01T *1/105;* **G03B** *42/02*
U.S. Cl. 250—586 **25 Claims**



1. A wavelength selective light collector, comprising:

an elongated, axially symmetric, hollow chamber defined by an interior surface of a shell with an axially extending slit to admit light;

a wavelength selective coating means, disposed on said interior surface of the shell, for selective attenuation of a first optical band of wavelengths and reflection of a second optical band of wavelengths; and

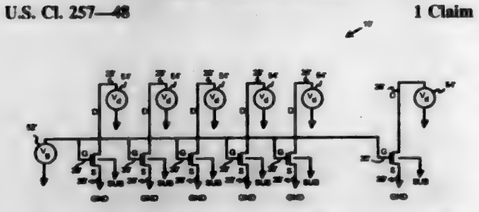
a light detector in optical communication with an interior of said shell through a port in said chamber, with substantially all attenuation of said first optical band of wavelengths in the collector resulting from said first optical band of wavelengths impinging upon said interior of said shell.

5,598,009

HOT CARRIER INJECTION TEST STRUCTURE AND TESTING TECHNIQUE FOR STATISTICAL EVALUATION

Nguyen D. Bui, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 340,138, Nov. 15, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 468,222
Int. Cl.[6] H01L *23/58*
U.S. Cl. 257—48 **1 Claim**



1. An improved method for testing multiple gate transistors including the steps of:

connecting a source terminal of each of said transistors to a first ground;

interconnecting a gate terminal of each transistor while applying a first source of supply potential; and

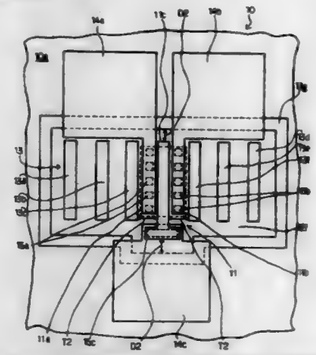
selectively applying a second source of supply potential to a third terminal of a selected transistor.

5,598,010

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING DUMMY PATTERN EFFECTIVE AGAINST MICRO LOADING EFFECT

Yoshihide Uematsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 358,369, Dec. 19, 1994, abandoned. This application May 16, 1996, Ser. No. 648,716
Claims priority, application Japan, Dec. 24, 1993, 5-326667
Int. Cl.[6] H01L *21/56;29/78;* **H05K** *3/12*
U.S. Cl. 257—48 **6 Claims**



1. A semiconductor integrated circuit device fabricated on a semiconductor substrate having a major area and a test pattern area, comprising:

a) an integrated circuit formed in said major area, and having a plurality of circuit components and a second circuit component, a plurality of pattern components being incorporated in said plurality of circuit components at first intervals, said second circuit component being spaced from said plurality of pattern components by a first distance;

b) a test component having a test pattern and used for evaluating at least one of said plurality of circuit components; and

c) a peripheral dummy pattern formed in said test pattern area, surrounding said test component and spaced from said test pattern by a second distance equal to said first distance, said peripheral dummy pattern and said test pattern being concurrently patterned together with said plurality of pattern components.

5,598,011

THIN FILM TRANSISTOR AND METHOD OF MAKING THE SAME

Eul Y. Oh, Kwacheon-si, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Division of Ser. No. 56,773, May 4, 1993, Pat. No. 5,409,851. This application Jan. 23, 1995, Ser. No. 376,923
Claims priority, application Rep. of Korea, May 4, 1992, 7604; May 25, 1992, 8880; May 27, 1992, 9085; May 28, 1992, 9155
Int. Cl.[6] H01L *29/04*
U.S. Cl. 257—57 **25 Claims**

1. A thin film transistor comprising:

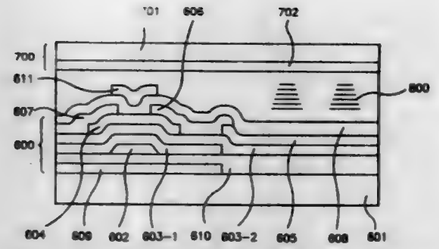
an insulating substrate;

a first metal layer formed on said insulating substrate said first metal layer having slanted side walls and a line width of approximately 5 μm;

a second metal layer formed on said insulating substrate and covering said first metal layer, said second metal layer being anodized to function as a first insulating film having a line width of approximately 20 μm;

a second insulating film formed over the entire surface of the insulating substrate and the first insulating film;

an amorphous silicon film formed on one side portion of said second insulating film;



a pixel electrode formed on the other side portion of the second insulating film;

a drain electrode formed on the second insulating film overlapping both an upper surface of one side portion of said pixel electrode and an upper surface of one side portion of said amorphous silicon film;

a source electrode formed on the second insulating film overlapping an upper surface of the other side portion of the amorphous silicon film; and

a passivation film formed over the entire surface of the resulting structure.

5,598,012

THIN-FILM TRANSISTOR WITH WIDE GATE ELECTRODE AND LIQUID CRYSTAL DISPLAY INCORPORATING SAME

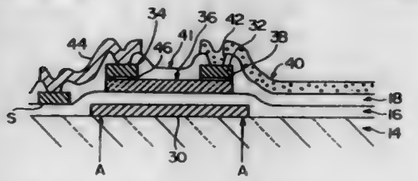
Hiroyuki Hebiguchi, Miyagi-ken, Japan, assignor to Frontec Incorporated, Sendai, Japan

Filed Sep. 27, 1995, Ser. No. 534,612

Claims priority, application Japan, Oct. 13, 1994, 6-248184

Int. Cl.[6] H01L *29/04*

U.S. Cl. 257—59 **7 Claims**



1. A thin-film transistor for selectively applying a signal from a signal electrode line to a pixel electrode of a liquid crystal display, the thin-film transistor comprising:

a substrate;

a gate electrode formed on the substrate, the gate electrode having a first width measured in a first direction;

a gate insulating layer formed on the gate electrode;

a semiconductor layer formed on the gate insulating layer, the semiconductor layer having a second width measured in the first direction and including opposing first and second ends and a channel region located between the first and second ends;

an ohmic contact layer formed on the semiconductor layer;

a source electrode formed on the ohmic contact layer over the first end of the semiconductor layer;

a drain electrode formed on the ohmic contact layer over the second end of the semiconductor layer such that the drain electrode is spaced apart from source electrode by the channel region of the semiconductor layer; and

a protective film formed on the gate insulating layer, the source electrode, the channel region of the semiconductor layer, and the drain electrode;

wherein the pixel electrode is electrically connected to the drain electrode through a first hole in the protective film;

wherein the signal electrode line is electrically connected to the source electrode through a second hole in the protective film;

wherein the first width of the gate electrode is greater than the second width of the semiconductor layer, and

wherein the source electrode and the drain electrode are formed between the first and second ends of the semiconductor layer.

5,598,013

SEMICONDUCTOR DEVICE HAVING A SOURCE-DRAIN REGION OF A LOAD TRANSISTOR THAT IS FORMED BY IMPLANTING AN INPURITY USING AN INSULATION LAYER AS A MASK

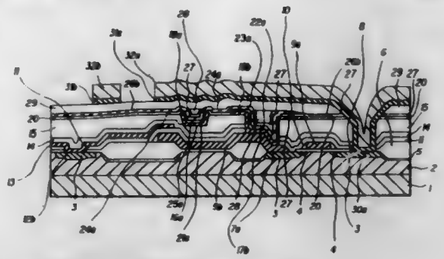
Hiroaki Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 353,319

Claims priority, application Japan, Dec. 3, 1993, 5-303719

Int. Cl.[6] H01L *27/11*

U.S. Cl. 257—67 **15 Claims**



1. A semiconductor device, comprising:

a first conductivity type of driver transistor;

a second conductivity type of load transistor formed on the driver transistor; and

an insulation layer formed between the driver transistor and the load transistor;

wherein the insulation layer is provided thereon with a depression area in which a channel region, a gate insulation layer and a gate electrode of the load transistor are formed; and

wherein the load transistor is a bottom-gate type, in which the gate electrode of the load transistor is provided under the channel region.

5,598,014

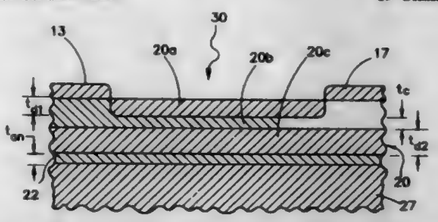
HIGH GAIN ULTRAVIOLET PHOTOCONDUCTOR BASED ON WIDE BANDGAP NITRIDES

Barbara G. Barany, Falcon Heights; Scott T. Reimer, Fagan; Robert P. Ulmer, Hopkins, and J. David Zook, Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 28, 1995, Ser. No. 396,314

Int. Cl.[6] H01L *31/0328*

U.S. Cl. 257—187 **19 Claims**



1. A UV photoconductor having an active layer comprising gallium nitride, and having a number of electron donor sites and a smaller number of electron acceptor sites, wherein the difference between the number of donor sites and the number of acceptor sites is approximately 10^{15} to 5×10^{16} per cubic centimeter, said active layer having a surface for exposure to UV illumination and

adjacent to the surface, a depletion region having a first thickness when incident UV illumination on the surface is relatively low, and a second thickness smaller than the first thickness while incident UV illumination on the surface is relatively large.

5,598,015

HETERO-JUNCTION BIPOLAR TRANSISTOR AND SEMICONDUCTOR DEVICES USING THE SAME

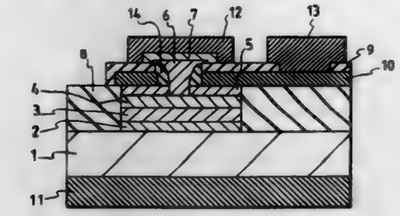
Tomonori Tanoue, Machida; Hiroshi Masuda, Kodaira, both of Japan; Tohru Nakamura, San Diego, Calif.; Takahiro Onai, Ome, and Katsuyoshi Washio, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 123,070, Sep. 17, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 357,342

Claims priority, application Japan, Sep. 18, 1992, 4-249192

Int. Cl.[6] H01L *31/0328;31/0336;27/082*

U.S. Cl. 257—197 **5 Claims**



1. A hetero-junction bipolar transistor comprising:

a collector layer, composed of a single crystalline compound semiconductor having a first conductivity type;

a base layer composed of a single crystalline compound semiconductor having a second conductivity type opposite to said first conductivity type, formed on said collector layer;

a surface protection layer, composed of a single crystalline compound semiconductor formed on said base layer, having an opening to expose part of said base layer, and having a wider forbidden band width than that of said base layer;

an emitter layer, formed on said base layer within said opening, an upper surface of the emitter layer having a larger area than that of a lower surface of the emitter layer, the emitter layer being composed of a single crystalline compound semiconductor of said first conductivity type and having a wider forbidden band width than that of said base layer;

an emitter electrode, having a larger area than that of said lower surface of said emitter layer, and being electrically connected to said upper surface of said emitter layer;

a base electrode electrically connected to said base layer; and

a collector electrode electrically connected to said collector layer.

5,598,016

BACK-ILLUMINATED TYPE PHOTOELECTRIC CONVERSION DEVICE

Akihito Tanabe, and Shigeru Tohyama, both of Tokyo, Japan, assignors to NEC Corporation, Japan

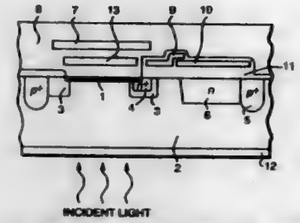
Filed Dec. 16, 1994, Ser. No. 358,015

Claims priority, application Japan, Dec. 27, 1993, 5-330293

Int. Cl.[6] H01L *27/148*

U.S. Cl. 257—229 **3 Claims**

1. A back-illuminated type photoelectric conversion device comprising a reflecting plate disposed, via an insulating film, in opposition to a charge accumulation-type photodiode formed on a semiconductor substrate of the photoelectric conversation device for reflecting light incident from the substrate side through said



photodiode and said insulating film toward the photodiode side, and a transparent electrode disposed within said insulating film sandwiched between said reflecting plate and said photodiode in opposition to said photodiode and transparent to the incident light, wherein said transparent electrode is electrically biased and electrically separated from said photodiode.

5,598,017

IMAGE SENSOR HAVING CHARGE COUPLED DEVICE REGISTERS AND DRIVING METHOD THEREOF

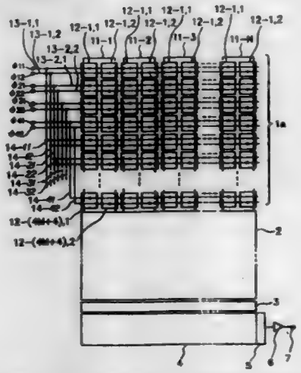
Kazuo Konuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 20, 1994, Ser. No. 325,152

Claims priority, application Japan, Nov. 11, 1993, 5-282236

Int. Cl.[6] H01L *27/148*

U.S. Cl. 257—232 **20 Claims**



1. An image sensor including a plurality of charge-coupled device ("CCD") registers arranged in the form of a matrix and oriented in a column direction of the matrix, the CCD registers each respectively having a photo-sensitive CCD channel formed therein, the CCD channel having a plurality of gate electrodes disposed thereon, and a plurality of conductors each respectively connected to one of the gate electrodes at each of the CCD registers, said sensor comprising:

a plurality of electrode sets each respectively comprising a plurality of the gate electrodes disposed at each of the CCD registers,

the electrode sets being separately arranged in a column direction of the matrix of the CCD registers,

the gate electrodes in each of the electrode sets being separately arranged in a different direction from the column direction; and

said sensor further comprising a combination of interconnections among the conductors for selectively applying a number of pulse voltages different in phase to the gate electrodes in each of the electrode sets.

5,598,018

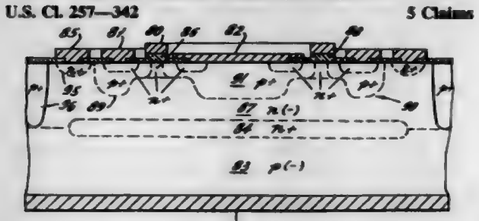
HIGH POWER MOSFET WITH LOW ON-RESISTANCE AND HIGH BREAKDOWN VOLTAGE

Alexander Lidow, Hermosa Beach, and Thomas Herman, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 288,685, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 17,511, Feb. 12, 1993, Pat. No. 5,338,961, which is a continuation of Ser. No. 303,818, Jan. 30, 1989, Pat. No. 5,191,396, which is a division of Ser. No. 90,664, Aug. 28, 1987, abandoned, which is a division of Ser. No. 456,813, Jan. 10, 1983, Pat. No. 4,705,759, which is a division of Ser. No. 232,713, Feb. 9, 1981, Pat. No. 4,376,286, which is a continuation of Ser. No. 951,310, Oct. 13, 1978, abandoned. This application Jun. 6, 1995, Ser. No. 470,094

Int. Cl.[6] H01L *29/76;29/94;31/062;31/113*

U.S. Cl. 257—342 **5 Claims**



1. A three-terminal power metal oxide silicon field effect transistor device comprising:

a wafer of semiconductor material having first and second opposing semiconductor surfaces; said wafer of semiconductor material having a relatively lightly doped major body portion for receiving junctions and being doped with impurities of one conductivity type;

at least first and second spaced base regions of the opposite conductivity type to said one conductivity type formed in said wafer and extending from said first semiconductor surface to a depth beneath said first semiconductor surface; the space between said at least first and second base regions defining a common conduction region of one conductivity type at a given first semiconductor surface location;

first and second source regions of said one conductivity type formed in said at least first and second base regions, respectively, at first and second first surface locations and extending from said first and second first surface locations to a depth less than said depth of said base regions; said first and second source regions being laterally spaced along said first semiconductor surface from the facing respective edges of said common conduction region thereby to define first and second channel regions along said first semiconductor surface between each of said first and second source regions, respectively, and said common conduction region;

source electrode means connected to said source regions and comprising a first terminal;

gate insulation layer means on said first surface, disposed at least on said first and second channel regions;

gate electrode means on said gate insulation layer means, overlying said first and second channel regions and comprising a second terminal;

a drain electrode connected to said first surface and comprising a third terminal;

each of said at least first and second spaced base regions of said opposite conductivity type having respective profiles which include relatively shallow depth regions extending from said common region and underlying their said respective first and second source regions, and respective relatively deep, relatively large radius regions extending from said shallow depth regions which are laterally spaced from beneath said respective source regions on the side of said source regions which is away from said common region.

5,598,019

SEMICONDUCTOR DEVICE HAVING TRENCH ISOLATION STRUCTURE AND METHOD OF MANUFACTURING THE SAME

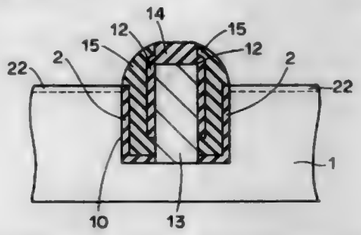
Shigeki Komori, and Takehisa Yamaguchi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,952

Claims priority, application Japan, Apr. 7, 1993, 5-080735; Mar. 15, 1994, 6-043916

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—397 **10 Claims**



1. A semiconductor device having a trench isolation structure, comprising:

a semiconductor substrate having a main surface;

a trench for element isolation, formed in the main surface of said semiconductor substrate;

a first insulating layer formed over said trench;

a conductive layer formed on said first insulating layer and extending above said main surface; and

a second insulating layer formed over said trench so as to extend from said conductive layer to an upper end corner portion of a sidewall of said trench with an increasingly downwardly sloping surface, and having a higher relative dielectric constant than that of said first insulating layer.

5,598,020

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF MANUFACTURING THE SAME

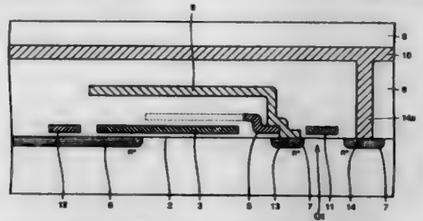
Ryuichi Matsuo, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1995, Ser. No. 383,124

Claims priority, application Japan, Feb. 28, 1994, 6-030160

Int. Cl.[6] H01L *27/76;27/11*

U.S. Cl. 257—401 **15 Claims**



1. A semiconductor integrated circuit device, comprising:

a semiconductor substrate having a main surface;

a first conductor of prescribed width and thickness, formed on the main surface of said semiconductor substrate with an insulating film therebetween;

a second conductor formed on the main surface of said semiconductor substrate with an insulating film therebetween so as to be placed near one side surface of said first conductor and to have its one end extended over a top surface near said one side surface of said first conductor with an insulating film therebetween; and

an impurity diffusion layer formed at the main surface of said semiconductor substrate under a region where said first and second conductors are close to each other, wherein:

the semiconductor device comprises an SRAM;

the first conductor and the second conductor constitute gate electrodes for first and second driver transistors for the SRAM, respectively;

an impurity region constitutes a common source region for the first and second driver transistors; and

the first and second conductors are electrically connected to drain regions of the second and first driver transistors by conductor layers directly connected to contacts formed to expose the surfaces of the drain regions of the second and the first driver transistors, respectively.

5,598,021

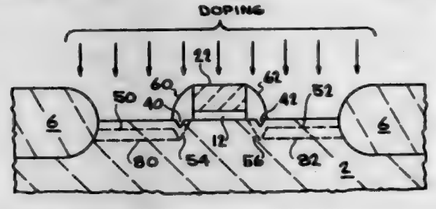
MOS STRUCTURE WITH HOT CARRIER REDUCTION

Sungki O, Milpitas, and Philippe Schoenborn, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jan. 18, 1995, Ser. No. 374,195

Int. Cl.[6] H01L *27/108;29/76;29/94;29/00*

U.S. Cl. 257—408 **9 Claims**



1. An MOS structure in a semiconductor substrate having protection against bombardment of gate oxide by electrons energized by high electric fields in the substrate comprising:

a) a first trench in said substrate formed in between and laterally adjacent to:

i) a drain region in said substrate; and

ii) a channel region of said substrate over which said gate oxide and a gate electrode are formed;

said first trench formed in said substrate at a point spaced at least about 10 Å from said gate oxide and said gate electrode formed on said substrate;

b) a lightly doped (LDD) region formed in said substrate beneath said first trench between said channel region and said drain region and laterally contiguous with both said drain region and said channel region; and

c) an oxide spacer formed over and in said trench to fill said trench and on a sidewall of said gate electrode to permit subsequent formation of said drain region in said substrate adjacent said LDD region formed beneath said first trench and said oxide spacer;

whereby electrons traveling through said channel region to said drain region will follow a path deeper in said substrate and farther spaced from said gate oxide in the portion of said channel region of said substrate adjacent said first trench where high electric fields are encountered.

5,598,022

OPTICAL SEMICONDUCTOR DEVICE

Mikio Kyomasu, Hamamatsu, Japan, assignor to Hamamatsu Photonics K.K., Hamamatsu, Japan

Continuation-in-part of Ser. No. 899,591, Jun. 18, 1992, Pat. No. 5,410,175, which is a continuation of Ser. No. 576,065, Aug. 31, 1990, abandoned. This application Sep. 16, 1994, Ser. No. 306,933

Claims priority, application Japan, Sep. 17, 1993, 5-231561

Int. Cl.[6] H01L *27/14*

U.S. Cl. 257—458 **24 Claims**



1. An optical semiconductor device comprising a PIN photodiode, said optical semiconductor device comprising:

a substrate of N-type semiconductor material;

a low concentration N-type layer of semiconductor material formed on said substrate;

a P-type semiconductor layer formed on said low concentration N-type layer, wherein said PIN photodiode has said substrate, said low concentration N-type layer and said P-type semiconductor layer;

a first well layer of P-type semiconductor material formed on said low concentration N-type layer;

a first functioning circuit formed on said first well layer;

a second well layer of P-type semiconductor material formed on said low concentration N-type layer; and

a second functioning circuit formed on said second well layer, whereby said first functioning circuit and said second functioning circuit are isolated from each other.

5,598,023

PHOTOELECTRIC CONVERTING APPARATUS

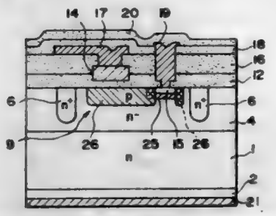
Shigeyuki Matsumoto, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 44,898, Apr. 7, 1993, abandoned, which is a continuation of Ser. No. 630,762, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 242,146, Sep. 9, 1988, abandoned. This application Nov. 15, 1994, Ser. No. 339,749

Claims priority, application Japan, Sep. 11, 1987, 62-226711

Int. Cl.[6] H01L *31/11;27/142*

U.S. Cl. 257—462 **25 Claims**



1. A photoelectric converting apparatus comprising:

an n-type semiconductor substrate;

a p-type base region, said p-type base region comprising a low concentration region of low impurity concentration and a high concentration region of high impurity concentration, wherein carriers generated by photo-excitation are accumulated in said higher concentration region and wherein said p-type base region has no direct electrical connection to an external lead;

an n^+ emitter region comprising an emitter electrode, said emitter region being formed by doping impurities into said substrate and said emitter region being in contact with said low concentration region, wherein a transistor configuration is defined by said p-type base region, said n^+ emitter region and

said substrate, wherein said low concentration region is provided between said n-type semiconductor substrate and said n^+ emitter region, wherein a signal is read out from said emitter electrode in response to accumulated carriers when said emitter electrode is at a floating potential; and

an n^- collector region having a lower impurity concentration than said n^+ emitter region, wherein said p-type base region is disposed on said n^- collector region and at least a portion of said n^+ emitter region is in contact with said high impurity concentration region of said p-type base region.

5,598,824

Patent Not Issued For This Number

5,598,825

SEMICONDUCTOR DEVICE COMPRISES AN IMPURITY LAYER HAVING BORON IONS IN THE FORM OF CLUSTERS OF ICOSAHEDRON STRUCTURE

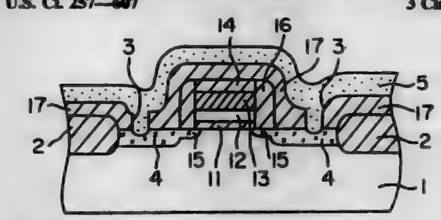
Atsushi Murakoshi, Kawasaki; Ichiro Mizushima, Yokohama; Masaharu Watanabe, Kawasaki, and Masahiko Yoshiki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 997,363, Dec. 28, 1992, Pat. No. 5,413,943. This application Feb. 23, 1995, Ser. No. 392,481

Claims priority, application Japan, Dec. 27, 1991, 3-346544; Dec. 9, 1992, 4-329401

Int. Cl.[6] H01L *29/167;29/307;29/227*

U.S. Cl. 257—607 **3 Claims**



1. A semiconductor device comprising:

a silicon layer; and

an impurity layer containing boron ions in such a way that at least a part of boron ions are contained in the form of clusters of icosahedron structure each composed of 12 boron atoms, said impurity layer being formed in said silicon layer.

5,598,826

LOW DIELECTRIC CONSTANT INSULATION LAYER FOR INTEGRATED CIRCUIT STRUCTURE AND METHOD OF MAKING SAME

Ashok K. Kapoor, Palo Alto, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 84,821, Jun. 28, 1993, Pat. No. 5,470,801. This application Jun. 5, 1995, Ser. No. 464,309

Int. Cl.[6] H01L *23/58;31/0352*

U.S. Cl. 257—634 **7 Claims**

1. An integrated circuit structure comprising:

a) one or more non-porous lower insulation layers selected from the group consisting of an oxide of silicon, silicon nitride, and mixtures of same;

b) a low dielectric constant insulation layer formed over said one or more non-porous lower insulation layers and comprising:

i) a porous insulation material comprising a matrix of:

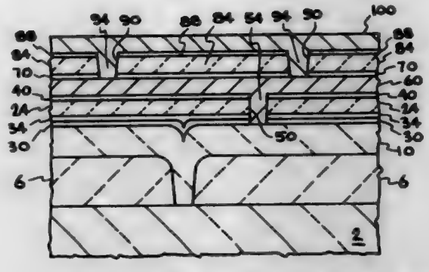
1) a non-extractable insulation material selected from the group consisting of an oxide of silicon, silicon nitride, aluminum oxide, and mixtures of same, having a dielectric constant of less than about 3.9; and

2) portions of an extractable insulation material selected from the group consisting of germanium oxide, germanium sulfide, and silicon sulfide; said porous insulation material formed by substantially removing said extractable material from a composite layer comprising a mixture of said non-extractable insulation material and said extractable insulation material; and

ii) one or more dopants selected from the group consisting of boron, phosphorus, and arsenic, in an individual amount not exceeding about 5 wt. %, based on the weight of said porous insulation material; and

c) one or more non-porous upper insulation layers formed over said low dielectric constant insulation layer and selected from the group consisting of an oxide of silicon, silicon nitride, and mixtures of same;

wherein said one or more non-porous lower insulation layers beneath said low dielectric constant insulation layer, and said one or more non-porous Upper insulation layers above said low dielectric constant insulation layer, inhibit migration of impurities, including said dopants, from said low dielectric constant insulation layer.



5,598,827

SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING THE SAME

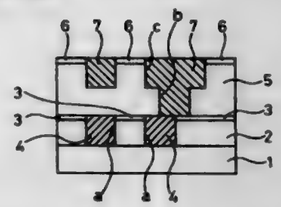
Masazumi Matsuura, Hyogo-ken, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 37,133, Mar. 25, 1993, abandoned. This application Dec. 21, 1995, Ser. No. 575,842

Claims priority, application Japan, Jun. 24, 1992, 4-166179

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—635 **12 Claims**



1. A semiconductor device having a multilayer interconnection structure, comprising:

a first insulating layer having a first opening, the first insulating layer being formed on a semiconductor substrate;

a first etching prevention film formed on said first insulating layer;

a first interconnection layer formed in said first opening;

a second insulating layer having a second opening, the second insulating layer being formed on said first etching prevention film and said first interconnection layer; and

a second interconnection layer formed in said second opening and formed on and electrically connected with said first interconnection layer, said second interconnection layer being further formed on and in contact with an upper surface of said first etching prevention film, wherein said first etching prevention film is in direct contact with a side surface of said first interconnection layer and an upper surface of said first insulating layer.

5,598,028

HIGHLY-PLANAR INTERLAYER DIELECTRIC THIN FILMS IN INTEGRATED CIRCUITS

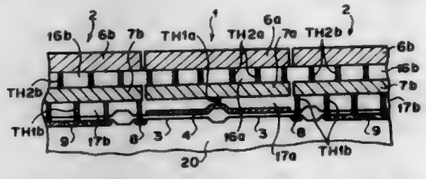
Aldo Losavio, Bergamo, and Maurizio Bacchetta, Cologno Monzese, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 419,826, Apr. 11, 1995. This application Jun. 6, 1995, Ser. No. 468,282

Claims priority, application European Pat. Off., Apr. 12, 1994, 94830167

Int. Cl.[6] H01L *23/58;23/48*

U.S. Cl. 257—644 **16 Claims**



1. An integrated circuit comprising a silicon substrate wherein electronic devices are obtained, comprising first-level electrical interconnection lines over said substrate and second-level electrical interconnection lines, the first-level and second-level electrical interconnection lines being separated by an insulating layer, characterized in that the insulating layer comprises:

a barrier layer superimposed over the first-level electrical interconnection lines;

a first insulator material layer doped with phosphorous and boron, superimposed over the barrier layer, having a concentration of phosphorous higher than a concentration of boron, the concentration of phosphorous being suitable to make the first insulator material layer act as a gettering layer for high-mobility ions and the concentration of boron depending on the concentration of phosphorous and being suitable to make the first insulator material layer stable; and

a generally planar second insulator material layer doped with boron and phosphorous, superimposed over the first insulator material layer, having a concentration of boron in the second insulator material layer equal to or higher than a concentration of phosphorous in the second insulator material layer, the concentration of boron being suitable to lower a melting-point temperature of the second insulator material layer to a prescribed value and the concentration of phosphorous being suitable to make the layer stable.

5,598,029

POWER SUPPLY WIRING FOR SEMICONDUCTOR DEVICE

Kazumasa Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

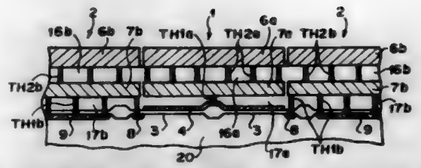
Filed Sep. 13, 1994, Ser. No. 305,392

Claims priority, application Japan, Sep. 13, 1993, 5-227380

Int. Cl.[6] H01L *23/58;23/62*

U.S. Cl. 257—665 **34 Claims**

1. Power supply wiring adapted for semiconductor device comprising:



at least one first power supply line structure and at least two second power supply line structures, which are disposed adjacent to both sides of said first power supply line structure;

said first power supply line structure comprising a capacitance forming insulating film formed on a semiconductor substrate, a capacitance forming electrically conductive film on said capacitance forming insulating film and a first power supply line formed on said capacitance forming electrically conductive film via a first insulating layer and electrically connected to said capacitance forming electrically conductive film through a plurality of through holes in said first insulating layer which are disposed, in a direction in which said first power supply line structure extends, at an interval smaller than substantially the same distance as the width of said first power supply line structure; and

said second power supply line structures each comprising a second power supply line formed on said semiconductor substrate via a second insulating layer and electrically connected to said semiconductor substrate through a through hole in said second insulating layer.

5,598,030

SEMICONDUCTOR DEVICE HAVING MULTILEVEL TAB LEADS

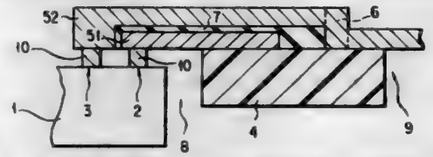
Shin-ichi Imai, Yokohama, and Katsuji Fujita, Ooita, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 377,486, Jan. 24, 1995, abandoned, which is a continuation of Ser. No. 63,657, May 20, 1993, abandoned. This application Oct. 23, 1995, Ser. No. 546,826

Claims priority, application Japan, May 21, 1992, 4-128996

Int. Cl.[6] H01L *23/495;23/02*

U.S. Cl. 257—666 **14 Claims**



1. A TAB film for semiconductor integrated circuit devices comprising:

a resin film having a surface and at least two edge portions; and

a plurality of leads partly engaged with said resin film, each of said plurality of leads having outer lead portions extending beyond one of said two edge portions and inner lead portions provided on said resin film to be electrically connected to bonding pads of a semiconductor chip at tips dedicated to said inner lead portions, said tips extending beyond the other of said two edge portions,

at least two of said inner lead portions of said leads adjacent to each other lie in a first section and a second section on said, resin film, said first section being on a side of said outer lead portion and said second section being on a side of said semiconductor chip, each of said adjacent leads of said first section being spaced from one another and physically engaged with said surface of said resin film, said adjacent leads of said second section being stacked one over the other on said resin film along a length of said adjacent leads so as to be electrically insulated from each other, one of said adjacent leads of said second section covering a substantial portion of the other of said adjacent leads of said second section.

5,598,031

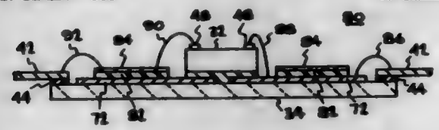
ELECTRICALLY AND THERMALLY ENHANCED PACKAGE USING A SEPARATE SILICON SUBSTRATE

Richard L. Groover, Santa Clara; William K. Shu; Sang S. Lee, both of Sunnyvale, and George Fujimoto, Santa Clara, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 82,122, Jun. 23, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,939

Int. Cl.[6] H01L *23/495;23/06*

U.S. Cl. 257—668 **40 Claims**



1. An integrated-circuit package assembly, comprising:
an integrated-circuit die;
a separate silicon substrate, of silicon wafer material from a silicon wafer, having a top surface and a bottom surface, said integrated-circuit die being fixed to the top surface of the separate silicon substrate, said separate silicon substrate serving as a heat spreader for the integrated-circuit die;
a package body containing the separate silicon substrate with the integrated-circuit die fixed to the separate silicon substrate, said package body being a molded package body which is formed around a leadframe, said integrated-circuit die and said separate silicon substrate to which the integrated-circuit die is fixed;
said leadframe having leads extending inwardly towards a central region of said leadframe, said leads having bonding fingers formed at the inward ends thereof
wherein said separate silicon substrate has lateral dimensions greater than the lateral dimensions of said integrated-circuit die and wherein at least one interposer area is formed on said top surface of said silicon substrate for attachment of connection wires from said integrated-circuit die or said leadframe.

5,598,032

HYBRID CHIP CARD CAPABLE OF BOTH CONTACT AND CONTACT-FREE OPERATION AND HAVING ANTENNA CONTACTS SITUATED IN A CAVITY FOR AN ELECTRONIC MODULE

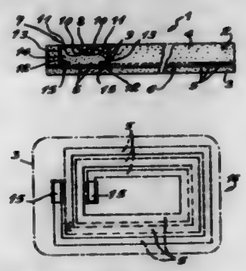
Jean-Christophe Fidalgo, Gemenos, France, assignor to Gemplus Card International, Gemenos, France

Filed Feb. 13, 1995, Ser. No. 388,102

Claims priority, application France, Feb. 14, 1994, 94 01652

Int. Cl.[6] H01L *23/02;* **H01Q** *1/38;1/40;* **G06K** *19/06*

U.S. Cl. 257—679 **35 Claims**



1. A hybrid chip card comprising
an electronic module having
an integrated circuit chip,
contact pads connected to said integrated circuit chip for a contact-using operation of said card, and
first and second contact zones;
a card body, the card body having a cavity formed therein for holding the electronic module, and the cavity opening out on a face of the card body for receiving the electronic module; and
an antenna, the antenna having first and second contacts situated in the cavity, and the antenna being connected to said first and second contact zones of said electronic module via the first and second contacts.

5,598,033

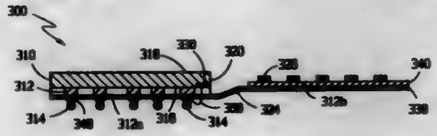
MICRO BGA STACKING SCHEME

James F. Behlen, Sunnyvale; Rafiqul Hussain, Fremont, and Munir Haq, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 16, 1995, Ser. No. 543,678

Int. Cl.[6] H01L *23/02*

U.S. Cl. 257—686 **16 Claims**



1. An integrated circuit package assembly comprising:
a semiconductor chip (**310**) having a top surface, said chip having a plurality of peripheral contacts (**330**) disposed on said top surface;
a sheet-like interposer (**312**) being formed of a main portion (**312***a*) and an extension (**312***b*) extending outwardly from said main portion, said interposer having a first surface facing toward said chip and a second surface facing away from said chip;
said interposer having a length dimension in the plane of the first surface which is slightly larger than twice a corresponding length dimension of said chip in the plane of the top surface and having a width dimension which is substantially equal to a corresponding width dimension of said chip;
only said main portion of said interposer overlying said top surface of said chip with said extension thereof extending outwardly from an edge of said chip;
a plurality of central terminals (**348**) disposed on said main portion of said interposer, said central terminals facing away from said chip and being exposed at said second surface of said interposer;
a plurality of masses (**314**) of electrically conductive bonding material being connected to corresponding ones of said plurality of central terminals;
a plurality of lands (**326**) disposed in side-by-side relationship on said extension on said first surface of said interposer and being electrically connected to corresponding ones of said plurality of masses; and
said plurality of masses being connected in a pattern so that the outermost mass is unconnected to any of said plurality of lands, the first adjacent outermost mass is connected to the outermost land, the second adjacent outermost mass is connected to the first adjacent outermost land, and each subsequent next adjacent outermost mass is connected to a corresponding next adjacent outermost land.

5,598,034

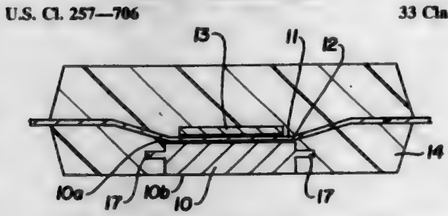
PLASTIC PACKAGING OF MICROELECTRONIC CIRCUIT DEVICES

Gene F. Wakefield, Plano, Tex., assignor to VLSI Packaging Corporation, Richardson, Tex.

Filed Jul. 22, 1992, Ser. No. 922,041

Int. Cl.[6] H01L *23/10;23/34*

U.S. Cl. 257—706 **33 Claims**



1. A package for electronic circuit components comprising:
(a) a lead frame defining a die location having terminal leads extending therefrom;
(b) a molded body of plastic material enclosing the lead frame die location and defining a package having opposed sides and opposed edges with terminal leads extending from at least one of said opposed edges;
(c) an electronic circuit chip positioned in said die location and in electrical communication with said terminal leads; and
(d) a body of thermally conductive material wholly contained within said molded body of plastic, said body of thermally conductive material having first and second opposed major faces and a flange extending from and at least partially defining the edge surfaces thereof connected to said lead frame with said first major face in thermal contact with said electronic circuit chip and said second major face substantially parallel with and adjacent one of said opposed sides of said package but covered with a layer of said plastic material.

5,598,035

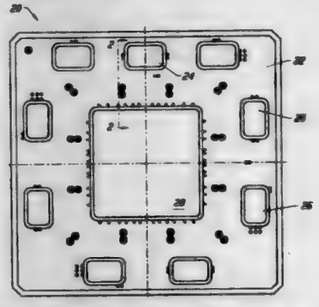
INTEGRATED CIRCUIT PACKAGE WITH EXTERNAL STORAGE CAPACITOR FOR IMPROVED SIGNAL QUALITY FOR SENSITIVE INTEGRATED CIRCUIT ELEMENTS

Stefan Rusu, Sunnyvale; Clayton L. Yee, San Francisco; Deviprasad Mailadi, Campbell, and Alan C. Rogers, Palo Alto, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 294,080, Aug. 22, 1994, abandoned. This application Apr. 29, 1996, Ser. No. 639,721

Int. Cl.[6] H01L *23/34*

U.S. Cl. 257—723 **10 Claims**



1. A package for an integrated circuit, comprising:
a package body for housing an integrated circuit including a phase-locked loop and clock driven internal circuitry;
an external clock pin connected to said package body to route an external clock signal to said phase-locked loop;
a package-mounted storage capacitor positioned on said package body to generate a precision control signal; and
a signal path between said package-mounted storage capacitor and said phase-locked loop to route said precision control signal from said package-mounted storage capacitor to said phase-locked loop such that said phase-locked loop generates an internal clock signal for said clock driven internal circuitry.

5,598,036

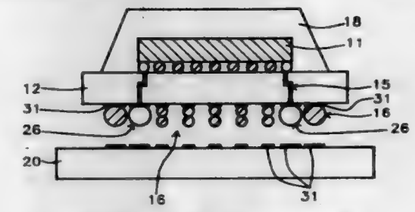
BALL GRID ARRAY HAVING REDUCED MECHANICAL STRESS

Tony H. Ho, Hsin-Chu, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Jun. 15, 1995, Ser. No. 490,855

Int. Cl.[6] H01L *23/58;23/48;23/52*

U.S. Cl. 257—738 **22 Claims**



1. A semiconductor packaging structure comprising:
an electrically insulating .mechanically stressed substrate having a top surface and a bottom surface;
a region of maximum mechanical stress within said substrate;
a semiconductor die mounted on said top surface;
means, located on said top surface, for electrically contacting selected areas on said die;
a first plurality of solder joints, integral with said bottom surface and projecting downwardly therefrom, positioned so as to underlie said region of maximum mechanical stress;
a second plurality of solder joints, integral with said bottom surface and projecting downwardly therefrom, having a lower melting point than said first plurality of solder joints and arranged as a regular array over said bottom surface, excepting locations occupied by said first plurality of solder joints; and
wiring layers, embedded within said substrate between said top and bottom surfaces, for connecting said means for contacting the die to the solder joints.

5,598,037

SEMICONDUCTOR DEVICE WITH A CONTACT MEMBER MADE OF SEMICONDUCTOR MATERIAL HAVING A COLUMNAR STRUCTURE

Shin Kikuchi, Isehara; Mamoru Miyawaki, Tokyo; Genzo Monma, Hiratsuka; Hayao Ohzu, Kawasaki; Shunsuke Inoue, Yokohama; Yoshio Nakamura, Atsugi; Takeshi Ichikawa, Zama; Osamu Ikeda, Tokyo, and Tetsunobu Kochi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

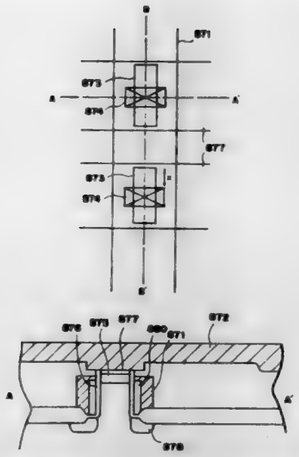
Division of Ser. No. 872,295, Apr. 22, 1992, Pat. No. 5,466,961. This application Mar. 15, 1995, Ser. No. 404,746

Claims priority, application Japan, Apr. 23, 1991, 3-92304; Apr. 23, 1991, 3-92305; Apr. 26, 1991, 3-97243; Jun. 28, 1991, 3-184168; Jun. 28, 1991, 3-184169; Jun. 28, 1991, 3-184170; Jun. 28, 1991, 3-184171

Int. Cl.[6] H01L *27/02;29/10*

U.S. Cl. 257—773 **7 Claims**

1. A semiconductor device having a member which is the subject of contact and which is formed into a rectangular or a rectangular-like shape, said semiconductor device comprising,



a contact hole formed in such a manner that its longer side crosses at substantially right angles from the direction of the longer side of said contact member which is the subject of contact, wherein said member which is the subject of contact comprises semiconductor material having a columnar structure formed on said substrate.

5,598,038

RESIN ENCAPSULATED SEMICONDUCTOR DEVICE

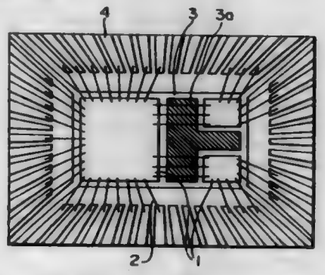
Yoichi Sugano, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 336,262, Nov. 8, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,312

Claims priority, application Japan, Nov. 11, 1993, 5-305871

Int. Cl.[6] H01L *23/50;25/00*

U.S. Cl. 257—787 **11 Claims**



1. A resin encapsulated semiconductor device, comprising three semiconductor pellets mounted adjacent to one another on respective portions of only one island in a lead frame assembly, and at least one window formed in said island between said semiconductor pellets, wherein said window is defined by a T-shaped void space in said island, and said semiconductor pellets are arranged around and separated by said window so as to leave connected together portions of said island on which said pellets are mounted.

5,598,039

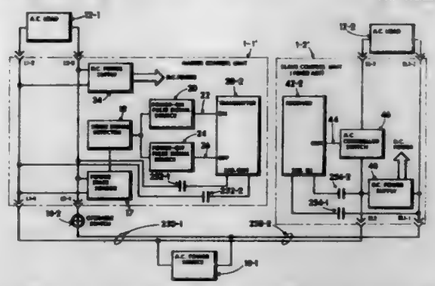
METHOD AND APPARATUS FOR SENSING STATE OF ELECTRIC POWER FLOW THROUGH A MASTER CIRCUIT AND PRODUCING REMOTE CONTROL OF A SLAVE CIRCUIT

Harold J. Weber, Holliston, Mass., assignor to Touchstone Patent Trust, Holliston, Mass.

Filed Mar. 15, 1993, Ser. No. 31,322

Int. Cl.[6] G08B *1/00*

U.S. Cl. 307—38 **20 Claims**



7. Means for remotely changing a state of power flow through a second circuit in response to a sensed change in a state of power flow through a first circuit and therefor comprising:

a source of alternating current (a.c.) power;

first a.c. circuit means including a first a.c. load means and operable switch means seriately coupled with the source of a.c. power;

second a.c. circuit means including a second a.c. load means and remote control switch means seriately coupled with the source of a.c. power;

means for sensing the state of a.c. power flow through the first a.c. circuit means;

means for determining change in the sensed said state of a.c. power flow;

means for producing a first control pulse signal in response to a first level to second level shift in the determined change;

means for sending the first control pulse signal as a first wireless control signal; and,

means for remotely receiving the first wireless control signal and coupling it with the remote control switch means to establish a first state of power flow through the second a.c. circuit means.

5,598,040

LASER WRITER HAVING HIGH SPEED HIGH CURRENT LASER DRIVER

William R. Markis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1995, Ser. No. 455,963

Int. Cl.[6] H02J *3/14*

U.S. Cl. 307—38 **4 Claims**

1. A laser writer having a laser driver including:

at least one write laser;

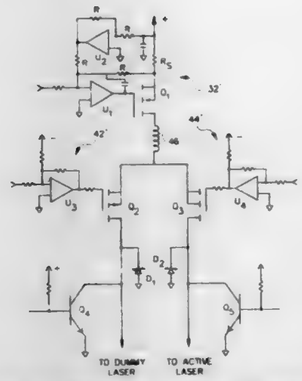
a dump load associated with said at least one write laser;

a constant current source;

switch means for alternatively connecting the constant current source to the at least one write laser and to the dump load associated with the at least one write laser; and

an inductor positioned so as to be connected

between the constant current source and the at least one write laser when the at least one write laser is connected to the constant current source by the switch means, and



between the constant current source and the dump load when the dump load is connected to the constant current source by the switch means.

5,598,041

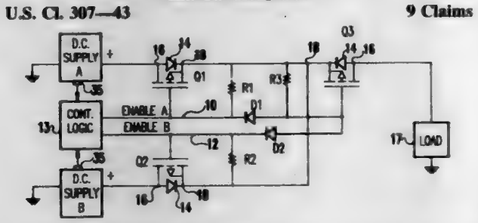
EFFICIENT FAULT TOLERANT SWITCHING CIRCUIT FOR REDUNDANT D. C. POWER SUPPLIES

Scott C. Willis, Manassas, Va., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Nov. 16, 1995, Ser. No. 559,584

Int. Cl.[6] H02J *1/04*

U.S. Cl. 307—43 **9 Claims**



1. A fault tolerant switching circuit for a redundant power supply, comprising in combination:

a first d.c. power source;

a second d.c. power source;

a load;

a first MOSFET control switch having an integral diode;

said first MOSFET control switch connected in series between said first d.c. power source and said load with its integral diode forwardly biased from said first power supply to said load;

a second MOSFET control switch having an integral diode, said second MOSFET control switch connected in series between said second d.c. power source and said load with its integral diode forwardly biased from said second power source to said load;

a MOSFET isolation switch having an integral diode, said MOSFET isolation switch connected in series between said load and said first MOSFET control switch and said second MOSFET control switch with the integral diode of said MOSFET isolation switch back biased from said first d.c. power source to said load and from said second d.c. power source to said load;

a first enable signal line connected to a gate electrode of said first MOSFET control switch and a gate electrode of said MOSFET isolation switch, said first enable signal line closing said first MOSFET control switch and said MOSFET isolation switch in a first state of said first enable signal line and opening said first MOSFET control switch and said MOSFET isolation switch in a second state of said first enable signal line; and

a second enable signal line connected to a gate electrode of said second MOSFET control switch and a gate electrode of said MOSFET isolation switch, said second enable signal line closing said second MOSFET control switch and said MOSFET isolation switch in a first state of said second enable signal line and opening said second MOSFET control switch and said MOSFET isolation switch in a second state of said second enable signal line.

5,598,042

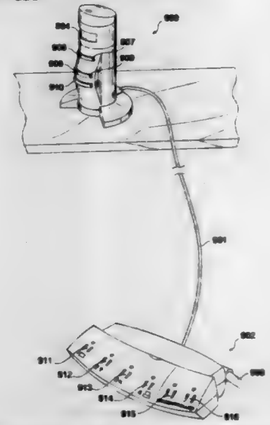
MOVEABLE DESKTOP LOAD CONTROLLER

Jerome M. Mix, Redwood City; Charles C. Hu, Saratoga, and James M. Young, Boulder Creek, both of Calif., assignors to The Watt Stopper, Santa Clara, Calif.

Continuation-in-part of Ser. No. 125,989, Sep. 22, 1993, Pat. No. 5,455,487. This application Jun. 7, 1995, Ser. No. 481,604

Int. Cl.[6] H01H *35/00*

U.S. Cl. 307—116 **13 Claims**



1. A system for controlling power to first and second electric outlets, said system comprising:

(a) a portable unit enclosed in a first casing, said portable unit comprising:

1) a motion detector for detecting whether an area in which the portable apparatus is positioned is occupied;

2) a first switch, corresponding to said first electric outlet, for allowing a user to select a first state where power to said first electric outlet is switched ON and OFF in response to said motion detector and a second state where power to said first electric outlet is not switched ON and OFF in response to said motion detector;

3) a second switch, corresponding to said second electric outlet, for allowing a user to select a first state where power to said second electric outlet is switched ON and OFF in response to said motion detector and a second state where power to said second electric outlet is not switched ON and OFF in response to said motion detector;

4) a processor, coupled to said motion detector and said first and second switches, for timing periods in which motion is not detected by said motion detector and for generating an analog dam signal to control whether power to said first and second switches is switched ON or OFF;

(b) a powerstrip, enclosed in a second casing separate from said first casing and coupled to said portable unit, for housing said first and second electric outlets, said powerstrip comprising:

1) means for receiving AC power from an external source;

2) an analog-to-digital converter for receiving and converting said analog data signal into first and second power control signals;

3) a first power switch, coupled to said analog-to-digital converter, for switching power to said first electric outlet ON and OFF in response to said first power control signal; and

4) a second power switch, coupled to said analog-to-digital converter, for switching power to said second electric outlet ON and OFF in response to said second power control signal.

5,598,043

DUST-PROOF STRUCTURE FOR A LINEAR MOTION ACTUATOR

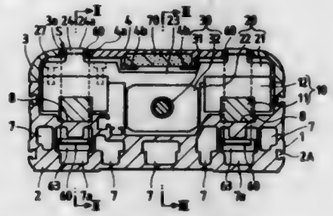
Takashi Hirano, and Sousuke Kawashima, both of Gunma, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Apr. 13, 1994, Ser. No. 227,832

Claims priority, application Japan, Apr. 13, 1993, 5-018702 U

Int. Cl.[6] H02K *5/10*

U.S. Cl. 310—12 **12 Claims**



1. A linear motion actuator comprising:

a casing including a slit extending in an axial direction;

a carriage being axially movable along a guide rail in said casing, said carriage including a driven member mounting portion protruded outside through said slit for mounting a driven member;

a seal band fastened to said driven member mounting portion of said carriage so as to move corresponding to a movement of said carriage for sealing an opening of said slit regardless of a location of said carriage when said seal band is moved by said carriage along said slit; and

a driving means for driving said carriage to move along said guide rail, wherein said seal band is looped by fastening both ends thereof respectively at front and rear sides of said driven member mounting portion in the axial direction.

5,598,044

LINEAR MOTOR

Hirobumi Satouri, and Takao Iwasa, both of Kashiwa, Japan, assignors to Oriental Motor Co., Ltd., Tokyo, Japan

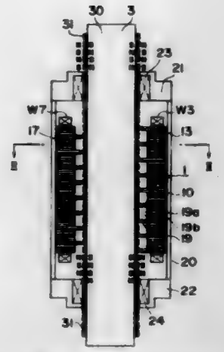
Filed Sep. 13, 1994, Ser. No. 305,355

Claims priority, application Japan, Sep. 13, 1993, 5-226784

Int. Cl.[6] H02K *41/02*

U.S. Cl. 310—12 **3 Claims**

1. A linear motor including a stator provided with a stator core having an even number of salient poles disposed at equal angle radially inward and a plurality of stator teeth formed on inner peripheral surfaces of said salient poles in a shaft direction and windings wound on said salient poles individually and a mover provided with a mover core disposed within said stator and supported movably in the shaft direction and having a plurality of permanent magnet poles disposed on an outer periphery thereof in the shaft direction at equal pitch equal to a half of a pitch of said stator teeth and magnetized in the radial direction to have different polarities alternately in the shaft direction, characterized in that



said stator core includes stator core elements formed by laminating a predetermined number of stator iron plates of said stator core and said stator core elements are laminated with said elements being rotated sequentially by the equal angle determined by an arrangement of said salient poles of said stator iron plates to form said stator core, said stator salient poles being constituted by pairs of salient poles and including m sets of salient pole groups composed of (N/2m) sets of salient pole pairs disposed uniformly at an angle of (720m/N) degrees where N is the number of said stator salient poles and m is the number of phases of said motor, each of said pairs of salient poles being defined by two salient poles that are next to one another, windings wound on (N/m)-1 or (N/m)-2 salient poles belonging to said salient pole groups being connected to have opposite polarities to each other between said pair of salient poles and being connected to have the same polarity to each other between said salient poles which do not constitute said pair of salient poles and are disposed to interpose said salient pole of the other phase therebetween to constitute phase windings for m phases, remaining salient poles, which do not participate in phase configuration, of said salient pole group for the phases, being arranged to detect a position in the shaft direction and a movement direction of said mover as sensor poles, whereby said linear motor can be operated as an m-phase linear pulse motor or a brushless DC linear motor.

5,598,045

MINIATURE MOTOR

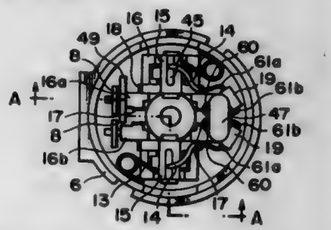
Takahiro Ohtake; Masahiko Kato, and Toshiya Yuhi, all of Chiba-ken, Japan, assignors to Mabuchi Motor Co., Ltd., Chiba-ken, Japan

Filed Aug. 17, 1994, Ser. No. 292,235

Claims priority, application Japan, Sep. 29, 1993, 5-242659

Int. Cl.[6] H02K *11/00;5/24;7/00*

U.S. Cl. 310—40 MM **10 Claims**



1. A miniature motor comprising:

a case made of metallic material and having an open end;

a permanent magnet fixed to an inner circumference of said case;

a case cap fitted to an opened end of said case, said case cap having an inner face facing an inside of said case;

a rotor positioned inside said case and rotatably supported by bearings in said case cap and said case, said rotor including an armature iron core facing said magnet, said rotor also including a commutator;

a pair of electrical input terminals on said case cap;

first and second connecting members being electrically conductive and positioned on said inner face of said case cap, each of said connecting members including first and second connecting terminals, each of said first connecting terminals being connected one of directly and via an electrically conductive member to a separate one of said input terminals, said shape of said connecting members being a U-shape when projected on an end face of said case cap;

first and second brush holders mounted on said inner face of said case cap in an electrically insulated manner from said connecting members, each of said brush holders including a pair of brush terminals, said first and second connecting members having a shape encircling respective said brush holders when projected on said end face of said case cap, said shape of said brush holders and said shape of said connecting members being formed to be point-symmetrical with respect to an axis of said rotor;

first and second brushes positioned in respective said brush holders and making sliding contact with said commutator, said brushes including respective pig-tail wires, said respective pig-tail wires being electrically connected to a second terminal of respective said first and second connecting members;

a capacitor connected across two of said terminals.

5,598,046

STEPPING MOTOR WITH DIFFERENT SIZED OR MISSING TEETH

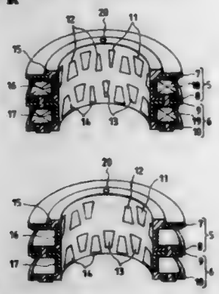
Hiroshi Miyazawa; Hatsuo Kitahara, and Hiroshi Namaizawa, all of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 2, 1995, Ser. No. 382,642

Claims priority, application Japan, Feb. 2, 1994, 6-30877

Int. Cl.[6] H02K *37/00*

U.S. Cl. 310—49 R **4 Claims**



1. A stepping motor comprising:

coil subassemblies arranged in an axial direction of a cylindrical rotor and integrated with a resin portion, each one of said coil subassemblies having upper and lower stator cores and a coil formed therebetween, each one of the stator cores having comblike polar teeth in a central portion thereof, the polar teeth being alternately arranged and confronting a magnet of the cylindrical rotor, wherein

a gate portion for charging a resin is disposed on a side surface of the resin portion, the polar teeth close to the gate portion have a smaller width than the other polar teeth, and a gap between the polar teeth of smaller width is greater than a gap between the other polar teeth.

5,598,047

ELECTRIC MOTOR FOR DRIVING MAGNETIC DISK

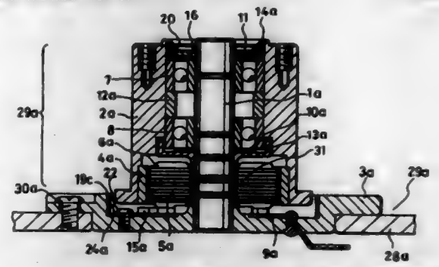
Katsunori Sakuragi, and Hideshi Fukutani, both of Yonago, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 471,362, Jun. 6, 1995, abandoned, which is a division of Ser. No. 72,749, Jun. 7, 1993, Pat. No. 5,483,113. This application Feb. 26, 1996, Ser. No. 606,994

Claims priority, application Japan, Jun. 9, 1992, 4-39277; Jun. 18, 1992, 4-159202; Dec. 22, 1992, 4-341895

Int. Cl.[6] H02K *7/00*

U.S. Cl. 310—67 R **2 Claims**



1. An electric motor for driving a magnetic disk, comprising:

a bracket secured to and fixed on a magnetic disk driving unit;

a stationary shaft fixed on said bracket and extending axially to a region where said magnetic disk is accommodated;

a hub for carrying and rotating said magnetic disk;

at least one bearing supported by said stationary shaft, for rotatably holding said hub;

a rotor magnet provided on an inner circumference of a cylindrical recess formed in said hub, for generating a rotational force on said hub;

a stator core with a plurality of coils provided on said stationary shaft at a position that confronts said rotor magnet;

at least one magnet fluid seal arranged to prevent a dispersion of grease from said bearing; and

at least one magnetic fluid seal holder made of a resin and secured to at least one of said stationary shaft and said hub, said at least one magnetic fluid seal holder retaining said magnetic fluid seal, said at least one magnetic fluid seal holder being made of a resin for increasing rigidity of a rotor.

5,598,048

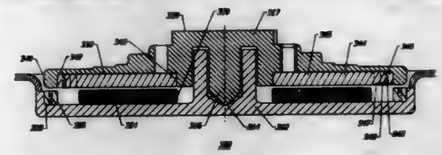
INTEGRATED PASSIVE MAGNETIC BEARING SYSTEM AND SPINDLE MAGNET FOR USE IN AN AXIAL MAGNET SPINDLE MOTOR

John C. Dunfield, Santa Cruz, and Kamran Oveyasi, Aptos, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Aug. 12, 1994, Ser. No. 289,949

Int. Cl.[6] H02K *7/09*; G11B *17/02*

U.S. Cl. 310—90.5 **16 Claims**



1. In a reduced height disc drive having a flat spindle motor assembly comprised of a spindle permanent magnet held in opposition to an electromagnet assembly attached to a stator, an apparatus for journaling a rotor having a hub shaft about said stator of said flat spindle motor comprising:

a stator comprising a base portion and a stator well, said stator well comprising a raised centrally disposed cylindrical portion disposed on said base portion, said stator well for receiving said hub shaft;

a pivot, said pivot for pivotally displacing said rotor about said stator, said pivot for engaging said hub shaft at a base portion of said stator well;

a first annular disc, said disc comprising an axially aligned magnetic pole, said disc radially extending from said stator;

a spindle permanent magnet having a first and second end and non-magnetized region disposed there between, said first end comprising a plurality of magnetic poles disposed on said rotor in opposition to said spindle motor electromagnet assembly, said second end comprised of a like axially aligned magnetic pole disposed on said rotor, opposing and offset to the inside of said axially aligned magnetic pole on said first annular disc; and

bearing means disposed between said hub shaft and said stator well, said bearing means for providing additional radial stiffness to said flat spindle motor assembly.

5,598,049

SLOT SEALING ARRANGEMENT

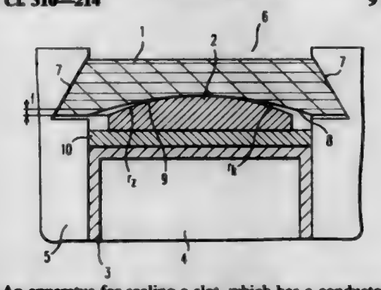
Walter Meier, Waltenschwil, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Aug. 18, 1994, Ser. No. 292,752

Claims priority, application Germany, Aug. 18, 1993, 43 27 775.6

Int. Cl.[6] H02K *3/48*

U.S. Cl. 310—214 **9 Claims**



1. An apparatus for sealing a slot, which has a conductor bar or coil positioned therein, in a laminated stator core of an electrical machine, which comprises:

at least one upper prismatic body having an underneath surface portion which is inclined in a longitudinal direction of the upper body, and

a lower prismatic body, an upper surface of which faces the upper body and is inclined in an opposite direction to the inclination of the lower surface of the upper body, wherein wedging is produced by relative displacement of the upper and lower bodies with respect to one another, and wherein a force is introduced from the conductor bar or coil to the upper body, essentially at a central section thereof, over the entire length thereof and remaining sections of the lower surface of the upper body are spaced radially from the upper surface of the lower body.

5,598,050

ACOUSTIC ACTUATOR AND FLEXTENSIONAL COVER PLATE THERE FOR

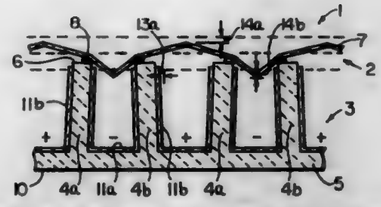
Leslie J. Bowen, Concord, and Richard L. Gentilman, Acton, both of Mass., assignors to Materials Systems Inc., Littleton, Mass.

Filed Feb. 17, 1995, Ser. No. 392,548

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—322 **11 Claims**

1. A flextensional cover plate for redirecting the vibrational displacement of terminal ends of at least two pairs of bender elements, wherein the elements of each pair vibrate toward and away from each other, said flexteasional cover plate comprising:



at least two flexible pleats each configured to be bondable to terminal ends of one of said pairs of said bender elements; and

a planar member disposed parallel to said bender element vibrational displacement and bonded to or unitary with said pleats, said planar member being interconnected by said flexible pleats to said terminal ends, and said flextensional cover plate being configured such that, on actuation, said bender element vibrational displacement results in flexing of said flexible pleats and said flexing results in cover plate vibrational displacement at said planar member in a direction normal to said element vibrational displacement.

5,598,051

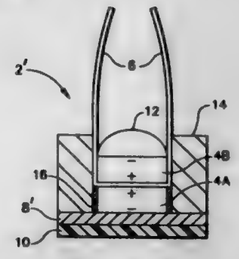
BILAYER ULTRASONIC TRANSDUCER HAVING REDUCED TOTAL ELECTRICAL IMPEDANCE

Gregg W. Frey, East Wenatchee, Wash., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 21, 1994, Ser. No. 343,065

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—334 **6 Claims**



1. An ultrasonic transducer comprising:

an array case made of electrically conductive material electrically connected to ground and comprising four walls which define a rectangular recess, each of said four walls extending perpendicular to a reference plane;

a first planar transducer array of piezoelectric transducer elements arranged inside said recess of said array case at a first elevation and parallel to said reference plane, wherein each piezoelectric transducer element of said first planar transducer array has a front face with a first array front electrode on the surface thereof and a rear face with a first array rear electrode on the surface thereof;

a second planar transducer array of piezoelectric transducer elements arranged inside said recess of said array case at a second elevation less than said first elevation and parallel to said reference plane, wherein each piezoelectric transducer element of said second planar transducer array has a front face with a second array front electrode on the surface thereof and a rear face with a second array rear electrode on the surface thereof;

a multiplicity of electrically conductive traces sandwiched between said first and second planar transducer arrays, each conductive trace being electrically connected to a respective first array front electrode and to a respective second array rear electrode,

wherein said first transducer array is poled in a first direction and said second transducer array is poled in a second direction opposite to said first direction, each of said first and second transducer arrays has a thickness equal to one-quarter of an ultrasonic wavelength transmitted by said transducer, and said conductive traces have a thickness less than 0.01 times said ultrasonic wavelength.

5,598,052

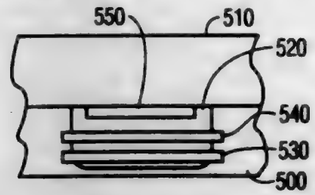
VACUUM MICROELECTRONIC DEVICE AND METHODOLOGY FOR FABRICATING SAME

Babar A. Khan, Ossining; David A. Cammack, Scarborough, and Ronald Pinker, Peekskill, all of N.Y., assignors to Philips Electronics North America, New York, N.Y.

Continuation-in-part of Ser. No. 177,089, Dec. 30, 1993, Pat. No. 5,438,343, which is a continuation-in-part of Ser. No. 922,707, Jul. 28, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 359,249

Int. Cl.[6] H01J *21/10*

U.S. Cl. 313—310 **11 Claims**



1. A vacuum state electronic device comprising:

first and second substrates, each substrate having a contacting surface;

at least one cavity disposed in at least one of the substrates, said cavity having an opening in the contacting surface of the at least one substrate, and said cavity containing a vacuum;

an electron emitting electrode disposed within the cavity;

an electron receiving electrode disposed within the cavity;

at least one electron modulating electrode disposed between the electron emitting electrode and the electron receiving electrode for modulating the flow of electrons therebetween;

the first and second substrates being joined together across their respective contacting surfaces to seal the cavity.

5,598,053

LCD-CRT HYBRID IMAGE TUBE

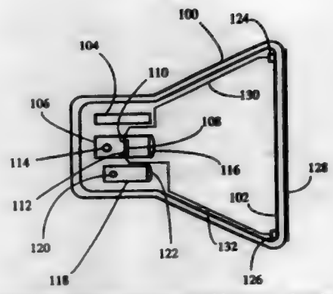
John L. Johnson, Huntsville, Ala., and Kevin L. Landel, Cardiff, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 20, 1995, Ser. No. 409,463

Int. Cl.[6] H01J *29/10*; G02F *1/13*

U.S. Cl. 313—364 **9 Claims**

1. An LCD-CRT hybrid image tube, said tube comprising: a screen comprised of a plurality of pixels, each of said pixels being made of a phosphor dot triplet, a means for exciting said phosphor dots, a first radiation source for emitting decay stimulation spectra toward said screen; an LCD array positioned between said first source and said screen, said array being suitable for receiving video signals from externally and, in response thereto, transmitting decay patterns to said phosphor dots and a re-imaging lens, said re-imaging lens being placed between said array and said screen for re-imaging the decay patterns on said screen, thereby controlling the intensity of the visible light output of said dots.



5,598,054

DISPLAY DEVICE OF THE FLAT-PANEL TYPE COMPRISING AN ELECTRON TRANSPORT DUCT AND A SEGMENTED FILAMENT

Petrus H. F. Trompenaars, Tilburg; Edward C. Cosman, Waalre; Edwin A. Montie, Heeze; Theunis S. Baller, Eindhoven; Nicolaas Lambert, Waalre; Siebe T. De Zwart, Valkenswaard, and Antonius J. J. Rademakers, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

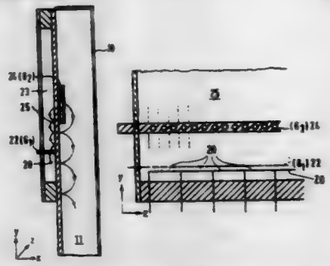
PCT No. PCT/IB94/00137, § 371 Date Jan. 25, 1995, § 102(e) Date Jan. 25, 1995, PCT Pub. No. WO94/28572, PCT Pub. Date Dec. 8, 1994

PCT Filed Jun. 2, 1994, Ser. No. 374,753

Claims priority, application European Pat. Off., Jun. 2, 1993, 93201566; Dec. 20, 1993, 93203586; May 11, 1994, 94201340

Int. Cl.[6] H01J *31/12*

U.S. Cl. 313—422 **19 Claims**



1. A display device comprising a luminescent screen, a plurality of transport ducts, means for controllably providing electrons in the transport ducts, means for promoting propagation of the electrons within the transport ducts by secondary emission, means for extracting electrons from selected locations along the transport ducts, and means for directing the extracted electrons toward the screen, characterized in that said means for controllably providing electrons in the transport ducts comprises:

a. wall means having at least one line of apertures in communication with respective ones of the transport ducts for admitting electrons into said transport ducts;

b. a plurality of anode electrodes provided on the wall means around respective ones of the at least one line of apertures;

c. control electrode means proximate the anode electrodes and including at least one trough-shaped portion disposed opposite to the apertures; and

d. line cathode means disposed within the at least one trough-shaped portion and extending along the at least one line of apertures.

5,598,055

DEFLECTION DEVICE FOR USE IN A COLOR CATHODE-RAY TUBE

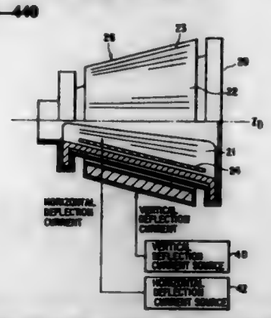
Masatsugu Inoue; Kunio Fukuda, both of Fukaya; Nobuhiko Akoh, Gunma-ken; Tohru Takahashi, Kumagaya, and Norio Shimizu, Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 16, 1993, Ser. No. 46,993

Claims priority, application Japan, Apr. 17, 1992, 4-096882; Aug. 14, 1992, 4-216242

Int. Cl.[6] H01J *29/70*

U.S. Cl. 313—440 **5 Claims**



3. A deflection device for use in a color cathode-ray tube having a center axis and means for emitting in-line electron beams, the deflection device comprising:

horizontal deflection means for deflecting the electron beams in a horizontal direction in response to horizontal deflection signals, the horizontal deflection means including a pair of horizontal deflection coils for generating a pincushion-shaped horizontal deflection magnetic field;

vertical deflection means for deflecting the electron beams in a vertical direction in response to vertical deflection signals, the vertical deflection means including a pair of vertical deflection coils for generating a barrel-shaped vertical deflection magnetic field; and

correction means for correcting the deflection of the electron beams by applying a correcting magnetic field to the electron beams in response to the horizontal deflection signals, the correction means including:

a first pair of correction coils which are located near and symmetric with respect to a vertical axis, orthogonal to the center axis, where currents flow through the correction coils in synchronism with, and in a direction opposite to, the currents flowing in the horizontal deflection coils, and

a second pair of correction coils which are located near and symmetric with respect to the vertical axis, where currents flow in synchronism with, and in the same direction as, the currents flowing in the horizontal deflection coils.

5,598,056

MULTILAYER PILLAR STRUCTURE FOR IMPROVED FIELD EMISSION DEVICES

Sungho Jin, Millington; Gregory P. Kochanski, Dunellen, and Wei Zhu, North Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

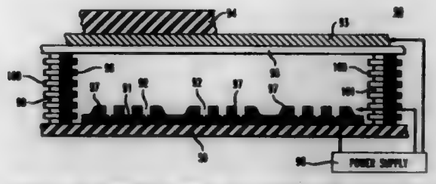
Filed Jan. 31, 1995, Ser. No. 380,774

Int. Cl.[6] H01J *1/88*

U.S. Cl. 313—495 **3 Claims**

1. In a field emission device comprising an emitter cathode, an anode and a plurality of insulating pillars separating said cathode and anode, the improvement wherein:

at least one of said plurality of insulating pillars comprises a multilayer structure composed of alternating conducting layers and insulating layers;



wherein said insulating layers are recessed with respect to said conducting layers to form grooves in said at least one of said plurality of insulating pillars.

5,598,057

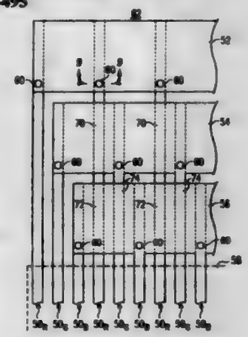
REDUCTION OF THE PROBABILITY OF INTERLEVEL OXIDE FAILURES BY MINIMIZATION OF LEAD OVERLAP AREA THROUGH BUS WIDTH REDUCTION

Kenneth G. Vickers, Whitesboro, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 13, 1995, Ser. No. 402,596

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—495 **6 Claims**



1. A field emission display apparatus comprising:

an emitter plate comprising a plurality of column conductors intersecting a plurality of row conductors, and electron emitters at the intersection of each of said row and column conductors; and

an anode plate adjacent said emitter plate, said anode plate comprising conductive stripes which are alternately covered by material luminescing in a first, second and third primary color, said conductive stripes covered by the same luminescent material being electrically interconnected by a first, second and third bus respectively to form comb-like structures corresponding to each of said colors; said second bus overlapping said conductive stripes of said first color, and said third bus overlapping said conductive stripes of said first and second colors;

wherein said buses have a width which increases monotonically from lowest current carrying portions of said buses to highest current carrying portions of said buses.

5,598,058

MULTI-COLOR ELECTROLUMINESCENT DISPLAY

Bradley J. LaPointe, Shorewood, Minn., assignor to Leading Edge Industries, Inc., Minnetonka, Minn.

Filed Feb. 9, 1995, Ser. No. 388,062

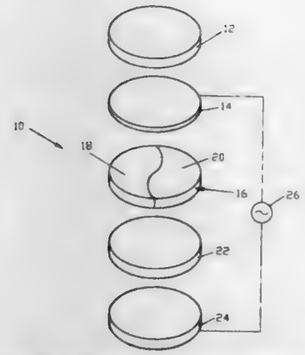
Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—503 **6 Claims**

1. A thick film multi-color display comprising:

a transparent substrate;

a transparent electrode deposited thereon;



a phosphor layer deposited thereon, said phosphor layer having at least two regions having different overall compositions providing visually distinct spectra of light, said compositions selected to luminesce when placed in a common electric field;

a dielectric layer deposited onto said phosphor layer; and

a second electrode deposited on to said dielectric layer.

5,598,059

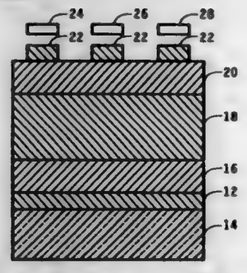
AC TFEL DEVICE HAVING A WHITE LIGHT EMITTING MULTILAYER PHOSPHOR

Sey-Shing Sun, Beaverton, and Richard T. Tuenge, Hillsboro, both of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 234,567, Apr. 28, 1994, abandoned. This application Apr. 19, 1995, Ser. No. 424,222

Int. Cl.[6] H01J *1/62;63/04*

U.S. Cl. 313—509 **5 Claims**



1. An AC thin film electroluminescent (TFEL) device including a plurality of phosphor layers for forming a white light-emitting phosphor comprising:

(a) a bottom substrate;

(b) a first electrode layer deposited on the bottom substrate;

(c) a first insulating layer deposited on the first electrode layer;

(d) a red light-emitting phosphor layer comprising a ZnS:Mn layer deposited on the first insulating layer;

(e) a blue green light-emitting phosphor layer comprising an SrS:Ce layer deposited on the red light-emitting phosphor layer;

(f) a blue light-emitting phosphor layer comprising a $Sr_x Ca_{1-x} Ga_2S_4$:Ce layer, where $1 \geq x \geq 0$, deposited on the blue green layer;

(g) a transparent second insulating layer placed atop the blue light-emitting phosphor layer; and

(h) a transparent second electrode layer deposited on the transparent second insulating layer.

5,598,060

SEGMENTED PHOTOMULTIPLIER TUBE WITH AT LEAST TWO WAYS DISPOSED ON BOTH SIDES OF AN AXIAL PLANE

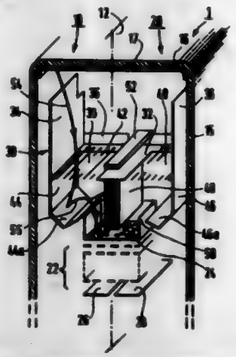
Pierre l'Hermite, Brive, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1994, Ser. No. 335,540

Claims priority, application France, Nov. 9, 1993, 93 13378

Int. Cl.[6] H01J *43/00*

U.S. Cl. 313—532 **19 Claims**



1. A segmented photomultiplier tube having at least two multiplication paths, including a sealed envelope having a front face on the inner surface of which a photocathode is provided, and from the latter, arranged one after the other, an electronic optical means providing a division of photo-electrons in one of the multiplication paths according to their starting position from the photocathode, as well as an electron multiplier of the segmented type, having at least one input dynode, wherein said electronic optical means comprises an electrode which, in a direction away from the photo-cathode, includes a focusing portion and a collection cage portion, said focusing portion and said collection cage portion separated by a median plate, said median plate having at least two apertures with at least one aperture arranged on each respective side of an axial plane, each of these apertures being covered by a highly transparent grid, the focusing portion having two walls which face the axial plane and are raised towards the photocathode, whilst the collection cage has two lateral edges which face the axial plane and have a portion that is folded towards the axial plane so as to form a surface intended for effecting a first multiplication of the photoelectrons, and in that said collection cage further includes a partition which is substantially centered on the axial plane and extends from the plate in a direction away from the photocathode.

5,598,061

PHOTOMULTIPLIER

Kimitsugu Nakamura; Yoshio Fujita, and Keiichi Ohishi, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Mar. 7, 1995, Ser. No. 399,989

Claims priority, application Japan, Mar. 7, 1994, 6-035790

Int. Cl.[6] H01J *43/04;43/20;43/00*

U.S. Cl. 313—532 **6 Claims**

1. A photomultiplier, comprising:

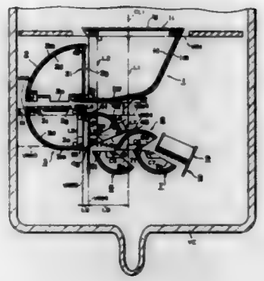
a vessel;

a photocathode arranged in said vessel;

a first dynode array including box-and-grid dynodes, being arranged in said vessel;

a second dynode array including in-line dynodes, being arranged in said vessel; and

a dynode having a curved secondary electron emitting layer opposing both a secondary electron emitting layer of a last-stage dynode of said first dynode array and a secondary



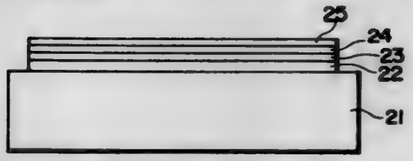
electron emitting layer of a first-stage dynode of said second dynode array.

5,598,062

TRANSPARENT PHOTOCATHODE

Yoshiki Eguni, Hamamatsu, Japan, assignor to Hamamatsu Photonics K.K., Hamamatsu, Japan

Continuation of Ser. No. 257,146, Jun. 9, 1994, abandoned. This application Oct. 25, 1995, Ser. No. 547,990
Claims priority, application Japan, Jun. 22, 1993, 5-150743
Int. Cl.[6] H01J *40/06*
U.S. Cl. 313—542 **4 Claims**



1. A transparent photocathode having a high sensitivity to light with a wavelength between 1.3 μm and 1.8 μm used in optical communication, comprising:

a transparent substrate;

a silver layer formed on said transparent substrate and having an oxidized surface thereof, said silver layer consisting essentially of silver particles, said silver particles including at least silver particles having a diameter greater than 100 nm; and

an alkaline layer comprising a potassium layer consisting essentially of potassium and a cesium layer consisting essentially of cesium, said alkaline layer formed on said oxidized surface of said silver layer.

5,598,063

MEANS FOR SUPPORTING AND SEALING THE LEAD STRUCTURE OF A LAMP

Paul G. Mathews, Chesterland, and Martin N. Hanniak, Macedonia, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 16, 1992, Ser. No. 991,603
Int. Cl.[6] H01J *61/36*
U.S. Cl. 313—623 **18 Claims**

1. A lamp comprising:

(a) an envelope of vitreous light-transmitting material enclosing an internal space where light is generated,

(b) a light-generating means within said internal space,



(c) conductive lead structure projecting into said internal space and comprising an inner lead member, an outer lead member, and a foil member connected between said inner and outer lead members, and in which:

(d) said envelope includes a first envelope portion surrounding said foil member and sealed thereto,

(e) said envelope further includes a second envelope portion of tubular form located closer to the internal space than said first envelope portion, and

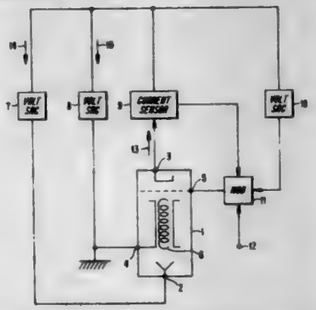
(f) a tubular bead of vitreous material is provided about said inner lead member; said bead fitting within said second envelope portion, sealingly joined thereto, and supporting said inner lead member in a precise predetermined position within said envelope; said inner lead member projecting inwardly beyond said bead and providing support for said light-generating assembly at the inner end of said inner lead member.

5,598,064

METHOD AND DEVICE FOR REDUCING BEAM CURRENT MODULATION CAUSED BY MECHANICAL VIBRATIONS IN A TWT

Sven O. Wallander, Göteborg, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 2, 1995, Ser. No. 397,869
Claims priority, application Sweden, Mar. 3, 1994, 9400723
Int. Cl.[6] H01J *25/34*
U.S. Cl. 315—3.5 **11 Claims**



4. A device for reducing modulation of a beam current of a travelling wave tube caused by mechanical vibrations, comprising:

means for measuring the modulation of the beam current and for forming a signal that represents a difference between the measured modulation and a reference value; and

means for changing a grid bias of the travelling wave tube based on the signal, whereby the beam current is affected such that the measured modulation is opposed;

wherein the means for measuring the modulation of the beam current comprises means for measuring a cathode current of the travelling wave tube.

5,598,065

LIGHTING SYSTEM FOR SNOWMOBILES AND THE LIKE

Allen J. Lakosky, 312-2nd Ave. North, Virginia, Minn. 55792

Filed Jan. 25, 1994, Ser. No. 187,400
Int. Cl.[6] B60Q *1/26*
U.S. Cl. 315—77 **11 Claims**



1. A lighting system for off-road vehicles comprising:

an inert gas discharge lamp;

protecting means for protecting said lamp;

mounting means for mounting the lighting system on said vehicle, said mounting means being operably coupled to said protecting means and comprising clamp means for releasably coupling said protecting means to an underside surface of said vehicle, whereby the lighting system is mounted on an underside surface of said vehicle; and

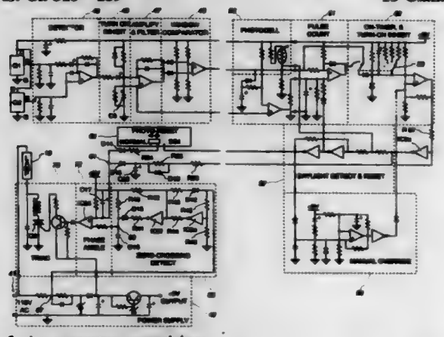
wiring and control means for coupling said lamp to a power source and for controlling said lamp.

5,598,066

TWO-LEVEL SECURITY LIGHTING SYSTEM

David L. Wiesemann, Benton Township, Berrien County, Mich.; Daniel E. Schaaf, Michigan City, Ind., and Wai-Shing P. Ko, Kwai Chung, Hong Kong, assignors to Heath Company, Benton Harbor, Mich.

Continuation of Ser. No. 282,986, Jul. 29, 1994, abandoned. This application Feb. 13, 1996, Ser. No. 600,823
Int. Cl.[6] H05B *37/02*
U.S. Cl. 315—159 **13 Claims**



1. An apparatus comprising:

first sensor means for detecting a first predetermined condition external to said apparatus, said first predetermined condition being motion relative to said first sensor means of a person or an object separate from said apparatus;

second sensor means for detecting a second predetermined condition, said second predetermined condition being a predetermined level of light external to said apparatus;

a lamp which can emit a first level of illumination and which can emit a second level of illumination substantially greater than said first level of illumination, said lamp capable of switching rapidly from said first level of illumination to said second level of illumination; and

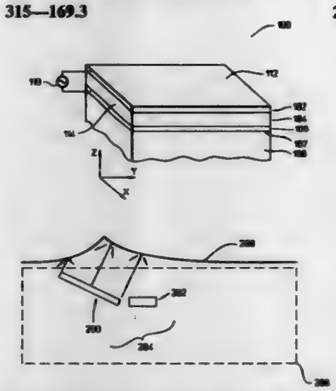
control circuit means coupled to said lamp and responsive to said first and second sensor means for causing said lamp to emit light at said first level of illumination in response to said second predetermined condition in the absence of said first predetermined condition, and for causing said lamp to emit light at said second level of illumination in response to detection of said first predetermined condition, said control means including selectively actuable manual override means for selectively overriding said first and second sensor means by manual actuation to cause said lamp to emit light at said second level of illumination, said manual override means including means for disabling said lamp in the absence of said second predetermined condition after said manual override means has been selected.

5,598,067

ELECTROLUMINESCENT DEVICE AS A SOURCE FOR A SCANNER

Kent Vincent, 20863 Sola St., Cupertino, Calif. 95014; Gerd O. Mueller, and Regina B. Mueller-Mach, both of 3491 Swelgert Rd., San Jose, Calif. 95132

Filed Jun. 7, 1995, Ser. No. 479,376
Int. Cl.[6] G09G *3/10*
U.S. Cl. 315—169.3 **25 Claims**



1. An electroluminescent device used as an illuminating source in a scanning apparatus to scan a medium with a plurality of areas in a first dimension, and a plurality of areas in a second dimension, and with each area capable of carrying information, the device comprising a solid-state electroluminescent element, which comprises:

a transparent electrode with a top surface;

a radiation generating stack under the transparent electrode; and

a second electrode under the radiation generating stack, the second electrode having a bottom surface;

such that:

radiation is generated from the radiation generating stack when a selected voltage source is coupled across the electrodes;

most of the radiation generated is emitted from the top surface; and

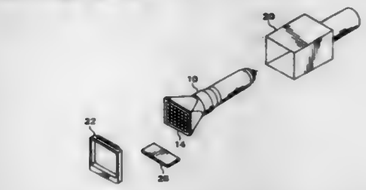
when the scanning apparatus scans the medium, the emitted radiation is substantially uniform at least across the top surface of the transparent electrode to create uniform radiation for illuminating a plurality of areas across the first dimension and at least one area across the second dimension of the medium.

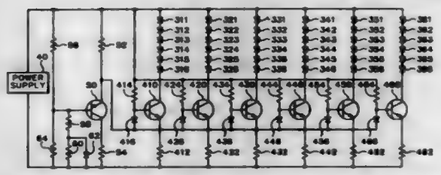
5,598,068

LIGHT EMITTING APPARATUS COMPRISING MULTIPLE GROUPS OF LEDS EACH CONTAINING MULTIPLE LEDS

Kiyokazu Shirai, Kawasaki, Japan, assignor to Sony/Tektronix Corporation, Tokyo, Japan

Filed Mar. 10, 1995, Ser. No. 401,519
Claims priority, application Japan, Mar. 18, 1994, 6-073904
Int. Cl.[6] H05B *43/00*
U.S. Cl. 315—185 R **14 Claims**





1. An electronic instrument including a cathode ray tube having a faceplate provided with a graticule and an illumination device for illuminating the graticule, the illumination device comprising:

a support member defining a plurality of discrete positioning areas, said discrete positioning areas being arranged adjacent to each other without any intervening spacing;

a plurality of light emitting diode groups, each group having a plurality of light emitting diodes connected in series, the light emitting diodes being mounted on the support member such that one light emitting diode of each light emitting diode group is positioned in each of said discrete positioning areas;

a plurality of current sources equal in number to the plurality of light emitting diode groups, each current source coupled to respective ones of the light emitting diode groups for applying currents to a each of the light emitting diode groups; and

a bias circuit coupled to each current source for supplying a control bias to the current sources to control the current applied by the current sources to the light emitting diode groups,

and wherein the support member is positioned adjacent an edge of the faceplate such that the plurality of discrete positioning areas are disposed along said edge of the faceplate.

5,598,069

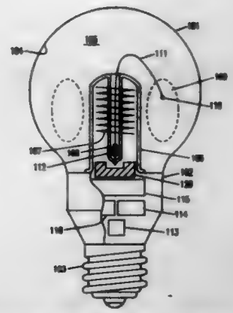
AMALGAM SYSTEM FOR ELECTRODELESS DISCHARGE LAMP

Ron van Os, Sunnyvale, and David Chasen, Palo Alto, both of Calif., assignors to Diablo Research Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 352,267, Dec. 7, 1994, abandoned, which is a continuation of Ser. No. 129,893, Sep. 30, 1993, abandoned. This application Nov. 15, 1995, Ser. No. 559,255
Int. Cl.[6] H05B *41/16*
U.S. Cl. 315—248 **36 Claims**

1. An electrodeless discharge lamp having a radio frequency power source, said lamp comprising:

a sealed lamp vessel containing a gaseous mixture of mercury and a rare gas;



a coil network for inducing a high-frequency electromagnetic field into said mixture so as to induce a plasma in said gaseous mixture;

an impedance matching network between said power source and said coil network, said impedance matching network for providing a preselected power transfer function between said power source and said coil network;

a control amalgam disposed within said plasma; and

a supporting member for supporting said control amalgam and thermally isolating said control amalgam from said vessel;

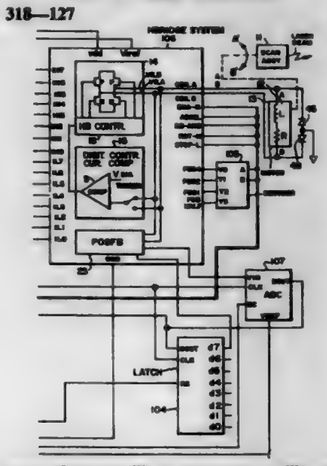
wherein said control amalgam controls the vapor pressure of said mercury during steady-state operation of said lamp.

5,598,070

OPTICAL SCANNER CONTROL SYSTEMS AND CIRCUITS

Edward P. Coleman, Fairport, N.Y., assignor to PSC Inc., Webster, N.Y.

Filed Dec. 9, 1994, Ser. No. 353,411
Int. Cl.[6] H02K *29/08;33/16*
U.S. Cl. 318—127 **11 Claims**



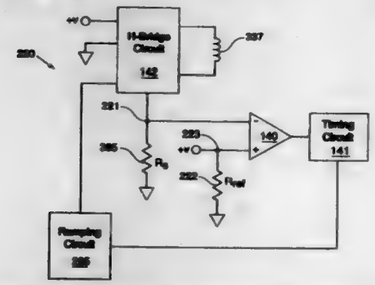
1. A system for controlling a motor to oscillate in opposite senses and which is operative to drive an optical scan beam over a scan angle to scan a certain distance over a field of view, and which motor has a coil, said system comprising means for switching current flow direction in the coil, means for generating a selectable high current threshold and a low current threshold for the magnitude of said current flow, means for comparing said thresholds and the current flow in the coil for operating said switching means for turning the current to the coil off and on when the high and low thresholds are reached respectively to control the current in said coil thereby controlling said motor to scan said beam over said certain distance.

5,598,071

METHOD FOR STARTING AND COMMUTATING A PERMANENT-MAGNET DIRECT CURRENT MOTOR HAVING A SINGLE PHASE WINDING

John C. Dunfield, Santa Cruz; Gunter K. Heine, Aptos, both of Calif.; Marcel Jufer, Morges, Switzerland, and Kamran Oveysi, Aptos, Calif., assignors to Seagate Technology, Scotts Valley, Calif.

Division of Ser. No. 273,535, Jul. 11, 1994. This application Jun. 7, 1995, Ser. No. 483,074
Int. Cl.[6] H02P *1/00*
U.S. Cl. 318—254 **4 Claims**



1. A method for starting and commutating a permanent-magnet, direct current motor having a single phase winding and having a corresponding look up table stored in a motor control circuit, said method comprising the steps of:

injecting a first current pulse having a first polarity in the winding of the standing motor, said first current pulse being long enough to effectuate an accurate measurement, but not so long that the motor moves;

measuring the time required for the injected first current pulse to reach a predetermined magnitude thereby obtaining a first rise time;

injecting a second current pulse having the opposite polarity in the winding of the standing motor, said second current pulse being long enough to effectuate an accurate measurement, but not so long that the motor moves;

measuring the time required for the injected second current pulse to reach said predetermined magnitude thereby obtaining a second rise time;

determining the difference between said first and second rise times;

applying a drive current of the proper polarity to cause rotation of said motor in a preselected direction based upon the sign of the differences of the first and second rise times compared with the values in said look up table stored in said motor control circuit;

using values in said look up table stored in said motor control circuit for locating pole position of the permanent magnet rotor of the motor;

commutating the motor by providing timed drive pulses to the motor, said step of commutating comprising the following steps:

turning off the drive current prior to a back emf crossing;

sensing the back emf voltage when the drive current is turned off;

turning the drive current back on after the back emf crossing; and

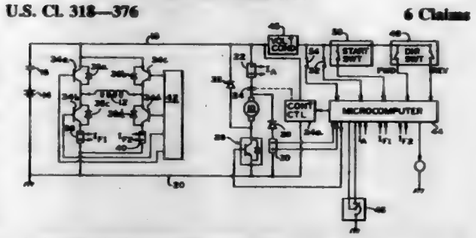
using the sensed back emf voltage to generate timed ramp drive pulses.

5,598,072

REGENERATIVE BRAKING CIRCUIT UTILIZING SEPARATELY EXCITED MOTOR

Joe C. Lambert, Mebane, N.C., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 4, 1995, Ser. No. 416,271
Int. Cl.[6] H02P *3/14*
U.S. Cl. 318—376 **6 Claims**



1. A method of regenerative electrical braking of an electrically propelled vehicle, the vehicle including at least one separately excited direct current (DC) electric traction motor coupled in driving relationship with at least one wheel of the vehicle, the motor having an armature winding coupled via one terminal thereof through a first switching means to a relatively positive terminal of a DC power source and coupled via another terminal thereof through a second switching means to a relatively negative terminal of the DC power source, the motor further including a field winding coupled via an H-bridge switching means to the DC power source, the method comprising the steps of:

sensing a commanded change in an operating mode of the vehicle from a propulsion mode to a non-propulsion mode;

open circuiting the first switch means in response to the step of sensing to disconnect the one motor terminal from the DC power source positive terminal;

operating the H-bridge switching means to reverse the connection of the field winding to the DC power source for reversing field flux developed in the motor whereby the motor armature is effectively connected in a regenerative braking mode for producing electric current in response to continued rotation of the armature caused by rotation of the at least one wheel from continued motion of the vehicle; and

modulating the second switching means to effect a build-up of current in the armature winding by cyclical short-circuiting thereof to enable regenerative braking to substantially zero speed of the vehicle.

5,598,073

DRIVE CIRCUIT FOR A BRUSHLESS DIRECT-CURRENT MOTOR

Helmut Haas, St. Georgen, and Mojtaba Moini, Königsfeld, both of Germany, assignors to Papst Licensing GmbH, Spaichingen, Germany

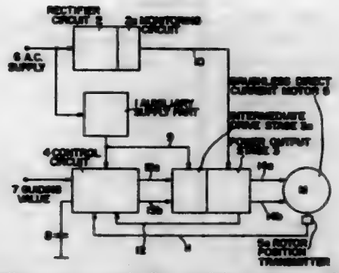
Continuation of Ser. No. 76,720, Jun. 14, 1993, Pat. No. 5,343,129, which is a continuation of Ser. No. 932,737, Aug. 25, 1992, Pat. No. 5,220,258. This application Aug. 18, 1994, Ser. No. 292,693
Claims priority, application Germany, Jun. 18, 1990, 40 19 338.1
Int. Cl.[6] H02P *1/18;6/20*
U.S. Cl. 318—431 **16 Claims**

1. A driver circuit for a brushless DC motor with:

at least one power output stage for motor windings of the motor;

a control circuit for control of the power output stage, with output signals which are directed by a sensor arrangement and are adjustable according to a determination of a reference value or a scheduling value;

a current supply arrangement with a rectifier for the current supply of the power output stage with a drive voltage rectified from an AC voltage supplied from an AC power line;



an auxiliary power supply for supplying current to the control circuit with a DC voltage that is lower than the drive voltage for the power output stage; and

an intermediate driver stage, connected between the power output stage and the control circuit, through which output currents of the power output stage are controllable proportional to the output signals of the control circuit, whereby the intermediate driver stage is likewise supplied with current through the auxiliary power supply, wherein:

the control circuit delivers output pulses each yielding a control pulse for the motor current which comprises, within each commutation phase, a pulse which, in a first range of motor current, has the form of a symmetrical triangular pulse of variable amplitude and, at relatively higher motor currents, has the form of a trapezoidal pulse of variable width, and wherein the control circuit further comprises means for providing the triangular or trapezoidal pulse lying symmetrically within a commutation phase.

6. A driver circuit for a brushless DC motor with:

at least one power output stage for motor windings of the motor;

a control circuit for control of the power output stage, with output signals which are directed by a sensor arrangement and are adjustable according to a determination of a reference value or a scheduling value;

a current supply arrangement with a rectifier for the current supply of the power output stage with a drive voltage rectified from an AC voltage supplied from an AC power line;

an auxiliary power supply for supplying current to the control circuit with a DC voltage that is lower than the drive voltage for the power output stage; and

an intermediate driver stage, connected between the power output stage and the control circuit, through which output currents of the power output stage are controllable proportional to the output signals of the control circuit, whereby the intermediate driver stage is likewise supplied with current through the auxiliary power supply,

additionally comprising a restart circuit which supplies a separate supply voltage to the intermediate driver stage, including means for maintaining the separate supply voltage at about a nominal value in case the motor operates regularly, and means for supplying the separate supply voltage intermittently in case the motor is overloaded or blocked.

5,598,074

VIRTUAL HALL-EFFECT SIGNAL GENERATING FOR A BRUSHLESS SENSORLESS ELECTRICAL ROTARY MACHINE

Hao Huang, Montevideo, Minn., assignor to SL Montevideo Technology, Inc., Montevideo, Minn.

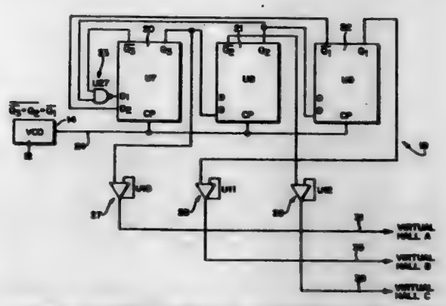
Continuation of Ser. No. 246,899, May 20, 1994, Pat. No. 5,469,033. This application Jul. 13, 1995, Ser. No. 502,292

Int. Cl.[6] H02P 6/18

U.S. Cl. 318—439 **11 Claims**

1. A brushless sensorless electrical rotary machine comprising:

a rotor and a stator and including a plurality of windings driven by a multiphase inverter for selectively energizing said windings in sequence;



a voltage controlled oscillator for controlling the frequency of the multiphase inverter, and having an output and an input; and

a solid state virtual Hall signal generator circuit operatively connected to voltage controlled oscillator output to provide output signals substantially the same as those of Hall-effect sensors, and including square forms that are separated 120° in time domain and are low voltage for 180° and high voltage for another 180°.

5,598,075

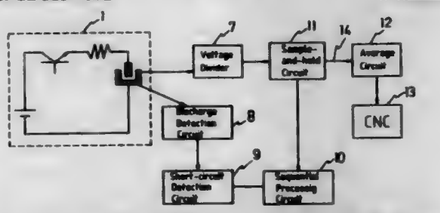
SERVO CONTROL METHOD AND APPARATUS FOR DISCHARGING MACHINE

Jui-Fang Liang, Jang Hwa, and Hsing-Jung Chuang, Taipei, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Sep. 13, 1995, Ser. No. 527,819

Int. Cl.[6] B23P 1/08

U.S. Cl. 318—571 **3 Claims**



1. A servo control method for use on an electrical discharging machine having a discharging electrode for discharging electric arc on a working piece, said method comprising the following steps of:

(1) detecting whether discharging condition is normal or arc, a short-circuit condition being judged when the count of arc discharging continuously exceeds a preset number of N;

(2) detecting whether discharging process is in on-time period for a normal and an arc discharging or in off-time period for a short-circuit discharging;

(3) if in on-time period, obtaining the value of average voltage in accordance with the following equation:

$$V_{g1}=(V_i*T_i+V_d*T_{on})/(T_i+T_{on})$$

wherein

V_{g1} represents average voltage,

V_i represents ignition voltage,

V_d represents discharging voltage,

T_i represents ignition delay, and

T_{on} represents length of the duration the discharging is on;

(4) if not in off-time period, obtaining the value of average voltage V_{g1} by using sample-and-hold method;

(5) using numeral control (CNC) method based on the obtained value of average voltage to control the discharging machine feedrate;

(6) if short-circuit condition is being judged, interrupting the discharging process for an off-time period and obtaining the value of average voltage in accordance with the following equation:

$$V_{g2}=(V_i*T_i+V_d*T_{on})/(T_i+T_{on}+T_{off})$$

wherein

V_{g2} represents average voltage,

V_i represents ignition voltage,

V_d represents discharging voltage,

T_i represents ignition delay,

T_{on} represents length of the duration the discharging is on, and

T_{off} represents length of the duration the discharging is off;

and based on the obtained valve of average voltage V_{g2} by using sample-and-hold method to retreat the discharging machine quickly.

5,598,076

PROCESS FOR OPTIMIZING CONTROL PARAMETERS FOR A SYSTEM HAVING AN ACTUAL BEHAVIOR DEPENDING ON THE CONTROL PARAMETERS

Werner Neubauer; Siegfried Beclonek; Marcus Möller, all of München, and Martin Joppich, Unterhaching, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

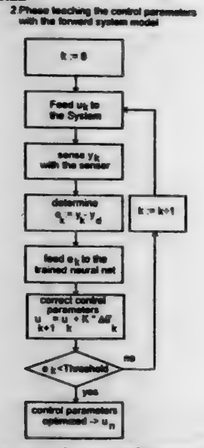
PCT No. PCT/DE92/01017, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/12475, PCT Pub. Date Jun. 24, 1994

PCT Filed Dec. 4, 1992, Ser. No. 244,756

Claims priority, application Germany, Dec. 9, 1991, 41 40 550.1

Int. Cl.[6] G05B 19/408

U.S. Cl. 348—568.22 **10 Claims**



1. A process for generating control parameters for a reference behavior of a system having an actual behavior depending on control parameters, comprising the steps of:

a) teaching a trainable component said actual behavior of said system,

b) determining a difference between said reference behavior and said actual behavior of said system, which is a reference deviation, as a function of said control parameters;

c) supplying said difference to at least one trainable component to which said actual behavior of said system has been taught,

d) providing from said at least one trainable component a correction value for said control parameters corresponding to said reference deviation,

e) determining new control parameters with aid of said correction value in such a way that said control parameters bring about an improvement of said actual behavior with respect to said reference behavior of said system, and

f) performing at least the steps b) through e) until a difference between said reference behavior and said actual behavior of said system falls below a predetermined value.

5,598,077

CONTROL APPARATUS AND A CONTROL METHOD FOR A SERVOMOTOR

Shunsuke Matsubara; Yasusuke Iwashita, and Tadashi Okita, all of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

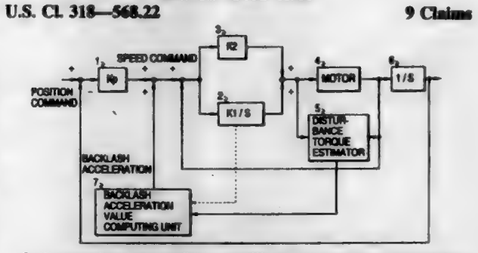
PCT No. PCT/JP94/01326, § 371 Date Apr. 18, 1995, § 102(e) Date Apr. 18, 1995, PCT Pub. No. WO95/05703, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 10, 1994, Ser. No. 416,898

Claims priority, application Japan, Aug. 19, 1993, 5-225027; Dec. 16, 1993, 5-342810

Int. Cl.[6] G05B 11/01

U.S. Cl. 318—568.22 **9 Claims**



1. A control apparatus for controlling a servomotor, comprising:

disturbance torque estimating means for estimating the magnitude of a disturbance torque to which the servomotor is subjected;

integrator target value setting means for setting, as a target value for a speed control loop integrator, the sum of the value in the speed control loop integrator at the time of reversal of servomotor rotation and a value obtained by doubling a value which is obtained by inverting the sign of the disturbance torque just before the reversal of motor rotation, which is estimated by said disturbance torque estimating means;

speed command offset applying means for applying an offset to a speed command after the reversal of motor rotation so that the speed control loop integrator can quickly shift to the target value set by said integrator target value setting means; and

means for sending the target value to the servomotor.

5,598,078

DEVICE FOR DETECTING STEP-OUT OF A STEPPING MOTOR

Naoyuki Maeda, Inuyama, Japan, assignor to TRW Steering Systems Japan Co., Ltd., Aichi-ken, Japan

Filed Aug. 3, 1994, Ser. No. 285,179

Claims priority, application Japan, Aug. 4, 1993, 5-193584

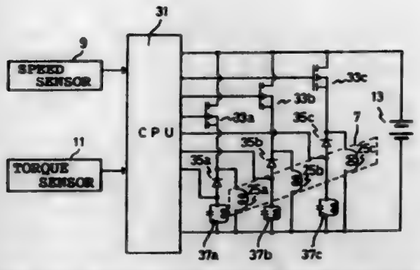
Int. Cl.[6] H02K 29/04

U.S. Cl. 318—696 **12 Claims**

1. A device for detecting step-out of a stepping motor having a stator coil comprising:

detecting means for detecting at least one of current and voltage of a recovery circuit, said recovery circuit being connected in parallel with the stator coil, said recovery circuit exhibiting signals indicative of switching transient of said stator coil, said signal indicative of switching transient being indicative of a step-out condition; and

determining means for comparing said at least one of detected current and voltage signals indicative of said switching transient to a corresponding one of a reference current and voltage;



said recovery circuit comprising an LC parallel resonance circuit.

5,598,079

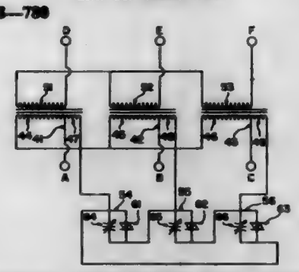
A.C. INDUCTION DEVICES HAVING TUNED COMPOUND WINDINGS

Gary D. Robert, Riverton, Utah, assignor to Remtech, L.C., Sandy, Utah

Continuation-in-part of Ser. No. 871,866, Apr. 20, 1992, abandoned. This application Sep. 24, 1993, Ser. No. 125,815

Int. Cl.[6] H02P *1/26*

U.S. Cl. 318—780 **11 Claims**



1. An alternating current induction device wherein energy is transferred inductively between windings, which includes: a combined pair of windings which are positioned to have a critical coefficient of inductive coupling between them and which are conductively and inductively dependent, said pair including a dominant winding connected to a power supply terminal and a reflux winding electrically and inductively connected to the dominant winding such that voltages produced in the dominant and reflux windings are combined algebraically, a third winding in tight-to-critical coupled transformer relation with the combined pair, and means responsive to the algebraic sum of the voltages produced in the combined pair of windings, said means being connected to the reflux winding for reducing to a minimum the net reactive factor of the coupled dominant and third windings and the net reflected impedance of the dominant winding, thereby facilitating maximum energy transfer between the dominant and third windings.

5,598,080

STARTING DEVICE FOR A SINGLE-PHASE INDUCTION MOTOR

Niels D. Jensen, Bjerringbro, and Jørgen Dauglbjerg, Ulstrup, both of Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Feb. 12, 1993, Ser. No. 17,211

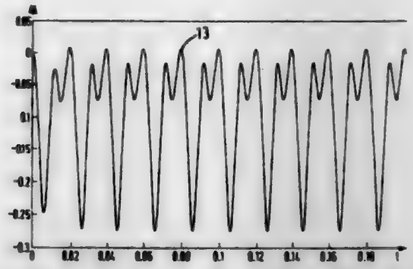
Claims priority, application Germany, Feb. 14, 1992, 42 04 323.9; May 9, 1992, 42 15 263.1

Int. Cl.[6] H02P *5/34*

U.S. Cl. 318—794 **4 Claims**

1. A single phase induction motor comprising:

a motor coil;



a first auxiliary coil connected in parallel with the motor coil;

a capacitor connected in series with the first auxiliary coil; and

a starting device comprising a rectifier element, a resistance element, a second auxiliary coil inductively coupled to the first auxiliary coil, and a switch means for deactivating the rectifier element, wherein the rectifier element, the second auxiliary coil, the resistance element and the switch means are connected in series with each other and in parallel with the first auxiliary coil and the capacitor, and wherein the starting device acts in cooperation with the first auxiliary coil for providing a nonzero average flux within the motor coil during a start-up phase of the motor.

5,598,081

VECTOR CONTROL METHOD FOR CONTROLLING A ROTOR SPEED OF AN INDUCTION MOTOR

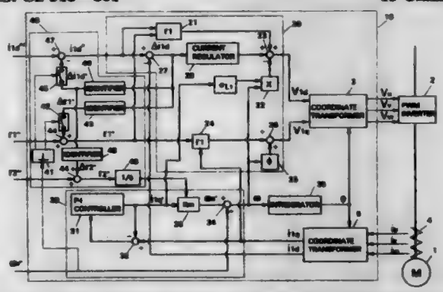
Yukihiko Okumura, Hirakata; Hiroshi Yusa, Shijonawate, and Tadayoshi Mukai, Izumisano, all of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Sep. 27, 1994, Ser. No. 310,762

Claims priority, application Japan, Sep. 27, 1993, 5-239945; May 31, 1994, 6-119204; Jun. 1, 1994, 6-119953

Int. Cl.[6] H02P *5/34*

U.S. Cl. 318—801 **15 Claims**



1. A vector control method for controlling a rotor speed of an induction motor by use of an inverter which provides an AC current of varying frequency to said induction motor, and a vector controller which provides control voltage Vu, Vv, Vw, in response to an excitation current command i_{1d}* indicative of an excitation current being fed to said induction motor, a desired rotation speed command ω_r*, and a primary frequency ω, for controlling said inverter to vary said rotor speed, said method comprising the steps of:

detecting a primary current being fed to said induction motor;

analyzing said detected primary current to derive therefrom an excitation current i_{1d} and a detected torque current i_{1q};

multiplying a torque value represented by said detected torque current i_{1q} by a predetermined motor constant K_m to obtain a slip frequency ω_s; and

adding thus obtained slip frequency ω_s to said rotation speed command ω_r* to determine said primary frequency ω ($\omega=\omega_r$*$+\omega_s$);

calculating a deviation between said delay torque current i_{1q}' and said detected torque current i_{1q} and supplying said deviation to a proportional plus integral controller, said proportional plus integral controller producing as an output an updated delayed torque current i_{1q}' as said torque value for determining said primary frequency ω.

5,598,082

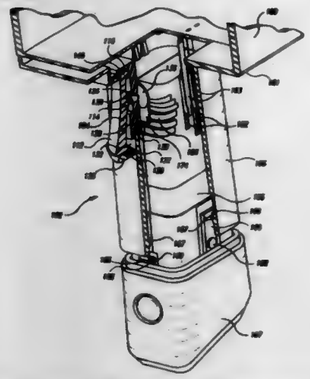
REPLACEABLE TRIGGER SWITCH FOR BATTERY OPERATED DEVICE

David Gilpin, Everett; George Wright, Duvall, and Jon M. Bishay, Mukilteo, all of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Nov. 10, 1993, Ser. No. 150,484

Int. Cl.[6] H01M *10/42*

U.S. Cl. 320—2 **12 Claims**



1. A handle assembly for a portable, battery-powered bar code reader device having a first lifetime, comprising:

a handle attached to the battery-powered device and having an interior handle chamber;

a trigger pivotally retained by the handle for pivotal movement between a rest position and an actuation position, the trigger having a pivotal portion and an actuator portion extending toward the handle chamber and a user engageable portion positioned for engagement by a user to allow the user to selectively move the trigger from the rest position to the actuation position;

at least one rechargeable battery having a second lifetime;

a battery case containing the rechargeable battery therein, the battery case being releasably retained within the handle chamber;

a single trigger switch carried by the battery case and electrically connected to the rechargeable battery, the trigger switch having a third lifetime and being positioned to be actuated by the actuator portion of the trigger upon movement thereof to the actuation position, the trigger switch requiring a first actuating force to actuate the trigger switch from the rest position to an intermediate position, and requiring a second actuating force to actuate the trigger switch from the intermediate position to the actuation position, the first actuating force being greater than the second actuating force to provide a tactile indication to a user that the trigger switch is actuated, wherein the third lifetime of the trigger switch is less than the first lifetime of the portable device, but the third lifetime is greater than the second lifetime of the rechargeable battery, and wherein the trigger switch is replaceable with replacement of the rechargeable battery; and

a biasing and sealing member of a resilient material positioned between the actuator portion of the trigger and the trigger switch and being adapted to transmit an actuation force on the trigger switch in response to movement of the trigger to the actuation position, and positioned between the pivotal portion of the trigger and the battery-powered device to provide a biasing force on the trigger to bias the trigger toward the rest position.

5,598,083

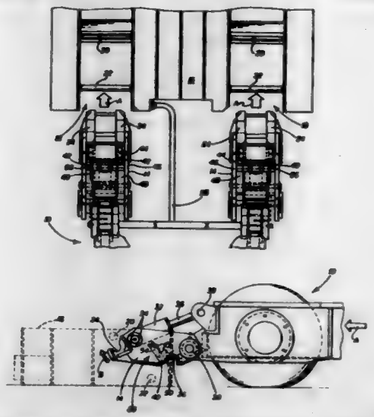
BATTERY CHANGING SYSTEM FOR ELECTRICALLY POWERED VEHICLE

Paul M. Gaskins, Bristol, Tenn., assignor to Stanley Corporation, Millersburg, Ky.

Filed May 19, 1995, Ser. No. 444,946

Int. Cl.[6] H02J *7/00*; B62D *25/00*

U.S. Cl. 320—2 **12 Claims**



1. A battery changing system for an electrically powered vehicle, comprising:

a housing for a battery including first and second spaced engagement points;

a battery manipulating arm mounted to the vehicle for raising and lowering said battery, said battery manipulating arm including means for engaging said first and second engagement points on said battery housing, a recess for receiving said first engagement point and a saddle for receiving said second engagement point, said recess and said saddle having entryways opening in substantially opposite directions; and

means mounted to one of said battery manipulating arm and said battery housing for locking together said engaging means on said battery manipulating arm and said second, spaced engagement point on said battery housing.

5,598,084

CHARGING BATTERIES OF ELECTRIC VEHICLES

Arlie L. Keith, Rte. 2, Box 93b, Laurel Springs, N.C. 28644

Division of Ser. No. 49,053, Apr. 19, 1993, Pat. No. 5,462,439. This application Jun. 7, 1995, Ser. No. 473,849

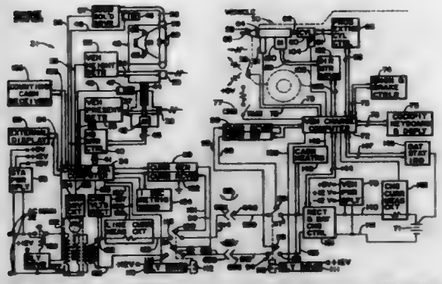
Int. Cl.[6] H01M *10/44*

U.S. Cl. 320—2 **71 Claims**

1. A system for charging the batteries of electric vehicles, comprising:

a charge station to which a vehicle may be presented to receive an electric charge, said charge station including a station computer and a source of charging voltage;

a vehicle charging system including a vehicle computer and charge control circuits disposed on an electric vehicle that has a battery for supplying motive energy to the vehicle, said vehicle computer including manifestations identifying battery parameters including at least the nominal charging voltage thereof;



apparatus for establishing a connection between said charge station and said charging system employing a medium suitable for transferring electric power therebetween; and

selection means connecting both of said computers to said connection medium for transfer of signals therebetween, said vehicle computer sending signals to said station computer indicative of said battery manifestations, and said computers thereafter exchanging ready signals indicating that each is ready to commence battery charging, said computers responding to said ready signals to cause said selection means to disconnect said computers from said connection apparatus and to connect said source of charging voltage and said charge control circuits to said connection medium.

5,598,085

CIRCUIT ARRANGEMENT FOR CHARGING RECHARGEABLE BATTERIES

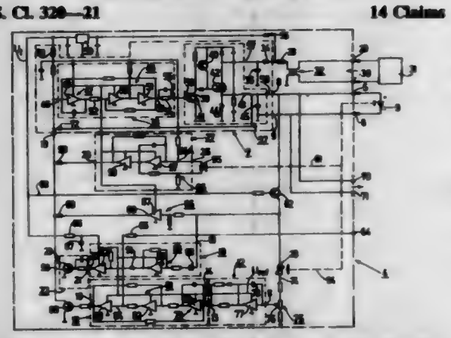
Rudolf Hauler, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1994, Ser. No. 275,854

Claims priority, application Austria, Jul. 14, 1993, A1394/93

Int. Cl.[6] H01M *10/46*; H02J *7/04*

U.S. Cl. 320—21 **14 Claims**



1. A circuit arrangement for charging rechargeable batteries, comprising: a first terminal and a second terminal to which at least one battery is connectable in order to be charged, a charging current source connected to both terminals and adapted to supply thereto charging current pulse trains, said current source having a control input to which a pulse-shaped control signal can be applied to enable and to inhibit the supply of a charging current pulse train, and wherein the current source, in accordance with the pulse-shaped control signal applied to its control input, supplies to the at least one battery the charging current pulse train of charging current pulses which occur during successive charging periods which are spaced from one another by charging pauses, wherein

the first terminal of the circuit arrangement is coupled to an input of a first detection device which receives a voltage which is proportional to a sum voltage at the first terminal and comprising the battery no-load voltage and a pulse-shaped charging voltage which is superposed on said battery no-load voltage and which is proportional to the charging current pulses via the internal resistance of the battery, and to derive an actual voltage proportional to an average sum voltage, which comprises the battery no-load voltage and the average-value voltage superposed on said battery no-load voltage and resulting from the pulse-shaped charging voltage, wherein the first detection device detects the actual voltage dependent upon a variable reference voltage available in the first detection device, and generates at its output a detection signal which corresponds to the detection result and depends on the actual voltage and on the reference voltage,

means coupling the output of the first detection device to an input of a control pulse generator for generating the pulse-shaped control signal, the detection signal enabling said control pulse generator to control the duty cycle of the pulse-shaped control signal generated by said control pulse generator at an output thereof,

second means coupling the output of the control pulse generator to the control input of the charging current source to enable or inhibit the supply of a charging current pulse train, and

for an increasing actual voltage or a decreasing reference voltage in the first detection device the control pulse generator, dependent on the detection signal applied to its input, varies the duty cycle the pulse-shaped control signal which it can generate such that the charging current source reduces the ratio between the charging period and the charging pause in the charging current pulse train, and

means for varying the reference voltage available in the first detection device in the same sense as the duty cycle of the pulse-shaped control signal at the output of the control pulse generator dependent on said duty cycle.

5,598,086

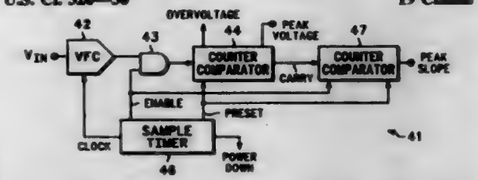
PEAK VOLTAGE AND PEAK SLOPE DETECTOR FOR A BATTERY CHARGER CIRCUIT

Thomas A. Somerville, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 3, 1995, Ser. No. 510,999

Int. Cl.[6] H02J *7/04*

U.S. Cl. 320—30 **19 Claims**



1. A peak voltage and peak slope detector circuit for a battery charger circuit comprising:

a Voltage to Frequency Converter (VFC) responsive to a battery voltage for providing a VFC signal;

a first counter comparator responsive to said VFC for generating a pulse count of said VFC signal during a predetermined time period wherein said pulse count corresponds to a voltage magnitude of said battery voltage and wherein said pulse count is compared against a previous pulse count to determine when a peak voltage occurs; and

a timer circuit for gating said VFC signal to said first counter comparator for said predetermined time period.

5,598,087

SYSTEM FOR MONITORING RESIDUAL CAPACITY OF BATTERY

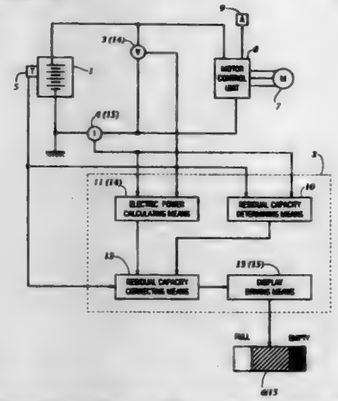
Kazuhiro Hara, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1994, Ser. No. 255,786

Claims priority, application Japan, Jan. 8, 1993, 5-137734

Int. Cl.[6] H02J *7/00*; G01N *27/416*

U.S. Cl. 320—48 **14 Claims**



14. A battery monitor system for monitoring the residual capacity of a battery, comprising:

residual capacity determining means for determining the residual capacity of the battery at the time the battery starts being discharged;

detecting means for repeatedly detecting the voltage and current of the battery during discharge;

discharging current integrating means for integrating the detected discharging current from the time the battery starts being discharged;

electric power calculating means for calculating the output electric power of the battery based on the detected voltage and the detected current when the battery is being discharged;

residual capacity correcting means for correcting the residual capacity determined by said residual capacity determining means based on the calculated output electric power; and

display means for indicating spent energy, the residual capacity and a residual capacity corrective value determined by said correcting means.

5,598,088

METHOD FOR DETERMINING THE CHARGE STATE OF A BATTERY, IN PARTICULAR A VEHICLE STARTER BATTERY

Geroff Richter, Hildesheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/01349, § 371 Date Jun. 23, 1995, § 102(e) Date Jun. 23, 1995, PCT Pub. No. WO95/14239, PCT Pub. Date May 26, 1995

PCT Filed Nov. 17, 1994, Ser. No. 491,884

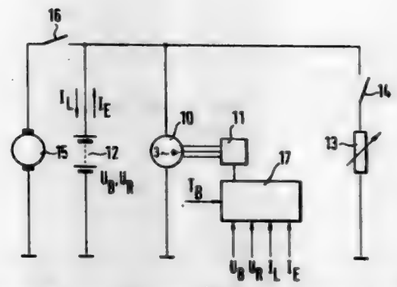
Claims priority, application Germany, Nov. 19, 1993, 43 39 568.6

Int. Cl.[6] H01M *10/44*; G01R *31/36*; G01N *27/416*

U.S. Cl. 320—48 **6 Claims**

1. A method of determining a charge state of a vehicle starter battery charged by a generator, said method comprising the steps of:

a) measuring a battery current from the starter battery and an open-circuit voltage of the starter battery in conjunction with detecting specific operating states;



b) feeding measured values of the battery current and the open-circuit voltage to computing means for drawing a conclusion regarding the charge state of the starter battery from measured variables including the battery current and the open-circuit voltage;

c) measuring a battery temperature;

d) combining the measured variables by correction functions formed at least according to the battery temperature measured in step c);

e) measuring a discharging current of the starter battery during a first time period and measuring a charging current of the stater battery during a second time period, the discharging current being a current for which a final voltage is reached after the first time period; and

f) determining a third time period characterizing a residual time still available from a mutual relationship established between the discharging current in the first time period and the charging current in the second time period determined.

5,598,089

SECONDARY BATTERY CHARGING APPARATUS

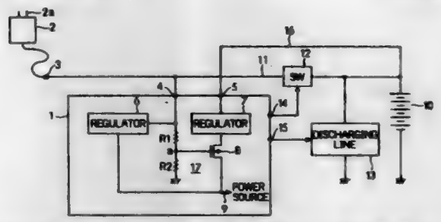
Yuichi Shintomi, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Apr. 27, 1995, Ser. No. 429,474

Claims priority, application Japan, Apr. 28, 1994, 6-090962

Int. Cl.[6] H02J *7/00*

U.S. Cl. 320—56 **5 Claims**



2. A controller which controls charging and discharging of a secondary battery, said controller comprising:

a terminal for outputting a control signal for controlling a charging line and a discharging line of the secondary battery;

a first input terminal for inputting a voltage from the charging line;

a second input terminal for inputting a voltage from the secondary battery; and

a changeover circuit which selects a voltage applied to the first input terminal when the voltage is applied to the first input terminal and selects a voltage at the second input terminal when no voltage is present at the first input terminal,

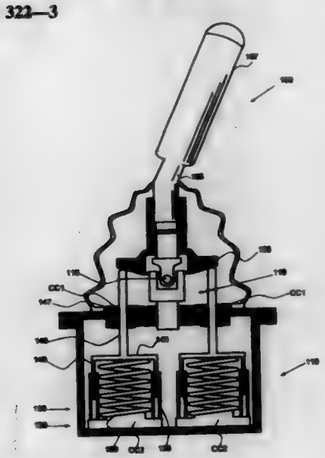
wherein said controller operates by using an output of the changeover circuit as a power source.

5,598,090

INDUCTIVE JOYSTICK APPARATUS

Thomas M. Baker, Peoria, Ill.; George Codina, North Hollywood, Calif., and Larry H. Franzen, Dunlap, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 31, 1995, Ser. No. 507,134
Int. Cl.[6] H02K 35/00
U.S. Cl. 322—3 7 Claims



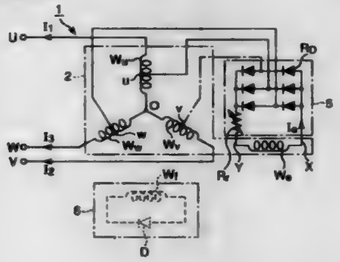
1. A joystick, comprising;
a control shaft;
a base;
means for universally, pivotally mounting the control shaft to the base;
a plurality of centering springs for biasing the control shaft to a neutral position, the centering springs extending and contracting in response to pivotal movement of the control shaft; and
an oscillator circuit being coupled to the centering springs for producing an output signal having a frequency responsive to the inductance of the centering springs.

5,598,091

THREE-PHASE BRUSHLESS SELF-EXCITED SYNCHRONOUS GENERATOR WITH NO ROTOR EXCITING WINDINGS

Satoru Satake, Tokyo; Yukio Hosaka, Hiroshima; Yukio Onogi, Hiroshima, and Kenji Inoue, Hiroshima, all of Japan, assignors to Satake Corporation, Tokyo, Japan

Filed Aug. 10, 1995, Ser. No. 513,526
Claims priority, application Japan, Aug. 11, 1994, 6-212044
Int. Cl.[6] H02P 9/10
U.S. Cl. 322—62 7 Claims



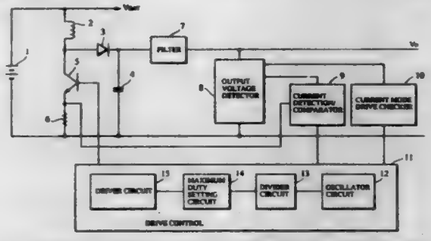
1. A three-phase brushless self-excited synchronous generator comprising:
a stator having a stator core, primary generating windings and excitation windings having the number of poles odd-number times the number of poles of said primary generating windings, said primary generating windings and said excitation windings being wound on said stator core;
a rotor having a rotor core and a plurality of field windings wound on said rotor core, having the same number of poles as that of said primary generating windings, said plurality of field windings being arranged at positions where they are magnetically coupled with both static magnetic fields produced by said excitation windings and odd-order spatial higher harmonic components of armature reaction magnetic fields produced by said primary generating windings;
a control rectifier means connected between said primary generating winding and said excitation windings, for full-wave rectifying electromotive forces induced in said primary generating windings so that direct currents flow in said excitation windings; and
a plurality of semiconductor rectifier elements respectively connected in series in said plurality of field windings, for half-wave rectifying electromotive forces respectively induced in said plurality of field windings so that DC currents flow in said plurality of field windings.

5,598,092

DC-DC CONVERTER

Masanori Ohtsuka, Yokohama, and Kazunari Kitani, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1994, Ser. No. 255,984
Claims priority, application Japan, Jun. 10, 1993, 5-138573
Int. Cl.[6] G05F 1/656
U.S. Cl. 323—222 6 Claims



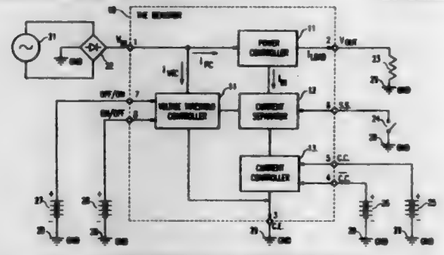
1. A DC-DC converter having switching means for switching a current flowing through a coil which flows in accordance with a standard clock signal provided from outside, and in which an output voltage is controlled by controlling a current flow through said coil by said switching means, said DC-DC converter comprising:
a maximum duty setting circuit which limits the maximum on time during one cycle of switching operation of said switching means;
a detection circuit for detecting said output voltage;
a current control circuit for limiting the current flowing through said coil in accordance with said output voltage; and
a control circuit for controlling the duty of the switching operation of said switching means in accordance with the current flowing limited by said current control circuit when said detected output is larger than a predetermined value, and for performing a switching operation of the switching means in the maximum on time controlled by said maximum duty setting circuit when the output detected by said detection circuit is as much as, or smaller than the predetermined value.

5,598,093

LOW DISSIPATION CONTROLLABLE ELECTRON VALVE FOR CONTROLLING ENERGY DELIVERED TO A LOAD AND METHOD THEREFOR

Benjamin Acatrinei, 5184 68th St., San Diego, Calif. 92115-1746

Filed Jul. 26, 1995, Ser. No. 507,784
Int. Cl.[6] G05F 5/00
U.S. Cl. 323—299 20 Claims



THE BLOCK SCHEMATIC DIAGRAM FOR THE CLASSIC RENISTOR

1. A controllable electron valve for controlling an energy delivered to a load circuit in response to an input power source, comprising:
a power controller for controlling a voltage across said load circuit, an input current being introduced to said power controller via an input voltage (V_{IN}) electrode, said input current being generated by said input power source, said input current including a load current and an internal current (I_{IN}), said load current being output by said power controller to said load circuit, the internal current (I_{IN}) being output via a switching output;
a current controller for maintaining the internal current (I_{IN}) at a constant value, said current controller having an output coupled to a ground, having an input, and having at least one current control electrode;
a voltage threshold controller for outputting a threshold current, said voltage threshold controller having at least one input and at least one output; and
a current separator for controlling the passage of the internal current (I_{IN}) and said threshold current to said constant current source, a first input of said current separator being coupled to said switching output of said power controller, a second input of said current separator being coupled to said output of said voltage threshold controller, an output of said current separator being coupled to said input of said current controller.

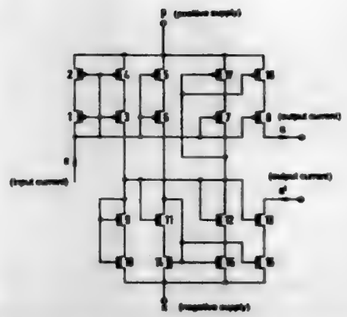
5,598,094

CURRENT MIRROR

Oliver Kiehl, München, and Rudolf Koch, Oberhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 6, 1994, Ser. No. 301,867
Claims priority, application Germany, Sep. 3, 1993, 43 29 866.4
Int. Cl.[6] G05F 3/20
U.S. Cl. 323—315 6 Claims

1. A current mirror, comprising:
first through eighteenth transistors having control terminals and load paths;
the load paths of said first and second transistors being connected in series for carrying an input current to a first supply potential;
the control terminals of said first, second, third, fourth, fifth, sixth, seventh and eighth transistors receiving the input current;
the load paths of said fourth, third, ninth and tenth transistors being connected in series between the first supply potential and a second supply potential;



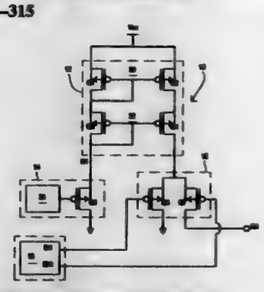
said third and ninth transistors having a tap therebetween being connected to the control terminals of said ninth, tenth, eleventh, twelfth and thirteenth transistors;
the load paths of said fifth, sixth, eleventh and fourteenth transistors being connected in series between the first and second supply potentials;
said sixth and eleventh transistors having a tap therebetween being connected to the control terminals of said fourteenth, fifteenth and sixteenth transistors;
the load paths of said seventeenth, seventh, twelfth and fifteenth transistors being connected in series between the first and second supply potentials;
said seventh and twelfth transistors having a tap therebetween being connected to the control terminals of said seventeenth and eighteenth transistors;
the load paths of said eighteenth and eighth transistors being connected in series for tapping a first output current being proportional to the input current from the first supply potential;
the load paths of said sixteenth and thirteenth transistors being connected in series for tapping a second output current of equal magnitude to the first output current from the second supply potential; and
said ninth through sixteenth transistors being of one conduction type and said seventeenth, eighteenth and first through eighth transistors being of the other conduction type.

5,598,095

SWITCHABLE CURRENT SOURCE FOR DIGITAL-TO-ANALOG CONVERTER (DAC)

William N. Schnaitter, San Ramon, Calif., assignor to Alliance Semiconductor Corporation, San Jose, Calif.

Filed Mar. 8, 1995, Ser. No. 401,022
Int. Cl.[6] G05F 3/16
U.S. Cl. 323—315 20 Claims



1. A switchable current source comprising:
a current source having a reference input and a current output;
reference current means coupled to the reference input for supplying a reference current to said current source;

signal generating means for generating an enable signal; and

current switch means coupled to the current output for switching the current output path between an output node and a ground node, said current switch means responsive to the enable signal such that a first current path is provided between the current output and the output node prior to disabling a second current path between the current output and the ground node.

5,598,096

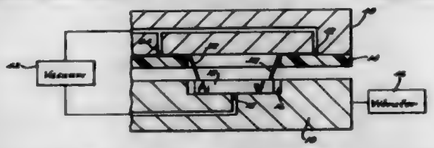
METHOD AND APPARATUS FOR TESTING AN INTEGRATED CIRCUIT USING CONTROLLED WIREBONDING AND WIREBONDING REMOVAL

Cuong V. Pham, Northville; Brian J. Hayden, Royal Oak; Bethany J. Wallus, Birmingham, and Peter R. Chirlian, Dearborn, all of Mich.; assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 2, 1994, Ser. No. 348,432

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—158.1 **16 Claims**



1. An apparatus for testing an integrated circuit having a plurality of bond pads comprising:

a bond substrate having a location for an integrated circuit, said location having a plurality of traces around said location;

a first fixture holding said bond substrate in a fixed relation to first fixture and holding said integrated circuit in a fixed relation to said first fixture and said bond substrate;

wirebonding means for forming wirebonds between said traces to said bond pads;

testing means for providing electrical signals from said traces to said bond pads for verifying said integrated circuit;

a second fixture for lifting said bond substrate while said integrated circuit remains held to said first fixture; and

vibration means for vibrating one of said first fixture or said second fixture so that said wirebonds are broken at a predetermined location near said bond pad.

5,598,097

DIELECTRIC RESONATOR-BASED ELECTRON PARAMAGNETIC RESONANCE PROBE

Charles P. Scholes, Delmar, and Andrzej Sienkiewicz, Albany, both of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

Filed Jul. 22, 1994, Ser. No. 278,936

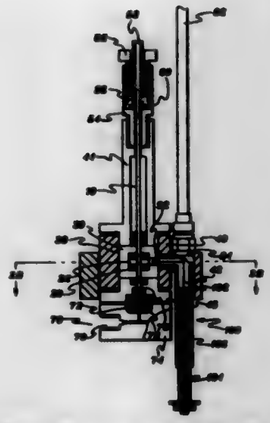
Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—316 **28 Claims**

1. An electron paramagnetic resonance probe comprising:

at least one dielectric resonator having a hole exteading axially therethrough;

a microwave shield surrounding said resonator, said microwave shield having a hole extending axially therethrough and comprising a low loss dielectric polymeric material having a metallic coating wherein the hole within said microwave shield is aligned with the hole of said at least one dielectric resonator; and



a coupler wherein microwaves generated from a distant source are coupled to said resonator.

5,598,098

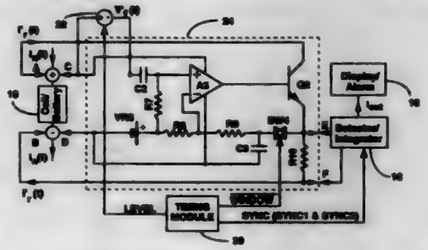
ELECTRONIC BATTERY TESTER WITH VERY HIGH NOISE IMMUNITY

Keith S. Champlin, 5437 Elliot Ave. South, Minneapolis, Minn. 55417

Filed Aug. 11, 1994, Ser. No. 289,382

Int. Cl.[6] G01R *31/36*; G01N *27/04*;*27/416*

U.S. Cl. 324—430 **12 Claims**



1. An electronic circuit with an output signal containing a component proportional to an element of conductance of an electrochemical cell or battery comprising:

high-gain amplifier means including power amplifying output means providing said output signal;

internal feedback means, including logic-controlled switch means and holding capacitor means, said internal feedback means coupling said output signal to the input of said high-gain amplifier means and said holding capacitor means instantaneously following said output signal when said logic-controlled switch means is in a first state, said internal feedback means not coupling said output signal to said input of said high-gain amplifier means and said holding capacitor means storing a fixed voltage when said logic-controlled switch means is in a second state;

external feedback means, including feedback resistor means, coupling said output signal to said electrochemical cell or battery;

voltage sourcing means providing logic-selectable discrete voltage levels;

capacitive coupling means coupling the series combination of said electrochemical cell or battery and said voltage sourcing means to said input of said high-gain amplifier means; and,

timing means coupled to said logic-controlled switch means and to said voltage sourcing means, said timing means directing

said voltage sourcing means to periodically step-change between said discrete voltage levels, and also directing said logic-controlled switch means to assume said second state immediately before said step-change and to assume said first state at a given time after said step-change.

5,598,099

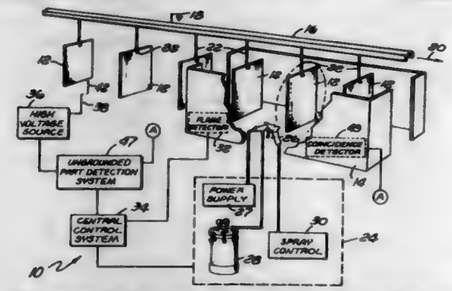
SYSTEM AND METHOD FOR COINCIDENCE DETECTION OF UNGROUNDED PARTS WITH DETECTORS LOCATED WITHIN AND OUTSIDE A PRODUCTION COATING AREA

David A. Castleman, Claremont, Calif.; Don R. Scarbrough, Elyria, Ohio, and Robert C. Lindrud, Santa Fe, N.M., assignors to Fire Sentry Systems, Inc., Cleveland, and Nordson Corp., Amherst, both of Ohio

Filed Jun. 22, 1995, Ser. No. 493,674

Int. Cl.[6] H05B *3/00*

U.S. Cl. 324—456 **8 Claims**



1. A system for detecting and controlling ungrounded or inadequately grounded parts prior to subjecting said parts to an electrostatic coating process in an electrostatic coating area, comprising:

a source for imparting an electrical charge to said parts under test;

a radio-frequency detection system located outside the electrostatic coating area for sensing energy levels radiated by sparking and/or corona discharge resulting from an ungrounded or inadequately grounded part under test; and

a coincidence detector located within the electrostatic coating area for sensing and discriminating energy levels radiated by spurious sparking and/or corona discharge resulting from an external source other than said ungrounded or inadequately grounded part under test.

5,598,100

DEVICE FOR AND METHOD OF EVALUATING SEMICONDUCTOR INTEGRATED CIRCUIT

Toshinori Maeda, Osaka, and Yukiharu Uraoka, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 986,031, Dec. 4, 1992, Pat. No. 5,504,431. This application Nov. 1, 1995, Ser. No. 551,413

Claims priority, application Japan, Dec. 9, 1991, 3-324386; Nov. 4, 1992, 4-294926

Int. Cl.[6] G01R *31/26*

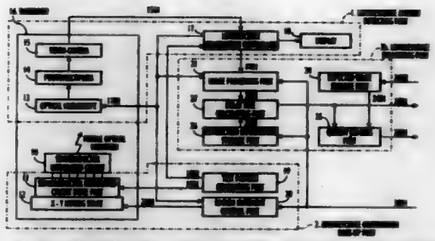
U.S. Cl. 324—501 **7 Claims**

5. A device for evaluating a property of a semiconductor integrated circuit in which a transistor is arranged,

luminescence amount variation detecting means for detecting a time variation of a luminescence amount of a weak optical radiation which the transistor in the semiconductor integrated circuit emits owing to a not carrier effect;

connection information memory means memorizing information on connection state of the transistor; and

evaluation means which obtains a time variation of the luminescence amount detecting means, and evaluates a delay time of



the transistor based on the information on connection state of the transistor which is memorized in the connection information memory means.

5,598,101

CIRCUIT ARRANGEMENT HAVING A WEAR INDICATOR TO INDICATE END OF SERVICE LIFE

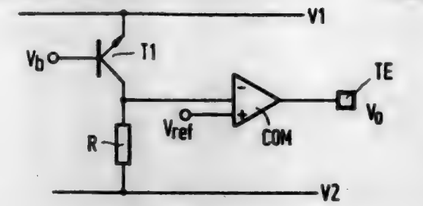
Wilhelmus P. M. Den Dekker, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 308,469, Sep. 19, 1994, abandoned, which is a continuation of Ser. No. 991,664, Dec. 16, 1992, abandoned. This application Apr. 12, 1995, Ser. No. 422,014

Claims priority, application European Pat. Off., Dec. 18, 1991, 91203342

Int. Cl.[6] G01E *31/02*

U.S. Cl. 324—537 **6 Claims**



1. A circuit arrangement, comprising a circuit having a first component and means for indicating a circuit condition governing circuit end of service life, characterized in that the means comprises a wear indicator circuit comprising a second component, an electrical functional parameter of said second component being proportioned so that during normal operation of the circuit the second component of the wear indicator circuit will become defective before the first component of the circuit becomes defective, the first and second components performing the same electrical function during normal operation of the circuit, the means comprising a detector for signalling a defective condition of the wear indicator to indicate the circuit is near the end of its service life, and the circuit and the wear indication being integrated on a semiconductor substrate.

5,598,102

METHOD FOR DETECTING DEFECTS IN SEMICONDUCTOR INSULATORS

Michael C. Smayling, Missouri City, and Klaus A. Anselm, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

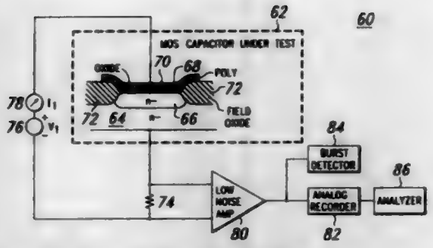
Division of Ser. No. 109,282, Aug. 19, 1993. This application Jun. 7, 1995, Ser. No. 484,459

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—537 **4 Claims**

1. A system containing a semiconductor memory device, the memory device having been tested for reliability by testing for defects in insulators on the memory device, the testing comprising the steps of:

a. applying a non-destructive voltage across the insulator to be tested;



b. measuring currents induced by the voltage;
c. determining current spectral density of the measured currents; and
d. detecting the presence of defects in the insulator by comparing the current spectral density to a predetermined reference current spectral density.

5,598,103

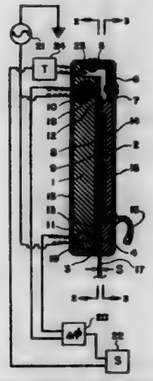
INTERFACE DISTANCE SENSOR AND ITS APPLICATION TO PRESSURE SENSING

Hyok S. Lew, and Yun S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 133,349, Oct. 8, 1993, Pat. No. 5,499,544. This application Dec. 19, 1994, Ser. No. 358,723

Int. Cl.[6] G01B *7/15*

U.S. Cl. 324—662 **20 Claims**



1. An apparatus for converting an interface distance between two reference surfaces to an electrical signal representing the interface distance, comprising in combination:

a) a first reference surface defined by a surface of at least one electrically conductive member, and a second reference surface defined by a surface of another electrically conductive member, said first and second reference surfaces disposed in a face-to-face relationship allowing a change in separation distance between the first and second reference surfaces, wherein the first reference surface comprises the surface of said one electrically conductive member in one of the following two relationship; the first reference surface comprises the surface of said one electrically conductive member, and the first reference surface comprises the surface of said one electrically conductive member and a surface of a third electrically conductive member having the surface thereof disposed in a coplanar side-by-side relationship with respect to the surface of said one electrically conductive member;

b) means for supplying an input alternating electrical signal to said another electrically conductive member through at least one electrical conductor disposed in one of the following two relationship; the electrical conductor is connected to said another electrically conductive member, and the electrical conductor is connected to said third electrically conductive member that transmits the input alternating electrical signal to said another electrically conductive member by capacitive electrical interaction between said third electrically conductive member and said another electrically conductive member; and

c) means for obtaining an electrical variable related to a phase angle difference between two output alternating electrical signals respectively taken off through two electrical conductors disposed in one of the following three relationships; the two electrical conductors respectively extend from two different positions on said one electrically conductive member, the two electrical conductors respectively extend from said one electrically conductive member and said another electrically conductive member, and the two electrical conductors respectively extend from said one electrically conductive member and from the electrical conductor supplying the input alternating electrical signal to said another electrically conductive member.

5,598,104

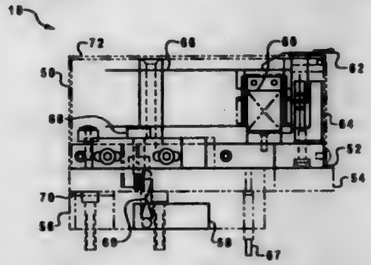
BREAKAWAY TEST PROBE ACTUATOR USED IN A PROBING APPARATUS

James E. Boyette, Jr., Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1994, Ser. No. 322,813

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—754 **6 Claims**



1. A probe positioning apparatus comprising:
a probe tip;
a probe actuator connected to said probe tip;
a probe plate coupled to said probe actuator;
a magnetic probe plate clamp for magnetically coupling to said probe plate in such a fashion as to provide a slip plane between said probe plate clamp and said probe plate, thus providing collision compliance for said probe positioning apparatus, and wherein said magnetic probe clamp further comprises a magnetic shunt that is moveable along a magnetic flux direction for shunting a magnetic flux used to clamp magnetically said probe positioning apparatus in place.

5,598,105

ELEMENTARY CELL FOR CONSTRUCTING ASYNCHRONOUS SUPERCONDUCTING LOGIC CIRCUITS

Itaru Kurosawa, Tsukuba; Hiroshi Nakagawa, Ushiku; Masahiro Aoyagi; Masaaki Maezawa, both of Tsukuba; Takashi Nanya, Kawasaki, and Yoshio Kameda, Narashino, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

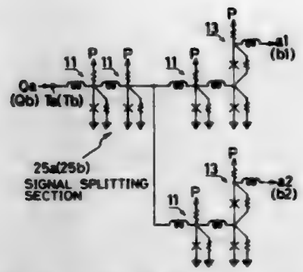
Filed Nov. 27, 1995, Ser. No. 562,746

Claims priority, application Japan, Dec. 16, 1994, 6-313015

Int. Cl.[6] H03K *19/195*

U.S. Cl. 326—6 **12 Claims**

1. An elementary cell for constructing asynchronous superconducting logic circuits, comprising:



two inputs each of which receives as an input pulse a logic signal pulse propagated as a single-flux-quantum;
an OR circuit section connected to the two inputs for producing an OR output pulse when an input pulse is applied to at least one of the two inputs;
a first arrival pulse memory section connected to the two inputs for recording arrival of an input pulse which arrives earlier at one of the two inputs; and
an AND circuit section including said first arrival pulse memory section, connected to the two inputs for producing an AND output pulse when the arrival of the input pulse is recorded in said first arrival pulse memory section and an input pulse arrives at the other of the two inputs, and connected to a reset input terminal for erasing any content of said first arrival pulse memory section when it receives a reset signal pulse on the reset input terminal.

5,598,106

SEMICONDUCTOR INTEGRATED CIRCUIT FOR PREVENTING DETERIORATION OF THE CHARACTERISTICS OF AN N-CHANNEL TYPE TRANSISTOR

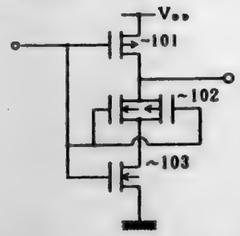
Yuji Kawasaki, and Jun Koyama, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed May 19, 1995, Ser. No. 445,412

Claims priority, application Japan, May 20, 1994, 6-131417

Int. Cl.[6] H03K *17/10*

U.S. Cl. 326—21 **12 Claims**



1. A semiconductor integrated circuit comprising:
a first transistor circuit which includes at least one P-channel type transistor and has a first signal input terminal and a first signal output terminal;
a second transistor circuit which includes at least one N-channel type transistor and has a second signal input terminal connected with the first signal input terminal and a second signal output terminal; and
at least one transmission gate circuit which is arranged between the first and second output terminals and electrically connected to the first and second output terminal,
wherein the transmission gate circuit has two input terminals and an input signal supplied to the first and second transistor circuits is input to the two input terminals of the transmission gate circuit.

5,598,107

CURRENT SWITCHING CIRCUIT HAVING REDUCED CURRENT NOISE OPERATION

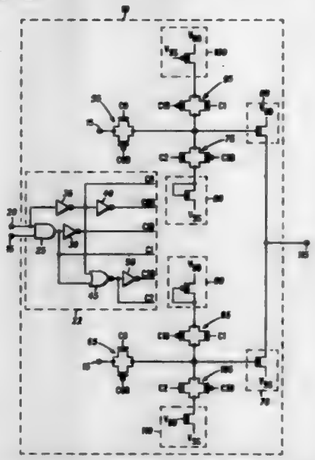
Nihat Cabuk, Waldkraiburg, Germany, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 5, 1995, Ser. No. 435,682

Claims priority, application United Kingdom, May 19, 1994, 9410067

Int. Cl.[6] H03K *17/16*

U.S. Cl. 326—27 **4 Claims**



1. A current switching circuit comprising an output; an input for receiving an input signal having one of an upper and a lower signal level; first and second current switching means responsive to the input signal for switching the output between first and second signal levels in dependence upon the input signal; a first diode coupled transistor selectively coupled between the first switching means and a first potential; a second diode coupled transistor selectively coupled between the second switching means and a second potential; control means coupled to the first and second current switching means and to the first and second diode coupled transistors for providing control of the selective coupling therebetween in response to a control signal, wherein in dependence on the control signal the control means selectively couples the respective diode coupled transistors to the respective current switching means such that the output is switched at least two switching speeds depending on whether the respective diode coupled transistor are coupled to the respective current switching means, such that at the lower switching speed, residual current present between the first and second switching means is substantially reduced.

5,598,108

HIGH-DENSITY ERASABLE PROGRAMMABLE LOGIC DEVICE ARCHITECTURE USING MULTIPLEXER INTERCONNECTIONS, AND REGISTERED MACROCELL WITH PRODUCT TERM ALLOCATION AND ADJACENT PRODUCT TERM STEALING

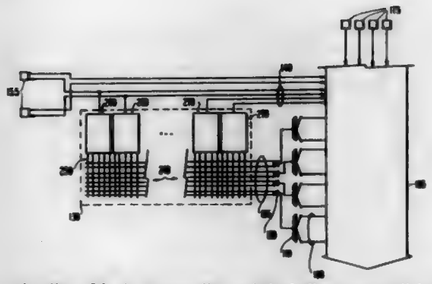
Bruce B. Pedersen, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 331,964, Oct. 31, 1994, which is a continuation of Ser. No. 123,435, Sep. 17, 1993, Pat. No. 5,384,499, which is a continuation-in-part of Ser. No. 43,146, Mar. 31, 1993, Pat. No. 5,268,598, which is a continuation of Ser. No. 957,891, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 691,640, Apr. 25, 1991, Pat. No. 5,241,224. This application Feb. 26, 1996, Ser. No. 605,445

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—41 **2 Claims**

1. A programmable logic array integrated circuit comprising:



a plurality of logic macrocells, each including macrocell logic circuitry;

a plurality of first pluralities of product term logic circuits;

a plurality of second product term logic circuits, each of said second product term logic circuits being associated with a respective one of said first pluralities of product term logic circuits;

a combinatorial circuit for logically combining output signals of at least the product term logic circuits in one of said first pluralities of product term logic circuits; and

programmable switching circuitry for applying to the macrocell logic circuitry of one of said macrocells either an output signal of said combinatorial circuit or any output signal of the second product term logic circuit associated with said one of said first pluralities of product term logic circuits.

5,598,109

PROGRAMMABLE LOGIC ARRAY DEVICE WITH GROUPED LOGIC REGIONS AND THREE TYPES OF CONDUCTORS

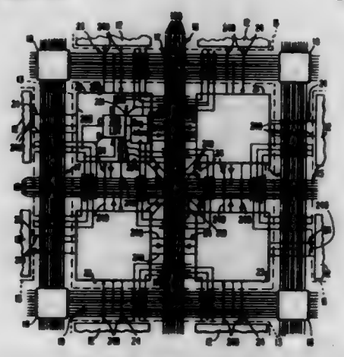
William W. Leong, San Francisco; Richard G. Cliff, Milpitas, and Cameron McClintock, Mountain View, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 308,300, Feb. 14, 1995, Pat. No. 5,537,057. This application Apr. 2, 1996, Ser. No. 626,513

The portion of the term of this patent subsequent to Feb. 14, 2015, has been disclaimed.

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—41 **25 Claims**



1. A programmable logic array device having first and second substantially orthogonal array dimensions and comprising:

a plurality of regions of programmable logic arranged in rows and columns substantially along said first and second orthogonal array dimensions, each of said regions having a plurality of terminals comprising a plurality of inputs and at least one output, and producing an output signal on said output which is a programmable function of an input signal applied to said inputs of said region, said regions being grouped into logic subsets, each of said logic subsets comprising a plurality of said regions, each of said regions belonging to only one of said logic subsets;

a first group of conductors for conducting signals to, from and among said logic subsets, each conductor in said first group of conductors extending along substantially the entire length of one of said first and second orthogonal array dimensions;

a second group of conductors, each of said subsets having at least one conductor of said second group of conductors associated therewith, for conducting signals to, from and among said regions in said logic subset;

a third group of conductors, each of which conveys signals directly from one of said regions in one of said logic subsets to another of said regions in said one of said logic subsets;

a first group of connectors for programmably selectively connecting any conductor in one of said first, second and third groups of conductors to at least one of (a) an input to, and (b) an output of, one of said regions, at least one connector in said first group of connectors connecting at least one conductor in said first group of conductors directly to an input of one of said regions; and

a second group of connectors for programmably selectively connecting conductors in said first group of conductors to other conductors in said first and second groups of conductors.

5,598,110

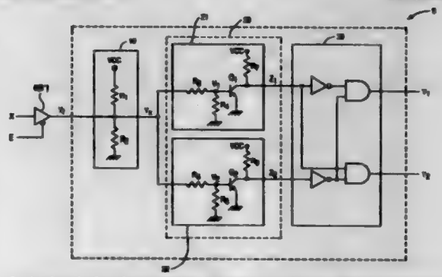
DETECTOR CIRCUIT FOR USE WITH TRI-STATE LOGIC DEVICES

Yao-Tsung Chang, Chung-Li, Taiwan, assignor to Acer Incorporated, Taipei, Taiwan

Filed Nov. 1, 1994, Ser. No. 332,834

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—60 **10 Claims**



1. A circuit for determining whether an input signal represents a logic high, a logic low, or is floating, comprising:

a voltage level generator having an input terminal for receiving said input signal and an output terminal electrically common with the input terminal, the voltage level generator providing at the output terminal (a) a first voltage representing a logic low when said input signal represents a logic low, the first voltage lying in a first fixed voltage range, the first voltage range including a maximum voltage, (b) a second voltage representing a logic high when said input signal represents a logic high, the second voltage lying in a second fixed voltage range, the second voltage range including a minimum voltage, and (c) a third voltage, between said maximum voltage of the first voltage range and the minimum voltage of the second voltage range, when said input signal is floating;

a first threshold circuit having an output terminal, coupled to said voltage level generator, for generating a logical high signal at the output terminal of said first threshold circuit if and only if said voltage at the output terminal of said voltage level generator is above a fourth voltage between said minimum voltage of the second voltage range and the third voltage, said first threshold circuit including a first voltage divider for dividing the voltage at the output terminal of said voltage level generator;

a second threshold circuit having an output terminal, coupled to said voltage level generator, for generating a logical high signal at the output terminal of said second threshold circuit if and only if said voltage at the output terminal of said voltage level generator is above a fifth voltage between said maximum voltage of the first voltage range and third voltage, said second threshold circuit including a second voltage divider for dividing the voltage at the output terminal of said voltage level generator; and

a logic circuit, coupled to said first and second threshold circuits and having a pair of output terminals, for providing a first unique combination of logic levels if said input signal represents a logic high, a second unique combination of logic levels if said input signal represents a logic low, and a third unique combination of logic levels if said input signal is floating.

5,598,111

DELAY CIRCUIT FOR DIGITAL SIGNAL PROCESSING

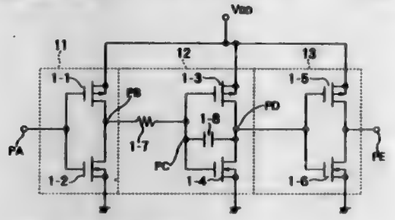
Toshio Enomoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 28, 1994, Ser. No. 266,589

Claims priority, application Japan, Aug. 3, 1993, 5-191500

Int. Cl.[6] H03K *19/0948; 17/16*

U.S. Cl. 326—83 **2 Claims**



1. A delay circuit comprising:

a first inverter for inverting a signal level of an input signal;

a second inverter comprising:

a first resistor, one terminal of which is connected to an output terminal of the first inverter;

a P-channel MOS transistor, a gate of which is connected to the other terminal of the first resistor and one terminal of a current path which receives a first voltage;

an N-channel MOS transistor, a gate of which is connected to the other terminal of the first resistor, one terminal of a current path which receives a second voltage, and the other terminal of the current path which is connected to the other terminal of the current path of the P-channel MOS transistor; and

a capacitor, one terminal of which is connected to the other terminal of the first resistor for forming a capacitor-resistor (CR) circuit determining a delay by charging and discharging thereof, and the other terminal of which is connected to the other terminal of the current path of the P-channel MOS transistor; and

a third inverter, an input terminal of which is connected to a connection node between the current path of the P-channel MOS transistor and the current path of the N-channel MOS transistor, and for inverting a signal level of an output signal of the second inverter, whereby at least one of the P-channel MOS transistor and the N-channel MOS transistor operates in a cutoff region depending on a voltage of an output signal of the first inverter,

wherein a threshold value VTP2 of the P-channel MOS transistor of said second inverter and a threshold value VTN2 of the N-channel MOS transistor of said second inverter satisfy the following equations:

$$-2Vdd/5<VTP2<-Vdd/5$$

$$Vdd/5<VTN2<2Vdd/5$$

wherein Vdd represents a difference between the first and second voltages,

each of the first and third inverters comprises a P-channel MOS transistor and an N-channel MOS transistor whose current paths are cascade-connected,

wherein a threshold value VTP1 of the P-channel MOS transistor and a threshold value VTN1 of the N-channel MOS transistor of the first inverter and a threshold value VTP3 of the P-channel MOS transistor and a threshold value VTN3 of the N-channel MOS transistor of the third inverter satisfy the following equations:

$$-Vdd/5<VTP1<-Vdd/6 \quad (1)$$

$$Vdd/6<VTN1<Vdd/5 \quad (2)$$

$$-Vdd/5<VTP3<-Vdd/6 \quad (3)$$

$$Vdd/6<VTN3<Vdd/5 \quad (4).$$

5,598,112

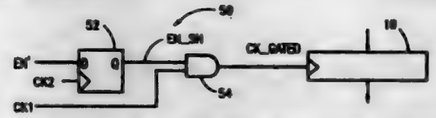
CIRCUIT FOR GENERATING A DEMAND-BASED GATED CLOCK

Christopher E. Phillips, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 26, 1995, Ser. No. 451,219

Int. Cl.[6] H03K *19/096*

U.S. Cl. 326—93 **5 Claims**



1. A demand-based clocking circuit for generating a demand-based gated clock signal, the clocking circuit comprising:

a latch circuit having a data output, a data input connected to receive an enable signal having an active logic state and an inactive logic state, and a clock input connected to receive a first input clock signal having periodic clock cycles wherein, in each of said clock cycles, the first input clock signal has a first logic state during a first portion of the clock cycle and transitions to a second logic state during a second portion of the clock cycle, the data output being connected to provide a shifted enable signal that transitions from the inactive logic state to the active logic state on the first transition of the first input clock signal from the first to the second logic state after the enable signal transitions from the inactive to the active logic state, and that transitions from the active to the inactive logic state on the first transition of the first input clock signal from the first to the second logic state after the enable signal transitions from the active to the inactive logic state; and

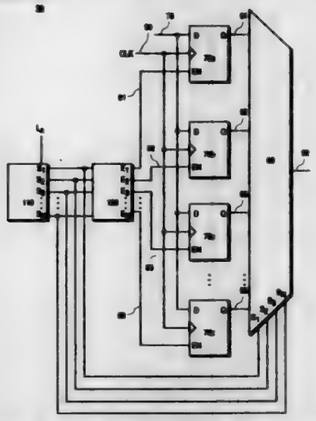
a logic circuit responsive to the shifted enable signal and to a second input clock signal having periodic clock cycles wherein, in each of said clock cycles, the second input clock signal has the second logic state during a first portion of the cycle and transitions to the first logic state during a second portion of the cycle, for providing the gated clock signal such that the gated clock signal transitions from the inactive to the active logic state on the first transition of the second input clock signal from the first to the second logic state after the shifted enable signal transitions from the inactive to the active logic state, and that transitions from the active to the inactive logic state on the transition of the shifted enable signal from the active to the inactive logic state.

5,598,113

FULLY ASYNCHRONOUS INTERFACE WITH PROGRAMMABLE METASTABILITY SETTLING TIME SYNCHRONIZER

Jerry Jex, Forrest Grove; Charles Dike, Hillsboro, and Keith Self, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 19, 1995, Ser. No. 375,361
Int. Cl.[6] H03K *19/00;5/135*
U.S. Cl. 326—94 **19 Claims**



1. A circuit for synchronizing an input signal according to a sample clock, said circuit comprising:

a first latch for receiving said input signal and clocked by said sample clock;

a second latch for receiving said input signal and clocked by said sample clock;

a third latch for receiving said input signal and clocked by said sample clock;

a multiplexing circuit for receiving outputs originating from said first latch, said second latch and said third latch, said multiplexing circuit for outputting one of said outputs for sampling in response to read enable signals;

write enable circuitry for generating write enable signals, said write enable signals coupled to said first latch, said second latch and said third latch; and

wherein for a given clock cycle, said write enable signals enable a single one of said first, second and third latches for receiving said input signal and said read enable signals enable another single one of said first, second and third latches for outputting through said multiplexing circuit.

5,598,114

HIGH SPEED REDUCED AREA MULTIPLEXER

Shahram Jamshidi, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

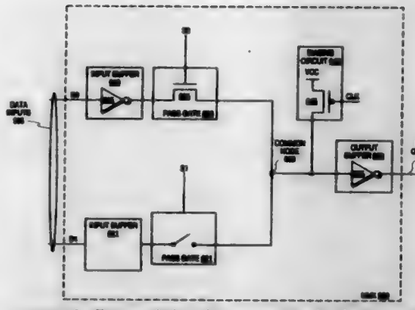
Filed Sep. 27, 1995, Ser. No. 534,487
Int. Cl.[6] H03K *19/094;19/084*
U.S. Cl. 326—113 **14 Claims**

1. A multiplexer comprising:

a first input buffer and a first pass gate coupled in series between a first data input and a common node;

a second input buffer and a second pass gate coupled in series between a second data input and the common node;

a biasing circuit coupled to the common node and a supply voltage, the biasing circuit being operative to bias the common node to the supply voltage when neither pass gate is switched on to pass data from its corresponding input buffer to the common node; and



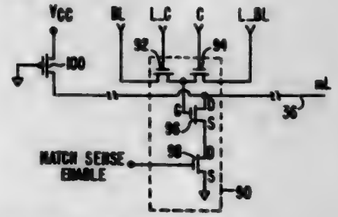
an output buffer coupled to the common node, the output buffer operative to output an output signal to a data output in response to a voltage of the common node.

5,598,115

COMPARATOR CELL FOR USE IN A CONTENT ADDRESSABLE MEMORY

John C. Holst, San Jose, Calif., assignor to Intergraph Corporation, Huntsville, Ala.

Division of Ser. No. 23,904, Feb. 23, 1993, Pat. No. 5,446,685.
This application Feb. 8, 1995, Ser. No. 385,496
Int. Cl.[6] H03K *19/094*
U.S. Cl. 326—119 **8 Claims**



1. A comparator cell comprising:

a signal line;

charging means for charging said signal line to a selected potential;

potential altering means, coupled to said signal line, for altering said selected potential on said signal line by flowing current between said signal line and a current supply in response to the assertion of a potential altering signal, wherein the assertion of the potential altering signal occurs when a mismatch in a content addressable memory (CAM) cell occurs; and

potential maintaining means, coupled to said potential altering means, for preventing current flow between said signal line and said current supply when a potential maintaining signal is asserted, regardless of whether or not the potential altering signal is asserted, wherein the potential maintaining signal is asserted during times other than a match sensing period.

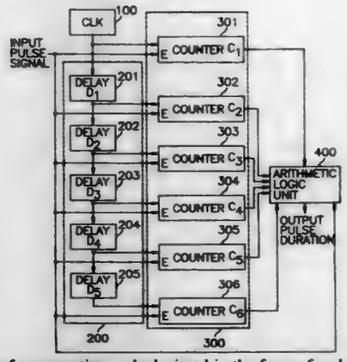
5,598,116

APPARATUS FOR MEASURING A PULSE DURATION

Oh-Sang Kwon, Seoul, Rep. of Korea, assignor to Daewoo Electronics, Co. Ltd., Seoul, Rep. of Korea

Filed Oct. 30, 1995, Ser. No. 550,332
Claims priority, application Rep. of Korea, Oct. 31, 1994, 94-28325
Int. Cl.[6] H03K *9/08*
U.S. Cl. 327—31 **2 Claims**

1. An apparatus for measuring a duration(Y) of an input pulse signal(I), which comprises:



means for generating a clock signal in the form of a clock pulse train having a period(T);

means for delaying the clock signal and providing N-1 number of delayed clock signals, each of the delayed clock signals being delayed by a delay time((T/N)*i), N being a positive integer greater than 1 and i being an integer from 1 to N-1;

means for counting the number of clock pulses contained in the clock signal and each of the delayed clock signals, respectively, during the duration(Y) of the input pulse signal(I) and providing the count values; and

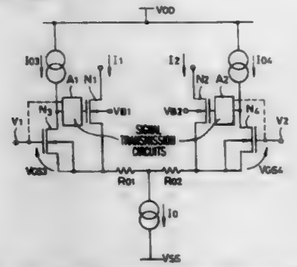
means for detecting a maximum count value(n) among the count values provided from the counting means and calculating the duration(Y) of the input pulse signal(I) based on the maximum count value(n).

5,598,117

MOS DIFFERENTIAL VOLTAGE-TO-CURRENT CONVERTER CIRCUIT WITH IMPROVED LINEARITY

Koji Deguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 1, 1994, Ser. No. 269,789
Claims priority, application Japan, Jul. 5, 1993, 5-165611; Dec. 20, 1993, 5-318871
Int. Cl.[6] H02M *11/00*
U.S. Cl. 327—103 **2 Claims**



1. A MOS differential voltage-to-current converter circuit comprising:

first and second MOS transistors;

a resistor connected between the sources of said first and second MOS transistors;

a first constant current source for supplying operation current for said first and second MOS transistors;

third and fourth MOS transistors having sources respectively connected to the source of said first and second MOS transistors and receiving a differential input voltage at the gates thereof;

second and third constant current sources for supplying operation currents for said third and fourth MOS transistors, respectively, said second and third constant current sources being connected to the drains of said third and fourth MOS transistors, respectively; and

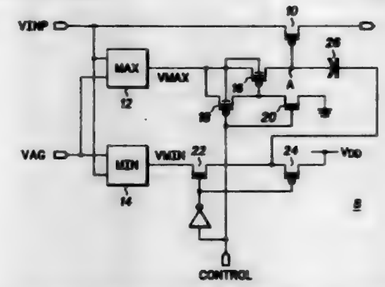
first and second signal transmission means for transmitting drain outputs of said third and fourth MOS transistors to the gates of said first and second MOS transistors for taking the current flowing through said first and second MOS transistors as a differential output, wherein said first and second signal transmission means include one of an amplifier circuit, an attenuation circuit, and a voltage follower circuit.

5,598,118

DRIVER CIRCUITS FOR SWITCHING TRANSISTORS

Vladimir Kolfmann, Rishon-Lezion; Israel Kashat, Netanya, and Yachin Afek, Kfar Saba, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 21, 1994, Ser. No. 326,910
Claims priority, application United Kingdom, Nov. 5, 1993, 9322878
Int. Cl.[6] H03B *1/00;* H03K *17/687*
U.S. Cl. 327—108 **21 Claims**



1. A driver circuit for switching a transistor from a first state in which the transistor switch is closed such that an input signal is transferred to an output and a second state in which the transistor switch is open, the driver circuit comprises:

a first reference node for receiving a first reference voltage signal;

a second reference node for receiving a second reference voltage signal;

maximum detection means coupled to receive the input signal and the first reference voltage signal and for providing at an output the greater of the two signals, the output of the maximum detection means being selectively coupled to the gate electrode of the transistor switch;

minimum detection means coupled to receive the input signal and the first reference voltage signal and for providing at an output the lesser of the two signals;

voltage shifting means having an input selectively coupled to the second reference node and to the output of the minimum detection means and an output coupled to the gate electrode of the transistor switch;

wherein in the second state the output of the maximum detection means is coupled to the gate electrode of the transistor switch and the output of the voltage shifting means and the input of the voltage shifting means is coupled to the second reference voltage signal, and wherein in the first state, the output of the minimum detection means is coupled to the input of the voltage shifting means such that the output of the voltage shifting means is shifted by the minimum output signal to a voltage level which corresponds to the difference between the second reference voltage signal and the minimum output signal such that the voltage on the gate electrode of the transistor switch is dependent on the maximum output signal and the signal at the output of the voltage shifting means, whereby the gate-to-source voltage of the transistor switch is independent of the input signal.

5,598,119

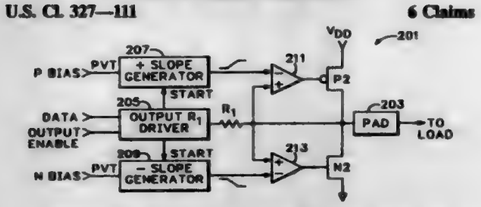
METHOD AND APPARATUS FOR A LOAD ADAPTIVE PAD DRIVER

Billy E. Thayer, and Scott A. Linn, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 5, 1995, Ser. No. 417,335

Int. Cl.[6] H03K *17/687;3/01*

U.S. Cl. 327—111 **6 Claims**



1. Apparatus for driving an integrated circuit output pad in response to a data output signal that switches between a first data signal having a first predetermined value and second data signal having a second predetermined value, said output pad having a load connected thereto, comprising:

first driver means, having an input connected for receiving said data output signal and an output for transmitting said data output signal to said output pad such that said output pad switches from said first predetermined value to said second predetermined value and from said second predetermined value to said first predetermined value at a first driver means rate of transition at said output pad that is dependent upon said load;

signal generator means for generating a predetermined reference signal having a slope such that said slope is positive-going when said data output signal switches with a positive-going data output signal transition and said slope is negative-going when said data output signal switches with a negative-going data output signal transition, said signal generator means having an input connected to trigger said predetermined refereace signal in response to each data output signal switch and an output;

comparator means, having a first input connected to said output of said signal generator means and a second input coupled to said first driver means, for comparing said slope of said predetermined reference signal to said first driver means rate of transition of said data output signal at said output pad during a transition between said first and second predetermined values; and

second driver means, having an input coupled to said comparator means and an output coupled to said output pad, for driving said output pad at a rate dependent upon said predetermined refereace signal when said first driver means rate of transition of said data output signal at said output pad during a transition between said first and second predetermined values is slower than said slope of said reference signal.

5,598,120

DUAL LATCH CLOCKED LSSD AND METHOD

Stephen A. Yurash, Palo Alto, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 75,343, Jun. 7, 1993, Pat. No. 5,463,336. This application Jul. 17, 1995, Ser. No. 503,253

Int. Cl.[6] H03K *3/289*

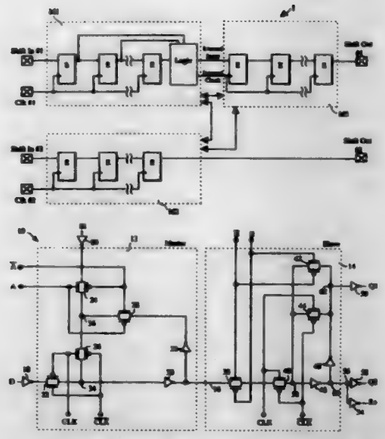
U.S. Cl. 327—202 **26 Claims**

1. An integrated circuit with dual latch clocked LSSD comprising:

a first module responsive to a first external clock and a first external shift input and operative to produce a first shift output, wherein said first module includes at least one dual latch clocked LSSD including at least:

a first latch;

a second latch; and



non-latching connective circuitry coupling said first latch to said second latch such that said at least one dual latch docked LSSD includes at least said first latch, said second latch, and said non-latching connective circuitry and is operative to provide at least three operational modes of said at least one dual latch docked LSSD including a functional mode, a capture mode, and a shift mode,

wherein at least one of the operational modes is level sensitive and at least one of the operational modes is edge triggered,

wherein during said functional mode said first latch latches a data input in accordance with a system clock and produces a first latch output, and then said second latch latches said first latch output in accordance with said system clock,

wherein during said capture mode said first latch latches said data input in accordance with said system clock, and then said second latch latches said first latch output in accordance with a first scan clock, and

wherein during said shift mode, said first latch latches a scan input in accordance with a second scan clock, and then said second latch latches said first latch output in accordance with said first scan dock.

5,598,121

SWITCHING CIRCUIT FOR EMBODYING AN I/O SIGNAL IN A SINGLE TERMINAL

Myung-Hyun Nam, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 27, 1993, Ser. No. 126,967

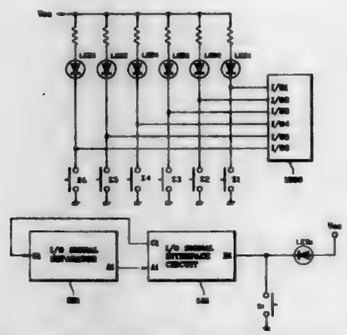
Claims priority, application Rep. of Korea, Nov. 23, 1992, 1992-22839

Int. Cl.[6] H03K *17/28;17/296;17/62*

U.S. Cl. 327—392 **12 Claims**

1. A single I/O terminal type switching circuit adapted to be connected to a number of switches forming a plurality of parallel switch-path pairs therewith, each said switch-path pair being operably connected to said switching circuit at a respective single terminal thereof, said switching circuit comprising:

at least one I/O signal interface means, coupled at a single terminal thereof to a corresponding first switch-path pair composed of at least a first switch, for detecting when said first switch is initially depressed at which time a current is provided to a current path connected to the single terminal, said current path being maintained, in response to a delay signal, for at least a predetermined delay period following a detection signal generated by said at least one I/O signal interface means to indicate that said first switch was initially depressed; and



at least one I/O signal separator means responsive to said detection signal from a corresponding I/O signal interface means for generating said delay signal for said corresponding I/O signal interface means, said delay signal being active at least for said predetermined delay period.

5,598,122

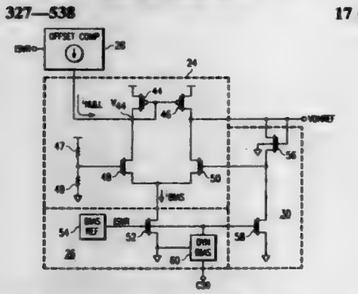
VOLTAGE REFERENCE CIRCUIT HAVING A THRESHOLD VOLTAGE SHIFT

David C. McClure, Denton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 20, 1994, Ser. No. 359,926

Int. Cl.[6] G05F *1/10*

U.S. Cl. 327—538 **17 Claims**



1. A voltage reference circuit, comprising:

a first reference transistor, having a source/drain path connected on a first end to a power supply voltage, and having a gate connected to a drain end of its source/drain path;

a second reference transistor having a source/drain path connected between a second end of the first reference transistor and a common node, and having a gate for receiving a reference voltage;

a first mirror transistor, having a source/drain path connected between the power supply voltage and an output node, and having a gate connected to the gate of the first reference transistor;

a second mirror transistor, having a source/drain path connected between the output node and the common node, and having a gate;

a bias current source, coupled to the common node, for conducting a current including the sum of the currents in the second reference transistor and the second mirror transistor; and

a threshold voltage shift device, having a source/drain path connected between the gate of the second mirror transistor and the output node, and having a gate connected to its drain, wherein the threshold voltage shift device is constructed having a size that is closely matched to a size of an output driver device and wherein the output node is coupled to the output driver device.

5,598,123

FILTER ARRANGEMENT FOR SUPPRESSING AN AC VOLTAGE SUPERPOSED ON A DC VOLTAGE PRESENT ACROSS POLES OF A DC VOLTAGE SOURCE

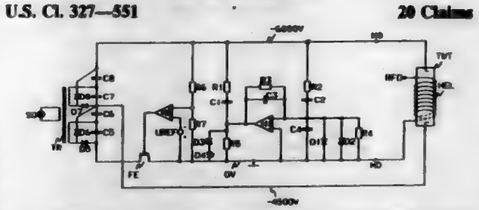
Jean-Pierre Deme, Charleroi, Belgium, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Jan. 1, 1995, Ser. No. 457,399

Claims priority, application European Pat. Off., Jan. 3, 1994, 94201593

Int. Cl.[6] H03B *1/00*

U.S. Cl. 327—551 **20 Claims**



1. A filter arrangement for suppressing an AC voltage superposed on a DC voltage provided across first (KO) and second (HO) poles of a voltage source, comprising:

a series coupling of a first capacitance (C1) and an impedance (R5), the series coupling being coupled between the first (KO) and the second (HO) poles of said voltage source,

voltage limiting means (D3, D4) coupled to the impedance (R5) and adapted to limit a voltage across the impedance (R5); and

an amplifier arrangement (N1, C2, R2, C3, R3, C4, R4, D1, D2) having an inverting input coupled to said first pole (KO) of said voltage source, and an output coupled to a junction point of said first capacitance (C1) and said impedance (R5), said impedance (R5) being connected as a load for the amplifier arrangement.

5,598,124

CIRCUIT CONFIGURATION FOR SUPPRESSING NOISE SIGNALS

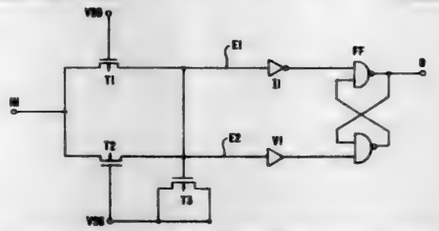
Hans-Gerd Kirchhoff, Ratingen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 31, 1995, Ser. No. 509,412

Claims priority, application Germany, Jul. 29, 1994, 44 27 015.1

Int. Cl.[6] H03K *17/62;* **H04B** *1/10*

U.S. Cl. 327—552 **3 Claims**



1. A circuit configuration for noise signal suppression, comprising:

an input signal terminal;

two inputs being controlled by said input signal terminal;

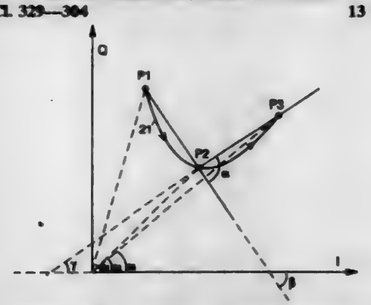
transfer gates each being connected in series with a respective one of said inputs and having first and second terminals, said first terminal being connected to said input signal terminal; and

at least one transistor being connected as a capacitor and being connected to said second terminal of each of said transfer gates.

5,598,125
METHOD FOR DEMODULATING A DIGITALLY MODULATED SIGNAL AND A DEMODULATOR

Jarmo Mäkinen, Espoo, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

PCT No. PCT/FI94/00230, § 371 Date Dec. 4, 1995, § 102(e) Date Dec. 4, 1995, PCT Pub. No. WO94/28662, PCT Pub. Date Dec. 8, 1994
PCT Filed Jun. 2, 1994, Ser. No. 557,196
Claims priority, application Finland, Jun. 2, 1993, 932519
Int. Cl.[6] H03D 3/00; H04L 27/14;27/22
U.S. Cl. 329—304 13 Claims

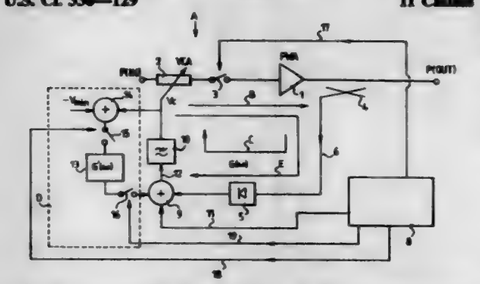


1. A method for demodulating a digitally modulated signal, according to which method a signal (S) to be received is mixed essentially to quadrature related I and Q baseband signals, characterized in that from the baseband signals are measured differences (α) between directional angles (β, γ) of sequential shifts of a signal point on I/Q plane and said difference is utilized for decision-making concerning a received symbol.

5,598,126
METHOD AND ARRANGEMENT FOR CONTROLLING THE OPERATION OF A HIGH-FREQUENCY POWER AMPLIFIER

André P. Dekker, Oulu, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI94/00425, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO95/00866, PCT Pub. Date Mar. 30, 1995
PCT Filed Sep. 22, 1994, Ser. No. 454,269
Claims priority, application Finland, Sep. 23, 1993, 934168
Int. Cl.[6] H03G 3/20
U.S. Cl. 330—129 11 Claims

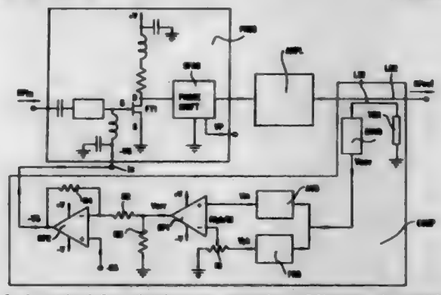


9. An arrangement for controlling a high-frequency power amplifier, comprising:
- a high-frequency power amplifier provided in a forward line and having an input side and an output side;
- a feedback line functionally provided for said forward line, between the output side and the input side of said amplifier;
- a control means functionally connected to the input side of said amplifier and communicating with said feedback line;
- a sampler serving as input to said feedback line from said forward line;
- a detector connected to said feedback line between said output side and said input side of said amplifier;
- a switching means connected to the forward line for switching the amplifier between an OFF state and a gain state;
- a control unit operable for providing a control signal for operating said switching means for switching said amplifier;
- a parallel loop disconnectably connected in parallel with a portion of said feedback line and to be provided with a reference voltage feed;
- a signal adapter provided in said parallel loop, said signal adapter having a transfer function which substantially corresponds to the transfer function of a power control loop constituted by said forward line and said feedback line, measured where said parallel loop connects with said portion of said feedback line.

5,598,127
PROCEDURE AND CIRCUIT FOR ADAPTIVE COMPENSATION OF THE GAIN DISTORTIONS OF A MICROWAVE AMPLIFIER WITH LINEARIZER

Antonio Abbiati, S. Angelo Lodigiano; Carlo Buoli, Mirandola, and Luigi Cervi, Olmeneta, all of Italy, assignors to Italtel S.p.A., Milan, Italy

PCT No. PCT/EP93/03432, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO94/15395, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 6, 1993, Ser. No. 454,369
Claims priority, application Italy, Dec. 23, 1992, MI92A2936
Int. Cl.[6] H03C 1/32
U.S. Cl. 330—149 5 Claims



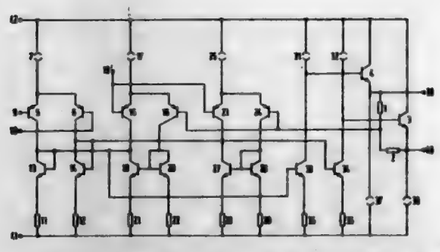
1. A method for adaptive compensation of linearized amplifier gain distortions in digitally modulated signals amplification, or in amplification of any other modulated signal such that a peak-to-average power ratio is constant, which method comprises the following steps to be performed sequentially and continuously:
- detecting and measuring a peak power value and an average power value of modulation envelope of an amplified signal;
- subtracting a constant peak-to-average power ratio from the peak to average power ratio of the amplified signal so as to obtain an error signal; and
- correcting the gain of the linearized amplifier for zeroing or minimizing the error signal.

5,598,128
OPERATIONAL AMPLIFIER WITH HIGH COMMON MODE REJECTION

Werner Velt, Unterhaching, and Robert-Grant Irvine, München, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 5, 1995, Ser. No. 435,322
Claims priority, application Germany, May 5, 1994, 44 15 953.6
Int. Cl.[6] H03F 3/45
U.S. Cl. 330—252 2 Claims

1. An operational amplifier, comprising:

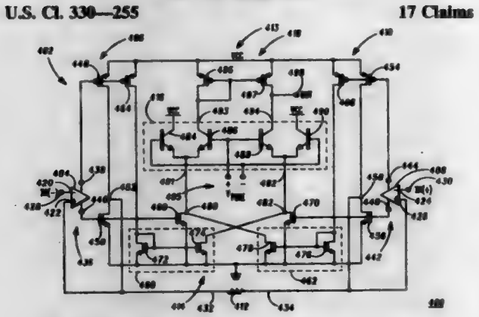


- a symetrical end stage being formed of emitter followers, said end stage having output terminals forming outputs of the operational amplifier and having input terminals;
- a voltage divider being connected between said output terminals of said end stage and having a tap;
- a first differential amplifier stage having input terminals forming symmetrical inputs of the operational amplifier and having output terminals each being coupled to a respective one of said input terminals of said end stage;
- loads each terminating a respective one of said output terminals of said first differential amplifier stage;
- two second parallel-connected differential amplifier stages each having a first input terminal connected to a reference potential, a second input terminal connected to said tap of said voltage divider, and an output terminal each being coupled to a respective one of said loads; and
- two current mirrors having input circuits forming said loads and having output circuits each being connected to a respective one of said input terminals of said end stage, and current sources each being connected to a respective one of said output circuits of said current mirrors.

5,598,129
LOW CURRENT DRAIN OPERATIONAL TRANSCONDUCTANCE AMPLIFIER

Mark J. Chambers, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 24, 1995, Ser. No. 518,935
Int. Cl.[6] H03F 3/45
U.S. Cl. 330—255 17 Claims

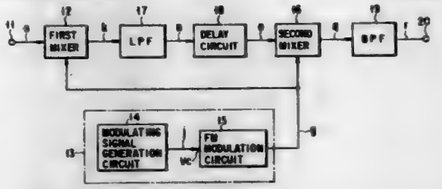


1. An operational transconductance amplifier comprising:
- an input stage configured to receive a differential input signal, the input stage including:
  - an amplification stage having a first input and a second input for receiving the differential input signal and a first differential output for providing a first differential output signal and a second differential output for providing a second differential output signal;
  - a class-AB amplification stage including a first class-AB amplifier coupled to the first differential output for receiving the first differential output signal and a second class-AB amplifier coupled to the second differential output for receiving the second differential output signal, the first class-AB amplifier having an output coupled to the first input of the amplification stage in a unity gain configuration and the second class-AB amplifier having an output coupled to the second input of the amplification stage in a unity gain configuration;
  - a resistive element coupled between the output of the first class-AB amplifier and the output of the second class-AB amplifier;
  - a current source having a first input coupled to the first differential output for receiving the first differential output signal and a second input coupled to the second differential output for receiving the second differential output signal, the current source further including a first current output and a second current output, the current source providing a first output current at the first current output in response to the first differential output signal and a second output current at the second current output in response to the second differential output signal; and
  - a current summer coupled to the first current output and the second current output for summing the first output current and the second output current and providing an output signal.

5,598,130
PHASE MODULATOR CAPABLE OF INDIVIDUALLY DEFINING MODULATION DEGREE AND MODULATION FREQUENCY

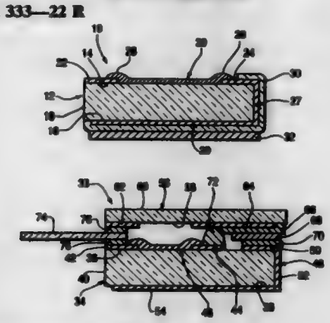
Etsuji Mesuda, and Osamu Tagiri, both of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Oct. 5, 1995, Ser. No. 539,439
Claims priority, application Japan, Oct. 20, 1994, 6-255435
Int. Cl.[6] H03C 3/00; H03B 29/00
U.S. Cl. 332—119 14 Claims



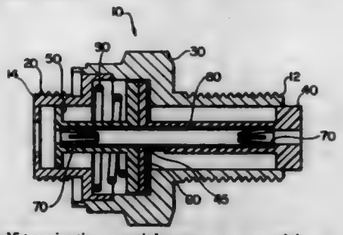
1. A phase modulator comprising:
- FM signal generating means for generating an FM signal obtained by frequency-modulating a reference frequency signal with a modulating frequency signal in order to set a modulation degree and a modulation frequency in phase modulation;
- first frequency conversion means for mixing an input signal having a predetermined carrier frequency with the FM signal from said FM signal generating means;
- first signal extracting means for extracting one of upper and lower sideband signals obtained from said first frequency conversion means as an intermediate frequency signal;
- delay means for delaying the intermediate frequency signal from said first signal extracting means by a predetermined time in order to set the modulation degree in said phase modulator;
- second frequency conversion means for mixing the intermediate frequency signal delayed by said delay means with the FM signal from said FM signal generating means; and
- second signal extracting means for extracting a frequency signal corresponding to the carrier frequency component of upper and lower sideband signals obtained from said second frequency conversion means.

5,598,131
AC COUPLED TERMINATION
Joseph B. Mazzochette, Cherry Hill, N.J., assignor to EMC Technology, Inc., Cherry Hill, N.J.
Filed Nov. 16, 1995, Ser. No. 558,394
Int. Cl.[6] H01P 1/26
U.S. Cl. 333—22 R 11 Claims



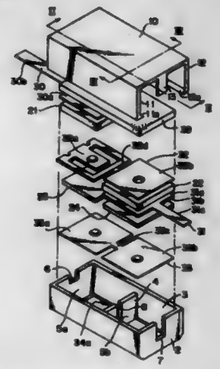
1. An AC termination comprising:
a substrate of an insulating material having first and second opposed surfaces and a peripheral edge;
a conductive input termination on the first surface of the substrate;
a conductive output termination over the second surface of the substrate;
a resistance element on said first surface of the substrate and having a pair of ends, one end of the resistance element being electrically connected to said input termination; and
a capacitor on said substrate and electrically connected in series between the other end of the resistance element and the output termination.

5,598,132
SELF-TERMINATING COAXIAL CONNECTOR
David J. Stabile, Horseheads, N.Y., assignor to LRC Electronics, Inc., Horseheads, N.Y.
Filed Jan. 25, 1996, Ser. No. 591,385
Int. Cl.[6] H01P 1/10;1/26; H01R 17/12;33/96
U.S. Cl. 333—22 R 9 Claims



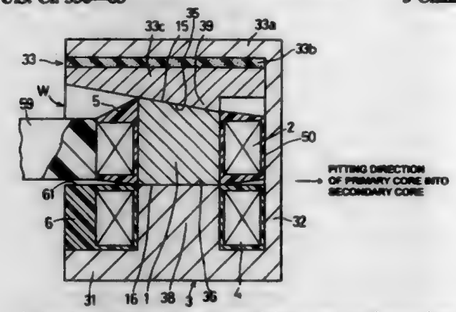
1. A self-terminating coaxial connector comprising:
a body open on each of two ends, said body having a central bore disposed therethrough, a first end of said body for receiving a coaxial cable, a second end of said body having a mating area;
a first insulator having a central bore disposed therethrough, said first insulator movably disposed along a common longitudinal axis within said body, said first insulator having a recess from an outside surface thereof to said central bore of said first insulator;
a second insulator having a central bore disposed therethrough, said second insulator movably disposed along a common longitudinal axis within said body, a first end of said second insulator engaging a first end of said first insulator;
a spring, said spring disposed about said second insulator;
a terminal assembly, said terminal assembly comprising a tubular terminal disposed along a common longitudinal axis within said central bore of said first insulator and said central bore of said second insulator, said tubular terminal having a contact disposed at each end for receiving a center conductor of a cable;
a termination resistor disposed within said recess of said first insulator, said termination resistor having a first lead bonded to and electrically communicating with said tubular terminal;
an end cap open on each of two ends, said end cap having a central bore disposed therethrough, a first end of said end cap having a mating area cooperating with the mating area of said body, a second end of said end cap for receiving a distribution cable; and
said first insulator, said second insulator, said terminal assembly and said termination resistor being movably disposed between a first position and a second position within said connector.

5,598,133
LADDER FILTER CONTAINING PIEZORESONATOR WITH CONDUCTIVE ELASTIC SHEET
Kenji Fuse, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan
Continuation of Ser. No. 147,161, Nov. 3, 1993, abandoned. This application May 23, 1995, Ser. No. 447,423
Claims priority, application Japan, Nov. 5, 1992, 4-295674
Int. Cl.[6] H03H 9/00;9/58
U.S. Cl. 333—189 3 Claims



1. A ladder filter comprising:
a box-type case made of an insulating material;
a grounding terminal comprising a conductive thin flat plate contained in the case at a bottom thereof;
a conductive elastic sheet contained in the case such that one side of the conductive elastic sheet is entirely in contact with the grounding terminal;
a partition member with a plurality of cut-outs contained in the case vertically on the conductive elastic sheet, the partition member dividing an inside of the case into a plurality of containing portions;
a plurality of parallel piezoresonators contained in the containing portions of the case, each of the parallel piezoresonators being disposed such that one side is entirely in contact with the conductive elastic sheet;
a plurality of series piezoresonators contained in the containing portion of the case above the parallel piezoresonators;
a plurality of junction terminals inserted in the cutouts of the partition member and contained in the containing portions of the case, the junction terminal connecting the parallel piezoresonators with the series piezoresonators electrically;
an input terminal contained in one of the containing portions, the input terminal being electrically connected with the series piezoresonator contained in the same containing portion; and
an output terminal contained in another containing portion, the output terminal being electrically connected with the series piezoresonator contained in the same containing portion.

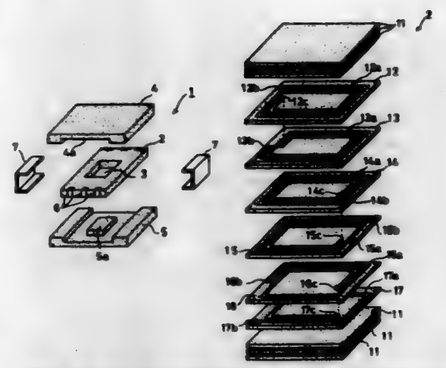
5,598,134
ELECTROMAGNETIC POWER SUPPLYING APPARATUS FOR ELECTRIC MOTOR VEHICLE
Makoto Ito, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Continuation-in-part of Ser. No. 153,759, Nov. 17, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,398
Claims priority, application Japan, Nov. 19, 1992, 4-310456
Int. Cl.[6] H01F 27/26;27/30
U.S. Cl. 336—83 5 Claims



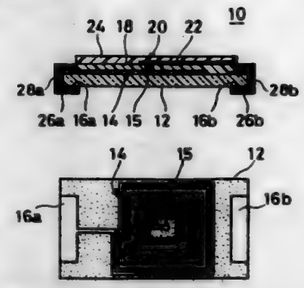
1. An electromagnetic power supplying apparatus for an electric motor vehicle comprising:
a primary winding structure having a primary coil wound around a primary core where said primary core is formed in the shape of a pillar with a reduced height;
a secondary winding structure having a secondary core where said secondary core has a central core portion about which is wound a secondary coil, a movable core member disposed opposite said central core portion with a gap therebetween for receiving therein said primary winding structure, and interconnecting core portions supporting said movable core member for movement relative thereto, said interconnecting core portions being joined to said central core portion for establishing a closed magnetic circuit linking said primary and secondary coils when said primary winding structure is inserted in said gap; and
means for urging said movable core member against said primary core upon insertion of said primary winding structure in said gap.

5,598,135
TRANSFORMER
Eiichi Maeda, and Hideyuki Mihara, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Sep. 21, 1992, Ser. No. 948,162
Claims priority, application Japan, Sep. 20, 1991, 3-270294
Int. Cl.[6] H01F 5/00
U.S. Cl. 336—200 18 Claims

1. A transformer comprising:
a) a multi-layered coil block formed by laminating and sintering sheets made from a ceramic material containing glass, at least one of the sheets having conduction patterns located thereon, said multi-layered coil block having an opening and a recess formed therein;
b) external electrodes formed at a peripbery of each of the layers of said multi-layered coil block and connected to said conduction patterns; and
c) a core inserted into said opening in said multi-layered coil block and located in said recess in said multi-layered coil block such that the multi-layered coil block and the core are contained in a common plane.

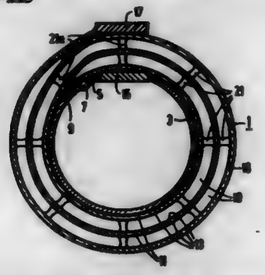


5,598,136
CHIP COIL AND MANUFACTURING METHOD THEREOF
Osamu Kano, and Atsuo Sendo, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Continuation of Ser. No. 206,823, Mar. 2, 1994, abandoned, which is a continuation of Ser. No. 25,820, Mar. 3, 1993, abandoned, which is a continuation of Ser. No. 885,059, May 15, 1992, which is a continuation of Ser. No. 730,493, Jul. 16, 1991, which is a division of Ser. No. 671,670, Mar. 19, 1991, Pat. No. 5,071,509, which is a continuation of Ser. No. 395,907, Aug. 18, 1989, abandoned. This application Nov. 16, 1994, Ser. No. 341,681
Claims priority, application Japan, Aug. 19, 1988, 63-206951
Int. Cl.[6] H01F 5/00
U.S. Cl. 336—200 4 Claims



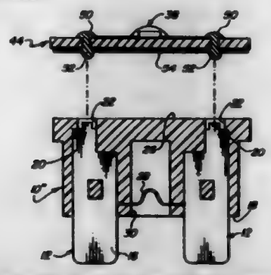
1. A chip coil, comprising:
a substrate having a first surface;
a coil conductor and a pair of terminal electrodes formed on said first surface of said substrate, said coil conducting having a first coil end and a second coil end, said first coil end being connected to one of said pair of terminal electrodes;
a connecting conductor having a first connecting end and a second connecting end, said first connecting end being connected to said second coil end, said second connecting end being connected to the other of said pair of terminal electrodes;
a first insulation film arranged between said coil conductor and said connecting conductor, said connecting conductor being extended from said first connecting end and away from said first surface of said substrate in a direction of a thickness of said first insulation film to a surface of said first insulation film and then to said second connecting end; and
a second insulation film covering at least a portion of said connecting conductor.

5,598,137
COIL FOR HIGH-VOLTAGE TRANSFORMER
Friedrich Alber, Koengen; Rudolf Dodelmaier, Aichtal; Siegfried Kramer, Kirchheim; Hans Schott, Lenningen, and Siegfried Weiss, Bissingen, all of Germany, assignors to Siemens Aktiengesellschaft, München, Germany
PCT No. PCT/DE92/00189, § 371 Date Sep. 26, 1994, § 102(e) Date Sep. 26, 1994, PCT Pub. No. WO93/18528, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 5, 1992, Ser. No. 295,762
Int. Cl.[6] H01F 27/28
U.S. Cl. 336—223 20 Claims



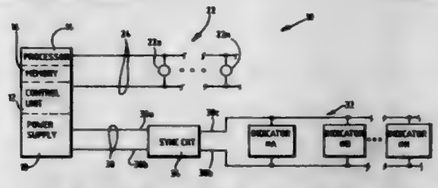
1. A coil, particularly for a high-tension transformer comprising:
a first electroconductive winding;
a first connecting element;
a second connecting element;
an insulating member attaching said first connecting element to said second connecting element; and
a second electroconductive winding arranged in insulated manner relative to the first winding and electrically connected to said second connecting element,
wherein:
said first winding forms a cylindrical former having an axial slit,
an insulating part is inserted into said axial slit, and
said second winding is carried by the first winding in an insulated manner.

5,598,138
FAULT-INDICATING BLADE FUSE
Joseph P. Jarzaczyk, Jr., 21 Pine Dr., Windsor, Conn. 06095
Filed Jan. 3, 1995, Ser. No. 368,383
Int. Cl.[6] H01H 85/30
U.S. Cl. 337—265 17 Claims



1. A fault-indicating blade fuse comprising a relatively thin and flat, generally rectangular, dielectric body defined by top, bottom and opposite side margins, and having an upper portion of long, narrow profile, taken in transverse cross section; a pair of generally parallel metal blades projecting downwardly beyond said bottom margin of said body; a link within said body electrically interconnecting said blades and being fusible to break the interconnection when subjected to current exceeding a rated value; and a light-emitting electrical device positioned for ready visibility from above said fuse and lying within the bounds of said upper body profile, said light-emitting device being so constructed and so connected to said blades as to be activated, for light emission, upon fusion of said link when subjected to such excessive current.

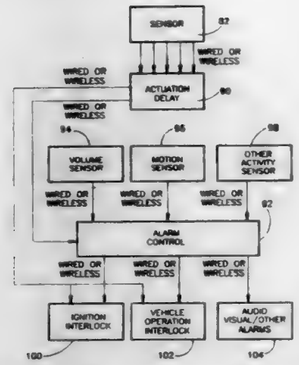
5,598,139
FIRE DETECTING SYSTEM WITH SYNCHRONIZED STROBE LIGHTS
Zia Karim, Warrenville, and Ed Thorp, Aurora, both of Ill., assignors to Pittway Corporation, Chicago, Ill.
Continuation of Ser. No. 129,744, Sep. 30, 1993, abandoned. This application Mar. 20, 1995, Ser. No. 406,658
Int. Cl.[6] G08B 25/00
U.S. Cl. 340—286.11 5 Claims



1. A fire detecting system with synchronized visual outputs indicative of a detected fire condition, the system comprising:
a plurality of spaced apart sensors wherein each of said sensors provides a signal indicative of a sense ambient condition;
a control unit with at least one communications link for providing bidirectional communication between said sensors and said unit, wherein said control unit includes circuitry for detecting an alarm condition in response to signals received from said sensors via said link, and wherein said unit includes a power supply which is enabled when said condition is detected;
a power conductor, separate from said link, coupled to said power supply;
a synchronizing circuit, coupled to said power conductor wherein said circuit produces a plurality of common, spaced apart synchronizing electrical pulses on at least a portion of said conductor, in response to said power supply being enabled; and
a plurality of flashable visual output devices, coupled in parallel to one another on said portion of said conductor, for receiving energy from said supply, if enabled and for receiving said common synchronizing pulses and wherein said output devices flash at essentially the same time, at a first rate, in response to said common synchronizing pulses and wherein said output devices flash in response to energy from said supply, in the absence of said synchronizing pulses.

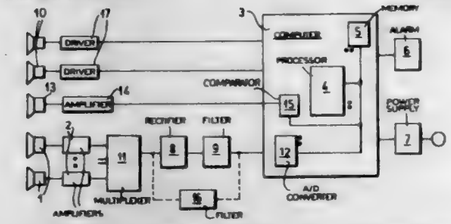
5,598,140
VEHICLE ANTI-THEFT SYSTEM INCLUDING A GEARSHIFT LOCK AND AN ANTI-THEFT DEVICE OPERATED THEREBY
Noach Elzas, Rishon Lezion, Israel, assignor to Mul-T-Lock Inc., Yavne, Israel
Continuation of Ser. No. 787,902, Nov. 5, 1991, Pat. No. 5,331,307. This application May 9, 1994, Ser. No. 240,184
Claims priority, application Israel, Nov. 6, 1990, 96262
Int. Cl.[6] B60R 25/10
U.S. Cl. 340—426 13 Claims

1. A vehicle including:
a gear shift lever;
a gear shift lock and a locking element for selectable locking engagement therewith said gear shift lock and locking element being operative to immobilize the gear shift lever; and
an ancillary vehicle anti-theft device,
said gear shift lock having a lock housing,



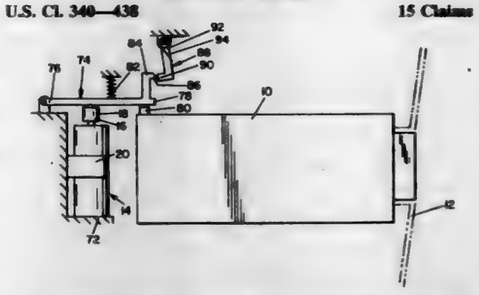
said locking element being operative for selectable locking engagement with the gear shift lock by insertion of said locking element into the gear shift lock without requiring key operation;
said gear shift lock including a locking element orientation sensor for sensing when said locking element is in locking engagement with said gear shift lock: and
said ancillary vehicle anti-theft device being characterized in that it is:
actuated indirectly other than by manual activation of said anti-theft device; and
deactuated automatically by removal of the locking element from locking engagement with the gear shift lock.

5,598,141
METHOD OF MONITORING A VEHICLE INTERIOR
Ullrich Grassmann, Düsseldorf; Michael Bollerott, Essen; Bertram Brenner, Dillingen/Dieffen, and Frank Obergriesser, Spiesen, all of Germany, assignors to Kiekert Aktiengesellschaft, Heiligenhaus, Germany
Filed Jul. 17, 1995, Ser. No. 503,150
Claims priority, application Germany, Jul. 16, 1994, 44 25 177.7
Int. Cl.[6] B60R 25/10
U.S. Cl. 340—426 16 Claims



1. A method of monitoring an interior of an automotive vehicle against an incursion, said method comprising the steps of:
(a) detecting sound waves in said interior;
(b) converting detected sound waves into electrical measurement signals representing the detected sound waves;
(c) amplifying said electrical measurement signals and supplying amplified electrical measurement signals to a computer;
(d) storing in said computer sample signals representing incursion conditions;
(e) automatically in said computer comparing said amplified electrical signals with the stored sample signals in accordance with a test function constituting least one of an identity test function and a similarity test function; and
(f) automatically with said computer triggering an alarm upon determination of an incursion determined by said test function by comparison of said amplified electrical signals with at least one of the stored sample signals, sound waves detected in said interior being generated by superimposition of sound waves on sound waves reflected within said interior from a sound wave emitter generating primary acoustic pulses in the vehicle interior, said sample signals stored in said computer representing sound waves produced by a primary sound wave source and reflected in a vehicle interior and other sound waves superimposed thereon.

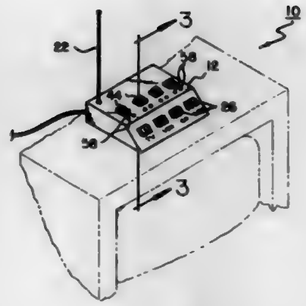
5,598,142
VEHICLE ACCESSORY PROTECTION SYSTEMS
James E. Winner, Jr., Hollywood Beach, Fla., assignor to Winner International Royalty Corporation, Sharon, Pa.
Division of Ser. No. 258,076, Jun. 10, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 566,688
Int. Cl.[6] B60Q 1/00
U.S. Cl. 340—438 15 Claims

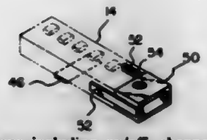


1. A security system for preventing unauthorized removal of a vehicle accessory from a mounted position on a vehicle comprising, dispensing container means containing a pressurized protective material and including valve means displaceable from a closed position to an open position in which said protective material is dispensed from said container means, a valve actuator member for displacing said valve means from said closed to said open position, said accessory in said mounted position thereof holding said actuator member in a first position corresponding to said closed position, means for displacing said actuator member in a direction from said first position toward a second position corresponding to said open position of said valve means in response to displacement of said accessory from said mounting position, and means for releasably holding said actuator member in a third position in which said actuator member is inoperable for displacing said valve means.

5,598,143
REMOTE CONTROL BEEPER LOCATOR
Jeff D. Wentz, 106 Cedar St., Lehighton, Pa. 18235
Continuation of Ser. No. 165,178, Dec. 13, 1993, abandoned. This application Jan. 22, 1996, Ser. No. 589,789
Int. Cl.[6] G08B 1/08
U.S. Cl. 340—539 1 Claim

1. A system for changing the function of a television set through a fixedly positioned remote control signal box and a hand held remote beeper and for locating the beeper if lost comprising:
a remote control signal box positionable in association with a television set and operatively connectable thereto, the control signal box being used to change functions of the television set





with such functions including on/off, channel changer, and volume changer, the control signal box having a receiver for receiving a signal from a remote source for changing such functions;

a plurality of hand held, remotely positionable beepers operatively coupled to the control signal box, each beeper having an emitter to emit a signal, the beepers including a first beeper for emitting a signal that changes the function of the television set, a second beeper for emitting a signal that changes the function of a videocassette recorder, and a third beeper for emitting a signal that changes the function of a compact disc player, and a battery within each beeper for the powering thereof;

a plurality of compact beeper modules each having a pair of resilient parallel fingers with inwardly facing frictional surfaces adapted to contact and grasp the end of the each beeper;

an emitter in the control signal box with an antenna adapted to send out an electrical signal in a citizen band range at any one of a plurality of frequencies corresponding in number to the number of beepers, a plurality of switches in the control signal box corresponding in number to the number of beepers, the switches adapted to generate and emit a signal of a different frequency when actuated, the switches being energized selectively by a user;

a receiver and antenna each contained within the compact beeper module of the first beeper, the second beeper, and the third beeper, each receiver adapted to receive a discrete electrical signal, each receiver being tuned to a particular frequeacy emitted by the control signal box as dictated by the particular switch energized by a user; and an audio component in each receiver to generate a noise upon receipt by the beeper of a particular signal from the control signal box of its associated tuned frequency, the audio component being powered by a battery;

recharging contacts disposed within the control signal box and removably securable with the beeper for recharging its battery; and

attachment means formed of a pile type fastener for removably coupling the beeper with the control signal box.

5,598,144

ANTI-THEFT VEHICLE SYSTEM

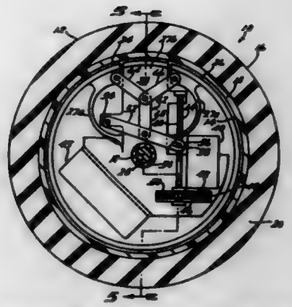
Jeffrey J. Lace, Huntington Beach, Calif., assignor to Actodyne General, Inc., Huntington Beach, Calif.

Filed Dec. 30, 1994, Ser. No. 366,886

Int. Cl.[6] G08B *13/14*

U.S. Cl. 340—568 **23 Claims**

1. An anti-theft vehicle system for a vehicle wheel having a rotational axis comprising:



at least one inhibitor disposed within the vehicle wheel to selectively engage and disengage the vehicle wheel to resist and allow rotational movement of the vehicle wheel about the rotational axis; rotatable means disposed within the vehicle wheel and cooperating with said at least one inhibitor for moving said at least one inhibitor between an engaged position and a disengaged position with the vehicle wheel; and

a receiver mounted within the vehicle wheel to receive an electrical signal to activate said rotatable means.

5,598,145

DRIVER PHOTOGRAPHING APPARATUS

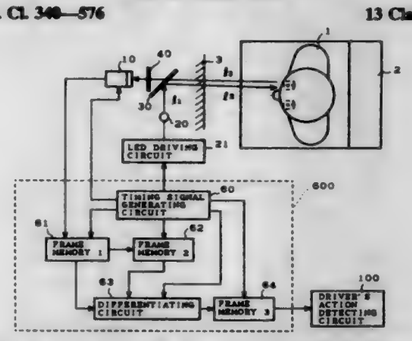
Mitsuo Shimotani; Minoru Nishida; Akira Okada, and Yoshiharu Morihiro, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1994, Ser. No. 288,936

Claims priority, application Japan, Nov. 11, 1993, 5-282502

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—576 **13 Claims**



1. A driver photographing apparatus for monitoring a driver in a vehicle wherein background light is present, the driver having eyes with pupils, the photographing apparatus comprising:

an illuminating means for illuminating the driver with a first beam of light along a first optical path, the first beam of light being reflected from the driver to form a second beam of light along a second optical path, the second beam of light having a frequency;

a photographing means for forming an image based upon light received at the photographing means, the photographing means being disposed along the second optical path so that the photographing means receives the second beam of light and forms an image of said driver, the first and second optical paths being along a substantially same axis; and

limiting means for limiting an effect of the background light on the image, the limiting means including means for limiting the effect on the image of components of the background light at the frequency of the second beam of light.

5,598,146

RAIN SENSOR

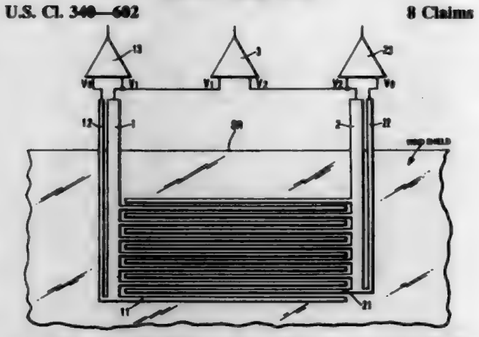
Hans-Joachim Schröder, Wiesbaden, Germany, assignor to VDO Adolf Schindling AG, Frankfurt, Germany

Filed Jul. 10, 1995, Ser. No. 500,417

Claims priority, application Germany, Jul. 11, 1994, 44 24 028.7

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—602 **8 Claims**



1. A rain sensor located on the outside of the windshield of a motor vehicle in a region passed over by a windshield wiper, the sensor comprising:

at least one conductive track which is connected to an electric potential within the motor vehicle,

wherein said at least one conductive track configured as a loop to permit measurement of a loop resistance of the conductive track for an electrical detection of a tear in said at least one conductive track.

5,598,147

SMOKE DETECTING APPARATUS FOR FIRE ALARM

Mikio Mochizuki; Hideo Ito, and Ryousaku Kobayashi, all of Tokyo, Japan, assignors to Nohmi Bosai Ltd., Tokyo, Japan

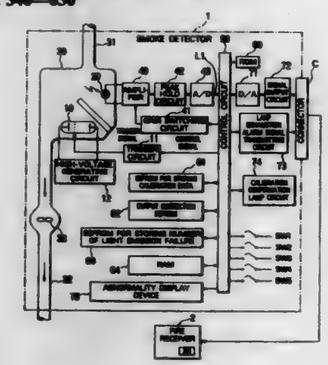
Continuation of Ser. No. 144,421, Nov. 2, 1993, abandoned.

This application Nov. 2, 1995, Ser. No. 552,175

Claims priority, application Japan, Nov. 4, 1992, 4-319351; Nov. 5, 1992, 4-321277

Int. Cl.[6] G08B *17/10*

U.S. Cl. 340—630 **17 Claims**



1. A smoke detecting apparatus comprising:

a smoke chamber into which smoke to be detected is introduced;

a light emitting lamp disposed in said smoke chamber;

a light receiving element disposed in said smoke chamber so as to receive light emitted from said light emitting lamp and scattered by said smoke;

amplification means for amplifying an output signal from said light receiving element;

augmentation means for augmenting, upon receipt of a command, the output signal of said amplification means; and

control means for (a) detecting a density of the smoke on the basis of an output signal from said amplification means, (b) comparing an amplitude of the output signal from said amplification means with a fixed value, and (c) generating an abnormality indication when the amplitude of the output signal from said amplification means is judged to be smaller than said fixed value;

augmentation command switch means manually switched on to apply said command to said augmentation means, the amplitude of the output signal from said amplification means being gradually augmented every time said augmentation command switch means is manually switched on when the abnormality indication is generated by said control means.

5,598,148

METHOD AND A NETWORK FOR TRANSMITTING LOCAL AND GLOBAL RADIO CALLS

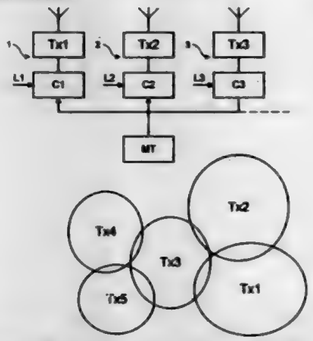
Helmut Koechler, Samstagern, Switzerland, assignor to Erika Koechler, Samstagern, Switzerland

Filed Oct. 17, 1994, Ser. No. 323,550

Claims priority, application European Pat. Off., Dec. 3, 1993, 93119476

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.21 **5 Claims**



1. A method for operating a radio transmitter sending digital messages, said radio transmitter receiving high priority messages from a first source and low priority messages from a second source, wherein each of said high priority messages is to be sent at a predefined time, said method comprising the steps of:

assembling said high priority messages into a global signal and filling gaps in said global signal with predefined gap markers, said global signal substantially corresponding to the signal to be emitted by the radio transmitter in the absence of low priority messages,

feeding said global signal to said radio transmitter,

determining in said radio transmitter if any of said low priority messages are to be sent and if yes, replacing at least part of said gap markers by said low priority messages.

5,598,149

COMMERCIAL-SIZE, AUTOMATIC INDUSTRIAL PLANT HAVING SEVERAL PARTS

Klaus-Dieter Schreiter, Erlangen, and Wilhelm Stewen, Oberhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, and Ruhrkohle Aktiengesellschaft, Essen, both of Germany

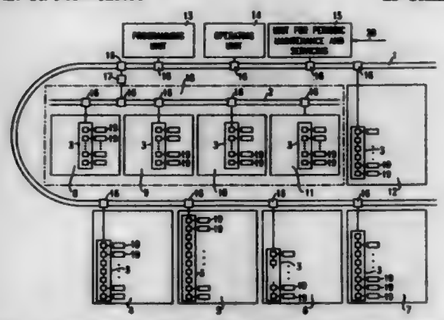
PCT No. PCT/EP92/01725, § 371 Date Mar. 28, 1994, § 102(e) Date Mar. 28, 1994, PCT Pub. No. WO93/03429, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 30, 1992, Ser. No. 185,883

Claims priority, application Germany, Jul. 31, 1991, 41 25 374.4

Int. Cl.[6] H04Q 9/00

U.S. Cl. 340—825.06 23 Claims



1. An automation system for a primary industry industrial plant having several partially interacting parts, comprising:

a) automation devices which carry out individual functions;

b) a data bus;

c) local data transmission units connecting said automation devices thereby permitting said automation devices to exchange data directly and thereby defining automation groups being capable of operating autonomously, according to the technological structure of the plant; and

d) interface units coupling said local data transmission units to said data bus, wherein said automation devices independently process values from the plant to control the plant components assigned to each of the automation groups distributed according to their programming, based on plant data supplied to them, said interface units allowing communication between automation devices allocated to different automation groups.

5,598,150

POLLING COMMUNICATION SYSTEM

Noriyuki Suzuki, Tokyo; Kazutoshi Shimada, Yokosuka; Eisaku Tatsumi, Yokohama; Shinichi Sunakawa, Kawasaki, and Katsuhiko Nagasaki, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1993, Ser. No. 68,192

Claims priority, application Japan, Jun. 1, 1992, 4-165329; Apr. 23, 1993, 5-120594

Int. Cl.[6] H04Q 1/00

U.S. Cl. 340—825.07 34 Claims

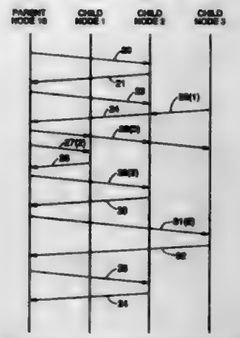
1. A communication system comprising a parent node and a plurality of children nodes, wherein

said parent node receives messages having a predetermined format from the plurality of children nodes;

when said parent node receives a broken predetermined message from the plurality of children nodes, the parent node recognizes existence of a new child node and transmits a predetermined broadcast message to the plurality of children nodes, and

the parent node sequentially transmits a specific message to each of the children nodes;

said parent node receives a response message from each of the plurality of children nodes and recognizes the state of each of the plurality of children nodes in accordance with said response message received from each child node.



5,598,151

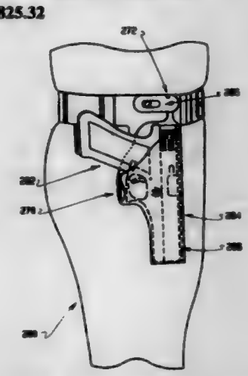
FIREARM SECURITY SYSTEM AND ACCESS LOCK THEREFOR

Dennis R. Teril, Jr., 122 State St., Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 986,433, Dec. 4, 1992, Pat. No. 5,416,472. This application Feb. 2, 1995, Ser. No. 382,536

Int. Cl.[6] G06F 7/04

U.S. Cl. 340—825.32 20 Claims



1. A firearm security system comprising a repository having a housing which defines an internal space which receives at least a portion of at least one firearm therein; a firearm received in the repository; means for transmitting a first alarm signal indicative of an emergency condition upon removal of the firearm from the repository; means operatively associated with the repository and the first alarm signal transmitting means for overriding the first alarm signal transmitting means to prevent transmission of the first alarm signal and instead transmit a second alarm signal indicative of authorized access to the firearm; and means for transmitting a third alarm signal independently of the removal of the firearm from the repository.

5,598,152

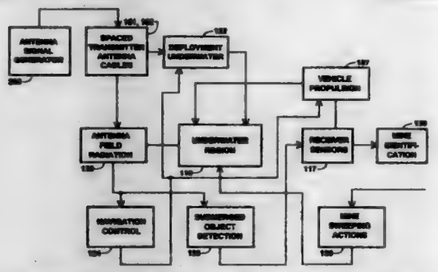
MINE SWEEPING SYSTEM FOR MAGNETIC AND NON-MAGNETIC MINES

John F. Scarzello, Columbia; Peter B. Keller, Takoma Park, and Richard W. Harrison, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1994, Ser. No. 368,268

Int. Cl.[6] H04B 13/02; G01S 17/00; B63G 7/06

U.S. Cl. 340—850 10 Claims



1. A mine sweeping system having antenna cables from which electromagnetic radiation is emitted and receiver means for detection of emitted electromagnetic radiation, a method comprising the steps of: deploying said antenna cables in spaced relation to each other within an underwater region to establish therein an electromagnetic a radiation field modified by objects to be detected; controlling signal input to said antenna cables for establishing a navigational grid within the electromagnetic radiation field throughout the underwater region; transporting said receiver means through the underwater region under control of said navigational grid; and signal processing data output from the receiver means during said transporting thereof for identification and location of said objects to be detected within the underwater region.

5,598,153

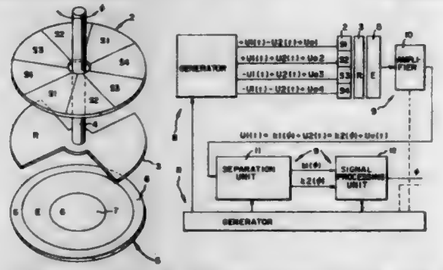
CAPACITIVE ANGULAR DISPLACEMENT TRANSDUCER

Georg Brasseur, Esslergasse 20, A-1130 Wien, and Thomas Eberharter, Sebastian Kneipp Gasse 10/6, A-1020 Wien, both of Austria

Filed Jul. 8, 1993, Ser. No. 87,261

Int. Cl.[6] G08C 19/10

U.S. Cl. 340—870.37 10 Claims



1. Measuring device for the measurement of a rotor angle Φ including a capacitive angular displacement transducer for generating an output that varies with an angular displacement Φ of a shaft, comprising:

a first stator having a plurality of transmitting electrodes used to generate electric fields within the transducer due to excitation signals applied to said plurality of transmitting electrodes, said plurality of transmitting electrodes being a number of electrically conducting circle sectors of equal area which are electrically isolated from each other and completely cover a rotational angle of 2π on said first stator;

a second stator which is parallel and coaxial to said first stator comprising a conductive ring electrode for receiving excitation from said first stator and producing an electric output signal;

a rotor mounted on an axis and located parallel and coaxial between said first stator and said second stator, said rotor having at least one rotor blades in the form of circle sectors, wherein the central angle of each rotor blade is equal to at least the sum of the central angles of two sectors of said first stator

a generator delivering output voltages to the sectors and an evaluation unit connected to said second stator;

said generator providing at least two different electrically separable output signals;

said evaluation unit using one single input and comprising at least one separation unit connected via an amplifier to said second stator;

said at least one separation unit being capable to separate the received input signal with respect to the excitation signals into angle dependent transfer functions, and a following signal processing unit determining the rotor angle from said angle dependent transfer functions.

5,598,154

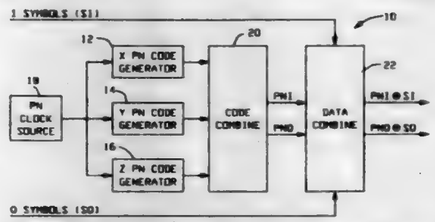
APPARATUS AND METHOD FOR GENERATING AND UTILIZING PSEUDONOISE CODE SEQUENCES

Michael L. Wilson, Salt Lake City; John W. Zscheile, Jr., West-Farmington; Richard J. Saggio, and Alan E. Lundquist, both of Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 2, 1994, Ser. No. 348,669

Int. Cl.[6] H03M 7/00

U.S. Cl. 341—50 11 Claims



1. Apparatus and method for generating a plurality of mutually orthogonal sequence signals, comprising:

a clock;

a first plurality of PN code generators each clocked by said clock and each producing a PN sequence signal, said resulting first plurality of PN sequence signals being independent of each other, wherein each of said first plurality of PN sequence generators also produces a signal representing the inverse of its PN sequence signal and signal representing another phase of its PN sequence signal; and

code combining means, receiving said first plurality of PN sequence signals, said first plurality of inverted PN sequence signals and said first plurality of differently phased PN sequence signals, for producing a second plurality of mutually orthogonal PN sequence signals, wherein each of said second plurality of PN sequence signals represents a PN sequence that is longer than any of the first plurality of PN sequence signals, the first plurality of inverted PN sequence signals and the first plurality of differently phased PN sequence signals.

5,598,155

VARIABLE LENGTH DECODING METHOD AND APPARATUS

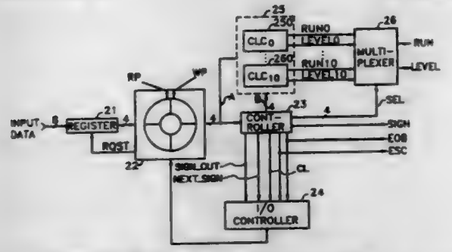
Wooyoun Ahn, Songtan, and Myung-rae Cho, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Sep. 26, 1995, Ser. No. 536,305

Claims priority, application Rep. of Korea, Sep. 26, 1994, 94-24148

Int. Cl.[6] H03M *7/40*

U.S. Cl. 341—67 **22 Claims**



1. A variable length decoding apparatus comprising:

memory means for storing and outputting variable length coded data in increments of N-bit data,

wherein an increment of said N-bit data which is currently output from said memory means is a current N-bit data, and another increment of said N-bit data which is output before said current N-bit data is a previous N-bit data;

wherein said memory means outputs said previous N-bit data and shifts said previous N-bit data from an initial bit of said previous N-bit data by a value of a control signal, and

wherein said memory means subsequently outputs said current N-bit data which has an initial bit that is determined by shifting said previous N-bit data;

control means for inputting said previous and current N-bit data and for determining a particular group of a plurality of groups to which said current N-bit data belongs,

wherein said plurality of groups comprise variable length codes of a variable length code table and are formed based on characteristics of said variable length codes,

wherein said control means determines said particular group by comparing code state values with said current N-bit data,

wherein said code state values respectively correspond to said plurality of groups of said variable length codes, and

wherein said control means outputs a code length signal which represents a number of bits of one of said code state values used to determine said particular group, a select signal which represents said particular group, and said previous N-bit data;

combination logic means for generating a plurality of symbols,

wherein said combination logic means comprises a plurality of input logic combinations which respectively correspond to said plurality of groups,

wherein values of said plurality of input logic combinations are determined based on said previous N-bit data output from said control means and said current N-bit data output from said memory means,

wherein said plurality of symbols are respectively obtained for each of said plurality of groups based on said values of said input logic combinations; and

a multiplexer for receiving said plurality of symbols generated by said combination logic means and for selectively outputting a selected symbol from said plurality of symbols based on said select signal from said control means.

5,598,156

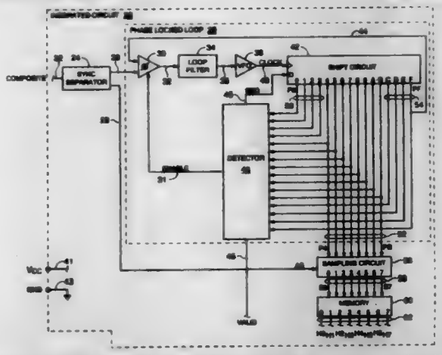
SERIAL TO PARALLEL CONVERSION WITH PHASE LOCKED LOOP

Glen Hush, Boise; Jake Baker, Meridian, and Tom Voshell, Boise, all of Id., assignors to Micron Display Technology, Inc., Boise, Id.

Filed Jan. 13, 1995, Ser. No. 372,412

Int. Cl.[6] H03M *9/00*

U.S. Cl. 341—100 **22 Claims**



5. A serial to parallel conversion circuit that provides a plurality of parallel signals in response to an input signal, wherein the input signal conveys data in serial and conveys a synchronizing signal, the conversion circuit comprising:

a. a phase locked loop comprising:

(1) an oscillator that provides a clock signal at a period responsive to an error signal;

(2) a shift circuit that shifts in response to the clock signal, provides a pointer signal, and provides an overflow signal;

(3) a comparator that provides the error signal by comparing in response to the synchronizing signal and the overflow signal; and

b. a plurality of memory devices that provide the plurality of parallel signals, wherein the pointer signal identifies a memory device of the plurality for writing in response to the data.

5,598,157

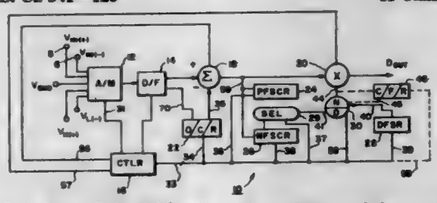
SIGMA DELTA ANALOG TO DIGITAL CONVERTER WITH THREE POINT CALIBRATION APPARATUS AND METHOD

John J. Korablum, Indialantic; Carlos A. Ugarte, Palm Bay, both of Fla., and Fan Y. Ma, Girang, Singapore, assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 28, 1994, Ser. No. 331,015

Int. Cl.[6] H03M *1/10*

U.S. Cl. 341—120 **11 Claims**



5. A Sigma Delta ADC with n bit resolution and three point calibration comprising:

an analog modulator;

means for applying an input offset reference signal to the Sigma Delta analog modulator to generate a digital offset correction signal;

an offset correction register for storing the digital offset correction signal;

means for applying a positive full scale signal to the Sigma Delta analog modulator to generate a positive full scale digital signal;

a positive full scale correction register for storing the positive full scale digital signal;

means for applying a negative full scale signal to the Sigma Delta analog modulator to generate a negative full scale digital signal; and

a negative full scale correction register for storing the negative full scale digital signal.

5,598,158

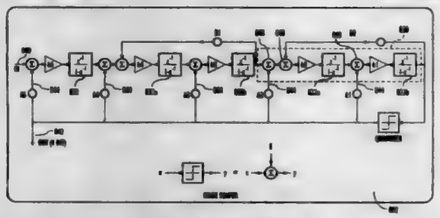
DIGITAL NOISE SHAPER CIRCUIT

Alfredo R. Linz, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 2, 1994, Ser. No. 333,386

Int. Cl.[6] H03M *3/02*

U.S. Cl. 341—143 **16 Claims**



1. A 1-bit noise shaper circuit, comprising:

a fifth order sigma-delta modulator network having a plurality of feedback paths, wherein said sigma-delta modulator network includes a plurality of integrators, wherein each said integrator includes an input, wherein said input of each said integrator is connected to a separate one of said feedback paths and wherein an n-bit digital signal input to said noise shaper circuit is converted to a 1-bit digital output signal, where n is greater than 1.

5,598,159

METHOD FOR THE FAST DECODING OF THE OUTPUT SIGNALS OF SIGMA DELTA MODULATORS

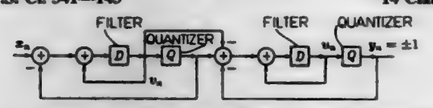
Soeren Hein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 24, 1995, Ser. No. 378,256

Claims priority, application Germany, Jan. 24, 1994, 44 01 883.5

Int. Cl.[6] H03M *3/00*

U.S. Cl. 341—143 **14 Claims**



1. A method for fast decoding of output signals of sigma delta modulators comprising the steps of:

acquiring a decoded output signal of a modulator using a sequence $x_{n+1}=P_2(P_1(x_n))$ of iteration steps, whereby x_0 is a predetermined start signal;

successively implementing two operations P_1 and P_2 in each of said iteration steps;

representing signals s by components s(n), s(n−1), s(n−2), . . . ,s(n−k) that are temporal samples of said signals s;

the operation P_1 being a projection in a space of all input signals of the modulator onto a set of all input signals that the modulator images onto an output signal to be decoded;

the operation P_2 being a projection onto a sub-space of all input signals of the modulator whose frequency spectrum is limited in a predetermined manner; and

selecting a representation of the input signals for both operations wherein the operation P_1 is implemented component-by-component, so that each component P_1 (s)(k) of P_1 (s) is calculated separately from all other components P_1 (s)(k') where k'≠k.

5,598,160

SIGNAL PROCESSING CIRCUIT WITH BUILT-IN DYNAMIC RANGE MATCHING

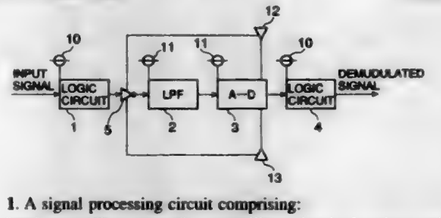
Makoto Matsushima, Mineo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 11, 1994, Ser. No. 320,686

Claims priority, application Japan, Oct. 14, 1993, 5-257052

Int. Cl.[6] H03M *1/12;1/06*

U.S. Cl. 341—155 **9 Claims**



1. A signal processing circuit comprising:

level-controlling means for controlling a level of a given pulse signal,

the level controlling being performed in a predetermined manner;

analog-signal producing means for producing an analog signal by integrating said pulse signal having undergone said level controlling; and

analog-signal processing means for processing said analog signal with a dynamic range thereof, said dynamic range being defined by a predetermined reference level, wherein the level controlling is performed in the predetermined manner such that a substantial possible level variation extent of said analog signal received by said analog-signal processing means corresponds to said dynamic range.

5,598,161

ANALOG-TO-DIGITAL CONVERTER HAVING REDUCED CIRCUIT AREA

Chikara Yamada, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Dec. 9, 1993, Ser. No. 163,763

Claims priority, application Japan, Dec. 18, 1992, 4-355504; Dec. 22, 1992, 4-356837; Dec. 25, 1992, 4-358926; Dec. 29, 1992, 4-361550; Dec. 29, 1992, 4-361551

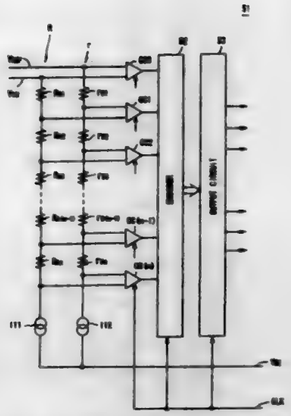
Int. Cl.[6] H03M *1/36;1/14*

U.S. Cl. 341—159 **21 Claims**

1. An analog-digital convertor circuit for entering to comparing means a plurality of reference voltages each divided by a selected voltage gradient and an input analog signal and outputting said input analog signal by converting said signal into a digital signal, wherein:

said input analog signal is inputted to an array of resistors in which a plurality of resistors are connected in series;

said input analog signal is attenuated by a nonlinear voltage gradient via said array of resistors and is inputted to said plurality of comparison means as an attenuated analog signal; and



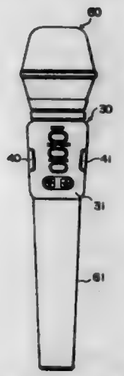
said input analog signal is converted into the digital signal based on the result of comparison between said attenuated analog signal and said plurality of reference voltages.

5,598,162

REMOVABLE AUDIO REMOTE CONTROLLER FOR A MICROPHONE

Junichi Terashima, and Jun Maruyama, both of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan

Filed Sep. 18, 1995, Ser. No. 529,869
Claims priority, application Japan, Nov. 14, 1994, 6-279514
Int. Cl.[6] G08C *19/12*
U.S. Cl. 341—176 **27 Claims**



1. A removable audio remote controller for attachment to a hand-held microphone body to enable a user to provide special effects to audio output signals from an audio reproduction system while holding the microphone, comprising:

a remote controller housing configured to be removably mounted on the microphone body;

a holder connected to the remote controller housing and configured to be removably secured to the microphone body;

user means on the remote controller housing for selecting audio effects to be applied to an audio output signal; and

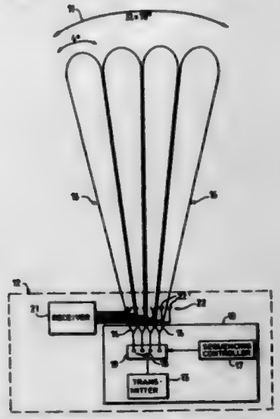
signal emitting means, on the remote controller housing, for communicating the selected audio effects to the audio reproduction system.

5,598,163

METHOD AND SYSTEM FOR OBJECT DETECTION WITHIN AN ANGULAR ZONE, AND ITS APPLICATIONS

Pascal Cornic, St Renan, and Patrice Cross, Plougonvelin, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Apr. 23, 1993, Ser. No. 53,157
Claims priority, application France, Apr. 30, 1992, 92 05373
Int. Cl.[6] G01S *7/28;13/06;13/60*
U.S. Cl. 342—70 **18 Claims**



1. A method using electromagnetic waves to detect one or more objects located in a given angular zone comprising the steps of:

successively illluminating, during transmission, a plurality of consecutive elementary zones that divide up said angular zone using at least one radiation pattern having a main lobe, said main lobe being defined as the region of said radiation pattern above a fixed threshold which is higher than or equal to the level of the side lobes of said pattern, said main lobe completely including a useful portion corresponding to a region free of overlap by main transmission lobes for said consecutive elementary zones,

receiving echo signals in parallel on a thinned array comprising a plurality of receiving elements i, and having an array function such that, for each of said illuminated elementary zones, a first lobe of said array function is comprised within said useful portion, and the two lobes immediately preceding and succeeding said first lobe are outside said main lobe, reception employing digital beam forming in a plurality of angular directions θ_{ri} , each said θ_{ri} corresponding to one of said elementary zones,

detecting, by comparison with a given threshold, the presence of echoes received in said various angular directions θ_{ri}, and

deducing therefrom an angular position of said objects detected.

5,598,164

VEHICLE OBSTACLE AVOIDANCE SYSTEM

George S. Reppas, 1030 San Raymundo Rd., Hillsborough, Calif. 94010; Robert G. Reppas, 48 Highland, Apt. 2, Cambridge, Mass. 02139, and Charles B. Reppas, 502 225th Pl., SE., Bothell, Wash. 98021

Continuation-in-part of Ser. No. 926,281, Aug. 10, 1992, abandoned. This application Aug. 9, 1993, Ser. No. 103,849
Int. Cl.[6] G01S *13/93*
U.S. Cl. 342—70 **18 Claims**

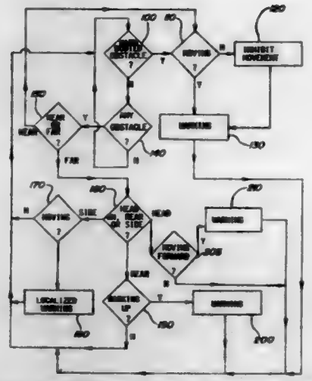
1. A vehicle system for warning of obstacles, the system comprising:

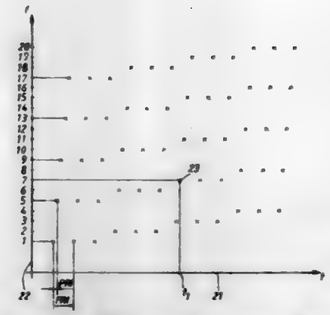
detection means for detecting the relationship of said obstacles to said vehicle;

discrimination means for determining the state of said vehicle, said state including whether said vehicle is moving or stationary, said discrimination means determines whether said vehicle is stationary by determining if said vehicle is in park or stopped;

logic means for interpreting said vehicle state and said relationship of said obstacles and for automatically causing forward movement of said vehicle to be inhibited without driver interaction when said vehicle state indicates said vehicle is stationary and when said detection means indicates said obstacle is within a predetermined proximity of said vehicle and when said obstacle is forward of said vehicle by automatically preventing said vehicle to be put in gear if said vehicle is in park or by automatically actuating a brake if said vehicle is stopped, thereby automatically preventing said driver from inadvertently driving forward into said obstacle, and for automatically causing rearward movement of said vehicle to be inhibited without driver interaction when said vehicle state indicates said vehicle is stationary and when said detection means indicates said obstacle is within said predetermined proximity of said vehicle and when said obstacle is rearward of said vehicle by automatically preventing said vehicle to be put in gear if said vehicle is in park or by automatically actuating said brake if said vehicle is stopped, thereby automatically preventing said driver from inadvertently driving rearward into said obstacle; and

overriding means for overriding said inhibition of said vehicle movement upon acknowledgment of said obstacle by said driver.





the number of radio-frequency pulses having different frequencies in the group.

5,598,166

MOBILE OBJECT POSITIONING SYSTEM

Seiji Ishikawa, Aichi-gun; Yoshihisa Suwa, Nishio; Takeshi Ito, Toyota, and Tomio Yasuda, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 1, 1996, Ser. No. 626,722
Claims priority, application Japan, Mar. 30, 1995, 7-074237
Int. Cl.[6] H04B *7/185;* **G01S** *5/02*
U.S. Cl. 342—357 **4 Claims**

1. A mobile object positioning system comprising:

GPS signal receiving means for receiving positioning radio signals from a plurality of satellites;

electronic control means connected to said receiving means for calculating a present location of a mobile object in accordance with the positioning radio signals and outputting present location data at a plurality of calculating times; and

mobile velocity detecting means disposed on the mobile object for detecting velocity of a moving mobile object and outputting a mobile velocity signal to said electronic control means;

wherein said electronic control means includes:

present location memory means for updating the present location data at each calculating time and storing the present location data;

error data estimating means for estimating an error of the present location data in accordance with the positioning radio signals and outputting error data at each estimating time; and

update prohibition means for determining a stationary condition of the mobile object in accordance with the mobile

velocity signal and for prohibiting updating the present location data when the stationary condition of the mobile object is determined and a value of the error data of a present estimating time is larger than that of a last previous estimating time.

5,598,167

METHOD AND APPARATUS FOR DIFFERENTIAL LOCATION OF A VEHICLE UNDER CONTROL OF AN INTERNAL CHANGE OF STATUS

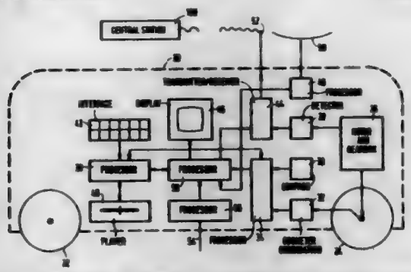
Frans Zijderhand, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1995, Ser. No. 433,669

Claims priority, application European Pat. Off., May 6, 1994, 94201259

Int. Cl.[6] G01S *3/02*

U.S. Cl. 342—457 **5 Claims**



1. A method for locating an earthbound and freely movable vehicle, said method comprising the steps of: interfacing a vehicle to an external coordinate system for determining an actual position of the vehicle, transmitting said actual position to a remote station, determining whether said vehicle has travelled a predetermined distance from said position and based on said determination, selectively transmitting a new actual position to said remote station.

5,598,168

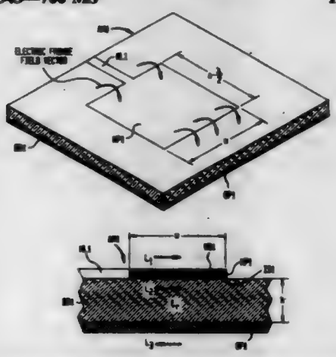
HIGH EFFICIENCY MICROSTRIP ANTENNAS

James G. Evans, Colts Neck; Martin V. Schneider, and Robert W. Wilson, both of Holmdel, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 8, 1994, Ser. No. 351,904

Int. Cl.[6] H01Q *11/38*

U.S. Cl. 343—700 MS **11 Claims**



1. A microstrip antenna for operation at a predetermined frequency, comprising:

a ground plane;

a dielectric substrate on said ground plane; and

a microstrip conductor arrangement having a microstrip conductor deposited on said substrate;

said microstrip conductor having a thickness sufficiently small to be substantially transparent to radiation is defined as permitting RF currents on an inner surface of said microstrip conductor to produce radiation, said inner surface being adjacent and facing said ground plane.

5,598,169

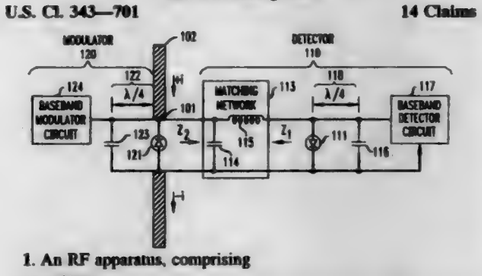
DETECTOR AND MODULATOR CIRCUITS FOR PASSIVE MICROWAVE LINKS

Lawrence M. Drabeck, Long Branch; Martin V. Schneider, Holmdel, and Cuong Tran, Howell, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 24, 1995, Ser. No. 409,782

Int. Cl.[6] H01Q *1/26*

U.S. Cl. 343—701 **14 Claims**



1. An RF apparatus, comprising

an antenna,

a detector diode connected across the antenna to detect modulated signals received by the antenna, said detector diode connecting to the antenna through a matching network such that an impedance of the detector diode at a predetermined RF frequency conjugately matches an antenna port impedance transformed through the matching network, and

a modulator diode connected across the antenna to modulate backscattering of the antenna.

5,598,170

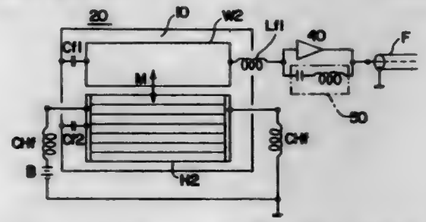
GLASS ANTENNA FOR AUTOMOBILES

Kazuhiko Nakase, Tokyo, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1992, Ser. No. 831,482

Int. Cl.[6] H01Q *1/02;1/32*

U.S. Cl. 343—704 **6 Claims**



1. A glass antenna for automobiles for receiving the FM broadcast band and the AM broadcast band, said antenna comprising:

a defogging heater wire which resonates in said FM broadcast band but not in said AM broadcast band,

a choke coil provided between a terminal end of said heater wire and a power supply circuit for preventing passage of signals in said FM broadcast band, and

a conductor which is installed in said window glass and has an output terminal, said conductor being resonant in said FM broadcast band but not in said AM broadcast band,

wherein said heater wire and conductor are installed in such a positional relationship that said heater wire and conductor are inductively coupled together in said FM broadcast band, said heater wire and conductor together are respectively capable of reception in said FM broadcast band, and said heater wire and conductor are not inductively coupled in said AM broadcast band so that reception of said AM broadcast band is accomplished only by said conductor.

5,598,171

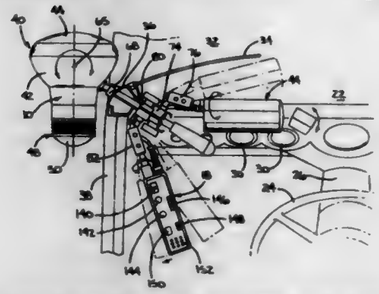
VELOCITY DETECTING SYSTEM

Carroll R. Cole, 2313 Ramsey Dr., Decatur, Ill. 62526

Division of Ser. No. 277,187, Jul. 19, 1994. This application Jun. 2, 1995, Ser. No. 459,752

Int. Cl.[6] H01Q *1/06;13/00*

U.S. Cl. 343—721 **2 Claims**



1. A radar antenna for a radar transmitting and receiving unit used to monitor the speed of a wheeled vehicle comprising:

a body of metallic material defining a cone shaped chamber, said chamber having a wide end open to one end of the exterior of said body and a narrow end opening to a turnstile cavity;

an oscillator mounted on said body adjacent said narrow end and in operable relation with said cavity; and

a spotlight housing including a pair of openings with a spotlight lens disposed in one of said openings and a spotlight within said housing, said spotlight housing mounting and surrounding at least part of said body to contain said oscillator while leaving said one end extending from said body through the other of said openings.

5,598,172

DUAL-POLARIZATION MICROWAVE LENS AND ITS APPLICATION TO A PHASED-ARRAY ANTENNA

Claude Chekroun, Gif sur Yvette, France, assignor to Thomson - CSF Radant, Les Ulis, France

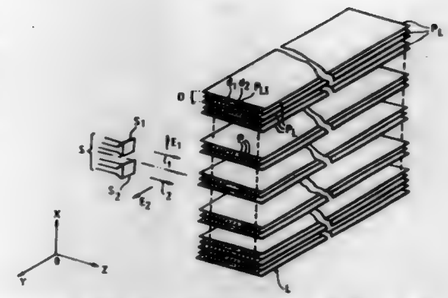
Filed Nov. 5, 1991, Ser. No. 799,785

Claims priority, application France, Nov. 6, 1990, 90 13708

Int. Cl.[6] H01Q *19/06;15/02*

U.S. Cl. 343—754 **12 Claims**

1. A microwave lens for receiving electromagnetic waves propagating in a first direction, said lens including a plurality of phase-shifting channels stacked along a second direction substantially normal to said first direction, said channels being separated from one another by conductive plates substantially perpendicular to said second direction, each of said channels including a plurality of phase-shifting panels disposed substantially perpendicular to said first direction, each of said panels carrying conductive wires substantially parallel to said second direction, said wires carrying diodes, the control of the On or OFF state of said diodes of a panel varying the phase shift induced by the panel on said waves, each of said channels being divided into at least two subchannels by means of an intermediate conductive plate disposed between two said conductive plates and substantially parallel thereto, the distance between one intermediate conductive plate and one adjacent conductive plate being at most equal to the half-wavelength of said waves, said two subchannels being respectively assigned to two waves whose electric fields are orthogonal, each including a plurality of phase-shifting panels, and means for rotating by 90° the polarization of the incident wave.



5,598,173

SHAPED-BEAM OR SCANNED BEAMS REFLECTOR OR LENS ANTENNA

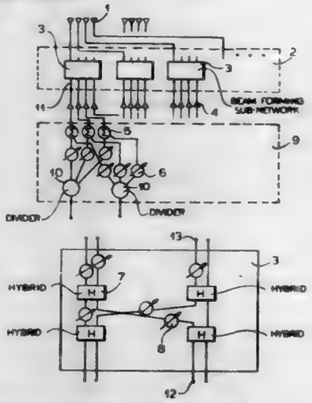
Raimondo Lo Forti, Guidonia, and Marco Lisi, Rome, both of Italy, assignors to Space Engineering S.p.A., Rome, and Alenia Spazion SpA, L'Aquila, both of Italy

Filed May 16, 1995, Ser. No. 442,142

Claims priority, application Italy, May 17, 1994, RM94A0306

Int. Cl.[6] H01Q *13/00;3/22*

U.S. Cl. 343—781 R **4 Claims**



1. A beam-type antenna system comprising:

an array of radiators defining an antenna beam;

antenna optics spaced from said array of radiators for focussing said beam and having a focal plane such that said array lies between said antenna optics and said focal plane and said array is outside said plane;

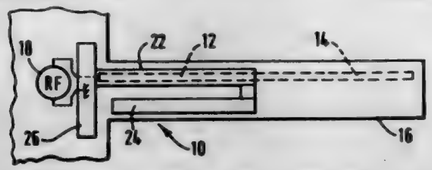
a passive main beam forming network connected to said array of radiators and comprising a plurality of beam forming subnetworks, each connected to a group of said radiators, each of said beam forming subnetworks being provided with pairs of input terminals, respective hybrids connected to said pairs of input terminals, respective phase shifters connected between said hybrids and respective output terminals, and further phase shifters connecting said hybrids of one pair of input terminals with hybrids of another pair of input terminals; and

respective power amplifiers connected to said input terminals.

5,598,174
PRINTED SLEEVE ANTENNA

Nedim Erkocevic, Nieuwegein, and Augustinus M. Jansen, St. Michielsgestel, both of Netherlands, assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Oct. 3, 1995, Ser. No. 538,316
Claims priority, application United Kingdom, Aug. 12, 1995, 9516564
Int. Cl.[6] H01Q 9/28
U.S. Cl. 343—795 6 Claims



1. An antenna system having a first end fed dipole antenna system (A_s) for a radio frequency generator having an operating wavelength (L), comprising:

on one side of an insulating sheet (16) a first and a second quarter wavelength (L/4) conductive strip (12, 14) in end-to-end connection;

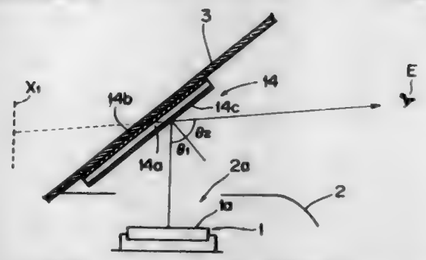
on the opposite side of the insulating sheet (16) a third quarter wavelength (L/4) conductive strip (22), overlying the first conductive strip (12), and a fourth conductive strip (24) of quarter wavelength (L/4) total length and having a longer arm spaced from and parallel to the third strip (22) and a shorter arm connected to the third strip;

and means to connect said radio frequency generator (18) between the end of the third strip (22) remote from the connection to the fourth strip (24), and the corresponding end of the first strip (12), whereby the second and fourth strips (14, 24) form a linear dipole antenna.

5,598,175
DISPLAY APPARATUS FOR VEHICLE

Tadashi Iino, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jan. 5, 1993, Ser. No. 610
Claims priority, application Japan, Jan. 7, 1992, 4-156 U
Int. Cl.[6] G09G 3/02
U.S. Cl. 345—7 6 Claims



1. A display apparatus for a vehicle comprising:

a displayer located within a vehicle for displaying vehicle information;

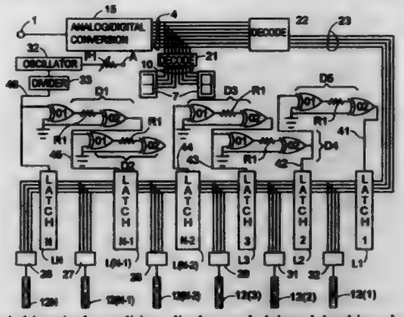
a non-transmissive dark member secured to a lower inside portion of a windshield; and

a reflective hologram secured to the non-transmissive dark member, said reflective hologram diffracting a display light from the displayer toward a driver of the vehicle, said non-transmissive dark member having an area at least as large as an area of the reflective hologram to preclude all external light from entering the reflective hologram.

5,598,176
TIME PERIOD ADJUSTABLE BAR GRAPH DISPLAY

Eric Klingenfus, 7505 Kavanaugh Rd., Crestwood, Ky. 40014

Filed Mar. 3, 1994, Ser. No. 205,868
The portion of the term of this patent subsequent to Jul. 3, 2013, has been disclaimed.
Int. Cl.[6] G09G 3/04
U.S. Cl. 345—35 3 Claims



1. A historical condition display and delayed latching device, comprising:

transducer input means for producing an analog input signal;

an analog to digital converter for receiving said analog input signal and generating a plurality of parallel digital input signals;

a first decoder for receiving said parallel digital input signals and driving at least one digital display;

a second decoder for receiving said parallel digital input signals and generating a four bit parallel digital input signal;

an adjustable timing signal delayed through a delay circuit and producing a plurality of selectively delayed active signals;

a plurality of latches connected in series, each of said plurality of latches receiving as input said four bit parallel digital input signal and one of said selectively delayed active signal and generating as output a selectively latched four bit digital signal, said plurality of latches arranged such that said parallel digital input signal cascades through each successive latch connected in series, said parallel digital input signal being transferred from one latch to another based upon said plurality of selectively delayed active signals;

a plurality of decoders, each of said decoders receiving said selectively latched four bit digital signals output from one of said plurality of latches and driving a digital 16 segment display bar graph.

5,598,177
DRIVING APPARATUS AND METHOD FOR AN ACTIVE MATRIX TYPE LIQUID CRYSTAL DISPLAY APPARATUS

Katsuya Mizukata, Nara; Takafumi Kawaguchi, Yamatotakada; Shiro Takeda, Tenri, and Makoto Takeda, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

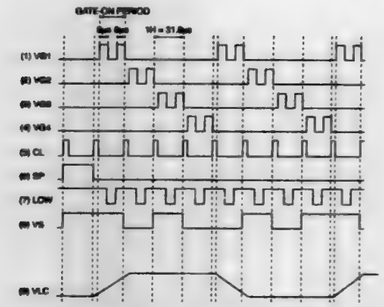
Continuation of Ser. No. 961,280, Oct. 16, 1992, abandoned.
This application Dec. 21, 1994, Ser. No. 361,460
Claims priority, application Japan, Oct. 22, 1991, 3-274331
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—92 14 Claims

1. A driving method for an active matrix type liquid crystal display apparatus having row and column electrodes, said driving method comprising the step of:

applying a gate-on pulse to each of said row electrodes for writing date for one line from said column electrodes,

wherein each of said row electrodes is connected to a gate of a switching transistor, each of said column electrodes is connected to a source of the switching transistor, and a voltage is applied to pixels disposed in the matrix via the switching transistors, and

said gate-on pulse having a pulse waveform which includes at least one concave portion within a gate-on period during a

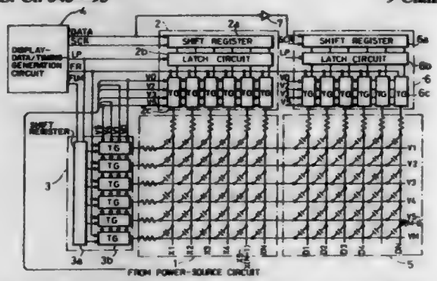


horizontal period H, said horizontal period H is T/n, where T is time for scanning all of said row electrodes and n is a number of said row electrodes.

5,598,178
LIQUID CRYSTAL DISPLAY

Hidetsugu Kawamori, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1994, Ser. No. 362,144
Claims priority, application Japan, Dec. 22, 1993, 5-325126
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—93 9 Claims



1. A liquid crystal display having a plurality of scanning lines to which scanning voltages are successively applied, a plurality of signal lines to which signal voltages in accordance with display data are applied in synchronism with the scanning voltages, and a liquid crystal display element wherein display elements are formed at intersections between the scanning lines and the signal lines, the display elements being turned on and turned off in accordance with driving voltages for the liquid crystal display while the polarity of the driving voltages for the liquid crystal display, which are determined by the scanning voltages and the signal voltages, is inverted at predetermined intervals, the liquid crystal display comprising:

a dummy-capacity section which has dummy display elements that are formed at intersections between scanning lines and a plurality of dummy-use signal lines to which inverted display data is applied; and

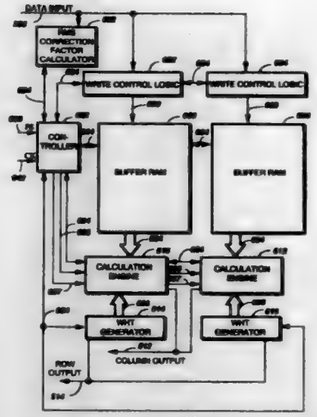
dummy-capacity driving means for driving said dummy-capacity section based on the inverted display data.

5,598,179
METHOD AND APPARATUS FOR DRIVING ELECTRONIC DISPLAYS

Noah Orlen, Boca Raton, and Ali Saidi, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 14, 1993, Ser. No. 75,943
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—98 12 Claims

1. A method for active addressing an electronic display comprising picture elements (pixels) controlled by a plurality of first and



second electrodes, the plurality of first electrodes being controlled by a plurality of periodic first drive signals having a predetermined number of time slots independent of data being displayed and the plurality of second electrodes being controlled by a plurality of second drive signals responsive of the data to be displayed, the method comprising the steps of:

(a) receiving successive frames of data to be displayed; and

(b) calculating, from each frame of data being received, the plurality of second drive signals for the plurality of second electrodes for a time slot of the predetermined number of time slots, said step of calculating calculates one of the plurality of second drive signals as a function of the plurality of periodic first drive signals for the time slot and a selected plurality of pixel values for pixels collectively controlled by the one of the plurality of second electrodes, said step of calculating further comprising the steps of:

(c) representing the plurality of periodic first drive signals as a sequency-ordered Walsh-Hadamard transform (WHT) matrix having a number of rows corresponding to the plurality of first electrodes and a number of columns corresponding to the predetermined number of time slots;

(d) identifying a plurality of hierarchical tree structures corresponding to the WHT matrix representation of the plurality of periodic first drive signals;

(e) encoding the frame of data being received; and

(f) processing the encoded data with the corresponding hierarchical tree structures being identified in the WHT matrix for addressing the pixels of the electronic display.

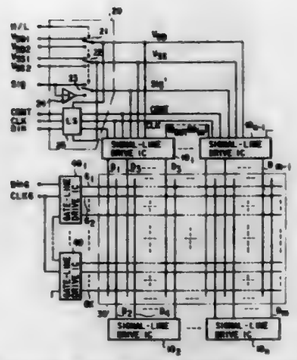
5,598,180
ACTIVE MATRIX TYPE DISPLAY APPARATUS

Kouhei Suzuki, and Kouji Suzuki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1993, Ser. No. 29,323
Claims priority, application Japan, Mar. 5, 1992, 4-048313
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—100 15 Claims

1. An active-matrix type display apparatus comprising:

a matrix display panel including a substrate having a major surface, a plurality of pixel electrodes arranged on said substrate in rows and columns, a plurality of signal lines formed on the major surface of said substrate and extending among the columns of said pixel electrodes, a plurality of gate lines formed on the major surface of said substrate, crossing said signal lines and extending among the rows of said pixel electrodes, a plurality of switching elements each connected between a corresponding one of said pixel electrodes and a corresponding one of said signal lines and controlled by a corresponding one of said gate lines, a common electrode



opposite to said pixel electrodes and held at a constant potential, and liquid crystal filled between said substrate and said common electrode;

gate-line drive means for applying a gate-drive voltage to each of said gate lines;

power-supply means for generating a first power-supply potential and a second power-supply potential lower than the first power-supply potential, each of the first and second power-supply potentials having respective high and low levels, with the first and second power-supply potentials synchronously varying between their respective high and low levels at predetermined intervals while maintaining a predetermined potential difference therebetween; and

signal-line drive means applied by the first power-supply potential and the second power-supply potential to be operated, for applying a signal voltage which is inverted in polarity at the predetermined intervals to each of said signal lines.

5,598,181

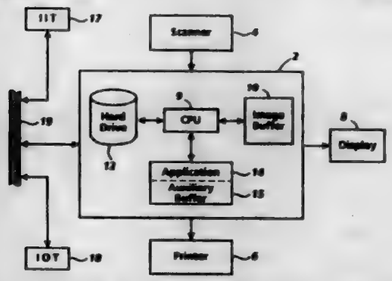
METHOD AND APPARATUS FOR ROTATING A DIGITAL IMAGE NINETY DEGREES USING A SMALL AUXILIARY BUFFER

Dorian Kermisch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 26, 1994, Ser. No. 312,366

Int. Cl.[6] G09G 5/00

U.S. Cl. 345—126 **13 Claims**



1. A method for rotating an image in place while entirely resident in a memory, the image being defined by a rectangular pattern of H lines with each line having W pixels, comprising the steps of:

segmenting the image into square blocks of N pixels per row and N lines per column, said segmenting step storing each line of W pixels defining the image in an array of memory words of an image buffer so that the image is entirely resident in the image buffer;

individually rotating, in place, each N×N square block of pixels in the image buffer segmented by said segmenting step through a selected angle; and

subsequent to said segmenting and said rotating steps, performing the steps of:

selecting a memory word of the image buffer as a starting memory location;

copying the memory word at the starting memory location into a memory word of a temporary storage buffer;

determining a replacement memory location s_{m+1} in the image buffer of the memory word in the temporary storage buffer originally stored at memory location s_m in the image buffer;

swapping the memory word in the temporary storage buffer with a memory word at the replacement memory location s_{m+1} in the image buffer;

repeating said steps of determining and swapping until the starting memory location in the image buffer is equivalent to the replacement memory location s_{m+1} in the image buffer for the memory word stored in the temporary storage buffer; and

replacing the memory word at the starting memory location in the image buffer with the memory word in the temporary storage buffer, to terminate said repeating step.

5,598,182

IMAGE SYNTHESIS AND PROCESSING

Andrew L. C. Berend, Cambridge; Mark J. Williams, Huntingdon, and Michael J. Brocklehurst, Cambridge, all of United Kingdom, assignors to Cambridge Animation Systems Limited, United Kingdom

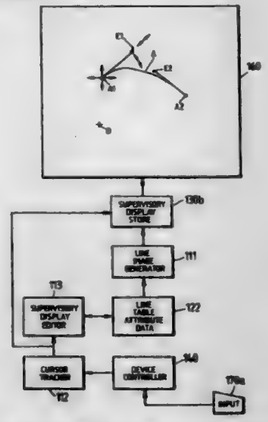
PCT No. PCT/GB92/00928, § 371 Date Jan. 24, 1994, § 102(e) Date Jan. 24, 1994, PCT Pub. No. WO92/21096, PCT Pub. Date Nov. 26, 1992

PCT Filed May 21, 1992, Ser. No. 150,100

Claims priority, application United Kingdom, May 21, 1991, 9110945; Aug. 12, 1991, 9117409; WIPO, Nov. 29, 1991, PCT/GB91/02122; Nov. 29, 1991, PCT/GB91/02124

Int. Cl.[6] G09G 5/36

U.S. Cl. 345—133 **68 Claims**



1. An image processing apparatus for generating output image data representing two-dimensional graphic objects, the apparatus comprising:

input means for generating user input signals; processing means for receiving said user input signals and for generating in response thereto object data defining said object with reference to first and second boundary lines;

storage means for storing the object data generated by the processing means; and

rendering means for processing the stored object data to generate an array of pixel values as said output image date;

wherein the processing means comprises:

means for generating a supervisory display for use in defining and editing said object data;

means for processing said user input signals to define, on the supervisory display, first and second two-dimensional lines for use as boundary lines of an object, each said boundary line having a user-defined path on the supervisory display; and

means for processing said user input signals to define on the display a sectional line connecting said first and second liens, the sectional line having a path on the supervisory display;

means responsive to the definition of said sectional line to generate said object data so as to define a two-dimensional graphic object having the first and second lines as first and second boundary lines; and

wherein the rendering means comprises:

means for defining a value of a visual attribute of the object along said sectional line; and

means for generating said pixel values such that the values of pixels representing the object throughout a region bounded by the sectional line and by the first and second boundary lines depend upon the attribute value defined along the sectional line.

5,598,183

SYSTEM AND METHOD FOR COMPUTER CURSOR CONTROL

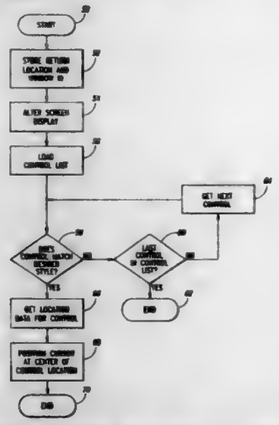
Kenneth R. Robertson, Redmond; Paul E. Henderson, Jr., Bellevue, both of Wash.; Samuel H. Smith, Stanford, Calif.; Carl T. Hellings, Redmond, Wash.; James A. Andrews, Issaquah, Wash.; Eric W. Hanson, Bellevue, Wash.; Timothy T. Brewer; Teresa L. Kelsey, both of Seattle, Wash.; Anthony R. Claflin, Bellevue, Wash.; Daniel S. Hoeger, Woodinville, Wash., and Lora K. McCambridge, Bellevue, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 188,639, Jan. 27, 1994, abandoned.

This application Dec. 12, 1995, Ser. No. 570,811

Int. Cl.[6] G09G 3/02

U.S. Cl. 345—145 **21 Claims**



1. A system for controlling the position of a cursor on a computer display coupled to a computer, the system comprising:

a cursor positioning device coupled to the computer to permit user control of the position of the cursor on the computer display;

a first storage area storing position data corresponding to a first position of the cursor in a first screen display on the computer display;

generation means for generating a second screen display;

positioning means for automatically positioning the cursor in said second screen display in response to the generation of said second screen display, said positioning means initially positioning said cursor at a default position in response to an initial generation of said second screen display by said generation means and automatically positioning the cursor at a user-selectable position in response to the generation of said second screen display at a time subsequent to said initial generation of said second screen display; and

selection means, operable by the user, to select said user-selectable cursor position different from said default position at said initial generation of said second screen display.

5,598,184

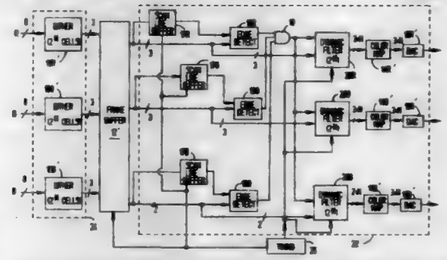
METHOD AND APPARATUS FOR IMPROVED COLOR RECOVERY IN A COMPUTER GRAPHICS SYSTEM

Anthony C. Barkans, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 27, 1992, Ser. No. 859,213

Int. Cl.[6] G09G 5/10

U.S. Cl. 345—149 **18 Claims**



1. In an interactive computer graphics system of the type that generates color information data for pixels of a display, and wherein pixel values corresponding to color information for each pixel are stored in a frame buffer, and further wherein the pixel values are obtained by dithering components of the color information data using a dither matrix, whereby color information data is lost as a result of said dithering, a method for recovering at least a portion of said lost data comprising the steps of:

a) defining a filter having an effective shape S;

b) reading ones of the pixel values from the frame buffer;

c) filtering components of the read pixel values with the filter while dynamically altering the effective shape of the filter in response to changes in magnitudes of the components of the read pixels values that indicate an edge in an image to be displayed to recover at least a portion of the lost data;

d) employing the filtered components to illuminate the pixels.

5,598,185

SYSTEM FOR ANALYZING MEDICAL IMAGES HAVING A PARTICULAR COLOR AND INTENSITY LOOK-UP TABLE

Bengt G. Holmgren, New York, N.Y., assignor to Integrated Image Solutions, Farmingdale, N.Y.

Filed Jun. 10, 1994, Ser. No. 258,859

Int. Cl.[6] G06F 159/00; G09G 5/04; G06K 9/00

U.S. Cl. 345—153 **6 Claims**

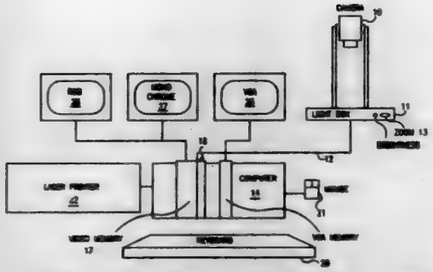
1. An apparatus for analyzing a mammogram to identify carcinoma-induced stress in tissue comprising:

a camera for creating a scanned video image from said mammogram;

a video signal digitizing means for creating a digitized image from said scanned video image comprising an array of pixels, each pixel defining a gray scale level for a point on said mammogram representing a tissue density recorded on said mammogram;

a computer including a video memory for storing said array of pixels, said computer being programmed to:

divide the array of pixels into discrete separate groups of pixels forming contiguous ranges of gray scales, each



group including pixels having a gray scale value within a range unique to said group;

assigning a single pixel value to each pixel of each group said single pixel value selected so that adjacent groups comprise non-contiguous groups of a single pixel value;

addressing a look-up with each assigned pixel value, to produce a plurality of pixel colors having a saturation and intensity level defined by each assigned pixel value whereby each color includes a range of intensity levels, said intensity level increasing from a black level to a maximum level for increasing assigned pixel values whereby further increases in an assigned pixel value produces another color which increases in intensity level for increasing assigned pixel values; and

a display for displaying an image comprising said pixel colors, wherein pixels lying within each of said groups have the same display value, said image having discrete boundaries defined by non-contiguous pixel values representing a tissue density gradient produced by carcinoma-induced stress.

5,598,186

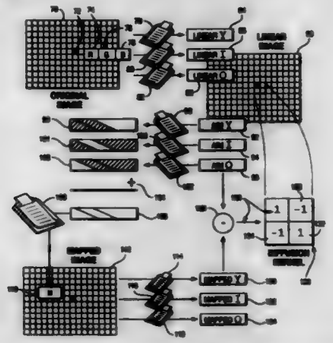
SYSTEM AND METHOD FOR IMAGE MAPPING IN LINEAR SPACE

Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 921,793, Jul. 30, 1992, abandoned. This application Mar. 13, 1995, Ser. No. 402,770

Int. Cl.[6] G09G *5/06*

U.S. Cl. 345—154 **4 Claims**



1. A method for eliminating artifacts arising from display nonlinearities in an image of pixels forming image colors in a computerized digital image processing system having a predetermined finite multichromatic, full-tone palette of colors, comprising:

translating into the digital domain each of said pixels to a linear luminance aim value and two color aim values, said aim values being in a domain linearly proportional to lumens when said image is displayed;

selecting in nonlinear space three intermediate values from respective ones of three lookup tables formed from said translated pixels wherein the number of bits for each of said translated pixels remains the same when formed in said lookup tables, each of said intermediate values corresponding to a respective different one of said luminance aim value and two-color aim values;

wherein each of said lookup tables corresponds to respective three color vectors wherein said three color vectors are each comprised of a luminance vector corresponding to said luminance aim value and two color vectors corresponding to said two color aim values; and

forming, by summing said three intermediate values, a pointer from said three intermediate values;

defining a lookup table corresponding to a plurality of said pointers to colors of said predetermined palette;

selecting one of said colors from said predetermined palette in linear lumen space in functional relation to said pointer as a closest color in said predetermined palette to one of said image colors;

mapping said pointer to a color value in said lookup table corresponding to said closest palette color; translating from said nonlinear space said mapped value back to linear space with corresponding mapped luminance and two color values;

repeating the preceding steps for each of said pixels to create a plurality of processed pixels; and

combining said processed pixels thereby effecting said eliminating of said artifacts and said display of said image.

5,598,187

SPATIAL MOTION PATTERN INPUT SYSTEM AND INPUT METHOD

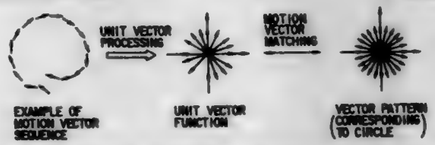
Yuji Ide, Yokohama; Kazuhiro Takashima, Tokyo; Toshihiro Morohoshi, Ichikawa, and Tomiyoshi Fukumoto, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1994, Ser. No. 242,429

Claims priority, application Japan, May 13, 1993, 5-111856

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—158 **20 Claims**



1. A spatial motion pattern input system for causing a control target device to perform control according to a spatial motion pattern of a spatial control input device, comprising:

move sensing means for sensing at least an amount of movement of the spatial control input device on two axes from the amount of movement of the device on three specific nonparallel axes in space, by means of an element built in the spatial control input device which operates in response to a change in velocity of the spatial control input device;

conversion means for converting said amount of movement of the spatial control input device on two axes into a first arbitrary direction motion vector sequence;

identification means for performing identification by comparing a second arbitrary direction motion vector sequence, corresponding to a basic motion pattern which was previously entered, with said first arbitrary direction motion vector sequence; and

execution means for controlling said control target device based on a recognition result from said identification means.

5,598,188

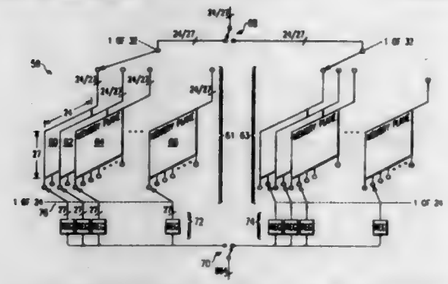
MEMORY ARCHITECTURE FOR REFORMATTING AND STORING DISPLAY DATA IN STANDARD TV AND HDTV SYSTEMS

Robert J. Gove, Plano, Tex.; Kelichiroh Abe; Sohichiroh Kamei, both of Tsukuba, Japan, and Donald B. Doherty, Irving, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 333,199, Nov. 2, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 476,162

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—185 **7 Claims**



1. A method of processing video data, said method comprising the steps of:

selecting a memory plane in a first half of a reformatter memory, said reformatter memory comprising said first half and a second half, each of said first and said second halves comprised of multiple memory planes, each memory plane comprising m memory locations, each of said memory locations capable of holding an n-bit input data word;

writing up to m n-bit input data words into said selected memory plane;

repeating said selecting and writing steps until all of said memory planes in said first half of said reformatter memory have been written to; and

reading n m-bit output data words from each of said memory planes in said first half of said reformatter memory, each of said m-bit output data words comprising one bit from each of said m n-bit input data words written into said selected memory plane.

5,598,189

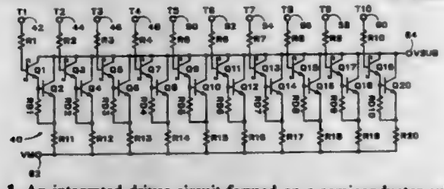
BIPOLAR INTEGRATED INK JET PRINTHEAD DRIVER

Ulrich E. Hess, Corvallis, Oreg.; James W. Grace, Los Altos Hills, Calif.; James R. Hulings, Fort Collins, Colo., and Jaime H. Bohorquez, Escondido, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 7, 1993, Ser. No. 118,104

Int. Cl.[6] B41J *2/07*

U.S. Cl. 347—9 **16 Claims**



1. An integrated driver circuit formed on a semiconductor substrate for use in an ink jet printhead comprising:

a common collector well formed by the substrate;

a plurality of bipolar transistor driver cells, each driver cell including a transistor having a base coupled to a respective base node for receiving a respective address signal, a collector contact connected directly to the common collector well, and an emitter that forms a respective driver emitter node; and

a plurality of heater resistors, each heater resistor coupled between a respective one of the driver emitter nodes and a common control terminal for receiving a common control signal,

wherein energy is selectively applied to a heater resistor by selectively applying an address signal to the base node of the corresponding driver cell and selectively applying the control signal to the control terminal and wherein energy is selectively removed by selectively removing either the address signal or the control signal.

5,598,190

RECORDING APPARATUS WITH STANDBY CONTROL FOR THERMAL HEAD

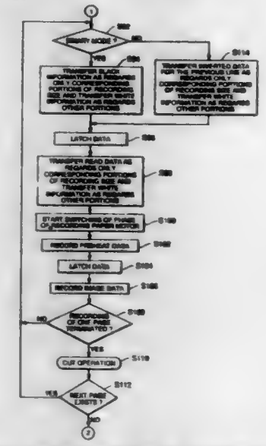
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,282

Claims priority, application Japan, Jun. 12, 1992, 4-153347

Int. Cl.[6] B41J *29/38;2/155*

U.S. Cl. 347—13 **28 Claims**



1. An image recording apparatus for recording an image on a recording medium using a recording head which records an image at a predetermined width, said apparatus comprising:

input means for inputting image data;

selection means for selecting a portion of said recording head, when a size of the image data input by said input means is smaller than said predetermined width, in accordance with said size;

recording means for recording the image data on the recording medium using the portion of said recording head selected by said selection means; and

control means for controlling temperature of said recording head by supplying energy to the portion of said recording head selected by said selection means when recording of the image data is not performed,

wherein said control means does not supply the energy to the other portion of said recording head not selected by said selection means.

5,598,191

ARCHITECTURE FOR AN INK JET PRINTER WITH OFFSET ARRAYS OF EJECTORS

Gary A. Kneezel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1995, Ser. No. 457,725

Int. Cl.[6] B41J *2/145;2/15;2/21*

U.S. Cl. 347—40 **19 Claims**

1. A printhead for ejecting ink imagewise onto a substrate, comprising:



a first plurality of ejectors arranged in a linear array, the ejectors thereof being spaced by a predetermined pitch; and

a second plurality of ejectors arranged in a linear array collinear with the first plurality of ejectors, the ejectors thereof being spaced by the predetermined pitch;

one of the first plurality of ejectors and a neighboring one of the second plurality of ejectors being spaced from each other by an integral number of pitches plus one-half pitch.

5,598,192

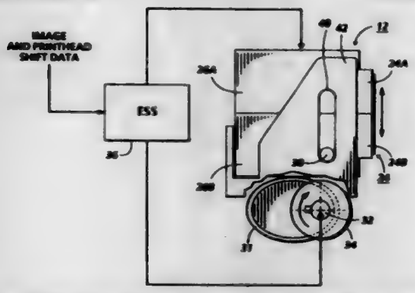
THERMAL INK JET PRINTHEAD WITH EXTENDED PRINT CAPABILITY

William R. Burger, Fairport; Steven R. Moore, Rochester, and Gary A. Kneezel, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 8, 1995, Ser. No. 485,865

Int. Cl.[6] B41J 2/145;2/15;2/21

U.S. Cl. 347—43 **11 Claims**



1. An apparatus for printing an image along a process direction and onto a recording sheet movable to the process direction, the apparatus comprising:

means for providing input image signals;

a printhead assembly including a single printhead having at least a first and second segment, said first and second segment aligned one above the other, in the transverse process direction, with said at least first segment adapted to eject ink of a characteristic different from the said at least second segment along a printing swath in the process direction, the assembly further including ink reservoirs for supplying ink to said first and second segment of the printhead in response to said input image signals; and

means to selectively move the printhead assembly back and forth transverse to the process direction to selectively position one of said first and second segment of the printhead to print along said printing swath.

5,598,193

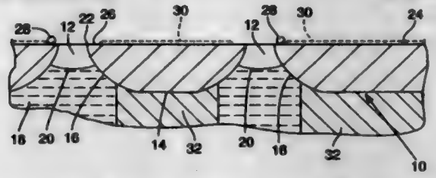
TREATMENT OF AN ORIFICE PLATE WITH SELF-ASSEMBLED MONOLAYERS

David J. Halko, and Barbara T. Halko, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 24, 1995, Ser. No. 410,624

Int. Cl.[6] B41J 2/135

U.S. Cl. 347—45 **26 Claims**



1. An orifice plate for an ink-jet pen, comprising:

an inner surface and an outer surface, and an orifice extending through the plate between the inner and outer surfaces; and

the outer surface having a self-assembled monolayer thereon.

5,598,194

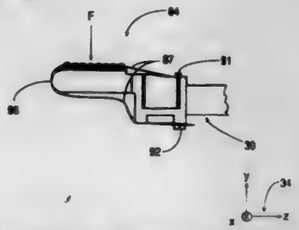
WIPING STRUCTURE FOR CLEANING ELECTRICAL CONTACTS FOR A PRINTER AND INK CARTRIDGE

Corrina A. E. Hall; W. Wistar Rhoads, both of Escondido; Patricia S. Brown, Encinitas, and Arthur K. Wilson, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 30, 1993, Ser. No. 56,009

Int. Cl.[6] B41J 2/01

U.S. Cl. 347—50 **17 Claims**



1. An apparatus for use with a printer, comprising:

a print carriage; and

a flexible insulating tape, said flexible insulating tape having a plurality of electrically conductive interconnect pads formed on a side of said flexible insulating tape so that said interconnect pads face away from said print carriage, said flexible insulating tape having a first end attached to said print carriage, a remaining portion of said flexible insulating tape being substantially unattached to the print carriage,

said flexible insulating tape having a second end opposite said first end, said second end being substantially free floating.

5,598,195

INK JET RECORDING METHOD

Toru Okamoto, and Susumu Hirakata, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

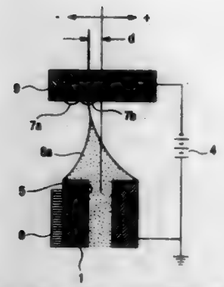
Filed Jun. 21, 1994, Ser. No. 267,029

Claims priority, application Japan, Jun. 22, 1993, 5-150119

Int. Cl.[6] B41J 2/06

U.S. Cl. 347—55 **6 Claims**

1. An electrostatic attracting-type ink jet recording method comprising the steps of:



applying a voltage pulse across a recording electrode connected to a recording head and an opposition electrode disposed on an opposite side of a recording medium or intermediate recording material, whereby a resulting Coulomb's force causes ink to jet for a period onto said recording medium or intermediate recording material through an orifice in said recording head to record an image thereon; and

maintaining a relaxation time of said ink, said relaxation time being equal to a dielectric constant of said ink multiplied by a volume resistivity of said ink during said ink jet recording in a range of 0.01 to 2 times said jetting period of said ink.

5,598,196

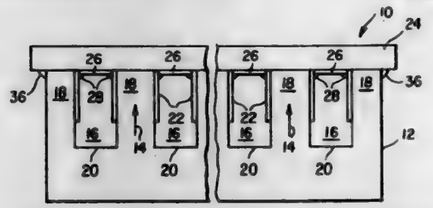
PIEZOELECTRIC INK JET PRINT HEAD AND METHOD OF MAKING

Hilarion Braun, Beaver Creek, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1992, Ser. No. 871,775

Int. Cl.[6] B41J 2/045

U.S. Cl. 347—68 **13 Claims**



6. A method of making a piezoelectric inkjet print head comprising the steps of:

a) forming a body of piezoelectric material having a plurality of parallel open topped channels separated by walls;

b) forming metal electrodes on opposite sides of said walls;

c) forming a top cover of insulating material having a pattern of parallel metal conductors congruent with the open tops of said channels;

d) coating said electrodes and said conductors with solder;

e) placing said top cover on said body; and

f) heating said top cover and said body to reflow said solder to bond said top cover to said body.

5,598,197

CONTINUOUS INK JET PRINTER

Jerzy M. Zaba, Cambridge, England, assignor to Domino Printing Sciences PLC, England

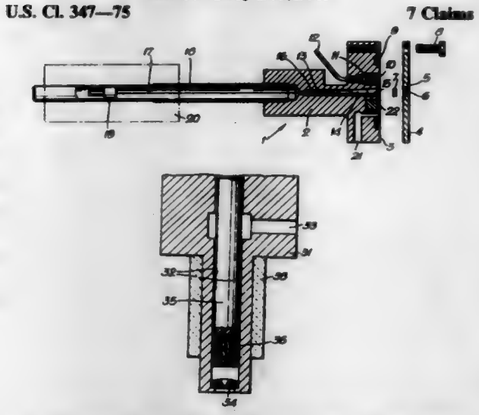
PCT No. PCT/GB90/01010, § 371 Date Dec. 12, 1991, § 102(e) Date Dec. 12, 1991, PCT Pub. No. WO91/00808, PCT Pub. Date Jan. 24, 1991

PCT Filed Jul. 2, 1990, Ser. No. 778,224

Claims priority, application United Kingdom, Jul. 11, 1989, 8915819

Int. Cl.[6] B41J 2/03;2/165

U.S. Cl. 347—75 **7 Claims**



1. A continuous ink jet printer printhead (1), the printhead having an ink channel (22,32,33); a nozzle (4,34) at one end of the ink channel (22,32); and, an oscillator (11,38) disposed to cause ejection of ink in the channel (22,32,33) through the nozzle (4,34) in use; characterised by means (14,15,35,36) provided internally of the printhead for closing off the nozzle (4,34) from the channel (22,32) to prevent seepage of ink therethrough during periods of non-printing.

5,598,198

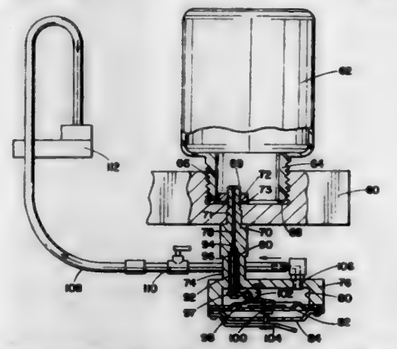
PRINTER INK REGULATION SYSTEMS

Thomas N. Taylor, Rochester, and Robert A. Panos, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1995, Ser. No. 368,564

Int. Cl.[6] G01D 15/18; B41J 2/175

U.S. Cl. 347—85 **20 Claims**



1. An ink regulation system for an ink jet printhead, comprising:

a mounting frame;

an ink supply reservoir secured to said mounting frame;

a valve housing operably secured to said mounting frame, said valve housing including an ink chamber;

a fitting supported in said mounting frame and including a bore having a first end communicating with said ink supply reservoir and a second end communicating with said valve housing for feeding ink from said ink supply reservoir to said ink chamber, said fitting including a valve seat in said bore;

a valve member located in said valve housing, said valve member having a sealing surface for cooperating with said valve seat to selectively seal thereagainst and prevent a flow of ink into said valve housing ink chamber; and,

a support means located in said valve housing ink chamber for supporting said valve member so that said valve member can reciprocate in relation to said valve seat to selectively allow a flow of ink into said valve housing ink chamber, said valve member responding to reduced ink pressure in said valve housing ink chamber upon ejection of ink therefrom to open and admit ink to said ink chamber by flow from said reservoir through said fitting bore.

5,598,199

PRINTER

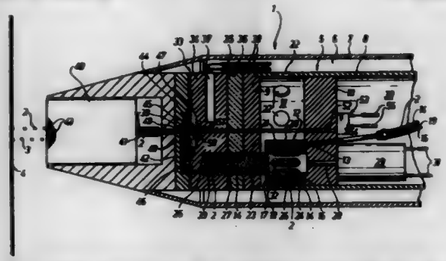
Ulf Mielke, Göteborg, Sweden, assignor to Jetline AB, Molndal, Sweden

PCT No. PCT/SE92/00870, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO93/11944, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 16, 1992, Ser. No. 244,874

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—88 **17 Claims**



1. A printer designed to apply droplets of hot melt ink onto a substrate in order to generate characters or symbols thereon, characterized by a housing, in which are provided a reservoir having an inlet for supply of the hot melt ink in solid state and an outlet, the hot melt ink in solid state is arranged to be supplied to the reservoir in the form of granules together with a carrier gas, and in that said reservoir is provided with perforations to allow escape of said carrier gas supplied thereto, a feeder adjacent the reservoir outlet, said feeder having an inlet for reception of the hot melt ink in solid state from the receiver and an outlet, a heater, and a print-head formed with an inlet which is connected to the feeder outlet and with at least one discharge nozzle, said feeder supplying the hot melt ink to the print-head while the ink is being melted with the aid of the heater, said print-head receiving said molten hot melt ink from the feeder and discharging said hot melt ink in the form of droplets from the discharge nozzle for application of said droplets on the substrate.

5,598,200

METHOD AND APPARATUS FOR PRODUCING A DISCRETE DROPLET OF HIGH TEMPERATURE LIQUID

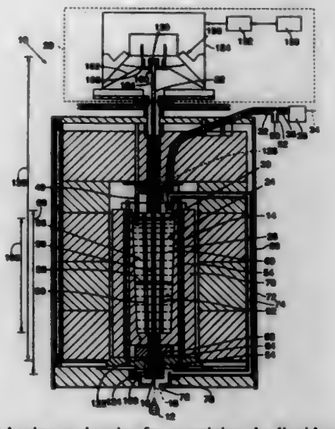
David W. Gore, 1233 NW Lewisburg Ave., Corvallis, Oreg. 97330

Filed Jan. 26, 1995, Ser. No. 378,713

Int. Cl.[6] G01D *15/18*; **B41J** *2/045*

U.S. Cl. 347—88 **19 Claims**

1. A high-temperature liquid droplet ejection apparatus for ejecting on demand a discrete droplet of a liquid metal at a high temperature from an orifice along a predetermined trajectory comprising:



a vessel having an interior for containing the liquid metal at a high temperature, the interior including an inlet end, a discharge region having an orifice, and a sidewall connecting the inlet end and the discharge region;

a thermally insulative impulse transmitting device having a base end exterior of the vessel and extending through the inlet end of the vessel and a head end having a face positioned within the interior and adjacent the orifice; and

an impulse generator that provides a physical impulse to the base end of the impulse transmitting device so that the face of the transmitting device is momentarily moved toward the orifice to produce an ejection pressure at the orifice that causes ejection of a discrete droplet of the liquid metal contained in the vessel from the orifice along a predetermined trajectory.

5,598,201

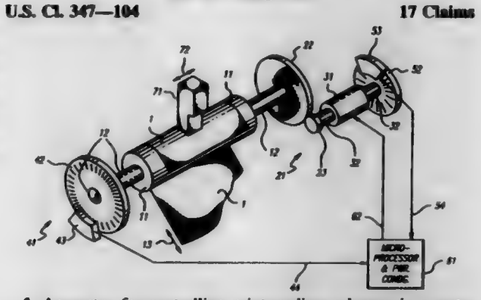
DUAL-RESOLUTION ENCODING SYSTEM FOR HIGH CYCLIC ACCURACY OF PRINT-MEDIUM ADVANCE IN AN INKJET PRINTER

Samuel A. Stodder, Encinitas, and Paul J. Wield, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1994, Ser. No. 189,354

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—104 **17 Claims**



1. Apparatus for controlling print-medium advance in a raster scanning device such as an inkjet printer; said apparatus comprising:

means for engaging and advancing such a print medium;

first position-monitoring means, coupled substantially directly to the engaging-and-advancing means, for providing a first electronic signal representing position of the engaging-and-advancing means;

means for providing a mechanical advantage, said mechanical-advantage means being coupled to the engaging-and-advancing means and having an element that moves in approximate correspondence with motion of the engaging-and-advancing means, but said element also having a mechanical advantage relative to the engaging-and-advancing means;

second position-monitoring means, coupled substantially directly to said element of the mechanical-advantage means, for providing a second electronic signal representing position of said element; and

digital electronic means for receiving the first and second electronic signals and combining them to obtain hybrid information representing position of the engaging-and-advancing means.

5,598,202

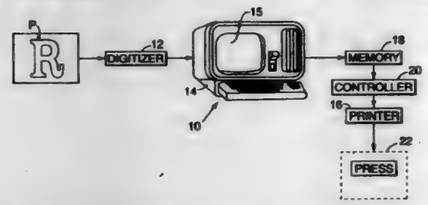
METHOD AND APPARATUS FOR PRINTING A GRAPHIC ON FABRIC

Mary E. P. Peterson, Delmar, N.Y., assignor to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Mar. 13, 1995, Ser. No. 404,192

Int. Cl.[6] B41J *2/325*

U.S. Cl. 367—213 **8 Claims**



1. A method for printing a graphic on fabric, said method comprising the steps of:

(a) providing a thermal transfer printer having a ribbon including a carrier layer and a layer of colorant supported on the carrier layer;

(b) providing the thermal printer with data defining the graphic to be printed on the fabric;

(c) coating a thermally stable substrate with a film of binder for the colorant

(d) causing the thermal printer to print the colorant onto the substrate according to the data to form a print area on the substrate including binder and colorant and an adjacent non-print area of the substrate including the binder film only;

(e) removing the binder film from the non-print area of the substrate; and

(f) thermally transferring the colorant and binder from the print area of the substrate to the fabric to print the graphic on the fabric.

5,598,203

LASER IRRADIATION DEVICE OF LASER PRINTERS

Hoon B. Choi, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 29, 1993, Ser. No. 143,099

Claims priority, application Rep. of Korea, Nov. 2, 1992, 1992-20427

Int. Cl.[6] B41J *2/47*

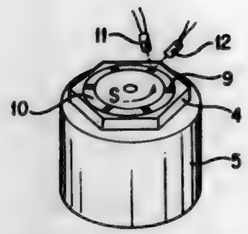
U.S. Cl. 347—250 **6 Claims**

1. A laser irradiation device of laser printers comprising,

a laser beam emitter;

a first lens for converting the laser beam emitted from the laser beam emitter into parallel laser beam;

a polygonal mirror for reflecting the parallel laser beam, the polygonal mirror being rotatable and including (i) a plurality of reflection surfaces and (ii) sensing means mounted on and rotatable with said mirror for sensing the starting point of each one of the reflection surfaces and for generating an output signal;



a second lens for receiving the laser beam reflected by the polygonal mirror; and

a controller for synthesizing said output signal from said sensing means with a picture signal and for generating a control signal to control the laser beam emitter.

5,598,204

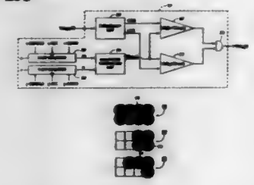
IMAGE HALFTONING SYSTEM CAPABLE OF PRODUCING ADDITIONAL GRADATIONS

Steven J. Harrington, Holley, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1994, Ser. No. 217,836

Int. Cl.[6] H04N *1/21*

U.S. Cl. 347—251 **28 Claims**



1. An apparatus for converting gray image signals to binary image signals, with each gray image signal having a gray density value, comprising:

a memory for storing the gray image signals and the binary image signals, each gray image signal stored in the memory being associated with a relative position in a halftone cell having a set of threshold values;

means, associated with said memory, for assigning a threshold value to each gray image signal in accordance with the relative position of each threshold value in the halftone cell, and defining a range of gray density values for each gray image signal; and

a logic circuit, in communication with said assigning means, for forming a halftone density pattern for the gray image signals having the threshold value assigned thereto within the range of gray density values for the corresponding gray image signal.

5,598,205

IMAGING APPARATUS

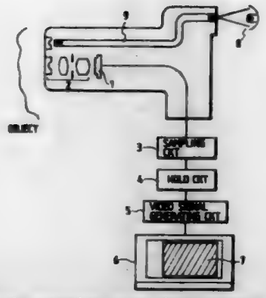
Kimihiko Nishioka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,176

Int. Cl.[6] H04N *7/18*; **A61B** *1/04*; *1/06*

U.S. Cl. 348—65 **8 Claims**

1. An imaging apparatus comprising: an objective lens system for forming an image of an object, a solid-state image pickup device for receiving the image formed by said objective lens



system, a signal processing means for generating video signals from signals output from said solid-state image pickup device and a display means for displaying an image of the object by using said video signals; wherein said objective lens system comprises at least one revolutionally asymmetrical refracting surface expressed by the formula (5) shown below for projecting a deformed image of said object onto said solid-state image pickup device and wherein said signal processing means further deforms signals of the deformed image provided from said solid-state image pickup device for displaying an image of the object on said display means,

$$x=\frac{(1/R_i)(y^2+z^2)}{1+\sqrt{1-(y^2+z^2)/R_i^2}}+B_{1i}y^2+B_{2i}z^2+E_{1i}y^4+ \quad (5)$$

$$E_{2i}y^2z^2+E_{3i}z^4+F_{1i}y^6+F_{2i}y^4z^2+F_{3i}y^2z^4+F_{4i}z^6+G_{1i}y^8+$$

$$G_{2i}y^6z^2+G_{3i}y^4z^4+G_{4i}y^2z^6+G_{5i}z^8+\ldots$$

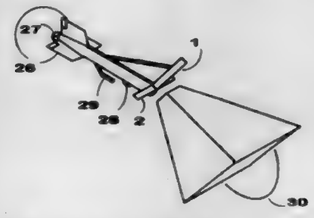
wherein the reference symbol i represents an ordinal number of a surface, the reference symbol x, y and z designate values on x, y and z axes respectively on an coordinates system on which a direction of an optical axis is taken as the x axis and a vertex of the refractive surface is taken as an origin, the reference symbol R_i denotes a radius of curvature of a reference sphere of the refractive surface, the reference symbols B_{1i}, B_{2i}, . . . represent aspherical surface coefficients, and the reference symbols E_{1i}, E_{2i}, . . . designate aspherical surface coefficients.

5,598,206

BEAMFORMED TELEVISION

James K. Bullis, 1155 Pimento Ave., Sunnyvale, Calif. 94087

Filed Apr. 11, 1994, Ser. No. 226,069
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—81 **49 Claims**



1. An imaging apparatus comprising:

(a) a plurality of transducers in a transmitting array where said transducers simultaneously transmit signals, and said signals are mutually phase related and are radiated over a common field of view wherein objects modify radiated signals, and said transducers are arranged to shape a beamformed directional transmitting response that includes a transmit beam and transmit grating lobes at predetermined angles, and

(b) signal means of generating, phase adjusting and distributing phase related transmit signals to cause simultaneous, coded signal transmit beams to form in respective transmit regions of said common field of view so as to identify said transmit regions by a unique code of a beam passing through a region, and

(c) a plurality of transducers in a receiving array where said transducers simultaneously receive signals, and said signals are mutually phase related and are radiated from common points in said common field of view after modification by said objects, and said transducers are arranged to shape a beamformed directional receiving response that includes a receive beam and receive grating lobes at predetermined angles, and

(d) signal means of phase adjusting and combining received signals to cause receive beam channels to form where said receive beam channels are associated with respective receive regions of said common field of view, and

(e) signal means of processing signals, from each of said receive beam channels, to separate coded signals and to form code channels for respective unique codes, where said code channels are associated with respective said transmit regions, and

(f) a predetermined relative orientation of said transmitting array and said receiving array to enable said transmit regions and said receive regions to determine locations, in two angular dimensions, of respective said objects in said common field of view, and to enable suppression of the effect of said transmit grating lobes by interaction of said beamformed directional receiving response and to enable suppression of the effect of said receive grating lobes by interaction of said beamformed directional transmitting response, and

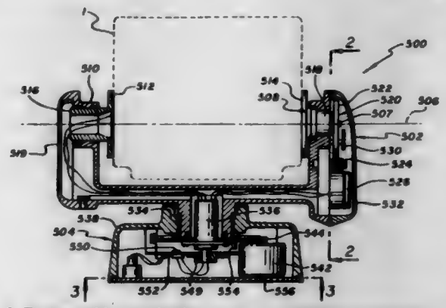
(g) signal means of processing signals to form image signals.

5,598,207

CAMERA POINTING MECHANISM USING PROXIMATE MAGNETIC SENSING

Alex L. Kormos, Los Angeles; David M. Masarik, Laguna Beach, and Paul R. Salvio, Palos Verdes Estates, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Apr. 12, 1994, Ser. No. 226,791
Int. Cl.[6] H04N 5/225
U.S. Cl. 348—148 **9 Claims**



1. For use with a car having a top, a mechanism for pointing an imaging system having a center of gravity, the mechanism comprising:

a tilt gimbal adaptable to support the imaging system and allow the imaging system to rotate about a first axis of rotation that extends through the center of gravity of the imaging system;

a pan gimbal supporting the tilt gimbal and rotating about a second axis of rotation;

a housing for supporting the pan gimbal and the tilt gimbal, the housing being mountable to the top of the car;

means, responsive to a first control signal, for rotating the pan gimbal;

means, responsive to a second control signal, for rotating the tilt gimbal; and

means for generating the first and second control signals, wherein the means for rotating the pan gimbal includes a pan gear attached to the pan gimbal, a longitudinal axis of the pan gear being coaxial with the second axis of rotation; and an electric motor and at least one gear for allowing the electric motor to drive the tilt gear,

wherein the means for rotating the pan gimbal further includes means for sensing the position of the pan gimbal, the sensing means including a magnetized portion on the pan gear and at least one magnetic sensor proximate the pan gear, and

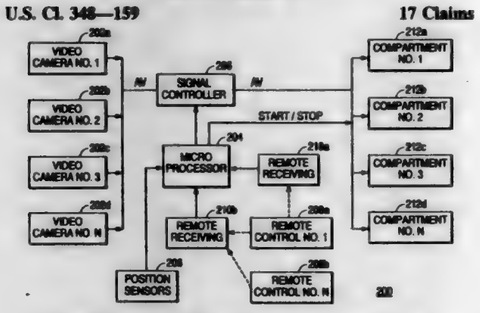
wherein the means for rotating the pan gimbal further includes a circuit board mounted proximate the pan gear and a circuit for driving the motor, the circuit and the at least one magnetic sensor being mounted on the board.

5,598,208

VIDEO VIEWING AND RECORDING SYSTEM

Shawn L. McClintock, Upper Saddle River, N.J., assignor to Sony Corporation, Japan, and Sony Corporation of America

Filed Sep. 26, 1994, Ser. No. 312,189
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—159 **17 Claims**



1. An event viewing and recording system comprising:

a plurality of video cameras positioned at predetermined locations at a predefined event occurrence area for capturing video images of activities occurring within a predetermined view of said event occurrence area and providing a video signal thereof;

control means for providing video selection signals indicating which of the video signals is desired to be viewed;

means for selectively routing video signals from said plurality of video cameras based on said video selection signals; and

a securing unit having at least one compartment for holding video recording equipment, said compartment including video terminals for providing the video signal routed by said means for selectively routing based on said video selection signals.

5,598,209

METHOD FOR AUTOMATICALLY ADJUSTING A VIDEO CONFERENCING SYSTEM CAMERA

Leo M. Cortjens, Norcross; Richard C. Mays, Atlanta, and Curtis M. Smith, Lawrenceville, all of Ga., assignors to Videoconferencing Systems, Inc., Norcross, Ga.

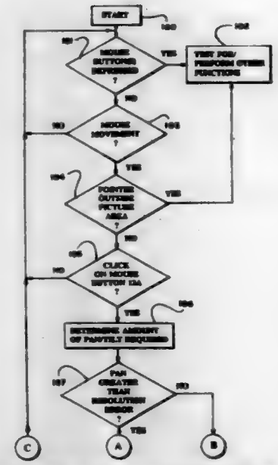
Division of Ser. No. 139,645, Oct. 28, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,655
Int. Cl.[6] H04N 5/232
U.S. Cl. 348—211 **24 Claims**

1. A method for adjusting a camera, said camera having a pan mechanism, said pan mechanism having, a resolution error, comprising the steps of:

providing a picture:

providing a pointer at a first location within said picture;

monitoring an output of a control device for an indication by a user to move said pointer;



moving said pointer to a second location in response to said indication;

monitoring said output of said control device for an indication by said user that said pointer is designating a desired object;

determining an amount of pan required to position said desired object in said center of said picture;

determining whether said amount of pan exceeds said resolution error; and

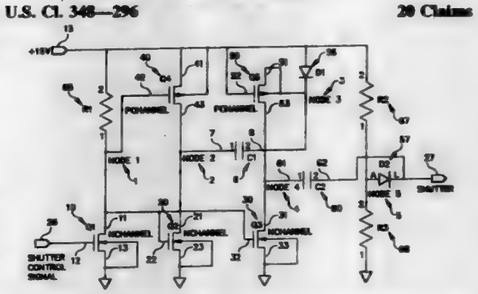
if said amount of pan exceeds said resolution error then panning said camera to position said desired object in the center of said picture.

5,598,210

ON CHIP DRIVER FOR ELECTRIC SHUTTERING

William J. Toohey, Shortsville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 15, 1995, Ser. No. 388,913
Int. Cl.[6] H04N 5/335
U.S. Cl. 348—296 **20 Claims**



1. An image sensing device having electronic shuttering comprising:

an image sensor chip;

a voltage multiplier containing a charge storage device built into the image sensing device;

a source of applying a first potential to the voltage multiplier;

a second potential generated from the voltage multiplier, the second potential being essentially twice the first potential; and

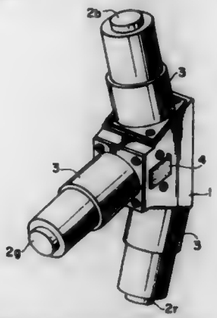
means for applying the second potential generated as an electronic shuttering signal.

5,598,211

TELEVISION CAMERA APPARATUS WITH DEVICE FOR PREVENTING CONDENSATION OF WATER VAPOR ON SURFACE OF IMAGE PICK-UP ELEMENT

Toshihiro Fukuro, Kodaira, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 129,339, Sep. 30, 1993, abandoned.
This application May 2, 1995, Ser. No. 432,863
Claims priority, application Japan, Oct. 7, 1992, 4-293699
Int. Cl.[6] H04N 5/225
U.S. Cl. 348—374 20 Claims



1. A television camera apparatus comprising:

at least one image-pickup element having a light incidence portion and being supported by an image-pickup element holder;

a first cooling means for cooling said at least one image-pickup element;

a housing connected with said image-pickup element holder, and enabling light to pass through at least a portion thereof for incidence on said light incidence portion of said image-pickup element; and

a temperature controlling cooling section provided in a predetermined portion of said housing, said temperature controlling cooling section having a cooling-side surface portion and a second cooling means for cooling said cooling-side surface portion to have a temperature lower than a temperature of said light incidence portion of said image-pickup element as cooled by said first cooling means during operation of the television camera apparatus so that free water contained in air inside of said housing is condensed on said cooling-side surface portion.

5,598,212

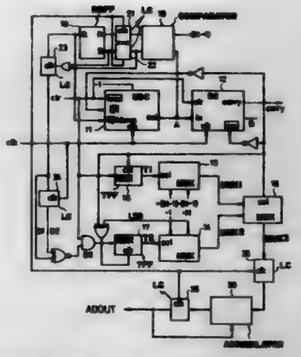
CONVERSION CIRCUIT FOR MUTUALLY CONVERTING BETWEEN PROGRESSIVE SCAN AND ZIG-ZAG SCAN VIDEO SIGNAL FORMATS

Yong S. Moon; Si J. Kim, and Soon H. Jang, all of Seoul, Rep. of Korea, assignors to Korea Telecommunication Authority, Rep. of Korea

Filed Jul. 25, 1995, Ser. No. 506,783
Claims priority, application Rep. of Korea, Feb. 25, 1995, 94-17974
Int. Cl.[6] H04N 7/30
U.S. Cl. 348—403 8 Claims

1. A scanning format conversion circuit for performing the mutual conversion between a progressive scanning format and a zig-zag scanning format to read or write NxN discrete cosine transform coefficients from or into a memory in a coding process or a decoding process of a video system, comprising:

up/down counting means for performing an up counting operation from 1 to N−1 and then a down counting operation from N−1 to 1, said up/down counting means being loaded with 1 at its initial state and then controlled in response to a carry signal in such a manner that it holds its count until the carry signal is generated;



down counting means being loaded with an output value from said up/down counting means to perform a down counting operation from the loaded value to 0, said down counting means generating the carry signal at the moment that its count becomes 0, and then applying the generated carry signal to said up/down counting means;

first selection means for inputting the carry signal from said down counting means as its selection control signal, said first selection means selecting in turn N−1 and −(N−1) in response to the carry signal from said down counting means;

second selection means for inputting the carry signal from said down counting means as its selection control signal, said second selection means selecting in turn 1 and N in response to the carry signal from said down counting means;

third selection means for inputting the carry signal from said down counting means as its selection control signal, said third selection means selecting one of output signals from said first and second selection means in response to the carry signal from said down counting means;

comparison means for comparing the output value from said up/down counting means with N−1;

phase change means for changing an output phase of said second selection means in response to an output signal from said comparison means so that only one of 1 and N can be repeatedly selected by said second selection means about the time that N−2 or −(N−1) is selected (N−1) times by said first selection means while 1 and N are in turn selected by said second selection means; and

accumulation means for accumulating an output signal from said third selection means to generate an address output signal;

whereby the count of the up/down counting means, corresponding to either a progressive scanning position or a zig-zig scanning position, results in the generation of an address output signal, corresponding respectively to the zig-zag scanning position or the progressive scanning position.

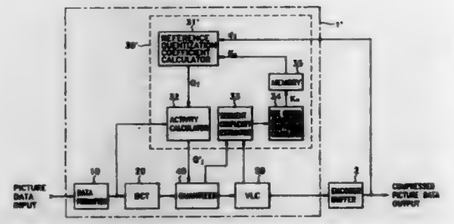
5,598,213

TRANSMISSION BIT-RATE CONTROLLING APPARATUS FOR HIGH EFFICIENCY CODING OF MOVING PICTURE SIGNAL

Tae-yun Chung, and Gyu-hwan Jung, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 14, 1995, Ser. No. 404,864
Claims priority, application Rep. of Korea, Mar. 15, 1994, 94-5105
Int. Cl.[6] H04N 7/36
U.S. Cl. 348—405 5 Claims

1. In an encoder having a data formatter, a DCT circuit, a transmission rate controlling apparatus, a quantizer, a variable-length coder and an encoder buffer, for compressing a moving



picture signal, said transmission rate controlling apparatus comprising:

a segment complexity estimator for receiving outputs of said quantizer and variable-length coder and estimating the complexity of a segment of a current frame relative to a previous frame;

a rate control adjustment coefficient calculator for receiving the output of said segment complexity estimator and calculating a rate control adjustment coefficient;

a reference quantization coefficient calculator for receiving said rate control adjustment coefficient and the output of said encoder buffer and calculating a reference quantization coefficient; and

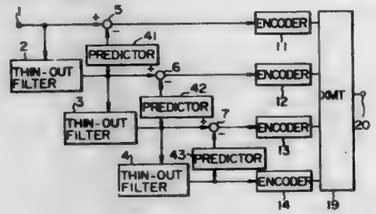
an activity calculator for receiving the output of said data formatter, calculating activity by a macroblock unit, performing an operation on said calculated activity using the output of said reference quantization coefficient calculator and outputting a new quantization coefficient.

5,598,214

HIERARCHICAL ENCODING AND DECODING APPARATUS FOR A DIGITAL IMAGE SIGNAL

Tetsujiro Kondo; Yasuhiro Fujimori, both of Kanagawa, and Takeharu Nishikata, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 313,811
Claims priority, application Japan, Sep. 30, 1993, 5-268050; Jul. 5, 1994, 6-175971
Int. Cl.[6] H04N 7/46
U.S. Cl. 348—414 24 Claims



1. An apparatus for encoding a first digital image signal representing pixels and having a first resolution, comprising:

means for forming said first digital image signal into a second digital image signal having a second resolution lower than said first resolution;

predicting means including class categorizing means for processing reference pixels of said second digital image signal to produce a class code, and means for producing a predicted signal at said first resolution from said reference pixels and said class code; and

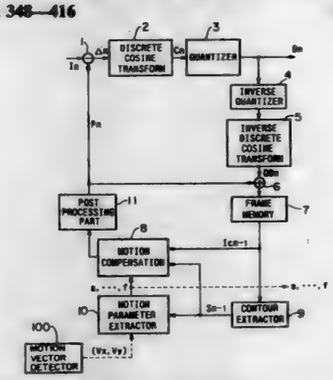
means for subtracting said predicted signal from said first digital image signal to produce a differential signal.

5,598,215

MOVING IMAGE ENCODER AND DECODER USING CONTOUR EXTRACTION

Hiroshi Watanabe, Kamakura, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 23, 1994, Ser. No. 247,975
Claims priority, application Japan, May 21, 1993, 5-120218
Int. Cl.[6] H04N 7/32
U.S. Cl. 348—416 10 Claims



1. A moving image encoder comprising:

a contour extracting means for dividing a local-decoded image into a plurality of segments and extracting contour information from said plurality of segments therein for each of an n number of frames, n being a natural number, in which encoding has been completed;

a motion parameter extracting means for extracting a set of motion parameters based on said contour information for each of an n number of frames in which encoding has been completed;

a motion compensation means for forming a prediction image based on said local decoded image, said contour information, and said set of motion parameters for each of an n number of frames in which encoding has been completed;

an encoding means for forming encoded information by means of quantizing a differential signal of said prediction image with a present frame;

a local decoding means for adding said prediction image to a signal formed by inverse quantization of said encoded information, forming said local decoded image from said signal, and storing said local decoded image into frame memory;

and a transmission means for transmitting said encoded information and said set of motion parameters for each of an n number of frames in which encoding has been completed;

wherein said information to be transmitted includes said encoded information and said set of motion parameters based on said contour information.

5,598,216

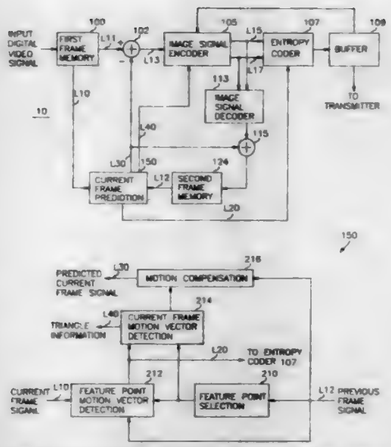
METHOD AND APPARATUS FOR ENCODING/DECODING A VIDEO SIGNAL

Min-Sub Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd, Seoul, Rep. of Korea

Filed May 4, 1995, Ser. No. 434,808
Claims priority, application Rep. of Korea, Mar. 20, 1995, 95-5868
Int. Cl.[6] H04N 7/32
U.S. Cl. 348—416 10 Claims

1. A method for reducing a transmission rate of a digital video signal, said digital video signal having a plurality of frames including a current frame and its previous frame, by selectively encoding the current frame, comprising the steps of:

(a) selecting a multiplicity of pixels in the previous frame as feature points and detecting motion vectors for the feature



points between the current frame and the previous frame, said feature points representing motions of objects in the digital video signal;

(b) determining a multiplicity of quasi-feature points on the current frame based on the feature points and the motion vectors thereof;

(c) defining non-overlapping polygons formed by line segments connecting the quasi-feature points;

(d) determining a predicted position on the previous frame for each pixel contained in each polygon of the current frame based on positional relationships between the quasi-feature points forming said each polygon and their corresponding feature points;

(e) providing a predicted pixel value for said each pixel based on the predicted position;

(f) generating a differential pixel value for said each pixel by subtracting the predicted pixel value from the pixel value of said each pixel;

(g) calculating an error value for each polygon by averaging the differential pixel values corresponding thereto;

(h) selecting, as processing regions, a multiple number of polygons in a descending order of their magnitude beginning from the maximum error value, and generating position information for the selected processing regions; and

(i) encoding the differential pixel values for each of the processing regions.

5,598,217

CIRCUIT FOR EXECUTING AN INTERPOLATION PROCESSING ON A SUB-SAMPLED IMAGE SIGNAL

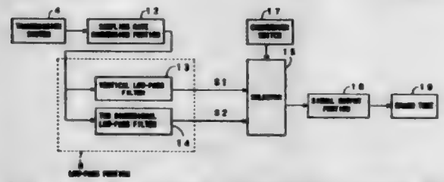
Ryuichi Yamaguchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 23, 1994, Ser. No. 347,115

Claims priority, application Japan, Dec. 7, 1993, 5-306199

Int. Cl.[6] H04N 7/24

U.S. Cl. 348—424 **10 Claims**



1. A circuit for executing an interpolation processing on a sub-sampled image signal, so arranged as to receive, from a transmitting side comprising:

(i) a transmitting-side low-pass filter portion which uses, as a prefilter for eliminating the high frequency component of a first image signal primitively sampled in the form of a square lattice, one of a first low-pass filter and a second low-pass filter of which transmissible band area is different from that of said first low-pass filter, said first low-pass filter including a vertical low-pass filter, and said second low-pass filter including a two dimensional low-pass filter, and

(ii) a sub-sampling portion for subsampling said first image signal after limited in band area by said transmitting-side low-pass filter portion, said first image signal being subsampled as inter-frame offset in the form of a quincunx

a second image signal obtained by sub-sampling said first image signal by said sub-sampling portion, said second image signal being subjected to interpolation processing;

said circuit for executing an interpolation processing on a sub-sampled image signal comprising:

a sampling rate conversion portion for generating a third image signal by interpolating zero into said second image signal;

a low-pass portion for generating (i) a fourth image signal by interpolating said third image signal generated by said sampling rate conversion portion, with a low-pass filter of which transmissible band area previously corresponds to the transmissible band area of said first low-pass filter, and (ii) a fifth image signal by interpolating said third image signal generated by said sampling rate conversion portion, with a low-pass filter of which transmissible band area previously corresponds to the transmissible band area of said second low-pass filter, said low-pass portion comprising: a vertical low-pass portion for generating said fourth image signal by interpolating, with a vertical low-pass filter, said third image signal from said sampling rate conversion portion; and a two dimensional low-pass portion for generating said fifth image signal by interpolating, with a two dimensional low-pass filter, said third image signal from said sampling rate conversion portion;

selection control means for supplying an instruction signal which instructs to select said fourth or fifth image signal generated by said low-pass portion; and

a signal selecting portion for selecting, based on the contents of said instruction signal from said selection control means, said fourth or fifth image signal generated by said lowpass portion, said fourth or fifth image signal thus selected being then supplied.

5,598,218

NTSC-PAL CONVERTER

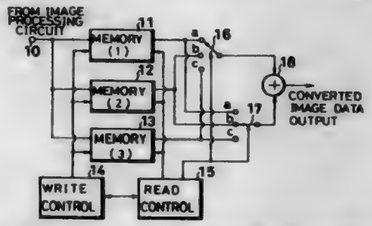
Kiyoshi Inoue, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 11, 1995, Ser. No. 570,602

Claims priority, application Japan, Dec. 15, 1994, 6-333329

Int. Cl.[6] H04N 7/07

U.S. Cl. 348—443 **2 Claims**



1. An NTSC-Pal converter for generating image signals in the PAL format from signals in the NTSC format comprising:

field memories for three fields which are provided for storing said image data in the NTSC format for three fields;

a write control circuit for sequentially writing and controlling field signals in the NTSC format in said field memories for three fields;

a read control circuit for selecting from these field memories at the moment to start the conversion into the PAL format two field memories which are not being written into and controlling reading so that the image data in the two field memories is sequentially read out;

an output circuit for generating image signals in the PAL format from the image signals read by said read control circuit; and

wherein said read control circuit preferably generates the frame image signals in the PAL format by adding horizontal line data of an odd-numbered field to that of an even-numbered field to produce horizontal line data of frame data in the PAL format, and reading and interpolating data in duplicate every predetermined number of horizontal lines.

5,598,219

DATA EXTRACTING APPARATUS FOR VALIDATING DATA MULTIPLEXED IN A VIDEO SIGNAL

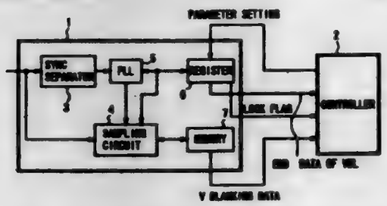
Miki Furuya, Saitama; Tadashi Enaki, Tokyo; Teruhiko Kori, and Satoshi Tsuchiya, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,441

Claims priority, application Japan, Jul. 1, 1994, 6-173517

Int. Cl.[6] H04N 7/087

U.S. Cl. 348—465 **4 Claims**



1. A data extracting apparatus for extracting data multiplexed to a predetermined interval of a video signal, comprising:

a PLL circuit for generating a sampling clock phase locked with a sync signal transmitted in said video signal and for generating a lock flag indicating whether said sampling clock is correctly phase locked with said sync signal;

a sampling circuit for sampling the video signal in time with the sampling clock; and

a memory for storing data sampled by said sampling circuit,

wherein said data is designated as valid or invalid on a basis of a status of said lock flag when the data is sampled.

5,598,220

DIGITAL SIGNAL WITH MULTILEVEL SYMBOLS AND SYNC RECOGNITION

Richard W. Citta, Oak Park; Gary J. Sgrignoli, Mt. Prospect, and Rudolf Turner, Hawthorn Woods, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 894,096, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 732,368, Jul. 18, 1991, abandoned. This application Mar. 2, 1994, Ser. No. 204,972

Int. Cl.[6] H04N 7/00

U.S. Cl. 348—471 **74 Claims**

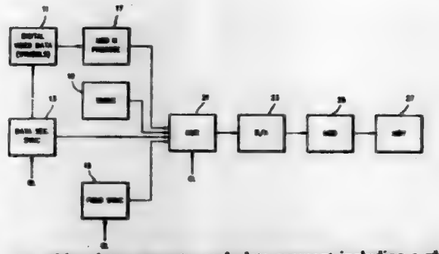
1. A digital television signal receiver comprising:

means for receiving a digital signal formatted in blocks of video information in the form of multilevel data symbols and having repetsive data segments, each data segment including a plurality of said data symbols and each data segment including synchronizing signals for establishing a fixed timing relationship between successive ones of said data segments, with one of said data segments including a field timing signal;

means for developing a reference field timing signal, at the repetition rate of said repetitive data segments;

means for comparing at least a portion of each of said received data segments with said reference field time signal; and

detection means responsive to the comparison for determining said one data segment in said video block.



5,598,221

BROADCASTING SYSTEM DISCRIMINATING TELEVISION RECEIVER FOR DIFFERENTIATING BETWEEN ANALOG AND DIGITAL TELECAST SIGNALS

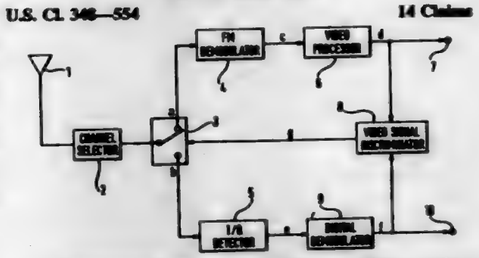
Yasunori Miyahara, and Syun-ichi Azuma, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1995, Ser. No. 377,596

Claims priority, application Japan, Jan. 24, 1994, 6-005608; Jun. 20, 1994, 6-137259

Int. Cl.[6] H04N 5/46

U.S. Cl. 348—554 **14 Claims**



1. A broadcasting system discriminating television receiver, comprising:

an FM demodulator which demodulates an FM-modulated analog broadcasting signal;

a video circuit which converts the demodulated output of the FM demodulator into a first video signal;

an I/Q wave detector which detects an I/Q-modulated digital broadcasting signal;

a digital demodulator which demodulates the I/Q-modulated digital broadcast signal detected into a second video signal;

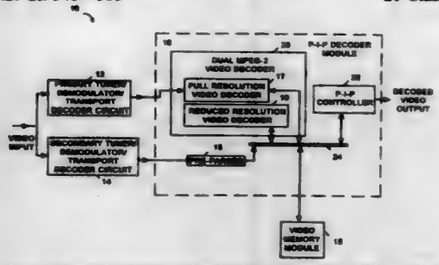
a video signal discriminator which generates a discriminated video signal based on at least one of the first and second video signals; and

selector means for selecting which of the FM demodulator and the I/Q wave detector will receive an input signal based on the video signal discriminated by the video discriminating circuit.

5,598,222
METHOD AND APPARATUS FOR DECODING MULTIPLE VIDEO BITSTREAMS USING A COMMON MEMORY

Frank A. Lane, Medford, N.J., assignor to Hatachi American, Ltd., Tarrytown, N.Y.

Filed Apr. 18, 1995, Ser. No. 424,686
Int. Cl.[6] H04N 5/262;5/45
U.S. Cl. 348—568 20 Claims



1. A picture-in-picture circuit for generating full resolution images from first encoded video data and reduced resolution images from second encoded video data, comprising:

first decoder means for decoding the first encoded video data to generate first decoded video data;

second decoder means for decoding at least a portion of the second encoded video data to generate second decoded video data;

video memory module means coupled to the first and second decoder means for storing the first encoded video data, the first decoded video data, at least the portion of the second encoded video data and the second decoded video data, the video memory module means including:

i. a first segment of memory for storing the first encoded video data and the first decoded video data; and

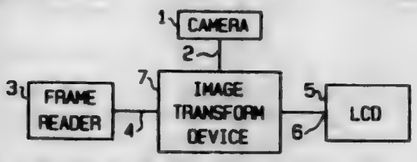
ii. a second segment of memory for storing at least the portion of the second encoded video data and the second decoded video data, the second segment of memory being smaller than the first segment of memory; and

picture-in picture control module means coupled to the first and second decoding means for selectively combining the first and second decoded video data to form a single video signal.

5,598,223
METHOD FOR TRANSFORMING A VIDEO IMAGE INTO AN IMAGE SUITABLE FOR A DISPLAY MATRIX

Thierry Leroux, IFS, and Christian Massart, Clichy-Sous-Bois, both of France, assignors to Essilor International, Charenton le Pont, France

Filed May 4, 1995, Ser. No. 434,488
Claims priority, application France, May 10, 1994, 94 05728
Int. Cl.[6] H04N 9/74;7/18
U.S. Cl. 348—589 6 Claims



1. A lens centering apparatus comprising:

a unit supplying a video image of a lens to be centered;

a spectacle frame reading unit comprising a microprocessor generating an image of a spectacle frame and of an alignment pattern to be inset into said video image of the lens;

a display device which includes a display matrix;

a video analog-digital convertor designed to receive the video image of the lens and to supply digital signals at its output corresponding to even-numbered and odd-numbered fields and composite field and line synchronization signals;

an image storage memory having at least an even-numbered portion and at least an odd-numbered portion, accessible for asynchronous read and write operations;

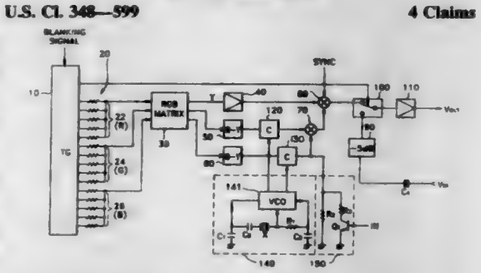
a graphics controller managing writing of the digital signals supplied by said convertor into said image storage memory, and reading of said image storage memory, and supplying at its output a signal for said display matrix; and

an inset memory designed to receive said image to be inset, and said graphics controller further managing reading of said image inset memory and incorporating into said signal for said display matrix said image to be inset.

5,598,224
CIRCUIT FOR SUPERIMPOSING TEXT ON AN IMAGE

Hae-min Choi, Kwacheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Mar. 24, 1995, Ser. No. 409,683
Claims priority, application Rep. of Korea, Dec. 20, 1994, 94-35345
Int. Cl.[6] H04N 9/76
U.S. Cl. 348—599 4 Claims



1. A superimposing circuit comprising:

an N-bit transmission gate for transmitting N-bit RGB data in a pixel unit in response to a blanking signal;

a signal synthesizer for generating R, G and B signals, by separating each component of R, G and B from the N-1 least significant bits of said N-bit RGB data output from said transmission gate;

an RGB matrix for receiving said R, G and B signals and generating a luminance signal, and first and second color difference signals;

a luminance signal amplifier for amplifying said luminance signal;

a pair of modulators for modulating said first and second color difference signals, respectively;

a first mixer for synthesizing said modulated first and second color difference signals and generating a carrier color signal;

a second mixer for synthesizing said carrier color signal, said amplified luminance signal and a complex synchronizing signal and generating a complex image signal;

an attenuator for attenuating an external image signal;

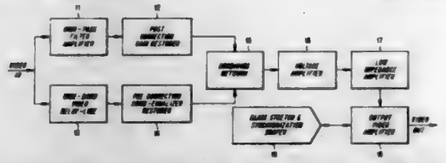
an image signal selector for selectively outputting said attenuated external image signal or said complex image signal according to the most significant bit value of said N-bit RGB data; and

an output amplifier for amplifying said selected image signal.

5,598,225
METHOD AND APPARATUS FOR IMPROVING TRANSMITTED VIDEO SIGNAL STRUCTURE

Jimmie D. Songer, Burleson, Tex., assignor to Magma, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 242,170, May 13, 1994, Pat. No. 5,486,874. This application Jun. 6, 1995, Ser. No. 468,133
Int. Cl.[6] H04N 5/14
U.S. Cl. 348—606 18 Claims



9. A video processor, having an input and an output, for compensating accumulated phase and amplitude errors encountered during transmission over a communications channel, of a video signal, comprising:

high-pass-filter-and-amplifier means, coupled to said input, having a bandwidth characteristic inverse to a low-pass characteristic encountered during transmission of the video signal over the communications channel, for filtering the video signal as a filtered-video signal and for inverting the filtered-video signal as an inverted-filtered-video signal;

post-restorer means for restoring the inverted-filtered-video signal to a restored-signal level, thereby generating a restored-inverted-filtered-video signal;

delay means, coupled to said input, for delaying the video signal as a delayed-video signal;

comb-equalizing means for adjusting the delayed-video signal to a restored-delayed-video signal; and

combining means for combining the restored-inverted-filtered-video signal and the restored-delayed-video signal to generate a composite-video signal at said output.

17. A method using a video processor, for compensating accumulated phase and amplitude errors encountered during transmission of a video signal, comprising the steps of:

filtering the video signal with a bandwidth characteristic inverse to a low-pass effect encountered during transmission of the video signal;

inverting the filtered-video signal, thereby generating an inverted-filtered-video signal;

delaying the video signal by an odd integer multiple of a half cycle at a subcarrier frequency thereby generating a delayed-video signal;

combining the inverted-filtered-video signal and the delayed-video signal to generate a composite-video signal;

amplifying the composite-video signal with a voltage amplifier;

matching impedances of the amplified-composite-video signal from the voltage amplifier using a low impedance amplifier; and

outputting the amplified-composite-video signal through an output-video amplifier.

18. A method using a video processor, for compensating accumulated phase and amplitude errors encountered during transmission of a video signal, comprising the steps of:

filtering the video signal with a bandwidth characteristic inverse to a low-pass effect encountered during transmission of the video signal;

inverting the filtered-video signal, thereby generating an inverted-filtered-video signal;

restoring the inverted-filtered-video signal to a restored level as a restored-inverted-filtered-video signal;

delaying the video signal by an odd integer multiple of a half cycle at a subcarrier frequency thereby generating a delayed-video signal;

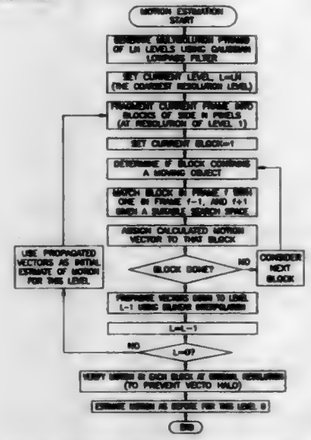
restoring the delayed-video signal to a restored-signal level as a restored-delayed-video signal; and

combining the restored-inverted-filtered-video signal and the restored-delayed-video signal to generate a composite-video signal.

5,598,226
REPARING CORRUPTED DATA IN A FRAME OF AN IMAGE SEQUENCE

Anil C. Kokaram, Cambridge, United Kingdom, assignor to AVT Communications Ltd., London, England

Filed Jul. 29, 1994, Ser. No. 282,901
Claims priority, application United Kingdom, Aug. 4, 1993, 9316153
Int. Cl.[6] G06K 9/00
U.S. Cl. 348—607 30 Claims

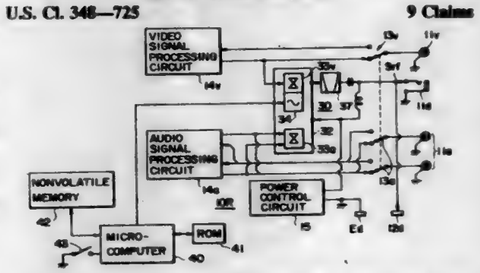


1. A method of repairing a damaged pixel, having coordinates x and y, in a current frame f of an image sequence having a plurality of frames, the method comprising: determining a corrected value for the damaged pixel by an autoregression process using an autoregression model in the form of a linear weighted combination of the values of pixels in a zone containing the damaged pixel and located in the current frame and in substantially the same zone of a motion compensated frame preceding and/or succeeding the current frame in the image sequence; and replacing the value I (x,y,f) of the damaged pixel by said corrected value.

5,598,227
TELEVISION CAMERA/RECORDER AND A SYSTEM FOR TRANSMITTING SIGNALS REPRODUCED BY THE SAME

Tsutomu Mikami, Saitama; Masuyasu Kaneko, Ibaragi, and Yoshiharu Murase, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1993, Ser. No. 163,524
Claims priority, application Japan, Dec. 24, 1992, 4-357657
Int. Cl.[6] H04N 5/44;5/225
U.S. Cl. 348—725 9 Claims



1. A television camera/recorder apparatus for processing image signals and playback signals, comprising:

an RF converter for converting playback signals into carrier television signals of a specified television channel and for

sending the carrier television signals to an antenna terminal of an external television receiver;

an output jack at which the carrier television signals are superposed on dc power of a predetermined value, wherein said carrier television signals include at least one of first and second carrier television signals of different respective frequencies; and

a nonvolatile memory for storing data representing default television channels associated respectively with the at least first and second carrier television signals provided by the RF converter.

3. A television camera/recorder apparatus for processing image signals and playback signals and including a case, the apparatus comprising:

an RF converter for converting playback signals into carrier television signals of a specified television channel and for sending the carrier television signals to an antenna terminal of an external television receiver;

an adaptor detachably connected to said case for receiving through a signal transferring means the carrier television signals from the RF converter and for transferring said carrier television signals to the antenna terminal of the television receiver;

an output jack at which the carrier television signals are superposed on a dc power of a predetermined value; and

a plug identifying means for identifying a type of a plug connected to the output jack for controllably supplying the carrier television signals provided by the RF converter to the output jack according to the type of the plug connected to the output jack.

7. An adapter apparatus comprising:

a case;

an RF converter for converting playback television signals into carrier television signals of a specified television channel;

an adapter incorporating the RF converter, capable of being detachably connected to the case, and connected to an antenna terminal of an external television receiver to send the carrier television signals to the antenna terminal of the external television receiver, the adapter being provided with an output jack at which the carrier television signals are superposed on dc power;

signal transferring means operating as one of a contact conduction type or a contactless conduction type for transferring the carrier television signals from the RF converter to the adapter; and

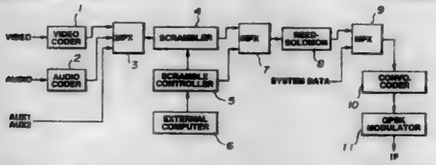
a nonvolatile memory for storing data representing default television channels associated with the carrier television signals provided by the RF converter.

5,598,228

CHANNEL SELECTION IN A DIGITAL TELEVISION RECEIVER

Mitsumasa Saitoh, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,606
Claims priority, application Japan, Sep. 8, 1993, 5-222955
Int. Cl.[6] H04N *5/44*
U.S. Cl. 348—732 **8 Claims**



1. In a television receiver arranged for receiving a full-digital television signal having digital data including digital video data and digital audio data, a channel selecting system comprising:

means for detecting a broadcasting carrier of the received television signal while changing a receive frequency to a receive frequency in a different frequency band; and

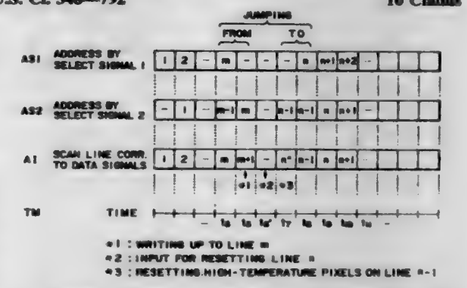
means for making a check whether the digital data are locked in the vicinity of the receive frequency after the broadcasting carrier is detected.

5,598,229

METHOD AND APPARATUS FOR LIQUID CRYSTAL DISPLAY TO ACHIEVE SMOOTH TRANSITIONS BETWEEN THE JUMPING OF SCANNING LINES

Shinjiro Okada, Isehara; Yutaka Inaba, Kawaguchi, and Kazunori Katakura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 171,180, Dec. 22, 1993, abandoned.
This application Oct. 2, 1995, Ser. No. 538,039
Claims priority, application Japan, Dec. 24, 1992, 4-357213
Int. Cl.[6] H04N *3/14*; G09G *3/36*
U.S. Cl. 348—792 **10 Claims**



1. A driving method for a liquid crystal device of a type comprising a first electrode substrate having thereon a group of scanning lines, a second electrode substrate having thereon a group of data lines intersecting the scanning lines, and a liquid crystal disposed between the scanning lines and the data lines so as to form a pixel at each intersection of the scanning lines and the data lines, said driving method comprising, depending on a given jumping signal, the following sequential steps of:

(a) simultaneously applying a first scanning selection signal (A) to an m-th scanning line and a second scanning selection signal (B), different from the first scanning selection signal, to an m-th−1 scanning line and, in synchronism with the first and second scanning selection signals, applying data signals to the data lines, each data signal being for determining a display state of an associated pixel on the m-th scanning line and for compensating a display state of an associated pixel on the m-th−1 scanning line;

(b) applying the second scanning selection signal (B) to the m-th scanning line while not applying either the first or the second scanning selection signal to an m-th+1 scanning line and, in synchronism with the second scanning selection signal (B), applying data signals to the data lines, each of the data signals being for compensating the display state of an associated pixel on the m-th scanning line; and

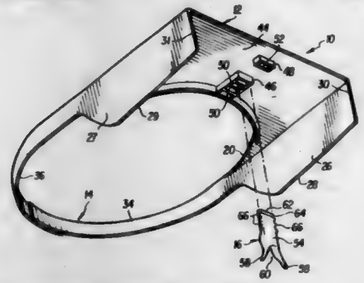
(c) after a jumping of scanning lines after execution of said step (b), applying the first scanning selection signal (A) to a p-th scanning line and, in synchronism with the first scanning selection signal, applying data signals to the data lines, each data signal being for determining a display state of an associated pixel on the p-th scanning line.

5,598,230

ANTI-GLARE EYE SHIELD

James S. Quaresima, 6 Higbee Rd., Hampton Bays, N.Y. 11946

Filed Nov. 3, 1995, Ser. No. 552,618
Int. Cl.[6] G02C *7/10;5/02;1/00*; A61F *9/00*
U.S. Cl. 351—44 **17 Claims**



1. An anti-glare eye shield comprising

a top portion having a first edge conforming to a wearer's forehead, a second edge opposite said first edge and a pair of side edges extending between said first and second edges;

a side member coupled to each of said side edges and extending downwardly substantially perpendicular to said top portion;

a strap member coupled to each of said side members, wherein said strap members define a head encircling band, each strap member having coupling means for adjustably coupling said strap members together;

a nose bridge for supporting said shield; and

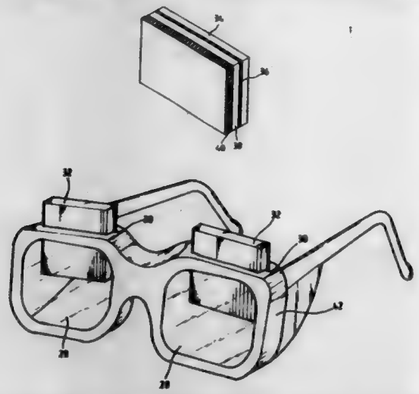
a plurality of nose bridge coupling means on a bottom surface of said top portion for removably coupling with said nose bridge, each said nose bridge coupling means being positioned along an axis and spaced from said first edge for selectively spacing said nose bridge from said first edge.

5,598,231

GLASSES CAPABLE OF PRODUCING A THREE-D VISUAL EFFECT

Ming-Yen Lin, Taipei, Taiwan, assignor to Artificial Parallax Electronics Corp., Taipei, Taiwan

Filed Dec. 4, 1995, Ser. No. 567,089
Int. Cl.[6] G02C *7/12;1/00*; G02F *1/1335*
U.S. Cl. 351—49 **2 Claims**



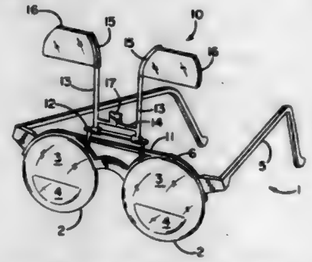
1. A pair of glasses capable of producing a three-D visual effect, comprising a frame, two polarizing lenses set in said frame, and two additional laminated lenses removably attached to said frame to be located behind said two polarizing lenses; said two polarizing lenses producing two polarizing angles which are normal to each other; and said laminated lenses each consisting of two glass sheet layers, an LCD layer disposed between said two glass sheet layers, and a polarizer layer laminated to an outer surface of one of said glass sheet layers; whereby when a voltage is applied to said LCD layer, molecules constituting said LCD layer rotate and change their arrangement direction to achieve the effect of blocking light, thereby enabling said pair of glasses to produce a 3-D visual effect.

5,598,232

BIFOCAL-COMPENSATING EYEGLASS ATTACHMENT

George R. Proesti, P.O. Box #283, Bryn Athyn, Pa. 19009

Filed Feb. 20, 1996, Ser. No. 603,437
Int. Cl.[6] G02C *7/06;7/08*
U.S. Cl. 351—54 **16 Claims**



1. An attachment for bifocal eyeglasses including at least one eyeglass lens having a first correcting region providing corrected distant-vision and a second correcting region providing corrected near-vision, the attachment comprising:

a compensating lens sized and shaped for covering the second correcting region of the eyeglass lens without substantially covering the first correcting region of the eyeglass lens and providing optical compensation for the second correcting region so that corrected distant-vision is provided over substantially all of the first and second correcting regions of the eyeglass lens; and

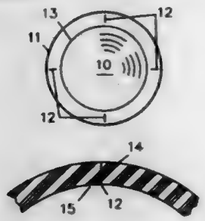
attachment means for attaching the compensating lens to the eyeglasses.

5,598,233

SOFT CONTACT LENS WITH CONTAMINATION INDICATOR

Constantine Haralambopoulos, Rochester, and Alexandra Hara, New York, both of N.Y., assignors to Harold A. Gell, Silver Spring, Md.

Filed Aug. 18, 1994, Ser. No. 292,816
Int. Cl.[6] G02C *7/04*
U.S. Cl. 351—160 H **20 Claims**



1. A lens, comprising:

an optical correcting center section;

flange surrounding said optical correcting center section; and

at least one flexible opening through the material of said lens dimensioned to permit liquid carried wastes to flow from the posterior to the exterior surface of said lens wherein said opening is dimensioned so that when waste materials accrete on the inner surfaces of said opening, said opening expands due to the accumulative accreted waste to a point where it interrupts the visual continuity of said lens and becomes visible to the wearer.

5,598,234

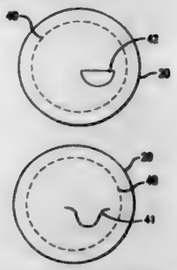
METHOD OF MANUFACTURING TORIC SINGLE VISION, SPHERICAL OR ASPHERIC BIFOCAL, MULTIFOCAL OR PROGRESSIVE CONTACT LENSES

Ronald D. Blum, Roanoke, Va., and Amitava Gupta, Bethesda, Md., assignors to Innotech, Inc., Roanoke, Va.

Continuation-in-part of Ser. No. 988,053, Nov. 23, 1992, Pat. No. 5,406,341. This application Mar. 23, 1994, Ser. No. 216,381

Int. Cl.[6] G02C *7/04*

U.S. Cl. 351—160 R **8 Claims**



1. A method for making a finished spherical or aspheric bifocal, multifocal or progressive addition contact lens, comprising the steps of:

fitting a patient requiring a near correction with an optic comprising a single vision contact lens for optimal distance vision and comfortable fit; observing said optical preform for signs of rotation after said fitting step;

stabilizing said optical preform to prevent rotation observed in said observing step;

marking a portion of the optic corresponding to the center location of the pupil on the convex side of the optic to form an optical preform;

removing the optical preform from the eye of the patient;

marking the concave side of the optical preform at a position corresponding to the mark on the convex side denoting the center of the pupil;

removing the mark disposed on the convex side of the optical preform;

placing a specified volume of polymerizable resin in a mold embodying the required correction that includes an add power zone so that the resin fills intervening space between the mold and the optical preform;

aligning the add power zone on the optical preform to a predetermined position with respect to the mark on the optical preform designating the center of the pupil;

polymerizing the resin; and

demolding the optical preform to obtain the finished contact lens having the required correction.

5,598,235

METHOD AND AN APPARATUS FOR TESTING A SUBJECT'S RESPONSE TO VISUAL STIMULI

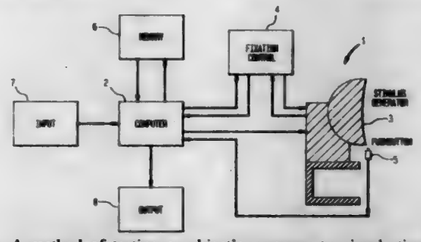
Anders Heijl, Danska vägen 62, S-226 39 Lund; Jonny Olsson, Fasanvägen 5A, S-227 31 Lund, and Holger Rootzén, Olshögsvägen 6, S-223 60 Lund, all of Sweden

Filed Mar. 21, 1995, Ser. No. 408,033

Claims priority, application WIPO, Mar. 22, 1994, PCT/SE94/00256

Int. Cl.[6] A61B *3/02;3/00*

U.S. Cl. 351—224 **16 Claims**



1. A method of testing a subject's response to visual stimuli, comprising the steps of:

successively presenting a plurality of visual stimuli to the subject;

detecting any response received from the subject within a predetermined time period as a result of each presentation of a visual stimulus as well as the time of receipt of the detected response; and

classifying each presented stimulus as one of the following: seen, unseen or uncertain;

wherein the step of classifying comprises the substeps of:

classifying a presented stimulus as seen, if a response is received within a predetermined response time window within the predetermined time period;

classifying a presented stimulus as uncertain, if a response is received within predetermined time interval before the beginning or after the end of the predetermined response time window; and

classifying a presented stimulus as unseen, if it is classified as neither seen nor uncertain.

5,598,236

CAMERA USING A FILM HAVING A MAGNETIC RECORDING PORTION

Toshiharu Ueda, Yokohama, and Akira Egawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 288,263, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 890,405, May 29, 1992, abandoned. This application Dec. 27, 1995, Ser. No. 580,274

Claims priority, application Japan, May 30, 1991, 3-153743; Jun. 12, 1991, 3-166221; Jun. 12, 1991, 3-166222; Jun. 12, 1991, 3-166223

Int. Cl.[6] G03B *7/00;17/24;17/26*

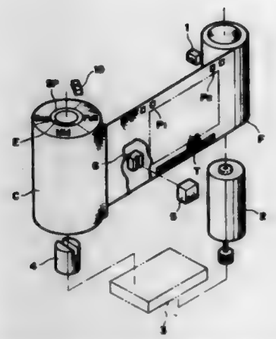
U.S. Cl. 396—319 **12 Claims**

1. A camera using a cartridge in which a film having a magnetic recording portion in each frame is loaded, the cartridge having an indication portion that indicates an exposure state of the film in the cartridge, said camera comprising:

indication state detection means for detecting an indication state from the indication portion of the film cartridge;

read means for reading information recorded in the magnetic recording portion in each frame of the film; and

determination means for (i) determining whether a frame of the film is exposed or not on the basis of the information read by said read means, (ii) determining the exposure state of the film and (iii) detecting an inconsistency between an exposure state of the film indicated by the indication portion detected by said indication state detection means and an exposure state of the film being determined.



5,598,237

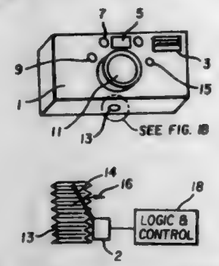
IMAGE CAPTURE APPARATUS

Dale F. McIntyre, Honeoye Falls, and Kenneth M. Haas, Oakfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,549

Int. Cl.[6] G03B *29/00*

U.S. Cl. 396—264 **15 Claims**



1. A camera for capturing images, comprising:

means for setting at least one of shutter speed, focal length, or aperture of the camera to establish for the camera a first set of exposure parameters for operation in a first, hand-held condition and a second set of exposure parameters for operation in a second, stabilized non-hand-held condition;

means for determining whether the camera is to be operated in the first condition or the second condition; and

means, responsive to the means for determining, for preventing use of a portion of the second set of exposure parameters when the camera is to be operated in the first condition.

5,598,238

CAMERA WITH FRONT FLIP-UP FLASH UNIT AND REAR FLIP-UP FLASH RETAINER HAVING FRONT AND REAR VIEWFINDER OPENINGS

Stanley W. Stephenson, III, Spencerport, and Alan G. Codd, Jr., Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

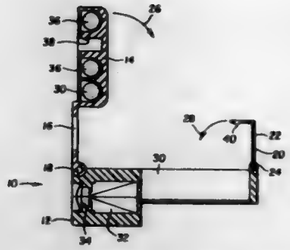
Filed Jan. 11, 1996, Ser. No. 584,479

Int. Cl.[6] G03B *15/03;17/02*

U.S. Cl. 396—178 **6 Claims**

1. A camera comprising a body portion, a flash unit having a front viewfinder opening and supported to be flipped up from said body portion for picture-taking and to be flipped down to the body portion for storage, and a cover part having a rear viewfinder opening and supported to be flipped up from said body portion to align said rear viewfinder opening with said front viewfinder opening when said flash unit is flipped up for picture-taking and to be flipped down partly over the flash unit when the flash unit is flipped down for storage, is characterized in that:

said flash unit and said cover part are supported to be flipped down independently of one another, in opposite directions, to permit the flash unit to be flipped down first for storage and the cover part to be flipped down second to partly cover the flash unit.



5,598,239

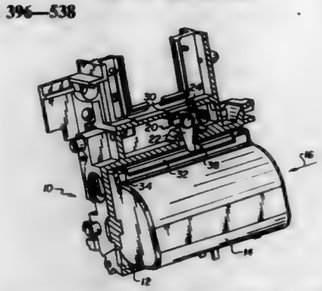
CASSETTE RETAINING APPARATUS

Joel S. Lawther, and Anthony DiRisio, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,339

Int. Cl.[6] G03B *17/26*

U.S. Cl. 396—538 **1 Claim**



1. A cassette retaining apparatus comprising a holding chamber into which a film cassette is to be inserted and from which the cassette may be removed, and retaining means biased into engagement with the film cassette to retain the cassette in said chamber, is characterized in that:

said retaining means has elastic means for exerting a first force to be biased into engagement with the film cassette, which force incidentally resists insertion of the cassette into said chamber though is weak enough to make it easy to manually insert the cassette into the chamber, and for exerting a second force to to manually insert the cassette into the chamber, and for exerting a second force to be biased into engagement with the film cassette, which force incidentally resists removal of the cassette from the chamber and is stronger than the first force to make it difficult for the cassette to be unintentionally dislodged from the chamber;

said elastic means includes a pivotable retaining piece which is resiliently flexible in order to exert the first force and, when the film cassette is inserted in said chamber, to first permit the cassette to flex said retaining piece out of the way of the cassette in opposition to that force and to then permit the retaining piece to receiver its original shape in an exterior cavity in the cassette to engage the cassette, and which is coupled with a separate spring to be pivotally spring-urged in order to exert the second force to maintain the retaining piece in the exterior cavity and when the cassette is removed from

the chamber, to permit the cassette, to pivot the retaining piece out of the cavity to disengage the cassette in opposition to that force.

5,598,240

ZOOM LENS DRIVE SYSTEM FOR LENS SHUTTER TYPE OF CAMERA

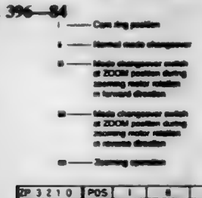
Keisuke Haraguchi; Shinsuke Kohmoto; Takeo Kobayashi; Shigeru Kondoh; Hideki Ohkubo; Norio Numako, and Saburo Sugawara, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

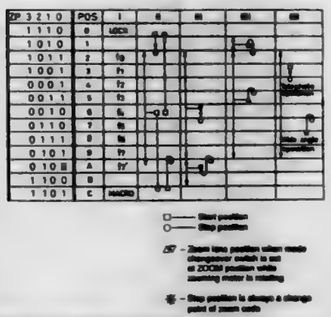
Continuation of Ser. No. 362,753, Dec. 22, 1994, Pat. No. 5,475,456, which is a continuation of Ser. No. 97,217, Jul. 27, 1993, abandoned, which is a continuation of Ser. No. 884,479, May 13, 1992, Pat. No. 5,280,317, which is a continuation of Ser. No. 633,023, Dec. 24, 1990, abandoned, which is a continuation of Ser. No. 510,676, Apr. 18, 1990, Pat. No. 5,162,831, which is a continuation of Ser. No. 143,946, Jan. 7, 1988, Pat. No. 4,936,664. This application Jun. 7, 1995, Ser. No. 487,156

Claims priority, application Japan, May 12, 1986, 61-108278; Sep. 19, 1986, 61-143964; Nov. 26, 1986, 61-181723; Feb. 5, 1987, 61-15853

Int. Cl.[6] G03B *5/00*

U.S. Cl. 396—84 **16 Claims**





1. A zoom lens shutter camera comprising:

a photographic optical system and a finder optical system which is independent of said photographic optical system, said photographic optical system having an optical axis and including a zoom lens, said zoom lens having a plurality of lens groups which are supported within said camera, said zoom lens being movable: (a) within a zooming range in order to vary the focal length of said zoom lens; (b) to an accommodated position in which said zoom lens is located closer to a film plane surface in said camera than when said zoom lens is within said zooming range; and (c) within a transition range located between one end of said zooming range and said accommodated position;

a zoom lens position detection system capable of detecting the position of said zoom lens;

a motor for driving said zoom lens;

a manually operable zoom switch for selectively forwardly or reversely rotating said motor to respectively move said zoom lens in first and second opposite directions along said optical axis when said zoom lens is within said zooming range;

a main switch for selectively forwardly or reversibly driving said motor to move said zoom lens from a position within said zooming range to said accommodated position, or from said accommodated position to a position within said zooming range; and

a motor control system for supplying electrical power to said motor when said motor is driving said zoom lens;

wherein, when said main switch is operated so as to move said zoom lens to said accommodated position, (i) said zoom lens is driven by said motor when said position detection system determines that the zoom lens is positioned within said transition range, and (ii) said motor stops driving said zoom lens when said apparatus determines that said zoom lens is located at said accommodated position.

5,598,241

CAMERA HAVING A LENS OPENING

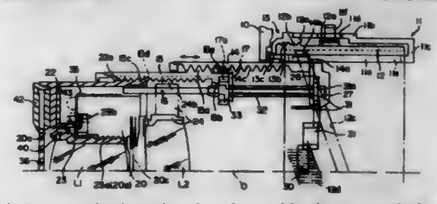
Hiroshi Nomura, and Takamitsu Sasaki, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1994, Ser. No. 353,212

Claims priority, application Japan, Dec. 6, 1993, 5-305455

Int. Cl.[6] G03B *3/00;5/00;13/36*

U.S. Cl. 396—79 **19 Claims**



1. A camera having a lens barrel movable along an optical axis of the camera, comprising:

a photographic optical system provided in said lens barrel, said photographic optical system including a focusing lens group located at a front end of said photographic optical system;

a lens frame provided in said lens barrel for supporting said focusing lens group, said lens frame protecting forwardly from an infinite focus position to a shortest focus position for a focusing operation; and

a lens opening provided on a front part of said lens barrel, said lens opening exposing said focusing lens group to an outside of said lens barrel,

wherein said lens opening is formed so as to allow said lens frame to project forwardly through said lens opening when said lens frame moves to said shortest focus position.

5,598,242

VIBRATION COMPENSATION MODE SELECTION APPARATAUS AND ASSOCIATED VISUAL DISPLAY FOR A CAMERA

Junichi Ouni, Kawasaki; Hiroshi Wakabayashi, Yokohama; Hidenori Miyamoto, Urayasu; Isao Soshi, Tokyo; Minoru Kato, Kawasaki; Tetsuo Amemuna, Ageo, and Yoshio Imura, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 4, 1994, Ser. No. 356,863

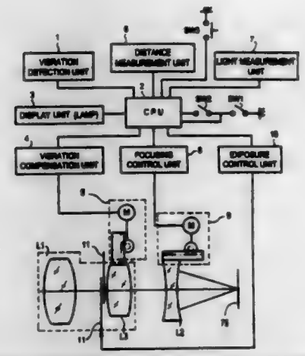
Claims priority, application Japan, Dec. 14, 1993, 5-313715; Feb. 3, 1994, 6-011878; Feb. 4, 1994, 6-032052; Feb. 4, 1994, 6-033112

Int. Cl.[6] G03B *5/00;13/00;17/40*

U.S. Cl. 396—55 **44 Claims**

1. An image producing apparatus comprising:

a vibration detection unit to detect vibrations in the image producing apparatus;



a vibration compensation unit to correct for the effects of the vibrations detected by the vibration detection unit on the image;

a mode selection unit to selectively disable the vibration compensation unit in response to input from a user of the image producing apparatus; and

said vibration detection unit continues to detect vibration when the mode selection unit disables the vibration compensation unit.

5,598,243

CAMERA HAVING REMOVABLE VIEWFINDER AND VISUAL LINE DETECTION DEVICE

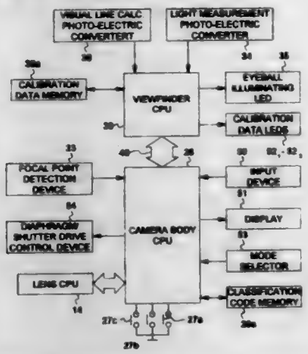
Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed May 31, 1994, Ser. No. 251,294

Claims priority, application Japan, May 31, 1993, 5-129207

Int. Cl.[6] G03B *13/02*

U.S. Cl. 396—51 **28 Claims**



23. A method of using a camera having a visual line detection device and a viewfinder that is detachable from a camera body, said method comprising:

determining correction values for use in calculating a value relative to a visual line of a photographer on the basis of a detected visual axis when the photographer views an object through the viewfinder; and

storing plural sets of said correction values in a correction value storage device in said viewfinder, each set being stored in correspondence with a classification code that is specific to a particular camera body.

5,598,244

CAMERA MECHANISM DISPLACEMENT MEANS

Tomas Johansson, Falkenberg, Sweden, assignor to Victor Hasselblad AB, Sweden

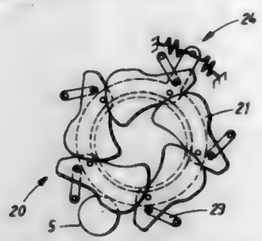
PCT No. PCT/SE93/00493, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO93/25935, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 3, 1993, Ser. No. 347,342

Claims priority, application Sweden, Jun. 9, 1992, 9201751

Int. Cl.[6] G03B *9/10*

U.S. Cl. 396—495 **11 Claims**



1. Means for effecting cyclic displacement of a mechanical system which is displaceable between a pair of end positions in a camera, said means comprising spring means for biasing said system towards a neutral position between said pair of end positions, and drive means actuatable to supply additional energy during said displacement of said system when said system is between said pair of end positions for insuring that said system sequentially reaches said pair of end positions.

5,598,245

FLANGE BACK MECHANISM FOR PHOTOGRAPHIC CAMERA

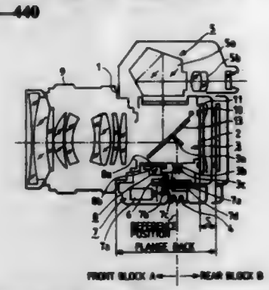
Yamamoto Masaru; Atsuta Toshikatsu; Koshimizu Yoshinori; Kitamura Nobuo; Ishikawa Tadaaki, and Yasuharu Shin, all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation-in-part of Ser. No. 226,894, Apr. 7, 1994. This application Jun. 16, 1994, Ser. No. 260,529

Claims priority, application Japan, Aug. 11, 1993, 5-217961

Int. Cl.[6] G03B *17/02*

U.S. Cl. 396—440 **6 Claims**



1. A flange back mechanism for a camera, comprising:

a first section having a lens mount adapted to receive a camera lens thereon, the lens defining an optical axis and a refereace flange back position on the optical axis, the reference flange back position being a focal point of the lens when the lens is set at infinity; and

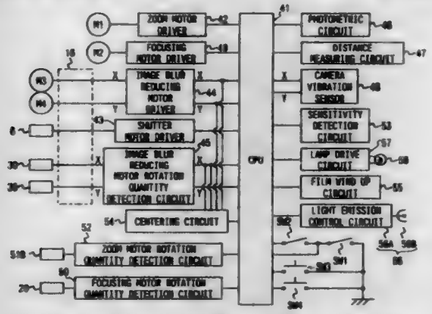
a second section coupled to the first section and holding a film on which an image is to be formed, wherein the second section is movable relative to the first section along the optical axis so that the film on the optical axis is moveable toward and locatable at a first position closer to the lens relative to the reference flange back position.

5,598,246

CAMERA CAPABLE OF REDUCING IMAGE BLUR

Hidenori Miyamoto, Urayasu; Tatsuo Amanuma, Ageo, and Toshiyuki Nakamura, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 358,620, Dec. 14, 1994, abandoned.
This application Dec. 12, 1995, Ser. No. 570,823
Claims priority, application Japan, Dec. 15, 1993, 5-315148; Dec. 15, 1993, 5-315149; Dec. 15, 1993, 5-315150
Int. Cl.[6] G03B *5/00;15/03*
U.S. Cl. 396—55 **35 Claims**



1. A camera capable of reducing image blur comprising;

a vibration detection device that detects a quantity of camera vibration,

an image blur reducing device that, based upon a detection output from said vibration detection device, electrically drives an image blur reducing optical system in a direction that is different from a direction of an optical axis of a photographic lens in order to reduce blurring of a photographic image,

a flash photographing device that, when a flash photographing condition is present, performs photographing with emitting an illuminating light to illuminate a photographic subject,

a pre-light emission device that performs pre-light emission prior to flash photographing in order to reduce a red eye phenomenon, and

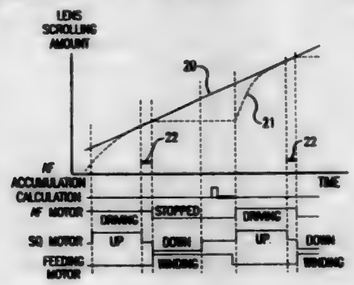
a control device that, when said flash photographing condition is present, causes said image blur reducing device and said flash photographing device to operate after said pre-light emission by said pre-light emission device is completed.

5,598,247

AUTOMATIC FOCUS ADJUSTMENT DEVICE

Toshimi Watanabe, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 515,063
Claims priority, application Japan, Sep. 7, 1994, 6-214080
Int. Cl.[6] G03B *13/36*
U.S. Cl. 396—95 **20 Claims**



1. An automatic focus adjustment device, comprising a camera capable of continuous photography that is equipped with:

a phototaking lens;

focus detection means for repeatedly detecting the focus adjustment state of said phototaking lens and for outputting focus detection results at each detection of said focus adjustment state;

memory means for storing said focus detection results; and

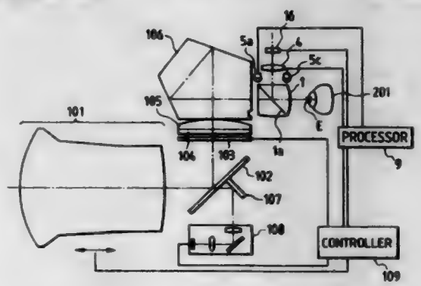
driving means for, in at least a portion of the time between a first and a second exposure during continuous photography, selectively driving said phototaking lens based on focus detection results obtained by said focus detection means and stored in said memory means before said first exposure and based on focus detection results obtained by said focus detection means after said first exposure.

5,598,248

OPTICAL APPARATUS HAVING VISUAL POINT DETECTION FUNCTION

Akihiko Nagano, Kawasaki; Yasuo Suda, Yokohama, and Kazuki Konishi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 815,050, Dec. 31, 1991, abandoned.
This application Feb. 10, 1994, Ser. No. 194,642
Claims priority, application Japan, Jan. 8, 1991, 3-011492
Int. Cl.[6] G03B *13/02;13/18*
U.S. Cl. 396—51 **18 Claims**



1. An apparatus including:

conversion means for receiving light reflected by an eye, and converting the light into an electrical signal;

generating means for generating information relating to a visual point observed by an observer on the basis of the electrical signal;

optical means having a lens through which the observer observes a view field;

setting means for setting a calibration mode;

display means for displaying a mark at a predetermined position in or near the view field in response to a setting operation of said setting means;

observer actuated means for starting said generating means in response to an action by the observer;

calculation means for calculating compensation information for causing the information generated by said generating means relating to the visual point observed by the observer when he or she watches the mark to substantially coincide with position information of the mark; and

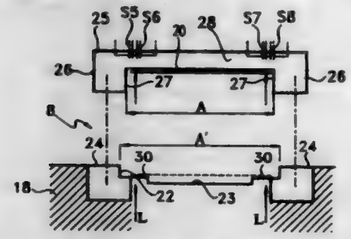
alarm means for indicating to the observer that the compensation information is not correct in a case where the compensation information is not correct.

5,598,249

DX CODE SENSING NEGATIVE FILM CARRIER

Masahiko Kuwayama, Urawa, and Yoshihiro Yamamoto, Tokyo, both of Japan, assignors to Samsung Aerospace Industries, Ltd., Changwon, Rep. of Korea

Filed Sep. 23, 1994, Ser. No. 311,043
Claims priority, application Japan, Sep. 24, 1993, 5-261640
Int. Cl.[6] G03B *27/52*
U.S. Cl. 355—41 **6 Claims**



1. A negative film carrier comprising a body formed with a film path for feeding a negative film which has a DX code formed on at least on side thereof, said negative film carrier further comprising:

a restriction member for restricting the lateral movement of the negative film along said film path, said restriction member having a ceiling portion located above an upper portion of the film path formed in the body of said carrier, and a pair of bridge supports extending downward from either side of the ceiling portion and installed on both sides of the film path, the width between the two bridge supports being the same as or narrower than that of said film; and,

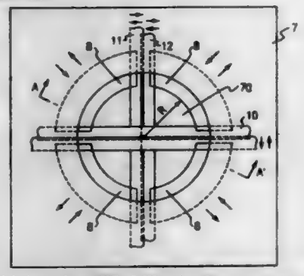
DX code sensors for detecting the DX code integrally formed in said restriction member.

5,598,250

PREFABRICATED MODIFIED ILLUMINATION APPARATUS FOR FORMING FINE PATTERNS IN A SEMICONDUCTOR DEVICE

Sang M. Bae, Bubaleub, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Mar. 7, 1995, Ser. No. 400,045
Claims priority, application Rep. of Korea, Mar. 7, 1994, 1994-4394
Int. Cl.[6] G03B *27/54;27/72*
U.S. Cl. 355—67 **6 Claims**



1. A prefabricated modified illumination apparatus for forming fine patterns in a semiconductor device comprising:

a plate having a transmission hole in the center;

a plurality of first blades for intercepting light which transmits through said transmission hole of said plate, said blades being radially moveable and being controlled by an external power-driven machine so that said plurality of first blades varies the area of said transmission hole;

a plurality of second blades of a cross-bar type, which intercept light transmitting through said transmission hole, said second blades being moveable toward and away from one another and being controlled by said external power-driven machine so that said second blades vary the area of said transmission hole; and

a plurality of third blades of a length-bar type, which intercept light transmitting through said transmission hole, said third blades being moveable toward and away from one another and being controlled by said external power-driven machine so that said third blades vary the area of said transmission hole,

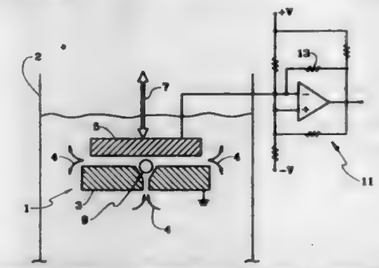
wherein said second blades are superimposed on said third blades in the area of said transmission hole.

5,598,251

CONCENTRATION SENSING BY VISCOSITY MEASUREMENT

George K. Parish, Winchester, and William J. Thornhill, Lexington, both of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed May 15, 1995, Ser. No. 440,602
Int. Cl.[6] G03G *15/10*
U.S. Cl. 399—30 **4 Claims**



1. Imaging apparatus comprising a chamber to contain liquid toner for imaging and a measuring device to measure the concentration of solids in a liquid in said chamber, said measuring device comprising a horizontal bottom plate in said chamber, a horizontal top plate moveable vertically with respect to said bottom plate in said chamber, means to measure the capacitance between said bottom plate and said top plate, means to measure the time period while said top plate falls in said liquid between a first predetermined capacitance measured by said means to measure and a second predetermined capacitance measured by said means to measure, and means to interpret said time difference as the concentration of said solids in said liquid for replenishing said toner.

5,598,252

ELECTRONIC IMAGE FORMING APPARATUS WITH REDUCED RESIDUAL CARRIER AND TONER ATTRACTION

Hideo Yamana, Ikoma; Fumio Shimura, Chiba; Keichi Imai, Higashi-Osaka; Shiren Wakahara, Osaka; Yushi Yui, Nabari; Eiichi Kido, Yamato-Koriyama, and Hiromu Yoshimoto, Yamabe-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

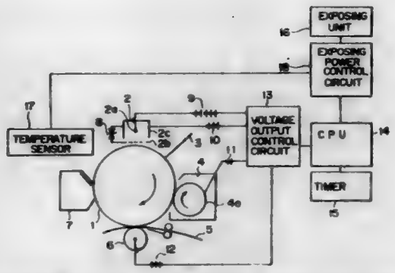
Division of Ser. No. 77,988, Jun. 15, 1993, Pat. No. 5,459,555.
This application Jul. 11, 1995, Ser. No. 500,597
Claims priority, application Japan, Jun. 17, 1992, 4-157948
Int. Cl.[6] G03G *15/00*
U.S. Cl. 399—46 **7 Claims**

1. An image forming apparatus, comprising:

a photosensitive body having a photosensitive surface;

a main charger for charging said photosensitive body with a predetermined electric potential;

an exposing unit for applying a ray of light on said photosensitive surface to form an electrostatic latent image, including regulating means for regulating a power of said ray of light;



a developing unit for developing said electric latent image to form a toner image;

a transfer charger for transferring said toner image on an image transfer paper;

a power supply unit for supplying power to each of said main charger, said developing unit and said transfer charger; and

control means for controlling said power supply unit after an image forming operation to raise an electric potential of said photosensitive body to a predetermined high level by said main charger, to lower the electric potential of said photosensitive body to a predetermined low level by said transfer charger and then to cut off a bias voltage of said developing unit, and for controlling said exposing unit after a control of said power supply unit to apply a regulated ray of light to said photosensitive body gradually enhancing said power of said ray of light to reduce carrier attraction and toner attraction.

5,598,253

LIQUID DEVELOPER APPARATUS AND METHOD USING TWO DIFFERENT BIAS VOLTAGES FOR PREVENTING FOG IN THE BACKGROUND OF AN IMAGE

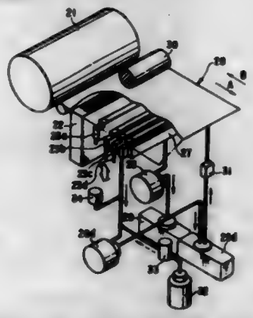
Atsushi Yagi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1995, Ser. No. 523,790

Claims priority, application Japan, Sep. 7, 1994, 6-213570

Int. Cl.[6] G03G *15/10*

U.S. Cl. 399—240 **12 Claims**



1. A liquid developer apparatus comprising:

a developer unit for applying a liquid developer to an electrostatic latent image formed on a recording medium and having a predetermined polarity;

voltage generation means for generating a first bias voltage and a second bias voltage which has the same polarity as the electricity of the electrostatic latent image and is higher than the first bias voltage;

switch means for selectively outputting one of the first and second bias voltages to the developer unit; and

control means for controlling the switch means such that the switch means outputs the second bias voltage during a predetermined period of time other than a period of time in which the electrostatic latent image is developed.

5,598,254

CARTRIDGE FOR REPLENISHING TWO-INGREDIENT DEVELOPER TO AN IMAGE FORMING APPARATUS AND A REPLENISHING DEVICE USING THE SAME

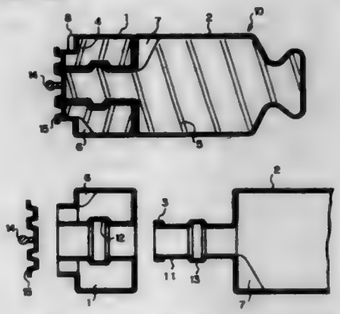
Masumi Ikesue, Tokyo; Tsukuru Kai, Fujisawa; Hidetoshi Yano, Yokohama, and Nobuto Yokokawa, Gotenba, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1995, Ser. No. 521,324

Claims priority, application Japan, Aug. 31, 1994, 6-207632; Oct. 28, 1994, 6-255629; Nov. 4, 1994, 6-271312; Nov. 4, 1994, 6-271314; Jul. 6, 1995, 7-171157

Int. Cl.[6] G03G *15/06*

U.S. Cl. 399—262 **8 Claims**



1. In a cartridge having two containers constructed into a single assembly and each storing a content of particular kind, one of said containers coaxial with the other container is fitted in a bore formed at a center of said other container by an annular portion, said containers having respective openings positioned at a same side and coaxial with each other.

5,598,255

ELECTROSTATOGRAPHIC PRINTER FOR FORMING A TONER IMAGE ONTO A RECEPTOR WEB ADAPTED TO REDUCE SMUDGING

Etienne M. De Cock; Lucien A. De Schampheleare, both of Edegem, and Bart J. Van Dessel, St-Antonius, all of Belgium, assignors to Xeikon N.V., Mortsel, Belgium

Filed Mar. 6, 1995, Ser. No. 398,899

Claims priority, application European Pat. Off., Mar. 11, 1994, 94301783

Int. Cl.[6] G03G *15/14*

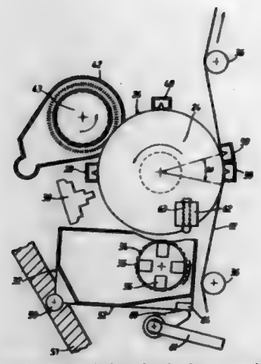
U.S. Cl. 355—234 **14 Claims**

1. An electrostatographic printer for forming an image onto a receptor element, which printer comprises:

(i) at least one toner image-producing electrostatographic station comprising rotatable endless surface means onto which a toner image can be formed, means for forming an electrostatic latent image on said endless surface means and a developing unit for depositing electrostatically charged toner particles onto said electrostatic latent image;

(ii) means for conveying a receptor element in the form of a web past said image-producing station; and

(iii) transfer means for transferring said toner image on said rotatable surface means onto said receptor element web,



wherein said developing unit is selectively moveable between an operative position and a non-operative position while said endless surface means rotates and said transfer means transfers residual toner image and said endless surface means onto said receptor element web.

5,598,256

IMAGE FORMING APPARATUS

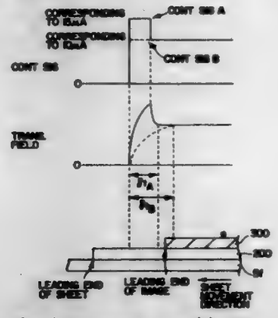
Yoichi Kimura, Kawaguchi; Isao Kumada, Yamato; Takashi Hasegawa, Ageo, and Satoshi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1995, Ser. No. 371,143

Claims priority, application Japan, Jan. 11, 1994, 6-013211

Int. Cl.[6] G03G *15/16*

U.S. Cl. 399—316 **35 Claims**



1. An image forming apparatus comprising:

an image bearing member for bearing an image;

a recording material carrying member for carrying the recording material to a transfer position;

transfer charging means for transferring the image from said image bearing member onto the recording material carried on the recording material carrying member at the transfer position;

a power source for supplying a voltage to said transfer charging means during an image transfer operation; and

control means for changing an output of said transfer charging means from a first level to a second level prior to arrival of an image area of said image bearing member at the transfer position and after arrival of a leading edge of the recording material carried on said recording material carrying member at the transfer position, wherein the second level is higher than a third level of the output of said transfer charging means which is a level when the image area is at the transfer position, and wherein said first level is lower than the third level.

5,598,257

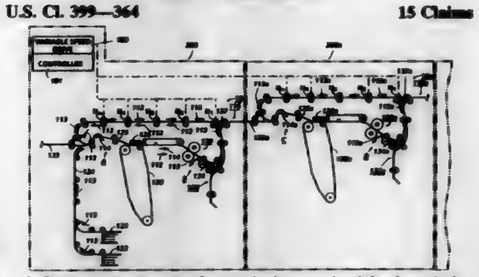
SIMPLEX AND DUPLEX PRINTING SYSTEM USING A REVERSIBLE DUPLEX PATH

Paul D. Keller, Webster, and Glenn M. Keenan, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1995, Ser. No. 537,055

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—364 **15 Claims**



1. In a printing system for producing a print job, the printing system including:

a print engine for imaging regular substrates fed to the print engine from a regular substrate feeding apparatus and delivering a resulting imaged regular substrates to an output; and

a duplexer operatively coupled to said print engine having a first path for feeding imaged regular substrates to the print engine for duplex printing, said duplexer having a second, sheet insertion, path for feeding special sheets to said output of imaged regular substrates, said duplexer comprises a be-directional sheet feeding path for transporting the regular substrates being duplex printed in a first direction, and for the transporting special sheets in a second direction in said bi-directional sheet feeding path.

5,598,258

IMAGE FORMING APPARATUS WITH INTERCONNECTED SORTERS AND CONTROL DEVICE THEREFOR

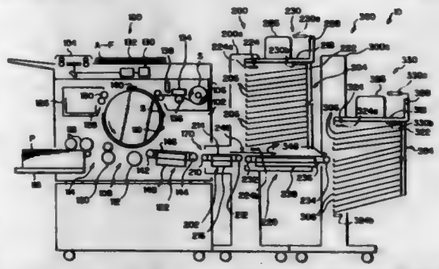
Mitsuo Seto, Shibata-machi, and Tomoya Otome, Sendai, both of Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi-ken, and Canon Aptex Inc., Mitsukaido, both of Japan

Filed Feb. 17, 1995, Ser. No. 389,953

Claims priority, application Japan, May 16, 1994, 6-101417

Int. Cl.[6] G03G *21/00*

U.S. Cl. 399—85 **5 Claims**



1. A control device for controlling an image forming apparatus having a plurality of interconnected sorters each having a plurality of bins for sorting papers undergone image formation, said control device comprising:

at least one of priority mode setting means for setting a priority mode for causing any one of a first sorter to a last sorter to operate prior to the other sorter, and exclusive mode setting means for causing only one of any of said first sorter to said last sorter to operate; and

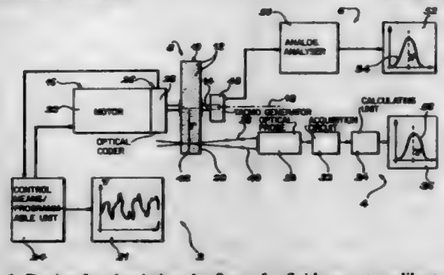
control means for selecting the sorter to be used in response to an output signal of said priority mode setting means or an output signal of said exclusive mode setting means.

5,598,259

DEVICE TO SIMULATE THE FLOW OF A FLUID SO AS TO CALIBRATE A LASER VELOCIMETRIC DEVICE

Dominique Barbier, Pertuis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 27, 1994, Ser. No. 364,219
Claims priority, application France, Dec. 28, 1993, 93 15746
Int. Cl.[6] G01P *3/36*; G09B *9/00*
U.S. Cl. 356—28.5 **10 Claims**



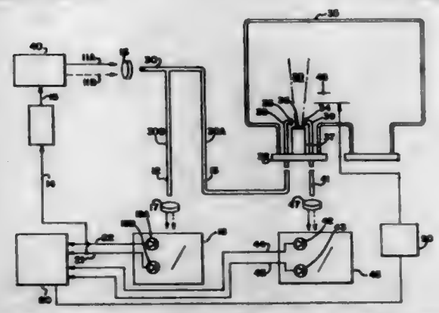
1. Device for simulating the flow of a fluid so as to calibrate a laser beam velocimetric apparatus comprising a mobile element for simulating the flow of a fluid intercepting at least one laser beam of the velocimetric apparatus and means for moving the mobile element, wherein said device further including means for controlling movement means so as to apply to the simulation element a movement with a speed varying according to a gaussian type statistical speed distribution selected by an operator.

5,598,260

APPARATUS AND METHOD FOR OPTICAL-BASED FLUX MONITORING OF AN EFFUSION CELL ADJACENT THE OUTPUT ORIFICE

Peter D. Brewer, and Gregory L. Olson, both of Westlake Village, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 7, 1995, Ser. No. 483,680
Int. Cl.[6] G01N *21/31*
U.S. Cl. 356—72 **19 Claims**



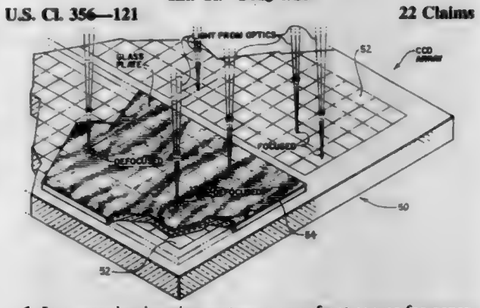
1. A device for monitoring the flux of atoms from an output orifice of an effusion cell during MBE comprising:
a radiation source generating a resonant radiation;
a first radiation guide mounted to direct the resonant radiation across the output orifice of the effusion cell; and
a detector to detect the resonant radiation transmitted across the output orifice of the effusion cell adjacent the orifice.

5,598,261

WAVEFRONT SENSOR FOR A SCANNING IMAGER

Alan L. Duncan, Sunnyvale, Calif.; Daniel S. Acton, Riverton, Wyo., and Richard L. Kendrick, Foster City, Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Jul. 7, 1995, Ser. No. 499,608
Int. Cl.[6] G01J *1/20*
U.S. Cl. 356—121 **22 Claims**



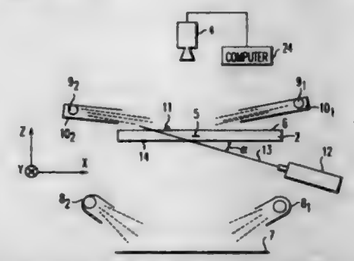
1. In a scanning imaging system, a wavefront sensor for generating focused and defocused images of an object scene that is being imaged by the imaging system from a single input optical beam impinged thereon, and wherein the focused and defocused images are combinable to estimate optical wavefront aberrations present in the imaging system, the wavefront sensor comprising:
a) a first and a second detector means disposed in substantially parallel relation to one another and lying within a common focal plane of the imaging system, said first and second detector means for generating a first and second image, respectively, as an input optical beam moves over said first and second detector means in a cross scan direction;
b) defocusing means disposed over at least a portion of said second detector means for inducing a known field-independent focus error in said input optical beam prior to impingement on said second detector means; and wherein
c) said first image generated by said first detector means defining a best focused image of the object scene and said second image generated by said second detector means and said defocusing means defining a slightly defocused image of the object scene.

5,598,262

PROCESS AND DEVICE FOR INSPECTING TRANSPARENT MATERIAL

Yann Jutard, Reunes, and Jean-Jacques Sacre, Chateaugiron, both of France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR93/01015, § 371 Date Apr. 20, 1995, § 102(e) Date Apr. 20, 1995, PCT Pub. No. WO94/09358, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 13, 1993, Ser. No. 325,172
Claims priority, application France, Oct. 20, 1992, 92 12526
Int. Cl.[6] G01N *21/89*
U.S. Cl. 356—239 **19 Claims**
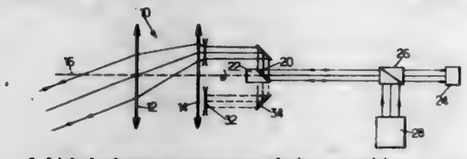


1. Method for inspecting transparent material by illumination by means of at least one light source, and by observation of the thickness of the material by at least one camera characterized comprising the steps of: uniformly illuminating with a first light source a bright background placed relative to the camera behind the material to be viewed by transparency through the material covering the field of view of the camera and serving as contrast reference:
laterally illuminating with a second light source the surface of the material by grazing said surface without substantially penetrating said material in order to distinguish defects included within the material from parasitic elements deposited on its surface and diffracting light;
viewing by transparency by the camera, placed in the vertical to the surface of the material, a sequence of contrasted images reproducing the thickness of the material; and
processing information acquired by the successive images which are representative of the material seen in its thickness, to detect and locate the defects included within the thickness of the material corresponding to dark spots on the image.

5,598,263

LIGHT-BACKSCATTER MEASUREMENT DEVICE SUITABLE FOR USE ON BOARD A CRAFT

Frédéric Safa, Toulouse, France, assignor to Matra Marconi Space France, Paris, France

Filed Sep. 12, 1995, Ser. No. 526,932
Claims priority, application France, Sep. 13, 1994, 94 10905
Int. Cl.[6] G01N *21/47*
U.S. Cl. 356—342 **10 Claims**



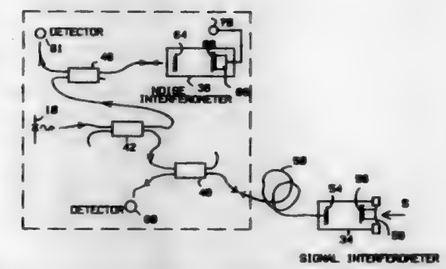
1. Light backscatter measurement device, comprising:
a laser source for emitting short light pulses along a common path;
a channel for receiving a backscattered light flux along said common path, having a detector, and
optical conical scanning means for angularly locating a viewing direction of said device, common to said pulses of light emitted by said laser source and backscattered light returning to said channel, said conical scanning means comprising a mirror, means for rotating said mirror stepwise by successive mutually equal angular intervals about a scanning axis for stopping said mirror in successive angular positions and reflectively diverting said common path to successive diverting paths distributed at said angular intervals and a plurality of stationary reflectors distributed at said angular intervals each on one of said deflected paths, for being successively conjugated with said common optical path by said mirror which has a size much smaller than a size of a beam of said backscattered light flux entering the device from successive viewing directions and reaching said common path and a size of a beam of said light pulses emitted by the laser source and exiting the device.

5,598,264

NOISE COMPENSATED INTERFEROMETRIC MEASURING DEVICE AND METHOD USING SIGNAL AND REFERENCE INTERFEROMETERS

Michael Failes, P.O. Box 262, Campbellville, Ontario, Canada

Filed May 18, 1995, Ser. No. 443,772
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—352 **18 Claims**



1. In an interferometric device having an optical path length and operable to produce an interference signal from coherent light emitted from a coherent light emitter means at wavelengths, wherein said interference signal comprises fringes and is a function of the wavelength of the coherent light and the optical path length, a measuring device for measuring the optical path length comprising:
control means for controlling the interference signal in response to a control signal;
optical detector means or detecting said interference signal and sending a detection signal indicative of a phase of a fringe in said interference signal;
fringe tracking means for tracking a fringe of said interference signal and operable to receive the detection signal from the optical detection means and send the control signal to the control means;
wherein as the optical path length changes, the fringe tracking means sends the control signal to the control means to change the interference signal to maintain the detection signal indicative of the phase of the fringe;
wherein the control signal is indicative of the optical path length;
modulating means for modulating the wavelength of the coherent emitter means about a base wavelength at a modulation frequency;
wherein said fringe tracking means comprises synchronous sample and hold means to periodically sample the detection signal at a frequency of twice the modulation frequency;
wherein the synchronous sample and hold means is synchronous with the modulating means and said sample and hold means samples and holds two sampled detection signals each cycle of the modulating means;
wherein the fringe tracking means comprises comparing means to compare the two sampled detection signals for each cycle of the modulating means and provide a difference signal for each cycle of the modulating means corresponding to a difference between the two sampled detection signals;
wherein the control signal corresponds to the difference signal for each cycle and causes the control means to change the interference signal in response thereto;
noise interferometer means for measuring noise in the coherent light emitter means, said noise interferometer means comprising;
a fixed partially reflective surface and a movable reflective surface;
motion means for moving said movable reflective surface relative to the fixed partially reflective surface in response to a movement signal:
light transmission means for transmitting the coherent light from the coherent light emitter means to the noise interferometer means, said noise interferometer means producing a noise interference signal in response thereto;
noise optical detector means for detecting the noise interference signal and operable to send a noise detection signal indicative of fringes in said noise interference signal; and
noise fringe tracking means for tracking a noise fringe of said noise interference signal and operable to receive the noise detection signal from the noise optical detection means and

send the movement signal to the motion means, said noise fringe tracking means comprising;

synchronous noise detection means to periodically detect the noise detection signal at a frequency about twice the modulation frequency, wherein said synchronous noise detection means is synchronous with the modulating means and said noise detection means detects and stores two noise detection signals each cycle of the modulating means;

comparing means to compare the two noise detection signals for each cycle of the modulating means and provide a noise difference signal for each cycle corresponding to a difference between the two, noise detection signals; and

combining means for combining the difference signal with an inverse of the noise difference signal;

wherein the movement signal corresponds to a combination of the difference signal and the inverse of the noise difference signal; and

wherein the noise difference signal is indicative of the noise in the laser emitter means.

5,598,265

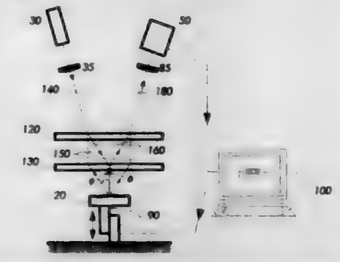
METHOD FOR PROFILING AN OBJECT SURFACE USING A LARGE EQUIVALENT WAVELENGTH AND SYSTEM THEREFOR

Peter de Groot, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Apr. 6, 1995, Ser. No. 417,793

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—360 **33 Claims**



1. A method of profiling a surface of an object using desensitized interference fringes from a desensitized interferometer means comprising the steps of:

illuminating said desensitized interferometer means with a source of light having an associated wavelength for providing said desensitized interference fringes, said desensitized interferometer means having an associated equivalent wavelength larger than said light source associated wavelength and an associated equivalent coherence length;

generating measurement data for at least one image pixel in the field of view of said desensitized interferometer means by displacing said object with respect to said desensitized interferometer means for providing a variation of intensity as a function of scan position, said variations of intensity comprising a signal related to said equivalent wavelength modulated by an equivalent coherence signal envelope that limits any interference effect to a range within said equivalent coherence length, said signal corresponding to said interference fringes, said equivalent coherence envelope corresponding to fringe contrast for said fringes; and

analyzing said measurement data for determining a surface height corresponding to each of said image pixels.

5,598,266

DEVICE FOR DETECTING DEFECTS REMOVED FROM FIBROUS MATERIAL USING OPTICAL INSPECTION

Georges Cornuejols, Montpellier, France, assignor to Le Centre De Cooperation Internationale En Recherche Agronomique Pour Le Developpement (CIRAD), Paris, France

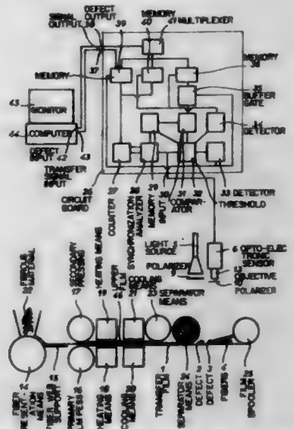
PCT No. PCT/FR93/00753, § 371 Date Jan. 18, 1995, § 102(e) Date Jan. 18, 1995, PCT Pub. No. WO94/02838, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 22, 1993, Ser. No. 367,229

Claims priority, application France, Jul. 22, 1992, 92 09258

Int. Cl.[6] G01J *4/00*; G01N *21/00*;*21/84*

U.S. Cl. 356—367 **10 Claims**



1. Device for detecting defects from fibrous material comprising:

a transfer film;

means for pressing the fibrous material onto the transfer film and transferring defects onto the film;

separating means for separating the fibrous material from the transfer film, the transfer film carrying the defects and fibers adhering to defects,

an opto-electronic sensor producing a signal representative of defects on the transfer film in an optical field of the sensor,

image processing means connected to the sensor for analyzing the signal issued by the sensor and for counting the defects which are represented by the signal issued by the sensor.

5,598,267

OPTICAL SENSOR FOR ORTHOGONAL RADIATION MODES

John R. Sambles, Crediton, and Guy P. Bryan-Brown, Heathfield, both of England, assignors to British Technology Group Limited, London, England

Continuation of Ser. No. 261,306, Jun. 16, 1994, abandoned, which is a continuation of Ser. No. 110,842, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 807,838, Jan. 21, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 384,591

Claims priority, application United Kingdom, Jul. 21, 1989, 8916764

Int. Cl.[6] G01J *4/00*

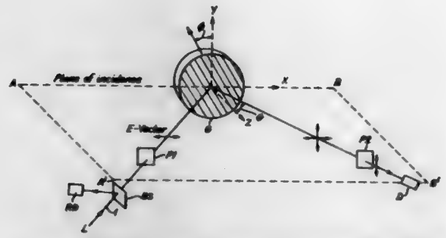
U.S. Cl. 356—369 **39 Claims**

1. An apparatus for sensing polarization conversion in a coating layer on a diffraction grating having grating lines lying in a grating plane, said apparatus comprising:

means for illuminating the coating with radiation at a first polarization, the direction of said first polarization and the direction of the grating lines being disposed at an angle with respect to one another in the grating plane, said angle being greater than 0° and less than 90°;

means for receiving radiation reflected by the coating layer at a second polarization, said first polarization and said second polarization being disposed in radiation paths that are crossed with respect to one another; and

means for sensing a maximum of received radiation reflected by the coating layer.



5,598,268

PROCESS FOR DETERMINING THE LOCATION OF A POSITIONING BODY IN RELATION TO A REFERENCE BODY AND DEVICE FOR IMPLEMENTING THE PROCESS

Helmut Kellner, Moormerland-Veenh, Germany, assignor to E.M.S. Technik GmbH, Leer, Germany

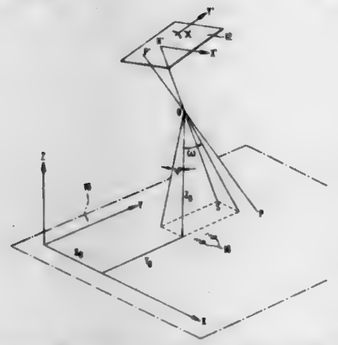
PCT No. PCT/DE93/00628, § 371 Date Mar. 3, 1995, § 102(e) Date Mar. 3, 1995, PCT Pub. No. WO94/03775, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 14, 1993, Ser. No. 374,574

Claims priority, application Germany, Jul. 31, 1992, 42 25 270.9

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—375 **20 Claims**



1. A process for determining a location of a positioning body in relation to a reference body, said process comprising the steps of:

providing on a positioning body a scale with marks of known coordinates in a plane;

providing a scanner on the reference body, the scanner including a projection surface, on which the marks of a scale are projected, and an imaging lens;

calculating coordinates of a center of projection of the imaging lens from the known coordinates of the marks on the scale via a projecting relationship between the projection surface of the scanner and the plane of the scale, whereby the marks provide their coordinate information with respect to the scale in coded form and are decoded for the calculation,

wherein the scale comprises two orthogonal surface scales;

wherein the marks of both surface scales form intersection regions; and wherein the calculation is based on at least four centers of intersection regions of the marks of both surface scales defining an area as the known coordinates of the marks.

5,598,269

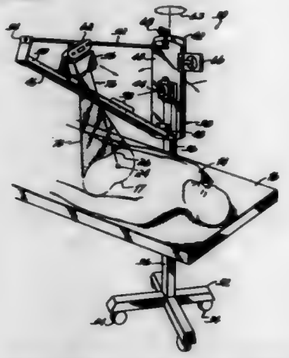
LASER GUIDED ALIGNMENT APPARATUS FOR MEDICAL PROCEDURES

Yuli Kitaevich, Loveland; Neil D. Johnson, Cincinnati, both of Ohio; Michael T. Miller, Pittsford, N.Y., and Alan Brown, Longmeadow, Mass., assignors to Children's Hospital Medical Center, Cincinnati, Ohio

Filed May 12, 1994, Ser. No. 241,969

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—399 **7 Claims**



1. A laser guided alignment apparatus for medical procedures, comprising:

a first laser light source for producing a laser line beam;

a second laser light source for producing a laser fan beam, said laser line beam being in a same plane as said laser fan beam; and

a frame for supporting said first and second laser light sources;

means for adjusting an angle of said laser fan beam relative to a vertical reference plane; and

means for measuring the angle of said laser fan beam relative to said vertical reference plane.

5,598,270

SENSOR DEVICE AND POSITION DETERMINATION PROCESS AND THEIR USE FOR THE CONTROL OF AN INSERTION ROBOT

Claudio Meisser, Cham, and Felix Siegenen, Kriens, both of Switzerland, assignors to ESEC S.A., Cham, Switzerland

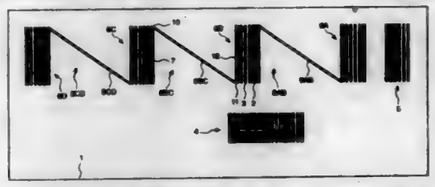
PCT No. PCT/CH93/00132, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO93/24806, PCT Pub. Date Dec. 9, 1993

PCT Filed May 21, 1993, Ser. No. 190,886

Claims priority, application Switzerland, Jun. 3, 1992, 01787/92

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—400 **13 Claims**



1. A system for sensing the relative position of two mutually displaceable objects, comprising:

an optical code provided in a code field of a substantially planar code carrier arranged on one of said objects for displacement therewith;

an optical scanner having a field of view which extends throughout a viewing angle relative to an optical center, the optical scanner being equipped to detect illumination density and direction from said optical center for reading said optical code; said scanner being arranged on the other of said objects for displacement therewith;

an illuminator for causing light to become incident on said code field;

means for displacing at least one of said objects relative to the other of said objects, and thereby causing light which has become incident on said code field to become within said viewing angle and detectable by said optical scanner;

said field being substantially rectangular, having a longitudinal centerline and including a plurality of fields arranged in a series extending along said centerline and including at least one substantially positioning field arranged between two substantially rectangular interfields;

said positioning field containing coded information about the position of said positioning field with respect to a reference point on said one of said objects and about the identity of one of said objects;

each said interfield including at least one boundary line between two areas which, when illuminated by said illuminator, can cause differing illumination density to be detected by said optical scanner, said boundary line crossing said centerline at an oblique angle thereto; and

control means operatively interconnecting said optical scanner and said displacing means, for mutually positioning said two objects so as to provide a determined relative position, based on differing illuminator density detected by said optical scanner as a result of illumination of said boundary lines of said interfields by said illuminator.

5,598,271

CONTROL METHOD FOR A DIGITAL COPIER IN A TWO-SIDED DOCUMENT COPY MODE WITH INTERRUPTS

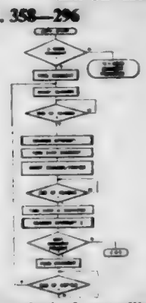
Masayuki Ohtani, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 296,248

Claims priority, application Japan, Aug. 30, 1993, 5-214400

Int. Cl.[6] H04N *1/21*; G03G *21/00*

U.S. Cl. 358—296 **10 Claims**



1. A method of controlling a digital copier operable in a two-sided document copy mode and having a scanner for reading a document image, a printer for printing out image data generated by said scanner on a sheet, an automatic document feeder (ADF) for transporting a document to be read by said scanner and having a document turning function, storing means capable of storing image data representative of at least two documents, and control means, said method comprising the steps of:

(a) causing, when the two-sided document copy mode is selected, said ADF to turn over a two-sided document to a second side, and causing said scanner to read said second side of said two-sided document before copying a first side of said two-sided document;

(b) storing image data representative of said second side in said storing means;

(c) causing said ADF to turn over said two-sided document to said first side;

(d) causing said scanner to read said first side of said two-sided document turned over;

(e) storing, image data representative of said first side in said storing means and, at the same time, sequentially reading said image data representative of said first and second sides out of said storing means; and

(f) causing said printer to print out said image data representative of said first and second sides.

5,598,272

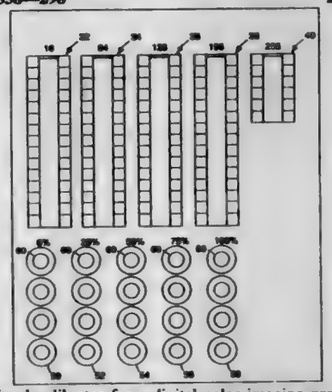
VISUAL CALIBRATOR FOR COLOR HALFTONE IMAGING

Richard S. Fisch, St. Paul; David A. Larshus, Maplewood; John A. Sands, Oakdale, and Mark E. VerMurlen, White Bear Township, Ramsey County, all of Minn., assignors to Imation, Inc., Oakdale, Minn.

Filed Apr. 7, 1994, Ser. No. 224,322

Int. Cl.[6] H04N *1/40;1/46*; G03F *3/08*

U.S. Cl. 358—298 **20 Claims**



1. A visual calibrator for a digital color imaging proof system comprising a series of patches on a carrier layer, said patches composed of combinations of at least two colors in halftone or continuous print, and associated with at least some of the patches are alphanumeric markings which relate to specific changes in an imaging signal for adjustment of the imaging system to modify the color of a proof towards a desired target color.

5,598,273

RECORDING CONTROL DEVICE AND METHOD UTILIZING A TEST SIGNAL HAVING MULTIPLE FREQUENCIES

Kazuhiro Kurisaki; Yoshikazu Kanazawa, and Yoshiaki Mimura, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 92,216, Jul. 16, 1993, abandoned.

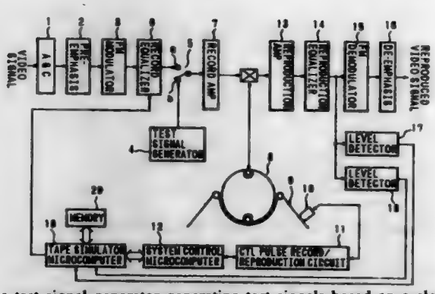
This application Aug. 24, 1995, Ser. No. 519,014

Claims priority, application Japan, Jul. 17, 1992, 4-190864; Sep. 16, 1992, 4-246323

Int. Cl.[6] H04N *5/782*

U.S. Cl. 386—9 **46 Claims**

33. A magnetic recording control device for correcting frequency characteristics of a video signal to be recorded on a magnetic recording medium, comprising:



a test signal generator generating test signals based on a clock signal;

recording unit recording said test signals on said magnetic recording medium;

reproducing unit reproducing said recorded test signals;

detecting unit detecting reproduction levels of said reproduced test signals; and

correcting unit correcting frequency characteristics of said video signal based on said detected reproduction levels, wherein

said recording unit records said corrected video signal on said magnetic recording medium.

5,598,274

IMAGE SIGNAL RECORDING AND REPRODUCING SYSTEM

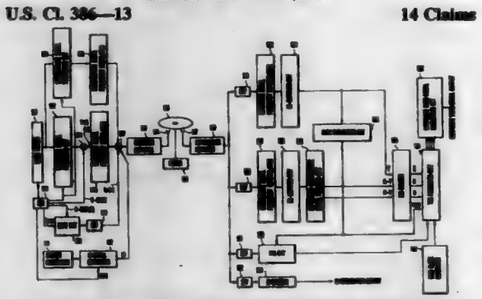
Tokihiko Ogura, and Ryo Fujimoto, both of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 58,757, Apr. 28, 1993, abandoned, which is a continuation of Ser. No. 610,892, Nov. 6, 1990, abandoned. This application Sep. 19, 1994, Ser. No. 308,627

Claims priority, application Japan, Nov. 10, 1989, 1-291292; Nov. 10, 1989, 1-293603; Nov. 10, 1989, 1-293604; Nov. 10, 1989, 1-293606; Nov. 10, 1989, 1-293607

Int. Cl.[6] H04N *5/76;5/911*

U.S. Cl. 386—13 **14 Claims**



1. An image signal recording and reproducing system arranged to record an image signal consisting of a luminance signal and a chrominance signal and including horizontal and vertical blanking portions on a recording medium and to reproduce a recorded image signal from said recording medium, comprising:

(A) luminance signal frequency-modulating means arranged to receive said luminance signal and to frequency-modulate the received luminance signal, thereby forming and outputting a frequency-modulated luminance signal;

(B) chrominance signal frequency-modulating means arranged to receive said chrominance signal and to frequency-modulate the received chrominance signal, thereby forming and outputting a frequency-modulated chrominance signal;

(C) pilot signal generating means for generating a pilot signal having a single frequency positioned in a frequency band where the frequency-modulated chrominance signal outputted from said chrominance signal frequency-modulating means is positioned and which is lower than a frequency band where the frequency-modulated luminance signal outputted from said luminance signal frequency-modulating means is positioned;

(D) pilot signal frequency-multiplexing means arranged to frequency-multiplex the frequency-modulated luminance signal outputted from said luminance signal frequency-modulating means with the frequency-modulated chrominance signal outputted from said chrominance signal frequency-modulating means, thereby forming a record image signal, and to frequency-multiplex the pilot signal generated by said pilot signal generating means with a portion of said record image signal, said portion of which corresponds to the vertical and horizontal blanking periods of the record image signal, except the image signal period of said record image signal and to output a frequency-multiplexed signal;

(E) recording means for recording the frequency-multiplexed signal outputted from said pilot signal frequency-multiplexing means on the recording medium;

(F) reproducing means for reproducing from said recording medium the frequency-multiplexed signal recorded on said recording medium by said recording means;

(G) extracting means for receiving the frequency-multiplexed signal outputted from said reproducing means and, when a signal is received from said reproducing means, said signal corresponding to a period which is a part of the vertical and horizontal blanking periods of the frequeacy-multiplexed signal, said blanking periods from which the periods of vertical and horizontal synchronizing signals are removed, thereby extracting the pilot signal frequency-multiplexed with said signal;

(H) sampling clock signal generating means for generating a sampling clock signal which is phase-synchronized with said pilot signal thus extracted by said extracting means; and

(I) time base variation correcting means arranged to extract the record image signal from the frequency-modulated signal reproduced from said recording medium by said reproducing means and to apply a time base variation correction process to the extracted record image signal in accordance with the sampling clock signal generated by said sampling clock signal generating means.

5,598,275

VIDEO SIGNAL RECORDING APPARATUS HAVING AN INTERVAL RECORDING MODE COMPATIBLE WITH AN OVERLAP RECORDING MODE

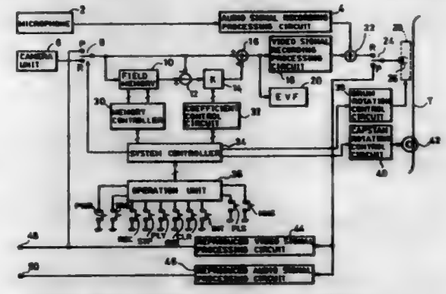
Kenichi Nagasawa, Kawasaki; Koji Takahashi, Yokohama, and Chikara Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 792,921, Nov. 15, 1991, abandoned. This application Jun. 24, 1994, Ser. No. 265,623

Claims priority, application Japan, Nov. 20, 1990, 2-316255

Int. Cl.[6] H04N *5/91;5/76;5/225;5/262*

U.S. Cl. 386—117 **10 Claims**



1. A video signal recording apparatus, comprising:

(a) overlapping means, operable in an overlap mode, for gradually switching and recording a first video signal to a second video signal during a first predetermined time period;

(b) interval record means, operable in an interval record mode different from the overlap mode, for recording a video signal during a second predetermined time period, said interval record means automatically operating at every predetermined interval; and

(c) control means for setting the second predetermined time period relative to the first predetermined time period to ensure the overlap mode and the interval record mode are compatible in a condition when said interval record means and said overlapping means are operating, said control means setting the second predetermined time period to be longer than the first predetermined time period when the interval record means and the overlapping means are operating.

5,598,276

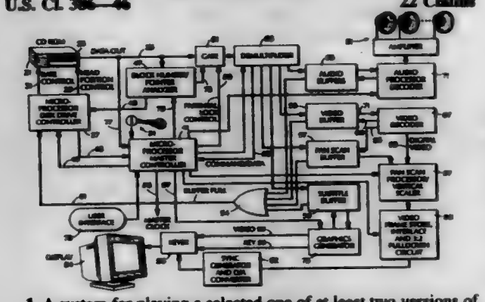
SYSTEM AND METHOD FOR CONTROLLING PLAY OF MULTIPLE VERSIONS OF THE SAME MOTION PICTURE STORED ON AN OPTICAL DISK

Christopher J. Cookson; Lewis S. Ostrover, and Warren N. Lieberfarb, all of Los Angeles, Calif., assignors to Time Warner Entertainment Co., L.P., Burbank, Calif.

Continuation of Ser. No. 144,785, Oct. 29, 1993, abandoned. This application Dec. 18, 1995, Ser. No. 573,719

Int. Cl.[6] H04N *5/76*

U.S. Cl. 386—46 **22 Claims**



1. A system for playing a selected one of at least two versions of the same video program material contained on a software carrier, said software carrier having recorded thereon a single track with three different types of interleaved video data blocks containing respectively (1) video data unique to one of said at least two versions, (2) video data unique to the other of said at least two versions, and (3) video data common to said at least two versions, with said track containing at least one data block of each of said three types, comprising means for registering which of said versions is to be played, means for selecting only the blocks containing video data unique to the version being played and blocks containing video data common to said at least two versions, and means for sequentially reading only the selected video data to form a playback signal from the video data contained in the selected blocks to the exclusion of the video data in the same track in the unique to the version which is not being played.

5,598,277

METHOD OF CORRECTING ERRORS IN DIGITAL VCR WITH HORIZONTAL AND VERTICAL DETECTION AND CORRECTION

Sang W. Kim; Seung H. Kim, both of Daejon, and Chi S. Won, Kyungki-Do, all of Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

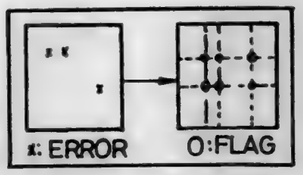
Filed Jul. 12, 1993, Ser. No. 89,887

Claims priority, application Rep. of Korea, Jul. 16, 1992, 12760/1992

Int. Cl.[6] H04N *5/94*

U.S. Cl. 386—116 **1 Claim**

1. A method of correcting errors in a digital VCR comprising:



a vertical detection stop for detecting errors from vertical coded sections of played back data from a tape;

a horizontal detection step for detecting errors from horizontal coded sections of played back data from the tape;

a flag-setting step for setting flags at cross-points of the detected error in said vertical and horizontal coded sections of the played back data;

a horizontal correction step for correcting the detected errors positioned at the cross-points having the flags set;

an error erasure step for erasing in ones of the horizontal coded sections from which detectable but non-correctable errors are detected only those of the errors positioned at the cross-points having flags set; and

a vertical correction step for correcting in a vertical direction the errors erased in said error erasure step.

5,598,278

SYSTEM CONFIGURATION METHOD FOR AUDIO-VIDEO APPARATUS WITH DIGITAL BUS INTERFACE

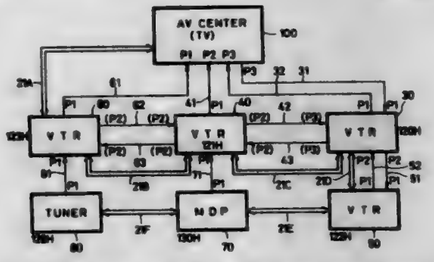
Shigeo Tanaka, Tokyo; Hiroshi Yamazaki, Kanagawa; Noriko Kotabe, Chiba; Kouichi Sugiyama, Kanagawa; Makoto Sato, Kanagawa; Akira Katsuyama, Kanagawa; Yoshio Onukabe, Kanagawa, and Yasuo Kanagaya, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1994, Ser. No. 278,954

Claims priority, application Japan, Jul. 30, 1993, 5-188559

Int. Cl.[6] H04N *5/91;7/10*

U.S. Cl. 386—96 **10 Claims**



1. A method for controlling an audio-video system having an audio-video center and a plurality of audio-video devices, said method comprising the steps of:

storing information in said audio-video center representative of a plurality of predetermined connection states each respectively representing a standard connection pattern between said audio-video center and said audio-video devices;

selecting a group of desired audio-video devices from among said plurality of audio-video devices;

selecting one of said predetermined connection states repreaenting a respective connection pattern;

determining whether any of the audio-video devices utilized in the selected connection pattern are not included in the selected group of desired audio-video devices so as to obtain non-use audio-video devices;

inserting information representative of said non-use audio-video devices into the selected connection pattern information so as to form control information; and

controlling said group of desired audio-video devices in accordance with said control information.

5,598,279

DOCUMENT CIRCULATING APPARATUS WITH AUTOMATIC DELETION OF DATA

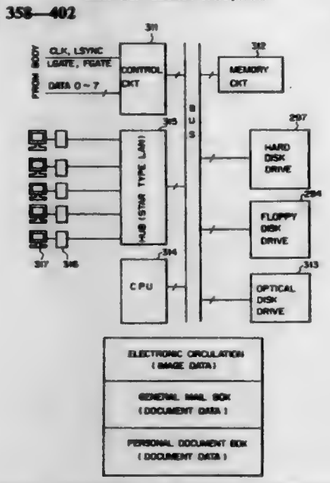
Rie Ishii, Seka; Masayuki Hayashi, Yokohama; Takeshi Yamakawa, Fujisawa, and Hiroyuki Takahashi, Tsurugashima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 2, 1994, Ser. No. 334,022

Claims priority, application Japan, Nov. 2, 1993, 5-274375; Mar. 3, 1994, 6-033810

Int. Cl.[6] H04N *1/21;1/32*

U.S. Cl. 358—402 **12 Claims**



1. A document circulating apparatus for providing documents to a plurality of terminals comprising:

an image reading device;

storing means for storing image data and document data;

control means for controlling said storing means;

system constructing means for constructing a network system for connecting said plurality of terminals; and

image outputting means;

said apparatus automatically deleting, among the image data and the document data stored in said storing means, particular data;

said apparatus managing the access condition of terminals or users in relation to the image data and the document data presented.

5,598,280

FILM LENS AND A SURFACE LIGHT SOURCE USING THE SAME

Toshikazu Nishie; Michiko Takeuchi, and Nobu Masubuchi, all of Tokyo-to, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Mar. 22, 1994, Ser. No. 215,789

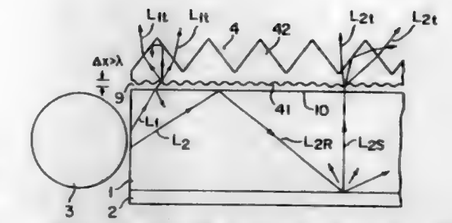
Claims priority, application Japan, Mar. 23, 1993, 5-086954; Nov. 29, 1993, 5-323214

Int. Cl.[6] G02F *1/13*

U.S. Cl. 349—57 **6 Claims**

1. A film lens adapted for use with a source light, comprising:

a light transmitting base having first and second opposite sides, said first side having a plurality of concave or convex unit lenses, said second side having plurality of projections, said



projections having a profile height not smaller than a wavelength of the source light and not greater than 100 μm, wherein the height Δh of each said projection is given by

$$\Delta h \geq \lambda_{max}/2\Delta\theta^2,$$

where λ_{max} is the maximum wavelength of the visible spectrum of the light source, and $\Delta\theta$ is the angular radius of the light source as viewed through a reflective surface of the film lens, said projections are arranged noncylically in one- and two- dimensional modes, and the width Δx of each said projection is given by

$$\Delta x \leq 100\ \mu m, \text{ and}$$

the average distance d between each two adjacent projections is given by

$$d<2P,$$

where P is the arrangement cycle of the unit lenses.

5,598,281

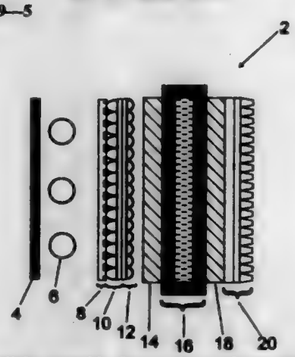
BACKLIGHT ASSEMBLY FOR IMPROVED ILLUMINATION EMPLOYING TAPERED OPTICAL ELEMENTS

Scott M. Zimmerman, Basking Ridge; Karl W. Beeson, Princeton, and Paul M. Ferm, Morristown, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Nov. 19, 1993, Ser. No. 283,232

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 349—5 **17 Claims**



7. A backlight assembly for use in an electro-optical display comprising

(a) a light generating means;

(b) a concentrating means having a planar light input surface in close proximity to said light generating means, a planar light output surface distal from and parallel to said light input surface and smaller in surface area than said light input surface and mirrored sidewalls wherein said light rays enter through said light input surface and travel through said concentrating means via reflection and emerge from said light output surface as a more concentrated light source; and

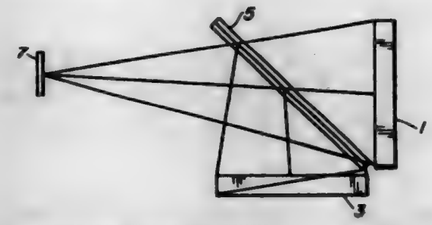
(c) a collimating means disposed in close proximity to said output surface and having a light input surface that accepts said concentrated light source from said concentrating means and transmits the light rays via refraction that emerge as a substantially collimated light source.

5,598,282

FOLDING STEREOSCOPIC COMPUTER DISPLAY

Steven L. DeGroot, Raleigh, N.C., assignor to ATI Technologies Inc., Thornhill, Canada

Filed Oct. 17, 1994, Ser. No. 323,875
Int. Cl.[6] G02F 1/1335; H04N 13/04
U.S. Cl. 349—15 **6 Claims**



1. A stereoscopic display comprising:
(a) a pair of display means having faces mutually oriented between approximately 90° and 120° to each other,
(b) means for polarizing light from images displayed on the respective display means, light from one image being polarized orthogonally to the light from the other image,
(c) a semitransparent mirror disposed between and approximately bisecting the angle between the pair of display means for transmitting light from an image displayed on one display means and reflecting light from an image displayed on the other display means, toward a viewing position,
(d) each of the display means displaying images oriented in mirror image orientation to the other with respect to said mirror,
(e) each of the display means being comprised of a liquid crystal display (LCD),
(f) each LCD being comprised of a polarizing filter, the polarizing filters having polarization directions 90° to each other,
(g) one edge of each of the LCDs being hinged to the other and to one edge of said mirror,
(h) and further including two pair of mirror alignment arms which are equal in length, each pair slidingly hinged between an edge of the mirror and respective fixed positions at corresponding edges of the LCD, whereby the LCDs may be rotated about the hinge connecting them together from a mutually facing closed position to an open position between 90° and 120° apart while the arms maintain said mirror in a position bisecting the angle between the LCDs.

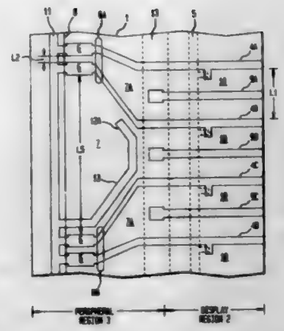
5,598,283

SHORT CIRCUIT LINE HAVING A CONDUCTIVE EXTENSION BETWEEN GROUPS OF TERMINALS IN A LIQUID CRYSTAL DISPLAY DEVICE

Yoshiharu Fujii, Sagamihara; Toshihiko Yoshida, Yokohama, and Hiroaki Kitahara, Hachioji, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1994, Ser. No. 263,094
Claims priority, application Japan, Jun. 21, 1993, 5-148762
Int. Cl.[6] G02F 1/1343;1/1345
U.S. Cl. 349—143 **10 Claims**

1. In a liquid crystal display device including a display region in which a plurality of liquid crystal display elements are formed in a matrix and a peripheral region surrounding the display region, wherein said display region includes a plurality of gate lines arranged in parallel with one another and a plurality of reference voltage lines each of which is formed between corresponding pair



of adjacent the gate lines and serves as an electrode for storage capacitors of associated ones of said liquid crystal display elements, and said peripheral region includes a plurality of connecting terminals which are separated from each other by a distance smaller than a distance between adjacent gate lines in said display region, said connecting terminals being arranged in a piuraiity of groups, said gate iines each being connected to a respective connecting terminals, and a conductive snort-circuit line is formed along said peripheral region so that said connecting terminals are short-circuited, the improvement comprising a conductor extending from said conductive short-circuit line and formed between one of said plurality of reference voltage iines and a region adjacent said one of said plurality of reference voltage lines which region is between adjacent groups of connecting terminals connected to gate lines.

5,598,284

ELECTRO-OPTICAL DEVICE DEFINED BY RELATIONSHIP OF DATA VOLTAGE, RESIDUAL VOLTAGE, SPONTANEOUS POLARIZATION, AND LIQUID CRYSTAL TIME CONSTANT AND CAPACITANCE

Noriaki Koguchi, Tokyo; Takeshi Nishi; Masaaki Hiroki, both of Kanagawa; Toshiharu Yamaguchi, Gifu, and Toshimitsu Konuma, Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Dec. 16, 1994, Ser. No. 358,179
Claims priority, application Japan, Dec. 25, 1993, 5-347676
Int. Cl.[6] G02F 1/133;1/1343;1/13; G09G 3/36
U.S. Cl. 349—33 **26 Claims**



1. An electro-optical device comprising:
a pair of substrates;
a transistor provided on one of the pair of substrates;
a pixel electrode provided on the one of the pair of substrates and connected with one of source and drain of the transistor;
another electrode provided on the other of the pair of substrates; and
an electro-optical modulating layer provided between the pair of substrates, the electro-optical modulating layer comprising a material selected from the group consisting of a ferroelectric liquid crystal, an antiferroelectric liquid crystal and a mixture thereof with a polymer,
wherein a formula

$$C_{LC}\{V-V_{rem}-2V\exp(-W/\tau_{LC})\}>2P_S S$$

holds where P_S is spontaneous polarization of the ferroelectric liquid crystal or the antiferroelectric liquid crystal, C_{LC} is a capacitance between the pixel electrode and the another electrode, V is a magnitude of a pulse voltage applied to a the pixel electrode, W is

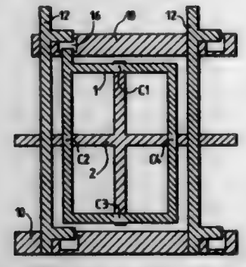
a width of the pulse voltage τ_{LC} is a time constant of a pixel comprising the pixel electrode, S is an area of the pixel electrode, and V_{rem} is a residual voltage due to residual charge between the pixel electrode and the another electrode immediately before application of a next pulse.

5,598,285

LIQUID CRYSTAL DISPLAY DEVICE

Katsumi Kondo, Katsuta; Hiromu Terao, Mito; Hidetoshi Abe; Masuyuki Ohta, both of Katsuta, all of Japan; Kenkichi Suzuki, Oxford, United Kingdom; Tohru Sasaki; Genshiro Kawachi, both of Hitachi, Japan, and Junichi Ohwada, Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1993, Ser. No. 123,472
Claims priority, application Japan, Sep. 18, 1992, 4-249938; Jan. 20, 1993, 5-7355
Int. Cl.[6] G22F 1/136; G02F 1/1343;1/141
U.S. Cl. 349—39 **81 Claims**



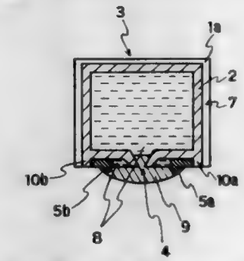
1. A liquid crystal display device having a plurality of pixel elements and means for applying electrical signals to said plurality of pixel elements for varying the optical transmissivity thereof, said liquid crystal display device including:
a polarizer having at least one polarizing plate;
a liquid crystal layer extending in a plane parallel to said at least one polarizing plate;
a plurality of pixel electrodes, signal wiring electrodes and scanning wiring electrodes forming a plurality of thin film transistor devices corresponding to the plurality of pixel elements, said pixel electrodes extending in a common direction within each pixel element and said signal wiring electrodes extending in said common direction over more than one of said plurality of pixel elements; and
common electrodes spaced from said plurality of thin film transistor devices, said common electrodes extending in said common direction over said more than one of said plurality of pixel elements;
wherein said means for applying electrical signals is arranged to apply said electrical signals in such a way that electric fields between said pixel electrodes and said common electrodes have components in a direction parallel to the plane of said liquid crystal layer, thereby to vary the optical transmissivity of light passing through said at least one polarizing plate and said liquid crystal layer for each pixel element; and
wherein at least one of:
(a) there are a pair of pixel electrodes for each pixel element, said signal wiring electrodes extending between said pair of pixel electrodes at each pixel element, and said pair of pixel electrodes being disposed between a pair of common electrodes at each pixel element;
(b) said common electrodes are on an opposite side of said liquid crystal layer from said pixel electrodes;
(c) there is an insulating film between said pixel electrode and the common electrodes at each pixel element, and wherein said means for applying signals is arranged to apply a driving signal to said scanning wiring electrodes, said driving signal having a scanning period which is shorter than a time constant formed by a product of a specific resistance of said insulating film and a dielectric constant of said insulating film;
(d) at least one of said common electrodes is common to two adjacent ones of said plurality of pixel elements; and
(e) said liquid crystal display device has an optical anisotropic medium with a phase difference less than a product of a thickness of the liquid crystal layer and a refractive index anisotropy of the liquid crystal layer, a difference between an absolute value of the product of the thickness of the liquid crystal layer and the refractive index anisotropy of the liquid crystal layer and an absolute value of the phase difference of the anisotropic medium being between 0.21 μm and 0.36 μm, and wherein the angles between components of electric fields in a direction parallel to the plane of said liquid crystal layer and the direction of orientation of molecules at opposite surfaces of the liquid crystal layer are the same.

5,598,286

LIQUID CRYSTAL DISPLAY DEVICE PROVIDED WITH LIQUID CRYSTAL ELEVATION STOPPERS

Masahiro Yanagi, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 174,058, Dec. 28, 1993, Pat. No. 5,477,361. This application Jun. 23, 1995, Ser. No. 494,092
Int. Cl.[6] G02F 1/1335;1/1333;1/1339
U.S. Cl. 349—58 **14 Claims**



1. A liquid crystal display device comprising:
a pair of transparent substrates,
a sealant layer provided between the substrates to give spacing by a predetermined distance,
an opening formed in a part of the sealant layer,
a pair of liquid-crystal-elevation stoppers provided on both sides of the opening and on an outer side of the sealant layer between the substrates, said stoppers including a different member than said sealant layer, said stoppers being coplanar with said peripheral edge, or as to project from said peripheral edge,
a liquid crystal material introduced through the opening into the spacing, and
a opening-sealing member formed at end in the vicinity of the opening to seal the liquid crystal material within the spacing between the substrates.

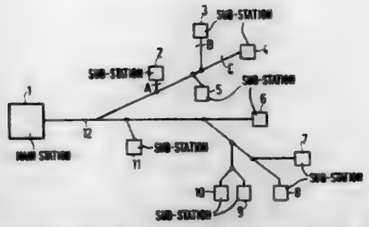
5,598,287

MULTIPLE ACCESS TELECOMMUNICATION NETWORK

Carel-Jan L. Van Driel, and Atul N. Sinha, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 151,319, Nov. 12, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,573
Claims priority, application European Pat. Off., Nov. 19, 1992, 92203569
Int. Cl.[6] H04J 14/02; H04B 10/04
U.S. Cl. 359—125 **4 Claims**

1. A sub-station for use in a telecommunication network comprising a main station, a plurality of sub-stations, and a common



channel for transmission of information signals from the sub-stations to the main station; said sub-station comprising:

auxiliary modulating means for generating an auxiliary signal by modulating an information signal on a subcarrier having a predetermined frequency which is uniquely assigned to said sub-station to distinguish from subcarrier frequencies assigned to other sub-stations in said network;

primary modulating means coupled to said auxiliary modulating means to receive said auxiliary signal and modulate it on a carrier having a predetermined frequency which is substantially the same for all sub-stations in said network, resulting in a modulated carrier which is a transmit signal for transmission over said channel; and

reducing means coupled between said auxiliary modulating means and said primary modulating means which, in response to said auxiliary signal, reduces the amplitude of said modulated carrier transmit signal during intervals in which said auxiliary signal has an amplitude at or below a predetermined reference level thereof.

5,598,288

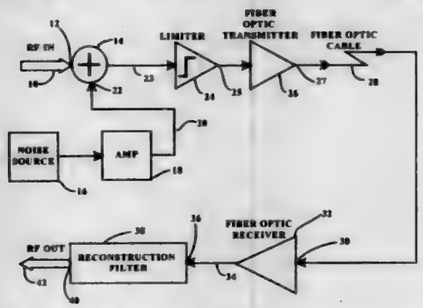
RF FIBER OPTIC TRANSMISSION UTILIZING DITHER

Stuart J. Collar, Algonquin, Ill., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jul. 31, 1995, Ser. No. 509,634

Int. Cl.[6] H04B *10/12*

U.S. Cl. 359—173 **1 Claim**



1. A fiber optic RF link comprising:

means for introducing an RF signal, including multiple narrow band signal components, to a summing junction;

a noise source for generating a dither signal;

means connected to the output of the noise source for amplifying the dither signal prior to its introduction to the summing junction;

means located at the summing junction for adding the RF signal and the dither signal to create a dithered RF signal to be transmitted;

amplitude limiting means connected at its input to the output of the summing junction for linearly quantizing the dithered RF signal to two levels;

fiber optic transmitter means connected at its input to an output of the limiting means for converting the dithered RF signal from an electrical to optical form;

a fiber optic cable connected at its input to an output of the fiber optic transmitter for propagating the dithered RF signal;

fiber optic receiver means, connected at its input to the output of the cable, for reconverting the dithered RF signal from optical to electrical form; and

a narrow bandpass filter means connected at its input to an output of the fiber optic receiver and having a narrow bandwidth centered at the frequency of the RF signal for removing the dither signal and recovering the original RF signal.

5,598,289

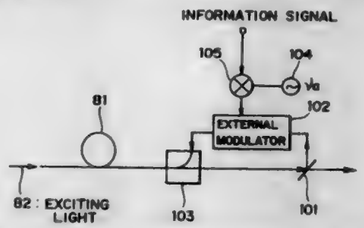
OPTICAL SYSTEMS MAKING USE OF PHENOMENON OF STIMULATED BRILLOUIN SCATTERING

Shigeki Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 32,240, Mar. 17, 1993, Pat. No. 5,515,192. This application Nov. 9, 1995, Ser. No. 556,012

Int. Cl.[6] H04B *10/12*

U.S. Cl. 359—173 **27 Claims**



1. An optical communication system making use of stimulated Brillouin amplification comprising:

an optical transmission line formed of a nonlinear optical medium showing stimulated Brillouin scattering at a threshold value;

exciting light supply means for supplying exciting light having a higher intensity than said threshold value to said optical transmission line from a first end; and

signal light supply means for supplying signal light having a frequency lower than the frequency of said exciting light by a predetermined frequency and modulated with an information signal to said optical transmission line at a second end, wherein said signal light supply means further includes:

means for splitting said exciting light output from the second end of said Optical transmission line into two components,

means for subcarrier-modulating one of said split components of light, and

means for supplying said subcarrier-modulated light to said optical transmission line at the second end.

5,598,290

DATA TRANSFER APPARATUS UTILIZING INFRARED RAYS

Junji Tanaka, Yamatokoriyama, and Masanobu Watanabe, Ikoma-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 14, 1994, Ser. No. 260,455

Claims priority, application Japan, Jun. 30, 1993, 5-162663

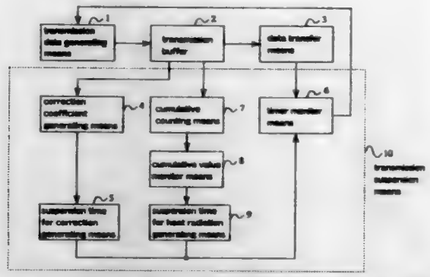
Int. Cl.[6] H04B *10/04*

U.S. Cl. 359—180 **21 Claims**

2. A data transfer apparatus utilizing infrared rays comprising:

transmission data generating means for generating one transmission unit of transmission data;

a transmission buffer for storing said one transmission unit of said transmission data produced by said transmission data generating means;



data transfer means for modulating and transferring each of said transmission data in said one transmission unit stored in said transmission buffer into a space by utilizing an infrared ray emitting LED; and

transmission suspending means for determining a transmission suspension time to be added after sending said one transmission unit of said transmission data determined based on the bit values included in said one transmission unit of said transmission data to be sent;

said data transfer means waiting said transmission suspension time before sending a next transmission unit of said transmission data;

wherein said transmission suspending means comprises:

correction coefficient generating means for generating an adjacent correction coefficient defined by the number of two values "0" and "1" constituting said one transmission unit of said transmission data that has been stored in said transmission buffer;

means for generating a suspension time for correction in which said transmission suspension time is determined from the adjacent correction coefficient, said suspension time being added after said data transfer means has sent said one transmission unit of said transmission data;

timer monitoring means for detecting that said data transfer means has completed the transmission of said one transmission unit of said transmission data, counting the passage of said transmission suspension time that has been output from said means for generating said suspension time for correction, and giving, after the passage of said transmission suspension time, an instruction for generating the next data to said transmission data generating means.

5,598,291

POLYGON MIRROR MOUNTING STRUCTURE

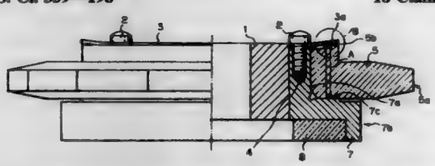
Soichi Isobe; Masaaki Sano; Yoshio Inoue, all of Kanagawa-ken, and Kazuo Shimizu, Saitama-ken, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Sep. 23, 1994, Ser. No. 310,753

Claims priority, application Japan, Sep. 24, 1993, 5-261481; Sep. 6, 1994, 6-239484

Int. Cl.[6] G02B *26/08; 7/182*

U.S. Cl. 359—198 **18 Claims**



1. A polygon mirror mounting structure mounting a polygon mirror to an outer periphery of a rotor, said mounting structure comprising:

a mirror seating surface formed on an outer peripheral portion of said rotor for seating said polygon mirror thereon;

a ring-shaped step portion formed on the top of said mirror, said step portion extending circumferentially of said mirror and being concentric with said rotor; and

a retaining member having a ring-shaped configuration and including a plurality of radially outwardly extending pawls, said retaining member being mounted with said pawls directly pressing on said step portion of said mirror and urging said mirror downwardly onto said mirror seating surface and radially outwardly.

5,598,292

METHOD OF DESIGNING A POST-OBJECTIVE TYPE OPTICAL SCANNER AND PRODUCT MADE BY THE METHOD

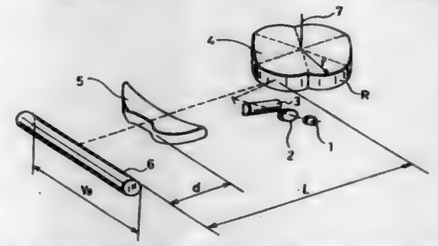
Motonobu Yoshikawa; Yoshiharu Yamamoto, both of Osaka, and Hironori Nakashima, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 1, 1993, Ser. No. 22,651

Claims priority, application Japan, Mar. 2, 1992, 4-044755

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—216 **8 Claims**



1. A post-objective type optical scanner for directing a converged light beam upon a scanning surface, the scanner comprising:

a rotating optical deflector including a plurality of convex reflecting surfaces upon which the converged light beam is directed at a point of deflection on the plurality of reflecting surfaces for reflecting the converged light beam along an optical path between the point of deflection and the scanning surface as the optical deflector rotates at a specified scanning speed selected depending upon a correlative relationship between a scanning speed, defined as a scanning width on the scanning surface per an angle unit of rotation of the rotating optical deflector, and a curvature of field in a scanning direction associated with the scanning surface, wherein the specified scanning speed is larger than 1/60 radians of a length of the optical path and smaller than 1/32 radians of the length of the optical path; and

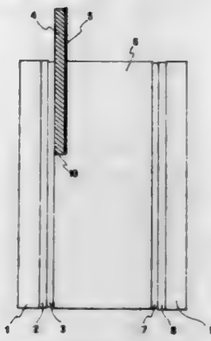
a compensating lens positioned along the optical path, the compensating lens including an incident surface facing the rotating optical deflector and an outgoing surface facing the scanning surface, the incident surface having a toric shape exploiting the correlative relationship to compensate for the curvature of field in the scanning direction and for a curvature of field in a sub-scanning direction associated with the scanning surface, the outgoing surface having an aspheric shape to compensate for an f-Θ characteristic which is a measure of proportionality between the scanning width and an angle of scanning of the rotating optical deflector.

5,598,293

ELECTROCHROMIC GLASS FOR USE IN CARS AND BUILDINGS

Mino Green, London, United Kingdom, assignor to Societa Italiana Vetro - SIV - S.p.A, San Salvo, CH, Italy

Continuation of Ser. No. 185,381, Jan. 24, 1994, abandoned. This application Sep. 11, 1995, Ser. No. 526,322
Claims priority, application Italy, Jan. 22, 1993, RM93A0028
Int. Cl.[6] G02F *1/153*
U.S. Cl. 359—275 **4 Claims**



1. A transparent electrochromic glazing capable of varying its light transmission values throughout its surface area in response to the application of an electric field, said glazing consisting essentially of a first substrate of transparent glass material, a conductor layer applied on one surface of said substrate, a first transparent electrode applied in contact with said conductor layer, a transparent electrolyte in contact with said electrode, a second transparent electrode in contact with said electrolyte, a second conductor layer in contact with said second electrode and a second substrate of transparent sheet material on which said second conductor layer is applied, wherein said transparent electrolyte a polymer spreadable in contact with said first electrode, formed of lithium perchlorate dissolved in a solution of a propylene carbonate and polymethylmethacrylate in which the ratio by weight of propylene carbonate to polymethylmethacrylate is 1.5 to 1.8, comprising a reference electrode positioned between said first transparent electrode and said electrolyte polymer, said reference electrode comprising an insulating strip of polyethylene terephthalate in contact with said first transparent electrode having a width of 0.5 to 2 mm, a thickness lower than 10% of the thickness of said polymer electrolyte and a length in contact with said polymer electrolyte lower than 20 mm, and a conductive layer of gold in contact with said polymer electrolyte, having a thickness of substantially 700 Angstroms coated on said strip.

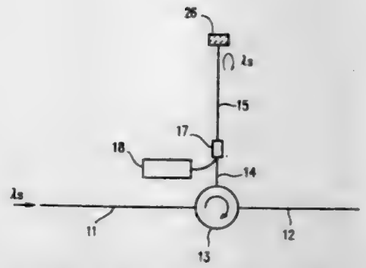
5,598,294

OPTICAL FIBER AMPLIFIER AND OPTICAL FIBER COMMUNICATION SYSTEM

Tomoaki Uno, Kobe; Jun Ohya, Osaka, and Masahiro Mitsuda, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 16, 1995, Ser. No. 515,714
Claims priority, application Japan, Aug. 18, 1994, 6-194086
Int. Cl.[6] H01S *3/00*
U.S. Cl. 359—341 **14 Claims**

1. An optical fiber amplifier comprising:
a rare earth element doped optical fiber; and
a pump light generator for optically pumping the rare earth element doped optical fiber;
wherein a gain per unit length of the rare earth element doped optical fiber has a wavelength dependence;
wherein the optical fiber amplifier further comprises at least two reflectors, each of the reflectors selectively reflecting an optical signal in a predetermined wavelength band among at least



two optical signals input from an input end of the rare earth element doped optical fiber; and
wherein a distance from the input end of the rare earth element doped optical fiber to the first reflector and a distance from the input end of the rare earth element doped optical fiber to the second reflector are adjusted so as to substantially equalize a first gain applied to an optical signal having a first wavelength with a second gain applied to an optical signal having a second wavelength.

5,598,295

MICROSCOPE SLIDE WITH CONTRASTING SURFACES ON OPPOSITE SIDES

Randie R. Olofson, Stratham, N.H., assignor to Erie Scientific Company, Portsmouth, N.H.

Filed Jul. 21, 1995, Ser. No. 505,015
Int. Cl.[6] G02B *21/34*
U.S. Cl. 359—398 **26 Claims**



1. A microscope slide having a first side and a second side, said first side having an opaque, scratchable coating with a first color located generally at a marking region of said slide, and said second side having a contrastingly colored second coating generally positioned behind said opaque coating on said first side of said slide, whereby markings scratched into said first coating are highly visible when viewed from said first side and appear as markings of said second color against a background of said contrasting first color.

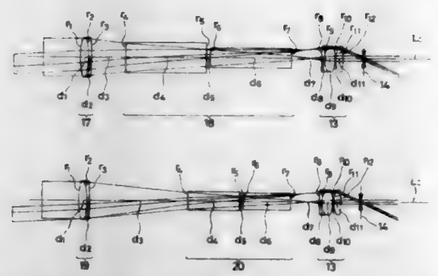
5,598,296

PRISMATIC TELESCOPE OPTICAL SYSTEM

Masaki Imaizumi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1995, Ser. No. 458,063
Claims priority, application Japan, Jun. 1, 1994, 6-119870
Int. Cl.[6] G02B *15/14*
U.S. Cl. 369—421 **7 Claims**

1. A telescope optical system including one optical system selected from a plurality of substantially equal overall length but different observation magnification optical systems, said selection providing a desired observation magnification for said telescope



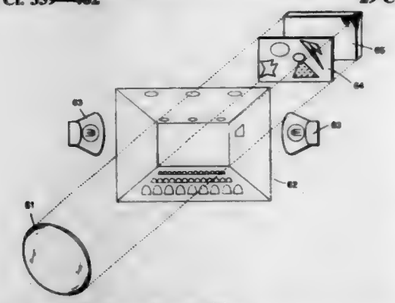
optical system, each of said plurality of optical systems comprising, in order from an image side:
an objective system;
a prism system; and
an eyepiece system;
a first optical system of said plurality of optical systems having a first observation magnification, and a second optical system of said plurality of optical systems having a second observation magnification different from said first observation magnification;
each of said plurality of optical systems having a substantially equal overall length; and
said prism system of said first optical system having a first refractive index, and said prism system of said second optical system having a second refractive index different from said first refractive index, whereby said first optical system has said different observation magnification yet said substantially equal overall length as compared to said second optical system.

5,598,297

IMAGE DISPLAY UNIT

Atsushi Yamanaka, Chiba, and Kunio Kojima, Tougane, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 17, 1994, Ser. No. 291,865
Claims priority, application Japan, Aug. 26, 1993, 5-211493; Jan. 27, 1994, 6-007455
Int. Cl.[6] G02B *27/22*; G09G *5/00*
U.S. Cl. 359—462 **29 Claims**



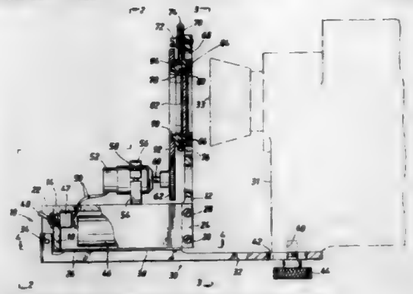
1. An image display unit comprising:
a casing;
an image display within the casing, said image display displaying a center image;
environmental image display means within the casing at the periphery of said image display for displaying an environmental image, the environmental image providing a background context for the center image; and
image magnifying means within the casing for magnifying images produced by the image display and by the environmental image display means and for allowing an observer to view the magnified environmental image together with the magnified center image in a visual field through the image magnifying means.

5,598,298

POLARIZATION PERCEPTION DEVICE

Victor S. Whitehead, Seabrook, Tex., and Kinsell L. Coulson, Vacaville, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 863,883, Apr. 6, 1992, abandoned. This application Jan. 18, 1995, Ser. No. 374,452
Int. Cl.[6] G02B *5/30*
U.S. Cl. 359—485 **4 Claims**



1. A polarization perception device, comprising:
base structure;
a polarizing filter having opposite broad sides and a centerline perpendicular to the sides, the filter being mounted on the base structure for relative rotation with respect thereto and with a major portion of the area of the filter substantially unobstructed on either side;
automatic drive means carried by the base structure and operatively connected to the filter and adapted to move the filter angularly about its centerline at a speed slow enough to permit changes in light transmission by virtue of the angular movement of the filter to be perceived as light phase and dark phase pulses by a human observer, a light phase image being formed on the retina of the eye of the human observer, but fast enough so that the light phase of each such pulse occurs prior to fading of the light phase image of the preceding pulse from the observer's retina;
wherein the base structure has an upright portion having a through opening and mounting a plurality of idler rollers circumferentially spaced about the through opening;
a generally annular carrier concentrically receiving the filter, centered within the idler rollers and rotatably supported thereby in alignment with the through opening; and
further comprising a first gear projecting radially outwardly from the carrier and a second gear meshing with the first gear and connected to the drive means for angular movement thereby.

5,598,299

PHOTOGRAPHIC LENS HAVING IMAGE STABILIZING FUNCTION

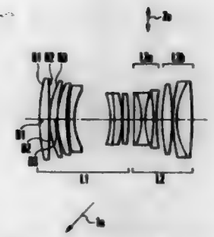
Shingo Hayakawa, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,749
Claims priority, application Japan, Apr. 27, 1994, 6-112852
Int. Cl.[6] G02B *27/64*
U.S. Cl. 359—557 **4 Claims**

1. A photographic lens system comprising, from front to rear, a first lens unit of positive refractive power and a second lens unit of negative refractive power, wherein said second lens unit has a front lens sub-unit of negative refractive power and a rear lens sub-unit of positive refractive power, wherein said front lens sub-unit is made movable for decentering to stabilize an image, and wherein said first lens unit is made axially movable for focusing; and wherein said lens system satisfies the following conditions:

$$0.35<f1/f<0.95$$

$$0.2<\Delta L/f1<0.8$$



wherein fl and f are the focal lengths of said first lens unit and the entire system, respectively, and ΔL is the maximum focusing movement of said first lens unit.

5,598,300

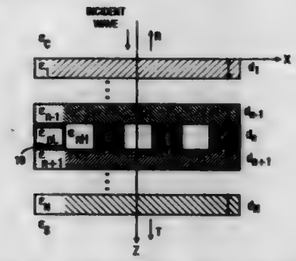
EFFICIENT BANDPASS REFLECTION AND TRANSMISSION FILTERS WITH LOW SIDEBANDS BASED ON GUIDED-MODE RESONANCE EFFECTS

Robert Magnusson, and Shu-Shaw Wang, both of Arlington, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 5, 1995, Ser. No. 465,386

Int. Cl.[6] G02B 5/20

U.S. Cl. 359—566 **29 Claims**



1. An ideal or near ideal, multiple-layer, guided-mode, reflection, resonance filter for use with an input wave having a resonant wavelength, said filter comprising:

a cover having a cover permittivity;

a substrate having a substrate permittivity;

at least one unmodulated layer of homogenous, dielectric material having a thickness near either ¼ or ½ of said wavelength;

at least one modulated layer of an arbitrarily ordered grating adjacent to said at least one unmodulated layer and having a thickness near either ¼ or ½ of said wavelength; and wherein at least one of any said layer has a permittivity greater than both said substrate permittivity and said cover permittivity.

5,598,301

METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN A COMPUTER AND A TAPE RECORDER

Hideto Suzuki, and Takayuki Horikoshi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

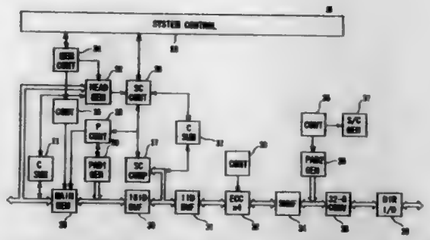
Continuation of Ser. No. 174,412, Dec. 28, 1993, abandoned. This application Jul. 14, 1995, Ser. No. 502,861

Claims priority, application Japan, Dec. 31, 1992, 4-360622

Int. Cl.[6] G11B 5/09;27/36

U.S. Cl. 360—53 **4 Claims**

1. A recording/reproducing control apparatus for transferring data to be recorded to a data recorder as recording data of sequentially added block number data in a block unit and monitoring reproducing data received from said data recorder simultaneously reproduced when the recording data is recorded, comprising:



a main memory for receiving from outside and storing the data to be recorded, for supplying the recording data, and during reproduction for storing and delivering to the outside reproduced data;

record buffer means for receiving the recording data supplied by said main memory, transferring the recording data to said data recorder, and simultaneously, sequentially storing the recording data of a number of said block units corresponding to a simultaneous reproducing time;

means for detecting an error in the reproducing data;

retransferring means for retransferring, when during recording an error is detected in the reproducing data, the recording data stored in said record buffer means to said data recorder starting from the data designated by a block number at which the error occurred, without affecting the operation of said main memory; and

means for detecting, during reproduction, a retransfer processing which occurred during recording of the reproduced data,

wherein during reproduction, the reproduced data is sequentially obtained by said main memory through said record buffer means, except when the retransfer processing which occurred during recording is detected in the reproduced data, the reproduced data is discarded without being passed from said record buffer means to said main memory.

5,598,302

METHOD AND APPARATUS FOR DETECTING DIGITAL PLAYBACK SIGNALS USING PHASE EQUALIZATION AND WAVEFORM SHAPING OF PLAYBACK SIGNALS

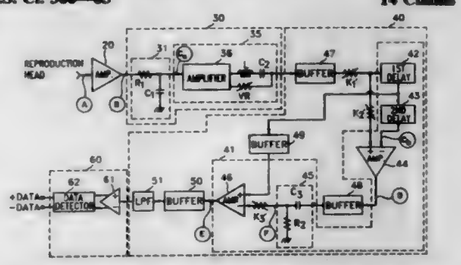
See-hun Park, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 6, 1994, Ser. No. 254,572

Claims priority, application Rep. of Korea, Jun. 5, 1993, 93-10175

Int. Cl.[6] G11B 5/35

U.S. Cl. 360—65 **14 Claims**



1. A digital playback signal detection apparatus for use in a digital recording and reproducing apparatus for equalizing and correcting a playback signal from a recording medium to thereby detect recorded data, said digital playback signal detection apparatus comprising:

phase equalization means for compensating for and correcting loss of a low frequency band and distorted phase of said playback signal so as to generate a phase-equalized signal;

waveform shaping means for delaying said phase-equalized signal by a predetermined time interval to thereby generate first and second delay signals, for linearly adding said phase-equalized signal to the second delay signal to thereby produce a high-band compensated signal, and for linearly adding said high-band compensated signal to the first delay signal to thereby output a waveform compensated signal; and

data detection means for detecting the originally recorded data using said waveform compensated signal and a corresponding phase-inverted signal.

5,598,303

METHOD AND APPARATUS FOR SYNCHRONIZING THE ROTATIONS OF DATA STORAGE DISKS IN A PLURALITY OF DISK STORAGE DEVICES

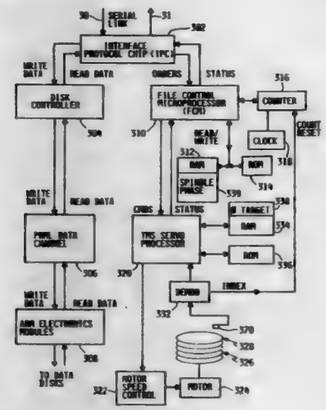
J. Wyn Jones, Winchester; Stephen P. Legg, Park Gate, and Eric L. Newman, Ailbrook, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 122,272, Sep. 17, 1993, abandoned. This application Mar. 6, 1996, Ser. No. 608,992

Claims priority, application United Kingdom, Sep. 18, 1992, 9219762

Int. Cl.[6] G11B 27/19

U.S. Cl. 360—73.02 **4 Claims**



1. A data storage system comprising:

a plurality of disk storage devices, each device having at least one ratatable data storage disk;

a controller in communication with the plurality of storage devices, said controller comprising:

(a) calculating means, responsive to a position-indicating signal, from each of two or more of the plurality of storage devices, indicative of the rotationl angular position of the disk in each device at a particular time, for calculating the relative angular displacements of the disks in said two or more devices,

(b) means, responsive to the calculated relative angular displacements of the disks in said two or more devices, for issusing a correction signal to each of the devices indicating a change in angular position of the disk required to synchronize the rotations of the disks is said two or more devices, each of the disk devices including means, responsive to the correction signal, for effecting a temporary change in rotational velocity of the disk to cause the required change in angular position, and

(c) means for issusing a synchronization signal to each of said two or more devices; each of the disk devices including means, responsive to the synchronization signal, for issusing said position-indicating signals;

wherein each disk storage device further comprises:

means for detecting a disk index mark during rotation of the disk and for producing an index pulse; and

a counter responsive to said index pulse for measuring the elapsed time from said pulse to provide an indication of an angular displacement of said disk from said index mark, the counter resetting on receipt of said index pulse;

wherein the synchronization signal from the controller causes the counter to freeze and the position-indicating signal issued by the device indicates the frozen value of the counter.

5,598,304

FUZZY CONTROLLER FOR AN ACTUATOR AND THE CONTROLLING METHOD THEREOF

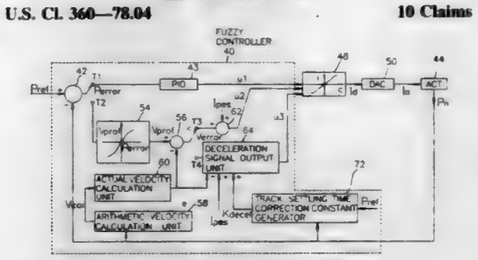
Hyun-Taek Choi; Il hong Suh; Woo Sok Chang, all of Seoul; Janghee Lee, Incheon, and Goonjin Kim, Seoul, all of Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 149,833, Nov. 10, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 382,902

Claims priority, application Rep. of Korea, Nov. 16, 1992, 92-21516

Int. Cl.[6] G11B 5/596

U.S. Cl. 360—78.04 **10 Claims**



1. A fuzzy controller for an actuator, comprising:

a first error generation unit for outputting a position error value with inputs of a present position value of said actuator and a reference value from an external input unit for controlling said actuator;

a first switching unit for switching a track following operation to a track seeking operation or vice versa to control said actuator according to a result of a comparison of said position error value and a first predetermined value;

a first control signal generation unit for generating a track following operation control signal for said track following operation of said actuator based on said position error value inputted according to a switching operation of said first switching unit;

a velocity error generation unit for generating a velocity error value by calculating a difference between a target velocity value and an actual velocity value, wherein said target velocity value is determined based on said position error value inputted according to said switching operation of said first switching unit and said actual velocity value is calculated through an arithmetic operation;

a second switching unit for switching an acceleration control to a deceleration control or vice versa for said actuator by comparing said velocity error value with a result of an arithmetic operation between a second predetermined value and said actual velocity value;

a second control signal generation unit for generating an acceleration control signal for accelerating said actuator by adding said velocity error value inputted according to a switching operation of said second switching unit and a track position error integration value obtained from an integration of track position error values, wherein said track position error values are indicative of values occurring when said actuator is off-track from the center of a track and said integration of track position error values occurs at every sampling; and

a third control signal generation unit for generating a deceleration control signal for decelerating said actuator by performing an arithmetic operation between a fuzzy inference value

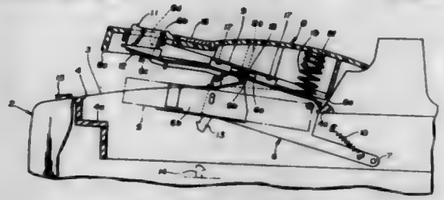
generated according to fuzzy rules based on said velocity error value inputted according to a switching operation of said second switching unit and a differential velocity error value, said track position error integration value, a third predetermined value and said actual velocity value.

5,598,305

MAGNETIC RECORDING AND REPRODUCING DEVICE HAVING A LID MEMBER WHICH FORMS PART OF A GRIP

Atsushi Nakanishi, Tokyo; Mitsuo Hoshino, Saitama, and Yoshitaka Matsumoto, Aichi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 23, 1991, Ser. No. 704,389
Claims priority, application Japan, May 30, 1990, 2-140767
Int. Cl.[6] G11B *15/675*
U.S. Cl. 360—96.6 **12 Claims**



1. A magnetic recording and reproducing device comprising:

a main body having a portion with a surface defining a grip to permit said device to be hand held, said surface having a cassette insertion port therein dimensioned to permit a tape cassette to be loaded or unloaded through said insertion port;

a cassette holder pivotally supported by said main body for movement between a cassette receiving position at which said holder can receive a cassette through said port, and an operative position in which a tape cassette in said holder is disposed in a tape cassette loaded position within said main body;

a lid member mounted on said holder for limited movements in respect to the latter and being movable with said holder between opened and closed positions with respect to said cassette insertion port in response to pivoting of said cassette holder between said cassette receiving and operative positions, respectively, said lid member forming a part of said grip when in said closed position; and

a spring member coupled to said cassette holder and to said lid member for pulling said lid member toward said cassette holder when said cassette holder is in said operative position and thereby securely abutting a circumferential edge of said lid member against a circumferential edge of said cassette insertion port.

5,598,306

DAMPING POST FOR REDUCING ACOUSTIC NOISE IN A DISK DRIVE

Gregory M. Frees, Sunnyvale, Calif., and Masakazu Sasaki, Kanagawa, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1994, Ser. No. 282,932
Int. Cl.[6] G11B *33/14*
U.S. Cl. 360—97.02 **17 Claims**

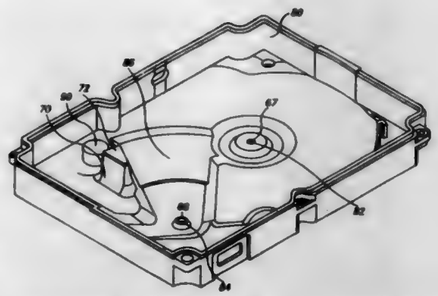
1. A disk drive assembly comprising:

a disk stack assembly comprising at least one disk;

an actuator assembly;

a housing having an inner chamber;

a post, separate from said disk stack assembly and said actuator assembly, extending from a first surface of said inner chamber, said post having a compressible material at an end, said compressible material abutting in a compressed state an opposing second surface of said inner chamber.

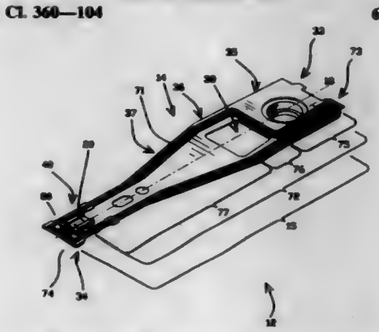


5,598,307

INTEGRATED GIMBAL SUSPENSION ASSEMBLY

Jeffry S. Bennin, Hutchinson, Minn., assignor to Hutchinson Technology Inc., Hutchinson, Minn.

Continuation-in-part of Ser. No. 227,960, Apr. 15, 1994, Pat. No. 5,491,597, Ser. No. 227,978, Apr. 15, 1994, and Ser. No. 249,117, May 25, 1994. This application Jan. 7, 1995, Ser. No. 478,396
Int. Cl.[6] G11B *021/16*
U.S. Cl. 360—104 **6 Claims**



1. An integral lead magnetic head suspension for attachment to an actuator arm within a disk drive, said head suspension comprising, in combination:

a load beam including a base region at its proximal end for attachment to an actuator arm, said load beam having plural conductive electrical traces patterned on a surface of said load beam, at least one of the traces being insulated from the surface of said load beam, said traces projecting beyond a distal end of said load beam to form a pair of spaced trace portions extending in a longitudinal direction of said load beam beyond said distal end of said load beam, said load beam also having a load protuberance located thereon adjacent the distal end thereof; and

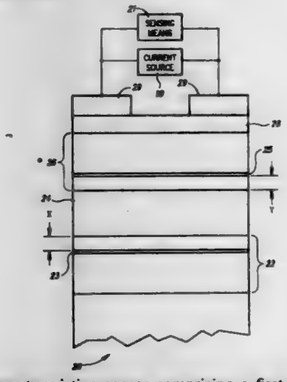
gimbal means having a tongue portion including a slider mounting surface to which a slider is to be mounted, said tongue portion supported for pivotal movement about a pitch axis by a cross leg that is spaced from said distal end of said load beam and interconnecting said pair of spaced trace portions projecting from the distal end of the load beam, at least one of said spaced trace portions being electrically insulated from said cross leg and extending onto said tongue portion, said spaced trace portions aligned with and displaced outwardly from a longitudinal axis of the load beam so that a head slider, when mounted on said slider mounting surface of the tongue portion is pivotally movable between the spaced trace portions of the gimbal means, said gimbal means further being aligned with said load beam so that the load protuberance of the load beam will engage the head slider when mounted to said tongue portion.

5,598,308

MAGNETORESISTIVE SENSOR HAVING MULTILAYER THIN FILM STRUCTURE

Bernard Dieny, Grenoble Cedex, France; Bruce A. Gurney, Santa Clara, Calif.; Stuart S. P. Parkin, San Jose, Calif.; Ian L. Sanders, Morgan Hill, Calif.; Virgil S. Speriosu, San Jose, Calif., and Dennis R. Wilhoit, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 750,157, Aug. 26, 1991, Pat. No. 5,341,261. This application Aug. 15, 1994, Ser. No. 290,324
Int. Cl.[6] G11B *5/127;5/33*
U.S. Cl. 360—113 **7 Claims**



1. A magnetoresistive sensor comprising a first layer of ferromagnetic material and a second layer of ferromagnetic material, said first and second ferromagnetic layers separated by a spacer layer of non-magnetic material, each of said first and second ferromagnetic layers being in contact with an adjacent surface of said non-magnetic layer, an interface being formed therebetween, at least one of said first and second ferromagnetic layers including therein a thin layer of metallic material sandwiched within ,said ferromagnetic layer, said thin layer of metallic material spaced from said interface between said ferromagnetic layer and said spacer layer a distance x, said thin layer of metallic material forming a localized region within said ferromagnetic layer wherein the spin dependent scattering properties are different from the spin dependent scattering properties of said ferromagnetic material.

5,598,309

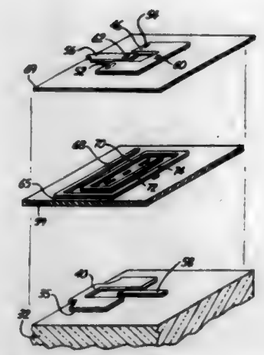
METHOD OF MAKING INDUCTIVE TRANSDUCER WITH CLOSED-LOOP POLE CIRCUMSCRIBING I-SHAPED POLE

Charles H. Tolman, Bloomington, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 327,182, Oct. 21, 1994, Pat. No. 5,546,256. This application May 11, 1995, Ser. No. 438,684
Int. Cl.[6] G11B *5/147*
U.S. Cl. 360—126 **4 Claims**

1. A method of making a magnetic transducer, comprising:

forming a first layer of magnetic material on a substrate to form a front portion of a first pole piece, the front portion having first and second arms, each arm having a front end, the front ends of the arms being joined to form a front region, the front region defining a first surface of a transducing gap, the first and second arms being spaced apart to form a region of low leakage-flux density between them;



forming a first layer of insulating material over the first layer of magnetic material;

forming a layer of conductive material on the first layer of insulating material to form a conductor portion of an inductive coil over the first and second arms of the front portion of the first pole piece;

forming a second layer of insulating material over the layer of conductive material; and

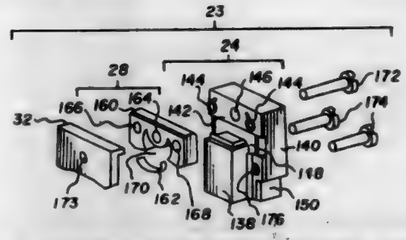
forming a second layer of magnetic material on the second layer of insulating material to form a front portion of a second pole piece, the front portion eft the second pole piece having a front end having a second surface confronting the first surface to form the transducing gap, the front portion of the second pole piece lying between the first and second arms of the front portion of the first pole piece in the region of low leakage-flux density.

5,598,310

MAGNETIC HEAD-TO-MEDIA BACKER ASSEMBLY

David L. Rowden; Dale W. Ryan, and Thomas C. Merle, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1995, Ser. No. 431,182
Int. Cl.[6] G11B *15/60*
U.S. Cl. 360—130.32 **13 Claims**



1. A magnetic head-to-media backer assembly for urging a magnetic media into contact with a magnetic head comprising;

a magnetic head mounting backer plate having inner and outer sides, top and bottom latitudinal edges and longitudinal edges for mounting a magnetic head on the inner side thereof, the backer plate further comprising first and second locating pins mounted to the inner side adjacent to and in parallel with the top latitudinal edge and a plate mounting hole extending through the plate for accommodating a mounting screw;

a magnetic head-to media backer device mounted on the backer plate comprising a frame having a cavity therein and a spring member partially contained within the cavity, said frame further comprising first and second locating holes extending there through for receiving the first and second locating pins

and a frame mounting hole extending through the frame for accommodating the mounting screw there through; and

an asymmetrically shaped film guide cover plate mounted over said backer device having a tapped hole therethrough for fastening with the mounting screw;

whereby the cover plate is removably fastened to the backer plate and the backer device is captured between the backer plate and the cover plate.

5,598,311

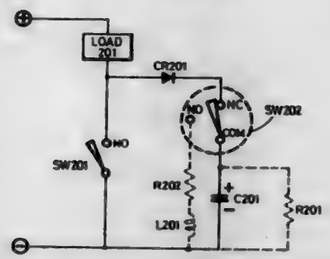
D.C. BREAKER ARC EXTINGUISHING CIRCUIT

Tai-Her Yang, No. 32 Lane 29, Taipin St., Si-Hu Town Dzan-Hwa, Taiwan

Continuation of Ser. No. 192,619, Feb. 7, 1994, abandoned. This application Apr. 26, 1996, Ser. No. 639,894

Int. Cl.[6] H02H 3/00

U.S. Cl. 361—9 **5 Claims**



1. A direct current (DC) cut-off switch arc extinguishing circuit, comprising:

a DC power source having two terminals;

a cut-off switch and a load connected in series between the two terminals of the power supply, said cut-off switch having first and second contacts; and

shunt circuit means including a diode and capacitor connected in series between the first and second contacts of the cut-off switch to shunt residual voltage present on the contacts in order to charge the capacitor following opening of the cut-off switch and thereby extinguish any arc present when the cut-off switch is opened; and

capacitor discharge means for discharging the capacitor to prepare for extinguishing the arc when the cut-off switch is cut off for a second time,

wherein said capacitor discharge means for discharging the capacitor to prepare for extinguishing the arc when the cut-off switch is cut off for a second time includes a second switch arranged to connect the capacitor to a capacitor discharge resistor following charging of the capacitor in order to discharge the capacitor through the capacitor discharge resistor.

5,598,312

DEVICE FOR CONTROLLING A MECHANISM DRIVEN BY A LENS ONE ELECTRIC MOTOR

Roger Mervan, Gratentour, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

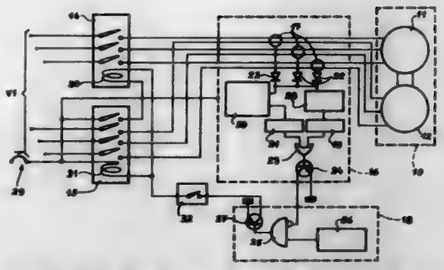
Filed May 25, 1994, Ser. No. 248,952

Claims priority, application France, Jun. 1, 1993, 93 06513

Int. Cl.[6] H02H 5/04

U.S. Cl. 361—31 **12 Claims**

1. Device for controlling an electric pump which comprises two electric motors supplied by a three-phase power supply across two contactor relays, said device comprising a circuit for detecting the current consumption of the electric pump and for comparing the detected value with a minimum current threshold and a maximum current threshold for determining whether said consumption is outside a predetermined range, with confirmation of the result of said comparison for a defined time; a circuit for controlling the



stoppage of the electric pump for a predetermined time, as a function of the result of said comparison;

a circuit for detecting the energizing of the electric pump to bring about a stoppage for a given time of the control of the electric pump for each appearance of the supply of said device, in order to provide protection against supply transients of the control or power supply;

an unbalance current detection circuit for detecting unbalance between the currents of the three phases of said three-phase power supply, said unbalance detection circuit having three current transformers respectively traversed by the wires of each phase; a calculating member coupled to said unbalance detection circuit and receiving a signal therefrom in the case of an unbalance between the currents of the three phases; and

a transient detection circuit connected to three current transformers across three diodes, whereby when transients or an unbalance between phases are detected, a stopping control signal is generated to control the stopping of the electric pump.

5,598,313

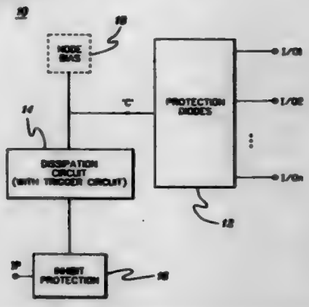
ELECTROSTATIC DISCHARGE SUPPRESSION CIRCUIT FOR INTEGRATED CIRCUIT CHIPS

John E. Gersbach, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,135

Int. Cl.[6] H02H 9/00

U.S. Cl. 361—56 **15 Claims**



9. A suppression circuit for dissipating an electrostatic discharge at an input and/or output node of an integrated circuit, said suppression circuit comprising:

a clamping circuit for shunting the electrostatic discharge at the input and/or output node to a common node;

discharge means coupled to the common node for dissipating the electrostatic discharge shunted thereto;

a trigger circuit connected to the common node and the discharge means, said trigger circuit including regenerative feedback for fast turn on of the discharge means as the electrostatic discharge is shunted to the common node, thereby preventing damage to the integrated circuit due to said electrostatic discharge; and

inhibit means coupled to the discharge means for selective inhibiting of the discharge means to render said suppression circuit inoperative when the integrated circuit is in normal operation, said inhibit means having a control input, said control input being electrically isolated from said integrated circuit and any signal supplied thereto when said suppression circuit is operative.

5,598,314

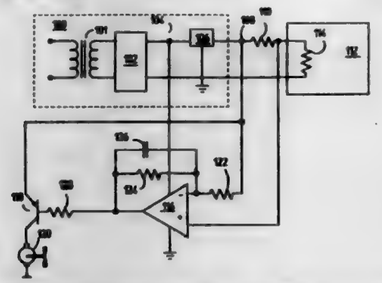
CONTROL OF COOLING FAN BY USING POWER SUPPLY CURRENT

Steven G. Hall, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 2, 1993, Ser. No. 146,545

Int. Cl.[6] H02H 3/00

U.S. Cl. 361—93 **1 Claim**



1. In an electronic system having a power supply that provides a current to the electronic system, a cooling system comprising:

a fan;

a circuit board trace having a controlled trace resistance over a portion of the trace, the circuit board trace connected in series with the power supply so that the current to the electronic system flows through the circuit board trace;

a threshold detector, connected across the controlled trace resistance, having a threshold output indicating whether a voltage across the controlled trace resistance exceeds a predetermined value; and

a fan switch controller, connected to the threshold detector, in which the fan is switched on only when the threshold output indicates that the voltage across the controlled trace resistance exceeds the predetermined value.

5,598,315

SELF-POWER TRIPPING RELAY WITH BALANCED POWER SUPPLY CURRENT AND MEASUREMENT CURRENT

Timothy B. Phillips, Raleigh, N.C., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 144,116, Oct. 27, 1993, abandoned. This application Feb. 16, 1996, Ser. No. 604,209

Int. Cl.[6] H02H 3/00

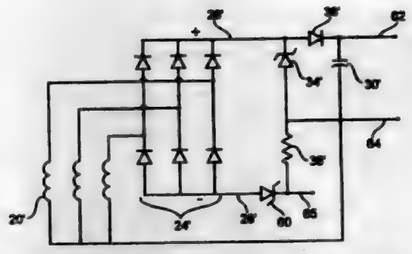
U.S. Cl. 361—93 **19 Claims**

1. A current induction arrangement for developing a power supply voltage and a measurement signal from a circuit path, comprising:

a power supply including a capacitor arranged to accumulate current to develop a voltage with respect to common having a selected polarity;

a current transformer inducing current from the circuit path and providing an output having a first induced-current signal component of the selected polarity and a second induced-current signal component of the opposite polarity;

a rectifier circuit arranged to receive the output from the current transformer, and produce the first induced current signal component at a first output terminal, coupled to the capacitor for accumulating thereat, and the second induced current signal component at a second output terminal;



a first voltage clamping circuit receiving at least a portion of the first induced-current signal component, the first voltage clamping circuit having a first clamping terminal coupled to the first output terminal and a second terminal coupled to common;

a second circuit including a second voltage clamping circuit and coupled between the second output terminal and common, the second circuit arranged for developing a measurement voltage corresponding to the current produced by the current transformer and for providing a prescribed balance between the second induced-current signal component used to develop the measurement voltage and the first induced-current signal component used to charge the power supply capacitor; and

the first and second induced-current signal components being returned to the current transformer via common.

5,598,316

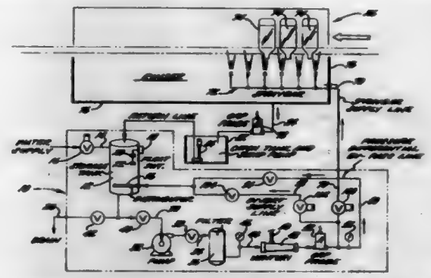
METHOD FOR REDUCING STATIC ELECTRICAL CHARGES BY APPLICATION OF OZONATED WATER

John R. Kasting, Jr., Waxhaw, N.C., assignor to OziDyn, Incorporated, Monroe, N.C.

Continuation-in-part of Ser. No. 986,055, Dec. 7, 1992, Pat. No. 5,368,815. This application Oct. 21, 1994, Ser. No. 327,312

Int. Cl.[6] H05F 1/00

U.S. Cl. 361—212 **12 Claims**



1. A method for substantially eliminating static electrical charges from articles comprising the steps of:

(a) supplying water from a source thereof for ozonation;

(b) injecting ozone into the water for the ozonation;

(c) returning at least a predetermined first portion of the ozonated water to the source through means arranged for bypassing the articles;

(d) supplying a predetermined second portion of the ozonated water to the articles, when the concentration of ozone in the ozonated water is sufficient, for substantially eliminating static electrical charges associated with the articles; and

(e) returning at least a substantial portion of the second portion of the ozonated water to the source.

5,598,317

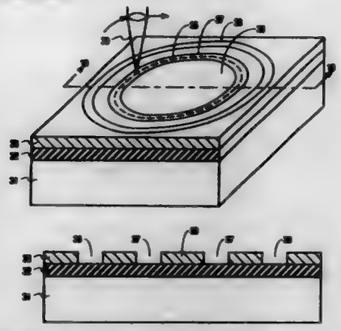
LASER PATTERNED SEMICONDUCTOR CAPACITOR

Charan Hanrahan, Fremont, and Andrew P. Stack, San Jose, both of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Division of Ser. No. 94,676, Jul. 20, 1993. This application Feb. 7, 1996, Ser. No. 597,785

Int. Cl.[6] H01G *4/005;4/06*

U.S. Cl. 361—313 **9 Claims**



1. A semiconductor capacitor comprising:

a semiconductor substrate having an upper surface wherein the semiconductor substrate forms a first plate of the capacitor;

an insulating layer located over the upper surface of said substrate, the insulating layer having an upper surface, wherein the insulating layer extends over substantially the entire upper surface of the substrate; and

an electrically conductive patterned thin film located over the upper surface of the insulating layer, the patterned thin film comprising a first patterned area which forms a second plate of the capacitor, a second patterned area which laterally surrounds said first patterned area and is electrically isolated from the first patterned area, and a third patterned area which laterally surrounds the second patterned area and is electrically isolated from the first and second patterned area, wherein the third patterned area extends over substantially the entire upper surface of the insulating layer.

5,598,318

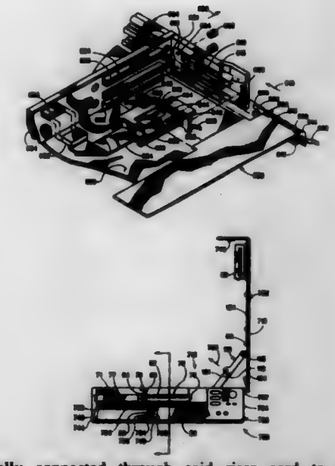
PERSONAL COMPUTER WITH CONFIGURATIONAL FLEXIBILITY AND SERVICE FEATURES

John R. Dewitt; Todd A. McClurg; Jay H. Neer, all of Boca Raton, and Orlando Pimienta, Miami, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 134,199, Oct. 8, 1993, Pat. No. 5,495,389. This application Aug. 21, 1995, Ser. No. 517,226

Int. Cl.[6] G06F *1/16;* **H05K** *7/04;* **H01R** *13/73*

U.S. Cl. 361—683 **22 Claims**



1. Personal computer apparatus comprising:

a frame with a generally flat bottom portion, an upstanding attachment side, and a rear frame opening, said frame being open above said bottom portion;

an essentially rectangular front frame bezel extending along a front edge of said bottom portion and along said upstanding attachment side, attached to said frame, wherein said attachment side of said frame extends rearward from said front frame bezel;

a planar board assembly fastened within said frame, by planar board attachment means, to said bottom portion, said planar board assembly including a riser connecter directed upward from said planar board assembly;

a central support structure for electrically connecting option card assemblies with said planar board assembly, said central support structure including a riser card engaging said riser connector, a plurality of card connectors on said riser card electrically connected through said riser card to said riser connector, and a rear attachment framework extending within said rear frame opening, wherein said rear attachment framework includes a plurality of rear slots extending therethrough and means for attaching a plurality of card assemblies of a first type in alignment with said rear slots and in engagement with various of said card connectors;

an "L"-shaped cover with a generally flat top portion and a cover side extending downward at a side of said top portion opposite said attachment side of said frame, said cover being open below said top portion;

a storage device attached to said top portion, extending below said top portion, by storage device attachment means; and

cover attachment means attaching said top cover to said frame section to pivot about an axis extending along said attachment side of said frame, permitting pivotal movement of said top cover between a closed cover position, in which said central support structure is held in engagement with said riser connector, and an open cover position in which said central support structure can be disengaged from said riser connector, wherein said cover moves substantially through a ninety-degree angle between said closed cover position and said open cover position with said top portion of said cover extending horizontally in said closed cover position and vertically in said open cover position.

19. Personal computer apparatus comprising:

a frame section with a generally flat bottom portion, a front frame bezel, and a rear frame opening, said frame section being open above said bottom portion;

a planar board assembly fastened within said frame section, by planar board attachment means, to said bottom portion, said planar board assembly including a riser connecter directed upward from said planar board assembly;

a central support structure for electrically connecting option card assemblies with said planar board assembly, said central support structure including a riser card engaging said riser connector, a plurality of card connectors on said riser card electrically connected through said riser card to said riser connector, and a rear attachment framework extending within said rear frame opening, wherein said rear attachment framework includes a plurality of rear slots extending therethrough and means for attaching a plurality of card assemblies of a first type in alignment with said rear slots and in engagement with various of said card connectors;

a top cover with a top portion, said top cover being open below said top portion;

a storage device attached to said top portion, extending below said top portion, by storage device attachment means;

cover attachment means attaching said top cover to said frame section along a cover attachment edge of said top cover and along a frame attachment of said frame section, permitting pivotal movement of said top cover between a closed cover position, in which said central support structure is held in engagement with said riser connector, and an open cover position in which said central support structure can be disengaged from said riser connector;

a socket assembly for removably receiving a circuit card of a second type, said socket assembly including a plurality of socket contacts for establishing electrical contact with a plurality of mating contacts along an end of said second type of circuit card inserted therein;

an ejection mechanism for facilitating removal of said second type of circuit card; and

a bracket attaching said socket assembly and said ejection mechanism to said rear attachment framework in alignment with one of said rear slots for inserting and ejecting said circuit card of a second type therethrough.

5,598,319

MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH GAME PACK DRIVER

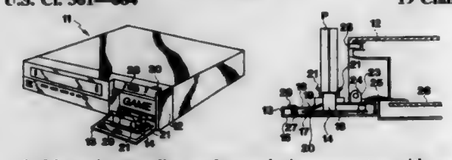
Chang Y. Lee, Kyungki-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 21, 1994, Ser. No. 361,214

Claims priority, application Rep. of Korea, Dec. 29, 1993, 30353/1993; May 9, 1994, 10098/1994

Int. Cl.[6] H05K *7/60*

U.S. Cl. 361—684 **19 Claims**



1. Magnetic recording and reproducing apparatus with game pack driver, comprising:

a main body;

a front panel connected to the main body;

a game pack receiving means located on the front panel for receiving and holding a game pack in communication with the game pack driver to provide easy loading and unloading of a game pack even when the main body other than the front panel may be otherwise confined; and

said game pack receiving means including

a cartridge cover having a game pack socket, said cartridge cover being pivotally connected to the front panel of the main body such that the cartridge cover turns relative to the front panel between opened and closed positions.

5,598,320

ROTABLE AND SLIDEBLE HEAT PIPE APPARATUS FOR REDUCING HEAT BUILD UP IN ELECTRONIC DEVICES

Thomas Toedtman, and Randall S. Welch, both of Lake Forest, Calif., assignors to AST Research, Inc., Irvine, Calif.

Filed Mar. 6, 1995, Ser. No. 399,409

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—687 **24 Claims**

1. A portable battery powered notebook-type computer system comprising a movable heat pipe apparatus, said movable heat pipe apparatus comprising

a heat sink capable of being placed in thermal communication with an electronic device,

a heat pipe comprising a first end and a second end,

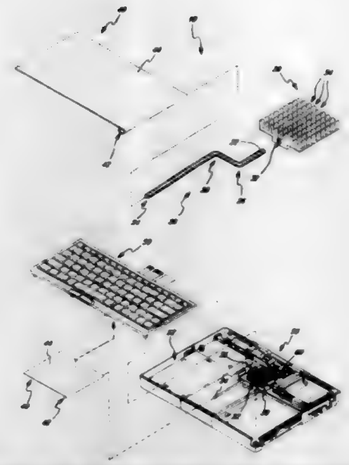
said first end capable of being movably coupled to said heat sink, and

said second end capable of being movably coupled to a heat dissipating surface,

said heat sink comprises a plurality of fins for increased surface area and an integral cylindrical passageway adapted for receiving said first end of said heat pipe wherein said first end is capable of sliding and rotating within said cylindrical passageway.

said heat dissipating surface is a heat spreader comprising a metal plate and a cylindrical opening formed from one end of said metal plate and adapted for receiving said second end of said heat pipe wherein said second end is capable of sliding and rotating within said cylindrical opening, said cylindrical opening being positioned on an underside of a keyboard, and

said heat pipe is shaped such that said second end is approximately parallel to said first end and said second end is capable of being rotated about an axis defined by said first end.



5,598,321

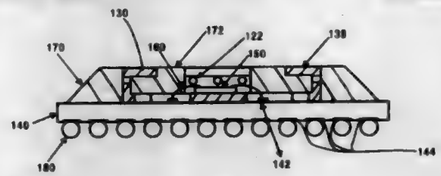
BALL GRID ARRAY WITH HEAT SINK

Shahram Mostafazadeh, Santa Clara, and Joseph O. Smith, Morgan Hill, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 11, 1995, Ser. No. 526,733

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—704 **19 Claims**



1. An electronic device comprising:

a substrate including a plurality of inner lead pads formed on a surface thereof;

a heat dissipating member including a die attach pad mounted on the substrate, a second portion surrounding the die attach pad, and a plurality of thermal conductors thermally connecting the die attach pad with the second portion such that heat is transferred from the die attach pad to the second portion along the plurality of thermal conductors, wherein a plurality of openings are defined by an outer edge of the die attach pad, an inner edge of the second portion and the thermal conductors;

an integrated circuit chip mounted on the die attach pad such that heat generated by the integrated circuit chip is transferred to the die attach pad, the integrated circuit chip including a plurality of bonding pads, each of the plurality of bonding pads being electrically connected to one of the plurality of inner lead pads by a wire extending through one of the plurality of openings; and

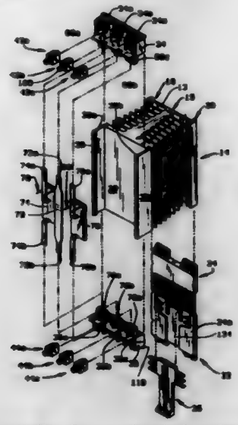
a molded cover formed over the substrate, the heat dissipating member and the integrated circuit chip.

5,598,322

POWER CONTROL SYSTEM

Theodore T. Von Arx, LaCrescent; Robert A. Judd, Winona, both of Minn., and Russell A. Schneidewind, Nashotah, Wis., assignors to Watlow Winona, Inc., Winona, Minn.

Continuation of Ser. No. 313,334, Sep. 27, 1994, abandoned.
This application Jul. 2, 1996, Ser. No. 674,659
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—704 **14 Claims**



1. A power controller for an electrical resistance heater, the power controller comprising:

a heat sink defining a front side, a rear side, a top end, and a bottom end;

power control circuitry disposed at said front side of said heat sink; and

a DIN rail mounting assembly disposed at said rear side of said heat sink, said DIN rail mounting assembly including:

a back plate defining a front face and a rear face, said front face positioned adjacent said rear side of said heat sink and adapted to be slidably received onto said heat sink, said back plate including a pair of rail capture tongs disposed on said rear face, a configured recess disposed in said front face, and a configured opening disposed within said recess; and

a slider disposed in said recess and limitedly movable therein in response to mounting on a DIN rail, said slider held between said recess and said rear side of said heat sink, and including a rail capture prong adapted to extend through said configured opening;

wherein a top portion of a DIN rail is retained by said pair of rail capture tongs, and a bottom portion of the DIN rail is releasably retained by said rail capture prong.

5,598,323

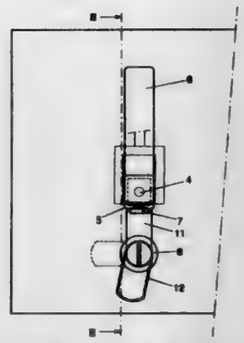
DEVICE FOR PROTECTING A COMPUTER

Joseph J. P. M. Muller, 's-Hertogenbosch, Netherlands, assignor to Tulip Computers International B.V., Netherlands

Filed Mar. 2, 1995, Ser. No. 396,497
Claims priority, application Netherlands, Mar. 3, 1994, 9400327
Int. Cl.[6] H05K *5/00*
U.S. Cl. 361—726 **5 Claims**

1. A computer comprising:

a housing having a wall, the wall defining an opening;



a cover for closing the housing, said cover having a closed condition in which it is located opposite the wall of the housing;

a switch for switching the computer on and off;

a lock having a lock case fixed to the cover;

a key for operating the lock;

an operating member for actuating the switch and being fixed to the cover;

a latch element coupled with the lock and being positionable into three positions with the key, wherein, in a first of the three positions, the latch element blocks the operating member from actuating the switch and prevents the cover for closing the housing from being opened, in a second of the three positions, the latch element prevents the cover for closing the housing from being opened, and in a third of the three positions, the latch element is located opposite the opening defined in the wall of the housing, the opening being shaped so as to permit passage of the latch element therethrough,

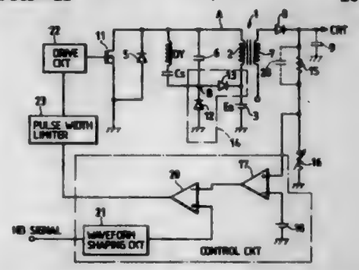
wherein the cover can be opened and the key can be removed from the lock case at least in the first and the second of the three positions of the latch element.

5,598,324

RESONANCE POWER CIRCUIT WITH CLAMPING CIRCUIT

Nobuaki Imamura, and Nobuhiro Oyama, both of Kanagawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 126,885, Sep. 23, 1993, abandoned.
This application Mar. 22, 1996, Ser. No. 620,593
Claims priority, application Japan, Sep. 25, 1992, 4-280555; Oct. 13, 1992, 4-300468; Jul. 29, 1993, 5-208985
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—21 **26 Claims**



1. A resonance power circuit for generating a high output voltage, comprising:

a flyback transformer having a primary coil and a secondary coil;

a driving power source connected to said primary coil of said flyback transformer;

a switching device for conducting an ON/OFF control of a current which flows through said primary coil;

a resonance capacitor which cooperates with said primary coil for producing a series resonance to generate a flyback pulse when said switching device is in an OFF period;

a detection circuit connected to said secondary coil of said flyback transformer for detecting a voltage output from said secondary coil;

a control circuit for controlling an ON period of said switching device on the basis of the voltage detected by said detection circuit to control a peak level of said flyback pulse;

a damper diode for allowing a reverse current to flow through said primary coil during a damper period; and

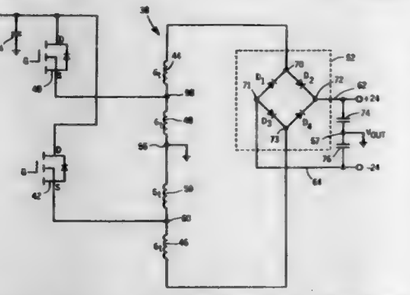
a clamping circuit for clamping a voltage across both terminals of said resonance capacitor to a voltage of said driving power source during a period from an end of said damper period to a start of the ON period of said switching device.

5,598,325

SERIES COUPLED NON-ISOLATED BIPOLAR TRANSFORMER WITHIN AUTOMOTIVE POWER AMPLIFIER

John J. Pleitz, 1750 S. Price, Tempe, Ariz. 85281

Filed Jul. 24, 1995, Ser. No. 506,034
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—24 **6 Claims**



1. A power stage for use in an automobile audio amplifier, the amplifier including circuitry for affirmatively compensating for ground loop potential, so as to reject ground loop induced potentials, the automobile providing a DC voltage source, the power stage comprising:

a conversion means for converting the direct voltage to two out of phase alternating pulse trains provided at first and second input nodes;

a ground connected to a ground node;

first and second primary windings having identical numbers of turns, the first primary winding connected between the first input node and the ground node and the second primary winding connected between the second input and the ground node;

a full wave diode bridge rectifier having upper and lower input nodes and positive and negative output nodes;

first and second series windings, said first series winding connected between the first input node and the upper input node and the second series winding connected between the second input node and the lower input node; and

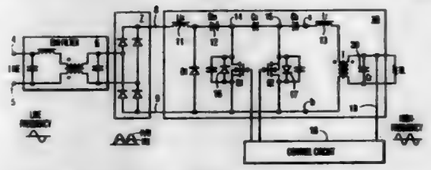
a positive rail connected to the positive output node and a negative rail connected to the negative output node.

5,598,326

HIGH FREQUENCY AC/AC CONVERTER WITH PF CORRECTION

Rui Liu, and Wen-Jian Gu, both of Croton-on-Hudson, N.Y., assignors to Philips Electronics North America, New York, N.Y.

Continuation of Ser. No. 197,530, Feb. 10, 1994, abandoned.
This application Jan. 25, 1996, Ser. No. 591,042
Int. Cl.[6] H02J *3/00*
U.S. Cl. 363—34 **34 Claims**



1. A high frequency converter apparatus comprising:

first and second input terminals for connection to a source of DC supply voltage for the converter,

output means including a resonant circuit for connection to a load to be driven by the converter,

first and second controlled switching devices of the same type,

a first series circuit including an inductor, a rectifier element, and said first controlled switching device coupled to said input terminals such that current flows from the input terminals through the rectifier element when the first controlled switching device is conductive,

a storage capacitor coupled to said rectifier element and to said output means,

said second controlled switching device being coupled to said storage capacitor,

first and second diodes coupled across said first and second controlled switching devices, respectively, and

a control circuit responsive at least to a voltage developed across the storage capacitor and having output means coupled to control electrodes of the first and second controlled switching devices so as to alternately trigger the first and second controlled switching devices on and off at a high frequency, said first switching device providing power factor correction and also being a part of a high frequency DC/AC inverter.

5,598,327

PLANAR TRANSFORMER ASSEMBLY INCLUDING NON-OVERLAPPING PRIMARY AND SECONDARY WINDINGS SURROUNDING A COMMON MAGNETIC FLUX PATH AREA

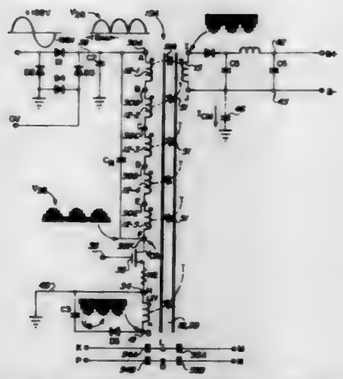
Thomas A. Somerville; Walter B. Meinel, and R. Mark Stitt, II, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 969,508, Oct. 30, 1992, Pat. No. 5,353,001, and Ser. No. 63,163, May 11, 1993, Pat. No. 5,304,917, which is a continuation-in-part of Ser. No. 850,286, Mar. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 621,014, Nov. 30, 1990, Pat. No. 5,111,131, said Ser. No. 969,508is a continuation of Ser. No. 645,224, Jan. 24, 1991, abandoned. This application Jan. 28, 1994, Ser. No. 188,159
Int. Cl.[6] H02M *7/537;* **H01H** *85/02*
U.S. Cl. 363—131 **22 Claims**

1. A planar transformer assembly comprising in combination:

(a) an insulative layer having a top surface and a bottom surface;

(b) a first spiral winding on the top surface, surrounding a magnetic flux path area;



(c) a second spiral winding on the bottom surface, surrounding the magnetic flux path area, concentric with the first spiral winding, in non-overlapping relation to the first spiral winding;

(d) a ferrite core assembly including

i. a first core section including a thin, flat first ferrite plate disposed on the top surface and subtending the first and second spiral windings, and

ii. a second core section including a thin, flat second ferrite plate disposed on the bottom surface and subtending the first and second spiral windings.

5,598,328

FILTER MODULE FOR A FREQUENCY CONVERTER

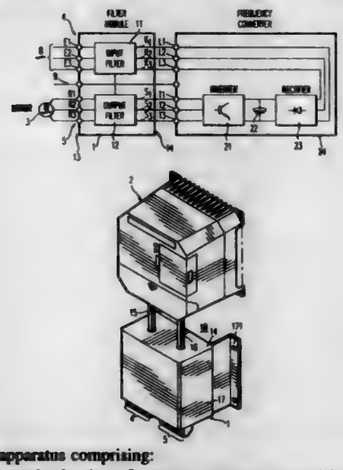
Christophe Dore, Fontenay Le Fleury, France, assignor to Telemecanique, Rueil Malmaison, France

Continuation of Ser. No. 151,186, Nov. 12, 1993, abandoned. This application May 15, 1995, Ser. No. 441,643

Claims priority, application France, Nov. 27, 1992, 92 14529

Int. Cl.[6] H02M *7/12*; H05K *7/20*

U.S. Cl. 363—141 **6 Claims**



1. An apparatus comprising:

a self-contained unitary frequency converter comprising:

a rectifier; and

an inverter connected to receive an output of the rectifier;

a self-contained unitary filter module comprising:

an input filter having an output connected to the rectifier of the frequency converter; and

an output filter having an input to receive an output from the inverter of the frequency converter.

5,598,329

METHOD AND DEVICE FOR CONTROLLING A PROCESS

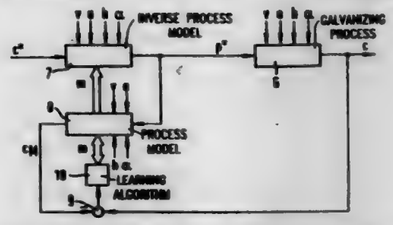
Martin Niemann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 17, 1995, Ser. No. 373,819

Claims priority, application European Pat. Off., Jan. 17, 1994, 94100589

Int. Cl.[6] G05B *13/04*

U.S. Cl. 364—150 **11 Claims**



1. A method for controlling a process wherein an output variable (c) that depends on a plurality of influential parameters (v, a, h, α) acting on the process is influenced by a correcting variable (p*) acting through a correcting element on the process in such fashion that it assumes the value of a preset control variable (c*), comprising the steps of:

a) calculating a model output value (c_M) using of a model of the process, wherein the model output value (c_M) is calculated as a function of the correcting variable (p*) supplied as an input to the model and the plurality of influential variables (v, a, h, α) and as a function of a plurality of variable model parameters (m);

b) comparing the model output value (c_M) with the measured output variable (c) of the process;

c) depending on the results of the comparison in step b), changing the plurality of model parameters (m) to reduce a difference between the model output value (c_M) and the output variable (c) of the process; and

d) using the model of the process thus adapted to the actual process event to determine the correcting variable (p*) acting through the correcting element on the process as a function of the control variable (c*) and the plurality of influential variables (v, a, h, α),

wherein a layer thickness (c) of a strip passing through a liquid bath is regulated in the process, with air being blown from a nozzle against the strip as it emerges from the liquid bath, with a layer thickness being the output variable of the process, air pressure (p) representing the controlling variable, and strip speed (v) as well as the geometric arrangement of the nozzle relative to the strip being the influential parameters acting on the process.

5,598,330

Patent Not Issued For This Number

5,598,331

Patent Not Issued For This Number

5,598,332

CASH REGISTER CAPABLE OF TEMPORARY-CLOSING OPERATION

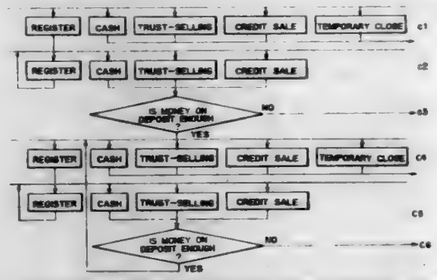
Kenichi Wakabayashi, Yamato-Koriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1992, Ser. No. 870,780

Claims priority, application Japan, Apr. 17, 1991, 3-085514

Int. Cl.[6] G06F *17/60*

U.S. Cl. 395—224 **8 Claims**



1. A cash register having a temporary-closing function for closing a first transaction temporarily in order to register data of another transaction, when a paid amount is less than a total amount of said first transaction, said cash register comprising:

an input means for inputting data of said first transaction including a unit price and a quantity, and a payment with its payment kind;

a calculating means for calculating said total amount based on said data inputted by said input means;

a determining means for determining whether said payment inputted by said input means is less than said total amount calculated by said calculating means;

a temporary-closing means for performing a temporary closing of said first transaction of said total amount, by registering said payment and said total amount, and by issuing a receipt describing said payment, said total amount and a remainder of said total amount when said determining means determines that said payment is less than said total amount;

wherein said temporary-closing means gathers the total payments that have been made and registers a payment of a part of said remainder, when said part of said remainder is paid after closing by said temporary-closing means; and

a closing means for final closing of said total amount of said first transaction by registering payment data of said remainder and it is determined that the total payments match the total amount of said first transaction, when said remainder is paid after said temporary closing by said temporary-closing means.

5,598,333

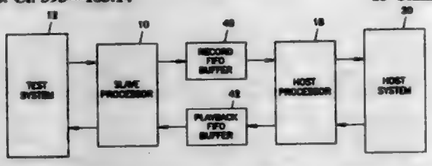
APPARATUS AND METHOD FOR ELECTRONICALLY TRACKING AND DUPLICATING USER INPUT TO AN INTERACTIVE ELECTRONIC DEVICE

Michael Marsico, Jr., 17 Laurel Rd., Lake Peekskill, N.Y. 10537

Division of Ser. No. 199,816, Feb. 22, 1994, Pat. No. 5,408,408. This application Mar. 1, 1995, Ser. No. 397,416

Int. Cl.[6] G06F *161/00*

U.S. Cl. 395—183.14 **13 Claims**



1. An apparatus for electronically tracking and duplicating user input operating software on an interactive electronic device, comprising:

(a) an input device for accepting the user input as the user input operates the software and translating the user input into electronic user input data;

(b) a real time slave processor, coupled to the interactive electronic device and the input device, for instantaneously capturing and storing the electronic user input data in real time from the input device as the user input continuously operates the software during ordinary operating conditions, and for transmitting the electronic user input data to the interactive electronic device; and

(c) a host processor, coupled to the slave processor, for exchanging data and control signals therewith, wherein the host processor further comprises means for collecting the electronic user input data from the slave processor, for storing the electronic user input data in an electronic memory, for retrieving the electronic user input data from the electronic memory, and for transmitting the electronic user input data to the slave processor for later playback through the interactive electronic device, so that the electronic user input data is electronically tracked and precisely duplicated.

5,598,334

SYSTEM FOR DETERMINING AN ABNORMAL OPERATING CONDITION IN SPEED RATIOS OF AN AUTOMATIC TRANSMISSION AND A METHOD THEREFOR

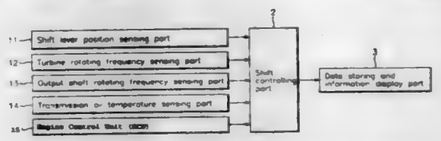
Myungshin Shin, and Heejun Kim, both of Kyungki-do, Rep. of Korea, assignors to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,774

Claims priority, application Rep. of Korea, Dec. 30, 1993, 93-31247

Int. Cl.[6] F16H *61/12*; B60K *41/10*

U.S. Cl. 364—424.08 **7 Claims**



1. A system for determining an abnormal operating condition in speed ratios of an automatic transmission of an automotive vehicle, comprising:

shift lever position sensing means for sensing a set position of a shift lever and outputting a shift lever position signal;

turbine rotating frequency sensing means for sensing the rotating frequency of a turbine used as an input axle of the transmission and outputting a turbine rotating frequency signal;

output shaft rotating frequency means for sensing the rotating frequency of an output shaft connected to an output axle of the transmission and outputting an output shaft rotating frequency signal;

means for determining a desired speed ratio from the shift lever position signal;

shift controlling means including,

means for determining whether or not a shifting operation to the desired speed ratio is being performed;

means for determining if an abnormal operating condition exists during a shifting operation by comparing the actual speed ratio calculated from the rotating frequency signal and the rotating frequency signal with the desired speed ratio;

means for outputting an error code and a sensing signal corresponding to the determined abnormal condition; and

data storing and information display means connected to said shift controlling means, for storing error codes for a plurality of abnormal conditions, and operating an information display device in response to the error control and sensing signals from said output means corresponding to one of said stored

plurality of abnormal conditions to enable an operator to identify a potential problem with a particular component of the transmission.

5,598,335

SYSTEM AND METHOD FOR CONTROLLING A SHIFT POSITION WHEN A VEHICLE TRAVELS ALONG A STEEPLY SLOPED ROAD OR A SHARPLY CURVED ROAD

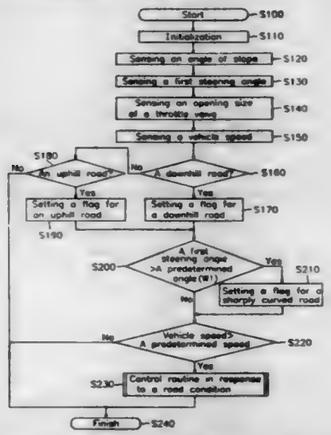
Jinho You, Seoul, Rep. of Korea, assignee to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Apr. 6, 1995, Ser. No. 417,693

Claims priority, application Rep. of Korea, Apr. 6, 1994, 94-7178

Int. Cl.[6] G06F *7/70*; F16H *59/30*

U.S. Cl. 364—424.094 **9 Claims**



1. A device for controlling a shift position of a vehicle in response to a road condition when the vehicle travels along a steeply sloped road or a sharply curved road comprising:

first means for sensing an angular deviation of the vehicle about both a longitudinal axis thereof and a lateral axis perpendicular to the longitudinal axis, the angular deviation corresponding to any incline of a road, converting the sensed angular deviation into an electric signal, and outputting the signal, said first means including a mass which is soaked in fluid having a drag force, a variable resistance connected with said mass by a wire which is not bent, and a voltage output means for outputting a corresponding voltage according to a value of the variable resistance changed by a movement of said mass;

second means for sensing a steering angle of the vehicle in response to operation of a steering wheel, converting the sensed angle into an electric signal, and outputting the signal;

third means for sensing an opening size of a throttle valve cooperating with an accelerator pedal of the vehicle, converting the sensed opening size into an electric signal, and outputting the signal;

fourth means for sensing a running speed of the vehicle, converting the sensed speed into an electric signal, and outputting the signal;

fifth means responsive to said first means for sensing the angular deviation of the vehicle, said second means for sensing the steering angle of the vehicle, said third means for sensing the opening size of the throttle, and said fourth means for sensing the running speed of the vehicle, for selectively adjusting a current shift position upon detecting a reduction in speed, if the vehicle is angularly deviated and the vehicle runs at over the predetermined speed, and outputting a control signal representative of the selectively adjusted current shift position; and

a solenoid valve for controlling a hydraulic pressure of the vehicle in response to the control signal outputted from said fifth means.

5,598,336

AUTOMATIC TRANSMISSION CONTROL SYSTEM WITH VARIABLE LOCKUP TIMING

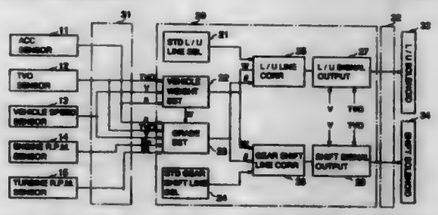
Masayuki Kume, and Junichi Ishii, both of Katsuta, Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Engineering Co., Ltd., both of Japan

Continuation of Ser. No. 105,120, Aug. 12, 1993, Pat. No. 5,434,780. This application Jun. 1, 1995, Ser. No. 456,464

Claims priority, application Japan, Sep. 8, 1992, 4-239825

Int. Cl.[6] G06F *19/00*; F16H *59/48*; G06E *1/00*

U.S. Cl. 364—424.08 **7 Claims**



1. An automatic transmission control system for a transmission which is provided in an automobile having a throttle valve whose opening is varied based on manipulation magnitude of an acceleration pedal so that quantity of air flow delivered into an engine is adjusted, and has a speed change gear, a torque converter, and a lockup mechanism for the torque converter; comprising

air flow quantity detection means for detecting either one of said throttle valve opening and said quantity of air flow delivered into the engine based on the throttle valve opening;

speed detection means for detecting vehicle speed of said automobile;

acceleration magnitude detection means for detecting acceleration magnitude of said automobile;

neural network means having at least an input layer into which each of detected values detected by each of said detection means is entered and an output layer which delivers either one of a value of a running resistance and a value of a factor which exerts influence on the running resistance, each of said layers having a plurality of neurons, said plurality of neurons being coupled each other by a synapse so that a signal can travel among said neurons, and said synapse being endowed with a weighting factor such that either one of the value of the running resistance and the value of the factor which exerts influence on the running resistance delivered from the output layer is to be an actual value;

standard lockup line memory means for storing therein a single lockup line which corresponds to a condition when the running resistance is standard;

lockup line correction means for correcting the single lockup line in accordance with either of said running resistance or said value of the influential factor as delivered by said neural network means; and

lockup signal output means for deciding a timing of either lockup "ON" or lockup "OFF" in accordance with the lockup line corrected by said lockup line correction means, and for delivering a lockup signal to said lockup mechanism so as to drive the lockup mechanism at the decided timing.

5,598,337

SUSPENSION APPARATUS WITH DRIVING STATE FEEDBACK FOR VEHICLES

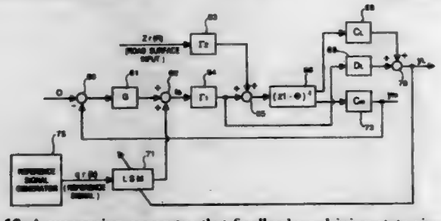
Tetsuro Butsuen, Hiroshima-ken; Yasunori Yamamoto, Higashihiroshima, and Tohru Yoshioka, Hatsukaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 127,365, Sep. 28, 1993, abandoned. This application Jun. 28, 1995, Ser. No. 495,872

Claims priority, application Japan, Sep. 30, 1992, 4-262239

Int. Cl.[6] G06F *7/70*

U.S. Cl. 364—424.046 **17 Claims**



10. A suspension apparatus that feedbacks a driving state signal indicative of a driving state of a vehicle to a shock damping unit provided between sprung mass and unsprung mass of the vehicle to vary a suspension characteristic, comprising:

generation means for generating a reference signal corresponding to vibration from a road surface which induces resonance of the unsprung mass;

filter means for inputting the reference signal and the driving state signal, the operation of said filter means being controlled in accordance with the input driving state signal;

feedforward control means for feedforwarding an output signal from the filter means to the shock damping unit so as to minimize the vibration corresponding to the reference signal; and

prohibition means for prohibiting operation of said feedforward control means when the driving state signal indicates a predetermined condition.

5,598,338

DEVICE FOR DETECTING THE EXISTENCE OF MOVING BODIES IN AN IMAGE

Hiroyasu Taniguchi; Haruki Furuuwa; Jun Hatakenaka, and Akinobu Seki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 201,267, Feb. 24, 1994, Pat. No. 5,396,283, which is a division of Ser. No. 852,652, Mar. 17, 1992, Pat. No. 5,313,295. This application Jan. 19, 1995, Ser. No. 375,552

Claims priority, application Japan, Mar. 19, 1991, 3-54281; Mar. 26, 1991, 3-61964; Jun. 28, 1991, 3-158300; Nov. 21, 1991, 3-06295

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—436 **19 Claims**

1. An image processing device for measuring traffic flows which comprises:

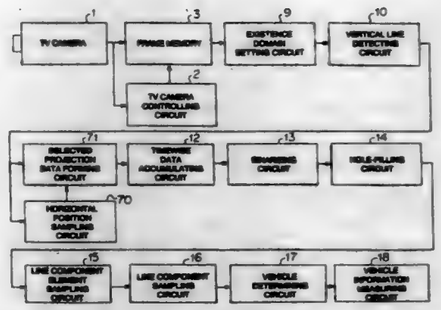
means for taking an image;

a frame memory for storing a plurality of image data elements that define the image;

means for selecting a set of image data elements from the plurality of image data elements, the selected set of image data elements being indicative of a portion of the image within an existence domain, the existence domain defining an intended vehicle path in the image;

means for selecting vehicle data representing potential vehicles from the set of image data elements, the vehicle data defining line edges;

means for generating information that defines one of a center of gravity value and a width based upon the vehicle data defining the line edges, and preserving the information;



means for selecting projection data from the vehicle data based on the information from the means for generating and preserving;

means for timewisely accumulating the projection data selected by the means for selecting the projection data;

means for determining the existence of a vehicle moving in the portion of the image within the existence domain based on the timewisely accumulated projection data; and

a state quantities measuring device for measuring state quantities of the vehicle determined by the means for determining.

5,598,339

NAVIGATION APPARATUS FOR VEHICLES

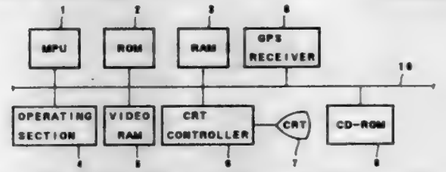
Tohru Yoshihara; Shigeru Tmijmura; Shinichi Takamura; Masashi Shimakata; Masaya Adachi; Hayato Yoshida; Hitoshi Ando, and Tsutomu Honda, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 662,592, Mar. 1, 1991, abandoned. This application Dec. 1, 1994, Ser. No. 352,816

Claims priority, application Japan, Mar. 6, 1990, 2-52831; Mar. 15, 1990, 2-62630

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—449.7 **22 Claims**



1. A vehicle navigation system, comprising:

a global positioning system receiver for receiving position signals;

means for determining if the position signals received are sufficient for converting the position signals into display information;

means for converting the position signals into the display information;

means for displaying the display information in a first form whenever said determining means determines that the position signals received are sufficient for converting the position signals into the display information;

means for changing the display information into an altered form whenever said determining means determines that the position signals received are not sufficient for converting the position signals into the display information;

means for receiving almanac data from a plurality of satellites; and

means for calculating, based on the almanac data, a time at which said global positioning system receiver will again be within receiving range of a sufficient number of the satellites for the position signals to be converted into the display information.

5,598,340

METHOD OF PRODUCING INDUSTRIAL COMPONENTS BY THE ACTION OF LIGHT ON A POLYMERIZABLE OR CROSSLINKABLE LIQUID SUBSTANCE WITHOUT REQUIRING SUPPORTS

Claude P. Mediard, Villers Les Nancy Cedex; André L. Allanic, Nancy, and Philippe J. Schaeffer, Atton, all of France, assignors to Laser 3D, Villers Les Nancy Cedex, France

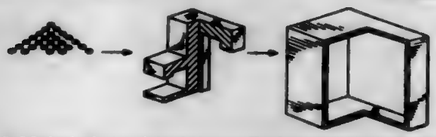
PCT No. PCT/FR93/00537, § 371 Date Feb. 1, 1995, § 102(e) Date Feb. 1, 1995, PCT Pub. No. WO93/25376, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 7, 1993, Ser. No. 347,460

Claims priority, application France, Jun. 5, 1992, 92 07021

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.27 10 Claims



1. Method of manufacturing a set E of three-dimensional solid components by phototransformation of a polymerizable or crosslinkable organic material, by absorption of light by polymerization or cross-linking photoinitiators, which comprises:

a) providing at least one source of light radiation;

b) providing automated members for establishing and for superposing, automatically, thin layers of the material;

c) confining the light emitted by the source of light radiation in the form of at least one point of impact on the material;

d) automatically moving said at least one point of impact on the material;

e) storing the geometrical shape of the set E;

f) computing a set of elementary volumes such that, once they are phototransformed, said elementary volumes altogether constitute a set F of components such that E is included in F;

g) controlling and driving all the automated members necessary for the manufacture; and

h) including in the set F of components constructed for the manufacture of the set E, a set G of solid particles, which form during the manufacturing step, a powder of phototransformed material mixed with material still in liquid form, said particles not necessarily having the same geometrical shape.

5,598,341

REAL-TIME IN-LINE DEFECT DISPOSITION AND YIELD FORECASTING SYSTEM

Zhi-Min Ling; Thao Vo; Shu-May He; Ying Shiau, all of San Jose; Yeng-Kaung Peng, Saratoga, and Yung-Tao Lin, Fremont, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 10, 1995, Ser. No. 401,490

Int. Cl.[6] G06F *19/00*

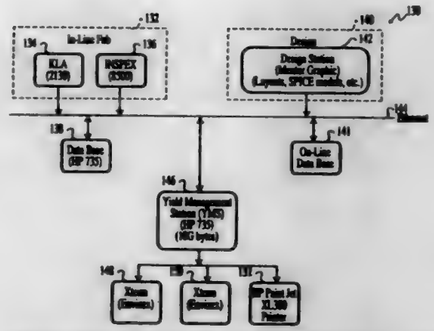
U.S. Cl. 364—468.17 17 Claims

1. A real-time in-line defect disposition and yield forecasting system for a semiconductor wafer having layers containing devices, comprising:

an in-line fabrication inspection tool inspecting at least two layers of the semiconductor wafer and producing first information including particle size, particle location and number of particles introduced therein for each of the at least two layers;

a design review station inspecting the at least two layers of the semiconductor wafer and producing second information including layouts of each of the at least two layers; and

a yield management station, operatively connected to said in-line fabrication inspection tool and to said design review station, retrieving the first information and the second information, determining at least one of a number of killer defects



for the devices in each of the at least two layers and a defect sensitive area index for each of the at least two layers responsive to the first and second information, and further determining a priority for analyzing each of the at least two layers responsive to at least one of the number of killer defects and the defect sensitive area index for each of the at least two layers.

5,598,342

CABLE TESTER

John A. Siemon, Woodbury; Martin Green, Shelton, and Frank Sundermeyer, Prospect, all of Conn., assignors to The Siemon Company, Watertown, Conn.

Filed Jan. 31, 1995, Ser. No. 382,231

Int. Cl.[6] G01R *1/04*

U.S. Cl. 364—481 41 Claims



1. A cable tester for testing a wiring scheme having a plurality of wires with a first connector at one end thereof and a second connector at another end thereof, said cable tester comprising:

a master control unit comprising,

(1) a first housing,

(2) a third connector having a plurality of contacts, said third connector associated with said first housing, said third connector for interfacing with the first connector of the wiring scheme under test,

(3) a first circuit for applying a first signal to said contacts of said third connector for testing continuity of the wires connected to the first connector in accordance with a selected test mode, said first circuit for applying a second signal to said contacts of said third connector for testing transmission of the wires connected to the first connector in accordance with said selected test mode, said first circuit disposed in said first housing,

(4) a switch in communication with said first circuit for selecting said test mode, said switch disposed at said first housing, and

(5) a display in communication with said first circuit for displaying test conditions, said display disposed at said first housing; and

a remote unit comprising,

(1) a second housing, one end of said second housing for interfacing with the second connector of the wiring scheme under test, and

(2) a second circuit for interconnecting the wires connected to the second connector, said second circuit disposed at said second housing.

5,598,343

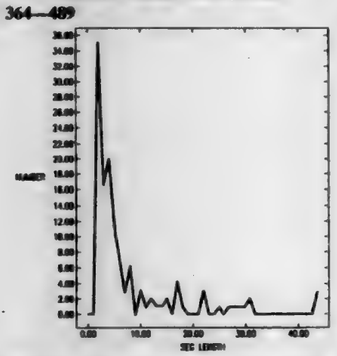
METHOD OF SEGMENTING AN FPGA CHANNEL ARCHITECTURE FOR MAXIMUM ROUTABILITY AND PERFORMANCE

Kaushik Roy, West Lafayette, Ind., and Sudip K. Nag, Pittsburgh, Pa., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1993, Ser. No. 130,605

Int. Cl.[6] H03K *19/177;17/693*

U.S. Cl. 364—489 1 Claim



1. A method of segmenting a field programmable gate array (FPGA) channel architecture comprising:

(a) designing an initial channel architecture for a row-based FPGA having a preselected number of horizontal tracks in each channel and a preselected number of logic elements in each row, including assigning an arbitrary channel segmentation for the channel, wherein any single segment is no less than the width of one logic module, and wherein the same segmentation is used for each channel in the FPGA;

(b) modifying the assigned arbitrary channel segmentation by either merging two adjacent segments in a track or breaking a segment within a track into two segments, wherein the segments are randomly selected for either merging or breaking;

(c) determining the routing cost associated with different preselected net distributions with the assigned channel segmentation as follows:

$$C_i = v_r \cdot |N_{in}| + v_w \cdot \alpha_i + v_o \cdot \sum_{k \in N_{in}} \frac{\theta_{jk}}{k_r - k_l}$$

where the first term $V_r \cdot |N_{in}|$ represents the number of 1-segment unroutable nets, the second term $V_{w \cdot \alpha i}$ represents the segment wastage factor, and the last term

$$v_o \cdot \sum_{k \in N_{in}} \frac{\theta_{jk}}{k_r - k_l}$$

represents the percentage segment overlap for the unroutable nets;

(d) repeat step (c) for each of the channels in the FPGA and add the cost of routing each channel to calculate a total cost C;

(e) repeating step (b) by again modifying the channel architecture;

(f) again repeating the step of determining the routing cost according to the formula in step (c) and (d) associated with different pre-selected net distributions with the modified channel segmentation;

(g) if the total routing cost is lower after modifying the channel architecture then this modification is accepted and if the total routing cost after modifying the channel architecture is higher then this modification is accepted only with a probability e $^{-|\delta(c)|/Temp}$ where $|\delta(c)|$ is the absolute value of the change in cost C and Temp is the annealing temperature, otherwise the modification is rejected and a further modification is made; and

(f) repeating the steps of modifying the channel architecture and calculating the cost of routing until a certain minimal cost is achieved.

5,598,344

METHOD AND SYSTEM FOR CREATING, VALIDATING, AND SCALING STRUCTURAL DESCRIPTION OF ELECTRONIC DEVICE

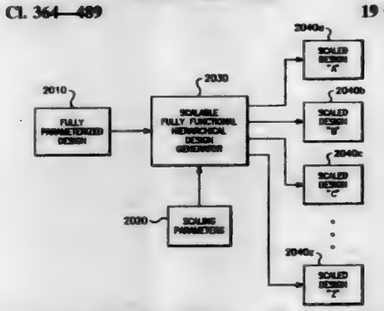
Carlos Dangelo, Los Gatos; Doron Mintz, Sunnyvale, and Manouchehr Vafai, Los Gatos, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 76,729, Jun. 14, 1993, Pat. No. 5,544,066, and Ser. No. 76,738, Jun. 14, 1993, Pat. No. 5,557,531, and Ser. No. 76,728, Jun. 14, 1993, Pat. No. 5,541,849, and Ser. No. 77,483, Jun. 14, 1993, Pat. No. 5,553,002, each which is a continuation-in-part of Ser. No. 54,053, Apr. 26, 1993, and Ser. No. 77,294, Jun. 14, 1993, which is a continuation-in-part of Ser. No. 54,053, and Ser. No. 917,801, Jul. 20, 1992, Pat. No. 5,220,512, which is a continuation of Ser. No. 512,129, Apr. 19, 1990, abandoned, said Ser. No. 54,053is a continuation of Ser. No. 507,201, Apr. 6, 1990, Pat. No. 5,222,030. This application Feb. 8, 1994, Ser. No. 193,306

The portion of the term of this patent subsequent to Jun. 22, 2010, has been disclaimed.

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 19 Claims



14. A method of scaling an electronic design, comprising:

providing a completed, parameterized, fully-functional electronic design on an ECAD system;

providing on the ECAD system a set of scaling parameters including one or more scaling constraints on one or more corresponding parameters of the electronic design; and

using the electronic design as a model design, selectively replicating and interconnecting modules of the electronic design to produce a scaled design which satisfies the one or more scaling constraints.

5,598,345

METHOD AND APPARATUS FOR INSPECTING SOLDER PORTIONS

Nobufumi Tokura, Fukuoka-ken, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 795,151, Nov. 20, 1991, abandoned. This application Apr. 11, 1994, Ser. No. 225,944

Claims priority, application Japan, Nov. 29, 1990, 2-333924

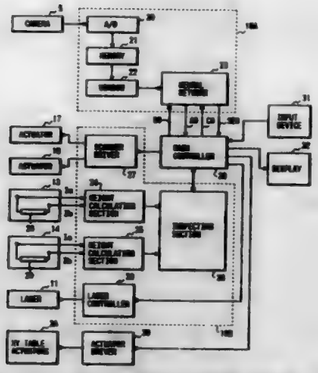
Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 16 Claims

1. An apparatus comprising:

image taking means for taking an image of an object to be inspected, and outputting an image signal representative thereof;

first deciding means for deciding a condition of the object in response to the image signal and for executing a learning process;



measuring means for measuring a height of the object, and outputting a height signal representative of a height of the object;

second deciding means for deciding a condition of the object in response to the height signal; and

control means for, in cases where the first deciding means can not decide the condition of the object, enabling the measuring means to measure the height of the object and enabling the second deciding means to decide the condition of the object, and enabling the first deciding means to execute the learning process on the object in response to a result of the decision by the second deciding means.

5,598,346

ARRAY OF CONFIGURABLE LOGIC BLOCKS INCLUDING NETWORK MEANS FOR BROADCASTING CLOCK SIGNALS TO DIFFERENT PLURALITIES OF LOGIC BLOCKS

Om P. Agrawal, San Jose; Michael J. Wright, Menlo Park, and Ju Shen, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 423,303, Apr. 18, 1995, Pat. No. 5,490,074, which is a division of Ser. No. 271,872, Jul. 7, 1994, Pat. No. 5,422,823, which is a division of Ser. No. 12,573, Feb. 1, 1993, Pat. No. 5,329,460, which is a division of Ser. No. 394,221, Aug. 15, 1989, Pat. No. 5,212,652. This application Feb. 5, 1996, Ser. No. 596,679

Int. Cl.[6] H03K *17/693*

U.S. Cl. 364—489 **16 Claims**

1. A programmable integrated circuit comprising:

(a) a plurality of programmably configurable logic blocks (CLB's) for carrying out program-defined logic functions;

(b) a programmably configurable interconnect network for providing program-defined routing of signals between the plurality of programmably configurable logic blocks (CLB's);

wherein said configurable logic blocks each includes:

(a. 1) input signal inputting means distributed about the configurable logic block for delivering a received set of input signals and clock signals into the configurable logic block,

(a. 1a) said input signal inputting means including CLB-internal clock generating means for receiving said clock signals and programmably deriving a CLB-internal clock signal from the received clock signals;

(a. 2) signal processing means for processing the delivered input signals in accordance with one or more programmably-defined functions and developing therefrom a set of result signals;

(a. 3) output signal dispensing means distributed about the configurable logic block (CLB) for dispensing from the configurable logic block, a set of output signals derived from said result signals,

(a. 3a) said output signal dispensing means including a plurality of clocked register means each clocked by said CLB-internal clock signal, each clocked register means being for storing and outputting a programmably-selected one of said result signals.

5,598,347

LAYOUT METHOD FOR DESIGNING AN INTEGRATED CIRCUIT DEVICE BY USING STANDARD CELLS

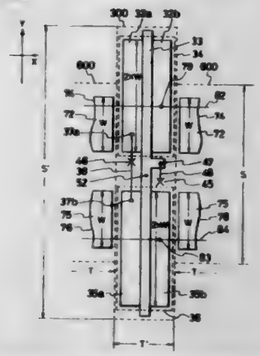
Tadashi Iwasaki, Tokyo, Japan, assignee to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 54,107, Apr. 27, 1993, abandoned. This application Jul. 22, 1994, Ser. No. 279,219

Claims priority, application Japan, Apr. 27, 1992, 4-107206

Int. Cl.[6] G06F *15/00*; H01L *27/10*

U.S. Cl. 364—491 **14 Claims**



1. A layout method of a semiconductor integrated circuit device, comprising the steps of:

(a) preparing first basic cells and second basic cells,

each of said first basic cells having a first reference point and each of said second basic cells having a second reference point,

each of said second basic cells having the same circuit function and the same cell width as those of each of said first basic cells,

each of said second basic cells having the same relative position of a signal input terminal to said second reference point as that of each of said first basic cells to said first reference point,

each of said second basic cells having the same relative position of a signal output terminal to said second reference point as that to said first reference point of each of said first basic cells, and

each of said second basic cells having a different load driving capability from that of each of said first basic cells;

(b) providing layouts of said first basic cells and interconnections therebetween to obtain a desired function of said semiconductor integrated circuit device,

said first basic cells being aligned in a first direction so that cell width directions of said first basic cells are kept in said first direction,

adjacent two ones of said first basic cells being in contact with each other;

(c) evaluating an obtainable performance of said first basic cells whose layouts have been provided in said step (b) to determine whether or not any of said first basic cells deteriorate said performance regarding load driving capability;

said performance of said first basic cells being evaluated in consideration with respective loads connected to individual signal output terminals of said first basic cells;

said respective loads of said first basic cells being determined by said layouts provided in said step (b);

(d) specifying an unsuitable cell having an unsuitable load driving capability which deteriorates said performance from said first basic cells whose layouts have been provided in said step (b) in accordance with said respective loads and said driving capabilities of said first basic cells, obtained in said step (c); and

(e) replacing said unsuitable cell of said first basic cells specified in said step (d) with one of said second basic cells without changing said layouts of said interconnections between said first basic cells, wherein

said second reference point of said one of second basic cells to replace said unsuitable cell is positioned on said first reference point of said unsuitable cell.

5,598,348

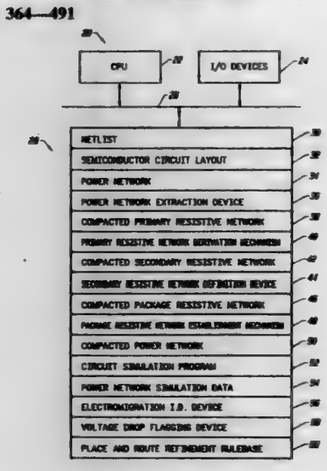
METHOD AND APPARATUS FOR ANALYZING THE POWER NETWORK OF A VLSI CIRCUIT

Stefan Rusu, Sunnyvale, and Clayton L. Yee, San Francisco, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Sep. 22, 1994, Ser. No. 310,936

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—491 **8 Claims**



1. A method of analyzing the power network performance of a semiconductor circuit layout, said method comprising the steps of:

extracting from a semiconductor circuit layout the power network associated with said semiconductor circuit layout;

deriving a compacted resistive network corresponding to said power network, said deriving step including the steps of

deriving a primary resistive network including a set of primary compaction components characterizing power trunks within said semiconductor circuit layout, each of said primary compaction components including an associated power trunk length value and power trunk width value for use in calculating a primary compaction component resistance value, and

deriving a secondary resistive network including a set of secondary compaction components characterizing the electrical resistance of power straps that deliver power to transistors within said semiconductor circuit layout, each of said secondary compaction components including an associated power strap length value characterizing the physical length of the power straps in a functional region of said semiconductor circuit layout and a width value characterizing the physical width of the sum of all power straps in said functional region;

running a circuit simulation of said compacted resistive network to identify any power network performance that does not comply with predetermined criteria; and

refining the topology of said semiconductor circuit layout to improve power network performance that does not comply with said predetermined criteria.

5,598,349

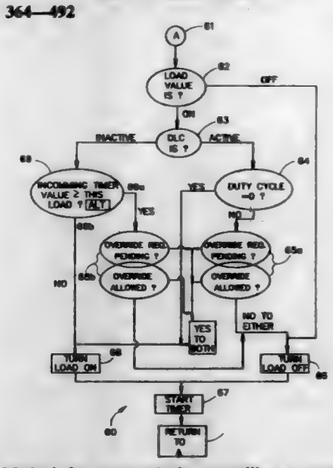
RESPONDING TO PRICING SIGNALS FROM A POWER SUPPLIER USING MIXED ADD/SHED AND PROFILE SETBACK DELTA SCHEMES

Kurt L. Ellinson, and Robert J. Schnell, both of Plymouth, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 25, 1994, Ser. No. 329,128

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—492 **6 Claims**



2. A Method for cooperatively controlling a community of individual user premise subsystems each of which is controlled by controllers on a substantial portion of said community of user premises, said method comprising:

sending information signals from the utility provider for the community which contains at least one of the following values: DLC, tier, time, real-time and price,

receiving said information signals from said utility provider at the user premise,

interpreting the information signals to provide a value to the controllers,

making the interpreted signals available to controller processors which control said subsystems in said users' premises, and

if a processor receiving said interpreted signal has access to information regarding setback profiles for its subsystem, then having such processor locate a value match in the setback profile for the value indicated by said utility information signal, and then controlling its subsystem with that matching value by using it to generate a setback delta for the subsystem controller and providing it to said controller, and

if the processor is one which does not access profile information for its subsystem, then having such processor compare the predetermined tier value of its subsystem to the information signal provided by the utility, and if its value is greater, doing nothing, else turning off the subsystem for which it is responsible.

5,598,350

GENETIC MOTIF EXTRACTING METHOD AND APPARATUS

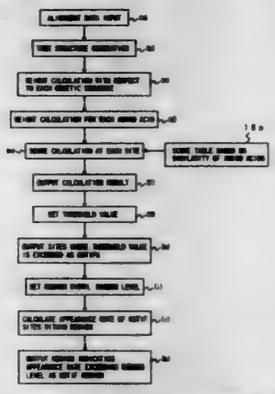
Yuichi Kawanishi, Kawasaki; Takashi Gojobori, Mishima; Yoshio Tateno, Mishima; Kazuko Ikeo, Mishima, and Masahito Kawai, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, and National Institute of Genetics, Shizuoka, both of Japan

Filed Nov. 10, 1994, Ser. No. 339,233

Claims priority, application Japan, Nov. 12, 1993, 5-283329

Int. Cl.[6] G06F *19/00;15/00*

U.S. Cl. 364—496 **9 Claims**



1. A genetic motif extracting apparatus adapted to extract a motif from genetic sequence information, said motif having a regularity in a distinctive feature that specifies a genetic function, said genetic motif extracting apparatus comprising:

weight calculation means for calculating a weight of each genetic sequence from a length of at least one branch of an evolution tree structure that is related to a plurality of genetic sequences;

score calculation means for calculating a score that indicates a degree of similarity of sequence elements of the genetic sequences appearing at a site for each site of the genetic sequences using the weight calculated by said weight calculation means; and

feature information extraction means for extracting a part of the genetic sequence having the regularity in the distinctive feature as the motif based on the score calculated by said score calculation means.

5,598,351

COMMUNICATION SYSTEM

John C. Chater; Ian Chater; Guy Chater, all of 4/6 The Paragon, Blackheath Village, London, England; Martin D. Keywood, and Ian W. Henley, both of London, England, assignors to John C. Chater; Ian Chater, and Guy Chater, all of London, England

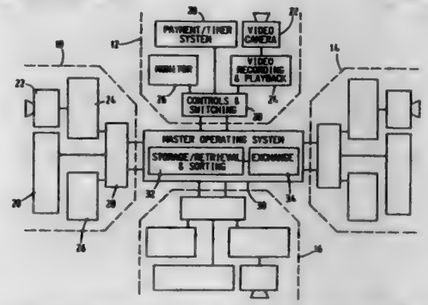
PCT No. PCT/GB94/00377, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO94/19907, PCT Pub. Date Sep. 2, 1994

PCT Filed Feb. 26, 1993, Ser. No. 325,421

Claims priority, application United Kingdom, Feb. 26, 1993, 9303998

Int. Cl.[6] H04N *1/327*

U.S. Cl. 364—514 A **38 Claims**



1. A communication system for facilitating introductions comprising a plurality of terminals, each with a video camera directed to view an individual using said terminal, said recording means for recording a visual image of said individual, means for adding said image to a store containing corresponding images from other said terminals, networking means for networking images from said store amongst terminals from which the images do not originate, selecting means enabling said individual to select an image from amongst those transmitted to his/her terminal, indicating means to indicate such selection to the terminal from which the selected image originated, communication means controlled by the individual at the selected terminal enabling the individuals at the selecting and selected terminals to communicate with each other, and means enabling the individual at the selected terminal to review a video recording of the individual at the selecting terminal before activating the communication means.

5,598,352

METHOD AND APPARATUS FOR AUDIO AND VIDEO SYNCHRONIZING IN MPEG PLAYBACK SYSTEMS

Mark A. Rosenau, San Jose, Calif.; Daryl Sartain, Austin, Tex.; Daniel T. Daum, San Jose, Calif., and Jeffrey G. Ort, Kirkland, Wash., assignors to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 316,015, Sep. 30, 1994. This application Dec. 14, 1994, Ser. No. 358,611

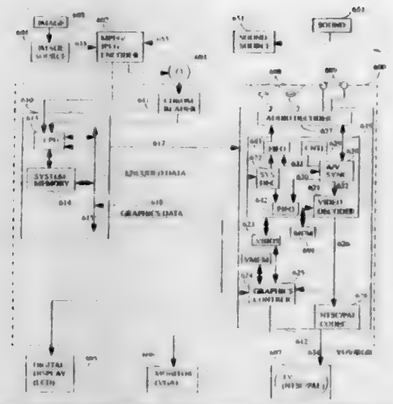
Int. Cl.[6] H04N *7/12*

U.S. Cl. 364—514 A **24 Claims**

1. An apparatus for synchronizing audio and video signals from an encoded data stream comprising at least audio data packets, video data packets, audio presentation time stamps, and video presentation time stamps, said apparatus comprising:

a system decoder for receiving the encoded data stream and separating said encoded data stream into an encoded audio data stream and an encoded video data stream, which encoded audio data stream comprises at least audio data packets and audio presentation time stamps and which encoded video data strew comprises at least said video data packets and video presentation time stamps;

a first audio data buffer, coupled to said system decoder, for receiving and storing audio data packets and audio presentation time stamps from said encoded audio data stream;



a first audio presentation time stamp detector, coupled to said system decoder, for detecting the presence of an audio presentation time stamp in the encoded audio data stream;

a latch, coupled to said first audio presentation time stamp detector, for storing a detected audio presentation time stamp from the encoded audio data stream;

a system time clock counter, coupled to said first audio presentation time stamp detector, for receiving said audio presentation time stamp as a start count when a load signal is received, incrementing said start count according to a predetermined clock frequency and outputting a system time clock;

a video decoder, coupled to said system decoder and said system time clock counter, for receiving said system time clock and said encoded video data stream and decoding said encoded video data stream in synchronization with said system time clock;

an audio decoder, for receiving said audio data packets from the encoded audio data stream and decoding said audio data packets, wherein said audio decoder further comprises a second audio data buffer for receiving the encoded audio data stream from said first audio data buffer and storing audio data packets and audio presentation time stamps; and

a second audio presentation time stamp detector, coupled to said audio decoder, for detecting the presence of an audio presentation time stamp in the encoded audio data stream and outputting a load signal to said system time clock counter when audio data packets corresponding to said audio presentation time stamp are decoded.

5,598,353

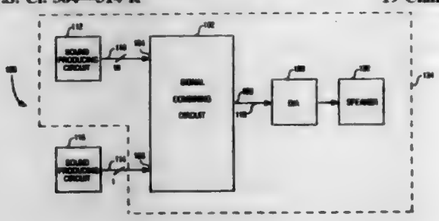
METHOD AND APPARATUS FOR COMBINING A MULTIPLE-BIT DIGITAL AUDIO SIGNAL WITH A SINGLE-BIT DIGITAL AUDIO SIGNAL

Lawrence F. Heyl, Mountain View, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 15, 1994, Ser. No. 290,356

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **19 Claims**



5,598,354

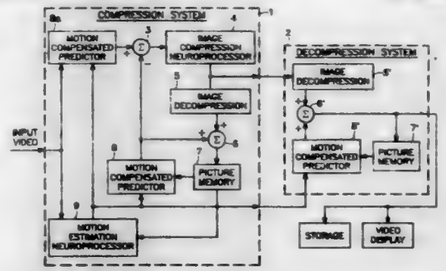
MOTION VIDEO COMPRESSION SYSTEM WITH NEURAL NETWORK HAVING WINNER-TAKE-ALL FUNCTION

Wai-Chi Fang, San Marino, and Bing J. Sheu, Los Angeles, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 16, 1994, Ser. No. 357,578

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **28 Claims**



1. An image data system comprising:

a compression system, comprising:

an image compressor;

an image decompressor correlative to said image compressor having an input connected to an output of said image compressor;

a feedback summing node having one input connected to an output of said image decompressor;

a picture memory having an input connected to an output of said feedback summing node;

means for comparing an image stored in said picture memory with a received input image and deducing therefrom pixels having differences between said stored image and said received image and for retrieving from said picture memory a partial image comprising said pixels only and applying said partial image to another input of said feedback summing node, whereby to produce at the output of said feedback summing node an updated decompressed image;

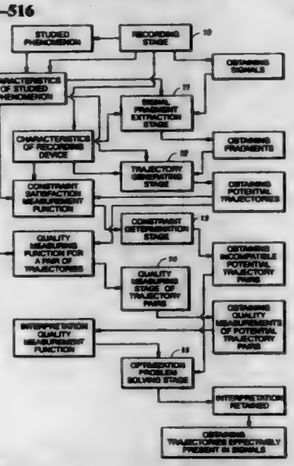
a subtraction node having one input connected to received said received image and another input connected to receive said partial image so as to generate a difference image, said image compressor having an input connected to receive said difference image whereby to produce a compressed difference image at the output of said image compressor.

5,598,355

PROCESS FOR THE TRAJECTOGRAPHY OF OBJECTS AND DEVICE FOR PERFORMING THIS PROCESS

Dominique Deron, Breville sur Mer, and Laurent Herault, Claix, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 18, 1995, Ser. No. 423,718
Claims priority, application France, May 2, 1994, 94 05325
Int. Cl.[6] G01S *13/52*
U.S. Cl. 364—516 **13 Claims**



1. Process for obtaining trajectories of moving objects, by optimizing at least one criterion of the physics of the observed phenomenon, characterized in that it comprises the following stages:

a stage of recording signals formed from characteristic fragments of positions of objects at different instants, parts of the same nature as the fragments, but which are noise, and parts attributable to noise without any possible confusion;

a stage of extracting parts of signals having the same nature as the fragments and determination of characteristics associated therewith, on the basis of a priori knowledge on their nature and on the sought trajectory;

a stage of subdividing all the parts of signals previously extracted into classes, each class representing a potential trajectory and having a predetermined number of fragments;

a stage of selecting a subset of classes satisfying constraints linked with the type of phenomenon observed and comprising:

the generation of a set of n-uplets constituted by a subset of n classes,

the measurement of the compatibility of the classes assembled in n-uplets by a first analytical function determined on the basis of constraints linked with the type of phenomenon observed and the acquisition device,

the measurement of the quality of the n-uplets by a second analytical function, determined on the basis of constraints linked with the phenomenon observed and the acquisition device;

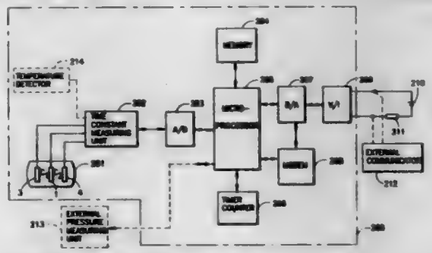
a stage of selecting from among the classes representing the potential trajectories of those satisfying constraints, by a process of optimizing among the constraints of at least the preceding criterion or criteria using preceding compatibility and quality measurements, so as to obtain "real" trajectories of the objects.

5,598,356

DISPLACEMENT CONVERTING DEVICE AND METHOD FOR MEASURING PRESSURE DIFFERENCES USING SAME

Toshihiro Yamamoto, and Satoru Nakamura, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 14, 1994, Ser. No. 322,999
Claims priority, application Japan, Oct. 14, 1993, 5-256198
Int. Cl.[6] G01L *9/12;19/04*
U.S. Cl. 364—558 **14 Claims**



1. A displacement converting device, comprising:

a pair of capacitors formed by a diaphragm and a pair of fixed electrodes arranged and facing either side of said diaphragm;

means for measuring capacitances C1, C2 of said pair of capacitors;

first means for calculating constants α, β, based on the floating capacitances within said capacitances C1, C2;

wherein f(P) of a first operation (1) is linear to a plurality of known pressure differences P in both the negative and positive ranges of said pressure difference P;

said device effective for using capacitances C1, C2 of said pair of capacitors measured by said capacitance measuring means, using capacitances C1, C2 of said pair of capacitors measured by said capacitance measuring means during preliminary calibration based on C1(P), C2(P) of said first operation (1) for known pressure differences P;

second means for calculating constants calculating f(P) of said first operation (1) during said preliminary calibration for each of said known plurality of pressure differences P;

said device effective for using constants α, β calculated by said first means for calculating constants, and capacitances C1(P), C2(P) measured by said means for measuring capacitances for said plurality of known pressure differences P,

calculating constant f(0) corresponding to f(P) when pressure difference P is 0 based on a second operation (2), which defines the linearity of the two, using values for f(P) and said known pressure differences P;

said device effective for calculating a proportional constant KP for a positive range of pressure difference P or (and) a proportion constant KP for a negative range of pressure difference P;

means for measuring pressure difference calculating f(P) of operation (1) during pressure difference measurement using constants alpha, beta calculated by first means for calculating constants, and using capacitances C1(P), C2(P) measured by means for measuring capacitance for pressure difference P; and

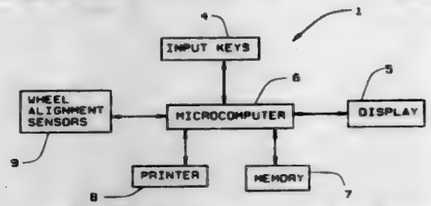
said device effective for calculating pressure difference P from the relationship in operation (2) using said f(P) and using constant f(0) and proportional constant KP calculated by said second means for calculating constants.

5,598,357

SHIM ADJUSTMENT SYSTEM AND METHOD FOR WHEEL ALIGNMENT APPARATUS

Nicholas J. Colarelli, III, Creve Coeur, and Daniel B. January, St. Peters, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Jul. 22, 1994, Ser. No. 278,893
Int. Cl.[6] B62D *17/00*
U.S. Cl. 364—559 **28 Claims**



1. A shim adjustment facilitating system for wheel alignment apparatus comprising:

camber and toe sensing apparatus for sensing the camber and toe of a wheel on a vehicle to be aligned;

a memory for storing camber and toe specification for a plurality of vehicles;

a computer for comparing the sensed camber and toe with the corresponding specification of camber and toe for the wheel of the vehicle to be aligned, for selecting a shim from a plurality of standard shims and an orientation for said shim to attempt to correct both camber and toe in accordance with a preset priority, and for determining residual camber error and residual toe error which would result from installation of said shim at said orientation;

at least one manually operable input device operable by a user for selecting a different desired priority of residual camber error and residual toe error, the computer being responsive to the manually operable input device for selecting another orientation which attempts to correct both camber and toe in accordance with said different desired priority; and

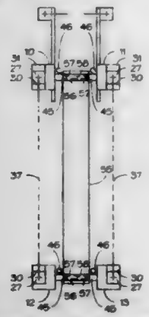
a display for visually displaying residual camber error and residual toe error, whereby the user can see the change in the residual errors resulting from the user's selection of a desired priority.

5,598,358

APPARATUS AND METHOD FOR CALIBRATING VEHICLE WHEEL ALIGNMENT INSTRUMENTS

James R. Gender, Kirkwood, and Daniel B. January, St. Peters, both of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed May 24, 1995, Ser. No. 449,019
Int. Cl.[6] G01C *25/00*
U.S. Cl. 364—571.01 **20 Claims**



1. A calibration fixture for calibrating vehicle wheel alignment instruments comprising:

a frame having a longitudinal axis, a transverse axis perpendicular to the longitudinal axis, a top, a bottom, and first and second ends;

a first rotatable shaft disposed at the first end of the frame, said first shaft having a longitudinal axis generally parallel to the transverse axis of the frame, the first shaft being mounted to the frame for rotation about its longitudinal axis and having first and second ends for removably mounting first and second sensor assemblies for calibration;

a second rotatable shaft disposed at the second end of the frame, said second shaft having a longitudinal axis generally parallel to the transverse axis of the frame, the second shaft being mounted to the frame for rotation about its longitudinal axis and having first and second ends for removably mounting third and fourth sensor assemblies for calibration;

means for mounting the frame to a base so that the top of the frame is up and the shafts are disposed to mount the first, second, third and fourth sensor assemblies;

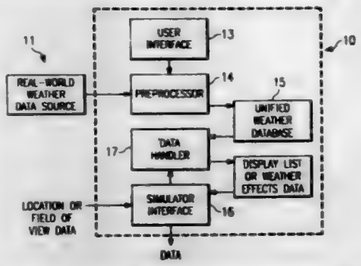
said frame being configured such that it may also be mounted to the base with the bottom of the frame up and still be disposed to mount the sensor assemblies.

5,598,359

WEATHER EFFECTS GENERATOR FOR SIMULATION SYSTEMS

Bruce C. Montag; Dennis J. Wenzel, and Richard P. Weyrauch, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of Ser. No. 145,761, Oct. 29, 1993, Pat. No. 5,409,379. This application Nov. 18, 1994, Ser. No. 342,103
Int. Cl.[6] G01W *1/10*
U.S. Cl. 364—578 **33 Claims**



1. A method of providing data representing weather effects to an image generator that generates a three-dimensional infrared image, comprising the steps of:

accessing a three-dimensional real-world weather database to obtain a three-dimensional set of data elements, each data element having at least a three-dimensional location value, a liquid water content value, and a temperature value;

culling said data elements to determine which are within a field-of-view, to obtain a set of field-of-view data elements;

sorting said field-of-view data elements to form a list of data elements in depth order;

assigning a graphics primitive to each of said field-of-view data elements;

covering an image plane with the graphic primitives associated with the frontmost of said field-of-view data elements, such that a certain percentage of said image plane is covered;

repeating said covering step, using said field-of-view data elements in front to back order, until the image plane has been covered a predetermined number of times or until a predetermined number of said field-of-view data elements have been used; and

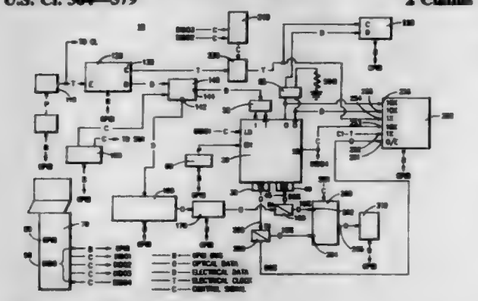
assigning said field-of-view data elements to one or more depth bins on the basis of the results of said covering step, so as to generate a prioritized display list.

5,598,360

AUTOMATED SYSTEM AND CORRESPONDING METHOD FOR TESTING ELECTRO-OPTIC MODULES

David C. Bogdan, Vestal; Donald L. Pearl, Endwell; David T. Pribula, Port Crane, all of N.Y.; Nancy R. Aulet, Austin, Tex.; Muhammed I. Hussain, Hopewell Junction, and George W. Hutt, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 13,460, Feb. 4, 1993, Pat. No. 5,546,325.
This application May 23, 1995, Ser. No. 448,283
Int. Cl.[6] H04B *10/08*
U.S. Cl. 364—579 **2 Claims**



1. A system, comprising:

an electronic computer;

pattern generating means, under the control of, and capable of communication with, said computer, for generating digital electrical patterns at a transmission speed of interest; and

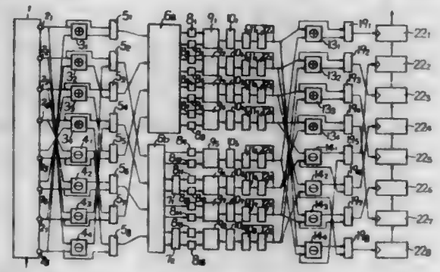
electro-optic means, capable of communication with said computer and said pattern generating means, for generating an optical pattern in response to an electrical pattern from said pattern generating means, generated in response to a transmitter test command from the computer, and for generating an electrical signal in response to a received optical pattern generated in response to a receiver test command from the computer.

5,598,361

DISCRETE COSINE TRANSFORM PROCESSOR

Tetsu Nagamatsu, Kawasaki, Japan, and Lee-Sup Kim, Dongdaemoon-Ku, Rep. of Korea, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,382
Claims priority, application Japan, Oct. 26, 1993, 5-267376
Int. Cl.[6] G06F *17/14*
U.S. Cl. 364—725 **13 Claims**



1. A discrete cosine transform processor comprising:

first memory means for storing multiplication and accumulation data of transform matrix components for the same digit-position bit values of N-unit even-order data of 2N-units of numbered input data, at addresses determined on the basis of the same digit-position bit values of the N-unit even-order data thereof;

second memory means for storing multiplication and accumulation data of transform matrix components and the same digit-position bit values of N-unit odd-order data of 2N-units of numbered input data, at addresses determined on the basis of the same digit-position bit values of the N-unit odd-order data thereof;

inverting means for receiving a part of the data read from said second memory means, said inverting means outputting the part of the data received from said second memory means as they are in the case of a forward direction transformation, and said inverting means inverting and then outputting the part of the data receive, from said second memory means in the case of an inverse direction transformation;

first accumulation means for accumulatively adding the data read from said first memory means; and

second accumulation means for accumulatively adding the data outputted by said inverting means and another part of the data read from said second memory means, the other part of the data read from said second memory means not including the part of the data received by said inverting means,

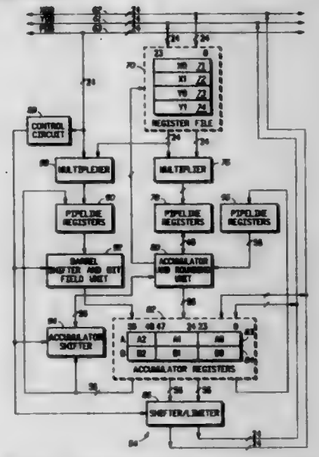
wherein said first memory means stores different data for the forward and the inverse direction transformations, and said second memory means stores the same data for both the forward and the inverse direction transformations.

5,598,362

APPARATUS AND METHOD FOR PERFORMING BOTH 24 BIT AND 16 BIT ARITHMETIC

Judah L. Adelman, Jerusalem; Paul Marino, Kfar-Saba; Avner Goren, Rosh-Haayin, all of Israel, and Garth Hillman, Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 22, 1994, Ser. No. 361,486
Int. Cl.[6] G06F *7/38*
U.S. Cl. 364—736 **17 Claims**



1. A method for performing an arithmetic operation in a data processing system, the method comprising the steps of:

asserting a mode bit in a status register of the data processing system, the mode bit is asserted to enter an N-bit operating mode of the data processing system, and the mode bit is negated to enter an M-bit operating mode, where N and M are integers, and N is less than M;

providing a first N-bit operand to first M-bit storage unit when the mode bit is asserted, the first N-bit operand having a first predetermined alignment in the first M-bit storage unit;

providing a second N-bit operand to a second M-bit storage unit when the mode bit is asserted, the second N-bit operand having the first predetermined alignment in the second M-bit storage unit;

performing an arithmetic operation on the first and second N-bit operands in the first predetermined alignment to obtain a 2N-bit result in the first predetermined alignment;

storing the result in a 2M-bit storage unit, the 2N-bit result having the first predetermined alignment; and

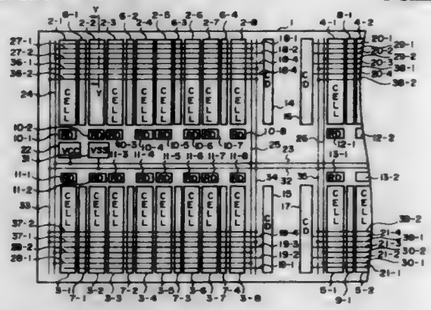
shifting the 2N-bit result to align the 2N-bit result in a second predetermined alignment with a shifting circuit, restoring the 2N-bit result in the 2M-bit storage unit, and negating all unused bits in the 2M-bit storage unit with the shifting circuit.

5,598,363

SEMICONDUCTOR DEVICE HAVING AN IMPROVED RELIABILITY

Toshiya Uchida, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 25, 1996, Ser. No. 590,362
Claims priority, application Japan, Jun. 16, 1995, 7-150033
Int. Cl.[6] H01L *27/10*
U.S. Cl. 365—63 **8 Claims**



1. A semiconductor device, comprising:

a plurality of signal lines;

a plurality of first power lines for supplying electric power at a first voltage level; and

a plurality of second power lines for supplying electric power at a second voltage level;

said signal lines, said first power lines and said second power lines extending parallel and being disposed such that:

a signal line is laterally bounded by a first power line at a first side thereof and by another first power line at the other side thereof,

and such that:

a signal line different from said signal line that is bounded laterally by said first power lines, is laterally bounded by a second power line at a first side thereof and by another second power line at the other side thereof.

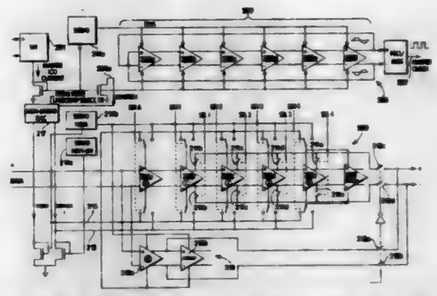
5,598,364

ALL-MOS PRECISION DIFFERENTIAL DELAY LINE WITH DELAY A PROGRAMMABLE FRACTION OF A MASTER CLOCK PERIOD

Kevin J. McCall, Leominster; James Kovacs, and Wyn Palmer, both of North Andover, all of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Nov. 17, 1995, Ser. No. 560,002
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—73 **17 Claims**

1. A write precompensation circuit for producing from write data a precompensated write data output in a write data path of a digital data storage channel including a magnetic storage device, the channel including a ring oscillator of at least one delay buffer having a characteristic delay, the ring oscillator having a master



clock output, said output having an amount of write precompensation specified by a digital delay word supplied to the write precompensation circuit, the write precompensation circuit comprising:

a serial chain of delay buffers having an input connected to receive the write data, the serial chain having an output tap after at least one delay buffer of the serial chain and a delay output after at least another delay buffer of the serial chain, each delay buffer of the serial chain having a delay which tracks the characteristic delay; and

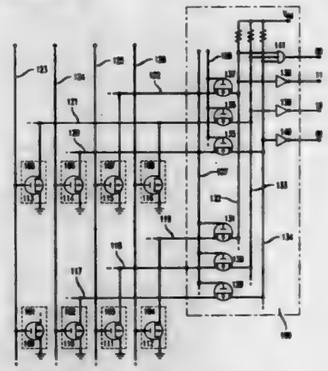
a delay word decoder including a select circuit which as a function of the delay word supplied selects as the precompensated write data output one of the output tap and the delay output.

5,598,365

HIGH-DENSITY READ-ONLY MEMORY

Masakazu Shoji, Warren, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 408,673, Mar. 21, 1995, Pat. No. 5,528,534. This application Jun. 22, 1995, Ser. No. 493,609
Int. Cl.[6] G11C *17/00*
U.S. Cl. 365—104 **10 Claims**



1. A read-only memory device comprising:

an array of individual memory sites including at least one switchable memory element at each of said sites;

a plurality of bitlines, each capable of being grounded via a connection through each of said switchable memory elements in a particular row of said memory site array; and

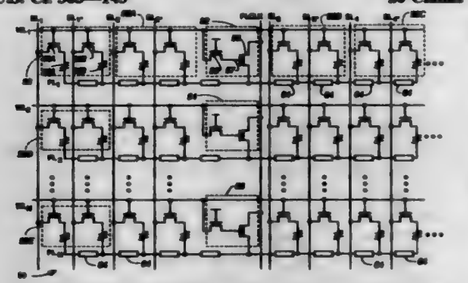
a decoding circuit connected to said plurality of bitlines, adapted to provide an output indicative of a particular one of said plurality of bitlines being grounded via a specific one of said switchable memory elements in said particular row of said memory site array.

5,598,366

FERROELECTRIC NONVOLATILE RANDOM ACCESS MEMORY UTILIZING SELF-BOOTSTRAPPING PLATE LINE SEGMENT DRIVERS

William F. Krause, Colorado Springs, and Dennis R. Wilson, Black Forest, both of Colo., assignors to Ramtron International Corporation, Colorado Springs, Colo.

Filed Aug. 16, 1995, Ser. No. 515,558
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 20 Claims



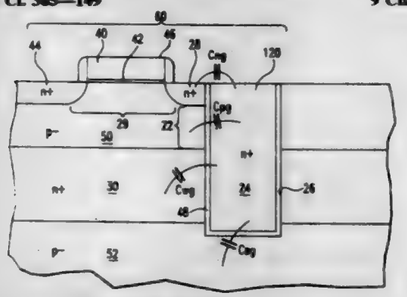
1. A ferroelectric nonvolatile random access memory array comprising:
- a plurality of ferroelectric memory cells arranged in rows and columns, a word line coupled to a word line input of each of the ferroelectric memory cells in a row, and a bit line coupled to a bit line input of each of the ferroelectric memory cells in a column;
- a plurality of plate lines, each plate line being arranged into a plurality of plate line segments each coupled to a plate line input of a predetermined number of the ferroelectric memory cells in a row; and
- a plurality of NMOS plate line segment drivers associated with each plate line, wherein each of the plate line segment drivers is coupled to a corresponding plate line segment for selectively driving the corresponding plate line segment to a full rail voltage.

5,598,367

TRENCH EPROM

Wendell P. Noble, Milton, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 481,675
Int. Cl.[6] G11C *11/24;11/34*
U.S. Cl. 365—149 9 Claims



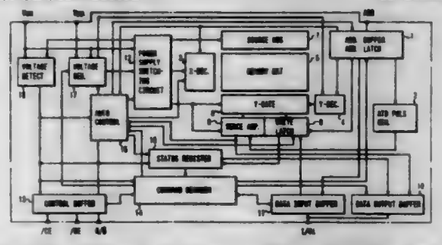
1. A semiconductor chip comprising:
- a semiconductor substrate having a planar surface and a first substrate region;
- a first FET having a first gate adjacent a first gate insulator adjacent a first channel in said first substrate region and a first and a second diffused region; and
- a second FET connected in series with said first FET, said second FET having a second gate adjacent a second gate insulator adjacent a second channel in said first substrate region, said second gate floating and not connected to said first gate, said second gate predominantly capacitively coupled to a control electrode, said control electrode being a third diffused region.

5,598,368

BATCH ERASABLE NONVOLATILE MEMORY DEVICE AND ERASING METHOD

Masahito Takahashi, Kodaira; Michiko Odagiri, Kurotshi; Takashi Furuno, Koganei; Kazunori Furusawa, and Masashi Wada, both of Kodaira, all of Japan, assignors to Hitachi, Ltd.; Hitachi ULSI Engineering Corp., both of Tokyo, and Hitachi Tohbu Semiconductor, Ltd., Saitama, all of Japan

Filed May 19, 1995, Ser. No. 445,105
Claims priority, application Japan, May 19, 1994, 6-129691
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—185.01 11 Claims



10. A method for changing a threshold voltage of a plurality of memory cells by ejecting electrons injected into the floating gates of said plurality of memory cells respectively having a control gate, a floating gate and a pair of semiconductor regions, comprising the steps of:
- ejecting electrons from said floating gates to make a threshold voltage of said plurality of memory cells lower than a first voltage, in a first ejecting operation;
- injecting electrons into the floating gates to make the threshold voltage of those memory cells, whose threshold voltage is determined to be 0 V or over and lower than a second voltage, higher than said second voltage after said first ejecting operation in an injecting operation; and
- ejecting electrons from said floating gates to make the threshold voltage of said plurality of memory cells higher than 0 V after said injecting operation, in a second ejecting operation.

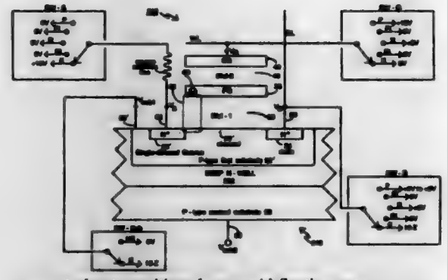
5,598,369

FLASH EEPROM ARRAY WITH FLOATING SUBSTRATE ERASE OPERATION

Jian Chen, San Jose, and Nader Radjy, Palo Alto, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 267,726, Jun. 28, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 484,252
Int. Cl.[6] G11C *17/00*
U.S. Cl. 365—185.27 21 Claims

9. A flash EEPROM comprising:
- an array of programmable and erasable memory cells, the memory cells being organized in rows and columns, each of the memory cell having
- a first substrate of a first type,
- a source region of a second type formed on said first substrate,
- a drain region of said second type formed on said first substrate,
- a channel of said first type formed on said first substrate, said channel being positioned between said source region and drain region, wherein said source region is single-diffused so as to minimize the length of said channel;
- a floating gate positioned over said channel, and



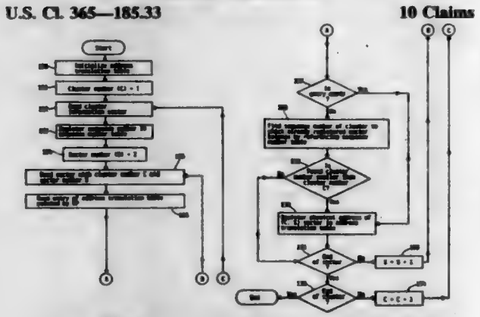
- a control gate positioned over said floating gate;
- a plurality of bit lines, each coupled to said drains of one of said columns of cells in said array;
- a plurality of word lines, each coupled to said gates of one of said rows of cells in said array; and
- logic circuit means for providing a plurality of voltages to said memory cells for programming and erasure, said logic circuit means further comprising:
- a source voltage supply means for generating and supplying a first voltage to the source of each memory cell during erasure;
- a control gate voltage supply means for generating and supplying a second voltage to said control gate of each memory cell during erasure; and
- a substrate voltage supply means for allowing said first substrates to float during erasure.

5,598,370

NONVOLATILE MEMORY WITH CLUSTER-ERASE FLASH CAPABILITY AND SOLID STATE FILE APPARATUS USING THE SAME

Hideto Nijima, Tokyo; Hideo Asano, Machida; Yoshinori Sakaue, Tokyo, and Takashi Toyooka, Kawasaki, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 200,343, Feb. 23, 1994. This application Apr. 26, 1995, Ser. No. 429,395
Claims priority, application Japan, Feb. 24, 1993, 5-035228
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—185.33 10 Claims



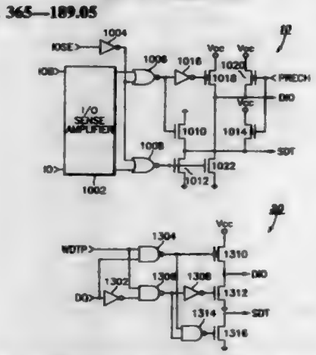
1. A nonvolatile memory for cluster-erase flash, comprising:
- a flash memory having N clusters each having M sectors, wherein M and N are integers greater than one;
- each of said N clusters includes a cluster information sector, wherein one of said M sectors is said cluster information sector;
- and said cluster information sector of each of said N clusters holds a sequence number, wherein no two of said cluster information sectors have the same sequence number.

5,598,371

DATA INPUT/OUTPUT SENSING CIRCUIT OF SEMICONDUCTOR MEMORY DEVICE

Ho-Cheol Lee, Seoul, and Seung-Hun Lee, Suwon, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 30, 1995, Ser. No. 565,292
Claims priority, application Rep. of Korea, Dec. 19, 1994, 35014/1994
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.05 5 Claims



1. A data input/output sensing circuit of a semiconductor memory device including a plurality of memory cells, said circuit comprising:
- input/output lines of said memory cells;
- data input/output terminals connected to outside of said memory cells;
- a single data input/output line connected between said input/output lines and said data input/output terminals;
- sensing means for sensing whether or not effective data is provided in said data input/output lines to thereby generate a sensing signal;
- output driving means for transmitting data of said data input/output lines to said data input/output terminals in response to said sensing signal; and
- writing driving means for inputting data of said data input/output terminals in response to said sensing signal.

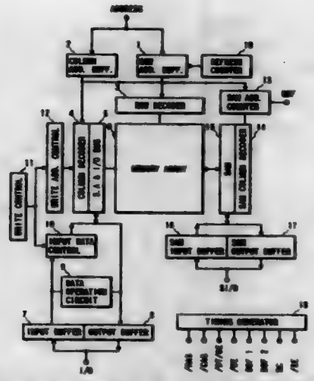
5,598,372

SEMICONDUCTOR MEMORY

Miki Matsumoto, Ohme; Kanji Oishi, Koganei; Masahiro Katayama, Ohme, and Kazufumi Watanabe, Hachioji, all of Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corp., both of Tokyo, Japan

Filed Jul. 25, 1995, Ser. No. 507,604
Claims priority, application Japan, Jul. 27, 1994, 6-194893
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—230.01 12 Claims

1. A semiconductor memory comprising:
- a memory portion having a plurality of memory cells furnished at the points of intersection between a plurality of word lines and a plurality of data lines;
- an operation circuit having a plurality of operation modes and operating in accordance with a designated operation mode;
- a first external terminal;
- a first output circuit furnished interposingly between the output terminal of said operation circuit and said first external terminal, said first output circuit feeding the output data of said operation circuit to said first external terminal;
- a second output circuit furnished interposingly between said output terminal of said operation circuit and said memory portion, said second output circuit feeding the output data of said operation circuit as write data to said memory portion;



a first input circuit for providing a first input terminal of said operation circuit with first data supplied from outside said semiconductor memory; and

a second input circuit furnished interposingly between a second input terminal of said operation circuit and said memory portion, said second input circuit providing said second input terminal with second data retrieved from said memory portion;

wherein said operation circuit receives and operates on said first and said second data in accordance with said designated operation mode; and

wherein the output data of said operation circuit is given to said first external terminal in the operation cycle in which the same output data is written to said memory portion.

5,598,373

SEMICONDUCTOR MEMORY SYSTEM

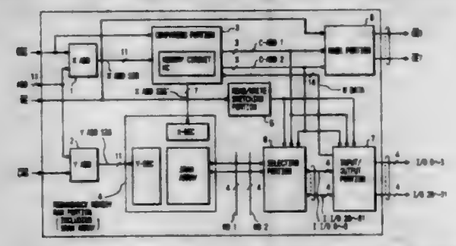
Shoji Wada, Tokyo; Kunchide Kenmizaki, Kodaira; Masaya Muranaka, Akishima; Masahiro Ogata, Ohme; Hidetomo Aoyagi, Tachikawa; Tetsuya Kitano, Kodaira; Masahiro Katayama, Ohme; Shoji Kubono, Akishima; Yukihide Suzuki, Akishima; Makoto Morino, Akishima; Shuichi Miyatake, Hamura; Seiichi Shundo, Hatoyama-machi; Yoshihisa Koyama, Hamura, and Nobuhiko Ohno, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corp., both of Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 476,765

Claims priority, application Japan, Jun. 29, 1994, 6-170287

Int. Cl.[6] G11C *7/00;8/00;11/34;29/00*

U.S. Cl. 365—230.03 **8 Claims**



1. A semiconductor memory system having a defect remedy large-scale integrated circuit, said large-scale integrated circuit comprising:

an input interface portion for capturing address and control signals, said input interface portion being the same as that of a dynamic random access memory;

an input/output interface portion corresponding to a data bus of a memory device comprised of a plurality of dynamic random access memories;

a memory circuit to which a chip address and an X defective address of any of the plurality of dynamic random access memories are electrically written, said memory circuit being substantially made nonvolatile;

a redundancy remedy random access memory portion comprising a static random access memory wherein a word line is selected by a compare match signal between an X address signal and the defective address of said memory circuit, the X address signal and the defective address being captured via said input interface portion, and a column is selected by a Y address signal captured via said input interface portion;

a selecting portion for connecting a data input/output bus of said redundancy remedy random access memory portion to an input/output circuit corresponding to a defective chip address;

a data input/output portion for selectively activating an input/output circuit to be connected to a data bus corresponding to a dynamic random access memory found defective; and

a mask portion for outputting a control signal for putting in a high-impedance state an output pin of the defective dynamic random access memory in a read operation.

5,598,374

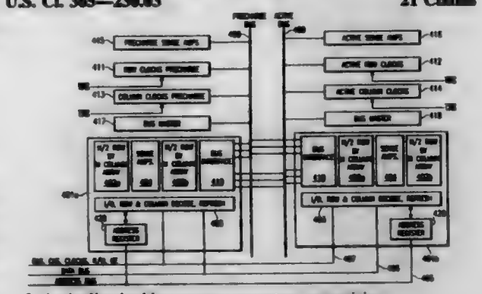
PIPELAND ADDRESS MEMORIES, AND SYSTEMS AND METHODS USING THE SAME

G. R. Mohan Rao, Dallas, Tex., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Jul. 14, 1995, Ser. No. 502,479

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—230.03 **21 Claims**



1. A pipelined address memory system comprising:

a plurality of memory units, each including an array of memory cells and circuitry for accessing selected ones of said cells in said array;

a precharge bus for carrying precharge control signals;

an active bus for carrying active cycle control signals;

circuitry coupled to said precharge bus for generating said precharge control signals;

circuitry coupled to said active bus for generating said active cycle control signals;

circuitry for selectively coupling said memory units to said precharge bus for precharge; and

circuitry for selectively coupling said memory units to said active bus for active operation.

5,598,375

STATIC RANDOM ACCESS MEMORY DYNAMIC ADDRESS DECODER WITH NON-OVERLAP WORD-LINE ENABLE

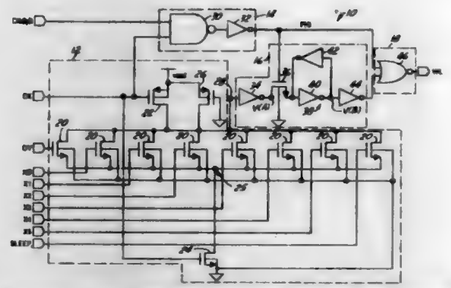
Jyh-Ren Yang; Ching-Ching Chi, and Tien-Yu Wu, all of Hsinchu, Taiwan, assignors to Electronics Research & Service Organization, Hsinchu, Taiwan

Filed Jun. 23, 1995, Ser. No. 494,275

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.06 **16 Claims**

1. An address decoder circuit for use with memory means of the type having a plurality of word enable lines, comprising:



decoder means coupled to a preselected combination of true and complemented address data bits for generating an output signal in response to said preselected combination;

deadtime signal generating means responsive to an input clock signal and a delayed clock signal for generating a deadtime signal having an active state and an inactive state, wherein said active state is longer than said inactive state;

track and latch means coupled to said decoder means for tracking said decoder output signal when said deadtime signal is in said active state and for latching and outputting said decoder output signal as said deadtime signal transitions to said inactive state; and,

switching means responsive to the output of said track and latch means and having an output for coupling to one of the word enable lines for preventing enabling of the word enable line when said deadtime signal is in said active state and for enabling the word enable line when said deadtime signal has transitioned to said inactive state.

5,598,376

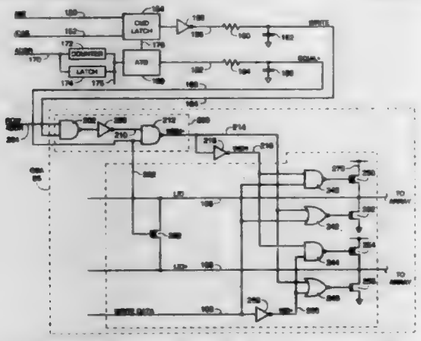
DISTRIBUTED WRITE DATA DRIVERS FOR BURST ACCESS MEMORIES

Todd A. Merritt, and Troy A. Manning, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 386,894, Feb. 10, 1995, which is a continuation-in-part of Ser. No. 370,761, Dec. 23, 1994. This application Jun. 30, 1995, Ser. No. 497,354

Int. Cl.[6] G11C *11/401*

U.S. Cl. 365—230.06 **19 Claims**



1. A memory device having a plurality of internal data line pairs, an equilibration control circuit and a write cycle control circuit, the memory device further comprising:

a plurality of data sense amplifiers each coupled to the equilibration control circuit, the write cycle control circuit and at least one of the data line pairs;

a plurality of write data drivers, each write data driver associated with at least one of said data sense amplifiers; and

a plurality of write data driver enable circuits, each write driver enable circuit associated with one of said write data drivers to enable said write data drivers to drive data onto at least one of the data line pairs in response to deassertion of an equilibrate signal from the equilibration control circuit while a write cycle enable signal from the write cycle control circuit is asserted.

5,598,377

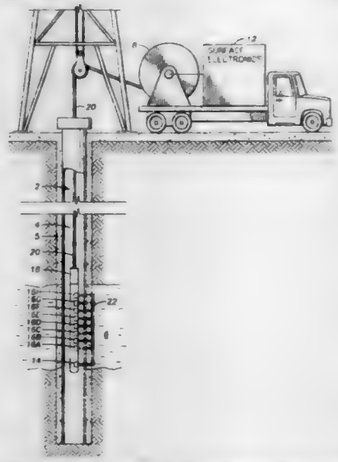
METHOD FOR CORRECTING COMPRESSIONAL VELOCITY WELL LOGS FOR EFFECTS OF GAS IN EARTH FORMATIONS

Todd K. Fishburn, and Jane E. Thomas Smith, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Oct. 4, 1995, Ser. No. 539,123

Int. Cl.[6] G01V *1/40*

U.S. Cl. 367—31 **23 Claims**



1. A method of correcting compressional velocity well log measurements for effects of gas in pore space of earth formation, said method comprising the steps of:

determining a relationship between measurements of shear velocity and a ratio of measurements of compressional velocity with respect to said shear velocity for said earth formations, wherein said pore space of said earth formations is substantially liquid-filled;

determining a first boundary of said relationship corresponding to when said earth formations are substantially composed of shale;

determining a second boundary of said relationship corresponding to when said earth formation are substantially devoid of shale;

determining a cutoff by adjusting an ordinate intercept value of said relationship to substantially include said shear velocity and compressional velocity measurements corresponding to said earth formation having gas in said pore space, said cutoff substantially excluding said shear and compressional velocity measurements corresponding to said earth formations being substantially liquid-filled;

for each measurement of shear and compressional velocity included within said cutoff, determining a shale volume and a corrected ratio of compressional velocity to shear velocity, said corrected ratio determined by scaling with respect to said shale volume between said first boundary and said second boundary; and

for each corrected ratio thus determined, applying said corrected ratio to a corresponding measurement of said shear velocity to calculate corrected compressional velocity.

5,598,378

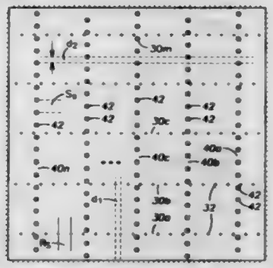
METHOD OF PERFORMING HIGH RESOLUTION CROSSED-ARRAY SEISMIC SURVEYS

David M. Flentge, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 71,515, Jun. 3, 1993, Pat. No. 5,511,039. This application Nov. 14, 1994, Ser. No. 339,489

Int. Cl.[6] G01V *1/20; 1/36*

U.S. Cl. 367—56 **3 Claims**



1. A method of performing a seismic survey, comprising the steps of:

generating seismic signals at a plurality of source locations, said source locations substantially equally spaced along a plurality of source lines, said source lines being substantially parallel to each other and substantially equally spaced from each other; and

detecting said seismic signals at a plurality of receiver locations, said receiver locations substantially equally spaced along a plurality of receiver lines, said receiver lines being substantially parallel to each other and substantially equally spaced from each other, said receiver lines intersecting said source lines non-perpendicularly.

wherein the positions of said source locations within succeeding source lines of a series of said source lines in positional order are staggered from said source locations within the preceding source lines by a fraction of the spacing between adjacent source locations within said source lines, said spacing measured perpendicular to said receiver lines, where said fraction is of the form 1/j, where j is an integer.

5,598,379

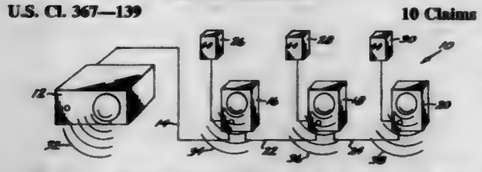
SATELLITE ULTRASONIC PEST REPELLER

Patrick F. Malleolo, 1541 Parkway Loop, Suite G, Tustin, Calif. 92680

Filed Feb. 23, 1996, Ser. No. 606,287

Int. Cl.[6] H04R *1/02*

U.S. Cl. 367—139 **10 Claims**



10. A pest repeller apparatus adapted to deliver a selectable electronic output signal from an ultrasonic pest repeller master unit in the form of an electronic input signal to a first satellite unit in a serial chain of at least one such satellite units, said master unit having an acoustic waveform output signal corresponding to said electronic output signal, and each said satellite unit comprising:

signal processor means for processing the electronic input signal in order to produce a replicated signal for delivery to a subsequent satellite unit in said serial chain, said replicated signal having the original shape and amplitude of said master unit electronic output signal;

power driver means for applying the input signal received by said signal processor means to an included audio amplifier in order to produce an intermediate signal therefrom;

transducer means adapted to transform the intermediate signal from the power driver audio amplifier into a satellite acoustic signal and to emit the satellite acoustic signal in the ambient;and

power supply means connected to supply power to both said signal processor means and said power driver means.

5,598,380

COMPOSITE WALL, NOTABLY MOTOR VEHICLE WINDSHIELD, INCLUDING AN ULTRASONIC DEVICE FOR DETECTING THE PRESENCE OF FOREIGN BODIES ON ONE OF ITS FACES

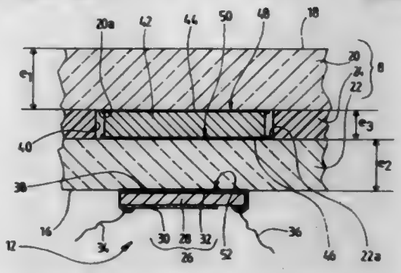
Eric Saurer, Bevaix; Jean-Pierre Migeot, Peseux, and Roland Jeanmonod, Neuchâtel, all of Switzerland, assignors to Asulab, S.A., Bienne, Switzerland

Filed Jan. 17, 1995, Ser. No. 373,076

Claims priority, application France, Feb. 8, 1994, 94 01403

Int. Cl.[6] H04R *17/00; G05B 5/00*

U.S. Cl. 367—140 **20 Claims**



1. A composite wall comprising a first sheet having a first thickness, a second sheet having a second thickness, said sheets being separated by an intermediate layer having a third thickness, and an ultrasonic detection device cooperating with an external face of said second sheet to detect the presence of foreign bodies on an external face of said first sheet, said detection device comprising transducer means able to emit an incidental ultrasonic signal of frequency f, said transducer means also being able to receive an ultrasonic signal reflected on said face of said first sheet representative of the presence or absence of said foreign bodies, said intermediate layer comprising, at least facing the transducer means, a recess in which is placed an inserted element having two opposite faces respectively in close contact with the first and second sheets, said frequency f of the transducer means satisfying the following relationships:

$$f=K_1.V_1/2e_1=K_2.V_2/2e_2=K_3.V_3/2e_3$$

where K_1, K_2 and K_3 are defined integers, e_1, e_2 and e_3 are respectively the thickness of the first sheet, the thickness of the second sheet and the thickness of the inserted element, and V_1, V_2 and V_3 are respectively the propagation speeds of an ultrasonic wave in the first sheet, in the second sheet and in the inserted element.

5,598,381

METHOD FOR TAKING DIRECTIONS AND TIMEPIECE INTENDED TO MAKE USE OF THIS METHOD

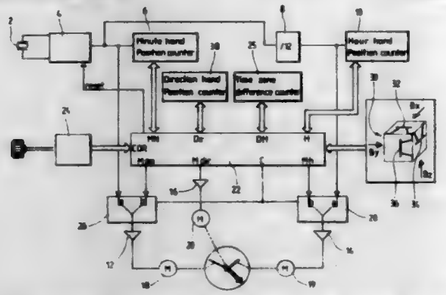
Etienne Bernard, Boudry, and Rudolf Dinger, Saint-Aubin, both of Switzerland, assignors to ASULAB S.A., Bienne, Switzerland

Filed Dec. 12, 1994, Ser. No. 355,338

Claims priority, application Switzerland, Dec. 23, 1993, 3860/93

Int. Cl.[6] G04C *11/02;* **G04G** *9/00*

U.S. Cl. 368—10 **1 Claim**



1. A timepiece comprising a time base, display means for displaying a local time, and time setting means for setting said local time, said display means also being for displaying additional data which are a function of a place where the timepiece is located on the earth's surface, said timepiece further comprising:

means for determining the value of the time difference between the local time and the time of a reference time zone;

means for converting said time difference value into an approximate value of the local longitude;

means for determining the inclination of the earth's magnetic field in relation to the horizontal;

means for converting the determined inclination of the earth's magnetic field into an approximate value of the local latitude;

a time difference counter for keeping account of all changes in said displayed time that are produced by said time setting means when there is a change of time zone, the contents of said counter corresponding to said time difference value;

calculating means for calculating, as a function of said place where the timepiece is located, the azimuth of a preselected place on the earth's surface; and

measuring means for determining the direction of magnetic north;

wherein said calculating means determines, as a function of said azimuth and said direction of the magnetic north, the direction of said preselected place, said additional displayed data being said direction of the preselected place, and said direction being displayed with the aid of a pointer.

5,598,382

DUAL PLANE EL PANEL

Wayne A. Wilson, Gilbert, and James H. Butt, Mesa, both of Ariz., assignors to Durel Corporation, Chandler, Ariz.

Filed Nov. 8, 1995, Ser. No. 555,213

Int. Cl.[6] G04B *19/32*

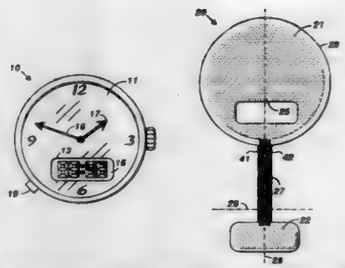
U.S. Cl. 368—226 **12 Claims**

1. An electroluminescent panel for providing illumination in two parallel planes, said panel comprising:

a first electroluminescent lamp;

a second electroluminescent lamp on a common substrate with said first electroluminescent lamp;

wherein said first electroluminescent lamp and said second electroluminescent lamp are spaced apart a predetermined distance along a first axis;



wherein the portion of said substrate between said first electroluminescent lamp and said second electroluminescent lamp is narrower than the larger of the electroluminescent lamps, enabling said second electroluminescent lamp robe reoriented relative to said first electroluminescent lamp to provide stacked lamps in separate planes.

5,598,383

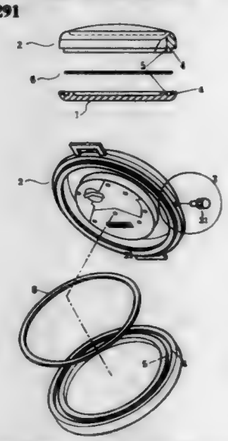
WATCH WITH DOUBLE THREAD COUPLING DEVICE

Tai H. Li, No. 1, Alley 5, Lane 23, Shiaw 1 Rd., Keelung, Taiwan, China

Filed Nov. 17, 1994, Ser. No. 342,454

Int. Cl.[6] G04B *37/00*

U.S. Cl. 368—291 **1 Claim**



1. A watch with improved water-proof and pressure-resistance characteristics of, said watch comprising:

(a) a casing, a bottom cover affixed to said casing, a screw winding crown, and a receiving port on said casing for receiving said screw winding crown;

(b) a first double-thread coupling arrangement provided between said screw winding crown and said receiving port, said first double-thread coupling arrangement comprising an externally and internally threaded annular section provided on said screw winding crown, a matching externally and internally threaded annular recess provided in said receiving port, and a first packing ring provided between said receiving port and said screw winding crown; and

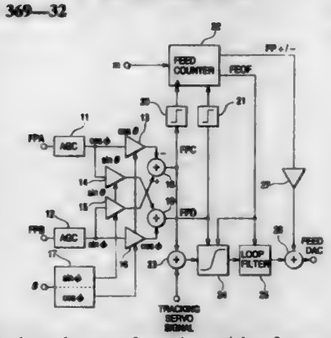
(c) a second double-thread coupling arrangement provided between said casing and said bottom cover, said second double-thread coupling arrangement comprising an externally and internally threaded annular protrusion provided on said casing, a matching externally and internally threaded annular groove provided in said bottom cover, and a second packing ring provided between said casing and said bottom cover.

5,598,384

FEED SEARCH SYSTEM FOR OPTICAL DISK RECORDING DEVICE

Shinji Aoshima, and Morito Morishima, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Dec. 22, 1995, Ser. No. 577,773
Claims priority, application Japan, Dec. 27, 1994, 6-338266
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—32 **11 Claims**



1. A feed search system for setting a pickup from a position to a target position, comprising:

a feed mechanism for moving the pickup to the target position, said feed mechanism including a feed motor for moving said feed mechanism by a revolution thereof;

a converting device for converting the revolution of said motor to a first signal and a second signal;

phase shifting means for generating a third signal and a fourth signal obtained by shifting the first signal and the second signal in accordance with a phase displacement from a rising zero cross point in a last cycle of the first signal between the position and the target position to the target position;

counting means for counting rising zero cross points of the third signal in accordance with the number of revolutions of said motor being contained between the position and the target position, and outputting a brake signal at a falling zero cross point which is sequent to a last counted one of the rising zero cross points of the third signal; and

controlling means for outputting a control signal for moving the pickup to the target position,

wherein when said counting means outputs the brake signal, said controlling means output the control signal so as to stop the pickup at a rising zero cross point which is sequent to said falling zero cross point of the third signal.

5,598,385

MEDIA LIBRARY SYSTEM WITH IMPROVED MEDIA MANAGEMENT SCHEME

Makoto Mizukami, Tokyo; Shigetaro Iwatsu, Saitamaken; Mamo Sakai, Tokyo; Masahiro Ueno, Saitamaken; Nobuyoshi Izawa, Tokyo, and Kikuji Katou, Saitamaken, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

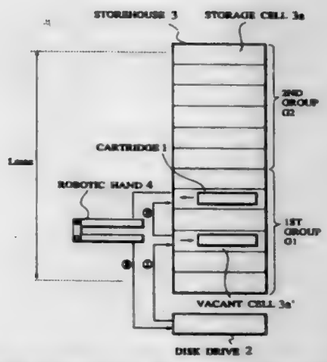
Filed Dec. 2, 1994, Ser. No. 349,089
Claims priority, application Japan, Dec. 2, 1993, 5-302754; Dec. 28, 1993, 5-335435; Dec. 28, 1993, 5-335442; Feb. 16, 1994, 6-019457
Int. Cl.[6] G11B *17/22;15/68*
U.S. Cl. 369—36 **24 Claims**

1. A media library system, comprising:

a storehouse having a plurality of storage cells for storing a plurality of recording media;

media driving means for executing data read/write operations with respect to the recording media;

media carrying means for carrying the recording media between the storehouse and the media driving means, so as to exchange a previously used recording medium mounted on



the media driving means with a new recording medium stored in the storehouse; and

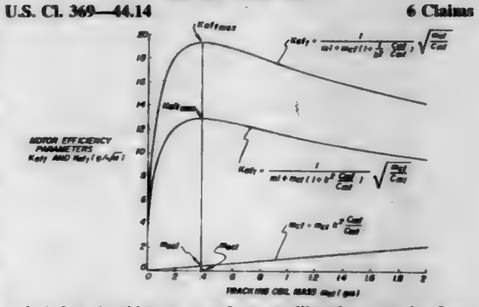
control means for controlling a media exchange operation of the media carrying means to exchange the previously used recording medium with the new recording medium such that the storage cells of the storehouse are divided into at least two groups arranged in an order of average distances with respect to the media driving means, including a first group with a shortest average distance with respect to the media driving means among said at least two groups and a last group with a longest average distance with respect to the media driving means among said at least two groups, and at least one vacant cell not storing any recording medium is secured among the storage cells of the first group after the media exchange operation is completed, wherein the control means controls the media exchange operation of the media carrying means such that the previously used recording medium is stored in the vacant cell of the first group first, and then the new recording medium is mounted on the media driving means from any one of said at least two groups, and in a case where the new recording medium is taken from one of said at least two groups other than the first group, one recording medium with a lowest utilization frequency among each group other than the last group is moved to a currently vacant cell in an adjacent group having a greater average distance with respect to the media driving means than said each group sequentially so as to secure said at least one vacant cell in the first group.

5,598,386

OPTIMIZED LINEAR MOTORS FOR FOCUS/TRACKING ACTUATORS IN OPTICAL DISK DRIVES

Boris A. Shtipelman, Rochester, and James A. Barnard, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1995, Ser. No. 376,567
Int. Cl.[6] G11B *7/09*
U.S. Cl. 369—44.14 **6 Claims**



1. A focus/tracking actuator for controlling the respective focus and tracking positions of a movably mounted lens assembly used

to direct a focused beam of radiation onto a desired data track on a moving recording element, said focus/tracking actuator comprising a pair of moving coil type linear motors, one of said motors being adapted to control the focus position of said lens assembly, and the other of said motors being adapted to control the tracking position of said lens assembly, each of said focus and tracking controlling motors comprising a coil of wire disposed in a magnetic air gap and adapted to move therein in response to an applied current flow in said coils, each of said coils having a mass substantially defined by the equations:

$$m_{ocf}=m_l/[1+(1/k^2)(C_{mt}/C_{mf})]$$

$$m_{oct}=m_l/[1+k^2(C_{mf}/C_{mt})],$$

where m_{ocf} is the mass of the focus motor coil; m_{oct} is the mass of the tracking motor coil; m_l is the mass of the movably mounted lens assembly; k is the ratio of the focus motor efficiency to the tracking motor efficiency; and C_{mf} and C_{mt} are the respective motor design parameters defined by the expression

$$\gamma\rho/(\beta B)^2,$$

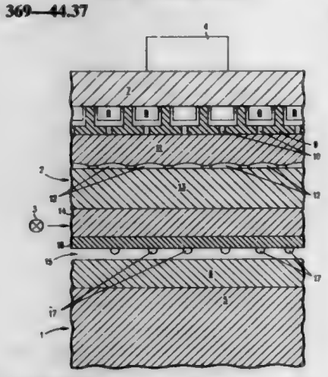
where γ is the density (kg/m^3) of the wire material of the coil; ρ is the resistivity of the wire material (ohm-meters); β is the ratio between the effective and the total length of the coil wire, and B is the magnetic flux (Tesla) crossing the wire.

5,598,387

HIGH-DENSITY OPTICAL DATA STORAGE UNIT AND METHOD FOR WRITING AND READING INFORMATION

Wolfgang D. Pohl, Adliswil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 311,823, Sep. 22, 1994, Pat. No. 5,461,600, which is a continuation of Ser. No. 978,015, Nov. 18, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,245
Claims priority, application European Pat. Off., Jun. 25, 1992, 92810334
Int. Cl.[6] G11B *7/135*
U.S. Cl. 369—44.37 **18 Claims**



1. An optical data storage system comprising:

a data storage medium having a plurality of data bit areas;

a plurality of near field optical elements each having a diameter in the range of 10–100 nanometers, each located proximate one of the data bit areas;

an interrogation light source for providing light to the near field optical elements; and

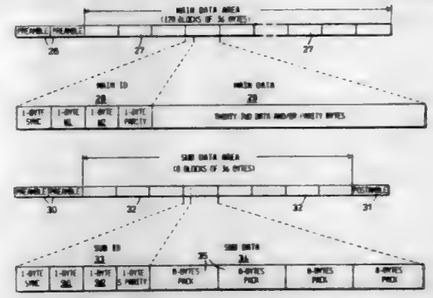
a plurality of diffraction limited optical elements, each associated with one of the near field optical elements, each optical element for receiving particularly scattered light from its associated near field optical element.

5,598,388

STORING PLURAL DATA RECORDS ON TAPE IN AN ENTITY WITH AN INDEX ENTRY COMMON TO THOSE RECORDS

David J. Van Maren, Fort Collins, Colo., and Mark Simms, Bristol, England, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 761,837, Nov. 18, 1991, abandoned. This application Jan. 6, 1994, Ser. No. 177,807
Claims priority, application United Kingdom, Jan. 19, 1990, 9001335
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—47 **29 Claims**



1. A data storage method for storing user data organized into a plurality of records and associated information on a sequentially-accessible data storage medium, comprising the steps of:

writing the data to said medium in groups independently of said organization of the records, said groups forming a sequence of groups on said medium and each group having an associated index;

writing cumulative information to the medium for each of said groups such that the cumulative information is indicative of the contents of all of the groups up to and including the group in the sequence of groups for which the cumulative information is written;

writing specific information indicative of the individual contents of each group to at least one entry in its associated index, said specific information being usable to facilitate access to the individual contents;

forming at least one entity having a plurality of records; and

writing a single entry with specific information to at least one group index for each entity so formed, each said entry being related to a corresponding entity and substantially no entry being related to any individual record of said corresponding entity.

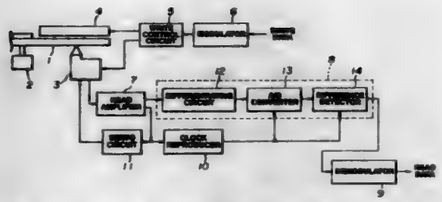
5,598,389

SIGNAL DETECTOR FOR AN OPTICAL INFORMATION REPRODUCING APPARATUS

Junichi Nakano, Hachioji; Hiroshi Ezawa, Sagamihara, and Nobuhide Matsubayashi, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,699
Claims priority, application Japan, Sep. 3, 1993, 5-220240; Oct. 22, 1993, 5-265199; May 19, 1994, 6-105778
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—48 **16 Claims**

1. A signal detector for an optical information reproducing apparatus that reproduces a channel clock responsively to inherent marks formed on an optical recording medium, on which record data is recorded in the form of marks so that an edge of each mark is associated with a 1 after having been modulated so that the number of 1's resulting from modulation in a block, serving as a unit of modulation, becomes N (N is larger than 0 and an integer) and converted in an NRZI mode, and that then reproduces said



record data from said optical recording medium synchronously with said channel clock, comprising:

signal detecting means for detecting a signal that has a peak amplitude corresponding to said edge of each mark;

sampling means for sampling an output of said signal detecting means synchronously with said channel clock; and

differential detecting means for determining the N largest absolute values of output levels sampled by said sampling means and for selecting N bits, corresponding to the determined N largest absolute values.

5,598,390

DUAL MORE RECORDING AND REPRODUCING APPARATUS HAVING TWO RECORDING REGIONS USING DIFFERING REPRODUCTION PRINCIPLES

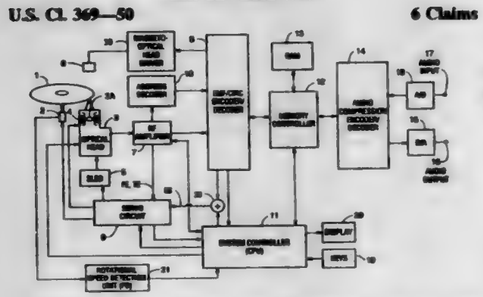
Hiroshi Saitoh, Saitama, and Hideki Takahashi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 449,264, May 24, 1995, abandoned, which is a division of Ser. No. 255,467, Jun. 8, 1994. This application May 2, 1996, Ser. No. 643,228

Claims priority, application Japan, Jun. 14, 1993, 5-165953; Jun. 14, 1993, 5-165954

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—50 **6 Claims**



1. A recording and/or reproducing apparatus for a disc-shaped recording medium, said disc shaped recording medium having first and second recording regions, with information signals being recorded using pits in the first recording region, and information signals being recorded using a magneto-optical method employing a pregroove in the second region, comprising:

head means for recording/reproducing information signals to/from the disc-shaped recording medium and moving between the first and second recording regions of the disc-shaped recording medium;

a spindle motor for rotationally driving the disc-shaped recording medium;

first spindle control signal generating means for generating a first spindle control signal according to data read out from the second recording region of the disc-shaped recording medium by said head means;

second spindle control signal generating means for generating a second spindle control signal according to data read out from the first recording region of the disc-shaped recording medium by said head means;

rotational detecting means for detecting the number of rotations of said spindle motor;

third spindle control signal generating means for generating a third spindle motor control signal based on a signal from said rotational detecting means; and

control means for determining as to whether said head means is positioned in the first region or the second region of the disc-shaped recording medium according to the output signal from said head means, said control means for selecting said first, second and third spindle control signals outputted from said first, second and third spindle control signal generating means according to the determination result and controlling said spindle motor using the selected spindle control signal.

5,598,391

APPARATUS FOR RECORDING DATA AND STATICALLY STORING AND RECORDING SUPERVISORY INFORMATION REPRESENTING CONTENTS OF THE DATA ON A RECORDING MEDIUM

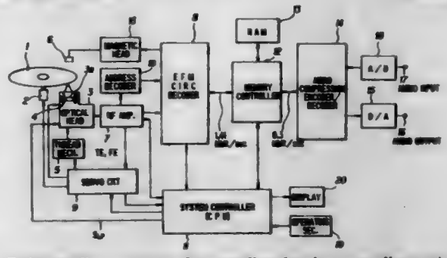
Hiroshi Mukawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,242

Claims priority, application Japan, Oct. 27, 1993, 5-289852

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—54 **7 Claims**



7. A recording apparatus for recording data in a recording region of a recording medium and recording supervisory information representing contents of the data recorded in the recording medium, comprising:

recording means for recording the data and the supervisory information in the recording medium;

a non-volatile memory for the supervisory information;

a control means for renewing the supervisory information and storing it in the non-volatile memory at a certain time interval, the control means including means to detect, when power is initially supplied to the recording apparatus, whether a recording of the renewed supervisory information to the recording medium has been previously implemented and recording the renewed supervisory information which has been stored in the memory to the recording medium when it is detected that recording to the recording medium of the renewed supervisory information stored in the memory has not been implemented.

5,598,392

DATA REPRODUCTION SYSTEM SYNCHRONIZED BY RECORDING DATA

Haruhiko Izumi, and Masakazu Taguchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

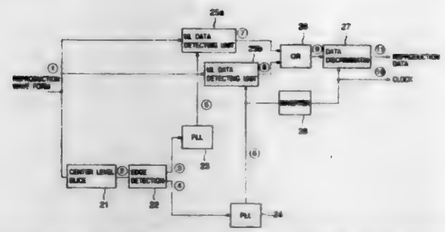
Filed Aug. 11, 1994, Ser. No. 289,231

Claims priority, application Japan, Nov. 9, 1993, 5-279942; Dec. 27, 1993, 5-333356

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—59 **9 Claims**

1. A data reproducing system obtaining a reproduction signal via a head from an optical disk recording medium in which signals obtained by modulation of recording data in accordance with a rule corresponding to a partial response characteristic have been



recorded, and generating a data signal corresponding to the recording data based on the reproduction signal, said data reproducing system comprising:

clock generating means for generating a synchronizing clock based on the reproduction signal corresponding to the recording data;

said clock generating means including

first clock generating means for generating a first synchronizing clock in which phase synchronization is performed based on leading edges of the reproduction signal; and

second clock generating means for generating a second synchronizing clock in which phase synchronization is performed based on trailing edges of the reproduction signal; and

signal generating means, operating in synchronism with the synchronizing clock generated by said clock generating means, for sampling levels of the reproduction signal and for generating the data signal from the sampled levels in accordance with a maximum likelihood sequence estimation method,

said signal generating means including

first maximum likelihood data detecting means for sampling levels of the reproduction signal in synchronism with the first synchronizing clock from said first clock generating means and for generating from the sampled levels a first data signal corresponding to the leading edges of the reproduction signal in accordance with the maximum likelihood sequence estimation method;

second maximum likelihood data detecting means for sampling levels of the reproduction signal in synchronism with said second synchronizing clock from said second clock generating means and for generating from the sampled levels a second data signal corresponding to the trailing edges of the reproduction signal in accordance with the maximum likelihood sequence estimation method; and

signal composition means for composing the first data signal from said first maximum likelihood data detecting means and the second data signal from said second maximum likelihood data detecting means and for generating the data signal to be output.

5,598,393

METHOD AND APPARATUS FOR READING DATA

Amir Alon, Yahud; Shlomo Shapira, and Itzhak Katz, both of Petach Tikva, all of Israel, assignors to Zen Research N.V., Netherlands Antilles

Division of Ser. No. 43,254, Apr. 6, 1993, Pat. No. 5,426,623. This application Feb. 24, 1995, Ser. No. 394,309

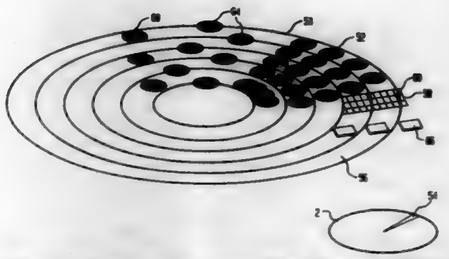
Claims priority, application Israel, Apr. 10, 1992, 101570

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—102 **6 Claims**

1. A method of reading data from an optical disk, comprising the steps of:

a) providing means for illuminating a selected part of the optical disk and acquiring an optical image of a plurality of tracks of the optical disk;



b) providing a detector matrix comprising a plurality of detectors for detecting light, each of said detectors producing an output signal which is proportional to the intensity of the detected light, said detected light being non-coherent light;

c) causing an optical image corresponding to an illuminated area to fall on said detector matrix;

d) transferring the output signal of said detector matrix to image processing means;

e) analyzing the output signal of the said detector matrix using an edge detection algorithm method to compute track center data for each data track, the computed track center data comprising position coordinates of the track center for each data track;

f) saving in memory means the computed track center data; and

g) electronically shifting the computed track center position when an actually detected track center is moved with respect to said computed track center.

5,598,394

OPTICAL PICK-UP

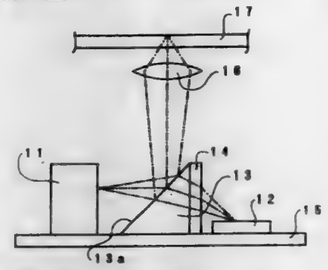
Katsutoshi Hibino, and Yasuko Teragaki, both of Gifu, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 16, 1995, Ser. No. 442,162

Claims priority, application Japan, May 19, 1994, 6-131216

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—112 **7 Claims**



1. An optical pick-up comprising:

a laser source for emitting a laser beam:

a beam splitter for splitting the laser beam by reflecting a part of the laser beam at a first surface and by refracting the other part of the laser beam at the first surface, the refracted part being passed through the beam splitter and emerged from a second surface;

a microlens for focusing the beam which is emerged from the second surface of the beam splitter, the microlens being integrally formed on the second surface;

a photo detector for detecting the beam which is focused by the microlens at a focal point of the microlens and for outputting detection signal responsive to the beam which is focused by the microlens; and

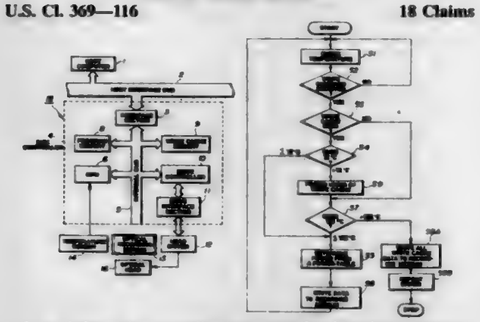
a substrate mounted with the laser source, the beam splitter, the microlens and the photo detector.

5,598,395

DATA LOSS PREVENTION IN A CACHE MEMORY WHEN THE TEMPERATURE OF AN OPTICAL RECORDING MEDIUM IS ABNORMAL

Yoshimi Watanabe, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1994, Ser. No. 330,859
Claims priority, application Japan, Nov. 2, 1993, 5-274404
Int. Cl.[6] G11B 20/10;7/00
U.S. Cl. 369—116 18 Claims



1. An information recording apparatus for detecting a temperature and controlling a data write operation comprising:
- a driving means for driving a light source radiating laser light onto an optical recording medium with a predetermined power for performing at least a data recording operation;
- a detecting means for detecting a surface temperature of said optical recording medium;
- a temporary memory means for temporarily storing data to be transferred from a computer host means and to be recorded on the optical recording medium; and
- a control means for controlling power of said laser light through said driving means so as to become a predetermined power, said control means for controlling at least one processing between processing for determining whether a temperature detected by said detecting means is greater than a regular value set at a value equal to or less than an abnormal temperature, and for writing all of said data to be recorded but not to be recorded yet on said optical recording medium and to be currently stored in said temporary memory means, on said optical recording medium after forbidding using of said temporary memory means if the detected temperature is over the regular value, or another processing for reporting an error to said computer host means after writing all of said data to be recorded but not to be recorded yet on said optical recording medium and to be currently stored in said temporary memory means, on said optical recording medium, if the detected temperature is greater than the regular value.

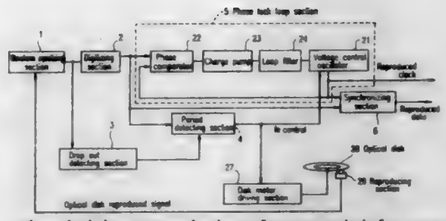
5,598,396

OPTICAL DISK REPRODUCING APPARATUS

Ryusuke Horibe, Kobe; Masaharu Imura, Neyagawa, and Toshiyuki Shimada, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 12, 1996, Ser. No. 599,821
Claims priority, application Japan, Feb. 15, 1995, 7-026849
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—124 12 Claims

1. An optical disk reproducing apparatus comprising:
- a waveform equalizing means for emphasizing a predetermined range of frequency band of a reproduced signal;
- a digitizing means for digitizing the reproduced signal which has been emphasized by the wave equalizing means at a predetermined level, so as to convert the emphasized reproduced signal into a digital signal;
- a period detecting means for detecting and outputting a period of a predetermined pattern included in the digital signal;



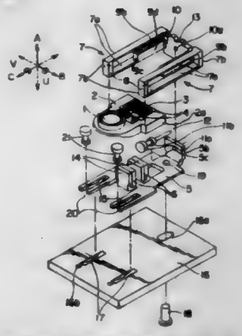
- a phase lock loop means having a free-run period, for controlling the free-run period based on the output of the period detecting means so that the free-run period becomes substantially equal to a period of a clock component of the digital signal, and for outputting a reproduced clock signal by reproducing the clock component of the digital signal; and
- a synchronizing means for synchronizing the digital signal with the reproduced clock signal so as to output a synchronized signal as reproduced data, wherein the period detecting means comprises:
- a counting means for successively counting a pulse width or a pulse interval of the digital signal;
- a maximum value memory means for holding a maximum value of all the counted values obtained by the counting means during a predetermined period, the maximum value being updated every time a new maximum value is detected;
- an adding means for adding the maximum value held by the maximum value memory means and a subsequent counted value obtained by the counting means so as to obtain an added value in response to the update of the maximum value in the maximum value memory means; and
- a maximum value detecting means for outputting the added value as a period of the predetermined pattern every time the predetermined period has passed.

5,598,397

OBJECTIVE LENS DRIVE IN AN OPTICAL DISK MECHANISM

Song Sim, Seoul, Rep. of Korea, assignor to Hyundai Electronics Ind. Co., Ltd., Kyeongki-do, Rep. of Korea

Filed Oct. 4, 1994, Ser. No. 317,803
Claims priority, application Rep. of Korea, Oct. 15, 1993, 1993-21441
Int. Cl.[6] G11B 7/08;7/09
U.S. Cl. 369—244 14 Claims



1. An objective lens drive device for use in an optical disk apparatus to move an objective lens in focusing and tracking directions, said objective lens drive device comprising:
- a support including a first end having elongated grooves and said support also including a second end;
- an actuator base mounted on said support, said actuator base including a first end having slides positioned in said grooves of said support and said actuator base also including a second end;

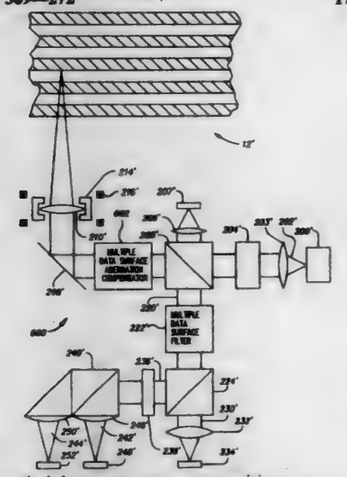
- a holder to support an objective lens having a center, said holder being mounted on said actuator base;
- an adjustment device operable to move said second end of said actuator base toward and away from said support while said slides on said first end of said actuator base slide within said grooves in said first end of said support, thereby tilting said holder in opposite directions about a first axis located at a position to extend through the center of the objective lens to be supported by said holder;
- a spring plate device including at least one vertically displaceable focusing spring plate connected to said holder and at least one horizontally displaceable tracking spring plate having a first end integral with said focusing spring plate and a second end secured to a spring plate body; and
- a rubber spring pin pivotally connecting said spring plate body and said actuator base to enable, upon application of a force to said spring plate body, said spring plate body, said spring plate device and said holder to pivot together relative to said actuator base about a second axis that perpendicularly intersects said first axis at the center of the objective lens to be supported by said holder.

5,598,398

MULTIPLE DATA SURFACE OPTICAL DATA STORAGE SYSTEM

Margaret E. Best, San Jose; Hal J. Rosen, Los Gatos; Kurt A. Rubin, Santa Clara, and Timothy C. Strand, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 371,309, Jan. 10, 1995, which is a continuation of Ser. No. 79,473, Jun. 18, 1993, which is a division of Ser. No. 710,226, Jun. 4, 1991, Pat. No. 5,255,262. This application Apr. 19, 1995, Ser. No. 424,854
Int. Cl.[6] G11B 7/24;7/26
U.S. Cl. 369—272 17 Claims



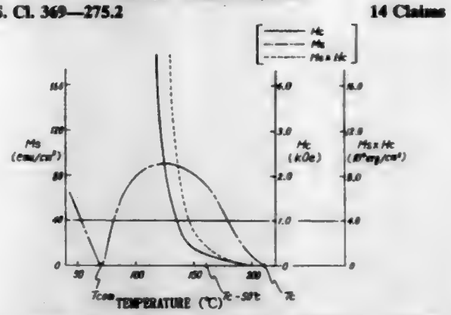
1. An optical data storage system comprising:
- a medium receptor for receiving an optical data storage medium having a plurality of separate data surfaces located at different depths in the medium;
- an electromagnetic radiation source for producing an electromagnetic radiation beam;
- a surface identifying device for identifying the type of optical detection associated with the data surfaces present in the medium;
- a focus device for focussing the radiation beam to a selected one of the plurality of data surfaces of the medium;
- an optical detector for receiving a return radiation beam from the medium; and
- a data circuit coupled to the optical detector for generating a data signal;
- wherein one of the data surfaces contains recorded information representing the type of optical detection associated with the data surfaces present in the optical data storage medium.

5,598,399

MAGNETO-OPTICAL RECORDING MEDIUM HAVING MULTIPLE MAGNETIC LAYERS FOR MAGNETO-OPTICAL RECORDING MEDIUM

Noriyuki Ogihara, Abiko; Yoshinori Shirai, Kitasoma-gun, and Takehiko Yorozu, Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 24, 1995, Ser. No. 518,889
Claims priority, application Japan, Aug. 24, 1994, 6-222417; Jun. 20, 1995, 7-176554
Int. Cl.[6] G11B 7/24;11/00
U.S. Cl. 369—275.2 14 Claims



1. A magneto-optic recording medium comprising a magneto-optic recording layer on a substrate,
said magneto-optic recording layer having, in the range of the Curie temperature Tc to (Tc-50) °C., a value of a product of a saturated magnetization Ms and a coercive force Hc of not more than 4×10^4 erg/cm^3.

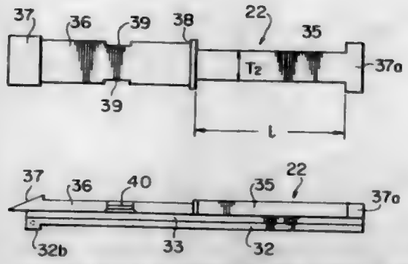
5,598,400

DISC CARTRIDGE HAVING AN OPENING/CLOSING SLIDER MECHANISM

Yoshito Tanaka, Ibaraki-ken, and Toshinori Sugiyama, Tsukuba, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Division of Ser. No. 291,573, Aug. 16, 1994, Pat. No. 5,495,467, which is a continuation of Ser. No. 956,304, Oct. 5, 1992, abandoned, which is a division of Ser. No. 548,568, Jul. 5, 1990, Pat. No. 5,166,844. This application Dec. 29, 1995, Ser. No. 580,646
Claims priority, application Japan, Jul. 5, 1989, 1-171818; Dec. 28, 1989, 1-150155; Dec. 28, 1989, 1-338163; Dec. 28, 1989, 1-338164; Dec. 28, 1989, 1-338166
Int. Cl.[6] G11B 23/03
U.S. Cl. 369—291 19 Claims

1. A disc cartridge to be loaded between two opposed heads of a disc drive comprising:
(A) a cartridge case comprising:
(1) two sides, each having a side surface, and which define a space for receiving a disc which is rotatable about an axis; and
(2) a cartridge case front edge situated at the portion of the cartridge case first inserted into said disc drive, comprising:
(a) a reinforcement portion comprising:
(i) two ends; and
(ii) a stepped cut out portion which can be passed through a space between two opposed heads of the disc drive upon loading of the disc cartridge into the disc drive; and



(b) guide means for guiding a sliding motion of a slider, wherein said guide means are located longitudinally outward of each end of said reinforcement portion;

(B) a shutter plate receiving surface on each side of said cartridge case for allowing a shutter plate means to slide therein, wherein said shutter plate receiving surface is recessed relative to said side surface of said cartridge case and extends rearward from said cartridge case front edge, thereby forming a shutter plate receiving recess;

(C) a head insertion window formed in each of said shutter plate receiving surfaces, wherein each head insertion window has a front end defined by said reinforcement portion;

(D) shutter plate means disposed in each said shutter plate receiving recess for covering and uncovering each of said head insertion windows upon sliding movement thereof; and

(E) a slider slidably mounted at said cartridge case front edge and fixed to said shutter plate means, wherein said slider comprises:

(1) a front slider portion, situated at the portion of said slider first loaded into said disc drive, comprising:

(a) a head insertion portion having two ends and a front surface, adapted to be situated at said front end of said head insertion window when said shutter plate means is moved to an uncovering position for fully uncovering said head insertion window, and of a width small enough to pass through said spacing between said two opposed heads of said disc drive upon loading said disc cartridge into said disc drive;

(b) a shutter mounting portion situated at one end of said head insertion portion, of a width greater than said width of said head insertion portion, fixed to said shutter plate means, and having a front surface which is recessed relative to said front surface of said head insertion portion; and

(c) a pin engagement portion, situated at the other end of said head insertion portion and of a width greater than said width of said head insertion portion; and

(2) a rear portion, situated at a rear position relative to said front portion of said slider; and

(3) a connecting portion connecting said front portion of said slider and said rear portion of said slider, having a width narrower than a width of said rear portion, thereby defining at either side of said slider a guide step engaging said guide means.

5,598,401

APPARATUS AND METHOD FOR A DIGITAL DATA COMMUNICATIONS DEVICE TO OPERATE IN AN ANALOG MODE

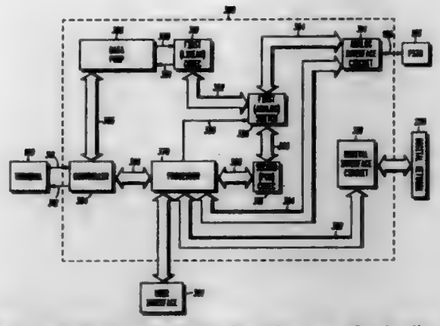
Steven R. Blackwell; John T. Pearson, both of Huntsville, Ala., and Charles C. Fridlin, IV, Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1995, Ser. No. 407,749

Int. Cl.[6] H04L 1/22

U.S. Cl. 379—94 **42 Claims**

1. A data communications device selectively operable in at least one of a plurality of operating modes, including a first operating mode and a second operating mode, the data communications device coupleable to a terminal and to at least two of a plurality of communications networks for transferring data between the terminal and one of the plurality of communications networks, including a first communications network and a second communications network, the data communications device comprising:



a controller;

a data pump coupled to the controller;

a first codec coupled to the data pump;

a second codec;

a first interface circuit coupleable to the first communications network;

a second interface circuit coupleable to the second communications network;

a first switch coupled to the first codec, to the second codec and to the first interface circuit; and

a processor coupled to the controller, to the second codec, to the first interface circuit, to the second interface circuit, and to the first switch, the processor responsive to a status signal to selectively configure the data communications device for operation in the first operating mode for communications through the first communications network and for operation in the second operating mode for communications through the second communications network.

5,598,402

MULTIPLEXER WITH TRANSMISSION BACK-UP FUNCTION

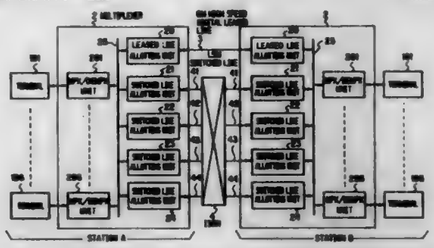
Tunetoshi Mizusawa, Tokyo, and Masahiko Saito, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Jun. 21, 1995, Ser. No. 493,133

Claims priority, application Japan, Jun. 22, 1994, 6-140376

Int. Cl.[6] H04J 3/22; H04L 1/22

U.S. Cl. 370—225 **4 Claims**



1. A multiplexer with transmission line back-up function, comprising:

a multiplexer part for converting the data signals from a plurality of terminals into a multiplexed signal and switching a transmitting side transmission line such that all time slots of the multiplexed signal are normally allotted to the side of a leased transmission line prepared for normal transmission line and allotted, in the event of a trouble in the leased transmission line, to the side of a plurality of parallel switched lines prepared for back-up, and a de-multiplexer part for switching a receiving side transmission line in correspondence to the multiplexer part and de-multiplexing multiplexed signal after the switching of the transmission line into a plurality of data signals sent to the terminal side;

the multiplexer part includes:

a plurality of multiplexer units for allotting the plurality of data signals to predetermined time slots of the multiplexed signal according to respectively corresponding multiplexing timing signals;

a multiplexed signal bus for transmitting the multiplexed signal to various parts in the system,

a leased line bus control address control memory for receiving multiplexing information and holding a leased line allotting signal for allotting all the time slots on the multiplexed signal bus to the leased line side;

a leased line switching circuit normally outputting the leased line bus allotting signal and switching the same signal according to a switching signal to a vacant bus allotting signal for allotting all the time slots on the multiplexed signal bus in the vacant state, a leased line buffer memory for receiving the multiplexed signal bus time slot signals according to an output signal of the leased line switching circuit and outputting the received signals as a leased line multiplexed signal;

a leased line interface unit sending out the converted signal format to the leased line side and converting a signal format by inserting a leased line sync signal in the leased line multiplexed signal;

a plurality of bus control address control memories for receiving the multiplexing information and holding a switched line bus allotting signal for allotting the multiplexed signal bus time slots dividedly to the corresponding switched lines;

a plurality of switched line switching circuits for outputting the switched line allotting signal according to the switching signal and normally outputting a vacant bus allotting signal for allotting the multiplexed signal bus time slots in the vacant state;

a plurality of switched line buffer memories for receiving the multiplexed signal bus time slot signals according to an output signal for the switched line switching circuit for conversion to a corresponding switched line side transmission speed to output as switched line multiplexed signal;

a plurality of switched line interface units for converting the signal format by inserting a switched line sync signal and a calling signal for line connection control in the switched line multiplexed signal and then sending the converted signal form to the corresponding switched line side;

a control unit for outputting the multiplexing timing signal, the multiplexing information, the leased line sync signal and the switched line sync signal by receiving a clock signal generated in the system, a received clock signal extracted in the de-multiplexer part and a received sync signal, outputting the switching signal and the calling signal by receiving a leased line trouble signal issued in the event of trouble in the leased line, and outputting the switching signal by receiving a calling signal output when the calling signal is received in the de-multiplexer part; and

a control bus for transmitting various input and output signals to and from the control unit to various parts in the system.

5,598,403

PATH SETTING CONTROL SYSTEM IN COMMUNICATION NETWORK

Noboru Tatsuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

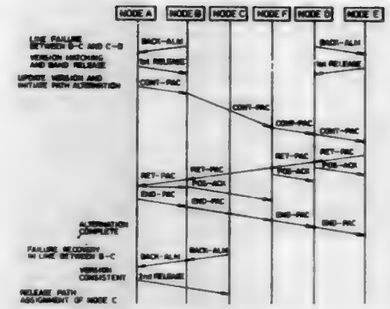
Filed Jun. 22, 1995, Ser. No. 494,565

Claims priority, application Japan, Jun. 22, 1994, 6-139943

Int. Cl.[6] H04J 3/14

U.S. Cl. 370—221 **11 Claims**

1. A path setting control system in a communication network including terminal nodes located at ends of a path for data transmission, and a plurality of relay nodes located at intermediate positions in said path, and performing alteration process of the path at the occurrence of simultaneous failure in transmission lines at both sides of one relay node among said plurality of relay nodes, said path setting control system comprising:



path alternation designating means included in a closest one of said plurality of relay nodes which is located at the closest position to said one relay node, for commanding alternation of said path to one of said terminal nodes in response to said failure; and

path releasing and alternating means incorporated in said one of said terminal nodes, for performing path releasing process and alternating process in response to said alternation command; and

path release designating means incorporated in said one of said terminal nodes, for commanding release of a currently set path for said one relay node in response to an alternation command for the path transmitted from said one relay node due to said failure of one of said transmission lines upon recovery of said failure in another one of said transmission lines.

5,598,404

TRANSMISSION DIVERSITY FOR A CDMA/TDD MOBILE TELECOMMUNICATION SYSTEM

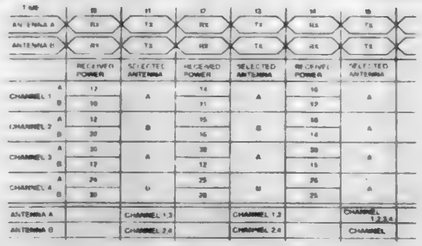
Masaki Hayashi, Yokohama; Kazuyuki Miya, Machida, and Osamu Kato, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 14, 1995, Ser. No. 388,416

Claims priority, application Japan, Feb. 16, 1994, 6-019365; Sep. 6, 1994, 6-212434

Int. Cl.[6] H04J 13/04; H04L 5/14; H04B 7/06

U.S. Cl. 370—342 **28 Claims**



21. A mobile telecommunication system for performing communication over a plurality of channels by utilizing a CDMA/TDD system, each channel having a spreading code assigned to it, said mobile telecommunication system including a base station which comprises:

a plurality of antenna means for receiving and radiating signals;

despreading means for despreading signals received by each of the antenna means using the spreading codes assigned to all of the channels, to thereby generate for every antenna means a set of despread signals for all of the channels;

comparison means for receiving the sets of despread signals and ascertaining the power level of the received signal for each channel at each of the antenna means;

spreading means for spreading transmission data for each channel with the spreading code assigned to that channel, to thereby generate a plurality spread data for all of the channels;

means, receiving signals from the comparison means, for selecting one of the antenna means from among the plurality of antenna means to radiate the spread data for each channel; and

multiplexing means for multiplexing spread data that have been selected for radiation by the same antenna means.

5,598,405

TIME DIVISION MULTIPLE ACCESS TIME DIVISION DUPLEX TYPE TRANSMITTER-RECEIVER

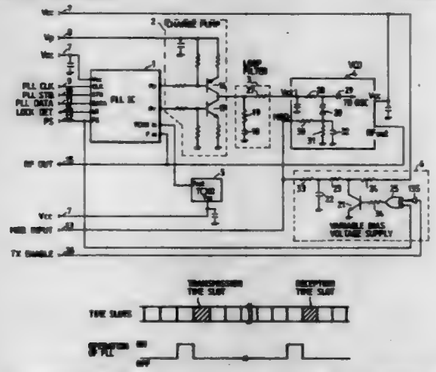
Yoshitaka Hirose, Soma, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1995, Ser. No. 377,571

Claims priority, application Japan, Jan. 25, 1994, 6-006482; Jan. 25, 1994, 6-006483

Int. Cl.[6] H03L 7/06

U.S. Cl. 370—280 **7 Claims**



1. A TDMA/TDD type transmitter-receiver for performing a signal transmission operation and a signal reception operation during each of a plurality of time frames, each time frame including a plurality of time slots having a common length, the signal transmission operation occurring during a transmission time slot and the signal reception operation occurring during a reception time slot of each time frame, wherein the transmission time slot and the reception time slot are separated by at least one time slot during which the transmitter-receiver performs neither of the signal transmission operation and the signal reception operation, the transmitter-receiver comprising a PLL synthsizer oscillator circuit which includes at least a PLL control circuit, a voltage-controlled oscillator and a loop filter,

wherein the voltage-controlled oscillator generates an output signal having a first frequency when performing the signal transmission operation and having a second frequency when performing the signal reception operation,

wherein the PLL control circuit is responsible for a control voltage through the loop filter supplied to the voltage-controlled oscillator, the control voltage having a first voltage level during the signal transmission operation and a second voltage level during the signal reception operation,

wherein the PLL control circuit is closed during a first period of a time just preceding the transmission time slot and during a second period of a time just preceding the reception time slot,

wherein the PLL control circuit is opened during the transmission and reception time slots, and

wherein during the transmission and reception time slots, a frequency of oscillation of the voltage-controlled oscillator is controlled by a voltage level stored by the loop filter.

5,598,406

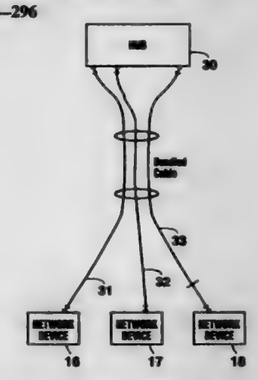
HIGH SPEED DATA TRANSFER OVER TWISTED PAIR CABLING

Alan Albrecht, Granite Bay; Steven H. Goody, Roseville, both of Calif.; Michael P. Spratt, Bath, England; Joseph A. Curcio, Jr., Folsom, and Daniel J. Dove, Applegate, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 246,536, May 20, 1994, Pat. No. 5,438,571, which is a continuation-in-part of Ser. No. 972,694, Nov. 6, 1992, Pat. No. 5,550,836. This application Jan. 12, 1995, Ser. No. 371,721

Int. Cl.[6] H04L 5/16

U.S. Cl. 370—296 **7 Claims**



7. In a local network system in which a hub is connected to each of a plurality of network nodes, a method for sending consecutive data packets to a first network node while allowing exchange of control signals between the hub and the first network node, the method comprising the steps of:

(a) transmitting the first data packet from the hub to the first network node, wherein transmission of the first data packet is performed using half-duplex transmission over all data channels between the hub and the first network node so that during the transmission of the first data packet the first network node is unable to transmit any information to the hub;

(b) transmitting an idle control signal from the hub to each of the network nodes, wherein transmission of the idle control signal is performed using duplex transmission between the hub and the first network node so that during the transmission of the idle control signal the first network node is able to transmit information, including a send request, to the hub; including the substep of:

(b.1) receiving at the hub any send request from the first network node and storing and scheduling the send request with any other received network node requests; and,

(c) transmitting a second data packet from the hub to the first network node, wherein transmission of the second data packet is performed using half-duplex transmission over all data channels between the hub and the first network node so that during the transmission of the second data packet the first network node is unable to transmit any information to the hub.

5,598,407

CORDLESS LOCAL AREA NETWORK HAVING A FIXED CENTRAL CONTROL DEVICE

Andrew Bud, Ivrea, and Rino Furno, Zimone, both of Italy, assignors to Sixtel S.p.A., Ivrea, Italy

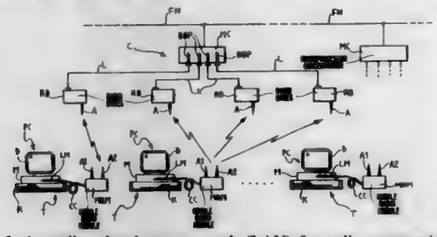
PCT No. PCT/EP92/02230, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/07684, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 28, 1992, Ser. No. 211,489

Claims priority, application Italy, Oct. 7, 1991, TO91A0757

Int. Cl.[6] H04J 4/00

U.S. Cl. 370—330 **18 Claims**



1. A cordless local area network (LAN) for radio communications of data between a plurality of user stations (T), through a central control device (C), each user station (T) comprising a mobile radio module (MRM), an adaptor device (LM) and a data terminal (PC) having a data bus (DB), said adaptor device (LM) (PC) being connected to said mobile radio module (MRM) by a flexible multicore cable (CC) and to said data bus (DB), said central control device (C) comprising a plurality of radio bases (RB) installed in respective predetermined fixed positions for providing cordless two-way communications of said data with said mobile radio modules (MRM) and a microprocessor concentrator (MC) connected to said radio bases (RB) by connecting lines (L), said adaptor device (LM) comprising:

—activating/de-activating means for activating/de-activating said cordless two-way communications,

—a buffer memory, and

—a main microprocessor which is connected to said data bus (DB), to said buffer memory (55), and to said activating/deactivating means, said main microprocessor being operable to control the exchange of said data with said data bus (DB) in a predetermined manner, to store said data into said buffer memory, and to pilot said activating/de-activating means in such a manner that said cordless two-way communications are activated each time said data are stored in said buffer memory and are kept open for a determined period of time after the transmission of said data has been completed.

5,598,408

SCALABLE PROCESSOR TO PROCESSOR AND PROCESSOR TO I/O INTERCONNECTION NETWORK AND METHOD FOR PARALLEL PROCESSING ARRAYS

John R. Nickolls, Los Altos; John Zapisek, Cupertino; Won S. Kim, Fremont; Jeffrey C. Kalb, Saratoga; W. Thomas Blank; Eliot Wegbreit, both of Palo Alto, and Kevin Van Horn, Mountain View, all of Calif., assignors to MasPar Computer Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 461,492, Jan. 5, 1990, Pat. No. 5,280,474. This application Jan. 14, 1994, Ser. No. 182,250

Int. Cl.[6] H04Q 11/00

U.S. Cl. 370—351 **29 Claims**

1. In a parallel processor having an array of processor elements, an interconnection network for indirectly routing data between a first set of the processor elements and a second set of the processor elements comprising:

a first bidirectional pipeline element having a set of first ports and a set of second ports;

first bidirectional routing path segments respectively coupled at first ends thereof to the first ports of the first pipeline element, and at second ends thereof to the processor elements, the first routing path segments including a first bidirectional switch stage responsive to header information on the first routing path segments to configure the first routing path segments; and

second bidirectional routing path segments respectively coupled at first ends thereof to the second ports of the first pipeline element, and at second ends thereof to the processor elements, the second routing path segments including a second bidirectional switch stage responsive to header information on the second routing path segments to configure the second routing path segments;

a second bidirectional pipeline element having a set of first ports and a set of second ports, the first routing path segments being coupled to the array of processor elements through the second pipeline element with second ends thereof being coupled to the first ports of the second pipeline element, and the second ports of the second pipeline element being coupled to the processor elements; and

a third bidirectional pipeline element having a set of first ports and a set of second ports, the second routing path segments being coupled to the array of processor elements through the third pipeline element with second ends thereof being coupled to the first ports of the third pipeline element, and the second ports of the third pipeline element being coupled to the processor elements.

5,598,409

PROGRAMMABLE TELECOMMUNICATIONS SWITCH FOR PERSONAL COMPUTER

Robert P. Madonna, W. Barnstable; Robert J. Buttell, Pocasset, and Mark P. Hebert, Kingston, all of Mass., assignors to Excel, Inc., Hyannis, Mass.

Continuation of Ser. No. 350,589, Dec. 6, 1994, abandoned, which is a continuation of Ser. No. 216,692, Mar. 23, 1994, abandoned, which is a continuation of Ser. No. 953,690, Sep. 29, 1992, Pat. No. 5,321,744. This application May 21, 1996, Ser. No. 651,123

Int. Cl.[6] H04M 3/00; 3/22

U.S. Cl. 370—364 **28 Claims**

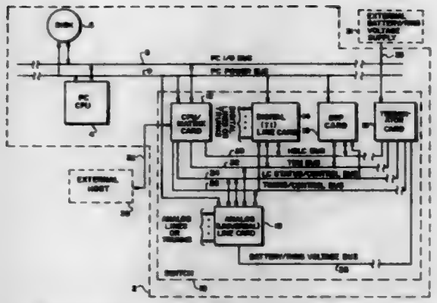
1. A programmable communications switch system comprising:

a personal computer including,

a time slot interchange,

a central call processor configured to perform real-time call control processing functions on said time slot interchange, and

an internal host computer having a first application-oriented operating system to run communications applications that control said central call processor; and



an external host computer having a second application-oriented operating system to run communications applications that control said central call processor;

a host selector coupled to said central call processor, configured to select one of said internal and external host computers to control said central call processor,

wherein said call control processor perfbrms all real-time call control processing in response to commands from said selected host computer,

wherein said selected host computer controls said central call processor exclusively of said non-selected host computer.

5,598,410

METHOD AND APPARATUS FOR ACCELERATED PACKET PROCESSING

Geoffrey C. Stone, Minneapolis, Minn., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 29, 1994, Ser. No. 366,225

Int. Cl.[6] H04L *12/56; G06F 13/00*

U.S. Cl. 370—469 **31 Claims**



30. A method for utilizing a protocol data unit processing device in a heterogeneous communication network to transfer protocol data units within the communication network, the method comprising the steps of:

(a) receiving a first and a second protocol data unit from the communication network, the first and the second protocol data unit being of different types;

(b) establishing subsequent processing requirements of the first and the second protocol data unit to generate at least one associated directive for each protocol data unit;

(c) synchronizing each protocol data unit with the at least one associated directive for each protocol data unit to generate a first and a second synchronized protocol data unit, respectively;

(d) restructuring each synchronized protocol data unit in accordance with the at least one associated directive for each protocol data unit to generate a first and a second restructured protocol data unit, respectively; and

(e) providing the first and the second restructured protocol data unit to other components in the communication network.

5,598,411

ISDN TERMINAL ADAPTER CAPABLE OF AUTOMATICALLY CHANGING FROM A PACKET SWITCHING MODE TO A CIRCUIT SWITCHING MODE

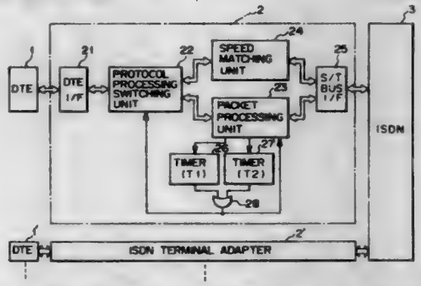
Yoshiki Matsukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 350,999

Claims priority, application Japan, Dec. 1, 1993, 5-329694

Int. Cl.[6] H04J *3/24*

U.S. Cl. 370—352 **19 Claims**



1. An integrated service digital network (ISDN) terminal adapter for connecting a terminal and an ISDN, comprising:

packet switching means, operatively connected to said terminal and said ISDN, for establishing data communication by packet switching;

circuit switching means, operatively connected to said terminal and said ISDN, for establishing data communication by circuit switching;

selecting means, operatively connected to said packet switching means and said circuit switching means, for selecting one of said packet switching means and said circuit switching means;

first timer means, operatively connected to said packet switching means for counting a first time period during which no response is received when said packet switching means establishes said data communication by packet switching, said first timer means controlling said selecting means to select said circuit switching means when the first time period exceeds a first value; and

second timer means, operatively connected to said packet switching means and said selecting means, for counting a second time period from a first time corresponding to transmitting a data packet to a second time corresponding to receiving an acknowledgment of receipt of the data packet after said packet switching means establishes said data communication by packet switching, said second timer means controlling said selecting means to select said circuit switching means when the second time period exceeds a second value.

5,598,412

SWITCHING ARRANGEMENT FOR WIRELESS TERMINALS CONNECTED TO A SWITCH VIA A DIGITAL PROTOCOL CHANNEL

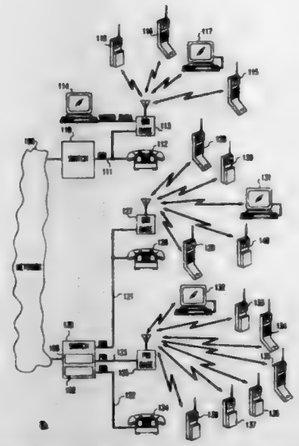
Gary L. Griffith, Arvada; Michael L. Nienaber, Thornton, and Norman W. Petty, Boulder, all of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 176,183, Jan. 3, 1994, abandoned. This application Oct. 24, 1995, Ser. No. 547,643

Int. Cl.[6] H04L *12/50;12/56*

U.S. Cl. 370—352 **27 Claims**

1. A switch arrangement comprising:



a switch including a plurality of ports and means for coupling signals between a pair of said ports, where each of the ports includes at least one circuit switched information channel and at least one packet switched channel, said switch for providing communications features usable by wired terminals to any terminals that are connected to said ports; and

a wireless base station connected to one of said ports, said wireless base station using only said features usable by wired terminals in its interactions with the switch to provide wireless communications to wireless terminals.

5,598,413

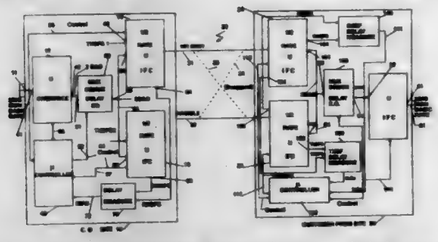
FOUR-WIRE, HALF-RATE ARCHITECTURE WITH EMBEDDED DIFFERENTIAL DELAY COMPENSATION FOR EXTENDING RANGE OF BASIC RATE ISDN COMMUNICATIONS

Michael S. Sansom, Huntsville; Lonnie S. McMillian, Madison; Roger W. Cain, Somerville; Robert J. Toth, Huntsville, and Gary M. Willoughby, Harvest, all of Ala., assignors to Adtran, Inc., Huntsville, Ala.

Filed Jul. 10, 1995, Ser. No. 500,441

Int. Cl.[6] H04T *3/06*

U.S. Cl. 370—468 **21 Claims**



1. A method of conducting integrated services digital network (ISDN) communications between a first site and a second site comprising the steps of:

(a) providing a plurality of transmission paths between said first and second sites;

(b) measuring the differential transport delay between respective ones of said plurality of transmission paths;

(c) demultiplexing a basic rate ISDN communication channel supplied to said first site into a plurality of sub-rate ISDN communication channels, and transmitting respective ones of said plurality of sub-rate ISDN communication channels over respective ones of said plurality of transmission paths from said first site to said second site, such that the transmission frequency of a respective sub-rate ISDN channel corresponds to the frequency of said basic rate ISDN communication channel divided by the number of sub-rate ISDN communication channels in said plurality of sub-rate ISDN communication channels; and

(d) at said second site, multiplexing said plurality of sub-rate ISDN communication channels transmitted in step (c) into a basic rate ISDN channel for delivery to a basic rate ISDN link served by said second site, in such a manner as to compensate for the differential transport delay between said respective ones of the plurality of transmission paths between said second site and said first site, and wherein step (b) comprises the steps of:

(b1) transmitting, over one of said transmission paths from said first site to said second site, framing structure of one of said plurality of sub-rate ISDN channels with a prescribed lead time relative to the framing structure of another of said plurality of sub-rate ISDN channels that is transmitted over another of said transmission paths from said first site to said second site, and

(b2) at said second site, measuring the differential delay between framing structures of said one and said another of said plurality of sub-rate ISDN channels, so as to provide said measure of said differential transport delay between said one and said another of said plurality of transmission paths, and

wherein step (b1) includes conveying information in an out of band maintenance channel of one of said sub-rate channels that marks said one of said sub-rate channels with information that allows step (b2) to determine differential transport delay between said transmission paths independent of connections of said transmission paths to said first and second sites.

5,598,414

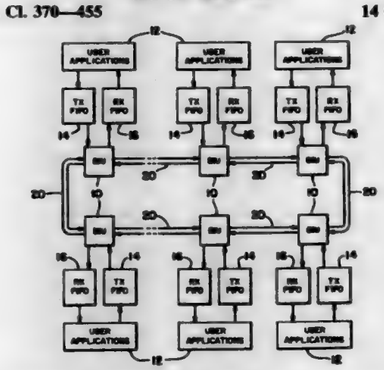
ACCESS TO TRANSMIT ON A MESSAGE PRIORITY BASIS

Robert A. Walser, Box 1240, 2395 Campo Flores La., West Point, Calif. 95255, and Earl E. Rydell, R.R. #1, Box 326F, Swisher, Iowa 52338

Continuation of Ser. No. 652,805, Feb. 6, 1991, abandoned. This application Jun. 4, 1993, Ser. No. 72,664

Int. Cl.[6] H04J *3/02*

U.S. Cl. 370—455 **14 Claims**



1. A method for granting to a station access to transmit on a ring bus based on priorities accorded to data message frames awaiting transmission comprising:

assigning a priority number to each data message frame adapted for transmission on the ring bus;

circulating on the ring bus a token having a priority field adapted to receive said priority number;

at a station having a data message frame awaiting transmission entering the priority number of said data message frame into the priority field of the token;

granting access to transmit only after processing the token to assure that no other station has another data message frame having a higher priority;

transmitting a "busy" condition that prevents any other station from gaining access to transmit; and

wherein the token having an entered priority number less than the "highest" possible is processed by:

circulating the token to each other station on the ring bus after entry of the priority number;

at each other station having another data message frame awaiting transmission, modifying the priority number in the priority field of the token only if the priority number at said other station is higher than the priority number previously entered; and

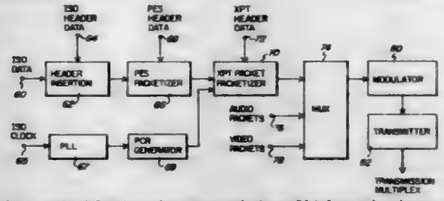
granting access to transmit to whichever station receives the token having the priority number that was previously entered into the priority field by it.

5,598,415

TRANSMISSION OF HIGH RATE ISOCHRONOUS DATA IN MPEG-2 DATA STREAMS

Ray Nuber, La Jolla, and Paul Moroney, Olivenhain, both of Calif., assignors to General Instrument Corporation of Delaware, Chicago, Ill.

Filed Aug. 4, 1995, Ser. No. 511,266
Int. Cl.[6] H04J 3/00
U.S. Cl. 370—474 **22 Claims**



1. A method for the robust transmission of high rate isochronous data in an MPEG-2 type transport stream, comprising the steps of:

providing said isochronous data in a packetized elementary stream (PES) having a PES header preceding a PES payload, said PES payload including an isochronous data header followed by a plurality of isochronous data presentation units;

aligning said isochronous data header and the presentation units which follow within said PES such that the first byte of the isochronous data header immediately follows the last byte of the PES header;

inserting a clock increment value in said isochronous data header specifying the ratio of said isochronous data rate to a reference clock rate, said clock increment value enabling said isochronous data rate to be derived from said reference clock rate at a decoder; and

packaging said PES into a plurality of isochronous data transport packets such that a first payload byte of each transport packet is the first byte of an isochronous data presentation unit and a last payload byte of each of said packets is the last byte of an isochronous data presentation unit.

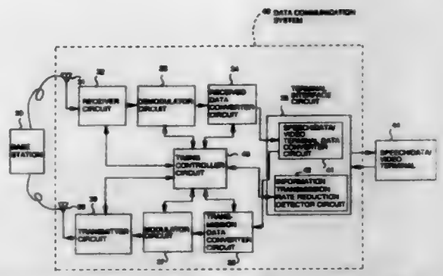
5,598,416

DATA COMMUNICATION SYSTEM

Daisuke Yamada, Kawasaki, and Osamu Kato, Yokohama, both of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Feb. 10, 1995, Ser. No. 386,463
Claims priority, application Japan, Feb. 18, 1994, 6-020950
Int. Cl.[6] H04J 3/16
U.S. Cl. 370—468 **10 Claims**

1. A data communication system provided between a base station and a terminal, said data communication system receiving



transmission data from said terminal and transmitting said transmission data to said base station through at least one usable channel in a plurality of channels, said data communication system comprising:

(a) a terminal interface which comprises:

(i) means for determining whether a number of usable channels included in said at least one usable channel is sufficient for transmission of the transmission data at one of a first information transmission rate and a first source encoding rate;

(ii) means for requesting said terminal to reduce an information transmission rate, at which said transmission data is transmitted, from said first information transmission rate to a second information transmission rate when the means for determining determines that the number of usable channels is insufficient for transmission at said first information transmission rate and for requesting said terminal to reduce a source encoding rate, with which said transmission data is generated, from said first source encoding rate to a second source encoding rate when said means for determining determines that the number of usable channels is insufficient for transmission at said first source encoding rate;

(b) a received data converter circuit for receiving from said base station a first signal including a control signal indicating said number of usable channels;

(c) timing control means for receiving from said terminal a second signal indicating a number of said plurality of channels which said terminal desires to use for transmitting said transmission data and for generating a transmission control signal which indicates said number of channels which said terminal desires to use;

(d) said received data converter circuit providing said control signal to said timing control means, said timing control means detecting said number of usable channels from said control signal and informing said means for determining of said number of usable channels; and

(e) a transmission data converter circuit for adding said transmission control signal received from said timing control means to the transmission data received from said terminal for transmission to said base station.

5,598,417

DYNAMIC CONTROL OF A DATA CHANNEL IN A TDM WIRELESS COMMUNICATION SYSTEM

Kenneth J. Crisler, Lake Zurich, and Michael L. Needham, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 431,173, Apr. 28, 1995, abandoned.
This application May 13, 1996, Ser. No. 644,929
Int. Cl.[6] H04J 3/16
U.S. Cl. 370—348 **33 Claims**

1. In a TDM wireless communication system comprising a plurality of communication units and a central controller that



allocates a plurality of time slots among the plurality of communication units, wherein the plurality of communication units are logically divided into a first group and a second group, and wherein a data channel allocated to the second group comprises a portion of the plurality of time slots, a method for the central controller to dynamically control the portion of the plurality of time slots, the method comprising steps of:

a) receiving from a communication unit of the first group a request for at least one time slot of the plurality of time slots;

b) transmitting, via the data channel, responsive to the request, a data channel update message to the second group, wherein the data channel update message comprises an allocation profile that indicates the portion of the plurality of time slots; and

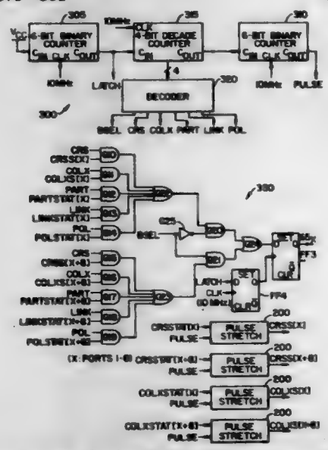
c) allocating the at least one time slot to the communication unit of the first group once the data channel update message has been transmitted.

5,598,418

REPEATER STATUS LED ARRAY INTERFACE

William Lo, Santa Clara, and Stephen McRobert, Sunnyvale, both of Calif., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Filed Nov. 10, 1994, Ser. No. 337,633
Int. Cl.[6] H04J 3/14
U.S. Cl. 370—501 **11 Claims**



11. An apparatus for interfacing between a repeater and an indicator array, the apparatus comprising:

means for multiplexing a first plurality of status signals generated by the repeater for each of a second plurality of ports onto a third plurality of status signal lines, wherein said third plurality is less than said second plurality; and

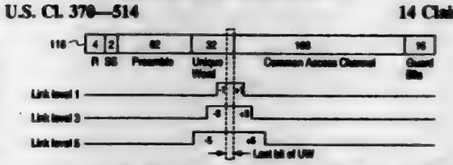
means, coupled to said means for multiplexing, for activating indicators of the indicator array for a status period responsive to particular ones of said plurality of status signals asserted on said third plurality of status lines.

5,598,419

DYNAMIC SYNCHRONIZATION CODE DETECTION WINDOW

David L. Weigand, Sunnyvale, Calif., and Charles J. Maick, Crystal Lake, Ill., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 17, 1995, Ser. No. 502,875
Int. Cl.[6] H04J 3/06; H04L 7/00
U.S. Cl. 370—514 **14 Claims**



1. A synchronization method performed by a TDMA communication system, said system transmitting and receiving bursts of serial data within time slots, said method comprising the steps of:

comparing received data with a predetermined slot synchronization code;

detecting a first match between a received synchronization code and said predetermined synchronization code;

dynamically adjusting a size of a time window for detecting a last bit of a subsequently received synchronization code matching said predetermined synchronization code;

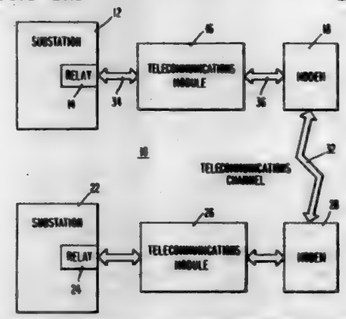
after said step of dynamically adjusting, detecting a second match between subsequently received data and said predetermined synchronization code; and determining whether a last bit of said data qualifying as said second match occurs within said time window and, if so, synchronizing slot times in said TDMA communication system with said received synchronization code.

5,598,420

APPARATUS AND METHOD FOR GENERATING A POWER SIGNAL FOR A POWER SYSTEM FROM SIGNALS GENENRATED BY A COMMUNICATION DEVICE

Barry M. Kaufman, Pine Brook, N.J., assignor to ABB Power T&D Company, Inc., Raleigh, N.C.

Continuation of Ser. No. 134,291, Oct. 8, 1993, abandoned.
This application Dec. 22, 1995, Ser. No. 577,063
Int. Cl.[6] G06F 11/00
U.S. Cl. 371—20.1 **26 Claims**



1. A method of generating a power signal for a power system from signals generated by a communications device, said method comprising the steps of:

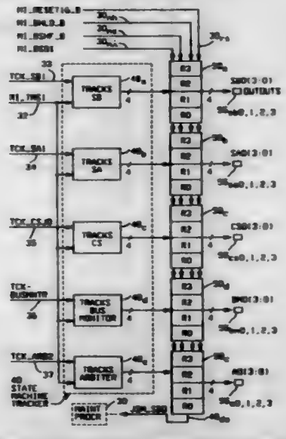
a) determining error signals from the signals generated by the communications device;
b) determining, as a function of said error signals, whether said communications device is operating within an allowable error bandwidth of the power system; and
c) when the communications device is operating within the allowable error bandwidth, generating the power signal from the signals generated by the communications device and when the communications device is not operating within the allowable error bandwidth, generating the power signal from a guard signal where the power system ignores the power signal when it is generated from a guard signal.

5,598,421

METHOD AND SYSTEM FOR TRACKING THE STATE OF EACH ONE OF MULTIPLE JTAG CHAINS USED IN TESTING THE LOGIC OF INTERGRATED CIRCUITS

Dan T. Tran; Wayne C. Dutwyler, both of Laguna Niguel, and Long V. Ha, Walnut, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 17, 1995, Ser. No. 390,712
Int. Cl.[6] G01R *31/28*
U.S. Cl. 371—22.3 **6 Claims**



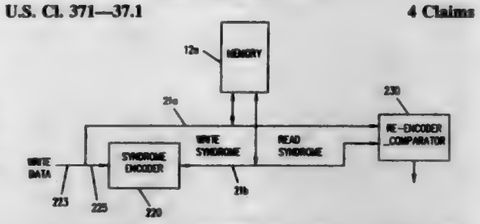
6. In a digital network having multiple integrated circuits each of which has a dedicated JTAG register chain for testing and diagnosing said integrated circuits wherein each said JTAG register chain operates through 14 states such that 7 states are sequenced for a data register and 7 states are sequenced for an instruction register using the standard 7-step sequence provided by the JTAG IEEE Standard 1149.1, a system for sensing the present state condition of each JTAG register chain comprising:
(a) means for using a digital bit code to establish each state of said 7 data register sequences and 7 instruction register sequences plus codes for an Idle state and Run Test state;
(b) means for setting each of said JTAG registers into said Run Test state;
(c) means for stepping said Data Register and said Instruction Register through said sequeace of 7 states;
(d) JTAG tracker means including:
(d1) a dedicated JTAG tracker for monitoring each one of said dedicated JTAG register chains;
(d2) readout means for reading out the said digital bit code indicating the present state of a selected one of said dedicated JTAG register chains;
(e) means for shifting the state of any one of said JTAG register chains from its presently known state to a desired subsequent state.

5,598,422

DIGITAL COMPUTER HAVING AN ERROR CORRECTION CODE (ECC) SYSTEM WITH COMPARATOR INTEGRATED INTO RE-ENCODER

Michael L. Longwell, and Paul F. Groepler, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 273,512, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 13,128, Feb. 3, 1993, abandoned, which is a continuation of Ser. No. 516,628, Apr. 30, 1990, abandoned. This application Sep. 7, 1995, Ser. No. 531,572
Int. Cl.[6] H03M *13/00*
U.S. Cl. 371—37.1 **4 Claims**



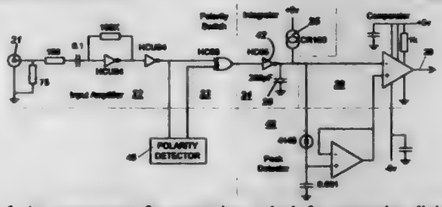
1. An error correction code (ECC) system for a computer system including an ECC syndrome encoder for generating an initial M-bit syndrome from each N-bit digital word for use in the computer, said ECC system comprising:
receiving circuitry for receiving each N-bit digital word and its associated initial ECC M-bit syndrome; and
M syndrome bit generators each coupled to said receiving circuitry for combining a unique pattern of less than N bits from the N-bit digital words from the receiving circuitry with a unique pattern of less than M bits from the initial M-bit syndromes, with each of the N bits providing an input to a plurality of less than M syndrome bit generators, each generator providing a corresponding error bit of an error code.

5,598,423

VERY LOW JITTER CLOCK RECOVERY FROM SERIAL AUDIO DATA

Edmund Meitner, 4637 Mac Leod Tr. S.W., Calgary/Alberta, Canada

Continuation of Ser. No. 802,332, Dec. 4, 1991, Pat. No. 5,404,362. This application Jan. 3, 1995, Ser. No. 367,833
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—47.1 **7 Claims**



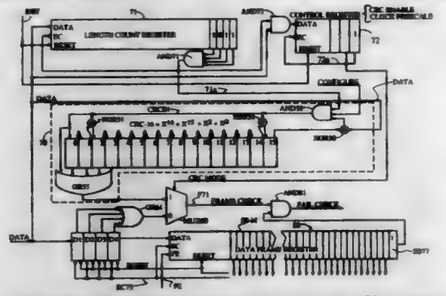
1. An arrangement for generating a clock for processing digital audio signals in a digital audio system receiving digital signals representing audio information in a predetermined code, wherein said digital information includes data information subdivided in blocks of data including block identifying preamble information, said preamble information including a signal violating said predetermined code, comprising
means for generating an unipolar pulse sequence repreasenting said digital signal; and
analog circuit means for detecting said code violating signal in said unipolar pulse sequence and outputting a preamble repetition frequency signal.

5,598,424

ERROR DETECTION STRUCTURE AND METHOD FOR SERIAL OR PARALLEL DATA STREAM USING PARTIAL POLYNOMIAL CHECK

Charles R. Erickson, Fremont; Philip M. Freidin, Sunnyvale, both of Calif., and William A. Wilkie, Edinburgh, Scotland, assignors to Xilinx, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 641,994, Jan. 16, 1991, Pat. No. 5,321,704. This application Jun. 14, 1994, Ser. No. 259,765
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—48 **2 Claims**



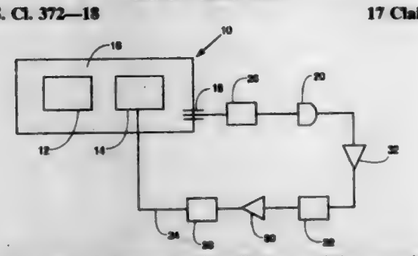
1. Structure for detecting an error in a parallel set of bit streams, comprising:
means for receiving said parallel set of bit streams;
means for generating an error checkword from said parallel set of bit streams, at least one bit of said error checkword being a function of all previously transmitted bits in said parallel set of bit streams;
means for testing a function of said error checkword including said at least one bit; and
means for counting bits in said parallel set of bit streams wherein at a given count said means for counting bits activates said means for testing a function;
in which said means for generating an error checkword comprises a computer controlled by a software algorithm.

5,598,425

HIGH STABILITY ULTRA-SHORT SOURCES OF ELECTROMAGNETIC RADIATION

Ravinder K. Jain, Albuquerque, N.M.; John G. McInerney, Cork, Ireland; Kalidev'Apura P. J. Reddy, Mathikere, Ind., and Chi Yan, Albuquerque, N.M., assignors to University of New Mexico, Albuquerque, N.M.

Filed Nov. 15, 1993, Ser. No. 153,012
Int. Cl.[6] H01S *3/098*
U.S. Cl. 372—18 **17 Claims**



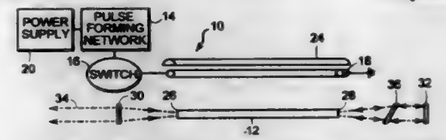
1. A source of electromagnetic radiation consisting essentially of:
an amplifying medium and a resonant cavity having an output;
means for generating a drive signal derived from a regenerative feedback signal generated from a portion of said output, further characterized in that said portion is passed through a narrow bandpass filter in generating said regenerative feedback signal and characterized as free of a frequency divider and as free of an external frequency synthesizer; and,
means for modulating said electromagnetic radiation within said cavity, said modulation means driven by said drive signal whereby subsequent output is characterized as having pulse durations shorter than about 10,000 periods of the center frequency of said electromagnetic radiation unless restricted to longer pulse durations by the gain band width of the amplifying medium.

5,598,426

METHOD AND DYE LASER APPARATUS FOR PRODUCING LONG PULSES OF LASER RADIATION

James C. Hsia, Andover, and Rafael A. Sierra, Palmer, both of Mass., assignors to Candela Laser Corporation, Wayland, Mass.

Filed Feb. 3, 1995, Ser. No. 383,412
Int. Cl.[6] H01S *3/20*
U.S. Cl. 372—53 **14 Claims**



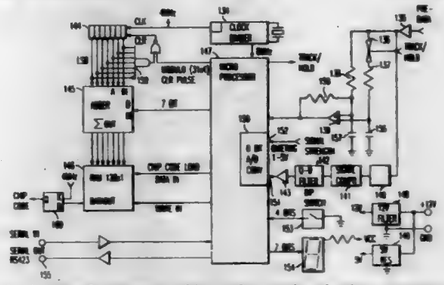
1. A method of generating a pulsed beam of laser radiation having a long duration, comprising:
generating an excitation pulse having (i) a constant amplitude in coordination with a constant lasing threshold for a flashlamp-excited dye laser and (ii) an increasing amplitude in coordination with an increasing lasing threshold for the flashlamp-excited dye laser;
driving the flashlamp-excited dye laser with the excitation pulse; and
producing a pulsed output beam of laser radiation from the flashlamp-excited dye laser of at least 500 microseconds in duration.

5,598,427

WIRELESS ALARM SYSTEM

James D. Arthur, Costa Mesa, Calif.; H. Britton Sanderford, Jr., New Orleans, and Robert E. Rouquette, Kenner, both of La., assignors to Azonn Corporation, New Orleans, La.

Division of Ser. No. 569,682, Aug. 20, 1990, Pat. No. 5,095,682, which is a continuation of Ser. No. 266,461, Nov. 2, 1988, Pat. No. 4,977,577. This application Oct. 24, 1991, Ser. No. 782,345
The portion of the term of this patent subsequent to Feb. 28, 2014, has been disclaimed.
Int. Cl.[6] H04B *1/69*
U.S. Cl. 375—200 **11 Claims**



1. A spread spectrum chip code synchronization apparatus, coupled to a baseband output of a receiver, the spread spectrum chip code synchronization apparatus comprising:

means coupled to the baseband output of said receiver for sampling and digitizing a plurality of analog baseband signals, from the baseband output of said receiver, as a plurality of data signals, wherein each of the analog baseband signals is sampled and digitized as one of the plurality of data signals during one chip time;

register means, including a plurality of shift registers, said register means coupled to said sampling and digitizing means, for shifting the plurality of data signals sequentially through the plurality of shift registers; and

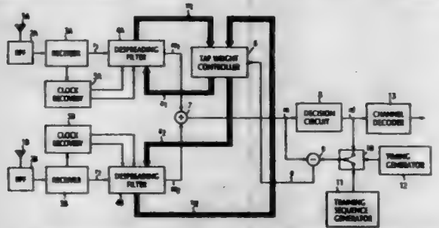
means coupled to said register means for adding in parallel each of the plurality of data signals stored in said plurality of shift registers with a respective one of a plurality of weights, as a respective result, and for adding sequentially the results as a correlation sum for attaining chip code synchronization.

5,598,428

DS/CDMA DIVERSITY RECEIVER WITH DESPREADING FILTERS USING COMBINER WHEREIN FIRST AND SECOND DESPREADING FILTERS ARE DELAYED WITH RESPECT TO EACH OTHER BY A PERIOD OF HALF THE CHIP RATE

Toshifumi Sato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 356,952
Claims priority, application Japan, Dec. 16, 1993, 5-316173
Int. Cl.[6] H04K *1/00*; H04B *15/00*
U.S. Cl. 375—206 **9 Claims**



1. A direct-sequence code division multiple access receiver comprising:

a first diversity branch having a first antenna, a first receiver connected thereto for recovering a transmitted symbol which was spread at a chip rate with a spreading code of predetermined length, and a first despreading filter comprising a tapped delay line having a series of taps for successively delaying a recovered symbol to produce tap signals, a plurality of multipliers for weighting the tap signals with a first vector of tap weight coefficients, and an adder for summing the weighted tap signals to produce an output signal of the first despreading filter;

a second diversity branch having a second antenna, a second receiver connected thereto for recovering a transmitted symbol which was spread at the chip rate with the spreading code, and a second despreading filter comprising a tapped delay line having a series of taps for successively delaying the recovered symbol to produce tap signals, a plurality of multipliers for weighing the tap signals with a second vector of tap weight coefficients, and an adder for summing the weighted tap signals to produce an output signal of the second despreading filter;

the tap signals of the first and second despreading filters being delayed with respect to each other by a period equal to half the reciprocal of the chip rate and the number of the taps of the delay lines of the first and second despreading filters defining a length which equals an integral multiple of the length of the spreading code;

a diversity combiner for combining the output signals of said first and second despreading filters to produce a combined signal;

a decision circuit for making a threshold decision based on said combined signal to produce a decision output signal;

means for detecting a decision error from said combined signal and said decision output signal; and

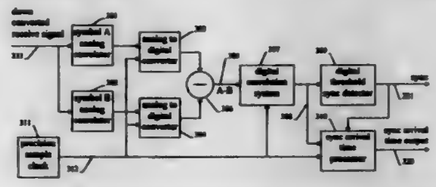
control means for controlling said first and second vectors of tap weight coefficients with the tap signals of said first and second despreading filters and said decision error so that the decision error is reduced to a minimum.

5,598,429

MULTI-LEVEL CORRELATION SYSTEM FOR SYNCHRONIZATION DETECTION IN HIGH NOISE AND MULTI-PATH ENVIRONMENTS

Kenneth E. Marshall, 8179 San Leandro, Dallas, Tex. 75218

Filed Jul. 15, 1994, Ser. No. 276,033
Int. Cl.[6] H04L *27/30*
U.S. Cl. 375—210 **2 Claims**



1. A method for two level correlation and detection of a synchronization pattern comprising the steps of:

a. correlating a down converted, received signal for coincidence with two expected unique symbol chip sequences, to generate two symbol correlator outputs;

b. sampling and converting the two symbol correlator outputs into digital format;

c. finding the binary difference of the two symbol correlator outputs and applying the differential result to inputs of top level, synchronization pattern, digital correlators;

d. programming the top level digital correlators for an expected synchronization pattern and signature;

e. calculating a dynamic threshold level using average received signal strength during a synchronization period and average correlator output during a specified period, as inputs for a table lookup of precalculated threshold values;

f. detecting the arrival of the synchronization pattern when an output of the top level digital correlators exceeds the dynamic threshold level;

g. processing outputs of the top level digital correlators to determine a precise synchronization arrival time; and

h. comparing the output of the top level digital correlators to determine a received synchronization signature.

5,598,430

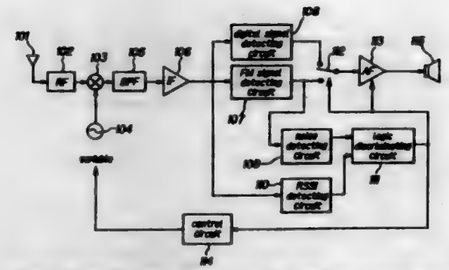
ANALOG/DIGITAL RECEIVER

Yumi Hachisuka, Matsudo, and Kiyoshi Tanaka, Chiba, both of Japan, assignors to Uniden Corporation, Chiba, Japan

Filed Dec. 20, 1994, Ser. No. 359,384
Claims priority, application Japan, Nov. 15, 1994, 6-280966
Int. Cl.[6] H04L *25/00*; *27/00*
U.S. Cl. 375—216 **8 Claims**

1. An analog/digital receiver comprising:

a receiver stage for a received signal;



a digital signal detector for detecting a digital signal output from said receiver stage;

an analog signal detector for detecting an analog signal output from said receiver stage;

a noise detector for determining whether a noise component output from said analog signal detector is not less than a specified value;

an RSSI detector for determining whether received signal strength output from said receiver stage is not less than a specified value;

a discriminator for making a determination as to whether said received input is an analog modulation signal or a digital modulation signal according to the determination made by said noise detector as well as by the RSSI detector; and

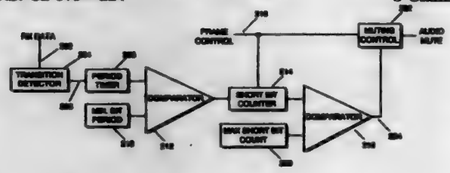
a selector for selecting either the output from said digital signal detector or the output from said analog signal detector according to the result of determination by said discriminator.

5,598,431

METHOD AND APPARATUS FOR SIGNAL QUALITY DETECTION IN A COMMUNICATION SYSTEM

Gary S. Lobel, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1994, Ser. No. 363,769
Int. Cl.[6] H04B *3/46*
U.S. Cl. 375—224 **8 Claims**



5. A method of muting audio in a communication device, comprising the steps of:

establishing a muting threshold;

establishing an unmuting threshold;

receiving digital data in the form of bits;

determining if a bit transition is detected;

determining the elapsed time between a current bit transition and a previous bit transition;

comparing the elapsed time to a predetermined bit length;

incrementing a counter in response to the elapsed time between the current transition and the previous transition being less than the predetermined bit length;

muting the audio when the counter exceeds the muting threshold;

determining whether the end of a receive frame is received; and

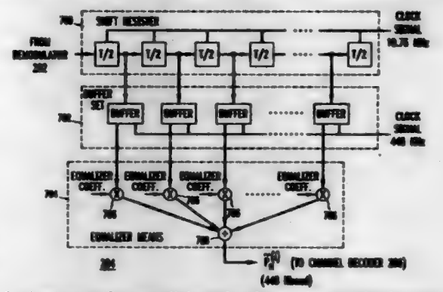
unmuting the audio when the counter exceeds the unmuting threshold and the end of a receive frame has been determined.

5,598,432

METHOD AND APPARATUS FOR EQUALIZING RECEIVED SIGNAL SAMPLES BY RECEIVING INPUT IN A REGISTER AT A RATE GREATER THAN OR EQUAL TO THE FIRST RATE INTO A PLURALITY OF REGISTERS SAMPLES AT A SECOND RATE LOWER THAN THE COUPLED TO ONE STORAGE ELEMENT OF THE REGI

Lee-Fang Wei, Lincroft, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 110,907, Aug. 24, 1993, abandoned.
This application Apr. 2, 1996, Ser. No. 627,829
Int. Cl.[6] H03H *7/30*
U.S. Cl. 375—229 **18 Claims**



1. Apparatus for equalizing signal samples received over a channel, the signal samples representing a predetermined number of signals, the apparatus comprising:

a shift register having a plurality of storage elements, the shift register adapted to receive signal samples from the channel at a first clock rate;

a plurality of registers, each of the plurality of registers being coupled to a respective one of the storage elements to receive and store signal samples at a second clock rate that is lower than a symbol rate at which symbols are transmitted over the channel; and

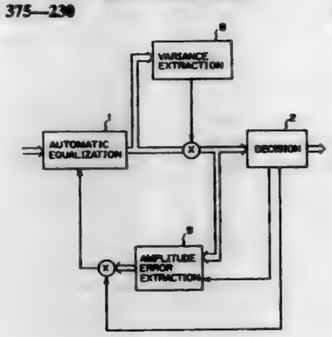
means, coupled to the plurality of registers, for equalizing a signal sample of a first signal and at least one sample of a second signal to generate an equalized output symbol for the first signal.

5,598,433

AUTOMATIC EQUALIZER AND DATA MODE CONVERGENCE METHOD

Takashi Kaku, and Kyoko Hirao, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 11,700, Feb. 1, 1993, abandoned.
This application May 15, 1995, Ser. No. 441,014
Claims priority, application Japan, Jan. 31, 1992, 4-016185
Int. Cl.[6] H04B *3/04*
U.S. Cl. 375—230 **18 Claims**



1. An automatic equalizer comprising:

a transversal automatic equalizing section for supplying an output signal, said transversal automatic equalizing section having a tap coefficient;

variance extracting means for extracting a degree of output signal distribution on two-dimensional coordinates of said transversal automatic equalizing section and for correcting said output signal of said transversal automatic equalizing section to a selected level according to said extracted output signal distribution and outputting the corrected output signal;

first decision means for receiving the corrected output signal and deciding a signal point corresponding to the corrected output signal received from said variance extracting means; and

phase compensating means for amending the tap coefficient of said transversal automatic equalizing section, according to an error signal obtained based on a predecision input signal and a postdecision output signal from said first decision means.

5,598,434

AUTOMATIC EQUALIZER WITH A BRANCHED INPUT FOR IMPROVED ACCURACY

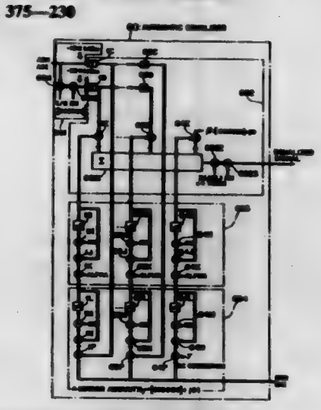
Takashi Kaku; Ryoji Ohira, and Hideo Miyazawa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 7, 1995, Ser. No. 524,835

Claims priority, application Japan, Dec. 28, 1994, 6-317333

Int. Cl.[6] H03H *7/30*

U.S. Cl. 375—230 **6 Claims**



1. An automatic equalizer, comprising:

an equalization calculation section including a plurality of delaying sections, a tap coefficient multiplication section and a totaling calculation section;

a tap coefficient error correction section for correcting errors of tap coefficients for said equalization calculation section based on an input from an input level setting section and an output from said automatic equalizer; and

said input level setting section for setting an input signal level to said equalization calculation section and an input signal level to said tap coefficient error correction section to levels different from each other.

5,598,435

DIGITAL MODULATION USING QAM WITH MULTIPLE SIGNAL POINT CONSTELLATIONS NOT EQUAL TO A POWER OF TWO

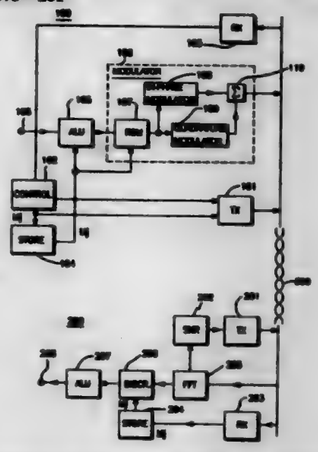
Richard G. C. Williams, Suffolk, England, assignor to British Telecommunications public limited company, London, England

Filed Feb. 4, 1994, Ser. No. 192,092

Claims priority, application European Pat. Off., Dec. 23, 1993, 93310461

Int. Cl.[6] H04K *1/10*; H03M *7/02*; H04L *17/02*

U.S. Cl. 375—261 **12 Claims**



1. An apparatus for transmission of data using quadrature amplitude modulation, said apparatus comprising:

(a) modulation means controllable to produce consecutive output symbols in which a plurality of carriers of different frequencies each have a selected phase and amplitude;

(b) mapping means for controlling modulation of a carrier in accordance with a signal point constellation having a plurality of signal points, wherein at least two carriers are controlled in accordance with signal point constellations having mutually different numbers of points and wherein at least two signal point constellations have a number of points not equal to a power of two;

(c) conversion means operable to receive a group of bits to be transmitted by two or more carriers controlled in accordance with signal point constellations having a number of points not equal to a power of two and to generate from the group of bits, considered as a binary number, the digits of a number having the same numerical value, the base of each digit being the number of points in the signal point constellation employed for a respective carrier, the mapping means being responsive to a respective digit to select a point from the relevant signal point constellation.

5,598,436

DIGITAL TRANSMISSION SYSTEM WITH PREDISTORTION

Américo Brajal, Villeneuve-Le-Roi, and Antoine Chouly, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

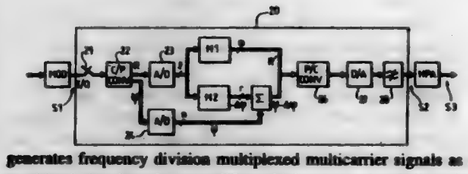
Filed Jun. 28, 1994, Ser. No. 268,079

Claims priority, application France, Jun. 29, 1993, 93 07922

Int. Cl.[6] H04K *1/02*

U.S. Cl. 375—297 **5 Claims**

1. A digital signal transmission system operating with constellation coding, the system comprising an orthogonal frequency-division multiplexing modulation unit which receives a digital signal, multiplexes the signal, processes the multiplexed signal and



generates frequency division multiplexed multicarrier signals as a combined signal, and an amplifier which causes signal distortion and has a power amplifier input, a predistortion circuit inserted between the frequency-division multiplexing modulation unit and the amplifier, said predistortion circuit predistorting the combined signal received at the power amplifier input with signal characteristics that are inverse to the distortion created by the amplifier, and generating a predistorted combined signal so that, after the predistorted multicarrier signals pass through the amplifier, the amplifier delivers undistorted multiplexed multicarrier signals.

5,598,437

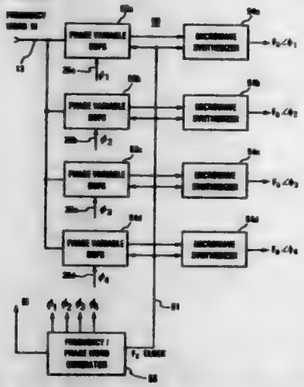
MULTICHANNEL FREQUENCY AND PHASE VARIABLE RADIO FREQUENCY SIMULATOR

Stanley J. Goerss, Highland, Md., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 16, 1993, Ser. No. 92,610

Int. Cl.[6] H04L *27/18*

U.S. Cl. 345—308 **1 Claim**



1. A multi-output frequency and phase variable signal source having selectively variable phase relationships between outputs for simulating a complex wavefront, comprising:

a plurality of first frequency synthesizers each operating at the same output frequency, and

a plurality of second direct digital frequency synthesizers, each of which supplies selectively variable phase shift information to a respective one of said first frequency synthesizers for initiating its operation at a phase differing from that of the others of said first frequency synthesizers thereby producing a plurality of outputs from said first synthesizers at the same frequency and at predetermined differing phases, said second direct digital frequency synthesizers each comprising:

a. phase accumulator means including a phase register for receiving a clock signal and digital information corresponding to a frequency of operation and synchronously producing a digital output corresponding to a predetermined value of a sinusoid at a phase designated by the digital output, and including a first adder having inputs for receiving, respectively, a digital word corresponding to a frequency and the phase register digital output, the output of said first adder being coupled to an input of said phase register,

b. memory means for storing predetermined values of a sinusoid at phases designated respectively, by phase addresses corresponding to the digital output from said phase accumulator means,

c. means for producing a second digital word corresponding to a predetermined phase shift for producing a phase address output used to select an address in the memory means containing the sinusoidal value for the waveform at the point indicated by the desired phase shift input,

d. second adder means for receiving the digital output from said phase accumulator means and said second digital word corresponding to a predetermined phase shift, the output of said second adder means supplying to said memory means an address therein shifted by a value corresponding to said second digital word and

e. digital to analog converter means for producing an analog waveform output corresponding to the value selected by the phase address output supplied to said memory means, the output from said digital to analog converter means being supplied to said first frequency synthesizer connected, respectively, to the second direct digital frequency synthesizer for producing a predetermined phase of operation thereof.

5,598,438

CORDLESS TELECOMMUNICATION APPARATUS

Jürgen Lepping, Essen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

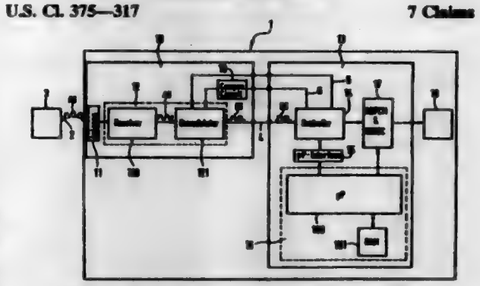
PCT No. PCT/DE93/00971, § 371 Date May 1, 1995, § 102(e) Date May 1, 1995, PCT Pub. No. WO94/10783, PCT Pub. Date May 11, 1994

PCT Filed Oct. 12, 1993, Ser. No. 428,142

Claims priority, application Germany, Oct. 30, 1992, 42 36 774.3

Int. Cl.[6] H04L *25/06*

U.S. Cl. 375—317 **7 Claims**



1. A cordless telecommunication apparatus, comprising:

conversion means for converting an analog RF signal into a digital data stream:

synchronization means for synchronizing the digital data stream with respect to an apparatus clock to produce a synchronized data stream,

said conversion means comprise comparator means for comparing the analog RF signal with a reference signal generated from the analog RF signal by integration and generate the digital data stream in accordance with a result of the comparison, and

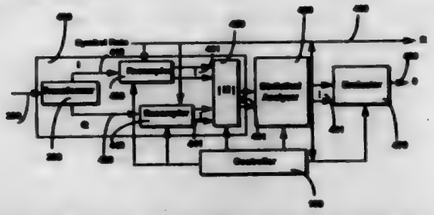
detection means are provided which, in the case of a first succession of two identical bit values of the synchronized data stream, control said comparator means in such a manner that integration of the analog RF signal is interrupted and integration of RF signal sections corresponding to the two successive bit values is compensated for.

5,598,439

METHOD AND APPARATUS FOR SYMBOL CLOCK PHASE RECOVERY

Douglas R. Wagner, Monroe, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 13, 1994, Ser. No. 242,484
Int. Cl.[6] H04L 27/14
U.S. Cl. 375—326 20 Claims



1. An apparatus for determining the phase of a symbol clock of a modulated signal having a predetermined symbol period, the apparatus comprising:

sampler with an input connected to the modulated signal and an output, the sampler having a fixed predetermined sample period;

repetitive resampler with an input connected to the sampler and an output, the resampler having a predetermined resample period;

statistical analyzer with an input connected to the output of the resampler and an output;

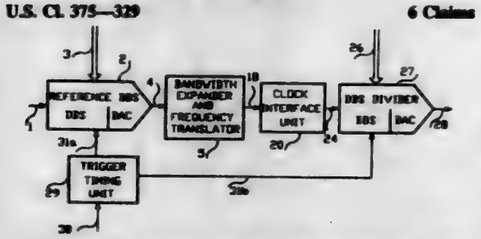
evaluator with an input connected to the output of the statistical analyzer and an output, the output indicating the phase of the symbol clock.

5,598,440

DDS DRIVEN DDS SYNTHESIZER FOR GENERATING SINEWAVE WAVEFORMS WITH REDUCED SPURIOUS SIGNAL LEVELS

Jerzy Domagala, Dollard des Ormeaux, Canada, assignor to MPB Technologies Inc., Clnire, Canada

Filed Nov. 8, 1994, Ser. No. 336,183
Int. Cl.[6] H03L 7/18
U.S. Cl. 375—329 6 Claims



1. A reduced spurs level, high resolution and fast switching Direct Digital Synthesizer (DDS) driven DDS frequency synthesizer (DDS[2] synthesizer) for generation of a sinewave output signal of digitally programmed frequency, comprising:

a) a Reference DDS means including a DDS and a Digital to Analog Converter (DAC), having a fixed input clock frequency and generating an output signal of frequency digitally programmed by a reference frequency control word;

b) a DDS Divider means including a DDS and a DAC having an input clock signal of programmable frequency and generating said sinewave output signal of digitally programmed frequency by a division ratio control word;

c) bandwidth expander means to enlarge a bandwidth of the Reference DDS means output signal to an output signal of enlarged bandwidth required by said input clock signal of said DDS Divider means;

d) frequency translator means to shift said output signal of said enlarged bandwidth received from the bandwidth expander means to a frequency sited output signal of frequency range required by said input clock signal of said DDS Divider means;

e) reshaping means to reshape said frequency shifted output signal received from said frequency translator means to a form required by said input clock signal of said DDS Divider means; and

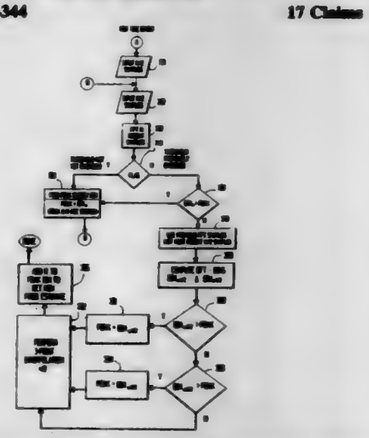
f) Trigger Timing Unit means to enable the programming process of said DDS[2] synthesizer subassemblies.

5,598,441

CARRIER ACQUISITION TECHNIQUE FOR MOBILE RADIO QPSK DEMODULATOR

Brian W. Krueger, Sykesville; Joseph B. Browder, Elkridge, and Jeffrey S. Baird, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 13, 1994, Ser. No. 322,840
Int. Cl.[6] H03D 1/00
U.S. Cl. 375—344 17 Claims



12. A method for estimating a frequency of a carrier wave signal in a phase shift keying system, the method comprising the steps of:

receiving the carrier wave signal;

performing a fast Fourier transform on the received carrier wave signal to provide a plurality of energy signals corresponding to respective ones of a plurality of frequencies;

storing transform values corresponding to the energy signals in a plurality of discrete Fourier transform bins of a memory, each bin containing a respective transform value indicative of a respective one of the plurality of frequencies;

determining which of the plurality of bins is an mth bin storing a transform value having a largest energy;

performing a three point interpolation process to determine a ratio R representing a relationship between the energy of the mth bin and one of an (m+½)th bin and an (m−½)th bin; and

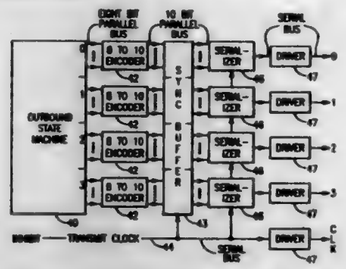
adding a signal representing the ratio R to a signal representing an amplitude of the mth bin to provide a signal representing the estimated frequency of the received carrier wave signal.

5,598,442

SELF-TIMED PARALLEL INTER-SYSTEM DATA COMMUNICATION CHANNEL

Thomas A. Gregg, Highland; Robert S. Capowski, Verbank; Daniel F. Casper, Poughkeepsie, and Frank D. Ferraiolo, New Windsor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1994, Ser. No. 261,522
Int. Cl.[6] H04L 7/00
U.S. Cl. 375—354 7 Claims



1. An inter-system data communication channel for coupling data words between two physically separated systems, comprising in combination:

an outbound transmit state machine for framing each word in said data words into a plurality of parallel bytes and for generating idle character sequences and data character sequences for each parallel byte;

means for separately encoding each of said parallel bytes along with its idle character sequence and data character sequence;

means to buffer store an encoded output of said means for separately encoding;

a bus coupled between said two physically separated systems, said bus comprised of a respective electrically conducting line for transmitting said each of said plurality of parallel bytes as a serial data stream and a separate line for transmitting a transmit clock signal;

means including parallel to serial conversion means and said transmit clock signal to couple synchronously said each of said plurality of parallel bytes as the serial data stream from said means to buffer store respectively to one said electrically conducting line;

means to couple said transmit clock signal to said separate line for transmitting the transmit clock signal;

a serial bit stream receiver respectively coupled to each said electrically conducting line and a transmit clock receiver coupled to said line for transmitting a transmit clock signal;

phase alignment means coupled to each said serial bit stream receiver and to said transmit clock receiver to separately phase align each serial data stream on each said electrically conducting line with said transmit clock signal; and

means coupled to said clock phase alignment means to align bytes that were transmitted synchronously.

5,598,443

METHOD AND APPARATUS FOR SEPARATING DATA AND CLOCK FROM A DIGITAL DATA STREAM

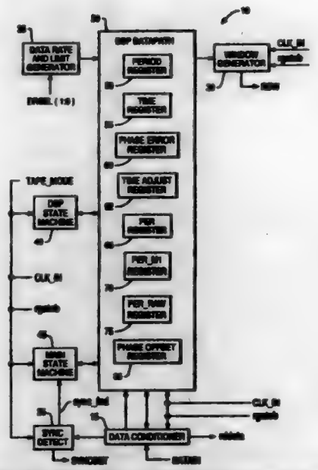
Alan D. Poeppelman, Fort Collins, Colo., assignor to AT&T Global Information Solutions Company (aka NCR Corporation), Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Filed May 23, 1994, Ser. No. 247,386
Int. Cl.[6] H04L 7/02;7/00
U.S. Cl. 375—359 25 Claims

1. A method for generating a read data window for separating data and clock information from a data stream, the method comprising the steps of:

maintaining a period value;

maintaining a time value;



modifying the time value based upon the period value;

adjusting the time value during each of a plurality of clock cycles; and

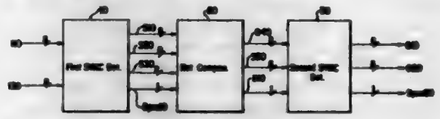
generating a read data window based upon the adjusted time value.

5,598,444

SYNC DETECTING APPARATUS AND METHOD THEREOF

Kwang W. Lim, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Mar. 3, 1995, Ser. No. 399,109
Claims priority, application Rep. of Korea, Mar. 7, 1994, 94-4371
Int. Cl.[6] H04L 7/00
U.S. Cl. 375—368 4 Claims



1. A sync detecting apparatus comprising:

a first sync detecting circuit for comparing a received input signal transmitted from a receiver with a previously-recognized reference signal to detect a sync signal and a rotated amount thereof;

a rotation compensating circuit for compensating for the rotated amount of the sync signal detected in said first sync detecting circuit to produce a compensated sync signal; and

a second sync detecting circuit for further accurately detecting the synchronization in accordance with a periodicity of said sync signal in case of a remaining rotation error included in the compensated sync signal from said rotation compensating circuit.

3. A sync detecting circuit comprising:

a first sync detecting circuit for comparing a signal transmitted from a receiver with a previously-recognized reference signal to detect a sync signal and a rotated amount thereof;

a rotation compensating circuit for compensating for the rotated amount of the sync signal detected in said first sync detecting circuit to produce a compensated sync signal

a second sync detecting circuit for further accurately detecting the synchronization in accordance with a periodicity of said sync signal in case of a remaining rotation error included in the compensated sync signal from said rotation compensating circuit; and

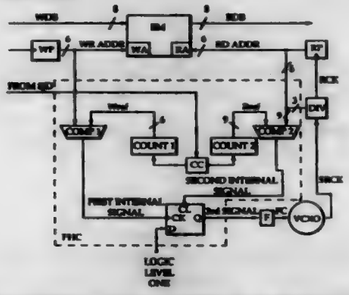
said first sync detecting circuit including a line buffer for delaying the received input signal and an addition/subtraction comparator for adding and subtracting with respect to the signal delayed in said line buffer to generate a signal representing the rotated amount of the received input signal and said sync signal.

5,598,445

JITTER REDUCTION SYSTEM IN DIGITAL DEMULTIPLEXERS

Francisco J. Castano Pinto, Tres Cantos, and José V. Rodriguez Benito, Madrid, both of Spain, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Mar. 28, 1995, Ser. No. 412,129
Claims priority, application Spain, Mar. 28, 1994, 9400667
Int. Cl.[6] H04L 7/00;25/36;25/40
U.S. Cl. 375—372 **4 Claims**



1. Jitter reduction system for a digital demultiplexer, comprising an elastic read-write memory subassembly (EM, WP, WA, RP, RA), having a read clock (RCK) that is varied in frequency in accordance with a control signal (FC) that is obtained from a phase detector (PHC) as a function of a difference in times when a read pointer (RP) and a write pointer (WP) each take, respectively, determined read reference value (Rref) add write reference value (Wref), wherein when in a cycle of an elastic memory (EM) of the elastic read-write memory subassembly, an instant when the write pointer (WP) takes the write reference value (Wref), leads or lags, with respect to previous periods, by at least one write clock cycle (WCK), the write reference value is increased or decreased by this same number of clock cycles, so that a direct current component of an output signal of the phase detector (PHC) is not altered abruptly, but the read reference (Rref), is accordingly increased or decreased gradually in fractions of a read clock (RCK) period, in order to produce a smooth increment or decrement in the frequency of the read clock (RCK) that compensates for differences in filling and emptying rates of the elastic memory (EM).

5,598,446

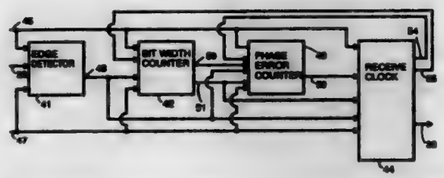
CLOCK EXTRACTION OF A CLOCK SIGNAL USING RISING AND FALLING EDGES OF A RECEIVED TRANSMISSION SIGNAL

Roland M. M. H. Van Der Tuijn, Mougins, France, assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 8, 1995, Ser. No. 525,999
Int. Cl.[6] H03D 3/24
U.S. Cl. 375—373 **10 Claims**

1. A method for extracting a clock signal from a received signal, the method comprising the steps of:

(a) detecting edges of the received signal where the received signal transitions between a logic 0 and a logic 1;



(b) determining a center between each pair of consecutive edges detected in step (a);

(c) generating an extracted dock signal; and,

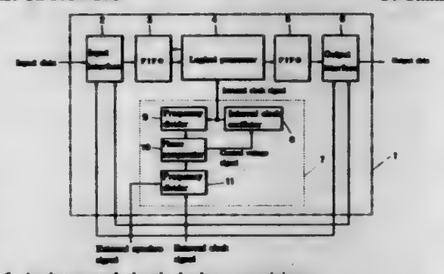
(d) varying the phase of the extracted clock signal based on the center between each pair of consecutive edges determined in step (b).

5,598,447

INTEGRATED CIRCUIT DEVICE HAVING INTERNAL FAST CLOCK SOURCE

Akira Ueal, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 10, 1993, Ser. No. 60,733
Claims priority, application Japan, May 11, 1992, 4-144898
Int. Cl.[6] H01L 27/00; H03D 3/24
U.S. Cl. 375—376 **14 Claims**



1. An integrated circuit device comprising:

an input interface operative in response to an external clock signal for sequentially receiving data in synchronization with a given external (synchro) synchronization signal;

a phase-locked loop (PLL) unit (including an internal clock source) operative in phase-locked manner according to the external (synchro) synchronization signal and the external clock signal for generating an internal clock signal which is faster than the external clock signal;

a processing unit operative in response to the internal clock signal for sequentially processing the received data; and

an output interface operative in response to the external clock signal and the external synchronization signal for sequentially transmitting the processed data in synchronization with the external synchronization signal and the external clock signal.

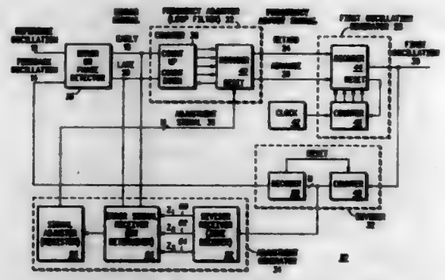
5,598,448

METHOD AND APPARATUS FOR CONTROLLING A DIGITAL PHASE LOCK LOOP AND WITHIN A CORDLESS TELEPHONE

James W. Girardeau, Jr., Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 6, 1995, Ser. No. 399,005
Int. Cl.[6] H03D 3/24
U.S. Cl. 375—376 **3 Claims**

1. An apparatus for controlling a digital phase lock loop comprising:



an error detector, wherein the error detector determines an error signal based on a difference between a reference oscillation and a feedback oscillation;

a frequency adjuster having a counter for receiving the error signal, and a decoder coupled to the counter for providing a frequency adjust signal based on a count value of the counter and an adjusting signal;

a first oscillation generator, wherein the first oscillation generator generates a first oscillation based on the frequency adjust signal;

a divider, wherein the divider divides the first oscillation by a predetermined divisor to produce the feedback oscillation; and

an adjustment generator for determining the adjusting signal based on the predetermined divisor and the error signal;

wherein the adjustment generator comprises:

an error signal receiver, coupled to the error detector, for receiving the error signal;

a divisor receiver, coupled to the divider, for receiving a predetermined divisor that is used to divide the first oscillation to produce the feedback oscillation, and providing at least two zone signals to the error signal receiver based on the predetermined divisor; and

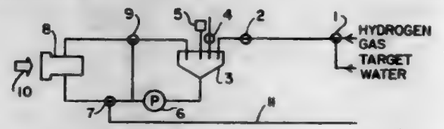
a signal adjuster, coupled to the error signal receiver, for providing a count limit to the decoder of the frequency adjuster, the adjusting signal, wherein the adjusting signal adjusts sensitivity of the phase lock loop such that injected noise is reduced.

5,598,449

SYNTHESIS OF LABELED COMPOUND

Shigeki Yamazaki, and Hideyuki Nakagawa, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation of Ser. No. 955,749, Dec. 17, 1992, abandoned.
This application Jan. 26, 1995, Ser. No. 378,949
Claims priority, application Japan, Apr. 17, 1991, 3-085366; Apr. 17, 1991, 3-085367; Apr. 17, 1991, 3-085368
Int. Cl.[6] G21G 1/10
U.S. Cl. 376—195 **3 Claims**



1. A process for the synthesis of ^{13}N-ammonia in a target system, in a synthesis apparatus comprising:

circulating target water in said target system;

charging hydrogen into said synthesis apparatus to create a pressurized condition of 0.5 to 2 kg/cm^2 to maintain the target water in a reducing atmosphere;

wherein said circulating is conducted continuously at a speed to prevent the target water in an irradiation cell from changing into an oxidizing atmosphere upon irradiation of a proton beam; and

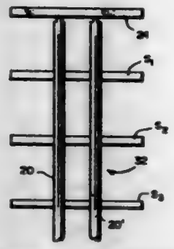
irradiating said target water with a proton beam to produce ^{13}N-ammonia having a radiochemical purity of 95% or more.

5,598,450

FUEL BUNDLE WITH ADJUSTABLE FLOW AND REACTIVITY

Richard A. Proebstle, and Bruce Matzner, both of San Jose, Calif., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 347,865, Nov. 23, 1994, abandoned.
This application Mar. 22, 1996, Ser. No. 624,032
Int. Cl.[6] G21G 3/32
U.S. Cl. 376—435 **13 Claims**



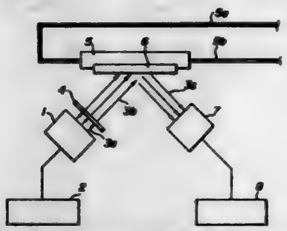
1. In a fuel bundle for a boiling water nuclear reactor comprising a plurality of fuel rods secured within an array and extending between upper and lower tie plates, and including at least one additional fuel rod extending from said lower tie plate but terminating short of said upper tie plate, the improvement comprising a removable extension rod secured to said at least one additional fuel rod and extending substantially to said upper tie plate.

5,598,451

APPARATUS FOR MEASURING THE SULFUR COMPONENT CONTAINED IN OIL

Kazunaga Ohno; Yukio Hashizume; Kazuo Hoshai, and Masahiko Kuwata, all of Tokyo, Japan, assignors to DKK Corporation, Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 551,823
Claims priority, application Japan, Nov. 11, 1994, 6-301626
Int. Cl.[6] G01N 23/223
U.S. Cl. 378—44 **6 Claims**



1. An apparatus for measuring the Sulfur component contained in oil comprising:

an X-ray tube having a target made of Titanium;

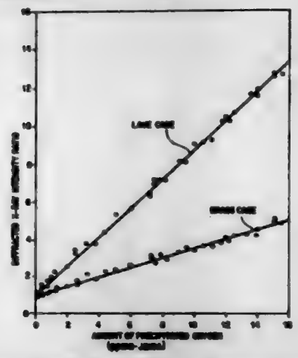
a filtering means for filtering X-rays radiated from said X-ray tube comprising a filter made of Titanium;

a measurement cell for introducing a sample to be measured therein;

an X-ray applying means for applying X-rays filtered by said filtering means onto said sample in the measurement cell to emit fluorescent X-rays from said sample; and

a detecting means for detecting said fluorescent X-rays emitted from said sample.

5,598,452
METHOD OF EVALUATING A SILICON SINGLE CRYSTAL
Hiroshi Takeno; Ryoji Hoshi; Satoshi Ushio, and Takao Takenaka, all of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan
Filed Sep. 6, 1995, Ser. No. 524,453
Claims priority, application Japan, Sep. 8, 1994, 6-240630
Int. Cl.[6] G01N 23/207
U.S. Cl. 378—73 8 Claims

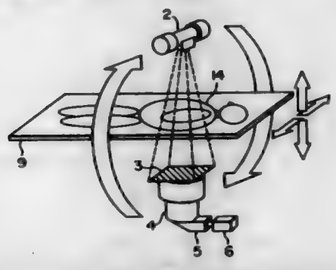


1. A method of evaluating a silicon single crystal comprising the steps of;

irradiating frontside surface of a preliminary heat treated sample silicon wafer with X-rays, taking out diffracted X-rays produced by Bragg diffraction at a particular lattice plane in said silicon wafer from backside surface, measuring the intensity of said diffracted X-ray, thereby preparing a correlation between the diffracted X-ray intensity and amount of precipitated oxygen of silicon wafers, characterized in:

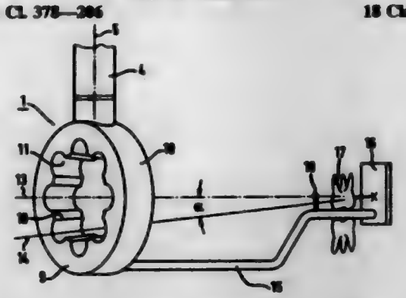
measuring the diffracted X-ray intensity of the heat treated sample silicon wafer and calculating the amount of precipitated oxygen thereof from the prepared correlation.

5,598,453
METHOD FOR X-RAY FLUOROSCOPY OR RADIOGRAPHY, AND X-RAY APPARATUS
Rika Baba, Kokubunji; Kan Ueda, Ome; Kazuaki Sekihara, Musashimurayama; Hiromori Ueki, Sagamihara, and Keiji Umetani, Hino, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan
Filed Aug. 22, 1995, Ser. No. 517,852
Claims priority, application Japan, Aug. 30, 1994, 6-205282; Apr. 24, 1995, 7-098263
Int. Cl.[6] G21K 5/10
U.S. Cl. 378—146 21 Claims



1. A fluoroscopic or radiographic method or CT scan method in which a pair of an X-ray source and an X-ray detector opposed to the X-ray source is rotated on a circular orbit and at the same time a subject is moved parallelly with respect to a rotation plane of said pair to perform X-ray fluoroscopic or radiographic operation or CT scan.

5,598,454
X-RAY DIAGNOSTICS INSTALLATION
Manfred Franetzki; Werner Guenther, and Josef Plootz, all of Bensheim, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 11, 1995, Ser. No. 420,215
Claims priority, application Germany, Apr. 26, 1994, 44 14 689.2
Int. Cl.[6] A61B 6/14
U.S. Cl. 378—206 18 Claims



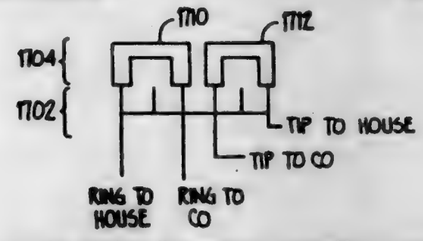
1. An x-ray tomosynthesis installation for use in producing an image of a focal plane of a subject, comprising:

a penetrating radiation emitter which emits a beam of penetrating radiation including a reference ray;

means for coupling said radiation emitter at a plurality of different positions along a circular arc, said circular arc having a steer on said reference axis for always and automatically positioning said radiation emitter so that said reference ray intersects a reference axis perpendicular to said focal plane, at a non-zero acute angle; and

means for defining said reference axis so as to be stationary with respect to said means for positioning.

5,598,455
ALARM AND TEST SYSTEM FOR A DIGITAL ADDED MAIN LINE
David C. Bliven, San Jose; Anthony Vranicar, Santa Clara; Phillip B. Vail, San Leandro; Gerald L. Shimatrick, Danville, all of Calif., and Julian S. Mullaney, Raleigh, N.C., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 12,293, Feb. 1, 1993, Pat. No. 5,404,401, which is a continuation of Ser. No. 791,749, Nov. 12, 1991, Pat. No. 5,195,125, which is a continuation of Ser. No. 584,325, Sep. 17, 1990, Pat. No. 5,111,497. This application Dec. 28, 1994, Ser. No. 360,104
Int. Cl.[6] H04M 1/21;3/08
U.S. Cl. 379—27 7 Claims



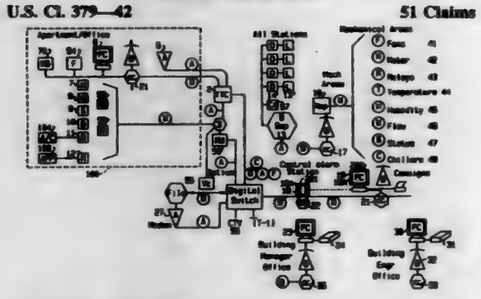
1. A first telephone line connector, connectable to a second telephone line connector comprising first and second electrical conductors providing telephone signals and third and fourth electrical conductors connectable to subscriber equipment, said first telephone line connector comprising:

a first shunt conductor for connecting the first and third electrical conductors in the second telephone line connector when said first telephone line connector is connected to the second telephone line connector;

a second shunt conductor for connecting the second and fourth electrical conductors in the second telephone line connector when said first telephone line connector is connected to the second telephone line connector; and

said first telephone line connector being environmentally protected with a gel sealing means.

5,598,456
INTEGRATED TELEPHONE, INTERCOM, SECURITY AND CONTROL SYSTEM FOR A MULTI-UNIT BUILDING
David H. Feinberg, 2 Apollo Rd., Manalapan, N.J. 07726
Continuation of Ser. No. 81,876, Jun. 23, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,573
Int. Cl.[6] H04M 11/04
U.S. Cl. 379—42 51 Claims



1. An integrated telephone, intercom, security and control system for a building having a plurality of building units comprising:

a plurality of telephone lines;

at least one telecommunications device located in at least one of said building units and connected to at least one of said telephone lines and having a unique telephone number;

switching means for receiving user programmed commands and being connected to said at least one telecommunications device by at least one of said telephone lines and arranged to connect at least one of said telephone lines either to at least another of said telephones line or to an outside telephone line;

a plurality of sensors located in each building unit and in common areas of the building for generating signals indicative of conditions therein;

at least one control module connected to said switching means by at least one of said telephone lines and having a unique telephone number and adapted to at least receive said signals generated by said sensors and determine said conditions from said signals;

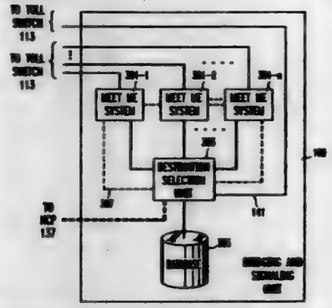
a monitoring station, including a memory device and an output device, connected to said switching means by at least one of said telephone lines;

said at least one control module adapted to selectively send information indicative of said conditions to said monitoring station upon determining a change in at least one of said conditions in said each building unit or said common areas of the building via said telephone lines and said monitoring station adapted to receive and store said information in said memory and output data indicative of said conditions;

said at least one control module adapted to accept said user programmed commands from a user calling its unique telephone number via said switching means; and,

said at least one control module adapted to be controlled by user programmed information stored in said memory of said monitoring station and downloaded to a memory in said at least one control module.

5,598,457
TECHNIQUE FOR PROVIDING REDUNDANT CAPABILITY IN A PERSONAL MOBILE COMMUNICATION SYSTEM
Mark J. Foladare, Kendall Park; Shelley B. Goldman, East Brunswick; Aslam Y. Khan, Holmdel; Lyndon M. Pan, Little Silver; David P. Silverman, Somerville; Yao-Chung Tsao, Middletown, and Ray Phillip Weber, Bridgewater, all of N.J., assignors to AT&T, Holmdel, N.J.
Filed Sep. 30, 1994, Ser. No. 316,613
Int. Cl.[6] H04Q 7/38
U.S. Cl. 379—57 2 Claims



1. A method for use in completing a first telephone call of a first party to a second party, the method comprising the steps of:

receiving said first telephone call; then

selecting a first one of a plurality of meet-me systems, wherein if one of the plurality of meet-me systems handled a most recent call to the second party and information corresponding to the one of the plurality of meet-me systems is stored in a network data base, then said one of the plurality of meet-me systems is selected as the first one of the plurality of meet-me systems;

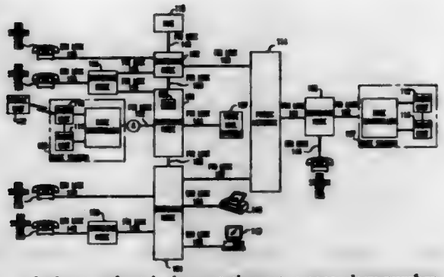
routing said first telephone call to said selected first one of the plurality of meet-me systems if said selected first one of the plurality of meet-me systems is available;

connecting a return call by said second party to said first telephone call based on the information stored in the network data base.

5,598,458
TELECOMMUNICATION SWITCHING SYSTEM HAVING TRANSPARENT WIRELESS FEATURES
Bruce M. Bales, Louisville; Gary L. Griffith, Arvada, and Vijai Prakash, Boulder, all of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Continuation of Ser. No. 995,417, Dec. 18, 1992, abandoned. This application Jan. 11, 1995, Ser. No. 371,652
Int. Cl.[6] H04Q 7/20
U.S. Cl. 379—58 26 Claims

1. A method for providing telephone service to wireless telephones and telephone station sets by a telecommunication switching system having a plurality of switching nodes, the method comprising the steps of:

assigning by the telecommunication switching system a directory number of a directory dialing plan to both a wireless



telephone and a telephone station set, a secondary number of a secondary dialing plan to the wireless telephone, and another secondary number of the secondary dialing plan to the telephone station set;

routing by the telecommunication switching system incoming call information for an incoming call from a calling telephone for the directory number to both the wireless telephone using the secondary number and to the telephone station set using the other secondary number while the incoming call is active;

transmitting first control information by the wireless telephone in response to the routing of the incoming call information addressed to the directory number to the telecommunication switching system;

transmitting second control information to the telephone station set by the telecommunaication switching system in response to the first control information;

transmitting third control information to a calling terminal originating the incoming call by the telecommunication switching system in response to the first control information;

executing a directory number management application on the telecommunication switching system to manage incoming calls;

identifying the wireless telephone to a first switching node of the telecommunication switching system by the secondary number;

identifying the telephone station set to the first switching node of the telecommunication switching system by the other secondary number; and

identifying the wireless telephone and telephone station set as being connected to the first switching node to the directory number management application by the directory number.

5,598,459

AUTHENTICATION AND HANDOVER METHODS AND SYSTEMS FOR RADIO PERSONAL COMMUNICATIONS

Jacobus C. Haartsen, Staffanstorp, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.

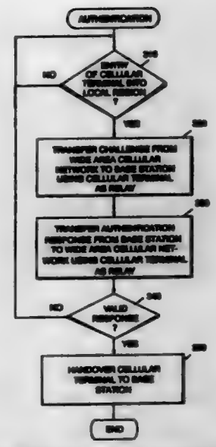
Filed Jun. 29, 1995, Ser. No. 496,353
Int. Cl.[6] H04Q *7/24;7/28;7/38*
U.S. Cl. 379—58 **21 Claims**

1. An authentication method between a cellular terminal and a telephone base station, the telephone base station connecting a wire telephone network to the cellular terminal within a local region in a cell of a wide area cellular network which uses a plurality of channels within a cellular network spectrum, said authentication method comprising the steps of:

detecting that said cellular terminal is within said local region;

transferring an authentication challenge from said wide area cellular network to said telephone base station via radio communication with said cellular terminal;

transferring an authentication response from said base station to said wide area cellular network via radio communication with said cellular terminal; and



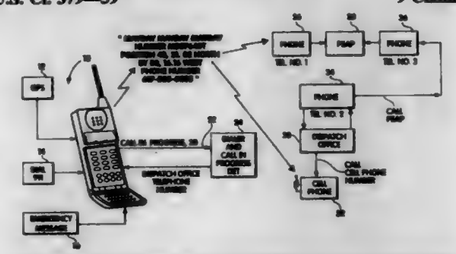
in response to a valid authentication response, initiating communication between said wire telephone network and said cellular terminal, via said base station.

5,598,460

EMERGENCY BACK-UP SYSTEM FOR ENHANCING RELIABILITY OR RESCUE

Robert K. Tendler, Chestnut Hill, Mass., assignor to Tendler Cellular, Inc., Boston, Mass.

Filed Feb. 9, 1996, Ser. No. 600,345
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—59 **9 Claims**



1. A system for increasing the reliability of rescue comprising:

a first telephone at one location;

means at said first telephone for initiating an emergency call by calling a first predetermined number;

means associated with said first telephone responsive to the initiating of said emergency call for reporting the location thereof;

a public service access point at a second location including a second telephone having said first predetermined number for receiving calls and means for dispatching rescue services responsive to a received call;

means at said first telephone for detecting the occurrence and termination of said emergency call;

means at said first telephone responsive to the detected termination of said emergency call for causing said first telephone to call a second predetermined number and report the fact of an emergency and said location; and,

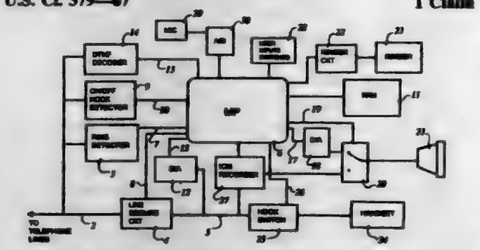
means including a dispatch center at a third location including a third telephone having said second predetermined number for receiving said reported emergency and location, for dialing a third predetermined number at said public service access point, for reporting the fact of said emergency and the location thereof, and for interrogating personnel at said public service access point location as to the status of the dispatch of said rescue services.

5,598,461

PERSONALIZED ANNUNCIATION SIGNALING PHONE UNIT

Stephen Greenberg, c/o R. Greenberg, Apt. #405, 555 Jervis St., Vancouver, B.C., Canada

Filed May 26, 1994, Ser. No. 250,867
Int. Cl.[6] H04M *1/64;1/00*
U.S. Cl. 379—67 **1 Claim**



1. A personalized ring telephone unit, including:

a telephone line connection for receiving a telephone line from a central office;

a ring detector for detecting an incoming call across said telephone line connection and providing an incoming call indication signal at an output thereof upon detecting the incoming call;

line seizure circuitry for seizing said telephone line upon recieving an off-hook command signal at an input thereof;

first outgoing message delivery means for delivering a first outgoing message across said seized telephone line;

first controller means for producing said off-hook command signal at the input of said line seizure circuitry in response to said incoming call indication signal produced at the output of said ring detector and for activating said first outgoing message delivery means after producing said off-hook command signal;

a code detector for receiving a predetermined code across said telephone line connection and for producing a personalized identification command signal at an output thereof in accordance with the predetermined code received thereby;

a speaker for producing an audio acoustic signal in response to an electric signal received at an input thereof;

personalized annunciating storage means for storing a plurality of personalized audio messages, whereby each personalized audio message provides an indication of the identity of the person sought by a caller; and

second controller means responsive to said personalized identification command signal produced at said output of said code detector for controlling said personalized annunciating storage means to provide a corresponding one of said personalized audio messages to said input of said speaker, wherein said one of said personalized audio messages identified the person sought by a caller;

an incoming message recording unit having a first input means connected across said seized telephone line and a second input means for receiving an incoming message record command signal, said incoming message recording unit operating to start recording signals received by said first input means thereof upon receiving said incoming message record command signal at said second input means thereof;

first message completion detection means for detecting the end of said first outgoing message; and

third controller means for generating said incoming message record command signal upon the detection of the end of first outgoing message by said first message completion detection means;

a microphone for recieving an audio acoustic signal from a user and producing an electrical signal at output thereof;

user input means for allowing a user control over the operation of said personalized ring telephone unit, said user input means including a plurality of personalized annunciator record switches, each personalized record switch being associated with an identity of a person sought by a caller, said user input means further including an outgoing message record switch, and an incoming message playback switch;

fourth controller means responsive to the actuation of one of said personalized annunciator record switches for recording said electrical signal produced by said microphone as one of said plurality of personalized audio messages on said personalized annunciating storage means, said one of said plurality of personalized audio messages associated with said one of said personalized annunciator record switches providing an indication of the identity of the person sought by a caller; and

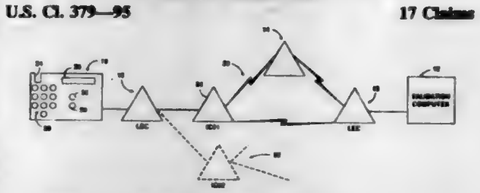
fifth controller means responsive to the actuation of said outgoing message record switch for recording an electrical signal produced by said microphone as said first outgoing message on outgoing message storage means.

5,598,462

TELECOMMUNICATIONS NETWORK ROUTING

Michael A. Trusmner, 9009 W. 110th St., #1, Overland Park, Kans. 66210, and Jeffery B. Mosley, Rte. 2, Box 227A, Peculiar, Mo. 64078

Filed Sep. 25, 1992, Ser. No. 951,243
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—95 **17 Claims**



1. A telecommunications network comprising:

a means for receiving information associated with an identification of a point-of-sale communication device;

a means for accessing data comprising at least one destination number, wherein said data has been previously stored in association with the information received relating to the identification of said point-of-sale communication device; and

means for establishing communications between said point-of-sale communication device and said destination using said destination number.

5,598,463

REMOTE TERMINAL FOR CENTRAL DICTATING SYSTEM

John Saccardo, 5 Fieldcrest Ter., North Reading, Mass. 01864, and Daniel Collins, 27A Cove Ave., Framingham, Mass. 01701

Filed Oct. 12, 1994, Ser. No. 322,802
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—97 **3 Claims**

1. A terminal unit for communicating voice and control signals with a host unit over a telephone line, the terminal unit comprising:

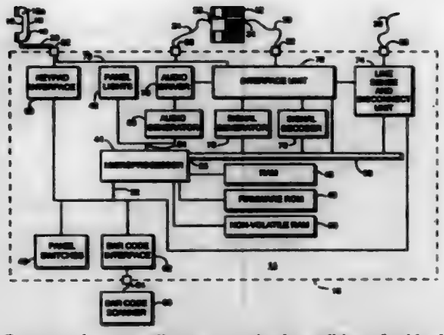
A. a telephone having a base unit and a handset,

B. a control unit comprising

1) a keypad on said handset and actuatable by a user holding said handset,

2) an interface unit including means for sensing actuation of keys on said keypad and transmitting corresponding tone signals over said telephone line,

C. means for holding said telephone line and



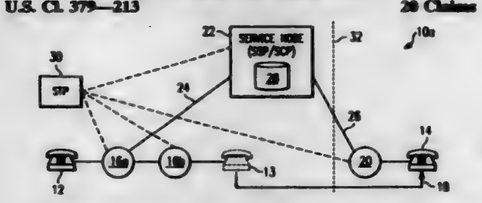
D. means for responding to an on-hook condition of said telephone by transmitting a predetermined code over said line to said host unit and then disconnecting said terminal from said line.

5,598,464

METHOD AND APPARATUS FOR PROVIDING LOCAL NUMBER PORTABILITY

Thomas L. Hess, Plano, Tex., and William R. Minch, Arlington Heights, Ill., assignors to DSC Communications Corporation, Plano, Tex.

Filed Jun. 20, 1995, Ser. No. 493,773
Int. Cl.[6] H04Q 3/62; H04M 3/42
U.S. Cl. 379—213 **20 Claims**



1. A system for delivering a call to a ported called party having an associated pre-porting telephone number, comprising:

a first switch operable to receive the call, the first switch assigned to service the pre-porting telephone number, the first switch operable to attempt to place the call to the called party, the first switch further operable to generate a trigger if the called party is no longer serviced by the first switch;

a service node coupled to the first switch, the service node operable to receive the call in response to the trigger generated by the first switch, the service node operable to generate routing information; and

a second switch coupled to the service node and identified by the routing information, the second switch operable to receive the call from the service node and to complete the call to the called party using the pre-porting telephone number.

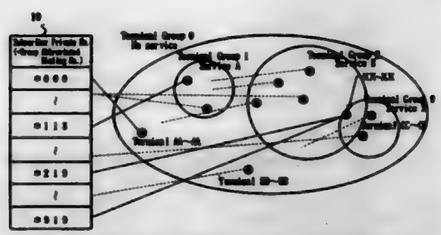
5,598,465

EXCHANGE CONTROLLING SYSTEM FOR MANAGING TERMINAL GROUPS

Shigeru Shratori, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 333,512, Nov. 2, 1994, abandoned.
This application Apr. 24, 1996, Ser. No. 636,893
Claims priority, application Japan, Apr. 6, 1994, 6-092956
Int. Cl.[6] H04Q 3/64
U.S. Cl. 379—266 **9 Claims**

1. An exchange controlling system for managing terminal groups, comprising:



a plurality of terminals each being assigned an individual terminal number, said plurality of terminals being changeably arranged in groups, formed as switch service groups, each group being assigned a group number corresponding to a switch service;

a network for connecting a call from a subscriber to a destination terminal among the plurality of terminals; and

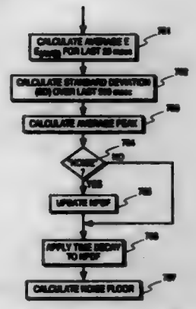
a central processor, operatively connected to the network, for controlling the network so as to connect the call from the subscriber to the destination terminal which is identified by a private subscriber number dialed by the subscriber and composed of at least one digit corresponding to the group number of a group that the destination terminal is arranged in and at least one digit corresponding to the destination terminal number and to perform the switch service corresponding to the group number.

5,598,466

VOICE ACTIVITY DETECTOR FOR HALF-DUPLEX AUDIO COMMUNICATION SYSTEM

David L. Graumann, Vancouver, Wash., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 28, 1995, Ser. No. 520,305
Int. Cl.[6] H04M 9/10; 9/08; G10L 3/00; 9/18
U.S. Cl. 379—389 **31 Claims**



1. A method of locating a noise floor for qualifying a signal, comprising the steps of:

establishing a noise power density function (NPDF), based on:

a relationship between an approximate peak level of the signal and a current level of the signal, and

a plurality of standard deviation values of the signal, each of the standard deviation values corresponding to one of a plurality of time intervals;

repeatedly updating the NPDF to produce a current state of the NPDF; and

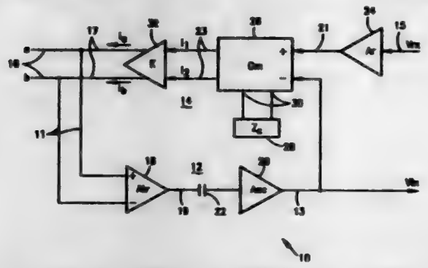
using the current state of the NPDF to locate the noise floor.

5,598,467

SIGNAL INTERFACE CIRCUIT WITH SELECTABLE SIGNAL INTERFACE PARAMETERS

Duncan J. Brenner, Lochwinnoch; Roger K. Benton, Edinburgh, both of Scotland, and James B. Wieser, Pleasanton, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 9, 1994, Ser. No. 353,095
Int. Cl.[6] H04M 1/76
U.S. Cl. 379—398 **29 Claims**



1. An apparatus including a signal interface circuit with selectable signal interface parameters, said signal interface circuit comprising:

a pair of impedance terminals for coupling to an impedance circuit having a selectable impedance value associated therewith;

a pair of signal terminals for coupling to an external signal line pair and conducting outgoing and incoming signals therefrom and thereto, respectively, wherein said pair of signal terminals has a definable termination impedance associated therewith and said external signal line pair has a line impedance associated therewith, and wherein said definable termination impedance is defined in accordance with said selectable impedance value;

a transmitter circuit, coupled to said pair of signal terminals and having a definable transmitter transfer function associated therewith, for receiving said outgoing signal and providing a transmit signal in accordance with said definable transmitter transfer function, wherein said definable transmitter transfer function is defined in accordance with said selectable impedance value; and

a receiver circuit, coupled to said pair of impedance terminals, said pair of signal terminals and said transmitter circuit and having a definable receiver transfer function associated therewith, for receiving an input signal and said transmit signal and providing said incoming signal in accordance with said definable receiver transfer function, wherein said definable receiver transfer function is defined in accordance with said selectable impedance value.

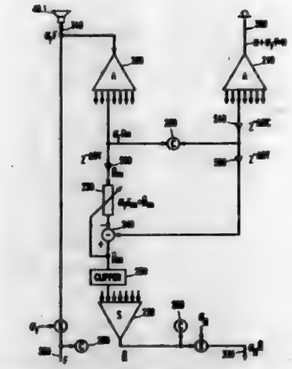
5,598,468

METHOD AND APPARATUS FOR ECHO REMOVAL IN A COMMUNICATION SYSTEM

Egbert Ammicht, Budd Lake, N.J., and James C. H. Thi, Gaithersburg, Md., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 69,960, May 28, 1993, abandoned.
This application Feb. 9, 1995, Ser. No. 386,174
Int. Cl.[6] H04M 9/08
U.S. Cl. 379—410 **24 Claims**

11. In the operation of a communication system having a microphone and a loudspeaker so disposed that there is a feedback path from the loudspeaker to the microphone, a method for measuring coupling loss that inheres between the loudspeaker and the microphone, said loss optionally including gain due to amplification of input to the loudspeaker and output from the microphone, the method comprising:



a) operating an adaptive filter, thereby to acquire data that represent coupling characteristics of the feedback path;

b) detecting when the adaptive filter is well adapted and when it is not well adapted; and

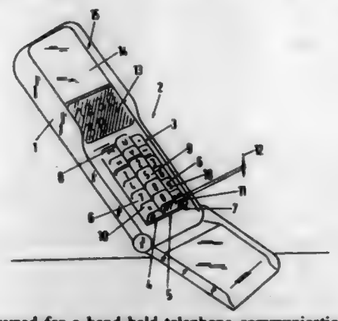
c) updating an estimate of the coupling loss only when the adaptive filter is well adapted, said updating step comprising the further step of enabling a gated average to be updated only when an indicator of adaption of said adaptive filter exceeds a threshold.

5,598,469

KEYPAD FOR A COMMUNICATION INSTRUMENT, PARTICULARLY A SUBSCRIBER'S INSTRUMENT FOR TELEPHONE COMMUNICATION

Friedrich Preker, Düsseldorf, Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Continuation of Ser. No. 344,486, Nov. 23, 1994, abandoned, which is a continuation of Ser. No. 805,889, Dec. 11, 1991, abandoned. This application Nov. 15, 1995, Ser. No. 559,250
Claims priority, application Germany, Dec. 21, 1990, 40 41 987.8
Int. Cl.[6] H04M 1/00
U.S. Cl. 379—433 **7 Claims**



1. A keypad for a hand held telephone communication instrument for receiving and transducing audio information and including a housing having a surface from which the keypad outwardly projects, said keypad comprising:

a plurality of push buttons each projecting outwardly from the housing surface and inwardly depressible toward the housing surface from an undepressed condition to a depressed condition by a user of the instrument for operating said each push button;

said plural push buttons being arranged in three separate and distinct, parallel, non-overlapping rows comprising a first row, a second row and a third row located between said first and

second rows and defining across said first, second and third rows a width of the keypad;

each said push button comprising an upper button surface disposed at a first distance from the housing surface in said undepressed condition and at a second distance from the housing surface in said depressed condition of the said each push button;

said push buttons of said third row being disposed in immediately confronting adjacency and in substantial edge-to-edge abutment to said push buttons of each of said first and second rows so as to minimize the width of the keypad and such that the push buttons of each said row are disposed substantially without intervening space between said push buttons of said each row and the push buttons of an immediately adjacent one of said rows and such that each said push button of each said row is independently movable between said undepressed and depressed conditions without interference with the push buttons of an immediately adjacent one of said rows;

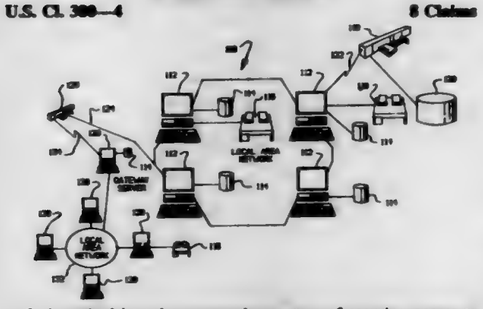
the upper surface of each said push button of said first and second rows; being spaced from the housing surface by a first height in said undepressed condition, and the upper surface of each said push button of said third row being spaced from the housing surface by a second height greater than said first height in said undepressed condition.

5,598,470

METHOD AND APPARATUS FOR ENABLING TRIAL PERIOD USE OF SOFTWARE PRODUCTS: METHOD AND APPARATUS FOR UTILIZING A DECRYPTION BLOCK

Thomas E. Cooper, Louisville; Hudson W. Phillips, Boulder, and Robert F. Pryor, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1994, Ser. No. 235,831
Int. Cl.[6] H04L 9/32;9/00
U.S. Cl. 380—4 **8 Claims**



1. A method in a data processing system of securing access to particular files which are stored in a computer-accessible memory media, comprising the method steps of:

providing a file management program as an operating system component of said data processing system;

storing a plurality of files including at least one encrypted file and at least one unencrypted file in said computer-accessible memory media;

for each of said at least one encrypted file:

(a) recording in said computer-accessible memory media a preselected portion of said at least one encrypted file;

(b) generating a decryption block which includes information which can be utilized to decrypt said at least one encrypted file;

(c) inserting said decryption block in said at least one encrypted file in the place of said preselected portion;

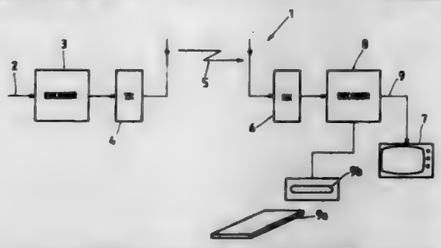
utilizing said file management program to (a) monitor data processing system calls for a called file stored in said computer-accessible memory media, and (b) determine whether said called file has an inserted decryption block, and (c) process said called file in one manner if said called file has an inserted decryption block, and process said called file in a different manner if said called file does not have an inserted decryption block.

5,598,471

METHOD AND APPARATUS FOR ENCODING AND DECODING OF AUDIO TRANSMISSION SIGNALS

Pieter Rademeyer, Pretoria, South Africa, assignor to South African Microelectronic Systems Ltd., South Africa

Filed Nov. 14, 1994, Ser. No. 339,464
Claims priority, application South Africa, Nov. 16, 1993, 93/8534
Int. Cl.[6] H04L 9/00; H04N 7/16
U.S. Cl. 380—9 **25 Claims**



1. A system for encrypting and decrypting an audio transmission signal, comprising:

an encoder for encrypting the audio transmission signal prior to transmission, the encoder having frequency-varying means for varying the carrier frequency of the signal to be any one of a plurality of known frequencies, in accordance with an encryption algorithm;

a transmitter for transmitting the encrypted signal;

a receiver for receiving the encrypted signal; and

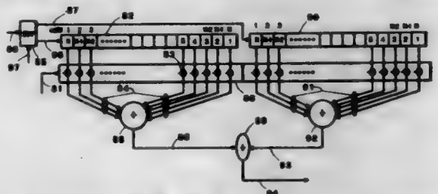
a decoder for decrypting the received signal, the decoder having a demultiplexing filter for separating segments of the received signal corresponding to each one of the plurality of known carrier frequencies, and means for selectively connecting each segment of the received signal to a corresponding demodulator in accordance with a decryption algorithm.

5,598,472

CHARGE-COUPLED-DEVICE BASED ALL-ANALOG WAVE FORM SCRAMBLING WITH APPLICATIONS IN AUDIO, VIDEO, VIDEO-ON-DEMAND, AND TV SYSTEMS

Leonard Schuchman, and Aaron Weinberg, both of Potomac, Md., assignors to Stanford Telecommunications, Inc., Reston, Va.

Filed Dec. 22, 1994, Ser. No. 362,269
Int. Cl.[6] H04N 7/167
U.S. Cl. 380—14 **6 Claims**



1. A scrambled analog signalling system having a source of analog signals to be sent to a receiving device, comprising:

a multiple stage charge coupled means having analog signal input terminal connected to receive analog signal samples from said source of analog signals, said multiple stage charge coupled device having N stages, corresponding stage taps, and an input clock signal,

shuffling circuit means having a first input connected to said N stage taps for receiving the analog signal samples at the said stage taps, a second input for receiving a random seed signal to cause a random reordering of incoming analog signal samples, a source of random seed signals connected to said second input, and an output means connected to receive a stream of said analog signal samples which have been shuffled according to a mapping code carried by said random seed signal,

filter means for reconstructing said analog signal in its scrambled format, and

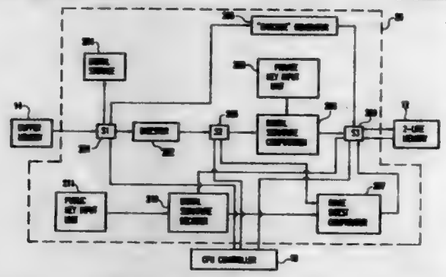
transmission means for conveying said analog signal in its scrambled format to said receiving device.

5,598,473

DIGITAL SIGNATURE GENERATOR/VERIFIER/ RECORDER (DS-GVR) FOR ANALOG TRANSMISSIONS

Ralph Linsker, Millwood, and Charles H. Bennett, Croton-on-Hudson, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 17, 1994, Ser. No. 292,155
Int. Cl.[6] H04L 9/30; H04N 1/44
U.S. Cl. 380—18 **8 Claims**



1. A method of using digital signatures to authenticate analog messages transmitted between a sender and a receiver using a public key algorithm, the sender having a private key and a registered public key, the method comprising the steps of:

generating an analog signal corresponding to an analog message to be authenticated;

converting the analog signal to a digital message signal;

computing a first image digest from said digital message signal;

computing a digest signature using the sender's private key and the computed first image digest;

combining at least the digital message signal, the computed digest signature and the sender's public key to form said composite digital message;

converting the composite digital message to a composite message analog signal;

transmitting the composite message analog signal to a receiver;

converting a received composite message analog signal to a received composite digital message signal which is decomposed to yield the recovered digital message signal and the recovered digest signature;

recovering the sender's public key from the received composite digital message;

validating the sender's public key;

decoding the recovered digest signature to yield a reconstructed image digest using a public key provided by the sender to the receiver;

computing a second image digest from the recovered digital message signal; and

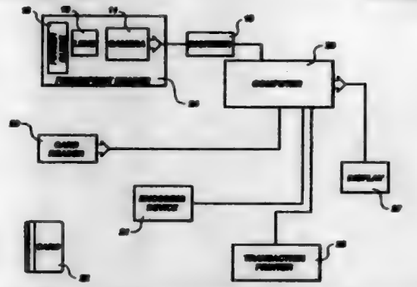
comparing the computed second image digest with the reconstructed image digest to determine the authenticity of the received message analog signal.

5,598,474

PROCESS FOR ENCRYPTING A FINGERPRINT ONTO AN I.D. CARD

Neldon P. Johnson, 512 S. 860 East, American Fork, Utah 84003

Continuation-in-part of Ser. No. 218,743, Mar. 29, 1994, abandoned. This application Mar. 10, 1995, Ser. No. 402,014
Int. Cl.[6] H04L 9/00
U.S. Cl. 380—23 **10 Claims**



1. An apparatus for reading unique identifying characteristics from a body part, transmitting said unique identifying characteristics to a computer, digitizing the characteristics, and then having a computer with the ability to separate out from the whole unique identifying characteristics into separate unique identifying characteristics and then distinguish and identify the different unique characteristics and then giving each of those unique identifying characteristics a unique code that represents the unique identifying characteristics type and location relative to other unique identifying characteristics for the purpose of affixing them on an identification document, or electronic storage medium including the following components:

means for transferring the characteristics from a camera means to a digitizer;

means for transferring the characteristics from the digitizer to the computer for the purpose of separating out from the whole image each unique identifying characteristic;

means for identifying each unique characteristic by type;

means for giving each identifying characteristic its own unique code which is comprised of the type and also relative location;

means for transmitting the unique identification characteristics code to the computer for storage and processing; and

means for imprinting the unique identification characteristics codes on the electronic storage medium.

5,598,475

ROLLING CODE IDENTIFICATION SCHEME FOR REMOTE CONTROL APPLICATIONS

Eric G. Soenen, Plano; Gregory B. Davis, Allen, and Angie Dycus, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 23, 1995, Ser. No. 408,874
Int. Cl.[6] H04L 9/32;9/00
U.S. Cl. 380—23 **5 Claims**

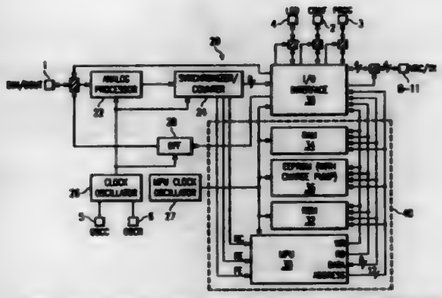
1. A method of sending and receiving an encrypted data transmission signal in a remote control access system, comprising the steps of:

encrypting a data transmission signal into a binary number of n bytes in transmitter;

transmitting the encrypted data transmission signal;

receiving the encrypted data transmission signal in a receiver;

decrypting, in the receiver, the encrypted data transmission signal by performing an inverse exclusive OR logic operation on the binary number of n bytes;



granting access to the system if the received decrypted data transmission signal is between the range of 1 and 256 of a previous received decrypted data transmission signal stored in the receiver.

5,598,476

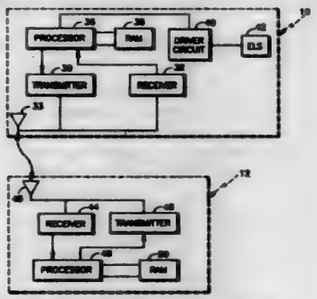
RANDOM CLOCK COMPOSITION-BASED CRYPTOGRAPHIC AUTHENTICATION PROCESS AND LOCKING SYSTEM

Robert E. LaBarre, Willington, and Philip J. Koopman, Jr., Hebron, both of Conn., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation of Ser. No. 425,595, Apr. 20, 1995, abandoned. This application Oct. 26, 1995, Ser. No. 548,384

Int. Cl.[6] H04L 9/00

U.S. Cl. 380—23 **27 Claims**



9. An electronic locking apparatus comprising:

a first device comprising:

a random number generator for generating an n-bit first clocking key;

an encryption system for encrypting said n-bit first clocking key;

a first transmitter for transmitting said encrypted n-bit first clocking key;

a first receiver; and

a first composition processor for generating a first response code based on said n-bit first clocking key;

a second device comprising:

a second receiver for receiving said encrypted n-bit first clocking key;

decryption system for recovering a second clocking key from said received encrypted n-bit first clocking key; and

a second composition processor for generating a second response code based on said second clocking key; and

an authentication system for comparing said first and second response codes and for unlocking said locking apparatus if said first and second response codes match.

5,598,477

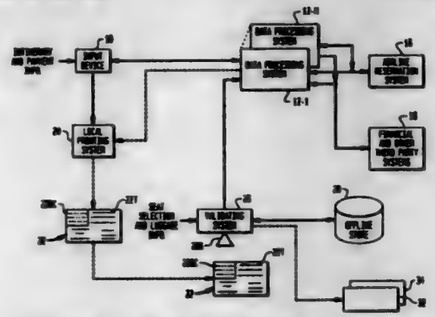
APPARATUS AND METHOD FOR ISSUING AND VALIDATING TICKETS

William Berson, Weston, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 22, 1994, Ser. No. 343,392

Int. Cl.[6] H04L 9/00

U.S. Cl. 380—51 **21 Claims**



1. A system for issuing tickets, comprising:

a) a data processing system for:

a1) receiving ticket request information; and,

a2) generating ticket information; said ticket information including encrypted validating information;

b) a local printing system for:

b1) receiving said ticket information; and,

b2) printing said encrypted validating information on a ticket in a machine readable format; and

c) a validating system for:

c1) automatically converting said encrypted validating information in machine readable format into a digital format;

c2) decrypting said encrypted validating information.

c3) locally testing said validating information with respect to information on said ticket to validate said ticket; and,

c4) if said ticket is valid, downloading at least a portion of said ticket information for reconciliation of accounts.

5,598,478

SOUND IMAGE LOCALIZATION CONTROL APPARATUS

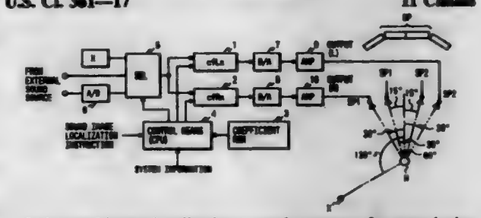
Yoshiaki Tanaka, Fujisawa; Hiroshi Hayashi, Tokyo; Norihiko Fuchigami, Yokohama; Masahiro Nakayama, Sagamihara; Takuma Suzuki, and Mitsuo Matsumoto, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 20, 1993, Ser. No. 169,198

Claims priority, application Japan, Dec. 18, 1992, 4-355759; Dec. 21, 1992, 4-356358; Dec. 28, 1992, 4-361642

Int. Cl.[6] H04R 5/00

U.S. Cl. 381—17 **11 Claims**



1. A sound image localization control apparatus for reproducing sounds from signals supplied from a sound source through a pair of convolvers by using a pair of transducers disposed apart from each other and for controlling sound image localization to make a listener feel that the listener hears sounds from a sound image localized at a desired sound image location different from positions of the transducers, comprising:

a pair of convolvers, each convolver performing a convolution operation on the signals supplied from the sound source according to coefficients set therein;

storing means for storing groups of coefficients of the convolvers calculated as impulse responses on the basis of head-related transfer functions measured at each sound image location by performing an operation of converging a number of the coefficients of each group to a predetermined number, and an operation of scaling the coefficients of each group to a predetermined level; and

coefficient supply means for reading a group of the coefficients corresponding to a designated sound image location from the storing means and supplying the read group of the coefficients to the pair of the convolvers.

5,598,479

DEVICE FOR REDUCING TIRE/ROAD SURFACE NOISE

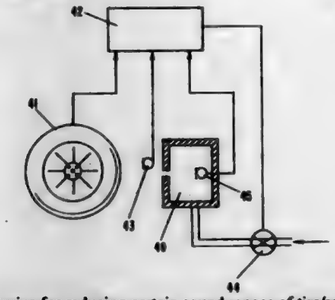
Thomas Dodt, Hanover; Frank Gauterin, Neustadt; Thomas Schulze, Hanover; Geert Rolk, Cremlingen, and Heinrich Heinink, Garbsen, all of Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany

Filed Jan. 30, 1995, Ser. No. 381,411

Claims priority, application Germany, Jan. 29, 1994, 44 02 699.4

Int. Cl.[6] G10K 11/16

U.S. Cl. 381—71 **83 Claims**



1. A device for reducing certain sound ranges of tire/road surface noise emitted by a motor vehicle equipped with an ABS system, said device comprising:

sound absorbers in the form of resonators positioned in an area of sound projection of the tire/road surface noise, said resonators adjustable to sound ranges that are proportional to the rpm of the wheel;

said resonators connected to the inner wall of a wheel well of the motorized vehicle;

an electronic control device for receiving a signal derived from the ABS system in the form of the rpm of the wheel;

said electronic control device adjusting said resonators as a function of a total number of tread blocks of the tire, the sound emission characteristics, and the rpm of the wheel.

5,598,480

MULTIPLE OUTPUT TRANSFORMER NETWORK FOR SOUND REPRODUCING SYSTEM

Man H. Kim, 19422 Sturgess Dr., Torrance, Calif. 90503

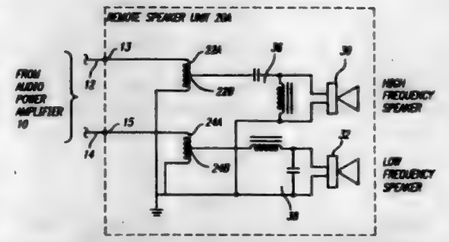
Filed Apr. 27, 1995, Ser. No. 429,585

Claims priority, application Rep. of Korea, Nov. 7, 1994, 94-29454

Int. Cl.[6] H03G 5/00

U.S. Cl. 381—99 **2 Claims**

1. In sound reproducing equipment, the combination of: an audio output power amplifier and a remote speaker unit coupled to the audio output power amplifier by first and second extension leads; said remote speaker unit including first and second speakers,



first and second autotransformers connected to the audio output power amplifier by the first and second extension leads respectively, a first bandpass filter coupling the first autotransformer to the first speaker, and a second bandpass filter coupling the second autotransformer to the second speaker, said first and second speakers being respectively high-frequency and low-frequency speakers, and said first and second bandpass filters being respectively high-frequency bandpass and low-frequency bandpass filters having predetermined cross-over characteristics, said first autotransformer comprising a winding having one side connected to the first extension lead and a second side connected to ground and having a tap on said winding connected to said high-frequency filter, and said second autotransformer comprising a winding having one side connected to the second extension lead and a second side connected to ground and having a tap connected to said low-frequency filter.

5,598,481

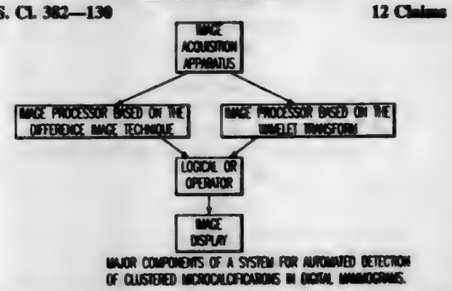
COMPUTER-AIDED METHOD FOR IMAGE FEATURE ANALYSIS AND DIAGNOSIS IN MAMMOGRAPHY

Robert M. Nishikawa, Chicago; Takehiro Ema; Hiroyuki Yoshida, both of Westmont, and Kunio Doi, Willowbrook, all of Ill., assignors to Arch Development Corporation, Chicago, Ill.

Division of Ser. No. 235,530, Apr. 29, 1994. This application Sep. 29, 1995, Ser. No. 536,450

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—130 **12 Claims**



MAJOR COMPONENTS OF A SYSTEM FOR AUTOMATED DETECTION OF CLUSTERED MICROCALCIFICATIONS IN DIGITAL MAMMOGRAMS.

1. A method for automated detection of an abnormal anatomic region, comprising:

obtaining a digital image of an object including said anatomic region;

first filtering said digital image using a first set of filters having a first transfer function to produce a difference image based on a difference between a signal-enhanced and a signal suppressed image of said digital image;

second filtering said digital image using a wavelet decomposition and reconstruction of said digital image to produce a transformation image;

processing said difference image to identify in said difference image first locations which corresponds to potential abnormal regions;

processing said transformation image to identify in said transformation image second locations which correspond to potential abnormal regions;

logically OR'ing the first and second locations to identify as candidate abnormal regions all those first and second locations which are separated by a predetermined distance or more; and,

processing the candidate abnormal regions to identify abnormal regions from amoeg said candidate abnormal regions.

5,598,482

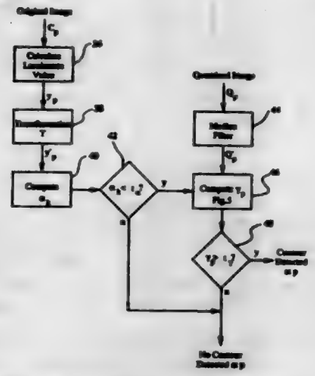
IMAGE RENDERING SYSTEM AND ASSOCIATED METHOD FOR MINIMIZING CONTOURS IN A QUANTIZED DIGITAL COLOR IMAGE

Thyagarajan Balasubramanian, West Lafayette, Ind.; King Chai, and Joseph DiVincenzo, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 833,865, Feb. 11, 1992, abandoned. This application May 16, 1994, Ser. No. 243,433

Int. Cl.[6] G06K 9/48

U.S. Cl. 382—199 **13 Claims**



1. A method for minimizing the contouring effects in a quantized digital image, comprising the steps of:

a) quantizing an original image using a quantizer to produce a quantized image;

b) determining, by a digital computer, the luminance value for each pixel of the original digital image and the quantized version of the original image;

c) determining, by the computer, busy and smooth regions in the original digital image;

d) for smooth regions, determining, by the computer, luminance variations (gradients) in the original digital image for each pixel by a first Sobel operator;

e) for corresponding smooth regions, determining by the computer luminance variations in the quantized digital image for each pixel by a second Sobel operator;

f) determining, by the computer, the difference between the original luminance variations and the quantized luminance variations for each pixel by a differencer coupled to said first Sobel operator and coupled to said second Sobel operator;

g) selecting, by the computer, a threshold value that when exceeded is indicative of the existence of contours;

h) comparing, by the computer, the difference of step f) with the threshold value of step g) and if the threshold is exceeded indexing the presence of a contour at an associated pixel of the quantized image;

i) for each pixel (i,j) of the quantized image searching, by the computer, for a contour index in a window of pixels around each pixel; and

j) when a contour index is found, computing a new color to be placed at each pixel (i,j).

5,598,483

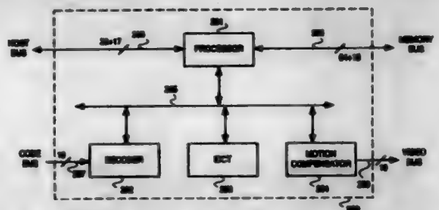
MPEG VIDEO DECOMPRESSION PROCESSOR

Stephen C. Purcell, Mountain View; David E. Galbi, Santa Clara; Frank H. Liao, Sunnyvale, and Yvonne C. Tse, Fremont, all of Calif., assignors to C-Cube Microsystems, Inc., Milpitas, Calif.

Division of Ser. No. 46,474, Apr. 13, 1993, Pat. No. 5,379,356. This application Oct. 24, 1994, Ser. No. 297,722

Int. Cl.[6] G06K 9/36

U.S. Cl. 382—232 **4 Claims**



1. An apparatus for decompressing coded compressed video signal, said apparatus being coupled to a memory, said apparatus comprising:

a bus, coupled to said memory, said bus providing read and write accesses to said memory;

a first-in-first-out (FIFO) buffer for receiving from said memory via said bus compressed video signals, said compressed video signals encoded by variable-length codes;

a decoding circuit, coupled to said FIFO buffer, for decoding the variable-length codes of said coded compressed video signals received from said FIFO buffer;

an inverse discrete cosine transform (IDCT) circuit, receiving said decoded video signals, for performing an inverse discrete cosine transform on said decoded video signals, and for providing said transformed video signals on said bus;

a motion compensation circuit, coupled to receive said transformed video signals from said bus and coupled to receive over said bus reference frames from said memory, said motion compensation circuit reconstructing video signals using said reference frames to further decode said transformed video signals, and storing said reconstructed video signals in said memory via said bus; and

a memory controller, coupled to said memory, said FIFO, said IDCT circuit, and said motion compensation circuit, for controlling memory access over said bus by said FIFO, said IDCT circuit, and said motion compensation circuit, in accordance with a predetermined priority scheme.

5,598,484

APPARATUS FOR ENCODING AN IMAGE SIGNAL

Kazuhiro Suzuki; Koh Kamizawa; Yutaka Koshi, and Setsu Kunitake, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 936,346, Aug. 28, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 385,204

Claims priority, application Japan, Aug. 30, 1991, 3-220593; Aug. 30, 1991, 3-220596

Int. Cl.[6] G06K 9/36;9/46

U.S. Cl. 382—239 **3 Claims**

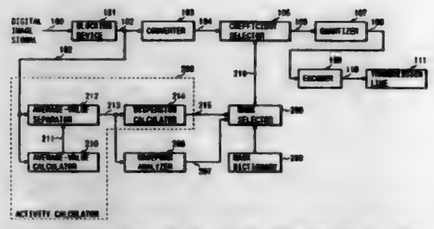
1. An apparatus for encoding an image signal in which the image signal is formed into blocks and is subjected to an orthogonal transform, and a transforming coefficient is coded, comprising:

means for dividing the image signal into pixel blocks;

means for performing a two-dimensional orthogonal transform with respect to each of said pixel blocks;

waveform analyzing means for comparing the wave form in each of the pixel blocks with a plurality of typical patterns to output identification information for identifying a most similar typical pattern;

storage means for storing a plurality of items of mask information representing the significance or insignificance of each of



a plurality of transforming coefficients obtained by said means for performing a two-dimensional orthogonal transform;

mask selecting means for selecting the mask information from said storage means on the basis of the identification information from said waveform analyzing means;

coefficient selecting means for determining the significance or insignificance of each of the transforming coefficients by using the mask information selected to set to 0 a transforming coefficient determined to be insignificant and for yielding at least one transforming coefficient selected by the selecting means and not determined to be insignificant; and

encoding means for encoding the transforming coefficient selected by the selecting means.

5,598,485

APPARATUS FOR PERFORMING A JOINT FOURIER TRANFORM UTILIZING APERTURES OF LOW CORRELATION

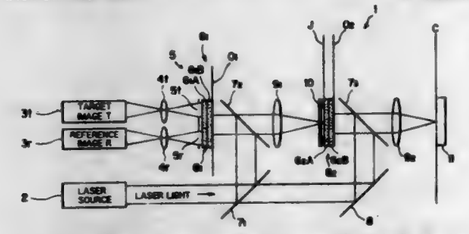
Yuji Kobayashi; Haruyoshi Toyoda, both of Hamamatsu, and Terushige Hori, Osaka, all of Japan, assignors to Hamamatsu Photonics K.K., Tokyo, Japan

Filed Dec. 6, 1993, Ser. No. 161,343

Claims priority, application Japan, Dec. 4, 1992, 4-325513

Int. Cl.[6] G06K 9/64

U.S. Cl. 382—278 **11 Claims**



1. A spatial Fourier transforming apparatus for jointly Fourier transforming a plurality of input images to obtain a Joint Fourier transform image of the plurality of input images, the apparatus comprising:

a light source for radiating light bearing a plurality of input images and a background image;

a mask member for receiving the light from said light source, said mask member having a mask area for blocking light bearing the background image to thereby transmit light bearing at least a portion of each of the plurality of input images; and

Fourier transforming means for receiving the light bearing at least portions of the plurality of input images having passed through said mask member and for jointly Fourier transforming the at least portions of the plurality of input images to thereby obtain a Joint Fourier Transform image of the plurality of input images;

wherein the mask area of said mask member has a plurality of apertures each for transmitting light bearing the at least a portion of a corresponding one of the plurality of input images, the plurality of apertures having low correlation with one another; and

wherein the mask area has light transmittance of a zero value for blocking the light from said light source, each of the plurality of apertures has high light transmittance, and the plurality of apertures each has light transmittance lowering gradually from the center of the aperture to the edge of the aperture.

5,598,486

IMAGE TRANSFORMATION APPARATUS

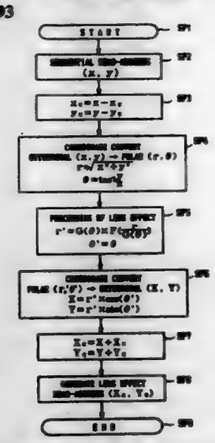
Katsuakira Moriwake, and Toshihiro Shiraishi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 13, 1994, Ser. No. 227,831

Claims priority, application Japan, Apr. 17, 1993, 5-113966

Int. Cl.[6] G06K 9/32

U.S. Cl. 382—293 **12 Claims**



1. Apparatus for transforming input video data representing an input video image, comprising:

storage means for storing said input video data;

means for supplying a rectangular coordinate address representing a location in a transformed image;

means for converting said rectangular coordinate address to a polar coordinate address having a radius coordinate and an angular coordinate;

transforming means for transforming said polar coordinate address to a transformed polar coordinate address having a transformed radius coordinate and a transformed angular coordinate in accordance with first and second pattern functions corresponding to first and second patterns which establish a pattern of said transformed image and a curvature function which is a function of the radius coordinate of the polar coordinate address and a virtual lens having a predetermined radius of curvature producing said transformed image as if the input video image is viewed through said virtual lens having said predetermined radius of curvature, at least one of said first and second pattern functions being dependent upon said angular coordinate of said polar coordinate address and a rotation angle which establishes a rotational view of the respective pattern;

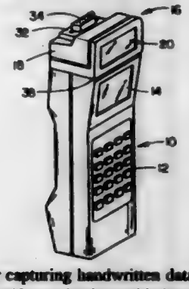
means for converting said transformed polar coordinate address to a transformed rectangular coordinate address; and

means for retrieving from said storage means said input video data corresponding to said transformed rectangular coordinate address of said input video image and providing said retrieved input video data as data for said rectangular coordinate address of said transformed image.

5,598,487
HAND-HELD DATA ENTRY SYSTEM REMOVABLE SIGNATURE PAD

David C. Hacker, Jacksonville, Fla.; Jerry L. Walter, Cedar Rapids, Iowa; Arvin D. Danielson, Solon, Iowa, and Dennis A. Durbin, Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 275,096, Jul. 14, 1994, abandoned, which is a continuation of Ser. No. 852,400, Mar. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 415,169, Sep. 29, 1989, Pat. No. 5,123,864, said Ser. No. 852,400is a continuation-in-part of Ser. No. 451,322, Dec. 15, 1989, Pat. No. 5,227,614, which is a continuation-in-part of Ser. No. 143,921, Jan. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 897,547, Aug. 15, 1986, abandoned. This application Sep. 14, 1994, Ser. No. 306,073
Int. Cl.[6] G06K 9/22; G06F 3/00; G08C 21/00; G09G 5/00
U.S. Cl. 382—313 13 Claims



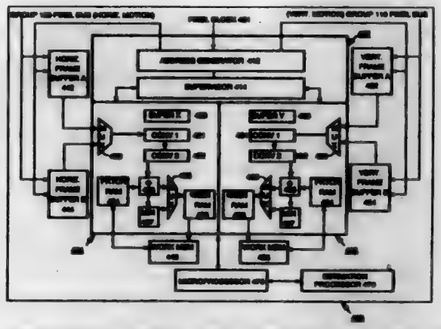
1. Apparatus for capturing handwritten data, comprising:
(a) a hand-held self-contained portable handwritten data capture assembly capable of receiving normally generated handwritten material, said assembly comprising an integral combination of a portable data terminal for processing data,
(b) a removable handwritten data receiving module removably connected to the data terminal and having a longitudinally extensive receiving surface for receiving a spatially extended sequence of information conveying handwritten data while the module is connected with the data terminal,
(c) means in said receiving module for reading the spatially extended sequence of information conveying handwritten data as applied to said receiving surface and entering the data into the data terminal, and
(d) said hand-held self-contained portable handwritten data capture assembly having a handgrip region comprising a bottom surface and adjoining side surfaces, providing a grip cross section such that the data capture assembly can be hand held with the operator's hand in simultaneous contact with the bottom surface and the adjoining side surfaces of the data capture assembly.

5,598,488
OBJECT MOVEMENT ESTIMATOR USING ONE-DIMENSIONAL OPTICAL FLOW

Tomaso Poggio, Wellesley, Mass.; John G. Harris, Gainesville, Fla., and Nicola Ancona, Bari, Italy, assignors to Massachusetts Institute of Technology, Cambridge, Mass., and Technopolis CSATA Novus Ortus, Italy

Filed Sep. 13, 1993, Ser. No. 120,591
Int. Cl.[6] G06K 9/64; G06F 17/15
U.S. Cl. 382—278 6 Claims

1. A system for predicting a time to contact of a first object moving towards a second object, comprising:
sensing means affixed to said first object for sensing a two-dimensional plurality of image portions of said second object, said sensing means including a first group of sensors and a second group of sensors, the first group of sensors not being collinear with the second group of sensors;

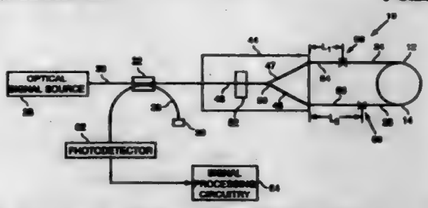


a first memory coupled to said sensing means for storing said sensed image portions at a first instant of time;
a second memory coupled to said sensing means for storing said sensed image portions at a second instant of time;
a correlator coupled to said first and second memories for estimating one-dimensional optical flows by performing correlations on said sensed image portions at said first instant of time and said sensed image portions at said second instant of time, a first one of said correlations corresponding to a first component of said image portions incident on said first group of sensors and a second one of said correlations corresponding to a second component of said image portions incident on said second group of sensors; and
an estimator, coupled to said correlator, for generating an estimate of said time to contact in response to results of said correlations by said correlator.

5,598,489
DEPOLARIZED FIBER OPTIC ROTATION SENSOR WITH LOW FARADAY EFFECT DRIFT

George A. Pavlath, Thousand Oaks; Ronald J. Michal, Wrightwood; Ralph A. Patterson, Canoga Park, and Sidney X. Y. Huang, West Hills, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Filed Jul. 27, 1994, Ser. No. 281,339
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—12 6 Claims



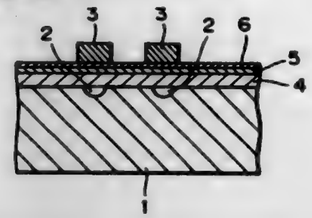
1. Apparatus for reducing magnetic field sensitivity in a fiber optic rotation sensor that senses rotations about the axis of a sensing coil formed in a length of an optical fiber by detecting phase differences in a pair of counterpropagating waves in the sensing coil, the sensing coil being formed such that it has a sensitivity to external magnetic fields such that the Faraday effect causes a phase difference in the counterpropagating waves in the sensing coil, comprising:
an optical signal source;
a multifunction integrated optics chip having a first optical waveguide formed thereon, the first optical waveguide being arranged to receive optical signals from the optical signal source, the multifunction integrated optics chip having second and third optical waveguides formed thereon such that the first, second and third optical waveguides intersect to form a Y-coupler, the multifunction integrated optics chip further

including a phase modulator formed therein to modulate the phase of waves in the first optical waveguide;
first and second fiber optic multifunction integrated optics chip leads formed of polarization-maintaining optical fiber and arranged to extend from the ends of the second and third optical waveguides, each of the first and second fiber optic multifunction integrated optics chip leads having two mutually perpendicular principal axes of birefringence, the first and second fiber optic multifunction integrated optics chip leads being arranged relative to the second and third optical waveguides, respectively, such that the linear polarization of optical signals output from the second and third optical waveguides are directed along one of the principal axes of birefringence of each of the first and second multifunction integrated optics chip leads;
first and second sensing coil leads of polarization-maintaining optical fiber extending from the sensing coil, each of the first and second sensing coil leads having two mutually perpendicular principal axes of birefringence;
a first splice formed between the first sensing coil lead and the first multifunction integrated optics chip lead, the first sensing coil lead and the first multifunction integrated optics chip lead being arranged such that their corresponding principal axes of birefringence are at angles of approximately 45° relative to one another such that the counterclockwise wave in the sensing coil is depolarized, the first multifunction integrated optics chip lead having a length L_1 between the multifunction integrated optics chip and the first splice such that a first selected phase change between polarization components occurs in optical waves that propagate the distance L_1 in the first multifunction integrated optics chip lead; and
a second splice formed between the second sensing coil lead and the second multifunction integrated optics chip lead a distance L_2 from the multifunction integrated optics chip, the second sensing coil lead and the second multifunction integrated optics chip lead being arranged such that their corresponding principal axes of birefringence are at angles of approximately 45° relative to one another such that the counterclockwise wave in the sensing coil is depolarized.

5,598,490
DIELECTRIC OPTICAL WAVEGUIDE DEVICE

Hirono Hakogi, and Takashi Yamane, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 190,478, Feb. 2, 1994, Pat. No. 5,473,711. This application Jun. 2, 1995, Ser. No. 459,459
Claims priority, application Japan, Sep. 17, 1993, 5-231496
Int. Cl.[6] G02B 6/12
U.S. Cl. 385—14 7 Claims

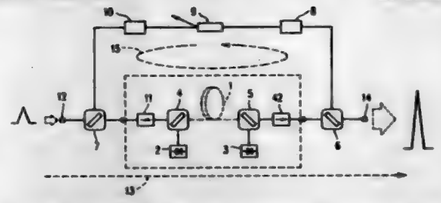


1. A dielectric optical waveguide device comprising:
a dielectric substrate;
a pair of optical waveguides formed in said substrate;
an insulating buffer layer provided on said substrate;
a semiconductor film provided on said buffer layer;
a pair of metal electrodes arranged in spaced relationship from each other so as to correspond to said optical waveguides formed in said substrate; and
a diffusion suppressing layer provided so as to be interposed between said semiconductor film and said electrodes, said diffusion suppressing layer being formed of insulating material having a diffusion constant on a solid-phase alloying reaction with said electrodes smaller than a diffusion constant on a solid-phase alloying reaction between said electrodes and said semiconductor film.

5,598,491
OPTICAL FIBER AMPLIFIER AND OPTICAL FIBER TRANSMISSION APPARATUS

Jun Ohya; Tomoaki Uno, both of Osaka, and Masahiro Mitsuda, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 22, 1995, Ser. No. 517,987
Claims priority, application Japan, Aug. 23, 1994, 6-198301
Int. Cl.[6] G02B 6/28; H01S 3/30
U.S. Cl. 385—24 20 Claims

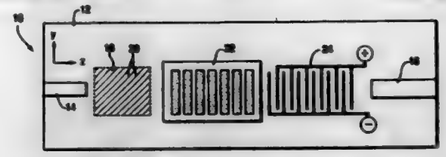


1. An optical fiber amplifier comprising a rare earth doped optical fiber and a pumping light source for outputting pumping light for pumping the rare earth doped optical fiber, the optical fiber amplifier optically amplifying signal light received at an input end and outputting the amplified signal light from an output end,
wherein the optical fiber amplifier further includes:
a selector for selecting a portion of light of spontaneous emission generated in the rare earth doped optical fiber, which has a wavelength shorter than the wavelength of the signal light; and
an optical fiber resonator for laser-oscillating the portion of light of spontaneous emission generated in the rare earth doped optical fiber, which is selected by the selector, thereby to keep a gain substantially fixed independent of a variation in the input power and wavelength of the signal light.

5,598,492
METAL-FERROMAGNETIC OPTICAL WAVEGUIDE ISOLATOR

Jacob M. Hammer, 42 City Gate La., Annapolis, Md. 21401

Filed Oct. 10, 1995, Ser. No. 541,915
Int. Cl.[6] G02B 6/27
U.S. Cl. 385—27 8 Claims



1. An optical waveguide isolator comprising:
a body of a semiconductor material having a surface and first and second ends;
a waveguide in the body extending along said surface between said ends;
an input guide at the first end and an output guide at the second end;

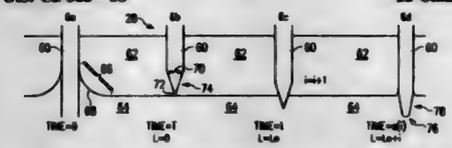
a Bragg deflection grating analyzer adjacent the input guide;
a Faraday rotator waveguide TE-TM mode converter adjacent the analyzer; and
a TE-TM mode converter between the Faraday rotator and the output guide;
said Faraday rotator including a layer of an amorphous or polycrystalline metallic-ferromagnetic material extending along the waveguide.

5,598,493

METHOD AND SYSTEM FOR FORMING AN OPTICAL FIBER MICROLENS

Harry B. Basham, Jr., and Richard E. Lucas, Jr., both of Plano, Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Filed May 16, 1994, Ser. No. 243,142
Int. Cl.[6] G02B *6/32*
U.S. Cl. 385—33 **12 Claims**



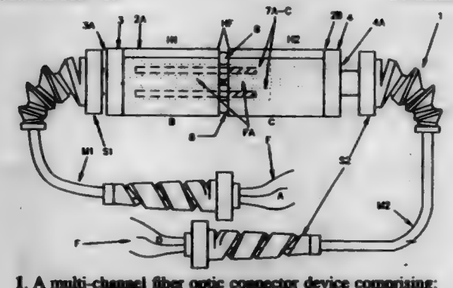
1. A method for forming a microlens on an optical fiber by performing the steps of:
inserting the optical fiber predetermined depth in a bath comprising an oil layer, an acid layer, and a boundary between the oil layer and the acid layer;
etching the portion of the optical fiber contacted by the acid layer by forming a meniscus around the optical fiber to selectively and controllably form on the optical fiber a microlens having a predetermined shape.

5,598,494

MULTI-CHANNEL FIBER OPTIC CONNECTOR

Greg Behrmann, Columbia; Dale Smith, Baltimore, both of Md., and Greg Rosan, Palo Alto, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1995, Ser. No. 546,879
Int. Cl.[6] G02B *6/00;6/38*
U.S. Cl. 385—59 **14 Claims**



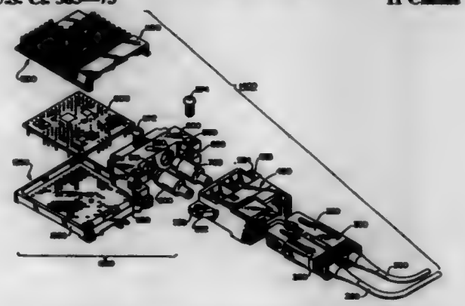
1. A multi-channel fiber optic connector device comprising:
(a) first and second connector halves, each of said connector halves comprising a back end portion;
(b) first and second strain relief rings;
(c) first and second strain reliefs;
(d) a plurality of optical fibers;
said first and second strain relief rings being connected to said first and second connector at said back end portion, respectively;
each of said strain relief rings further comprising a central aperture, said central aperture constructed so as to comprise a threading, said each of said first and second reliefs being screwed into said apertures, respectively;
said plurality of optic fibers constructed so as to be positioned through each of said reliefs and each of said rings;
said rings further comprising a cover, said cover constructed so as to blanket heads of screws positioned within said first and second connector halves.

5,598,495

FIBER OPTIC CONNECTOR HOUSING, FIBER OPTIC RECEPTACLE, ACCESSORIES EMPLOYING FIBER OPTIC CONNECTOR HOUSINGS AND CORRESPONDING OPTICAL ASSEMBLIES

Jeffrey W. Rittle, Endicott; William W. Vetter, Vestal, and James R. Webb, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 975,770, Nov. 13, 1992, Pat. No. 5,325,454. This application May 11, 1995, Ser. No. 439,829
Int. Cl.[6] G02B *6/00;6/36*
U.S. Cl. 385—75 **11 Claims**



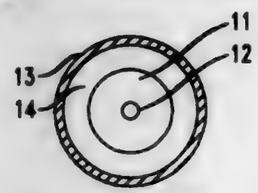
1. A device for cleaning at least one optical surface with a fluid, comprising:
at least a first tube through which a fluid is to be injected, and at least a first fluid nozzle, connected to a front end of said first tube;
at least a first plug frame which is adapted to receive, and which contains, said first tube and said first nozzle, the latter protruding through an opening in a front end of said first plug frame;
at least a first fiber optic connector housing which contains said first plug frame, said first nozzle protruding through an opening in a front end of said first fiber optic connector housing;
at least a second tube through which a fluid is to injected, and at least a second fluid nozzle, connected to a front end of said second tube;
at least a second plug frame which is adapted to receive, and which contains, said second tube and said second nozzle, the latter protruding through an opening in a front end of said second plug frame;
at least a second fiber optic connector housing which contains said second plug frame, said second nozzle protruding through an opening in a front end of said second fiber optic connector housing; and
means, extending between said first and second fiber optic connector housings, for maintaining said first and second fiber optic connector housings in a substantially side-by-side relationship while permitting each of said first and second fiber optic connector housings to move in at least four different directions relative to the other fiber optic connector housing.

5,598,496

OPTICAL FIBER CONNECTOR COMPRISING A GLASS FERRULE, AND METHOD OF MAKING SAME

Jerry M. Anderson, Austell, Ga.; Robert W. Filas, Bridgewater; David W. Johnson, Jr., Bedminster, both of N.J.; Norman R. Lampert, Norcross, Ga.; Eliezer M. Rabinovich, Berkeley Heights, N.J., and David N. Ridgway, Conyers, Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 14, 1995, Ser. No. 572,359
Int. Cl.[6] G02B *6/00;6/36*
U.S. Cl. 385—84 **13 Claims**



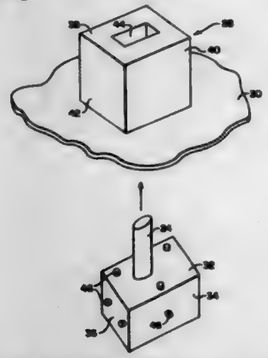
1. An article comprising an optical fiber connector, the connector comprising a substantially cylindrical glass ferrule having an outer cylinder surface and a center bore adapted for receiving therein an optical fiber;
CHARACTERIZED IN THAT
the outer cylinder surface comprises an etched surface, and a protective coating is disposed on the etched surface, the protective coating comprising one or more elements selected from the group consisting of Ni, Cu, Co, Pd, Pt, Au and Rh.

5,598,497

APPARATUS FOR MOUNTING A LIGHT SOURCE WITHIN A SYSTEM FOR COUPLING LIGHT INTO AN OPTIC FIBER OR FIBER BUNDLE

Thomas W. Roller, Moorpark, Calif., assignor to Cogent Light Technologies, Inc., Santa Clarita, Calif.

Filed Jul. 14, 1995, Ser. No. 502,563
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—92 **10 Claims**



1. In a system for coupling light from a source through an optical system and into an output fiber optic element, wherein the source and the optical system are mounted within a housing and wherein, for proper operation, the source must be disposed in precise alignment with the optical system, the improvement comprising:
mounting the source to a removable assembly for slidable insertion into and removal from the housing, with said assembly including elements for maintaining precise alignment of the source with the optical system while the source and assembly are positioned within the housing;
wherein the elements for maintaining precise alignment include a plurality of mounting pads, with at least one first mounting pad aligned along a first plane, at least one second mounting pad aligned along a second plane not parallel to the first plane, and at least one third mounting pad aligned along a third plane not parallel to either the first or second planes.

5,598,498

MODULAR OPTICAL FIBER CORE TAPE, SEPARABLE INTO A PLURALITY OF TAPE UNITS OR MODULES, METHOD OF MANUFACTURING SUCH TAPE AND OPTICAL CABLE USING THE SAME

Gerardo Consenzi, Rome, Italy, assignor to Alcatel Cavi S.p.A., Cologno Monzese, Italy

Filed Sep. 30, 1994, Ser. No. 316,128
Claims priority, application Italy, Oct. 12, 1993, MI93A2152
Int. Cl.[6] G02B *6/44*
U.S. Cl. 385—114 **18 Claims**



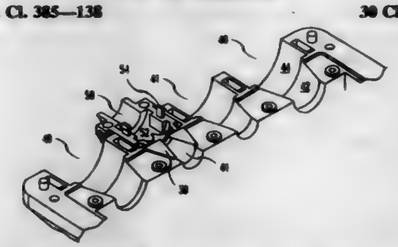
1. Modular optical fiber core tape, separable into a plurality of tape units or modules, for use in optical cables, said tape including a modular series of optical fibers, each having a primary coating, disposed in a parallel arrangement on a plane and embedded in a synthetic resin matrix, a splitting into said modules of said tape being provided for along at least one longitudinal section between contiguous fibers of consecutive modules, wherein at least one separation element is embedded in said resin matrix at said at least one longitudinal section for facilitating the splitting of the tape along said longitudinal section, and wherein the synthetic resin matrix is a material that is cuttable by the separation elements and that is chemically compatible with the primary coating of each said optical fiber.

5,598,499

SEAL FOR CABLE SPLICE CLOSURE

Denis E. Burek, Cumming, and Marc D. Jones, Lithonia, both of Ga., assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed Nov. 1, 1995, Ser. No. 548,359
Int. Cl.[6] G02B *6/00*
U.S. Cl. 385—138 **30 Claims**



1. A seal for providing a seal between a cable and a port in a closure, comprising:
a conical shaped outer surface having a first base and a first truncated top, said first base defining a rear end of said seal and said first truncated top defining a front end of said seal;

an aperture extending completely through said seal from said front end to said rear end, said aperture defining a conical shaped inner surface of said seal with said conical shaped inner surface having a second base at said front end and a second truncated top located near said rear end of said seal; and

a slit extending completely through said seal from said outer surface to said inner surface and extending from said front end of said seal toward said rear end of said seal;

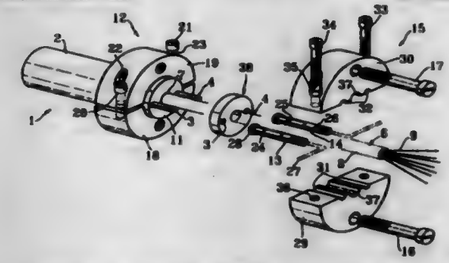
wherein said outer surface of said seal is for engaging said port, said inner surface of said seal is for engaging said cable, and portions of said seal on either side of said slit are forced together when said seal is compressed from said rear end toward said front end, whereby said port in said closure is sealed.

5,598,500

FIXING, EARTHING AND SEALING DEVICE FOR OPTICAL CABLES

Daniel Crespel, Lannion, and Jean-Pierre Louboutin, Trebeurden, both of France, assignors to France Telecom, Paris, France

Filed Jan. 3, 1996, Ser. No. 582,383
Claims priority, application France, Jan. 9, 1995, 95 00161
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—139 18 Claims



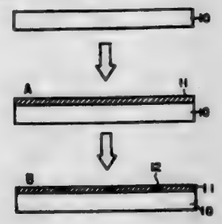
1. Device (1) for fixing, earthing and sealing the end of an optical cable, including at least one optical module (6), an outer jacket (2), especially made of relatively deformable plastic, having a cylindrical general shape, freely surrounding the optical module consisting of a set of adjacent fibres (9) which are independent or preferably housed in a confinement sheath (8), and at least one reinforcing element (3, 4) having a high mechanical strength, in particular a high tensile strength, in order to take up and absorb the forces exerted on the cable without transferring them to the optical module, characterized in that it includes an immobilizing member (12) operating by clamping the jacket from outside the latter, at least one hollow protective sealing plug (13, 14, 46) capable of being placed around and possibly crimped onto a part of the reinforcing element that extends from the front end of the jacket which has been cut beforehand in order to strip the optical module, this plug including a flange (28), possibly protruding, bearing against a plane surface made on the end of the jacket, and a locking assembly (15) for clamping over the plug, this locking assembly being formed by two opposite jaws (29, 30) which mutually interact, closing together onto the external surface of the plug in a diametral plane passing through the axis of the latter, means (16, 17) being furthermore provided for closing together the locking assembly for clamping over the plug with respect to the member for immobilizing the jacket, so as locally to compress the latter by means of the flange of the plug, thereby achieving sealing with respect to the outside of the reinforcing element extending into the thickness of the sheath, parallel with its longitudinal axis.

5,598,501

POLYIMIDE OPTICAL WAVEGUIDE AND METHOD OF MANUFACTURING THE SAME

Yusuke Marue, Kodaira; Shigekazu Sasaki, Iruma; Toshiaki Tamamura, Atsugi; Toru Matsuura, Yokohama; Shinji Ando, Tokyo; Shinsuke Matsui, Kodaira, and Fumio Yamamoto, Hoya, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 213,918, Mar. 15, 1994, abandoned. This application Apr. 18, 1995, Ser. No. 423,695
Claims priority, application Japan, Mar. 18, 1993, 5-082516; Jun. 28, 1993, 5-178574
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—143 14 Claims



1. A method of manufacturing a polyimide optical waveguide, comprising the steps of:

forming a core made of a polyimide whose refractive index is controlled to be a predetermined value by electron beam irradiation; and

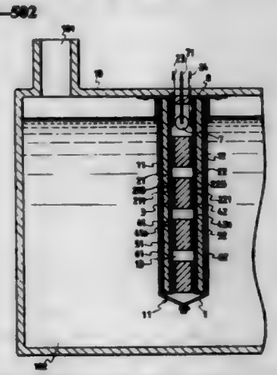
forming a cladding set in contact with said core, and said cladding being made of the same material as said core and having a refractive index lower than that of said core.

5,598,502

PTC HEATER FOR USE IN LIQUID WITH CLOSE ELECTRICAL AND THERMAL COUPLING BETWEEN ELECTRODE PLATES AND THERMISTORS

Minoru Takahashi, and Makoto Ono, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 5, 1994, Ser. No. 285,449
Claims priority, application Japan, Aug. 20, 1993, 5-049970 U; Apr. 19, 1994, 6-080232
Int. Cl.[6] H05B 3/14
U.S. Cl. 392—502 7 Claims



1. A PTC heater for use in liquid comprising:

a case including first and second radiating members having peripheries which engage each other and which are shielded to define an internal space inside said case, said case having an opening between said first and second radiating members;

plural electrode plates arranged in said internal space, each of said electrode plates having elastic projections on both of opposing sides of each of said electrode plates;

at least one positive temperature coefficient thermistor having electrodes provided on opposing surfaces, said at least one positive temperature coefficient thermistor being arranged between said electrode plates while the projections on one of said opposing sides of said electrode plates are in contact with said electrodes;

projections on another of said opposing sides of said electrode plates being engaged with an inside wall of said case; and

a thermally conductive adhesive resin disposed between said electrodes of said at least one positive temperature coefficient thermistor and said electrode plates.

5,598,503

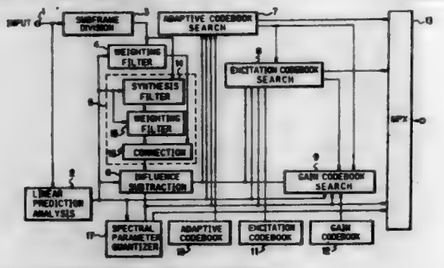
Patent Not Issued For This Number

5,598,504

SPEECH CODING SYSTEM TO REDUCE DISTORTION THROUGH SIGNAL OVERLAP

Toshiki Miyano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 212,723
Claims priority, application Japan, Mar. 15, 1993, 008736
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.31 7 Claims



1. A speech coding system comprising:

a linear prediction analysis circuit for developing spectral parameters for subframes of an input speech signal divided at predetermined intervals in each frame;

an adaptive codebook;

an excitation codebook;

a gain codebook;

a first weighting filter for producing a perceptually weighted speech signal using said input speech signal and said spectral parameters of a present sub-frame; and

an overlap signal generation circuit further comprising:

a synthesis filter; and

a second weighting filter;

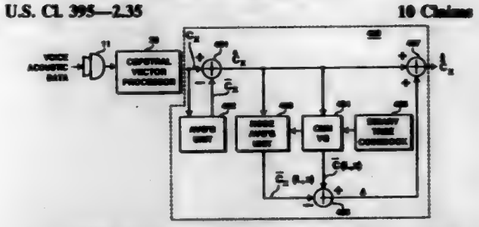
wherein a zero input response of the synthesis filter is developed for a predetermined length by providing the input speech signal of said present subframe as an initial value, and wherein said second weighting filter weights said zero input response to produce at least one overlap signal based on spectral parameters for a next subframe, and wherein optical codevectors are searched from said adaptive, excitation and gain codebooks according to a signal obtained by connecting said overlap said overlap signal to a trailing end of said perceptually weighted speech signal.

5,598,505

CEPSTRAL CORRECTION VECTOR QUANTIZER FOR SPEECH RECOGNITION

Stephen C. Austin, San Mateo, and Adam B. Flaeberg, Saratoga, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1994, Ser. No. 316,118
Int. Cl.[6] G10L 3/02
U.S. Cl. 395—2.35 10 Claims



4. A method for correcting cepstral vectors representative of speech from an acoustical test environment for use in a speech processing system by using a vector quantization (VQ) codebook based on training data from an acoustical training environment, and by applying correction vectors to the cepstral vectors, the method comprising:

(a) acquiring a set of cepstral vectors representative of speech signals from the acoustical training environment;

(b) computing an average cepstral vector from the acquired set of cepstral vectors, the average cepstral vector representative of the acoustical training environment without speech;

(c) correcting the set of cepstral vectors by subtracting the average cepstral vector of step (b) from each of the acquired set of cepstral vectors of step (a) for producing a set of coarsely corrected vectors;

(d) generating a VQ codebook tree from the set of coarsely corrected vectors of step (c) in which each codebook tree node is a vector that is representative of a set of coordinates describing a centroid of a distinct cluster, each cluster having an assigned subset of the set of coarsely corrected vectors of step (c), the subset of coarsely corrected vectors in each cluster being closer to the centroid of the cluster to which the subset is assigned than to any other cluster;

(e) acquiring new cepstral vectors from a test environment and computing a running average test vector,

(f) correcting each new cepstral vector of from the test environment by

(i) subtracting the running average cepstral vector from step (e) from each new cepstral vector to obtain a coarsely corrected new vector,

(ii) vector quantizing the coarsely corrected new vector of step (f)(i) using the VQ codebook tree of step (d) to obtain a VQ vector,

(iii) accumulating a running average node vector from a set of new vectors associated with a node of the VQ codebook tree to which each vector of the set of new vectors is closest,

(iv) generating a fine correction vector from the VQ vector of step (f)(ii) by subtracting the running average node vector corresponding to the VQ vector node,

(v) producing a finely corrected new vector by adding the fine correction vector to the coarsely corrected new vector; and

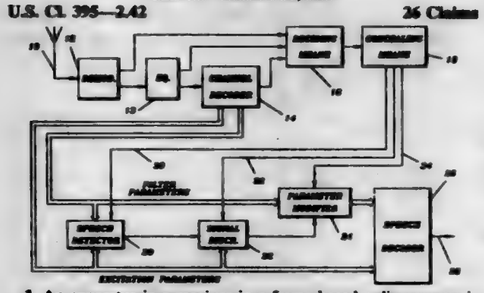
(g) outputting the finely corrected new vector for processing by the speech processing system.

5,598,506

APPARATUS AND A METHOD FOR CONCEALING TRANSMISSION ERRORS IN A SPEECH DECODER

Karl T. Wigren, Uppsala, and Rolf A. Bergström, Mölndal, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 10, 1994, Ser. No. 258,579
Claims priority, application Sweden, Jun. 11, 1993, 9302025
Int. Cl.[6] G10L 5/06;9/00
U.S. Cl. 395—2.42 26 Claims



1. An apparatus in a receiver in a frame based radio communication system, for concealing transmission errors in a speech decoder caused by a communication channel, which speech decoder is of the source-filter type and is controlled by means including internal state variables updated on a frame by frame basis for modifying received filter parameters representing background sounds transmitted over said communication channel, said apparatus comprising:

(a) means for detecting frames containing transmission errors;

(b) means for deciding whether a frame in which transmission errors have been detected is acceptable;

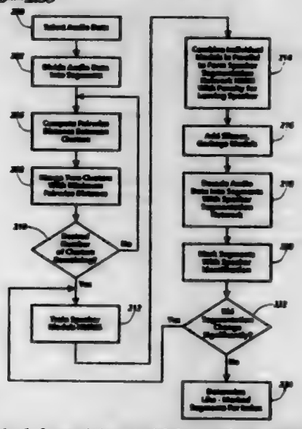
(c) means for concealing said detected transmission errors by restricting updating of at least one of said internal state variables of said speech decoder if said detected frame is declared non-acceptable by said deciding means.

5,598,507

METHOD OF SPEAKER CLUSTERING FOR UNKNOWN SPEAKERS IN CONVERSATIONAL AUDIO DATA

Donald G. Kimber, Mt. View; Lynn D. Wilcox, Portola Valley, and Francine R. Chen, Menlo Park, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1994, Ser. No. 226,523
Int. Cl.[6] G10L 5/06
U.S. Cl. 395—2.55 9 Claims



1. A method for training multiple speaker models based on speech from a multiplicity of speakers, comprising the steps of:

a) providing a portion of audio data including speech from at least all of the multiplicity of speakers;

b) dividing said portion of audio data into data segments;

c) treating said data segments as clusters and computing a pairwise distance between each cluster and every other cluster, basing said pairwise distance on a likelihood measurement that two clusters were created by a same speaker, said likelihood measurement being biased by a Markov duration model based on the prior probability of speaker changes;

d) combining two clusters with a minimum pairwise distance into a new cluster.

5,598,508

REAL-TIME WAVEFORM ANALYSIS USING ARTIFICIAL NEURAL NETWORKS

Julian M. Goldmann, 130 S. Hudson St., Denver, Colo. 80222

Filed Oct. 18, 1991, Ser. No. 779,219
Int. Cl.[6] G06F 15/48;15/18
U.S. Cl. 395—22 19 Claims



1. A method of analyzing a periodic characteristic waveform in a signal using neural networks, said method comprising the steps of:

(a) protraining first and second neural networks to recognize a starting point and an end point of said characteristic waveform;

(b) transmitting said signal to a buffer, said buffer having greater than N storage locations each having an index number, said characteristic waveform in said signal having starting and end points;

(c) serially transmitting the contents of said buffer to said first and second neural networks each neural network having N input nodes, and each input node having an index number, inputting data to each input node from buffer locations having the same index number as a corresponding input node, said neural network input nodes receiving a value of zero from buffer locations not yet receiving any portions of said signal;

(d) causing said first neural network to generate an output which is a representation of the index number of the input node receiving said starting point of said characteristic waveform, and causing said second neural network to generate an output which is a representation of the index number of the input node receiving said end point of said characteristic waveform.

5,598,509

METHOD OF CONFIGURING A NEURAL NETWORK AND A DIAGNOSIS/RECOGNITION SYSTEM USING THE SAME

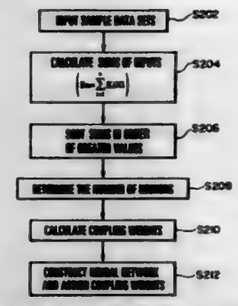
Isao Takahashi, Machashi; Fumihiro Endo, and Tokio Yamagiwa, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 111,472, Aug. 25, 1993. This application Mar. 18, 1994, Ser. No. 214,769
Claims priority, application Japan, Aug. 28, 1992, 4-230288; Aug. 31, 1992, 4-230859; Mar. 18, 1993, 5-058328
Int. Cl.[6] G06E 1/00;3/00
U.S. Cl. 395—22 18 Claims

1. A method for analytically determining coupling weights using a neural network having an input layer, at least a hidden layer and an output layer, said method comprising the steps of:

classifying learning data input to said input layer based on features thereof into classifications of learning data;

inputting learning data for each of said classifications of learning data;



calculating a total sum for each of said classifications of learning data;

correlating teacher data corresponding to the calculated total sum for each of said classifications of learning data in the order of magnitude of the calculated total sum for each output of said output layer; and

determining coupling weights based on the teacher data corresponding to the classification of learning data having a maximum calculated total sum, total sums of said classifications of learning data before and after any change of the teacher data, and the teacher data; and

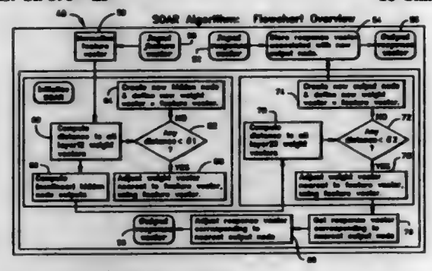
performing recognition or diagnosis by using said neural network having the determined coupling weights.

5,598,510

SELF ORGANIZING ADAPTIVE REPLICATE (SOAR)

Patrick F. Castelaz, Yorba Linda, Calif., assignor to Loma Linda University Medical Center, Loma Linda, Calif.

Filed Oct. 18, 1993, Ser. No. 137,569
Int. Cl.[6] G06E 1/00;3/00; G06F 15/18
U.S. Cl. 395—23 18 Claims



1. A neural network comprising:

a plurality of input nodes each receiving one or more input node inputs and producing an input node output;

a plurality of hidden nodes each receiving one or more hidden node inputs and producing a hidden node output, each of said hidden node outputs being a non-linear function of their respective hidden node inputs;

one or more output nodes, each receiving one or more output node inputs and producing an output node output;

first set of weighted connections coupling said input node outputs to said hidden nodes, the weights of said connections for each hidden node comprising an input weight vector;

second set of weighted connections coupling said hidden node outputs to said output nodes, the weights of said connections for each output node comprising a hidden node weight vector, wherein substantially every input node is connected to every hidden node, and substantially every hidden node is connected to every output node:

means for computing a set of first distance vectors that are a function of the difference between each input weight vector and an input feature vector comprising the inputs to said input nodes, said first distance vectors being fed to the hidden nodes as inputs;

means for computing a set of second distance vectors that are a function of the difference between each hidden node weight vector, and a vector comprising the outputs of said hidden nodes;

means for determining the smallest of the second distance vectors;

means for generating an output from the output node associated with the smallest second distance vector, whereby for each unique input feature vector one output node generates a response and; means for training said network in response to a training feature vector including, means for determining if the smallest of said first distance vectors is less than a predetermined threshold and,

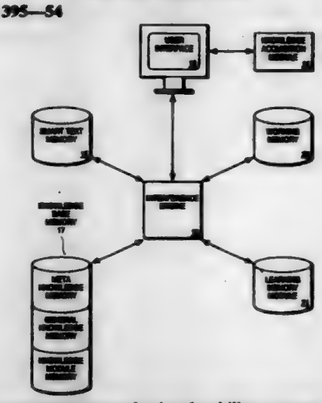
means for adjusting the weights for the hidden node weight vector associated with said smallest first distance vector so as to make said distance smaller if the smallest of said first distance vectors is less than the predetermined threshold.

5,598,511

METHOD AND APPARATUS FOR INTERPRETING DATA AND ACCESSING ON-LINE DOCUMENTATION IN A COMPUTER SYSTEM

Jan S. Petrinjak, Phoenix; Terri L. Corbett, Chandler; Erik O. Berg, Phoenix, and Judy Aguilar, Chandler, all of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 28, 1992, Ser. No. 999,279
Int. Cl.[6] G06F 15/18
U.S. Cl. 395—54 13 Claims



11. In a computer system having the ability to execute a plurality of independent application programs, a method for interpreting data from one or more of the computer application programs and from previous test results stored in a learning module to assist a user in solving a computer system and application problem, the method comprising the computer implemented steps of:

storing meta knowledge and general knowledge in a knowledge base, said meta knowledge being rules of logic, said general knowledge being application-independent rules;

loading a first knowledge module into the knowledge base, said first knowledge module being specific to a first application program;

receiving a list of facts about the problem;

comparing a list of facts to the meta knowledge, general knowledge, or first knowledge module rules in the knowledge base, wherein said comparing the list of facts produces additional facts by application of the facts to the meta knowledge,

general knowledge, or first knowledge module rules in the knowledge base, said comparing the list of facts being repeated until either a valid conclusion is reached or no additional facts are produced;

determining whether the learning module stores previous test results that are relevant to solving the problem;

comparing the previous test results that are relevant to solving the problem to the meta knowledge, general knowledge, or first knowledge module rules in the knowledge base, wherein said comparing the previous test results produces additional facts by application of the previous test results to the meta knowledge, general knowledge, or first knowledge module rules in the knowledge base, said comparing the previous test results being repeated until either a valid conclusion is reached or no additional facts are produced; and

selecting a second knowledge module which provides additional information about solving the problem, wherein said second knowledge module being specific to a second application program, the first and second application programs being independent;

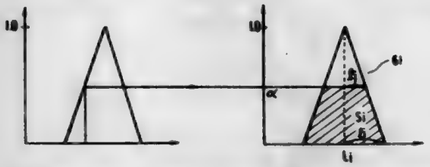
wherein said comparing the list of facts, comparing the previous test results, and selecting a second knowledge module being performed by an inference engine, wherein said inference engine interprets the list of facts by applying the list of facts to the meta knowledge, general knowledge, or second knowledge module rules in the knowledge base to solve the problem.

5,598,512

DEVICE AND CORRESPONDING METHOD FOR DETERMINING A FUZZY LOGIC CONCLUSION BASED ON A PLURALITY OF MACHINING RULES

Tomoaniun Niwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 935,876, Aug. 26, 1992, Pat. No. 5,493,582. This application Mar. 16, 1995, Ser. No. 405,824
Claims priority, application Japan, Sep. 2, 1991, 3-221587
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—61 6 Claims



5. A fuzzy inference method which uses a plurality of rules and the significance βi of each of said rules to realize a fuzzy inference conclusion to control a machine, comprising the steps of:

predetermining the significance βi of each of said rules; representing at least a number (n) of said rules each as a geometric shape;

determining an area Si and center of gravity position Li of each of said number of geometric shapes;

determining said fuzzy inference conclusion in accordance with the following:

$$L = \frac{\sum_{i=1}^{n} (Si * Li * \beta i)}{\sum_{i=1}^{n} (Si * \beta i)}$$

(n = number of said rules);

and

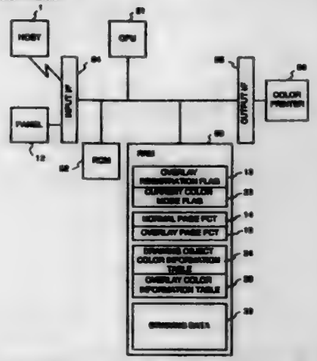
controlling said machine using said fuzzy inference conclusion.

5,598,513

COLOR RECORDING APPARATUS AND PROCESS THEREFOR

Katsuhiko Asazi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 967,236, Oct. 27, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,035
Claims priority, application Japan, Nov. 1, 1991, 3-288055
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—109 20 Claims



1. A color printing apparatus for printing information data comprising:

data receiving means for receiving data and a color mode flag;

manual color information setting means for manually setting in a color information table printing color information of the data to be received by said data receiving means;

judging means for judging a state of the received color mode flag; and

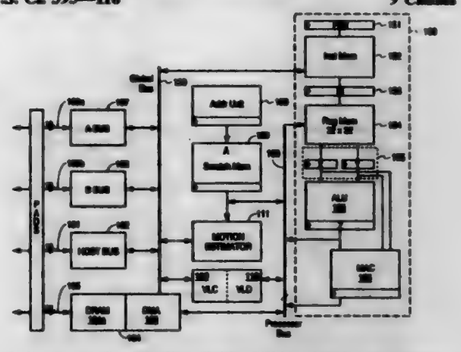
switching means for switching a print of the received data in a color designated by color information included in the received data or in a color designated by color information set in the color information table, in accordance with the judged state of the color mode flag.

5,598,514

STRUCTURE AND METHOD FOR A MULTISTANDARD VIDEO ENCODER/DECODER

Stephen C. Purcell, Mountain View; Didier J. Le Gall, Los Altos, and Subrata Bose, Santa Clara, all of Calif., assignors to C-Cube Microsystems, Milpitas

Filed Aug. 9, 1993, Ser. No. 105,253
Int. Cl.[6] G06T *1/00*
U.S. Cl. 395—118 9 Claims



1. A structure for encoding digitized video signals representing a series of frames of images, said digitized video signals being stored in an external memory system, said structure comprising:

a first and a second video ports, each video port being configurable to be either an input port or an output port for video signals;

a host bus interface circuit for interfacing with an external host computer;

a scratch-pad memory for storing a portion of said series of frames of images;

a processor for arithmetic and logic operations, wherein said processor computing coefficients of a discrete cosine transform of said portion of said series of frames of images, and for applying a quantization step for said coefficients to obtained quantized coefficients under a lossy compression algorithm;

a motion estimation unit for matching objects in motion between said frames of images, said motion estimation unit providing as data output motion vectors representing said motion of said objects in motion between said frames of images;

a variable-length coding unit for applying an entropy coding scheme on said quantized coefficients and said motion vectors to represent said video signals;

a global bus accessible by said first and second video port, said host bus interface, said scratch-pad memory, said processor, said motion estimation unit, and said variable-length coding unit, said global bus providing data transfer among said first and second video port, said host bus interface, said scratch-pad memory, said processor, said motion estimation unit, and said variable-length coding unit;

a processor bus having a higher bandwidth than said global bus for providing data transfer among said processor, said scratch-pad memory, and said variable-length coding unit; and

a memory controller for (a) controlling data transfers between said external memory and said structure, and (b) for controlling the uses of said global bus and said processor bus.

5,598,515

SYSTEM AND METHOD FOR RECONSTRUCTING SURFACE ELEMENTS OF SOLID OBJECTS IN A THREE-DIMENSIONAL SCENE FROM A PLURALITY OF TWO DIMENSIONAL IMAGES OF THE SCENE

Amnon Shashua, Cambridge, Mass., assignor to Gen Tech Corp., Tokyo, Japan

Filed Jan. 10, 1994, Ser. No. 179,726
Int. Cl.[6] G06T *11/40*
U.S. Cl. 395—122 15 Claims



1. A scene reconstruction system for generating a reconstruction of a scene from two two-dimensional images of at least one object in a three-dimensional scene as recorded from a plurality of diverse locations, each location defining an image plane for one of said images, including:

A. an epipole location generator for identifying, for each said image plane, coordinates defining an epipole location, the epipole location for each said image plane comprising a point of intersection between of a line interconnecting the locations and a respective one of said image planes;

B. a homography generator for using the epipoles and coordinates in the respective image planes of selected reference points in the scene which define at least one reference plane to generate a homography that relates coordinates of projections of the selected respective points onto the image planes;

C. a depth value generator for using the homography generated by the homography generator and coordinates of the projection of at least one additional point in the respective image planes to generate a depth value; and

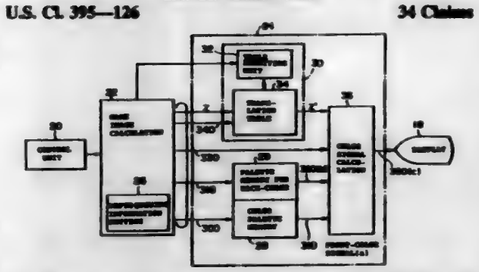
D. a scene reconstructor for using coordinates of projection of at least one point of the object onto the image planes and the depth value generated by the depth value generator for said at least one point for generating a reconstruction of said at least one point in the scene.

5,598,516

IMAGE SYNTHESIZING SYSTEM AND VIDEO GAME APPARATUS USING THE SAME

Kazuhiro Mori, Yokohama, Japan, assignor to Namco Ltd., Tokyo, Japan

PCT No. PCT/JP94/00989, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO95/00918, PCT Pub. Date Jan. 5, 1995
PCT Filed Jun. 21, 1994, Ser. No. 393,017
Claims priority, application Japan, Jun. 21, 1993, 5-173698
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—126 34 Claims



1. An image synthesizing system for perspectively transforming and projecting a 3-D object in a virtual 3-D space represented by a combination of polygons onto a projection plane in a view-point coordinate system to calculate front-color specifying data for every pixel and to synthesize an image to be displayed, said image synthesizing system comprising:

depth cueing information setting means for setting back-color signals used in the depth cueing depending on a scene displayed and for calculating the depth information of said each polygon in said view-point coordinate system;

a first color palette responsive to said front-color specifying data output corresponding to each pixel for outputting a color signal as a front-color signal; and

color signal calculation means responsive to said depth information, said front-color signal and said back-color signal for outputting a depth-cued color signal for each pixel.

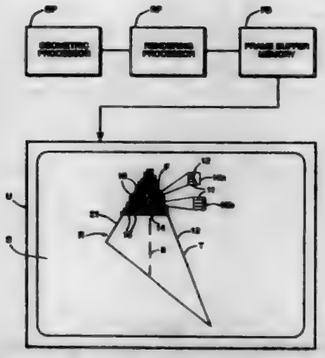
5,598,517

COMPUTER GRAPHICS PIXEL RENDERING SYSTEM WITH MULTI-LEVEL SCANNING

Gary S. Watkins, Salt Lake City, Utah, assignor to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Filed Jan. 10, 1995, Ser. No. 370,669
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—141 26 Claims

1. A computer graphics process for scan processing object primitives to generate display pixels, as in a frame buffer, the pixels being organized in screen space having an associative space relationship with a display image space, said process including the steps of:



defining object primitives in relation to a plurality of panels, each panel including a plurality of span areas, each span area including a plurality of contiguous pixel areas of said display image space;

scanning said panels to locate span areas;

scanning said span areas to locate lapped spans, with lapped pixels within a primitive;

scanning pixels within said lapped spans to locate lapped pixels for processing; and

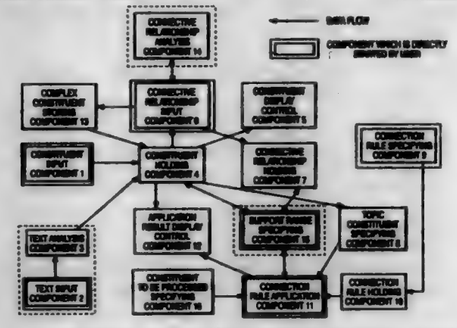
processing said lapped pixels as scanned, pixel-by-pixel, span-by-span to provide pixel data in said frame buffer.

5,598,518

TEXT EDITING APPARATUS FOR REARRANGING SENTENCES

Kazuo Saito, Yokohama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 208,261
Claims priority, application Japan, Mar. 18, 1993, 5-075024
Int. Cl.[6] G06F 17/21
U.S. Cl. 395—793 **24 Claims**



1. A text editing apparatus for rearranging sentences, comprising:

constituent input means for inputting text constituents comprising at least one sentence;

constituent holding means for holding said constituents input by said constituent input means;

connective relationship input means for inputting a connective relationship selected from plural kinds of connective relationships according to the relations among constituents held by said constituent holding means;

connective relationship holding means for holding said connective relationships input by said connective relationship input means;

connection rule holding means for holding a plurality of connection rules to select a constituent to be connected with relational constituents according to connective relationships with said relational constituents;

connection rule application means for rearranging said constituents held by said constituent holding means by means of repetition of selecting one constituent from said relational constituents, each of which has a connective relationship with the constituent selected just before, by applying said plurality of connection rules held by said connective relationship connection rule holding means to connective relationships held by said connection rule holding means according to a priority of each connection rule; and

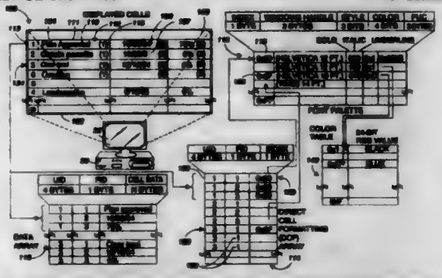
display means for displaying constituents rearranged by said connection rule application means.

5,598,519

METHOD AND SYSTEM FOR DIRECT CELL FORMATTING IN A SPREADSHEET

Ramon Narayanan, Bellevue, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Nov. 8, 1994, Ser. No. 335,999
Int. Cl.[6] G06F 17/30
U.S. Cl. 395—765 **46 Claims**



1. An improved method of formatting cells and characters in a computer spreadsheet, comprising the steps of:

allocating a worksheet data array having a plurality of cells containing data elements;

allocating a first table for storing cell format information which represents the appearance of the cells and the data elements within the cells;

allocating a second table separately from said data array for storing an index pointing to an item of cell format information stored in the first table, the second table storing the index in association with cell identifying information;

generating an index to the item of cell format information stored in the first table;

storing the cell format information in the first table according to the index;

storing the index to the cell format information in at least one location in the second table; and

displaying a selected cell in accordance with the stored cell format information.

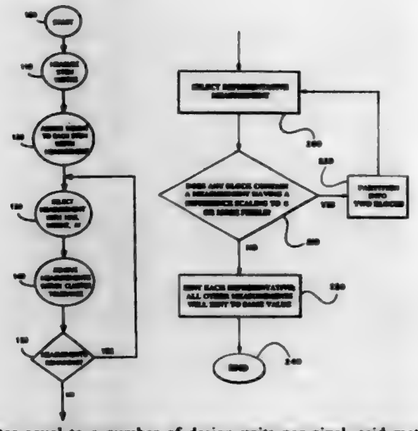
5,598,520

METHODS AND APPARATUS FOR HINTING A FONT FOR CONTROLLING STEM WIDTH AS FONT SIZE AND RESOLUTION OF OUTPUT DEVICE VARY

Dov Harel, Bellevue; Martin P. Taupa, Woodinville, and Eliyezer Kohen, Mercer Island, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Sep. 26, 1994, Ser. No. 311,962
Int. Cl.[6] G06F 3/14
U.S. Cl. 395—169 **17 Claims**

1. In an automatic typography system, a method of hinting a font having glyphs with a plurality of stems, said hinting being for reproduction of said glyphs on a pixel based device using a scaling



factor equal to a number of design units per pixel, said method comprising the steps of:

measuring the width of each of said plurality of stems to produce a plurality of stem width measurements;

assigning a weight to each of said plurality of stem width measurements, said weight being at least a function of the number of times said stem width measurement was detected in said step of measuring the width of each of said plurality of stems;

clustering said stem width measurements to provide a set of clustered measurements by:

(a) selecting as a first stem width measurement a particular one of said plurality of stem width measurements having the greatest said weight assigned thereto;

(b) adding said first stem width measurement to said set of clustered measurements a next clustered measurement and deleting said first stem width measurement from said plurality of stem width measurements;

(c) deleting from said plurality of stem width measurements all of said stem width measurements having values within a range of values determined by said first stem width measurement and a stem cluster tolerance value;

(d) repeating sub-steps (a) through (c) above, until all of said plurality of stem width measurements have been deleted;

partitioning said set of clustered measurements into one or more blocks of clustered measurements as a function of said scaling factor and a predetermined threshold ε so that each said block corresponds to a unique, with respect to others of said blocks, integer number of said pixels; and

hinting each of the blocks of clustered measurements to one of said plurality of integer numbers of pixels.

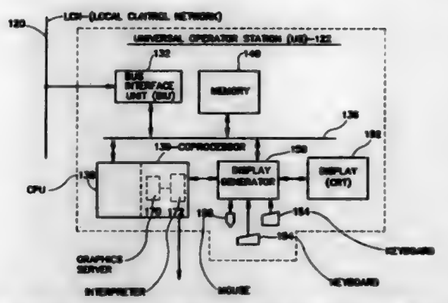
5,598,521

DIRECTLY CONNECTED DISPLAY OF PROCESS CONTROL SYSTEM IN AN OPEN SYSTEMS WINDOWS ENVIRONMENT

William B. Kilgore, and William S. Cochell, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 899,199, Jun. 16, 1992, abandoned.
This application Apr. 24, 1995, Ser. No. 427,645
Int. Cl.[6] G06F 3/00
U.S. Cl. 395—326 **4 Claims**

1. In a process control system having a plurality of physical modules, each physical module being operatively connected to a local control network (LCN) bus, communication via the LCN bus being in accordance with a proprietary protocol, each physical module performing a predetermined function, and each physical module being equivalent of each of the other physical modules in terms of right of access to the LCN bus for purposes of transmitting data to each of the other physical modules, one of said physical modules being an operator station module for providing



an interface between an operator and the process control system, the operator station module including a display system for the process control system, and further wherein the operator station module provides an interface between the process control system and a remote computer system thereby permitting the remote computer system to display information on the display system of the process control system, the display system comprising:

a) a display generator having at least one first input port, a first output port, a first communication port connected to a module bus of the operator station module, the module bus being operatively connected to the LCN bus of the process control system, and a second communication port;

b) at least one input device, each input device being connected to a corresponding number of first input ports of the display generator, for communicating information from a user to the display generator;

c) a display device connected to the first output port of the display generator for displaying information provided by the display generator;

d) a module central process unit (CPU), connected to the module bus, for processing control and display data from the process control system, the module CPU providing a communication link to the process control system via the proprietary protocol thereby maintaining security and integrity of the process control system;

e) a coprocessor, having a graphics server logic, the coprocessor connected to the module CPU for receiving control and display data from the process control system, the coprocessor further having a port adapted to receive control and display data from the remote computer system, the coprocessor further connected to the second communication part of the display generator, the coprocessor controlling the display of data on the display device, the data being displayed being from the process control system and the remote computer system in response to the control data received by the coprocessor, the data being displayed in a windows format, wherein the display generator cases the data received form the LCN bus of the process control system to be displayed on the display device whenever the graphics server logic fails.

5,598,522

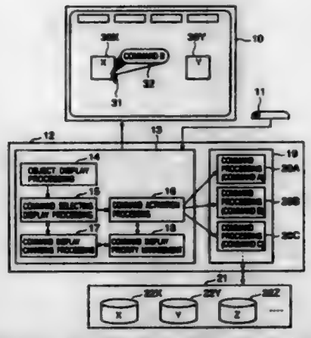
COMMAND PROCESSING SYSTEM USED UNDER GRAPHICAL USER INTERFACE UTILIZING POINTING DEVICE FOR SELECTION AND DISPLAY OF COMMAND WITH EXECUTION OF CORRESPONDING PROCESS

Masayuki Inatomi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 14, 1994, Ser. No. 274,844
Claims priority, application Japan, Aug. 25, 1993, 5-210319
Int. Cl.[6] G06F 3/00
U.S. Cl. 395—352 **8 Claims**

1. A command processing system operational under graphical user interface circumstances in a computer system having a display unit and a pointing device, said command processing system comprising:

object display control means for causing said display unit to display items identifying objects which can be processed;



selecting means for selecting an item representing an object, among the items displayed on said display unit, by manipulating said pointing device;

command display control means for causing said display unit to display a single command, selected from among commands applicable to the object represented by the item selected by said selecting means; and

display changing means for changing the displayed command to another command, determined from among the commands applicable to the selected object, wherein when an operation for selecting the command displayed by the display unit is carried out by manipulating said pointing device, a process represented by the displayed command is executed by said computer system.

5,598,523

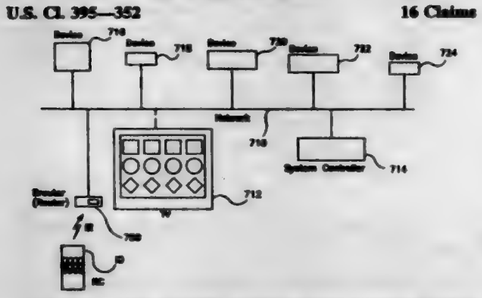
METHOD AND SYSTEM FOR DISPLAYED MENU ACTIVATION USING A MATCHING DISTINCTIVE ARRANGEMENT OF KEYPAD ACTUATORS

Yosuke Fujita, Allendale, N.J., assignor to Panasonic Technologies, Inc., Princeton, N.J.

Continuation of Ser. No. 221,182, Mar. 31, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 608,217

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—352 **16 Claims**



1. Apparatus for controlling devices from a remote location, comprising:

control keypad means having multiple actuators in a distinctive arrangement such that the multiple actuators are arranged in a plurality of rows and a plurality of columns, wherein each of the plurality of rows or columns includes actuators having a common physical attribute, common physical attributes for adjacent rows or columns being different;

display means, located remotely from the control keypad, for displaying a control menu;

means for generating the control menu, wherein the control menu presents a plurality of options in a format including a plurality of rows and a plurality of columns having common row or column physical attributes which match the distinctive arrangement of the multiple actuators on the control keypad means; and

means responsive to the plurality of actuators for executing a corresponding control menu option when selected by an actuator of the control keypad means.

5,598,524

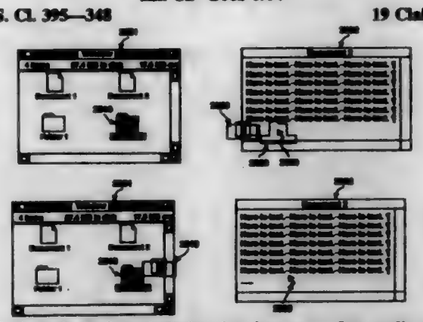
METHOD AND APPARATUS FOR IMPROVED MANIPULATION OF DATA BETWEEN AN APPLICATION PROGRAM AND THE FILES SYSTEM ON A COMPUTER-CONTROLLED DISPLAY SYSTEM

Robert G. Johnston, Jr.; Mark L. Stern, and David L. Evans, all of Cupertino, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 3, 1993, Ser. No. 25,989

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—348 **19 Claims**



1. A method of manipulating data between a first application program and a file system of a computer-controlled display system comprising the following steps:

a. a user selecting an item in a first window, said first window under control of a first application program;

b. said user dragging said item to a second window, said second window under control of a file system manager of said computer controlled display system;

c. said user deselecting said item; and

d. said file system manager automatically creating a file having a type indicated by said item said file containing first data which is received from said first application program and contains content represented by said item.

5,598,525

APPARATUS, SYSTEMS AND METHODS FOR CONTROLLING GRAPHICS AND VIDEO DATA IN MULTIMEDIA DATA PROCESSING AND DISPLAY SYSTEMS

Robert M. Nally, Plano, and John C. Schafer, Wylie, both of Tex., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jan. 23, 1995, Ser. No. 376,919

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—520 **47 Claims**

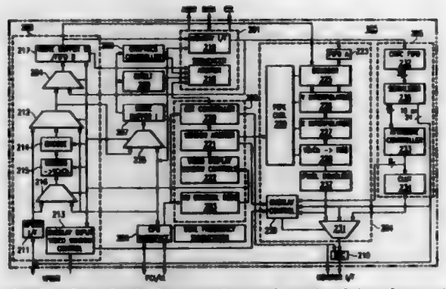
13. A controller comprising:

circuitry for writing selectively each word of received data into a selected one of on-screen and off-screen memory spaces of a frame buffer;

a first port for receiving video and graphics data, a word of said data received with an address of said memory spaces directing said word to be processed as a word of video data or a word of graphics data;

a second port for receiving real-time video data;

circuitry for generating an address associated with a selected one of said memory spaces for a word of said real-time video data;



circuitry for selectively retrieving said words of data from said on-screen and off-screen memory spaces as data is rastered for driving a display;

a graphics backend pipeline for processing ones of said words of data representing graphics data retrieved from said frame buffer;

a video backend pipeline for processing other ones of said words of data representing video data retrieved from said frame buffer, said circuitry for retrieving always rastering a stream of data from said frame buffer to said graphics backend pipeline and rastering video data to said video backend pipeline when a display raster scan reaches a display position of a window; and

output selector circuitry for selecting for output between words of data output from said graphics backend pipeline and words of data output from said video backend pipeline.

5,598,526

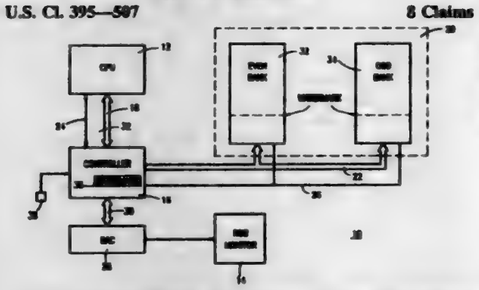
METHOD AND SYSTEM FOR DISPLAYING IMAGES USING A DYNAMICALLY RECONFIGURABLE DISPLAY MEMORY ARCHITECTURE

Andrew Daniel, San Jose, and Spencer Greene, Palo Alto, both of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.

Filed Feb. 23, 1995, Ser. No. 393,052

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—507 **8 Claims**



1. A method of mapping data transfers on a data bus connected between a controller and a memory storage element, the method comprising:

providing a control signal to the controller, the control signal that is selectively set to represent any one of a plurality of control values;

based upon the selected control value of the control signal, transferring data between the controller and the memory storage element in accordance with a data mapping protocol corresponding to the selected control value of the control signal; and

providing a watermark value that delineates the memory storage element as including first and second sections, and wherein the data mapping protocol maps data transfers between the controller and the first section of the memory storage element in accordance with a first mapping mode and transfers data between the controller and the second section of the memory storage element in accordance with a second mapping mode.

5,598,527

COMPACT AND ERGONOMIC COMMUNICATIONS TERMINAL EQUIPPED WITH PROXIMITY DETECTION SURFACES

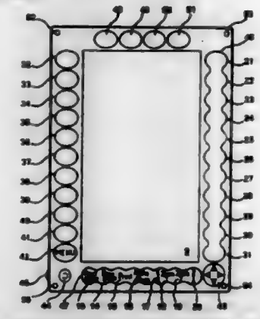
Marie-Hélène Debrus, Boulogne Billancourt; Philippe Gaultier, Le Chesnay, and Patrick Vouillon, Villebon Sur Yvette, all of France, assignors to Sextant Avionique, Meudon La Foret, France

Continuation of Ser. No. 142,915, Oct. 29, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 424,685

Claims priority, application France, Nov. 12, 1992, 92 13798

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—173 **14 Claims**



1. A man-machine communications terminal comprising a viewing screen and command means distributed around the periphery of the screen and comprising two detection devices, each detecting a position of a finger of an operator on a respective axis thereof, the axes of these two devices being perpendicular and each disposed facing an edge of the screen, each of said two detection devices having a first operating mode, enabling an object to be located on its detection axis, and a second operating mode according to which its detection axis is divided into a plurality of switching segments each constituting a switching zone assimilable with a switch operating key, each switching segment of said switching segments comprising means for triggering said second operating mode, said two detection devices further having means for guiding said finger along their respective axes, and means for centering said finger on each of said switching zones,

wherein the means for guiding and the means for centering have a structure raised above an upper surface of each of said two detection devices for respectively guiding said finger along the axes of the two detection devices and centering said finger respectively on each of the switching zones, said upper surface being entirely flat and smooth,

wherein the means for guiding consists of raised edges along a longitudinal axis which extends parallel to and on both sides of the axes of the detection devices so as to form with the upper surface of each of said two detection devices a gutter with a U-shaped profile,

and the means for centering consist of scallopings arranged on each of the raised edges, each of which delimits a switching segment,

means for activating the means for triggering the second operating mode when said finger exerts a pressure exceeding a certain threshold on a switching segment,

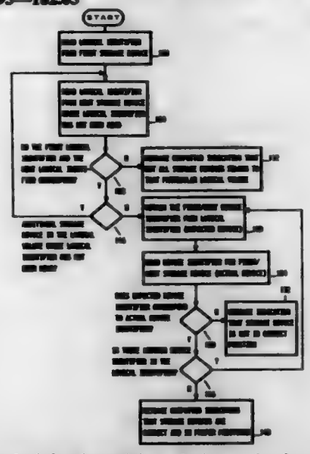
wherein each of said switching segments being positioned below the upper surface and being a switch constituted by at least a fixed contact element and a mobile contact element which is applied on the fixed contact element under the effect of a pressure exceeding said certain threshold, said contact elements being used to detect the proximity of an electrically conductive finger by capacitive effect.

5,598,528

CHECKING FOR PROPER LOCATIONS OF STORAGE DEVICE IN A STORAGE DEVICE ARRAY

David Larson, Broomfield; Robert E. Stubbs, and Gene Edstrom, both of Longmont, all of Colo., assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 794,114, Nov. 15, 1991, Pat. No. 5,369,758. This application Oct. 19, 1994, Ser. No. 325,989
Int. Cl.[6] G06F 11/28;11/30
U.S. Cl. 395—182.05 **36 Claims**



17. A method for determining whether each of a plurality of storage devices of a logical volume of storage devices is a proper member of the logical volume of storage devices, comprising:

providing a device identifier on each storage device of a logical volume of storage devices, each of the device identifiers on each of said storage devices being different for each of said storage devices of said logical volume;

providing a logical identifier on each of said storage devices of said logical volume, said logical identifier being formed all of said device identifiers for said storage devices of said logical volume;

reading out said logical identifier from each of said storage devices of said logical volume; and

determining whether each of said storage devices of said logical volume is a proper storage device in said logical volume by checking said logical identifier read out in said reading step.

5,598,529

COMPUTER SYSTEM RESILIENT TO A WIDE CLASS OF FAILURES

Juan A. Garay, Yonkers, and Kenneth J. Perry, Riverdale, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

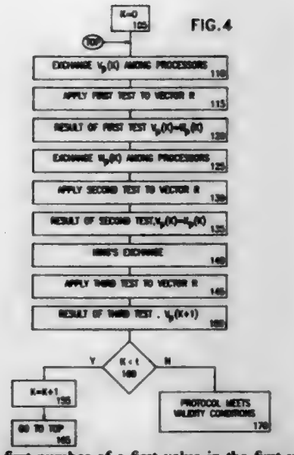
Continuation of Ser. No. 870,013, Apr. 15, 1992, abandoned. This application Apr. 3, 1995, Ser. No. 416,594
Int. Cl.[6] G06F 11/34
U.S. Cl. 395—182.09 **3 Claims**

1. A method for a fault-tolerant computer system of n processors to achieve consensus comprising the steps of:

a. exchanging sequentially processor output signals among the processors in the computer system;

b. creating a first vector of received values in each processor, the received values representing the values of the signals sent from each of the system processors;

c. replacing the output signal at each processor with a first result value determined by a first test using the first vector of received values, a maximum number of total tolerated failures, t, the number of system processors, n, and a maximum number of tolerated byzantine failures, b, the first test comparing a first number of a first value in the first vector to n-t and a second number of a second value in the first vector to b to determine the first result value;



d. exchanging the first result value of each processor sequentially among every processor in the computer system;

e. creating a second vector of received values in each processor, the second vector of received values representing the first result values sent from each of the system processors;

f. replacing the output signal at each processor with a second result value determined by a second test using the second vector of received values and the maximum number of tolerated byzantine failures;

g. exchanging, during a round of information exchange called a King's exchange, a second result value of a King processor, the King processor being an only processor in the system that is exchanging values in the King's exchange;

h. creating a third vector, of one value, in each processor, the value of the third vector called a King processor value and representing the second result value sent by the King processor;

i. replacing the output signal at each processor with a third result value determined by a third test using the second vector of received values, the second result value, the maximum number of total tolerated failures, the number of system processors, the maximum number of tolerated byzantine failures, and the King processor value;

j. repeating steps a through i for a number of times one more than a number of total failures that a protocol is designed to tolerate resulting in a consensus meeting at least a minimum validity condition.

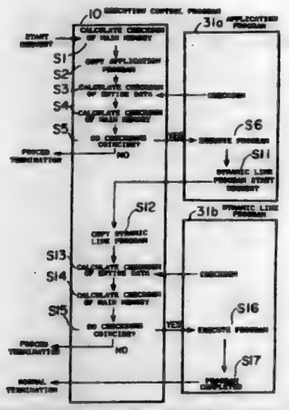
5,598,530

METHOD AND APPARATUS FOR CONTROLLING USING CHECKSUMS EXECUTION OF OBJECT PROGRAMS

Takeaki Nagao, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 121,576, Sep. 16, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,285
Claims priority, application Japan, Feb. 16, 1993, 5-026330
Int. Cl.[6] G06F 11/00;11/10
U.S. Cl. 395—182.19 **13 Claims**

1. An apparatus for verifying programs by copying an object program stored in external storage unit to a main memory and for controlling execution of the object program, said apparatus comprising:



first calculating unit, coupled to the main memory, for calculating, as a first checksum, a checksum of data which is stored in the main memory before the object program is loaded into the main memory;

program copying unit for making a copy of the object program stored in the external storage unit and loading the copy into the main memory after the first checksum is calculated by said first calculating means;

adding means for adding the first checksum and a second checksum to obtain a third checksum, the second checksum being obtained when the object program is generated by compilation and is affixed to the object program as auxiliary data;

second calculating means, coupled to the main memory, for calculating, as a fourth checksum, a checksum of data stored in the main memory after the object program is loaded into the main memory by said program copying means; and

execution control means for comparing the third checksum with the fourth checksum, for executing the object program when the third checksum coincides with the fourth checksum, and for inhibiting execution of the object program when the third checksum does not coincide with the fourth checksum.

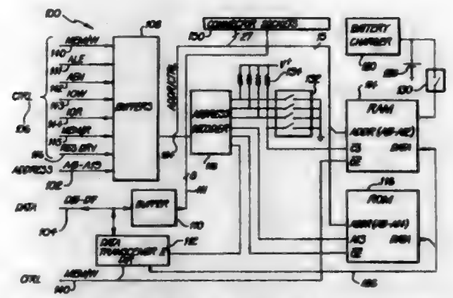
5,598,531

METHOD AND APPARATUS FOR PREVENTING "DISEASE" DAMAGE IN COMPUTER SYSTEMS

Andrew R. Hill, North Richmond, Australia, assignor to William Stanley Hill, and Questa Mary Hill, both of North Richmond, Australia

PCT No. PCT/AU92/00213, § 371 Date Jan. 28, 1993, § 102(e) Date Jan. 28, 1993, PCT Pub. No. WO92/21087, PCT Pub. Date Nov. 26, 1992
PCT Filed May 13, 1992, Ser. No. 969,299
Claims priority, application Australia, May 13, 1991, PK6119
Int. Cl.[6] G01R 31/28; G06F 11/00
U.S. Cl. 395—186 **32 Claims**

1. A method of preventing viral disease damage to data stored at a plurality of memory locations dispersed throughout a computer system, said computer system including a microprocessor, an address bus and a data bus interconnecting the microprocessor with at least volatile and non-volatile memory storage locations dispersed throughout said computer system, said method comprising the steps of determining an advance step or steps required to write data to one or more of said memory storage locations, continuously monitoring the operation of said computer system at least via an address bus and said data bus of said computer system to identify if one of said advance step(s) is undertaken, wherein at least one of said determining step and said monitoring step comprises accessing said data bus to ascertain the existence of one of said advance step(s), and before the operation of said computer system continues in the event that one or more of said advance steps is undertaken, checking an inteaded action to follow said undertaken advance step to determine if said intended action is permitted;



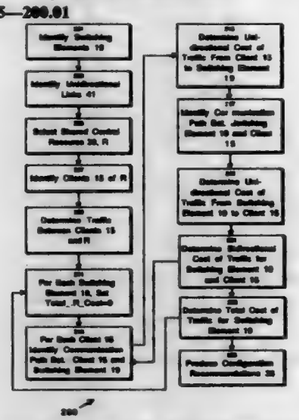
wherein one said advance step is an interrupt service operation involving a memory write operation and said monitoring comprises amending a pointer to said interrupt service operation, said pointer residing at one of said memory locations, to point to a dummy memory location, said amending includes transferring said pointer from said one memory location to said dummy memory location via said data bus, and monitoring a control instruction loaded via said data bus into said dummy memory location to determine if said control instruction implement alteration of data at one of said memory locations.

5,598,532

METHOD AND APPARATUS FOR OPTIMIZING COMPUTER NETWORKS

Moshe Liron, Palo Alto, Calif., assignor to Optimal Networks, Palo Alto, Calif.

Filed Oct. 21, 1993, Ser. No. 141,180
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—200.01 **17 Claims**



1. For a network including a plurality of interconnected network segments forming a network configuration, each network segment having at least one node, the network having at least one shared central resource interconnected in a network segment, a computer implemented method of optimizing the network configuration, comprising the computer executed steps of:

creating a network model of network traffic flow and network topology;

receiving an input specifying at least one network performance goal;

selecting at least one optimization rule as a function of the specified at least one network performance goal; comprising,

optimizing the network configuration by determining an optimal network traffic flow using the selected at least one optimization rule by:

identifying at least one switching element on the network;

selecting a shared central resource;

identifying all clients on the network communicating with the shared central resource;

for each switching element, determining from the network model a network traffic flow between the shared central resource as positioned at the switching element and all clients communicating with the shared central resource;

determining a traffic cost for each network traffic flow according to the network performance goal; and

comparing said traffic costs to determine the switching element having a lowest traffic cost.

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COMPOUND ELECTRONIC APPARATUS HAVING A COMPUTER AND FACSIMILE CONNECTED VIA A COMMON MEMORY FOR COMMUNICATIONS INCLUDING PRINTING COMPUTER DATA WITH THE FACSIMILE

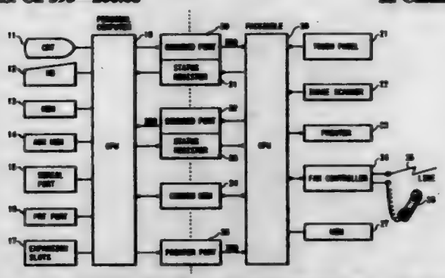
Masayuki Yokota; Toshiyuki Nakazawa; Osamu Ogawa, all of Yokohama; Nobuyuki Tanaka, Tokyo, and Hiroya Tabata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 222,364, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 607,866, Oct. 30, 1990, abandoned. This application Dec. 27, 1994, Ser. No. 364,426

Claims priority, application Japan, Oct. 31, 1989, 1-281821

Int. Cl.[6] G06F *15/167*

U.S. Cl. 395—200.08 **22 Claims**



1. A processing system having a facsimile function and other functions, said processing system comprising:

common memory means for storing a program for performing the facsimile function and the other functions;

common work memory means for storing data required for the facsimile function and the other functions;

first and second processing means each connected between said common memory means and said common work memory means each for processing data, wherein each of said first and second processing means accesses said common memory means and said common work memory means;

print means for printing, at a first resolution, data processed by said first processing means; and

interpolating means for interpolating data processed by said second processing means such that the processed data is printed by said print means, wherein said interpolating means causes said print means to print, at a second resolution different from the first resolution, the data processed by said second processing means with a correction of a change in character size due to the difference between the first and second resolutions.

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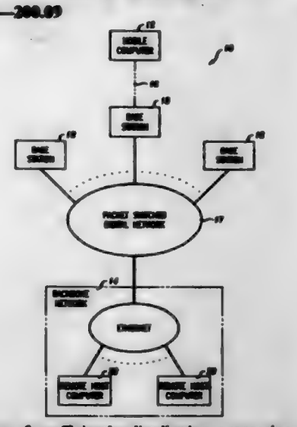
SIMULTANEOUS VERIFY LOCAL DATABASE AND USING WIRELESS COMMUNICATION TO VERIFY REMOTE DATABASE

Zygmunt Haas, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 21, 1994, Ser. No. 309,711

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—200.09 **11 Claims**



1. A process for efficiently distributing processing between a mobile computing device having limited resources and at least one remote computing device having substantially more resources than said mobile computing device, in response to a user invoking an application at the mobile computing device, comprising the steps of:

establishing wireless communication for transferring information between the mobile computing device and the at least one remote computing device;

executing with the mobile computing device a first version of an algorithm for performing a function associated with the user-invoked application to obtain a first result;

executing at the at least one remote computing device, substantially concurrently with said executing at the mobile computing device, a second version of an algorithm for performing the function associated with the user-invoked application to obtain a second result;

supplying to the invoked application on the mobile computing device at least one of the first result and the second result.

5,598,535

SYSTEM FOR SELECTIVELY AND CUMULATIVELY GROUPING PACKETS FROM DIFFERENT SESSIONS UPON THE ABSENCE OF EXCEPTION CONDITION AND SENDING THE PACKETS AFTER PRESELECTED TIME CONDITIONS

Brad L. Brech; Gary S. Delp, and Albert A. Slane, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1994, Ser. No. 283,289

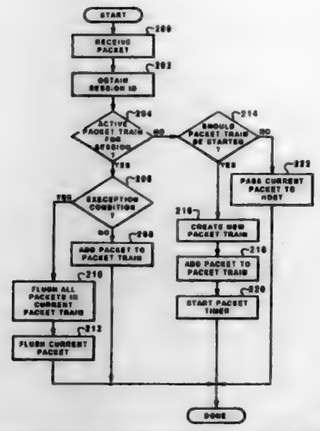
Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.13 **3 Claims**

1. A data processing system for processing a plurality of related packets received at a logical unit within said data processing system, wherein packets from different sessions may be interpersed within said plurality of packets, said data processing system comprising:

a host system, wherein said host system is connected to said logical unit;

reception means for receiving said plurality of packets at said logical unit, wherein each of said plurality of packets includes a header containing a session identifier;



examination means for examining said session identifier in each of said plurality of packets received at said logical unit to identify said session for each of said plurality of packets;

grouping means for selectively and cumulatively grouping all packets within a first identified session received during a first preselected time period in a first group when there is no exception condition related to the packet resources shortage for the first identified session, and for selectively and cumulatively grouping all packets within a second identified session received during a second preselected time period in a second group when there is no exception condition related to the packet resources shortage for the second identified session, wherein said first group is associated with said first preselected time period and said second group is associated with said second preselected time period;

processing means for processing said first group and said second group concurrently;

flushing means for flushing said groups of packets to said host system upon detection of said exception condition; and

transmitting means for transmitting said groups to said host system after each preselected period has completed and the absence of the exception condition.

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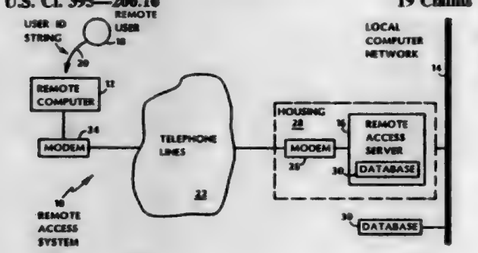
APPARATUS AND METHOD FOR PROVIDING REMOTE USERS WITH THE SAME UNIQUE IP ADDRESS UPON EACH NETWORK ACCESS

Frank G. Slaughter, III, Weston; Russell C. Gocht, Bedford, and David McCool, Tewksbury, all of Mass., assignors to Shiva Corporation, Burlington, Mass.

Filed Aug. 9, 1994, Ser. No. 287,775

Int. Cl.[6] H04J *3/02*

U.S. Cl. 395—200.16 **19 Claims**



1. A method for providing a remote user with access to a computer network, comprising:

receiving a user identification string from a communication port, the string having been entered by the remote user at a remote computer which is coupled to the communication port, the string uniquely identifying the remote user;

using the user identification string to access a database and retrieve a unique internet protocol (IP) address associated with the user identification string, the remote computer needing the IP address to communicate on the computer network, the database including a unique user identification string for each remote user and a unique IP address for each user identification string such that the same unique IP address is retrieved every time a particular remote user enters the user identification string uniquely identifying that remote user;

sending the IP address to the remote computer via the communication port; and

allowing the remote computer to access the computer network and to communicate on the computer network using the IP address.

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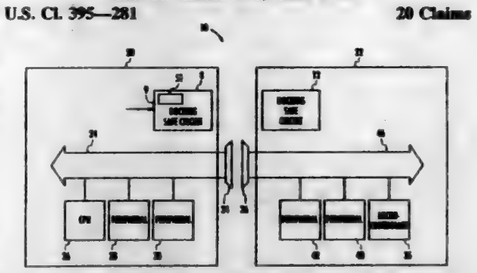
APPARATUS AND METHOD FOR DRIVING A BUS TO A DOCKING SAFE STATE IN A DOCKABLE COMPUTER SYSTEM INCLUDING A DOCKING STATION AND A PORTABLE COMPUTER

Scott Swanstrom, Cedar Park, Calif., and Douglas D. Gephardt, Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 276,250, Jul. 18, 1994, which is a continuation-in-part of Ser. No. 255,663, Jun. 9, 1994, which is a continuation-in-part of Ser. No. 217,951, Mar. 25, 1994, abandoned. This application Jul. 26, 1994, Ser. No. 280,314

Int. Cl.[6] H05K *7/10*; G06F *13/00*

U.S. Cl. 395—281 **20 Claims**



9. A method of docking or undocking a portable computer and a host station of a dockable computer system, said portable computer having a processing unit coupled to a computer bus and said host station having a host bus, said dockable computer system including a dock circuit for generating a DOCK signal in response to docking or undocking said portable computer, said computer bus being physically, and electrically coupled with said host bus when said portable computer is docked with said host station, said docking circuit sensing when said portable computer is about to be docked or undocked with said host station and determining when said portable computer is docking or undocking to generate said DOCK signal, said method comprising the steps of:

receiving said DOCK signal provided by said dock circuit;

driving said computer bus to a docking safe state in response to said dock signal by placing a plurality of bidirectional terminals coupled to said computer bus to an output state; and

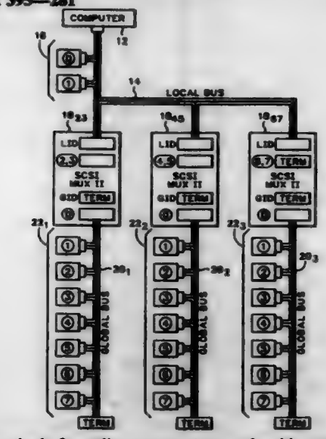
coupling or uncoupling said host bus and said computer bus, whereby said portable computer remains powered on without suspending operation of said processing unit when said portable computer is coupled with or uncoupled from said host station.

5,598,538

SCSI MULTIPLEXER FOR COUPLING A COMPUTER LOCAL BUS TO A SHARED PERIPHERAL GLOBAL BUS

Andrew Cooper, Hillsdale, N.J., assignor to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 106,886, Aug. 16, 1993, abandoned. This application Jun. 12, 1995, Ser. No. 489,575
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—281 1 Claim



1. A method of coupling a computer on a local bus with a shared peripheral device on a global bus via a multiplexer according to the small computer systems interface (SCSI) specification comprising the steps of:

sending a pseudo-op code from the computer to the multiplexer, the pseudo-op code containing a first local bus identification (ID) corresponding to a first local bus ID for the multiplexer, to initiate a pseudo-op code sequence to set up the multiplexer to receive a command to talk to the shared peripheral device;

transmitting from the computer a code corresponding to a second local bus ID of the multiplexer to start arbitration by the multiplexer for the global bus;

connecting the local bus to the global bus via the multiplexer when arbitration is won by the multiplexer;

transferring data between the computer and the shared peripheral device; and

repeating the transferring step until the computer sends the pseudo-op code to the multiplexer to run the pseudo-op code sequence again to release the global bus.

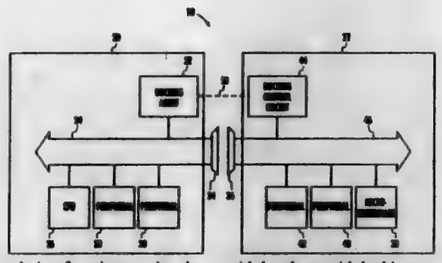
5,598,539

APPARATUS AND METHOD FOR ACHIEVING HOT DOCKING CAPABILITIES FOR A DOCKABLE COMPUTER SYSTEM

Douglas D. Gephardt, Austin, and Scott Swanstrom, Cedar Park, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 217,951, Mar. 25, 1994, abandoned. This application Nov. 7, 1995, Ser. No. 553,196
Int. Cl.[6] G06F 13/20
U.S. Cl. 395—281 21 Claims

21. In a dockable computer system comprised of a host computer station, including a station bus, and a mobile computer unit including a processor, and a unit bus, the unit bus including a data bus, wherein said system is capable of residing in at least two distinct states, a docked state in which said unit is operatively associated with said station and an undocked state in which said unit is physically separate from said station, the improvement comprising an in-line docking agent coupled between said unit bus and said station bus when said system is in said docked state, said docking agent performing at least a buffering function, and voltage



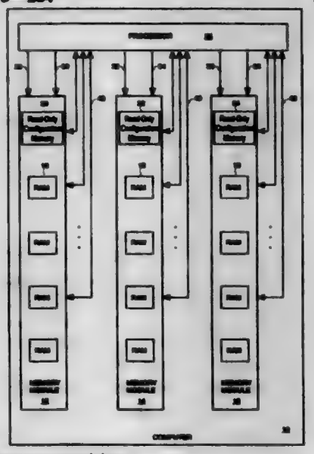
translation function on signals on said data bus, said docking agent quieting said unit bus by obtaining bus mastership of said unit bus and disabling a bus clock signal for said bus without suspending said processor in said computer unit when said system changes from said undocked state to said docked state or from said docked state to said undocked state, whereby said mobile computer unit remains powered ON when said system changes from said undocked state to said docked state or from said docked state to said undocked state.

5,598,540

MEMORY MODULE INCLUDING READ-WRITE MEMORY AND READ-ONLY CONFIGURATION MEMORY ACCESSED ONLY SEQUENTIALLY AND COMPUTER SYSTEM USING AT LEAST ONE SUCH MODULE

Steven D. Krueger, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 954,631, Sep. 30, 1992. This application Jun. 7, 1995, Ser. No. 475,244
Int. Cl.[6] G06F 1/22
U.S. Cl. 395—284 30 Claims



1. A computer comprising:

a. a processor for processing data, said processor having an address bus for generating addresses, a data bus having a plurality of bit lines for transferring data, said processor generating a module select signal SEL, an inverse column address strobe signal $\overline{CAS}$ and an inverse configuration signal $\overline{CONFIG}$;

b. at least one memory module for storing the data; each memory module connected to said address bus and said data bus and receiving said module select signal SEL, said inverse column address strobe signal and said inverse configuration signal from said processor; each memory module comprising

a read-write memory having a predetermined memory depth and a configuration memory, wherein the configuration memory:

(i) contains memory module characteristic information;

(ii) is adapted for storing a sequence of binary data values;

(iii) has a NEXT signal pin;

(iv) includes a data pointer pointing to one of said sequence of binary data values, said data pointer set to a first binary data value of said sequence of binary data values upon simultaneous receipt of said module select signal SEL and an inverse configuration signal $\overline{CONFIG}$, said data pointer set to a next binary data value of said sequence of binary data values when said inverse column address strobe signal $\overline{CAS}$ is no longer received on said NEXT signal pin; and

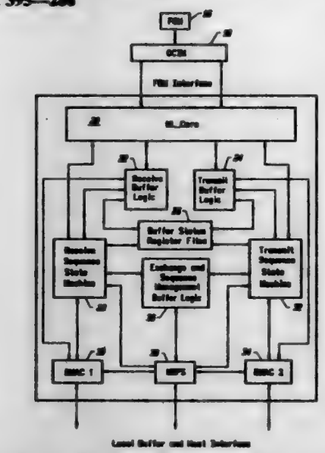
(v) supplies a single bit of the stored sequence of binary data values pointed to by said data pointer upon each receipt of said inverse column address strobe signal $\overline{CAS}$ on said NEXT signal pin; wherein the configuration memory is adapted for receiving at the NEXT signal pin, and responding to, a $\overline{CAS}$ signal used by standard DRAMs.

5,598,541

NODE LOOP PORT COMMUNICATION INTERFACE SUPER CORE FOR FIBRE CHANNEL

Srinivasa R. Malladi, Santa Clara, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Oct. 24, 1994, Ser. No. 329,832
Int. Cl.[6] G06F 15/17
U.S. Cl. 395—286 11 Claims



1. A Super Core integrated system for use in a communication environment such as fibre channel for encoding and decoding data and implementing frame structures and byte sequences within a node port comprising

core circuitry for encoding and decoding data and error checking said data,

staging buffers connected with said core circuitry including Receive Buffer Logic and transmit buffer logic, said Receive Buffer Logic and said transmit buffer logic including buffers for frame headers and link frames and providing control to read and write from headers and link frames in buffers base on programmed steering,

buffer status register files for storing status of header and link buffers in said Receive Buffer Logic and said write buffer logic,

direct memory access control means for providing a data transfer interface to a local/host memory,

an embedded processor for facilitating data transfers to and from local/host memory,

a Receive Sequence State Machine coupled to said core circuitry, said staging buffers, said buffer status register files, said processor, and said direct memory access control means, said Receive Sequence State Machine controlling the transfer of data frames to memory including updating sequence and exchange information and generating interrupts to said processor when all data frames of a sequence are received, when termination of a sequence is received, when link control frames are received, and upon receipt of partial sequence data,

a Transmit Sequence State Machine coupled to said core circuitry, said staging buffers and said buffer status register files, said processor and said direct memory access control means, said Transmit Sequence State Machine controlling transmission of data sequences and link frames from host memory to staging buffers, and

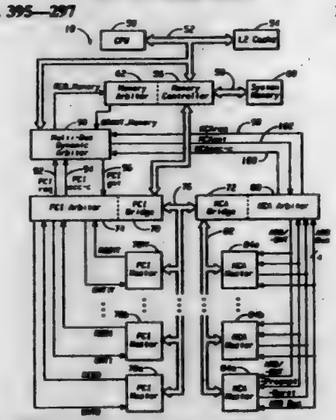
an Exchange and Sequence Management Buffer Logic connected with said processor, said Receive Sequence State Machine, and said Transmit Sequence State Machine, said Exchange and Sequence Management Buffer Logic providing control of exchange and sequence status information and including storage buffers for exchange information and sequence information of data exchange to and from memory through said Receive sequence State Machine and said Transmit Sequence State Machine.

5,598,542

METHOD AND APPARATUS FOR BUS ARBITRATION IN A MULTIPLE BUS INFORMATION HANDLING SYSTEM USING TIME SLOT ASSIGNMENT VALUES

Wan L. Leung, Coral Springs, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1994, Ser. No. 287,213
Int. Cl.[6] G06F 13/372
U.S. Cl. 395—297 14 Claims



1. A multibus computer system, comprising:

(a) a central processing unit (CPU) having a host processor bus associated therewith;

(b) a plurality of bus controllers in circuit communication with said CPU for controlling information transfer over a plurality of peripheral buses;

(c) a bus arbiter for arbitrating accesses between each of said peripheral buses; and

(d) a dynamically alterable time slot assignment register in circuit communication with said CPU and said bus arbiter for dynamically storing a time slot assignment value responsive to said CPU, said time slot assignment value being dependent upon the average access time of each of said plurality of busses to said host processor bus and being used to directly divide accesses to one of said bus controllers, among the others of said plurality of bus controllers, with one access to said one bus controller being granted per time slot position during contention for accessing said one bus;

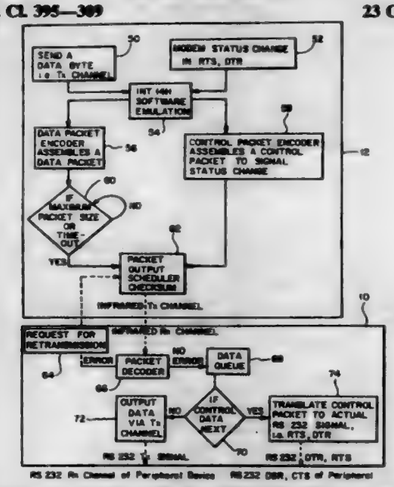
whereby the bandwidth of said host processor bus is allocated between said peripheral buses.

5,598,543

METHOD OF INTERFACING BETWEEN DATA TRANSMISSION SYSTEMS HAVING AN UNEQUAL NUMBER OF TRANSCEIVER PORTS

John Notarianni, 135 Midway St., Babylon, N.Y. 11702, and Yuwa Chan, Long Island City, N.Y., assignors to John Notarianni, Babylon, N.Y.

Filed Sep. 26, 1994, Ser. No. 313,857
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—309 23 Claims



1. A method of interfacing between a first data transmission system and a second data transmission system utilizing an interface mechanism, the first data transmission system having a first plurality of transceiver ports, the second data transmission system having a second plurality of transceiver ports, the method comprising the steps of:

a) generating an information signal including at least one of a data signal and a control signal within the first data transmission system, the data signal representing data to be provided by the first data transmission system, the control signal representing control commands to be provided by the first data transmission system for controlling communication between the interface mechanism and the second data transmission system;

b) compressing the at least one of a data signal and control signal within the first data transmission system to provide at least one of a data packet signal and control packet signal;

c) transmitting at least one of the data packet signal and the control packet signal to an interface mechanism;

d) decompressing the at least one of the data packet signal and control packet signal to provide at least one of a data information signal and a control information signal;

e) converting the at least one of a data information signal and control information signal to a format which is recognizable to the second data transmission system, the converted control information signal directly controlling communication between the interface mechanism and the second data transmission system; and

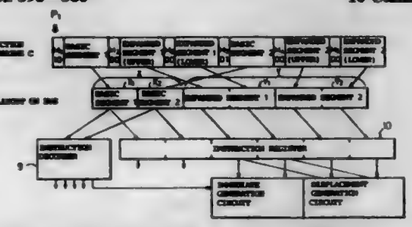
f) providing the at least one of a data information signal and control information signal to the second data transmission system.

5,598,544

INSTRUCTION BUFFER DEVICE FOR PROCESSING AN INSTRUCTION SET OF VARIABLE-LENGTH INSTRUCTION CODES

Toshiharu Ohshima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP91/01430, § 371 Date Jun. 16, 1992, § 102(e) Date Jun. 16, 1992, PCT Pub. No. WO92/07320, PCT Pub. Date Apr. 30, 1992
PCT Filed Oct. 18, 1991, Ser. No. 861,786
Claims priority, application Japan, Oct. 20, 1990, 2-283066
Int. Cl.[6] G06F 9/30
U.S. Cl. 395—380 10 Claims



1. An instruction buffer device for processing an instruction code string having at least one basic segment including a code for distinguishing the type of instructions, each basic segment having an expanded segment added depending upon a designation of the basic segment; said basic segment and said expanded segment respectively having lengths a multiple of a predetermined unit length; the length of said expanded segment being variable, said instruction buffer device comprising:

a bus having segments corresponding to the basic segments of an instruction code string and a plurality of segments corresponding to the expanded segments of an instruction code string, the segments corresponding to the basic segment being contiguous, the segments corresponding to the expanded segments being contiguous;

instruction decoder means connected to said bus for simultaneously decoding said instruction code string without a preset delay; and

instruction buffer means connected to said bus including:

marking means for marking each unit length of said instruction code string as one of said basic segment and expanded segment;

code reading means for reading said instruction code string;

code storage means for storing said instruction code string;

marking storage means for storing said marking;

an output selection circuit responsive to information from said marking storage means for selecting a predetermined instruction code string from said code storage means for outputting to said instruction decoder means via said bus;

means for identifying the leading position of the instruction code string to be output to said instruction decoder means; and

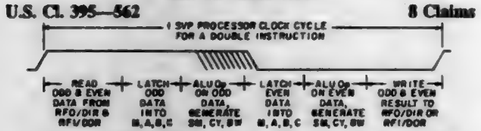
a control circuit that controls the re-arranging of segments in an instruction code string prior to outputting the instruction code string to said bus coupling of one or more codes in the portions in said code string beginning at said leading position, indicated as said basic segments by said marking, in a length not exceeding a predetermined length for outputting to segments of said bus corresponding to a basic segment such that basic segments from different code strings are arranged contiguously on said bus, and to output the portions of said code string beginning from said leading position, indicated as an expanded segment by a marking, to segment, of said bus corresponding to an expanded segment such that expanded segments related to different basic segments are arranged contiguously on said bus.

5,598,545

CIRCUITRY AND METHOD FOR PERFORMING TWO OPERATING INSTRUCTIONS DURING A SINGLE CLOCK IN A PROCESSING DEVICE

Jim Childers, Fort Bend; Peter Reinecke, Lockhart, both of Tex.; Yutaka Takahashi, Ushiku, and Seiichi Yamamoto, Ibaragi, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 421,493, Oct. 13, 1989, abandoned.
This application Mar. 25, 1993, Ser. No. 37,467
Int. Cl.[6] G06F 9/30
U.S. Cl. 395—562 8 Claims



1. A method for performing two instructions in parallel in a processing element including a single instruction arithmetic and logic unit (ALU) and addressable storage locations, the method comprising the steps of:

(a) reading simultaneously a first and second data pair from said storage locations addressed respectively by a first and second of said instructions; a first portion of each said data pair being stored in consecutively addressed of said storage locations; a second portion of each said data pair being stored in consecutively addressed of said storage locations;

(b) operating upon said first data pair and obtaining a result with said ALU;

(c) repeating step (b) for said second data pair; and,

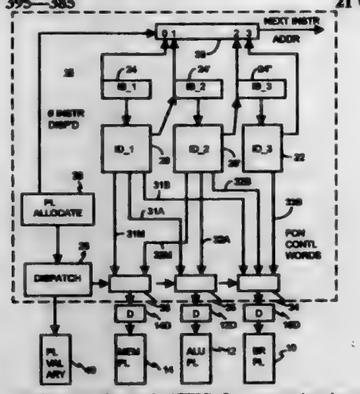
(d) writing results obtained from steps (b) and (c) into respective of said storage locations.

5,598,546

DUAL-ARCHITECTURE SUPER-SCALAR PIPELINE

James S. Blomgren, San Jose, Calif., assignor to Exponential Technology, Inc., San Jose, Calif.

Filed Aug. 31, 1994, Ser. No. 298,583
Int. Cl.[6] G06F 9/30
U.S. Cl. 395—385 21 Claims



1. A central processing unit (CPU) for processing instructions from two separate instruction sets, the CPU comprising:

RISC instruction decode means for decoding instructions from a RISC instruction set, the RISC instruction set having a first encoding of operations;

CISC instruction decode means for decoding instructions from a CISC instruction set, the CISC instruction set having a second encoding of operations, the first encoding of operations substantially independent from the second encoding of operations;

instruction set indicating means for indicating an instruction set to be decoded, the instruction set indicating means having a RISC state indicating that the RISC instruction set be decoded, the instruction set indicating means having a CISC state indicating that the CISC instruction set be decoded;

select means, coupled to the RISC instruction decode means and the CISC instruction decode means, for outputting a control word, the control word generated from a decoding of an instruction from the RISC instruction set by the RISC instruction decode means when the instruction set indicating means is in the RISC state, the control word generated from a decoding of an instruction from the CISC instruction set by the CISC instruction decode means when the instruction set indicating means is in the CISC state, the control word having a third encoding of operations to control words, the third encoding of operations to control words being related to but substantially different from the first encoding and the second encoding; and

execute means, coupled to the select means and receiving the control word, for executing operations, the execute means executing an operation decoded by the RISC instruction decode means when the instruction set indicating means is in the RISC state, the execute means executing an operation decoded by the CISC instruction decode means when the instruction set indicating means is in the CISC state,

wherein RISC instructions and CISC instructions are directly decoded to the control word, the CISC instructions not being translated to RISC instructions,

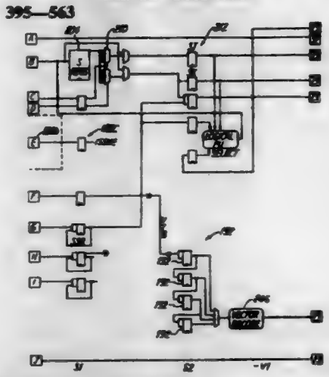
whereby instructions from both the RISC instruction set and the CISC instruction set are decoded into control words which are executed by the CPU.

5,598,547

VECTOR PROCESSOR HAVING FUNCTIONAL UNIT PATHS OF DIFFERING PIPELINE LENGTHS

Douglas R. Beard, Eleva; Andrew E. Phelps; Michael A. Woodmansee, both of Eau Claire; Richard G. Blewett, Altoona; Jeffrey A. Lohman, Eau Claire; Alexander A. Silbey, Eau Claire; George A. Spix, Eau Claire; Frederick J. Simmons, Neillsville, all of Wis., and Don A. Van Dyke, Pleasanton, Calif., assignors to Cray Research, Inc., Eagan, Minn.

Continuation of Ser. No. 395,320, Feb. 28, 1995, which is a continuation of Ser. No. 536,409, Jun. 11, 1990, Pat. No. 5,430,884. This application Jun. 7, 1995, Ser. No. 478,815
Int. Cl.[6] G06F 9/38
U.S. Cl. 395—563 2 Claims



1. A vector processor comprising:

a plurality of functional unit paths each having one path input and one path output, and at least one functional unit path having a plurality of arithmetic and/or logical functional elements including:

a first functional element receiving first input operands from the one path input of the at least one functional unit path and processing the first input operands in a first number of pipeline stages to provide a first output operand to the one path output of the at least one functional unit path;

a second functional element receiving second input operands from the one path input of the at least one functional unit path and processing the second input operands in a second number of pipeline stages, which differs from the first number of pipeline stages to provide a second output operand to the one path output of the at least one functional unit path;

program instruction initiation means responsive to a first instruction having the first input operands for initiating the first instruction to commence processing of first input operands in the first functional element of the at least one functional unit path, and said program instruction initiation means responsive to a second instruction having the second input operands for initiating the second instruction to commence processing of second input operands in the second functional element of the at least one functional unit path dependent upon completion of loading of the first input operand into the first functional element only if the second number of pipeline stages is equal to or greater than the first number of pipeline stages.

5,598,548

MEMORY MANAGEMENT DEVICE HAVING EMPTY MEMORY BLOCK MAINTENANCE FUNCTION AND FACSIMILE APPARATUS USING IT

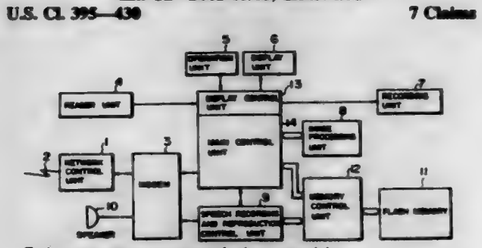
Hideo Matsuo, Zama; Kazumi Anzai, Yokohama, and Hiroshi Miyazaki, Chigasaki, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Nov. 3, 1994, Ser. No. 335,343

Claims priority, application Japan, Nov. 10, 1993, 5-280834

Int. Cl.[6] G06F *13/00*; H04N *1/32*

U.S. Cl. 395—430 **7 Claims**



7. A memory management device comprising:

a memory having a storage area divided into plural blocks which are erasable only in blocks;

control means for dividing said plural blocks of said memory in accordance with erasing conditions of any possible information to be stored and controlling said memory to store information to be stored into a block whose erasing condition corresponds to an erasing condition of said information to be stored; and

erasing means for erasing a content stored in each block when the erasing conditions of all information stored in the block are satisfied.

5,598,549

ARRAY STORAGE SYSTEM FOR RETURNING AN I/O COMPLETE SIGNAL TO A VIRTUAL I/O DAEMON THAT IS SEPARATED FROM SOFTWARE ARRAY DRIVER AND PHYSICAL DEVICE DRIVER

Dale F. Rathunde, Wheaton, Ill., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

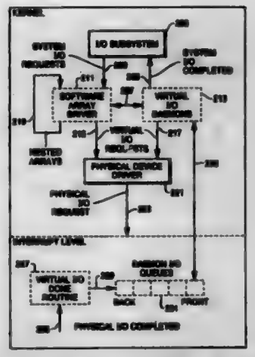
Filed Jan. 11, 1993, Ser. No. 76,652

Int. Cl.[6] G06F *7/22*

U.S. Cl. 395—441 **22 Claims**

1. An array storage system, comprising:

a plurality of drives for storing data;



a physical device driver corresponding to each one of said plurality of drives;

a software array driver module for receiving a system I/O request and translating said system I/O request into one or more virtual I/O requests, said virtual I/O request being provided to one or more of said physical device drivers;

each one of said physical device drivers receiving a virtual I/O request operating to translate said received I/O request into a physical I/O request, said physical I/O request being provided to said drive corresponding to said one of said physical device drivers;

a separate call-back module, different from said physical device drivers, for receiving physical I/O complete signals from said plurality of drives and translating said physical I/O complete signals into one or more virtual I/O complete signals corresponding to said one or more virtual I/O requests; and

a separate virtual I/O daemon module, different from said software array driver module, for receiving said one or more virtual I/O complete signals from said call-back module and translating said received virtual I/O complete signals into a system I/O complete signal;

wherein said one or more virtual I/O complete signals are communicated to said virtual I/O daemon module independently of said physical device drivers and said software array driver module.

5,598,550

CACHE CONTROLLER FOR PROCESSING SIMULTANEOUS CACHE ACCESSES

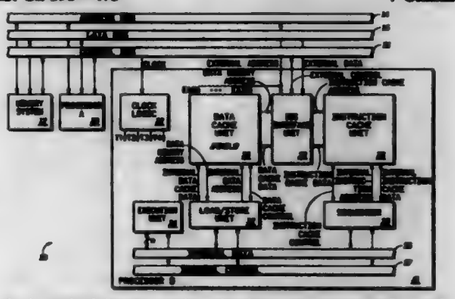
Gene W. Shen; James S. Golab, both of Austin, and William C. Moyer, Dripping Springs, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 829,114, Jan. 31, 1992, abandoned.

This application Nov. 30, 1994, Ser. No. 346,986

Int. Cl.[6] G06F *13/362*

U.S. Cl. 395—473 **7 Claims**



1. A method for processing simultaneous accesses of a cache memory, comprising the steps of:

communicating an external address value using an external address bus using an external address bus;

communicating an internal address value using an internal address bus using an internal address bus;

decoding the external address value to access a first memory location in a first cache tag memory using a first decoder, the first decoder being coupled to the external address bus for receiving the external address value;

concurrently decoding the internal address value to access a second memory location in a second cache tag memory using a second decoder, the second decoder being coupled to the external address bus for receiving the internal address value;

concurrently accessing a status value from a status memory which corresponds to both the first memory location in the first cache tag memory and the second memory location in the second cache tag memory, the status memory being coupled to the first cache tag memory and being coupled to the second cache tag memory; and

selectively modifying the status value using a logic circuit to provide a modified status value when the first memory location of the first cache tag memory and the second memory location of the second cache tag memory are concurrently accessed.

5,598,551

CACHE INVALIDATION SEQUENCE SYSTEM UTILIZING ODD AND EVEN INVALIDATION QUEUES WITH SHORTER INVALIDATION CYCLES

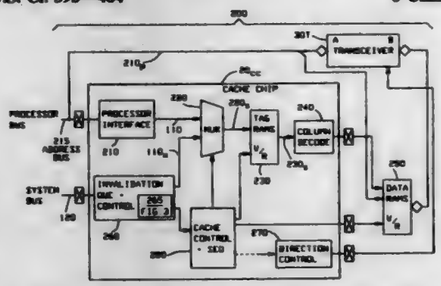
Saul Barajas, Mission Viejo; David M. Kalish, Laguna Niguel; Bruce E. Whittaker, Mission Viejo, and Keith S. Saldanha, Trabuco Canyon, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 93,428, Jul. 16, 1993, abandoned.

This application Feb. 15, 1996, Ser. No. 602,259

Int. Cl.[6] G06F *12/00;12/06*

U.S. Cl. 395—484 **5 Claims**



1. In a data processing system where a processor card holds a central processor and cache memory means each of which connects to a system bus communicating with a main memory, an I/O module and other digital modules, a cache memory invalidation sequence system comprising:

(a) means for enabling said processor direct access to a Tag RAM module of said cache memory means, wherein said means to enable processor access to said Tag RAM module includes:

(a) processor interface means connected to said Tag RAM module via a multiplexor means for enabling access to said cache data RAM;

(b) transceiver means for transferring a data word from said data RAM after a match "hit" in said Tag RAM module;

(c) said multiplexor means, controlled by said sequence control means, for allocating processor access to said cache memory means after said two clock invalidation cycle which involved a cache hit; and one clock period memory updating cycle which involved in cache miss

(d) processor address bus means for transmitting addresses to said Tag RAM Module

(b) system bus means including:

(b1) connection pathways for said processor, said I/O module and said other digital modules to said main memory;

(b2) a connection pathway to said cache memory means;

(c) said cache memory means including:

(c1) processor interface means connected to said system bus means for directly transmitting processor address requests to said tag RAM module via an access multiplexer means;

(c2) said tag RAM module holding addresses of words residing in a cache data RAM;

(c3) invalidation address queue means for storing addresses residing in said tag RAM module to be invalidated during an invalidation cycle, said queue means including:

(c3a) bus means for directly accessing said tag RAM module via said access multiplexer means;

(c3b) sequence control means for allocating separate clock periods for said invalidation cycles without inhibiting said processor's direct access to said cache memory means; including:

(i) means to execute a cache invalidation cycle in two clock periods on a cache hit sequence;

(ii) means to execute a cache cycle in one clock period on a cache miss sequence

(c3c) first queue store means for holding even addresses for invalidation;

(c3d) second queue store means for holding odd addresses for invalidation;

(c3e) control means for simultaneously completing an invalidation cycle of an odd and an even invalidation address, and including means to load, into said first and second queue means, any write command address appearing on said system bus.

5,598,552

ERROR FREE DATA TRANSFERS

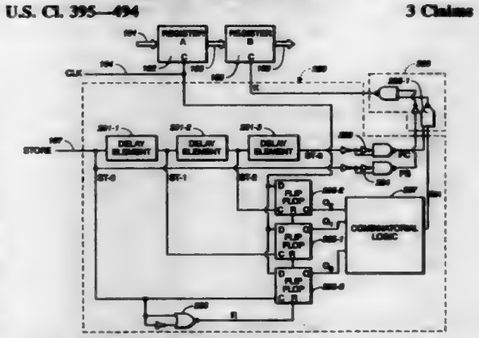
Bahram Fotouhi, and Mir B. Ghaderi, both of Cupertino, Calif., assignors to Sierra Semiconductor Corporation, San Jose, Calif.

Continuation of Ser. No. 686,705, Apr. 17, 1991, abandoned.

This application Aug. 3, 1994, Ser. No. 285,755

Int. Cl.[6] G06F *13/42;13/372*

U.S. Cl. 395—494 **3 Claims**



1. An apparatus comprising:

a first storage register having a data input port and a data output port and being clocked by a first clock signal;

a transfer signal occurring asynchronously with respect to the first clock signal;

transfer control means responsive to the first clock signal and the transfer signal for producing a second clock signal; and

a second storage register having a data input port connected to the data output port of the first storage register and a data output port and being clocked by the second clock signal;

wherein said transfer control means:

produces a single occurrence of the second clock signal in response to a single occurrence of the transfer signal—if the transfer signal and a temporally-nearest occurrence of

the first clock signal are separated by at least a predetermined amount of time; and

produces a delayed occurrence of the second clock signal in response to, and delayed with respect to, a single occurrence of the transfer signal—if the transfer signal and a temporally-nearest occurrence of the first clock signal are not separated by at least said predetermined amount of time.

5,598,553

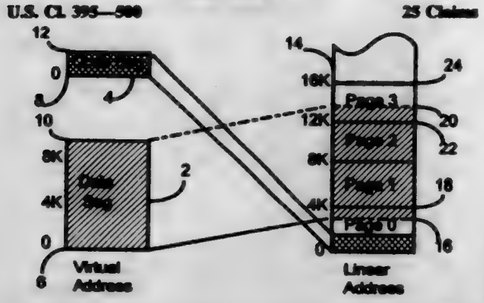
PROGRAM WATCHPOINT CHECKING USING PAGING WITH SUB-PAGE VALIDITY

David E. Richter, San Jose; Earl T. Cohen, Fremont, and James S. Blomgren, San Jose, all of Calif., assignors to Exponential Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 207,857, Mar. 8, 1994, Pat. No. 5,440,710. This application May 18, 1995, Ser. No. 444,813

Int. Cl.[6] G06F 9/455

U.S. Cl. 395—500 **25 Claims**



1. A paging system adapted for emulating watchpoint checking wherein pages absent watchpoints are not checked for watchpoint violations, whereas pages containing watchpoints are tested for watchpoint violations by a sub-page validity buffer for checking validity of a virtual address, said virtual address comprising a virtual page number and a page offset, said sub-page validity buffer comprising:

a plurality of buffer entries, each of said plurality of buffer entries comprising:

a virtual page number field; and

a sub-page validity field for indicating a valid subset of page offsets within a page;

first compare means for receiving said virtual page number and comparing said virtual page number field with said virtual page number, said first compare means indicating a selected buffer entry of said plurality of buffer entries if said virtual page number field matches said virtual page number, said selected buffer entry including a selected sub-page validity field; and

second compare means for receiving said selected sub-page validity field and comparing said page offset to said valid subset of page offsets, said second compare means indicating that said page offset is valid if said page offset is not within said valid subset of page offsets, said second compare means signaling that said page offset is valid if no buffer entry in said plurality of buffer entries is a matching buffer entry, said matching buffer entry containing said virtual page number field matching said virtual page number,

wherein the absence of said matching buffer entry in said sub-page validity buffer indicates that watchpoints do not need to be checked for said virtual address,

wherein pages completely absent watchpoints are not checked for watchpoint violations.

5,598,554

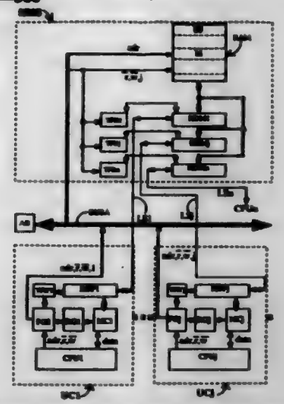
MULTIPORT SERIES MEMORY COMPONENT

Daniel Litaize, Saint Orens De Gameville; Jean-Claude Sellaier, Ramonville Saint-Agne; Abdelaziz Mzoughi, Toulouse; Fatima-Zahra Elkhiili, Toulouse; Mostapha Laiaia, Toulouse, and Pascal Saisral, Toulouse, all of France, assignors to Centre National De La Recherche Scientifique (C.N.R.S.), Paris, France

Division of Ser. No. 24,883, Mar. 1, 1993, which is a continuation of Ser. No. 408,113, Aug. 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 470,589

Int. Cl.[6] G06F 9/00;9/44

U.S. Cl. 395—500 **8 Claims**



1. A multiport series memory component for a multiprocessor system comprising an integrated circuit having a random access memory unit (RAM) of a predetermined width corresponding to a block of information (bi), an assembly of shift registers ($RDM_1 \ldots RDM_j \ldots RDM_n$), each having a width corresponding to the size of the memory unit, an internal parallel bus (BUSI) connecting the access of the memory unit and the shift registers, a shift register selection logic (LSR) for validating the link on the internal bus between the memory unit and a predetermined shift register, and an assembly of external input/output pins (adbloc, admot, numreq, cs, wr, rd, bitbloc, normal/config, hi, di) for the input of addresses to the memory unit (RAM), for the input of addresses to the selection logic (LSR), for the input and the validation of transfer commands in reading or writing of a block of information (bi) between the memory unit (RAM) and the shift registers (RDM), for the input of a clock signal to each shift register (RDM_j), for bit by bit input of a block of information (bi) to each shift register (RDM_j) and for the bit by bit output of a block of information from each shift register (RDM_j).

5,598,555

DATA TRANSMISSION APPARATUS

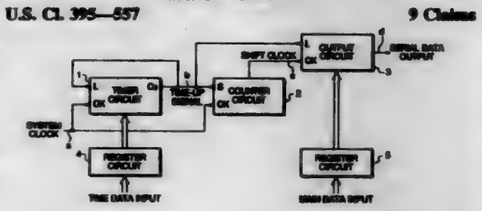
Masahiro Ito, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 27, 1994, Ser. No. 364,359

Claims priority, application Japan, Dec. 28, 1993, 5-349735; Dec. 28, 1993, 5-349736

Int. Cl.[6] G06F 1/14

U.S. Cl. 395—557 **9 Claims**



1. A data transmission apparatus comprising:

a timer circuit disposed to have time data input thereto, said time data specifying a time interval of transmission of main data forming parallel data together with said time data, said timer circuit counting said time interval specified by said time data input thereto to generate a time-up signal upon completion of counting said time interval, and having next one of said time data input thereto upon generation of said time-up signal;

a transmission clock-generating circuit for frequency-dividing a predetermined system clock to generate a transmission clock signal, said transmission clock-generating circuit being responsive to said time-up signal delivered from said timer circuit, for correcting a phase of said transmission clock signal; and

a serial data transmission circuit responsive to said time-up signal delivered from said timer circuit, for having said parallel data input thereto, and for converting said parallel data into serial data, based on said transmission clock signal delivered from said transmission clock-generating circuit, to deliver said serial data.

5,598,556

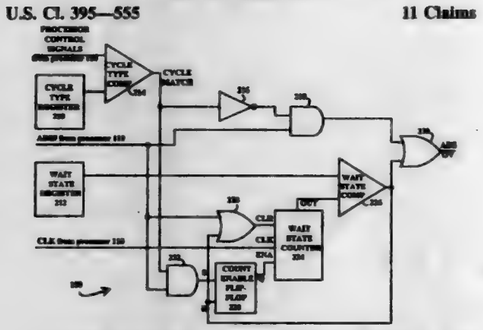
CONDITIONAL WAIT STATE GENERATOR CIRCUIT

Atish Ghosh, and Jennifer B. Peacis, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 7, 1995, Ser. No. 568,849

Int. Cl.[6] G06F 1/12

U.S. Cl. 395—555 **11 Claims**



1. A timing circuit for generating a selectable number of wait states which are imposed on a processor system under a selectable operating condition, the processor furnishing a timing signal on a timing signal line, a plurality of processor control signals indicative of a processor operating condition on a corresponding plurality of processor control signal lines and a clock signal on a clock signal line, the timing circuit comprising:

a programmable selector of processor operating condition setting a programmed operating condition;

a wait state generation activation circuit coupled to the plurality of processor control signal lines and coupled to the programmable selector of processor operating condition, the wait state generation being activated when the processor operating condition matches the programmed operating condition and the wait state generation being otherwise inactivated;

a timing signal pass-through circuit coupled to the wait state generation activation circuit and coupled to the timing signal line for passing through the timing circuit when the wait state generation is inactivated;

a programmable selector of wait state delay number setting a programmed timing delay;

a wait state counter coupled to the clock signal line and coupled to the wait state generator activation circuit for counting a number of clock signals when the wait state generation is activated; and

a timing signal delay circuit coupled to the wait state counter and coupled to the programmable selector of wait state delay for delaying the timing signal until the number of clock signals counted by the wait state counter reaches the programmed timing delay.

5,598,557

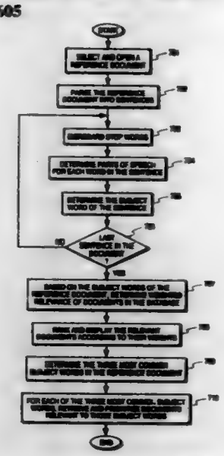
APPARATUS AND METHOD FOR RETRIEVING AND GROUPING IMAGES REPRESENTING TEXT FILES BASED ON THE RELEVANCE OF KEY WORDS EXTRACTED FROM A SELECTED FILE TO THE TEXT FILES

Christopher G. Doner, San Francisco; Lawrence G. Miller, Saratoga; Ian D. Emmons, Richmond, and Michael R. Barnes, Berkeley, all of Calif., assignors to Caere Corporation, Los Gatos, Calif.

Filed Sep. 22, 1992, Ser. No. 948,669

Int. Cl.[6] G06F 17/30;17/21

U.S. Cl. 395—605 **30 Claims**



1. A computer system for searching and retrieving files in a database comprising:

a bus;

an input device coupled to said bus for selecting a first reference file;

a storage area coupled to said bus having stored therein a program;

a processor coupled to said bus for executing said program, said program including

an algorithm for determining significant words of text comprising said first file, and

a comparison algorithm for comparing said significant words of said first reference file and text of a second file in said database; and

a display device, coupled to said bus, for displaying a plurality of said significant words from said first reference file and one or more images corresponding to retrieved files, wherein said one or more images are grouped based upon the retrieved files' relevance to said plurality of said significant words, wherein selecting one of said images designates the corresponding retrieved file as a second reference file for initiating a second search and retrieval of files in said database which are relevant to said second reference file.

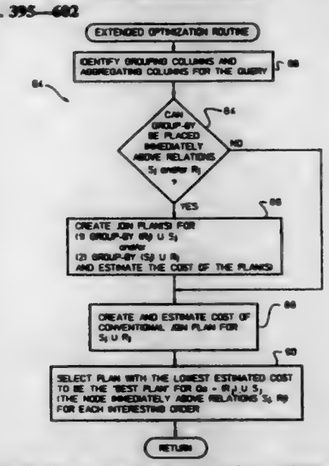
5,598,558

Patent Not Issued For This Number

5,598,559
METHOD AND APPARATUS FOR OPTIMIZING QUERIES HAVING GROUP-BY OPERATORS

Sarajit Chaudhuri, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 270,289, Jul. 1, 1994, abandoned.
This application May 28, 1996, Ser. No. 653,804
Int. Cl.[6] G06F 17/30
U.S. Cl. 395—602 7 Claims



1. A method for optimizing a query for a relational database, said method comprising:

(a) receiving a query to be optimized for processing, the query having a group-by operator; and

(b) generating query execution plans having a root node, relations which are joined at nodes and nodes representing group-by operations placed preceding every internal join node for which placement of a group-by operation generates an execution plan equivalent to an execution plan having the group-by operation at the root node, wherein each said group-by operation performs a group-by operation on one of said relations, by:

(b1) identifying grouping columns and aggregate columns for the query; and

(b2) determining, based on the grouping columns and the aggregate columns for the query, whether a node repreasenting a group-by operation can be placed preceding the join nodes of the execution plan;

(c) estimating cost for each execution plans; and

(d) choosing the execution plan having the lowest estimated cost.

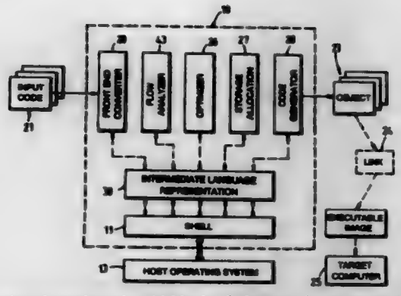
5,598,560
TRACKING CONDITION CODES IN TRANSLATION CODE FOR DIFFERENT MACHINE ARCHITECTURES

Thomas R. Benson, Hollis, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 7, 1991, Ser. No. 666,882
Int. Cl.[6] G06F 9/45;9/00
U.S. Cl. 395—707 29 Claims

1. A method of processing input computer code by a computer in a code translator to produce translated code, comprising the steps of:

accessing and parsing said code by said computer to generate a flow graph in an intermediate language from said code, the flow graph being a data structure composed of blocks, and the blocks being composed of intermediate_language elements, where each element represents a single expression in said code, and where each block represents a sequence of one or more elements with no intermediate entry or exit;



tracing through each said block of elements in a reverse direction from its exit to its entry to detect any elements which read or set condition codes, where said condition codes represent bits set in a status register in a processor executing said computer code;

producing from those detected elements which read condition codes a first set of condition codes;

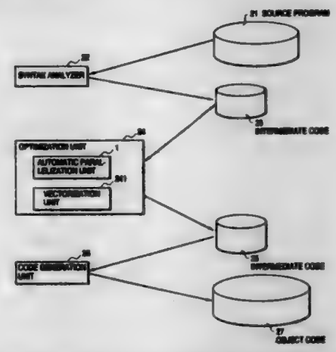
removing from the first set those condition codes which are set by other detected elements to produce a second required set of required condition codes; and

generating from the required set instructions in said translated code to set the required condition codes to simulate reading and setting of the condition codes.

5,598,561
OPTIMIZING COMPILER WHICH GENERATES MULTIPLE INSTRUCTION STREAMS TO BE EXECUTED IN PARALLEL

Hiroshi Funaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 24, 1992, Ser. No. 918,832
Claims priority, application Japan, Jul. 25, 1991, 3-207152
Int. Cl.[6] G06F 9/45
U.S. Cl. 395—706 4 Claims



1. A compiling system for a parallel execution computer system which produces an object program from a given source program and supplies said object program to said parallel execution computer system, said compiling system comprising:

(a) syntax analysis means for receiving said source program, interpreting said source program and translating said source program into a first intermediate code;

(b) detection means for receiving said first intermediate code and detecting a portion of said first intermediate code which may be implemented by a different code which generates a same result as said portion;

(c) parallelizing means for adding to said first intermediate code said different code for producing a composite intermediate code;

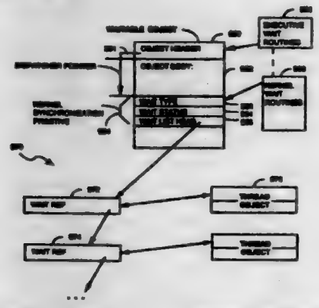
(d) conversion means for receiving said composite intermediate code and modifying said composite intermediate code into a second intermediate code to allow said portion and said different code to be executed in parallel until either has finished execution; and

(e) object program generating means for generating said object program from said second intermediate code.

5,598,562
SYSTEM AND METHOD FOR ADDING NEW WAITABLE OBJECT TYPES TO OBJECT ORIENTED COMPUTER OPERATING SYSTEM

David N. Cutler, Bellevue; James W. Kelly, Jr., and Frank L. Perazzoli, Jr., both of Redmond, all of Wash., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 962,397, Oct. 16, 1992, Pat. No. 5,297,283, which is a continuation of Ser. No. 374,165, Jun. 29, 1989, abandoned. This application Mar. 1, 1994, Ser. No. 205,025
Int. Cl.[6] G06F 9/46
U.S. Cl. 395—674 24 Claims



20. A method of adding to a pre-existing computer operating system support for managing resources of a new resource class, the resources of the new resource class imposing a latency on any thread of execution requesting service therefrom, the computer operating system operating in a computer system having a memory means for storing data and data structures, the pre-existing computer operating system managing resources of a plurality of pre-existing resource classes, each said pre-existing resource class having a corresponding pre-existing data structure type, the method comprising the steps of:

defining a new data structure type corresponding to the new resource class, said data structure type sharing with said pre-existing resource data structure types a common header format, each said data structure type having a distinct associated body format;

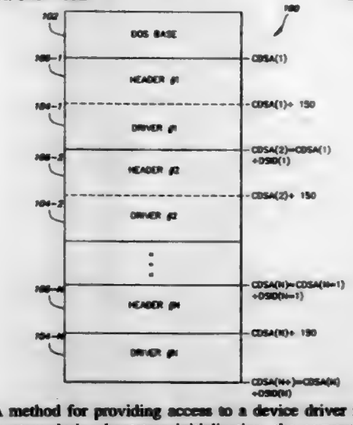
said common header format including a dispatcher datum whose value indicates an address in said memory means of a synchronization data structure for use in managing the waiting of said any thread of execution waiting on said resource; and

adding to said pre-existing computer operating system said new data structure type, and adding object service routines for manipulating data structures of said new data structure type to form a modified computer operating system, said object service routines including means for causing any thread of execution to wait when requesting services from said resource until an associated wait termination condition is satisfied and for updating ones of said synchronization data structures accordingly.

5,598,563
METHOD OF LOADING DEVICE DRIVERS FROM ROM WITHOUT REQUIREMENT OF SYSTEM TO HAVE ANY HARDDISKS OR FLOPPY DRIVES AND WITHOUT USING CONFIG.SYS FILE

Terrance R. Spies, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 976,945, Nov. 16, 1992, abandoned.
This application Aug. 3, 1994, Ser. No. 285,485
Int. Cl.[6] G06F 9/445
U.S. Cl. 395—652 25 Claims



1. A method for providing access to a device driver in a computer system during bootstrap initialization, the computer system having computer memory with an adapter region and a conventional random access memory region, each memory region having memory addresses, the computer system having a read only memory unit containing an operating system portion, initialization code for setting up access to the device driver, and the device driver, the initialization code having a location on the read only memory unit and containing a device driver execution stub, the method comprising the computer-implemented steps of:

physically mapping the read only memory unit into the adapter region of computer memory so that at least a portion of the read only memory unit is accessible through adapter region memory addresses;

transferring control to the operating system portion stored on the read only memory unit;

under control of the operating system portion being executed from the read only memory unit, determining the location of the initialization code on the read only memory unit and transferring control to the determined location of the initialization code; and

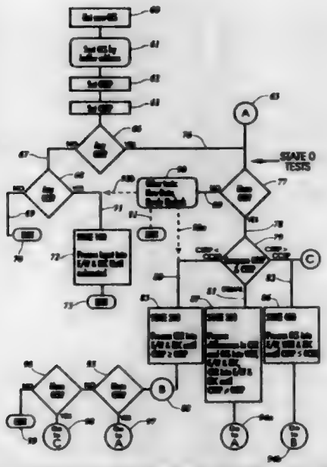
under control of the initialization code being executed from the read only memory unit, copying the device driver execution stub to the conventional random access memory region, the stub containing instructions for accessing the device driver such that when code executes the stub, the stub transfers control to the device driver in the adapter region of computer memory.

5,598,564
SYSTEM FOR IMPLEMENTING STATE TABLE IN COMPUTER CODE

W. Daniel Barker, III, 1954 Gotham Way, Atlanta, Ga. 30324

Division of Ser. No. 893,724, Jun. 5, 1992, Pat. No. 5,420,965.
This application Dec. 20, 1994, Ser. No. 360,213
Int. Cl.[6] G06F 9/00
U.S. Cl. 395—705 2 Claims

1. In a method of implementing an algorithmic state machine with a plurality of program instructions for a digital computer that includes the steps of assigning a particular state identifier of a plurality of state identifiers to each state into which said state



machine can be placed by its operation, and defining a plurality of inputs to be tested at each said state to control transition to a next state, the improvement comprising the steps of:

providing a state tabbing procedure that takes a predetermined plurality of parameters as arguments, said predetermined plurality of parameters including a label identifying an operational procedure to be performed that is called by said state tabbing procedure, a predetermined number N of next state labels, N being a positive integer greater than one, a label identifying one of a plurality of tests having a result that controls said transition to a next state, each of said plurality of tests providing N possible results,

said state tabbing procedure being responsive to each of said plurality of tests to cause said state machine to branch to said next state identified by a particular one of said N next state labels that corresponds to a particular one of said N possible results that actually occurs; and

providing said plurality of program instructions such that there is one of said program instructions for said each state into which said state machine can be placed by its operation and each of said plurality of program instructions in a form that has said particular state identifier as a label to which said state machine can branch when said state tabbing procedure is called.

5,598,565

METHOD AND APPARATUS FOR SCREEN POWER SAVING

Dennis Reinhardt, Palo Alto, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 29, 1993, Ser. No. 174,769

Int. Cl.[6] G06F *1/30*; G09G *3/36*

U.S. Cl. 395—750 **18 Claims**

1. An apparatus for conserving power in a portable electronic device, said apparatus comprising:

a flat panel display system, said flat panel display system providing an output display for said portable electronic device, said flat panel display system comprising a plurality of individual pixels;

a flat panel display power management system, said flat panel display power management system coupled to said flat panel display system, said flat panel display power management system providing a controllable amount of power to each of said plurality of individual pixels such that each of said plurality of individual pixels may be displayed at a different level of visibility;

a processor in said electronic device; and



a software program running on said processor in said portable electronic device, said software program configuring said flat panel display power management system such that said software program determines a subset of said plurality of pixels that will receive more power than pixels not in said subset if said flat panel display power management system enters an active state.

5,598,566

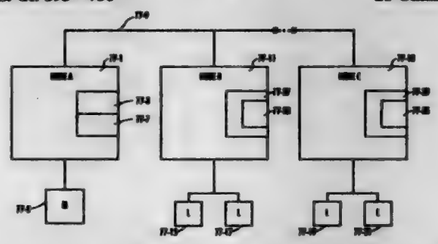
NETWORKED FACILITIES MANAGEMENT SYSTEM HAVING A NODE CONFIGURED WITH DISTRIBUTED LOAD MANAGEMENT SOFTWARE TO MANIPULATE LOADS CONTROLLED BY OTHER NODES

Gregory A. Pascucci, Waukesha; David E. Rasmussen, Wales; Gaylon M. Declous, Milwaukee; James R. Garbe, Greenfield; Susan M. Hyzer, Brown Deer; Karen L. Wocat, Wauwatosa; Vaivavan Vaivavan, Milwaukee; David L. Koch, Fox Point; Donald A. Gottschalk, Jr., Milwaukee; Dennis E. Burkhardt, Franklin; Darrell E. Standish, New Berlin; Paul W. Madsen, Oak Creek; Dan J. Spacek, Cudahy; Clay G. Nesler, New Berlin; James K. Stark, Wauwatosa; Otto M. Mageland, Greenfield; Robert R. Singers, Brown Deer, and Michael E. Wagner, Delafield, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Division of Ser. No. 476,831, Jan. 30, 1990, abandoned. This application Jan. 7, 1994, Ser. No. 179,494

Int. Cl.[6] G06F *15/177*

U.S. Cl. 395—750 **21 Claims**



1. A method of limiting energy consumption of a network having loads controlled by nodes communicating over the network, the nodes having storage means and processing means, the nodes including a master node having a high level load shedding software feature and other nodes having local software object features, the local software object features controlling the loads, the method comprising steps of:

storing load restoration characteristics of the loads controlled by the other nodes in the storage means of the other nodes;

executing the high level load shedding software feature in the processing means of the master node to limit energy consumption of the network, and subsequently transmitting over the network commands to shed particular loads controlled by the other nodes;

executing predefined load shedding processing in the other nodes controlling the particular loads by using the local

software object features, each of the local software object features having a data base manager and attributes stored in a data base in each of the other nodes, the local software object features shedding the particular loads in response to the commands;

under control of the local software object features, restoring the particular loads independently of the commands from the master node in response to the attributes of the local software object features.

5,598,567

APPARATUS FOR CONTROLLING POWER SUPPLY IN A COMPUTER SYSTEM BY INTRODUCING DELAYS BEFORE ACTIVATION AND DEACTIVATION OF POWER

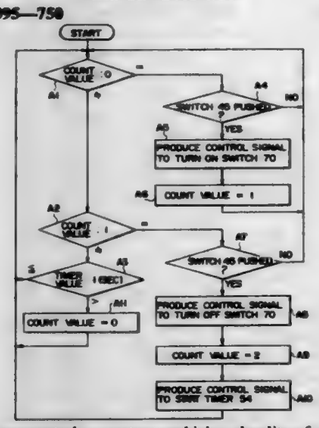
Ryoei Ninomiya, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 784,715, Oct. 30, 1991, abandoned. This application Nov. 16, 1994, Ser. No. 341,925

Claims priority, application Japan, Nov. 7, 1990, 2-301688; Sep. 30, 1991, 3-278693

Int. Cl.[6] G06F *1/26*

U.S. Cl. 395—750 **11 Claims**



1. A power control apparatus to which a plurality of components are connected, comprising:

supplying means for supplying voltage to the components;

a momentary switch capable of being depressed by a user;

a timer for counting a predetermined period of time;

a memory retaining status information represented by one of a first, a second and a third value, the first value indicating that voltage supply to the components is possible, the second value indicating that prevention of voltage supply to the components is possible, and the third value indicating that voltage supply to the components is being inhibited; and

control means for monitoring the status information in said memory and a depression of said momentary switch and thereby controlling power supply to the components, including:

means, in response to the depression of said momentary switch while the status information represents the first value, allowing voltage supply to the components and changing the first value to the second value,

means, in response to the depression of said momentary switch while the status information represents the second value, inhibiting voltage supply to the components, changing the second value to the third value, and starting said timer, and

means, in response to a termination of running of said timer while the status information represents the third value, changing the third value to the first value.

5,598,568

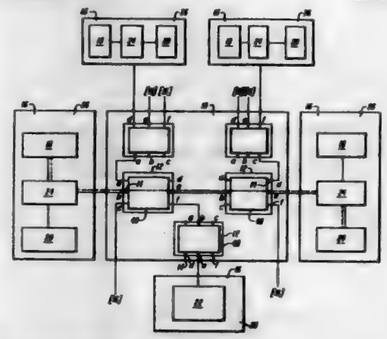
MULTICOMPUTER MEMORY ACCESS ARCHITECTURE

Robert C. Frisch, Westford, Mass., assignor to Mercury Computer Systems, Inc., Chelmsford, Mass.

Filed May 6, 1993, Ser. No. 58,485

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **13 Claims**



1. In a multicomputer having at least:

(a) a plurality of processing nodes, each having memory means for storing memory address-accessible digital signals,

(b) each of said processing nodes having associated processing means for executing a memory access instruction for generating an access request for access to a digital signal stored in at least one of said memory means, the access request including a memory address associated with that digital signal, and

(c) at least one crossbar, having a plurality of ports, each said port coupled to a processing node or a port of another crossbar, for transfer of digital signals therebetween,

the improvement for providing a scalable multicomputer, wherein:

each of said processing nodes includes

mapping means for mapping selected addresses contained in access requests generated by the associated processing means to addresses in the memory means of that processing nodes and for mapping other selected addresses contained in access requests generated by the associated processing means to addresses in the memory means of another processing node,

a crossbar interface, coupled to a port of said crossbar, said crossbar interface including routing means responsive to selected access requests including those other selected addresses for generating a routing signal representative of a succession of crossbar ports between the associated processing node and a processing node where the requested digital signal is stored, and for transmitting said routing signal to the crossbar port to which said crossbar interface is coupled,

the routing means of at least a selected processing node including (i) routing register means for storing one or more routing paths, each identifying a succession of crossbar ports between the selected processing node and another processing node,

(ii) means for transmitting to the processing node in which the requested digital signal is stored an address in an access request, where that address serves as an offset into the memory of that processing node where the digital signal is stored, and (iii) means responsive to an access request for obtaining from the register means a routing path between the selected processing node and a processing node in which the requested digital signal is stored,

whereby each processing node can directly access the memory means of another processing node by executing memory access instructions, of the type that it uses to access its own memory means, to generate memory access requests for directly accessing the memory means of such other processing node,

said crossbar having crossbar logic circuit means comprising decoding means responsive to said routing signal for establishing an internal path through said crossbar for transferring the request and any digital signals accessed thereby between the

processing node that generated the request and the processing node where the digital signal is stored,

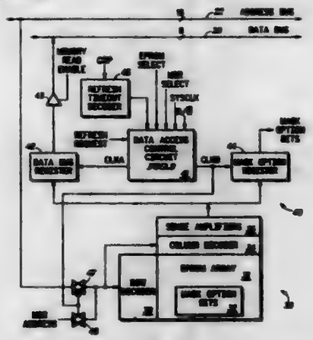
each processing node includes means for responding to a memory access request routed by the crossbar from another processing node to transfer the requested signals therewith.

5,598,569

DATA PROCESSOR HAVING OPERATING MODES SELECTED BY AT LEAST ONE MASK OPTION BIT AND METHOD THEREFOR

Michael I. Catherwood, and George L. Espinor, both of Austin, Tex., assignors to Motorola Inc., Shaumburg, Ill.

Filed Oct. 17, 1994, Ser. No. 323,558
Int. Cl.[6] G06F *12/16*
U.S. Cl. 395—800 **14 Claims**



1. A data processor having operating modes configured at program time by at least one mask option bit, comprising:

a central processing unit coupled to an address bus and to a data bus, for accessing memory and for processing instructions; and

a nonvolatile memory system coupled to said address and data buses, comprising:

an array of nonvolatile memory cells for storing a plurality of data bits and the at least one mask option bit;

a decoder coupled to said address bus, for selecting at least one memory cell of said array of nonvolatile memory cells in response to an address conducted on said address bus;

a sense amplifier having an input coupled to said decoder, and an output;

a coupling circuit having an input coupled to said output of said sense amplifier, a control input for receiving a first control signal, and an output coupled to said data bus, said coupling circuit providing a data bit to said data bus indicative of said output of said sense amplifier in response to said first control signal;

a mask option register comprising at least one static memory cell, having an input coupled to said output of said sense amplifier, a control input for receiving a second control signal and an output for providing the at least one mask option bit, said mask option register storing a data bit indicative of said output of said sense amplifier in response to said second control signal; and

a control circuit coupled to said array of nonvolatile memory cells for activating copying of the at least one mask option bit from the array of nonvolatile memory cells to the mask option register in response to a refresh request signal when said central processing unit is not accessing said plurality of data bits;

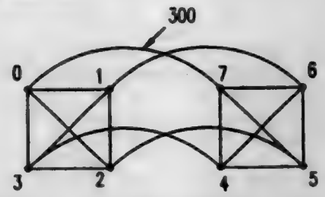
whereby reliability of the data processor is improved by implementing the at least one mask option bit and said plurality of data bits in a common array.

5,598,570

EFFICIENT DATA ALLOCATION MANAGEMENT IN MULTIPROCESSOR COMPUTER SYSTEM

Ching-Tien Ho, San Jose, and Mandayam T. Raghunath, Berkeley, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 291,966, Aug. 17, 1994, abandoned, which is a continuation of Ser. No. 819,823, Jan. 10, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 386,229
Int. Cl.[6] G06F *15/76*
U.S. Cl. 395—800 **17 Claims**



HYPER-CUBE-LIKE MULTIPROCESSOR SYSTEM

1. A method for converting a Gray code to a binary code data allocation for a n-dimensional hypercube multiprocessor computer system, each processor of the system having a processor address of n bits and each processor having a plurality of data-blocks, each given processor having a neighbor in an i-th dimension, i being a dimensional and bit index having an integral value in the range $(0 \leq i \leq (n-1))$ such that the given processor and the i-th dimension neighbor processor have processor addresses which are identical except for the i-th bit thereof, the method being implemented for execution by the processors of the system, the method comprising the steps of:

(a) for each processor, dividing the data-blocks thereof into first and second halves;

(b) exchanging in parallel the second half of the data-blocks of each processor with the second half of the data blocks of a neighbor processor along an (n−2)-th dimension of said processor and

(c) executing in parallel in each processor, for an index i, wherein i:=0 to n−2, the following steps:

(i) determining if an (i+1)-th bit of an inverse Gray code of the processor address has a value of one; and

(ii) if a value of one is determined in step (i), exchanging the first half of said data-blocks, with the first half of the data-blocks of a neighbor processor along the i-th dimension of said processor, otherwise exchanging the second half of said data-blocks, with a the second half of the data-blocks of a neighbor processor along the i-th dimension of said processor.

5,598,571

DATA PROCESSOR FOR CONDITIONALLY MODIFYING EXTENSION BITS IN RESPONSE TO DATA PROCESSING INSTRUCTION EXECUTION

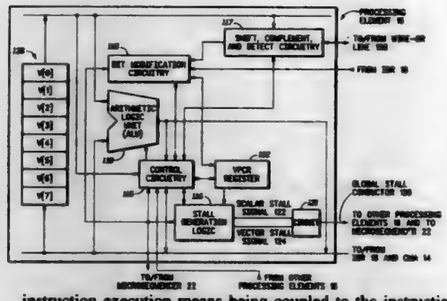
Michael G. Gallup; L. Rodney Goke, and Robert W. Sexton, Jr., all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 40,779, Mar. 31, 1993. This application Mar. 8, 1995, Ser. No. 401,400
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—8 **32 Claims**

1. A data processor, comprising:

an instruction storage circuit for storing a data processing instruction;

instruction execution means for executing a data processing operation in response to the data processing instruction, the



instruction execution means being coupled to the instruction storage circuit for receiving the data processing instruction;

storage means for storing a plurality of extension values, each of the plurality of extension values being used during execution of the data processing operation, the storage means being coupled to the instruction execution means for communicating each of the plurality of extension values; and

modification means for conditionally modifying each of the plurality of extension values during execution of the data processing instruction, wherein the

data processing instruction is one of a preliminary and a non-preliminary instruction,

the preliminary instruction modifying each of the plurality of extension values in response to a result of the data processing instruction, and

the non-preliminary instruction modifying each of the plurality of extension values to be in a default state,

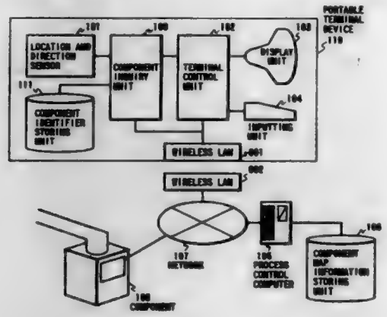
the modification means being coupled to the storage means for communicating each of the plurality of extension values being conditionally modified in response to the data processing instruction.

5,598,572

INFORMATION TERMINAL SYSTEM GETTING INFORMATION BASED ON A LOCATION AND A DIRECTION OF A PORTABLE TERMINAL DEVICE

Koichiro Tanikoshi, Hitachi; Masayuki Tani, Hitachinaka; Kimiya Yamaashi, Hitachi; Harumi Uchigasaki, Hitachinaka; Masayasu Futakawa; Masato Horita, both of Hitachi; Shoshiro Kuzunuki, Hitachinaka; Atsuhiko Nishikawa, and Takekazu Maruyama, both of Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1995, Ser. No. 404,743
Claims priority, application Japan, Mar. 18, 1994, 6-048242
Int. Cl.[6] G06F *9/24;13/42*
U.S. Cl. 395—800 **15 Claims**



1. An information terminal system including a process control computer which controls a plant composed of a plurality of physical components, and a portable terminal device for inputting information to at least one of said process control computer and said components and for obtaining information from at least one of said process control computer and said components, said information terminal system comprising:

component identifying means provided in at least one of said process control computer and said portable terminal device, for identifying a component from a plurality of physical components included in a plant, by using a direction indicated by said portable terminal device,

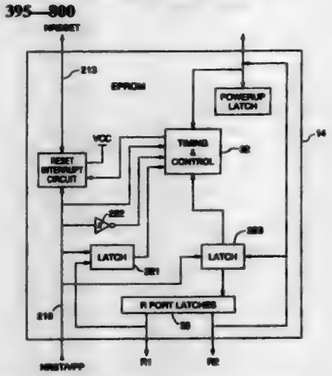
wherein information pertaining to one of said components, as identified by said component identifying means, is input and obtained by said portable terminal device.

5,598,573

MULTIPLE CHIP PROCESSOR ARCHITECTURE WITH RESET INTERCEPT CIRCUIT

Christopher M. Hall, Redwood City; Gary D. Phillips; David W. Weinrich, both of San Jose, and Robert M. Salter, III, Saratoga, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 359,417, Dec. 20, 1994. This application May 19, 1995, Ser. No. 446,018
Int. Cl.[6] G06F *15/76*
U.S. Cl. 395—800 **3 Claims**



1. A multiple chip package processor comprising:

a first die having a first pad for accepting a first signal, said die including circuitry coupled to said first pad for placing said first die in a reset state responsive to said first signal being in a first condition and for placing said first die in a second state responsive to said first signal being in a second condition, said die further having a second pad;

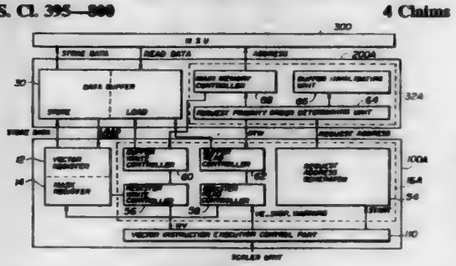
a second die having a third pad coupled to said second pad on said first die for accepting a second signal, said second die including circuitry for placing said second die in a reset state responsive to said second signal being in said first condition and for placing said second die in a second state responsive to said second signal being in a third condition, and

a reset intercept circuit on said first die coupled between said first pad and said second pad, said reset intercept circuit comprising means for outputting said second signal in said first state responsive to said first signal being in said first state and for outputting said second signal in said third state responsive to said first signal being in said second state.

5,598,574
VECTOR PROCESSING DEVICE

Toru Yoshinaga, and Naoki Shinjo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 115,321, Sep. 2, 1993, abandoned. This application Mar. 18, 1996, Ser. No. 617,148
Claims priority, application Japan, Nov. 30, 1992, 4-320593
Int. Cl.[6] G06F 9/00
U.S. Cl. 395—800 4 Claims



1. A vector processing device comprising:

a vector unit outputting access requests, each access request comprising a vector instruction, said vector instruction comprising an instruction identifier, said vector unit comprising:

operation pipelines, and

a vector register connected to the operation pipelines;

a memory control unit coupled to the vector register and comprising a data buffer;

a memory unit, coupled to the data buffer and accessed by the operation pipelines, storing results of operations obtained from the operation pipelines;

first means for counting for each vector instruction a number of pieces of data read from the vector register and transmitted to the data buffer; and

second means for selectively interrupting the access requests output from the vector unit to the memory unit based on the number of pieces of data counted by the first means and on a value of the instruction identifier, if the operation pipelines are chained via the vector register; and

wherein the vector processing device further comprises:

a vector controller coupled to the second means and outputting the vector identifier;

third means, provided in said second means, for outputting address information and the instruction identifier to the memory unit received from the vector controller;

fourth means, provided in the memory control unit, for temporarily storing said address information and said instruction identifier; and

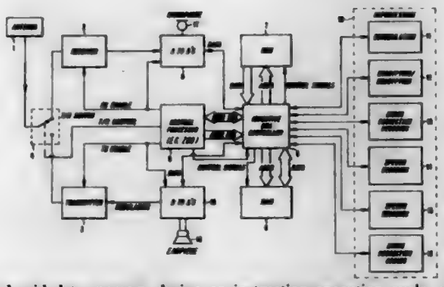
fifth means for selectively interrupting the access request by referring to said instruction identifier stored in the fourth means and for selecting the address information concerning an instruction in a register chained state.

5,598,575
MULTIPROCESSOR DATA MEMORY SHARING SYSTEM IN WHICH ACCESS TO THE DATA MEMORY IS DETERMINED BY THE CONTROL PROCESSOR'S ACCESS TO THE PROGRAM MEMORY

Paul W. Dent, Stehag, and Alf J. P. Larsson, Björrod, both of Sweden, assignors to Ericsson Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 143,640, Nov. 1, 1993, abandoned. This application Apr. 15, 1996, Ser. No. 626,911
Int. Cl.[6] G06F 13/28
U.S. Cl. 395—800 25 Claims

1. In a system including a control processor, a coprocessor, a program memory and a data memory, said control processor accessing said program memory during an instruction fetch cycle and said data memory during an instruction execution cycle, an apparatus for controlling access to said data memory, said apparatus comprising:



control processor interface means for coupling to said control process;

coprocessor interface means for coupling to said coprocessor;

detection means, coupled to said control processor interface means, for detecting when said control processor requests access to said program memory and generating a first access control signal in response thereto;

scheduling means, coupled to said coprocessor interface means, for detecting when said coprocessor requests access to said data memory and generating a second access control signal in response thereto;

a switch, having a switch control input means, a first interface means for coupling to memory address, memory data and memory control signals associated with said control processor, a second interface means for coupling to memory address, memory data and memory control signals associated with said coprocessor, and a data memory interface means for coupling to said data memory, wherein said switch alternatively couples said first interface means or said second interface means to said data memory interface means in response to a switch control signal received from said control input; and

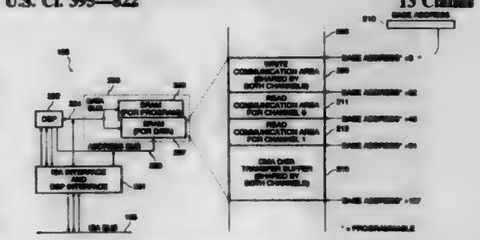
arbitration means, coupled to said detection means, said scheduling means, and said switch, for generating a switch control signal only in response to said first and second access control signals,

wherein said instruction fetch and instruction execution cycles are mutually exclusive.

5,598,576
AUDIO OUTPUT DEVICE HAVING DIGITAL SIGNAL PROCESSOR FOR RESPONDING TO COMMANDS ISSUED BY PROCESSOR BY EMULATING DESIGNATED FUNCTIONS ACCORDING TO COMMON COMMAND INTERFACE

Mark Hsu, San Jose; Yaan Le Corsec, Fremont, and Julien T. Nguyen, Redwood City, all of Calif., assignors to Sigma Designs, Incorporated, Fremont, Calif.

Filed Mar. 30, 1994, Ser. No. 219,841
Int. Cl.[6] G06F 15/02
U.S. Cl. 395—822 13 Claims



1. A computer system, comprising:

a system bus, a processor coupled to said system bus, a system memory coupled to said system bus, and an audio-output device coupled to said system bus, said audio-output device comprising

a bus-interface element having means for coupling to said system bus, means for receiving a plurality of commands issued by said processor, and means for transmitting data to said processor;

a digital signal processor coupled to said bus-interface element, said digital signal processor having means for interpreting and executing instructions, means for receiving from said bus-interface element a signal indicative of receipt of at least one of said plurality of commands, and means for sending to said bus-interface element a signal indicative of completion of said at least one command;

a local memory coupled to said bus-interface element and to said digital signal processor, said local memory having a communication area;

said bus-interface element having means for writing to said communication area upon receipt of a first subset of said plurality of commands, and means for reading from said communication area upon receipt of a second subset of said plurality of commands; and

said digital signal processor having means for reading from and writing to said communication area in response to said at least one command;

said communication area comprising a plurality of addressable registers pointed to by a base register, said base register comprising a dynamically allocable value indicative of an address of one of said plurality of addressable registers, wherein said plurality of commands issued by said processor are in a format required by a common command interface for said audio-output device, and wherein said Digital Signal Processor is disposed to respond to said commands by emulating designated functions according to said common command interface.

5,598,577
COMPUTER SYSTEM WITH AUTOMATIC DRIVE MODEL ID RECOGNITION AND DRIVE TYPE ADAPTATION

Anthony L. Overfield, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 243,219, Apr. 6, 1994, abandoned, which is a continuation of Ser. No. 814,026, Dec. 26, 1991, abandoned. This application Dec. 8, 1995, Ser. No. 569,389
Int. Cl.[6] G06F 13/10;9/00
U.S. Cl. 395—830 20 Claims



1. In a computer system having a disk drive and having a configuration memory, a method of conditionally specifying to the computer system a plurality of drive parameters appropriate for the disk drive, comprising the steps of:

sending a model-identification-query to the disk drive, said model-identification-query causing the disk drive to return a model-identification-string which identifies the disk drive's manufacturer and model number;

comparing the model-identification-string returned from the disk drive against a plurality of entries within a recognition table, said recognition table containing an entry for each of a plurality of disk drives, by vendor and model number thereof, which are each known to perform satisfactorily with the computer system, said recognition table being pre-stored within the computer system and containing, for each entry, a field specifying a permissible model-identification-string for the respective entry and a field specifying a corresponding drive-type-number for the respective entry, said comparing step for finding an entry within the recognition table which corresponds to the returned model-identification-string, if such a matching entry is present within the recognition table, and otherwise for determining that no matching entry is present within the recognition table;

retrieving, upon finding a matching entry within the recognition table, the drive-type-number corresponding thereto;

storing, upon retrieving a drive-type-number from the recognition table, the retrieved drive-type-number into the configuration memory of the computer system; and

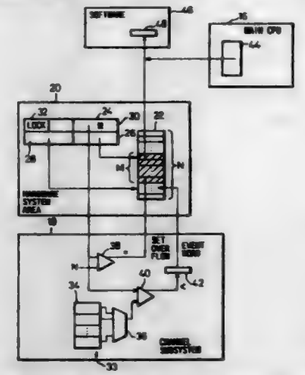
preventing upon determining that no matching entry is present within the recognition table, a user of the computer system from manually storing a drive-type-number into the configuration memory of the computer system;

wherein the drive parameters appropriate for the disk drive are specified to the computer system by reference to a pre-stored configuration table using the retrieved drive-type-number previously stored within the configuration memory, said configuration table containing, for each drive-type-number from a group of known drive-type-numbers, a corresponding plurality of drive parameters.

5,598,578
DATA PROCESSING SYSTEM HAVING EVENT WORD HANDLING FACILITY WHICH CAN SEND EVENT WORD OF HIGHER SIGNIFICANCE WITHOUT FAILURE

Masahiro Hatta, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1994, Ser. No. 214,283
Claims priority, application Japan, Jun. 21, 1993, 5-148765
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—835 6 Claims



6. A data processing system having an event word handling facility with a buffer, comprising:

means for storing a plurality of threshold values;

means for selecting one of the plurality of threshold values appropriate to an event word to be generated when a condition for generating the event word has occurred;

means for comparing the selected threshold value with a numerical value indicating a quantity of event words stored in the buffer; and

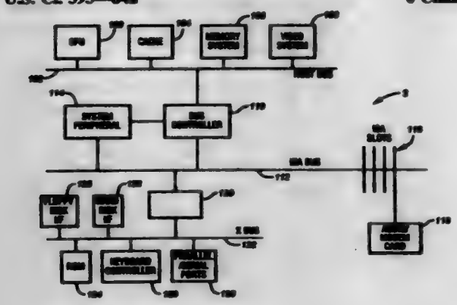
means for storing the event word into the buffer in accordance with a comparison result made by the comparing means.

5,598,579

SYSTEM FPR TRANSFERRING DATA BETWEEN TWO BUSES USING CONTROL REGISTERS WRITABLE BY HOST PROCESSOR CONNECTED TO SYSTEM BUS AND LOCAL PROCESSOR COUPLED TO LOCAL BUS

Mark W. Walker, Spring, and John S. Thayer, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 25, 1994, Ser. No. 234,847
Int. Cl.[6] G06F *15/02*
U.S. Cl. 395—842 **6 Claims**



1. A computer system comprising:

a host processor;

a system bus coupled to said host processor;

an expansion device, said expansion device including:

a local processor;

local memory;

a local bus coupled to said local processor and said local memory; and

a local DMA controller coupled to said system bus and to said local bus, said local DMA controller comprising:

a data transfer channel between the system and local busses; and

control registers for specifying data transfer operations using said data transfer channel, wherein said control registers are writable by said host processor and said local processor; and

a host DMA controller coupled to said system bus, writable by said host processor and operable with said local DMA controller for transferring data between said local memory and devices coupled to said system bus.

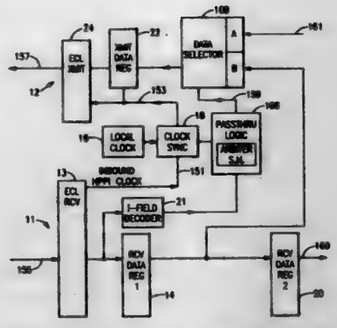
5,598,580

HIGH PERFORMANCE CHANNEL ADAPTER HAVING A PASS THROUGH FUNCTION

William F. Detschel, Saugerties; Darwin W. Norton, Jr., Stone Ridge, and Richard C. Paddock, Red Hook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 264,215, Jun. 22, 1994, Pat. No. 5,404,452, which is a continuation of Ser. No. 558,083, Jul. 25, 1990, abandoned. This application Apr. 3, 1995, Ser. No. 415,965
Int. Cl.[6] G06F *13/12*
U.S. Cl. 395—855 **2 Claims**

1. An adapter for connecting at least three devices to a high performance parallel interface channel connected in a "Daisy chain", each of said devices being capable of both sending and receiving bursts of data with a data clock, said adapter comprising:



inbound receiver means connected to said channel for receiving said bursts of data and data clock;

decoder means for decoding routing information contained in said bursts of data;

pass through logic means connected to said decoder means for interpreting said routing information;

first latch means connected to said inbound receiver means for temporarily storing data bursts;

second latch means connected to said first latch means for accepting data bursts when said routing information identifies a device to which the adapter is connected;

data selector means connected to said first latch means for selecting data from said device or from said first latch means;

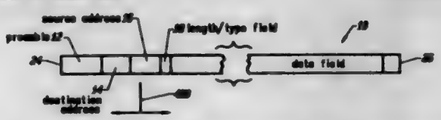
outbound transmitter means connected to said channel for transmitting bursts of data and a data clock, said outbound transmitter means also being connected to said data selector means for transmitting data bursts from said first latch means when said routing information does not identify said device.

5,598,581

VARIABLE LATENCY CUT THROUGH BRIDGE FOR FORWARDING PACKETS IN RESPONSE TO USER'S MANUAL ADJUSTMENT OF VARIABLE LATENCY THRESHOLD POINT WHILE THE BRIDGE IS OPERATING

Bernard N. Daines, Union City; Lazar Bivenbaum, Saratoga, and Richard J. Hausman, Soquel, all of Calif., assignors to Cisco Systems, Inc., San Jose, Calif.

Filed Aug. 6, 1993, Ser. No. 103,439
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—872 **24 Claims**



1. A cut-through bridge for connecting at least two computer networks, the networks each having a plurality of computer devices interconnected by a plurality of data cables wherein data packets are transmitted over the data cables, the cut-through bridge comprising:

a buffer for temporally holding the data packets;

a controller for controlling said buffer such that the data packets are forwarded out of said buffer upon command from said controller; and

means for adjusting a latency threshold of the buffer while the cut-through bridge is operating in the computer network, the latency threshold being that portion of each data packet which is received by the buffer prior to said controller commanding said buffer to forward that data packet, wherein the means for adjusting adjusts the latency threshold in response to a user's manual adjustment of the cut-through bridge.

DESIGNS

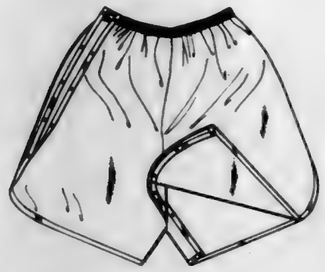
JANUARY 28, 1997

377,557

PATIENT TRUNKS GARMENT

Joyce V. Jagger, P.O. Box 1927, Binghamton, N.Y. 13902

Filed Mar. 27, 1995, Ser. No. 36,734
Term of patent 14 years
U.S. Cl. D2—738

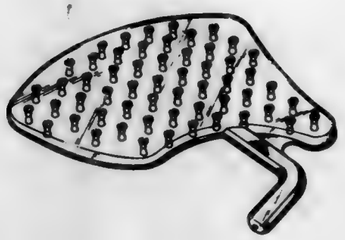


377,559

BLADDER FOR A SHOE SOLE

Joel L. Passke, Portland, and James C. Sell, Jr., Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Jun. 6, 1996, Ser. No. 55,526
Term of patent 14 years
U.S. Cl. D2—961

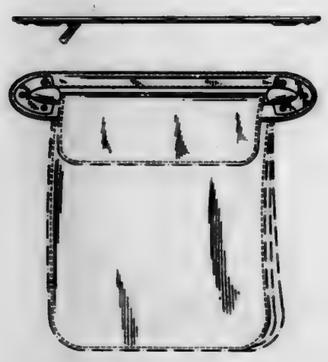


377,558

POCKET PORTION

Pierino Guidi, Schieti di Urbino, Italy, assignor to Piero Guidi di Pierino Giuseppe Guidi & C. s.n.c., Schieti di Urbino, Italy

Filed Dec. 21, 1994, Ser. No. 32,536
Claims priority, application Italy, Jun. 23, 1994, MI94 U 000334
Term of patent 14 years
U.S. Cl. D2—857



377,560

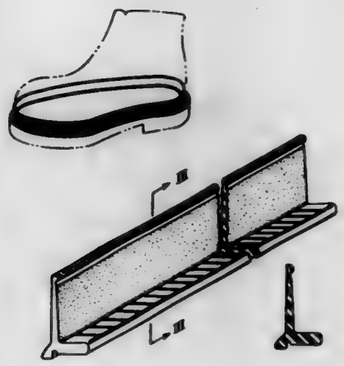
SIDE ELEMENT OF A SHOE UPPER

William J. Worthington, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 24, 1995, Ser. No. 46,697
Term of patent 14 years
U.S. Cl. D2—972



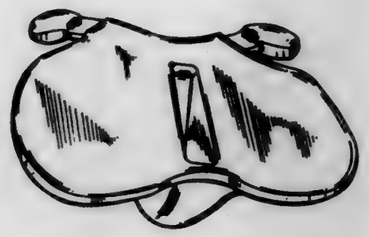
377,561
FOOTWEAR WELT WRAP
Larry W. McClelland, Rockford, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.
Filed Feb. 16, 1996, Ser. No. 50,387
Term of patent 14 years
U.S. Cl. D2—977



377,562
PENDANT FOR KEYS
Jürgen Wolfram, Winnender Strasse 1/1, D-71409 Schwaikheim, Germany
Filed May 5, 1995, Ser. No. 38,482
Claims priority, application Hague Agreement, Nov. 7, 1994, DM/031,237
Term of patent 14 years
U.S. Cl. D3—211



377,563
FISHING ROD SUPPORT
Lewis A. McConnell, Tokoroa, New Zealand, assignor to Equaliser Tackle Limited, Auckland, New Zealand
Filed Jun. 27, 1995, Ser. No. 41,140
Term of patent 14 years
U.S. Cl. D3—221



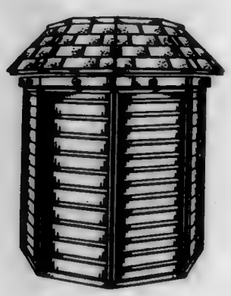
377,564
SHOULDER PAD FOR CARRYING SKIS
Alicia T. Brown, 10467 Barnwall St., Bellflower, Calif. 90706
Filed Feb. 29, 1996, Ser. No. 51,050
Term of patent 14 years
U.S. Cl. D3—221



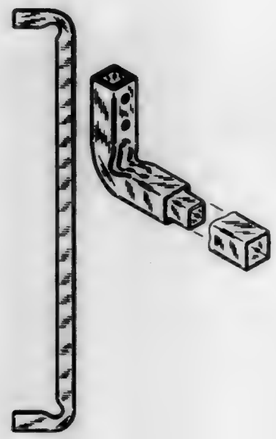
377,565
CHAIR WITH WHEAT STYLE BACK RUNGS
Sidney A. Lenger, Kernsville, N.C., assignor to Schottenstein Stores Corporation, Columbus, Ohio
Filed Oct. 25, 1995, Ser. No. 45,637
Term of patent 14 years
U.S. Cl. D6—358



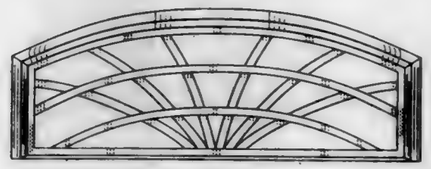
377,566
DISPLAY DEVICE
James R. Norge, Jr., 513 S. Mill St., New Castle, Pa. 16101
Filed May 22, 1995, Ser. No. 39,292
Term of patent 14 years
U.S. Cl. D6—457



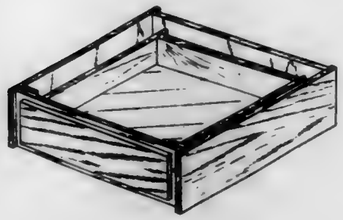
377,567
FRAME SUPPORT FOR A RECLINING CHAIR
Donald G. Scott, Tupelo, Miss., assignor to The Trenel Company, Moscow, Tenn.
Filed Feb. 13, 1996, Ser. No. 51,842
Term of patent 14 years
U.S. Cl. D6—495



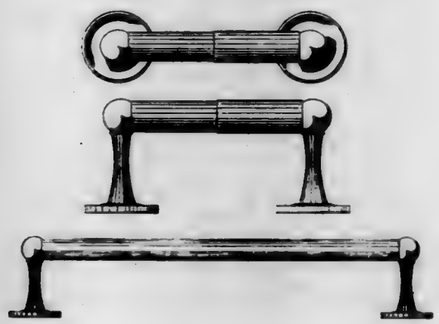
377,568
HEADBOARD
Charles C. Cain, High Point, N.C., assignor to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Division of Ser. No. 29,984, Oct. 28, 1994, Pat. No. Des. 368,601. This application Jan. 31, 1996, Ser. No. 51,701
Term of patent 14 years
U.S. Cl. D6—585



377,569
UNDERDRESSER FOR USE UNDER BEDS
Theodore D. Coyer, Loveland, Colo., assignor to Probity Manufacturing, Inc., Loveland, Colo.
Filed Jul. 27, 1994, Ser. No. 26,408
Term of patent 14 years
U.S. Cl. D6—510



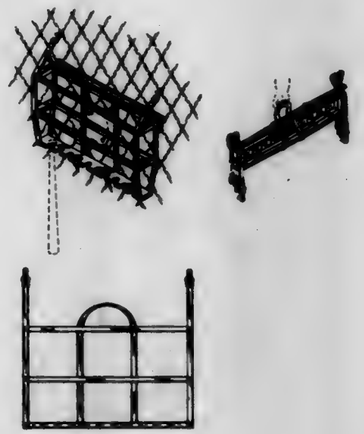
377,570
BATHROOM ACCESSORY FIXTURE
Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Rancho Dominguez, Calif.
Filed Jan. 29, 1995, Ser. No. 41,839
Term of patent 14 years
U.S. Cl. D6—524



377,571
DOUBLE TOWEL BAR
Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Rancho Dominguez, Calif.
Filed Aug. 29, 1995, Ser. No. 41,008
Term of patent 14 years
U.S. Cl. D6—578



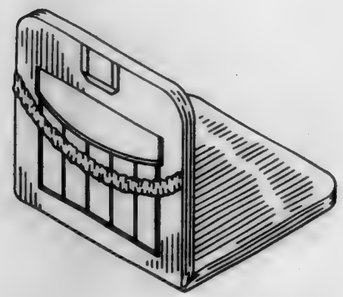
377,572
BAT AND HELMET RACK
Walter R. Martin, 4432 Towers Rd., St. Charles, Mo. 63304
Filed Dec. 11, 1995, Ser. No. 47,663
Term of patent 14 years
U.S. Cl. D6—552



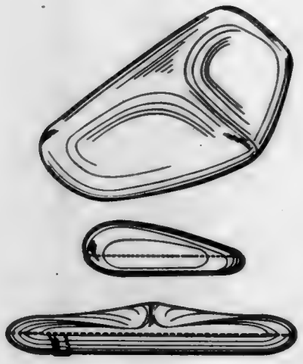
377,573
BEACH ACCESSORY
Hubert Morgan, 32117 Millingport Rd., Albemarle, N.C. 28001
Filed Jan. 11, 1996, Ser. No. 48,691
Term of patent 14 years
U.S. Cl. D6—596



377,574
PORTABLE CHAIR CUSHION
Nellie A. Mades, 620 Saddle Dr., Florissant, Mo. 63033
Filed Jul. 20, 1995, Ser. No. 41,635
Term of patent 14 years
U.S. Cl. D6—601



377,575
MOLDED FOAM PILLOW
Jack A. Lowrey, Jr., 5041 Old Pullman Rd., #3B, and Joel E. Anderson, 907 E. 6th St., both of Moscow, Id. 83843
Filed Dec. 11, 1995, Ser. No. 47,709
Term of patent 14 years
U.S. Cl. D6—601



377,576
ESPRESSO MACHINE
Richard Amiel, Oberaach, Switzerland, assignor to Arthur Eugster AG, Romanshorn, Switzerland
Filed Mar. 15, 1995, Ser. No. 36,304
Term of patent 14 years
U.S. Cl. D7—307



377,577

QUICK DRIP COFFEEMAKER WITH THERMAL CARAFE

Morison S. Cousins, Winter Park; D. Scott Miller, Orlando, both of Fla., and Sally K. Cashin, Waurwatosa, Wis., assignors to The West Bend Company, West Bend, Wis.

Filed Oct. 20, 1995, Ser. No. 45,480

Term of patent 14 years

U.S. Cl. D7—309



377,578

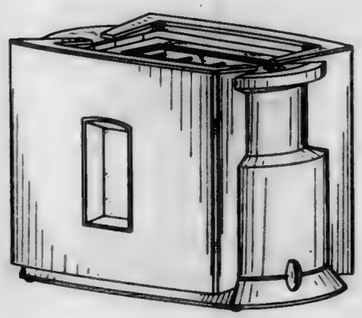
TOASTER

Matt Barthelemy, Burlingame, and Souja Schiefer, Palo Alto, both of Calif., assignors to Sunbeam Products, Inc., Fort Lauderdale, Fla.

Filed Aug. 10, 1995, Ser. No. 42,441

Term of patent 14 years

U.S. Cl. D7—330



377,579

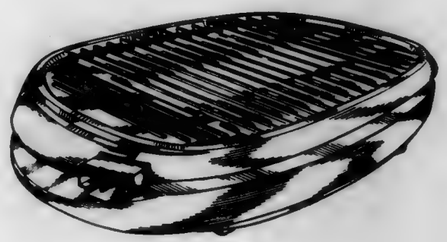
GRILLER

William J. O'Brien, and Stephen J. McClean, both of Sydney, Australia, assignors to Breville Pty Ltd., Sydney, Australia

Filed Sep. 26, 1995, Ser. No. 44,537

Term of patent 14 years

U.S. Cl. D7—359



377,580

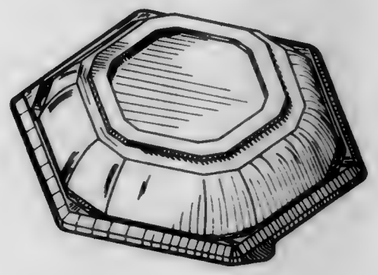
DOMED COVER FOR A CATERING CONTAINER

Thomas J. Hayes, Wauconda; Thomas T. Taber, Park Ridge, and Michael J. A. Segan, Batavia, all of Ill., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 14, 1995, Ser. No. 42,609

Term of patent 14 years

U.S. Cl. D7—392.1



377,581

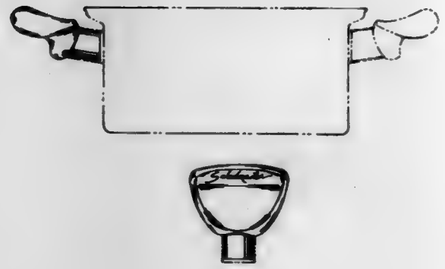
HANDLE FOR A COOKING VESSEL

Jeffrey Rohrer, Kewaskum, Wis., assignor to Regal Ware, Inc., Kewaskum, Wis.

Division of Ser. No. 35,299, Feb. 24, 1995, Pat. No. Des. 369,718. This application Dec. 11, 1995, Ser. No. 44,837

Term of patent 14 years

U.S. Cl. D7—393



377,582

CUP WITH A STAND

Shyue-Jong A. Yang, 19847 E. Country Hollow Dr., Walnut, Calif. 91789

Filed Dec. 20, 1995, Ser. No. 48,104

Term of patent 14 years

U.S. Cl. D7—507



377,583

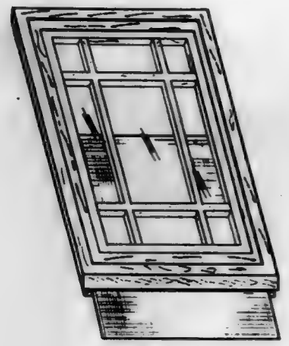
HOUSEHOLD TRAY WITH A REMOVABLE BASE

Thomas C. Burke, Jr., 7917 Blueberry Hill Ct., Richmond, Va. 23229

Filed Nov. 6, 1995, Ser. No. 46,862

Term of patent 14 years

U.S. Cl. D7—554



377,584

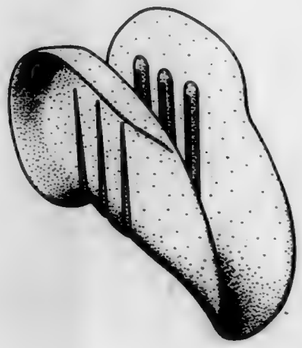
BAGEL HOLDER

Robert Cherney, Minneapolis, Minn., assignor to Cherne, LLC, Minneapolis, Minn.

Filed May 20, 1996, Ser. No. 54,783

Term of patent 14 years

U.S. Cl. D7—601



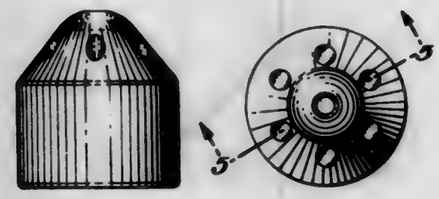
377,585
FRUIT/VEGETABLE NETTING DISPLAY HAMMOCK
Christopher J. McArdle, Alta Loma, Calif., assignor to Prodyne Enterprises, Inc., Ontario, Calif.
Filed Nov. 24, 1995, Ser. No. 47,011
Term of patent 14 years
U.S. Cl. D7—628



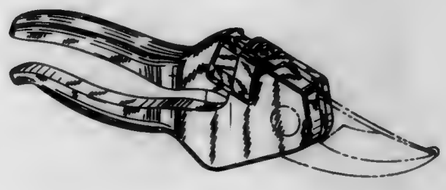
377,587
HANDLE FOR SPOONS
Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.
Continuation-in-part of Ser. No. 14,501, Oct. 22, 1993, Pat. No. Des. 366,603, and a continuation-in-part of Ser. No. 14,528, Oct. 22, 1993, Pat. No. Des. 364,077, and a continuation-in-part of Ser. No. 14,496, Oct. 22, 1993, Pat. No. Des. 363,651, and a continuation-in-part of Ser. No. 14,500, Oct. 22, 1993, Pat. No. Des. 365,583, each which is a continuation-in-part of Ser. No. 3,463, Jan. 12, 1993, Pat. No. 5,269,420. This application Jun. 27, 1995, Ser. No. 40,823
Term of patent 14 years
U.S. Cl. D7—654



377,586
BUOY UTENSIL HOLDER
Jason McBride, Rte. 54 & Buoy Blvd., R.R. 1, Box 1348, Fenwick Island, Del. 19944
Filed Feb. 5, 1996, Ser. No. 49,958
Term of patent 14 years
U.S. Cl. D7—639



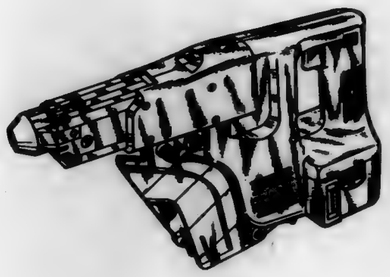
377,588
TOOL HANDLES
Douglas J. Birkholz, De Forest, Wis., assignor to Fiskars Inc., Madison, Wis.
Filed Aug. 7, 1995, Ser. No. 42,302
Term of patent 14 years
U.S. Cl. D8—5



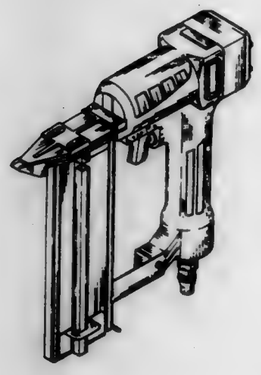
377,589
WIRE STRETCHER
Wayland F. Moore, Box 665, and Glynard Moore, Box 586, both of Matador, Tex. 75224
Filed Aug. 15, 1995, Ser. No. 42,635
Term of patent 14 years
U.S. Cl. D8—44



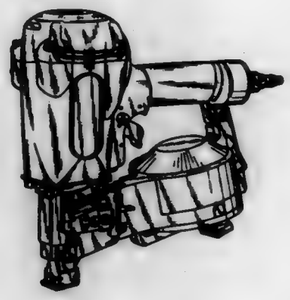
377,591
PORTABLE ELECTRIC DRIVER
Takeo Hattori, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan
Filed Apr. 14, 1995, Ser. No. 37,713
Claims priority, application Japan, Oct. 14, 1994, 6-31273
Term of patent 14 years
U.S. Cl. D8—68



377,590
NAIL STAPLER
Min-Hsing Lai, P.O. Box 1750, Taichung, Taiwan
Filed Feb. 9, 1995, Ser. No. 34,663
Term of patent 14 years
U.S. Cl. D8—68



377,592
PNEUMATIC NAILING MACHINE
Takeo Hattori, Tokyo, Japan, assignor to Max Co., Ltd., Tokyo, Japan
Filed Sep. 26, 1995, Ser. No. 44,542
Claims priority, application Japan, Mar. 27, 1995, 7-8247
Term of patent 14 years
U.S. Cl. D8—69



377,593

STAND FOR TOOLS AND ACCESSORIES

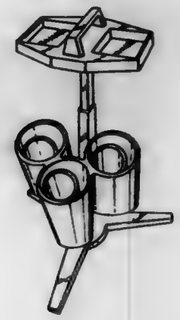
Thomas Telfer, Kilcoy, Ercall Road, Brightons by Falkirk, FK2 0TG, and James Telfer, 37 Park Avenue, Bilston, Roslin, Midlothian, EH25 9SE, both of United Kingdom

Filed Sep. 22, 1995, Ser. No. 44,320

Claims priority, application United Kingdom, Mar. 30, 1995, 2046375

Term of patent 14 years

U.S. Cl. D8—71



377,594

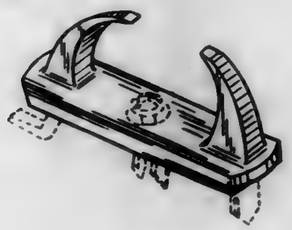
TOOLHOLDER

Don A. Hollingsworth, 10511 Keokuk Ave., Chatsworth, Calif. 91311

Filed Oct. 6, 1995, Ser. No. 45,061

Term of patent 14 years

U.S. Cl. D8—71



377,595

CUTTER

Saul Wiezenthal, P.O. Box 440901, Miami, Fla. 33144

Filed Nov. 9, 1995, Ser. No. 46,202

Term of patent 14 years

U.S. Cl. D8—98



377,596

CANE DOOR PULL

Martin S. Simon, and Ira J. Simon, both of Long Beach, Calif., assignors to Triangle Brass Manufacturing Company, Inc., Los Angeles, Calif.

Filed Nov. 14, 1995, Ser. No. 46,392

Term of patent 14 years

U.S. Cl. D8—315



377,597

VISE JAW

Alexander R. Podgers, Lake City, Pa., assignor to Reed Manufacturing Company, Erie, Pa.

Filed Dec. 30, 1994, Ser. No. 34,986

Term of patent 14 years

U.S. Cl. D8—349



377,598

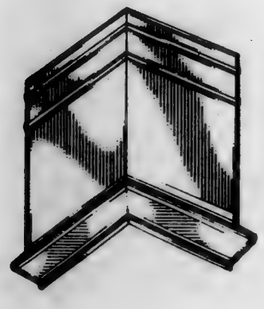
ANGLED THREE COAT PLASTERING CORNER SUPPORT

Harold W. Beard, Jr., P.O. Box 5485, Carefree, Ariz. 85377

Filed Nov. 9, 1995, Ser. No. 46,203

Term of patent 14 years

U.S. Cl. D8—354



377,599

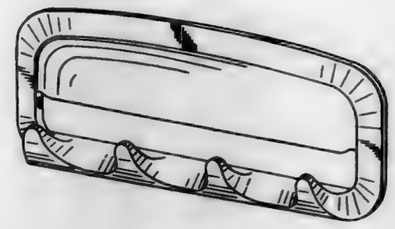
HOOK

James A. Hofman, Warrenville, Ill., assignor to SELFIX, Inc., Chicago, Ill.

Filed Dec. 22, 1995, Ser. No. 48,289

Term of patent 14 years

U.S. Cl. D8—372



377,600

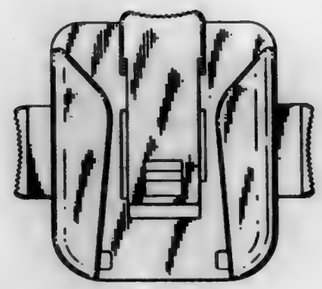
SUSPENSION DEVICE

Michael Sacks, P.O. Box 456, Manchester, M60 2LL; Izhak Z. Ali, Shrewsbury, and David F. Clark, Madeley, all of United Kingdom, assignors to Michael Sacks, Manchester, United Kingdom

Filed Jul. 5, 1995, Ser. No. 41,893

Term of patent 14 years

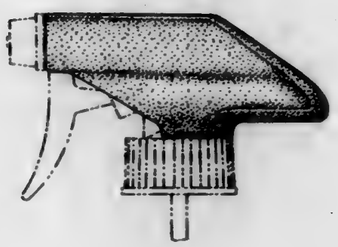
U.S. Cl. D8—373



377,601
PEG FASTENER
Vincent T. Kozyrski, Plainville, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.
Filed Nov. 27, 1995, Ser. No. 47,138
Term of patent 14 years
U.S. Cl. D8—382



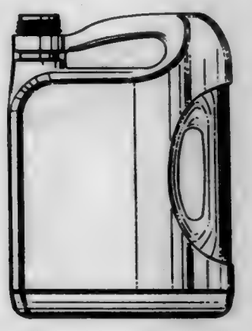
377,602
SPRAYER SHROUD
Ronald Wadsworth, Cambria, Calif., assignor to Calmar Inc., City of Industry, Calif.
Filed Nov. 2, 1995, Ser. No. 45,930
Term of patent 14 years
U.S. Cl. D9—448



377,603
BOTTLE
Willem J. Smith, P.O. Box 877, Parow, 7500, South Africa
Filed Jul. 17, 1995, Ser. No. 41,521
Claims priority, application South Africa, Jan. 16, 1995, 95/0826
Term of patent 14 years
U.S. Cl. D9—520



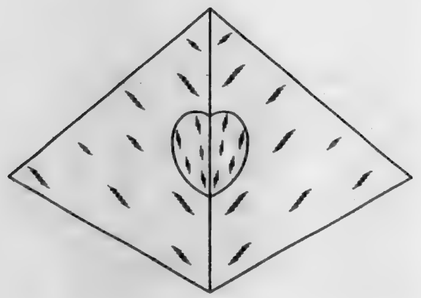
377,604
CONTAINER
David E. Salmon, Watford; Stephen F. Kelsey, London; Gerard M. O'Brien, Rickmansworth, and Ian H. Crowther, Wembley, all of United Kingdom, assignors to Castrol Limited, Wiltshire, England
Filed Aug. 2, 1995, Ser. No. 42,160
Claims priority, application United Kingdom, Feb. 3, 1995, 2045018
Term of patent 14 years
U.S. Cl. D9—528



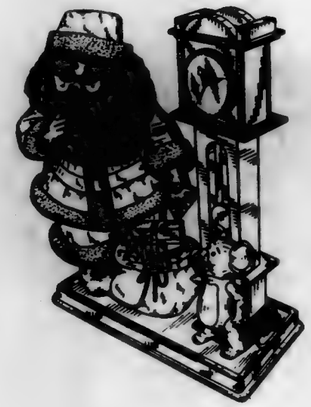
377,605
PERFUME BOTTLE
Alain Boucheron, Paris, France, assignor to PCI Parfums et Cosmetiques International, Paris, France
Filed Nov. 7, 1994, Ser. No. 30,155
Claims priority, application France, May 5, 1994, 942655
Term of patent 14 years
U.S. Cl. D9—535



377,606
BOTTLE
Steven M. Rowe, 9030 W. Sahara Ave. Ste. 888, Las Vegas, Nev. 89117
Filed Jan. 16, 1996, Ser. No. 48,926
Term of patent 14 years
U.S. Cl. D9—564



377,607
SANTA CLAUS FIGURE AND CLOCK
Seymour Cohen, Jericho, N.Y., assignor to Telco Creations, Inc., Hicksville, N.Y.
Filed Sep. 29, 1995, Ser. No. 44,704
Term of patent 14 years
U.S. Cl. D10—6



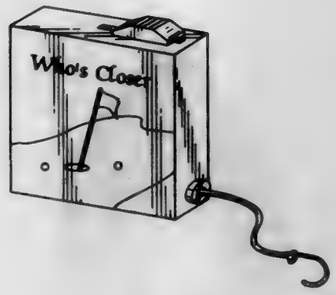
377,608
CLOCK
Miwako Hikida, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jul. 18, 1995, Ser. No. 41,561
Term of patent 14 years
U.S. Cl. D10—10



377,609
DIGITAL CLOCK
Patrick Marguerie, rue des Cygnes, France, assignor to Impex, SA, Les Abrets, France
Filed Apr. 11, 1995, Ser. No. 37,345
Claims priority, application WIPO, Oct. 12, 1994, DM/030959
Term of patent 14 years
U.S. Cl. D10—15



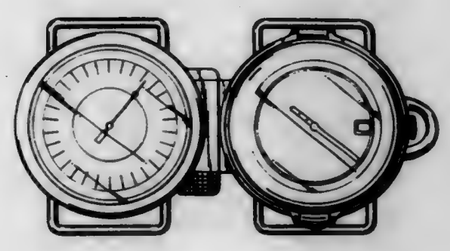
377,611
DISTANCE MEASURING DEVICE FOR GOLFERS
Stephen R. Milkie, 43 Stratford Rd., Wheeling, W. Va. 26003
Filed Sep. 26, 1995, Ser. No. 44,571
Term of patent 14 years
U.S. Cl. D10—70



377,610
OUTDOOR THERMOMETER
Cheng-Yen Liang, 10F-3, No. 9, Sec. 2, Roosevelt Road, Taipei, Taiwan
Filed Feb. 15, 1996, Ser. No. 58,781
Term of patent 14 years
U.S. Cl. D10—58



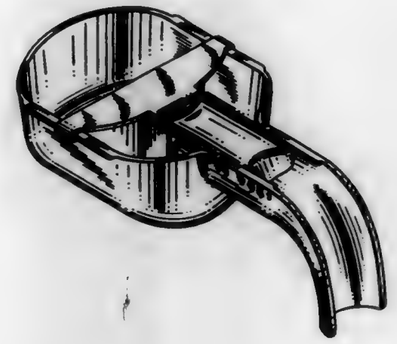
377,612
WATCH WITH COMPASS AND ALTIMETER
Robert M. Lee, 970 Icehouse, Reno, Nev. 89431
Filed Oct. 10, 1995, Ser. No. 45,089
Term of patent 14 years
U.S. Cl. D10—31



377,613
WRIST WATCH
Giovanni B. Consolo, Localita Vico, 87056 Santo Stefano Di Rogliano (Cosenza), Italy
Filed Apr. 12, 1995, Ser. No. 37,427
Claims priority, application WIPO, Oct. 17, 1994, DM/031027
Term of patent 14 years
U.S. Cl. D10—32



377,615
ADJUSTABLE MEASURING CONTAINER
Franz M. Weterrings, Tuscumbia, Ala., assignor to Robbins Industries, Inc., Florence, Ala.
Filed Jan. 16, 1996, Ser. No. 48,901
Term of patent 14 years
U.S. Cl. D10—46.3



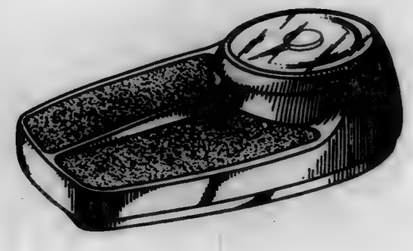
377,614
WATCH
Severin S. Wunderman, Irvine, Calif., assignor to Severin Montres AG (Severin Montres SA) (Severin Montres Ltd.), Lengnau, Switzerland
Filed Jun. 19, 1995, Ser. No. 40,773
Claims priority, application WIPO, Feb. 20, 1995, DMA/002791
Term of patent 14 years
U.S. Cl. D10—32



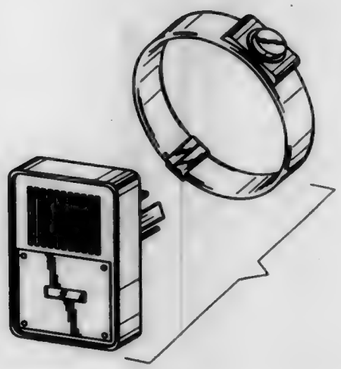
377,616
CALIPER
Robert A. Mackin, 1033 Lake Point, Flagstaff, Ariz. 86004
Filed Oct. 26, 1995, Ser. No. 45,668
Term of patent 14 years
U.S. Cl. D10—73



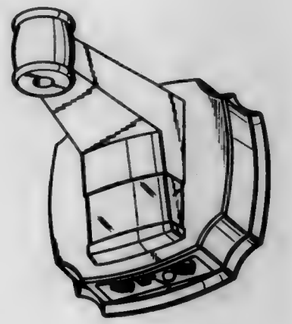
377,617
SCALE HOUSING
Gary W. Gerstner, 10211 Turner Ave., Evergreen Park, Ill. 60805; Stanley T. Greenes, 1914 Idlewild La., Charlestown, Mass. 02129, and Beth A. Gahagan, 1498 Runaway Bay, Columbus, Ohio 43204
Filed Nov. 27, 1995, Ser. No. 47,833
Term of patent 14 years
U.S. Cl. D10—92



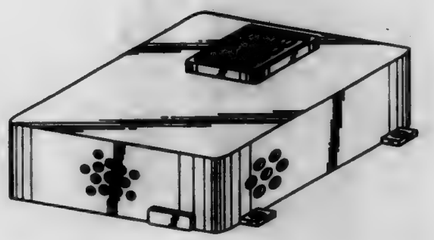
377,618
COMBINED TRANSMITTER AND RECEIVER FOR A CALL LIGHT UNIT
Harold E. Yarbrough, 3165 Yard St., Oroville, Calif. 95966
Filed Dec. 15, 1995, Ser. No. 47,880
Term of patent 14 years
U.S. Cl. D10—104



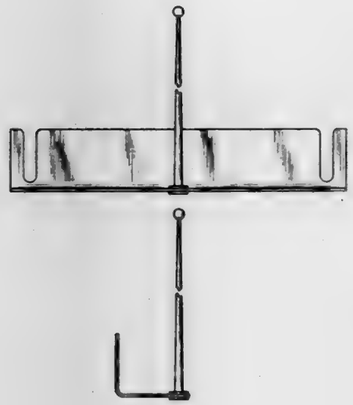
377,619
MOUNTING BASE FOR A LIGHT FIXTURE WITH PASSIVE INFRARED MOTION DETECTOR
Donald R. Sandell, San Jose, Calif., assignor to Larry C. Y. Lee, Hayward, Calif.
Filed Oct. 16, 1995, Ser. No. 45,300
Term of patent 14 years
U.S. Cl. D10—106



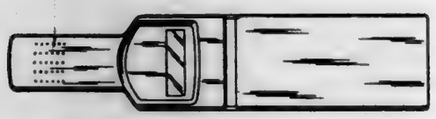
377,620
PORTABLE HOME ALARM
Robert Bottistic, P.O. Box 331453, Atlantic Beach, Fla. 32233
Filed Feb. 6, 1996, Ser. No. 50,018
Term of patent 14 years
U.S. Cl. D10—106



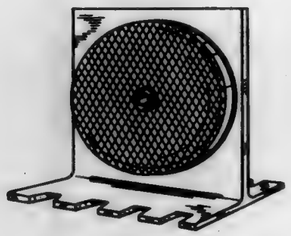
377,621
BUMPER ENGAGING VEHICLE PARKING GUIDE
Samuel J. Papa, 128 Hadden Rd., Rochester, N.Y. 14626
Filed Dec. 18, 1995, Ser. No. 48,010
Term of patent 14 years
U.S. Cl. D10—109



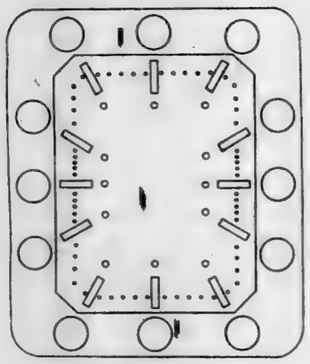
377,622
TIMING LIGHT FOR AUTOMOTIVE ENGINES
Icon C. Chen, Laguna Hills, and Michael S. Wilson, Long Beach, both of Calif., assignors to Innova Electronics Corp., Fountain Valley, Calif.
Filed Jan. 31, 1996, Ser. No. 49,781
Term of patent 14 years
U.S. Cl. D10—112



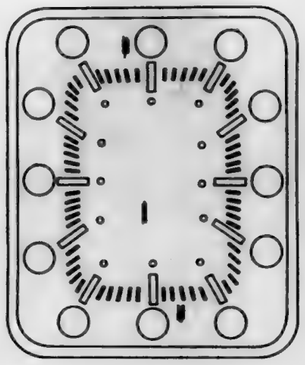
377,623
FLEXIBLE BARRICADE MARKER
Karl Weid, 1276 Robinwood Dr., Elgin, Ill. 60123
Filed Jan. 26, 1996, Ser. No. 49,471
Term of patent 14 years
U.S. Cl. D10—113



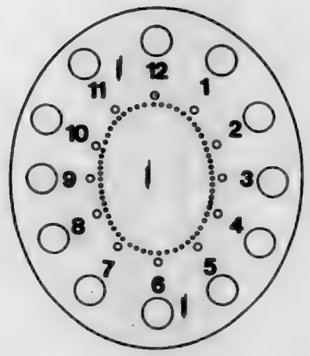
377,624
CLOCK FACE
Gene Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Division of Ser. No. 28,677, Mar. 30, 1994, Pat. No. Des. 366,852. This application Oct. 23, 1995, Ser. No. 45,492
Term of patent 14 years
U.S. Cl. D10—125



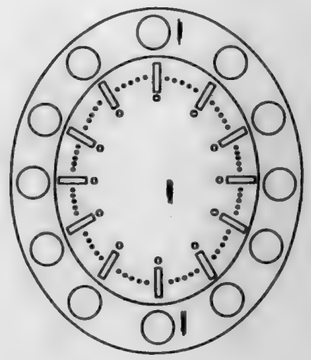
377,625
CLOCK FACE
Gene Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Division of Ser. No. 20,677, Mar. 30, 1994, Pat. No. Des. 366,852. This application Oct. 23, 1995, Ser. No. 45,495
Term of patent 14 years
U.S. Cl. D10—125



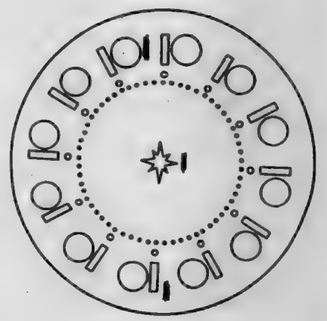
377,626
CLOCK FACE
Gene Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Division of Ser. No. 20,661, Mar. 30, 1994. This application Oct. 23, 1995, Ser. No. 45,491
Term of patent 14 years
U.S. Cl. D10—126



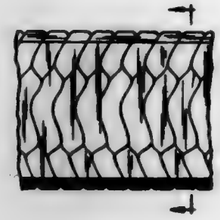
377,627
CLOCK FACE
Gene Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Division of Ser. No. 20,677, Mar. 30, 1994, Pat. No. Des. 366,852. This application Oct. 23, 1995, Ser. No. 45,494
Term of patent 14 years
U.S. Cl. D10—126



377,628
CLOCK FACE
Gene Svast, 2113 S. Gunderson, Berwyn, Ill. 60402
Division of Ser. No. 20,678, Mar. 30, 1994, Pat. No. Des. 367,624. This application Oct. 23, 1995, Ser. No. 45,496
Term of patent 14 years
U.S. Cl. D10—126



377,629
JEWELRY CHAIN
Giulio Lunardon, Pove del Grappa, Italy, assignor to Ore-America, Inc., Burbank, Calif.
Filed Feb. 3, 1995, Ser. No. 34,396
Term of patent 14 years
U.S. Cl. D11—13



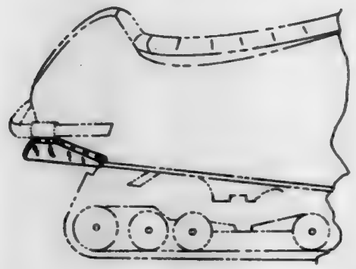
377,630
PENDANT
Carol M. Winandy, 1295 Des Plaines Ave., Des Plaines, Ill. 60018
Filed Mar. 28, 1995, Ser. No. 36,835
Term of patent 14 years
U.S. Cl. D11—81



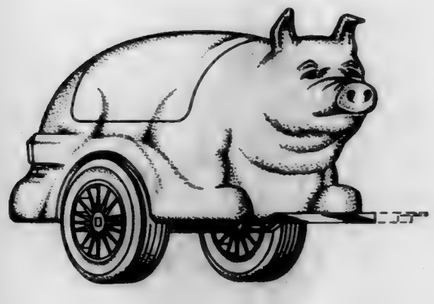
377,631
SLEEPING GIRL ON ROCKING CHAIR FIGURE
Seymour Cohen, Jericho, N.Y., assignor to Toico Creations, Inc., Hicksville, N.Y.
Filed Aug. 30, 1995, Ser. No. 43,277
Term of patent 14 years
U.S. Cl. D11—131



377,632
SET OF SNOWMOBILE TUNNEL TRIMS
Harry C. Strother, 6620 N. CTH J, Cato, Wis. 54206
Filed Aug. 21, 1995, Ser. No. 42,896
Term of patent 14 years
U.S. Cl. D12—7



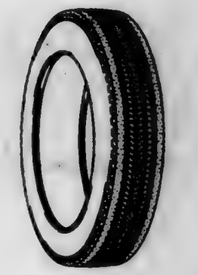
377,633
MOTORCYCLE TRAILER
Steven Hutchins, 4341 Hwy. 24, Anderson, S.C. 29624
Filed Sep. 16, 1993, Ser. No. 13,822
Term of patent 14 years
U.S. Cl. D12—102



377,634
BICYCLE TRAINING BAR
Pasquale DeLeo, 45 Bowen Ave., Medford, Mass. 02155
Filed Nov. 24, 1995, Ser. No. 46,997
Term of patent 14 years
U.S. Cl. D12—114



377,635
AUTOMOBILE TIRE
Kazuki Numata, Akashi, Japan, assignor to Sumitomo Rubber Industries Ltd., Kobe, Japan
Filed May 9, 1995, Ser. No. 38,686
Claims priority, application Japan, Nov. 10, 1994, 6-34590
Term of patent 14 years
U.S. Cl. D12—147



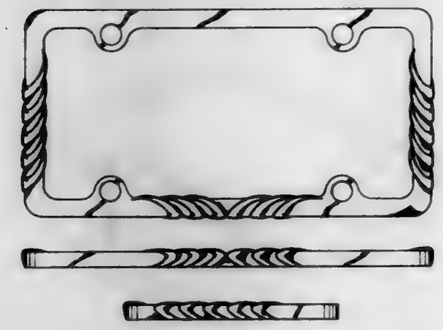
377,636
AUTOMOBILE TIRE
Koya Hamamoto, Hiratsuka; Hiroshi Tokizaki, and Izumi Kuramochi, both of Tokyo, all of Japan, assignors to The Yokohama Rubber Co. Ltd., Tokyo, Japan
Filed Jul. 12, 1995, Ser. No. 41,856
Claims priority, application Japan, Feb. 27, 1995, 7-4825
Term of patent 14 years
U.S. Cl. D12—147



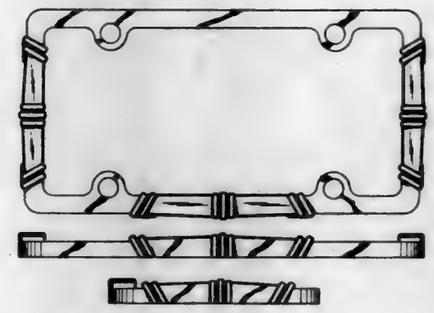
377,637
VEHICLE LICENSE PLATE HANGER
George W. Berry, Jr., 305 W. Pine St., West, Tex. 76691-1432
Filed Nov. 30, 1994, Ser. No. 31,903
Term of patent 14 years
U.S. Cl. D12—193



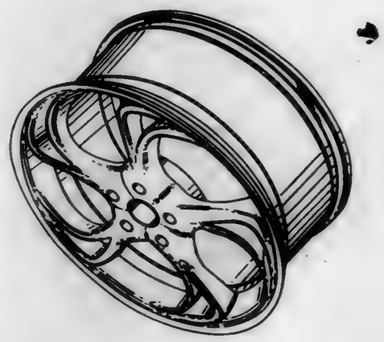
377,638
LICENSE PLATE FRAME
Linda Kheyfets, Miami Beach, Fla., assignor to Rally Accessories, Inc., Miami, Fla.
Filed Feb. 29, 1996, Ser. No. 50,909
Term of patent 14 years
U.S. Cl. D12—193



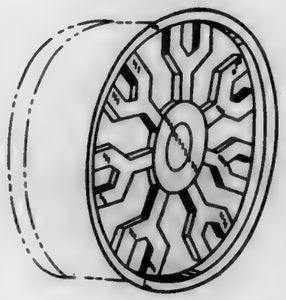
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LICENSE PLATE FRAME
Linda Kheyfets, Miami Beach, Fla., assignor to Rally Accessories, Inc., Miami, Fla.
Filed Feb. 29, 1996, Ser. No. 50,910
Term of patent 14 years
U.S. Cl. D12—193



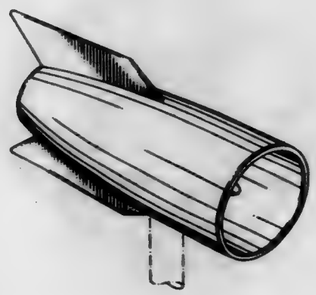
377,640
VEHICLE WHEEL
Mark D. Neeper, Denver, Colo., assignor to Mobile Hi-Tech Wheels, Torrance, Calif.
Filed Apr. 24, 1996, Ser. No. 53,599
Term of patent 14 years
U.S. Cl. D12—209



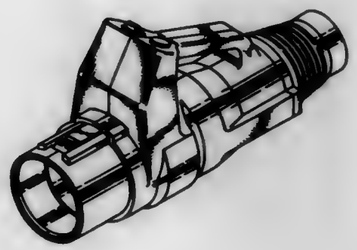
377,641
FRONT FACE OF A VEHICLE WHEEL
Ellsworth Nice, 627 Columbus Ave., Boston, Mass. 02118
Filed Jun. 8, 1995, Ser. No. 40,822
The portion of the term of this patent subsequent to Dec. 17, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—211



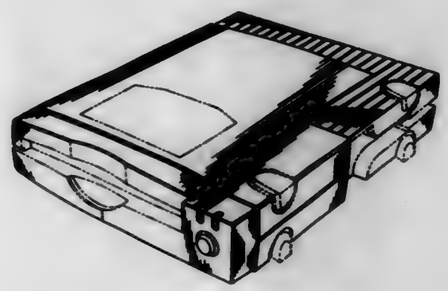
377,642
WIND GENERATOR
Tom Drake, 279 Melo St., Kapaa, HI. 96746
Continuation-in-part of Ser. No. 17,395, Jan. 12, 1994, abandoned. This application Jan. 24, 1995, Ser. No. 33,954
Term of patent 14 years
U.S. Cl. D13—115



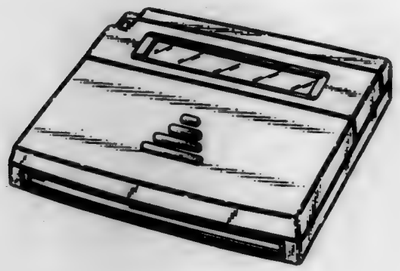
377,643
CONNECTOR FOR ELECTRIC SUPPLIER FOR ELECTRIC CAR
Takayoshi Endo, and Toshiaki Hasegawa, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Japan
Division of Ser. No. 31,261, Nov. 22, 1994, Pat. No. Des. 369,783. This application Mar. 25, 1996, Ser. No. 52,180
Claims priority, application Japan, Jul. 19, 1994, 6-21409
Term of patent 14 years
U.S. Cl. D13—146



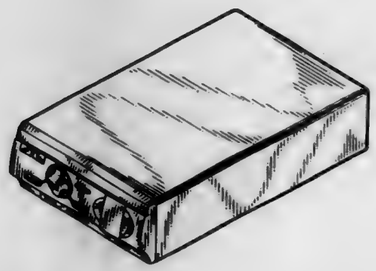
377,644
COMPUTER DATA STORAGE DEVICE
Carl F. Nickles, Ogden, Utah, and Nicholas Brawne, Columbus, Ohio, assignors to Iomega Corporation, Roy, Utah
Filed Aug. 25, 1995, Ser. No. 48,747
Term of patent 14 years
U.S. Cl. D14—100



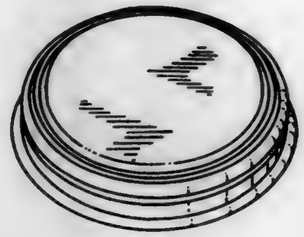
377,645
IC CARD READER
Masaaki Iwamoto; Hirokazu Hirata, and Takako Motoi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Nov. 3, 1995, Ser. No. 47,806
Claims priority, application Japan, Jun. 15, 1995, 7-16839
Term of patent 14 years
U.S. Cl. D14—105



377,646
PHOTO IMAGE READER
Katsumi Hirabayashi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 26, 1996, Ser. No. 50,759
Claims priority, application Japan, Aug. 28, 1995, 7-25027
Term of patent 14 years
U.S. Cl. D14—107



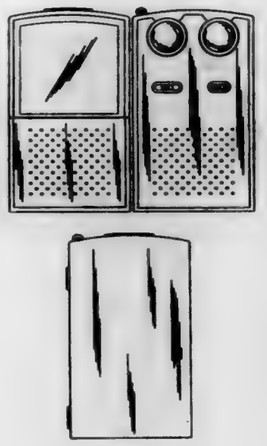
377,647
ELECTRONIC TOKEN
Nicholas M. G. Fekete, Richardson; Elaine J. Gattenby, Allen, and Michael L. Bolan, Dallas, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.
Filed Dec. 7, 1994, Ser. No. 31,823
Term of patent 14 years
U.S. Cl. D14—114



377,648
MULTIMEDIA PLAYER
Chi-yaung Young, Taipei, Taiwan, assignor to Jampoo Corp., Taipei, Taiwan
Filed May 26, 1995, Ser. No. 39,347
Term of patent 14 years
U.S. Cl. D14—136



377,649
RADIO ALARM CLOCK
Lai L. Wong, Hong Kong, Hong Kong, assignor to Ballanda Limited, Kwai Chung, Hong Kong
Filed Nov. 17, 1994, Ser. No. 31,265
Term of patent 14 years
U.S. Cl. D14—171



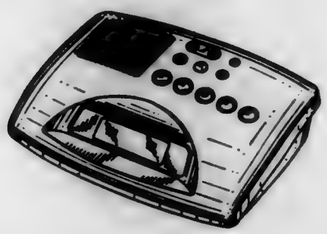
377,651
REMOTE CONTROLLER
Mark Blazotti, San Jose, and Michael J. Nuttall, Portola Valley, both of Calif., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Oct. 26, 1994, Ser. No. 30,323
Term of patent 14 years
U.S. Cl. D14—218



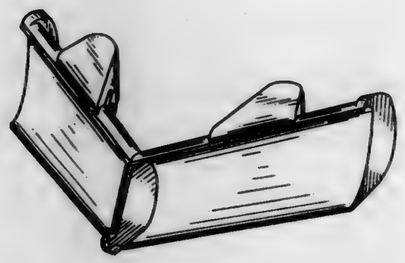
377,652
BASE STATION FOR A MOBILE COMMUNICATION NETWORK
Mauno Särkiniemi, Oulu, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland
Filed Mar. 4, 1996, Ser. No. 51,135
Claims priority, application Finland, Sep. 7, 1995, 955/95
Term of patent 14 years
U.S. Cl. D14—240



377,650
RADIO RECEIVER COMBINED WITH CLOCK
Shinichi Obata, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 6, 1995, Ser. No. 47,515
Term of patent 14 years
U.S. Cl. D14—171



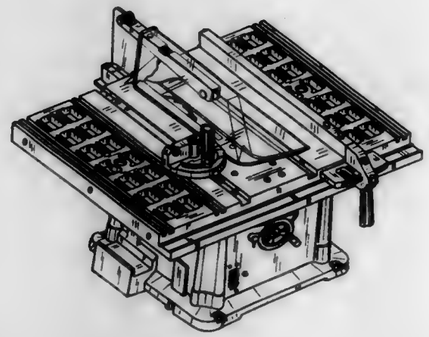
377,653
SNOW PLOW
George T. Matisz; Ernest Matisz, both of 4921 Baptist Rd., Pittsburgh, Pa. 15227, and Joseph M. Bailay, 524 S. Murtland St., Pittsburgh, Pa. 15208
Filed Oct. 19, 1995, Ser. No. 45,425
Term of patent 14 years
U.S. Cl. D15—11



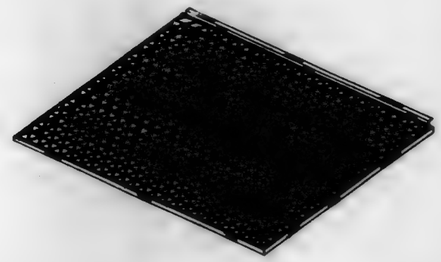
377,655
INSERT
Rebecca J. Smith, Rockford, Ill., assignor to Newell Operating Company, Freeport, Ill.
Filed Mar. 8, 1996, Ser. No. 51,872
Term of patent 14 years
U.S. Cl. D15—139



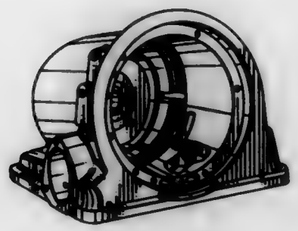
377,654
MOTORIZED TABLE SAW
Frederick B. Jedlicka, Jerseyville, Ill.; Daniel A. Terpstra, Kirkwood, and James D. Schroeder, St. Peters, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Continuation-in-part of Ser. No. 28,662, Sep. 19, 1994, abandoned. This application Jun. 19, 1995, Ser. No. 40,464
Term of patent 14 years
U.S. Cl. D15—133



377,656
SCREEN
Vincent D. Leone, and Kenneth W. Seyffert, both of Houston, Tex., assignors to Environmental Procedures, Inc., Houston, Tex.
Division of Ser. No. 14,571, Oct. 25, 1993, Pat. No. Des. 366,040, which is a continuation-in-part of Ser. No. 56,123, Apr. 30, 1993, Pat. No. 5,385,669, which is a continuation-in-part of Ser. No. 105,696, Aug. 12, 1993, Pat. No. 5,392,925.
This application Jan. 4, 1996, Ser. No. 48,575
Term of patent 14 years
U.S. Cl. D15—147



377,657
TRANSMISSION HOUSING
John F. Winters, Sr., Cocoa, Fla., assignor to J. W. Performance Transmissions, Inc., Rockledge, Fla.
Filed Jan. 11, 1996, Ser. No. 48,881
Term of patent 14 years
U.S. Cl. D15—149



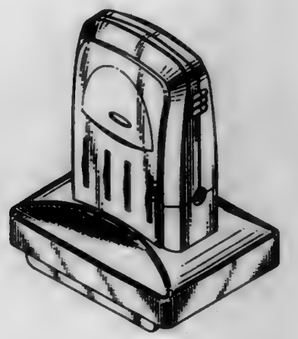
377,658
DRIP CATCH STAND FOR ENGINES
Stewart Adamson, and Brook L. Adamson, both of 285 E. 325 N., Blackfoot, Id. 83221
Filed Dec. 8, 1995, Ser. No. 47,610
Term of patent 14 years
U.S. Cl. D15—150



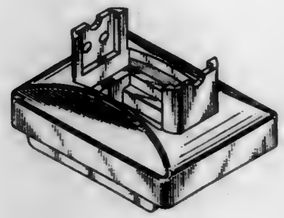
377,659
EYEGLASS FRAME FRONT
Su M. W. Chang, No. 20-1, Lane 54, An Ho Road, Sec. 2, Taipei, Taiwan
Filed Jun. 22, 1995, Ser. No. 48,616
Term of patent 14 years
U.S. Cl. D16—315



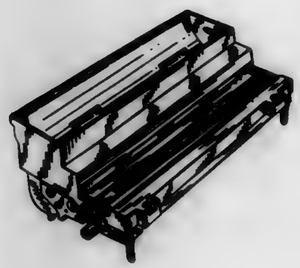
377,660
STAMPER
Masaki Kida, and Motohide Imaizumi, both of Tokyo, Japan, assignors to Shachihata Inc., Nagoya, Japan
Filed Apr. 19, 1996, Ser. No. 53,356
Claims priority, application Japan, Nov. 15, 1995, 7-34651
Term of patent 14 years
U.S. Cl. D18—15



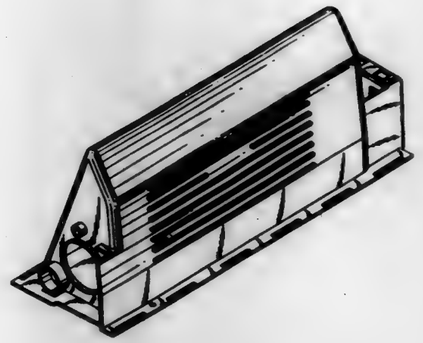
377,661
BASE FOR A STAMPER
Masaki Kida, and Motohide Imaizumi, both of Tokyo, Japan, assignors to Shachihata Inc., Nagoya, Japan
Filed Apr. 19, 1996, Ser. No. 53,357
Claims priority, application Japan, Nov. 15, 1995, 7-34652
Term of patent 14 years
U.S. Cl. D18—18



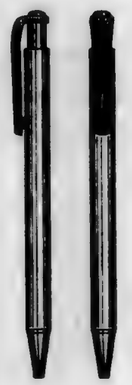
377,662
IMAGE DRUM CARTRIDGE
Shiichi Ootani; Minoru Mizutani, and Yoshiharu Moniyama, all of Tokyo, Japan, assignors to Oki Data Corporation, Tokyo, Japan
Filed Jan. 30, 1995, Ser. No. 40,978
Claims priority, application Japan, Jan. 9, 1995, 7-000051
Term of patent 14 years
U.S. Cl. D18—43



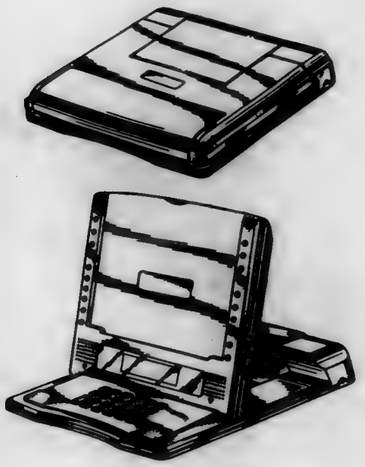
377,663
CONTAINER FOR TONER
Philipp Ziegler, Galgenen, Switzerland, assignor to Franz Buttner AG, Egg, Switzerland
Continuation-in-part of Ser. No. 13,071, Sep. 17, 1993, abandoned. This application Aug. 29, 1995, Ser. No. 43,224
Claims priority, application Switzerland, Mar. 19, 1993, DM/025579
Term of patent 14 years
U.S. Cl. D18—43



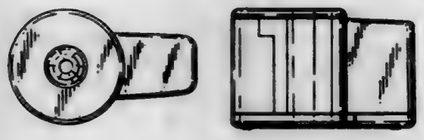
377,664
WRITING INSTRUMENT
Hironaichi Izushima, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan
Filed Feb. 20, 1996, Ser. No. 50,463
Term of patent 14 years
U.S. Cl. D19—51



377,665
ELECTRONIC TEACHING QUIZZER
Damon R. Soddiler, Inglewood; Gregory B. Bergeron, La Habra, and Brian A. Mehler, Long Beach, all of Calif., assignors to Educational Insights, Inc., Carson, Calif.
Filed Mar. 22, 1996, Ser. No. 52,089
Term of patent 14 years
U.S. Cl. D19—60



377,666
BATTERY OPERATED PENCIL SHARPENER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Nov. 8, 1995, Ser. No. 46,163
Claims priority, application United Kingdom, May 11, 1995, 2047415
Term of patent 14 years
U.S. Cl. D19—73



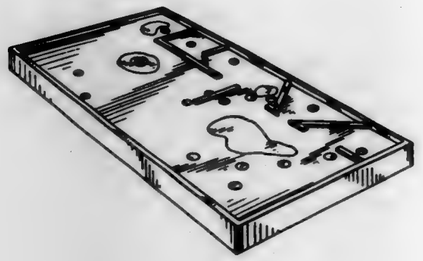
377,667
INTERCHANGEABLE ADVERTISING PANEL FOR THE FACE PLATE OF A COIN TELEPHONE BOX
James R. DeArkland, 8119 Buena Fortuna, Carpinteria, Calif. 93013
Filed Oct. 16, 1995, Ser. No. 45,301
Term of patent 14 years
U.S. Cl. D20—22



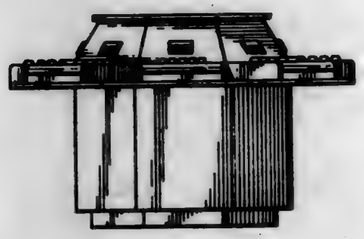
377,668
CARD HOLDER
James R. Biram, P.O. Box 6359, Laguna Niguel, Calif. 92607, and Christine A. Brennan, 15 Monarch Bay Pl. #104, Dana Point, Calif. 92629
Filed May 12, 1995, Ser. No. 38,875
Term of patent 14 years
U.S. Cl. D20—41



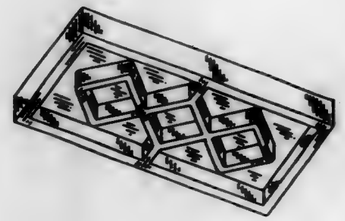
377,669
TABLE TOP GOLF GAME
David W. Walker, 865 W. Franklin, Berne, Ind. 46711
Filed Aug. 21, 1995, Ser. No. 42,892
Term of patent 14 years
U.S. Cl. D21—11



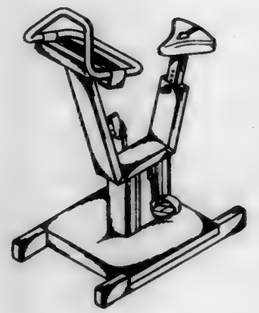
377,670
GAMING CABINET
W. Scott Means, and Cary Means, both of West Union, W. Va., assignors to DCD Manufacturing, Inc., Myrtle Beach, S.C.
Filed Jul. 27, 1995, Ser. No. 41,931
Term of patent 14 years
U.S. Cl. D21—37



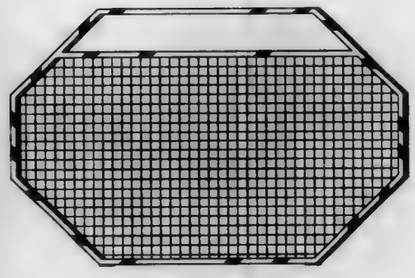
377,671
RECTANGULAR BRICK FOR A TOY CONSTRUCTION SET
Richard Gabriel, Portland, Oreg., assignor to Matrix Toys, Ltd., Portland, Oreg.
Filed Jan. 11, 1996, Ser. No. 49,630
Term of patent 14 years
U.S. Cl. D21—108



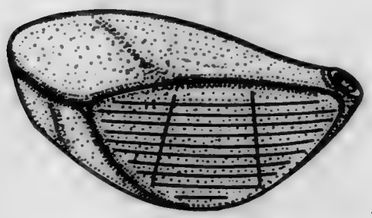
377,672
EXERCISE CYCLE
Rick Wanner, Bothell, Wash., and Timothy O. Armstrong, Providence, Utah, assignors to Precor Incorporated, Bothell, Wash.
Filed Dec. 19, 1995, Ser. No. 48,888
Term of patent 14 years
U.S. Cl. D21—194



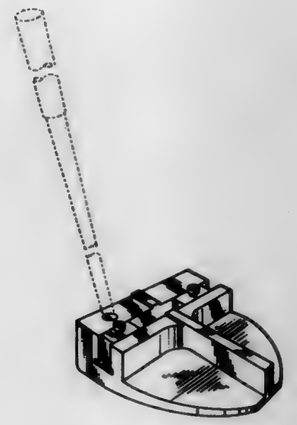
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REBOUNDING HOCKEY GOAL TARGET
Gregg W. Henrickson, 1451 Cardinal Ln., Chaska, Minn. 55318
Filed Jan. 14, 1994, Ser. No. 17,687
Term of patent 14 years
U.S. Cl. D21—200



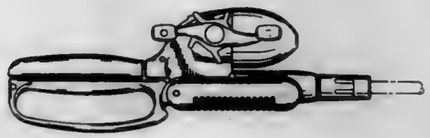
377,674
GOLF CLUB HEAD
Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.
Continuation-in-part of Ser. No. 17,271, Jan. 10, 1994, Pat. No. Des. 356,843, which is a continuation-in-part of Ser. No. 819,940, Jan. 13, 1992, Pat. No. Des. 343,434. This application Jan. 13, 1995, Ser. No. 33,515
The portion of the term of this patent subsequent to Dec. 5, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—214



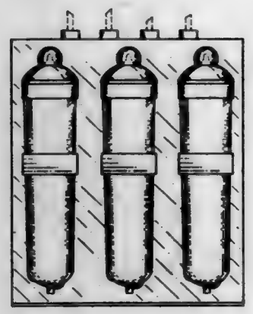
377,675
GOLF CLUB HEAD
Steven D. Abel, 6051 W. Greentree Dr., Somis, Calif. 93066
Filed Sep. 12, 1995, Ser. No. 43,872
Term of patent 14 years
U.S. Cl. D21—219



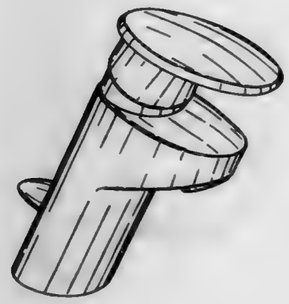
377,676
COMBINATION FISHING ROD HANDLE AND REEL
Richard J. Robbins, Derby, Kans.; Kent L. Zwayer, and Nyle Erxleben, both of Tulsa, Okla., assignors to Zebco Div. of Brunswick Corporation, Tulsa, Okla.
Filed Nov. 14, 1995, Ser. No. 46,416
Term of patent 14 years
U.S. Cl. D22—138



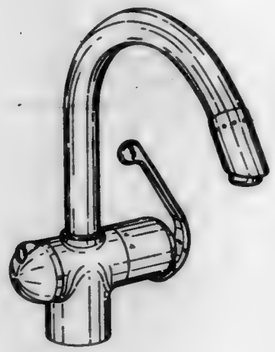
377,677
WATER PURIFICATION UNIT
Adam Robbins, San Marcos, Calif., assignor to Nimbus Water Systems, Inc., San Marcos, Calif.
Filed Feb. 23, 1996, Ser. No. 51,831
Term of patent 14 years
U.S. Cl. D23—209



377,678
WASHING TABLE FAUCET
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Aug. 25, 1995, Ser. No. 43,371
Claims priority, application Germany, Feb. 27, 1995, 95 01 629.5
Term of patent 14 years
U.S. Cl. D23—238



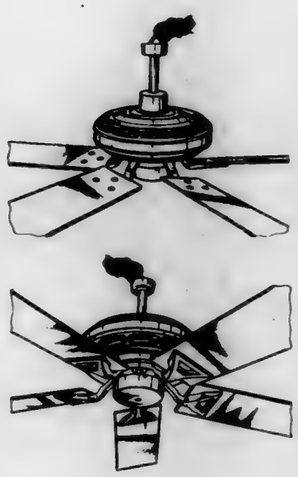
377,679
FAUCET
Adolf Gottwald, Iserlohn, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Oct. 20, 1995, Ser. No. 46,663
Claims priority, application Germany, May 17, 1995, M9504847.1
Term of patent 14 years
U.S. Cl. D23—238



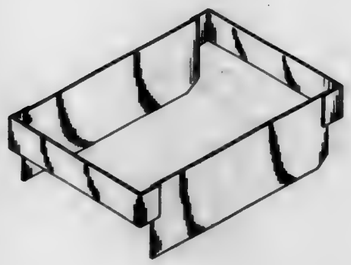
377,680
TOILET VENTILATOR
Warren D. Kimber, 17336 Woodcrest Dr. NE, Bothell, Wash. 98011, and Rolf Johannessen, 11840 W. Bowmont St., Boise, Id. 83713
Filed Jul. 24, 1995, Ser. No. 41,720
Term of patent 14 years
U.S. Cl. D23—309



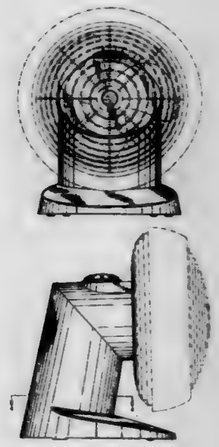
377,681
CEILING FAN
Jan Jaspers-Fayer, Idyllwild, Calif., assignor to Minka Lighting, Inc., Corona, Calif.
Filed Apr. 4, 1995, Ser. No. 37,119
Term of patent 14 years
U.S. Cl. D23—377



377,682
HEAT REFLECTOR
Erich J. Schlosser, Barrington; J. Michael Alden, Palatine, and Robert T. Stephen, Barrington, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed May 5, 1995, Ser. No. 38,411
Term of patent 14 years
U.S. Cl. D23—386



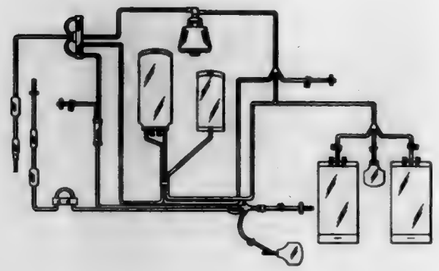
377,683
STAND FOR A PORTABLE ELECTRIC FAN WITH A SWIVEL MOUNT
Jui-Shang Wang, Taipei, Taiwan; Rodney Jané, Westborough; John Longan, Natick, both of Mass.; Stanley Greene, Homewood, Ill.; Gregory Holderfield, Oak Park, Ill., and Steven Valentor, Wesmont, Ill., assignors to Duracraft Corp., Southborough, Mass.
Division of Ser. No. 37,280, Apr. 10, 1995. This application Nov. 6, 1995, Ser. No. 46,010
Term of patent 14 years
U.S. Cl. D23—411



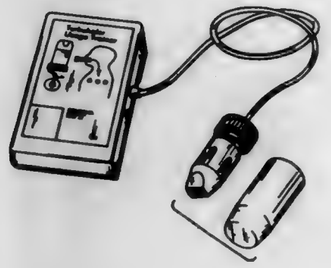
377,684
SOFTGEL CAPSULE
Gregory A. Schurig, Clearwater, and David G. Williams, Palm Harbor, both of Fla., assignors to R. P. Scherer Corporation, Troy, Mich.
Filed Dec. 4, 1995, Ser. No. 47,412
Term of patent 14 years
U.S. Cl. D24—104



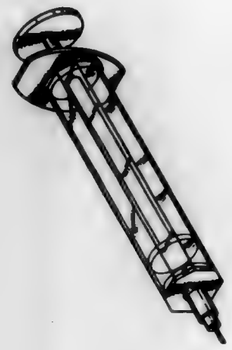
377,685
BLOOD WITHDRAWAL AND SEPARATION SET
Theodore H. S. Siltings, Norwood; Joseph R. Plante, Medway; Andrew Lanciano, Plymouth; James R. Leible, Foxboro; Robert B. Carr, Jr., Wellesley; David W. Newby, Raynham, all of Mass., and Tracey R. Knapp, Coralville, Iowa, assignors to Haemonetics Corp., Braintree, Mass.
Filed Sep. 26, 1995, Ser. No. 44,778
Term of patent 14 years
U.S. Cl. D24—108



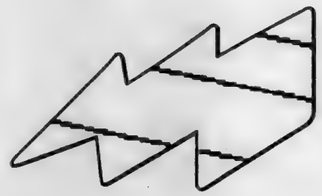
377,686
TRAINING DEVICE FOR INHALER
Johan Waldeck, Södra Sandby, and Nils G. Marnfeldt, Blentarp, both of Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden
Filed Sep. 26, 1994, Ser. No. 28,911
Claims priority, application Sweden, Mar. 25, 1994, 94-0732
Term of patent 14 years
U.S. Cl. D24—110



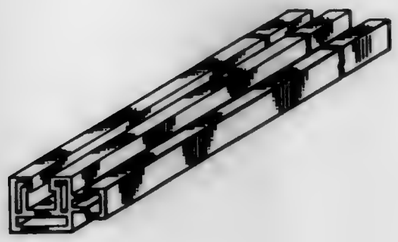
377,687
SINGLE-USE SYRINGE
Dallas Udovch, 2670 35th Ave., San Francisco, Calif. 94116
Filed Oct. 19, 1995, Ser. No. 46,641
Term of patent 14 years
U.S. Cl. D24—114



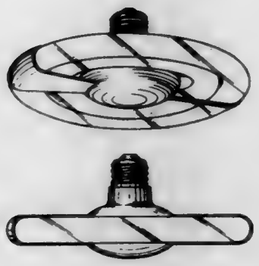
377,688
ADHESIVE BANDAGE BACKING
Wayne K. Dunshee, and Peter W. Dunshee, both of Maplewood, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 14, 1995, Ser. No. 40,785
Term of patent 14 years
U.S. Cl. D24—189



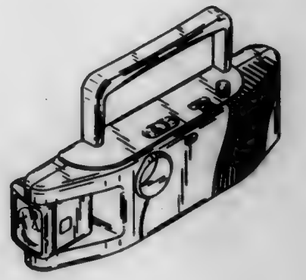
377,689
WALL COMPONENT
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Dec. 28, 1995, Ser. No. 48,415
Term of patent 14 years
U.S. Cl. D25—124



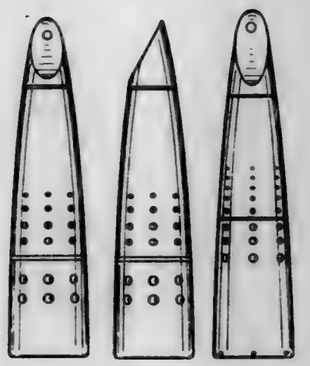
377,690
FLUORESCENT LAMP
Takeshi Matsumura, Osaka, and Masashi Sangen, Hyogo, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Aug. 24, 1995, Ser. No. 43,855
Claims priority, application Japan, Mar. 24, 1995, 7-7925
Term of patent 14 years
U.S. Cl. D26—26



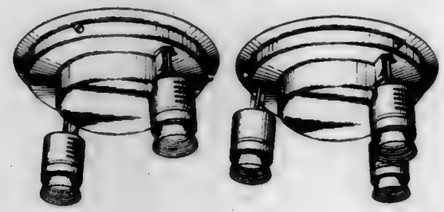
377,691
RADIO LANTERN
Se K. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jan. 16, 1996, Ser. No. 49,880
Claims priority, application United Kingdom, Sep. 6, 1995, 2056201
Term of patent 14 years
U.S. Cl. D26—38



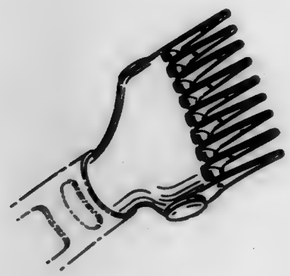
377,692
FLASHLIGHT
Werner G. Westhoff, Cologne, Germany, assignor to WWK Elektrogeräte GmbH, Cologne, Germany
Filed Oct. 20, 1994, Ser. No. 29,958
Term of patent 14 years
U.S. Cl. D26—49



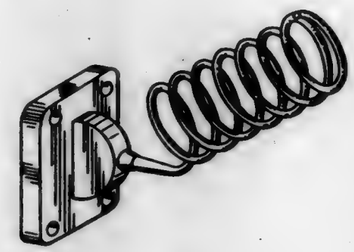
377,693
CEILING LAMP
Michel Lechasseur, 1009, rue du Parc Industriel, St-Jean-Chrysostome, Québec, Canada
Filed May 15, 1995, Ser. No. 38,814
Claims priority, application Canada, Apr. 19, 1995, 1995-0846
Term of patent 14 years
U.S. Cl. D26—63



377,694
STYLING HEAD
Henri Seval, Barchon, Belgium, assignor to Faco S.A., Waudre, Belgium
Filed Dec. 22, 1994, Ser. No. 32,672
Claims priority, application WIPO, Jun. 24, 1994, DM/029951
Term of patent 14 years
U.S. Cl. D28—18



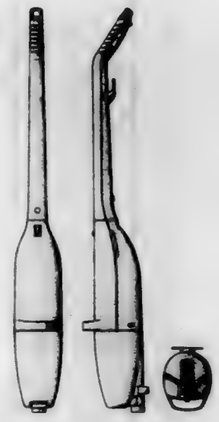
377,695
CURLING IRON RECEPTACLE
Leonard Puckett, 3283 Maple Ln., Hazel Crest, Ill. 60429
Filed Nov. 2, 1995, Ser. No. 46,748
Term of patent 14 years
U.S. Cl. D28—38



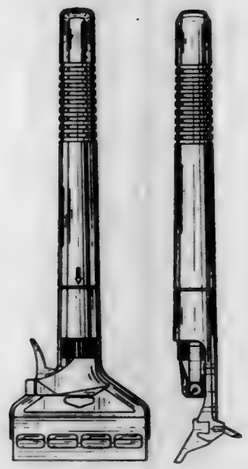
377,696
STRAIGHT RAZOR
Erhard Schmitz, Solingen, Germany, assignor to Teudeo-Werk GmbH, Solingen, Germany
Filed Apr. 11, 1994, Ser. No. 21,133
Claims priority, application Germany, Oct. 9, 1993, M93 07 840.4
Term of patent 14 years
U.S. Cl. D28—45



377,697
VACUUM CLEANER
Ronald J. Stephens, Rittman, and Jeffrey S. Louis, Akron, both of Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed Dec. 1, 1995, Ser. No. 47,329
Term of patent 14 years
U.S. Cl. D32—31



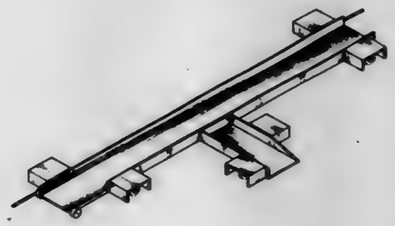
377,698
CLEANING TOOL
Scott Schaffer, Haysville, Kans., assignor to Wescon Products Company, Wichita, Kans.
Filed Dec. 21, 1995, Ser. No. 48,127
Term of patent 14 years
U.S. Cl. D32—42



377,699
GRILL CLEANING TOOL
Robert A. McLaughlin, 8 Starboard Way, Tequesta, Fla. 33469
Filed Jan. 27, 1995, Ser. No. 34,125
Term of patent 14 years
U.S. Cl. D32—46



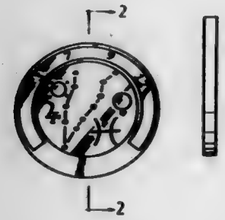
377,700
MOTOR VEHICLE DOLLY FRAME
Richard A. Butler, Renton, Wash., assignor to Northwest Machine and Fabrication Services, Inc., Kent, Wash.
Filed Jan. 2, 1996, Ser. No. 48,510
Term of patent 14 years
U.S. Cl. D34—28



377,701
TALISMAN
Susanna Monosov, 98 Glenmanor Way, Thornhill, Ontario, Canada
Filed Nov. 29, 1995, Ser. No. 47,211
Term of patent 14 years
U.S. Cl. D99—25



377,702
TALISMAN
Susanna Monosov, 98 Glenmanor Way, Thornhill, Ontario, Canada
Filed Nov. 29, 1995, Ser. No. 47,213
Term of patent 14 years
U.S. Cl. D99—25



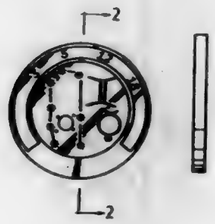
377,703
TALISMAN
Susanna Monosov, 98 Glenmanor Way, Thornhill, Ontario, Canada
Filed Nov. 29, 1995, Ser. No. 47,214
Term of patent 14 years
U.S. Cl. D99—25



377,704
TALISMAN
Susanna Monosov, 98 Glenmanor Way, Thornhill, Ontario, Canada
Filed Nov. 29, 1995, Ser. No. 47,215
Term of patent 14 years
U.S. Cl. D99—25



377,705
TALISMAN
Sumana Manoorar, 98 Glenmanor Way, Thornhill, Ontario, Canada
Filed Nov. 29, 1995, Ser. No. 47,216
Term of patent 14 years
U.S. Cl. D99—25



377,706
SWAN MAIL BOX COVER
Robert D. Perrish, 29085 Hubbard, Livonia, Mich. 48152
Filed Jun. 28, 1995, Ser. No. 40,839
Term of patent 14 years
U.S. Cl. D99—30



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TO WHOM

PATENTS WERE ISSUED ON THE 28th DAY OF JANUARY, 1997

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. K. Technical Laboratory Inc.: *See*—
Kodo, Hideaki; and Nakajima, Hisashi, 5,597,525, Cl. 264-537.000.
A.P. Green Industries, Inc.: *See*—
Whaley, Lee R., 5,597,528, Cl. 266-100.000.
Aaslyng, Dorrit A.: *See*—
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Abadi, Max M. Pinty condom. 5,596,997, Cl. 128-844.000.
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Cetrelli, Renzo; and Hultmark, Ingvar, 5,597,628, Cl. 428-34.600.
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ABB Power T&D Company, Inc.: *See*—
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DeWille, Normanella T.; Chandler, Michael A.; Mazer, Terrence B.; Ragan, Robert J.; Snowden, Gregory A.; Geraghty, Maureen E.; and Johnson, Catherine D., 5,597,595, Cl. 426-74.000.
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Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Ohta, Masuyuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Ohwada, Junichi, 5,598,285, Cl. 349-39.000.
Abe, Keiichiroh: *See*—
Gove, Robert J.; Abe, Keiichiroh; Kamei, Sohichiroh; and Doherty, Donald B., 5,598,188, Cl. 345-185.000.
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Maruyama, Tohru; Abe, Michio; Nomiyama, Hiroaki; Okazaki, Sachiko; Kogoma, Masuhiro; and Kodama, Makoto, 5,597,456, Cl. 204-165.000.
Abe, Yoshifumi: *See*—
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Behlen, James F.; Hussain, Rafiqul; and Haq, Munir, 5,598,033, Cl. 257-686.000.
Bui, Nguyen D., 5,598,009, Cl. 257-48.000.
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Ishikawa, Seiji; Suwa, Yoshihisa; Ito, Takashi; and Yasuda, Tomio, 5,598,166, Cl. 342-357.000.
Katagiri, Masayoshi; and Suzuki, Kazuhiko, 5,597,214, Cl. 303-10.000.

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Akzo Nobel N.V.: *See*—
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Samuel, Edward G., 5,597,937, Cl. 556-190.000.

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Bonham, Harry B., Jr.; and Lucas, Richard E., Jr., 5,598,493, Cl. 385-33.000.
Hogge, Charles R., Jr.; and Bhatt, Pankaj H., 5,596,804, Cl. 29-840.000.

Alcide Corporation: *See*—
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Mills, Gregory J.; and Maley, William S., 5,596,816, Cl. 34-346.000.

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Alexander, Joseph A., Jr., to Instituform (Netherlands) B.V. Compact apparatus for everting a liner and method. 5,597,353, Cl. 425-387.100.

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Linder, Charles; Nemas, Mara; Perry, Mordechai; and Ketraro, Reuven, 5,597,863, Cl. 525-61.000.

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Medard, Claude P.; Allasic, André L.; and Schaeffer, Philippe J., 5,598,340, Cl. 364-468.270.

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Lyles, Thomas W.; and Allen, Daniel C., 5,597,181, Cl. 280-846.000.

Allen, Edward: *See*—
Schneider, H. Michael; Allen, Edward; Woodling, Richard; and Barnes, Roy, 5,597,489, Cl. 210-670.000.

Alliance Semiconductor Corporation: *See*—
Daniel, Andrew; and Greene, Spencer, 5,598,526, Cl. 395-507.000.
Schnaitter, William N., 5,598,095, Cl. 323-315.000.

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Chang, Chin-Hsiung; and Gualdron, Miguel A., 5,597,545, Cl. 423-484.000.
Lesertz, James E., 5,596,871, Cl. 60-39.030.
Rhee, Seong K.; Taig, Alistair G.; and Towers, Kenneth S., 5,597,292, Cl. 417-322.000.
Zimmerman, Scott M.; Beeson, Karl W.; and Fern, Paul M., 5,598,281, Cl. 349-5.000.

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Alpha Enterprises, Inc.: *See*—
Weisburn, James T.; and Burdett, Ronald K., 5,597,068, Cl. 206-308.100.

Alps Electric Co., Ltd.: *See*—
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Altenbach, Robert J.: *See*—
Meyer, Michael D.; Altenbach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizin, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., 5,597,823, Cl. 514-250.000.

Altera Corporation: *See*—
Leong, William W.; Cliff, Richard G.; and McClintock, Cameron, 5,598,109, Cl. 326-41.000.
Pedersen, Bruce B., 5,598,108, Cl. 326-41.000.

Altshuler, Alexander, to Nobler Technologies, Inc. Magnetron cathode sputtering method and apparatus. 5,597,459, Cl. 204-192.120.

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Amanuma, Tatsuo: *See*—
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Amerchol Corporation: *See*—
Gruber, James V., 5,597,811, Cl. 514-55.000.

American Axle & Manufacturing Inc.: *See*—
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American Biltrite, Inc.: *See*—
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American Calan, Inc.: *See*—
Briggs, Douglas V.; and Stevens, George C., 5,596,950, Cl. 119-489.000.

American Cyanamid Company: *See*—
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American Home Products Corporation: *See*—
Crossley, Roger; and Opalko, Albert, 5,597,834, Cl. 514-314.000.

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McCall, Kevin J.; Kovacs, Janos; and Palmer, Wyn, 5,598,364, Cl. 365-73.000.

Ancona, Nicola: *See*—
Poggio, Tomaso; Harris, John G.; and Ancona, Nicola, 5,598,488, Cl. 382-278.000.

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Anderson, William J.: *See*—
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Ando, Hitoshi: *See*—
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Ando, Shinji: *See*—
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Anselm, Klaus A.: *See*—
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Antos, Douglas R.; Darmon, Michael J.; Graham, William F.; and Thomas, Richard R., to Du Pont de Nemours, E. I., and Company. Coating compositions of an acrylic fluorocarbon polymer and a fluorinated polyisocyanate. 5,597,874, Cl. 525-331.200.

Antonini, Joe, to Dana Corporation. Single split oil seal. 5,597,168, Cl. 277-152.000.

Anzai, Katsuhiko, to Canon Kabushiki Kaisha. Color recording apparatus and process therefor. 5,598,513, Cl. 395-109.000.

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Anzai, Syun-ichi: *See*—
Miyahara, Yasunori; and Anzai, Syun-ichi, 5,598,221, Cl. 348-554.000.

Aoki, Riichirou: *See*—
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Aoshima, Masashi; Shigematsu, Hiroaobu; Wadaki, Takeru; Kasehara, Toshikatsu; Watanabe, Kazuya; and Tanaka, Toshiyuki, to Sumitomo Chemical Company Limited; and Toyoda Gosei Co., Ltd. Vulcanizable rubber compositions and vulcanized rubber. 5,597,860, Cl. 524-505.000.

Aoshima, Shinji; and Morishima, Morito, to Yamaha Corporation. Feed search system for optical disk recording device. 5,598,384, Cl. 369-32.000.

Aoyagi, Hidetomo: *See*—
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Aoyagi, Masahiro: *See*—
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AP Parts Manufacturing Company: *See*—
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Apple Computer, Inc.: *See*—
Austin, Stephen C.; and Fineberg, Adam B., 5,598,505, Cl. 395-2.350.
Heyl, Lawrence P., 5,598,353, Cl. 364-514.00R.
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Applewhite, John: *See*—
Johnson, Lonnie G., and Applewhite, John, 5,596,978, Cl. 124-72.000.

Applied Materials, Inc.: *See*—
Salzman, Philip M., 5,597,439, Cl. 156-345.000.

Aqua-Ion Systems, Inc.: *See*—
Johnson, Dennis E. J., 5,597,479, Cl. 210-192.000.

Aragon, Joel T.: *See*—
Bunce, Steven M.; and Aragon, Joel T., 5,598,007, Cl. 250-566.000.

Araki, Hideaki; Fukuta, Junzo; and Fukaya, Masashi, to Sumitomo Metal Ceramics, Inc. Ceramic circuit board and process for producing same. 5,597,644, Cl. 428-210.000.

Arch Development Corporation: *See*—
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ARCO Chemical Technology, L.P.: *See*—
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Argillier, Jean-François: *See*—
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Arima, Hideaki: *See*—
Ajika, Natsuo; Arima, Hideaki; and Hachisuka, Atsushi, 5,597,755, Cl. 437-52.000.

Arkenol, Inc.: *See*—
Parone, William A.; and Cuzens, John E., 5,597,714, Cl. 435-100.000.

Arlton, David J.: *See*—
Arlton, Paul E.; and Arlton, David J., 5,597,138, Cl. 244-17.130.

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Arora, Kartar S.: *See*—
Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., 5,597,406, Cl. 106-237.000.
Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., 5,597,407, Cl. 106-237.000.

Arriza, Jeffrey: *See*—
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Arthur, James D.; Sanderford, H. Britton, Jr.; and Rousselle, Robert E., to Axonn Corporation. Wireless alarm system. 5,598,427, Cl. 375-200.000.

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Lin, Ming-Yen, 5,598,231, Cl. 351-49.000.

Arudi, Ravindra L.; and Haidos, John C., to Imation Corp. Dispersing polymers for phthalocyanine pigments used in organic photoconductors. 5,597,675, Cl. 430-134.000.

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Marken, John; Schieven, Gary L.; Hellstrom, Ingegerd; Hellstrom, Karl E.; and Aruffo, Alejandro, 5,597,707, Cl. 435-69.300.

Asada, Kazuhiko; Ueno, Koichi; Kashihara, Shin-ichiro; Okamoto, Shigemi; Kurose, Katsuo; Kawahara, Kazuhiko; and Mitsuhashi, Ken-ichiro, to Kabushiki Kaisha Kobe Seiko Sho. Heat exchanging apparatus. 5,597,037, Cl. 165-110.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Furuzono, Goro; Fujiwara, Takashi; and Igarashi, Tsuneo, 5,597,631, Cl. 428-364.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Sugawara, Saburo, 5,598,240, Cl. 396-84.000.
Kurosawa, Yuichi, 5,596,905, Cl. 74-443.000.
Nomura, Hiroshi; and Sasaki, Takamitsu, 5,598,241, Cl. 396-79.000.

Asano, Hideo: *See*—
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Asano, Masamichi; Iwahashi, Hiroshi; Kirisawa, Ryouhei; Nakayama, Ryozo; Inoue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Method of manufacturing NAND type EEPROM. 5,597,748, Cl. 437-43.000.

Asayama, Junko: *See*—
Takimoto, Akio; Wakamoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,597,889, Cl. 528-353.000.

Ase, Hisashi; Ishikawa, Kazutoshi; and Imabayashi, Hideki, to Idemitsu Petrochemical Co., Ltd. Process for producing styrenic polymer. 5,597,879, Cl. 526-65.000.

Ashland Inc.: *See*—
Ward, Irl E., 5,597,420, Cl. 134-38.000.

Ashurst Technology Corporation (Ireland Limited): *See*—
Tack, William T., 5,597,529, Cl. 420-532.000.

Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; and Matsumoto, Takumi, to SMC Corporation. Electromagnetic pilot type selector valve. 5,597,015, Cl. 137-625.640.

AST Research, Inc.: *See*—
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Astec Industries, Inc.: *See*—
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ASULAB S.A.: *See*—
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Poupelloman, Alan D., 5,598,443, Cl. 375-359.000.
Rutlands, Dale F., 5,598,549, Cl. 395-441.000.

ATI Technologies Inc.: *See*—
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Atomic Energy of Canada Limited: *See*—
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Atotech Deutschland GmbH: *See*—
Ragge, Andrea; Meyer, Heinrich; and Urrutia Desmaison, Gonzalo, 5,597,471, Cl. 205-199.000.

Aubert, Lucien; and Martin, Richard, to L'Oreal. Use of extracts of filamentous bacteria as cosmetic agents to combat ageing of the skin. 5,597,558, Cl. 424-70.100.

Auclair, John W.: *See*—
Auclair, William T.; Auclair, John W.; and Auclair, Randolph L., 5,597,314, Cl. 439-98.000.

Auclair, Randolph L.: *See*—
Auclair, William T.; Auclair, John W.; and Auclair, Randolph L., 5,597,314, Cl. 439-98.000.

Auclair, William T.; Auclair, John W.; and Auclair, Randolph L., to Electric Motion Company, Inc. Cable shield ground clamp. 5,597,314, Cl. 439-98.000.

Audibert, Annie; Argillier, Jean-François; Lecourtier, Jacqueline; Bailey, Louise; and Reid, Paul I., to Institut Francais du Petrole; and Dowell Schlumberger, Inc. Drilling processes and fluid used in well drilling applications. 5,597,783, Cl. 507-120.000.

Augustine, Patricia C.: *See*—
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Aulet, Nancy R.: *See*—
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Auschra, Clemens; Oncis, Juergen; and Pennewiss, Horst, to Roehm GmbH Chemische Fabrik. Comb polymers. 5,597,871, Cl. 525-309.000.

Ausimont S.p.A.: *See*—
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Aust, Steven D.; and Bumpus, John A., to Utah State University Foundation. Process for the degradation of coal tar and its constituents by white rot fungi. 5,597,730, Cl. 435-262.500.

Austel, Volkhard: *See*—
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Austin, Stephen C.; and Flaxberg, Adam B., to Apple Computer, Inc. Cepstral correction vector quantizer for speech recognition. 5,598,505, Cl. 395-2.350.

Automated Prescription Systems, Inc.: *See*—
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Avery Dennison Corporation: *See*—
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Avery, Gary D.: *See*—
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Avramenko, Lawrence: *See*—
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AVT Communications Ltd.: *See*—
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Axxon Corporation: *See*—
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Baader North America Corporation: *See*—
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Baba, Nobuo: *See*—
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Baba, Rita; Ueda, Ken; Sekihara, Kensuke; Ueki, Hiromori; and Umetani, Keiji, to Hitachi Medical Corporation. Method for X-ray fluoroscopy or radiography, and X-ray apparatus. 5,598,453, Cl. 378-146.000.

Bacchetta, Maurizio: *See*—
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Bachmann, Bernd: *See*—
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Bachmann, Brian: *See*—
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Bachofen, Willy A.: *See*—
Frommherz, Harald; Leuthold, Albert; and Weider, Marc, 5,597,126, Cl. 241-172.000.

Bae, Sung C.; Park, Jae R.; and Son, Jong C., to Samsung Electronics Co., Ltd. Apparatus for untwisting clothes in an automatic washer. 5,596,891, Cl. 68-133.000.

Bae, Sung M., to Hyundai Electronics Industries Co., Ltd. Prefabricated modified illumination apparatus for forming fine patterns in a semiconductor device. 5,598,250, Cl. 355-67.000.

Baejin Corporation: *See*—
Ju, Dong S., 5,597,007, Cl. 135-124.000.

Baffelli, Gianni; and von Weissenfluh, Beat A., to Hawe Neos Dental Dr H.v. Weissenfluh AG. Expanded portion toothpaste. 5,597,553, Cl. 424-49.000.

Bailey, Louise: *See*—
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Baiocchi, Leandro: *See*—
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Baird, Jeffrey S.: *See*—
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Baker, Christopher W.: *See*—
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Baker Hughes Incorporated: *See*—
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Baker, Jake: *See*—
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Baker, Jeffrey C.; and Roberts, Bradley M., to Eli Lilly and Company. Preparation of stable insulin analog crystals. 5,597,893, Cl. 530-304.000.

Baker, Paul W.: *See*—
Knight, John W.; Baker, Paul W.; and Jones, David P., 5,596,933, Cl. 108-51.100.

Baker, Samuel; and Harrison, James, to JWI Ltd. Paper machine dryer fabrics containing hollow monofilaments. 5,597,450, Cl. 162-348.000.

Baker, Thomas M.; Codina, George; and Franzen, Larry H., to Caterpillar Inc. Inductive joystick apparatus. 5,598,090, Cl. 322-3.000.

Balasubramanian, Thyagarajan; Choi, King; and DiVincenzo, Joseph, to Eastman Kodak Company. Image rendering system and associated method for minimizing contours in a quantized digital color image. 5,598,482, Cl. 382-199.000.

Bales, Bruce M.; Griffith, Gary L.; and Prakash, Vijai, to Lucent Technologies Inc. Telecommunication switching system having transparent wireless features. 5,598,458, Cl. 379-58.000.

Ball Corporation: *See*—
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Baller, Thomas S.: *See*—
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Balloul, Jean-Marc: *See*—
Sondermeyer, Paul; Balloul, Jean-Marc; Pierce, Raymond; Grzych, Jean-Marie; Kieny, Marie-Paule; Loison, Gérard; Capron, André; and Lecocq, Jean-Pierre, 5,597,570, Cl. 424-191.100.

Baltimore Aircoil Company, Inc.: *See*—
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Balz, Eric R.: *See*—
Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

Banks, Gerald F.: *See*—
Hunking, Maurice J.; Banks, Gerald F.; and Walter, Todd E., 5,597,350, Cl. 452-117.000.

Banner, David; Lesslauer, Werner; Lötscher, Hansruedi; and Stüber, Dietrich, to Hoffmann-La Roche Inc. Tumor necrosis factor muteins. 5,597,899, Cl. 530-351.000.

Bär, Daniel: *See*—
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Barajas, Saul; Kaliath, David M.; Whitaker, Bruce E.; and Saldanha, Keith S., to Unisys Corporation. Cache invalidation sequence system utilizing odd and even invalidation queues with shorter invalidation cycles. 5,598,551, Cl. 395-484.000.

Barany, Barbara G.; Reimer, Scott T.; Ulmer, Robert P.; and Zook, J. David, to Honeywell Inc. High gain ultraviolet photoconductor based on wide bandgap nitrides. 5,598,014, Cl. 257-187.000.

Barbee, Gary W., Sr. Prosthetic utensil and tool holding device for both the right hand and left hand. 5,597,189, Cl. 294-25.000.

Barber, George B.; Adsetts, Andrew; Deacon, Peter W.; Maschim, Dorm; and Wang, Yin, to Rio Linda Chemical Co., Inc. Preparation of chlorite. 5,597,544, Cl. 423-472.000.

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Barbier, Dominique, to Commissariat a l'Energie Atomique. Device to simulate the flow of a fluid so as to calibrate a laser velocimetric device. 5,598,259, Cl. 356-28.500.

Barden, William M., to Caterpillar Inc. Level indicating mechanism for a work machine. 5,596,826, Cl. 37-466.000.

Barkans, Anthony C., to Hewlett-Packard Company. Method and apparatus for improved color recovery in a computer graphics system. 5,598,184, Cl. 345-149.000.

Barker, Charles R., III; Olson, Richard E.; Lindquist, Stephen E.; Hartnerich, Massimo; Cease, David A.; and Sobolewski, Robert S., to Digital Equipment Corporation. High performance fan heatsink assembly. 5,597,034, Cl. 165-80.300.

Barker, W. Daniel, III. System for implementing state table in computer code. 5,598,564, Cl. 395-705.000.

Barnard, James A.: *See*—
Shtipelman, Boris A.; and Barnard, James A., 5,598,386, Cl. 369-44.140.

Barnes, Michael R.: *See*—
Doner, Christopher G.; Miller, Lawrence G.; Emmons, Ian D.; and Barnes, Michael R., 5,598,557, Cl. 395-605.000.

Barnes, Roger P.; and Johnston, Jonathan A., to Gates Corporation, The. Twin screw extruder for processing elastomeric compositions. 5,597,235, Cl. 366-76.600.

Barnes, Roy: *See*—
Schneider, H. Michael; Allen, Edward; Woodling, Richard; and Barnes, Roy, 5,597,489, Cl. 210-670.000.

Barnett, Irvin. Lead paint removal. 5,597,787, Cl. 510-203.000.

Bart, Kurt A.; Wdziekonski, Wojciech; and Wu, Frank, to Hoover Universal, Inc. Adjustable vehicle seat armrest with a ratchet. 5,597,209, Cl. 297-411.380.

Bartlett, William P.: *See*—
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Bartling, Russell D.: *See*—
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Barton, Lawrence G. H., to Torrington Company, The. Antifriction element for use between relatively sliding components of an adjustable steering column. 5,596,907, Cl. 74-493.000.

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Bauer, Gerhard; Baumstark, Roland; Bott, Kasper; and Voss, Hartwig, 5,597,466, Cl. 204-529.000.
Bernsen, Rudolf, 5,597,905, Cl. 534-788.000.
Bratz, Matthias; Kober, Reiner; Seele, Rainer; Saupe, Thomas; Meyer, Norbert; Walker, Nigel; Landes, Andreas; and Walter, Helmut, 5,597,776, Cl. 504-105.000.
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zschiesche, Ruth, 5,597,885, Cl. 528-44.000.
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teach, Helmut; Minges, Roland; and Streu, Joachim, 5,597,942, Cl. 560-25.000.

BASF Magnetics GmbH: *See*—
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Basha, Fatima Z.: *See*—
Meyer, Michael D.; Altenbach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizin, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., 5,597,823, Cl. 514-250.000.

Bassett, John D.: *See*—
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Bastard, Joel: *See*—
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Basu, Dibyendu; and Basu, Susan M. Soil enhancing compound and method for producing same. 5,597,399, Cl. 71-9.000.

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Bates, John B.; and Dudney, Nancy J., to Martin Marietta Energy Systems, Inc. Electrolyte for an electrochemical cell. 5,597,660, Cl. 429-191.000.

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Feng, Xiangdong; and Einziger, Robert E., 5,597,516, Cl. 252-625.000.
Romine, Robert A.; and Snowden-Swan, Lesley J., 5,597,851, Cl. 521-41.000.

Battist, Gerald E.: *See*—
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Bauer, Wolfgang; Baumgart, Dieter; and Zöller, Walter, to Hoechst AG. Water-soluble polyazo dyestuffs. 5,597,387, Cl. 8-437.000.

Baumann, Matthias: *See*—
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Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lärmann, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,597,939, Cl. 558-8.000.
Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romanis; Möller-Peddinghaus, Reiner; and Hatzelmann, Armin, 5,597,833, Cl. 514-312.000.
Maurer, Fritz; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Hartwig, Jürgen; Turberg, Andreas; and Mencke, Norbert, 5,597,812, Cl. 514-118.000.
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Bayer Corporation: *See*—
Wicks, Douglas A.; Gindin, Lyuba K.; Yenke, Philip E.; and Jonsson, E. Haakan, 5,597,930, Cl. 548-314.100.

Bayer, Glen H., Jr.; and O'Leary, Timothy J., to Minnesota Mining and Manufacturing Company. Application member for applying a coating material to a substrate. 5,597,618, Cl. 427-207.100.

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Bayer, Timothy J.: *See*—
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Beakes, John M., to Globe Products Inc. Apparatus for manufacturing armatures. 5,596,799, Cl. 29-733.000.

Beard, Douglas R.; Phelps, Andrew E.; Woodmansee, Michael A.; Blewett, Richard G.; Lohman, Jeffrey A.; Silbey, Alexander A.; Spix, George A.; Simmons, Frederick J.; and Van Dyke, Don A., to Cray Research, Inc. Vector processor having functional unit paths of differing pipeline lengths. 5,598,547, Cl. 395-563.000.

Beard, Jay T. Circle cutter for drywall with measure guide. 5,596,809, Cl. 30-310.000.

Bearden, Roby, Jr.: *See*—
Kerby, Michael C.; Bearden, Roby, Jr.; Davis, Stephen M.; and Clavenna, LeRoy, 5,597,474, Cl. 208-50.000.

Beaudoin, Benoit. Pump station flowmeter. 5,597,960, Cl. 73-861.000.

Beavers, Dale W.; Fischer, Jerry F.; Dicola, Vince; and Boyer, John D., to Beavers, Dale W. Resilient traffic bollard with rotatable collar. 5,597,262, Cl. 404-6.000.

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Bauer, Heinz; Becker, Burckhard; Frohnhaus, Ernst-Reiner; and Karthaus, Ulrich, 5,596,910, Cl. 74-526.000.

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Becton Dickinson and Company: *See*—
Linn, C. Preston; Pitner, J. Bruce; and Mize, Pat D., 5,597,696, Cl. 435-6.000.

Beeler, Douglas C., to Dia-Compe, U.S.A., Inc. Bicycle hub with bearing preload adjuster. 5,597,242, Cl. 384-517.000.

Beeler, Mark T.: *See*—
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Beeson, Karl W.: *See*—
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Behlen, James F.; Hussain, Rafiqul; and Haq, Munir, to Advanced Micro Devices, Inc. Micro BGA stacking scheme. 5,598,033, Cl. 257-686.000.

Behner, Ray E. Hole cutter. 5,597,274, Cl. 408-204.000.

Behrmann, Greg; Smith, Dale; and Ronan, Greg, to United States of America, Army. Multi-channel fiber optic connector. 5,598,494, Cl. 385-59.000.

Beisswenger, Dieter, to TRW Repa GmbH. Seat belt buckle. 5,596,795, Cl. 24-633.000.

Beisswenger, Siegfried; and Fliedner, Michael, to Leybold Aktiengesellschaft. Process and apparatus for the continuous or semi-continuous coating of eyeglass lenses. 5,597,609, Cl. 427-8.000.

Bell, Brigham R.: *See*—
Bloom, Charles P.; Bell, Brigham R.; Linton, Franklyn N., Jr.; Haines, Mark H.; and Norton, Edwin H., 5,597,312, Cl. 434-362.000.

Bell, Charles A.; Heath, Warren J.; and Kleinman, Norman M., to Precision Systems, Inc. Automatic multiple-sample multiple-reagent dispensing method in chemical analyzer. 5,597,733, Cl. 436-54.000.

Bell, Eric L.: *See*—
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Bell, Malcolm R.: *See*—
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Bellehumeur, Alex R.; Nehmeus, John R., II; and Haarlammert, Guy W. Puck for use on a non-ice surface. 5,597,161, Cl. 473-588.000.

Bello, James L.: *See*—
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Wang, Yongcai; Anderson, Charles C.; Bello, James L.; and DeLaura, Mario D., 5,597,680, Cl. 430-523.000.

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Bender, Albert, to Hoechst Aktiengesellschaft. Phenolic-resin-modified natural resin acid esters, a process for their preparation and their use as binder resins in printing inks. 5,597,884, Cl. 528-34.000.

Benecke-Kaliko AG: *See*—
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Bennett, Charles H.: *See*—
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Benson, Douglas H.: *See*—
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Benson, Thomas R., to Digital Equipment Corporation. Tracking condition codes in translation code for different machine architectures. 5,598,560, Cl. 395-707.000.

Benson, William M. Underground system for treating soil. 5,596,836, Cl. 47-1.010.

Benton, Roger K.: *See*—
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Berend, Andrew L. C.; Williams, Mark J.; and Brocklehurst, Michael J., to Cambridge Animation Systems Limited. Image synthesis and processing. 5,598,182, Cl. 345-133.000.

Berg, Erik O.: *See*—
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Berg, Lloyd, to Berg, Lloyd. Separation of 3-carene and limonene by extractive distillation. 5,597,455, Cl. 203-57.000.

Berg Technology, Inc.: *See*—
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Bergagnini, Norberto, to Sandberg & Sikorski Diamond Corp. Ring remount wrap assembly. 5,596,887, Cl. 63-15.100.

Bergamini, Michael V. W.; Vallet Mas, José A.; Cabello, Gemma T.; and Cabrera, Antonio L., to Laboratorios Cusi, S.A. Diclofenac and tobramycin formulations for ophthalmic and otic topicalusc. 5,597,560, Cl. 424-78.040.

Bergen, Gary R.; and Malley, George E., to Emhart Inc. Illuminated door lock. 5,597,227, Cl. 362-100.000.

Bergsten, Donald A.: *See*—
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Bergsten, Jeffrey D.; and Bergsten, Donald A., to Industrial Ergonomics. Ergonomic arm support. 5,597,207, Cl. 297-411.350.

Bergström, Rolf A.: *See*—
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Bernes, Rudolf, to BASF Aktiengesellschaft. Preparation of benzothiazolylazoanilines. 5,597,905, Cl. 534-788.000.

Bernardon, Jean-Michel; and Pilgrim, William R., to Centre International de Recherches Dermatologiques Galderma (Cird Galderma). Di(aromatic) compounds and their use in human and veterinary medicine and in cosmetics. 5,597,839, Cl. 514-357.000.

Bernhard, Dennis P.; Rowles, Howard C.; Tirakad, Ramanathan R.; and Bassett, John D., to Air Products and Chemicals, Inc. Light component stripping in plate-fin heat exchangers. 5,596,883, Cl. 62-618.000.

Berndt, Michael T., to Burns Aerospace Corporation. Convertible passenger seat assembly. 5,597,139, Cl. 244-118.600.

Berry, Robert L.; and Pruitt, Gerald R., to Hughes Aircraft Co. Split stirling cycle cryogenic cooler with spring-assisted expander. 5,596,875, Cl. 62-6.000.

Berson, William, to Pitney Bowes Inc. Apparatus and method for issuing and validating tickets. 5,598,477, Cl. 380-51.000.

Berson, Xavier; Vivet, Alain; and Bertrand, Eric, to Commissariat a l'Energie Atomique. Microwave refining and melting furnace. 5,597,504, Cl. 219-693.000.

Bertram, Bryan L.: *See*—
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Bertrand, Eric: *See*—
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Beuche, Charles F. Masonry reinforcement. 5,596,857, Cl. 52-421.000.

Beutchmer, William E. Method induction of antigen-specific immune tolerance. 5,597,563, Cl. 424-93.700.

Beuse, Michael; Gutzmann, Timothy; Koppers, Roger; and Ruhr, Richard, to Ecolab Inc. Adherent foam cleaning compositions. 5,597,793, Cl. 510-434.000.

Beuser, Paul R.: *See*—
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Beut, Margaret E.; Rosen, Hal J.; Rubin, Kurt A.; and Strand, Timothy C., to International Business Machines Corporation. Multiple data surface optical data storage system. 5,598,398, Cl. 369-272.000.

Bevtex Kabushiki-Kaisha: *See*—
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Beugelsdyk, Anthony F.: *See*—
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Bezwada, Rao S.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Blends of absorbable polyoxaamides. 5,597,579, Cl. 424-426.000.

Bhandiwad, Manoj: *See*—
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Bhatt, Padmanabh P.; and Raul, Victor A., to Dow Corning Corporation. Method of controlling release of an active or drug from a silicone rubber matrix. 5,597,584, Cl. 424-486.000.

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Binns, Lloyd S., to Air Industries Corporation. Torque measuring device for free running self-locking nut and bolt combination. 5,597,964, Cl. 73-861.210.

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Biomedical Sensors, Ltd.: *See*—
Markle, David R.; Crane, Barry C.; Irvine, Michael P.; Hendry, Stuart P.; and Paterson, William, 5,596,988, Cl. 128-635.000.

BioNumerik Pharmaceuticals, Inc.: *See*—
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Birbaum, Jean-Luc; Rytz, Gerhard; Van Toan, Vien; Valet, Andreas; and Winms, Norbert, to Ciba-Geigy Corporation. Latent light stabilizers. 5,597,854, Cl. 524-100.000.

Birch, Brian J.; and Morris, Nicholas A., to Van den Bergh Foods Co., Division of Conopco, Inc. Device for electrochemical measurements. 5,597,463, Cl. 204-405.000.

Birenbaum, Lazar: *See*—
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Bittner, Helmut: *See*—
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Blackman, Ken R.: *See*—
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Blackwell, Steven R.; Pearson, John T.; and Fridlin, Charles C., IV, to Motorola, Inc. Apparatus and method for a digital data communications device to operate in an analog mode. 5,598,401, Cl. 379-94.000.

Blaha-Schnabel, Alex, to Paul Ritzau Pari-Werk GmbH. Apparatus for drying and buffering aerosols. 5,596,982, Cl. 128-200.140.

Blake, William L. Torque controlled infinite ratio friction drive hub. 5,597,056, Cl. 192-6.00A.

Blaney, Geoffrey W.; and Tangum, Richard R., to Board of Regents, University of Texas. Building block; system and method for construction using same. 5,596,853, Cl. 52-223.700.

Blank, Roy L., to Richardson-Vicks Inc. Use of salicylic acid for regulating skin wrinkles and/or skin atrophy. 5,597,813, Cl. 514-159.000.

Blank, Roy L., to Richardson-Vicks Inc. Use of salicylic acid for regulating skin wrinkles and/or skin atrophy. 5,597,814, Cl. 514-159.000.

Blank, W. Thomas: *See*—
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Blinov, Leonid; and Neuberger, Wolfgang, to Ceram Optic Industries, Inc. Method and apparatus for coating dielectrics. 5,597,624, Cl. 427-575.000.

Blitz, Leslie S., to S.J. Bee Corp. Garment hanger having label indicator. 5,597,100, Cl. 223-85.000.

Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., to Raychem Corporation. Alarm and test system for a digital added main line. 5,598,455, Cl. 379-27.000.

Bloch, Ricardo A.; Nibert, Roger K.; Ryer, Jack; and Watts, Raymond F., to Exxon Chemical Patents Inc. Increasing the friction durability of power transmission fluids through the use of oil soluble competing additives. 5,597,506, Cl. 508-421.000.

Block Drug Company Inc.: *See*—
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Bloom, Charles P.; Bell, Brigham R.; Linton, Franklyn N., Jr.; Haines, Mark H.; and Norton, Edwin H., to U S West Technologies, Inc. Intelligent tutoring method and system. 5,597,312, Cl. 434-362.000.

Bloomer, Glenn A.; and VanLaeen, Daniel L., to Minnesota Mining and Manufacturing Company. Changeable media labels. 5,597,634, Cl. 428-40.100.

Blue Oaks Materials Limited Partnership: *See*—
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Blum, Ronald D.; and Gupta, Amitava, to Innotech, Inc. Method of manufacturing toric single vision, spherical or aspheric bifocal, multifocal or progressive contact lenses. 5,598,234, Cl. 351-160.00R.

Blundell, Ross: *See*—
Brown, Stephen; and Blundell, Ross, 5,597,582, Cl. 424-456.000.

Board of Regents, University of Texas: *See*—
Blaney, Geoffrey W.; and Tangum, Richard R., 5,596,853, Cl. 52-223.700.

Board of Regents, The University of Texas System: *See*—
Deckard, Carl R., 5,597,589, Cl. 425-174.400.
Gaynor, Richard B.; Garcia, Joseph A.; and Harrich, David, 5,597,895, Cl. 530-324.000.
Magnusson, Robert; and Wang, Shu-Shaw, 5,598,300, Cl. 359-566.000.
Sherry, A. Dean; Zhao, Piyu; and Malloy, Craig R., 5,597,548, Cl. 424-9.300.

Board of Supervisors of Louisiana State University and Agricultural and Mechanical College: *See*—
Jaynes, Jesse M.; and Derrick, Kenneth S., 5,597,945, Cl. 800-205.000.
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Hubbard, Robert P., 5,597,203, Cl. 297-284.300.

Boattini, Pier P.: *See*—
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Boaz, Neil W.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Farrell, Robert P., 5,597,841, Cl. 514-373.000.

Boche, Daniel K.: *See*—
Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

Bocionek, Siegfried: *See*—
Neubauer, Werner; Bocionek, Siegfried; Möller, Marcus; and Joppich, Martin, 5,598,076, Cl. 348-568.220.

Bock, Eckhard: *See*—
Bootz, Konrad; Hoppe, Manfred; Bock, Eckhard; Reddig, Wolfram; Eizenhöfer, Thomas; Harms, Wolfgang; and Herd, Karl-Joseph, 5,597,902, Cl. 534-622.000.

Bock, Mark G.: *See*—
Chambers, Mark S.; Fletcher, Stephen R.; Mistassa, Victor G.; and Bock, Mark G., 5,597,915, Cl. 540-509.000.

Bocko, Peter L.; Lapp, Josef C.; Nelson, John W.; and Schad, Carolyn K., to Corning Incorporated. Method for low temperature precompaction of glass. 5,597,395, Cl. 65-33.400.

Bocquet, Jean-Pierre, to SKID. Machine for treating, in particular sanding ski soles. 5,597,344, Cl. 451-65.000.

Boczar, Fred A.: *See*—
Thomas, David E.; Boczar, Fred A.; and Goforthe, Ronald D., 5,597,279, Cl. 411-432.000.

Bode, Barbara A.; and Cattadoris, Joe, Jr. Vertical jump enhancement system. 5,597,376, Cl. 482-121.000.

Bodmeier, Roland: *See*—
McGinity, James W.; Gerding, Thomas G.; and Bodmeier, Roland, 5,597,849, Cl. 514-648.000.

Bodzak, Stanislaw; and Mayer, Hanspeter, to Robert Bosch GmbH. Fuel feed pump for a fuel injection pump for internal combustion engines. 5,597,291, Cl. 417-310.000.

Bogaerts, Constant; Van Bchelpoel, Eric; Goossens, Henri; Van Goethem, Luc; and Van Alten, Luc, to AGFA-Gevaert N. V. Plate assembly. 5,597,259, Cl. 403-263.000.

Bogart, Delafield, Ferrier Inc.: *See*—
Lieberman, Robert E.; Krasny, Jacques; and Ferrier, Ian R., 5,597,072, Cl. 206-534.000.

Bogdan, David C.; Pearl, Donald L.; Pribula, David T.; Aulet, Nancy R.; Hussain, Muhammed I.; and Hutt, George W., to International Business Machines Corporation. Automated system and corresponding method for testing electro-optic modules. 5,598,360, Cl. 364-579.000.

Bogle, David W.; Hicks, Timothy J.; and Favre, Clinton T., to Laitram Corporation, The. Removal of glass articles from conveyor belts. 5,597,063, Cl. 198-635.000.

Boborquez, Jaime H.: *See*—
Hess, Ulrich E.; Grace, James W.; Hulings, James R.; and Boborquez, Jaime H., 5,598,189, Cl. 347-9.000.

Bok, Song H.; Jeong, Tae S.; Kim, Sung U.; Kwon, Byoung M.; Kim, Young K.; Son, Kwang H.; Lee, Hang W.; and Kwon, Yong K., to Korea Institute of Science and Technology. Acyl CoA:cholesterol acyltransferase inhibitors. 5,597,835, Cl. 514-338.000.

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Bollerott, Michael: *See*—
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Boltinghouse, Gary L., Jr.: *See*—
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Boltovskaya, Marina: *See*—
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zarnitsky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Starovetskaya, Nelli, 5,597,700, Cl. 435-7.920.

Bolyard, Darl J.; Price, James E.; Welch, Dicky R.; Hess, Gerhard; and Petzold, Jürgen, to Triangle Pacific Corporation. Low profile hardwood flooring strip and method of manufacture. 5,597,024, Cl. 144-369.000.

Bond, Malcolm; Engle, Gary; Forma, Joseph J.; and Naumann, Theodore F., to Cedaron Medical, Inc. Physiological evaluation and exercise system. 5,597,373, Cl. 482-4.000.

Bonham, Harry B., Jr.; and Lucas, Richard E., Jr., to Alcatel Network Systems, Inc. Method and system for forming an optical fiber microlens. 5,598,493, Cl. 385-33.000.

Bonnet, Jacqueline: *See*—
Brion, Jean-Daniel; Chollet, Anne-Marie; Demuynck, Luc; De Montarby, Lucy; Rolland, Yves; Bonnet, Jacqueline; Ghezzi, Pietro; and Fradin, Armel, 5,597,819, Cl. 514-225.200.

Bonutti, Peter M. Armrest assembly. 5,597,208, Cl. 297-411.350.

Book, John E.; Grey, Delton A., Jr.; King, Christopher G.; and Mantone, Antony, to General Electric Company. Niobium tin sheet for superconducting magnets. 5,597,423, Cl. 148-98.000.

Bootz, Konrad; Hoppe, Manfred; Bock, Eckhard; Reddig, Wolfram; Eizenhöfer, Thomas; Harms, Wolfgang; and Herd, Karl-Joseph, to Bayer Aktiengesellschaft. Bi -and polyfunctional reacti e dyestuffs, their preparation and their use. 5,597,902, Cl. 534-622.000.

Bordeau, Kenneth J.: *See*—
Glamkowski, Edward J.; Chiang, Yulin; Strupczewski, Joseph T.; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,597,842, Cl. 514-373.000.

Borell, Michael: *See*—
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Bormuth, Horst: *See*—
Winter, Andreas; Bormuth, Horst; and Bachmann, Bernd, 5,597,881, Cl. 526-348.000.

Bornand, Etienne; and Dinger, Rudolf, to ASULAB S.A. Method for taking directions and timepiece intended to make use of this method. 5,598,381, Cl. 368-10.000.

Bose, Subroto: *See*—
Purcell, Stephen C.; Le Gall, Didier J.; and Bose, Subroto, 5,598,514, Cl. 395-118.000.

Bosten, Donald R.; Kriaski, John R.; and Cooper, Randy G., to Porter-Cable Corporation. Sander vaccum housing and pad frame system. 5,597,347, Cl. 451-356.000.

Bothra, Subhas: *See*—
Nowak, Edward D.; Bothra, Subhas; Estock, David; and Erck, Wesley, 5,597,668, Cl. 430-5.000.

Bott, Kasper: *See*—
Bauer, Gerhard; Baumstark, Roland; Bott, Kasper; and Voss, Harwig, 5,597,466, Cl. 204-529.000.

Bouldin & Lawson, Inc.: *See*—
Bouldin, Floyd E., 5,597,125, Cl. 241-136.000.

Bouldin, Floyd E., to Bouldin & Lawson, Inc. Apparatus for fluffing bales of peat moss and other organic matter. 5,597,125, Cl. 241-136.000.

Boulos, Daniel M. Device for making a liquid appear to rise up a tube. 5,596,827, Cl. 40-406.000.

Bowen, Leslie J.; and Gentilman, Richard L., to Materials Systems Inc. Acoustic actuator and flexuresional cover plate there for. 5,598,050, Cl. 310-322.000.

Boyer, John D.: *See*—
Bowers, Dale W.; Fischer, Jerry F.; Dicola, Vince; and Boyer, John D., 5,597,262, Cl. 404-6.000.

Boyette, James E., Jr., to International Business Machines Corporation. Breakaway test probe actuator used in a probing apparatus. 5,598,104, Cl. 324-754.000.

Boyle, Daniel. Aquarium landscape system. 5,597,228, Cl. 362-101.000.

Bracco International B.V.: *See*—
Schneider, Michel; Brochot, Jean; Puginier, Jérôme; and Yan, Feng, 5,597,549, Cl. 424-9.510.

Brackett, John M.: *See*—
Wong, Martin; Finley, David M.; Ramp, John M.; Boltinghouse, Gary L., Jr.; Shaffer, Mark R.; Stroupe, Stephen D.; and Brackett, John M., 5,597,702, Cl. 435-18.000.

Bradbury, E. Douglas, to Manitou Mountain Bikes, Inc. Suspension fork for bicycles. 5,597,169, Cl. 280-276.000.

Bradford Company: *See*—
Bradford, Judson A., 5,597,113, Cl. 229-120.360.

Bradford, Judson A., to Bradford Company. Recyclable container partition. 5,597,113, Cl. 229-120.360.

Bradford White Corporation: *See*—
Lannes, Eric M.; and Stuntz, Charles W., 5,596,952, Cl. 122-13.100.

Brajal, Andrico; and Chouly, Antoine, to U.S. Philips Corporation. Digital transmission system with predistortion. 5,598,436, Cl. 375-297.000.

Brake, Glenn: *See*—
Hansen, Dennis; Brake, Glenn; and Johnsson, James G., 5,596,934, Cl. 109-50.000.

Brange, Jens J. V., to Novo Nordisk A/S. Transdermal insulin. 5,597,796, Cl. 514-3.000.

Braun, Walter: *See*—
Funk, Dieter; Bruns, Dieter; Wenning, Rolf; Braun, Walter; and Pilz, Joachim, 5,597,397, Cl. 65-171.000.

Brauneur, Georg; and Eberharter, Thomas. Capacitive angular displacement transducer. 5,598,153, Cl. 340-870.370.

Braun, Matthias; Kober, Reiner; Seeis, Rainer; Saupe, Thomas; Meyer, Norbert; Walther, Nigel; Landes, Andreas; and Walter, Helmut, to BASF Aktiengesellschaft. Substituted pyrido[2, 3-dipyrimidines as antidotes for herbicidal cyclohexanones. 5,597,776, Cl. 504-105.000.

Brauer, Karl K. K. M., to Mayr, Leslie. Music slide rule reference device and system. 5,597,969, Cl. 84-473.000.

Braun, Carl J.: *See*—
Levings, Charles S., III; Dowey, Ralph E.; and Braun, Carl J., 5,597,698, Cl. 435-6.000.

Braun, Hilarion, to Eastman Kodak Company. Piezoelectric ink jet print head and method of making. 5,598,196, Cl. 347-68.000.

Brautigan, Jeffrey J.: *See*—
Schoenberg, Gregory B.; Kim, Jeong Y.; and Brautigan, Jeffrey J., 5,596,970, Cl. 123-497.000.

Bravo, Sergio M. Watertight sealing system for manhole having a spill bucket. 5,597,263, Cl. 404-26.000.

Bray, Verne; and Hansen, Glen, to Nuco Industries, Inc. One piece tubular elbow and process of manufacture. 5,597,185, Cl. 285-179.000.

Breborowicz, Andrzej; and Oreopoulos, Dimitrios G., to Baxter International Inc. Peritoneal dialysis solutions. 5,597,805, Cl. 514-19.000.

Brech, Brad L.; Delp, Gary S.; and Slane, Albert A., to International Business Machines Corporation. System for selectively and cumulatively grouping packets from different sessions upon the absence of exception condition and sending the packets after preselected time conditions. 5,598,535, Cl. 395-200.130.

Bredal, Torben. Method for the extrusion of metal or plastic profiles and apparatus for working method. 5,596,895, Cl. 72-16.500.

Breipohl, Gerhard; Henke, Stephan; Knolle, Jochen; Schölkens, Bernward; Alpermann, Hans-Georg; Gerhards, Hermann; and Wirth, Klaus, to Hoechst Aktiengesellschaft. Bradykinin peptides with modifications at the N terminus. 5,597,803, Cl. 514-15.000.

Breitbarth, Richard. Composition for stimulating and inducing hair growth. 5,597,575, Cl. 424-401.000.

Breitenstein, Benjamin: *See*—
Thibaut, Daniel; Breitenstein, Benjamin; and Kirchberger, Linda, 5,597,857, Cl. 524-400.000.

Brenner, Duncan J.; Benton, Roger K.; and Wieser, James B., to National Semiconductor Corporation. Signal interface circuit with selectable signal interface parameters. 5,598,467, Cl. 379-398.000.

Bresco, Inc.: *See*—
Ruth, Stephen M.; Klecker, Brian D.; and Frank, A. Richard, 5,597,057, Cl. 192-46.000.

Bresee, Arthur J.; and Van De Graff, Fabian M., to High Vacuum Apparatus Mfg., Inc. Quick release clamp for bonnet and flange of gate valves. 5,597,184, Cl. 285-24.000.

Bresee, Bruce R., to Nemours Foundation, The. Surgery patient headrest. 5,596,780, Cl. 5-636.000.

Bresser, Bertram: *See*—
Graessmann, Ulrich; Bollerott, Michael; Bresser, Bertram; and Obergriesser, Frank, 5,598,141, Cl. 340-426.000.

Brewer, Peter D.; and Olson, Gregory L., to Hughes Aircraft Company. Apparatus and method for optical-based flux monitoring of an effusion cell adjacent the output orifice. 5,598,260, Cl. 356-72.000.

Brewer, Timothy L.: *See*—
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy L.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,598,183, Cl. 345-145.000.

Bridgeport Metal Goods Manufacturing Company, The: *See*—
Vanes, Martin M., 5,597,254, Cl. 401-122.000.

Bridgestone Corporation: *See*—
Utamonoiya, Tadashi; Shimokawa, Yoshinori; and Toyoda, Minoru, 5,597,652, Cl. 428-382.000.

Briggs, Douglas V.; and Stevens, George C., to American Calan, Inc. Poultry transport compartment with inwardly opening doors. 5,596,950, Cl. 119-489.000.

Brightman, Ronald: *See*—
Tramaglio, Anthony; and Brightman, Ronald, 5,597,349, Cl. 451-451.000.

Brill, Winston J.: *See*—
John, Mallyakal E.; Umbeck, Paul F.; and Brill, Winston J., 5,597,718, Cl. 435-172.300.

Brion, Jean-Daniel; Chollet, Anne-Marie; Donnyack, Luc; De Monterby, Lucy; Rolland, Yves; Bonact, Jacqueline; Ghezzi, Pietro; and Fradin, Arnael, to Adir Et Compagnie. Phenothiazine cytokine inhibitors. 5,597,819, Cl. 514-225.200.

Brissenden, James S.; Wilson, Robert J.; and Varma, Sanjeev K., to New Venture Gear, Inc. Transfer case with integrated viscous coupling. 5,597,369, Cl. 475-89.000.

Brisson-Noel, Anne: *See*—
Gueudon, Jean-Luc; Thierry, Dominique; Ullmann, Agnès; Gicquel, Brigitte; and Brisson-Noel, Anne, 5,597,911, Cl. 536-24.320.

Brister, Charles; and Schenkel, Dale, to Brister, Charles C. Accelerator pedal override apparatus for self-propelled motorized cart with aligned brake and accelerator pushrod type operator pedals. 5,597,048, Cl. 180-292.000.

Brister, Charles C.: *See*—
Brister, Charles; and Schenkel, Dale, 5,597,048, Cl. 180-292.000.

Bristol-Myers Squibb Company: *See*—
Marlowe, John; Schieven, Gary L.; Hellstrom, Ingegerd; Hellstrom, Karl E.; and Arruffo, Alejandro, 5,597,707, Cl. 435-69.300.
Siegall, Clay B.; Gawlak, Susan L.; and Marquardt, Hans, 5,597,569, Cl. 424-183.100.

British Nuclear Fuels plc: *See*—
Tolley, Mark R.; and Macastie, Lynne E., 5,597,484, Cl. 210-611.000.

British Technology Group Limited: *See*—
Sambles, John R.; and Bryan-Brown, Guy P., 5,598,267, Cl. 356-369.000.

British Technology Group USA Inc.: *See*—
Jacobson, James W.; Strausberg, Robert L.; Wilson, Susan D.; Pope, Sharon H.; Strausberg, Susan L.; Ruff, Michael D.; Augustine, Patricia C.; and Danforth, Harry D., 5,597,571, Cl. 424-191.100.

British Telecommunications public limited company: *See*—
Williams, Richard G. C., 5,598,435, Cl. 375-261.000.

Bro, William L. Automated and interactive behavioral and medical guidance system. 5,596,994, Cl. 128-732.000.

Brochot, Jean: *See*—
Schneider, Michel; Brochot, Jean; Puginier, Jérôme; and Yan, Feng, 5,597,549, Cl. 424-9.510.

Brocklehurst, Michael J.: *See*—
Berend, Andrew L. C.; Williams, Mark J.; and Brocklehurst, Michael J., 5,598,182, Cl. 345-133.000.

Broekaert, Willem F.; Cammue, Bruno P. A.; Rees, Sarah B.; and Vanderleyden, Josef, to Zeneca Limited. Biocidal proteins. 5,597,801, Cl. 514-12.000.

Bronder, Joseph B.: *See*—
Kroeger, Brian W.; Bronder, Joseph B.; and Baird, Jeffrey S., 5,598,441, Cl. 375-344.000.

Brooks, Houston G., Jr.: *See*—
Connelly, Mark C.; Chakraborty, Utpal R.; and Brooks, Houston G., Jr., 5,597,688, Cl. 435-5.000.

Brooks, James E.: *See*—
Voseck, Wallace B., Jr.; Brooks, James E.; Eberhardt, John R.; and Rezaie, Hooshang A., 5,597,974, Cl. 102-307.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Yamada, Takahiro; Ogawa, Masao; and Shibata, Eiji, 5,596,940, Cl. 112-225.000.

Brousseau, Michel J.: *See*—
Lawrence, Kenneth J.; and Brousseau, Michel J., 5,596,912, Cl. 76-107.100.

Brown, Alan: *See*—
Kitaevich, Yuli; Johnson, Neil D.; Miller, Michael T.; and Brown, Alan, 5,598,269, Cl. 356-399.000.

Brown, David K. Ultrafines coal pulverizer. 5,597,127, Cl. 241-188.200.

Brown, Dennis M.; Luck, Edward; Twardzik, Daniel R.; and Purchio, Anthony F., to Oncogen; and Matrix Pharmaceuticals. TGF-β protein compositions for inhibition of cell proliferation. 5,597,578, Cl. 424-422.000.

Brown, Houston S., to Shell Oil Company. Dyeing of polyketone fiber. 5,597,389, Cl. 8-490.000.

Brown, J. Keenan: *See*—
Jones, Steven M.; Janicki, Michael J.; Lang, Thomas F.; Brown, J. Keenan; Liebig, John R.; and Wang, Xiaohua, 5,598,003, Cl. 250-363.040.

Brown, Patricia S.: *See*—
Hall, Corrina A. E.; Rhoads, W. Wistar; Brown, Patricia S.; and Wilson, Arthur K., 5,598,194, Cl. 347-50.000.

Brown, Stephen; and Blundell, Ross, to Sanofi. Oral gel capsule formulation of 1,2,4-benzotriazine oxides. 5,597,582, Cl. 424-456.000.

Bruchmann, Bernd: *See*—
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zachiesche, Ruth, 5,597,885, Cl. 528-44.000.
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teach, Helmut; Minges, Roland; and Steeu, Joachim, 5,597,942, Cl. 560-25.000.

Bruehl, Hubert; and Schwer, Harald, to Mercedes-Benz AG. Rack-and-pinion steering system mounting. 5,597,049, Cl. 180-400.000.

Brun, André; Tardy, Marie-Claude; Vaganay, Alain; and Vandeputte, Joris, to Rhone Merieux. Preparation of antigens of and of vaccines for the virus of mystery disease, antigens and vaccines obtained for the prevention of this disease. 5,597,721, Cl. 435-235.100.

Bruns, Dieter: *See*—
Funk, Dieter; Bruns, Dieter; Wenning, Rolf; Brans, Walter; and Pilz, Joachim, 5,597,397, Cl. 65-171.000.

Brun-Vezinet, Francoise: *See*—
Montagnier, Luc; Guetard, Denise; Brun-Vezinet, Francoise; and Clavel, Francois, 5,597,896, Cl. 530-388.350.

Bryan-Brown, Guy P.: *See*—
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Bryan-Brown, Michael. Composting apparatus. 5,597,732, Cl. 435-290.400.

Bryant, John C.; and Harkey, James C. Poultry and bird feed delivery system. 5,596,946, Cl. 119-52.100.

Buchanan, Charles M.: *See*—
Edgar, Kevin J.; and Buchanan, Charles M., 5,597,912, Cl. 536-63.000.

Bud, Andrew; and Furno, Rino, to Sixtel S.p.A. Cordless local area network having a fixed central control device. 5,598,407, Cl. 370-330.000.

Budai, Zoltan: *See*—
Szirt nee Kislelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.

Buehler, John: *See*—
Chauhan, Sushil; France, Gordon; and Buehler, John, 5,597,844, Cl. 514-400.000.

Bui, Nguyen D., to Advanced Micro Devices, Inc. Hot carrier injection test structure and testing technique for statistical evaluation. 5,598,009, Cl. 257-48.000.

Bullis, James K. Beamformed television. 5,598,206, Cl. 348-81.000.

Bullock, Bruce M.: *See*—
Bullock, Robert L.; and Bullock, Bruce M., 5,596,936, Cl. 105-458.000.

Bullock, Robert L.; and Bullock, Bruce M., to Standard Car Truck Company. Rail car bridge plate. 5,596,936, Cl. 105-458.000.

Bumol, Thomas F.; and McEvoy, Leslie M., to Eli Lilly and Company. Monoclonal antibodies reactive with a human atheroma associated antigen. 5,597,726, Cl. 435-337.000.

Bumpus, John A.: *See*—
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Bumsted, Thomas C., to D & M Plastics Corporation. Method and apparatus for making a molded cellular antenna coil. 5,596,797, Cl. 29-601.000.

Bunce, Steven M.; and Aragon, Joel T., to Intermec Corporation. Symbology reader with fixed focus spotter beam. 5,598,007, Cl. 250-566.000.

Buoli, Carlo: *See*—
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Buosi, Francesco: *See*—
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Burborough, William R., to Lucas Industries public limited company. Fuel pump. 5,596,967, Cl. 123-450.000.

Burdett, Ronald K.: *See*—
Weisburn, James T.; and Burdett, Ronald K., 5,597,068, Cl. 206-308.100.

Burek, Denis E.; and Jones, Marc D., to Lucent Technologies, Inc. Seal for cable splice closure. 5,598,499, Cl. 385-138.000.

Burger, William R.; Moore, Steven R.; and Kneezel, Gary A., to Xerox Corporation. Thermal ink jet printhead with extended print capability. 5,598,192, Cl. 347-43.000.

Burgin, Markus, to Pelikan Produktions AG. Ink ribbon cassette. 5,597,248, Cl. 400-207.000.

Burke Group, The: *See*—
Kelly, David L., 5,596,846, Cl. 52-125.200.

Burkhardt, Dennis E.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Burkhart, Larry J.; Gast, Floyd B., Jr.; Shearer, Kenneth W.; and Singer, Mark D., to Carrier Corporation. Method for determining optimum placement of refrigerant line muffler. 5,596,879, Cl. 62-296.000.

Burkholder, Timothy P.; Kudlacz, Elizabeth M.; and Le, Tieu-Binh, to Merrell Pharmaceuticals Inc. Substituted alkyldiamine derivatives. 5,597,845, Cl. 514-419.000.

Burmester, Heino. Acceleration limit switch. 5,597,066, Cl. 200-292.000.

Burns Aerospace Corporation: *See*—
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Burr-Brown Corporation: *See*—
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Burroughs Wellcome Company: *See*—
Holder, Anthony A.; Lockyer, Michael J.; Sandhu, Jasbir S.; Riveros-Moreno, Valentina; and Odink, Karel G., 5,597,708, Cl. 435-69.300.

Burton, Joseph D.; Vuyk, Stephen P.; and Hatch, Steven C. Insert for loose-leaf binder. 5,597,256, Cl. 402-4.000.

Bushnell, Paul J.; and Yannascoli, Donald, to Carrier Corporation. Counterweight drag eliminator. 5,597,293, Cl. 417-410.300.

Butler, Robert E.: *See*—
LaVelle, Edward R.; and Butler, Robert E., 5,596,939, Cl. 112-130.000.

Butler, Sandra M.: *See*—
Taddei-Peters, W. C.; and Butler, Sandra M., 5,597,908, Cl. 536-23.100.

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Konstantinov, Alexander; Foux, Boris; Sapunov, Alexander; Zarnitsky, Evgeny; Nazinova, Svetlana; Boltovskaya, Marina; and Staroselskaya, Nelli, 5,597,700, Cl. 435-7.920.

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Nagasawa, Kenichi; Takahashi, Koji; and Sato, Chikara, 5,598,275, Cl. 386-117.000.
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Cerman Optic Industries, Inc.: *See*—
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Chambers, Mark J., to Motorola, Inc. Low current drain operational transconductance amplifier. 5,598,129, Cl. 330-255.000.
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Reo, Joseph, 5,597,115, Cl. 229-229.000.

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Moser, Roland; and Bär, Daniel, 5,597,886, Cl. 528-91.000.
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Pham, Cuong V.; Hayden, Brian J.; Walles, Bethany J.; and Cibirka, Peter R., 5,598,096, Cl. 324-158.100.

Cieller, Werner. Cable-layers. 5,597,266, Cl. 405-154.000.

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Nally, Robert M.; and Schafer, John C., 5,598,525, Cl. 395-520.000.
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Cohen, Elliot. Demulsifier composition and method of use. 5,597,513, Cl. 252-358.000.

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Heim, Barry B.; and Colbert, Freeman D., 5,597,758, Cl. 437-60.000.

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Dodt, Thomas; Gauterin, Frank; Schulze, Thomas; Roik, Geert; and Huinink, Heinrich, 5,598,479, Cl. 381-71.000.
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Cooper, Andrew, to Tektronix, Inc. SCSI multiplexer for coupling a computer local bus to a shared peripheral global bus. 5,598,538, Cl. 395-281.000.

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Agro, James V., 5,597,327, Cl. 439-617.000.
Walker, Jan J., 5,597,992, Cl. 218-121.000.
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Bostea, Donald R.; Kriaski, John R.; and Cooper, Randy G., 5,597,347, Cl. 451-356.000.

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Coppens, Paul: *See*—
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COR Therapeutics, Inc.: *See*—
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Petrinjak, Jan S.; Corbett, Terri L.; Berg, Erik O.; and Aguiar, Judy, 5,598,511, Cl. 395-54.000.

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Anderson, James G.; Collins, Thomas A.; Hampton, Leslie E.; Lipp, G. Daniel; Mack, Alfred N.; and Weiss, David S., 5,597,503, Cl. 219-552.000.
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Cortjens, Leo M.; Mays, Richard C.; and Smith, Curtis M., to Videoconferencing Systems, Inc. Method for automatically adjusting a video conferencing system camera. 5,598,209, Cl. 348-211.000.

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Cosman, Edward C.: *See*—
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Crane, Barry C.: *See*—
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Croda, Inc.: *See*—
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Stadulis, Jerome M., 5,597,043, Cl. 166-280.000.

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Graebe, Robert H., 5,596,781, Cl. 5-710.000.

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Daines, Bernard N.; Birenbaum, Lazar; and Hausman, Richard J., to Cisco Systems, Inc. Variable latency cut through bridge for forwarding packets in response to user's manual adjustment of variable latency threshold point while the bridge is operating. 5,598,581, Cl. 395-872.000.
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Antonini, Joe, 5,597,168, Cl. 277-152.000.
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Drigani, Fausto; and Morasca, Pietro, 5,596,898, Cl. 72-236.000.
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Anton, Douglas R.; Darmon, Michael J.; Graham, William F.; and Thomas, Richard R., 5,597,874, Cl. 525-331.200.
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Kamireddy, Balreddy; Darsley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,597,573, Cl. 424-234.100.
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Jeppesen, Hanne D.; Heiberg, Jakob; and Lillelund, Stig, 5,597,096, Cl. 222-498.000.
Datacolor International Applied Color Systems, Inc.: *See*—
Suess, Josef-Anton, 5,596,890, Cl. 68-15.000.
Dataproducts Corporation: *See*—
Yu, Kelvin W.; and Schnitzel, Susan, 5,597,856, Cl. 524-227.000.
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Tran, Dan T.; Datwyler, Wayne C.; and Ha, Long V., 5,598,421, Cl. 371-22.300.
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Jensen, Niels-D.; and Daugbjerg, Jørgen, 5,598,080, Cl. 318-794.000.
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Roseman, Mark A.; Sartain, Daryl; Daum, Daniel T.; and Ort, Jeffrey G., 5,598,352, Cl. 364-514.00A.
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Klein, Johann; Daute, Peter; Hees, Udo; and Beuer, Bernd, 5,597,934, Cl. 534-26.000.
David, James J.; Duesterhoeft, Scott S.; Spickler, John M.; and Hiyama, Naoki, to Berg Technology, Inc. Memory card connector having improved eject mechanism and method of use. 5,597,316, Cl. 439-159.000.
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Wilson, Phillip S.; and Herrman, Marie J., 5,597,586, Cl. 425-67.000.
Davis, Eric R.: *See*—
Gladden, Ernest L.; Thureson, Gary R.; Zappalorti, Alvaro; Davis, Eric R.; and Lucca, Frank J., 5,597,973, Cl. 102-289.000.
Davis, Gary T. Abrasion resistant slide fastener. 5,596,793, Cl. 24-394.000.
Davis, Gregory B.: *See*—
Soenen, Eric G.; Davis, Gregory B.; and Dycus, Angie, 5,598,475, Cl. 380-23.000.
Davis, McKay H. Battery system for sustained bicycle pathway illumination, and methods. 5,597,225, Cl. 362-72.000.
Davis, Robert A.: *See*—
Kumar, Kanta; Davis, Robert A.; Nichols, Sheila M.; and Buttery, Howard J., 5,597,557, Cl. 424-70.170.
Davis, Robert B.: *See*—
Steigman, Frederic N.; Kohler, Rudolph H.; and Davis, Robert B., 5,597,123, Cl. 241-23.000.
Davis, Stephen M.: *See*—
Kerby, Michael C.; Beardea, Roby, Jr.; Davis, Stephen M.; and Clavenna, LeRoy, 5,597,474, Cl. 208-50.000.
Davis, Steven D., to Whipak Lane, Inc. Cutoff assembly for a form fill and seal packaging machine. 5,596,867, Cl. 53-554.000.
Dawson, John; and Patrikus, John J., to General Electric Company. Turbine frame static seal. 5,597,286, Cl. 415-115.000.
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Scringa, Luigi, 5,598,006, Cl. 250-559.460.
Deacon, Peter W.: *See*—
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Dean, James C.; Dean, Robert C., Jr.; and Yonkers, E. Hubbard, to Hypertherm, Inc. Switch mechanism for operating a plasma arc torch, other tools or weapons. 5,597,497, Cl. 219-121.480.
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Dean, James C.; Dean, Robert C., Jr.; and Yonkers, E. Hubbard, 5,597,497, Cl. 219-121.480.
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Decious, Gaylon M.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Speeck, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.
Decision Point Marketing: *See*—
Welker, Brian H.; Beeler, Mark T.; and Rogers, David M., 5,596,880, Cl. 62-372.000.

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De Cock, Etienne M.; De Schamphelaere, Lucien A.; and Van Dessel, Bart J., to Xeikon N.V. Electrostatographic printer for forming a toner image onto a receptor web adapted to reduce smudging. 5,598,255, Cl. 355-234.000.
Dedelmaier, Rudolf: *See*—
Alber, Friedrich; Dedelmaier, Rudolf; Kromer, Siegfried; Schott, Hans; and Weiss, Siegfried, 5,598,137, Cl. 336-223.000.
Deere & Company: *See*—
Maiwald, Marvin A.; and Romig, Bernard E., 5,597,172, Cl. 280-672.000.
DeGroof, Steven L., to ATI Technologies Inc. Folding stereoscopic computer display. 5,598,282, Cl. 349-15.000.
DeGroot, Kenneth P.: *See*—
Thomas, Christopher P.; Comesworth, Timothy A.; DeGroot, Kenneth P.; Ehlers, Jeffery C.; McMackin, Mark E.; and Jones, Keith L., 5,596,975, Cl. 123-686.000.
de Groot, Peter, to Zygo Corporation. Method for profiling an object surface using a large equivalent wavelength and system therefor. 5,598,265, Cl. 356-360.000.
Deguchi, Koji, to NEC Corporation. MOS differential voltage-to-current converter circuit with improved linearity. 5,598,117, Cl. 327-103.000.
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Claus, Rolf P.; and Dehnhard, Martin, 5,597,701, Cl. 435-7.930.
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Noguchi, Toru; Goto, Kazuo; Hayashi, Sigehiko; Kawahara, Masahiro; Murakami, Susumu; Yamaguchi, Yoshio; and Deki, Shigehito, 5,597,614, Cl. 427-162.000.
Dekker, André P., to Nokia Telecommunications Oy. Method and arrangement for controlling the operation of a high-frequency power amplifier. 5,598,126, Cl. 330-129.000.
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Huergo, Concepción C.; Sierra González, Victoriano G.; Gutiérrez Vazquez, Maria M.; Bisset Jorria, Gonzalo; Garcia Inia, Luis G.; de la Caridad Puentes Rizo, Gisela; del Carmen Sampedro Herrera, Maria; Sotolongo Padrón, Franklin; Le Riverend Morales, Eloisa X.; and Galguera Dominguez, Manuel A., 5,597,572, Cl. 424-197.910.
DeLaura, Mario D.: *See*—
Anderson, Charles C.; Wang, Yongcai; DeLaura, Mario D.; and Bello, James L., 5,597,681, Cl. 430-523.000.
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Delaware Capital Formation, Inc.: *See*—
Gilliland, Oscar; Vafaie, Foad; Hughes, Martin W.; Thurmond, Charlie R., III; and Tomes, Paul, 5,597,987, Cl. 187-285.000.
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DeLessert, Daniel; and Demeter, Michael L., to Whitaker Corporation, The. Laminated miniature multi-conductor connector and method for manufacture. 5,597,326, Cl. 439-608.000.
DeLiso, Evelyn M.; Gadkaree, Kishor P.; Mach, Joseph F.; and Streicher, Kevin P., to Corning Incorporated. Carbon-coated inorganic substrates. 5,597,617, Cl. 427-228.000.
Dell USA, L.P.: *See*—
Longwell, Michael L.; and Groepler, Paul F., 5,598,422, Cl. 371-37.100.
Overfield, Anthony L., 5,598,577, Cl. 395-830.000.
Smith, Randall; and Mills, R. Steven, 5,597,035, Cl. 165-80.300.
Dell, William J.: *See*—
Cha, Alice S.; and Dell, William J., 5,597,603, Cl. 426-573.000.
Delp, Gary S.: *See*—
Brech, Brad L.; Delp, Gary S.; and Slane, Albert A., 5,598,535, Cl. 395-200.130.
Deluca, Hector F.; and Slatopolsky, Eduardo, to Wisconsin Alumni Research Foundation. Prevention of hyperphosphatemia in kidney disorder patients. 5,597,815, Cl. 514-167.000.
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Swenson, Rolf E., to Wisconsin Alumni Research Foundation. Intermediate for the preparation of 19-nor vitamin D compounds. 5,597,932, Cl. 549-214.000.
DeMars, Robert A. Can holder. 5,597,190, Cl. 294-33.000.
Demeter, Michael L.: *See*—
DeLessert, Daniel; and Demeter, Michael L., 5,597,326, Cl. 439-608.000.
De Monterby, Lucy: *See*—
Brion, Jean-Daniel; Chollet, Anne-Marie; Demuynck, Luc; De Monterby, Lucy; Rolland, Yves; Bonnet, Jacqueline; Ghezzi, Pietro; and Fradin, Armel, 5,597,819, Cl. 514-225.200.
Demuynck, Luc: *See*—
Brion, Jean-Daniel; Chollet, Anne-Marie; Demuynck, Luc; De Monterby, Lucy; Rolland, Yves; Bonnet, Jacqueline; Ghezzi, Pietro; and Fradin, Armel, 5,597,819, Cl. 514-225.200.
Den Dekker, Wilhelmus P. M., to U.S. Philips Corporation. Circuit arrangement having a wear indicator to indicate end of service life. 5,598,101, Cl. 324-537.000.
Dennis, Jerry T.: *See*—
Edgar, Roy S.; Dennis, Jerry T.; and Trine, Ralph D., 5,596,892, Cl. 70-164.000.
Dent, Paul W.; and Larsson, Alf J. P., to Ericsson Inc. Multiprocessor data memory sharing system in which access to the data memory is determined by the control processor's access to the progr. m memory. 5,598,575, Cl. 395-800.000.
Dental Concepts Inc.: *See*—
Wagner, Eugene C., 5,597,554, Cl. 424-53.000.
Denton, Frank R., III: *See*—
Pendalwar, Shekhar L.; and Denton, Frank R., III, 5,597,663, Cl. 429-198.000.
Deroo, Dominique; and Hermitt, Laureat, to Commissariat a l'Energie Atomique. Process for the trajectography of objects and device for performing this process. 5,598,355, Cl. 364-516.000.
Derrick, Kenneth S.: *See*—
Jaynes, Jesse M.; and Derrick, Kenneth S., 5,597,945, Cl. 800-205.000.
Jaynes, Jesse M.; and Derrick, Kenneth S., 5,597,946, Cl. 800-205.000.
Desai, Ranjit C.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Parrell, Robert F., 5,597,841, Cl. 514-373.000.
Desautels, John T.; Beyer, Timothy J.; and Mora, Juan R., to General Electric Company. Method using restrained cauls for composite molding. 5,597,435, Cl. 156-245.000.
De Schamphelaere, Lucien A.: *See*—
De Cock, Etienne M.; De Schamphelaere, Lucien A.; and Van Dessel, Bart J., 5,598,255, Cl. 355-234.000.
Desmarais, Lionel C.; and Stone, Bernie A., to Ledcor Industries Limited. Rubber tired railway plough. 5,596,822, Cl. 37-104.000.
Desse, Jean-Pierre, to Alcatel N.V. Filter arrangement for suppressing an AC voltage superposed on a DC voltage present across poles of a DC voltage source. 5,598,123, Cl. 327-551.000.
Desouches, Alain M.: *See*—
Church, Mark A.; Desouches, Alain M.; and Krebs, Richard E., 5,597,340, Cl. 451-5.000.
Detroit Diesel Corporation: *See*—
Faber, Roger A., 5,596,961, Cl. 123-184.380.
Kennedy, Lawrence C., 5,596,954, Cl. 123-41.840.
Detschel, William F.; Norton, Darwin W., Jr.; and Paddock, Richard C., to International Business Machines Corporation. High performance channel adapter having a pass through function. 5,598,580, Cl. 395-855.000.
Dettling, Joseph C.: *See*—
Hu, Zhicheng; Wan, Chung-Zong; Lai, Yiu-Kwan; and Dettling, Joseph C., 5,597,771, Cl. 502-304.000.
Deubner, Ted E.: *See*—
Cox, Marvin L.; Beugelsdyk, Anthony F.; Deubner, Ted E.; Novak, Donald R.; and Urben, Arthur L., 5,596,909, Cl. 74-523.000.
Deutsche Aerospace AG: *See*—
Surauer, Michael; and Bittner, Helmut, 5,597,143, Cl. 244-164.000.
Wilke, Karl-Heinz, 5,597,136, Cl. 244-3.160.
Devauchelle, Gérard; Corutti, Martine; and Persillos, Cécile, to Institut National de la Recherche Agronomique (I.N.R.A.); and Centre National de la Recherche Scientifique (C.N.R.S.). Nucleotide sequences permitting the replication and maintenance of a genetic information in animal cells. 5,597,689, Cl. 435-5.000.
Dewey, Ralph E.: *See*—
Levings, Charles S., III; Dewey, Ralph E.; and Braun, Carl J., 5,597,698, Cl. 435-6.000.
DeWille, Normanella T.; Chandler, Michael A.; Mazer, Terrence B.; Ragan, Robert J.; Snowden, Gregory A.; Geraghty, Maureen E.; and Johnson, Catherine D., to Abbott Laboratories. Low pH beverage fortified with calcium and vitamin D. 5,597,595, Cl. 426-74.000.
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Grosjean, François; Huvey, Michel; and Dewinille, Bernard, 5,597,431, Cl. 156-169.000.
Dewitt, John R.; McClurg, Todd A.; Neer, Jay H.; and Pimienta, Orlando, to International Business Machines Corporation. Personal computer with configurational flexibility and service features. 5,598,318, Cl. 361-683.000.
De Zwart, Siebe T.: *See*—
Trompenaars, Petrus H. F.; Cosman, Edward C.; Mostie, Edwin A.; Baller, Theunis S.; Lambert, Nicolaas; De Zwart, Siebe T.; and Rademakers, Antonius J. J., 5,598,054, Cl. 313-422.000.
Dia-Compe, U.S.A., Inc.: *See*—
Beeler, Douglas C., 5,597,242, Cl. 384-517.000.
Diablo Research Corporation: *See*—
van Os, Ron; and Chazea, David, 5,598,069, Cl. 315-248.000.
Diamond, Gary M.: *See*—
Jordan, Richard F.; and Diamond, Gary M., 5,597,935, Cl. 556-11.000.
Diamond, Paul. Screening assay for inhibitors and activators of RNA and DNA-dependent nucleic acid polymerases. 5,597,697, Cl. 435-6.000.
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Beavers, Dale W.; Fischer, Jerry F.; Dicola, Vince; and Boyer, John D., 5,597,262, Cl. 404-6.000.
Diehl, P. Robert: *See*—
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Dieny, Bernard; Gurney, Bruce A.; Parkin, Stuart S. P.; Sanders, Ian L.; Speriosu, Virgil S.; and Wilhoit, Dennis R., to International Business Machines Corporation. Magnetoresistive sensor having multilayer thin film structure. 5,598,308, Cl. 360-113.000.
Dierlam, Oliver T., to CRC-Evans Pipeline International, Inc. Ping style pipe line-up clamp with copper back-up shoes. 5,597,108, Cl. 228-49.300.

Dietrich, David M.: *See*—
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Dietz, Joel P.: *See*—
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Digital Equipment Corporation: *See*—
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Benson, Thomas R., 5,598,560, Cl. 395-707.000.
Cutler, David N.; Kelly, James W., Jr.; and Perazzoli, Frank L., Jr., 5,598,562, Cl. 395-674.000.

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Dillard, Gary J.; and McAlice, Timothy J., to United Technologies Corporation. Gas turbine exhaust liner with milled air chambers. 5,596,870, Cl. 60-39.020.

DiMatteo, Paul; and Clubb, Charles, to Nova Technologies, Inc. Patient transfer seat. 5,596,775, Cl. 5-81.10C.

Ding, Maynard G.: *See*—
Snyder, William J.; Ding, Maynard G.; Semenza, Richard T.; and Jackson, Johnny D., 5,597,298, Cl. 431-8.000.

Dinger, Rudolf: *See*—
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Dionex Corporation: *See*—
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Stillian, John R.; and Siriraks, Archava, 5,597,481, Cl. 210-198.200.

DiRisio, Anthony: *See*—
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Display Technologies, Inc.: *See*—
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DiStefano, Thomas H.: *See*—
Karavakis, Konstantine; DiStefano, Thomas H.; and Fjelstad, Joseph, 5,597,470, Cl. 205-118.000.

DiVincenzo, Joseph: *See*—
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DKK Corporation: *See*—
Ohno, Kazunaga; Hashizume, Yukio; Hosimi, Kazuo; and Kuwata, Masahiko, 5,598,451, Cl. 378-44.000.

Doany, Fuad E.; and Singh, Rama N., to IBM Corporation. Optical relay lens system for projection displays. 5,597,222, Cl. 353-33.000.

Dobles, Thomas R.; DuMont, David A.; Gilman, Paul B.; Kim, Sang H.; Link, Steven G.; and Parton, Richard L., to Eastman Kodak Company. Sensitizing dye combination for photographic materials. 5,597,687, Cl. 430-574.000.

Dodds, Denis. Draw tinner target for paint ball guns, pellet guns, and the like. 5,597,164, Cl. 273-371.000.

Dodt, Thomas; Gauterin, Frank; Schulze, Thomas; Roik, Geert; and Hulsiek, Heinrich, to Continental Aktiengesellschaft. Device for reducing tire/road surface noise. 5,598,479, Cl. 381-71.000.

Doheny Eye Institute: *See*—
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Doherty, Donald B.: *See*—
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Doi, Shigeo: *See*—
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Dolco Packaging Corp.: *See*—
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Domagala, Jerzy, to MPB Technologies Inc. DDS driven DDS synthesizer for generating sinewave waveforms with reduced spurious signal levels. 5,598,440, Cl. 375-329.000.

Dombrowski, Anne W.: *See*—
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Domon, Charles: *See*—
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Domonig, Georg; and Marsh, Rick, to Grass America, Inc. Bracket for mounting a drawer guide supporting a moveable structure for use in a desk or cabinet. 5,597,220, Cl. 312-334.400.

Domergue, Bruno; Fischer, Beatrice; and Munk, Larry, to Institut Francais Du Petrole. Apparatus for processing a product from catalytic reforming. 5,597,404, Cl. 96-134.000.

Domino Printing Sciences PLC: *See*—
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Doner, Christopher G.; Miller, Lawrence G.; Emmons, Ian D.; and Barnes, Michael R., to Caere Corporation. Apparatus and method for retrieving and grouping images representing text files based on the relevance of key words extracted from a selected file to the text files. 5,598,557, Cl. 395-605.000.

Dove, Christophe, to Telemecanique. Filter module for a frequency converter. 5,598,328, Cl. 363-141.000.

Doron Precision Systems, Inc.: *See*—
Byerly, David C., 5,597,399, Cl. 472-60.000.

Dorsch, Norman: *See*—
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Doubet, Paul: *See*—
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Douglas & Lomason Company: *See*—
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Dove, Daniel J.: *See*—
Albrecht, Alan; Goody, Steven H.; Sprott, Michael P.; Curcio, Joseph A., Jr.; and Dove, Daniel J., 5,598,406, Cl. 370-296.000.

Dow Chemical Company, The: *See*—
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LaPack, Mark A.; Nesarick, Terry J.; Martin, William F.; and Klecka, Gary M., 5,597,402, Cl. 95-12.000.

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Blum, Padmanabh P.; and Raul, Victor A., 5,597,584, Cl. 424-486.000.
Hanneman, Larry F.; Krukonis, Val; Tingey, Thomas J.; and Watkins, James J., 5,597,648, Cl. 428-40.700.

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Heckler, Ronald E.; and Johnson, Peter L., 5,597,836, Cl. 514-352.000.

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Audibert, Annie; Argillier, Jean-François; Lacourtier, Jacqueline; Bailey, Louise; and Reid, Paul I., 5,597,783, Cl. 507-120.000.

Dr. Karl Thomae GmbH: *See*—
Himmelsbach, Frank; Pieper, Helmut; Austel, Volkhard; Linz, Günter; Müller, Thomas; Eisert, Wolfgang; and Weisenberger, Johannes, 5,597,825, Cl. 514-255.000.

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Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driskora, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.

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DSC Communications Corporation: *See*—
Hess, Thomas L.; and Misch, William R., 5,598,464, Cl. 379-213.000.

DSM Chemie Linz GmbH: *See*—
Hackl, Kurt A.; Rössler, Markus; Müllner, Martin; and Stern, Gerhard, 5,597,917, Cl. 544-130.000.

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Anton, Douglas R.; Darmon, Michael J.; Graham, William F.; and Thomas, Richard R., 5,597,874, Cl. 525-331.200.
Dear, Terrence A.; and Ingard, Karl U., 5,597,985, Cl. 181-227.000.

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Nicholson, Myron D.; Kajiwara, Edward M.; Ducharme, Paul E., Jr.; McAllister, Merlan E.; and Waha, Joseph R., 5,597,587, Cl. 425-71.000.

Dudney, Nancy J.: *See*—
Bates, John B.; and Dudney, Nancy J., 5,597,660, Cl. 429-191.000.

Duesterhoeft, Scott S.: *See*—
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Duff, Michael, to Monsanto Canada Inc. Injection device for injecting articles into trees and a method of treating same. 5,596,837, Cl. 47-57.500.

Dull, Gary M.; and Caldwell, William S. Pyrimidinyl or Pyridinyl alkenyl amine compounds. 5,597,919, Cl. 544-242.000.

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Duncan, Charles W. Stake puller with stake supporting back plate. 5,597,151, Cl. 254-199.000.

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Dunn, Murray R., to Shanklin Corporation. Seal wire control for packaging machinery responsive to product flow. 5,597,499, Cl. 219-243.000.

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Teleha, Christopher A., 5,597,916, Cl. 544-127.000.

Durbin, Dennis A.: *See*—
Hacker, David C.; Walter, Jerry L.; Danielson, Arvin D.; and Durbin, Dennis A., 5,598,487, Cl. 382-313.000.

Durel Corporation: *See*—
Wilson, Wayne A.; and Butt, James H., 5,598,382, Cl. 368-226.000.

Dyble, Bertie J.; Dyson, Robert W., deceased (by Richard Holznecht, administrator); and Foss, William C., to Panoramic, Inc. Method and apparatus for manufacturing plastic canisters. 5,597,433, Cl. 156-203.000.

Dycus, Angie: *See*—
Soenen, Eric G.; Davis, Gregory B.; and Dycus, Angie, 5,598,475, Cl. 380-23.000.

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Mignardi, Michael A.; Ng, Laurinda; Croff, Ronald S.; McKenna, Robert; and Dyer, Lawrence D., 5,597,767, Cl. 437-227.000.

Dyson, Robert W., deceased (by Richard Holznecht, administrator): *See*—
Dyble, Bertie J.; Dyson, Robert W., deceased; and Foss, William C., 5,597,433, Cl. 156-203.000.

E.M.S. Technik GmbH: *See*—
Kellner, Helmut, 5,598,268, Cl. 356-375.000.

Earth, Research Institute of Innovative Technology for the: *See*—
Kamiyama, Eiji; Fusegawa, Kazuhiro; and Toyama, Noeho, 5,597,744, Cl. 437-40.000.

Easterly, Clay E.; Vass, Arpad A.; and Tyndall, Richard L., to Martin Marietta Energy Systems, Inc. Method for the removal and recovery of mercury. 5,597,729, Cl. 435-262.500.

Eastman Chemical Company: *See*—
Edgar, Kevin J.; and Buchanan, Charles M., 5,597,912, Cl. 536-63.000.
Nelson, Gregory W.; Cherry, Clinton; and Olsen, Eric G., 5,597,891, Cl. 528-481.000.

Eastman Kodak Company: *See*—
Anderson, Charles C.; Wang, Yongcai; DeLaura, Mario D.; and Bello, James L., 5,597,681, Cl. 430-523.000.
Balasubramanian, Thyagarajan; Choi, King; and DiVincenzo, Joseph, 5,598,482, Cl. 382-199.000.
Braun, Hilarion, 5,598,196, Cl. 347-68.000.
Chari, Krishnan; and Smith, Wendell F., Jr., 5,597,685, Cl. 430-551.000.
Dobles, Thomas R.; DuMont, David A.; Gilman, Paul B.; Kim, Sang H.; Link, Steven G.; and Parton, Richard L., 5,597,687, Cl. 430-574.000.
Lawther, Joel S.; and DiRisio, Anthony, 5,598,239, Cl. 396-538.000.
MacIntyre, Gladys L.; and Bell, Eric L., 5,597,686, Cl. 430-567.000.
Markis, William R., 5,598,040, Cl. 307-38.000.
Martin, Thomas W.; and King, Ronald S., 5,597,775, Cl. 503-227.000.
McIntyre, Dale F.; and Haas, Kenneth M., 5,598,237, Cl. 396-264.000.
Rowden, David L.; Ryan, Dale W.; and Merle, Thomas C., 5,598,310, Cl. 360-130.320.
Shtipelman, Boris A.; and Barnard, James A., 5,598,386, Cl. 369-44.140.
Spencer, Timothy F.; and Walter, Gerald N., 5,596,915, Cl. 83-20.000.
Stephenson, Stanley W., III; and Codd, Alan G., Jr., 5,598,238, Cl. 396-178.000.
Toohey, William J., 5,598,210, Cl. 348-296.000.
Wang, Yongcai; Anderson, Charles C.; Bello, James L.; and DeLaura, Mario D., 5,597,680, Cl. 430-523.000.

Eatock, David: *See*—
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Eaton Corporation: *See*—
Chen, Hai; Evans, George W., Jr.; and Zirpoli, Leo V., 5,597,991, Cl. 200-50.020.
Hutchison, Wayne K.; Eybergen, William N.; Blackman, Ken R.; and Phillips, Victor A., 5,596,882, Cl. 62-503.000.

Ebara Corporation: *See*—
Inobe, Soichi; Sano, Masaaki; Inoue, Yoshio; and Shimizu, Kazuo, 5,598,291, Cl. 359-198.000.

Eberhardt, John R.: *See*—
Voreck, Wallace E., Jr.; Brooks, James E.; Eberhardt, John R.; and Rezaie, Hooshang A., 5,597,974, Cl. 102-307.000.

Eberharter, Thomas: *See*—
Brasseur, Georg; and Eberharter, Thomas, 5,598,153, Cl. 340-870.370.

Ebert Composites Corporation: *See*—
Johnson, David W., 5,597,629, Cl. 428-36.100.

Ebisuno, Tadahiro: *See*—
Yamada, Mikio; Ebisuno, Tadahiro; Moriyama, Keiji; and Sugimoto, Kazushige, 5,597,365, Cl. 473-354.000.

Ecolab Inc.: *See*—
Besse, Michael; Gutzmann, Timothy; Keppers, Roger; and Ruhr, Richard, 5,597,793, Cl. 510-434.000.

Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

Edauw, Peter; Portzline, Carey; and Wiener, Timothy, to Nordica S.p.A.; and Rollerblade, Inc. Adjustable shell for sports shoes. 5,596,820, Cl. 36-115.000.

Edde, Pierre. Teaching model of the bronchial and lungs useful for teaching the biology of those organs. 5,597,310, Cl. 434-272.000.

Edgar, Albert D., to International Business Machines Corporation. System and method for image mapping in linear space. 5,598,186, Cl. 345-154.000.

Edgar, Kevin J.; and Buchanan, Charles M., to Eastman Chemical Company. Process for preparing cellulose esters by use of carboxylic acids. 5,597,912, Cl. 536-63.000.

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Edstrom, Gene: *See*—
Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,598,528, Cl. 395-182.050.

Eez-Away Limited: *See*—
Queally, Peter; and Leanon, Oliver, 5,597,351, Cl. 452-135.000.

Egawa, Akira: *See*—
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Egis Pharmaceutical: *See*—
Szirt nee Kistelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.

Eguchi, Ken, to Canon Kabushiki Kaisha. Liquid crystal device. 5,597,626, Cl. 428-1.000.

Eguchi, Masakazu: *See*—
Iwashige, Naoyuki; and Eguchi, Masakazu, 5,597,075, Cl. 209-10.000.

Eguchi, Ryuichi: *See*—
Ooyagi, Yashichi; Hayashi, Tomohiko; Inoue, Mitsutoshi; Kakimoto, Michiyuki; and Eguchi, Ryuichi, 5,597,436, Cl. 156-259.000.

Egyed, Andras: *See*—
Szirt nee Kistelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.

Ehlers, Jeffery C.: *See*—
Thomas, Christopher P.; Cossesworth, Timothy A.; DeGroot, Kenneth P.; Ehlers, Jeffery C.; McMackin, Mark E.; and Jones, Keith L., 5,596,975, Cl. 123-686.000.

Eibl, Johann; Pichler, Ludwig; and Schwarz, Hans-Peter, to Immuno Aktiengesellschaft. Treatment with lys-plasminogen of reperfusion injury and brain edema caused by ischemia. 5,597,800, Cl. 514-12.000.

Eichelberger, Mitchell P.: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Y.; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,597,869, Cl. 525-192.000.

Eicher, Bernhard; and Popp, Xaver, to Fatzer AG. Method and apparatus for producing a retaining net. 5,597,017, Cl. 140-3.00B.

Einziger, Robert E.: *See*—
Feng, Xiangdong; and Einziger, Robert E., 5,597,516, Cl. 252-625.000.

Eisenmann, Wilhelm, to Alfred Karcher GmbH & Co. Flat jet nozzle for a high-pressure cleaning device. 5,597,122, Cl. 239-589.000.

Eisert, Wolfgang: *See*—
Himmelsbach, Frank; Pieper, Helmut; Austel, Volkhard; Linz, Günter; Müller, Thomas; Eisert, Wolfgang; and Weisenberger, Johannes, 5,597,825, Cl. 514-255.000.

Eizen, Noach, to Mul-T-Lock Inc. Vehicle anti-theft system including a gearshift lock and an anti-theft device operated thereby. 5,598,140, Cl. 340-426.000.

Eisenhöfer, Thomas: *See*—
Bootz, Konrad; Hoppe, Manfred; Bock, Eckhard; Reddig, Wolfram; Eisenhöfer, Thomas; Harms, Wolfgang; and Herd, Karl-Joseph, 5,597,902, Cl. 534-622.000.

Elder, Jack E., to General Motors Corporation. Slide port valve for an internal combustion engine. 5,596,966, Cl. 123-337.000.

Electric Motion Company, Inc.: *See*—
Auclair, William T.; Auclair, John W.; and Auclair, Randolph L., 5,597,314, Cl. 439-98.000.

Electric Power Research Institute: *See*—
Guerra, Lawrence E.; and Ruhl, Craig S., 5,596,889, Cl. 68-12.020.

Electronics Research & Service Organization: *See*—
Yang, Jyh-Ren; Chi, Ching-Ching; and Wu, Tien-Yu, 5,598,375, Cl. 365-230.060.

Electrostatics, Inc.: *See*—
Testone, Anthony Q., 5,596,783, Cl. 15-1.510.

Eli Lilly and Company: *See*—
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Bumol, Thomas F.; and McEvoy, Leslie M., 5,597,726, Cl. 435-337.000.

Elkhlifi, Fatima-Zahra: *See*—
Litaize, Daniel; Salinier, Jean-Claude; Mzoughi, Abdelaziz; Elkhlifi, Fatima-Zahra; Laiam, Mustapha; and Sainrat, Pascal, 5,598,554, Cl. 395-500.000.

Ellgen, Paul C., to Kerr-McGee Corporation. Lithium manganese oxide compound and method of preparation. 5,597,664, Cl. 429-224.000.

Elliason, Kurt L.; and Schnell, Robert J., to Honeywell Inc. Responding to pricing signals from a power supplier using mixed add/shed and profile setback delta schemes. 5,598,349, Cl. 364-492.000.

Elliott, Gregory E., to Domen, Charles. Disposable coupon holder for a shopping cart. 5,597,104, Cl. 224-411.000.

Ellis-El, Emmanuel, to Sayfie, Robert J. Modified long term self feeding planter. 5,596,839, Cl. 47-79.000.

Elmore, Steven W.: *See*—
Meyer, Michael D.; Altenbach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizin, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Weadt, Michael D., 5,597,823, Cl. 514-250.000.

Ema, Takehiro: *See*—
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EMC Technology, Inc.: *See*—
Mazzochette, Joseph B., 5,598,131, Cl. 333-22.00R.

Emhart Inc.: *See*—
Bergen, Gary R.; and Maffey, George B., 5,597,227, Cl. 362-100.000.

Emmons, Ian D.: *See*—
Doner, Christopher G.; Miller, Lawreace G.; Emmons, Ian D.; and Barnes, Michael R., 5,598,557, Cl. 395-605.000.

Enami Seiki Mfg. Co., Ltd.: *See*—
Enami, Toshiaki, 5,596,923, Cl. 100-53.000.

Enami, Toshiaki, to Enami Seiki Mfg. Co., Ltd. Press working machine. 5,596,923, Cl. 100-53.000.

Encrenaz, Claude, to Pechiney Recherche. Electrode for electrophoretic deposition. 5,596,803, Cl. 29-825.000.

Endo, Fumihiro: *See*—
Takahashi, Isao; Endo, Fumihiro; and Yamagiwa, Tokio, 5,598,509, Cl. 395-22.000.

Endo, Satoru; Imai, Yoshisada; and Okuno, Hiroyuki, to NSK Ltd. Method and apparatus for measuring the preload gap of a double row rolling bearing. 5,597,966, Cl. 73-862.490.

Endoh, Tetsuo: *See*—
Asano, Masamichi; Iwahashi, Hiroshi; Kirisawa, Ryouhei; Nakayama, Ryozo; Inoue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, 5,597,748, Cl. 437-43.000.

Energy Conversion Devices, Inc.: *See*—
Fritzsche, Helmut; Ovshinsky, Stanford R.; and Young, Rosa, 5,597,411, Cl. 117-104.000.

Engelhard Corporation: *See*—
Hu, Zhicheng; Wan, Chang-Zong; Lui, Yiu-Kwan; and Dettling, Joseph C., 5,597,771, Cl. 502-304.000.

Engle, Gary: *See*—
Bond, Malcolm; Engle, Gary; Forma, Joseph J.; and Naumann, Theodore F., 5,597,373, Cl. 482-4.000.

Enichem Augusta Industriale S.r.l.: *See*—
Genova, Calogero; Buosi, Francesco; and Guarnerio, Sandra, 5,597,576, Cl. 424-401.000.

Eniricerche S.p.A.: *See*—
Giroldini, William; Rinaldi, Antonio; Landoni, Gianluigi; and Carlo, Neri, 5,597,855, Cl. 524-105.000.

Enomoto, Toshio, to NEC Corporation. Delay circuit for digital signal processing. 5,598,111, Cl. 326-83.000.

Enriquez, Manuel C.: *See*—
Van Erden, Donald L.; Enriquez, Manuel C.; and Weltekamper, Hans, 5,597,640, Cl. 428-192.000.

Ensign-Bickford Company, The: *See*—
Gladden, Ernest L.; Thureson, Gary R.; Zappaloni, Alvaro; Davis, Eric R.; and Lucca, Frank J., 5,597,973, Cl. 102-289.000.

Enzacor Properties Limited: *See*—
Ying, Thomas K. S., 5,597,564, Cl. 424-94.650.

Epton, Harold A. S.: *See*—
Leifert, Carlo; Epton, Harold A. S.; and Sigee, David C., 5,597,565, Cl. 424-115.000.

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Nowak, Edward D.; Bothra, Subhas; Estock, David; and Erck, Wesley, 5,597,668, Cl. 430-5.000.

Erdelen, Christoph: *See*—
Maurer, Fritz; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Hartwig, Jürgen; Turberg, Andreas; and Menzke, Norbert, 5,597,812, Cl. 514-118.000.

Erickson, Charles R.; Freidin, Philip M.; and Wilkie, William A., to Xilinx, Inc. Error detection structure and method for serial or parallel data stream using partial polynomial check. 5,598,424, Cl. 371-48.000.

Ericsson Inc.: *See*—
Dent, Paul W.; and Larsson, Alf J. P., 5,598,575, Cl. 395-800.000.
Haartsen, Jacobus C., 5,598,459, Cl. 379-58.000.

Erie Scientific Company: *See*—
Olofson, Randie R., 5,598,295, Cl. 359-398.000.

Erkocevic, Nedim; and Jansen, Augustinus M., to Lucent Technologies, Inc. Printed sleeve antenna. 5,598,174, Cl. 343-795.000.

ESEC S.A.: *See*—
Meisser, Claudio; and Singeisen, Felix, 5,598,270, Cl. 356-400.000.

Espinor, George L.: *See*—
Catherwood, Michael I.; and Espinor, George L., 5,598,569, Cl. 395-800.000.

Esselte Meto International GmbH: *See*—
Volk, Heinrich, 5,597,441, Cl. 156-579.000.

Essilor International: *See*—
Leroux, Thierry; and Massart, Christine, 5,598,223, Cl. 348-589.000.

Estrada, Alberto; Redmond, Mark J.; and Laarveld, Bernard, to University of Saskatchewan. Quinoa saponin compositions and methods of use. 5,597,807, Cl. 514-26.000.

Ethicon Endo-Surgery, Inc.: *See*—
Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., 5,597,107, Cl. 227-175.200.

Ethicon, Inc.: *See*—
Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,597,579, Cl. 424-426.000.

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Loper, John T., 5,597,390, Cl. 44-391.000.

Evans & Sutherland Computer Corp.: *See*—
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Evans, David L.: *See*—
Johnston, Robert G., Jr.; Stern, Mark L.; and Evans, David L., 5,598,524, Cl. 395-348.000.

Evans, George W., Jr.: *See*—
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Evans, Ronald M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., to Salk Institute for Biological Studies, The. DNA encoding thyroid hormone receptor compositions and methods. 5,597,705, Cl. 435-69.100.

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Everlast Products Inc.: *See*—
Tremaglio, Anthony; and Brightman, Ronald, 5,597,349, Cl. 451-451.000.

EVT Energie- und Verfahrenstechnik GmbH: *See*—
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Ewart, James M.: *See*—
McPhee, J. Brent; and Ewart, James M., 5,597,191, Cl. 294-82.140.

Ewer, Fred L. Hub lock for vehicle. 5,597,058, Cl. 192-69.430.

Excel, Inc.: *See*—
Madonna, Robert P.; Buttell, Robert J.; and Hebert, Mark P., 5,598,409, Cl. 370-364.000.

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Blomgren, James S., 5,598,546, Cl. 395-385.000.
Richter, David E.; Cohen, Earl T.; and Blomgren, James S., 5,598,553, Cl. 395-500.000.

Exxon Chemical Patents Inc.: *See*—
Bloch, Ricardo A.; Nibert, Roger K.; Ryer, Jack; and Watts, Raymond F., 5,597,506, Cl. 508-421.000.
White, Donald A.; Wang, Hsien-Chang; and Li, Dongming, 5,597,866, Cl. 525-74.000.

Exxon Research & Engineering Co.: *See*—
Kerby, Michael C.; Bearden, Roby, Jr.; Davis, Stephen M.; and Clavenna, LeRoy, 5,597,474, Cl. 208-50.000.

Eybergen, William N.: *See*—
Hutchison, Wayne K.; Eybergen, William N.; Blackman, Ken R.; and Phillips, Victor A., 5,596,882, Cl. 62-503.000.

Ezaki, Tadashi: *See*—
Furuya, Miki; Ezaki, Tadashi; Kori, Teruhiko; and Tsuchiya, Satoshi, 5,598,219, Cl. 348-465.000.

Ezawa, Hiroshi: *See*—
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Faber, Roger A., to Detroit Diesel Corporation. Intake manifold assembly for four-cycle internal combustion engine. 5,596,961, Cl. 123-184.380.

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Knight, John W.; Baker, Paul W.; and Jones, David P., 5,596,933, Cl. 108-51.100.

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Hofmann, Heinrich; Glas, Günther; Langer, Roland; and Massiotis, Vasilis, 5,596,798, Cl. 29-724.000.

Fagan, Marc J.: *See*—
Preston, Charles E.; and Fagan, Marc J., 5,596,861, Cl. 53-52.000.

Failes, Michael. Noise compensated interferometric measuring device and method using signal and reference interferometers. 5,598,264, Cl. 356-352.000.

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Kunze, Norbert; Weber, Georg; Fallenbeck, Wolfgang; Klufer, Helmut; and Klemmler, Georg, 5,596,805, Cl. 29-898.055.

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Carey, Charles F.; Fallon, Kenneth M.; Markovich, Voya R.; Powell, Douglas O.; Vlasak, Gary P.; and Zarr, Richard S., 5,597,469, Cl. 205-118.000.

Fang, Wai-Chi; and Sheu, Bing J., to California Institute of Technology. Motion video compression system with neural network having winner-take-all function. 5,598,354, Cl. 364-514.00R.

Fanguy, Roy C., to Texas A&M University System, The. Hemisphere-belt floor system. 5,596,949, Cl. 119-458.000.

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Smith, Brian S.; McMillin, Kenneth W.; Wells, John H.; Farr, A. James; and Mitchell, Jerry L., 5,597,599, Cl. 426-316.000.

Farrell, Robert P.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Farrell, Robert P., 5,597,841, Cl. 514-373.000.

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Fast, Peder, to Ultralux AB. Method and an arrangement for illuminating flags. 5,597,226, Cl. 362-84.000.

Fatzer AG: *See*—
Eicher, Bernhard; and Popp, Xaver, 5,597,017, Cl. 140-3.00B.

Favre, Clinton T.: *See*—
Bogle, David W.; Hicks, Timothy J.; and Favre, Clinton T., 5,597,063, Cl. 198-635.000.

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Feinberg, David H. Integrated telephone, intercom, security and control system for a multi-unit building. 5,598,456, Cl. 379-42.000.

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Feng, Xiangdong; and Einziger, Robert E., to Battelle Memorial Institute. Process for immobilizing plutonium into vitreous ceramic waste forms. 5,597,516, Cl. 252-625.000.

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Plichta, Wojtek; Liu, Ivan; Fennessy, Charles W.; and Lang, Frank, 5,597,229, Cl. 362-153.100.

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Honegger, Werner, 5,596,932, Cl. 101-485.000.

Ferenc, Milan: *See*—
Michalský, Jiří, deceased; Hrbata, Jiří; Křepelka, Jiří; Mělka, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Kolomičný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

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Zimmerman, Scott M.; Beeson, Karl W.; and Ferm, Paul M., 5,598,281, Cl. 349-5.000.

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Gregg, Thomas A.; Capowski, Robert S.; Casper, Daniel F.; and Ferrariolo, Frank D., 5,598,442, Cl. 375-354.000.

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Leanox, James R.; Nelson, Daniel C.; and Pepper, Roger T., 5,597,611, Cl. 427-113.000.

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Gebauer, Andreas; Lindner, Joachim; Schierling, Bernhard; Stockmann, Bernd; and Sudau, Jörg, 5,597,059, Cl. 192-70.120.

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Anderson, Jerry M.; Filas, Robert W.; Johnson, David W., Jr.; Lampert, Norman R.; Rabinovich, Eliezer M.; and Ridgway, David N., 5,598,496, Cl. 385-84.000.

Filbey, Jennifer A.: *See*—
Choe, Eui W.; Forbes, Charles E.; Filbey, Jennifer A.; and Sherriff, Stephan F., 5,597,651, Cl. 428-373.000.

Filtec-Filtertechnologie GmbH: *See*—
Mouissie, Bob, 5,597,328, Cl. 439-620.000.

Fineberg, Adam B.: *See*—
Austin, Stephen C.; and Fineberg, Adam B., 5,598,505, Cl. 395-2.350.

Fingerle, Hans; and Weigand, Horst, to Silt-Werke GmbH & Co. KG. Cooking pot cover. 5,597,088, Cl. 220-662.000.

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Wong, Martin; Finley, David M.; Ramp, John M.; Boltinghouse, Gary L., Jr.; Shaffar, Mark R.; Stroupe, Stephen D.; and Brackett, John M., 5,597,702, Cl. 435-18.000.

FIP Industriale S.p.A.: *See*—
Scaramuzza, Mauro; and Piccolo, Mauro, 5,597,239, Cl. 384-36.000.

Fire Sentry Systems, Inc.: *See*—
Castleman, David A.; Scarbrough, Don R.; and Lindrud, Robert C., 5,598,099, Cl. 324-456.000.

Fisch, Richard S.; Larubas, David A.; Sands, John A.; and VerMurlen, Mark E., to Imation, Inc. Visual calibrator for color halftone imaging. 5,598,272, Cl. 358-298.000.

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Domergue, Bruno; Fischer, Beatrice; and Mank, Larry, 5,597,404, Cl. 96-134.000.

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Beavers, Dale W.; Fischer, Jerry F.; Dicola, Vince; and Boyer, John D., 5,597,262, Cl. 404-6.000.

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Fishburn, Todd K.; and Thomas Smith, Jane E., to Western Atlas International, Inc. Method for correcting compressional velocity well logs for effects of gas in earth formations. 5,598,377, Cl. 367-31.000.

Fisk, Allan T., to Foster-Miller, Inc. Guided mole. 5,597,046, Cl. 175-67.000.

Fjelstad, Joseph: *See*—
Karavakis, Konstantine; DiStefano, Thomas H.; and Fjelstad, Joseph, 5,597,470, Cl. 205-118.000.

Flachglas Aktiengesellschaft: *See*—
Funk, Dieter; Bruns, Dieter; Wenning, Rolf; Brans, Walter; and Pilz, Joachim, 5,597,397, Cl. 65-171.000.

Flentge, David M., to Western Atlas International, Inc. Method of performing high resolution crossed-array seismic surveys. 5,598,378, Cl. 367-56.000.

Fletcher, Stephen R.: *See*—
Chambers, Mark S.; Fletcher, Stephen R.; Matassa, Victor G.; and Bock, Mark G., 5,597,915, Cl. 540-509.000.

Fliedner, Michael: *See*—
Beisswenger, Siegfried; and Fliedner, Michael, 5,597,609, Cl. 427-8.000.

Flood, Dennis, to NCR Corporation. Cash dispensing apparatus (ATM) and method for separating rejected bank notes. 5,597,996, Cl. 235-379.000.

Flory, Curt A.; and Myerholtz, Carl A., to Hewlett-Packard Company. Mass selective multinotch filter with orthogonal excision fields. 5,598,001, Cl. 250-292.000.

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Sass, Ingo; Bayer, Hans-Joachim; Kleiser, Klaus; and Glinger, Jörg, 5,597,045, Cl. 175-62.000.

Fluoroware, Inc.: *See*—
Rauworth, Barry L.; and Hennen, John M., 5,597,085, Cl. 220-403.000.

FMC Corporation: *See*—
Lee, Pui-Tseng H.; and Nicholson, Paul, 5,597,780, Cl. 504-271.000.
Richards, Joseph C.; Hills, William A.; and Snow, William C., 5,597,791, Cl. 510-372.000.

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Folkerts, Charles H.: *See*—
Sultan, Myrna C.; Folkerts, Charles H.; Matthews, Gregory P.; and Kushion, Mark D., 5,596,972, Cl. 123-520.000.

Food Guardian Limited: *See*—
Colley, Terence; Minter, Stephen; and Carnie, John, 5,597,238, Cl. 374-106.000.

Food Industry Research and Developenent Institute: *See*—
Lee, Yun-Huey; Chu, Wen-Shen; and Hsu, Wen-Hwei, 5,597,704, Cl. 435-25.000.

Foot, John T.: *See*—
Thompson, David; Foster, Alistair J.; Sokell, Steve; Foot, John T.; and Hoskinson, Brian, 5,597,047, Cl. 180-68.400.

Forbes, Charles E.: *See*—
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Forck, Glen F.: *See*—
Carter, Jeffrey J., Jr.; Cannon, Howard N.; Shively, Kirk S.; Forck, Glen F.; Nagarajan, Raj T.; and Meister, Steven F., 5,597,118, Cl. 239-92.000.

Ford, Brian D., to SmithKline Beecham p.l.c. 7,42-Bis(O-demethyl)rapamycin. 5,597,715, Cl. 435-118.000.

Ford Motor Company: *See*—
Gable, Patricia A.; Shrout, David J.; and Stone, Jeffrey A., 5,597,331, Cl. 439-754.000.

Hazen, David J., 5,596,960, Cl. 123-90.440.
Huls, Timothy A., 5,597,566, Cl. 464-119.000.
McCabe, Robert W.; Usmen, Rengin K.; and Gandhi, Harendra S., 5,597,772, Cl. 502-332.000.
Pham, Cuong V.; Hayden, Brian J.; Walles, Bethany J.; and Cibirka, Peter R., 5,598,096, Cl. 324-158.100.
Schindler, James H.; Haberstroh, Robert W.; and Hicks, John B., 5,597,173, Cl. 280-690.000.
Schoenberg, Gregory B.; Kim, Jeong Y.; and Brautigan, Jeffrey J., 5,596,970, Cl. 123-497.000.

Forest Engineering Research Institute of Canada: *See—*
McPhee, J. Brent; and Ewart, James M., 5,597,191, Cl. 294-82.140.

Fortner, Sharon A. Sectioned window cornice. 5,597,025, Cl. 160-38.000.

Forma, Joseph J.: *See—*
Bond, Malcolm; Engle, Gary; Forma, Joseph J.; and Naumann, Theodore F., 5,597,373, Cl. 482-4.000.

Formica Technology, Inc.: *See—*
Laurence, Kenneth J.; and Broussard, Michel J., 5,596,912, Cl. 76-107.100.

Foss, William C.: *See—*
Dyble, Bertie J.; Dyson, Robert W., deceased; and Foss, William C., 5,597,433, Cl. 156-203.000.

Foster, Alistair J.: *See—*
Thompson, David; Foster, Alistair J.; Sokell, Steve; Foot, John T.; and Hoskinson, Brian, 5,597,047, Cl. 180-68.400.

Foster-Miller, Inc.: *See—*
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Foster, Paul A.: *See—*
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Foster Wheeler Energy Corporation: *See—*
Tang, John T., 5,597,541, Cl. 423-244.010.

Fotouhi, Bahram; and Ghaderi, Mir B., to Sierra Semiconductor Corporation. Error free data transfers. 5,598,552, Cl. 395-494.000.

Foux, Boris: *See—*
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Bolotovskaya, Marina; and Starostetskaya, Nelli, 5,597,700, Cl. 435-7.920.

Fradin, Armel: *See—*
Brion, Jean-Daniel; Chollet, Anne-Marie; Demuynck, Luc; De Mooterby, Lucy; Rolland, Yves; Bonnet, Jacqueline; Ghezzi, Pietro; and Fradin, Armel, 5,597,819, Cl. 514-225.200.

France, Gordon: *See—*
Chauhan, Sushil; France, Gordon; and Buehler, John, 5,597,844, Cl. 514-400.000.

France Telecom: *See—*
Crespel, Daniel; and Louboutin, Jean-Pierre, 5,598,500, Cl. 385-139.000.

Franetzki, Manfred; Guenther, Werner; and Ploetz, Josef, to Siemens Aktiengesellschaft. X-ray diagnostics installation. 5,598,454, Cl. 378-206.000.

Frank, A. Richard: *See—*
Rush, Stephen M.; Klecker, Brian D.; and Frank, A. Richard, 5,597,057, Cl. 192-46.000.

Frankes, Joachim: *See—*
Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Frankes, Joachim; and Halm, Hans, 5,597,253, Cl. 401-98.000.

Franklin, Thomas L. Poker game where players are given two chances at receiving replacement cards. 5,597,162, Cl. 273-292.000.

Franzen, Larry H.: *See—*
Baker, Thomas M.; Codina, George; and Franzen, Larry H., 5,598,090, Cl. 322-3.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Hannbitzer, Günther; and Böke, Winfried, 5,597,473, Cl. 205-780.500.

Fredj, Abdennacour; Johnston, James P.; Labeque, Regine; and Thoen, Christiaan A., to Procter & Gamble Company, The. Detergent compositions inhibiting dye transfer. 5,597,795, Cl. 510-528.000.

Freed, Brian S.: *See—*
Tegeler, John J.; Rauckman, Barbara S.; Harner, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,597,838, Cl. 514-357.000.

Freed, Ellen; and Ruggieri, Rosamaria, to Onyx Pharmaceuticals, Inc. Interaction of RAF-1 and 14-3-3 proteins. 5,597,719, Cl. 435-194.000.

Freedenberg, Philip J. Cue game training apparatus. 5,597,360, Cl. 473-2.000.

Frees, Gregory M.; and Sasaki, Masakazu, to International Business Machines Corporation. Damping post for reducing acoustic noise in a disk drive. 5,598,306, Cl. 360-97.020.

Freezing Machines, Inc.: *See—*
Roth, Eldon, 5,597,352, Cl. 452-138.000.

Freidin, Philip M.: *See—*
Erickson, Charles R.; Freidin, Philip M.; and Wilkie, William A., 5,598,424, Cl. 371-48.000.

Freund, Peter W.: *See—*
Hanson, Jay L.; Nixon, James E.; Hoium, Stanley O.; and Freund, Peter W., 5,596,878, Cl. 62-160.000.

Frey, Gregg W., to General Electric Company. Bilayer ultrasonic transducer having reduced total electrical impedance. 5,598,051, Cl. 310-334.000.

Fricke, Andreas; and Luxem, Heiner, to Heidelberger Druckmaschinen AG. Device for register correction and for compensating for distorted sheets in a feeder of a sheet-fed rotary printing press. 5,596,929, Cl. 101-410.000.

Fridlin, Charles C., IV: *See—*
Blackwell, Steven R.; Pearson, John T.; and Fridlin, Charles C., IV, 5,598,401, Cl. 379-94.000.

Friesen, Wolfram: *See—*
Schoen, Horst; Heyer, Horst W.; and Friesen, Wolfram, 5,597,612, Cl. 427-152.000.

Frisch, Robert C., to Mercury Computer Systems, Inc. Multicomputer memory access architecture. 5,598,568, Cl. 395-800.000.

Fritzsche, Helmut; Ovshinsky, Stanford R.; and Young, Rosa, to Energy Conversion Devices, Inc. Method of forming a single crystal material. 5,597,411, Cl. 117-104.000.

Fritzsche, Katharina, to Ciba-Geigy Corporation. Process for fixation of dyes containing at least one polymerizable double bond by means of UV light. 5,597,388, Cl. 8-444.000.

Frohnhaus, Ernst-Reiner: *See—*
Bauer, Heinz; Becker, Burckhard; Frohnhaus, Ernst-Reiner; and Karthaus, Ulrich, 5,596,910, Cl. 74-526.000.

Frommelt, Uwe: *See—*
Becker, Rudolf; Willim, Hans-Dieter; and Frommelt, Uwe, 5,597,078, Cl. 212-231.000.

Frommherz, Harald; Leuthold, Albert; and Weider, Marc, to Bachofen, Willy A. Stirred ball mill. 5,597,126, Cl. 241-172.000.

Frontec Incorporated: *See—*
Hebiguchi, Hiroyuki, 5,598,012, Cl. 257-59.000.

Fruchtmann, Romanis: *See—*
Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romanis; Möller-Peddinghaus, Reiner; and Hatzelmann, Armin, 5,597,833, Cl. 514-312.000.

Fuchigami, Norihito: *See—*
Tanaka, Yoshiaki; Hayashi, Hiroshi; Fuchigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, 5,598,478, Cl. 381-17.000.

Fuentes, Luis C.; Gonzalez, Niurka E.; and Gonzalez, Pedro R. Vertical blind assembly. 5,597,026, Cl. 160-115.000.

Fuisz, Richard C.; Battist, Gerald E.; and Myers, Garry L., to Fuisz Technologies Ltd. Method of making crystalline sugar and products resulting therefrom. 5,597,416, Cl. 127-30.000.

Fuisz, Richard C., to Fuisz Technologies Ltd. Saccharide-based matrix incorporating maltodextrin and process for making. 5,597,608, Cl. 426-658.000.

Fuisz Technologies Ltd.: *See—*
Fuisz, Richard C.; Battist, Gerald E.; and Myers, Garry L., 5,597,416, Cl. 127-30.000.
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Fuji Electric Co., Ltd.: *See—*
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Fuji Jukogyo Kabushiki Kaisha: *See—*
Ogawa, Ryuichi, 5,597,269, Cl. 407-54.000.

Fuji Oil Company, Limited: *See—*
Samoto, Masahiko; Akasaka, Takeshi; and Mori, Hiroyuki, 5,597,607, Cl. 426-656.000.

Fuji Oozx Inc.: *See—*
Kenmoku, Takeji; Hamada, Akihiro; and Umino, Shinichi, 5,596,959, Cl. 123-90.330.

Fuji Photo Film Co., Ltd.: *See—*
Dan, Shigeyuki; and Nakayama, Takao, 5,597,671, Cl. 430-49.000.
Ishii, Yoshio; Mihayashi, Keiji; and Morigaki, Masakazu, 5,597,682, Cl. 430-533.000.
Kato, Eiichi, 5,597,672, Cl. 430-49.000.
Kaya, Akimasa, 5,597,131, Cl. 242-532.400.
Saito, Shinji; and Yamazaki, Nobuo, 5,597,638, Cl. 428-141.000.
Uchida, Minoru; Tomita, Shunichi; and Kawagishi, Toshio, 5,597,683, Cl. 430-544.000.
Yoshioka, Yasuhiro, 5,597,679, Cl. 430-503.000.

Fuji Photo Optical Co., Ltd.: *See—*
Inoue, Kiyoshi, 5,598,218, Cl. 348-443.000.
Kobayashi, Hideo, 5,597,224, Cl. 362-16.000.
Tanaka, Toshizumi, 5,596,991, Cl. 128-662.060.

Fuji Xerox Co., Ltd.: *See—*
Okamoto, Toru; and Hirakata, Susumu, 5,598,195, Cl. 347-55.000.
Saito, Kazuo, 5,598,518, Cl. 395-793.000.
Suzuki, Kazuhiro; Kamizawa, Koh; Koshi, Yutaka; and Kunitake, Setsu, 5,598,484, Cl. 382-239.000.

Fujicopian Co., Ltd.: *See—*
Suematsu, Hideki; Ikemoto, Manabu; and Kameda, Yuriko, 5,597,641, Cl. 428-195.000.

Fujii, Yasuhito: *See—*
Ohtani, Mitsuaki; Matsutani, Shigeru; Yoshida, Tadashi; Tanaka, Kazushige; Fujii, Yasuhito; and Shirahase, Kazuhiro, 5,597,943, Cl. 560-42.000.

Fujii, Yoshiharu; Yoshida, Toshihiko; and Kitahara, Hiroaki, to International Business Machines Corporation. Short circuit line having a conductive extension between groups of terminals in a liquid crystal display device. 5,598,283, Cl. 349-143.000.

Fujikoki MFG. Co., Ltd.: *See—*
Watanabe, Kazuhiko; Shinohara, Kota; and Ikoma, Tetsurou, 5,597,117, Cl. 236-92.00B.

Fujimori, Yasuhiro: *See—*
Kondo, Tetsujiro; Fujimori, Yasuhiro; and Nishikata, Takeharu, 5,598,214, Cl. 348-414.000.

Fujimoto, George: *See—*
Groover, Richard L.; Shu, William K.; Lee, Sang S.; and Fujimoto, George, 5,598,031, Cl. 257-668.000.

Fujimoto, Ryo: *See—*
Ogura, Tokihiko; and Fujimoto, Ryo, 5,598,274, Cl. 386-13.000.

Fujisawa, Yoshikazu: *See—*
Gunji, Takahiro; Fujisawa, Yoshikazu; Tabata, Masamune; and Okamoto, Kazuhisa, 5,597,657, Cl. 428-680.000.

Fujita, Katsuji: *See—*
Imai, Shin-ichi; and Fujita, Katsuji, 5,598,030, Cl. 257-666.000.

Fujita, Yoshio: *See—*
Nakamura, Kimitsugu; Fujita, Yoshio; and Ohishi, Keiichi, 5,598,061, Cl. 313-532.000.

Fujita, Yosuke, to Panasonic Technologies, Inc. Method and system for displayed menu activation using a matching distinctive arrangement of keypad actuators. 5,598,523, Cl. 395-352.000.

Fujitsu Limited: *See—*
Chinzei, Kiyoshi, 5,597,152, Cl. 270-39.050.
Grilletto, Carlo; and Love, David G., 5,597,412, Cl. 118-50.000.
Hakogi, Hironao; and Yamane, Takashi, 5,598,490, Cl. 385-14.000.
Hatta, Masahiro, 5,598,578, Cl. 395-835.000.
Inatomi, Masayuki, 5,598,522, Cl. 395-352.000.
Izumi, Haruhiko; and Taguchi, Masakazu, 5,598,392, Cl. 369-59.000.
Kaku, Takashi; and Hirao, Kyoko, 5,598,433, Cl. 375-230.000.
Kaku, Takashi; Okita, Ryoji; and Miyazawa, Hideo, 5,598,434, Cl. 375-230.000.
Kawanishi, Yuichi; Gojobori, Takashi; Tateno, Yoshio; Ikeo, Kazuho; and Kawai, Masahito, 5,598,350, Cl. 364-496.000.
Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,598,528, Cl. 395-182.050.
Nagae, Takaaki, 5,598,530, Cl. 395-182.190.
Ohshima, Toshiharu, 5,598,544, Cl. 398-380.000.
Siratori, Sigeru, 5,598,465, Cl. 379-266.000.
Uchida, Toshiya, 5,598,363, Cl. 365-63.000.
Watanabe, Shigeki, 5,598,289, Cl. 359-173.000.
Yoshinaga, Toru; and Shinjo, Naoki, 5,598,574, Cl. 395-800.000.

Fujiwara, Takashi: *See—*
Furumoto, Goro; Fujiwara, Takashi; and Igarashi, Tsuneo, 5,597,631, Cl. 428-364.000.

Fukanuma, Tetsuhiko: *See—*
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Fukaya, Masashi: *See—*
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Fukuda, Kumio: *See—*
Inoue, Masatsugu; Fukuda, Kumio; Akoh, Nobuhiko; Takahashi, Tohru; and Shimizu, Norio, 5,598,055, Cl. 313-440.000.

Fukumoto, Tomiyoshi: *See—*
Ide, Yuji; Takashima, Kazuhiro; Morohoshi, Toshihiro; and Fukumoto, Tomiyoshi, 5,598,187, Cl. 345-158.000.

Fukuro, Toshihiro, to Hitachi Denshi Kabushiki Kaisha. Television camera apparatus with device for preventing condensation of water vapor on surface of image pick-up element. 5,598,211, Cl. 348-374.000.

Fukuta, Junzo: *See—*
Araki, Hideaki; Fukuta, Junzo; and Fukaya, Masashi, 5,597,644, Cl. 428-210.000.

Fukutani, Hideshi: *See—*
Sakuragi, Katsunori; and Fukutani, Hideshi, 5,598,047, Cl. 310-67.00R.

Fukutomi, Norihisa: *See—*
Munezane, Tsuyoshi; Fukutomi, Norihisa; and Matsumoto, Osamu, 5,597,121, Cl. 239-408.000.

Fulcher, Carol A.: *See—*
Zimmerman, Theodore S.; Foster, Paul A.; and Fulcher, Carol A., 5,597,711, Cl. 435-69.600.

Funaki, Hiroshi, to NEC Corporation. Optimizing compiler which generates multiple instruction streams to be executed in parallel. 5,598,561, Cl. 395-706.000.

Funk, Dieter; Brans, Dieter; Wenning, Rolf; Brans, Walter; and Pilz, Joachim, to Flachglas Aktiengesellschaft. Transfer device for bent glass sheets. 5,597,397, Cl. 65-171.000.

Furman, Alla: *See—*
Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,597,514, Cl. 252-390.000.

Furno, Rino: *See—*
Bud, Andrew; and Furno, Rino, 5,598,407, Cl. 370-330.000.

Furukawa Electric Co., Ltd., The: *See—*
Ozaki, Masanori; and Mashimo, Keiji, 5,597,064, Cl. 200-269.000.

Furumoto, Goro; Fujiwara, Takashi; and Igarashi, Tsuneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Prepreg, composite molding body, and method of manufacture of the composite molded body. 5,597,631, Cl. 428-364.000.

Furuno, Takeshi: *See—*
Takahashi, Masahito; Odagiri, Michiko; Furuno, Takeshi; Furusawa, Kazunori; and Wada, Masashi, 5,598,368, Cl. 365-185.010.

Furusawa, Haruki: *See—*
Taniguchi, Hiroyasu; Furusawa, Haruki; Hatakenaka, Jun; and Seki, Akinobu, 5,598,338, Cl. 364-436.000.

Furusawa, Kazunori: *See—*
Takahashi, Masahito; Odagiri, Michiko; Furuno, Takeshi; Furusawa, Kazunori; and Wada, Masashi, 5,598,368, Cl. 365-185.010.

Furuya, Miki; Ezaki, Tadashi; Kori, Teruhiko; and Tsuchiya, Satoshi, to Sony Corporation. Data extracting apparatus for validating data multiplexed in a video signal. 5,598,219, Cl. 348-465.000.

Fuse, Kenji, to Murata Manufacturing Co., Ltd. Ladder filter containing piezoresonator with conductive elastic sheet. 5,598,133, Cl. 333-189.000.

Fusegawa, Kazuhiro: *See—*
Kamiyama, Eiji; Fusegawa, Kazuhiro; and Toyama, Noaho, 5,597,744, Cl. 437-40.000.

Futakawa, Masayasu: *See—*
Tanikoshi, Koichiro; Tani, Masayuki; Yamaashi, Kimiya; Uchigasaki, Harumi; Futakawa, Masayasu; Horita, Masato; Kuzunoki, Shoshiro; Nishikawa, Atsuhiko; and Maruyama, Takekazu, 5,598,572, Cl. 395-800.000.

Fyfe, Edward R., to Hexcel-Fyfe Co., L.L.C. Structural bearing. 5,597,240, Cl. 384-36.000.

G.E.T. Australia Pty Ltd.: *See—*
Peterson, Louis G., 5,597,260, Cl. 403-319.000.

G. Siempelkamp GmbH & Co.: *See—*
Gerhardt, Klaus, 5,596,924, Cl. 100-930.0RP.

Gable, Patricia A.; Shroat, David J.; and Stone, Jeffrey A., to Ford Motor Company. Battery connector for an automotive electrical system. 5,597,331, Cl. 439-754.000.

Gadkaree, Kishor P.: *See—*
DeLiso, Evelyn M.; Gadkaree, Kishor P.; Mach, Joseph F.; and Streicher, Kevin P., 5,597,617, Cl. 427-228.000.

Gal, Izhak: *See—*
Gorney, Moshe; and Gal, Izhak, 5,597,119, Cl. 239-241.000.

Galarneau, Lynn; and Rogers, Daniel J., to Honeywell Inc. Scale-up process for replicating large area diffractive optical elements. 5,597,613, Cl. 427-162.000.

Galbi, David E.: *See—*
Purcell, Stephen C.; Galbi, David E.; Liao, Frank H.; and The, Yvonne C., 5,598,483, Cl. 382-232.000.

Galguera Dominguez, Manuel A.: *See—*
Huergo, Concepción C.; Sierra Gonzáñez, Victoriano G.; Gutiérrez Vazquez, Maria M.; Bisset Jorrin, Gonzalo; Garcia Imia, Luis G.; de la Caridad Puentes Rizo, Gisela; del Carmen Sampedro Herrera, Maria; Sotolongo Padrón, Franklin; Le Riverend Morales, Eloisa X.; and Galguera Dominguez, Manuel A., 5,597,572, Cl. 424-197.910.

Gali, Carl E.: *See—*
Hall, Richard Z.; and Gali, Carl E., 5,596,974, Cl. 123-620.000.

Gallagher, Dennis M.; and Nobile, John R., to Pitney Bowes Inc. Method for preventing jams in a tape ejecting apparatus. 5,596,916, Cl. 83-23.000.

Gallagher, Kevin F.: *See—*
Pereira, Abel G.; Gallagher, Kevin F.; Abend, Phillip G.; and Carson, John C., Jr., 5,597,555, Cl. 424-59.000.

Gallo, Bruce M. Method and apparatus for the in-situ treatment of contamination in soil. 5,597,265, Cl. 405-128.000.

Gallup, David F.: *See—*
Gregory, Christian T.; Noles, David R.; Gallup, David F.; and Heller, David H., 5,597,200, Cl. 297-180.130.

Gallup, Michael G.; Golze, L. Rodney; and Seaton, Robert W., Jr., to Motorola Inc. Data processor for conditionally modifying extension bits in response to data processing instruction execution. 5,598,571, Cl. 395-8.000.

Galvelpor SA: *See—*
Lagadec, Jean, 5,596,951, Cl. 119-525.000.

Gandhi, Harendra S.: *See—*
McCabe, Robert W.; Usmen, Rengin K.; and Gandhi, Harendra S., 5,597,772, Cl. 502-332.000.

Gänger, Jörg: *See—*
Sass, Ingo; Bayer, Hans-Joachim; Kleiser, Klaus; and Gänger, Jörg, 5,597,045, Cl. 175-62.000.

Gant, Floyd B., Jr.: *See—*
Burkhart, Larry J.; Gant, Floyd B., Jr.; Shearer, Kenneth W.; and Singer, Mark D., 5,596,879, Cl. 62-296.000.

Ganzel, Blaise J. Vehicle roll control apparatus. 5,597,180, Cl. 280-772.000.

Garay, Juan A.; and Perry, Kenneth J., to International Business Machines Corporation. Computer system resilient to a wide class of failures. 5,598,529, Cl. 395-182.090.

Garbe, James R.: *See—*
Paucucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Garcia, Joseph A.: *See—*
Gaynor, Richard B.; Garcia, Joseph A.; and Harrich, David, 5,597,895, Cl. 530-324.000.

Garcia Imia, Luis G.: *See—*
Huergo, Concepción C.; Sierra Gonzáñez, Victoriano G.; Gutiérrez Vazquez, Maria M.; Bisset Jorrin, Gonzalo; Garcia Imia, Luis G.; de la Caridad Puentes Rizo, Gisela; del Carmen Sampedro Herrera, Maria; Sotolongo Padrón, Franklin; Le Riverend Morales, Eloisa X.; and Galguera Dominguez, Manuel A., 5,597,572, Cl. 424-197.910.

Garrett, Peter R.; and Giles, Dennis, to Lever Brothers Company, Division of Conopco, Inc. Microemulsion detergent composition containing specific ethoxylated alcohol based surfactant system. 5,597,507, Cl. 510-340.000.

Gaskins, Paul M., to Stanley Corporation. Battery charging system for electrically powered vehicle. 5,598,083, Cl. 320-2.000.

Gates Corporation, The: *See—*

Barnes, Roger P.; and Johnston, Jonathan A., 5,597,235, Cl. 366-76.600.

Gaultier, Philippe: *See*—
Debrus, Marie-Hélène; Gaultier, Philippe; and Vouillon, Patrick, 5,598,527, Cl. 345-173.000.

Gauteria, Frank: *See*—
Dodt, Thomas; Gauteria, Frank; Schulze, Thomas; Roik, Geert; and Huinink, Heinrich, 5,598,479, Cl. 381-71.000.

Gawlak, Susan L.: *See*—
Siegall, Clay B.; Gawlak, Susan L.; and Marquardt, Hans, 5,597,569, Cl. 424-183.100.

Gaynor, Richard B.; Garcia, Joseph A.; and Harrich, David, to Board of Regents, University of Texas System. Transdominant tat mutants and uses thereof. 5,597,895, Cl. 530-324.000.

Gebauer, Andreas; Lindner, Joachim; Schierling, Bernhard; Stockmann, Bernd; and Sudau, Jörg, to Fichtel & Sachs AG. Flywheel assembly for a motor vehicle, the flywheel assembly having a gap seal. 5,597,059, Cl. 192-70.120.

Gega Corporation: *See*—
Lotz, Horst K.; and Lotz, Mattias, 5,597,030, Cl. 164-263.000.

Gell, Harold A.: *See*—
Haralambopoulos, Constantine; and Hara, Alexandra, 5,598,233, Cl. 351-160.00H.

Gelner, Larry: *See*—
Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, 5,597,514, Cl. 252-390.000.

Gemplus Card International: *See*—
Fidalgo, Jean-Christophe, 5,598,032, Cl. 257-679.000.

Gen Tech Corp.: *See*—
Shashua, Amnon, 5,598,515, Cl. 395-122.000.

Gender, James R.; and January, Daniel B., to Hunter Engineering Company. Apparatus and method for calibrating vehicle wheel alignment instruments. 5,598,358, Cl. 364-571.010.

Genentech, Inc.: *See*—
Clark, Ross G., 5,597,797, Cl. 514-12.000.
Clark, Ross G.; Yeung, Douglas A.; and Oeswein, James Q., 5,597,802, Cl. 514-12.000.

General Electric Company: *See*—
Book, John E.; Grey, Delton A., Jr.; King, Christopher G.; and Mantone, Antony, 5,597,423, Cl. 148-98.000.
Dawson, John; and Patrikus, John J., 5,597,286, Cl. 415-115.000.
Desautels, John T.; Bayer, Timothy J.; and Mora, Juan R., 5,597,435, Cl. 156-245.000.
Frey, Gregg W., 5,598,051, Cl. 310-334.000.
Joshi, Narendra D.; and Koshoffer, John M., 5,596,873, Cl. 60-738.000.
King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; and Dardaris, David M., 5,597,887, Cl. 528-196.000.
Lambert, Joe C., 5,598,072, Cl. 318-376.000.
Mathews, Paul G.; and Hassink, Martin N., 5,598,063, Cl. 313-623.000.
Proebstle, Richard A.; and Matzner, Bruce, 5,598,450, Cl. 376-435.000.
Riner, Ann M.; Jackson, Melvin R.; and Hughes, John R., 5,597,967, Cl. 75-249.000.

General Instrument Corporation of Delaware: *See*—
Nuber, Ray; and Moroney, Paul, 5,598,415, Cl. 370-474.000.

General Motors Corporation: *See*—
Elder, Jack E., 5,596,966, Cl. 123-337.000.
Sultan, Myrna C.; Folkerts, Charles H.; Matthews, Gregory P.; and Knutson, Mark D., 5,596,972, Cl. 123-520.000.

Genetics Institute, Inc.: *See*—
Roa, Eyal; Turek, Thomas J.; Isaacs, Benjamin S.; Patel, Himakshi; and Kenley, Richard A., 5,597,897, Cl. 530-350.000.

Genova, Calogero; Buoni, Francesco; and Guarnerio, Sandra, to Enichem Augusta Industriale S.r.l. Oil-based transparent gels. 5,597,576, Cl. 424-401.000.

Gensho, Toshio: *See*—
Itoh, Humitaka; Makino, Toru; Katoh, Masayasu; and Gensho, Toshio, 5,597,786, Cl. 508-506.000.

Gentilman, Richard L.: *See*—
Bowen, Leslie J.; and Gentilman, Richard L., 5,598,050, Cl. 310-322.000.

Gentry, Barbara J.: *See*—
Gentry, Paul E.; and Gentry, Barbara J., 5,596,841, Cl. 49-35.000.

Gentry, Paul E.; and Gentry, Barbara J. Mailbox with signal device. 5,596,841, Cl. 49-35.000.

Genz, Manfred: *See*—
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teoh, Helmut; Minges, Roland; and Steu, Joachim, 5,597,942, Cl. 560-25.000.

Georg Fischer Giessereianlagen AG: *See*—
Weimann, Wendelin, 5,597,031, Cl. 164-270.100.

George, Nelson A.: *See*—
Zingle, Ralph D.; and George, Nelson A., 5,596,814, Cl. 34-296.000.

George, Stephen G.: *See*—
Smart, Graeme M.; Hayes, Michael P.; and George, Stephen G., 5,597,963, Cl. 73-861.650.

Gephardt, Douglas D.; and Swanstrom, Scott, to Advanced Micro Devices, Inc. Apparatus and method for achieving hot docking capabilities for a dockable computer system. 5,598,539, Cl. 395-281.000.

Gephardt, Douglas D.: *See*—
Swanstrom, Scott; and Gephardt, Douglas D., 5,598,537, Cl. 395-281.000.

Geraghty, Maureen E.: *See*—
DeWille, Normanella T.; Chandler, Michael A.; Mazer, Terrence B.; Ragan, Robert J.; Snowden, Gregory A.; Geraghty, Maureen E.; and Johnson, Catherine D., 5,597,595, Cl. 426-74.000.

Gerbasi, Dennis G.; Thayer, Bruce E.; and Lange, Clark V., to Xerox Corporation. Slow brush rotation in standby to avoid brush flat spots. 5,597,419, Cl. 134-6.000.

Gerber Garment Technology, Inc.: *See*—
Gerber, H. Joseph; and Kuchta, Richard, 5,596,917, Cl. 83-152.000.

Gerber, H. Joseph; and Kuchta, Richard, to Gerber Garment Technology, Inc. Apparatus for conveying and cutting sheet material on a vacuum bed with system for sealing end portions of the bed. 5,596,917, Cl. 83-152.000.

Gerber, Liza. Method and apparatus for hair styling. 5,597,000, Cl. 132-279.000.

Gerber Scientific Products, Inc.: *See*—
Peterson, Mary E. P., 5,598,202, Cl. 367-213.000.

Gerbrandt, Harold F. Swath turner. 5,596,868, Cl. 56-365.000.

Gerding, Thomas G.: *See*—
McGinity, James W.; Gerding, Thomas G.; and Bodmeier, Roland, 5,597,849, Cl. 514-648.000.

Gerhards, Hermann: *See*—
Breipohl, Gerhard; Henke, Stephan; Knolle, Jochen; Schölkens, Bernward; Alpermann, Hans-Georg; Gerhards, Hermann; and Wirth, Klaus, 5,597,803, Cl. 514-15.000.

Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Belt press for continuous manufacture of wood-product members. 5,596,924, Cl. 100-930.0RP.

Gernhardt, Gregory H.: *See*—
Snyder, James G.; and Gernhardt, Gregory H., 5,597,167, Cl. 277-53.000.

Gersbach, John E., to International Business Machines Corporation. Electrostatic discharge suppression circuit for integrated circuit chips. 5,598,313, Cl. 361-56.000.

Ghaderi, Mir B.: *See*—
Fotouhi, Bahram; and Ghaderi, Mir B., 5,598,552, Cl. 395-494.000.

Ghezzi, Pietro: *See*—
Brion, Jean-Daniel; Chollet, Anne-Marie; Demuynck, Luc; De Montarby, Lucy; Rolland, Yves; Bonnet, Jacqueline; Ghezzi, Pietro; and Fradin, Armel, 5,597,819, Cl. 514-225.200.

Ghosh, Atish; and Poncis, Jennifer B., to Advanced Micro Devices, Inc. Conditional wait state generator circuit. 5,598,556, Cl. 395-555.000.

Ghosh, Sankar, to Yale University. NF-κB activation regulatory protein, IκB-β. 5,597,898, Cl. 530-350.000.

Giampetro, Donald A.: *See*—
Chalupa, William F.; King, Alan H.; and Giampetro, Donald A., 5,597,604, Cl. 426-590.000.

Gibbs, Edward R. Automobile cover deployment and storage system. 5,597,196, Cl. 296-98.000.

Gicquel, Brigitte: *See*—
Gueadon, Jean-Luc; Thierry, Dominique; Ullmann, Agnès; Gicquel, Brigitte; and Brisson-Noel, Anne, 5,597,911, Cl. 536-24.320.

Gierenz, Gerhard: *See*—
Lepsius, Tilwin; Gierenz, Gerhard; Traselis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,597,253, Cl. 401-98.000.

Gigler, Gabor: *See*—
Szirt nee Kiselelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.

Giguere, Vincent: *See*—
Evans, Ronald M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,597,705, Cl. 435-69.100.

Giles, Dennis: *See*—
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Gilliland, Oscar; Vafaie, Foad; Hughes, Martin W.; Thurmond, Charlie R., III; and Tomes, Paul, to Delaware Capital Formation, Inc. Twin post, telescoping jack hydraulic elevator system. 5,597,987, Cl. 187-285.000.

Gilman, Paul B.: *See*—
Dobles, Thomas R.; DuMont, David A.; Gilman, Paul B.; Kim, Sang H.; Link, Steven G.; and Parton, Richard L., 5,597,687, Cl. 430-574.000.

Gilpin, David; Wright, George; and Bishay, Jon M., to Intermec Corporation. Replaceable trigger switch for battery operated device. 5,598,082, Cl. 320-2.000.

Gilton, Terry L., to Micron Technology, Inc. Method for etching semiconductor wafers. 5,597,444, Cl. 156-643.100.

Gindia, Lyuba K.: *See*—
Wicks, Douglas A.; Gindia, Lyuba K.; Yeske, Philip E.; and Jonsson, E. Hauksa, 5,597,930, Cl. 548-314.100.

Giordan, Judith C.: *See*—
Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., 5,597,406, Cl. 106-237.000.
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Girardeau, James W., Jr., to Motorola Inc. Method and apparatus for controlling a digital phase lock loop and within a cordless telephone. 5,598,448, Cl. 375-376.000.

Giroldini, William; Rinaldi, Antonio; Landoni, Gianluigi; and Carlo, Neri, to Enimicrocbe S.p.A. Poly(pentaerythrityl diphosphonate) and its use in self-extinguishing thermoplastic compositions. 5,597,855, Cl. 524-105.000.

Girten, Beverly E.; and Tuttle, Ronald R., to Houghten Pharmaceuticals. Use of a substituted 1,3-benzodioxole to reduce a wasting condition. 5,597,843, Cl. 514-376.000.

Gisler, Markus, to Sandoz Ltd. Disazo dyes containing 1-amino-8-hydroxynaphthalene-3,6-or 4,6-disulfonic acid biscoupling component radicals and 5-cyano-2, 4-or 4,6-dichloropyrimidyl fiber-reactive groups. 5,597,903, Cl. 534-637.000.

Gist-Brocades N.V.: *See*—
van Rijn, Ferdinand T. J.; Tan, Hong S.; and Warmerdam, Martinus J. M., 5,597,598, Cl. 426-310.000.

Gitkin, Merrill: *See*—
Simon, Terry; Gitkin, Merrill; and Sowa, Frank, 5,597,027, Cl. 160-168.100.

Gittinger, Andreas: *See*—
Nielinger, Werner; Gittinger, Andreas; Ostlinning, Edgar; Idel, Karsten-Josef; and Schulte, Helmut, 5,597,888, Cl. 528-335.000.

Gladden, Ernest L.; Thureson, Gary R.; Zappalorti, Alvaro; Davis, Eric R.; and Lucca, Frank J., to Ensign-Bickford Company, The. Signal transmission fuse. 5,597,973, Cl. 102-289.000.

Gladfelter, Elizabeth J.: *See*—
Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

Glamkowski, Edward J.; Chiang, Yulin; Strupczewski, Joseph T.; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., to Hoechst-Roussel Pharmaceuticals, Inc. 3-heteroaryl-1-pyrrolidinealkanols and derivatives thereof and their therapeutic utility. 5,597,842, Cl. 514-373.000.

Glance, Brad M.: *See*—
Glance, Patrick M.; and Glance, Brad M., 5,597,205, Cl. 297-362.140.

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Glas, Günther: *See*—
Hofmann, Heinrich; Glas, Günther; Langer, Roland; and Massiotis, Vasilis, 5,596,798, Cl. 29-724.000.

Glass, Robert: *See*—
Craig, George D.; Glass, Robert; and Rupp, Bernhard, 5,597,457, Cl. 204-165.000.

Glaxo Wellcome Inc.: *See*—
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,597,828, Cl. 514-275.000.

Globe Products Inc.: *See*—
Beakes, John M., 5,596,799, Cl. 29-733.000.

Gloor, René, to Zellweger Luwa AG. Method for the absolute measurement of the tearing strength of fibres. 5,596,901, Cl. 73-159.000.

Gocayne, Jeannine D.: *See*—
Rosen, Craig A.; Coleman, Timothy A.; Adams, Mark D.; and Gocayne, Jeannine D., 5,597,709, Cl. 435-69.400.

Gocht, Russell C.: *See*—
Slaughter, Frank G., III; Gocht, Russell C.; and McCool, David, 5,598,536, Cl. 395-200.160.

Goforthe, Ronald D.: *See*—
Thomas, David E.; Boczar, Fred A.; and Goforthe, Ronald D., 5,597,279, Cl. 411-432.000.

Gojobori, Takashi: *See*—
Kawanishi, Yuichi; Gojobori, Takashi; Tateno, Yoshio; Ikeo, Kazuho; and Kawai, Masahito, 5,598,350, Cl. 364-496.000.

Goke, L. Rodney: *See*—
Gallup, Michael G.; Goke, L. Rodney; and Seaton, Robert W., Jr., 5,598,571, Cl. 395-8.000.

Golab, James S.: *See*—
Shen, Gene W.; Golab, James S.; and Moyer, William C., 5,598,550, Cl. 395-473.000.

Gold Star Electron Co., Ltd.: *See*—
Kim, Hong S., 5,597,666, Cl. 430-5.000.

Golden, Randy. Bidirectional side dump trailer. 5,597,211, Cl. 298-17.600.

Goldfarb, David, to Scico, Inc. Blood oximeter. 5,596,986, Cl. 128-633.000.

Goldman, Julian M. Real-time waveform analysis using artificial neural networks. 5,598,508, Cl. 395-22.000.

Goldman, Shelley B.: *See*—
Foladare, Mark J.; Goldman, Shelley B.; Khan, Aslam Y.; Pan, Lyndon M.; Silverman, David P.; Tseo, Yao-Chung; and Weber, Roy Philip, 5,598,457, Cl. 379-57.000.

Goldstar Co., Ltd.: *See*—
Choi, Hoon B., 5,598,203, Cl. 347-250.000.
Kim, Sang W.; Kim, Seung H.; and Won, Chi S., 5,598,277, Cl. 386-116.000.
Lee, Chang Y., 5,598,319, Cl. 361-684.000.
Oh, Eui Y., 5,598,011, Cl. 257-57.000.

Goldstein, David B.: *See*—
Haines, Timothy G.; and Goldstein, David B., 5,597,379, Cl. 606-80.000.

Goldston, Mark R.; Bemis, Jon; and Pelsue, David, to L.A. Gear, Inc. Replaceable shoe heel spring and stabilizer. 5,596,819, Cl. 36-35.00R.

Golovin, Milton N.: *See*—
Isaacson, Mark J.; and Golovin, Milton N., 5,597,662, Cl. 429-192.000.

Gonzalez, Niurka E.: *See*—
Fuentes, Luis C.; Gonzalez, Niurka E.; and Gonzalez, Pedro R., 5,597,026, Cl. 160-115.000.

Gonzalez, Pedro R.: *See*—
Fuentes, Luis C.; Gonzalez, Niurka E.; and Gonzalez, Pedro R., 5,597,026, Cl. 160-115.000.

Goody, Steven H.: *See*—
Albrecht, Alan; Goody, Steven H.; Spratt, Michael P.; Curcio, Joseph A., Jr.; and Dove, Daniel J., 5,598,406, Cl. 370-296.000.

Goossen, Henri: *See*—
Bogaerts, Constant; Van Eichelpoel, Eric; Goossen, Henri; Van Goethem, Luc; and Van Aken, Luc, 5,597,259, Cl. 403-263.000.

Gore, David W. Method and apparatus for producing a discrete droplet of high temperature liquid. 5,598,200, Cl. 347-88.000.

Goren, Avner: *See*—
Adelman, Judah L.; Marino, Paul; Goren, Avner; and Hillman, Garth, 5,598,362, Cl. 364-736.000.

Gorney, Moshe; and Gal, Izhak, to Naan Irrigation Systems. Rotating sprinkler having magnetic coupling elements for transmitting motion. 5,597,119, Cl. 239-241.000.

Göser, Hubert; Harbecke, Detlef; and Wille, Helmut, to Continental Aktiengesellschaft. Toothed belt having an end attachment part. 5,597,368, Cl. 474-204.000.

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Scarsello, John F.; Keller, Peter B.; and Harrison, Richard W., 5,598,152, Cl. 340-850.000.
Harry, David W., III. Sewage effluent disposal system having sparger in holding tank. 5,597,477, Cl. 210-86.000.
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Hartmann, Matthew G. Ventilated shelf liners and attachment means therefor. 5,597,077, Cl. 211-134.000.
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Hartwig, Jürgen: *See*—
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Harwood, H. James; and Jolly, Steven W., to University of Akron. Process to improve chemical and oxidative stability of hydrogenated polymers. 5,597,875, Cl. 525-332.800.
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Hasegawa, Takanori, to Riso Kagaku Corporation. Method and device for pressure type stencil printing. 5,596,925, Cl. 101-127.100.
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Hastings, Calvin R.; Hauser, Ernest M.; and Miller, Robert C., to Caldon, Inc. Apparatus for determining fluid flow. 5,597,962, Cl. 73-861.290.
Hatachi American, Ltd.: *See*—
Lane, Frank A., 5,598,222, Cl. 348-568.000.
Hatagishi, Yuji, to Yazaki Corporation. Pressure-contact connector. 5,597,330, Cl. 439-752.000.
Hatakeyama, Jun: *See*—
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Hatakeyama, Kazuhiro: *See*—
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Hatakeyama, Toshiya: *See*—
Akita, Noboru; Hatakeyama, Toshiya; Shimada, Takashi; and Iwata, Keiichi, 5,597,540, Cl. 423-241.000.
Hatanaka, Miyoshi. Screw type water flow generating apparatus. 5,597,288, Cl. 415-182.100.
Hatayama, Katsuo: *See*—
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Hatch, Steven C.: *See*—
Burton, Joseph D.; Vuyk, Stephen P.; and Hatch, Steven C., 5,597,256, Cl. 402-4.000.
Hatta, Masahiro, to Fujitsu Limited. Data processing system having event word handling facility which can send event word of higher significance without failure. 5,598,578, Cl. 395-835.000.
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Hauni Maschinenbau AG: *See*—
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Hausch, Gail W.; and Thames, Donald, to Norton Chemical Process Products Corporation. Distributor trough junctions. 5,597,655, Cl. 428-595.000.
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Hausman, Richard J.: *See*—
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Havlovitz, Paul M., to Republic Tool & Mfg. Corp. Collapsible drop spreader. 5,597,092, Cl. 222-45.000.
Hawe Neos Dental Dr H.v. Weissenfluh AG: *See*—
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Hawkins & Loridas, Inc.: *See*—
Hawkins, Roger S.; and Loridas, Christopher N., 5,597,392, Cl. 55-274.000.
Hawkins, Roger S.; and Loridas, Christopher N., to Hawkins & Loridas, Inc. Register filter. 5,597,392, Cl. 55-274.000.
Hayakawa, Shingo, to Canon Kabushiki Kaisha. Photographic lens having image stabilizing function. 5,598,299, Cl. 359-557.000.
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Hayashi, Kunio: *See*—
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Hayashi, Masaki; Miya, Kazuyuki; and Kato, Osamu, to Matsushita Elecaric Industrial Co., Ltd. Transmission diversity for a CDMA/TDD mobile telecommunication system. 5,598,404, Cl. 370-342.000.
Hayashi, Masayuki: *See*—
Ishii, Rie; Hayashi, Masayuki; Yamakawa, Takeshi; and Takahashi, Hiroyuki, 5,598,279, Cl. 358-402.000.
Hayashi, Seita, to Kabushiki Kaisha Komatsu Seisakusho. Coupling joint for an operative lever apparatus. 5,597,261, Cl. 403-354.000.
Hayashi, Sigehiko: *See*—
Noguchi, Toru; Goto, Kazuo; Hayashi, Sigehiko; Kawahara, Masahito; Murakami, Susumu; Yamaguchi, Yoshio; and Deki, Shigehito, 5,597,614, Cl. 427-162.000.
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Hayes, Michael P.: *See*—
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Haygood, James G.; and Calloway, Jeffrey T., to Haygood, James G. Batting practice device. 5,597,159, Cl. 473-424.000.
Hazen, David J., to Ford Motor Company. Internal combustion engine. 5,596,960, Cl. 123-90.440.
Hearn, Dennis; and Hickey, Thomas P., to Chemical Research & Licensing Company. Gasoline desulfurization process. 5,597,476, Cl. 208-208.00R.
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Sherman, Marshall L.; Castellano, Thomas M.; and Moya, José J., 5,596,995, Cl. 128-736.000.
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Heath, Warren J.: *See*—
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Hebiguchi, Hiroyuki, to Prosnec Incorporated. Thin-film transistor with wide gate electrode and liquid crystal display incorporating same. 5,598,012, Cl. 257-59.000.
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Kusch, Hans-Jürgen; Ruf, Bernd; and Stellberger, Rudi, 5,596,919, Cl. 83-507.000.
Marmin, Jean-Claude; and Bastard, Joel, 5,596,928, Cl. 101-378.000.
Rössler, Georg; and Wagensommer, Bernhard, 5,596,931, Cl. 101-484.000.
Heiji, Anders; Olsson, Jonny; and Rootzén, Holger. Method and an apparatus for testing a subject's response to visual stimuli. 5,598,235, Cl. 351-224.000.
Heim, Barry B.; and Colbert, Freeman D., to Motorola, Inc. Method for forming an electrostatic discharge protection device. 5,597,758, Cl. 437-60.000.
Heimann Optoelectronics GmbH: *See*—
Schieferdecker, Joerg; and Voelklein, Friedemann, 5,597,957, Cl. 73-755.000.
Hein, Soeren, to Siemens Aktiengesellschaft. Method for the fast decoding of the output signals of sigma delta modulators. 5,598,159, Cl. 341-143.000.
Heine, Gunter K.: *See*—
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Heintzeman, Michael G. Table saw tenonizer jig. 5,597,023, Cl. 144-204.200.
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Hellier, Robert: *See*—
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Hellstrom, Karl E.: *See*—
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Helmick, Richard L., to United States of America, Navy. Rotary compressor with pulsation minimizing discharge. 5,597,287, Cl. 415-119.000.
Hempel, Eugene O., to Texas Instruments Incorporated. Method and system for chemical mechanical polishing of semiconductor wafer. 5,597,443, Cl. 156-636.100.
Hempel, Eugene O., Jr., to Texas Instruments Incorporated. Method and apparatus for holding a semiconductor wafer during a chemical mechanical polish (CMP) process. 5,597,346, Cl. 451-287.000.
Henderson, Pamela D. Method of coloring crystalline material. 5,597,596, Cl. 426-242.000.
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Henkel Corporation: *See*—
Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., 5,597,406, Cl. 106-237.000.
Fischer, Stephen A.; Arora, Kartar S.; Grinstein, Reuben; McCurry, Patrick M., Jr.; and Giordan, Judith C., 5,597,407, Cl. 106-237.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
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Klein, Johann; Daute, Peter; Hees, Udo; and Beuer, Bernd, 5,597,934, Cl. 534-26.000.
Lepsius, Tilwin; Gierenz, Gerhard; Tranelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Hahn, Hans, 5,597,253, Cl. 401-98.000.
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Henty, David L. Method for microwave processing of high temperature superconductors. 5,597,782, Cl. 505-480.000.
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Herman Miller, Inc.: *See*—
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Herms, James K.; and Markowitz, Kenneth J., to Block Drug Company Inc. Dentinal desensitizing compositions. 5,597,552, Cl. 424-49.000.
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Herzberg, Carol E., to Minnesota Mining and Manufacturing Company. Method of making multilayer nonwoven thermal insulating batts. 5,597,427, Cl. 156-628.000.
Hess, Thomas L.; and Minch, William R., to DSC Communications Corporation. Method and apparatus for providing local number portability. 5,598,464, Cl. 379-213.000.
Hess, Ulrich E.; Grace, James W.; Hulings, James R.; and Bohorquez, Jaime H., to Hewlett-Packard Company. Bipolar integrated ink jet printhead driver. 5,598,189, Cl. 347-9.000.
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Flory, Curt A.; and Myerholtz, Carl A., 5,598,001, Cl. 250-292.000.
Halko, David J.; and Halko, Barbara T., 5,598,193, Cl. 347-45.000.
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Van Maren, David J.; and Simms, Mark, 5,598,388, Cl. 369-47.000.
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Heyer, Horst W.: *See*—
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Heyl, Lawrence F., to Apple Computer, Inc. Method and apparatus for combining a multiple-bit digital audio signal with a single-bit digital audio signal. 5,598,353, Cl. 364-514.00R.
Hibino, Katsutoshi; and Teragaki, Yasuko, to Sanyo Electric Co., Ltd. Optical pick-up. 5,598,394, Cl. 369-112.000.
Hickey, Thomas P.: *See*—
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Hicks, John B.: *See*—
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Hicks, Timothy J.: *See*—
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High Vacuum Apparatus Mfg., Inc.: *See*—
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High Voltage Graphics, Inc.: *See*—
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Highland Supply Corporation: *See*—
Weder, Donald E., 5,596,862, Cl. 53-397.000.
Hill, Andrew R., to Hill, William Stanley; and Hill, Questa Mary. Method and apparatus for preventing "disease" damage in computer systems. 5,598,531, Cl. 395-186.000.
Hill, George A. Shutter system and method. 5,596,849, Cl. 52-202.000.
Hill, Questa Mary: *See*—
Hill, Andrew R., 5,598,531, Cl. 395-186.000.
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Himmelsbach, Frank; Pieper, Helmut; Austel, Volkhard; Linz, Günter; Müller, Thomas; Eisert, Wolfgang; and Weisenberger, Johannes, to Dr. Karl Thomae GmbH. Biphenyl derivatives, pharmaceutical compositions containing these compounds and processes for preparing them. 5,597,825, Cl. 514-255.000.
Hinoshita, Shinji; Nakayama, Akinari; Watanabe, Kiyoshi; Yagyu, Hideki; Ishi, Shinya; and Iwata, Shigeru, to Hitachi Cable, Ltd. Unshielded twisted pair cable. 5,597,981, Cl. 174-110.00R.
Hinze, Billy W. Extended cab truck storage seat. 5,597,201, Cl. 297-188.100.
Hippe, Werner; Meyer, Günter; and Reinke, Martin, to Robert Bosch GmbH. Method of restoring heating walls of coke oven battery. 5,597,452, Cl. 201-41.000.
Hirakata, Susumu: *See*—
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Hiraoka, Junichiro: *See*—
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Hirota, Toshiyuki, to NEC Corporation. Process of fabricating semiconductor device having capacitor increased in capacitance by roughening surface of accumulating electrode. 5,597,760, Cl. 437-60.000.
Hirsch, Mordechai, to Noga Engineering Ltd. Dual direction countersink. 5,597,273, Cl. 408-199.000.
Hisanaga, Shigeru: *See*—
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Choe, Bui W.; Forbes, Charles E.; Pilbey, Jennifer A.; and Sherriff, Stephan F., 5,597,651, Cl. 428-373.000.
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Stern, Alvin S., 5,597,901, Cl. 530-351.000.
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Hogan, Scott H. Tool with changeable working tip. 5,597,275, Cl. 408-239.00R.
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Hara, Kazuhiro, 5,598,087, Cl. 320-48.000.
Ogawa, Ken; Machida, Kei; and Sono, Hiroshi, 5,596,956, Cl. 123-90.110.
Soda, Chiharu, 5,597,333, Cl. 440-61.000.
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Hope, Norman B. Golf club strike indicator. 5,597,361, Cl. 473-237.000.
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Hori, Manabu; Watanabe, Ikuo; Ohtake, Hiroshi; Harada, Kengo; Maruo, Joji; Morita, Tominori; Yamamoto, Takeshi; and Tsutsui, Hisayoshi, to Kanebo, Ltd. 1, 4-benzoxazine derivative and pharmaceutical compositions containing the same. 5,597,820, Cl. 514-230.500.
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Howard, Frederick T. Self cleaning toilet. 5,596,774, Cl. 4-420.000.
Howard, Harry R.; Macor, John E.; Chenard, Bertrand L.; Sprouse, Jeffrey S.; and Schulz, David W., to Pfizer Inc. Compositions containing sertraline and a 5-HT_{1D} receptor agonist or antagonist. 5,597,826, Cl. 514-255.000.
Howard, Henry E., to Praxair Technology, Inc. Cryogenic rectification system for producing gaseous oxygen and high purity nitrogen. 5,596,886, Cl. 62-646.000.
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Hsia, James C.; and Sierra, Rafael A., to Candela Laser Corporation. Method and dye laser apparatus for producing long pulses of laser radiation. 5,598,426, Cl. 372-53.000.
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Huang, Li-chu C. Collapsible safeguard rail structure. 5,596,776, Cl. 5-426.000.

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Huang, Sidney X. Y.: *See*—
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Hutchison, Wayne K.; Eybergen, William N.; Blackman, Ken R.; and Phillips, Victor A., to Eaton Corporation. Receiver for refrigerant and method of making same. 5,596,882, Cl. 62-503.000.

Hutt, George W.: *See*—
Bogdan, David C.; Pearl, Donald L.; Pribula, David T.; Aulet, Nancy R.; Hussain, Muhammed I.; and Hutt, George W., 5,598,360, Cl. 364-579.000.

Huvey, Michel: *See*—
Grosjean, François; Huvey, Michel; and Dewimille, Bernard, 5,597,431, Cl. 156-169.000.

Hydac Technology GmbH: *See*—
Schön, Otmar, 5,596,772, Cl. 4-361.000.

Hyde, Richard M.: *See*—
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,597,827, Cl. 514-255.000.
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,597,828, Cl. 514-275.000.

Hydra-Shield Manufacturing, Inc.: *See*—
Stebling, Henry J.; Istre, Roy, Jr.; Levine, Sheldon; and Nichols, Horace E., Jr., 5,596,893, Cl. 70-175.000.

Hydraulik-Ring Antriebs- und Steuerungstechnik GmbH: *See*—
Trzmiel, Alfred; Stephan, Wolfgang; and Schmied, Peter, 5,597,367, Cl. 474-110.000.

Hypertherm, Inc.: *See*—
Dean, James C.; Dean, Robert C., Jr.; and Yonkers, E. Hubbard, 5,597,497, Cl. 219-121.480.

Hyundai Electronics America: *See*—
Poeppelman, Alan D., 5,598,443, Cl. 375-359.000.
Rathunde, Dale F., 5,598,549, Cl. 395-441.000.

Hyundai Electronics Ind. Co., Ltd.: *See*—
Sim, Song, 5,598,397, Cl. 369-244.000.

Hyundai Electronics Industries Co., Ltd.: *See*—
Bae, Sang M., 5,598,250, Cl. 355-67.000.
Cho, Gyoung S., 5,597,462, Cl. 204-298.110.
Lim, Kwang W., 5,598,444, Cl. 375-368.000.

Hyundai Motor Co.: *See*—
Jang, Jaeduk, 5,597,372, Cl. 477-143.000.
Lee, Unkoo, 5,597,171, Cl. 280-667.000.
Shin, Myungshin; and Kim, Heejun, 5,598,334, Cl. 364-424.080.
You, Jinho, 5,598,335, Cl. 364-424.094.

Hyzer, Susan M.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madsen, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Iannicllo, Robert M.: *See*—
Narayanan, Kolazi S.; Iannicllo, Robert M.; and Prichard, David W., 5,597,574, Cl. 424-401.000.

IBM Corporation: *See*—
Doany, Fuad E.; and Singh, Rama N., 5,597,222, Cl. 353-33.000.
Linsker, Ralph; and Bennett, Charles H., 5,598,473, Cl. 380-18.000.

Ichikawa, Takeshi: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Ichisose, Hiroki; Takeda, Keiso; Kojima, Susumu; and Sadakane, Shinji, to Toyota Jidosha Kabushiki Kaisha. Engine. 5,596,957, Cl. 123-179.180.

ICI Canada, Inc.: *See*—
Chattopadhyay, Arun K., 5,597,977, Cl. 149-6.000.

Ide, Yuji; Takashima, Kazuhiro; Moroboshi, Toshihiro; and Fukumoto, Tomiyoshi, to Kabushiki Kaisha Toshiba. Spatial motion pattern input system and input method. 5,598,187, Cl. 345-158.000.

Idel, Karsten-Josef: *See*—
Nietlispach, Werner; Gittinger, Andreas; Ostlinning, Edgar; Idel, Karsten-Josef; and Schulte, Helmut, 5,597,888, Cl. 528-335.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Ase, Hisashi; Ishikawa, Kazutoshi; and Imabayashi, Hideki, 5,597,879, Cl. 526-65.000.
Matsumoto, Tadahiro; Takahashi, Hiroyuki; and Matsuzawa, Kouzaburo, 5,597,428, Cl. 156-69.000.

Igarashi, Shigeru; Usui, Toshihiro; Hiraoka, Junichiro; Hashimoto, Keiko; Uchiwa, Hideyo; Murakami, Umeji; Sugimoto, Kenichi; Minamino, Hiromi; and Horikoshi, Toshio, to Kanebo, Ltd. Hair coloring composition comprising anti-hair antibodies immobilized on coloring materials, and hair coloring methods. 5,597,386, Cl. 8-405.000.

Igarashi, Tsuneo: *See*—
Furumoto, Goro; Fujiwara, Takashi; and Igarashi, Tsuneo, 5,597,631, Cl. 428-364.000.

Igen, Inc.: *See*—
Gudibande, Satyanarayana R.; and Kenten, John H., 5,597,910, Cl. 536-24.300.
Kamireddy, Balreddy; Darsley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,597,573, Cl. 424-234.100.

Iguchi, Katsuji, to Sharp Kabushiki Kaisha. Method of making nonvolatile memory cell with crystallized floating gate. 5,597,749, Cl. 437-43.000.

Iida, Chinami: *See*—
Sato, Eiji; Ozaki, Eiji; Iida, Chinami; Kobayashi, Yoshimasa; and Sakimae, Akihiro, 5,597,716, Cl. 435-129.000.

Igami, Yoshiki, to Hamamatsu Photonics K.K. Transparent photocathode. 5,598,062, Cl. 313-542.000.

Iino, Kimio: *See*—
Sugimura, Yukio; Iino, Kimio; Tsujita, Yoshio; Shimada, Yoko; Kobayashi, Tomowo; and Kagasaki, Takeshi, 5,597,846, Cl. 514-450.000.

Iino, Tadashi, to Yazaki Corporation. Display apparatus for vehicle. 5,598,175, Cl. 345-7.000.

Ikeda, Hayao: *See*—
Umemura, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Ikeda, Osamu: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Ikeda, Takashi; and Homma, Akira, to Unitika Ltd. Antitheft label for use on objects and an absorptive pad having such an antitheft label for use on food. 5,597,653, Cl. 428-411.100.

Ikegaya, Akihiko: *See*—
Moriguchi, Hideki; Murakami, Daisuke; Ikegaya, Akihiko; and Nomura, Toshio, 5,597,272, Cl. 407-119.000.

Ikemoto, Manabu: *See*—
Suematsu, Hideki; Ikemoto, Manabu; and Kameda, Yuriko, 5,597,641, Cl. 428-195.000.

Ikeo, Kazuho: *See*—
Kawanishi, Yuichi; Gojobori, Takashi; Tateno, Yoshio; Ikeo, Kazuho; and Kawai, Masahito, 5,598,350, Cl. 364-496.000.

Ikesu, Satoru; and Kaneko, Yutaka, to Konica Corporation. Silver halide color photographic light-sensitive material. 5,597,684, Cl. 430-549.000.

Ikesue, Masumi; Kai, Tsukuru; Yano, Hidetoshi; and Yokotawa, Nobuto, to Ricoh Company, Ltd. Cartridge for replenishing two-ingredient developer to an image forming apparatus and a replenishing device using the same. 5,598,254, Cl. 399-262.000.

Ikoma, Tetsurou: *See*—
Watanabe, Kazuhiko; Shinohara, Kota; and Ikoma, Tetsurou, 5,597,117, Cl. 236-92.00B.

Illinois Tool Works Inc.: *See*—
Kasel, Calvin E., 5,596,863, Cl. 53-399.000.

Imabayashi, Hideki: *See*—
Ase, Hisashi; Ishikawa, Kazutoshi; and Imabayashi, Hideki, 5,597,879, Cl. 526-65.000.

Imai, Shin-ichi; and Fujita, Katsuji, to Kabushiki Kaisha Toshiba. Semiconductor device having multilevel tab leads. 5,598,030, Cl. 257-666.000.

Imai, Yoshisada: *See*—
Endo, Satoru; Imai, Yoshisada; and Okuno, Hiroyuki, 5,597,965, Cl. 73-862.490.

Imaizumi, Masaki, to Olympus Optical Co., Ltd. Prismatic telescope optical system. 5,598,296, Cl. 369-421.000.

Imamura, Nobuaki; and Oyama, Nobuhiro, to Murata Manufacturing Co., Ltd. Resonance power circuit with clamping circuit. 5,598,324, Cl. 363-21.000.

Imation Corp.: *See*—
Arudi, Ravindra L.; and Haidos, John C., 5,597,675, Cl. 430-134.000.

Imation, Inc.: *See*—
Fisch, Richard S.; Larshus, David A.; Sands, John A.; and VerMurlen, Mark E., 5,598,272, Cl. 358-298.000.

Immunivest Corporation: *See*—
Liberti, Paul A.; and Pino, Maria A., 5,597,531, Cl. 423-57.000.

Immuno Aktiengesellschaft: *See*—
Eibl, Johann; Pichler, Ludwig; and Schwarz, Hans-Peter, 5,597,800, Cl. 514-12.000.

Imperial Chemical Industries PLC: *See*—
Pakley, Martin E.; and Valentin, Friedrich H. H., 5,597,539, Cl. 423-210.000.

Imura, Masaharu: *See*—
Horibe, Ryusuke; Imura, Masaharu; and Shimada, Toshiyuki, 5,598,396, Cl. 369-124.000.

Imura, Yoshio: *See*—
Omi, Junichi; Wakabayashi, Hiroshi; Miyamoto, Hidenori; Soshi, Isao; Kato, Minoru; Amanuma, Tatsuo; and Imura, Yoshio, 5,598,242, Cl. 396-55.000.

Ina Wälzlager Schaeffler KG: *See*—
Kaiser, Theodor; Lippert, Roland; Hartmann, Cornelius; Kohler, Horst D.; Mayer, Ernst; and Scherb, Bruno, 5,597,243, Cl. 384-551.000.
Rieder, Guido, 5,597,356, Cl. 464-131.000.

Inaba, Shigemitsu; Hashizawa, Shigemi; and Kuboshima, Hidehiko, to Yazaki Corporation. Electro-magnetically shielded connector. 5,597,322, Cl. 439-578.000.

Inaba, Yutaka: *See*—
Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,598,229, Cl. 348-792.000.

Inakoshi, Daisuke; and Sodeyama, Hideo, to Seiko Epson Corporation; and King Jim Co., Ltd. Tape cartridge for use in a tape printer. 5,597,247, Cl. 400-207.000.

Inatomi, Masayuki, to Fujitsu Limited. Command processing system used under graphical user interface utilizing pointing device for selection and display of command with execution of corresponding process. 5,598,522, Cl. 395-352.000.

Industrial Ergonomics: *See*—
Bergsten, Jeffrey D.; and Bergsten, Donald A., 5,597,207, Cl. 297-411.350.

Industrial Technology Research Institute: *See*—
Chen, Mei-Soong, 5,597,747, Cl. 437-41.000.
Chin, Ming-Jer; and Tzeng, Jaw-Horng, 5,597,130, Cl. 242-356.000.
Han, Wei-kuo; and Cheng, Chung-Hsiung, 5,597,055, Cl. 188-371.000.
Ho, Tony H., 5,598,036, Cl. 257-738.000.
Hsu, Chao-Chin; and You, Ruey B., 5,596,771, Cl. 2-428.000.
Liang, Jui-Pang; and Chuang, Hsing-Jung, 5,598,075, Cl. 318-571.000.
Lou, Chine-Gie; and Lee, Yu-Hua, 5,597,754, Cl. 437-52.000.

Ingard, Karl U.: *See*—
Dear, Terrence A.; and Ingard, Karl U., 5,597,985, Cl. 181-227.000.

Inno-Vent Plastics, Inc.: *See*—
Stephenson, Michael R., 5,596,847, Cl. 52-198.000.

Innotech, Inc.: *See*—
Blum, Ronald D.; and Gupta, Amitava, 5,598,234, Cl. 351-160.00R.

Inoue, Kenji: *See*—
Sasake, Satoru; Hosaka, Yukio; Onogi, Yukio; and Inoue, Kenji, 5,598,091, Cl. 322-62.000.

Inoue, Kiyoshi, to Fuji Photo Optical Co., Ltd. NTSC-PAL converter. 5,598,218, Cl. 348-443.000.

Inoue, Masatsugu; Fukuda, Kumio; Akoh, Nobuhiko; Takahashi, Tohru; and Shimizu, Norio, to Kabushiki Kaisha Toshiba. Deflection device for use in a color cathode-ray tube. 5,598,055, Cl. 313-440.000.

Inoue, Mitsutoshi: *See*—
Ooyagi, Yashichi; Hayashi, Tomohiko; Inoue, Mitsutoshi; Kakimoto, Michiyuki; and Eguchi, Ryuichi, 5,597,436, Cl. 156-259.000.

Inoue, Satoshi: *See*—
Asano, Masamichi; Iwahashi, Hiroshi; Kirisawa, Ryouhei; Nakayama, Ryozo; Inoue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, 5,597,748, Cl. 437-43.000.

Inoue, Shunsuke: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Inoue, Yoshio: *See*—
Isobe, Soichi; Sano, Masaaki; Inoue, Yoshio; and Shimizu, Kazuo, 5,598,291, Cl. 359-198.000.

Insituform (Netherlands) B.V.: *See*—
Alexander, Joseph A., Jr., 5,597,353, Cl. 425-387.100.

Institut Francais du Petrole: *See*—
Audibert, Annie; Argillier, Jean-François; Lecourtier, Jacqueline; Bailey, Louise; and Reid, Paul I., 5,597,783, Cl. 507-120.000.
Domergue, Bruno; Fischer, Beatrice; and Mank, Larry, 5,597,404, Cl. 96-134.000.
Grosjean, François; Huvey, Michel; and Dewimille, Bernard, 5,597,431, Cl. 156-169.000.

Institut National de la Recherche Agronomique (I.N.R.A.): *See*—
Devauchelle, Gérard; Cerutti, Martine; and Persillon, Cécile, 5,597,689, Cl. 435-5.000.

Institut Pasteur: *See*—
Guesdon, Jean-Luc; Thierry, Dominique; Ullmann, Agnès; Gicquel, Brigitte; and Brisson-Noel, Anne, 5,597,911, Cl. 536-24.320.
Montagnier, Luc; Guetard, Denise; Brun-Vezinet, Francoise; and Clavel, Francois, 5,597,896, Cl. 530-388.350.

Insu-Form Incorporated: *See*—
Hacker, John H., 5,596,860, Cl. 52-763.000.

Integrated Device Technology, Inc.: *See*—
Hanrahan, Ciaran; and Stack, Andrew P., 5,598,317, Cl. 361-313.000.

Integrated Image Solutions: *See*—
Holmgren, Bengt G., 5,598,185, Cl. 345-153.000.

Intel Corporation: *See*—
Graumann, David L., 5,598,466, Cl. 379-389.000.
Jamshidi, Shahram, 5,598,114, Cl. 326-113.000.
Jex, Jerry; Dike, Charles; and Self, Keith, 5,598,113, Cl. 326-94.000.
Petrinjak, Jan S.; Corbett, Terri L.; Berg, Erik O.; and Agnier, Judy, 5,598,511, Cl. 395-54.000.
Reinhardt, Dennis, 5,598,565, Cl. 395-750.000.

Intergraph Corporation: *See*—
Holst, John C., 5,598,115, Cl. 326-119.000.

Internec Corporation: *See*—
Bunce, Steven M.; and Aragon, Joel T., 5,598,007, Cl. 250-566.000.
Gilpin, David; Wright, George; and Bishay, Jon M., 5,598,082, Cl. 320-2.000.

International Business Machines Corporation: *See*—
Best, Margaret E.; Rosen, Hal J.; Rubin, Kurt A.; and Strand, Timothy C., 5,598,398, Cl. 369-272.000.
Bogdan, David C.; Pearl, Donald L.; Pribula, David T.; Aulet, Nancy R.; Hussain, Muhammed I.; and Hutt, George W., 5,598,360, Cl. 364-579.000.
Boyette, James E., Jr., 5,598,104, Cl. 324-754.000.

Brech, Brad L.; Delp, Gary S.; and Slane, Albert A., 5,598,535, Cl. 395-200.130.
Carey, Charles F.; Fallon, Kenneth M.; Markovich, Voya R.; Powell, Douglas O.; Vlasak, Gary P.; and Zarr, Richard S., 5,597,469, Cl. 205-118.000.
Church, Mark A.; Descouches, Alain M.; and Krebs, Richard E., 5,597,340, Cl. 451-5.000.
Cooper, Thomas E.; Philips, Hudson W.; and Pryor, Robert F., 5,598,470, Cl. 380-4.000.
Detschel, William F.; Norton, Darwin W., Jr.; and Paddock, Richard C., 5,598,580, Cl. 395-855.000.
Dewitt, John R.; McClurg, Todd A.; Neer, Jay H.; and Pimienta, Orlando, 5,598,318, Cl. 361-683.000.
Dieny, Bernard; Gurney, Bruce A.; Partin, Stuart S. P.; Sanders, Ian L.; Speriosu, Virgil S.; and Wilhoit, Dennis R., 5,598,308, Cl. 360-113.000.
Edgar, Albert D., 5,598,186, Cl. 345-154.000.
Frees, Gregory M.; and Sasaki, Masakazu, 5,598,306, Cl. 360-97.020.
Fujii, Yoshiharu; Yoshida, Toshihiko; and Kitahara, Hiroaki, 5,598,283, Cl. 349-143.000.
Garay, Juan A.; and Perry, Kenneth J., 5,598,529, Cl. 395-182.090.
Gershach, John E., 5,598,313, Cl. 361-56.000.
Gregg, Thomas A.; Capowski, Robert S.; Casper, Daniel F.; and Ferrasolo, Frank D., 5,598,442, Cl. 375-354.000.
Ho, Ching-Tien; and Raghunath, Mandayam T., 5,598,570, Cl. 395-800.000.
Jones, J. Wyn; Legg, Stephen P.; and Newman, Eric L., 5,598,303, Cl. 360-73.020.
Leung, Wan L., 5,598,542, Cl. 395-297.000.
Niijima, Hideto; Asano, Hideo; Sakane, Yoshinori; and Toyooka, Takashi, 5,598,370, Cl. 365-185.330.
Noble, Wendell P., 5,598,367, Cl. 365-149.000.
Pohl, Wolfgang D., 5,598,387, Cl. 369-44.370.
Rittle, Jeffrey W.; Vetter, William W.; and Webb, James R., 5,598,495, Cl. 385-75.000.

International Paper Company: *See*—
Westerberg, J. Lennart, 5,597,445, Cl. 162-29.000.

International Rectifier Corporation: *See*—
Lidow, Alexander; and Herman, Thomas, 5,598,018, Cl. 257-342.000.

Imai, Koichi: *See*—
Yamana, Hideo; Shimazu, Fumio; Imai, Koichi; Wakabara, Shirou; Yui, Yoshi; Kido, Eiichi; and Yoshimoto, Hiromu, 5,598,252, Cl. 399-46.000.

Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of loading green tire on a bladderless tire vulcanizer. 5,597,429, Cl. 156-111.000.

Irvine, Michael P.: *See*—
Markle, David R.; Crane, Barry C.; Irvine, Michael P.; Hendry, Stuart P.; and Paterson, William, 5,596,988, Cl. 128-635.000.

Irvine, Robert-Grant: *See*—
Veit, Werner; and Irvine, Robert-Grant, 5,598,128, Cl. 330-252.000.

Isaacs, Benjamin S.: *See*—
Ron, Eyal; Turek, Thomas J.; Isaacs, Benjamin S.; Patel, Himakshi; and Kenley, Richard A., 5,597,897, Cl. 530-350.000.

Isaacs, Richard: *See*—
Danishefsky, Samuel J.; Masters, John; Young, Wendy; Link, J. Thomas; Isaacs, Richard; and Snyder, Lawrence B., 5,597,931, Cl. 549-214.000.

Isaacson, Mark J.; and Golovin, Milton N., to Valence Technology, Inc. Curable solid electrolytes containing a modified viscosity agent and electrolytic cells produced therefrom. 5,597,662, Cl. 429-192.000.

Iscar Ltd.: *See*—
Men, Yuri; and Satran, Amir, 5,597,271, Cl. 407-113.000.

Ishi, Shinya: *See*—
Hinoshita, Shinji; Nakayama, Akinari; Watanabe, Kiyoshi; Yagyu, Hideki; Ishi, Shinya; and Iwata, Shigeru, 5,597,981, Cl. 174-110.00R.

Ishibashi, Akira: *See*—
Ito, Satoshi; Hiei, Fusoshi; Ishibashi, Akira; Toda, Atsushi; and Nakayama, Norikazu, 5,597,740, Cl. 437-23.000.

Ishibashi, Shogo: *See*—
Totani, Tinginobu; Tashiro, Kazuhiro; Ishibashi, Shogo; and Sasaki, Kiyoshi, 5,597,588, Cl. 425-143.000.

Ishibashi, Toshiyuki: *See*—
Akiokz, Koji; Kobayashi, Osamu; Shimoda, Tatsuya; Ishibashi, Toshiyuki; and Ozaki, Ryuichi, 5,597,425, Cl. 148-302.000.

Ishida, Shigeru: *See*—
Nakae, Yasuhiko; Ishida, Shigeru; Muse, Shoichi; and Shibata, Yasuhiro, 5,597,861, Cl. 524-601.000.

Ishii, Hiroyuki: *See*—
Ito, Akira; and Ishii, Hiroyuki, 5,597,409, Cl. 106-671.000.

Ishii, Junichi: *See*—
Kume, Masayuki; and Ishii, Junichi, 5,598,336, Cl. 364-424.080.

Ishii, Masayuki: *See*—
Harada, Keizo; Ishii, Masayuki; and Yamanaka, Shosaku, 5,597,665, Cl. 429-235.000.

Ishii, Rie; Hayashi, Masayuki; Yamakawa, Takeshi; and Takahashi, Hiroyuki, to Ricoh Company, Ltd. Document circulating apparatus with automatic deletion of data. 5,598,279, Cl. 358-402.000.

Ishii, Yoshio; Mihayashi, Keiji; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,597,682, Cl. 430-533.000.

Ishikawa, Kazutoshi: *See*—
Ase, Hisashi; Ishikawa, Kazutoshi; and Imabayashi, Hideki, 5,597,879, Cl. 526-65.000.

Ishikawa, Noboru: *See*—
Hamano, Terufumi; Adachi, Michiaki; Mashimo, Kazuhiko; Ishikawa, Noboru; and Kishi, Nobuo, 5,597,106, Cl. 227-8.000.

Ishikawa, Seiji; Suwa, Yoshihisa; Ito, Takeshi; and Yasuda, Tomio, to Aisin Seiki Kabushiki Kaisha. Mobile object positioning system. 5,598,166, Cl. 342-357.000.

Ishikawa, Shinji; Chigusa, Yoshiki; Nakamura, Motonori; Makio, Yoshinori; and Watanabe, Morio, to Sumitomo Electric Industries, Ltd. Process for producing glass preform for optical fiber. 5,597,398, Cl. 65-413.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Iwashige, Naoyuki; and Eguchi, Masakazu, 5,597,075, Cl. 209-10.000.

Ishikawajima Sangyo Kikai Kabushiki Kaisha: *See*—
Iwashige, Naoyuki; and Eguchi, Masakazu, 5,597,075, Cl. 209-10.000.

Isobe, Soichi; Sano, Masaaki; Inoue, Yoshio; and Shimizu, Kazuo, to Ebara Corporation. Polygon mirror mounting structure. 5,598,291, Cl. 359-198.000.

Isonishi, Seiji: *See*—
Howell, Stephen B.; Christen, Randolph D.; Isonishi, Seiji; and Andrews, Paul A., 5,597,798, Cl. 514-12.000.

ISP Investments Inc.: *See*—
Malawer, Edward G.; Narayanan, Kolazi S.; Cullen, James P.; and Rocafort, Colleen M., 5,597,551, Cl. 424-47.000.
Narayanan, Kolazi S.; Iannicllo, Robert M.; and Pritchard, David W., 5,597,574, Cl. 424-401.000.
Ulmer, Herbert; and Login, Robert B., 5,597,870, Cl. 525-304.000.

Istituto Ricerca Francesco Angelini S.p.A.: *See*—
Nicoletti, Rosario; and Baiocchi, Leandro, 5,597,913, Cl. 536-123.100.

Istre, Roy, Jr.: *See*—
Stehling, Henry J.; Istre, Roy, Jr.; Levine, Sheldon; and Nichols, Horace E., Jr., 5,596,893, Cl. 70-175.000.

Italtel S.p.A.: *See*—
Abbiati, Antonio; Buoli, Carlo; and Cervi, Luigi, 5,598,127, Cl. 330-149.000.

Italtraco S.r.L.: *See*—
Torini, Alberto, 5,597,493, Cl. 210-799.000.

Ito, Akira; and Ishii, Hiroyuki, to Nichireki Company, Limited. Bituminous reinforcing material for grouting. 5,597,409, Cl. 106-671.000.

Ito, Hideo: *See*—
Mochizuki, Mikio; Ito, Hideo; and Kobayashi, Ryousaku, 5,598,147, Cl. 340-630.000.

Ito, Kenichi; and Matayoshi, Hirobumi, to Hidan Co. Cosmetic container. 5,597,252, Cl. 401-78.000.

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Ito, Masahiro, to Yamaha Corporation. Data transmission apparatus. 5,598,555, Cl. 395-557.000.

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Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, 5,597,998, Cl. 235-487.000.

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Vogel, Gerald; and Tholen, Joseph, 5,597,487, Cl. 210-652.000.

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Ritter, Ann M.; Jackson, Melvin R.; and Hughes, John R., 5,597,967, Cl. 75-249.000.

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Martin-Cocher, Jean-Paul; and Jaconelli, Georges, 5,596,866, Cl. 53-442.000.

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Chopdekar, Vilas M.; Schleck, James R.; Guo, Cheng; and Hall, Amanda J., 5,597,517, Cl. 252-700.000.

James River Corporation of Virginia: *See*—
Schulz, Galyn A., 5,597,639, Cl. 428-156.000.

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Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,597,579, Cl. 424-426.000.

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Yock, Paul; Jang, Yue-Teh; and Salmon, Stephen M., 5,596,990, Cl. 128-662.060.

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Jones, Steven M.; Janicki, Michael J.; Lang, Thomas F.; Brown, J. Keenan; Liebig, John R.; and Wang, Xiaobao, 5,598,003, Cl. 250-363.040.

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Ertocevic, Nedim; and Jansen, Augustinus M., 5,598,174, Cl. 343-795.000.

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Colarelli, Nicholas J., III; and January, Daniel B., 5,598,357, Cl. 364-599.000.
Gender, James R.; and January, Daniel B., 5,598,358, Cl. 364-571.010.

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Akita, Noboru; Hatakeyama, Toshiya; Shimada, Takashi; and Iwata, Keiichi, 5,597,540, Cl. 423-241.000.

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Sauter, Eric; Mignot, Jean-Pierre; and Jeanmonod, Roland, 5,598,380, Cl. 367-140.000.

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Simon, Terry; Gitkin, Merrill; and Sowa, Frank, 5,597,027, Cl. 160-168.100.

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Jensen, Niels D.; and Daugbjerg, Jørgen, to Grundfos A/S. Starting device for a single-phase induction motor. 5,598,080, Cl. 318-794.000.

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Bok, Song H.; Jeong, The S.; Kim, Sung U.; Kwon, Byoung M.; Kim, Young K.; Son, Kwang H.; Lee, Hang W.; and Kwon, Yong K., 5,597,835, Cl. 514-338.000.

Jeppesen, Hanne D.; Hoiberg, Jakob; and Lillelund, Stig, to Dart Industries Inc. Shaker for condiments. 5,597,096, Cl. 222-498.000.

Jervis, James E., to Raychem Corporation. Medical devices incorporating SIM alloy elements. 5,597,378, Cl. 606-78.000.

Jet-Pro Company, Inc.: *See*—
Rice, Garland G.; and Long, David H., 5,596,815, Cl. 34-346.000.

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Mielke, Ulf, 5,598,199, Cl. 347-88.000.

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Haimes, Howard B.; and Jimenez, Pablo A., 5,597,808, Cl. 514-33.000.

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Childers, Terri C.; Haney, Jack E.; Joe, Debra R.; Mikolaitis, William B.; Porter, Randal D.; and Thomas, H. Neal, 5,597,083, Cl. 215-220.000.

Johansen, James G.: *See*—
Haman, Dennis; Brake, Glenn; and Johansen, James G., 5,596,934, Cl. 109-50.000.

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Johansson, Tomas, to Victor Hasselblad AB. Camera mechanism displacement means. 5,598,244, Cl. 396-495.000.

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Martin, Wallace A.; Kindt-Larsen, Ture; and Adams, Jonathan P., 5,597,519, Cl. 264-1.380.

Johnson, Catherine D.: *See*—
DeWille, Normanella T.; Chandler, Michael A.; Mazur, Terrence B.; Ragan, Robert J.; Snowden, Gregory A.; Geraghty, Maureen E.; and Johnson, Catherine D., 5,597,595, Cl. 426-74.000.

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Anderson, Jerry M.; Filas, Robert W.; Johnson, David W., Jr.; Lamport, Norman R.; Rabinovich, Eliezer M.; and Ridgway, David N., 5,598,496, Cl. 385-84.000.

Johnson, Dennis E. J., to Aqua-Ion Systems, Inc. Electro-coalescence/magnetic separation (ECMS) system and components for removal of contaminants from water streams, including desalinization. 5,597,479, Cl. 210-192.000.

Johnson, John L.; and Landel, Kevin L., to United States of America, Army. LCD-CRT hybrid image tube. 5,598,053, Cl. 313-364.000.

Johnson, Lonnie G.; and Applewhite, John, to Johnson Research & Development Co, Inc. Rapid fire compressed air gun. 5,596,978, Cl. 124-72.000.

Johnson, Neil D.: *See*—
Kitaevich, Yuli; Johnson, Neil D.; Miller, Michael T.; and Brown, Alan, 5,598,269, Cl. 356-399.000.

Johnson, Neldon P. Process for encrypting a fingerprint onto an I.D. card. 5,598,474, Cl. 380-23.000.

Johnson, Peter L.: *See*—
Hackler, Ronald E.; and Johnson, Peter L., 5,597,836, Cl. 514-352.000.

Johnson, Randall P.; and Stewart, Christopher G., to Joy MM Delaware Inc. Displaceable filtering apparatus for airborne contaminates. 5,597,393, Cl. 55-356.000.

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Johnson, Lonnie G.; and Applewhite, John, 5,596,978, Cl. 124-72.000.

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Sinclair, A. Richard; and Johnson, Richard L., II, 5,597,784, Cl. 507-219.000.

Johnson, Rodney G. Retaining and support assembly for machinery lift platforms. 5,597,050, Cl. 182-2.000.

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Jasu, George J.; and Nesler, Clay G., 5,597,354, Cl. 454-229.000.
Pracucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Wood, Kasra L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis B.; Standish, Darrell E.; Madsen, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael R., 5,598,566, Cl. 395-750.000.

Johnson, William R., to Junkyard Dogs, Ltd. Interactive book having electroluminescent display pages and animation effects. 5,597,183, Cl. 283-83.000.

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Prodi, Abdessamcen; Johnston, James P.; Labeque, Regine; and Thoen, Christiaan A., 5,597,795, Cl. 510-528.000.

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Barnes, Roger P.; and Johnston, Jonathan A., 5,597,235, Cl. 366-76.600.

Johnston, Robert G., Jr.; Stern, Mark L.; and Evans, David L., to Apple Computer, Inc. Method and apparatus for improved manipulation of data between an application program and the files system on a computer-controlled display system. 5,598,524, Cl. 395-348.000.

Jolly, Steven W.: *See*—
Harwood, H. James; and Jolly, Steven W., 5,597,875, Cl. 525-332.800.

Jon, Jong K. Ignition safety device of gas lighter. 5,597,299, Cl. 431-153.000.

Jones, Aidan P. R.: *See*—
Curzon, Alan D.; White, Ronald G.; and Jones, Aidan P. R., 5,597,522, Cl. 264-177.160.

Jones, Allen, to PDQ Manufacturing, Inc. Motor vehicle dryer. 5,596,818, Cl. 34-666.000.

Jones, David P.: *See*—
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Jones, Gordon. Quick coupling for heavy equipment attachment. 5,597,283, Cl. 414-723.000.

Jones, Howland D. T.: *See*—
Haaland, David M.; Jones, Howland D. T.; and Thomas, Edward V., 5,596,992, Cl. 128-664.000.

Jones, J. Wyn; Legg, Stephen P.; and Newman, Eric L., to International Business Machines Corporation. Method and apparatus for synchronizing the rotations of data storage disks in a plurality of disk storage devices. 5,598,303, Cl. 360-73.020.

Jones, Keith L.: *See*—
Thomas, Christopher P.; Costesworth, Timothy A.; DeGroot, Kenneth P.; Ehlers, Jeffery C.; McMacklin, Mark E.; and Jones, Keith L., 5,596,975, Cl. 123-686.000.

Jones, Kevin R.: *See*—
Tubel, Paulo S.; Mullins, Albert A., II; Jones, Kevin R.; and Richardson, Frank D., 5,597,042, Cl. 166-250.010.

Jones, Marc D.: *See*—
Burek, Denis E.; and Jones, Marc D., 5,598,499, Cl. 385-138.000.

Jones, Steven M.; Janicki, Michael J.; Lang, Thomas F.; Brown, J. Keenen; Liebig, John R.; and Wang, Xiaobin, to ADAC Laboratories. Large field of view transmission and small field of view emission scan within gamma camera system. 5,598,003, Cl. 250-363.040.

Jonsson, E. Haakan: *See*—
Wicks, Douglas A.; Giadin, Lyuba K.; Yeske, Philip E.; and Jonsson, E. Haakan, 5,597,930, Cl. 548-314.100.

Jonsson, S. Roland: *See*—
Winberg, H. P. Erik; and Jonsson, S. Roland, 5,598,165, Cl. 342-137.000.

Joppich, Martin: *See*—
Neubauer, Werner; Bocionek, Siegfried; Möller, Marcus; and Joppich, Martin, 5,598,076, Cl. 348-568.220.

Jordan, Franklin F., to Prospex Roofing Products Inc. Cover for standing seam of roof which is clad with plastic membrane. 5,596,858, Cl. 52-460.000.

Jordan, Richard F.; and Diamond, Gary M., to University of Iowa Research Foundation. Synthesis of anso-metallocene catalysts. 5,597,935, Cl. 556-11.000.

Joshi, Narendra D.; and Kosboffer, John M., to General Electric Company. Gas turbine combustor with a plurality of circumferentially spaced premixers. 5,596,873, Cl. 60-738.000.

Joy MM Delaware Inc.: *See*—
Johnson, Randall F.; and Stewart, Christopher G., 5,597,393, Cl. 55-356.000.

Ju, Doug S., to Baejin Corporation. Foldable tent frame. 5,597,007, Cl. 135-124.000.

Judd, Robert A.: *See*—
Von Arx, Theodore T.; Judd, Robert A.; and Schneidewind, Russell A., 5,598,322, Cl. 361-704.000.

Jufer, Marcel: *See*—
Dunfield, John C.; Heine, Gunter K.; Jufer, Marcel; and Oveyasi, Kamran, 5,598,071, Cl. 318-254.000.

Jung, Gyu-hwan: *See*—
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Junkyard Dogs, Ltd.: *See*—
Johnson, William R., 5,597,183, Cl. 283-83.000.

Jutard, Yann; and Sacre, Jean-Jacques, to Thomson-CSF. Process and device for inspecting transparent material. 5,598,262, Cl. 356-239.000.

JWI Ltd: *See*—
Baker, Samuel; and Harrison, James, 5,597,450, Cl. 162-348.000.

Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; and Kawashima, Kazunari, 5,597,163, Cl. 273-309.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Seito, Tsutomu, 5,597,971, Cl. 84-669.000.
Seto, Hiroshi; and Matsunaga, Kaoru, 5,597,970, Cl. 84-604.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asada, Kazuhiko; Ueno, Koichi; Kashihara, Shin-ichiro; Okamoto, Shigeru; Kurose, Katsuo; Kuwahara, Kazuhiko; and Mitsuhashi, Ken-ichiro, 5,597,037, Cl. 165-110.000.

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Kabushiki Kaisha Nippon Conlux: *See*—
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Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Miyazawa, Hiroshi; Kitahara, Hatsuo; and Namaizawa, Hiroshi, 5,598,046, Cl. 310-49.00R.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Matsuura, Naoki, 5,597,177, Cl. 280-731.000.
Nishio, Minoru, 5,597,989, Cl. 200-6.00R.

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Asano, Masamichi; Iwabashi, Hiroshi; Kirisawa, Ryoshei; Nakayama, Ryozo; Iacue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, 5,597,748, Cl. 437-43.000.
Ide, Yuji; Takashima, Kazuhiro; Morohoshi, Toshihiro; and Fukumoto, Tomiyoshi, 5,598,187, Cl. 345-158.000.
Imai, Shin-ichi; and Fujita, Katsuji, 5,598,030, Cl. 257-666.000.
Iacue, Masatsugu; Fukuda, Kumio; Akoh, Nobuhiko; Takahashi, Tohru; and Shimizu, Norio, 5,598,055, Cl. 313-440.000.
Kodera, Masako; Yano, Hiroyuki; Shigeta, Atsushi; Aoki, Riichirou; Yajima, Hiromi; and Okano, Haruo, 5,597,341, Cl. 451-5.000.
Maeda, Takeo; and Momose, Hiroshi, 5,597,757, Cl. 437-59.000.
Miyahara, Yasunori; and Aazai, Syun-ichi, 5,598,221, Cl. 348-554.000.
Murakoshi, Atsushi; Mizushima, Ichiro; Watanabe, Masaharu; and Yoshiki, Masahiko, 5,598,025, Cl. 257-607.000.
Nagamatsu, Tetsu; and Kim, Lee-Sup, 5,598,361, Cl. 364-725.000.
Ninomiya, Ryosi, 5,598,567, Cl. 395-750.000.
Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, 5,597,996, Cl. 235-487.000.
Suzuki, Koshei; and Suzuki, Kouji, 5,598,180, Cl. 345-100.000.
Watanabe, Yoshihiro; Nakamura, Hiroki; Harada, Nozomu; Murakami, Seiji; Sakamoto, Tsutomu; Taira, Kazuki; and Saitoh, Yutaka, 5,597,223, Cl. 353-97.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
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Umemura, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.
Yamamoto, Shinya; Fukasawa, Tetsuhiko; and Hisanaga, Shigeru, 5,597,297, Cl. 418-55.100.

Kabushiki Kaisha Yasuda Corporation: *See*—
Yasuda, Masahiro, 5,596,998, Cl. 132-275.000.

Kabuto, Noriko: *See*—
Morigaki, Kenichi; Kabuto, Noriko; and Haraguchi, Kazunori, 5,597,659, Cl. 429-190.000.

Kaeuzmann, Hans-Jürgen; and An Haak, Karl W., to An Haak, Karl W. Chitosan foil for wound sealing and process for its preparation. 5,597,581, Cl. 424-449.000.

Kagasaki, Takeshi: *See*—
Sugimura, Yukio; Iiao, Kimio; Tsujita, Yoshio; Shimada, Yoko; Kobayashi, Tomowo; and Kagasaki, Takeshi, 5,597,846, Cl. 514-450.000.

Kagawa, Tetsuya: *See*—
Yanagida, Masato; Sato, Takako; and Kagawa, Tetsuya, 5,597,311, Cl. 434-358.000.

Kägeler, Peter: *See*—
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Kai, Tsukuru: *See*—
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Kaiser, Ulrich, to Texas Instruments Deutschland GmbH. Apparatus for wireless chemical sensing. 5,597,534, Cl. 422-82.020.

Kajiwara, Edward M.: *See*—
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Kakimoto, Michiyuki: *See*—
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Kaku, Takashi; and Hirao, Kyoko, to Fujitsu Limited. Automatic equalizer and data mode convergence method. 5,598,433, Cl. 375-230.000.

Kaku, Takashi; Okita, Ryoji; and Miyazawa, Hideo, to Fujitsu Limited. Automatic equalizer with a branched input for improved accuracy. 5,598,434, Cl. 375-230.000.

Kalb, Jeffrey C.: *See*—
Nickolls, John R.; Zapisek, John; Kim, Won S.; Kalb, Jeffrey C.; Blank, W. Thomas; Weghreit, Elliot; and Van Horn, Kevin, 5,598,408, Cl. 370-351.000.

Kalin, James T.: *See*—
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Kalinowski, Juan R. Foldable portable building. 5,596,844, Cl. 52-79.500.

Kalish, David M.: *See*—
Barajas, Saul; Kalish, David M.; Whitaker, Bruce B.; and Saldanha, Keith S., 5,598,551, Cl. 395-484.000.

Kalotay, Paul Zoltan, to Micro Motion, Inc. Viscosimeter calibration system and method of operating the same. 5,597,949, Cl. 73-54.010.

Kameda, Yoshio: *See*—
Kurosawa, Itaru; Nakagawa, Hiroshi; Aoyagi, Masahiro; Maezawa, Masaaki; Nanya, Takashi; and Kameda, Yoshio, 5,598,105, Cl. 326-6.000.

Kameda, Yuriko: *See*—
Suematsu, Hideki; Ikemoto, Manabu; and Kameda, Yuriko, 5,597,641, Cl. 428-195.000.

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Obata, Kenzo; Kitazumi, Yosimi; Watanabe, Takeshi; Teramae, Kouji; and Nojiri, Tadao, 5,597,997, Cl. 235-455.000.

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Clasen, Dennis R.; and Kleiner, Don H., 5,596,823, Cl. 37-232.000.

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Sass, Ingo; Bayer, Hans-Joachim; Kleiser, Klaus; and Gänger, Jörg, 5,597,045, Cl. 175-62.000.

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Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,597,939, Cl. 558-8.000.

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Breipohl, Gerhard; Henke, Stephan; Knolle, Jochen; Schöllkens, Bernward; Alpermann, Hans-Georg; Gerhards, Hermann; and Wirth, Klaus, 5,597,803, Cl. 514-15.000.

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Akioka, Koji; Kobayashi, Osamu; Shimoda, Tatsuya; Ishibashi, Toshiyuki; and Ozaki, Ryuichi, 5,597,425, Cl. 148-302.000.

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Mochizuki, Mikio; Ito, Hideo; and Kobayashi, Ryousaku, 5,598,147, Cl. 340-630.000.

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Sato, Eiji; Ozaki, Eiji; Iida, Chinami; Kobayashi, Yoshimasa; and Sakimae, Akihiro, 5,597,716, Cl. 435-129.000.

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Kiehl, Oliver; and Koch, Rudolf, 5,598,094, Cl. 323-315.000.

Kochanski, Gregory P.: *See*—
Jin, Sungho; Kochanski, Gregory P.; and Zhu, Wei, 5,598,056, Cl. 313-495.000.

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Maruyama, Tohru; Abe, Michio; Nomiyama, Hiroaki; Okazaki, Sachiko; Kogoma, Masuhiro; and Kodama, Makoto, 5,597,456, Cl. 204-165.000.

Kodera, Masako; Yano, Hiroyuki; Shigeta, Atsushi; Aoki, Riichirou; Yajima, Hiromi; and Okano, Haruo, to Kabushiki Kaisha Toshiba. Semiconductor planarizing apparatus. 5,597,341, Cl. 451-5.000.

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Maruyama, Tohru; Abe, Michio; Nomiyama, Hiroaki; Okazaki, Sachiko; Kogoma, Masuhiro; and Kodama, Makoto, 5,597,456, Cl. 204-165.000.

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Kohen, Eliyezer: *See*—
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Kohler, Horst D.: *See*—
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Kohler, Rudolph H.: *See*—
Steigman, Frederic N.; Kohler, Rudolph H.; and Davis, Robert B., 5,597,123, Cl. 241-23.000.

Kohmoto, Shinsuke: *See*—
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Koifman, Vladimir; Kashat, Israel; and Afek, Yachin, to Motorola, Inc. Driver circuits for switching transistors. 5,598,118, Cl. 327-108.000.

Koito Manufacturing Co., Ltd.: *See*—
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Kojima, Hiroshi; and Baba, Nobuo, to Singer Company N.V., The. Feeding support for a sewn product. 5,596,942, Cl. 112-260.000.

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Ichinose, Hiroki; Takeda, Keiso; Kojima, Susumu; and Sadakane, Shinji, 5,596,957, Cl. 123-179.180.

Kokaram, Anil C., to AVT Communications Ltd. Reparing corrupted data in a frame of an image sequence. 5,598,226, Cl. 348-607.000.

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Michalský, Jiř˝, deceased; Hrbata, Jiř˝; Křepelka, Jiř˝; Měška, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Koloničný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

Komamura, Takeo, to Softken Co., Ltd. Picture frame device. 5,596,829, Cl. 40-721.000.

Komaru, Yukako: *See*—
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Komax Holding AG: *See*—
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Komiya, Yasuhiko: *See*—
Kuwana, Takeshi; Nishino, Yoshiya; Komiya, Yasuhiko; and Matsuda, Kunio, 5,596,921, Cl. 99-340.000.

Komori, Ayako: *See*—
Kataoka, Ichiro; Mori, Takahiro; Yamada, Satoru; Shiotsuka, Hidenori; and Komori, Ayako, 5,597,422, Cl. 136-259.000.

Komori, Shigeki; and Yamaguchi, Takehisa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having trench isolation structure and method of manufacturing the same. 5,598,019, Cl. 257-397.000.

Komoriya, Isao: *See*—
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Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Obta, Masuyuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Ohwada, Junichi, to Hitachi, Ltd. Liquid crystal display device. 5,598,285, Cl. 349-39.000.

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König, Klaus: *See*—
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Konop, Jeffrey A., to Harnischfeger Corporation. Directional indicating device for detecting improper orientation of a hoist lifting line. 5,597,079, Cl. 212-273.000.

Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Staroswetskaya, Nelli, to California Research, LLC. Method for detecting free insulin-like growth-factor-binding protein 1 and a test device for detecting the ruptures of fetal membranes using the above method. 5,597,700, Cl. 435-7.920.

Konuma, Kazuo, to NEC Corporation. Image sensor having charge coupled device registers and driving method thereof. 5,598,017, Cl. 257-232.000.

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Kogushi, Noriaki; Nishi, Takeshi; Hiroki, Masaaki; Yamaguchi, Toshiharu; and Konuma, Toshimitsu, 5,598,284, Cl. 349-33.000.

Koopman, Philip J., Jr.: *See*—
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Korea Institute of Science and Technology: *See*—
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Kori, Teruhiko: *See*—
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Körtge, Randolf: *See*—
Overdiek, Gerhard; Lauth, Hans-Jürgen; Nguyen, Van D.; and Körtge, Randolf, 5,597,008, Cl. 137-15.000.

Koshi, Yutaka: *See*—
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Koshoffer, John M.: *See*—
Joshi, Narendra D.; and Koshoffer, John M., 5,596,873, Cl. 60-738.000.

Kotabe, Noriko: *See*—
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Kovacs, Janos: *See*—
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Koyama, Jun: *See*—
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Koyama, Kenichi: *See*—
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Koyama, Yoshihisa: *See*—
Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

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Kraft, Kenneth G.: *See*—
Kincaid, Jeffrey; Bhandiwad, Manoj; and Kraft, Kenneth G., 5,597,258, Cl. 403-144.000.

Kramedjian, Armand J.; and O'Brien, Terrance F. Interlocking modular product delivery system. 5,597,114, Cl. 229-122.100.

Kramer, Lee; Williams, Roger S.; Williams, Jeffrey A.; Mello, Frank C.; and Miller, Dale V., to Sara Lee Corporation. Cooked meat products having a simulated net surface. 5,597,606, Cl. 426-641.000.

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Culwell, Jeff C., 5,597,080, Cl. 212-278.000.

Krasny, Jacques: *See*—
Lieberman, Robert E.; Krasny, Jacques; and Ferrier, Ian R., 5,597,072, Cl. 206-534.000.

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Krebs, Richard E.: *See*—
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Křepelka, Jiř˝: *See*—
Michalský, Jiř˝, deceased; Hrbata, Jiř˝; Křepelka, Jiř˝; Měška, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Koloničný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

Kreusch, Christian: *See*—
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Sultan, Myrna C.; Folkerts, Charles H.; Matthews, Gregory P.; and Kushion, Mark D., 5,596,972, Cl. 123-520.000.

Kusumoto, Toshihiko: *See*—
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Kvast, Magnus: *See*—
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Goldston, Mark R.; Bemis, Jon; and Pelsue, David, 5,596,819, Cl. 36-35.00R.

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Fredj, Abdennaceur; Johnston, James P.; Labeque, Regine; and Thoen, Christiaan A., 5,597,795, Cl. 510-528.000.

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Lace, Jeffrey J., to Actodyne General, Inc. Anti-theft vehicle system. 5,598,144, Cl. 340-568.000.

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Lagadec, Jean, to Galvelpor SA. Grated floorboard for animal housing. 5,596,951, Cl. 119-525.000.

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Lai, Jui H. Stage combustion rotary engine. 5,596,963, Cl. 123-236.000.

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See*—
Grenier, Maurice, 5,596,885, Cl. 62-646.000.

Laitram Corporation, The: *See*—
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Lalam, Mustapha: *See*—
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Landel, Kevin L.: *See*—
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Lane, Frank A., to Hatachi American, Ltd. Method and apparatus for decoding multiple video bitstreams using a common memory. 5,598,222, Cl. 348-568.000.

Lang, Frank: *See*—
Plichta, Wojtek; Liu, Ivan; Fennessy, Charles W.; and Lang, Frank, 5,597,229, Cl. 362-153.100.

Lang, Thomas F.: *See*—
Jones, Steven M.; Janicki, Michael J.; Lang, Thomas F.; Brown, J. Keenan; Liebig, John R.; and Wang, Xiaohan, 5,598,003, Cl. 250-363.040.

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Lange, Stephen J.; Benson, Douglas H.; Hackett, John W.; Lavon, Gary D.; and Seitz, Bret D., to Procter & Gamble. Zero scrap absorbent core formation process. 5,597,437, Cl. 156-260.000.

Langer, Roland: *See*—
Hofmann, Heinrich; Glas, Günther; Langer, Roland; and Massiotis, Vasilis, 5,596,798, Cl. 29-724.000.

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Lannes, Eric M.; and Staats, Charles W., to Bradford White Corporation. Indirect water heater. 5,596,952, Cl. 122-13.100.

Lanzara, Richard G. Method for determining drug compositions to prevent desensitization of cellular receptors. 5,597,699, Cl. 435-7.210.

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Lapp, Josef C.: *See*—
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Larshus, David A.: *See*—
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Larson, David; Stubbs, Robert E.; and Edstrom, Gene, to Fujitsu Limited. Checking for proper locations of storage device in a storage device array. 5,598,528, Cl. 395-182.050.

Larsson, Alf J. P.: *See*—
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Medard, Claude P.; Allanic, André L.; and Schaeffer, Philippe J., 5,598,340, Cl. 364-468.270.

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Lau, Kenneth. Light fixture. 5,597,233, Cl. 362-294.000.

Lauer, Henk H.; Grossman, Paul D.; and Mead, Dennis E., to Perkin-Elmer Corporation, The. Capillary electrophoresis. 5,597,468, Cl. 204-604.000.

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Lauth, Hans-Jürgen: *See*—
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LaVelle, Edward R.; and Butler, Robert E., to Sara Lee Corporation. Apparatus for forming tubular collars. 5,596,939, Cl. 112-130.000.

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Le, Hung V.: *See*—
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Leach, Michael J.: *See*—
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Leahy, David J. Controlled pourability of fluids. 5,597,090, Cl. 222-1.000.

Lebensfeld, Steven; and Blaustein, Lawrence. Toy mold system with undercuts. 5,597,593, Cl. 425-410.000.

Lebold, Suzanne A.: *See*—
Meyer, Michael D.; Alteabach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizia, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., 5,597,823, Cl. 514-250.000.

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Lechman, John N., to Nova Manufacturing & Assembly, Inc. Monitor support structure for tilt angle adjustment. 5,597,218, Cl. 312-223.300.

Lecocq, Jean-Pierre: *See*—
Sondermeyer, Paul; Balloul, Jean-Marc; Pierce, Raymond; Grzych, Jean-Marie; Kieny, Marie-Paule; Loison, Gérard; Capron, André; and Lecocq, Jean-Pierre, 5,597,570, Cl. 424-191.100.

Le Cornec, Yann: *See*—
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Ledcor Industries Limited: *See*—
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Lee, Chang Y., to Goldstar Co., Ltd. Magnetic recording and reproducing apparatus with game pack driver. 5,598,319, Cl. 361-684.000.

Lee, Chi-Yuan. Lock structure for the automatic shift lever of a car. 5,596,894, Cl. 70-201.000.

Lee, Edmund L.: *See*—
Meyer, Michael D.; Alteabach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizia, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., 5,597,823, Cl. 514-250.000.

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Lee, Gary K. Push pad unit for dispensing fluids. 5,597,093, Cl. 222-113.000.

Lee, Hang W.: *See*—
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Lee, Ho-Cheol; and Lee, Seung-Hun, to Samsung Electronics Co., Ltd. Data input/output sensing circuit of semiconductor memory device. 5,598,371, Cl. 365-189.050.

Lee, Janghee: *See*—
Choi, Hyun-Taek; Suh, Il hong; Chang, Woo Sok; Lee, Janghee; and Kim, Goonjin, 5,598,304, Cl. 360-78.040.

Lee, Jing M. Process for producing urea. 5,597,454, Cl. 203-49.000.

Lee, Min-Sub, to Daewoo Electronics Co., Ltd. Method and apparatus for encoding/decoding a video signal. 5,598,216, Cl. 348-416.000.

Lee, Richard J.: *See*—
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Lee, Sang S.: *See*—
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Lee, Seung-Hun: *See*—
Lee, Ho-Cheol; and Lee, Seung-Hun, 5,598,371, Cl. 365-189.050.

Lee, Soeng-Yeol. Golf bag stand. 5,597,144, Cl. 248-96.000.

Lee, Unkoo, to Hyundai Motor Company. Vehicle suspension system for a steerable drive wheel. 5,597,171, Cl. 280-667.000.

Lee, Young J.; and Shin, Backchul. Interchangeable and adjustable putter. 5,597,362, Cl. 473-244.000.

Lee, Yu-Hua: *See*—
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Lee, Yun-Huey; Chu, Wen-Shen; and Hsu, Wen-Hwei, to Food Industry Research and Development Institute. Bioconversion of cephalosporin C to glutaryl-7-aminocephalosporanic acid. 5,597,704, Cl. 435-25.000.

Le Gall, Didier J.: *See*—
Purcell, Stephen C.; Le Gall, Didier J.; and Bose, Subroto, 5,598,514, Cl. 395-118.000.

Leger, Pierre; Marchais, Olivier; and Bienaime, Francis, to Societe D'Applications Generales D'Electricite et de Mecanique Sagem. Vibrating beam gyroscopic measuring apparatus. 5,597,955, Cl. 73-504.160.

Legg, Stephen P.: *See*—
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Legutko, Thomas J.: *See*—
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Lehrich, Friedhelm: *See*—
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Leifert, Carlo; Epton, Harold A. S.; and Sigee, David C., to Secretary of State for Ministry of Agriculture, Fisheries & Food in her Britannic Majesty's Government of Great Britain and Northern Ireland, The. Antibiotics for biological control of post harvest diseases. 5,597,565, Cl. 424-115.000.

Leiss, Dirk, to Benecke-Kaliko AG. Single-layer or multiple-layer surface foil for laminating on substrates. 5,597,864, Cl. 525-64.000.

Le Masson, Jacques; and Commier, Philippe, to Salomon S.A. Alpine ski equipped with a double action stiffening and/or shock absorbing device. 5,597,170, Cl. 280-602.000.

Lenertz, James E., to AlliedSignal Inc. Deceleration fuel control system for a turbine engine. 5,596,871, Cl. 60-39.030.

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O, Sungki; and Schoenborn, Philippe, 5,598,021, Cl. 257-408.000.

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Burborough, William R., 5,596,967, Cl. 123-450.000.

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Bergen, Gary R.; and Maffey, George E., 5,597,227, Cl. 362-100.000.

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Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

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Magma, Inc.: *See*—
Songer, Jimmie D., 5,598,225, Cl. 348-606.000.

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Onda, Kazuhiko; and Makino, Yoichi, 5,597,743, Cl. 437-39.000.

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Weigand, David L.; and Malek, Charles J., 5,598,419, Cl. 370-514.000.

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Mills, Gregory J.; and Maley, William S., 5,596,816, Cl. 34-346.000.

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Maurer, Dieter; Stadlmair, Manfred; and Marny, Ernst, 5,596,927, Cl. 101-363.000.

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Bradbury, E. Douglas, 5,597,169, Cl. 280-276.000.

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Domergue, Bruno; Fischer, Beatrice; and Mank, Larry, 5,597,404, Cl. 96-134.000.

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Smalley, Dennis R.; Vorgitch, Thomas J.; Manners, Chris R.; Hull, Charles W.; and VanDorin, Stacie L., 5,597,520, Cl. 264-401.000.

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Preker, Friedrich, 5,598,469, Cl. 379-433.000.
Raeche, Christian, 5,597,430, Cl. 156-161.000.

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Markowitz, Kenneth J.: *See*—
Herms, James K.; and Markowitz, Kenneth J., 5,597,552, Cl. 424-49.000.

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Siegall, Clay B.; Gawlak, Susan L.; and Marquardt, Hans, 5,597,569, Cl. 424-183.100.

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Croiset, Christian; and Robert, Michel, 5,597,281, Cl. 414-498.000.

Marrelli, John D., to Texaco, Inc. Two and three phase flow metering with a water cut monitor and an orifice plate. 5,597,961, Cl. 73-861.040.

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Domenig, Georg; and Marsh, Rick, 5,597,220, Cl. 312-334.400.

Marshall, Kenneth E. Multi-level correlation system for synchronization detection in high noise and multi-path environments. 5,598,429, Cl. 375-210.000.

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Regan, Thomas; and Martin, Jose, 5,597,421, Cl. 136-253.000.

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Bates, John B.; and Dudney, Nancy J., 5,597,660, Cl. 429-191.000.
Easterly, Clay E.; Vass, Arpad A.; and Tyndall, Richard L., 5,597,729, Cl. 435-262.500.

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LaPack, Mark A.; Nestrick, Terry J.; Martin, William F.; and Klecka, Gary M., 5,597,402, Cl. 95-12.000.

Martin-Cocher, Jean-Paul; and Jaconelli, Georges, to Newtec International. Method and device for the exterior packaging, by heat-shrinking, of a palletized load. 5,596,866, Cl. 53-442.000.

Martino, Ralph A., to Premdor, Inc. Semi-finished wood simulating product and method. 5,597,620, Cl. 427-262.000.

Maruo, Joji: *See*—
Hori, Manabu; Watanabe, Ikuo; Otaka, Hiroshi; Harada, Kengo; Maruo, Joji; Morita, Tominori; Yamamoto, Takeshi; and Tsutsui, Hisayoshi, 5,597,820, Cl. 514-230.500.

Maruo, Yasuko; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, to Nippon Telegraph and Telephone Corporation. Polyimide optical waveguide and method of manufacturing the same. 5,598,501, Cl. 385-143.000.

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Maruyama, Jun: *See*—
Terashima, Junichi; and Maruyama, Jun, 5,598,162, Cl. 341-176.000.

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Nomura, Hideaki; and Maruyama, Kazutoshi, 5,597,562, Cl. 424-85.100.

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Tanikoshi, Koichiro; Tani, Masayuki; Yamaashi, Kimiya; Uchigasaki, Harumi; Futakawa, Masayasu; Horita, Masato; Kuzumaki, Shoshiro; Nishikawa, Atsuhiko; and Maruyama, Takekazu, 5,598,572, Cl. 395-800.000.

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Masaichi, Inaba; Hirofumi, Matsumoto; and Yasuyuki, Tanaka, to Nippon Mektron, Ltd. Method for manufacturing a magnetic head suspension provided with circuit wiring. 5,597,496, Cl. 216-94.000.

Masarik, David M.: *See*—
Kormos, Alex L.; Masarik, David M.; and Salvio, Paul R., 5,598,207, Cl. 348-148.000.

Masaru, Yamamoto; Toshikatsu, Atsuta; Yoshinori, Koshimizu; Nobuo, Kitamura; Tadaaki, Ishikawa; and Shin, Yasuhara, to Kyocera Corporation. Flange back mechanism for photographic camera. 5,598,245, Cl. 396-440.000.

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Hamano, Terufumi; Adachi, Michiaki; Mashimo, Kazuhiko; Ishikawa, Noboru; and Kishi, Nobuo, 5,597,106, Cl. 227-8.000.

Mashimo, Keiji: *See*—
Ozaki, Masanori; and Mashimo, Keiji, 5,597,064, Cl. 200-269.000.

MasPar Computer Corporation: *See*—
Nickolls, John R.; Zapiack, John; Kim, Won S.; Kalb, Jeffrey C.; Blank, W. Thomas; Wegbreit, Eliot; and Van Horn, Kevin, 5,598,408, Cl. 370-351.000.

Massachusetts Eye & Ear Infirmary: *See*—
Dreyer, Evan B., 5,597,809, Cl. 514-37.000.
Rizzo, Joseph, III, 5,597,381, Cl. 623-4.000.

Massachusetts Institute of Technology: *See*—
Kunz, Roderick R., 5,597,868, Cl. 525-154.000.
Munroe, David J.; and Housman, David E., 5,597,694, Cl. 435-6.000.
Poggio, Tomaso; Harris, John G.; and Ancona, Nicola, 5,598,488, Cl. 382-278.000.

Massart, Christian: *See*—
Leroux, Thierry; and Massart, Christian, 5,598,223, Cl. 348-589.000.

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Kamireddy, Balreddy; Darsley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,597,573, Cl. 424-234.100.

Massie, Richard A. Boat trailer marking device. 5,596,944, Cl. 116-28.00R.

Massiotis, Vasilis: *See*—
Hofmann, Heinrich; Glas, Günther; Langer, Roland; and Massiotis, Vasilis, 5,596,798, Cl. 29-724.000.

MasterFlo Technology, Inc.: *See*—
Claassen, Robert D., 5,597,156, Cl. 271-225.000.

Masters, John: *See*—
Danishefsky, Samuel J.; Masters, John; Young, Wendy; Link, J. Thomas; Isaacs, Richard; and Snyder, Lawrence B., 5,597,931, Cl. 549-214.000.

Masubuchi, Nobu: *See*—
Nishio, Toshikazu; Takeuchi, Michiko; and Masubuchi, Nobu, 5,598,280, Cl. 349-57.000.

Masuda, Hiroshi: *See*—
Tanoue, Tomonori; Masuda, Hiroshi; Nakamura, Tohru; Onai, Takahiro; and Washio, Katsuyoshi, 5,598,015, Cl. 257-197.000.

Masuoka, Fujio: *See*—
Asano, Masamichi; Iwahashi, Hiroshi; Kirisawa, Ryoubei; Nakayama, Ryozo; Inoue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, 5,597,748, Cl. 437-43.000.

Matassa, Victor G.: *See*—
Chambers, Mark S.; Fletcher, Stephen R.; Matassa, Victor G.; and Bock, Mark G., 5,597,915, Cl. 540-509.000.

Matayoshi, Hirobumi: *See*—
Ito, Kenichi; and Matayoshi, Hirobumi, 5,597,252, Cl. 401-78.000.

Matchim, Dorm: *See*—
Barber, George B.; Adsetts, Andrew; Deacon, Peter W.; Matchim, Dorm; and Wang, Yan, 5,597,544, Cl. 423-472.000.

Materials Systems Inc.: *See*—
Bowen, Leslie J.; and Gentilman, Richard L., 5,598,050, Cl. 310-322.000.

Mathews, Paul G.; and Hassink, Martin N., to General Electric Company. Means for supporting and sealing the lead structure of a lamp. 5,598,063, Cl. 313-623.000.

Mathews, Robert: *See*—
Williams, Jeffrey P.; Welin, Dana; Mathews, Robert; Towle, Alvin; and Orrick, Alec, 5,597,995, Cl. 235-375.000.

Mathewson, Paul R. Water hydratable gel-filled textile wrap. 5,597,577, Cl. 424-402.000.

Matji, José A.; and Alcaide, Antonio, to Coriay S.L.; and Metgrove Ltd. Nitric esters of derivatives of the 2-(2,6-di-halo-phenylamino) phenylacetic acid and process for their preparation. 5,597,847, Cl. 514-509.000.

Matl, Karl: *See*—
Zöller, Alfons; Matl, Karl; Götzelmann, Rainer; and Sauer, Günther, 5,597,622, Cl. 427-563.000.

Matra Marconi Space France: *See*—
Safa, Frédéric, 5,598,263, Cl. 356-342.000.

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Brown, Dennis M.; Luck, Edward; Twardzik, Daniel R.; and Purchio, Anthony F., 5,597,578, Cl. 424-422.000.

Matsubara, Masayuki; and Kitamura, Yasuhiko, to Daishowa Seiki Kabushiki Kaisha. Wrench. 5,596,913, Cl. 81-59.100.

Matsubara, Shunsuke; Iwashita, Yasusuke; and Okita, Tadashi, to Fanuc Ltd. Control apparatus and a control method for a servomotor. 5,598,077, Cl. 318-568.220.

Matsubayashi, Nobuhide: *See*—
Nakano, Junichi; Ezawa, Hiroshi; and Matsubayashi, Nobuhide, 5,598,389, Cl. 369-48.000.

Matsuda, Kunio: *See*—
Kuwana, Takeshi; Nishino, Yoshiya; Komiya, Yasuhiko; and Matsuda, Kunio, 5,596,921, Cl. 99-340.000.

Matsui, Shinsuke: *See*—
Maruo, Yasuko; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, 5,598,501, Cl. 385-143.000.

Matsukawa, Yoshiki, to NEC Corporation. ISDN terminal adapter capable of automatically changing from a packet switching mode to a circuit switching mode. 5,598,411, Cl. 370-352.000.

Matsumoto, Miki; Oishi, Kanji; Katayama, Masahiro; and Watanabe, Kazufumi, to Hitachi, Ltd.; and Hitachi ULSI Engineering Corp. Semiconductor memory. 5,598,372, Cl. 365-230.010.

Matsumoto, Mitsuo: *See*—
Tanaka, Yoshiaki; Hayashi, Hiroshi; Fachigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, 5,598,478, Cl. 381-17.000.

Matsumoto, Osamu: *See*—
Munezane, Tsuyoshi; Fukutomi, Norihisa; and Matsumoto, Osamu, 5,597,121, Cl. 239-408.000.

Matsumoto, Shigeyuki, to Canon Kabushiki Kaisha. Photoelectric converting apparatus. 5,598,023, Cl. 257-462.000.

Matsumoto, Tadahiro; Takahashi, Hiroyuki; and Matsuzawa, Kouzaburo, to Idemitsu Petrochemical Co., Ltd. Method of sealing containers. 5,597,428, Cl. 156-69.000.

Matsumoto, Takumi: *See*—
Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; and Matsumoto, Takumi, 5,597,015, Cl. 137-625.640.

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Matsumoto, Yoshitaka: *See*—
Nakanishi, Atsushi; Hoshino, Mitsuo; and Matsumoto, Yoshitaka, 5,598,305, Cl. 360-96.600.

Matsunaga, Kaoru: *See*—
Sato, Hiroshi; and Matsunaga, Kaoru, 5,597,970, Cl. 84-604.000.

Matsuo, Hideo; Aazai, Kazumi; and Miyazaki, Hitoshi, to Matsushita Graphic Communication Systems, Inc. Memory management device having empty memory block maintenance function and facsimile apparatus using it. 5,598,548, Cl. 395-430.000.

Matsuo, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device and method of manufacturing the same. 5,598,020, Cl. 257-401.000.

Matsushima, Makoto, to Ricoh Company, Ltd. Signal processing circuit with built-in dynamic range matching. 5,598,160, Cl. 341-155.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Akazawa, Teruyuki; Kawahara, Sadao; Shimizu, Akihiko; and Abe, Yoshifumi, 5,597,296, Cl. 418-55.100.
Hayashi, Masaki; Miya, Kazuyuki; and Kato, Osamu, 5,598,404, Cl. 370-342.000.
Horibe, Ryusuke; Imura, Masaharu; and Shimada, Toshiyuki, 5,598,396, Cl. 369-124.000.
Maeda, Toshinori; and Uraoka, Yukiharu, 5,598,100, Cl. 324-501.000.
Morigaki, Kenichi; Kabuto, Noriko; and Haraguchi, Kazunori, 5,597,659, Cl. 429-190.000.
Ohya, Jun; Uno, Tomoaki; and Mitsuda, Masahiro, 5,598,491, Cl. 385-24.000.
Sakuragi, Katsunori; and Fukutani, Hideshi, 5,598,047, Cl. 310-67.00R.
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahiko; Sato, Shigehiro; and Yokotani, Fumiko, 5,597,889, Cl. 528-353.000.
Takura, Nobufumi, 5,598,345, Cl. 364-489.000.
Uno, Tomoaki; Ohya, Jun; and Mitsuda, Masahiro, 5,598,294, Cl. 359-341.000.
Yamada, Daisuke; and Kato, Osamu, 5,598,416, Cl. 370-468.000.
Yanagisawa, Ryuichi, 5,598,217, Cl. 348-424.000.
Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Nakashima, Hironori, 5,598,292, Cl. 359-216.000.

Matsushita Electric Works, Ltd.: *See*—
Okamura, Yukihiko; Yuasa, Hiroaki; and Mukai, Tadayoshi, 5,598,081, Cl. 318-801.000.

Matsushita Graphic Communication Systems, Inc.: *See*—
Matsuo, Hideo; Aazai, Kazumi; and Miyazaki, Hitoshi, 5,598,548, Cl. 395-430.000.

Matsutani, Shigeru: *See*—
Obitani, Mitsuaki; Matsutani, Shigeru; Yoshida, Tadashi; Tanaka, Kazushige; Fujii, Yasuhiko; and Shirahase, Kazuhiro, 5,597,943, Cl. 560-42.000.

Matsuura, Masaru; and Sasaki, Jun, to Kikkoman Corporation. Process for preparing cheese-like food product. 5,597,594, Cl. 426-44.000.

Matsuura, Masazumi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and method of fabricating the same. 5,598,027, Cl. 257-635.000.

Matsuura, Naoki, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Steering wheel pad structure. 5,597,177, Cl. 280-731.000.

Matsuura, Tohru: *See*—
Maruo, Yasuko; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, 5,598,501, Cl. 385-143.000.

Matsuzawa, Kouzaburo: *See*—
Matsumoto, Tadahiro; Takahashi, Hiroyuki; and Matsuzawa, Kouzaburo, 5,597,428, Cl. 156-69.000.

Matte, James T.: *See*—
Stout, Gregg W.; and Matte, James T., 5,597,040, Cl. 166-51.000.

Matthews, Gregory P.: *See*—
Sultan, Myrna C.; Folkerts, Charles H.; Matthews, Gregory P.; and Knahion, Mark D., 5,596,972, Cl. 123-520.000.

Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romanis; Müller-Peddinghaus, Reiner; and Hatzelmann, Armin, to Bayer Aktiengesellschaft. Substituted quinol-2-yl-methoxy-phenylacetic acid derivatives. 5,597,833, Cl. 514-312.000.

Matzner, Bruce: *See*—
Prosbetde, Richard A.; and Matzner, Bruce, 5,598,450, Cl. 376-435.000.

Maurer, Dieter; Stadlmair, Manfred; and Murray, Ernst, to MAN Roland Druckmaschinen AG. Chamber doctor. 5,596,927, Cl. 101-363.000.

Maurer, Fritz; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Hartwig, Jürgen; Turberg, Andreas; and Meuche, Norbert, to Bayer Aktiengesellschaft. Phosphoramidothioate and process of use to combat pests. 5,597,812, Cl. 514-118.000.

Maw, Taishih: *See*—
Honda, Kenji; Perry, Donald F.; and Maw, Taishih, 5,597,678, Cl. 430-331.000.

Max Co., Ltd.: *See*—
Hamano, Terufumi; Adachi, Michiaki; Mashimo, Kazuhiko; Ishikawa, Noboru; and Kishi, Nobuo, 5,597,106, Cl. 227-8.000.

Mayer, Bruno Franz P., to Critical Device Corporation. Needleless vacuum container port system. 5,597,536, Cl. 422-103.000.

Mayer, Ernst: *See*—
Kaiser, Theodor; Lippert, Roland; Hartmann, Cornelius; Kohler, Horst D.; Mayer, Ernst; and Scherb, Bruno, 5,597,243, Cl. 384-551.000.

Mayer, Hanspeter: *See*—
Bodzak, Stanislaw; and Mayer, Hanspeter, 5,597,291, Cl. 417-310.000.

Mayfield, Daniel R. Personal flotation/transportation device. 5,597,277, Cl. 441-130.000.

Mayr, Leslie: *See*—
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Cortjens, Leo M.; Mays, Richard C.; and Smith, Curtis M., 5,598,209, Cl. 348-211.000.

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Butsuen, Tetsuro; Yamamoto, Yasunori; and Yoshioka, Tohru, 5,598,337, Cl. 364-424.046.

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Dillard, Gary J.; and McAlice, Timothy J., 5,596,870, Cl. 60-39.020.

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Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

McCall, Kevin J.; Kovacs, Janos; and Palmer, Wyn, to Analog Devices, Inc. All-MOS precision differential delay line with delay a programmable fraction of a master clock period. 5,598,364, Cl. 365-73.000.

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Leong, William W.; Cliff, Richard G.; and McClintock, Cameron, 5,598,109, Cl. 326-41.000.

McClintock, Shawn L., to Sony Corporation; and Sony Corporation of America. Video viewing and recording system. 5,598,208, Cl. 348-159.000.

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King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; and Derderis, David M., 5,597,887, Cl. 528-196.000.

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Slaughter, Frank G., III; Gocht, Russell C.; and McCool, David, 5,598,536, Cl. 395-200.160.

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Taylor, Peter; and McEachern, Roderick J., 5,597,538, Cl. 423-3.000.

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Bumol, Thomas F.; and McEvoy, Leslie M., 5,597,726, Cl. 435-337.000.

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Rasmussen, Royce C.; and McFarland, Victor D., 5,597,001, Cl. 134-104.200.

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Satow, Arnold, 5,597,975, Cl. 102-514.000.

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Jain, Raviader K.; McInerney, John G.; Reddy, Kalidev'Apura P. J.; and Yan, Chi, 5,598,425, Cl. 372-18.000.

McIntyre, Dale F.; and Haas, Kenneth M., to Eastman Kodak Company. Image capture apparatus. 5,598,237, Cl. 396-264.000.

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Migaardi, Michael A.; Ng, Laurinda; Croff, Ronald S.; McKenna, Robert; and Dyer, Lawrence D., 5,597,767, Cl. 437-227.000.

McKown, William J. Delayed motion drive for model railroad locomotives. 5,596,937, Cl. 105-96.000.

McLarty, George C., III; Waldrop, Anthony R.; and Loadholdt, Paul S., to Milliken Research Corporation. Knitted furniture support fabric. 5,596,888, Cl. 66-195.000.

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Thomas, Christopher P.; Costesworth, Timothy A.; DeGroot, Kenneth P.; Ehlers, Jeffery C.; McMackin, Mark E.; and Jones, Keith L., 5,596,975, Cl. 123-686.000.

McMillen, Bobby E., to United Technologies Motor Systems, Inc. Starter drive clutch. 5,596,902, Cl. 74-7.00C.

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Evans, Raymond D., Jr.; McMillen, Timothy R.; and Woytowich, Mark S., 5,597,418, Cl. 134-6.000.

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Smith, Brian S.; McMillin, Kenneth W.; Wells, John H.; Parr, A. James; and Mitchell, Jerry L., 5,597,599, Cl. 426-316.000.

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Christenson, Ronald E.; Schrafel, Tracy L.; and Bartlett, William P., 5,597,174, Cl. 280-704.000.

McPhee, J. Brent; and Ewart, James M., to Forest Engineering Research Institute of Canada. Auto release choker. 5,597,191, Cl. 294-82.140.

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Lauer, Henk H.; Grossman, Paul D.; and Mead, Dennis E., 5,597,468, Cl. 204-604.000.

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Johanson, Mark A.; and Noone, Michael S., 5,596,996, Cl. 128-772.000.

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Meinz, Maria S.: *See*—
Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.

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Carter, Jeffrey J., Jr.; Cannon, Howard N.; Shively, Kirk S.; Porck, Glen F.; Nagarajan, Raj T.; and Meister, Steven F., 5,597,118, Cl. 239-92.000.

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Mello, Frank C.: *See*—
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Men, Yuri; and Satran, Amir, to Iscar Ltd. Exchangeable cutting insert having secondary cutting edges used as wipers. 5,597,271, Cl. 407-113.000.

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Maurer, Fritz; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Hartwig, Jürgen; Turberg, Andreas; and Meuche, Norbert, 5,597,812, Cl. 514-118.000.

Menasco Company, The: *See*—
Moghe, Bhalchandra; Shevade, Makarand; Kaast, Radhakrishna; and Lins, Elizabeth, 5,597,556, Cl. 424-65.000.

Mercedes-Benz AG: *See*—
Bruehl, Hubert; and Schwer, Harald, 5,597,049, Cl. 180-400.000.
Fischle, Gerhard; Baumann, Matthias; Klingel, Ralph; Mieslinger, Thomas; and Pfister, Carola, 5,597,215, Cl. 303-139.000.

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Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.
Sanguinetti, Michael C.; Salata, Joseph J.; and Lynch, Joseph J., Jr., 5,597,818, Cl. 514-221.000.

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Chambers, Mark S.; Fletcher, Stephen R.; Matassa, Victor G.; and Bock, Mark G., 5,597,915, Cl. 540-509.000.

Mercury Computer Systems, Inc.: *See*—
Priach, Robert C., 5,598,568, Cl. 395-800.000.

Merle, Thomas C.: *See*—
Rowden, David L.; Ryan, Dale W.; and Merle, Thomas C., 5,598,310, Cl. 360-130.320.

Merrell Pharmaceuticals Inc.: *See*—
Burkholder, Timothy P.; Kudlacz, Elizabeth M.; and Le, Tien-Binh, 5,597,845, Cl. 514-419.000.

Merrien, Pierre. Controlled method for injection casing using a mold under vacuum, especially intended for aluminium or magnesium alloys and device for carrying out said method. 5,597,032, Cl. 164-457.000.

Merrill, Gary L.: *See*—
Harrie, Michael R.; and Merrill, Gary L., 5,596,833, Cl. 43-122.000.

Merriman, Gregory H.: *See*—
Tegeler, John J.; Rauckman, Barbara S.; Harner, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,597,838, Cl. 514-357.000.

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Mertzlufft, Friedrich: *See*—
Zander, Rolf; and Mertzlufft, Friedrich, 5,596,983, Cl. 128-204.180.

Messerer, Beat. Chain necklaces. 5,596,869, Cl. 59-82.000.

Mesters, Carolus M. A. M.: *See*—
Evans, Wayne E.; and Mesters, Carolus M. A. M., 5,597,773, Cl. 502-348.000.

Mesuda, Etsuji; and Tagiri, Osamu, to Anritsu Corporation. Phase modulator capable of individually defining modulation degree and modulation frequency. 5,598,130, Cl. 332-119.000.

Metgrove Ltd.: *See*—
Matji, José A.; and Alcaide, Antonio, 5,597,847, Cl. 514-509.000.

Methode Electronics, Inc.: *See*—
Scheitz, John T.; and Capilupo, Kathleen A., 5,597,319, Cl. 439-342.000.

Metric Systems Corporation: *See*—
Meyers, David L.; and Hudson, Howard J., 5,597,145, Cl. 248-97.000.

Meyer, Erich; and Rothbauer, Juergen, to Optima Maschinenfabrik Dr. Bühler GmbH & Co. Apparatus for forming stacks. 5,597,285, Cl. 414-798.600.

Meyer, Günter: *See*—
Hippe, Werner; Meyer, Günter; and Reinke, Martin, 5,597,452, Cl. 201-41.000.

Meyer, Heinrich: *See*—
Ragge, Andrea; Meyer, Heinrich; and Urrutia Desmaison, Gonzalo, 5,597,471, Cl. 205-159.000.

Meyer, Michael D.; Altenbach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizin, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., to Abbott Laboratories. Tricyclic substituted hexahydrobenz (e)isoindole alpha-1 adrenergic antagonists. 5,597,823, Cl. 514-250.000.

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Bratz, Matthias; Kober, Reiner; Seele, Rainer; Saupe, Thomas; Meyer, Norbert; Walker, Nigel; Landes, Andreas; and Walter, Helmut, 5,597,776, Cl. 504-105.000.

Meyer, Willy, to Ciba-Geigy Corporation. Sulfoxylarcas. 5,597,779, Cl. 504-215.000.

Meyerhoff, Leonard, to United States of America, Navy. Cavitation suppressing ducted propeller system. 5,597,245, Cl. 440-67.000.

Meyers, David L.; and Hudson, Howard J., to Metric Systems Corporation. Individual sandbagging accessory apparatus. 5,597,145, Cl. 248-97.000.

Mezei, Tibor: *See*—
Szirt nee Kislelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.

Michaelides, Michael R.; and Hong, Yufeng, to Abbott Laboratories. Tetracyclic compounds as dopamine agonists. 5,597,832, Cl. 514-285.000.

Michal, Ronald J.: *See*—

Pavlath, George A.; Michal, Ronald J.; Patterson, Ralph A.; and Huang, Sidney X. Y., 5,598,489, Cl. 385-12.000.

Michalska, Miluska, Jana Michalska, legal heirs: *See*—
Michalský, Jiř˝, deceased; Hrbata, Jiř˝; Křepelka, Jiř˝; Mělka, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Kolosičný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

Michalský, Jiř˝, deceased (by Miluška Michalská, Jana Michalská, legal heirs); Hrbata, Jiř˝; Křepelka, Jiř˝; Mělka, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Kolosičný, Alois; and Urbanec, Josef, to VUFB a.s. 6-[X-(2-hydroxyethyl) aminoalkyl]-5,11-dioxo-5,6-dihydro-11-H-indeno[1.2-c]isoquinolines and their use as antineoplastic agents. 5,597,831, Cl. 514-284.000.

Miché, John A. Earthquake latch. 5,597,188, Cl. 292-183.000.

Micro Motion, Inc.: *See*—
Kalotay, Paul Zoltan, 5,597,949, Cl. 73-54.010.

Micron Display Technology, Inc.: *See*—
Hush, Glen; Baker, Jake; and Voshell, Tom, 5,598,156, Cl. 341-100.000.

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Fazan, Pierre C.; and Figura, Thomas A., 5,597,756, Cl. 437-52.000.
Gilton, Terry L., 5,597,444, Cl. 156-643.100.
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Prall, Kirk, 5,597,746, Cl. 437-416.000.

Microsoft Corporation: *See*—
Harel, Dov; Tompa, Martin P.; and Kohen, Eliyezer, 5,598,520, Cl. 395-169.000.
Narayanan, Raman, 5,598,519, Cl. 395-765.000.
Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., 5,598,183, Cl. 345-145.000.
Spies, Terence R., 5,598,563, Cl. 395-652.000.

Mid-America Building Products Corporation: *See*—
Schiedegger, Charles E., 5,596,852, Cl. 52-212.000.

Mielke, Ulf, to Jetline AB. Printer. 5,598,199, Cl. 347-88.000.

Mieslinger, Thomas: *See*—
Fischle, Gerhard; Baumann, Matthias; Klingel, Ralph; Miesslinger, Thomas; and Pfister, Carola, 5,597,215, Cl. 303-139.000.

Migita, Yoshihiro: *See*—
Matsumoto, Taro; Wada, Hisaya; Migita, Yoshihiro; Hatayama, Katsuo; and Seliguchi, Yoshinori, 5,597,921, Cl. 544-343.000.

Mignardi, Michael A.; Ng, Laurinda; Croff, Ronald S.; McKenna, Robert; and Dyer, Lawrence D., to Texas Instruments Incorporated. Separation of wafer into die with wafer-level processing. 5,597,767, Cl. 437-227.000.

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Saurer, Eric; Mignot, Jean-Pierre; and Jeanmonod, Roland, 5,598,380, Cl. 367-140.000.

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Maeda, Eiichi; and Mihara, Hideyuki, 5,598,135, Cl. 336-200.000.

Mihayashi, Keiji: *See*—
Ishii, Yoshio; Mihayashi, Keiji; and Morigaki, Masakazu, 5,597,682, Cl. 430-533.000.

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Michalský, Jiř˝, deceased; Hrbata, Jiř˝; Křepelka, Jiř˝; Mělka, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Kolosičný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

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Childers, Terri C.; Haney, Jack E.; Joe, Debra R.; Mikolaitis, William B.; Porter, Randal D.; and Thomas, H. Neal, 5,597,083, Cl. 215-220.000.

Miksic, Boris A.; Chandler, Christophe; Kharshan, Margarita; Furman, Alla; Rudman, Barry; and Gelner, Larry, to Correc Corporation. Corrosion inhibitor for reducing corrosion in metallic concrete reinforcements. 5,597,514, Cl. 252-390.000.

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Miller, Charles E.; Waers, John F.; Magin, James A.; Custer, Randal L.; and Lopez, John T. Method and apparatus for dispensing natural gas with pressure sensor calibration. 5,597,020, Cl. 141-95.000.

Miller, Dale V.: *See*—
Kramer, Lee; Williams, Roger S.; Williams, Jeffrey A.; Mello, Frank C.; and Miller, Dale V., 5,597,606, Cl. 426-641.000.

Miller, James. Rocker arm bridge for internal combustion engines. 5,596,958, Cl. 123-90.230.

Miller, Kenneth: *See*—
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Doner, Christopher G.; Miller, Lawrence G.; Emmons, Ian D.; and Barnes, Michael R., 5,598,557, Cl. 395-605.000.

Miller, Michael T.: *See*—
Kitaevich, Yuli; Johnson, Neil D.; Miller, Michael T.; and Brown, Alan, 5,598,269, Cl. 356-399.000.

Miller, Robert C.: *See*—
Hastings, Calvin R.; Hauser, Ernest M.; and Miller, Robert C., 5,597,962, Cl. 73-861.290.

Miller, Timothy R.: *See*—
Walker, Michael R.; and Miller, Timothy R., 5,597,384, Cl. 623-66.000.

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McLarty, George C., III; Waldrop, Anthony R.; and Loadholdt, Paul S., 5,596,888, Cl. 66-195.000.

Millipore Investment Holdings Limited: *See*—
Lutz, Herb, 5,597,486, Cl. 210-639.000.

Mills, Gregory J.; and Maley, William S., to Alcoa of Australia Ltd. Method for drying particulate material. 5,596,816, Cl. 34-346.000.

Mills, R. Steven: *See*—
Smith, Randall; and Mills, R. Steven, 5,597,035, Cl. 165-80.300.

Mims, Calvin. Baseball batting training apparatus. 5,597,160, Cl. 124-16.000.

Mimura, Yoshiaki: *See*—
Kurisaki, Kazuhiro; Kanazawa, Yoshikazu; and Mimura, Yoshiaki, 5,598,273, Cl. 386-9.000.

Minamino, Hiromi: *See*—
Igarashi, Shigeru; Usui, Toshihiro; Hiraoka, Junichiro; Hashimoto, Keiko; Uchiwa, Hideyo; Murakami, Umeji; Sugimoto, Kenichi; Minamino, Hiromi; and Horikoshi, Toshio, 5,597,386, Cl. 8-405.000.

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Minch, William R.: *See*—
Hess, Thomas L.; and Minch, William R., 5,598,464, Cl. 379-213.000.

Minebea Company, Ltd.: *See*—
Yoneyama, Masayuki, 5,597,067, Cl. 200-344.000.

Minges, Roland: *See*—
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zachieache, Ruth, 5,597,885, Cl. 528-44.000.
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Tesch, Helmut; Minges, Roland; and Streu, Joachim, 5,597,942, Cl. 560-25.000.

Minnesota Mining and Manufacturing Company: *See*—
Bayer, Glen H., Jr.; and O'Leary, Timothy J., 5,597,618, Cl. 427-207.100.
Bloomer, Glenn A.; and VanLanen, Daniel L., 5,597,634, Cl. 428-40.100.
Herzberg, Carol E., 5,597,427, Cl. 156-628.000.
Kaegas, Steven L.; Sprute, Emil D.; and Stych, Dean J., 5,597,677, Cl. 430-273.100.
Kumar, Kanta; Davis, Robert A.; Nichols, Sheila M.; and Buttery, Howard J., 5,597,557, Cl. 424-70.170.
Pospisil, Jirina V.; Hansen, James D.; and Cleary, James D., 5,597,302, Cl. 433-8.000.

Minolta Co., Ltd.: *See*—
Kisbe, Akio; Hamada, Masataka; Ueda, Hiroshi; Sugitani, Kazumi; and Ootsuka, Hiroshi, 5,597,999, Cl. 250-201.700.

Minter, Stephen: *See*—
Colley, Terence; Minter, Stephen; and Carnie, John, 5,597,238, Cl. 374-106.000.

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Miska, Stanley R.: *See*—
Courtney, Daniel T.; Hermann, Kenneth W.; and Miska, Stanley R., 5,597,979, Cl. 174-35.00R.

Mistyurik, John D., to Monarch Marking Systems, Inc. Ink ribbon cartridge. 5,597,249, Cl. 400-234.000.

Mitchell, Jerry L.: *See*—
Smith, Brian S.; McMillin, Kenneth W.; Wells, John H.; Parr, A. James; and Mitchell, Jerry L., 5,597,599, Cl. 426-316.000.

Mitsubishi Chemical Corporation: *See*—
Kohama, Keiko; Hatakeyama, Kazuhisa; Kurusu, Yasurou; and Yukawa, Hideaki, 5,597,727, Cl. 435-252.320.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ajika, Natsuo; Arima, Hideaki; and Hachisuka, Atsushi, 5,597,755, Cl. 437-52.000.
Komori, Shigeki; and Yamaguchi, Takehisa, 5,598,019, Cl. 257-397.000.
Kurisaki, Kazuhiro; Kanazawa, Yoshikazu; and Mimura, Yoshiaki, 5,598,273, Cl. 386-9.000.
Matsuo, Ryuichi, 5,598,020, Cl. 257-401.000.
Matsuura, Masazumi, 5,598,027, Cl. 257-635.000.
Munezane, Tsuyoshi; Fukutomi, Norihisa; and Matsumoto, Osamu, 5,597,121, Cl. 239-408.000.
Nakao, Shuji, 5,597,667, Cl. 430-5.000.
Niwa, Tomomitsu, 5,598,512, Cl. 395-61.000.
Sakai, Kunito; Oshio, Kazuharu; and Kanegae, Hirozoh, 5,597,523, Cl. 264-219.000.
Shimotani, Mitsuo; Nishida, Minoru; Okada, Akira; and Morihiro, Yoshiharu, 5,598,145, Cl. 340-576.000.
Taniguchi, Hiroyasu; Furusawa, Haruki; Hatakenaka, Jun; and Seki, Akinobu, 5,598,338, Cl. 364-436.000.

Yorita, Mitsumasa; Toya, Hideaki; Hasegawa, Hiroshi; and Koyama, Kenichi, 5,597,993, Cl. 218-129.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Ueda, Katsunori; Yoshikawa, Satoshi; and Kawabe, Takashi, 5,596,968, Cl. 123-480.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Irie, Nobuhiko, 5,597,429, Cl. 156-111.000.

Mitsubishi Materials Corporation: *See*—
Kamiyama, Eiji; Fusegawa, Kazuhiro; and Toyama, Noriho, 5,597,744, Cl. 437-40.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sato, Eiji; Ozaki, Eiji; Iida, Chinami; Kobayashi, Yoshimasa; and Sakimae, Akihiro, 5,597,716, Cl. 435-129.000.

Mitsuboshi Belting Ltd.: *See*—
Noguchi, Toru; Goto, Kazuo; Hayashi, Sigehiko; Kawahara, Masahito; Murakami, Susumu; Yamaguchi, Yoshio; and Deki, Shigehito, 5,597,614, Cl. 427-162.000.

Mitsuda, Masahiro: *See*—
Ohya, Jun; Uno, Tomoaki; and Mitsuda, Masahiro, 5,598,491, Cl. 385-24.000.
Uno, Tomoaki; Ohya, Jun; and Mitsuda, Masahiro, 5,598,294, Cl. 359-341.000.

Mitsuhashi, Ken-ichiro: *See*—
Asada, Kazuhiko; Ueno, Koichi; Kashihara, Shin-ichiro; Okamoto, Shigemi; Kurose, Katsuo; Kuwahara, Kazuhiko; and Mitsuhashi, Ken-ichiro, 5,597,037, Cl. 165-110.000.

Miura, Satoshi, to Murata Manufacturing Co., Ltd. Method for coating electric component with resin. 5,597,610, Cl. 427-58.000.

Mix, Jerome M.; Hu, Charles C.; and Young, James M., to Watt Stopper, The. Moveable desktop load controller. 5,598,042, Cl. 307-116.000.

Miya, Kazuyuki: *See*—
Hayashi, Masaki; Miya, Kazuyuki; and Kato, Osamu, 5,598,404, Cl. 370-342.000.

Miyahara, Yasunori; and Anzai, Syun-ichi, to Kabushiki Kaisha Toshiba. Broadcasting system discriminating television receiver for differentiating between analog and digital telecast signals. 5,598,221, Cl. 348-554.000.

Miyake, Sumiya: *See*—
Tsujimoto, Motoyoshi; and Miyake, Sumiya, 5,597,867, Cl. 525-74.000.

Miyamoto, Hidenori; Amanuma, Tatsuo; and Nakamura, Toshiyuki, to Nikon Corporation. Camera capable of reducing image blur. 5,598,246, Cl. 396-55.000.

Miyamoto, Hidenori: *See*—
Omi, Junichi; Wakabayashi, Hiroshi; Miyamoto, Hidenori; Soshi, Isao; Kato, Minoru; Amanuma, Tatsuo; and Imura, Yoshio, 5,598,242, Cl. 396-55.000.

Miyano, Toshiki, to NEC Corporation. Speech coding system to reduce distortion through signal overlap. 5,598,504, Cl. 395-2.310.

Miyatake, Sinichi: *See*—
Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitazne, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

Miyawaki, Kunio: *See*—
Sunayama, Kazuyuki; Miyawaki, Kunio; Ohno, Minoru; and Miyazaki, Tatsuo, 5,597,498, Cl. 219-124.340.

Miyawaki, Mamoru: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Miyazaki, Hitoshi: *See*—
Matsuo, Hideo; Anzai, Kazumi; and Miyazaki, Hitoshi, 5,598,548, Cl. 395-430.000.

Miyazaki, Tatsuo: *See*—
Sunayama, Kazuyuki; Miyawaki, Kunio; Ohno, Minoru; and Miyazaki, Tatsuo, 5,597,498, Cl. 219-124.340.

Miyazawa, Hideo: *See*—
Kaku, Takashi; Okita, Ryoji; and Miyazawa, Hideo, 5,598,434, Cl. 375-230.000.

Miyazawa, Hiroshi; Kitahara, Hatsuo; and Namaizawa, Hiroshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Stepping motor with different sized or missing teeth. 5,598,046, Cl. 310-49.00R.

Miyoshi, Shinji: *See*—
Ohmi, Tadahiro; Miyoshi, Shinji; and Mizuguchi, Yasumitsu, 5,597,109, Cl. 228-199.000.

Mize, Pat D.: *See*—
Linn, C. Preston; Pitner, J. Bruce; and Mize, Pat D., 5,597,696, Cl. 435-6.000.

Mizuguchi, Yasumitsu: *See*—
Ohmi, Tadahiro; Miyoshi, Shinji; and Mizuguchi, Yasumitsu, 5,597,109, Cl. 228-199.000.

Mizukami, Makoto; Iwatsu, Shigetaro; Sakai, Masao; Ueno, Masahiro; Izawa, Nobuyoshi; and Katou, Kikuji, to Nippon Telegraph and Telephone Corporation. Camera capable of reducing image blur. 5,598,385, Cl. 369-36.000.

Mizukata, Katsuya; Kawaguchi, Takafumi; Takeda, Shiro; and Takeda, Makoto, to Sharp Kabushiki Kaisha. Driving apparatus and method for an active matrix type liquid crystal display apparatus. 5,598,177, Cl. 345-92.000.

Mizumoto, Mamoru: *See*—
Nishimura, Katsunori; Honbo, Hidetoshi; Gotoh, Akihiro; Mizumoto, Mamoru; and Horiba, Tatsuo, 5,597,526, Cl. 266-80.000.

Mizuno, Toshiyuki: *See*—
Umemura, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keizhi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Mizusawa, Tunetoshi; and Saito, Masahiko, to NEC Corporation. Multiplexer with transmission back-up function. 5,598,402, Cl. 370-225.000.

Mizushima, Ichiro: *See*—
Murakoshi, Atsushi; Mizushima, Ichiro; Watanabe, Masaharu; and Yoshiki, Masahiko, 5,598,025, Cl. 257-607.000.

Mo, Buxing. Apparatus and method for administering minerals. 5,597,550, Cl. 424-40.000.

Mochizuki, Mikio; Ito, Hideo; and Kobayashi, Ryousaku, to Nohmi Bosai Ltd. Smoke detecting apparatus for fire alarm. 5,598,147, Cl. 340-630.000.

Moerke Custom Products, Inc.: *See*—
Moerke, Duane C., 5,597,385, Cl. 55-274.000.

Moerke, Duane C., to Moerke Custom Products, Inc. Filtered exhaust wand for removing laser smoke. 5,597,385, Cl. 55-274.000.

Moghe, Bhalchandra; Shevade, Makarand; Kasat, Radhakrishna; and Linn, Elizabeth, to Mennen Company, The. Colored bicarbonate containing solid composition. 5,597,556, Cl. 424-65.000.

Mohaupt, Udo H., to Sowal Technologies International Inc. Capacitance weighing mat with substantially rigid separators. 5,597,984, Cl. 177-210.00C.

Mohrs, Klaus-Helmut: *See*—
Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romanis; Müller-Peddinghaus, Reiner; and Hatzelmann, Armin, 5,597,833, Cl. 514-312.000.

Moinard, Patrice, to AlliedSignal Europe Services Techniques. Valve with a threshold with retractable push rod. 5,597,012, Cl. 137-505.130.

Moini, Mojtaba: *See*—
Hass, Helmut; and Moini, Mojtaba, 5,598,073, Cl. 318-431.000.

Molex Incorporated: *See*—
Katsumori, Kazahara, 5,597,324, Cl. 439-587.000.
Wang, Leland; and Wong, Nai K., 5,597,320, Cl. 439-342.000.

Möller, Marcus: *See*—
Neubauer, Werner; Bocionek, Siegfried; Möller, Marcus; and Joppich, Martin, 5,598,076, Cl. 348-568.220.

Möller, Rudolf, to Muhr und Bender. Hose clamp. 5,596,790, Cl. 24-20.0EE.

Molten Corporation: *See*—
Shishido, Hideomi; Doi, Shigeo; Hirakiuchi, Masanori; and Okimoto, Hajime, 5,597,432, Cl. 156-170.000.

Momose, Hiroshi: *See*—
Maeda, Takeo; and Momose, Hiroshi, 5,597,757, Cl. 437-59.000.

Monarch Marking Systems, Inc.: *See*—
Mistyurik, John D., 5,597,249, Cl. 400-234.000.

Monma, Genzo: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Monsanto Canada Inc.: *See*—
Duff, Michael, 5,596,837, Cl. 47-57.500.

Monsanto Company: *See*—
Chalupa, William F.; King, Alan H.; and Giampetro, Donald A., 5,597,604, Cl. 426-590.000.

Montag, Bruce C.; Wenzel, Dennis J.; and Weyrauch, Richard P., to Southwest Research Institute. Weather effects generator for simulation systems. 5,598,359, Cl. 364-578.000.

Montagnier, Luc; Guetard, Denise; Brun-Vezinet, Francoise; and Clavel, Francois, to Institut Pasteur. New retrovirus human immunodeficiency virus type 2(HIV2), capable of causing AIDS, antigens obtained from this retrovirus and corresponding antibodies and their application for diagnostic purposes. 5,597,896, Cl. 530-388.350.

Montague, Peter G.: *See*—
Schepers, Frederik J.; and Montague, Peter G., 5,597,508, Cl. 510-417.000.

Montie, Edwin A.: *See*—
Trompenaars, Petrus H. F.; Cosmas, Edward C.; Montie, Edwin A.; Baller, Theunis S.; Lambert, Nicolaas; De Zwart, Siebe T.; and Rademakers, Antonius J. J., 5,598,054, Cl. 313-422.000.

Moog Inc.: *See*—
Vick, Ralph L., 5,597,014, Cl. 137-625.230.

Moon, Yong S.; Kim, Si J.; and Jang, Soon H., to Korea Telecommunication Authority. Conversion circuit for mutually converting between progressive scan and zig-zag scan video signal formats. 5,598,212, Cl. 348-403.000.

Moore, Carolyn E., to Ciba-Geigy Corporation. Microemulsion formulation for injection into trees. 5,597,840, Cl. 514-365.000.

Moore, Steven R.: *See*—
Burger, William R.; Moore, Steven R.; and Kaeezel, Gary A., 5,598,192, Cl. 347-43.000.

Mora, Juan R.: *See*—
Desautels, John T.; Bayer, Timothy J.; and Mora, Juan R., 5,597,435, Cl. 156-245.000.

Moraca, Pietro: *See*—
Drigani, Fausto; and Moraca, Pietro, 5,596,898, Cl. 72-236.000.

Morgan, James M. Firearm rest. 5,596,830, Cl. 42-94.000.

Mori, Hideo: *See*—

Umezawa, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Mori, Hiroyuki: *See—*
Samoto, Masahiko; Akasaka, Takeshi; and Mori, Hiroyuki, 5,597,607, Cl. 426-656.000.

Mori, Kazuhiro, to Namco Ltd. Image synthesizing system and video game apparatus using the same. 5,598,516, Cl. 395-126.000.

Mori, Takahiro: *See—*
Kaneoka, Ichiro; Mori, Takahiro; Yamada, Satoru; Shiotsuka, Hidenori; and Komori, Ayako, 5,597,422, Cl. 136-259.000.

Morigaki, Kenichi; Kabeto, Noriko; and Haraguchi, Kazunori, to Matsushita Electric Industrial Co., Ltd. Manufacturing method of a separator for a lithium secondary battery and an organic electrolyte lithium secondary battery using the same separator. 5,597,659, Cl. 429-190.000.

Morigaki, Masakazu: *See—*
Ishii, Yoshio; Mihayashi, Keiji; and Morigaki, Masakazu, 5,597,682, Cl. 430-533.000.

Moriguchi, Hideki; Murakami, Daisuke; Ikegaya, Akihiko; and Nomura, Toshio, to Sumitomo Electric Industries, Ltd. Coated hard alloy tool. 5,597,272, Cl. 407-119.000.

Morihiro, Yoshiharu: *See—*
Shimotani, Mitsuo; Nishida, Minoru; Okada, Akira; and Morihiro, Yoshiharu, 5,598,145, Cl. 340-576.000.

Morimoto, Yasuto: *See—*
Nakao, Tohru; Tanaka, Hiroshi; Morimoto, Yasuto; and Takehara, Shuzo, 5,597,918, Cl. 544-234.000.

Morino, Makoto: *See—*
Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

Morishima, Morito: *See—*
Aoshima, Shinji; and Morishima, Morito, 5,598,384, Cl. 369-32.000.

Morishita, Masakazu: *See—*
Sakamoto, Masaru; Morishita, Masakazu; and Nishimura, Shigeru, 5,597,741, Cl. 437-25.000.

Morishita, Tatsuya; and Murasugi, Takashi, to Unisia Jecs Corporation; and Nissan Motor Co., Ltd. Torsional damper with guided friction blocks. 5,597,355, Cl. 464-68.000.

Morita, Katsuaki, to Olympus Optical Co., Ltd. Ultrasonic probe. 5,596,989, Cl. 128-660.100.

Morita, Tominori: *See—*
Hori, Masabu; Watanabe, Ikuo; Ohtaka, Hiroshi; Harada, Kengo; Maruo, Joji; Morita, Tominori; Yamamoto, Takeshi; and Tsutsui, Hisayoshi, 5,597,820, Cl. 514-230.500.

Moriwaki, Katsuakira; and Shiraishi, Toshihiro, to Sony Corporation. Image transformation apparatus. 5,598,486, Cl. 382-293.000.

Moriya, Takao; and Suenari, Masaya, to Yamaha Hatsudoki Kabushiki Kaisha. Lubricating oil supply unit for two-cycle engines. 5,597,051, Cl. 184-6.100.

Moriyama, Keiji: *See—*
Yamada, Mikio; Ebisuno, Tadahiro; Moriyama, Keiji; and Sugimoto, Kazushige, 5,597,365, Cl. 473-354.000.

Moriyama, Tadashi: *See—*
Nagai, Kenichi; Yasuda, Kenji; Hama, Toshio; Sekiguchi, Yoshitoshi; Tachibana, Toshio; Nakanishi, Osamu; and Moriyama, Tadashi, 5,597,451, Cl. 201-4.000.

Moroboshi, Toshihiro: *See—*
Ide, Yuji; Takashima, Kazuhiro; Moroboshi, Toshihiro; and Fukamoto, Tomiyoshi, 5,598,187, Cl. 345-158.000.

Moroney, Paul: *See—*
Nuber, Ray; and Moroney, Paul, 5,598,415, Cl. 370-474.000.

Morris, Glenn. Fluid dispensing container. 5,597,097, Cl. 222-529.000.

Morris, Glenn. Top opening locking mailbox. 5,597,116, Cl. 232-20.000.

Morris, Nicholas A.: *See—*
Birch, Brian J.; and Morris, Nicholas A., 5,597,463, Cl. 204-405.000.

Morrison, Frank T., to Baltimore Aircoil Company, Inc. Header and coil arrangement for cooling apparatus. 5,596,877, Cl. 62-59.000.

Morrison, Ward D.; and Coombs, Perry L., to Cannon Industries, Inc. Bolt delivery system. 5,597,267, Cl. 405-303.000.

Morvan, Roger, to Aerospatiale Societe Nationale Industrielle. Device for controlling a mechanism driven by a less one electric motor. 5,598,312, Cl. 361-31.000.

Moser, Roland; and Bär, Daniel, to Ciba-Geigy Corporation. Heat-curable epoxy resin systems having a good reactivity/stability ratio. 5,597,886, Cl. 528-91.000.

Mosley, Jeffery B.: *See—*
Truemner, Michael A.; and Mosley, Jeffery B., 5,598,462, Cl. 379-95.000.

Mostafazadeh, Shahram; and Smith, Joseph O., to National Semiconductor Corporation. Ball grid array with heat sink. 5,598,321, Cl. 361-704.000.

Motegi, Kiyoshi: *See—*
Tanimoto, Akikazu; Motegi, Kiyoshi; and Komaru, Yukako, 5,597,590, Cl. 425-174.400.

Motorola Inc.: *See—*
Adelman, Judah L.; Marino, Paul; Goren, Avner; and Hillman, Garth, 5,598,362, Cl. 364-736.000.

Blackwell, Steven R.; Pearson, John T.; and Fridlin, Charles C., IV, 5,598,401, Cl. 379-94.000.

Cabuk, Nihat, 5,598,107, Cl. 326-27.000.

Catherwood, Michael I.; and Espinor, George L., 5,598,569, Cl. 395-800.000.

Chambers, Mark J., 5,598,129, Cl. 330-255.000.

Cristler, Kenneth J.; and Needham, Michael L., 5,598,417, Cl. 370-348.000.

Gallup, Michael G.; Goke, L. Rodney; and Seaton, Robert W., Jr., 5,598,571, Cl. 395-8.000.

Girardeau, James W., Jr., 5,598,448, Cl. 375-376.000.

Greer, Stuart E.; Dietz, Joel P.; and Sparkman, Aubrey K., 5,597,737, Cl. 437-8.000.

Heim, Barry B.; and Colbert, Freeman D., 5,597,758, Cl. 437-60.000.

Koifman, Vladimir; Kashet, Israel; and Afek, Yachin, 5,598,118, Cl. 327-108.000.

Lobel, Gary S., 5,598,431, Cl. 375-224.000.

Melton, Cynthia M.; and Pfahl, Robert, 5,597,110, Cl. 228-203.000.

Orlen, Noah; and Saidi, Ali, 5,598,179, Cl. 345-98.000.

Passlack, Matthias; and Abrokwah, Jonathan K., 5,597,768, Cl. 437-236.000.

Pendalwar, Shekhar L.; and Denton, Frank R., III, 5,597,663, Cl. 429-198.000.

Reber, William L.; and Pertunen, Cary D., 5,597,182, Cl. 283-67.000.

Shea, Gene W.; Golab, James S.; and Moyer, William C., 5,598,550, Cl. 395-473.000.

Somerville, Thomas A., 5,598,086, Cl. 320-30.000.

Mousinie, Bob, to Filtec-Filtertechnologie GmbH. Multi-pole connector with filter configuration. 5,597,328, Cl. 439-620.000.

Mowaz, Zeev; and Kariv, Amnon. Automobile cover. 5,597,197, Cl. 296-136.000.

Moya, José J.: *See—*
Sherman, Marshall L.; Castellano, Thomas M.; and Moya, José J., 5,596,995, Cl. 128-736.000.

Moyer, William C.: *See—*
Shea, Gene W.; Golab, James S.; and Moyer, William C., 5,598,550, Cl. 395-473.000.

MPB Technologies Inc.: *See—*
Domagala, Jerzy, 5,598,440, Cl. 375-329.000.

Mueller, Gerd O.: *See—*
Vincent, Kent; Mueller, Gerd O.; and Mueller-Mach, Regina B., 5,598,067, Cl. 315-169.300.

Mueller, Joachim: *See—*
Neubert, Werner; Schadow, Joachim; Mueller, Joachim; Staebler, Manfred-Otto; Dohr, Manfred; and Warkentin, Heinz, 5,596,810, Cl. 30-369.000.

Mueller-Mach, Regina B.: *See—*
Vincent, Kent; Mueller, Gerd O.; and Mueller-Mach, Regina B., 5,598,067, Cl. 315-169.300.

Muhr und Bender: *See—*
Möller, Rudolf, 5,596,790, Cl. 24-20.0EE.

Mukai, Tadayoshi: *See—*
Okasmura, Yukihiko; Yuasa, Hiroaki; and Mukai, Tadayoshi, 5,598,081, Cl. 318-801.000.

Mukawa, Hiroshi, to Sony Corporation. Apparatus for recording data and statically storing and recording supervisory information representing contents of the data on a recording medium. 5,598,391, Cl. 369-54.000.

Mul-T-Lock Inc.: *See—*
Eizen, Noach, 5,598,140, Cl. 340-426.000.

Mulcahy, Leo T.: *See—*
Hank, Mark A.; Mulcahy, Leo T.; Peterson, Ralph S.; and Streisel, Robert C., 5,597,447, Cl. 162-135.000.

Mullaney, Julian S.: *See—*
Blivea, David C.; Vrasicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,598,455, Cl. 379-27.000.

Mullen, Ken I., to University of California Office of Technology Transfer, The Regents of the. Surfactant monitoring by foam generation. 5,597,950, Cl. 73-60.110.

Muller, Joseph J. P. M., to Tulip Computers International B.V. Device for protecting a computer. 5,598,323, Cl. 361-726.000.

Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal sulphonylaminocarbonyltriazolinones having substituents bonded via oxygen of the formula. 5,597,939, Cl. 558-8.000.

Müller, Thomas: *See—*
Himmelsbach, Frank; Pieper, Helmut; Austel, Volkhard; Linz, Günter; Müller, Thomas; Eisert, Wolfgang; and Weisenberger, Johannes, 5,597,825, Cl. 514-255.000.

Müller-Peddinghaus, Reiner: *See—*
Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romania; Müller-Peddinghaus, Reiner; and Hatzelmann, Armin, 5,597,833, Cl. 514-312.000.

Mullineaux, Philip M.: *See—*
Guerineau, Jean F.; Mullineaux, Philip M.; and Parnell, Edgar W., 5,597,717, Cl. 435-172.300.

Mullins, Albert A., II: *See—*
Tubel, Paulo S.; Mullins, Albert A., II; Jones, Kevin R.; and Richardson, Frank D., 5,597,042, Cl. 166-250.010.

Müllner, Martin: *See—*
Hackl, Kurt A.; Rösler, Markus; Müllner, Martin; and Stern, Gerhard, 5,597,917, Cl. 544-130.000.

Munezane, Tsuyoshi; Fukutomi, Norihisa; and Matsumoto, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection valve. 5,597,121, Cl. 239-408.000.

Munroe, David J.; and Housman, David E., to Massachusetts Institute of Technology. Interspersed repetitive element-bubble amplification of nucleic acids. 5,597,694, Cl. 435-6.000.

Munson, James R.; Bertram, Bryan L.; and Caldwell, Joseph D., to Dallas Group of America, Inc., The. The treatment of cooking oils and fats with magnesium silicate and alkali materials. 5,597,600, Cl. 426-330.600.

Mura, Albert J.: *See—*
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Farrell, Robert P., 5,597,841, Cl. 514-373.000.

Murakami, Daisuke: *See—*
Moriguchi, Hideki; Murakami, Daisuke; Ikegaya, Akihiko; and Nomura, Toshio, 5,597,272, Cl. 407-119.000.

Murakami, Seiji: *See—*
Watanabe, Yoshihiro; Nakamura, Hiroki; Harada, Nozomu; Murakami, Seiji; Sakamoto, Tsutomu; Taira, Kazuki; and Saitoh, Yutaka, 5,597,223, Cl. 353-97.000.

Murakami, Susumu: *See—*
Noguchi, Toru; Goto, Kazuo; Hayashi, Sigehiko; Kawahara, Masahito; Murakami, Susumu; Yanaguchi, Yoshio; and Deki, Shigehito, 5,597,614, Cl. 427-162.000.

Murakami, Toru, to NEC Corporation. Methods for determing cholesterol oxidase activity in an aqueous test sample, determining whether a test compound is capable of inhibiting cholesterol oxidase activity and determining the degree of cholesterol oxidase inhibitory activity. 5,597,703, Cl. 435-25.000.

Murakami, Umeji: *See—*
Igarashi, Shigeru; Usui, Toshihiro; Hiraoka, Junichiro; Hashimoto, Keiko; Uchiwa, Hideyo; Murakami, Umeji; Sugimoto, Kenichi; Minamino, Hiromi; and Horikoshi, Toshio, 5,597,386, Cl. 8-405.000.

Murakoshi, Atsushi; Mizushima, Ichiro; Watanabe, Masaharu; and Yoshiki, Masahiko, to Kabushiki Kaisha Toshiba. Semiconductor device comprises an impurity layer having boron ions in the form of clusters of icosahedron structure. 5,598,025, Cl. 257-607.000.

Muranaka, Masaya: *See—*
Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

Murase, Yoshiharu: *See—*
Mikami, Tsutomu; Kaneko, Masayasu; and Murase, Yoshiharu, 5,598,227, Cl. 348-725.000.

Murasugi, Takashi: *See—*
Morishita, Tatsuya; and Murasugi, Takashi, 5,597,355, Cl. 464-68.000.

Murata Manufacturing Co., Ltd.: *See—*
Fuse, Kenji, 5,598,133, Cl. 333-189.000.
Imamura, Nobuaki; and Oyama, Nobuhiro, 5,598,324, Cl. 363-21.000.
Ito, Nobuhiro; Shibano, Tomio; and Yaji, Kaneo, 5,597,956, Cl. 73-514.180.
Kano, Osamu; and Senda, Atsuo, 5,598,136, Cl. 336-200.000.
Kohno, Yoshiaki; and Suzuki, Tatsuya, 5,597,494, Cl. 216-6.000.
Maeda, Eiichi; and Mihara, Hideyuki, 5,598,135, Cl. 336-200.000.
Miura, Satoshi, 5,597,610, Cl. 427-58.000.
Nakamura, Takeshi, 5,597,954, Cl. 73-503.000.

Murata, Yasuyuki; Nakanishi, Yoshinori; and Ochi, Mitsukazu, to Shell Oil Company. Epoxy resin composition containing novolac with adjacent hydroxyl groups. 5,597,876, Cl. 525-481.000.

Mure, Shoichi: *See—*
Nakae, Yasuhiko; Ishida, Shigeru; Mure, Shoichi; and Shibata, Yasuhiro, 5,597,861, Cl. 524-601.000.

Murgolo, Nicholas: *See—*
Dalie, Barbara; Miller, Kenneth; Murgolo, Nicholas; and Tisdall, Stephen, 5,597,710, Cl. 435-69.600.

Murphy, William A.: *See—*
Coy, David H.; Woltering, Eugene A.; O'Dorisio, M. Sue; O'Dorisio, Thomas M.; and Murphy, William A., 5,597,894, Cl. 530-311.000.

Musco, Vincent A.: *See—*
Cayer, Christine M.; Musco, Vincent A.; and Peterson, Robert F., Jr., 5,597,777, Cl. 504-116.000.

Mutschler, Siegfried: *See—*
Hasenfratz, Rene; and Mutschler, Siegfried, 5,597,500, Cl. 219-385.000.

Mycogen Plant Science, Inc.: *See—*
Levings, Charles S., III; Dewey, Ralph E.; and Braun, Carl J., 5,597,698, Cl. 435-6.000.

Myerholtz, Carl A.: *See—*
Flory, Curt A.; and Myerholtz, Carl A., 5,598,001, Cl. 250-292.000.

Myers, Garry L.: *See—*
Fuisz, Richard C.; Battist, Gerald B.; and Myers, Garry L., 5,597,416, Cl. 127-30.000.

Mzoughi, Abdelaziz: *See—*
Litaize, Daniel; Salinier, Jean-Claude; Mzoughi, Abdelaziz; Elkhlifi, Fatima-Zahra; Lalam, Mustapha; and Sainrat, Pascal, 5,598,554, Cl. 395-500.000.

Naan Irrigation Systems: *See—*
Gorney, Moshe; and Gal, Izhak, 5,597,119, Cl. 239-241.000.

Naco Industries, Inc.: *See—*
Bray, Verne; and Hansen, Glen, 5,597,185, Cl. 285-179.000.

Nag, Sudip K.: *See—*
Roy, Kaushik; and Nag, Sudip K., 5,598,343, Cl. 364-489.000.

Nagabhushan, T. L.: *See—*
Hammond, Gerald; Le, Hung V.; Nagabhushan, T. L.; Reichert, Paul; and Trotta, Paul P., 5,597,900, Cl. 530-351.000.

Nagae, Takaaki, to Fujitsu Limited. Method and apparatus for controlling using checksums execution of object programs. 5,598,530, Cl. 395-182.190.

Nagai, Kazukiyo: *See—*
Ohta, Masafumi; Sakon, Yohta; Takahashi, Toshihiko; Adachi, Chihaya; and Nagai, Kazukiyo, 5,597,925, Cl. 548-145.000.

Nagai, Kenichi; Yasuda, Kenji; Hama, Toshio; Sekiguchi, Yoshitoshi; Tachibana, Toshio; Nakanishi, Osamu; and Moriyama, Tadashi, to Hitachi Zosen Corporation. Apparatus for thermally decomposing plastics and process for converting plastics into oil by thermal decomposition. 5,597,451, Cl. 201-4.000.

Nagai, Osamu; Okamoto, Kunihide; and Yamamoto, Kaoru, to Showa Corporation. Hydraulic damper. 5,597,054, Cl. 188-299.000.

Nagamatsu, Tetsu; and Kim, Lee-Sup, to Kabushiki Kaisha Toshiba. Discrete cosine transform processor. 5,598,361, Cl. 364-725.000.

Nagano, Akihiko; Seda, Yasuo; and Konishi, Kazuki, to Canon Kabushiki Kaisha. Optical apparatus having visual point detection function. 5,598,248, Cl. 396-51.000.

Nagano, Hiroyuki; and Suzuki, Nobuyuki, to Chugai Seiyaku Kabushiki Kaisha. Quinolone carboxylic acid derivatives in crystalline hydrate form. 5,597,923, Cl. 546-156.000.

Nagano, Shigetoshi: *See—*
Watanabe, Toru; and Nagano, Shigetoshi, 5,597,502, Cl. 219-528.000.

Nagarajan, Raj T.: *See—*
Carter, Jeffrey J., Jr.; Cannon, Howard N.; Shively, Kirk S.; Forck, Glen F.; Nagarajan, Raj T.; and Meister, Steven F., 5,597,118, Cl. 239-92.000.

Nagasaki, Katsuhiko: *See—*
Suzuki, Noriyuki; Shimada, Kazutoshi; Tatsumi, Eisaku; Sunakawa, Shinichi; and Nagasaki, Katsuhiko, 5,598,150, Cl. 340-825.070.

Nagasawa, Kenichi; Takahashi, Koji; and Sato, Chikara, to Canon Kabushiki Kaisha. Video signal recording apparatus having an interval recording mode compatible with an overlap recording mode. 5,598,275, Cl. 386-117.000.

Nagashima, Naoki: *See—*
Sumi, Hirofumi; and Nagashima, Naoki, 5,597,739, Cl. 437-21.000.

Nagata, Masahisa, to Toyota Jidosha Kabushiki Kaisha. Cylinder head for an internal combustion engine. 5,596,965, Cl. 123-306.000.

Nagel, Dale E.: *See—*
Sobotka, Stanley E.; Charles, John G., Sr.; Nagel, Dale E.; and Kalin, James T., 5,596,979, Cl. 126-91.00A.

Nagy, Bela G.: *See—*
Olson, Eric E., Jr.; and Nagy, Bela G., 5,596,813, Cl. 33-816.000.

Nakae, Yasuhiko; Ishida, Shigeru; Mure, Shoichi; and Shibata, Yasuhiro, to Nippon Paint Company, Ltd. Waterborne polyester paint. 5,597,861, Cl. 524-601.000.

Nakagaki, Keishi: *See—*
Umezawa, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Nakagawa, Hideyuki: *See—*
Yamazaki, Shigeki; and Nakagawa, Hideyuki, 5,598,449, Cl. 376-195.000.

Nakagawa, Hiroshi: *See—*
Kurosawa, Itaru; Nakagawa, Hiroshi; Aoyagi, Masahiro; Maezawa, Masaaki; Naniya, Takashi; and Kameda, Yoshio, 5,598,105, Cl. 326-6.000.

Nakajima, Hisashi: *See—*
Koda, Hideaki; and Nakajima, Hisashi, 5,597,525, Cl. 264-537.000.

Nakamura, Akio: *See—*
Adomi, Keizo; Noto, Nobuhiko; Nakamura, Akio; and Takenaka, Takao, 5,597,761, Cl. 437-127.000.

Nakamura, Hiroki: *See—*
Watanabe, Yoshihiro; Nakamura, Hiroki; Harada, Nozomu; Murakami, Seiji; Sakamoto, Tsutomu; Taira, Kazuki; and Saitoh, Yutaka, 5,597,223, Cl. 353-97.000.

Nakamura, Kimitsugu; Fujita, Yoshio; and Ohishi, Keiichi, to Hamamatsu Photonics K.K. Photomultiplier. 5,598,061, Cl. 313-532.000.

Nakamura, Motonori: *See—*
Ishikawa, Shinji; Chigusa, Yoshiki; Nakamura, Motonori; Makio, Yoshinori; and Watanabe, Morio, 5,597,398, Cl. 65-413.000.

Nakamura, Satoru: *See—*
Yamamoto, Toshihiro; and Nakamura, Satoru, 5,598,356, Cl. 364-558.000.

Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Bearing sensor and bearing-distance sensor. 5,597,954, Cl. 73-503.000.

Nakamura, Tohru: *See—*
Tanoue, Tomonori; Masuda, Hiroshi; Nakamura, Tohru; Onai, Takahiro; and Washio, Katsuyoshi, 5,598,015, Cl. 257-197.000.

Nakamura, Toshiyuki: *See—*
Miyamoto, Hidenori; Amasuma, Tatsuo; and Nakamura, Toshiyuki, 5,598,246, Cl. 396-55.000.

Nakamura, Yoshio: *See—*

Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Nakanishi, Atsushi; Hoshino, Mitsuo; and Matsumoto, Yoshitaka, to Sony Corporation. Magnetic recording and reproducing device having a lid member which forms part of a grip. 5,598,305, Cl. 360-96.600.

Nakanishi, Osamu: *See*—
Nagai, Kenichi; Yasuda, Kenji; Hama, Toshio; Sekiguchi, Yoshitoshi; Tachibana, Toshio; Nakanishi, Osamu; and Moriyama, Tadashi, 5,597,451, Cl. 201-4.000.

Nakanishi, Yoshinori: *See*—
Murata, Yasuyuki; Nakanishi, Yoshinori; and Ochi, Mitsukazu, 5,597,876, Cl. 525-481.000.

Nakano, Junichi; Ezawa, Hiroshi; and Matsubayashi, Nobuhide, to Olympus Optical Co., Ltd. Signal detector for an optical information reproducing apparatus. 5,598,389, Cl. 369-48.000.

Nakano, Toshihiko; and Amano, Tadashi, to Shin-Etsu Chemical Co., Ltd. Process of producing vinyl chloride polymer. 5,597,878, Cl. 526-62.000.

Nakao, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Photomask and photomask blank. 5,597,667, Cl. 430-5.000.

Nakao, Tohru; Tanaka, Hiroshi; Morimoto, Yasuto; and Takehara, Shuzo, to Yoshitomi Pharmaceutical Industries, Ltd. Fused pyridazine compound. 5,597,918, Cl. 544-234.000.

Nakase, Kazuhiko, to Harada Kogyo Kabushiki Kaisha. Glass antenna for automobiles. 5,598,170, Cl. 343-704.000.

Nakashima, Hironori: *See*—
Yoshikawa, Motonobu; Yamamoto, Yoshiharu; and Nakashima, Hironori, 5,598,292, Cl. 359-216.000.

Nakayama, Akinari: *See*—
Hinoshita, Shinji; Nakayama, Akinari; Watanabe, Kiyoshi; Yagyu, Hideki; Ishi, Shinya; and Iwata, Shigeru, 5,597,981, Cl. 174-110.00R.

Nakayama, Masahiro: *See*—
Tanaka, Yoshiaki; Hayashi, Hiroshi; Fuchigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, 5,598,478, Cl. 381-17.000.

Nakayama, Noritaka: *See*—
Ito, Satoshi; Hiei, Futoshi; Ishibashi, Akira; Toda, Atsushi; and Nakayama, Noritaka, 5,597,740, Cl. 437-23.000.

Nakayama, Ryozo: *See*—
Asano, Masamichi; Iwahashi, Hiroshi; Kiriswa, Ryouhei; Nakayama, Ryozo; Inoue, Satoshi; Shirota, Riichiro; Endoh, Tetsuo; and Masuoka, Fujio, 5,597,748, Cl. 437-43.000.

Nakayama, Takao: *See*—
Dan, Shigeyuki; and Nakayama, Takao, 5,597,671, Cl. 430-49.000.

Nakazawa, Toshiyuki: *See*—
Yokota, Masayuki; Nakazawa, Toshiyuki; Ogawa, Osamu; Tanaka, Nobuyoshi; and Tabata, Hisaya, 5,598,533, Cl. 395-200.080.

Nalco Chemical Company: *See*—
Chung, Daniel K.; and Ramesh, Manian, 5,597,490, Cl. 210-727.000.
Hurlock, John R.; and Ramesh, Manian, 5,597,859, Cl. 524-458.000.
Kerr, E. Michael; and Ramesh, Manian, 5,597,475, Cl. 208-188.000.
Ramesh, Manian; Cramm, Jeffrey R.; Werges, Darrell L.; and Howland, Christopher P., 5,597,858, Cl. 524-458.000.
Reed, Peter E.; and Greer, Carol S., 5,597,448, Cl. 162-166.000.

Nally, Robert M.; and Schafer, John C., to Cirrus Logic, Inc. Apparatus, systems and methods for controlling graphics and video data in multimedia data processing and display systems. 5,598,525, Cl. 395-520.000.

Nam, Myung-Hyun, to Samsung Electronics Co., Ltd. Switching circuit for embodying an I/O signal in a single terminal. 5,598,121, Cl. 327-392.000.

Namaizawa, Hiroshi: *See*—
Miyazawa, Hiroshi; Kitahara, Hatsuo; and Namaizawa, Hiroshi, 5,598,046, Cl. 310-49.00R.

Namco Ltd.: *See*—
Mori, Kazuhiro, 5,598,516, Cl. 395-126.000.

Nanya, Takashi: *See*—
Kurosawa, Itaru; Nakagawa, Hiroshi; Aoyagi, Masahiro; Maezawa, Masaaki; Nanya, Takashi; and Kameda, Yoshio, 5,598,105, Cl. 326-6.000.

Nanya, Toshiki: *See*—
Watanabe, Kazuhito; and Nanya, Toshiki, 5,597,673, Cl. 430-96.000.

Narayanan, Kolazi S.; Ianniello, Robert M.; and Pritchard, David W., to ISP Investments Inc. UV protective aqueous emulsion and emulsifiable solids for cosmetic and agrichemical formulations. 5,597,574, Cl. 424-401.000.

Narayanan, Kolazi S.: *See*—
Malawer, Edward G.; Narayanan, Kolazi S.; Cullen, James P.; and Rocafort, Colleen M., 5,597,551, Cl. 424-47.000.

Narayanan, Raman, to Microsoft Corporation. Method and system for direct cell formatting in a spreadsheet. 5,598,519, Cl. 395-765.000.

National Institute of Genetics: *See*—
Kawanishi, Yuichi; Gojobori, Takashi; Tateno, Yoshio; Ikeo, Kazuho; and Kawai, Masahito, 5,598,350, Cl. 364-496.000.

National Institute of Water and Atmospheric Research: *See*—
Smart, Graeme M.; Hayes, Michael P.; and George, Stephen G., 5,597,963, Cl. 73-861.650.

National Science Council: *See*—
Li, Kuo-Tseng; Huang, Min-Yu; and Cheng, Wen-Da, 5,597,546, Cl. 423-573.100.

National Semiconductor Corporation: *See*—
Bremner, Duncan J.; Benton, Roger K.; and Wieser, James B., 5,598,467, Cl. 379-398.000.
Hall, Christopher M.; Phillips, Gary D.; Weisrich, David W.; and Salter, Robert M., III, 5,598,573, Cl. 395-800.000.
Mostafazadeh, Shahram; and Smith, Joseph O., 5,598,321, Cl. 361-704.000.
Phillips, Christopher E., 5,598,112, Cl. 326-93.000.
Weigand, David L.; and Malek, Charles J., 5,598,419, Cl. 370-514.000.

Naumann, Theodore F.: *See*—
Bond, Malcolm; Engle, Gary; Forma, Joseph J.; and Naumann, Theodore F., 5,597,373, Cl. 482-4.000.

Nazimova, Svetlana: *See*—
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Starosvetskaya, Nelli, 5,597,700, Cl. 435-7.920.

NCR Corporation: *See*—
Flood, Dennis, 5,597,996, Cl. 235-379.000.
Guido, Joseph; Seymour, Kenneth S.; and Zink, Murray R., 5,597,155, Cl. 271-119.000.

NEC Corporation: *See*—
Deguchi, Koji, 5,598,117, Cl. 327-103.000.
Enomoto, Toshio, 5,598,111, Cl. 326-83.000.
Funaki, Hiroshi, 5,598,561, Cl. 395-706.000.
Hirota, Toshiyuki, 5,597,760, Cl. 437-60.000.
Iwasaki, Tadashi, 5,598,347, Cl. 364-491.000.
Konuma, Kazuo, 5,598,017, Cl. 257-232.000.
Matsukawa, Yoshiki, 5,598,411, Cl. 370-352.000.
Miyano, Toshiki, 5,598,504, Cl. 395-2.310.
Mizusawa, Tsunetoshi; and Saito, Masahiko, 5,598,402, Cl. 370-225.000.
Murakami, Toru, 5,597,703, Cl. 435-25.000.
Niwa, Kenji, 5,597,752, Cl. 437-44.000.
Onda, Kazuhiko; and Makino, Yoichi, 5,597,743, Cl. 437-39.000.
Sato, Toshifumi, 5,598,428, Cl. 375-206.000.
Sugano, Yoichi, 5,598,038, Cl. 257-787.000.
Suzuki, Kazumasa, 5,598,029, Cl. 257-665.000.
Tanabe, Akihito; and Tohyama, Shigeru, 5,598,016, Cl. 257-229.000.
Tatsuki, Nobuo, 5,598,403, Cl. 370-221.000.
Uematsu, Yoshihide, 5,598,010, Cl. 257-48.000.
Yokoyama, Hiroaki, 5,598,013, Cl. 257-67.000.
Yoshimori, Masamori, 5,597,759, Cl. 437-60.000.

Ned, Alexander A.: *See*—
Kurtz, Anthony D.; Shor, Joseph S.; and Ned, Alexander A., 5,597,738, Cl. 437-21.000.

Nedderman, William H., Jr., to United States of America, Navy. Quick change fin assembly for buoyant test vehicles. 5,597,337, Cl. 441-79.000.

Needham, Michael L.: *See*—
Crisler, Kenneth J.; and Needham, Michael L., 5,598,417, Cl. 370-348.000.

Neer, Jay H.: *See*—
Dewitt, John R.; McClurg, Todd A.; Neer, Jay H.; and Pimienta, Orlando, 5,598,318, Cl. 361-683.000.

NEFCO Inc.: *See*—
Schaller, Earle, 5,597,483, Cl. 210-232.000.

Nehmens, John R., II: *See*—
Bellehumeur, Alex R.; Nehmens, John R., II; and Haarlammert, Guy W., 5,597,161, Cl. 473-588.000.

Nelson, Daniel C.: *See*—
Lennox, James R.; Nelson, Daniel C.; and Pepper, Roger T., 5,597,611, Cl. 427-113.000.

Nelson, Gregory W.; Cherry, Clinton; and Olsen, Eric G., to Eastman Chemical Company. Process for producing polyester articles having low acetaldehyde content. 5,597,891, Cl. 528-481.000.

Nelson, John W.: *See*—
Bocko, Peter L.; Lapp, Josef C.; Nelson, John W.; and Schad, Carolyn K., 5,597,395, Cl. 65-33.400.

Nelson, Richard A.: *See*—
Grieser, Jerry D.; Nelson, Richard A.; Schumacher, Gordon D.; Warner, Thomas B.; and Dietrich, David M., 5,597,221, Cl. 312-348.100.

Nemas, Mara: *See*—
Linder, Charles; Nemas, Mara; Perry, Mordechai; and Ketraro, Reuven, 5,597,863, Cl. 525-61.000.

Nemoto, Peter A.: *See*—
Glamkowski, Edward J.; Chiang, Yulin; Strupczewski, Joseph T.; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,597,842, Cl. 514-373.000.

Nemours Foundation, The: *See*—
Brean, Bruce R., 5,596,780, Cl. 5-636.000.

Neppl, Franz, to Siemens Aktiengesellschaft. Method for detaching chips from a wafer. 5,597,766, Cl. 437-226.000.

Nesler, Clay G.: *See*—
Janu, George J.; and Nesler, Clay G., 5,597,354, Cl. 454-229.000.
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Nestrick, Terry J.: *See*—
LaPack, Mark A.; Nestrick, Terry J.; Martin, William F.; and Klecka, Gary M., 5,597,402, Cl. 95-12.000.

Neubauer, Werner; Bocionek, Siegfried; Möller, Marcus; and Joppich, Martin, to Siemens Aktiengesellschaft. Process for optimizing control parameters for a system having an actual behavior depending on the control parameters. 5,598,076, Cl. 348-568.220.

Neuberger, Wolfgang: *See*—
Blinov, Leonid; and Neuberger, Wolfgang, 5,597,624, Cl. 427-575.000.

Neubert, Werner; Schadow, Joachim; Mueller, Joachim; Staebler, Manfred-Otto; Dohr, Manfred; and Warkentin, Heinz, to Robert Bosch GmbH. Machine tool. 5,596,810, Cl. 30-369.000.

Neurogen Corporation: *See*—
Shaw, Kenneth; Hutchison, Alan; Thurkauf, Andrew; and Tallman, John, 5,597,920, Cl. 544-250.000.

New Oji Paper Co., Ltd.: *See*—
Sato, Junichiro; Ando, Tadayo; Hayakawa, Sumio; and Ouchi, Ryuji, 5,597,446, Cl. 162-49.000.

New Pig Corporation: *See*—
Evans, Raymond D., Jr.; McMillen, Timothy R.; and Woytowich, Mark S., 5,597,418, Cl. 134-6.000.

New Venture Gear, Inc.: *See*—
Brissenden, James S.; Wilson, Robert J.; and Varma, Sanjeev K., 5,597,369, Cl. 475-89.000.

Newman, Alfred T. Ornamental carrier with flashlight-type eyes. 5,597,230, Cl. 362-154.000.

Newman, Eric L.: *See*—
Jones, J. Wyn; Legg, Stephen P.; and Newman, Eric L., 5,598,303, Cl. 360-73.020.

Newman, Paul B. D. Method of sterilizing an edible substrate with UV radiation. 5,597,597, Cl. 426-248.000.

Newtec International: *See*—
Martin-Cocher, Jean-Paul; and Jaconelli, Georges, 5,596,866, Cl. 53-442.000.

Neyndorff, Herma C.: *See*—
Chapman, John; Logan, Patricia M.; Neyndorff, Herma C.; and North, Janice, 5,597,722, Cl. 435-238.000.

Ng, Laurinda: *See*—
Mignardi, Michael A.; Ng, Laurinda; Croff, Ronald S.; McKenna, Robert; and Dyer, Lawrence D., 5,597,767, Cl. 437-227.000.

Nguyen, Julien T.: *See*—
Hsu, Mark; Le Cornec, Yann; and Nguyen, Julien T., 5,598,576, Cl. 395-822.000.

Nguyen, Loi N.; and Lin, Yih-Shung, to SGS-Thomson Microelectronics, Inc. Process of removing polymers in semiconductor vias. 5,597,983, Cl. 174-264.000.

Nguyen, Van D.: *See*—
Overdick, Gerhard; Lauth, Hans-Jürgen; Nguyen, Van D.; and Körtge, Randolf, 5,597,008, Cl. 137-15.000.

Niall, Hugh D.: *See*—
Coghlan, John P.; Peaschow, Jennifer D.; Tregear, Geoffrey W.; and Niall, Hugh D., 5,597,692, Cl. 435-6.000.

Nibert, Roger K.: *See*—
Bloch, Ricardo A.; Nibert, Roger K.; Ryer, Jack; and Watts, Raymond F., 5,597,506, Cl. 508-421.000.

Nicca Chemical Co., Ltd.: *See*—
Itoh, Hunnitaka; Makino, Toru; Katoh, Masayasu; and Gensho, Toshio, 5,597,786, Cl. 508-506.000.

Nichireki Company, Limited: *See*—
Ito, Akira; and Ishii, Hiroyuki, 5,597,409, Cl. 106-671.000.

Nichols, Horace E., Jr.: *See*—
Stebling, Henry J.; Istre, Roy, Jr.; Levine, Sheldon; and Nichols, Horace E., Jr., 5,596,893, Cl. 70-175.000.

Nichols, Kenneth E. Rack with convoluted main members for pickup trucks. 5,597,103, Cl. 224-324.000.

Nichols, Sheila M.: *See*—
Kumar, Kanta; Davis, Robert A.; Nichols, Sheila M.; and Buttery, Howard J., 5,597,557, Cl. 424-70.170.

Nicholson, Myron D.; Kajiwara, Edward M.; Ducharme, Paul E., Jr.; McAllister, Merlan E.; and Walta, Joseph R., to Viskase Corporation. Apparatus for the manufacture of cellulose food casing. 5,597,587, Cl. 425-71.000.

Nicholson, Paul: *See*—
Lee, Fui-Tseng H.; and Nicholson, Paul, 5,597,780, Cl. 504-271.000.

Nickolls, John R.; Zapisek, John; Kim, Won S.; Kalb, Jeffrey C.; Blank, W. Thomas; Wegbreit, Eliot; and Van Horn, Kevin, to MasPar Computer Corporation. Scalable processor to processor and processor to I/O interconnection network and method for parallel processing arrays. 5,598,408, Cl. 370-351.000.

Nicoletti, Rosario; and Baiocchi, Leandro, to Istituto Ricerca Francesco Angelini S.p.A. Glycogen polysaccharides. 5,597,913, Cl. 536-123.100.

Nielinger, Werner; Gittinger, Andreas; Ostlinning, Edgar; Idel, Karsten-Josef; and Schulte, Helmut, to Bayer Aktiengesellschaft. Process for the production of high molecular weight polyamide 6. 5,597,888, Cl. 528-335.000.

Niemann, Martin, to Siemens Aktiengesellschaft. Method and device for controlling a process. 5,598,329, Cl. 364-150.000.

Niemi, Pekka: *See*—
Saarikko, Anssi; Lahti, Lassi; Niemi, Pekka; Hellier, Robert; and Makkonen, Matti, 5,597,102, Cl. 224-197.000.

Nienaber, Michael L.: *See*—
Griffith, Gary L.; Nienaber, Michael L.; and Petty, Norman W., 5,598,412, Cl. 370-352.000.

Nifco Inc.: *See*—
Shibanushi, Yoshio, 5,596,794, Cl. 24-452.000.

Niijima, Hideto; Asano, Hideo; Sakaue, Yoshinori; and Toyooka, Takashi, to International Business Machines Corporation. Nonvolatile memory with cluster-erase flash capability and solid state file apparatus using the same. 5,598,370, Cl. 365-185.330.

Nikon Corporation: *See*—
Miyamoto, Hidenori; Amanuma, Tatsuo; and Nakamura, Toshiyuki, 5,598,246, Cl. 396-55.000.
Omi, Junichi; Wakabayashi, Hiroshi; Miyamoto, Hidenori; Soshi, Isao; Kato, Minoru; Amanuma, Tatsuo; and Imura, Yoshio, 5,598,242, Cl. 396-55.000.
Takagi, Tadao, 5,598,243, Cl. 396-51.000.
Tanimoto, Akikazu; Motegi, Kiyoshi; and Komaru, Yukako, 5,597,590, Cl. 425-174.400.
Watanabe, Toshimi, 5,598,247, Cl. 396-95.000.

Ninomiya, Ryozi, to Kabushiki Kaisha Toshiba. Apparatus for controlling power supply in a computer system by introducing delays before activation and deactivation of power. 5,598,567, Cl. 395-750.000.

Nippon Mektron, Ltd.: *See*—
Masaichi, Inaba; Hirofumi, Matsumoto; and Yasuyuki, Tanaka, 5,597,496, Cl. 216-94.000.

Nippon Paint Company, Ltd.: *See*—
Nakae, Yasuhiko; Ishida, Shigeru; Mure, Shoichi; and Shibata, Yasuhiro, 5,597,861, Cl. 524-601.000.

Nippon Sanso Corporation: *See*—
Kuwana, Takeshi; Nishino, Yoshiya; Komiya, Yasuhiko; and Matsuda, Kunio, 5,596,921, Cl. 99-340.000.

Nippon Steel Corporation: *See*—
Ooyagi, Yashichi; Hayashi, Tomohiko; Inoue, Mitsutoshi; Kakimoto, Michiyuki; and Eguchi, Ryuichi, 5,597,436, Cl. 156-259.000.
Yoshitomi, Yasunari; and Senuma, Takehide, 5,597,424, Cl. 148-111.000.

Nippon Telegraph and Telephone Corporation: *See*—
Maruo, Yasuto; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, 5,598,501, Cl. 385-143.000.
Mizukami, Makoto; Iwazu, Shigetaro; Sakai, Masao; Ueno, Masahiro; Izawa, Nobuyoshi; and Katou, Kikuji, 5,598,385, Cl. 369-36.000.
Watanabe, Hiroshi, 5,598,215, Cl. 348-416.000.

Nippondenso Co., Ltd.: *See*—
Obata, Kenzo; Kitazumi, Yosimi; Watanabe, Takeshi; Teramae, Kouji; and Nojiri, Tadao, 5,597,997, Cl. 235-455.000.
Yamamoto, Shinya; Fukanuma, Tetsuhiko; and Hisanaga, Shigeru, 5,597,297, Cl. 418-55.100.

Niro Holding A/S: *See*—
Hansen, Ove E., 5,596,817, Cl. 34-373.000.

Nisca Corporation: *See*—
Yamashita, Masashi, 5,597,154, Cl. 271-10.050.

Nishi, Takeshi: *See*—
Kogushi, Noriaki; Nishi, Takeshi; Hiroki, Masaaki; Yamaguchi, Toshiharu; and Konuma, Toshimitsu, 5,598,284, Cl. 349-33.000.

Nishida, Minoru: *See*—
Shimotani, Mitsuo; Nishida, Minoru; Okada, Akira; and Morihiro, Yoshiharu, 5,598,145, Cl. 340-576.000.

Nishikata, Takeharu: *See*—
Kondo, Tetsujiro; Fujimori, Yasuhiro; and Nishikata, Takeharu, 5,598,214, Cl. 348-414.000.

Nishikawa, Atsuhiko: *See*—
Tanikoshi, Koichiro; Tani, Masayuki; Yamashi, Kimiya; Uchigasaki, Harumi; Futakawa, Masayasu; Horita, Masato; Kuzunoki, Shoshiro; Nishikawa, Atsuhiko; and Maruyama, Takekazu, 5,598,572, Cl. 395-800.000.

Nishikawa, Robert M.; Ema, Takehiro; Yoshida, Hiroyuki; and Doi, Kunio, to Arch Development Corporation. Computer-aided method for image feature analysis and diagnosis in mammography. 5,598,481, Cl. 382-130.000.

Nishimura, Katsunori; Honbo, Hidetoshi; Gotoh, Akihiro; Mizamoto, Mamoru; and Horiba, Tatsuo, to Hitachi, Ltd. Lithium cell treating apparatus. 5,597,526, Cl. 266-80.000.

Nishimura, Shigeru: *See*—
Sakamoto, Masaru; Morishita, Masakazu; and Nishimura, Shigeru, 5,597,741, Cl. 437-25.000.

Nishino, Yoshiya: *See*—
Kuwana, Takeshi; Nishino, Yoshiya; Komiya, Yasuhiko; and Matsuda, Kunio, 5,596,921, Cl. 99-340.000.

Nishio, Minoru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switch assembly including cam operated pivoted contact. 5,597,989, Cl. 200-6.00R.

Nishio, Toshikazu; Takeuchi, Michiko; and Masubuchi, Nobu, to Dai Nippon Printing Co., Ltd. Film lens and a surface light source using the same. 5,598,280, Cl. 349-57.000.

Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Imaging apparatus. 5,598,205, Cl. 348-65.000.

Nishiumi, Kenji; and Sumi, Shusuke, to Kabushiki Kaisha Nippon Conlux. Coin processing apparatus. 5,597,061, Cl. 194-348.000.

Nissan Chemical Industries, Ltd.: *See*—
Watanabe, Yoshitane; Kashima, Yoshiyuki; and Takagi, Hiroyuki, 5,597,512, Cl. 252-315.600.

Nissan Motor Co., Ltd.: *See*—
Morishita, Tatsuya; and Murasugi, Takashi, 5,597,355, Cl. 464-68.000.
Toukura, Nobusuke, 5,597,371, Cl. 477-111.000.

Niwa, Kenji, to NEC Corporation. Method for manufacturing LDD type semiconductor device with complete self-alignment. 5,597,752, Cl. 437-44.000.

Niwa, Tomomicsu, to Mitsubishi Denki Kabushiki Kaisha. Device and corresponding method for determining a fuzzy logic conclusion based on a plurality of machining rules. 5,598,512, Cl. 395-61.000.

Nixon, James E.: *See*—
Hanson, Jay L.; Nixon, James E.; Hoium, Stanley O.; and Freund, Peter W., 5,596,878, Cl. 62-160.000.

NKK Corporation: *See*—
Yamazaki, Shigeki; and Nakagawa, Hideyuki, 5,598,449, Cl. 376-195.000.

Nobbs, Malcolm S.: *See*—
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,597,827, Cl. 514-255.000.
Miller, Alistair A.; Nobbs, Malcolm S.; Hyde, Richard M.; and Leach, Michael J., 5,597,828, Cl. 514-275.000.

Nobile, John R.: *See*—
Gallagher, Dennis M.; and Nobile, John R., 5,596,916, Cl. 83-23.000.

Noble, Wendell P., to International Business Machines Corporation. Treach EPROM. 5,598,367, Cl. 365-149.000.

Nobler Technologies, Inc.: *See*—
Altshuler, Alexander, 5,597,459, Cl. 204-192.120.

Nobuo, Kitamura: *See*—
Masaru, Yamamoto; Toshikatsu, Atsuta; Yoshinori, Koshimizu; Nobuo, Kitamura; Tadaaki, Ishikawa; and Shin, Yasuhara, 5,598,245, Cl. 396-440.000.

Noga Engineering Ltd.: *See*—
Hirsch, Mordechai, 5,597,273, Cl. 408-199.000.

Nogawa, Chiharu: *See*—
Uemura, Hiroyuki; and Nogawa, Chiharu, 5,597,774, Cl. 503-227.000.

Nogle, Thomas D., to Chrysler Corporation. Lubricating device for a planetary gear unit. 5,597,370, Cl. 475-159.000.

Noguchi, Jun: *See*—
Takeuchi, Masataka; Tokita, Koji; Ueda, Miyuki; Noguchi, Jun; and Yashima, Hideo, 5,597,661, Cl. 429-42.000.

Noguchi, Toru; Goto, Kazuo; Hayashi, Sigehiko; Kawahara, Masahiro; Murakami, Susumu; Yamaguchi, Yoshio; and Deki, Shigehito, to Mitsuboshi Belting Ltd. Ultrafine particle dispersed glassy material and method. 5,597,614, Cl. 427-162.000.

Nohmi Bosai Ltd.: *See*—
Mochizuki, Mikio; Ito, Hideo; and Kobayashi, Ryousaku, 5,598,147, Cl. 340-630.000.

Nojiri, Tadao: *See*—
Obata, Kenzo; Kitazumi, Yosimi; Watanabe, Takeshi; Teramae, Kouji; and Nojiri, Tadao, 5,597,997, Cl. 235-455.000.

Nokia Mobile Phones Ltd.: *See*—
Saarikko, Aassi; Lahti, Lassi; Niemi, Pekka; Hellier, Robert; and Makkonen, Matti, 5,597,102, Cl. 224-197.000.

Nokia Telecommunications Oy: *See*—
Dekker, André P., 5,598,126, Cl. 330-129.000.
Mikkinen, Jarmo, 5,598,125, Cl. 329-304.000.

Noles, David R.: *See*—
Gregory, Christian T.; Noles, David R.; Gallup, David F.; and Heller, David H., 5,597,200, Cl. 297-180.130.

Noma Inc.: *See*—
Plichta, Wojciek; Liu, Ivan; Fennessy, Charles W.; and Lang, Frank, 5,597,229, Cl. 362-153.100.

Nomiyama, Hiroaki: *See*—
Maruyama, Tohru; Abe, Michio; Nomiyama, Hiroaki; Okazaki, Sachiko; Kogoma, Masuhiro; and Kodama, Makoto, 5,597,456, Cl. 204-165.000.

Nomura, Hideaki; and Maruyama, Kazutoshi, to Kirin-Amgen, Inc. Oral dosage form of biologically active proteins. 5,597,562, Cl. 424-85.100.

Nomura, Hiroshi; and Sasaki, Takamitsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having a lens opening. 5,598,241, Cl. 396-79.000.

Nomura, Ichiro: *See*—
Iwai, Kumi; Nomura, Ichiro; and Kaneko, Tetsuya, 5,597,338, Cl. 445-51.000.

Nomura, Toshio: *See*—
Moriguchi, Hideki; Murakami, Daisuke; Ikegaya, Akihiko; and Nomura, Toshio, 5,597,272, Cl. 407-119.000.

Noninvasive Technology, Inc.: *See*—
Chance, Britton, 5,596,987, Cl. 128-633.000.

Nonomura, Arthur M.; and Benson, Andrew A. Methods and compositions for enhancing carbon fixation in plants. 5,597,400, Cl. 71-28.000.

Nonophase Diamond Technologies, Inc.: *See*—
Popovici, Galina; Prelas, Mark A.; Sung, T.; and Khasawinah, S., 5,597,762, Cl. 437-169.000.

Noone, Michael S.: *See*—
Johnason, Mark A.; and Noone, Michael S., 5,596,996, Cl. 128-772.000.

Norand Corporation: *See*—
Hacker, David C.; Walter, Jerry L.; Danielson, Arvin D.; and Durbin, Dennis A., 5,598,487, Cl. 382-313.000.

Norbeck, Daniel W.; Plattner, Jacob J.; and Rosen, Terry J., to Abbott Laboratories. Analogs of oxetanyl purines and pyrimidines. 5,597,824, Cl. 514-252.000.

Norbeck, Daniel W.: *See*—
Kempf, Dale J.; and Norbeck, Daniel W., 5,597,926, Cl. 548-204.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,927, Cl. 548-204.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,928, Cl. 548-204.000.

Nordica S.p.A.: *See*—
Edauw, Peter; Portzline, Carey; and Wiener, Timothy, 5,596,820, Cl. 36-115.000.

Nordson Corp.: *See*—
Castleman, David A.; Scarbrough, Don R.; and Lindrud, Robert C., 5,598,099, Cl. 324-456.000.

North, Janice: *See*—
Chapman, John; Logan, Patricia M.; Neyndorff, Herma C.; and North, Janice, 5,597,722, Cl. 435-238.000.

Northrop Grumman Corporation: *See*—
Collar, Stuart J., 5,598,288, Cl. 359-173.000.

Norton Chemical Process Products Corporation: *See*—
Hausch, Gail W.; and Thames, Donald, 5,597,655, Cl. 428-595.000.

Norton, Darwin W., Jr.: *See*—
Detschel, William F.; Norton, Darwin W., Jr.; and Paddock, Richard C., 5,598,580, Cl. 395-855.000.

Norton, Edwin H.: *See*—
Bloom, Charles P.; Bell, Brigham R.; Linton, Franklyn N., Jr.; Haines, Mark H.; and Norton, Edwin H., 5,597,312, Cl. 434-362.000.

Notarianni, John; and Chan, Yuwa, to Notarianni, John. Method of interfacing between data transmission systems having an unequal number of transceiver ports. 5,598,543, Cl. 395-309.000.

Noto, Nobuhiko: *See*—
Adomi, Keizo; Noto, Nobuhiko; Nakamura, Akio; and Takenaka, Takao, 5,597,761, Cl. 437-127.000.

Nova Manufacturing & Assembly, Inc.: *See*—
Lechman, John N., 5,597,218, Cl. 312-223.300.

Nova Technologies, Inc.: *See*—
DiMatteo, Paul; and Chubb, Charles, 5,596,775, Cl. 5-81.10C.

Novak, Donald R.: *See*—
Cox, Marvin L.; Beugeladyk, Anthony F.; Deubner, Ted E.; Novak, Donald R.; and Urban, Arthur L., 5,596,909, Cl. 74-523.000.

Novamax ITB s.r.l.: *See*—
Pedrazzini, Cesare, 5,597,465, Cl. 204-486.000.

Novo Nordisk A/S: *See*—
Brange, Jens J. V., 5,597,796, Cl. 514-3.000.
Outtrup, Helle; Dambmann, Claus; and Aaslyng, Dorrit A., 5,597,720, Cl. 435-221.000.

Nowak, Edward D.; Bothra, Subhas; Estock, David; and Erck, Wesley, to VLSI Technology, Inc. Patterned filled photo mask generation for integrated circuit manufacturing. 5,597,668, Cl. 430-5.000.

NSK Ltd.: *See*—
Endo, Satoru; Imai, Yoshisada; and Okuno, Hiroyuki, 5,597,965, Cl. 73-862.490.
Hirano, Takashi; and Kawashima, Sousuke, 5,598,043, Cl. 310-12.000.

Nuber, Ray; and Moroney, Paul, to General Instrument Corporation of Delaware. Transmission of high rate isochronous data in MPEG-2 data streams. 5,598,415, Cl. 370-474.000.

Nuchols, Richard P.: *See*—
Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., 5,597,107, Cl. 227-175.200.

Numako, Norio: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Sugawara, Saburo, 5,598,240, Cl. 396-84.000.

Nussenblatt, Robert B.: *See*—
Whitcup, Scott M.; Chan, Chi-Chao; and Nussenblatt, Robert B., 5,597,567, Cl. 424-143.100.

O, Sungki; and Schoenborn, Philippe, to LSI Logic Corporation. MOS structure with hot carrier reduction. 5,598,021, Cl. 257-408.000.

Obata, Kenzo; Kitazumi, Yosimi; Watanabe, Takeshi; Teramae, Kouji; and Nojiri, Tadao, to Nippondenso Co., Ltd. Optical information reader. 5,597,997, Cl. 235-455.000.

Obergriesser, Frank: *See*—
Graesmann, Ullrich; Bollerott, Michael; Bresser, Bertram; and Obergriesser, Frank, 5,598,141, Cl. 340-426.000.

O'Brien, Terrance F.: *See*—
Krasnedjian, Armand J.; and O'Brien, Terrance F., 5,597,114, Cl. 229-122.100.

OCG Microelectronic Materials, Inc.: *See*—
Honda, Kenji; Perry, Donald F.; and Maw, Taishih, 5,597,678, Cl. 430-331.000.

Ochi, Mitsukazu: *See*—
Murata, Yasuyuki; Nakanishi, Yoshinori; and Ochi, Mitsukazu, 5,597,876, Cl. 525-481.000.

Odagiri, Michiko: *See*—
Takahashi, Masahito; Odagiri, Michiko; Furuno, Takeshi; Furusawa, Kazunori; and Wada, Masashi, 5,598,368, Cl. 365-185.010.

Odink, Karel G.: *See*—
Holder, Anthony A.; Lockyer, Michael J.; Sandhu, Jasbir S.; Riveros-Moreno, Valentina; and Odink, Karel G., 5,597,708, Cl. 435-69.300.

O'Dorisio, M. Sue: *See*—
Coy, David H.; Woltering, Eugene A.; O'Dorisio, M. Sue; O'Dorisio, Thomas M.; and Murphy, William A., 5,597,894, Cl. 530-311.000.

O'Dorisio, Thomas M.: *See*—
Coy, David H.; Woltering, Eugene A.; O'Dorisio, M. Sue; O'Dorisio, Thomas M.; and Murphy, William A., 5,597,894, Cl. 530-311.000.

Oehrl, Wilhelm, to W. Schlafhorst AG & Co. Drive roller for the rotational frictional drive of a textile bobbin. 5,597,129, Cl. 242-18.0DD.

Oerwein, James Q.: *See*—
Clark, Ross G.; Yeung, Douglas A.; and Oerwein, James Q., 5,597,802, Cl. 514-12.000.

Ogata, Masahiro: *See*—
Wada, Shoji; Kenmizaki, Kanchide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

Ogawa, Hisahito: *See*—
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,597,889, Cl. 528-353.000.

Ogawa, Ken; Machida, Kei; and Sono, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Electromagnetically driven valve control system for internal combustion engines. 5,596,956, Cl. 123-90.110.

Ogawa, Masao: *See*—
Yamada, Takahiro; Ogawa, Masao; and Shibata, Eiji, 5,596,940, Cl. 112-225.000.

Ogawa, Nobuo: *See*—
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Ogawa, Nobuo; Sakurai, Shunichiro; and Suzuki, Tomio, 5,597,848, Cl. 514-539.000.

Ogawa, Osamu: *See*—
Yokota, Masayuki; Nakazawa, Toshiyuki; Ogawa, Osamu; Tanaka, Nobuyoshi; and Tabata, Hisaya, 5,598,533, Cl. 395-200.080.

Ogawa, Ryuichi, to Fuji Jukogyo Kabushiki Kaisha. Cutting tool for honeycomb core. 5,597,269, Cl. 407-54.000.

Ogihara, Noriyuki; Shirai, Yoshinori; and Yorozu, Takehiko, to Hitachi Maxell, Ltd. Magneto-optical recording medium having multiple magnetic layers for magneto-optical recording medium. 5,598,399, Cl. 369-275.200.

Ogino, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Outboard drive transmission system. 5,597,334, Cl. 440-75.000.

Ogura, Tokihiko; and Fujimoto, Ryo, to Canon Kabushiki Kaisha. Image signal recording and reproducing system. 5,598,274, Cl. 386-13.000.

Oh, Eui Y., to Goldstar Co., Ltd. Thin film transistor and method of making the same. 5,598,011, Cl. 257-57.000.

O'Hanlon, Joseph B., to Paul Mueller Company. Balanced drive with radially slotted countercrank for orbital tube whip rod heat exchanger. 5,597,036, Cl. 165-94.000.

Ohashi, Hideki; and Karasawa, Shinji, to Koito Manufacturing Co., Ltd. Vehicular headlamp having improved collision safety. 5,597,232, Cl. 362-265.000.

Ohio State University Research Foundation, The: *See*—
Coy, David H.; Woltering, Eugene A.; O'Dorisio, M. Sue; O'Dorisio, Thomas M.; and Murphy, William A., 5,597,894, Cl. 530-311.000.

Ohishi, Keiichi: *See*—
Nakamura, Kimitsugu; Fujita, Yoshio; and Ohishi, Keiichi, 5,598,061, Cl. 313-532.000.

Ohkubo, Hideki: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Sugawara, Saburo, 5,598,240, Cl. 396-84.000.

Ohmi, Tadahiro; Miyoshi, Shinji; and Mizuguchi, Yasumitsu, to Osaka Sanso Kogyo Kabushiki Kaisha. Welding method for forming chromium oxide passivated film at welded portion, welding apparatus, and process apparatus. 5,597,109, Cl. 228-199.000.

Ohno, Kazumasa; Hashizume, Yukio; Husimi, Kazuo; and Kuwata, Masahiko, to DKK Corporation. Apparatus for measuring the sulfur component contained in oil. 5,598,451, Cl. 378-44.000.

Ohno, Minoru: *See*—
Sunayama, Kazuyuki; Miyawaki, Kunio; Ohno, Minoru; and Miyazaki, Tatsuo, 5,597,498, Cl. 219-124.340.

Ohno, Moriyuki: *See*—
Takanishi, Toshiaki; and Ohno, Moriyuki, 5,597,198, Cl. 296-194.000.

Ohno, Nobuhiko: *See*—
Wada, Shoji; Kenmizaki, Kanchide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.

Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, to Kabushiki Kaisha Toshiba. Recording medium using reversible recording material and method of processing record to recording medium. 5,597,998, Cl. 235-487.000.

Ohshima, Toshiharu, to Fujitsu Limited. Instruction buffer device for processing an instruction set of variable-length instruction codes. 5,598,544, Cl. 398-380.000.

Ohta, Masafumi; Sakon, Yohta; Takahashi, Toshihiko; Adachi, Chihaya; and Nagai, Kazukiyo, to Ricoh Company, Ltd. Method of producing oxadiazole compounds. 5,597,925, Cl. 548-145.000.

Ohta, Masuyuki: *See*—
Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Ohta, Masuyuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Ohwada, Junichi, 5,598,285, Cl. 349-39.000.

Ohtaka, Hiroshi: *See*—
Hori, Manabu; Watanabe, Ikuo; Ohtaka, Hiroshi; Harada, Kengo; Maruo, Joji; Morita, Tominori; Yamamoto, Takeshi; and Tsutsui, Hisayoshi, 5,597,820, Cl. 514-230.500.

Ohtake, Takahiro; Kato, Masahiko; and Yuhi, Toshiya, to Mabuchi Motor Co., Ltd. Miniature motor. 5,598,045, Cl. 310-40.0MM.

Ohtani, Masayuki, to Ricoh Company, Ltd. Control method for a digital copier in a two-sided document copy mode with interrupts. 5,598,271, Cl. 358-296.000.

Ohtani, Mitsuaki; Matsutani, Shigeru; Yoshida, Tadashi; Tanaka, Kazushige; Fujii, Yasuhiko; and Shirahase, Kazuhiro, to Shionogi & Co., Ltd. Phospholipase A_2 inhibitor. 5,597,943, Cl. 560-42.000.

Ohtsuka, Masanori; and Kitani, Kazunari, to Canon Kabushiki Kaisha. DC-DC converter. 5,598,092, Cl. 323-222.000.

Ohwada, Junichi: *See*—
Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Ohta, Masuyuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Ohwada, Junichi, 5,598,285, Cl. 349-39.000.

Ohya, Jun; Uno, Tomoaki; and Mitsuda, Masahiro, to Matsushita Electric Industrial Co., Ltd. Optical fiber amplifier and optical fiber transmission apparatus. 5,598,491, Cl. 385-24.000.

Ohya, Jun: *See*—
Uno, Tomoaki; Ohya, Jun; and Mitsuda, Masahiro, 5,598,294, Cl. 359-341.000.

Ohzu, Hayao: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Mouma, Geazo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kobchi, Tetsunobu, 5,598,037, Cl. 257-773.000.

Oishi, Kanji: *See*—
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Brewer, Peter D.; and Olson, Gregory L., 5,598,260, Cl. 356-72.000.

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Barker, Charles R., III; Olson, Richard E.; Lindquist, Stephen E.; Hartsaich, Massimo; Cease, David A.; and Soboiewski, Robert S., 5,597,034, Cl. 165-80.300.

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Imaizumi, Masaki, 5,598,296, Cl. 369-421.000.
Morita, Katsuaki, 5,596,989, Cl. 128-660.100.
Nakano, Junichi; Ezawa, Hiroshi; and Matsubayashi, Nobuhide, 5,598,389, Cl. 369-48.000.
Nishioka, Kimihiko, 5,598,205, Cl. 348-65.000.
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Auschra, Clemens; Omeis, Juergen; and Pennewiss, Horst, 5,597,871, Cl. 525-309.000.

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Takahashi, Minoru; and Ono, Makoto, 5,598,502, Cl. 392-502.000.

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Freed, Ellen; and Ruggieri, Rosamaria, 5,597,719, Cl. 435-194.000.

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Kinba, Akio; Hamada, Masataka; Ueda, Hiroshi; Sugitani, Kazumi; and Ootsuka, Hiroshi, 5,597,999, Cl. 250-201.700.

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Coussley, Roger; and Opalko, Albert, 5,597,834, Cl. 514-314.000.

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Meyer, Erich; and Rothbauer, Juergen, 5,597,285, Cl. 414-798.600.

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Liron, Moshe, 5,598,532, Cl. 395-200.010.

Orb Electrical Steels Limited: *See*—
Snell, David, 5,596,896, Cl. 72-75.000.

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Cai, Sui X.; Keana, John F. W.; and Weber, Eckard, 5,597,922, Cl. 544-354.000.

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Breborowicz, Andrzej; and Oreopoulos, Dimitrios G., 5,597,805, Cl. 514-19.000.

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Satomi, Hirobumi; and Iwasa, Takao, 5,598,044, Cl. 310-12.000.

Oriol, Nancy E.; and Bennett, Frederick M., to Beth Israel Hospital. Fetal data processing system and method. 5,596,993, Cl. 128-698.000.

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Roenau, Mark A.; Sartain, Daryl; Daum, Daniel T.; and Ort, Jeffrey G., 5,598,352, Cl. 364-514.00A.

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Connelly, Mark C.; Chakraborty, Utpal R.; and Brooks, Houston G., Jr., 5,597,688, Cl. 435-5.000.

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Ohmi, Tadahiro; Miyoshi, Shinji; and Mizuguchi, Yasumitsu, 5,597,109, Cl. 228-199.000.

Osakabe, Yoshio: *See*—
Tanaka, Shigeo; Yamazaki, Hiroshi; Kotabe, Noriko; Sugiyama, Kouichi; Sato, Makoto; Katsuyama, Akira; Osakabe, Yoshio; and Kusagaya, Yasuo, 5,598,278, Cl. 386-96.000.

Oshio, Kazuharu: *See*—
Sakai, Kunito; Oshio, Kazuharu; and Kanegae, Hirozoh, 5,597,523, Cl. 264-219.000.

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Cox, James R.; Qi, Ru-Yi; and Karam, Ronald E., 5,597,511, Cl. 252-301.40R.

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Haimes, Howard B.; and Jimenez, Pablo A., 5,597,808, Cl. 514-33.000.

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Nielinger, Werner; Gittinger, Andreas; Ostlinning, Edgar; Idel, Karsten-Josef; and Schulte, Helmut, 5,597,888, Cl. 528-335.000.

Ostrover, Lewis S.: *See*—
Cookson, Christopher J.; Ostrover, Lewis S.; and Lieberfarb, Warren N., 5,598,276, Cl. 386-46.000.

Ota, Morihiko: *See*—
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Skalski, Clement A., 5,597,988, Cl. 187-393.000.

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Sato, Mitsuo; and Otomo, Tomoya, 5,598,258, Cl. 399-85.000.

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Mazza, Jorge A.; and Outumuro, Pablo, 5,597,485, Cl. 210-635.000.

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Dunfield, John C.; and Oveyssi, Kamran, 5,598,048, Cl. 310-90.500.
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Ovist, Andy: *See*—
Horlitz, Siegfinde; and Ovist, Andy, 5,597,306, Cl. 433-173.000.

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Fritzsche, Helmut; Ovshinsky, Stanford R.; and Young, Rosa, 5,597,411, Cl. 117-104.000.

Oxford, Ronald C.: *See*—
Terreazio, Gabriel M.; Diehl, P. Robert; and Oxford, Ronald C., 5,597,128, Cl. 241-231.000.

OxiDyn, Incorporated: *See*—
Kasting, John R., Jr., 5,598,316, Cl. 361-212.000.

Oyama, Nobuhiro: *See*—
Imamura, Nobuaki; and Oyama, Nobuhiro, 5,598,324, Cl. 363-21.000.

O'Young, Chi-Lin; Sawicki, Robert A.; Yin, Yuan-Gen; Xu, Wen-Qing; and Suib, Steven L., to Texaco Inc. Dehydrogenation of N-paraffin to N-olefin employing manganese oxide octahedral molecular sieve as catalyst. 5,597,944, Cl. 585-654.000.

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Ozaki, Nobuo. Bicycle rear derailleur. 5,597,366, Cl. 474-82.000.

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Pacific Bank Technology, Inc.: *See*—
Hamm, Dennis; Brake, Glenn; and Johanson, James G., 5,596,934, Cl. 109-50.000.

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Detschel, William F.; Norton, Darwin W., Jr.; and Paddock, Richard C., 5,598,580, Cl. 395-855.000.

Pakor, Inc.: *See*—
Smith, Brian S.; McMillin, Kenneth W.; Wells, John H.; Farr, A. James; and Mitchell, Jerry L., 5,597,599, Cl. 426-316.000.

Palmer, Bruce R.: *See*—
Kauffman, James W.; and Palmer, Bruce R., 5,597,515, Cl. 252-520.000.

Palmer, David W. Flow regulator. 5,597,011, Cl. 137-497.000.

Palmer, Wyn: *See*—
McCall, Kevin J.; Kovacs, Janos; and Palmer, Wyn, 5,598,364, Cl. 365-73.000.

Palmgren, Tor H. G.: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Y.; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,597,869, Cl. 525-192.000.

Pan, Lyndon M.: *See*—
Foladare, Mark J.; Goldman, Shelley B.; Khan, Aslam Y.; Pan, Lyndon M.; Silverman, David P.; Tsao, Yao-Chung; and Weber, Roy Philip, 5,598,457, Cl. 379-57.000.

Panasonic Technologies, Inc.: *See*—
Fujita, Yosuke, 5,598,523, Cl. 395-352.000.

Pandolfi, Renato; and Valle, Mario, to Conti Complett S.p.A. Machine for turning stockings the right way out, with high operating reliability. 5,597,098, Cl. 223-39.000.

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Dyble, Bertie J.; Dyson, Robert W., deceased; and Foss, William C., 5,597,433, Cl. 156-203.000.

Panos, Robert A.: *See*—
Taylor, Thomas N.; and Panos, Robert A., 5,598,198, Cl. 347-85.000.

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Papst Licensing GmbH: *See*—
Hans, Helmut; and Moini, Mojtaba, 5,598,073, Cl. 318-431.000.

Parasin, Alexander V., to Canadian Plywood Association. Collapsible pallet bin. 5,597,084, Cl. 220-4.280.

Parish, George K.; and Thornhill, William J., to Lexmark International, Inc. Concentration sensing by viscosity measurement. 5,598,251, Cl. 399-30.000.

Park, Hyun C. Multi-utility shoe brush system. 5,596,785, Cl. 15-114.000.

Park, Jae R.: *See*—
Bae, Sang C.; Park, Jae R.; and Son, Jong C., 5,596,891, Cl. 68-133.000.

Park, See-hun, to Samsung Electronics Co., Ltd. Method and apparatus for detecting digital playback signals using phase equalization and waveform shaping of playback signals. 5,598,302, Cl. 360-65.000.

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Wilson, Tom C.; and Sims, Howard, 5,596,881, Cl. 62-503.000.

Parker, Steven E., to Tuthill Corporation. Rotary to linear actuator. 5,596,903, Cl. 74-89.000.

Parkin, Stuart S. P.: *See*—
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Parnell, Edgar W.: *See*—
Guerineau, Jean F.; Mullineaux, Philip M.; and Parnell, Edgar W., 5,597,717, Cl. 435-172.300.

Parsons, Llewellyn B. Rope clamp. 5,596,791, Cl. 24-130.000.

Parton, Richard L.: *See*—
Dobles, Thomas R.; DuMont, David A.; Gilman, Paul B.; Kim, Sang H.; Link, Steven G.; and Parton, Richard L., 5,597,687, Cl. 430-574.000.

Pasch, Nicholas F.: *See*—
Kapoor, Ashok K.; and Pasch, Nicholas F., 5,598,026, Cl. 257-634.000.

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., to Johnson Service Company. Networked facilities management system having a node configured with distributed load management software to manipulate loads controlled by other nodes. 5,598,566, Cl. 395-750.000.

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Pate, Ray H. Method of manufacturing an anode bar from a metal sleeve, a metal rod and a metal ring. 5,597,461, Cl. 204-286.000.

Patel, Himakshi: *See*—
Ron, Eyal; Turek, Thomas J.; Isaacs, Benjamin S.; Patel, Himakshi; and Kenley, Richard A., 5,597,897, Cl. 530-350.000.

Paterson, William: *See*—
Markle, David R.; Crane, Barry C.; Irvine, Michael P.; Hendry, Stuart P.; and Paterson, William, 5,596,988, Cl. 128-635.000.

Patrikus, John J.: *See*—
Dawson, John; and Patrikus, John J., 5,597,286, Cl. 415-115.000.

Patterson, Ralph A.: *See*—
Pavlath, George A.; Michal, Ronald J.; Patterson, Ralph A.; and Huang, Sidney X. Y., 5,598,489, Cl. 385-12.000.

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O'Hanlon, Joseph B., 5,597,036, Cl. 165-94.000.

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Payne, Robert C., to Sandvik AB. Chainsaw guide bar. 5,596,811, Cl. 30-383.000.

Payne, William H. Hydro-mechanical power transmission. 5,596,872, Cl. 60-468.000.

PDQ Manufacturing, Inc.: *See*—
Jones, Allen, 5,596,818, Cl. 34-666.000.

Pearl, Donald L.: *See*—
Bogdan, David C.; Pearl, Donald L.; Pribula, David T.; Aulet, Nancy R.; Hussain, Muhammed I.; and Hsu, George W., 5,598,360, Cl. 364-579.000.

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Blackwell, Steven R.; Pearson, John T.; and Fridlin, Charles C., IV, 5,598,401, Cl. 379-94.000.

Pecha, Ernst. Apparatus for the adhesive fixing of at least one joining part. 5,597,440, Cl. 156-351.000.

Pechiney Recherche: *See*—
Encrenaz, Claude, 5,596,803, Cl. 29-825.000.

Pedersen, Bruce B., to Altera Corporation. High-density erasable programmable logic device architecture using multiplexer interconnections, and registered macrocell with product term allocation and adjacent product term stealing. 5,598,108, Cl. 326-41.000.

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Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., 5,597,019, Cl. 141-18.000.

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McGrath, Michael A., 5,597,294, Cl. 417-417.000.

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Mecke, Norbert; and Titze, Lothar, 5,597,633, Cl. 428-41.500.

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Burgin, Markus, 5,597,248, Cl. 400-207.000.

Pelsue, David: *See*—
Goldston, Mark R.; Bemis, Jon; and Pelsue, David, 5,596,819, Cl. 36-35.00R.

Pencis, Jennifer B.: *See*—
Ghosh, Atish; and Pencis, Jennifer B., 5,598,556, Cl. 395-555.000.

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Peng, Yeng-Kaung: *See*—
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Pennewiss, Horst: *See*—
Auschra, Clemens; Omeis, Juergen; and Pennewiss, Horst, 5,597,871, Cl. 525-309.000.

Penschow, Jennifer D.: *See*—
Coghlan, John P.; Penschow, Jennifer D.; Tregear, Geoffrey W.; and Niall, Hugh D., 5,597,692, Cl. 435-6.000.

Pepper, Roger T.: *See*—
Leanox, James R.; Nelson, Daniel C.; and Pepper, Roger T., 5,597,611, Cl. 427-113.000.

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Cutler, David N.; Kelly, James W., Jr.; and Perazzoli, Frank L., Jr., 5,598,562, Cl. 395-674.000.

Pereira, Abel G.; Gallagher, Kevin F.; Abend, Phillip G.; and Carson, John C., Jr., to Croda, Inc. Fatty alkoxylate esters of aliphatic and aromatic dicarboxylic acids. 5,597,555, Cl. 424-59.000.

Perkin-Elmer Corporation, The: *See*—
Lauer, Henk H.; Grossman, Paul D.; and Mead, Dennis E., 5,597,468, Cl. 204-604.000.

Perkins, Christopher M.; and Sivik, Mark R., to Procter & Gamble Company, The. Method for manufacturing cobalt catalysts. 5,597,936, Cl. 556-148.000.

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DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Swenson, Rolf E., 5,597,932, Cl. 549-214.000.

Perry, Donald F.: *See*—
Honda, Kenji; Perry, Donald F.; and Maw, Taishih, 5,597,678, Cl. 430-331.000.

Perry, Kenneth J.: *See*—
Garay, Juan A.; and Perry, Kenneth J., 5,598,529, Cl. 395-182.090.

Perry, Mordechai: *See*—
Linder, Charles; Nemas, Mara; Perry, Mordechai; and Ketraro, Reuven, 5,597,863, Cl. 525-61.000.

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Hauk, Mark A.; Mulcahy, Leo T.; Peterson, Ralph S.; and Streisel, Robert C., 5,597,447, Cl. 162-135.000.
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Pike, Richard D.; and Peterson, Richard M., 5,597,645, Cl. 96-99.000.
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Bolyard, Darl J.; Price, James E.; Welch, Dicky R.; Henn, Gerhard; and Petzold, Jürgen, 5,597,024, Cl. 144-369.000.
Pfahl, Robert: *See*—
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Fischle, Gerhard; Baumann, Matthias; Klingel, Ralph; Mieslinger, Thomas; and Pfister, Carola, 5,597,215, Cl. 303-139.000.
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Howard, Harry R.; Macor, John E.; Chenard, Bertrand L.; Sprouse, Jeffrey S.; and Schulz, David W., 5,597,826, Cl. 514-255.000.
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Hall, Christopher M.; Phillips, Gary D.; Weinrich, David W.; and Salter, Robert M., III, 5,598,573, Cl. 395-800.000.
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Hinson, Donald O., 5,597,892, Cl. 528-501.000.
Phillips, Robert W.: *See*—
Hamilton, Alistair R.; and Phillips, Robert W., 5,597,157, Cl. 271-225.000.
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Hutchison, Wayne K.; Eybergen, William N.; Blackman, Ken R.; and Phillips, Victor A., 5,596,882, Cl. 62-503.000.
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Pickard, Peter B. Foldable chair with retractable leg rest. 5,597,210, Cl. 297-423.360.
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Soudemeyer, Paul; Balloul, Jean-Marc; Pierce, Raymond; Grzych, Jean-Marie; Kieny, Marie-Paule; Loison, Gérard; Capron, André; and Lecocq, Jean-Pierre, 5,597,570, Cl. 424-191.100.
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Bernardon, Jean-Michel; and Pilgrim, William R., 5,597,839, Cl. 514-357.000.
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Funk, Dieter; Bruns, Dieter; Wenning, Rolf; Brans, Walter; and Pilz, Joachim, 5,597,397, Cl. 65-171.000.
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Dewit, John R.; McClurg, Todd A.; Neer, Jay H.; and Pimienta, Orlando, 5,598,318, Cl. 361-683.000.
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Pino, Maria A.: *See*—
Liberti, Paul A.; and Pino, Maria A., 5,597,531, Cl. 423-57.000.
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Pipaloff, Alexander G. Multi-chamber rotary fluid machine with at least two ring members carrying vanes. 5,597,295, Cl. 418-6.000.
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Linn, C. Preston; Pitner, J. Bruce; and Mize, Pat D., 5,597,696, Cl. 435-6.000.
Pitney Bowes Inc.: *See*—
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Gallagher, Dennis M.; and Nobile, John R., 5,596,916, Cl. 83-23.000.
Pittway Corporation: *See*—
Karina, Zia; and Thorp, Ed, 5,598,139, Cl. 340-286.110.
Planar Systems, Inc.: *See*—
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Pleitz, John J. Series coupled non-isolated bipolar transformer within automotive power amplifier. 5,598,325, Cl. 363-24.000.
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Praetzki, Manfred; Guenther, Werner; and Ploetz, Josef, 5,598,454, Cl. 378-206.000.
Poeppelman, Alan D., to AT&T Global Information Solutions Company (aka NCR Corporation); Hyundai Electronics America; and Symbios Logic Inc. Method and apparatus for separating data and clock from a digital data stream. 5,598,443, Cl. 375-359.000.
Poggio, Tomaso; Harris, John G.; and Ancona, Nicola, to Massachusetts Institute of Technology; and Technopolis CSATA Novus Ortus. Object movement estimator using one-dimensional optical flow. 5,598,488, Cl. 382-278.000.
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Polishook, Jon D.: *See*—
Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.
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Usanov, Jury G.; Voronov, Jury A.; and Polivanov, Pavel P., 5,597,953, Cl. 73-335.020.
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Unger, Reinhard; Sieckmann, Hartmut; and Wiltzer, Karl-Heinz, 5,597,852, Cl. 521-48.500.
Popat, Pradeep P. Dual-mode automatic window covering system responsive to AC-induced flicker in ambient illumination. 5,598,000, Cl. 250-206.000.
Pope, Sharon H.: *See*—
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Popovici, Galina; Prelas, Mark A.; Sung, T.; and Khasawinah, S., to Nonophase Diamond Technologies, Inc. Field-enhanced diffusion using optical activation. 5,597,762, Cl. 437-169.000.
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Eicher, Bernhard; and Popp, Xaver, 5,597,017, Cl. 140-3.00B.
Porter-Cable Corporation: *See*—
Bosten, Donald R.; Kriaski, John R.; and Cooper, Randy G., 5,597,347, Cl. 451-356.000.
Porter, Randal D.: *See*—

Childers, Terri C.; Haney, Jack E.; Joe, Debra R.; Mikolaitis, William B.; Porter, Randal D.; and Thomas, H. Neal, 5,597,083, Cl. 215-220.000.
Portola Packaging, Inc.: *See*—
Luch, Daniel; and Adams, Brian M., 5,597,082, Cl. 215-44.000.
Portzline, Carey: *See*—
Edauw, Peter; Portzline, Carey; and Wiener, Timothy, 5,596,820, Cl. 36-115.000.
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Post, Adrian: *See*—
Mah, Donald; and Post, Adrian, 5,597,091, Cl. 222-3.000.
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Powell, Ralph B., Jr., to Hoover Universal, Inc. Method of removing flash from a blow molded container. 5,597,524, Cl. 264-536.000.
Powers, Michael D., to Kimberly-Clark Corporation. Nonwoven protective laminate. 5,597,647, Cl. 442-382.000.
Prakash, Vijai: *See*—
Bales, Bruce M.; Griffith, Gary L.; and Prakash, Vijai, 5,598,458, Cl. 379-58.000.
Prall, Kirk, to Micron Technology, Inc. Method of forming field effect transistors relative to a semiconductor substrate and field effect transistors produced according to the method. 5,597,746, Cl. 437-416.000.
Praxair Technology, Inc.: *See*—
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Snyder, William J.; Ding, Maynard G.; Semenza, Richard T.; and Jackson, Johnny D., 5,597,298, Cl. 431-8.000.
Steigman, Frederic N.; Kohler, Rudolph H.; and Davis, Robert B., 5,597,123, Cl. 241-23.000.
Precision Systems, Inc.: *See*—
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Precision Valve Corporation: *See*—
Ferrara, Daniel A., Jr., 5,597,095, Cl. 222-402.120.
Preker, Friedrich, to Mannesmann Aktiengesellschaft. Keypad for a communication instrument, particularly a subscriber's instrument for telephone communication. 5,598,469, Cl. 379-433.000.
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Martino, Ralph A., 5,597,620, Cl. 427-262.000.
Preston, Charles E.; and Fagan, Marc J. System and method for establishing an absolute reference point for an envelope inserter cycle. 5,596,861, Cl. 53-52.000.
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Bogdan, David C.; Pearl, Donald L.; Pribula, David T.; Aulet, Nancy R.; Hussain, Muhammed I.; and Hunt, George W., 5,598,360, Cl. 364-579.000.
Price, James E.: *See*—
Bolyard, Darl J.; Price, James E.; Welch, Dicky R.; Henn, Gerhard; and Petzold, Jürgen, 5,597,024, Cl. 144-369.000.
Pritchard, David W.: *See*—
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Fredj, Abdennaceur; Johnston, James P.; Labeque, Regine; and Thoen, Christiaan A., 5,597,795, Cl. 510-528.000.
Perkins, Christopher M.; and Sivik, Mark R., 5,597,936, Cl. 556-148.000.
Sadlowski, Eugene S., 5,597,789, Cl. 510-230.000.
Thoen, Christiaan A. J. K., 5,597,790, Cl. 510-303.000.
Proebstle, Richard A.; and Matzner, Bruce, to General Electric Company. Fuel bundle with adjustable flow and reactivity. 5,598,450, Cl. 376-435.000.
Pronesti, George R. Bifocal-compensating eyeglass attachment. 5,598,232, Cl. 351-54.000.
Prospex Roofing Products Inc.: *See*—
Jordan, Franklin F., 5,596,858, Cl. 52-460.000.
Pruitt, Gerald R.: *See*—
Berry, Robert L.; and Pruitt, Gerald R., 5,596,875, Cl. 62-6.000.
Pryor, Robert F.: *See*—
Cooper, Thomas E.; Philips, Hudson W.; and Pryor, Robert F., 5,598,470, Cl. 380-4.000.
PSC Inc.: *See*—
Coleman, Edward P., 5,598,070, Cl. 318-127.000.
Puginier, Jérôme: *See*—
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Purcell, Stephen C.; Galbi, David E.; Liao, Frank H.; and Tse, Yvonne C., to C-Cube Microsystems, Inc. MPEG video decompression processor. 5,598,483, Cl. 382-232.000.
Purcell, Stephen C.; Le Gall, Didier J.; and Bose, Subroto, to C-Cube Microsystems. Structure and method for a multistandard video encoder/decoder. 5,598,514, Cl. 395-118.000.
Purchio, Anthony F.: *See*—
Brown, Dennis M.; Lack, Edward; Twardzik, Daniel R.; and Purchio, Anthony F., 5,597,578, Cl. 424-422.000.
Purifry, LLC: *See*—
Griffin, Jerry A., 5,597,601, Cl. 426-417.000.
Puritan-Bennett Corporation: *See*—
O'Mahony, John J.; and Farnham, Floyd R., III, 5,596,984, Cl. 128-205.240.
Pusl, Kenneth E.; and Sisilli, C. Vincent, to Reynolds and Reynolds Company, The. Business form with adhesive for window mounting. 5,597,635, Cl. 428-42.200.
Putman, J. Michael. Rail-mounted stabilizer for surgical instrument. 5,597,146, Cl. 248-276.100.
Qi, Ru-Yi: *See*—
Cox, James R.; Qi, Ru-Yi; and Karam, Ronald E., 5,597,511, Cl. 252-301.408.
Quantum Chemical Corporation: *See*—
Jackson, Paul H., 5,597,865, Cl. 525-71.000.
Quantum Logic Corp: *See*—
Stein, Alexander, 5,597,237, Cl. 374-9.000.
Quaresima, James S. Anti-glare eye shield. 5,598,230, Cl. 351-44.000.
Queally, Peter; and Lennon, Oliver, to Eez-Away Limited. Carcass deboning. 5,597,351, Cl. 452-135.000.
R B & W Corporation: *See*—
Thomas, David E.; Boczar, Fred A.; and Goforthe, Ronald D., 5,597,279, Cl. 411-432.000.
R. T. Vanderbilt Company, Inc.: *See*—
Karol, Thomas J., 5,597,785, Cl. 508-274.000.
Rabinovich, Eliezer M.: *See*—
Anderson, Jerry M.; Filas, Robert W.; Johnson, David W., Jr.; Lampert, Norman R.; Rabinovich, Eliezer M.; and Ridgway, David N., 5,598,496, Cl. 385-84.000.
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Matzke, Michael; Mohrs, Klaus-Helmut; Raddatz, Siegfried; Fruchtmann, Romanis; Müller-Peddinghaus, Reiner; and Hatzelmann, Armin, 5,597,833, Cl. 514-312.000.
Rademakers, Antonius J. J.: *See*—
Trompenaars, Petrus H. F.; Cosman, Edward C.; Montie, Edwin A.; Bailer, Thomis S.; Lambert, Nicolaas; De Zwart, Siebe T.; and Rademakers, Antonius J. J., 5,598,054, Cl. 313-422.000.
Rademeyer, Pieter, to South African Microelectronic Systems Ltd. Method and apparatus for encoding and decoding of audio transmission signals. 5,598,471, Cl. 380-9.000.
Radjy, Nader: *See*—
Chen, Jian; and Radjy, Nader, 5,598,369, Cl. 365-185.270.
Raehse, Wilfried: *See*—
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Ragge, Andrea; Meyer, Heinrich; and Urrutia Desmaison, Gonzalo, to Atotech Deutschland GmbH. Solution for coating non-conductors with conductive polymers and their metallization process. 5,597,471, Cl. 205-159.000.
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Ho, Ching-Tien; and Raghunath, Mandayam T., 5,598,570, Cl. 395-800.000.
Rainer, Norman B. Sponge for the absorption of metal ions. 5,597,850, Cl. 521-29.000.
Ralston Purina Company: *See*—
Ritchie, David A., 5,596,948, Cl. 119-417.000.
Ramesh, Manian; Cramm, Jeffrey R.; Werges, Darrell L.; and Howland, Christopher P., to Nalco Chemical Company. Hydrophobically associating dispersants used in forming polymer dispersions. 5,597,858, Cl. 524-458.000.
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Ramp, John M.: *See*—
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Ramtron International Corporation: *See*—
Kraus, William F.; and Wilson, Dennis R., 5,598,366, Cl. 365-145.000.
Rao, G. R. Mohan, to Cirrus Logic, Inc. Pipeland address memories, and systems and methods using the same. 5,598,374, Cl. 365-230.030.
Rasche, Christian, to Mannesmann Aktiengesellschaft. Process and apparatus for manufacturing a body reinforced with fiber-composite material. 5,597,430, Cl. 156-161.000.
Rasmussen, David E.: *See*—

Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Rasmussen, Royce C.; and McFarland, Victor D., to Royce Industries, L.C. Portable equipment wash station with retractable flooring system. 5,597,001, Cl. 134-104.200.

Rathunde, Dale F., to AT&T Global Information Solutions Company; Hyundai Electronics America; and Symbios Logic Inc. Array storage system for returning an I/O complete signal to a virtual I/O daemon that is separated from software array driver and physical device driver. 5,598,549, Cl. 395-441.000.

Rauckman, Barbara S.: *See*—
Tegeler, John J.; Rauckman, Barbara S.; Harner, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,597,838, Cl. 514-357.000.

Raul, Victor A.: *See*—
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Raunworth, Barry L.; and Hensen, John M., to Fluoroware, Inc. Composite, pressure-resistant drum type container. 5,597,085, Cl. 220-403.000.

Ray, Charles M., Sr. Dental wrench. 5,597,305, Cl. 433-141.000.

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Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,598,455, Cl. 379-27.000.
Jervis, James B., 5,597,378, Cl. 606-78.000.

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Reddy, Kalidev'Apura P. J.: *See*—
Jain, Ravinder K.; McInerney, John G.; Reddy, Kalidev'Apura P. J.; and Yan, Chi, 5,598,425, Cl. 372-18.000.

Redford, Peter M.; and Stern, Donald S., to TV Interactive Data Corporation. Method for starting up a process automatically on insertion of a storage media into a host device. 5,597,307, Cl. 434-118.000.

Redmond, Mark J.: *See*—
Estrada, Alberto; Redmond, Mark J.; and Laarveld, Bernard, 5,597,807, Cl. 514-26.000.

Reed, Peter B.; and Greer, Carol S., to Nalco Chemical Company. Method for reducing pitch deposition using copolymer of N-vinyl acetamide. 5,597,448, Cl. 162-166.000.

Rees, Sarah B.: *See*—
Broeksert, Willem F.; Cannesse, Bruno P. A.; Rees, Sarah B.; and Vanderleyden, Jozef, 5,597,801, Cl. 514-12.000.

Reeves, Holdsworth. Cylindrical bale-wrapping machine. 5,596,864, Cl. 53-399.000.

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Reichlová, Růžena: *See*—
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Childers, Jim; Reinecke, Peter; Takahashi, Yutaka; and Yamamoto, Seiichi, 5,598,545, Cl. 395-562.000.

Reinfelder, Gerd-Ruediger: *See*—
Lepsius, Tilwin; Giereaz, Gerhard; Traxelis, Klaus; Reinfelder, Gerd-Ruediger; Franken, Joachim; and Halm, Hans, 5,597,253, Cl. 401-98.000.

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Hippe, Werner; Meyer, Günter; and Reinke, Martin, 5,597,452, Cl. 201-41.000.

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Robert, Gary D., 5,598,079, Cl. 318-780.000.

Reo, Joseph, to Church & Dwight Co., Inc. Resealable container for powdered materials. 5,597,115, Cl. 229-229.000.

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Havlovitz, Paul M., 5,597,092, Cl. 222-45.000.

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Jenekhe, Samson A., 5,597,890, Cl. 528-397.000.

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Scholes, Charles P.; and Sienkiewicz, Andrzej, 5,598,097, Cl. 324-316.000.

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Birwer, Martin R., 5,597,062, Cl. 198-600.000.

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Paul, Kenneth E.; and Sitilli, C. Vincent, 5,597,635, Cl. 428-42.200.

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Payne, Charles T., Jr.; and Robertson, Field L., 5,596,897, Cl. 72-84.000.

Reynolds Tech Fabricators, Inc.: *See*—
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Rezaie, Hooshang A.: *See*—
Voreck, Wallace E., Jr.; Brooks, James E.; Eberhardt, John R.; and Rezaie, Hooshang A., 5,597,974, Cl. 102-307.000.

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Hall, Corrina A. E.; Rhoads, W. Wistar; Brown, Patricia S.; and Wilson, Arthur K., 5,598,194, Cl. 347-50.000.

Rhone Merieux: *See*—
Brun, André; Tardy, Marie-Claude; Vaganay, Alain; and Vandeputte, Joris, 5,597,721, Cl. 435-235.100.

Rhone-Poulenc Agrochimie Limited: *See*—
Guerineau, Jean F.; Mullineaux, Philip M.; and Parnell, Edgar W., 5,597,717, Cl. 435-172.300.

Rhône-Poulenc Rorer Pharmaceuticals Inc.: *See*—
Spada, Alfred P.; and Persons, Paul E., 5,597,837, Cl. 514-357.000.

Rice, Garland G.; and Long, David H., to Jet-Pro Company, Inc. Material drying process. 5,596,815, Cl. 34-346.000.

Rice, Patrick W.; Youngberg, Lon T.; and Kearns, Kerry D., to Halliburton Company. Particulate filtration screen weld joint test apparatus and associated methods. 5,597,959, Cl. 73-850.000.

Richards, Joseph C.; Hills, William A.; and Snow, William C., to FMC Corporation. Stable peracid sols, gels and solids. 5,597,791, Cl. 510-372.000.

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Tubel, Paulo S.; Mullins, Albert A., II; Jones, Kevin R.; and Richardson, Frank D., 5,597,042, Cl. 166-250.010.

Richardson-Vicks Inc.: *See*—
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Richter, David E.; Cohen, Earl T.; and Blomgren, James S., to Exponential Technology, Inc. Program watchpoint checking using paging with sub-page validity. 5,598,553, Cl. 395-500.000.

Richter, Gerolf, to Robert Bosch GmbH. Method for determining the charge state of a battery, in particular a vehicle starter battery. 5,598,088, Cl. 320-48.000.

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Grigoryan, Leonid S.; and Yakushi, Kyuya, 5,597,405, Cl. 106-20.00R.
Ikezoe, Masumi; Kai, Tsukuru; Yano, Hidetoshi; and Yokokawa, Nobuto, 5,598,254, Cl. 399-262.000.
Ishii, Rie; Hayashi, Masayuki; Yamakawa, Takeshi; and Takahashi, Hiroyuki, 5,598,279, Cl. 358-402.000.
Matsushima, Makoto, 5,598,160, Cl. 341-155.000.
Ohta, Masafumi; Sakoe, Yohta; Takahashi, Toshihiko; Adachi, Chihaya; and Nagai, Kazukiyo, 5,597,925, Cl. 548-145.000.
Ohtani, Masayuki, 5,598,271, Cl. 358-296.000.
Uemura, Hiroyuki; and Nogawa, Chiharu, 5,597,774, Cl. 503-227.000.
Watanabe, Kazuhito; and Nanya, Toshiki, 5,597,673, Cl. 430-96.000.
Yanagida, Masato; Sato, Takako; and Kagawa, Tetsuya, 5,597,311, Cl. 434-358.000.

Ridenour, Ralph G.; and Kerr, Dennis W., to Universal Enterprises, Inc. Tube fitting. 5,597,186, Cl. 285-330.000.

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Anderson, Jerry M.; Flias, Robert W.; Johnson, David W., Jr.; Lampert, Norman R.; Rabinovich, Eliezer M.; and Ridgway, David N., 5,598,496, Cl. 385-84.000.

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Claus, Rolf P.; and Dehnhard, Martin, 5,597,701, Cl. 435-7.930.

Rieder, Guido, to INA Walzlager Schaeffler KG. Sealing arrangement for a cardan spider bush. 5,597,356, Cl. 464-131.000.

Rieger, Klaus K., to High Performance Tube, Inc. Evaporator tube. 5,597,039, Cl. 165-133.000.

Riess, Thomas. Method and apparatus for treatment of gait problems associated with parkinson's disease. 5,597,309, Cl. 434-258.000.

Rinaldi, Antonio: *See*—
Giroldini, William; Rinaldi, Antonio; Landoni, Gianluigi; and Carlo, Neri, 5,597,855, Cl. 524-105.000.

Rindone, Renato R.: *See*—
Huang, Der-Shing; and Rindone, Renato R., 5,597,978, Cl. 149-19.600.

Ringgenberg, Paul: *See*—
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Rio Linda Chemical Co., Inc.: *See*—
Barber, George B.; Adsetts, Andrew; Deacon, Peter W.; Matchim, Dorm; and Wang, Yan, 5,597,544, Cl. 423-472.000.

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Hasegawa, Takanori, 5,596,925, Cl. 101-127.100.

Ritchie, David A., to Ralston Purina Company. Animal urine collection and analysis system and its method of use. 5,596,948, Cl. 119-417.000.

Ritter, Ann M.; Jackson, Melvin R.; and Hughes, John R., to General Electric Company. Aluminum-silicon alloy foils. 5,597,967, Cl. 75-249.000.

Ritter, Vincent A. Rodent exclusion device. 5,596,834, Cl. 43-124.000.

Rittle, Jeffrey W.; Vetter, William W.; and Webb, James R., to International Business Machines Corporation. Fiber optic connector housing, fiber optic receptacle, accessories employing fiber optic connector housings and corresponding optical assemblies. 5,598,495, Cl. 385-75.000.

Riva, Carlo: *See*—
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Riverwood International Corporation: *See*—
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Rivett, Janet: *See*—
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Rizzo, Joseph, III, to Massachusetts Eye and Ear Infirmary. Methods for epi-retinal implantation. 5,597,381, Cl. 623-4.000.

RMT Associates, Inc.: *See*—
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Robert Bosch GmbH: *See*—
Bodzak, Stanislaw; and Mayer, Hanspeter, 5,597,291, Cl. 417-310.000.
Grytz, Uwe; and Vieweg, Ulrich, 5,597,166, Cl. 277-12.000.
Hippe, Werner; Meyer, Günter; and Reinke, Martin, 5,597,452, Cl. 201-41.000.
Neubert, Werner; Schadow, Joachim; Mueller, Joachim; Staebler, Manfred-Otto; Dohr, Manfred; and Warkentin, Heinz, 5,596,810, Cl. 30-369.000.
Richter, Gerolf, 5,598,088, Cl. 320-48.000.

Robert, Gary D., to Remtech, L.C. A.C. induction devices having tuned compound windings. 5,598,079, Cl. 318-780.000.

Robert, Michel: *See*—
Croiset, Christian; and Robert, Michel, 5,597,281, Cl. 414-498.000.

Roberts, Bradley M.: *See*—
Baker, Jeffrey C.; and Roberts, Bradley M., 5,597,893, Cl. 530-304.000.

Roberts, Daryl; and Butz, James R., to ADA Technologies, Inc. Method for dispersing an atomized liquid stream. 5,597,044, Cl. 169-46.000.

Roberts, David J., to W. A. Deutsher Pty. Ltd. Self-drilling screw. 5,597,357, Cl. 470-9.000.

Robertson, Field I.: *See*—
Payne, Charles T., Jr.; and Robertson, Field I., 5,596,897, Cl. 72-84.000.

Robertson, Kenneth R.; Henderson, Paul E., Jr.; Smith, Samuel H.; Hellings, Carl T.; Andrews, James A.; Hanson, Eric W.; Brewer, Timothy T.; Kelsey, Teresa L.; Claflin, Anthony R.; Hoeger, Daniel S.; and McCambridge, Lora K., to Microsoft Corporation. System and method for computer cursor control. 5,598,183, Cl. 345-145.000.

Robinson, Jerry H., to Wellcutter Inc. Well head cutting and capping system. 5,597,041, Cl. 166-55.000.

Rocafort, Colleen M.: *See*—
Malawer, Edward G.; Narayanan, Kolazi S.; Cullen, James P.; and Rocafort, Colleen M., 5,597,551, Cl. 424-47.000.

Rodriguez Beato, José V.: *See*—
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Roehm GmbH Chemische Fabrik: *See*—
Auschra, Clemens; Omeis, Juergen; and Pennewiss, Horst, 5,597,871, Cl. 525-309.000.

Rogers, Alan C.: *See*—
Rusu, Stefan; Yee, Clayton L.; Malladi, Deviprasad; and Rogers, Alan C., 5,598,035, Cl. 257-723.000.

Rogers, Daniel J.: *See*—
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Rogers, David M.: *See*—
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Rogleja, Boris. Descender. 5,597,052, Cl. 188-65.500.

Rohm and Haas Company: *See*—
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Kirk, Thomas C.; and Witiak, David, 5,597,509, Cl. 510-223.000.

Rohm Co., Ltd.: *See*—
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Roik, Geert: *See*—
Dodt, Thomas; Gauterin, Frank; Schulze, Thomas; Roik, Geert; and Huinink, Heinrich, 5,598,479, Cl. 381-71.000.

Rolf, Devon A.; Rolf, Rebecca L.; and Wong, Leland L. Fabric device for covering vehicle opening. 5,597,028, Cl. 160-354.000.

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Rolf, Devon A.; Rolf, Rebecca L.; and Wong, Leland L., 5,597,028, Cl. 160-354.000.

Rolland, Yves: *See*—
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Roller, Thomas W., to Cogent Light Technologies, Inc. Apparatus for mounting a light source within a system for coupling light into an optic fiber or fiber bundle. 5,598,497, Cl. 385-92.000.

Rollerblade, Inc.: *See*—
Edauw, Peter; Portzline, Carey; and Wiener, Timothy, 5,596,820, Cl. 36-115.000.

Romig, Bernard E.: *See*—
Maiwald, Marvin A.; and Romig, Bernard E., 5,597,172, Cl. 280-672.000.

Romine, Robert A.; and Snowden-Swan, Lesley J., to Battelle Memorial Institute. Method for the addition of vulcanized waste rubber to virgin rubber products. 5,597,851, Cl. 521-41.000.

Ron, Eyal; Turek, Thomas J.; Isaacs, Benjamin S.; Patel, Himakshi; and Kenley, Richard A., to Genetics Institute, Inc. Pharmaceutical formulations of osteogenic proteins. 5,597,897, Cl. 530-350.000.

Ronan, Greg: *See*—
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Rootzén, Holger: *See*—
Heijl, Anders; Olsson, Jonny; and Rootzén, Holger, 5,598,235, Cl. 351-224.000.

Roschen, Robert E.: *See*—
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Rosen, Craig A.; Coleman, Timothy A.; Adams, Mark D.; and Gocayne, Jeannine D., to Human Genome Sciences, Inc. Human growth hormone splice variants hGHV-2(88) and hGHV-3(53). 5,597,709, Cl. 435-69.400.

Rosen, Hal J.: *See*—
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Rosen, Terry J.: *See*—
Norbeck, Daniel W.; Plattner, Jacob J.; and Rosen, Terry J., 5,597,824, Cl. 514-252.000.

Rosenau, Mark A.; Sartain, Daryl; Daum, Daniel T.; and Ort, Jeffrey G., to Cirrus Logic, Inc. Method and apparatus for audio and video synchronizing in MPEG playback systems. 5,598,352, Cl. 364-514.00A.

Rosendale, David: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Y.; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,597,869, Cl. 525-192.000.

Rosset, James. Variable color light projector. 5,597,231, Cl. 362-231.000.

Rössler, Georg; and Wagensommer, Bernhard, to Heidelberger Druckmaschinen AG. Device and method for damping mechanical vibrations of a printing press. 5,596,931, Cl. 101-484.000.

Rössler, Markus: *See*—
Hackl, Kurt A.; Rösler, Markus; Müllner, Martin; and Stern, Gerhard, 5,597,917, Cl. 544-130.000.

Roth, Eldon, to Freezing Machines, Inc. Separator screen and screening method. 5,597,352, Cl. 452-138.000.

Rothbauer, Juergen: *See*—
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Rottländer, Ulrich: *See*—
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Rouquette, Robert E.: *See*—
Arthur, James D.; Sanderford, H. Britton, Jr.; and Rouquette, Robert E., 5,598,427, Cl. 375-200.000.

Rowden, David L.; Ryan, Dale W.; and Merle, Thomas C., to Eastman Kodak Company. Magnetic head-to-media backer assembly. 5,598,310, Cl. 360-130.320.

Rowles, Howard C.: *See*—
Bernhard, Dennis P.; Rowles, Howard C.; Tarakad, Ramasathan R.; and Bassett, John D., 5,596,883, Cl. 62-618.000.

Roy, Kaushik; and Nag, Sudip K., to Texas Instruments Incorporated. Method of segmenting an FPGA channel architecture for maximum routability and performance. 5,598,343, Cl. 364-489.000.

Roy, William J.; and Legutko, Thomas J., to Carrier Corporation. Burner emission device. 5,597,301, Cl. 431-347.000.

Royce Industries, L.C.: *See*—
Rasmussen, Royce C.; and McFarland, Victor D., 5,597,001, Cl. 134-104.200.

Rubin, Kurt A.: *See*—
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Rudman, Barry: *See*—

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Ruf, Bernd: *See—*
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Ruggieri, Rosamaria: *See—*
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Ruhl, Craig S.: *See—*
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Ruhr, Richard: *See—*
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Rundle, Christopher; and Borell, Michael. Game device for a radio controlled vehicle. 5,597,165, Cl. 273-442.000.

Ruopp, Eckart: *See—*
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Ruoss, Gerhard, to Ruoss Spezialmaschinen. Process for providing a stator core with stator windings. 5,596,796, Cl. 29-596.000.

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Rusu, Stefan; Yee, Clayton L.; Malladi, Devipraasad; and Rogers, Alan C., to Sun Microsystems, Inc. Integrated circuit package with external storage capacitor for improved signal quality for sensitive integrated circuit elements. 5,598,035, Cl. 257-723.000.

Rusu, Stefan; and Yee, Clayton L., to Sun Microsystems, Inc. Method and apparatus for analyzing the power network of a VLSI circuit. 5,598,348, Cl. 364-491.000.

Ruth, Stephen M.; Klecker, Brian D.; and Frank, A. Richard, to Brenco, Inc. One-way clutch apparatus. 5,597,057, Cl. 192-46.000.

Ryan, Dale W.: *See—*
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Rydell, Earl E.: *See—*
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Ryer, Jack: *See—*
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Ryobi Limited: *See—*
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S.J. Bee Corp.: *See—*
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Saarikko, Anssi; Lahti, Lassi; Niemi, Pekka; Hellier, Robert; and Makkonen, Matti, to Nokia Mobile Phones Ltd. Attachment device for a mobile station. 5,597,102, Cl. 224-197.000.

Saccardo, John; and Collins, Daniel. Remote terminal for central dictating system. 5,598,463, Cl. 379-97.000.

Sacre, Jean-Jacques: *See—*
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Sadakane, Shinji: *See—*
Ichinose, Hiroki; Takeda, Keiso; Kojima, Susumu; and Sadakane, Shinji, 5,596,957, Cl. 123-179.180.

Sadlowski, Eugene S., to Procter & Gamble Company, The. Liquid or granular automatic dishwashing detergent compositions containing silicate and low molecular weight modified polyacrylate copolymers. 5,597,789, Cl. 510-230.000.

Safa, Frédéric, to Matra Marconi Space France. Light-backscatter measurement device suitable for use on board a craft. 5,598,263, Cl. 356-342.000.

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Saggio, Richard J.: *See—*
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Saidi, Ali: *See—*
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Saindane, Manohar T.: *See—*
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Sainrat, Pascal: *See—*
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Saint Gobain/Norton Industrial Ceramics Corp.: *See—*
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Saito, Kazuo, to Fuji Xerox Co., Ltd. Text editing apparatus for rearranging sentences. 5,598,518, Cl. 395-793.000.

Saito, Kenji: *See—*
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Saito, Masahiko: *See—*
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Saitoh, Yutaka: *See—*
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Sakaguchi Dennetsu Kabushiki Kaisha: *See—*
Watanabe, Toru; and Nagano, Shigetoshi, 5,597,502, Cl. 219-528.000.

Sakai, Kunito; Oshio, Kazuharu; and Kanegae, Hirozoh, to Mitsubishi Denki Kabushiki Kaisha. Molding apparatus and method in which a mold cavity gasket is deformed by separately applied pressure. 5,597,523, Cl. 264-219.000.

Sakai, Masao: *See—*
Mizukami, Makoto; Iwatsu, Shigetaro; Sakai, Masao; Ueno, Masahiro; Izawa, Nobuyoshi; and Katou, Kikuji, 5,598,385, Cl. 369-36.000.

Sakamoto, Masaru; Morishita, Masakazu; and Nishimura, Shigeru, to Canon Kabushiki Kaisha. Process for forming a recrystallized layer and diffusing impurities. 5,597,741, Cl. 437-25.000.

Sakamoto, Tsutomu: *See—*
Watanabe, Yoshihiro; Nakamura, Hiroki; Harada, Nozomu; Murakami, Seiji; Sakamoto, Tsutomu; Taira, Kazuki; and Saitoh, Yutaka, 5,597,223, Cl. 353-97.000.

Sakase, Yoshinori: *See—*
Niijima, Hideto; Asano, Hideo; Sakase, Yoshinori; and Toyooka, Takashi, 5,598,370, Cl. 365-185.330.

Sakimae, Akihiro: *See—*
Sato, Eiji; Ozaki, Eiji; Iida, Chinami; Kobayashi, Yoshimasa; and Sakimae, Akihiro, 5,597,716, Cl. 435-129.000.

Sakon, Yohta: *See—*
Ohta, Masafumi; Sakon, Yohta; Takahashi, Toshihiko; Adachi, Chihaya; and Nagai, Kazukiyo, 5,597,925, Cl. 548-145.000.

Sakuragi, Katsunori; and Fukutani, Hideshi, to Matsushita Electric Industrial Co., Ltd.. Electric motor for driving magnetic disk. 5,598,047, Cl. 310-67.00R.

Sakurai, Shunichiro: *See—*
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Ogawa, Nobuo; Sakurai, Shunichiro; and Suzuki, Tomio, 5,597,848, Cl. 514-539.000.

Salata, Joseph J.: *See—*
Sanguinetti, Michael C.; Salata, Joseph J.; and Lynch, Joseph J., Jr., 5,597,818, Cl. 514-221.000.

Saldanha, Keith S.: *See—*
Barajas, Saul; Kalish, David M.; Whittaker, Bruce E.; and Saldanha, Keith S., 5,598,551, Cl. 395-484.000.

Salinier, Jean-Claude: *See—*
Litaize, Daniel; Salinier, Jean-Claude; Mzoughi, Abdelaziz; Elkhlifi, Fatima-Zahra; Lalam, Mustapha; and Sainrai, Pascal, 5,598,554, Cl. 395-500.000.

Salk Institute for Biological Studies, The: *See—*
Evans, Ronald M.; and Umesono, Kazuhiko, 5,597,693, Cl. 435-6.000.
Evans, Ronald M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,597,705, Cl. 435-69.100.

Salmon, Stephen M.: *See—*
Yock, Paul; Jang, Yue-Teh; and Salmon, Stephen M., 5,596,990, Cl. 128-662.060.

Salomon S.A.: *See—*
Le Masson, Jacques; and Commier, Philippe, 5,597,170, Cl. 280-602.000.

Salter, Robert M., III: *See—*
Hall, Christopher M.; Phillips, Gary D.; Weinrich, David W.; and Salter, Robert M., III, 5,598,573, Cl. 395-800.000.

Salvio, Paul R.: *See—*
Kormos, Alex L.; Masarik, David M.; and Salvio, Paul R., 5,598,207, Cl. 348-148.000.

Salzman, Philip M., to Applied Materials, Inc. Process gas inlet and distribution passages. 5,597,439, Cl. 156-345.000.

Sambles, John R.; and Bryan-Brown, Guy P., to British Technology Group Limited. Optical sensor for orthogonal radiation modes. 5,598,267, Cl. 356-369.000.

Samoto, Masahiko; Akasaka, Takeshi; and Mori, Hiroyuki, to Fuji Oil Company, Limited. Process for preparing fractionated soybean proteins and foods using the same. 5,597,607, Cl. 426-656.000.

Sampsell, Jeffrey B., to Texas Instruments Incorporated. High-yield spatial light modulator with light blocking layer. 5,597,736, Cl. 437-2.000.

Samuel, Edward G., to Albemarle Corporation. Conversion of deep internal olefins into primary alkylaluminum compounds by isomerization-displacement. 5,597,937, Cl. 556-190.000.

Samsung Aerospace Industries, Ltd.: *See—*
Kuwayama, Masahiko; and Yamamoto, Yoshihiro, 5,598,249, Cl. 355-41.000.

Samsung Electronics Co., Ltd.: *See—*
Ahn, Wooyoun; and Cho, Myong-rae, 5,598,155, Cl. 341-67.000.
Bae, Sang C.; Park, Jae R.; and Son, Jong C., 5,596,891, Cl. 68-133.000.
Choi, Hae-min, 5,598,224, Cl. 348-599.000.
Choi, Young-joon, 5,597,408, Cl. 106-481.000.
Chung, Tae-yun; and Jung, Gyu-hwan, 5,598,213, Cl. 348-405.000.
Lee, Ho-Cheol; and Lee, Seung-Hun, 5,598,371, Cl. 365-189.050.
Nam, Myung-Hyun, 5,598,121, Cl. 327-392.000.
Park, See-hun, 5,598,302, Cl. 360-65.000.
Sim, Sang-pil, 5,597,763, Cl. 437-195.000.

Sanchez, John E., Jr.; Chan, Darin A.; and Besser, Paul R., to Advanced Micro Devices. Method for producing alloy films using cold sputter deposition process. 5,597,458, Cl. 204-192.300.

Sandberg & Sikforski Diamond Corp.: *See—*
Bergagnini, Norberto, 5,596,887, Cl. 63-15.100.

Sanderford, H. Britton, Jr.: *See—*
Arthur, James D.; Sanderford, H. Britton, Jr.; and Rouquette, Robert E., 5,598,427, Cl. 375-200.000.

Sanders, Ian L.: *See—*
Dieny, Bernard; Gurney, Bruce A.; Parkin, Stuart S. P.; Sanders, Ian L.; Speriosu, Virgil S.; and Wilhoit, Dennis R., 5,598,308, Cl. 360-113.000.

Sandhu, Jasbir S.: *See—*
Holder, Anthony A.; Lockyer, Michael J.; Sandhu, Jasbir S.; Riveros-Moreno, Valentina; and Odink, Karel G., 5,597,708, Cl. 435-69.300.

Sandia Corporation: *See—*
Haaland, David M.; Jones, Howland D. T.; and Thomas, Edward V., 5,596,992, Cl. 128-664.000.

Sandor, Robert B.; LaNieve, Herman L., III; and Roschen, Robert E., to Hoechst Celanese Corp. Composite yarns having high cut resistance for severe service. 5,597,649, Cl. 428-370.000.

Sandoz Ltd.: *See—*
Gisler, Marius, 5,597,903, Cl. 534-637.000.

Sands, John A.: *See—*
Fisch, Richard S.; Larshus, David A.; Sands, John A.; and VerMurlen, Mark E., 5,598,272, Cl. 358-298.000.

Sandvik AB: *See—*
Payne, Robert C., 5,596,811, Cl. 30-383.000.

Sanguinetti, Michael C.; Salata, Joseph J.; and Lynch, Joseph J., Jr., to Merck & Co., Inc. Methods of treating cardiac arrhythmia. 5,597,818, Cl. 514-221.000.

Sankyo Company, Limited: *See—*
Sugimura, Yukio; Iino, Kimio; Tsujita, Yoshio; Shimada, Yoko; Kobayashi, Tomowo; and Kagasaki, Takeshi, 5,597,846, Cl. 514-450.000.

Sano, Masaaki: *See—*
Isobe, Soichi; Sano, Masaaki; Inoue, Yoshio; and Shimizu, Kazuo, 5,598,291, Cl. 359-198.000.

Sano, Naoto: *See—*
Akutagawa, Masato; and Sano, Naoto, 5,597,670, Cl. 430-30.000.

Sanofi: *See—*
Brown, Stephen; and Blundell, Ross, 5,597,582, Cl. 424-456.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Ogino, Hiroshi, 5,597,334, Cl. 440-75.000.

Sansom, Michael S.; McMillian, Lonnie S.; Cain, Roger W.; Toth, Robert J.; and Willoughby, Gary M., to Adtran, Inc. Four-wire, half-rate architecture with embedded differential delay compensation for extending range of basic rate ISDN communications. 5,598,413, Cl. 370-468.000.

Santel, Hans-Joachim: *See—*
Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürsen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,597,939, Cl. 558-8.000.

Santrol, Inc.: *See—*
Sinclair, A. Richard; and Johnson, Richard L., II, 5,597,784, Cl. 507-219.000.

Sanyo Electric Co., Ltd.: *See—*
Hibino, Katsutoshi; and Teragaki, Yasuko, 5,598,394, Cl. 369-112.000.

Sara Lee Corporation: *See—*
Kramer, Lee; Williams, Roger S.; Williams, Jeffrey A.; Mello, Frank C.; and Miller, Dale V., 5,597,606, Cl. 426-641.000.
LaVelle, Edward R.; and Butler, Robert E., 5,596,939, Cl. 112-130.000.

Sartain, Daryl: *See—*
Roesner, Mark A.; Sartain, Daryl; Daum, Daniel T.; and Ort, Jeffrey G., 5,598,352, Cl. 364-514.00A.

Sasada, Katsuhiro: *See—*
Todokoro, Hideo; Otaka, Tadashi; Maeda, Tatsuya; and Sasada, Katsuhiro, 5,598,002, Cl. 250-310.000.

Sasaki, Jun: *See—*
Matsuura, Masaru; and Sasaki, Jun, 5,597,594, Cl. 426-44.000.

Sasaki, Kiyoshi: *See—*
Totani, Tsuginobu; Tashiro, Kazuhiro; Ishibashi, Shogo; and Sasaki, Kiyoshi, 5,597,588, Cl. 425-143.000.

Sasaki, Masakazu: *See—*
Frees, Gregory M.; and Sasaki, Masakazu, 5,598,306, Cl. 360-97.020.

Sasaki, Shigekuni: *See—*
Matuo, Yasuko; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, 5,598,501, Cl. 385-143.000.

Sasaki, Takamitsu: *See—*
Nogura, Hiroshi; and Sasaki, Takamitsu, 5,598,241, Cl. 396-79.000.

Sasaki, Tohru: *See—*
Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Ohta, Masayuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Otwada, Junichi, 5,598,285, Cl. 349-39.000.

Sass, Ingo; Bayer, Hans-Joachim; Kleiser, Klaus; and Glinger, Jörg, to Flowtex-Service Gesellschaft Fur Horizontalbohrsysteme mbH & Co. KG; Sass, Ingo; and Schumacher Umweltsud Transtechnik. Process and tool for laying underground collector mains for liquids and gases. 5,597,045, Cl. 175-62.000.

Satake Corporation: *See—*
Satake, Satoru; Hosaka, Yukio; Osogi, Yukio; and Inoue, Kenji, 5,598,091, Cl. 322-62.000.

Satake, Satoru; Hosaka, Yukio; Osogi, Yukio; and Inoue, Kenji, to Satake Corporation. Three-phase brushless self-excited synchronous generator with no rotor exciting windings. 5,598,091, Cl. 322-62.000.

Sato, Chikara: *See—*
Nagasawa, Kenichi; Takahashi, Koji; and Sato, Chikara, 5,598,275, Cl. 386-117.000.

Sato, Eiji; Ozaki, Eiji; Iida, Chinami; Kobayashi, Yoshimasa; and Sakimae, Akihiro, to Mitsubishi Rayon Co., Ltd. Process for producing D-lactic acid and L-lactamide. 5,597,716, Cl. 435-129.000.

Sato, Fumie, to Taisho Pharmaceutical Co., Ltd.; and Sato, Fumie. Process for producing intermediate for 13,14-didehydroprostaglandin E. 5,597,938, Cl. 556-436.000.

Sato, Hideharu: *See—*
Asou, Yoshio; Hayashi, Bunya; Sato, Hideharu; and Matsumoto, Takumi, 5,597,015, Cl. 137-625.640.

Sato, Hirofumi: *See—*
Umemura, Satoshi; Kawamura, Hisao; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Sato, Hiroshi; and Matsunaga, Kaoru, to Kabushiki Kaisha Kawai Gakki Seisakusho. Waveform processing apparatus and an electronic musical instrument using the output waveform thereof. 5,597,970, Cl. 84-604.000.

Sato, Junichiro; Ando, Tadayo; Hayakawa, Sumio; and Ouchi, Ryuji, to New Oji Paper Co., Ltd. Method of controlling a position of rotor in a high pressure feeder. 5,597,446, Cl. 162-49.000.

Sato, Makoto: *See—*
Tanaka, Shigeo; Yamazaki, Hiroshi; Kotabe, Noriko; Sugiyama, Koichi; Sato, Makoto; Katsuyama, Akira; Osakabe, Yoshio; and Kusagaya, Yasuo, 5,598,278, Cl. 386-96.000.

Sato, Mitsuo; and Otomo, Tomoya, to Tohoku Ricoh Co., Ltd.; and Canon Aptex Inc. Image forming apparatus with interconnected sorters and control device therefor. 5,598,258, Cl. 399-85.000.

Sato, Shigehiro: *See—*
Takimoto, Akio; Wakamoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,597,889, Cl. 528-353.000.

Sato, Takako: *See—*
Yanagida, Masato; Sato, Takako; and Kagawa, Tetsuya, 5,597,311, Cl. 434-358.000.

Sato, Toshifumi, to NEC Corporation. DS/CDMA diversity receiver with despreading filters using combiner wherein first and second despreading filters are delayed with respect to each other by a period of half the chip rate. 5,598,428, Cl. 375-206.000.

Satomi, Hirobumi; and Iwasa, Takao, to Oriental Motor Co., Ltd. Linear motor. 5,598,044, Cl. 310-12.000.

Satow, Arnold, to McGean-Rohco, Inc. Mechanical plating of small arms projectiles. 5,597,975, Cl. 102-514.000.

Satran, Amir: *See—*
Mea, Yuri; and Satran, Amir, 5,597,271, Cl. 407-113.000.

Sauder Woodworking Co.: *See—*
Grieser, Jerry D.; Nelson, Richard A.; Schumacher, Gordon D.; Warner, Thomas B.; and Dietrich, David M., 5,597,221, Cl. 312-348.100.

Sauer, Günther: *See—*
Zöller, Alfons; Matl, Karl; Götzelmann, Rainer; and Sauer, Günther, 5,597,622, Cl. 427-563.000.

Saupe, Thomas: *See—*
Bratz, Matthias; Kober, Reiner; Seele, Rainer; Saupe, Thomas; Meyer, Norbert; Walker, Nigel; Landes, Andreas; and Walter, Helmut, 5,597,776, Cl. 504-105.000.

Saur, Dietrich. Flow-through cell with a hanging mercury drop electrode. 5,597,464, Cl. 204-409.000.

Saurer, Eric; Mignot, Jean-Pierre; and Jeanmonod, Roland, to Asulab, S.A. Composite wall, notably motor vehicle windshield, including an ultrasonic device for detecting the presence of foreign bodies on one of its faces. 5,598,380, Cl. 367-140.000.

Sawicki, Robert A.: *See—*
O'Young, Chi-Lin; Sawicki, Robert A.; Yin, Yuan-Gen; Xu, Wen-Qing; and Suib, Steven L., 5,597,944, Cl. 585-654.000.

Sayfie, Robert J.: *See—*
Ellis-El, Emmanuel, 5,596,839, Cl. 47-79.000.

Scaramuzza, Mauro; and Piccolo, Mauro, to FIP Industriale S.p.A. Spheric cap bearing device for safely connecting elements of bridges, viaducts, buildings and the like. 5,597,239, Cl. 384-36.000.

Scarbrough, Don R.: *See*—
Castleman, David A.; Scarbrough, Don R.; and Lindrud, Robert C., 5,598,099, Cl. 324-456.000.
Scarzello, John F.; Keller, Peter B.; and Harrison, Richard W., to United States of America, Navy. Mine sweeping system for magnetic and non-magnetic mines. 5,598,152, Cl. 340-850.000.
Schaaf, Daniel E.: *See*—
Wiesemann, David L.; Schaaf, Daniel E.; and Ko, Wai-Shing P., 5,598,066, Cl. 315-159.000.
Schad, Carolyn K.: *See*—
Bocko, Peter L.; Lapp, Josef C.; Nelson, John W.; and Schad, Carolyn K., 5,597,395, Cl. 65-33.400.
Schadow, Joachim: *See*—
Neubert, Werner; Schadow, Joachim; Mueller, Joachim; Staebler, Manfred-Otto; Dohr, Manfred; and Warkentin, Heinz, 5,596,810, Cl. 30-369.000.
Schaedlich, Frank H.; and Schneeberger, Daniel R., to Tekran Inc. Apparatus for detecting mercury. 5,597,535, Cl. 422-88.000.
Schaeffer, Philippe J.: *See*—
Medard, Claude P.; Albanic, André L.; and Schaeffer, Philippe J., 5,598,340, Cl. 364-468.270.
Schafer, John C.: *See*—
Nally, Robert M.; and Schafer, John C., 5,598,525, Cl. 395-520.000.
Schaller, Earle, to NEFCO Inc. Vented baffle system. 5,597,483, Cl. 210-232.000.
Schauer, Carla M.: *See*—
Stanley, Ronald D., Jr.; Schauer, Carla M.; and Schauer, Jim K., 5,597,002, Cl. 134-149.000.
Schauer, Jim K.: *See*—
Stanley, Ronald D., Jr.; Schauer, Carla M.; and Schauer, Jim K., 5,597,002, Cl. 134-149.000.
Scheitz, John T.; and Capilupo, Kathleen A., to Methode Electronics, Inc. Zero insertion force pin grid array socket. 5,597,319, Cl. 439-342.000.
Schenkel, Dale: *See*—
Brister, Charles; and Schenkel, Dale, 5,597,048, Cl. 180-292.000.
Schepers, Frederik J.; and Montague, Peter G., to Lever Brothers Company, Division of Conopco, Inc. Liquid detergent composition containing deflocculating polymer with ionic monomers. 5,597,508, Cl. 510-417.000.
Scherb, Bruno: *See*—
Kaiser, Theodor; Lippert, Roland; Hartmann, Cornelius; Kohler, Horst D.; Mayer, Ernst; and Scherb, Bruno, 5,597,243, Cl. 384-551.000.
Schering Corporation: *See*—
Dalie, Barbara; Miller, Kenneth; Murgolo, Nicholas; and Tindall, Stephen, 5,597,710, Cl. 435-69.600.
Hammond, Gerald; Le, Hung V.; Nagabhushan, T. L.; Reichert, Paul; and Trotta, Paul P., 5,597,900, Cl. 530-351.000.
Scherrer, Norbert; Galion, Philippe; and Hardouin, Etienne, to Societe Europeenne de Propulsion. Vacuum-enclosed integral cryogenic valve. 5,597,009, Cl. 137-375.000.
Scherzer, Dietrich: *See*—
Lutter, Heinz-Dieter; Brochmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lagmayr, Michael; and Zschiesche, Ruth, 5,597,885, Cl. 528-44.000.
Schiedegger, Charles E., to Mid-America Building Products Corporation. Plastic building product. 5,596,852, Cl. 52-212.000.
Schiefferdecker, Joerg; and Voelklein, Friedemann, to Heimann Optoelectronics GmbH. Microvacuum sensor having an expanded sensitivity range. 5,597,957, Cl. 73-755.000.
Schierling, Bernhard: *See*—
Gebauer, Andreas; Lindner, Joachim; Schierling, Bernhard; Stockmann, Bernd; and Sudau, Jörg, 5,597,059, Cl. 192-70.120.
Schieven, Gary L.: *See*—
Marken, John; Schieven, Gary L.; Hellstrom, Ingegerd; Hellstrom, Karl E.; and Arruffo, Alejandro, 5,597,707, Cl. 435-69.300.
Schiller, August; Dorsch, Norman; Graf, Werner; and Strasser, Alois, to Wacker-Chemie GmbH. Tin compound-containing compositions as one of the two components of two component systems which crosslink at room temperature to give organopolysiloxane elastomers. 5,597,882, Cl. 528-18.000.
Schindler, James H.; Haberstroh, Robert W.; and Hicks, John B., to Ford Motor Company. Attachment apparatus for controlling rotations of a tension strut. 5,597,173, Cl. 280-690.000.
Schlatter, Manfred; and Scholtysik, Bernd, to BASF Magnetics GmbH. Tape winding device providing uniform winding and rapid installation and removal of winding arm. 5,597,132, Cl. 242-547.000.
Schleck, James R.: *See*—
Chopdekar, Vilas M.; Schleck, James R.; Guo, Cheng; and Hall, Amanda J., 5,597,517, Cl. 252-700.000.
Schlegel Corporation: *See*—
Courtney, Daniel T.; Hermann, Kenneth W.; and Mitka, Stanley R., 5,597,979, Cl. 174-35.00R.
Schleinz, Robert J.; Conrad, Daniel J.; and Kacherovsky, Joseph S., to Kimberly-Clark Corporation. Dual substrate, single-pass printing process and substrates printed thereby. 5,597,642, Cl. 428-195.000.
Schlumberger Technology Corporation: *See*—
Voreck, Wallace E., Jr.; Brooks, James E.; Eberhardt, John R.; and Rezaie, Hooshang A., 5,597,974, Cl. 102-307.000.
Schmidt, Robert R.: *See*—
Müller, Klaus-Helmut; König, Klaus; Kluth, Joachim; Lürsaen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,597,939, Cl. 558-8.000.
Schmied, Peter: *See*—
Trzmiel, Alfred; Stephan, Wolfgang; and Schmied, Peter, 5,597,367, Cl. 474-110.000.
Schnaitter, William N., to Alliance Semiconductor Corporation. Switchable current source for digital-to-analog converter (DAC). 5,598,095, Cl. 323-315.000.
Schneeberger, Daniel R.: *See*—
Schaedlich, Frank H.; and Schneeberger, Daniel R., 5,597,535, Cl. 422-88.000.
Schneider, H. Michael; Allen, Edward; Woodling, Richard; and Barnes, Roy, to Sepragen Corporation. Method for removing contaminants from water. 5,597,489, Cl. 210-670.000.
Schneider, Martin V.: *See*—
Drabeck, Lawrence M.; Schneider, Martin V.; and Tran, Cuong, 5,598,169, Cl. 343-701.000.
Evans, James G.; Schneider, Martin V.; and Wilson, Robert W., 5,598,168, Cl. 343-700.0MS.
Schneider, Michel; Brochot, Jean; Puginier, Jérôme; and Yan, Feng, to Bracco International B.V. Stable microbubble suspensions as enhancement agents for ultrasound echography. 5,597,549, Cl. 424-9.510.
Schneidewind, Russell A.: *See*—
Von Arx, Theodore T.; Judd, Robert A.; and Schneidewind, Russell A., 5,598,322, Cl. 361-704.000.
Schnell, Robert J.: *See*—
Elliason, Kurt L.; and Schnell, Robert J., 5,598,349, Cl. 364-492.000.
Schnitzel, Susan: *See*—
Yu, Kelvin W.; and Schnitzel, Susan, 5,597,856, Cl. 524-227.000.
Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Perlman, Kato L.; and Swenson, Rolf E., 5,597,932, Cl. 549-214.000.
Schoen, Horst; Heyer, Horst W.; and Friesen, Wolfram, to Stora Feldmuhle AG. Process for the manufacture of paper webs having CF or CB layers for pressure-sensitive recording. 5,597,612, Cl. 427-152.000.
Schoenberg, Gregory B.; Kim, Jeong Y.; and Brautigan, Jeffrey J., to Ford Motor Company. Fuel pump for an automotive fuel delivery system. 5,596,970, Cl. 123-497.000.
Schoenborn, Philippe: *See*—
O, Sungki; and Schoenborn, Philippe, 5,598,021, Cl. 257-408.000.
Scholes, Charles P.; and Sienkiewicz, Andrzej, to Research Foundation of State University of New York. Dielectric resonator-based electron paramagnetic resonance probe. 5,598,097, Cl. 324-316.000.
Schöllkens, Bernward: *See*—
Breipohl, Gerhard; Henke, Stephan; Knolle, Jochen; Schöllkens, Bernward; Alpermann, Hans-Georg; Gerhards, Hermann; and Wirth, Klaus, 5,597,803, Cl. 514-15.000.
Scholtysik, Bernd: *See*—
Schlatter, Manfred; and Scholtysik, Bernd, 5,597,132, Cl. 242-547.000.
Scholz, William F.; and Van Ham, Robert H., to Avery Dennison Corporation. Repulpable pressure-sensitive adhesive compositions. 5,597,654, Cl. 428-514.000.
Schön, Otmar, to Hydac Technology GmbH. Toilet flushing system with multi-diaphragm storage container having three fluid receiving chambers. 5,596,772, Cl. 4-361.000.
Schott, Hans: *See*—
Alber, Friedrich; Dedelmahr, Rudolf; Kromer, Siegfried; Schott, Hans; and Weiss, Siegfried, 5,598,137, Cl. 336-223.000.
Schrafel, Tracy L.: *See*—
Christenson, Ronald E.; Schrafel, Tracy L.; and Bartlett, William P., 5,597,174, Cl. 280-704.000.
Schreiter, Klaus-Dieter; and Steven, Wilhelm, to Siemens Aktiengesellschaft; and Ruhrkohle Aktiengesellschaft. Commercial-size, automatic industrial plant having several parts. 5,598,149, Cl. 340-825.060.
Schröder, Hans-Joachim, to VDO Adolf Schindling AG. Rain sensor. 5,598,146, Cl. 340-602.000.
Schroeder, Jon M. Thermoelectric generator and magnetic energy storage unit with controllable electric output. 5,597,976, Cl. 136-205.000.
Schuchman, Leonard; and Weinberg, Aaron, to Stanford Telecommunications, Inc. Charge-coupled-device based all-analog wave form scrambling with applications in audio, video, video-on-demand, and TV systems. 5,598,472, Cl. 380-14.000.
Schulhoff, Stephen G.: *See*—
Wohl, Michael C.; and Schulhoff, Stephen G., 5,597,300, Cl. 431-288.000.
Schulte, Helmut: *See*—
Nielinger, Werner; Gittinger, Andreas; Ostlinning, Edgar; Idel, Karsten-Josef; and Schulte, Helmut, 5,597,888, Cl. 528-335.000.
Schulz, David W.: *See*—
Howard, Harry R.; Macor, John E.; Chenard, Bertrand L.; Sprouse, Jeffrey S.; and Schulz, David W., 5,597,826, Cl. 514-255.000.
Schulz, Galyn A., to James River Corporation of Virginia. High softness embossed tissue. 5,597,639, Cl. 428-156.000.
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Dodt, Thomas; Gauterin, Frank; Schulze, Thomas; Roik, Geert; and Huinink, Heinrich, 5,598,479, Cl. 381-71.000.
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Sass, Ingo; Bayer, Hans-Joachim; Kleiser, Klaus; and Günger, Jörg, 5,597,045, Cl. 175-62.000.
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Scico, Inc.: *See*—
Goldfarb, David, 5,596,986, Cl. 128-633.000.
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Manura, John J.; Baker, Christopher W.; and Manos, John N., 5,596,876, Cl. 62-55.500.
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Scott, Thomas M.; and Scott, David R., 5,596,824, Cl. 37-403.000.
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Wong, Chi-Huey; and Kondo, Hirosato, 5,597,906, Cl. 536-1.110.
Zimmerman, Theodore S.; Foster, Paul A.; and Fulcher, Carol A., 5,597,711, Cl. 435-69.600.
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Dunfield, John C.; Heine, Gunter K.; Jufer, Marcel; and Oveyssi, Kamran, 5,598,071, Cl. 318-254.000.
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Leifert, Carlo; Epton, Harold A. S.; and Sigee, David C., 5,597,565, Cl. 424-115.000.
Šedivá, Jitka: *See*—
Michalský, Jiří, deceased; Hrbata, Jiří; Křepelka, Jiří; Mělka, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Koloničný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.
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Bratz, Matthias; Kober, Reiner; Seele, Rainer; Saupe, Thomas; Meyer, Norbert; Walker, Nigel; Landes, Andreas; and Walter, Helmut, 5,597,776, Cl. 504-105.000.
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Terashima, Junichi; and Maruyama, Jun, 5,598,162, Cl. 341-176.000.
Seiko Epson Corporation: *See*—
Akioka, Koji; Kobayashi, Osamu; Shimoda, Tatsuya; Ishibashi, Toshiyuki; and Ozaki, Ryuichi, 5,597,425, Cl. 148-302.000.
Inakoshi, Daisuke; and Sodeyama, Hideo, 5,597,247, Cl. 400-207.000.
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Matsumoto, Taro; Wada, Hisaya; Migita, Yoshihiro; Hatayama, Katsuo; and Sekiguchi, Yoshinori, 5,597,921, Cl. 544-343.000.
Sekiguchi, Yoshitoshi: *See*—
Nagai, Kenichi; Yasuda, Kenji; Hama, Toshio; Sekiguchi, Yoshitoshi; Tachibana, Toshio; Nakanishi, Osamu; and Moriyama, Tadashi, 5,597,451, Cl. 201-4.000.
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Suzuki, Tatsuo; and Ueyama, Takashi, 5,597,674, Cl. 430-109.000.
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Jex, Jerry; Dike, Charles; and Self, Keith, 5,598,113, Cl. 326-94.000.
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Snyder, William J.; Ding, Maynard G.; Semenza, Richard T.; and Jackson, Johnny D., 5,597,298, Cl. 431-8.000.
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Kawasaki, Yuji; and Koyama, Jun, 5,598,106, Cl. 326-21.000.
Kogushi, Noriaki; Nishi, Takeshi; Hiroki, Masaaki; Yamaguchi, Toshiharu; and Kouuma, Toshimitsu, 5,598,284, Cl. 349-33.000.
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Yoshitomi, Yasunari; and Senuma, Takehide, 5,597,424, Cl. 148-111.000.
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Schneider, H. Michael; Allen, Edward; Woodling, Richard; and Barnes, Roy, 5,597,489, Cl. 210-670.000.
Sextant Avionique: *See*—
Debrus, Marie-Hélène; Gaultier, Philippe; and Vouillon, Patrick, 5,598,527, Cl. 345-173.000.
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SF-Kooperation GmbH Beton-Konzepte: *See*—
Hagenah, Gerhard, 5,597,591, Cl. 425-346.000.
Sgrignoli, Gary J.: *See*—
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SGS-Thomson Microelectronics, Inc.: *See*—
McClure, David C., 5,598,122, Cl. 327-538.000.
Nguyen, Loi N.; and Lin, Yih-Shung, 5,597,983, Cl. 174-264.000.
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Losavio, Aldo; and Bacchetta, Maurizio, 5,598,028, Cl. 257-644.000.
Pio, Federico; Riva, Carlo; and Lucherini, Silvia, 5,597,750, Cl. 437-43.000.
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Wong, Martin; Finley, David M.; Ramp, John M.; Boltinghouse, Gary L., Jr.; Shaffar, Mark R.; Stroupe, Stephen D.; and Brackett, John M., 5,597,702, Cl. 435-18.000.
Shaffer, Robert W., II: *See*—
Vipond, Edward W.; and Shaffer, Robert W., II, 5,597,290, Cl. 416-204.00R.
Shakespeare: *See*—
Keller, Robert A., 5,597,646, Cl. 442-195.000.
Sham, Hing L.: *See*—
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,927, Cl. 548-204.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,928, Cl. 548-204.000.
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Dunn, Murray R., 5,597,499, Cl. 219-243.000.
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Sharp, Bruce R. Storage tank system with independent monitoring of ribs and tank wall. 5,597,948, Cl. 73-49.200.
Sharp Kabushiki Kaisha: *See*—
Iguchi, Katsuji, 5,597,749, Cl. 437-43.000.
Kawamori, Hidetsugu, 5,598,178, Cl. 345-93.000.
Mizukata, Katsuya; Kawaguchi, Takafumi; Takeda, Shiro; and Takeda, Makoto, 5,598,177, Cl. 345-92.000.
Tanaka, Junji; and Watanabe, Masanobu, 5,598,290, Cl. 359-180.000.
Wakabayashi, Kenichi, 5,598,332, Cl. 395-224.000.
Yamanaka, Atsushi; and Kojima, Kunio, 5,598,297, Cl. 359-462.000.
Yamasa, Hideo; Shimazu, Fumio; Inui, Koichi; Wakahara, Shirou; Yui, Yuuhi; Kido, Eiichi; and Yoshimoto, Hironu, 5,598,252, Cl. 399-46.000.
Sharp, Shirley. Garment waistband stretcher. 5,597,099, Cl. 223-61.000.
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Shaw, Lawrance N. Apparatus for unloading seedlings from a tray and transporting them elsewhere. 5,596,938, Cl. 111-105.000.
Shearer, Kenneth W.: *See*—
Burkhart, Larry J.; Gant, Floyd B., Jr.; Shearer, Kenneth W.; and Singer, Mark D., 5,596,879, Cl. 62-296.000.
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Brown, Houston S., 5,597,389, Cl. 8-490.000.
Evans, Wayne E.; and Mesters, Carolus M. A. M., 5,597,773, Cl. 502-348.000.
Hamilton, David M., Jr., 5,597,547, Cl. 423-632.000.
Murata, Yasuyuki; Nakanishi, Yoshinori; and Ochi, Mitsukazu, 5,597,876, Cl. 525-481.000.
Willis, Carl L., 5,597,872, Cl. 525-314.000.
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Curzon, Alan D.; White, Ronald G.; and Jones, Aidan P. R., 5,597,522, Cl. 264-177.160.
Shelton, William J., to L&P Property Management Company. Light guard attachment clamp. 5,596,792, Cl. 24-336.000.
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Agrawal, Om P.; Wright, Michael J.; and Shen, Ju, 5,598,346, Cl. 364-489.000.
Sheng, Yi-Chung: *See*—

Sheu, Shing-Ren; Su, Kuan-Cheng; Chang, Chen-Hui; and Sheng, Yi-Chung, 5,597,753, Cl. 437-52.000.
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Choe, Eui W.; Forbes, Charles E.; Fibey, Jennifer A.; and Sherriff, Stephan F., 5,597,651, Cl. 428-373.000.
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Shiau, Ying: *See*—
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Shibano, Tomio: *See*—
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Shibanushi, Yoshio, to Nifco Inc. Plastic surface fastener. 5,596,794, Cl. 24-452.000.
Shibata, Eiji: *See*—
Yamada, Takahiro; Ogawa, Masao; and Shibata, Eiji, 5,596,940, Cl. 112-225.000.
Shibata, Yasuhiro: *See*—
Nakae, Yasuhito; Ishida, Shigeru; Mure, Shoichi; and Shibata, Yasuhiro, 5,597,861, Cl. 524-601.000.
Shigematsu, Hironobu: *See*—
Aoshima, Masashi; Shigematsu, Hironobu; Wadaki, Takeru; Kanehara, Toshikatsu; Watanabe, Kazuya; and Tanaka, Toshiyuki, 5,597,860, Cl. 524-505.000.
Shigeta, Atsushi: *See*—
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Shimada, Kazutoshi: *See*—
Suzuki, Noriyuki; Shimada, Kazutoshi; Tatsumi, Eisaku; Sasakawa, Shinichi; and Nagasaki, Katsuhiko, 5,598,150, Cl. 340-825.070.
Shimada, Takashi: *See*—
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Shimada, Toshiyuki: *See*—
Horibe, Ryusuke; Imura, Masaharu; and Shimada, Toshiyuki, 5,598,396, Cl. 369-124.000.
Shimada, Yoko: *See*—
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Shimakata, Masashi: *See*—
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Shimazu, Fumio: *See*—
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Shimizu, Akihiko: *See*—
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Shimizu, Yutaka: *See*—
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Shimotani, Mitsuo; Nishida, Minoru; Okada, Akira; and Moribiro, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha. Driver photographing apparatus. 5,598,145, Cl. 340-576.000.
Shin, Backchul: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Hamada, Yuichi; Kashida, Meguru; and Kubota, Yoshihiro, 5,597,669, Cl. 430-5.000.
Itoh, Kunio; Shinohara, Toshio; and Takahashi, Masaharu, 5,597,853, Cl. 523-213.000.
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Shin-Etsu Handotai Co Ltd: *See*—
Adomi, Keizo; Noto, Nobuhiko; Nakamura, Akio; and Takenaka, Takao, 5,597,761, Cl. 437-127.000.
Shin-Etsu Handotai Co., Ltd.: *See*—
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Shin, Myungshia; and Kim, Heejun, to Hyundai Motor Company. System for determining an abnormal operating condition in speed ratios of an automatic transmission and a method therefor. 5,598,334, Cl. 364-424.080.
Shin, Yasuharu: *See*—
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Shing, Yuh-Han: *See*—
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Shinjo, Naoki: *See*—
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Shinohara, Kota: *See*—
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Shinohara, Toshio: *See*—
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Shintomi, Yuichi, to Rohm Co., Ltd. Secondary battery charging apparatus. 5,598,089, Cl. 320-56.000.
Shionogi & Co., Ltd.: *See*—
Ohtani, Mitsuaki; Matsutani, Shigeru; Yoshida, Tadashi; Tanaka, Kazushige; Fujii, Yasuhiko; and Shirahase, Kazuhiro, 5,597,943, Cl. 560-42.000.
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Shioya, Shigemi: *See*—
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Shipman, Barry. Bundle tie tightening and cut off tool. 5,597,018, Cl. 140-123.600.
Shirahase, Kazuhiro: *See*—
Ohtani, Mitsuaki; Matsutani, Shigeru; Yoshida, Tadashi; Tanaka, Kazushige; Fujii, Yasuhiko; and Shirahase, Kazuhiro, 5,597,943, Cl. 560-42.000.
Shirai, Kiyokazu, to Sony/Tektronix Corporation. Light emitting apparatus comprising multiple groups of LEDs each containing multiple LEDs. 5,598,068, Cl. 315-185.00R.
Shirai, Yoshinori: *See*—
Ogihara, Noriyuki; Shirai, Yoshinori; and Yorozu, Takehiko, 5,598,399, Cl. 369-275.200.
Shiraishi, Toshihiro: *See*—
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Shirley, Kirk B. Portable crane. 5,597,081, Cl. 212-299.000.
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Shishido, Hideomi; Doi, Shigeo; Hiraktiuchi, Masanori; and Okimoto, Hajime, to Molten Corporation. Method for making balls for sports. 5,597,432, Cl. 156-170.000.
Shiva Corporation: *See*—
Slaughter, Frank G., III; Gocht, Russell C.; and McCool, David, 5,598,536, Cl. 395-200.160.
Shively, Kirk S.: *See*—
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Shoji, Masakazu, to Lucent Technologies Inc. High-density read-only memory. 5,598,365, Cl. 365-104.000.
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Showa Corporation: *See*—
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Shtipelman, Boris A.; and Barnard, James A., to Eastman Kodak Company. Optimized linear motors for focus/tracking actuators in optical disk drives. 5,598,386, Cl. 369-44.140.
Shu, William K.: *See*—
Groover, Richard L.; Shu, William K.; Lee, Sang S.; and Fujimoto, George, 5,598,031, Cl. 257-668.000.
Shundo, Seiichi: *See*—

Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.
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Sickler, Ernest H., Jr. Method and apparatus for improving the appearance of spider veins. 5,597,580, Cl. 424-443.000.
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Sieckmann, Hartmut: *See*—
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Siegall, Clay B.; Gawlak, Susan L.; and Marquardt, Hans, to Bristol-Myers Squibb Company. Bryodin 2 a ribosome-inactivating protein isolated from the plant *Bryonia dioica*. 5,597,569, Cl. 424-183.100.
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Franetzki, Manfred; Guenther, Werner; and Ploetz, Josef, 5,598,454, Cl. 378-206.000.
Grewal, Virinder S.; and Laux, Volker B., 5,597,438, Cl. 156-345.000.
Hein, Soeren, 5,598,159, Cl. 341-143.000.
Kiehl, Oliver; and Koch, Rudolf, 5,598,094, Cl. 323-315.000.
Kirchhoff, Hans-Gerd, 5,598,124, Cl. 327-552.000.
Lepping, Jürgen, 5,598,438, Cl. 375-317.000.
Neppl, Franz, 5,597,766, Cl. 437-226.000.
Neubauer, Werner; Bocionek, Siegfried; Möller, Marcus; and Joppich, Martin, 5,598,076, Cl. 348-568.220.
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Leifert, Carlo; Epton, Harold A. S.; and Sigee, David C., 5,597,565, Cl. 424-115.000.
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Kamireddy, Balreddy; Darsley, Michael J.; Simpson, David M.; and Massey, Richard J., 5,597,573, Cl. 424-234.100.
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Singer Company N.V., The: *See*—
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Siskiyou Design, Inc.: *See*—
Hodge, Robert, 5,597,149, Cl. 248-316.400.
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Bocquet, Jean-Pierre, 5,597,344, Cl. 451-65.000.
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Lynch, Steven, 5,596,848, Cl. 52-200.000.
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Huang, Hao, 5,598,074, Cl. 318-439.000.
Slane, Albert A.: *See*—
Brech, Brad L.; Delp, Gary S.; and Slane, Albert A., 5,598,535, Cl. 395-200.130.
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Deluca, Hector F.; and Slatopolsky, Eduardo, 5,597,815, Cl. 514-167.000.
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Smalley, Dennis R.; Vorgitch, Thomas J.; Manners, Chris R.; Hull, Charles W.; and VanDorin, Stacie L. Simultaneous multiple layer curing in stereolithography. 5,597,520, Cl. 264-401.000.

Smallwood, Paul. Endless belt display device. 5,596,828, Cl. 40-524.000.

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Behrmann, Greg; Smith, Dale; and Rosan, Greg, 5,598,494, Cl. 385-59.000.

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Mostafazadeh, Shahram; and Smith, Joseph O., 5,598,321, Cl. 361-704.000.

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Chari, Krishnan; and Smith, Wendell F., Jr., 5,597,685, Cl. 430-551.000.

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Ford, Brian D., 5,597,715, Cl. 435-118.000.
Grattan, Timothy J., 5,597,583, Cl. 424-464.000.

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Richards, Joseph C.; Hills, William A.; and Snow, William C., 5,597,791, Cl. 510-372.000.

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DeWille, Normanella T.; Chandler, Michael A.; Mazer, Terrence B.; Ragan, Robert J.; Snowden, Gregory A.; Geraghty, Maureen E.; and Johnson, Catherine D., 5,597,595, Cl. 426-74.000.

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Barker, Charles R., III; Olson, Richard E.; Lindquist, Stephen E.; Hartsarich, Massimo; Cease, David A.; and Sobolewski, Robert S., 5,597,034, Cl. 165-80.300.

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Green, Mino, 5,598,293, Cl. 359-275.000.

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Marique, Jean C.; and Boattini, Pier P., 5,597,394, Cl. 65-25.200.

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Leger, Pierre; Marchais, Olivier; and Bienaime, Francis, 5,597,955, Cl. 73-504.160.

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Inakoshi, Daisuke; and Sodeyama, Hideo, 5,597,247, Cl. 400-207.000.

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Komamura, Takeo, 5,596,829, Cl. 40-721.000.

Sokell, Steve: *See*—
Thompson, David; Foster, Alistair J.; Sokell, Steve; Foot, John T.; and Hoskinson, Brian, 5,597,047, Cl. 180-68.400.

Solheim, John A., to Karsten Manufacturing Corporation. Groove depth gauge for golf club heads. 5,596,812, Cl. 33-508.000.

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Vilbert, Bernard, 5,597,094, Cl. 222-214.000.

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Tuan, Pham A., 5,597,175, Cl. 280-723.000.

Solo, Alan J. Utility article attachable to footwear. 5,596,821, Cl. 36-136.000.

Somerville, Thomas A., to Motorola, Inc. Peak voltage and peak slope detector for a battery charger circuit. 5,598,086, Cl. 320-30.000.

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Son, Jong C.: *See*—
Bae, Sang C.; Park, Jae R.; and Son, Jong C., 5,596,891, Cl. 68-133.000.

Son, Kwang H.: *See*—
Bok, Song H.; Jeong, Tae S.; Kim, Sung U.; Kwon, Byoung M.; Kim, Young K.; Son, Kwang H.; Lee, Hang W.; and Kwon, Yong K., 5,597,835, Cl. 514-338.000.

Sondermeyer, Paul; Balloul, Jean-Marc; Pierce, Raymond; Grzych, Jean-Marie; Kieny, Marie-Paule; Loison, Gérard; Capron, André; and Lecocq, Jean-Pierre, to Transgene S.A. Protein recognized by antibodies raised against native P28 of schistosoma mansoni. 5,597,570, Cl. 424-191.100.

Songer, Jimmie D., to Magma, Inc. Method and apparatus for improving transmitted video signal structure. 5,598,225, Cl. 348-606.000.

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Furuya, Miki; Ezaki, Tadashi; Kori, Teruhiko; and Tsuchiya, Satoshi, 5,598,219, Cl. 348-465.000.
Ito, Satoshi; Hiei, Futoshi; Ishibashi, Akira; Toda, Atsushi; and Nakayama, Norikazu, 5,597,740, Cl. 437-23.000.
Kondo, Tetsujiro; Fujimori, Yasuhiro; and Nishikata, Takeharu, 5,598,214, Cl. 348-414.000.
McClintock, Shawn L., 5,598,208, Cl. 348-159.000.
Mikami, Tsunomu; Kaneko, Masayasu; and Murase, Yoshiharu, 5,598,227, Cl. 348-725.000.
Moriwake, Katsuakira; and Shiraishi, Toshihiro, 5,598,486, Cl. 382-293.000.
Mukawa, Hiroshi, 5,598,391, Cl. 369-54.000.
Nakanishi, Atsushi; Hoshino, Mitsuo; and Matsumoto, Yoshitaka, 5,598,305, Cl. 360-96.600.
Saitoh, Hiroshi; and Takahashi, Hideki, 5,598,390, Cl. 369-50.000.
Saitoh, Mitsumasa, 5,598,228, Cl. 348-732.000.
Sumi, Hirofumi; and Nagashima, Naoki, 5,597,739, Cl. 437-21.000.
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Tanaka, Shigeo; Yamazaki, Hiroshi; Kotabe, Noriko; Sugiyama, Kouichi; Sato, Makoto; Katsuyama, Akira; Osakabe, Yoshio; and Kusagaya, Yasuo, 5,598,278, Cl. 386-96.000.
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Sony/Tektronix Corporation: *See*—
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Soshi, Isao: *See*—
Omi, Junichi; Wakabayashi, Hiroshi; Miyamoto, Hidenori; Soshi, Isao; Kato, Minoru; Amanuma, Tatsuo; and Imura, Yoshio, 5,598,242, Cl. 396-55.000.

Sotolongo Padrón, Franklin: *See*—
Huergo, Concepción C.; Sierra González, Victoriano G.; Gutiérrez Vazquez, Maria M.; Bisset Jorrin, Gonzalo; Garcia Imia, Luis G.; de la Caridad Puentes Rizo, Gisela; del Carmen Sampedro Herrera, Maria; Sotolongo Padrón, Franklin; Le Riverend Morales, Eloisa X.; and Galguera Dominguez, Manuel A., 5,597,572, Cl. 424-197.910.

Soucy, Paul B. Solar device and method for assembly. 5,596,981, Cl. 126-704.000.

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Rademeyer, Pieter, 5,598,471, Cl. 380-9.000.

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Buynak, John D.; and Bachmann, Brian, 5,597,817, Cl. 514-200.000.

Southwest Research Institute: *See*—
Montag, Bruce C.; Wenzel, Dennis J.; and Weyrauch, Richard P., 5,598,359, Cl. 364-578.000.

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Mohaupt, Udo H., 5,597,984, Cl. 177-210.00C.

Space Engineering S.p.A.: *See*—
Lo Forti, Raimondo; and Lisi, Marco, 5,598,173, Cl. 343-781.00R.

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Leung, Yat F.; and Tilley, Scott W., 5,597,142, Cl. 244-164.000.

Spacek, Dan J.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

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Spang, Claudia: *See*—
Lutter, Heinz-Dieter; Bruchmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zachiesche, Ruth, 5,597,885, Cl. 528-44.000.

Sparkman, Aubrey K.: *See*—
Greer, Stuart E.; Dietz, Joel P.; and Sparkman, Aubrey K., 5,597,737, Cl. 437-8.000.

Spector, Donald. Stuffed toy figure and offspring assembly. 5,597,339, Cl. 446-226.000.

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Dieny, Bernard; Gurney, Bruce A.; Parkin, Stuart S. P.; Sanders, Ian L.; Speriosu, Virgil S.; and Wilhoit, Dennis R., 5,598,308, Cl. 360-113.000.

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David, James J.; Duesterhoeft, Scott S.; Spickler, John M.; and Hiyama, Naoki, 5,597,316, Cl. 439-159.000.

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Larsen, Scott D.; and Spilman, Charles H., 5,597,816, Cl. 514-183.000.

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Beard, Douglas R.; Phelps, Andrew E.; Woodmansee, Michael A.; Blewett, Richard G.; Lohman, Jeffrey A.; Silbey, Alexander A.; Spix, George A.; Simmons, Frederick J.; and Van Dyke, Don A., 5,598,547, Cl. 395-563.000.

Spratt, Michael P.: *See*—
Albrecht, Alan; Goody, Steven H.; Spratt, Michael P.; Curcio, Joseph A., Jr.; and Dove, Daniel J., 5,598,406, Cl. 370-296.000.

Spring AG Metallwarenfabrik Eschlikon: *See*—
Hasenfratz, Rene; and Mutschler, Siegfried, 5,597,500, Cl. 219-385.000.

Sprouse, Jeffrey S.: *See*—
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Sprute, Emil D.: *See*—
Kangas, Steven L.; Sprute, Emil D.; and Stych, Dean J., 5,597,677, Cl. 430-273.100.

SPX Corporation: *See*—
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Phillips, Timothy B., 5,598,315, Cl. 361-93.000.

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Maurer, Dieter; Stadlmair, Manfred; and Marny, Ernst, 5,596,927, Cl. 101-363.000.

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Staebler, Manfred-Otto: *See*—
Neubert, Werner; Schadow, Joachim; Mueller, Joachim; Staebler, Manfred-Otto; Dohr, Manfred; and Warkentin, Heinz, 5,596,810, Cl. 30-369.000.

Stamler Corporation: *See*—
Gaskins, Paul M., 5,598,083, Cl. 320-2.000.

Standard Car Truck Company: *See*—
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Standish, Darrell E.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Stanford Telecommunications, Inc.: *See*—
Schuchman, Leonard; and Weinberg, Aaron, 5,598,472, Cl. 380-14.000.

Stanley, Ronald D., Jr.; Schauer, Carla M.; and Schauer, Jim K. Roller spinning tool. 5,597,002, Cl. 134-149.000.

Stark, James K.: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

Starovetskaya, Nelli: *See*—
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Starovetskaya, Nelli, 5,597,700, Cl. 435-7.920.

Stehling, Henry J.; Istre, Roy, Jr.; Levine, Sheldon; and Nichols, Horace E., Jr., to Hydra-Shield Manufacturing, Inc. Devices for securing fire hydrant valves. 5,596,893, Cl. 70-175.000.

Steigman, Frederic N.; Kohler, Rudolph H.; and Davis, Robert B., to Praxair Technology, Inc. Ultra-high energy cryogenic impact system. 5,597,123, Cl. 241-23.000.

Stein, Alexander, to Quantum Logic Corp. Apparatus for measuring the emissivity of a semiconductor wafer. 5,597,237, Cl. 374-9.000.

Stein, Arthur; and Updegrave, William C., to Display Technologies, Inc. Pilfer-resistant peg hook assembly. 5,597,150, Cl. 248-551.000.

Stellberger, Rudi: *See*—
Kusch, Hans-Jürgen; Ruf, Bernd; and Stellberger, Rudi, 5,596,919, Cl. 83-507.000.

Stene, Bernie A.: *See*—
Desmarais, Lionel C.; and Stene, Bernie A., 5,596,822, Cl. 37-104.000.

Stepanov, Alexander: *See*—
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Starovetskaya, Nelli, 5,597,700, Cl. 435-7.920.

Stephan, Wolfgang: *See*—
Trzmiel, Alfred; Stephan, Wolfgang; and Schmied, Peter, 5,597,367, Cl. 474-110.000.

Stephens, William D., to United States of America, Army. High energy fuel gel slurries. 5,597,947, Cl. 44-268.000.

Stephenson, Michael R., to Inno-Vent Plastics, Inc. Baffle vent structure. 5,596,847, Cl. 52-198.000.

Stephenson, Stanley W., III; and Codd, Alan G., Jr., to Eastman Kodak Company. Camera with front flip-up flash unit and rear flip-up flash retainer having front and rear viewfinder openings. 5,598,238, Cl. 396-178.000.

Sterling Winthrop, Inc.: *See*—
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Farrell, Robert P., 5,597,841, Cl. 514-373.000.

Stern, Alvin S., to Hoffmann-La Roche Inc. Homogeneous human interleukin 2. 5,597,901, Cl. 530-351.000.

Stern, Donald S.: *See*—
Redford, Peter M.; and Stern, Donald S., 5,597,307, Cl. 434-118.000.

Stern, Eric J., to Yazaki Corporation. Locking clip with resilient barb arm. 5,597,280, Cl. 411-508.000.

Stern, Gerhard: *See*—
Hackl, Kurt A.; Rössler, Markus; Müllner, Martin; and Stern, Gerhard, 5,597,917, Cl. 544-130.000.

Stern, Mark L.: *See*—
Johnston, Robert G., Jr.; Stern, Mark L.; and Evans, David L., 5,598,524, Cl. 395-348.000.

Stevens, Edwin. Paint stripping compositions and methods. 5,597,788, Cl. 510-212.000.

Stevens, Elwood L.; and Houghton, Valinda. Wiping device for interior surfaces of vehicle windshield glass. 5,596,787, Cl. 15-220.100.

Stevens, George C.: *See*—
Briggs, Douglas V.; and Stevens, George C., 5,596,950, Cl. 119-489.000.

Stewart, Christopher G.: *See*—
Johnson, Randall F.; and Stewart, Christopher G., 5,597,393, Cl. 55-356.000.

Stewen, Wilhelm: *See*—
Schreiter, Klaus-Dieter; and Stewen, Wilhelm, 5,598,149, Cl. 340-825.060.

Stillian, John R.; and Siriraks, Archava, to Dionex Corporation. Electrochemical pretreatment system for liquid sample analysis. 5,597,481, Cl. 210-198.200.

Stitt, R. Mark, II: *See*—
Somerville, Thomas A.; Meinel, Walter B.; and Stitt, R. Mark, II, 5,598,327, Cl. 363-131.000.

Stockmann, Bernd: *See*—
Gebauer, Andreas; Lindner, Joachim; Schierling, Bernhard; Stockmann, Bernd; and Sodau, Jörg, 5,597,059, Cl. 192-70.120.

Stodder, Samuel A.; and Wield, Paul J., to Hewlett-Packard Company. Dual-resolution encoding system for high cyclic accuracy of print-medium advance in an inkjet printer. 5,598,201, Cl. 347-104.000.

Stoecker, Martin A.: *See*—
Greaves, John A.; Cloud, Norman P.; Stoecker, Martin A.; and Russotti, Raymond, 5,596,838, Cl. 47-58.000.

Stone, Geoffrey C., to Storage Technology Corporation. Method and apparatus for accelerated packet processing. 5,598,410, Cl. 370-469.000.

Stone, Jeffrey A.: *See*—

Gable, Patricia A.; Shrout, David J.; and Stone, Jeffrey A., 5,597,331, Cl. 439-754.000.
Stora Feldmuehle AG: *See—*
Schoen, Horst; Heyer, Horst W.; and Friesen, Wolfram, 5,597,612, Cl. 427-152.000.
Stornetti, Allen G., to Hughes Aircraft Company. Efficient mass translation device. 5,597,141, Cl. 244-164.000.
Storage Technology Corporation: *See—*
Stone, Geoffrey C., 5,598,410, Cl. 370-469.000.
Stout, Gregg W.; and Mante, James T., to Western Company of North America. Combination gravel packing/frac apparatus for use in a subterranean well bore. 5,597,040, Cl. 166-51.000.
Strand, Timothy C.: *See—*
Best, Margaret E.; Rosen, Hal J.; Rubin, Kurt A.; and Strand, Timothy C., 5,598,398, Cl. 369-272.000.
Strandberg, Gary M.: *See—*
Klier, John; Strandberg, Gary M.; and Tucker, Christopher J., 5,597,792, Cl. 510-417.000.
Strasser, Alois: *See—*
Schiller, August; Dorsch, Norman; Graf, Werner; and Strasser, Alois, 5,597,882, Cl. 528-18.000.
Strausberg, Robert L.: *See—*
Jacobson, James W.; Strausberg, Robert L.; Wilson, Susan D.; Pope, Sharon H.; Strausberg, Susan L.; Ruff, Michael D.; Augustine, Patricia C.; and Danforth, Harry D., 5,597,571, Cl. 424-191.100.
Strausberg, Susan L.: *See—*
Jacobson, James W.; Strausberg, Robert L.; Wilson, Susan D.; Pope, Sharon H.; Strausberg, Susan L.; Ruff, Michael D.; Augustine, Patricia C.; and Danforth, Harry D., 5,597,571, Cl. 424-191.100.
Streicher, Kevin P.: *See—*
DeLizo, Evelyn M.; Gadkaree, Kishor P.; Mach, Joseph F.; and Streicher, Kevin P., 5,597,617, Cl. 427-228.000.
Streicher, Stanley L.: *See—*
Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Carotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.
Streisel, Robert C.: *See—*
Hauk, Mark A.; Mulcahy, Leo T.; Peterson, Ralph S.; and Streisel, Robert C., 5,597,447, Cl. 162-135.000.
Streu, Joachim: *See—*
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teach, Helmut; Minges, Roland; and Streu, Joachim, 5,597,942, Cl. 560-25.000.
Stringa, Luigi, to De La Rue Giori S.A. Installation for quality control of printed sheets, especially security paper. 5,598,006, Cl. 250-559.460.
Strizki, Richard. Adjustable safety breakaway mounting apparatus. 5,596,845, Cl. 52-98.000.
Strong, Henry L.: *See—*
Marmor, Robert S.; and Strong, Henry L., 5,597,924, Cl. 546-179.000.
Stroupe, Stephen D.: *See—*
Wong, Martin; Finley, David M.; Ramp, John M.; Boltinghouse, Gary L., Jr.; Shaffer, Mark R.; Stroupe, Stephen D.; and Brackett, John M., 5,597,702, Cl. 435-18.000.
Strupczewski, Joseph T.: *See—*
Glazkowski, Edward J.; Chiang, Yulin; Strupczewski, Joseph T.; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,597,842, Cl. 514-373.000.
Struyk, David A., to Waterstrike Incorporated. Speed measuring and compensation apparatus for jet-propelled watercraft. 5,597,952, Cl. 73-170.140.
Stubbs, Robert E.: *See—*
Larson, David; Stubbs, Robert E.; and Edstrom, Gene, 5,598,528, Cl. 395-182.050.
Stüber, Dietrich: *See—*
Banner, David; Lesslauer, Werner; Lötscher, Hansruedi; and Stüber, Dietrich, 5,597,899, Cl. 530-351.000.
Stych, Dean J.: *See—*
Kangas, Steven L.; Sprute, Emil D.; and Stych, Dean J., 5,597,677, Cl. 430-273.100.
Su, Kuan-Cheng: *See—*
Shen, Shing-Ren; Su, Kuan-Cheng; Chung, Chen-Hui; and Sheng, Yi-Chung, 5,597,753, Cl. 437-52.000.
Subramanyam, Chakrapani: *See—*
Dunlap, Richard P.; Boaz, Neil W.; Mura, Albert J.; Kumar, Virendra; Subramanyam, Chakrapani; Desai, Ranjit C.; Hlasta, Dennis J.; Saindane, Manohar T.; Bell, Malcolm R.; Court, John J.; and Farrell, Robert P., 5,597,841, Cl. 514-373.000.
Suda, Yasuo: *See—*
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Sudau, Jörg: *See—*
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Suematsu, Hideki; Ikemoto, Manabu; and Kameda, Yuriko, to Fujicopian Co., Ltd. Thermal transfer medium. 5,597,641, Cl. 428-195.000.
Suesuri, Masaya: *See—*
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Suess, Josef-Anton, to Datacolor International Applied Color Systems, Inc. Beaker type dyeing machine. 5,596,890, Cl. 68-15.000.
Sugano, Yoichi, to NEC Corporation. Resin encapsulated semiconductor device. 5,598,038, Cl. 257-787.000.
Sugawara, Saburo: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Sugawara, Saburo, 5,598,240, Cl. 396-84.000.
Sugimoto, Kazushige: *See—*
Yamada, Mikio; Ebisuno, Tadahiro; Moriyama, Keiji; and Sugimoto, Kazushige, 5,597,365, Cl. 473-354.000.
Sugimoto, Kenichi: *See—*
Igarashi, Shigeru; Usui, Toshihiro; Hiraoka, Junichiro; Hashimoto, Keiko; Uchiwa, Hideyo; Murakami, Umeji; Sugimoto, Kenichi; Minamino, Hiromi; and Horikoshi, Toshio, 5,597,386, Cl. 8-405.000.
Sugimura, Yukio; Iino, Kimio; Tsujita, Yoshio; Shimada, Yoko; Kobayashi, Tomowo; and Kagasaki, Takeshi, to Sankyo Company, Limited. Radicicol derivatives, their preparation and their anti-tumor activity. 5,597,846, Cl. 514-450.000.
Sugitani, Kazumi: *See—*
Kinbe, Akio; Hamada, Masataka; Ueda, Hiroshi; Sugitani, Kazumi; and Ootsuka, Hiroshi, 5,597,999, Cl. 250-201.700.
Sugiyama, Kouichi: *See—*
Tanaka, Shigeo; Yamazaki, Hiroshi; Kotabe, Noriko; Sugiyama, Kouichi; Sato, Makoto; Katsuyama, Akira; Osakabe, Yoshio; and Kusagaya, Yasuo, 5,598,278, Cl. 386-96.000.
Sugiyama, Toshinori: *See—*
Tanaka, Yoshito; and Sugiyama, Toshinori, 5,598,400, Cl. 369-291.000.
Suh, Il hong: *See—*
Choi, Hyun-Taek; Suh, Il hong; Chang, Woo Sok; Lee, Janghee; and Kim, Goonjin, 5,598,304, Cl. 360-78.040.
Suib, Steven L.: *See—*
O'Young, Chi-Lin; Sawicki, Robert A.; Yin, Yuan-Gen; Xu, Wen-Qing; and Suib, Steven L., 5,597,944, Cl. 585-654.000.
Sultan, Myrna C.; Folkerts, Charles H.; Matthews, Gregory P.; and Kushion, Mark D., to General Motors Corporation. Integrated fueling control. 5,596,972, Cl. 123-520.000.
Sumi, Hirofumi; and Nagashima, Naoki, to Sony Corporation. MOS transistor and method for making the same. 5,597,739, Cl. 437-21.000.
Sumi, Shusuke: *See—*
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Sumitomo Bakelite Company Limited: *See—*
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Sumitomo Chemical Company Limited: *See—*
Aoshima, Masashi; Shigematsu, Hironobu; Wadaki, Takeru; Kanehara, Toshikatsu; Watanabe, Kazuya; and Tanaka, Toshiyuki, 5,597,860, Cl. 524-505.000.
Minamisaka, Kazuya; Sekiguchi, Masahito; and Saito, Kenji, 5,597,941, Cl. 558-337.000.
Seko, Shinzo, 5,597,940, Cl. 558-303.000.
Ushio, Hideki; and Higashii, Takayuki, 5,597,929, Cl. 548-253.000.
Sumitomo Electric Industries, Ltd.: *See—*
Harada, Keizo; Ishii, Masayuki; and Yamanaka, Shosaku, 5,597,665, Cl. 429-235.000.
Ishikawa, Shinji; Chigusa, Yoshiki; Nakamura, Motonori; Makio, Yoshinori; and Watanabe, Morio, 5,597,398, Cl. 65-413.000.
Moriguchi, Hideki; Murakami, Daisuke; Ikegaya, Akihiko; and Nomura, Toshio, 5,597,272, Cl. 407-119.000.
Sumitomo Metal Ceramics, Inc.: *See—*
Araki, Hideaki; Fukuta, Junzo; and Fukaya, Masashi, 5,597,644, Cl. 428-210.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Yamada, Mikio; Ebisuno, Tadahiro; Moriyama, Keiji; and Sugimoto, Kazushige, 5,597,365, Cl. 473-354.000.
Sun Microsystems, Inc.: *See—*
Ruzu, Stefan; Yee, Clayton L.; Malladi, Deviprasad; and Rogers, Alan C., 5,598,035, Cl. 257-723.000.
Ruzu, Stefan; and Yee, Clayton L., 5,598,348, Cl. 364-491.000.
Sun, Sey-Shing; and Tuenge, Richard T., to Planar Systems, Inc. AC TFEL device having a white light emitting multilayer phosphor. 5,598,059, Cl. 313-509.000.
Sunakawa, Shinichi: *See—*
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Sunayama, Kazuyuki; Miyawaki, Kunio; Ohno, Minoru; and Miyazaki, Tatsuo, to Hitachi Zosen Corporation. Method for welding corrugate portions by means of welding robot for corrugation lap joint. 5,597,498, Cl. 219-124.340.
Sundermeyer, Frank: *See—*
Siemon, John A.; Green, Martin; and Sundermeyer, Frank, 5,598,342, Cl. 364-481.000.
Sung, T.: *See—*
Popovici, Galina; Prelas, Mark A.; Sung, T.; and Khaswinah, S., 5,597,762, Cl. 437-169.000.
Superstill Technology, Inc.: *See—*
Sears, Stephan B., 5,597,453, Cl. 203-24.000.
Surauer, Michael; and Bittner, Helmut, to Deutsche Aerospace AG. Process and a device for controlling the attitude of a three-axis stabilized spinning spacecraft. 5,597,143, Cl. 244-164.000.
Sutherland, Robert L., to Riverwood International Corporation. Wrap-around carrier with corner bed restraints. 5,597,071, Cl. 206-434.000.
Suwa, Yoshihisa: *See—*

Ishikawa, Seiji; Suwa, Yoshihisa; Ito, Takeshi; and Yasuda, Tomio, 5,598,166, Cl. 342-357.000.
Suzuki, Emi: *See—*
Suzuki, Hiroko; Suzuki, Emi; and Suzuki, Yoshio, 5,596,778, Cl. 5-502.000.
Suzuki, Hideaki: *See—*
Liu, Bo; and Suzuki, Hideaki, 5,597,632, Cl. 428-41.100.
Suzuki, Hideto; and Horikoshi, Takayuki, to Sony Corporation. Method and apparatus for transferring data between a computer and a tape recorder. 5,598,301, Cl. 360-53.000.
Suzuki, Hiroko; Suzuki, Emi; and Suzuki, Yoshio. Air controlled comforter. 5,596,778, Cl. 5-502.000.
Suzuki, Kazuhiko: *See—*
Katagiri, Masayoshi; and Suzuki, Kazuhiko, 5,597,214, Cl. 303-10.000.
Suzuki, Kazuhiro; Kamizawa, Koh; Koshi, Yutaka; and Kunitake, Setsu, to Fuji Xerox Co., Ltd. Apparatus for encoding an image signal. 5,598,484, Cl. 382-239.000.
Suzuki, Kazumasa, to NEC Corporation. Power supply wiring for semiconductor device. 5,598,029, Cl. 257-665.000.
Suzuki, Kenkichi: *See—*
Kondo, Katsumi; Terao, Hiromu; Abe, Hidetoshi; Ohta, Masuyuki; Suzuki, Kenkichi; Sasaki, Tohru; Kawachi, Genshiro; and Ohwada, Junichi, 5,598,285, Cl. 349-39.000.
Suzuki, Koubei; and Suzuki, Kouji, to Kabushiki Kaisha Toshiba. Active matrix type display apparatus. 5,598,180, Cl. 345-100.000.
Suzuki, Kouji: *See—*
Suzuki, Koubei; and Suzuki, Kouji, 5,598,180, Cl. 345-100.000.
Suzuki Motor Corporation: *See—*
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Suzuki, Nobuyuki: *See—*
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Suzuki, Noriyuki; Shimada, Kazutoshi; Tatsumi, Eisaku; Sunakawa, Shinichi; and Nagasaki, Katsuhiko, to Canon Kabushiki Kaisha. Polling communication system. 5,598,150, Cl. 340-825.070.
Suzuki, Shintaro, to Dobeny Eye Institute. Cadherin-specific antibodies and hybridoma cell lines. 5,597,725, Cl. 435-328.000.
Suzuki, Takuma: *See—*
Tanaka, Yoshiaki; Hayashi, Hiroshi; Fuchigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, 5,598,478, Cl. 381-17.000.
Suzuki, Tatsuo; and Ueyama, Takashi, to Sekisui Chemical Co., Ltd. Toner resin composition and toner. 5,597,674, Cl. 430-109.000.
Suzuki, Tatsuya: *See—*
Kotno, Yoshiaki; and Suzuki, Tatsuya, 5,597,494, Cl. 216-6.000.
Suzuki, Tomio: *See—*
Ito, Yasuo; Kato, Hideo; Yasuda, Shingo; Ogawa, Nobuo; Sakurai, Shunichiro; and Suzuki, Tomio, 5,597,848, Cl. 514-539.000.
Suzuki, Yoshio: *See—*
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Suzuki, Yoshitaka; Tajima, Osamu; Ota, Morihiko; Yonemitsu, Satoshi; and Takahashi, Masaki, to Victor Company of Japan, Ltd. Color printer. 5,597,251, Cl. 400-645.400.
Suzuki, Yukihide: *See—*
Wada, Shoji; Kesmizaki, Kanchide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Shundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, 5,598,373, Cl. 365-230.030.
Svecom PE Srl: *See—*
Marin, Giancarlo, 5,597,134, Cl. 242-571.200.
Swanson, Malcolm L., to Astec Industries, Inc. System for and method of soil remediation and hot mix asphalt production. 5,596,935, Cl. 110-235.000.
Swanstrom, Scott; and Gephardt, Douglas D., to Advanced Micro Devices, Inc. Apparatus and method for driving a bus to a docking safe state in a dockable computer system including a docking station and a portable computer. 5,598,537, Cl. 395-281.000.
Swanstrom, Scott: *See—*
Gephardt, Douglas D.; and Swanstrom, Scott, 5,598,539, Cl. 395-281.000.
Swenson, Rolf E.: *See—*
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Syldath, Andreas: *See—*
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Symbios Logic Inc.: *See—*
Poeppelman, Alan D., 5,598,443, Cl. 375-359.000.
Rathunde, Dale F., 5,598,549, Cl. 395-441.000.
Szemeredi, Katalin: *See—*
Szirt nee Kislelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, 5,597,822, Cl. 514-247.000.
Szirt nee Kislelly, Eniko; Budai, Zoltan; Mezei, Tibor; Blasko, Gabor; Kazo nee Daroczi, Klara; Egyed, Andras; Gigler, Gabor; Fekete, Marton; Reiter nee Esses, Klara; Simig, Gyula; and Szemeredi, Katalin, to Egis Pharmaceutical. Pharmaceutical compositions for the prevention and/or treatment a gastrointestinal diseases. 5,597,822, Cl. 514-247.000.
Szuba, Louis. Internal combustion engine. 5,596,955, Cl. 123-51.0AA.
T. Sendzimir, Inc.: *See—*
Sendzimir, Michael G.; and Turley, John W., 5,596,899, Cl. 72-242.400.
Tabata, Hisaya: *See—*
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Tabata, Masamune: *See—*
Gunji, Takahiro; Fujisawa, Yoshikazu; Tabata, Masamune; and Okamoto, Kazuhisa, 5,597,657, Cl. 428-680.000.
Tachibana, Toshio: *See—*
Nagai, Kenichi; Yasuda, Kenji; Hama, Toshio; Sekiguchi, Yoshitoshi; Tachibana, Toshio; Nakanishi, Osamu; and Moriyama, Tadashi, 5,597,451, Cl. 201-4.000.
Tack, William T., to Ashurst Technology Corporation (Ireland Limited). Aluminum-scandium alloys. 5,597,529, Cl. 420-532.000.
Tadaaki, Ishikawa: *See—*
Masaru, Yamamoto; Toshikatsu, Atsuta; Yoshinori, Koshimizu; Nobuo, Kitamura; Tadaaki, Ishikawa; and Shin, Yasuhara, 5,598,245, Cl. 396-440.000.
Taddei-Peters, W. C.; and Butler, Sandra M., to Akzo Nobel N.V. Immunoreactive peptides of apo(a). 5,597,908, Cl. 536-23.100.
Tagiri, Osamu: *See—*
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Taguchi, Masakazu: *See—*
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Taguchi, Naoto, to Yazaki Corporation. Connector with engaging lever. 5,597,315, Cl. 439-157.000.
Taig, Alistair G.: *See—*
Rhee, Seong K.; Taig, Alistair G.; and Towers, Kenneth S., 5,597,292, Cl. 417-322.000.
Taira, Kazuki: *See—*
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Taisho Pharmaceutical Co., Ltd.: *See—*
Matsumoto, Taro; Wada, Hisaya; Migita, Yoshihiro; Hatayama, Katsuo; and Sekiguchi, Yoshinori, 5,597,921, Cl. 544-343.000.
Sato, Fumie, 5,597,938, Cl. 556-436.000.
Taiwan Semiconductor Manufacturing Company Ltd.: *See—*
Chen, Hsi-Chieh; and Hsu, Shun-Liang, 5,597,442, Cl. 156-626.100.
Tajima, Osamu: *See—*
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Takagi, Hiroyuki: *See—*
Watanabe, Yoshitsune; Kashima, Yoshiyuki; and Takagi, Hiroyuki, 5,597,512, Cl. 252-315.600.
Takagi, Tadao, to Nikon Corporation. Camera having removable viewfinder and visual line detection device. 5,598,243, Cl. 396-51.000.
Takahashi, Hideki: *See—*
Saitoh, Hiroshi; and Takahashi, Hideki, 5,598,390, Cl. 369-50.000.
Takahashi, Hiroyuki: *See—*
Ishii, Rie; Hayashi, Masayuki; Yamakawa, Takeshi; and Takahashi, Hiroyuki, 5,598,279, Cl. 358-402.000.
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Takahashi, Masaharu: *See—*
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Ohta, Masafumi; Sakoo, Yohta; Takahashi, Toshihiko; Adachi, Chihaya; and Nagai, Kazukiyo, 5,597,925, Cl. 548-145.000.
Takahashi, Yuji: *See—*
Maruyama, Hiroyoshi; Takahashi, Yuji; Toyama, Yoshikuni; Tasada, Shinichi; Kusumoto, Toshihiko; and Yashiro, Masahiko, 5,597,153, Cl. 271-4.100.
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Childers, Jim; Reinecke, Peter; Takahashi, Yutaka; and Yamamoto, Seiichi, 5,598,545, Cl. 395-562.000.
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Nakao, Tohru; Tanaka, Hiroshi; Morimoto, Yasuto; and Takehara, Shuzo, 5,597,918, Cl. 544-234.000.

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Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, to Matsushita Electric Industrial Co., Ltd. Organic polymer and preparation and use thereof. 5,597,889, Cl. 528-353.000.

Tallman, John: *See*—
Shaw, Kenneth; Hutchison, Alan; Thurkauf, Andrew; and Tallman, John, 5,597,920, Cl. 544-250.000.

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Maruo, Yasuko; Sasaki, Shigekuni; Tamamura, Toshiaki; Matsuura, Tohru; Ando, Shinji; Matsui, Shinsuke; and Yamamoto, Fumio, 5,598,501, Cl. 385-143.000.

Tamura, Satoshi: *See*—
Kimura, Yoichi; Kumada, Isao; Hasegawa, Takashi; and Tamura, Satoshi, 5,598,256, Cl. 399-316.000.

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Yokota, Masayuki; Nakazawa, Toshiyuki; Ogawa, Osamu; Tanaka, Nobuyoshi; and Tabata, Hisaya, 5,598,533, Cl. 395-200.080.

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Tanaka, Toshizumi, to Fuji Photo Optical Co., Ltd. Catheter type ultrasound probe. 5,596,991, Cl. 128-662.060.

Tanaka, Yoshiaki; Hayashi, Hiroshi; Fuchigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, to Victor Company of Japan, Ltd. Sound image localization control apparatus. 5,598,478, Cl. 381-17.000.

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Tang, John T., to Foster Wheeler Energy Corporation. Apparatus for cleaning and cooling synthesized gas. 5,597,541, Cl. 423-244.010.

Tangney, Thomas J.: *See*—
Hanneman, Larry F.; Krukonis, Val; Tangney, Thomas J.; and Watkins, James J., 5,597,648, Cl. 428-40.700.

Tangum, Richard R.: *See*—
Blaney, Geoffrey W.; and Tangum, Richard R., 5,596,853, Cl. 52-223.700.

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Tanikoshi, Koichiro; Tani, Masayuki; Yamashi, Kimiya; Uchigasaki, Harumi; Futakawa, Masayasu; Horita, Masao; Kuzunuki, Shoehiro; Nishikawa, Atsuhiko; and Maruyama, Takekazu, 5,598,572, Cl. 395-800.000.

Taniguchi, Hiroyasu; Furusawa, Haruki; Hatakenaka, Jun; and Seki, Akinobu, to Mitsubishi Denki Kabushiki Kaisha. Device for detecting the existence of moving bodies in an image. 5,598,338, Cl. 364-436.000.

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Tanner, John C., II: *See*—
Smith, Gary N.; and Tanner, John C., II, 5,597,530, Cl. 422-28.000.

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Bernhard, Dennis P.; Rowles, Howard C.; Tarakad, Ramanathan R.; and Bassett, John D., 5,596,883, Cl. 62-618.000.

Tardy, Marie-Claude: *See*—
Brun, André; Tardy, Marie-Claude; Vaganay, Alain; and Vandeputte, Joris, 5,597,721, Cl. 435-235.100.

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Umemura, Satoshi; Kawamura, Hisato; Mizuno, Toshiyuki; Alberda, Michelle; Ikeda, Hayato; Tarutani, Tomoji; Nakagaki, Keishi; Ueda, Yasunori; Mori, Hideo; Kimura, Kazuya; Kaneshige, Yuji; and Sato, Hirofumi, 5,596,920, Cl. 92-71.000.

Tashiro, Kazuhiro: *See*—
Totani, Tsuginobu; Tashiro, Kazuhiro; Ishibashi, Shogo; and Sasaki, Kiyoshi, 5,597,588, Cl. 425-143.000.

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Kawanishi, Yuichi; Gojobori, Takashi; Tateno, Yoshio; Ikeo, Kazuho; and Kawai, Masahiro, 5,598,350, Cl. 364-496.000.

Tatsuki, Noboru, to NBC Corporation. Path setting control system in communication network. 5,598,403, Cl. 370-221.000.

Tatsumi, Eisaku: *See*—
Suzuki, Noriyuki; Shimada, Kazutoshi; Tatsumi, Eisaku; Sunakawa, Shinichi; and Nagasaki, Katsuhiko, 5,598,150, Cl. 340-825.070.

Taylor, Peter; and McEachern, Roderick J., to Atomic Energy of Canada Limited. Process to remove rare earths from spent nuclear fuel. 5,597,538, Cl. 423-3.000.

Taylor, Thomas N.; and Panos, Robert A., to Xerox Corporation. Printer ink regulation systems. 5,598,198, Cl. 347-85.000.

TDK Corporation: *See*—
Takahashi, Minoru; and Ono, Makoto, 5,598,502, Cl. 392-502.000.
Tsunoda, Eizo; Shimizu, Yutaka; Yoshiike, Naomi; Onozawa, Katsumi; Katai, Kazuo; and Watanabe, Eiichi, 5,597,615, Cl. 427-172.000.

Teague, Michael. Article dispensing apparatus and method. 5,597,133, Cl. 242-560.300.

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Poggio, Tomaso; Harris, John G.; and Ancona, Nicola, 5,598,488, Cl. 382-278.000.

Techstone i Kinna AB: *See*—
Lindeberg, Jan-Inge, 5,597,627, Cl. 428-15.000.

Tegeler, John J.; Rauckman, Barbara S.; Harner, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., to Hoechst-Roussel Pharmaceuticals Inc. 1-alkyl-, 1-alkenyl-, and 1-alkynylaryl-2-amino-1,3-propanediols and related compounds. 5,597,838, Cl. 514-357.000.

Tegeler, John J.: *See*—
Glasnkowski, Edward J.; Chiang, Yelin; Strupczewski, Joseph T.; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,597,842, Cl. 514-373.000.

Teich, Rador, to RMT Associates, Inc. Garage door opener with remote safety sensors. 5,596,840, Cl. 49-26.000.

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Schaedlich, Frank H.; and Schneeberger, Daniel R., 5,597,535, Cl. 422-88.000.

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Cooper, Andrew, 5,598,538, Cl. 395-281.000.

Teleflex Incorporated: *See*—
Hall, Michael, 5,596,908, Cl. 74-502.400.

Telefonaktiebolaget LM Ericsson: *See*—
Wallander, Sven O., 5,598,064, Cl. 315-3.500.

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Wigren, Karl T.; and Bergström, Rolf A., 5,598,506, Cl. 395-2.420.
Winberg, H. P. Erik; and Jonsson, S. Roland, 5,598,165, Cl. 342-137.000.

Teleha, Christopher A., to DuPont Merck Pharmaceutical Company, The. 1 substituted oxindoles and azaoxindoles. 5,597,916, Cl. 544-127.000.

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Dore, Christophe, 5,598,328, Cl. 363-141.000.

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Teadler, Robert K., 5,598,460, Cl. 379-59.000.

Tendler, Robert K., to Teadler Cellular, Inc. Emergency back-up system for enhancing reliability or rescue. 5,598,460, Cl. 379-59.000.

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Daugherty, David; and Rivett, Janet, 5,597,194, Cl. 296-39.200.

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Hibino, Katsutoshi; and Teragaki, Yasuko, 5,598,394, Cl. 369-112.000.

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Terao, Hiromu: *See*—
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Terashima, Junichi; and Maruyama, Jun, to Sega Enterprises, Ltd. Removable audio remote controller for a microphone. 5,598,162, Cl. 341-176.000.

Terrenzio, Gabriel M.; Diehl, P. Robert; and Oxford, Ronald C., to Acrowood Corporation. Machine for destructuring wood chips. 5,597,128, Cl. 241-231.000.

Teuch, Helmut: *See*—
Pohl, Siegmund; Lehrich, Friedhelm; Genz, Manfred; Bruchmann, Bernd; Teuch, Helmut; Minges, Roland; and Streu, Joachim, 5,597,942, Cl. 560-25.000.

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Karavakis, Konstantine; DiStefano, Thomas H.; and Fjelstad, Joseph, 5,597,470, Cl. 205-118.000.

Testone, Anthony Q., to Electrostatics, Inc. Sheet and web cleaner with face plate on suction hood. 5,596,783, Cl. 15-1.510.

Texaco, Inc.: *See*—
Marrelli, John D., 5,597,961, Cl. 73-861.040.
O'Young, Chi-Lin; Sawicki, Robert A.; Yin, Yuan-Gen; Xu, Wen-Qing; and Suib, Steven L., 5,597,944, Cl. 585-654.000.

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Fanguy, Roy C., 5,596,949, Cl. 119-458.000.

Texas Instruments Deutschland GmbH: *See*—
Kaiser, Ulrich, 5,597,534, Cl. 422-82.020.

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Childers, Jim; Reinecke, Peter; Takahashi, Yutaka; and Yamamoto, Seiichi, 5,598,545, Cl. 395-562.000.
Gove, Robert J.; Abe, Keiichiroh; Kamei, Sohichiroh; and Doherty, Donald B., 5,598,188, Cl. 345-185.000.
Hempel, Eugene O., Jr., 5,597,346, Cl. 451-287.000.
Hempel, Eugene O., 5,597,443, Cl. 156-636.100.
Krueger, Steven D., 5,598,540, Cl. 395-284.000.
Mignardi, Michael A.; Ng, Laurinda; Croff, Ronald S.; McKenna, Robert; and Dyer, Lawrence D., 5,597,767, Cl. 437-227.000.
Roy, Kaushik; and Nag, Sudip K., 5,598,343, Cl. 364-489.000.
Sampsell, Jeffrey B., 5,597,736, Cl. 437-2.000.
Smayling, Michael C.; and Anselm, Klaus A., 5,598,102, Cl. 324-537.000.
Soenen, Eric G.; Davis, Gregory B.; and Dycus, Angie, 5,598,475, Cl. 380-23.000.
Vickers, Kenneth G., 5,598,057, Cl. 313-495.000.

Textron Inc.: *See*—
Lyles, Thomas W.; and Allen, Daniel C., 5,597,181, Cl. 280-846.000.

Thames, Donald: *See*—
Hausch, Gail W.; and Thames, Donald, 5,597,655, Cl. 428-595.000.

Thayer, Billy E.; and Linn, Scott A., to Hewlett-Packard Company. Method and apparatus for a load adaptive pad driver. 5,598,119, Cl. 327-111.000.

Thayer, Bruce E.: *See*—
Gerbasi, Dennis G.; Thayer, Bruce E.; and Lange, Clark V., 5,597,419, Cl. 134-6.000.

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Welker, Mark W.; and Thayer, John S., 5,598,579, Cl. 395-842.000.

Theard, Leslie P.: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Y.; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,597,869, Cl. 525-192.000.

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Hanson, Jay L.; Nixon, James E.; Hoium, Stanley O.; and Freund, Peter W., 5,596,878, Cl. 62-160.000.

Thi, James C. H.: *See*—
Ammicht, Egbert; and Thi, James C. H., 5,598,468, Cl. 379-410.000.

Thibaut, Daniel; Breitenstein, Benjamin; and Kirchberger, Linda, to Ciba-Geigy Corporation. Low-dust granules of plastic additives. 5,597,857, Cl. 524-400.000.

Thierry, Dominique: *See*—
Guesdon, Jean-Luc; Thierry, Dominique; Ullmann, Agnès; Gicquel, Brigitte; and Brisson-Noel, Anne, 5,597,911, Cl. 536-24.320.

Thoen, Christiaan A.: *See*—
Fredj, Abdennaceur; Johnston, James P.; Labeque, Regine; and Thoen, Christiaan A., 5,597,795, Cl. 510-528.000.

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Tholen, Joseph: *See*—
Vogel, Gerald; and Tholen, Joseph, 5,597,487, Cl. 210-652.000.

Thomas, Christopher P.; Coatesworth, Timothy A.; DeGroot, Kenneth P.; Ehlers, Jeffery C.; McMackin, Mark E.; and Jones, Keith L., to Chrysler Corporation. Method of pulse width modulating an oxygen sensor. 5,596,975, Cl. 123-686.000.

Thomas, David E.; Boczar, Fred A.; and Goforthe, Ronald D., to R B & W Corporation. Wheel nut. 5,597,279, Cl. 411-432.000.

Thomas, Edward V.: *See*—
Haaland, David M.; Jones, Howland D. T.; and Thomas, Edward V., 5,596,992, Cl. 128-664.000.

Thomas, H. Neal: *See*—
Childers, Terri C.; Haney, Jack E.; Joe, Debra R.; Mikolaitis, William B.; Porter, Randal D.; and Thomas, H. Neal, 5,597,083, Cl. 215-220.000.

Thomas, James H. Automotive hail protection and shade canopy. 5,597,005, Cl. 135-87.000.

Thomas, John E.; Boche, Daniel K.; McCall, John E., Jr.; Balz, Eric R.; Gladfelter, Elizabeth J.; and Pedersen, Daniel E., to Ecolab Inc. Dilution system for filling spray bottles. 5,597,019, Cl. 141-18.000.

Thomas, Richard R.: *See*—
Anton, Douglas R.; Darmon, Michael J.; Graham, William F.; and Thomas, Richard R., 5,597,874, Cl. 525-331.200.

Thomas Smith, Jane E.: *See*—
Fishburn, Todd K.; and Thomas Smith, Jane E., 5,598,377, Cl. 367-31.000.

Thompson, Bennie: *See*—
Knodel, Bryan D.; Thompson, Bennie; and Nuchols, Richard P., 5,597,107, Cl. 227-175.200.

Thompson, Catherine C.: *See*—
Evans, Ronald M.; Weinberger, Cary A.; Hollenberg, Stanley M.; Giguere, Vincent; Arriza, Jeffrey; Thompson, Catherine C.; and Ong, Estelita S., 5,597,705, Cl. 435-69.100.

Thompson, David; Foster, Alistair J.; Sokell, Steve; Foot, John T.; and Hoskinson, Brian, to Cummins Engine Company Limited. Radiator mounting for integrated power module. 5,597,047, Cl. 180-68.400.

Thompson, James M. Golf putter. 5,597,364, Cl. 473-314.000.

Thompson, John R.: *See*—
Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kartz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.

Thomson-CSF: *See*—
Cornic, Pascal; and Crema, Patrice, 5,598,163, Cl. 342-70.000.
Jutard, Yann; and Sacre, Jean-Jacques, 5,598,262, Cl. 356-239.000.

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Chekroun, Claude, 5,598,172, Cl. 343-754.000.

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Thornhill, William J.: *See*—
Parish, George K.; and Thornhill, William J., 5,598,251, Cl. 399-30.000.

Thorp, Ed: *See*—
Karim, Zia; and Thorp, Ed, 5,598,139, Cl. 340-286.110.

Thureson, Gary R.: *See*—
Gladden, Ernest L.; Thureson, Gary R.; Zappalorti, Alvaro; Davis, Eric R.; and Lucca, Frank J., 5,597,973, Cl. 102-289.000.

Thurkauf, Andrew: *See*—
Shaw, Kenneth; Hutchison, Alan; Thurkauf, Andrew; and Tallman, John, 5,597,920, Cl. 544-250.000.

Thurmond, Charlie R., III: *See*—
Gilliland, Oscar; Vafaie, Foad; Hughes, Martin W.; Thurmond, Charlie R., III; and Tomes, Paul, 5,597,987, Cl. 187-285.000.

Thut, Bruno H. Dynamically balanced pump impeller. 5,597,289, Cl. 415-200.000.

Tietje, Karin R.: *See*—
Meyer, Michael D.; Altenbach, Robert J.; Basha, Fatima Z.; Carroll, William A.; Drizin, Irene; Elmore, Steven W.; Kerwin, James F., Jr.; Lebold, Suzanne A.; Lee, Edmund L.; Sippy, Kevin B.; Tietje, Karin R.; and Wendt, Michael D., 5,597,823, Cl. 514-250.000.

Tilley, Scott W.: *See*—
Leung, Yat F.; and Tilley, Scott W., 5,597,142, Cl. 244-164.000.

Time Warner Entertainment Co., L.P.: *See*—
Cookson, Christopher J.; Ostrover, Lewis S.; and Lieberfarb, Warren N., 5,598,276, Cl. 386-46.000.

Timmons, Robert D. Fluid sampling device. 5,597,966, Cl. 73-864.630.

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Dalie, Barbara; Miller, Kenneth; Murgolo, Nicholas; and Tindall, Stephen, 5,597,710, Cl. 435-69.600.

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Hummel, Rolf E.; Ludwig, Matthias H.; and Vala, Martin, 5,597,621, Cl. 427-554.000.

University of Iowa Research Foundation: *See*—
Jordan, Richard F.; and Diamond, Gary M., 5,597,935, Cl. 556-11.000.

University of New Mexico: *See*—
Jain, Ravinder K.; McInerney, John G.; Reddy, Kalidev'Apura P. J.; and Yan, Chi, 5,598,425, Cl. 372-18.000.

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Estrada, Alberto; Redmond, Mark J.; and Laarveld, Bernard, 5,597,807, Cl. 514-26.000.

Uno, Tomoaki; Ohya, Jun; and Mitsuda, Masahiro, to Matsushita Electric Industrial Co., Ltd. Optical fiber amplifier and optical fiber communication system. 5,598,294, Cl. 359-341.000.

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Ohya, Jun; Uno, Tomoaki; and Mitsuda, Masahiro, 5,598,491, Cl. 385-24.000.

UOP: *See*—
Wegerer, David A.; and Lomas, David A., 5,597,537, Cl. 422-144.000.

Updegrave, William C.: *See*—
Stein, Arthur; and Updegrave, William C., 5,597,150, Cl. 248-551.000.

Upjohn Company, The: *See*—
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Upper Deck Company, The: *See*—
Longwell, Michael V.; and Lee, Richard J., 5,596,918, Cl. 83-332.000.

Uraoka, Yukiharu: *See*—
Maeda, Toshinori; and Uraoka, Yukiharu, 5,598,100, Cl. 324-501.000.

Urban, Arthur L.: *See*—
Cox, Marvin L.; Beugelsdyk, Anthony P.; Deubner, Ted E.; Novak, Donald R.; and Urban, Arthur L., 5,596,909, Cl. 74-523.000.

Urbanec, Josef: *See*—
Michalský, Jiř˝, deceased; Hrbata, Jiř˝; Křepelka, Jiř˝; Mělka, Milan; Miko, Milan; Hrubý, Milan; Fereac, Milan; Skácelová, Eva; Kejhová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Koloničný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.

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Ragge, Andrea; Meyer, Heinrich; and Urrutia Desmaison, Gonzalo, 5,597,471, Cl. 205-159.000.

Usanov, Jury G.; Voronov, Jury A.; and Polivanov, Pavel P., to Usanov, Jury Gennadievich. Gas moisture sensor and method of producing same. 5,597,953, Cl. 73-335.020.

Usanov, Jury Gennadievich: *See*—
Usanov, Jury G.; Voronov, Jury A.; and Polivanov, Pavel P., 5,597,953, Cl. 73-335.020.

Ushakov, Arkady, to Vaks, Serge. Electromagnetic control ball valve. 5,597,013, Cl. 137-596.160.

Ushio, Hideki; and Higashii, Takayuki, to Sumitomo Chemical Co., Ltd. Production process of 2-(tetrazol-5-yl)-4-oxo-4H-benzopyran. 5,597,929, Cl. 548-253.000.

Ushio, Satoshi: *See*—
Takeno, Hiroshi; Hoshi, Ryoji; Ushio, Satoshi; and Takenaka, Takao, 5,598,452, Cl. 378-73.000.

Usmen, Rengin K.: *See*—
McCabe, Robert W.; Usmen, Rengin K.; and Gandhi, Harendra S., 5,597,772, Cl. 502-332.000.

Usui, Akira, to Yamaha Corporation. Integrated circuit device having internal fast clock source. 5,598,447, Cl. 375-376.000.

Usui, Toshihiro: *See*—
Igarashi, Shigeru; Usui, Toshihiro; Hiraoka, Junichiro; Hashimoto, Keiko; Uchiwa, Hideyo; Murakami, Umeji; Sugimoto, Kenichi; Minamino, Hiromi; and Horikoshi, Toshio, 5,597,386, Cl. 8-405.000.

Utah State University Foundation: *See*—
Aust, Steven D.; and Bumpus, John A., 5,597,730, Cl. 435-262.500.

Utsunomiya, Tadashi; Shimokawa, Yoshinori; and Toyoda, Minoru, to Bridgestone Corporation. Conductive roll. 5,597,652, Cl. 428-382.000.

Vafai, Manouchehr: *See*—
Dangelo, Carlos; Mintz, Doron; and Vafai, Manouchehr, 5,598,344, Cl. 364-489.000.

Vafaie, Foad: *See*—
Gilliland, Oscar; Vafaie, Foad; Hughes, Martin W.; Thurmond, Charlie R., III; and Tomes, Paul, 5,597,987, Cl. 187-285.000.

Vaganay, Alain: *See*—
Brun, André; Tardy, Marie-Claude; Vaganay, Alain; and Vandeputte, Joris, 5,597,721, Cl. 435-235.100.

Vail, Philip B.: *See*—
Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,598,455, Cl. 379-27.000.

Vairavan, Vairavan: *See*—
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavan; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.

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Vala, Martin: *See*—
Hummel, Rolf E.; Ludwig, Matthias H.; and Vala, Martin, 5,597,621, Cl. 427-554.000.

Valeace Technology, Inc.: *See*—
Isaacson, Mark J.; and Golovin, Milton N., 5,597,662, Cl. 429-192.000.

Valentin, Friedrich H. H.: *See*—
Fakley, Martin E.; and Valentin, Friedrich H. H., 5,597,539, Cl. 423-210.000.

Valeo Thermique Moteur: *See*—
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Valet, Andreas: *See*—
Birbaum, Jean-Luc; Rytz, Gerhard; Van Toan, Vien; Valet, Andreas; and Würms, Norbert, 5,597,854, Cl. 524-100.000.

Valle, Mario: *See*—
Pandolfi, Renato; and Valle, Mario, 5,597,098, Cl. 223-39.000.

Vallet Mas, José A.: *See*—
Bergamini, Michael V. W.; Vallet Mas, José A.; Cabello, Genuma T.; and Cabrera, Antonio L., 5,597,560, Cl. 424-78.040.

Valmet Corporation: *See*—
Vestola, Juhani; and Harinen, Pekka, 5,597,449, Cl. 162-199.000.

Valmet Power Transmission Inc.: *See*—
Panttila, Väinö, 5,596,911, Cl. 74-665.0GA.

Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Birch, Brian J.; and Morris, Nicholas A., 5,597,463, Cl. 204-405.000.

Van Aken, Luc: *See*—
Bogaerts, Constant; Van Echelpoel, Eric; Goossen, Henri; Van Goethem, Luc; and Van Aken, Luc, 5,597,259, Cl. 403-263.000.

Van Blaircum, Bennie A.: *See*—
Harwood, Jon W.; and Van Blaircum, Bennie A., 5,597,986, Cl. 181-282.000.

Vandali, Andrew E.: *See*—
McDermott, Hugh J.; and Vandali, Andrew E., 5,597,380, Cl. 607-57.000.

Van De Graff, Fabian M.: *See*—
Brenes, Arthur J.; and Van De Graff, Fabian M., 5,597,184, Cl. 285-24.000.

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Brun, André; Tardy, Marie-Claude; Vaganay, Alain; and Vandeputte, Joris, 5,597,721, Cl. 435-235.100.

van der Lely, Cornelis. Construction for automatically milking animals. 5,596,945, Cl. 119-14.030.

Vanderleyden, Jozef: *See*—
Broeckaert, Willem F.; Cammue, Bruno P. A.; Rees, Sarah B.; and Vanderleyden, Jozef, 5,597,801, Cl. 514-12.000.

Vandersteene, Eric, to American Biltrite, Inc. Fitting piece for attaching and locking a freely-rotating replacement roller. 5,597,135, Cl. 242-599.400.

Van Der Tuijn, Roland M. M. H., to VLSI Technology, Inc. Clock extraction of a clock signal using rising and falling edges of a received transmission signal. 5,598,446, Cl. 375-373.000.

Van Dessel, Bart J.: *See*—
De Cock, Etienne M.; De Schamphelaere, Lucien A.; and Van Dessel, Bart J., 5,598,255, Cl. 355-234.000.

VanDorin, Stacie L.: *See*—
Smalley, Dennis R.; Vorgitch, Thomas J.; Manners, Chris R.; Hull, Charles W.; and VanDorin, Stacie L., 5,597,520, Cl. 264-401.000.

Van Driel, Carel-Jan L.; and Sinha, Atul N., to U.S. Philips Corporation. Multiple access telecommunication network. 5,598,287, Cl. 359-125.000.

Van Dyke, Don A.: *See*—
Beard, Douglas R.; Phelps, Andrew II.; Woodmansee, Michael A.; Blewett, Richard G.; Lohman, Jeffrey A.; Silbey, Alexander A.; Spix, George A.; Simmons, Frederick J.; and Van Dyke, Don A., 5,598,547, Cl. 395-563.000.

Van Echelpoel, Eric: *See*—
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Van Erden, Donald L.; Enriquez, Manuel C.; and Weltekamper, Hans, to Signode Corporation. Oriented plastic strap. 5,597,640, Cl. 428-192.000.

Van Goethem, Luc: *See*—
Bogaerts, Constant; Van Echelpoel, Eric; Goossen, Henri; Van Goethem, Luc; and Van Aken, Luc, 5,597,259, Cl. 403-263.000.

Vanguard International Semiconductor Corporation: *See*—
Koh, Chao-Ming; Lin, Yeh-Sen; and Chien, Rong-Wu, 5,597,764, Cl. 437-195.000.

Van Ham, Robert H.: *See*—
Scholz, William F.; and Van Ham, Robert H., 5,597,654, Cl. 428-514.000.

Van Horn, Kevin: *See*—
Nickolls, John R.; Zapisek, John; Kim, Won S.; Kalb, Jeffrey C.; Blank, W. Thomas; Wegbreit, Eliot; and Van Horn, Kevin, 5,598,408, Cl. 370-351.000.

VanLanen, Daniel L.: *See*—
Bloomer, Glenn A.; and VanLanen, Daniel L., 5,597,634, Cl. 428-40.100.

Van Maren, David J.; and Simms, Mark, to Hewlett-Packard Company. Storing plural data records on tape in an entity with an index entry common to those records. 5,598,388, Cl. 369-47.000.

van Os, Ron; and Chazen, David, to Diablo Research Corporation. Amalgam system for electrodeless discharge lamp. 5,598,069, Cl. 315-248.000.

van Rijn, Ferdinand T. J.; Tan, Hong S.; and Warmerdam, Martinus J. M., to Gist-Brocades N.V. Fungicide composition to prevent the growth of mould on foodstuff and agricultural products. 5,597,598, Cl. 426-310.000.

Van Rompuy, Ludo; and Coppens, Paul, to AGFA-Gevaert. N.V. Method for making improved imaging elements suitable for use in silver salt diffusion transfer process. 5,597,676, Cl. 430-204.000.

Van Toan, Vien: *See*—
Birbaum, Jean-Luc; Rytz, Gerhard; Van Toan, Vien; Valet, Andreas; and Würms, Norbert, 5,597,854, Cl. 524-100.000.

Varma, Sanjeev K.: *See*—
Brissenden, James S.; Wilson, Robert J.; and Varma, Sanjeev K., 5,597,369, Cl. 475-89.000.

Vasas, Martin M., to Bridgeport Metal Goods Manufacturing Company, The. Wiper with vanes for use with viscous cosmetics. 5,597,254, Cl. 401-122.000.

Vass, Arpad A.: *See*—
Easterly, Clay E.; Vass, Arpad A.; and Tyndall, Richard L., 5,597,729, Cl. 435-262.500.

VDO Adolf Schindling AG: *See*—
Schröder, Haas-Joachim, 5,598,146, Cl. 340-602.000.

Veit, Werner; and Irvine, Robert-Grant, to Siemens Aktiengesellschaft. Operational amplifier with high common mode rejection. 5,598,128, Cl. 330-252.000.

Venjakob Maschinenbau GmbH & Co KG: *See*—
Potthoff, Bernhard, 5,597,414, Cl. 118-70.000.

Vera-Cabrera, Lucio: *See*—
Laszlo, Adalbert; Handzel, Vera; and Vera-Cabrera, Lucio, 5,597,735, Cl. 436-525.000.

VerMurlen, Mark E.: *See*—
Fisch, Richard S.; Larshus, David A.; Sands, John A.; and VerMurlen, Mark E., 5,598,272, Cl. 358-298.000.

Vestil Manufacturing Company: *See*—
Edgar, Roy S.; Dennis, Jerry T.; and Trine, Ralph D., 5,596,892, Cl. 70-164.000.

Vestola, Juhani; and Harinen, Pekka, to Valmet Corporation. Method and device for conditioning the coating of a paper machine roll. 5,597,449, Cl. 162-199.000.

Vetter, William W.: *See*—
Rittle, Jeffrey W.; Vetter, William W.; and Webb, James R., 5,598,495, Cl. 385-75.000.

Veveris, Michael: *See*—
Crossdale, Garry W.; and Veveris, Michael, 5,597,021, Cl. 141-346.000.

Vick, Ralph L., to Moog Inc. High-flow direct-drive rotary servovalve. 5,597,014, Cl. 137-625.230.

Vickers, Kenneth G., to Texas Instruments Incorporated. Reduction of the probability of interlevel oxide failures by minimization of lead overlap area through bus width reduction. 5,598,057, Cl. 313-495.000.

Victor Company of Japan, Ltd.: *See*—
Suzuki, Yoshitaka; Tajima, Osamu; Ota, Morihiko; Yonemitsu, Satoshi; and Takahashi, Masaki, 5,597,251, Cl. 400-645.400.
Tanaka, Yoshiaki; Hayashi, Hiroshi; Fuchigami, Norihiko; Nakayama, Masahiro; Suzuki, Takuma; and Matsumoto, Mitsuo, 5,598,478, Cl. 381-17.000.

Victor Hasselblad AB: *See*—
Johansson, Tomas, 5,598,244, Cl. 396-495.000.

Videoconferencing Systems, Inc.: *See*—
Cortjens, Leo M.; Mays, Richard C.; and Smith, Curtis M., 5,598,209, Cl. 348-211.000.

Vieweg, Ulrich: *See*—
Grytz, Uwe; and Vieweg, Ulrich, 5,597,166, Cl. 277-12.000.

Vilbert, Bernard, to Solignac Industries S.A. Device with peristaltic pump which makes it possible to draw, weight and mix liquids automatically. 5,597,094, Cl. 222-214.000.

Vilmax S.A.: *See*—
Mazza, Jorge A.; and Outumuro, Pablo, 5,597,485, Cl. 210-635.000.

Vinarsky, Michael A. Sports bottle. 5,597,087, Cl. 220-482.000.

Vincent, Kent; Mueller, Gerd O.; and Mueller-Mach, Regina B. Electroluminescent device as a source for a scanner. 5,598,067, Cl. 315-169.300.

Vipond, Edward W.; and Shaffer, Robert W., II, to Tuthill Corporation. Multi-component fan assembly. 5,597,290, Cl. 416-204.00R.

Viskase Corporation: *See*—
Nicholson, Myron D.; Kajiwara, Edward M.; Ducharme, Paul E., Jr.; McAllister, Merlan E.; and Walta, Joseph R., 5,597,587, Cl. 425-71.000.

Vivet, Alain: *See*—
Berson, Xavier; Vivet, Alain; and Bertrand, Eric, 5,597,504, Cl. 219-693.000.

Vlasak, Gary P.: *See*—
Carey, Charles F.; Fallon, Kenneth M.; Markovich, Voya R.; Powell, Douglas O.; Vlasak, Gary P.; and Zarr, Richard S., 5,597,469, Cl. 205-118.000.

Vlasuk, George P.: *See*—
Webb, Thomas R.; Miller, Todd A.; Vlasuk, George P.; and Abelman, Matthew M., 5,597,804, Cl. 514-18.000.

VLSI Packaging Corporation: *See*—
Wakefield, Gene F., 5,598,034, Cl. 257-706.000.

VLSI Technology, Inc.: *See*—
Groover, Richard L.; Shu, William K.; Lee, Sang S.; and Fujimoto, George, 5,598,031, Cl. 257-668.000.
Nowak, Edward D.; Bothra, Subhas; Eatock, David; and Erck, Wesley, 5,597,668, Cl. 430-5.000.
Van Der Tuijn, Roland M. M. H., 5,598,446, Cl. 375-373.000.
Yurash, Stephen A., 5,598,120, Cl. 327-202.000.

Vo, Thao: *See*—
Ling, Zhi-Min; Vo, Thao; Ho, Siu-May; Shiau, Ying; Peng, Yeng-Kaung; and Lin, Yung-Tao, 5,598,341, Cl. 364-468.170.

Voelklein, Friedemann: *See*—
Schieferdecker, Joerg; and Voelklein, Friedemann, 5,597,957, Cl. 73-755.000.

Vogel, Gerald; and Tholen, Joseph, to J. Vogel Premium Water Co. Water purification and dispensing system. 5,597,487, Cl. 210-652.000.

Voith Sulzer Paper Technology North America, Inc.: *See*—
Graf, Edwin X., 5,597,415, Cl. 118-123.000.

Volk, Heinrich, to Esselte Meto International GmbH. Portable hand-held labelling and marking device and printing mechanism housing therefor. 5,597,441, Cl. 156-579.000.

Voltz, John: *See*—
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Von Arx, Theodore T.; Judd, Robert A.; and Schneidewind, Russell A., to Watlow Winona, Inc. Power control system. 5,598,322, Cl. 361-704.000.

Von Schalscha, Craig C. Excavation bucket grading attachment. 5,596,825, Cl. 37-407.000.

von Weissenfluh, Beat A.: *See*—
Baffelli, Gianni; and von Weissenfluh, Beat A., 5,597,553, Cl. 424-49.000.

Voreck, Wallace E., Jr.; Brooks, James E.; Eberhardt, John R.; and Rezaie, Hooshang A., to Schlumberger Technology Corporation. Shaped charge for a perforating gun having a main body of explosive including TATB and a sensitive primer. 5,597,974, Cl. 102-307.000.

Vorgitch, Thomas J.: *See*—
Smalley, Dennis R.; Vorgitch, Thomas J.; Manners, Chris R.; Hull, Charles W.; and VanDorin, Stacie L., 5,597,520, Cl. 264-401.000.

Voronov, Jury A.: *See*—
Usanov, Jury G.; Voronov, Jury A.; and Polivanov, Pavel P., 5,597,953, Cl. 73-335.020.

Voshell, Tom: *See*—
Hush, Glen; Baker, Jake; and Voshell, Tom, 5,598,156, Cl. 341-100.000.

Voss, Hartwig: *See*—
Bauer, Gerhard; Baumstark, Roland; Bott, Kaspar; and Voss, Hartwig, 5,597,466, Cl. 204-529.000.

Vouillon, Patrick: *See*—
Debrus, Marie-Hélène; Gaultier, Philippe; and Vouillon, Patrick, 5,598,527, Cl. 345-173.000.

Vranicar, Anthony: *See*—

Bliven, David C.; Vranicar, Anthony; Vail, Philip B.; Shimirak, Gerald L.; and Mullaney, Julian S., 5,598,455, Cl. 379-27.000.
VSL International AG: *See—*
Crigler, John R., 5,596,854, Cl. 52-223.130.
VUFB a.s: *See—*
Michalský, Jiří, deceased; Hrbata, Jiří; Křepelka, Jiří; Měška, Milan; Miko, Milan; Hrubý, Milan; Ferenc, Milan; Skácelová, Eva; Kejbová, Irena; Reichlová, Růžena; Kargerová, Anna; Šedivá, Jitka; Koloničný, Alois; and Urbanec, Josef, 5,597,831, Cl. 514-284.000.
Vuyk, Stephen P.: *See—*
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W. A. Deutsher Pty. Ltd.: *See—*
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W. L. Gore & Associates, Inc.: *See—*
Hansell, George A., III; and Voltz, John, 5,597,317, Cl. 429-289.000.
Zingle, Ralph D.; and George, Nelson A., 5,596,814, Cl. 34-296.000.
W. Schlafhorst AG & Co.: *See—*
Oehrl, Wilhelm, 5,597,129, Cl. 242-18.0DD.
Wachendorff-Neumann, Ulrike: *See—*
Maurer, Fritz; Erdelen, Christoph; Wachendorff-Neumann, Ulrike; Hartwig, Jürgen; Turberg, Andreas; and Mencke, Norbert, 5,597,812, Cl. 514-118.000.
Wachter, Hannes, to Hilti Aktiengesellschaft. Explosive powder charge operated setting tool with a magazine for fastening elements. 5,597,972, Cl. 89-1.140.
Wacker-Chemie GmbH: *See—*
Schiller, August; Dorsch, Norman; Graf, Werner; and Strasser, Alois, 5,597,882, Cl. 528-18.000.
Wada, Hisaya: *See—*
Matsumoto, Taro; Wada, Hisaya; Migita, Yoshihiro; Hatayama, Katsuo; and Sekiguchi, Yoshinori, 5,597,921, Cl. 544-343.000.
Wada, Masashi: *See—*
Takahashi, Masahito; Odagiri, Michiko; Furuno, Takeshi; Furusawa, Kazunori; and Wada, Masashi, 5,598,368, Cl. 365-185.010.
Wada, Shoji; Kenmizaki, Kanehide; Muranaka, Masaya; Ogata, Masahiro; Aoyagi, Hidetomo; Kitame, Tetsuya; Katayama, Masahiro; Kubono, Shoji; Suzuki, Yukihide; Morino, Makoto; Miyatake, Sinichi; Sbundo, Seiichi; Koyama, Yoshihisa; and Ohno, Nobuhiko, to Hitachi, Ltd.; and Hitachi ULSI Engineering Corp. Semiconductor memory system. 5,598,373, Cl. 365-230.030.
Wada, Tetsu: *See—*
Tsunoda, Masaki; and Wada, Tetsu, 5,596,962, Cl. 123-184.390.
Wada, Yoshisada; Iwase, Takahiro; Hayashi, Kunio; Tsuda, Kazuhiko; Shioya, Shigemi; and Hayashida, Yasushi, to Toyota Jidosha Kabushiki Kaisha. Steering gear apparatus of rack-and-pinion type. 5,596,904, Cl. 74-422.000.
Wadaki, Takeru: *See—*
Aoshima, Masashi; Shigematsu, Hironobu; Wadaki, Takeru; Kanehara, Toshikatsu; Watanabe, Kazuya; and Tanaka, Toshiyuki, 5,597,860, Cl. 524-505.000.
Waers, John F.: *See—*
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Wagensonnner, Bernhard: *See—*
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Wagner, Douglas R., to Hewlett-Packard Company. Method and apparatus for symbol clock phase recovery. 5,598,439, Cl. 375-326.000.
Wagner, Eugene C., to Dental Concepts Inc. Oral hygiene system. 5,597,554, Cl. 424-53.000.
Wagner, Michael E.: *See—*
Pascucci, Gregory A.; Rasmussen, David E.; Decious, Gaylon M.; Garbe, James R.; Hyzer, Susan M.; Woest, Karen L.; Vairavan, Vairavaa; Koch, David L.; Gottschalk, Donald A., Jr.; Burkhardt, Dennis E.; Standish, Darrell E.; Madaus, Paul W.; Spacek, Dan J.; Nesler, Clay G.; Stark, James K.; Mageland, Otto M.; Singers, Robert R.; and Wagner, Michael E., 5,598,566, Cl. 395-750.000.
Waiser, Shimon. Trigger device for crossbows, with automatically activated safety means. 5,596,976, Cl. 124-25.000.
Wakabayashi, Hiroshi: *See—*
Omi, Junichi; Wakabayashi, Hiroshi; Miyamoto, Hidenori; Soshi, Isao; Kato, Minoru; Amamuma, Tatsuo; and Imura, Yoshio, 5,598,242, Cl. 396-55.000.
Wakabayashi, Kenichi, to Sharp Kabushiki Kaisha. Cash register capable of temporary-closing operation. 5,598,332, Cl. 395-224.000.
Wakahara, Shirou: *See—*
Yanasa, Hideo; Shimazu, Fumio; Inui, Koichi; Wakahara, Shirou; Yui, Yuuhi; Kido, Eiichi; and Yoshimoto, Hiromu, 5,598,252, Cl. 399-46.000.
Wakefield, Gene F., to VLSI Packaging Corporation. Plastic packaging of microelectronic circuit devices. 5,598,034, Cl. 257-706.000.
Wakemoto, Hirofumi: *See—*
Takimoto, Akio; Wakemoto, Hirofumi; Tanaka, Eiichiro; Watanabe, Masanori; Asayama, Junko; Ogawa, Hisahito; Sato, Shigehiro; and Yokotani, Fumiko, 5,597,889, Cl. 528-353.000.
Walbrecht, Wolfram, to Groe & Hartmann GmbH & Co. KG. Solder contact. 5,597,332, Cl. 439-850.000.
Waldrop, Anthony R.: *See—*
McLarty, George C., III; Waldrop, Anthony R.; and Loadholdt, Paul S., 5,596,888, Cl. 66-195.000.
Walker, Jan J., to Cooper Industries, Inc. Current interchange for vacuum capacitor switch. 5,597,992, Cl. 218-121.000..
Walker, Michael L.: *See—*
Lake, Ronald W.; and Walker, Michael L., 5,596,808, Cl. 30-161.000.
Walker, Michael R.; and Miller, Timothy R., to Zimmer, Inc. Color coding for implant selection. 5,597,384, Cl. 623-66.000.
Walker, Nigel: *See—*
Bratz, Matthias; Kober, Reiner; Seele, Rainer; Saupe, Thomas; Meyer, Norbert; Walker, Nigel; Landes, Andreas; and Walter, Helmut, 5,597,776, Cl. 504-105.000.
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Yang, Tai-Her. D.C. breaker arc extinguishing circuit. 5,598,311, Cl. 361-9.000.
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Nakao, Tohru; Tanaka, Hiroshi; Morimoto, Yasuto; and Takehara, Shuzo, 5,597,918, Cl. 544-234.000.
Yoshitomi, Yasunari; and Senuma, Takehide, to Nippon Steel Corporation. Process for producing grain oriented electrical steel sheet having excellent magnetic properties. 5,597,424, Cl. 148-111.000.
Yoshizaki, Masuhiro; Komoriya, Isao; and Kitajima, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha. Intake air amount-estimating apparatus for internal combustion engines. 5,597,951, Cl. 73-118.200.
You, Jinho, to Hyundai Motor Company. System and method for controlling a shift position when a vehicle travels along a steeply sloped road or a sharply curved road. 5,598,335, Cl. 364-424.094.
You, Ruey B.: *See—*
Hsu, Chao-Chin; and You, Ruey B., 5,596,771, Cl. 2-428.000.
Young, James M.: *See—*
Mix, Jerome M.; Hu, Charles C.; and Young, James M., 5,598,042, Cl. 307-116.000.
Young, Joel H.: *See—*
Keil, Mark; Young, Joel H.; and Copeland, Kyle, 5,597,495, Cl. 216-66.000.
Young, Michael J. R. Apparatus for making an aperture in a tile. 5,597,345, Cl. 451-165.000.
Young, Rosa: *See—*
Fritzsche, Helmut; Ovshinsky, Stanford R.; and Young, Rosa, 5,597,411, Cl. 117-104.000.
Young, Roy E.; and Adelberg, Jeffrey W., to Clemson University. Plant propagation system. 5,597,731, Cl. 435-284.100.
Young, Wendy: *See—*
Danishefsky, Samuel J.; Masters, John; Young, Wendy; Link, J. Thomas; Isaacs, Richard; and Snyder, Lawrence B., 5,597,931, Cl. 549-214.000.
Youngberg, Lon T.: *See—*
Rice, Patrick W.; Youngberg, Lon T.; and Kearns, Kerry D., 5,597,959, Cl. 73-850.000.
Yu, Kelvin W.; and Schnitzel, Susan, to Dataproducts Corporation. Hot melt ink for transparency applications. 5,597,856, Cl. 524-227.000.
Yuasa, Hiroaki: *See—*
Okamura, Yukihiko; Yuasa, Hiroaki; and Mukai, Tadayoshi, 5,598,081, Cl. 318-801.000.
Yuhi, Toshiya: *See—*
Ohtake, Takahiro; Kato, Masahiko; and Yuhi, Toshiya, 5,598,045, Cl. 310-40.0MM.
Yui, Yuuhi: *See—*
Yamasa, Hideo; Shimazu, Fumio; Inui, Koichi; Wakahara, Shirou; Yui, Yuuhi; Kido, Eiichi; and Yoshimoto, Hiromu, 5,598,252, Cl. 399-46.000.
Yukawa, Hideaki: *See—*
Kohama, Keiko; Hatakeyama, Kazuhisa; Kurosu, Yasuroo; and Yukawa, Hideaki, 5,597,727, Cl. 435-252.320.
Yurash, Stephen A., to VLSI Technology, Inc. Dual latch clocked LSSD and method. 5,598,120, Cl. 327-202.000.
Zaba, Jerzy M., to Domino Printing Sciences PLC. Continuous ink jet printer. 5,598,197, Cl. 347-75.000.
Zamanzadeh, Mehrooz: *See—*
Carey, Jay F., II; and Zamanzadeh, Mehrooz, 5,597,656, Cl. 428-647.000.
Zambrano, Raffaele, to Consorzio per la Ricerca Sulla Microelettronica Nel Mezzogiorno. Semiconductor device and method. 5,597,742, Cl. 437-31.000.
Zander, Rolf; and Mertzlufft. Friedrich. Apparatus for oxygenating a patient. 5,596,983, Cl. 128-204.180.
Zapisek, John: *See—*
Nickolls, John R.; Zapisek, John; Kim, Won S.; Kalb, Jeffrey C.; Blank, W. Thomas; Wegbreit, Eliot; and Van Horn, Kevin, 5,598,408, Cl. 370-351.000.
Zappalorti, Alvaro: *See—*
Gladden, Ernest L., Thureson, Gary R.; Zappalorti, Alvaro; Davis, Eric R.; and Lucca, Frank J., 5,597,973, Cl. 102-289.000.
Zaraisky, Evgeny: *See—*
Konstantinov, Alexander; Foux, Boris; Stepanov, Alexander; Zaraisky, Evgeny; Nazimova, Svetlana; Boltovskaya, Marina; and Staroselskaya, Nelli, 5,597,700, Cl. 435-7.920.
Zarr, Richard S.: *See—*
Carey, Charles F.; Fallon, Kenneth M.; Markovich, Voya R.; Powell, Douglas O.; Vlasak, Gary P.; and Zarr, Richard S., 5,597,469, Cl. 205-118.000.
Zeiringer, Hans, to Treibacher Industrie AG. Spherical nitride. 5,597,543, Cl. 423-380.000.
Zellweger Luwa AG: *See—*
Gloor, René, 5,596,901, Cl. 73-159.000.
Zen Research N.V.: *See—*
Alon, Amir; Shapira, Shlomo; and Katz, Itzhak, 5,598,393, Cl. 369-102.000.
Zenco (No. 4) Limited: *See—*
Greaves, John A.; Cloud, Norman P.; Stoecker, Martin A.; and Russotti, Raymond, 5,596,838, Cl. 47-58.000.
Zeneca Limited: *See—*
Broekaert, Willem F.; Cammue, Bruno P. A.; Rees, Sarah B.; and Vanderleyden, Jozef, 5,597,801, Cl. 514-12.000.
Zenith Electronics Corporation: *See—*
Citta, Richard W.; Sgrignoli, Gary J.; and Turner, Rudolf, 5,598,220, Cl. 348-471.000.
Zhang, Zhenfeng: *See—*
Peter, Siegfried; Czech, Bernd; Weidner, Eckard; and Zhang, Zhenfeng, 5,597,602, Cl. 426-478.000.
Zhao, Chen: *See—*
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,927, Cl. 548-204.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; and Zhao, Chen, 5,597,928, Cl. 548-204.000.
Zhao, Piyu: *See—*
Sherry, A. Dean; Zhao, Piyu; and Malloy, Craig R., 5,597,548, Cl. 424-9.300.
Zhou, Deming. Gradient generator. 5,597,480, Cl. 210-198.200.
Zhu, Jianzhong; and Wiederin, Daniel R., to Cetac Technologies Inc. System for interfacing capillary zone electrophoresis and inductively coupled plasma-mass spectrometer sample analysis systems, and method of use. 5,597,467, Cl. 204-603.000.
Zhu, Wei: *See—*
Jin, Sungho; Kochanski, Gregory P.; and Zhu, Wei, 5,598,056, Cl. 313-495.000.
Zijderhand, Frans, to U.S. Philips Corporation. Method and apparatus for differential location of a vehicle under control of an internal change of status. 5,598,167, Cl. 342-457.000.
Zimmer, Inc.: *See—*
Walker, Michael R.; and Miller, Timothy R., 5,597,384, Cl. 623-66.000.
Zimmer, Johannes. Process and apparatus for producing precisely-registered rotary screens. 5,596,926, Cl. 101-129.000.
Zimmerman, Scott M.; Beeson, Karl W.; and Ferm, Paul M., to AlliedSignal Inc. Backlight assembly for improved illumination employing tapered optical elements. 5,598,281, Cl. 349-5.000.
Zimmerman, Theodore S.; Foster, Paul A.; and Fulcher, Carol A., to Scripps Research Institute, The. Factor VIII binding domain of von Willebrand factor. 5,597,711, Cl. 435-69.600.
Zingle, Ralph D.; and George, Nelson A., to W. L. Gore & Associates, Inc. Vented vial stopper for processing freeze-dried products. 5,596,814, Cl. 34-296.000.
Zink, Deborah L.: *See—*
Clapp, Wendy H.; Harris, Guy H.; Bills, Gerald F.; Curotto, James E.; Dombrowski, Anne W.; Driekorn, Sarah J.; Kurtz, Myra B.; Meinz, Maria S.; Onishi, Janet C.; Polishook, Jon D.; Streicher, Stanley L.; Thompson, John R.; Williams, Marie; and Zink, Deborah L., 5,597,806, Cl. 514-25.000.
Zink, Murray R.: *See—*
Guido, Joseph; Seymour, Kenneth S.; and Zink, Murray R., 5,597,155, Cl. 271-119.000.
Zip Dee, Inc.: *See—*
Simonetti, Louis, 5,597,006, Cl. 135-88.100.

Zirpoli, Leo V.: *See*—
Chen, Hai; Evans, George W., Jr.; and Zirpoli, Leo V., 5,597,991, Cl. 200-50.020.
Zöller, Alfons; Matl, Karl; Götzelmann, Rainer; and Sauer, Günther, to Leybold Aktiengesellschaft. Process for the production of a reflection-reducing coating on lenses. 5,597,622, Cl. 427-563.000.
Zöller, Walter: *See*—
Bauer, Wolfgang; Baumgart, Dieter; and Zöller, Walter, 5,597,387, Cl. 8-437.000.
Zook, J. David: *See*—
Barany, Barbara G.; Reimer, Scott T.; Ulmer, Robert P.; and Zook, J. David, 5,598,014, Cl. 257-187.000.
Zscheile, John W., Jr.: *See*—
Wilson, Michael L.; Zscheile, John W., Jr.; Saggio, Richard J.; and Lundquist, Alan E., 5,598,154, Cl. 341-50.000.
Zschiesche, Ruth: *See*—
Luner, Heinz-Dieter; Brachmann, Bernd; Spang, Claudia; Minges, Roland; Scherzer, Dietrich; Lugmayr, Michael; and Zschiesche, Ruth, 5,597,885, Cl. 528-44.000.
Zygo Corporation: *See*—
de Groot, Peter, 5,598,265, Cl. 356-360.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28th DAY OF JANUARY, 1997.

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Alexander Machinery, Inc.: *See*—
Alexander, William J., III, Re. 35,433, Cl. 95-24.000.
Alexander, William J., III, to Alexander Machinery, Inc. Coalescer filter and method. Re. 35,433, Cl. 95-24.000.
Alzati, Angelo: *See*—
Gola, Alberto; Alzati, Angelo; and Novelli, Aldo, Re. 35,434, Cl. 327-77.000.
Gola, Alberto; Alzati, Angelo; and Novelli, Aldo, to SGS-Thomson Microelectronics S. r. l. Bipolar-MOS comparator circuit with saturation prevention. Re. 35,434, Cl. 327-77.000.
Hitachi, Ltd.: *See*—
Saito, Atsushi; Maeda, Takeshi; Sugiyama, Hisataka; and Takasugi, Wasao, Re. 35,435, Cl. 369-59.000.
LaBounty, Kenneth R.: *See*—
LaBounty, Roy E.; and LaBounty, Kenneth R., Re. 35,432, Cl. 30-134.000.
LaBounty Manufacturing Co.: *See*—
LaBounty, Roy E.; and LaBounty, Kenneth R., Re. 35,432, Cl. 30-134.000.
LaBounty, Roy E.; and LaBounty, Kenneth R., to LaBounty Manufacturing Co. Demolition tool for a hydraulic excavator. Re. 35,432, Cl. 30-134.000.
Maeda, Takeshi: *See*—
Saito, Atsushi; Maeda, Takeshi; Sugiyama, Hisataka; and Takasugi, Wasao, Re. 35,435, Cl. 369-59.000.
Novelli, Aldo: *See*—
Gola, Alberto; Alzati, Angelo; and Novelli, Aldo, Re. 35,434, Cl. 327-77.000.
Saito, Atsushi; Maeda, Takeshi; Sugiyama, Hisataka; and Takasugi, Wasao, to Hitachi, Ltd. Method and apparatus for information recording and reproduction of a pit-shape-forming optical recording type. Re. 35,435, Cl. 369-59.000.
SGS-Thomson Microelectronics S. r. l.: *See*—
Gola, Alberto; Alzati, Angelo; and Novelli, Aldo, Re. 35,434, Cl. 327-77.000.
Sugiyama, Hisataka: *See*—
Saito, Atsushi; Maeda, Takeshi; Sugiyama, Hisataka; and Takasugi, Wasao, Re. 35,435, Cl. 369-59.000.
Takasugi, Wasao: *See*—
Saito, Atsushi; Maeda, Takeshi; Sugiyama, Hisataka; and Takasugi, Wasao, Re. 35,435, Cl. 369-59.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Fischbach, Fernando: *See*—
Stillwagon, Ross I.; Fischbach, Fernando; and Linscott, Jon F., B1 5,054,615, Cl. 206-373.000.
Goding, David A.: *See*—
Wright, Francis C.; and Goding, David A., B1 5,173,195, Cl. 210-802.000.
Linscott, Jon F.: *See*—
Stillwagon, Ross I.; Fischbach, Fernando; and Linscott, Jon F., B1 5,054,615, Cl. 206-373.000.
Mercer International, Inc.: *See*—
Wright, Francis C.; and Goding, David A., B1 5,173,195, Cl. 210-802.000.
Mylavarapu, Sundar R.: *See*—
Thelen, John E.; and Mylavarapu, Sundar R., B1 5,350,442, Cl. 95-115.000.
Nee, Robert M., to Polyguard Products Incorporated. Protective wrapping material. B1 4,983,449, Cl. 428-252.000.
Pneumatic Products Corp.: *See*—
Thelen, John E.; and Mylavarapu, Sundar R., B1 5,350,442, Cl. 95-115.000.
Polyguard Products Incorporated: *See*—
Nee, Robert M., B1 4,983,449, Cl. 428-252.000.
Stillwagon, Ross I.; Fischbach, Fernando; and Linscott, Jon F. Hot work organizer. B1 5,054,615, Cl. 206-373.000.
Thelen, John E.; and Mylavarapu, Sundar R., to Pneumatic Products Corp. Gas handling system and adsorbent dryer regeneration apparatus. B1 5,350,442, Cl. 95-115.000.
White, James W. Uniform flying height slider assembly with improved dynamic air bearing characteristics. B1 4,870,519, Cl. 360-103.000.
Wright, Francis C.; and Goding, David A., to Mercer International, Inc. Phase separator module. B1 5,173,195, Cl. 210-802.000.

LIST OF DESIGN PATENTEES

Abel, Steven D. Golf club head. 377,675, Cl. D21-219.000.
Adamson, Brook L.: *See*—
Adamson, Stewart; and Adamson, Brook L., 377,658, Cl. D15-150.000.
Adamson, Stewart; and Adamson, Brook L. Drip catch stand for engines. 377,658, Cl. D15-150.000.
Alden, J. Michael: *See*—
Schlosser, Erich J.; Alden, J. Michael; and Stephen, Robert T., 377,682, Cl. D23-386.000.
Ali, Islah Z.: *See*—
Sacks, Michael; Ali, Islah Z.; and Clark, David F., 377,600, Cl. D8-373.000.
Amiel, Richard, to Arthur Eugster AG. Espresso machine. 377,576, Cl. D7-307.000.
Anderson, Joel E.: *See*—
Lowrey, Jack A., Jr.; and Anderson, Joel E., 377,575, Cl. D6-601.000.
Armstrong, Timothy O.: *See*—
Wanzer, Rick; and Armstrong, Timothy O., 377,672, Cl. D21-194.000.
Arthur Eugster AG: *See*—
Amiel, Richard, 377,576, Cl. D7-307.000.
Astra Aktiebolag: *See*—
Waldeck, Johan; and Marnfeldt, Nils G., 377,686, Cl. D24-110.000.
Ballanda Limited: *See*—
Wong, Lai L., 377,649, Cl. D14-171.000.
Ballay, Joseph M.: *See*—
Matisz, George T.; Matisz, Ernest; and Ballay, Joseph M., 377,653, Cl. D15-11.000.
Barthelemy, Matt; and Schiefer, Sonja, to Sunbeam Products, Inc. Toaster. 377,578, Cl. D7-330.000.
Battistic, Robert. Portable home alarm. 377,620, Cl. D10-106.000.
Beard, Harold W., Jr. Angled three coat plastering corner support. 377,598, Cl. D8-354.000.
Bergeron, Gregory B.: *See*—
Saddler, Damon R.; Bergeron, Gregory B.; and Mehler, Brian A., 377,665, Cl. D19-60.000.
Berry, George W., Jr. Vehicle license plate hanger. 377,637, Cl. D12-193.000.
Biasotti, Mark; and Nuttall, Michael J., to Lucent Technologies Inc. Remote controller. 377,651, Cl. D14-218.000.
Biram, James R.; and Brennan, Christine A. Card holder. 377,668, Cl. D20-41.000.
Birkholz, Douglas J., to Fiskars Inc. Tool handles. 377,588, Cl. D8-5.000.
Bolan, Michael L.: *See*—
Fekete, Nicholas M. G.; Gattenby, Elaine J.; and Bolan, Michael L., 377,647, Cl. D14-114.000.
Boucheron, Alain, to PCI Parfums et Cosmetiques International. Perfume bottle. 377,605, Cl. D9-535.000.
Brawne, Nicholas: *See*—

Nicklos, Carl F.; and Brawne, Nicholas, 377,644, Cl. D14-100.000.
Brennan, Christine A.: *See—*
Biram, James R.; and Brennan, Christine A., 377,668, Cl. D20-41.000.
Breville Pty Ltd.: *See—*
O'Brien, William J.; and McClean, Stephen J., 377,579, Cl. D7-359.000.
Brown, Alicia T. Shoulder pad for carrying skis. 377,564, Cl. D3-221.000.
Burke, Thomas C., Jr. Household tray with a removable base. 377,583, Cl. D7-554.000.
Butler, Richard A., to Northwest Machine and Fabrication Services, Inc. Motor vehicle dolly frame. 377,700, Cl. D34-28.000.
Cain, Charles C., to Thomasville Furniture Industries, Inc. Headboard. 377,568, Cl. D6-505.000.
Callaway Golf Company: *See—*
Schmidt, Glenn H.; and Helmstetter, Richard C., 377,674, Cl. D21-214.000.
Calmar Inc.: *See—*
Wadsworth, Ronald, 377,602, Cl. D9-448.000.
Carr, Robert B., Jr.: *See—*
Sibinga, Theodoor H. S.; Plante, Joseph R.; Lanciano, Andrew; Loible, James R.; Carr, Robert B., Jr.; Newby, David W.; and Knapp, Tracey E., 377,685, Cl. D24-108.000.
Cashin, Sally K.: *See—*
Cousins, Morison S.; Miller, D. Scott; and Cashin, Sally K., 377,577, Cl. D7-309.000.
Castrol Limited: *See—*
Salmon, David E.; Kelsey, Stephen F.; O'Brien, Gerard M.; and Crowther, Ian H., 377,604, Cl. D9-528.000.
Chen, Ieon C.; and Wilson, Michael S., to Inanova Electronics Corp. Tuning light for automotive engines. 377,622, Cl. D10-112.000.
Cheng, Su M. W. Eyeglass frame front. 377,659, Cl. D16-315.000.
Cherney, Robert, to Chernz, LLC. Bagel holder. 377,584, Cl. D7-601.000.
Chernz, LLC: *See—*
Cherney, Robert, 377,584, Cl. D7-601.000.
Clark, David F.: *See—*
Sacks, Michael; Ali, Isiah Z.; and Clark, David F., 377,600, Cl. D8-373.000.
Cohen, Seymour, to Telco Creations, Inc. Santa Claus figure and clock. 377,607, Cl. D10-6.000.
Cohen, Seymour, to Telco Creations, Inc. Sleeping girl on rocking chair figure. 377,631, Cl. D11-131.000.
Consolo, Giovanni B. Wrist watch. 377,613, Cl. D10-32.000.
Cousins, Morison S.; Miller, D. Scott; and Cashin, Sally K., to West Bend Company, The. Quick drip coffeemaker with thermal carafe. 377,577, Cl. D7-309.000.
Coyer, Theodore D., to Probity Manufacturing, Inc. Underdresser for use under beds. 377,569, Cl. D6-510.000.
Crowther, Ian H.: *See—*
Salmon, David E.; Kelsey, Stephen F.; O'Brien, Gerard M.; and Crowther, Ian H., 377,604, Cl. D9-528.000.
Dallas Semiconductor Corporation: *See—*
Fekete, Nicholas M. G.; Gattenby, Elaine J.; and Bolan, Michael L., 377,647, Cl. D14-114.000.
DCD Manufacturing, Inc.: *See—*
Means, W. Scott; and Means, Cary, 377,670, Cl. D21-37.000.
DeArkland, James R. Interchangeable advertising panel for the face plate of a coin telephone box. 377,667, Cl. D20-22.000.
DeLeo, Pasquale. Bicycle training bar. 377,634, Cl. D12-114.000.
Drake, Tom. Wind generator. 377,642, Cl. D13-115.000.
Dunshee, Peter W.: *See—*
Dunshee, Wayne K.; and Dunshee, Peter W., 377,688, Cl. D24-189.000.
Dunshee, Wayne K.; and Dunshee, Peter W., to Minnesota Mining and Manufacturing Company. Adhesive bandage backing. 377,688, Cl. D24-189.000.
Duracraft Corp.: *See—*
Wang, Jui-Shang; Jané, Rodney; Longan, John; Gresens, Stanley; Holderfield, Gregory; and Valentor, Steven, 377,683, Cl. D23-411.000.
Educational Insights, Inc.: *See—*
Saddler, Damon R.; Bergeron, Gregory B.; and Mehler, Brian A., 377,665, Cl. D19-60.000.
Emerson Electric Co.: *See—*
Jedlicka, Frederick B.; Terpstra, Daniel A.; and Schroeder, James D., 377,654, Cl. D15-133.000.
Endo, Takayoshi; and Hasegawa, Toshiaki, to Yazaki Corporation. Connector for electric supplier for electric car. 377,643, Cl. D13-146.000.
Environmental Procedures, Inc.: *See—*
Leone, Vincent D.; and Seyffert, Kenneth W., 377,656, Cl. D15-147.000.
Equaliser Tackle Limited: *See—*
McConnell, Lewis A., 377,563, Cl. D3-221.000.
Erxleben, Nyle: *See—*
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Faco S.A.: *See—*
Smal, Henri, 377,694, Cl. D28-18.000.
Fekete, Nicholas M. G.; Gattenby, Elaine J.; and Bolan, Michael L., to Dallas Semiconductor Corporation. Electronic token. 377,647, Cl. D14-114.000.
Fiskars Inc.: *See—*
Birkholz, Douglas J., 377,588, Cl. D8-5.000.
Fletcher-Terry Company, The: *See—*
Kozyrski, Vincent T., 377,601, Cl. D8-382.000.
Franklin Brass Manufacturing Company: *See—*
Sharpe, Norton, 377,570, Cl. D6-524.000.
Sharpe, Norton, 377,571, Cl. D6-578.000.
Franz Buttner AG: *See—*
Ziegler, Philipp, 377,663, Cl. D18-43.000.
Friedrich Grohe Aktiengesellschaft: *See—*
Gottwald, Adolf, 377,678, Cl. D23-238.000.
Gottwald, Adolf, 377,679, Cl. D23-238.000.
Fuji Photo Film Co., Ltd.: *See—*
Hirabayashi, Katsumi, 377,646, Cl. D14-107.000.
Gabriel, Richard, to Matrix Toys, Ltd. Rectangular brick for a toy construction set. 377,671, Cl. D21-108.000.
Gahagan, Beth A.: *See—*
Gerstner, Gary W.; Gresens, Stanley T.; and Gahagan, Beth A., 377,617, Cl. D10-92.000.
Gattenby, Elaine J.: *See—*
Fekete, Nicholas M. G.; Gattenby, Elaine J.; and Bolan, Michael L., 377,647, Cl. D14-114.000.
Gerstner, Gary W.; Gresens, Stanley T.; and Gahagan, Beth A. Scale housing. 377,617, Cl. D10-92.000.
Gottwald, Adolf, to Friedrich Grohe Aktiengesellschaft. Washing table faucet. 377,678, Cl. D23-238.000.
Gottwald, Adolf, to Friedrich Grohe Aktiengesellschaft. Faucet. 377,679, Cl. D23-238.000.
Gresens, Stanley: *See—*
Wang, Jui-Shang; Jané, Rodney; Longan, John; Gresens, Stanley; Holderfield, Gregory; and Valentor, Steven, 377,683, Cl. D23-411.000.
Gresens, Stanley T.: *See—*
Gerstner, Gary W.; Gresens, Stanley T.; and Gahagan, Beth A., 377,617, Cl. D10-92.000.
Guidi, Pierino, to Piero Guidi di Pierino Giuseppe Guidi & C. s.n.c. Pocket portion. 377,558, Cl. D2-857.000.
Haemonetics Corp.: *See—*
Sibinga, Theodoor H. S.; Plante, Joseph R.; Lanciano, Andrew; Loible, James R.; Carr, Robert B., Jr.; Newby, David W.; and Knapp, Tracey E., 377,685, Cl. D24-108.000.
Hamamoto, Koya; Tokizaki, Hiroshi; and Kuramochi, Izumi, to Yokohama Rubber Co. Ltd., The. Automobile tire. 377,636, Cl. D12-147.000.
Harrison, Susan, to Zooth, Inc. Handle for spoons. 377,587, Cl. D7-654.000.
Hart, Keith, to Majestic Plastics Ltd. Wall component. 377,689, Cl. D25-124.000.
Hasegawa, Toshiaki: *See—*
Endo, Takayoshi; and Hasegawa, Toshiaki, 377,643, Cl. D13-146.000.
Hattori, Takeo, to Max Co., Ltd. Portable electric driver. 377,591, Cl. D8-68.000.
Hattori, Takeo, to Max Co., Ltd. Pneumatic nailing machine. 377,592, Cl. D8-69.000.
Hayes, Thomas J.; Taber, Thomas T.; and Sagan, Michael J. A., to Packaging Corporation of America. Domed cover for a catering container. 377,580, Cl. D7-392.100.
Helmstetter, Richard C.: *See—*
Schmidt, Glenn H.; and Helmstetter, Richard C., 377,674, Cl. D21-214.000.
Henrickson, Gregg W. Rebounding hockey goal target. 377,673, Cl. D21-200.000.
Hikida, Miwako, to Seikosha Co., Ltd. Clock. 377,608, Cl. D10-10.000.
Hirabayashi, Katsumi, to Fuji Photo Film Co., Ltd. Photo image reader. 377,646, Cl. D14-107.000.
Hirata, Hiroharu: *See—*
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Hofman, James A., to SELFIX, Inc. Hook. 377,599, Cl. D8-372.000.
Holderfield, Gregory: *See—*
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Hollingsworth, Don A. Toolholder. 377,594, Cl. D8-71.000.
Hoover Company, The: *See—*
Stephens, Ronald J.; and Louis, Jeffrey S., 377,697, Cl. D32-31.000.
Hutchins, Steven. Motorcycle trailer. 377,633, Cl. D12-102.000.
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Jaspers-Fayer, Jan, to Minka Lighting, Inc. Ceiling fan. 377,681, Cl. D23-377.000.

Jedlicka, Frederick B.; Terpstra, Daniel A.; and Schroeder, James D., to Emerson Electric Co. Motorized table saw. 377,654, Cl. D15-133.000.
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Kheyfets, Linda, to Rally Accessories, Inc. License plate frame. 377,639, Cl. D12-193.000.
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Kida, Masaki; and Imaizumi, Motohide, to Shachihata Inc. Base for a stamper. 377,661, Cl. D18-18.000.
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Weterrings, Frans M., to Robbins Industries, Inc. Adjustable measuring container. 377,615, Cl. D10-46.300.
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Winandy, Carol M. Pendant. 377,630, Cl. D11-81.000.
Winters, John F., Sr., to J. W. Performance Transmissions, Inc. Transmission housing. 377,657, Cl. D15-149.000.
Wolfram, Jürgen. Pendant for keys. 377,562, Cl. D3-211.000.
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Yuen, Se K., to John Manufacturing Limited. Radio Lantern. 377,691, Cl. D26-38.000.
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LIST OF PLANT PATENTEES

Bennett, Cecilia L. D., deceased (by Susan M. O'Brien, administratrix): *See—*
O'Brien, Susan M.; Bennett, Cecilia L. D., deceased, 9,786, Cl. Plt.-7.100.

Grant, Elizabeth M.: *See—*
Grant, William R.; Grant, Elizabeth M.; and Grant, W. Cal, 9,788, Cl. Plt.-51.100.

Grant, W. Cal: *See—*
Grant, William R.; Grant, Elizabeth M.; and Grant, W. Cal, 9,788, Cl. Plt.-51.100.

Grant, William R.; Grant, Elizabeth M.; and Grant, W. Cal. Sweet Gum Tree named 'Grant's Seedless Za-4'. 9,788, Cl. Plt.-51.100.

Kramer, Kurt. Heather 'Melanie'. 9,789, Cl. Plt.-54.100.

Nor'East Miniature Roses, Inc.: *See—*
Saville, F. Harmon, 9,785, Cl. Plt.-7.100.

O'Brien, Susan M.; Bennett, Cecilia L. D., deceased (by Susan M. O'Brien, administratrix). Miniature rose plant named 'Quiet Time'. 9,786, Cl. Plt.-7.100.

O'Brien, Susan M., administratrix: *See—*
O'Brien, Susan M.; Bennett, Cecilia L. D., deceased, 9,786, Cl. Plt.-7.100.

Otani Enterprises: *See—*
Otani, Hideki, 9,787, Cl. Plt.-37.000.

Otani, Hideki, to Otani Enterprises. Cherry tree: 'Red Crystal'. 9,787, Cl. Plt.-37.000.

Saville, F. Harmon, to Nor'East Miniature Roses, Inc. Miniature rose plant named 'SAVacook'. 9,785, Cl. Plt.-7.100.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 28, 1997

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2
239 5,596,770
428 5,596,771
462 5,596,768

CLASS 4
361 5,596,772
420 5,596,774
508 5,596,773

CLASS 5
81.1 C 5,596,775
426 5,596,776
502 5,596,778
600 5,596,779
636 5,596,780
710 5,596,781
721 5,596,777

CLASS 8
405 5,597,386
437 5,597,387
444 5,597,388
490 5,597,389

CLASS 15
1.51 5,596,783
83 5,596,784
114 5,596,785
119.2 5,596,786
220.1 5,596,787
352 5,596,788

CLASS 16
228 5,596,789

CLASS 24
20 EE 5,596,790
130 5,596,791
336 5,596,792
394 5,596,793
452 5,596,794
633 5,596,795

CLASS 29
596 5,596,796
601 5,596,797
724 5,596,798
733 5,596,799
751 5,596,800
774 5,596,801
825 5,596,802
5,596,803
840 5,596,804
898.055 5,596,805

CLASS 30
120.3 5,596,807
134 Re.35,432
161 5,596,808
310 5,596,809
369 5,596,810
383 5,596,811

CLASS 33
508 5,596,812
816 5,596,813

CLASS 34
296 5,596,814
346 5,596,815
5,596,816
373 5,596,817
666 5,596,818

CLASS 36
35 R 5,596,819
115 5,596,820
136 5,596,821

CLASS 37
104 5,596,822
232 5,596,823
403 5,596,824
407 5,596,825
466 5,596,826

CLASS 40
406 5,596,827
524 5,596,828
721 5,596,829

CLASS 42
94 5,596,830

CLASS 43
42.36 5,596,831
44.83 5,596,832
122 5,596,833
124 5,596,834

CLASS 44
268 5,597,947
391 5,597,390

CLASS 47
1.01 5,596,836
57.5 5,596,837
58 5,596,838
79 5,596,839

CLASS 49
26 5,596,840
35 5,596,841
177 5,596,842

CLASS 52
71 5,596,843
79.5 5,596,844
98 5,596,845
125.2 5,596,846
198 5,596,847
200 5,596,848
202 5,596,849
204.62 5,596,850
211 5,596,851
212 5,596,852
223.13 5,596,854
223.7 5,596,853
309.11 5,596,855
334 5,596,856
421 5,596,857
460 5,596,858
733.3 5,596,859
763 5,596,860

CLASS 53
52 5,596,861
397 5,596,862
399 5,596,863
5,596,864
428 5,596,865
442 5,596,866
554 5,596,867

CLASS 55
274 5,597,385
5,597,392
356 5,597,393

CLASS 56
365 5,596,868

CLASS 59
82 5,596,869

CLASS 60
39.02 5,596,870
39.03 5,596,871
468 5,596,872
738 5,596,873

CLASS 62
1 5,596,874
6 5,596,875
55.5 5,596,876
59 5,596,877
160 5,596,878
296 5,596,879
372 5,596,880
503 5,596,881
5,596,882
618 5,596,883
633 5,596,884
646 5,596,885
5,596,886

CLASS 63
15.1 5,596,887

CLASS 65
25.2 5,597,394
33.4 5,597,395
169 5,597,396
171 5,597,397
413 5,597,398

CLASS 66
195 5,596,888

CLASS 68
12.02 5,596,889
15 5,596,890
133 5,596,891

CLASS 70
164 5,596,892
175 5,596,893
201 5,596,894

CLASS 71
9 5,597,399
28 5,597,400

CLASS 72
16.5 5,596,895
75 5,596,896
84 5,596,897
236 5,596,898
242.4 5,596,899
457 5,596,900

CLASS 73
49.2 5,597,948
54.01 5,597,949
60.11 5,597,950
118.2 5,597,951
159 5,596,901
170.14 5,597,952
335.02 5,597,953
503 5,597,954
504.16 5,597,955
514.18 5,597,956
755 5,597,957
843 5,597,958
850 5,597,959
861 5,597,960
861.04 5,597,961
861.21 5,597,964
861.29 5,597,962
861.65 5,597,963
862.49 5,597,965
864.63 5,597,966

CLASS 74
7 C 5,596,902
89 5,596,903
422 5,596,904
443 5,596,905
478 5,596,906
493 5,596,907
502.4 5,596,908
523 5,596,909
526 5,596,910
665 GA 5,596,911

CLASS 75
249 5,597,967
304 5,597,401

CLASS 76
107.1 5,596,912

CLASS 81
59.1 5,596,913

CLASS 82
70.2 5,596,914

CLASS 83
20 5,596,915
23 5,596,916
152 5,596,917
332 5,596,918
507 5,596,919

CLASS 84
470 R 5,597,968
473 5,597,969
604 5,597,970
669 5,597,971

CLASS 89
1.14 5,597,972

CLASS 92
71 5,596,920

CLASS 95
12 5,597,402
24 Re.35,433
115 B1 5,350,442

CLASS 96
23 5,597,403
99 5,597,645
134 5,597,404

CLASS 99
340 5,596,921
380 5,596,922

CLASS 100
53 5,596,923
930 RP 5,596,924

CLASS 101
127.1 5,596,925
129 5,596,926
363 5,596,927
378 5,596,928
410 5,596,929
483 5,596,930
484 5,596,931
485 5,596,932

CLASS 102
289 5,597,973
307 5,597,974
514 5,597,975

CLASS 105
96 5,596,937
458 5,596,936

CLASS 106
20 R 5,597,405
237 5,597,406
5,597,407
481 5,597,408
671 5,597,409

CLASS 108
51.1 5,596,933

CLASS 109
50 5,596,934

CLASS 110
235 5,596,935

CLASS 111
105 5,596,938

CLASS 112
130 5,596,939
225 5,596,940
239 5,596,941
260 5,596,942

CLASS 114
245 5,596,943

CLASS 116
28 R 5,596,944

CLASS 117
84 5,597,410
104 5,597,411

CLASS 118
50 5,597,412
60 5,597,413
70 5,597,414
123 5,597,415

CLASS 119
14.03 5,596,945
52.1 5,596,946
223 5,596,947
417 5,596,948
458 5,596,949
489 5,596,950
525 5,596,951

CLASS 122
13.1 5,596,952
17 5,596,953

CLASS 123
41.84 5,596,954
51 AA 5,596,955
90.11 5,596,956
90.23 5,596,958
90.33 5,596,959
90.44 5,596,960
179.18 5,596,957
184.38 5,596,961
184.39 5,596,962
236 5,596,963
306 5,596,964
308 5,596,965
337 5,596,966
450 5,596,967
480 5,596,968
494 5,596,969
497 5,596,970
516 5,596,971
520 5,596,972
557 5,596,973
620 5,596,974
686 5,596,975

CLASS 124
16 5,597,160
25 5,596,976
35.2 5,596,977
72 5,596,978

CLASS 126
91 A 5,596,979
519 5,596,980
704 5,596,981

CLASS 127
30 5,597,416

CLASS 128
200.14 5,596,982
204.18 5,596,983
205.24 5,596,984
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633 5,596,986
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660.1 5,596,989
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664 5,596,992
698 5,596,993
732 5,596,994
736 5,596,995
772 5,596,996
844 5,596,997

CLASS 132
275 5,596,998
279 5,597,000

CLASS 134
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6 5,597,418
5,597,419
38 5,597,420
104.2 5,597,001
149 5,597,002
184 5,597,003

CLASS 135
29 5,597,004
87 5,597,005
88.1 5,597,006
124 5,597,007

CLASS 136
205 5,597,976
253 5,597,421
259 5,597,422

CLASS 137
15 5,597,008
375 5,597,009
381 5,597,010
497 5,597,011
505.13 5,597,012
596.16 5,597,013
625.23 5,597,014
625.64 5,597,015

CLASS 138
46 5,597,016

CLASS 140
3 B 5,597,017
123.6 5,597,018

CLASS 141
18 5,597,019
95 5,597,020
346 5,597,021
390 5,597,022

CLASS 144
204.2 5,597,023
369 5,597,024

CLASS 148
98 5,597,423
111 5,597,424
302 5,597,425

CLASS 149
6 5,597,977
19.6 5,597,978

CLASS 152
200 5,597,426

CLASS 156
69 5,597,428
111 5,597,429
161 5,597,430
169 5,597,431
170 5,597,432
203 5,597,433
240 5,597,434
245 5,597,435
259 5,597,436
260 5,597,437
345 5,597,438
5,597,439
351 5,597,440
579 5,597,441
626.1 5,597,442
628 5,597,427
636.1 5,597,443
643.1 5,597,444

CLASS 160
38 5,597,025
115 5,597,026
168.1 5,597,027
354 5,597,028

CLASS 162
29 5,597,445
49 5,597,446
135 5,597,447
166 5,597,448
199 5,597,449
348 5,597,450

CLASS 164
200 5,597,029
263 5,597,030
270.1 5,597,031
457 5,597,032

CLASS 165
55 5,597,033
80.3 5,597,034
5,597,035
94 5,597,036
110 5,597,037
121 5,597,038
133 5,597,039

CLASS 166
51 5,597,040
55 5,597,041
250.01 5,597,042
280 5,597,043

CLASS 169
46 5,597,044

CLASS 174
35 R 5,597,979
72 A 5,597,980
110 R 5,597,981
261 5,597,982
264 5,597,983

CLASS 175
62 5,597,045
67 5,597,046

CLASS 177
210 C 5,597,984

CLASS 180
68.4 5,597,047
292 5,597,048
400 5,597,049

CLASS 181
227 5,597,985
282 5,597,986

CLASS 182
2 5,597,050

CLASS 184
6.1 5,597,051

CLASS 187
285 5,597,987
393 5,597,988

CLASS 188
65.5 5,597,052
256 5,597,053
299 5,597,054
371 5,597,055

CLASS 192
6 A 5,597,056
46 5,597,057
69.43 5,597,058
70.12 5,597,059
105 C 5,597,060

CLASS 194
348 5,597,061

CLASS 198
600 5,597,062
635 5,597,063

CLASS 200
6 R 5,597,989
16 C 5,597,990
50.02 5,597,991
269 5,597,064
292 5,597,066
344 5,597,067

CLASS 201
4 5,597,451
41 5,597,452

CLASS 203
24 5,597,453
49 5,597,454
57 5,597,455

CLASS 204
165 5,597,456
5,597,457
192.12 5,597,459
192.3 5,597,458
212 5,597,460
286 5,597,461
298.11 5,597,462
405 5,597,463
409 5,597,464
486 5,597,465
529 5,597,466
603 5,597,467
604 5,597,468

CLASS 205
118 5,597,469
5,597,470
159 5,597,471
780.5 5,597,473

CLASS 206
308.1 5,597,068
373 B1 5,054,615
419 5,597,070
434 5,597,071
534 5,597,072
564 5,597,073
725 5,597,074

CLASS 208
50 5,597,474
188 5,597,475
208 R 5,597,476

CLASS 209
10 5,597,075
29 5,597,076

CLASS 210
86 5,597,477
192 5,597,479
198.2 5,597,480
5,597,481
209 5,597,482
232 5,597,483
611 5,597,484
635 5,597,485
639 5,597,486
652 5,597,487
663 5,597,488
670 5,597,489
727 5,597,490
754 5,597,491
787 5,597,492
799 5,597,493
802 B1 5,173,195

CLASS 211
134 5,597,077

CLASS 212
231 5,597,078
273 5,597,079
278 5,597,080
299 5,597,081

CLASS 215
44 5,597,082
220 5,597,083

CLASS 216
6 5,597,494
66 5,597,495
94 5,597,496

CLASS 218
121 5,597,992
129 5,597,993

CLASS 219
121.48 5,597,497
124.34 5,597,498
243 5,597,499
385 5,597,500
494 5,597,501
528 5,597,502
552 5,597,503
693 5,597,504

CLASS 220
4.28 5,597,084
403 5,597,085
421 5,597,086
482 5,597,087
662 5,597,088
710 5,597,089

CLASS 222
1 5,597,090
3 5,597,091
45 5,597,092
113 5,597,093
214 5,597,094
402.12 5,597,095
498 5,597,096
529 5,597,097

CLASS 223
39 5,597,098
61 5,597,099
85 5,597,100

CLASS 224
155 5,597,101
197 5,597,102
324 5,597,103
411 5,597,104

CLASS 226
118 5,597,105

CLASS 227
8 5,597,106
175.2 5,597,107

CLASS 228
49.3 5,597,108
199 5,597,109
203 5,597,110

CLASS 229
3.5 R 5,597,111
116 5,597,112
120.36 5,597,113
122.1 5,597,114
229 5,597,115

CLASS 232
20 5,597,116

CLASS 235
375 5,597,994
5,597,995
379 5,597,996
455 5,597,997
487 5,597,998

CLASS 236
92 B 5,597,117

CLASS 239
92 5,597,118
241 5,597,119
307 5,597,120
408 5,597,121
589 5,597,122

CLASS 241
23 5,597,123
30 5,597,124
136 5,597,125
172 5,597,126
188.2 5,597,127
231 5,597,128

CLASS 242
18 DD 5,597,129
356 5,597,130
532.4 5,597,131
547 5,597,132
560.3 5,597,133
571.2 5,597,134
599.4 5,597,135

CLASS 244
3.16 5,597,136
12.4 5,597,137
17.13 5,597,138
118.6 5,597,139
134 R 5,597,140
164 5,597,141
5,597,142
5,597,143

CLASS 248
96 5,597,144
97 5,597,145
276.1 5,597,146
280.11 5,597,147
311.2 5,597,148
316.4 5,597,149
551 5,597,150

CLASS 249
63 5,597,505

CLASS 250
201.7 5,597,999
206 5,598,000
292 5,598,001
310 5,598,002
363.04 5,598,003
370.09 5,598,004
459.1 5,598,005
559.46 5,598,006
566 5,598,007
586 5,598,008

CLASS 252
175 5,597,510
301.4 R 5,597,511
315.6 5,597,512
358 5,597,513
390 5,597,514
520 5,597,515
625 5,597,516
700 5,597,517

CLASS 254
199 5,597,151

CLASS 257
48 5,598,009
5,598,010
57 5,598,011
59 5,598,012
67 5,598,013
187 5,598,014
197 5,598,015
229 5,598,016
232 5,598,017
342 5,598,018
397 5,598,019
401 5,598,020
408 5,598,021
458 5,598,022
462 5,598,023
607 5,598,025
634 5,598,026
635 5,598,027
644 5,598,028
665 5,598,029
666 5,598,030
668 5,598,031
679 5,598,032
686 5,598,033
706 5,598,034
723 5,598,035
738 5,598,036
773 5,598,037
787 5,598,038

CLASS 264
1.21 5,597,518
1.38 5,597,519
37 5,597,521
177.16 5,597,522
219 5,597,523
401 5,597,520
536 5,597,524
537 5,597,525

CLASS 266
80 5,597,526
5,597,527
100 5,597,528

CLASS 270
39.05 5,597,152

CLASS 271
4.1 5,597,153
10.05 5,597,154
119 5,597,155
225 5,597,156
5,597,157

CLASS 273
292 5,597,162
309 5,597,163
371 5,597,164
442 5,597,165

CLASS 277
12 5,597,166
53 5,597,167
152 5,597,168

CLASS 280
276 5,597,169
602 5,597,170
667 5,597,171
672 5,597,172
690 5,597,173
704 5,597,174
723 5,597,175
728.2 5,597,176
731 5,597,177
733 5,597,178
735 5,597,179
772 5,597,180
846 5,597,181

CLASS 283
67 5,597,182
83 5,597,183

CLASS 285
24 5,597,184
179 5,597,185
330 5,597,186

CLASS 292
137 5,597,187
183 5,597,188

CLASS 294
25 5,597,189
33 5,597,190
82.14 5,597,191
96 5,597,192

CLASS 296
37.6 5,597,193
39.2 5,597,194
61 5,597,195
98 5,597,196
136 5,597,197
194 5,597,198

CLASS 297
144 5,597,199
180.13 5,597,200
188.1 5,597,201
195.1 5,597,202
284.3 5,597,203
353 5,597,204
362.14 5,597,205
378.12 5,597,206
411.35 5,597,207
5,597,208
411.38 5,597,209
423.36 5,597,210

CLASS 298
17.6 5,597,211

CLASS 300
21 5,597,212

CLASS 301
37.43 5,597,213

CLASS 303
10 5,597,214
139 5,597,215

CLASS 307
38 5,598,039
5,598,040
43 5,598,041
116 5,598,042

CLASS 310
12 5,598,043
5,598,044
40 MM 5,598,045
49 R 5,598,046
67 R 5,598,047
90.5 5,598,048
214 5,598,049
322 5,598,050
334 5,598,051

CLASS 312
9.54 5,597,216
201 5,597,217
223.3 5,597,218
330.1 5,597,219
334.4 5,597,220
348.1 5,597,221

CLASS 313
310 5,598,052
364 5,598,053
422 5,598,054
440 5,598,055
495 5,598,056
5,598,057
503 5,598,058
509 5,598,059
532 5,598,060
5,598,061
542 5,598,062
623 5,598,063

CLASS 315
3.5 5,598,064
77 5,598,065
159 5,598,066
169.3 5,598,067
185 R 5,598,068
248 5,598,069

CLASS 318
127 5,598,070
254 5,598,071
376 5,598,072
431 5,598,073
439 5,598,074
568.22 5,598,077
571 5,598,075
696 5,598,078
780 5,598,079
794 5,598,080
801 5,598,081

CLASS 320
2 5,598,082
5,598,083
5,598,084
21 5,598,085
30 5,598,086
48 5,598,087
5,598,088
56 5,598,089

CLASS 322
3 5,598,090
62 5,598,091

CLASS 323
222 5,598,092
299 5,598,093
315 5,598,094
5,598,095

CLASS 324
158.1 5,598,096
316 5,598,097
430 5,598,098
456 5,598,099
501 5,598,100
537 5,598,101
5,598,102
662 5,598,103
754 5,598,104

CLASS 326
6 5,598,105
21 5,598,106
27 5,598,107
41 5,598,108
5,598,109
60 5,598,110
83 5,598,111
93 5,598,112
94 5,598,113
113 5,598,114
119 5,598,115

CLASS 327
31 5,598,116
77 Re.35,434
103 5,598,117
108 5,598,118
111 5,598,119
202 5,598,120
392 5,598,121
538 5,598,122
551 5,598,123
552 5,598,124

CLASS 329
304 5,598,125

CLASS 330
129 5,598,126
149 5,598,127
252 5,598,128
255 5,598,129

CLASS 332
119 5,598,130

CLASS 333
22 R 5,598,131
5,598,132
189 5,598,133

CLASS 336
83 5,598,134
200 5,598,135
5,598,136
223 5,598,137

CLASS 337
265 5,598,138

CLASS 340
286.11 5,598,139
426 5,598,140
5,598,141
438 5,598,142
539 5,598,143
568 5,598,144
576 5,598,145
602 5,598,146
630 5,598,147
825.06 5,598,149
825.07 5,598,150
825.21 5,598,148
825.32 5,598,151
850 5,598,152
870.37 5,598,153

CLASS 341
50 5,598,154
67 5,598,155
100 5,598,156
120 5,598,157
143 5,598,158
5,598,159
155 5,598,160
159 5,598,161
176 5,598,162

CLASS 342
70 5,598,163
5,598,164
137 5,598,165
357 5,598,166
457 5,598,167

CLASS 343
700 MS 5,598,168
701 5,598,169
704 5,598,170
721 5,598,171
754 5,598,172
781 R 5,598,173
795 5,598,174

CLASS 345
7 5,598,175
35 5,598,176
92 5,598,177
93 5,598,178
98 5,598,179
100 5,598,180
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133 5,598,182
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149 5,598,184
153 5,598,185
173 5,598,186
158 5,598,187
173 5,598,527
185 5,598,188

308 5,598,437

CLASS 347
9 5,598,189
13 5,598,190
30 5,598,191
43 5,598,192
45 5,598,193
50 5,598,194
55 5,598,195
68 5,598,196
75 5,598,197
85 5,598,198
88 5,598,199
5,598,200
104 5,598,201
256 5,598,203
251 5,598,204

CLASS 348
65 5,598,205
81 5,598,206
148 5,598,207
159 5,598,208
211 5,598,209
296 5,598,210
374 5,598,211
403 5,598,212
405 5,598,213
414 5,598,214
416 5,598,215
5,598,216
424 5,598,217
443 5,598,218
465 5,598,219
471 5,598,220
554 5,598,221
568 5,598,222
568.22 5,598,076
589 5,598,223
599 5,598,224
606 5,598,225
607 5,598,226
725 5,598,227
732 5,598,228
792 5,598,229

CLASS 349
5 5,598,281
15 5,598,282
33 5,598,284
39 5,598,285
57 5,598,280
58 5,598,286
143 5,598,283

CLASS 351
44 5,598,230
49 5,598,231
54 5,598,232
160 H 5,598,233
160 R 5,598,234
224 5,598,235

CLASS 353
33 5,597,222
97 5,597,223

CLASS 355
41 5,598,249
67 5,598,250
234 5,598,255

CLASS 356
28.5 5,598,259
72 5,598,260
121 5,598,261
239 5,598,262
342 5,598,263
352 5,598,264
360 5,598,265
367 5,598,266
369 5,598,267
375 5,598,268
399 5,598,269
400 5,598,270

CLASS 358
296 5,598,271
298 5,598,272
402 5,598,279

CLASS 359
125 5,598,287
173 5,598,288
5,598,289
180 5,598,290
198 5,598,291
216 5,598,292
275 5,598,293
341 5,598,294
398 5,598,295
462 5,598,297
485 5,598,298
557 5,598,299
566 5,598,300

CLASS 360
53 5,598,301
65 5,598,302
73.02 5,598,303
78.04 5,598,304
96.6 5,598,305
97.02 5,598,306
103 B1 4,870,519
104 5,598,307
113 5,598,308
126 5,598,309
130.32 5,598,310

CLASS 361
9 5,598,311
31 5,598,312
56 5,598,313
93 5,598,314
5,598,315
212 5,598,316
313 5,598,317
683 5,598,318
684 5,598,319
687 5,598,320
704 5,598,321
5,598,322
726 5,598,323

CLASS 362
16 5,597,224
72 5,597,225
84 5,597,226
100 5,597,227
101 5,597,228
153.1 5,597,229
154 5,597,230
231 5,597,231
265 5,597,232
294 5,597,233
364 5,597,234

CLASS 363
21 5,598,324
24 5,598,325
34 5,598,326
131 5,598,327
141 5,598,328

CLASS 364
150 5,598,329
424.046 5,598,337
424.08 5,598,334
5,598,336
424.094 5,598,335
436 5,598,338
449.7 5,598,339
468.17 5,598,341
468.27 5,598,340
481 5,598,342
489 5,598,343
5,598,344
5,598,345
5,598,346
491 5,598,347
5,598,348
492 5,598,349
496 5,598,350
514 A 5,598,351
5,598,352
514 R 5,598,353
5,598,354
516 5,598,355
558 5,598,356
559 5,598,357
571.01 5,598,358
578 5,598,359
579 5,598,360
725 5,598,361
736 5,598,362

CLASS 365
63 5,598,363
73 5,598,364
104 5,598,365
145 5,598,366
149 5,598,367
185.01 5,598,368
185.27 5,598,369
185.33 5,598,370
189.05 5,598,371
230.01 5,598,372
230.03 5,598,373
5,598,374
230.06 5,598,375
5,598,376

CLASS 366
76.6 5,597,235
181.5 5,597,236

CLASS 367
31 5,598,377
56 5,598,378
139 5,598,379
140 5,598,380
213 5,598,202

CLASS 368
10 5,598,381
226 5,598,382
291 5,598,383

CLASS 369
32 5,598,384
36 5,598,385
44.14 5,598,386
44.37 5,598,387
47 5,598,388
48 5,598,389
90 5,598,390
54 5,598,391
59 Re.35,435
5,598,392
102 5,598,393
112 5,598,394
116 5,598,395
124 5,598,396
244 5,598,397
272 5,598,398
275.2 5,598,399
291 5,598,400
421 5,598,296

CLASS 370
221 5,598,403
225 5,598,402
280 5,598,405
296 5,598,406
330 5,598,407
342 5,598,404
348 5,598,417
351 5,598,408
352 5,598,411
5,598,412
364 5,598,409
455 5,598,414
468 5,598,413
5,598,416
469 5,598,410
474 5,598,415
501 5,598,418
514 5,598,419

CLASS 371
20.1 5,598,420
22.3 5,598,421
37.1 5,598,422
47.1 5,598,423
48 5,598,424

CLASS 372
18 5,598,425
53 5,598,426

CLASS 374
9 5,597,237
106 5,597,238

CLASS 375
200 5,598,427
206 5,598,428
210 5,598,429
216 5,598,430
224 5,598,431
229 5,598,432
230 5,598,433
5,598,434
261 5,598,435
297 5,598,436
317 5,598,438
326 5,598,439
329 5,598,440
344 5,598,441
354 5,598,442
359 5,598,443
368 5,598,444
372 5,598,445
373 5,598,446
376 5,598,447
5,598,448

CLASS 376
195 5,598,449
435 5,598,450

CLASS 378
44 5,598,451
73 5,598,452
146 5,598,453
206 5,598,454

CLASS 379
27 5,598,455
42 5,598,456
57 5,598,457
58 5,598,458
5,598,459
59 5,598,460
67 5,598,461
94 5,598,401
95 5,598,462
97 5,598,463
213 5,598,464
266 5,598,465
389 5,598,466
398 5,598,467
410 5,598,468
433 5,598,469

CLASS 380
4 5,598,470
9 5,598,471
14 5,598,472
18 5,598,473
23 5,598,474
5,598,475
5,598,476
51 5,598,477

CLASS 381
17 5,598,478
71 5,598,479
99 5,598,480

CLASS 382
130 5,598,481
199 5,598,482
232 5,598,483
239 5,598,484
278 5,598,485
5,598,488
293 5,598,486
313 5,598,487

CLASS 384
36 5,597,239
5,597,240
517 5,597,242
551 5,597,243

CLASS 385
12 5,568,489
14 5,598,490
24 5,598,491
27 5,598,492
33 5,598,493
59 5,598,494
75 5,598,495
84 5,598,496
92 5,598,497
114 5,598,498
138 5,598,499
139 5,598,500
143 5,598,501

CLASS 386
9 5,598,273
13 5,598,274
46 5,598,276
96 5,598,278
116 5,598,277
117 5,598,275

CLASS 392
502 5,598,502

CLASS 395
2.31 5,598,504
2.35 5,598,505
2.42 5,598,506
2.55 5,598,507
8 5,598,571
22 5,598,508
5,598,509
23 5,598,510
54 5,598,511
61 5,598,512
109 5,598,513
118 5,598,514
122 5,598,515
126 5,598,516
141 5,598,517
169 5,598,520
182.05 5,598,528
182.09 5,598,529
182.19 5,598,530
183.14 5,598,333
186 5,598,531
200.01 5,598,532
200.08 5,598,533
200.09 5,598,534
200.13 5,598,535
200.16 5,598,536
224 5,598,332
281 5,598,538
284 5,598,540
286 5,598,541
297 5,598,542
309 5,598,543
326 5,598,521
348 5,598,524
352 5,598,522
5,598,523
385 5,598,546
430 5,598,548
441 5,598,549
473 5,598,550
484 5,598,551
494 5,598,552
500 5,598,553
5,598,554
507 5,598,526
520 5,598,525
555 5,598,556
557 5,598,555
562 5,598,545
563 5,598,547
602 5,598,559
605 5,598,557
652 5,598,563
674 5,598,562
705 5,598,564
706 5,598,561
707 5,598,560
750 5,598,565
5,598,566
5,598,567
765 5,598,519
793 5,598,518
800 5,598,568
5,598,569
5,598,570
5,598,572
5,598,573
5,598,574
5,598,575
822 5,598,576
830 5,598,577
835 5,598,578
842 5,598,579
855 5,598,580
872 5,598,581

CLASS 396
51 5,598,243
5,598,248
55 5,598,242
5,598,246
79 5,598,241
84 5,598,240
95 5,598,247
178 5,598,238
264 5,598,237
319 5,598,236
440 5,598,245
495 5,598,244
538 5,598,239

CLASS 398
380 5,598,544

CLASS 399
30 5,598,251
46 5,598,252
85 5,598,258
240 5,598,253
262 5,598,254
316 5,598,256
364 5,598,257

CLASS 400
63 5,597,244
207 5,597,247
5,597,248
234 5,597,249
645.4 5,597,251

CLASS 401
78 5,597,252
98 5,597,253
122 5,597,254
207 5,597,255

CLASS 402
4 5,597,256

CLASS 403
144 5,597,258
263 5,597,259
319 5,597,260
354 5,597,261

CLASS 404
6 5,597,262
26 5,597,263

CLASS 405
36 5,597,264
128 5,597,265
154 5,597,266
303 5,597,267

CLASS 407
51 5,597,268
54 5,597,269
102 5,597,270
113 5,597,271
119 5,597,272

CLASS 408
199 5,597,273
204 5,597,274
239 R 5,597,275

CLASS 409
132 5,597,276

CLASS 411
134 5,597,278
432 5,597,279
508 5,597,280

CLASS 414
498 5,597,281
545 5,597,282
723 5,597,283
791.1 5,597,284
798.6 5,597,285

CLASS 415
115 5,597,286
119 5,597,287
182.1 5,597,288
200 5,597,289

CLASS 416
204 R 5,597,290

CLASS 417
310 5,597,291
322 5,597,292
410.3 5,597,293
417 5,597,294

CLASS 418
6 5,597,295
55.1 5,597,296
5,597,297

CLASS 420
532 5,597,529

CLASS 422
28 5,597,530
58 5,597,532
68.1 5,597,533
82.02 5,597,534
88 5,597,535
103 5,597,536
144 5,597,537

CLASS 423
3 5,597,538
57 5,597,531
210 5,597,539
241 5,597,540
244.01 5,597,541
305 5,597,542
380 5,597,543
472 5,597,544
484 5,597,545
573.1 5,597,546
632 5,597,547

CLASS 424
9.3 5,597,548
9.51 5,597,549
40 5,597,550
47 5,597,551
49 5,597,552
5,597,553
53 5,597,554
65 5,597,556
70.1 5,597,558
70.17 5,597,557
78.04 5,597,559
5,597,560
78.07 5,597,561
85.1 5,597,562
93.7 5,597,563
94.65 5,597,564
115 5,597,565
143.1 5,597,567
183.1 5,597,569
191.1 5,597,570
5,597,571
197.91 5,597,572
234.1 5,597,573

401 5,597,574
5,597,575
5,597,576
402 5,597,577
422 5,597,578
426 5,597,579
443 5,597,580
449 5,597,581
456 5,597,582
464 5,597,583
486 5,597,584
579 5,597,585

CLASS 425

67 5,597,586
71 5,597,587
143 5,597,588
174.4 5,597,589
5,597,590
346 5,597,591
367 5,597,592
387.1 5,597,353
410 5,597,593

CLASS 426

44 5,597,594
74 5,597,595
242 5,597,596
248 5,597,597
310 5,597,598
316 5,597,599
330.6 5,597,600
417 5,597,601
478 5,597,602
573 5,597,603
590 5,597,604
611 5,597,605
641 5,597,606
656 5,597,607
658 5,597,608

CLASS 427

8 5,597,609
58 5,597,610
113 5,597,611
152 5,597,612
162 5,597,613
5,597,614
172 5,597,615
207.1 5,597,618
228 5,597,617
244 5,597,619
262 5,597,620
554 5,597,621
563 5,597,622
575 5,597,623
5,597,624
5,597,625

CLASS 428

1 5,597,626
15 5,597,627
34.6 5,597,628
36.1 5,597,629
5,597,630
40.1 5,597,634
40.7 5,597,648
41.1 5,597,632
41.5 5,597,633
42.2 5,597,635
90 5,597,637
141 5,597,638
156 5,597,639
192 5,597,640
195 5,597,641
5,597,642
209 5,597,643
210 5,597,644
252 B1 4,983,449
364 5,597,631
370 5,597,649
5,597,650
373 5,597,651
382 5,597,652
411.1 5,597,653
514 5,597,654
595 5,597,655
647 5,597,656
680 5,597,657

CLASS 429

42 5,597,661
94 5,597,658
190 5,597,659
191 5,597,660
192 5,597,662
198 5,597,663
224 5,597,664
235 5,597,665
289 5,597,317

CLASS 430

5 5,597,666
5,597,667
5,597,668
5,597,669
30 5,597,670
49 5,597,671
5,597,672
96 5,597,673
109 5,597,674
134 5,597,675
204 5,597,676
273.1 5,597,677
331 5,597,678
503 5,597,679
523 5,597,680
5,597,681
533 5,597,682
544 5,597,683
549 5,597,684
551 5,597,685
567 5,597,686
574 5,597,687

CLASS 431

8 5,597,298
153 5,597,299
288 5,597,300
347 5,597,301

CLASS 433

8 5,597,302
74 5,597,303
75 5,597,304
141 5,597,305
173 5,597,306

CLASS 434

118 5,597,307
196 5,597,308
258 5,597,309
272 5,597,310
358 5,597,311
362 5,597,312

CLASS 435

5 5,597,688
5,597,689
6 5,597,692
5,597,693
5,597,694
5,597,696
5,597,697
5,597,698
7.21 5,597,699
7.92 5,597,700
7.93 5,597,701
18 5,597,702
23 5,597,691
25 5,597,703
5,597,704
69.1 5,597,705
69.3 5,597,707
5,597,708
69.4 5,597,709
69.6 5,597,710
5,597,711
91.41 5,597,713
100 5,597,714
118 5,597,715
129 5,597,716
172.3 5,597,717
5,597,718
194 5,597,719
221 5,597,720
235.1 5,597,721
238 5,597,722
252.32 5,597,727
262.5 5,597,728
5,597,729
5,597,730
284.1 5,597,731
290.4 5,597,732
328 5,597,725
337 5,597,726

CLASS 436

54 5,597,733
161 5,597,734
525 5,597,735

CLASS 437

2 5,597,736
8 5,597,737
21 5,597,738
5,597,739
23 5,597,740
25 5,597,741
31 5,597,742
39 5,597,743
40 5,597,744
41 5,597,745
5,597,747
43 5,597,748
5,597,749
5,597,750
5,597,751
44 5,597,752
52 5,597,753
5,597,754
5,597,755
5,597,756
59 5,597,757
60 5,597,758
5,597,759
5,597,760
127 5,597,761
169 5,597,762
195 5,597,763
5,597,764
203 5,597,765
226 5,597,766
227 5,597,767
236 5,597,768
416 5,597,746

CLASS 439

66 5,597,313
98 5,597,314
157 5,597,315
159 5,597,316
342 5,597,318
5,597,319
5,597,320
417 5,597,321
578 5,597,322
582 5,597,323
587 5,597,324
595 5,597,325
608 5,597,326
617 5,597,327
620 5,597,328
699.2 5,597,329
752 5,597,330
754 5,597,331
850 5,597,332

CLASS 440

61 5,597,333
67 5,597,245
75 5,597,334

CLASS 441

36 5,597,335
64 5,597,336
79 5,597,337
130 5,597,277

CLASS 442

195 5,597,646
382 5,597,647

CLASS 445

51 5,597,338

CLASS 446

226 5,597,339

CLASS 451

5 5,597,340
5,597,341
65 5,597,344
165 5,597,345
287 5,597,346
356 5,597,347
450 5,597,348
451 5,597,349

CLASS 452

117 5,597,350
135 5,597,351
138 5,597,352

CLASS 454

229 5,597,354

CLASS 464

68 5,597,355
119 5,597,566
131 5,597,356

CLASS 470

9 5,597,357

CLASS 472

50 5,597,358
60 5,597,359

CLASS 473

2 5,597,360
237 5,597,361
244 5,597,362
282 5,597,363
314 5,597,364
354 5,597,365
424 5,597,159
485 5,597,158
588 5,597,161

CLASS 474

82 5,597,366
110 5,597,367
204 5,597,368

CLASS 475

89 5,597,369
159 5,597,370

CLASS 477

111 5,597,371
143 5,597,372

CLASS 482

4 5,597,373
100 5,597,257
5,597,375
121 5,597,376

CLASS 501

136 5,597,769

CLASS 502

104 5,597,770
304 5,597,771
332 5,597,772
348 5,597,773

CLASS 503

227 5,597,774
5,597,775

CLASS 504

105 5,597,776
116 5,597,777
127 5,597,778
215 5,597,779
271 5,597,780

CLASS 505

120 5,597,781
480 5,597,782

CLASS 507

120 5,597,783
219 5,597,784

CLASS 508

274 5,597,785
421 5,597,506
506 5,597,786

CLASS 510

203 5,597,787
212 5,597,788
223 5,597,509
230 5,597,789
303 5,597,790
340 5,597,507
372 5,597,791
417 5,597,508
5,597,792
434 5,597,793
457 5,597,794
528 5,597,795

CLASS 514

3 5,597,796
12 5,597,797
5,597,798
5,597,799
5,597,800
5,597,801
5,597,802
5,597,803
5,597,804
5,597,805
5,597,806
26 5,597,807
33 5,597,808
37 5,597,809
54 5,597,810
55 5,597,811
118 5,597,812
159 5,597,813
5,597,814
167 5,597,815
183 5,597,816
200 5,597,817
221 5,597,818
225.2 5,597,819
230.5 5,597,820
232.8 5,597,821
247 5,597,822
250 5,597,823
252 5,597,824
255 5,597,825
5,597,826
5,597,827
275 5,597,828
283 5,597,829
5,597,830
284 5,597,831
285 5,597,832
312 5,597,833
314 5,597,834
338 5,597,835
352 5,597,836
357 5,597,837
5,597,838
5,597,839
365 5,597,840
373 5,597,841
5,597,842
376 5,597,843
400 5,597,844
419 5,597,845
450 5,597,846
509 5,597,847
539 5,597,848
648 5,597,849

CLASS 521

29 5,597,850
41 5,597,851
48.5 5,597,852

CLASS 523

213 5,597,853

CLASS 524

100 5,597,854
105 5,597,855
227 5,597,856
400 5,597,857
458 5,597,858
5,597,859
505 5,597,860
601 5,597,861

CLASS 525

61 5,597,863
64 5,597,864
71 5,597,865
74 5,597,866
5,597,867
154 5,597,868
192 5,597,869
304 5,597,870
309 5,597,871
314 5,597,872
330.1 5,597,873
331.2 5,597,874
332.8 5,597,875
481 5,597,876

CLASS 526

62 5,597,878
65 5,597,879
247 5,597,880
348 5,597,881

CLASS 528

18 5,597,882
34 5,597,884
44 5,597,885
91 5,597,886
196 5,597,887
335 5,597,888
353 5,597,889
397 5,597,890
481 5,597,891
501 5,597,892
388.35 5,597,896

CLASS 534

26 5,597,934
622 5,597,902
637 5,597,903
642 5,597,904
788 5,597,905

CLASS 536

1.11 5,597,906
23.1 5,597,908
24.3 5,597,909
5,597,910
24.32 5,597,911
63 5,597,912
123.1 5,597,913

CLASS 540

230 5,597,914
509 5,597,915

CLASS 544

127 5,597,916
130 5,597,917
234 5,597,918
242 5,597,919
250 5,597,920
343 5,597,921
354 5,597,922

CLASS 546

156 5,597,923
179 5,597,924

CLASS 548

145 5,597,925
204 5,597,926
5,597,927
5,597,928
253 5,597,929
314.1 5,597,930

CLASS 549

214 5,597,931
5,597,932
424 5,597,933

CLASS 556

11 5,597,935
148 5,597,936
190 5,597,937
436 5,597,938

CLASS 558

8 5,597,939
303 5,597,940
337 5,597,941

CLASS 560

25 5,597,942
42 5,597,943

CLASS 585

654 5,597,944

CLASS 600

16 5,597,377

CLASS 606

78 5,597,378
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01	:	5,597,041	5,597,190	5,597,711	5,598,206		5,598,557			5,598,477
		5,597,445	5,597,200	5,597,714	5,598,207		5,598,559	10	:	5,597,317
		5,597,947	5,597,216	5,597,719	5,598,260		5,598,565			5,597,573
		5,598,053	5,597,227	5,597,725	5,598,261		5,598,570			5,597,874
		5,598,401	5,597,230	5,597,765	5,598,276		5,598,573			5,597,916
		5,598,413	5,597,233	5,597,782	5,598,306		5,598,576	12	:	5,596,773
04	:	5,596,784	5,597,240	5,597,787	5,598,308		5,598,581			5,596,849
		5,596,812	5,597,244	5,597,797	5,598,317		4,870,519			5,596,859
		5,596,871	5,597,255	5,597,798	5,598,320		5,054,615			5,596,870
		5,597,000	5,597,257	5,597,799	5,598,321	08	: 5,596,800			5,596,938
		5,597,400	5,597,263	5,597,802	5,598,341		5,597,020			5,596,958
		5,597,758	5,597,295	5,597,804	5,598,344		5,597,169			5,596,987
		5,597,768	5,597,302	5,597,843	5,598,346		5,597,235			5,597,003
		5,598,086	5,597,307	5,597,856	5,598,348		5,597,276			5,597,010
		5,598,129	5,597,309	5,597,906	5,598,352		5,597,284			5,597,026
		5,598,325	5,597,320	5,597,909	5,598,353		5,597,312			5,597,056
		5,598,327	5,597,336	5,597,922	5,598,354		5,597,375			5,597,076
		5,598,382	5,597,340	5,597,964	5,598,369		5,597,529			5,597,145
		5,598,511	5,597,348	5,597,969	5,598,379		5,597,637			5,597,159
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05	:	5,597,781	5,597,378	5,598,001	5,598,406		5,598,103			5,597,196
06	:	5,596,785	5,597,410	5,598,003	5,598,408		5,598,184			5,597,350
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		5,596,809	5,597,439	5,598,009	5,598,415		5,598,366			5,597,483
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		5,596,825	5,597,457	5,598,018	5,598,419		5,598,412			5,597,519
		5,596,831	5,597,458	5,598,021	5,598,421		5,598,443			5,597,585
		5,596,833	5,597,468	5,598,026	5,598,424		5,598,458			5,597,620
		5,596,846	5,597,470	5,598,031	5,598,427		5,598,470			5,597,621
		5,596,854	5,597,481	5,598,033	5,598,450		5,598,508			5,597,663
		5,596,860	5,597,489	5,598,035	5,598,455		5,598,528			5,597,948
		5,596,861	5,597,499	5,598,042	5,598,467	09	: 5,596,899			5,597,958
		5,596,867	5,597,501	5,598,048	5,598,480		5,596,916			5,598,104
		5,596,918	5,597,505	5,598,067	5,598,483		5,596,917			5,598,142
		5,596,934	5,597,518	5,598,069	5,598,489		5,597,022			5,598,157
		5,596,937	5,597,520	5,598,071	5,598,497		5,597,095			5,598,179
		5,596,984	5,597,536	5,598,093	5,598,505		5,597,254			5,598,318
		5,596,990	5,597,559	5,598,095	5,598,507		5,597,264			5,598,487
		5,596,994	5,597,578	5,598,099	5,598,510		5,597,314			5,598,542
		5,596,995	5,597,601	5,598,108	5,598,514		5,597,349			5,350,442
		5,597,002	5,597,629	5,598,109	5,598,524		5,597,785	13	:	5,596,792
		5,597,014	5,597,635	5,598,112	5,598,526		5,597,898			5,596,836
		5,597,082	5,597,643	5,598,114	5,598,532		5,597,920			5,596,935
		5,597,092	5,597,654	5,598,115	5,598,537		5,597,973			5,596,978
		5,597,141	5,597,662	5,598,120	5,598,541		5,597,988			5,597,039
		5,597,142	5,597,668	5,598,144	5,598,546		5,598,138			5,597,071
		5,597,161	5,597,691	5,598,164	5,598,551		5,598,265			5,597,073
		5,597,184	5,597,693	5,598,194	5,598,552		5,598,342			5,597,080
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	5,597,116		5,597,474		5,597,792		5,597,821		5,598,238		5,597,393
	5,597,178		5,597,596		5,597,816		5,597,838		5,598,239		5,597,406
	5,597,181		5,597,599		5,597,830		5,597,842		5,598,257		5,597,407
	5,597,194		5,597,894		5,597,980		5,597,857		5,598,310		5,597,418
	5,597,645		5,597,937		5,597,994		5,597,866		5,598,326		5,597,420
	5,597,647		5,597,945		5,598,066		5,597,870		5,598,333		5,597,509
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	5,598,496	23 :	5,597,611		5,596,820		5,597,924		5,598,442		5,597,531
	5,598,499	24 :	5,596,774		5,596,878		5,597,931		5,598,473		5,597,605
	5,598,564		5,596,857		5,597,023		5,597,974		5,598,495		5,597,658
15 :	5,597,550		5,596,877		5,597,085		5,598,056		5,598,529		5,597,688
16 :	5,597,444		5,597,287		5,597,120		5,598,131		5,598,543		5,597,777
	5,597,746		5,597,300		5,597,202		5,598,168		5,598,580		5,597,837
	5,597,756		5,597,364		5,597,207		5,598,169	37 :	5,596,793		5,597,844
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	5,598,376		5,597,521		5,597,385		5,598,222		5,596,872		5,597,930
17 :	5,596,781		5,597,563		5,597,427		5,598,281		5,596,875		5,597,962
	5,596,797		5,597,567		5,597,487		5,598,365		5,596,880		5,598,143
	5,596,847		5,597,571		5,597,514		5,598,420		5,596,939		5,598,232
	5,596,862		5,597,709		5,597,557		5,598,432		5,597,139	44 :	5,596,834
	5,596,863		5,597,908		5,597,613		5,598,456		5,597,192		5,596,943
	5,596,936		5,597,985		5,597,618		5,598,457		5,597,199		5,597,337
	5,596,980		5,597,991		5,597,634		5,598,468		5,597,220		5,597,459
	5,597,006		5,598,005		5,597,675		5,598,523		5,597,242		5,597,678
	5,597,033		5,598,152		5,597,677		5,598,534		5,597,696	45 :	Re.35,433
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	5,597,160		5,598,492		5,598,058		5,597,133		5,597,960		5,597,423
	5,597,168		5,598,494		5,598,065		5,597,435		5,597,968		5,597,544
	5,597,182	25 :	5,596,813		5,598,074		5,597,950		5,598,072		5,597,589
	5,597,208		5,596,981		5,598,098		5,598,425		5,598,084		5,597,646
	5,597,218		5,596,993		5,598,272	36 :	5,596,775		5,598,282		5,597,731
	5,597,229		5,596,996		5,598,307		5,596,786		5,598,315	46 :	5,597,305
	5,597,234		5,597,011		5,598,309		5,596,807		5,598,316		5,597,352
	5,597,278		5,597,034		5,598,322		5,596,821	39 :	5,596,799	47 :	5,596,811
	5,597,308		5,597,044		5,598,349		5,596,886		5,596,801		5,596,830
	5,597,313		5,597,046		5,598,410		5,596,887		5,596,873		5,597,125
	5,597,319		5,597,090		5,598,535		5,596,915		5,596,912		5,597,174
	5,597,327		5,597,286	28 :	5,596,841		5,596,976		5,596,933		5,597,347
	5,597,362		5,597,290		5,596,881		5,597,100		5,596,955		5,597,353
	5,597,411		5,597,323		5,596,902		5,597,123		5,597,013		5,597,461
	5,597,448		5,597,377		5,597,162		5,597,150		5,597,068		5,597,660
	5,597,475		5,597,381		5,597,606		5,597,210		5,597,107		5,597,729
	5,597,479		5,597,421		5,597,987		5,597,222		5,597,148		5,597,891
	5,597,490		5,597,486	29 :	5,596,828		5,597,228		5,597,157		5,597,912
	5,597,530		5,597,694		5,596,944		5,597,245		5,597,167		5,598,083
	5,597,537		5,597,697		5,596,948		5,597,293		5,597,186	48 :	5,596,804
	5,597,545		5,597,733		5,597,025		5,597,298		5,597,221		5,596,853
	5,597,587		5,597,808		5,597,028		5,597,304		5,597,236		5,596,855
	5,597,604		5,597,809		5,597,036		5,597,341		5,597,249		5,596,893
	5,597,640		5,597,868		5,597,077		5,597,363		5,597,262		5,596,949
	5,597,702		5,597,897		5,597,201		5,597,369		5,597,274		5,596,974
	5,597,722		5,597,910		5,597,630		5,597,395		5,597,279		5,596,979
	5,597,823		5,598,039		5,597,762		5,597,413		5,597,282		5,597,016
	5,597,824		5,598,050		5,598,357		5,597,419		5,597,289		5,597,035
	5,597,832		5,598,364		5,598,358		5,597,438		5,597,437		5,597,040
	5,597,858		5,598,409	30 :	5,597,455		5,597,460		5,597,533		5,597,042
	5,597,859		5,598,426	31 :	5,597,206		5,597,469		5,597,595		5,597,043
	5,597,926		5,598,460		5,597,467		5,597,503		5,597,655		5,597,081
	5,597,927		5,598,463	32 :	5,597,103		5,597,527		5,597,789		5,597,108
	5,597,928		5,598,488	33 :	5,596,950		5,597,554		5,597,845		5,597,146
	5,598,090		5,598,515		5,597,267		5,597,561		5,597,865		5,597,151
	5,598,139		5,598,536		5,597,497		5,597,593		5,597,875		5,597,189
	5,598,171		5,598,568		5,597,586		5,597,603		5,597,936		5,597,195
	5,598,220	26 :	5,596,839		5,598,295		5,597,617		5,597,986		5,597,346
	5,598,288		5,596,852		5,598,560		5,597,680		5,598,063		5,597,389
	5,598,417		5,596,908	34 :	5,596,840		5,597,681		5,598,196		5,597,443
	5,598,481		5,596,952		5,596,876		5,597,685		5,598,269		5,597,454
	5,598,549		5,596,954		5,596,884		5,597,686	40 :	5,596,770		5,597,476
18 :	5,596,879		5,596,960		5,597,072		5,597,687		5,597,005		5,597,480
	5,596,892		5,596,961		5,597,112		5,597,699		5,597,093		5,597,482
	5,596,969		5,596,966		5,597,115		5,597,775		5,597,101		5,597,547
	5,597,060		5,596,970		5,597,237		5,597,806		5,597,495		5,597,548
	5,597,138		5,596,972		5,597,265		5,597,813		5,597,515		5,597,625
	5,597,301		5,596,975		5,597,310		5,597,814		5,597,664		5,597,728
	5,597,384		5,596,985		5,597,339		5,597,826		5,597,892		5,597,736
	5,597,532		5,597,027		5,597,379		5,597,841	41 :	5,596,808		5,597,737
	5,597,726		5,597,059		5,597,434		5,597,887		5,597,058		5,597,767
	5,597,836		5,597,104		5,597,506		5,597,890		5,597,149		5,597,773
	5,597,893		5,597,113		5,597,508		5,597,929		5,597,156		5,597,784
	5,598,343		5,597,173		5,597,517		5,597,944		5,597,283		5,597,817
	5,598,482		5,597,180		5,597,541		5,597,967		5,597,326		5,597,829
19 :	5,596,838		5,597,203		5,597,551		5,597,975		5,597,778		5,597,849
	5,597,172		5,597,204		5,597,552		5,597,979		5,598,059		5,597,872
	5,597,211		5,597,205		5,597,555		5,598,040		5,598,113		5,597,895
	5,597,935		5,597,209		5,597,556		5,598,052		5,598,119		5,597,959
20 :	5,596,815		5,597,213		5,597,574		5,598,070		5,598,189		5,597,961
	5,596,823		5,597,258		5,597,575		5,598,097		5,598,193		5,597,976
	5,596,889		5,597,280		5,597,579		5,598,132		5,598,200		5,597,983
	5,596,909		5,597,292		5,597,580		5,598,151	42 :	5,596,780		5,598,034
	5,598,462		5,597,331		5,597,600		5,598,181		5,596,783		5,598,057
21 :	5,596,977		5,597,370		5,597,649		5,598,185		5,596,814		5,598,102
	5,598,176		5,597,392		5,597,651		5,598,191		5,596,832		5,598,122
	5,598,251		5,597,402		5,597,700		5,598,192		5,596,845		5,598,158
22 :	5,596,947		5,597,477		5,597,710		5,598,198		5,596,851		5,598,186
	5,597,048		5,597,524		5,597,738		5,598,202		5,596,883		5,598,188
	5,597,063		5,597,566		5,597,771		5,598,204		5,596,988		5,598,225
	5,597,099		5,597,584		5,597,780		5,598,210		5,597,179		5,598,298
	5,597,158		5,597,648		5,597,788		5,598,230		5,597,316		5,598,300

	5,598,359		5,598,556		5,598,079		5,597,608		5,598,051		5,597,193
	5,598,362		5,598,569		5,598,154		5,597,850		5,598,082		5,597,354
	5,598,374		5,598,571		5,598,474		5,597,873		5,598,183		5,597,415
	5,598,377		5,598,577		5,598,517		5,598,000		5,598,439		5,597,433
	5,598,378		5,598,579	50 :	5,597,212		5,598,041		5,598,466		5,597,491
	5,598,422		4,983,449		5,597,732		5,598,234		5,598,519		5,597,639
	5,598,429	49 :	5,596,787		5,598,313	53 :	5,596,903		5,598,520		5,597,642
	5,598,431		5,597,001		5,598,367		5,597,128		5,598,562		5,597,718
	5,598,448		5,597,140	51 :	5,596,827		5,597,137		5,598,563		5,597,815
	5,598,464		5,597,185		5,596,897		5,597,277	54 :	5,596,824		5,597,869
	5,598,475		5,597,187		5,596,986		5,597,403		5,597,024		5,597,932
	5,598,493		5,597,225		5,597,057		5,597,516		5,597,401		5,597,966
	5,598,525		5,597,256		5,597,127		5,597,569		5,597,656		5,597,992
	5,598,539		5,597,275		5,597,360		5,597,707	55 :	5,596,818		5,598,547
	5,598,540		5,597,577		5,597,390		5,597,810		5,597,019		5,598,566
	5,598,545		5,597,730		5,597,416		5,597,851		5,597,062		
	5,598,550		5,597,818		5,597,447		5,598,007		5,597,079		

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01 :	377,615		377,665		377,657		377,655		377,574	45 :	377,633
04 :	377,598		377,667		377,684		377,682	32 :	377,606	48 :	377,587
	377,616		377,668		377,699		377,695		377,612		377,589
06 :	377,564		377,674	15 :	377,642	18 :	377,669	36 :	377,557		377,637
	377,570		377,675	16 :	377,575	20 :	377,676		377,607		377,647
	377,571		377,677		377,658		377,698		377,621		377,656
	377,578		377,681	17 :	377,580	25 :	377,634		377,631	49 :	377,644
	377,582		377,687		377,599		377,641	37 :	377,565	51 :	377,583
	377,585	08 :	377,569		377,617		377,683		377,568	53 :	377,672
	377,594		377,640		377,623		377,685		377,573		377,680
	377,596	09 :	377,601		377,624	26 :	377,561	39 :	377,697		377,700
	377,602	10 :	377,586		377,625		377,706	41 :	377,559	54 :	377,611
	377,614	12 :	377,577		377,626	27 :	377,584		377,560		377,670
	377,618		377,595		377,627		377,673		377,671	55 :	377,581
	377,619		377,620		377,628		377,688	42 :	377,566		377,588
	377,622		377,638		377,630	28 :	377,567		377,597		377,632
	377,651		377,639		377,654	29 :	377,572		377,653		

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06 :	9,786		9,787	17 :	9,788	25 :	9,785				

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